

STORMWATER MANAGEMENT REPORT

Prepared for:

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Block 14, Lot 1
4000 Bordentown Avenue
Borough of Sayreville
Middlesex County, New Jersey

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1. Introduction

The subject property is located at 4000 Bordentown Avenue in the Borough of Sayreville, Middlesex County, New Jersey. The property is identified as Block 14, Lot 1 on the Borough of Sayreville tax maps and is a total of 46.07 acres in size and will hereafter be referred to as “the site”. The site is bordered to the north by a park with wooded areas beyond; to the east by Bordentown Avenue and a neighboring industrial zone with wooded areas beyond; to the west by Jernee Mill Road and industrial uses with the South River beyond; and to the south by the intersection of Bordentown Avenue and Jernee Mill Road with wooded areas beyond. A tax map and aerial map are included at the beginning of Appendix G for reference.

The site is currently developed with an industrial building within the SED Zone. The proposed development consists of an industrial development consisting of two (2) warehouse buildings with optional rail access and associated parking, loading, sidewalks, and utilities. This project is a major development due to proposed disturbance greater than one acre, proposed regulated motor vehicle surface area greater than one-quarter acre of, and proposed impervious surface area greater than one-quarter acre.

This report summarizes the design objectives, methodology, and calculations for the conveyance, attenuation, treatment, and discharge of stormwater runoff leaving the site and is meant to accompany the Site Plan documents prepared by Bohler. 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*. Refer to the “Addendum to the Stormwater Management Report For Alternate Rail Design” for stormwater design modifications based on including the optional rail spurs.

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 DelMarVa 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 DelMarVa 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 Middlesex 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)	3.35	5.12	8.63
Adjustment Factor	1.00	1.01	1.03
Current Adjusted Rainfall (inches)	3.35	5.17	8.89

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

Event (year)	2	10	100
NOAA Atlas 14 Rainfall (inches)	3.35	5.12	8.63
Adjustment Factor	1.19	1.21	1.33
Future Adjusted Rainfall (inches)	3.99	6.20	11.48

2.2 Site Soils

Site soil information has been obtained from the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey database. The soil types present within the studied watershed are shown in Table 2.3. The soils consist of hydrologic soil group (HSG) Type A and Type D, therefore the CN values used in calculations are those associated with those soils. For the purpose of calculations, soils with undefined HSG are assumed to be Type D.

TABLE 2.3 - Site Soil Properties

Soil Symbol	Soil Name	Characteristics	Hydrologic Soil Group Rating
GamB	Galloway loamy sand	0-5% slopes	A/D
AtsA	Atsion sand	0-2% slopes, Northern Coastal Plain	A/D
PssA	Psammments	0-3% slopes	A
UR	Urban	N/A	undefined

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 A	HSG D
Open space, Good Condition (grass cover >75%)	39	80
Woods, Good Condition	30	77
Impervious Surfaces	98	98
Gravel	76	91

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. Full Tc calculations for each drainage area can be found in the HydroCAD summaries in Appendices A & B.

3. Pre-Development Site Conditions

The studied watershed area is a total of 61.02 acres in size, of which 25.32 acres are impervious surfaces, and consists of five unique drainage areas: Existing Drainage Areas #1 to 5, which are described in more detail below. In the pre-development condition, the site is developed with an industrial building with associated parking and loading areas. Currently, the runoff generated on site outfalls to Jernee Mill Road and various low spots in existing wetlands on-site and ultimately flows to the South River. The Existing Drainage Area Map in Appendix G illustrates the limits of each existing drainage area and how they relate to the existing site conditions.

3.1 Point of Analysis #1

Six of the existing drainage areas flow to Point of Analysis #1 located at the existing headwall across Jernee Mill Road near the western property corner. The Existing Drainage Area Map in Appendix G illustrates the identified point of analysis and how it relates to the existing topography on the site.

3.1.1 Existing Drainage Area #1A

Existing Drainage Area #1A contains 14.53 acres of land, including the entire existing roof area. The slope of the roof appears to slope to the northern side of the building where it goes through a series of pipes and ultimately flows to the existing headwall and Point of Analysis #1.

3.1.2 Existing Drainage Area #1B

Existing Drainage Area #1B contains 0.75 acres of land, of which 0.41 acres are impervious surface, and includes the portion of the loading area to the northwest of the building. The topography of the area slopes from north to south from a maximum elevation of approximately 19 to a minimum elevation of approximately 16 with slopes ranging from 1.5% to 20%. The runoff from Existing Drainage Area #1B flows from north to south and ultimately discharges to Point of Analysis #1.

3.1.3 Existing Drainage Area #1C

Existing Drainage Area #1C contains 1.68 acres of land, of which 1.28 acres are impervious surface, and includes a portion of the parking area in the middle of the site. The topography of the area slopes towards the existing inlets and stormwater infrastructure from a maximum elevation of approximately 20 to a minimum elevation of approximately 17 with slopes ranging from 2.5% to 10%. The runoff from Existing Drainage Area #1C flows through the existing stormwater infrastructure and ultimately discharges to Point of Analysis #1.

3.1.4 Existing Drainage Area #1D

Existing Drainage Area #1D contains 2.50 acres of land, of which 0.21 acres are impervious surface, and includes a portion of the lawn area on the southwestern corner of the site. The topography of the area slopes from east to west from a maximum elevation of approximately 17 to a minimum elevation of approximately 14 with slopes ranging from 1.5% to 25%. The runoff from Existing Drainage Area #1D flows to Jernee Mill Road and ultimately discharges to Point of Analysis #1.

3.1.5 Existing Drainage Area #1E

Existing Drainage Area #1E contains 8.36 acres of land, of which 6.29 acres are impervious surface, and includes the parking and loading area in the eastern portion of the site. The topography of the area slopes from south to north from a maximum elevation of approximately 21 to a minimum elevation of approximately 17 with slopes ranging from 0.67% to 50%. The runoff from Existing Drainage Area #1E flows to the existing on-site headwall and ultimately discharges to Point of Analysis #1.

3.1.6 Off-Site Area #1F

Located to the north of the proposed site, Off-Site Area #1F contains 7.60 acres of land, of which 0.13 acres are impervious surface, and includes mostly existing wooded area on the neighboring lot. Off-Site Area #1F has no proposed improvements, but runoff from this drainage area flows onto the site. The topography of the area slopes from north to south from a maximum elevation of approximately 30 to a minimum elevation of approximately 23 with slopes ranging from 2% to 50%. The runoff from Off-Site Area #1 flows through Existing Drainage Area #1E to the existing headwall in both the existing and proposed conditions and will be accounted for in the proposed stormwater management design. Off-Site Area #1E ultimately discharges to Point of Analysis #1.

3.2 Point of Analysis #2

Two of the existing drainage areas flow to Point of Analysis #2 located at the low point along the existing railroad near the western property corner. The Existing Drainage Area Map in Appendix G illustrates the identified point of analysis and how it relates to the existing topography on the site.

3.2.1 Existing Drainage Area #2A

Existing Drainage Area #2A contains 1.39 acres of land, of which 0.14 ac are impervious surface, and includes the northwest portion of the site. The topography of the area slopes from east to west from a maximum elevation of approximately 23 to a minimum elevation of approximately 15 with slopes ranging from 0.33% to 20%. The runoff from Existing Drainage Area #2A flows to the existing on-site headwall and ultimately discharges to Point of Analysis #2.

3.2.2 Off-Site Area #2B

Located to the north of the proposed site, Off-Site Area #2B contains 0.54 acres of land, all of which is wooded area on the neighboring property. Off-Site Area #2B has no proposed improvements, but runoff from this drainage area flows onto the site. The topography of the area slopes from east to west from a maximum elevation of approximately 27 to a minimum elevation of approximately 16 with slopes ranging from 2% to 50%. The runoff from Off-Site Area #2B flows through Existing Drainage Area #2A to the existing railroad in both the existing and proposed conditions and will be accounted for in the proposed stormwater management design. Off-Site Area #2B ultimately discharges to Point of Analysis #2.

3.3 Point of Analysis #3

Two of the existing drainage areas flow to Point of Analysis #3 located at the low point on-site in the northern wetlands pocket. The Existing Drainage Area Map in Appendix G illustrates the identified point of analysis and how it relates to the existing topography on the site.

3.3.1 Existing Drainage Area #3A

Existing Drainage Area #3A contains 2.06 acres of land, of which 0.80 acres are impervious surface, and includes the northern portion of the site. The topography of the area slopes generally from south to north from a maximum elevation of approximately 18 to a minimum elevation of approximately 15 with slopes ranging from 0.8% to 7%. The runoff from Existing Drainage Area #3A flows to the existing on-site wetlands and ultimately discharges to Point of Analysis #3.

3.3.2 Off-Site Area #3B

Located to the north of the proposed site, Off-Site Area #3B contains 6.53 acres of land, of which is 0.27 acres are impervious surface, but mostly consists of wooded area on the neighboring property. Off-Site Area #3B has no proposed improvements, but runoff from this drainage area flows onto the site. The topography of the area slopes from west to east from a maximum elevation of approximately 30 to a minimum elevation of

approximately 20 with slopes ranging from 2% to 10%. The runoff from Off-Site Area #3B flows through Existing Drainage Area #3A to the existing wetlands in both the existing and proposed conditions and will be accounted for in the proposed stormwater management design. Off-Site Area #3B ultimately discharges to Point of Analysis #3.

3.4 Point of Analysis #4

One of the existing drainage areas flow to Point of Analysis #4 located at the low point on-site in the southeastern wetlands pocket. The Existing Drainage Area Map in Appendix G illustrates the identified point of analysis and how it relates to the existing topography on the site.

3.4.1 Existing Drainage Area #4

Existing Drainage Area #4 contains 7.49 acres of land, of which 0.43 acres are impervious surface, and includes the southeastern portion of the lawn area. The topography of the area slopes generally from south to north from a maximum elevation of approximately 20 to a minimum elevation of approximately 15 with slopes ranging from 0.6% to 3%. The runoff from Existing Drainage Area #4 flows to the existing on-site wetlands and ultimately discharges to Point of Analysis #4.

3.5 Point of Analysis #5

One of the existing drainage areas flow to Point of Analysis #5 located at the low point on-site in the southwestern lawn area. The Existing Drainage Area Map in Appendix G illustrates the identified point of analysis and how it relates to the existing topography on the site.

3.5.1 Existing Drainage Area #5

Existing Drainage Area #5 contains 7.59 acres of land, of which 0.83 acres are impervious surface, and includes the southwestern portion of the lawn area. The topography of the area slopes generally towards the center of the lawn from a maximum elevation of approximately 17 to a minimum elevation of approximately 15 with slopes ranging from 0.5% to 3%. The runoff from Existing Drainage Area #5 flows to the existing on-site low spot and ultimately discharges to Point of Analysis #5.

4. Post-Development Site Conditions

The post-development condition for the site includes the construction of two (2) warehouse buildings and associated parking fields, loading areas, driveways, sidewalks, utility infrastructure, stormwater infrastructure, and other site improvements. The proposed site is designed in a manner that generally maintains the existing drainage patterns. The studied watershed area in the post-development condition contains the same 61.02-acre area that was studied in the pre-development condition and consists of eighteen unique drainage areas: Proposed Drainage Area #1A to J, Proposed Drainage Area #2A and B, Proposed Drainage Area #3A and B, Proposed Drainage Area #4, and Proposed Drainage Area #5, which are described in more detail below.

A proposed stormwater conveyance system will collect the runoff from the proposed buildings and impervious areas via inlets, manholes, and stormwater piping and redirect it to the proposed

underground infiltration basin, pervious pavement systems and constructed wetlands on the site. The construction of the proposed improvements will disturb approximately 46.36 acres of land and will create approximately 34.52 acres of impervious coverage on the site in the post-development condition. The Proposed Drainage Area Map in Appendix G illustrates the limits of each proposed drainage area and how they relate to the proposed site conditions

4.1 Point of Analysis #1

The fourteen drainage areas in the post development condition flow to the same Point of Analysis #1 identified in the existing condition, located near the western property corner. The proposed runoff to Point of Analysis #1 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. Refer to Section 4.7 Stormwater Quantity Controls for a summary of the pre-construction, allowable, and post-construction flows.

4.1.1 Proposed Drainage Area #1A

Proposed Drainage Area #1A consists of approximately 6.15 acres of land, of which 5.21 acres are impervious surface, and includes a portion of the roof as well as the area along the middle driveway that is conveyed directly to the wetlands. The driveways are routed through GI Manufactured Treatment Devices to provide water quality benefits prior to being discharged into the wetland area. The runoff from Proposed Drainage Area #1A is routed through Constructed Wetland #1A, and ultimately flows to the existing headwall and Point of Analysis #1.

4.1.2 Proposed Drainage Area #1B

Proposed Drainage Area #1B consists of approximately 5.41 acres of land, of which 4.41 acres are impervious surface, and includes a portion of the roof as well as the area along the middle driveway that is conveyed directly to the wetlands. The driveways are routed through GI Manufactured Treatment Devices to provide water quality benefits prior to being discharged into the wetland area. The runoff from Proposed Drainage Area #1B is routed to Constructed Wetland #1B, and ultimately flows to the existing headwall and Point of Analysis #1.

4.1.3 Proposed Drainage Area #1C

Proposed Drainage Area #1C consists of approximately 0.70 acres of land, none of which are impervious surfaces. The runoff from Proposed Drainage Area #1C is routed to Constructed Wetland #1C, and ultimately flows to the existing headwall and Point of Analysis #1.

4.1.4 Proposed Drainage Area #1D

Proposed Drainage Area #1D consists of approximately 8.13 acres of land, of which 7.23 acres are impervious surface, and includes a portion of the roof as well as the area along the left driveway that is conveyed directly to the wetlands. The driveways are routed through GI Manufactured Treatment Devices to provide water quality benefits prior to being discharged into the wetland area. The runoff from Proposed Drainage Area

#1D is routed to Constructed Wetland #1D, and ultimately flows to the existing headwall and Point of Analysis #1.

4.1.5 Proposed Drainage Area #1E

Proposed Drainage Area #1E consists of approximately 0.78 acres of land, of which 0.76 acres are impervious surface, and includes the southeastern employee parking area of Warehouse #2. The runoff from Proposed Drainage Area #1E is routed through Pervious Pavement #1 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.6 Proposed Drainage Area #1F

Proposed Drainage Area #1F consists of approximately 1.80 acres of land, of which 1.68 acres are impervious surface, and includes the middle employee parking area between of Warehouses #1 and #2. The runoff from Proposed Drainage Area #1F is routed through Pervious Pavement #2 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.7 Proposed Drainage Area #1G

Proposed Drainage Area #1G consists of approximately 0.73 acres of land, of which 0.70 acres are impervious surface, and includes the northern employee parking area of Warehouse #1. The runoff from Proposed Drainage Area #1G is routed through Pervious Pavement #3 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.8 Proposed Drainage Area #1H

Proposed Drainage Area #1H consists of approximately 11.00 acres of land, of which 10.63 acres are impervious surface, and includes the trailer parking lot in the back of the site. The runoff from Proposed Drainage Area #1H is routed through Pervious Pavement #4 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.9 Proposed Drainage Area #1I

Proposed Drainage Area #1I consists of approximately 0.76 acres of land, of which 0.74 acres are impervious surface, and includes the driveaisle in the front of Warehouse #1. The runoff from Proposed Drainage Area #1I is routed through Pervious Pavement #5 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.10 Proposed Drainage Area #1J

Proposed Drainage Area #1J consists of approximately 0.89 acres of land, of which 0.87 acres are impervious surface, and includes the driveaisle in the front of Warehouse #2. The runoff from Proposed Drainage Area #1J is routed through Pervious Pavement #6 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.11 Proposed Drainage Area #1K

Proposed Drainage Area #1K consists of approximately 2.47 acres of land, of which 2.41 acres are impervious surface, and includes the truck court of Warehouse #1. The runoff from Proposed Drainage Area #1K is routed through Basin #1 then discharges to Constructed Wetland #1 and ultimately flows to Point of Analysis #1.

4.1.12 Proposed Drainage Area #1L

Proposed Drainage Area #1L consists of approximately 2.62 acres of land, of which 0.17 acres are impervious surface, and includes the area within the site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #1L flows directly off-site into the Jernee Mill Road right-of-way and Point of Analysis #1.

4.1.13 Proposed Drainage Area #1M

Proposed Drainage Area #1M consists of approximately 1.00 acres of land, none of which are impervious surfaces, and includes the area within the site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #1M flows off-site through the rerouted headwall on-site and Point of Analysis #1.

4.1.14 Proposed Drainage Area #1N

Proposed Drainage Area #1N consists of approximately 7.60 acres of land, of which 0.13 acres are impervious surfaces, and includes the area off-site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #1N flows off-site through the rerouted headwall on-site and Point of Analysis #1.

4.2 Point of Analysis #2

Two drainage areas in the post development condition flow to the same Point of Analysis #2 identified in the existing condition, located at the low point along the existing railroad near the western property corner. The proposed runoff to Point 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. Refer to Section 4.7 Stormwater Quantity Controls for a summary of the pre-construction, allowable, and post-construction flows.

4.2.1 Proposed Drainage Area #2A

Proposed Drainage Area #2A consists of approximately 0.71 acres of land, none of which are impervious surfaces, and includes the area within the site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #2A flows off-site to the railroad and Point of Analysis #2.

4.2.2 Proposed Drainage Area #2B

Proposed Drainage Area #2B consists of approximately 0.54 acres of land, all of which are wood areas, and includes the area off-site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #2B flows through the site to the railroad and Point of Analysis #2.

4.3 Point of Analysis #3

Two drainage areas in the post development condition flow to the same Point of Analysis #3 identified in the existing condition, located at the low point on-site in the northern wetlands pocket. The proposed runoff to Point of Analysis #3 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. Refer to Section 4.7 Stormwater Quantity Controls for a summary of the pre-construction, allowable, and post-construction flows.

4.3.1 Proposed Drainage Area #3A

Proposed Drainage Area #3A consists of approximately 0.95 acres of land, none of which are impervious surfaces, and includes the area within the site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #3A flows on-site to the wetlands and Point of Analysis #3.

4.3.2 Proposed Drainage Area #3B

Proposed Drainage Area #3B consists of approximately 6.53 acres of land, of which 0.27 acres are impervious surface, and includes the area off-site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #3B flows on-site to the wetlands and Point of Analysis #3.

4.4 Point of Analysis #4

One drainage area in the post development condition flow to the same Point of Analysis #4 identified in the existing condition, located at the low point on-site in the southeastern wetlands pocket. The proposed runoff to Point of Analysis #4 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. Refer to Section 4.7 Stormwater Quantity Controls for a summary of the pre-construction, allowable, and post-construction flows.

4.4.1 Proposed Drainage Area #4A

Proposed Drainage Area #4A consists of approximately 2.25 acres of land, none of which are impervious surfaces, and includes the area within the site that does not flow through the proposed stormwater improvements or detention basins. The runoff from Proposed Drainage Area #4A flows on-site to the wetlands and Point of Analysis #3.

4.5 Point of Analysis #5

In the post development condition, no drainage areas flow to the same Point of Analysis #5 identified in the existing condition, located at the low point on-site in the southwestern lawn area. Since no runoff leaves the site in existing conditions, no runoff is proposed to leave the site in post development conditions.

4.6 Proposed Structural Stormwater Management Strategies

The eighteen drainage areas in the post development condition flow to the same points of analysis identified in the existing condition. Nine of the drainage areas, Proposed Drainage Area #1A to #1I, flow 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. Soil testpits were unable to be performed for areas of the site that are currently developed, as the site is active. The seasonal high water table elevations and infiltration rates were estimated in these areas for the stormwater design. The required testpits will be performed prior to construction.

4.6.1 Manufactured Treatment Devices

Manufactured treatment devices are proposed that will treat the runoff from motor vehicle surface areas for the water quality design storm. The Filterra and AquaPonic units are certified by the NJDEP to meet the requirements for Green Infrastructure. The Kraken Filters are certified by the NJDEP, but do not meet Green Infrastructure requirements as they are being used as pretreatment only. A copy of the certification is attached in Appendix F. Refer to Appendix D for a Summary Table of the Manufactured Treatment Devices.

4.6.2 Pervious Paving Systems

Pervious paving materials have been proposed as part of the overall site design and stormwater management system to reduce the impervious surface on site, provide 80% TSS removal for motor vehicle surfaces, and reduce the flow of runoff. The pervious paving systems have been designed to have a maximum ratio of additional inflow area to the pavement surface area of less than 3:1, a maximum surface slope of 5%, a storage bed that fully contains the water quality design storm runoff volume, and to discharge the design storm within 72 hours of a rain event.

Table 4.1 - Pervious Paving Systems Summary

Pervious Paving System #	1	2	3	4	5	6
Pervious Area (Acres)	0.29	0.54	0.24	4.16	0.56	0.72
Additional Drainage Area/Inflow Area (Acres)	0.49	1.26	0.49	6.84	0.20	0.17
Drainage Area Ratio	1.68:1	2.36:1	2.07:1	2.6:1	0.36:1	0.24:1

Max Surface Slope (%)	5	5	5	5	2	2
Underdrain Size (Inches)	6	6	6	6	15	15
Underdrain Capacity (cfs)	0.23	0.23	0.23	0.23	4.6	4.6
Drain Time (Hours)	30.5	55	29	24.5	15.5	16.5
TSS Removal	80%	80%	80%	80%	80%	80%
Water Quality Volume (cf)	2,854	6,385	2,648	39,925	2,792	3,267
Depth of BMP (Feet)	3.75	4.64	3.75	2.73	2.0	2.0
Number of Testpits/Borings	4	0*	0*	17	0*	4
Number of Required Soil Investigations	3	4	3	17	5	4
SHWT Elevation	12.1	TBD	TBD	11.76	TBD	7.0
Separation from SHWT	1.45	TBD	TBD	1.0	TBD	9.25

* Soil testing for BMPs under existing building or in active areas of the site will be performed prior to construction.

4.6.3 Small-Scale Infiltration Basins

Small-scale infiltration basins will be installed as a part of this project. The basins meet the minimum requirements of small-scale infiltration basins, including treatment of the entire water quality design storm volume, mechanical treatment devices, a minimum stone layer thickness of 6 inches, and at least 2 feet between the bottom of the stone layer and the seasonal high ground water table.

Additionally, as the site is currently developed and operation, the appropriate number of permeability tests have yet to be completed in the area of the proposed basin. Prior to construction, the required testing will be performed and a minimum infiltration rate of 1 inches per hour will be confirmed, as well as the seasonal high ground water table. The maximum design volume to be infiltrated is the Water Quality Storm Design volume, with larger storms discharged via outlet control structures. Small-scale infiltration basins achieve 80% TSS removal.

Table 4.2 - Small-Scale Infiltration Basins Summary

Infiltration Basin #	1
Drainage Area (Acres)	2.47

Pretreatment	MTD
Sand Layer Thickness (Inches)	6
Subsoil Permeability Rate (inches/hour)	TBD
Infiltration Rate Modeled (inches/hour)	0.5
Drain Time (Hours)	57
Water Quality Storm Depth (Feet)	0.2
Seasonal High Ground Water Elevation	TBD
System Bottom Elevation	10
TSS Removal	80%
Number of Testpits/Borings	0*
Number of Required Soil Investigations	4

* Soil testing for BMPs under existing building or in active areas of the site will be performed prior to construction.

4.6.4 Standard Constructed Wetlands

This project proposes a constructed wetland area and meets the minimum requirements of a constructed wetland. Pretreatment is provided to prevent heavy particles and floatables from entering the constructed wetlands. The constructed wetland has a minimum 10 acres drainage area, an outlet structure with the lowest orifice set at or above the normal water surface elevation, a mechanism that allows for the maintenance of the basin by draining the water from the basin, and water depths controlled by the outlet structure associated with the different zones of the constructed wetlands that conform to the *NJ Stormwater Best Management Practices Manual*. Additionally, the constructed wetland has been designed with two safety ledges that are 4 to 6 feet in width. The first ledge is located between 12 and 18 inches above the permanent pool elevation and the second ledge is constructed approximately 2.5 feet below the permanent pool elevation. The constructed wetland consists of four separate areas but are hydraulically connected via storm piping and is designed to function as one system.

Table 4.3 - Standard Constructed Wetlands Summary

Constructed Wetlands #	1A	1B	1C	1D
Drainage Area (Acres)	6.15	5.41	0.70	8.13
Wetlands Type	Extended Detention	Extended Detention	Extended Detention	Extended Detention
Pretreatment	Pervious Pavement, MTDs, and Leaf Screens	Pervious Pavement, MTDs, and Leaf Screens	Pervious Pavement and Infiltration Basin	Pervious Pavement, MTDs, and Leaf Screens
Pool Length-to-Width Ratio	2.75:1	1.48:1	N/A	1.36:1
Pretreatment Zone (%) ⁽¹⁾	N/A	N/A	N/A	N/A
Semi-wet Zone (%) ⁽¹⁾	913%	970%	N/A (negligible WQ Volume)	667%
High Marsh Zone (%) ⁽¹⁾	11%	14%	N/A (negligible WQ Volume)	10%
Low Marsh Zone (%) ⁽¹⁾	21%	39%	N/A (negligible WQ Volume)	20%
Pool Zone (%) ⁽¹⁾	10%	11%	N/A (negligible WQ Volume)	11%
Standing Water in High Marsh Zone (Inches)	6	6	6	6
Standing Water in Low Marsh Zone (Inches)	12	12	12	12
Standing Water in Pool Zone (Feet)	4	4	4	4
Outlet Type	Hooded	Hooded	Hooded	Hooded
Permanent Pool Water Elevation	9	9	9	9
High Safety Ledge Elevation	10	10	10	10
Low Safety Ledge Elevation	6.5	6.5	6.5	6.5
WQ Detention Time (hr)	N/A	N/A	N/A	24.00

(1) As a percentage of the Water Quality Design Storm volume.

4.6.5 Pipe Sizing

Calculations for sizing the stormwater pipe networks associated with the proposed stormwater management conveyance system can be found in Appendix E of this report. The Rational Method has been used to size the storm piping for the 25-year storm event, with calculations found in Appendix E. The calculations are based on a minimum time of concentration of 10 minute to any inlet. An Inlet Area Map is included in Appendix G. An evaluation of the existing pipe that discharges on the other side of Jernee Mill Road is also included in Appendix E.

4.6.6 Emergency Spillways

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

Table 4.4 - Emergency Spillways Summary

Emergency Spillway #	1A	1B	1C	1D
Basin is a Class IV Dam	Yes	Yes	Yes	Yes
Basin's Drainage Area (Acres)	6.15	5.41	0.70	8.13
Spillway Design Storm	150% of 100-Year	150% of 100-Year	150% of 100-Year	150% of 100-Year
Spillway Elevation	16.70	16.58	17.10	16.54
Spillway Peak Water Elevation	17.14	17.14	18.95	17.84
Top of Berm Elevation	18.14	18.14	19.95	18.84
Discharge Rate over spillway (cfs)	148.78	413.88	533.13	713.12
Velocity (fps)	1.69	1.98	3.59	3.05

4.7 Stormwater Quantity Controls

The following stormwater quantity standard technique from the *NJDEP Stormwater Management Regulations* is being applied to each drainage area as noted in Sections 4.1 through 4.5:

1. 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 proposed stormwater management facilities will consist of six pervious pavement systems, one small-scale infiltration basin, and one constructed wetlands to attenuate the flows from the drainage areas outlined in Section 4.1 utilizing the above referenced technique. Tables 4.5 and 4.6 summarize 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.

To Point of Analyses #2 to 5, the proposed runoff consists solely of areas that bypass the project's proposed stormwater management facilities. The flows from the drainage areas outlined in Section 4.2 to 4.5 are reduced in proposed conditions to meet the above referenced technique. Tables 4.7 to 4.14 summarize the existing, permitted, and proposed flow rates from the site to Point of Analyses #2 to 5, and detailed calculations can be found in Appendices A & B.

Table 4.5 - Point of Analysis #1 Existing vs. Proposed Flow Summary
Current Adjusted Precipitation Depths

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	66.26	50%	33.13	13.35
10-Year Storm	104.76	75%	78.57	36.67
100-Year Storm	185.02	80%	148.02	83.47

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.6 - Point of Analysis #1 Existing vs. Proposed Flow Summary
Future Adjusted Precipitation Depths**

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	80.92	50%	40.46	20.35
10-Year Storm	128.76	75%	96.57	50.78
100-Year Storm	244.95	80%	195.96	113.17

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.7 - Point of Analysis #2 Existing vs. Proposed Flow Summary
Current Adjusted Precipitation Depths**

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	1.45	50%	0.73	0.62
10-Year Storm	2.78	75%	2.09	1.29
100-Year Storm	5.61	80%	4.49	2.75

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.8 - Point of Analysis #2 Existing vs. Proposed Flow Summary
Future Adjusted Precipitation Depths**

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	1.94	50%	0.97	0.87
10-Year Storm	3.63	75%	2.72	1.72
100-Year Storm	7.76	80%	6.21	3.85

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.9 - Point of Analysis #3 Existing vs. Proposed Flow Summary
Current Adjusted Precipitation Depths**

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	5.24	50%	2.62	1.62
10-Year Storm	8.88	75%	6.66	3.28
100-Year Storm	16.39	80%	13.11	6.84

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.10 - Point of Analysis #3 Existing vs. Proposed Flow Summary
Future Adjusted Precipitation Depths**

	Existing Peak Flow (For Disturbed Areas)	Maximum Permitted Peak Flow		Proposed Peak Flow (For Disturbed Areas)
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	6.56	50%	3.28	2.21
10-Year Storm	11.03	75%	8.27	4.29
100-Year Storm	21.77	80%	17.42	9.39

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

Table 4.11 - Point of Analysis #4 Existing vs. Proposed Flow Summary
Current Adjusted Precipitation Depths

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	0.78	50%	0.39	0.00
10-Year Storm	1.21	75%	0.91	1.21
100-Year Storm	7.68	80%	6.14	1.78

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

Table 4.12 - Point of Analysis #4 Existing vs. Proposed Flow Summary
Future Adjusted Precipitation Depths

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	0.96	50%	0.48	0.01
10-Year Storm	2.17	75%	1.63	0.30
100-Year Storm	16.08	80%	12.86	4.24

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

Table 4.13 - Point of Analysis #5 Existing vs. Proposed Flow Summary
Current Adjusted Precipitation Depths

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	0.00	50%	0.00	0.00
10-Year Storm	0.00	75%	0.00	0.00
100-Year Storm	0.80	80%	0.64	0.00

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

**Table 4.14 - Point of Analysis #5 Existing vs. Proposed Flow Summary
Future Adjusted Precipitation Depths**

	Existing Peak Flow	Maximum Permitted Peak Flow		Proposed Peak Flow
	CFS	% of Existing	CFS ⁽¹⁾	CFS
2-Year Storm	0.00	50%	0.00	0.00
10-Year Storm	0.00	75%	0.00	0.00
100-Year Storm	4.30	80%	3.44	0.00

⁽¹⁾ Maximum Permitted Peak Flow is the permitted percentage of existing peak flow plus off-site peak flow.

4.8 Water Quality Controls

Water quality analysis is based on the requirements of *NJDEP Stormwater Management Regulations*, which requires the use of green infrastructure to provide 80% TSS removal of post-development runoff from new regulated motor vehicle surfaces generated from the water quality design storm before discharging the runoff. A small scale infiltration basin, porous pavement areas, and green infrastructure manufactured treatment devices proposed on-site each provide 80% TSS removal. To be considered as green infrastructure, the small-scale infiltration basin is proposed with a maximum drainage area of 2.5 acres (excluding the basin area), and the porous pavement areas are proposed with a maximum additional inflow area of three times the area occupied by the porous pavement. The proposed constructed wetlands is not intended to provide water quality.

4.9 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. The soils on-site additionally provide no groundwater recharge in existing conditions, as shown in the NJDEP Annual Groundwater Recharge Analysis spreadsheet in Appendix D. Due to the conditions described above, no groundwater recharge is proposed as part of the stormwater management facilities on site.

4.10 Soil Erosion and Sediment Control

The Soil Erosion and Sediment Control plans and details are included within the Site Plan documents prepared by Bohler 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 are being submitted to the Freehold Soil Conservation District for approval.

Conduit outlet protection is provided in the form of rip-rap aprons to prevent scour and provide a stable area for water exiting the stormwater systems to reduce velocity. Additionally, off-site stability has been reviewed in accordance with the *Standards for Soil*

Erosion and Sediment Control in New Jersey (SESC Standards). Calculations for rip-rap apron sizing can be found in Appendix E.

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

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

4.11 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 disturbed areas. The majority of the existing wooded areas remain undisturbed. Stormwater runoff will be discharged in a similar manner of existing conditions. 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 80% and is below the municipal ordinance requirement of 85% maximum impervious coverage. As part of the proposed site design, the minimum allowable parking and drive aisle sizes, in accordance with local ordinances, are used in lieu of larger stalls and aisles to reduce the amount of impervious surface in the post-development condition. Pervious pavement is additionally proposed in the parking and trailer areas to reduce impervious surface.

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

The footprint of the improvements has been minimized to the previously developed area. Most of the existing wooded areas remain undisturbed. Stormwater runoff will be discharged in a similar manner of existing conditions. Wetland disturbances have been minimized to continue providing water quality benefits. Soil erosion measures are proposed to be utilized during construction to protect the adjoining wetlands, tributary corridors, and undisturbed vegetation.

4. Minimize land disturbance, including clearing and grading.

The design of the improvements proposed on the site has preserved critical natural areas as part of the development. Areas that are forested, within wetland areas, or that have demonstrated high groundwater recharge capabilities have been identified on site and are specifically left outside the limits of disturbance of the proposed development. Existing impervious surfaces within the wetland buffers will also be removed as part of this project. The natural areas will be protected during construction through the use of silt fence, construction fence, and tree-protection fencing.

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

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

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

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

Proposed stormwater inlets have been specified with “eco” type curb pieces indicating the text “Dump No Waste, Drains to Waterways” and trash racks are specified for installation at the outlet control structure. 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. However, proposed stormwater management facilities intercept stormwater from the impervious surfaces and the proposed roadways, which will provide a collection point for vehicular pollutants. The proposed infiltration basin, pervious pavement and water quality devices will improve water quality from vehicular surfaces by 80%.

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

The soil erosion and sediment control plans address the requirement for establishing vegetation. Preventative source controls include the use of “eco” inlet curb pieces, storm drain inlets, and trash racks on outlet control structures. 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.

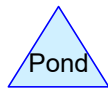
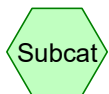
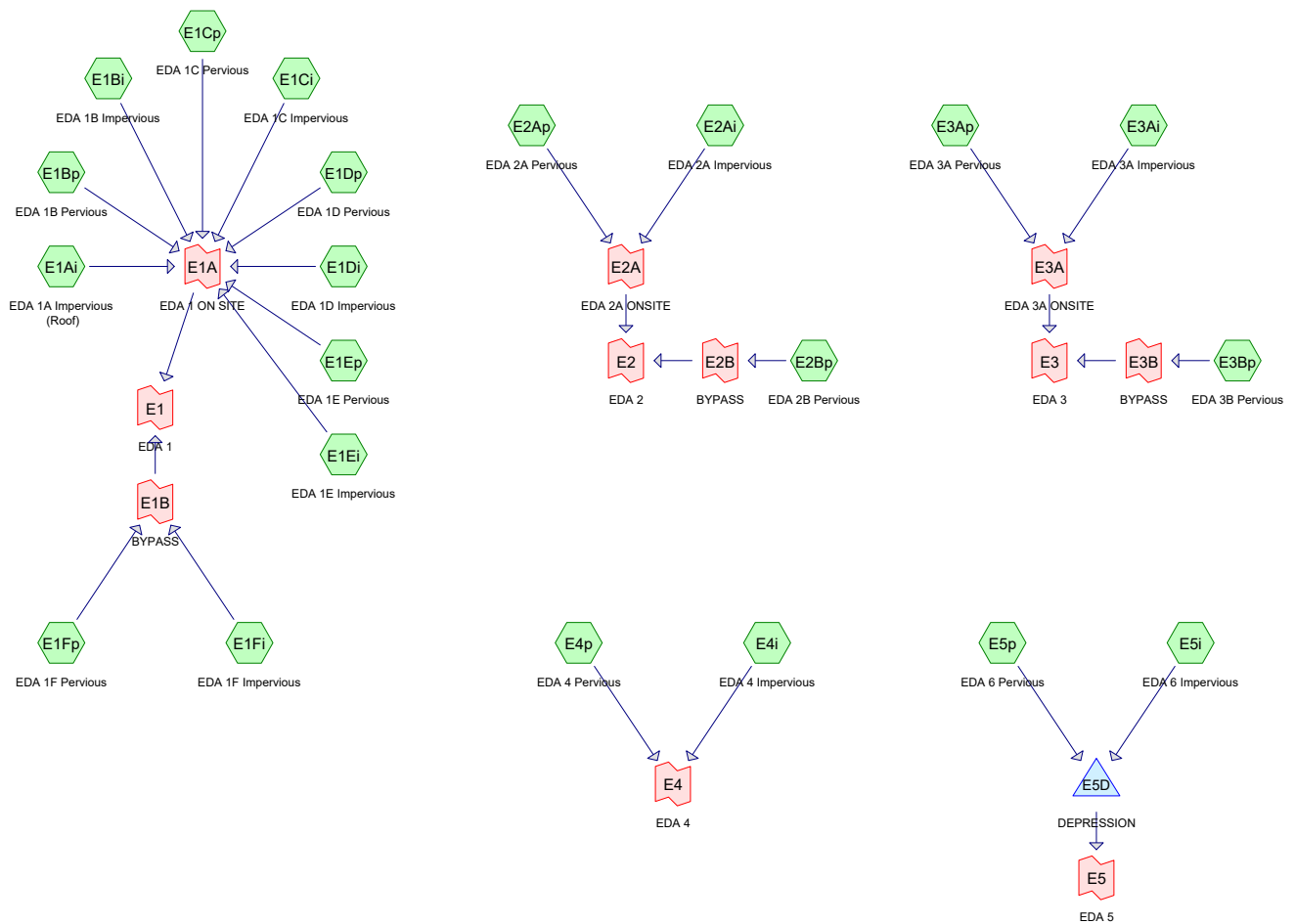
5. Conclusions

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 anticipates that the stormwater design will not have a negative impact to surrounding areas.

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

- ◆ 2-Year Storm Event without Tailwater
- ◆ 10-Year Storm Event without Tailwater
- ◆ 10-Year Storm Event with Tailwater
- ◆ 100-Year Storm Event without Tailwater
- ◆ 100-Year Storm Event with Tailwater



Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	3.35	2	3.35

Pre vs Post Rev. 3a

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Impervious Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=400' Slope=0.0100 '/' Tc=4.1 min CN=98 Runoff=42.51 cfs 164,400 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=272' Tc=2.8 min CN=98 Runoff=1.31 cfs 4,639 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=230' Tc=7.6 min CN=80 Runoff=0.43 cfs 1,874 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=265' Tc=7.5 min CN=98 Runoff=3.05 cfs 14,483 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=265' Tc=7.5 min CN=80 Runoff=0.52 cfs 2,204 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=695' Tc=19.2 min CN=98 Runoff=0.32 cfs 2,376 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=435' Tc=19.1 min CN=50 Runoff=0.06 cfs 1,335 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=441' Tc=5.4 min CN=98 Runoff=16.88 cfs 71,169 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=1.26"
Flow Length=412' Tc=8.5 min CN=76 Runoff=2.03 cfs 9,449 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=3.12"
Flow Length=861' Tc=19.4 min CN=98 Runoff=0.20 cfs 1,471 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=1.38"
Flow Length=861' Tc=19.4 min CN=78 Runoff=5.37 cfs 37,538 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=2.69"
Flow Length=382' Tc=14.9 min CN=94 Runoff=0.51 cfs 3,124 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=1.45"
Flow Length=382' Tc=14.9 min CN=79 Runoff=0.93 cfs 5,633 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.32"
Flow Length=289' Tc=12.9 min CN=77 Runoff=0.46 cfs 2,588 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=2.79"
Flow Length=218' Tc=2.9 min CN=95 Runoff=4.23 cfs 14,188 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=1.32"
Flow Length=218' Tc=2.9 min CN=77 Runoff=1.02 cfs 3,163 cf

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=1.14" Flow Length=860' Tc=19.5 min CN=74 Runoff=3.68 cfs 26,964 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=636' Tc=13.8 min CN=98 Runoff=0.78 cfs 4,865 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=636' Tc=10.9 min CN=39 Runoff=0.01 cfs 79 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=585' Tc=26.1 min CN=98 Runoff=1.08 cfs 9,391 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=585' Tc=26.1 min CN=41 Runoff=0.02 cfs 368 cf
Pond E5D: DEPRESSION	Peak Elev=15.87' Storage=9,759 cf Inflow=1.08 cfs 9,759 cf Outflow=0.00 cfs 0 cf
Link E1: EDA 1	Inflow=69.45 cfs 310,938 cf Primary=69.45 cfs 310,938 cf
Link E1A: EDA 1 ON SITE	Inflow=66.26 cfs 271,929 cf Primary=66.26 cfs 271,929 cf
Link E1B: BYPASS	Inflow=5.56 cfs 39,009 cf Primary=5.56 cfs 39,009 cf
Link E2: EDA 2	Inflow=1.90 cfs 11,345 cf Primary=1.90 cfs 11,345 cf
Link E2A: EDA 2A ONSITE	Inflow=1.45 cfs 8,758 cf Primary=1.45 cfs 8,758 cf
Link E2B: BYPASS	Inflow=0.46 cfs 2,588 cf Primary=0.46 cfs 2,588 cf
Link E3: EDA 3	Inflow=7.09 cfs 44,315 cf Primary=7.09 cfs 44,315 cf
Link E3A: EDA 3A ONSITE	Inflow=5.24 cfs 17,351 cf Primary=5.24 cfs 17,351 cf
Link E3B: BYPASS	Inflow=3.68 cfs 26,964 cf Primary=3.68 cfs 26,964 cf
Link E4: EDA 4	Inflow=0.78 cfs 4,945 cf Primary=0.78 cfs 4,945 cf
Link E5: EDA 5	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Total Runoff Area = 2,658,031 sf Runoff Volume = 381,302 cf Average Runoff Depth = 1.72"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 42.51 cfs @ 12.12 hrs, Volume= 164,400 cf, Depth= 3.12"
Routed to Link E1A : EDA 1 ON SITE

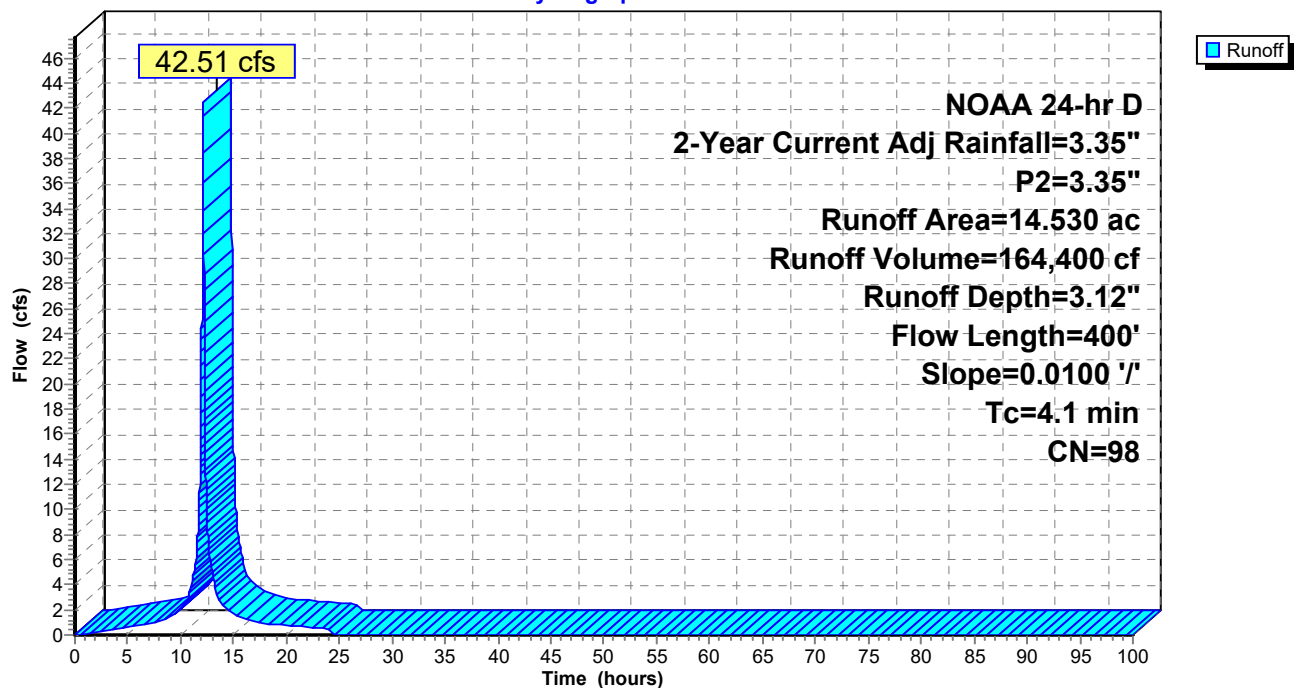
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.1	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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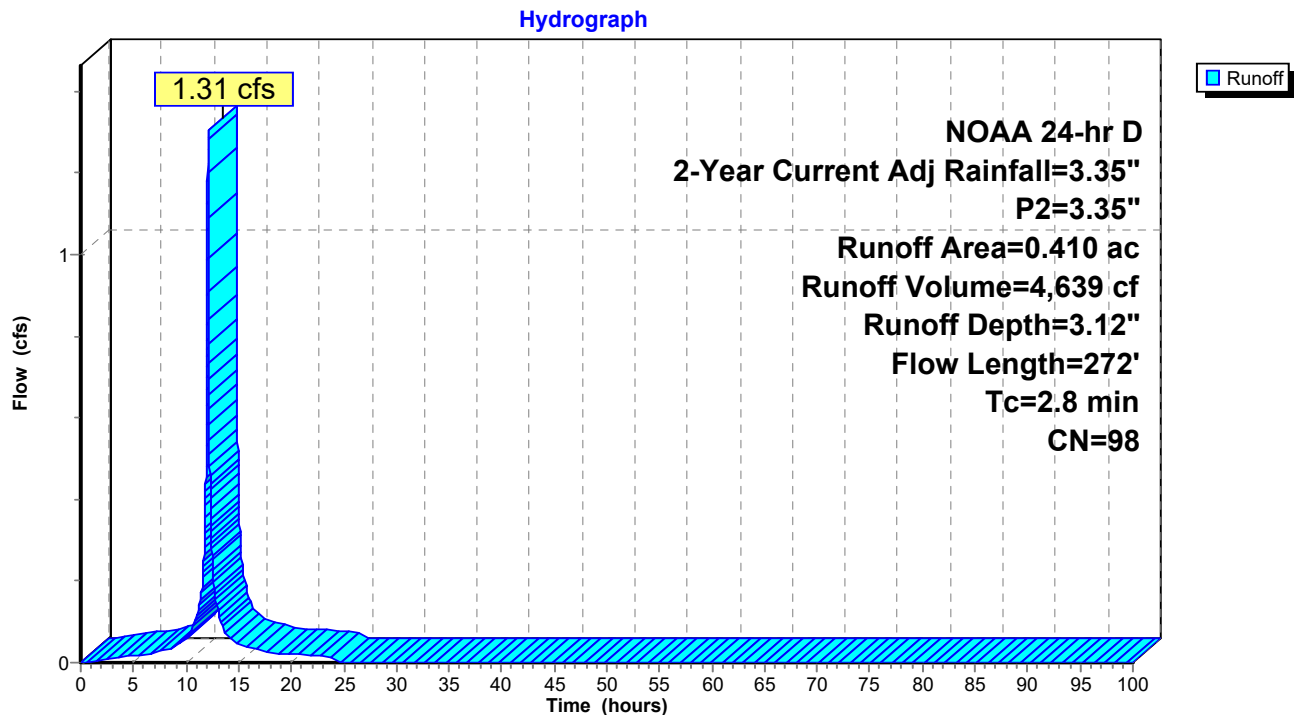
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 1.31 cfs @ 12.11 hrs, Volume= 4,639 cf, Depth= 3.12"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 0.43 cfs @ 12.16 hrs, Volume= 1,874 cf, Depth= 1.52"
Routed to Link E1A : EDA 1 ON SITE

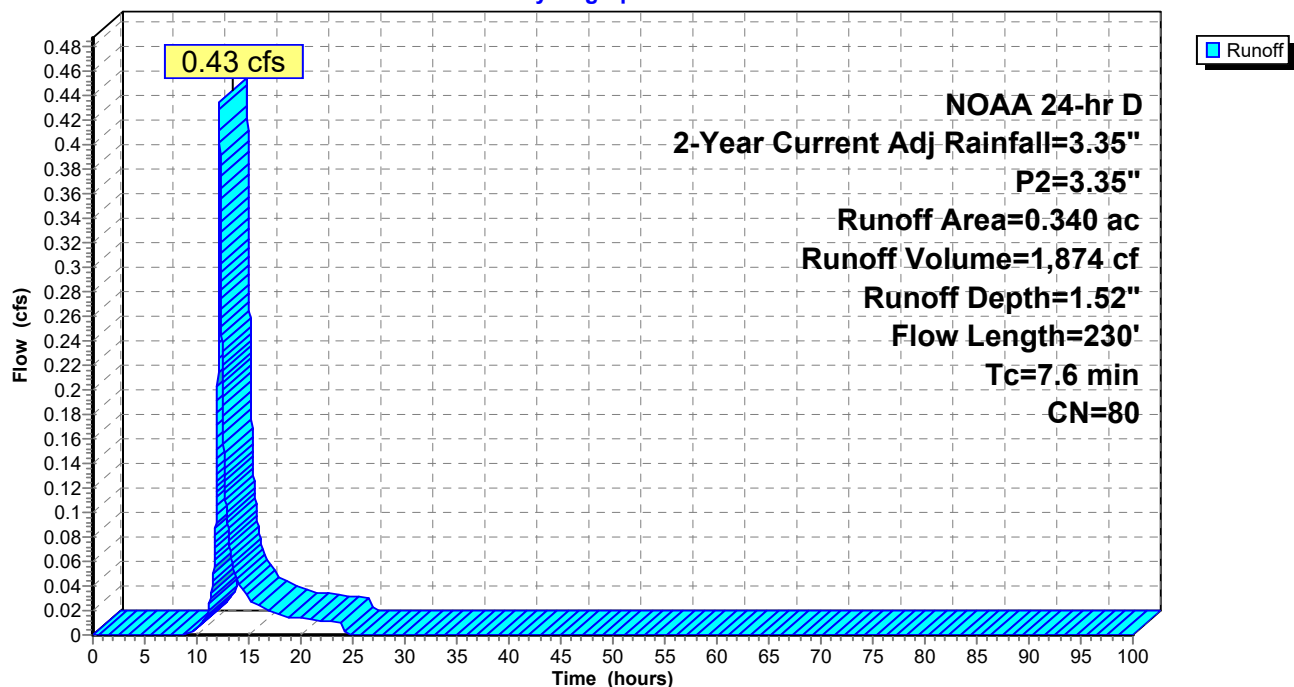
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0500	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.6	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 3.05 cfs @ 12.15 hrs, Volume= 14,483 cf, Depth= 3.12"
Routed to Link E1A : EDA 1 ON SITE

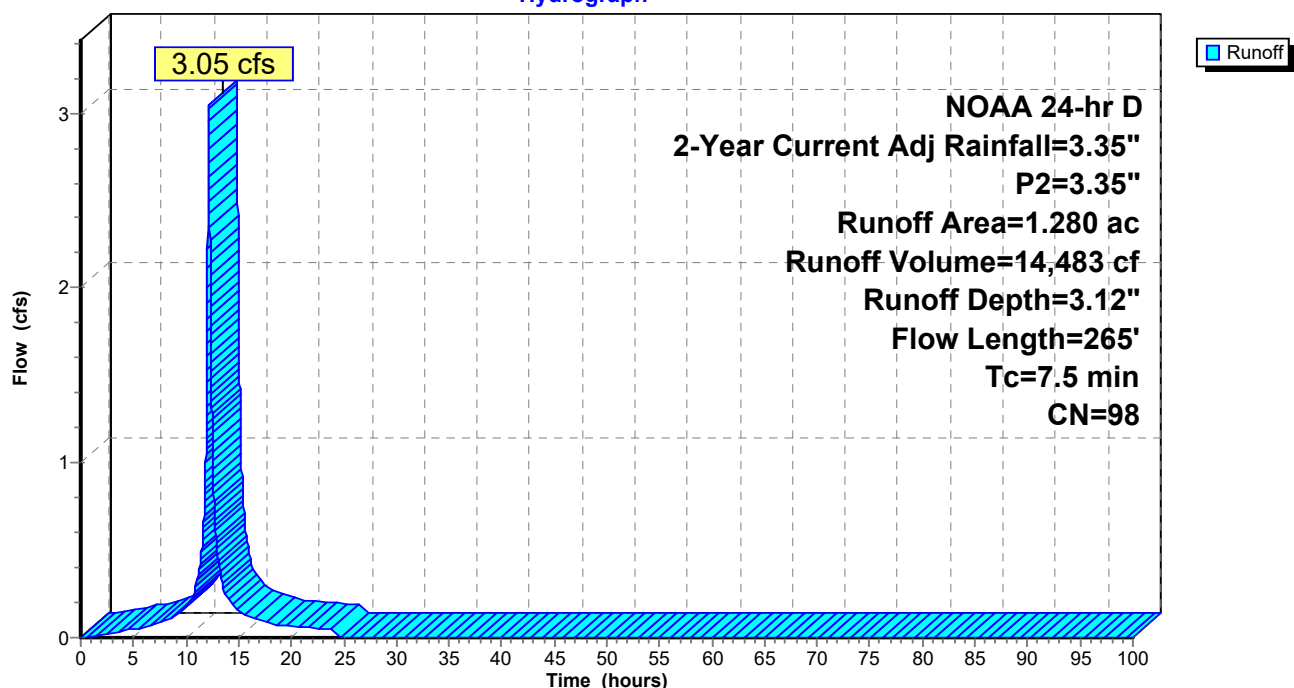
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 0.52 cfs @ 12.16 hrs, Volume= 2,204 cf, Depth= 1.52"
Routed to Link E1A : EDA 1 ON SITE

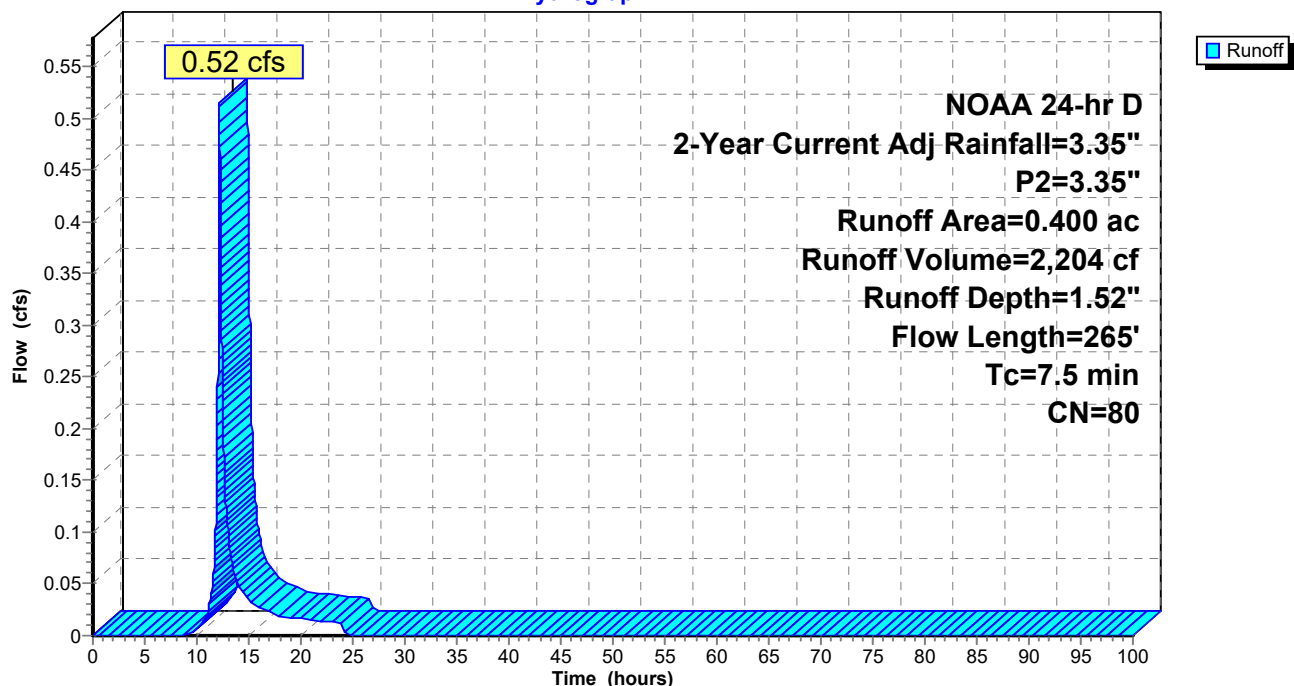
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 0.32 cfs @ 12.29 hrs, Volume= 2,376 cf, Depth= 3.12"
Routed to Link E1A : EDA 1 ON SITE

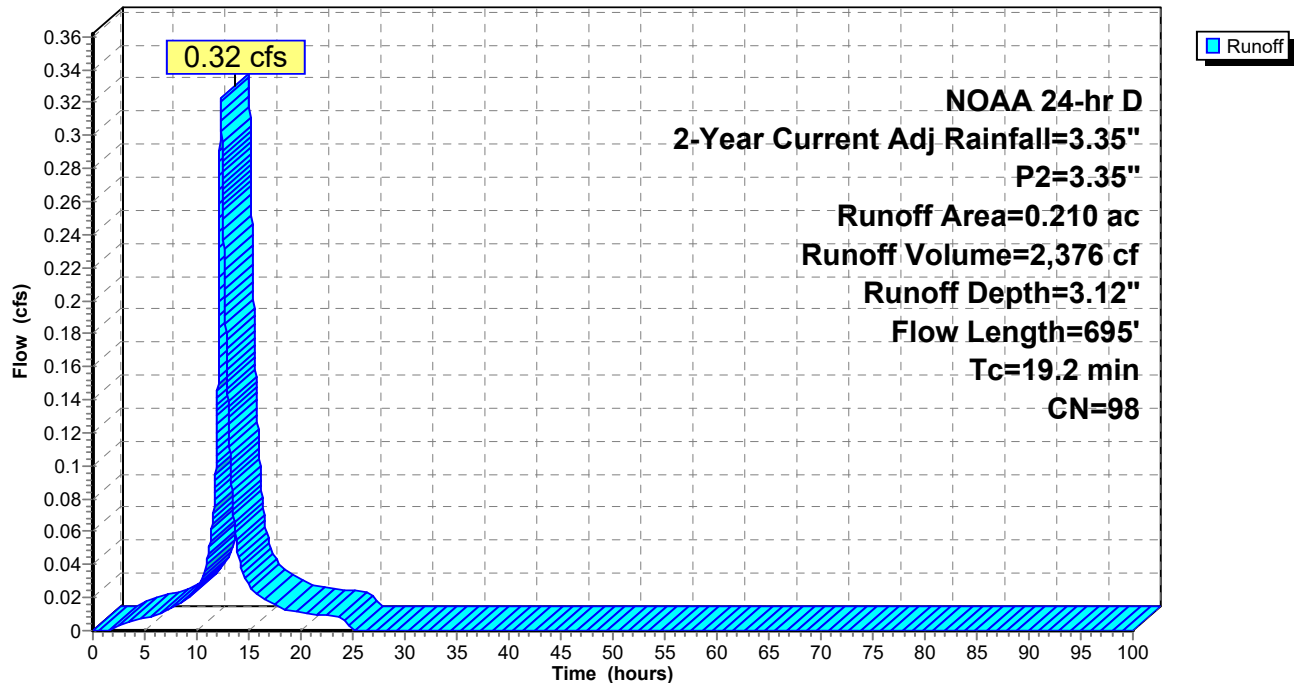
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0055	0.84		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.2	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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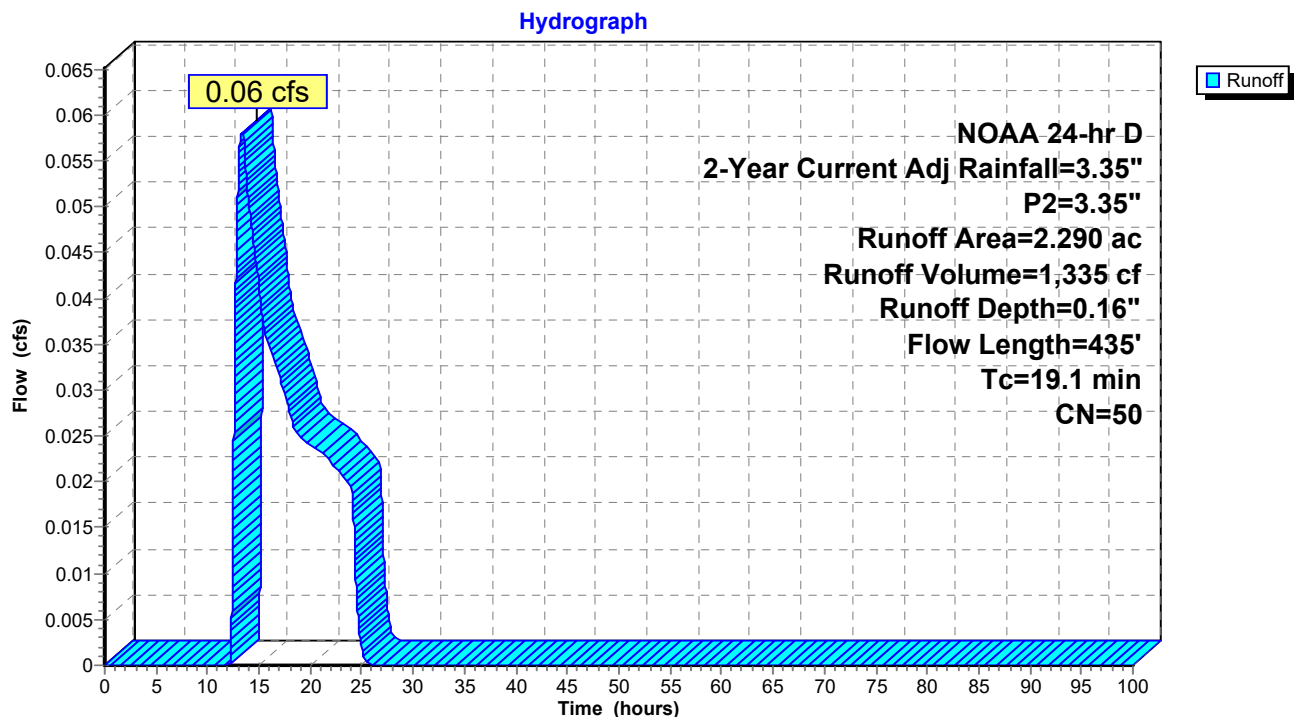
Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 0.06 cfs @ 13.33 hrs, Volume= 1,335 cf, Depth= 0.16"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.1	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Ei: EDA 1E Impervious

Runoff = 16.88 cfs @ 12.13 hrs, Volume= 71,169 cf, Depth= 3.12"
 Routed to Link E1A : EDA 1 ON SITE

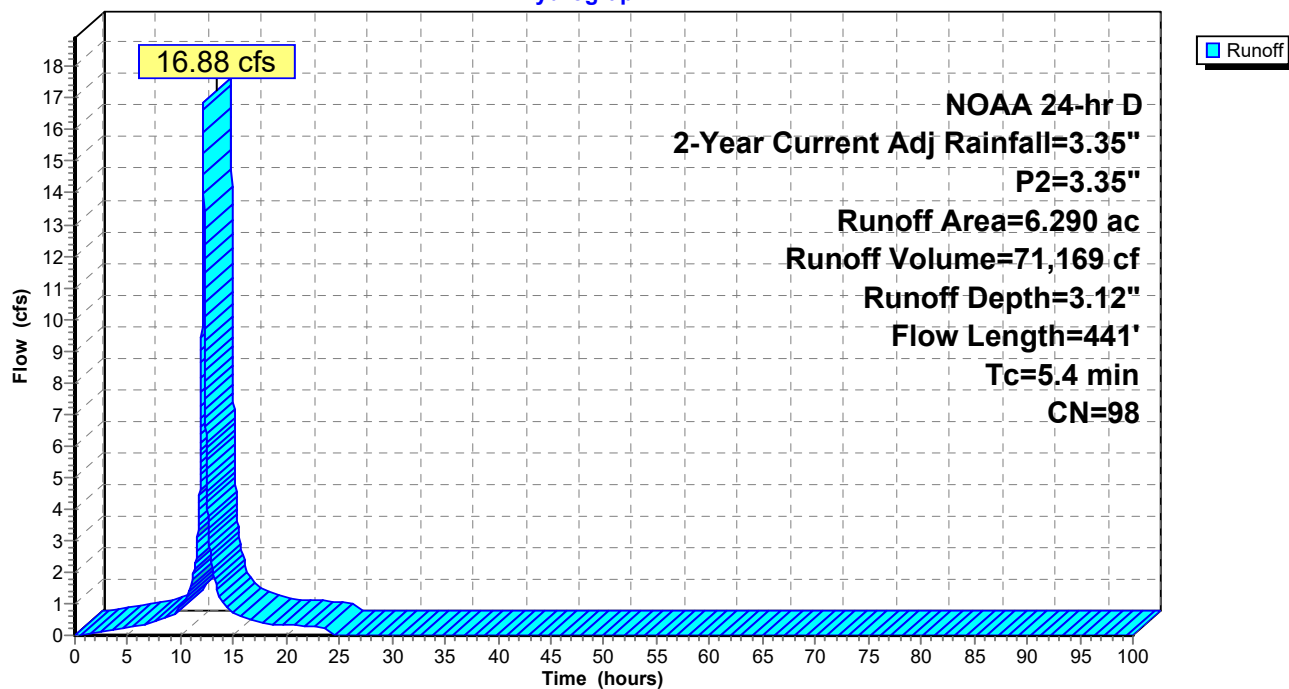
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.4	441	Total			

Subcatchment E1Ei: EDA 1E Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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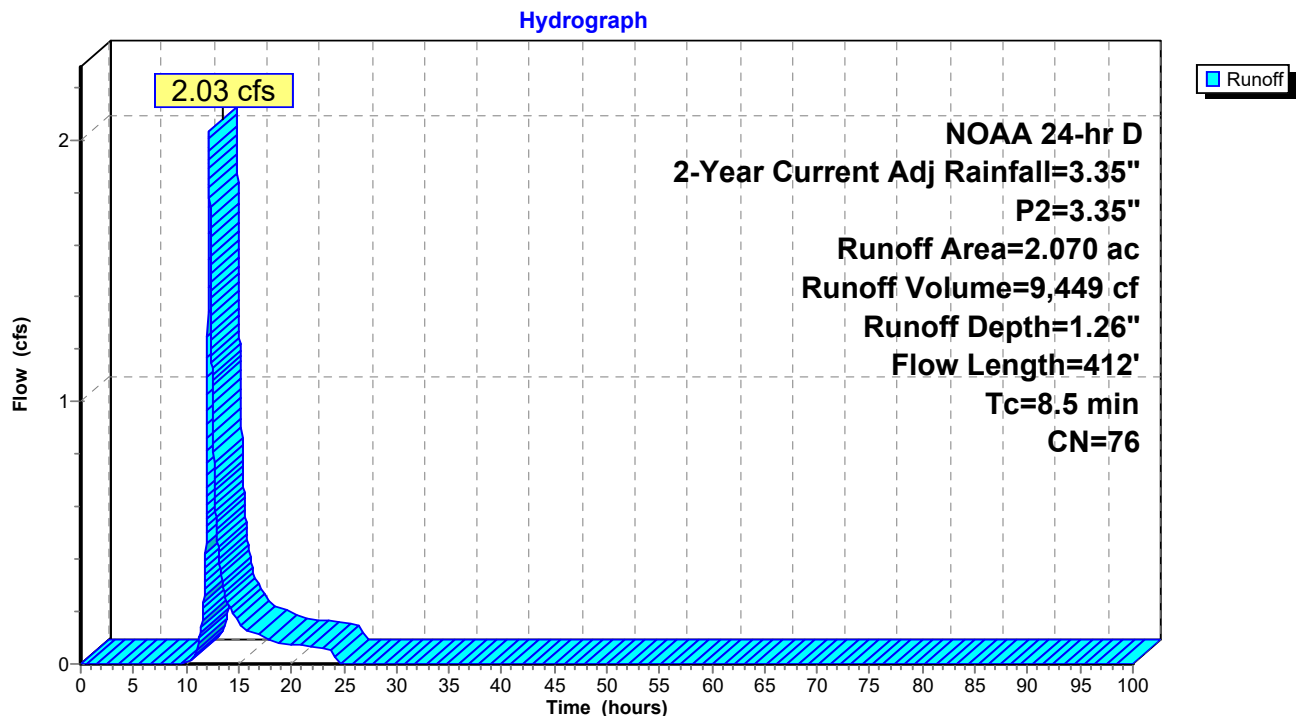
Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 2.03 cfs @ 12.18 hrs, Volume= 9,449 cf, Depth= 1.26"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	36	0.1806	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.5	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.20 cfs @ 12.29 hrs, Volume= 1,471 cf, Depth= 3.12"
Routed to Link E1B : BYPASS

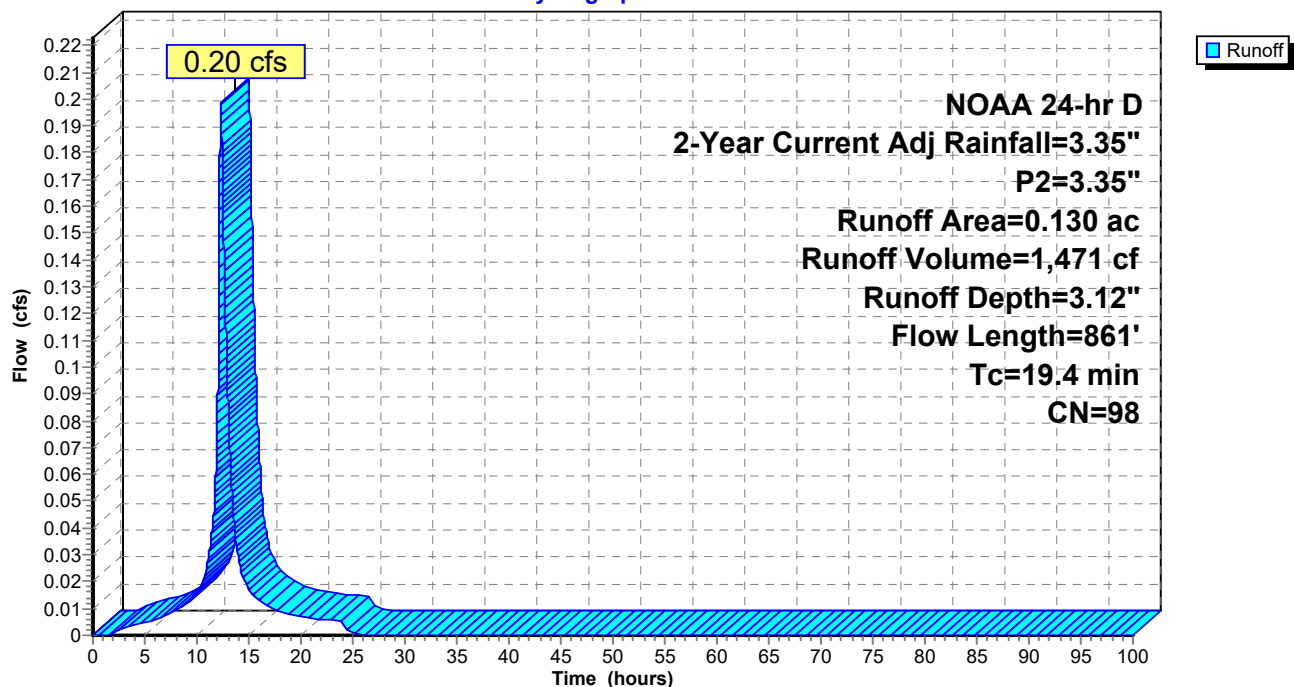
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 5.37 cfs @ 12.33 hrs, Volume= 37,538 cf, Depth= 1.38"
Routed to Link E1B : BYPASS

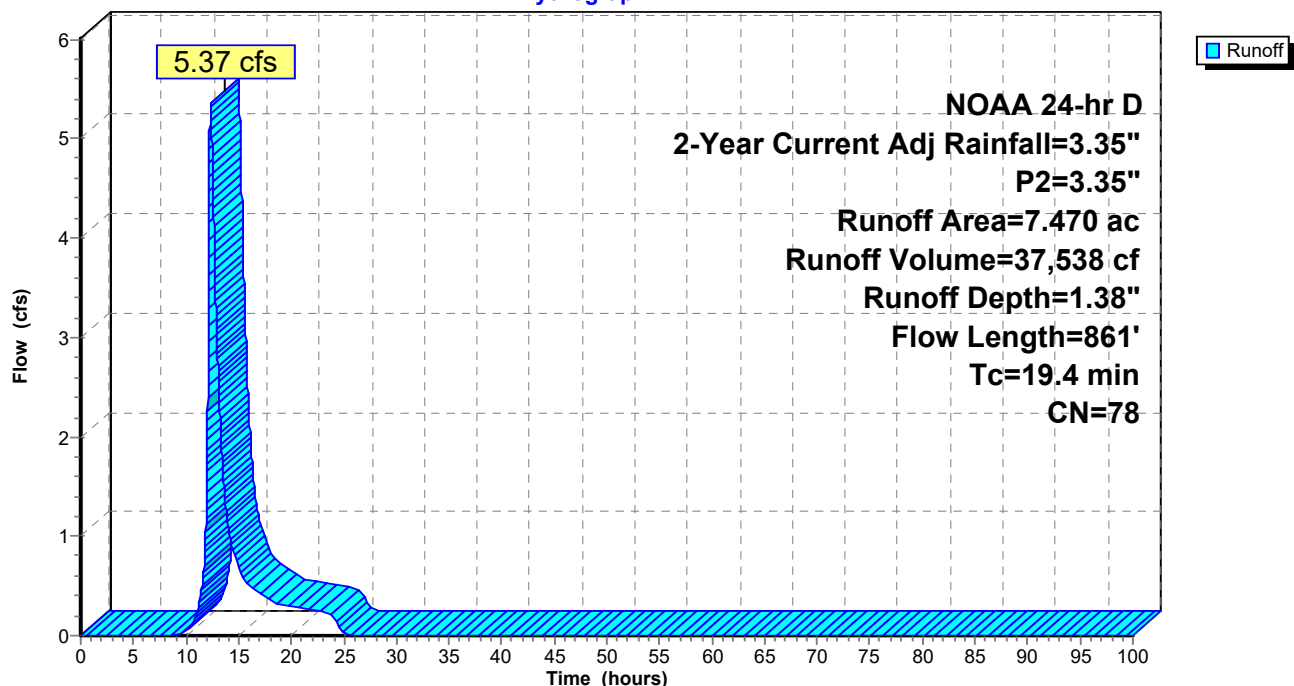
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 0.51 cfs @ 12.25 hrs, Volume= 3,124 cf, Depth= 2.69"
Routed to Link E2A : EDA 2A ONSITE

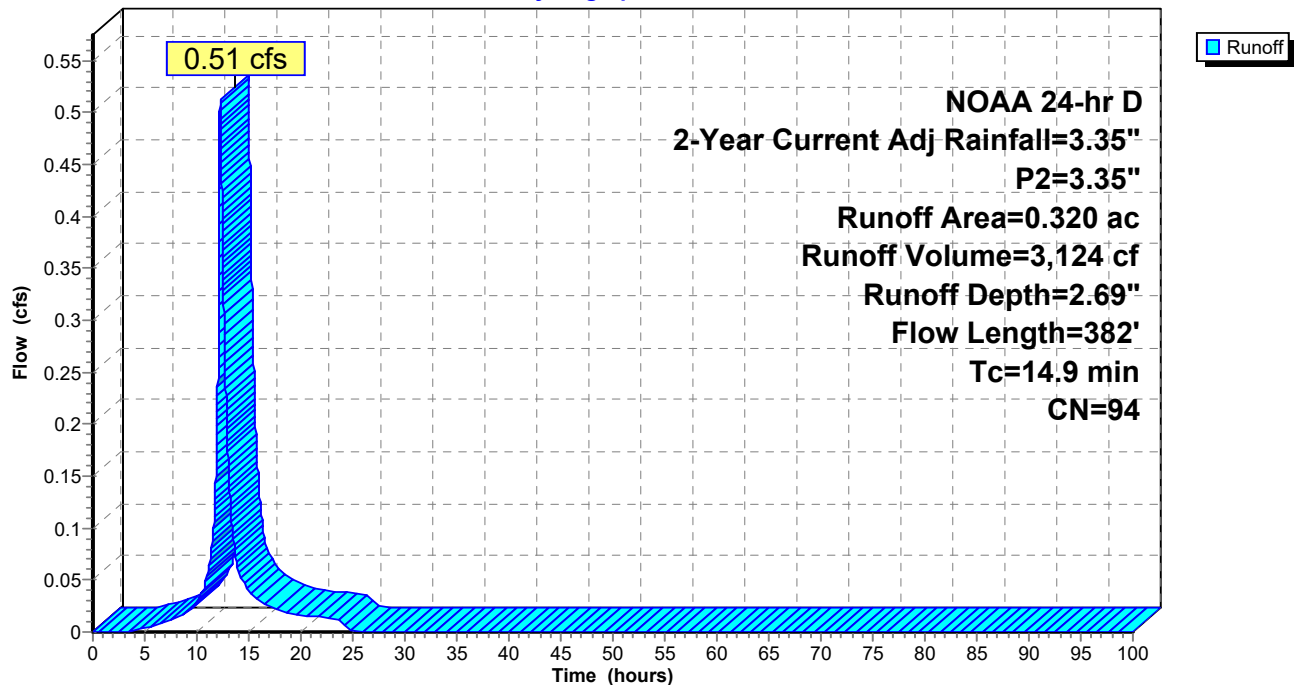
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 0.93 cfs @ 12.26 hrs, Volume= 5,633 cf, Depth= 1.45"
Routed to Link E2A : EDA 2A ONSITE

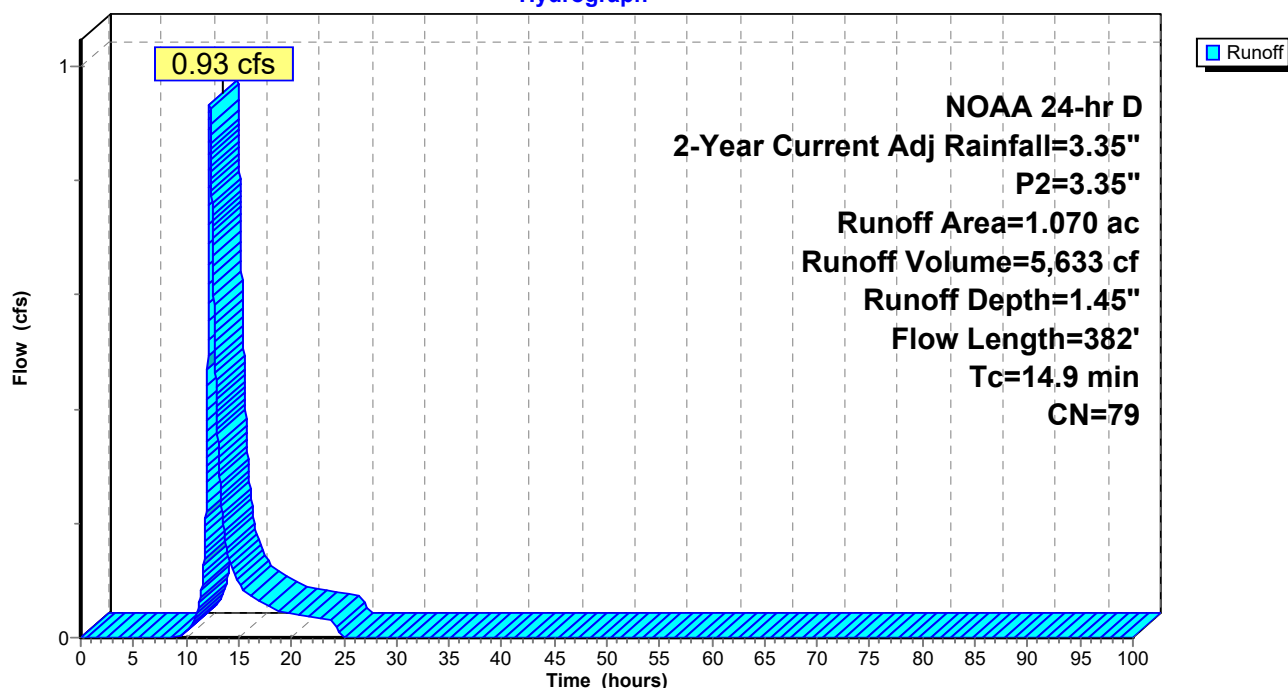
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf, Depth= 1.32"
Routed to Link E2B : BYPASS

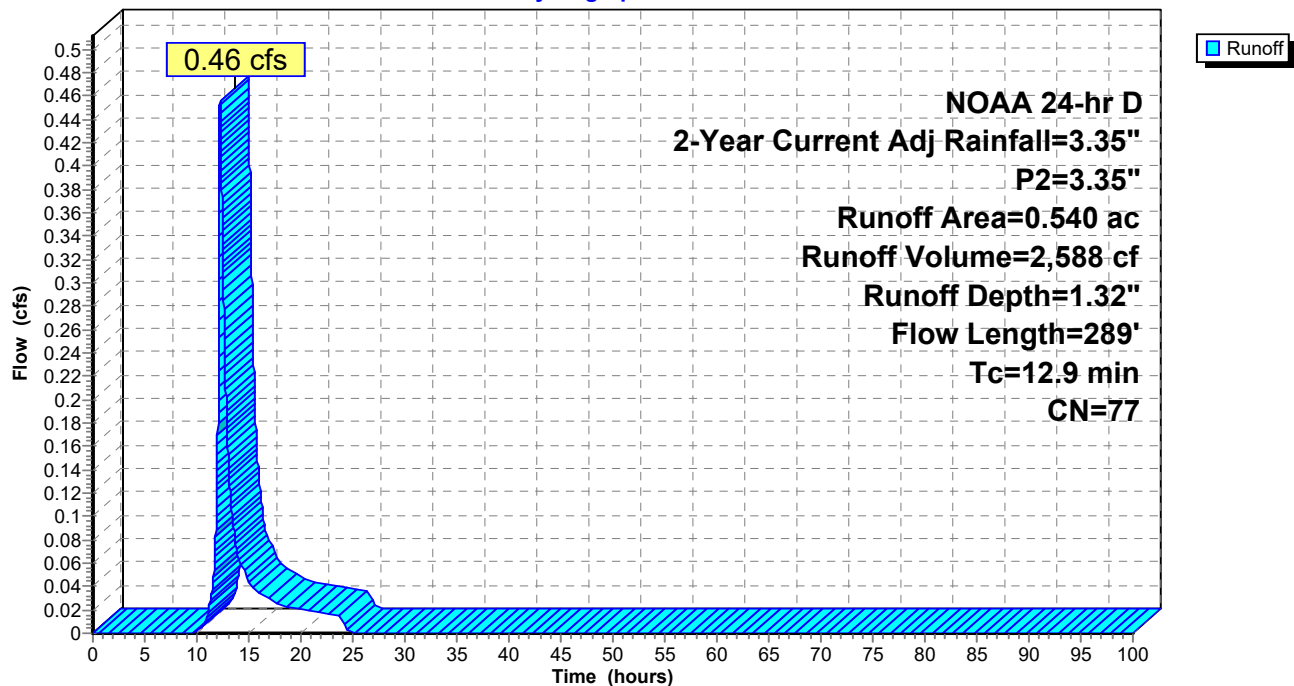
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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	46	0.0335	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.9	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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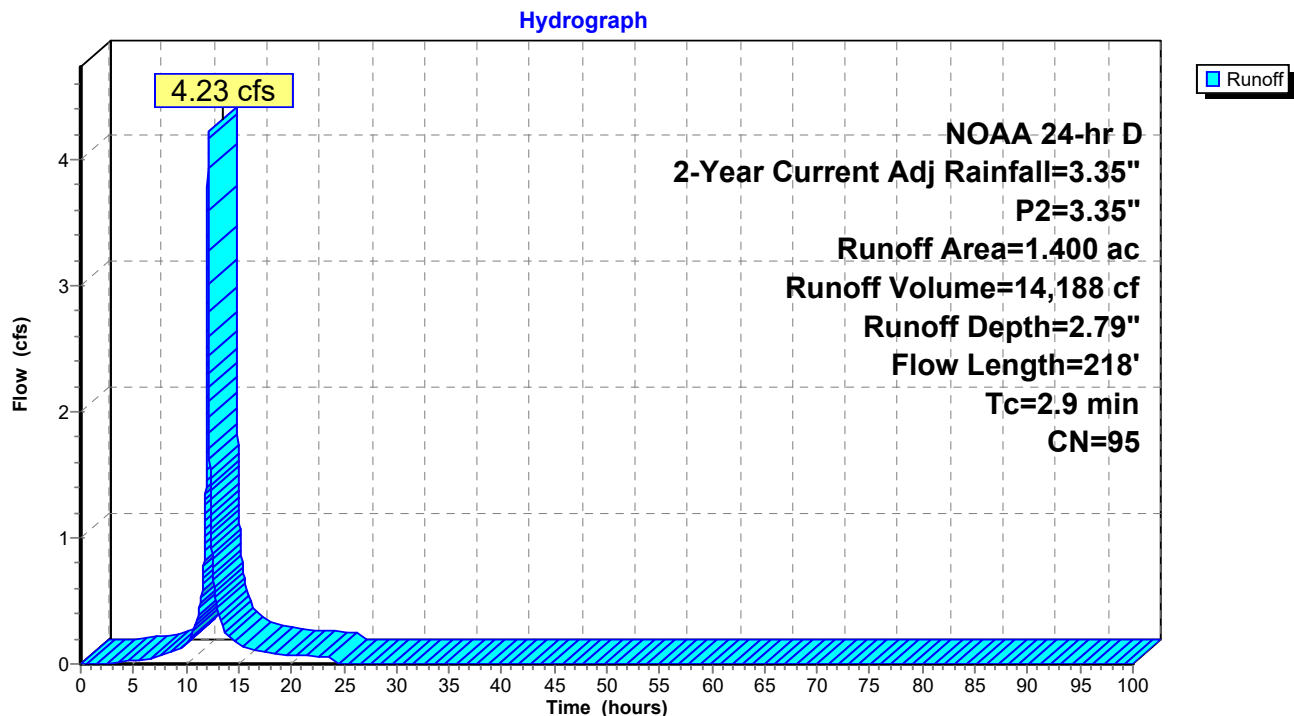
Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 4.23 cfs @ 12.11 hrs, Volume= 14,188 cf, Depth= 2.79"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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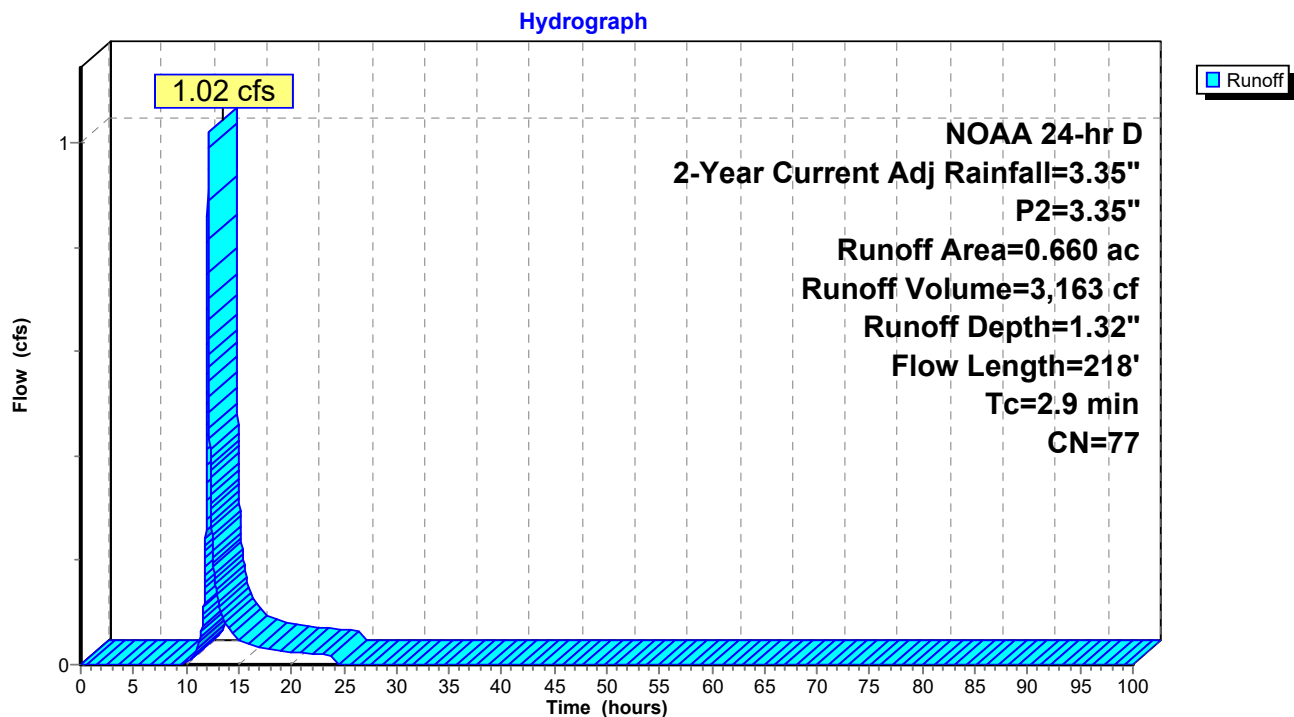
Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 1.02 cfs @ 12.11 hrs, Volume= 3,163 cf, Depth= 1.32"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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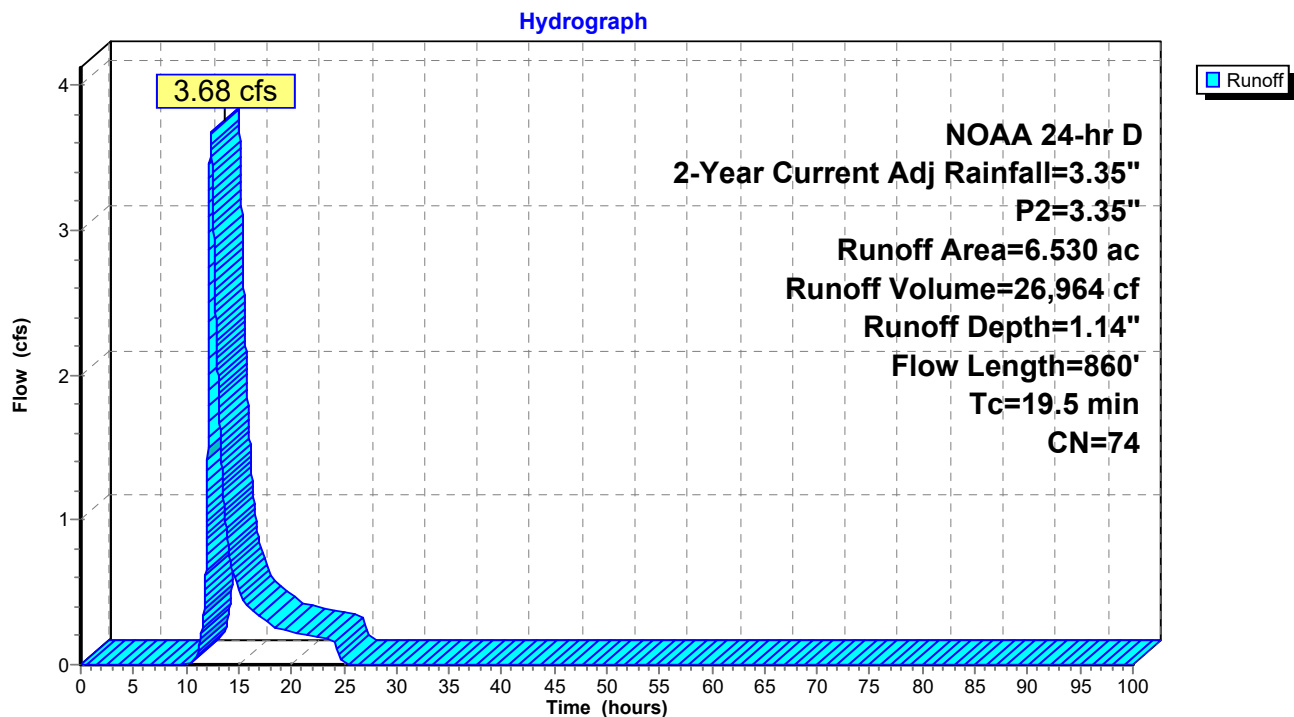
Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf, Depth= 1.14"
Routed to Link E3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	59	0.0550	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.5	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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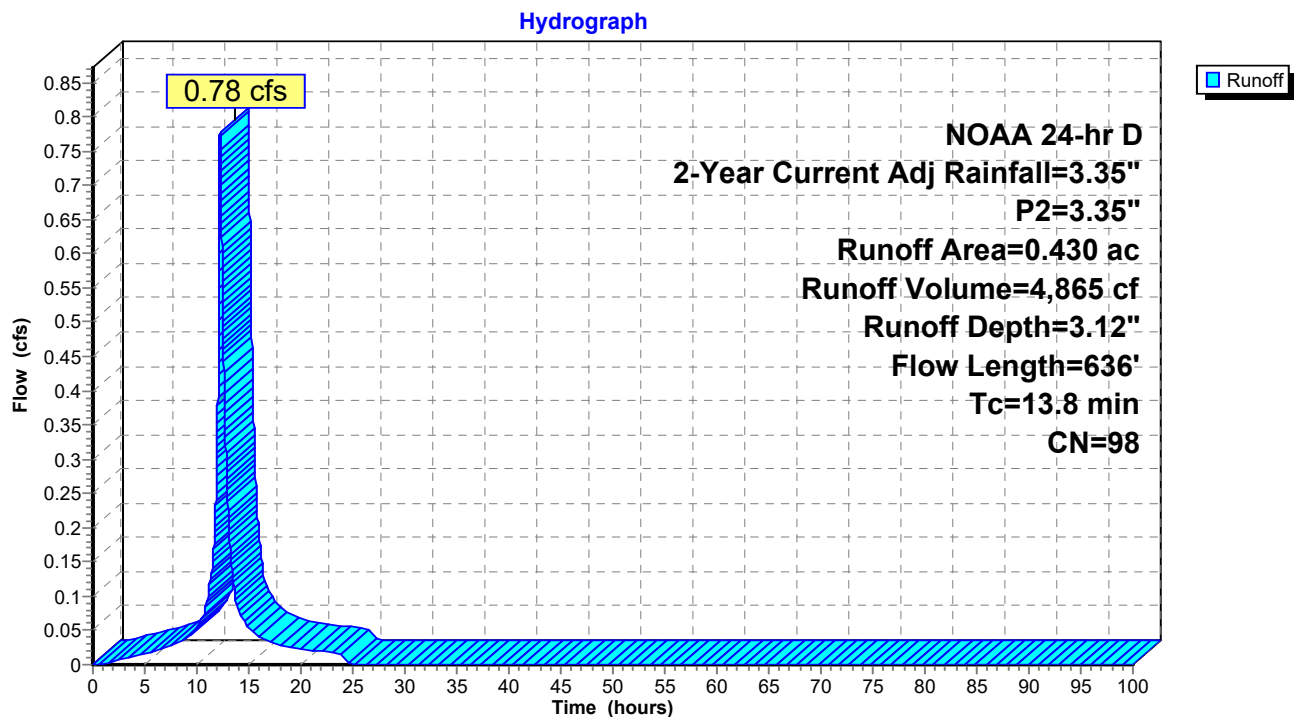
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 0.78 cfs @ 12.23 hrs, Volume= 4,865 cf, Depth= 3.12"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	636	Total			

Subcatchment E4i: EDA 4 Impervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 0.01 cfs @ 24.02 hrs, Volume= 79 cf, Depth= 0.00"
Routed to Link E4 : EDA 4

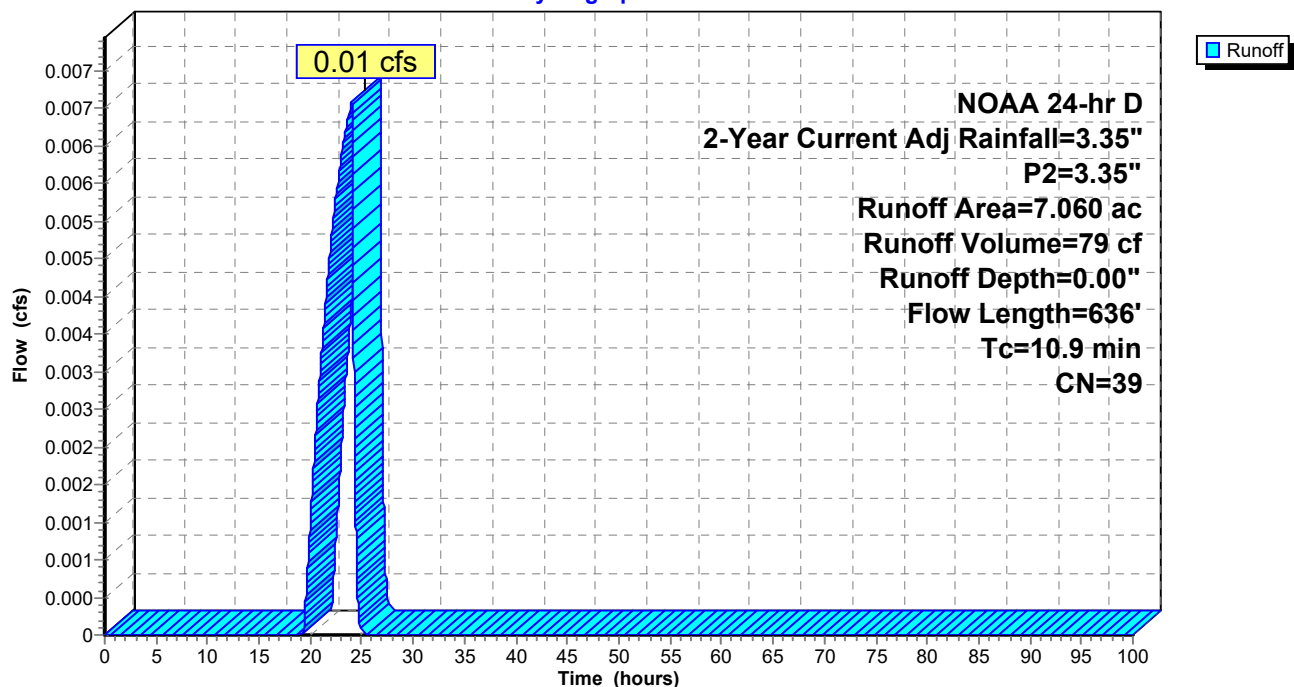
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.9	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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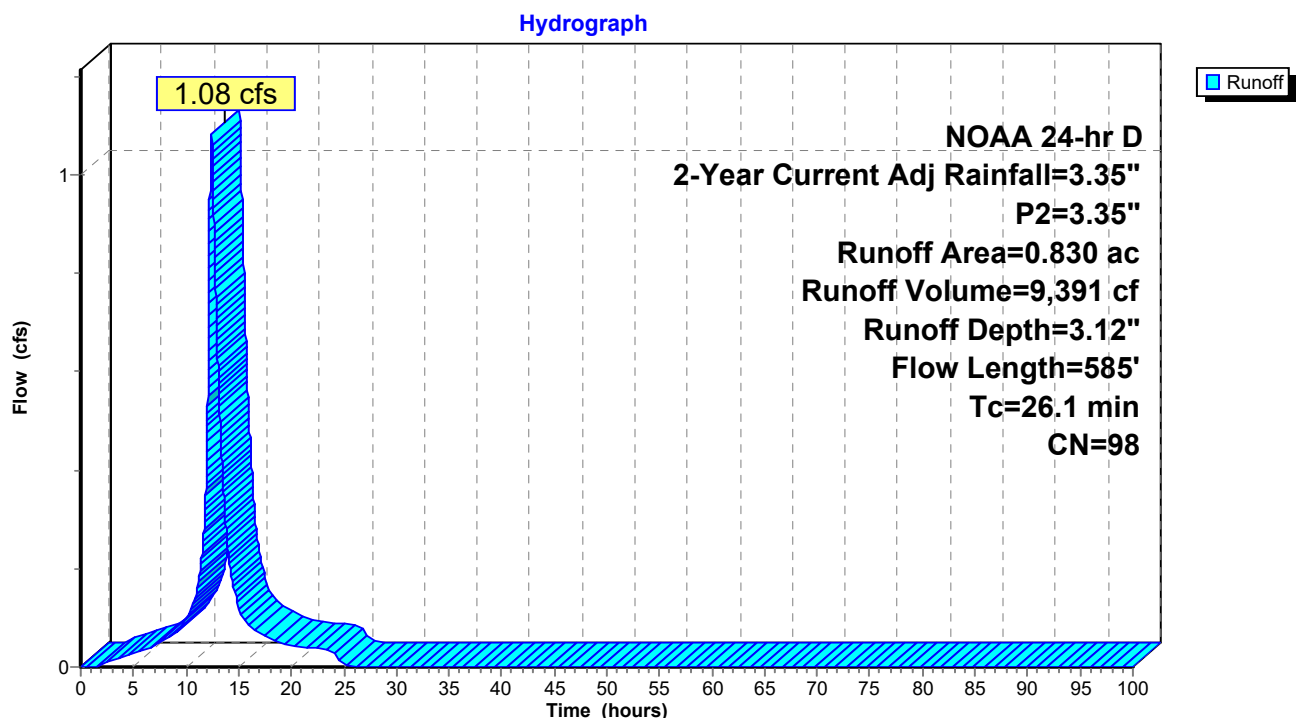
Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 1.08 cfs @ 12.41 hrs, Volume= 9,391 cf, Depth= 3.12"
Routed to Pond E5D : DEPRESSION

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5i: EDA 6 Impervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 0.02 cfs @ 23.38 hrs, Volume= 368 cf, Depth= 0.01"
 Routed to Pond E5D : DEPRESSION

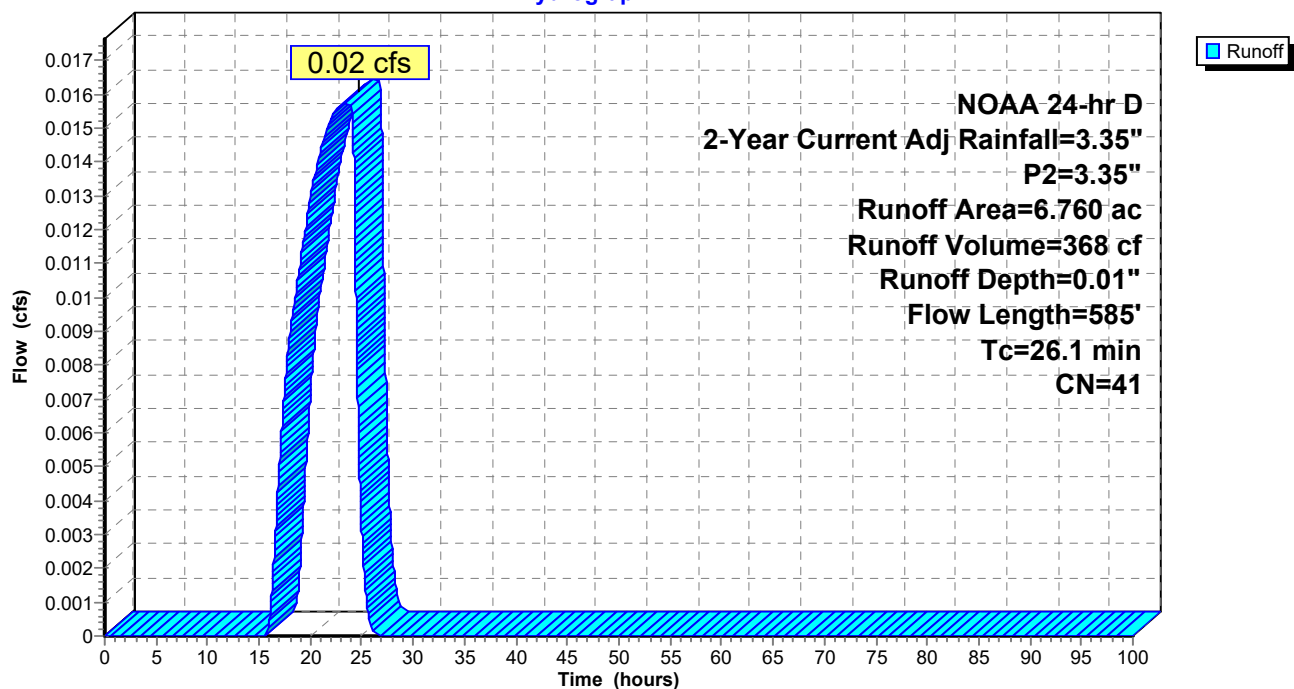
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.35" for 2-Year Current Adj event
 Inflow = 1.08 cfs @ 12.41 hrs, Volume= 9,759 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 15.87' @ 26.86 hrs Surf.Area= 35,724 sf Storage= 9,759 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

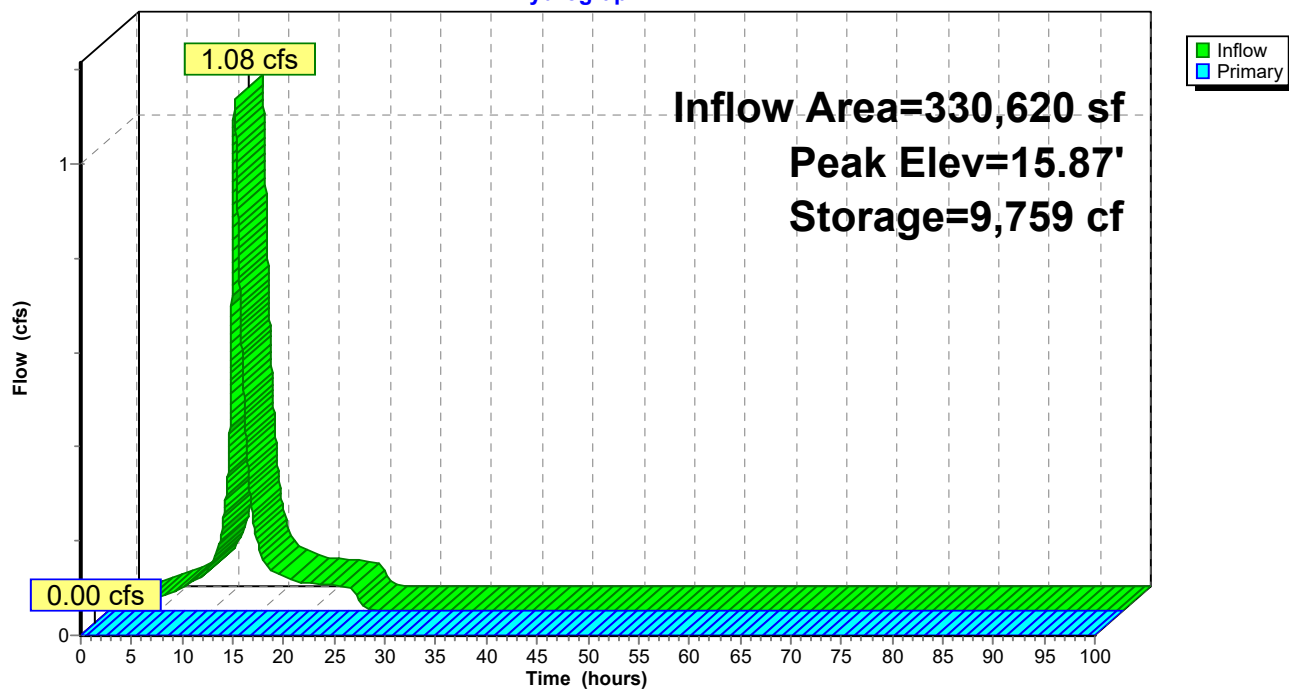
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.07' TW=0.00' (Dynamic Tailwater)↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E5D: DEPRESSION

Hydrograph



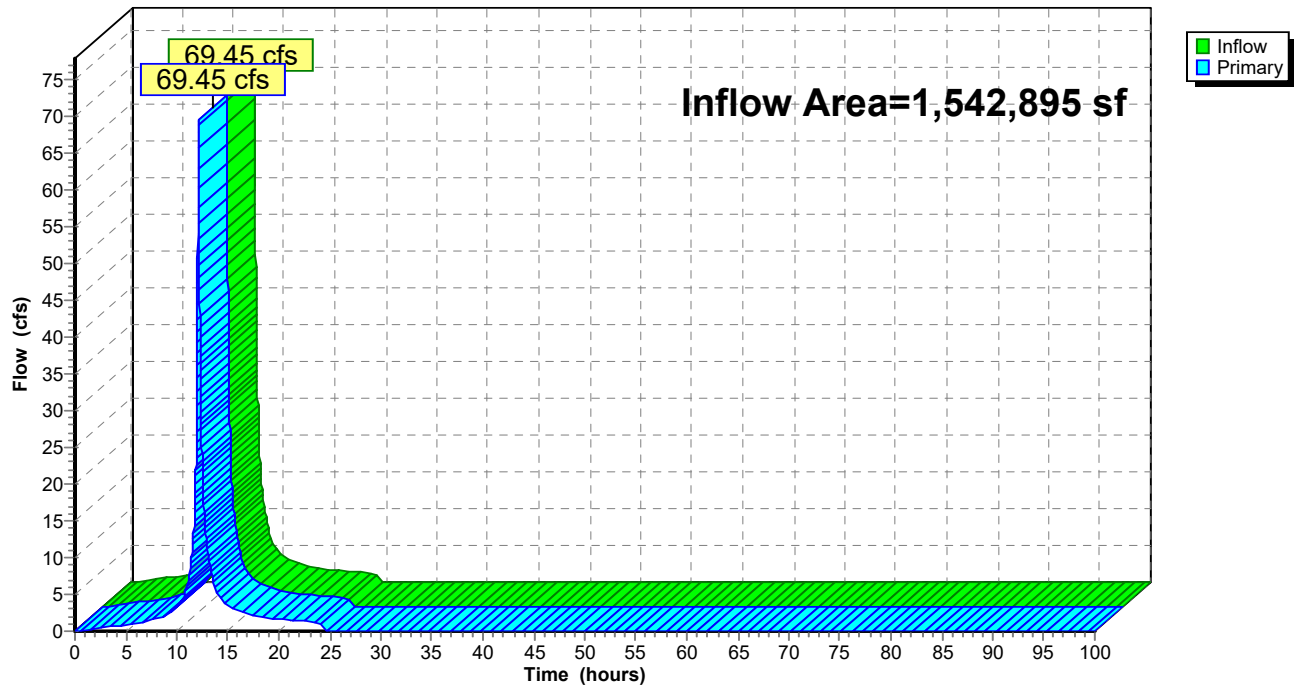
Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 2.42" for 2-Year Current Adj event
Inflow = 69.45 cfs @ 12.13 hrs, Volume= 310,938 cf
Primary = 69.45 cfs @ 12.13 hrs, Volume= 310,938 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1

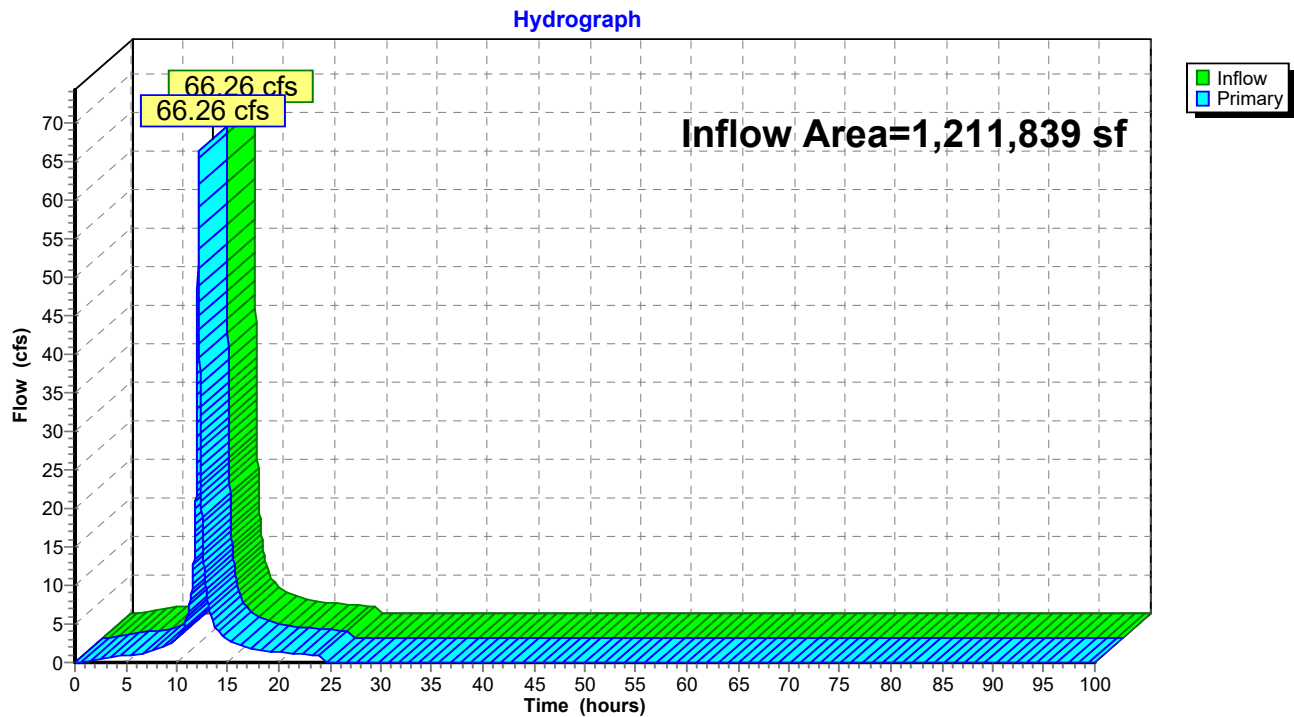
Hydrograph



Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 2.69" for 2-Year Current Adj event
Inflow = 66.26 cfs @ 12.12 hrs, Volume= 271,929 cf
Primary = 66.26 cfs @ 12.12 hrs, Volume= 271,929 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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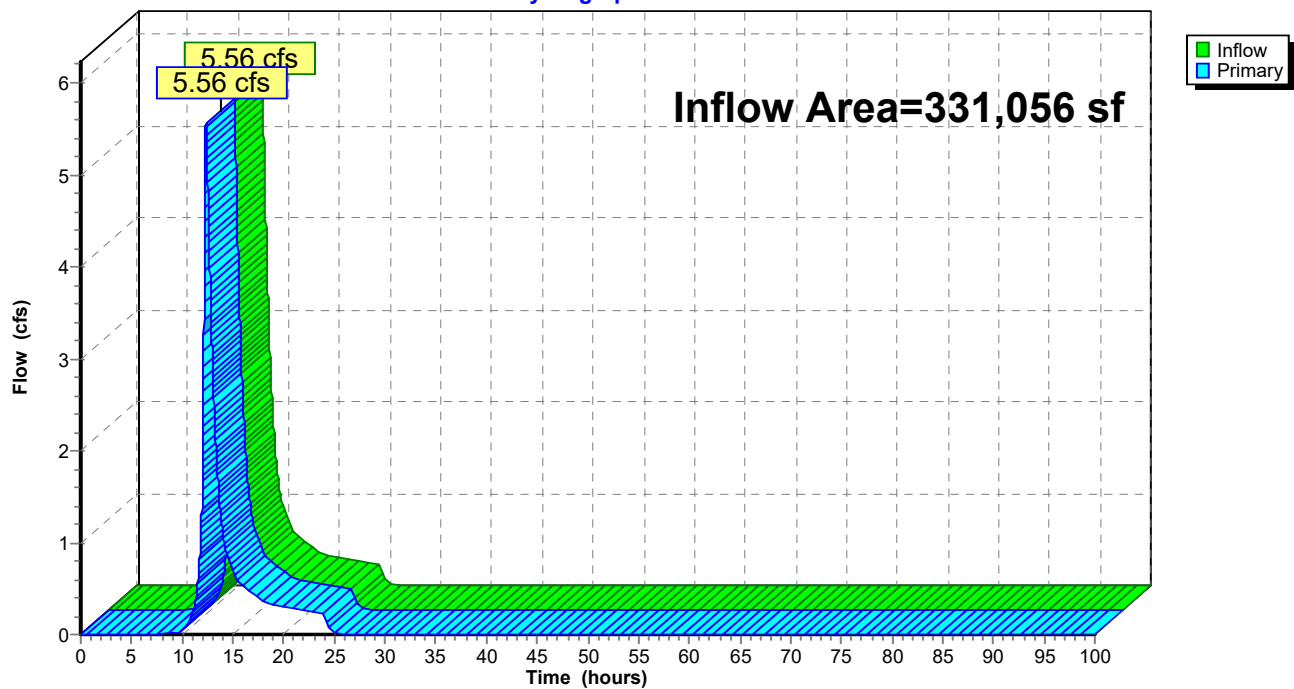
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 1.41" for 2-Year Current Adj event
Inflow = 5.56 cfs @ 12.33 hrs, Volume= 39,009 cf
Primary = 5.56 cfs @ 12.33 hrs, Volume= 39,009 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

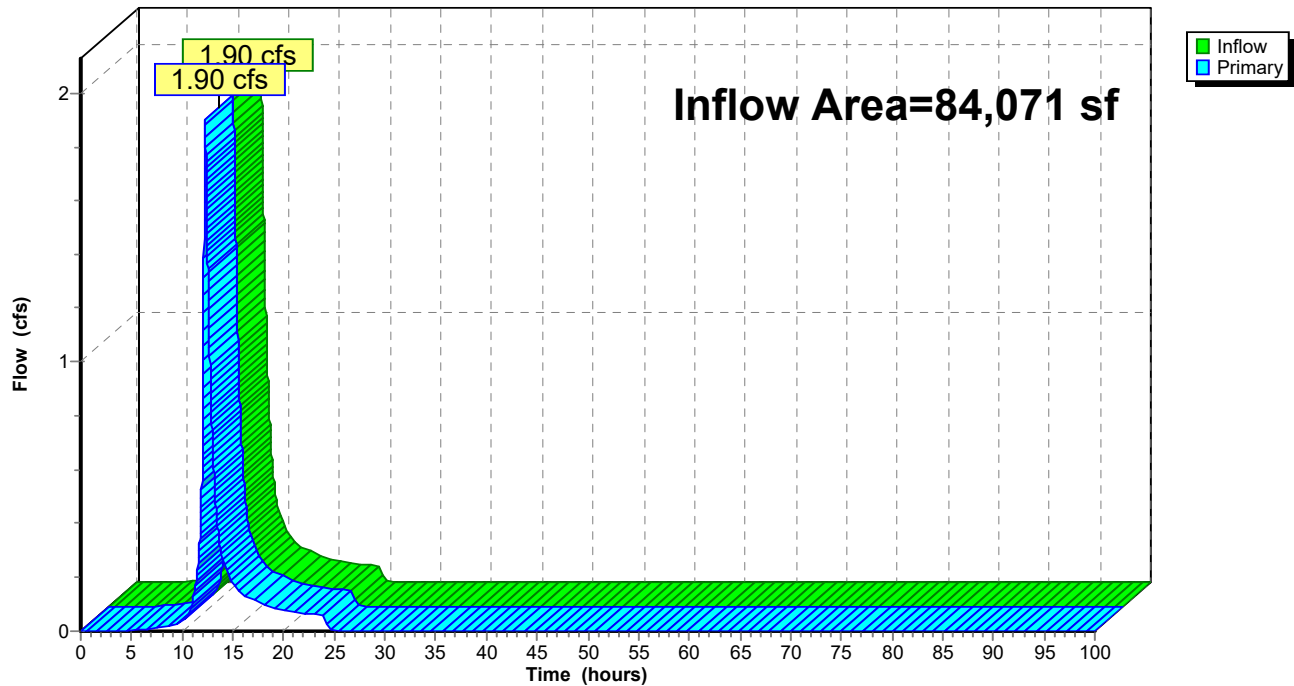
Hydrograph



Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 1.62" for 2-Year Current Adj event
Inflow = 1.90 cfs @ 12.25 hrs, Volume= 11,345 cf
Primary = 1.90 cfs @ 12.25 hrs, Volume= 11,345 cf, Atten= 0%, Lag= 0.0 min

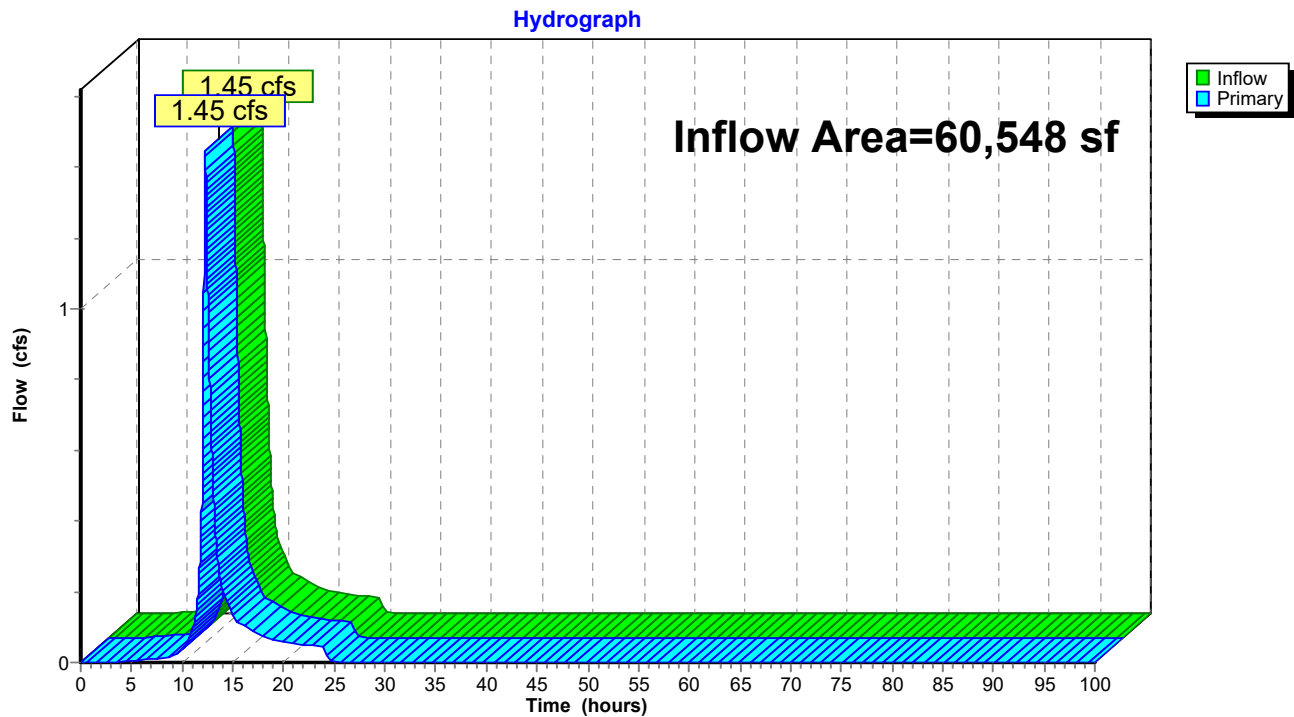
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2**Hydrograph**

Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 1.74" for 2-Year Current Adj event
Inflow = 1.45 cfs @ 12.25 hrs, Volume= 8,758 cf
Primary = 1.45 cfs @ 12.25 hrs, Volume= 8,758 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE

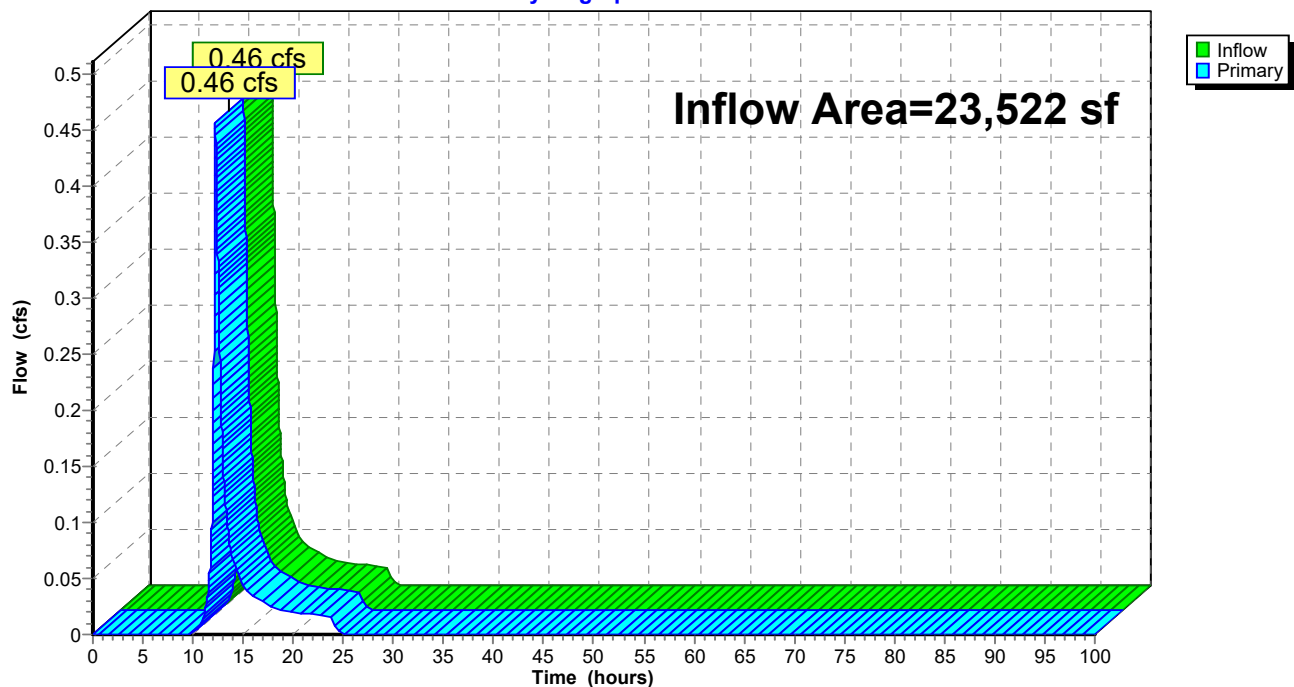
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 1.32" for 2-Year Current Adj event
Inflow = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf
Primary = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



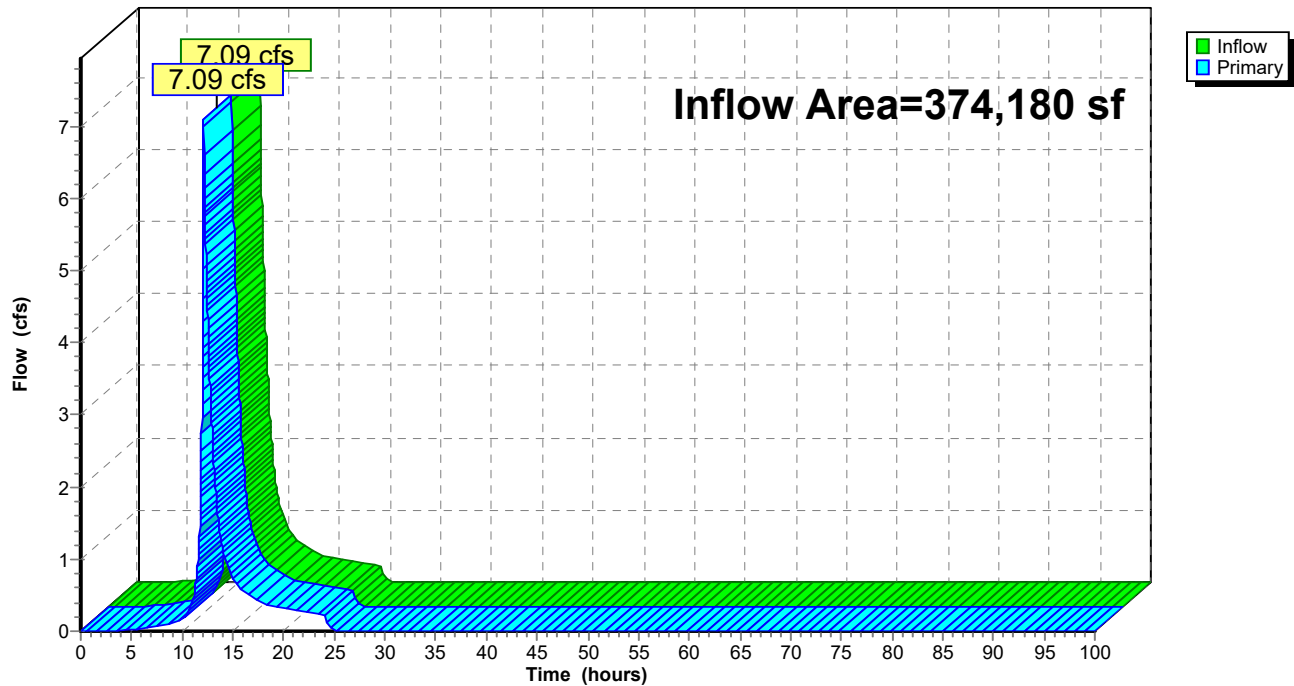
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 1.42" for 2-Year Current Adj event
Inflow = 7.09 cfs @ 12.12 hrs, Volume= 44,315 cf
Primary = 7.09 cfs @ 12.12 hrs, Volume= 44,315 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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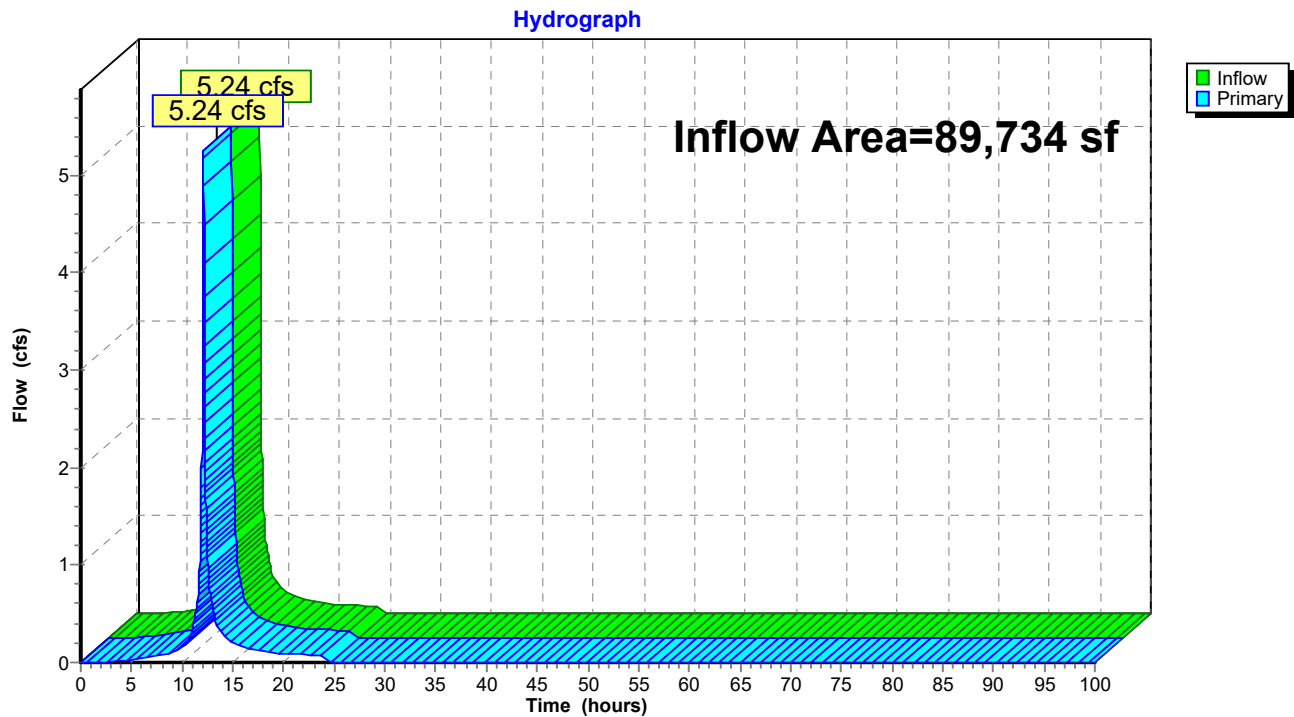
Page 41

Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 2.32" for 2-Year Current Adj event
Inflow = 5.24 cfs @ 12.11 hrs, Volume= 17,351 cf
Primary = 5.24 cfs @ 12.11 hrs, Volume= 17,351 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3A: EDA 3A ONSITE



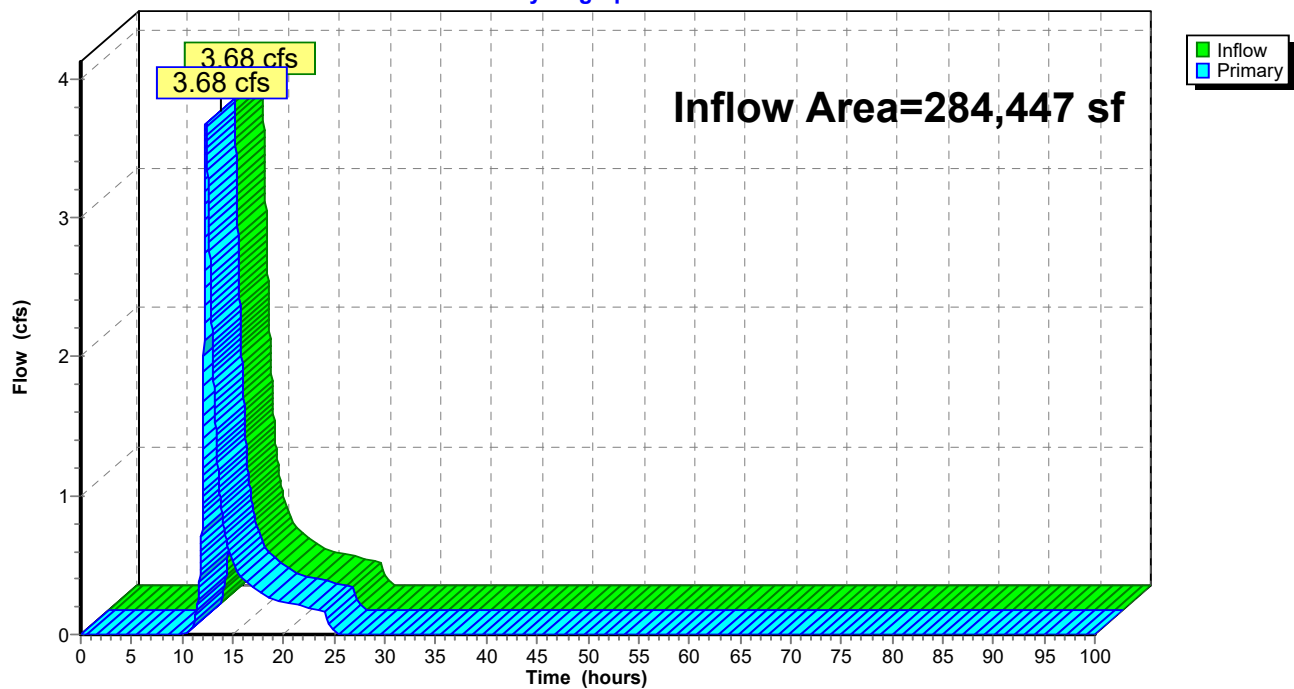
Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 1.14" for 2-Year Current Adj event
Inflow = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf
Primary = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS

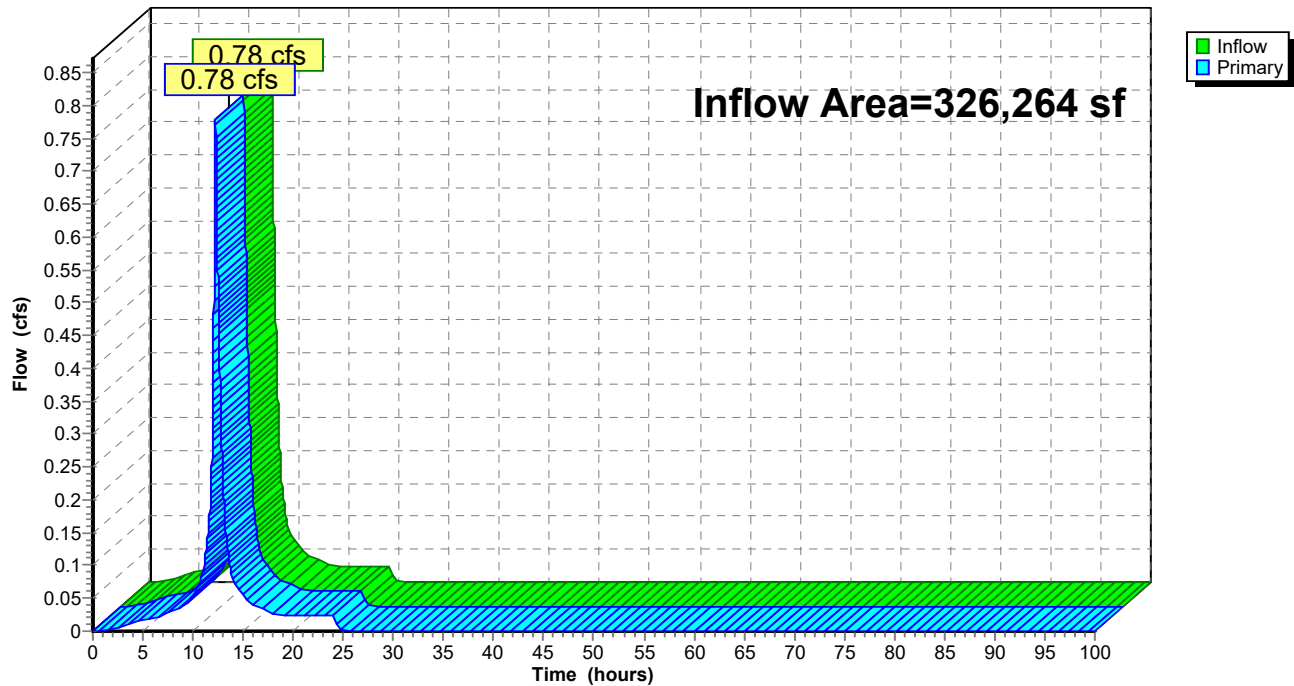
Hydrograph



Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 0.18" for 2-Year Current Adj event
Inflow = 0.78 cfs @ 12.23 hrs, Volume= 4,945 cf
Primary = 0.78 cfs @ 12.23 hrs, Volume= 4,945 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4**Hydrograph**

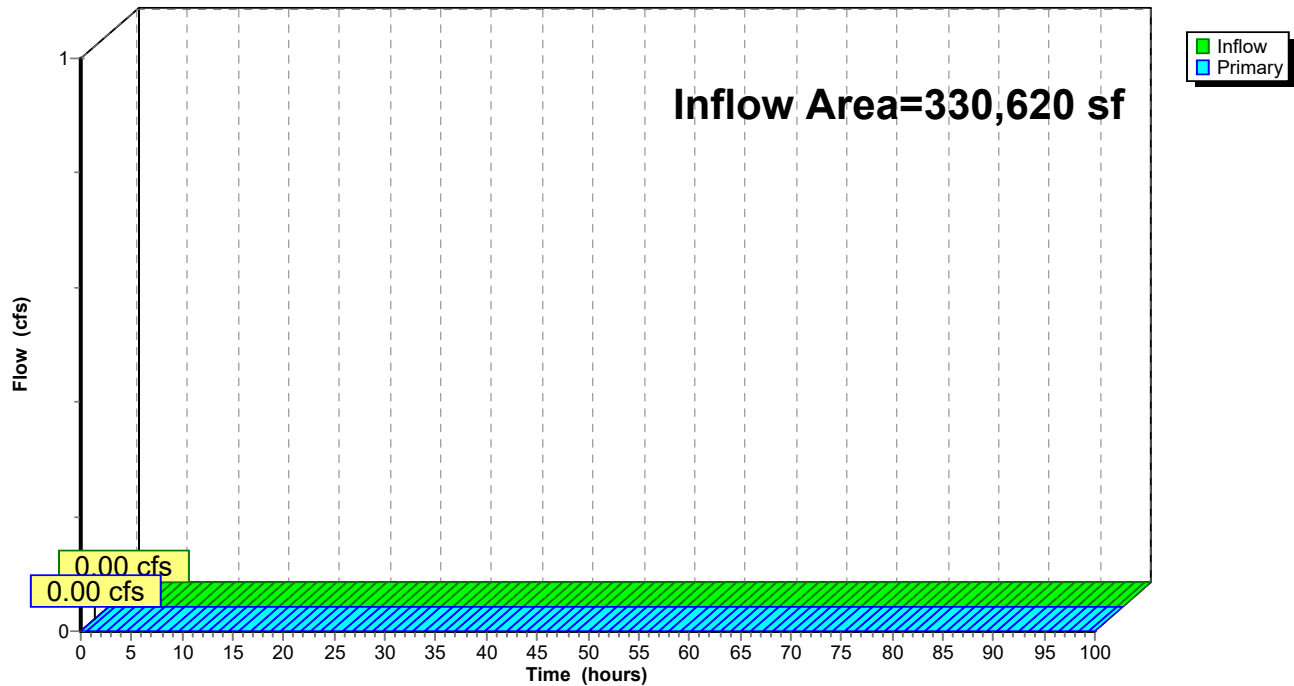
Summary for Link E5: EDA 5

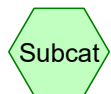
Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.00" for 2-Year Current Adj event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

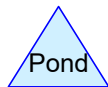
Link E5: EDA 5

Hydrograph





Reach



Link

Routing Diagram for Pre vs Post Rev. 3a

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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	3.35	2	3.35

Pre vs Post Rev. 3a

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
228,690	39	>75% Grass cover, Good, HSG A (P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P4p)
405,544	80	>75% Grass cover, Good, HSG D (P1Bp, P1Dp, P1Fp, P1Gp, P1Hp, P1Ip, P1Jp, P1Kp, P1Lp, P1Mp, P1Np, P2Ap, P3Ap, P3Bp)
1,521,986	98	Paved parking, HSG D (P1Ai, P1Bi, P1Di, P1Ei, P1Fi, P1Gi, P1Hi, P1Ii, P1Ji, P1Ki, P1Li, P1Ni)
17,424	30	Woods, Good, HSG A (P3Bp)
484,387	77	Woods, Good, HSG D (P1Mp, P1Np, P2Ap, P2Bp, P3Ap, P3Bp)
2,658,031	86	TOTAL AREA

Pre vs Post Rev. 3a

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
246,114	HSG A	P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P3Bp, P4p
0	HSG B	
0	HSG C	
2,411,917	HSG D	P1Ai, P1Bi, P1Bp, P1Di, P1Dp, P1Ei, P1Fi, P1Fp, P1Gi, P1Gp, P1Hi, P1Hp, P1Ii, P1Ip, P1Ji, P1Jp, P1Ki, P1Kp, P1Li, P1Lp, P1Mp, P1Ni, P1Np, P2Ap, P2Bp, P3Ap, P3Bp
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
228,690	0	0	405,544	0	634,234	>75% Grass cover, Good
0	0	0	1,521,986	0	1,521,986	Paved parking
17,424	0	0	484,387	0	501,811	Woods, Good
246,114	0	0	2,411,917	0	2,658,031	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	9.50	9.35	50.0	0.0030	0.013	0.0	24.0	0.0	
2	CW1A	9.00	8.00	634.0	0.0016	0.012	0.0	36.0	0.0	
3	CW1B	9.00	8.00	312.0	0.0032	0.012	0.0	48.0	0.0	
4	CW1C	9.00	8.00	1,202.0	0.0008	0.012	0.0	36.0	0.0	
5	CW1D	8.90	8.54	72.0	0.0050	0.012	0.0	48.0	0.0	
6	PP1	9.82	9.23	59.0	0.0100	0.013	0.0	15.0	0.0	
7	PP2	9.46	9.00	155.0	0.0030	0.013	0.0	36.0	0.0	
8	PP3	9.28	9.13	49.0	0.0031	0.013	0.0	30.0	0.0	
9	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
10	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
11	PP5	9.60	9.29	105.0	0.0030	0.013	0.0	15.0	0.0	
12	PP6	11.08	11.05	8.0	0.0037	0.013	0.0	15.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentP1Ai:	Runoff Area=5.210 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=16.28 cfs 58,949 cf
SubcatchmentP1Ap:	Runoff Area=0.940 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=100' Slope=0.1000 '/' Tc=5.0 min CN=39 Runoff=0.00 cfs 11 cf
SubcatchmentP1Bi:	Runoff Area=4.410 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=13.78 cfs 49,897 cf
SubcatchmentP1Bp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=110' Slope=0.1000 '/' Tc=5.1 min CN=80 Runoff=1.51 cfs 5,511 cf
SubcatchmentP1Cp:	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=110' Slope=0.1000 '/' Tc=5.1 min CN=39 Runoff=0.00 cfs 8 cf
SubcatchmentP1Di:	Runoff Area=7.230 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=22.60 cfs 81,804 cf
SubcatchmentP1Dp:	Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=1.38" Flow Length=100' Slope=0.1000 '/' Tc=5.0 min CN=78 Runoff=1.24 cfs 4,523 cf
SubcatchmentP1Ei:	Runoff Area=0.760 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=125' Tc=1.4 min CN=98 Runoff=2.63 cfs 8,599 cf
SubcatchmentP1Ep:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=76' Tc=4.2 min CN=39 Runoff=0.00 cfs 0 cf
SubcatchmentP1Fi:	Runoff Area=1.680 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=123' Tc=1.2 min CN=98 Runoff=5.83 cfs 19,008 cf
SubcatchmentP1Fp:	Runoff Area=0.120 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=81' Tc=3.1 min CN=80 Runoff=0.21 cfs 661 cf
SubcatchmentP1Gi:	Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=117' Tc=1.3 min CN=98 Runoff=2.44 cfs 7,920 cf
SubcatchmentP1Gp:	Runoff Area=0.030 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=92' Tc=4.2 min CN=80 Runoff=0.05 cfs 165 cf
SubcatchmentP1Hi:	Runoff Area=10.630 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=179' Slope=0.0150 '/' Tc=1.8 min CN=98 Runoff=36.02 cfs 120,274 cf
SubcatchmentP1Hp:	Runoff Area=0.370 ac 0.00% Impervious Runoff Depth=0.63" Flow Length=78' Slope=0.0450 '/' Tc=5.7 min CN=64 Runoff=0.18 cfs 847 cf
SubcatchmentP1Ii:	Runoff Area=0.740 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=15' Slope=0.0200 '/' Tc=0.3 min CN=98 Runoff=2.58 cfs 8,373 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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SubcatchmentP1Ip:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=10' Slope=0.0200 '/' Tc=1.5 min CN=80 Runoff=0.04 cfs 110 cf
SubcatchmentP1Ji:	Runoff Area=0.870 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=15' Slope=0.0200 '/' Tc=0.3 min CN=98 Runoff=3.04 cfs 9,844 cf
SubcatchmentP1Jp:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.47" Flow Length=10' Slope=0.0200 '/' Tc=1.5 min CN=60 Runoff=0.01 cfs 34 cf
SubcatchmentP1Ki:	Runoff Area=2.410 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=194' Tc=1.4 min CN=98 Runoff=8.35 cfs 27,268 cf
SubcatchmentP1Kp:	Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=1.52" Flow Length=149' Tc=2.9 min CN=80 Runoff=0.11 cfs 331 cf
SubcatchmentP1Li:	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=54' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=0.59 cfs 1,923 cf
SubcatchmentP1Lp:	Runoff Area=2.450 ac 0.00% Impervious Runoff Depth=0.55" Flow Length=228' Slope=0.0200 '/' Tc=11.4 min CN=62 Runoff=0.64 cfs 4,862 cf
SubcatchmentP1Mp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=1.45" Flow Length=412' Tc=8.5 min CN=79 Runoff=1.15 cfs 5,265 cf
SubcatchmentP1Ni: PDA 4B Impervious	Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=3.12" Flow Length=861' Tc=19.4 min CN=98 Runoff=0.20 cfs 1,471 cf
SubcatchmentP1Np: PDA 4B Pervious	Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=1.38" Flow Length=861' Tc=19.4 min CN=78 Runoff=5.37 cfs 37,538 cf
SubcatchmentP2Ap: PDA 2A Pervious	Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=1.45" Flow Length=382' Tc=14.9 min CN=79 Runoff=0.62 cfs 3,738 cf
SubcatchmentP2Bp: PDA 2B Pervious	Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.32" Flow Length=289' Tc=12.9 min CN=77 Runoff=0.46 cfs 2,588 cf
SubcatchmentP3Ap: PDA 3A Pervious	Runoff Area=0.950 ac 0.00% Impervious Runoff Depth=1.45" Flow Length=218' Tc=2.9 min CN=79 Runoff=1.62 cfs 5,002 cf
SubcatchmentP3Bp: PDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=1.14" Flow Length=860' Tc=19.5 min CN=74 Runoff=3.68 cfs 26,964 cf
SubcatchmentP4p: PDA 4 Pervious	Runoff Area=2.250 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=636' Tc=10.9 min CN=39 Runoff=0.00 cfs 25 cf
Pond B1: UG BASIN	Peak Elev=10.68' Storage=0.432 af Inflow=8.45 cfs 27,599 cf Outflow=0.46 cfs 18,108 cf
Pond CW1A: CONSTRUCTEDWETLANDS	Peak Elev=11.80' Storage=40,843 cf Inflow=19.57 cfs 98,375 cf 36.0" Round Culvert n=0.012 L=634.0' S=0.0016 '/' Outflow=3.99 cfs 96,609 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Pond CW1B: CONSTRUCTEDPeak Elev=11.76' Storage=43,009 cf Inflow=22.58 cfs 206,186 cf
48.0" Round Culvert n=0.012 L=312.0' S=0.0032 ' / Outflow=9.38 cfs 204,049 cf**Pond CW1C: CONSTRUCTED WETLANDS**Peak Elev=11.67' Storage=10,200 cf Inflow=9.95 cfs 235,298 cf
36.0" Round Culvert x 2.00 n=0.012 L=1,202.0' S=0.0008 ' / Outflow=9.91 cfs 235,004 cf**Pond CW1D: CONSTRUCTED**Peak Elev=11.55' Storage=40,655 cf Inflow=24.69 cfs 332,385 cf
Outflow=12.77 cfs 331,277 cf**Pond PP1: POROUS PAVEMENT**Peak Elev=15.73' Storage=5,974 cf Inflow=2.63 cfs 8,599 cf
Outflow=0.12 cfs 5,712 cf**Pond PP2: POROUS PAVEMENT**Peak Elev=15.15' Storage=14,886 cf Inflow=6.04 cfs 19,670 cf
Outflow=0.15 cfs 13,133 cf**Pond PP3: POROUS PAVEMENT**Peak Elev=16.88' Storage=5,497 cf Inflow=2.48 cfs 8,086 cf
Outflow=0.13 cfs 5,400 cf**Pond PP4: POROUS PAVEMENT**Peak Elev=13.90' Storage=64,842 cf Inflow=36.16 cfs 121,121 cf
Primary=6.52 cfs 54,168 cf Secondary=3.26 cfs 27,084 cf Outflow=9.78 cfs 81,252 cf**Pond PP5: POROUS PAVEMENT**Peak Elev=16.70' Storage=4,416 cf Inflow=2.62 cfs 8,483 cf
Outflow=0.85 cfs 5,654 cf**Pond PP6: POROUS PAVEMENT**Peak Elev=16.42' Storage=5,274 cf Inflow=3.05 cfs 9,878 cf
Outflow=0.84 cfs 6,619 cf**Link B1V: Valve**Inflow=0.46 cfs 18,108 cf
Primary=0.46 cfs 18,108 cf**Link P1: PDA 1**Inflow=17.01 cfs 382,336 cf
Primary=17.01 cfs 382,336 cf**Link P1A:**Inflow=13.35 cfs 343,327 cf
Primary=13.35 cfs 343,327 cf**Link P1B: BYPASS**Inflow=5.56 cfs 39,009 cf
Primary=5.56 cfs 39,009 cf**Link P2: PDA 2**Inflow=1.07 cfs 6,326 cf
Primary=1.07 cfs 6,326 cf**Link P2A: PDA 2A ONSITE**Inflow=0.62 cfs 3,738 cf
Primary=0.62 cfs 3,738 cf**Link P2B: BYPASS**Inflow=0.46 cfs 2,588 cf
Primary=0.46 cfs 2,588 cf**Link P3: PDA 3**Inflow=4.23 cfs 31,966 cf
Primary=4.23 cfs 31,966 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Link P3A: PDA 3A ONSITE

Inflow=1.62 cfs 5,002 cf

Primary=1.62 cfs 5,002 cf

Link P3B: BYPASS

Inflow=3.68 cfs 26,964 cf

Primary=3.68 cfs 26,964 cf

Link P4: PDA 4

Inflow=0.00 cfs 25 cf

Primary=0.00 cfs 25 cf

Link PP4V: Valve

Inflow=6.52 cfs 54,168 cf

Primary=6.52 cfs 54,168 cf

Total Runoff Area = 2,658,031 sf Runoff Volume = 493,514 cf Average Runoff Depth = 2.23"
42.74% Pervious = 1,136,045 sf 57.26% Impervious = 1,521,986 sf

Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ai:

Runoff = 16.28 cfs @ 12.11 hrs, Volume= 58,949 cf, Depth= 3.12"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

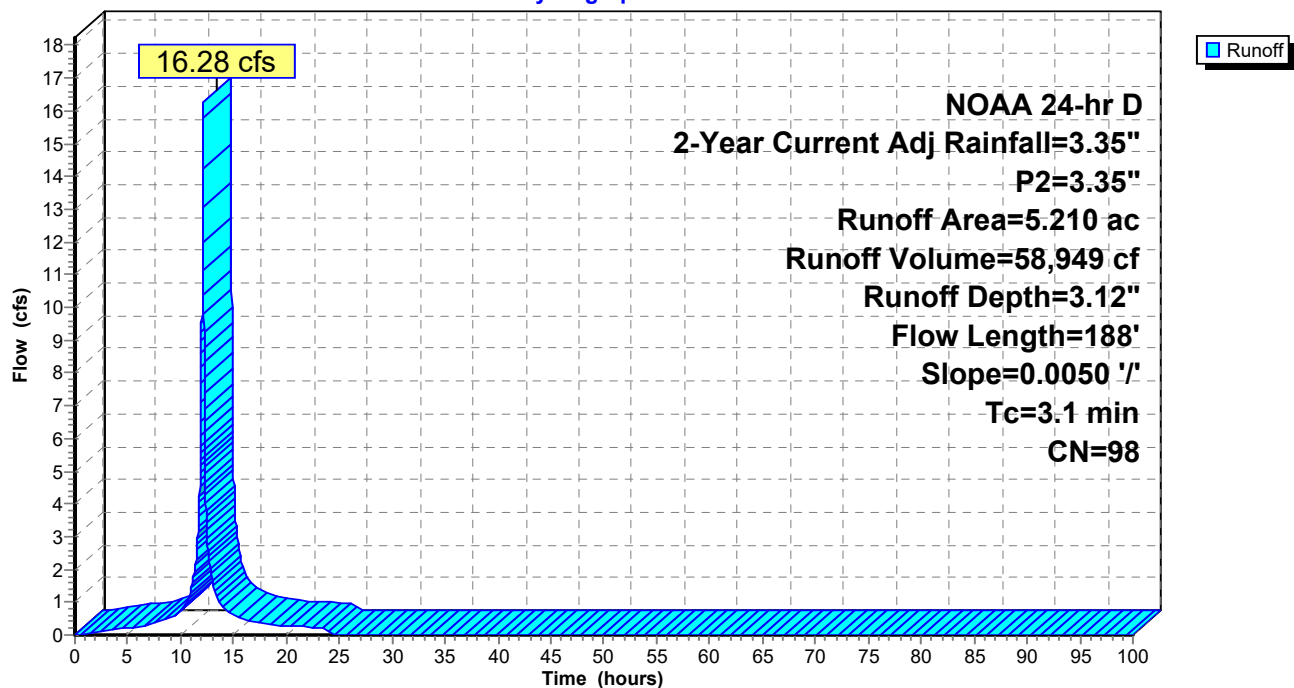
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
5.210	98	Paved parking, HSG D
5.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Ai:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ap:

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 11 cf, Depth= 0.00"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

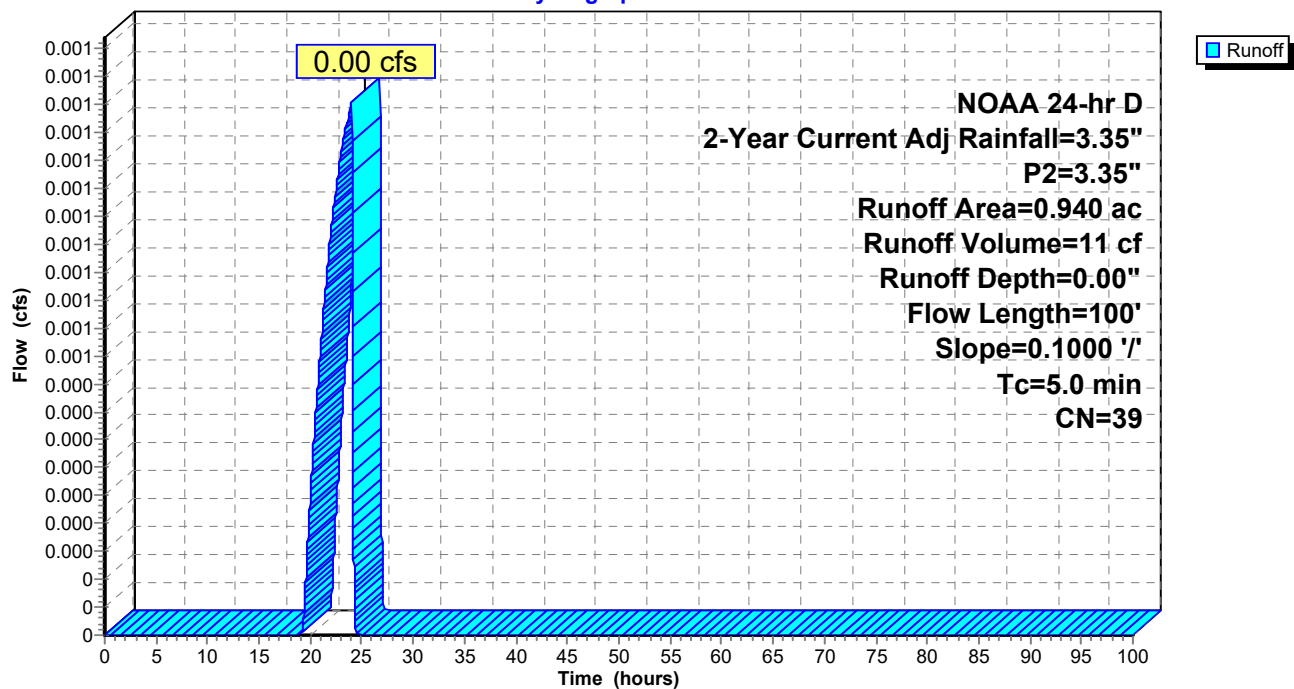
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.940	39	>75% Grass cover, Good, HSG A
0.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Ap:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Bi:

Runoff = 13.78 cfs @ 12.11 hrs, Volume= 49,897 cf, Depth= 3.12"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

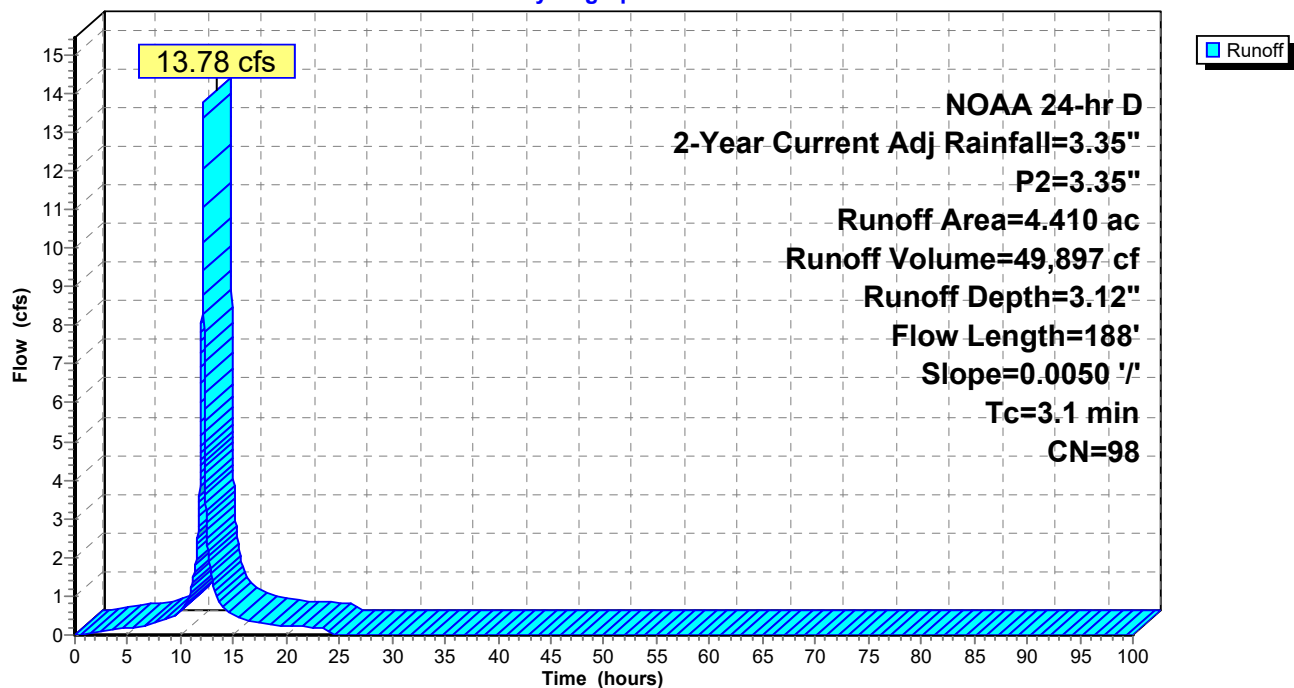
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
4.410	98	Paved parking, HSG D
4.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Bi:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Bp:

Runoff = 1.51 cfs @ 12.13 hrs, Volume= 5,511 cf, Depth= 1.52"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

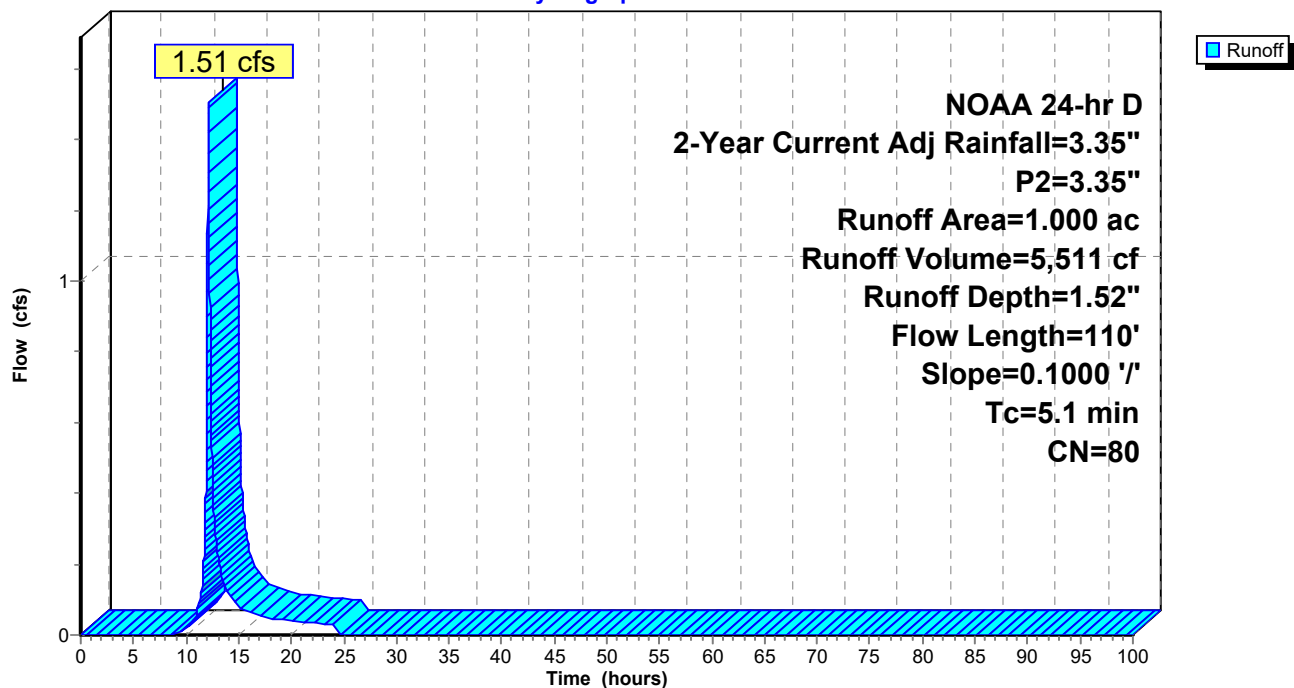
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
1.000	80	>75% Grass cover, Good, HSG D
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	110	Total			

Subcatchment P1Bp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Cp:

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 8 cf, Depth= 0.00"

Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

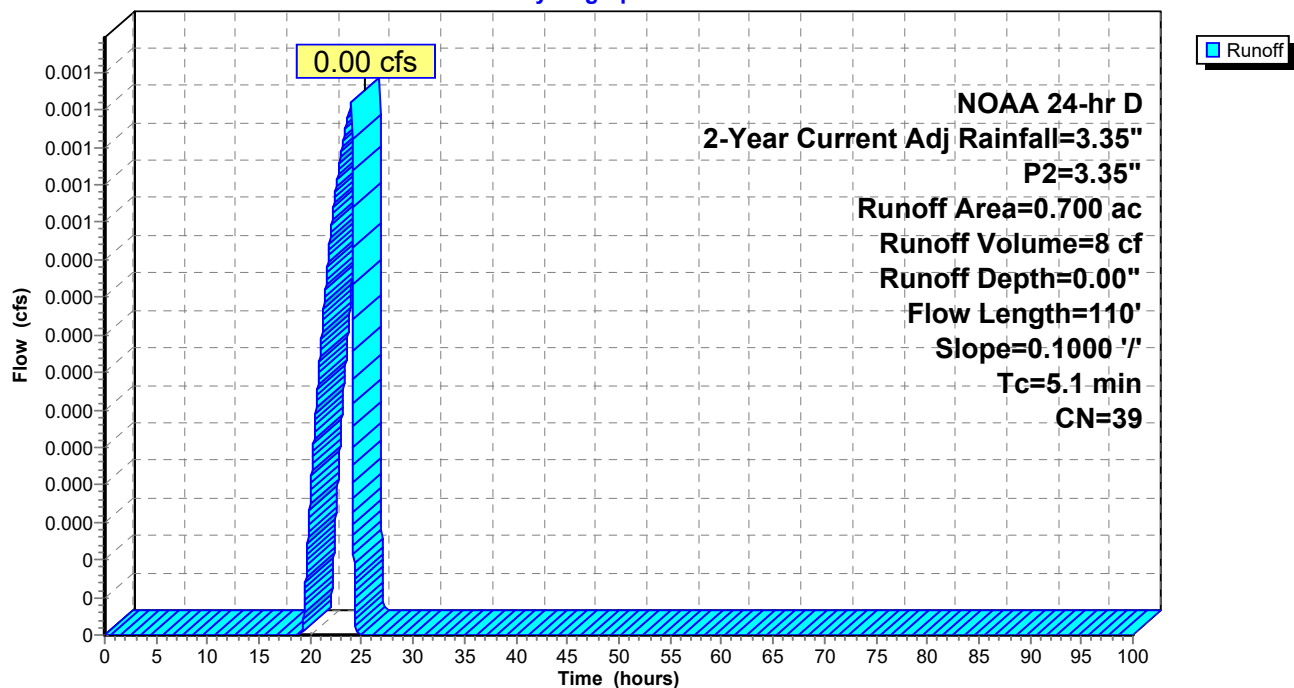
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.700	39	>75% Grass cover, Good, HSG A
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	110	Total			

Subcatchment P1Cp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Di:

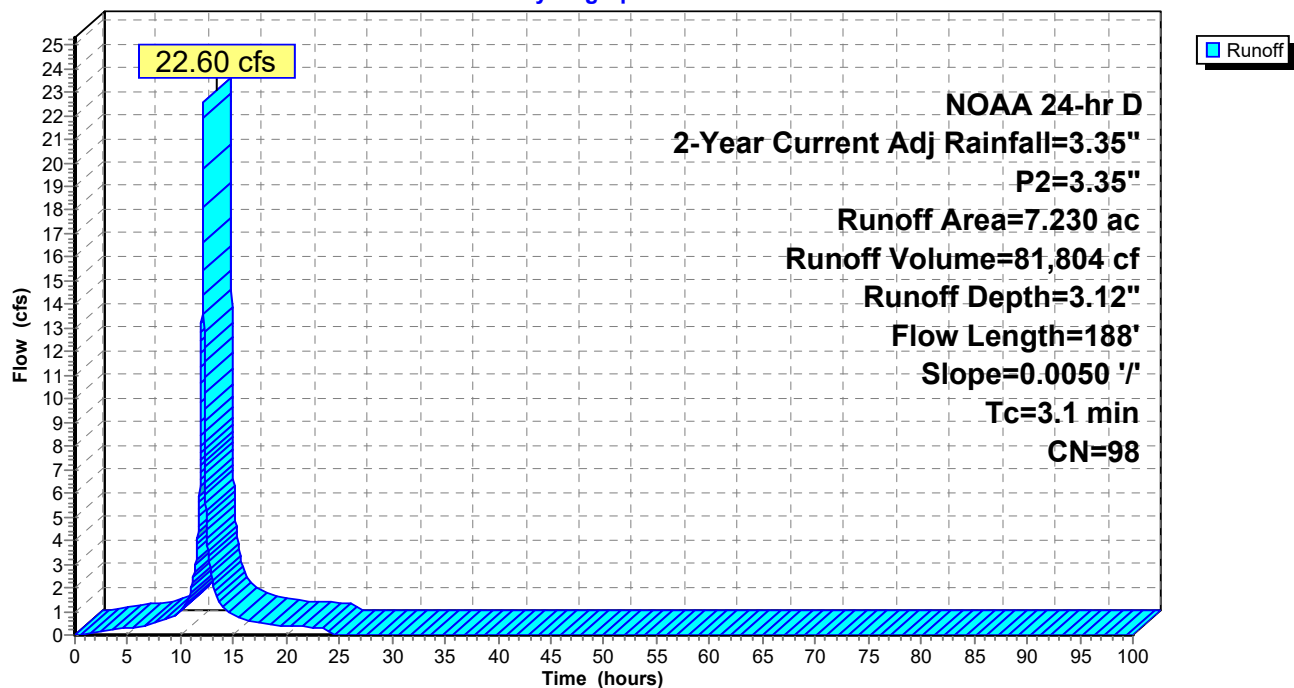
Runoff = 22.60 cfs @ 12.11 hrs, Volume= 81,804 cf, Depth= 3.12"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
7.230	98	Paved parking, HSG D
7.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Di:**Hydrograph**

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Dp:

Runoff = 1.24 cfs @ 12.13 hrs, Volume= 4,523 cf, Depth= 1.38"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

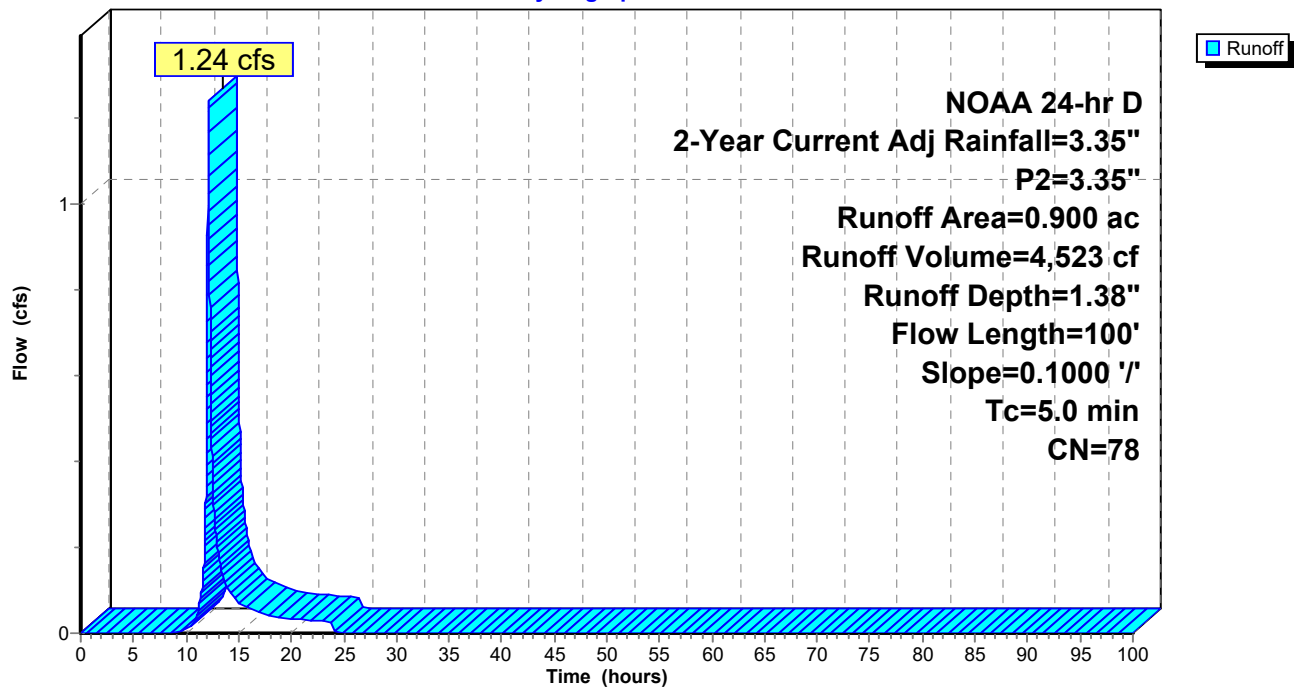
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.040	39	>75% Grass cover, Good, HSG A
0.860	80	>75% Grass cover, Good, HSG D
0.900	78	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Dp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ei:

Runoff = 2.63 cfs @ 12.10 hrs, Volume= 8,599 cf, Depth= 3.12"
Routed to Pond PP1 : POROUS PAVEMENT

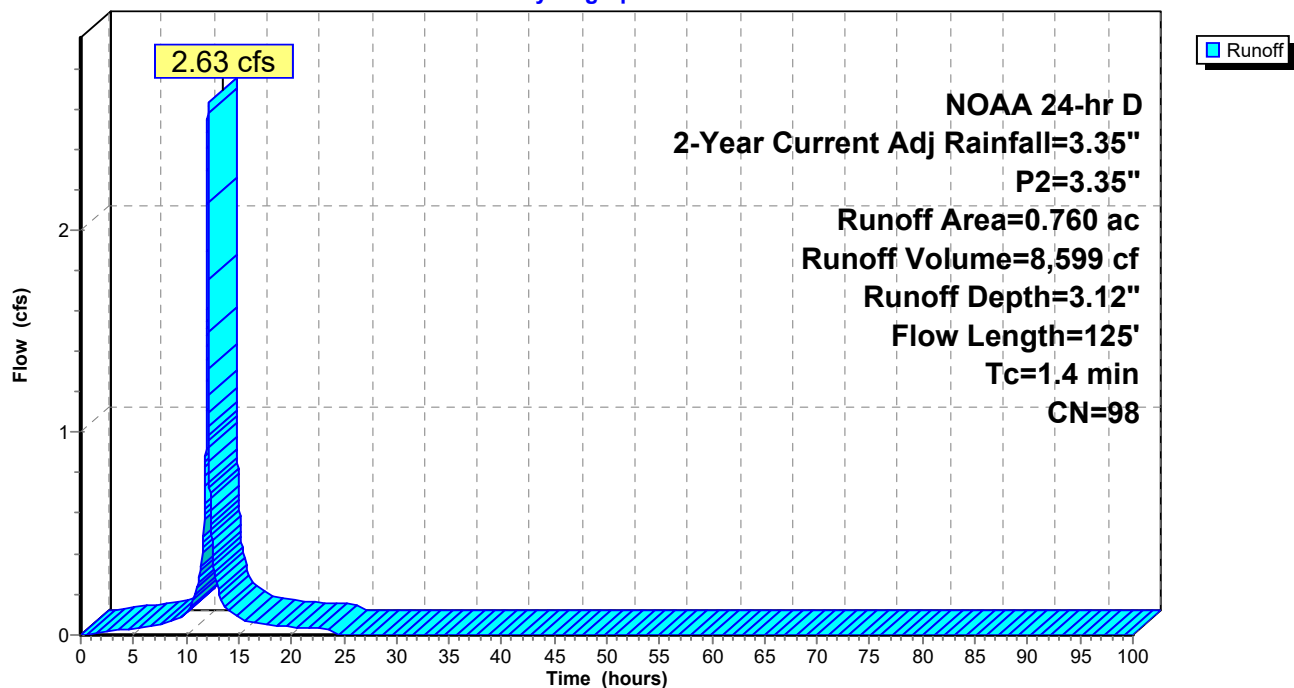
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG D
0.760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	68	0.0200	1.30		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	57	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	125	Total			

Subcatchment P1Ei:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ep:

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond PP1 : POROUS PAVEMENT

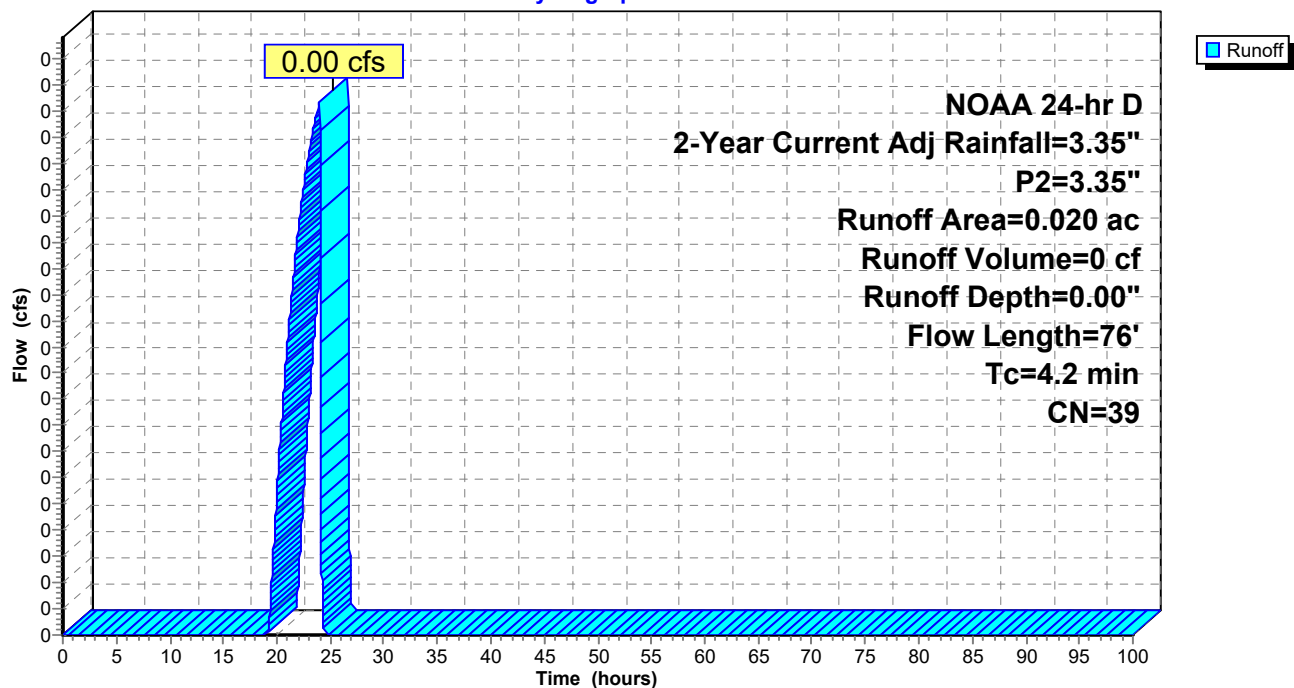
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.020	39	>75% Grass cover, Good, HSG A
0.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	31	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.4	45	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.2	76	Total			

Subcatchment P1Ep:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Fi:

Runoff = 5.83 cfs @ 12.10 hrs, Volume= 19,008 cf, Depth= 3.12"
Routed to Pond PP2 : POROUS PAVEMENT

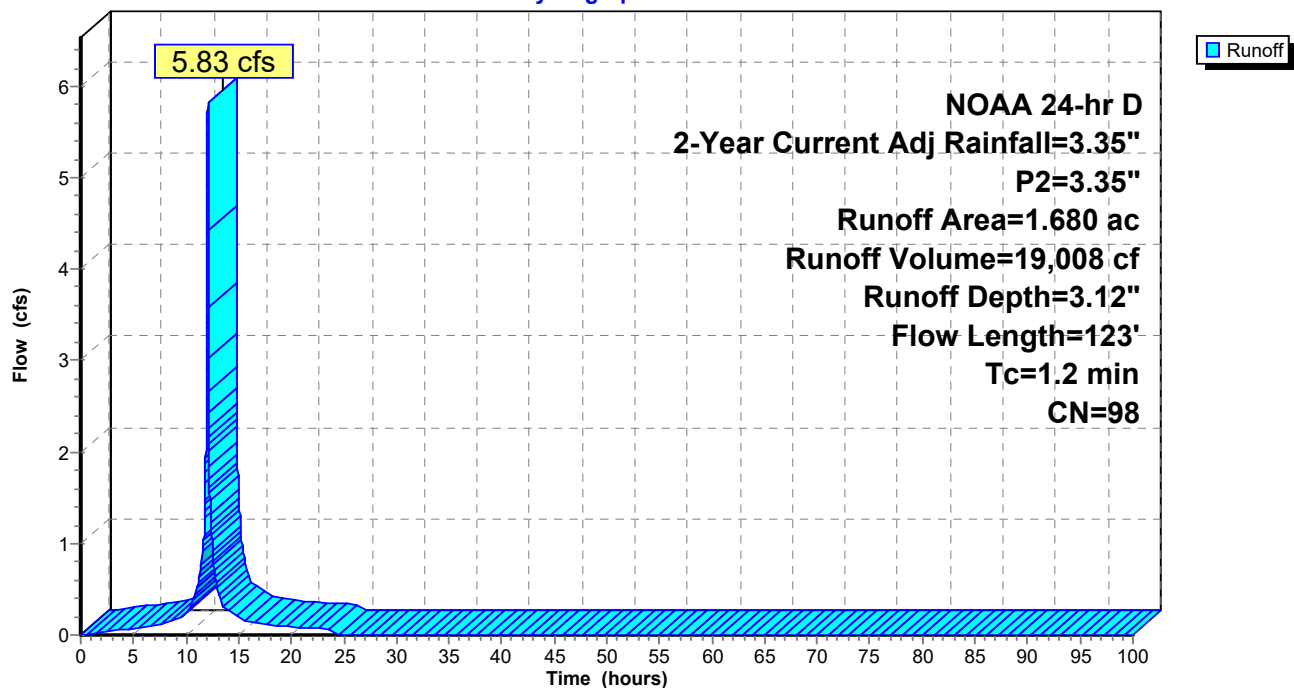
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
1.680	98	Paved parking, HSG D
1.680		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	68	0.0333	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	123	Total			

Subcatchment P1Fi:

Hydrograph



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Summary for Subcatchment P1Fp:

Runoff = 0.21 cfs @ 12.12 hrs, Volume= 661 cf, Depth= 1.52"
Routed to Pond PP2 : POROUS PAVEMENT

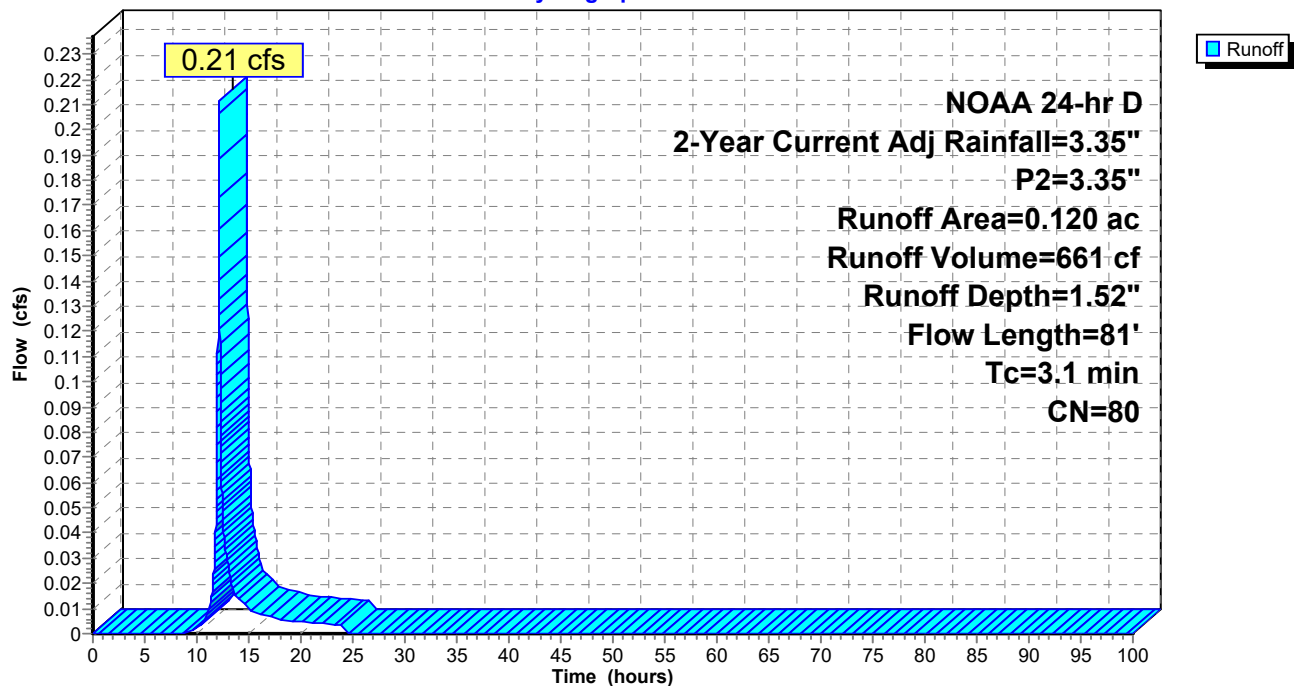
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.120	80	>75% Grass cover, Good, HSG D
0.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	18	0.0200	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	43	0.0333	1.46		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	81	Total			

Subcatchment P1Fp:

Hydrograph



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Summary for Subcatchment P1Gi:

Runoff = 2.44 cfs @ 12.10 hrs, Volume= 7,920 cf, Depth= 3.12"
Routed to Pond PP3 : POROUS PAVEMENT

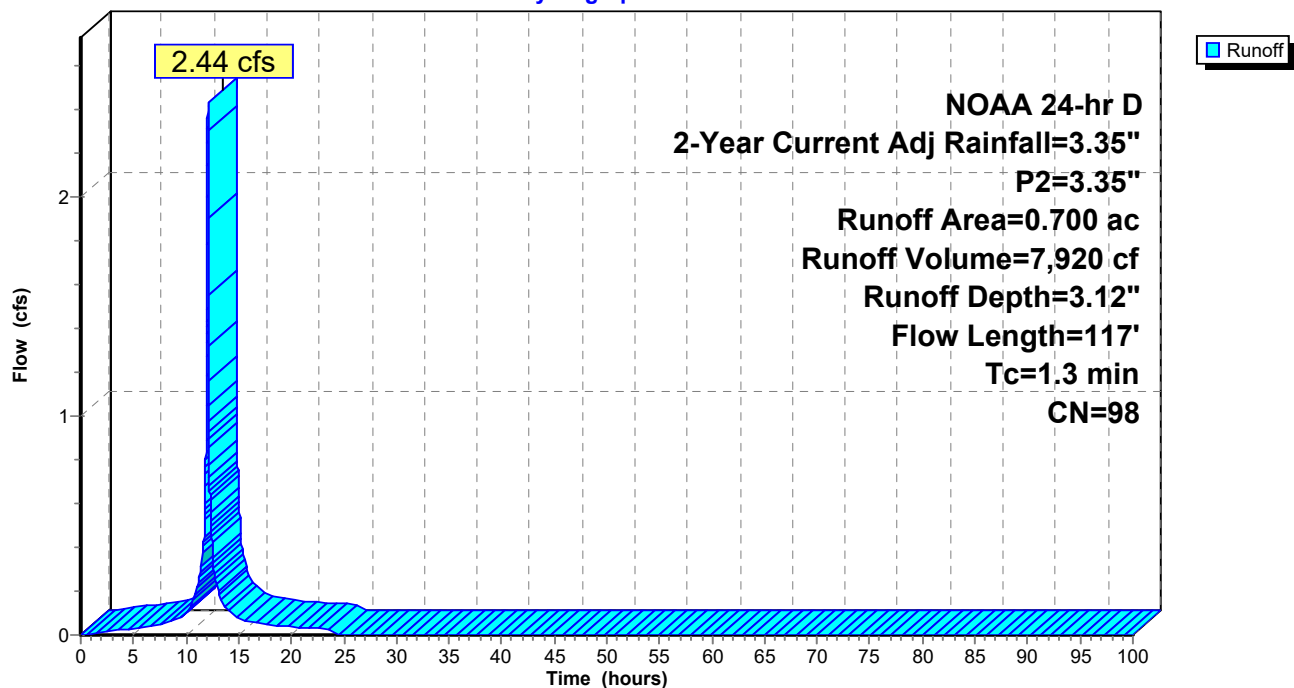
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	69	0.0250	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	48	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	117	Total			

Subcatchment P1Gi:

Hydrograph



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Summary for Subcatchment P1Gp:

Runoff = 0.05 cfs @ 12.13 hrs, Volume= 165 cf, Depth= 1.52"
Routed to Pond PP3 : POROUS PAVEMENT

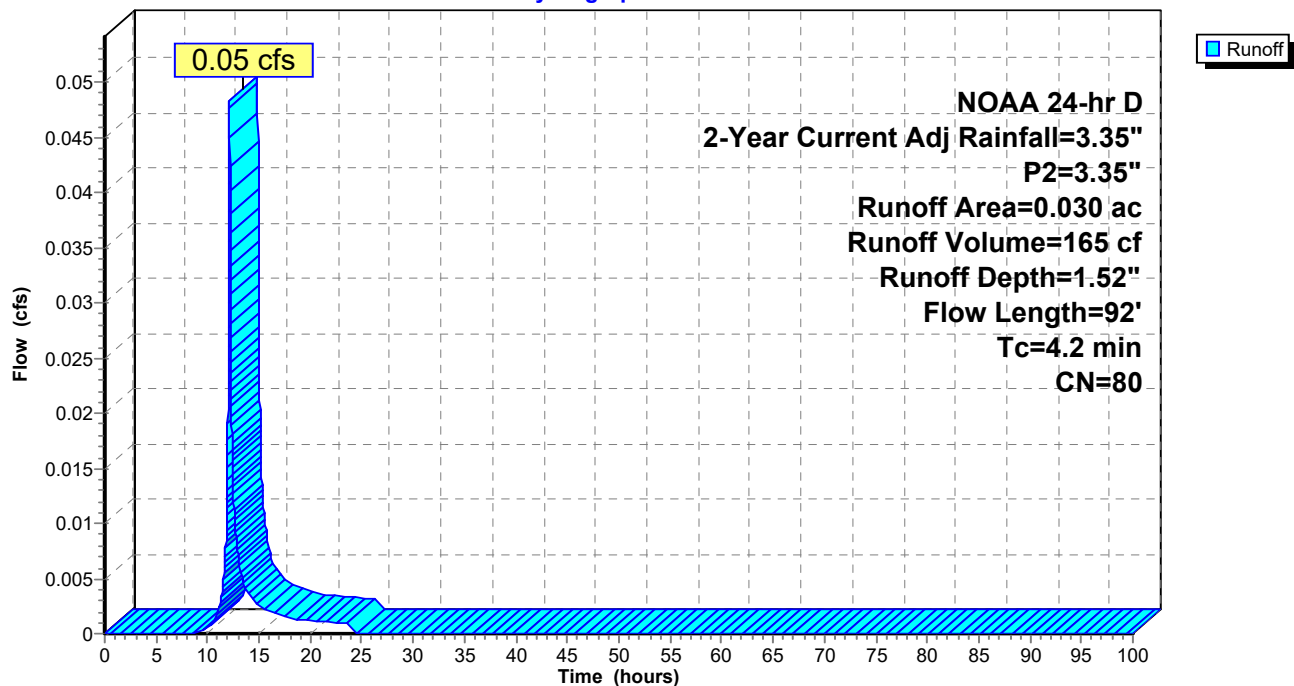
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.030	80	>75% Grass cover, Good, HSG D
0.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	29	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	8	0.0250	0.93		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.2	92	Total			

Subcatchment P1Gp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Hi:

Runoff = 36.02 cfs @ 12.10 hrs, Volume= 120,274 cf, Depth= 3.12"
Routed to Pond PP4 : POROUS PAVEMENT

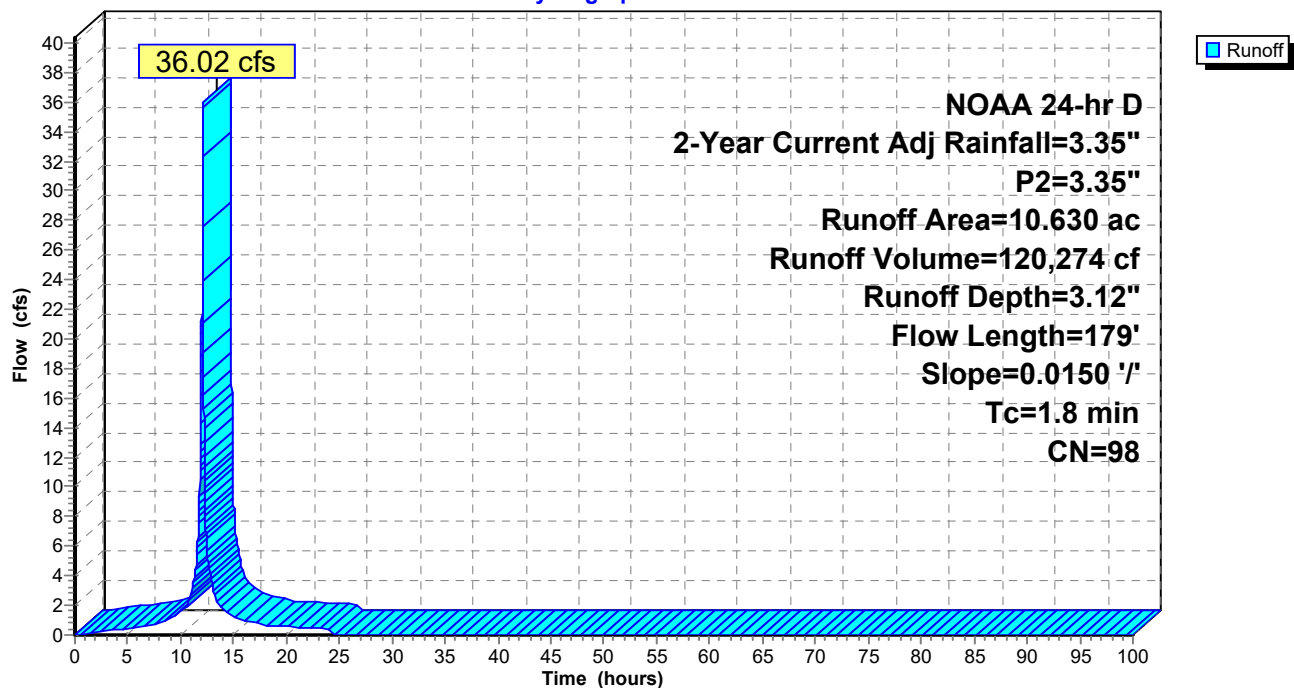
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
10.630	98	Paved parking, HSG D
10.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	79	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.8	179	Total			

Subcatchment P1Hi:

Hydrograph



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Summary for Subcatchment P1Hp:

Runoff = 0.18 cfs @ 12.15 hrs, Volume= 847 cf, Depth= 0.63"
Routed to Pond PP4 : POROUS PAVEMENT

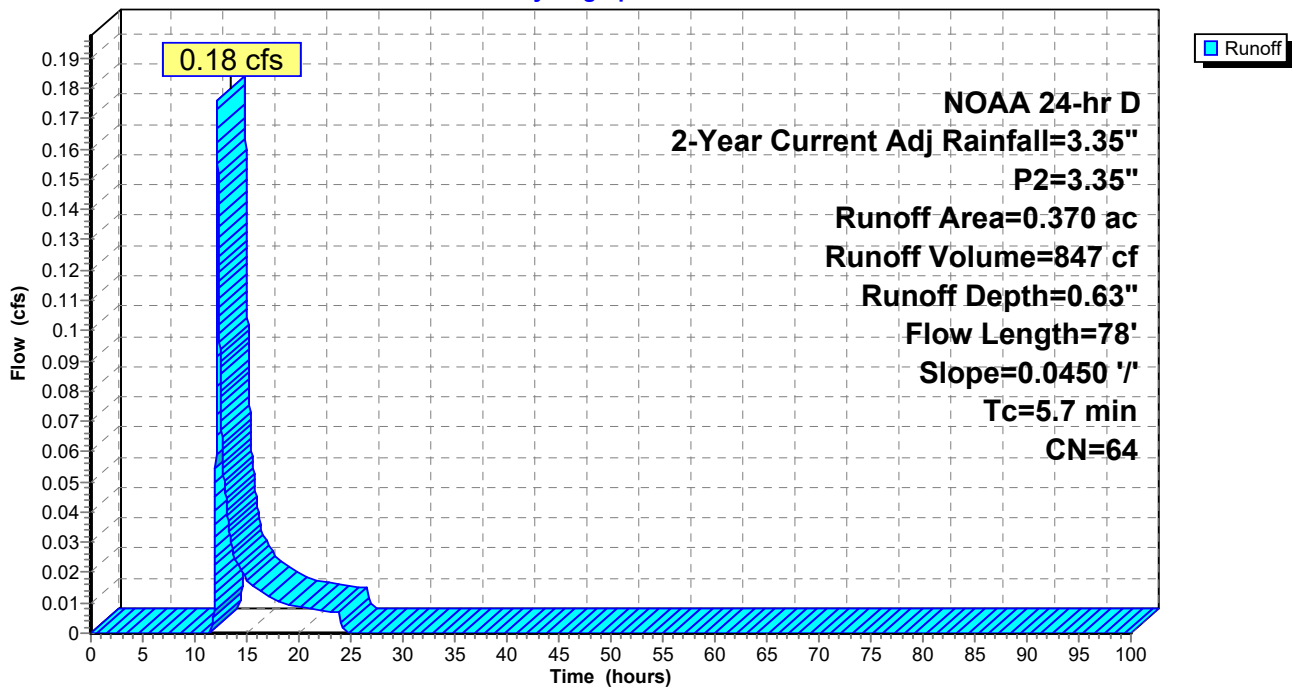
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.230	80	>75% Grass cover, Good, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.370	64	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	78	0.0450	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Hp:

Hydrograph



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Summary for Subcatchment P1li:

Runoff = 2.58 cfs @ 12.09 hrs, Volume= 8,373 cf, Depth= 3.12"
Routed to Pond PP5 : POROUS PAVEMENT

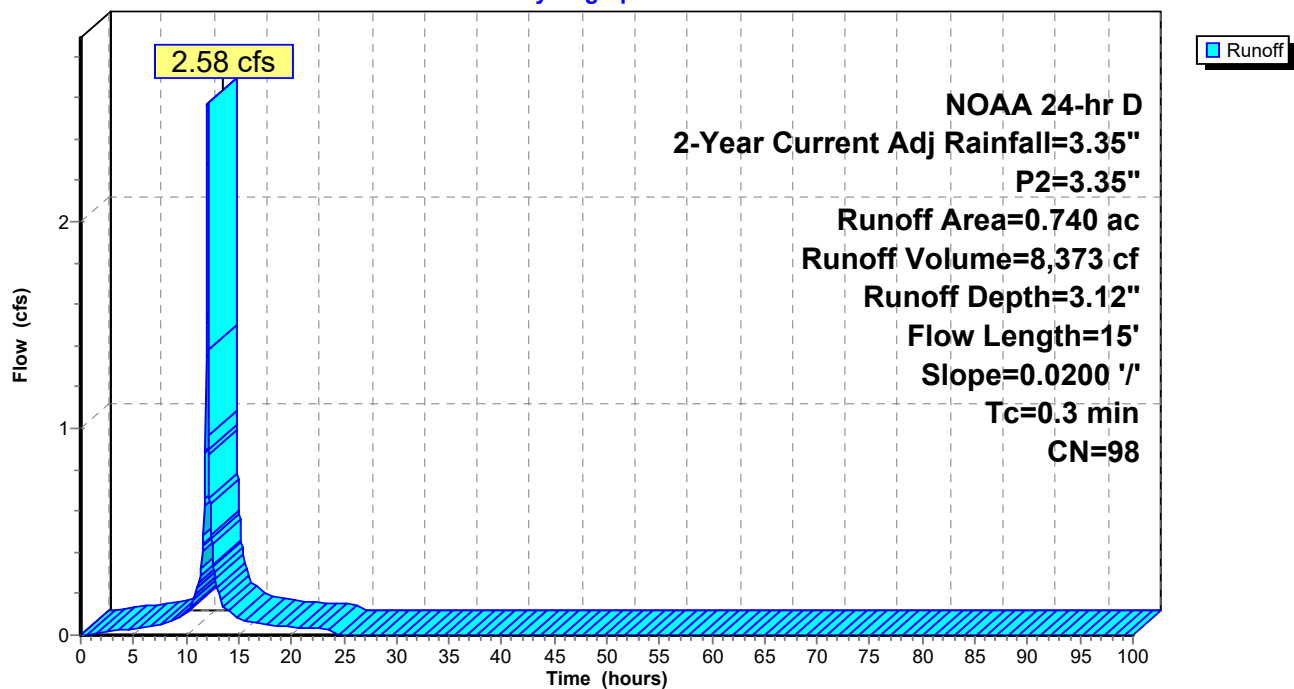
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
0.740		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.96		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1li:

Hydrograph



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Summary for Subcatchment P1lp:

Runoff = 0.04 cfs @ 12.10 hrs, Volume= 110 cf, Depth= 1.52"
Routed to Pond PP5 : POROUS PAVEMENT

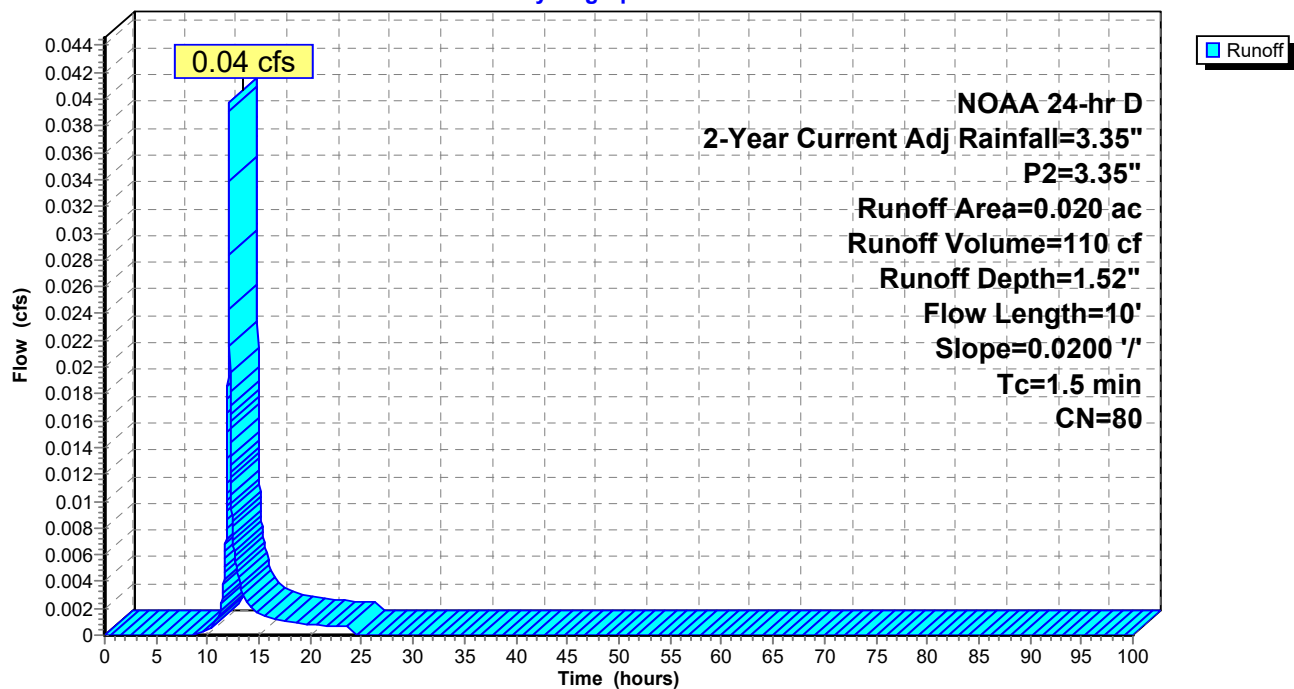
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.020	80	>75% Grass cover, Good, HSG D
0.020		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, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1lp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ji:

Runoff = 3.04 cfs @ 12.09 hrs, Volume= 9,844 cf, Depth= 3.12"
Routed to Pond PP6 : POROUS PAVEMENT

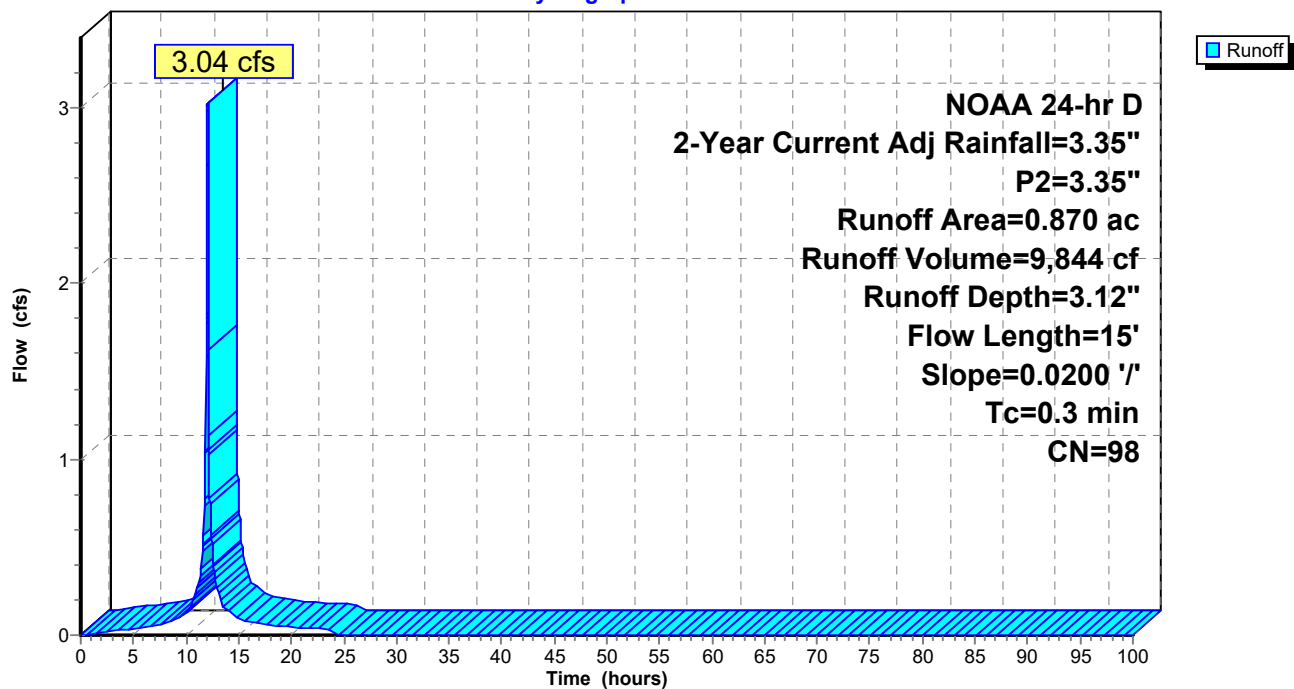
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.870	98	Paved parking, HSG D
0.870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.96		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1Ji:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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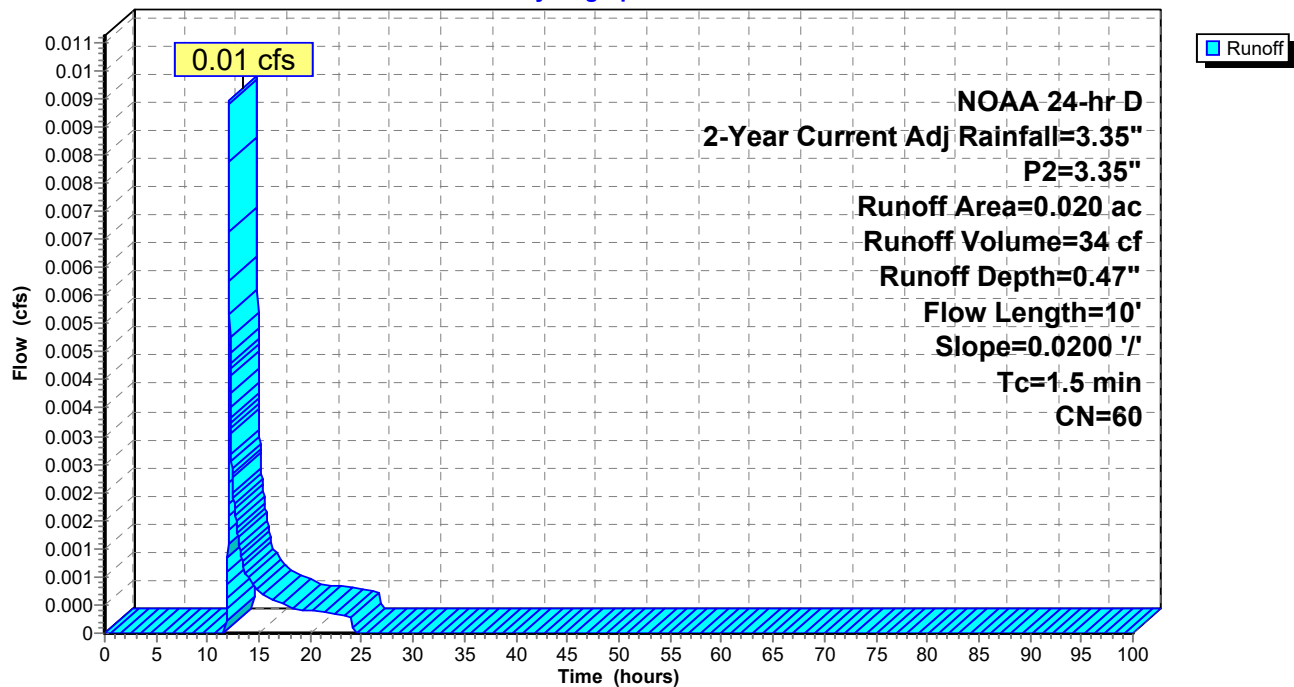
Summary for Subcatchment P1Jp:

Runoff = 0.01 cfs @ 12.11 hrs, Volume= 34 cf, Depth= 0.47"
Routed to Pond PP6 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.010	80	>75% Grass cover, Good, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.020	60	Weighted Average
0.020		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, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Jp:**Hydrograph**

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Summary for Subcatchment P1Ki:

Runoff = 8.35 cfs @ 12.10 hrs, Volume= 27,268 cf, Depth= 3.12"
Routed to Pond B1 : UG BASIN

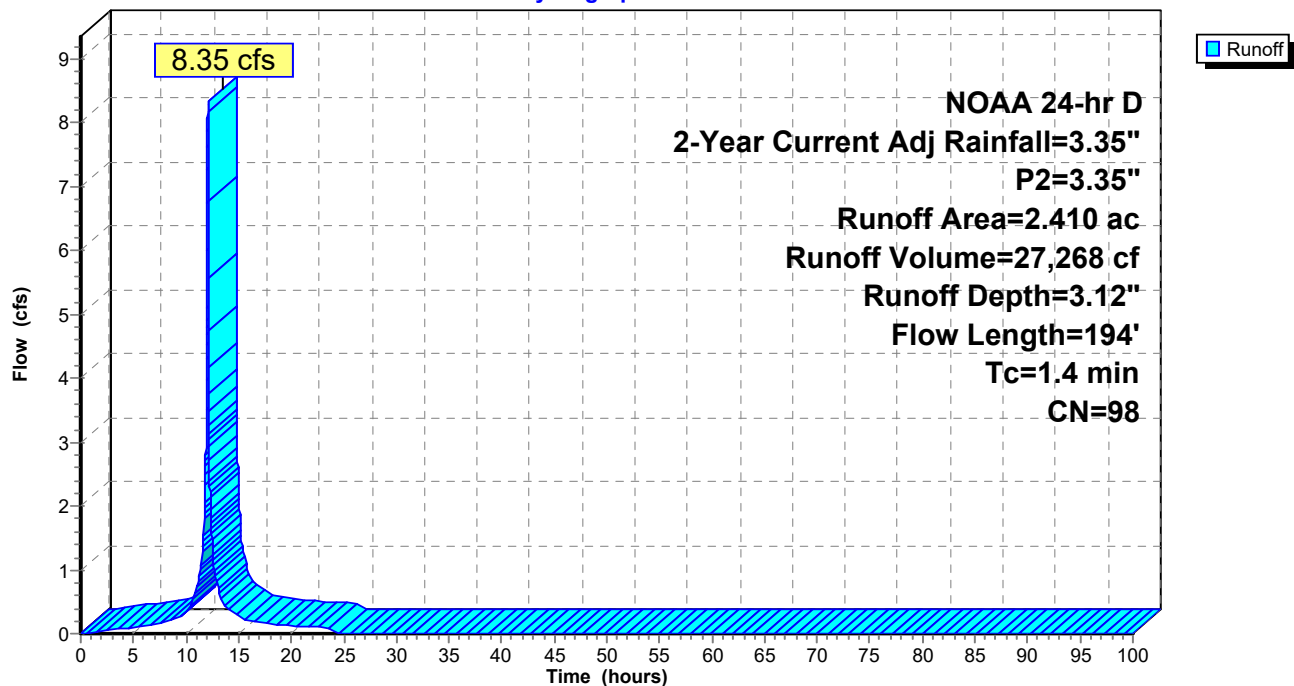
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
2.410	98	Paved parking, HSG D
2.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	72	0.0250	1.44		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	55	0.0350	3.80		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	67	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	194	Total			

Subcatchment P1Ki:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Kp:

Runoff = 0.11 cfs @ 12.11 hrs, Volume= 331 cf, Depth= 1.52"
Routed to Pond B1 : UG BASIN

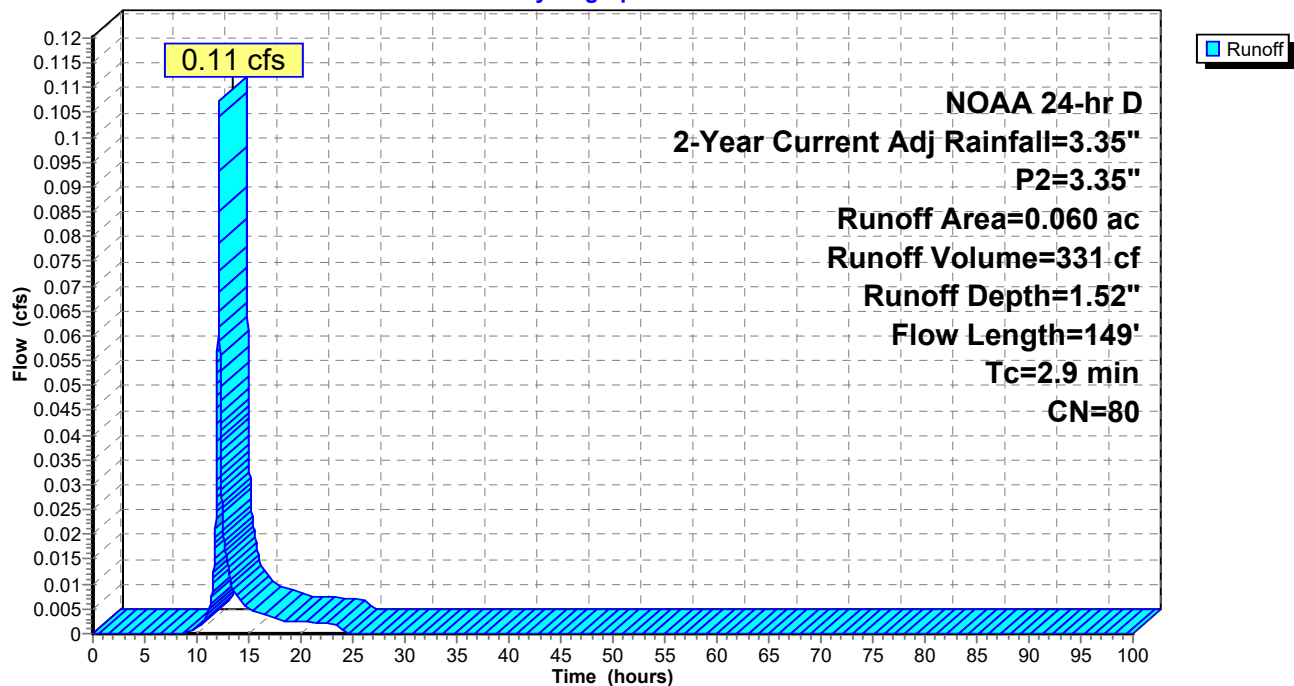
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	13	0.0250	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.8	67	0.0250	1.42		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	69	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	149	Total			

Subcatchment P1Kp:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Li:

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 1,923 cf, Depth= 3.12"
Routed to Link P1A :

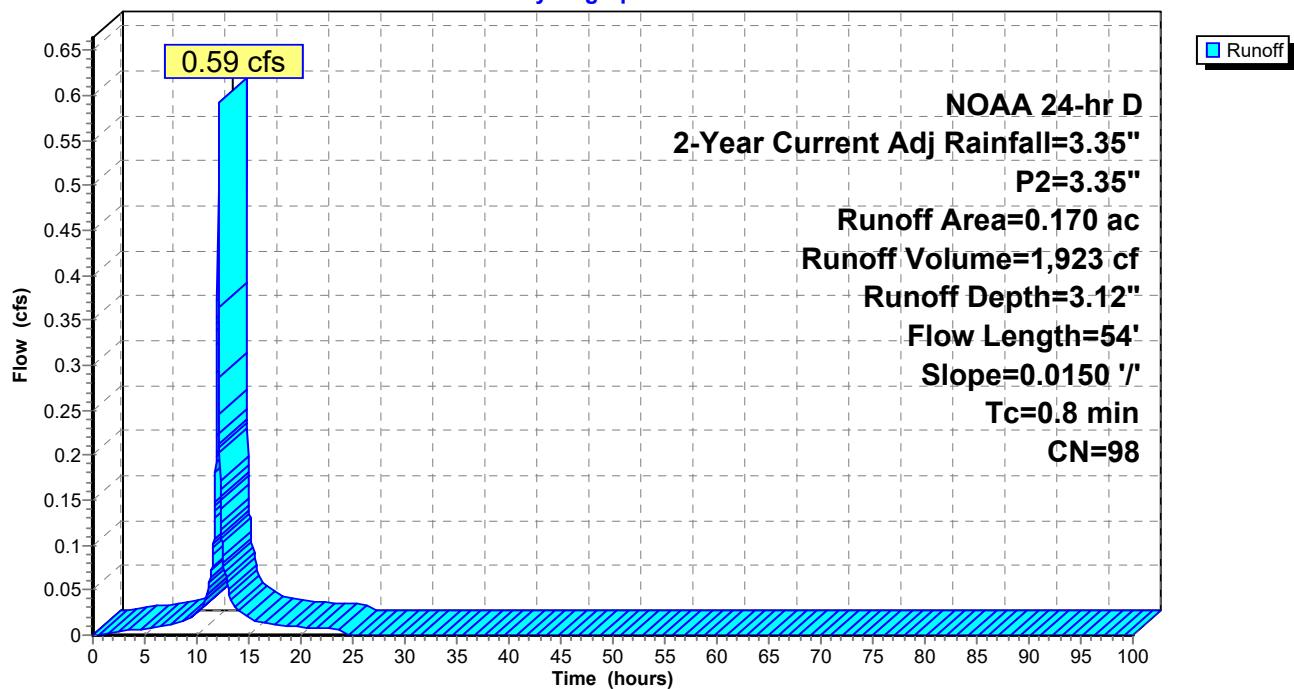
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.170	98	Paved parking, HSG D
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	54	0.0150	1.11		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1Li:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Lp:

Runoff = 0.64 cfs @ 12.26 hrs, Volume= 4,862 cf, Depth= 0.55"
Routed to Link P1A :

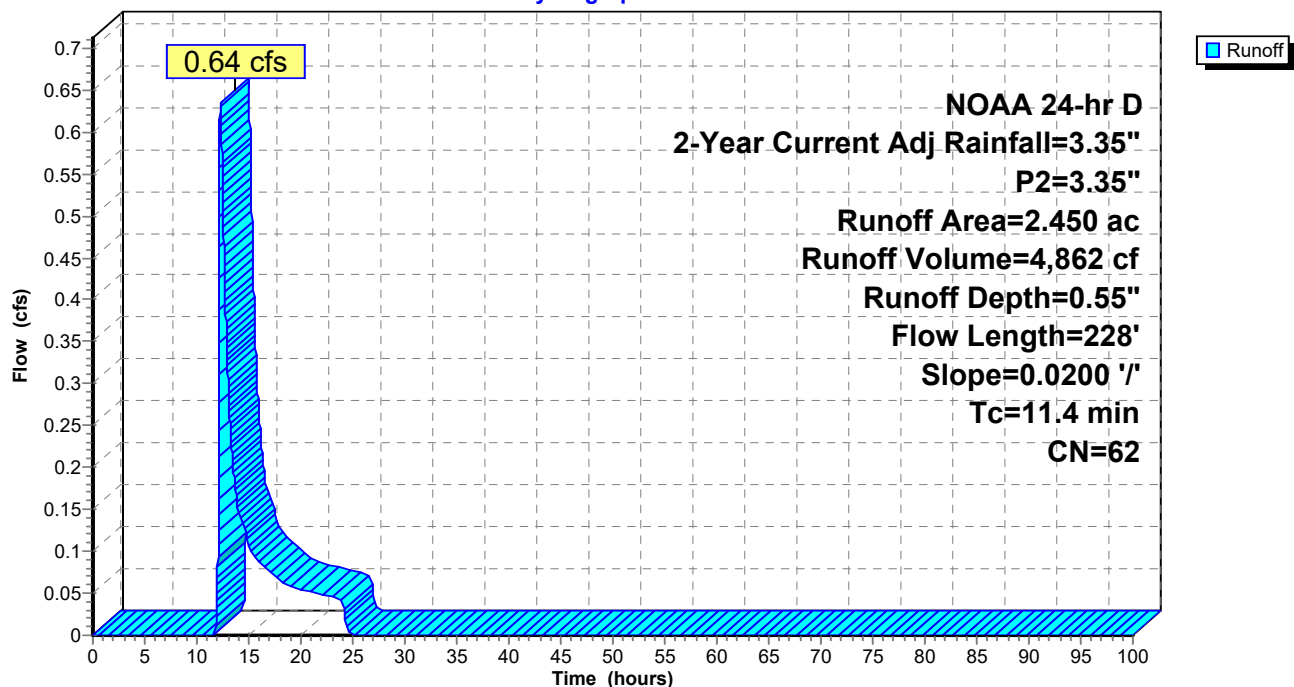
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
1.360	80	>75% Grass cover, Good, HSG D
1.090	39	>75% Grass cover, Good, HSG A
2.450	62	Weighted Average
2.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	94	0.0200	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
2.3	134	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.4	228	Total			

Subcatchment P1Lp:

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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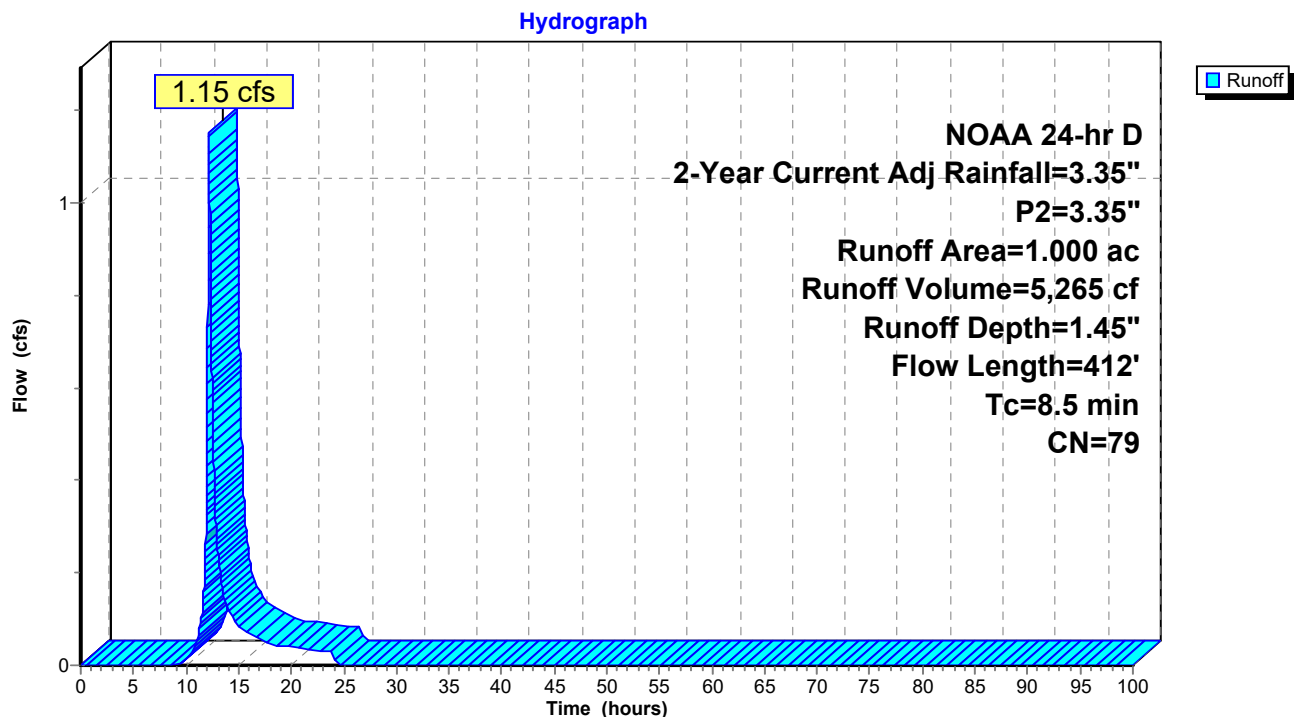
Summary for Subcatchment P1Mp:

Runoff = 1.15 cfs @ 12.17 hrs, Volume= 5,265 cf, Depth= 1.45"
Routed to Link P1A :

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.570	80	>75% Grass cover, Good, HSG D
0.430	77	Woods, Good, HSG D
1.000	79	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	36	0.1806	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.5	412	Total			

Subcatchment P1Mp:

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Ni: PDA 4B Impervious

Runoff = 0.20 cfs @ 12.29 hrs, Volume= 1,471 cf, Depth= 3.12"
Routed to Link P1B : BYPASS

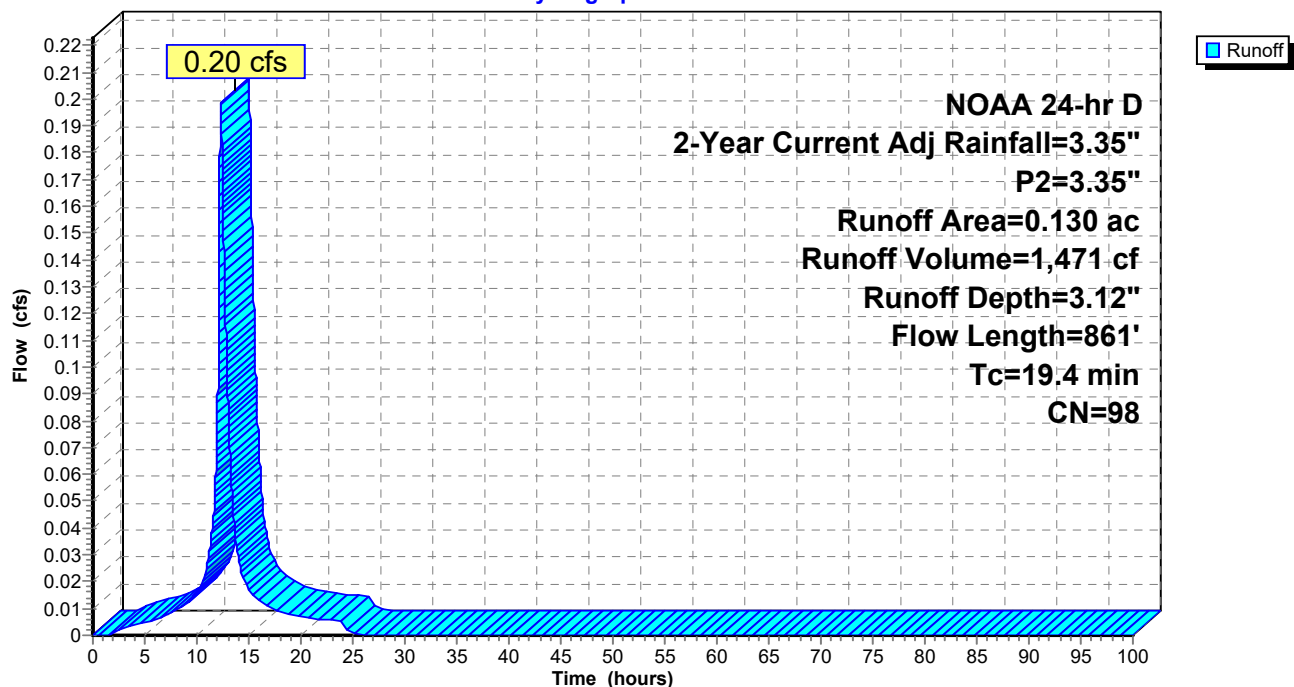
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment P1Ni: PDA 4B Impervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P1Np: PDA 4B Pervious

Runoff = 5.37 cfs @ 12.33 hrs, Volume= 37,538 cf, Depth= 1.38"
 Routed to Link P1B : BYPASS

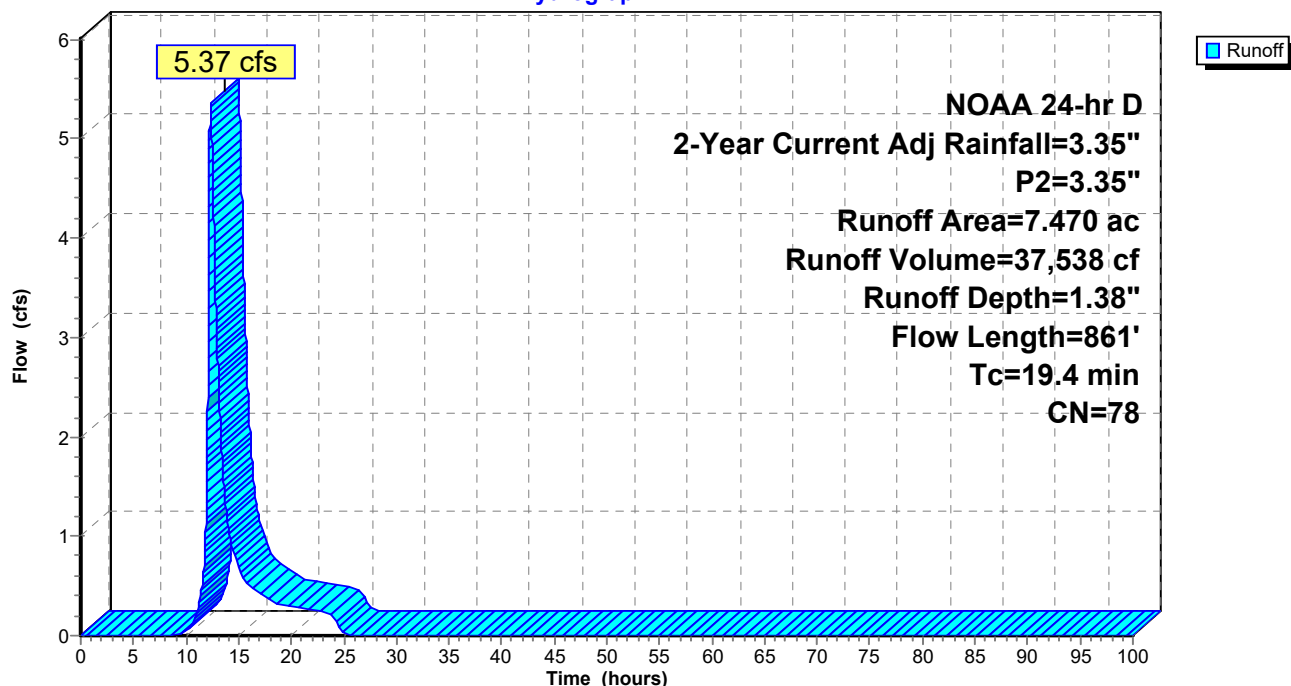
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment P1Np: PDA 4B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P2Ap: PDA 2A Pervious

Runoff = 0.62 cfs @ 12.26 hrs, Volume= 3,738 cf, Depth= 1.45"
 Routed to Link P2A : PDA 2A ONSITE

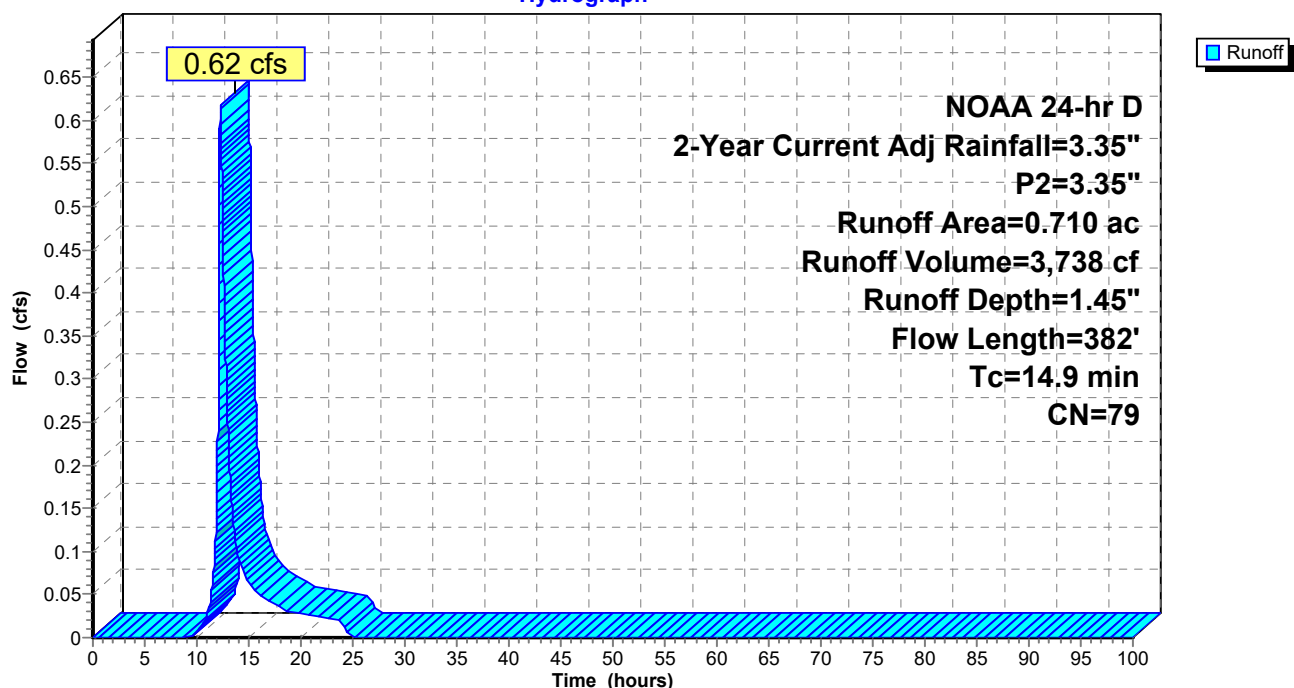
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.360	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
0.710	79	Weighted Average
0.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment P2Ap: PDA 2A Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Subcatchment P2Bp: PDA 2B Pervious

Runoff = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf, Depth= 1.32"
Routed to Link P2B : BYPASS

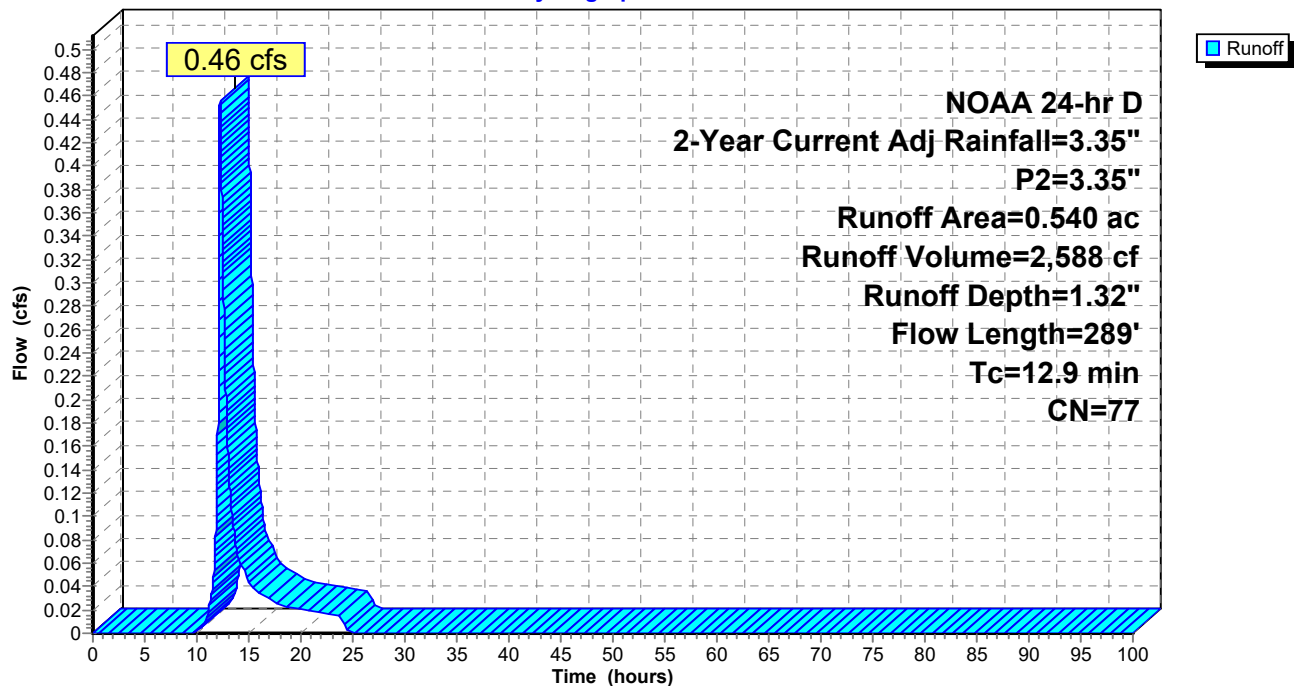
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	46	0.0335	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.9	289	Total			

Subcatchment P2Bp: PDA 2B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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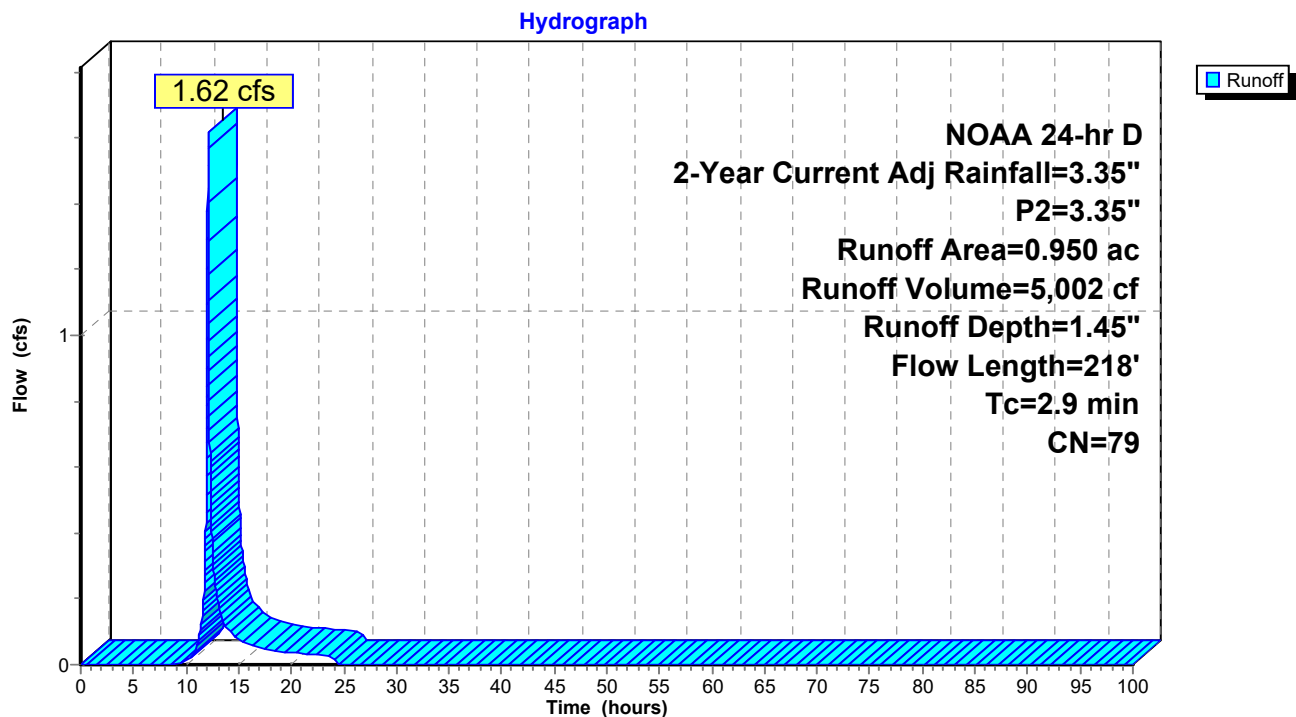
Summary for Subcatchment P3Ap: PDA 3A Pervious

Runoff = 1.62 cfs @ 12.11 hrs, Volume= 5,002 cf, Depth= 1.45"
Routed to Link P3A : PDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.430	77	Woods, Good, HSG D
0.520	80	>75% Grass cover, Good, HSG D
0.950	79	Weighted Average
0.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment P3Ap: PDA 3A Pervious

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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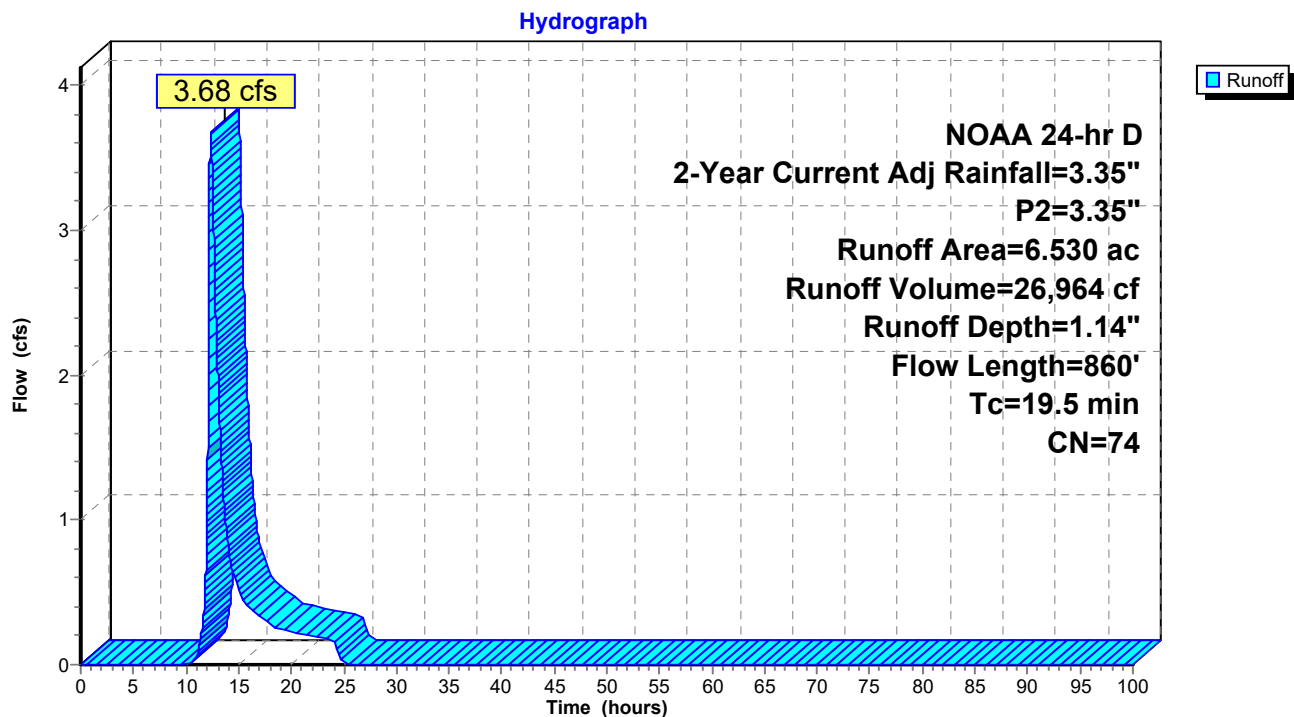
Summary for Subcatchment P3Bp: PDA 3B Pervious

Runoff = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf, Depth= 1.14"
Routed to Link P3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	59	0.0550	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.5	860	Total			

Subcatchment P3Bp: PDA 3B Pervious

Summary for Subcatchment P4p: PDA 4 Pervious

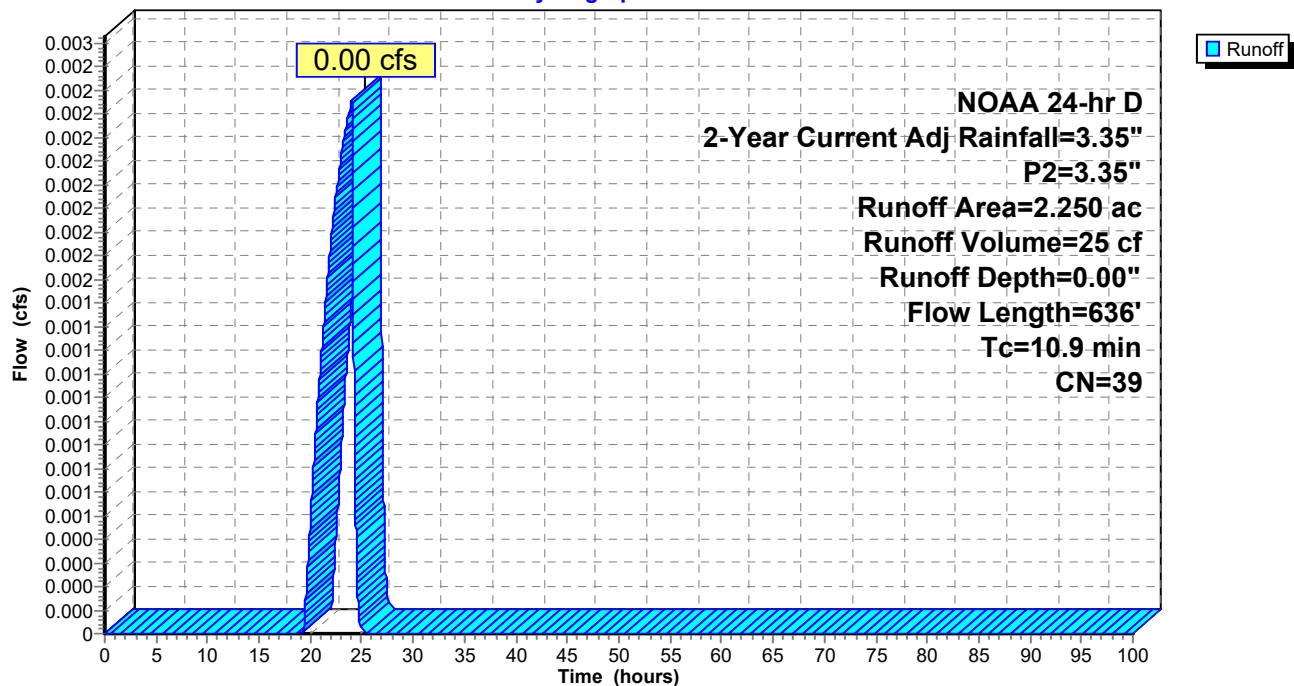
Runoff = 0.00 cfs @ 24.02 hrs, Volume= 25 cf, Depth= 0.00"
Routed to Link P4 : PDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

Area (ac)	CN	Description			
2.250	39	>75% Grass cover, Good, HSG A			
2.250		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.9	636	Total			

Subcatchment P4p: PDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 3.08" for 2-Year Current Adj event
 Inflow = 8.45 cfs @ 12.10 hrs, Volume= 27,599 cf
 Outflow = 0.46 cfs @ 13.56 hrs, Volume= 18,108 cf, Atten= 95%, Lag= 87.6 min
 Primary = 0.46 cfs @ 13.56 hrs, Volume= 18,108 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.68' @ 13.56 hrs Surf.Area= 0.559 ac Storage= 0.432 af

Plug-Flow detention time= 681.4 min calculated for 18,106 cf (66% of inflow)
 Center-of-Mass det. time= 571.2 min (1,326.2 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.46 cfs @ 13.56 hrs HW=10.68' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.46 cfs of 4.86 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.46 cfs @ 2.36 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 = 416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

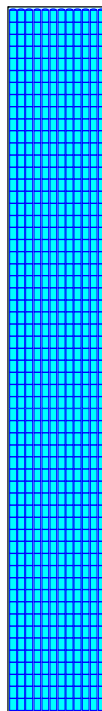
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

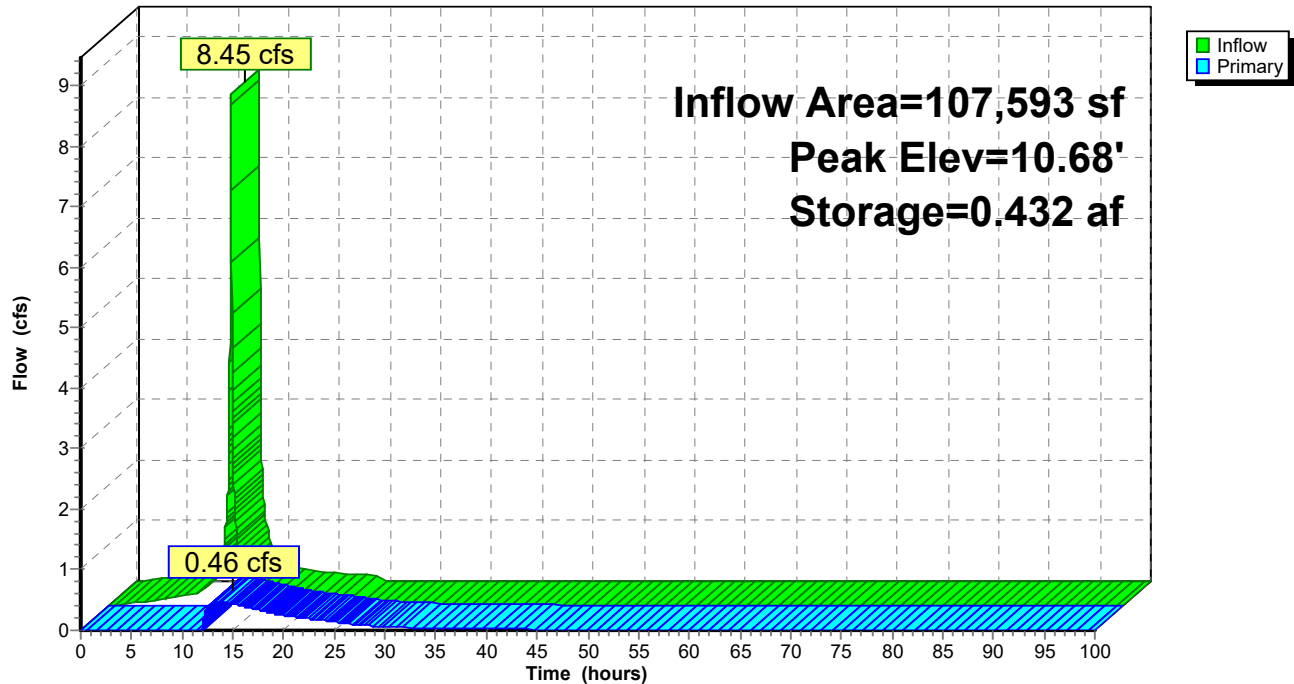
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 3.47" for 2-Year Current Adj event
 Inflow = 19.57 cfs @ 12.12 hrs, Volume= 98,375 cf
 Outflow = 3.99 cfs @ 13.21 hrs, Volume= 96,609 cf, Atten= 80%, Lag= 65.6 min
 Primary = 3.99 cfs @ 13.21 hrs, Volume= 96,609 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.80' @ 13.09 hrs Surf.Area= 19,615 sf Storage= 40,843 cf

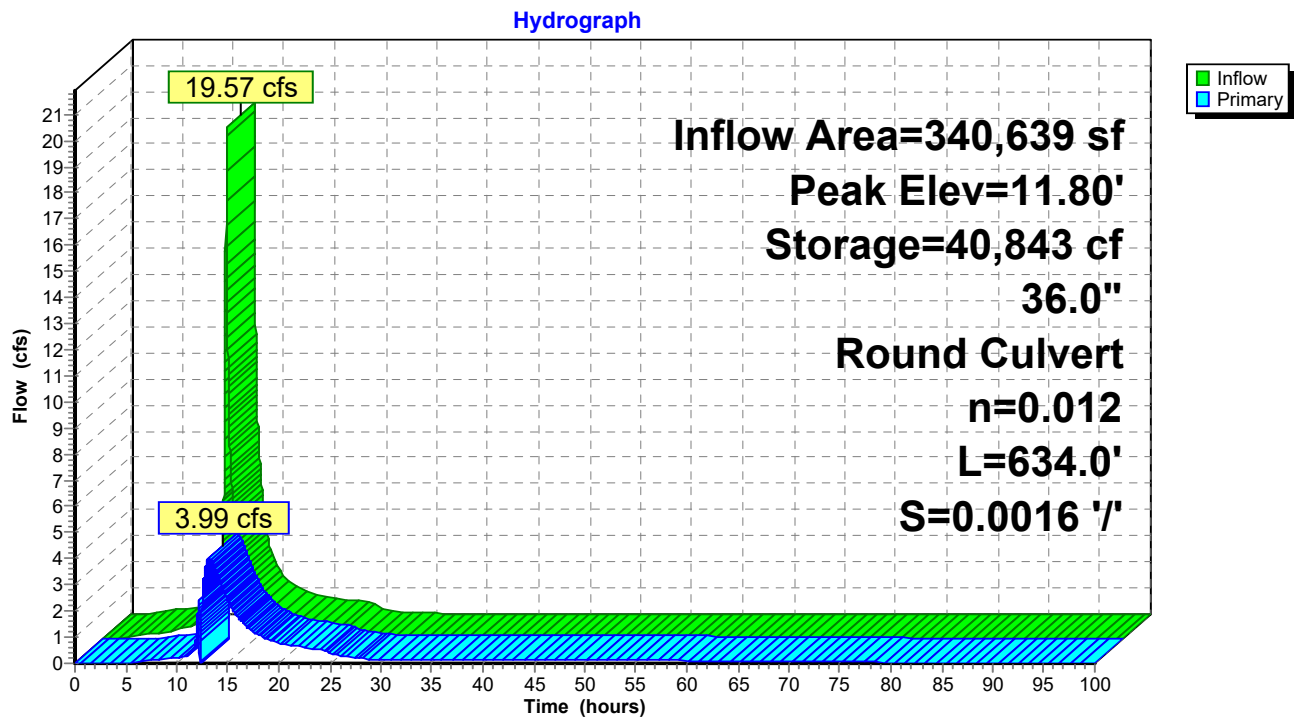
Plug-Flow detention time= 606.6 min calculated for 96,609 cf (98% of inflow)
 Center-of-Mass det. time= 586.3 min (1,429.0 - 842.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=4.03 cfs @ 13.21 hrs HW=11.79' TW=11.75' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 4.03 cfs @ 0.76 fps)

Pond CW1A: CONSTRUCTED WETLANDS 1A



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 2.34" for 2-Year Current Adj event
 Inflow = 22.58 cfs @ 12.12 hrs, Volume= 206,186 cf
 Outflow = 9.38 cfs @ 12.95 hrs, Volume= 204,049 cf, Atten= 58%, Lag= 49.7 min
 Primary = 9.38 cfs @ 12.95 hrs, Volume= 204,049 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.76' @ 13.07 hrs Surf.Area= 18,799 sf Storage= 43,009 cf

Plug-Flow detention time= 362.1 min calculated for 204,049 cf (99% of inflow)
 Center-of-Mass det. time= 321.4 min (1,439.4 - 1,118.0)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

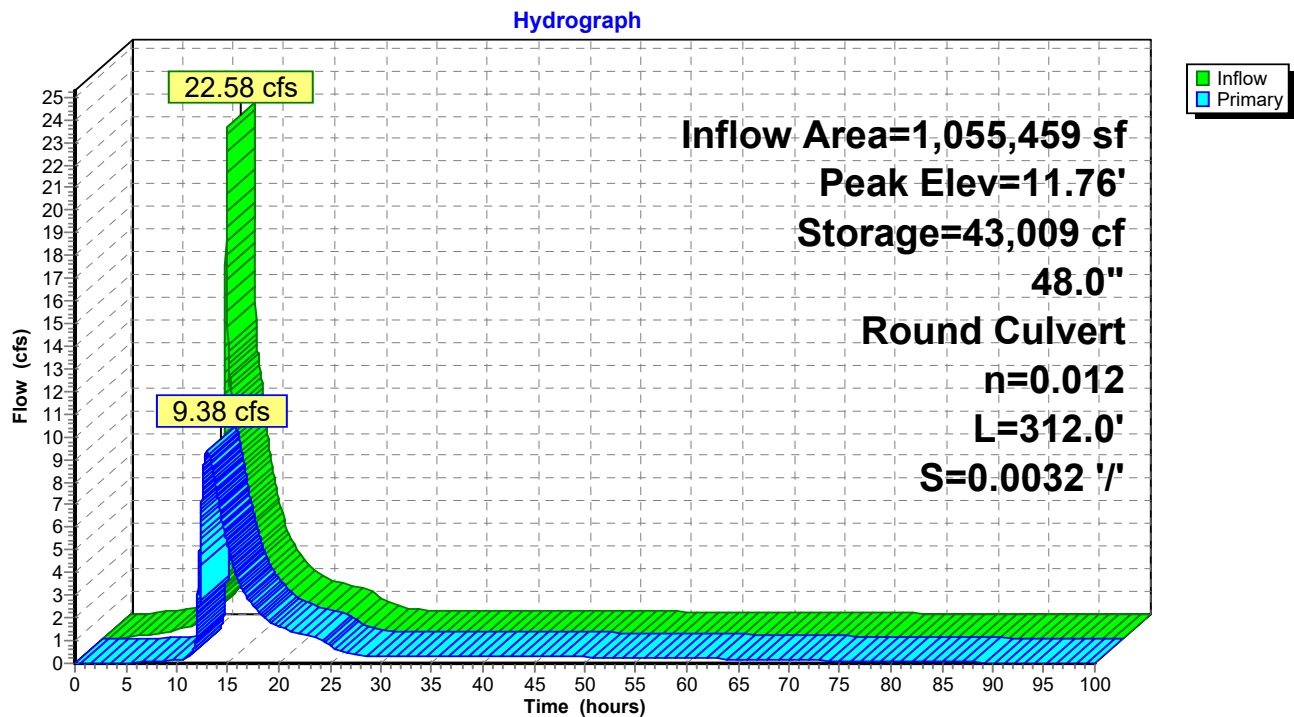
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=9.33 cfs @ 12.95 hrs HW=11.75' TW=11.66' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 9.33 cfs @ 1.43 fps)

Pond CW1B: CONSTRUCTED WETLANDS 1B



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 2.22" for 2-Year Current Adj event
 Inflow = 9.95 cfs @ 12.96 hrs, Volume= 235,298 cf
 Outflow = 9.91 cfs @ 13.10 hrs, Volume= 235,004 cf, Atten= 0%, Lag= 8.8 min
 Primary = 9.91 cfs @ 13.10 hrs, Volume= 235,004 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.67' @ 13.08 hrs Surf.Area= 6,104 sf Storage= 10,200 cf

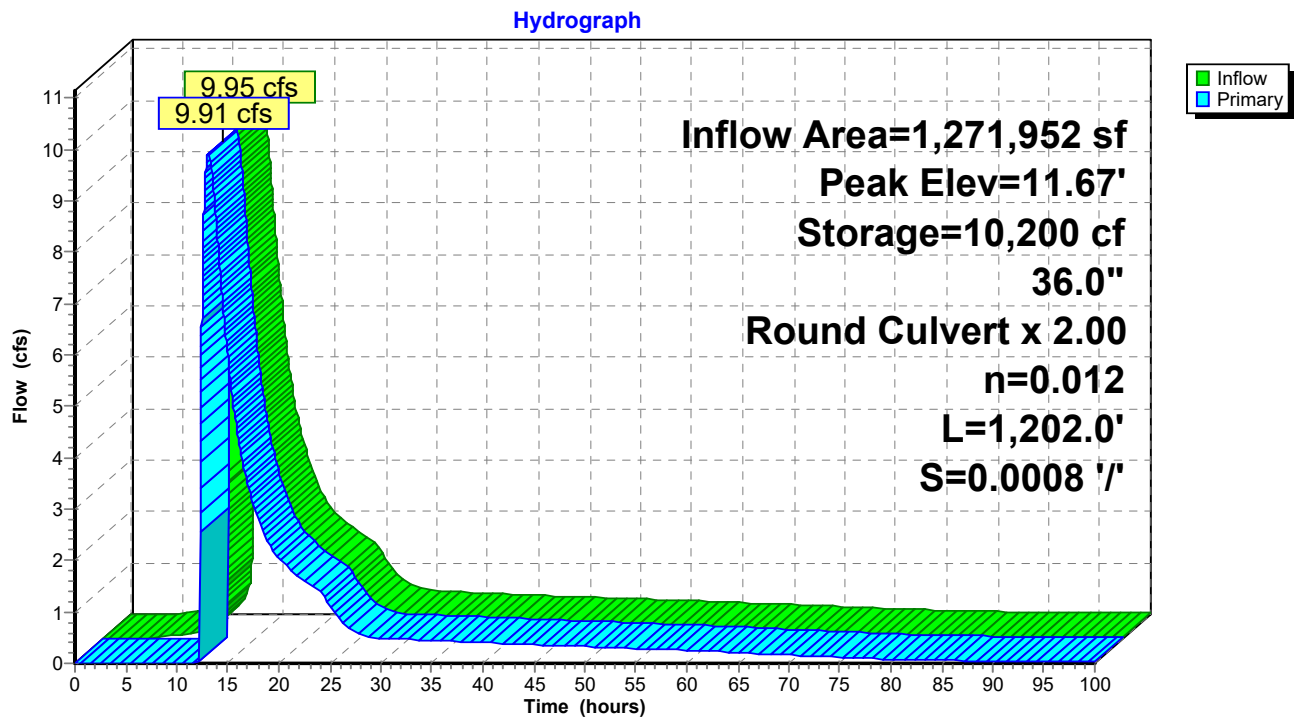
Plug-Flow detention time= 63.4 min calculated for 234,981 cf (100% of inflow)
 Center-of-Mass det. time= 57.8 min (1,500.4 - 1,442.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=9.91 cfs @ 13.10 hrs HW=11.67' TW=11.55' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 9.91 cfs @ 0.99 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 2.36" for 2-Year Current Adj event
 Inflow = 24.69 cfs @ 12.11 hrs, Volume= 332,385 cf
 Outflow = 12.77 cfs @ 13.06 hrs, Volume= 331,277 cf, Atten= 48%, Lag= 56.8 min
 Primary = 12.77 cfs @ 13.06 hrs, Volume= 331,277 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.55' @ 13.06 hrs Surf.Area= 19,873 sf Storage= 40,655 cf

Plug-Flow detention time= 222.8 min calculated for 331,244 cf (100% of inflow)
 Center-of-Mass det. time= 208.1 min (1,501.7 - 1,293.6)

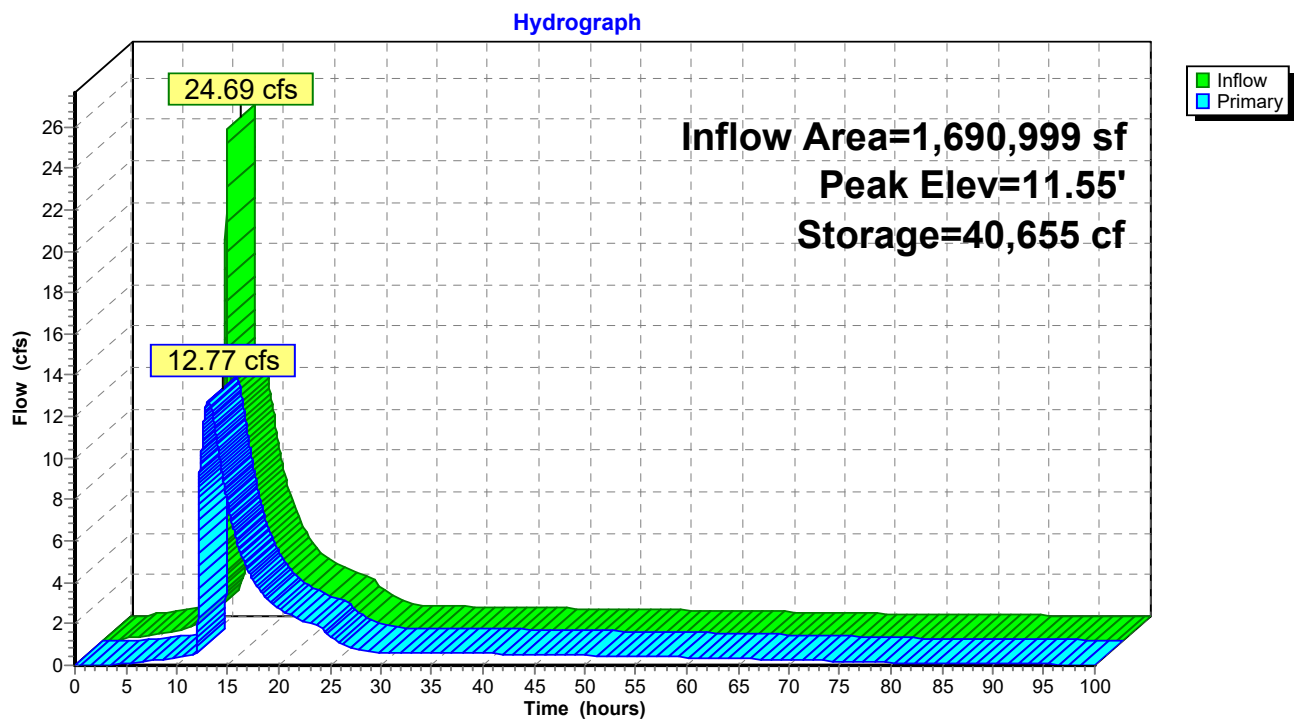
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=12.77 cfs @ 13.06 hrs HW=11.55' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 12.77 cfs of 37.72 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.78 cfs @ 7.50 fps)
 3=Orifice/Grate (Orifice Controls 11.99 cfs @ 2.91 fps)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond CW1D: CONSTRUCTED WETLANDS 1D



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 3.04" for 2-Year Current Adj event
 Inflow = 2.63 cfs @ 12.10 hrs, Volume= 8,599 cf
 Outflow = 0.12 cfs @ 14.11 hrs, Volume= 5,712 cf, Atten= 95%, Lag= 120.7 min
 Primary = 0.12 cfs @ 14.11 hrs, Volume= 5,712 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.73' @ 14.11 hrs Surf.Area= 12,680 sf Storage= 5,974 cf

Plug-Flow detention time= 619.2 min calculated for 5,712 cf (66% of inflow)
 Center-of-Mass det. time= 510.5 min (1,264.4 - 753.9)

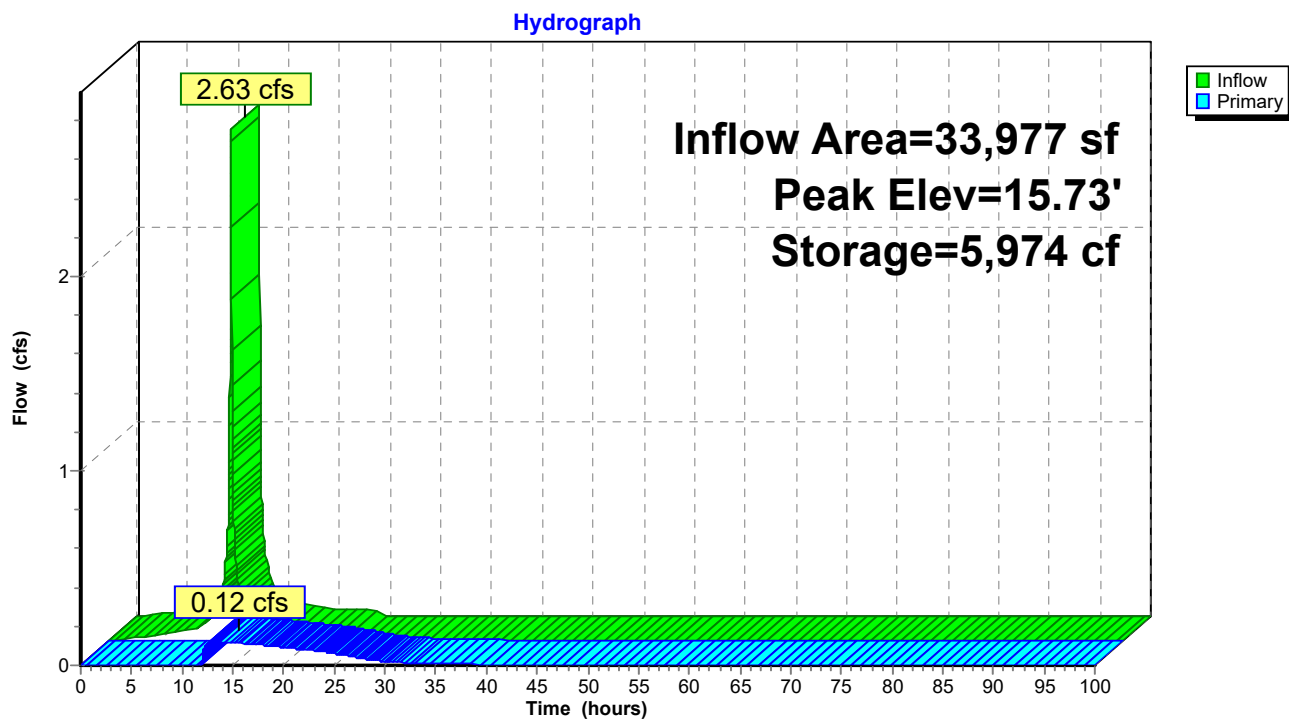
Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.12 cfs @ 14.11 hrs HW=15.73' TW=11.62' (Dynamic Tailwater)

- 1=Culvert (Passes 0.12 cfs of 11.77 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.12 cfs @ 3.45 fps)
- 3=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.45 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PP1: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 3.01" for 2-Year Current Adj event
 Inflow = 6.04 cfs @ 12.10 hrs, Volume= 19,670 cf
 Outflow = 0.15 cfs @ 16.43 hrs, Volume= 13,133 cf, Atten= 98%, Lag= 259.7 min
 Primary = 0.15 cfs @ 16.43 hrs, Volume= 13,133 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.15' @ 16.43 hrs Surf.Area= 23,328 sf Storage= 14,886 cf

Plug-Flow detention time= 1,004.4 min calculated for 13,132 cf (67% of inflow)
 Center-of-Mass det. time= 895.8 min (1,652.6 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

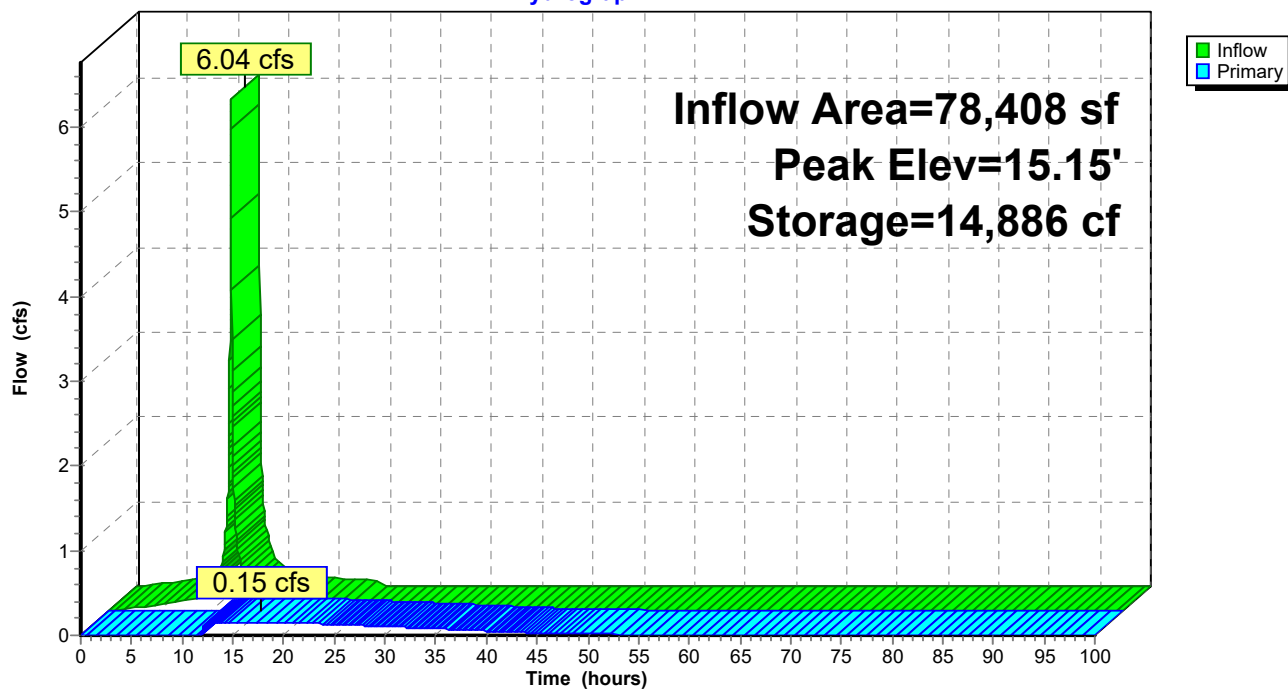
Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.15 cfs @ 16.43 hrs HW=15.15' TW=11.19' (Dynamic Tailwater)

1=Culvert (Passes 0.15 cfs of 62.09 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.15 cfs @ 4.34 fps)
 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP2: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 3.05" for 2-Year Current Adj event
 Inflow = 2.48 cfs @ 12.10 hrs, Volume= 8,086 cf
 Outflow = 0.13 cfs @ 13.78 hrs, Volume= 5,400 cf, Atten= 95%, Lag= 100.9 min
 Primary = 0.13 cfs @ 13.78 hrs, Volume= 5,400 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.88' @ 13.78 hrs Surf.Area= 10,368 sf Storage= 5,497 cf

Plug-Flow detention time= 553.4 min calculated for 5,400 cf (67% of inflow)
 Center-of-Mass det. time= 445.0 min (1,200.8 - 755.8)

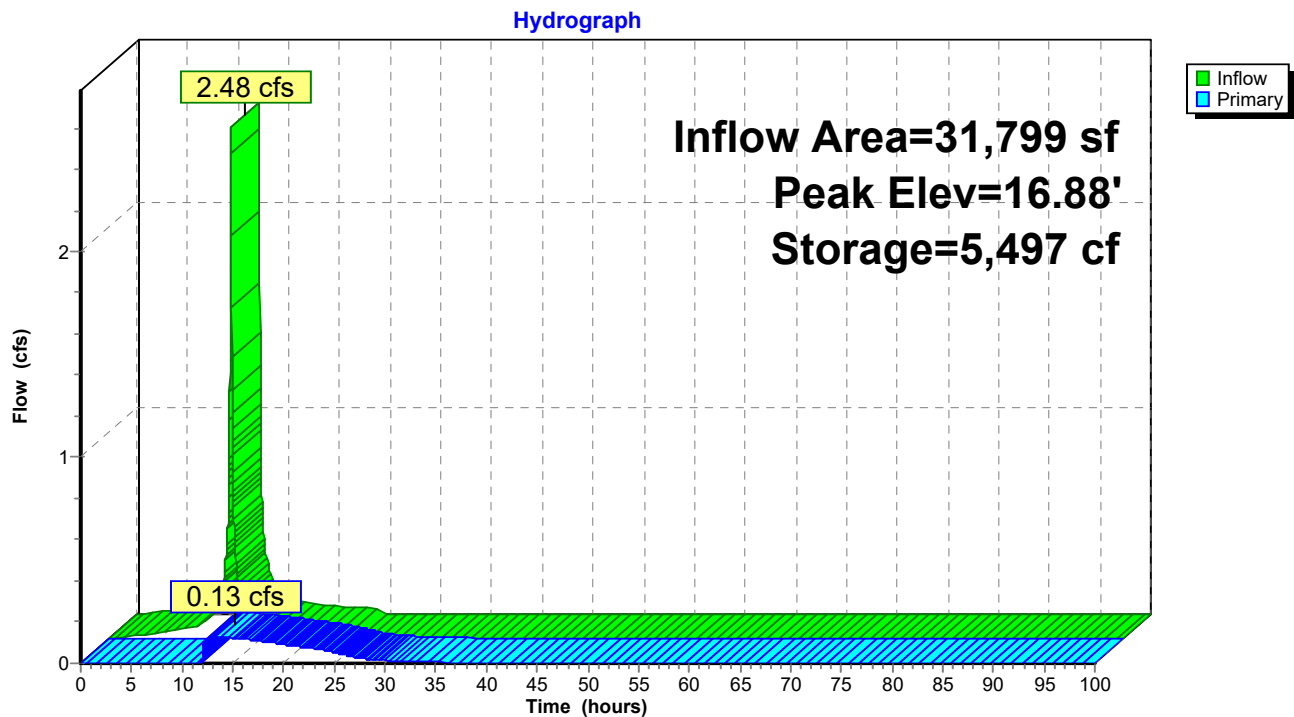
Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.13 cfs @ 13.78 hrs HW=16.88' TW=11.49' (Dynamic Tailwater)

- 1=Culvert (Passes 0.13 cfs of 54.87 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.13 cfs @ 3.67 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP3: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 3.03" for 2-Year Current Adj event
 Inflow = 36.16 cfs @ 12.10 hrs, Volume= 121,121 cf
 Outflow = 9.78 cfs @ 12.29 hrs, Volume= 81,252 cf, Atten= 73%, Lag= 11.5 min
 Primary = 6.52 cfs @ 12.29 hrs, Volume= 54,168 cf
 Routed to Link PP4V : Valve
 Secondary = 3.26 cfs @ 12.29 hrs, Volume= 27,084 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.90' @ 12.29 hrs Surf.Area= 181,216 sf Storage= 64,842 cf

Plug-Flow detention time= 275.9 min calculated for 81,252 cf (67% of inflow)
 Center-of-Mass det. time= 167.4 min (923.0 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.52 cfs @ 12.29 hrs HW=13.90' TW=0.00' (Dynamic Tailwater)

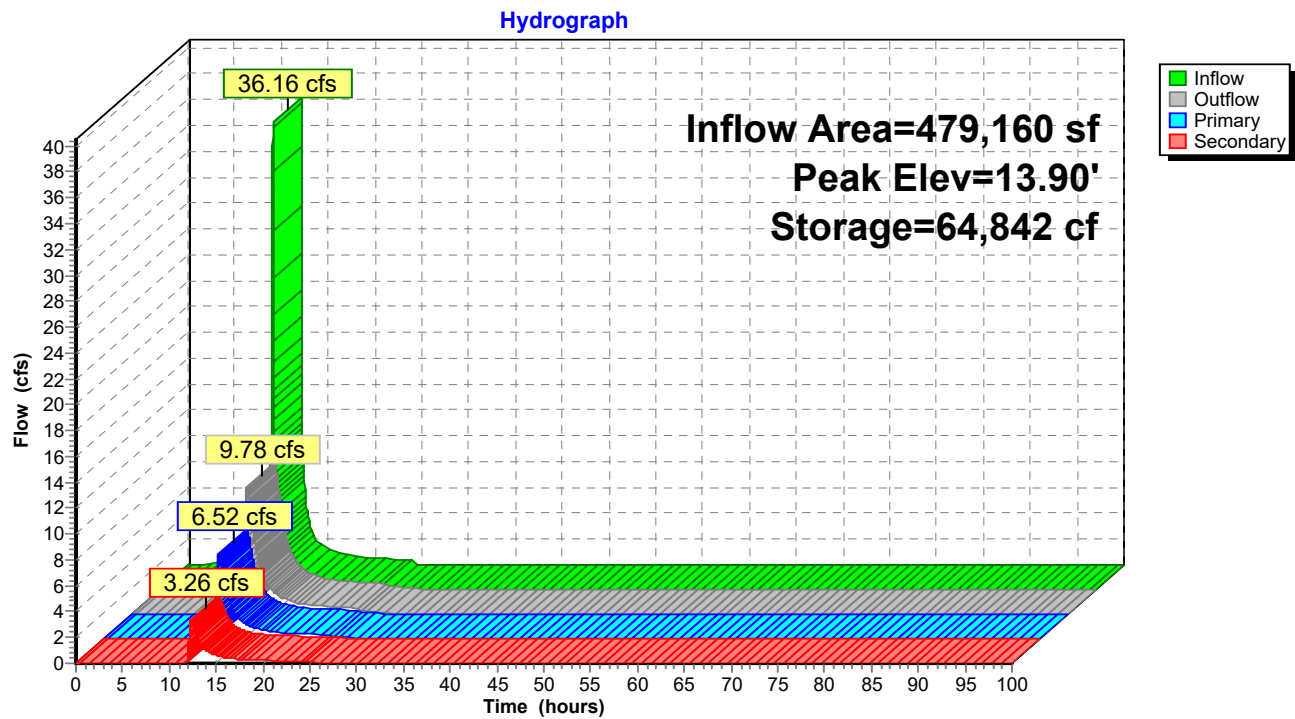
↑ **1=Culvert** (Passes 6.52 cfs of 116.31 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 6.52 cfs @ 1.92 fps)

Secondary OutFlow Max=3.26 cfs @ 12.29 hrs HW=13.90' TW=11.34' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 3.26 cfs of 54.55 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 3.26 cfs @ 1.92 fps)

Pond PP4: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 3.07" for 2-Year Current Adj event
 Inflow = 2.62 cfs @ 12.09 hrs, Volume= 8,483 cf
 Outflow = 0.85 cfs @ 12.20 hrs, Volume= 5,654 cf, Atten= 68%, Lag= 6.7 min
 Primary = 0.85 cfs @ 12.20 hrs, Volume= 5,654 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.70' @ 12.20 hrs Surf.Area= 24,388 sf Storage= 4,416 cf

Plug-Flow detention time= 259.1 min calculated for 5,653 cf (67% of inflow)
 Center-of-Mass det. time= 150.5 min (904.0 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

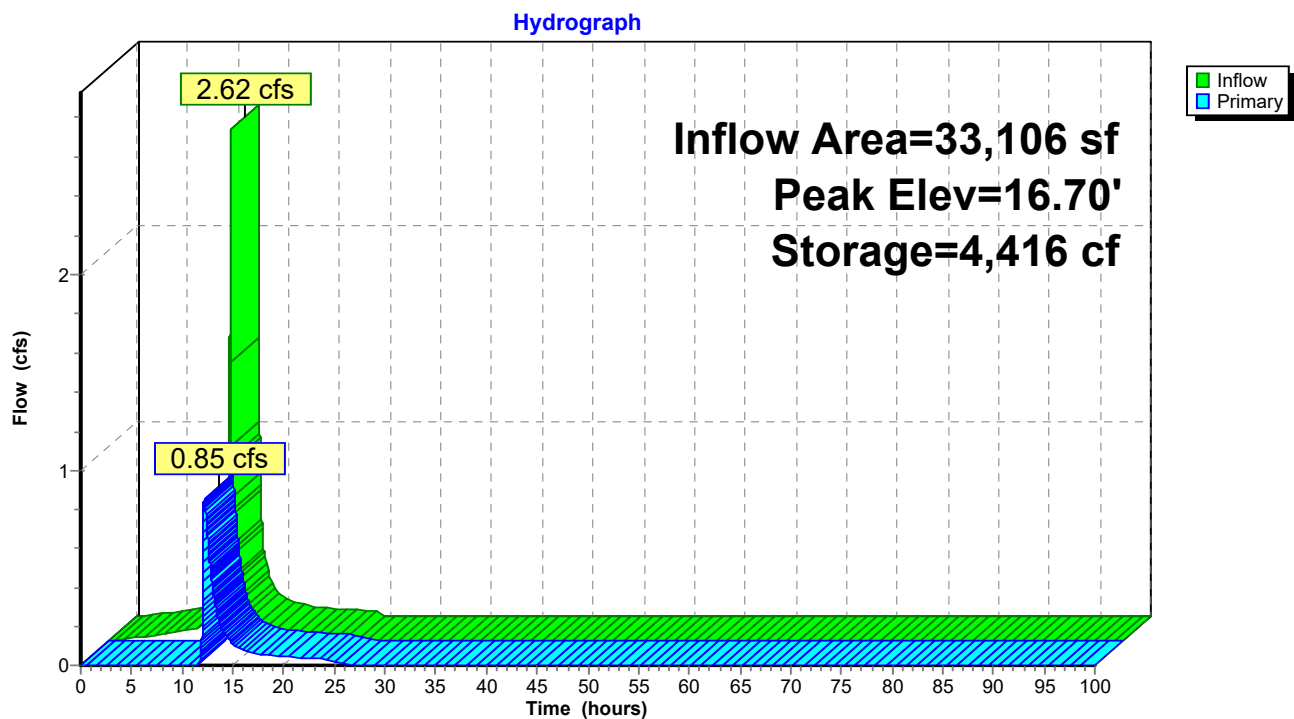
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.85 cfs @ 12.20 hrs HW=16.70' TW=11.35' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.85 cfs of 11.46 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.85 cfs @ 1.32 fps)

Pond PP5: POROUS PAVEMENT



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 3.06" for 2-Year Current Adj event
 Inflow = 3.05 cfs @ 12.09 hrs, Volume= 9,878 cf
 Outflow = 0.84 cfs @ 12.21 hrs, Volume= 6,619 cf, Atten= 73%, Lag= 7.4 min
 Primary = 0.84 cfs @ 12.21 hrs, Volume= 6,619 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.42' @ 12.21 hrs Surf.Area= 31,334 sf Storage= 5,274 cf

Plug-Flow detention time= 272.8 min calculated for 6,619 cf (67% of inflow)
 Center-of-Mass det. time= 164.3 min (917.1 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

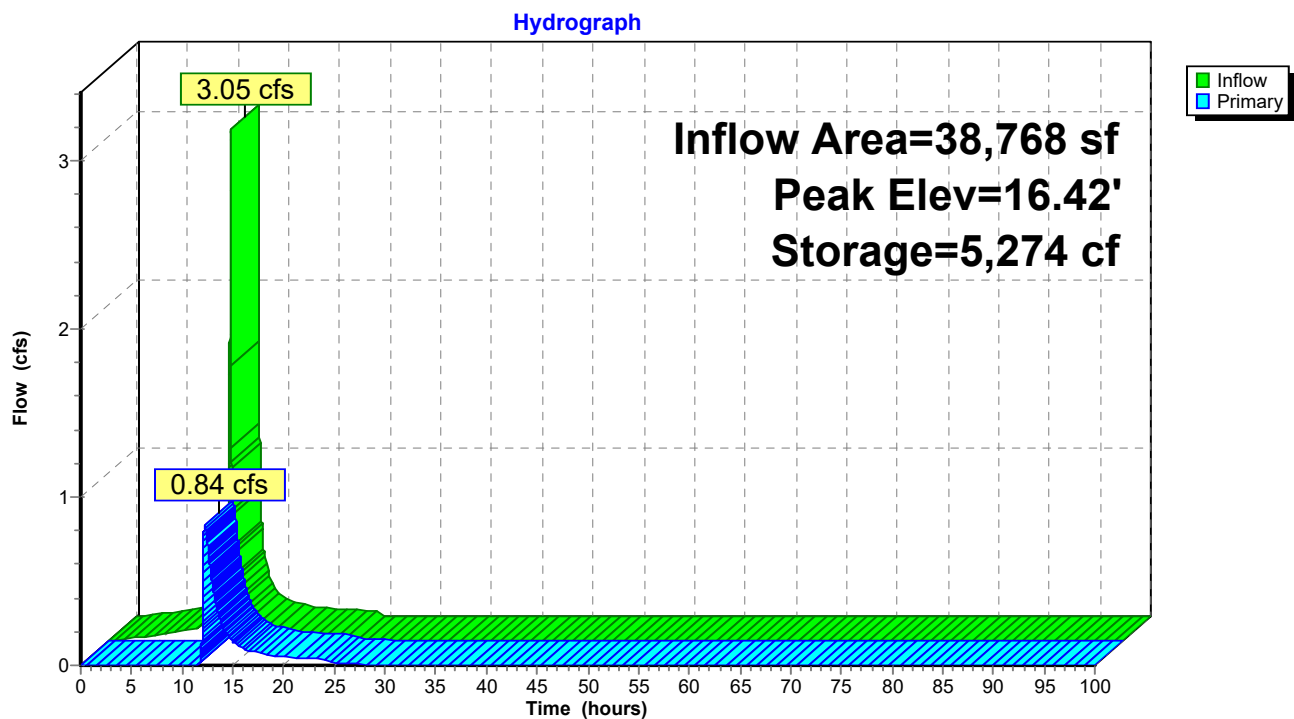
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.84 cfs @ 12.21 hrs HW=16.42' TW=11.17' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.84 cfs of 12.83 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.84 cfs @ 1.31 fps)

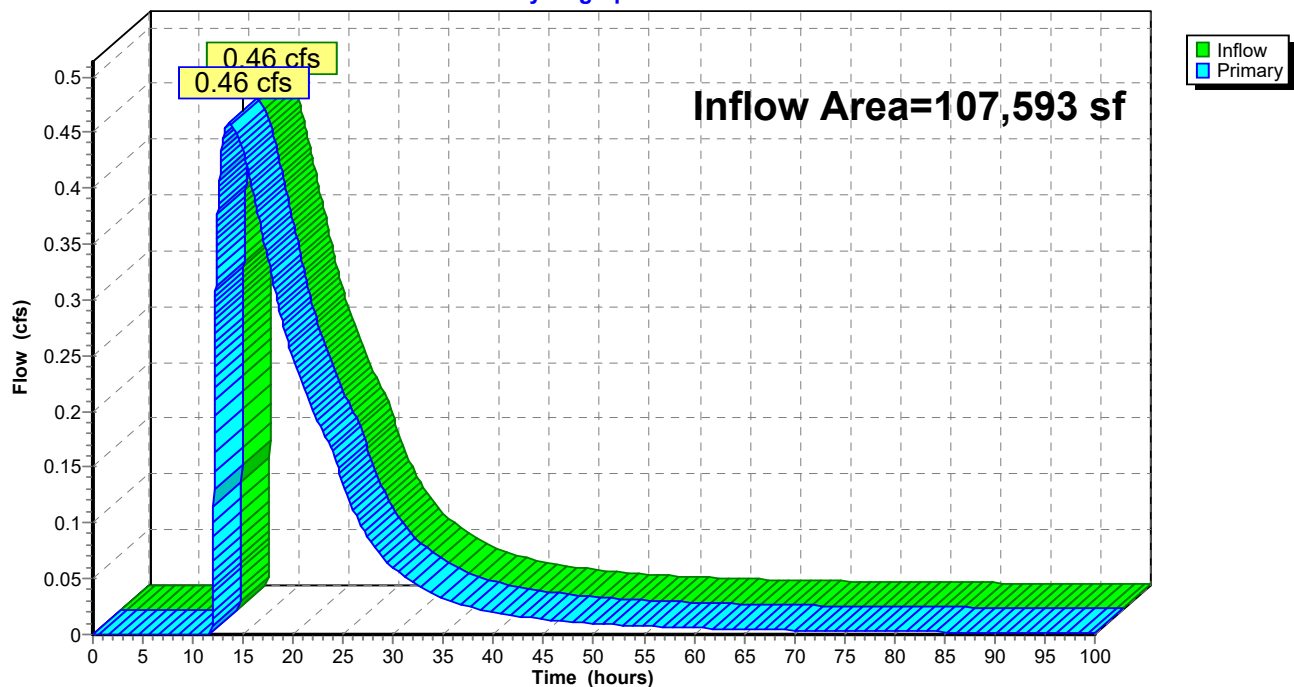
Pond PP6: POROUS PAVEMENT



Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 2.02" for 2-Year Current Adj event
Inflow = 0.46 cfs @ 13.56 hrs, Volume= 18,108 cf
Primary = 0.46 cfs @ 13.56 hrs, Volume= 18,108 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve**Hydrograph**

Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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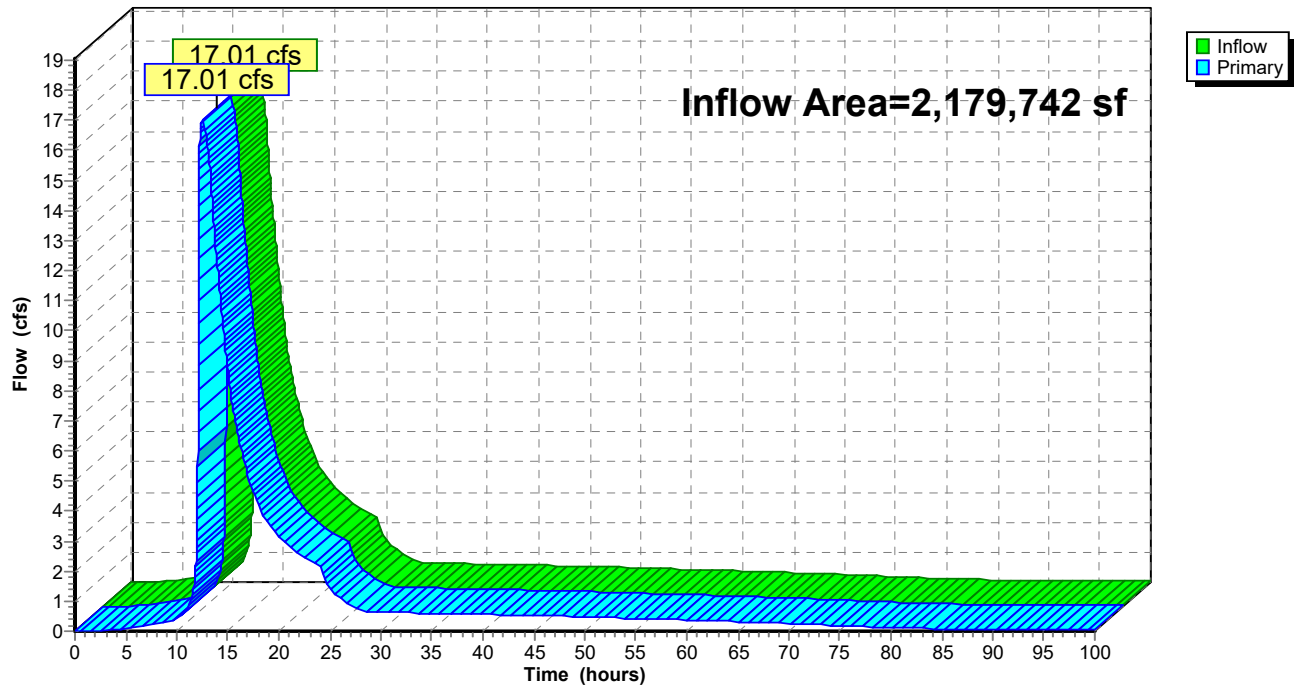
Summary for Link P1: PDA 1

Inflow Area = 2,179,742 sf, 69.82% Impervious, Inflow Depth > 2.10" for 2-Year Current Adj event
Inflow = 17.01 cfs @ 12.57 hrs, Volume= 382,336 cf
Primary = 17.01 cfs @ 12.57 hrs, Volume= 382,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1: PDA 1

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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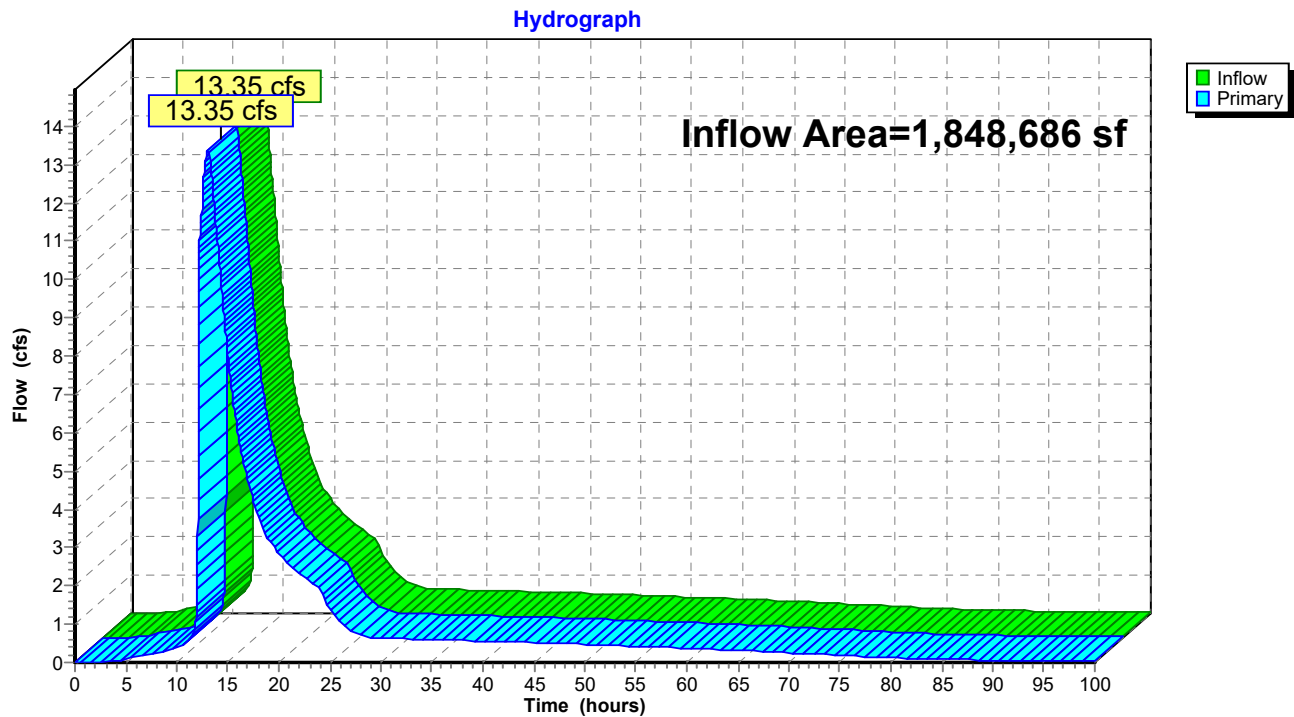
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Summary for Link P1A:

Inflow Area = 1,848,686 sf, 82.02% Impervious, Inflow Depth > 2.23" for 2-Year Current Adj event
Inflow = 13.35 cfs @ 13.01 hrs, Volume= 343,327 cf
Primary = 13.35 cfs @ 13.01 hrs, Volume= 343,327 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



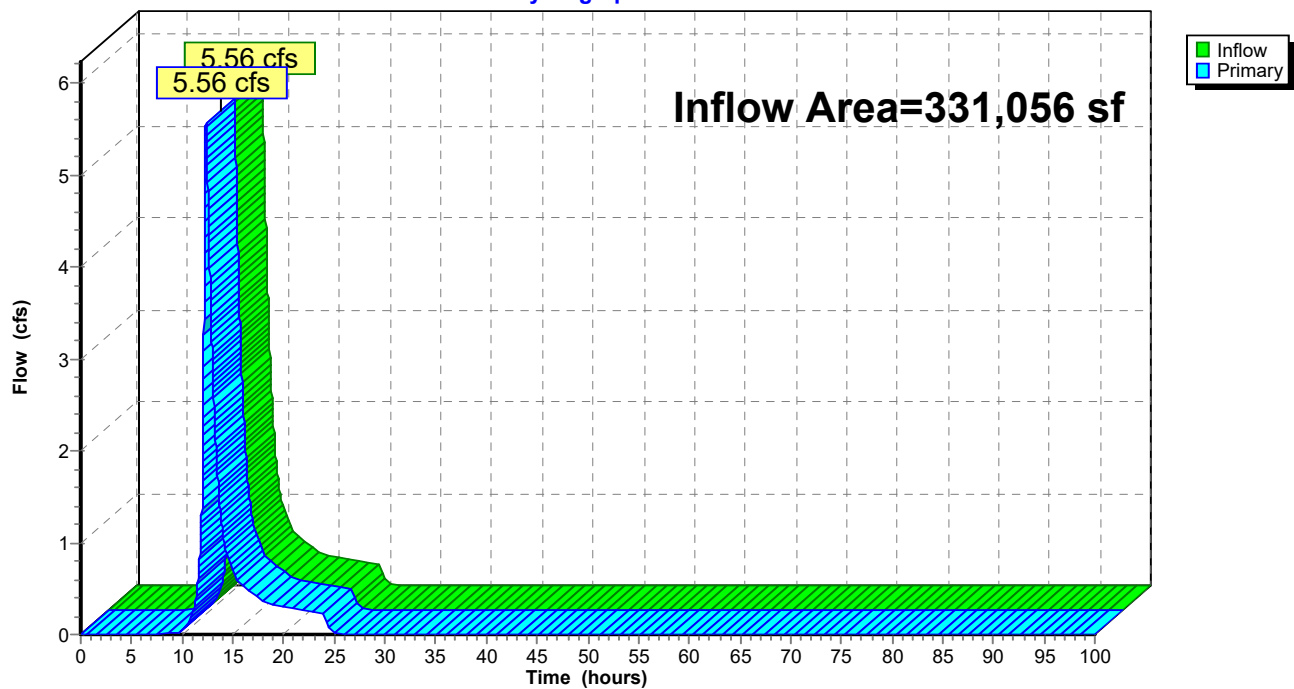
Summary for Link P1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 1.41" for 2-Year Current Adj event
Inflow = 5.56 cfs @ 12.33 hrs, Volume= 39,009 cf
Primary = 5.56 cfs @ 12.33 hrs, Volume= 39,009 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1B: BYPASS

Hydrograph



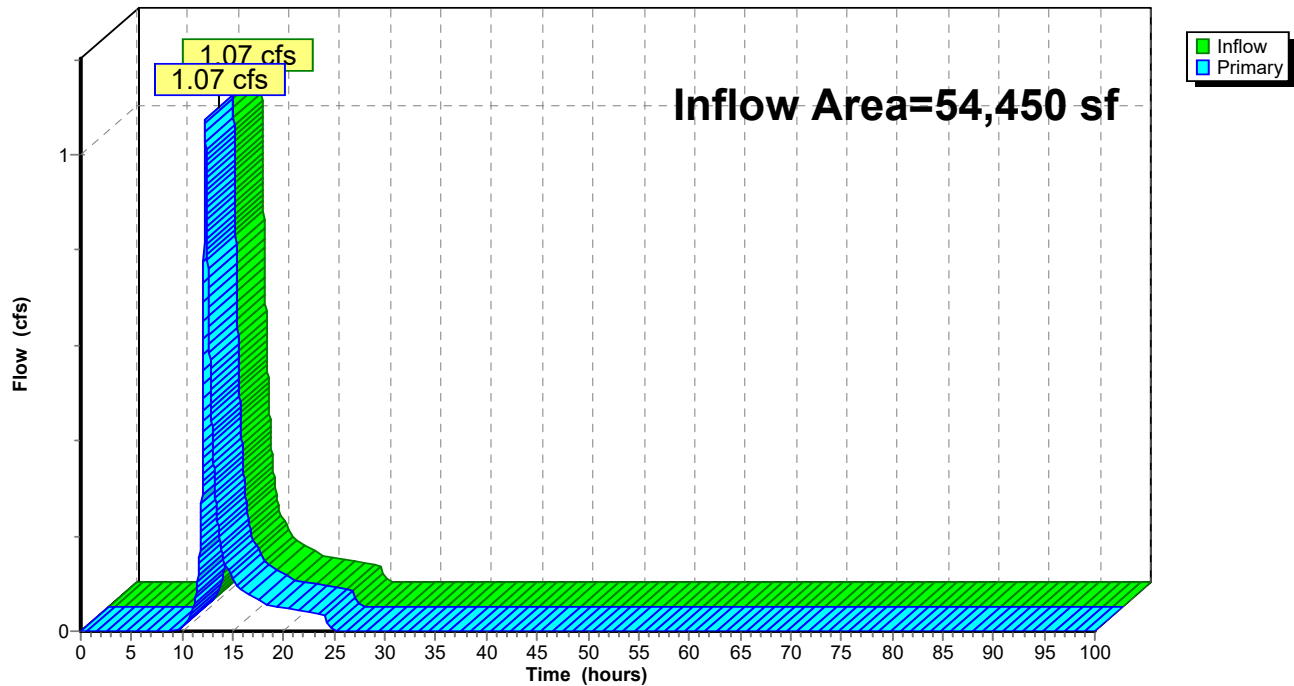
Summary for Link P2: PDA 2

Inflow Area = 54,450 sf, 0.00% Impervious, Inflow Depth = 1.39" for 2-Year Current Adj event
Inflow = 1.07 cfs @ 12.25 hrs, Volume= 6,326 cf
Primary = 1.07 cfs @ 12.25 hrs, Volume= 6,326 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2: PDA 2

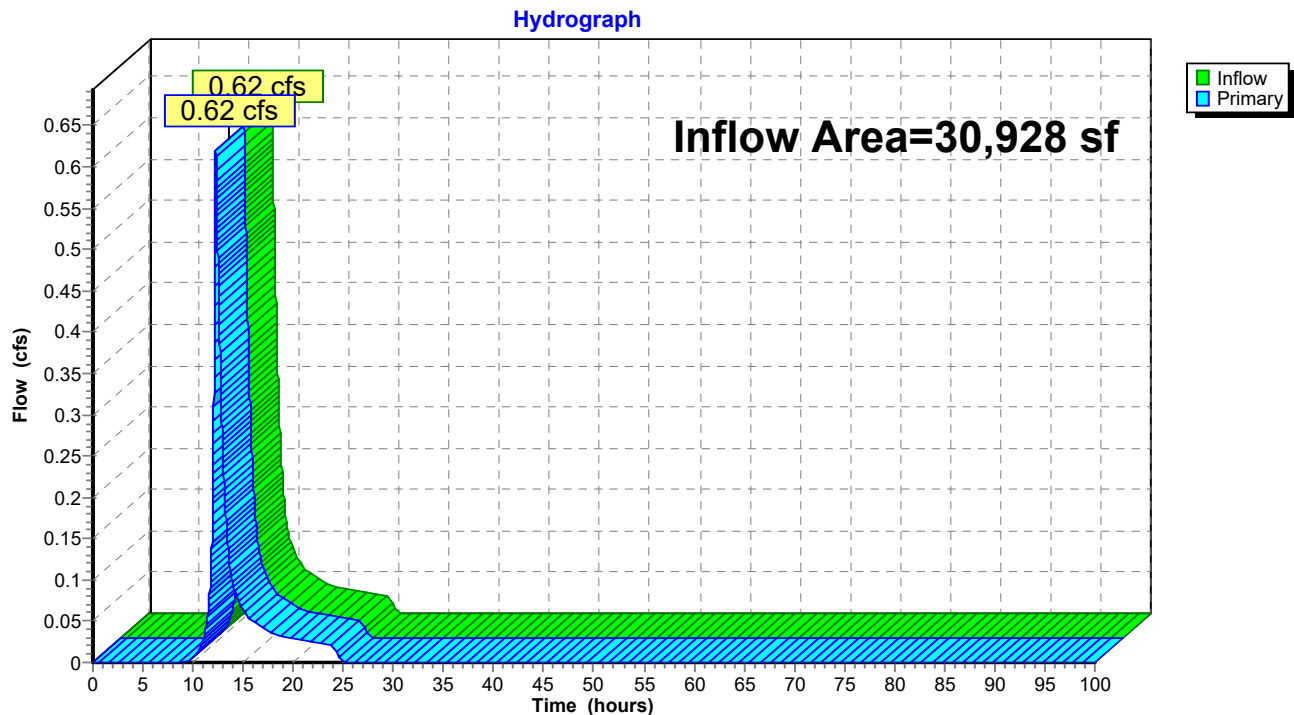
Hydrograph



Summary for Link P2A: PDA 2A ONSITE

Inflow Area = 30,928 sf, 0.00% Impervious, Inflow Depth = 1.45" for 2-Year Current Adj event
Inflow = 0.62 cfs @ 12.26 hrs, Volume= 3,738 cf
Primary = 0.62 cfs @ 12.26 hrs, Volume= 3,738 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2A: PDA 2A ONSITE

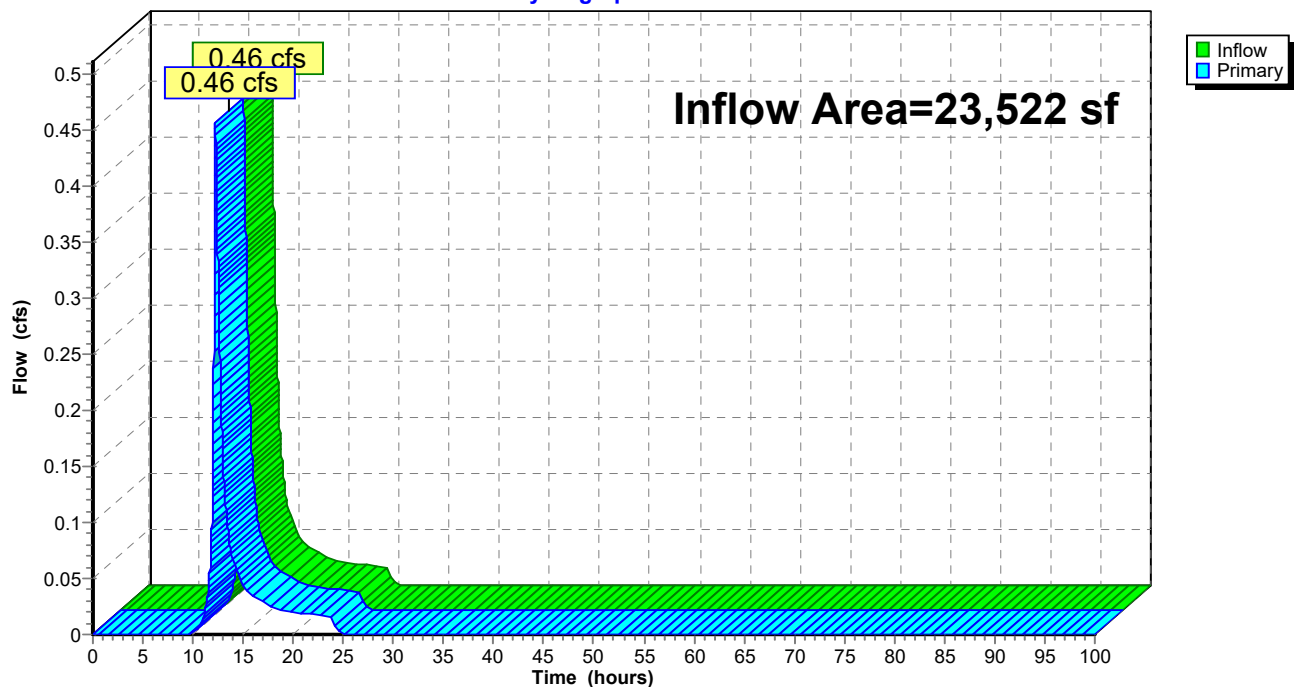
Summary for Link P2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 1.32" for 2-Year Current Adj event
Inflow = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf
Primary = 0.46 cfs @ 12.24 hrs, Volume= 2,588 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2B: BYPASS

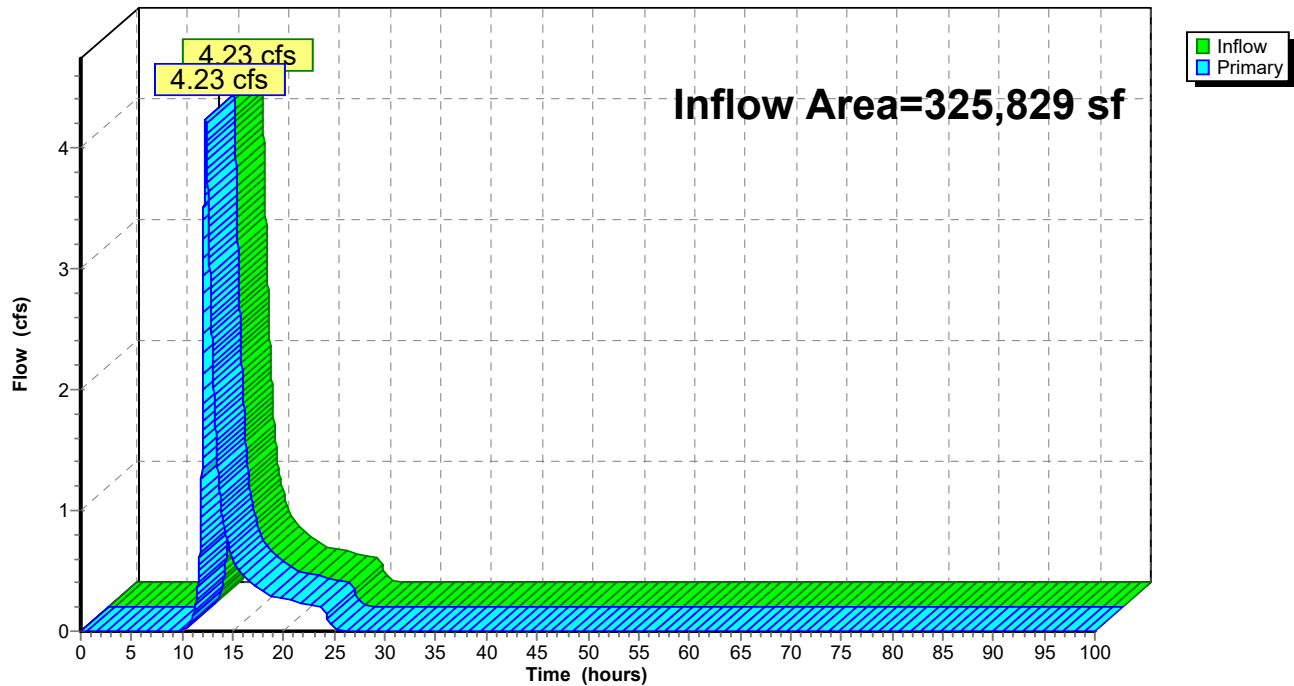
Hydrograph



Summary for Link P3: PDA 3

Inflow Area = 325,829 sf, 0.00% Impervious, Inflow Depth = 1.18" for 2-Year Current Adj event
Inflow = 4.23 cfs @ 12.31 hrs, Volume= 31,966 cf
Primary = 4.23 cfs @ 12.31 hrs, Volume= 31,966 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3: PDA 3**Hydrograph**

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NOAA 24-hr D 2-Year Current Adj Rainfall=3.35", P2=3.35"

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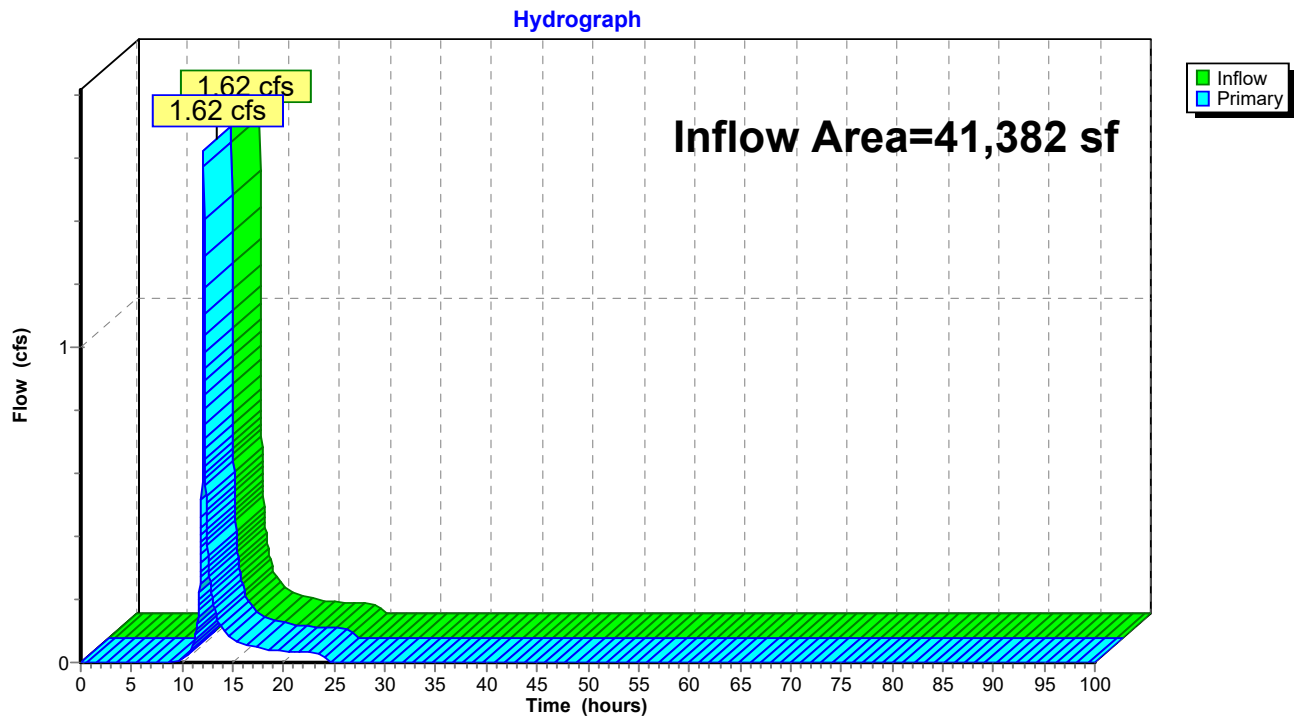
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Summary for Link P3A: PDA 3A ONSITE

Inflow Area = 41,382 sf, 0.00% Impervious, Inflow Depth = 1.45" for 2-Year Current Adj event
Inflow = 1.62 cfs @ 12.11 hrs, Volume= 5,002 cf
Primary = 1.62 cfs @ 12.11 hrs, Volume= 5,002 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3A: PDA 3A ONSITE



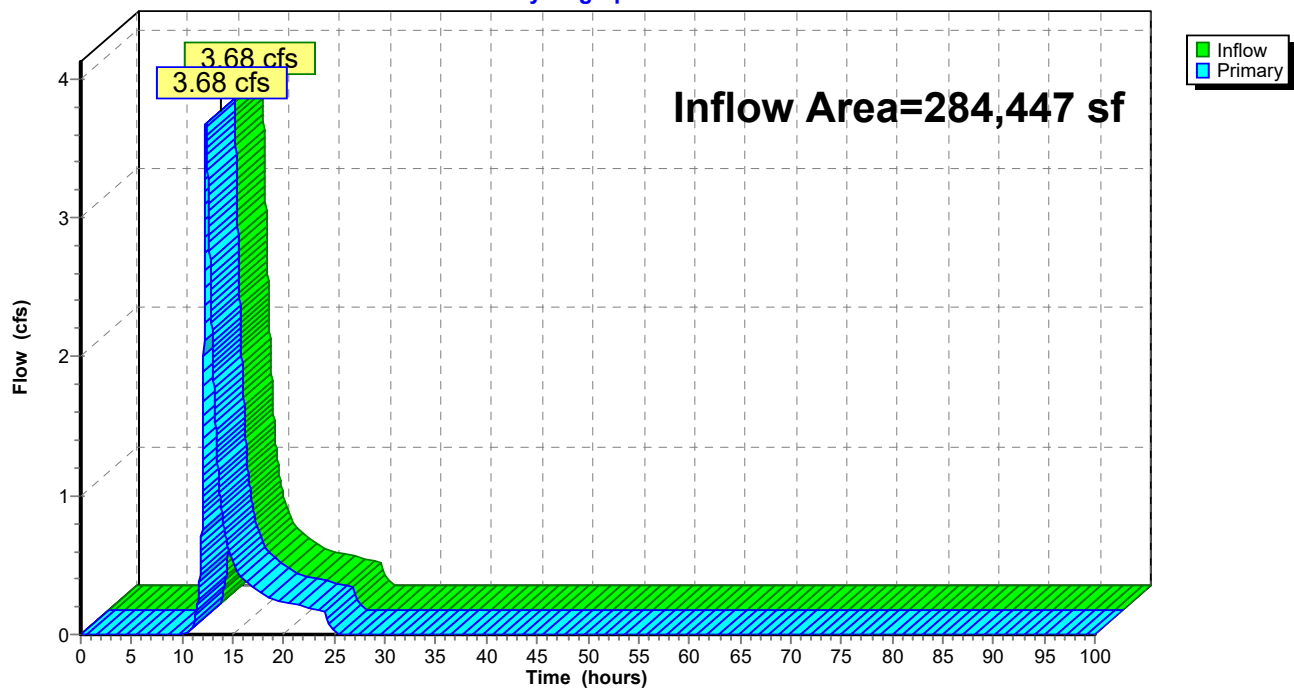
Summary for Link P3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 1.14" for 2-Year Current Adj event
Inflow = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf
Primary = 3.68 cfs @ 12.35 hrs, Volume= 26,964 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3B: BYPASS

Hydrograph



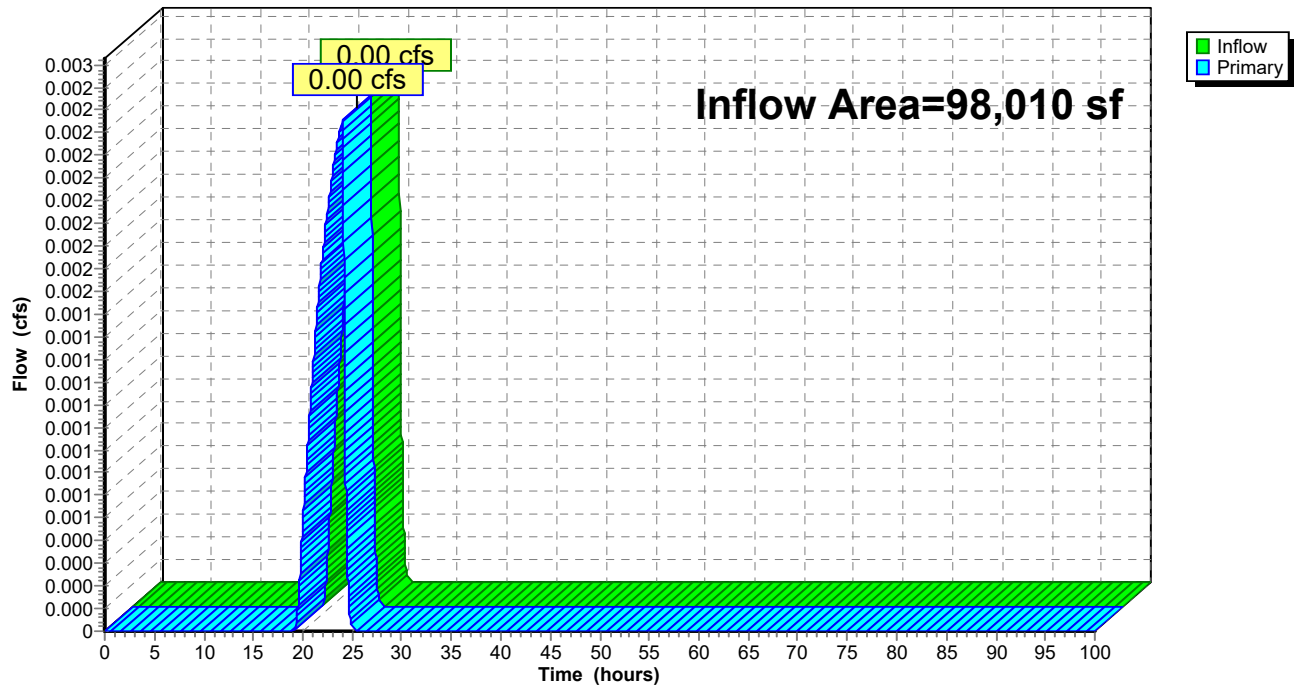
Summary for Link P4: PDA 4

Inflow Area = 98,010 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year Current Adj event
Inflow = 0.00 cfs @ 24.02 hrs, Volume= 25 cf
Primary = 0.00 cfs @ 24.02 hrs, Volume= 25 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P4: PDA 4

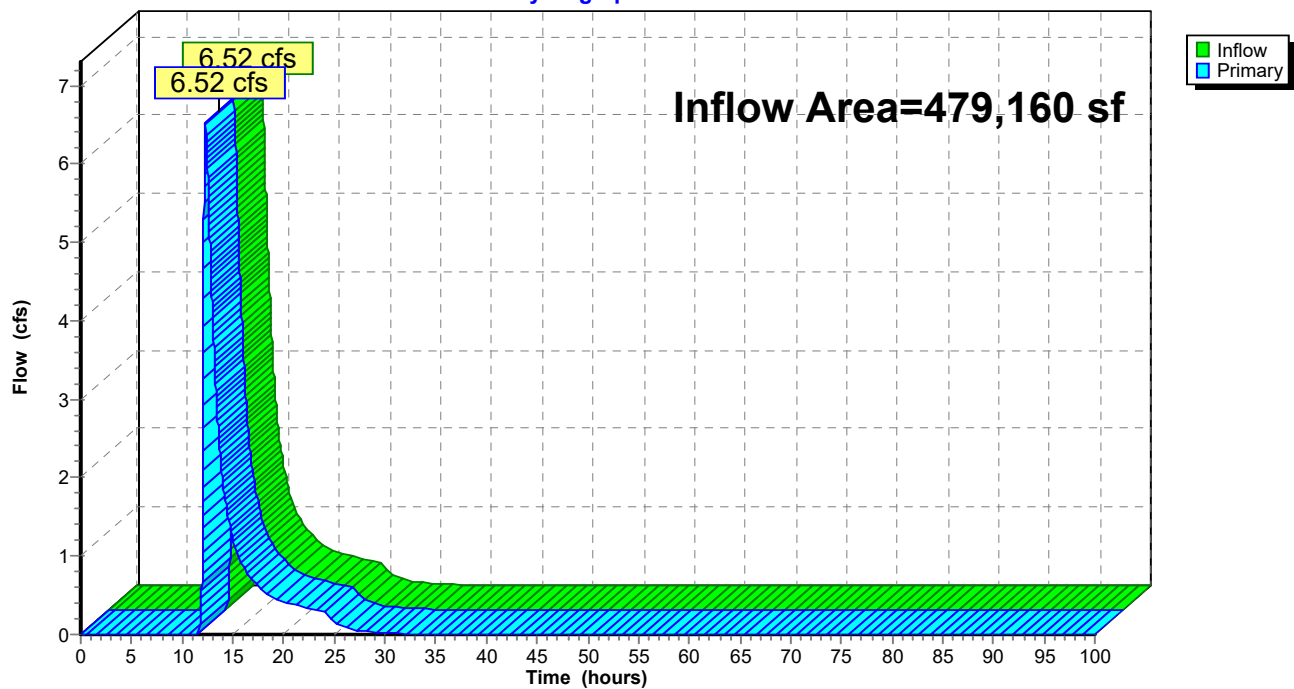
Hydrograph

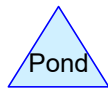
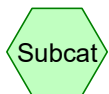
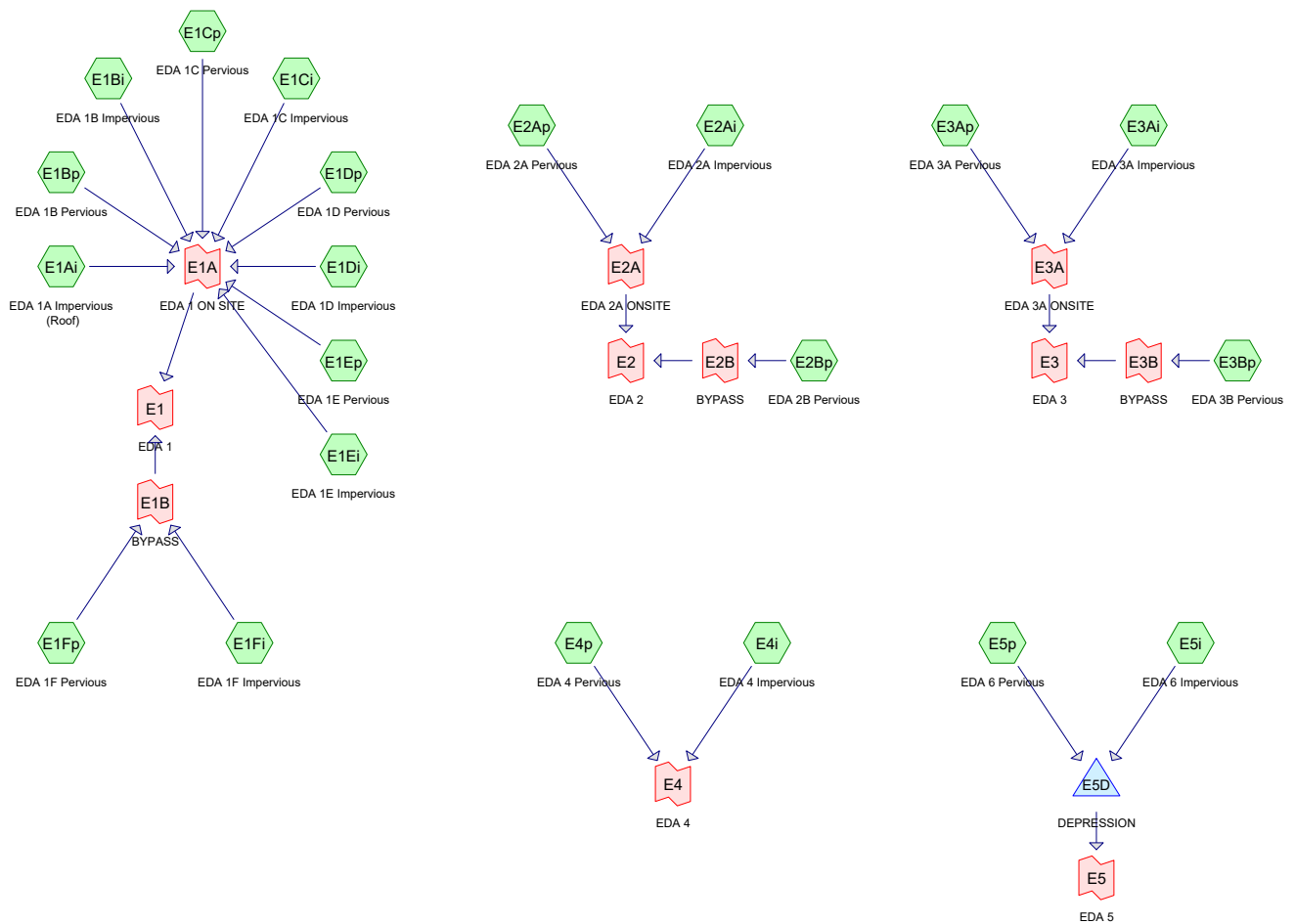


Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 1.36" for 2-Year Current Adj event
Inflow = 6.52 cfs @ 12.29 hrs, Volume= 54,168 cf
Primary = 6.52 cfs @ 12.29 hrs, Volume= 54,168 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve**Hydrograph**



Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	10-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	5.17	2	3.35

Pre vs Post Rev. 3a

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Impervious Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=400' Slope=0.0100 '/' Tc=4.1 min CN=98 Runoff=66.04 cfs 260,181 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=272' Tc=2.8 min CN=98 Runoff=2.03 cfs 7,342 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=3.04"
Flow Length=230' Tc=7.6 min CN=80 Runoff=0.88 cfs 3,754 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=265' Tc=7.5 min CN=98 Runoff=4.74 cfs 22,920 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=3.04"
Flow Length=265' Tc=7.5 min CN=80 Runoff=1.04 cfs 4,417 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=695' Tc=19.2 min CN=98 Runoff=0.50 cfs 3,760 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=0.76"
Flow Length=435' Tc=19.1 min CN=50 Runoff=0.59 cfs 6,343 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=441' Tc=5.4 min CN=98 Runoff=26.23 cfs 112,632 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=2.68"
Flow Length=412' Tc=8.5 min CN=76 Runoff=4.47 cfs 20,110 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=4.93"
Flow Length=861' Tc=19.4 min CN=98 Runoff=0.31 cfs 2,328 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=2.86"
Flow Length=861' Tc=19.4 min CN=78 Runoff=11.42 cfs 77,460 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=4.48"
Flow Length=382' Tc=14.9 min CN=94 Runoff=0.83 cfs 5,199 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=2.95"
Flow Length=382' Tc=14.9 min CN=79 Runoff=1.94 cfs 11,452 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=2.77"
Flow Length=289' Tc=12.9 min CN=77 Runoff=0.99 cfs 5,422 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=4.59"
Flow Length=218' Tc=2.9 min CN=95 Runoff=6.73 cfs 23,316 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=2.77"
Flow Length=218' Tc=2.9 min CN=77 Runoff=2.15 cfs 6,626 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=2.50" Flow Length=860' Tc=19.5 min CN=74 Runoff=8.62 cfs 59,274 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Runoff Depth=4.93" Flow Length=636' Tc=13.8 min CN=98 Runoff=1.21 cfs 7,700 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Runoff Depth=0.24" Flow Length=636' Tc=10.9 min CN=39 Runoff=0.28 cfs 6,042 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Runoff Depth=4.93" Flow Length=585' Tc=26.1 min CN=98 Runoff=1.69 cfs 14,862 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Runoff Depth=0.31" Flow Length=585' Tc=26.1 min CN=41 Runoff=0.36 cfs 7,727 cf
Pond E5D: DEPRESSION	Peak Elev=16.11' Storage=22,589 cf Inflow=1.79 cfs 22,589 cf Outflow=0.00 cfs 0 cf
Link E1: EDA 1	Inflow=111.99 cfs 521,246 cf Primary=111.99 cfs 521,246 cf
Link E1A: EDA 1 ON SITE	Inflow=104.76 cfs 441,458 cf Primary=104.76 cfs 441,458 cf
Link E1B: BYPASS	Inflow=11.72 cfs 79,788 cf Primary=11.72 cfs 79,788 cf
Link E2: EDA 2	Inflow=3.75 cfs 22,073 cf Primary=3.75 cfs 22,073 cf
Link E2A: EDA 2A ONSITE	Inflow=2.78 cfs 16,652 cf Primary=2.78 cfs 16,652 cf
Link E2B: BYPASS	Inflow=0.99 cfs 5,422 cf Primary=0.99 cfs 5,422 cf
Link E3: EDA 3	Inflow=13.72 cfs 89,216 cf Primary=13.72 cfs 89,216 cf
Link E3A: EDA 3A ONSITE	Inflow=8.88 cfs 29,942 cf Primary=8.88 cfs 29,942 cf
Link E3B: BYPASS	Inflow=8.62 cfs 59,274 cf Primary=8.62 cfs 59,274 cf
Link E4: EDA 4	Inflow=1.21 cfs 13,742 cf Primary=1.21 cfs 13,742 cf
Link E5: EDA 5	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Total Runoff Area = 2,658,031 sf Runoff Volume = 668,866 cf Average Runoff Depth = 3.02"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 66.04 cfs @ 12.12 hrs, Volume= 260,181 cf, Depth= 4.93"
Routed to Link E1A : EDA 1 ON SITE

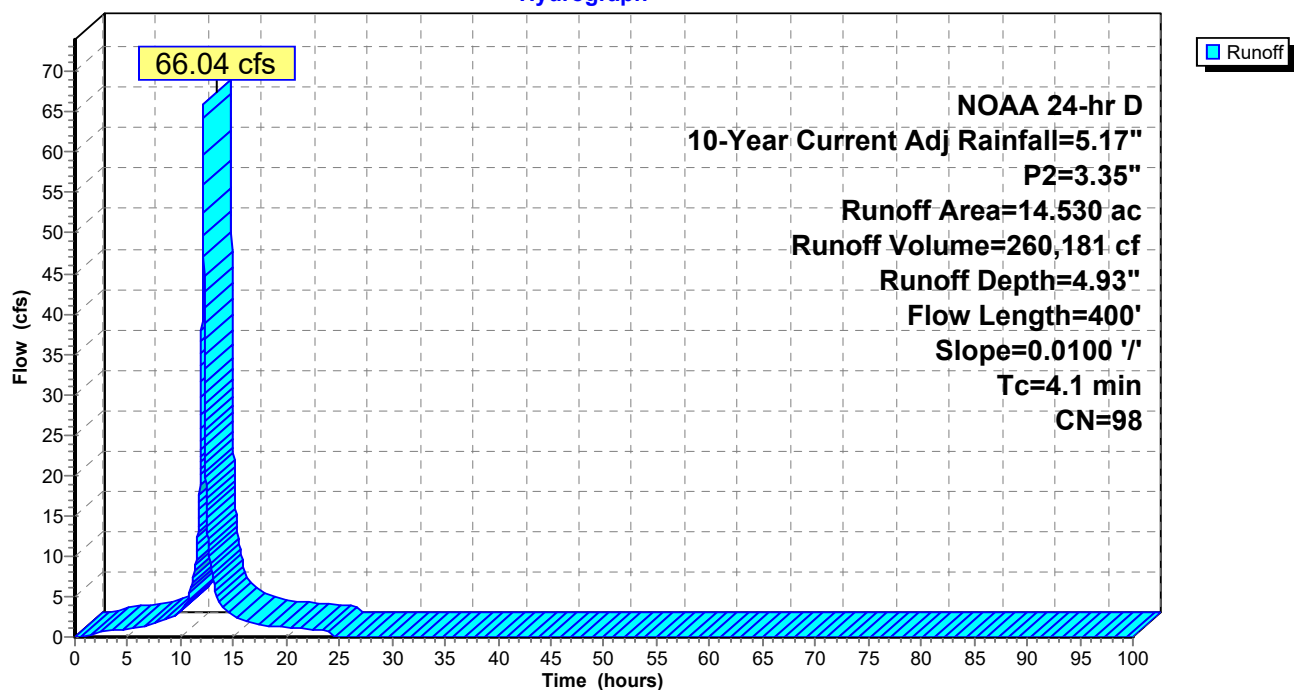
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.1	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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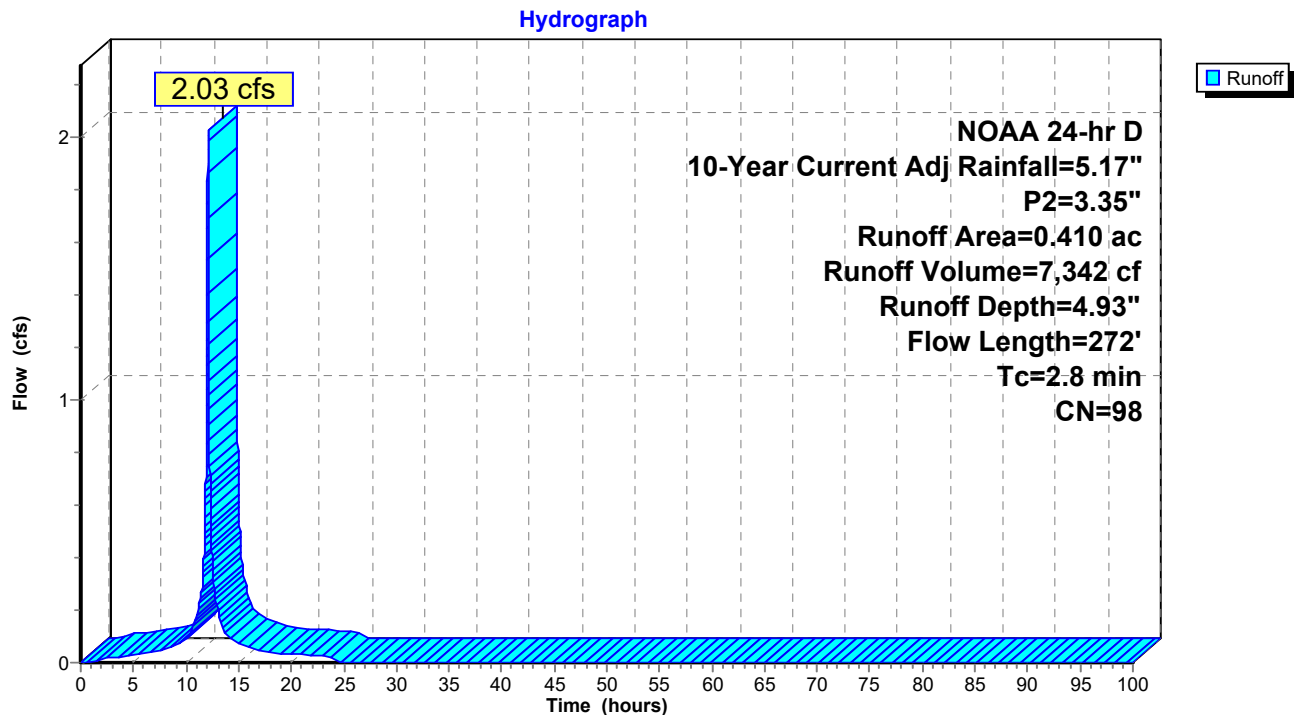
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 2.03 cfs @ 12.11 hrs, Volume= 7,342 cf, Depth= 4.93"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 0.88 cfs @ 12.16 hrs, Volume= 3,754 cf, Depth= 3.04"
Routed to Link E1A : EDA 1 ON SITE

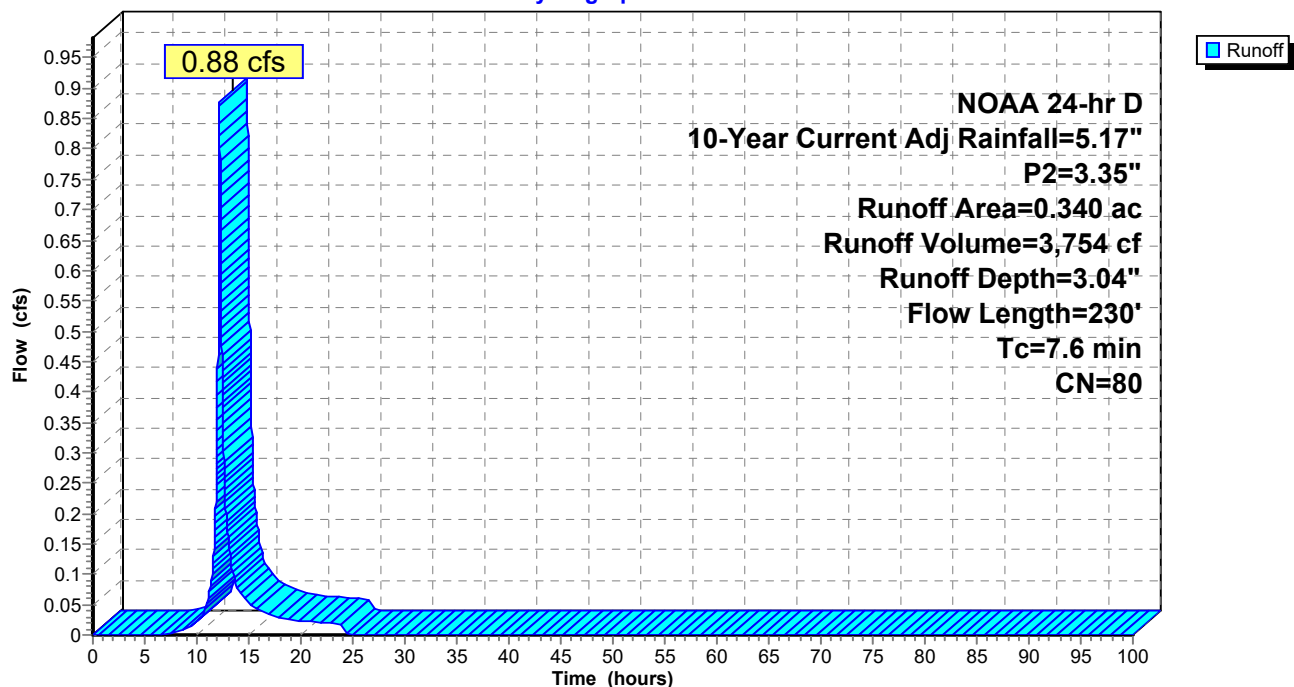
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0500	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.6	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 4.74 cfs @ 12.15 hrs, Volume= 22,920 cf, Depth= 4.93"
 Routed to Link E1A : EDA 1 ON SITE

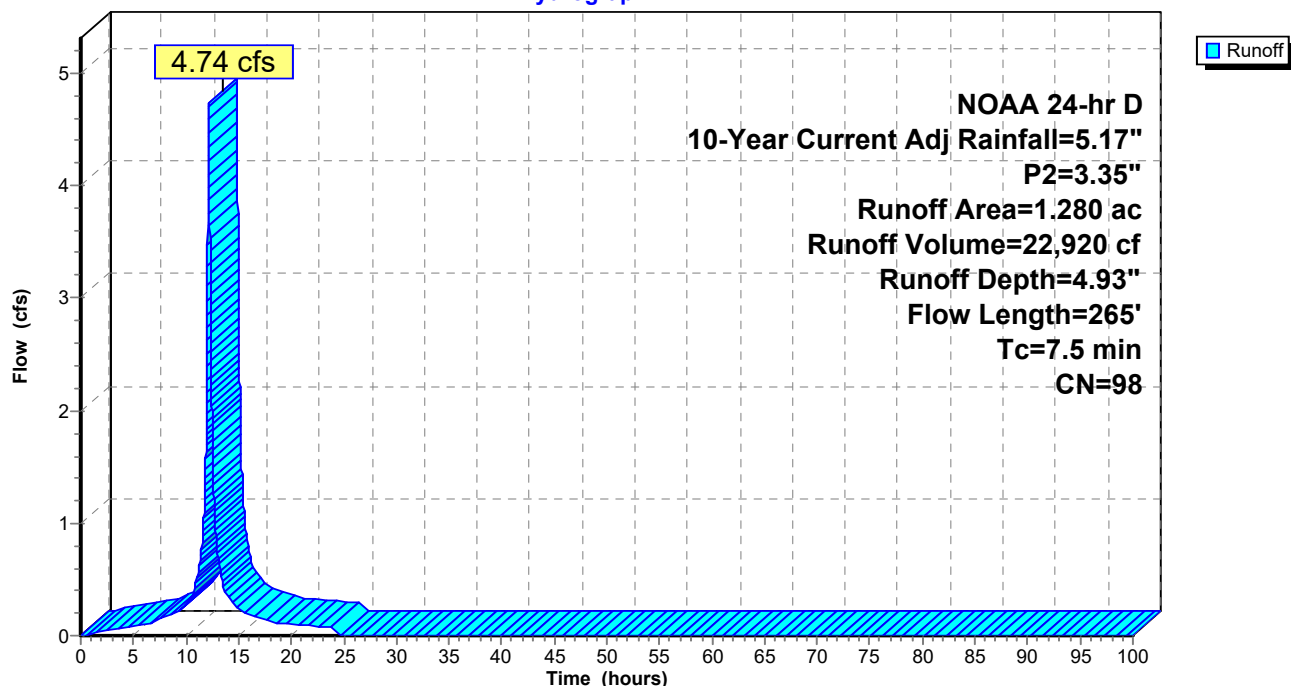
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 1.04 cfs @ 12.16 hrs, Volume= 4,417 cf, Depth= 3.04"
Routed to Link E1A : EDA 1 ON SITE

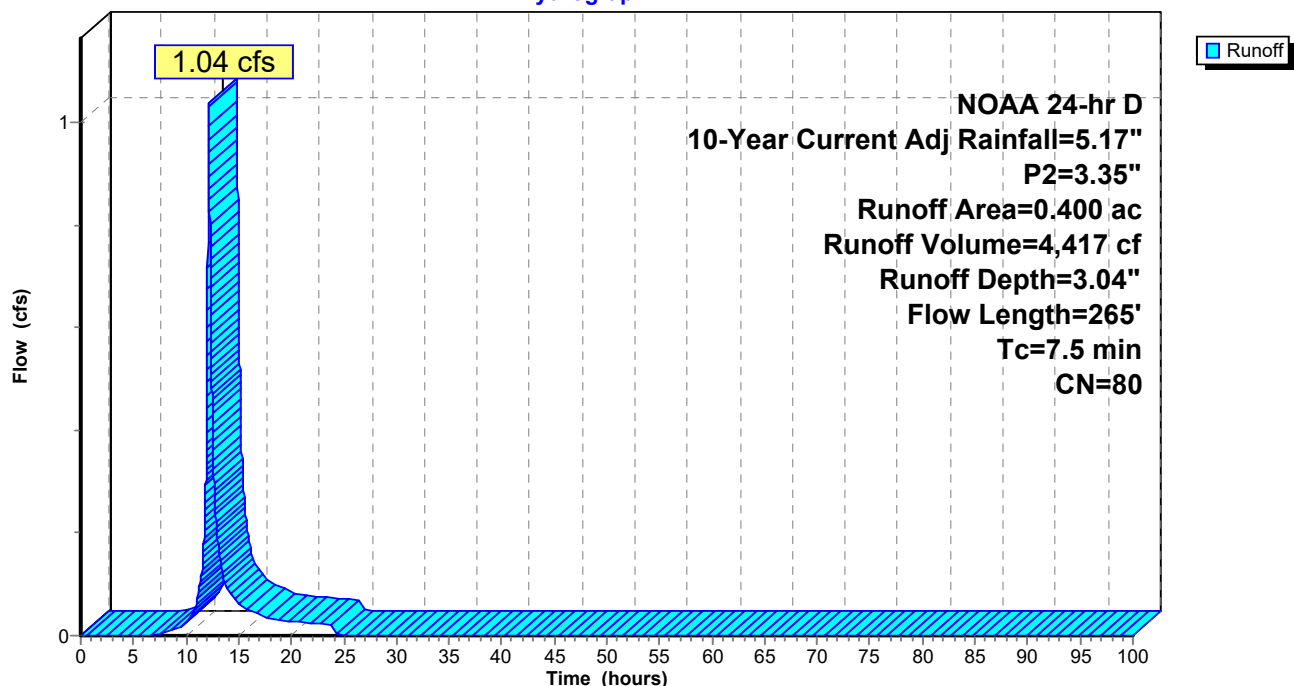
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 0.50 cfs @ 12.29 hrs, Volume= 3,760 cf, Depth= 4.93"
Routed to Link E1A : EDA 1 ON SITE

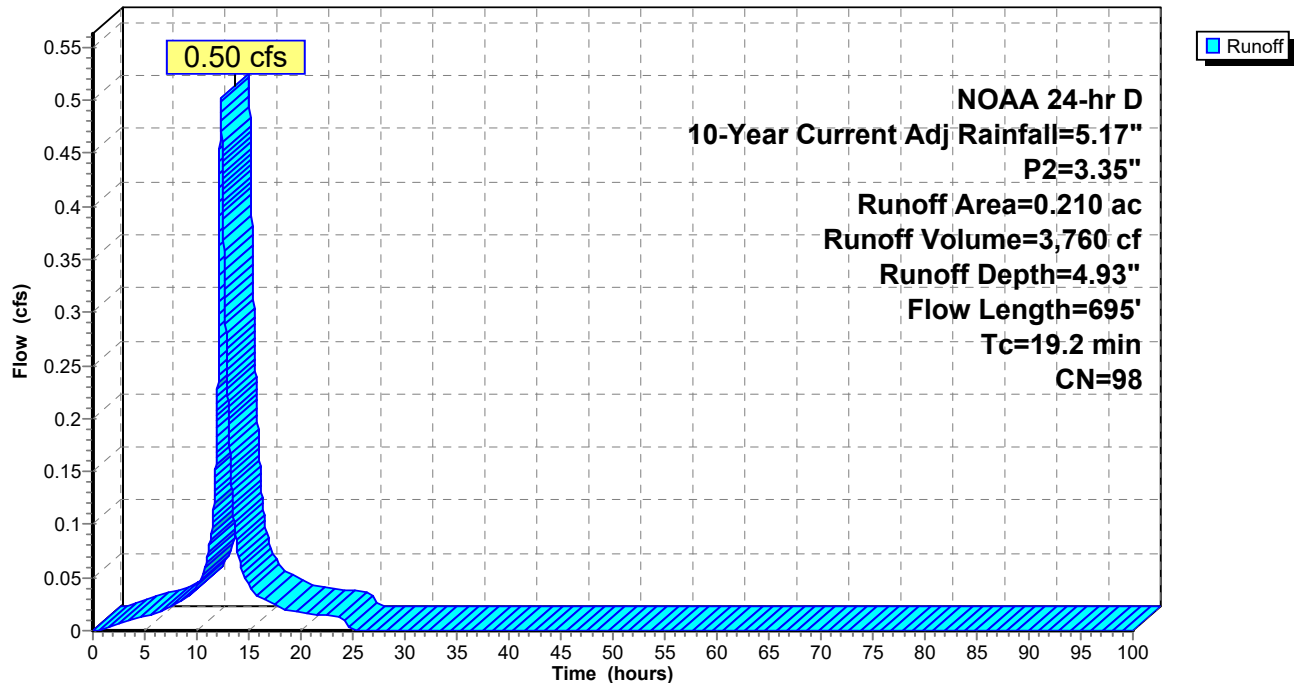
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0055	0.84		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.2	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 0.59 cfs @ 12.44 hrs, Volume= 6,343 cf, Depth= 0.76"
Routed to Link E1A : EDA 1 ON SITE

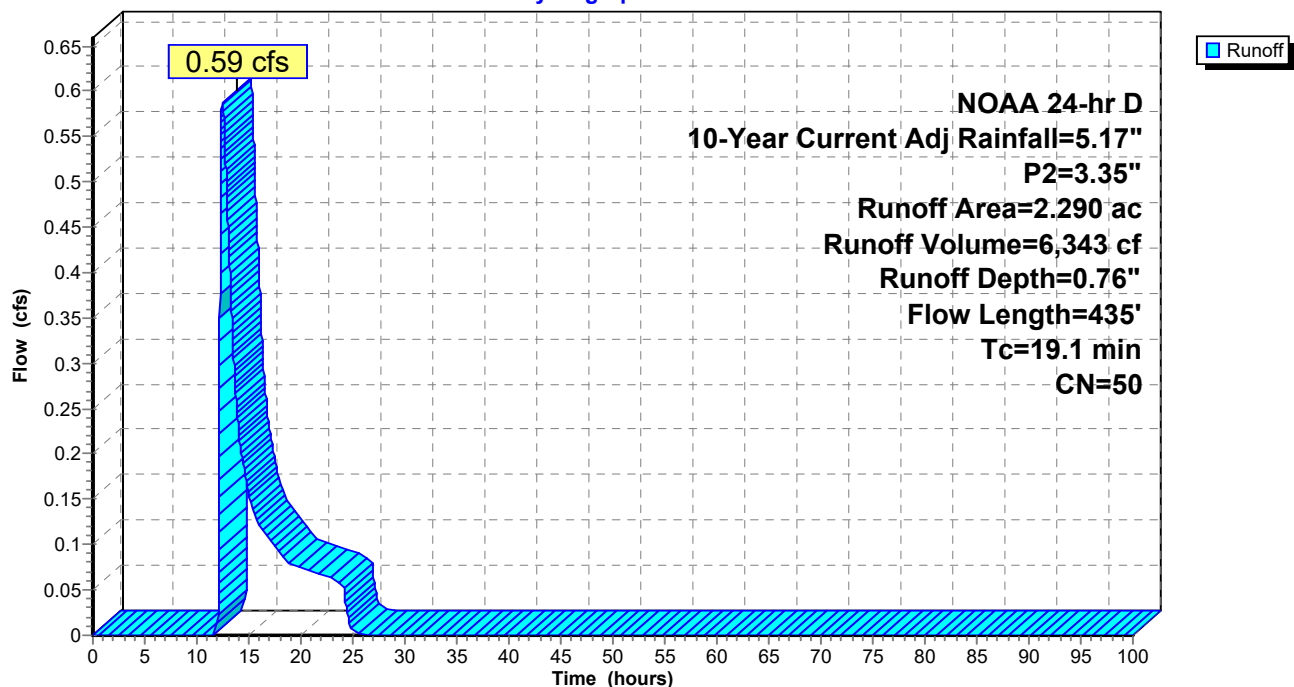
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.1	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Ei: EDA 1E Impervious

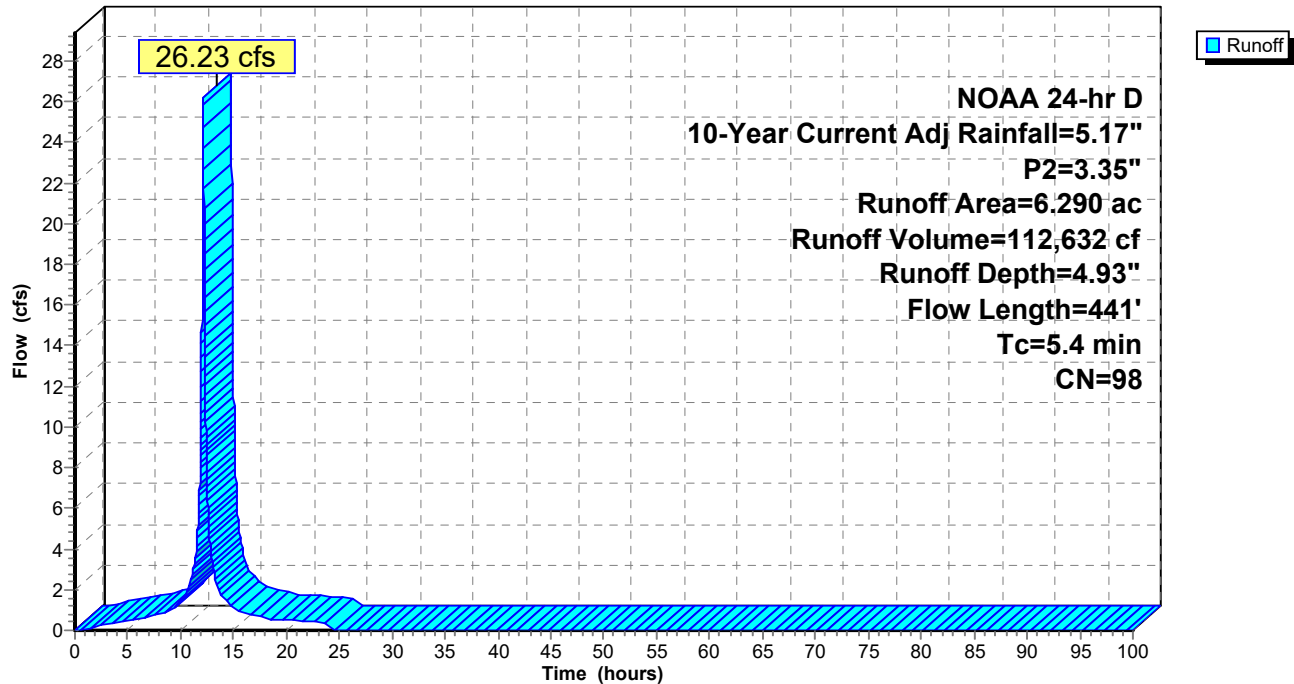
Runoff = 26.23 cfs @ 12.13 hrs, Volume= 112,632 cf, Depth= 4.93"

Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.4	441	Total			

Subcatchment E1Ei: EDA 1E Impervious**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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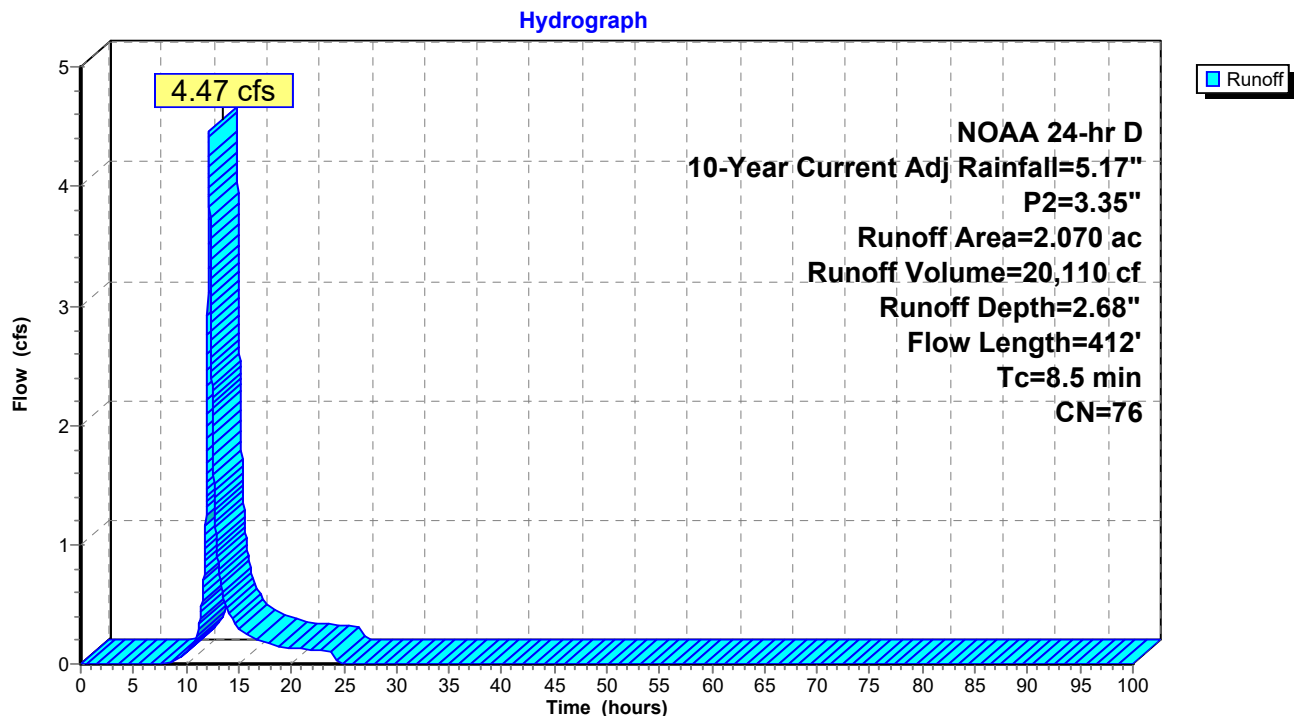
Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 4.47 cfs @ 12.17 hrs, Volume= 20,110 cf, Depth= 2.68"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	36	0.1806	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.5	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.31 cfs @ 12.29 hrs, Volume= 2,328 cf, Depth= 4.93"
Routed to Link E1B : BYPASS

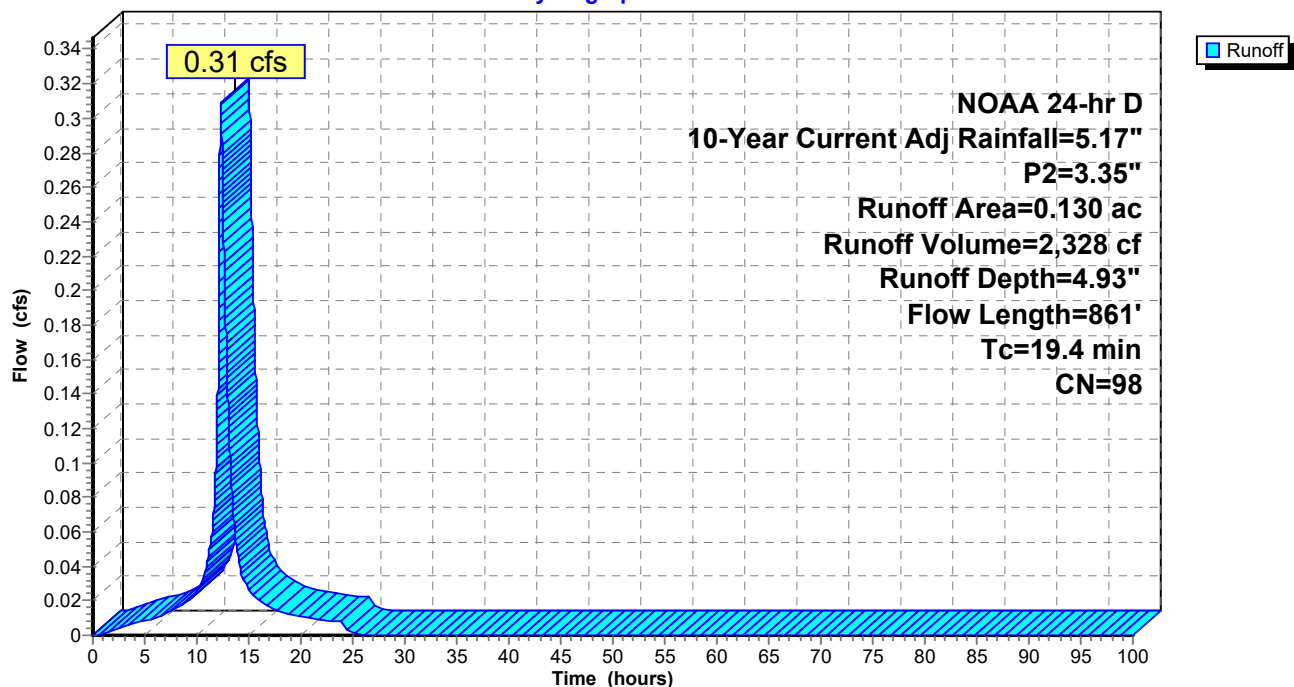
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 11.42 cfs @ 12.33 hrs, Volume= 77,460 cf, Depth= 2.86"
Routed to Link E1B : BYPASS

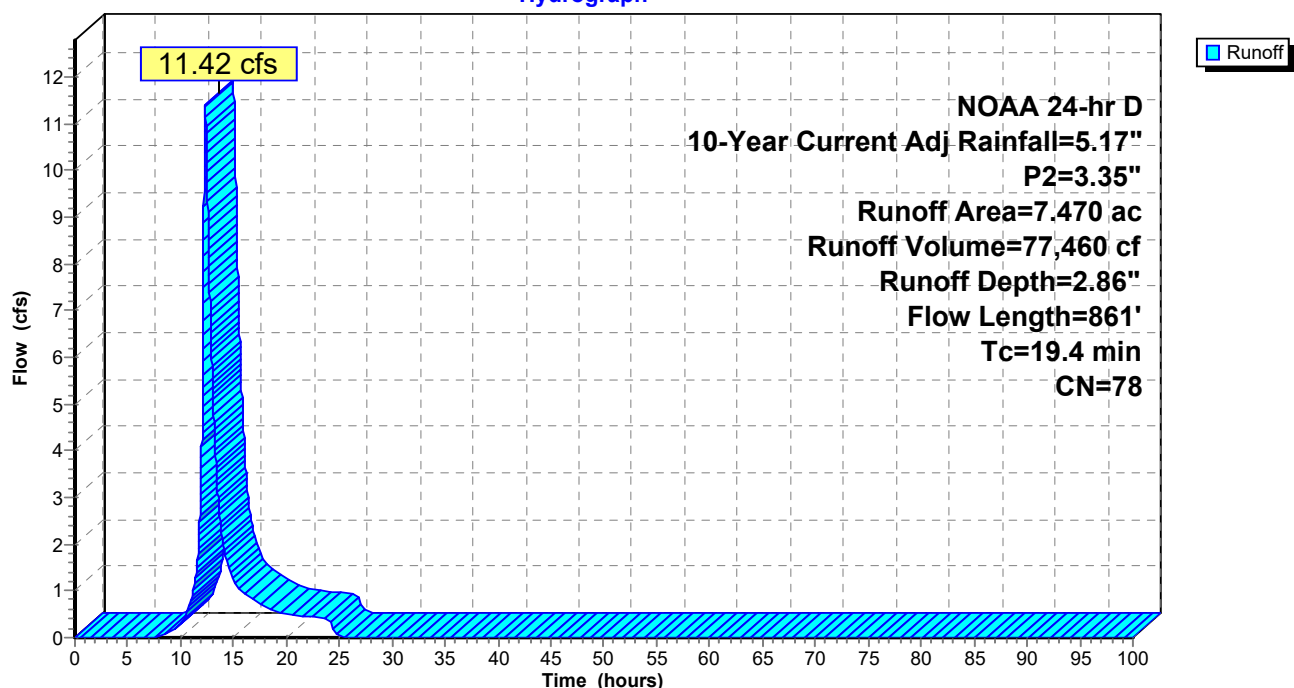
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 0.83 cfs @ 12.25 hrs, Volume= 5,199 cf, Depth= 4.48"
Routed to Link E2A : EDA 2A ONSITE

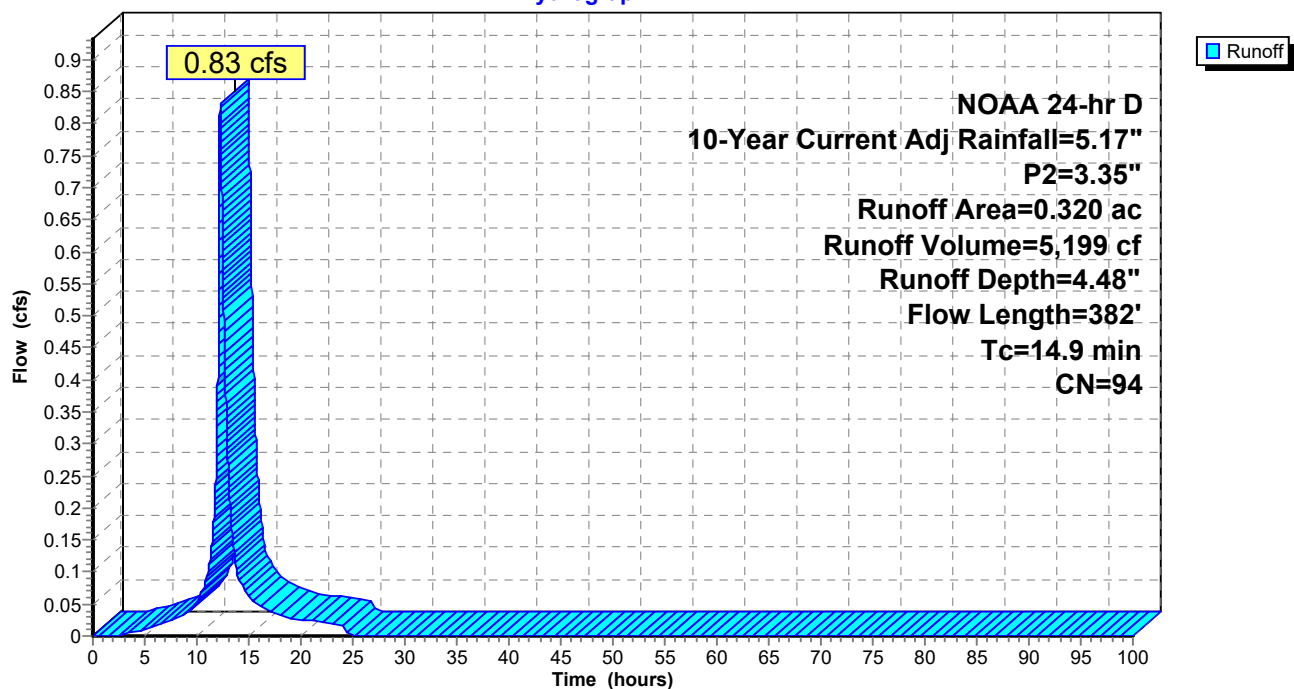
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 1.94 cfs @ 12.25 hrs, Volume= 11,452 cf, Depth= 2.95"
Routed to Link E2A : EDA 2A ONSITE

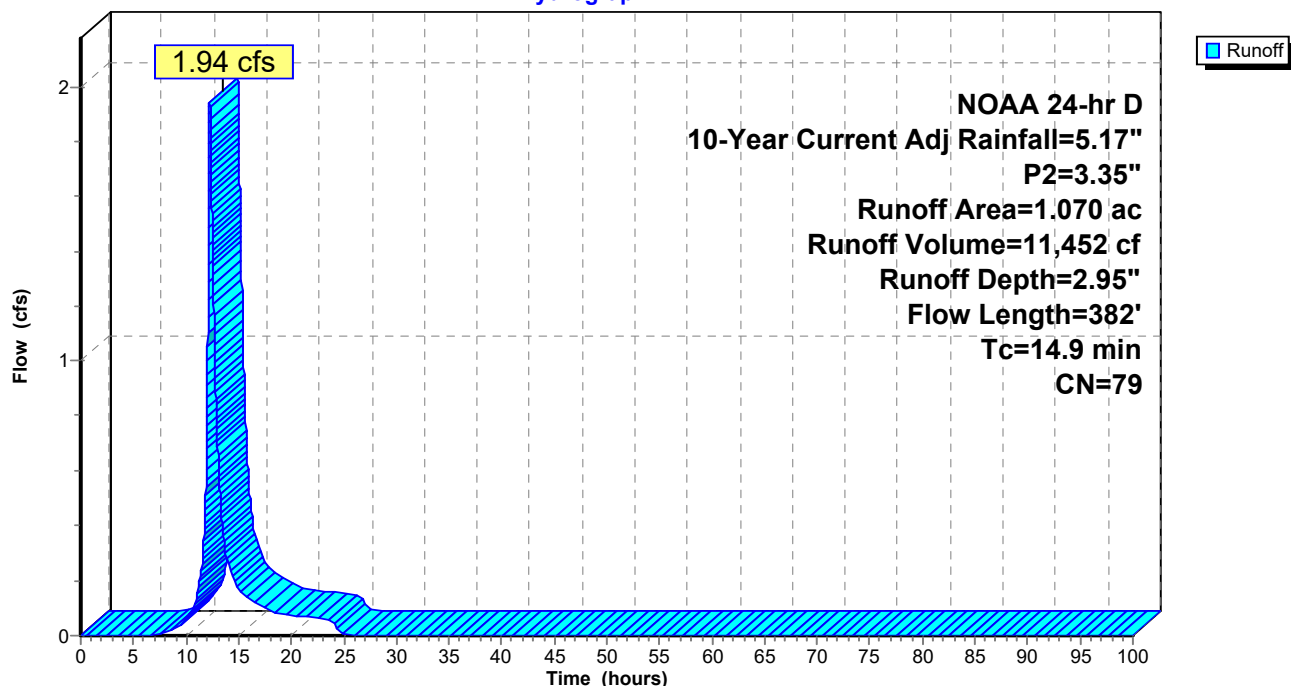
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 0.99 cfs @ 12.23 hrs, Volume= 5,422 cf, Depth= 2.77"
Routed to Link E2B : BYPASS

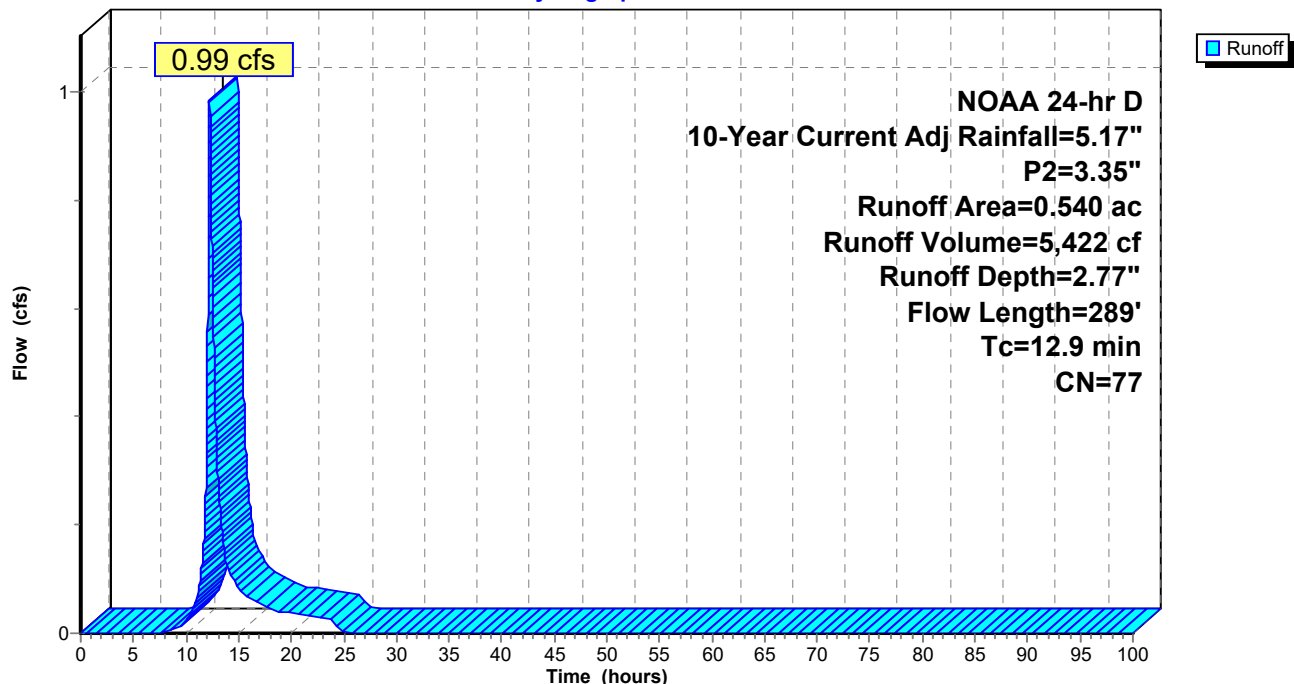
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	46	0.0335	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.9	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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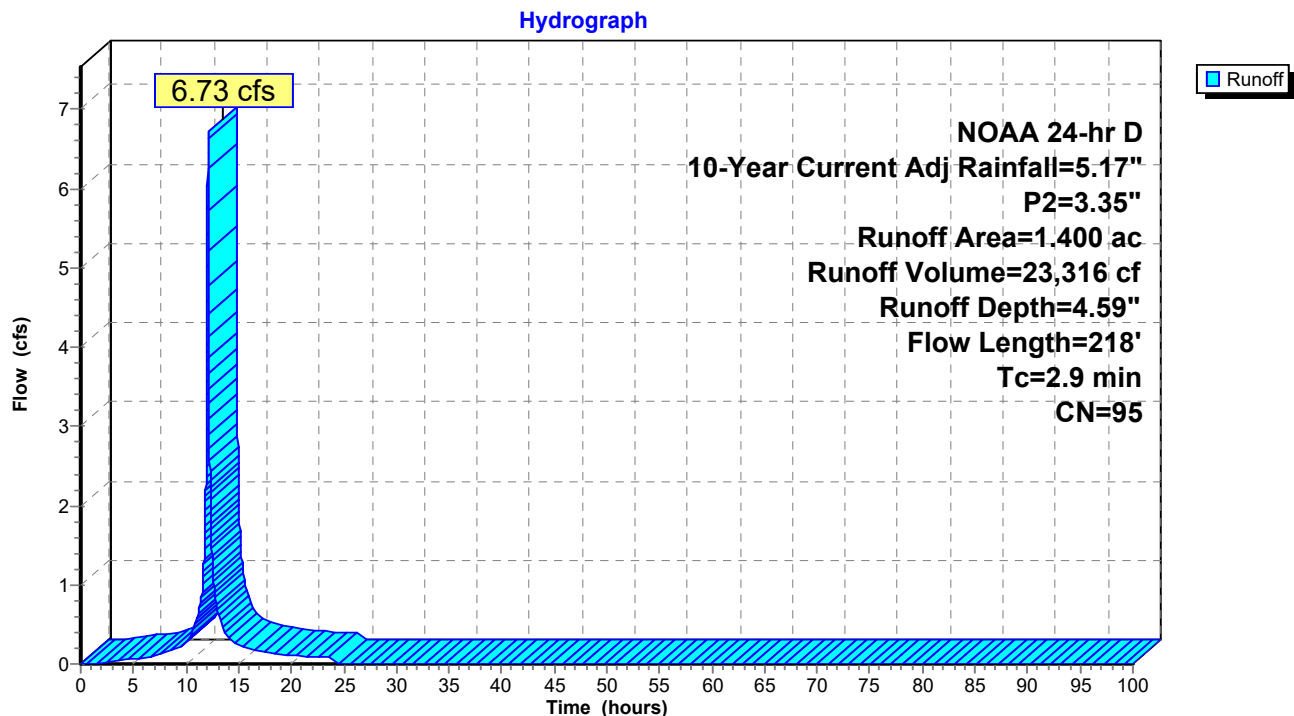
Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 6.73 cfs @ 12.11 hrs, Volume= 23,316 cf, Depth= 4.59"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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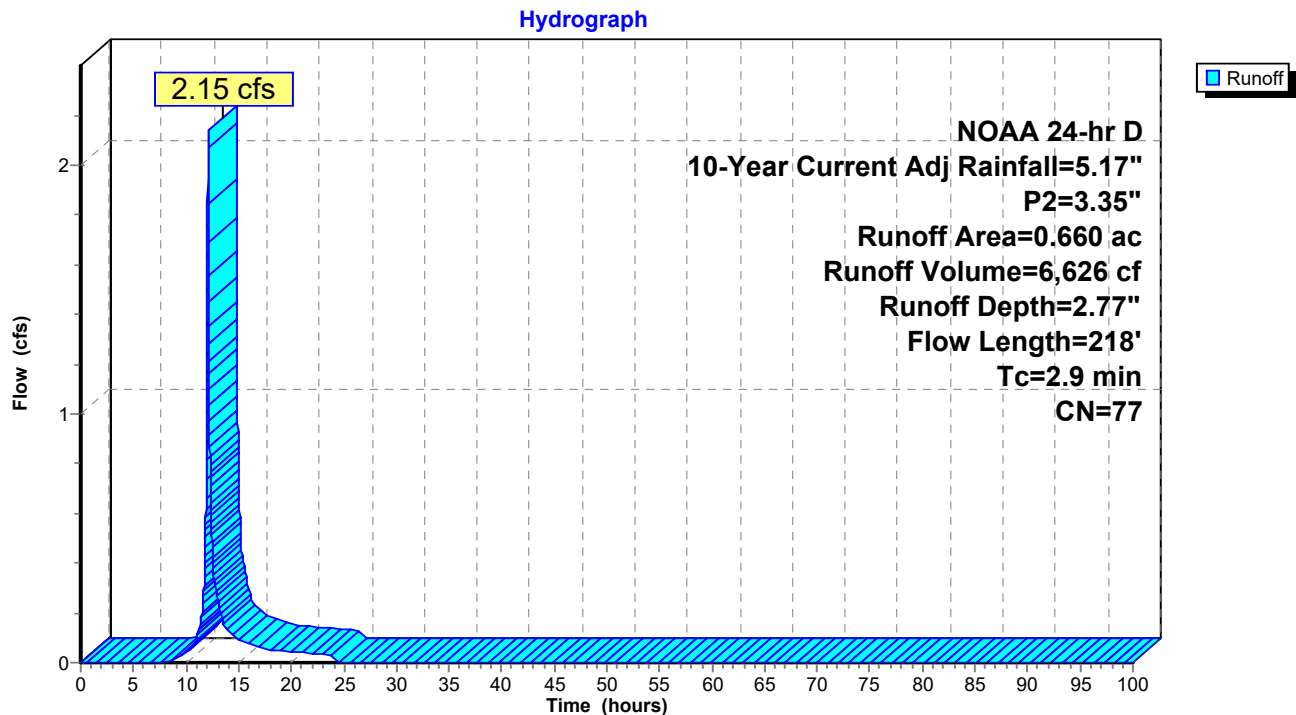
Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 2.15 cfs @ 12.11 hrs, Volume= 6,626 cf, Depth= 2.77"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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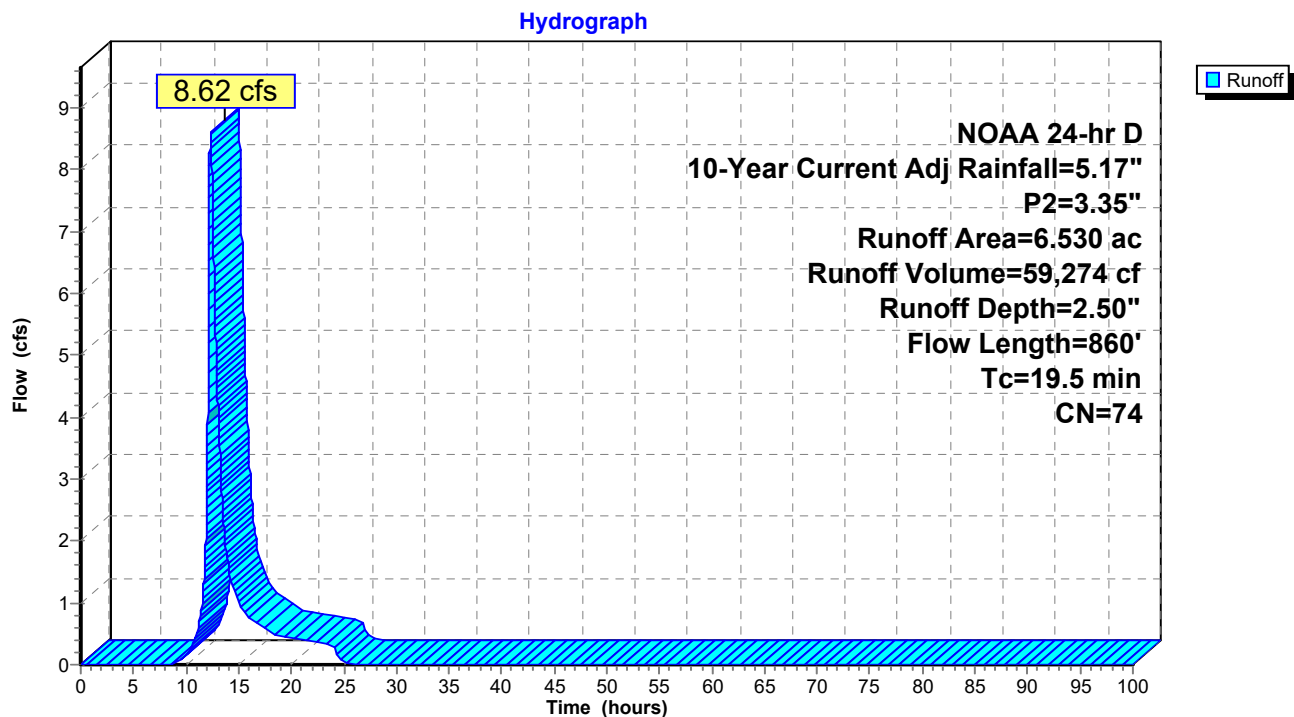
Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 8.62 cfs @ 12.31 hrs, Volume= 59,274 cf, Depth= 2.50"
Routed to Link E3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	59	0.0550	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.5	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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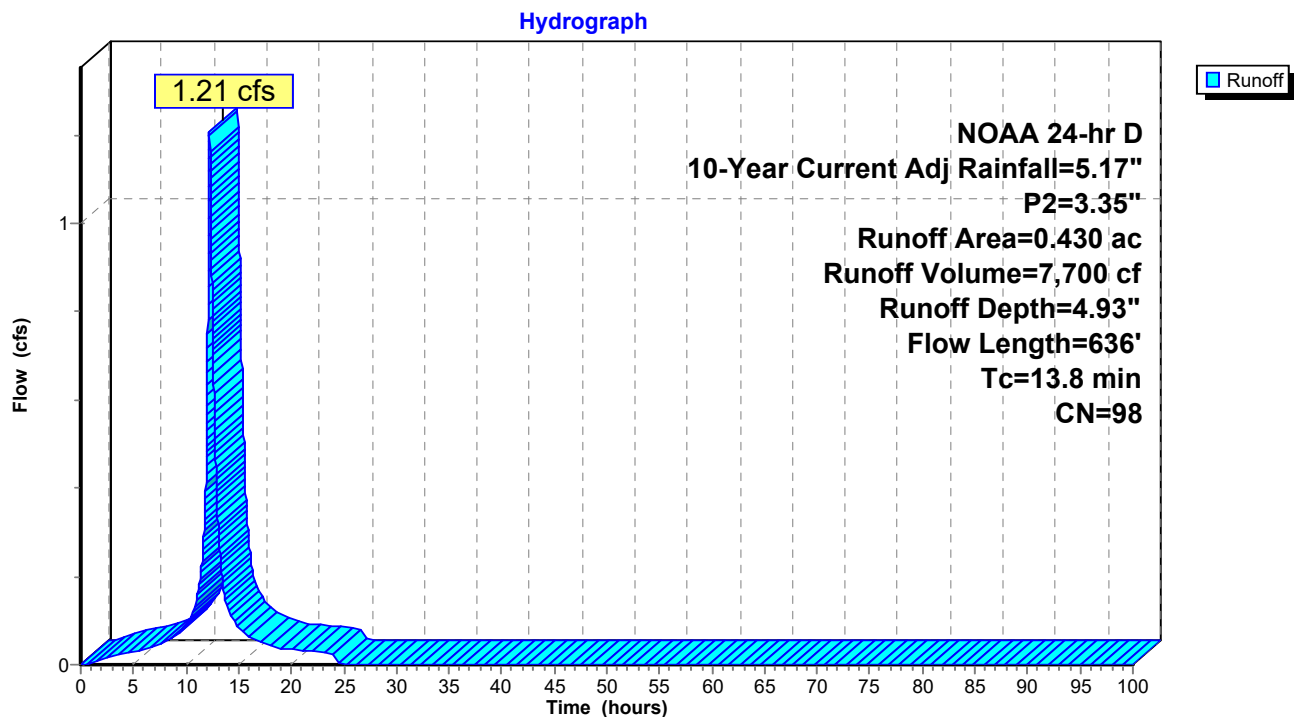
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 1.21 cfs @ 12.23 hrs, Volume= 7,700 cf, Depth= 4.93"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	636	Total			

Subcatchment E4i: EDA 4 Impervious

Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 0.28 cfs @ 13.06 hrs, Volume= 6,042 cf, Depth= 0.24"
Routed to Link E4 : EDA 4

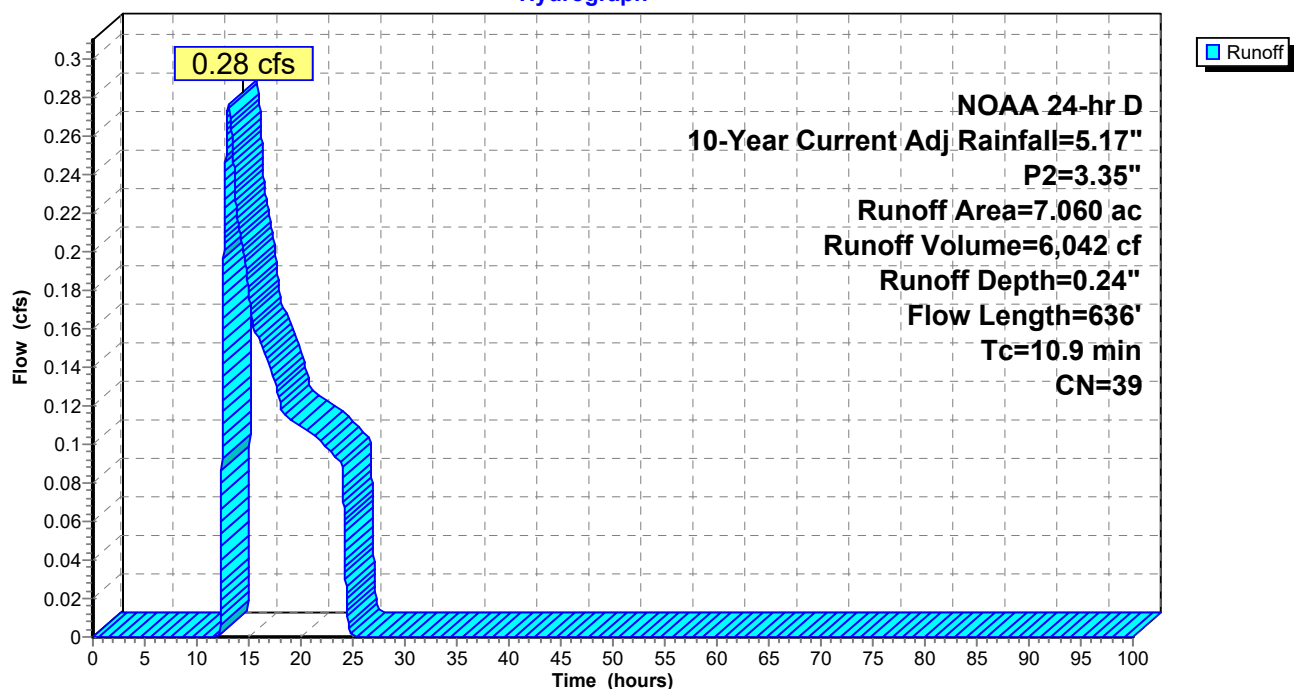
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.9	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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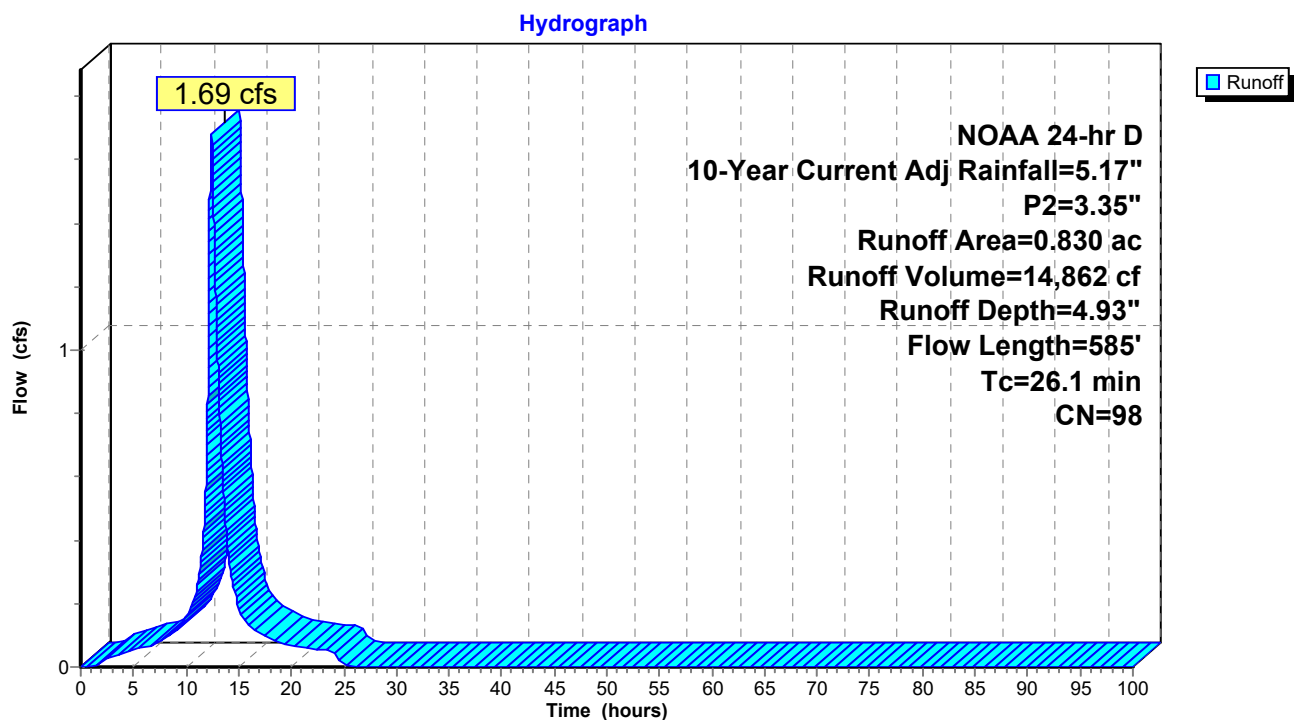
Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 1.69 cfs @ 12.41 hrs, Volume= 14,862 cf, Depth= 4.93"
Routed to Pond E5D : DEPRESSION

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5i: EDA 6 Impervious

Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 0.36 cfs @ 13.29 hrs, Volume= 7,727 cf, Depth= 0.31"
Routed to Pond E5D : DEPRESSION

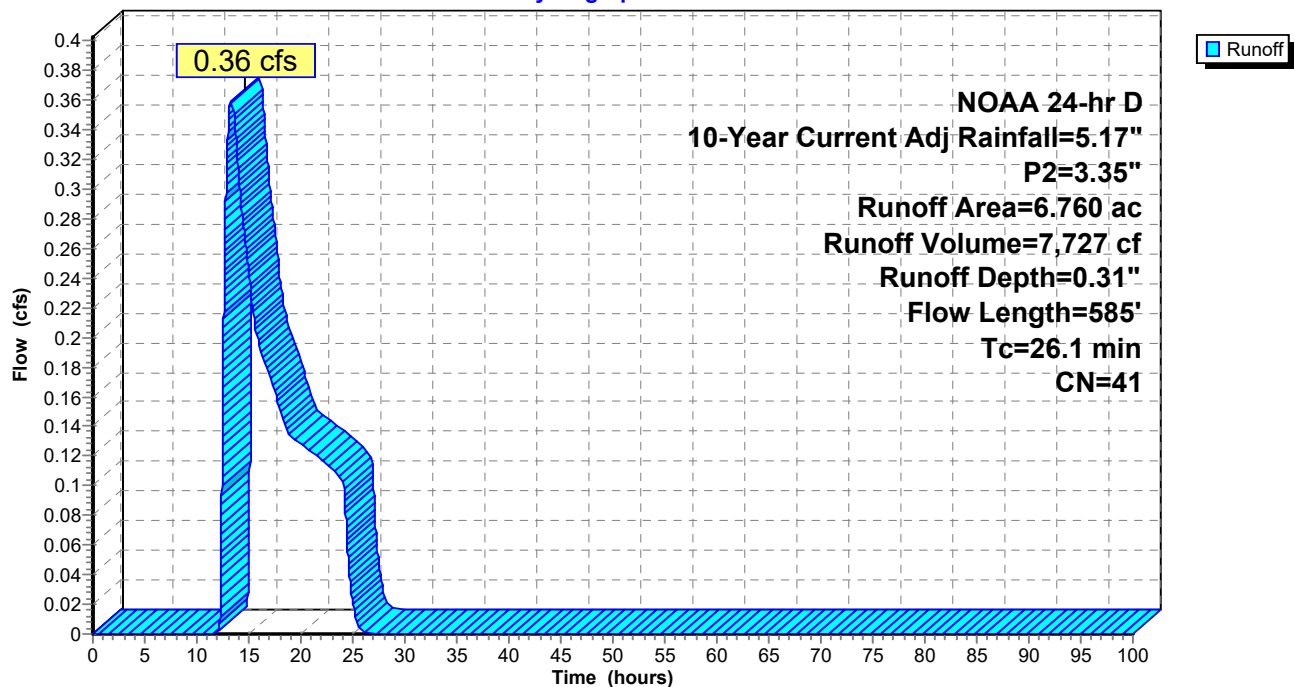
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Current Adj Rainfall=5.17", P2=3.35"

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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.82" for 10-Year Current Adj event
 Inflow = 1.79 cfs @ 12.42 hrs, Volume= 22,589 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.11' @ 26.86 hrs Surf.Area= 72,162 sf Storage= 22,589 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

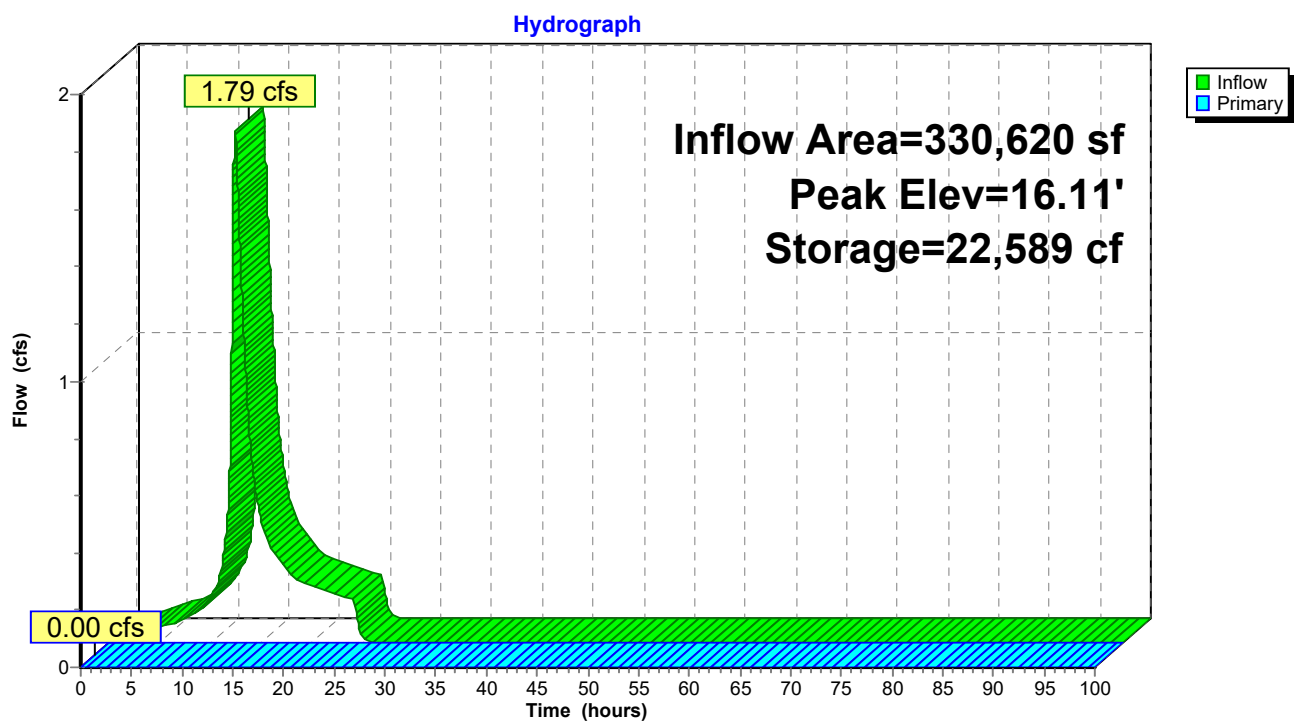
Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.07' TW=0.00' (Dynamic Tailwater)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E5D: DEPRESSION

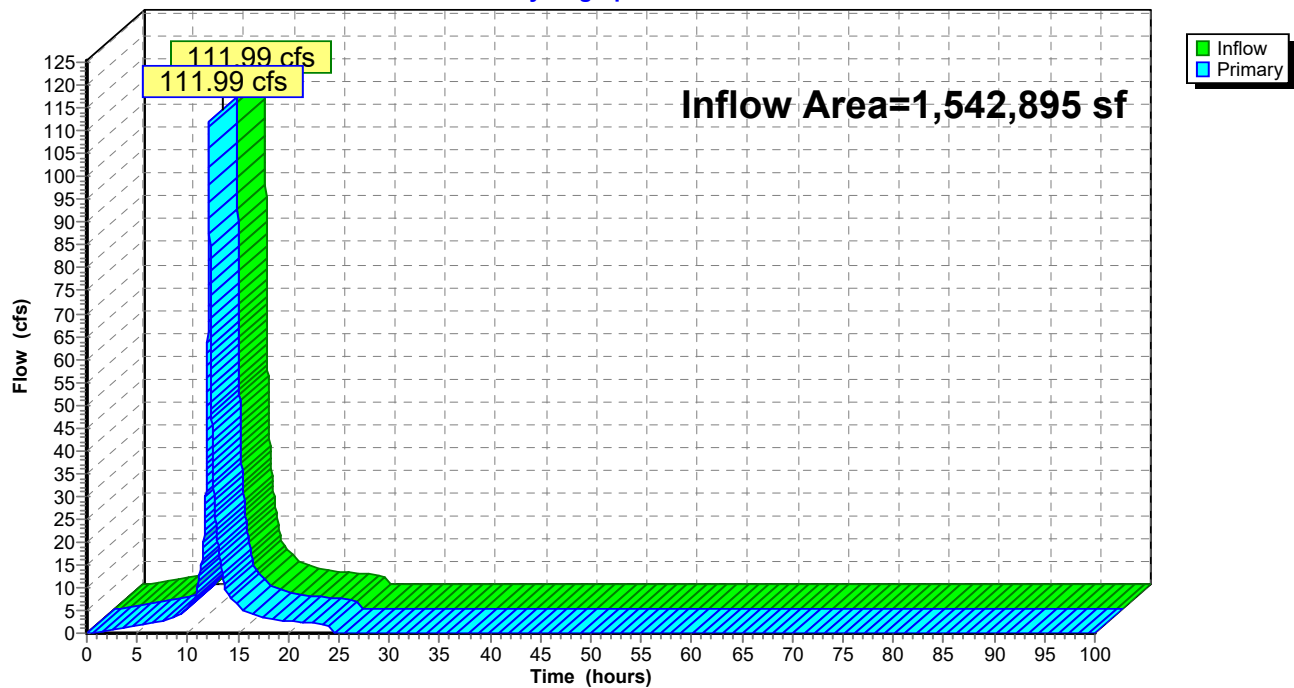
Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 4.05" for 10-Year Current Adj event
Inflow = 111.99 cfs @ 12.13 hrs, Volume= 521,246 cf
Primary = 111.99 cfs @ 12.13 hrs, Volume= 521,246 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1

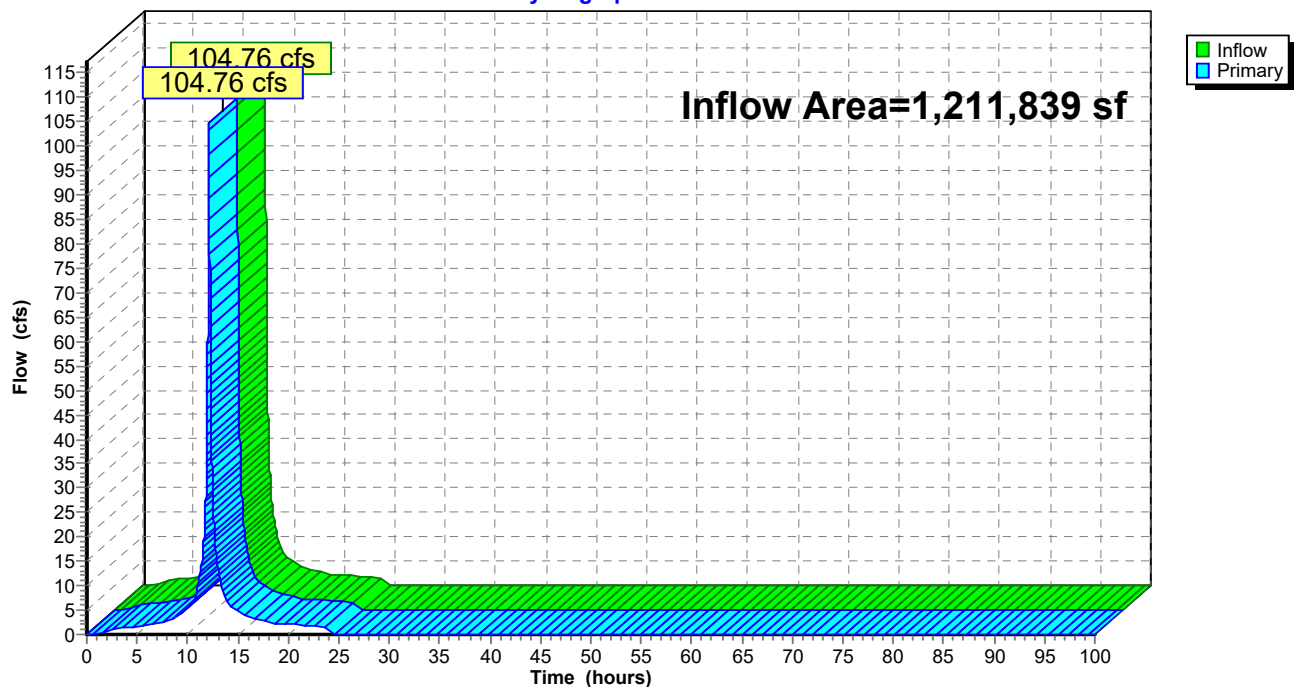
Hydrograph



Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 4.37" for 10-Year Current Adj event
Inflow = 104.76 cfs @ 12.12 hrs, Volume= 441,458 cf
Primary = 104.76 cfs @ 12.12 hrs, Volume= 441,458 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE**Hydrograph**

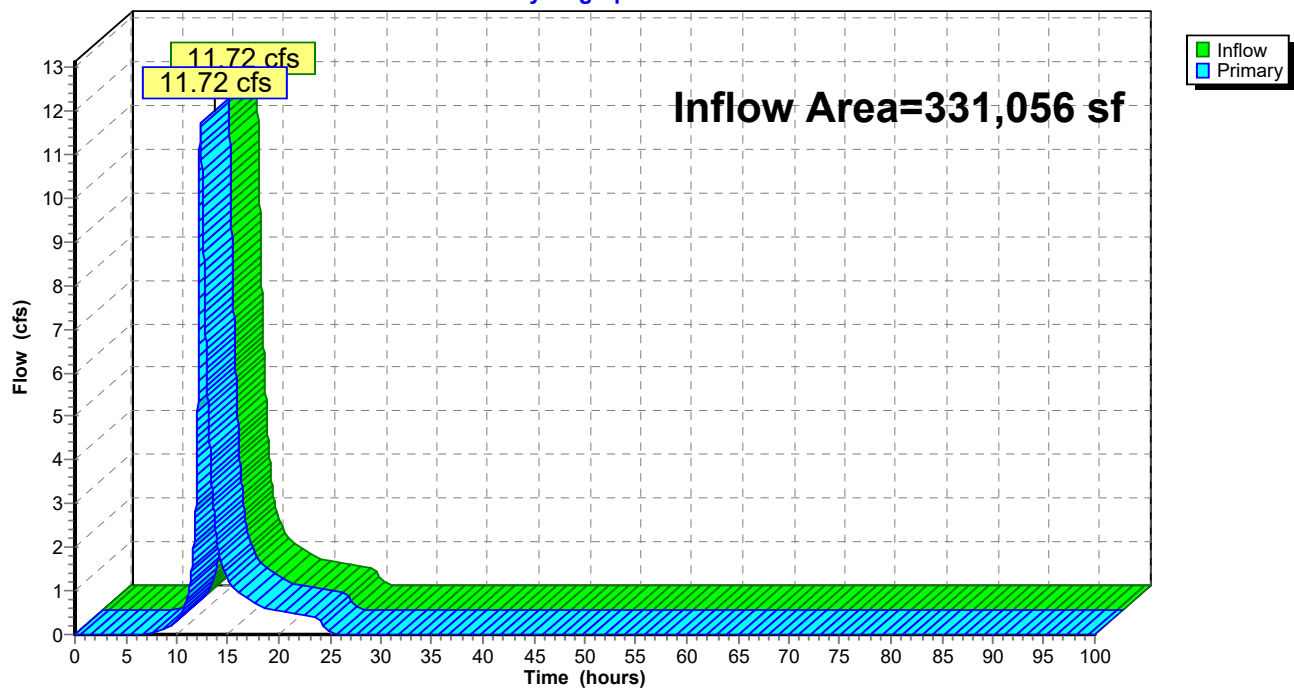
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 2.89" for 10-Year Current Adj event
Inflow = 11.72 cfs @ 12.33 hrs, Volume= 79,788 cf
Primary = 11.72 cfs @ 12.33 hrs, Volume= 79,788 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

Hydrograph



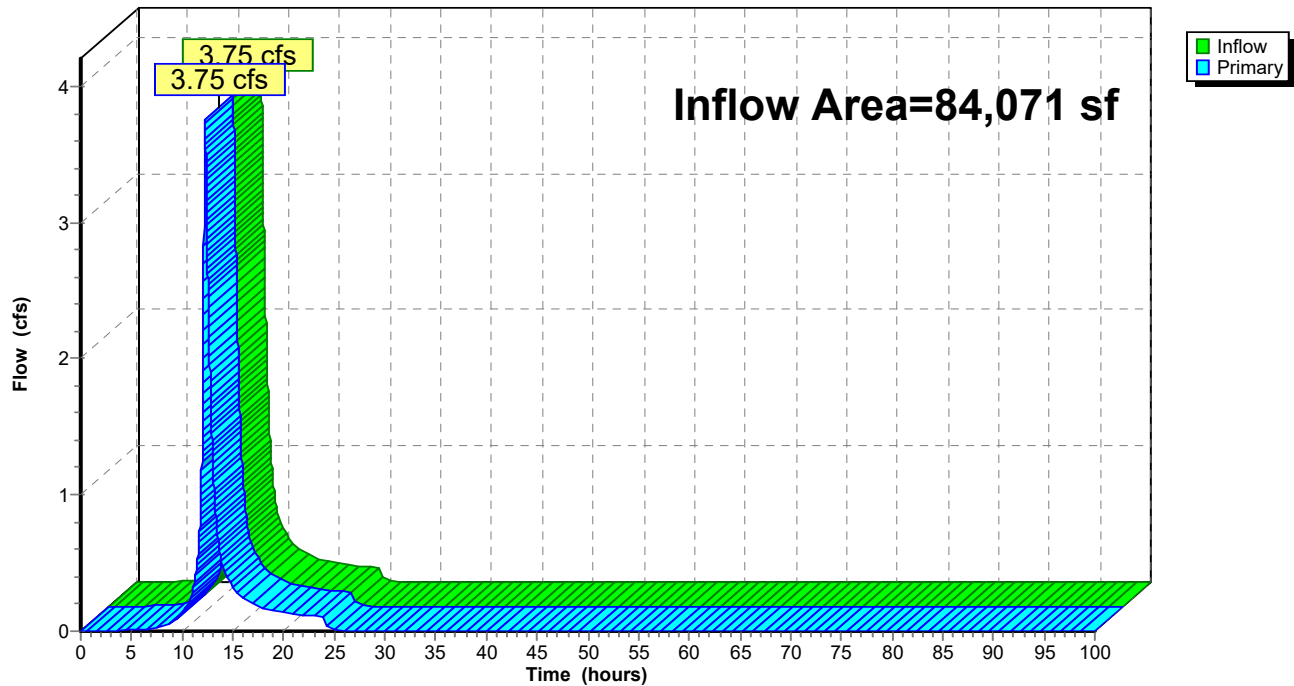
Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 3.15" for 10-Year Current Adj event
Inflow = 3.75 cfs @ 12.25 hrs, Volume= 22,073 cf
Primary = 3.75 cfs @ 12.25 hrs, Volume= 22,073 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2

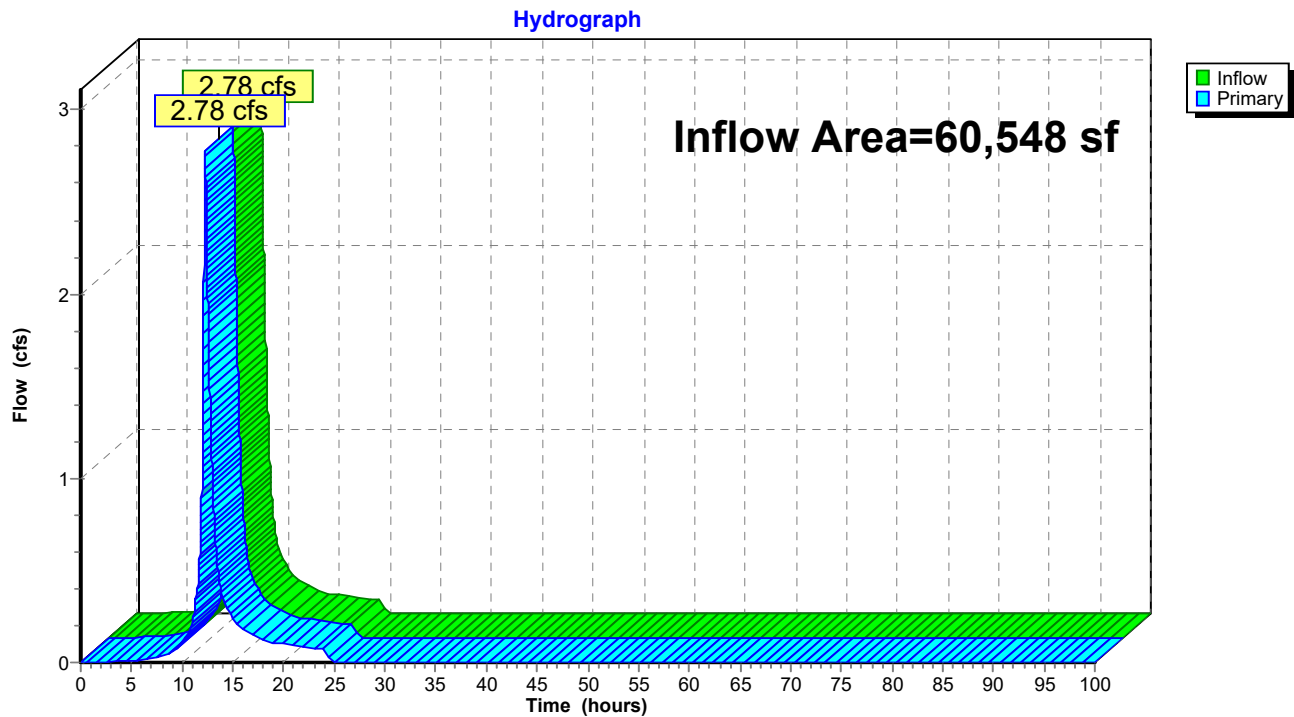
Hydrograph



Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 3.30" for 10-Year Current Adj event
Inflow = 2.78 cfs @ 12.25 hrs, Volume= 16,652 cf
Primary = 2.78 cfs @ 12.25 hrs, Volume= 16,652 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE

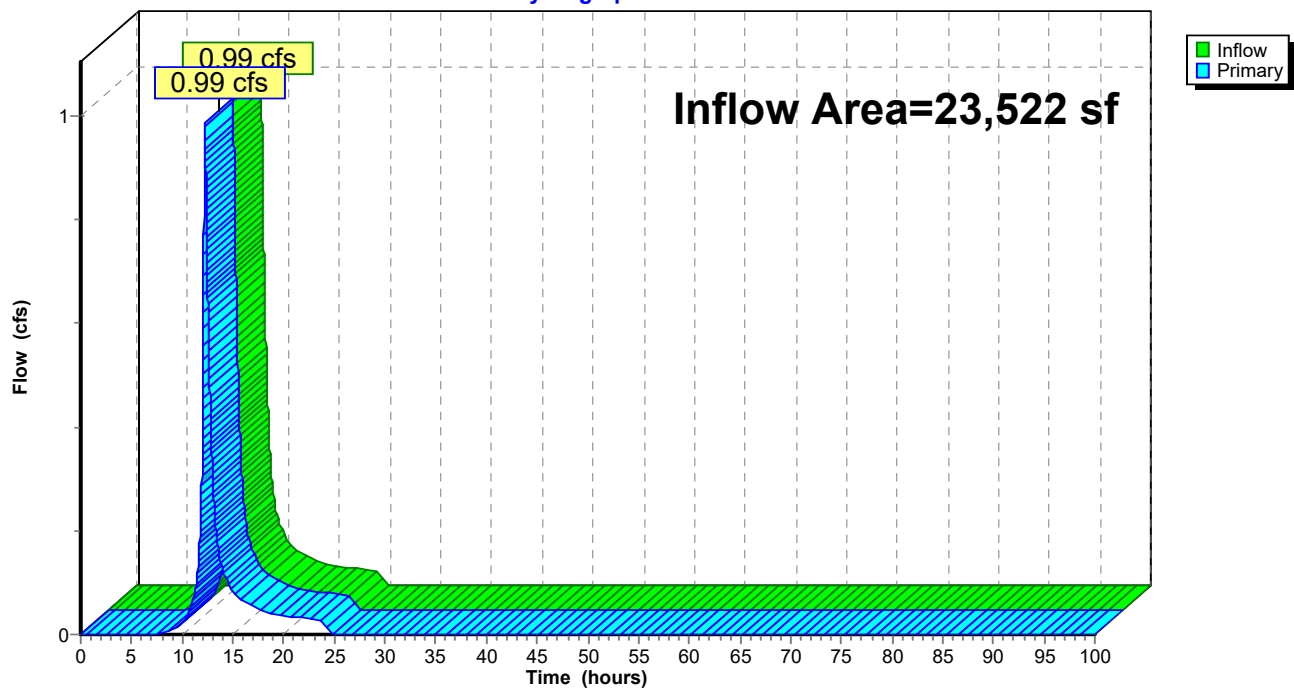
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 2.77" for 10-Year Current Adj event
Inflow = 0.99 cfs @ 12.23 hrs, Volume= 5,422 cf
Primary = 0.99 cfs @ 12.23 hrs, Volume= 5,422 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



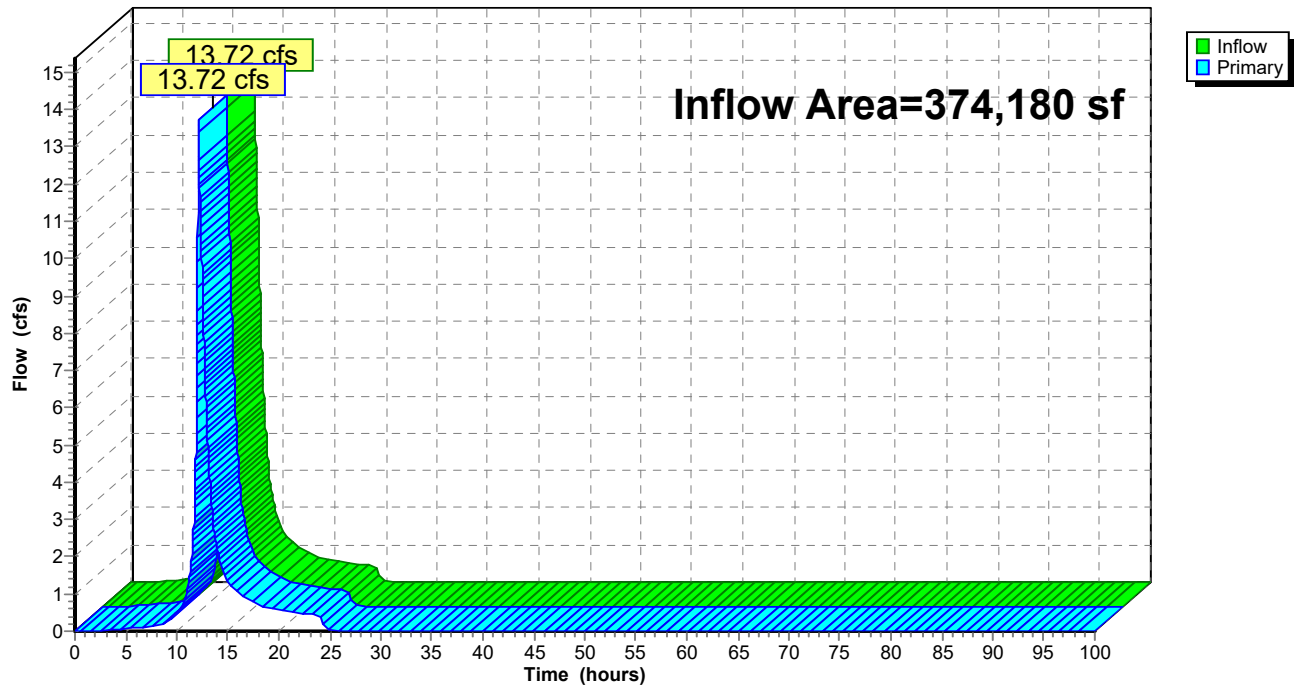
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 2.86" for 10-Year Current Adj event
Inflow = 13.72 cfs @ 12.12 hrs, Volume= 89,216 cf
Primary = 13.72 cfs @ 12.12 hrs, Volume= 89,216 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

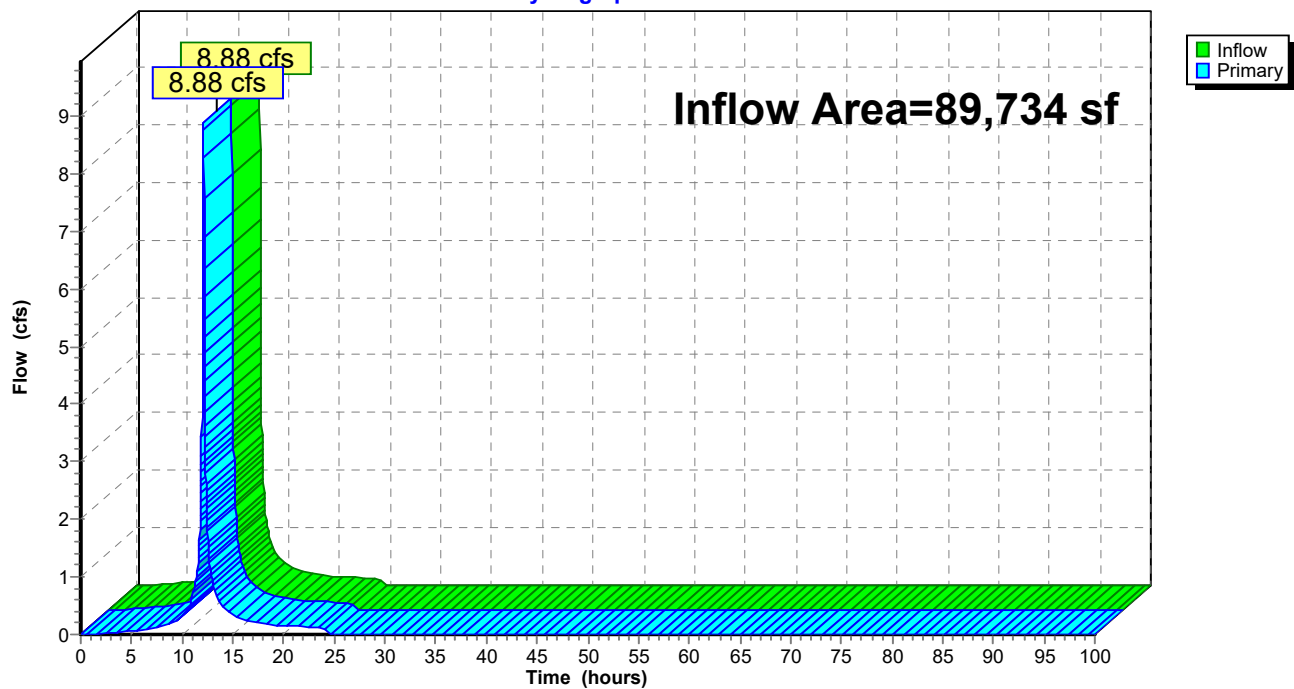
Hydrograph



Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 4.00" for 10-Year Current Adj event
Inflow = 8.88 cfs @ 12.11 hrs, Volume= 29,942 cf
Primary = 8.88 cfs @ 12.11 hrs, Volume= 29,942 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3A: EDA 3A ONSITE**Hydrograph**

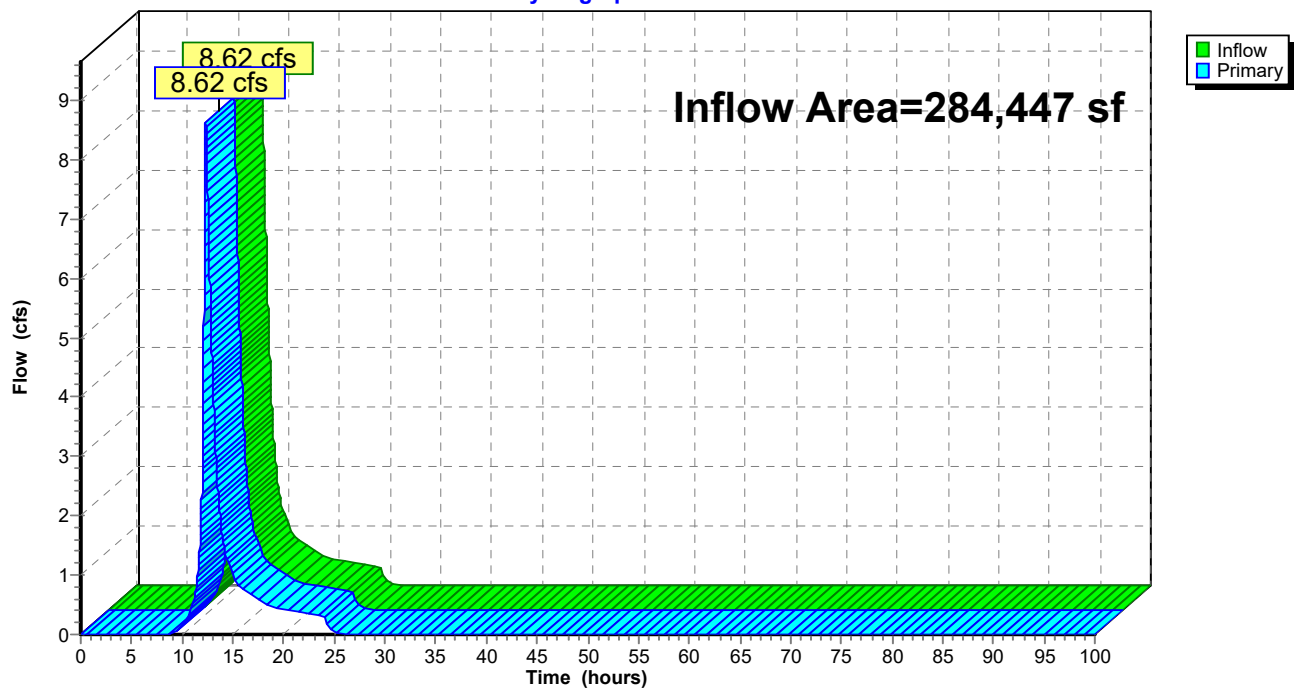
Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 2.50" for 10-Year Current Adj event
Inflow = 8.62 cfs @ 12.31 hrs, Volume= 59,274 cf
Primary = 8.62 cfs @ 12.31 hrs, Volume= 59,274 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS

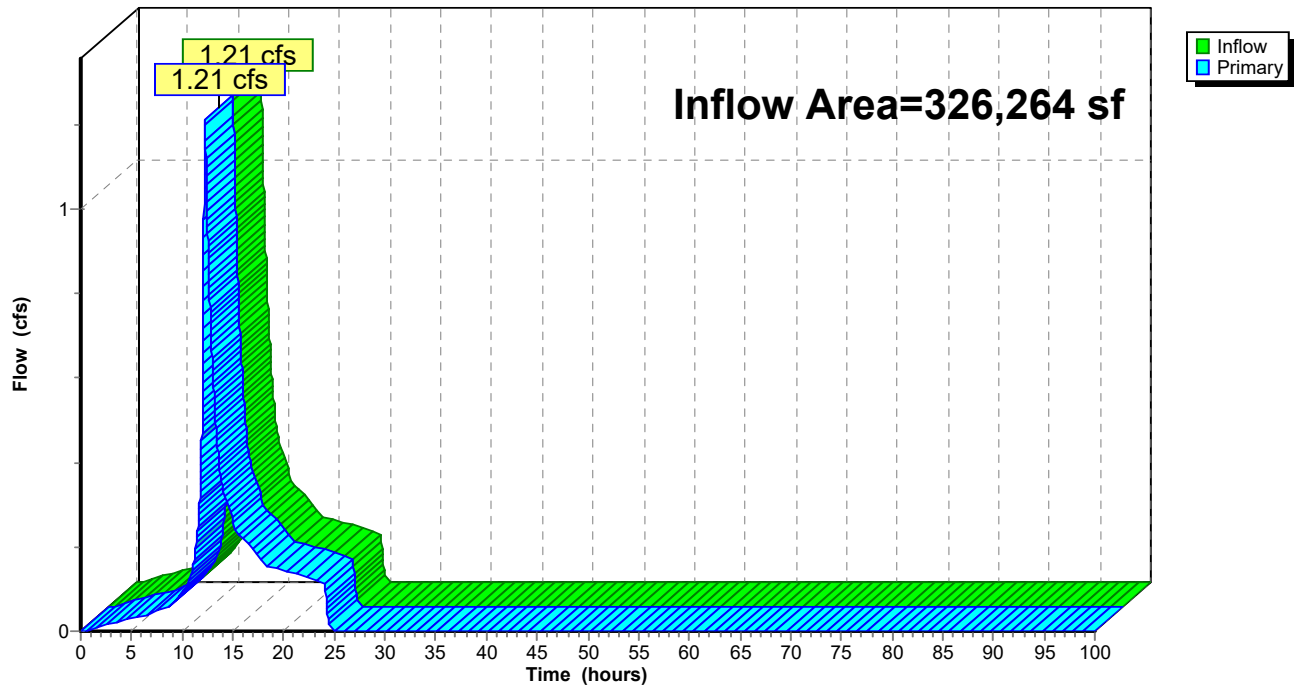
Hydrograph



Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 0.51" for 10-Year Current Adj event
Inflow = 1.21 cfs @ 12.24 hrs, Volume= 13,742 cf
Primary = 1.21 cfs @ 12.24 hrs, Volume= 13,742 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4**Hydrograph**

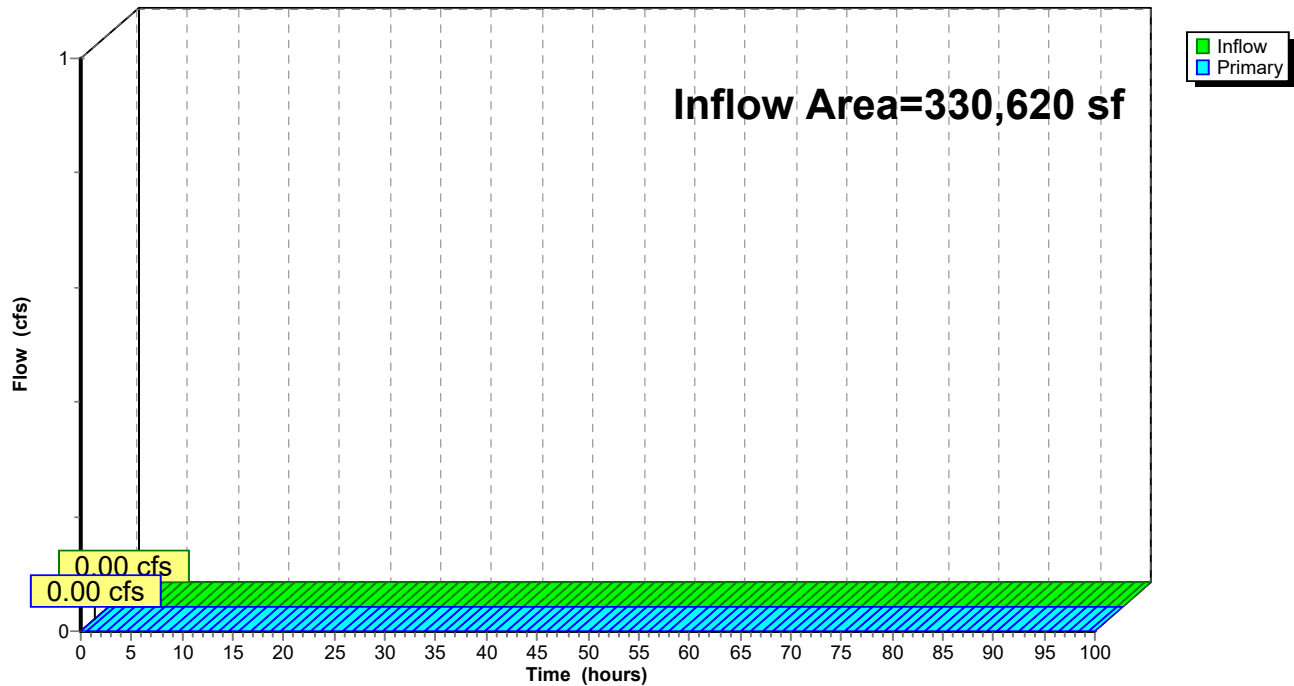
Summary for Link E5: EDA 5

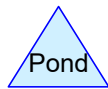
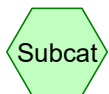
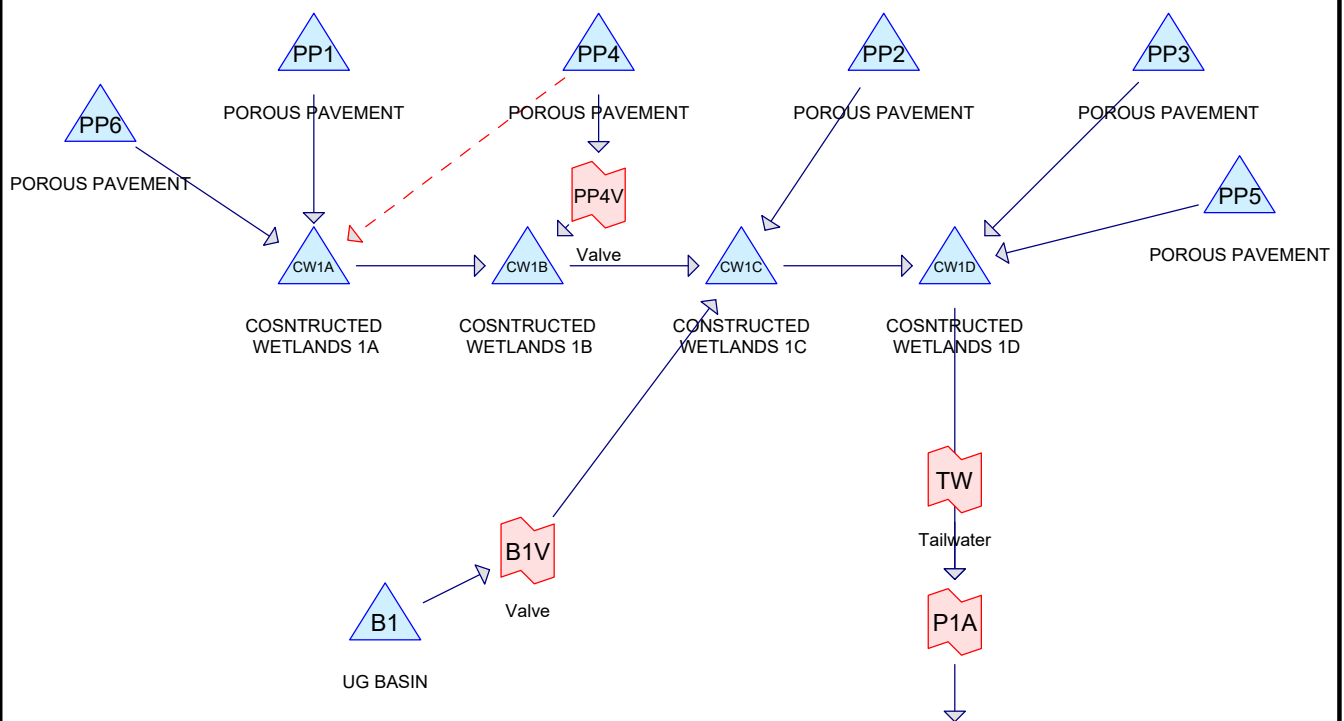
Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.00" for 10-Year Current Adj event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E5: EDA 5

Hydrograph





Routing Diagram for Pre vs Post- 10 yr tailwater Rev. 3a
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Pre vs Post- 10 yr tailwater Rev. 3a

Prepared by Bohler Engineering, PC

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	10-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	5.17	2	3.35

Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 4.89" for 10-Year Current Adj event
 Inflow = 13.17 cfs @ 12.10 hrs, Volume= 43,817 cf
 Outflow = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf, Atten= 92%, Lag= 61.9 min
 Primary = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.16' @ 13.13 hrs Surf.Area= 0.559 ac Storage= 0.646 af

Plug-Flow detention time= 562.6 min calculated for 34,307 cf (78% of inflow)
 Center-of-Mass det. time= 474.6 min (1,221.1 - 746.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.03 cfs @ 13.13 hrs HW=11.16' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.03 cfs of 8.74 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.80 cfs @ 4.07 fps)
- 3=Orifice/Grate (Orifice Controls 0.24 cfs @ 1.88 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

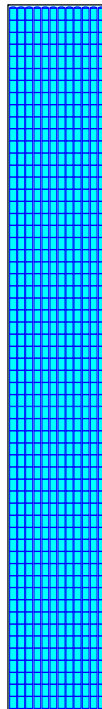
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

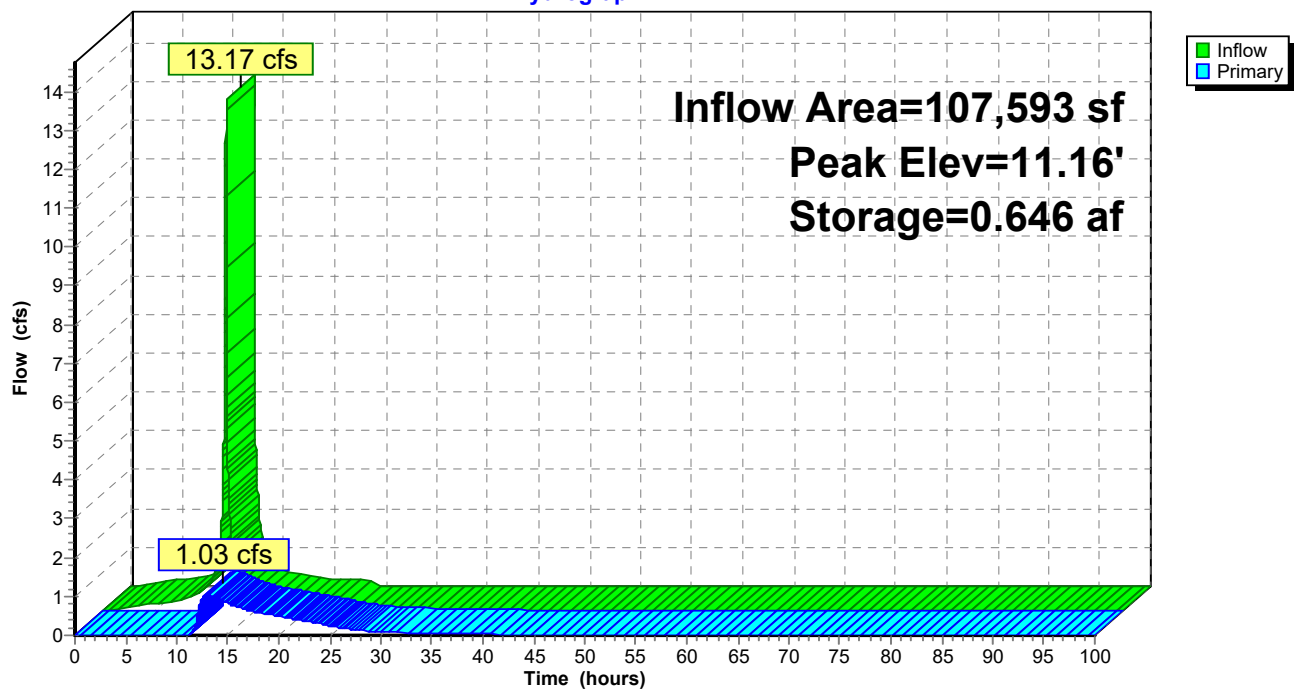
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 5.92" for 10-Year Current Adj event
 Inflow = 34.62 cfs @ 12.12 hrs, Volume= 168,173 cf
 Outflow = 9.87 cfs @ 12.98 hrs, Volume= 166,330 cf, Atten= 71%, Lag= 51.6 min
 Primary = 9.87 cfs @ 12.98 hrs, Volume= 166,330 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.00' @ 12.74 hrs Surf.Area= 22,785 sf Storage= 66,329 cf

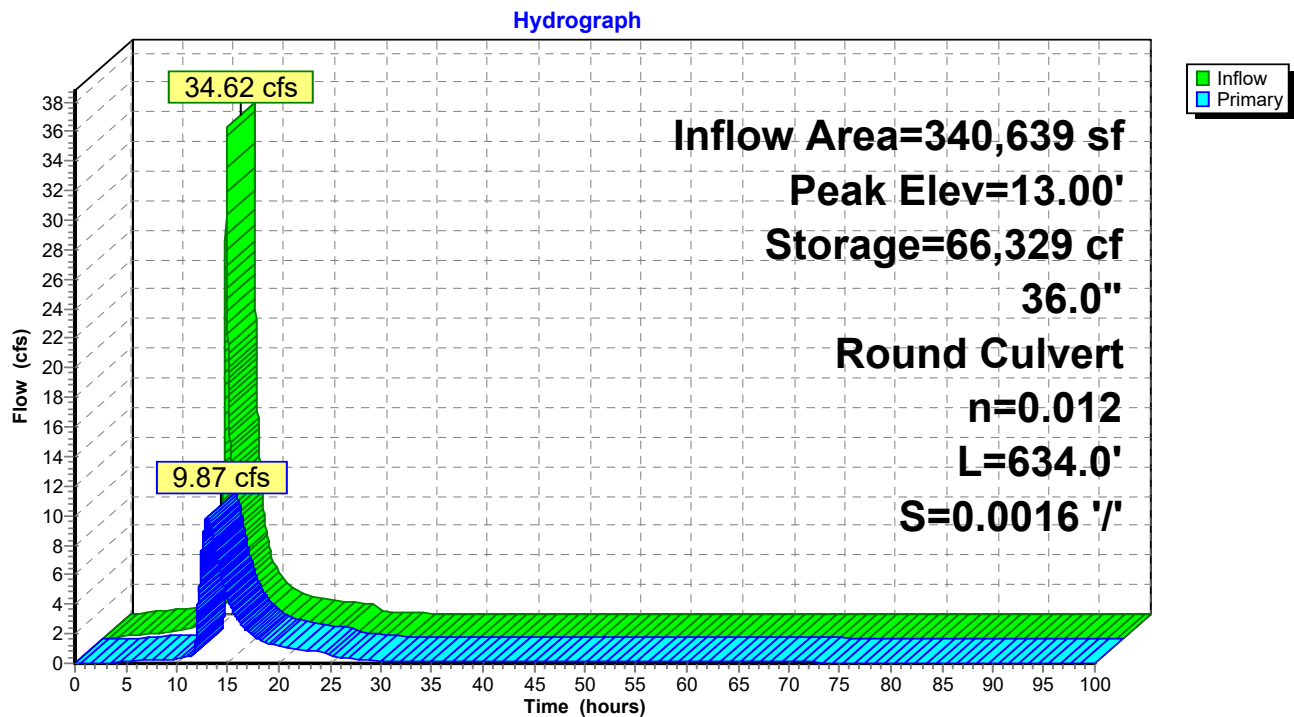
Plug-Flow detention time= 408.0 min calculated for 166,313 cf (99% of inflow)
 Center-of-Mass det. time= 395.0 min (1,218.6 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=9.99 cfs @ 12.98 hrs HW=12.95' TW=12.79' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 9.99 cfs @ 1.42 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth > 4.06" for 10-Year Current Adj event
 Inflow = 42.63 cfs @ 12.12 hrs, Volume= 354,412 cf
 Outflow = 22.42 cfs @ 12.64 hrs, Volume= 352,181 cf, Atten= 47%, Lag= 31.4 min
 Primary = 22.42 cfs @ 12.64 hrs, Volume= 352,181 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.86' @ 12.65 hrs Surf.Area= 20,776 sf Storage= 64,845 cf

Plug-Flow detention time= 237.2 min calculated for 352,145 cf (99% of inflow)
 Center-of-Mass det. time= 211.7 min (1,221.0 - 1,009.3)

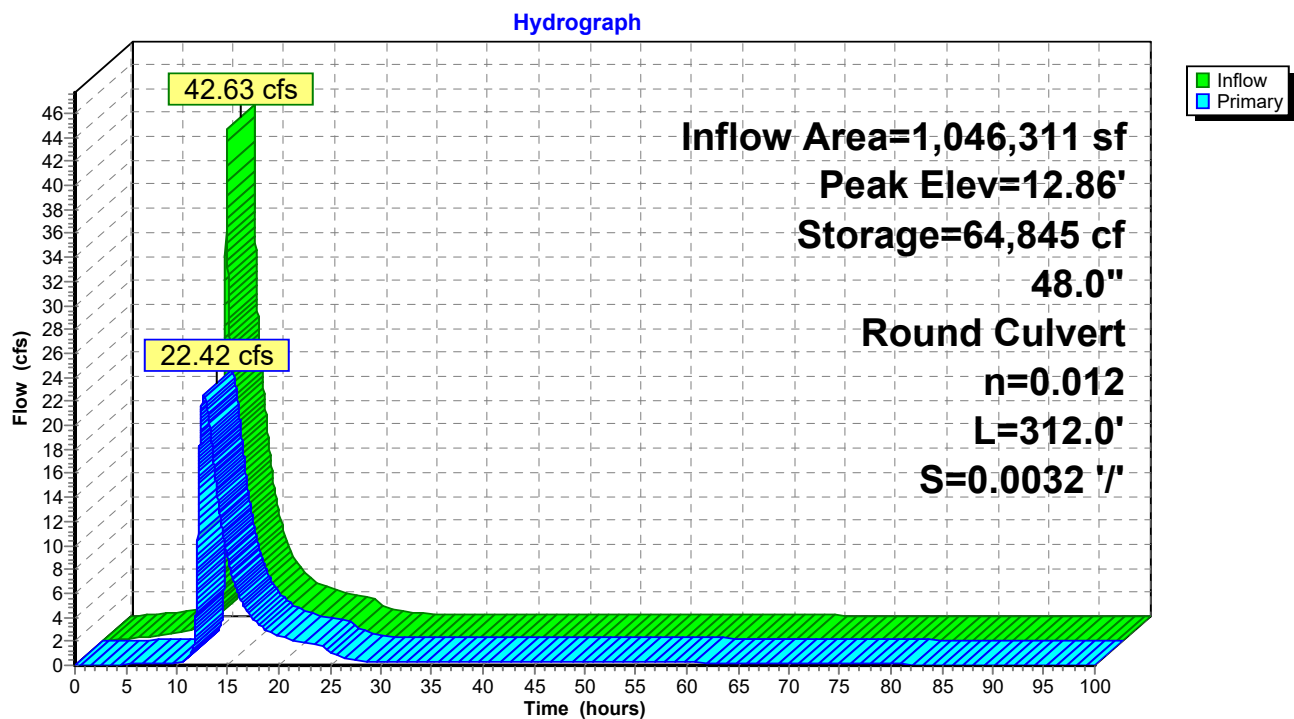
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=22.41 cfs @ 12.64 hrs HW=12.86' TW=12.65' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 22.41 cfs @ 2.30 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth > 3.91" for 10-Year Current Adj event
 Inflow = 25.00 cfs @ 12.61 hrs, Volume= 411,949 cf
 Outflow = 25.09 cfs @ 12.72 hrs, Volume= 411,641 cf, Atten= 0%, Lag= 6.5 min
 Primary = 25.09 cfs @ 12.72 hrs, Volume= 411,641 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.65' @ 12.64 hrs Surf.Area= 7,570 sf Storage= 16,899 cf

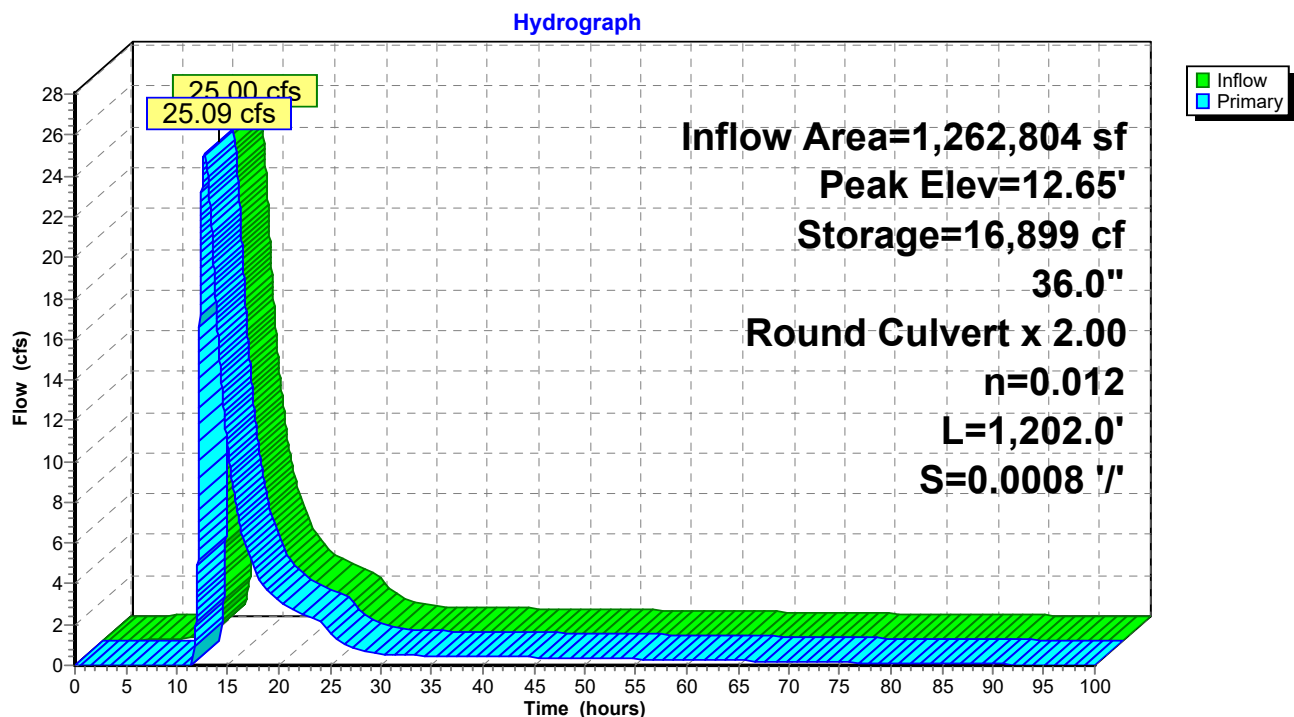
Plug-Flow detention time= 42.0 min calculated for 411,641 cf (100% of inflow)
 Center-of-Mass det. time= 38.6 min (1,269.3 - 1,230.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=25.13 cfs @ 12.72 hrs HW=12.64' TW=12.25' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 25.13 cfs @ 1.86 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth > 4.08" for 10-Year Current Adj event
 Inflow = 46.63 cfs @ 12.12 hrs, Volume= 571,259 cf
 Outflow = 32.86 cfs @ 12.55 hrs, Volume= 570,068 cf, Atten= 30%, Lag= 25.8 min
 Primary = 32.86 cfs @ 12.55 hrs, Volume= 570,068 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.26' @ 12.55 hrs Surf.Area= 21,451 sf Storage= 55,288 cf

Plug-Flow detention time= 145.1 min calculated for 570,068 cf (100% of inflow)
 Center-of-Mass det. time= 135.6 min (1,269.9 - 1,134.3)

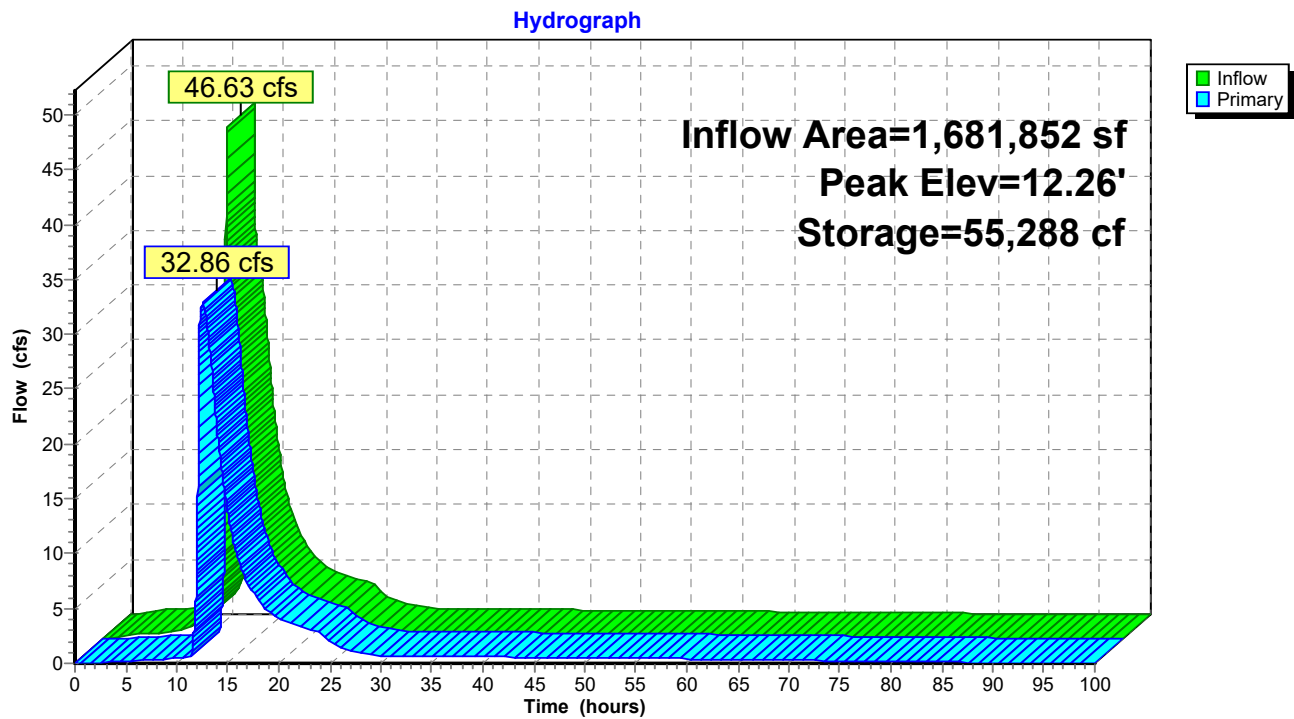
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=32.86 cfs @ 12.55 hrs HW=12.26' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 32.86 cfs of 55.37 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.89 cfs @ 8.53 fps)
- 3=Orifice/Grate (Orifice Controls 28.03 cfs @ 4.48 fps)
- 4=Sharp-Crested Rectangular Weir(Weir Controls 3.95 cfs @ 2.05 fps)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 4.81" for 10-Year Current Adj event
 Inflow = 4.09 cfs @ 12.10 hrs, Volume= 13,626 cf
 Outflow = 0.44 cfs @ 12.81 hrs, Volume= 10,738 cf, Atten= 89%, Lag= 43.1 min
 Primary = 0.44 cfs @ 12.81 hrs, Volume= 10,738 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.19' @ 12.81 hrs Surf.Area= 12,680 sf Storage= 8,293 cf

Plug-Flow detention time= 483.0 min calculated for 10,737 cf (79% of inflow)
 Center-of-Mass det. time= 396.0 min (1,141.6 - 745.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

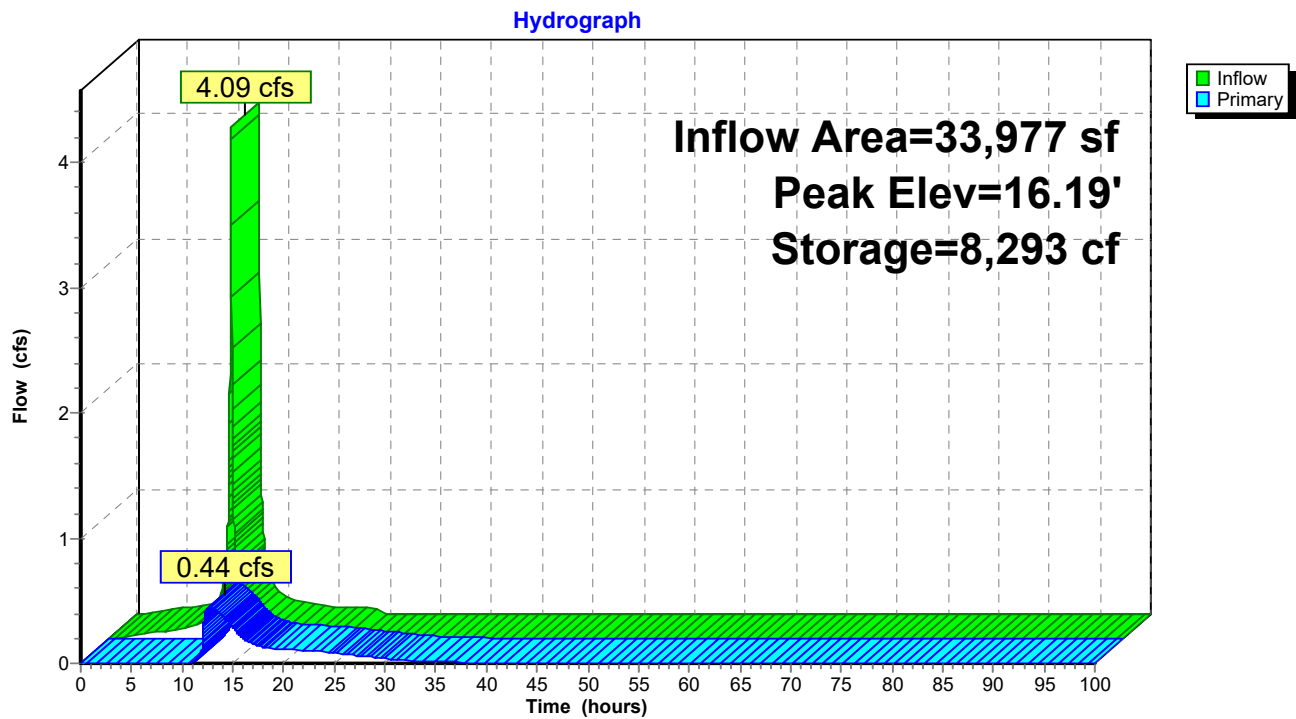
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 12.81 hrs HW=16.19' TW=12.99' (Dynamic Tailwater)

- 1=Culvert (Passes 0.44 cfs of 10.38 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.16 cfs @ 4.74 fps)
- 3=Orifice/Grate (Orifice Controls 0.28 cfs @ 2.85 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.23 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 4.81" for 10-Year Current Adj event
 Inflow = 9.46 cfs @ 12.10 hrs, Volume= 31,408 cf
 Outflow = 1.74 cfs @ 12.42 hrs, Volume= 24,859 cf, Atten= 82%, Lag= 19.0 min
 Primary = 1.74 cfs @ 12.42 hrs, Volume= 24,859 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.51' @ 12.42 hrs Surf.Area= 23,328 sf Storage= 18,334 cf

Plug-Flow detention time= 724.6 min calculated for 24,859 cf (79% of inflow)
 Center-of-Mass det. time= 638.0 min (1,386.5 - 748.5)

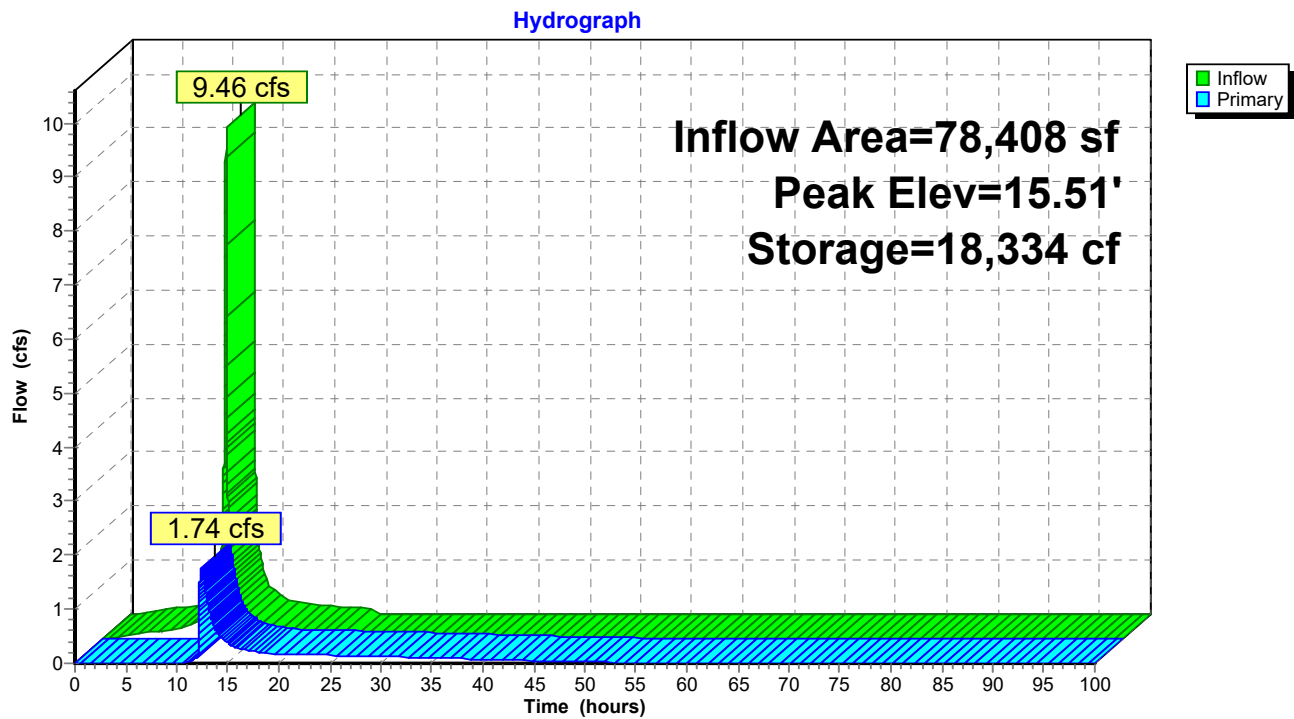
Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.74 cfs @ 12.42 hrs HW=15.51' TW=12.58' (Dynamic Tailwater)
 1=Culvert (Passes 1.74 cfs of 58.29 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.23 fps)
 3=Sharp-Crested Rectangular Weir (Weir Controls 1.56 cfs @ 1.62 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 4.86" for 10-Year Current Adj event
 Inflow = 3.87 cfs @ 12.10 hrs, Volume= 12,866 cf
 Outflow = 0.39 cfs @ 12.91 hrs, Volume= 10,179 cf, Atten= 90%, Lag= 48.6 min
 Primary = 0.39 cfs @ 12.91 hrs, Volume= 10,179 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.45' @ 12.91 hrs Surf.Area= 10,368 sf Storage= 7,899 cf

Plug-Flow detention time= 481.7 min calculated for 10,178 cf (79% of inflow)
 Center-of-Mass det. time= 395.4 min (1,142.8 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

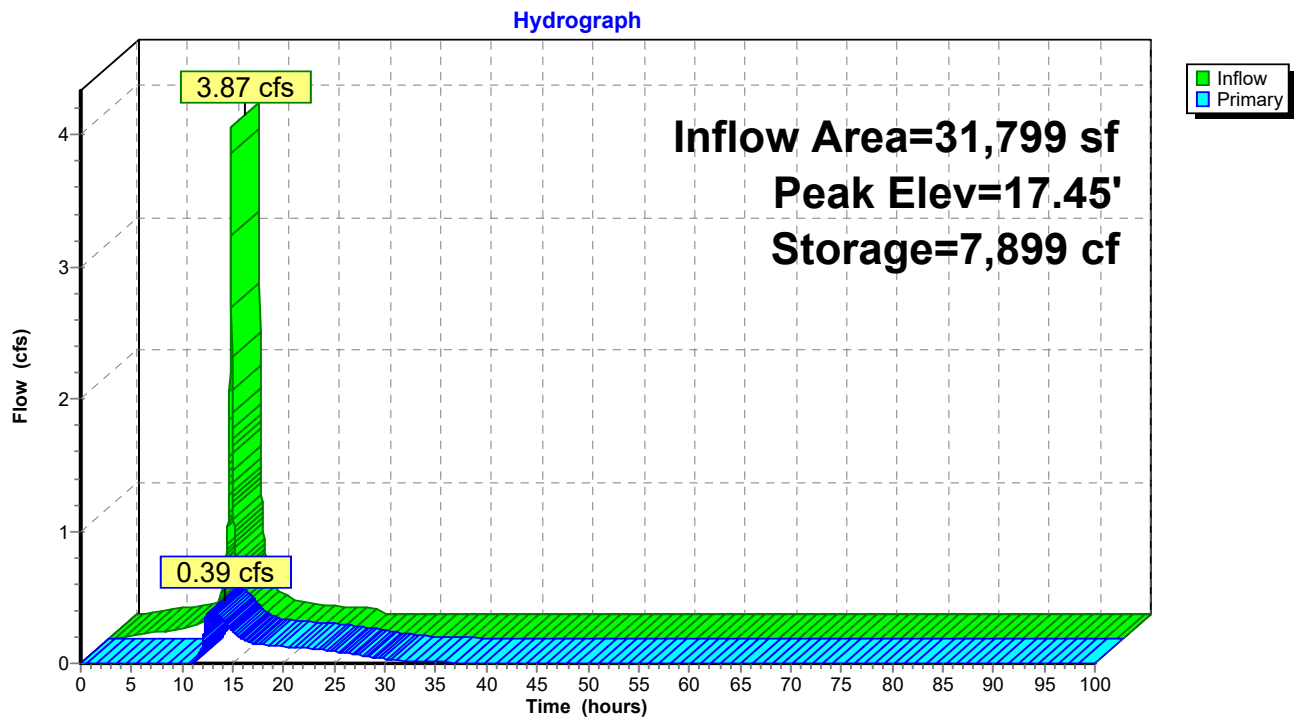
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.39 cfs @ 12.91 hrs HW=17.45' TW=12.22' (Dynamic Tailwater)

- 1=Culvert (Passes 0.39 cfs of 54.10 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.19 fps)
- 3=Orifice/Grate (Orifice Controls 0.21 cfs @ 2.45 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 4.82" for 10-Year Current Adj event
 Inflow = 56.42 cfs @ 12.10 hrs, Volume= 192,618 cf
 Outflow = 23.43 cfs @ 12.20 hrs, Volume= 152,750 cf, Atten= 58%, Lag= 5.8 min
 Primary = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf
 Routed to Link PP4V : Valve
 Secondary = 7.81 cfs @ 12.20 hrs, Volume= 50,917 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.18' @ 12.20 hrs Surf.Area= 181,216 sf Storage= 84,910 cf

Plug-Flow detention time= 218.7 min calculated for 152,750 cf (79% of inflow)
 Center-of-Mass det. time= 132.3 min (879.7 - 747.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

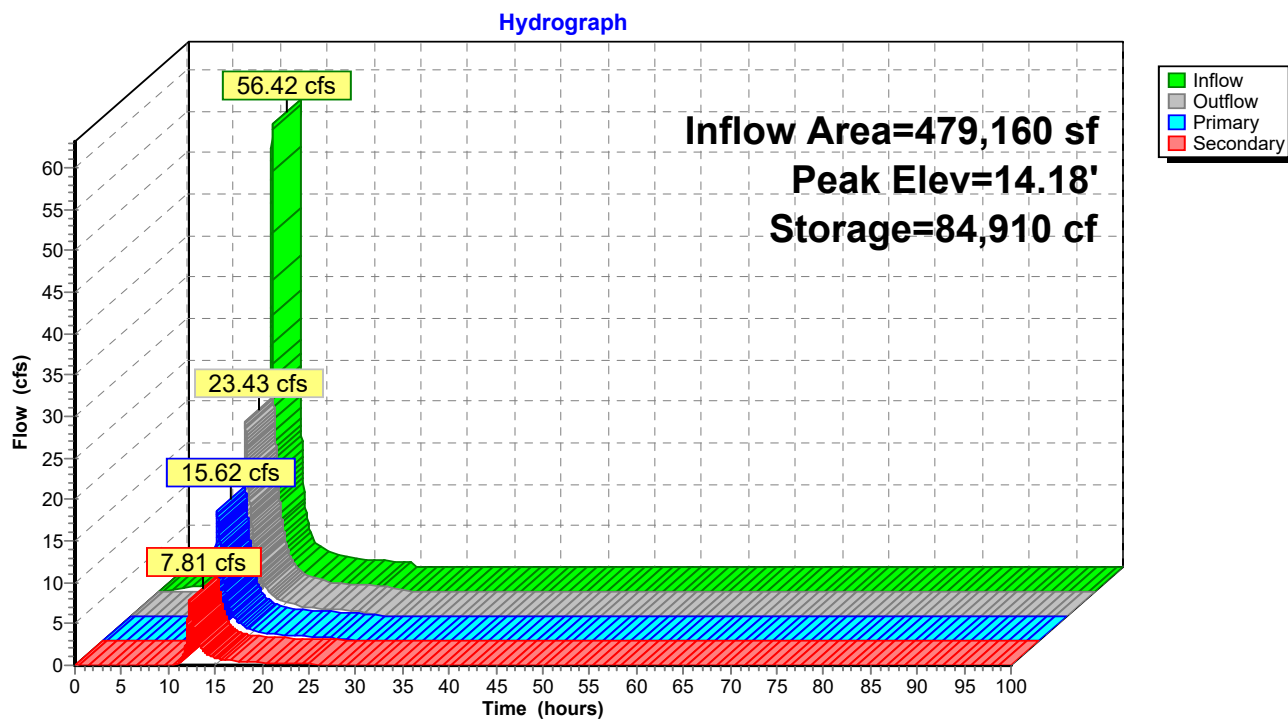
Primary OutFlow Max=15.62 cfs @ 12.20 hrs HW=14.18' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 15.62 cfs of 124.47 cfs potential flow)
 ↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 15.62 cfs @ 2.58 fps)

Secondary OutFlow Max=7.81 cfs @ 12.20 hrs HW=14.18' TW=12.40' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 7.81 cfs of 45.44 cfs potential flow)
 ↑ **4=Sharp-Crested Rectangular Weir**(Weir Controls 7.81 cfs @ 2.58 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 4.88" for 10-Year Current Adj event
 Inflow = 4.09 cfs @ 12.09 hrs, Volume= 13,472 cf
 Outflow = 2.03 cfs @ 12.11 hrs, Volume= 10,642 cf, Atten= 50%, Lag= 1.4 min
 Primary = 2.03 cfs @ 12.11 hrs, Volume= 10,642 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.83' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 5,673 cf

Plug-Flow detention time= 206.1 min calculated for 10,642 cf (79% of inflow)
 Center-of-Mass det. time= 119.1 min (864.1 - 744.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

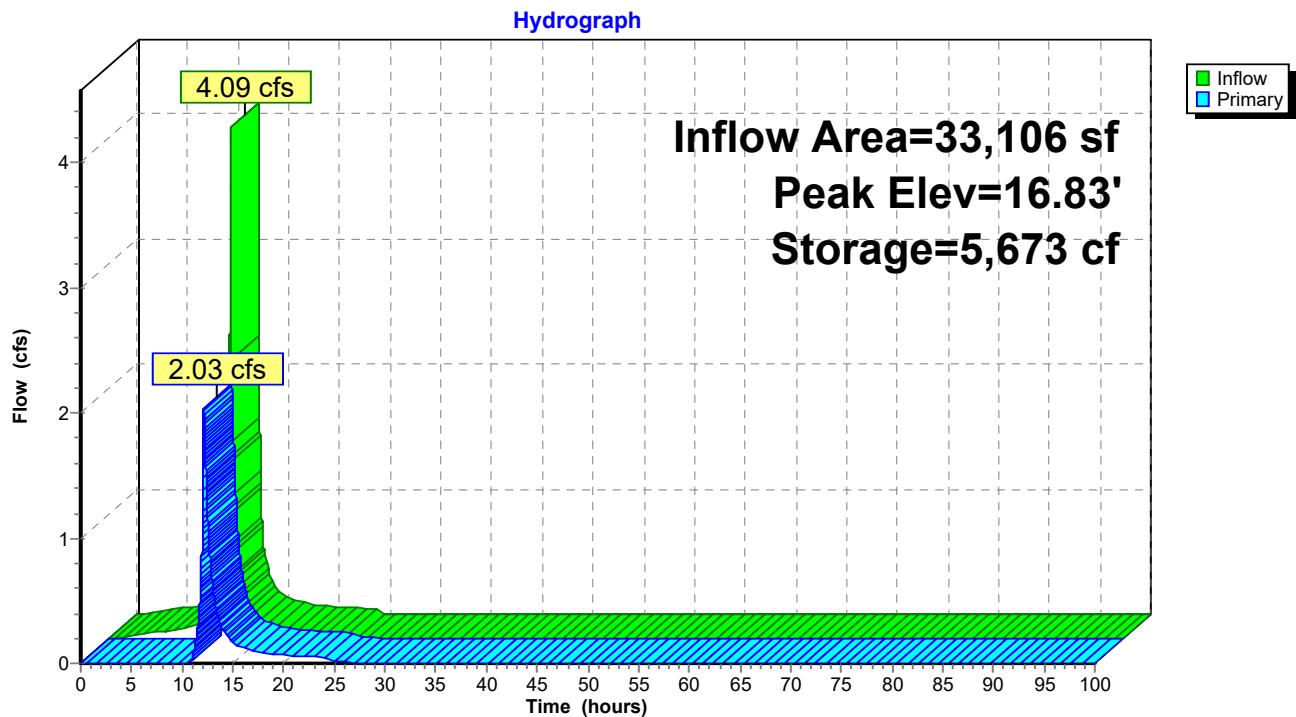
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.02 cfs @ 12.11 hrs HW=16.83' TW=11.93' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.02 cfs of 10.97 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.02 cfs @ 1.76 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 4.85" for 10-Year Current Adj event
Inflow = 4.75 cfs @ 12.09 hrs, Volume= 15,680 cf
Outflow = 2.03 cfs @ 12.12 hrs, Volume= 12,422 cf, Atten= 57%, Lag= 1.7 min
Primary = 2.03 cfs @ 12.12 hrs, Volume= 12,422 cf
Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 16.55' @ 12.12 hrs Surf.Area= 31,334 sf Storage= 6,915 cf

Plug-Flow detention time= 216.5 min calculated for 12,422 cf (79% of inflow)
Center-of-Mass det. time= 130.0 min (874.5 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

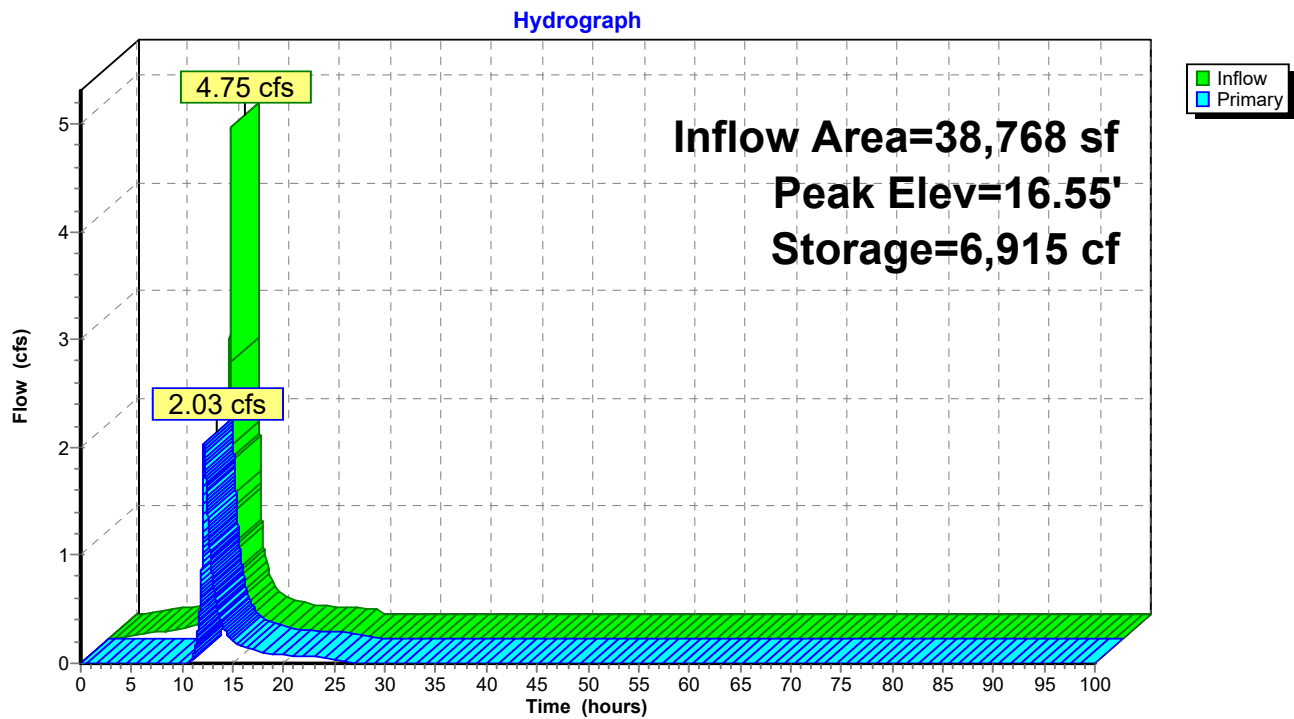
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.03 cfs @ 12.12 hrs HW=16.55' TW=12.06' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.03 cfs of 12.52 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.03 cfs @ 1.77 fps)

Pond PP6: POROUS PAVEMENT



Summary for Link B1V: Valve

Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

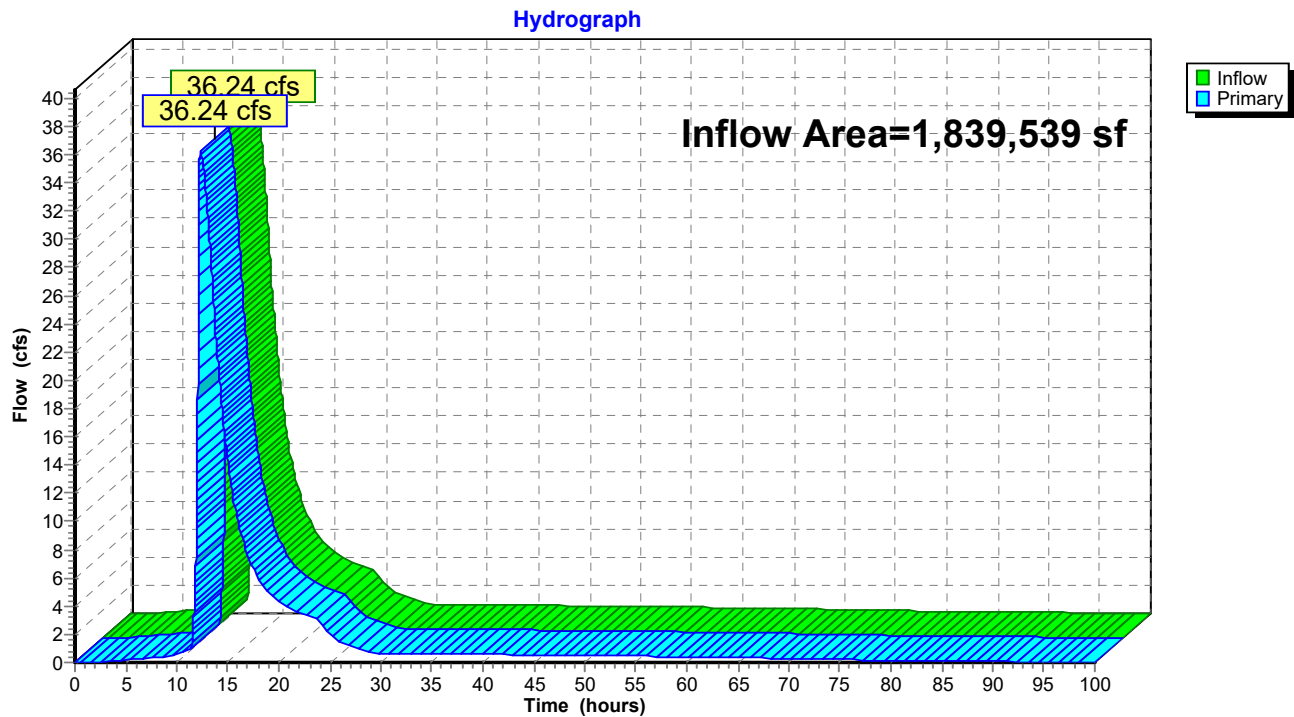


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth > 3.90" for 10-Year Current Adj event
Inflow = 36.24 cfs @ 12.34 hrs, Volume= 597,550 cf
Primary = 36.24 cfs @ 12.34 hrs, Volume= 597,550 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



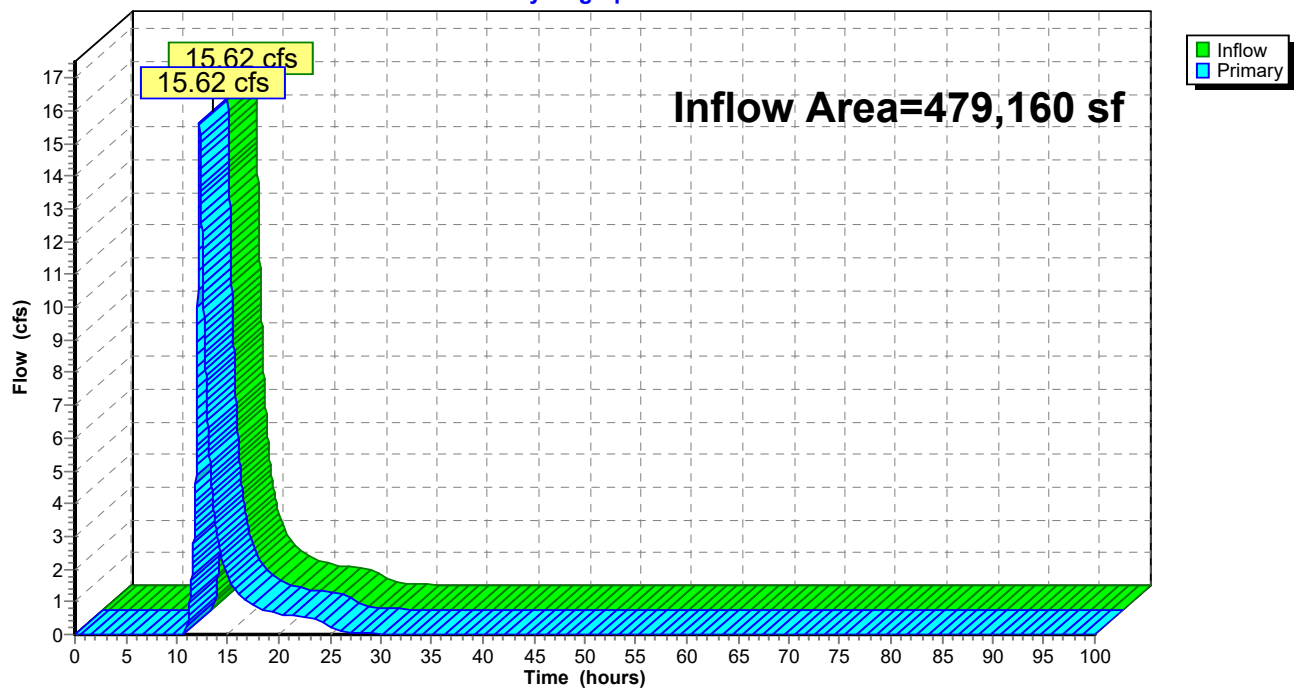
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 2.55" for 10-Year Current Adj event
Inflow = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf
Primary = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



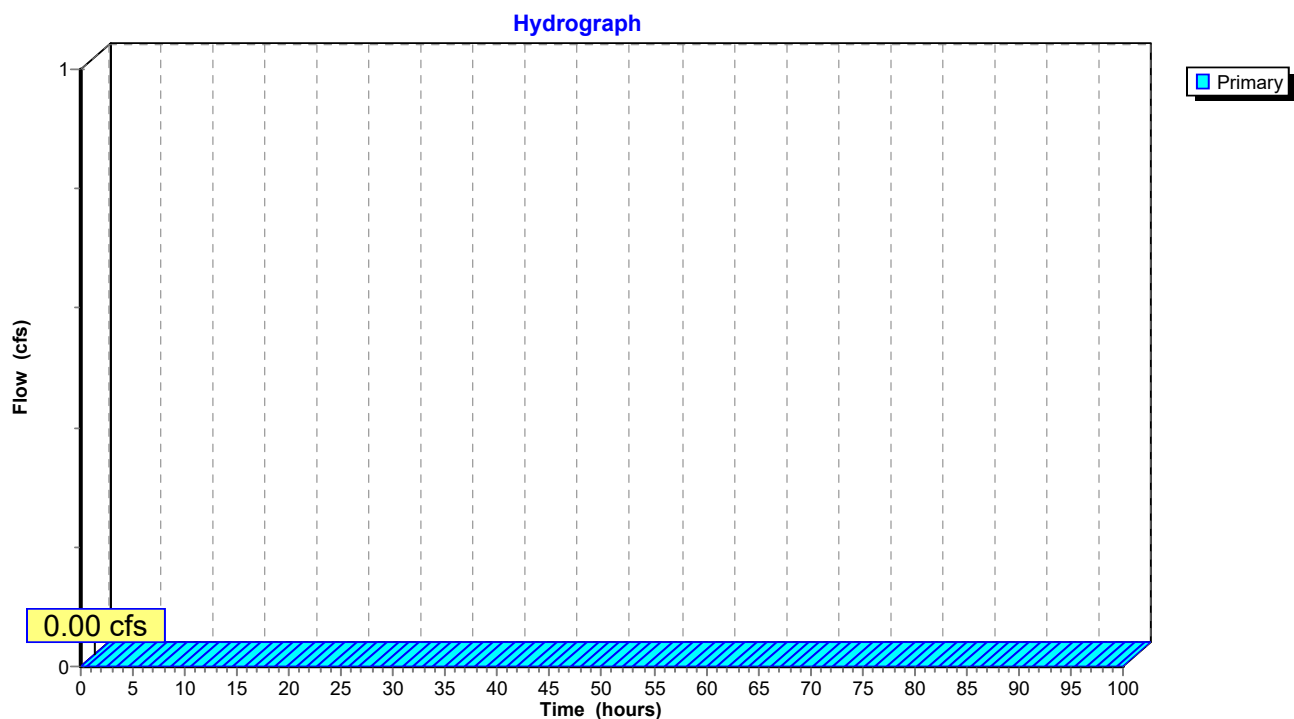
Summary for Link TW: Tailwater

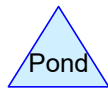
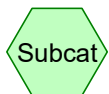
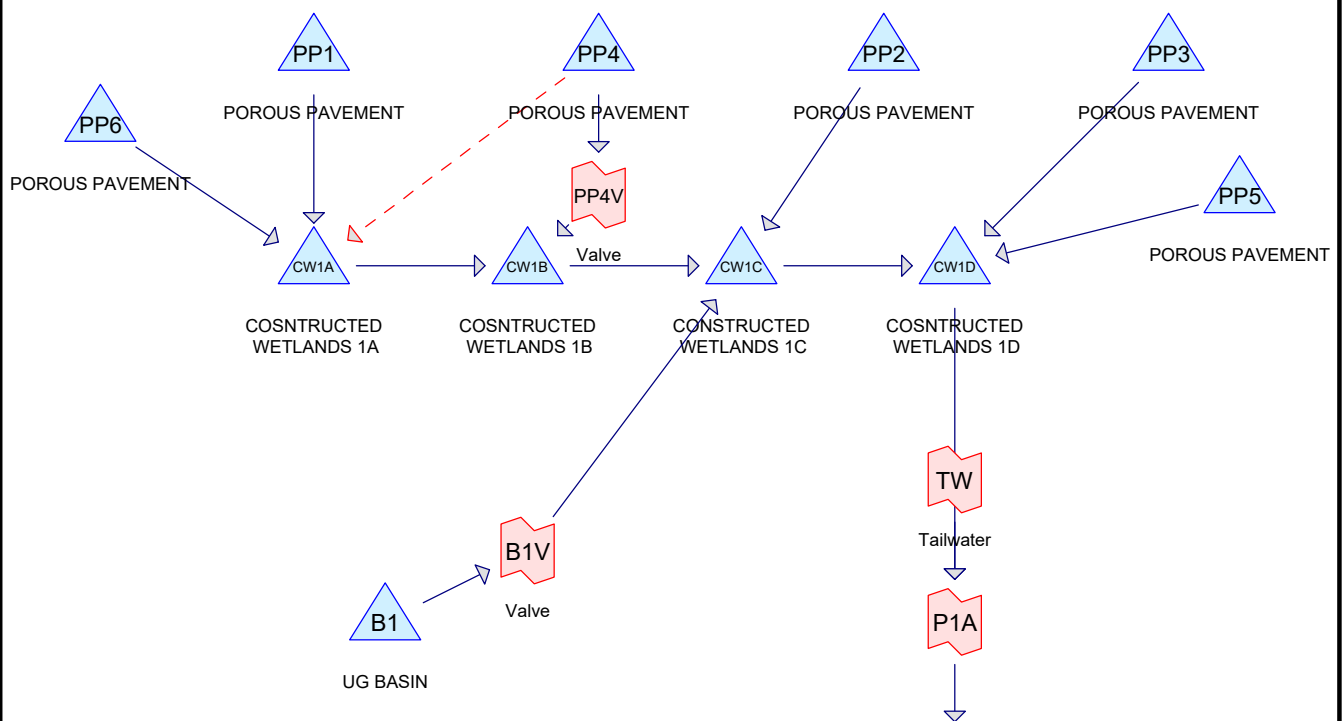
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 8.63'

Link TW: Tailwater





Routing Diagram for Pre vs Post- 10 yr tailwater Rev. 3a
 Prepared by Bohler Engineering, PC, Printed 8/18/2026
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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 4.89" for 10-Year Current Adj event
 Inflow = 13.17 cfs @ 12.10 hrs, Volume= 43,817 cf
 Outflow = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf, Atten= 92%, Lag= 61.9 min
 Primary = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.16' @ 13.13 hrs Surf.Area= 0.559 ac Storage= 0.646 af

Plug-Flow detention time= 562.6 min calculated for 34,307 cf (78% of inflow)
 Center-of-Mass det. time= 474.6 min (1,221.1 - 746.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50"W x 416.58"L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.03 cfs @ 13.13 hrs HW=11.16' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.03 cfs of 8.74 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.80 cfs @ 4.07 fps)
- 3=Orifice/Grate (Orifice Controls 0.24 cfs @ 1.88 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

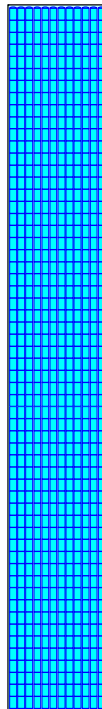
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

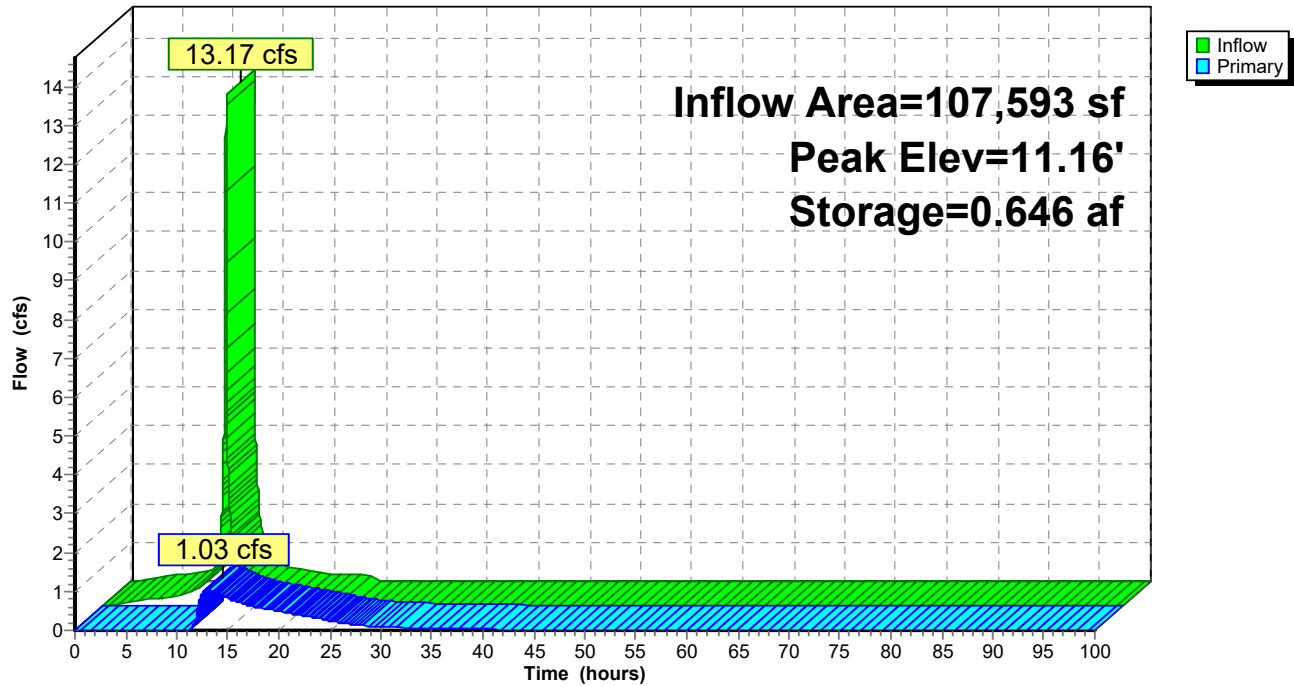
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 5.92" for 10-Year Current Adj event
 Inflow = 34.62 cfs @ 12.12 hrs, Volume= 168,173 cf
 Outflow = 9.87 cfs @ 12.98 hrs, Volume= 166,330 cf, Atten= 71%, Lag= 51.6 min
 Primary = 9.87 cfs @ 12.98 hrs, Volume= 166,330 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.00' @ 12.74 hrs Surf.Area= 22,785 sf Storage= 66,329 cf

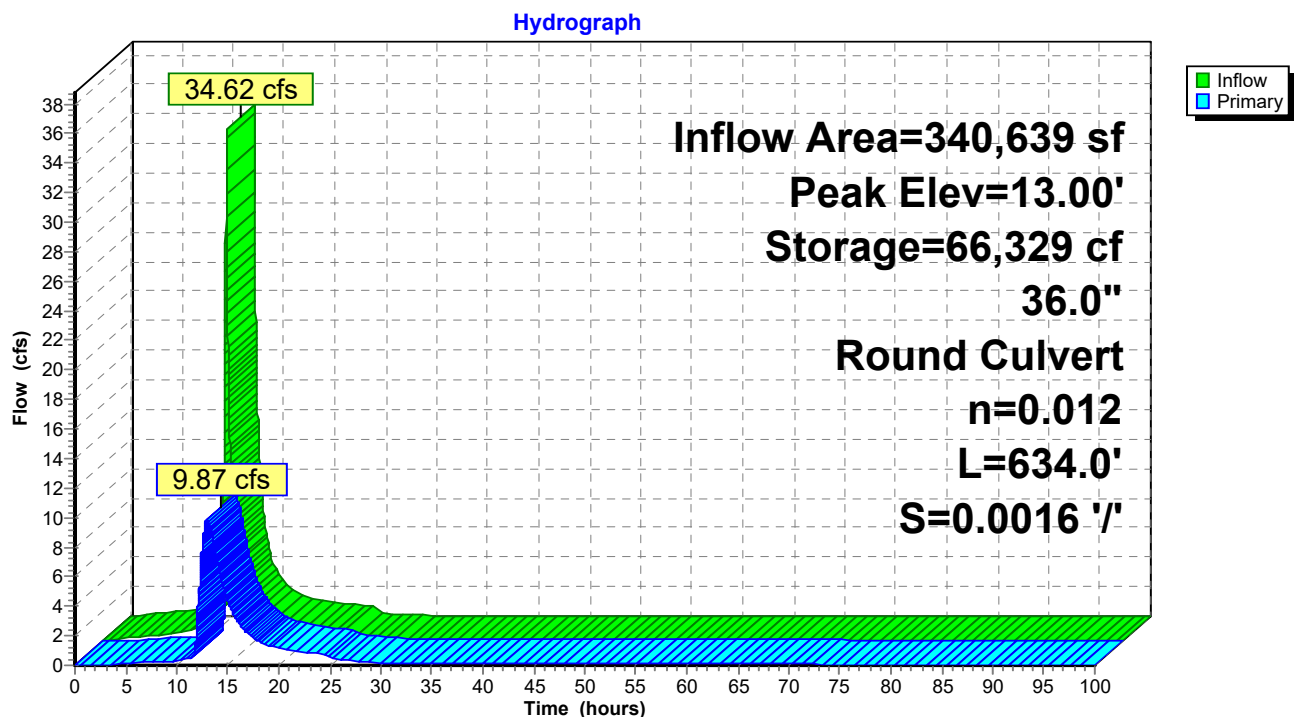
Plug-Flow detention time= 408.0 min calculated for 166,313 cf (99% of inflow)
 Center-of-Mass det. time= 395.0 min (1,218.6 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=9.99 cfs @ 12.98 hrs HW=12.95' TW=12.79' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 9.99 cfs @ 1.42 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth > 4.06" for 10-Year Current Adj event
 Inflow = 42.63 cfs @ 12.12 hrs, Volume= 354,412 cf
 Outflow = 22.42 cfs @ 12.64 hrs, Volume= 352,181 cf, Atten= 47%, Lag= 31.4 min
 Primary = 22.42 cfs @ 12.64 hrs, Volume= 352,181 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.86' @ 12.65 hrs Surf.Area= 20,776 sf Storage= 64,845 cf

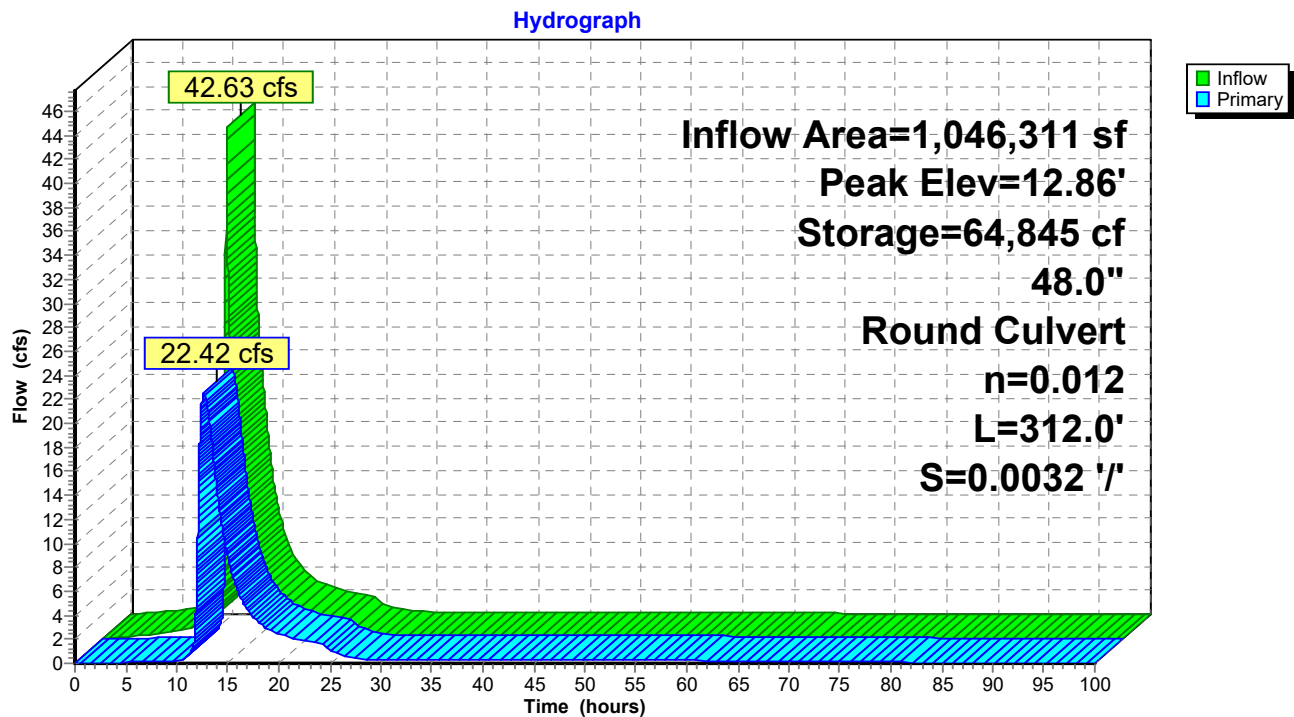
Plug-Flow detention time= 237.2 min calculated for 352,145 cf (99% of inflow)
 Center-of-Mass det. time= 211.7 min (1,221.0 - 1,009.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=22.41 cfs @ 12.64 hrs HW=12.86' TW=12.65' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 22.41 cfs @ 2.30 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth > 3.91" for 10-Year Current Adj event
 Inflow = 25.00 cfs @ 12.61 hrs, Volume= 411,949 cf
 Outflow = 25.09 cfs @ 12.72 hrs, Volume= 411,641 cf, Atten= 0%, Lag= 6.5 min
 Primary = 25.09 cfs @ 12.72 hrs, Volume= 411,641 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.65' @ 12.64 hrs Surf.Area= 7,570 sf Storage= 16,899 cf

Plug-Flow detention time= 42.0 min calculated for 411,641 cf (100% of inflow)
 Center-of-Mass det. time= 38.6 min (1,269.3 - 1,230.7)

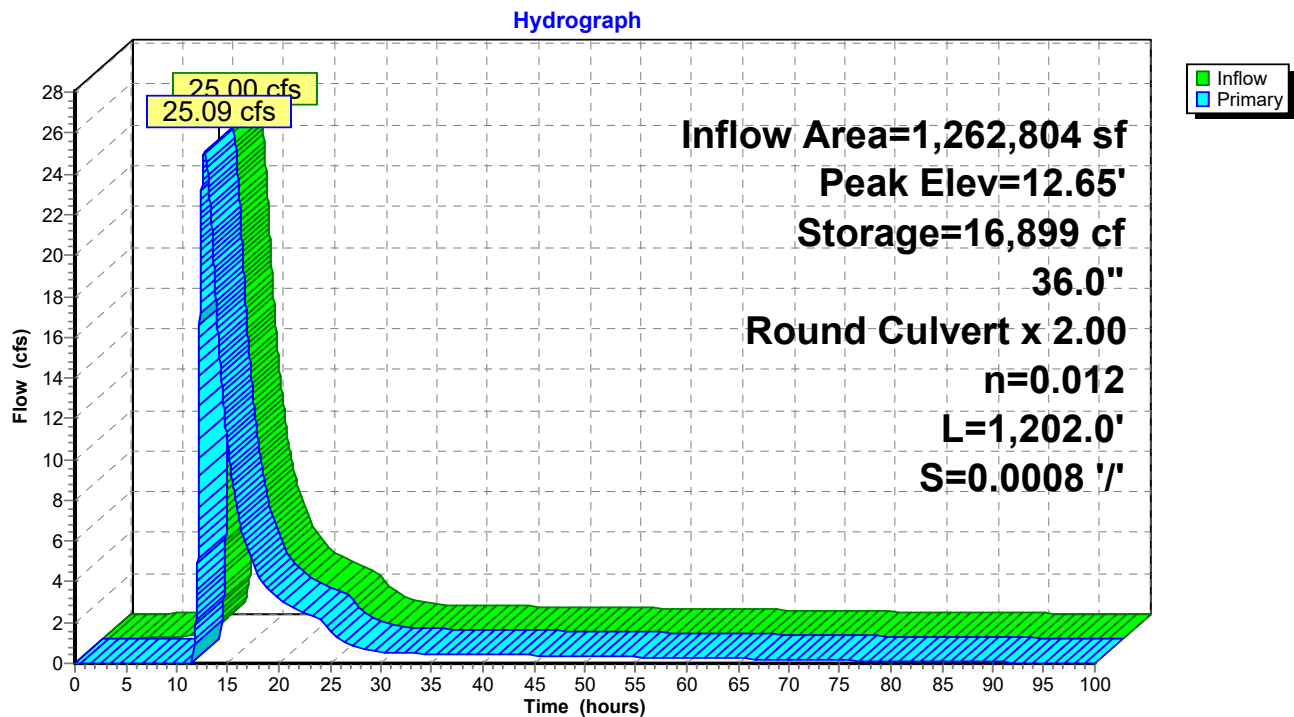
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=25.13 cfs @ 12.72 hrs HW=12.64' TW=12.25' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 25.13 cfs @ 1.86 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth > 4.08" for 10-Year Current Adj event
 Inflow = 46.63 cfs @ 12.12 hrs, Volume= 571,259 cf
 Outflow = 32.86 cfs @ 12.55 hrs, Volume= 570,068 cf, Atten= 30%, Lag= 25.8 min
 Primary = 32.86 cfs @ 12.55 hrs, Volume= 570,068 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.26' @ 12.55 hrs Surf.Area= 21,451 sf Storage= 55,288 cf

Plug-Flow detention time= 145.1 min calculated for 570,068 cf (100% of inflow)
 Center-of-Mass det. time= 135.6 min (1,269.9 - 1,134.3)

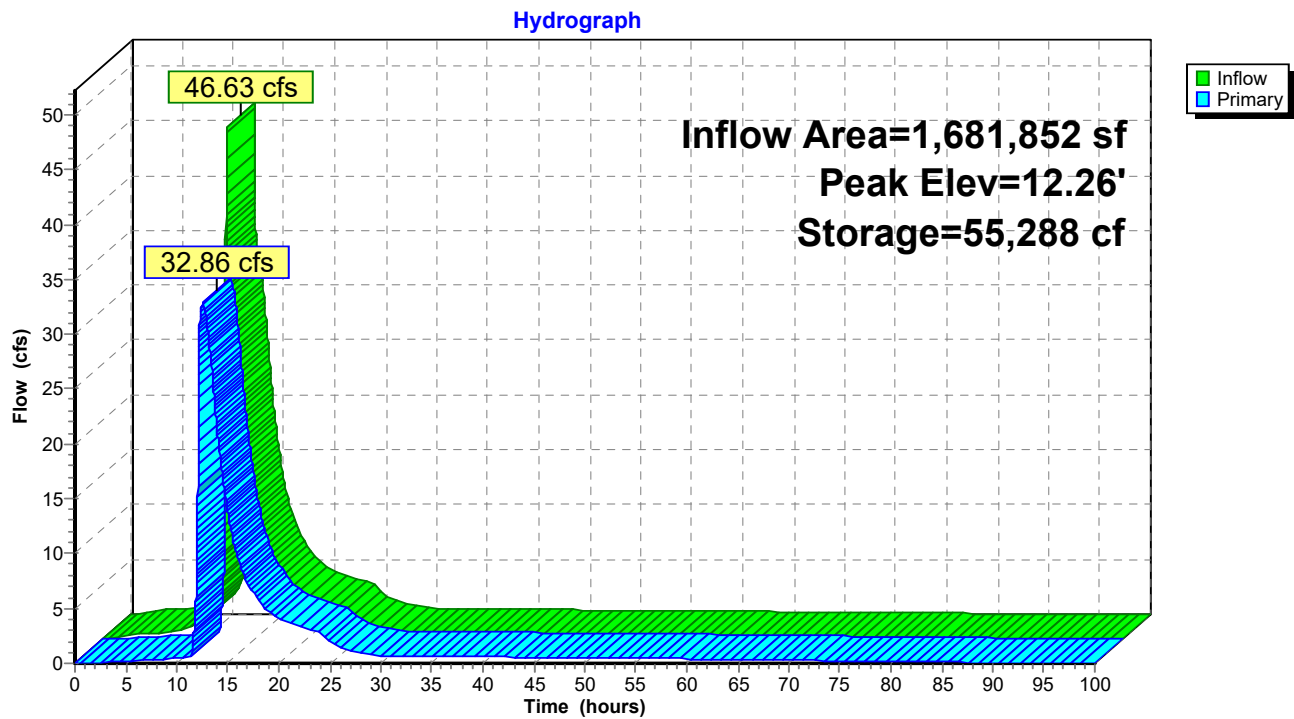
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=32.86 cfs @ 12.55 hrs HW=12.26' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 32.86 cfs of 55.37 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.89 cfs @ 8.53 fps)
- 3=Orifice/Grate (Orifice Controls 28.03 cfs @ 4.48 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 3.95 cfs @ 2.05 fps)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 4.81" for 10-Year Current Adj event
 Inflow = 4.09 cfs @ 12.10 hrs, Volume= 13,626 cf
 Outflow = 0.44 cfs @ 12.81 hrs, Volume= 10,738 cf, Atten= 89%, Lag= 43.1 min
 Primary = 0.44 cfs @ 12.81 hrs, Volume= 10,738 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.19' @ 12.81 hrs Surf.Area= 12,680 sf Storage= 8,293 cf

Plug-Flow detention time= 483.0 min calculated for 10,737 cf (79% of inflow)
 Center-of-Mass det. time= 396.0 min (1,141.6 - 745.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

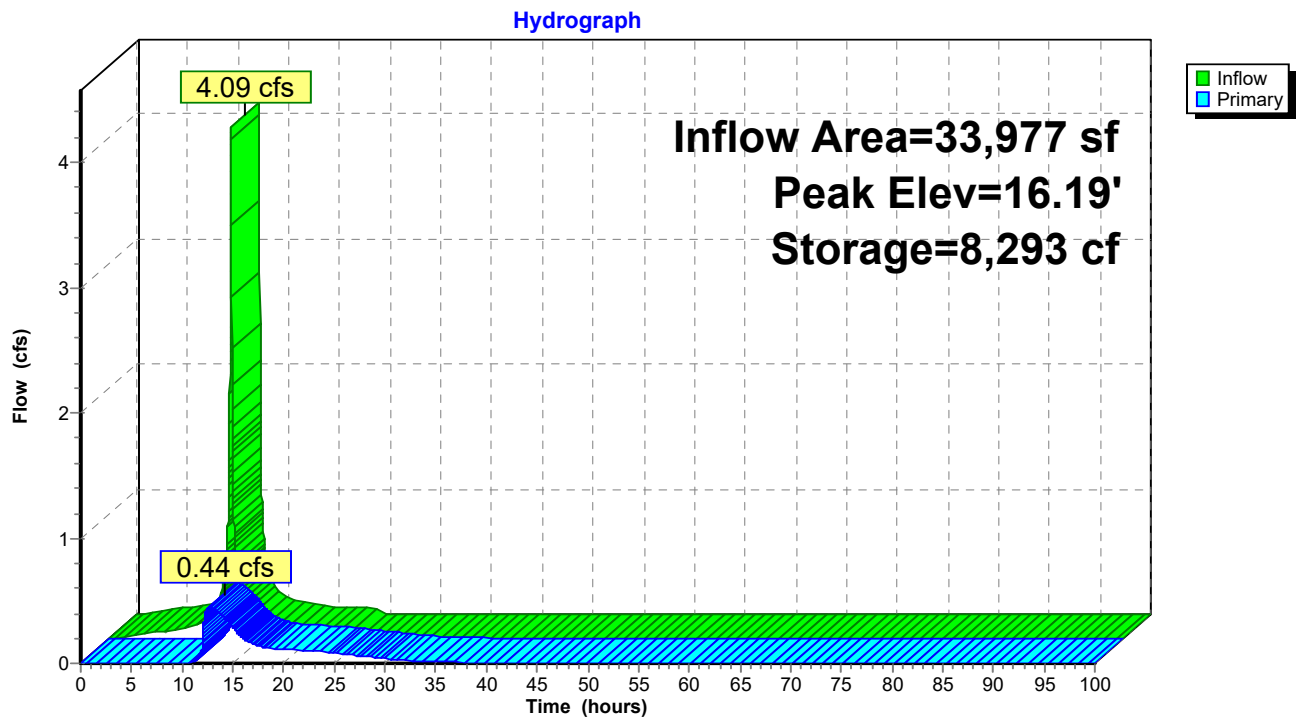
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 12.81 hrs HW=16.19' TW=12.99' (Dynamic Tailwater)

- 1=Culvert (Passes 0.44 cfs of 10.38 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.16 cfs @ 4.74 fps)
- 3=Orifice/Grate (Orifice Controls 0.28 cfs @ 2.85 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.23 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 4.81" for 10-Year Current Adj event
 Inflow = 9.46 cfs @ 12.10 hrs, Volume= 31,408 cf
 Outflow = 1.74 cfs @ 12.42 hrs, Volume= 24,859 cf, Atten= 82%, Lag= 19.0 min
 Primary = 1.74 cfs @ 12.42 hrs, Volume= 24,859 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.51' @ 12.42 hrs Surf.Area= 23,328 sf Storage= 18,334 cf

Plug-Flow detention time= 724.6 min calculated for 24,859 cf (79% of inflow)
 Center-of-Mass det. time= 638.0 min (1,386.5 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

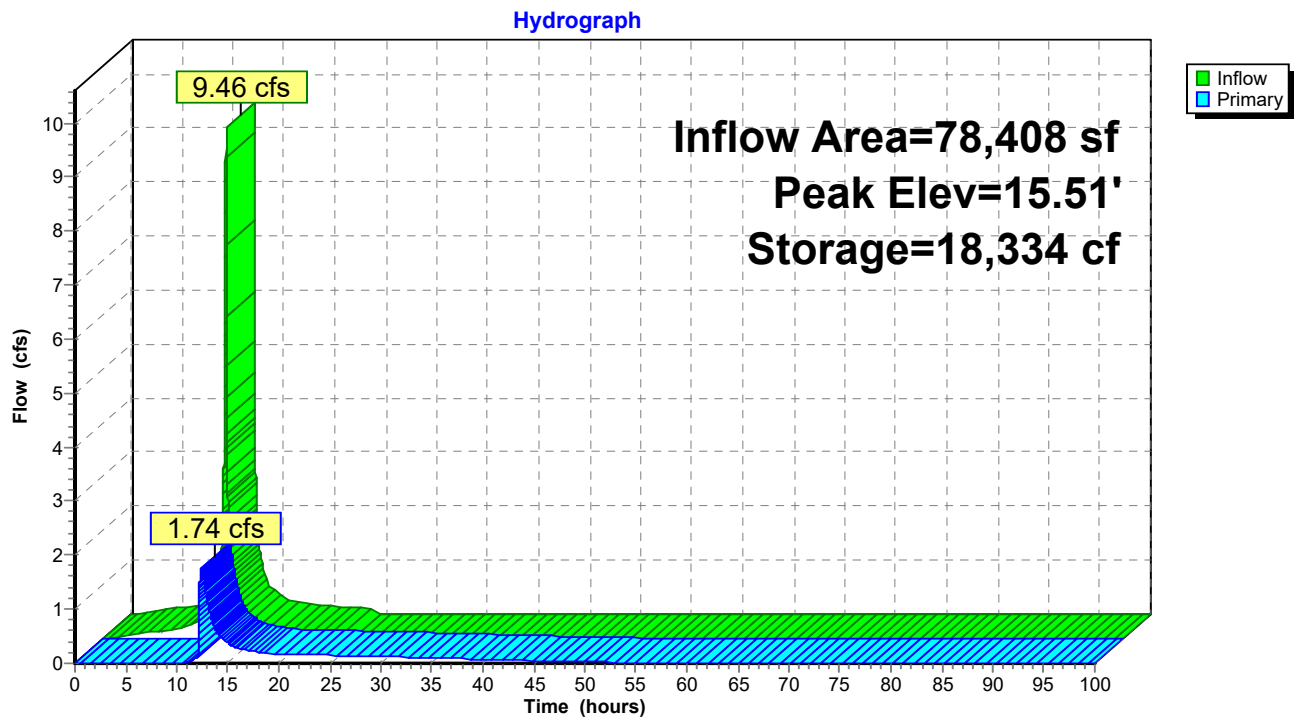
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.74 cfs @ 12.42 hrs HW=15.51' TW=12.58' (Dynamic Tailwater)

- 1=Culvert (Passes 1.74 cfs of 58.29 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.23 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 1.56 cfs @ 1.62 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 4.86" for 10-Year Current Adj event
 Inflow = 3.87 cfs @ 12.10 hrs, Volume= 12,866 cf
 Outflow = 0.39 cfs @ 12.91 hrs, Volume= 10,179 cf, Atten= 90%, Lag= 48.6 min
 Primary = 0.39 cfs @ 12.91 hrs, Volume= 10,179 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.45' @ 12.91 hrs Surf.Area= 10,368 sf Storage= 7,899 cf

Plug-Flow detention time= 481.7 min calculated for 10,178 cf (79% of inflow)
 Center-of-Mass det. time= 395.4 min (1,142.8 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

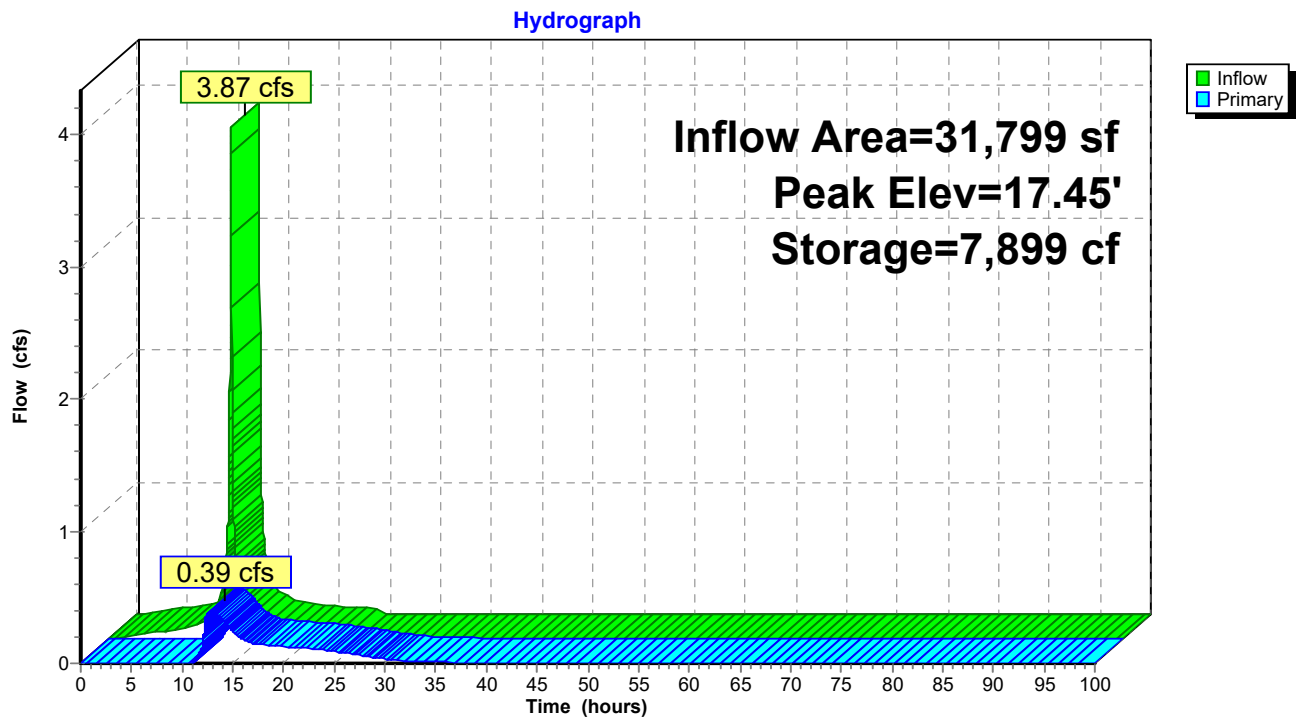
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.39 cfs @ 12.91 hrs HW=17.45' TW=12.22' (Dynamic Tailwater)

- 1=Culvert (Passes 0.39 cfs of 54.10 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.19 fps)
- 3=Orifice/Grate (Orifice Controls 0.21 cfs @ 2.45 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 4.82" for 10-Year Current Adj event
 Inflow = 56.42 cfs @ 12.10 hrs, Volume= 192,618 cf
 Outflow = 23.43 cfs @ 12.20 hrs, Volume= 152,750 cf, Atten= 58%, Lag= 5.8 min
 Primary = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf
 Routed to Link PP4V : Valve
 Secondary = 7.81 cfs @ 12.20 hrs, Volume= 50,917 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.18' @ 12.20 hrs Surf.Area= 181,216 sf Storage= 84,910 cf

Plug-Flow detention time= 218.7 min calculated for 152,750 cf (79% of inflow)
 Center-of-Mass det. time= 132.3 min (879.7 - 747.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

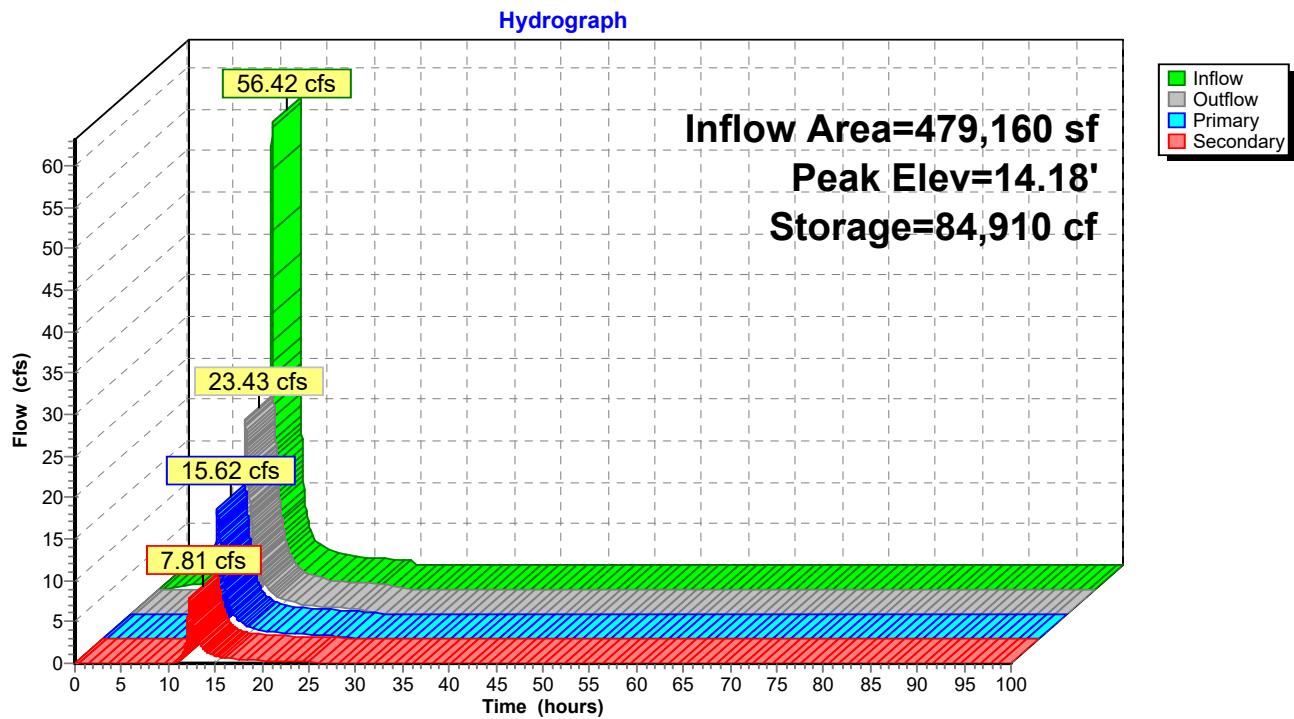
Primary OutFlow Max=15.62 cfs @ 12.20 hrs HW=14.18' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 15.62 cfs of 124.47 cfs potential flow)
 ↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 15.62 cfs @ 2.58 fps)

Secondary OutFlow Max=7.81 cfs @ 12.20 hrs HW=14.18' TW=12.40' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 7.81 cfs of 45.44 cfs potential flow)
 ↑ **4=Sharp-Crested Rectangular Weir**(Weir Controls 7.81 cfs @ 2.58 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 4.88" for 10-Year Current Adj event
 Inflow = 4.09 cfs @ 12.09 hrs, Volume= 13,472 cf
 Outflow = 2.03 cfs @ 12.11 hrs, Volume= 10,642 cf, Atten= 50%, Lag= 1.4 min
 Primary = 2.03 cfs @ 12.11 hrs, Volume= 10,642 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.83' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 5,673 cf

Plug-Flow detention time= 206.1 min calculated for 10,642 cf (79% of inflow)
 Center-of-Mass det. time= 119.1 min (864.1 - 744.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

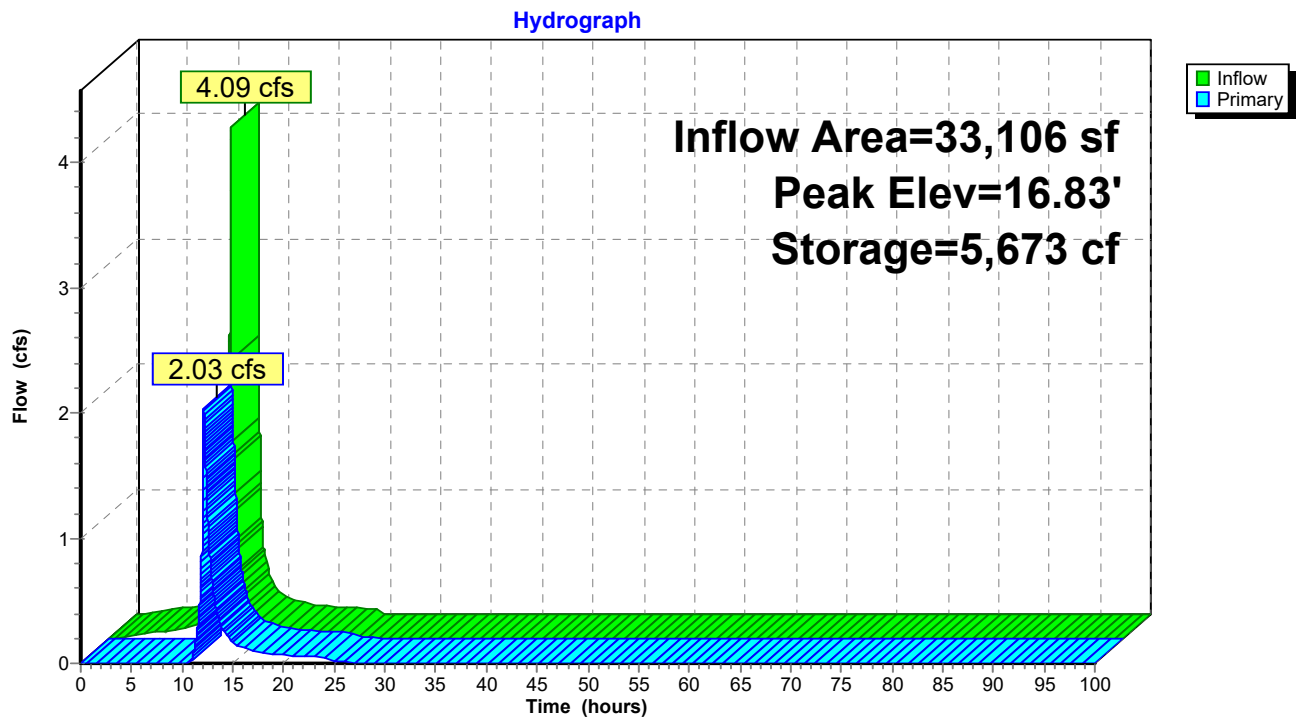
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.02 cfs @ 12.11 hrs HW=16.83' TW=11.93' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.02 cfs of 10.97 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.02 cfs @ 1.76 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 4.85" for 10-Year Current Adj event
Inflow = 4.75 cfs @ 12.09 hrs, Volume= 15,680 cf
Outflow = 2.03 cfs @ 12.12 hrs, Volume= 12,422 cf, Atten= 57%, Lag= 1.7 min
Primary = 2.03 cfs @ 12.12 hrs, Volume= 12,422 cf
Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 16.55' @ 12.12 hrs Surf.Area= 31,334 sf Storage= 6,915 cf

Plug-Flow detention time= 216.5 min calculated for 12,422 cf (79% of inflow)
Center-of-Mass det. time= 130.0 min (874.5 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

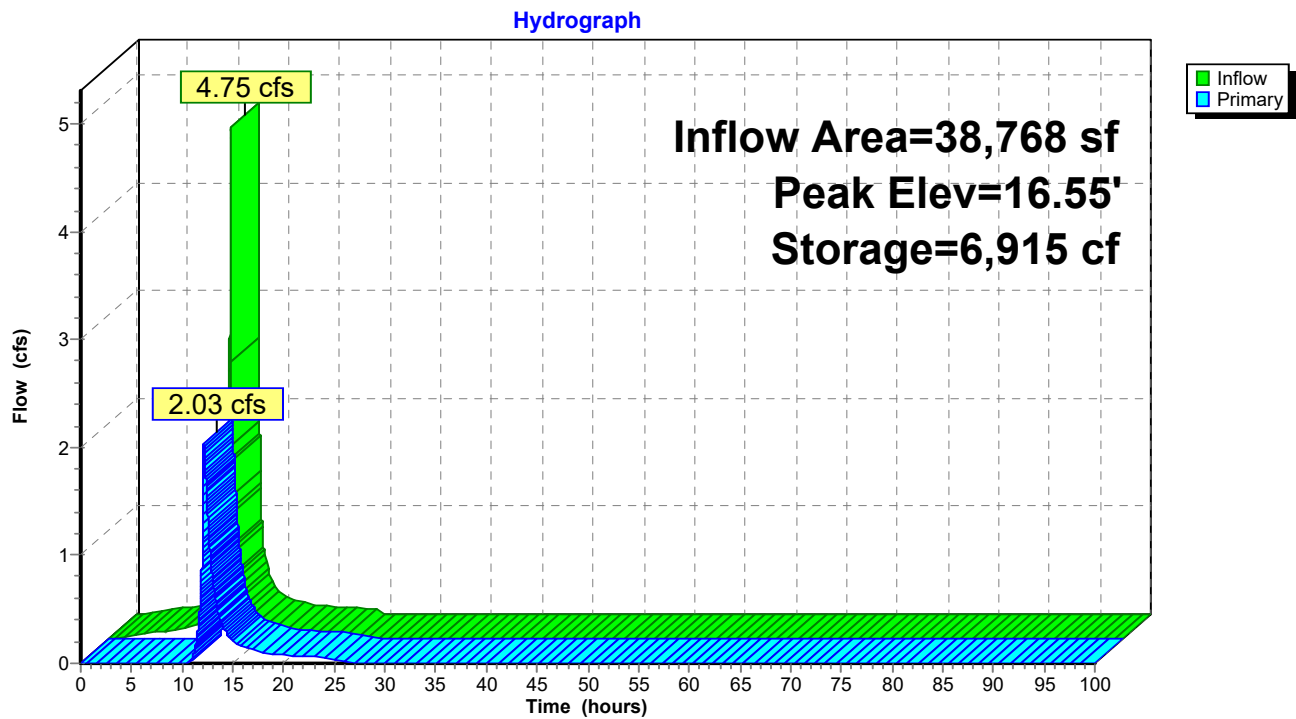
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.03 cfs @ 12.12 hrs HW=16.55' TW=12.06' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.03 cfs of 12.52 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.03 cfs @ 1.77 fps)

Pond PP6: POROUS PAVEMENT

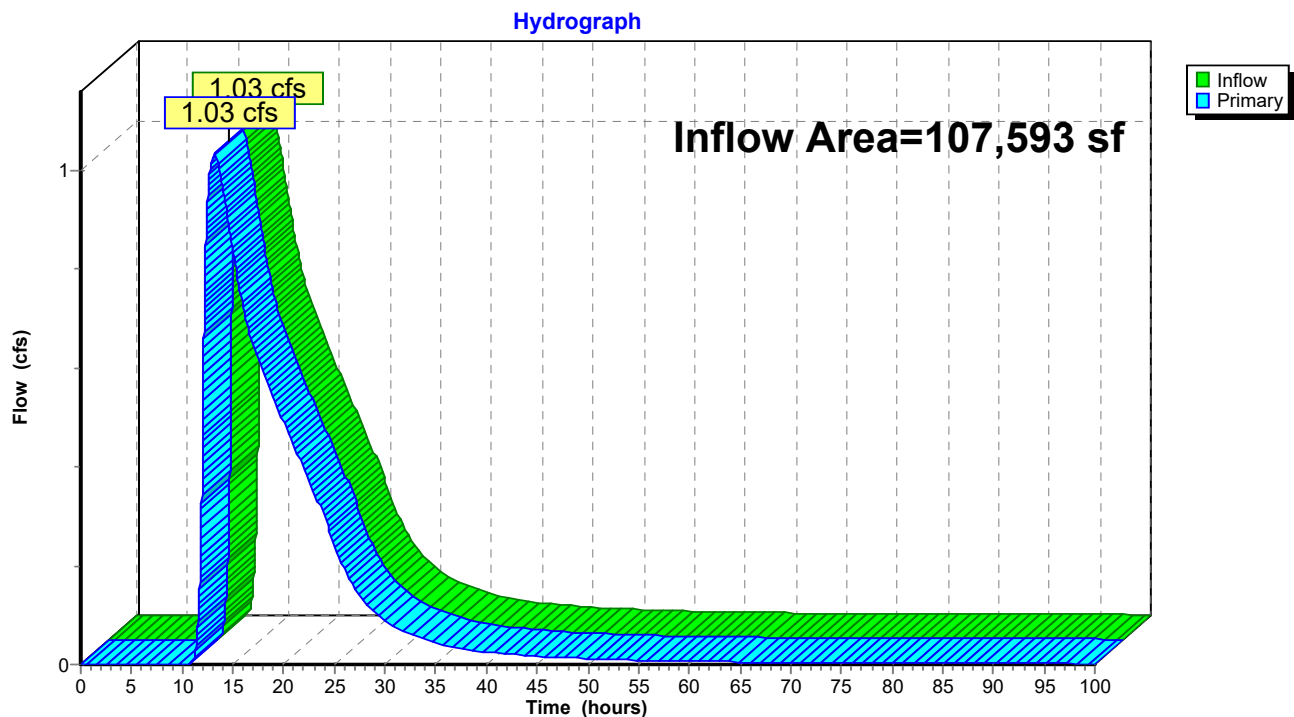


Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 3.83" for 10-Year Current Adj event
Inflow = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf
Primary = 1.03 cfs @ 13.13 hrs, Volume= 34,311 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

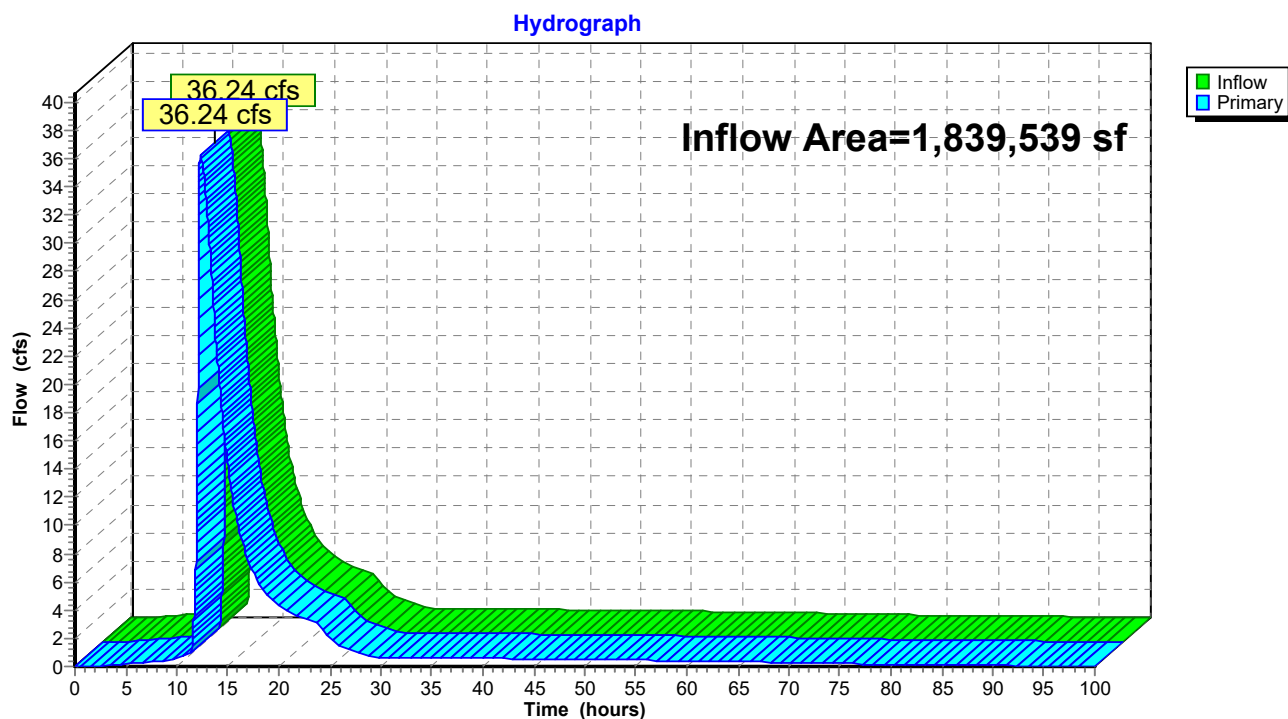


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth > 3.90" for 10-Year Current Adj event
Inflow = 36.24 cfs @ 12.34 hrs, Volume= 597,550 cf
Primary = 36.24 cfs @ 12.34 hrs, Volume= 597,550 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



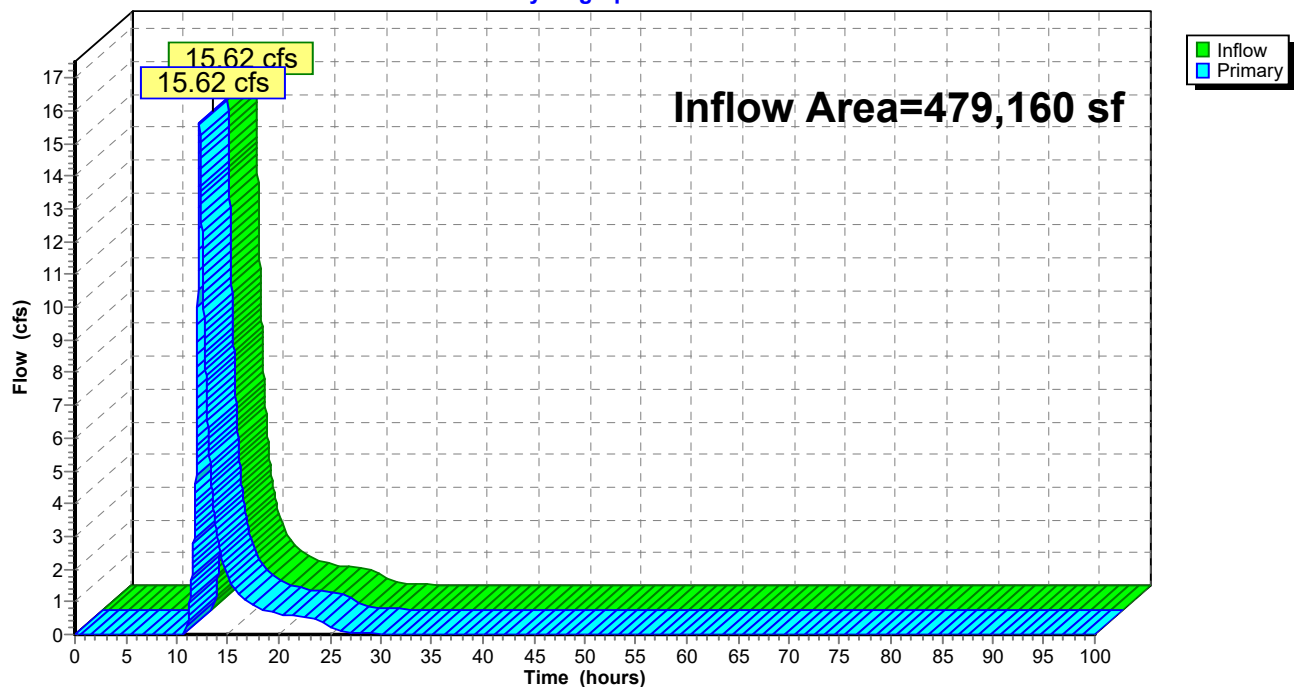
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 2.55" for 10-Year Current Adj event
Inflow = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf
Primary = 15.62 cfs @ 12.20 hrs, Volume= 101,833 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



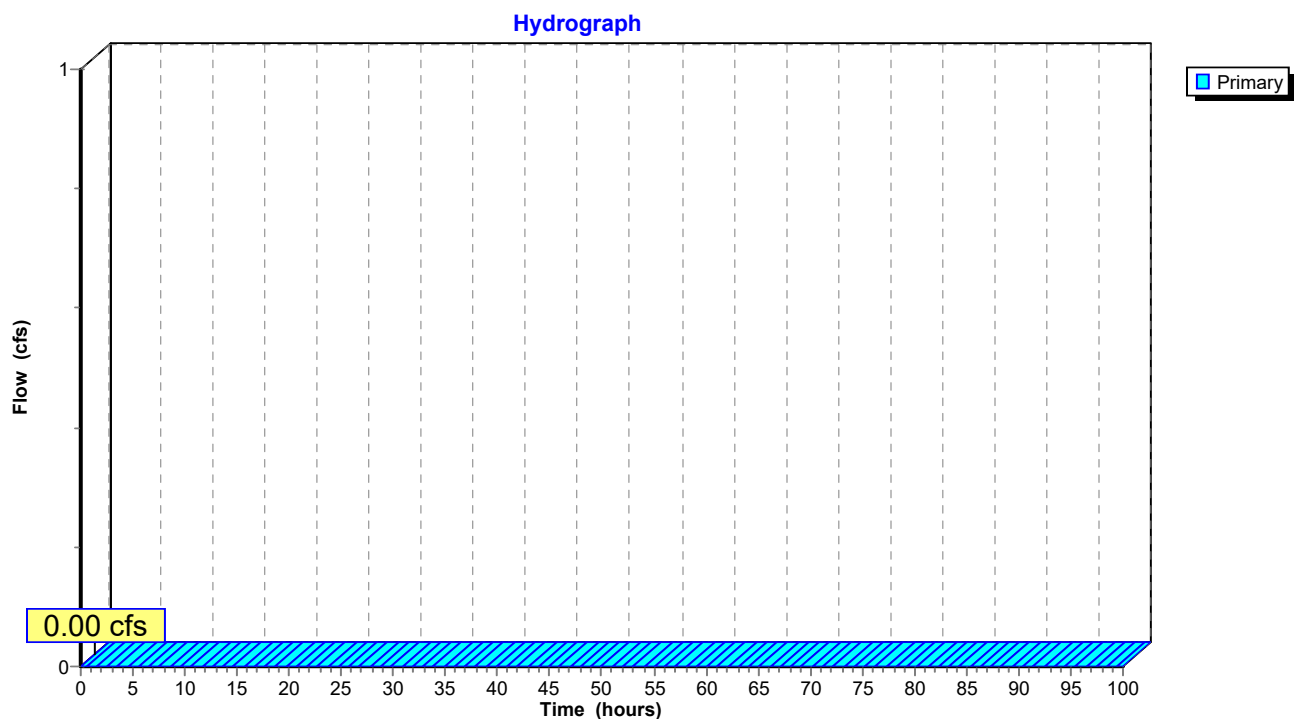
Summary for Link TW: Tailwater

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 8.63'

Link TW: Tailwater



Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 15.84 cfs @ 12.10 hrs, Volume= 53,017 cf
 Outflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 91%, Lag= 52.4 min
 Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.42' @ 12.97 hrs Surf.Area= 0.559 ac Storage= 0.754 af

Plug-Flow detention time= 515.1 min calculated for 43,501 cf (82% of inflow)
 Center-of-Mass det. time= 435.9 min (1,179.4 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Cap x 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.46 cfs @ 12.97 hrs HW=11.42' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.46 cfs of 10.93 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.93 cfs @ 4.74 fps)
- 3=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.68 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.06 fps)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

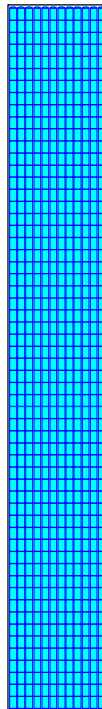
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

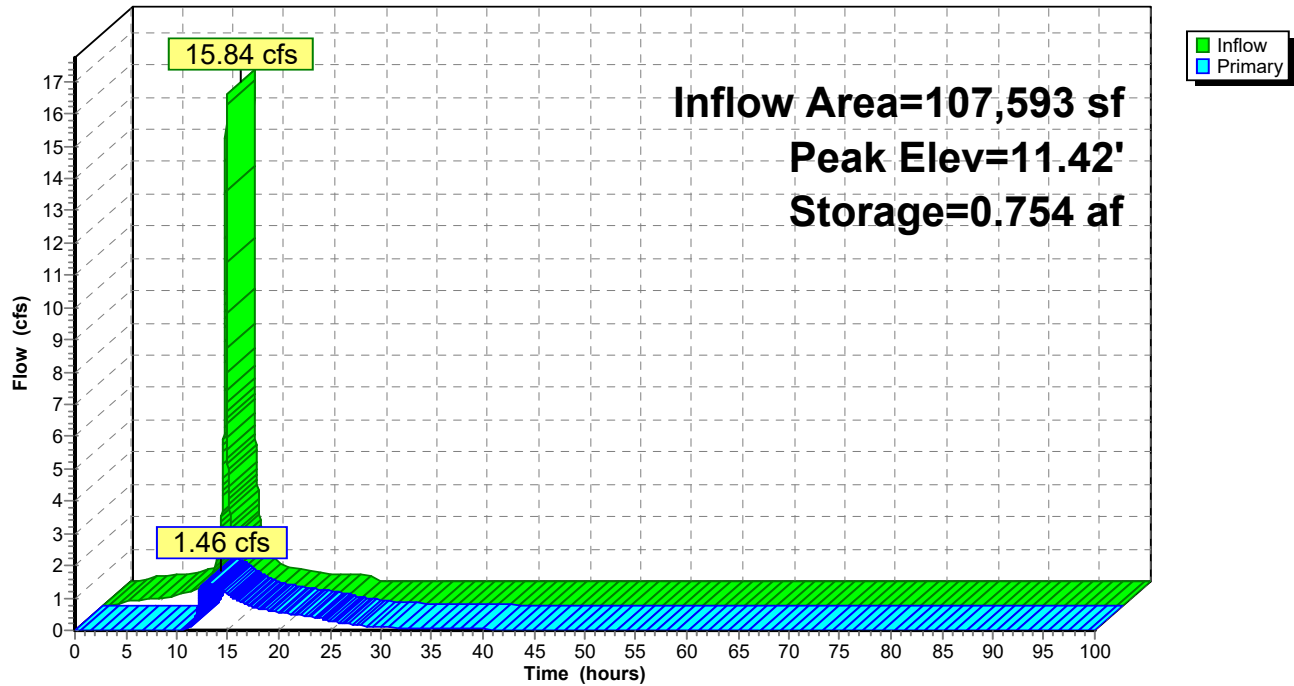
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 7.33" for 10-Year Future Adj event
Inflow = 43.10 cfs @ 12.11 hrs, Volume= 207,966 cf
Outflow = 12.28 cfs @ 13.08 hrs, Volume= 206,101 cf, Atten= 72%, Lag= 58.2 min
Primary = 12.28 cfs @ 13.08 hrs, Volume= 206,101 cf
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 13.69' @ 12.71 hrs Surf.Area= 24,627 sf Storage= 82,824 cf

Plug-Flow detention time= 353.7 min calculated for 206,101 cf (99% of inflow)
Center-of-Mass det. time= 342.4 min (1,157.9 - 815.5)

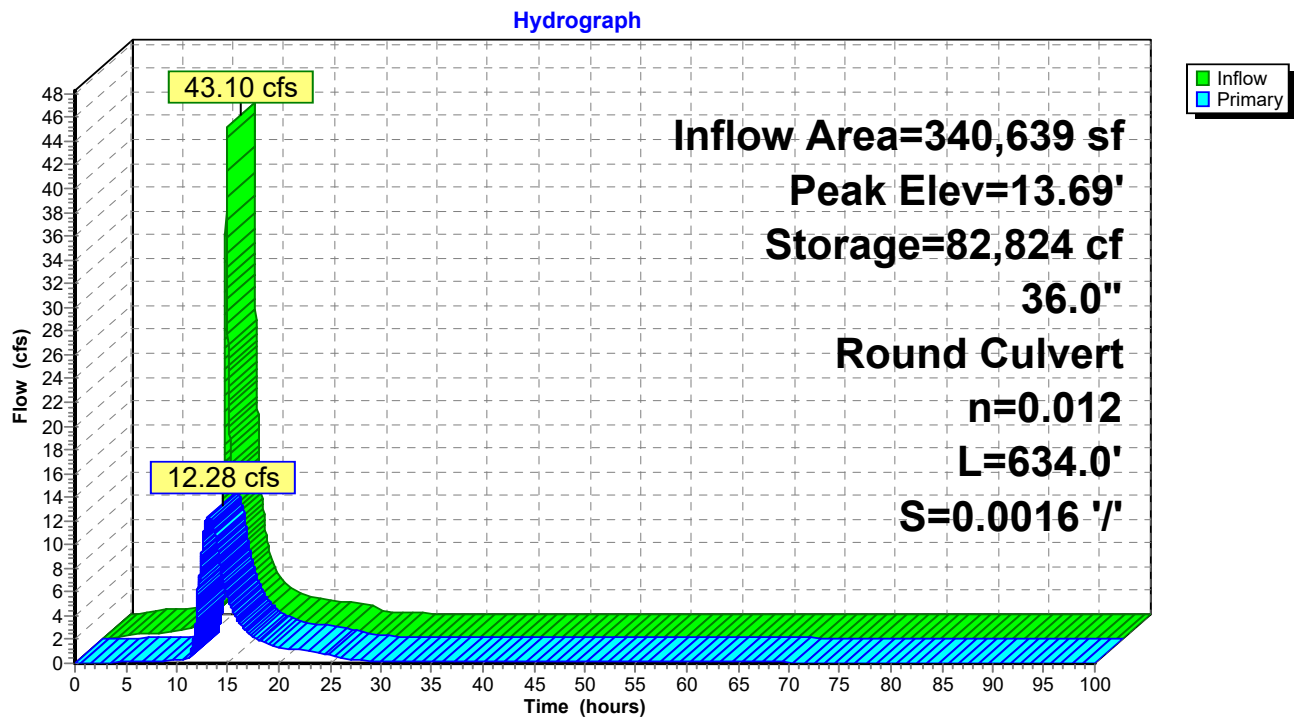
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=12.43 cfs @ 13.08 hrs HW=13.56' TW=13.30' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 12.43 cfs @ 1.76 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth > 5.05" for 10-Year Future Adj event
 Inflow = 54.54 cfs @ 12.12 hrs, Volume= 440,596 cf
 Outflow = 27.83 cfs @ 12.68 hrs, Volume= 438,338 cf, Atten= 49%, Lag= 33.8 min
 Primary = 27.83 cfs @ 12.68 hrs, Volume= 438,338 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.48' @ 12.63 hrs Surf.Area= 21,915 sf Storage= 78,103 cf

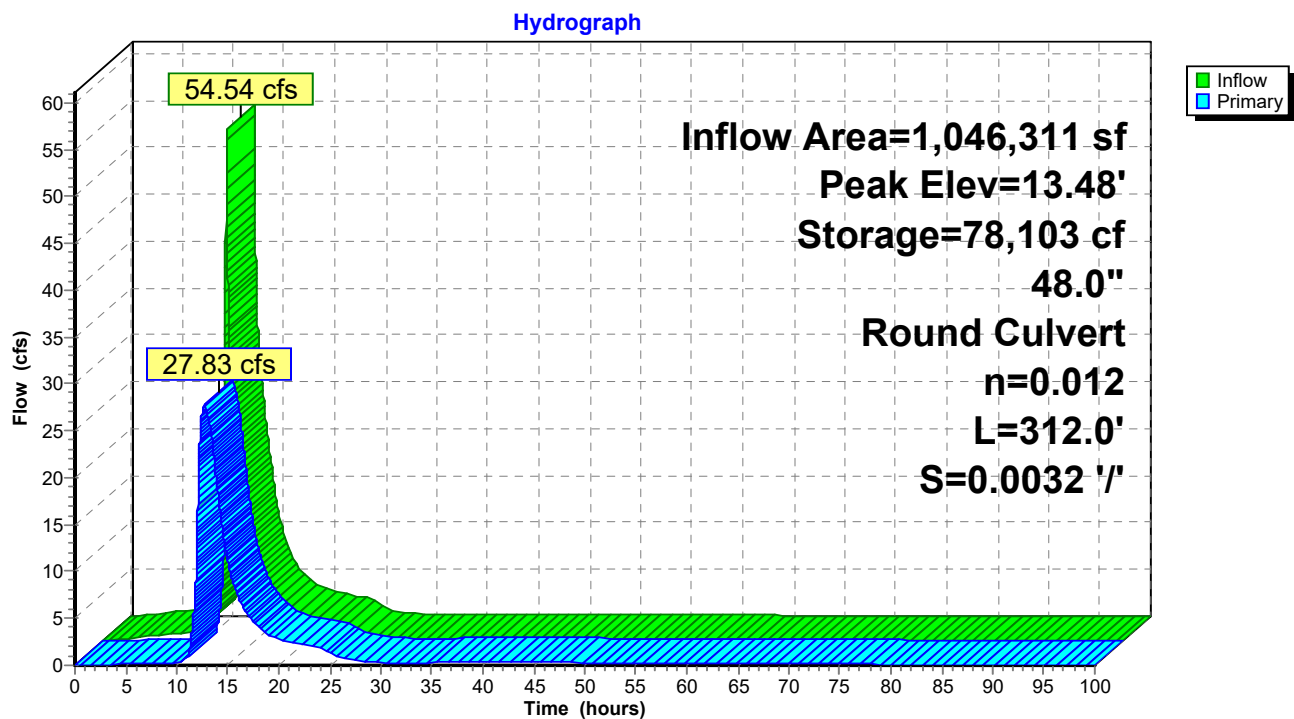
Plug-Flow detention time= 201.4 min calculated for 438,294 cf (99% of inflow)
 Center-of-Mass det. time= 180.5 min (1,156.5 - 976.1)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=27.93 cfs @ 12.68 hrs HW=13.48' TW=13.24' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 27.93 cfs @ 2.48 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth > 4.89" for 10-Year Future Adj event
Inflow = 31.74 cfs @ 12.54 hrs, Volume= 514,656 cf
Outflow = 31.91 cfs @ 12.72 hrs, Volume= 514,344 cf, Atten= 0%, Lag= 10.7 min
Primary = 31.91 cfs @ 12.72 hrs, Volume= 514,344 cf
Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 13.24' @ 12.61 hrs Surf.Area= 8,500 sf Storage= 21,655 cf

Plug-Flow detention time= 36.1 min calculated for 514,292 cf (100% of inflow)
Center-of-Mass det. time= 33.3 min (1,198.8 - 1,165.5)

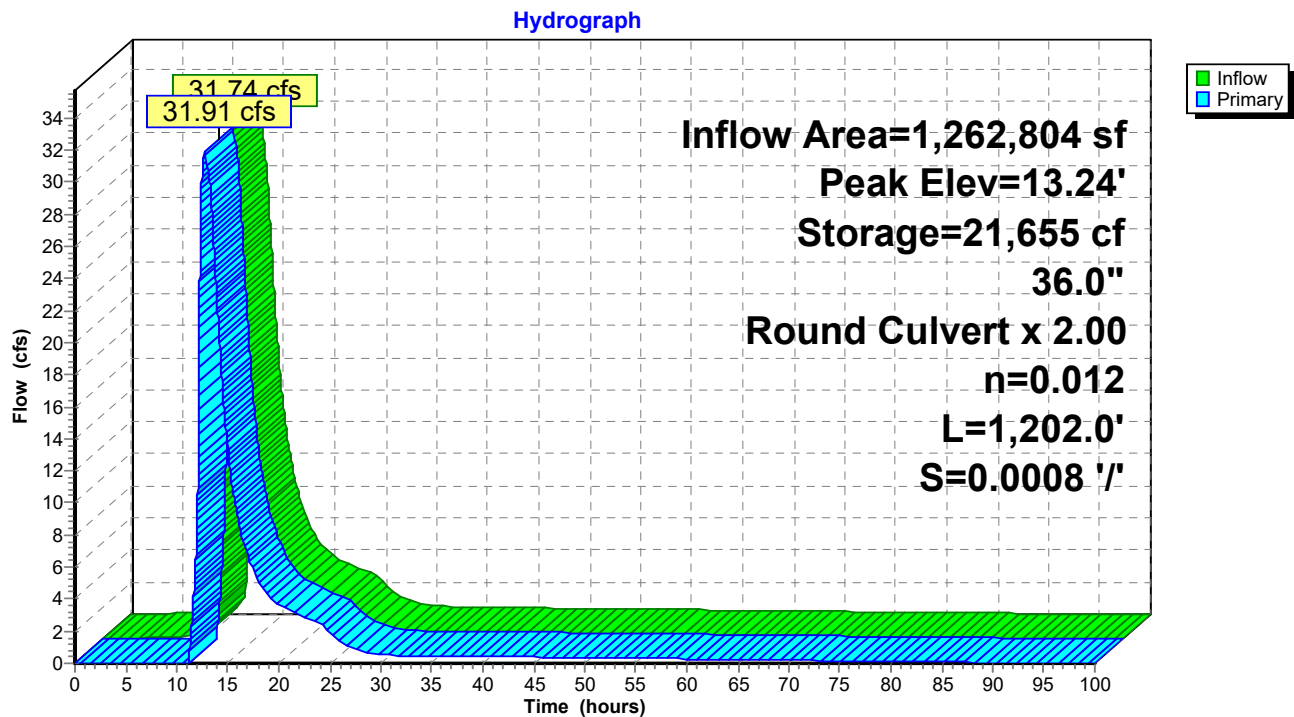
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=31.96 cfs @ 12.72 hrs HW=13.23' TW=12.52' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 31.96 cfs @ 2.26 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth > 5.06" for 10-Year Future Adj event
 Inflow = 62.95 cfs @ 12.12 hrs, Volume= 709,444 cf
 Outflow = 43.89 cfs @ 12.28 hrs, Volume= 708,229 cf, Atten= 30%, Lag= 9.8 min
 Primary = 43.89 cfs @ 12.28 hrs, Volume= 708,229 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.60' @ 12.28 hrs Surf.Area= 22,214 sf Storage= 62,577 cf

Plug-Flow detention time= 122.4 min calculated for 708,158 cf (100% of inflow)
 Center-of-Mass det. time= 114.5 min (1,198.4 - 1,083.9)

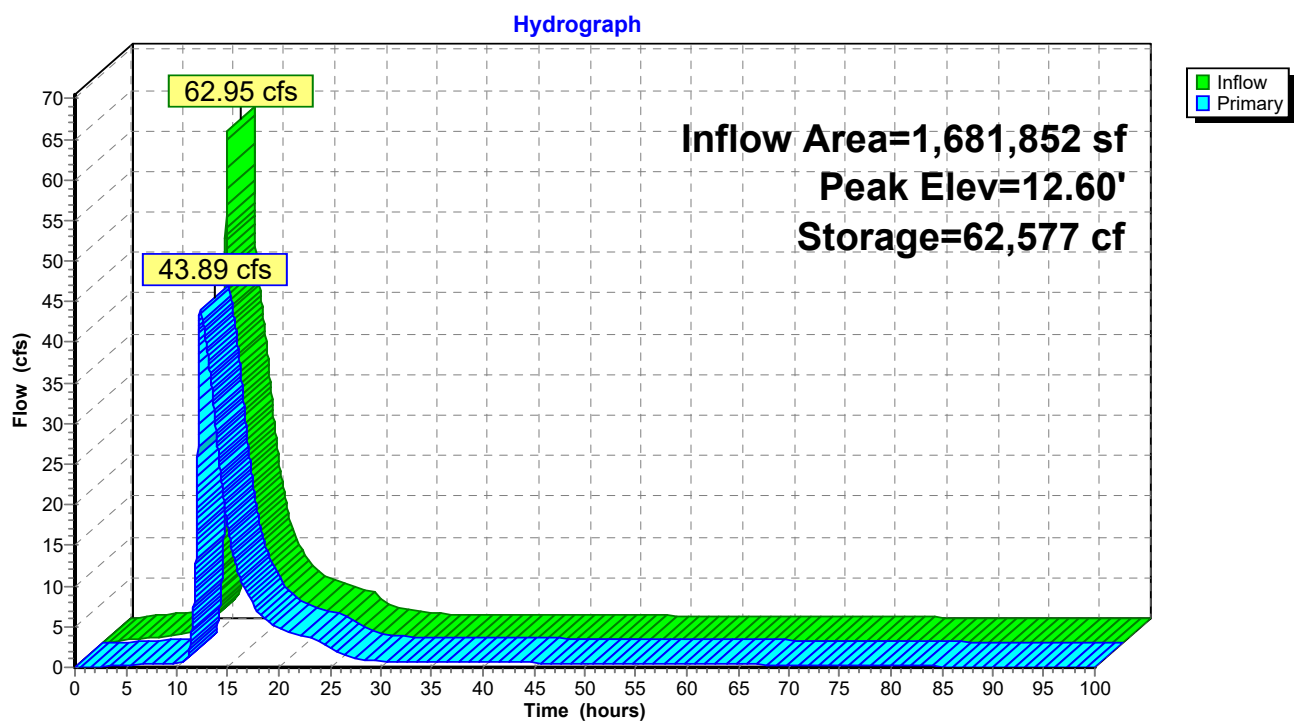
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=43.89 cfs @ 12.28 hrs HW=12.60' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 43.89 cfs of 63.99 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.93 cfs @ 8.97 fps)
- 3=Orifice/Grate (Orifice Controls 33.14 cfs @ 5.30 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 9.81 cfs @ 2.79 fps)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 5.82" for 10-Year Future Adj event
 Inflow = 4.93 cfs @ 12.10 hrs, Volume= 16,484 cf
 Outflow = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf, Atten= 77%, Lag= 13.4 min
 Primary = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.34' @ 12.32 hrs Surf.Area= 12,680 sf Storage= 9,094 cf

Plug-Flow detention time= 426.2 min calculated for 13,595 cf (82% of inflow)
 Center-of-Mass det. time= 347.5 min (1,090.2 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

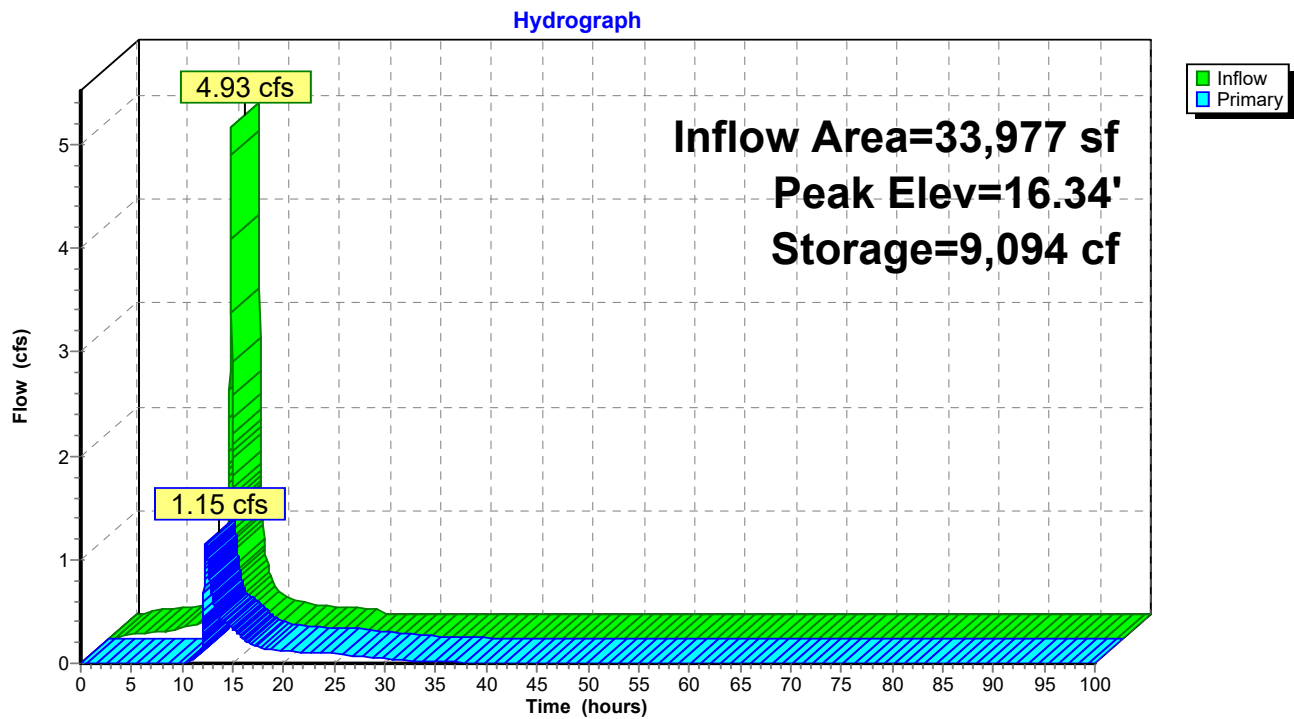
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.15 cfs @ 12.32 hrs HW=16.34' TW=13.35' (Dynamic Tailwater)

- 1=Culvert (Passes 1.15 cfs of 10.04 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.17 cfs @ 5.12 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 3.43 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.64 cfs @ 1.32 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 5.83" for 10-Year Future Adj event
 Inflow = 11.43 cfs @ 12.10 hrs, Volume= 38,082 cf
 Outflow = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf, Atten= 65%, Lag= 6.5 min
 Primary = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.71' @ 12.21 hrs Surf.Area= 23,328 sf Storage= 20,192 cf

Plug-Flow detention time= 610.4 min calculated for 31,528 cf (83% of inflow)
 Center-of-Mass det. time= 533.1 min (1,278.4 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

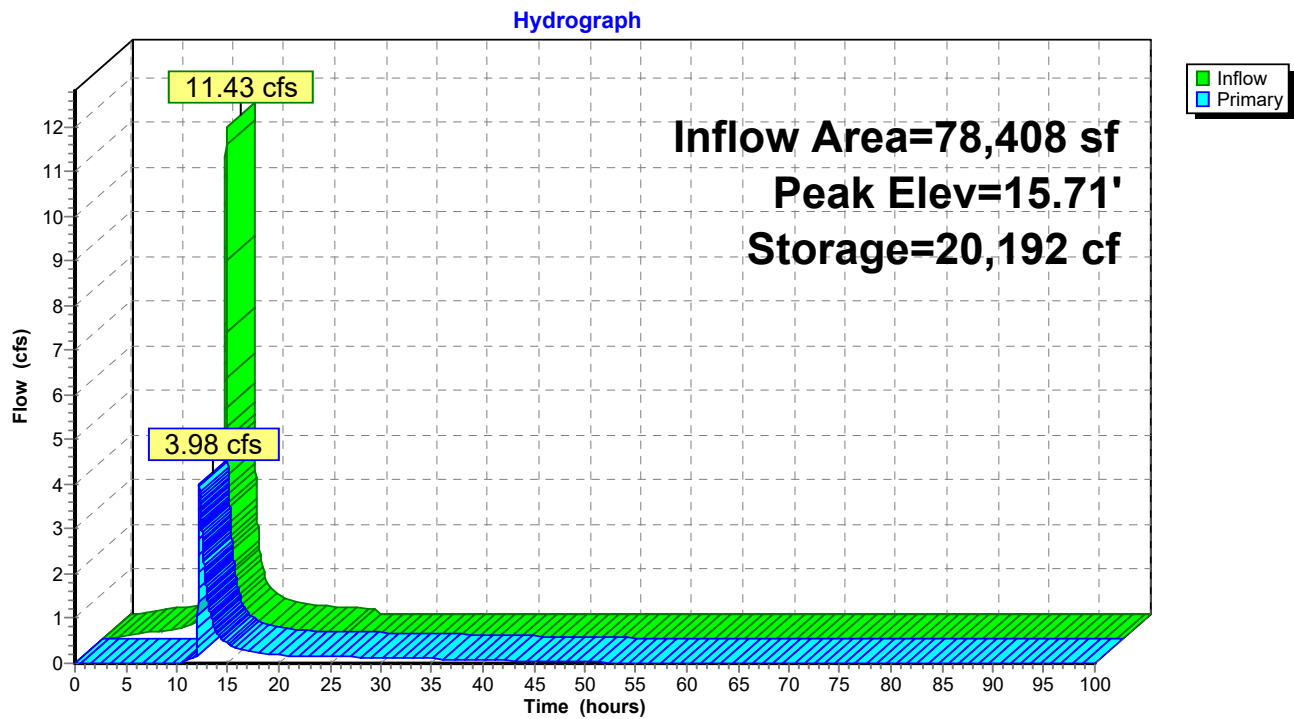
Primary OutFlow Max=3.97 cfs @ 12.21 hrs HW=15.71' TW=12.84' (Dynamic Tailwater)

1=Culvert (Passes 3.97 cfs of 57.67 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.19 cfs @ 5.66 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 3.78 cfs @ 2.18 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 5.88" for 10-Year Future Adj event
 Inflow = 4.65 cfs @ 12.10 hrs, Volume= 15,580 cf
 Outflow = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf, Atten= 84%, Lag= 25.5 min
 Primary = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.73' @ 12.52 hrs Surf.Area= 10,368 sf Storage= 9,039 cf

Plug-Flow detention time= 436.5 min calculated for 12,893 cf (83% of inflow)
 Center-of-Mass det. time= 358.7 min (1,102.9 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

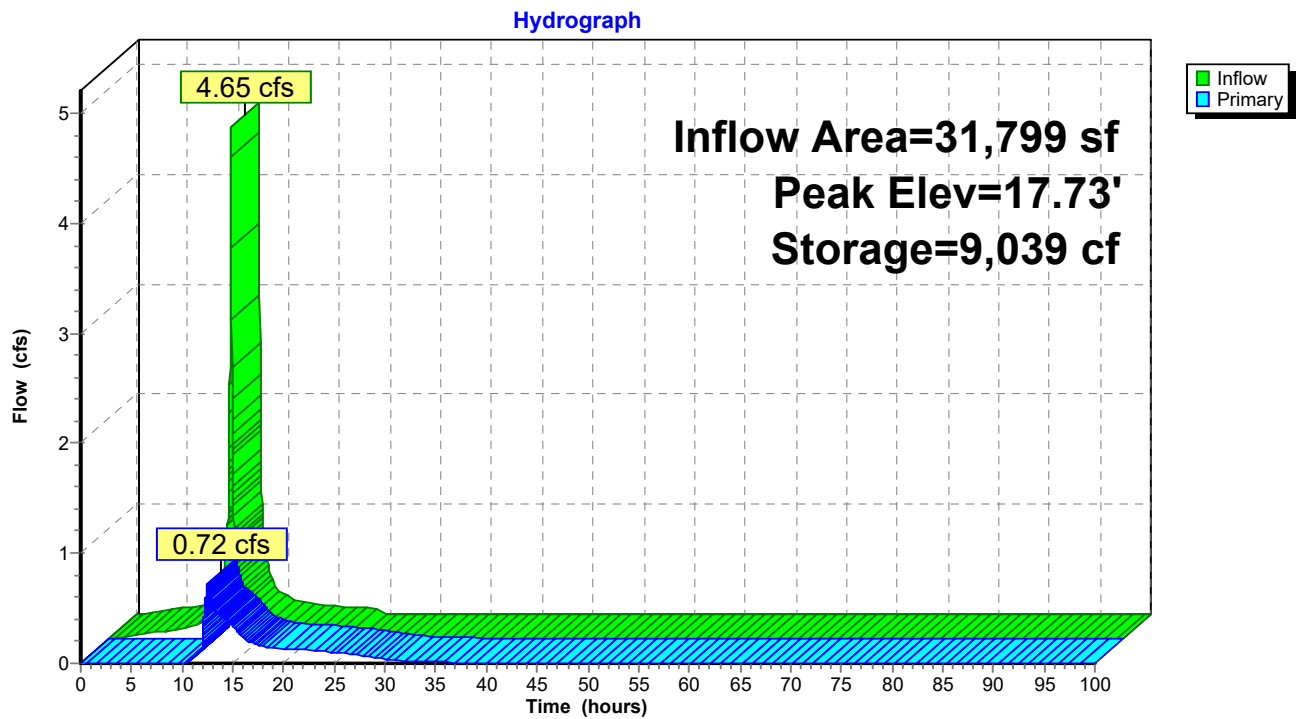
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.72 cfs @ 12.52 hrs HW=17.73' TW=12.56' (Dynamic Tailwater)

- 1=Culvert (Passes 0.72 cfs of 53.73 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 5.77 fps)
- 3=Orifice/Grate (Orifice Controls 0.31 cfs @ 3.51 fps)
- 4=Sharp-Crested Rectangular Weir(Weir Controls 0.22 cfs @ 0.92 fps)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 5.84" for 10-Year Future Adj event
 Inflow = 68.31 cfs @ 12.10 hrs, Volume= 233,274 cf
 Outflow = 30.10 cfs @ 12.18 hrs, Volume= 193,406 cf, Atten= 56%, Lag= 4.9 min
 Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf
 Routed to Link PP4V : Valve
 Secondary = 10.03 cfs @ 12.18 hrs, Volume= 64,185 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.30' @ 12.18 hrs Surf.Area= 181,216 sf Storage= 93,267 cf

Plug-Flow detention time= 199.2 min calculated for 193,406 cf (83% of inflow)
 Center-of-Mass det. time= 121.7 min (866.1 - 744.4)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=20.07 cfs @ 12.18 hrs HW=14.30' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 20.07 cfs of 127.72 cfs potential flow)

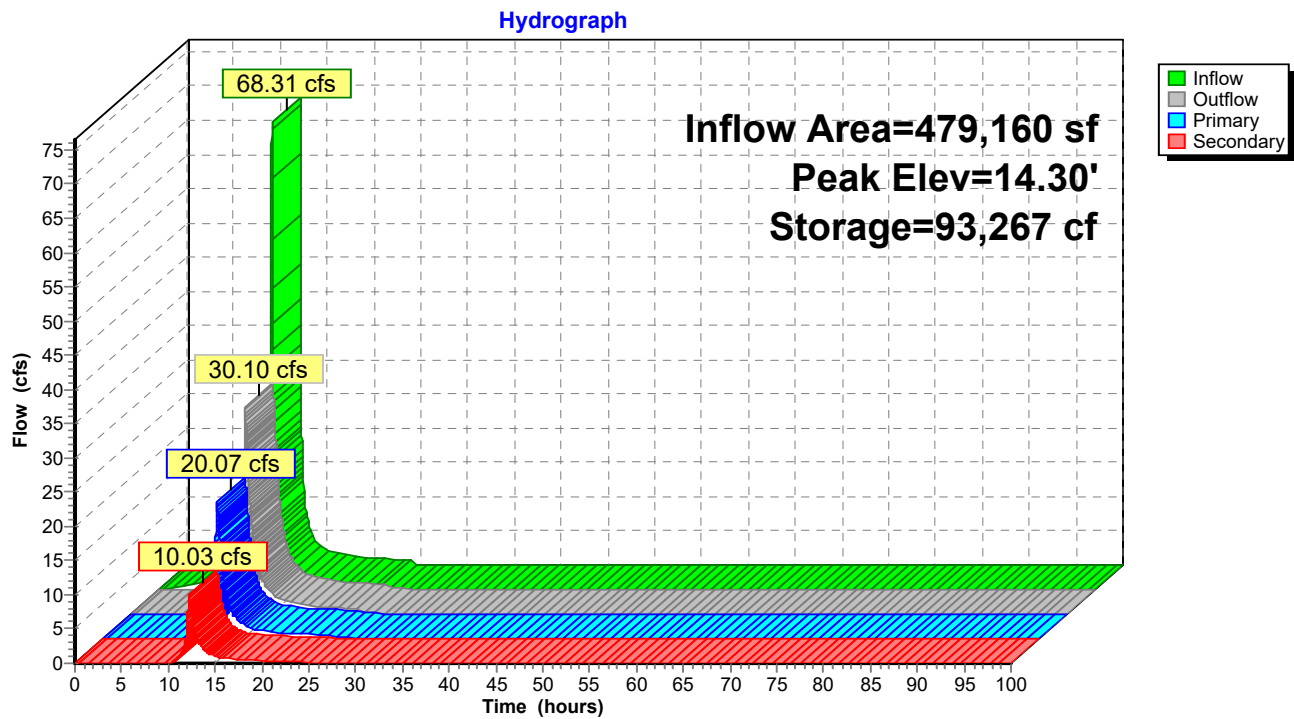
↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 20.07 cfs @ 2.81 fps)

Secondary OutFlow Max=10.03 cfs @ 12.18 hrs HW=14.30' TW=12.94' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 10.03 cfs of 39.63 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir**(Weir Controls 10.03 cfs @ 2.81 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 4.91 cfs @ 12.09 hrs, Volume= 16,302 cf
 Outflow = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf, Atten= 48%, Lag= 1.2 min
 Primary = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.88' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 6,171 cf

Plug-Flow detention time= 187.4 min calculated for 13,471 cf (83% of inflow)
 Center-of-Mass det. time= 109.6 min (851.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

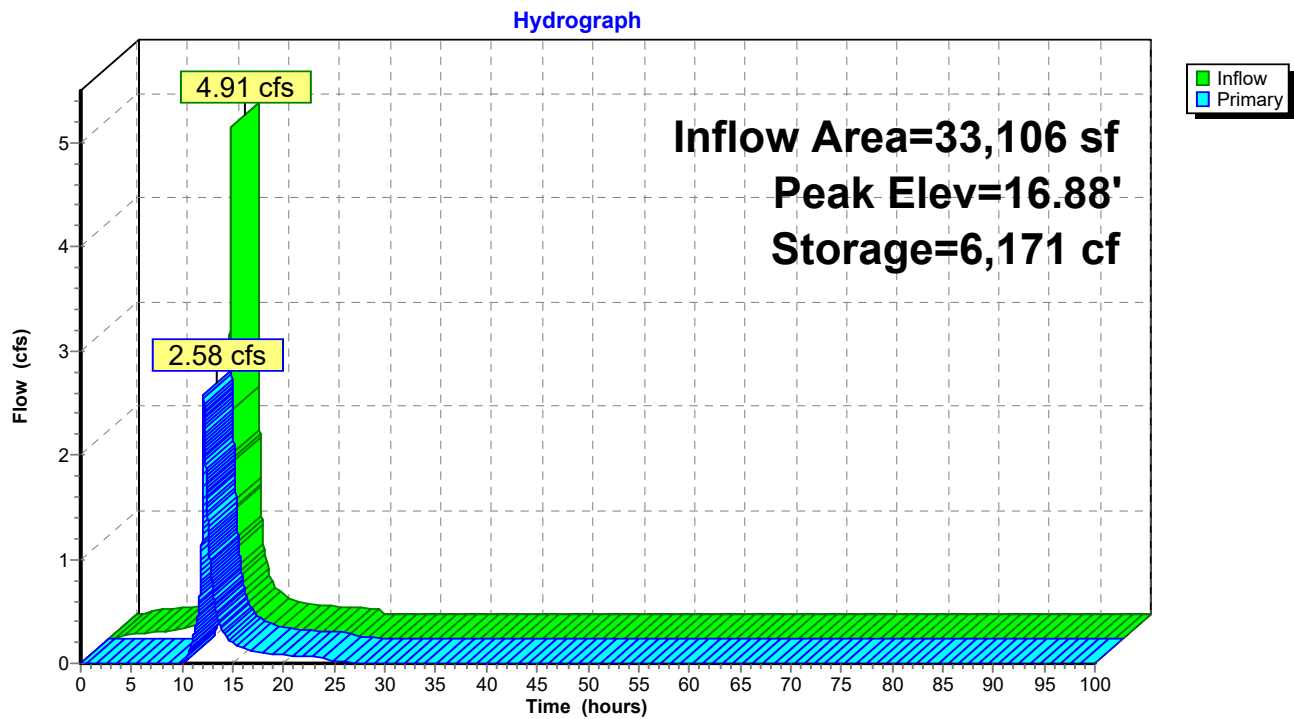
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.58 cfs @ 12.11 hrs HW=16.88' TW=12.32' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.58 cfs of 10.59 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.58 cfs @ 1.91 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 5.87" for 10-Year Future Adj event
 Inflow = 5.71 cfs @ 12.09 hrs, Volume= 18,977 cf
 Outflow = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf, Atten= 54%, Lag= 1.4 min
 Primary = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.61' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 7,601 cf

Plug-Flow detention time= 197.3 min calculated for 15,718 cf (83% of inflow)
 Center-of-Mass det. time= 119.6 min (861.0 - 741.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

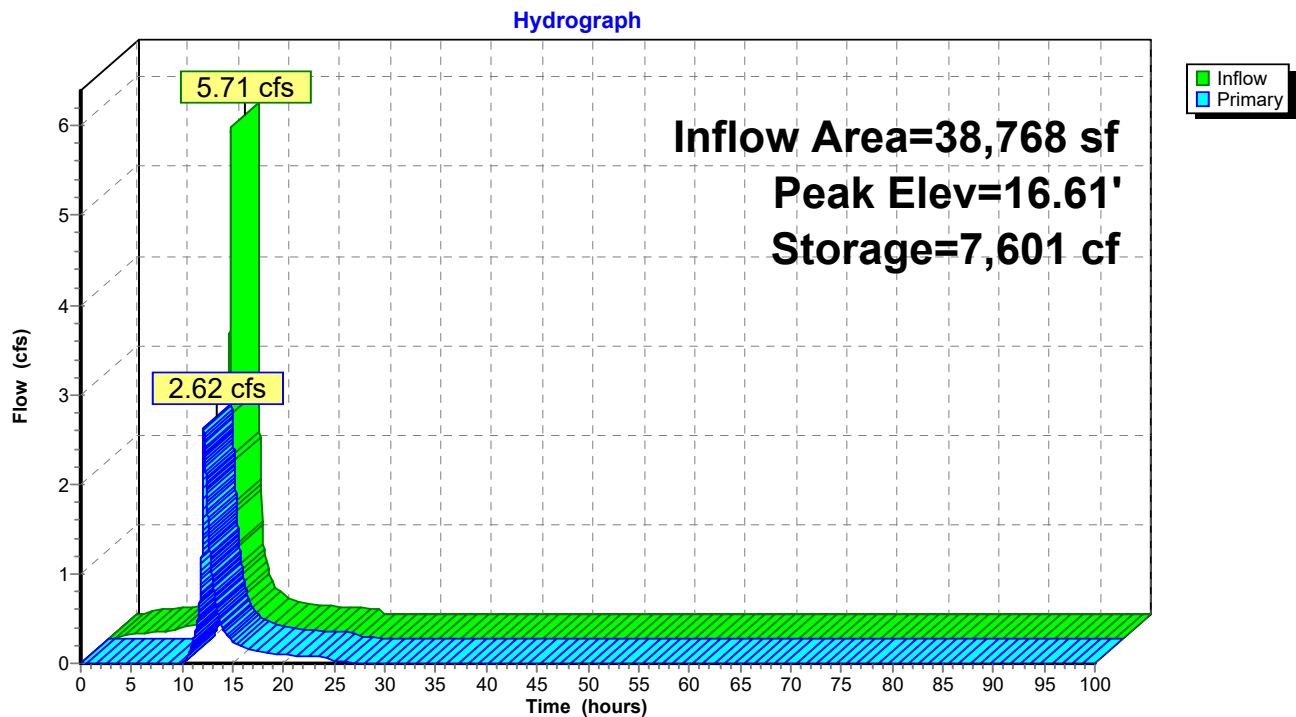
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.62 cfs @ 12.11 hrs HW=16.61' TW=12.60' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.62 cfs of 11.83 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.62 cfs @ 1.92 fps)

Pond PP6: POROUS PAVEMENT



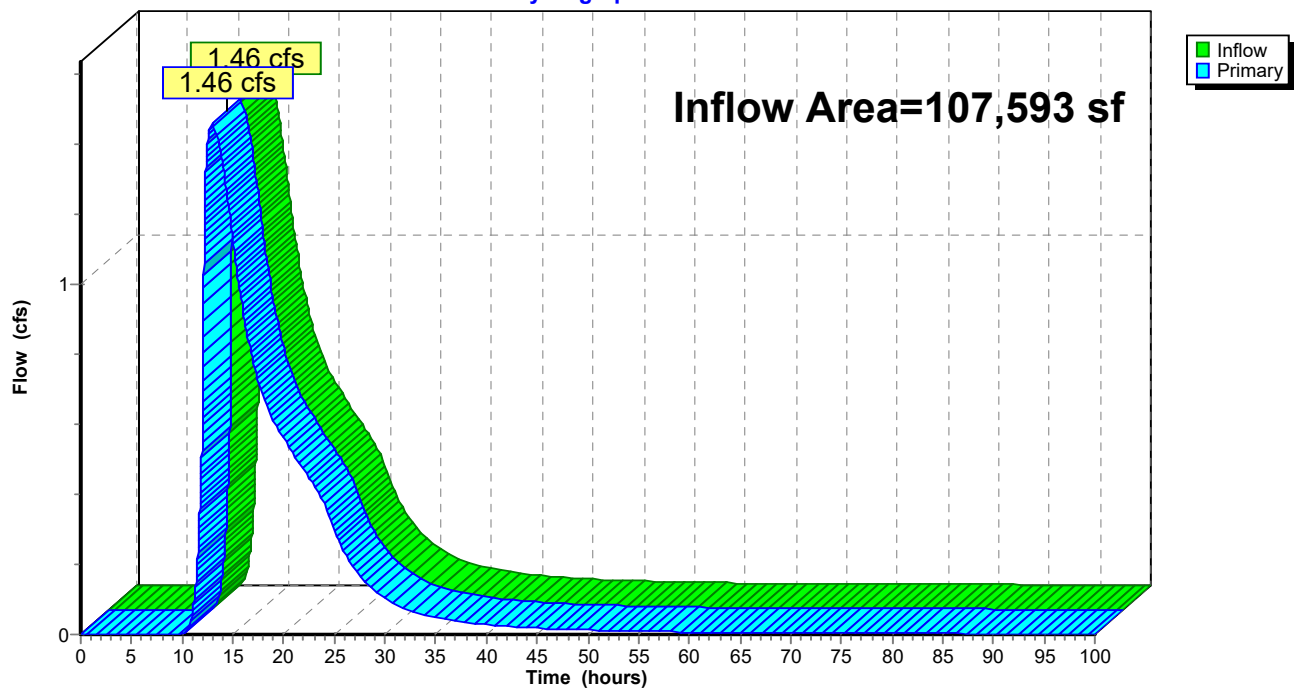
Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 4.85" for 10-Year Future Adj event
Inflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

Hydrograph

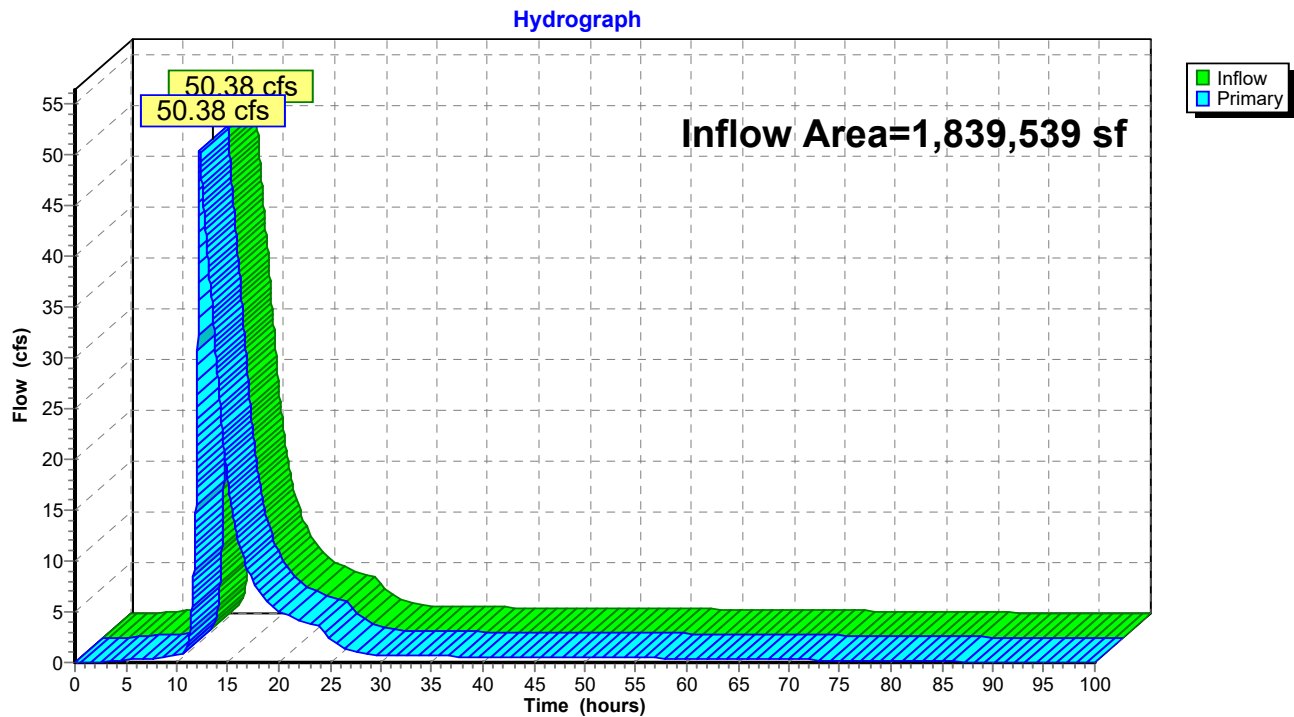


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth > 4.86" for 10-Year Future Adj event
Inflow = 50.38 cfs @ 12.25 hrs, Volume= 745,733 cf
Primary = 50.38 cfs @ 12.25 hrs, Volume= 745,733 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



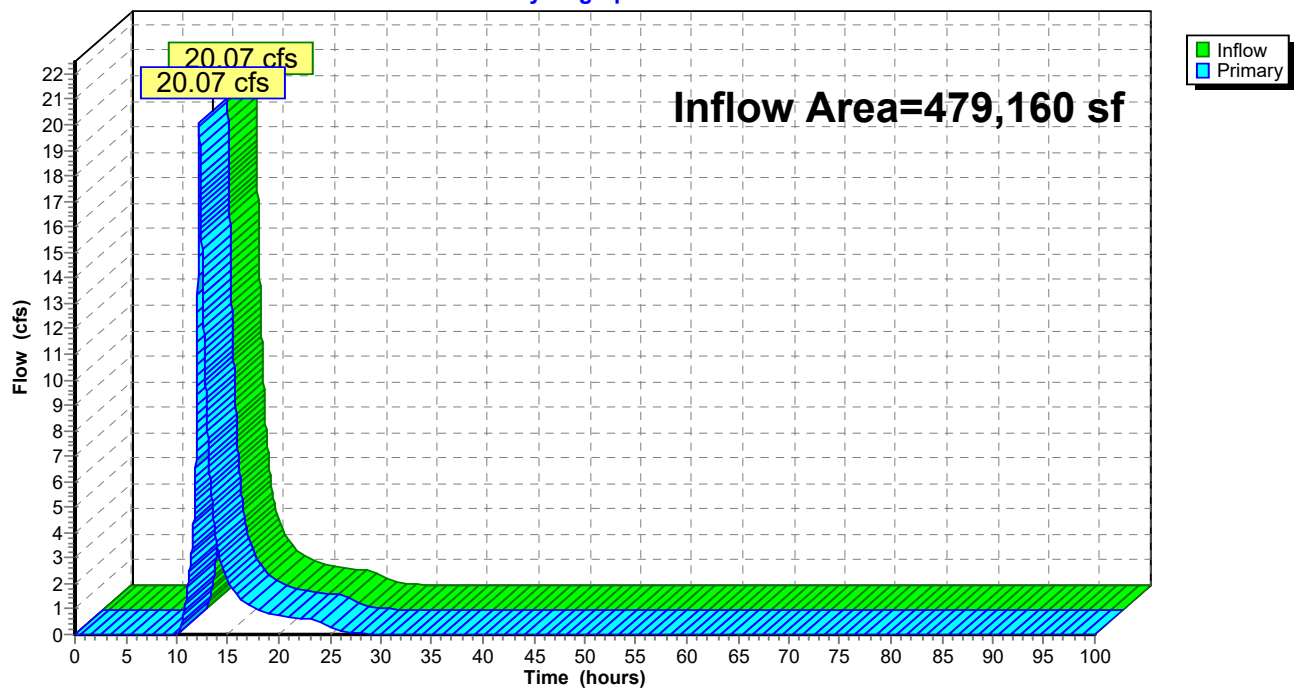
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 3.24" for 10-Year Future Adj event
Inflow = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf
Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



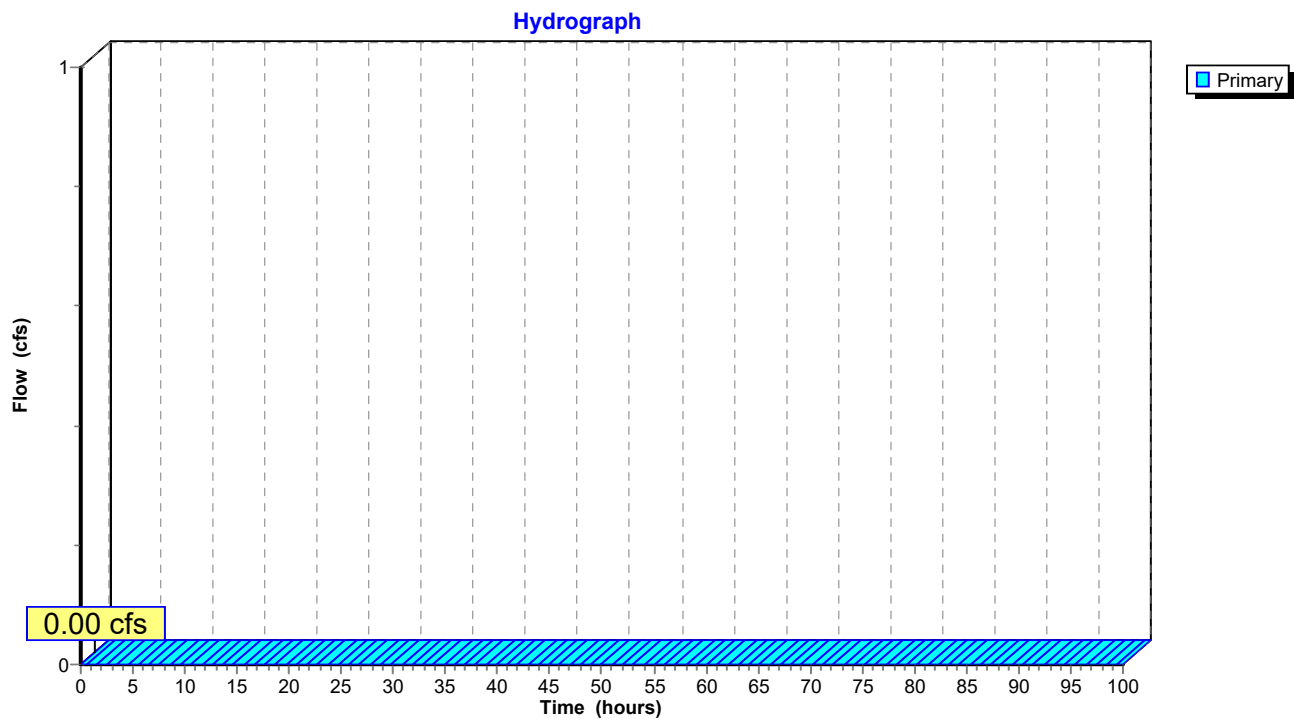
Summary for Link TW: Tailwater

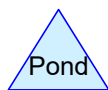
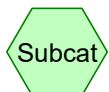
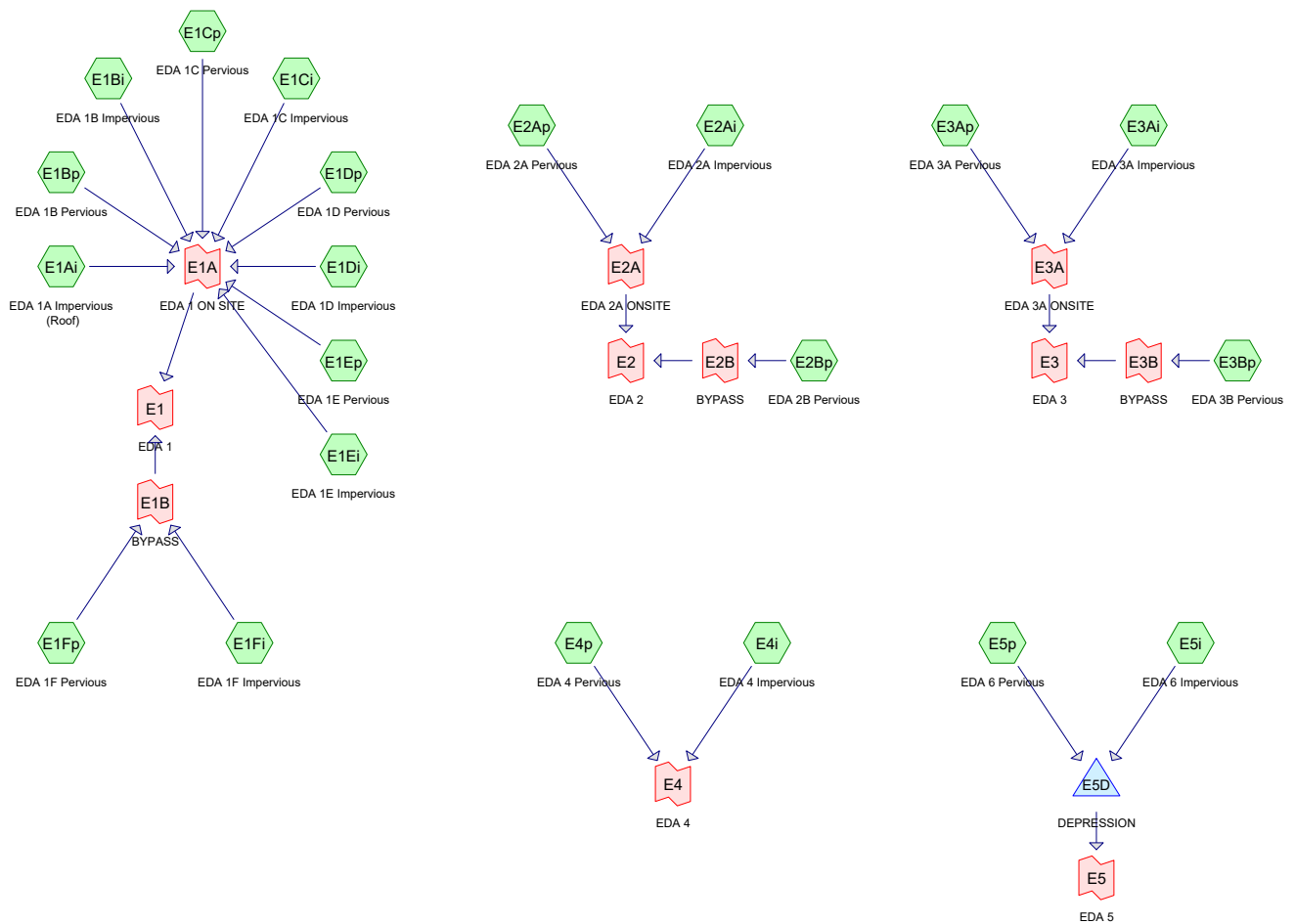
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 8.63'

Link TW: Tailwater





Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	8.89	2	3.35

Pre vs Post Rev. 3a

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

Pre vs Post Rev. 3a

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Impervious Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=400' Slope=0.0100 1' Tc=4.1 min CN=98 Runoff=113.95 cfs 456,219 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=272' Tc=2.8 min CN=98 Runoff=3.51 cfs 12,873 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=6.46"
Flow Length=230' Tc=7.6 min CN=80 Runoff=1.83 cfs 7,978 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=265' Tc=7.5 min CN=98 Runoff=8.18 cfs 40,190 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=6.46"
Flow Length=265' Tc=7.5 min CN=80 Runoff=2.17 cfs 9,386 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=695' Tc=19.2 min CN=98 Runoff=0.87 cfs 6,594 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=435' Tc=19.1 min CN=50 Runoff=3.16 cfs 23,364 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=441' Tc=5.4 min CN=98 Runoff=45.26 cfs 197,496 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=5.97"
Flow Length=412' Tc=8.5 min CN=76 Runoff=9.90 cfs 44,890 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=8.65"
Flow Length=861' Tc=19.4 min CN=98 Runoff=0.53 cfs 4,082 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=6.22"
Flow Length=861' Tc=19.4 min CN=78 Runoff=24.73 cfs 168,638 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=8.17"
Flow Length=382' Tc=14.9 min CN=94 Runoff=1.47 cfs 9,487 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=6.34"
Flow Length=382' Tc=14.9 min CN=79 Runoff=4.14 cfs 24,631 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=6.10"
Flow Length=289' Tc=12.9 min CN=77 Runoff=2.17 cfs 11,951 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=8.29"
Flow Length=218' Tc=2.9 min CN=95 Runoff=11.78 cfs 42,120 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=6.10"
Flow Length=218' Tc=2.9 min CN=77 Runoff=4.61 cfs 14,606 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Flow Length=860' Tc=19.5 min CN=74	Runoff Depth=5.73" Runoff=20.02 cfs 135,795 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Flow Length=636' Tc=13.8 min CN=98	Runoff Depth=8.65" Runoff=2.09 cfs 13,501 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Flow Length=636' Tc=10.9 min CN=39	Runoff Depth=1.55" Runoff=5.59 cfs 39,752 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Flow Length=585' Tc=26.1 min CN=98	Runoff Depth=8.65" Runoff=2.91 cfs 26,061 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Flow Length=585' Tc=26.1 min CN=41	Runoff Depth=1.77" Runoff=4.09 cfs 43,472 cf
Pond E5D: DEPRESSION	Peak Elev=16.41' Storage=51,826 cf Inflow=6.90 cfs 69,532 cf Outflow=0.80 cfs 20,127 cf	
Link E1: EDA 1		Inflow=201.41 cfs 971,709 cf Primary=201.41 cfs 971,709 cf
Link E1A: EDA 1 ON SITE		Inflow=185.02 cfs 798,989 cf Primary=185.02 cfs 798,989 cf
Link E1B: BYPASS		Inflow=25.27 cfs 172,719 cf Primary=25.27 cfs 172,719 cf
Link E2: EDA 2		Inflow=7.76 cfs 46,069 cf Primary=7.76 cfs 46,069 cf
Link E2A: EDA 2A ONSITE		Inflow=5.61 cfs 34,118 cf Primary=5.61 cfs 34,118 cf
Link E2B: BYPASS		Inflow=2.17 cfs 11,951 cf Primary=2.17 cfs 11,951 cf
Link E3: EDA 3		Inflow=28.48 cfs 192,522 cf Primary=28.48 cfs 192,522 cf
Link E3A: EDA 3A ONSITE		Inflow=16.39 cfs 56,727 cf Primary=16.39 cfs 56,727 cf
Link E3B: BYPASS		Inflow=20.02 cfs 135,795 cf Primary=20.02 cfs 135,795 cf
Link E4: EDA 4		Inflow=7.68 cfs 53,253 cf Primary=7.68 cfs 53,253 cf
Link E5: EDA 5		Inflow=0.80 cfs 20,127 cf Primary=0.80 cfs 20,127 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Total Runoff Area = 2,658,031 sf Runoff Volume = 1,333,085 cf Average Runoff Depth = 6.02"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 113.95 cfs @ 12.12 hrs, Volume= 456,219 cf, Depth= 8.65"

Routed to Link E1A : EDA 1 ON SITE

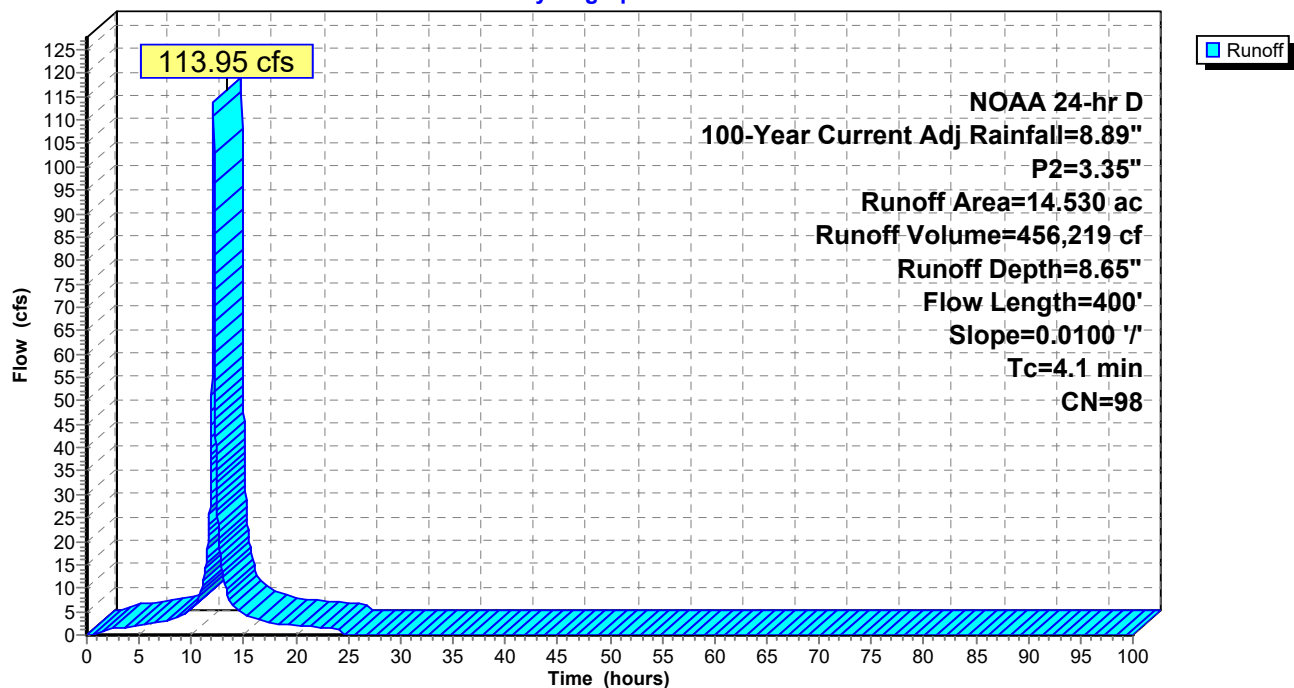
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.1	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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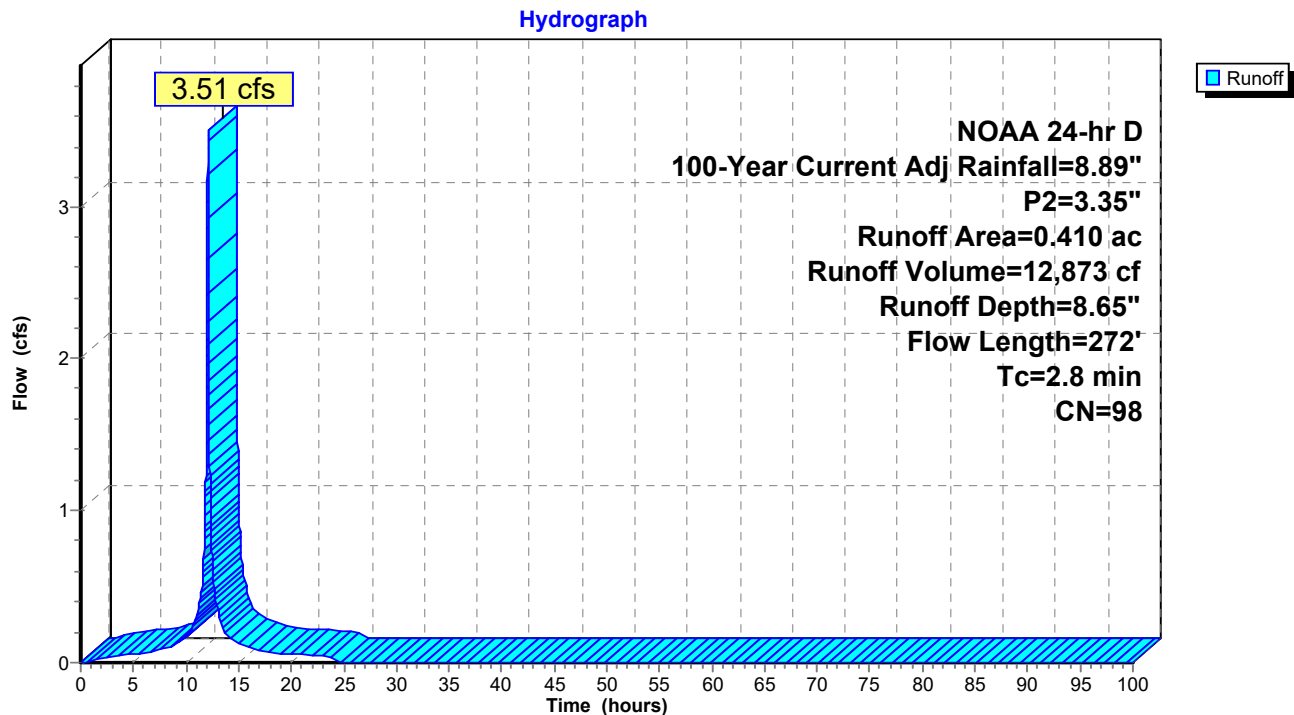
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 3.51 cfs @ 12.11 hrs, Volume= 12,873 cf, Depth= 8.65"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 1.83 cfs @ 12.16 hrs, Volume= 7,978 cf, Depth= 6.46"
 Routed to Link E1A : EDA 1 ON SITE

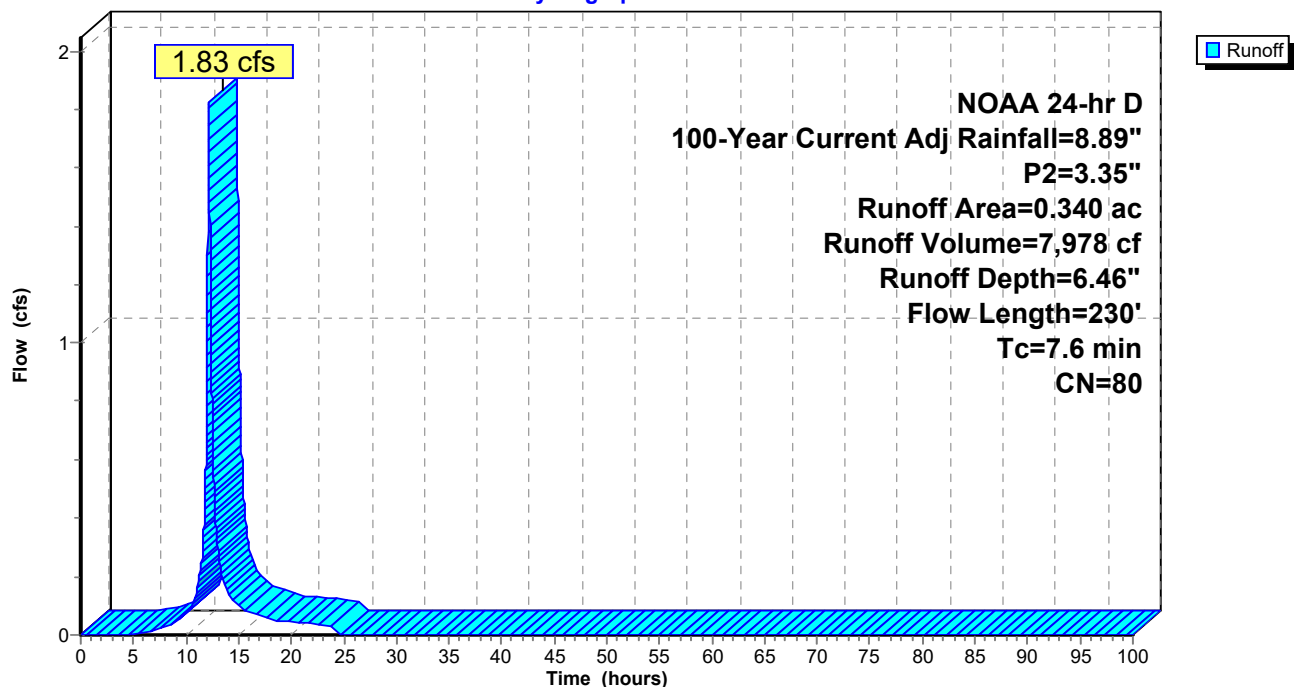
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0500	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.6	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 8.18 cfs @ 12.15 hrs, Volume= 40,190 cf, Depth= 8.65"
Routed to Link E1A : EDA 1 ON SITE

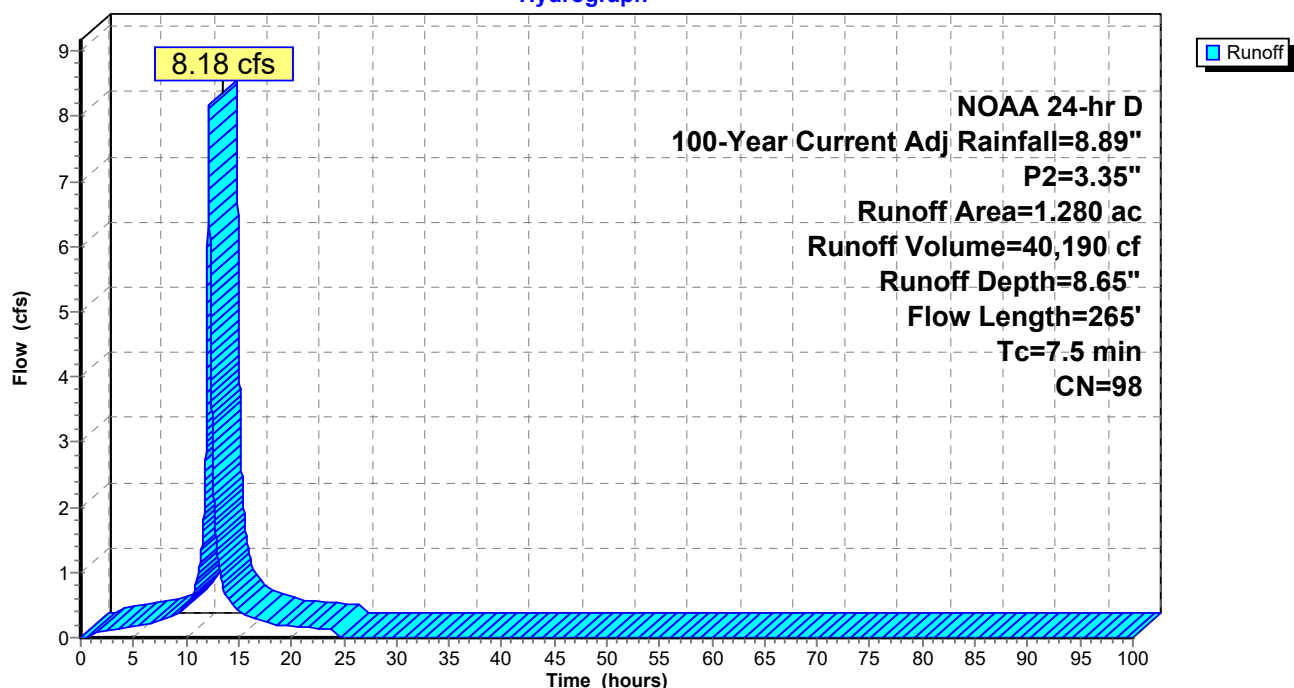
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 2.17 cfs @ 12.16 hrs, Volume= 9,386 cf, Depth= 6.46"
Routed to Link E1A : EDA 1 ON SITE

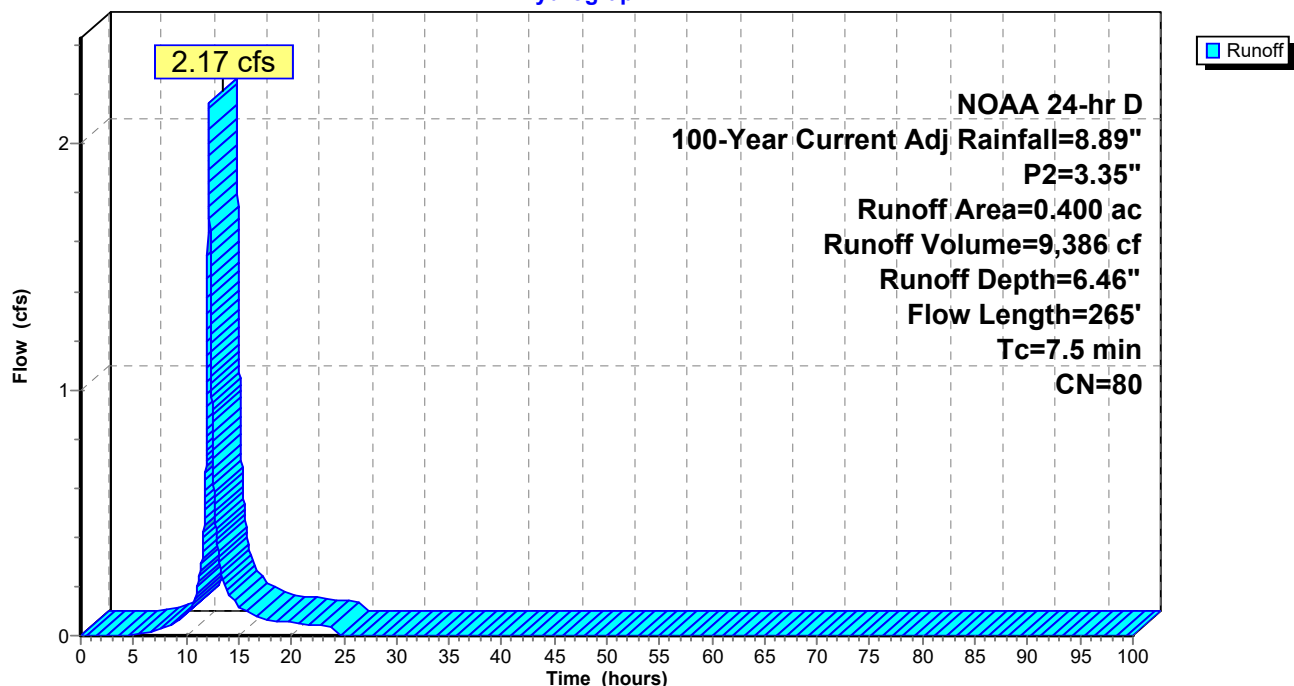
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	51	0.0139	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
7.5	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 0.87 cfs @ 12.29 hrs, Volume= 6,594 cf, Depth= 8.65"
Routed to Link E1A : EDA 1 ON SITE

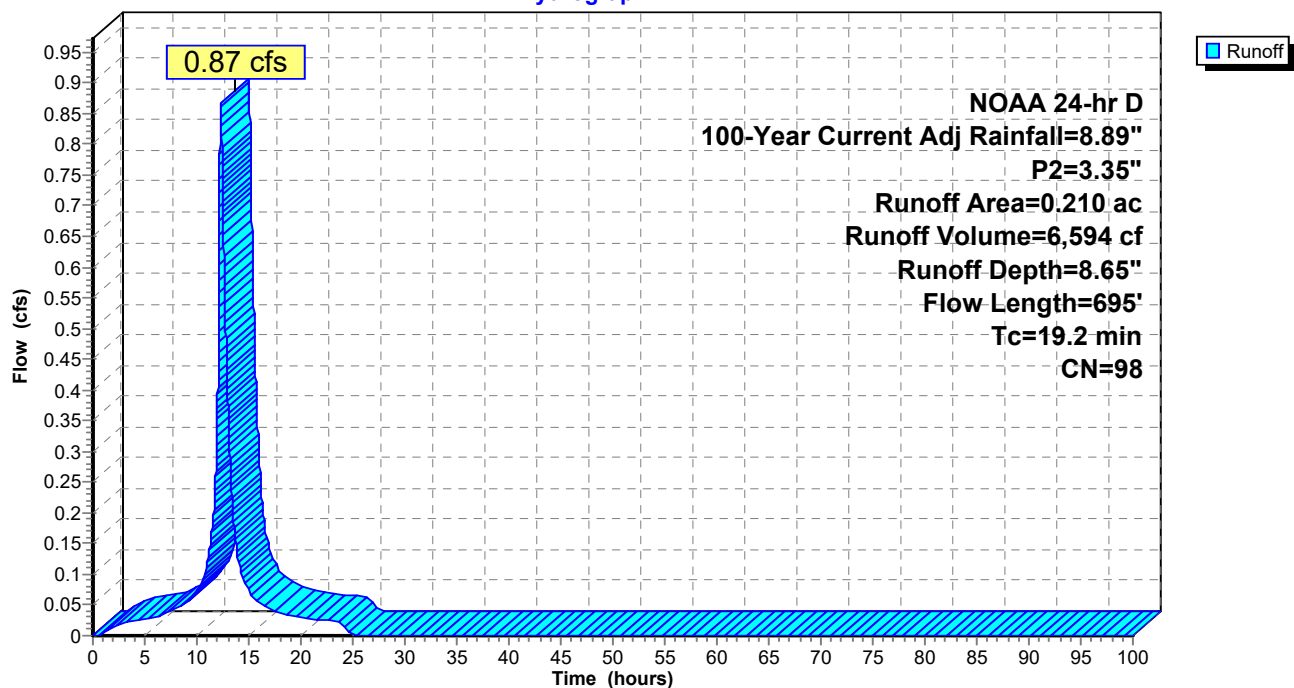
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0055	0.84		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.2	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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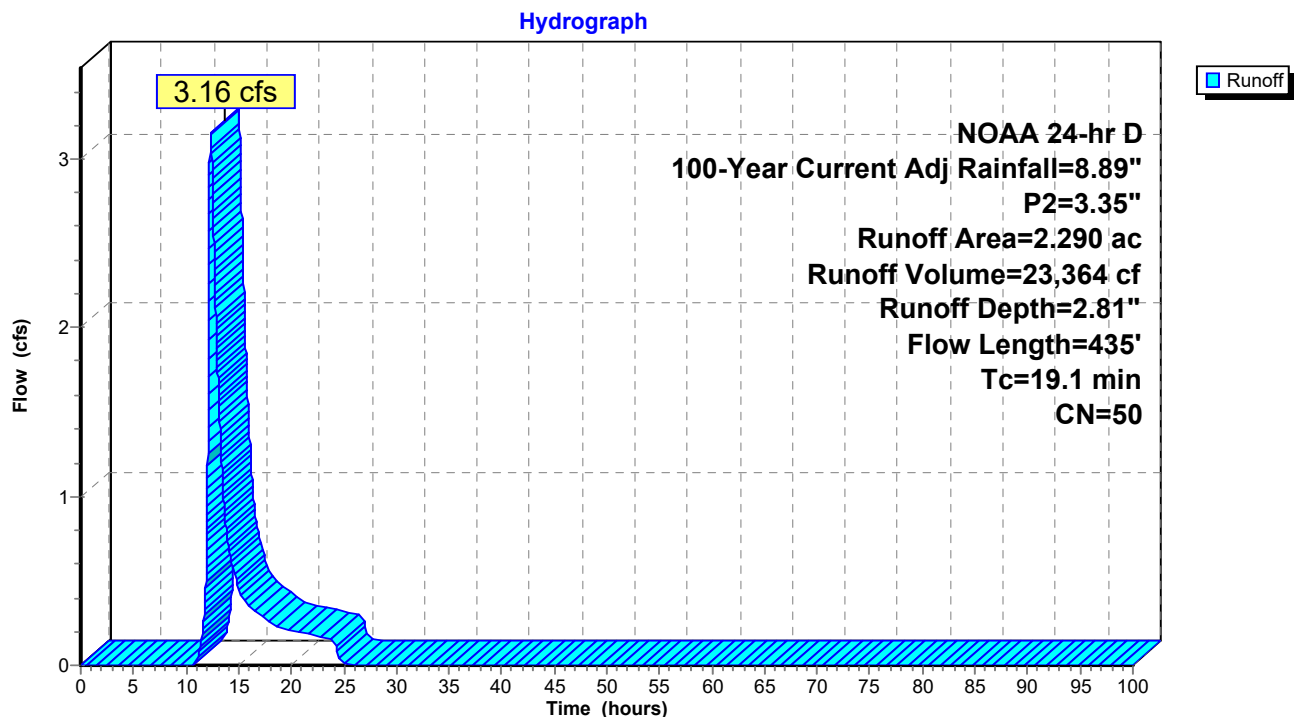
Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 3.16 cfs @ 12.34 hrs, Volume= 23,364 cf, Depth= 2.81"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0270	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.1	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Ei: EDA 1E Impervious

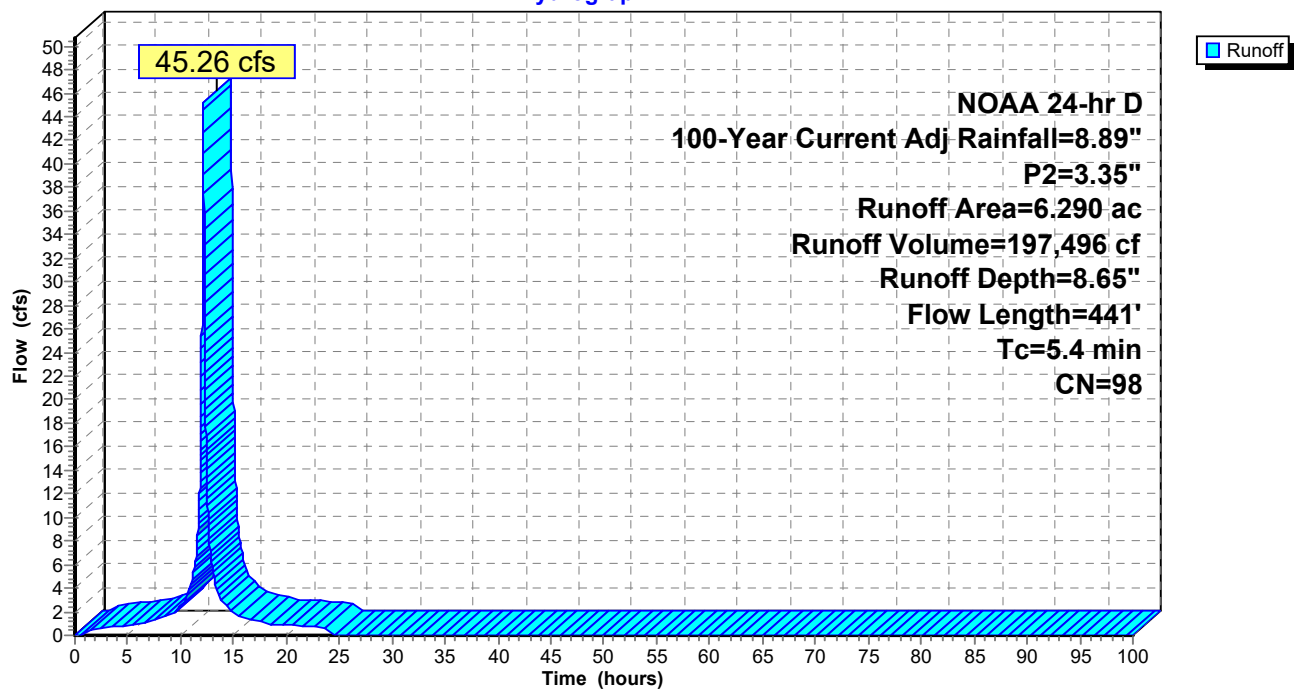
Runoff = 45.26 cfs @ 12.13 hrs, Volume= 197,496 cf, Depth= 8.65"

Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.4	441	Total			

Subcatchment E1Ei: EDA 1E Impervious**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 9.90 cfs @ 12.17 hrs, Volume= 44,890 cf, Depth= 5.97"
 Routed to Link E1A : EDA 1 ON SITE

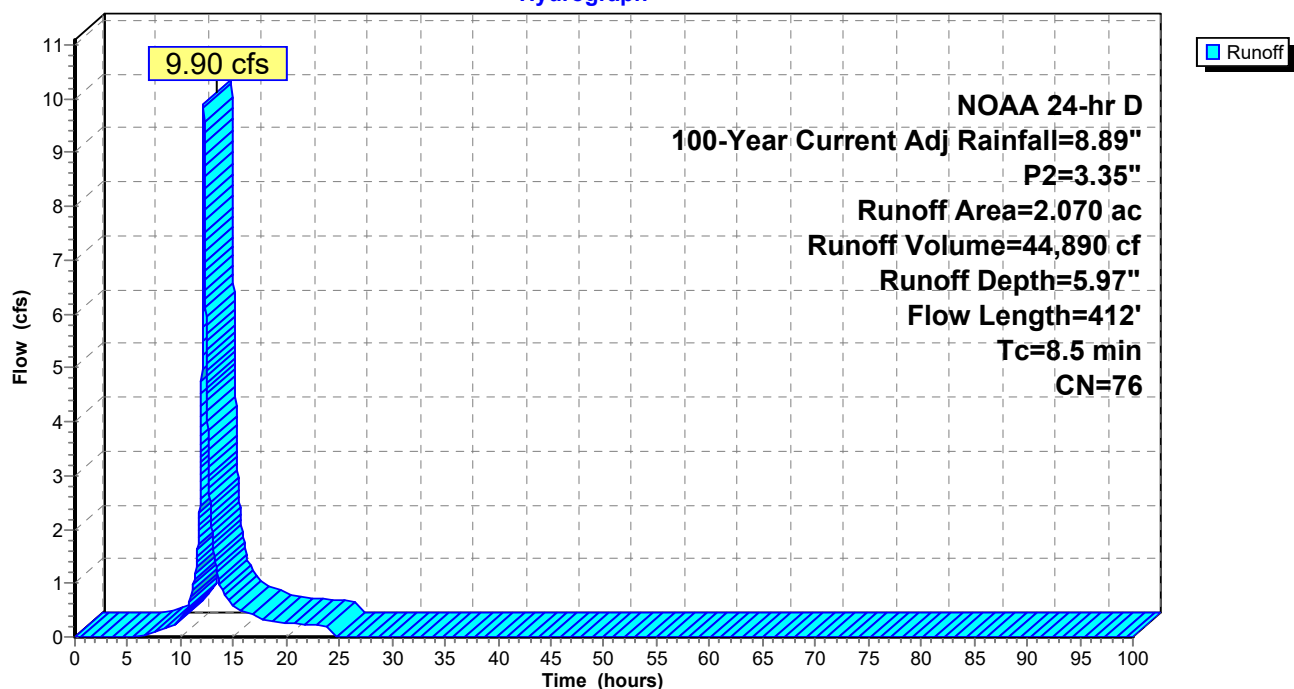
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	36	0.1806	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.5	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.53 cfs @ 12.29 hrs, Volume= 4,082 cf, Depth= 8.65"
Routed to Link E1B : BYPASS

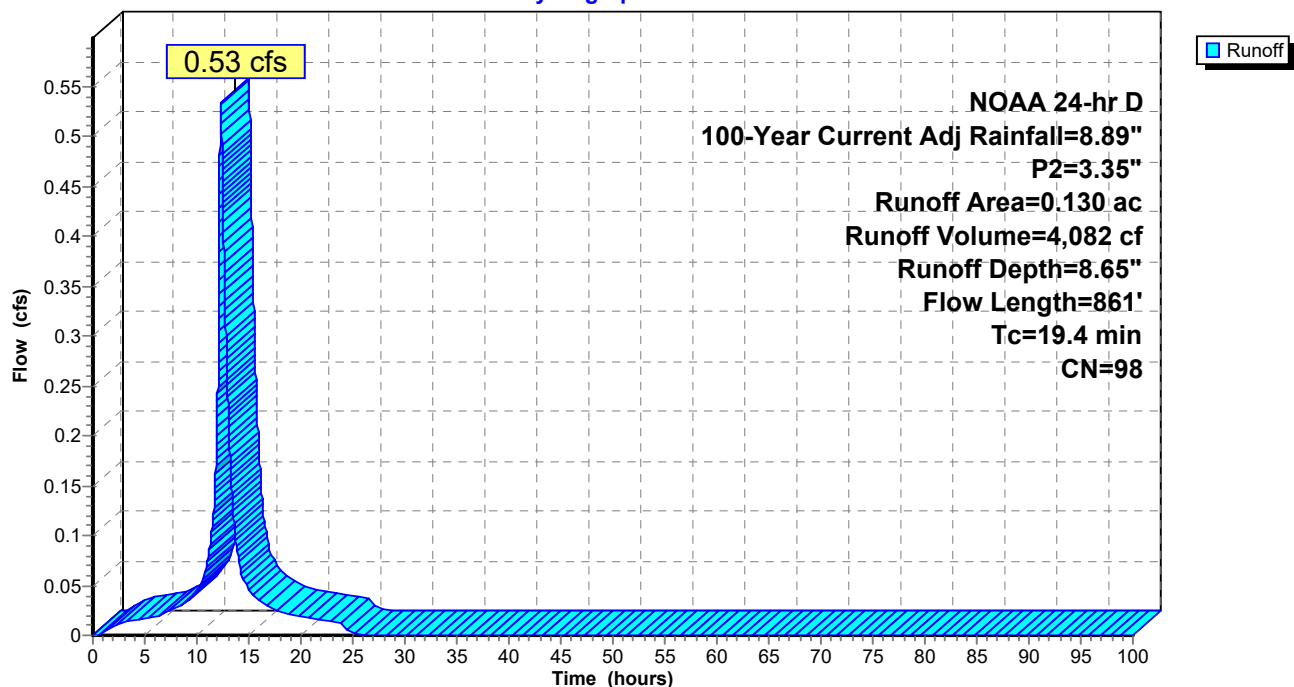
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 24.73 cfs @ 12.32 hrs, Volume= 168,638 cf, Depth= 6.22"
Routed to Link E1B : BYPASS

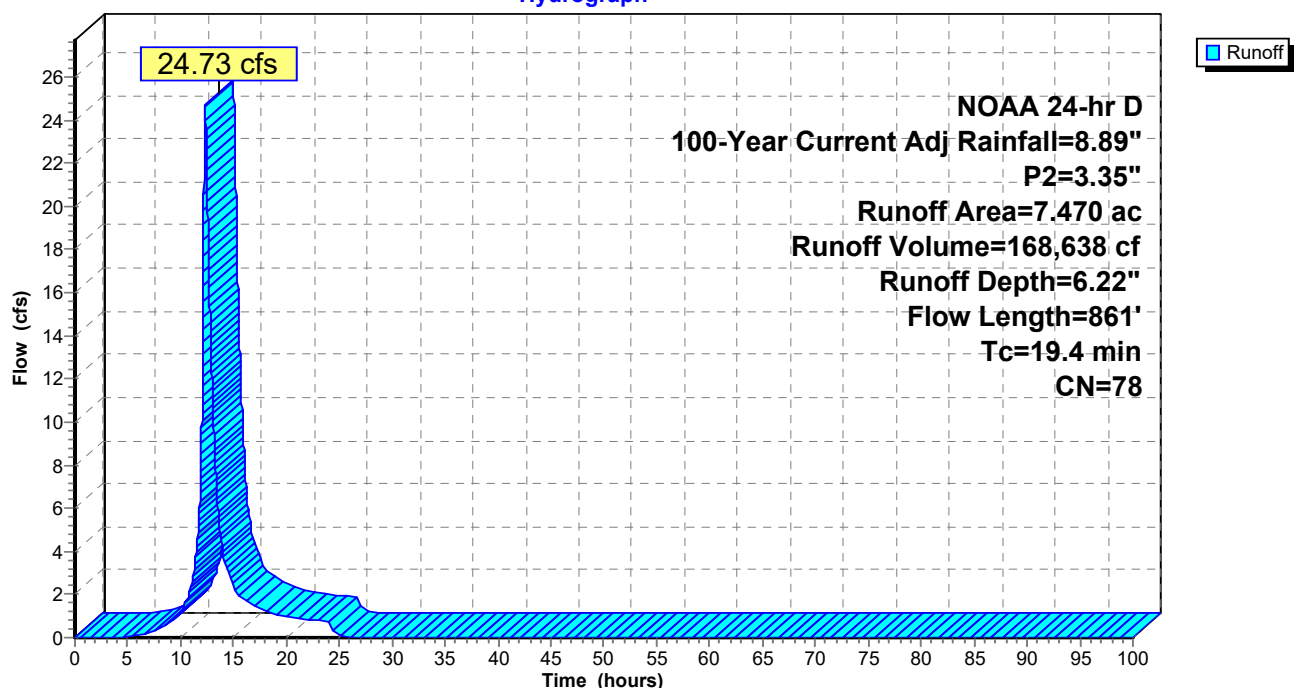
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 1.47 cfs @ 12.25 hrs, Volume= 9,487 cf, Depth= 8.17"
Routed to Link E2A : EDA 2A ONSITE

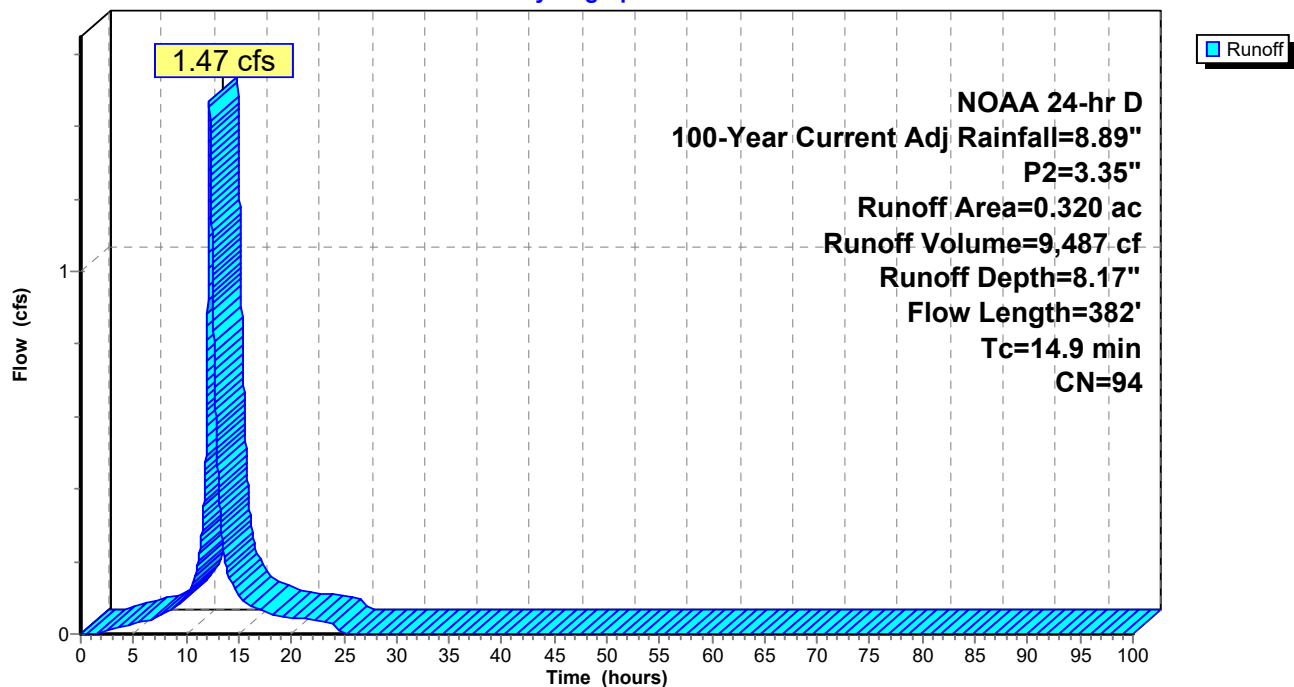
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 4.14 cfs @ 12.25 hrs, Volume= 24,631 cf, Depth= 6.34"
Routed to Link E2A : EDA 2A ONSITE

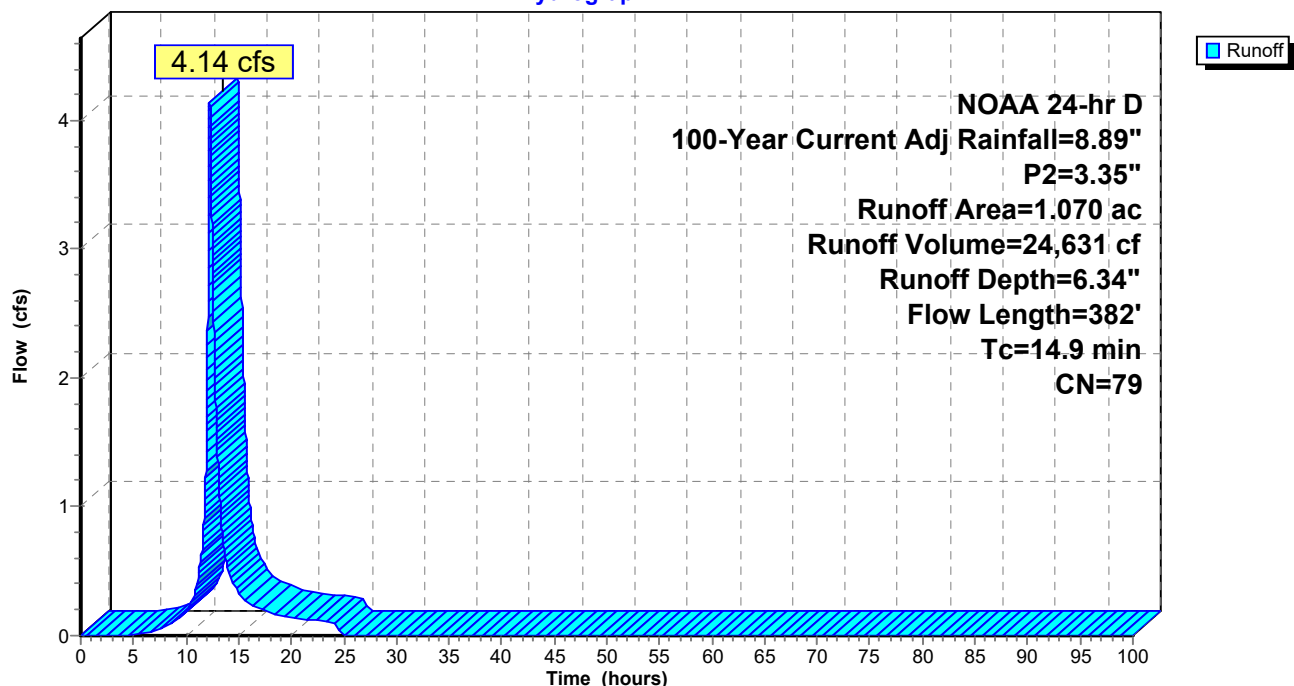
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf, Depth= 6.10"
Routed to Link E2B : BYPASS

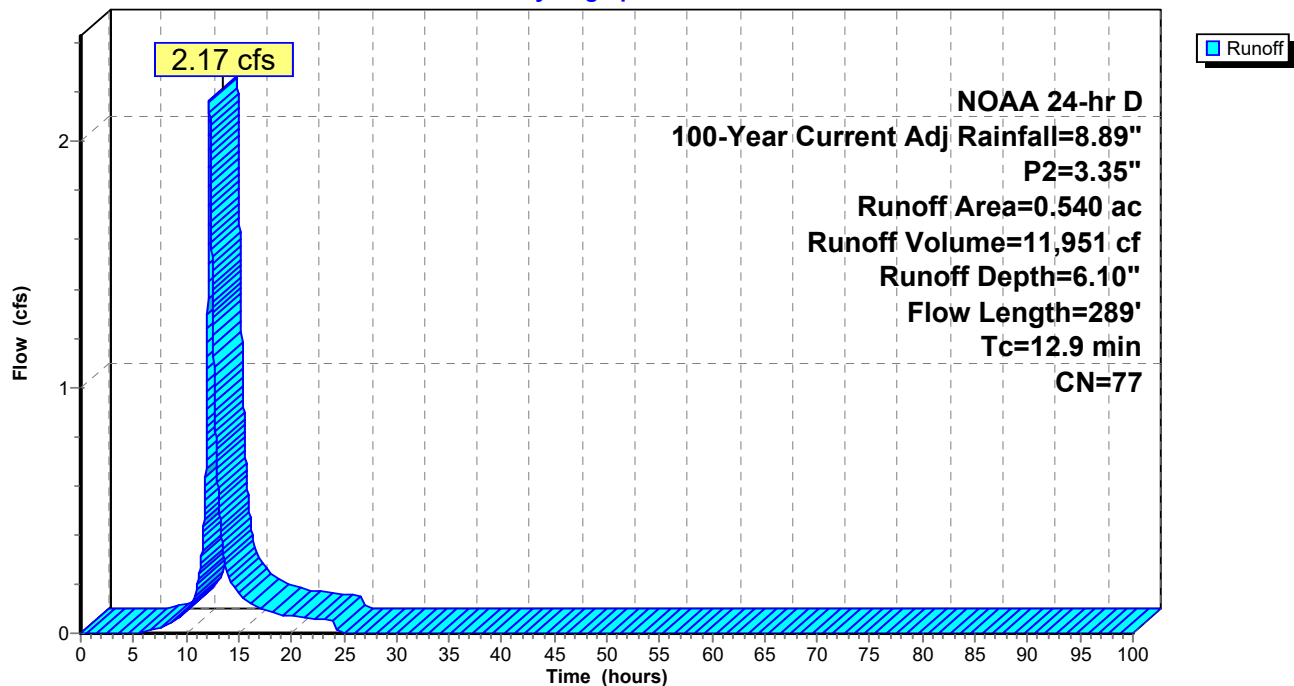
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	46	0.0335	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.9	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 11.78 cfs @ 12.11 hrs, Volume= 42,120 cf, Depth= 8.29"
Routed to Link E3A : EDA 3A ONSITE

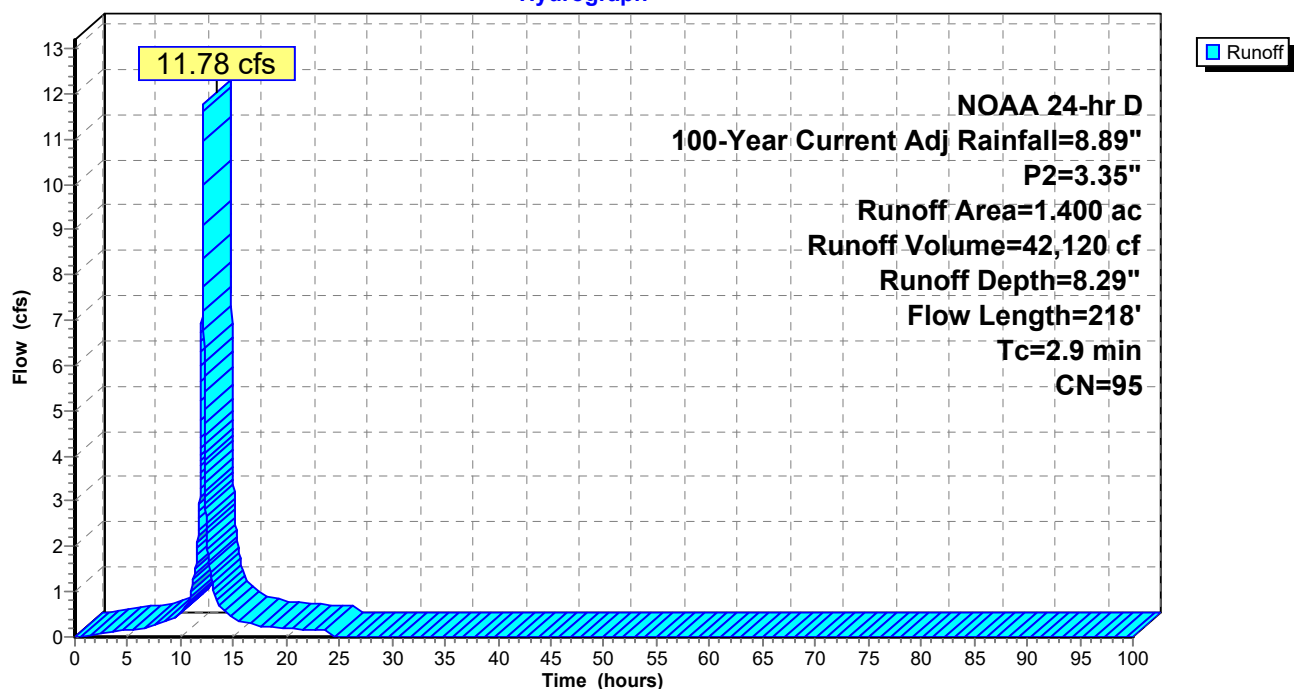
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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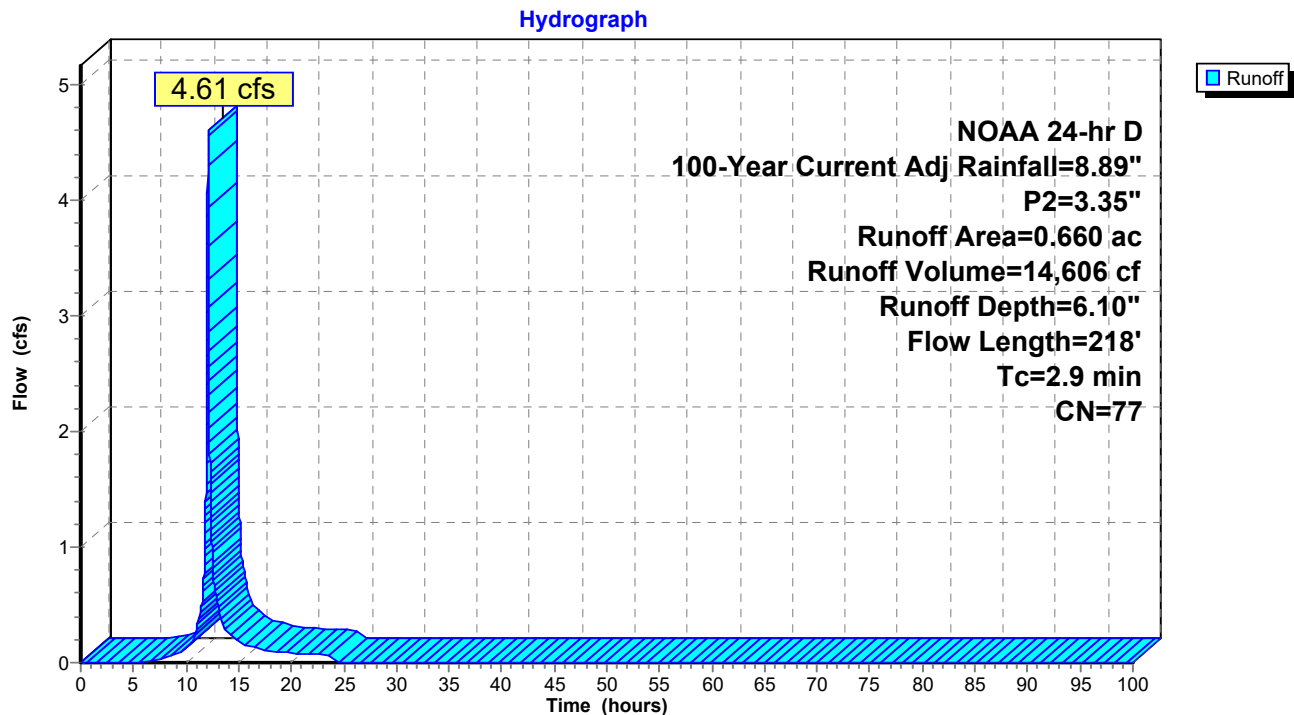
Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 4.61 cfs @ 12.11 hrs, Volume= 14,606 cf, Depth= 6.10"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf, Depth= 5.73"
Routed to Link E3B : BYPASS

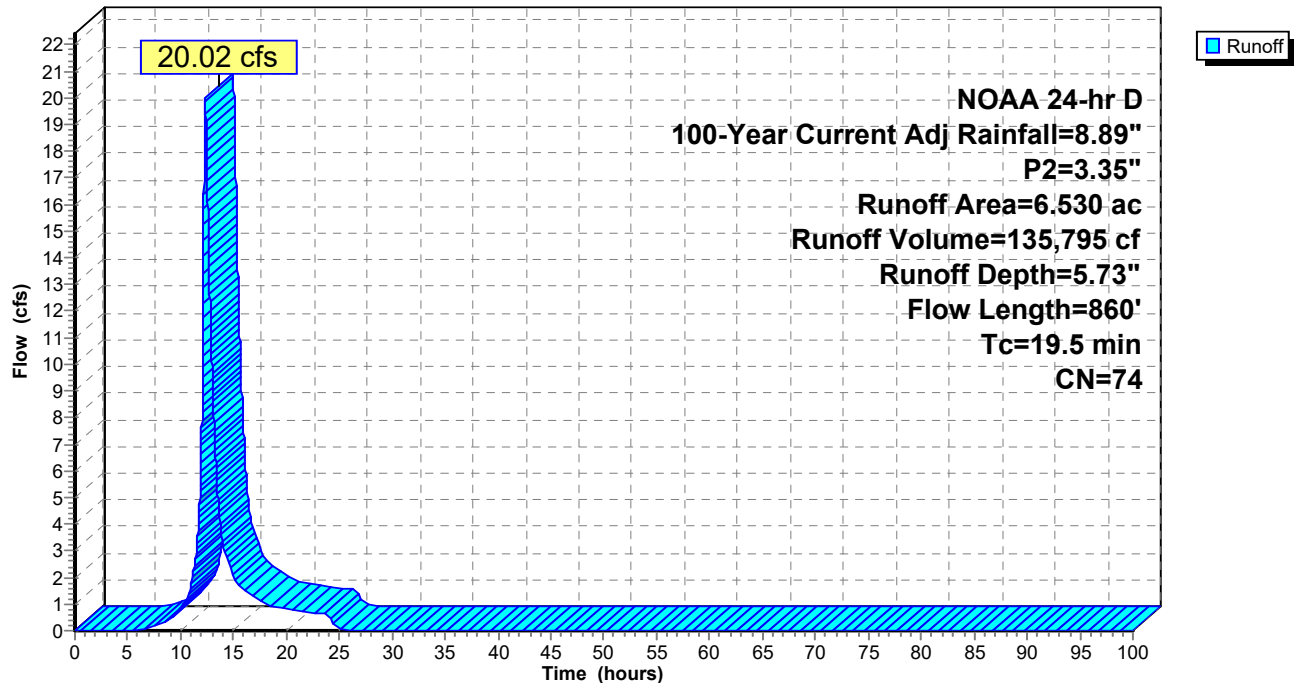
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	59	0.0550	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.5	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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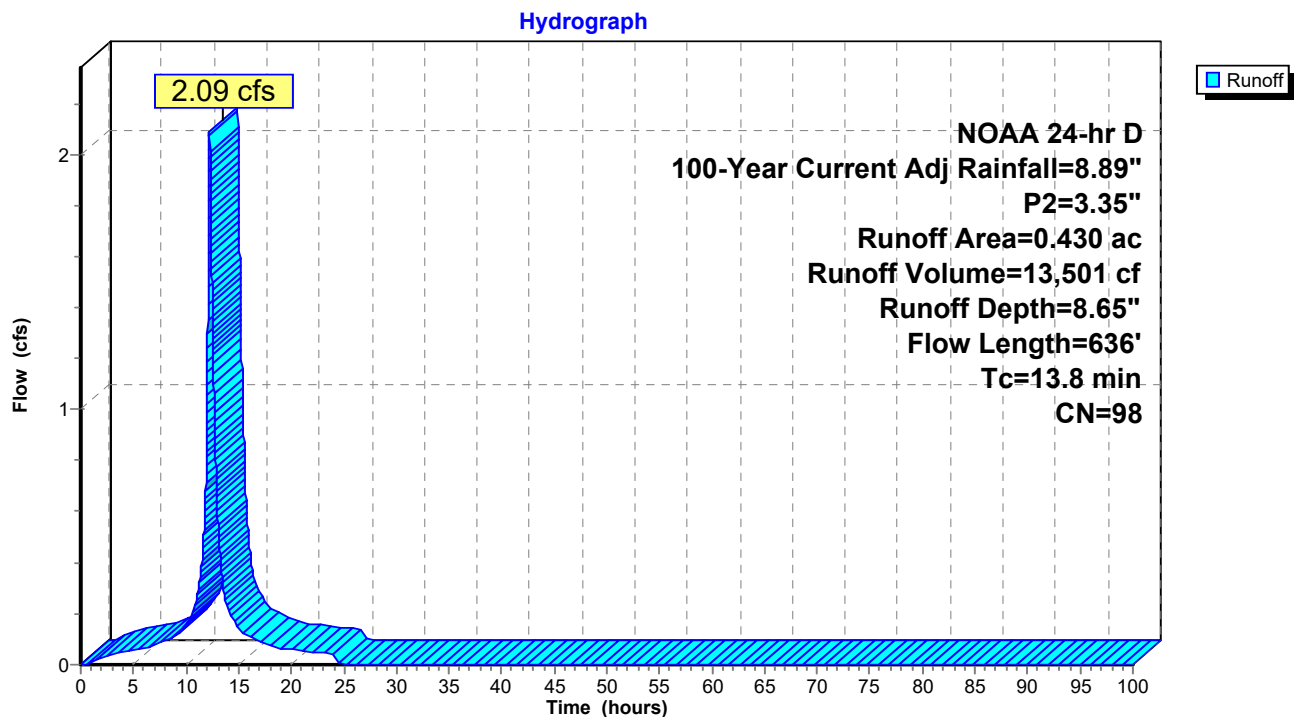
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 2.09 cfs @ 12.23 hrs, Volume= 13,501 cf, Depth= 8.65"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	636	Total			

Subcatchment E4i: EDA 4 Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 5.59 cfs @ 12.24 hrs, Volume= 39,752 cf, Depth= 1.55"
Routed to Link E4 : EDA 4

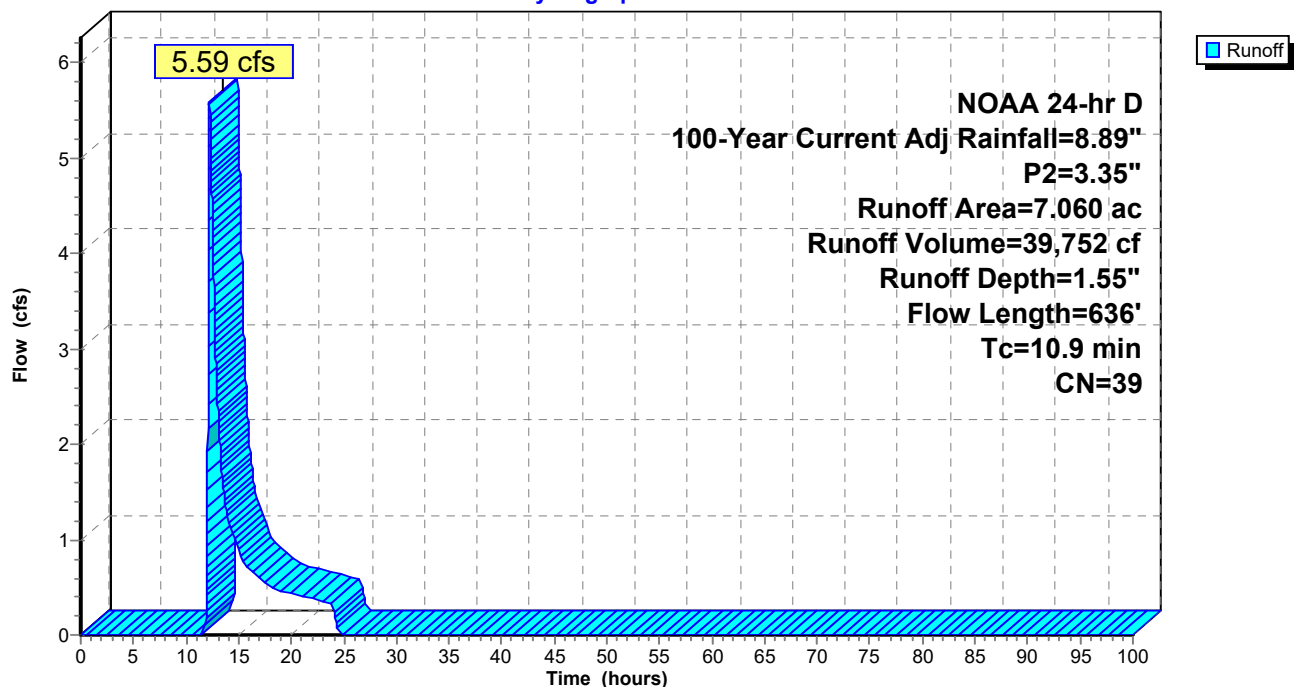
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.9	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 2.91 cfs @ 12.41 hrs, Volume= 26,061 cf, Depth= 8.65"
Routed to Pond E5D : DEPRESSION

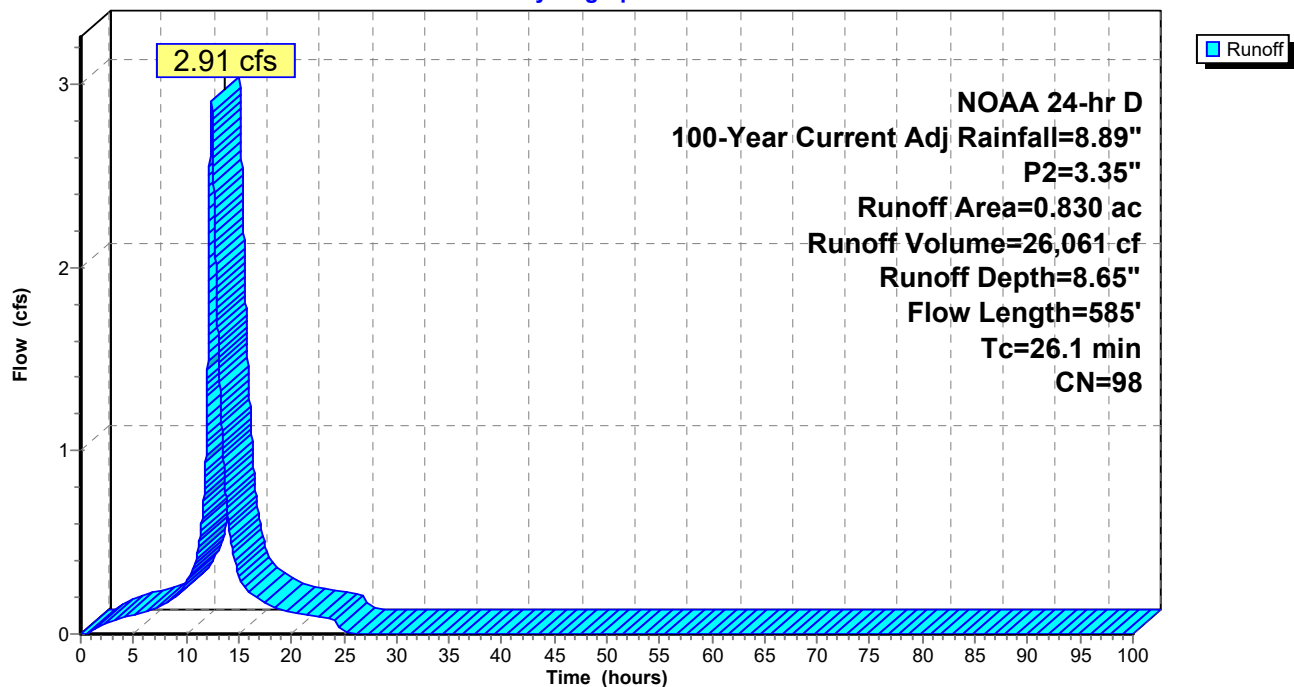
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5i: EDA 6 Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 4.09 cfs @ 12.53 hrs, Volume= 43,472 cf, Depth= 1.77"
Routed to Pond E5D : DEPRESSION

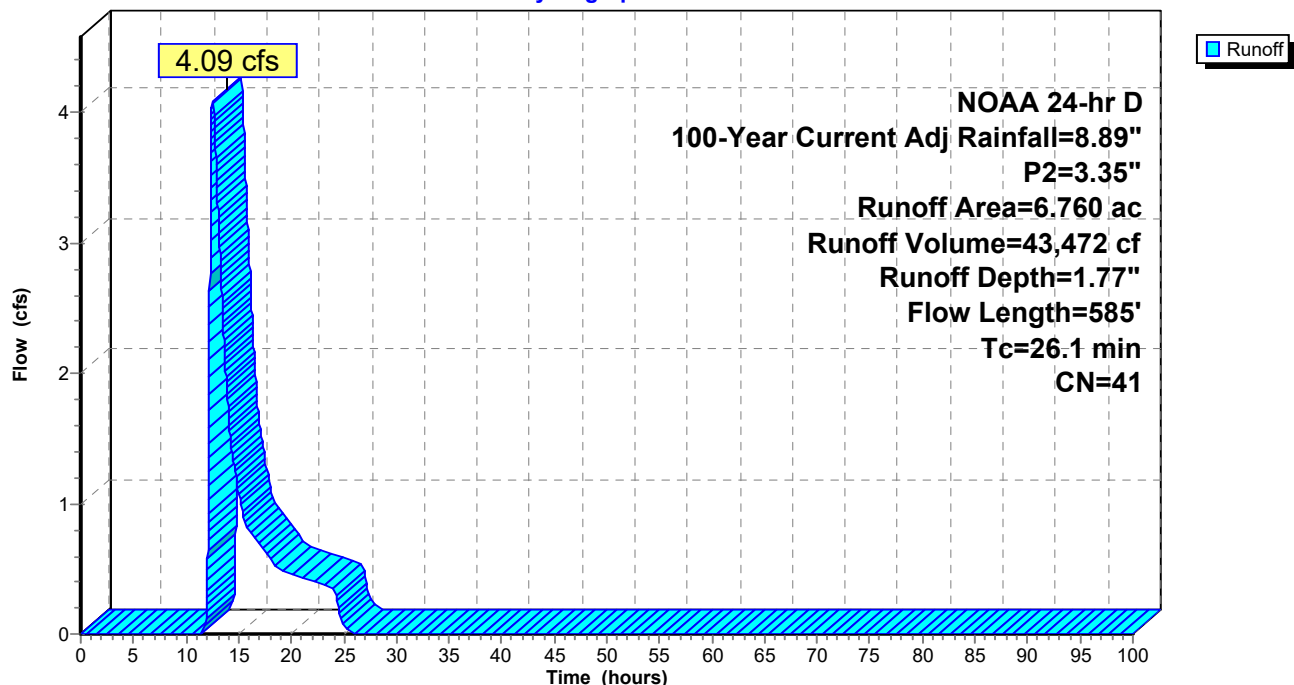
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	67	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
26.1	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 2.52" for 100-Year Current Adj event
 Inflow = 6.90 cfs @ 12.47 hrs, Volume= 69,532 cf
 Outflow = 0.80 cfs @ 17.51 hrs, Volume= 20,127 cf, Atten= 88%, Lag= 302.8 min
 Primary = 0.80 cfs @ 17.51 hrs, Volume= 20,127 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 16.41' @ 17.51 hrs Surf.Area= 122,721 sf Storage= 51,826 cf

Plug-Flow detention time= 568.8 min calculated for 20,125 cf (29% of inflow)

Center-of-Mass det. time= 355.0 min (1,234.5 - 879.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

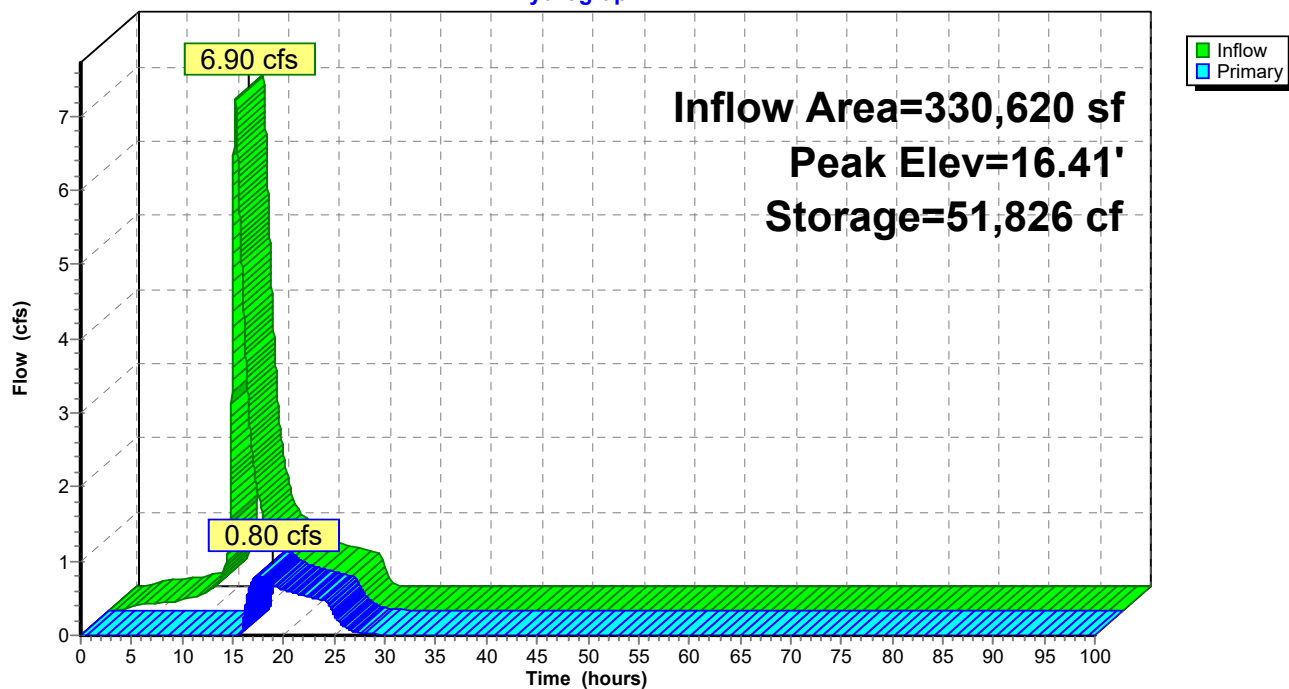
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.80 cfs @ 17.51 hrs HW=16.41' TW=0.00' (Dynamic Tailwater)↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.80 cfs @ 0.38 fps)

Pond E5D: DEPRESSION

Hydrograph



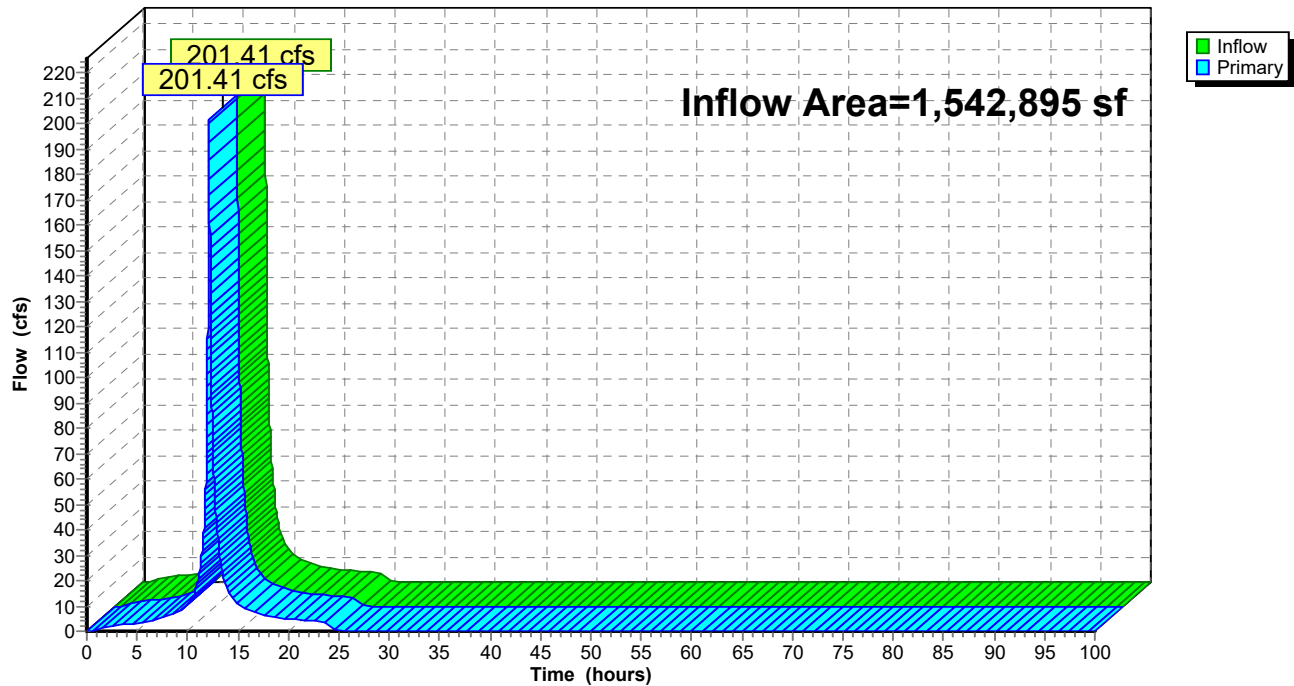
Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 7.56" for 100-Year Current Adj event
Inflow = 201.41 cfs @ 12.13 hrs, Volume= 971,709 cf
Primary = 201.41 cfs @ 12.13 hrs, Volume= 971,709 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1

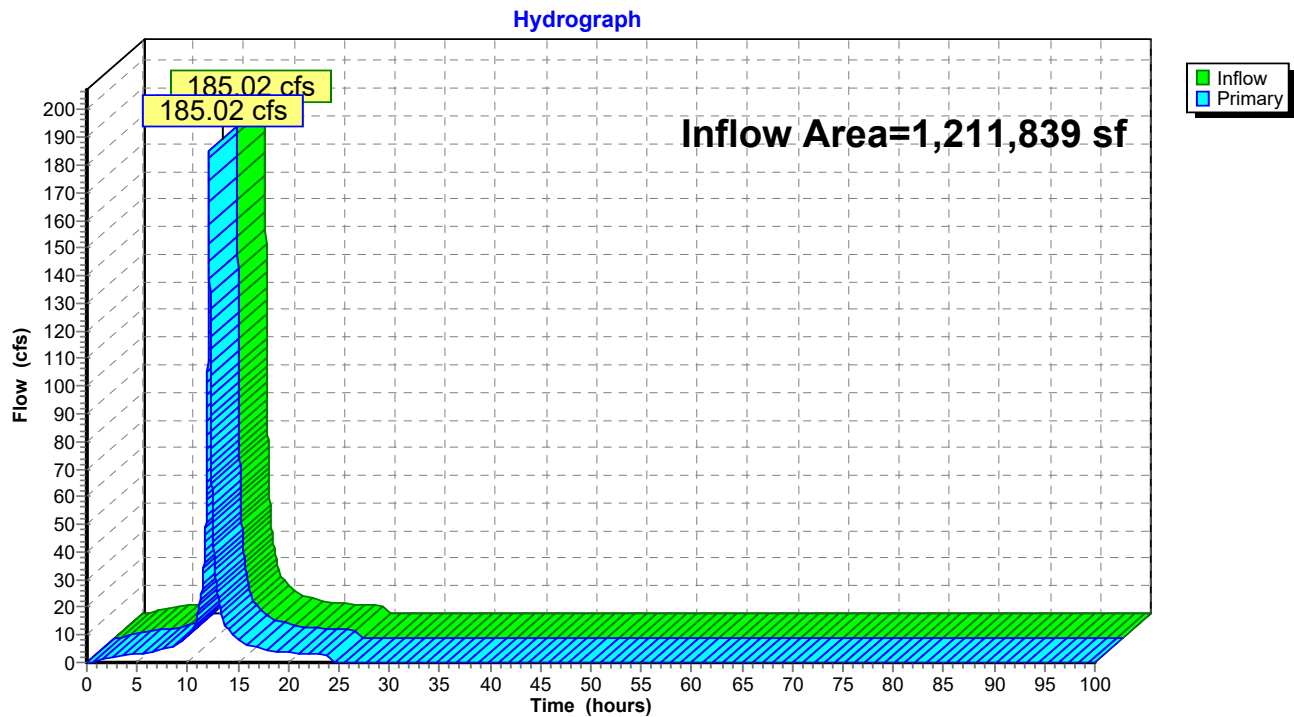
Hydrograph



Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 7.91" for 100-Year Current Adj event
Inflow = 185.02 cfs @ 12.13 hrs, Volume= 798,989 cf
Primary = 185.02 cfs @ 12.13 hrs, Volume= 798,989 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE

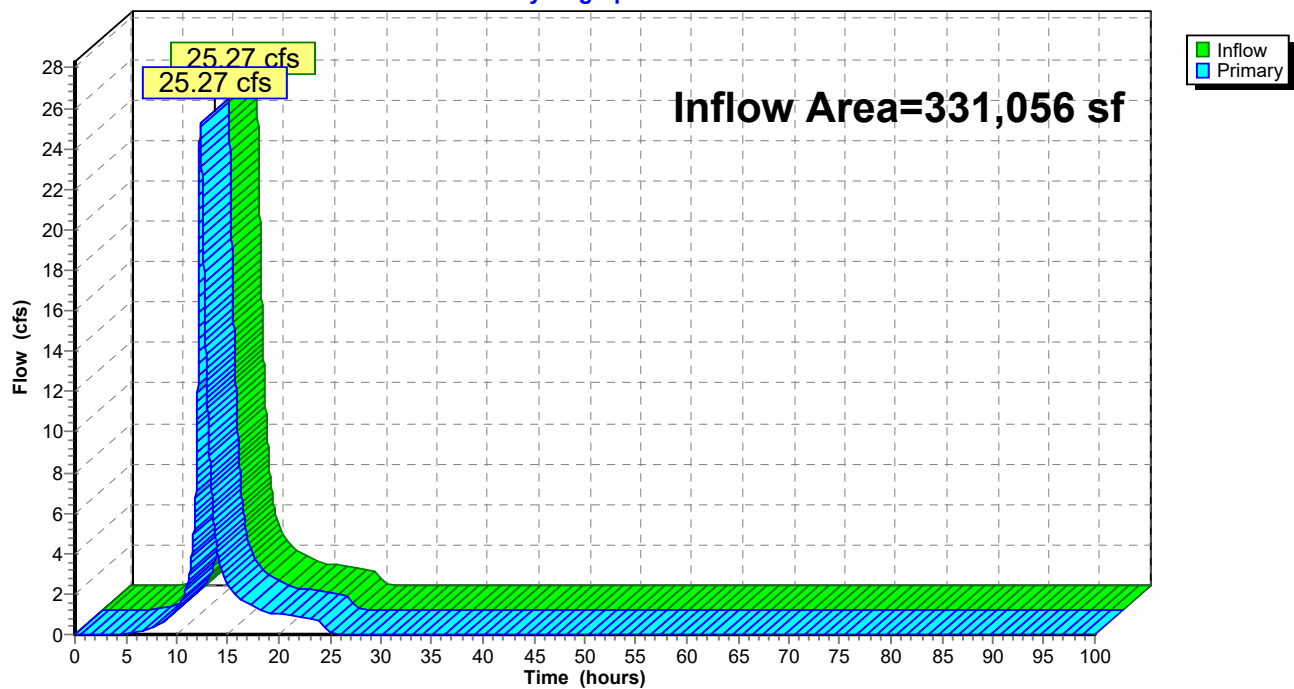
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 6.26" for 100-Year Current Adj event
Inflow = 25.27 cfs @ 12.30 hrs, Volume= 172,719 cf
Primary = 25.27 cfs @ 12.30 hrs, Volume= 172,719 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

Hydrograph



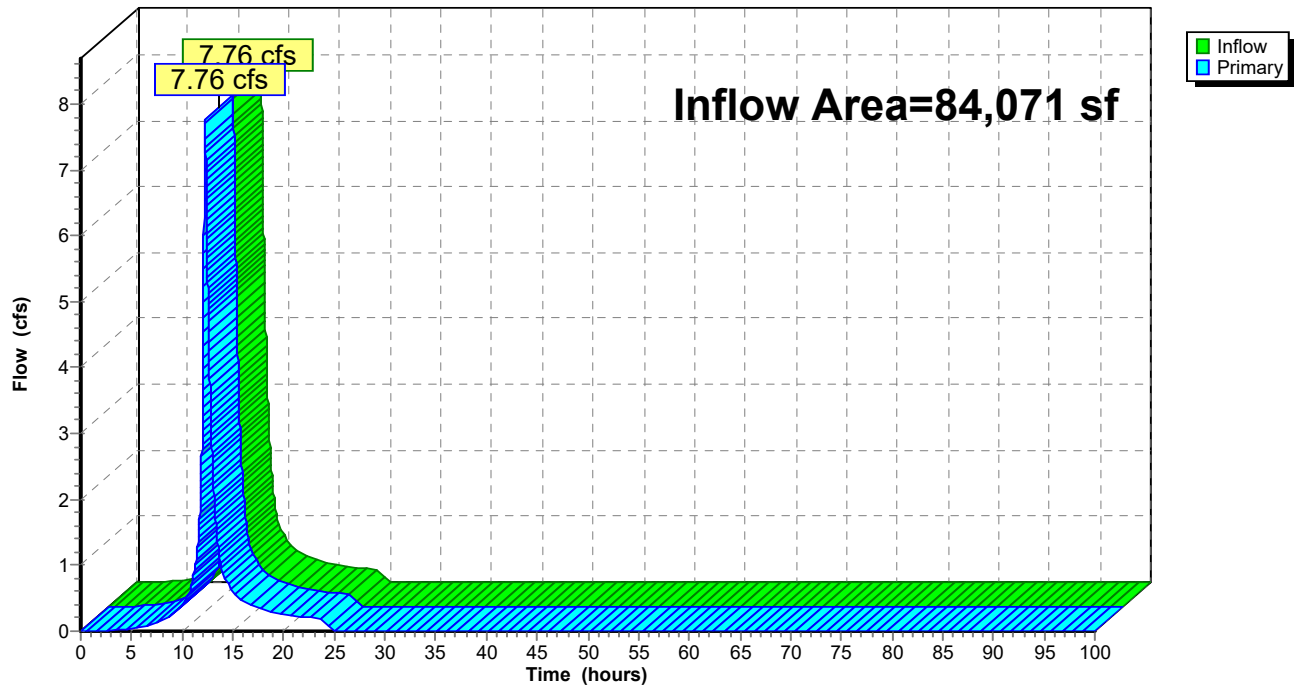
Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 6.58" for 100-Year Current Adj event
Inflow = 7.76 cfs @ 12.25 hrs, Volume= 46,069 cf
Primary = 7.76 cfs @ 12.25 hrs, Volume= 46,069 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2

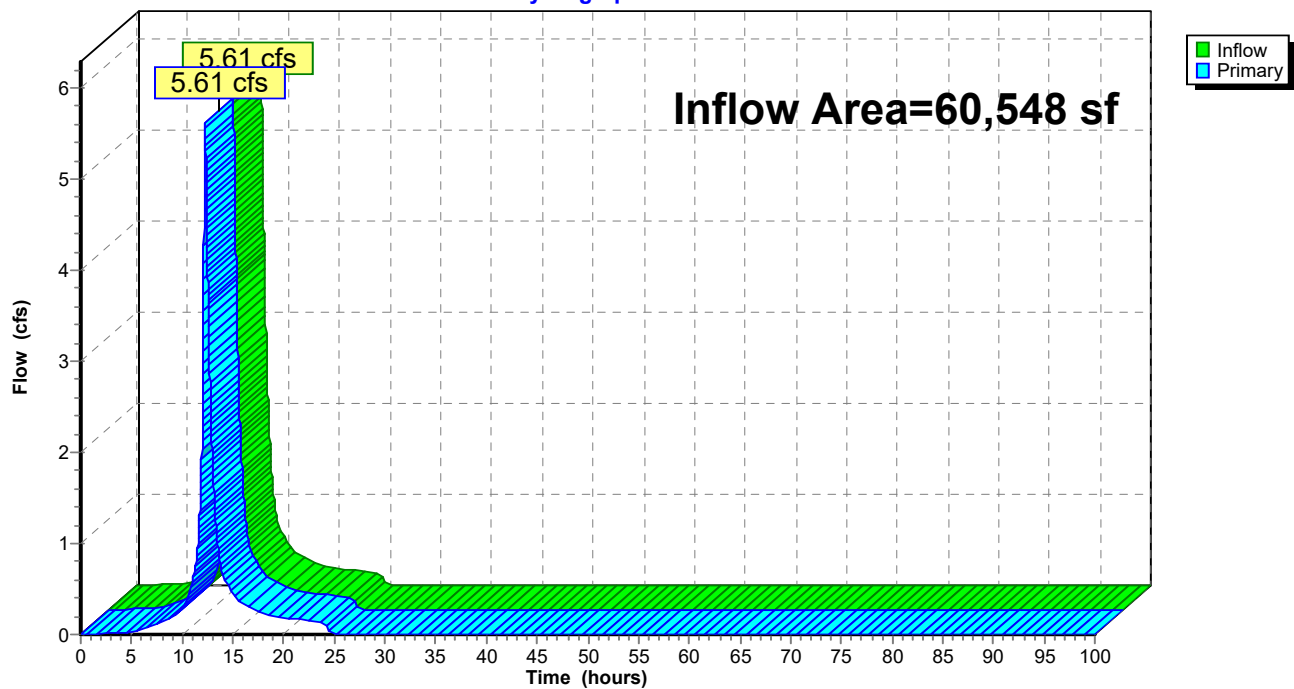
Hydrograph



Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 6.76" for 100-Year Current Adj event
Inflow = 5.61 cfs @ 12.25 hrs, Volume= 34,118 cf
Primary = 5.61 cfs @ 12.25 hrs, Volume= 34,118 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE**Hydrograph**

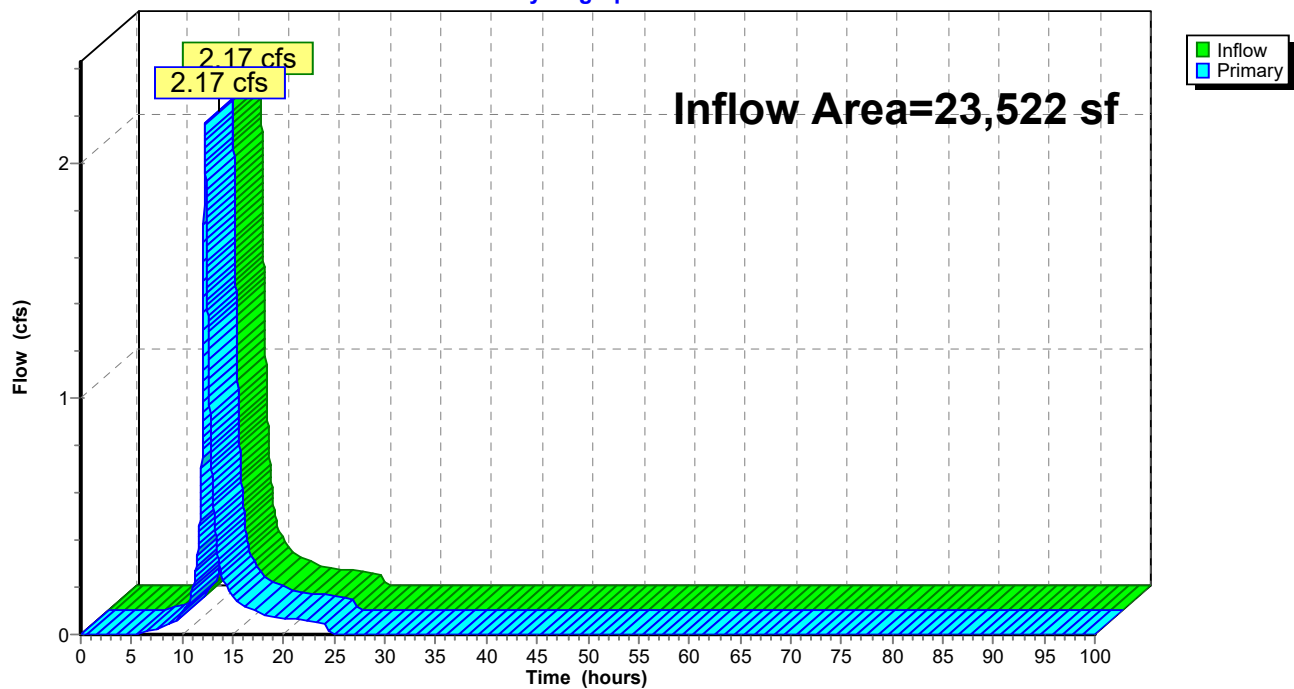
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 6.10" for 100-Year Current Adj event
Inflow = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf
Primary = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



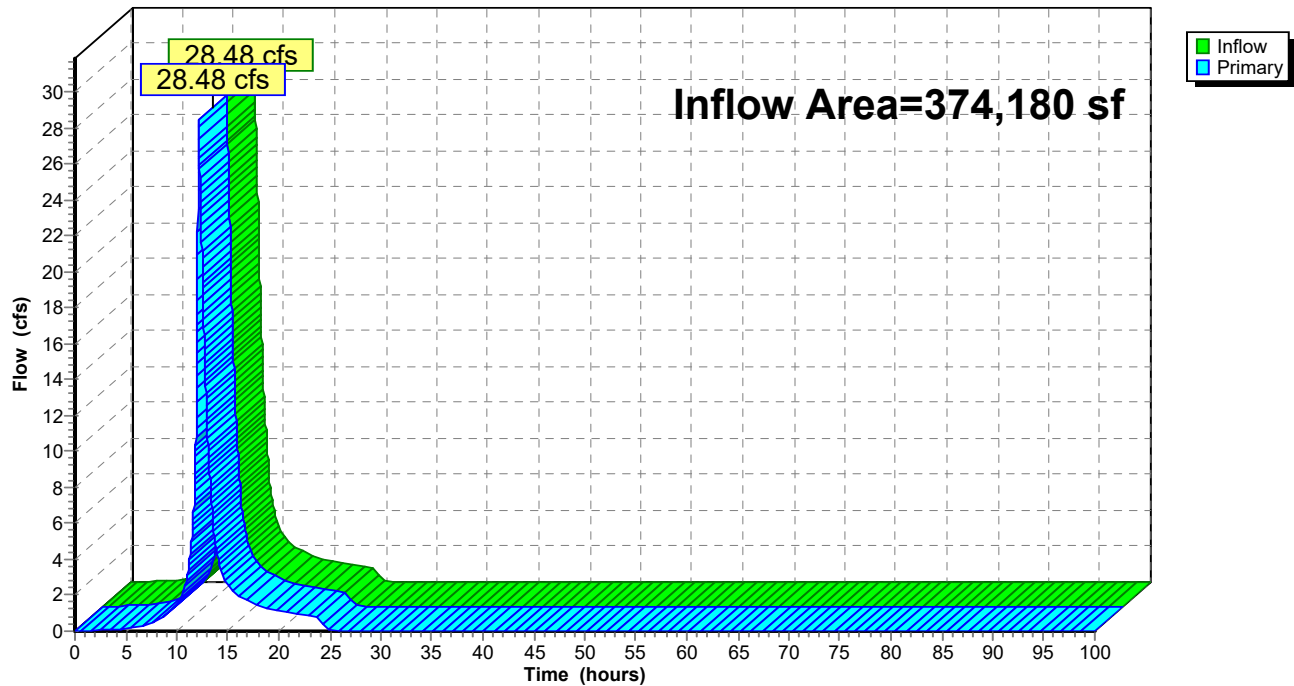
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 6.17" for 100-Year Current Adj event
Inflow = 28.48 cfs @ 12.12 hrs, Volume= 192,522 cf
Primary = 28.48 cfs @ 12.12 hrs, Volume= 192,522 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

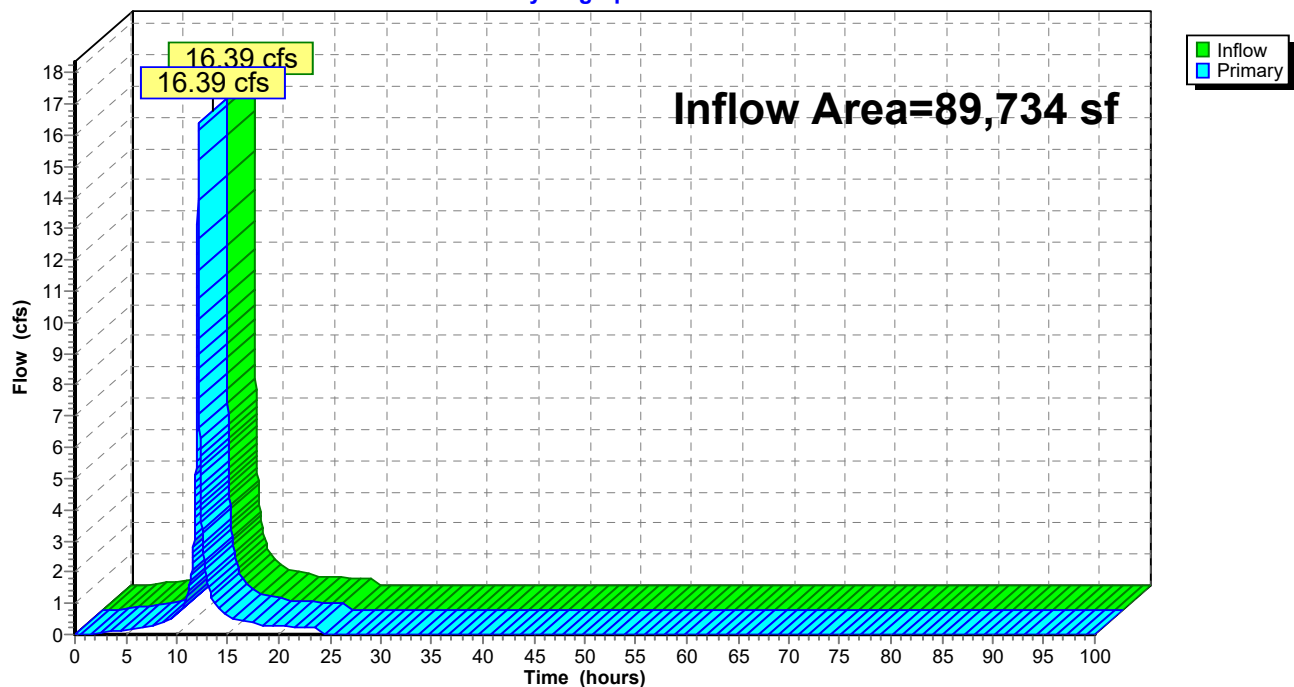
Hydrograph



Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 7.59" for 100-Year Current Adj event
Inflow = 16.39 cfs @ 12.11 hrs, Volume= 56,727 cf
Primary = 16.39 cfs @ 12.11 hrs, Volume= 56,727 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3A: EDA 3A ONSITE**Hydrograph**

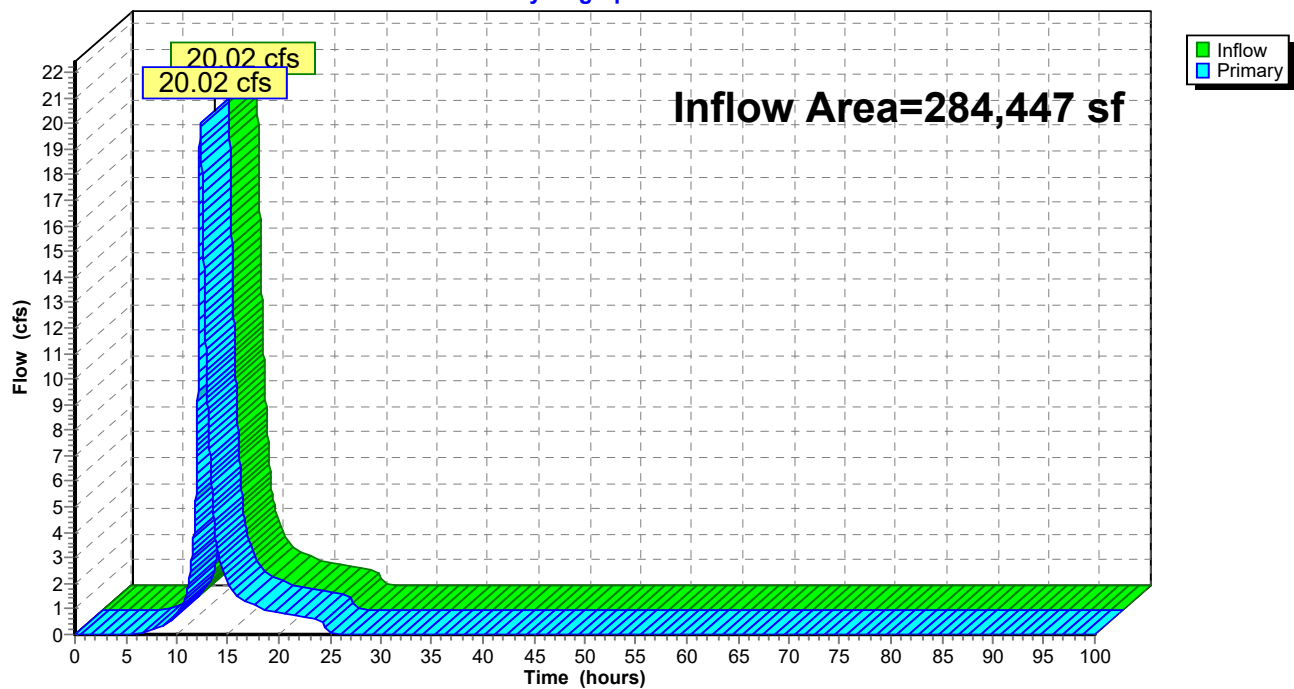
Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 5.73" for 100-Year Current Adj event
Inflow = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf
Primary = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS

Hydrograph



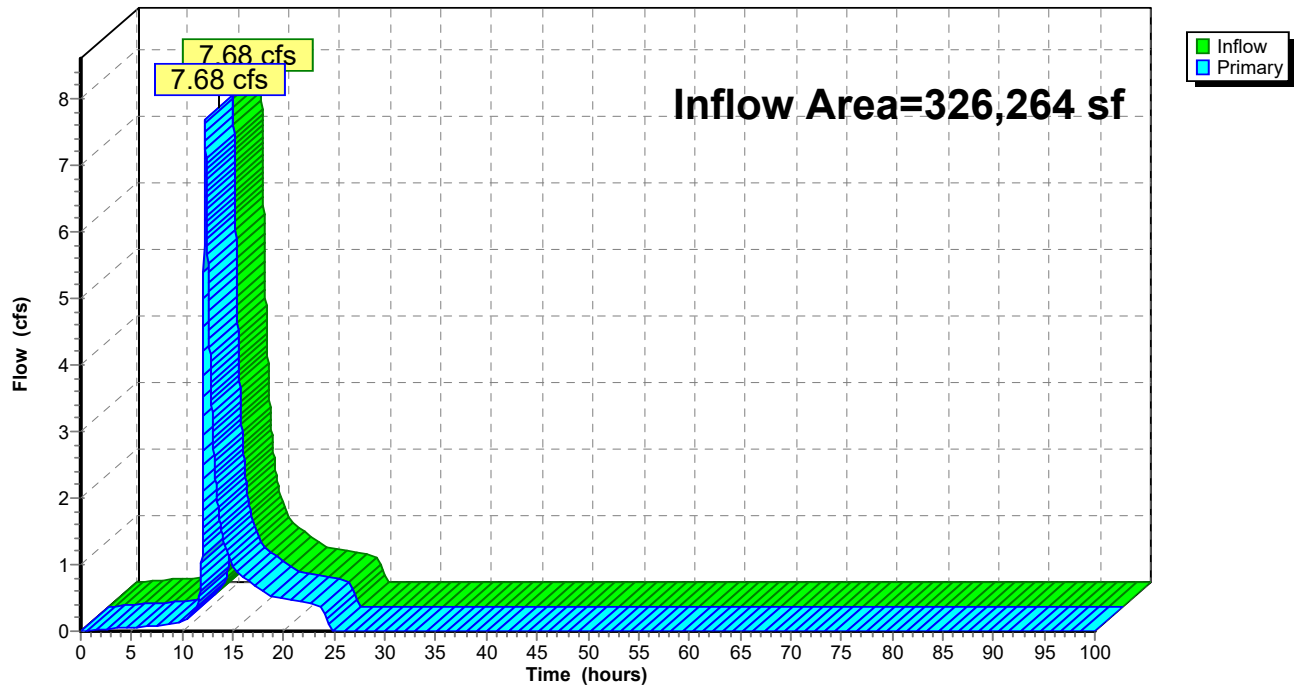
Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 1.96" for 100-Year Current Adj event
Inflow = 7.68 cfs @ 12.24 hrs, Volume= 53,253 cf
Primary = 7.68 cfs @ 12.24 hrs, Volume= 53,253 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4

Hydrograph



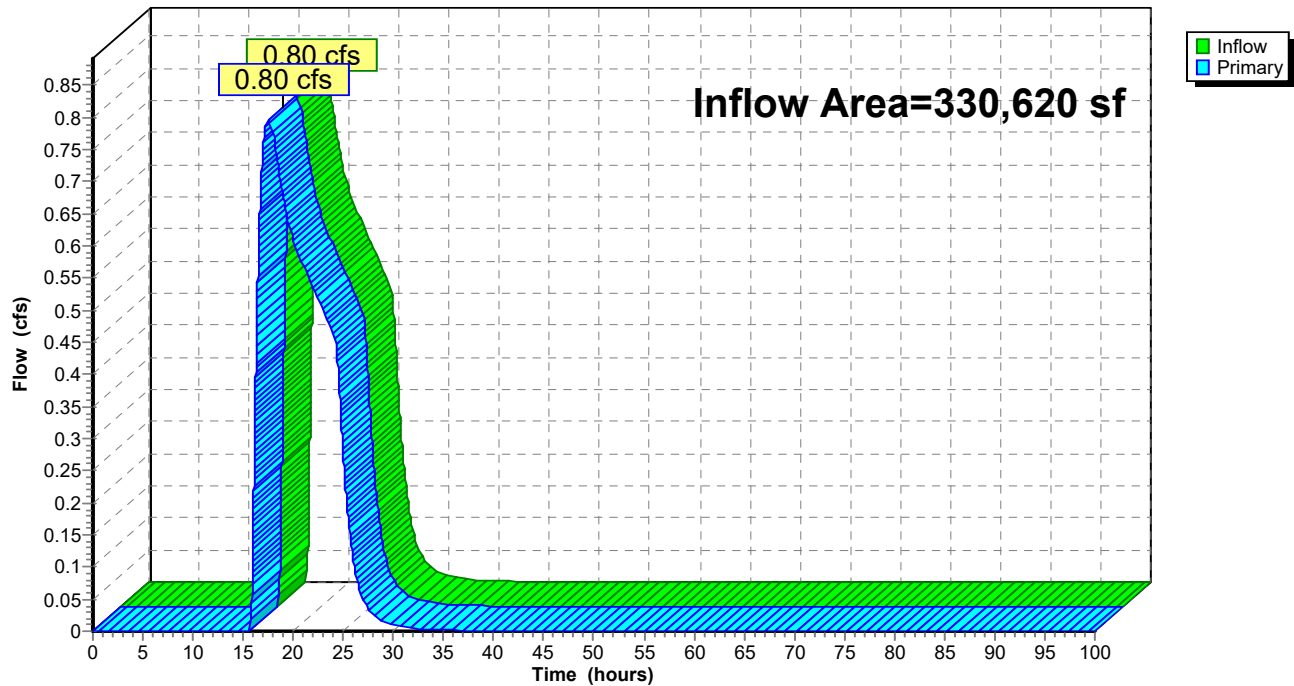
Summary for Link E5: EDA 5

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.73" for 100-Year Current Adj event
Inflow = 0.80 cfs @ 17.51 hrs, Volume= 20,127 cf
Primary = 0.80 cfs @ 17.51 hrs, Volume= 20,127 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E5: EDA 5

Hydrograph



Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	8.89	2	3.35

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
228,690	39	>75% Grass cover, Good, HSG A (P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P4p)
405,544	80	>75% Grass cover, Good, HSG D (P1Bp, P1Dp, P1Fp, P1Gp, P1Hp, P1Ip, P1Jp, P1Kp, P1Lp, P1Mp, P1Np, P2Ap, P3Ap, P3Bp)
1,521,986	98	Paved parking, HSG D (P1Ai, P1Bi, P1Di, P1Ei, P1Fi, P1Gi, P1Hi, P1Ii, P1Ji, P1Ki, P1Li, P1Ni)
17,424	30	Woods, Good, HSG A (P3Bp)
484,387	77	Woods, Good, HSG D (P1Mp, P1Np, P2Ap, P2Bp, P3Ap, P3Bp)
2,658,031	86	TOTAL AREA

Pre vs Post Rev. 3a

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
246,114	HSG A	P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P3Bp, P4p
0	HSG B	
0	HSG C	
2,411,917	HSG D	P1Ai, P1Bi, P1Bp, P1Di, P1Dp, P1Ei, P1Fi, P1Fp, P1Gi, P1Gp, P1Hi, P1Hp, P1Ii, P1Ip, P1Ji, P1Jp, P1Ki, P1Kp, P1Li, P1Lp, P1Mp, P1Ni, P1Np, P2Ap, P2Bp, P3Ap, P3Bp
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
228,690	0	0	405,544	0	634,234	>75% Grass cover, Good
0	0	0	1,521,986	0	1,521,986	Paved parking
17,424	0	0	484,387	0	501,811	Woods, Good
246,114	0	0	2,411,917	0	2,658,031	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	9.50	9.35	50.0	0.0030	0.013	0.0	24.0	0.0	
2	CW1A	9.00	8.00	634.0	0.0016	0.012	0.0	36.0	0.0	
3	CW1B	9.00	8.00	312.0	0.0032	0.012	0.0	48.0	0.0	
4	CW1C	9.00	8.00	1,202.0	0.0008	0.012	0.0	36.0	0.0	
5	CW1D	8.90	8.54	72.0	0.0050	0.012	0.0	48.0	0.0	
6	PP1	9.82	9.23	59.0	0.0100	0.013	0.0	15.0	0.0	
7	PP2	9.46	9.00	155.0	0.0030	0.013	0.0	36.0	0.0	
8	PP3	9.28	9.13	49.0	0.0031	0.013	0.0	30.0	0.0	
9	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
10	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
11	PP5	9.60	9.29	105.0	0.0030	0.013	0.0	15.0	0.0	
12	PP6	11.08	11.05	8.0	0.0037	0.013	0.0	15.0	0.0	

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NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentP1Ai:	Runoff Area=5.210 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=43.64 cfs 163,586 cf
SubcatchmentP1Ap:	Runoff Area=0.940 ac 0.00% Impervious Runoff Depth=1.55" Flow Length=100' Slope=0.1000 '/' Tc=5.0 min CN=39 Runoff=1.12 cfs 5,293 cf
SubcatchmentP1Bi:	Runoff Area=4.410 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=36.93 cfs 138,467 cf
SubcatchmentP1Bp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=6.46" Flow Length=110' Slope=0.1000 '/' Tc=5.1 min CN=80 Runoff=6.26 cfs 23,464 cf
SubcatchmentP1Cp:	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=1.55" Flow Length=110' Slope=0.1000 '/' Tc=5.1 min CN=39 Runoff=0.83 cfs 3,941 cf
SubcatchmentP1Di:	Runoff Area=7.230 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=188' Slope=0.0050 '/' Tc=3.1 min CN=98 Runoff=60.55 cfs 227,011 cf
SubcatchmentP1Dp:	Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=6.22" Flow Length=100' Slope=0.1000 '/' Tc=5.0 min CN=78 Runoff=5.51 cfs 20,318 cf
SubcatchmentP1Ei:	Runoff Area=0.760 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=125' Tc=1.4 min CN=98 Runoff=7.05 cfs 23,863 cf
SubcatchmentP1Ep:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=1.55" Flow Length=76' Tc=4.2 min CN=39 Runoff=0.03 cfs 113 cf
SubcatchmentP1Fi:	Runoff Area=1.680 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=123' Tc=1.2 min CN=98 Runoff=15.62 cfs 52,749 cf
SubcatchmentP1Fp:	Runoff Area=0.120 ac 0.00% Impervious Runoff Depth=6.46" Flow Length=81' Tc=3.1 min CN=80 Runoff=0.86 cfs 2,816 cf
SubcatchmentP1Gi:	Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=117' Tc=1.3 min CN=98 Runoff=6.52 cfs 21,979 cf
SubcatchmentP1Gp:	Runoff Area=0.030 ac 0.00% Impervious Runoff Depth=6.46" Flow Length=92' Tc=4.2 min CN=80 Runoff=0.20 cfs 704 cf
SubcatchmentP1Hi:	Runoff Area=10.630 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=179' Slope=0.0150 '/' Tc=1.8 min CN=98 Runoff=96.47 cfs 333,765 cf
SubcatchmentP1Hp:	Runoff Area=0.370 ac 0.00% Impervious Runoff Depth=4.50" Flow Length=78' Slope=0.0450 '/' Tc=5.7 min CN=64 Runoff=1.59 cfs 6,048 cf
SubcatchmentP1Ii:	Runoff Area=0.740 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=15' Slope=0.0200 '/' Tc=0.3 min CN=98 Runoff=6.91 cfs 23,235 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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SubcatchmentP1Ip:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=6.46" Flow Length=10' Slope=0.0200 '/' Tc=1.5 min CN=80 Runoff=0.16 cfs 469 cf
SubcatchmentP1Ji:	Runoff Area=0.870 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=15' Slope=0.0200 '/' Tc=0.3 min CN=98 Runoff=8.13 cfs 27,317 cf
SubcatchmentP1Jp:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=4.01" Flow Length=10' Slope=0.0200 '/' Tc=1.5 min CN=60 Runoff=0.11 cfs 291 cf
SubcatchmentP1Ki:	Runoff Area=2.410 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=194' Tc=1.4 min CN=98 Runoff=22.36 cfs 75,670 cf
SubcatchmentP1Kp:	Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=6.46" Flow Length=149' Tc=2.9 min CN=80 Runoff=0.44 cfs 1,408 cf
SubcatchmentP1Li:	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=54' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=1.59 cfs 5,338 cf
SubcatchmentP1Lp:	Runoff Area=2.450 ac 0.00% Impervious Runoff Depth=4.26" Flow Length=228' Slope=0.0200 '/' Tc=11.4 min CN=62 Runoff=7.29 cfs 37,874 cf
SubcatchmentP1Mp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=6.34" Flow Length=412' Tc=8.5 min CN=79 Runoff=5.04 cfs 23,020 cf
SubcatchmentP1Ni: PDA 4B Impervious	Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=8.65" Flow Length=861' Tc=19.4 min CN=98 Runoff=0.53 cfs 4,082 cf
SubcatchmentP1Np: PDA 4B Pervious	Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=6.22" Flow Length=861' Tc=19.4 min CN=78 Runoff=24.73 cfs 168,638 cf
SubcatchmentP2Ap: PDA 2A Pervious	Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=6.34" Flow Length=382' Tc=14.9 min CN=79 Runoff=2.75 cfs 16,344 cf
SubcatchmentP2Bp: PDA 2B Pervious	Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=6.10" Flow Length=289' Tc=12.9 min CN=77 Runoff=2.17 cfs 11,951 cf
SubcatchmentP3Ap: PDA 3A Pervious	Runoff Area=0.950 ac 0.00% Impervious Runoff Depth=6.34" Flow Length=218' Tc=2.9 min CN=79 Runoff=6.84 cfs 21,869 cf
SubcatchmentP3Bp: PDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=5.73" Flow Length=860' Tc=19.5 min CN=74 Runoff=20.02 cfs 135,795 cf
SubcatchmentP4p: PDA 4 Pervious	Runoff Area=2.250 ac 0.00% Impervious Runoff Depth=1.55" Flow Length=636' Tc=10.9 min CN=39 Runoff=1.78 cfs 12,669 cf
Pond B1: UG BASIN	Peak Elev=11.87' Storage=0.929 af Inflow=22.79 cfs 77,078 cf Outflow=5.88 cfs 67,558 cf
Pond CW1A: CONSTRUCTED	Peak Elev=15.09' Storage=119,821 cf Inflow=66.79 cfs 276,894 cf 36.0" Round Culvert n=0.012 L=634.0' S=0.0016 '/' Outflow=13.05 cfs 274,994 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Pond CW1B: CONSTRUCTED	Peak Elev=14.98' Storage=113,151 cf Inflow=82.02 cfs 674,289 cf 48.0" Round Culvert n=0.012 L=312.0' S=0.0032 ' /' Outflow=38.14 cfs 671,989 cf
Pond CW1C: CONSTRUCTED	Peak Elev=14.60' Storage=34,720 cf Inflow=47.15 cfs 792,501 cf 36.0" Round Culvert x 2.00 n=0.012 L=1,202.0' S=0.0008 ' /' Outflow=46.35 cfs 792,182 cf
Pond CW1D: CONSTRUCTED	Peak Elev=13.36' Storage=80,196 cf Inflow=98.60 cfs 1,080,381 cf Outflow=71.37 cfs 1,079,128 cf
Pond PP1: POROUS PAVEMENT	Peak Elev=16.69' Storage=10,838 cf Inflow=7.07 cfs 23,975 cf Outflow=4.06 cfs 21,086 cf
Pond PP2: POROUS PAVEMENT	Peak Elev=16.13' Storage=24,033 cf Inflow=16.46 cfs 55,565 cf Outflow=10.13 cfs 49,012 cf
Pond PP3: POROUS PAVEMENT	Peak Elev=18.11' Storage=10,624 cf Inflow=6.71 cfs 22,683 cf Outflow=3.61 cfs 19,995 cf
Pond PP4: POROUS PAVEMENT	Peak Elev=14.56' Storage=112,366 cf Inflow=97.88 cfs 339,813 cf Primary=31.40 cfs 237,364 cf Secondary=14.38 cfs 62,581 cf Outflow=44.98 cfs 299,945 cf
Pond PP5: POROUS PAVEMENT	Peak Elev=17.00' Storage=7,317 cf Inflow=7.07 cfs 23,704 cf Outflow=3.99 cfs 20,875 cf
Pond PP6: POROUS PAVEMENT	Peak Elev=16.73' Storage=9,142 cf Inflow=8.23 cfs 27,608 cf Outflow=4.11 cfs 24,349 cf
Link B1V: Valve	Inflow=5.88 cfs 67,558 cf Primary=5.88 cfs 67,558 cf
Link P1: PDA 1	Inflow=107.48 cfs 1,318,079 cf Primary=107.48 cfs 1,318,079 cf
Link P1A:	Inflow=83.47 cfs 1,145,360 cf Primary=83.47 cfs 1,145,360 cf
Link P1B: BYPASS	Inflow=25.27 cfs 172,719 cf Primary=25.27 cfs 172,719 cf
Link P2: PDA 2	Inflow=4.89 cfs 28,295 cf Primary=4.89 cfs 28,295 cf
Link P2A: PDA 2A ONSITE	Inflow=2.75 cfs 16,344 cf Primary=2.75 cfs 16,344 cf
Link P2B: BYPASS	Inflow=2.17 cfs 11,951 cf Primary=2.17 cfs 11,951 cf
Link P3: PDA 3	Inflow=22.23 cfs 157,664 cf Primary=22.23 cfs 157,664 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Link P3A: PDA 3A ONSITE

Inflow=6.84 cfs 21,869 cf

Primary=6.84 cfs 21,869 cf

Link P3B: BYPASS

Inflow=20.02 cfs 135,795 cf

Primary=20.02 cfs 135,795 cf

Link P4: PDA 4

Inflow=1.78 cfs 12,669 cf

Primary=1.78 cfs 12,669 cf

Link PP4V: Valve

Inflow=31.40 cfs 237,364 cf

Primary=31.40 cfs 237,364 cf

Total Runoff Area = 2,658,031 sf Runoff Volume = 1,590,084 cf Average Runoff Depth = 7.18"
42.74% Pervious = 1,136,045 sf 57.26% Impervious = 1,521,986 sf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ai:

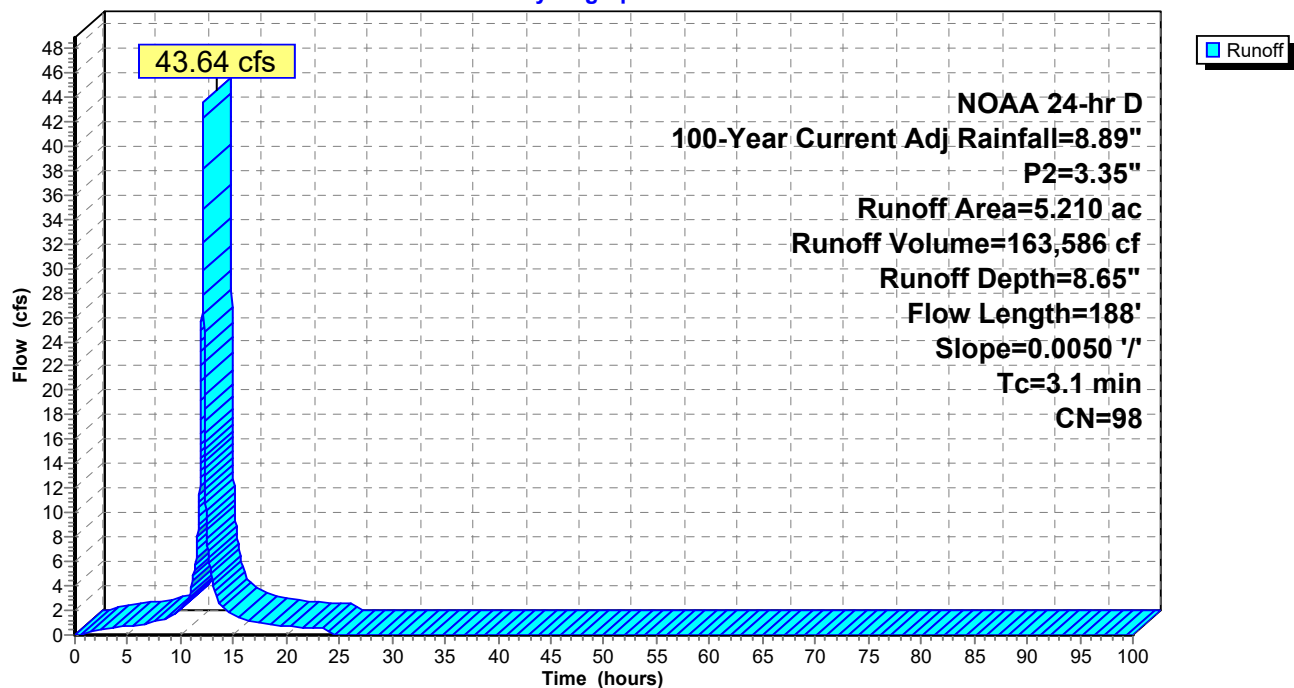
Runoff = 43.64 cfs @ 12.11 hrs, Volume= 163,586 cf, Depth= 8.65"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
5.210	98	Paved parking, HSG D
5.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Ai:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ap:

Runoff = 1.12 cfs @ 12.14 hrs, Volume= 5,293 cf, Depth= 1.55"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

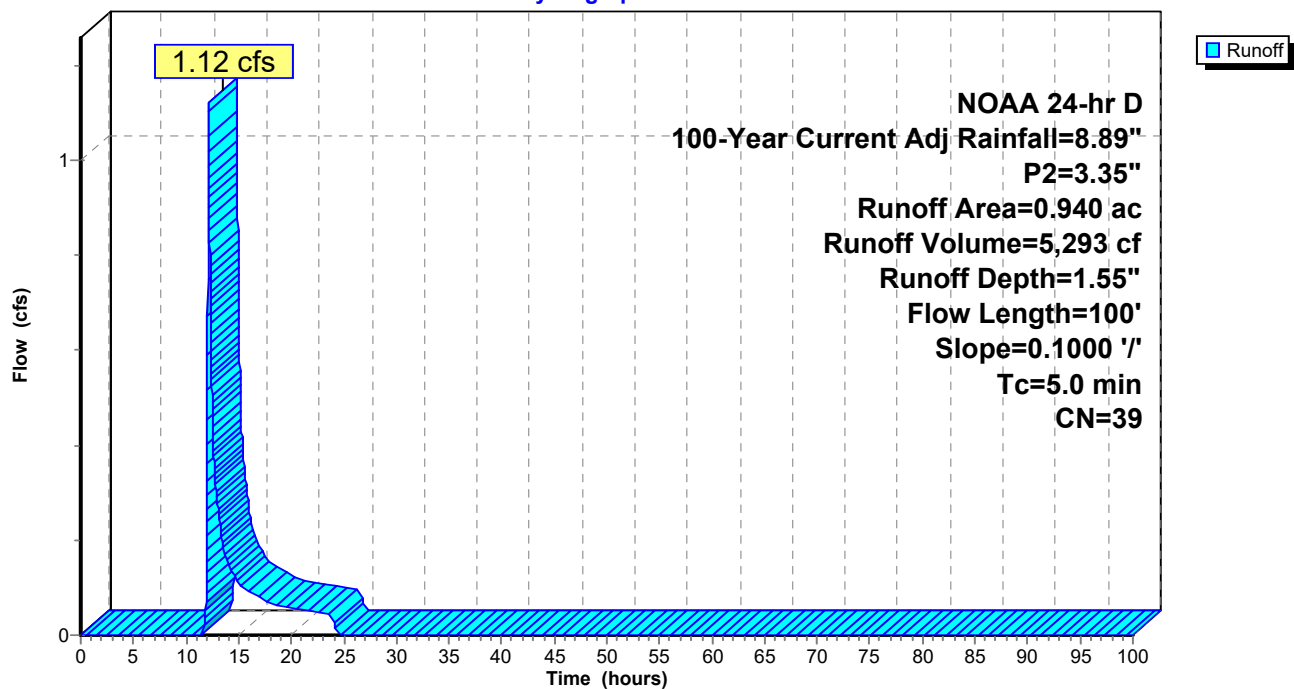
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.940	39	>75% Grass cover, Good, HSG A
0.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Ap:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Bi:

Runoff = 36.93 cfs @ 12.11 hrs, Volume= 138,467 cf, Depth= 8.65"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

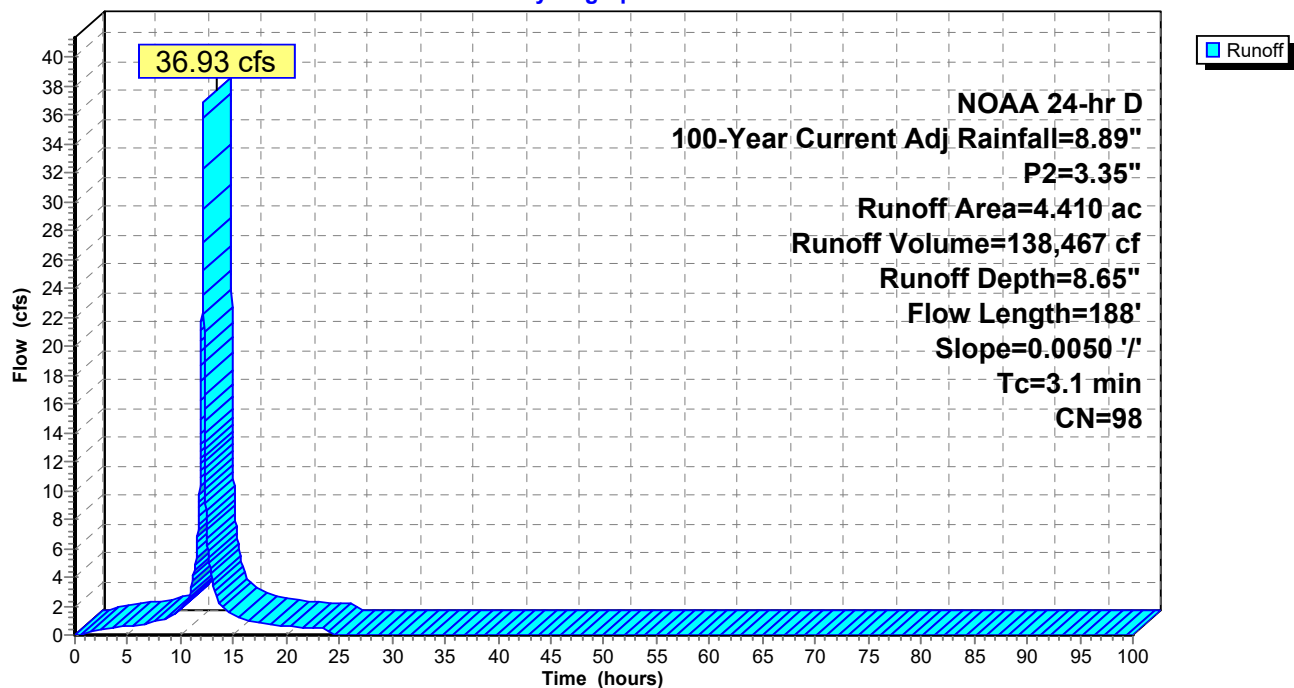
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
4.410	98	Paved parking, HSG D
4.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Bi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Bp:

Runoff = 6.26 cfs @ 12.13 hrs, Volume= 23,464 cf, Depth= 6.46"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

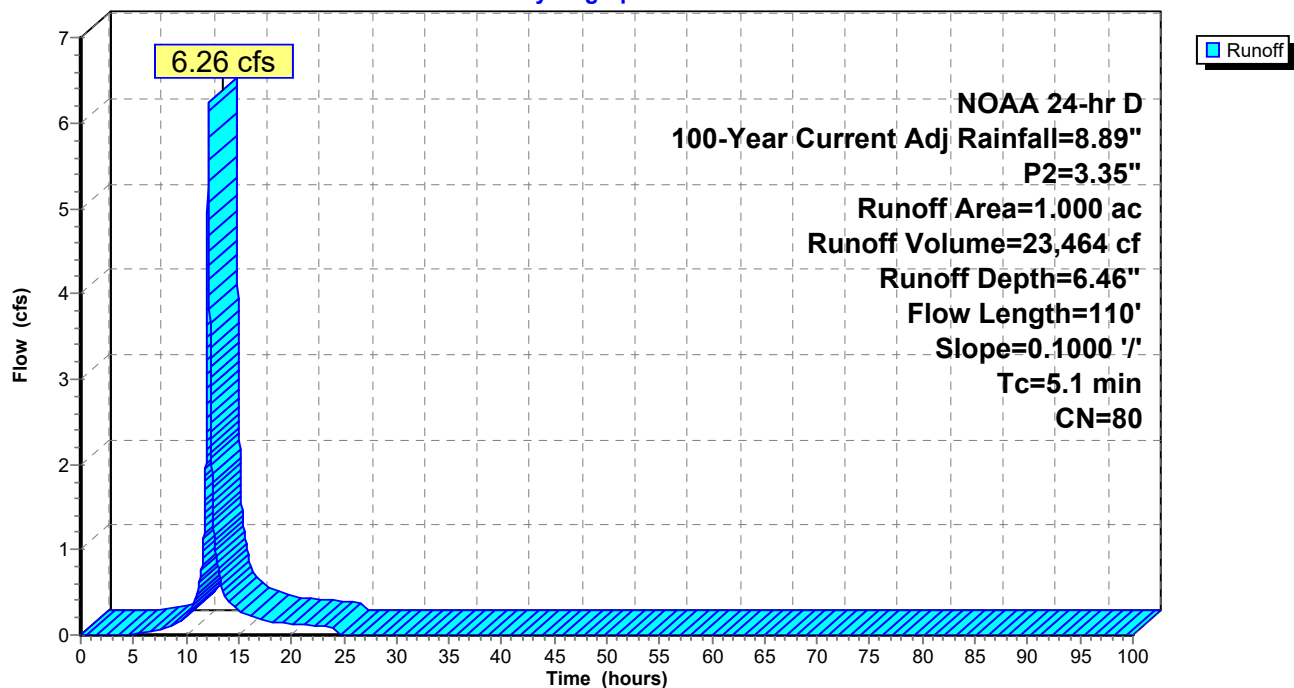
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
1.000	80	>75% Grass cover, Good, HSG D
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	110	Total			

Subcatchment P1Bp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Cp:

Runoff = 0.83 cfs @ 12.14 hrs, Volume= 3,941 cf, Depth= 1.55"

Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

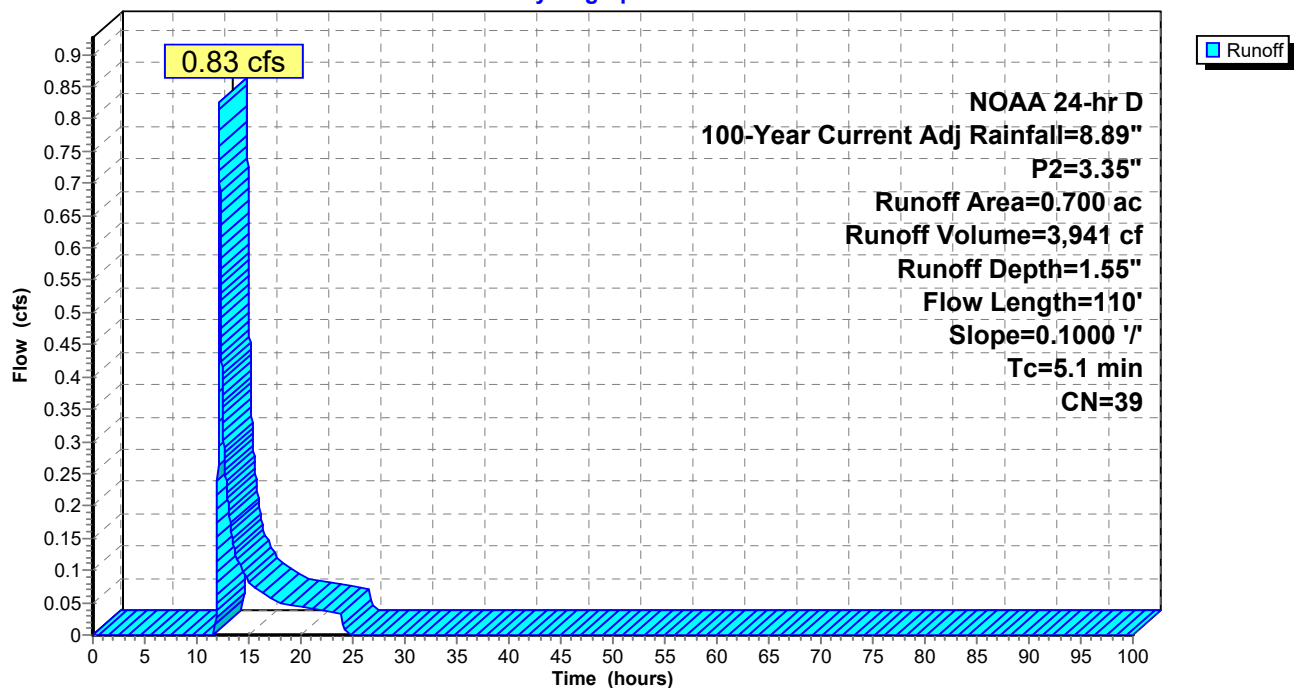
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.700	39	>75% Grass cover, Good, HSG A
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	110	Total			

Subcatchment P1Cp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Di:

Runoff = 60.55 cfs @ 12.11 hrs, Volume= 227,011 cf, Depth= 8.65"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

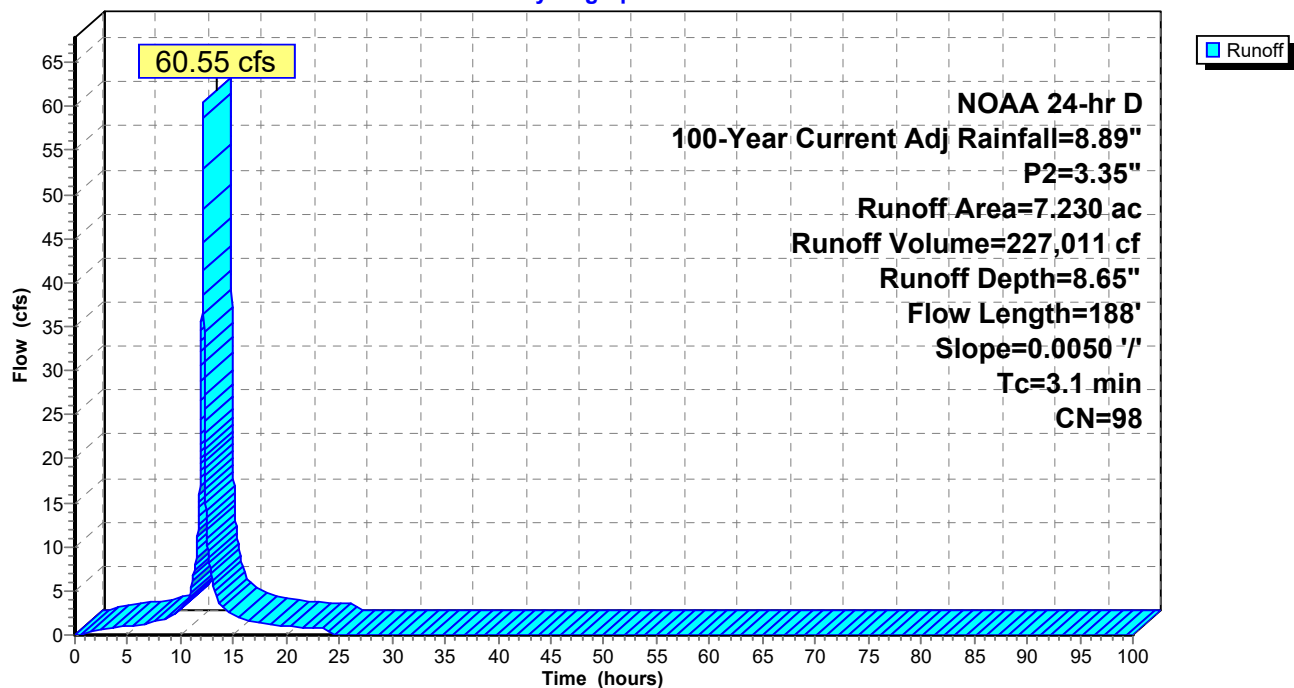
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
7.230	98	Paved parking, HSG D
7.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.81		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	188	Total			

Subcatchment P1Di:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Dp:

Runoff = 5.51 cfs @ 12.13 hrs, Volume= 20,318 cf, Depth= 6.22"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

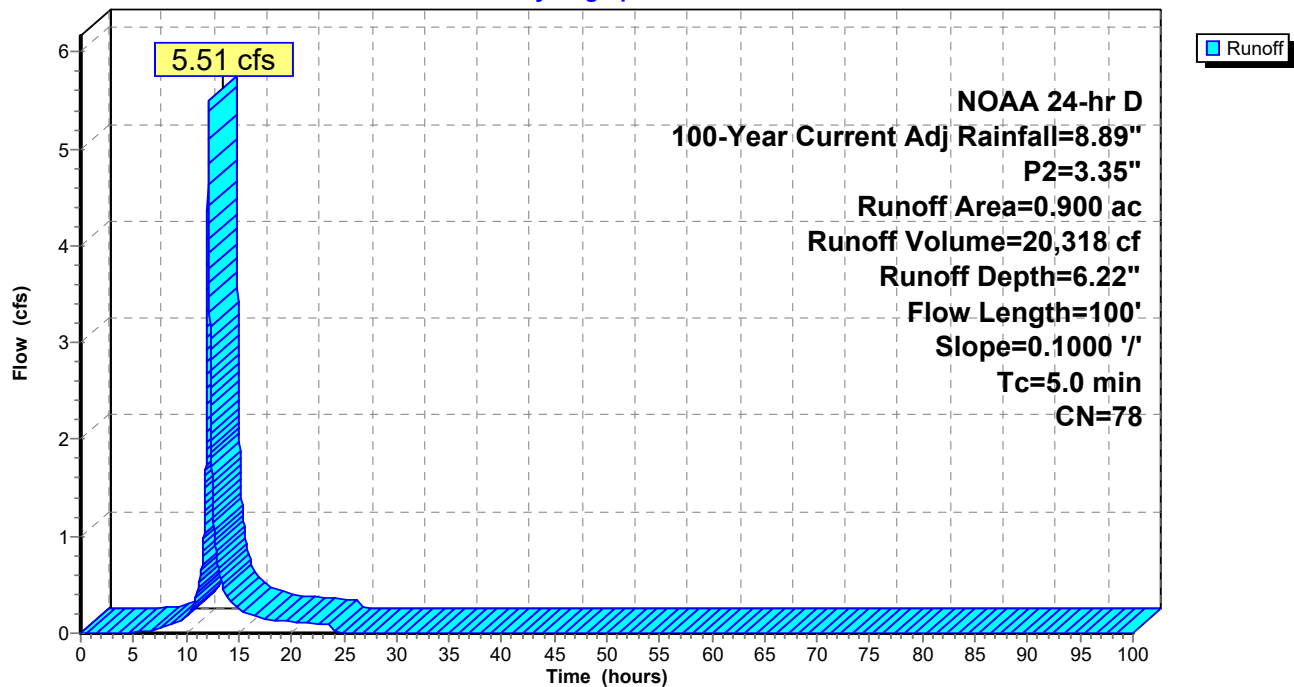
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.040	39	>75% Grass cover, Good, HSG A
0.860	80	>75% Grass cover, Good, HSG D
0.900	78	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1000	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Dp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ei:

Runoff = 7.05 cfs @ 12.10 hrs, Volume= 23,863 cf, Depth= 8.65"
Routed to Pond PP1 : POROUS PAVEMENT

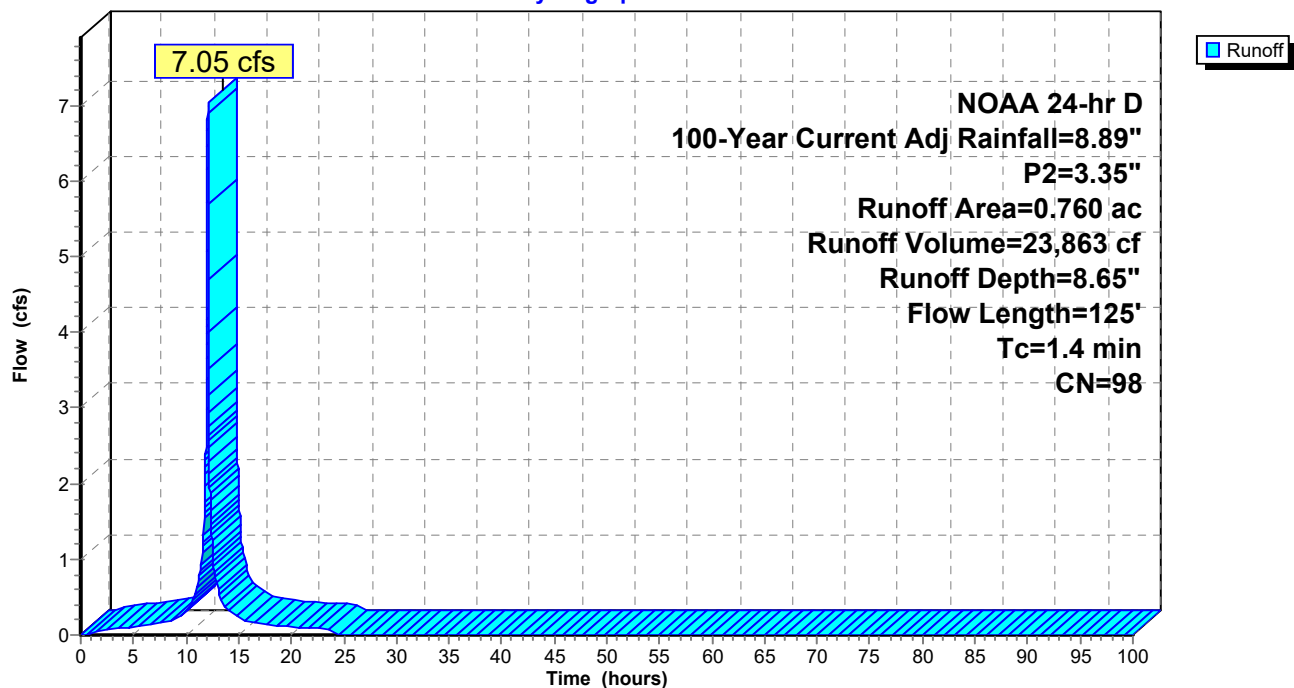
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG D
0.760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	68	0.0200	1.30		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	57	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	125	Total			

Subcatchment P1Ei:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ep:

Runoff = 0.03 cfs @ 12.13 hrs, Volume= 113 cf, Depth= 1.55"
Routed to Pond PP1 : POROUS PAVEMENT

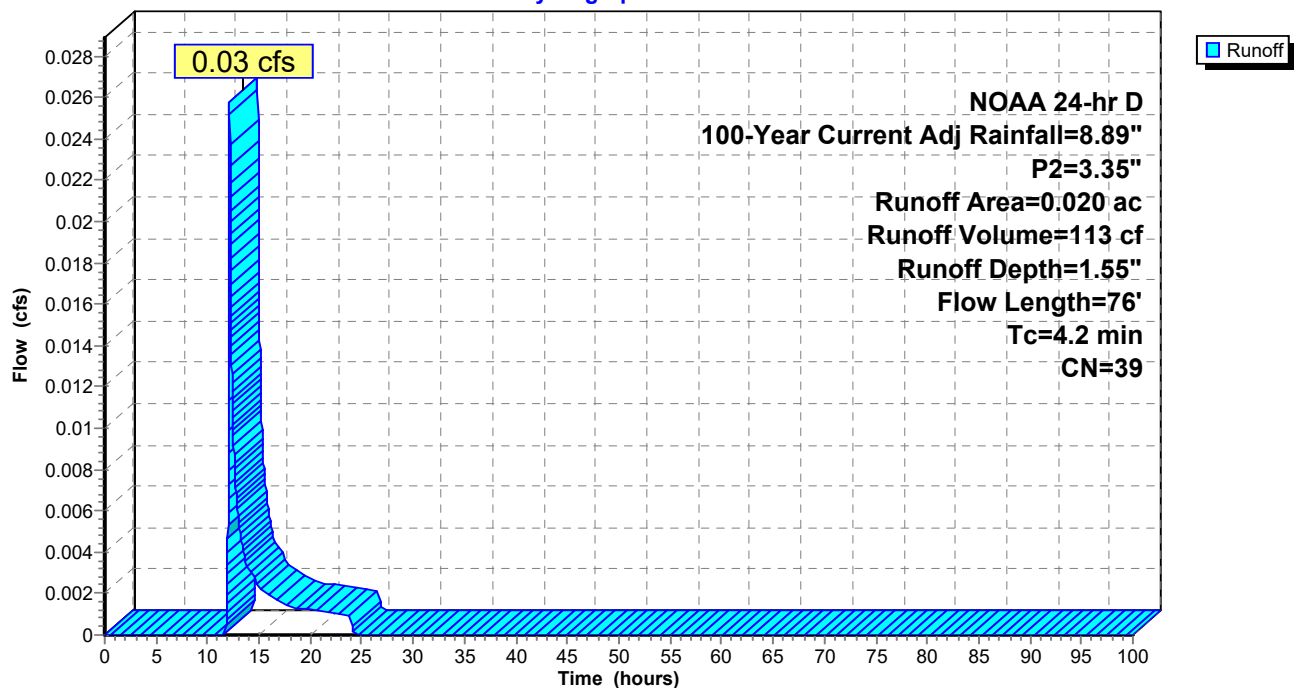
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.020	39	>75% Grass cover, Good, HSG A
0.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	31	0.0200	0.14		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.35"
0.4	45	0.0100	2.03		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
4.2	76	Total			

Subcatchment P1Ep:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Fi:

Runoff = 15.62 cfs @ 12.10 hrs, Volume= 52,749 cf, Depth= 8.65"
Routed to Pond PP2 : POROUS PAVEMENT

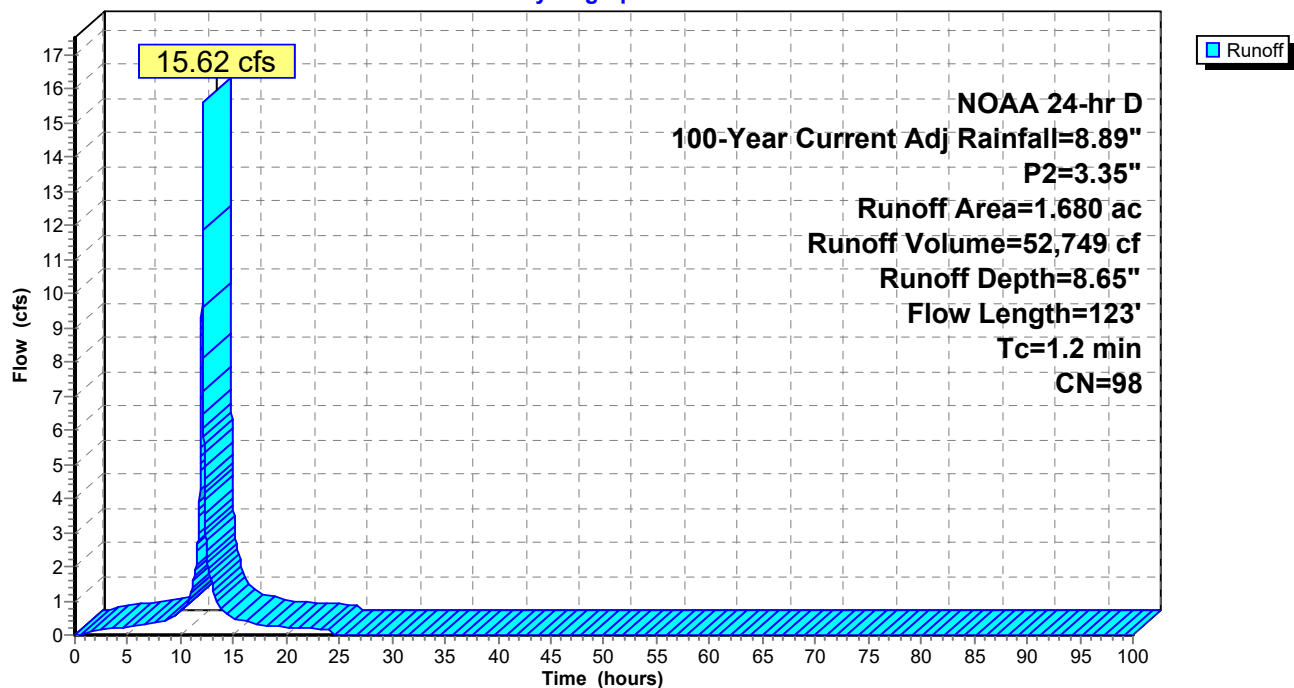
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
1.680	98	Paved parking, HSG D
1.680		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	68	0.0333	1.60		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	123	Total			

Subcatchment P1Fi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Fp:

Runoff = 0.86 cfs @ 12.11 hrs, Volume= 2,816 cf, Depth= 6.46"
Routed to Pond PP2 : POROUS PAVEMENT

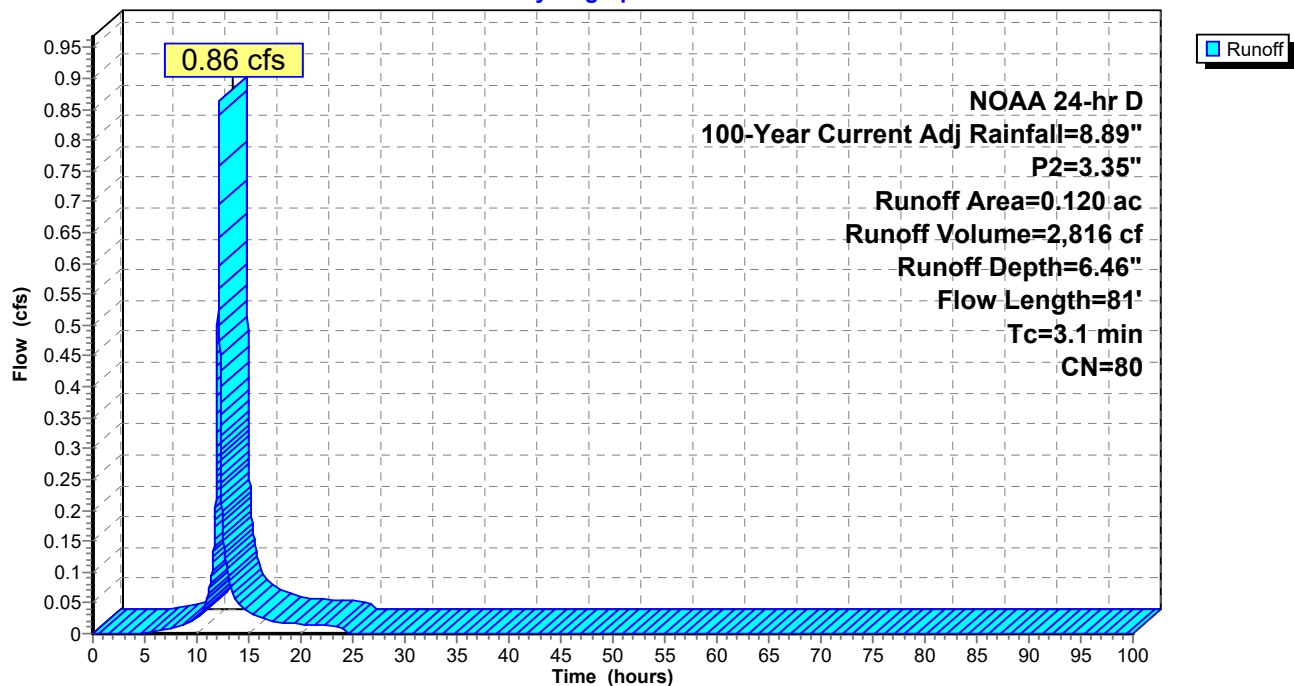
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.120	80	>75% Grass cover, Good, HSG D
0.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	18	0.0200	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	43	0.0333	1.46		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.1	81	Total			

Subcatchment P1Fp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Gi:

Runoff = 6.52 cfs @ 12.10 hrs, Volume= 21,979 cf, Depth= 8.65"
Routed to Pond PP3 : POROUS PAVEMENT

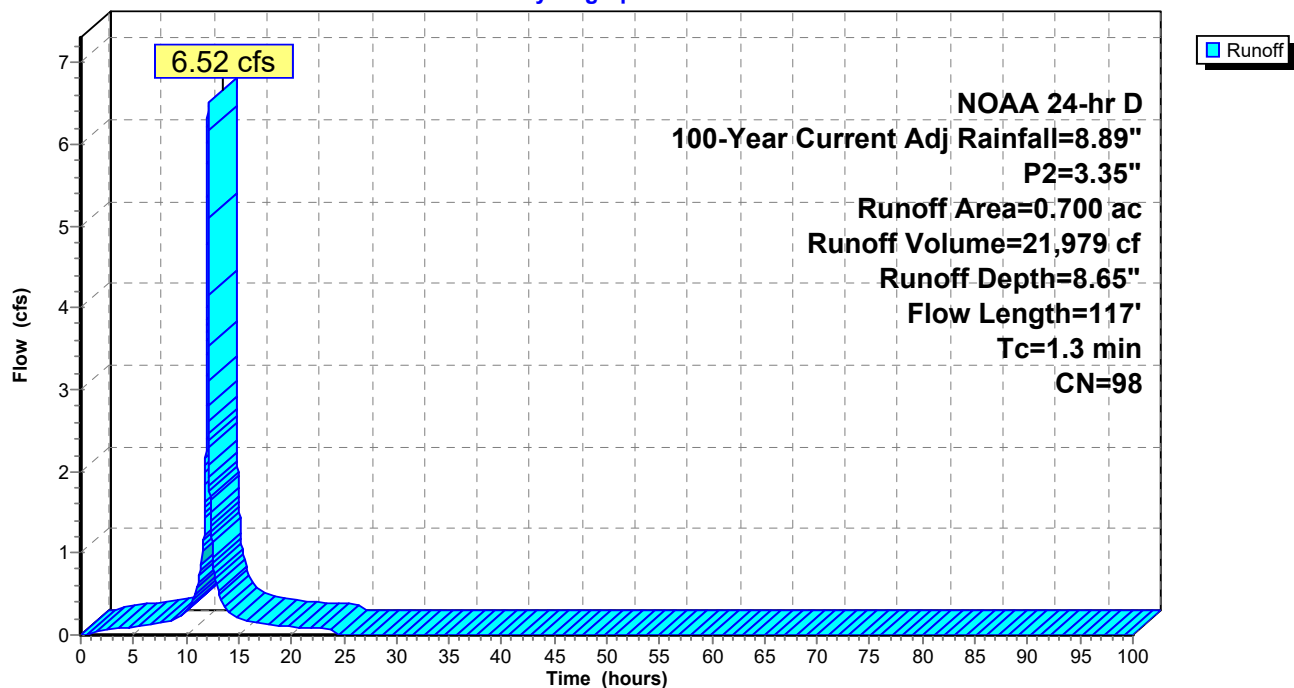
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	69	0.0250	1.43		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	48	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	117	Total			

Subcatchment P1Gi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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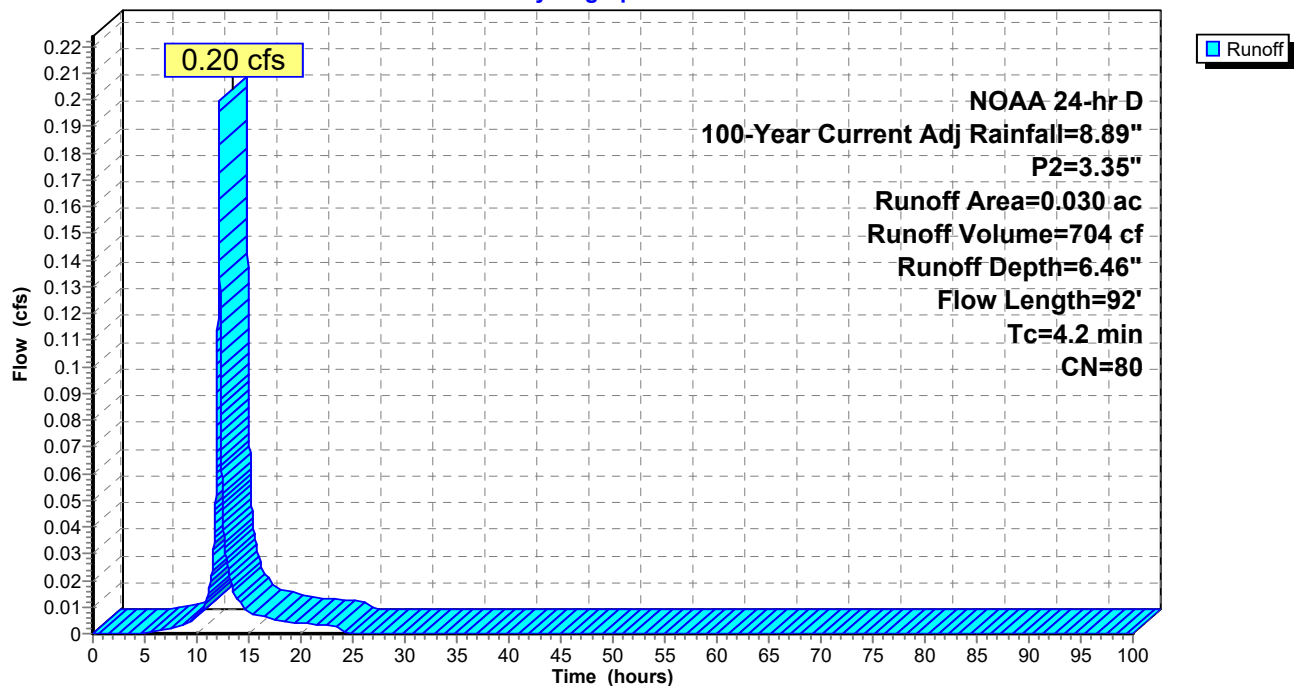
Summary for Subcatchment P1Gp:

Runoff = 0.20 cfs @ 12.12 hrs, Volume= 704 cf, Depth= 6.46"
Routed to Pond PP3 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.030	80	>75% Grass cover, Good, HSG D
0.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	29	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.1	8	0.0250	0.93		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.2	92	Total			

Subcatchment P1Gp:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Hi:

Runoff = 96.47 cfs @ 12.10 hrs, Volume= 333,765 cf, Depth= 8.65"
Routed to Pond PP4 : POROUS PAVEMENT

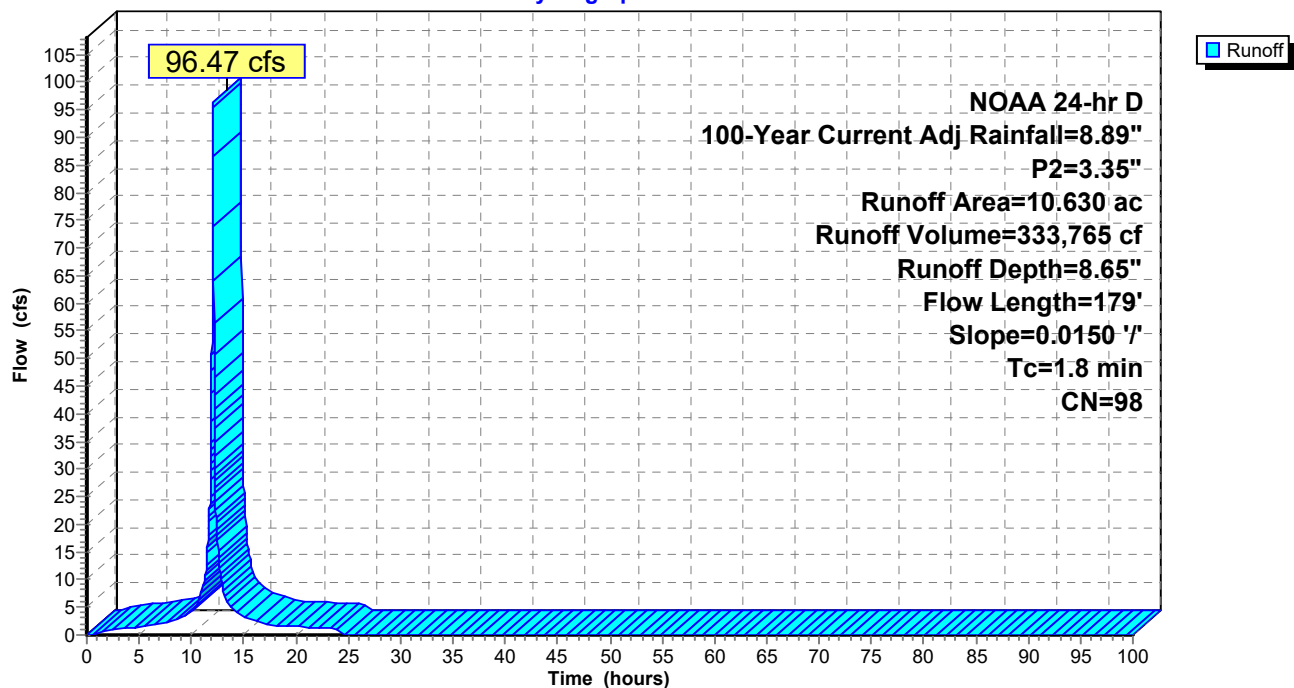
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
10.630	98	Paved parking, HSG D
10.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.25		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	79	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.8	179	Total			

Subcatchment P1Hi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Hp:

Runoff = 1.59 cfs @ 12.14 hrs, Volume= 6,048 cf, Depth= 4.50"
Routed to Pond PP4 : POROUS PAVEMENT

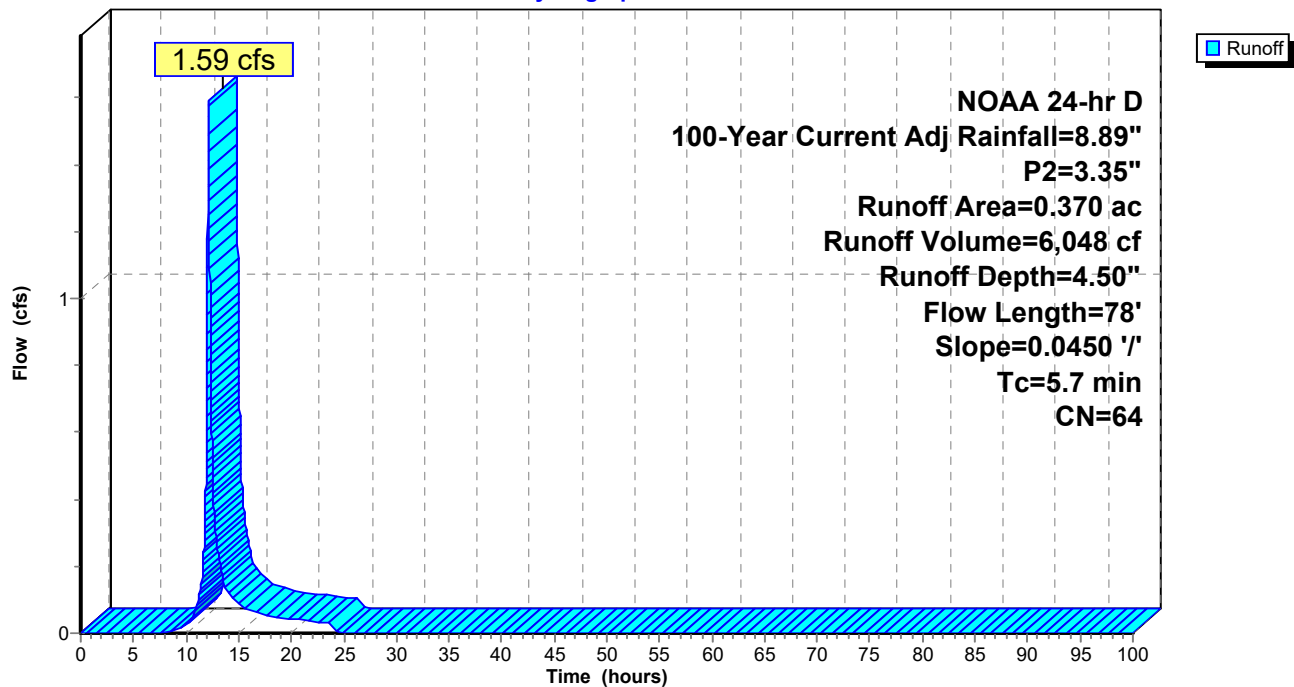
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.230	80	>75% Grass cover, Good, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.370	64	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	78	0.0450	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Hp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1li:

Runoff = 6.91 cfs @ 12.09 hrs, Volume= 23,235 cf, Depth= 8.65"
Routed to Pond PP5 : POROUS PAVEMENT

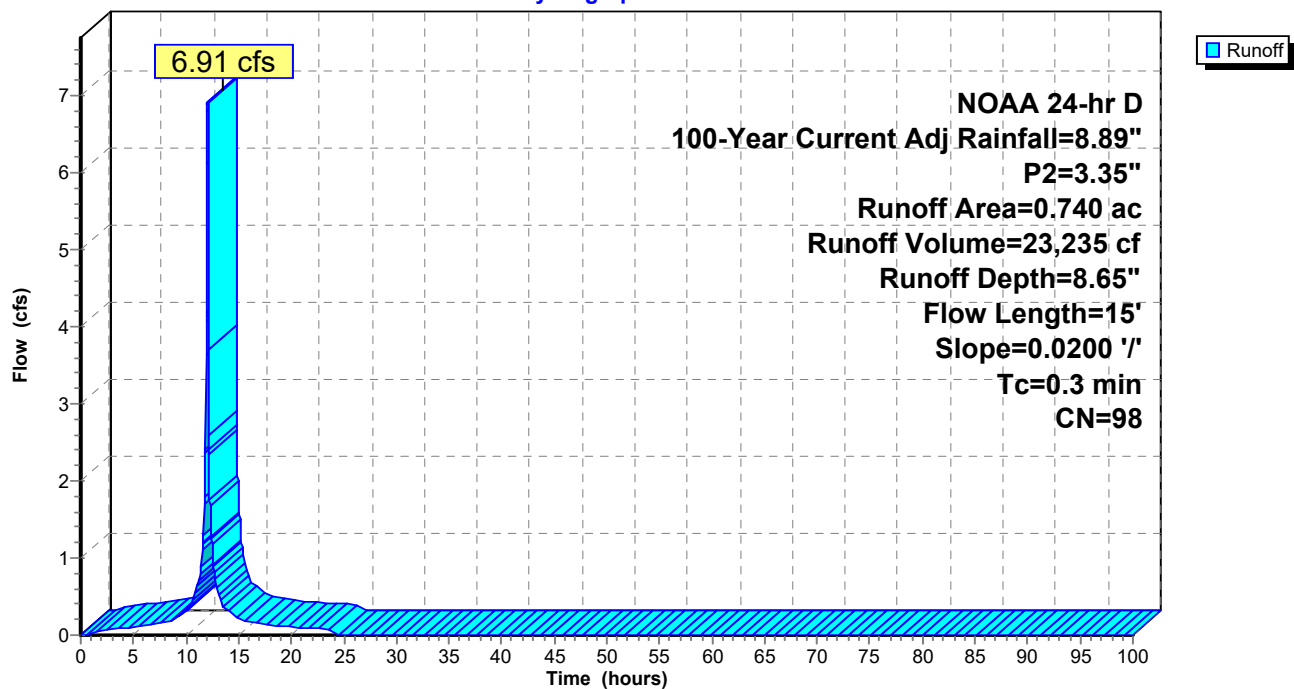
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
0.740		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.96		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1li:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1lp:

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 469 cf, Depth= 6.46"
Routed to Pond PP5 : POROUS PAVEMENT

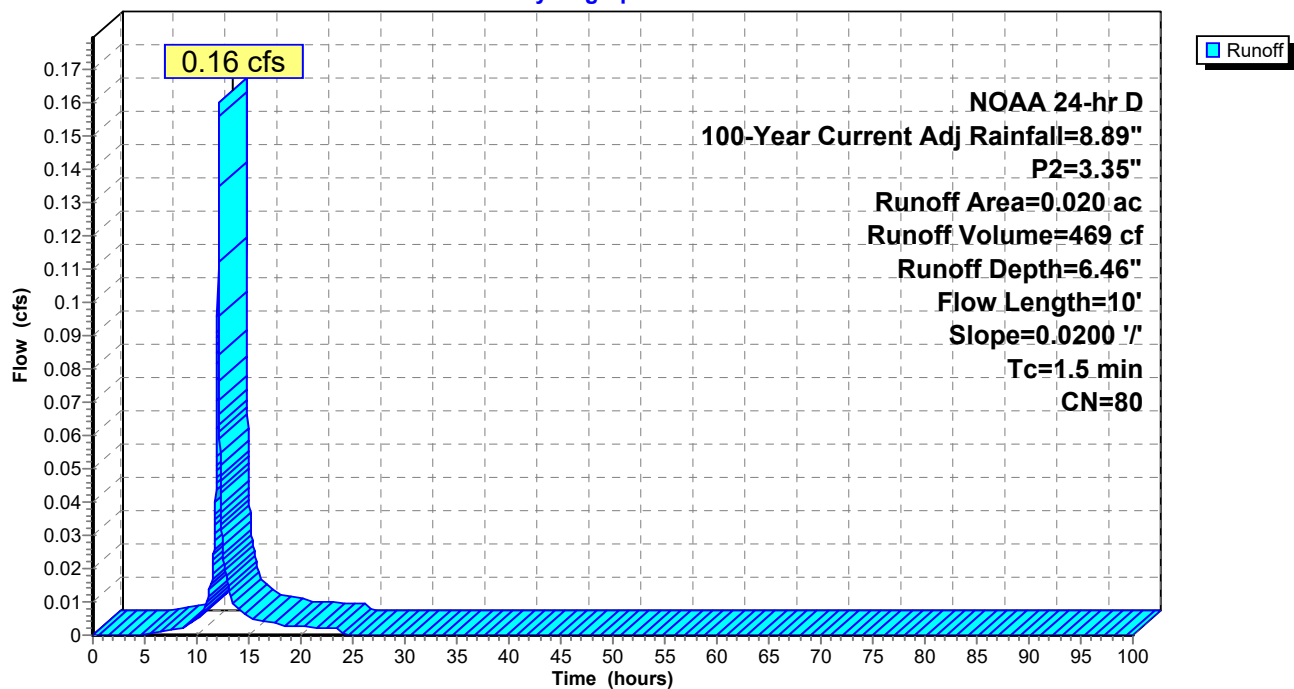
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.020	80	>75% Grass cover, Good, HSG D
0.020		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, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1lp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ji:

Runoff = 8.13 cfs @ 12.09 hrs, Volume= 27,317 cf, Depth= 8.65"
Routed to Pond PP6 : POROUS PAVEMENT

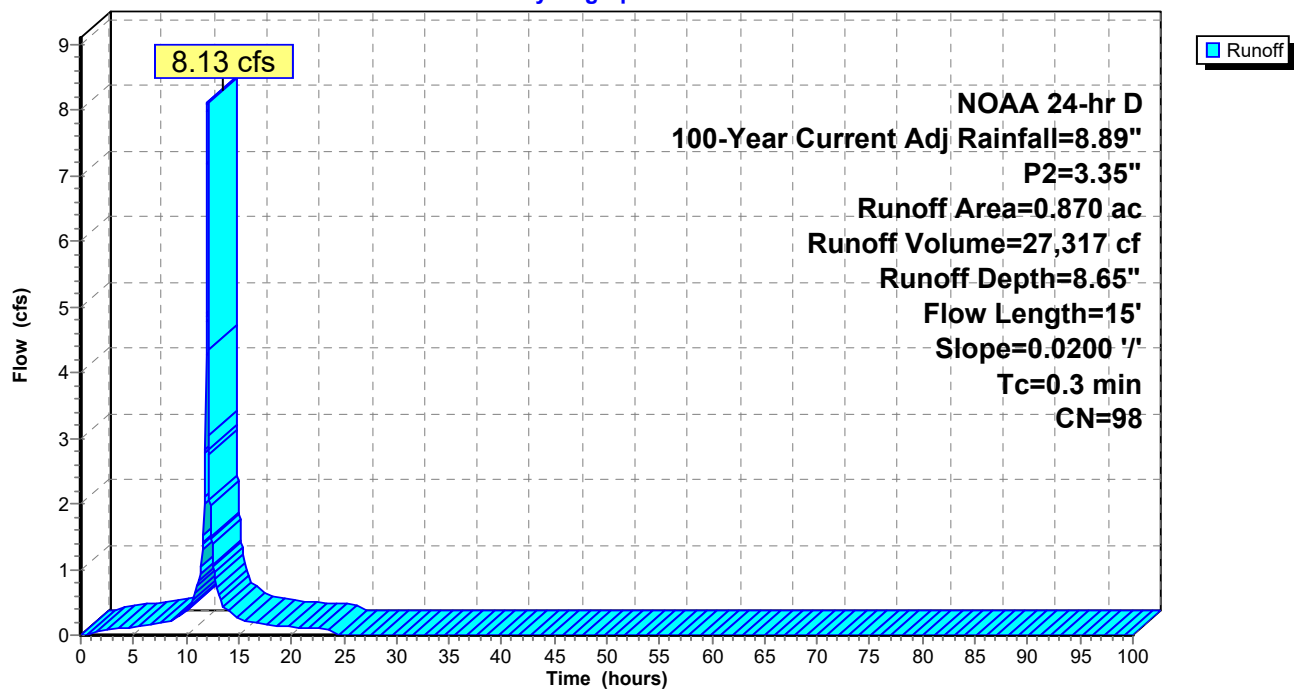
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.870	98	Paved parking, HSG D
0.870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.96		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1Ji:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Jp:

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 291 cf, Depth= 4.01"
Routed to Pond PP6 : POROUS PAVEMENT

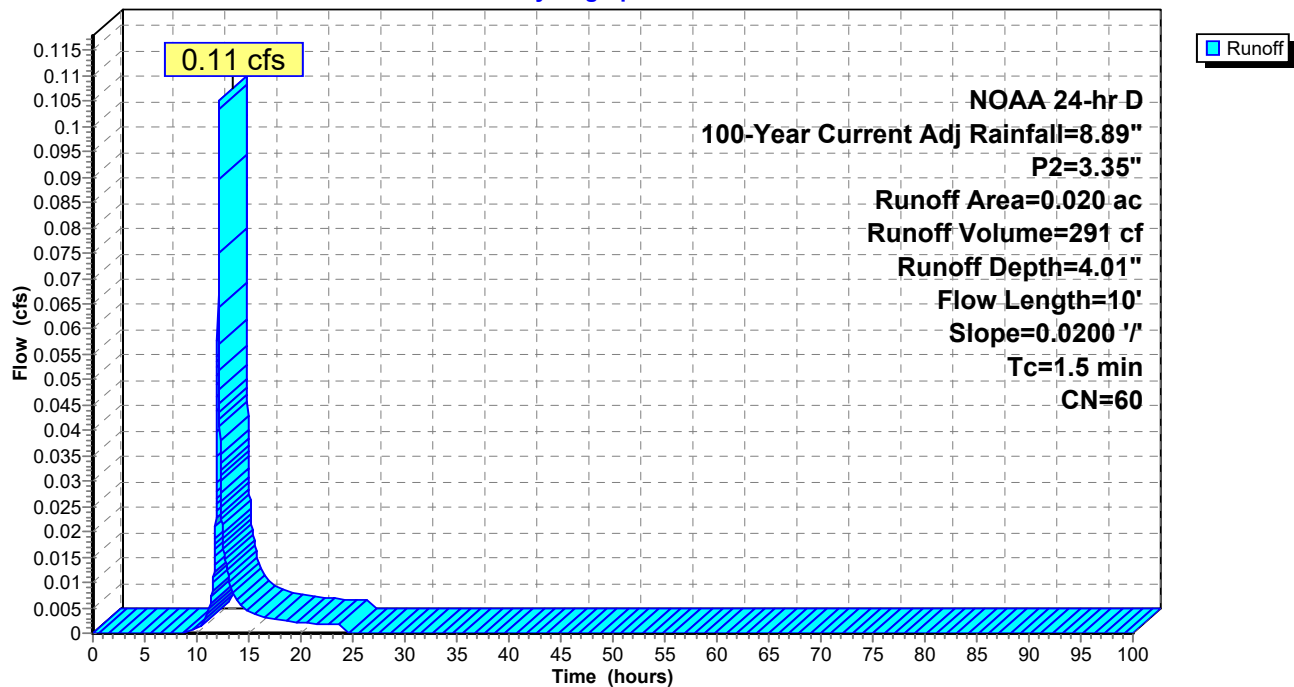
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.010	80	>75% Grass cover, Good, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.020	60	Weighted Average
0.020		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, Grass: Short n= 0.150 P2= 3.35"

Subcatchment P1Jp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ki:

Runoff = 22.36 cfs @ 12.10 hrs, Volume= 75,670 cf, Depth= 8.65"
Routed to Pond B1 : UG BASIN

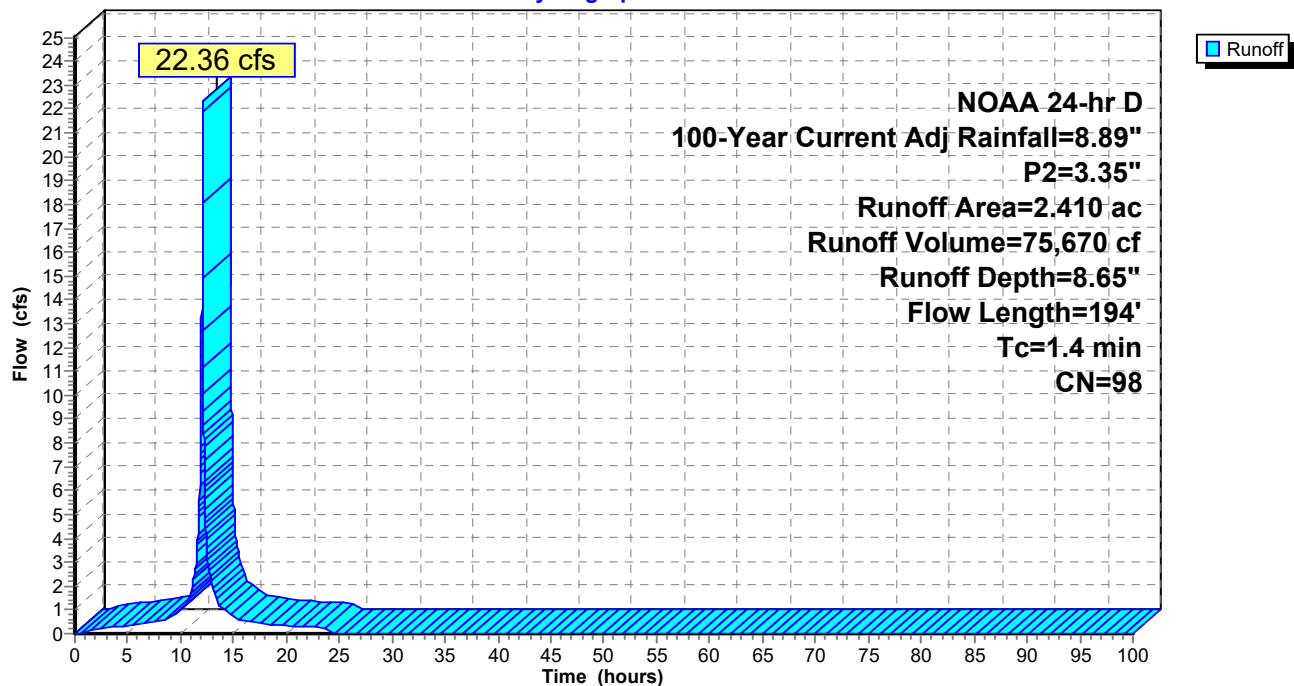
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
2.410	98	Paved parking, HSG D
2.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	72	0.0250	1.44		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	55	0.0350	3.80		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	67	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	194	Total			

Subcatchment P1Ki:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Kp:

Runoff = 0.44 cfs @ 12.11 hrs, Volume= 1,408 cf, Depth= 6.46"
Routed to Pond B1 : UG BASIN

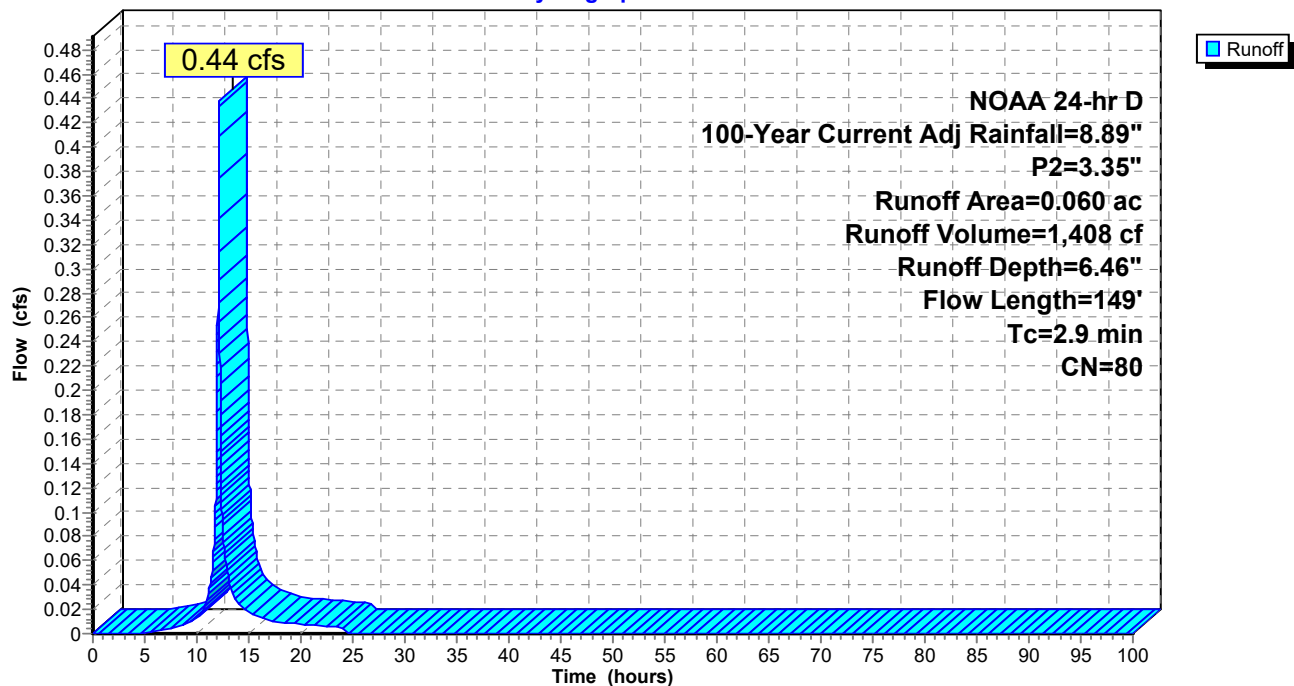
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	13	0.0250	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.8	67	0.0250	1.42		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	69	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	149	Total			

Subcatchment P1Kp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Li:

Runoff = 1.59 cfs @ 12.09 hrs, Volume= 5,338 cf, Depth= 8.65"
Routed to Link P1A :

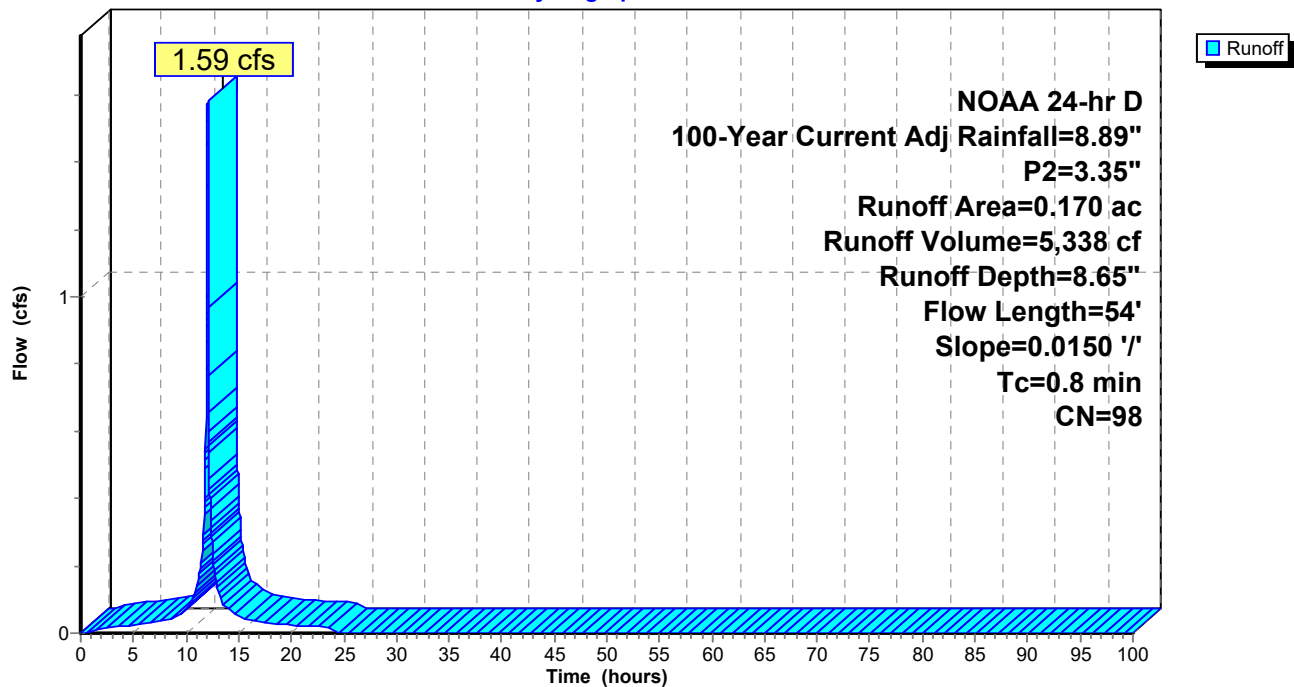
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.170	98	Paved parking, HSG D
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	54	0.0150	1.11		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment P1Li:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Lp:

Runoff = 7.29 cfs @ 12.21 hrs, Volume= 37,874 cf, Depth= 4.26"
Routed to Link P1A :

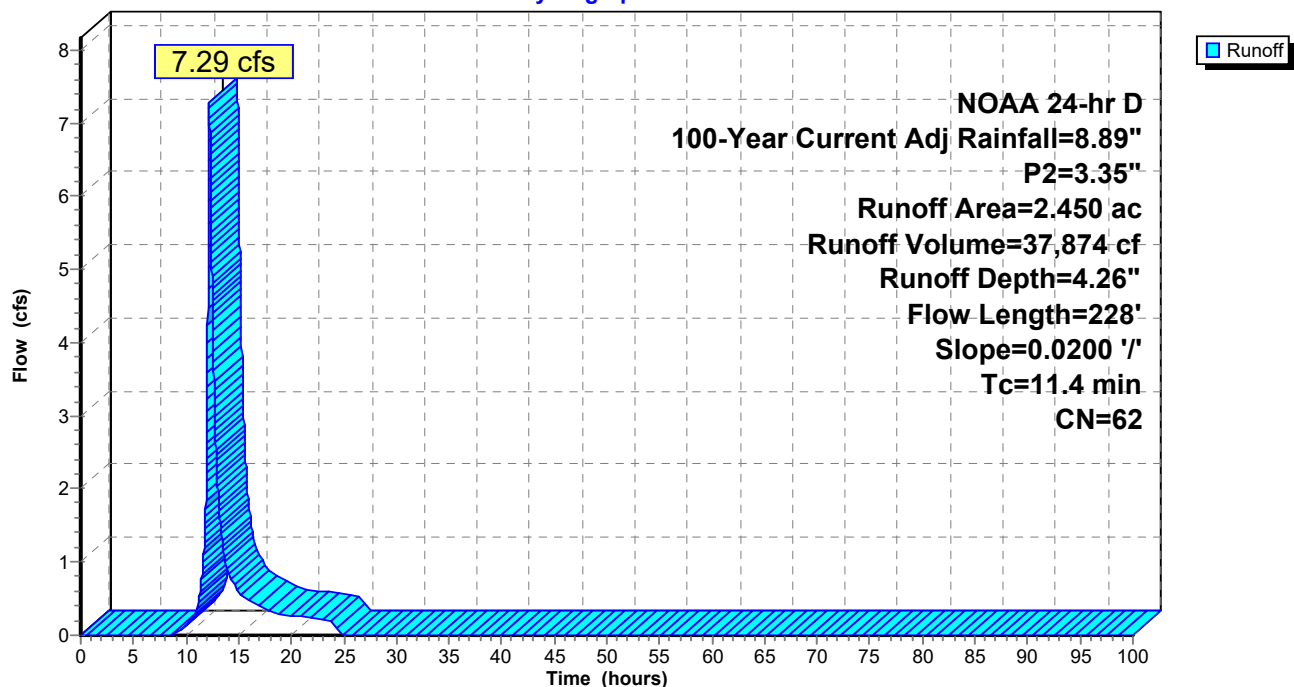
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
1.360	80	>75% Grass cover, Good, HSG D
1.090	39	>75% Grass cover, Good, HSG A
2.450	62	Weighted Average
2.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	94	0.0200	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 3.35" Using McCuen-Spiess flow length
2.3	134	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.4	228	Total			

Subcatchment P1Lp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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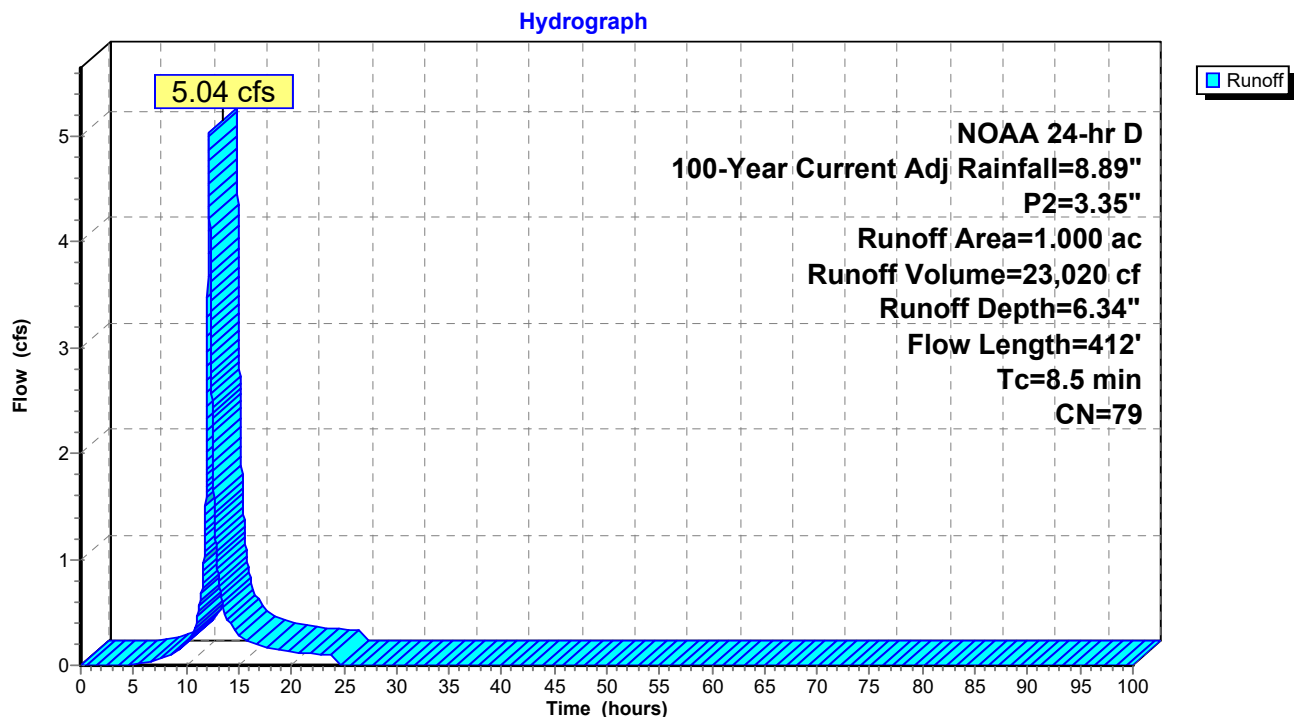
Summary for Subcatchment P1Mp:

Runoff = 5.04 cfs @ 12.17 hrs, Volume= 23,020 cf, Depth= 6.34"
Routed to Link P1A :

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.570	80	>75% Grass cover, Good, HSG D
0.430	77	Woods, Good, HSG D
1.000	79	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	36	0.1806	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.5	412	Total			

Subcatchment P1Mp:

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Ni: PDA 4B Impervious

Runoff = 0.53 cfs @ 12.29 hrs, Volume= 4,082 cf, Depth= 8.65"
Routed to Link P1B : BYPASS

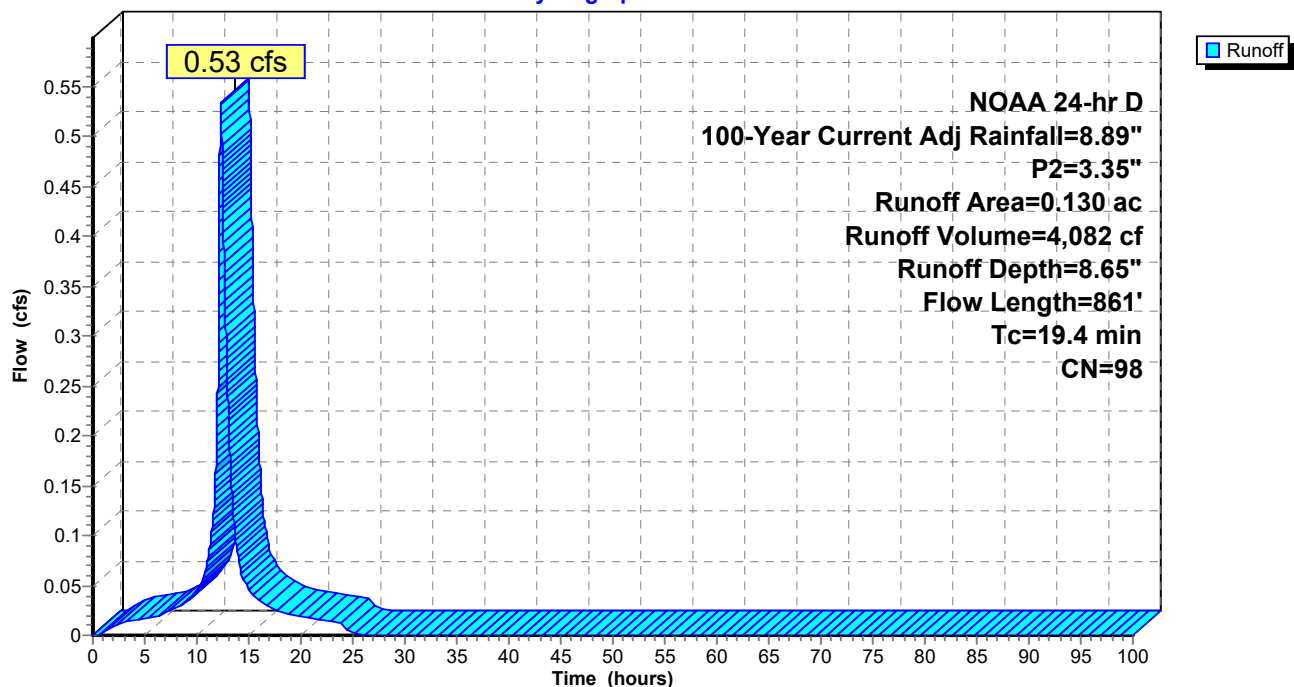
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment P1Ni: PDA 4B Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P1Np: PDA 4B Pervious

Runoff = 24.73 cfs @ 12.32 hrs, Volume= 168,638 cf, Depth= 6.22"
 Routed to Link P1B : BYPASS

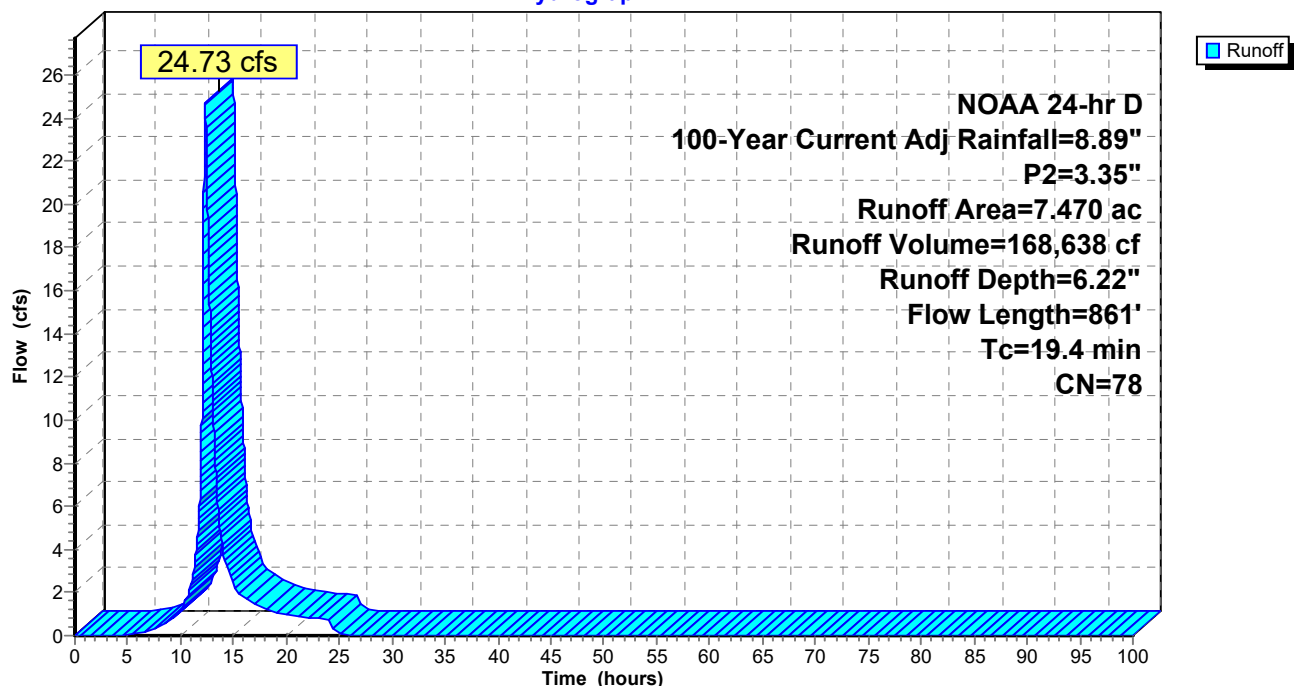
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.1900	0.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
19.4	861	Total			

Subcatchment P1Np: PDA 4B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P2Ap: PDA 2A Pervious

Runoff = 2.75 cfs @ 12.25 hrs, Volume= 16,344 cf, Depth= 6.34"
Routed to Link P2A : PDA 2A ONSITE

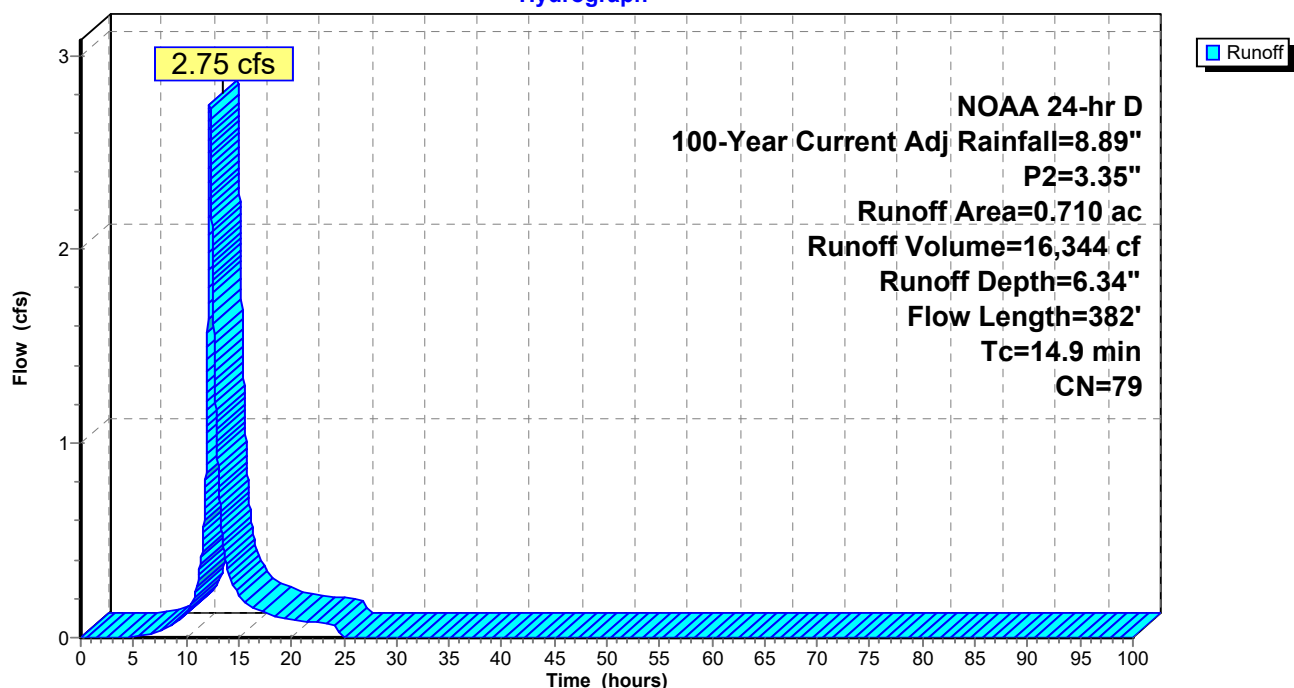
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.360	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
0.710	79	Weighted Average
0.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	70	0.0316	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.5	30	0.0167	1.03		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.9	382	Total			

Subcatchment P2Ap: PDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P2Bp: PDA 2B Pervious

Runoff = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf, Depth= 6.10"
Routed to Link P2B : BYPASS

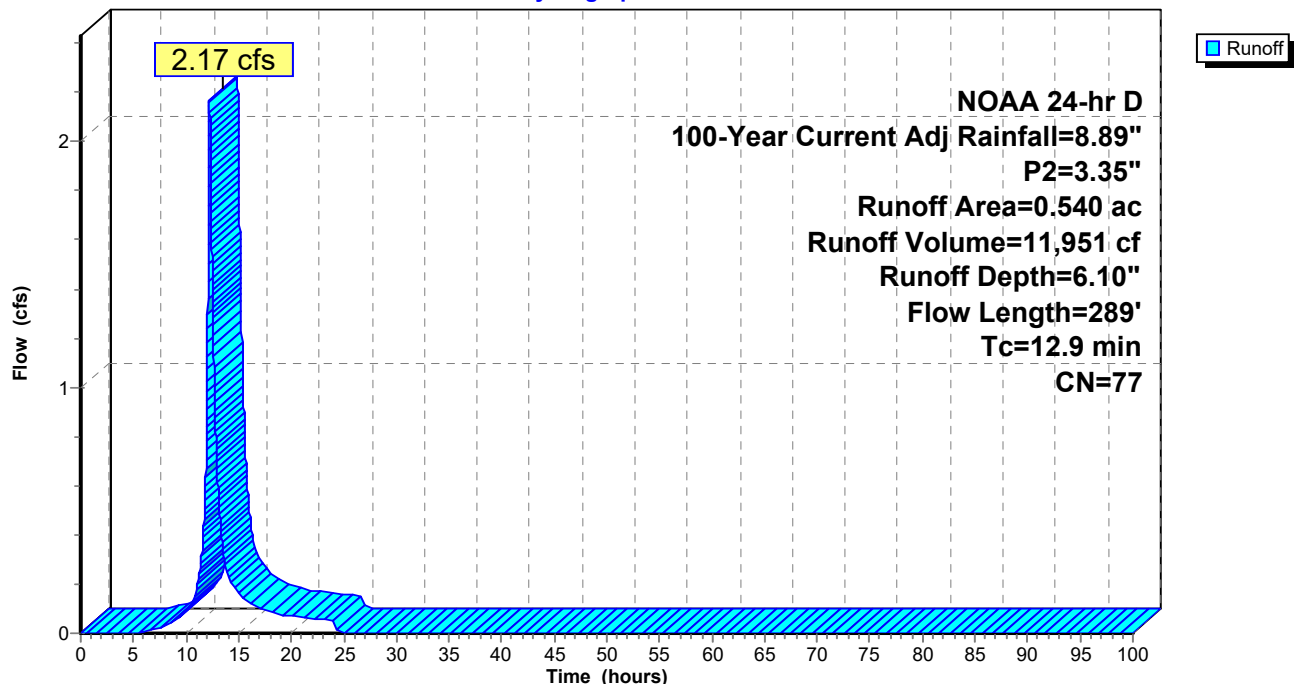
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	46	0.0335	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.9	289	Total			

Subcatchment P2Bp: PDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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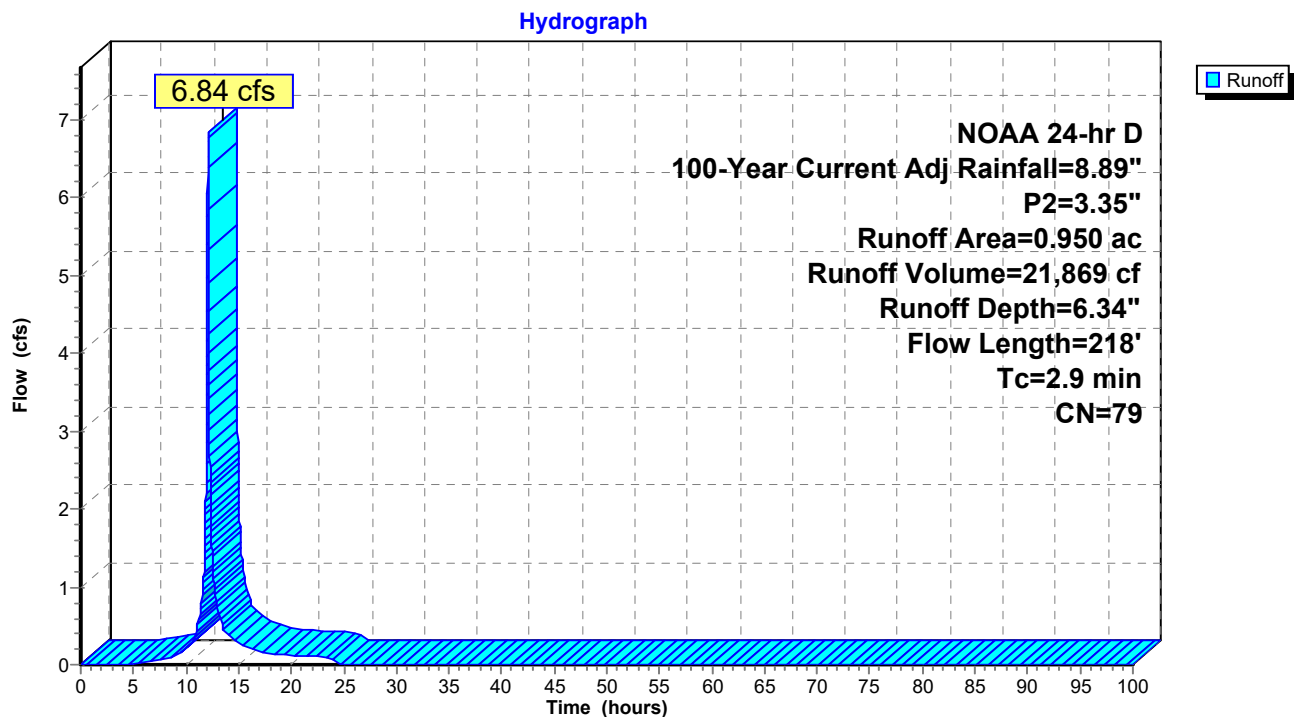
Summary for Subcatchment P3Ap: PDA 3A Pervious

Runoff = 6.84 cfs @ 12.11 hrs, Volume= 21,869 cf, Depth= 6.34"
Routed to Link P3A : PDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.430	77	Woods, Good, HSG D
0.520	80	>75% Grass cover, Good, HSG D
0.950	79	Weighted Average
0.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0312	1.68		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	218	Total			

Subcatchment P3Ap: PDA 3A Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Subcatchment P3Bp: PDA 3B Pervious

Runoff = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf, Depth= 5.73"
Routed to Link P3B : BYPASS

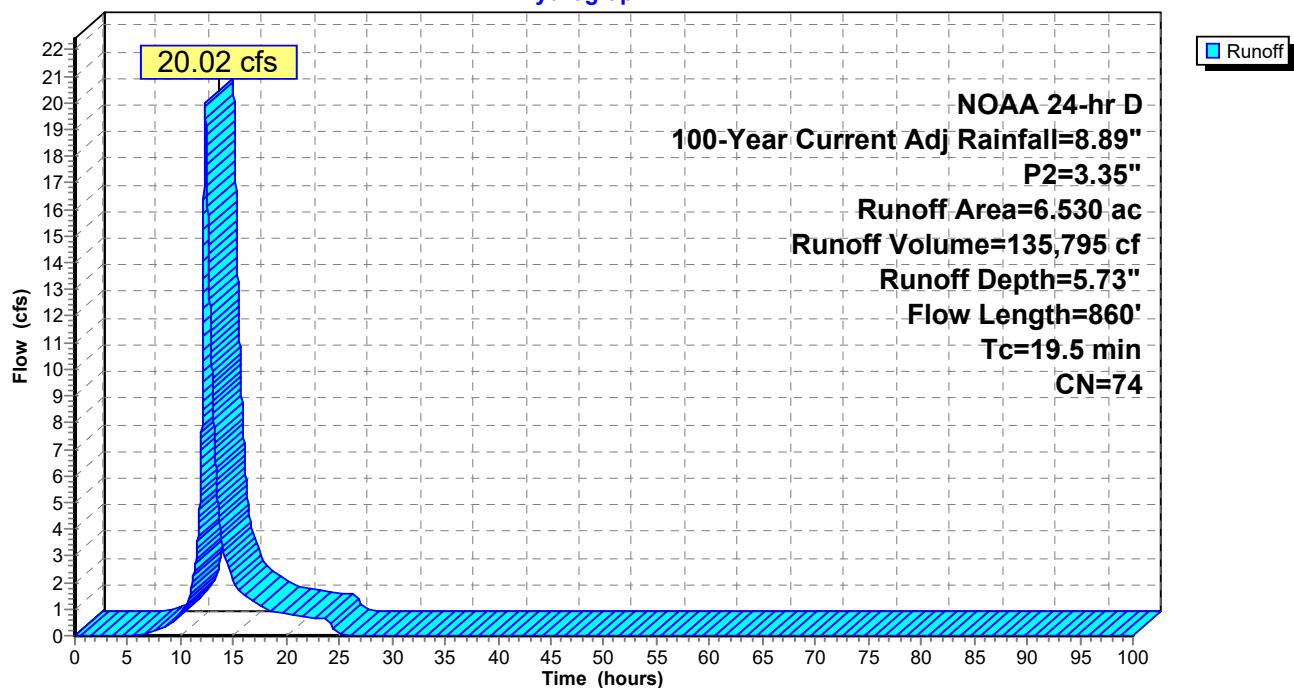
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	59	0.0550	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.35" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.5	860	Total			

Subcatchment P3Bp: PDA 3B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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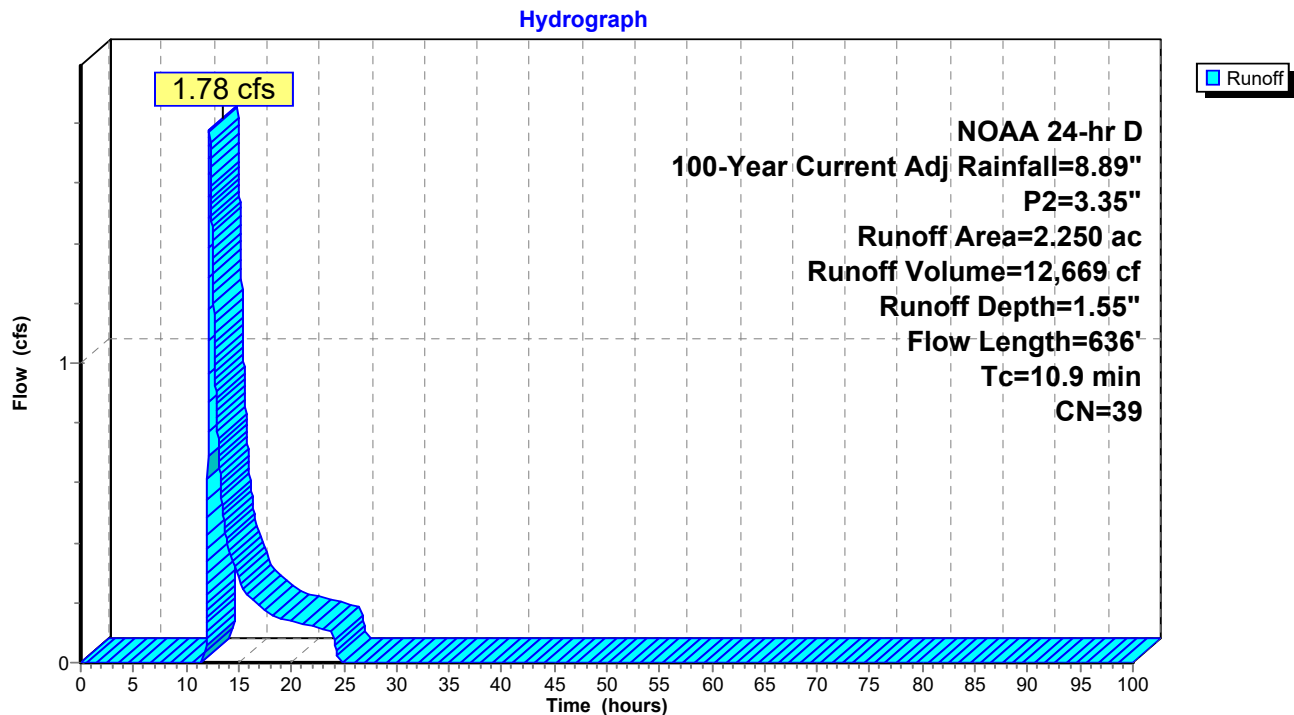
Summary for Subcatchment P4p: PDA 4 Pervious

Runoff = 1.78 cfs @ 12.24 hrs, Volume= 12,669 cf, Depth= 1.55"
Routed to Link P4 : PDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Area (ac)	CN	Description
2.250	39	>75% Grass cover, Good, HSG A
2.250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0088	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.35"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.9	636	Total			

Subcatchment P4p: PDA 4 Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 8.60" for 100-Year Current Adj event
 Inflow = 22.79 cfs @ 12.10 hrs, Volume= 77,078 cf
 Outflow = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf, Atten= 74%, Lag= 11.6 min
 Primary = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.87' @ 12.29 hrs Surf.Area= 0.559 ac Storage= 0.929 af

Plug-Flow detention time= 405.5 min calculated for 67,552 cf (88% of inflow)
 Center-of-Mass det. time= 342.9 min (1,081.4 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Cap x 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.88 cfs @ 12.29 hrs HW=11.87' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 5.88 cfs of 14.50 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.13 cfs @ 5.75 fps)
- 3=Orifice/Grate (Orifice Controls 0.83 cfs @ 4.21 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 3.92 cfs @ 2.21 fps)

Pond B1: UG BASIN - Chamber Wizard Field A**Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

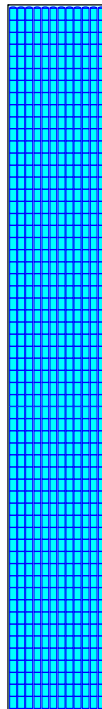
Overall Storage Efficiency = 62.5%

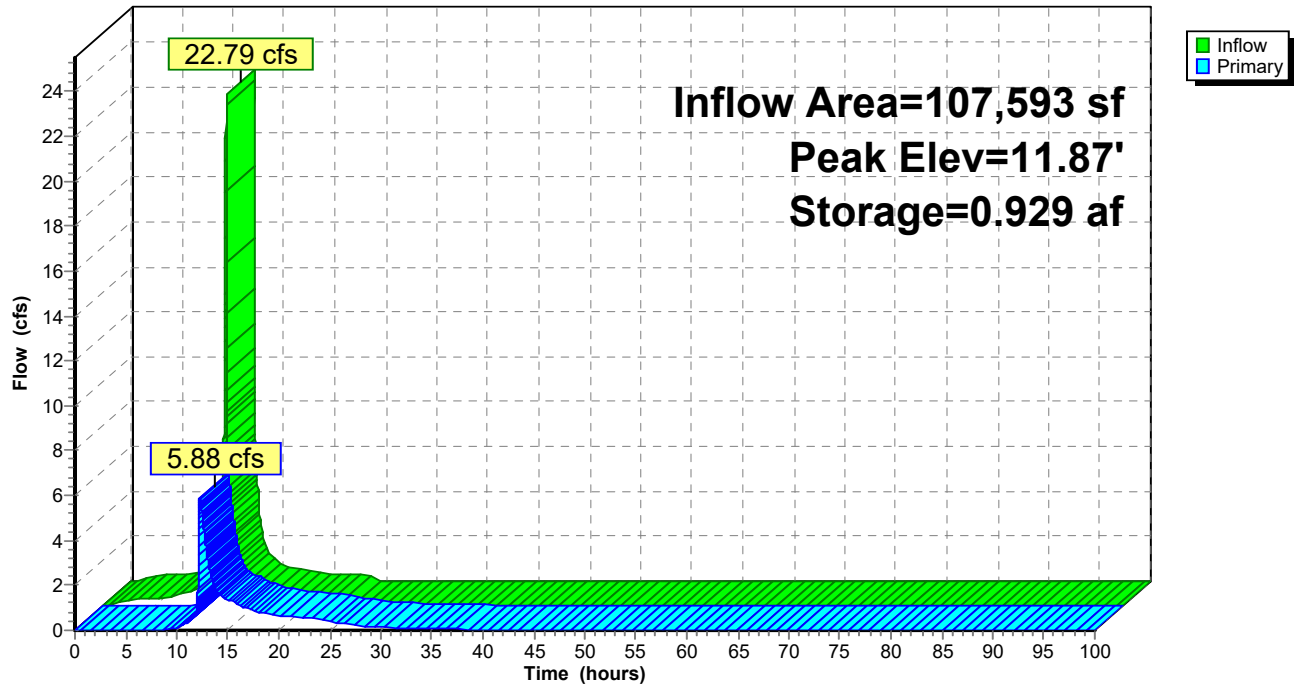
Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 9.75" for 100-Year Current Adj event
 Inflow = 66.79 cfs @ 12.12 hrs, Volume= 276,894 cf
 Outflow = 13.05 cfs @ 13.65 hrs, Volume= 274,994 cf, Atten= 80%, Lag= 92.3 min
 Primary = 13.05 cfs @ 13.65 hrs, Volume= 274,994 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 15.09' @ 12.76 hrs Surf.Area= 28,376 sf Storage= 119,821 cf

Plug-Flow detention time= 311.2 min calculated for 274,967 cf (99% of inflow)

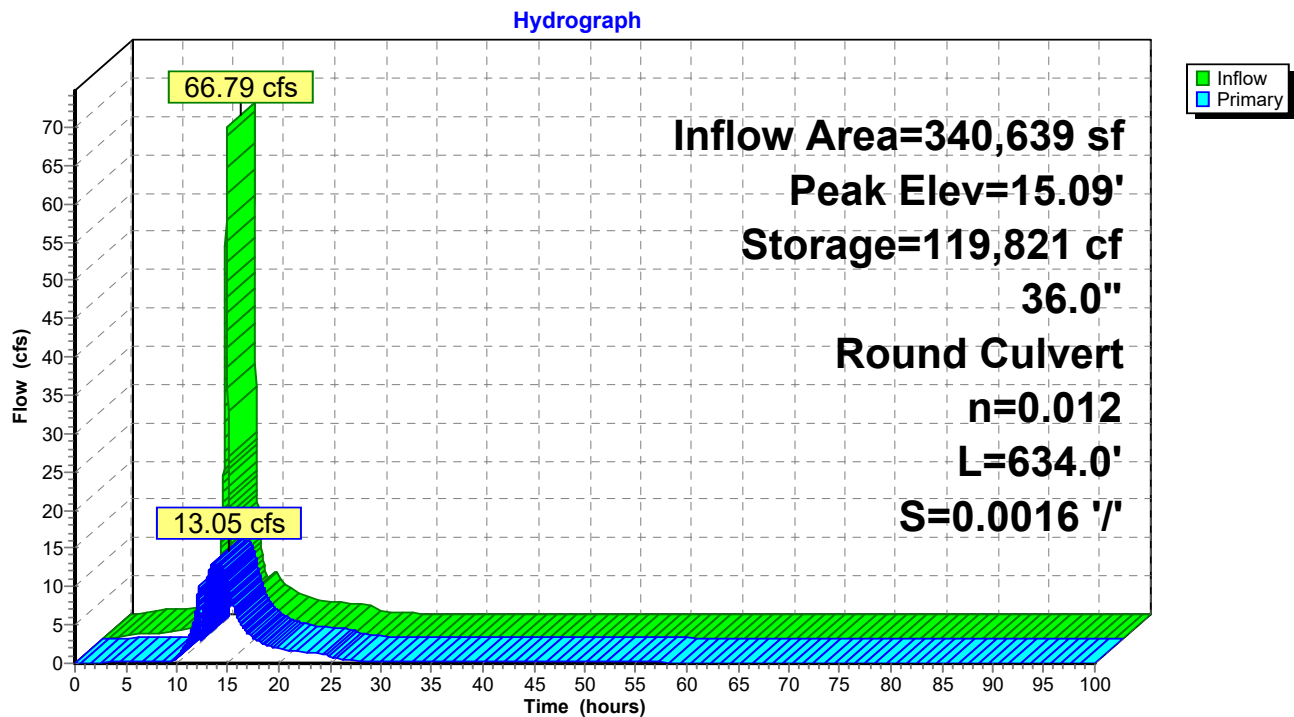
Center-of-Mass det. time= 302.5 min (1,108.8 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=13.33 cfs @ 13.65 hrs HW=14.41' TW=14.11' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 13.33 cfs @ 1.89 fps)

Pond CW1A: CONSTRUCTED WETLANDS 1A

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 7.67" for 100-Year Current Adj event
 Inflow = 82.02 cfs @ 12.12 hrs, Volume= 674,289 cf
 Outflow = 38.14 cfs @ 12.86 hrs, Volume= 671,989 cf, Atten= 53%, Lag= 44.4 min
 Primary = 38.14 cfs @ 12.86 hrs, Volume= 671,989 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 14.98' @ 12.64 hrs Surf.Area= 24,749 sf Storage= 113,151 cf

Plug-Flow detention time= 149.6 min calculated for 671,989 cf (100% of inflow)

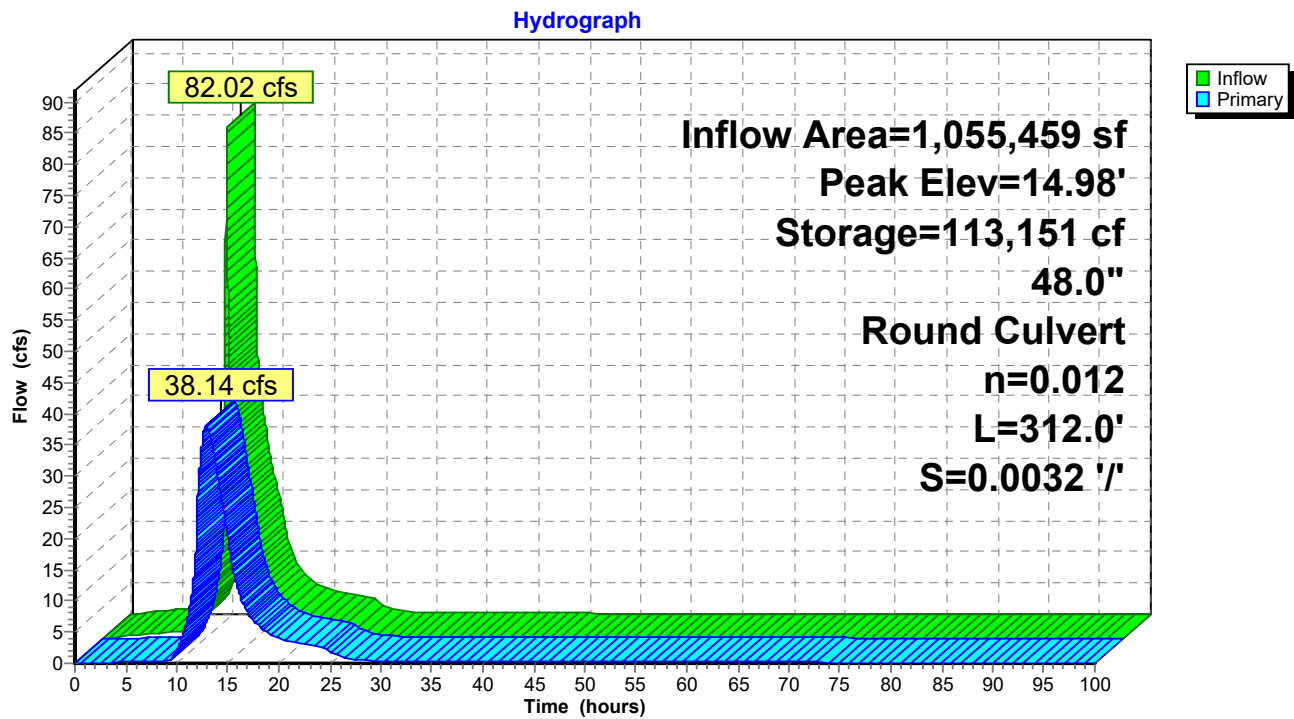
Center-of-Mass det. time= 135.4 min (1,061.9 - 926.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / S= 0.0032 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=38.41 cfs @ 12.86 hrs HW=14.91' TW=14.51' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 38.41 cfs @ 3.06 fps)

Pond CW1B: CONSTRUCTED WETLANDS 1B

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 7.48" for 100-Year Current Adj event
 Inflow = 47.15 cfs @ 12.14 hrs, Volume= 792,501 cf
 Outflow = 46.35 cfs @ 12.76 hrs, Volume= 792,182 cf, Atten= 2%, Lag= 37.3 min
 Primary = 46.35 cfs @ 12.76 hrs, Volume= 792,182 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.60' @ 12.59 hrs Surf.Area= 10,741 sf Storage= 34,720 cf

Plug-Flow detention time= 27.9 min calculated for 792,182 cf (100% of inflow)
 Center-of-Mass det. time= 26.0 min (1,092.4 - 1,066.4)

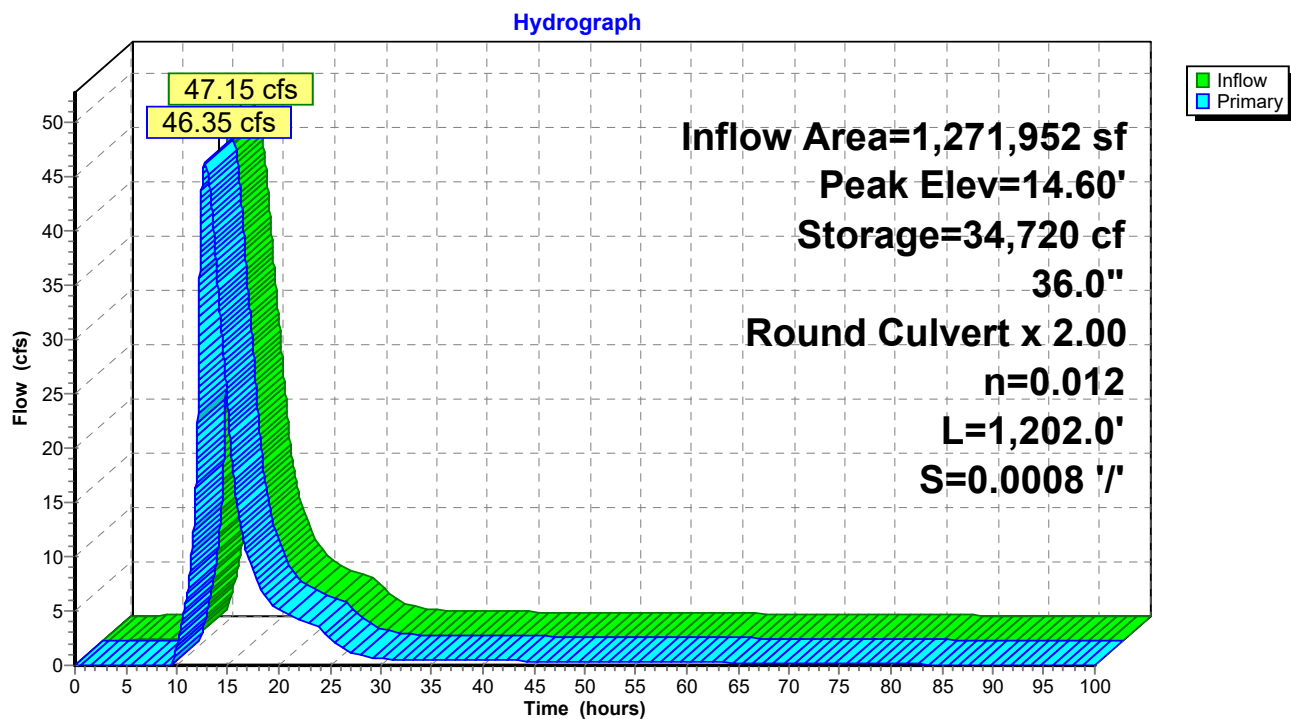
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=46.42 cfs @ 12.76 hrs HW=14.56' TW=13.06' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 46.42 cfs @ 3.28 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C

Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 7.67" for 100-Year Current Adj event
 Inflow = 98.60 cfs @ 12.12 hrs, Volume= 1,080,381 cf
 Outflow = 71.37 cfs @ 12.25 hrs, Volume= 1,079,128 cf, Atten= 28%, Lag= 7.8 min
 Primary = 71.37 cfs @ 12.25 hrs, Volume= 1,079,128 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.36' @ 12.25 hrs Surf.Area= 23,992 sf Storage= 80,196 cf

Plug-Flow detention time= 88.7 min calculated for 1,079,128 cf (100% of inflow)
 Center-of-Mass det. time= 83.3 min (1,089.9 - 1,006.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

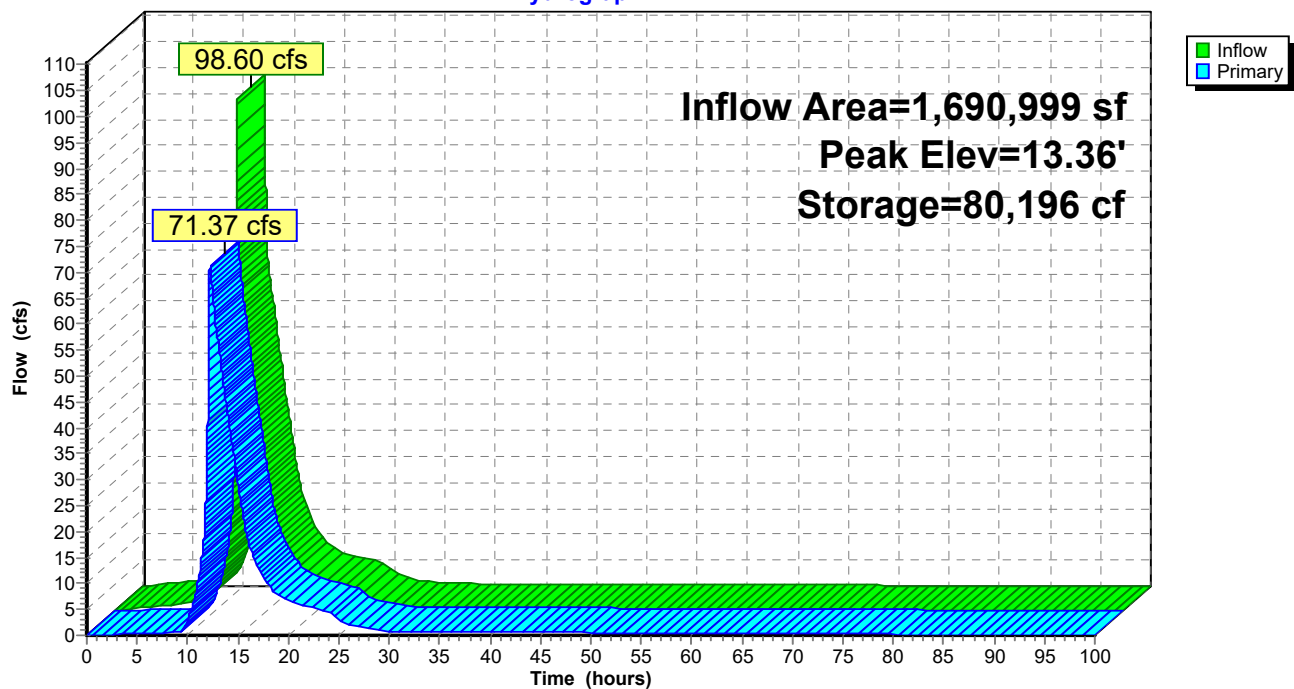
Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=71.37 cfs @ 12.25 hrs HW=13.36' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 71.37 cfs of 83.04 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.03 cfs @ 9.91 fps)
- 3=Orifice/Grate (Orifice Controls 42.42 cfs @ 6.79 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 27.92 cfs @ 3.99 fps)

Pond CW1D: CONSTRUCTED WETLANDS 1D

Hydrograph



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 8.47" for 100-Year Current Adj event
 Inflow = 7.07 cfs @ 12.10 hrs, Volume= 23,975 cf
 Outflow = 4.06 cfs @ 12.14 hrs, Volume= 21,086 cf, Atten= 43%, Lag= 2.6 min
 Primary = 4.06 cfs @ 12.14 hrs, Volume= 21,086 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.69' @ 12.14 hrs Surf.Area= 12,680 sf Storage= 10,838 cf

Plug-Flow detention time= 332.6 min calculated for 21,083 cf (88% of inflow)
 Center-of-Mass det. time= 271.0 min (1,009.1 - 738.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

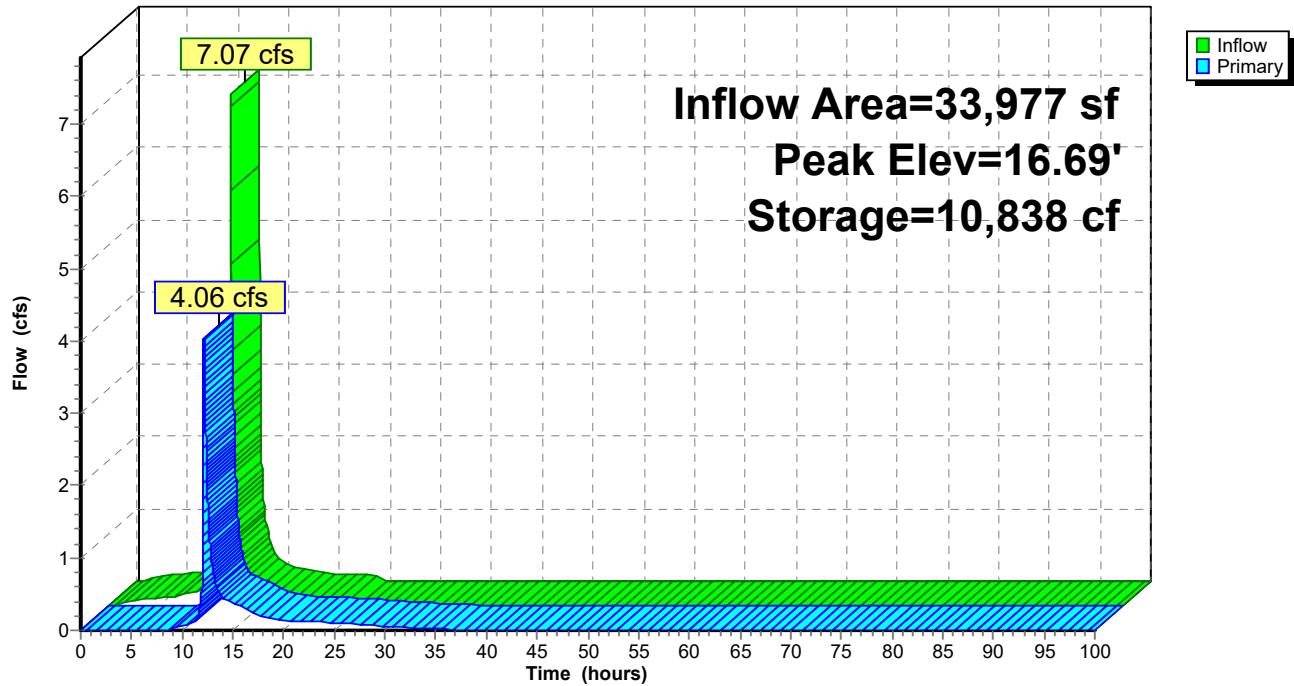
Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.05 cfs @ 12.14 hrs HW=16.69' TW=13.94' (Dynamic Tailwater)

- 1=Culvert (Passes 4.05 cfs of 9.63 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 5.84 fps)
- 3=Orifice/Grate (Orifice Controls 0.44 cfs @ 4.44 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 3.42 cfs @ 2.33 fps)

Pond PP1: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Prepared by Bohler Engineering, PC

Printed 8/18/2026

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Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 8.50" for 100-Year Current Adj event
 Inflow = 16.46 cfs @ 12.10 hrs, Volume= 55,565 cf
 Outflow = 10.13 cfs @ 12.13 hrs, Volume= 49,012 cf, Atten= 38%, Lag= 2.0 min
 Primary = 10.13 cfs @ 12.13 hrs, Volume= 49,012 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.13' @ 12.13 hrs Surf.Area= 23,328 sf Storage= 24,033 cf

Plug-Flow detention time= 439.0 min calculated for 49,012 cf (88% of inflow)
 Center-of-Mass det. time= 378.0 min (1,118.4 - 740.4)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

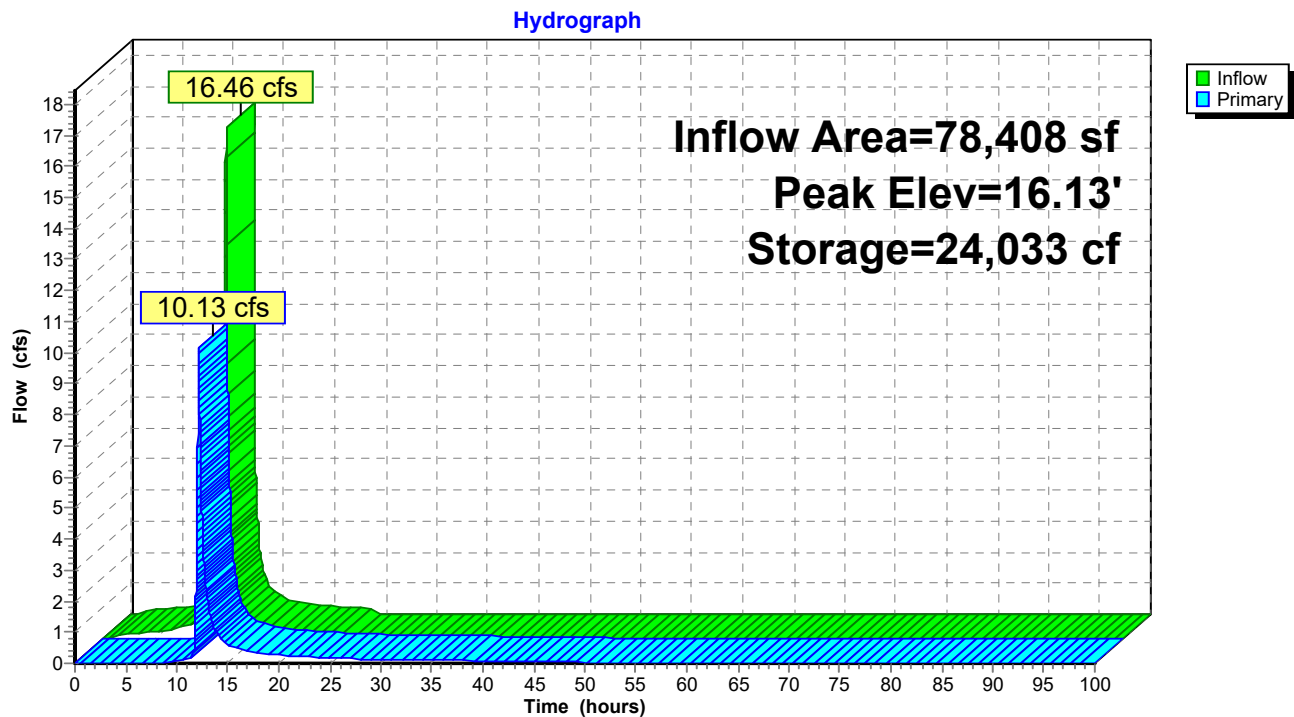
Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=10.12 cfs @ 12.13 hrs HW=16.12' TW=13.60' (Dynamic Tailwater)

1=Culvert (Passes 10.12 cfs of 54.13 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.44 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 9.90 cfs @ 3.02 fps)

Pond PP2: POROUS PAVEMENT

Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 8.56" for 100-Year Current Adj event
 Inflow = 6.71 cfs @ 12.10 hrs, Volume= 22,683 cf
 Outflow = 3.61 cfs @ 12.14 hrs, Volume= 19,995 cf, Atten= 46%, Lag= 2.8 min
 Primary = 3.61 cfs @ 12.14 hrs, Volume= 19,995 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.11' @ 12.14 hrs Surf.Area= 10,368 sf Storage= 10,624 cf

Plug-Flow detention time= 342.0 min calculated for 19,993 cf (88% of inflow)
 Center-of-Mass det. time= 281.2 min (1,020.5 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

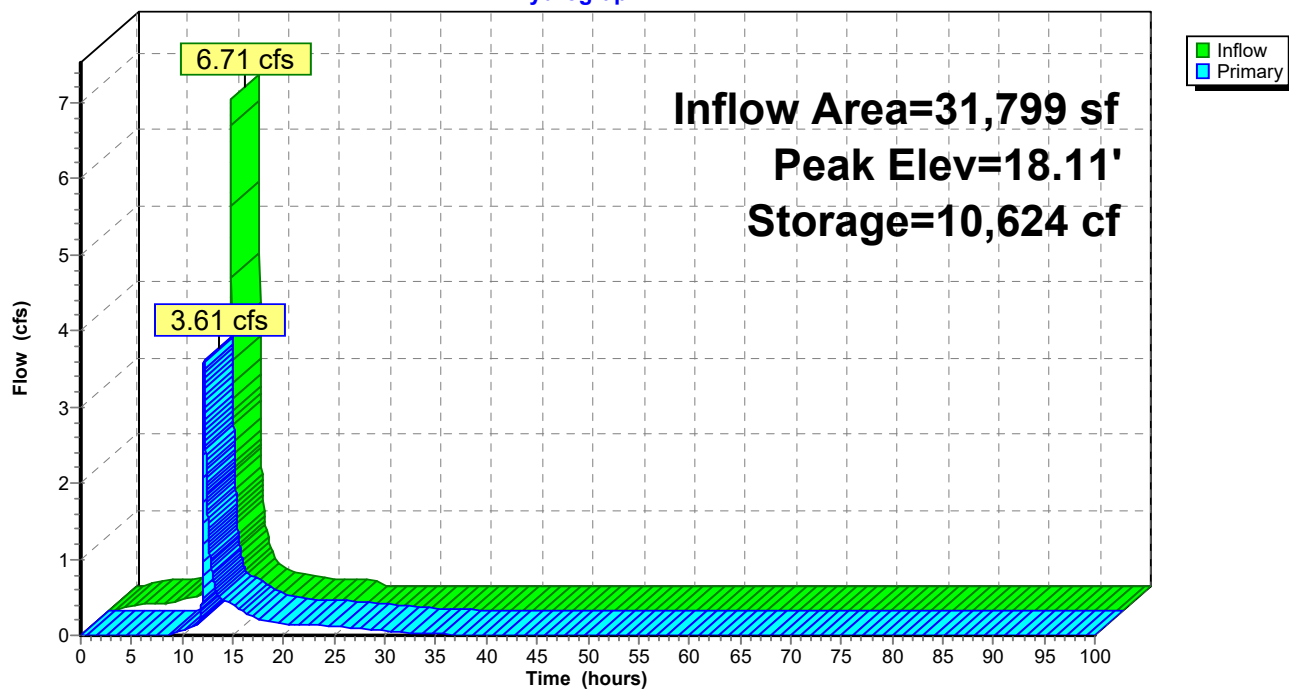
Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.60 cfs @ 12.14 hrs HW=18.11' TW=13.21' (Dynamic Tailwater)

- 1=Culvert (Passes 3.60 cfs of 52.33 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.49 fps)
- 3=Orifice/Grate (Orifice Controls 0.40 cfs @ 4.60 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 2.98 cfs @ 2.22 fps)

Pond PP3: POROUS PAVEMENT

Hydrograph



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 8.51" for 100-Year Current Adj event
 Inflow = 97.88 cfs @ 12.10 hrs, Volume= 339,813 cf
 Outflow = 44.98 cfs @ 12.15 hrs, Volume= 299,945 cf, Atten= 54%, Lag= 2.9 min
 Primary = 31.40 cfs @ 12.18 hrs, Volume= 237,364 cf
 Routed to Link PP4V : Valve
 Secondary = 14.38 cfs @ 12.13 hrs, Volume= 62,581 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.56' @ 12.18 hrs Surf.Area= 181,216 sf Storage= 112,366 cf

Plug-Flow detention time= 168.3 min calculated for 299,945 cf (88% of inflow)
 Center-of-Mass det. time= 107.4 min (847.2 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=31.39 cfs @ 12.18 hrs HW=14.56' TW=0.00' (Dynamic Tailwater)

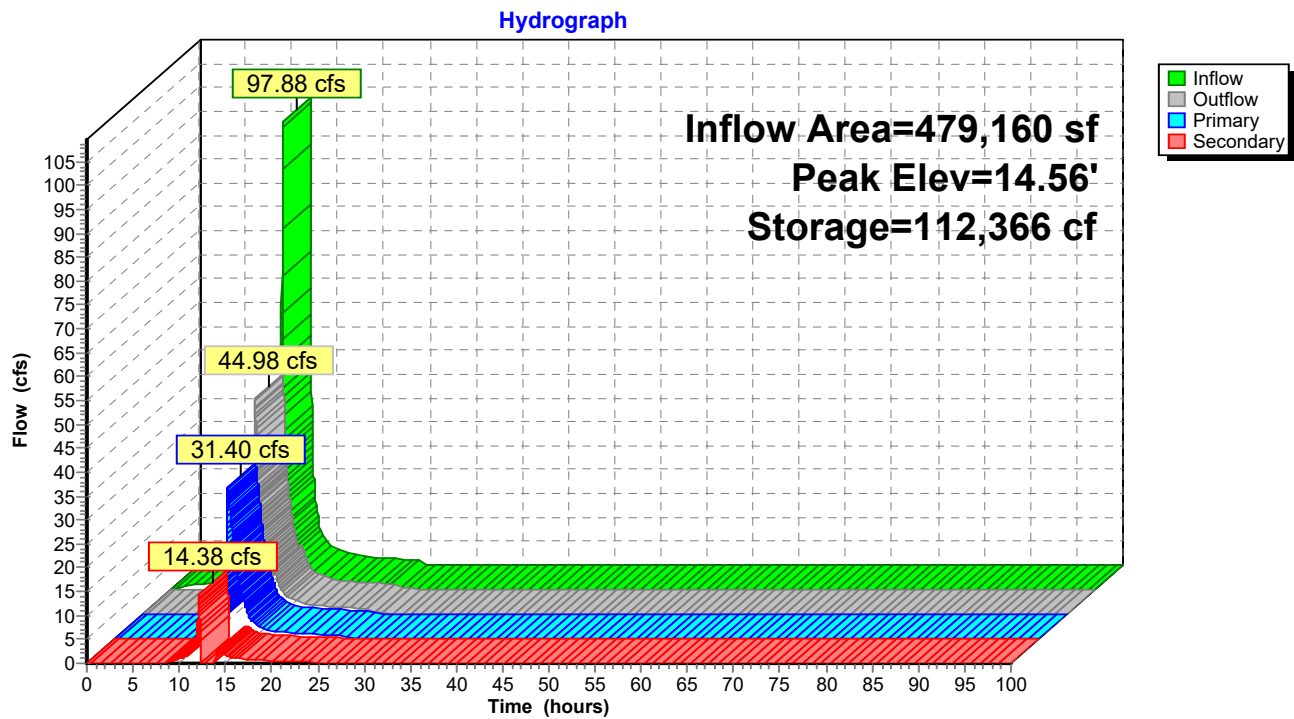
↑ **1=Culvert** (Passes 31.39 cfs of 134.84 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 31.39 cfs @ 3.27 fps)

Secondary OutFlow Max=13.97 cfs @ 12.13 hrs HW=14.53' TW=13.85' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 13.97 cfs of 27.97 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 13.97 cfs @ 3.00 fps)

Pond PP4: POROUS PAVEMENT

Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 8.59" for 100-Year Current Adj event
 Inflow = 7.07 cfs @ 12.09 hrs, Volume= 23,704 cf
 Outflow = 3.99 cfs @ 12.11 hrs, Volume= 20,875 cf, Atten= 44%, Lag= 1.3 min
 Primary = 3.99 cfs @ 12.11 hrs, Volume= 20,875 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.00' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 7,317 cf

Plug-Flow detention time= 154.0 min calculated for 20,875 cf (88% of inflow)
 Center-of-Mass det. time= 92.4 min (829.3 - 736.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

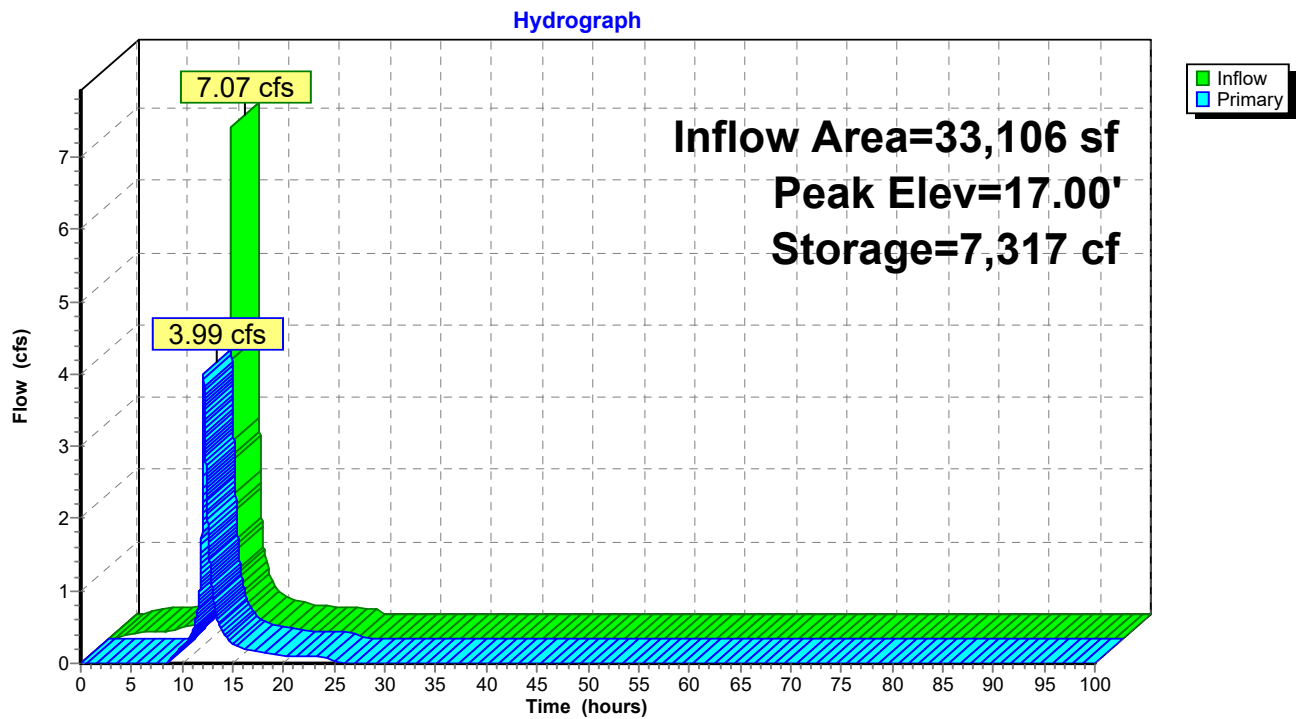
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.98 cfs @ 12.11 hrs HW=17.00' TW=13.05' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 3.98 cfs of 9.85 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 3.98 cfs @ 2.22 fps)

Pond PP5: POROUS PAVEMENT



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Current Adj Rainfall=8.89", P2=3.35"

Prepared by Bohler Engineering, PC

Printed 8/18/2026

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Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 8.55" for 100-Year Current Adj event
 Inflow = 8.23 cfs @ 12.09 hrs, Volume= 27,608 cf
 Outflow = 4.11 cfs @ 12.11 hrs, Volume= 24,349 cf, Atten= 50%, Lag= 1.4 min
 Primary = 4.11 cfs @ 12.11 hrs, Volume= 24,349 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.73' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 9,142 cf

Plug-Flow detention time= 161.8 min calculated for 24,347 cf (88% of inflow)
 Center-of-Mass det. time= 101.0 min (837.8 - 736.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

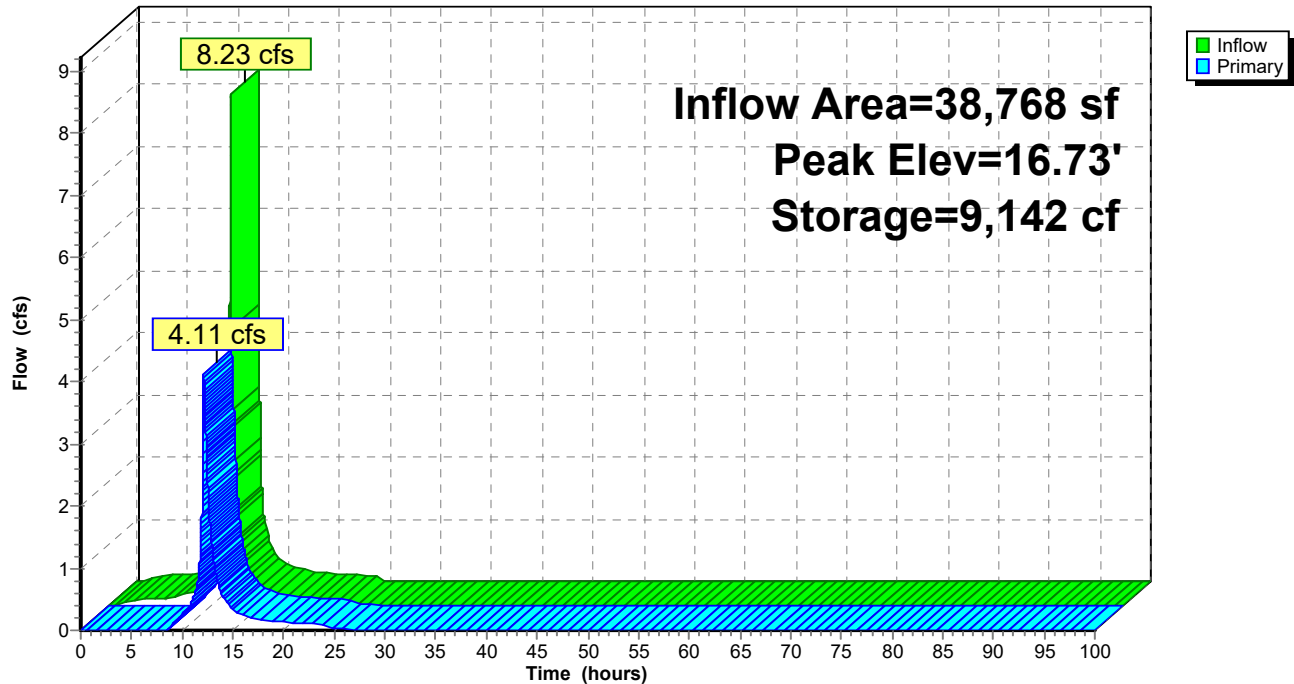
Primary OutFlow Max=4.10 cfs @ 12.11 hrs HW=16.73' TW=13.73' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.10 cfs of 10.24 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.10 cfs @ 2.24 fps)

Pond PP6: POROUS PAVEMENT

Hydrograph



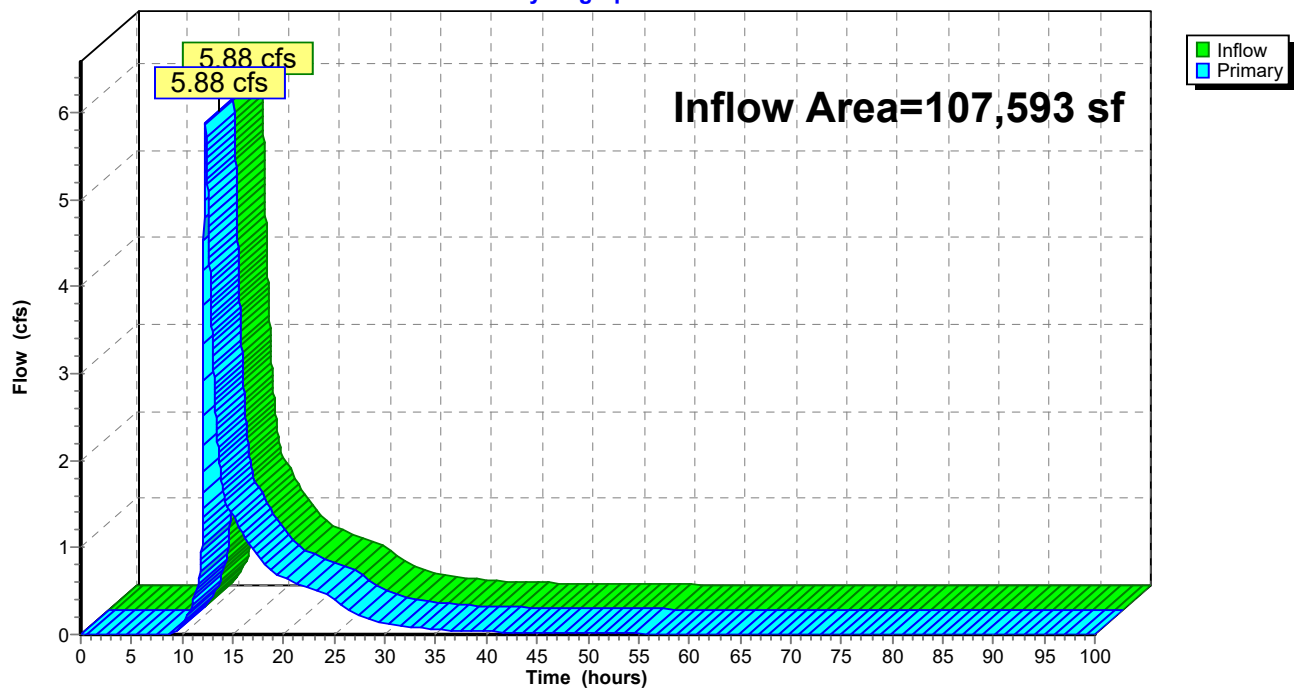
Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 7.53" for 100-Year Current Adj event
Inflow = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf
Primary = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

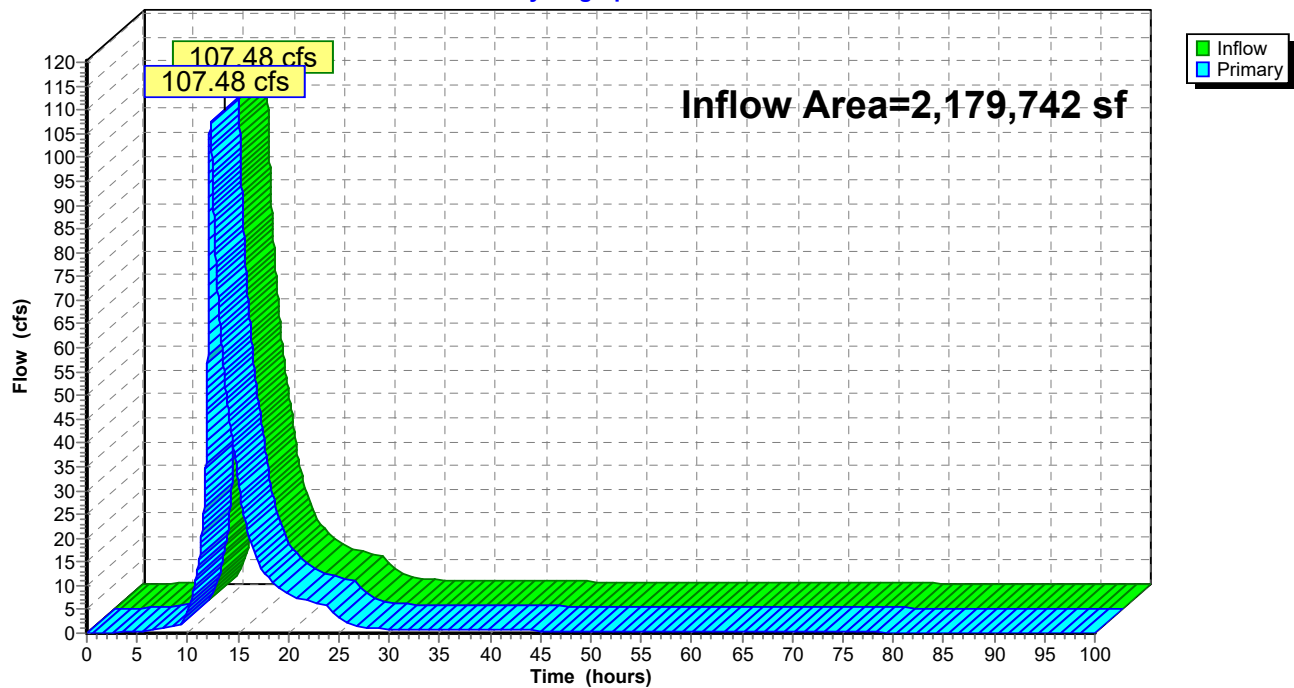
Hydrograph



Summary for Link P1: PDA 1

Inflow Area = 2,179,742 sf, 69.82% Impervious, Inflow Depth > 7.26" for 100-Year Current Adj event
Inflow = 107.48 cfs @ 12.26 hrs, Volume= 1,318,079 cf
Primary = 107.48 cfs @ 12.26 hrs, Volume= 1,318,079 cf, Atten= 0%, Lag= 0.0 min

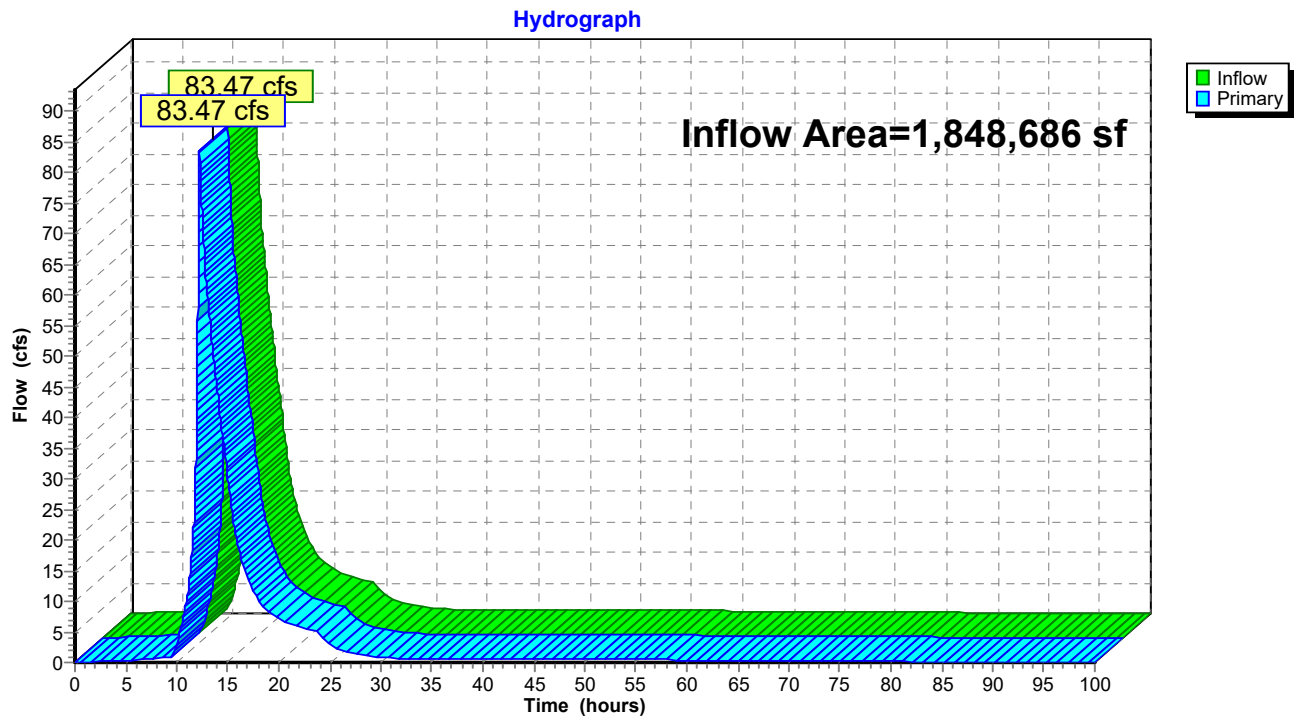
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1: PDA 1**Hydrograph**

Summary for Link P1A:

Inflow Area = 1,848,686 sf, 82.02% Impervious, Inflow Depth > 7.43" for 100-Year Current Adj event
Inflow = 83.47 cfs @ 12.23 hrs, Volume= 1,145,360 cf
Primary = 83.47 cfs @ 12.23 hrs, Volume= 1,145,360 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:

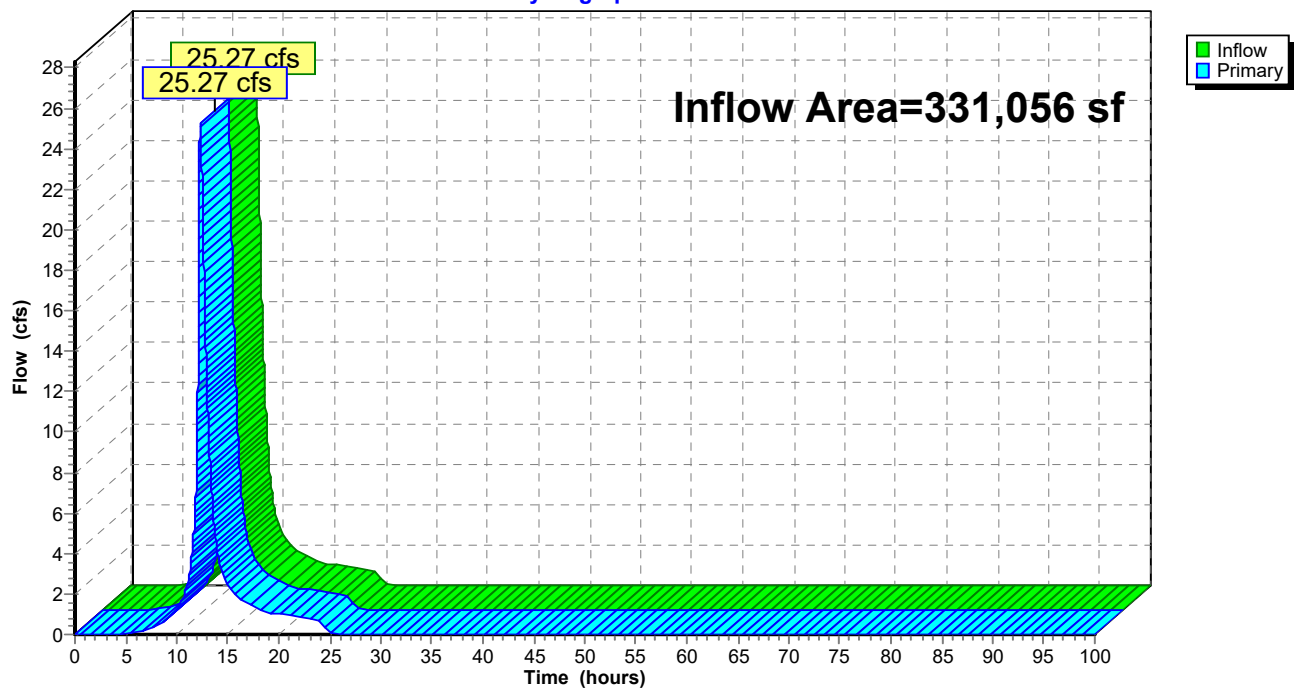
Summary for Link P1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 6.26" for 100-Year Current Adj event
Inflow = 25.27 cfs @ 12.30 hrs, Volume= 172,719 cf
Primary = 25.27 cfs @ 12.30 hrs, Volume= 172,719 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1B: BYPASS

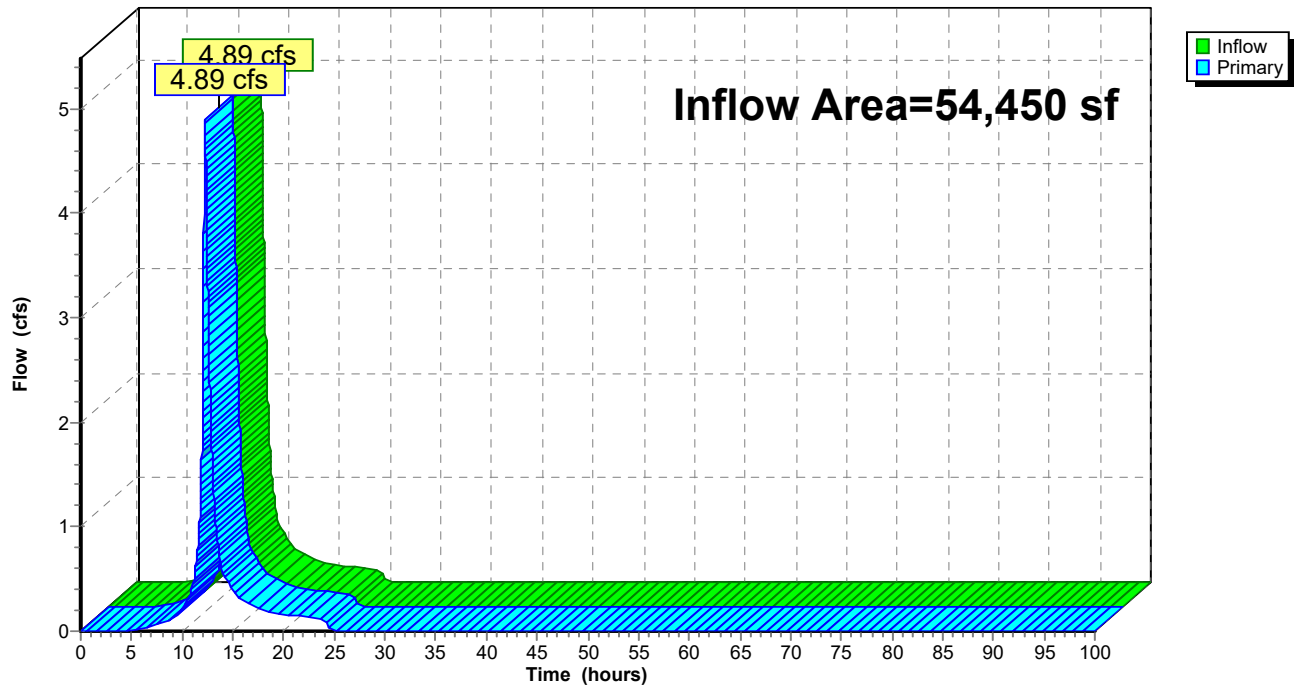
Hydrograph



Summary for Link P2: PDA 2

Inflow Area = 54,450 sf, 0.00% Impervious, Inflow Depth = 6.24" for 100-Year Current Adj event
Inflow = 4.89 cfs @ 12.24 hrs, Volume= 28,295 cf
Primary = 4.89 cfs @ 12.24 hrs, Volume= 28,295 cf, Atten= 0%, Lag= 0.0 min

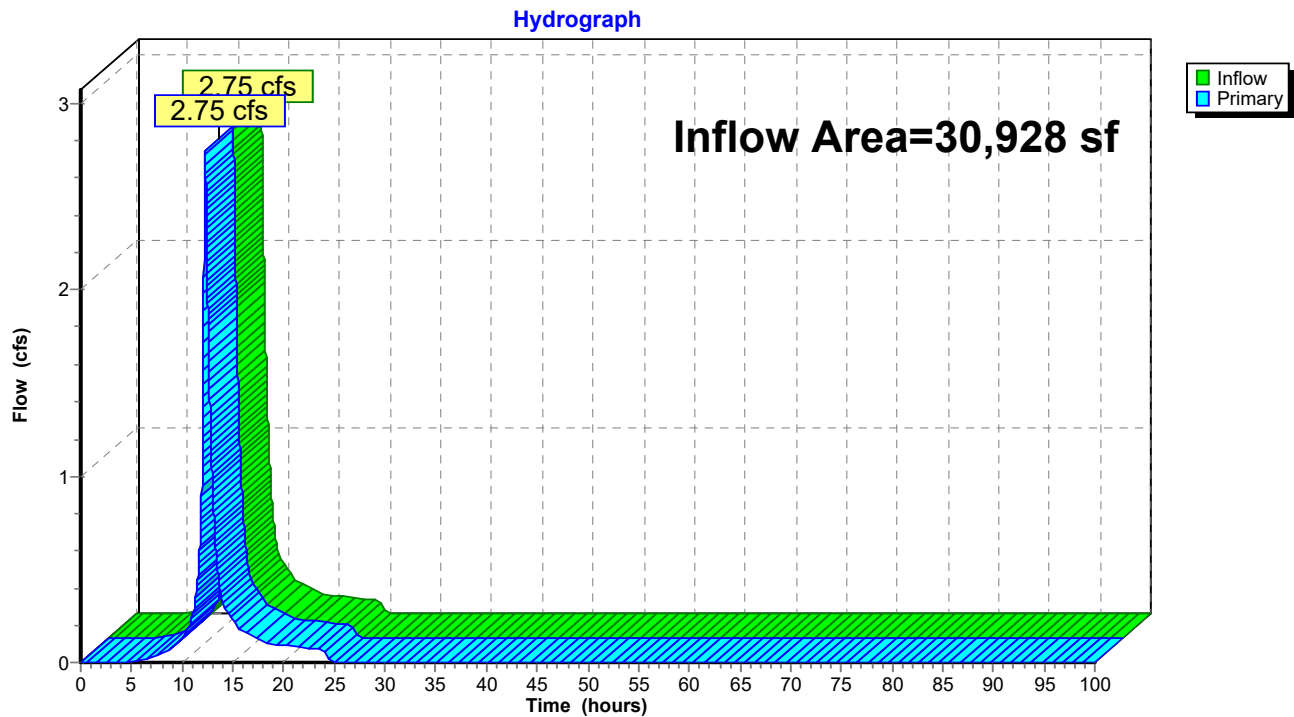
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2: PDA 2**Hydrograph**

Summary for Link P2A: PDA 2A ONSITE

Inflow Area = 30,928 sf, 0.00% Impervious, Inflow Depth = 6.34" for 100-Year Current Adj event
Inflow = 2.75 cfs @ 12.25 hrs, Volume= 16,344 cf
Primary = 2.75 cfs @ 12.25 hrs, Volume= 16,344 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2A: PDA 2A ONSITE

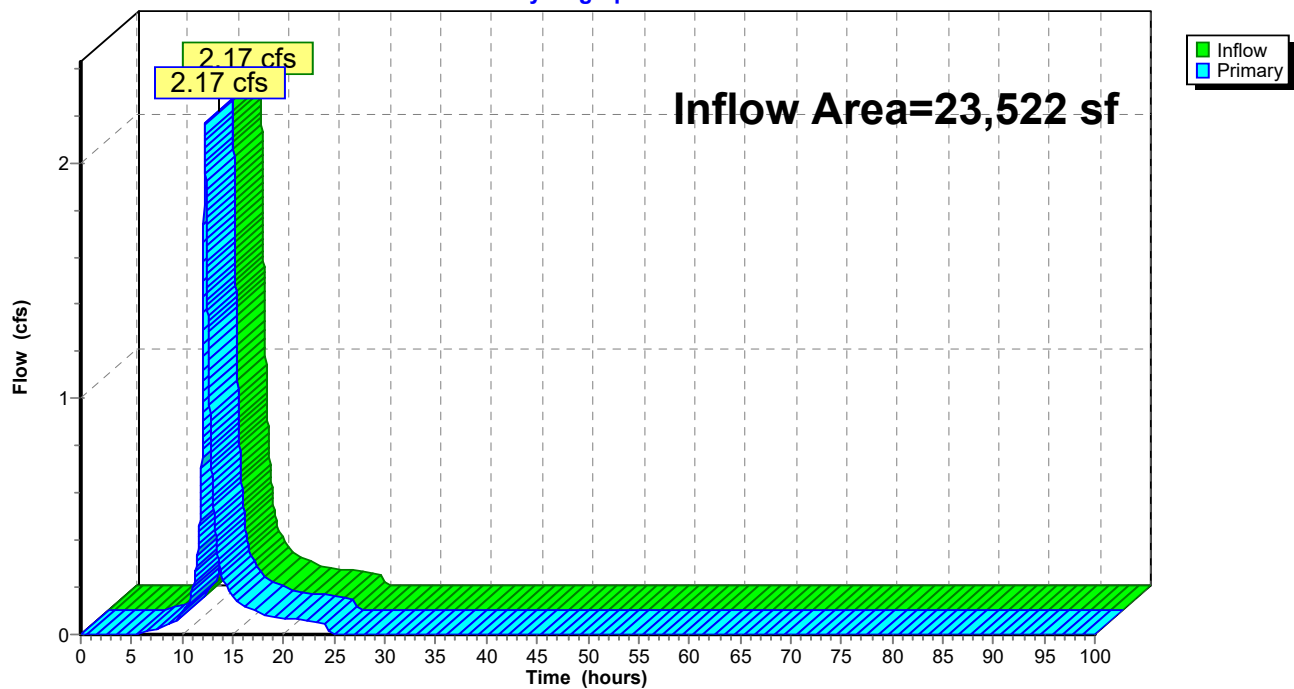
Summary for Link P2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 6.10" for 100-Year Current Adj event
Inflow = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf
Primary = 2.17 cfs @ 12.22 hrs, Volume= 11,951 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2B: BYPASS

Hydrograph



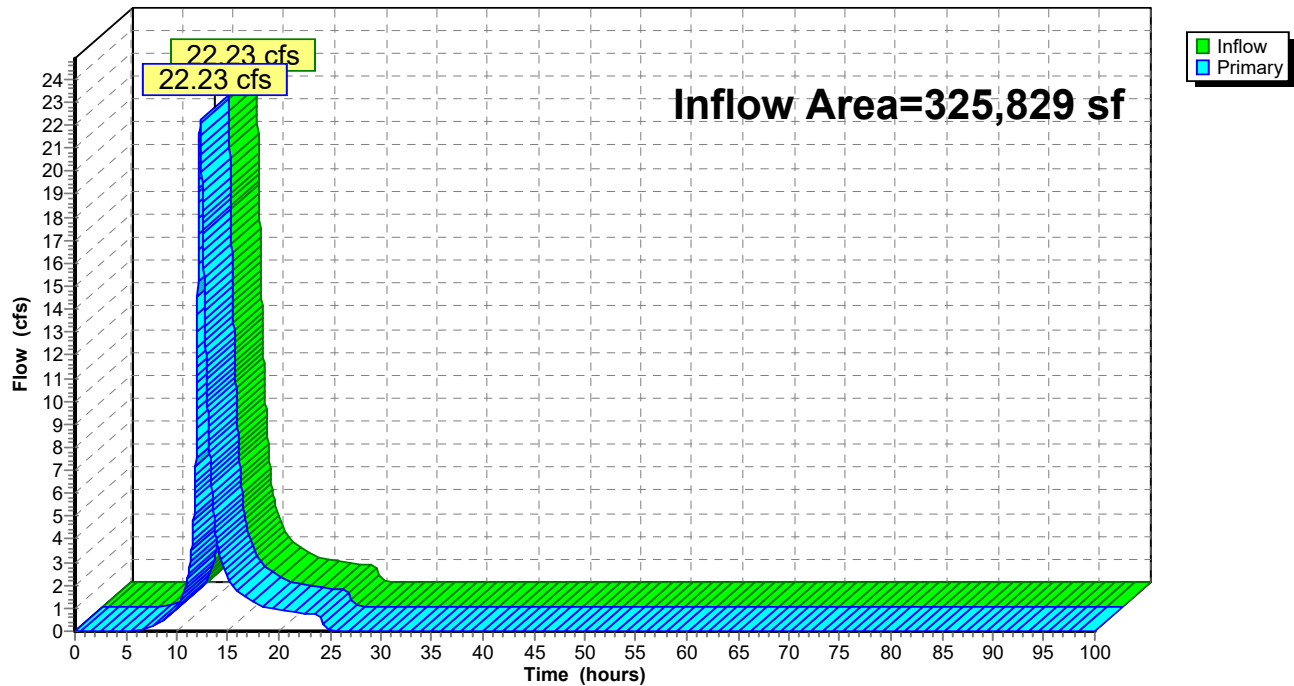
Summary for Link P3: PDA 3

Inflow Area = 325,829 sf, 0.00% Impervious, Inflow Depth = 5.81" for 100-Year Current Adj event
Inflow = 22.23 cfs @ 12.30 hrs, Volume= 157,664 cf
Primary = 22.23 cfs @ 12.30 hrs, Volume= 157,664 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3: PDA 3

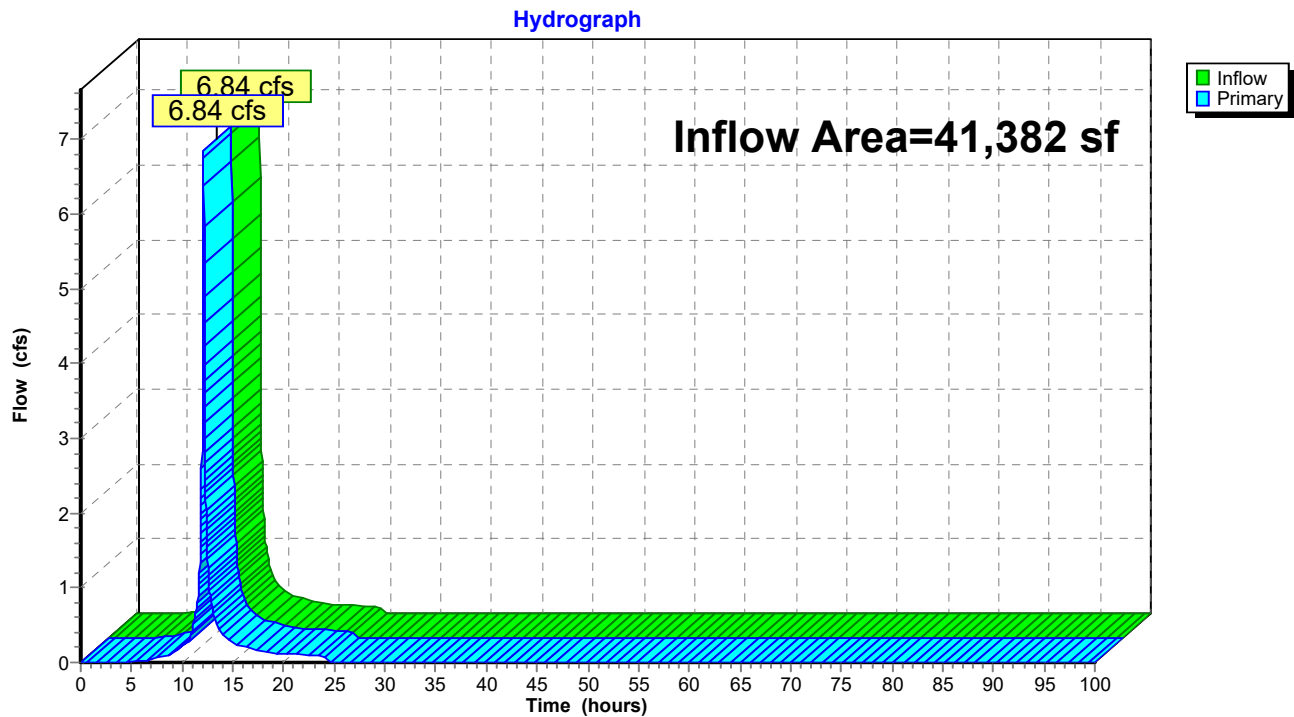
Hydrograph



Summary for Link P3A: PDA 3A ONSITE

Inflow Area = 41,382 sf, 0.00% Impervious, Inflow Depth = 6.34" for 100-Year Current Adj event
Inflow = 6.84 cfs @ 12.11 hrs, Volume= 21,869 cf
Primary = 6.84 cfs @ 12.11 hrs, Volume= 21,869 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3A: PDA 3A ONSITE

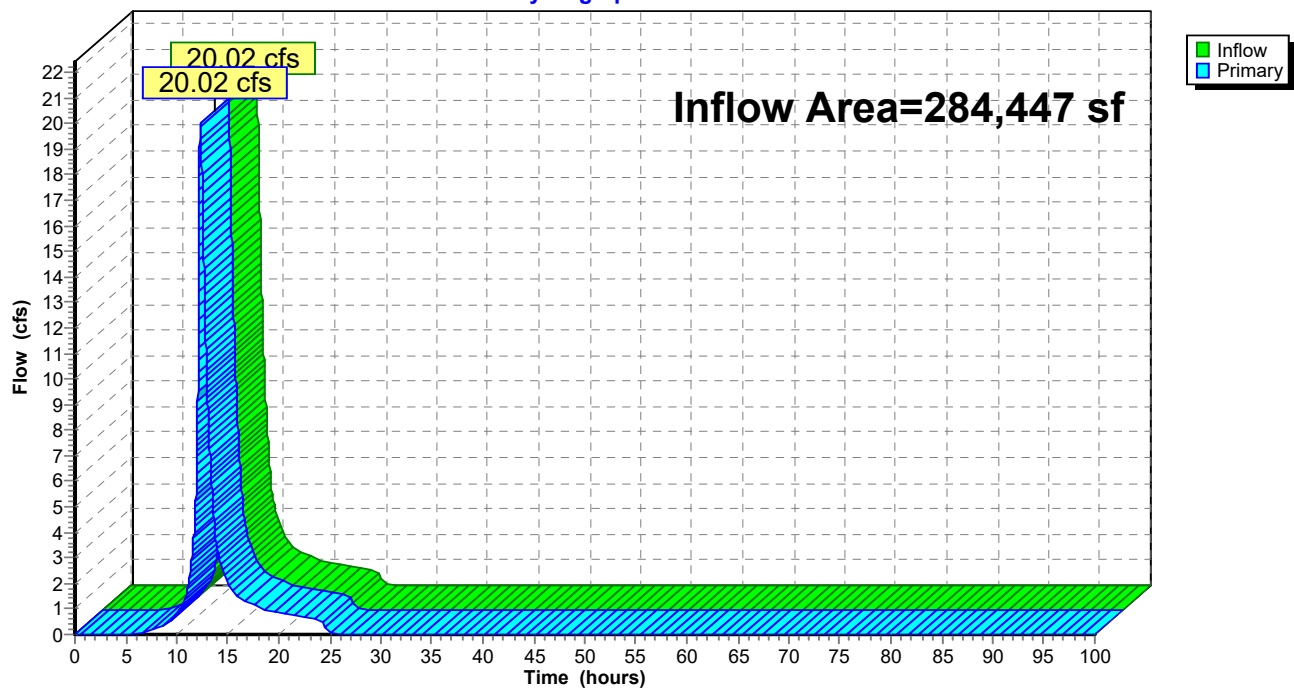
Summary for Link P3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 5.73" for 100-Year Current Adj event
Inflow = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf
Primary = 20.02 cfs @ 12.31 hrs, Volume= 135,795 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3B: BYPASS

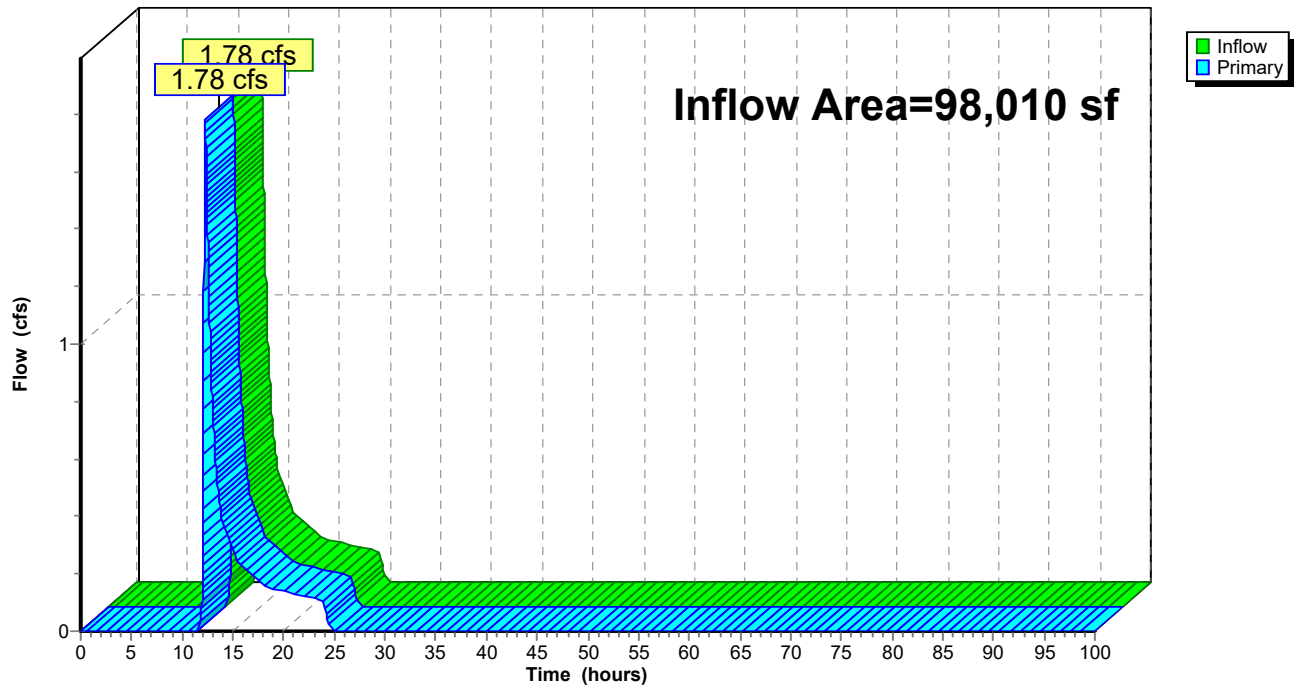
Hydrograph



Summary for Link P4: PDA 4

Inflow Area = 98,010 sf, 0.00% Impervious, Inflow Depth = 1.55" for 100-Year Current Adj event
Inflow = 1.78 cfs @ 12.24 hrs, Volume= 12,669 cf
Primary = 1.78 cfs @ 12.24 hrs, Volume= 12,669 cf, Atten= 0%, Lag= 0.0 min

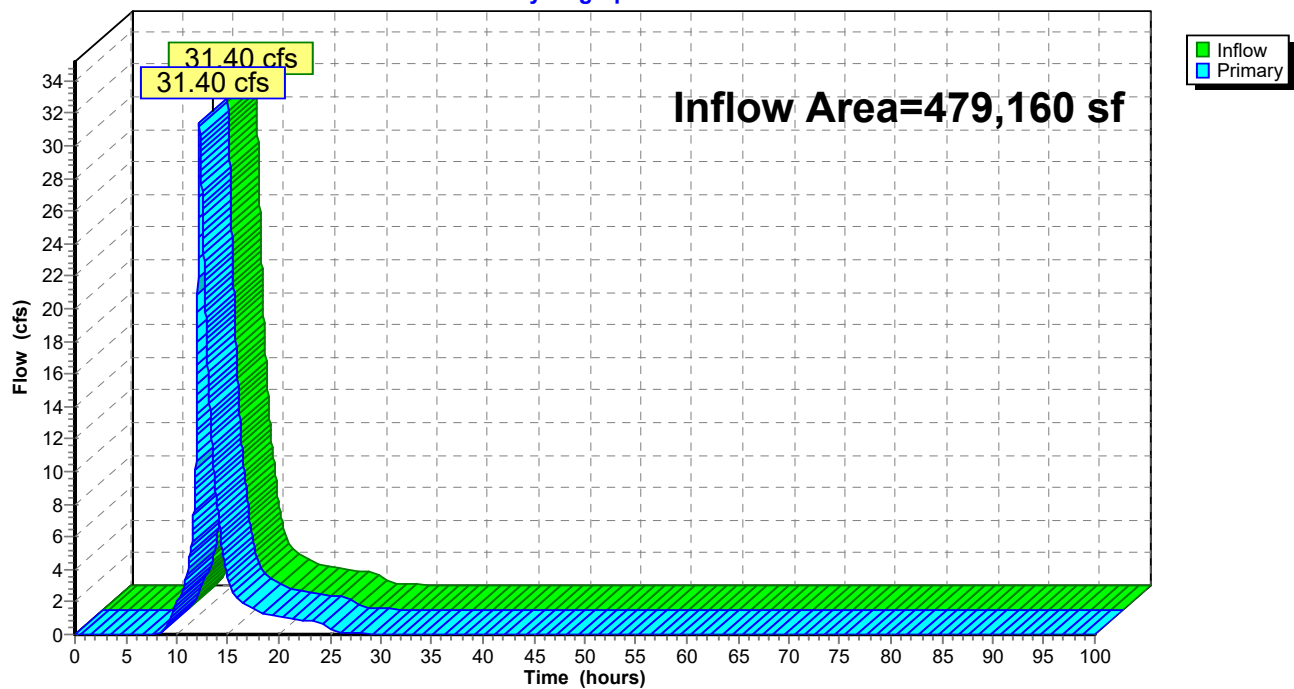
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

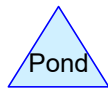
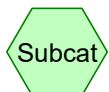
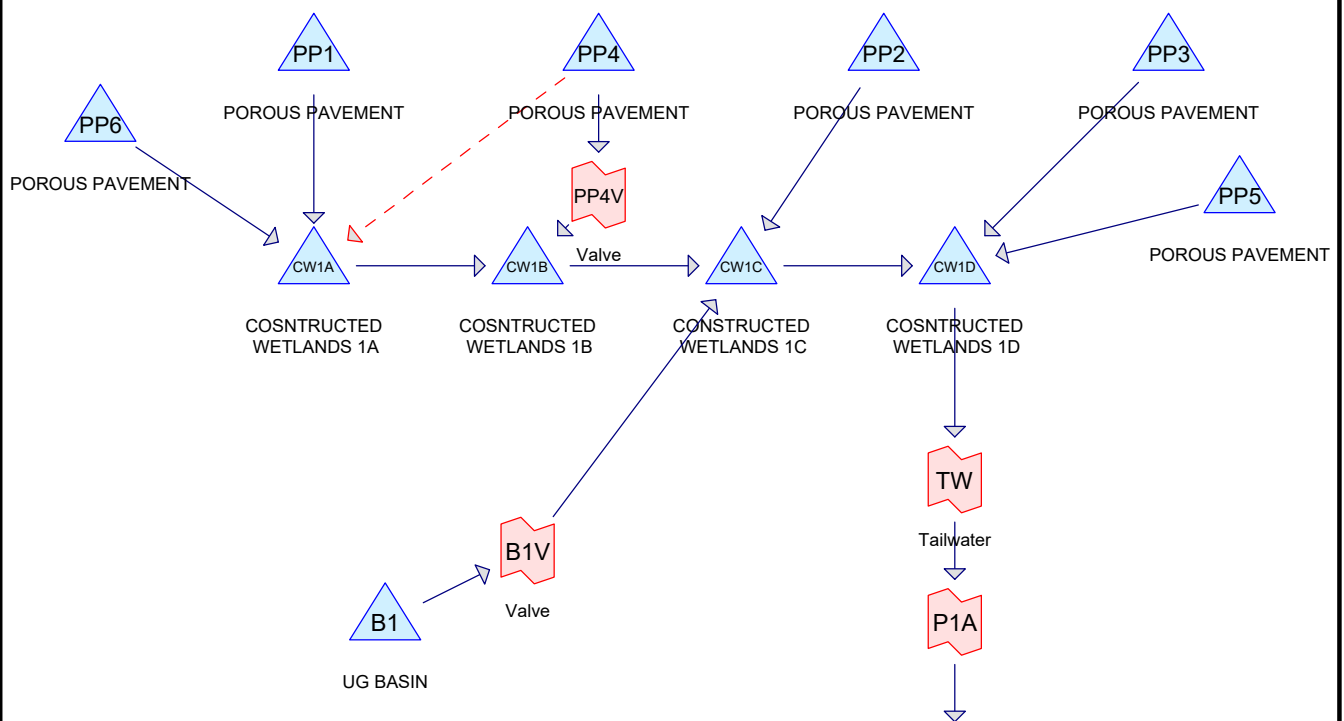
Link P4: PDA 4**Hydrograph**

Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 5.94" for 100-Year Current Adj event
Inflow = 31.40 cfs @ 12.18 hrs, Volume= 237,364 cf
Primary = 31.40 cfs @ 12.18 hrs, Volume= 237,364 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve**Hydrograph**



Routing Diagram for Pre vs Post- 100 yr tailwater Rev. 3a
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Pre vs Post- 100 yr tailwater Rev. 3a

Prepared by Bohler Engineering, PC

Printed 8/18/2026

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	8.89	2	3.35

Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 8.60" for 100-Year Current Adj event
 Inflow = 22.79 cfs @ 12.10 hrs, Volume= 77,078 cf
 Outflow = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf, Atten= 74%, Lag= 11.6 min
 Primary = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.87' @ 12.29 hrs Surf.Area= 0.559 ac Storage= 0.929 af

Plug-Flow detention time= 405.5 min calculated for 67,552 cf (88% of inflow)
 Center-of-Mass det. time= 342.9 min (1,081.4 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Cap x 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.88 cfs @ 12.29 hrs HW=11.87' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 5.88 cfs of 14.50 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.13 cfs @ 5.75 fps)
- 3=Orifice/Grate (Orifice Controls 0.83 cfs @ 4.21 fps)
- 4=Sharp-Crested Rectangular Weir(Weir Controls 3.92 cfs @ 2.21 fps)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

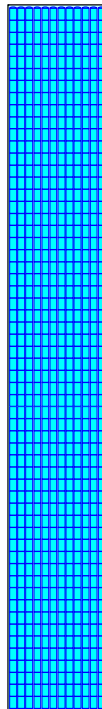
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

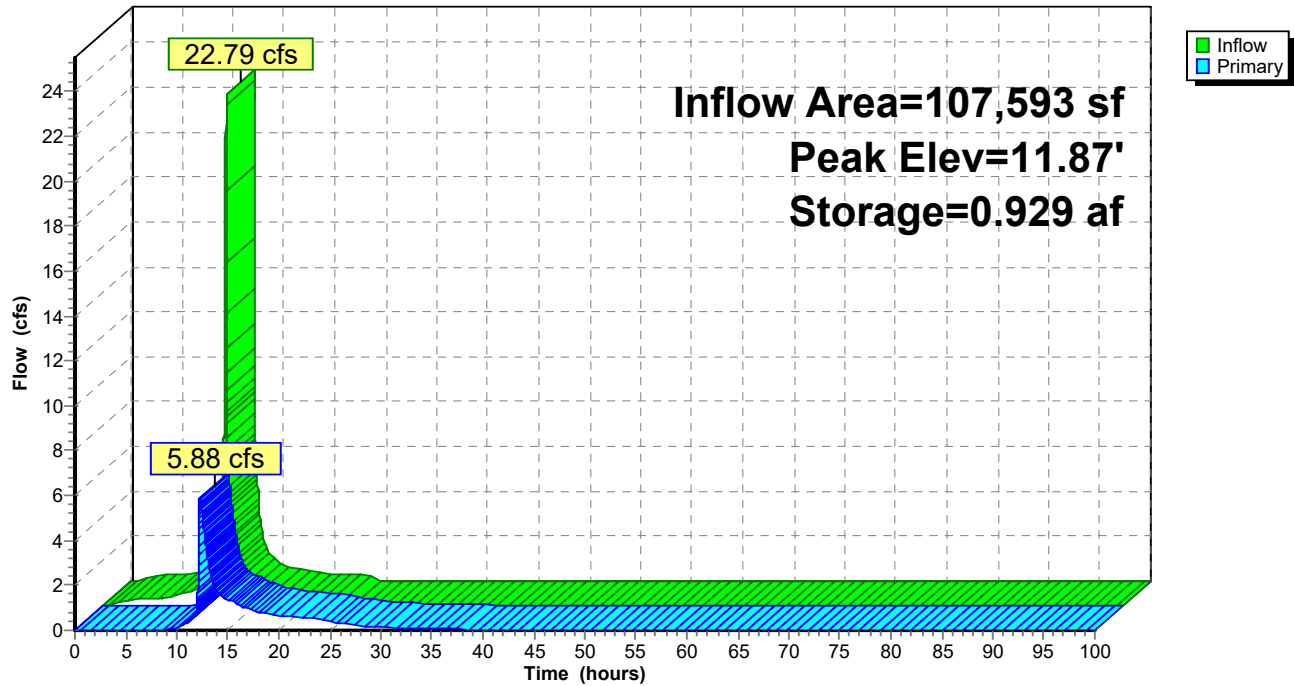
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 9.25" for 100-Year Current Adj event
 Inflow = 60.10 cfs @ 12.11 hrs, Volume= 262,489 cf
 Outflow = 12.41 cfs @ 13.74 hrs, Volume= 193,142 cf, Atten= 79%, Lag= 97.9 min
 Primary = 12.41 cfs @ 13.74 hrs, Volume= 193,142 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 15.85' @ 12.84 hrs Surf.Area= 30,431 sf Storage= 142,062 cf

Plug-Flow detention time= 264.5 min calculated for 193,142 cf (74% of inflow)

Center-of-Mass det. time= 136.8 min (943.6 - 806.8)

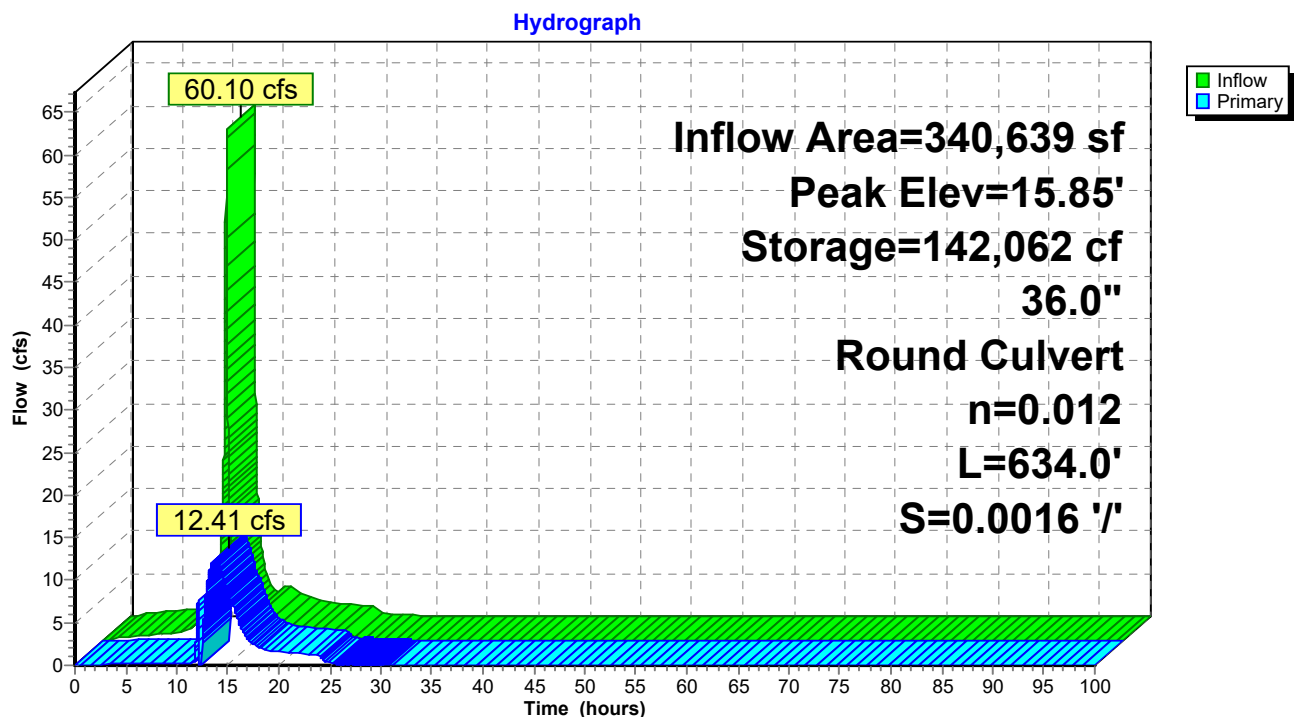
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=12.67 cfs @ 13.74 hrs HW=15.23' TW=14.96' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 12.67 cfs @ 1.79 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth = 6.88" for 100-Year Current Adj event
 Inflow = 78.36 cfs @ 12.12 hrs, Volume= 600,248 cf
 Outflow = 36.25 cfs @ 12.91 hrs, Volume= 529,696 cf, Atten= 54%, Lag= 47.7 min
 Primary = 36.25 cfs @ 12.91 hrs, Volume= 529,696 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 15.76' @ 12.70 hrs Surf.Area= 26,246 sf Storage= 132,879 cf

Plug-Flow detention time= 116.8 min calculated for 529,644 cf (88% of inflow)

Center-of-Mass det. time= 53.8 min (902.3 - 848.4)

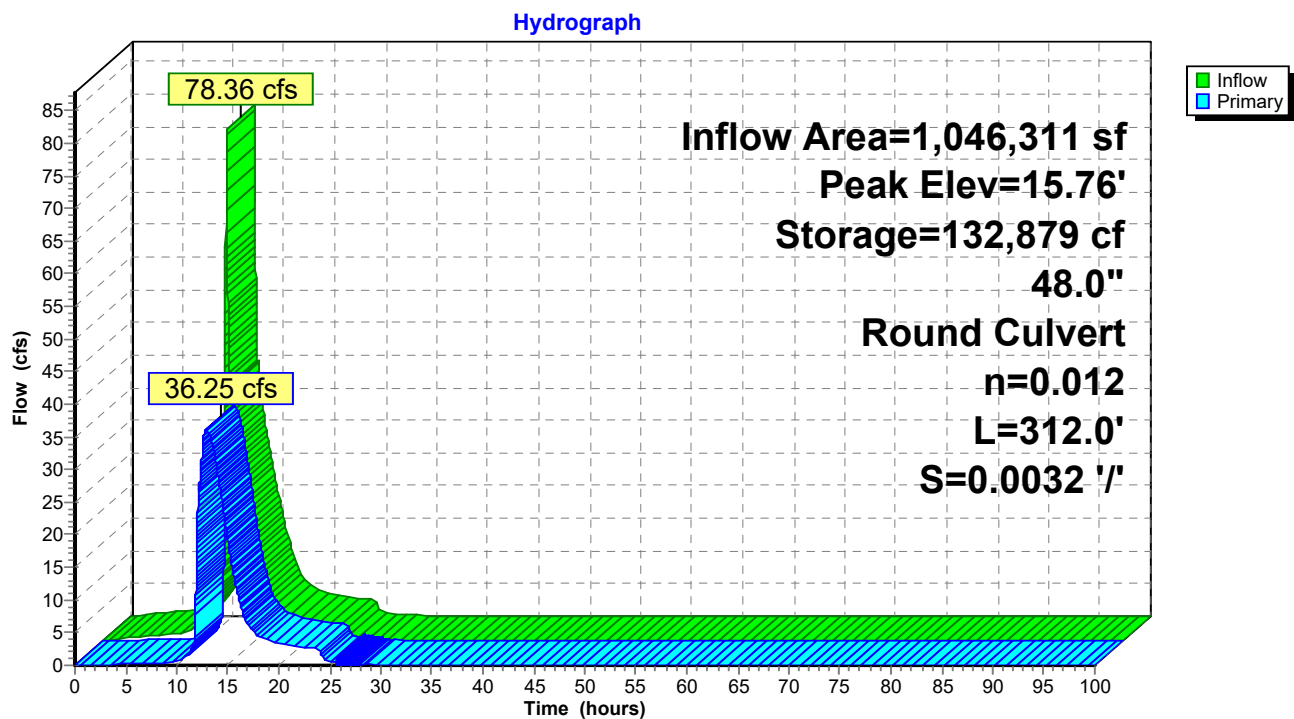
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / S= 0.0032 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=36.48 cfs @ 12.91 hrs HW=15.70' TW=15.33' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 36.48 cfs @ 2.90 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth = 6.18" for 100-Year Current Adj event
 Inflow = 43.93 cfs @ 12.14 hrs, Volume= 650,208 cf
 Outflow = 43.97 cfs @ 12.85 hrs, Volume= 629,497 cf, Atten= 0%, Lag= 42.5 min
 Primary = 43.97 cfs @ 12.85 hrs, Volume= 629,497 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.41' @ 12.64 hrs Surf.Area= 12,125 sf Storage= 43,949 cf

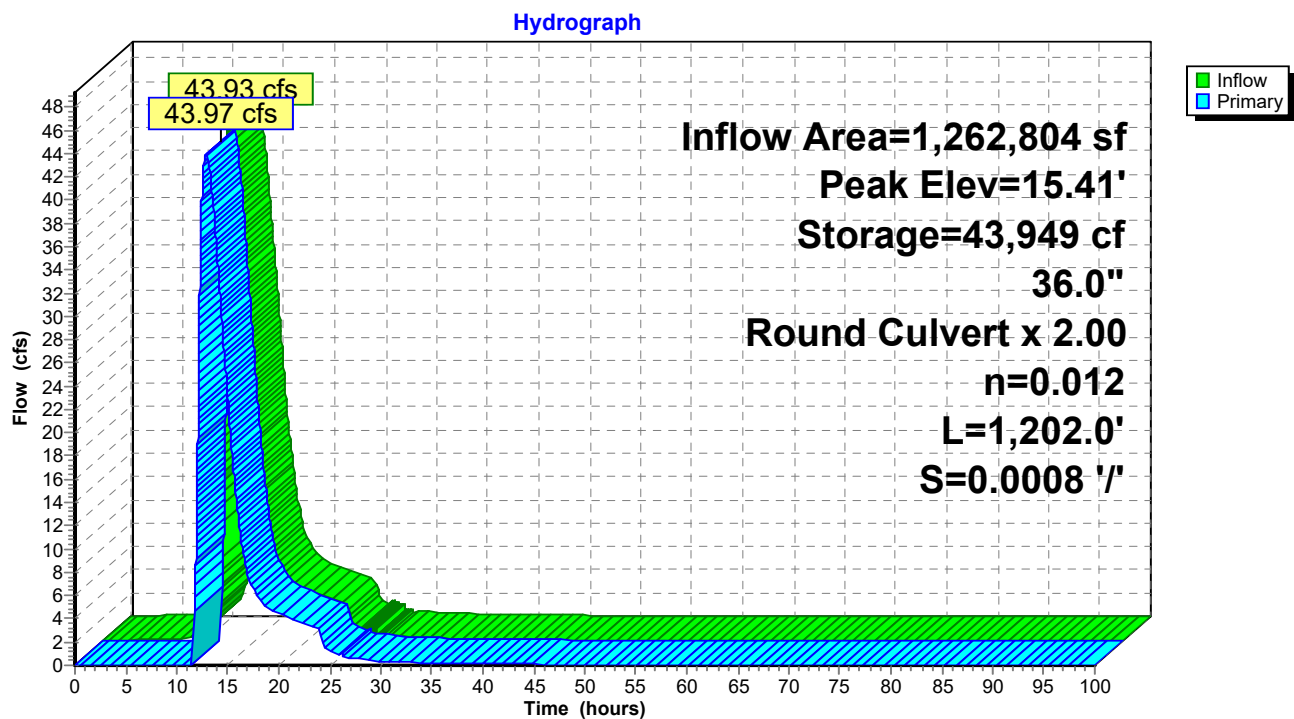
Plug-Flow detention time= 55.3 min calculated for 629,434 cf (97% of inflow)
 Center-of-Mass det. time= 15.9 min (953.2 - 937.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=44.03 cfs @ 12.85 hrs HW=15.36' TW=14.02' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 44.03 cfs @ 3.11 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth = 6.55" for 100-Year Current Adj event
 Inflow = 95.38 cfs @ 12.12 hrs, Volume= 917,696 cf
 Outflow = 66.09 cfs @ 12.26 hrs, Volume= 842,919 cf, Atten= 31%, Lag= 8.5 min
 Primary = 66.09 cfs @ 12.26 hrs, Volume= 842,919 cf
 Routed to Link TW : Tailwater

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.32' @ 12.26 hrs Surf.Area= 26,319 sf Storage= 104,450 cf

Plug-Flow detention time= 100.6 min calculated for 842,835 cf (92% of inflow)
 Center-of-Mass det. time= 37.3 min (933.3 - 896.0)

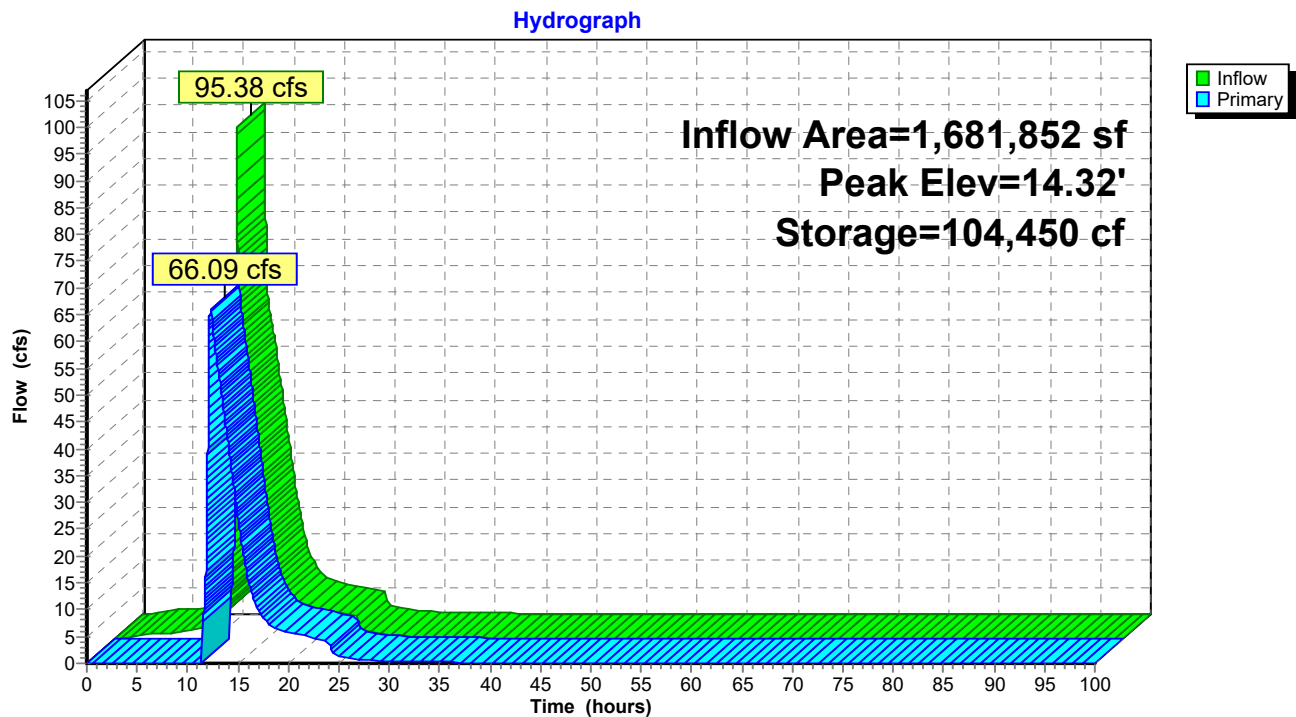
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=66.09 cfs @ 12.26 hrs HW=14.32' TW=13.13' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 66.09 cfs @ 5.26 fps)
- 2=Orifice/Grate (Passes < 0.55 cfs potential flow)
- 3=Orifice/Grate (Passes < 32.87 cfs potential flow)
- 4=Sharp-Crested Rectangular Weir (Passes < 47.47 cfs potential flow)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 8.47" for 100-Year Current Adj event
 Inflow = 7.07 cfs @ 12.10 hrs, Volume= 23,975 cf
 Outflow = 4.06 cfs @ 12.14 hrs, Volume= 21,086 cf, Atten= 43%, Lag= 2.6 min
 Primary = 4.06 cfs @ 12.14 hrs, Volume= 21,086 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.69' @ 12.14 hrs Surf.Area= 12,680 sf Storage= 10,838 cf

Plug-Flow detention time= 333.4 min calculated for 21,086 cf (88% of inflow)
 Center-of-Mass det. time= 271.3 min (1,009.4 - 738.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

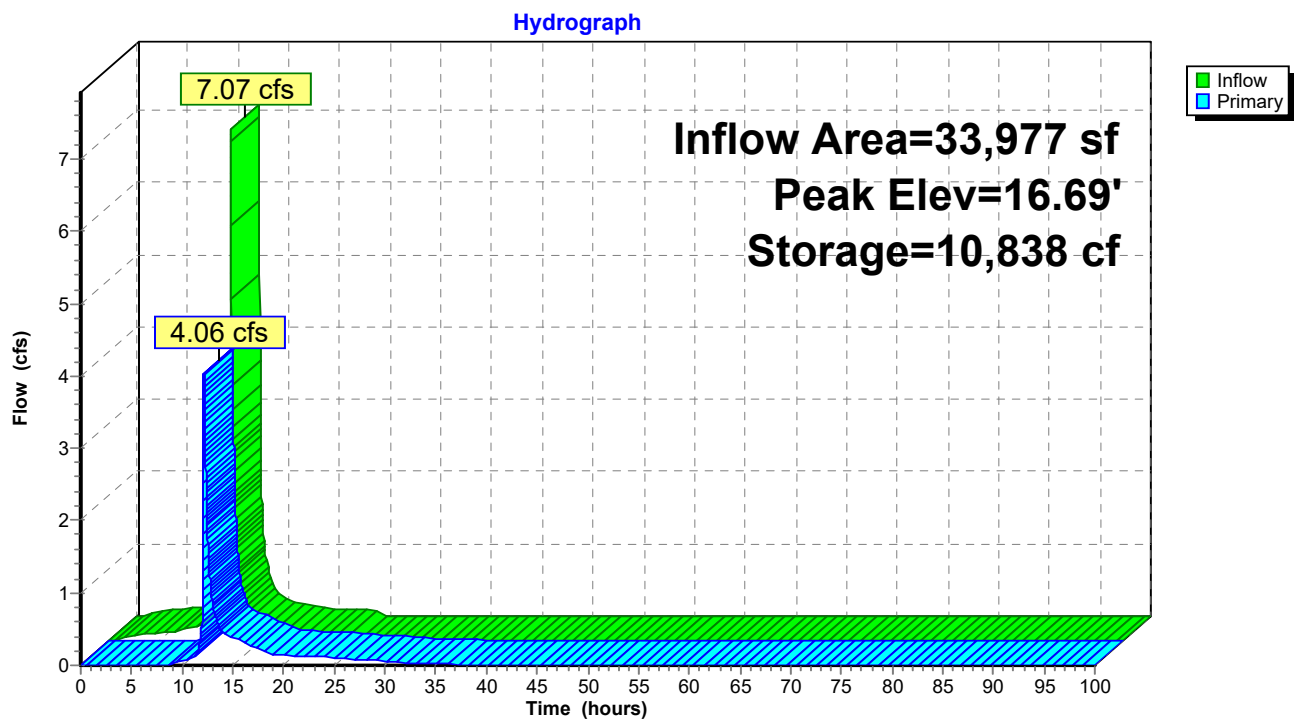
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.05 cfs @ 12.14 hrs HW=16.69' TW=14.65' (Dynamic Tailwater)

- 1=Culvert (Passes 4.05 cfs of 8.30 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 5.84 fps)
- 3=Orifice/Grate (Orifice Controls 0.44 cfs @ 4.44 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 3.42 cfs @ 2.33 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 8.50" for 100-Year Current Adj event
 Inflow = 16.46 cfs @ 12.10 hrs, Volume= 55,565 cf
 Outflow = 10.13 cfs @ 12.13 hrs, Volume= 49,012 cf, Atten= 38%, Lag= 1.9 min
 Primary = 10.13 cfs @ 12.13 hrs, Volume= 49,012 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.13' @ 12.13 hrs Surf.Area= 23,328 sf Storage= 24,033 cf

Plug-Flow detention time= 439.2 min calculated for 49,012 cf (88% of inflow)
 Center-of-Mass det. time= 378.3 min (1,118.7 - 740.4)

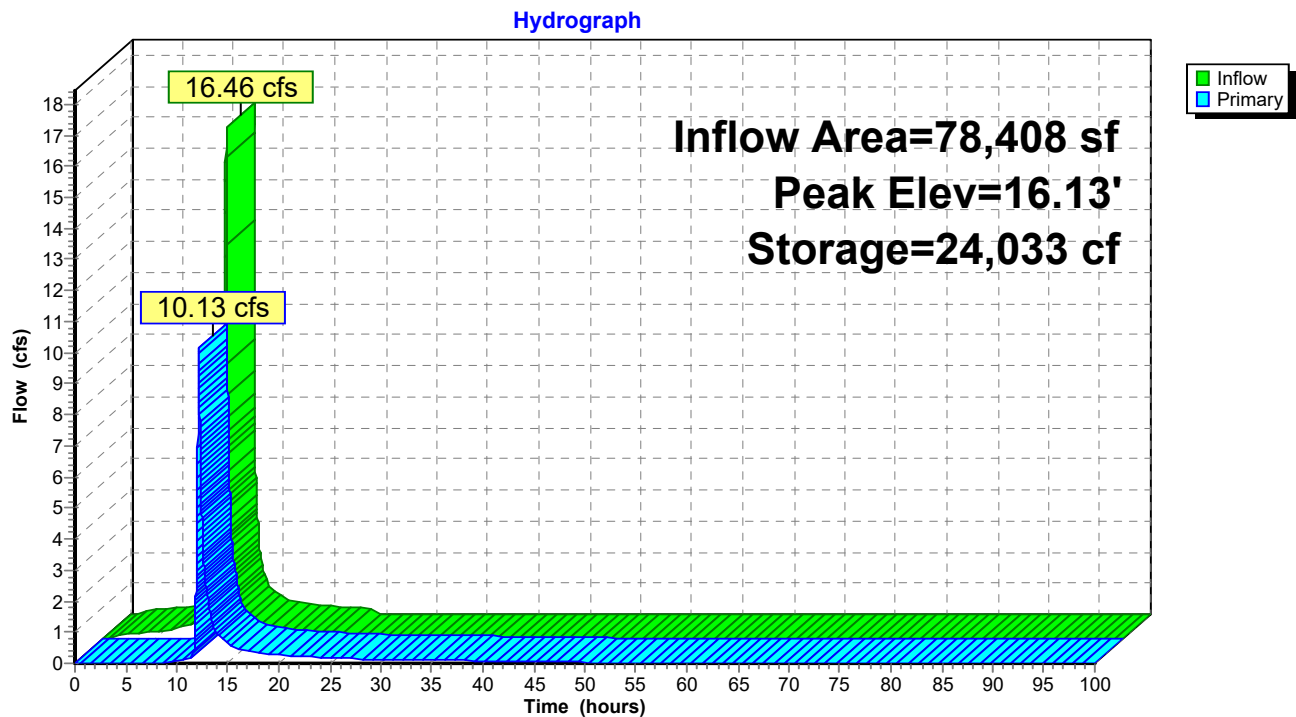
Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=10.11 cfs @ 12.13 hrs HW=16.12' TW=14.44' (Dynamic Tailwater)
 1=Culvert (Passes 10.11 cfs of 44.15 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.21 cfs @ 6.25 fps)
 3=Sharp-Crested Rectangular Weir (Weir Controls 9.90 cfs @ 3.02 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 8.56" for 100-Year Current Adj event
 Inflow = 6.71 cfs @ 12.10 hrs, Volume= 22,683 cf
 Outflow = 3.61 cfs @ 12.14 hrs, Volume= 19,995 cf, Atten= 46%, Lag= 2.8 min
 Primary = 3.61 cfs @ 12.14 hrs, Volume= 19,995 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.11' @ 12.14 hrs Surf.Area= 10,368 sf Storage= 10,624 cf

Plug-Flow detention time= 342.0 min calculated for 19,993 cf (88% of inflow)
 Center-of-Mass det. time= 281.2 min (1,020.5 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

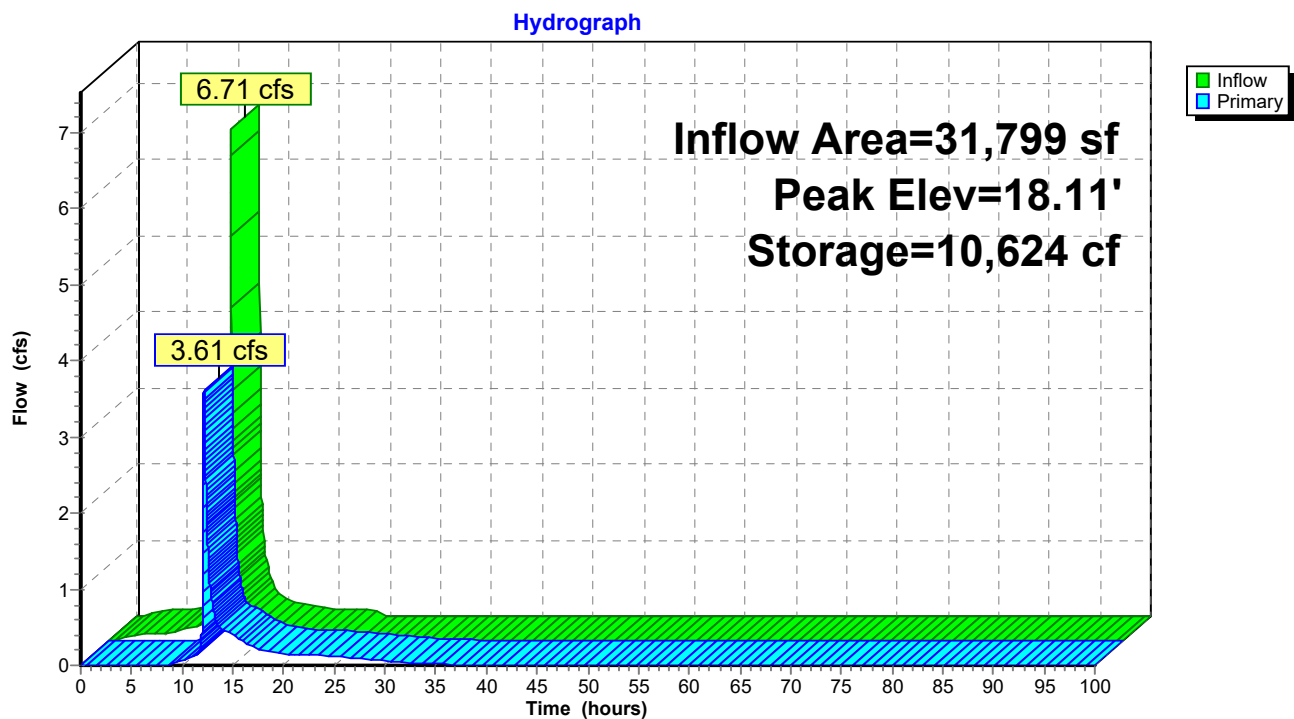
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.60 cfs @ 12.14 hrs HW=18.11' TW=14.16' (Dynamic Tailwater)

- 1=Culvert (Passes 3.60 cfs of 46.96 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.49 fps)
- 3=Orifice/Grate (Orifice Controls 0.40 cfs @ 4.60 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 2.98 cfs @ 2.22 fps)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 8.51" for 100-Year Current Adj event
 Inflow = 97.88 cfs @ 12.10 hrs, Volume= 339,813 cf
 Outflow = 36.64 cfs @ 12.12 hrs, Volume= 299,945 cf, Atten= 63%, Lag= 1.1 min
 Primary = 34.29 cfs @ 12.23 hrs, Volume= 251,769 cf
 Routed to Link PP4V : Valve
 Secondary = 8.62 cfs @ 12.07 hrs, Volume= 48,176 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.62' @ 12.23 hrs Surf.Area= 181,216 sf Storage= 116,876 cf

Plug-Flow detention time= 170.3 min calculated for 299,945 cf (88% of inflow)
 Center-of-Mass det. time= 109.4 min (849.2 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

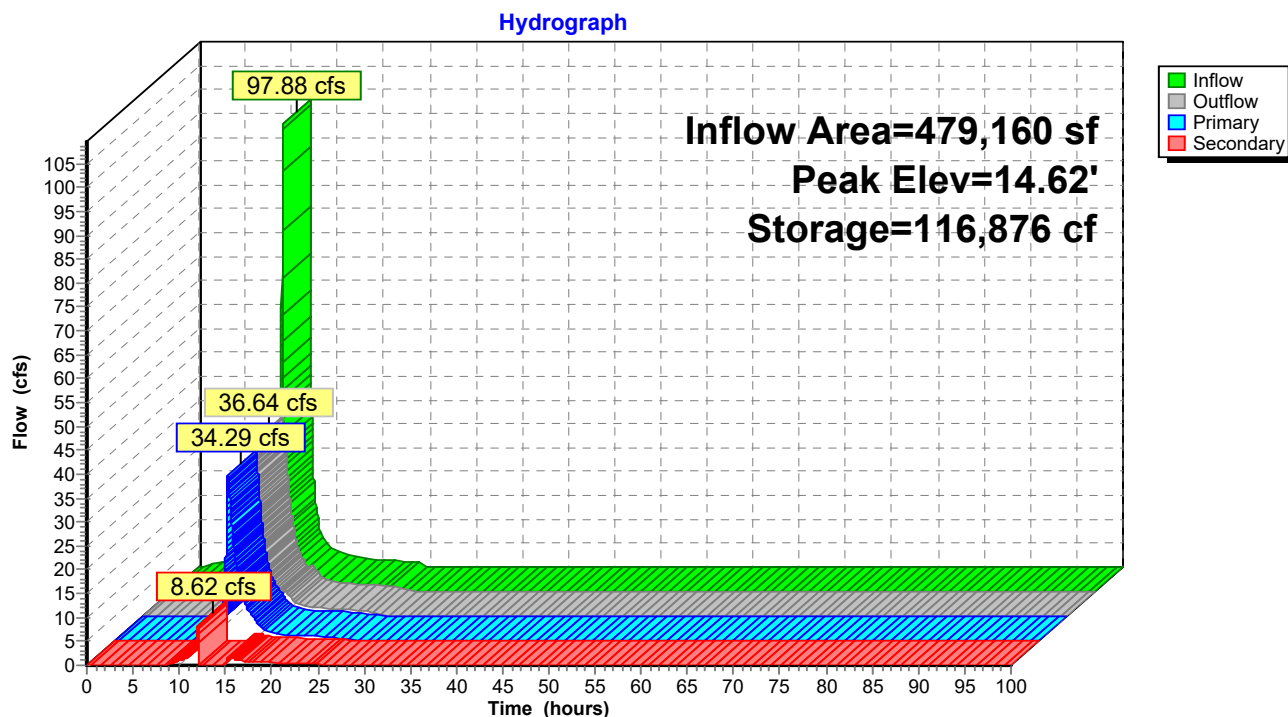
Primary OutFlow Max=34.28 cfs @ 12.23 hrs HW=14.62' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 34.28 cfs of 136.01 cfs potential flow)
 ↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 34.28 cfs @ 3.37 fps)

Secondary OutFlow Max=7.84 cfs @ 12.07 hrs HW=14.38' TW=14.17' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 7.84 cfs of 15.52 cfs potential flow)
 ↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 7.84 cfs @ 1.99 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 8.59" for 100-Year Current Adj event
 Inflow = 7.07 cfs @ 12.09 hrs, Volume= 23,704 cf
 Outflow = 3.99 cfs @ 12.11 hrs, Volume= 20,875 cf, Atten= 44%, Lag= 1.3 min
 Primary = 3.99 cfs @ 12.11 hrs, Volume= 20,875 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.00' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 7,317 cf

Plug-Flow detention time= 154.0 min calculated for 20,875 cf (88% of inflow)
 Center-of-Mass det. time= 92.4 min (829.3 - 736.9)

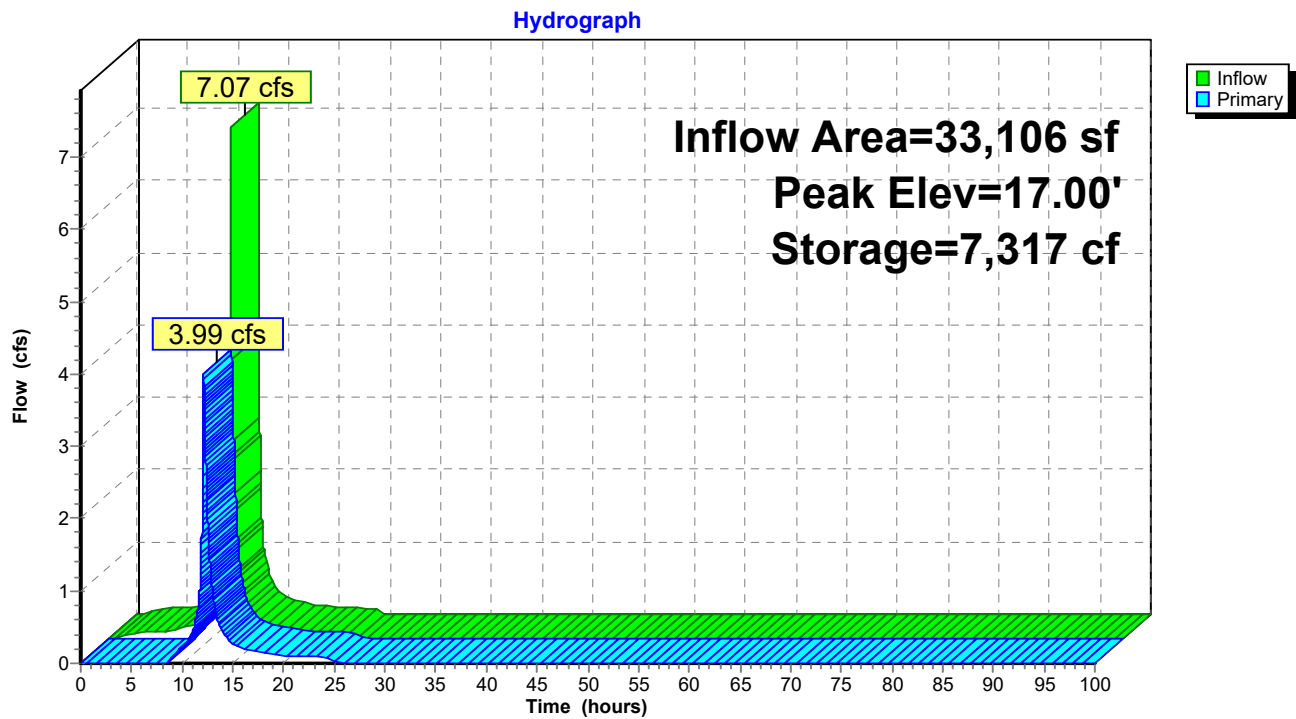
Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.98 cfs @ 12.11 hrs HW=17.00' TW=14.02' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 3.98 cfs of 8.56 cfs potential flow)
 ↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 3.98 cfs @ 2.22 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 8.55" for 100-Year Current Adj event
 Inflow = 8.23 cfs @ 12.09 hrs, Volume= 27,608 cf
 Outflow = 4.11 cfs @ 12.11 hrs, Volume= 24,349 cf, Atten= 50%, Lag= 1.4 min
 Primary = 4.11 cfs @ 12.11 hrs, Volume= 24,349 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.73' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 9,142 cf

Plug-Flow detention time= 161.8 min calculated for 24,347 cf (88% of inflow)
 Center-of-Mass det. time= 101.0 min (837.8 - 736.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

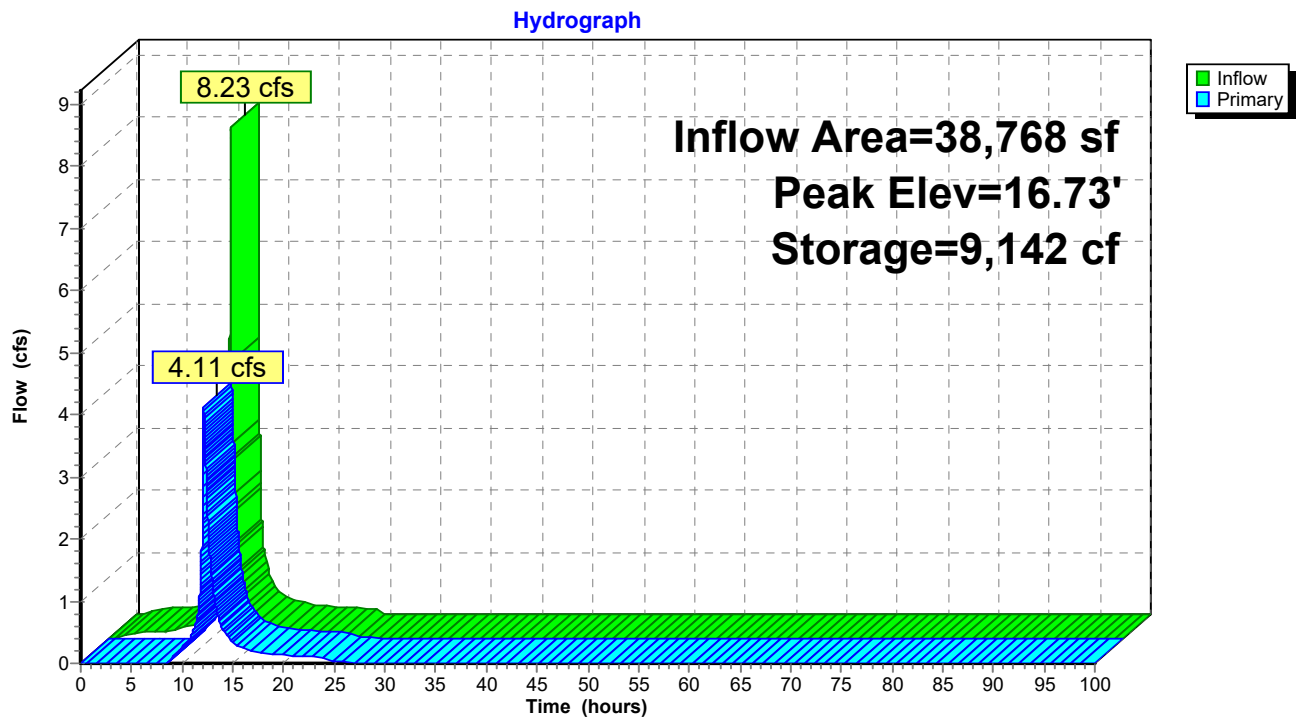
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.10 cfs @ 12.11 hrs HW=16.73' TW=14.47' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.10 cfs of 8.88 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.10 cfs @ 2.24 fps)

Pond PP6: POROUS PAVEMENT

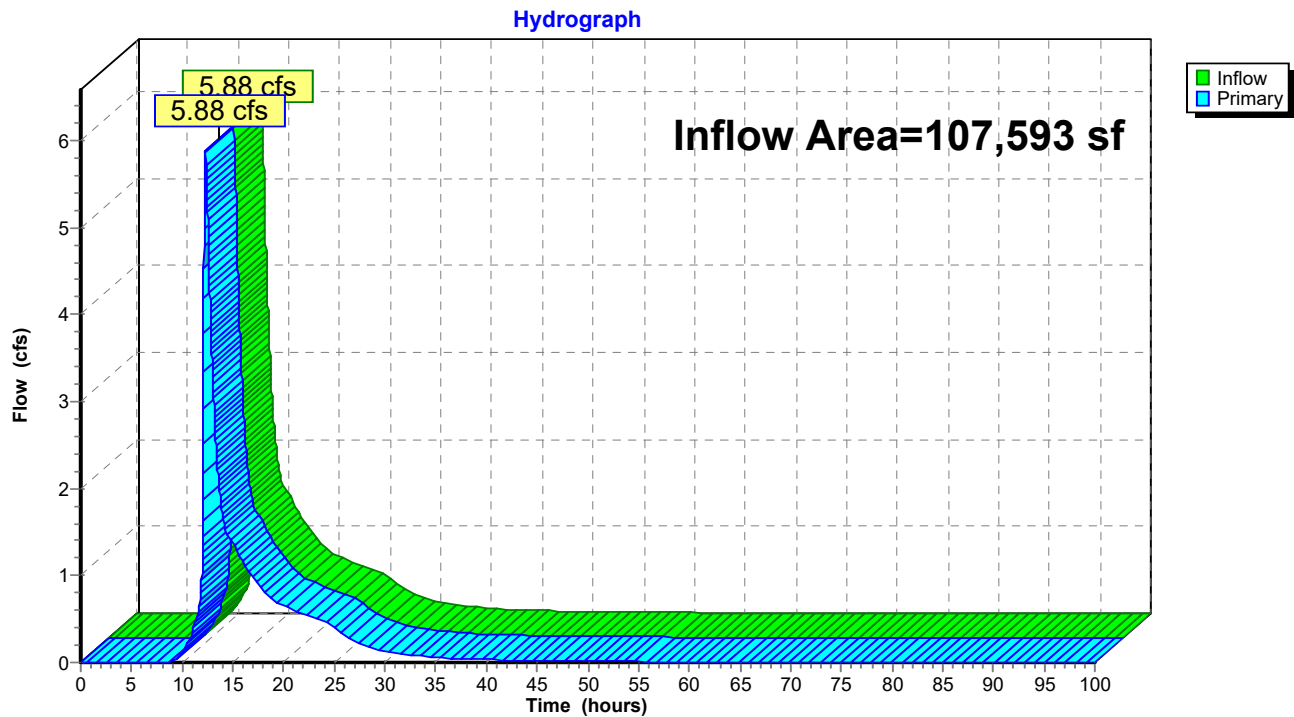


Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 7.53" for 100-Year Current Adj event
Inflow = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf
Primary = 5.88 cfs @ 12.29 hrs, Volume= 67,558 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

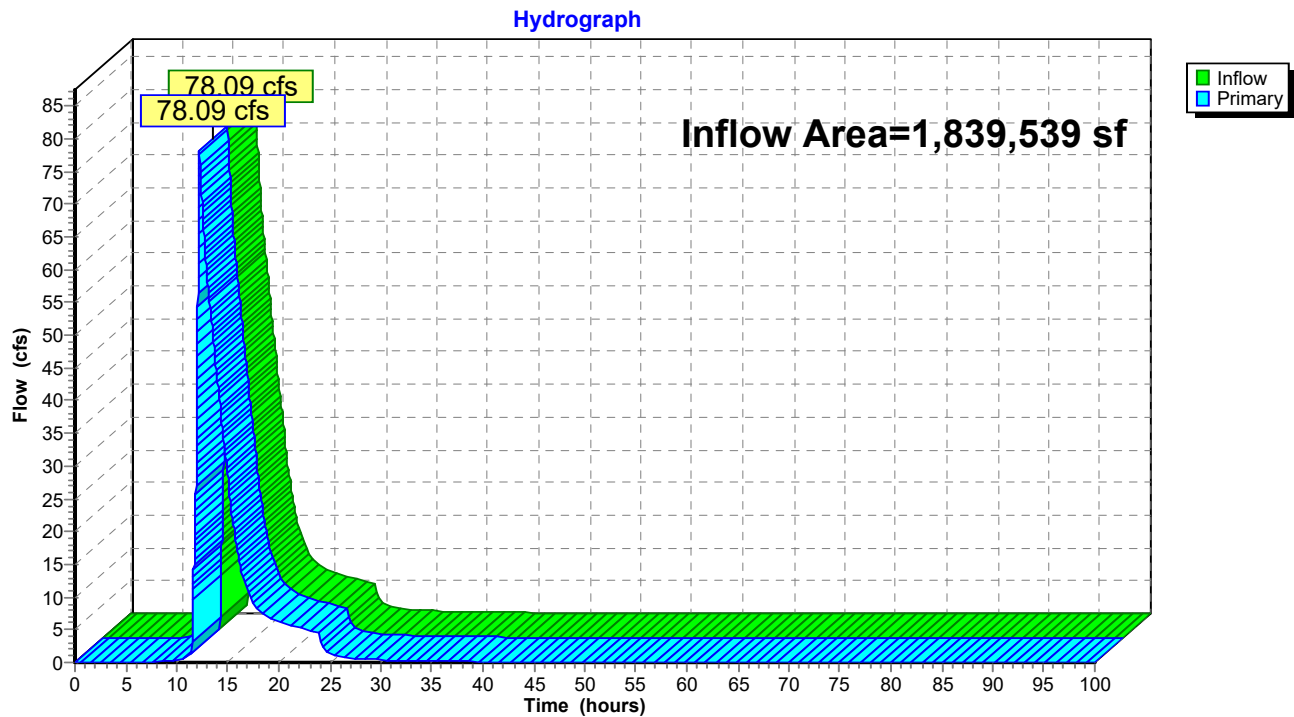


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth = 5.93" for 100-Year Current Adj event
Inflow = 78.09 cfs @ 12.23 hrs, Volume= 909,150 cf
Primary = 78.09 cfs @ 12.23 hrs, Volume= 909,150 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



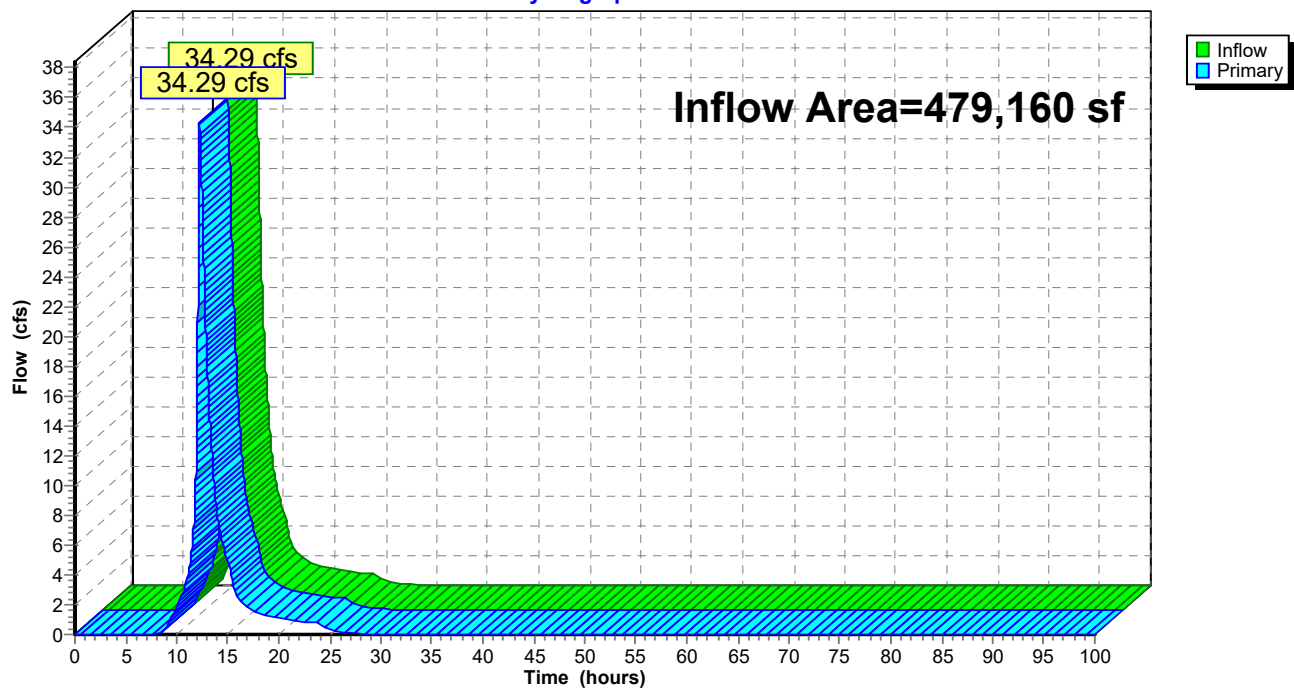
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 6.31" for 100-Year Current Adj event
Inflow = 34.29 cfs @ 12.23 hrs, Volume= 251,769 cf
Primary = 34.29 cfs @ 12.23 hrs, Volume= 251,769 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



Summary for Link TW: Tailwater

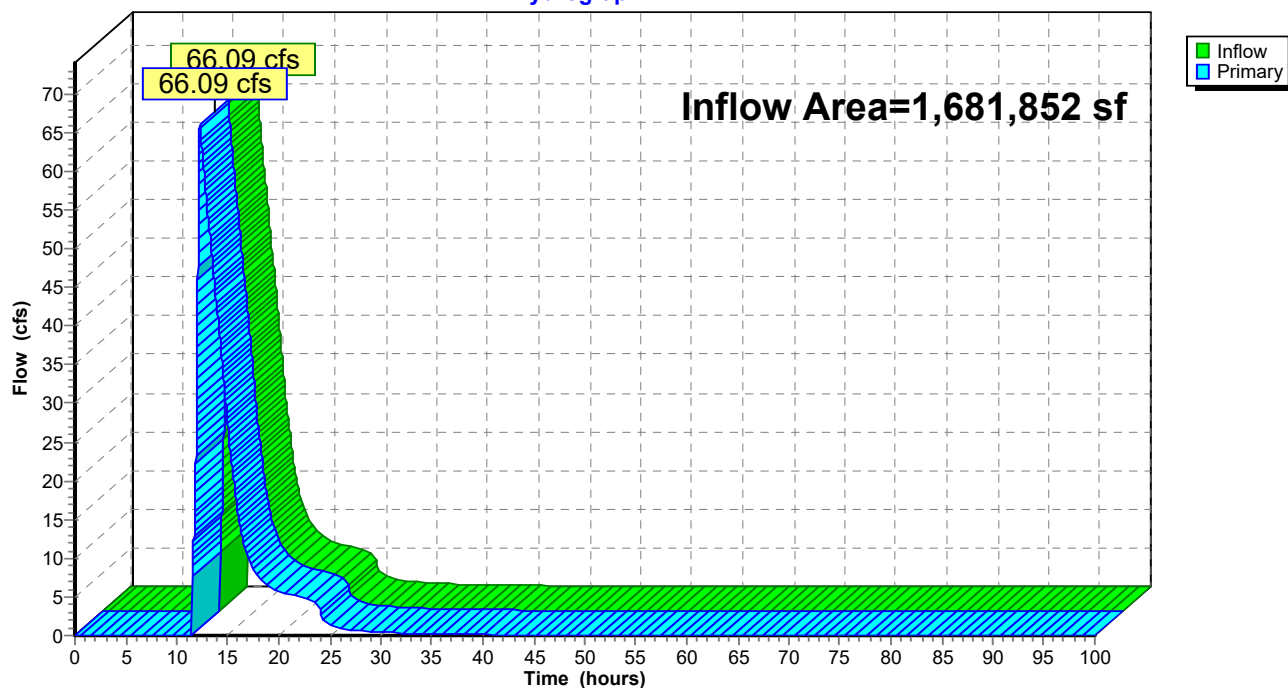
Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth = 6.01" for 100-Year Current Adj event
Inflow = 66.09 cfs @ 12.26 hrs, Volume= 842,919 cf
Primary = 66.09 cfs @ 12.26 hrs, Volume= 842,919 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 13.13'

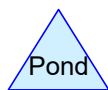
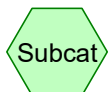
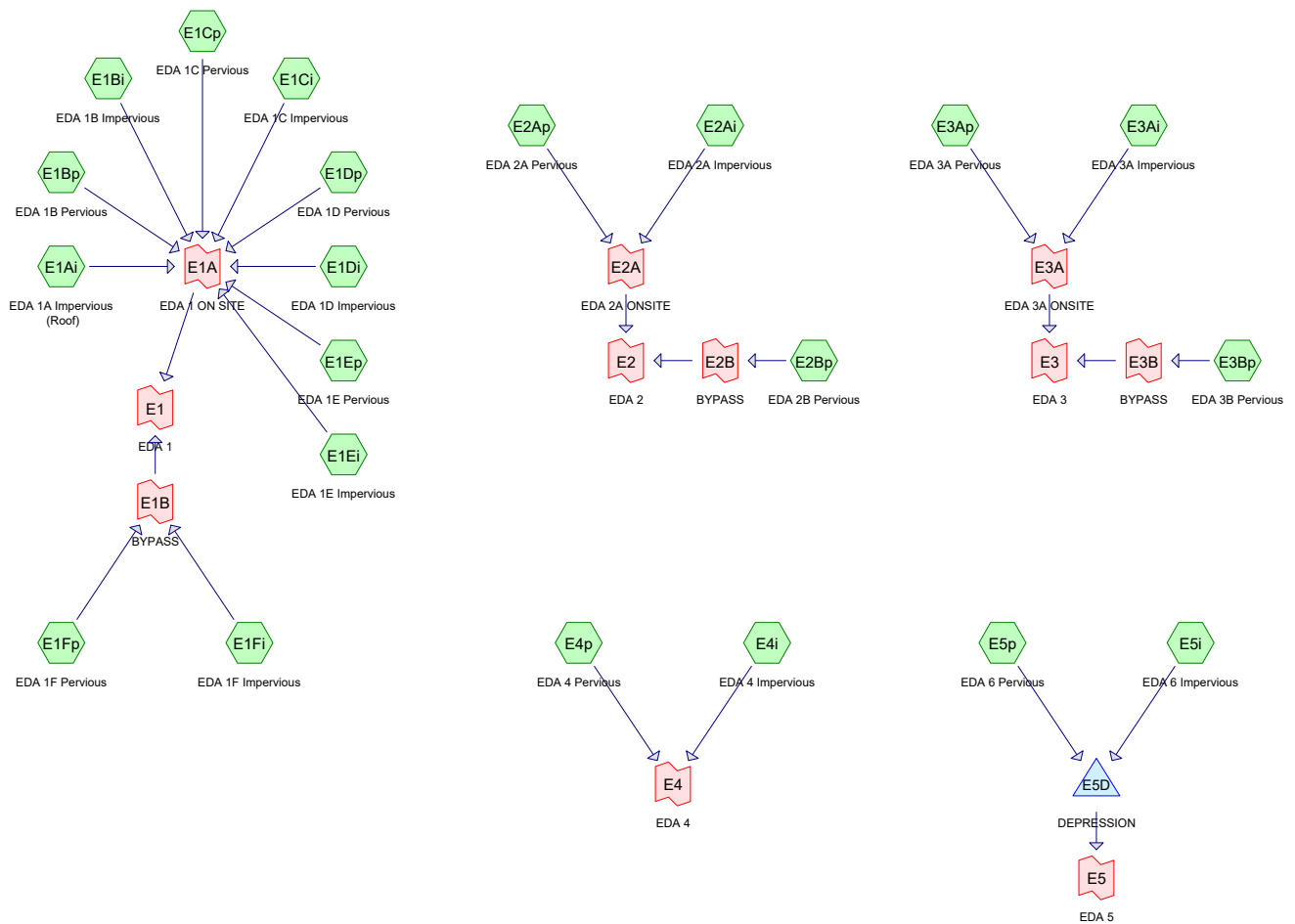
Link TW: Tailwater

Hydrograph



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

- ◆ 2-Year Storm Event without Tailwater
- ◆ 10-Year Storm Event without Tailwater
- ◆ 10-Year Storm Event with Tailwater
- ◆ 100-Year Storm Event without Tailwater
- ◆ 100-Year Storm Event with Tailwater



Routing Diagram for Pre vs Post Rev. 3a
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	3.99	2	3.99

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Impervious Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=400' Slope=0.0100 '/' Tc=3.9 min CN=98 Runoff=51.47 cfs 198,060 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=272' Tc=2.8 min CN=98 Runoff=1.56 cfs 5,589 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=2.03"
Flow Length=230' Tc=7.1 min CN=80 Runoff=0.61 cfs 2,510 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=265' Tc=6.9 min CN=98 Runoff=3.76 cfs 17,448 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=2.03"
Flow Length=265' Tc=6.9 min CN=80 Runoff=0.72 cfs 2,953 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=695' Tc=19.0 min CN=98 Runoff=0.39 cfs 2,863 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=0.33"
Flow Length=435' Tc=18.4 min CN=50 Runoff=0.17 cfs 2,746 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=441' Tc=5.2 min CN=98 Runoff=20.45 cfs 85,740 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=1.73"
Flow Length=412' Tc=8.2 min CN=76 Runoff=2.91 cfs 13,006 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=3.76"
Flow Length=861' Tc=18.7 min CN=98 Runoff=0.24 cfs 1,772 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=1.88"
Flow Length=861' Tc=18.7 min CN=78 Runoff=7.56 cfs 50,950 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=3.31"
Flow Length=382' Tc=14.3 min CN=94 Runoff=0.64 cfs 3,850 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=1.96"
Flow Length=382' Tc=14.3 min CN=79 Runoff=1.30 cfs 7,595 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.80"
Flow Length=289' Tc=12.1 min CN=77 Runoff=0.66 cfs 3,536 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=3.42"
Flow Length=218' Tc=2.8 min CN=95 Runoff=5.15 cfs 17,387 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=1.80"
Flow Length=218' Tc=2.8 min CN=77 Runoff=1.42 cfs 4,322 cf

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=1.59" Flow Length=860' Tc=18.7 min CN=74 Runoff=5.44 cfs 37,665 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=636' Tc=13.0 min CN=98 Runoff=0.96 cfs 5,861 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Runoff Depth=0.05" Flow Length=636' Tc=10.1 min CN=39 Runoff=0.03 cfs 1,153 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=585' Tc=25.3 min CN=98 Runoff=1.32 cfs 11,314 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Runoff Depth=0.08" Flow Length=585' Tc=25.3 min CN=41 Runoff=0.06 cfs 1,957 cf
Pond E5D: DEPRESSION	Peak Elev=15.95' Storage=13,271 cf Inflow=1.32 cfs 13,271 cf Outflow=0.00 cfs 0 cf
Link E1: EDA 1	Inflow=85.61 cfs 383,635 cf Primary=85.61 cfs 383,635 cf
Link E1A: EDA 1 ON SITE	Inflow=80.92 cfs 330,913 cf Primary=80.92 cfs 330,913 cf
Link E1B: BYPASS	Inflow=7.80 cfs 52,722 cf Primary=7.80 cfs 52,722 cf
Link E2: EDA 2	Inflow=2.60 cfs 14,982 cf Primary=2.60 cfs 14,982 cf
Link E2A: EDA 2A ONSITE	Inflow=1.94 cfs 11,445 cf Primary=1.94 cfs 11,445 cf
Link E2B: BYPASS	Inflow=0.66 cfs 3,536 cf Primary=0.66 cfs 3,536 cf
Link E3: EDA 3	Inflow=9.53 cfs 59,374 cf Primary=9.53 cfs 59,374 cf
Link E3A: EDA 3A ONSITE	Inflow=6.56 cfs 21,709 cf Primary=6.56 cfs 21,709 cf
Link E3B: BYPASS	Inflow=5.44 cfs 37,665 cf Primary=5.44 cfs 37,665 cf
Link E4: EDA 4	Inflow=0.96 cfs 7,015 cf Primary=0.96 cfs 7,015 cf
Link E5: EDA 5	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf

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Total Runoff Area = 2,658,031 sf Runoff Volume = 478,276 cf Average Runoff Depth = 2.16"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 51.47 cfs @ 12.12 hrs, Volume= 198,060 cf, Depth= 3.76"
Routed to Link E1A : EDA 1 ON SITE

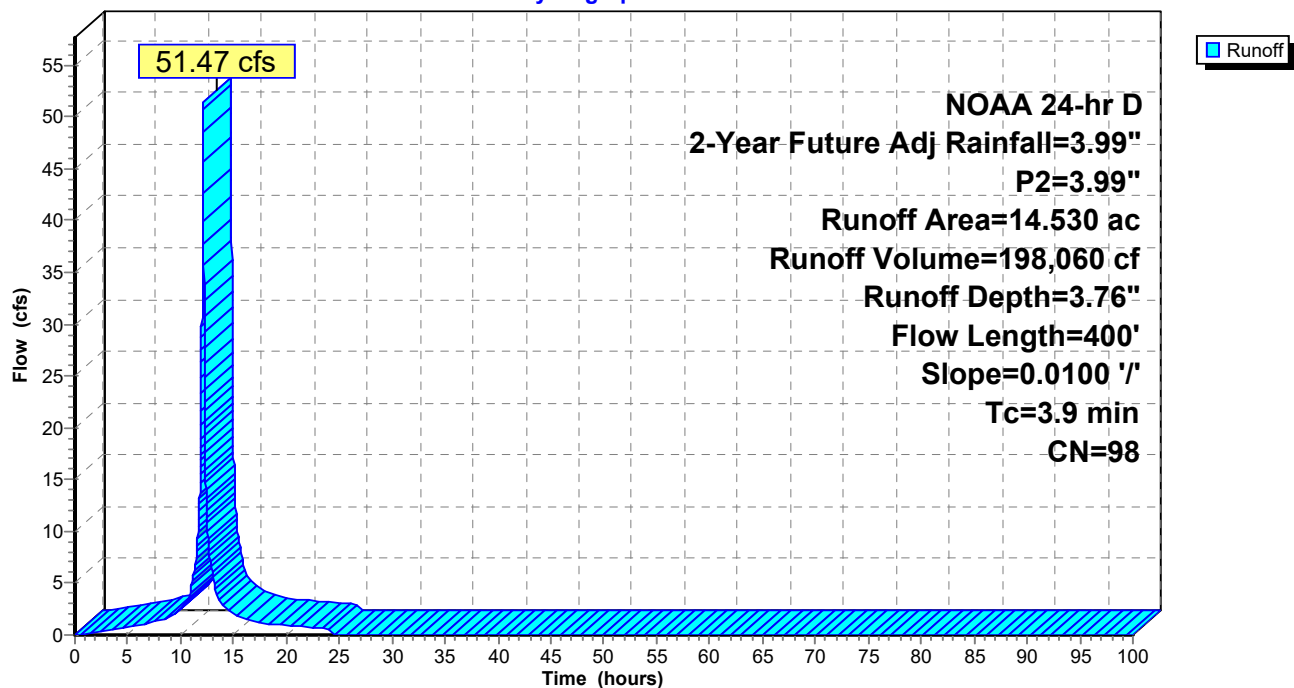
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.16		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



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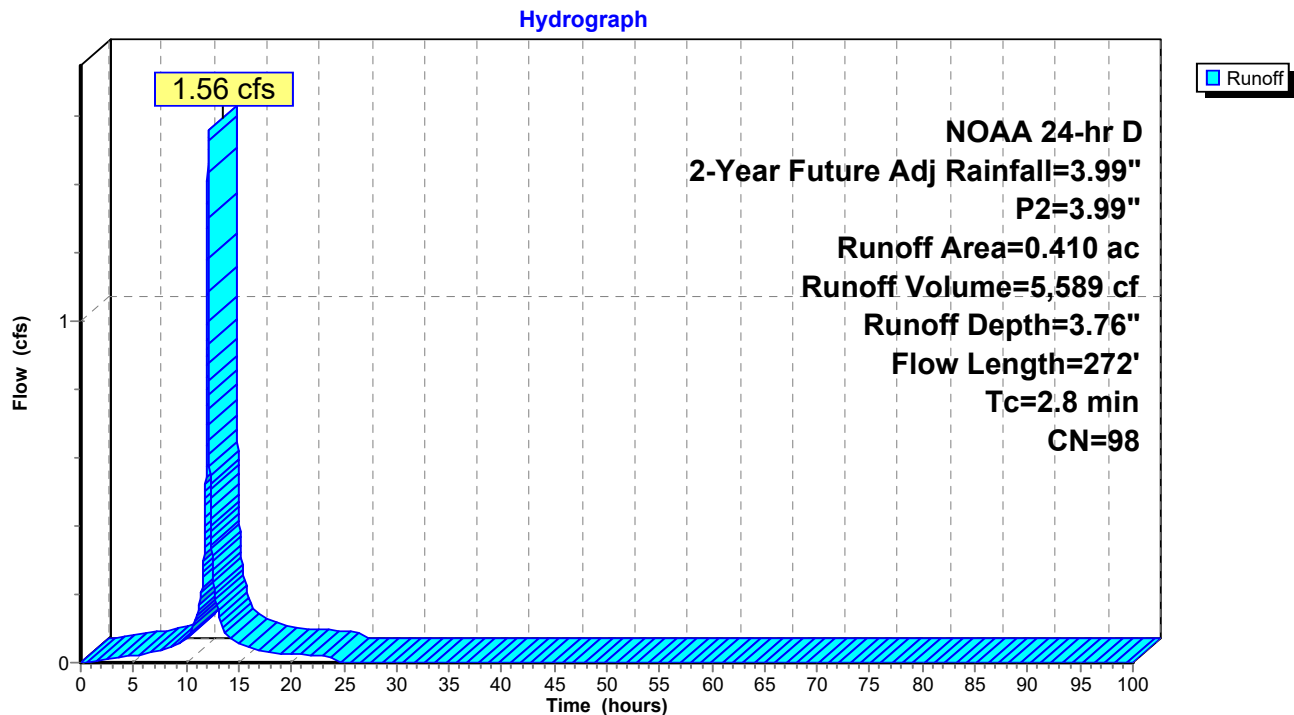
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 1.56 cfs @ 12.11 hrs, Volume= 5,589 cf, Depth= 3.76"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.22		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 0.61 cfs @ 12.15 hrs, Volume= 2,510 cf, Depth= 2.03"
Routed to Link E1A : EDA 1 ON SITE

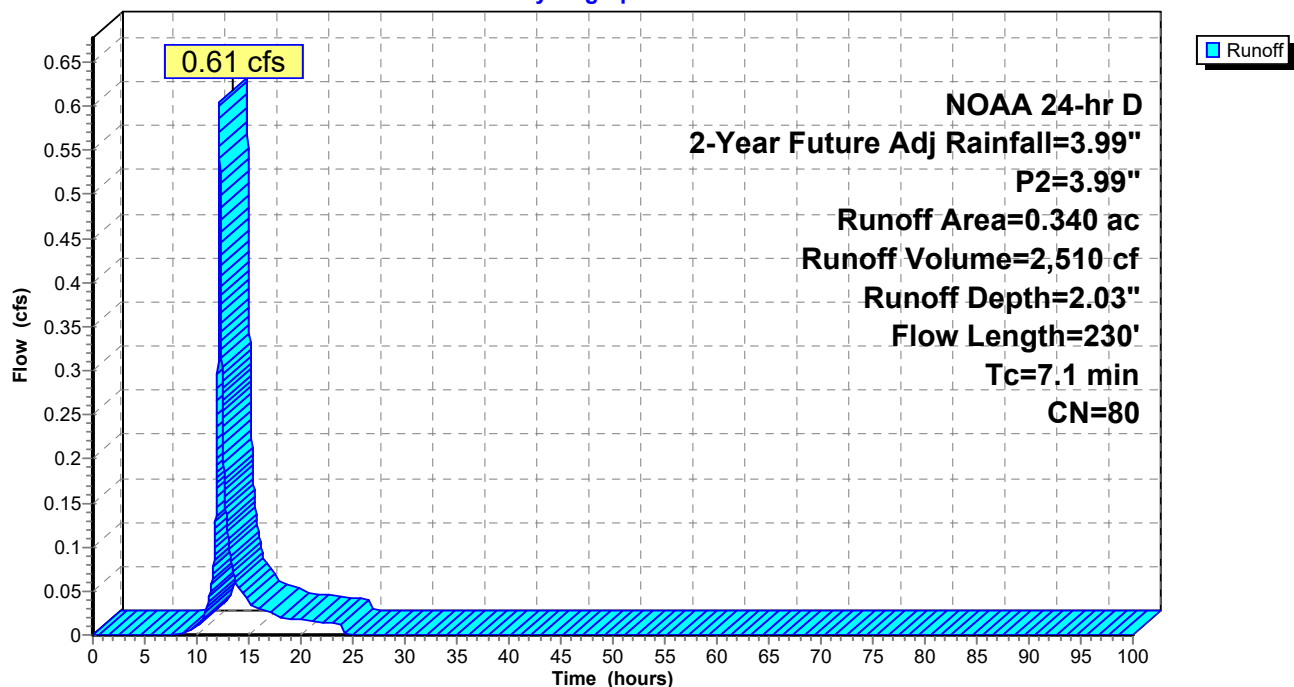
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0500	0.27		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.1	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 3.76 cfs @ 12.15 hrs, Volume= 17,448 cf, Depth= 3.76"
Routed to Link E1A : EDA 1 ON SITE

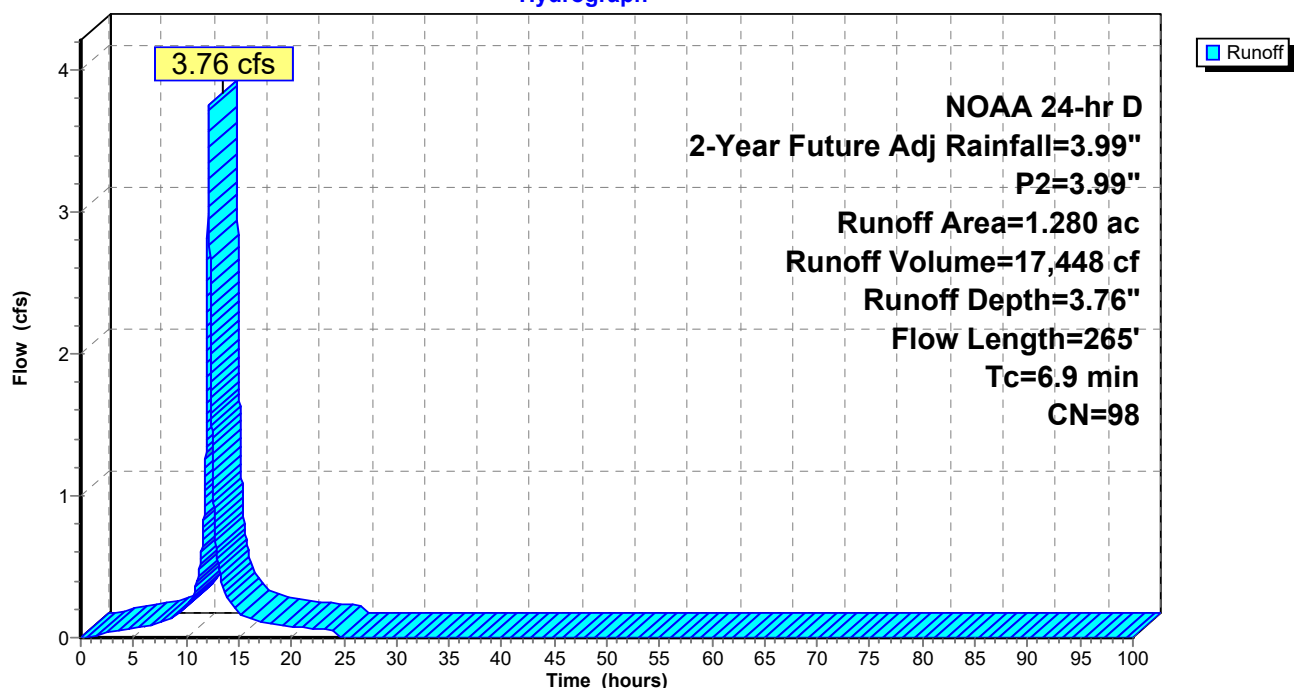
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 0.72 cfs @ 12.15 hrs, Volume= 2,953 cf, Depth= 2.03"
Routed to Link E1A : EDA 1 ON SITE

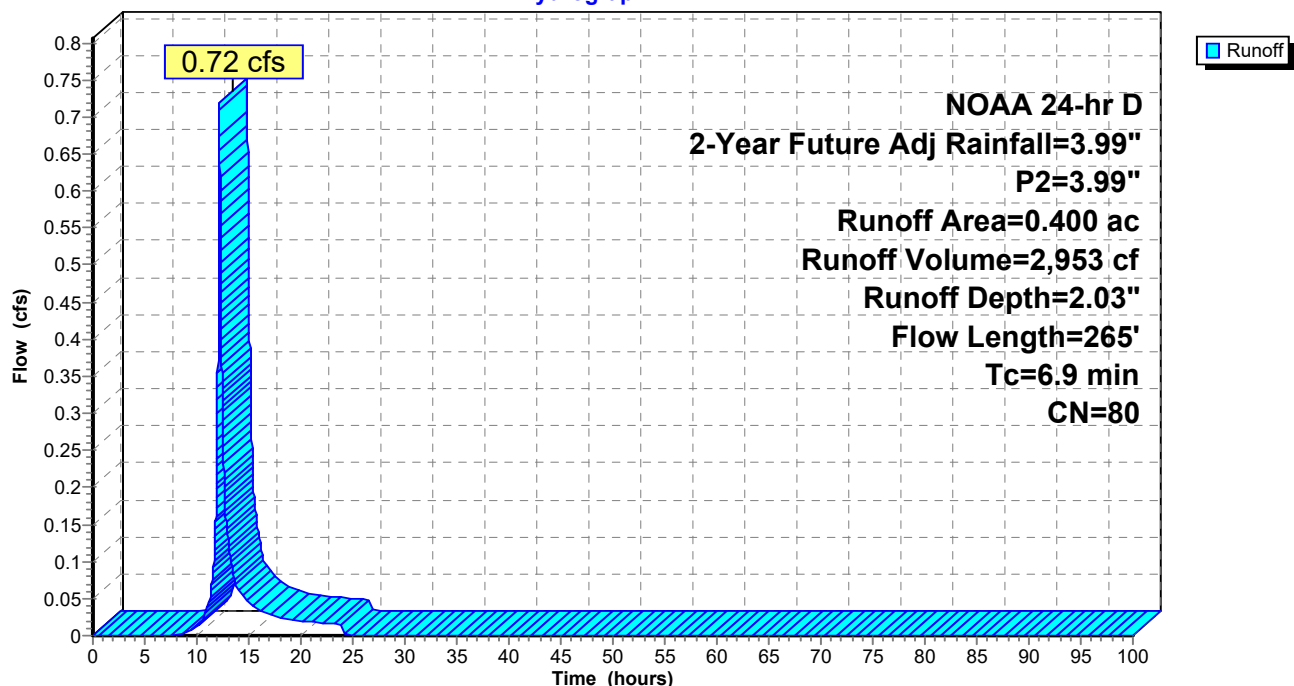
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 0.39 cfs @ 12.29 hrs, Volume= 2,863 cf, Depth= 3.76"
Routed to Link E1A : EDA 1 ON SITE

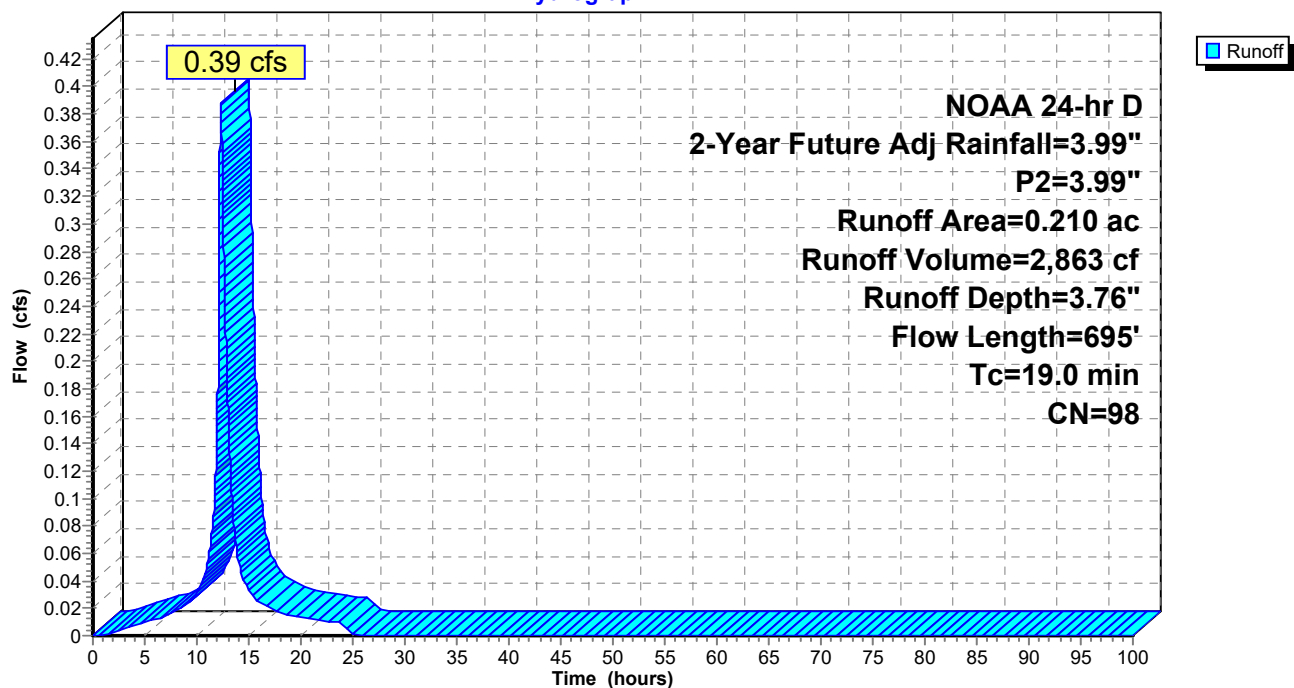
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0055	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.0	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 0.17 cfs @ 12.72 hrs, Volume= 2,746 cf, Depth= 0.33"
Routed to Link E1A : EDA 1 ON SITE

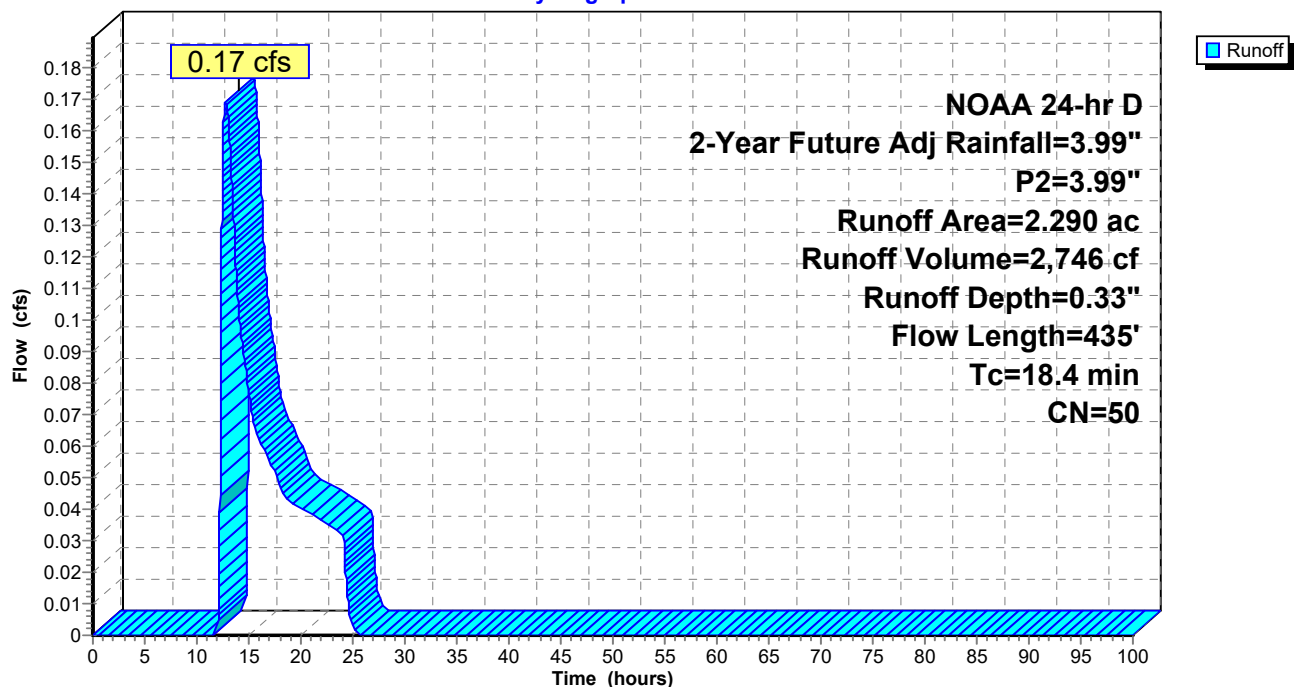
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0270	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.4	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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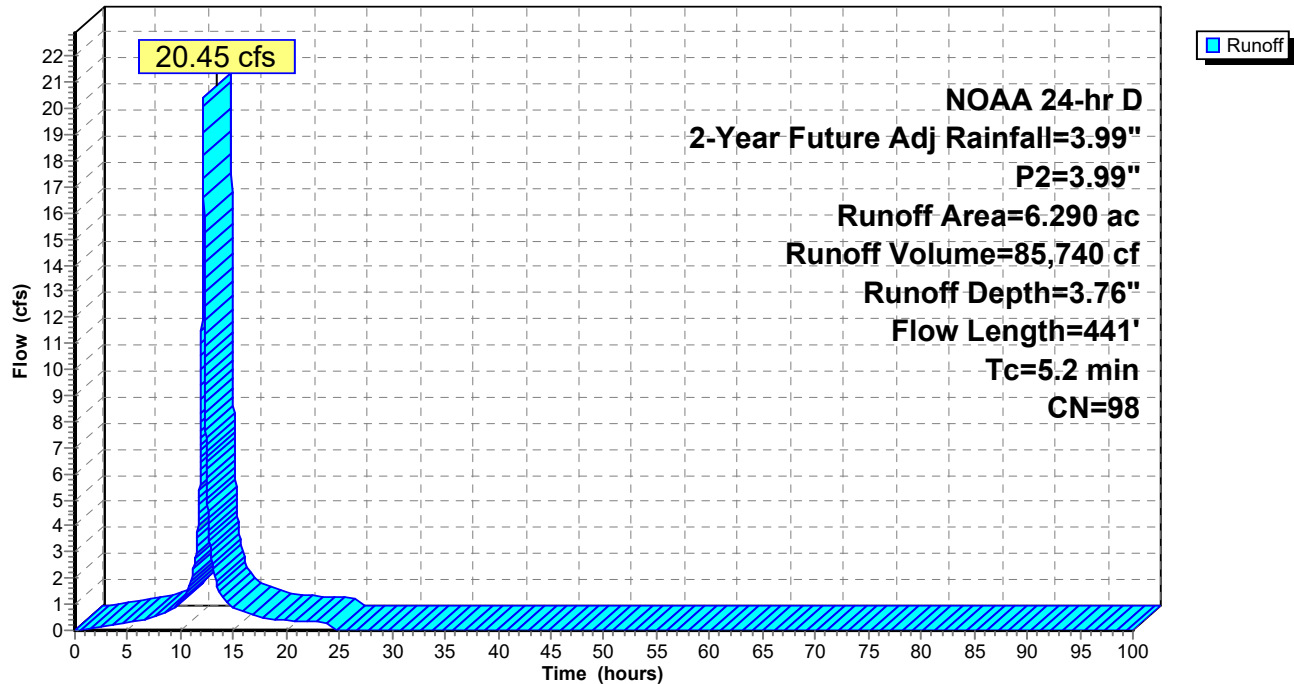
Summary for Subcatchment E1Ei: EDA 1E Impervious

Runoff = 20.45 cfs @ 12.13 hrs, Volume= 85,740 cf, Depth= 3.76"
 Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.2	441	Total			

Subcatchment E1Ei: EDA 1E Impervious**Hydrograph**

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 2.91 cfs @ 12.17 hrs, Volume= 13,006 cf, Depth= 1.73"
Routed to Link E1A : EDA 1 ON SITE

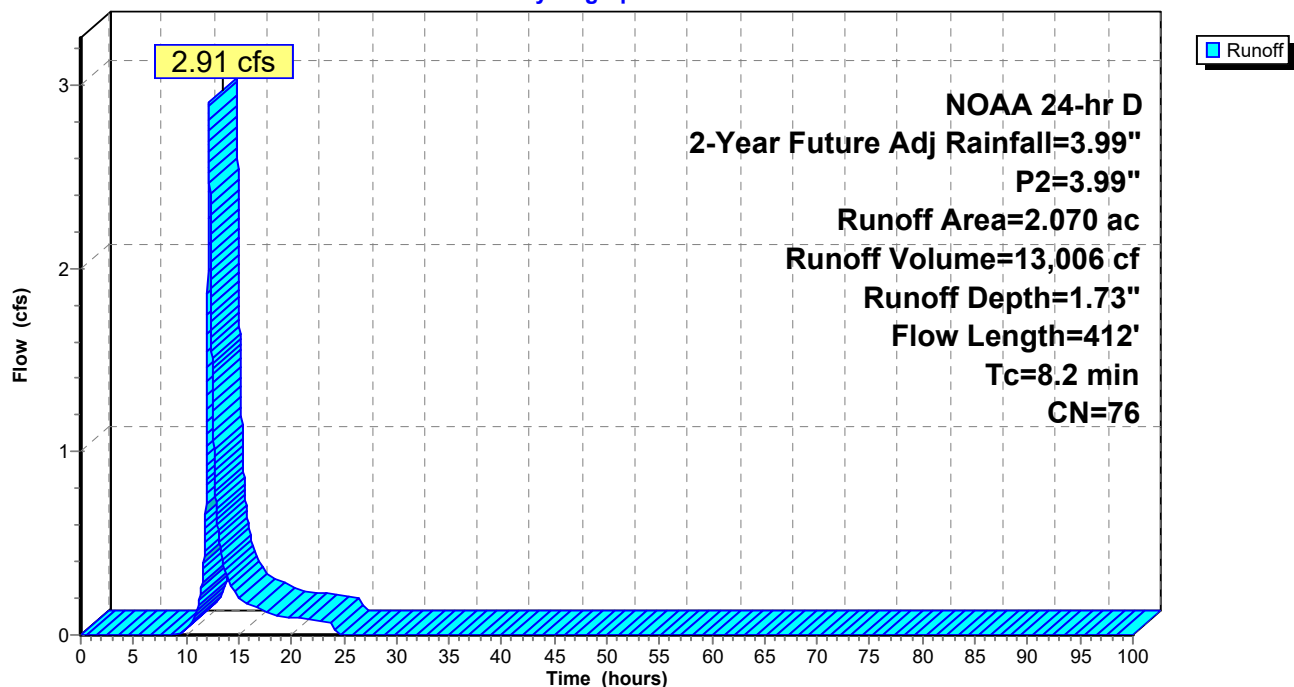
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.24 cfs @ 12.30 hrs, Volume= 1,772 cf, Depth= 3.76"
Routed to Link E1B : BYPASS

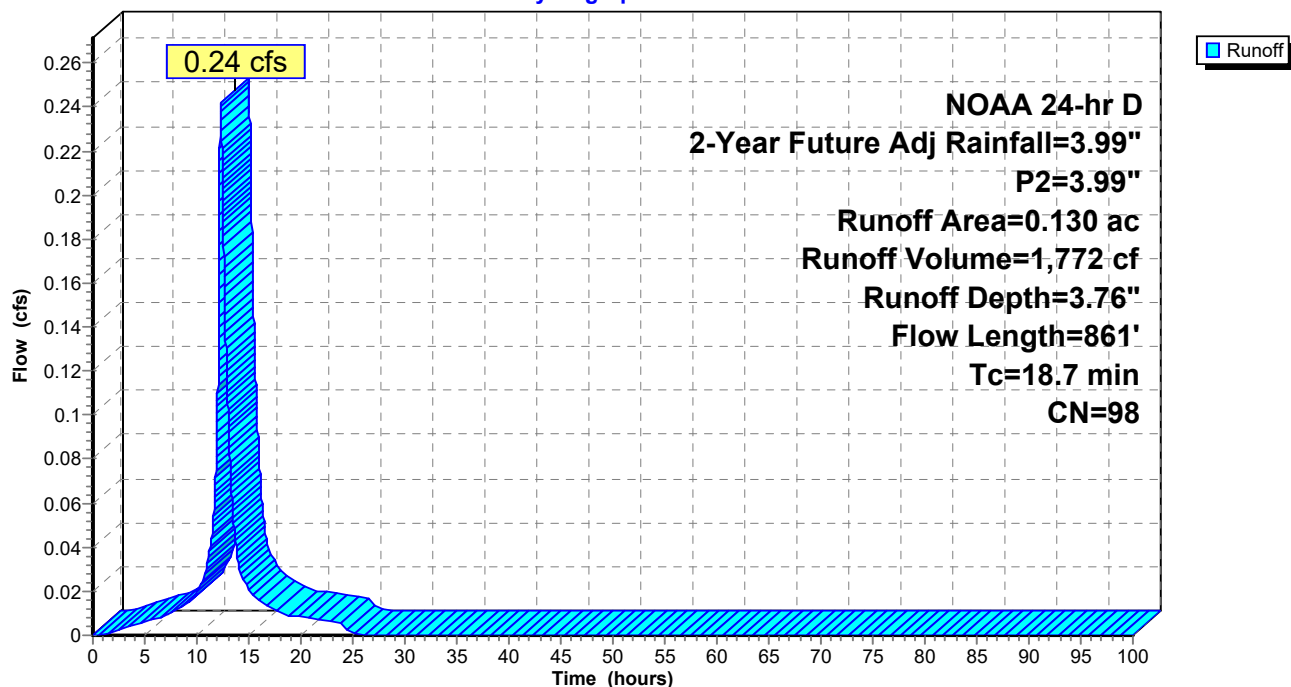
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 7.56 cfs @ 12.30 hrs, Volume= 50,950 cf, Depth= 1.88"
Routed to Link E1B : BYPASS

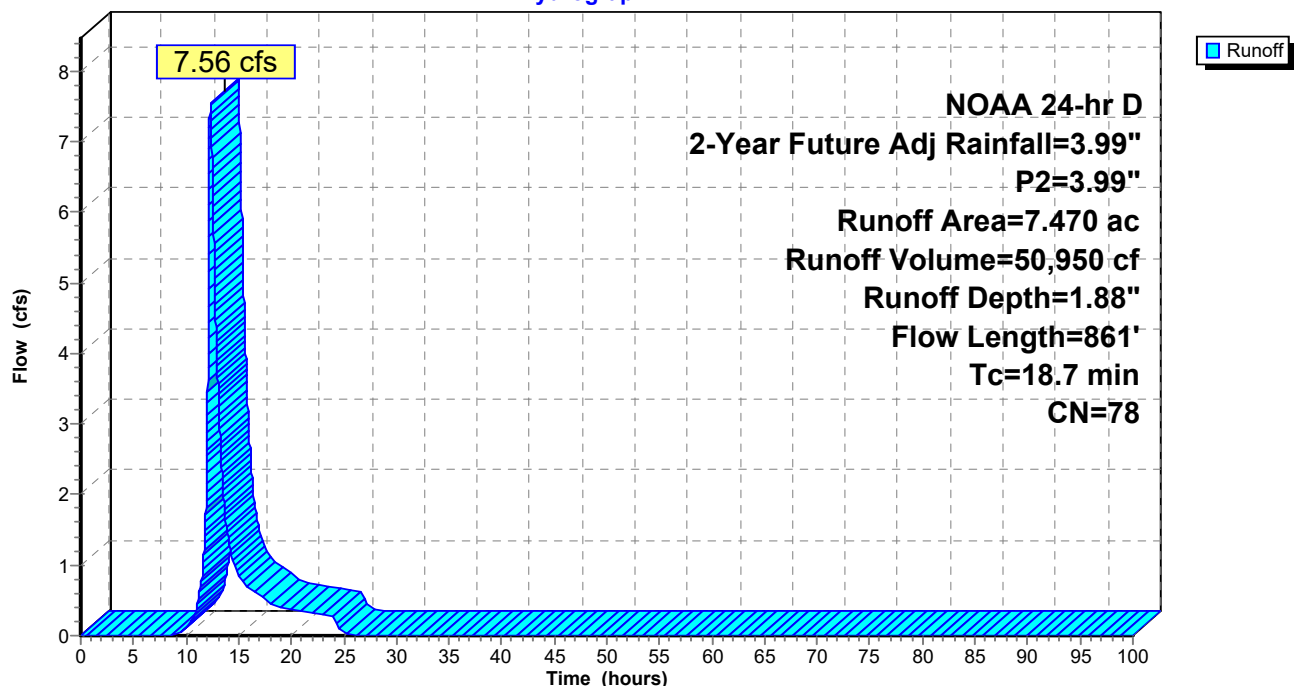
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 0.64 cfs @ 12.24 hrs, Volume= 3,850 cf, Depth= 3.31"
Routed to Link E2A : EDA 2A ONSITE

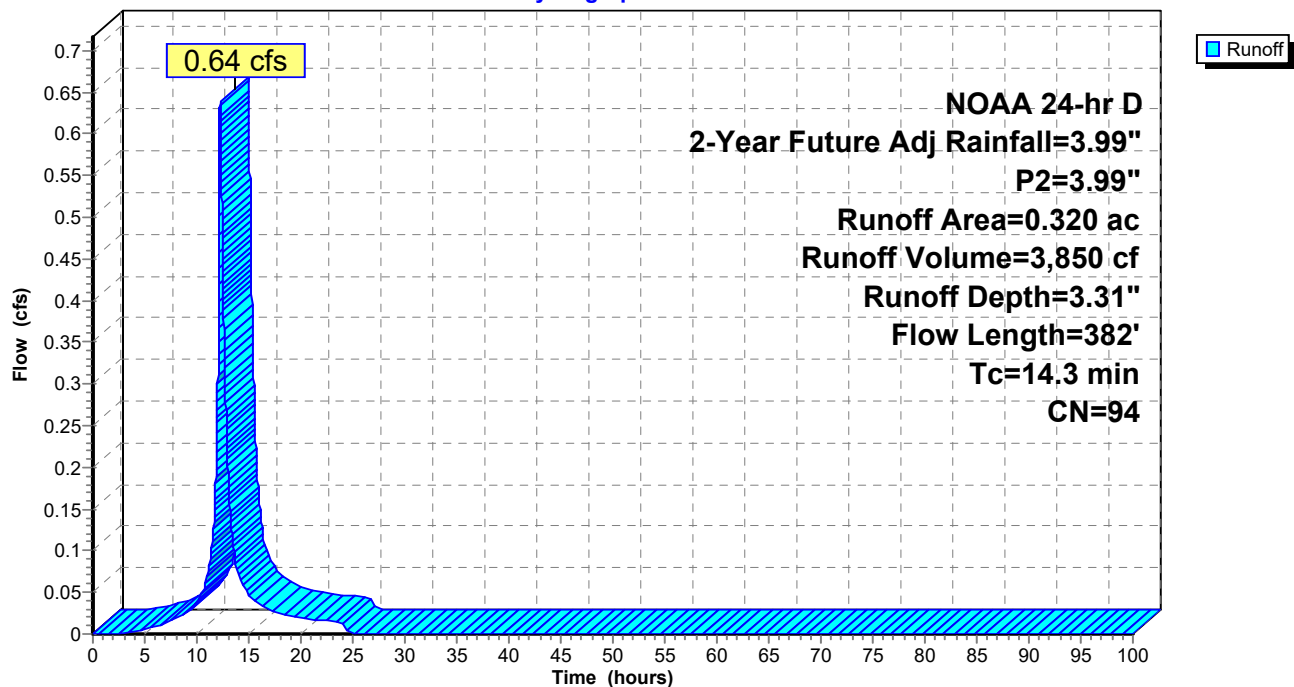
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 1.30 cfs @ 12.24 hrs, Volume= 7,595 cf, Depth= 1.96"
Routed to Link E2A : EDA 2A ONSITE

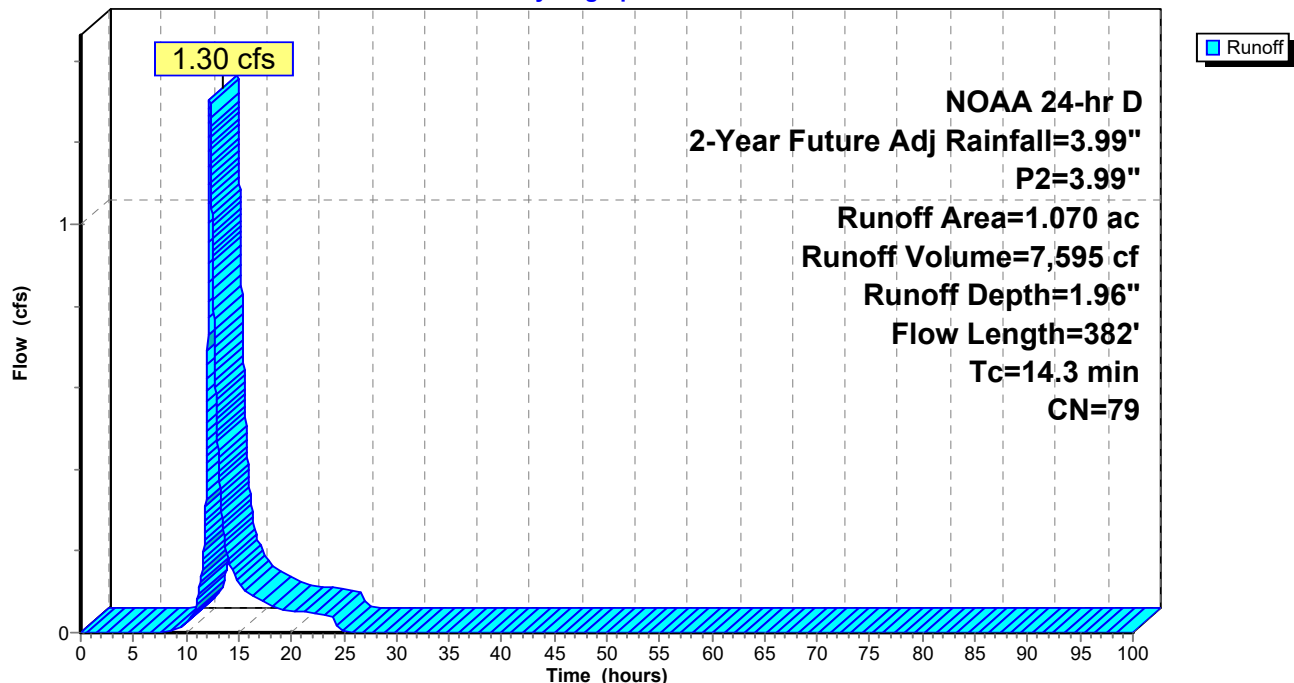
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf, Depth= 1.80"
Routed to Link E2B : BYPASS

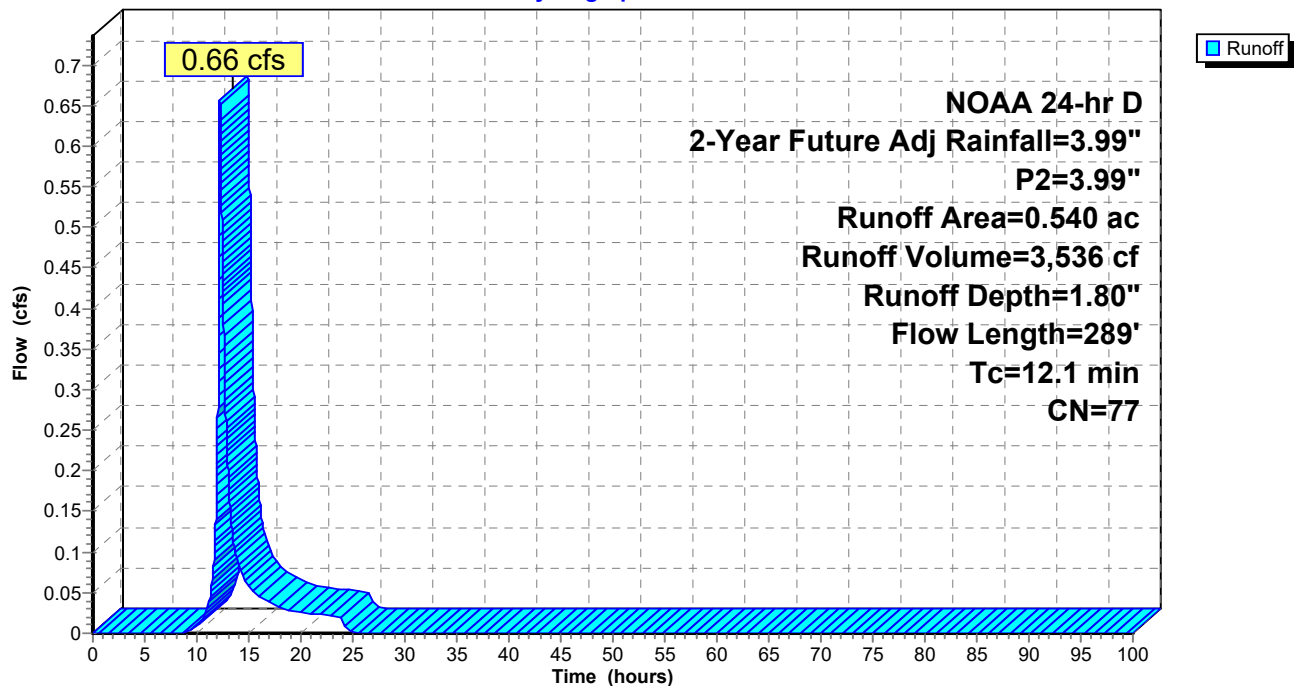
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 5.15 cfs @ 12.11 hrs, Volume= 17,387 cf, Depth= 3.42"
Routed to Link E3A : EDA 3A ONSITE

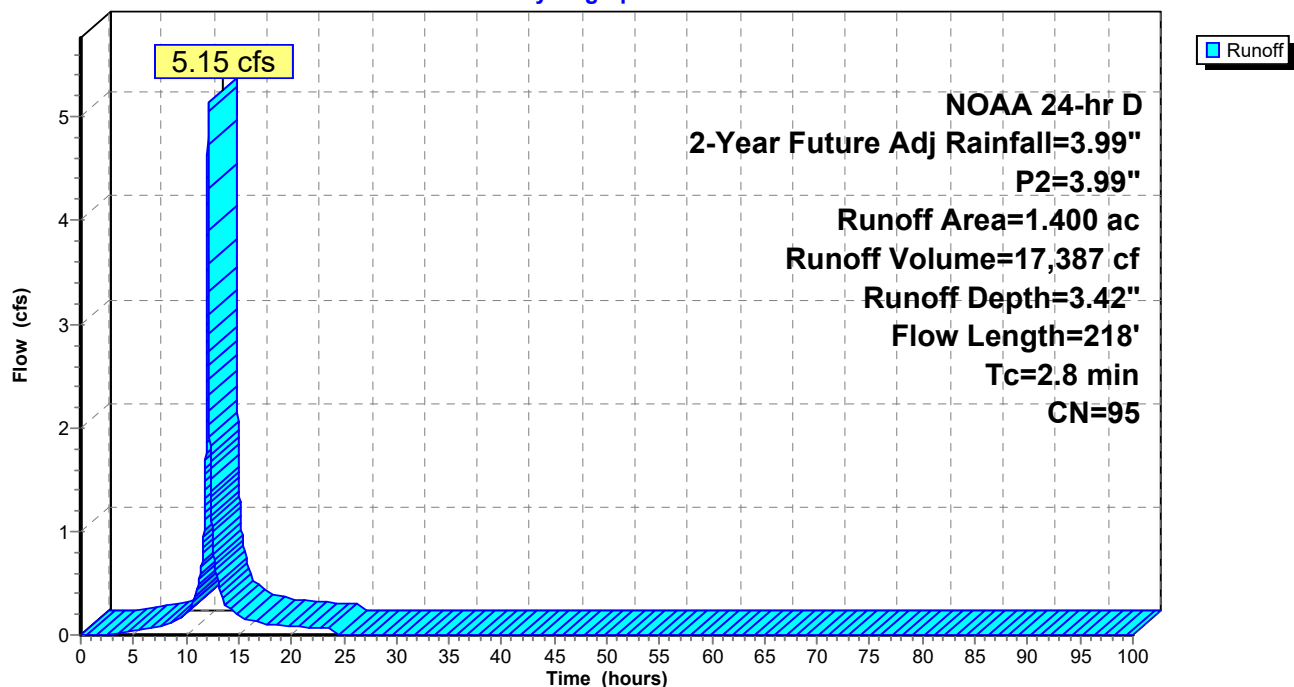
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

Hydrograph



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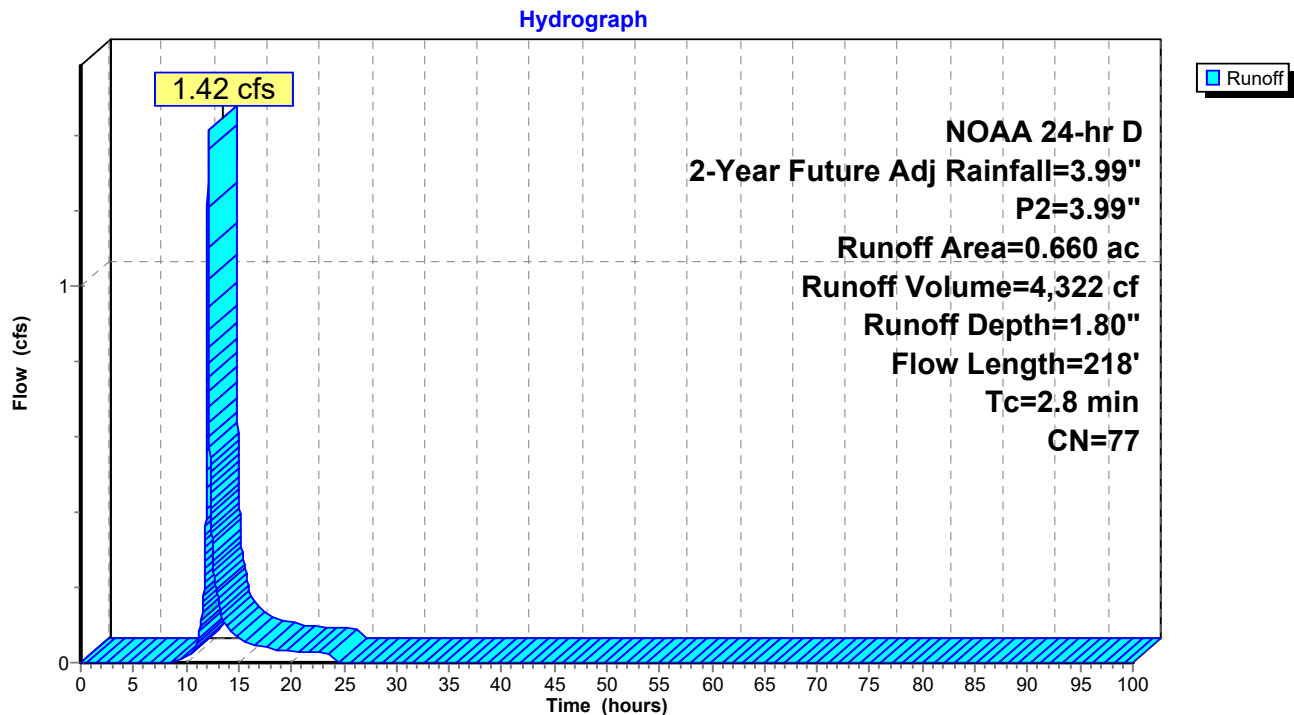
Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 1.42 cfs @ 12.11 hrs, Volume= 4,322 cf, Depth= 1.80"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

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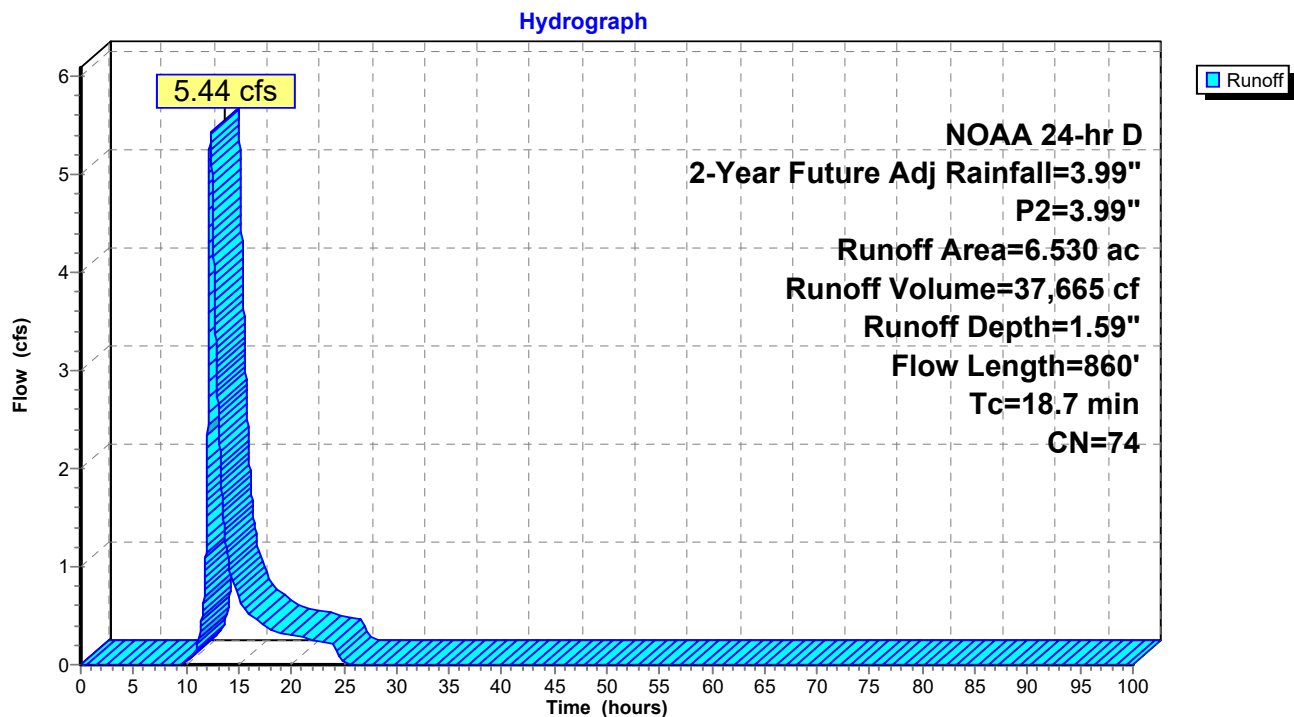
Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf, Depth= 1.59"
Routed to Link E3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

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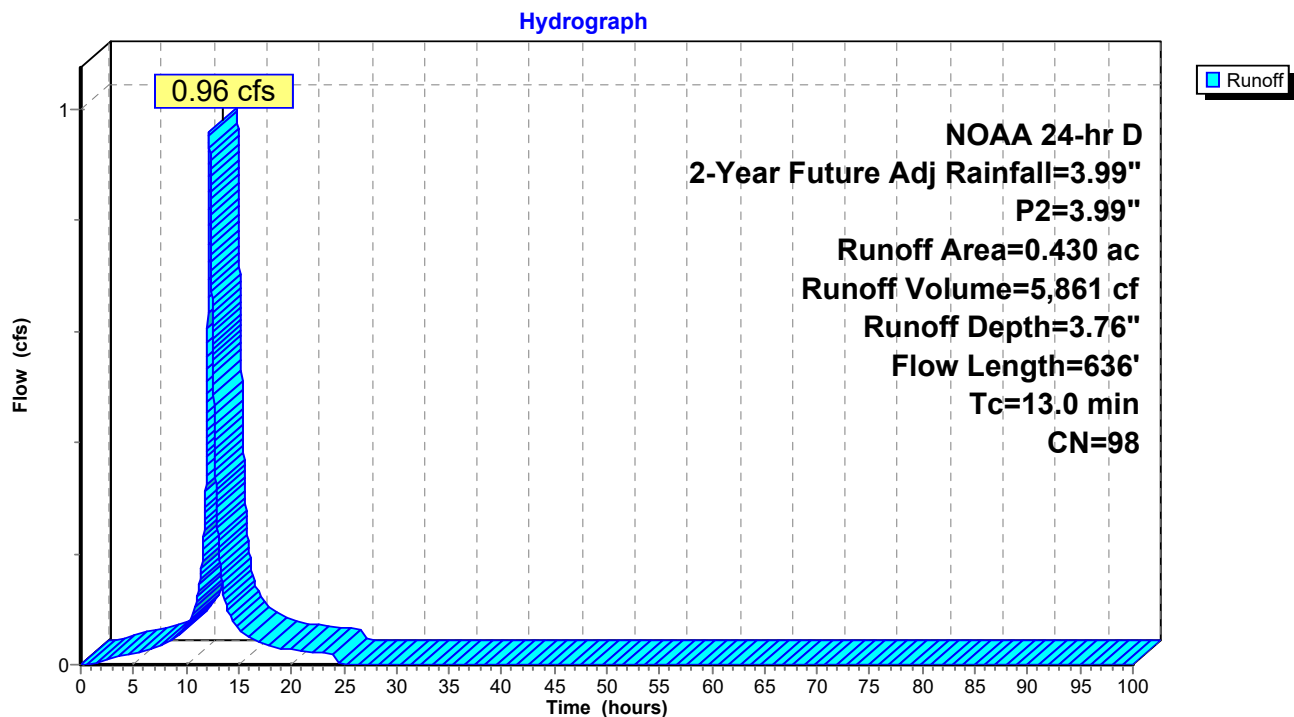
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 0.96 cfs @ 12.22 hrs, Volume= 5,861 cf, Depth= 3.76"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	636	Total			

Subcatchment E4i: EDA 4 Impervious

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 0.03 cfs @ 21.05 hrs, Volume= 1,153 cf, Depth= 0.05"
Routed to Link E4 : EDA 4

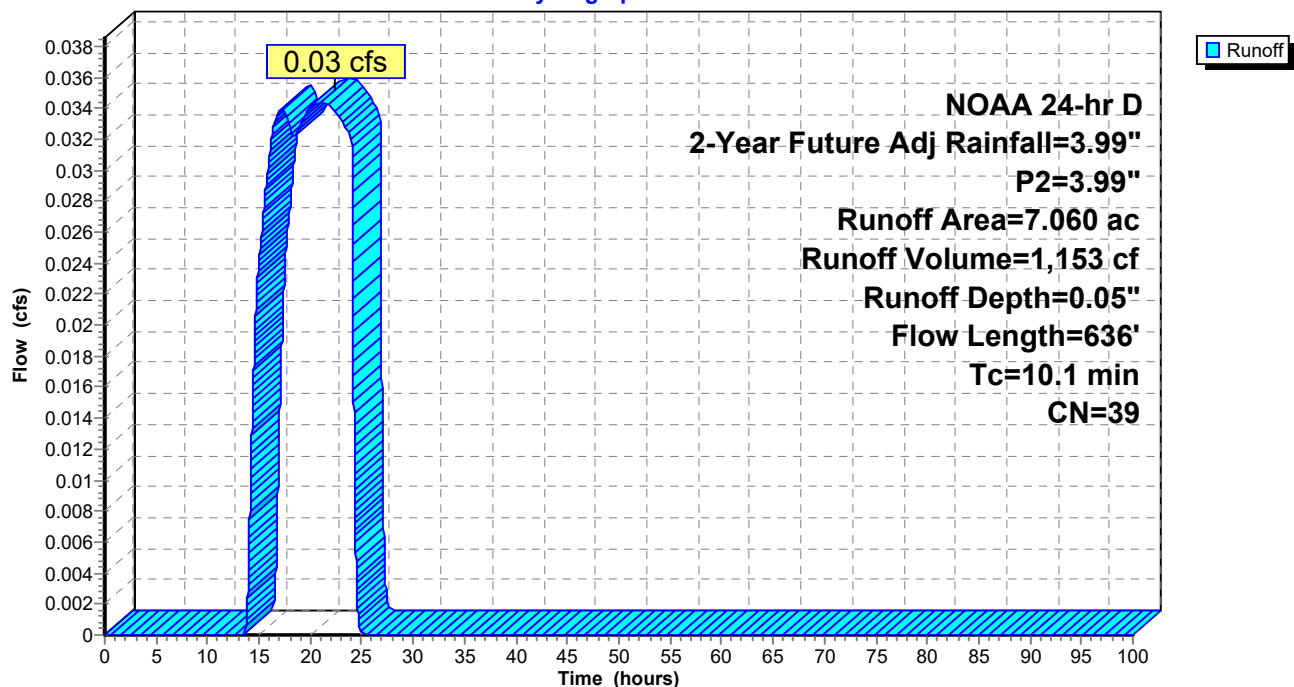
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



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Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 1.32 cfs @ 12.37 hrs, Volume= 11,314 cf, Depth= 3.76"
Routed to Pond E5D : DEPRESSION

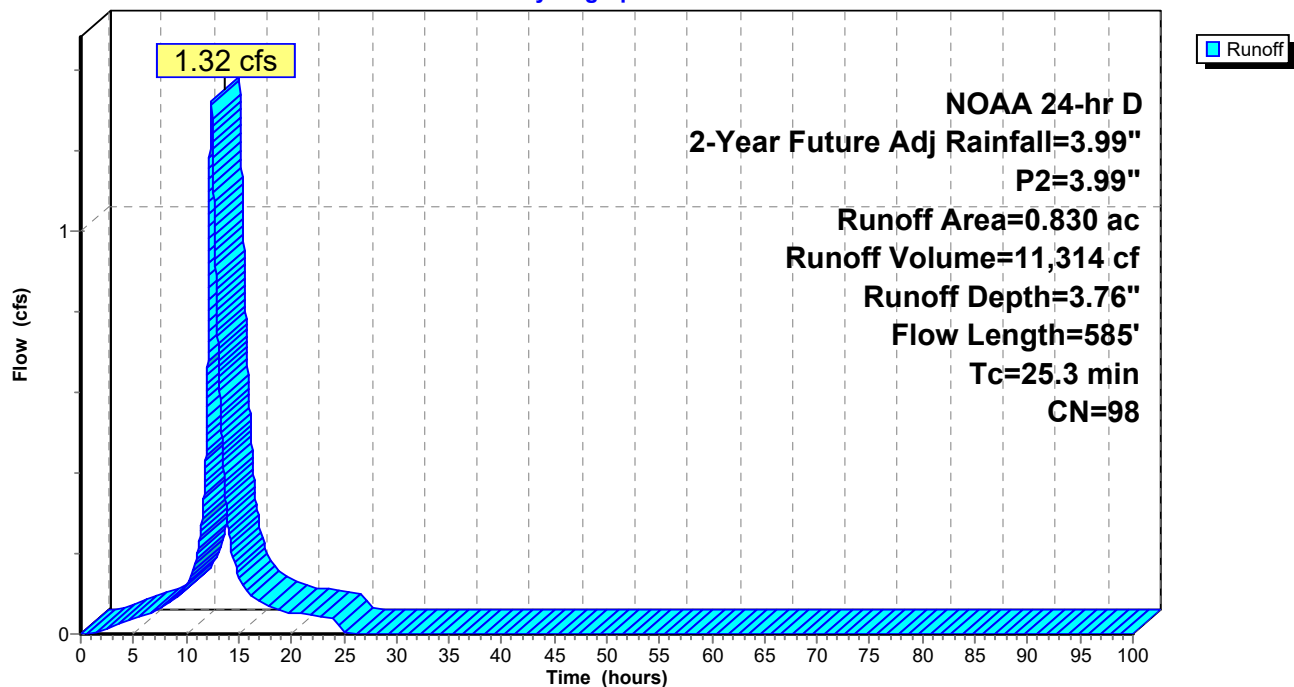
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5i: EDA 6 Impervious

Hydrograph



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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 0.06 cfs @ 16.53 hrs, Volume= 1,957 cf, Depth= 0.08"
 Routed to Pond E5D : DEPRESSION

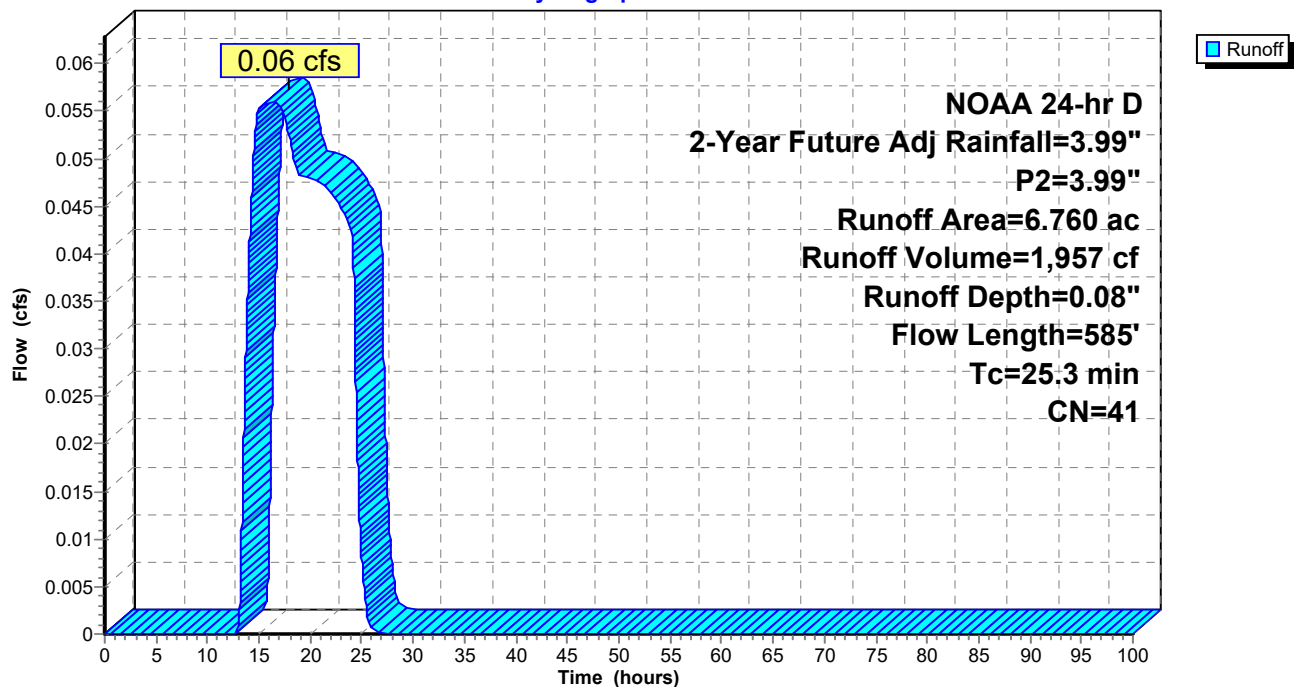
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.48" for 2-Year Future Adj event
 Inflow = 1.32 cfs @ 12.37 hrs, Volume= 13,271 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.95' @ 26.77 hrs Surf.Area= 47,186 sf Storage= 13,271 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

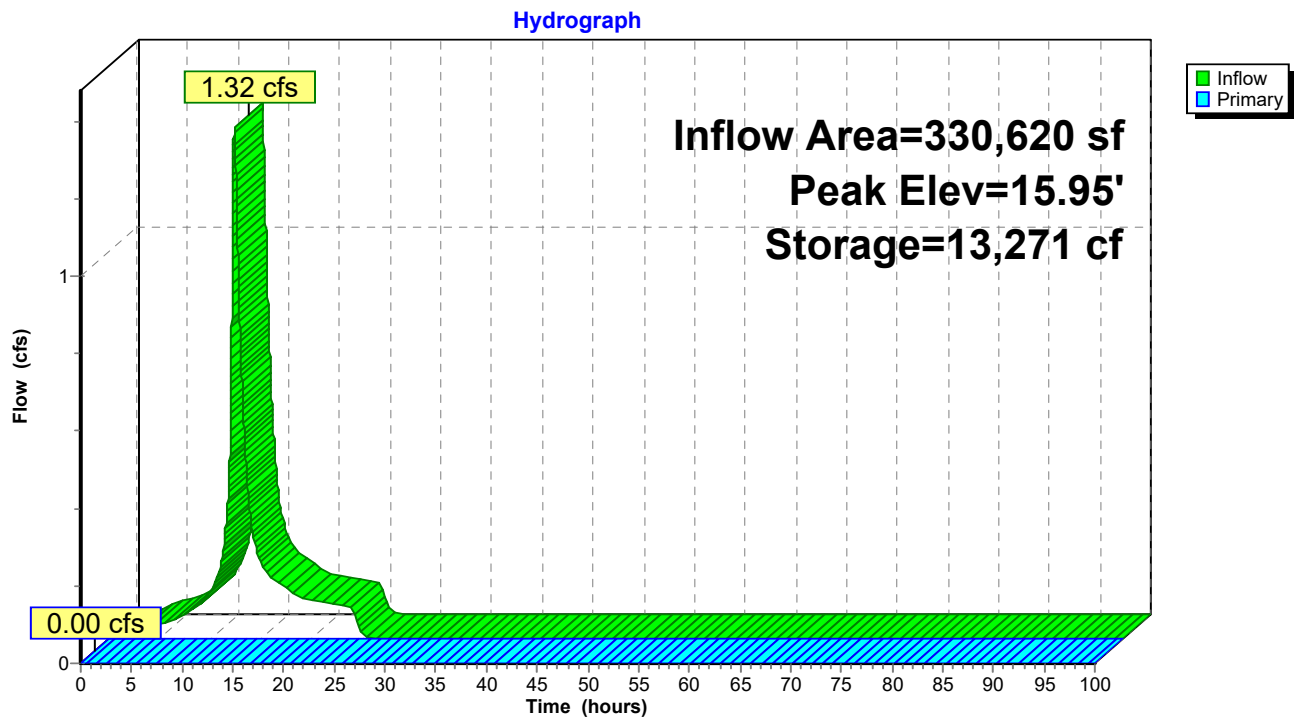
Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.07' TW=0.00' (Dynamic Tailwater)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E5D: DEPRESSION

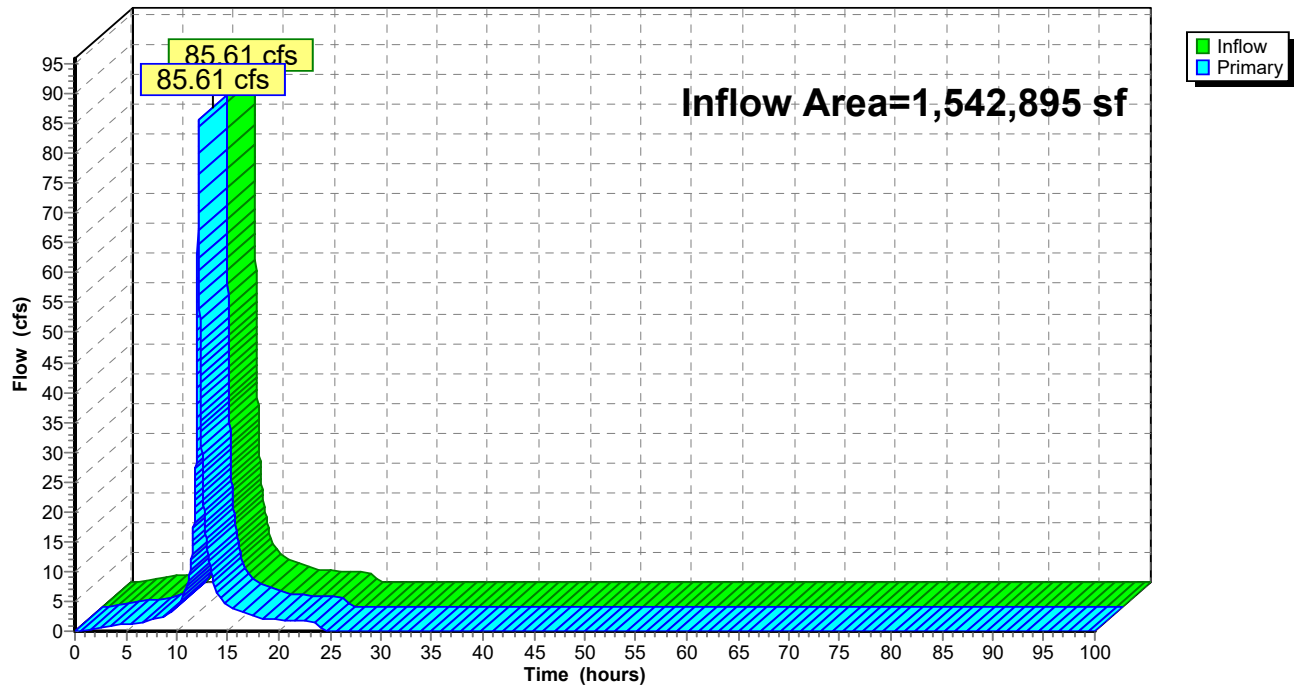
Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 2.98" for 2-Year Future Adj event
Inflow = 85.61 cfs @ 12.12 hrs, Volume= 383,635 cf
Primary = 85.61 cfs @ 12.12 hrs, Volume= 383,635 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1

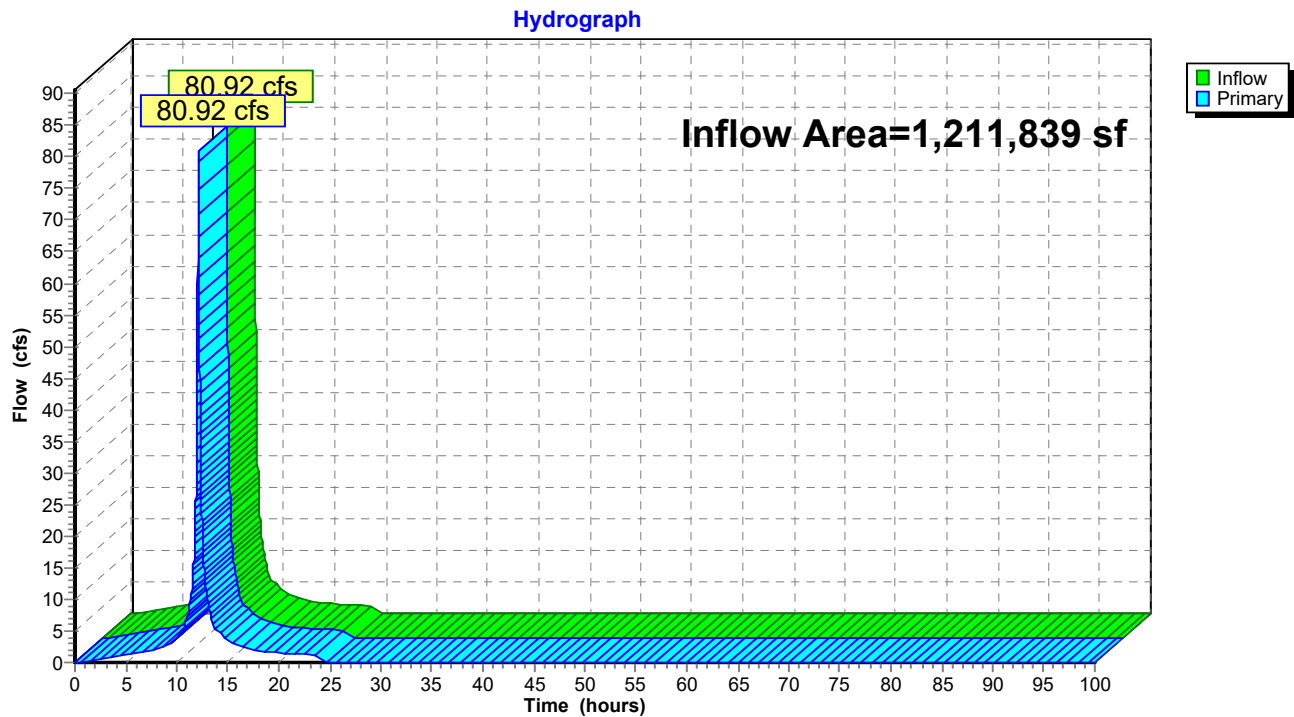
Hydrograph



Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 3.28" for 2-Year Future Adj event
Inflow = 80.92 cfs @ 12.12 hrs, Volume= 330,913 cf
Primary = 80.92 cfs @ 12.12 hrs, Volume= 330,913 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE

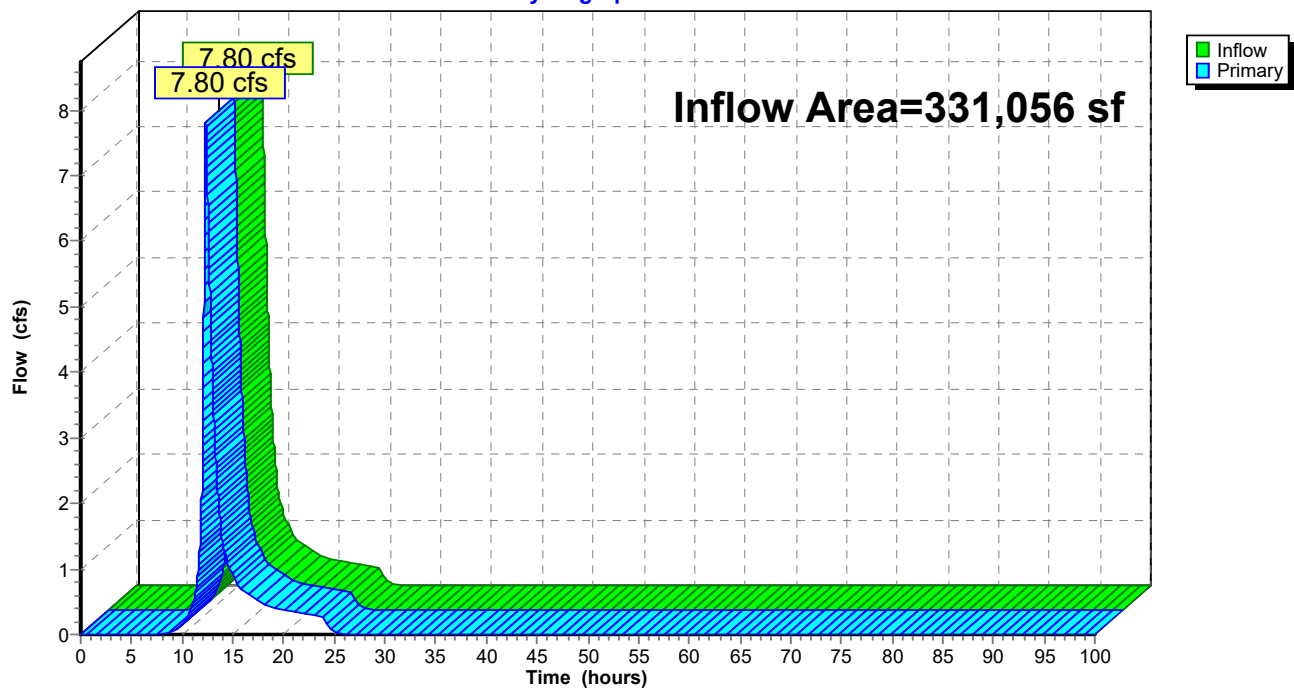
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 1.91" for 2-Year Future Adj event
Inflow = 7.80 cfs @ 12.30 hrs, Volume= 52,722 cf
Primary = 7.80 cfs @ 12.30 hrs, Volume= 52,722 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

Hydrograph



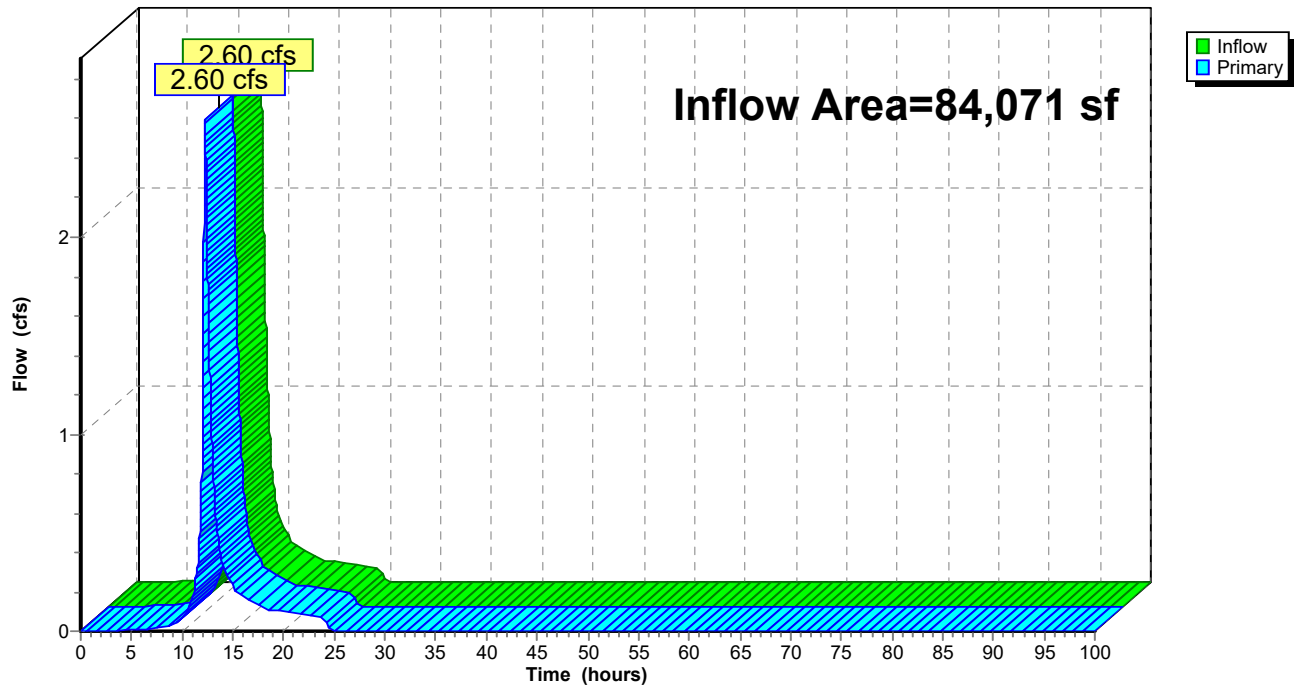
Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 2.14" for 2-Year Future Adj event
Inflow = 2.60 cfs @ 12.24 hrs, Volume= 14,982 cf
Primary = 2.60 cfs @ 12.24 hrs, Volume= 14,982 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2

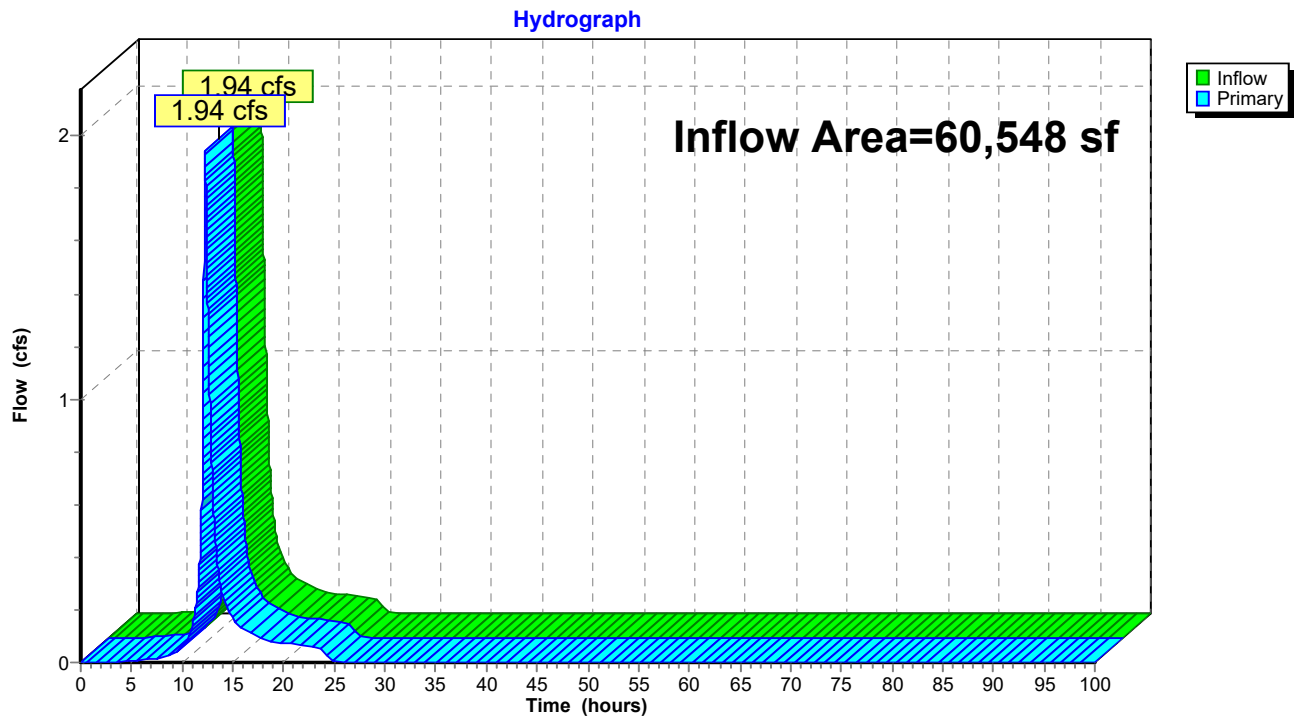
Hydrograph



Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 2.27" for 2-Year Future Adj event
Inflow = 1.94 cfs @ 12.24 hrs, Volume= 11,445 cf
Primary = 1.94 cfs @ 12.24 hrs, Volume= 11,445 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE

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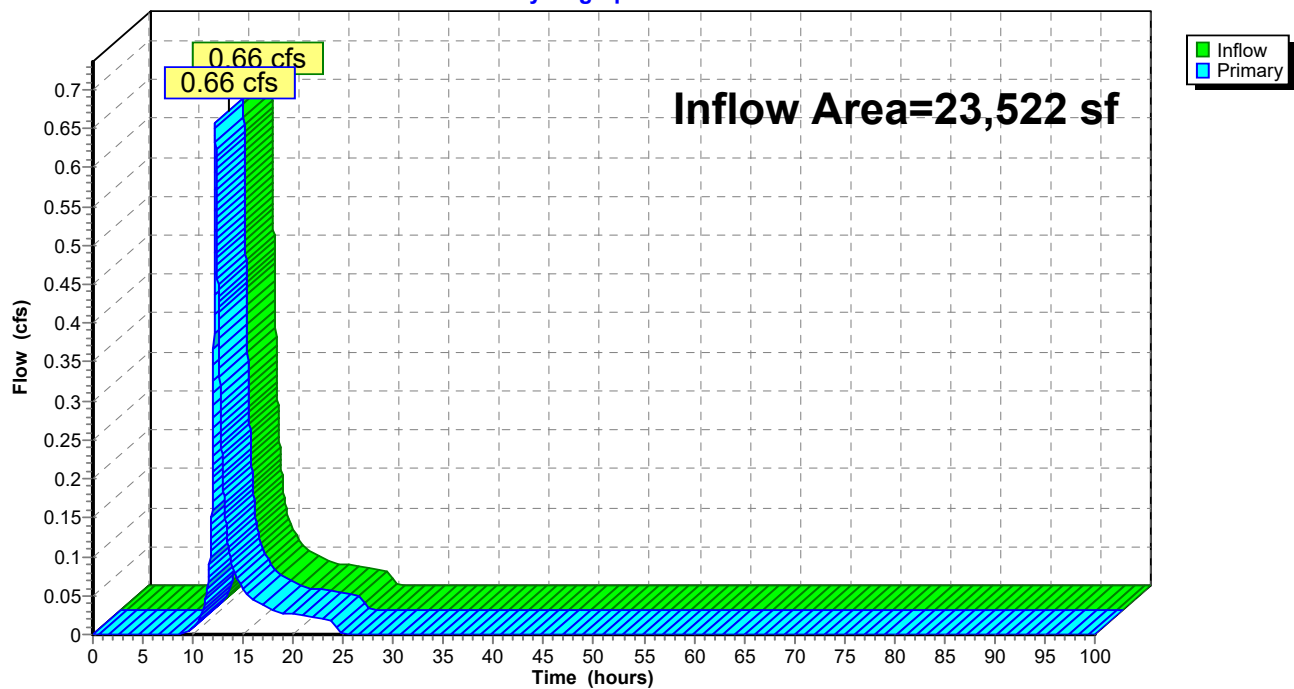
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 1.80" for 2-Year Future Adj event
Inflow = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf
Primary = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



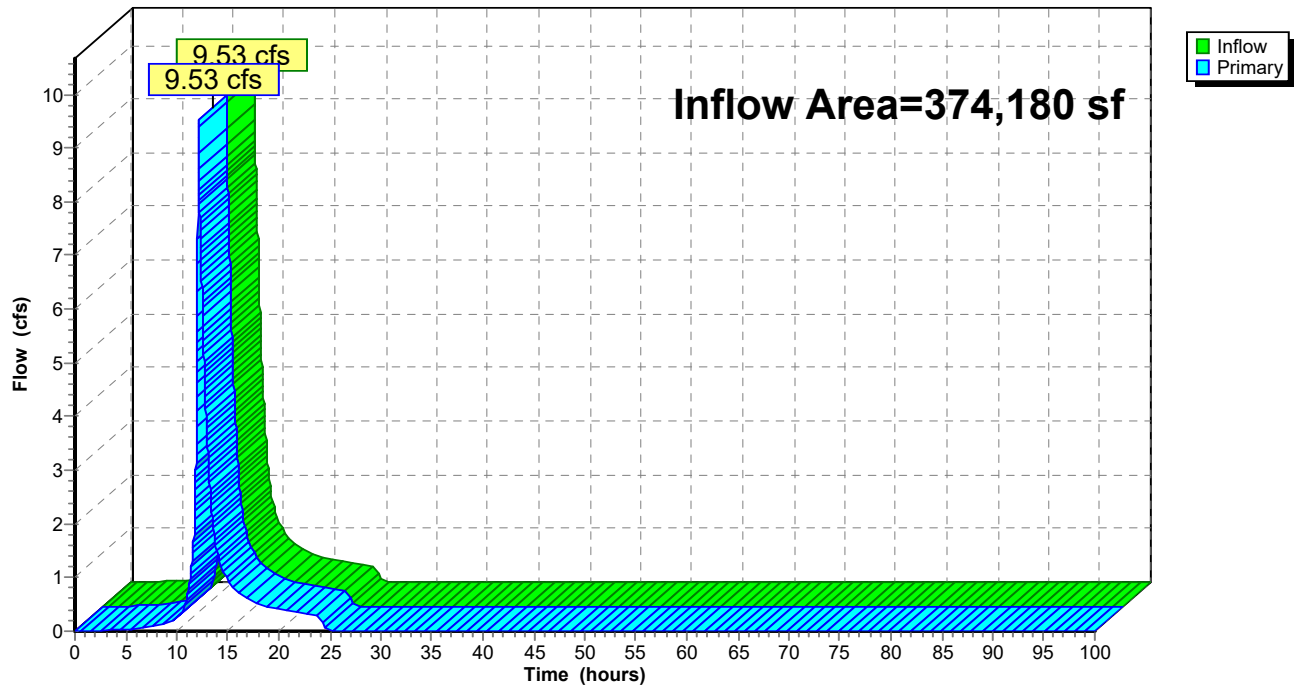
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 1.90" for 2-Year Future Adj event
Inflow = 9.53 cfs @ 12.12 hrs, Volume= 59,374 cf
Primary = 9.53 cfs @ 12.12 hrs, Volume= 59,374 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

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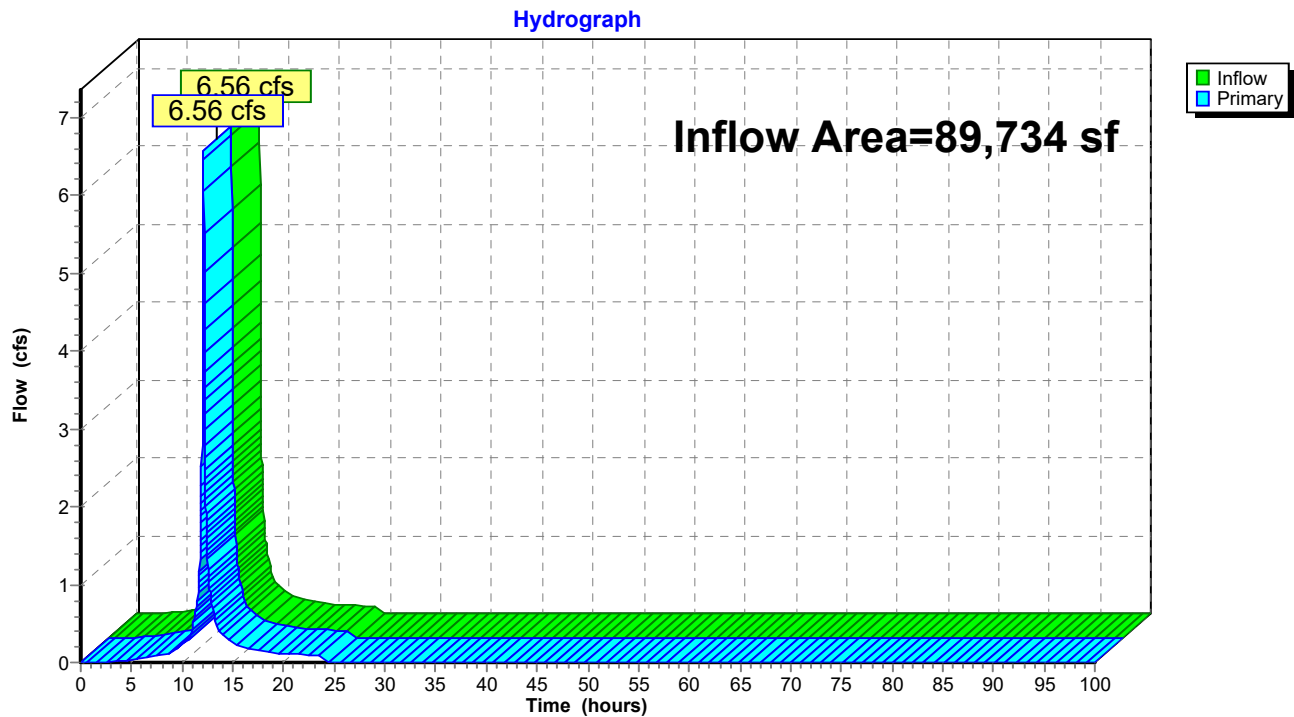
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Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 2.90" for 2-Year Future Adj event
Inflow = 6.56 cfs @ 12.11 hrs, Volume= 21,709 cf
Primary = 6.56 cfs @ 12.11 hrs, Volume= 21,709 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

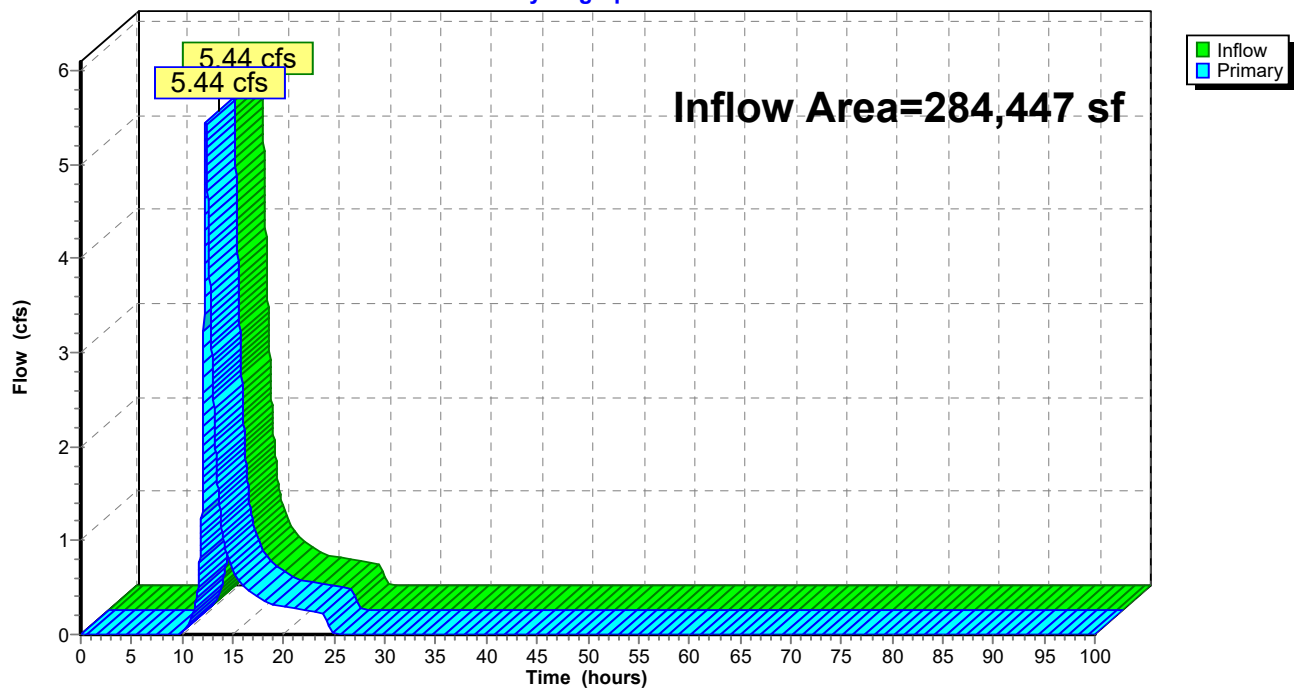
Link E3A: EDA 3A ONSITE



Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 1.59" for 2-Year Future Adj event
Inflow = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf
Primary = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS**Hydrograph**

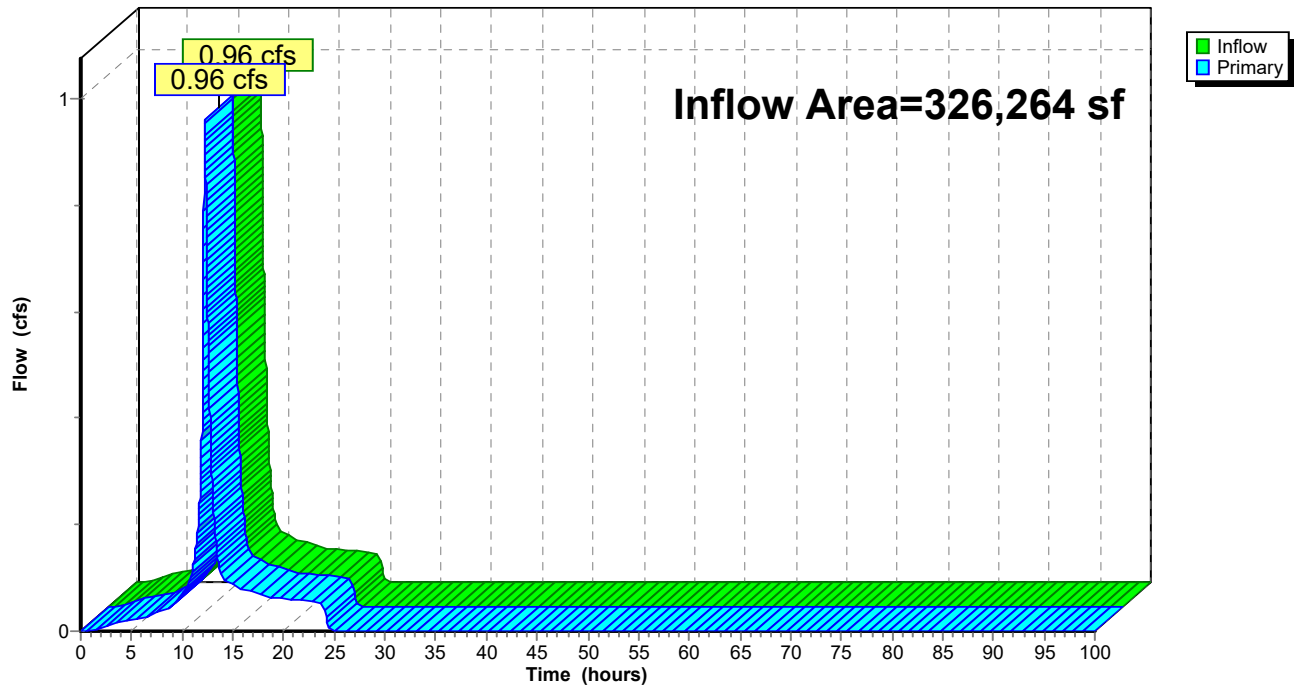
Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 0.26" for 2-Year Future Adj event
Inflow = 0.96 cfs @ 12.22 hrs, Volume= 7,015 cf
Primary = 0.96 cfs @ 12.22 hrs, Volume= 7,015 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4

Hydrograph



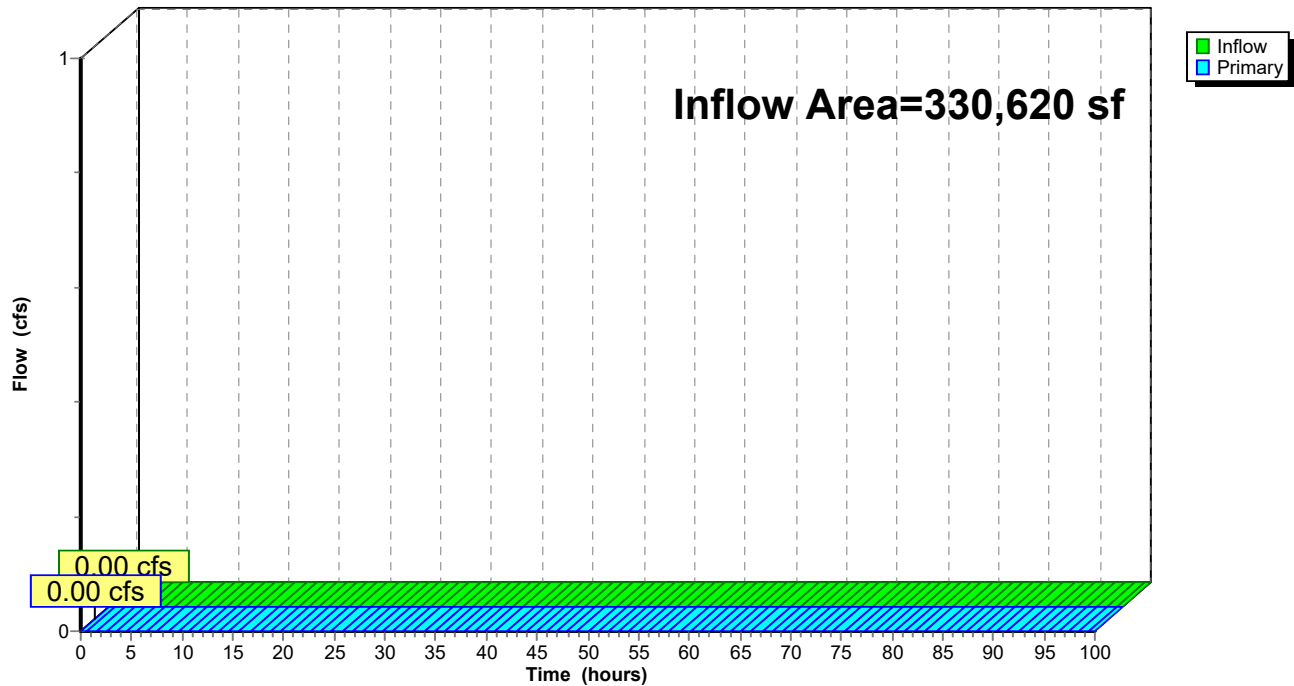
Summary for Link E5: EDA 5

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.00" for 2-Year Future Adj event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E5: EDA 5

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	3.99	2	3.99

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
228,690	39	>75% Grass cover, Good, HSG A (P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P4p)
405,544	80	>75% Grass cover, Good, HSG D (P1Bp, P1Dp, P1Fp, P1Gp, P1Hp, P1Ip, P1Jp, P1Kp, P1Lp, P1Mp, P1Np, P2Ap, P3Ap, P3Bp)
1,521,986	98	Paved parking, HSG D (P1Ai, P1Bi, P1Di, P1Ei, P1Fi, P1Gi, P1Hi, P1Ii, P1Ji, P1Ki, P1Li, P1Ni)
17,424	30	Woods, Good, HSG A (P3Bp)
484,387	77	Woods, Good, HSG D (P1Mp, P1Np, P2Ap, P2Bp, P3Ap, P3Bp)
2,658,031	86	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
246,114	HSG A	P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P3Bp, P4p
0	HSG B	
0	HSG C	
2,411,917	HSG D	P1Ai, P1Bi, P1Bp, P1Di, P1Dp, P1Ei, P1Fi, P1Fp, P1Gi, P1Gp, P1Hi, P1Hp, P1Ii, P1Ip, P1Ji, P1Jp, P1Ki, P1Kp, P1Li, P1Lp, P1Mp, P1Ni, P1Np, P2Ap, P2Bp, P3Ap, P3Bp
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
228,690	0	0	405,544	0	634,234	>75% Grass cover, Good
0	0	0	1,521,986	0	1,521,986	Paved parking
17,424	0	0	484,387	0	501,811	Woods, Good
246,114	0	0	2,411,917	0	2,658,031	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	9.50	9.35	50.0	0.0030	0.013	0.0	24.0	0.0	
2	CW1A	9.00	8.00	634.0	0.0016	0.012	0.0	36.0	0.0	
3	CW1B	9.00	8.00	312.0	0.0032	0.012	0.0	48.0	0.0	
4	CW1C	9.00	8.00	1,202.0	0.0008	0.012	0.0	36.0	0.0	
5	CW1D	8.90	8.54	72.0	0.0050	0.012	0.0	48.0	0.0	
6	PP1	9.82	9.23	59.0	0.0100	0.013	0.0	15.0	0.0	
7	PP2	9.46	9.00	155.0	0.0030	0.013	0.0	36.0	0.0	
8	PP3	9.28	9.13	49.0	0.0031	0.013	0.0	30.0	0.0	
9	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
10	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
11	PP5	9.60	9.29	105.0	0.0030	0.013	0.0	15.0	0.0	
12	PP6	11.08	11.05	8.0	0.0037	0.013	0.0	15.0	0.0	

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentP1Ai:	Runoff Area=5.210 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=19.73 cfs 71,018 cf
SubcatchmentP1Ap:	Runoff Area=0.940 ac 0.00% Impervious Runoff Depth=0.05" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=39 Runoff=0.00 cfs 154 cf
SubcatchmentP1Bi:	Runoff Area=4.410 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=16.70 cfs 60,113 cf
SubcatchmentP1Bp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=2.03" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=80 Runoff=2.09 cfs 7,381 cf
SubcatchmentP1Cp:	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=0.05" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=39 Runoff=0.00 cfs 114 cf
SubcatchmentP1Di:	Runoff Area=7.230 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=27.38 cfs 98,553 cf
SubcatchmentP1Dp:	Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=1.88" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=78 Runoff=1.75 cfs 6,139 cf
SubcatchmentP1Ei:	Runoff Area=0.760 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=125' Tc=1.3 min CN=98 Runoff=3.16 cfs 10,360 cf
SubcatchmentP1Ep:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.05" Flow Length=76' Tc=3.8 min CN=39 Runoff=0.00 cfs 3 cf
SubcatchmentP1Fi:	Runoff Area=1.680 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=123' Tc=1.1 min CN=98 Runoff=6.98 cfs 22,900 cf
SubcatchmentP1Fp:	Runoff Area=0.120 ac 0.00% Impervious Runoff Depth=2.03" Flow Length=81' Tc=2.9 min CN=80 Runoff=0.29 cfs 886 cf
SubcatchmentP1Gi:	Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=117' Tc=1.2 min CN=98 Runoff=2.90 cfs 9,542 cf
SubcatchmentP1Gp:	Runoff Area=0.030 ac 0.00% Impervious Runoff Depth=2.03" Flow Length=92' Tc=3.9 min CN=80 Runoff=0.07 cfs 221 cf
SubcatchmentP1Hi:	Runoff Area=10.630 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=179' Slope=0.0150 '/' Tc=1.7 min CN=98 Runoff=43.27 cfs 144,899 cf
SubcatchmentP1Hp:	Runoff Area=0.370 ac 0.00% Impervious Runoff Depth=0.97" Flow Length=78' Slope=0.0450 '/' Tc=5.2 min CN=64 Runoff=0.32 cfs 1,299 cf
SubcatchmentP1Ii:	Runoff Area=0.740 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=3.09 cfs 10,087 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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SubcatchmentP1Ip:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=2.03" Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=80 Runoff=0.05 cfs 148 cf
SubcatchmentP1Ji:	Runoff Area=0.870 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=3.63 cfs 11,859 cf
SubcatchmentP1Jp:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.76" Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=60 Runoff=0.02 cfs 55 cf
SubcatchmentP1Ki:	Runoff Area=2.410 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=194' Tc=1.4 min CN=98 Runoff=9.97 cfs 32,851 cf
SubcatchmentP1Kp:	Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=2.03" Flow Length=149' Tc=2.7 min CN=80 Runoff=0.15 cfs 443 cf
SubcatchmentP1Li:	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=54' Slope=0.0150 '/' Tc=0.7 min CN=98 Runoff=0.71 cfs 2,317 cf
SubcatchmentP1Lp:	Runoff Area=2.450 ac 0.00% Impervious Runoff Depth=0.86" Flow Length=228' Slope=0.0200 '/' Tc=10.7 min CN=62 Runoff=1.23 cfs 7,641 cf
SubcatchmentP1Mp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=1.96" Flow Length=412' Tc=8.2 min CN=79 Runoff=1.60 cfs 7,098 cf
SubcatchmentP1Ni: PDA 4B Impervious	Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=3.76" Flow Length=861' Tc=18.7 min CN=98 Runoff=0.24 cfs 1,772 cf
SubcatchmentP1Np: PDA 4B Pervious	Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=1.88" Flow Length=861' Tc=18.7 min CN=78 Runoff=7.56 cfs 50,950 cf
SubcatchmentP2Ap: PDA 2A Pervious	Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=1.96" Flow Length=382' Tc=14.3 min CN=79 Runoff=0.87 cfs 5,040 cf
SubcatchmentP2Bp: PDA 2B Pervious	Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.80" Flow Length=289' Tc=12.1 min CN=77 Runoff=0.66 cfs 3,536 cf
SubcatchmentP3Ap: PDA 3A Pervious	Runoff Area=0.950 ac 0.00% Impervious Runoff Depth=1.96" Flow Length=218' Tc=2.8 min CN=79 Runoff=2.21 cfs 6,743 cf
SubcatchmentP3Bp: PDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=1.59" Flow Length=860' Tc=18.7 min CN=74 Runoff=5.44 cfs 37,665 cf
SubcatchmentP4p: PDA 4 Pervious	Runoff Area=2.250 ac 0.00% Impervious Runoff Depth=0.05" Flow Length=636' Tc=10.1 min CN=39 Runoff=0.01 cfs 368 cf
Pond B1: UG BASIN	Peak Elev=10.86' Storage=0.512 af Inflow=10.12 cfs 33,294 cf Outflow=0.60 cfs 23,797 cf
Pond CW1A: CONSTRUCTED	Peak Elev=12.23' Storage=49,504 cf Inflow=25.29 cfs 122,745 cf 36.0" Round Culvert n=0.012 L=634.0' S=0.0016 '/' Outflow=6.08 cfs 120,938 cf

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Pond CW1B: CONSTRUCTED	Peak Elev=12.16' Storage=50,712 cf Inflow=29.84 cfs 259,319 cf 48.0" Round Culvert n=0.012 L=312.0' S=0.0032 '/' Outflow=14.25 cfs 257,131 cf
Pond CW1C: CONSTRUCTED	Peak Elev=12.02' Storage=12,428 cf Inflow=14.99 cfs 298,283 cf 36.0" Round Culvert x 2.00 n=0.012 L=1,202.0' S=0.0008 '/' Outflow=14.97 cfs 297,982 cf
Pond CW1D: CONSTRUCTED	Peak Elev=11.83' Storage=46,161 cf Inflow=30.49 cfs 417,156 cf Outflow=19.24 cfs 416,003 cf
Pond PP1: POROUS PAVEMENT	Peak Elev=15.89' Storage=6,796 cf Inflow=3.16 cfs 10,363 cf Outflow=0.24 cfs 7,475 cf
Pond PP2: POROUS PAVEMENT	Peak Elev=15.34' Storage=16,718 cf Inflow=7.26 cfs 23,786 cf Outflow=0.41 cfs 17,241 cf
Pond PP3: POROUS PAVEMENT	Peak Elev=17.13' Storage=6,549 cf Inflow=2.97 cfs 9,763 cf Outflow=0.17 cfs 7,077 cf
Pond PP4: POROUS PAVEMENT	Peak Elev=14.02' Storage=73,146 cf Inflow=43.54 cfs 146,197 cf Primary=9.99 cfs 70,886 cf Secondary=4.99 cfs 35,443 cf Outflow=14.98 cfs 106,329 cf
Pond PP5: POROUS PAVEMENT	Peak Elev=16.76' Storage=4,956 cf Inflow=3.14 cfs 10,235 cf Outflow=1.32 cfs 7,405 cf
Pond PP6: POROUS PAVEMENT	Peak Elev=16.47' Storage=5,932 cf Inflow=3.64 cfs 11,914 cf Outflow=1.27 cfs 8,655 cf
Link B1V: Valve	Inflow=0.60 cfs 23,797 cf Primary=0.60 cfs 23,797 cf
Link P1: PDA 1	Inflow=27.14 cfs 485,782 cf Primary=27.14 cfs 485,782 cf
Link P1A:	Inflow=20.35 cfs 433,060 cf Primary=20.35 cfs 433,060 cf
Link P1B: BYPASS	Inflow=7.80 cfs 52,722 cf Primary=7.80 cfs 52,722 cf
Link P2: PDA 2	Inflow=1.52 cfs 8,576 cf Primary=1.52 cfs 8,576 cf
Link P2A: PDA 2A ONSITE	Inflow=0.87 cfs 5,040 cf Primary=0.87 cfs 5,040 cf
Link P2B: BYPASS	Inflow=0.66 cfs 3,536 cf Primary=0.66 cfs 3,536 cf
Link P3: PDA 3	Inflow=6.20 cfs 44,408 cf Primary=6.20 cfs 44,408 cf

Pre vs Post Rev. 3a*NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"*

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Link P3A: PDA 3A ONSITE

Inflow=2.21 cfs 6,743 cf

Primary=2.21 cfs 6,743 cf

Link P3B: BYPASS

Inflow=5.44 cfs 37,665 cf

Primary=5.44 cfs 37,665 cf

Link P4: PDA 4

Inflow=0.01 cfs 368 cf

Primary=0.01 cfs 368 cf

Link PP4V: Valve

Inflow=9.99 cfs 70,886 cf

Primary=9.99 cfs 70,886 cf

Total Runoff Area = 2,658,031 sf Runoff Volume = 612,154 cf Average Runoff Depth = 2.76"
42.74% Pervious = 1,136,045 sf 57.26% Impervious = 1,521,986 sf

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Summary for Subcatchment P1Ai:

Runoff = 19.73 cfs @ 12.11 hrs, Volume= 71,018 cf, Depth= 3.76"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

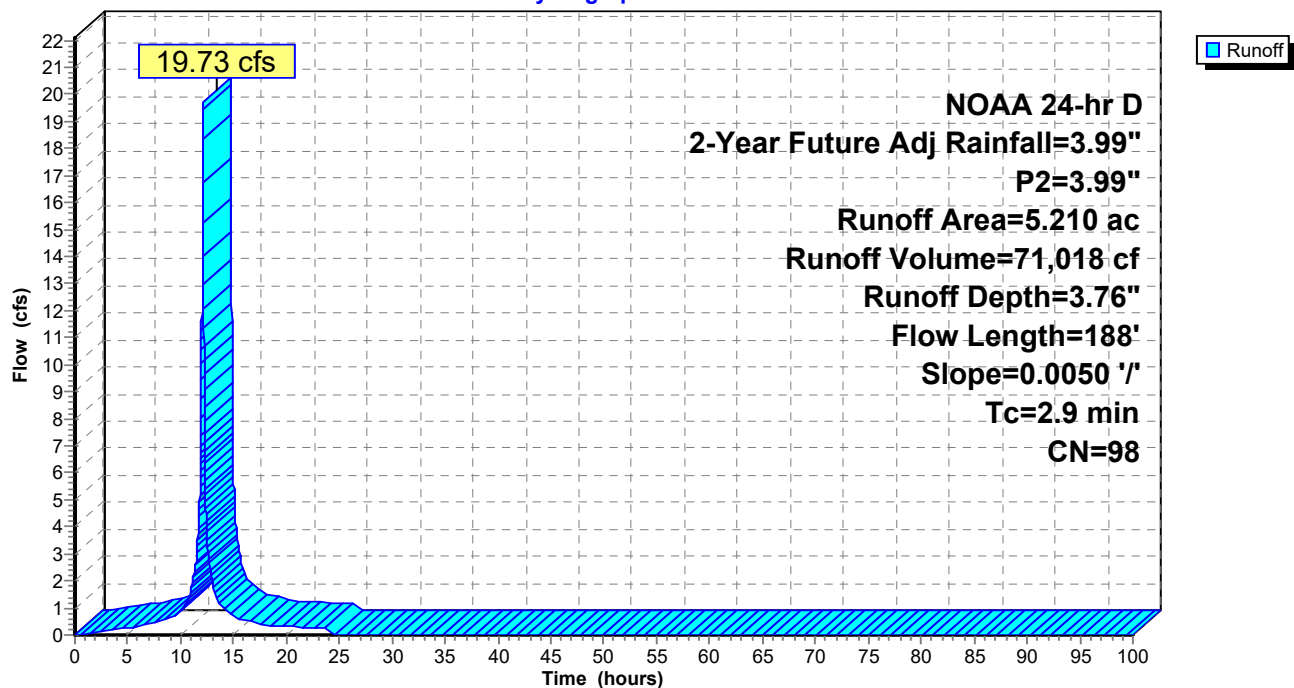
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
5.210	98	Paved parking, HSG D
5.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Ai:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Ap:

Runoff = 0.00 cfs @ 20.63 hrs, Volume= 154 cf, Depth= 0.05"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

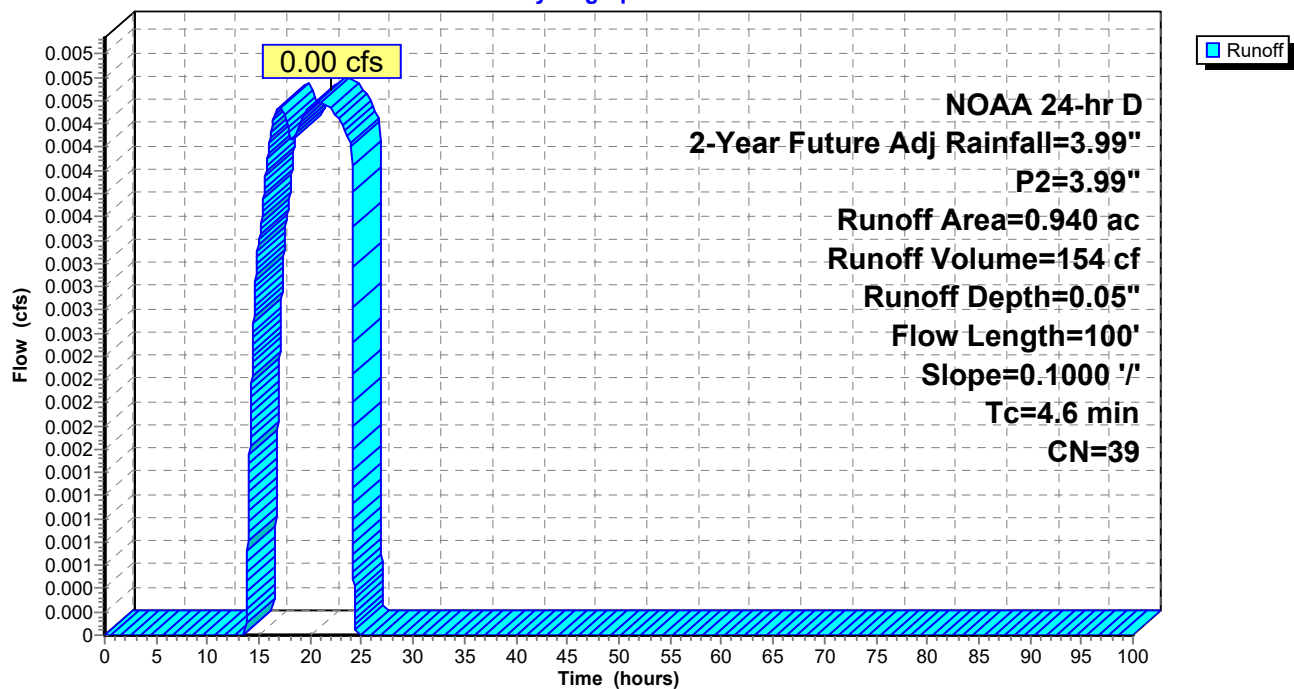
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.940	39	>75% Grass cover, Good, HSG A
0.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Ap:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Bi:

Runoff = 16.70 cfs @ 12.11 hrs, Volume= 60,113 cf, Depth= 3.76"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

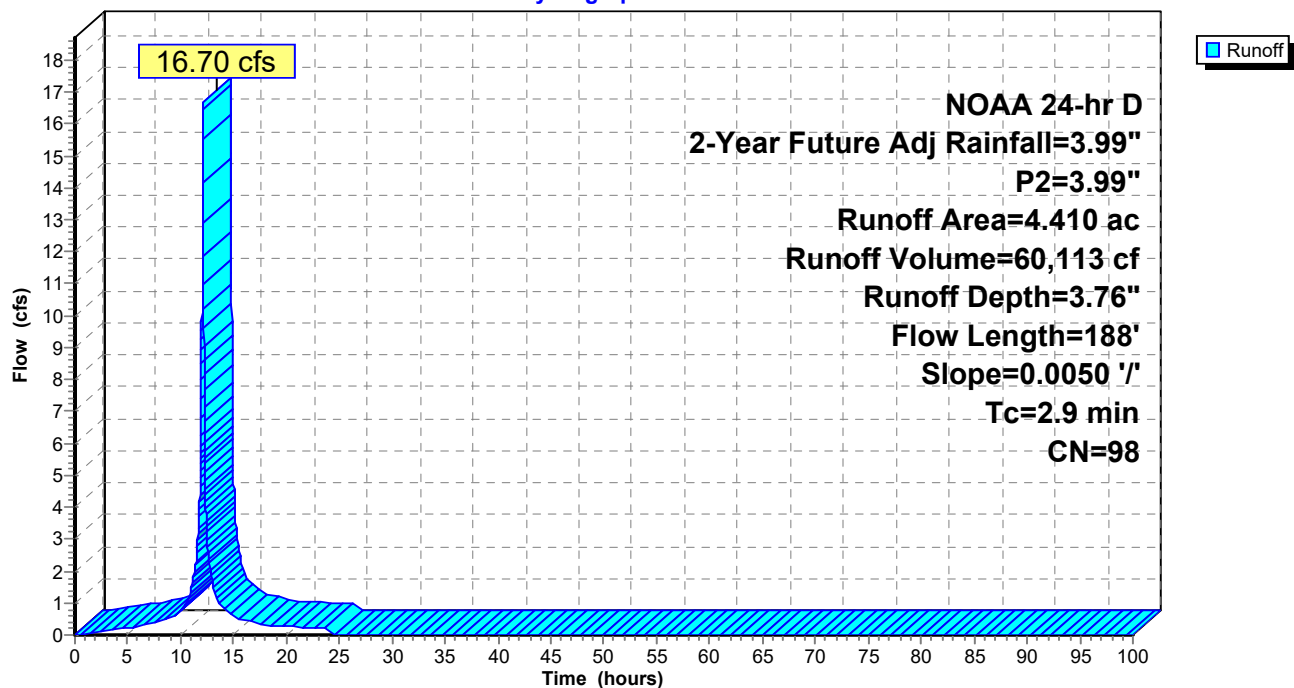
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
4.410	98	Paved parking, HSG D
4.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Bi:

Hydrograph



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Summary for Subcatchment P1Bp:

Runoff = 2.09 cfs @ 12.13 hrs, Volume= 7,381 cf, Depth= 2.03"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

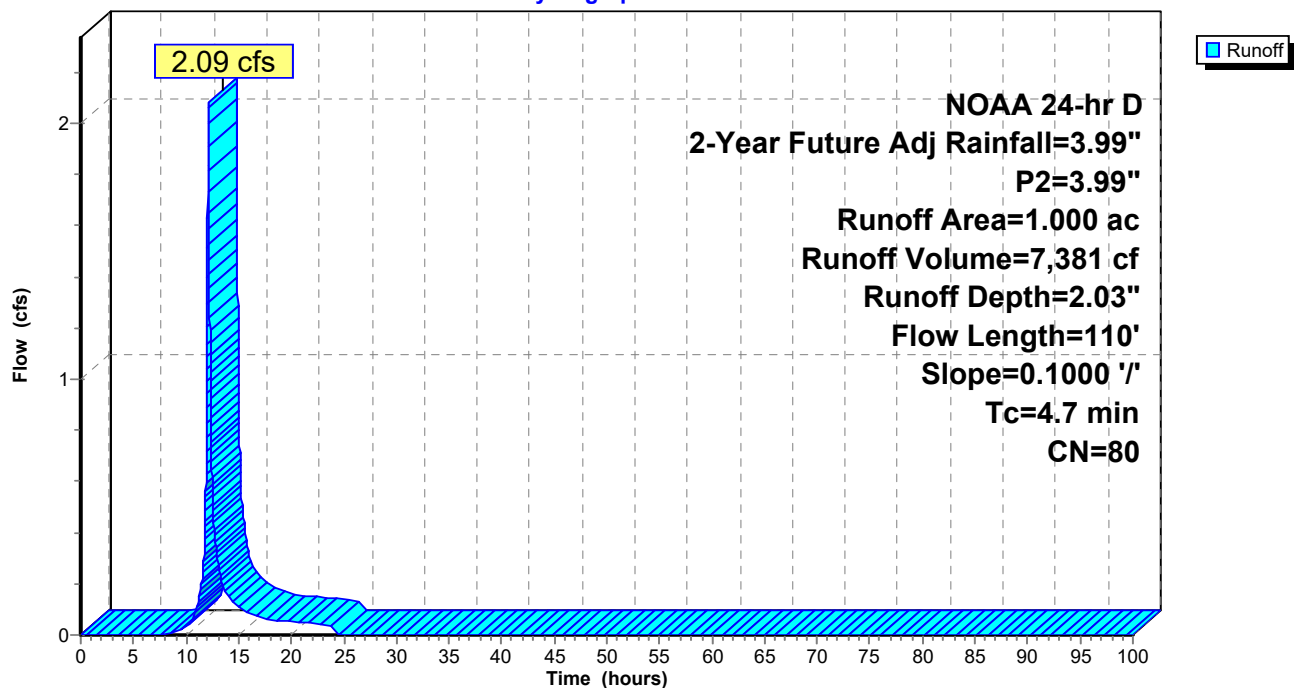
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
1.000	80	>75% Grass cover, Good, HSG D
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Bp:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Cp:

Runoff = 0.00 cfs @ 20.63 hrs, Volume= 114 cf, Depth= 0.05"
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

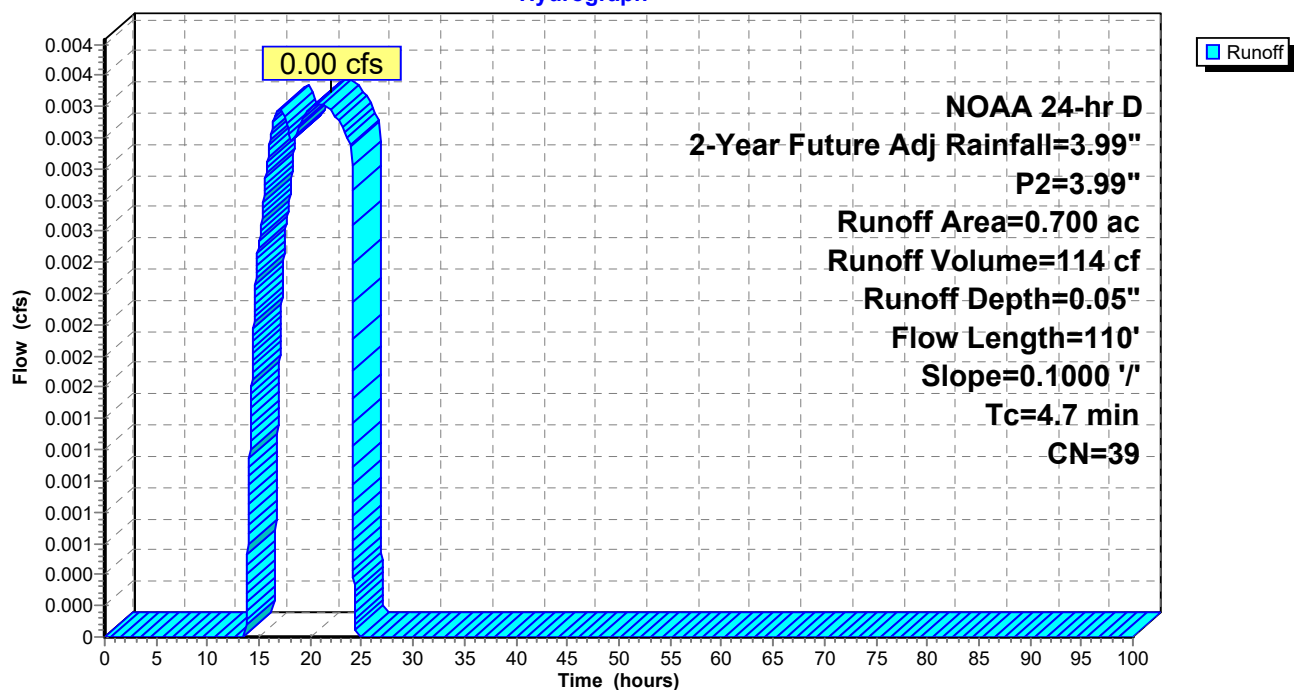
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.700	39	>75% Grass cover, Good, HSG A
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Cp:

Hydrograph



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Summary for Subcatchment P1Di:

Runoff = 27.38 cfs @ 12.11 hrs, Volume= 98,553 cf, Depth= 3.76"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

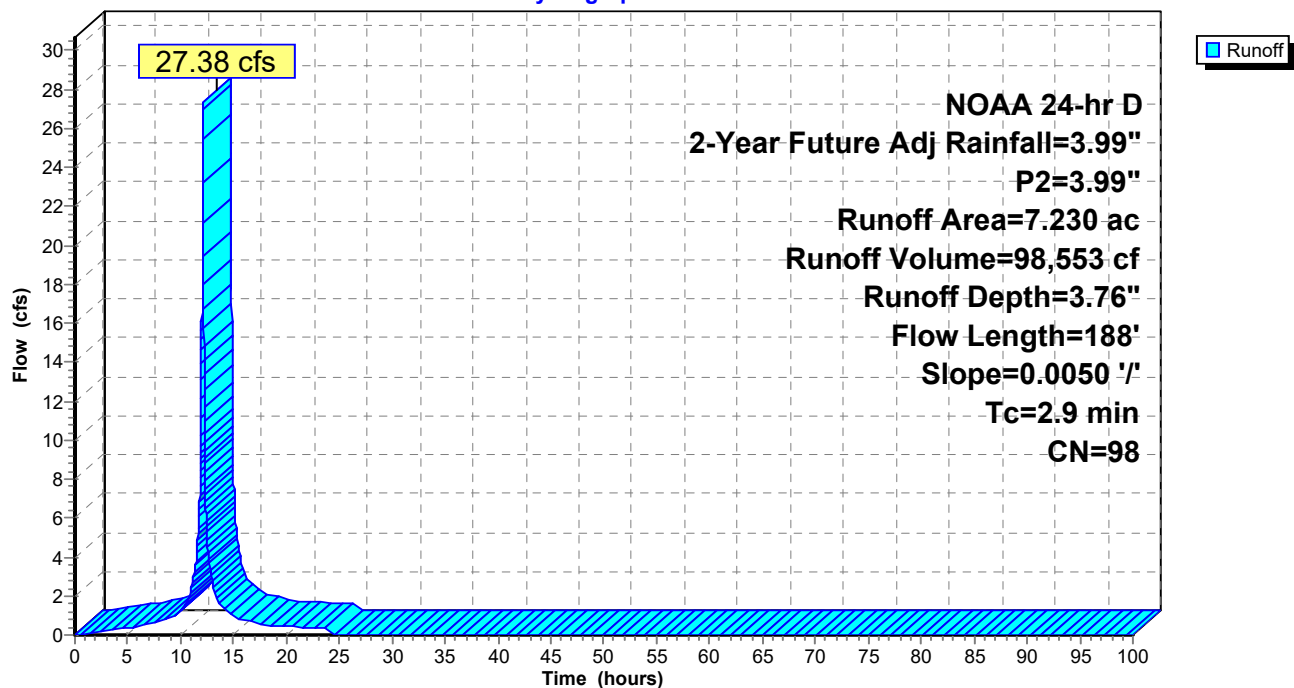
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
7.230	98	Paved parking, HSG D
7.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Di:

Hydrograph



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Summary for Subcatchment P1Dp:

Runoff = 1.75 cfs @ 12.13 hrs, Volume= 6,139 cf, Depth= 1.88"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

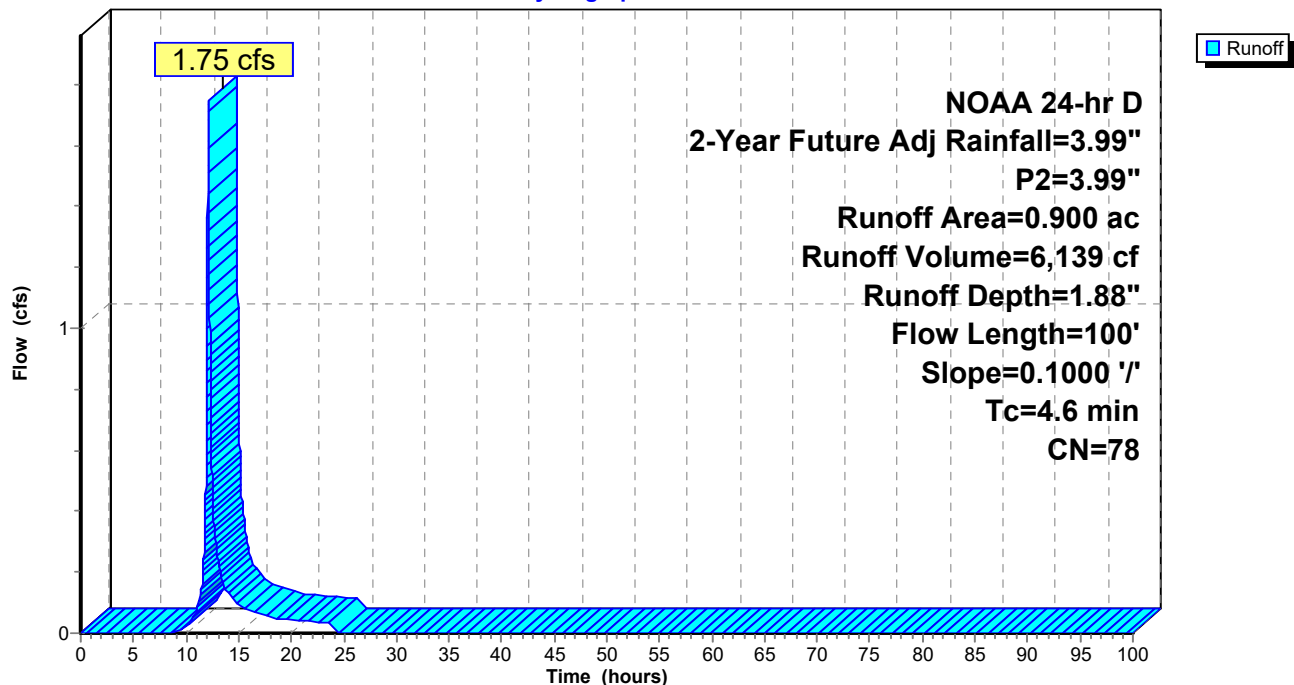
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.040	39	>75% Grass cover, Good, HSG A
0.860	80	>75% Grass cover, Good, HSG D
0.900	78	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Dp:

Hydrograph



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Summary for Subcatchment P1Ei:

Runoff = 3.16 cfs @ 12.10 hrs, Volume= 10,360 cf, Depth= 3.76"
Routed to Pond PP1 : POROUS PAVEMENT

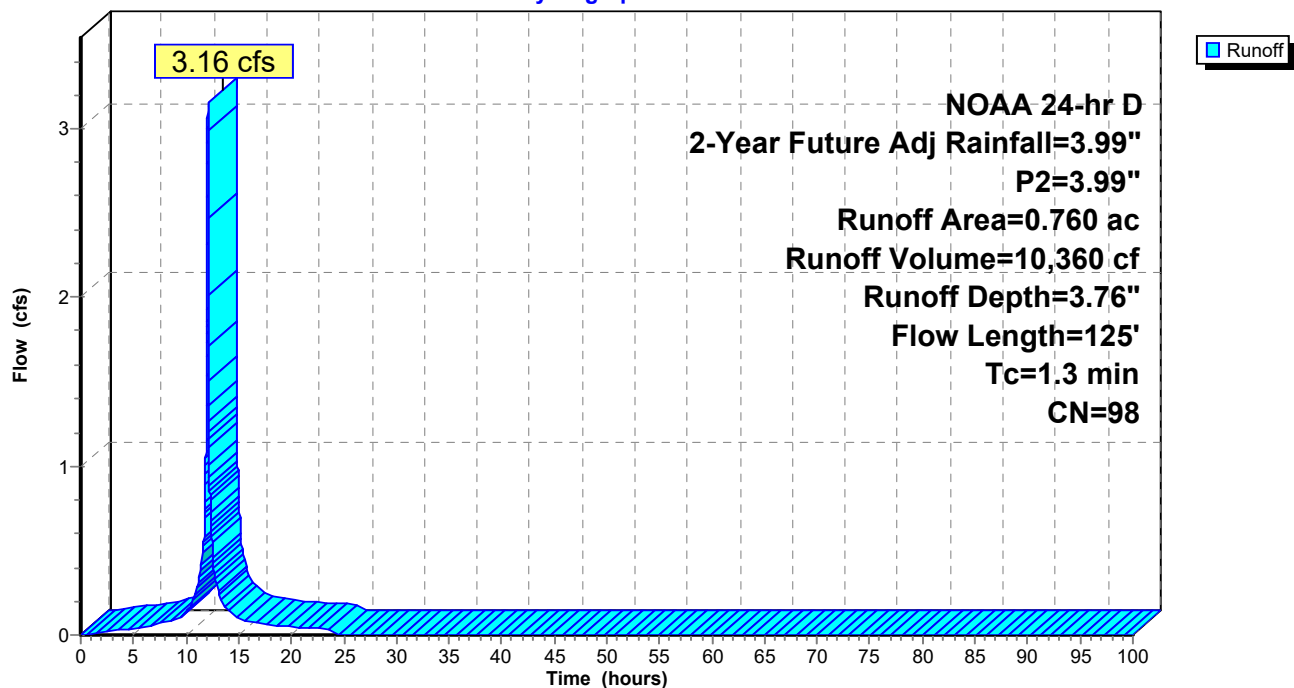
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG D
0.760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	68	0.0200	1.42		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	57	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment P1Ei:

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Summary for Subcatchment P1Ep:

Runoff = 0.00 cfs @ 20.62 hrs, Volume= 3 cf, Depth= 0.05"
Routed to Pond PP1 : POROUS PAVEMENT

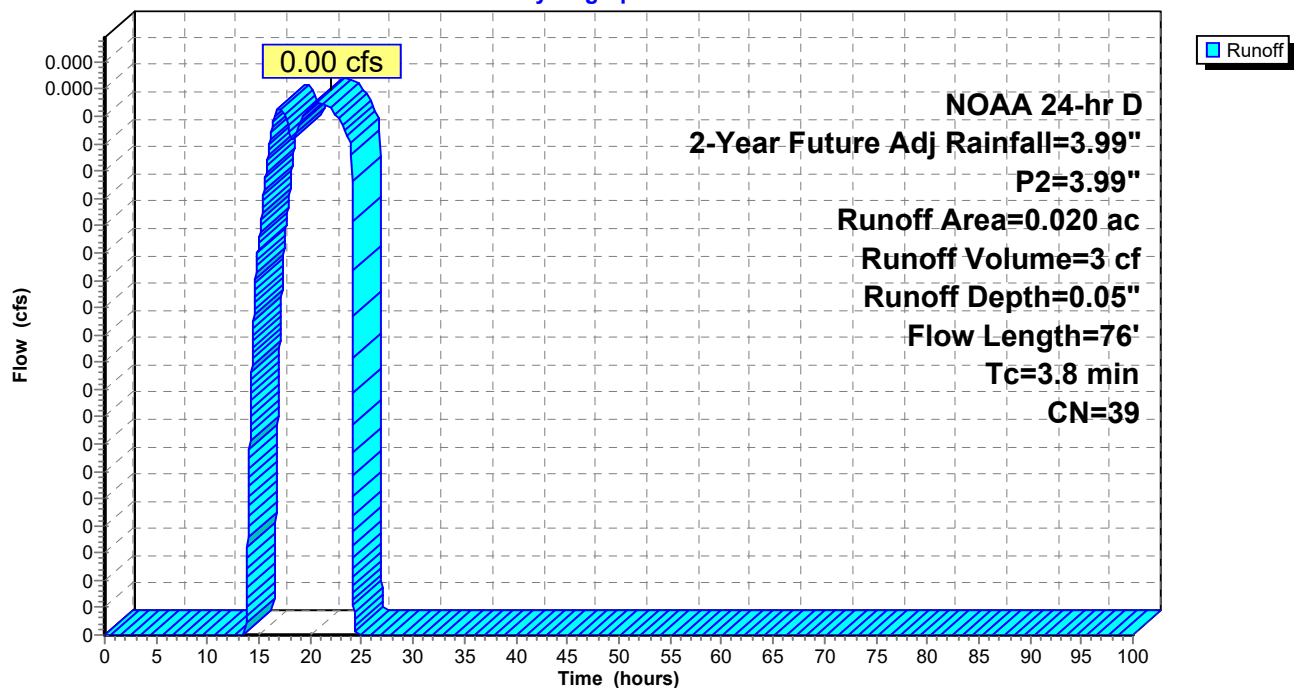
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.020	39	>75% Grass cover, Good, HSG A
0.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	31	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	45	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.8	76	Total			

Subcatchment P1Ep:

Hydrograph



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Summary for Subcatchment P1Fi:

Runoff = 6.98 cfs @ 12.10 hrs, Volume= 22,900 cf, Depth= 3.76"
Routed to Pond PP2 : POROUS PAVEMENT

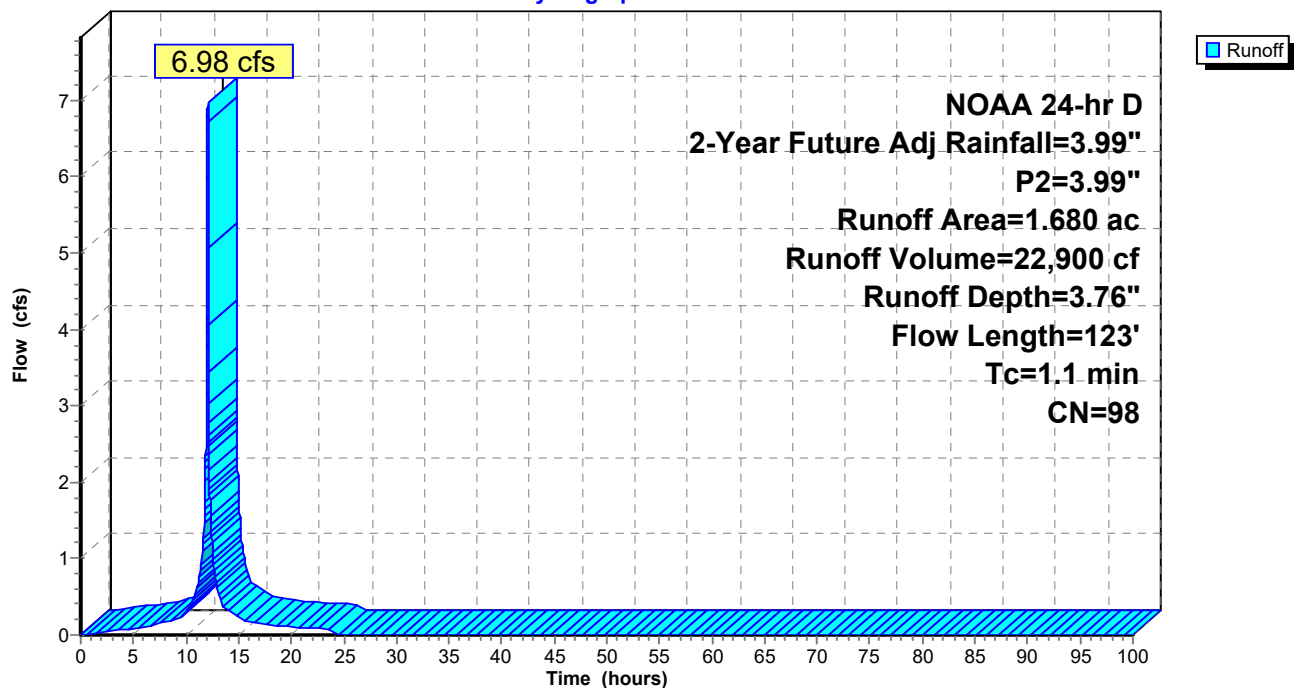
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
1.680	98	Paved parking, HSG D
1.680		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	68	0.0333	1.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	123	Total			

Subcatchment P1Fi:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Fp:

Runoff = 0.29 cfs @ 12.11 hrs, Volume= 886 cf, Depth= 2.03"
 Routed to Pond PP2 : POROUS PAVEMENT

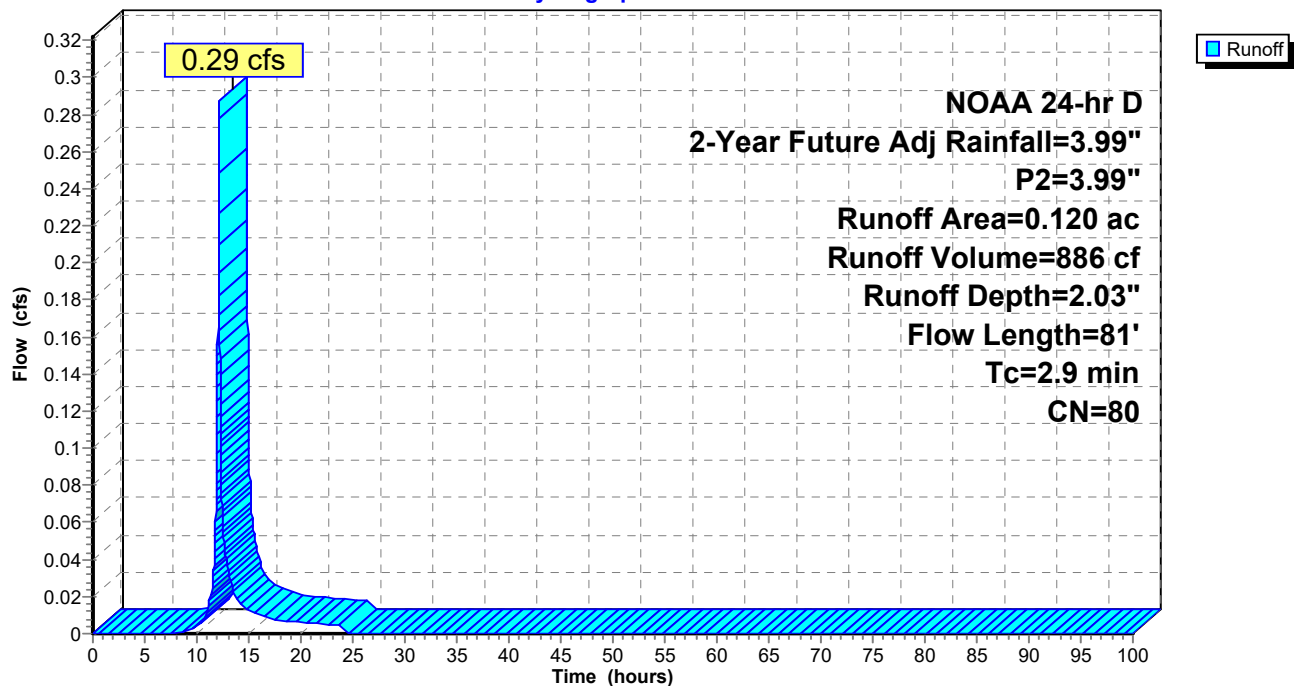
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.120	80	>75% Grass cover, Good, HSG D
0.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	43	0.0333	1.59		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	20	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	81	Total			

Subcatchment P1Fp:

Hydrograph



Pre vs Post Rev. 3a

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Summary for Subcatchment P1Gi:

Runoff = 2.90 cfs @ 12.10 hrs, Volume= 9,542 cf, Depth= 3.76"
Routed to Pond PP3 : POROUS PAVEMENT

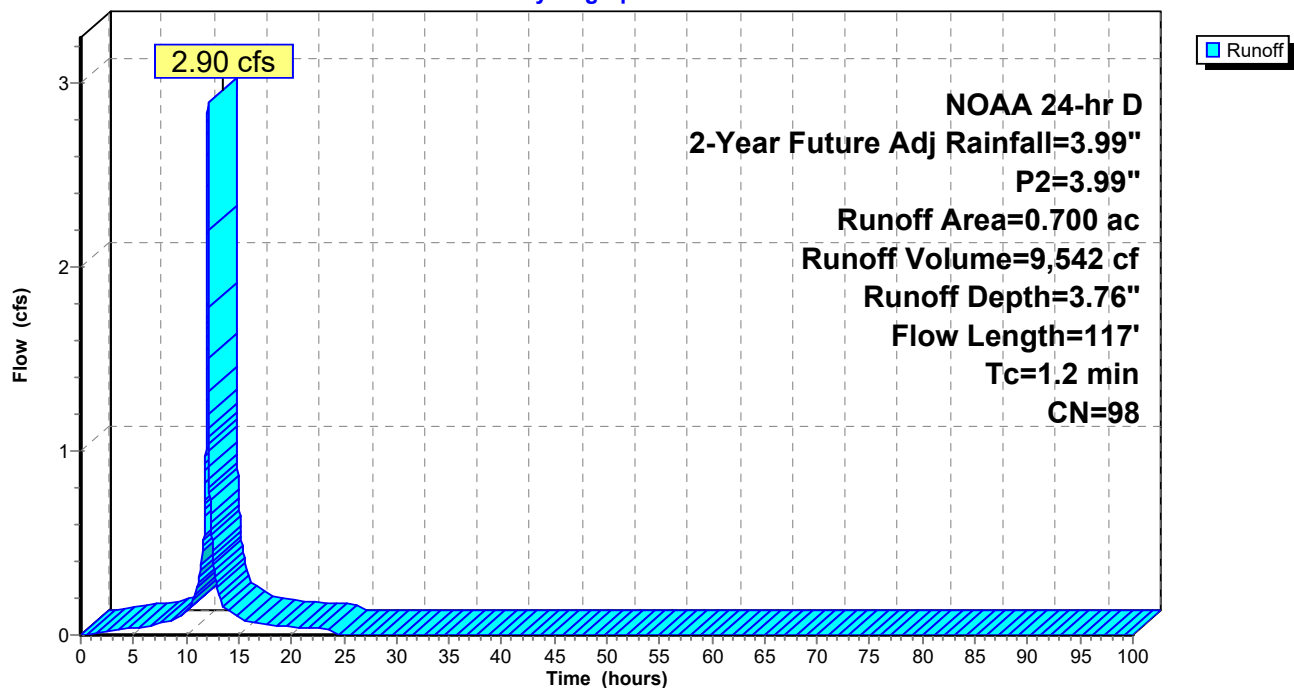
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	69	0.0250	1.56		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	48	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	117	Total			

Subcatchment P1Gi:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Gp:

Runoff = 0.07 cfs @ 12.12 hrs, Volume= 221 cf, Depth= 2.03"
Routed to Pond PP3 : POROUS PAVEMENT

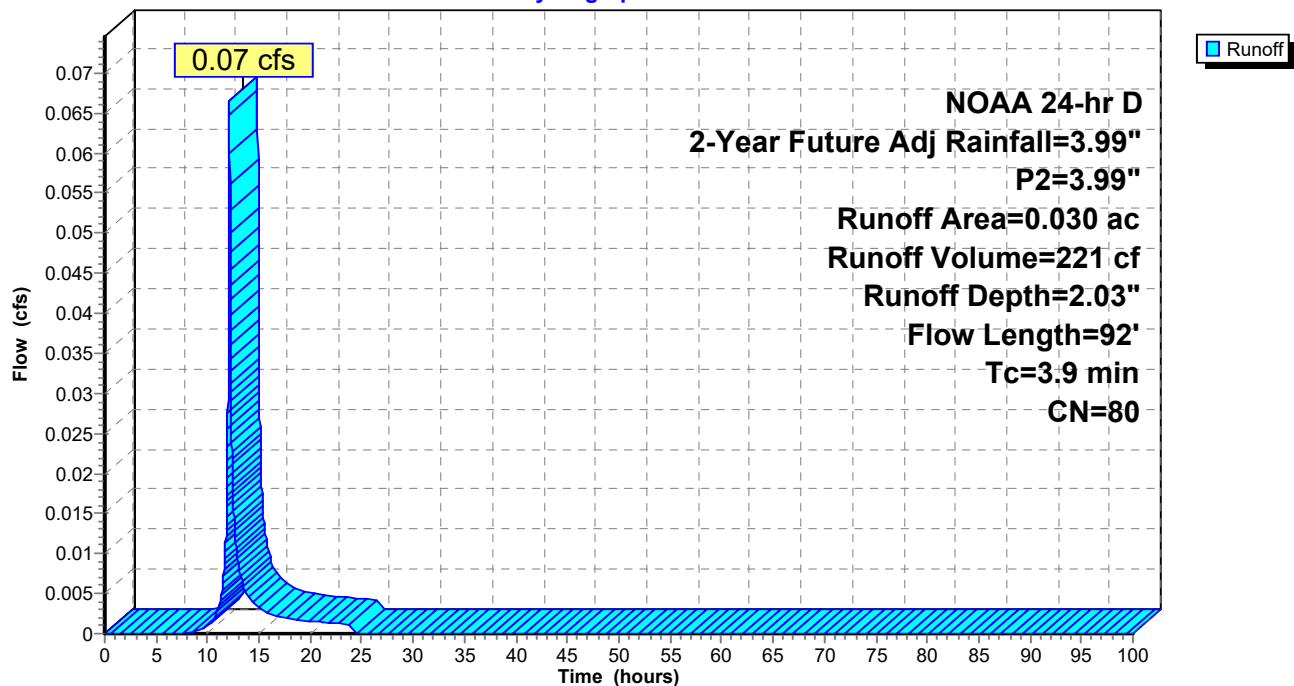
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.030	80	>75% Grass cover, Good, HSG D
0.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	29	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	8	0.0250	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	92	Total			

Subcatchment P1Gp:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Hi:

Runoff = 43.27 cfs @ 12.10 hrs, Volume= 144,899 cf, Depth= 3.76"
Routed to Pond PP4 : POROUS PAVEMENT

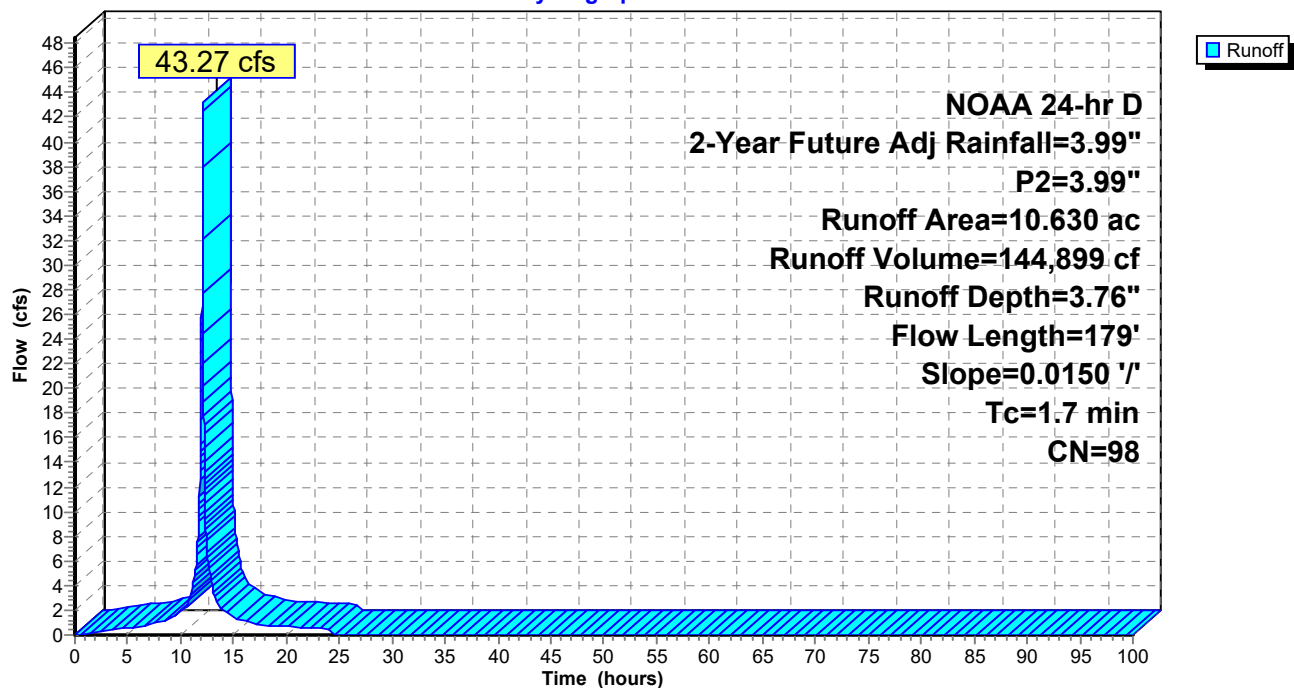
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
10.630	98	Paved parking, HSG D
10.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.37		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	79	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.7	179	Total			

Subcatchment P1Hi:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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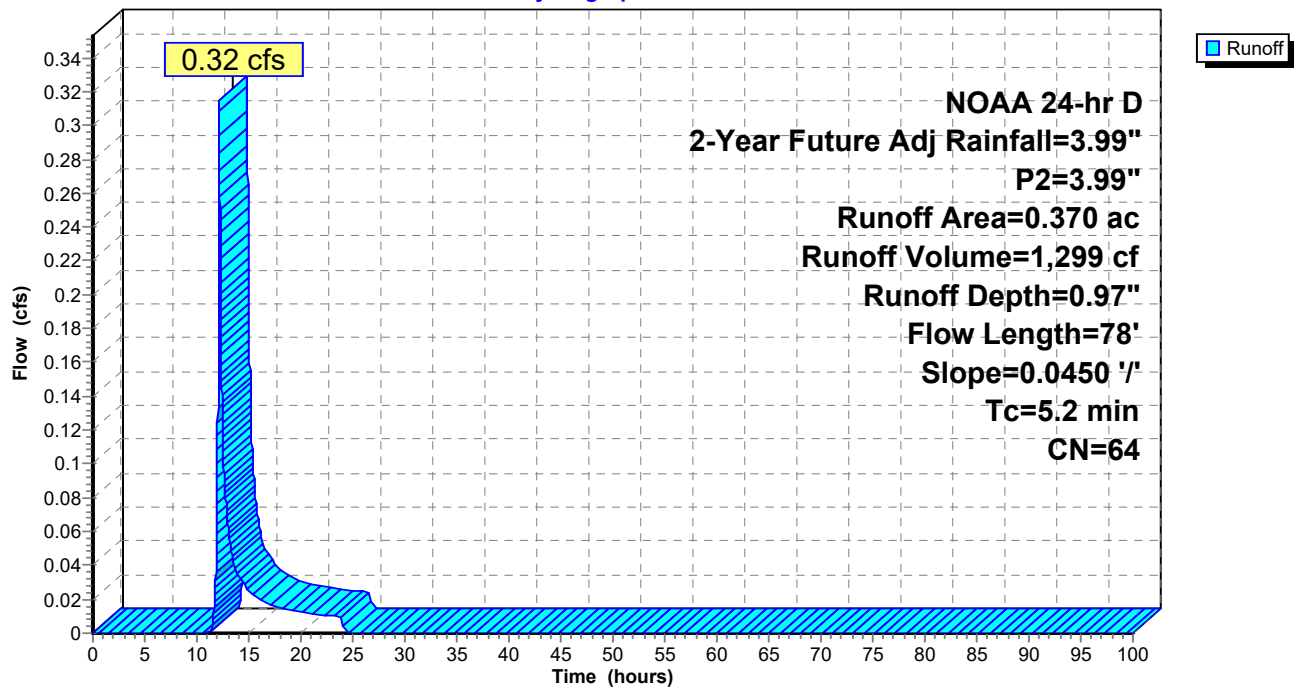
Summary for Subcatchment P1Hp:

Runoff = 0.32 cfs @ 12.14 hrs, Volume= 1,299 cf, Depth= 0.97"
Routed to Pond PP4 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.230	80	>75% Grass cover, Good, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.370	64	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	78	0.0450	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Hp:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1li:

Runoff = 3.09 cfs @ 12.09 hrs, Volume= 10,087 cf, Depth= 3.76"
Routed to Pond PP5 : POROUS PAVEMENT

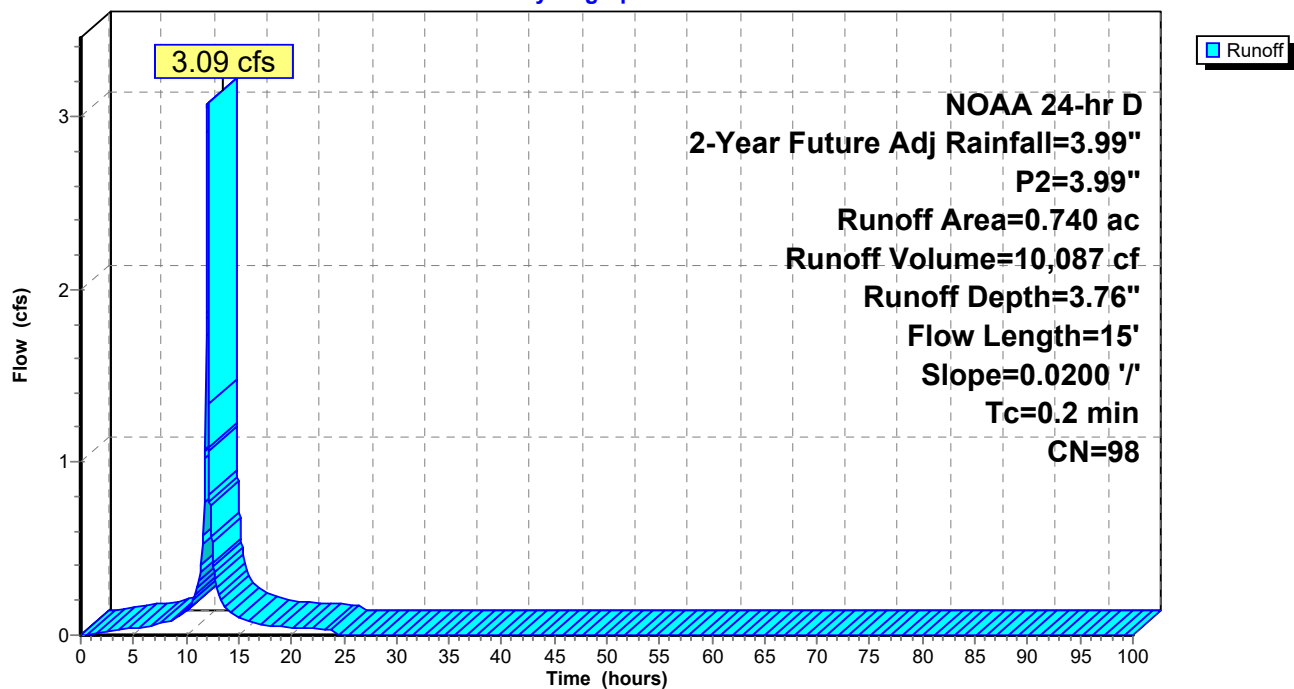
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
0.740		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1li:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1lp:

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 148 cf, Depth= 2.03"
Routed to Pond PP5 : POROUS PAVEMENT

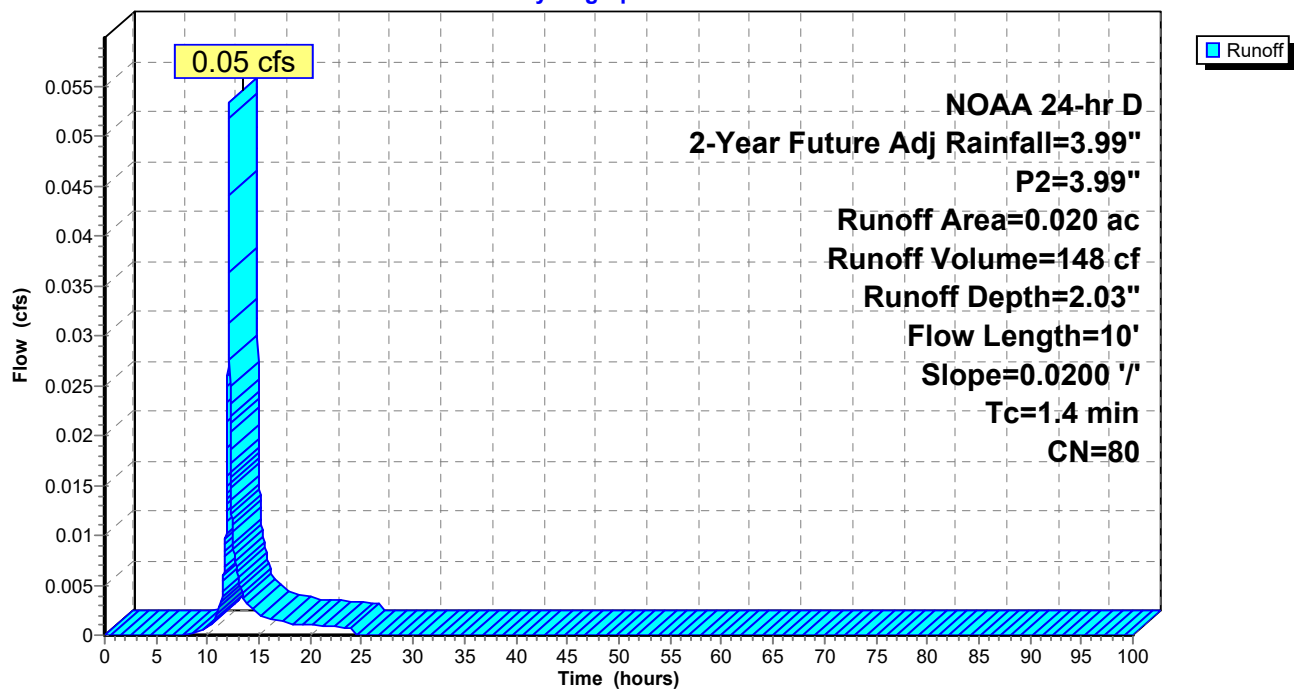
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.020	80	>75% Grass cover, Good, HSG D
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1lp:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Ji:

Runoff = 3.63 cfs @ 12.09 hrs, Volume= 11,859 cf, Depth= 3.76"
Routed to Pond PP6 : POROUS PAVEMENT

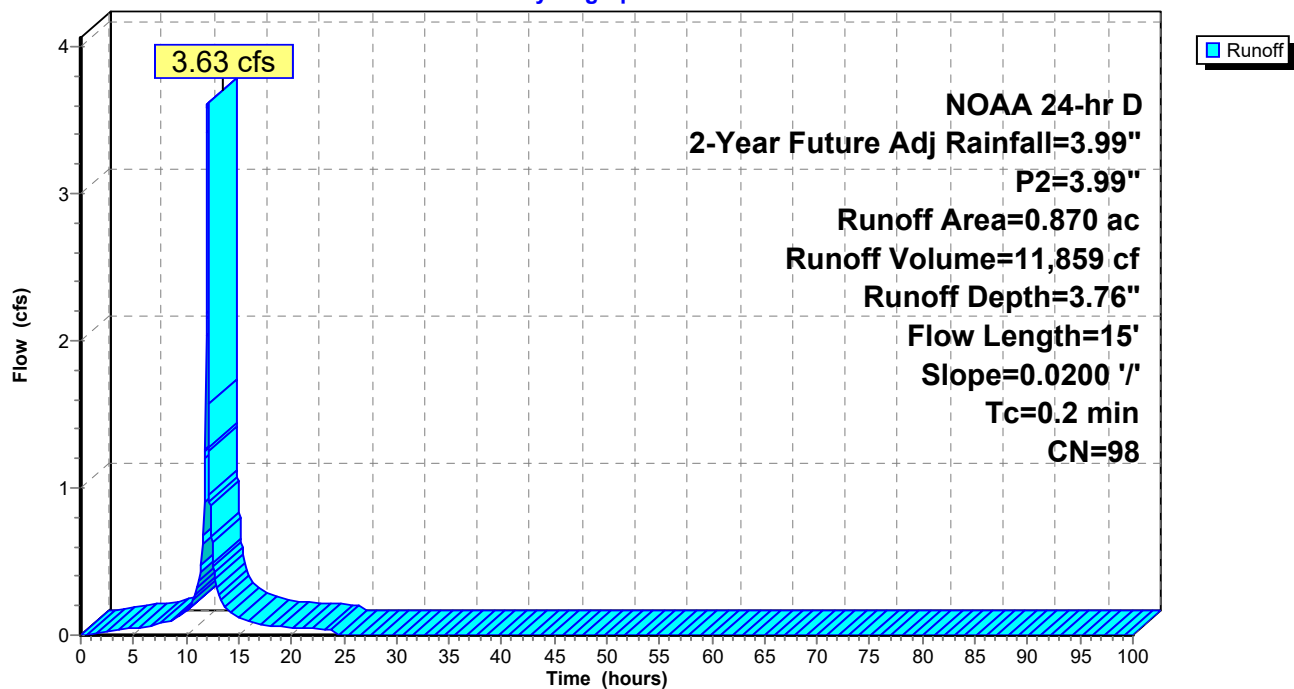
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.870	98	Paved parking, HSG D
0.870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Ji:

Hydrograph



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Summary for Subcatchment P1Jp:

Runoff = 0.02 cfs @ 12.10 hrs, Volume= 55 cf, Depth= 0.76"
Routed to Pond PP6 : POROUS PAVEMENT

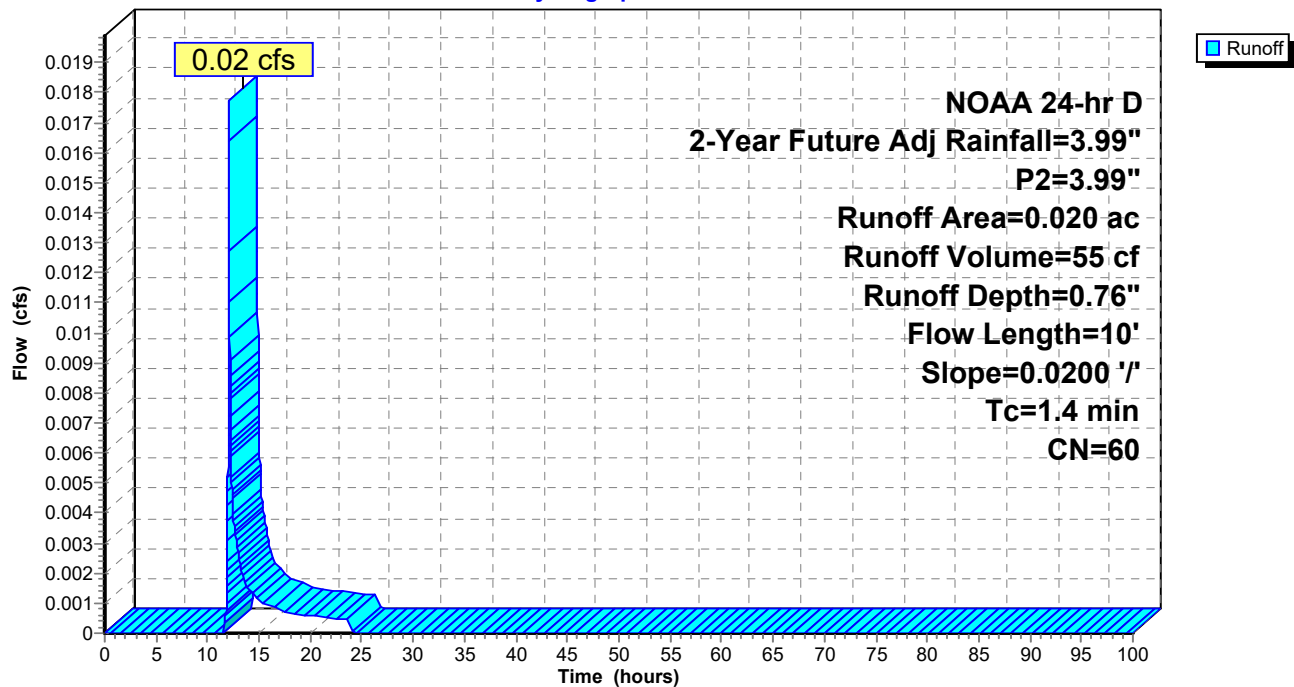
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.010	80	>75% Grass cover, Good, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.020	60	Weighted Average
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Jp:

Hydrograph



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Summary for Subcatchment P1Ki:

Runoff = 9.97 cfs @ 12.10 hrs, Volume= 32,851 cf, Depth= 3.76"
Routed to Pond B1 : UG BASIN

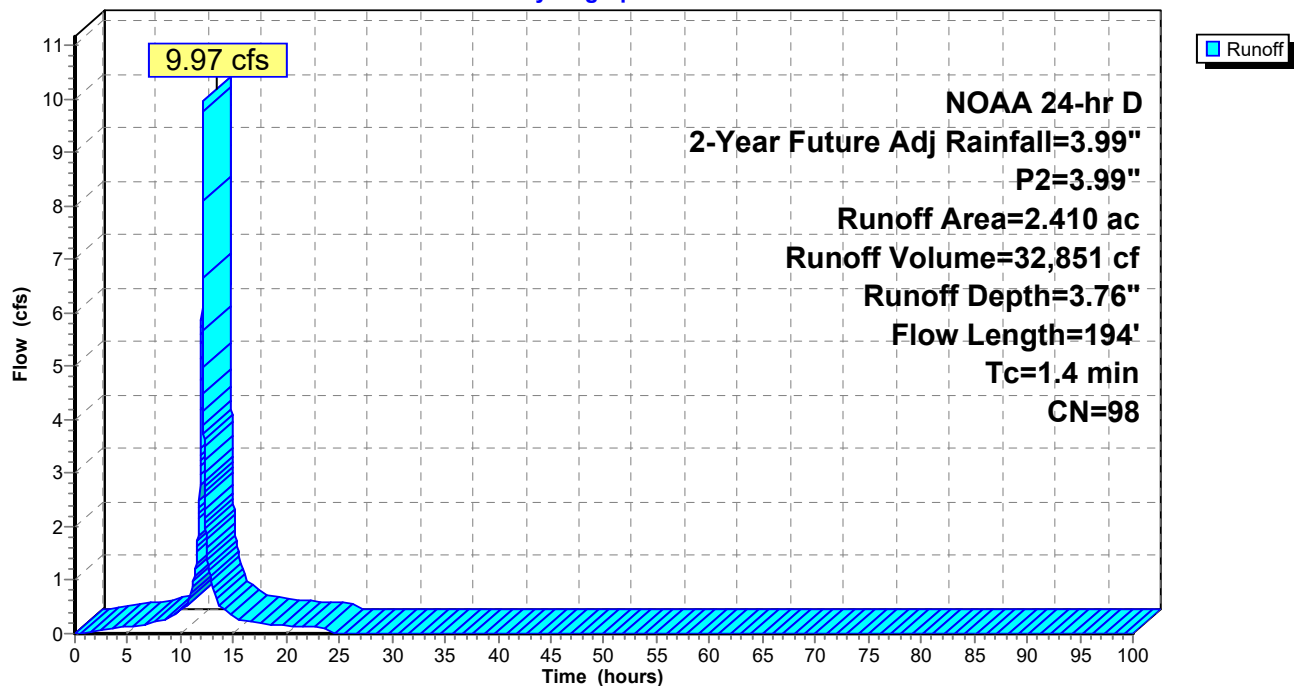
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
2.410	98	Paved parking, HSG D
2.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	72	0.0250	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	55	0.0350	3.80		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	67	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	194	Total			

Subcatchment P1Ki:

Hydrograph



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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P1Kp:

Runoff = 0.15 cfs @ 12.11 hrs, Volume= 443 cf, Depth= 2.03"
Routed to Pond B1 : UG BASIN

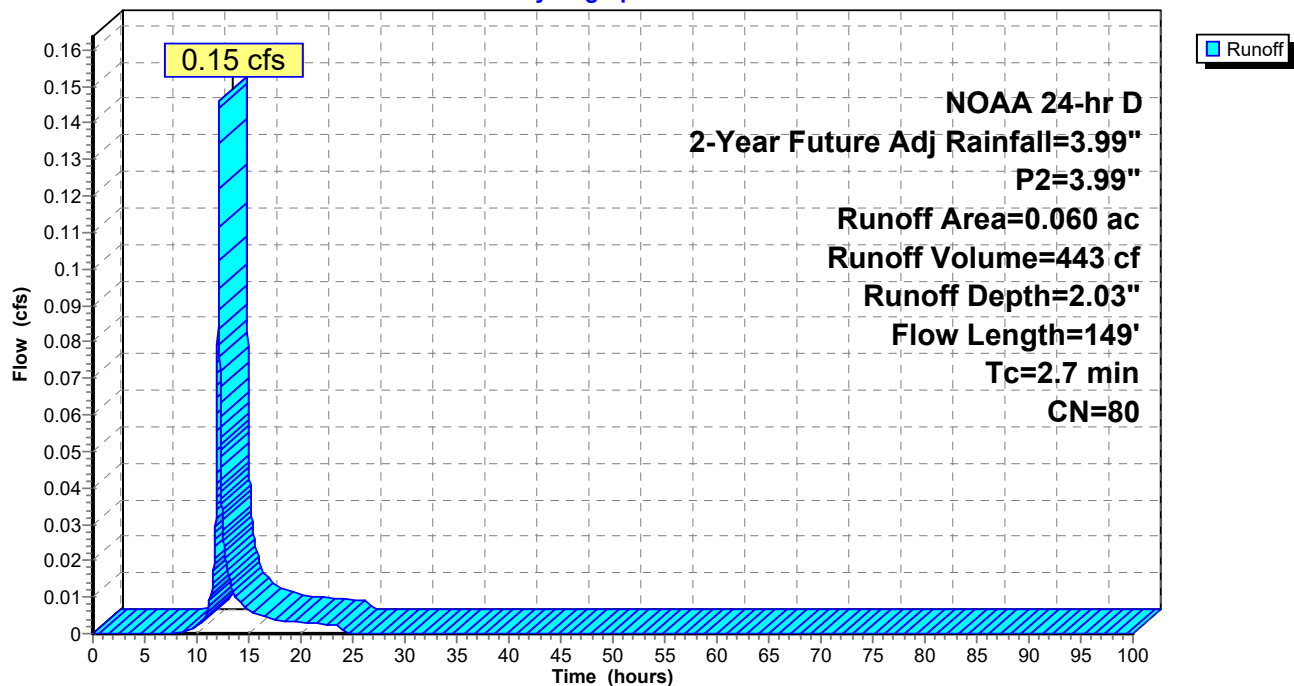
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0250	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.7	67	0.0250	1.55		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	69	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	149	Total			

Subcatchment P1Kp:

Hydrograph



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Summary for Subcatchment P1Li:

Runoff = 0.71 cfs @ 12.09 hrs, Volume= 2,317 cf, Depth= 3.76"
Routed to Link P1A :

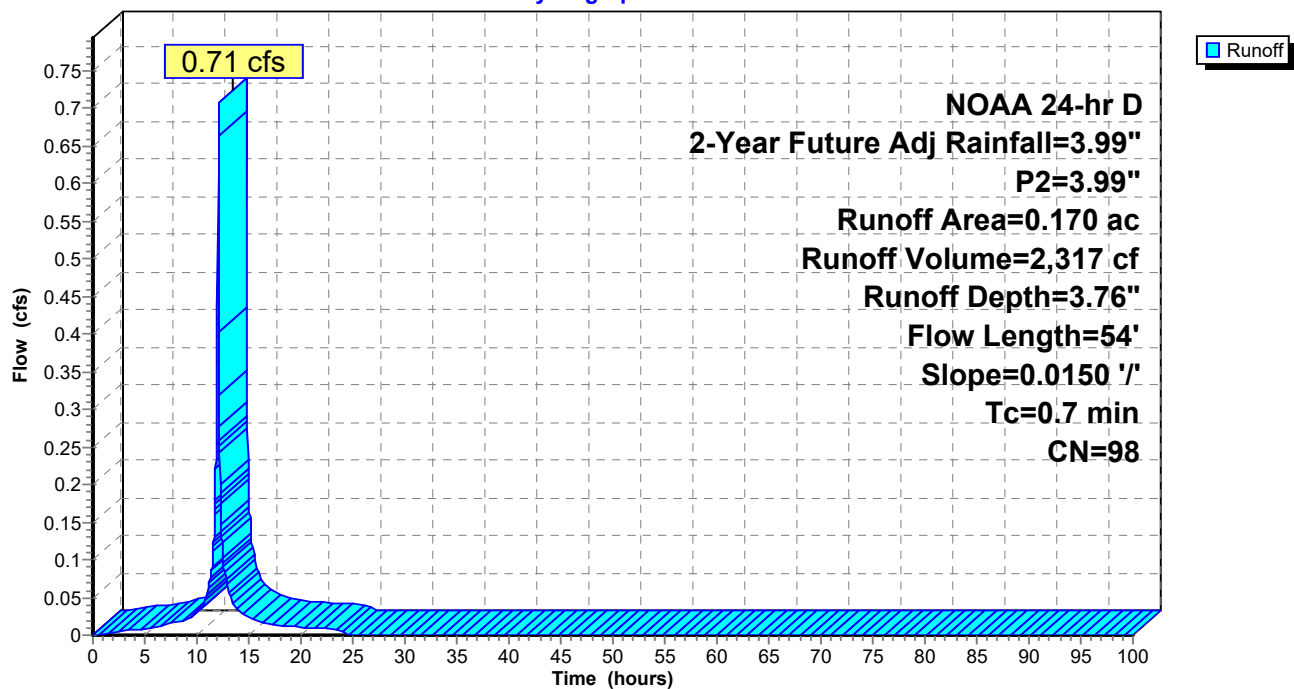
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.170	98	Paved parking, HSG D
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	54	0.0150	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Li:

Hydrograph



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Summary for Subcatchment P1Lp:

Runoff = 1.23 cfs @ 12.22 hrs, Volume= 7,641 cf, Depth= 0.86"
Routed to Link P1A :

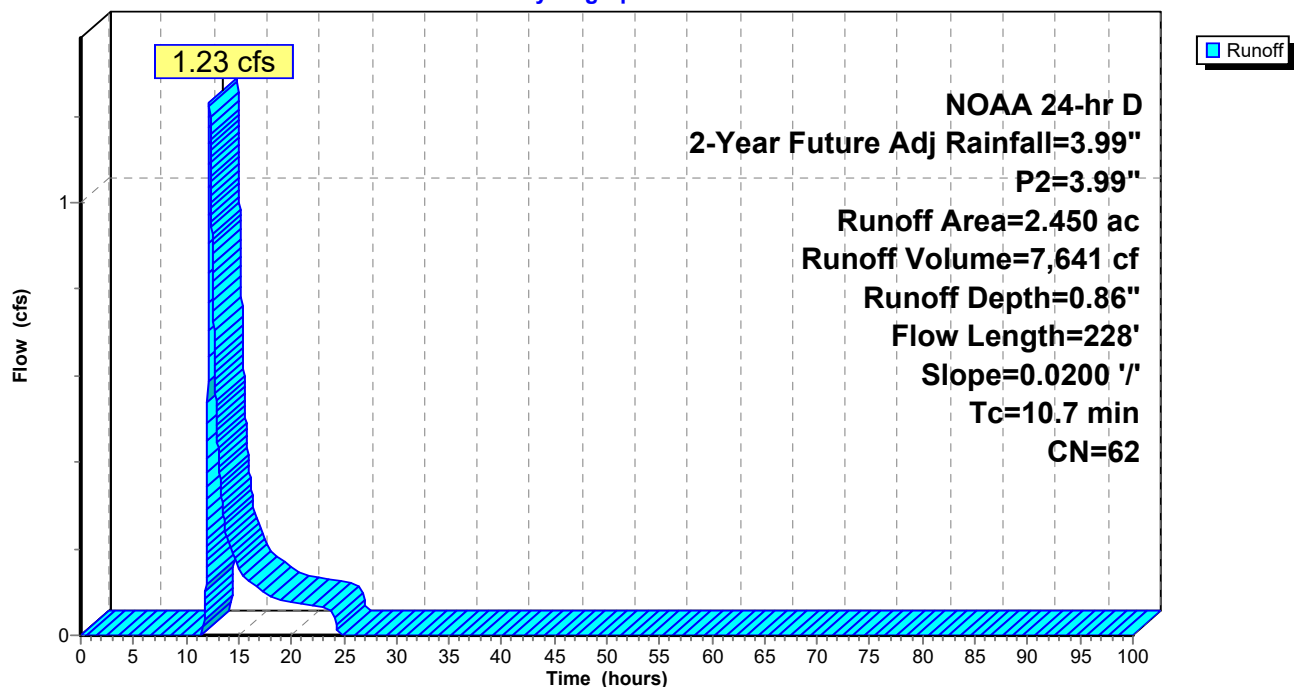
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
1.360	80	>75% Grass cover, Good, HSG D
1.090	39	>75% Grass cover, Good, HSG A
2.450	62	Weighted Average
2.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	94	0.0200	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
2.3	134	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.7	228	Total			

Subcatchment P1Lp:

Hydrograph



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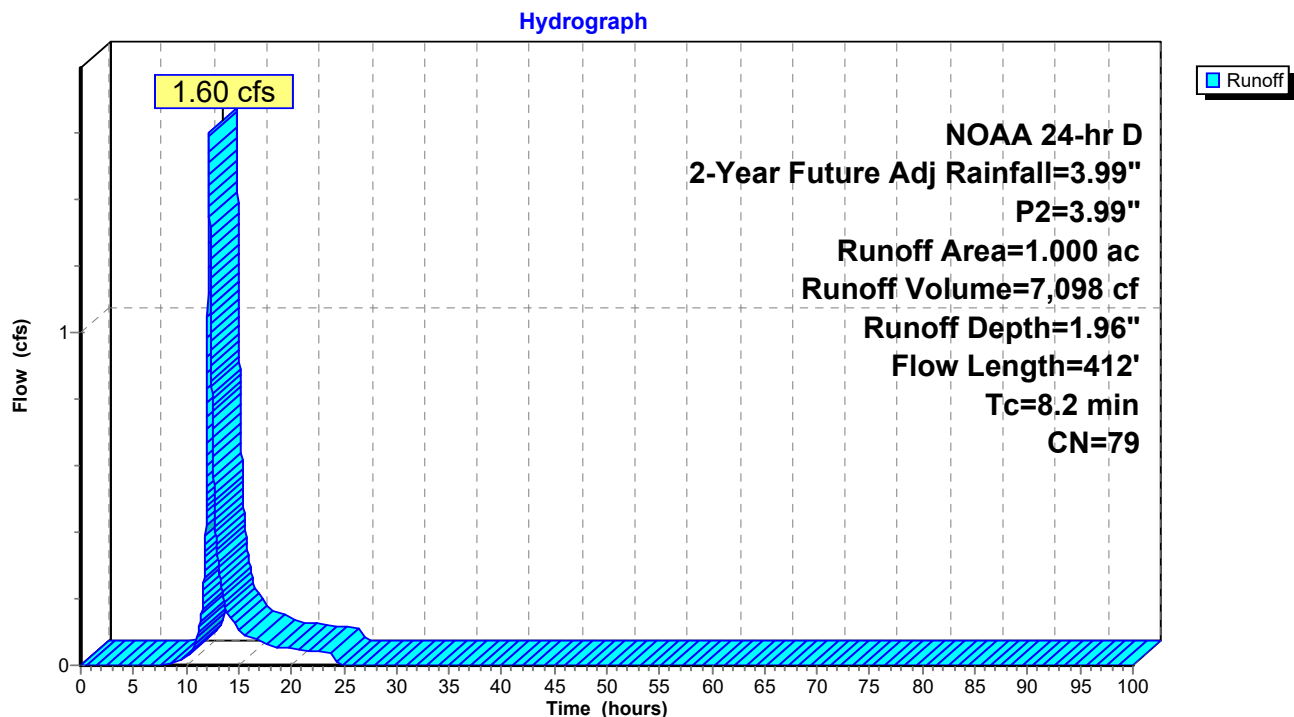
Summary for Subcatchment P1Mp:

Runoff = 1.60 cfs @ 12.17 hrs, Volume= 7,098 cf, Depth= 1.96"
Routed to Link P1A :

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.570	80	>75% Grass cover, Good, HSG D
0.430	77	Woods, Good, HSG D
1.000	79	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment P1Mp:

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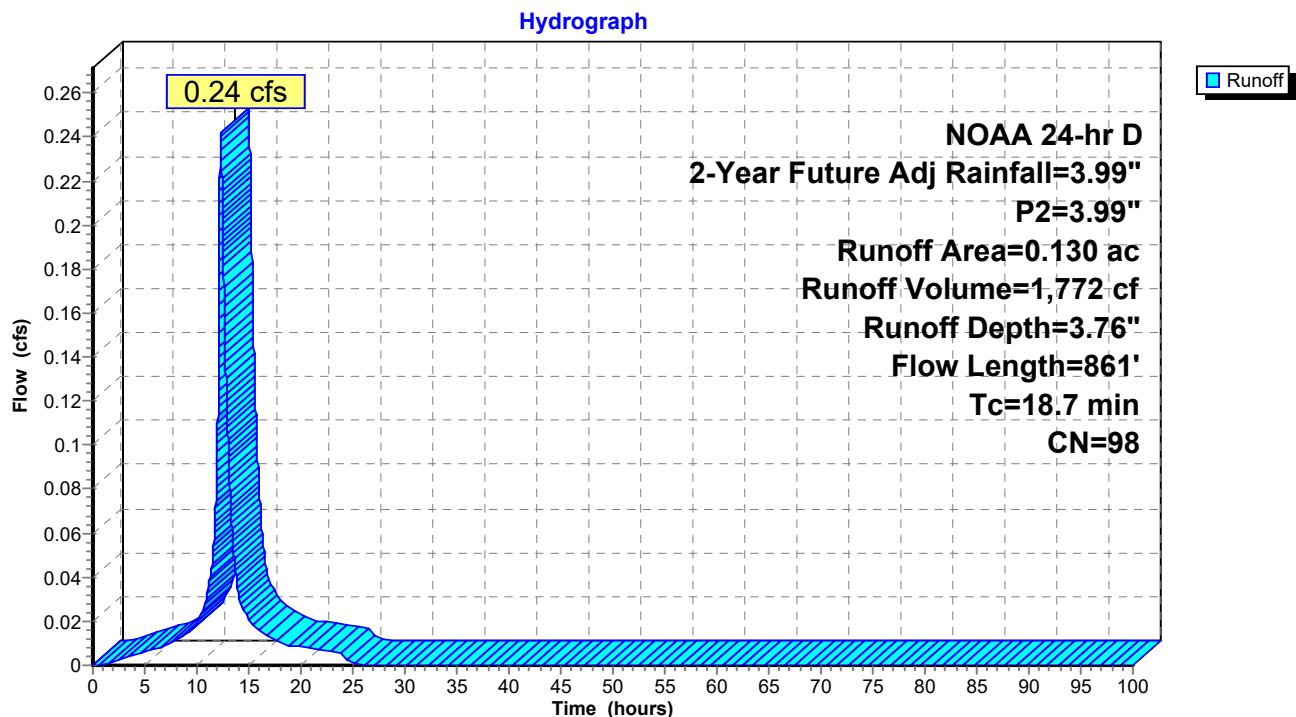
Summary for Subcatchment P1Ni: PDA 4B Impervious

Runoff = 0.24 cfs @ 12.30 hrs, Volume= 1,772 cf, Depth= 3.76"
Routed to Link P1B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Ni: PDA 4B Impervious

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Summary for Subcatchment P1Np: PDA 4B Pervious

Runoff = 7.56 cfs @ 12.30 hrs, Volume= 50,950 cf, Depth= 1.88"
Routed to Link P1B : BYPASS

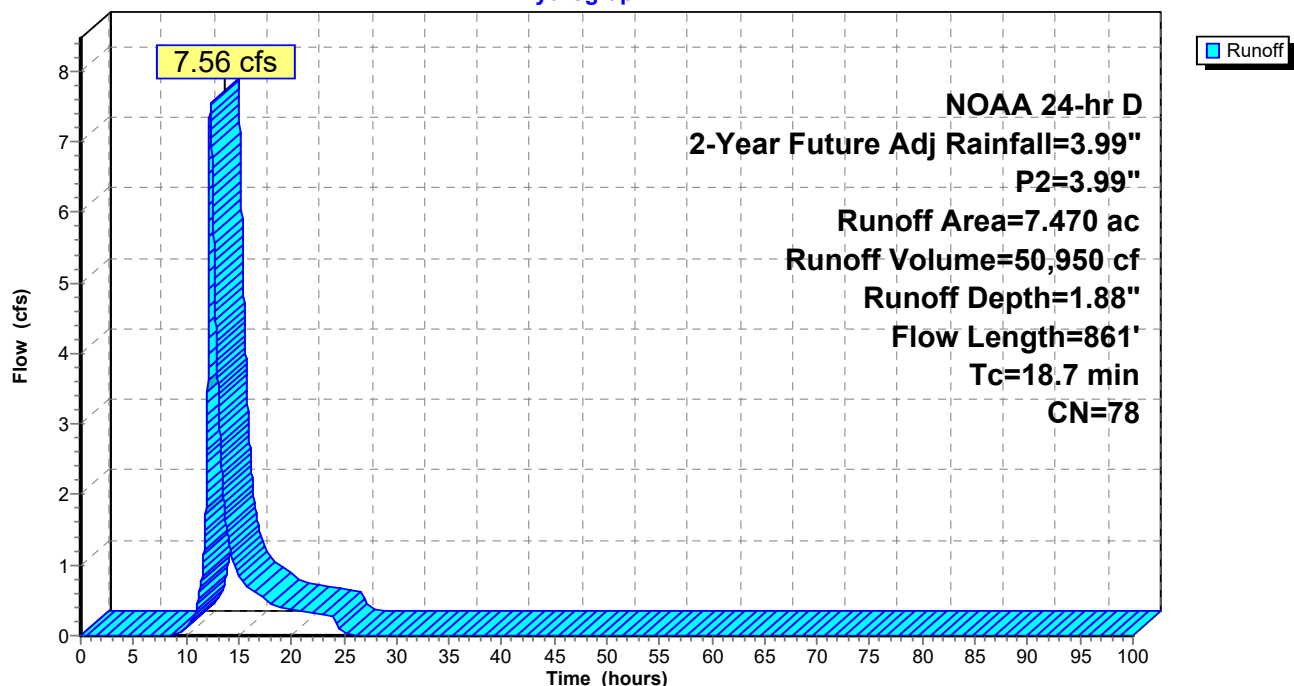
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Np: PDA 4B Pervious

Hydrograph



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Summary for Subcatchment P2Ap: PDA 2A Pervious

Runoff = 0.87 cfs @ 12.24 hrs, Volume= 5,040 cf, Depth= 1.96"
Routed to Link P2A : PDA 2A ONSITE

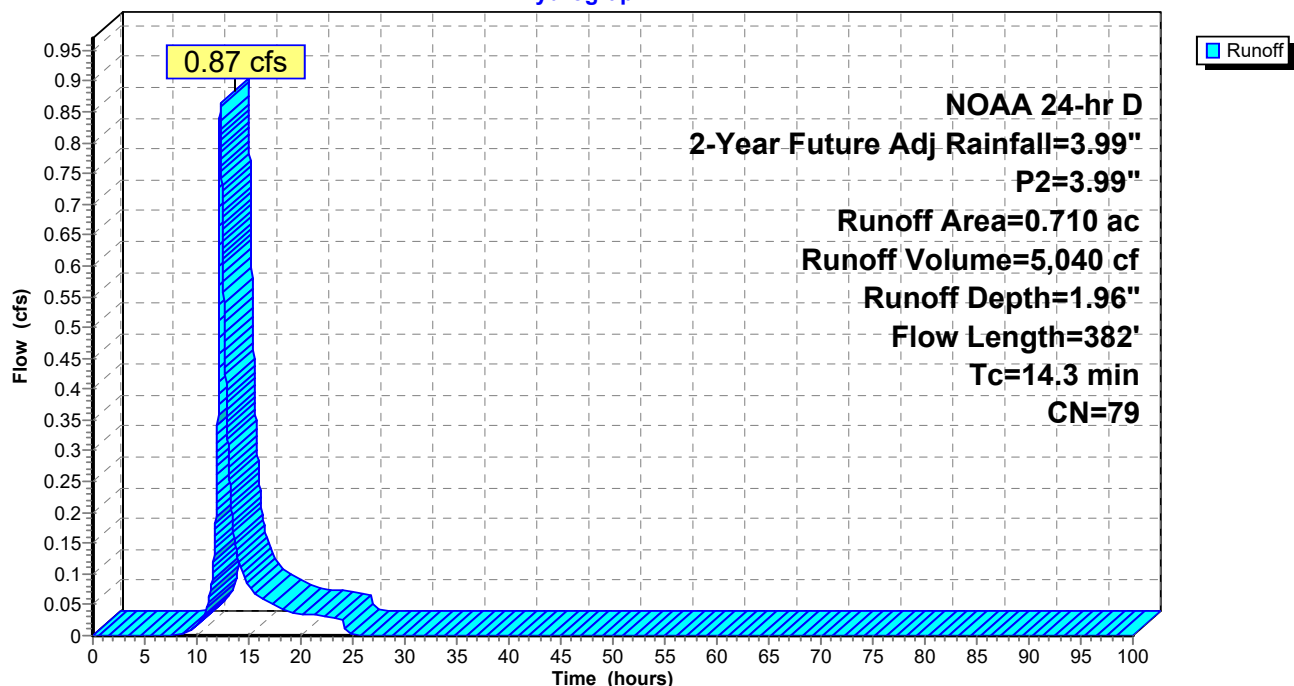
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.360	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
0.710	79	Weighted Average
0.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment P2Ap: PDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P2Bp: PDA 2B Pervious

Runoff = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf, Depth= 1.80"
Routed to Link P2B : BYPASS

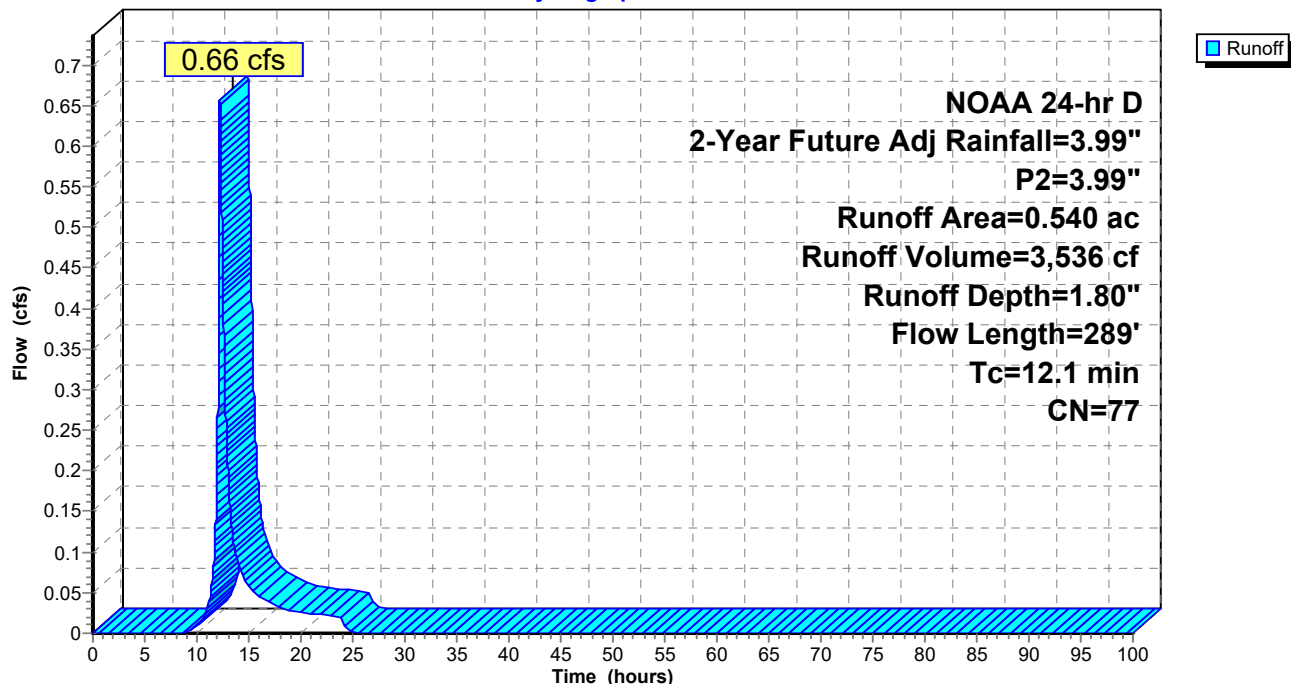
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment P2Bp: PDA 2B Pervious

Hydrograph



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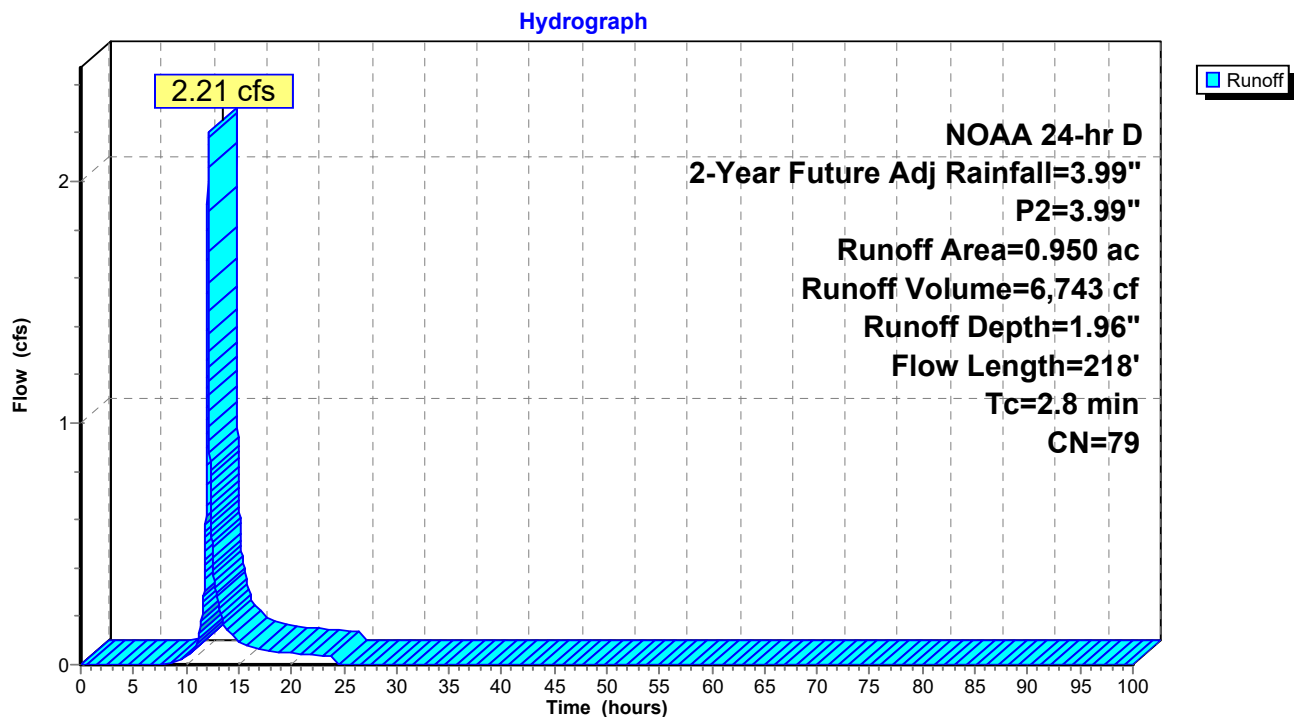
Summary for Subcatchment P3Ap: PDA 3A Pervious

Runoff = 2.21 cfs @ 12.11 hrs, Volume= 6,743 cf, Depth= 1.96"
Routed to Link P3A : PDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.430	77	Woods, Good, HSG D
0.520	80	>75% Grass cover, Good, HSG D
0.950	79	Weighted Average
0.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment P3Ap: PDA 3A Pervious

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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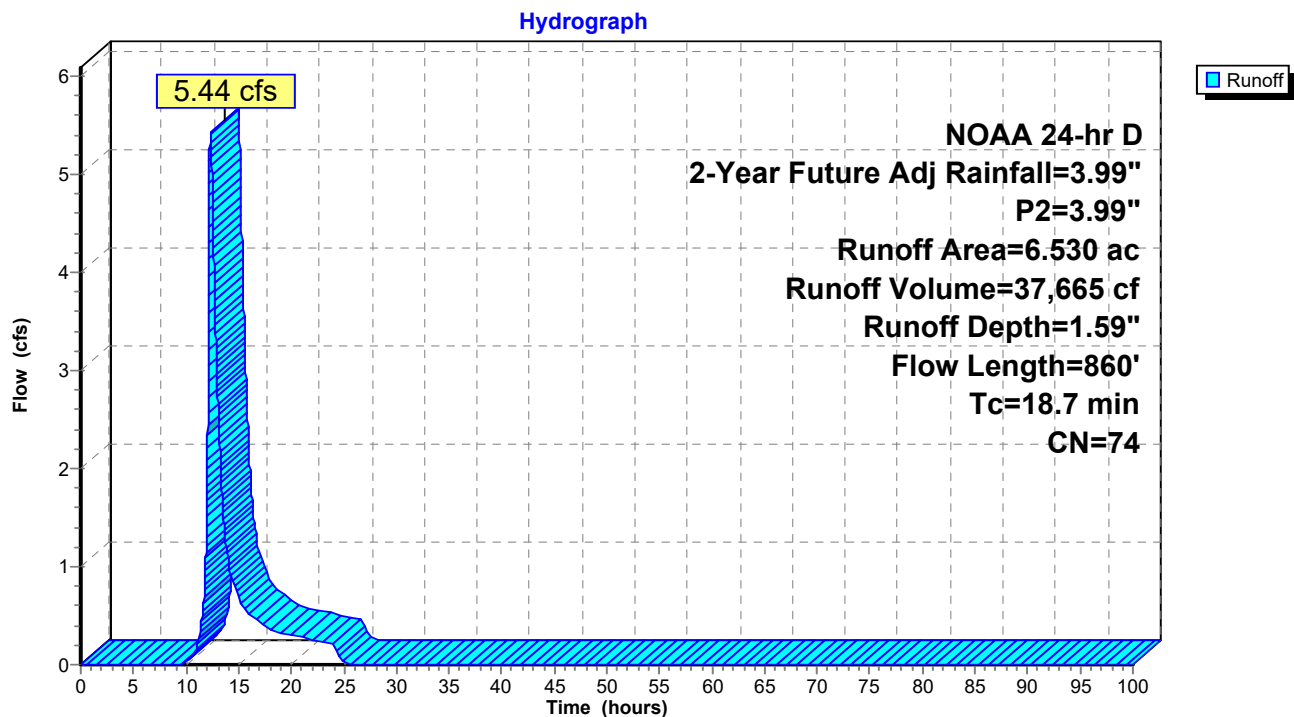
Summary for Subcatchment P3Bp: PDA 3B Pervious

Runoff = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf, Depth= 1.59"
Routed to Link P3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment P3Bp: PDA 3B Pervious

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Subcatchment P4p: PDA 4 Pervious

Runoff = 0.01 cfs @ 21.05 hrs, Volume= 368 cf, Depth= 0.05"
Routed to Link P4 : PDA 4

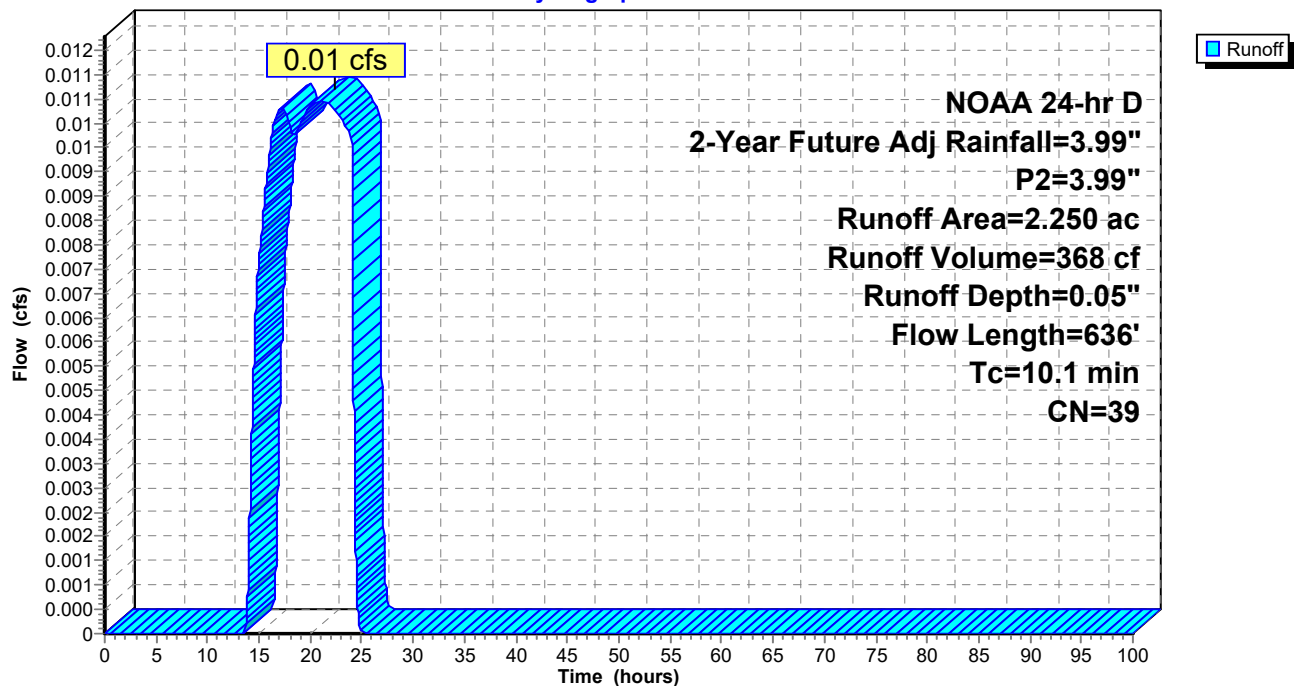
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

Area (ac)	CN	Description
2.250	39	>75% Grass cover, Good, HSG A
2.250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment P4p: PDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 3.71" for 2-Year Future Adj event
 Inflow = 10.12 cfs @ 12.10 hrs, Volume= 33,294 cf
 Outflow = 0.60 cfs @ 13.46 hrs, Volume= 23,797 cf, Atten= 94%, Lag= 81.9 min
 Primary = 0.60 cfs @ 13.46 hrs, Volume= 23,797 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.86' @ 13.46 hrs Surf.Area= 0.559 ac Storage= 0.512 af

Plug-Flow detention time= 628.2 min calculated for 23,797 cf (71% of inflow)
 Center-of-Mass det. time= 526.9 min (1,278.2 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Cap x 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.60 cfs @ 13.46 hrs HW=10.86' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.60 cfs of 6.20 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.60 cfs @ 3.07 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pre vs Post Rev. 3a

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NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 = 416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

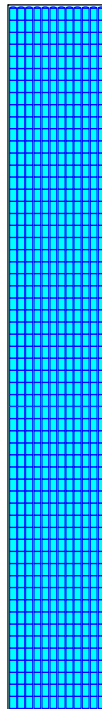
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

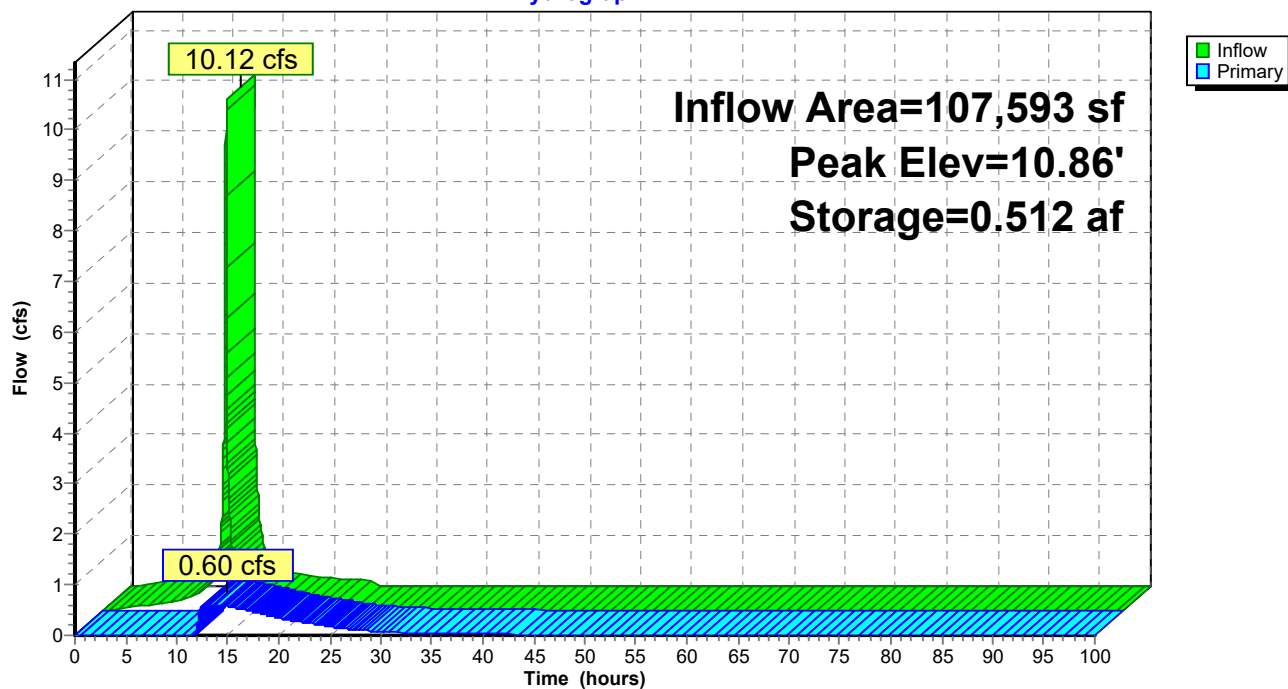
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 4.32" for 2-Year Future Adj event
 Inflow = 25.29 cfs @ 12.11 hrs, Volume= 122,745 cf
 Outflow = 6.08 cfs @ 12.99 hrs, Volume= 120,938 cf, Atten= 76%, Lag= 52.7 min
 Primary = 6.08 cfs @ 12.99 hrs, Volume= 120,938 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

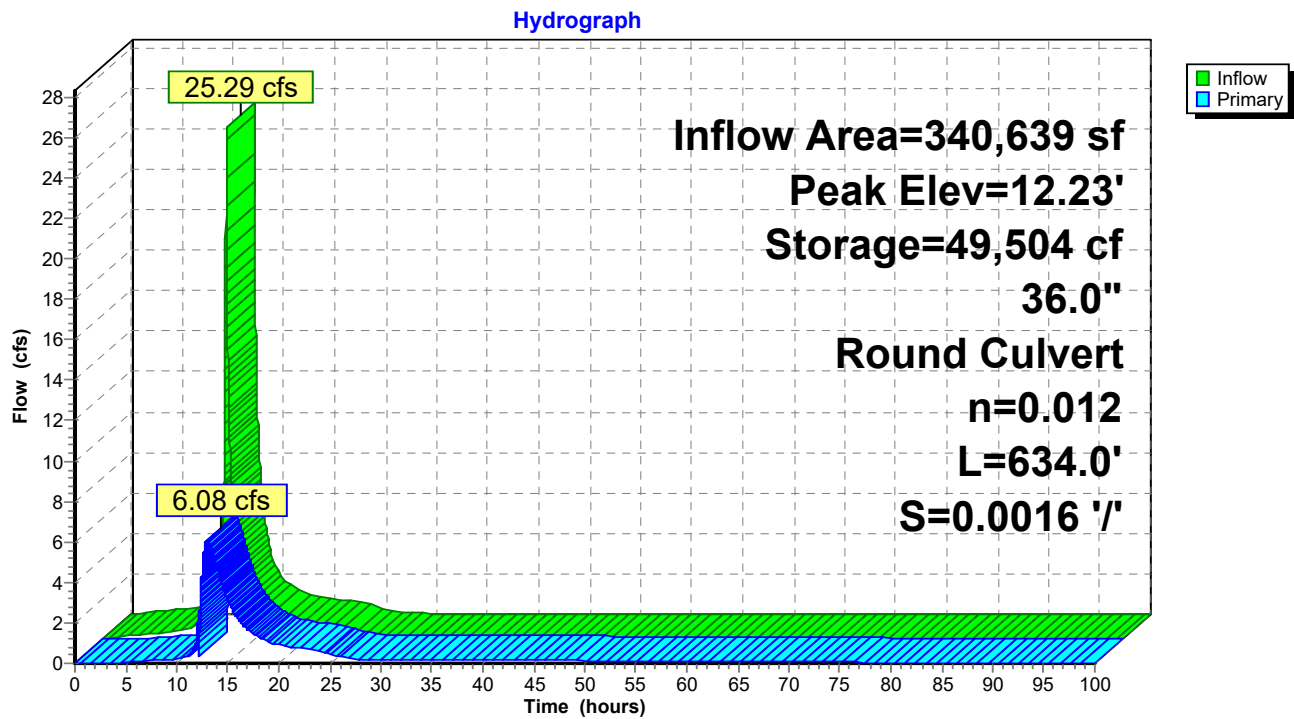
Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.23' @ 12.87 hrs Surf.Area= 20,743 sf Storage= 49,504 cf

Plug-Flow detention time= 515.6 min calculated for 120,938 cf (99% of inflow)
 Center-of-Mass det. time= 498.3 min (1,333.1 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=6.13 cfs @ 12.99 hrs HW=12.22' TW=12.15' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 6.13 cfs @ 1.01 fps)

Pond CW1A: CONSTRUCTED WETLANDS 1A

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 2.95" for 2-Year Future Adj event
 Inflow = 29.84 cfs @ 12.12 hrs, Volume= 259,319 cf
 Outflow = 14.25 cfs @ 12.76 hrs, Volume= 257,131 cf, Atten= 52%, Lag= 38.8 min
 Primary = 14.25 cfs @ 12.76 hrs, Volume= 257,131 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

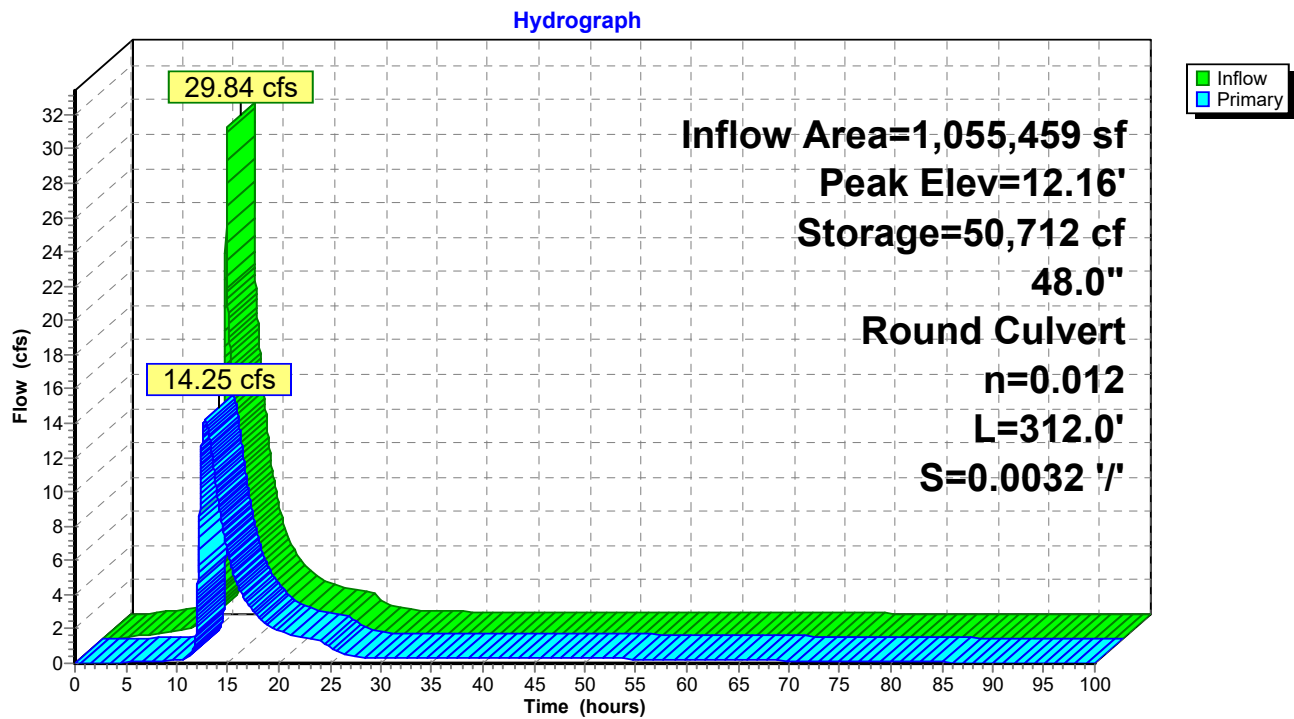
Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.16' @ 12.84 hrs Surf.Area= 19,535 sf Storage= 50,712 cf

Plug-Flow detention time= 302.9 min calculated for 257,106 cf (99% of inflow)
 Center-of-Mass det. time= 269.4 min (1,336.3 - 1,066.9)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=14.21 cfs @ 12.76 hrs HW=12.15' TW=12.02' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 14.21 cfs @ 1.84 fps)

Pond CW1B: CONSTRUCTED WETLANDS 1B

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 2.81" for 2-Year Future Adj event
 Inflow = 14.99 cfs @ 12.78 hrs, Volume= 298,283 cf
 Outflow = 14.97 cfs @ 12.90 hrs, Volume= 297,982 cf, Atten= 0%, Lag= 7.3 min
 Primary = 14.97 cfs @ 12.90 hrs, Volume= 297,982 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.02' @ 12.86 hrs Surf.Area= 6,602 sf Storage= 12,428 cf

Plug-Flow detention time= 53.2 min calculated for 297,952 cf (100% of inflow)
 Center-of-Mass det. time= 48.7 min (1,394.8 - 1,346.2)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

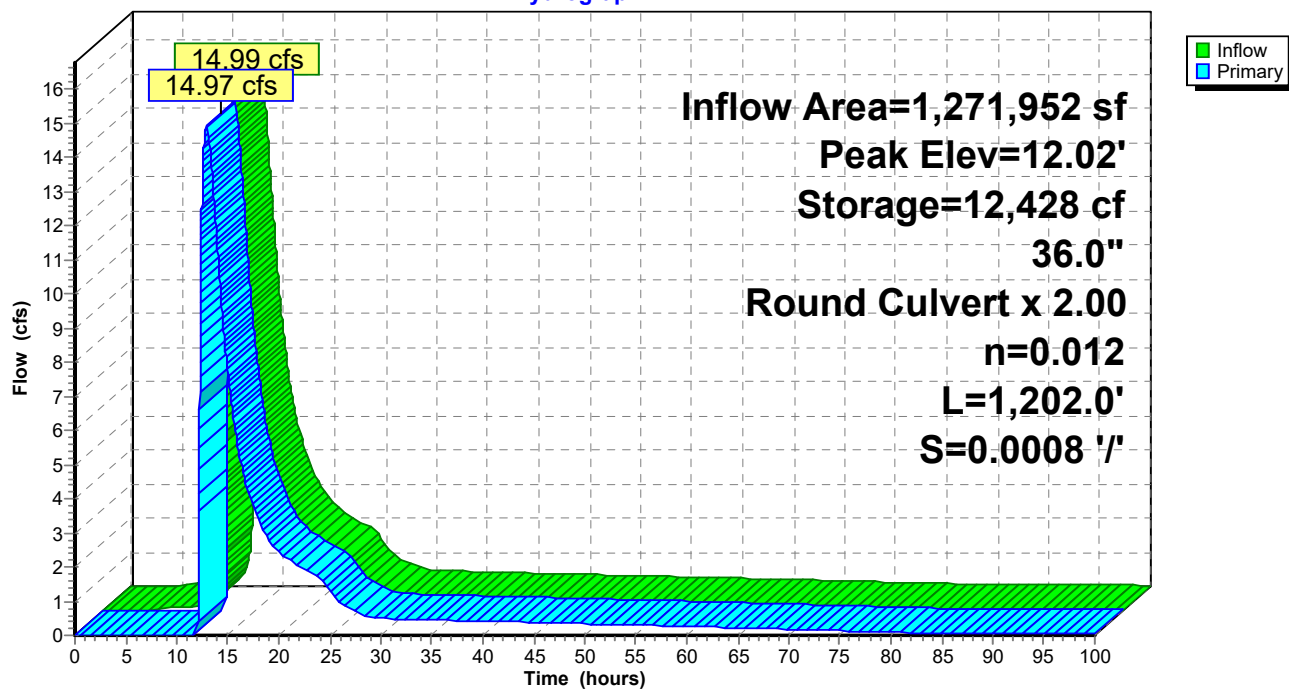
Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=14.98 cfs @ 12.90 hrs HW=12.02' TW=11.82' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 14.98 cfs @ 1.31 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 2.96" for 2-Year Future Adj event
 Inflow = 30.49 cfs @ 12.11 hrs, Volume= 417,156 cf
 Outflow = 19.24 cfs @ 12.83 hrs, Volume= 416,003 cf, Atten= 37%, Lag= 43.4 min
 Primary = 19.24 cfs @ 12.83 hrs, Volume= 416,003 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.83' @ 12.83 hrs Surf.Area= 20,471 sf Storage= 46,161 cf

Plug-Flow detention time= 186.6 min calculated for 416,003 cf (100% of inflow)
 Center-of-Mass det. time= 174.2 min (1,397.1 - 1,222.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

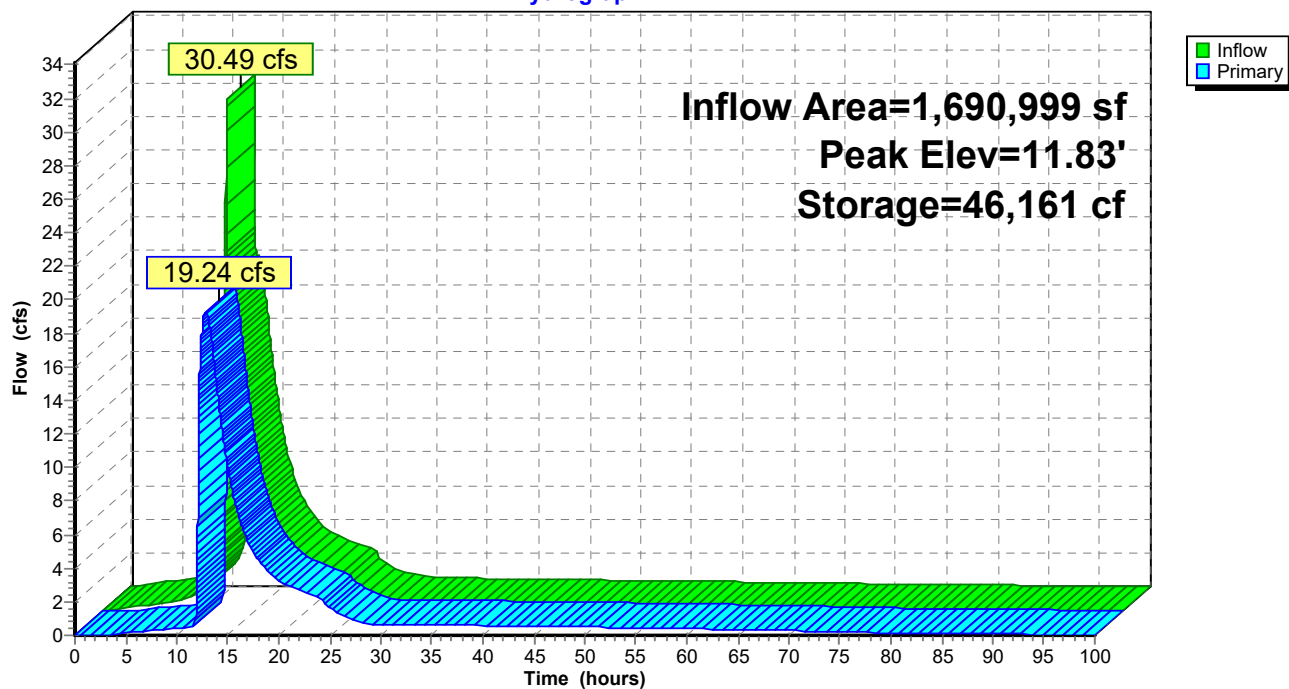
Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=19.24 cfs @ 12.83 hrs HW=11.83' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 19.24 cfs of 44.35 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.82 cfs @ 7.91 fps)
 3=Orifice/Grate (Orifice Controls 18.42 cfs @ 3.36 fps)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond CW1D: CONSTRUCTED WETLANDS 1D

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 3.66" for 2-Year Future Adj event
 Inflow = 3.16 cfs @ 12.10 hrs, Volume= 10,363 cf
 Outflow = 0.24 cfs @ 13.13 hrs, Volume= 7,475 cf, Atten= 92%, Lag= 62.2 min
 Primary = 0.24 cfs @ 13.13 hrs, Volume= 7,475 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.89' @ 13.13 hrs Surf.Area= 12,680 sf Storage= 6,796 cf

Plug-Flow detention time= 565.5 min calculated for 7,475 cf (72% of inflow)
 Center-of-Mass det. time= 465.9 min (1,216.0 - 750.2)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

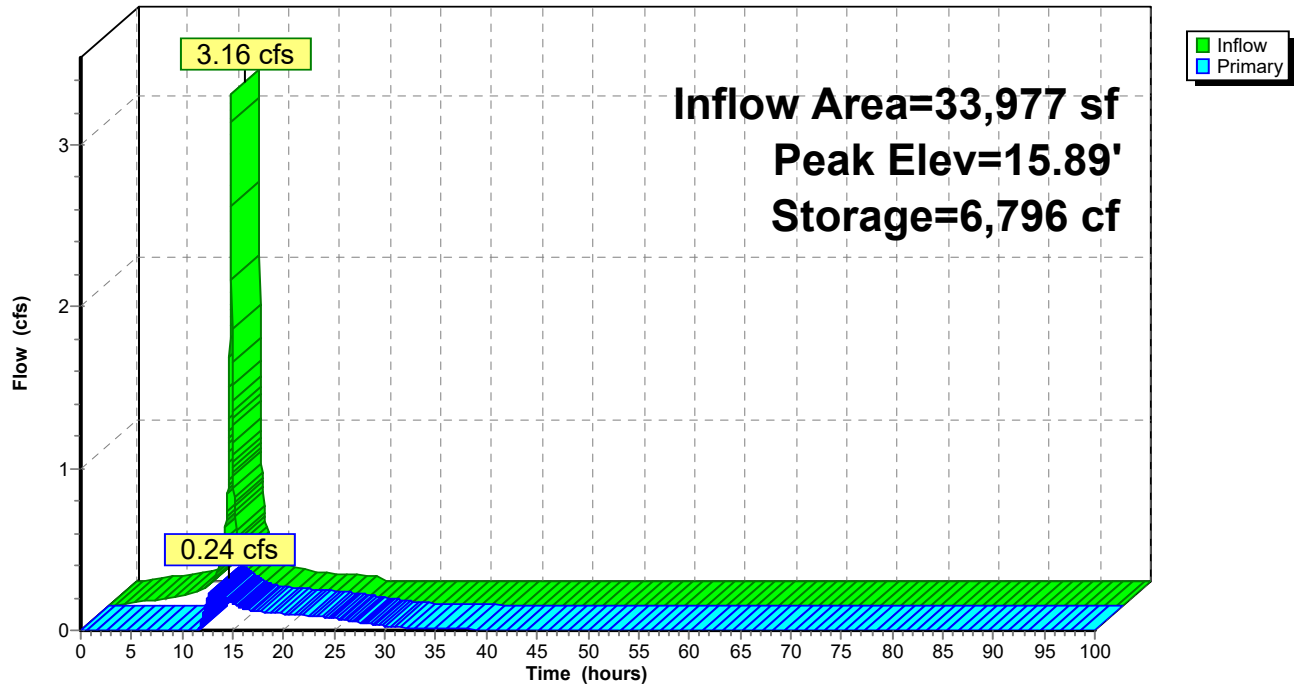
Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.24 cfs @ 13.13 hrs HW=15.89' TW=12.20' (Dynamic Tailwater)

- 1=Culvert (Passes 0.24 cfs of 11.16 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.13 cfs @ 3.96 fps)
- 3=Orifice/Grate (Orifice Controls 0.11 cfs @ 1.44 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP1: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 3.64" for 2-Year Future Adj event
 Inflow = 7.26 cfs @ 12.10 hrs, Volume= 23,786 cf
 Outflow = 0.41 cfs @ 13.52 hrs, Volume= 17,241 cf, Atten= 94%, Lag= 85.1 min
 Primary = 0.41 cfs @ 13.52 hrs, Volume= 17,241 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.34' @ 13.52 hrs Surf.Area= 23,328 sf Storage= 16,718 cf

Plug-Flow detention time= 935.1 min calculated for 17,241 cf (72% of inflow)
 Center-of-Mass det. time= 835.4 min (1,588.5 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

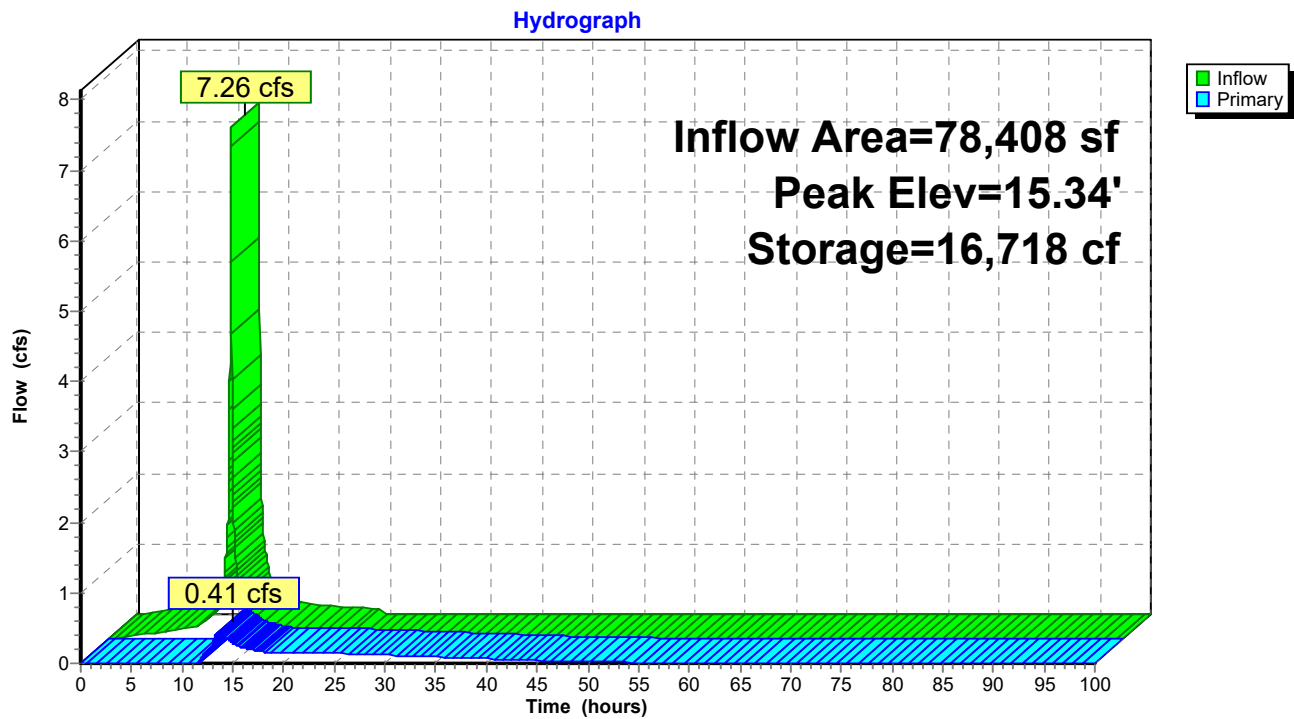
Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.41 cfs @ 13.52 hrs HW=15.34' TW=11.90' (Dynamic Tailwater)

1=Culvert (Passes 0.41 cfs of 63.10 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.16 cfs @ 4.83 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 0.25 cfs @ 0.88 fps)

Pond PP2: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 3.68" for 2-Year Future Adj event
 Inflow = 2.97 cfs @ 12.10 hrs, Volume= 9,763 cf
 Outflow = 0.17 cfs @ 13.51 hrs, Volume= 7,077 cf, Atten= 94%, Lag= 84.5 min
 Primary = 0.17 cfs @ 13.51 hrs, Volume= 7,077 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.13' @ 13.51 hrs Surf.Area= 10,368 sf Storage= 6,549 cf

Plug-Flow detention time= 554.4 min calculated for 7,077 cf (72% of inflow)
 Center-of-Mass det. time= 455.3 min (1,207.2 - 752.0)

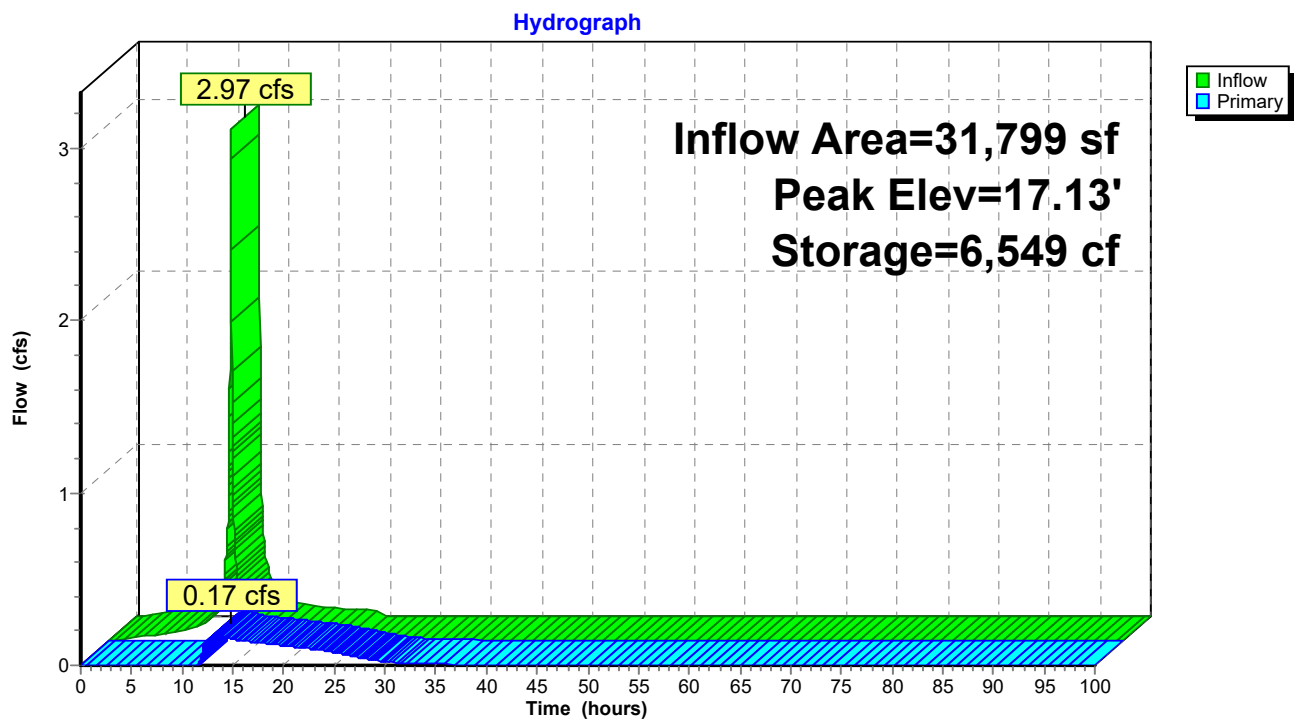
Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / S= 0.0031 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.17 cfs @ 13.51 hrs HW=17.13' TW=11.74' (Dynamic Tailwater)

- 1=Culvert (Passes 0.17 cfs of 54.89 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.15 cfs @ 4.40 fps)
- 3=Orifice/Grate (Orifice Controls 0.02 cfs @ 1.07 fps)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond PP3: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 3.66" for 2-Year Future Adj event
 Inflow = 43.54 cfs @ 12.10 hrs, Volume= 146,197 cf
 Outflow = 14.98 cfs @ 12.22 hrs, Volume= 106,329 cf, Atten= 66%, Lag= 7.5 min
 Primary = 9.99 cfs @ 12.22 hrs, Volume= 70,886 cf
 Routed to Link PP4V : Valve
 Secondary = 4.99 cfs @ 12.22 hrs, Volume= 35,443 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.02' @ 12.22 hrs Surf.Area= 181,216 sf Storage= 73,146 cf

Plug-Flow detention time= 250.0 min calculated for 106,329 cf (73% of inflow)
 Center-of-Mass det. time= 150.7 min (902.7 - 751.9)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=9.98 cfs @ 12.22 hrs HW=14.02' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 9.98 cfs of 119.75 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 9.98 cfs @ 2.22 fps)

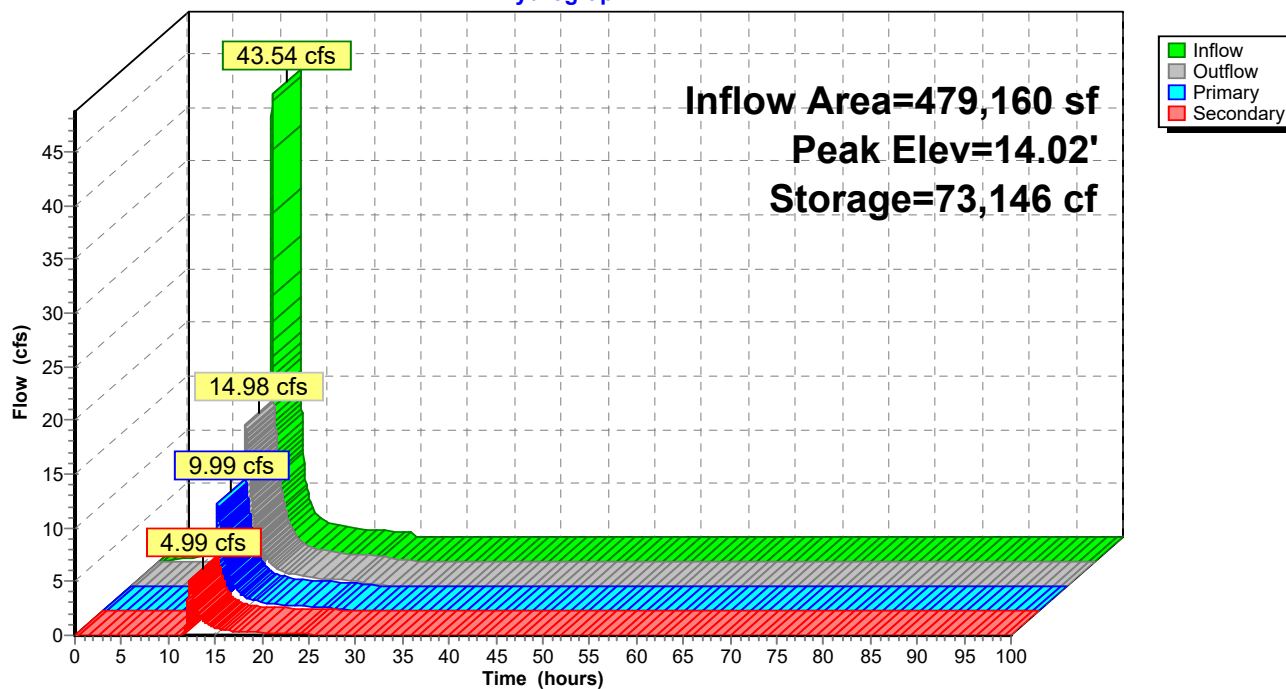
Secondary OutFlow Max=4.99 cfs @ 12.22 hrs HW=14.02' TW=11.70' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 4.99 cfs of 51.83 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 4.99 cfs @ 2.22 fps)

Pond PP4: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 2-Year Future Adj Rainfall=3.99", P2=3.99"

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Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 3.71" for 2-Year Future Adj event
 Inflow = 3.14 cfs @ 12.09 hrs, Volume= 10,235 cf
 Outflow = 1.32 cfs @ 12.11 hrs, Volume= 7,405 cf, Atten= 58%, Lag= 1.5 min
 Primary = 1.32 cfs @ 12.11 hrs, Volume= 7,405 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.76' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 4,956 cf

Plug-Flow detention time= 235.0 min calculated for 7,405 cf (72% of inflow)
 Center-of-Mass det. time= 135.6 min (885.2 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

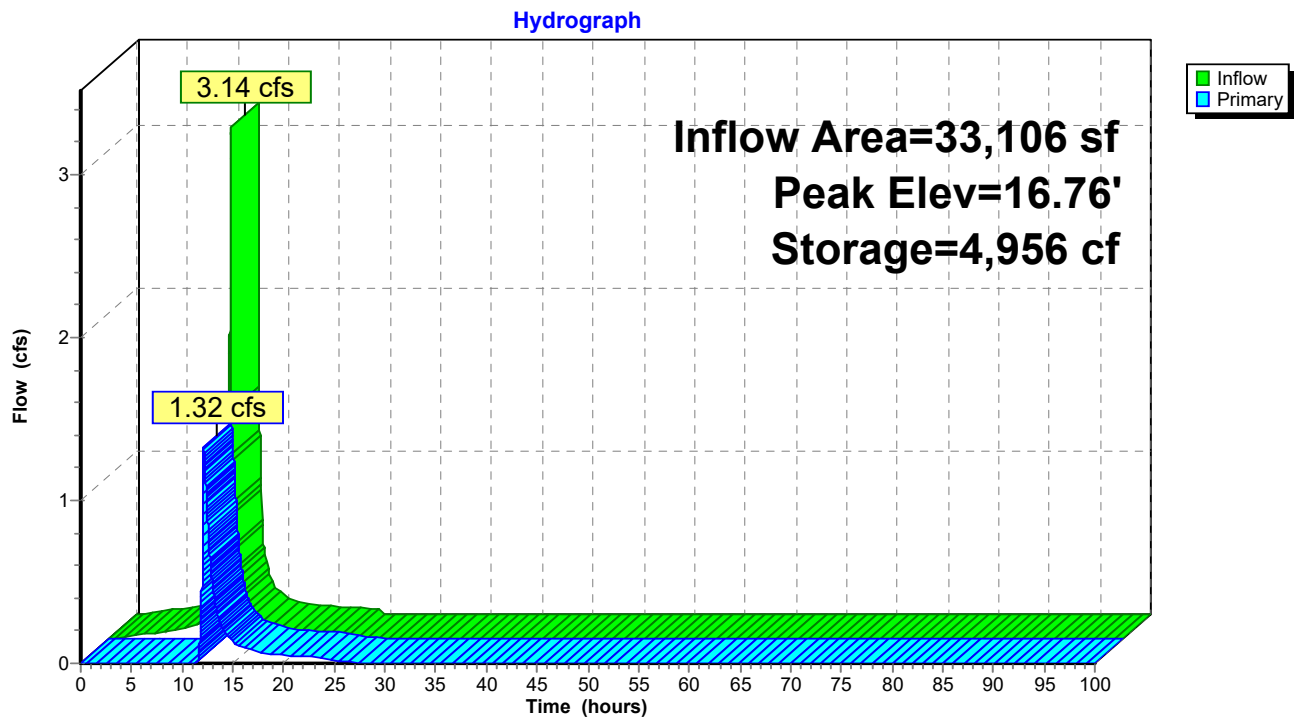
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.31 cfs @ 12.11 hrs HW=16.76' TW=11.47' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.31 cfs of 11.40 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.31 cfs @ 1.53 fps)

Pond PP5: POROUS PAVEMENT

Pre vs Post Rev. 3a

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Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 3.69" for 2-Year Future Adj event
 Inflow = 3.64 cfs @ 12.09 hrs, Volume= 11,914 cf
 Outflow = 1.27 cfs @ 12.13 hrs, Volume= 8,655 cf, Atten= 65%, Lag= 2.4 min
 Primary = 1.27 cfs @ 12.13 hrs, Volume= 8,655 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.47' @ 12.13 hrs Surf.Area= 31,334 sf Storage= 5,932 cf

Plug-Flow detention time= 247.4 min calculated for 8,655 cf (73% of inflow)
 Center-of-Mass det. time= 148.0 min (897.1 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

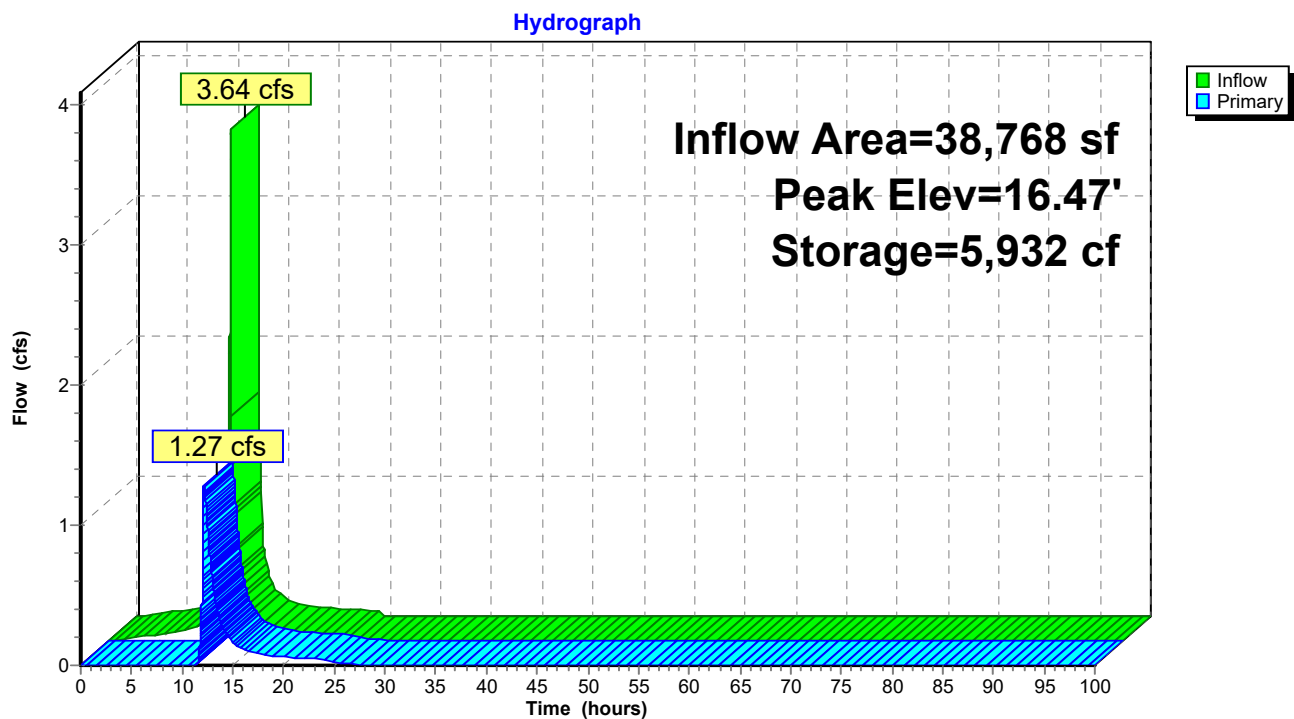
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.27 cfs @ 12.13 hrs HW=16.47' TW=11.38' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.27 cfs of 12.90 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.27 cfs @ 1.51 fps)

Pond PP6: POROUS PAVEMENT

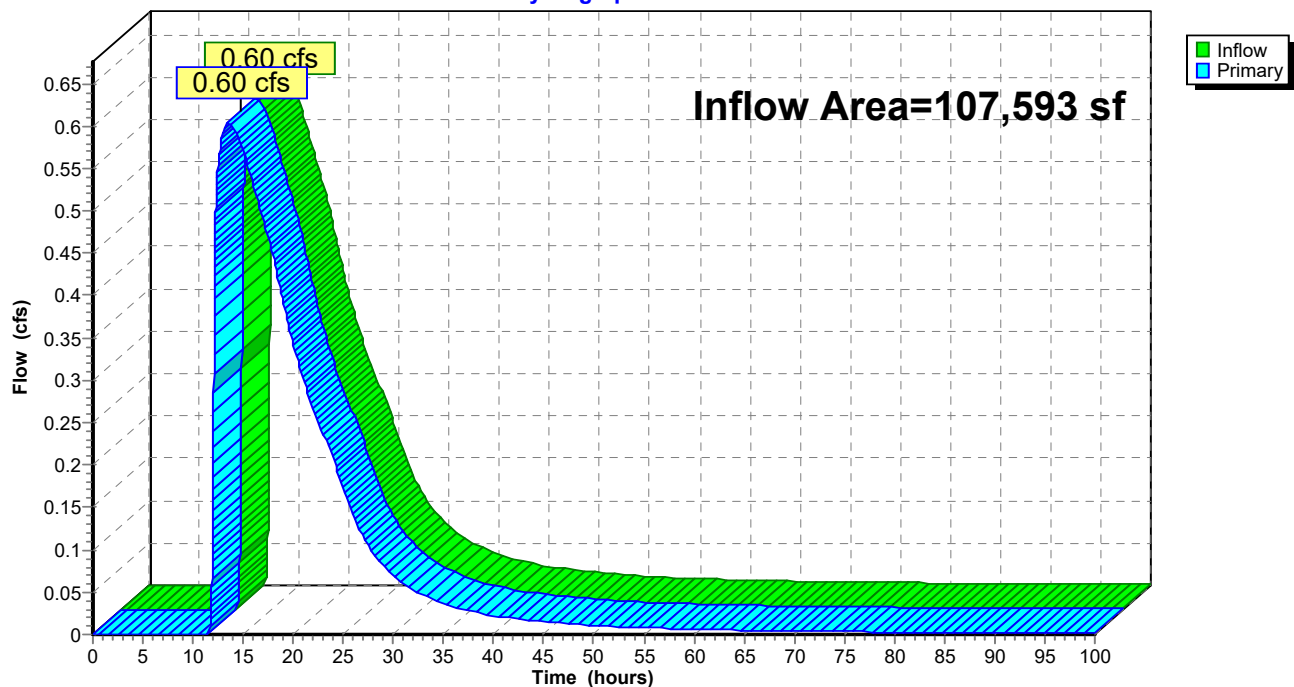
Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 2.65" for 2-Year Future Adj event
Inflow = 0.60 cfs @ 13.46 hrs, Volume= 23,797 cf
Primary = 0.60 cfs @ 13.46 hrs, Volume= 23,797 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

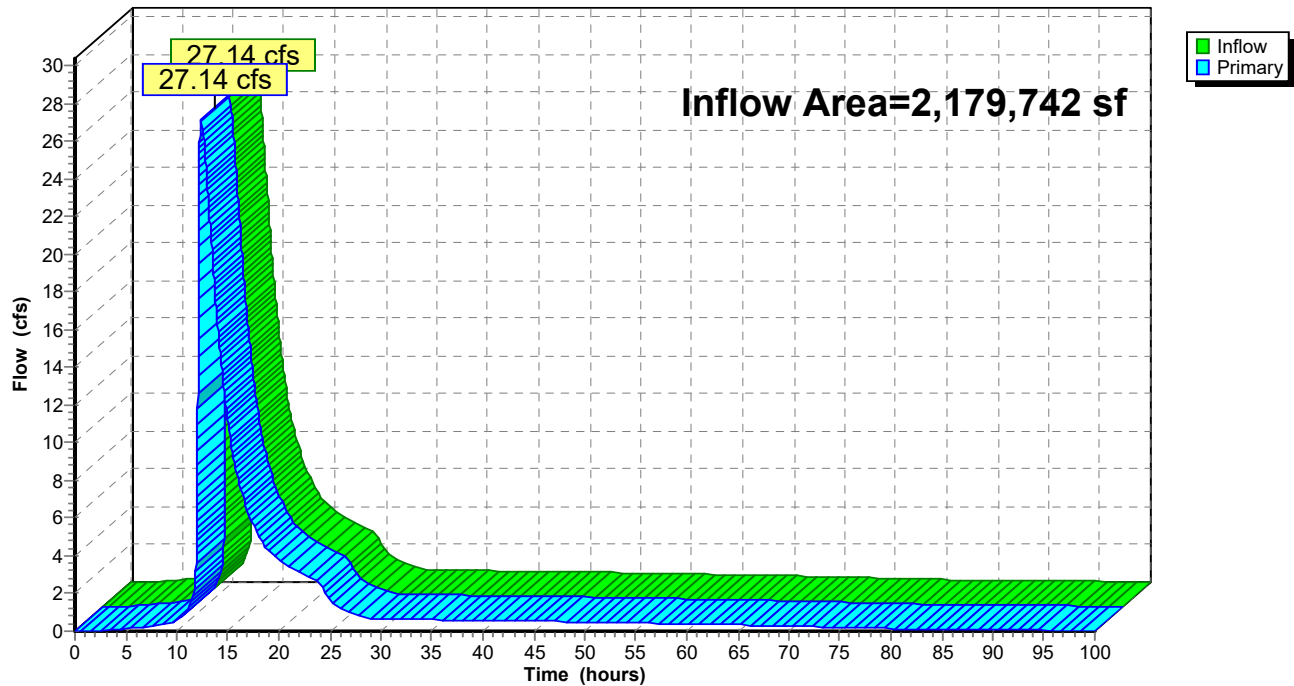
Hydrograph



Summary for Link P1: PDA 1

Inflow Area = 2,179,742 sf, 69.82% Impervious, Inflow Depth > 2.67" for 2-Year Future Adj event
Inflow = 27.14 cfs @ 12.37 hrs, Volume= 485,782 cf
Primary = 27.14 cfs @ 12.37 hrs, Volume= 485,782 cf, Atten= 0%, Lag= 0.0 min

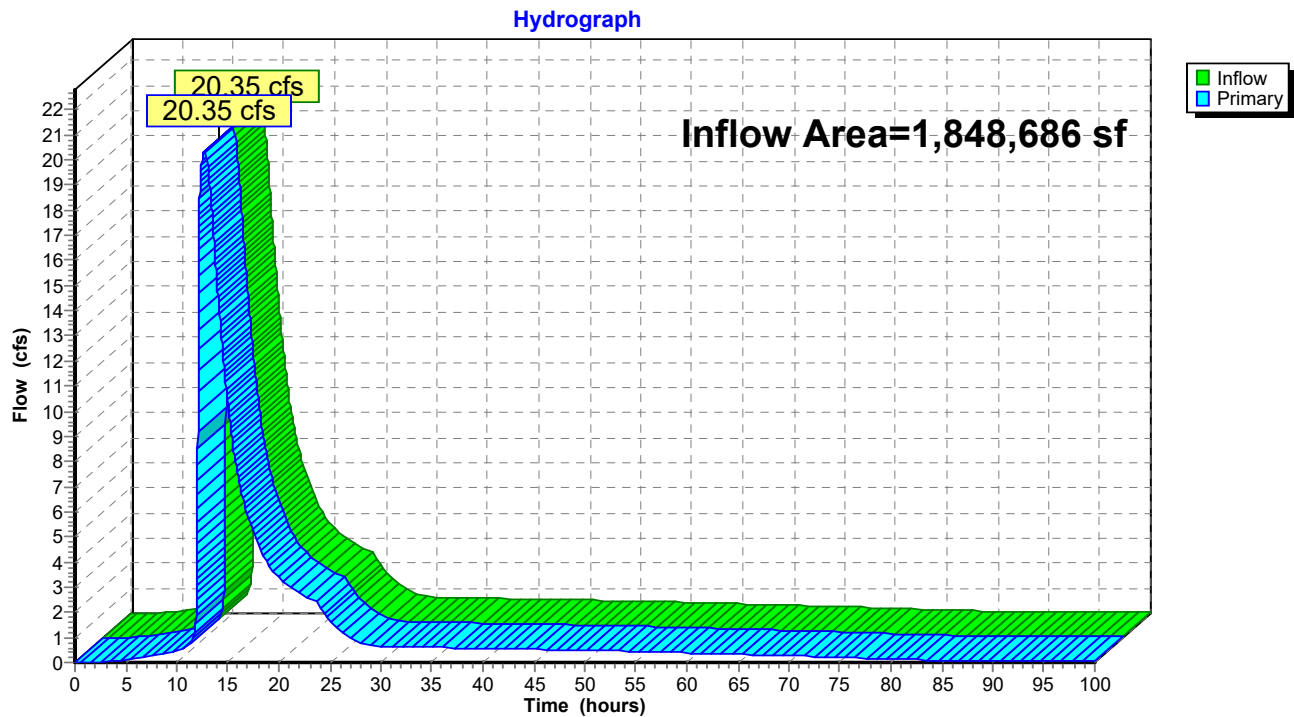
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1: PDA 1**Hydrograph**

Summary for Link P1A:

Inflow Area = 1,848,686 sf, 82.02% Impervious, Inflow Depth > 2.81" for 2-Year Future Adj event
Inflow = 20.35 cfs @ 12.66 hrs, Volume= 433,060 cf
Primary = 20.35 cfs @ 12.66 hrs, Volume= 433,060 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:

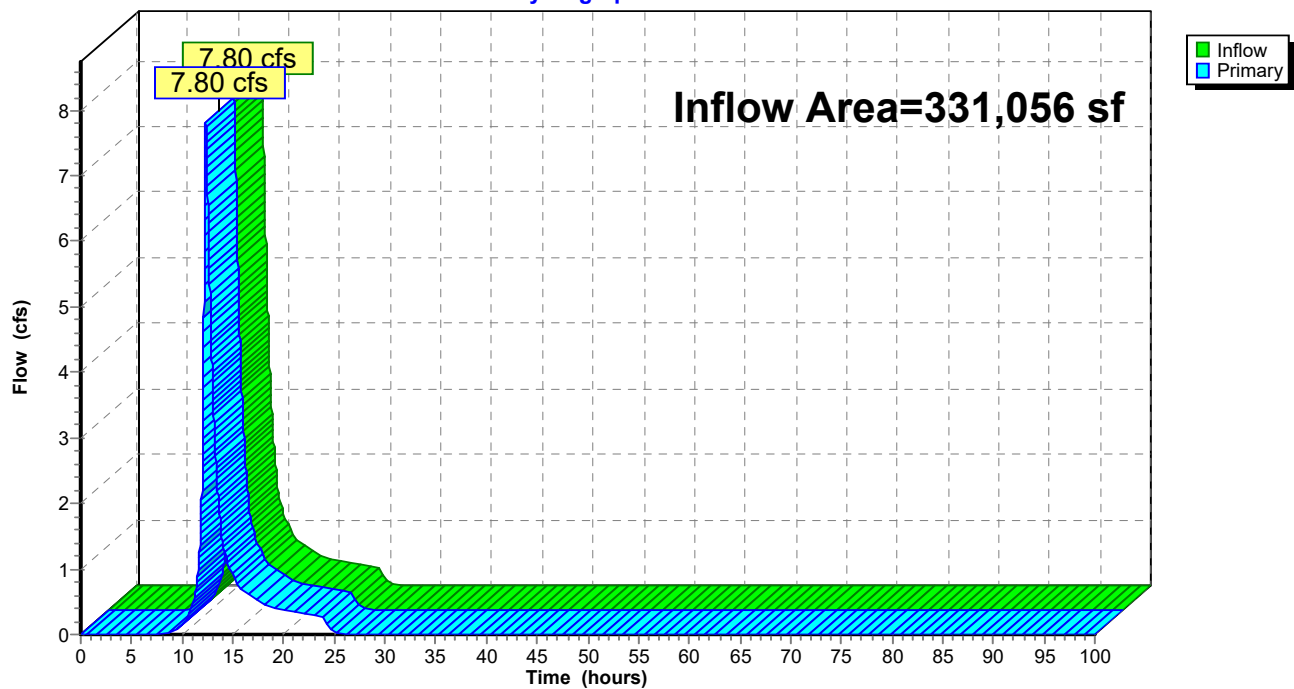
Summary for Link P1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 1.91" for 2-Year Future Adj event
Inflow = 7.80 cfs @ 12.30 hrs, Volume= 52,722 cf
Primary = 7.80 cfs @ 12.30 hrs, Volume= 52,722 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1B: BYPASS

Hydrograph



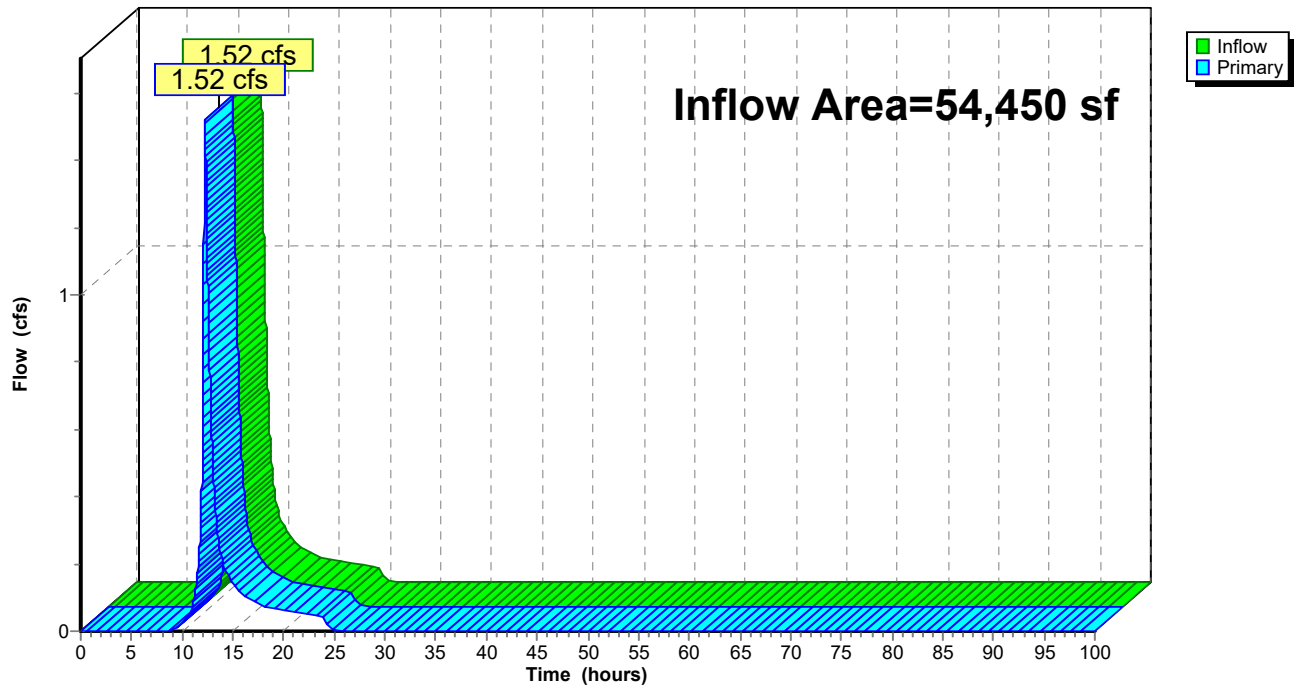
Summary for Link P2: PDA 2

Inflow Area = 54,450 sf, 0.00% Impervious, Inflow Depth = 1.89" for 2-Year Future Adj event
Inflow = 1.52 cfs @ 12.24 hrs, Volume= 8,576 cf
Primary = 1.52 cfs @ 12.24 hrs, Volume= 8,576 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2: PDA 2

Hydrograph



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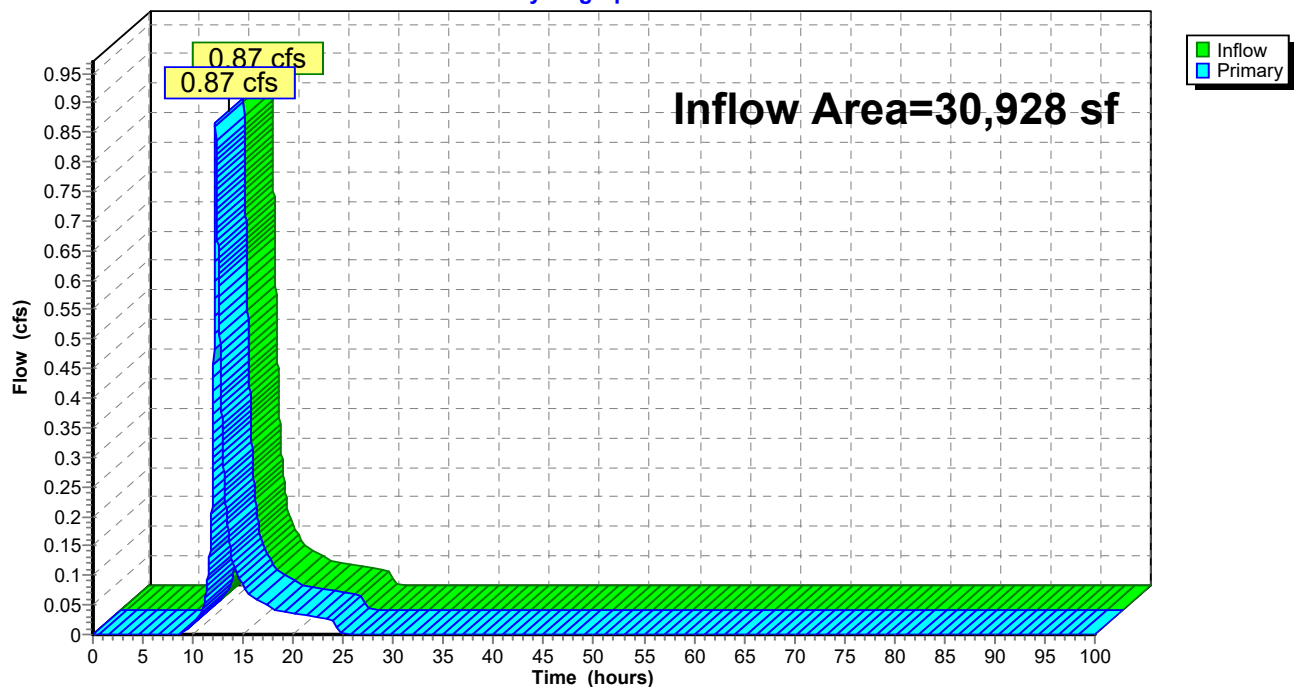
Summary for Link P2A: PDA 2A ONSITE

Inflow Area = 30,928 sf, 0.00% Impervious, Inflow Depth = 1.96" for 2-Year Future Adj event
Inflow = 0.87 cfs @ 12.24 hrs, Volume= 5,040 cf
Primary = 0.87 cfs @ 12.24 hrs, Volume= 5,040 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2A: PDA 2A ONSITE

Hydrograph



Pre vs Post Rev. 3a

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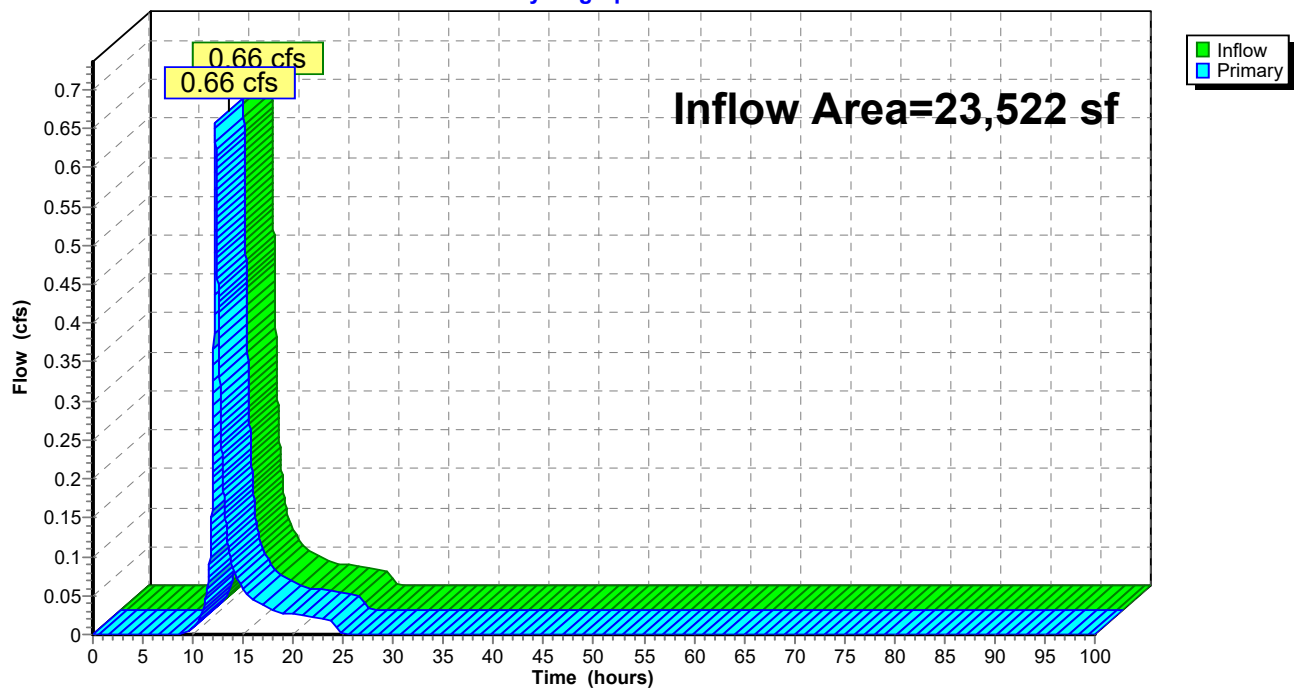
Summary for Link P2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 1.80" for 2-Year Future Adj event
Inflow = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf
Primary = 0.66 cfs @ 12.21 hrs, Volume= 3,536 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2B: BYPASS

Hydrograph



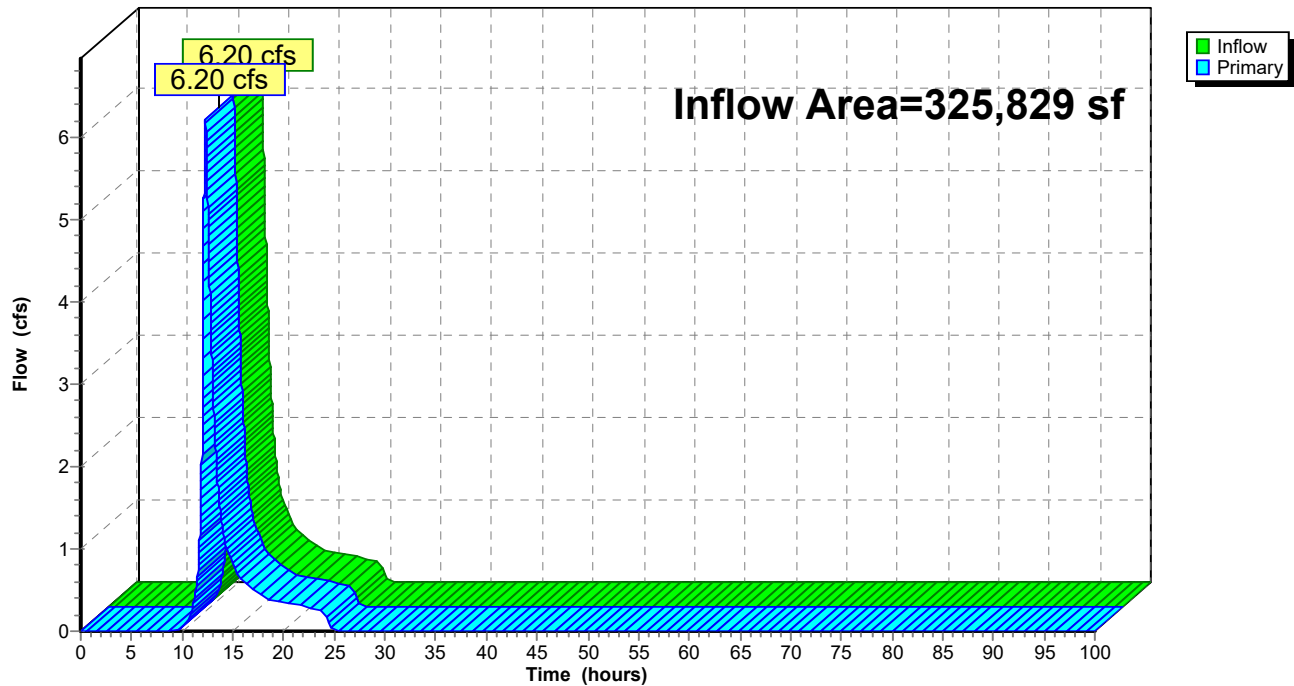
Summary for Link P3: PDA 3

Inflow Area = 325,829 sf, 0.00% Impervious, Inflow Depth = 1.64" for 2-Year Future Adj event
Inflow = 6.20 cfs @ 12.30 hrs, Volume= 44,408 cf
Primary = 6.20 cfs @ 12.30 hrs, Volume= 44,408 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3: PDA 3

Hydrograph



Pre vs Post Rev. 3a

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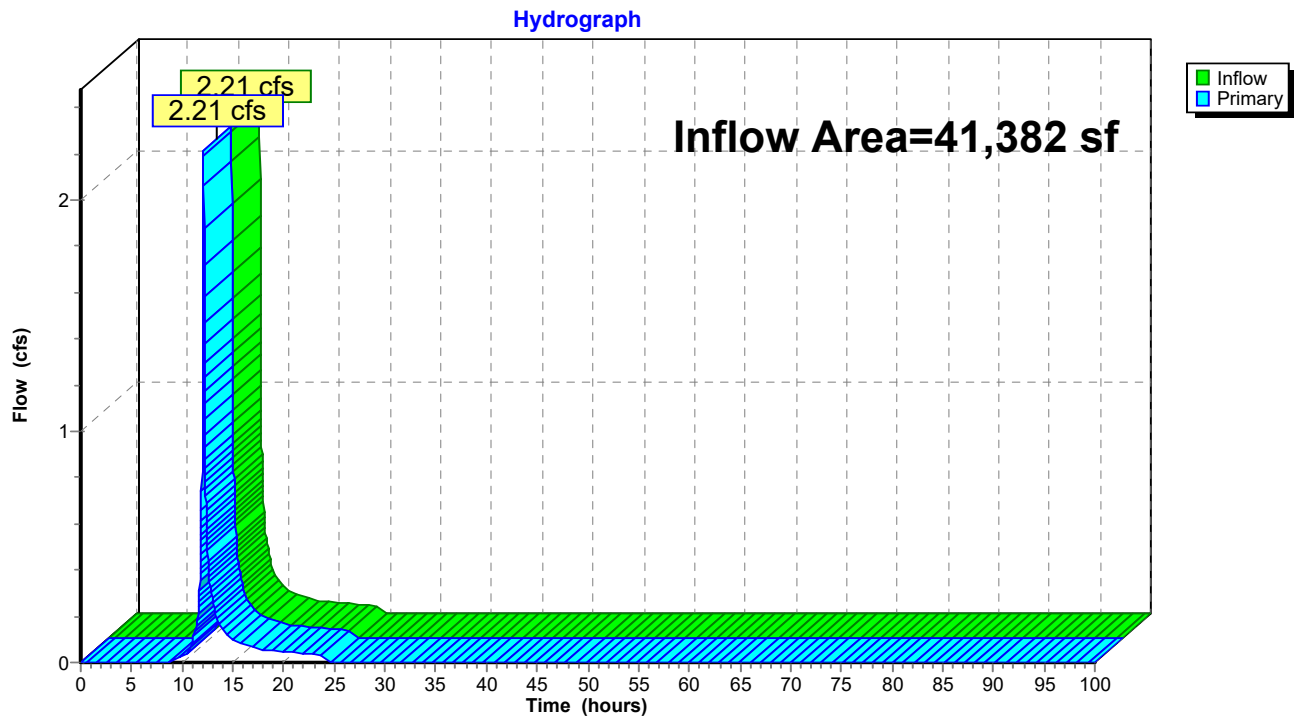
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Summary for Link P3A: PDA 3A ONSITE

Inflow Area = 41,382 sf, 0.00% Impervious, Inflow Depth = 1.96" for 2-Year Future Adj event
Inflow = 2.21 cfs @ 12.11 hrs, Volume= 6,743 cf
Primary = 2.21 cfs @ 12.11 hrs, Volume= 6,743 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

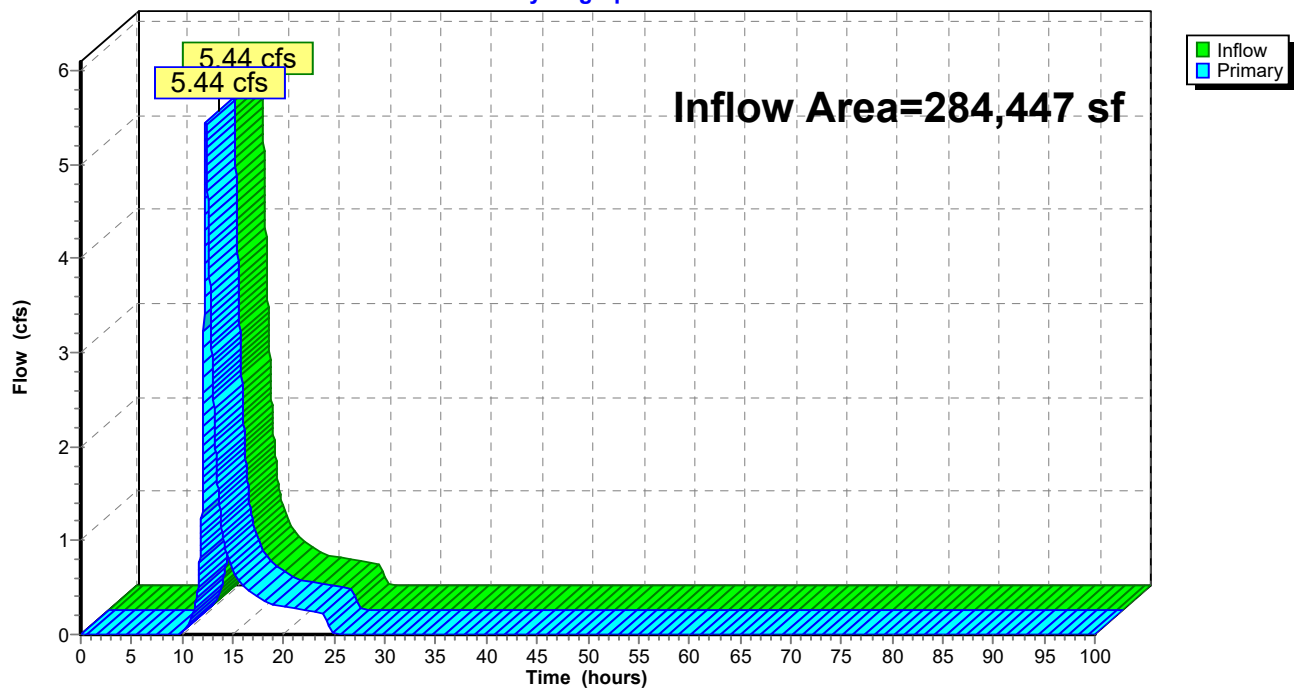
Link P3A: PDA 3A ONSITE



Summary for Link P3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 1.59" for 2-Year Future Adj event
Inflow = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf
Primary = 5.44 cfs @ 12.31 hrs, Volume= 37,665 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3B: BYPASS**Hydrograph**

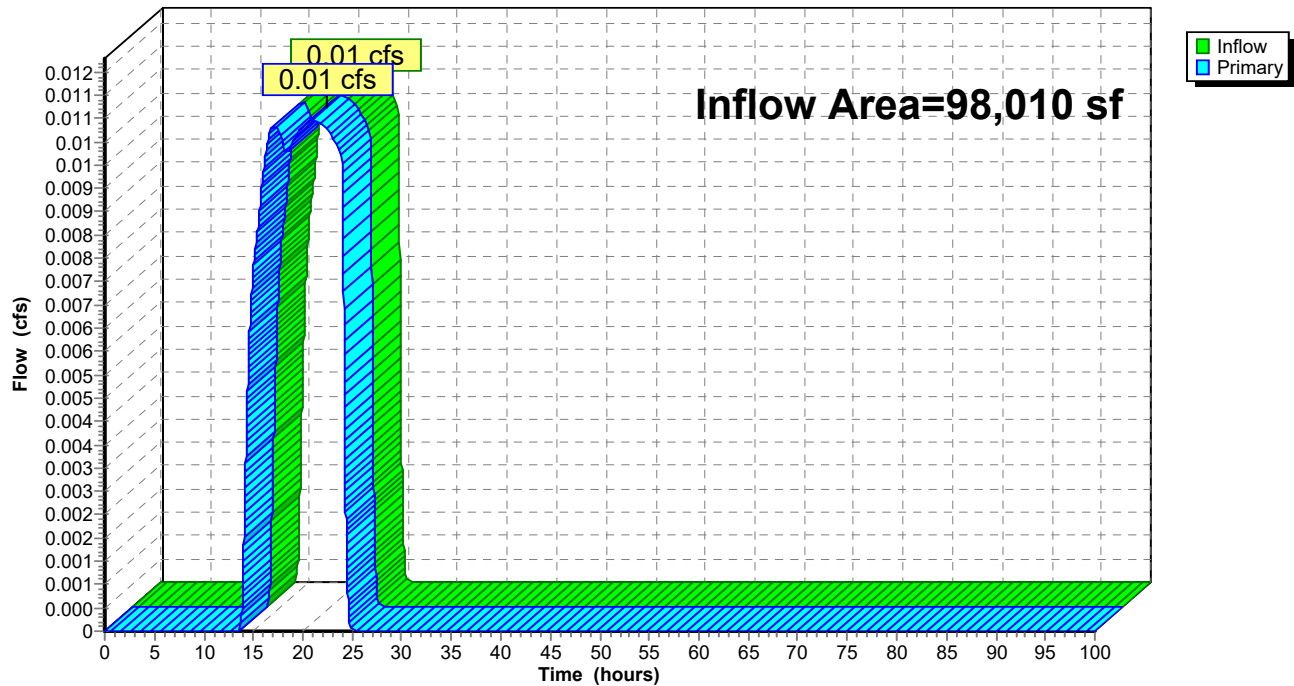
Summary for Link P4: PDA 4

Inflow Area = 98,010 sf, 0.00% Impervious, Inflow Depth = 0.05" for 2-Year Future Adj event
Inflow = 0.01 cfs @ 21.05 hrs, Volume= 368 cf
Primary = 0.01 cfs @ 21.05 hrs, Volume= 368 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P4: PDA 4

Hydrograph



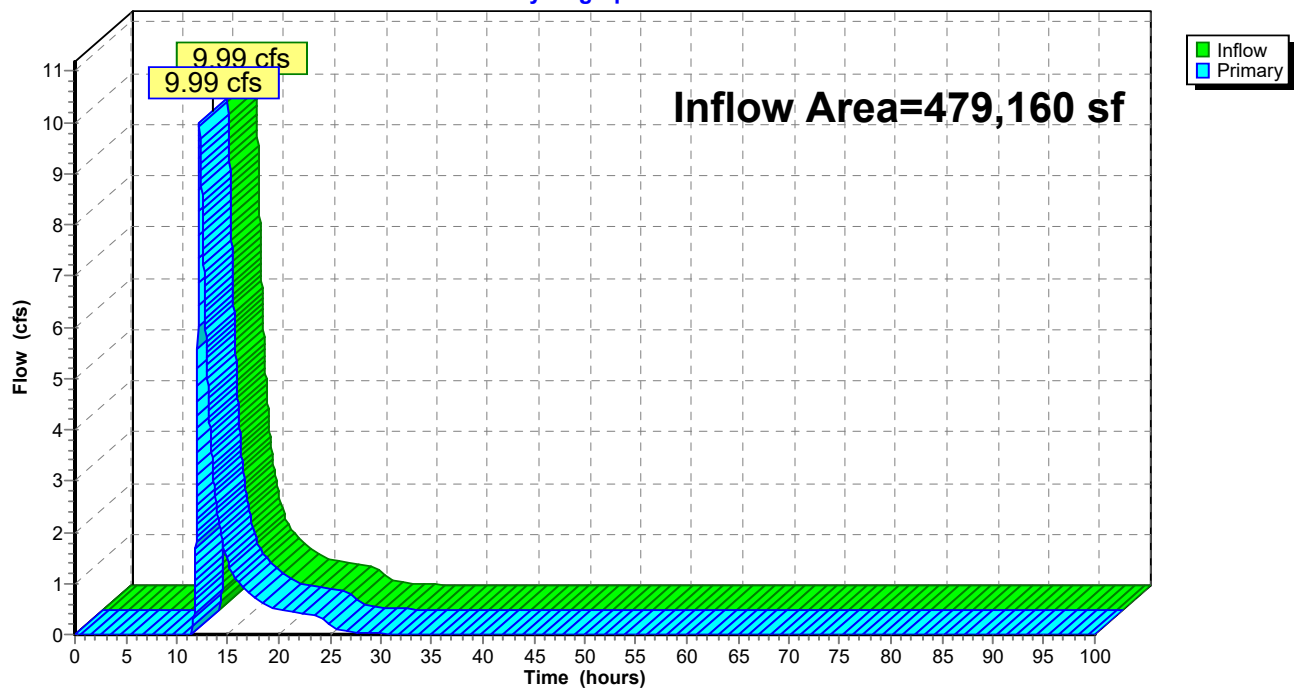
Summary for Link PP4V: Valve

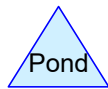
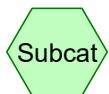
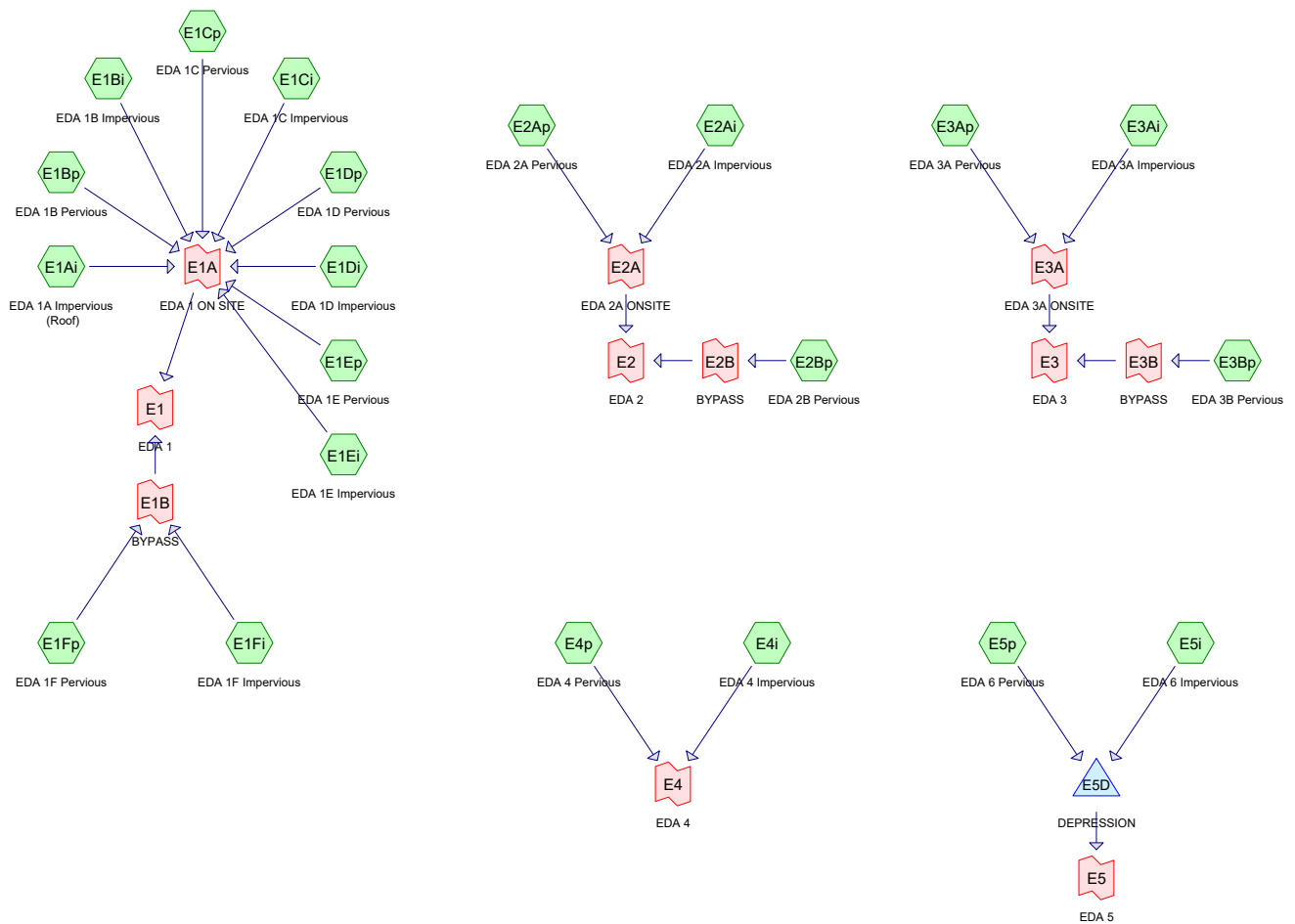
Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 1.78" for 2-Year Future Adj event
Inflow = 9.99 cfs @ 12.22 hrs, Volume= 70,886 cf
Primary = 9.99 cfs @ 12.22 hrs, Volume= 70,886 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph





Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	10-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	6.20	2	3.99

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Impervious Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=400' Slope=0.0100 '/' Tc=3.9 min CN=98 Runoff=80.37 cfs 314,441 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=272' Tc=2.8 min CN=98 Runoff=2.44 cfs 8,873 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=3.96"
Flow Length=230' Tc=7.1 min CN=80 Runoff=1.17 cfs 4,890 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=265' Tc=6.9 min CN=98 Runoff=5.87 cfs 27,700 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=3.96"
Flow Length=265' Tc=6.9 min CN=80 Runoff=1.40 cfs 5,753 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=695' Tc=19.0 min CN=98 Runoff=0.61 cfs 4,545 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=1.24"
Flow Length=435' Tc=18.4 min CN=50 Runoff=1.19 cfs 10,326 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=441' Tc=5.2 min CN=98 Runoff=31.93 cfs 136,121 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=3.55"
Flow Length=412' Tc=8.2 min CN=76 Runoff=6.06 cfs 26,700 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=5.96"
Flow Length=861' Tc=18.7 min CN=98 Runoff=0.38 cfs 2,813 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=3.76"
Flow Length=861' Tc=18.7 min CN=78 Runoff=15.37 cfs 101,851 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=5.49"
Flow Length=382' Tc=14.3 min CN=94 Runoff=1.03 cfs 6,383 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=3.86"
Flow Length=382' Tc=14.3 min CN=79 Runoff=2.60 cfs 14,988 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=3.65"
Flow Length=289' Tc=12.1 min CN=77 Runoff=1.35 cfs 7,163 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=5.61"
Flow Length=218' Tc=2.8 min CN=95 Runoff=8.19 cfs 28,511 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=3.65"
Flow Length=218' Tc=2.8 min CN=77 Runoff=2.84 cfs 8,755 cf

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=3.35" Flow Length=860' Tc=18.7 min CN=74 Runoff=11.95 cfs 79,498 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=636' Tc=13.0 min CN=98 Runoff=1.50 cfs 9,306 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Runoff Depth=0.50" Flow Length=636' Tc=10.1 min CN=39 Runoff=0.94 cfs 12,923 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=585' Tc=25.3 min CN=98 Runoff=2.07 cfs 17,962 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Runoff Depth=0.62" Flow Length=585' Tc=25.3 min CN=41 Runoff=0.96 cfs 15,289 cf
Pond E5D: DEPRESSION	Peak Elev=16.24' Storage=33,250 cf Inflow=2.77 cfs 33,250 cf Outflow=0.00 cfs 0 cf
Link E1: EDA 1	Inflow=138.77 cfs 644,013 cf Primary=138.77 cfs 644,013 cf
Link E1A: EDA 1 ON SITE	Inflow=128.76 cfs 539,348 cf Primary=128.76 cfs 539,348 cf
Link E1B: BYPASS	Inflow=15.74 cfs 104,665 cf Primary=15.74 cfs 104,665 cf
Link E2: EDA 2	Inflow=4.97 cfs 28,534 cf Primary=4.97 cfs 28,534 cf
Link E2A: EDA 2A ONSITE	Inflow=3.63 cfs 21,370 cf Primary=3.63 cfs 21,370 cf
Link E2B: BYPASS	Inflow=1.35 cfs 7,163 cf Primary=1.35 cfs 7,163 cf
Link E3: EDA 3	Inflow=18.11 cfs 116,764 cf Primary=18.11 cfs 116,764 cf
Link E3A: EDA 3A ONSITE	Inflow=11.03 cfs 37,266 cf Primary=11.03 cfs 37,266 cf
Link E3B: BYPASS	Inflow=11.95 cfs 79,498 cf Primary=11.95 cfs 79,498 cf
Link E4: EDA 4	Inflow=2.17 cfs 22,228 cf Primary=2.17 cfs 22,228 cf
Link E5: EDA 5	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Total Runoff Area = 2,658,031 sf Runoff Volume = 844,789 cf Average Runoff Depth = 3.81"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 80.37 cfs @ 12.12 hrs, Volume= 314,441 cf, Depth= 5.96"
Routed to Link E1A : EDA 1 ON SITE

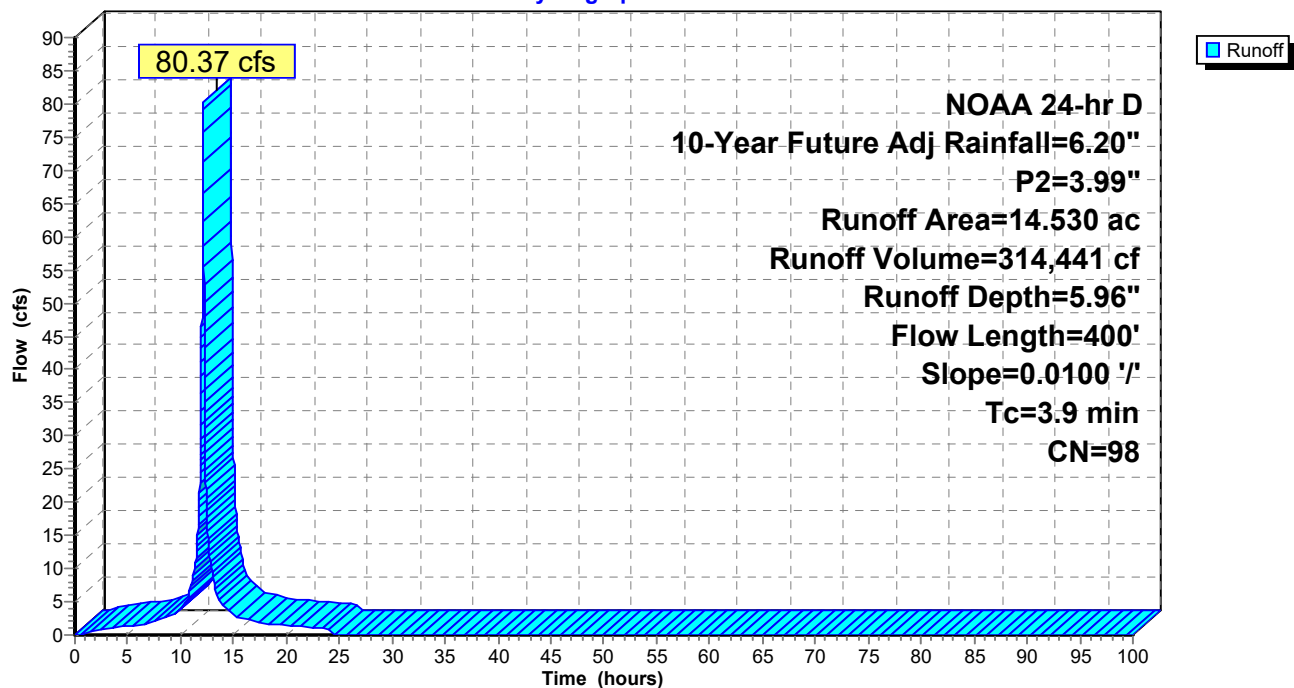
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.16		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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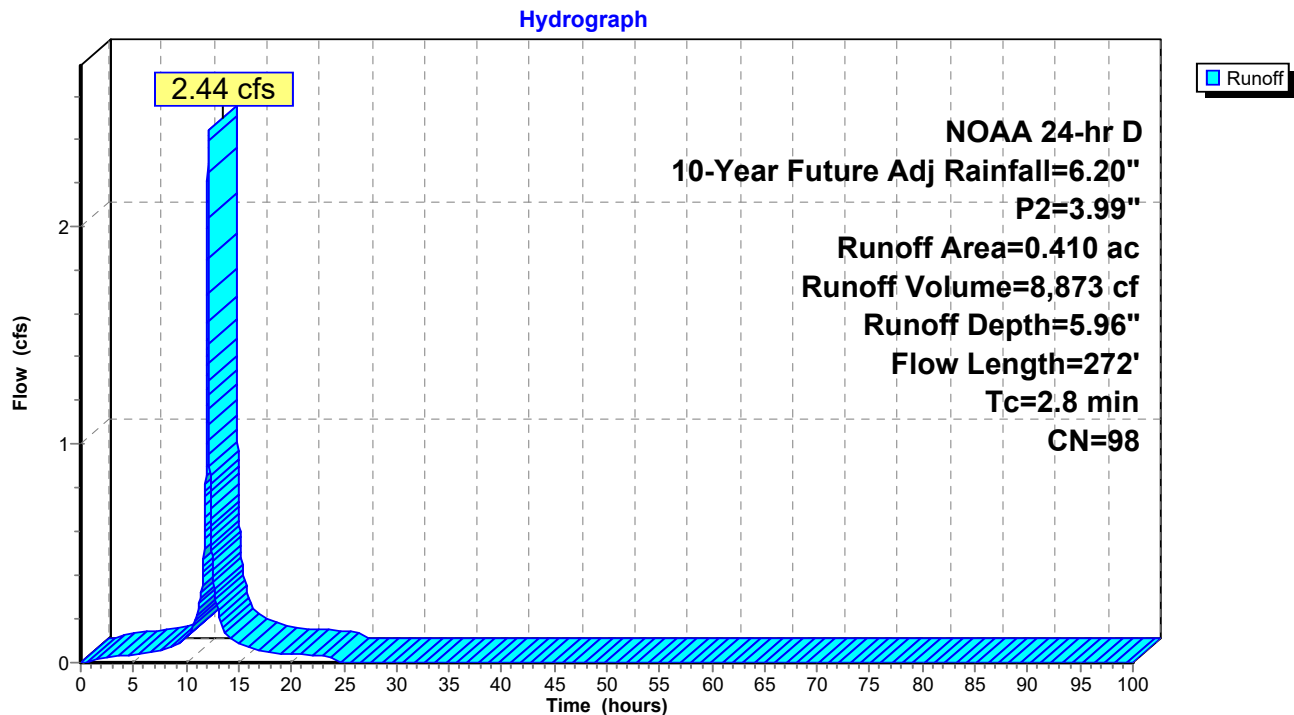
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 2.44 cfs @ 12.11 hrs, Volume= 8,873 cf, Depth= 5.96"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.22		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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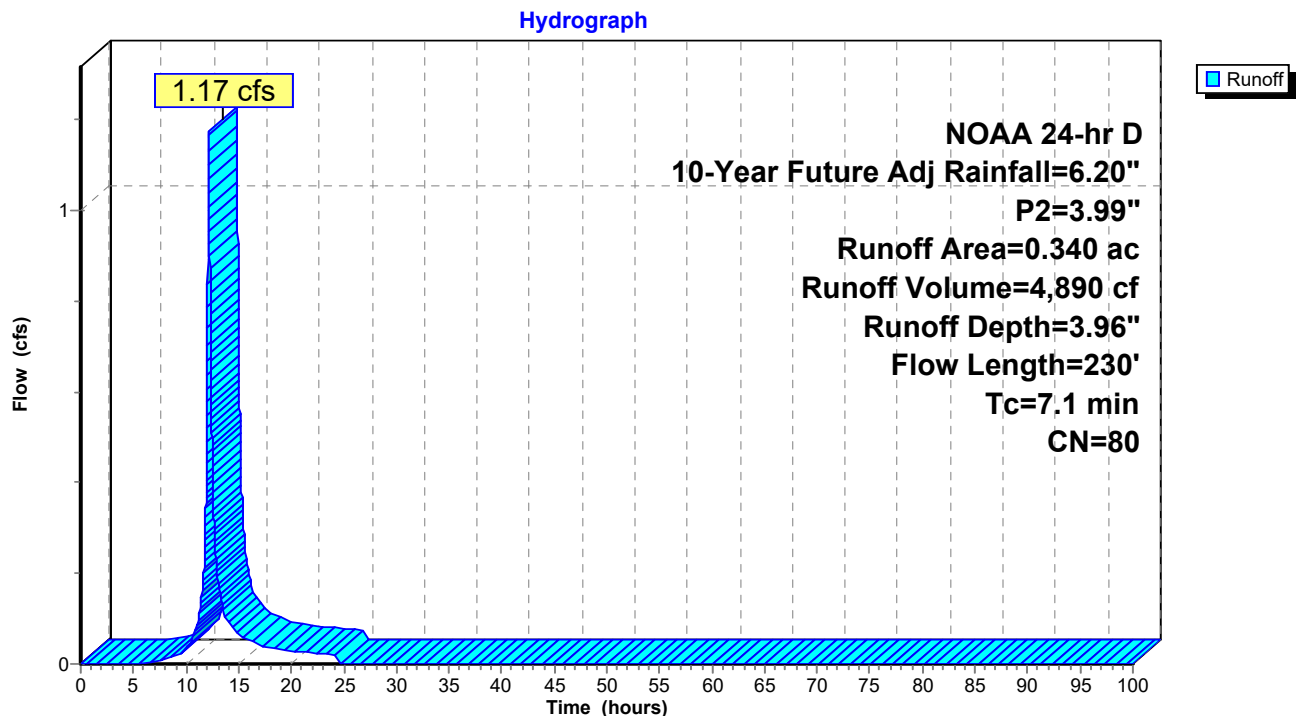
Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 1.17 cfs @ 12.15 hrs, Volume= 4,890 cf, Depth= 3.96"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0500	0.27		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.1	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 5.87 cfs @ 12.15 hrs, Volume= 27,700 cf, Depth= 5.96"
Routed to Link E1A : EDA 1 ON SITE

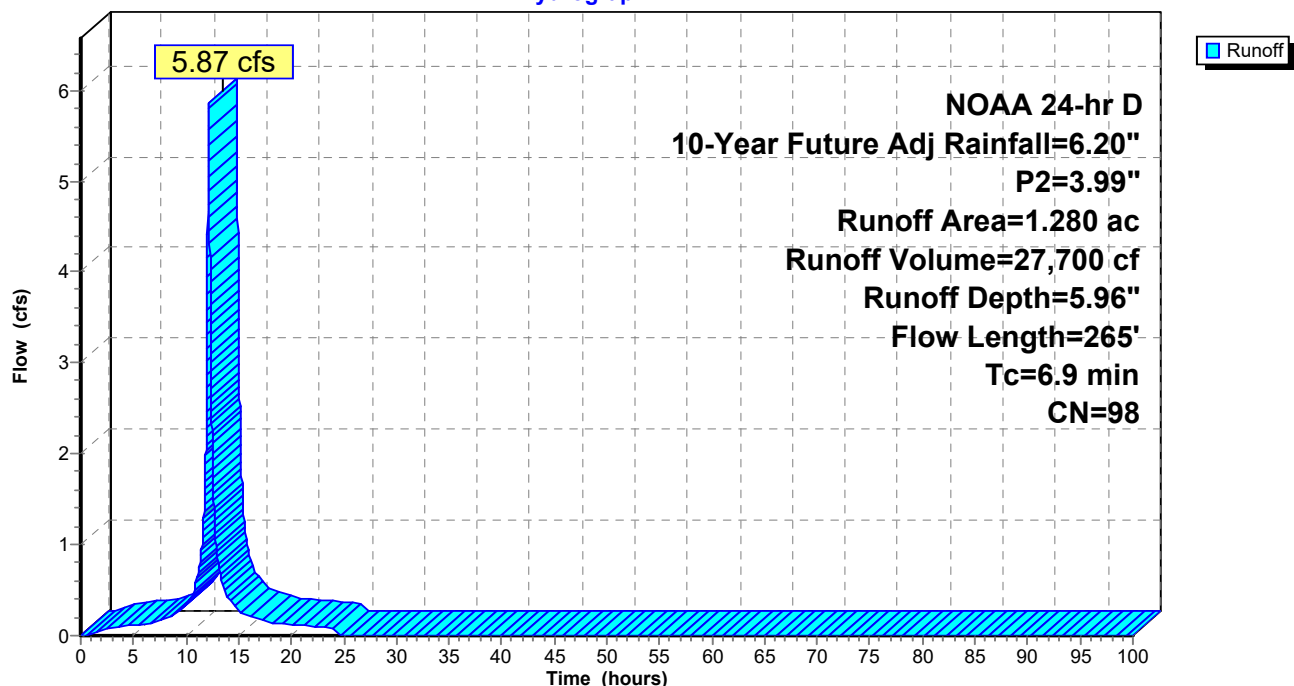
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 1.40 cfs @ 12.15 hrs, Volume= 5,753 cf, Depth= 3.96"
Routed to Link E1A : EDA 1 ON SITE

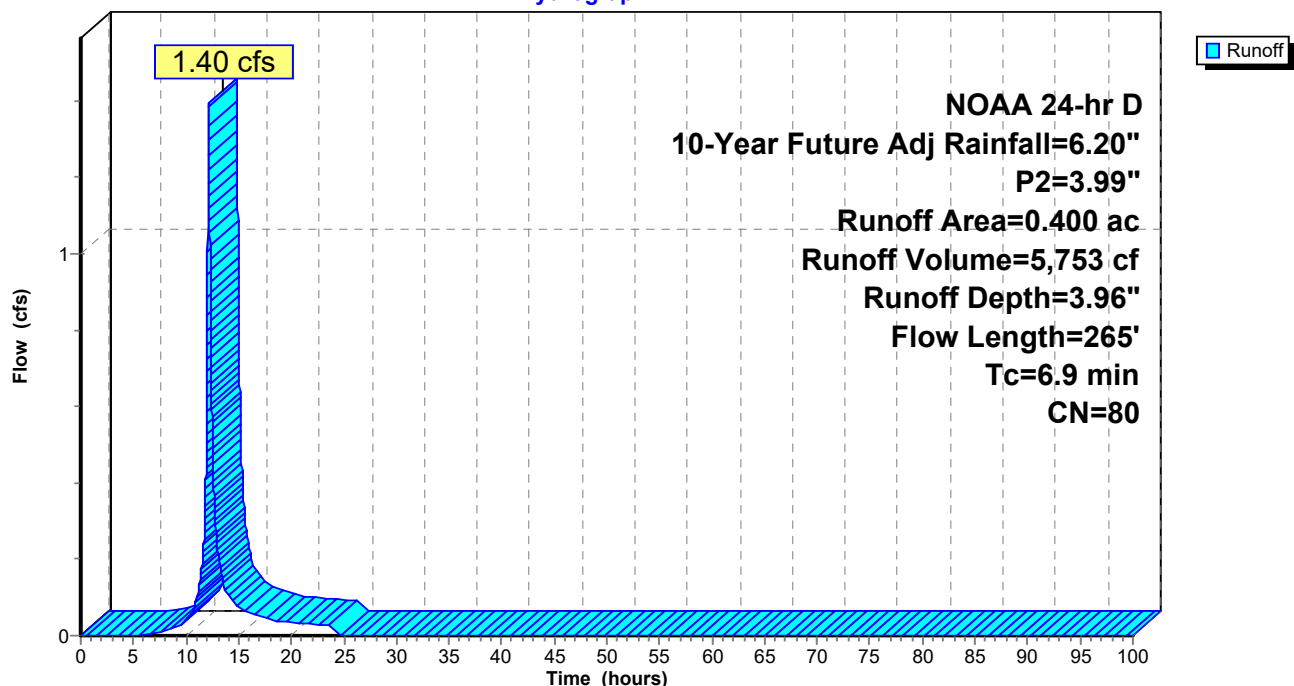
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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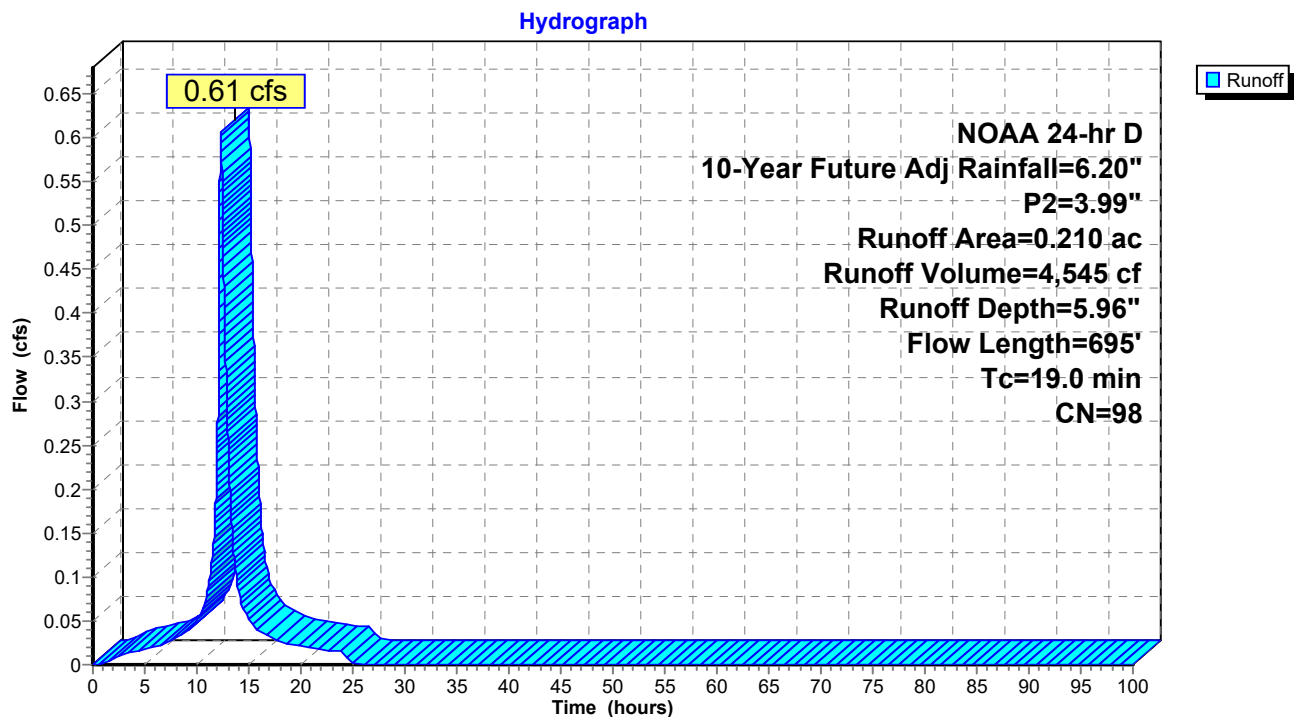
Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 0.61 cfs @ 12.29 hrs, Volume= 4,545 cf, Depth= 5.96"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0055	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.0	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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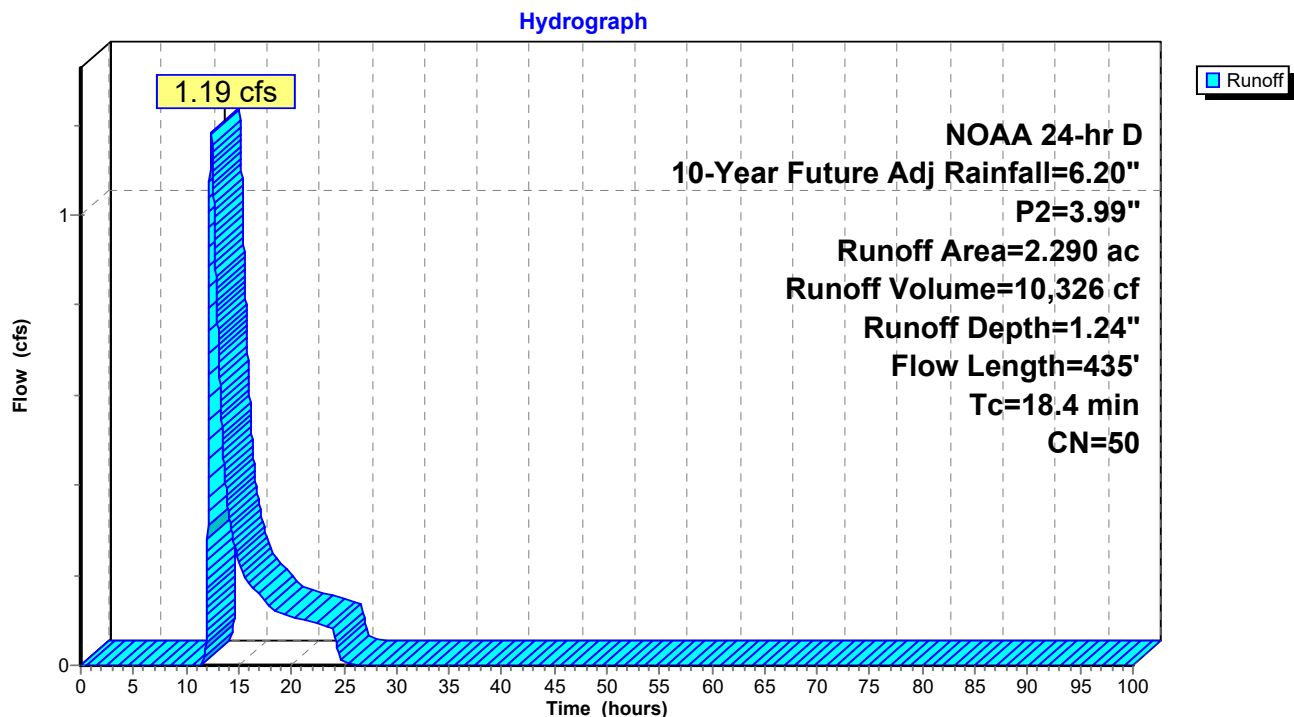
Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 1.19 cfs @ 12.36 hrs, Volume= 10,326 cf, Depth= 1.24"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0270	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.4	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Ei: EDA 1E Impervious

Runoff = 31.93 cfs @ 12.13 hrs, Volume= 136,121 cf, Depth= 5.96"

Routed to Link E1A : EDA 1 ON SITE

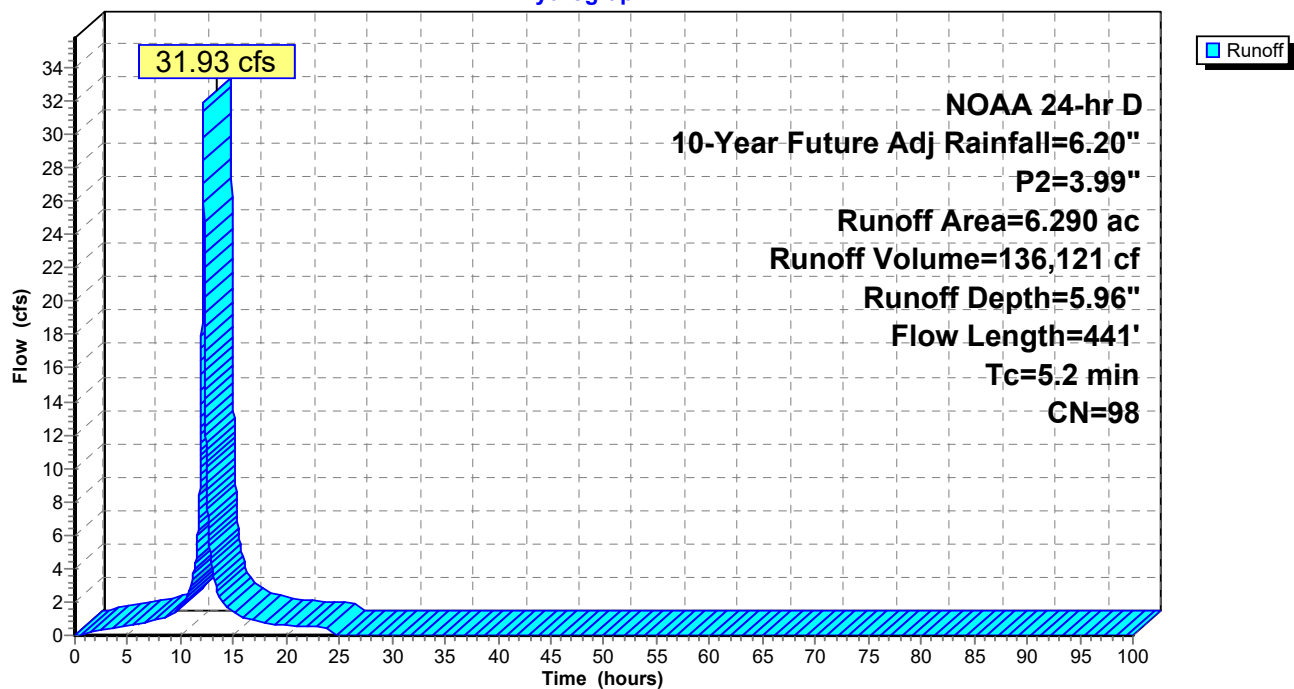
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.2	441	Total			

Subcatchment E1Ei: EDA 1E Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 6.06 cfs @ 12.17 hrs, Volume= 26,700 cf, Depth= 3.55"
Routed to Link E1A : EDA 1 ON SITE

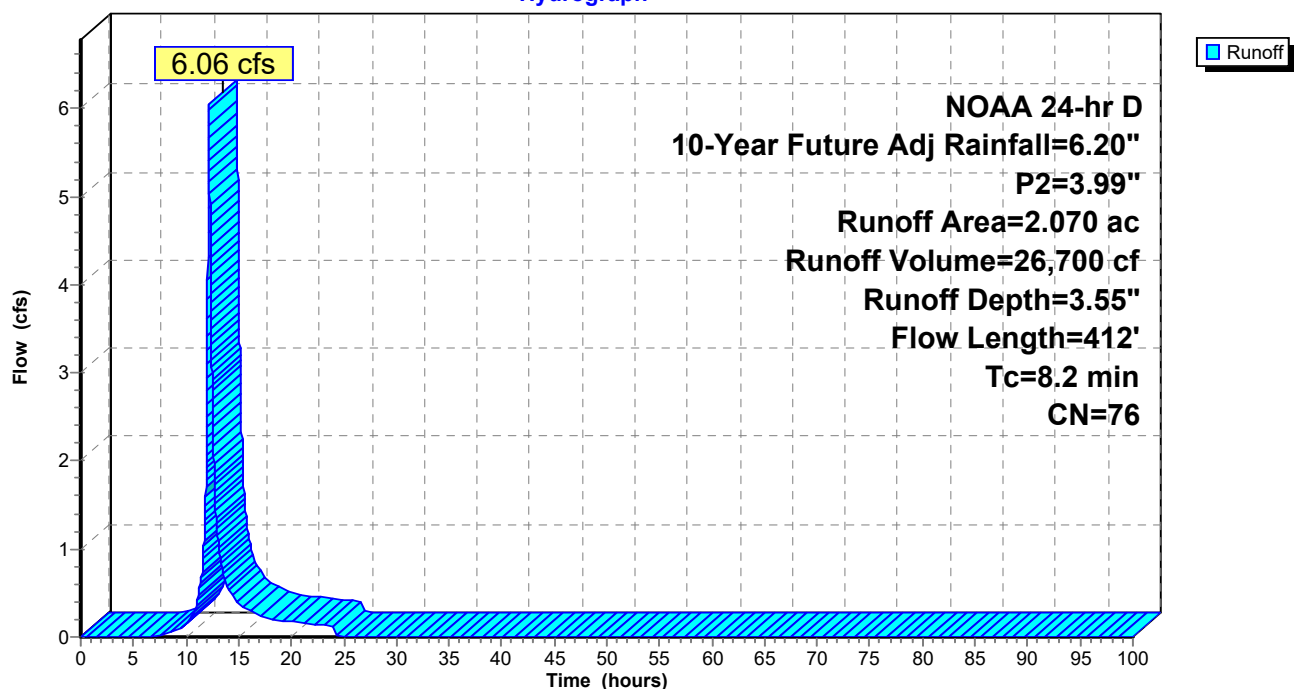
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.38 cfs @ 12.30 hrs, Volume= 2,813 cf, Depth= 5.96"
Routed to Link E1B : BYPASS

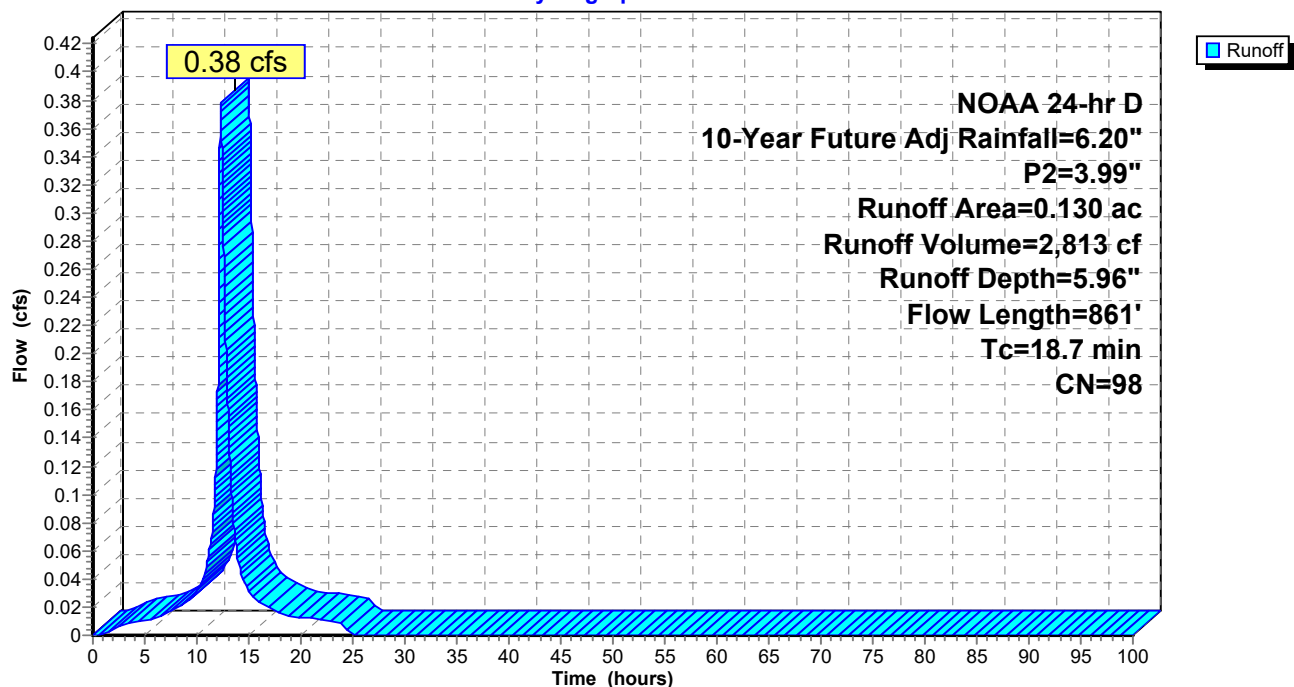
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 15.37 cfs @ 12.30 hrs, Volume= 101,851 cf, Depth= 3.76"
Routed to Link E1B : BYPASS

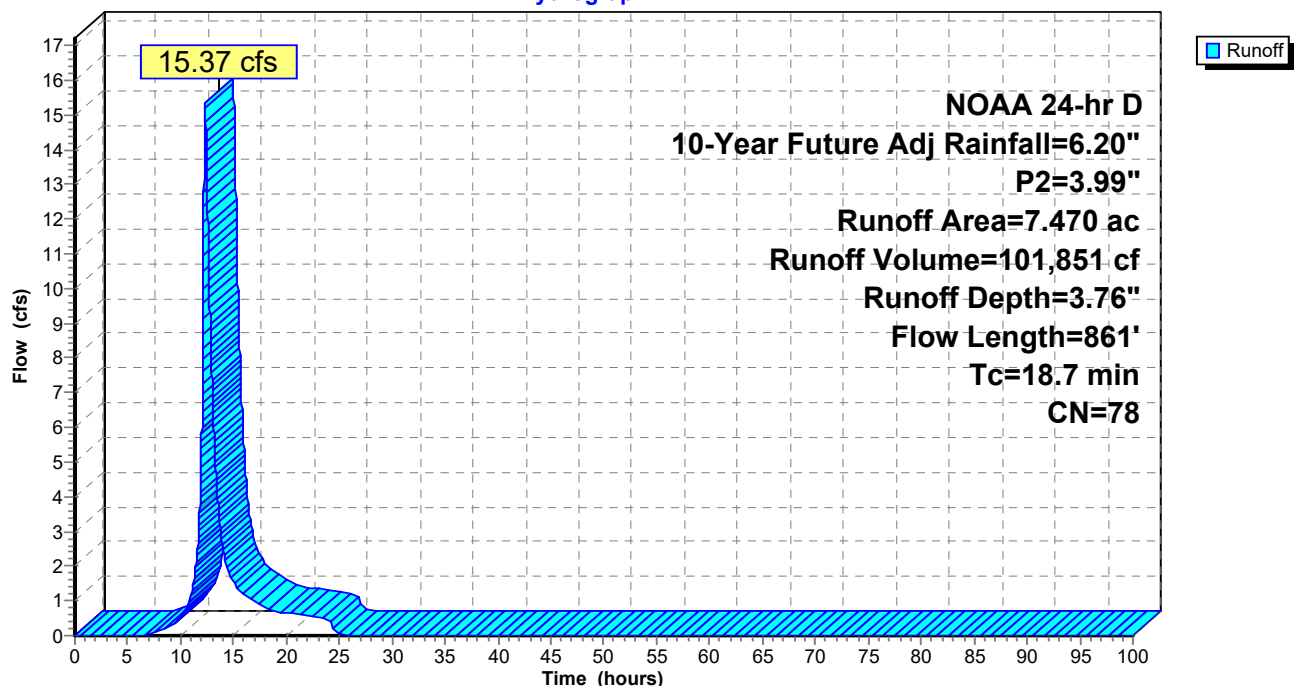
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 1.03 cfs @ 12.24 hrs, Volume= 6,383 cf, Depth= 5.49"
Routed to Link E2A : EDA 2A ONSITE

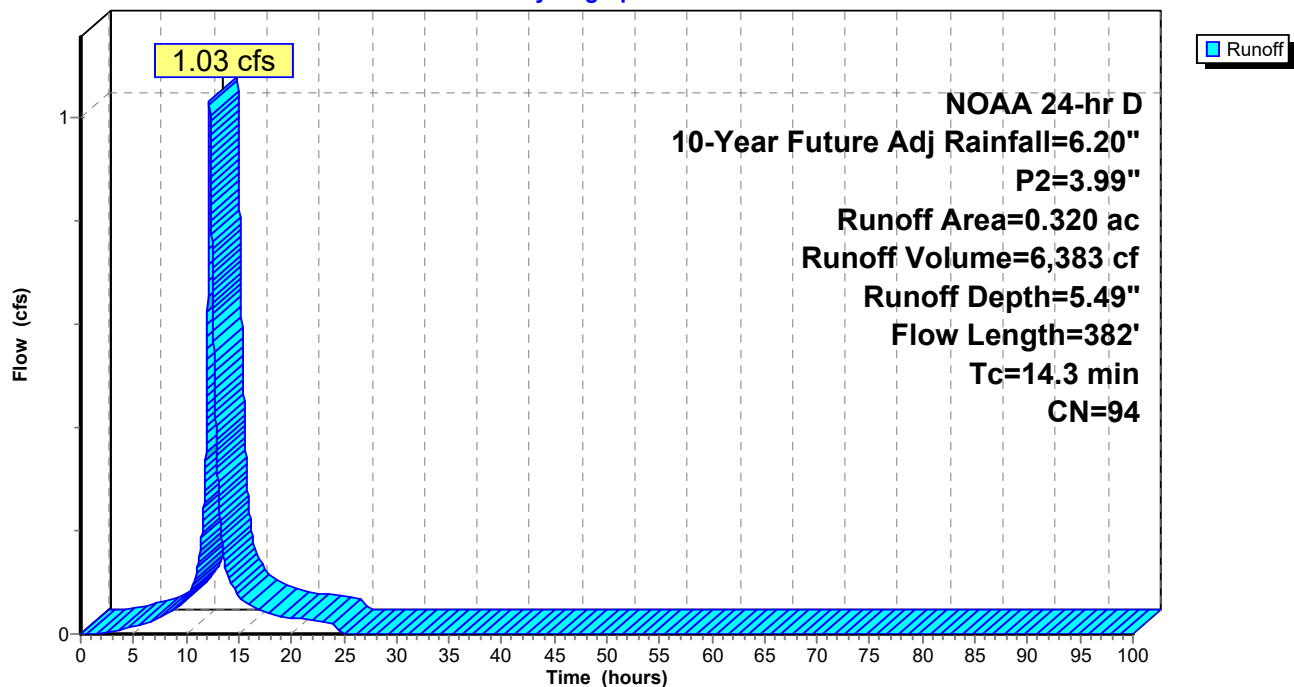
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 2.60 cfs @ 12.24 hrs, Volume= 14,988 cf, Depth= 3.86"
Routed to Link E2A : EDA 2A ONSITE

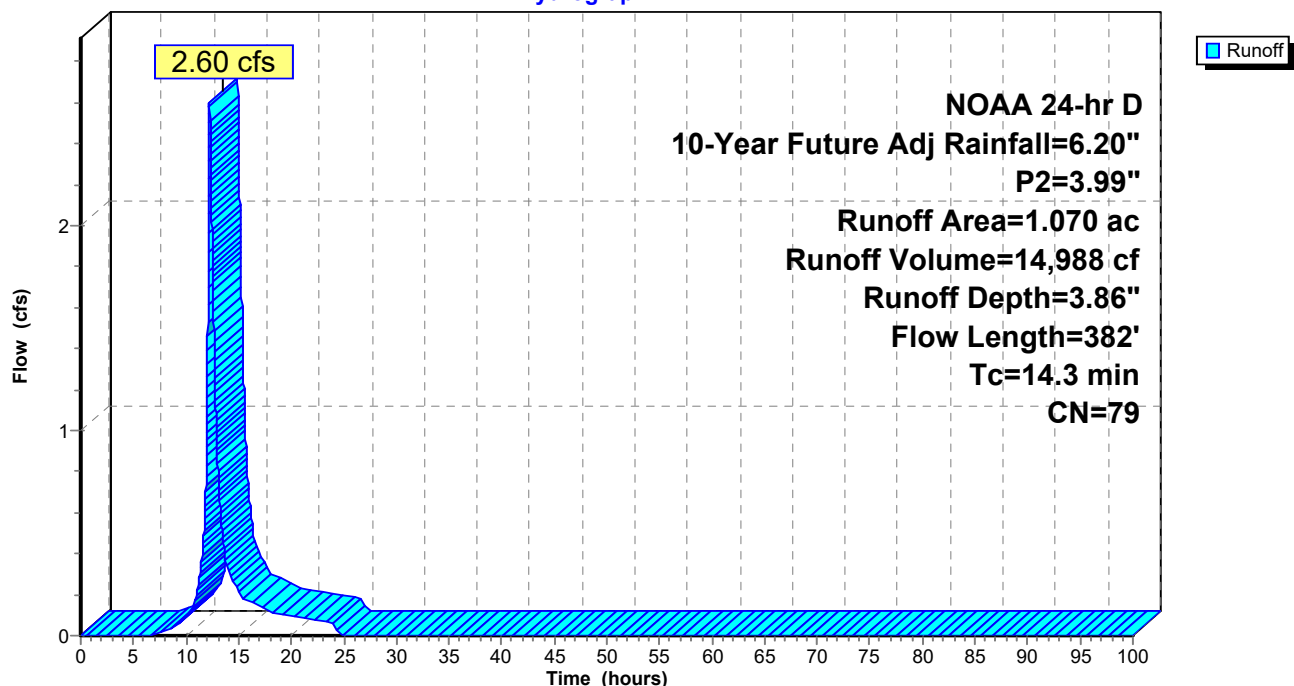
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf, Depth= 3.65"
Routed to Link E2B : BYPASS

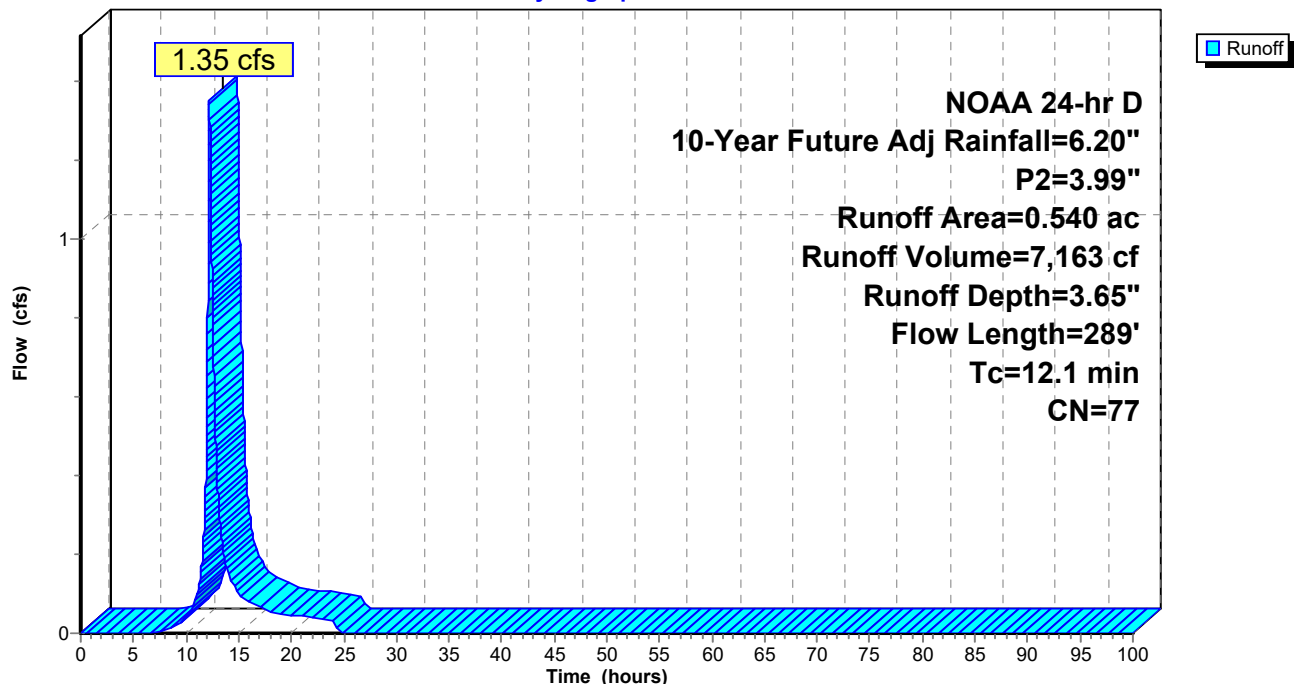
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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 8.19 cfs @ 12.11 hrs, Volume= 28,511 cf, Depth= 5.61"

Routed to Link E3A : EDA 3A ONSITE

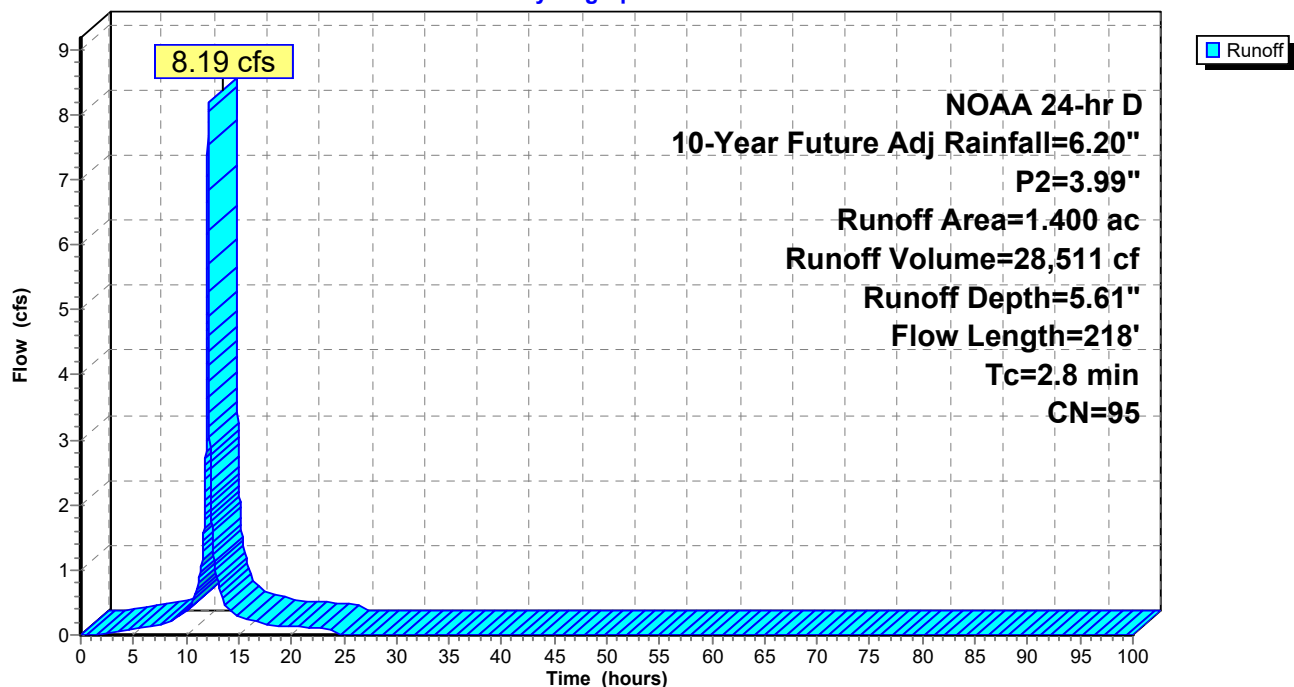
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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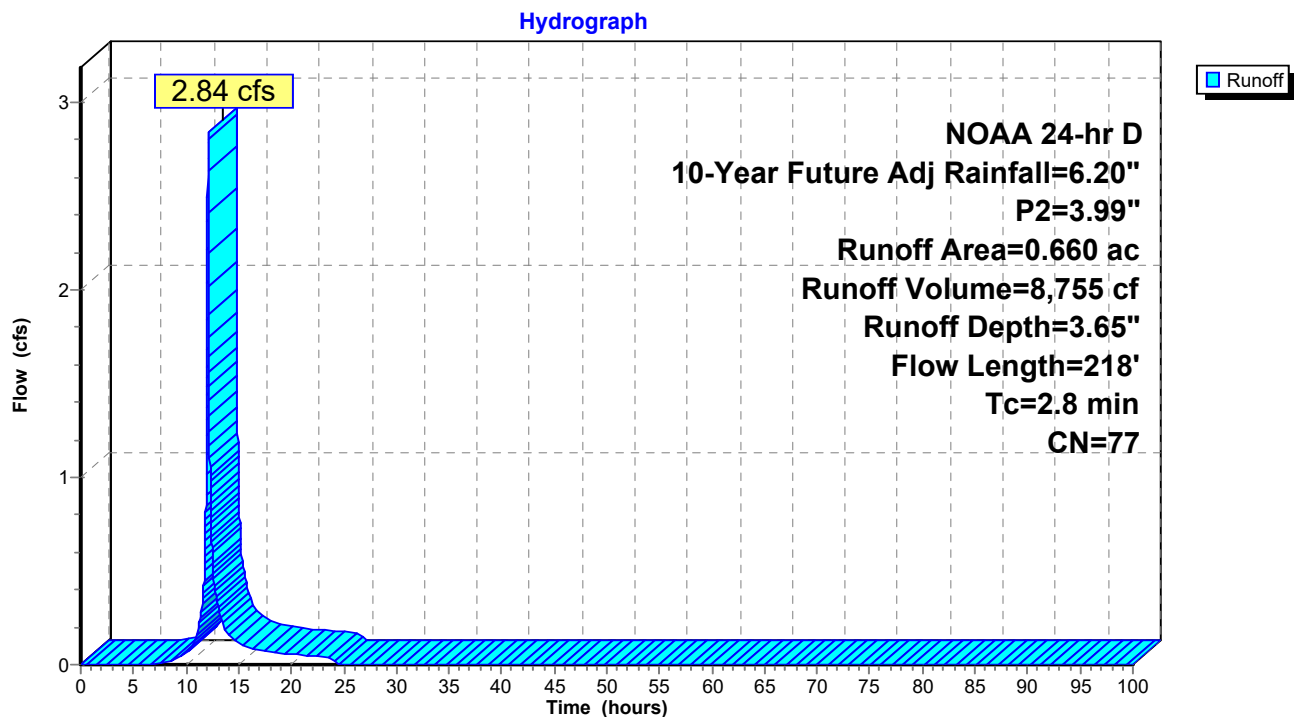
Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 2.84 cfs @ 12.11 hrs, Volume= 8,755 cf, Depth= 3.65"
Routed to Link E3A : EDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf, Depth= 3.35"
Routed to Link E3B : BYPASS

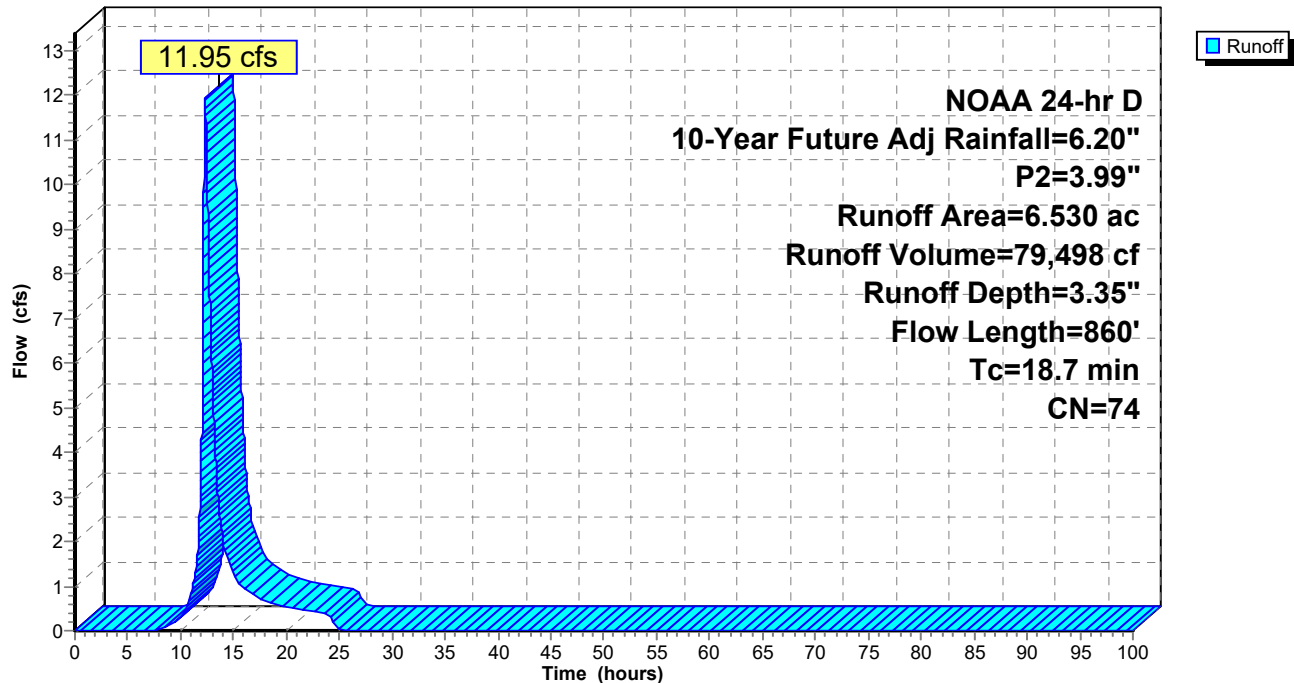
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

Hydrograph



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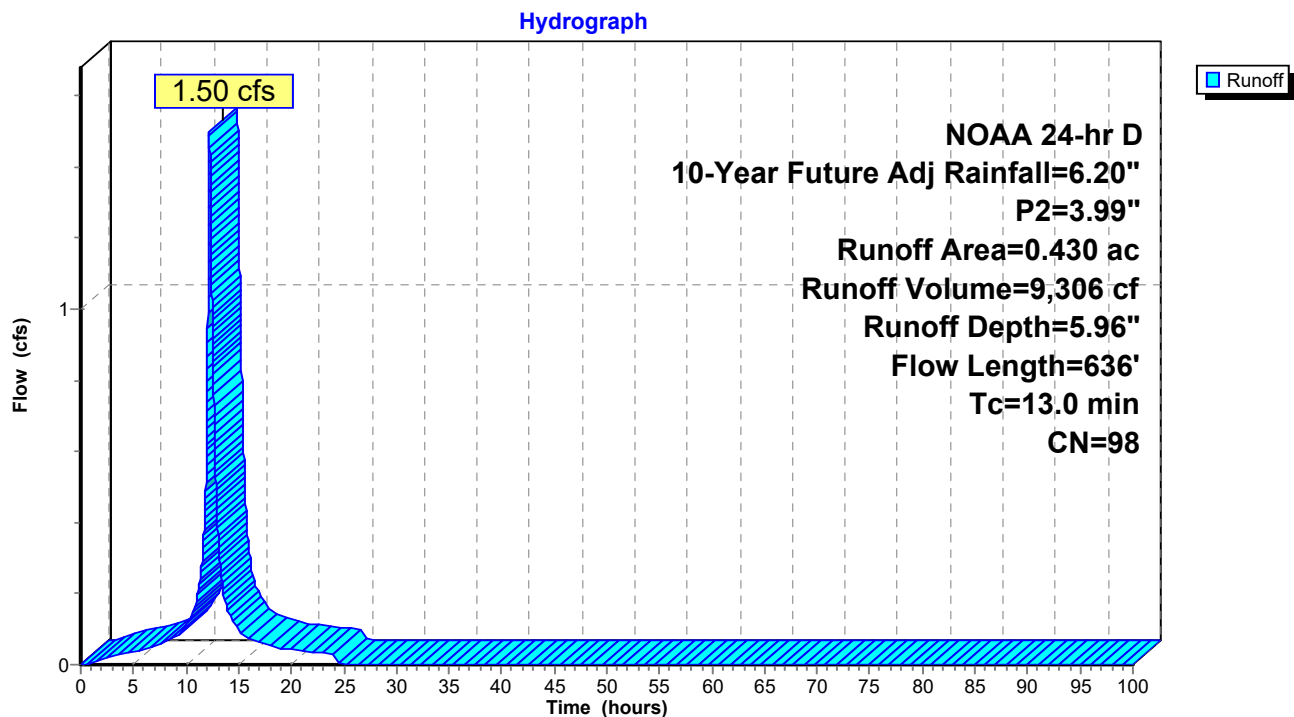
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 1.50 cfs @ 12.22 hrs, Volume= 9,306 cf, Depth= 5.96"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	636	Total			

Subcatchment E4i: EDA 4 Impervious

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 0.94 cfs @ 12.56 hrs, Volume= 12,923 cf, Depth= 0.50"
Routed to Link E4 : EDA 4

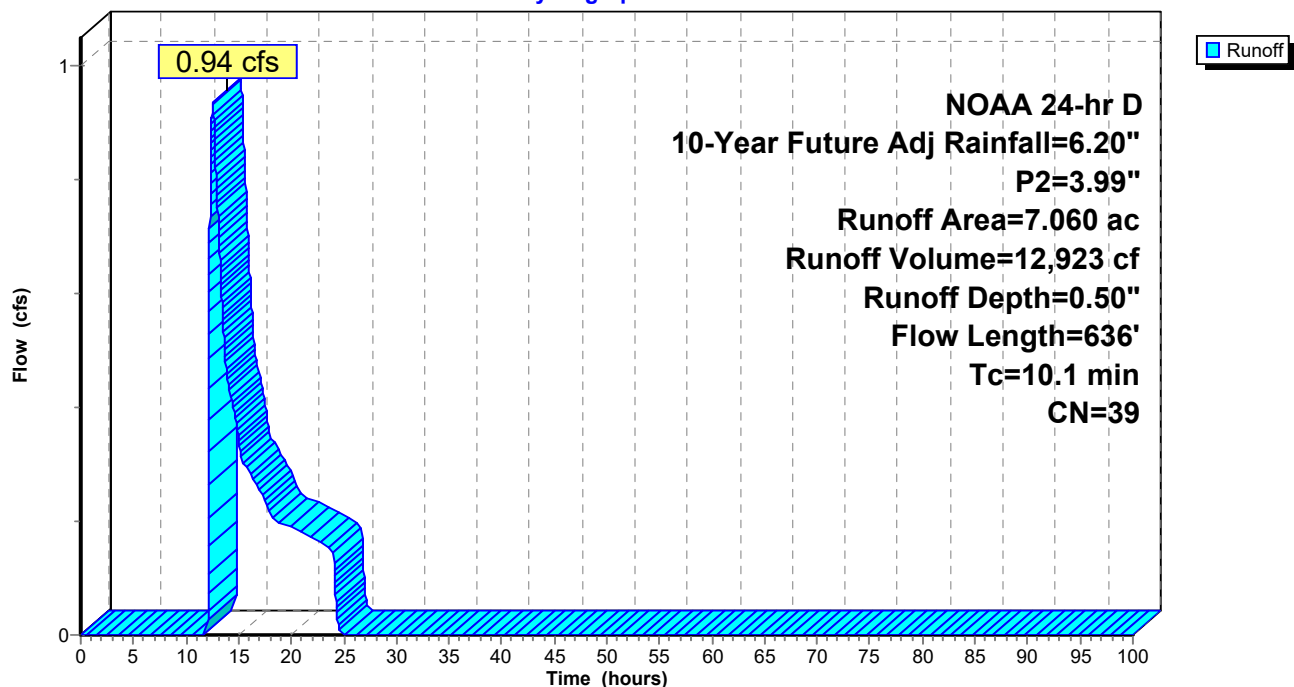
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 2.07 cfs @ 12.37 hrs, Volume= 17,962 cf, Depth= 5.96"
Routed to Pond E5D : DEPRESSION

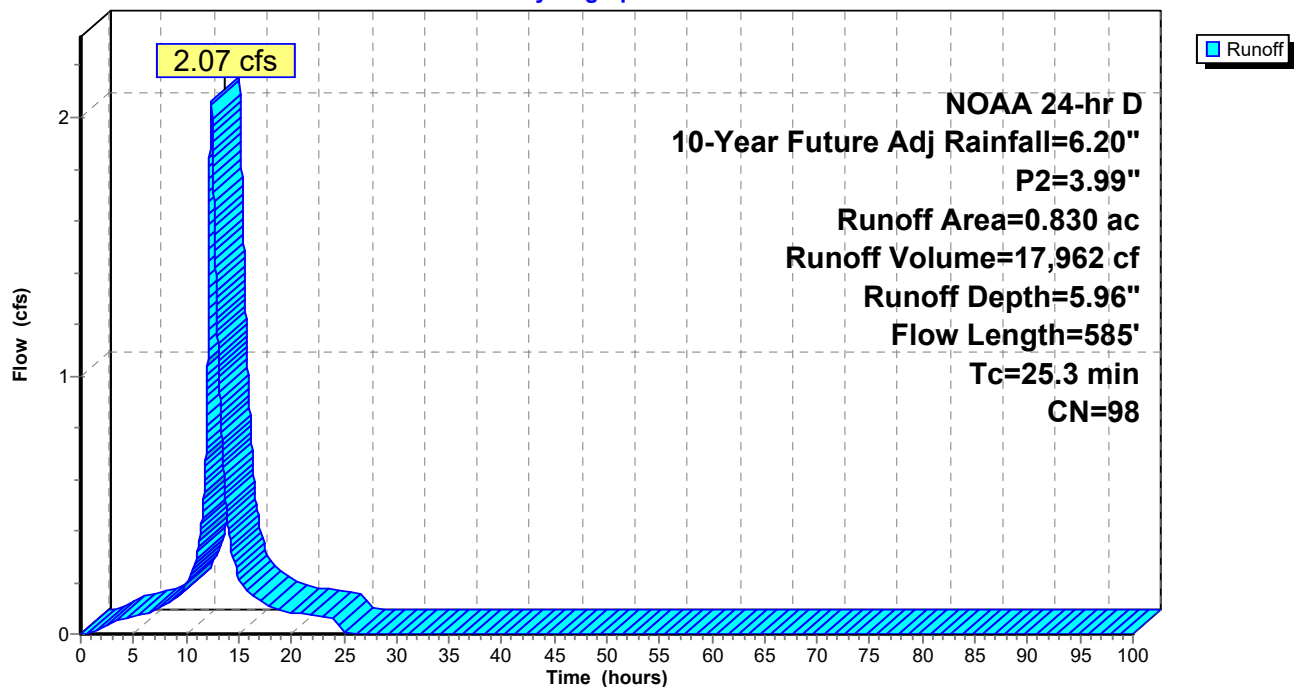
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5i: EDA 6 Impervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 0.96 cfs @ 12.82 hrs, Volume= 15,289 cf, Depth= 0.62"
 Routed to Pond E5D : DEPRESSION

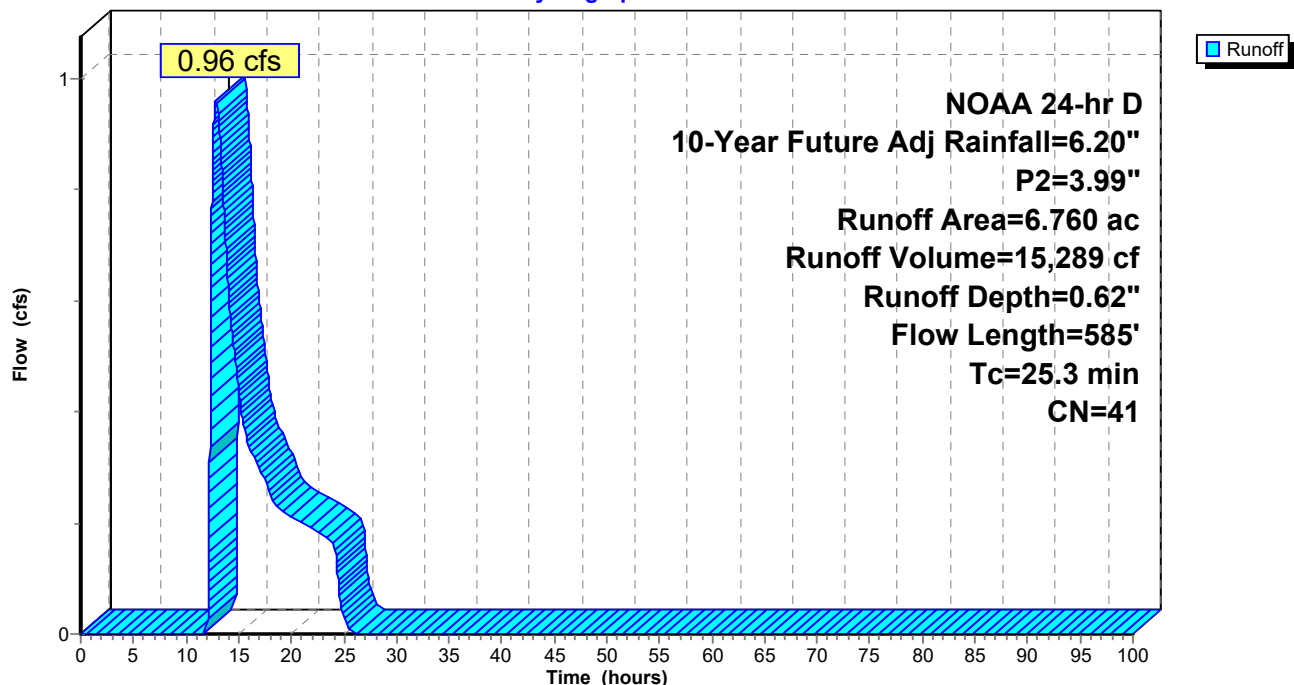
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 1.21" for 10-Year Future Adj event
 Inflow = 2.77 cfs @ 12.47 hrs, Volume= 33,250 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 16.24' @ 26.77 hrs Surf.Area= 93,810 sf Storage= 33,250 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

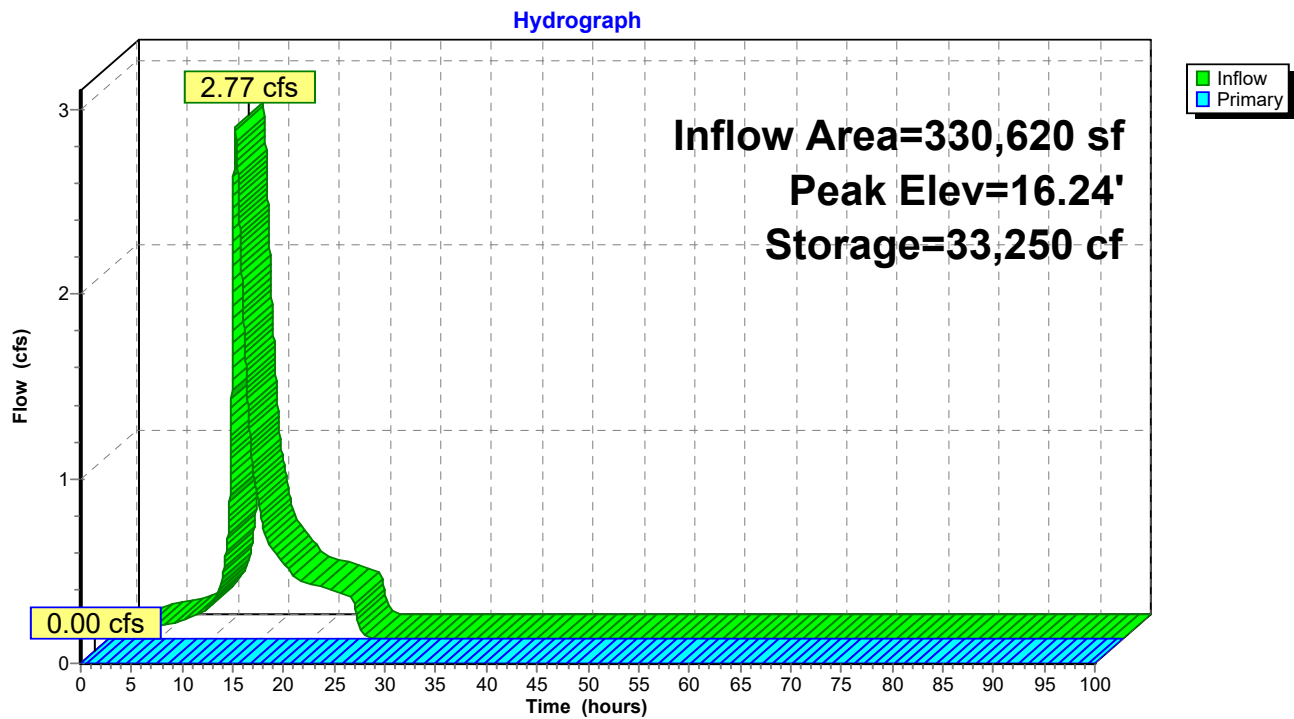
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

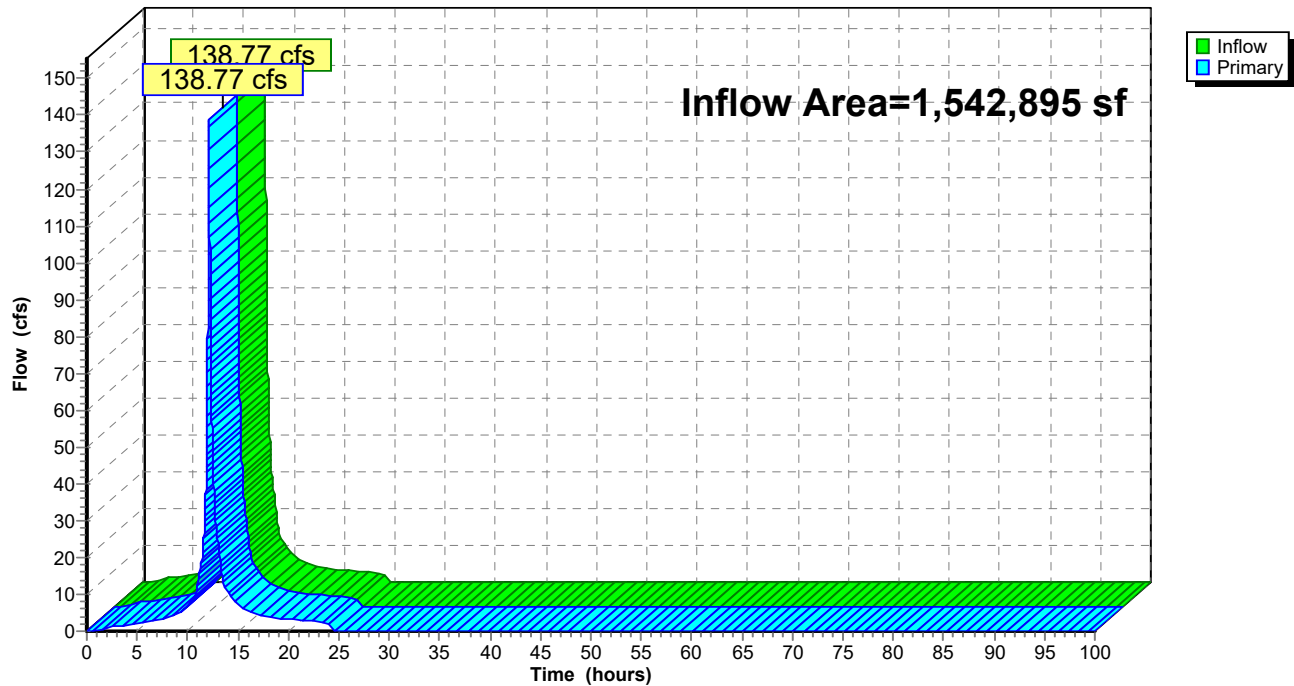
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.07' TW=0.00' (Dynamic Tailwater)↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E5D: DEPRESSION

Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 5.01" for 10-Year Future Adj event
Inflow = 138.77 cfs @ 12.12 hrs, Volume= 644,013 cf
Primary = 138.77 cfs @ 12.12 hrs, Volume= 644,013 cf, Atten= 0%, Lag= 0.0 min

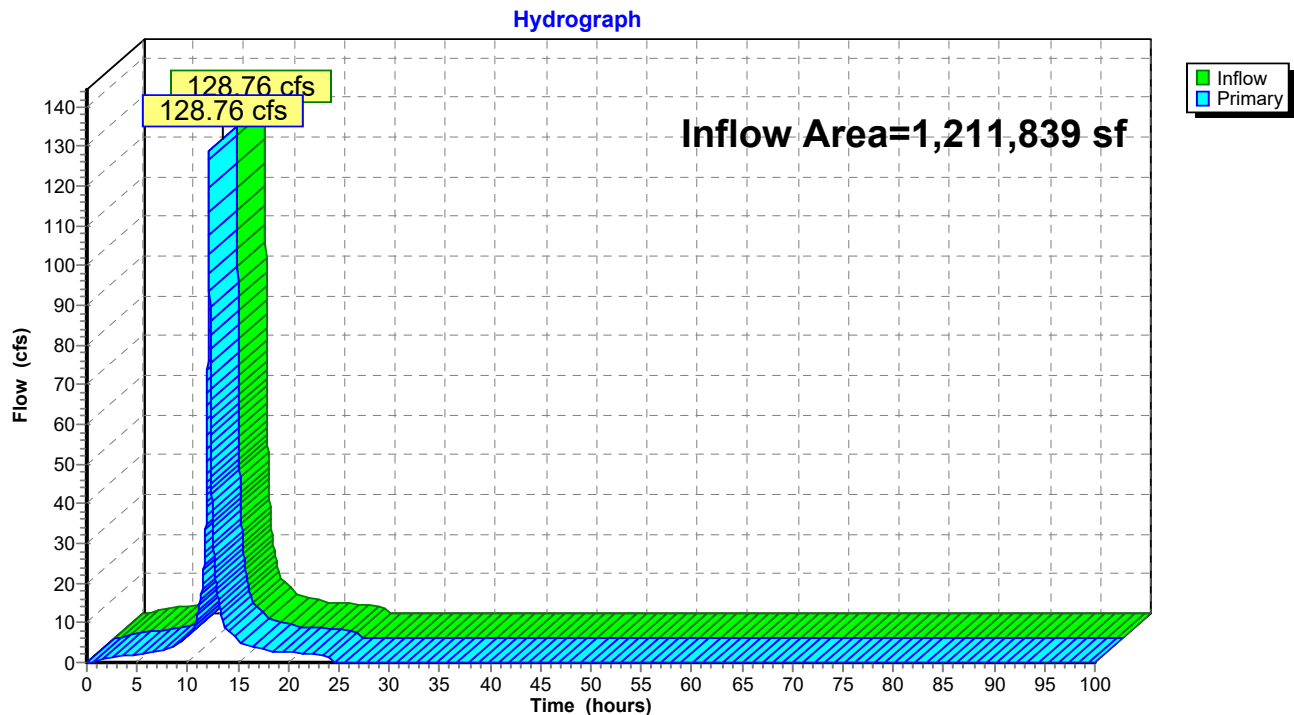
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1**Hydrograph**

Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 5.34" for 10-Year Future Adj event
Inflow = 128.76 cfs @ 12.12 hrs, Volume= 539,348 cf
Primary = 128.76 cfs @ 12.12 hrs, Volume= 539,348 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE

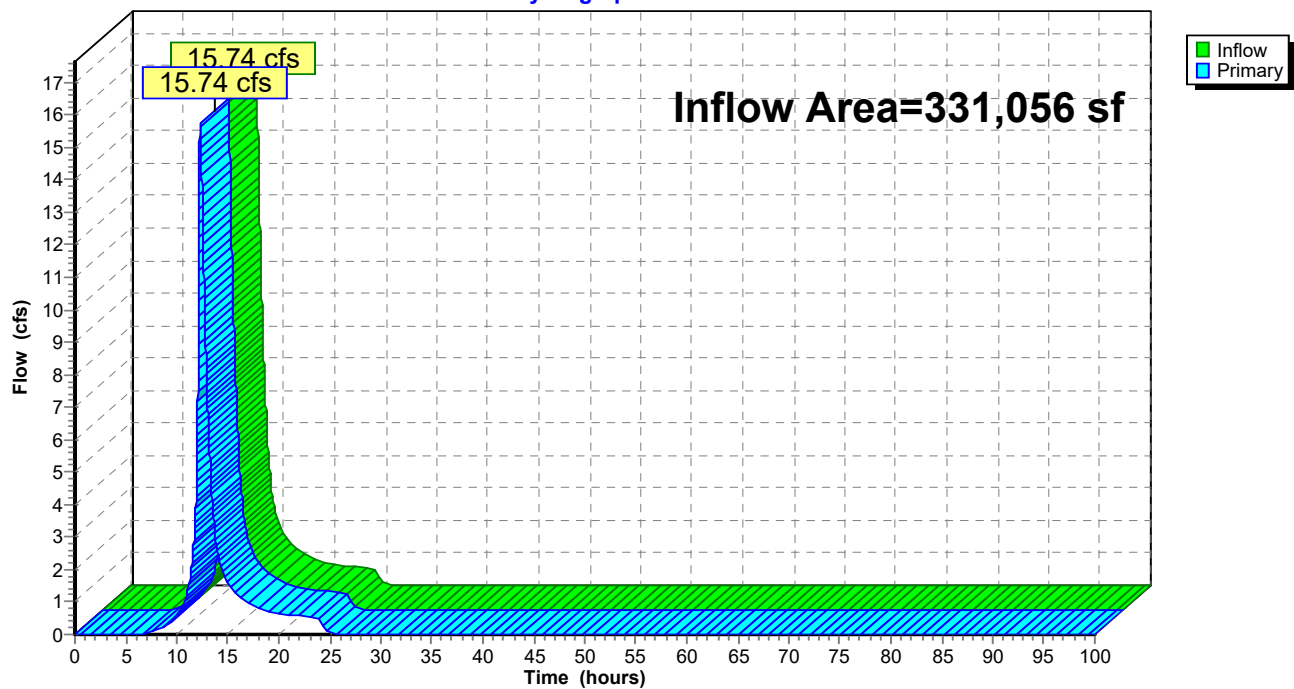
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 3.79" for 10-Year Future Adj event
Inflow = 15.74 cfs @ 12.30 hrs, Volume= 104,665 cf
Primary = 15.74 cfs @ 12.30 hrs, Volume= 104,665 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

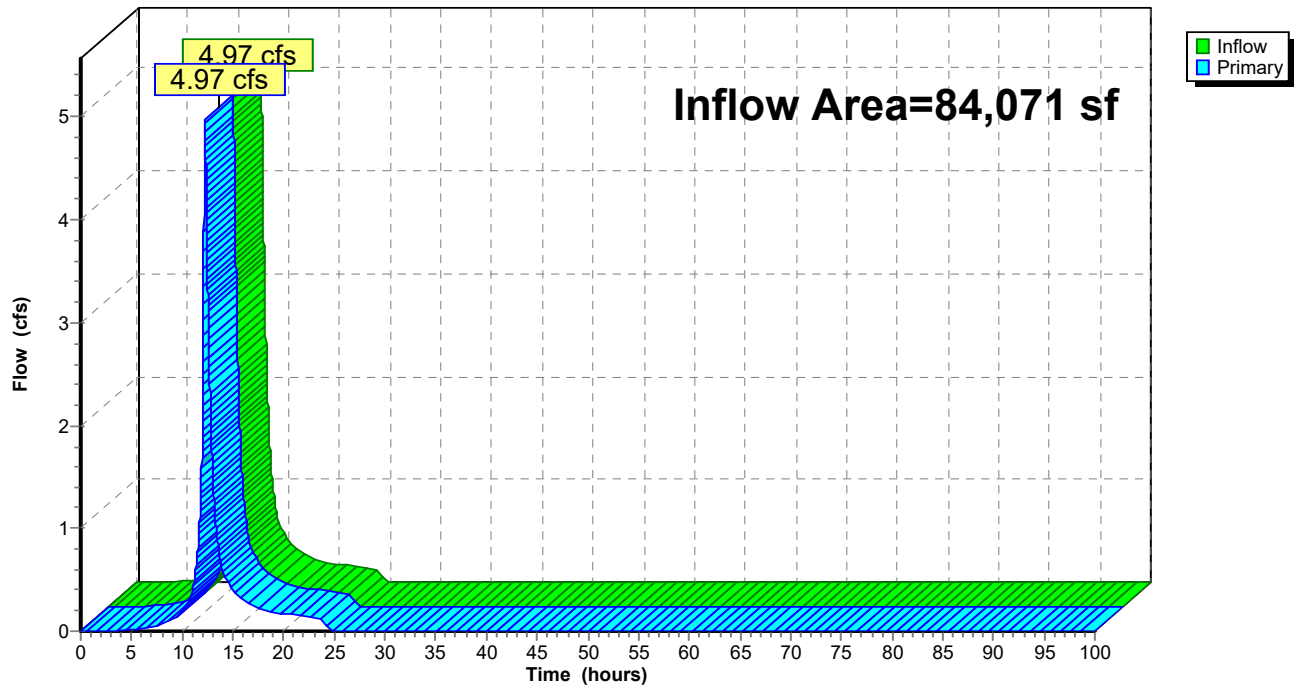
Hydrograph



Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 4.07" for 10-Year Future Adj event
Inflow = 4.97 cfs @ 12.23 hrs, Volume= 28,534 cf
Primary = 4.97 cfs @ 12.23 hrs, Volume= 28,534 cf, Atten= 0%, Lag= 0.0 min

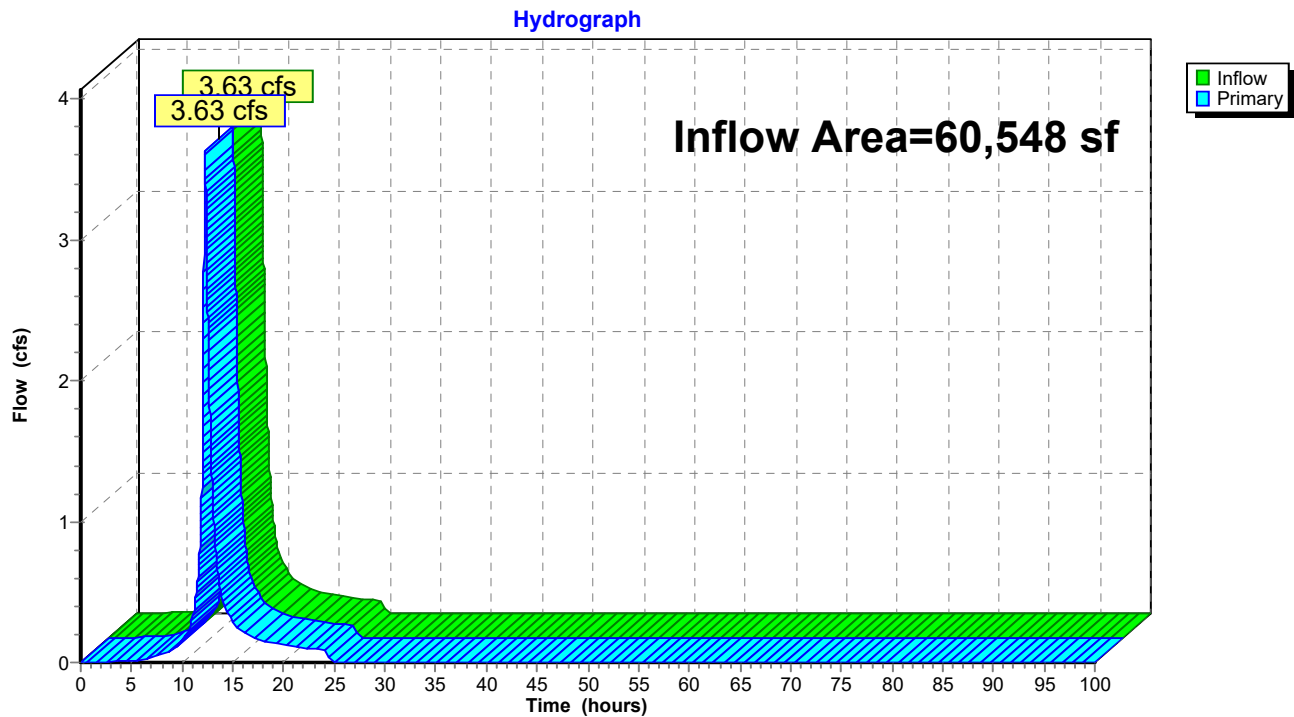
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2**Hydrograph**

Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 4.24" for 10-Year Future Adj event
Inflow = 3.63 cfs @ 12.24 hrs, Volume= 21,370 cf
Primary = 3.63 cfs @ 12.24 hrs, Volume= 21,370 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE

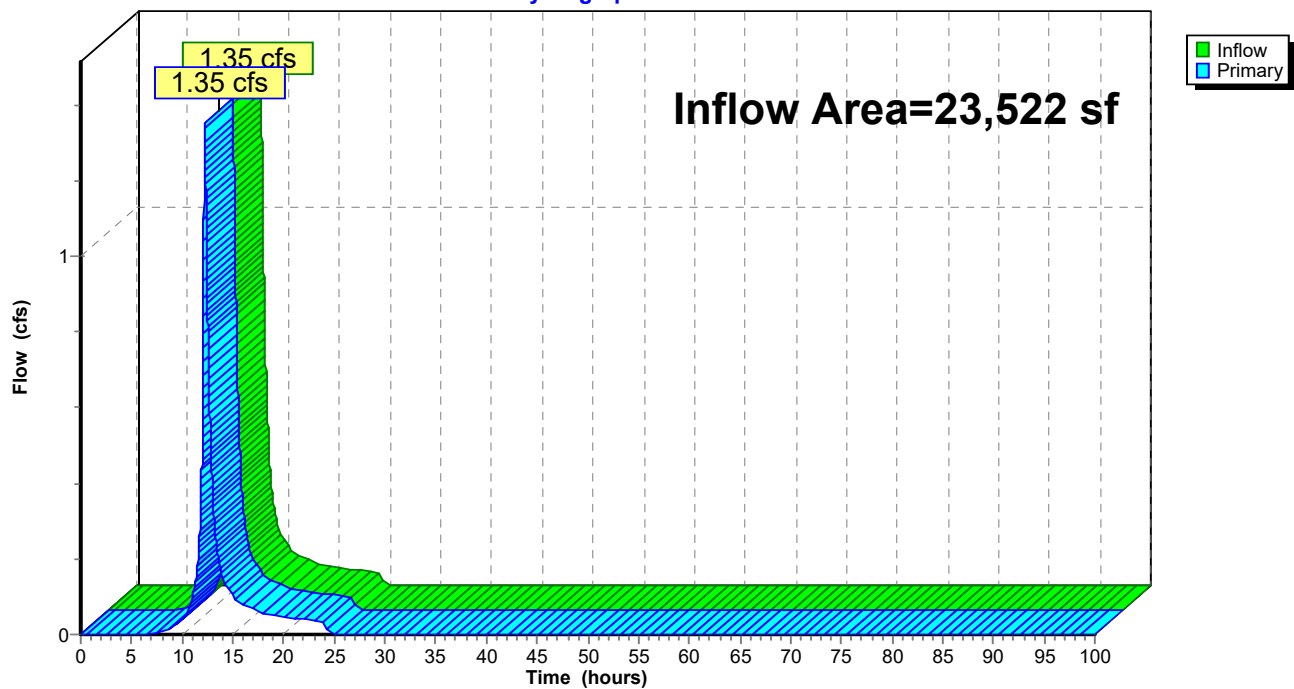
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 3.65" for 10-Year Future Adj event
Inflow = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf
Primary = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



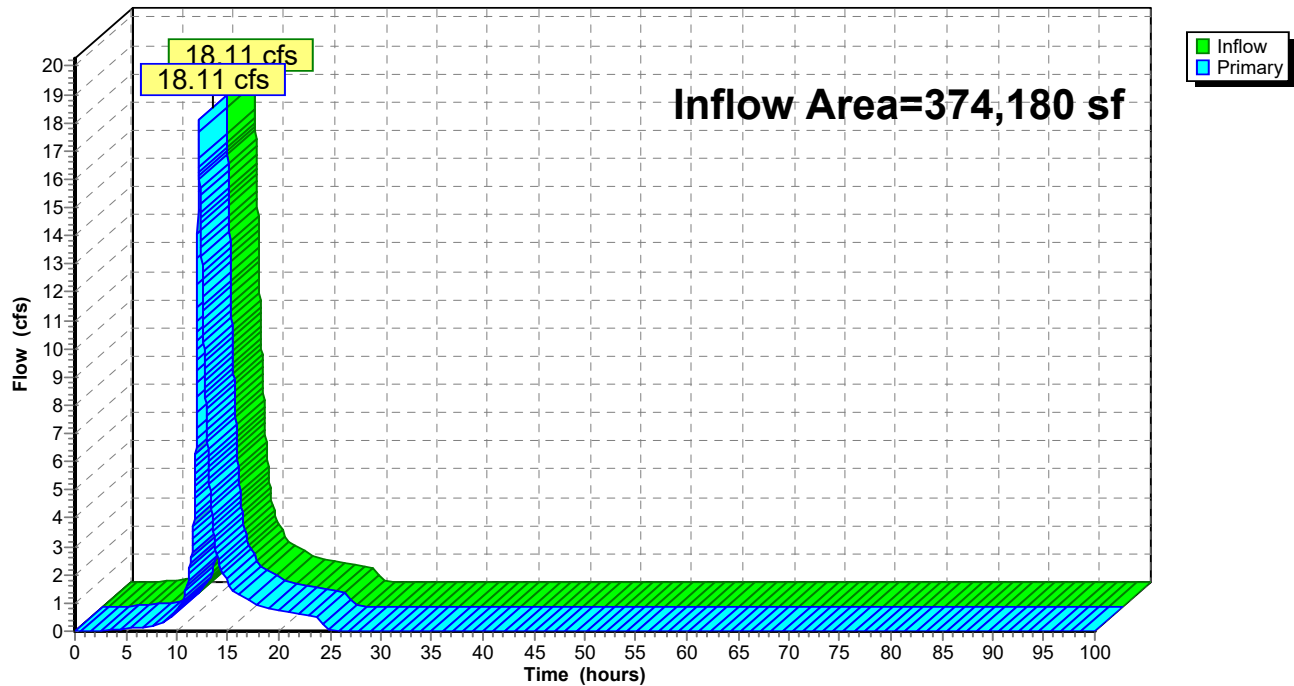
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 3.74" for 10-Year Future Adj event
Inflow = 18.11 cfs @ 12.12 hrs, Volume= 116,764 cf
Primary = 18.11 cfs @ 12.12 hrs, Volume= 116,764 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

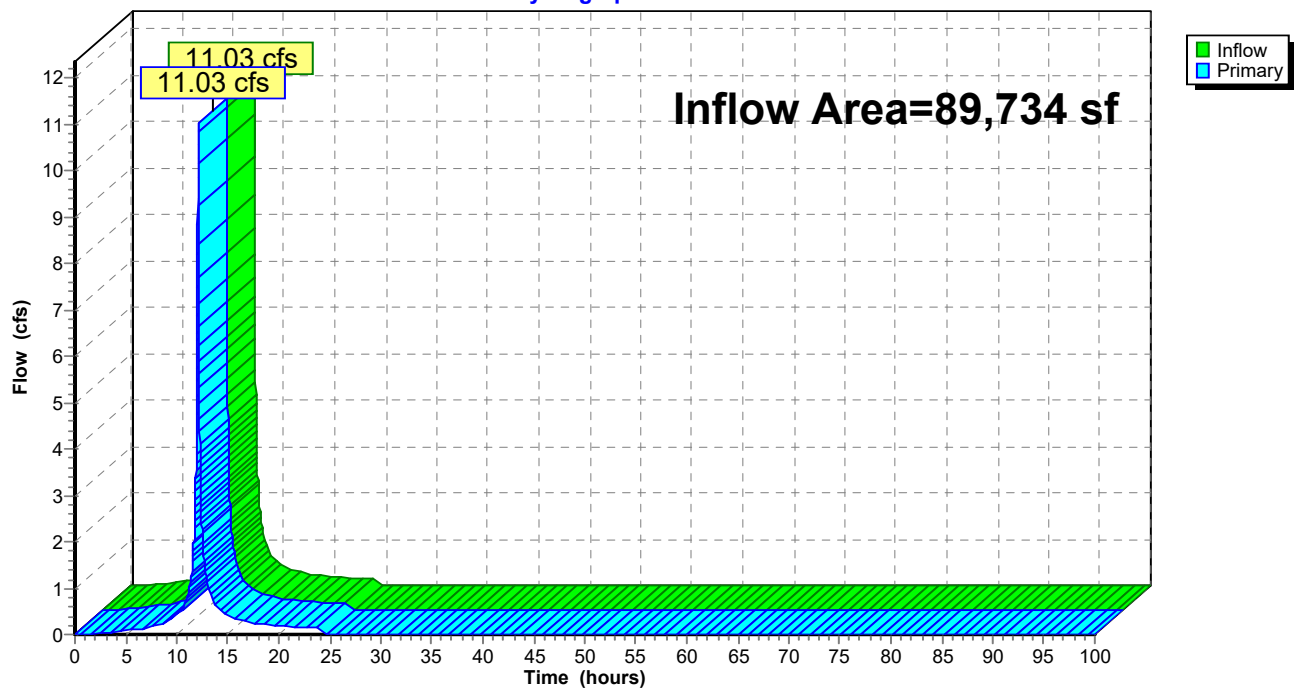
Hydrograph



Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 4.98" for 10-Year Future Adj event
Inflow = 11.03 cfs @ 12.11 hrs, Volume= 37,266 cf
Primary = 11.03 cfs @ 12.11 hrs, Volume= 37,266 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

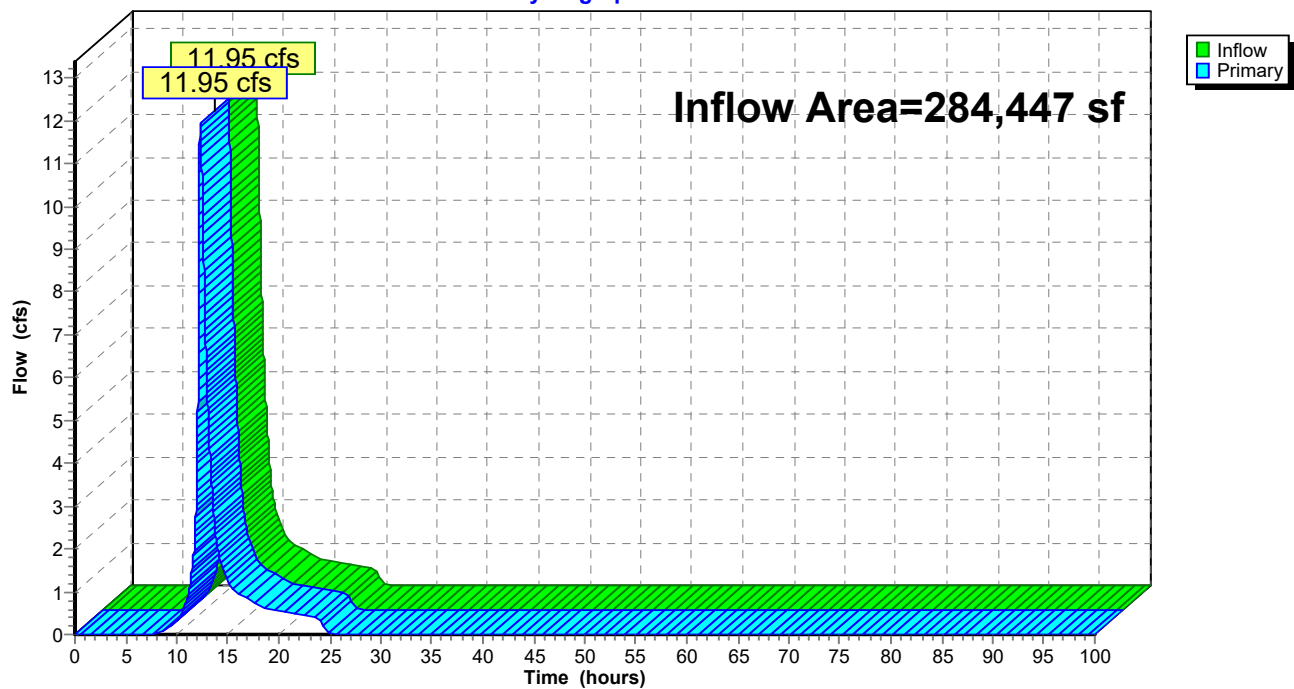
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3A: EDA 3A ONSITE**Hydrograph**

Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 3.35" for 10-Year Future Adj event
Inflow = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf
Primary = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

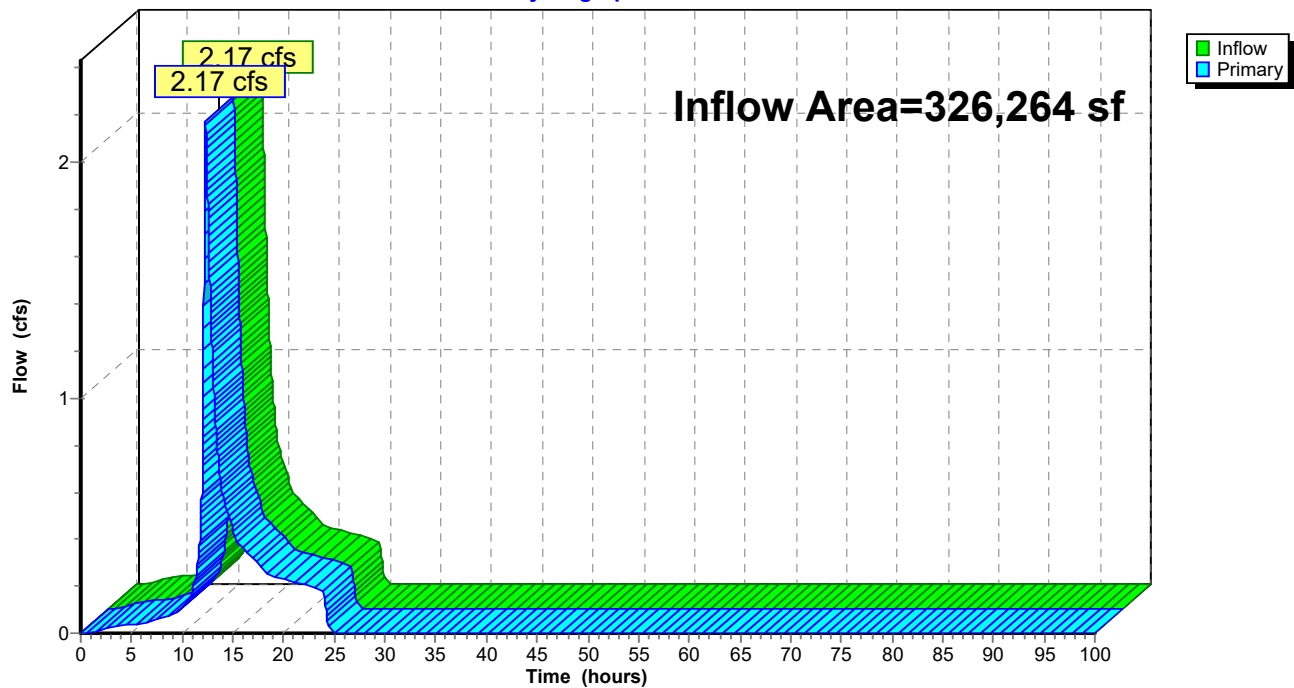
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS**Hydrograph**

Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 0.82" for 10-Year Future Adj event
Inflow = 2.17 cfs @ 12.28 hrs, Volume= 22,228 cf
Primary = 2.17 cfs @ 12.28 hrs, Volume= 22,228 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4**Hydrograph**

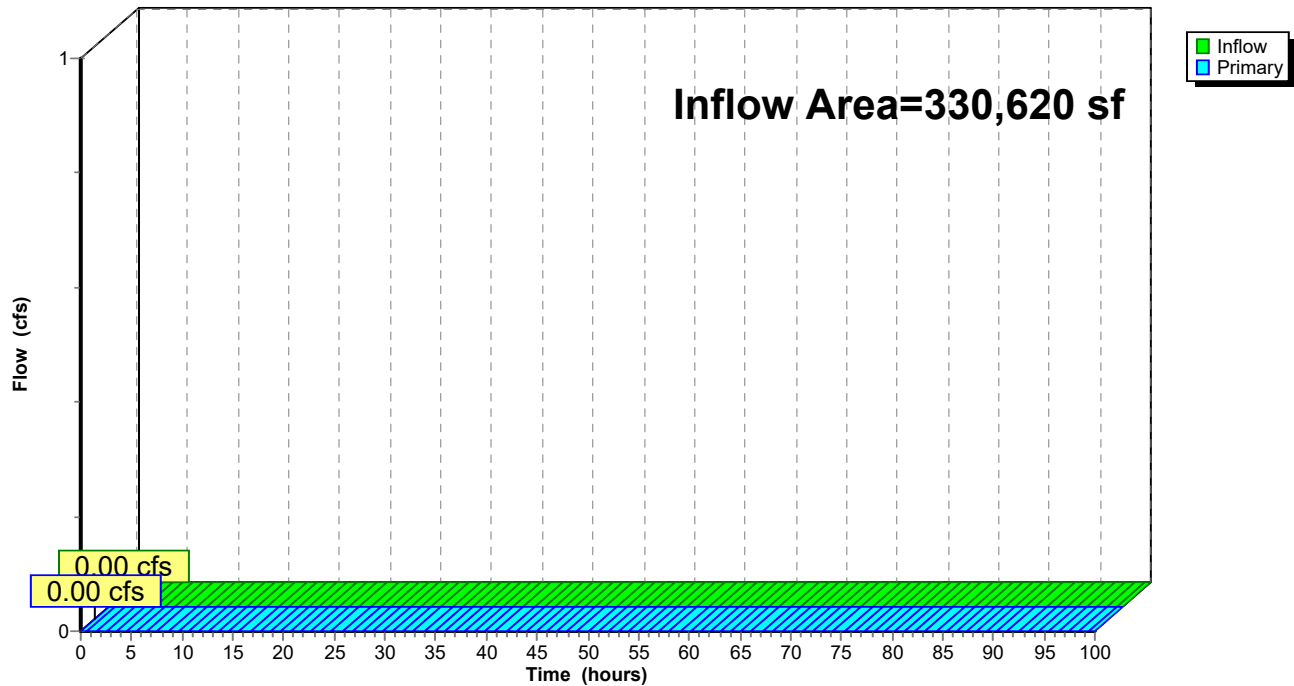
Summary for Link E5: EDA 5

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 0.00" for 10-Year Future Adj event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E5: EDA 5

Hydrograph



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	10-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	6.20	2	3.99

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
228,690	39	>75% Grass cover, Good, HSG A (P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P4p)
405,544	80	>75% Grass cover, Good, HSG D (P1Bp, P1Dp, P1Fp, P1Gp, P1Hp, P1Ip, P1Jp, P1Kp, P1Lp, P1Mp, P1Np, P2Ap, P3Ap, P3Bp)
1,521,986	98	Paved parking, HSG D (P1Ai, P1Bi, P1Di, P1Ei, P1Fi, P1Gi, P1Hi, P1Ii, P1Ji, P1Ki, P1Li, P1Ni)
17,424	30	Woods, Good, HSG A (P3Bp)
484,387	77	Woods, Good, HSG D (P1Mp, P1Np, P2Ap, P2Bp, P3Ap, P3Bp)
2,658,031	86	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
246,114	HSG A	P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P3Bp, P4p
0	HSG B	
0	HSG C	
2,411,917	HSG D	P1Ai, P1Bi, P1Bp, P1Di, P1Dp, P1Ei, P1Fi, P1Fp, P1Gi, P1Gp, P1Hi, P1Hp, P1Ii, P1Ip, P1Ji, P1Jp, P1Ki, P1Kp, P1Li, P1Lp, P1Mp, P1Ni, P1Np, P2Ap, P2Bp, P3Ap, P3Bp
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
228,690	0	0	405,544	0	634,234	>75% Grass cover, Good
0	0	0	1,521,986	0	1,521,986	Paved parking
17,424	0	0	484,387	0	501,811	Woods, Good
246,114	0	0	2,411,917	0	2,658,031	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	9.50	9.35	50.0	0.0030	0.013	0.0	24.0	0.0	
2	CW1A	9.00	8.00	634.0	0.0016	0.012	0.0	36.0	0.0	
3	CW1B	9.00	8.00	312.0	0.0032	0.012	0.0	48.0	0.0	
4	CW1C	9.00	8.00	1,202.0	0.0008	0.012	0.0	36.0	0.0	
5	CW1D	8.90	8.54	72.0	0.0050	0.012	0.0	48.0	0.0	
6	PP1	9.82	9.23	59.0	0.0100	0.013	0.0	15.0	0.0	
7	PP2	9.46	9.00	155.0	0.0030	0.013	0.0	36.0	0.0	
8	PP3	9.28	9.13	49.0	0.0031	0.013	0.0	30.0	0.0	
9	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
10	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
11	PP5	9.60	9.29	105.0	0.0030	0.013	0.0	15.0	0.0	
12	PP6	11.08	11.05	8.0	0.0037	0.013	0.0	15.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentP1Ai:	Runoff Area=5.210 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=30.80 cfs 112,748 cf
SubcatchmentP1Ap:	Runoff Area=0.940 ac 0.00% Impervious Runoff Depth=0.50" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=39 Runoff=0.15 cfs 1,721 cf
SubcatchmentP1Bi:	Runoff Area=4.410 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=26.07 cfs 95,436 cf
SubcatchmentP1Bp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=3.96" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=80 Runoff=4.02 cfs 14,383 cf
SubcatchmentP1Cp:	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=0.50" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=39 Runoff=0.11 cfs 1,281 cf
SubcatchmentP1Di:	Runoff Area=7.230 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=42.75 cfs 156,463 cf
SubcatchmentP1Dp:	Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=3.76" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=78 Runoff=3.47 cfs 12,271 cf
SubcatchmentP1Ei:	Runoff Area=0.760 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=125' Tc=1.3 min CN=98 Runoff=4.93 cfs 16,447 cf
SubcatchmentP1Ep:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=0.50" Flow Length=76' Tc=3.8 min CN=39 Runoff=0.00 cfs 37 cf
SubcatchmentP1Fi:	Runoff Area=1.680 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=123' Tc=1.1 min CN=98 Runoff=10.89 cfs 36,357 cf
SubcatchmentP1Fp:	Runoff Area=0.120 ac 0.00% Impervious Runoff Depth=3.96" Flow Length=81' Tc=2.9 min CN=80 Runoff=0.55 cfs 1,726 cf
SubcatchmentP1Gi:	Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=117' Tc=1.2 min CN=98 Runoff=4.53 cfs 15,149 cf
SubcatchmentP1Gp:	Runoff Area=0.030 ac 0.00% Impervious Runoff Depth=3.96" Flow Length=92' Tc=3.9 min CN=80 Runoff=0.13 cfs 431 cf
SubcatchmentP1Hi:	Runoff Area=10.630 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=179' Slope=0.0150 '/' Tc=1.7 min CN=98 Runoff=67.54 cfs 230,041 cf
SubcatchmentP1Hp:	Runoff Area=0.370 ac 0.00% Impervious Runoff Depth=2.41" Flow Length=78' Slope=0.0450 '/' Tc=5.2 min CN=64 Runoff=0.87 cfs 3,233 cf
SubcatchmentP1Ii:	Runoff Area=0.740 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=4.81 cfs 16,014 cf

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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SubcatchmentP1Ip:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=3.96" Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=80 Runoff=0.10 cfs 288 cf
SubcatchmentP1Ji:	Runoff Area=0.870 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=5.66 cfs 18,827 cf
SubcatchmentP1Jp:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=2.05" Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=60 Runoff=0.05 cfs 149 cf
SubcatchmentP1Ki:	Runoff Area=2.410 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=194' Tc=1.4 min CN=98 Runoff=15.57 cfs 52,154 cf
SubcatchmentP1Kp:	Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=3.96" Flow Length=149' Tc=2.7 min CN=80 Runoff=0.28 cfs 863 cf
SubcatchmentP1Li:	Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=54' Slope=0.0150 '/' Tc=0.7 min CN=98 Runoff=1.11 cfs 3,679 cf
SubcatchmentP1Lp:	Runoff Area=2.450 ac 0.00% Impervious Runoff Depth=2.23" Flow Length=228' Slope=0.0200 '/' Tc=10.7 min CN=62 Runoff=3.79 cfs 19,818 cf
SubcatchmentP1Mp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=3.86" Flow Length=412' Tc=8.2 min CN=79 Runoff=3.17 cfs 14,007 cf
SubcatchmentP1Ni: PDA 4B Impervious	Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=5.96" Flow Length=861' Tc=18.7 min CN=98 Runoff=0.38 cfs 2,813 cf
SubcatchmentP1Np: PDA 4B Pervious	Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=3.76" Flow Length=861' Tc=18.7 min CN=78 Runoff=15.37 cfs 101,851 cf
SubcatchmentP2Ap: PDA 2A Pervious	Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=3.86" Flow Length=382' Tc=14.3 min CN=79 Runoff=1.72 cfs 9,945 cf
SubcatchmentP2Bp: PDA 2B Pervious	Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=3.65" Flow Length=289' Tc=12.1 min CN=77 Runoff=1.35 cfs 7,163 cf
SubcatchmentP3Ap: PDA 3A Pervious	Runoff Area=0.950 ac 0.00% Impervious Runoff Depth=3.86" Flow Length=218' Tc=2.8 min CN=79 Runoff=4.29 cfs 13,307 cf
SubcatchmentP3Bp: PDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=3.35" Flow Length=860' Tc=18.7 min CN=74 Runoff=11.95 cfs 79,498 cf
SubcatchmentP4p: PDA 4 Pervious	Runoff Area=2.250 ac 0.00% Impervious Runoff Depth=0.50" Flow Length=636' Tc=10.1 min CN=39 Runoff=0.30 cfs 4,118 cf
Pond B1: UG BASIN	Peak Elev=11.42' Storage=0.754 af Inflow=15.84 cfs 53,017 cf Outflow=1.46 cfs 43,506 cf
Pond CW1A: CONSTRUCTED	Peak Elev=13.72' Storage=83,394 cf Inflow=43.10 cfs 207,857 cf 36.0" Round Culvert n=0.012 L=634.0' S=0.0016 '/' Outflow=12.29 cfs 205,991 cf

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Pond CW1B: CONSTRUCTED	Peak Elev=13.50' Storage=78,636 cf Inflow=55.50 cfs 445,141 cf 48.0" Round Culvert n=0.012 L=312.0' S=0.0032 ' /' Outflow=28.08 cfs 442,882 cf
Pond CW1C: CONSTRUCTED	Peak Elev=13.26' Storage=21,844 cf Inflow=32.02 cfs 519,200 cf 36.0" Round Culvert x 2.00 n=0.012 L=1,202.0' S=0.0008 ' /' Outflow=32.18 cfs 518,888 cf
Pond CW1D: CONSTRUCTED	Peak Elev=12.61' Storage=62,812 cf Inflow=63.43 cfs 713,988 cf Outflow=44.25 cfs 712,773 cf
Pond PP1: POROUS PAVEMENT	Peak Elev=16.34' Storage=9,094 cf Inflow=4.93 cfs 16,484 cf Outflow=1.15 cfs 13,595 cf
Pond PP2: POROUS PAVEMENT	Peak Elev=15.71' Storage=20,192 cf Inflow=11.43 cfs 38,082 cf Outflow=3.98 cfs 31,531 cf
Pond PP3: POROUS PAVEMENT	Peak Elev=17.73' Storage=9,039 cf Inflow=4.65 cfs 15,580 cf Outflow=0.72 cfs 12,893 cf
Pond PP4: POROUS PAVEMENT	Peak Elev=14.30' Storage=93,267 cf Inflow=68.31 cfs 233,274 cf Primary=20.07 cfs 129,331 cf Secondary=10.03 cfs 64,075 cf Outflow=30.10 cfs 193,406 cf
Pond PP5: POROUS PAVEMENT	Peak Elev=16.88' Storage=6,171 cf Inflow=4.91 cfs 16,302 cf Outflow=2.58 cfs 13,473 cf
Pond PP6: POROUS PAVEMENT	Peak Elev=16.61' Storage=7,601 cf Inflow=5.71 cfs 18,977 cf Outflow=2.62 cfs 15,718 cf
Link B1V: Valve	Inflow=1.46 cfs 43,506 cf Primary=1.46 cfs 43,506 cf
Link P1: PDA 1	Inflow=66.13 cfs 854,942 cf Primary=66.13 cfs 854,942 cf
Link P1A:	Inflow=50.78 cfs 750,278 cf Primary=50.78 cfs 750,278 cf
Link P1B: BYPASS	Inflow=15.74 cfs 104,665 cf Primary=15.74 cfs 104,665 cf
Link P2: PDA 2	Inflow=3.06 cfs 17,108 cf Primary=3.06 cfs 17,108 cf
Link P2A: PDA 2A ONSITE	Inflow=1.72 cfs 9,945 cf Primary=1.72 cfs 9,945 cf
Link P2B: BYPASS	Inflow=1.35 cfs 7,163 cf Primary=1.35 cfs 7,163 cf
Link P3: PDA 3	Inflow=13.37 cfs 92,805 cf Primary=13.37 cfs 92,805 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Link P3A: PDA 3A ONSITE

Inflow=4.29 cfs 13,307 cf

Primary=4.29 cfs 13,307 cf

Link P3B: BYPASS

Inflow=11.95 cfs 79,498 cf

Primary=11.95 cfs 79,498 cf

Link P4: PDA 4

Inflow=0.30 cfs 4,118 cf

Primary=0.30 cfs 4,118 cf

Link PP4V: Valve

Inflow=20.07 cfs 129,331 cf

Primary=20.07 cfs 129,331 cf

Total Runoff Area = 2,658,031 sf Runoff Volume = 1,042,220 cf Average Runoff Depth = 4.71"
42.74% Pervious = 1,136,045 sf 57.26% Impervious = 1,521,986 sf

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Summary for Subcatchment P1Ai:

Runoff = 30.80 cfs @ 12.11 hrs, Volume= 112,748 cf, Depth= 5.96"
Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

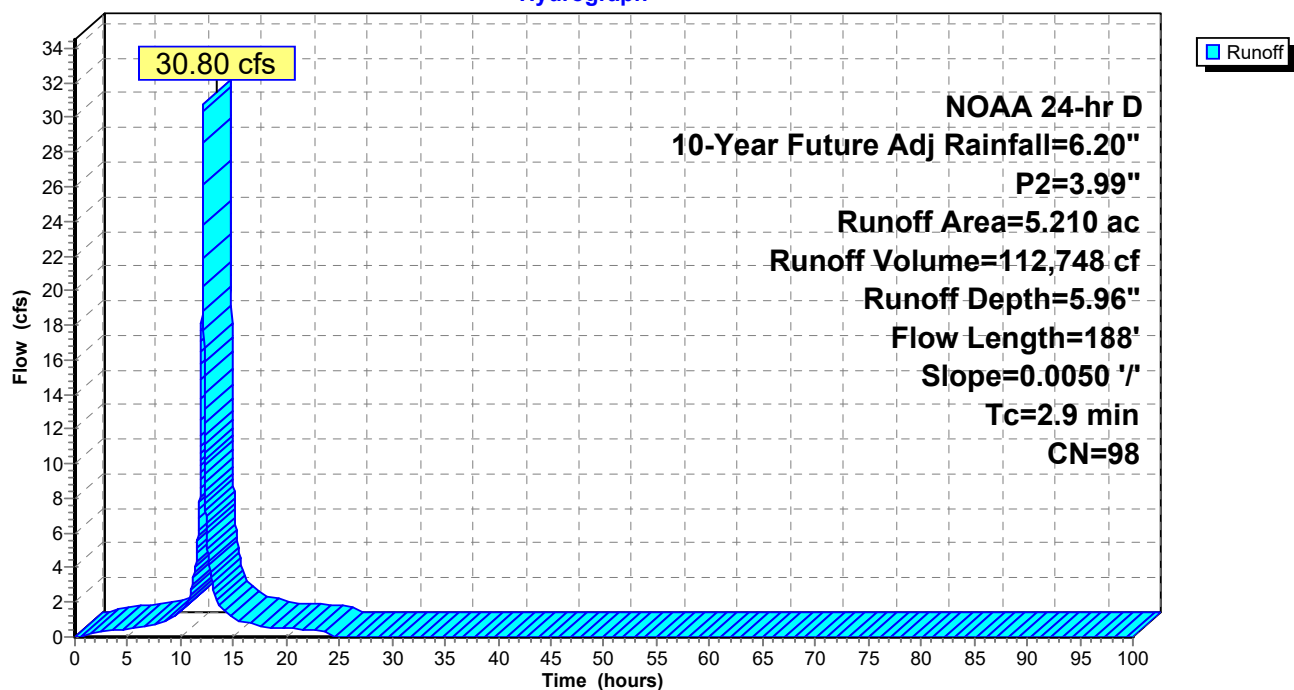
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
5.210	98	Paved parking, HSG D
5.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Ai:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ap:

Runoff = 0.15 cfs @ 12.32 hrs, Volume= 1,721 cf, Depth= 0.50"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

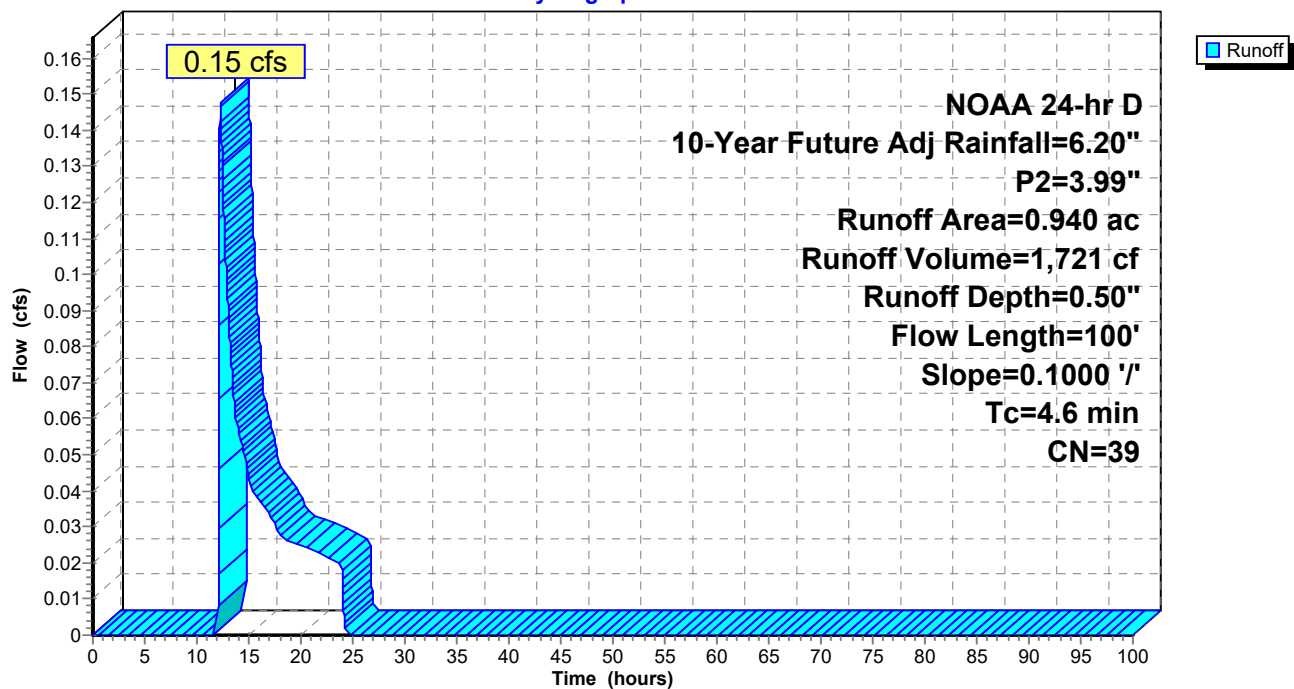
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.940	39	>75% Grass cover, Good, HSG A
0.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Ap:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Bi:

Runoff = 26.07 cfs @ 12.11 hrs, Volume= 95,436 cf, Depth= 5.96"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

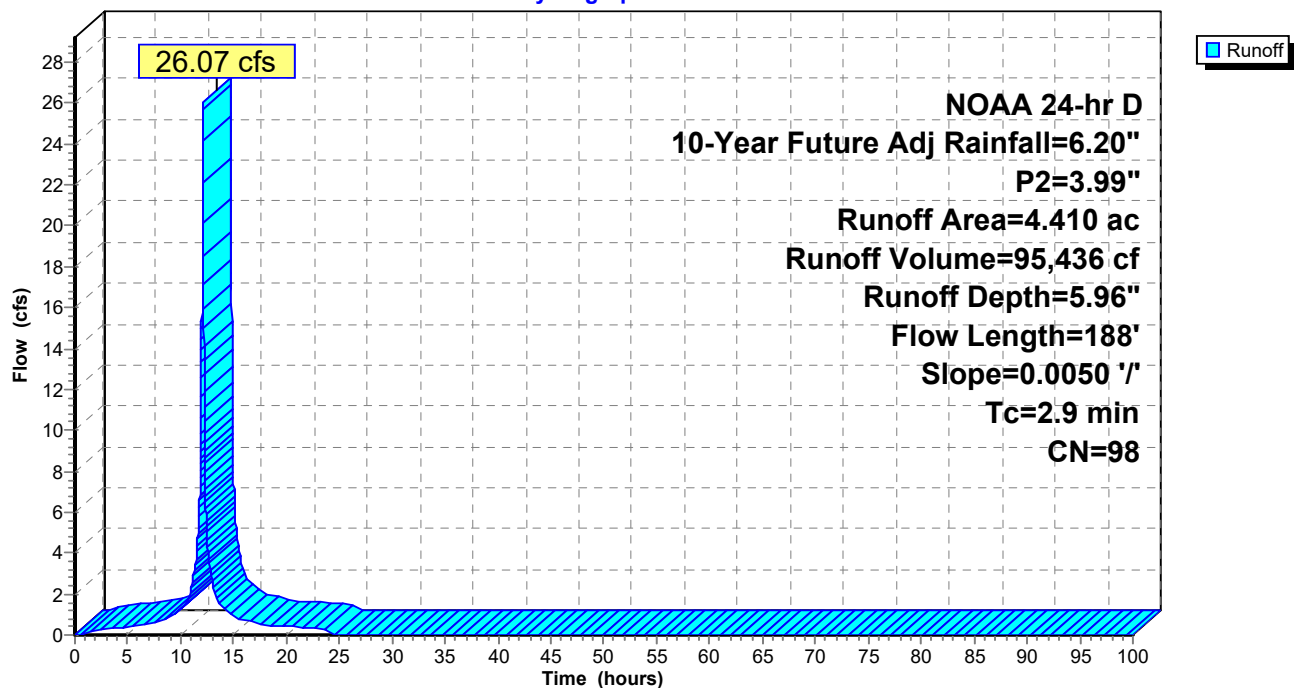
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
4.410	98	Paved parking, HSG D
4.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Bi:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Bp:

Runoff = 4.02 cfs @ 12.13 hrs, Volume= 14,383 cf, Depth= 3.96"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

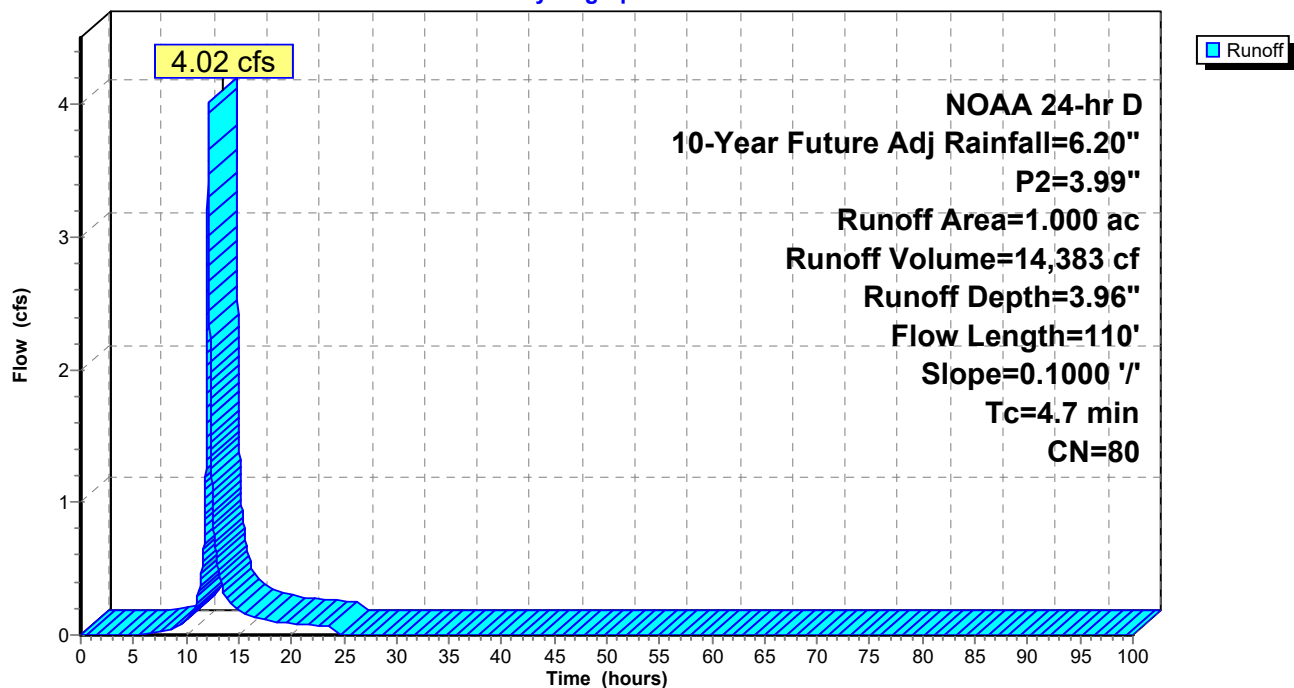
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
1.000	80	>75% Grass cover, Good, HSG D
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Bp:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Cp:

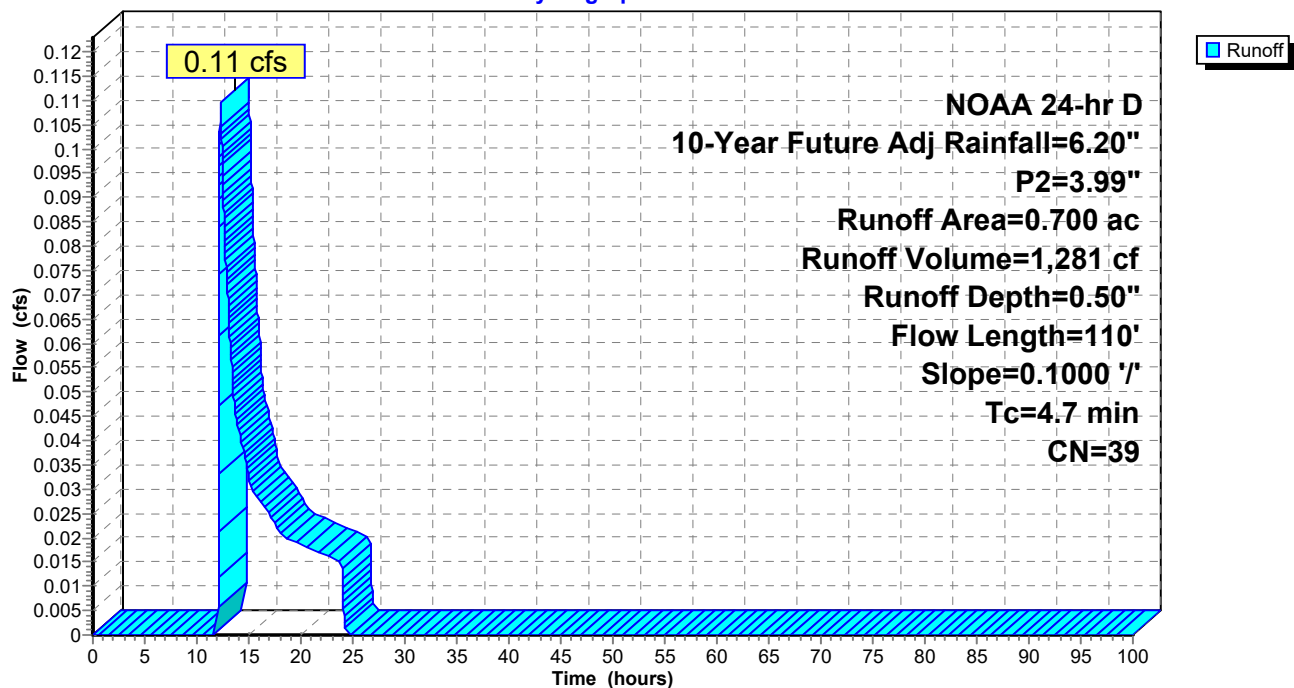
Runoff = 0.11 cfs @ 12.32 hrs, Volume= 1,281 cf, Depth= 0.50"

Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.700	39	>75% Grass cover, Good, HSG A
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Cp:**Hydrograph**

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Di:

Runoff = 42.75 cfs @ 12.11 hrs, Volume= 156,463 cf, Depth= 5.96"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

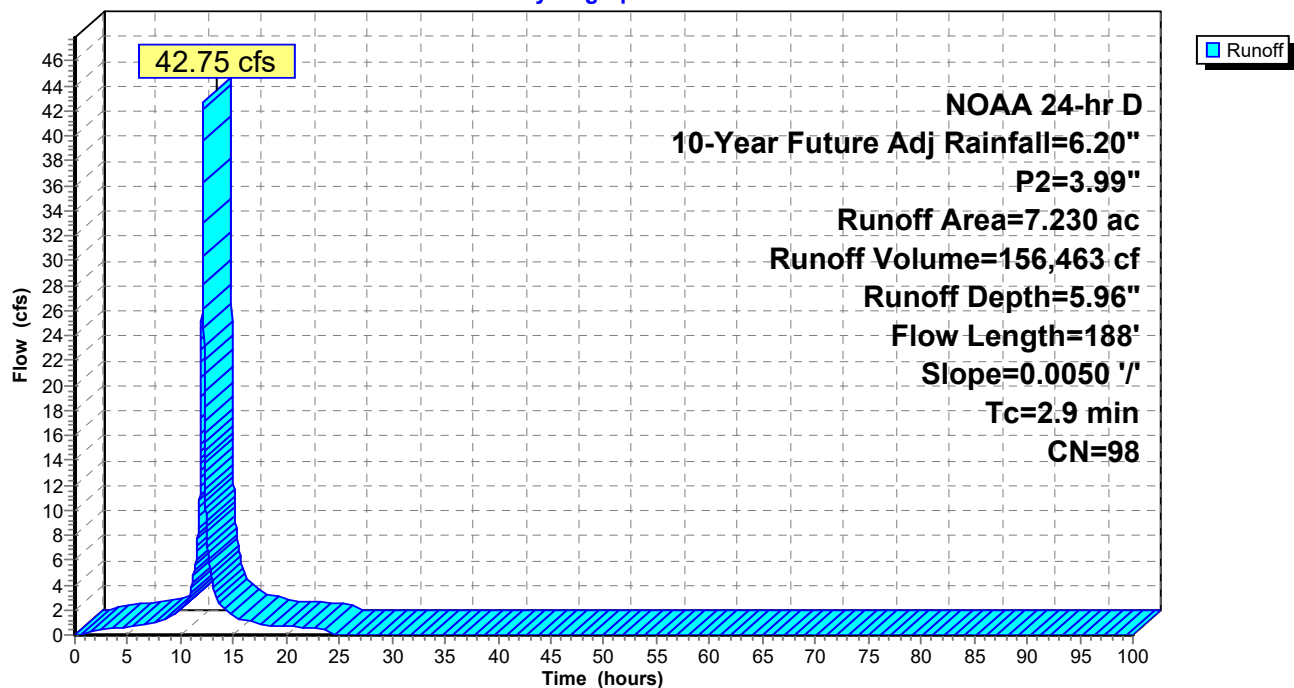
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
7.230	98	Paved parking, HSG D
7.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Di:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Dp:

Runoff = 3.47 cfs @ 12.13 hrs, Volume= 12,271 cf, Depth= 3.76"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

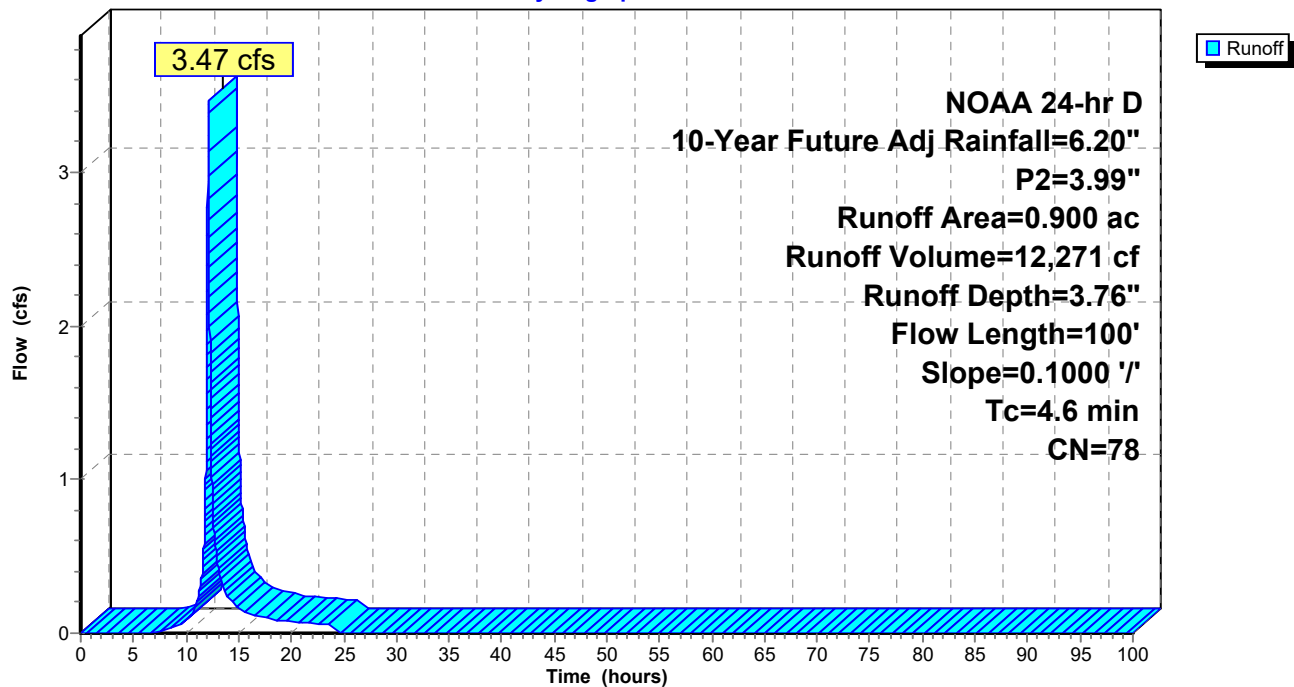
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.040	39	>75% Grass cover, Good, HSG A
0.860	80	>75% Grass cover, Good, HSG D
0.900	78	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Dp:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ei:

Runoff = 4.93 cfs @ 12.10 hrs, Volume= 16,447 cf, Depth= 5.96"
Routed to Pond PP1 : POROUS PAVEMENT

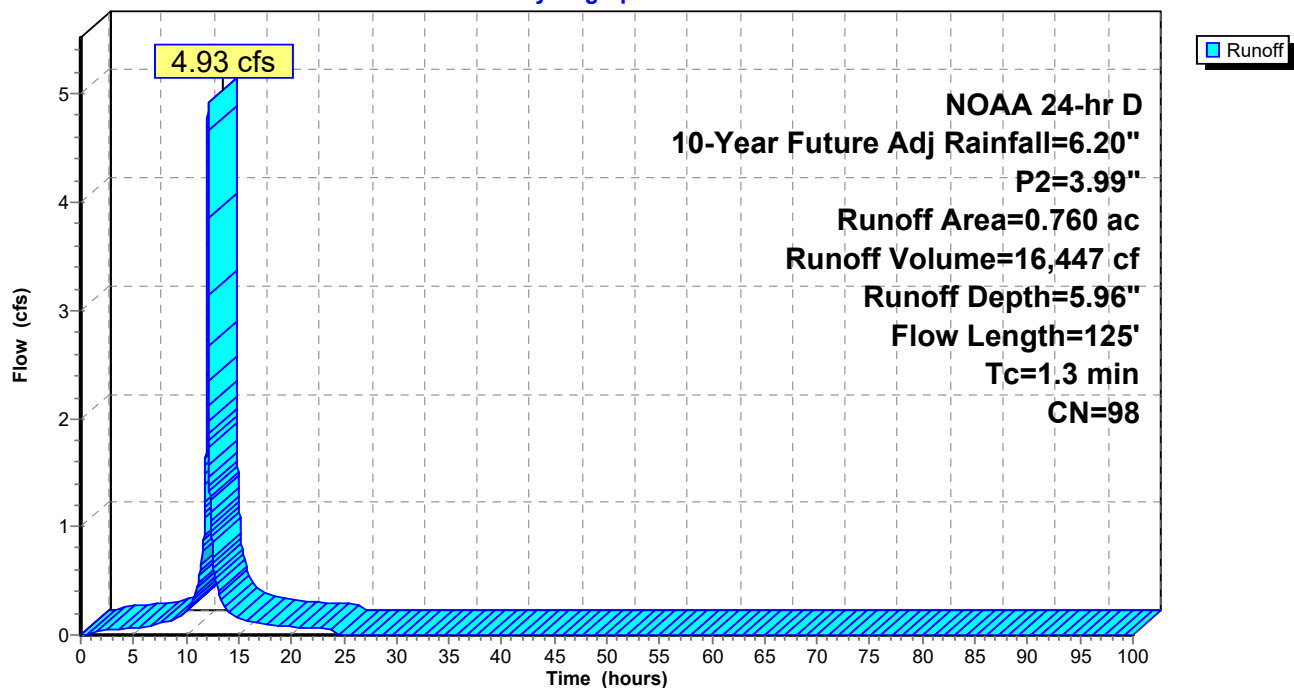
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG D
0.760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	68	0.0200	1.42		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	57	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment P1Ei:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ep:

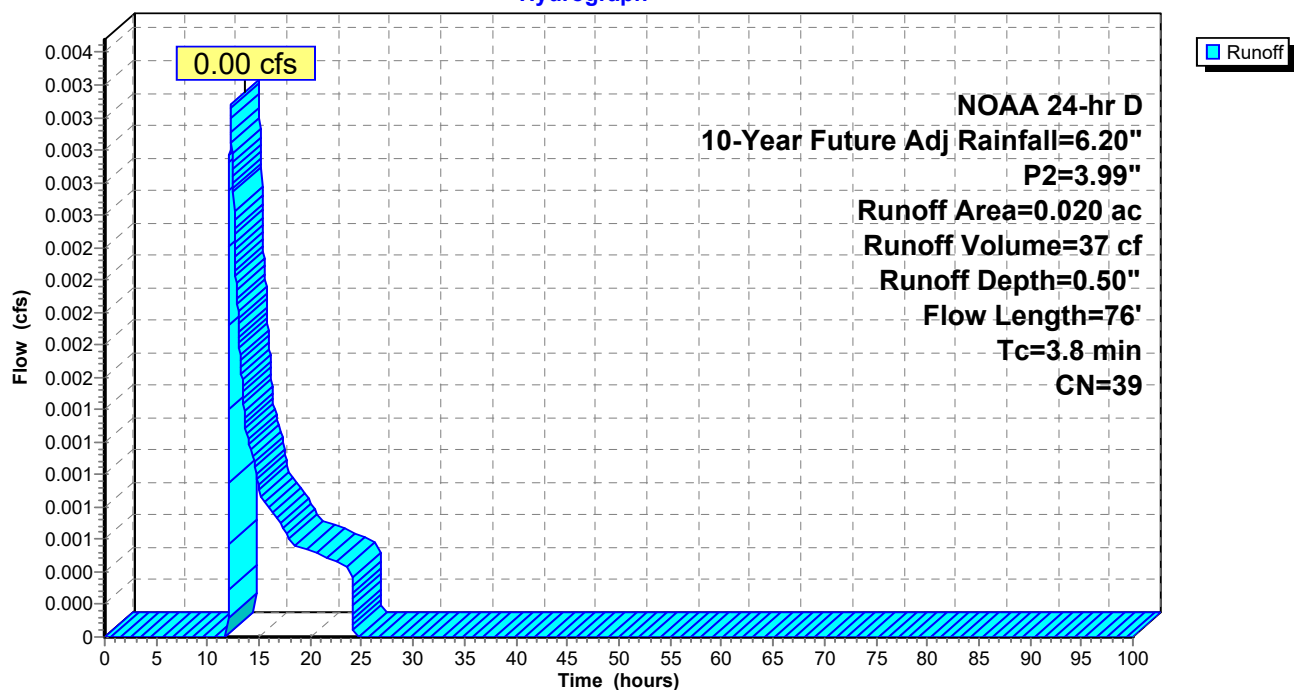
Runoff = 0.00 cfs @ 12.23 hrs, Volume= 37 cf, Depth= 0.50"
Routed to Pond PP1 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description			
0.020	39	>75% Grass cover, Good, HSG A			
0.020		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	31	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	45	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.8	76	Total			

Subcatchment P1Ep:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Fi:

Runoff = 10.89 cfs @ 12.10 hrs, Volume= 36,357 cf, Depth= 5.96"
Routed to Pond PP2 : POROUS PAVEMENT

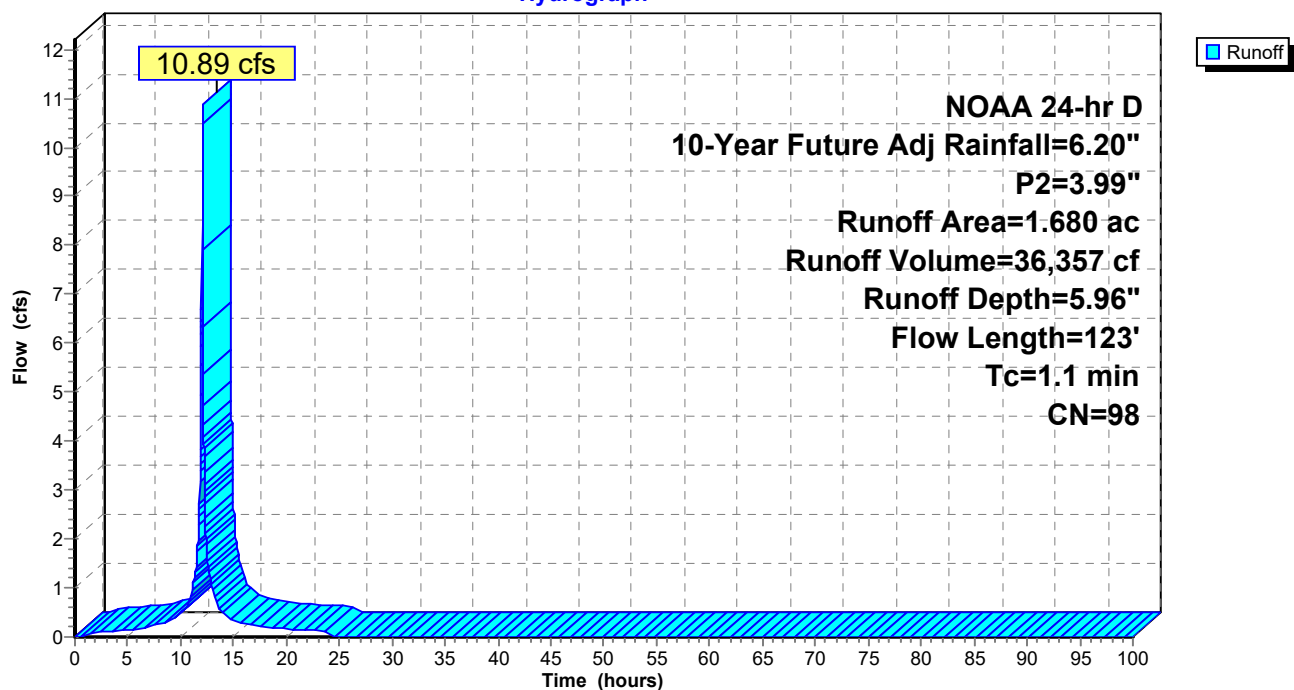
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
1.680	98	Paved parking, HSG D
1.680		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	68	0.0333	1.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	123	Total			

Subcatchment P1Fi:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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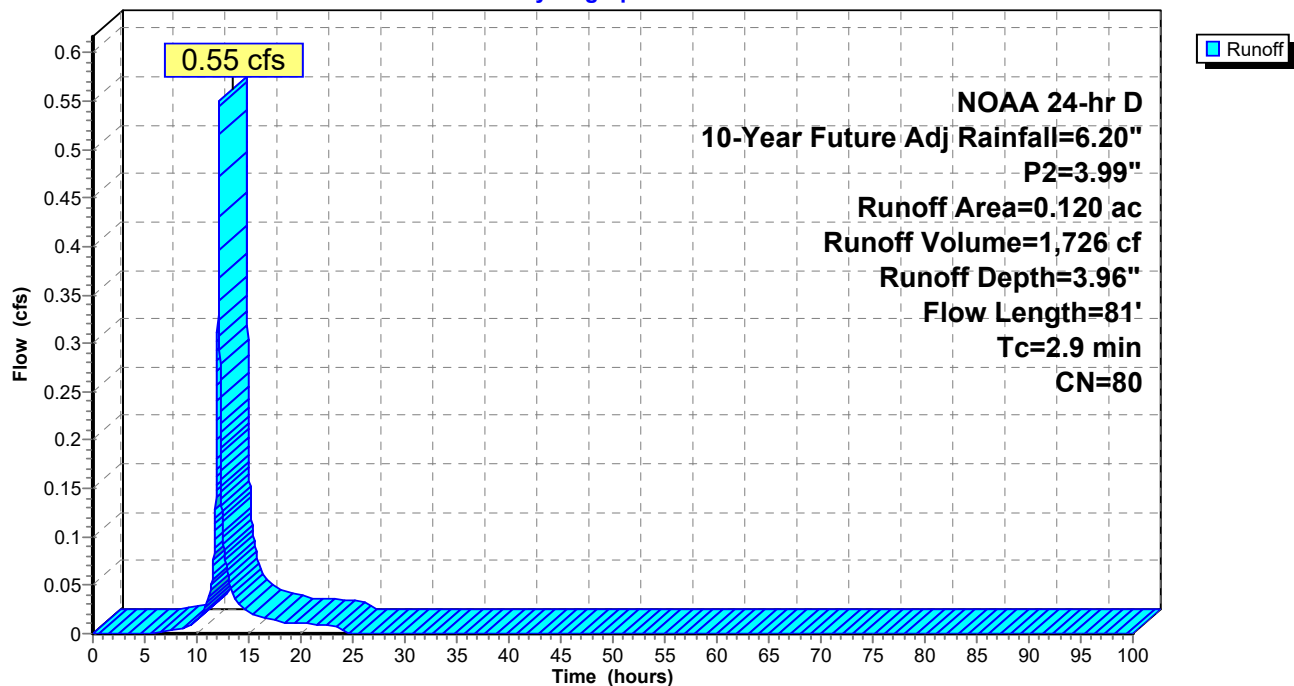
Summary for Subcatchment P1Fp:

Runoff = 0.55 cfs @ 12.11 hrs, Volume= 1,726 cf, Depth= 3.96"
Routed to Pond PP2 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.120	80	>75% Grass cover, Good, HSG D
0.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	43	0.0333	1.59		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	20	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	81	Total			

Subcatchment P1Fp:**Hydrograph**

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Gi:

Runoff = 4.53 cfs @ 12.10 hrs, Volume= 15,149 cf, Depth= 5.96"
Routed to Pond PP3 : POROUS PAVEMENT

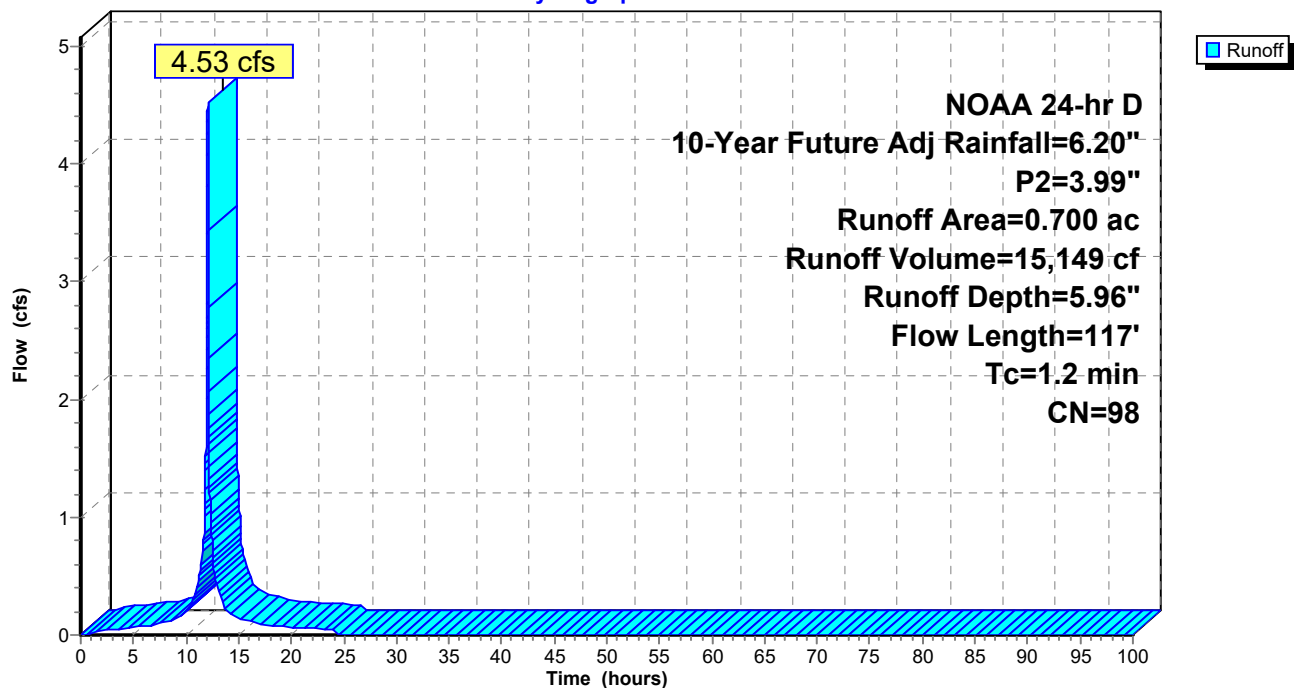
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	69	0.0250	1.56		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	48	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	117	Total			

Subcatchment P1Gi:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Gp:

Runoff = 0.13 cfs @ 12.12 hrs, Volume= 431 cf, Depth= 3.96"
Routed to Pond PP3 : POROUS PAVEMENT

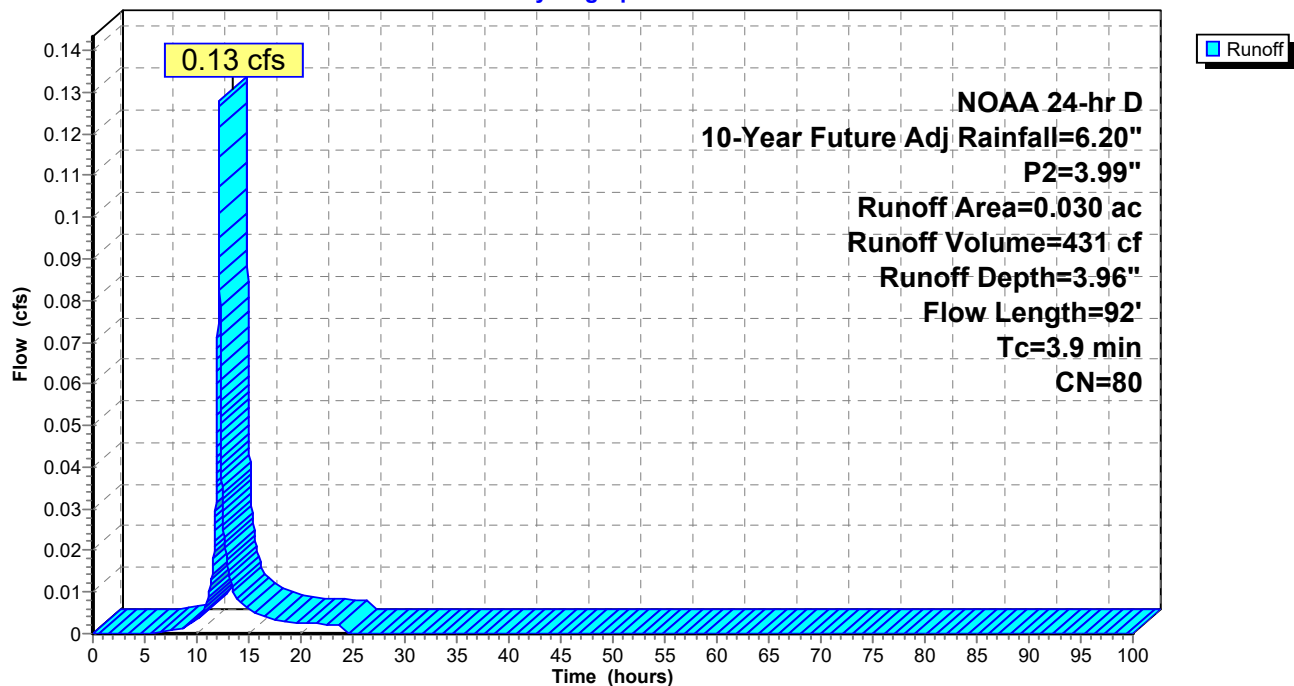
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.030	80	>75% Grass cover, Good, HSG D
0.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	29	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	8	0.0250	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	92	Total			

Subcatchment P1Gp:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Hi:

Runoff = 67.54 cfs @ 12.10 hrs, Volume= 230,041 cf, Depth= 5.96"
Routed to Pond PP4 : POROUS PAVEMENT

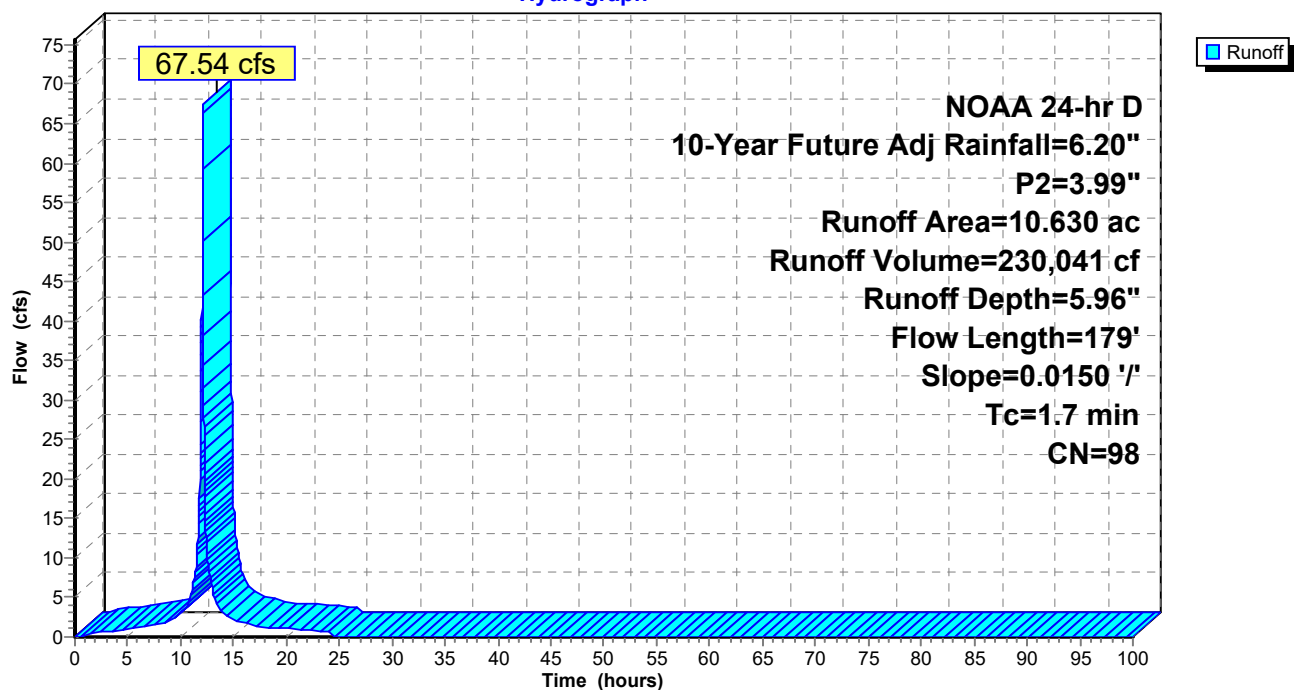
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
10.630	98	Paved parking, HSG D
10.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.37		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	79	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.7	179	Total			

Subcatchment P1Hi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Hp:

Runoff = 0.87 cfs @ 12.14 hrs, Volume= 3,233 cf, Depth= 2.41"
Routed to Pond PP4 : POROUS PAVEMENT

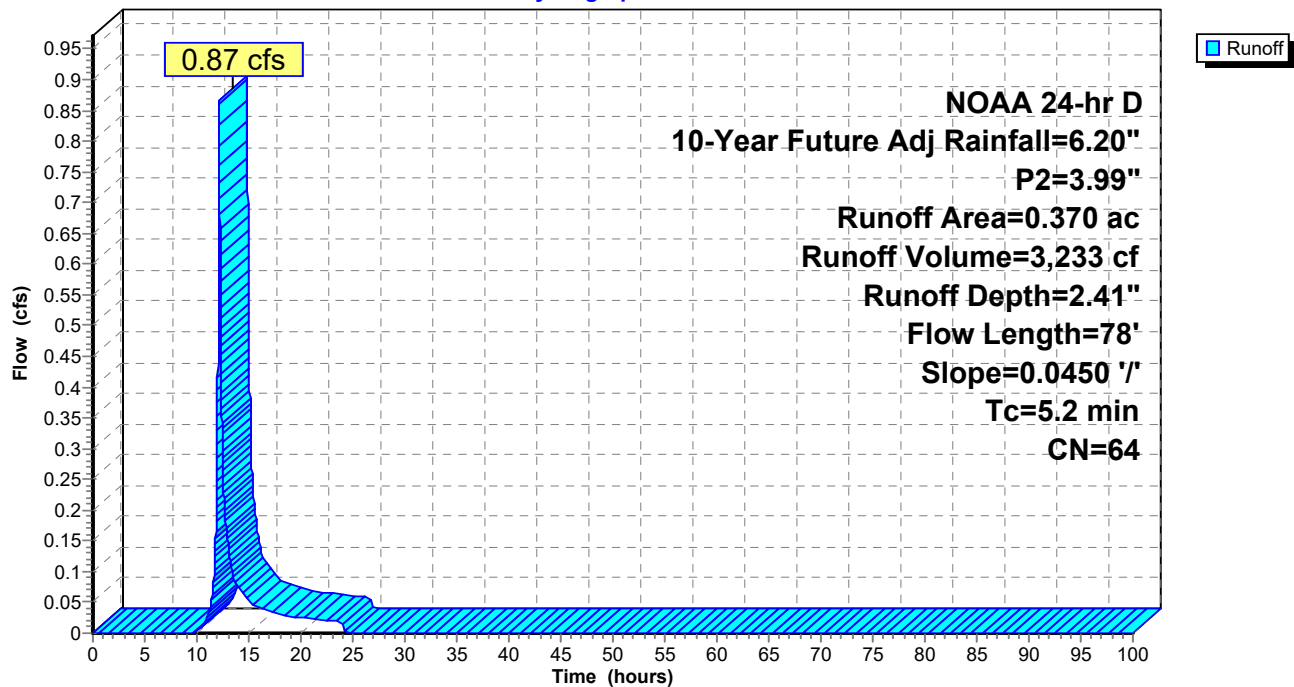
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.230	80	>75% Grass cover, Good, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.370	64	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	78	0.0450	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Hp:

Hydrograph



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Summary for Subcatchment P1li:

Runoff = 4.81 cfs @ 12.09 hrs, Volume= 16,014 cf, Depth= 5.96"
Routed to Pond PP5 : POROUS PAVEMENT

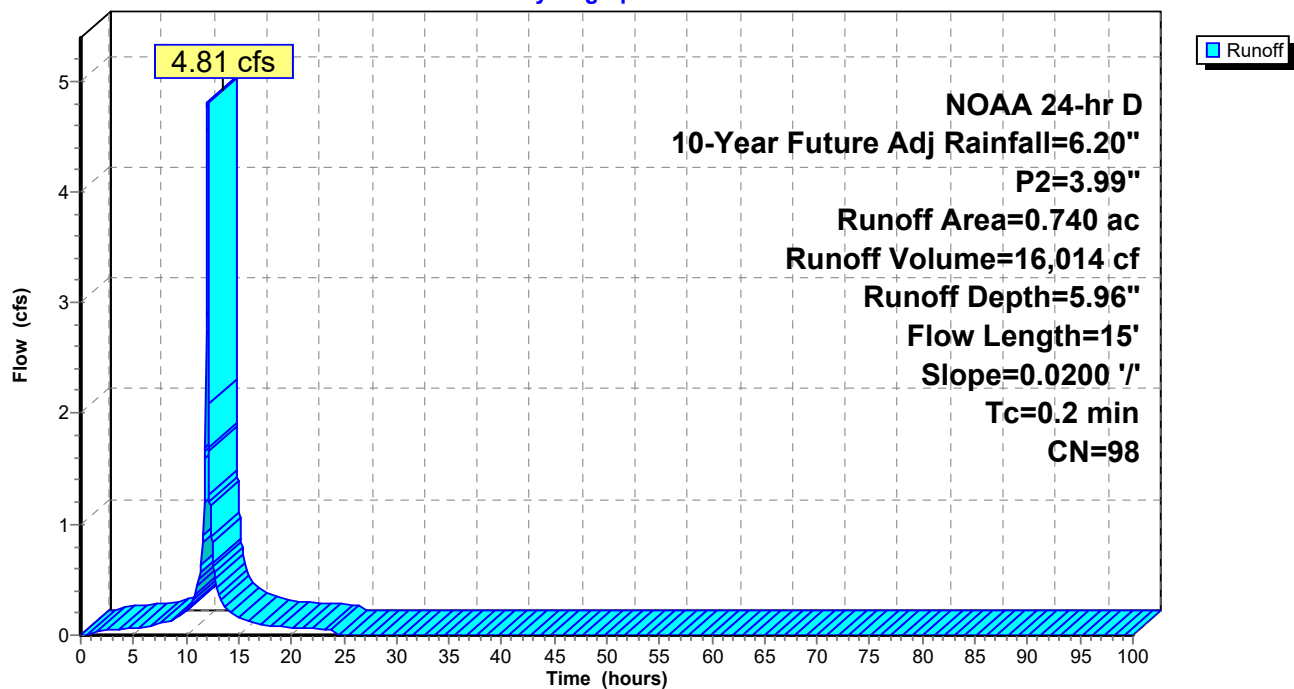
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
0.740		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1li:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1lp:

Runoff = 0.10 cfs @ 12.10 hrs, Volume= 288 cf, Depth= 3.96"
Routed to Pond PP5 : POROUS PAVEMENT

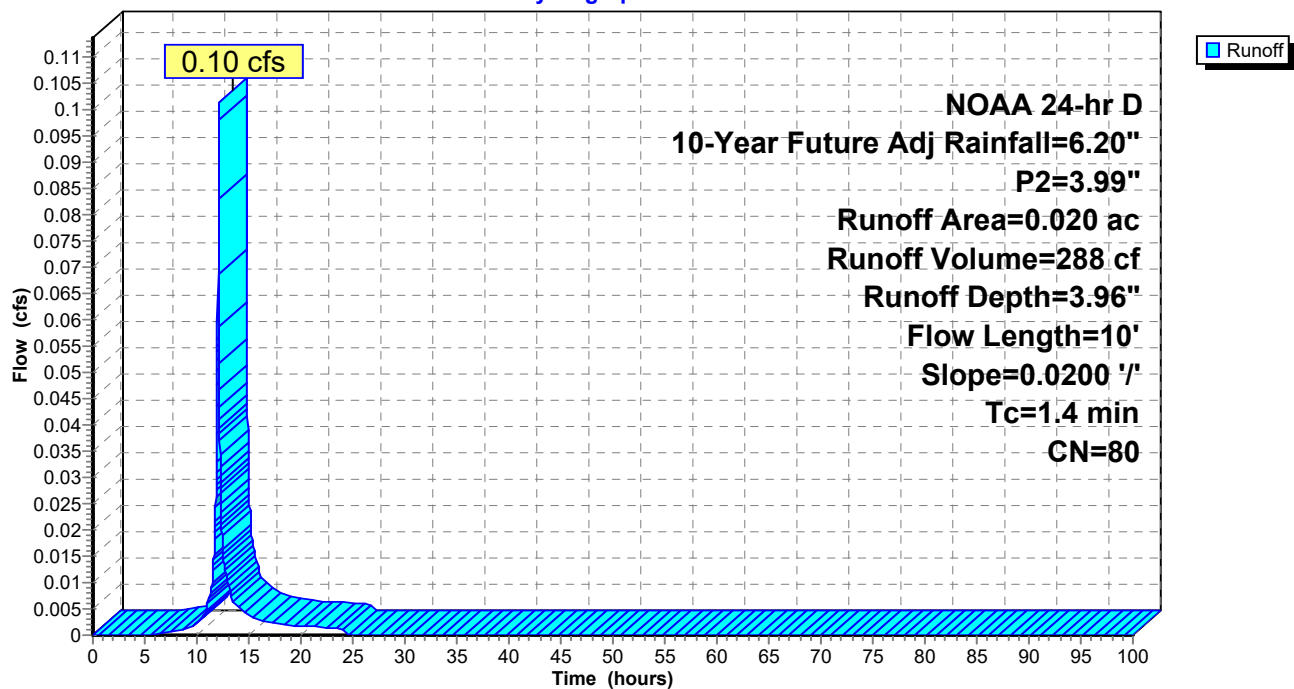
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.020	80	>75% Grass cover, Good, HSG D
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1lp:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ji:

Runoff = 5.66 cfs @ 12.09 hrs, Volume= 18,827 cf, Depth= 5.96"
Routed to Pond PP6 : POROUS PAVEMENT

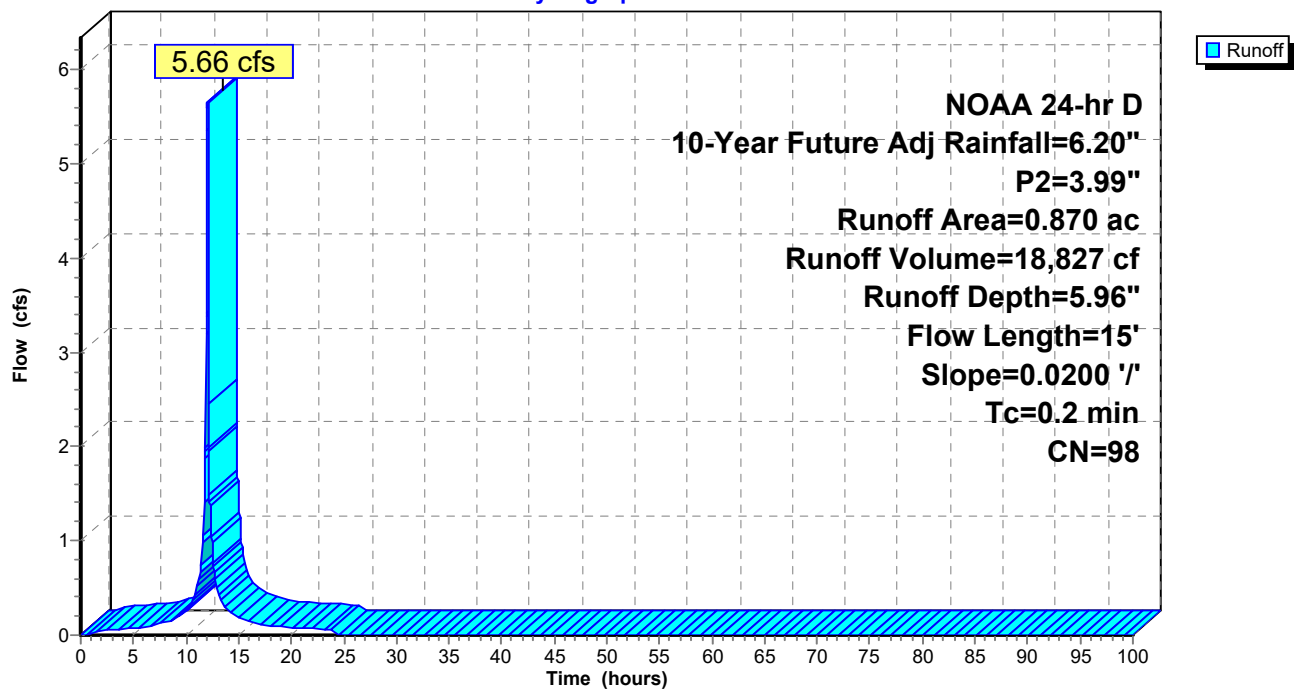
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.870	98	Paved parking, HSG D
0.870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Ji:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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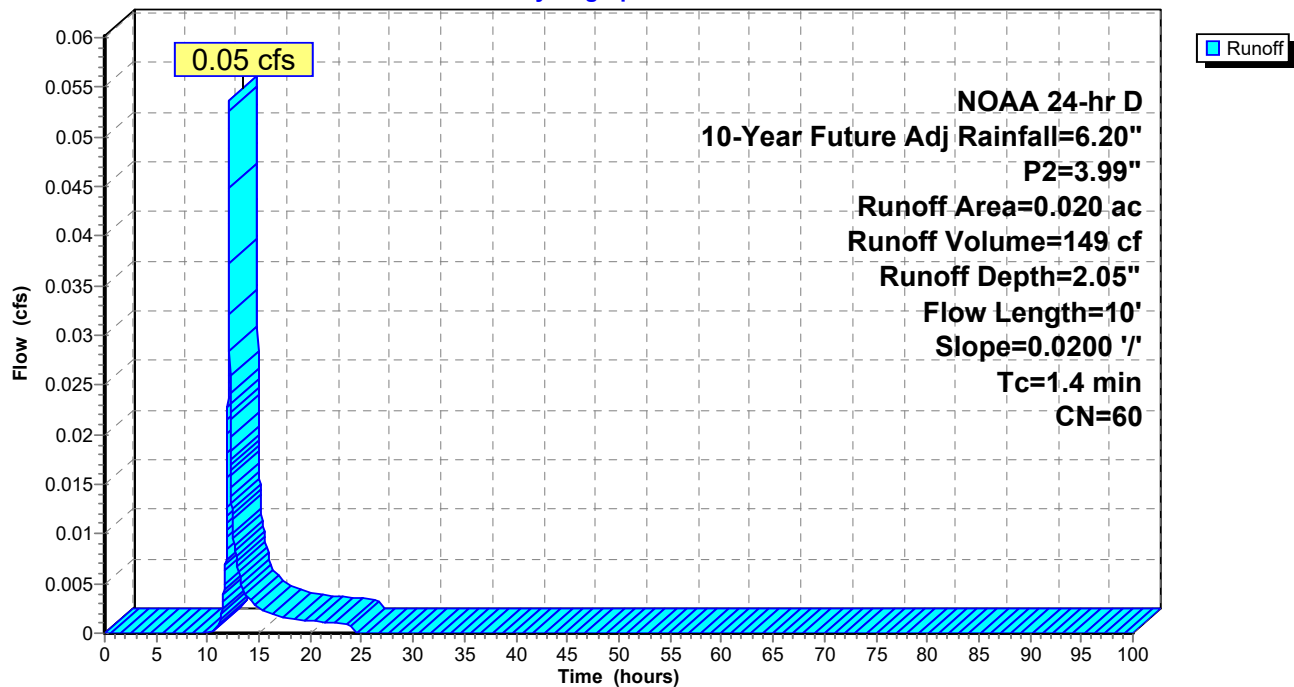
Summary for Subcatchment P1Jp:

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 149 cf, Depth= 2.05"
Routed to Pond PP6 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.010	80	>75% Grass cover, Good, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.020	60	Weighted Average
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Jp:**Hydrograph**

Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ki:

Runoff = 15.57 cfs @ 12.10 hrs, Volume= 52,154 cf, Depth= 5.96"
Routed to Pond B1 : UG BASIN

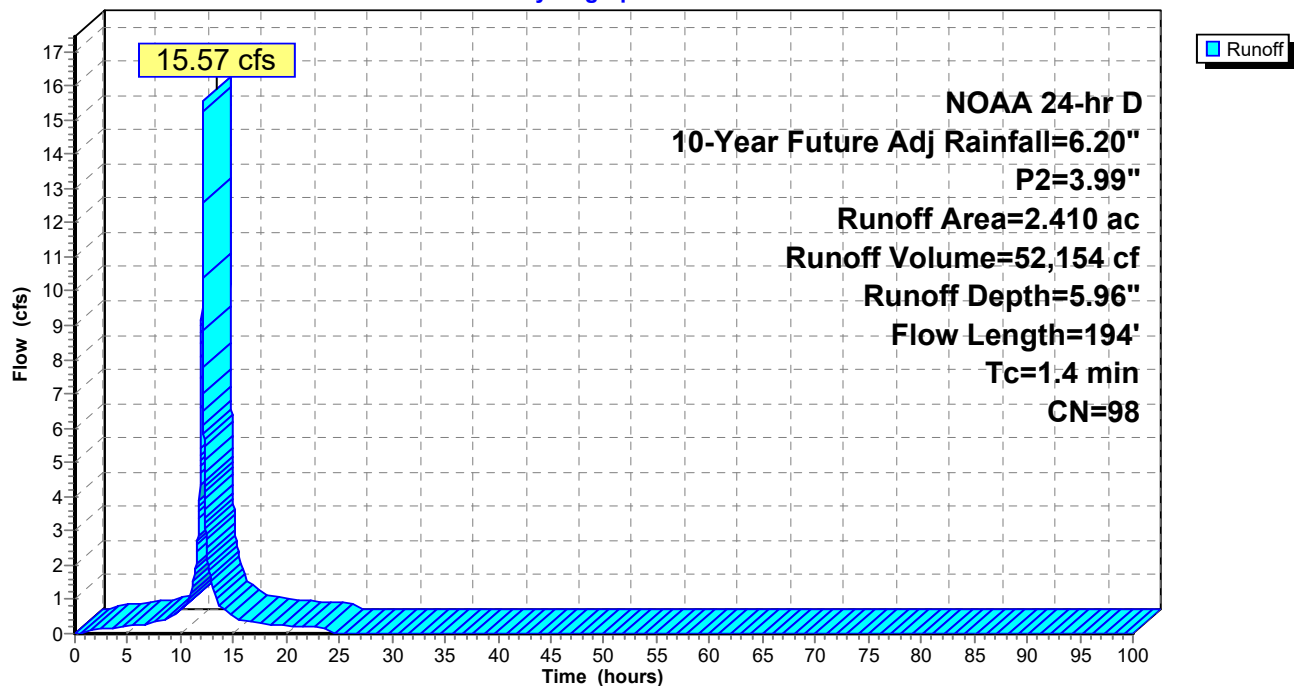
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
2.410	98	Paved parking, HSG D
2.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	72	0.0250	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	55	0.0350	3.80		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	67	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	194	Total			

Subcatchment P1Ki:

Hydrograph



Pre vs Post Rev. 3a

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Kp:

Runoff = 0.28 cfs @ 12.11 hrs, Volume= 863 cf, Depth= 3.96"
Routed to Pond B1 : UG BASIN

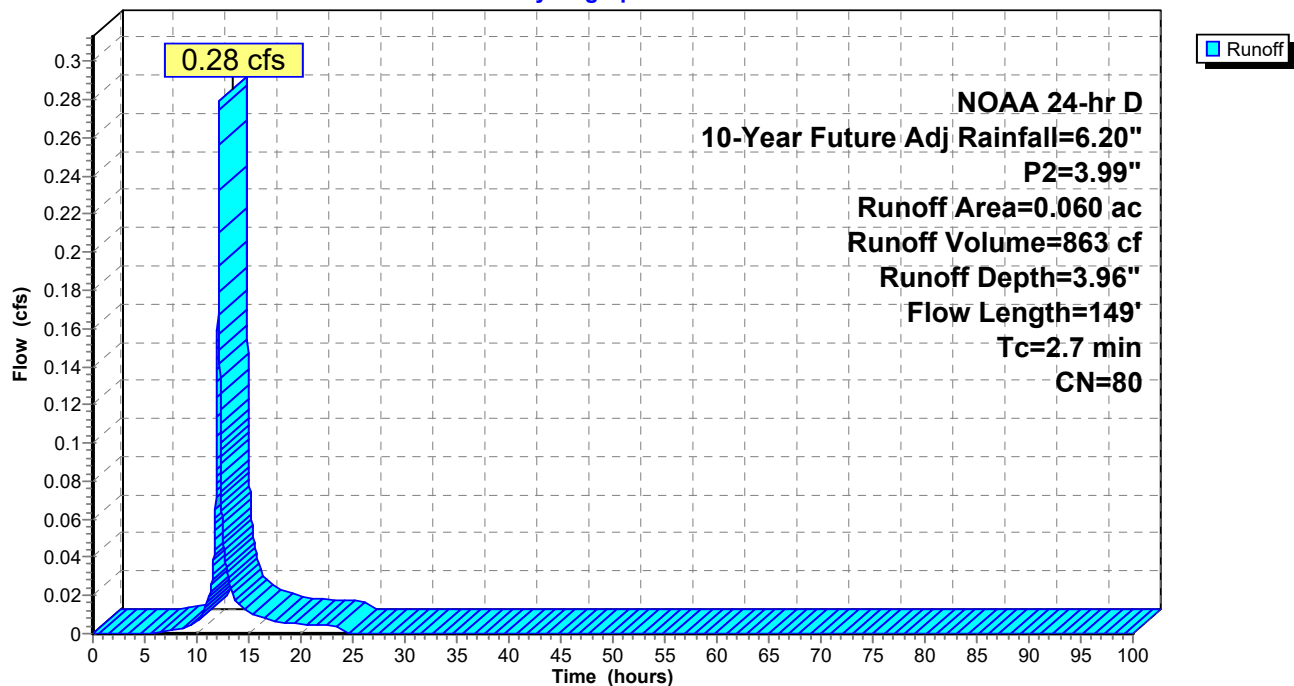
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0250	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.7	67	0.0250	1.55		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	69	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	149	Total			

Subcatchment P1Kp:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Li:

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 3,679 cf, Depth= 5.96"

Routed to Link P1A :

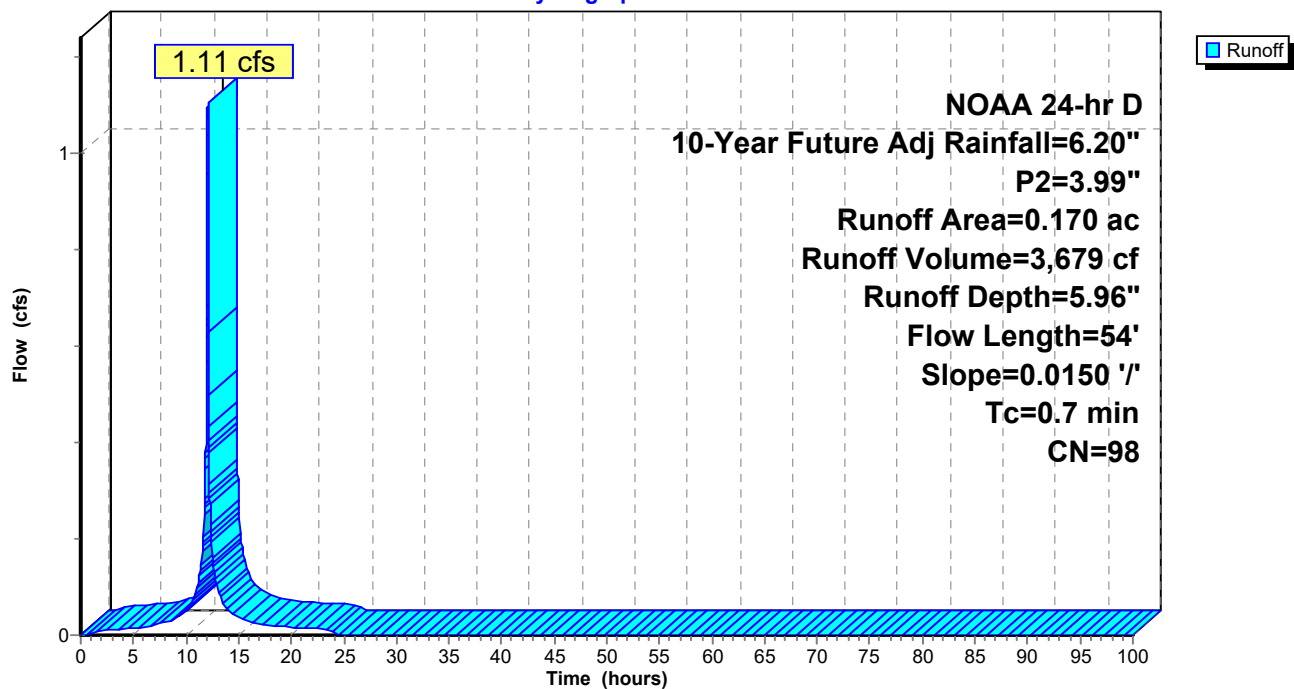
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.170	98	Paved parking, HSG D
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	54	0.0150	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Li:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Lp:

Runoff = 3.79 cfs @ 12.20 hrs, Volume= 19,818 cf, Depth= 2.23"
Routed to Link P1A :

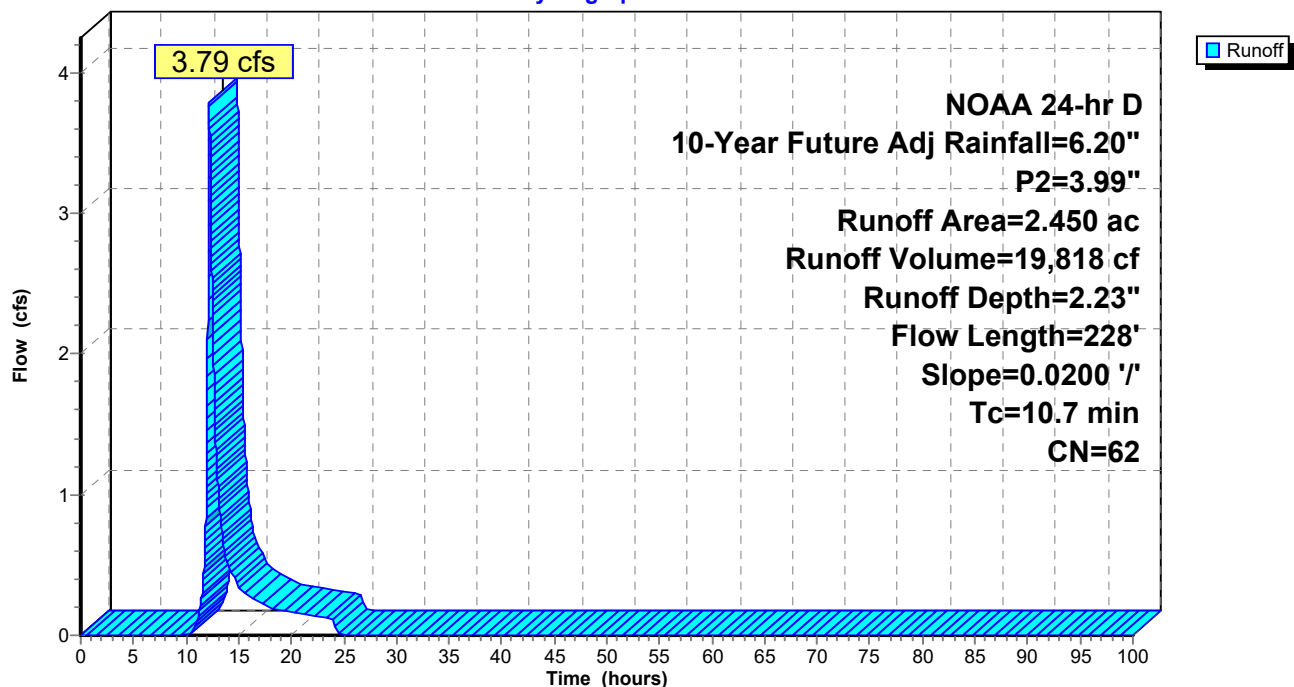
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
1.360	80	>75% Grass cover, Good, HSG D
1.090	39	>75% Grass cover, Good, HSG A
2.450	62	Weighted Average
2.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	94	0.0200	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
2.3	134	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.7	228	Total			

Subcatchment P1Lp:

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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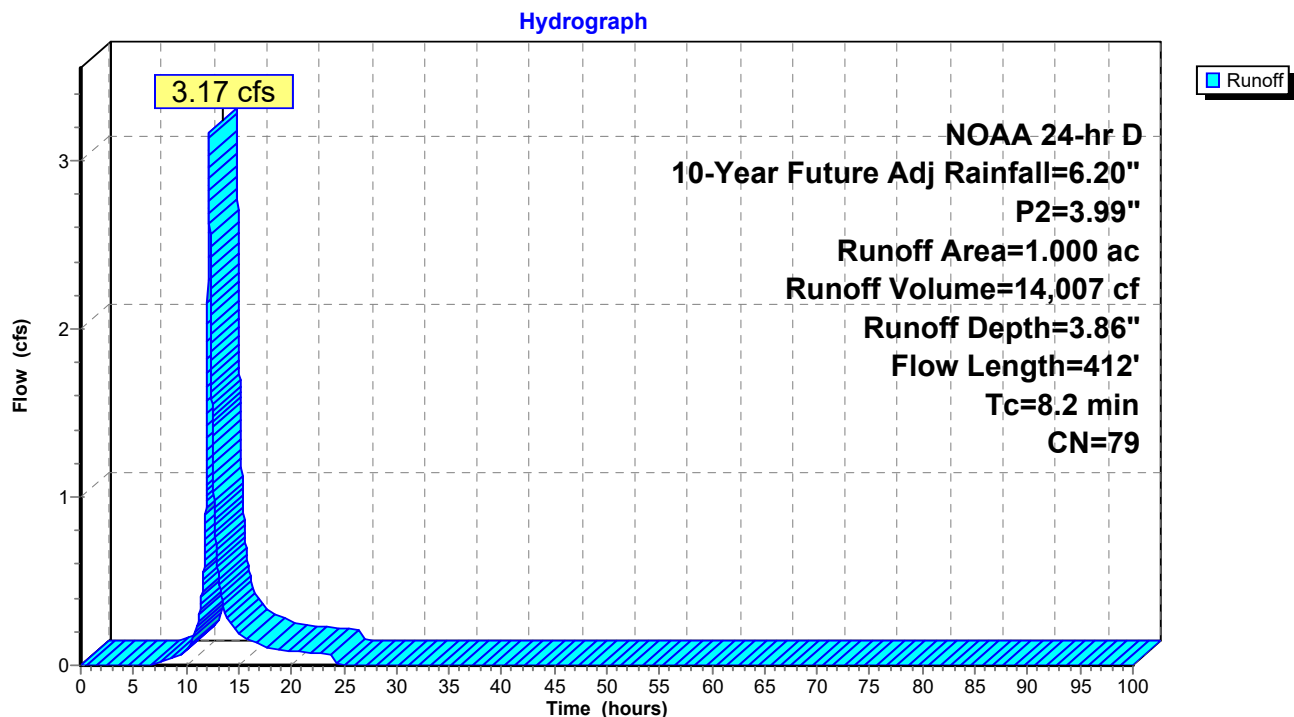
Summary for Subcatchment P1Mp:

Runoff = 3.17 cfs @ 12.17 hrs, Volume= 14,007 cf, Depth= 3.86"
Routed to Link P1A :

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.570	80	>75% Grass cover, Good, HSG D
0.430	77	Woods, Good, HSG D
1.000	79	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment P1Mp:

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Ni: PDA 4B Impervious

Runoff = 0.38 cfs @ 12.30 hrs, Volume= 2,813 cf, Depth= 5.96"
Routed to Link P1B : BYPASS

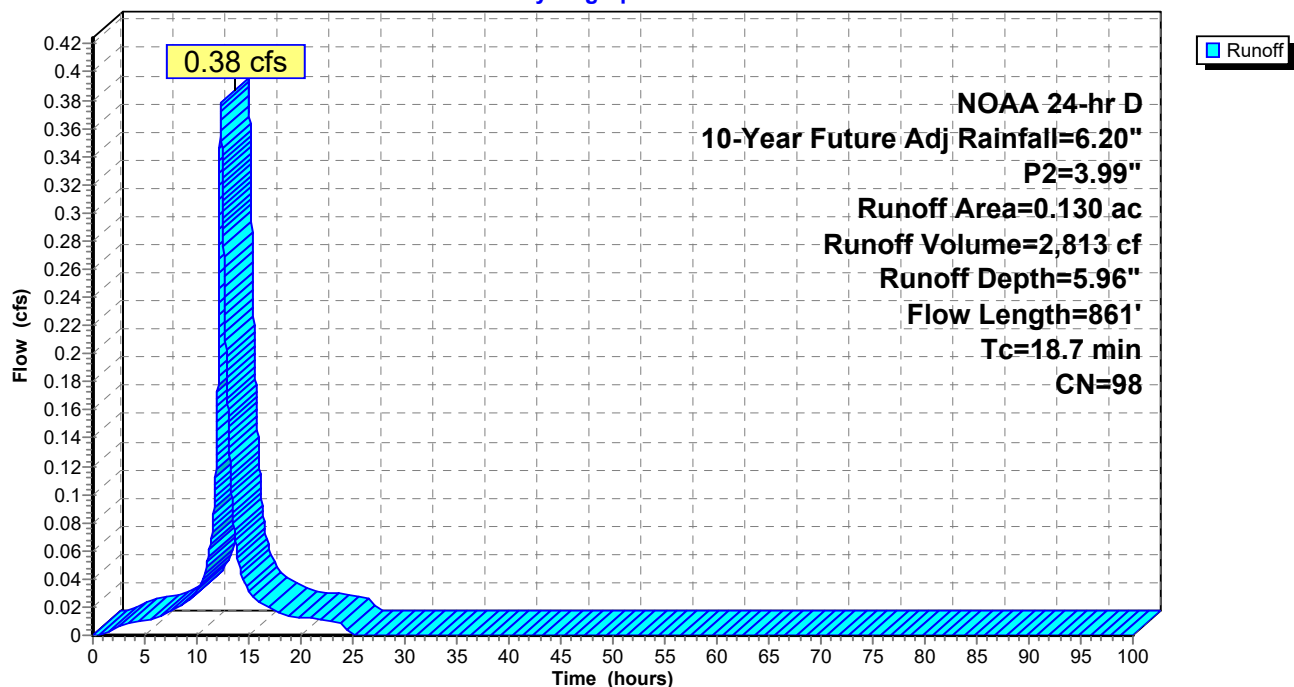
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Ni: PDA 4B Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P1Np: PDA 4B Pervious

Runoff = 15.37 cfs @ 12.30 hrs, Volume= 101,851 cf, Depth= 3.76"
Routed to Link P1B : BYPASS

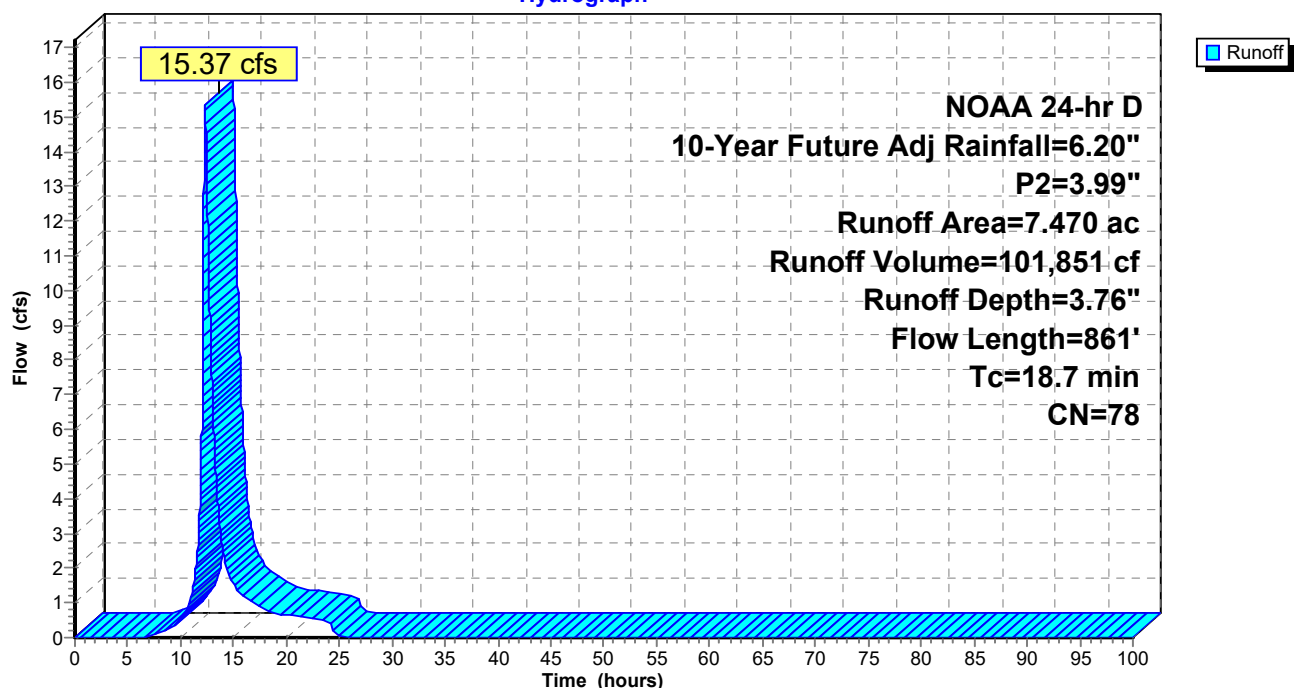
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Np: PDA 4B Pervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P2Ap: PDA 2A Pervious

Runoff = 1.72 cfs @ 12.24 hrs, Volume= 9,945 cf, Depth= 3.86"
Routed to Link P2A : PDA 2A ONSITE

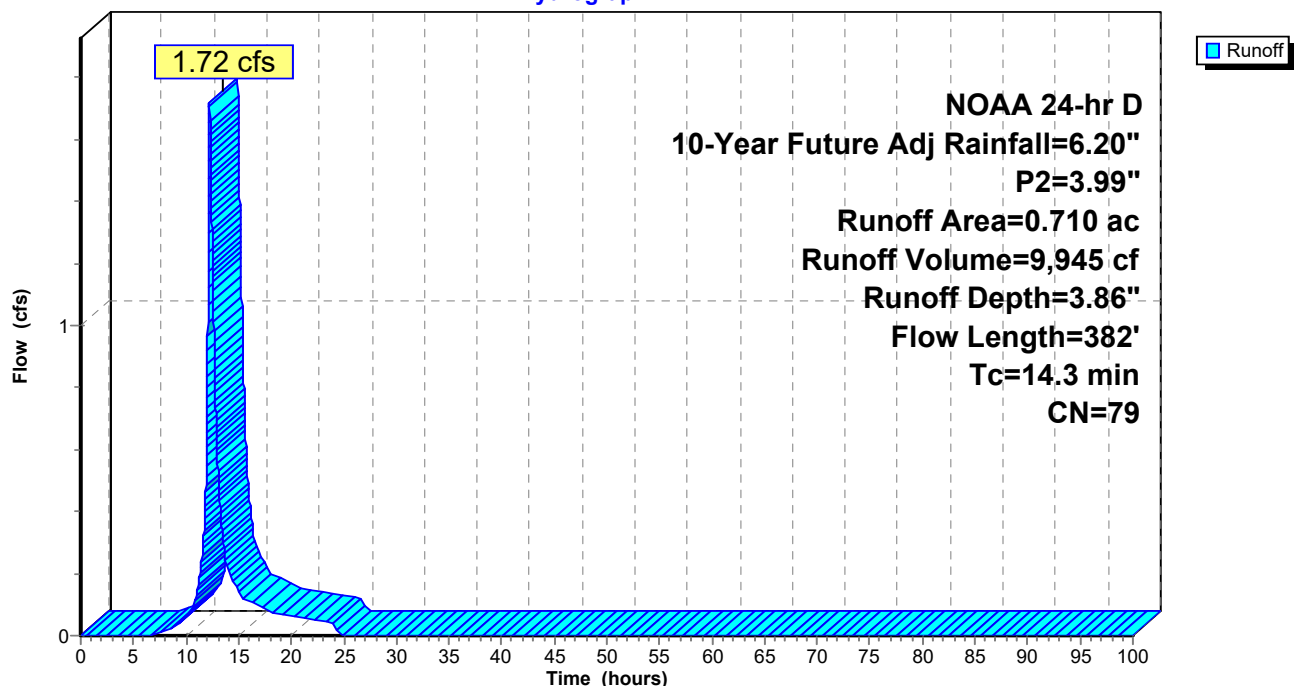
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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.360	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
0.710	79	Weighted Average
0.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment P2Ap: PDA 2A Pervious

Hydrograph



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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P2Bp: PDA 2B Pervious

Runoff = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf, Depth= 3.65"
Routed to Link P2B : BYPASS

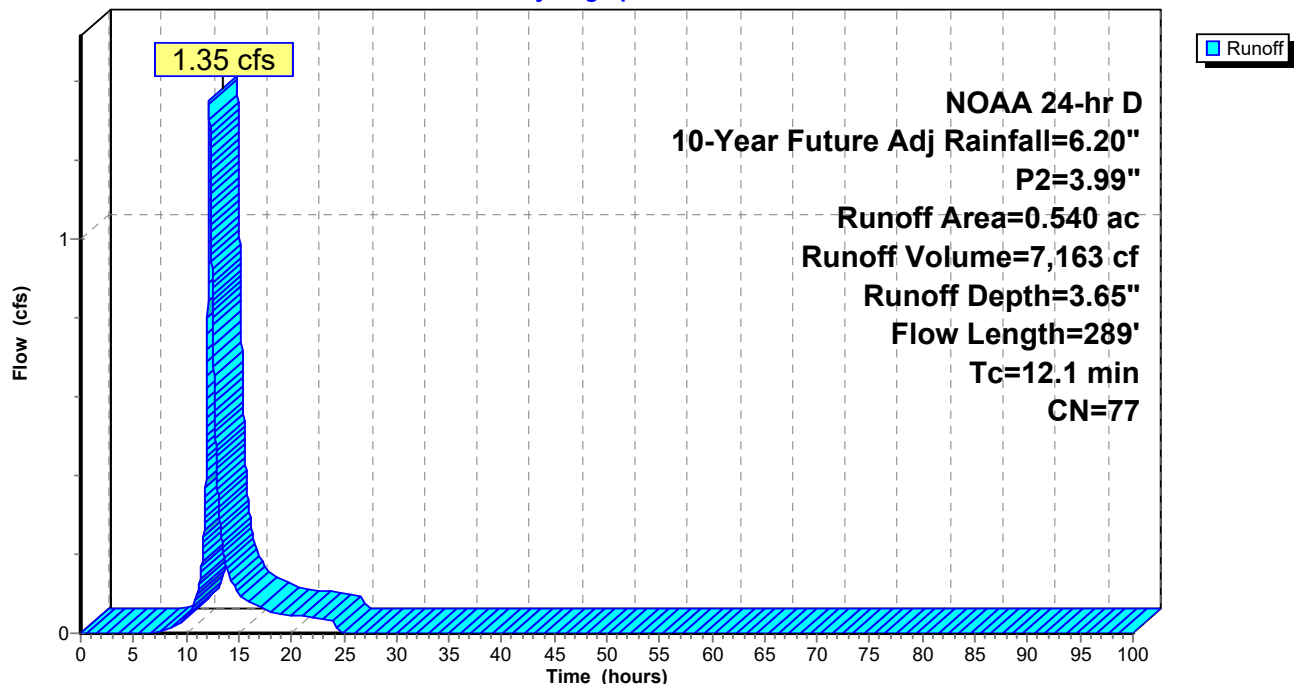
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment P2Bp: PDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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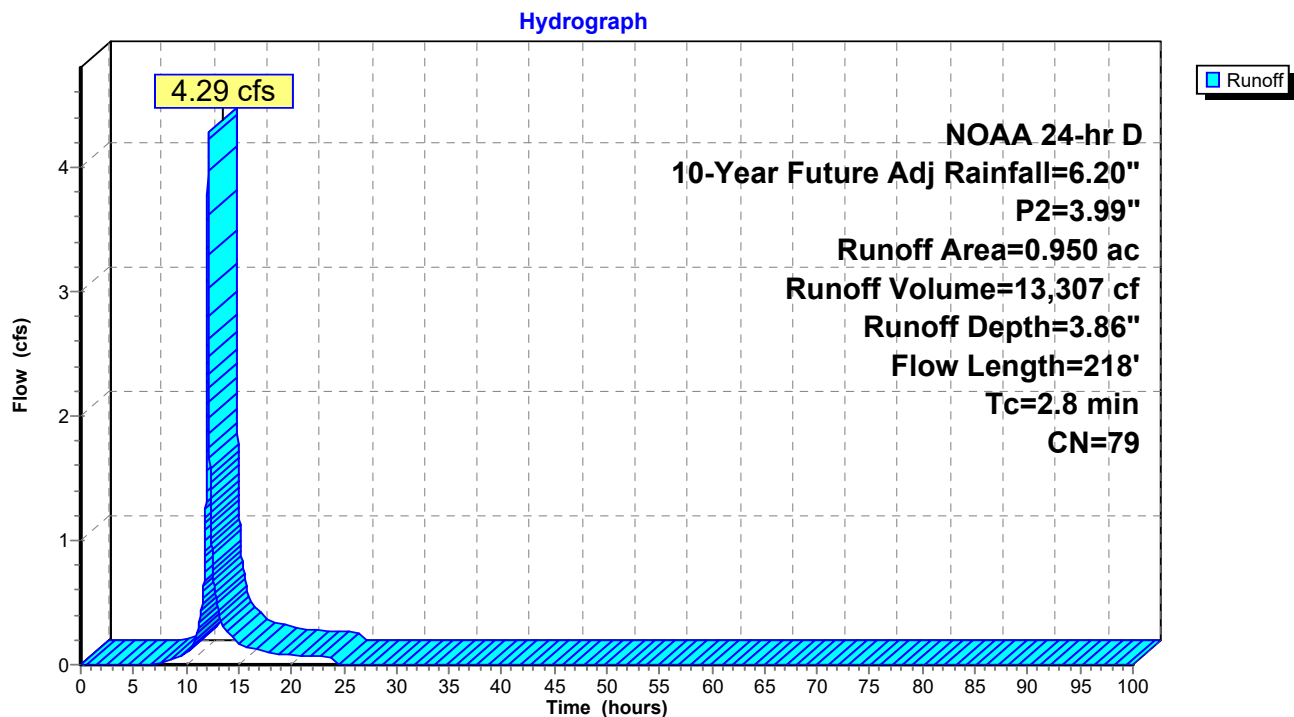
Summary for Subcatchment P3Ap: PDA 3A Pervious

Runoff = 4.29 cfs @ 12.11 hrs, Volume= 13,307 cf, Depth= 3.86"
Routed to Link P3A : PDA 3A ONSITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.430	77	Woods, Good, HSG D
0.520	80	>75% Grass cover, Good, HSG D
0.950	79	Weighted Average
0.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment P3Ap: PDA 3A Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Subcatchment P3Bp: PDA 3B Pervious

Runoff = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf, Depth= 3.35"
Routed to Link P3B : BYPASS

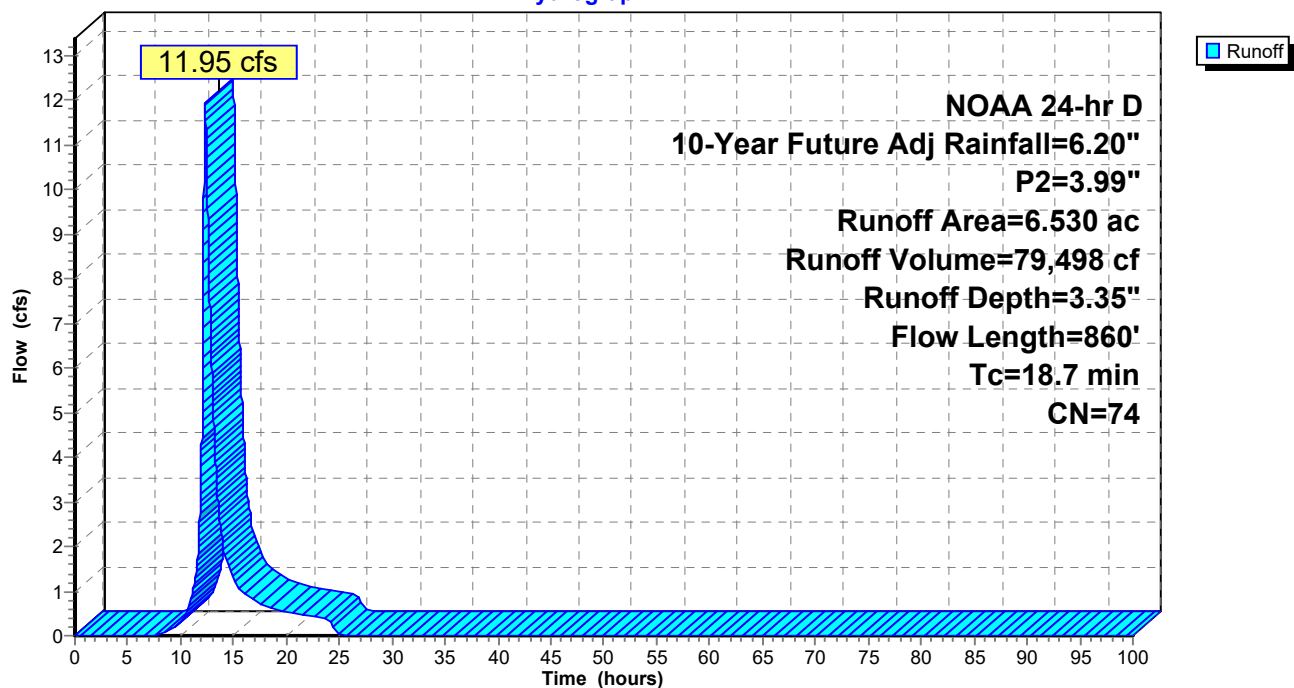
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment P3Bp: PDA 3B Pervious

Hydrograph



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Summary for Subcatchment P4p: PDA 4 Pervious

Runoff = 0.30 cfs @ 12.56 hrs, Volume= 4,118 cf, Depth= 0.50"
Routed to Link P4 : PDA 4

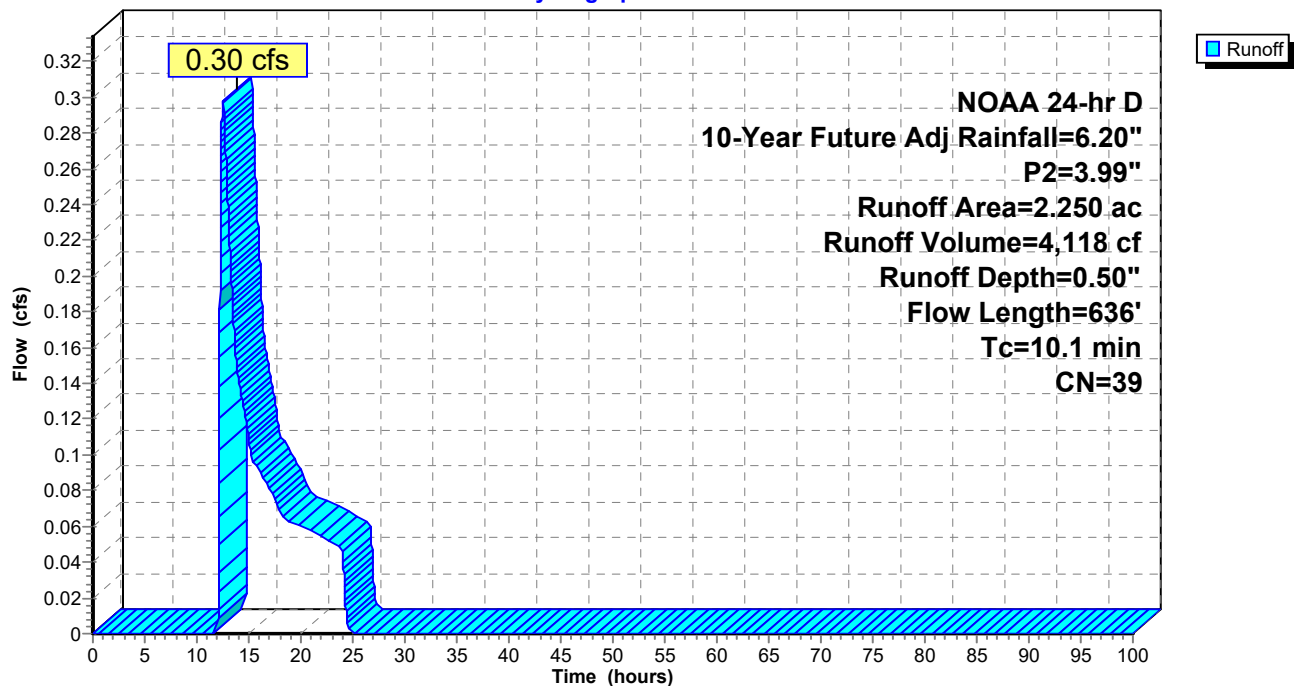
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Area (ac)	CN	Description
2.250	39	>75% Grass cover, Good, HSG A
2.250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment P4p: PDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 15.84 cfs @ 12.10 hrs, Volume= 53,017 cf
 Outflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 91%, Lag= 52.4 min
 Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.42' @ 12.97 hrs Surf.Area= 0.559 ac Storage= 0.754 af

Plug-Flow detention time= 515.1 min calculated for 43,501 cf (82% of inflow)
 Center-of-Mass det. time= 435.9 min (1,179.4 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.46 cfs @ 12.97 hrs HW=11.42' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.46 cfs of 10.93 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.93 cfs @ 4.74 fps)
- 3=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.68 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.06 fps)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

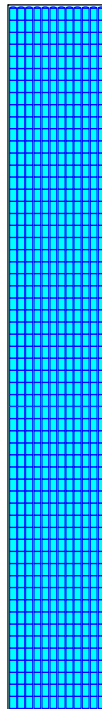
Overall Storage Efficiency = 62.5%

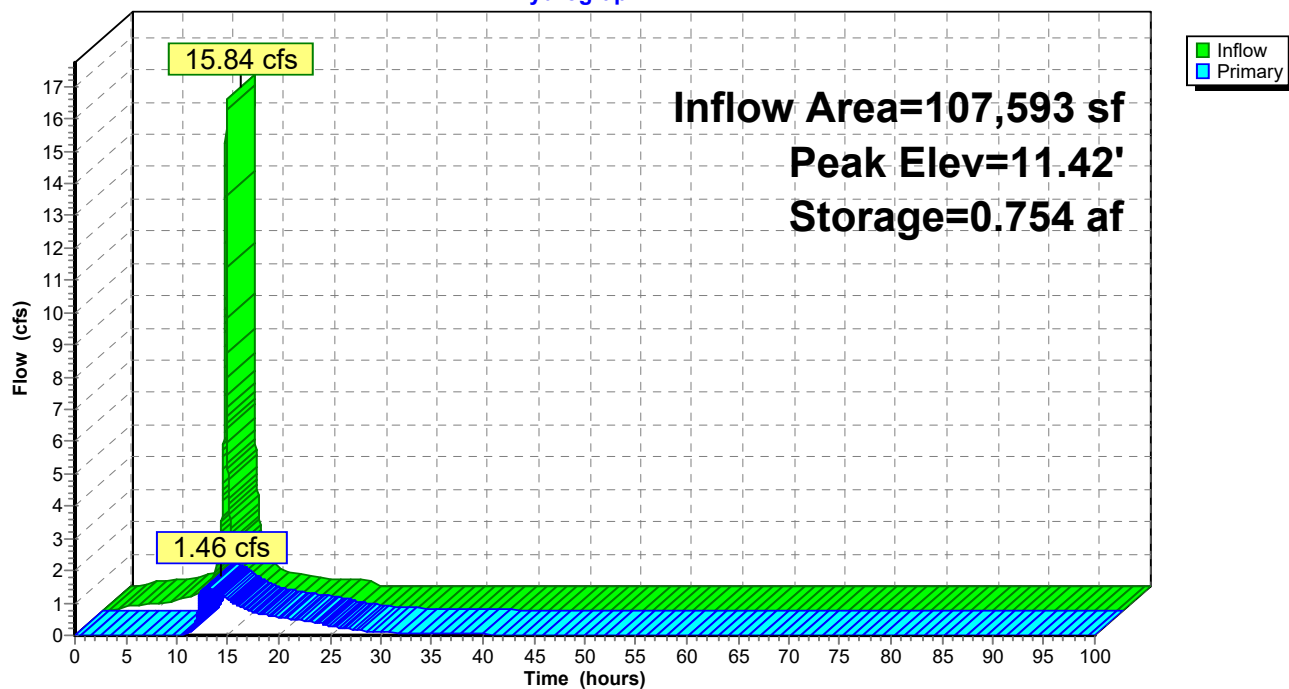
Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 7.32" for 10-Year Future Adj event
 Inflow = 43.10 cfs @ 12.11 hrs, Volume= 207,857 cf
 Outflow = 12.29 cfs @ 13.10 hrs, Volume= 205,991 cf, Atten= 71%, Lag= 59.3 min
 Primary = 12.29 cfs @ 13.10 hrs, Volume= 205,991 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.72' @ 12.71 hrs Surf.Area= 24,688 sf Storage= 83,394 cf

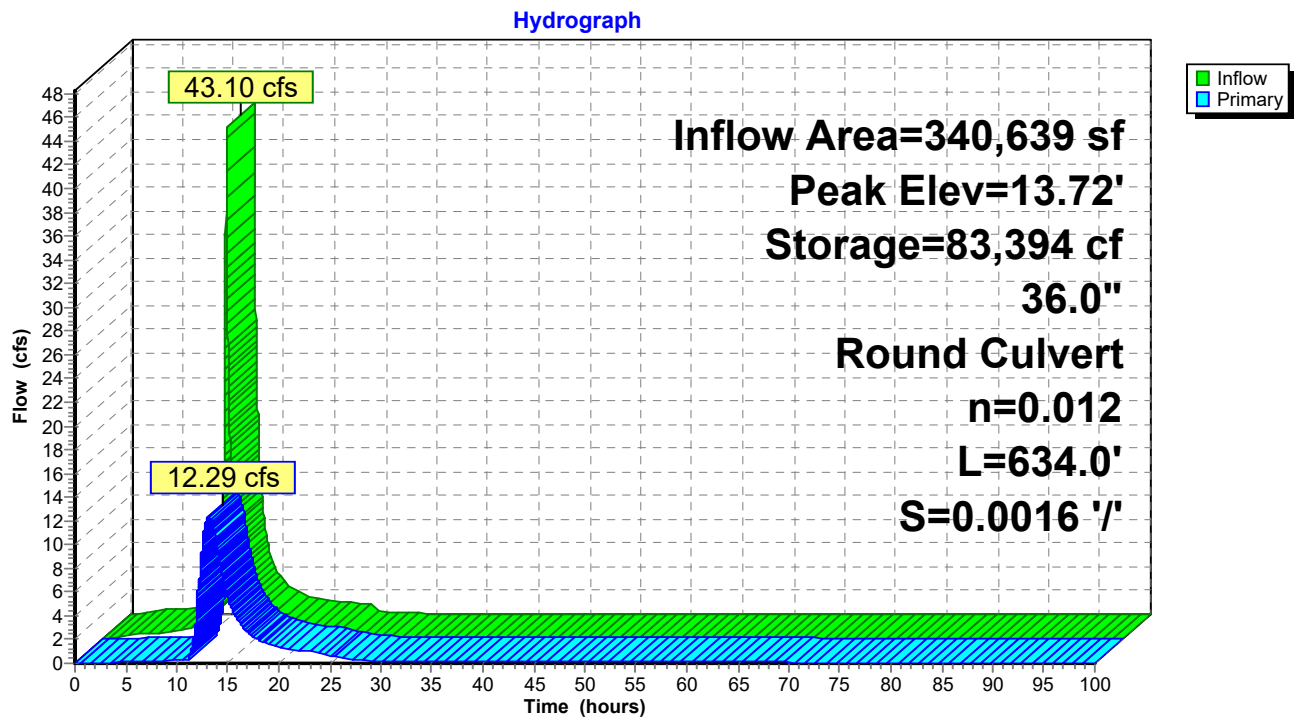
Plug-Flow detention time= 354.5 min calculated for 205,971 cf (99% of inflow)
 Center-of-Mass det. time= 343.6 min (1,159.1 - 815.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=12.45 cfs @ 13.10 hrs HW=13.57' TW=13.31' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 12.45 cfs @ 1.76 fps)

Pond CW1A: CONSTRUCTED WETLANDS 1A

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 5.06" for 10-Year Future Adj event
 Inflow = 55.50 cfs @ 12.12 hrs, Volume= 445,141 cf
 Outflow = 28.08 cfs @ 12.67 hrs, Volume= 442,882 cf, Atten= 49%, Lag= 33.3 min
 Primary = 28.08 cfs @ 12.67 hrs, Volume= 442,882 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.50' @ 12.62 hrs Surf.Area= 21,960 sf Storage= 78,636 cf

Plug-Flow detention time= 200.0 min calculated for 442,882 cf (99% of inflow)
 Center-of-Mass det. time= 179.1 min (1,153.3 - 974.1)

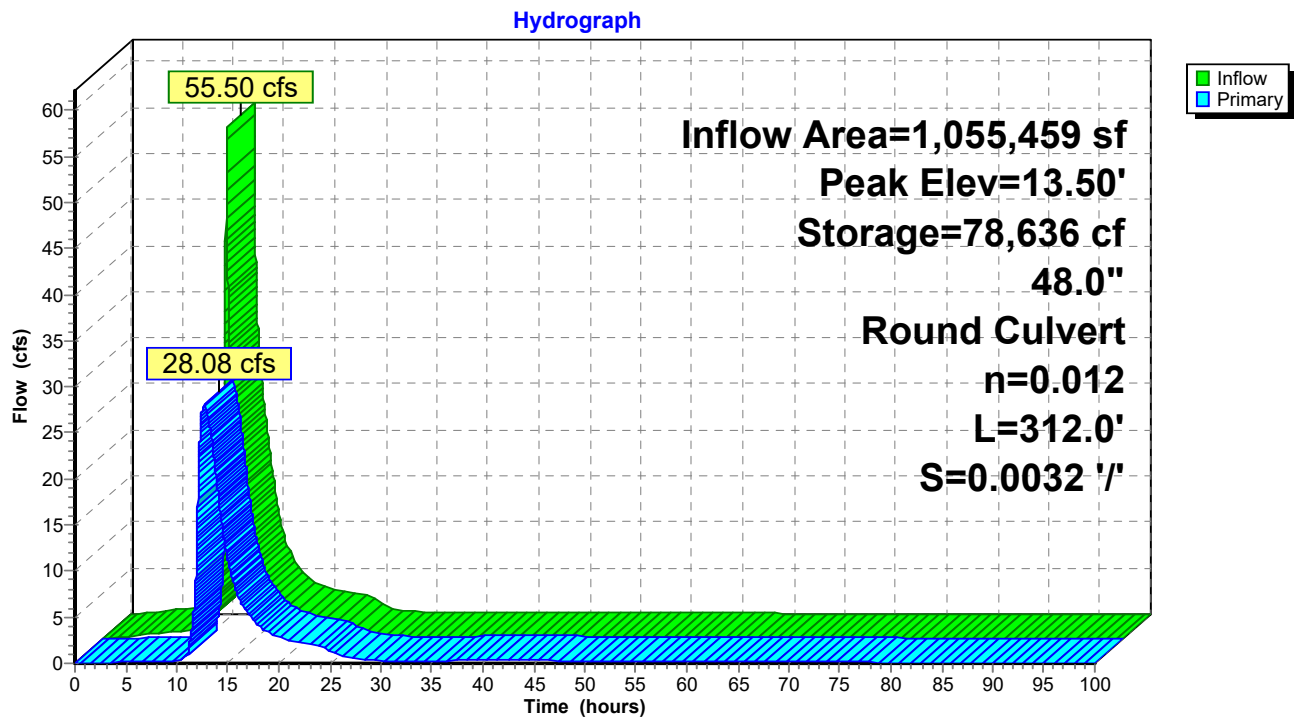
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / S= 0.0032 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=28.18 cfs @ 12.67 hrs HW=13.50' TW=13.26' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 28.18 cfs @ 2.49 fps)

Pond CW1B: CONSTRUCTED WETLANDS 1B

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 4.90" for 10-Year Future Adj event
 Inflow = 32.02 cfs @ 12.54 hrs, Volume= 519,200 cf
 Outflow = 32.18 cfs @ 12.71 hrs, Volume= 518,888 cf, Atten= 0%, Lag= 10.7 min
 Primary = 32.18 cfs @ 12.71 hrs, Volume= 518,888 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 13.26' @ 12.60 hrs Surf.Area= 8,535 sf Storage= 21,844 cf

Plug-Flow detention time= 35.9 min calculated for 518,836 cf (100% of inflow)

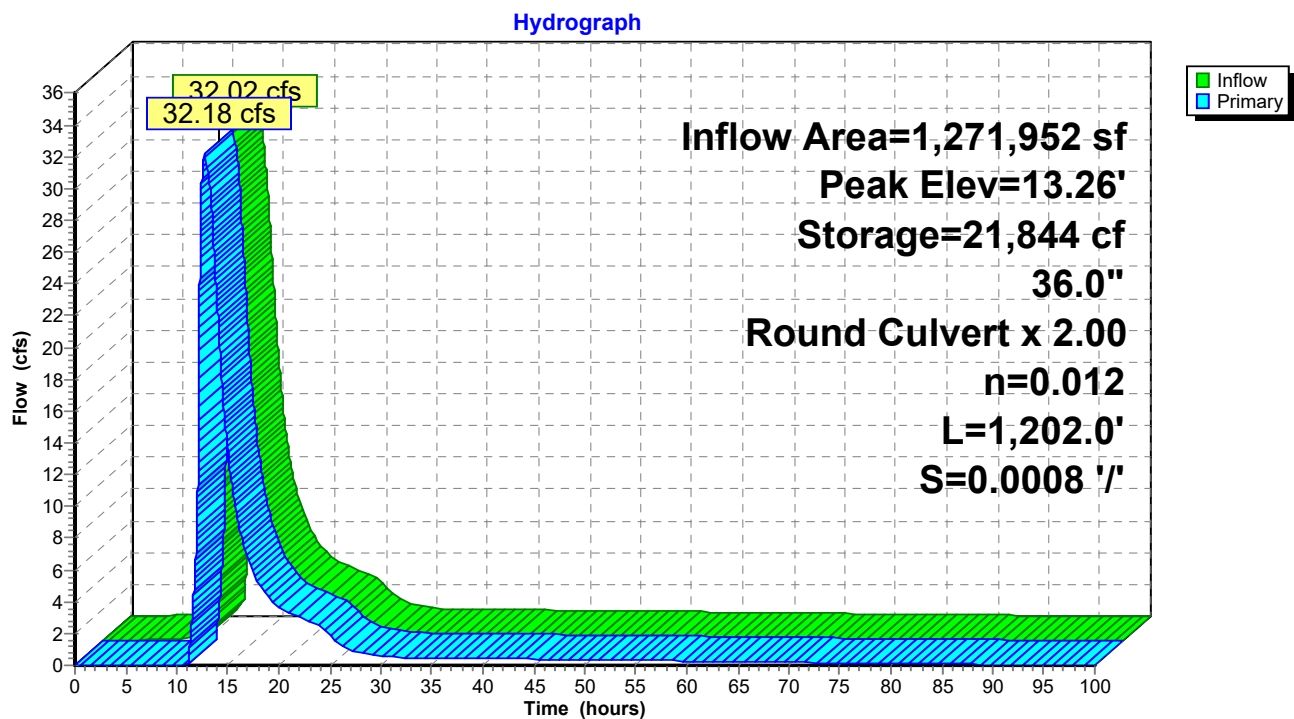
Center-of-Mass det. time= 33.1 min (1,195.8 - 1,162.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=32.23 cfs @ 12.71 hrs HW=13.25' TW=12.53' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 32.23 cfs @ 2.28 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 5.07" for 10-Year Future Adj event
 Inflow = 63.43 cfs @ 12.12 hrs, Volume= 713,988 cf
 Outflow = 44.25 cfs @ 12.28 hrs, Volume= 712,773 cf, Atten= 30%, Lag= 10.0 min
 Primary = 44.25 cfs @ 12.28 hrs, Volume= 712,773 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.61' @ 12.28 hrs Surf.Area= 22,238 sf Storage= 62,812 cf

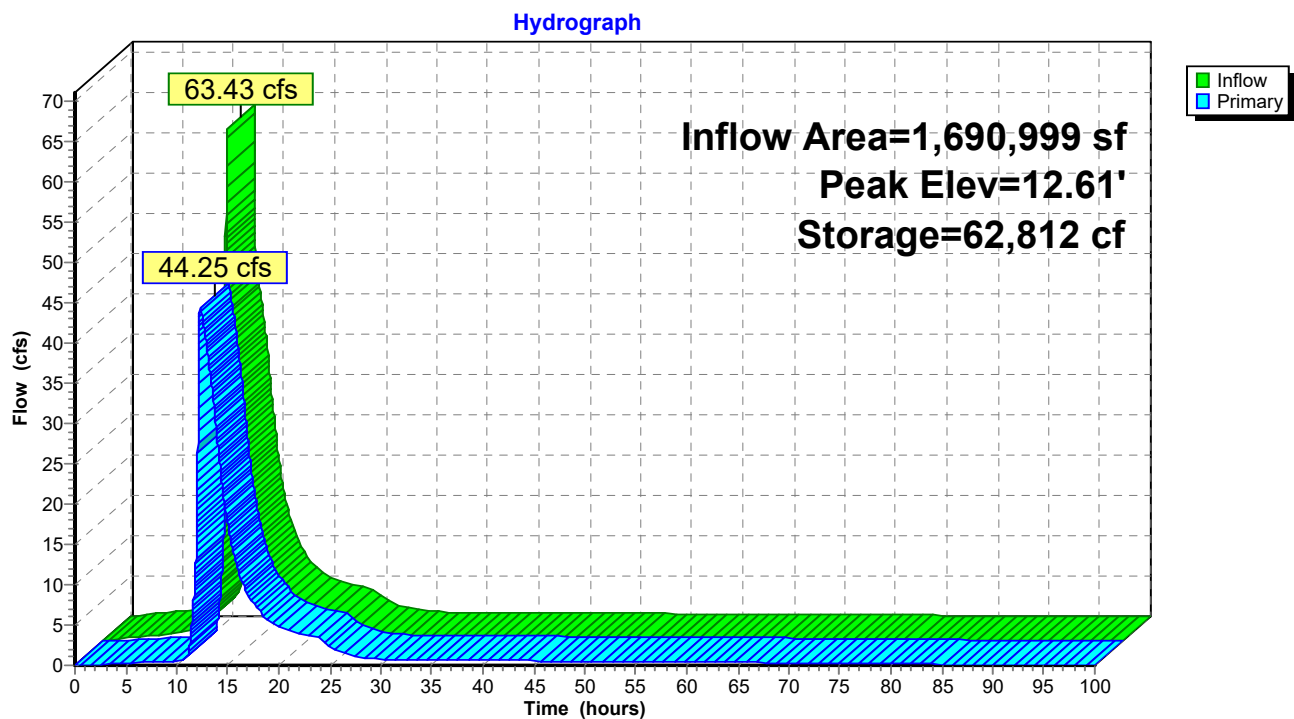
Plug-Flow detention time= 121.8 min calculated for 712,773 cf (100% of inflow)
 Center-of-Mass det. time= 113.9 min (1,196.3 - 1,082.4)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=44.25 cfs @ 12.28 hrs HW=12.61' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 44.25 cfs of 64.26 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.94 cfs @ 8.98 fps)
- 3=Orifice/Grate (Orifice Controls 33.29 cfs @ 5.33 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 10.02 cfs @ 2.81 fps)

Pond CW1D: CONSTRUCTED WETLANDS 1D

Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 5.82" for 10-Year Future Adj event
 Inflow = 4.93 cfs @ 12.10 hrs, Volume= 16,484 cf
 Outflow = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf, Atten= 77%, Lag= 13.4 min
 Primary = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.34' @ 12.32 hrs Surf.Area= 12,680 sf Storage= 9,094 cf

Plug-Flow detention time= 426.2 min calculated for 13,595 cf (82% of inflow)
 Center-of-Mass det. time= 347.5 min (1,090.2 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

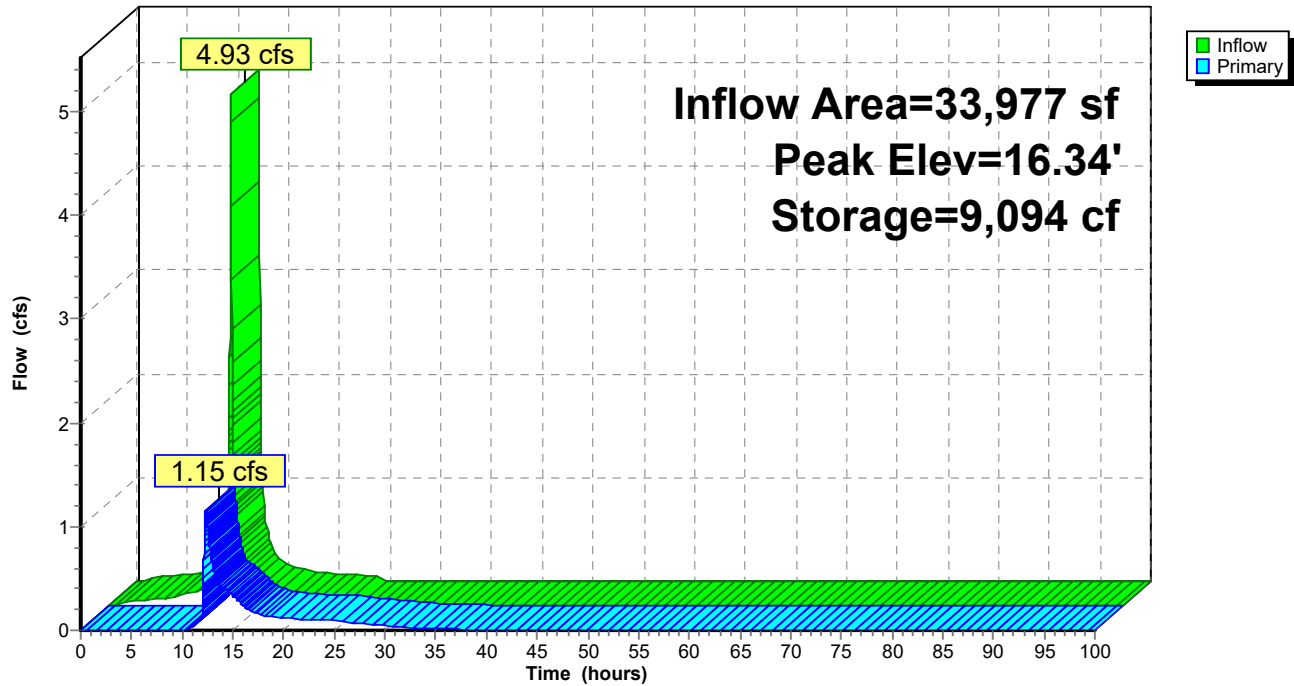
Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.15 cfs @ 12.32 hrs HW=16.34' TW=13.38' (Dynamic Tailwater)

- 1=Culvert (Passes 1.15 cfs of 10.00 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.17 cfs @ 5.12 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 3.43 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.64 cfs @ 1.32 fps)

Pond PP1: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 5.83" for 10-Year Future Adj event
 Inflow = 11.43 cfs @ 12.10 hrs, Volume= 38,082 cf
 Outflow = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf, Atten= 65%, Lag= 6.5 min
 Primary = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.71' @ 12.21 hrs Surf.Area= 23,328 sf Storage= 20,192 cf

Plug-Flow detention time= 610.4 min calculated for 31,528 cf (83% of inflow)
 Center-of-Mass det. time= 533.1 min (1,278.4 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

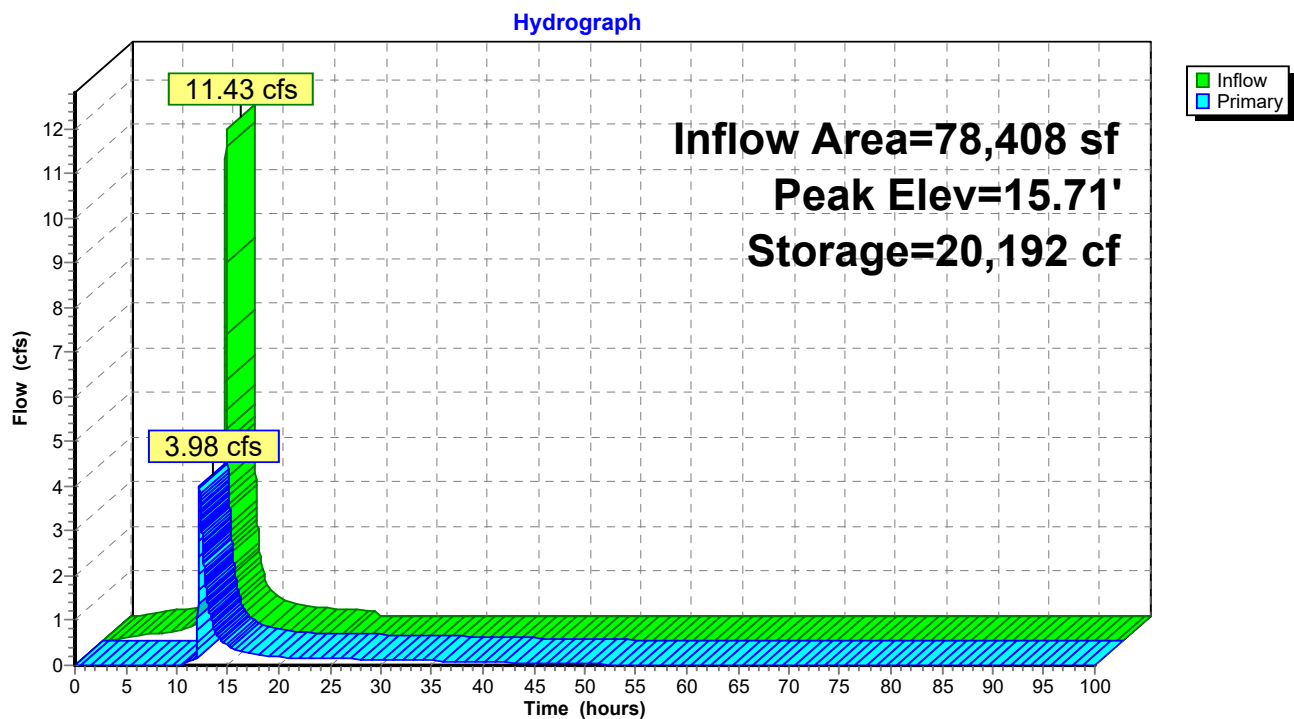
Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.97 cfs @ 12.21 hrs HW=15.71' TW=12.87' (Dynamic Tailwater)

1=Culvert (Passes 3.97 cfs of 57.43 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.19 cfs @ 5.66 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 3.78 cfs @ 2.18 fps)

Pond PP2: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 5.88" for 10-Year Future Adj event
 Inflow = 4.65 cfs @ 12.10 hrs, Volume= 15,580 cf
 Outflow = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf, Atten= 84%, Lag= 25.5 min
 Primary = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.73' @ 12.52 hrs Surf.Area= 10,368 sf Storage= 9,039 cf

Plug-Flow detention time= 436.5 min calculated for 12,893 cf (83% of inflow)
 Center-of-Mass det. time= 358.7 min (1,102.9 - 744.2)

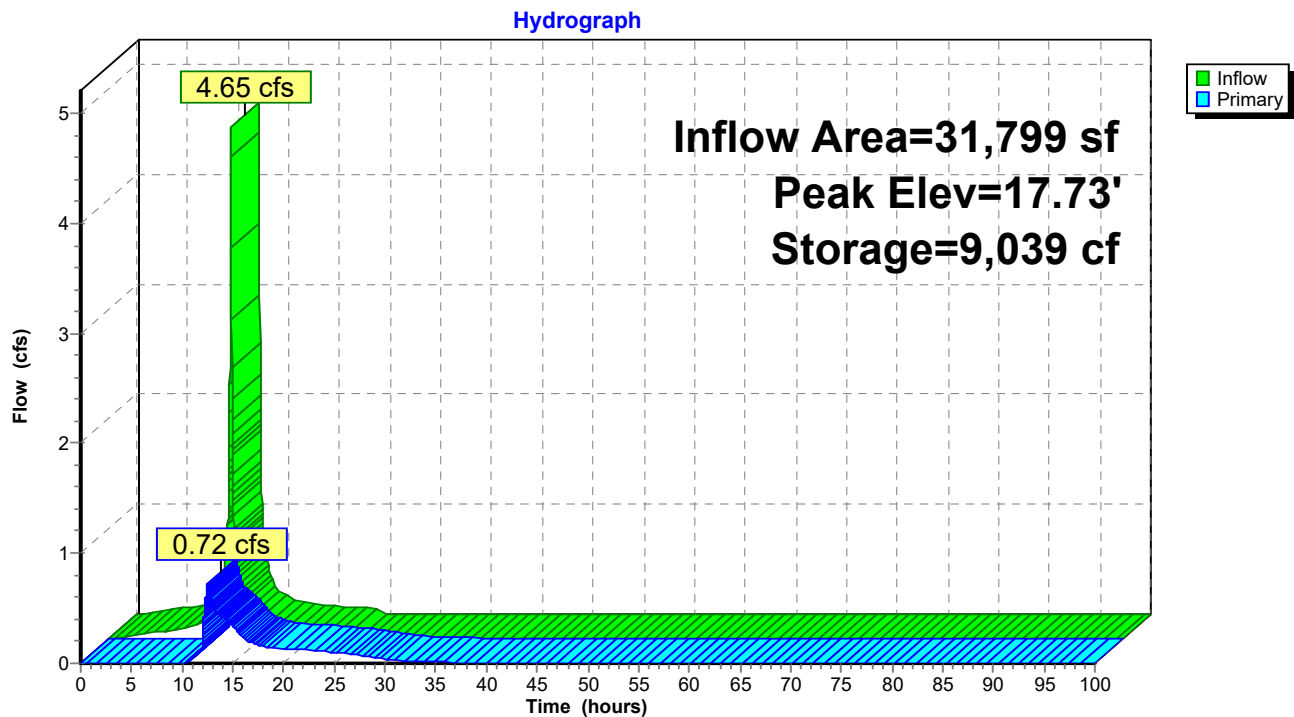
Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / S= 0.0031 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.72 cfs @ 12.52 hrs HW=17.73' TW=12.57' (Dynamic Tailwater)

- 1=Culvert (Passes 0.72 cfs of 53.68 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 5.77 fps)
- 3=Orifice/Grate (Orifice Controls 0.31 cfs @ 3.51 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.22 cfs @ 0.92 fps)

Pond PP3: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 5.84" for 10-Year Future Adj event
 Inflow = 68.31 cfs @ 12.10 hrs, Volume= 233,274 cf
 Outflow = 30.10 cfs @ 12.18 hrs, Volume= 193,406 cf, Atten= 56%, Lag= 4.9 min
 Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,331 cf
 Routed to Link PP4V : Valve
 Secondary = 10.03 cfs @ 12.18 hrs, Volume= 64,075 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.30' @ 12.18 hrs Surf.Area= 181,216 sf Storage= 93,267 cf

Plug-Flow detention time= 198.9 min calculated for 193,387 cf (83% of inflow)
 Center-of-Mass det. time= 121.7 min (866.1 - 744.4)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=20.07 cfs @ 12.18 hrs HW=14.30' TW=0.00' (Dynamic Tailwater)

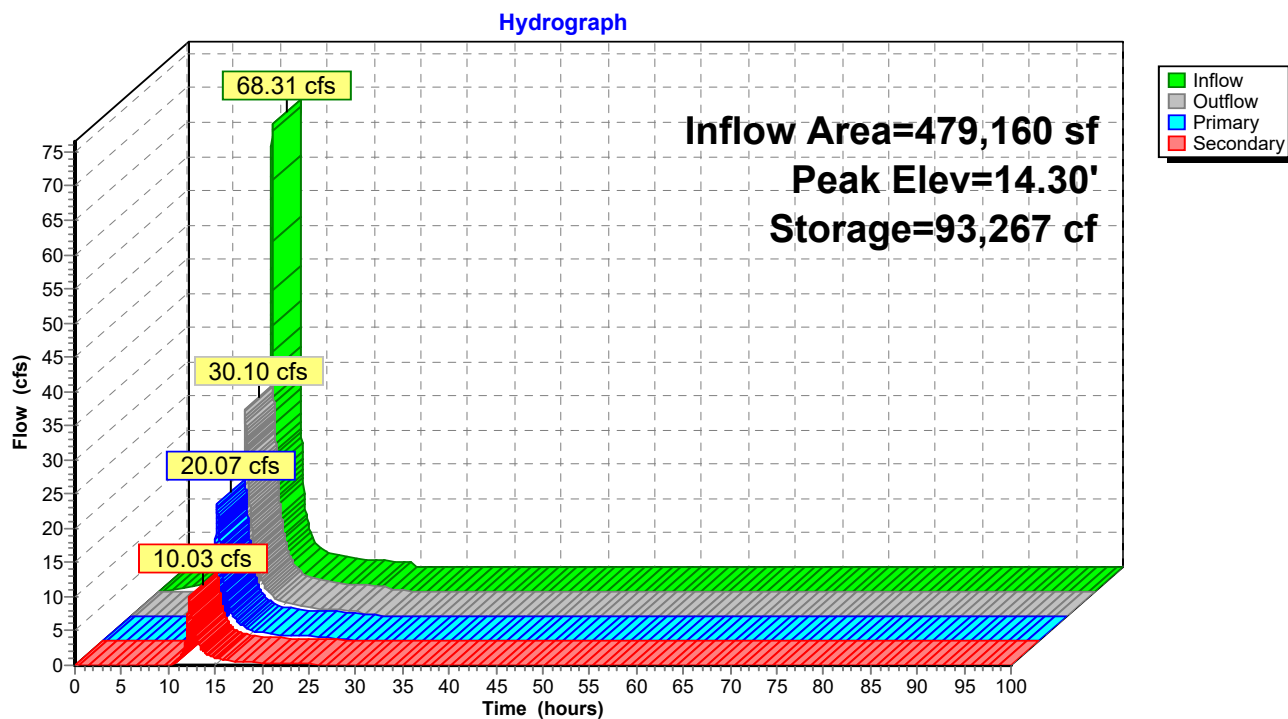
↑ **1=Culvert** (Passes 20.07 cfs of 127.72 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 20.07 cfs @ 2.81 fps)

Secondary OutFlow Max=10.03 cfs @ 12.18 hrs HW=14.30' TW=12.96' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 10.03 cfs of 39.28 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 10.03 cfs @ 2.81 fps)

Pond PP4: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 4.91 cfs @ 12.09 hrs, Volume= 16,302 cf
 Outflow = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf, Atten= 48%, Lag= 1.2 min
 Primary = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.88' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 6,171 cf

Plug-Flow detention time= 187.4 min calculated for 13,471 cf (83% of inflow)
 Center-of-Mass det. time= 109.6 min (851.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

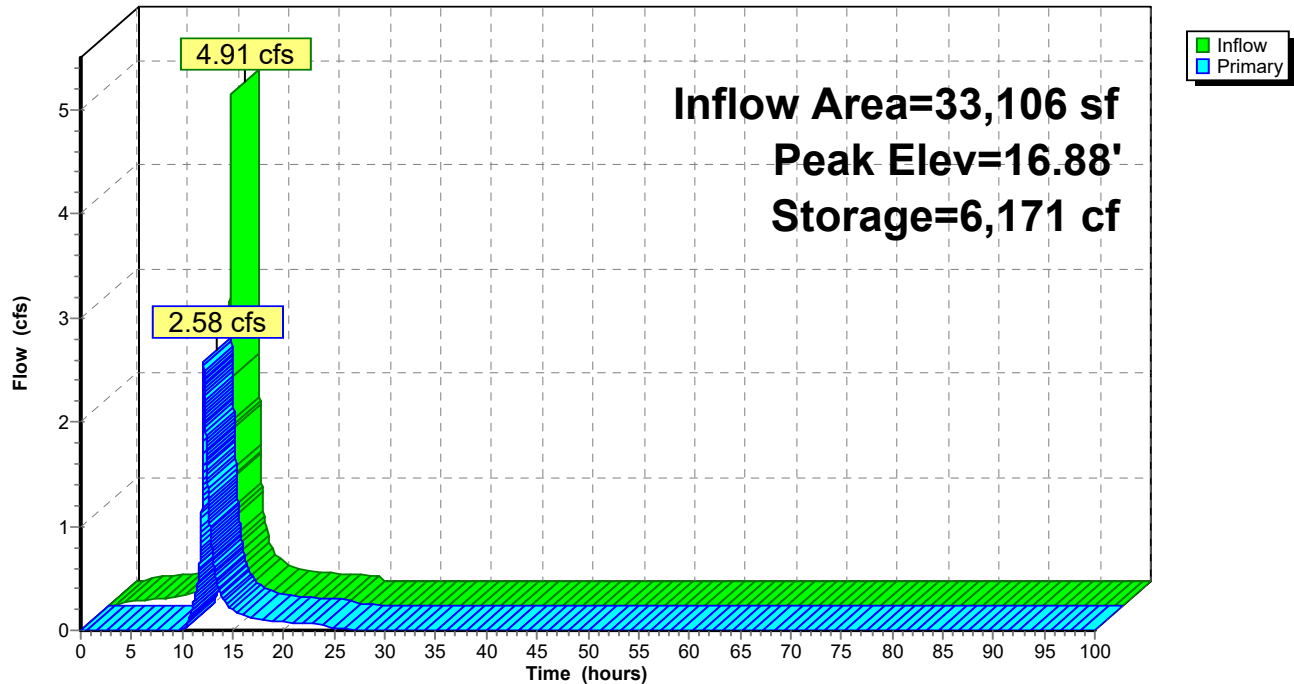
Primary OutFlow Max=2.58 cfs @ 12.11 hrs HW=16.88' TW=12.33' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.58 cfs of 10.57 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 2.58 cfs @ 1.91 fps)

Pond PP5: POROUS PAVEMENT

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 5.87" for 10-Year Future Adj event
 Inflow = 5.71 cfs @ 12.09 hrs, Volume= 18,977 cf
 Outflow = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf, Atten= 54%, Lag= 1.4 min
 Primary = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.61' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 7,601 cf

Plug-Flow detention time= 197.3 min calculated for 15,718 cf (83% of inflow)
 Center-of-Mass det. time= 119.6 min (861.0 - 741.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

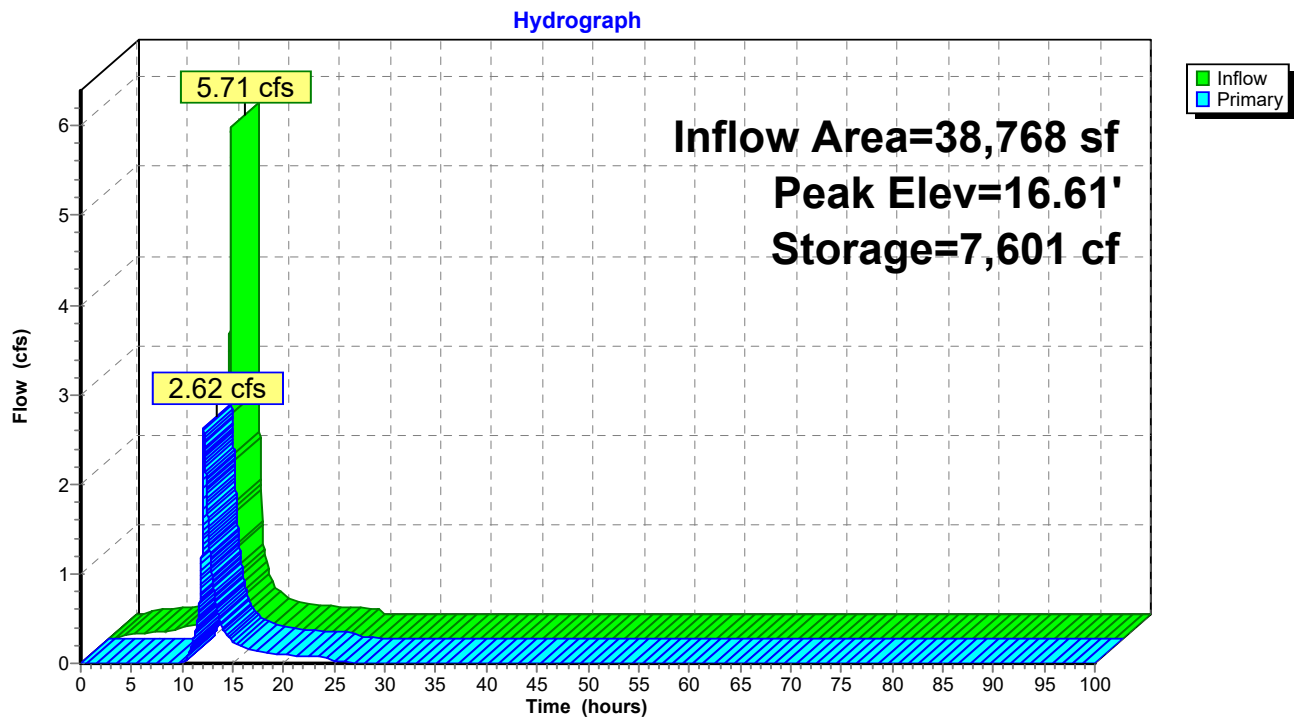
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.62 cfs @ 12.11 hrs HW=16.61' TW=12.62' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.62 cfs of 11.80 cfs potential flow)

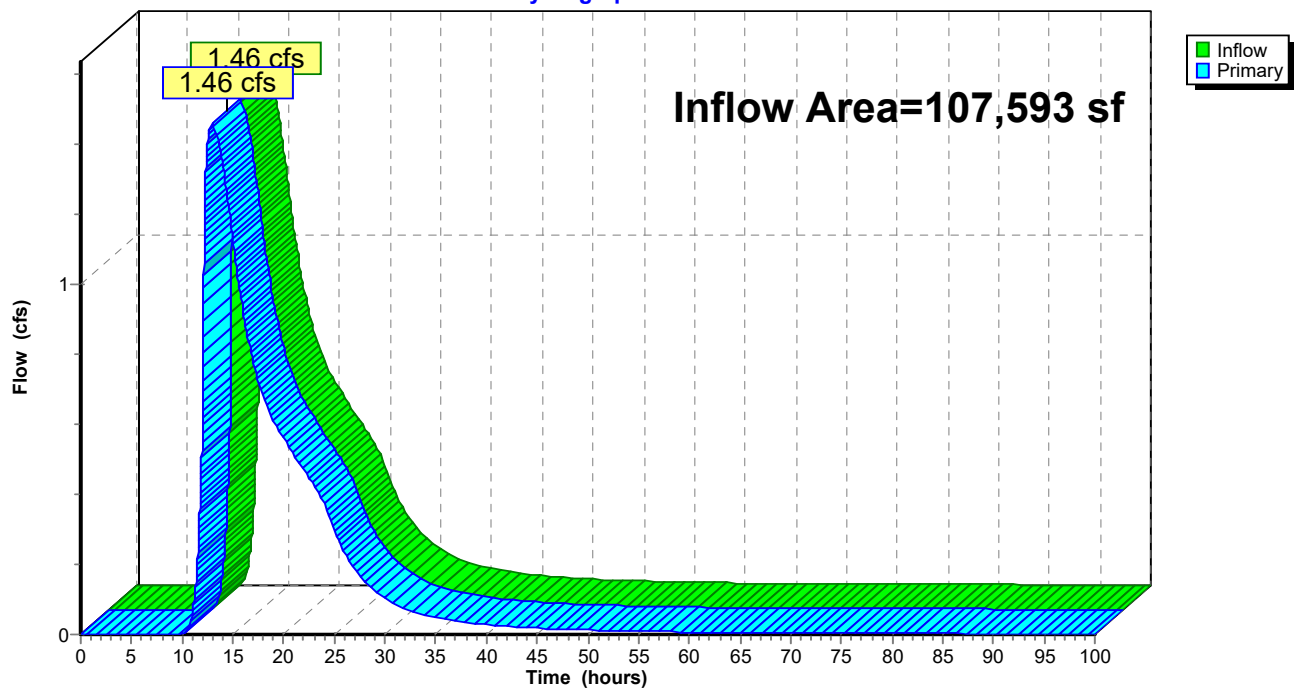
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.62 cfs @ 1.92 fps)

Pond PP6: POROUS PAVEMENT

Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 4.85" for 10-Year Future Adj event
Inflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

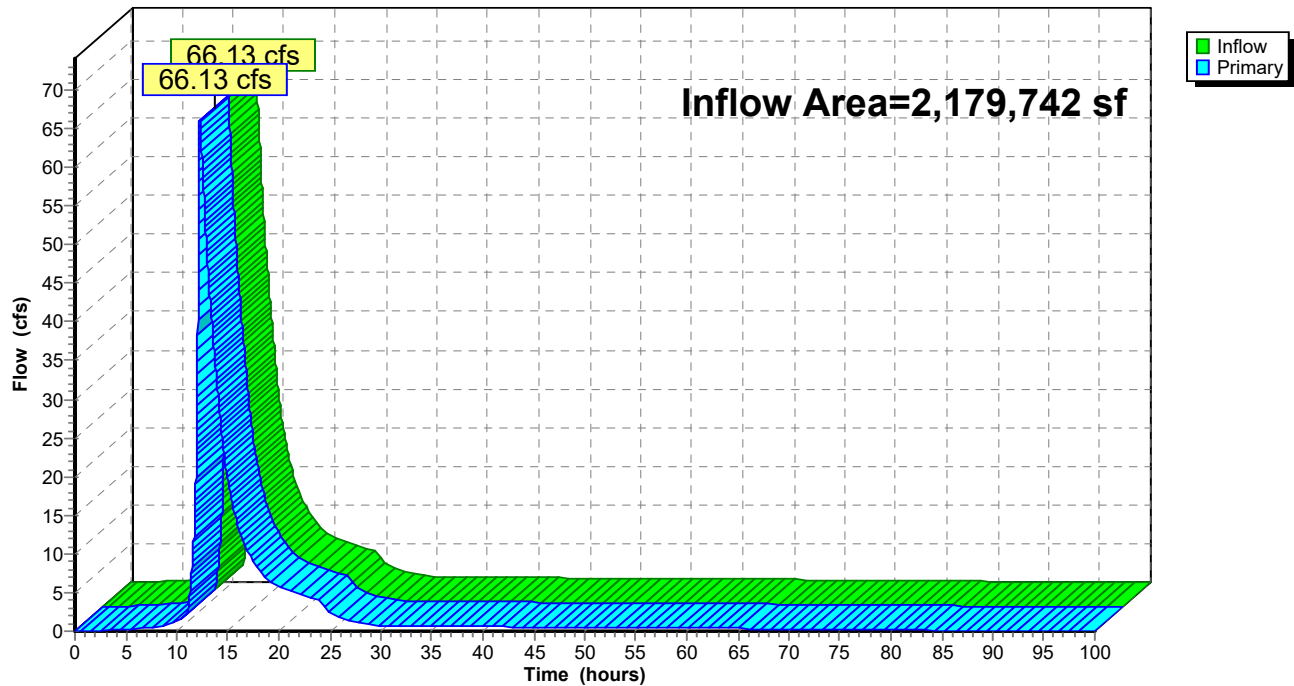
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve**Hydrograph**

Summary for Link P1: PDA 1

Inflow Area = 2,179,742 sf, 69.82% Impervious, Inflow Depth > 4.71" for 10-Year Future Adj event
Inflow = 66.13 cfs @ 12.27 hrs, Volume= 854,942 cf
Primary = 66.13 cfs @ 12.27 hrs, Volume= 854,942 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1: PDA 1**Hydrograph**

Pre vs Post Rev. 3a

Prepared by Bohler Engineering, PC

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

Printed 8/18/2026

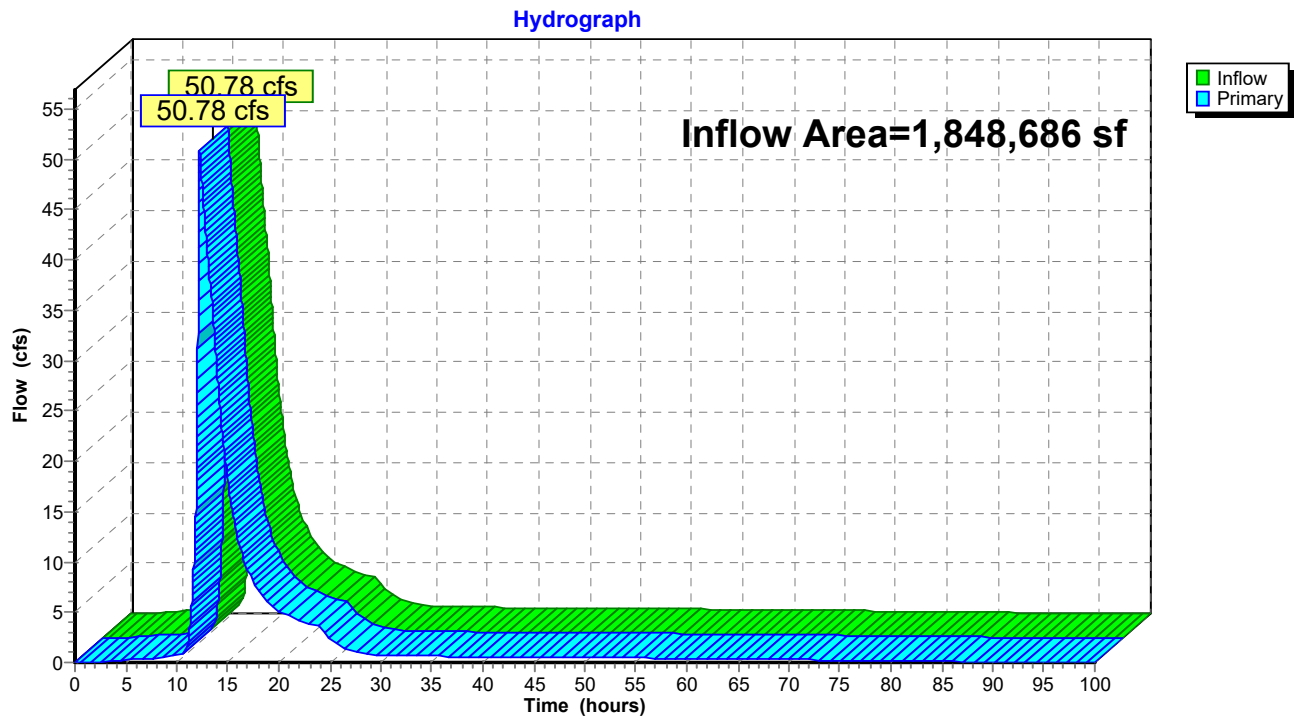
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Summary for Link P1A:

Inflow Area = 1,848,686 sf, 82.02% Impervious, Inflow Depth > 4.87" for 10-Year Future Adj event
Inflow = 50.78 cfs @ 12.25 hrs, Volume= 750,278 cf
Primary = 50.78 cfs @ 12.25 hrs, Volume= 750,278 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



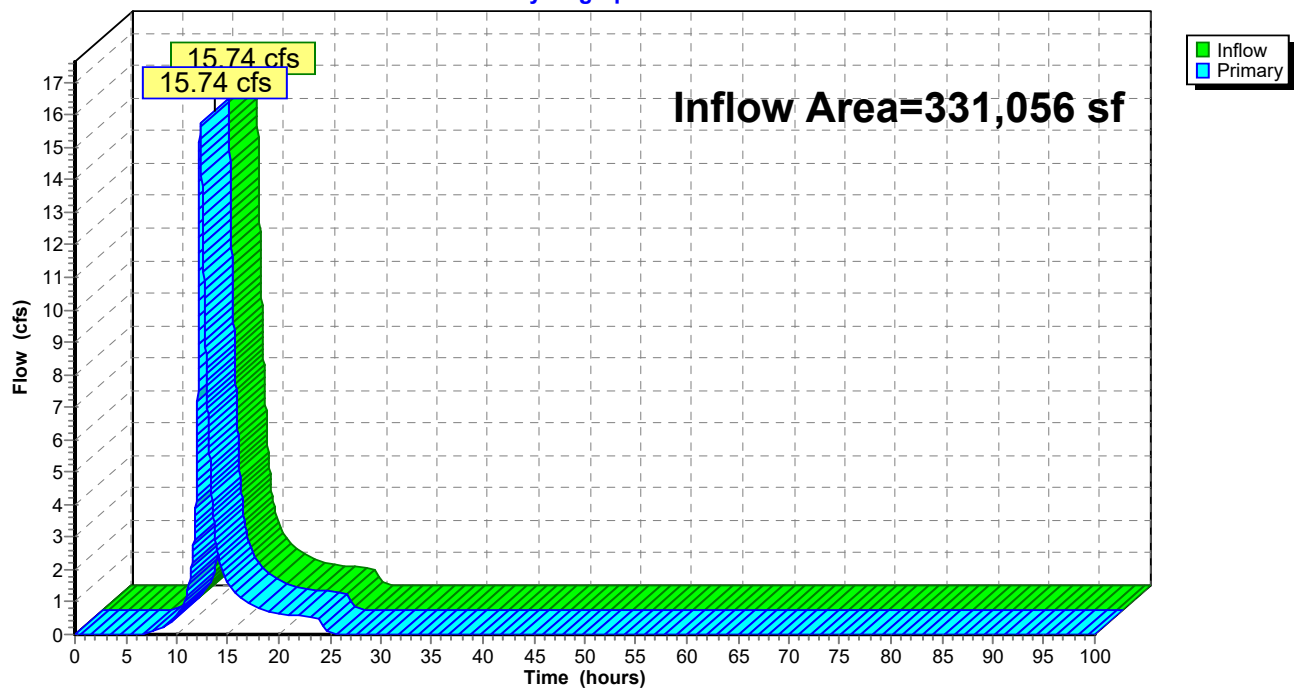
Summary for Link P1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 3.79" for 10-Year Future Adj event
Inflow = 15.74 cfs @ 12.30 hrs, Volume= 104,665 cf
Primary = 15.74 cfs @ 12.30 hrs, Volume= 104,665 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1B: BYPASS

Hydrograph



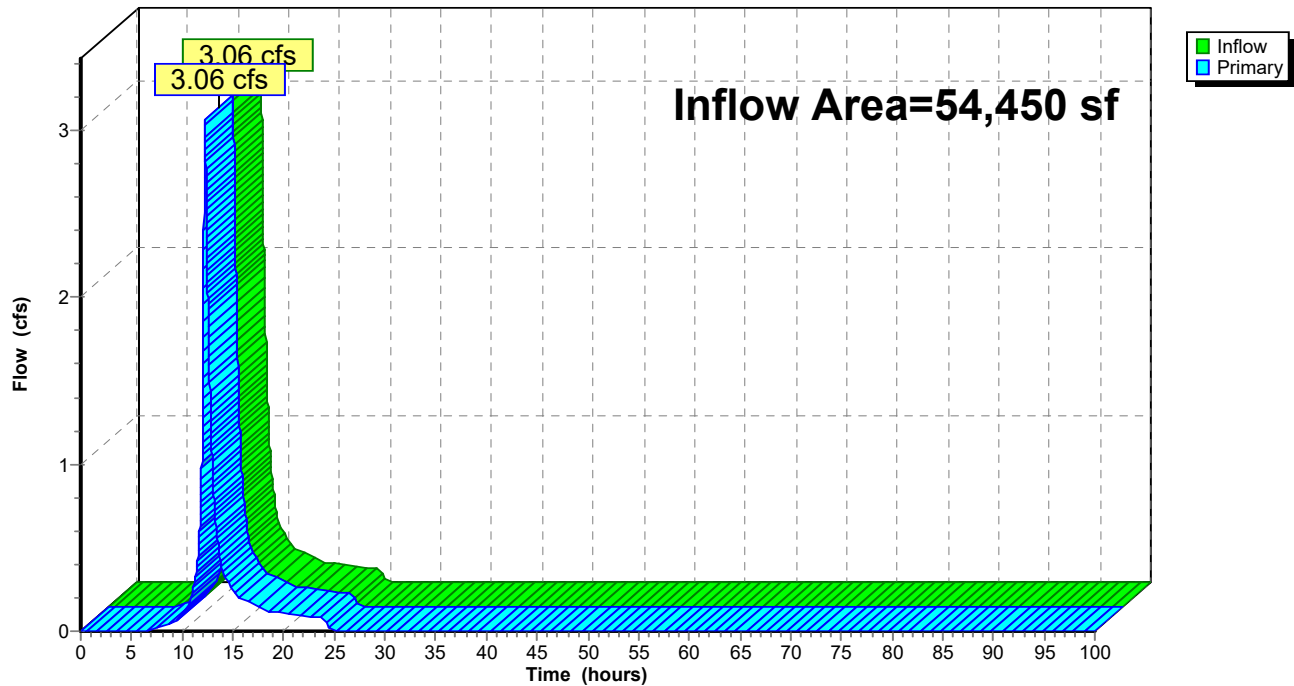
Summary for Link P2: PDA 2

Inflow Area = 54,450 sf, 0.00% Impervious, Inflow Depth = 3.77" for 10-Year Future Adj event
Inflow = 3.06 cfs @ 12.23 hrs, Volume= 17,108 cf
Primary = 3.06 cfs @ 12.23 hrs, Volume= 17,108 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2: PDA 2

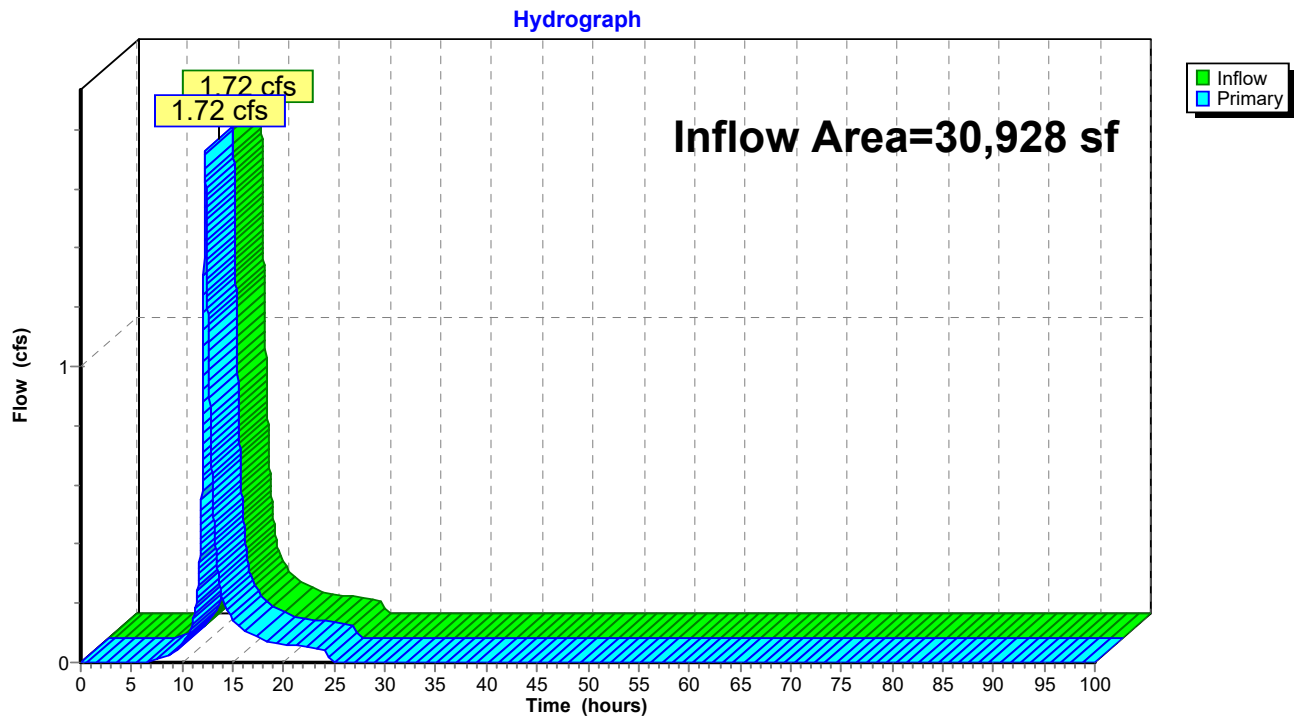
Hydrograph



Summary for Link P2A: PDA 2A ONSITE

Inflow Area = 30,928 sf, 0.00% Impervious, Inflow Depth = 3.86" for 10-Year Future Adj event
Inflow = 1.72 cfs @ 12.24 hrs, Volume= 9,945 cf
Primary = 1.72 cfs @ 12.24 hrs, Volume= 9,945 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2A: PDA 2A ONSITE

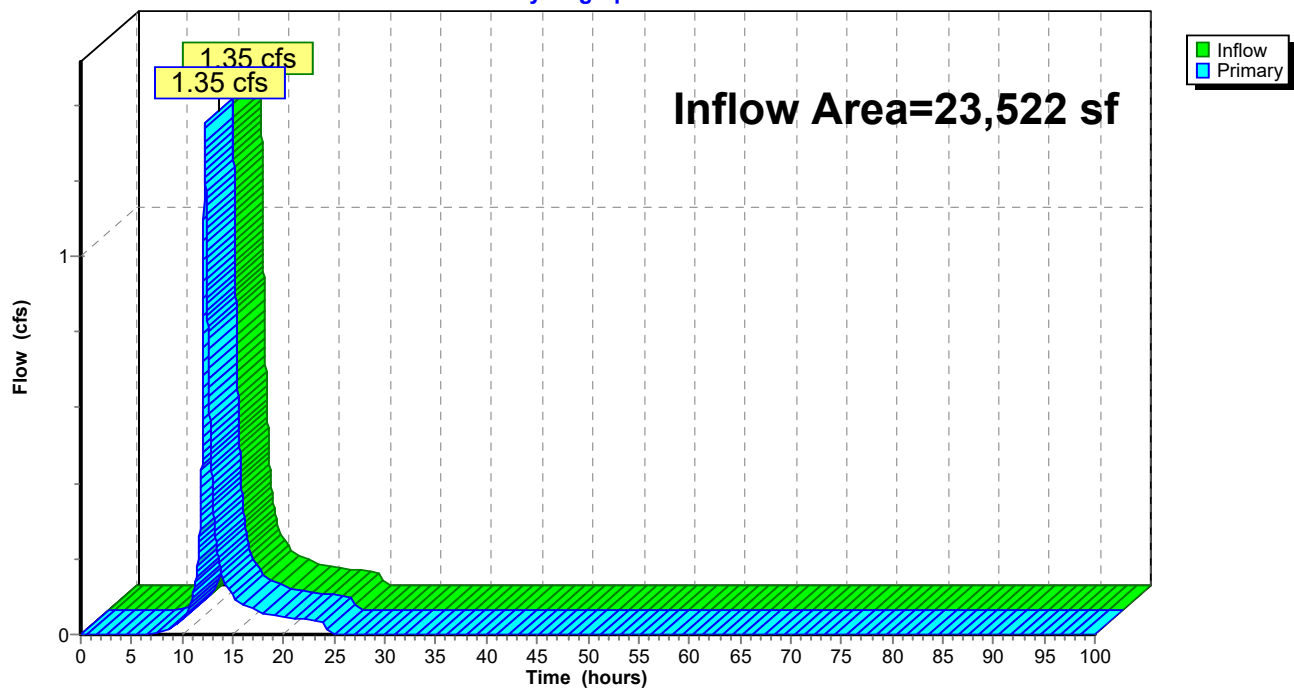
Summary for Link P2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 3.65" for 10-Year Future Adj event
Inflow = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf
Primary = 1.35 cfs @ 12.21 hrs, Volume= 7,163 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2B: BYPASS

Hydrograph



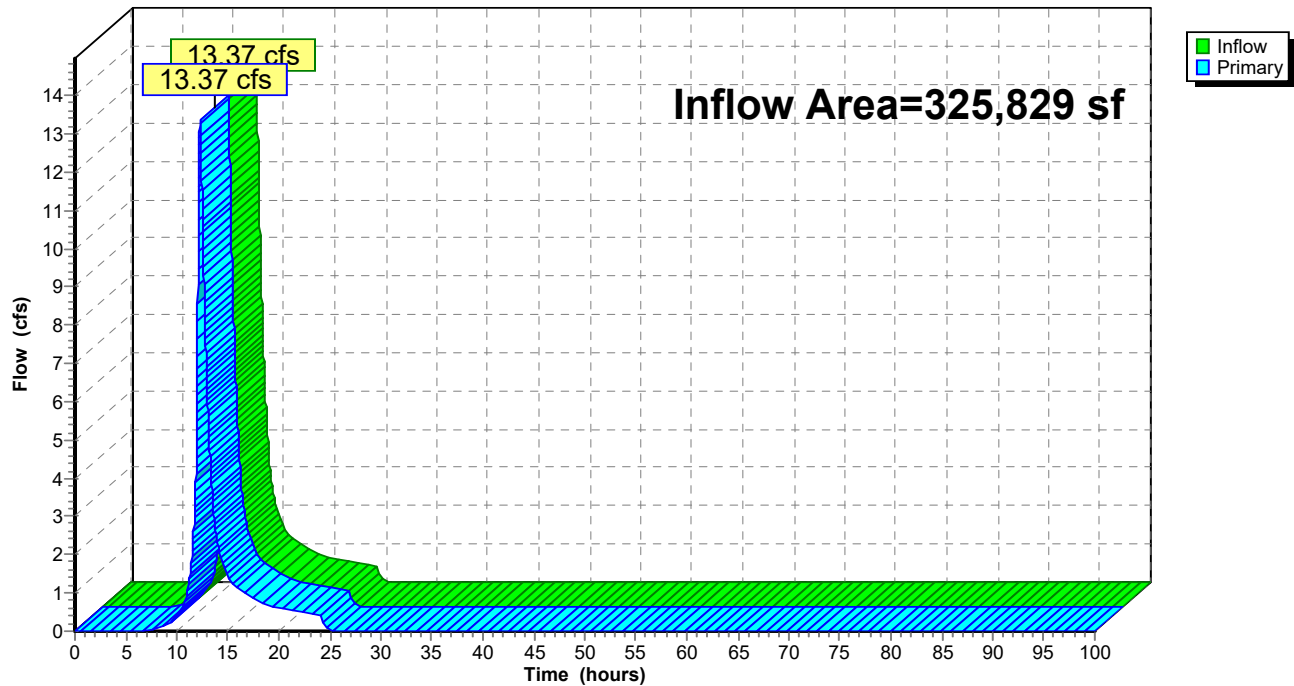
Summary for Link P3: PDA 3

Inflow Area = 325,829 sf, 0.00% Impervious, Inflow Depth = 3.42" for 10-Year Future Adj event
Inflow = 13.37 cfs @ 12.30 hrs, Volume= 92,805 cf
Primary = 13.37 cfs @ 12.30 hrs, Volume= 92,805 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3: PDA 3

Hydrograph



Pre vs Post Rev. 3a

Prepared by Bohler Engineering, PC

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NOAA 24-hr D 10-Year Future Adj Rainfall=6.20", P2=3.99"

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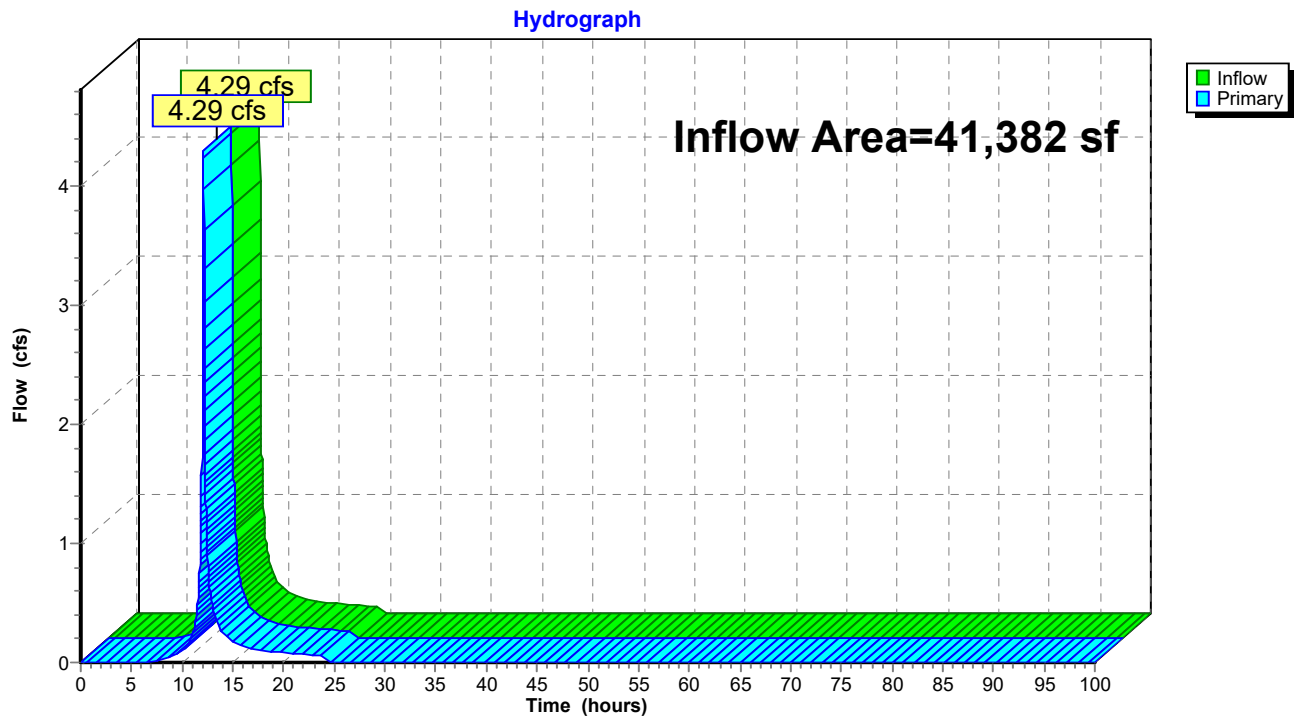
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Summary for Link P3A: PDA 3A ONSITE

Inflow Area = 41,382 sf, 0.00% Impervious, Inflow Depth = 3.86" for 10-Year Future Adj event
Inflow = 4.29 cfs @ 12.11 hrs, Volume= 13,307 cf
Primary = 4.29 cfs @ 12.11 hrs, Volume= 13,307 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

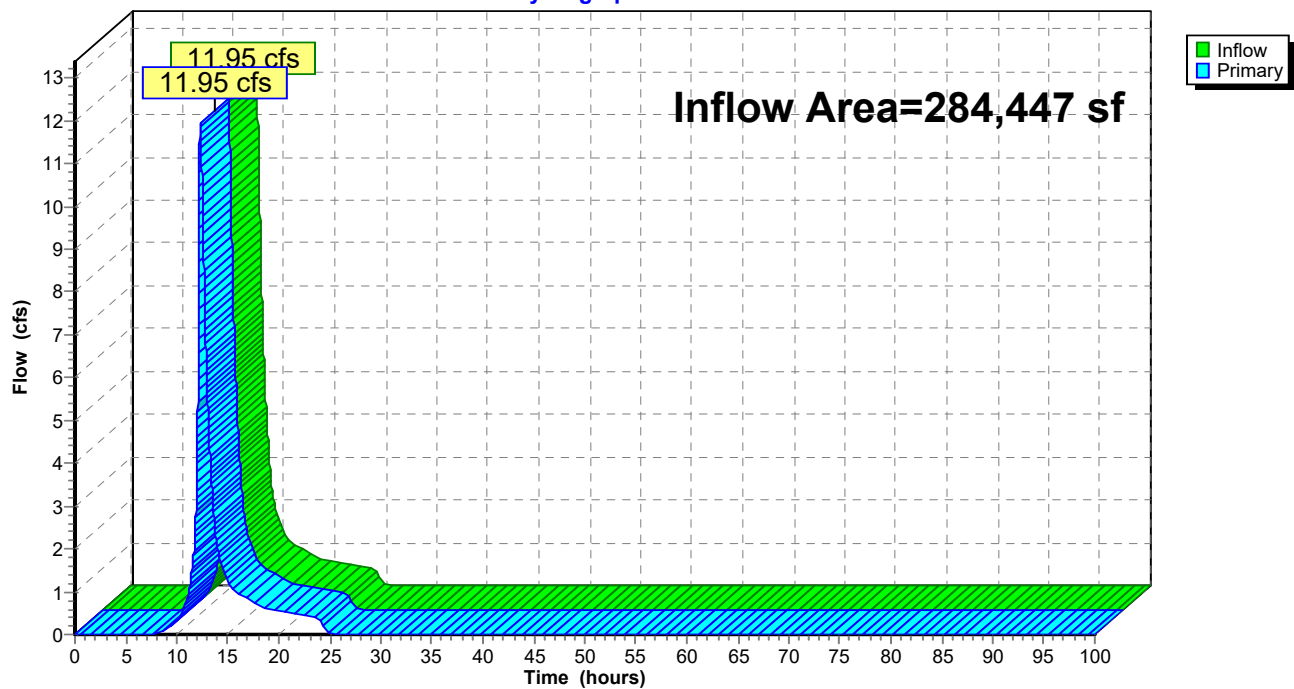
Link P3A: PDA 3A ONSITE



Summary for Link P3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 3.35" for 10-Year Future Adj event
Inflow = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf
Primary = 11.95 cfs @ 12.30 hrs, Volume= 79,498 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3B: BYPASS**Hydrograph**

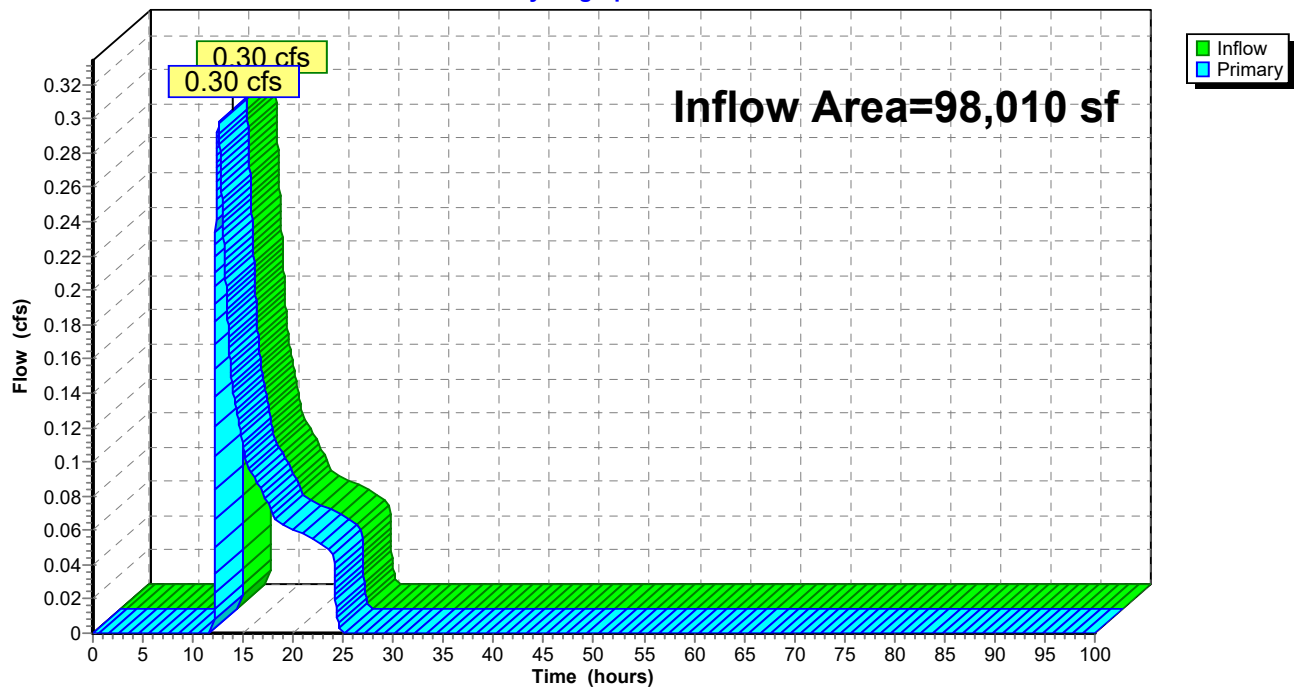
Summary for Link P4: PDA 4

Inflow Area = 98,010 sf, 0.00% Impervious, Inflow Depth = 0.50" for 10-Year Future Adj event
Inflow = 0.30 cfs @ 12.56 hrs, Volume= 4,118 cf
Primary = 0.30 cfs @ 12.56 hrs, Volume= 4,118 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P4: PDA 4

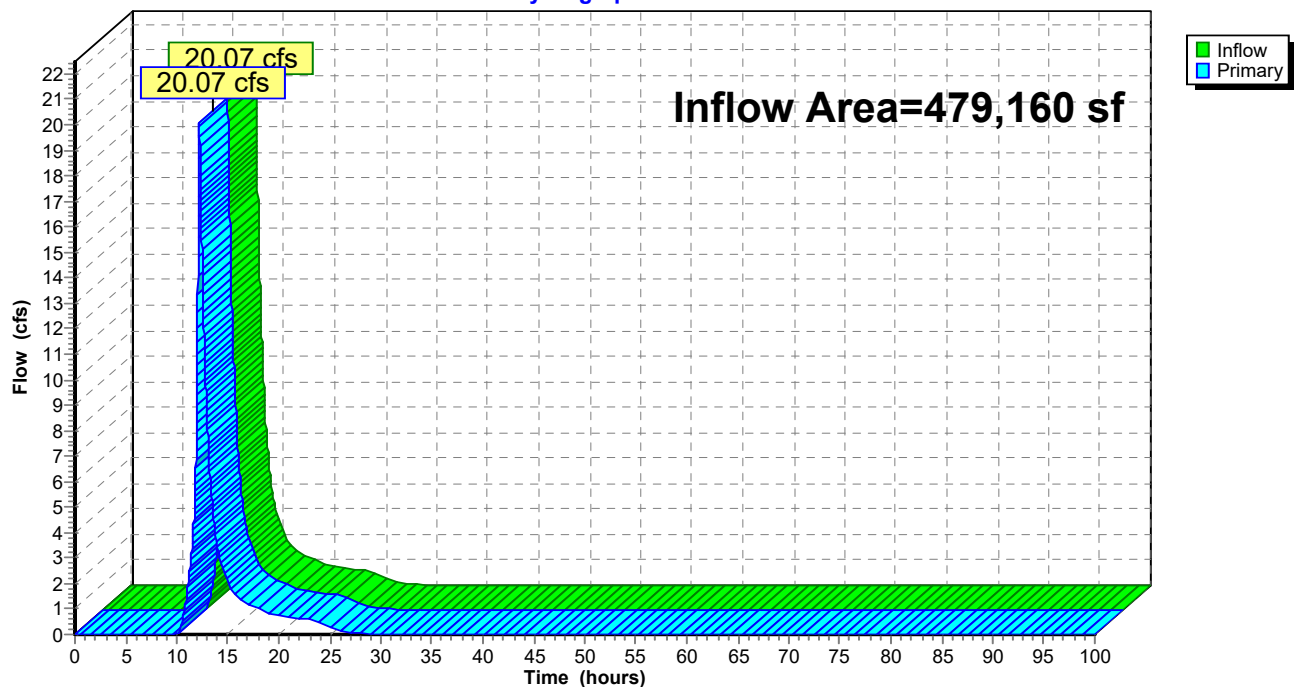
Hydrograph

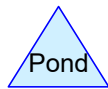
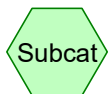
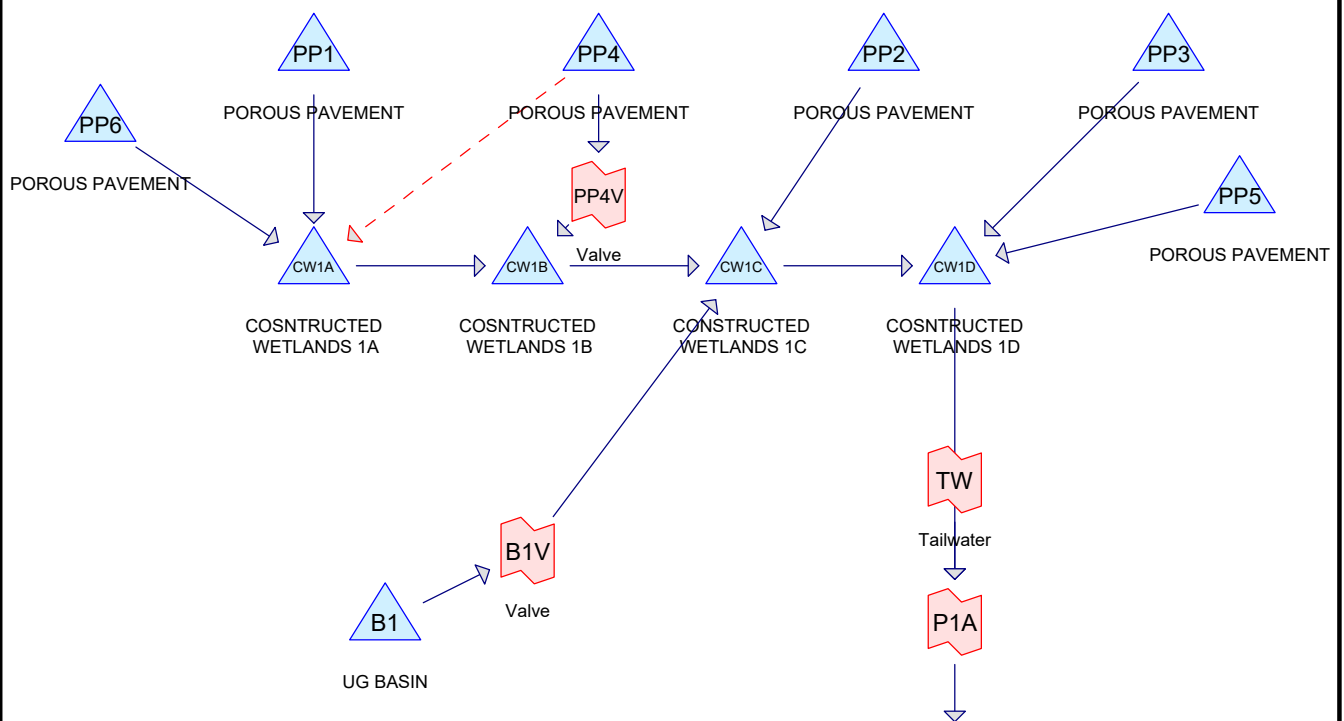


Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 3.24" for 10-Year Future Adj event
Inflow = 20.07 cfs @ 12.18 hrs, Volume= 129,331 cf
Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,331 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve**Hydrograph**



Routing Diagram for Pre vs Post- 10 yr tailwater Rev. 3a
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Pre vs Post- 10 yr tailwater Rev. 3a

Prepared by Bohler Engineering, PC

Printed 8/18/2026

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	10-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	6.20	2	3.99

Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 15.84 cfs @ 12.10 hrs, Volume= 53,017 cf
 Outflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 91%, Lag= 52.4 min
 Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 11.42' @ 12.97 hrs Surf.Area= 0.559 ac Storage= 0.754 af

Plug-Flow detention time= 515.1 min calculated for 43,501 cf (82% of inflow)
 Center-of-Mass det. time= 435.9 min (1,179.4 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Cap x 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.46 cfs @ 12.97 hrs HW=11.42' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.46 cfs of 10.93 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.93 cfs @ 4.74 fps)
- 3=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.68 fps)
- 4=Sharp-Crested Rectangular Weir(Weir Controls 0.00 cfs @ 0.06 fps)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

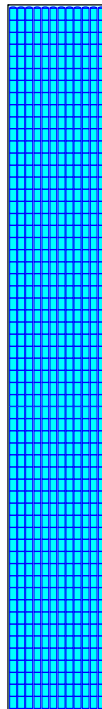
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

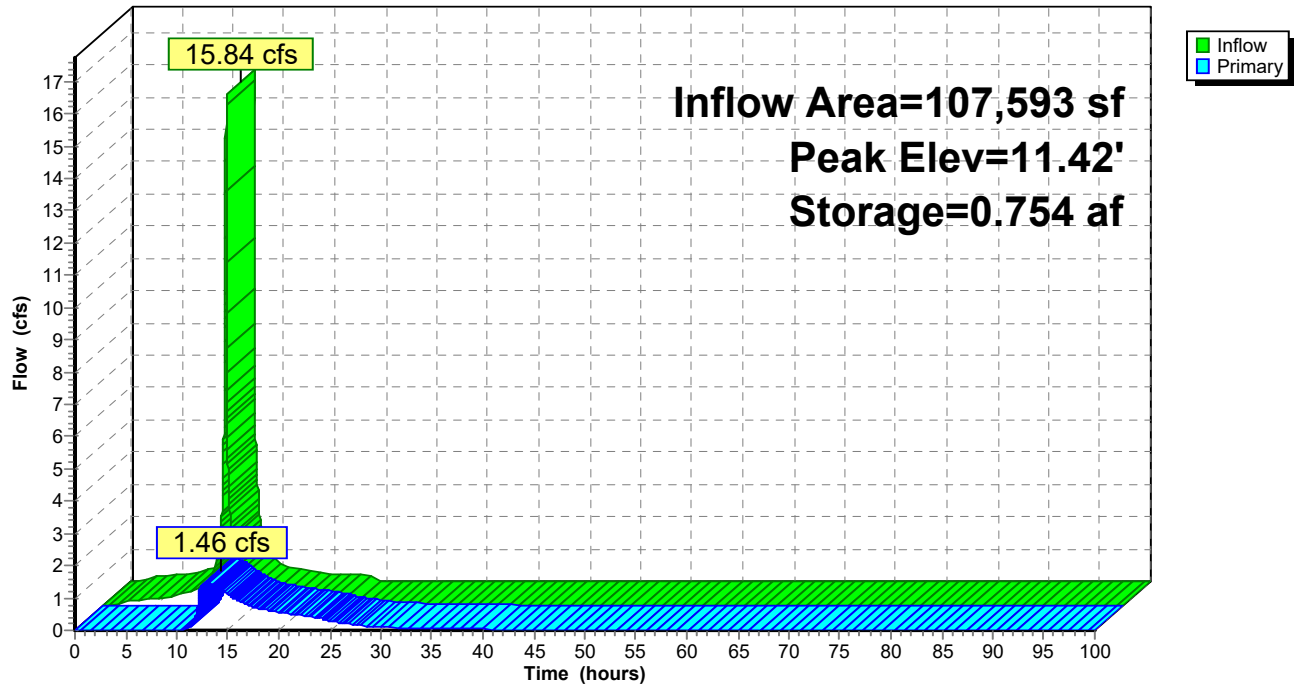
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 7.33" for 10-Year Future Adj event
 Inflow = 43.10 cfs @ 12.11 hrs, Volume= 207,966 cf
 Outflow = 12.28 cfs @ 13.08 hrs, Volume= 206,101 cf, Atten= 72%, Lag= 58.2 min
 Primary = 12.28 cfs @ 13.08 hrs, Volume= 206,101 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.69' @ 12.71 hrs Surf.Area= 24,627 sf Storage= 82,824 cf

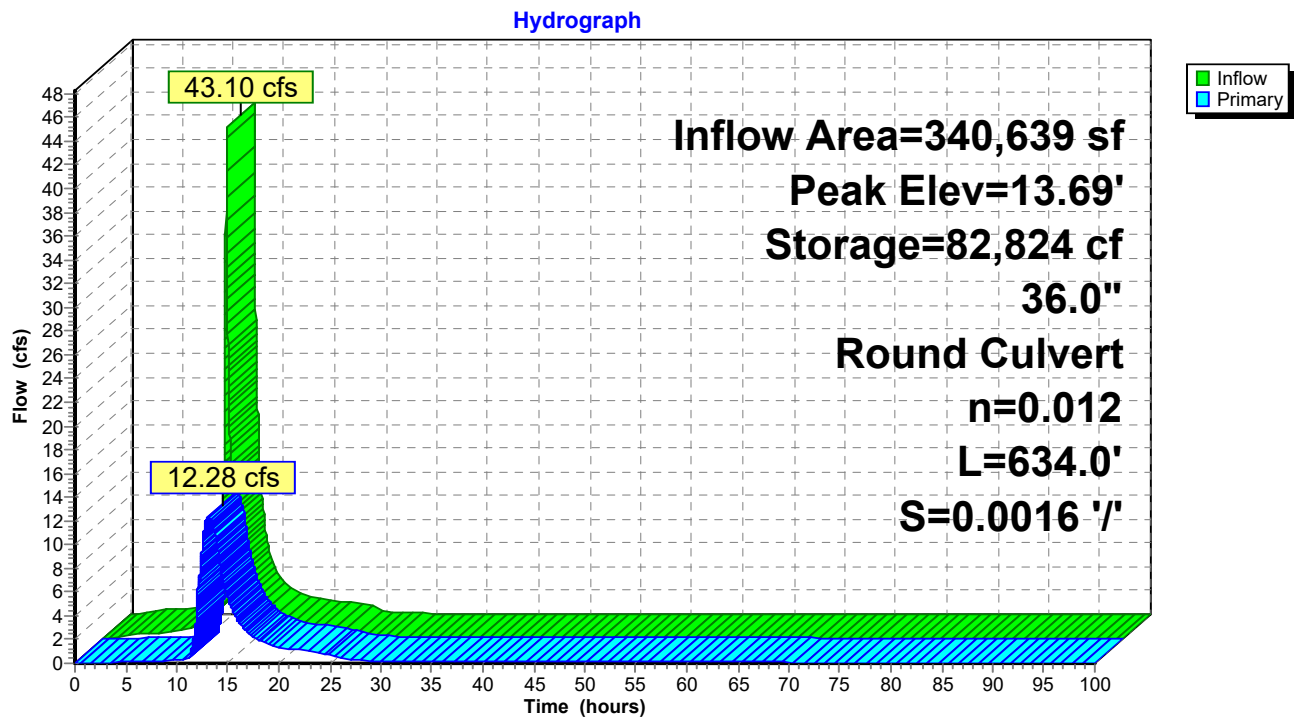
Plug-Flow detention time= 353.7 min calculated for 206,101 cf (99% of inflow)
 Center-of-Mass det. time= 342.4 min (1,157.9 - 815.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=12.43 cfs @ 13.08 hrs HW=13.56' TW=13.30' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 12.43 cfs @ 1.76 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth > 5.05" for 10-Year Future Adj event
 Inflow = 54.54 cfs @ 12.12 hrs, Volume= 440,596 cf
 Outflow = 27.83 cfs @ 12.68 hrs, Volume= 438,338 cf, Atten= 49%, Lag= 33.8 min
 Primary = 27.83 cfs @ 12.68 hrs, Volume= 438,338 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.48' @ 12.63 hrs Surf.Area= 21,915 sf Storage= 78,103 cf

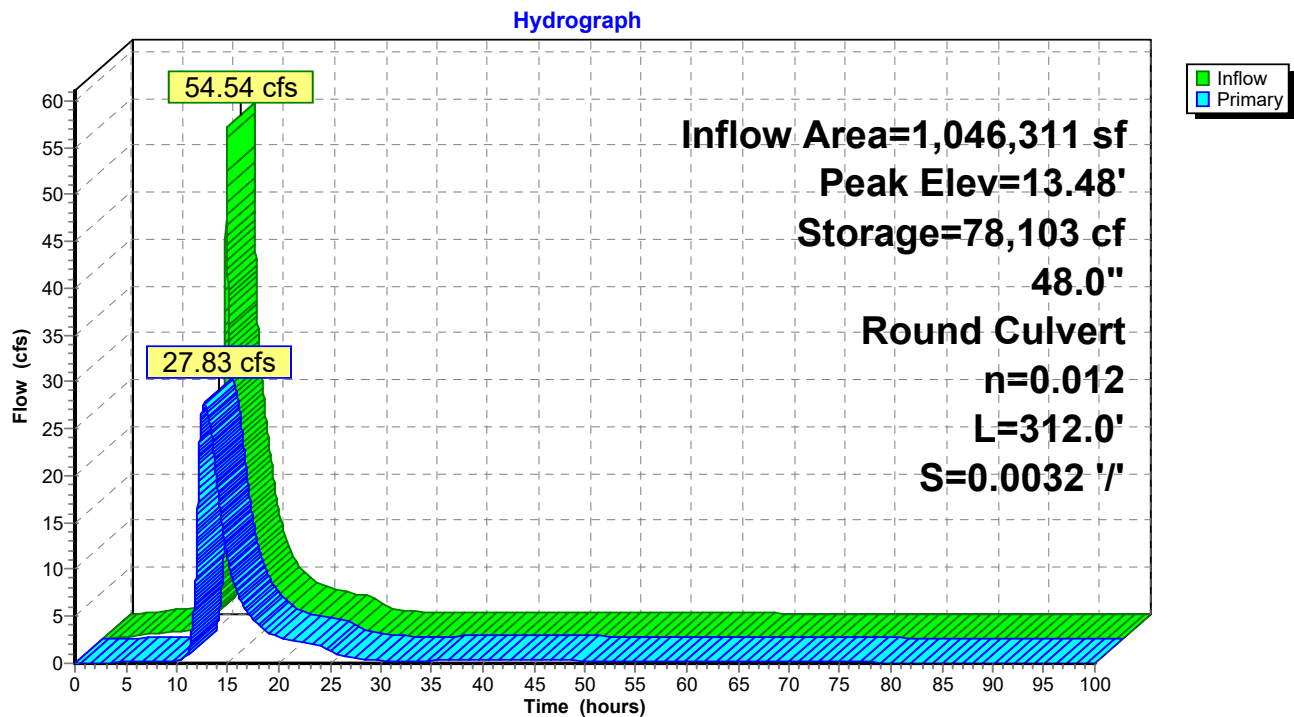
Plug-Flow detention time= 201.4 min calculated for 438,294 cf (99% of inflow)
 Center-of-Mass det. time= 180.5 min (1,156.5 - 976.1)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=27.93 cfs @ 12.68 hrs HW=13.48' TW=13.24' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 27.93 cfs @ 2.48 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth > 4.89" for 10-Year Future Adj event
Inflow = 31.74 cfs @ 12.54 hrs, Volume= 514,656 cf
Outflow = 31.91 cfs @ 12.72 hrs, Volume= 514,344 cf, Atten= 0%, Lag= 10.7 min
Primary = 31.91 cfs @ 12.72 hrs, Volume= 514,344 cf
Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 13.24' @ 12.61 hrs Surf.Area= 8,500 sf Storage= 21,655 cf

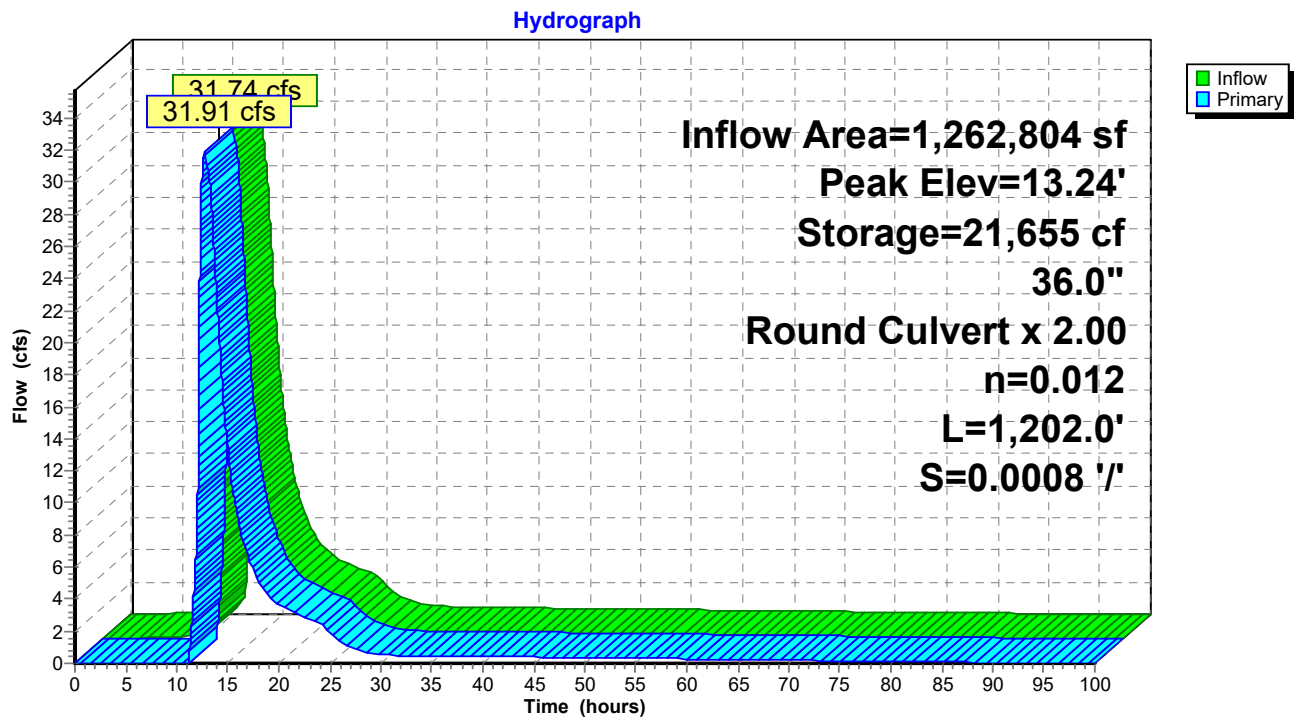
Plug-Flow detention time= 36.1 min calculated for 514,292 cf (100% of inflow)
Center-of-Mass det. time= 33.3 min (1,198.8 - 1,165.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=31.96 cfs @ 12.72 hrs HW=13.23' TW=12.52' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 31.96 cfs @ 2.26 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth > 5.06" for 10-Year Future Adj event
 Inflow = 62.95 cfs @ 12.12 hrs, Volume= 709,444 cf
 Outflow = 43.89 cfs @ 12.28 hrs, Volume= 708,229 cf, Atten= 30%, Lag= 9.8 min
 Primary = 43.89 cfs @ 12.28 hrs, Volume= 708,229 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.60' @ 12.28 hrs Surf.Area= 22,214 sf Storage= 62,577 cf

Plug-Flow detention time= 122.4 min calculated for 708,158 cf (100% of inflow)
 Center-of-Mass det. time= 114.5 min (1,198.4 - 1,083.9)

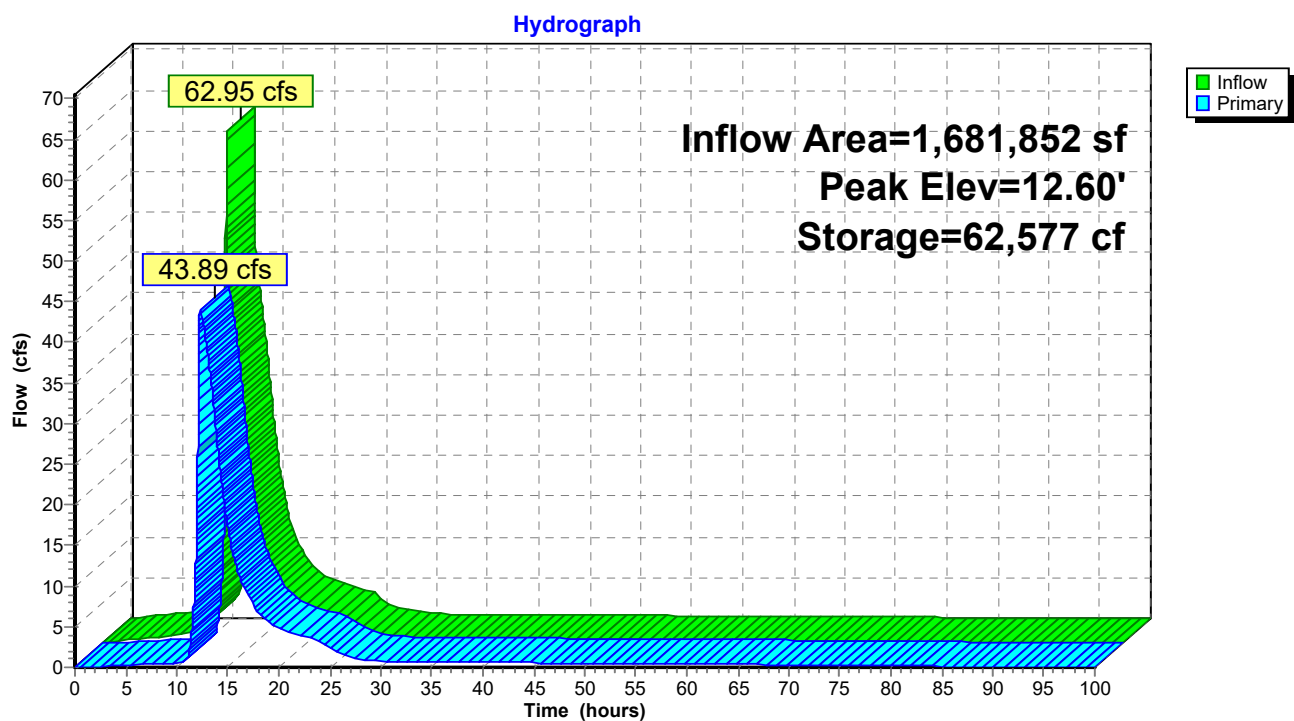
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=43.89 cfs @ 12.28 hrs HW=12.60' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 43.89 cfs of 63.99 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.93 cfs @ 8.97 fps)
- 3=Orifice/Grate (Orifice Controls 33.14 cfs @ 5.30 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 9.81 cfs @ 2.79 fps)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 5.82" for 10-Year Future Adj event
 Inflow = 4.93 cfs @ 12.10 hrs, Volume= 16,484 cf
 Outflow = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf, Atten= 77%, Lag= 13.4 min
 Primary = 1.15 cfs @ 12.32 hrs, Volume= 13,595 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.34' @ 12.32 hrs Surf.Area= 12,680 sf Storage= 9,094 cf

Plug-Flow detention time= 426.2 min calculated for 13,595 cf (82% of inflow)
 Center-of-Mass det. time= 347.5 min (1,090.2 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

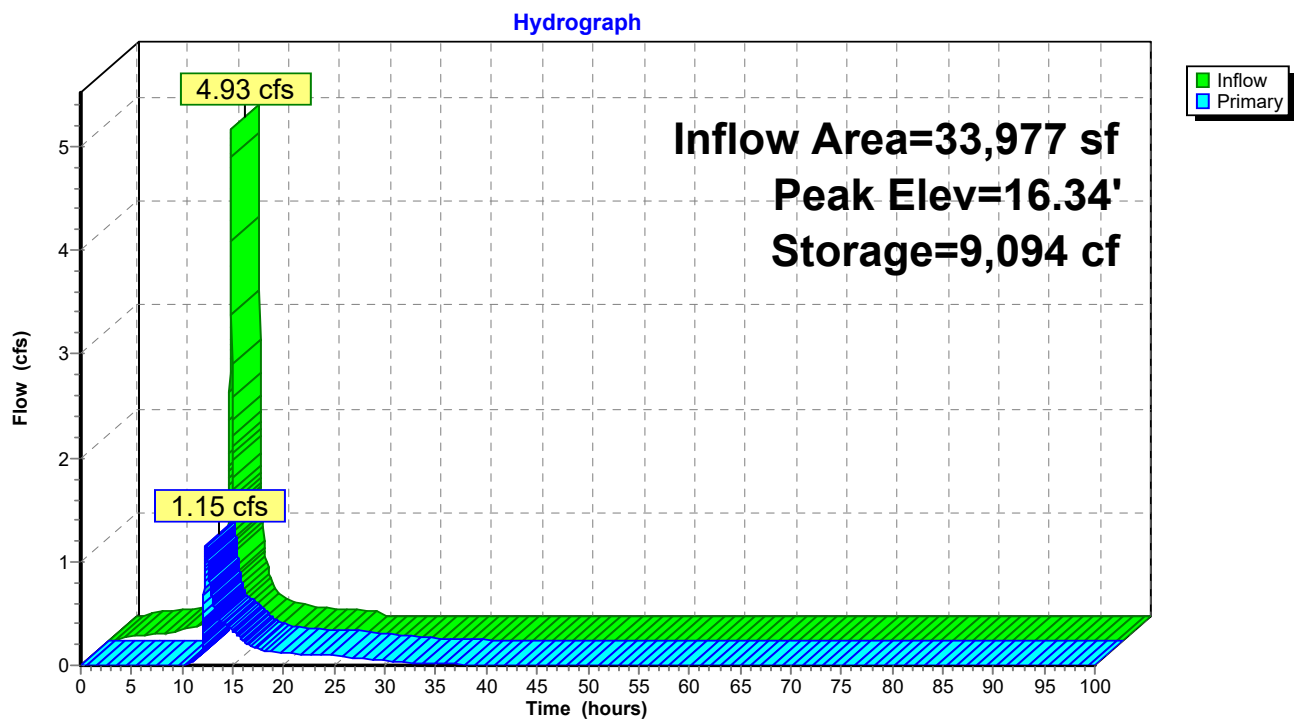
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.15 cfs @ 12.32 hrs HW=16.34' TW=13.35' (Dynamic Tailwater)

- 1=Culvert (Passes 1.15 cfs of 10.04 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.17 cfs @ 5.12 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 3.43 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.64 cfs @ 1.32 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 5.83" for 10-Year Future Adj event
 Inflow = 11.43 cfs @ 12.10 hrs, Volume= 38,082 cf
 Outflow = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf, Atten= 65%, Lag= 6.5 min
 Primary = 3.98 cfs @ 12.21 hrs, Volume= 31,531 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.71' @ 12.21 hrs Surf.Area= 23,328 sf Storage= 20,192 cf

Plug-Flow detention time= 610.4 min calculated for 31,528 cf (83% of inflow)
 Center-of-Mass det. time= 533.1 min (1,278.4 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

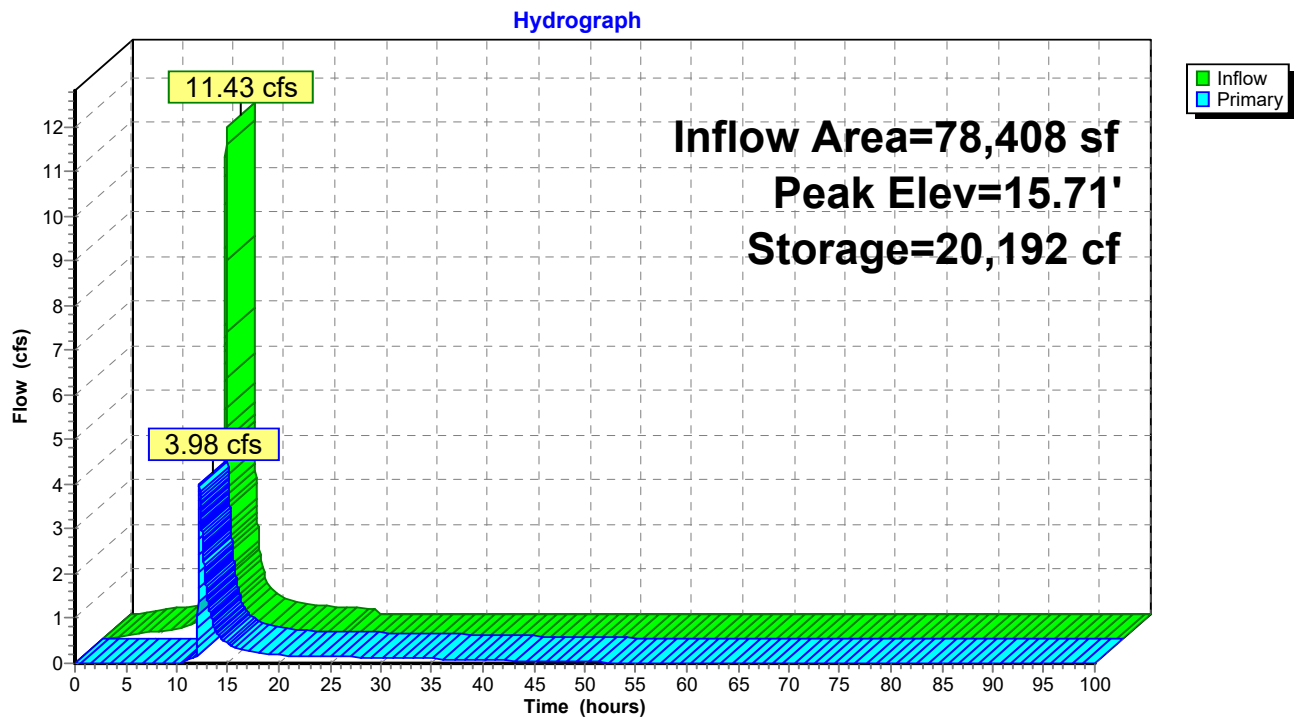
Primary OutFlow Max=3.97 cfs @ 12.21 hrs HW=15.71' TW=12.84' (Dynamic Tailwater)

1=Culvert (Passes 3.97 cfs of 57.67 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.19 cfs @ 5.66 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 3.78 cfs @ 2.18 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 5.88" for 10-Year Future Adj event
 Inflow = 4.65 cfs @ 12.10 hrs, Volume= 15,580 cf
 Outflow = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf, Atten= 84%, Lag= 25.5 min
 Primary = 0.72 cfs @ 12.52 hrs, Volume= 12,893 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.73' @ 12.52 hrs Surf.Area= 10,368 sf Storage= 9,039 cf

Plug-Flow detention time= 436.5 min calculated for 12,893 cf (83% of inflow)
 Center-of-Mass det. time= 358.7 min (1,102.9 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

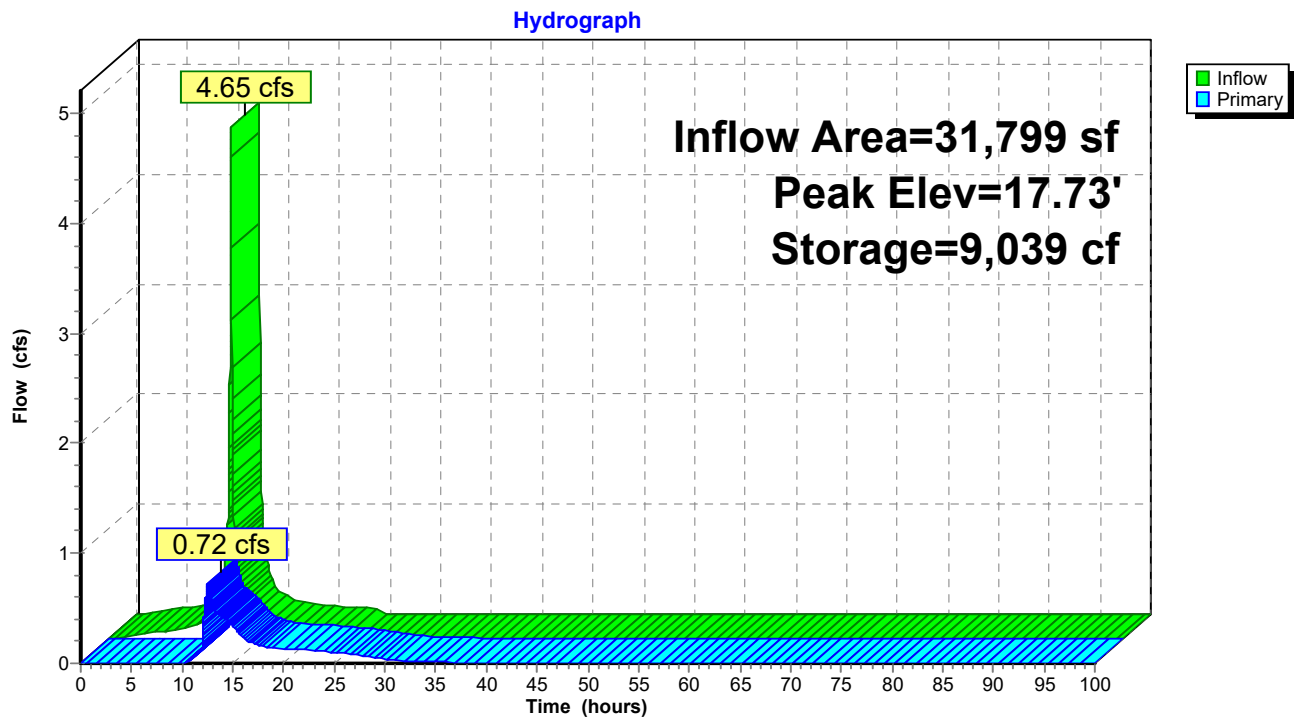
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.72 cfs @ 12.52 hrs HW=17.73' TW=12.56' (Dynamic Tailwater)

- 1=Culvert (Passes 0.72 cfs of 53.73 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 5.77 fps)
- 3=Orifice/Grate (Orifice Controls 0.31 cfs @ 3.51 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 0.22 cfs @ 0.92 fps)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 5.84" for 10-Year Future Adj event
 Inflow = 68.31 cfs @ 12.10 hrs, Volume= 233,274 cf
 Outflow = 30.10 cfs @ 12.18 hrs, Volume= 193,406 cf, Atten= 56%, Lag= 4.9 min
 Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf
 Routed to Link PP4V : Valve
 Secondary = 10.03 cfs @ 12.18 hrs, Volume= 64,185 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.30' @ 12.18 hrs Surf.Area= 181,216 sf Storage= 93,267 cf

Plug-Flow detention time= 199.2 min calculated for 193,406 cf (83% of inflow)
 Center-of-Mass det. time= 121.7 min (866.1 - 744.4)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=20.07 cfs @ 12.18 hrs HW=14.30' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 20.07 cfs of 127.72 cfs potential flow)

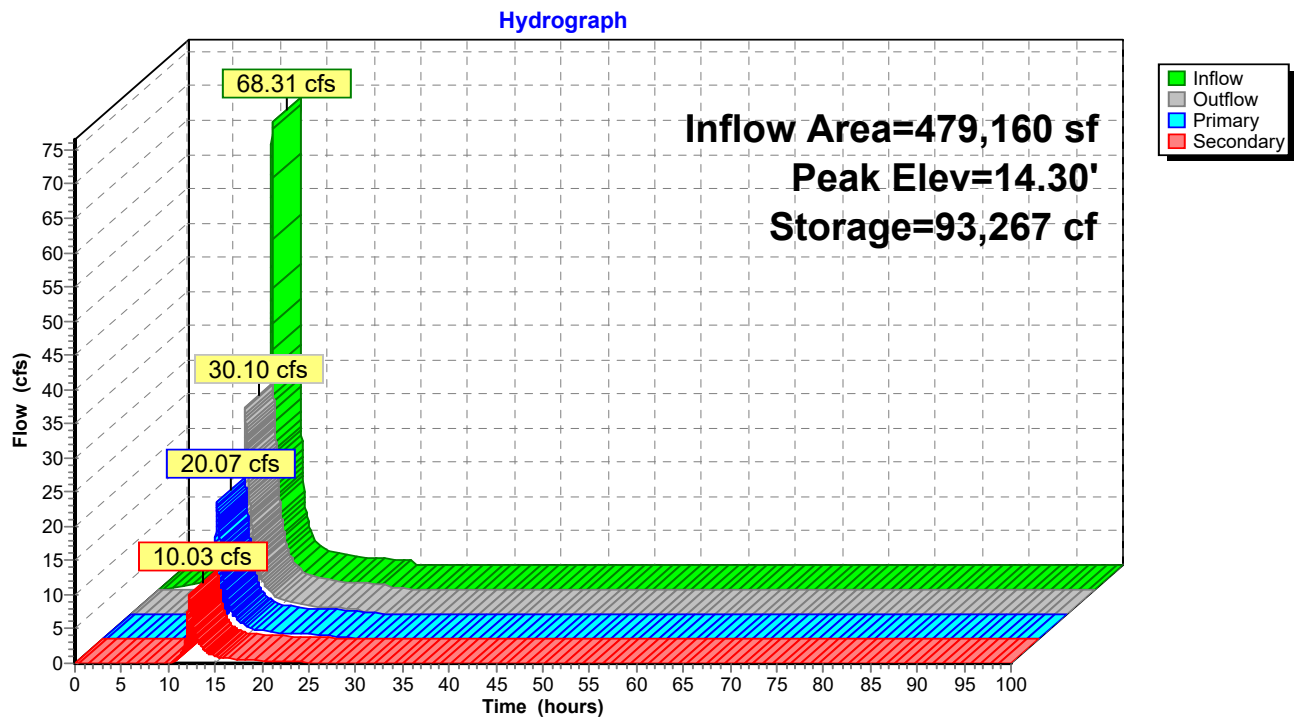
↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 20.07 cfs @ 2.81 fps)

Secondary OutFlow Max=10.03 cfs @ 12.18 hrs HW=14.30' TW=12.94' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 10.03 cfs of 39.63 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir**(Weir Controls 10.03 cfs @ 2.81 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 5.91" for 10-Year Future Adj event
 Inflow = 4.91 cfs @ 12.09 hrs, Volume= 16,302 cf
 Outflow = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf, Atten= 48%, Lag= 1.2 min
 Primary = 2.58 cfs @ 12.11 hrs, Volume= 13,473 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.88' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 6,171 cf

Plug-Flow detention time= 187.4 min calculated for 13,471 cf (83% of inflow)
 Center-of-Mass det. time= 109.6 min (851.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

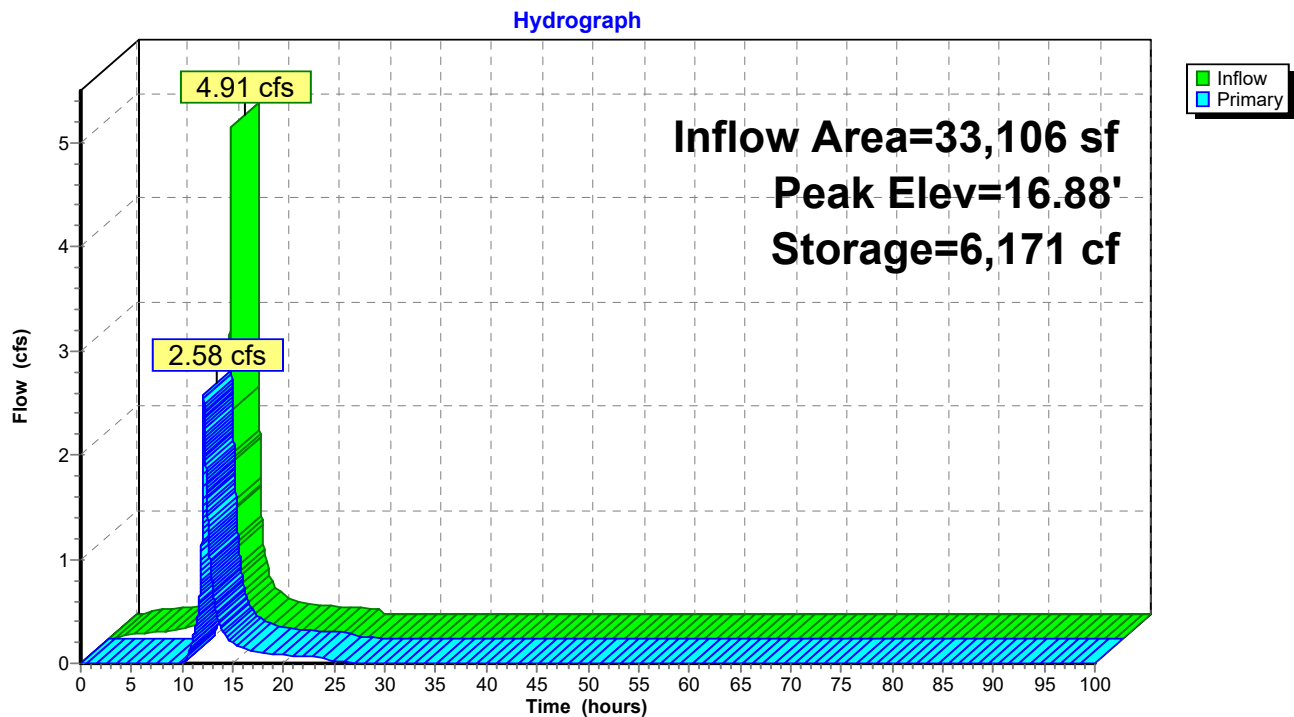
Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.58 cfs @ 12.11 hrs HW=16.88' TW=12.32' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.58 cfs of 10.59 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.58 cfs @ 1.91 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 5.87" for 10-Year Future Adj event
 Inflow = 5.71 cfs @ 12.09 hrs, Volume= 18,977 cf
 Outflow = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf, Atten= 54%, Lag= 1.4 min
 Primary = 2.62 cfs @ 12.11 hrs, Volume= 15,718 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.61' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 7,601 cf

Plug-Flow detention time= 197.3 min calculated for 15,718 cf (83% of inflow)
 Center-of-Mass det. time= 119.6 min (861.0 - 741.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

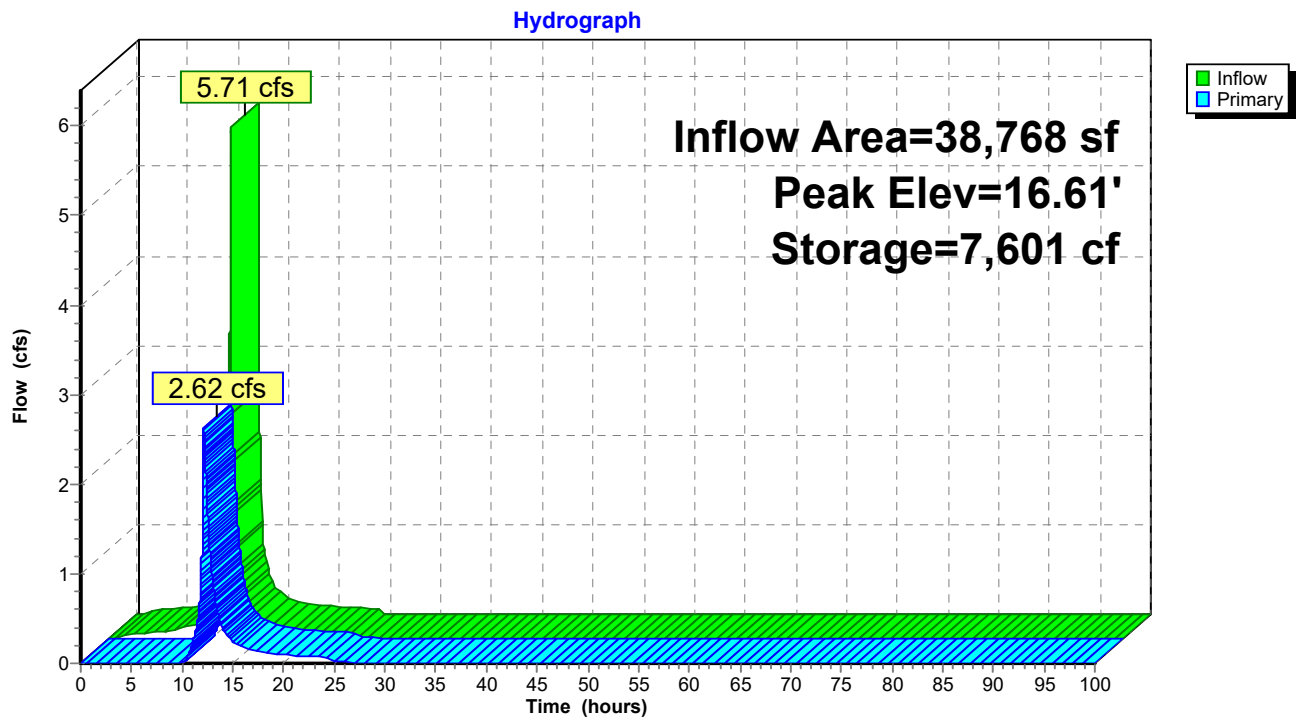
Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.62 cfs @ 12.11 hrs HW=16.61' TW=12.60' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 2.62 cfs of 11.83 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.62 cfs @ 1.92 fps)

Pond PP6: POROUS PAVEMENT

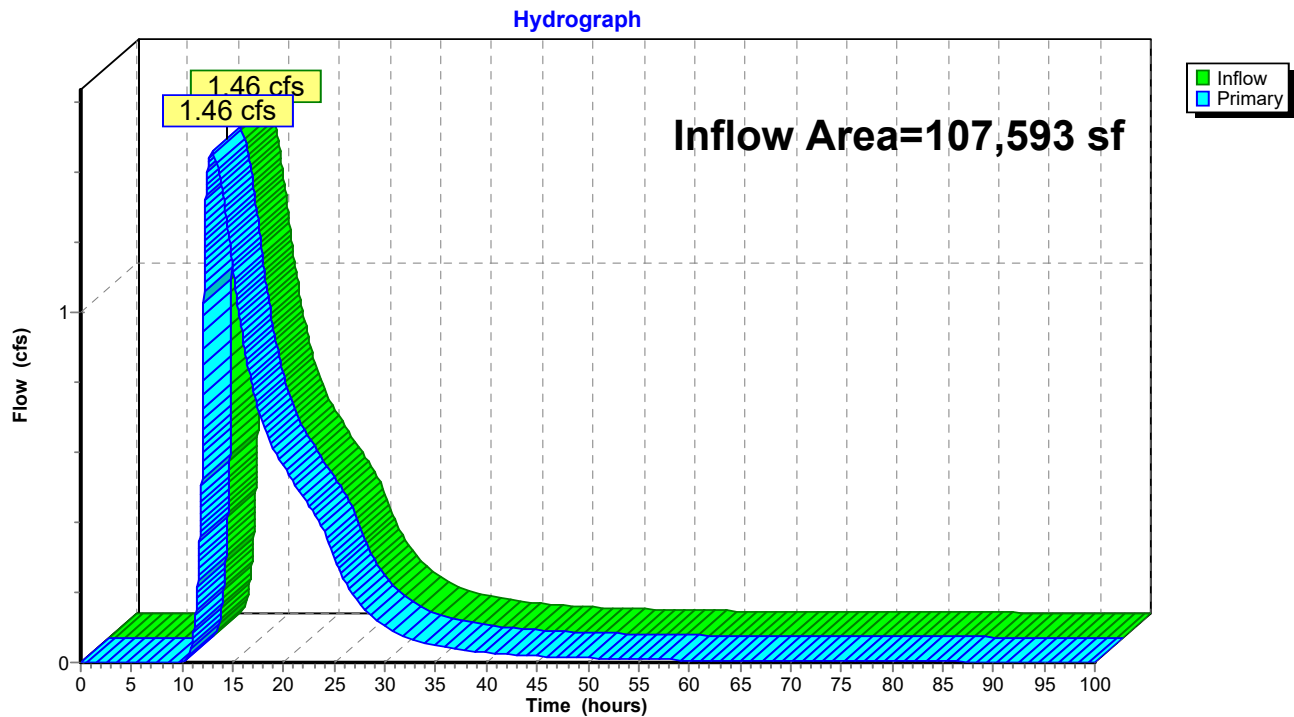


Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 4.85" for 10-Year Future Adj event
Inflow = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf
Primary = 1.46 cfs @ 12.97 hrs, Volume= 43,506 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

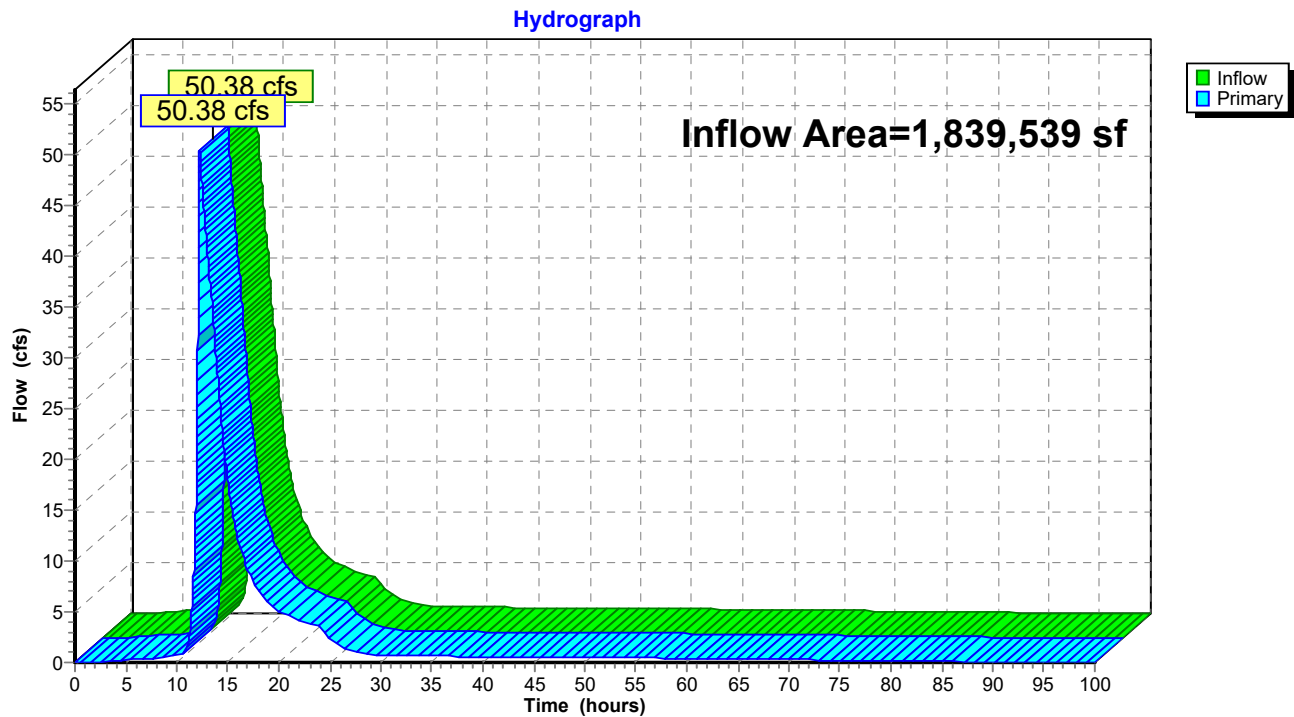


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth > 4.86" for 10-Year Future Adj event
Inflow = 50.38 cfs @ 12.25 hrs, Volume= 745,733 cf
Primary = 50.38 cfs @ 12.25 hrs, Volume= 745,733 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



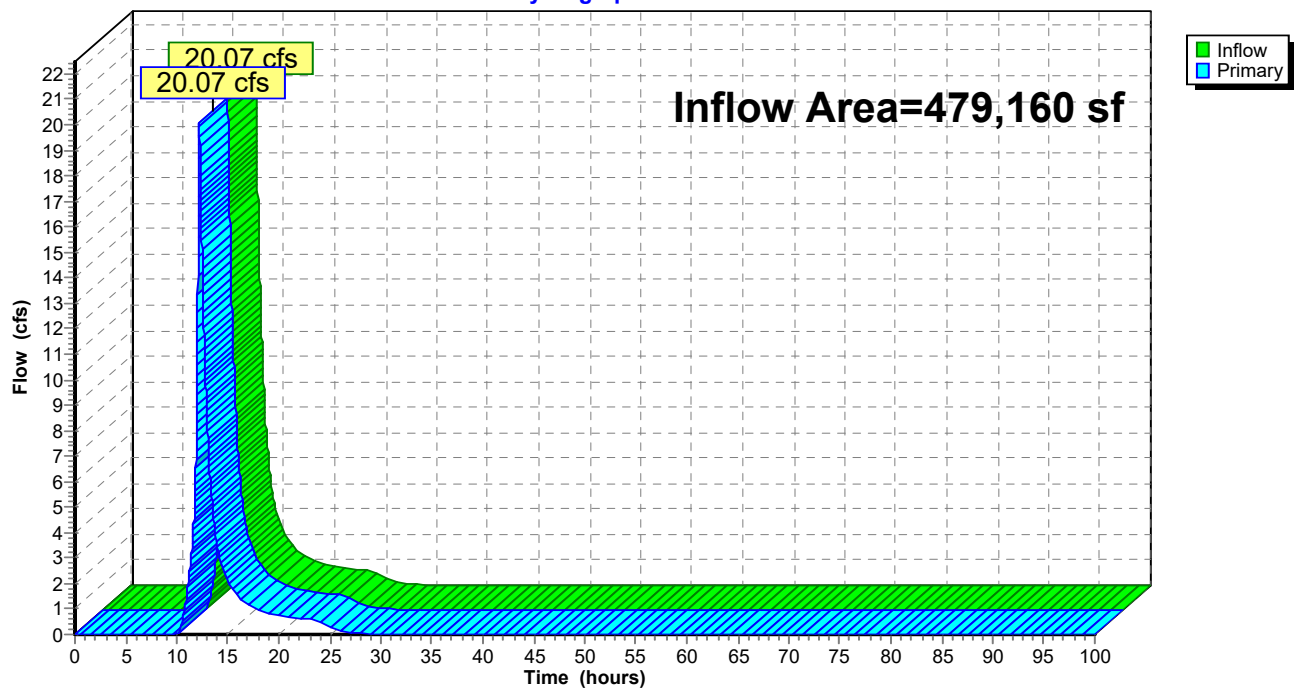
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 3.24" for 10-Year Future Adj event
Inflow = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf
Primary = 20.07 cfs @ 12.18 hrs, Volume= 129,221 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



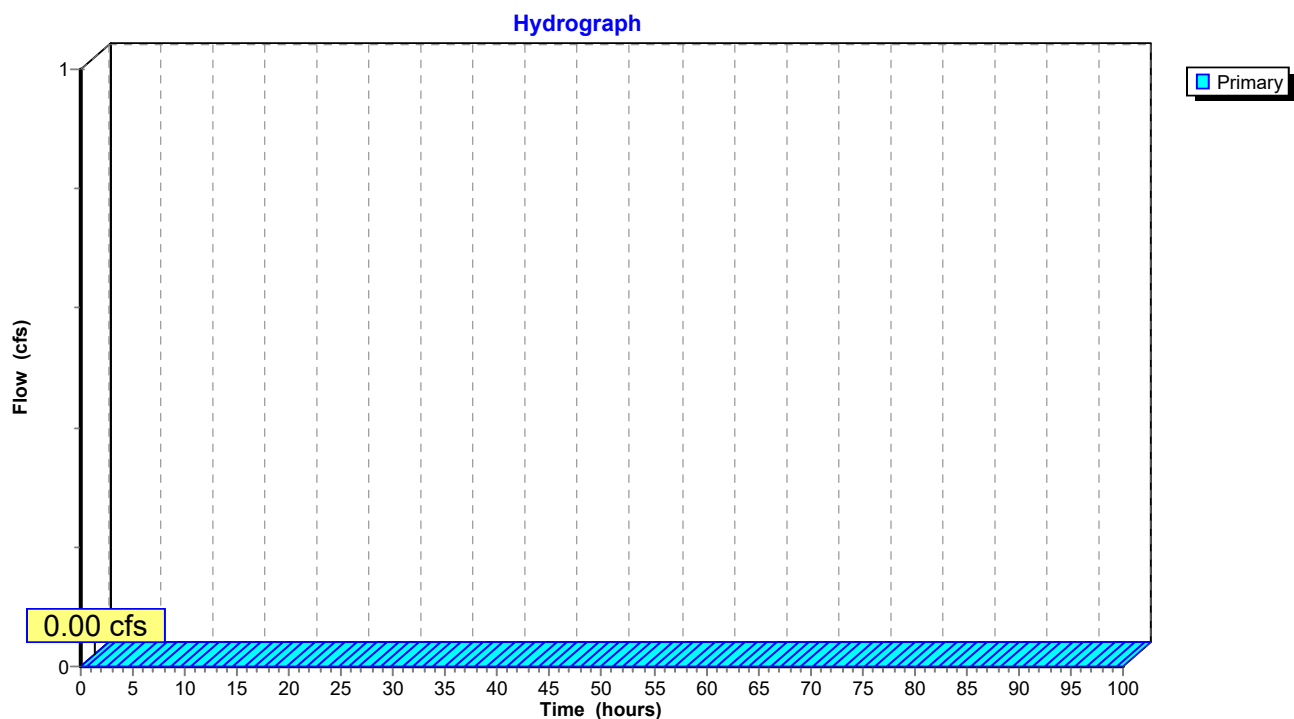
Summary for Link TW: Tailwater

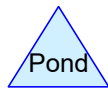
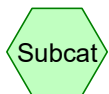
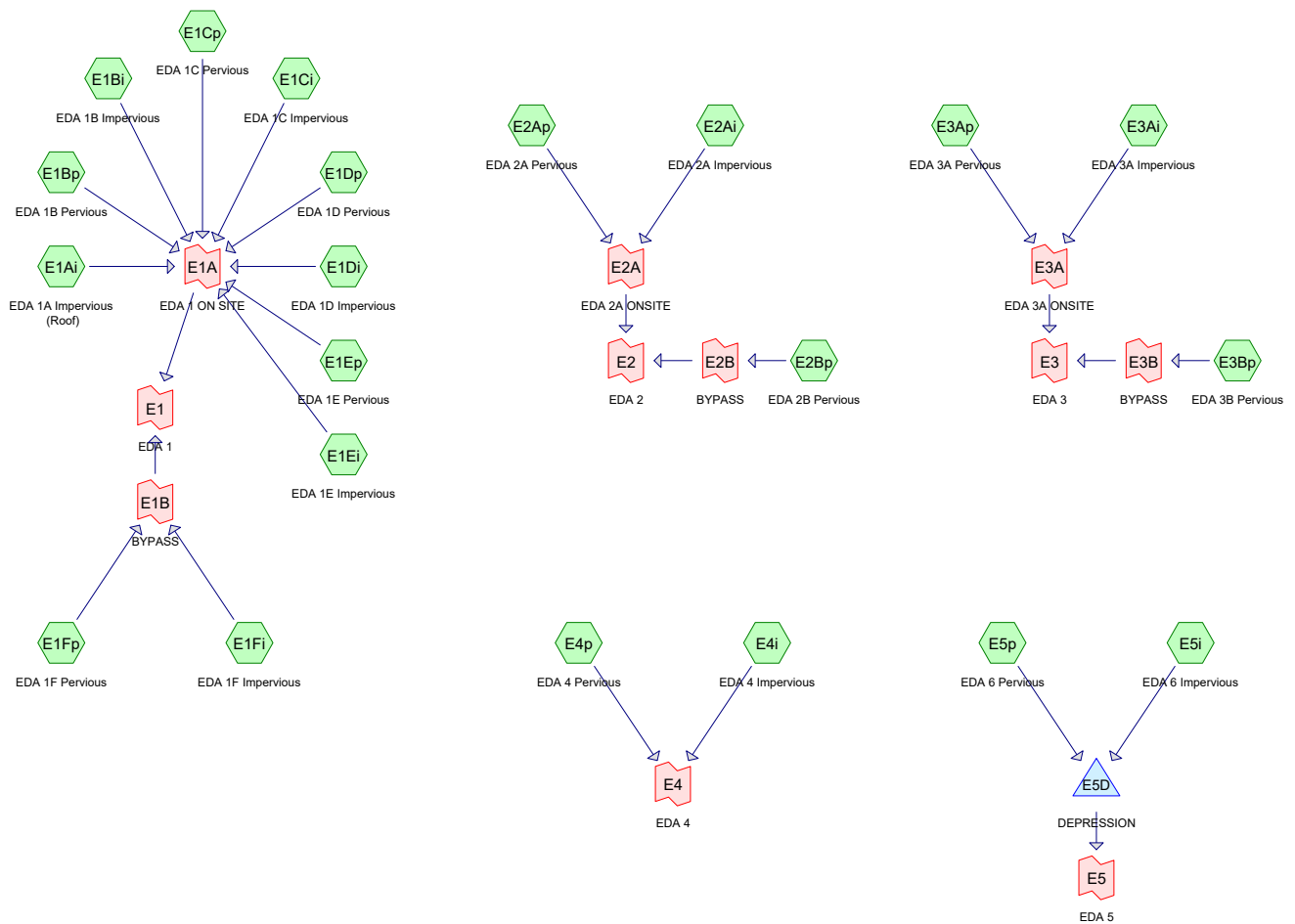
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 8.63'

Link TW: Tailwater





Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	11.48	2	3.99

Pre vs Post Rev. 3a

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
629,442	39	>75% Grass cover, Good, HSG A (E1Dp, E1Ep, E1Fp, E4p, E5p)
344,560	80	>75% Grass cover, Good, HSG D (E1Bp, E1Cp, E1Dp, E1Ep, E1Fp, E2Ap, E3Bp, E4p, E5p)
33,977	91	Gravel roads, HSG D (E2Ai, E3Ai)
58,806	98	Paved parking, HSG A (E1Di, E1Ei, E4i, E5i)
399,445	98	Paved parking, HSG D (E1Bi, E1Ci, E1Di, E1Ei, E1Fi, E2Ai, E3Ai, E4i, E5i)
632,927	98	Roofs, HSG D (E1Ai)
54,886	30	Woods, Good, HSG A (E1Dp, E1Ep, E3Bp, E4p)
503,989	77	Woods, Good, HSG D (E1Ep, E1Fp, E2Ap, E2Bp, E3Ap, E3Bp)
2,658,031	76	TOTAL AREA

Pre vs Post Rev. 3a

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
743,134	HSG A	E1Di, E1Dp, E1Ei, E1Ep, E1Fp, E3Bp, E4i, E4p, E5i, E5p
0	HSG B	
0	HSG C	
1,914,898	HSG D	E1Ai, E1Bi, E1Bp, E1Ci, E1Cp, E1Di, E1Dp, E1Ei, E1Ep, E1Fi, E1Fp, E2Ai, E2Ap, E2Bp, E3Ai, E3Ap, E3Bp, E4i, E4p, E5i, E5p
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
629,442	0	0	344,560	0	974,002	>75% Grass cover, Good	
0	0	0	33,977	0	33,977	Gravel roads	
58,806	0	0	399,445	0	458,251	Paved parking	
0	0	0	632,927	0	632,927	Roofs	
54,886	0	0	503,989	0	558,875	Woods, Good	
743,134	0	0	1,914,898	0	2,658,031	TOTAL AREA	

Pre vs Post Rev. 3a

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	E1Ci	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
2	E1Ci	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
3	E1Cp	0.00	0.00	36.0	0.0250	0.013	0.0	8.0	0.0	
4	E1Cp	0.00	0.00	115.0	0.0148	0.012	0.0	10.0	0.0	
5	E1Ei	0.00	0.00	67.0	0.0100	0.013	0.0	12.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentE1Ai: EDA 1A Runoff Area=14.530 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=400' Slope=0.0100 1' Tc=3.9 min CN=98 Runoff=149.19 cfs 592,772 cf

SubcatchmentE1Bi: EDA 1B Impervious Runoff Area=0.410 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=272' Tc=2.8 min CN=98 Runoff=4.53 cfs 16,727 cf

SubcatchmentE1Bp: EDA 1B Pervious Runoff Area=0.340 ac 0.00% Impervious Runoff Depth=8.94"
Flow Length=230' Tc=7.1 min CN=80 Runoff=2.57 cfs 11,038 cf

SubcatchmentE1Ci: EDA 1C Impervious Runoff Area=1.280 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=265' Tc=6.9 min CN=98 Runoff=10.89 cfs 52,219 cf

SubcatchmentE1Cp: EDA 1C Pervious Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=8.94"
Flow Length=265' Tc=6.9 min CN=80 Runoff=3.05 cfs 12,986 cf

SubcatchmentE1Di: EDA 1D Impervious Runoff Area=0.210 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=695' Tc=19.0 min CN=98 Runoff=1.13 cfs 8,567 cf

SubcatchmentE1Dp: EDA 1D Pervious Runoff Area=2.290 ac 0.00% Impervious Runoff Depth=4.61"
Flow Length=435' Tc=18.4 min CN=50 Runoff=5.62 cfs 38,350 cf

SubcatchmentE1Ei: EDA 1E Impervious Runoff Area=6.290 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=441' Tc=5.2 min CN=98 Runoff=59.29 cfs 256,609 cf

SubcatchmentE1Ep: EDA 1E Pervious Runoff Area=2.070 ac 0.00% Impervious Runoff Depth=8.40"
Flow Length=412' Tc=8.2 min CN=76 Runoff=14.02 cfs 63,137 cf

SubcatchmentE1Fi: EDA 1F Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=861' Tc=18.7 min CN=98 Runoff=0.70 cfs 5,304 cf

SubcatchmentE1Fp: EDA 1F Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=8.67"
Flow Length=861' Tc=18.7 min CN=78 Runoff=34.92 cfs 235,219 cf

SubcatchmentE2Ai: EDA 2A Impervious Runoff Area=0.320 ac 43.75% Impervious Runoff Depth=10.75"
Flow Length=382' Tc=14.3 min CN=94 Runoff=1.96 cfs 12,485 cf

SubcatchmentE2Ap: EDA 2A Pervious Runoff Area=1.070 ac 0.00% Impervious Runoff Depth=8.81"
Flow Length=382' Tc=14.3 min CN=79 Runoff=5.80 cfs 34,217 cf

SubcatchmentE2Bp: EDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=8.54"
Flow Length=289' Tc=12.1 min CN=77 Runoff=3.11 cfs 16,738 cf

SubcatchmentE3Ai: EDA 3A Impervious Runoff Area=1.400 ac 57.14% Impervious Runoff Depth=10.87"
Flow Length=218' Tc=2.8 min CN=95 Runoff=15.39 cfs 55,250 cf

SubcatchmentE3Ap: EDA 3A Pervious Runoff Area=0.660 ac 0.00% Impervious Runoff Depth=8.54"
Flow Length=218' Tc=2.8 min CN=77 Runoff=6.38 cfs 20,457 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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SubcatchmentE3Bp: EDA 3B Pervious	Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=8.13" Flow Length=860' Tc=18.7 min CN=74 Runoff=28.86 cfs 192,656 cf
SubcatchmentE4i: EDA 4 Impervious	Runoff Area=0.430 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=636' Tc=13.0 min CN=98 Runoff=2.79 cfs 17,542 cf
SubcatchmentE4p: EDA 4 Pervious	Runoff Area=7.060 ac 0.00% Impervious Runoff Depth=2.91" Flow Length=636' Tc=10.1 min CN=39 Runoff=13.31 cfs 74,506 cf
SubcatchmentE5i: EDA 6 Impervious	Runoff Area=0.830 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=585' Tc=25.3 min CN=98 Runoff=3.84 cfs 33,861 cf
SubcatchmentE5p: EDA 6 Pervious	Runoff Area=6.760 ac 0.00% Impervious Runoff Depth=3.22" Flow Length=585' Tc=25.3 min CN=41 Runoff=8.76 cfs 78,971 cf
Pond E5D: DEPRESSION	Peak Elev=16.45' Storage=57,078 cf Inflow=12.54 cfs 112,832 cf Outflow=4.30 cfs 63,427 cf
Link E1: EDA 1	Inflow=268.67 cfs 1,292,929 cf Primary=268.67 cfs 1,292,929 cf
Link E1A: EDA 1 ON SITE	Inflow=244.95 cfs 1,052,406 cf Primary=244.95 cfs 1,052,406 cf
Link E1B: BYPASS	Inflow=35.63 cfs 240,523 cf Primary=35.63 cfs 240,523 cf
Link E2: EDA 2	Inflow=10.83 cfs 63,440 cf Primary=10.83 cfs 63,440 cf
Link E2A: EDA 2A ONSITE	Inflow=7.76 cfs 46,702 cf Primary=7.76 cfs 46,702 cf
Link E2B: BYPASS	Inflow=3.11 cfs 16,738 cf Primary=3.11 cfs 16,738 cf
Link E3: EDA 3	Inflow=39.95 cfs 268,363 cf Primary=39.95 cfs 268,363 cf
Link E3A: EDA 3A ONSITE	Inflow=21.77 cfs 75,707 cf Primary=21.77 cfs 75,707 cf
Link E3B: BYPASS	Inflow=28.86 cfs 192,656 cf Primary=28.86 cfs 192,656 cf
Link E4: EDA 4	Inflow=16.08 cfs 92,048 cf Primary=16.08 cfs 92,048 cf
Link E5: EDA 5	Inflow=4.30 cfs 63,427 cf Primary=4.30 cfs 63,427 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Total Runoff Area = 2,658,031 sf Runoff Volume = 1,829,612 cf Average Runoff Depth = 8.26"
58.95% Pervious = 1,566,853 sf 41.05% Impervious = 1,091,178 sf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Ai: EDA 1A Impervious (Roof)

Runoff = 149.19 cfs @ 12.12 hrs, Volume= 592,772 cf, Depth=11.24"

Routed to Link E1A : EDA 1 ON SITE

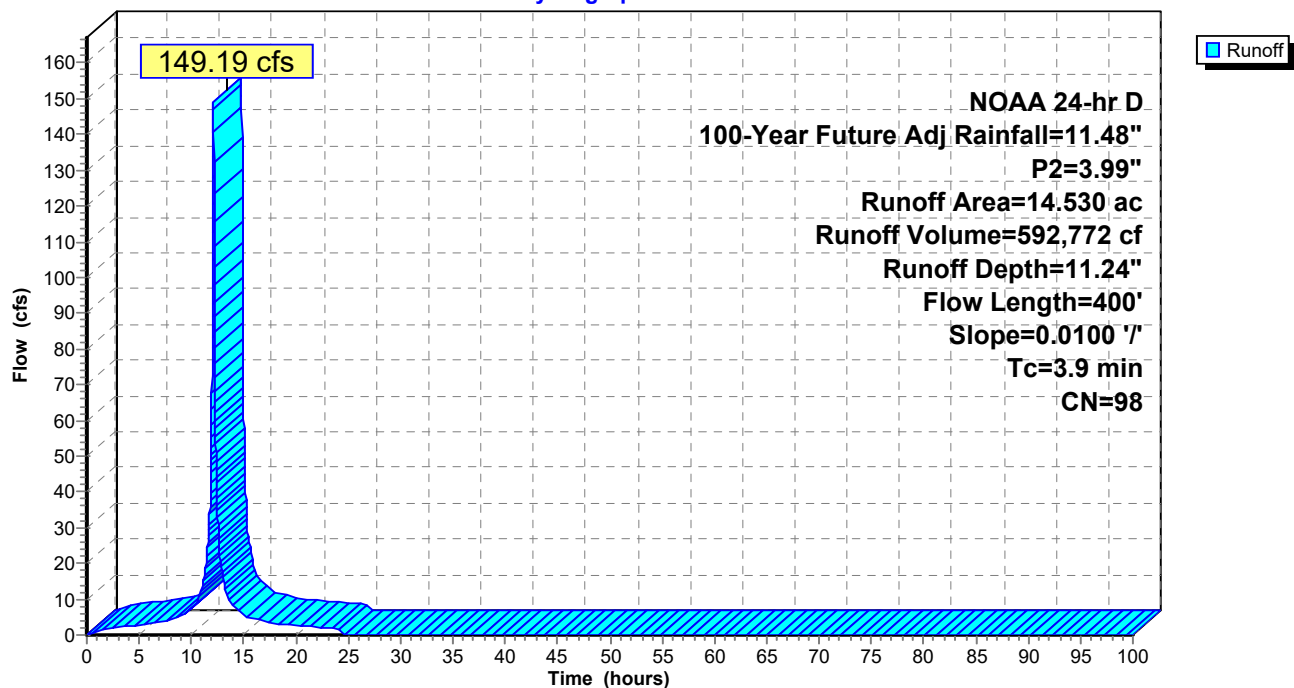
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
14.530	98	Roofs, HSG D
14.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.16		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
2.5	300	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	400	Total			

Subcatchment E1Ai: EDA 1A Impervious (Roof)

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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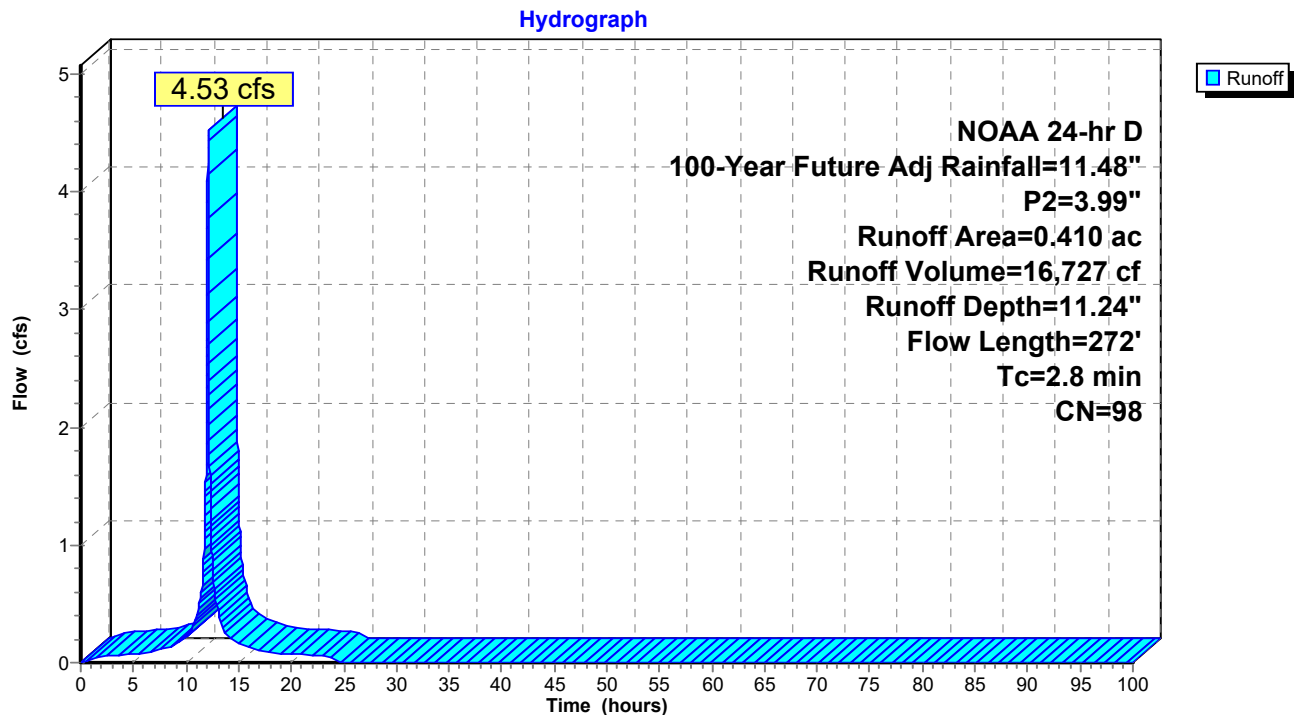
Summary for Subcatchment E1Bi: EDA 1B Impervious

Runoff = 4.53 cfs @ 12.11 hrs, Volume= 16,727 cf, Depth=11.24"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.410	98	Paved parking, HSG D
0.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.22		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.7	118	0.0278	1.17		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	54	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8	272	Total			

Subcatchment E1Bi: EDA 1B Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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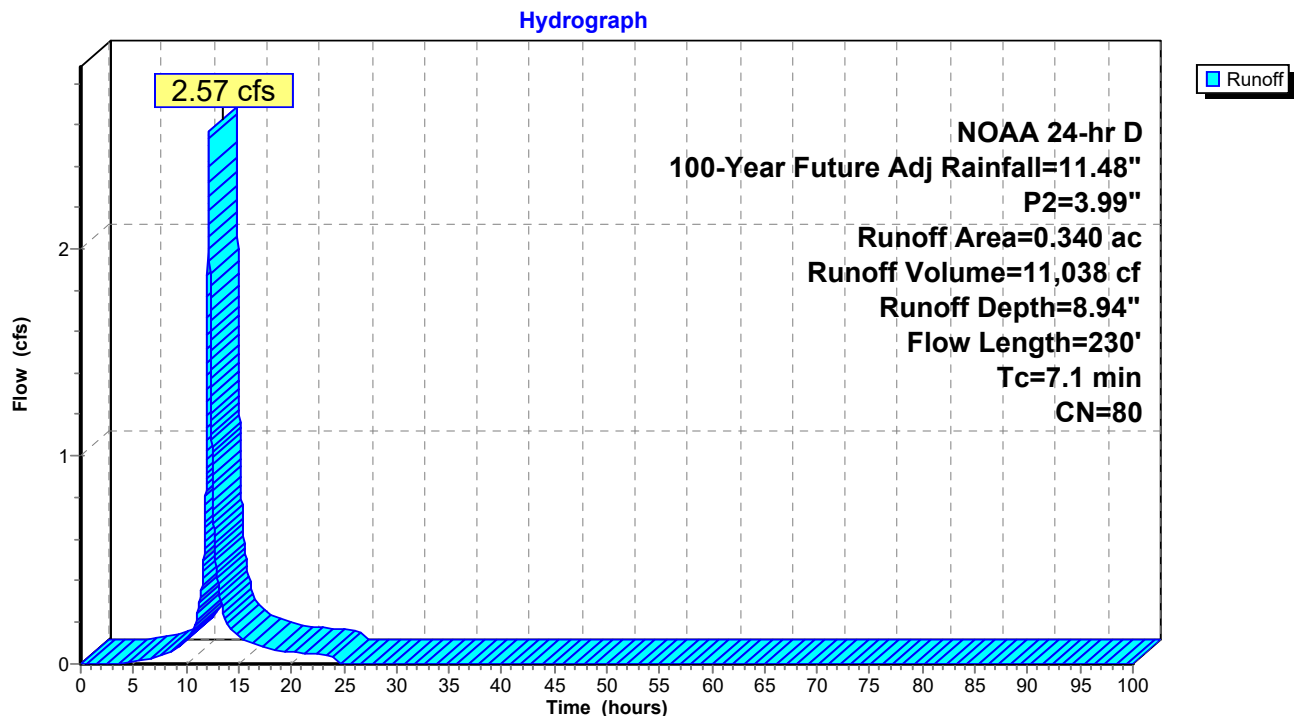
Summary for Subcatchment E1Bp: EDA 1B Pervious

Runoff = 2.57 cfs @ 12.15 hrs, Volume= 11,038 cf, Depth= 8.94"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.340	80	>75% Grass cover, Good, HSG D
0.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0500	0.27		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	21	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	62	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	47	0.0100	5.50	2.75	Channel Flow, Area= 0.5 sf Perim= 1.5' r= 0.33' n= 0.013 Asphalt, smooth
7.1	230	Total			

Subcatchment E1Bp: EDA 1B Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Ci: EDA 1C Impervious

Runoff = 10.89 cfs @ 12.15 hrs, Volume= 52,219 cf, Depth=11.24"
Routed to Link E1A : EDA 1 ON SITE

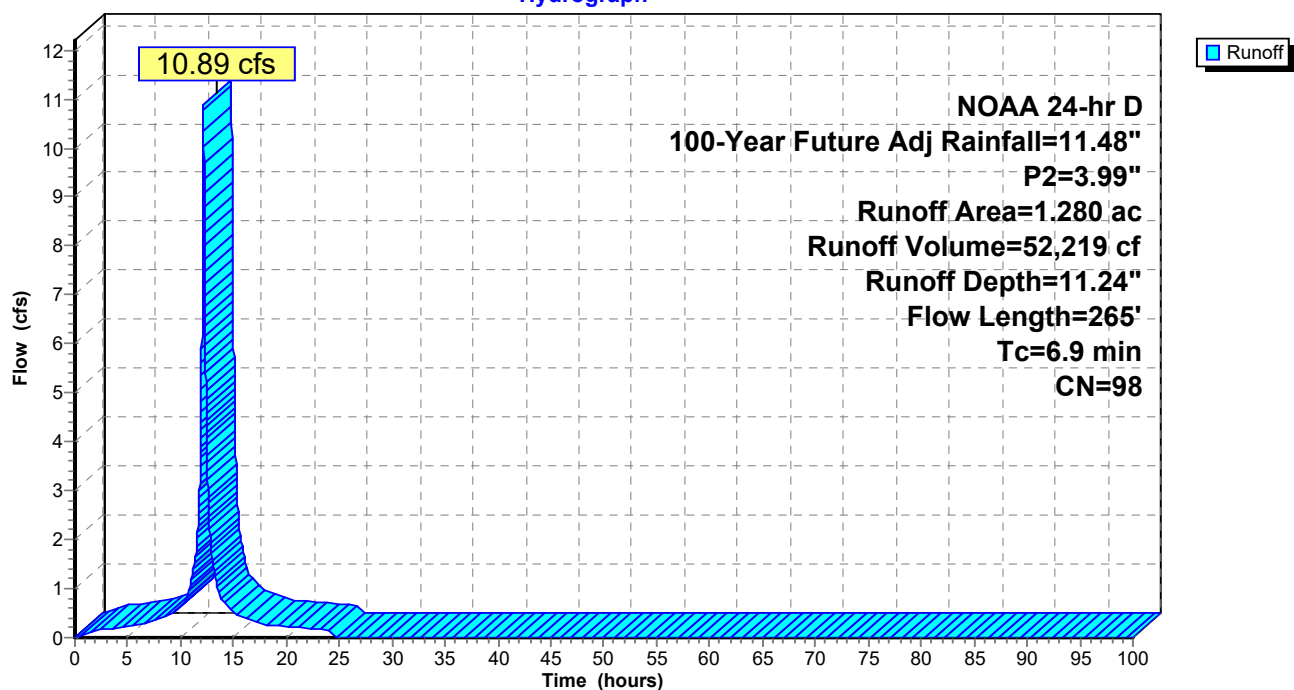
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
1.280	98	Paved parking, HSG D
1.280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Ci: EDA 1C Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Cp: EDA 1C Pervious

Runoff = 3.05 cfs @ 12.15 hrs, Volume= 12,986 cf, Depth= 8.94"
Routed to Link E1A : EDA 1 ON SITE

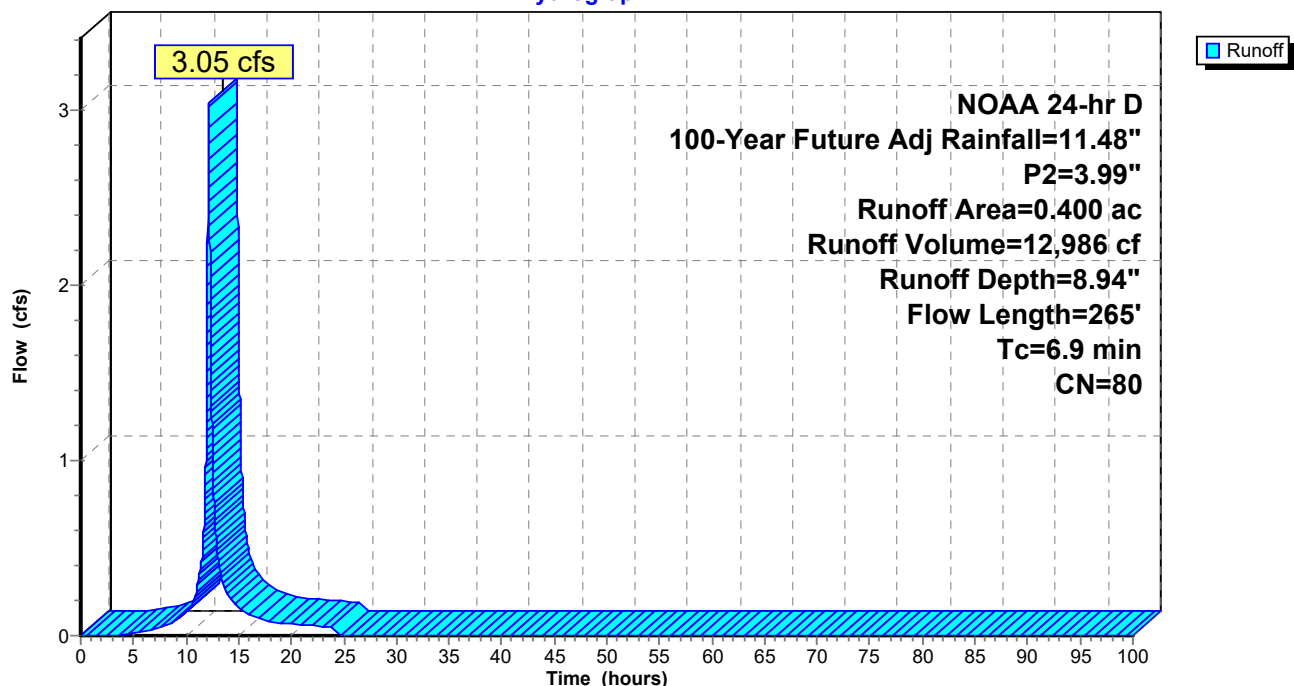
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.400	80	>75% Grass cover, Good, HSG D
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	51	0.0139	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	63	0.0129	2.31		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	36	0.0250	5.47	1.91	Pipe Channel, 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013 Concrete pipe, bends & connections
0.4	115	0.0148	5.29	2.89	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.012 Steel, smooth
6.9	265	Total			

Subcatchment E1Cp: EDA 1C Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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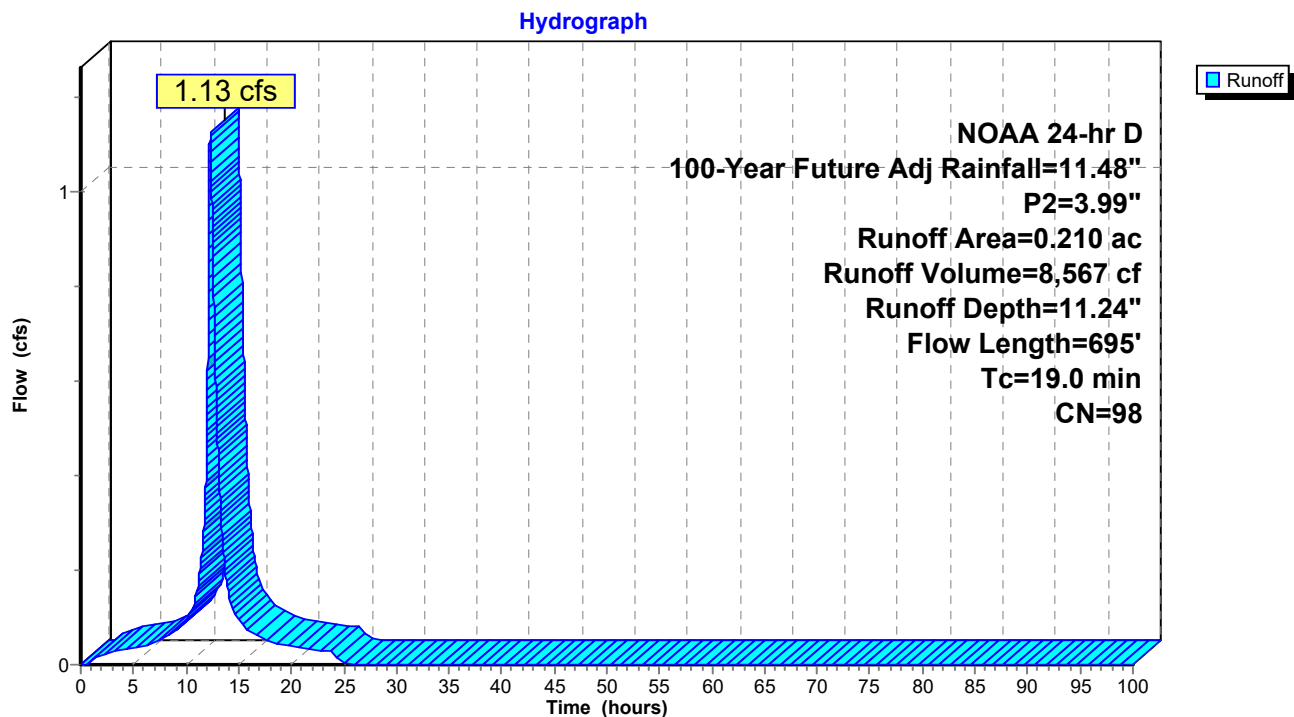
Summary for Subcatchment E1Di: EDA 1D Impervious

Runoff = 1.13 cfs @ 12.29 hrs, Volume= 8,567 cf, Depth=11.24"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
0.150	98	Paved parking, HSG A
0.210	98	Weighted Average
0.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0055	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	62	0.0153	2.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
16.8	533	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
19.0	695	Total			

Subcatchment E1Di: EDA 1D Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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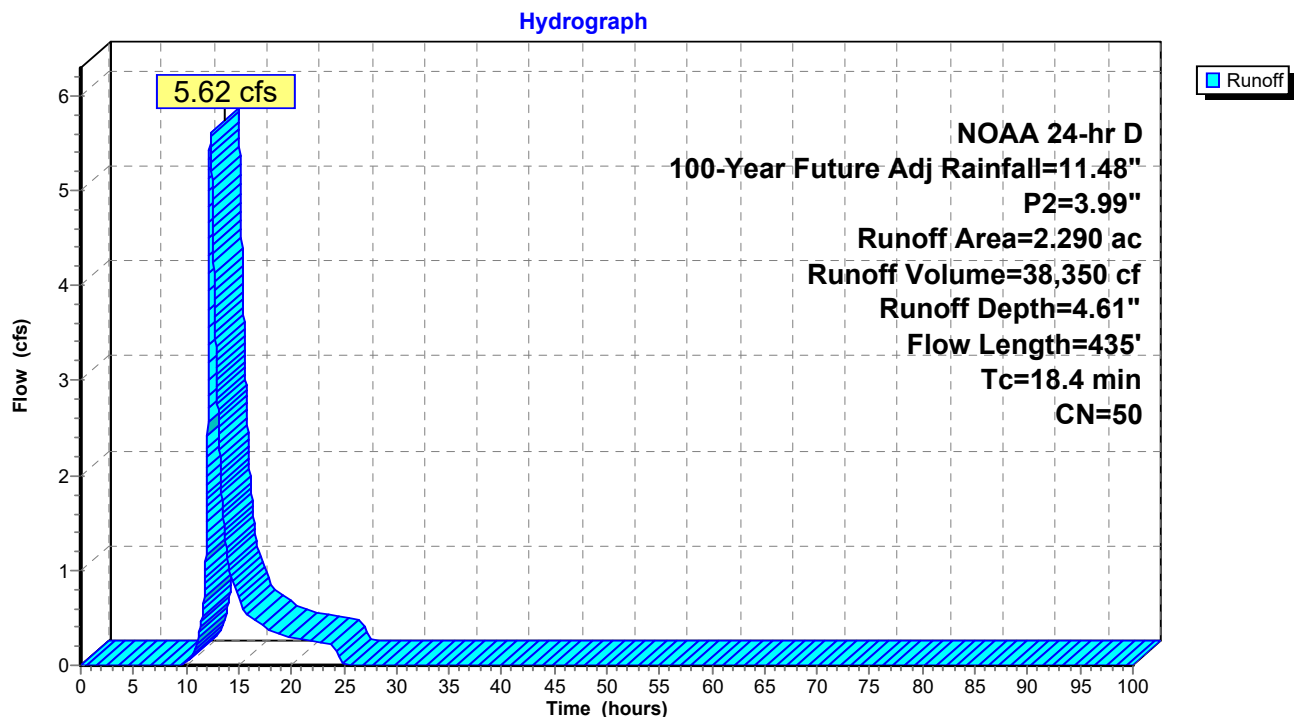
Summary for Subcatchment E1Dp: EDA 1D Pervious

Runoff = 5.62 cfs @ 12.31 hrs, Volume= 38,350 cf, Depth= 4.61"
Routed to Link E1A : EDA 1 ON SITE

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.640	80	>75% Grass cover, Good, HSG D
1.440	39	>75% Grass cover, Good, HSG A
0.210	30	Woods, Good, HSG A
2.290	50	Weighted Average
2.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.0270	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
10.6	335	0.0057	0.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.4	435	Total			

Subcatchment E1Dp: EDA 1D Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Ei: EDA 1E Impervious

Runoff = 59.29 cfs @ 12.13 hrs, Volume= 256,609 cf, Depth=11.24"

Routed to Link E1A : EDA 1 ON SITE

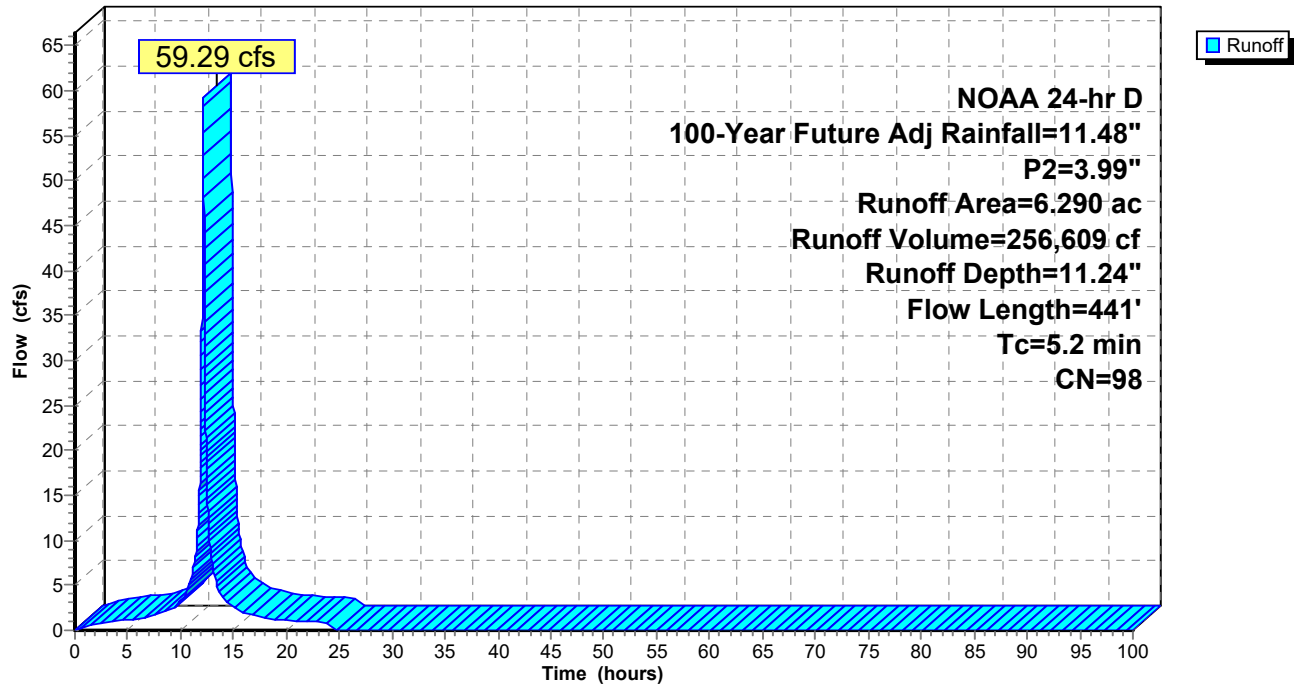
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
6.230	98	Paved parking, HSG D
0.060	98	Paved parking, HSG A
6.290	98	Weighted Average
6.290		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.6	75	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	67	0.0100	4.54	3.56	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.5	199	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
5.2	441	Total			

Subcatchment E1Ei: EDA 1E Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Ep: EDA 1E Pervious

Runoff = 14.02 cfs @ 12.17 hrs, Volume= 63,137 cf, Depth= 8.40"
Routed to Link E1A : EDA 1 ON SITE

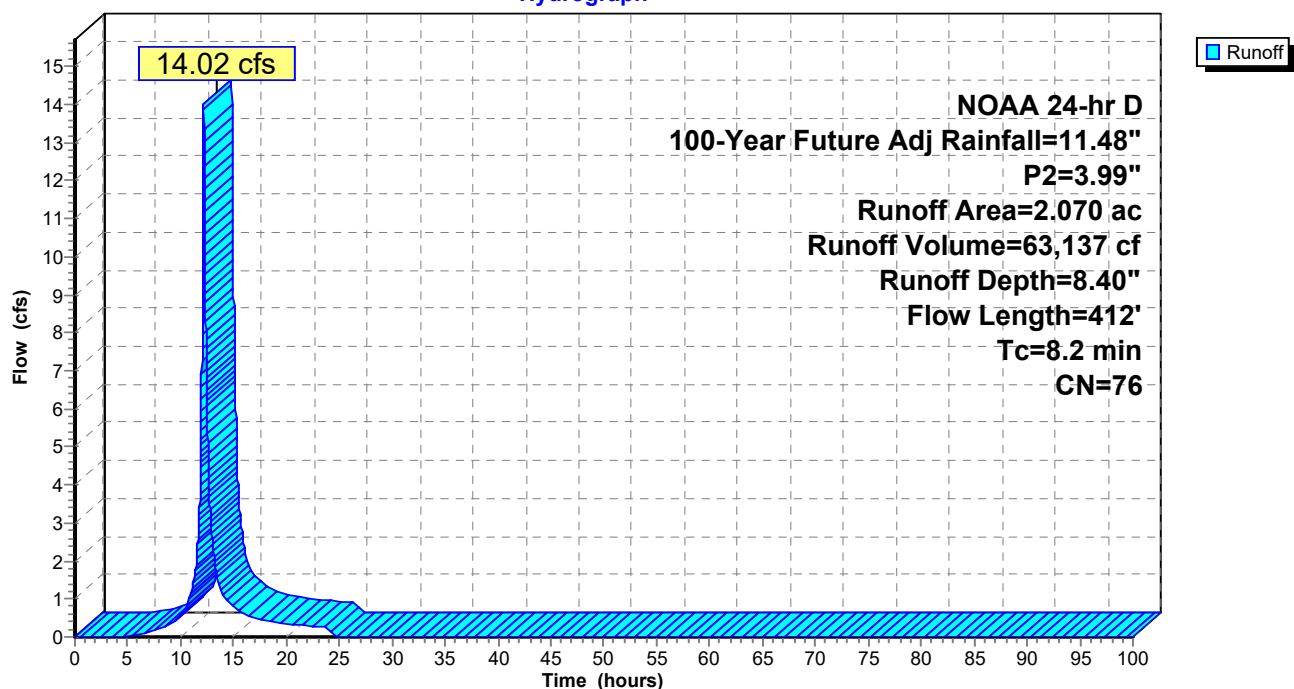
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
1.290	80	>75% Grass cover, Good, HSG D
0.650	77	Woods, Good, HSG D
0.090	39	>75% Grass cover, Good, HSG A
0.040	30	Woods, Good, HSG A
2.070	76	Weighted Average
2.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment E1Ep: EDA 1E Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Fi: EDA 1F Impervious

Runoff = 0.70 cfs @ 12.30 hrs, Volume= 5,304 cf, Depth=11.24"
Routed to Link E1B : BYPASS

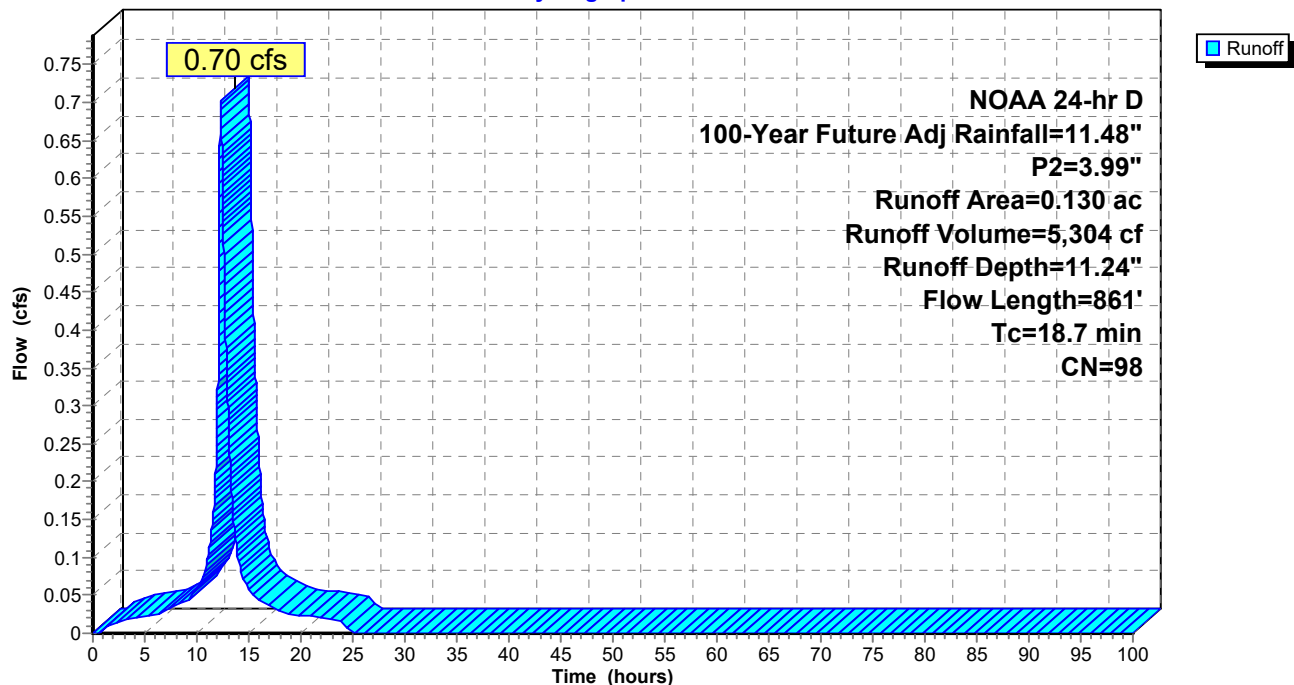
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fi: EDA 1F Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E1Fp: EDA 1F Pervious

Runoff = 34.92 cfs @ 12.30 hrs, Volume= 235,219 cf, Depth= 8.67"
Routed to Link E1B : BYPASS

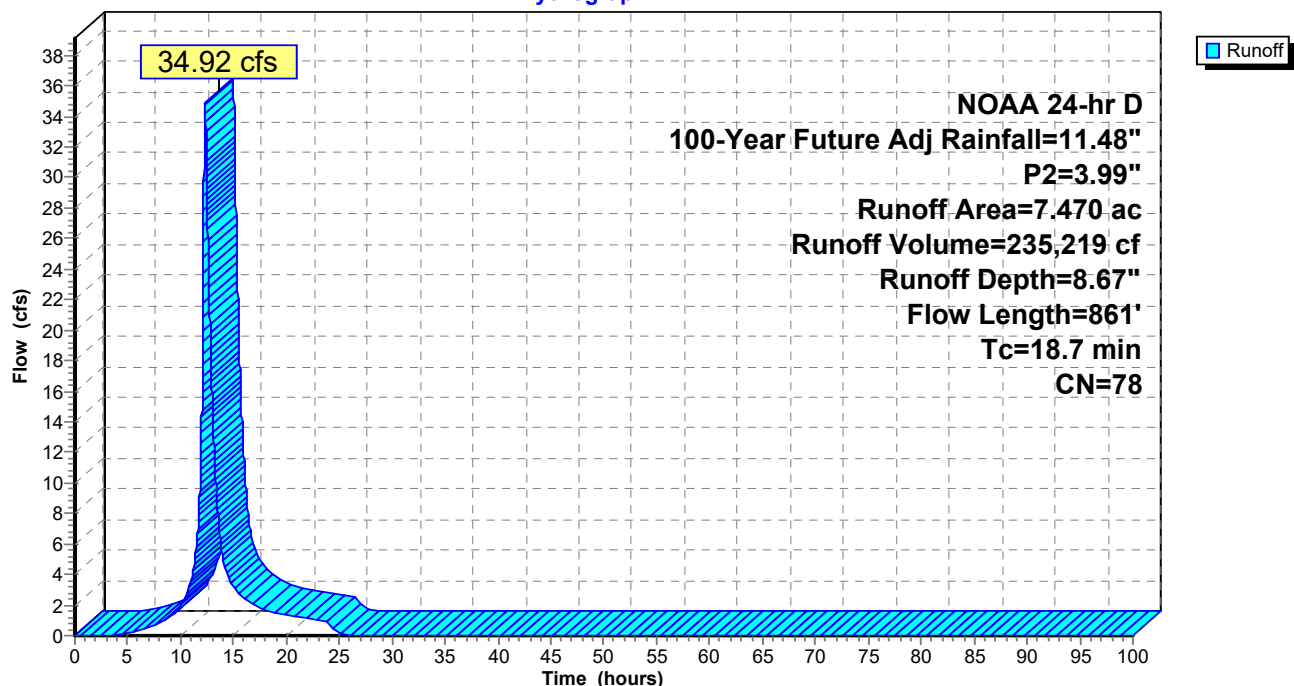
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment E1Fp: EDA 1F Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E2Ai: EDA 2A Impervious

Runoff = 1.96 cfs @ 12.24 hrs, Volume= 12,485 cf, Depth=10.75"
Routed to Link E2A : EDA 2A ONSITE

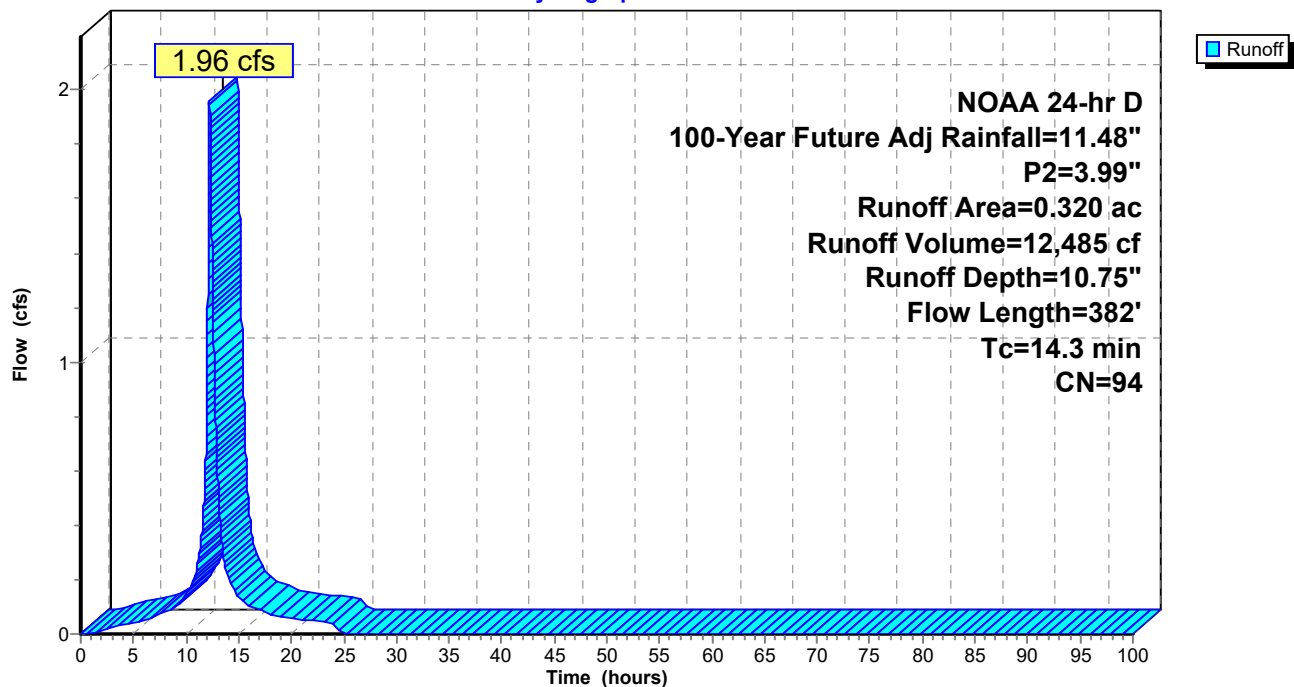
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG D
0.180	91	Gravel roads, HSG D
0.320	94	Weighted Average
0.180		56.25% Pervious Area
0.140		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ai: EDA 2A Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E2Ap: EDA 2A Pervious

Runoff = 5.80 cfs @ 12.24 hrs, Volume= 34,217 cf, Depth= 8.81"
Routed to Link E2A : EDA 2A ONSITE

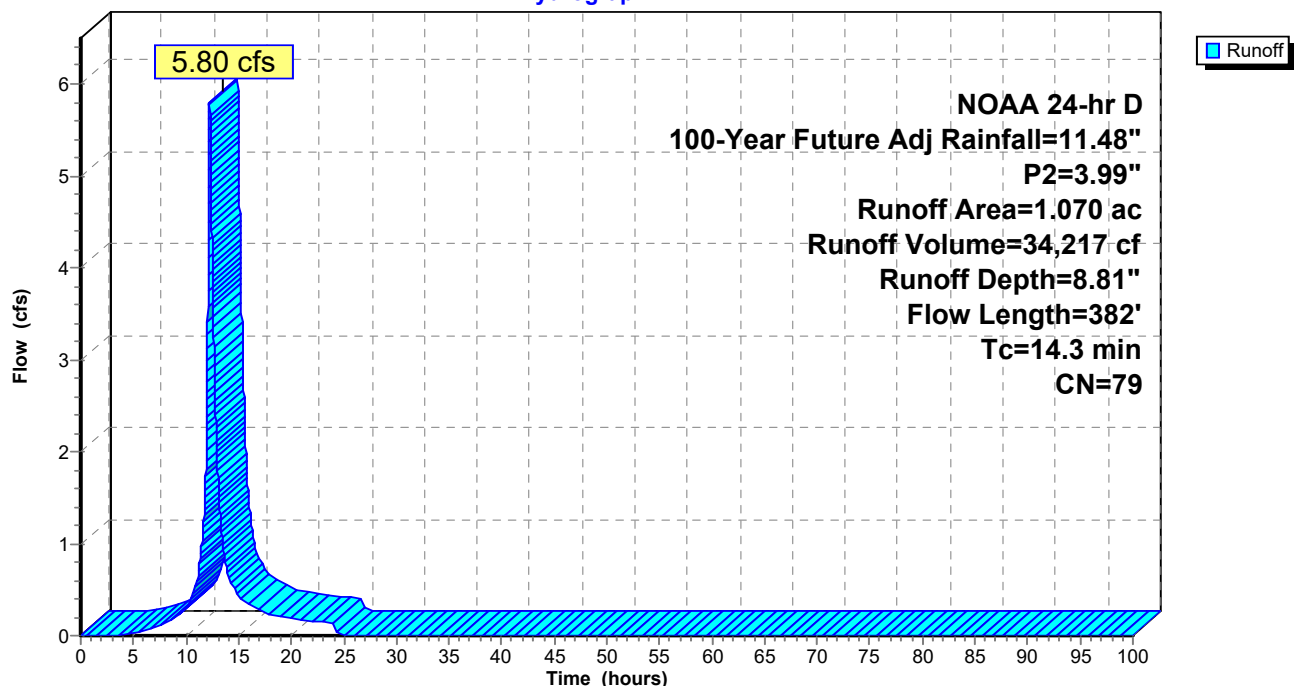
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.720	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
1.070	79	Weighted Average
1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment E2Ap: EDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E2Bp: EDA 2B Pervious

Runoff = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf, Depth= 8.54"
Routed to Link E2B : BYPASS

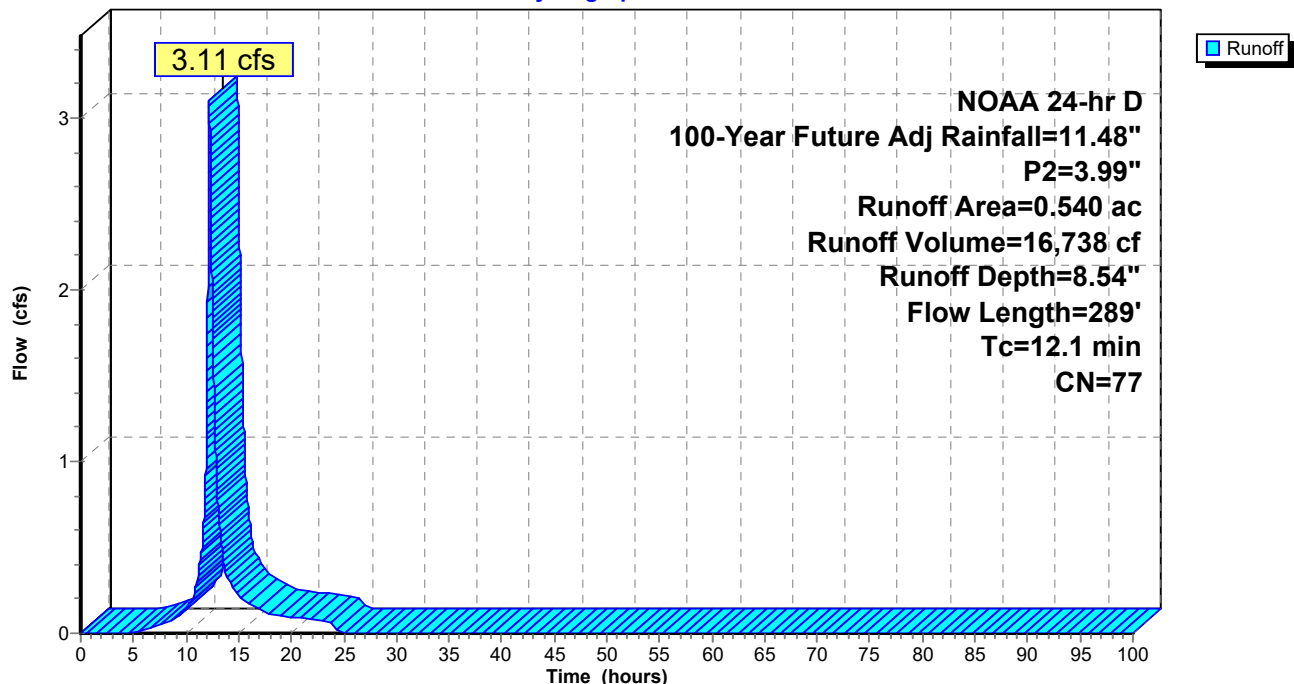
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment E2Bp: EDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E3Ai: EDA 3A Impervious

Runoff = 15.39 cfs @ 12.11 hrs, Volume= 55,250 cf, Depth=10.87"
Routed to Link E3A : EDA 3A ONSITE

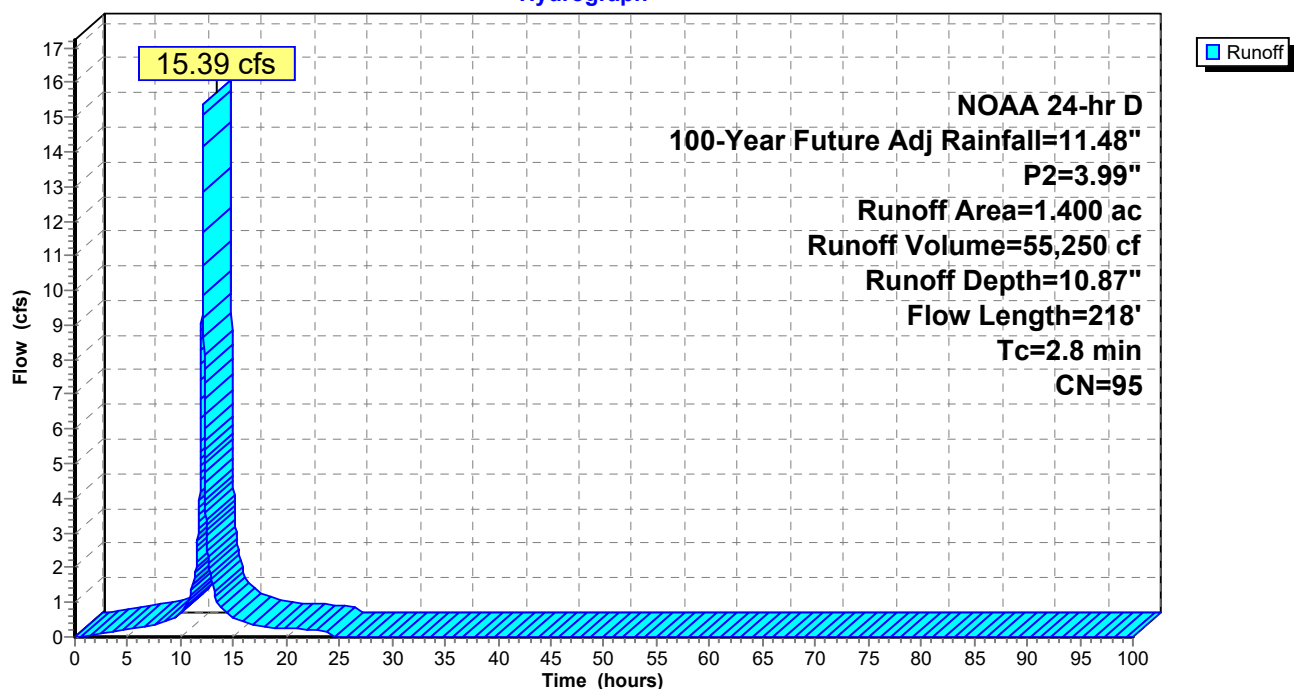
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.600	91	Gravel roads, HSG D
1.400	95	Weighted Average
0.600		42.86% Pervious Area
0.800		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ai: EDA 3A Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E3Ap: EDA 3A Pervious

Runoff = 6.38 cfs @ 12.11 hrs, Volume= 20,457 cf, Depth= 8.54"
Routed to Link E3A : EDA 3A ONSITE

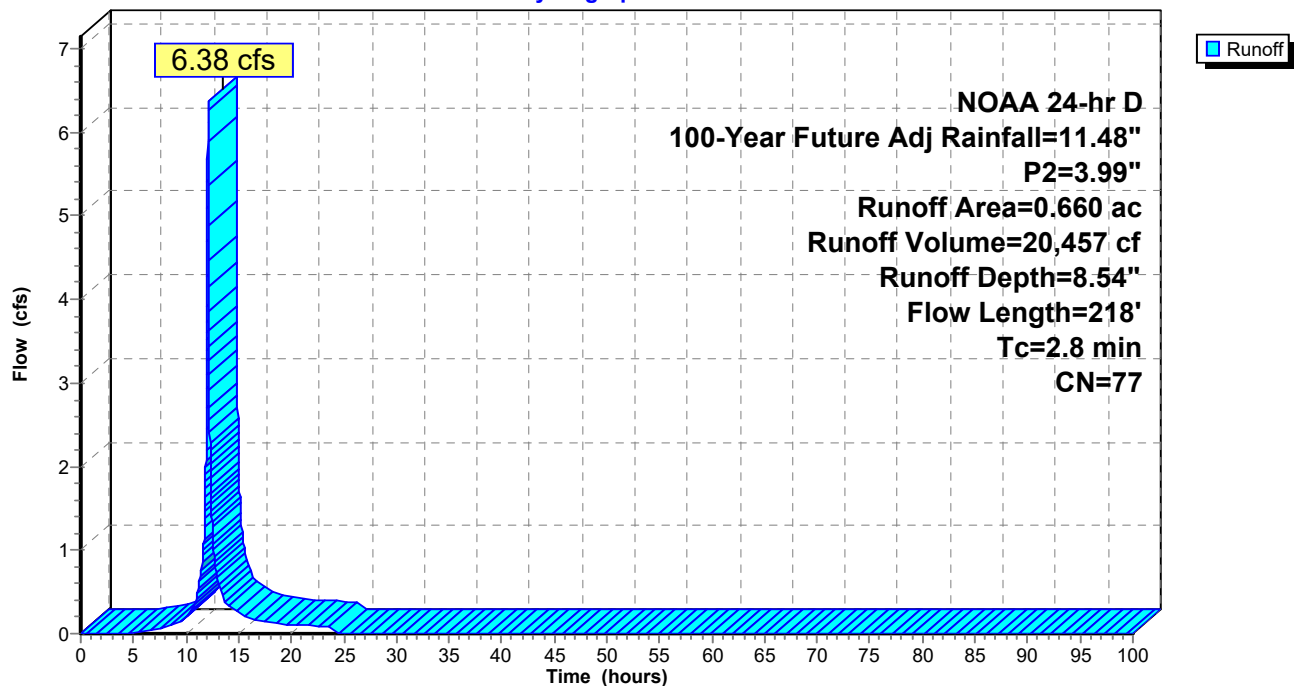
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.660	77	Woods, Good, HSG D
0.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment E3Ap: EDA 3A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E3Bp: EDA 3B Pervious

Runoff = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf, Depth= 8.13"
Routed to Link E3B : BYPASS

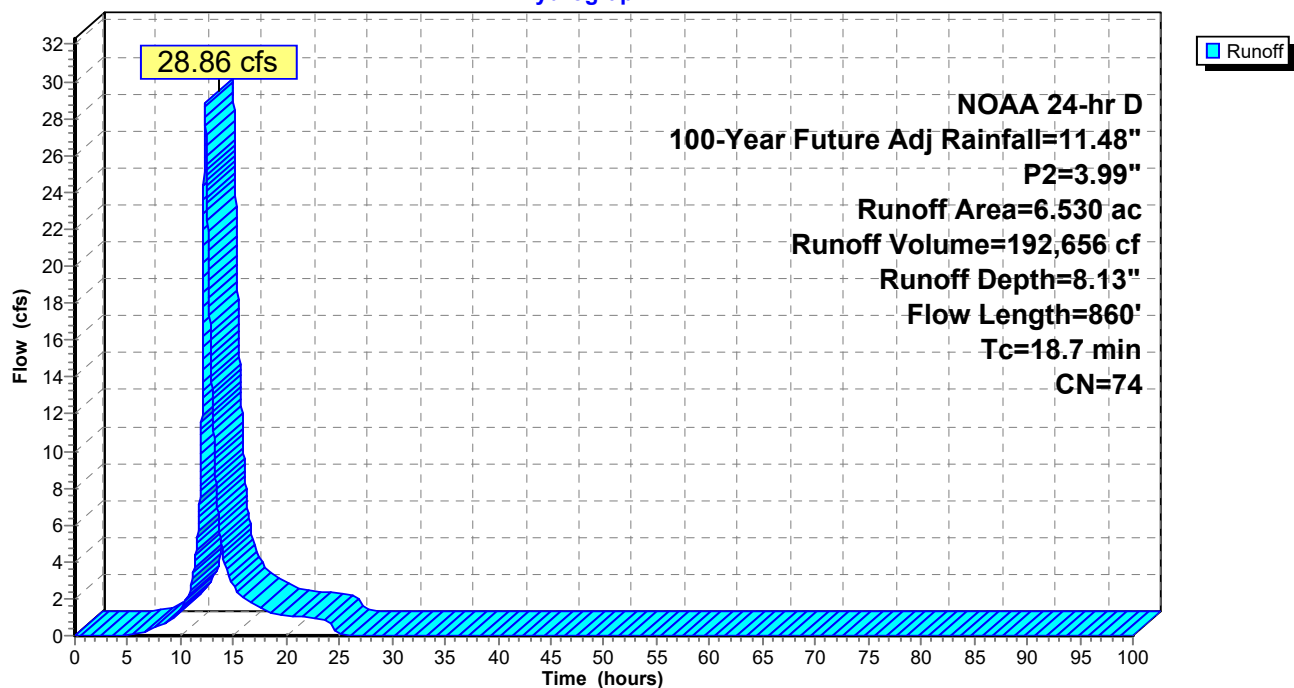
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment E3Bp: EDA 3B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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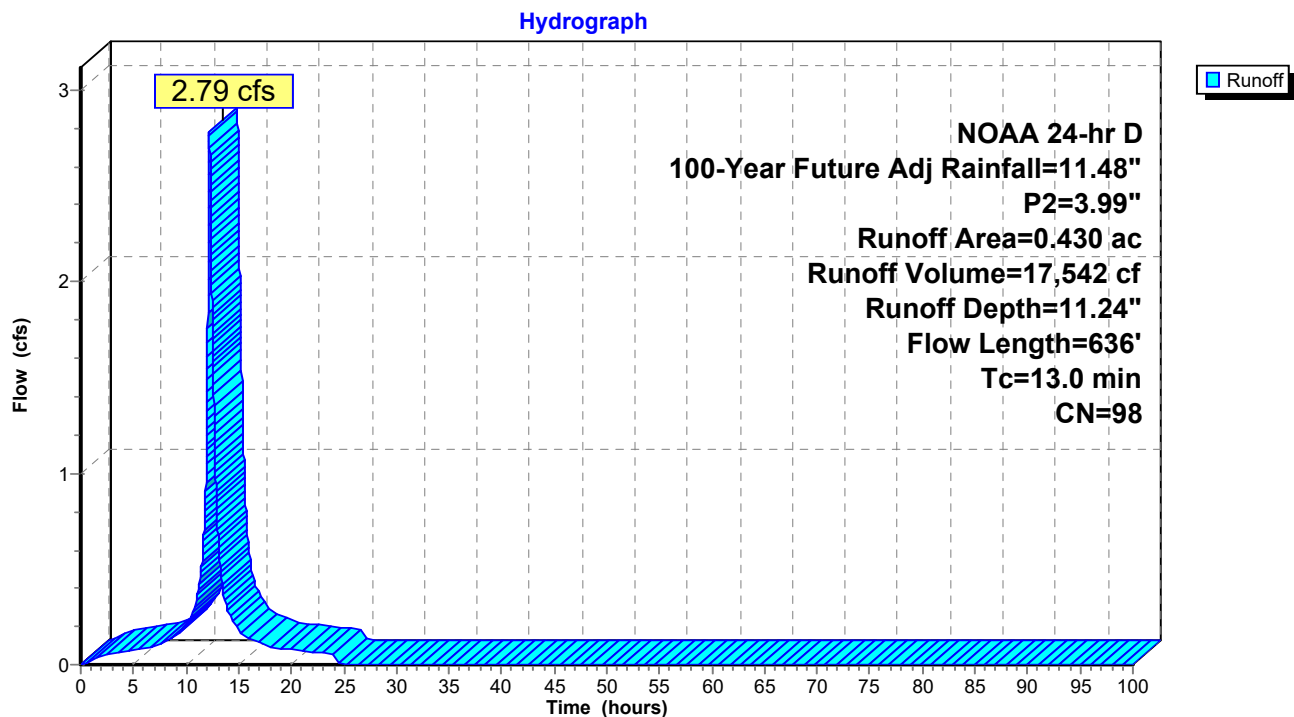
Summary for Subcatchment E4i: EDA 4 Impervious

Runoff = 2.79 cfs @ 12.22 hrs, Volume= 17,542 cf, Depth=11.24"
Routed to Link E4 : EDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.010	98	Paved parking, HSG D
0.420	98	Paved parking, HSG A
0.430	98	Weighted Average
0.430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.5	544	0.0830	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.0	636	Total			

Subcatchment E4i: EDA 4 Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E4p: EDA 4 Pervious

Runoff = 13.31 cfs @ 12.21 hrs, Volume= 74,506 cf, Depth= 2.91"
Routed to Link E4 : EDA 4

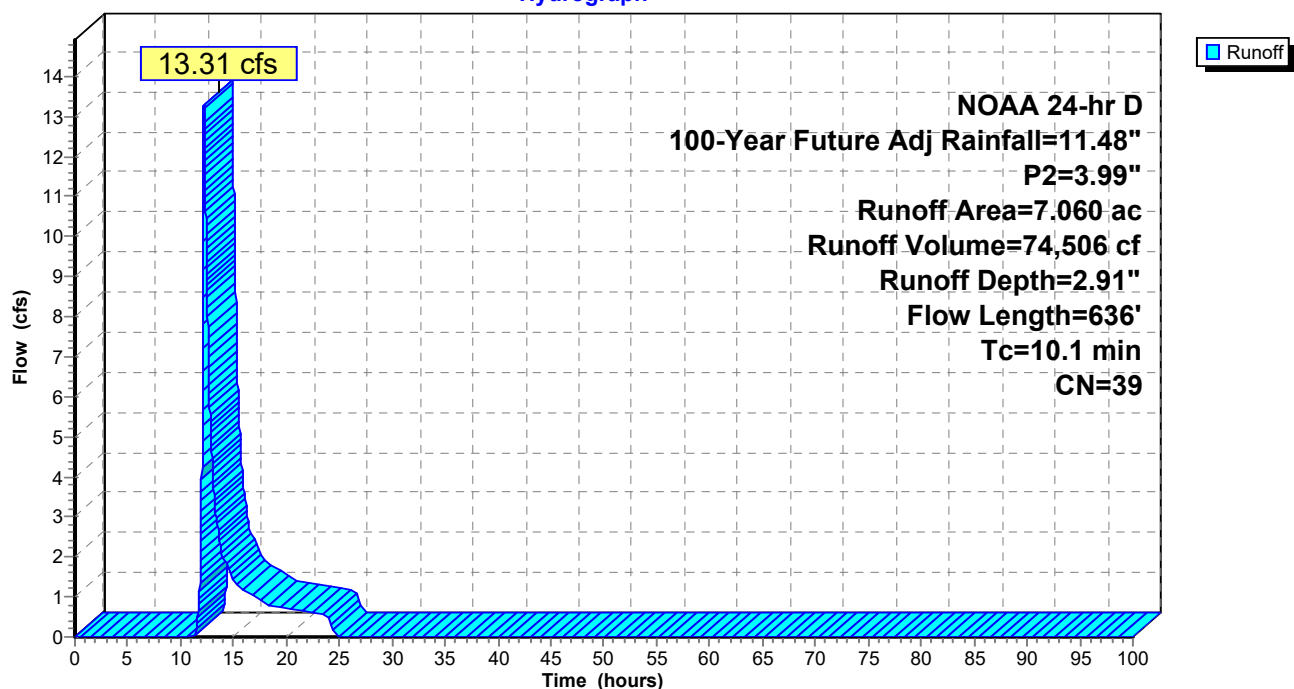
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
6.390	39	>75% Grass cover, Good, HSG A
0.610	30	Woods, Good, HSG A
7.060	39	Weighted Average
7.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment E4p: EDA 4 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E5i: EDA 6 Impervious

Runoff = 3.84 cfs @ 12.37 hrs, Volume= 33,861 cf, Depth=11.24"
Routed to Pond E5D : DEPRESSION

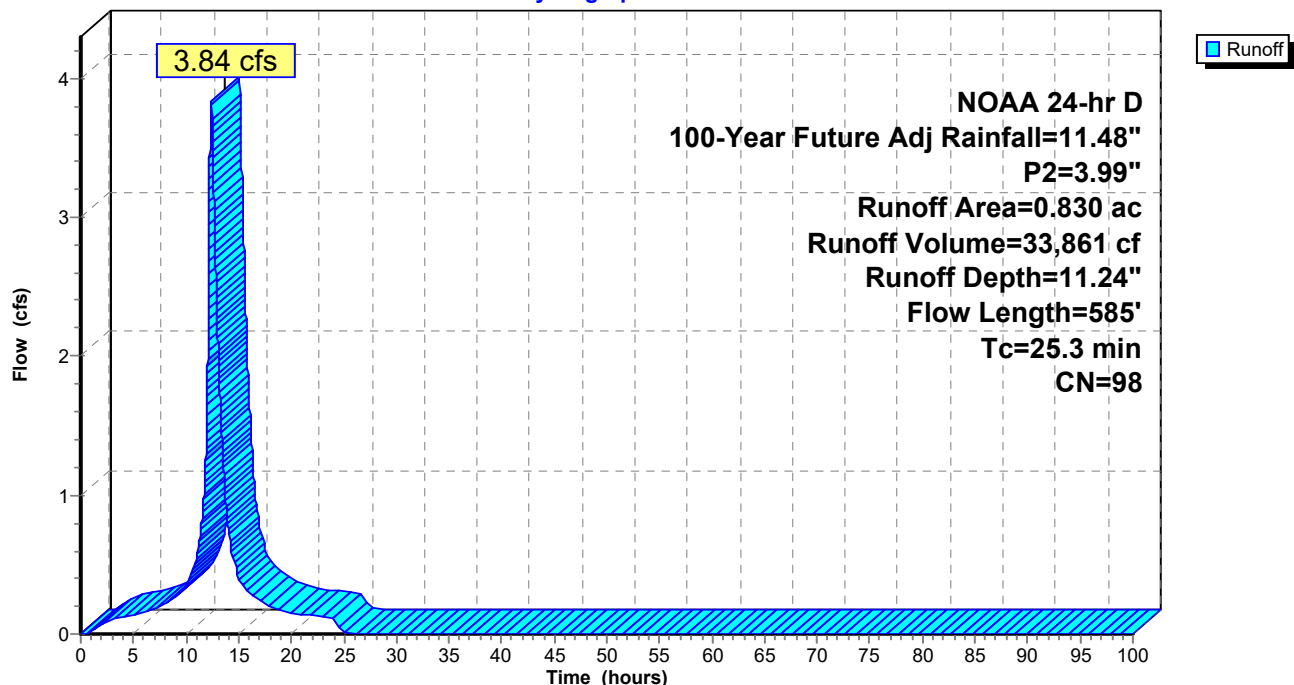
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG D
0.720	98	Paved parking, HSG A
0.830	98	Weighted Average
0.830		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5i: EDA 6 Impervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment E5p: EDA 6 Pervious

Runoff = 8.76 cfs @ 12.43 hrs, Volume= 78,971 cf, Depth= 3.22"
Routed to Pond E5D : DEPRESSION

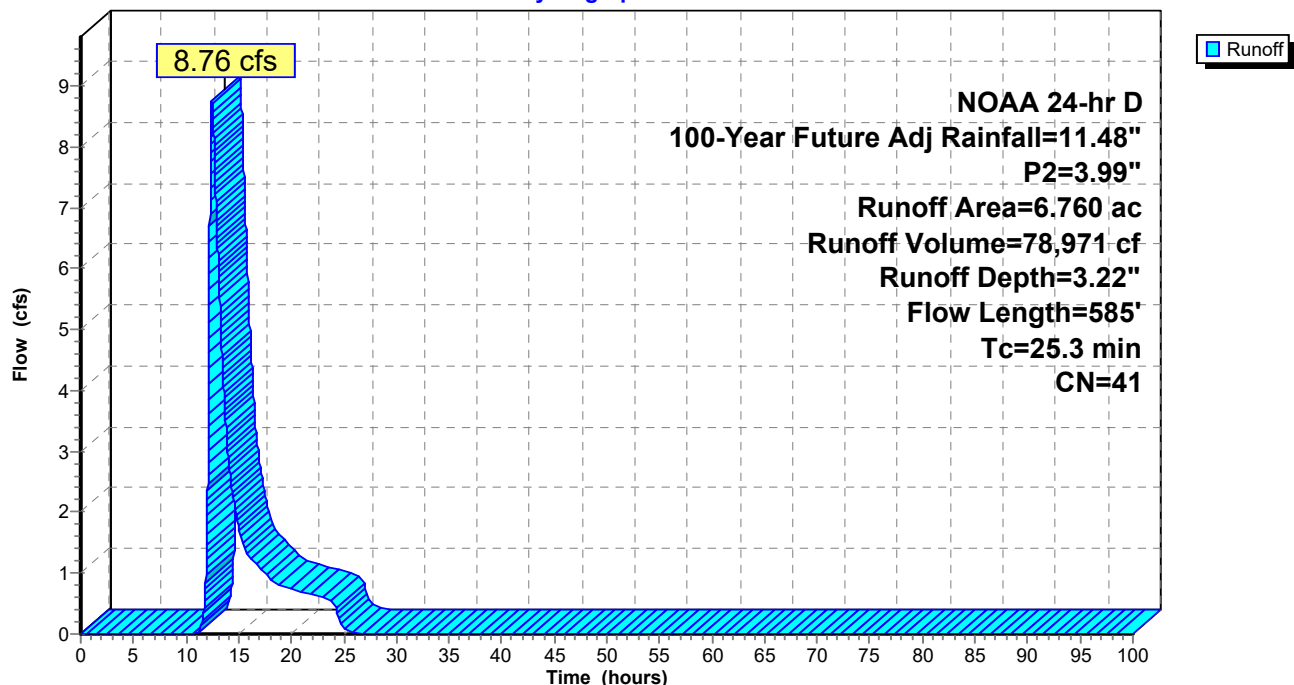
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.290	80	>75% Grass cover, Good, HSG D
6.470	39	>75% Grass cover, Good, HSG A
6.760	41	Weighted Average
6.760		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	67	0.0100	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	52	0.0040	1.28		Shallow Concentrated Flow, Paved Kv= 20.3 fps
15.4	434	0.0045	0.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
25.3	585	Total			

Subcatchment E5p: EDA 6 Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond E5D: DEPRESSION

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 4.10" for 100-Year Future Adj event
 Inflow = 12.54 cfs @ 12.42 hrs, Volume= 112,832 cf
 Outflow = 4.30 cfs @ 13.81 hrs, Volume= 63,427 cf, Atten= 66%, Lag= 82.9 min
 Primary = 4.30 cfs @ 13.81 hrs, Volume= 63,427 cf
 Routed to Link E5 : EDA 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 16.45' @ 13.81 hrs Surf.Area= 129,732 sf Storage= 57,078 cf

Plug-Flow detention time= 316.0 min calculated for 63,420 cf (56% of inflow)

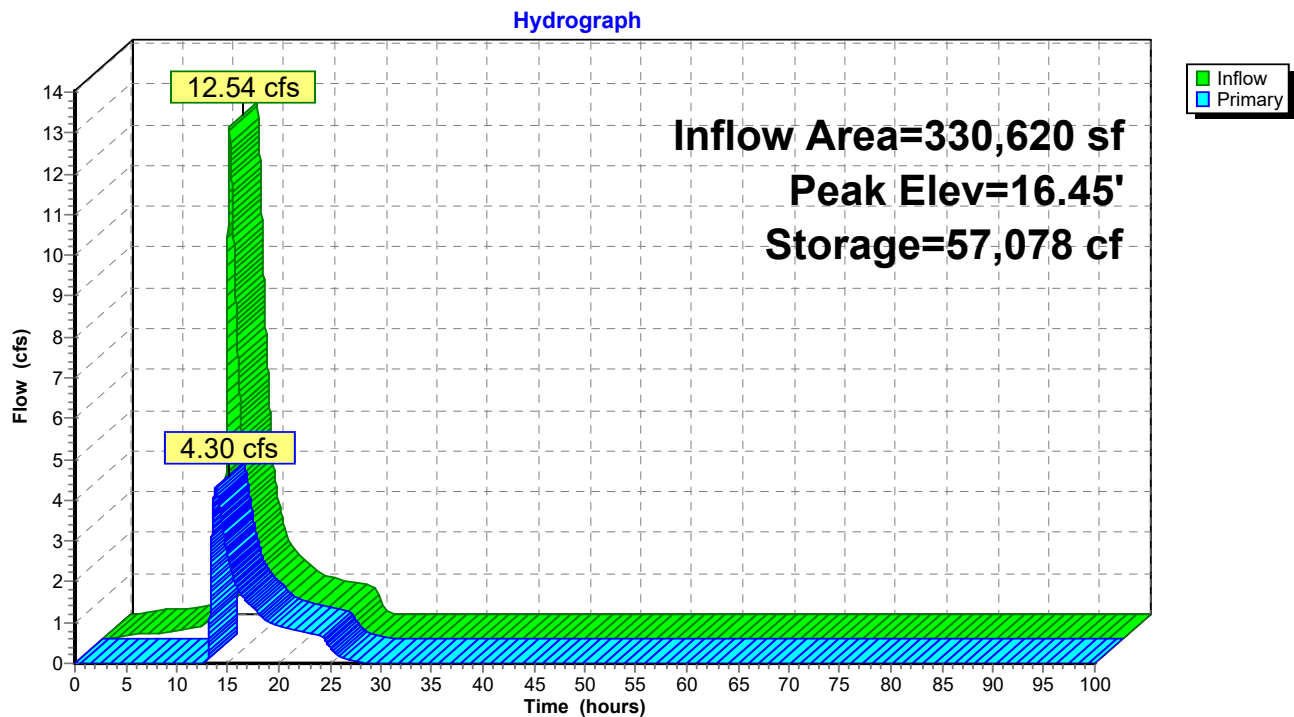
Center-of-Mass det. time= 171.6 min (1,045.6 - 874.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.07'	153,559 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.07	1,236	0	0
15.25	4,203	490	490
15.75	19,810	6,003	6,493
16.00	53,633	9,180	15,673
17.00	222,139	137,886	153,559

Device	Routing	Invert	Outlet Devices
#1	Primary	16.39'	105.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

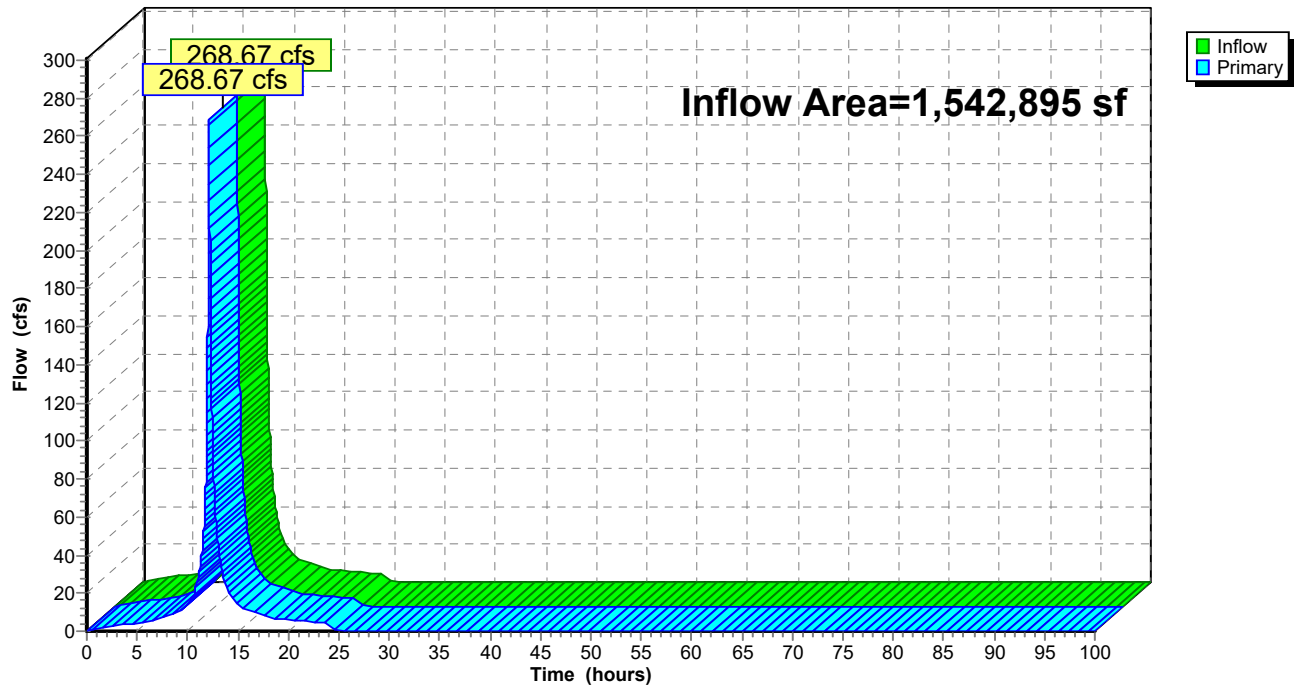
Primary OutFlow Max=4.30 cfs @ 13.81 hrs HW=16.45' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir**(Weir Controls 4.30 cfs @ 0.67 fps)

Pond E5D: DEPRESSION

Summary for Link E1: EDA 1

Inflow Area = 1,542,895 sf, 64.51% Impervious, Inflow Depth = 10.06" for 100-Year Future Adj event
Inflow = 268.67 cfs @ 12.13 hrs, Volume= 1,292,929 cf
Primary = 268.67 cfs @ 12.13 hrs, Volume= 1,292,929 cf, Atten= 0%, Lag= 0.0 min

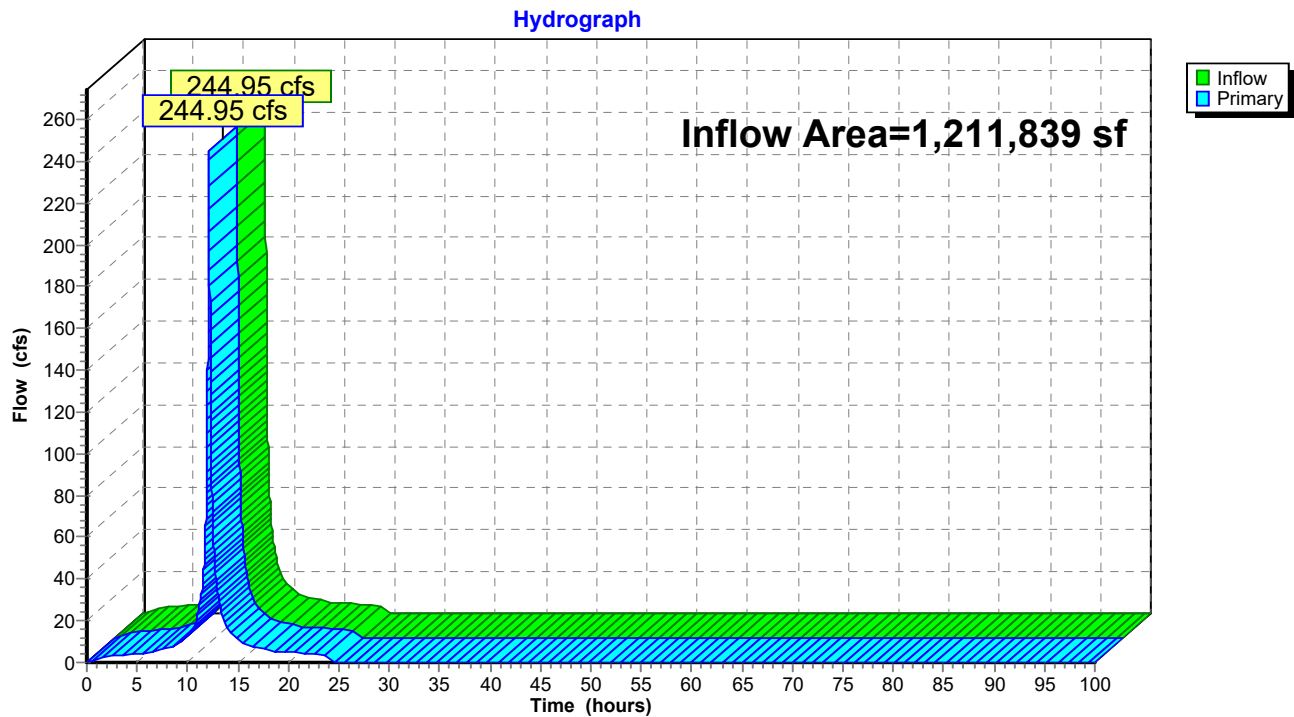
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1: EDA 1**Hydrograph**

Summary for Link E1A: EDA 1 ON SITE

Inflow Area = 1,211,839 sf, 81.67% Impervious, Inflow Depth = 10.42" for 100-Year Future Adj event
Inflow = 244.95 cfs @ 12.12 hrs, Volume= 1,052,406 cf
Primary = 244.95 cfs @ 12.12 hrs, Volume= 1,052,406 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1A: EDA 1 ON SITE

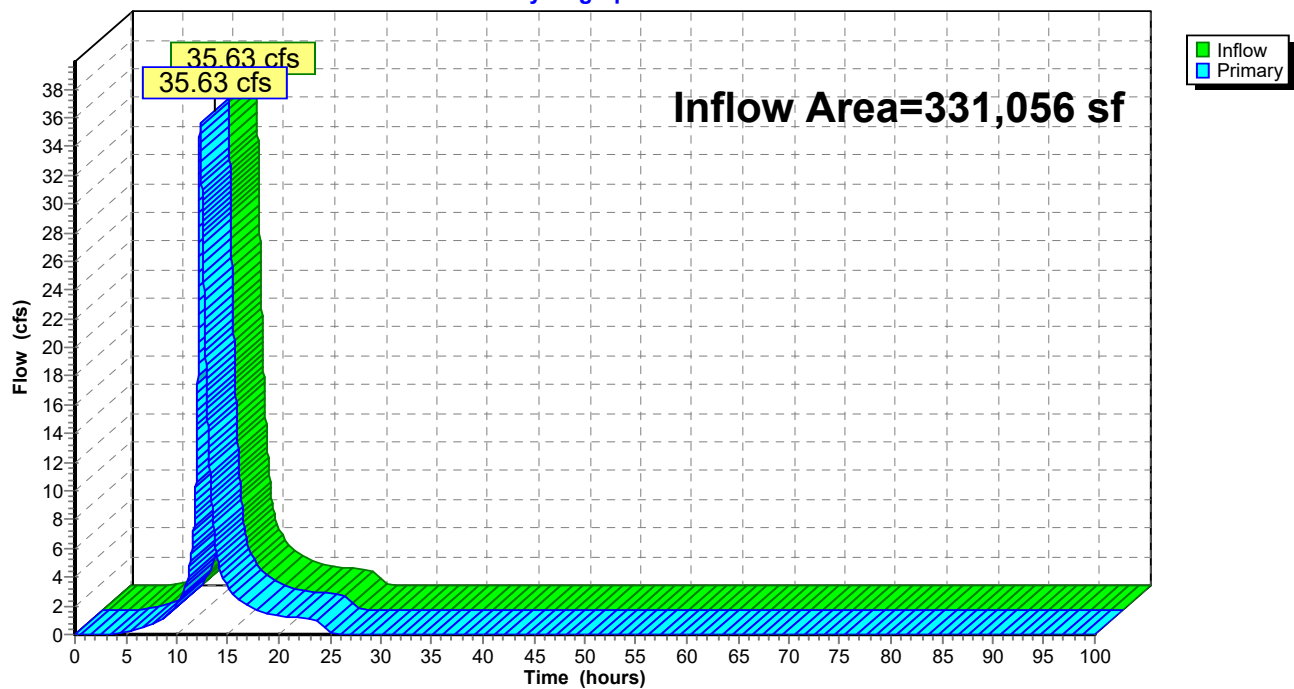
Summary for Link E1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 8.72" for 100-Year Future Adj event
Inflow = 35.63 cfs @ 12.30 hrs, Volume= 240,523 cf
Primary = 35.63 cfs @ 12.30 hrs, Volume= 240,523 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E1 : EDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E1B: BYPASS

Hydrograph



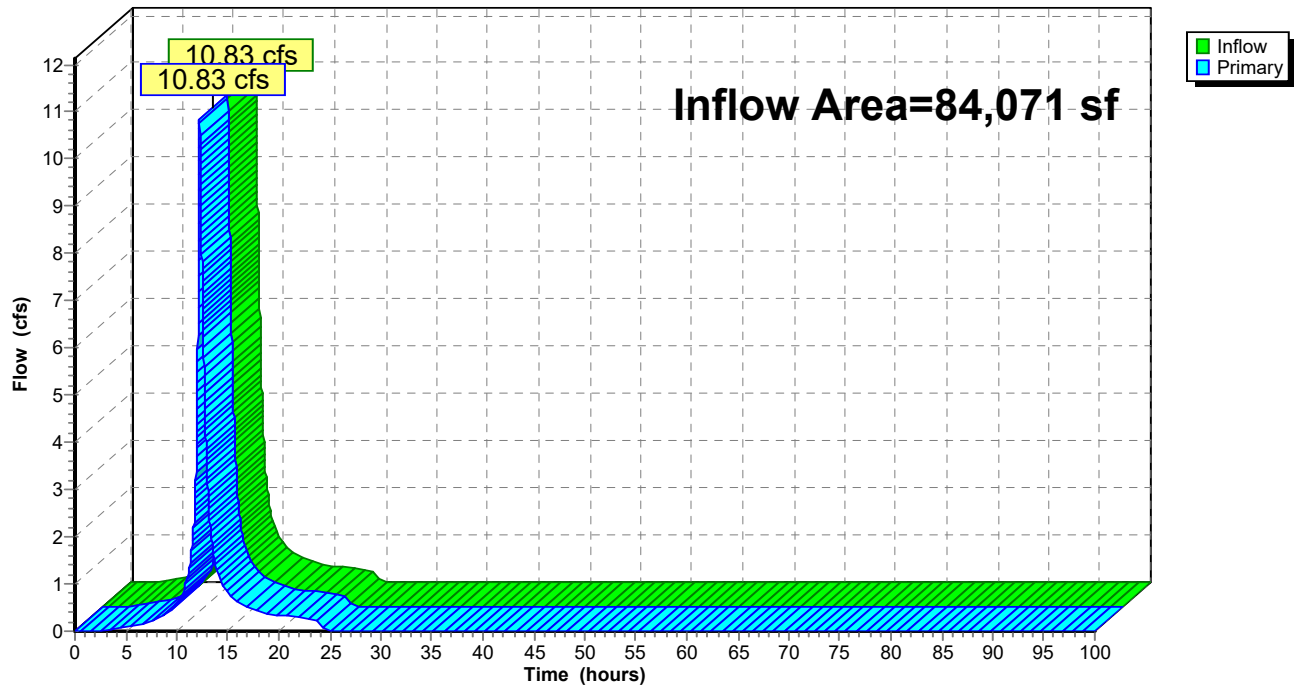
Summary for Link E2: EDA 2

Inflow Area = 84,071 sf, 7.25% Impervious, Inflow Depth = 9.06" for 100-Year Future Adj event
Inflow = 10.83 cfs @ 12.23 hrs, Volume= 63,440 cf
Primary = 10.83 cfs @ 12.23 hrs, Volume= 63,440 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2: EDA 2

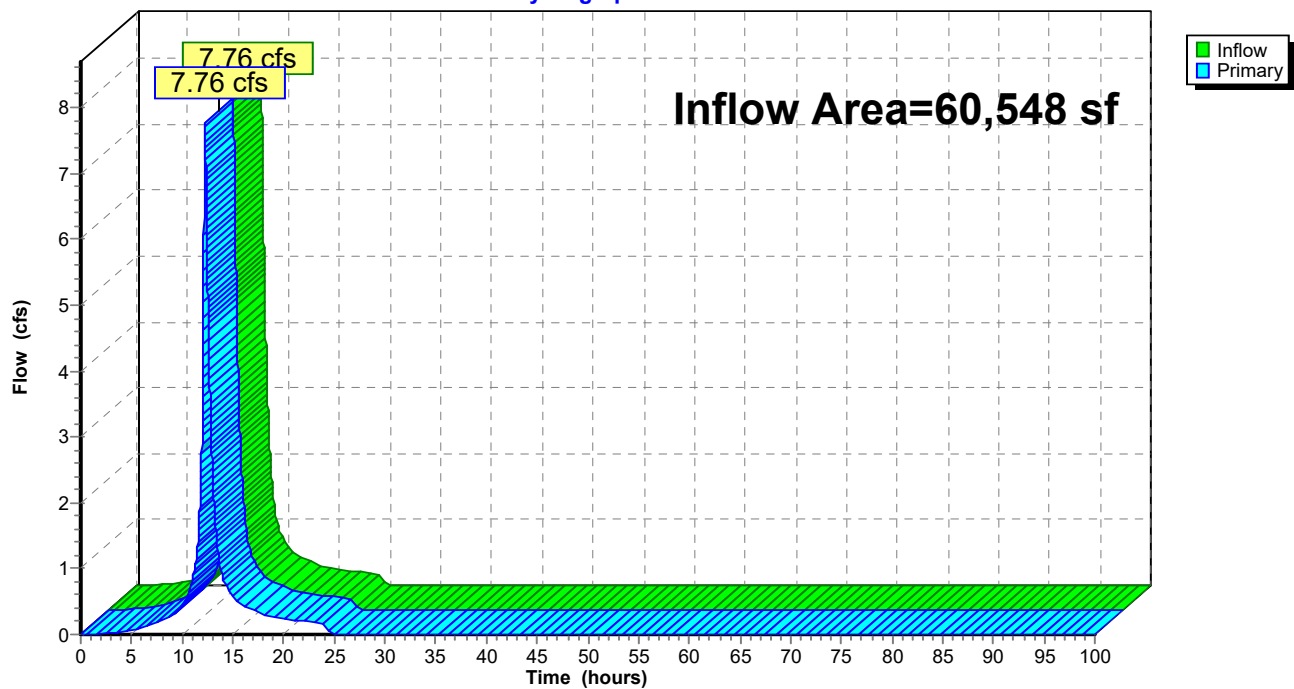
Hydrograph



Summary for Link E2A: EDA 2A ONSITE

Inflow Area = 60,548 sf, 10.07% Impervious, Inflow Depth = 9.26" for 100-Year Future Adj event
Inflow = 7.76 cfs @ 12.24 hrs, Volume= 46,702 cf
Primary = 7.76 cfs @ 12.24 hrs, Volume= 46,702 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2A: EDA 2A ONSITE**Hydrograph**

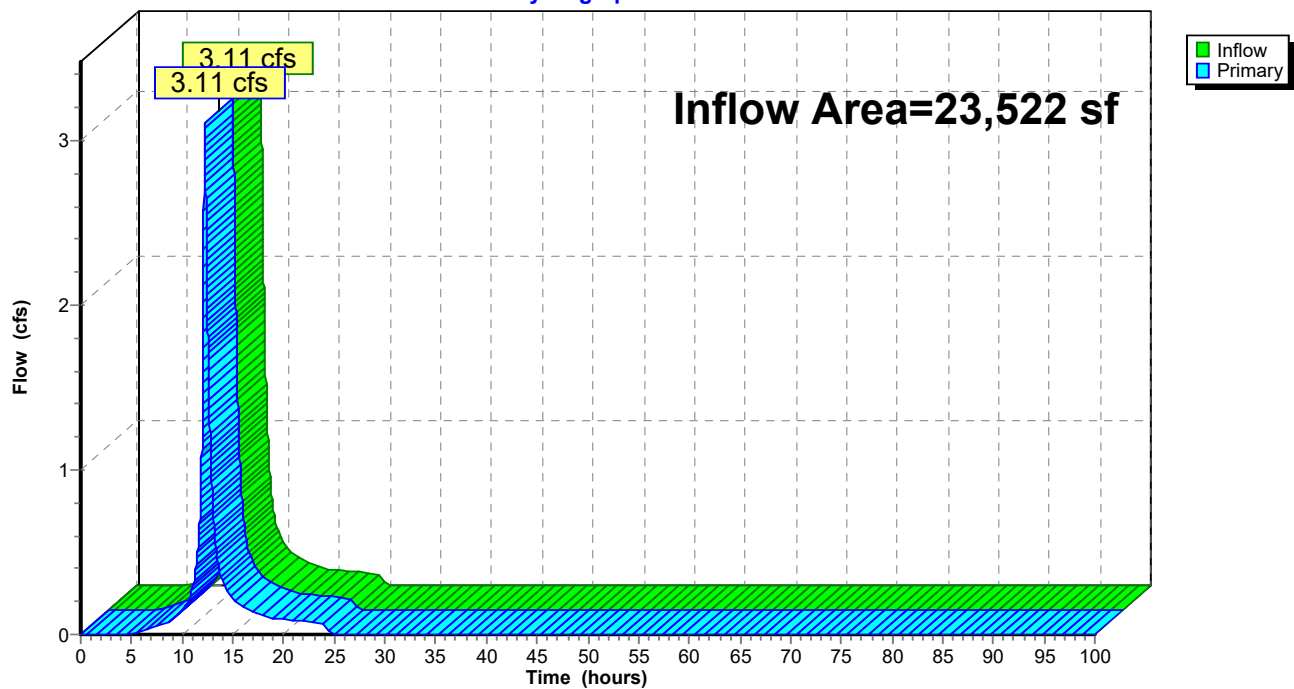
Summary for Link E2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 8.54" for 100-Year Future Adj event
Inflow = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf
Primary = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E2 : EDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E2B: BYPASS

Hydrograph



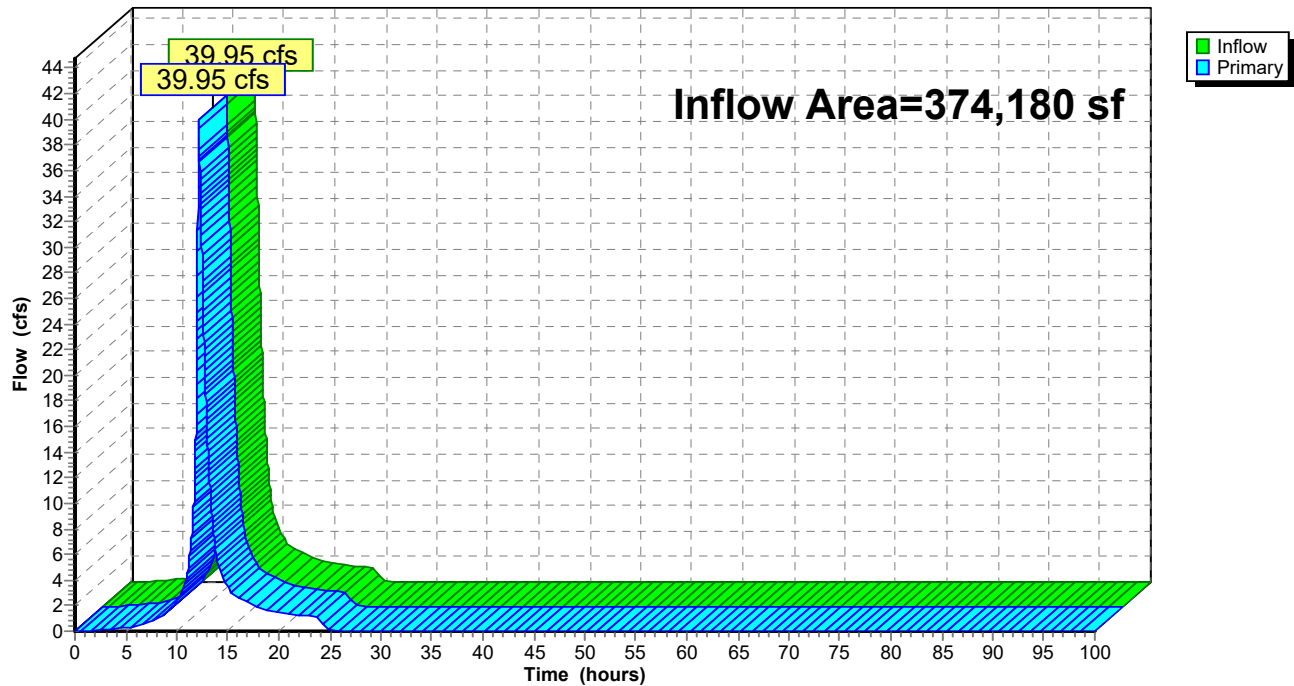
Summary for Link E3: EDA 3

Inflow Area = 374,180 sf, 9.31% Impervious, Inflow Depth = 8.61" for 100-Year Future Adj event
Inflow = 39.95 cfs @ 12.12 hrs, Volume= 268,363 cf
Primary = 39.95 cfs @ 12.12 hrs, Volume= 268,363 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3: EDA 3

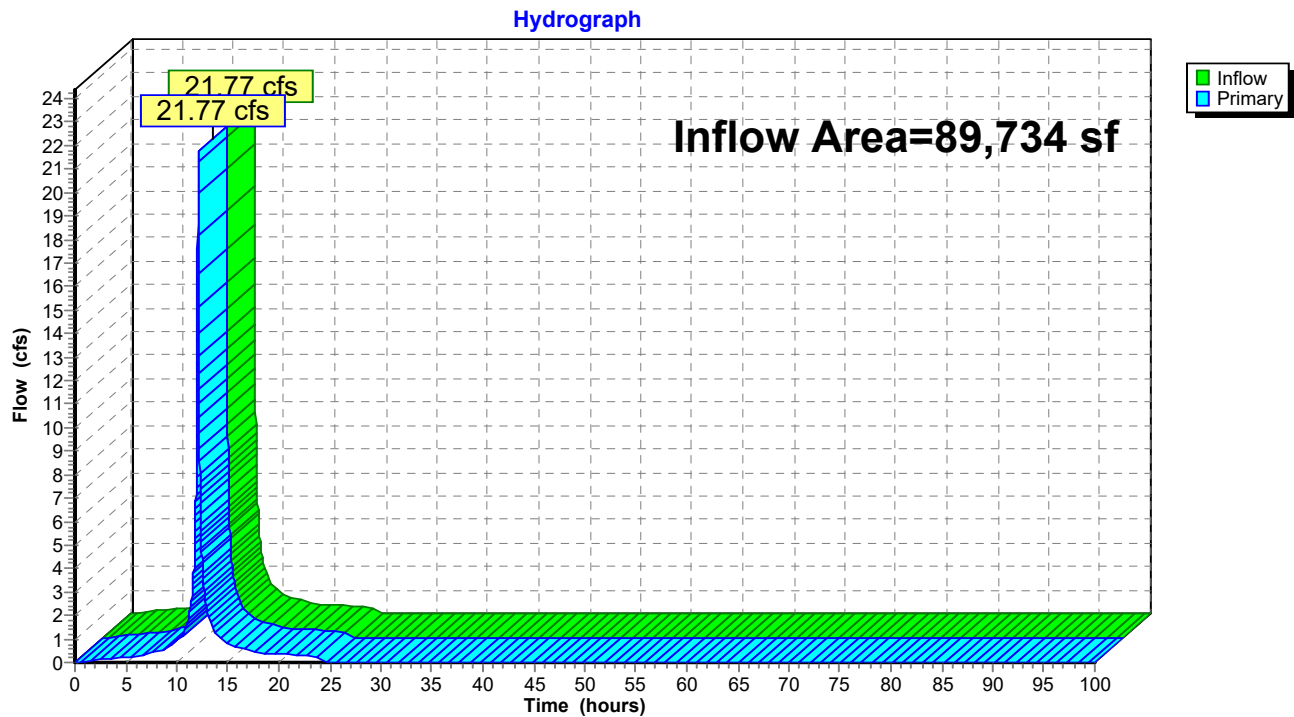
Hydrograph



Summary for Link E3A: EDA 3A ONSITE

Inflow Area = 89,734 sf, 38.83% Impervious, Inflow Depth = 10.12" for 100-Year Future Adj event
Inflow = 21.77 cfs @ 12.11 hrs, Volume= 75,707 cf
Primary = 21.77 cfs @ 12.11 hrs, Volume= 75,707 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3A: EDA 3A ONSITE

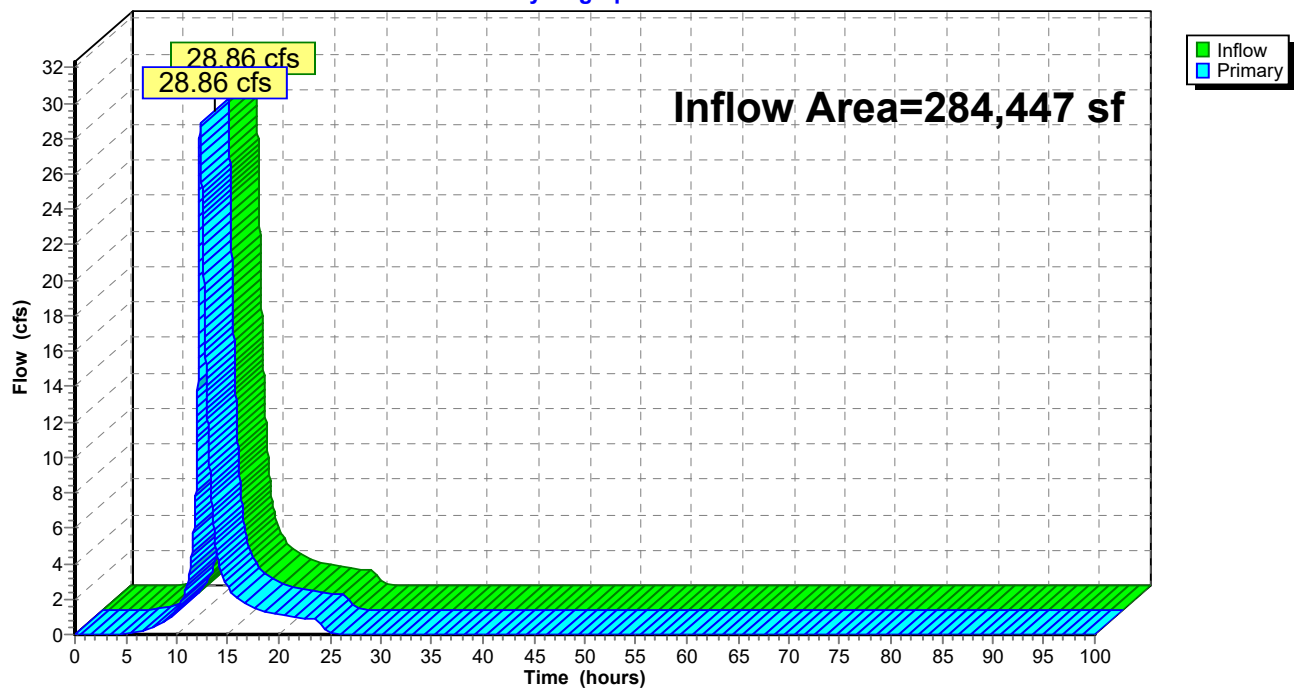
Summary for Link E3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 8.13" for 100-Year Future Adj event
Inflow = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf
Primary = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E3 : EDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E3B: BYPASS

Hydrograph



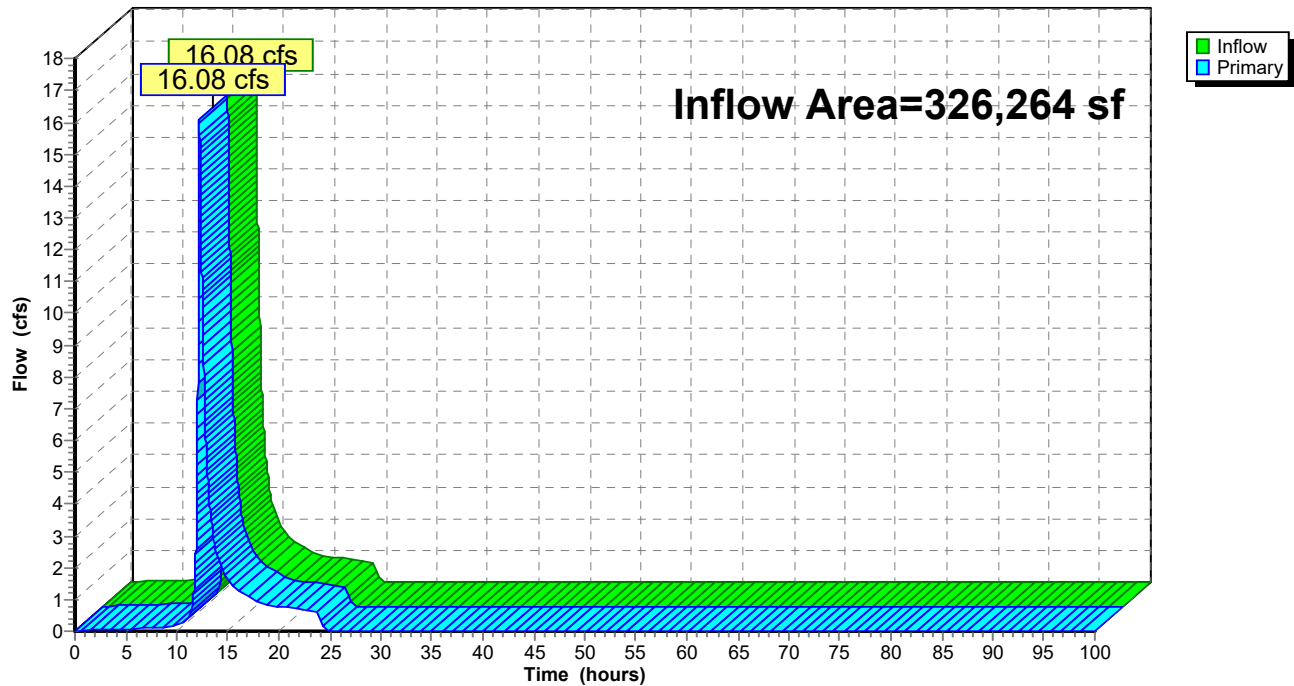
Summary for Link E4: EDA 4

Inflow Area = 326,264 sf, 5.74% Impervious, Inflow Depth = 3.39" for 100-Year Future Adj event
Inflow = 16.08 cfs @ 12.21 hrs, Volume= 92,048 cf
Primary = 16.08 cfs @ 12.21 hrs, Volume= 92,048 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E4: EDA 4

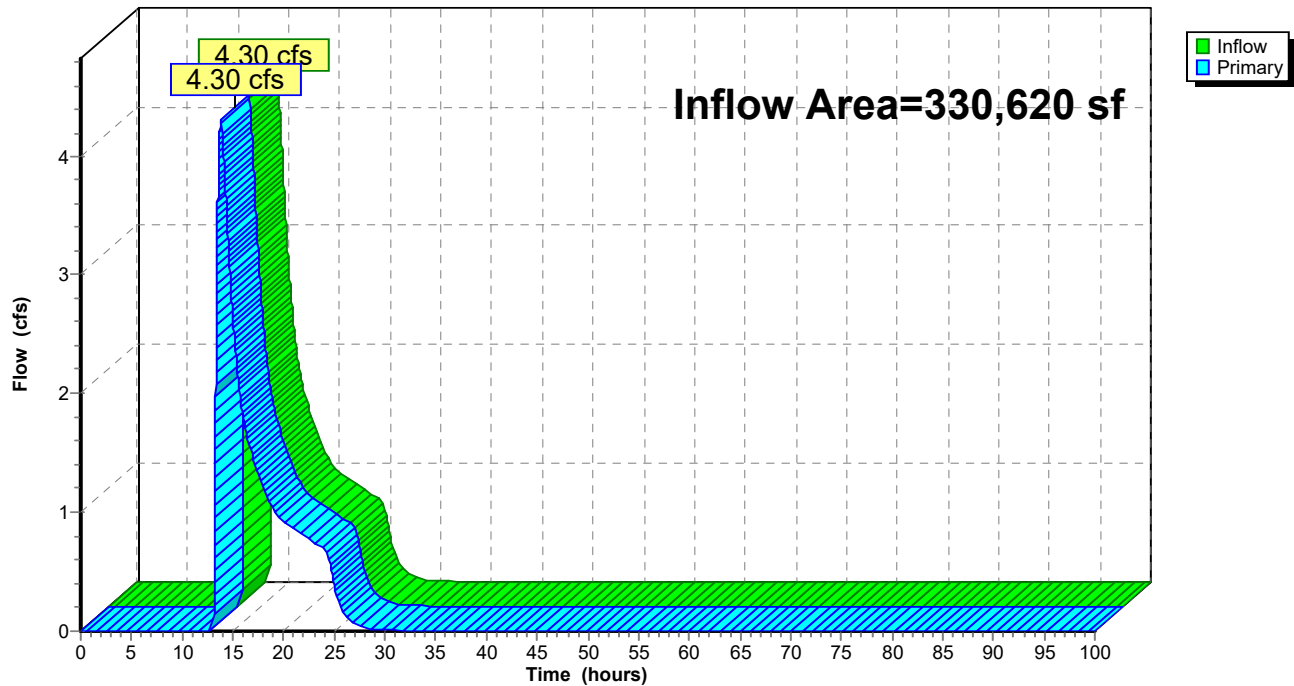
Hydrograph

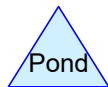
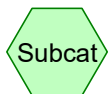
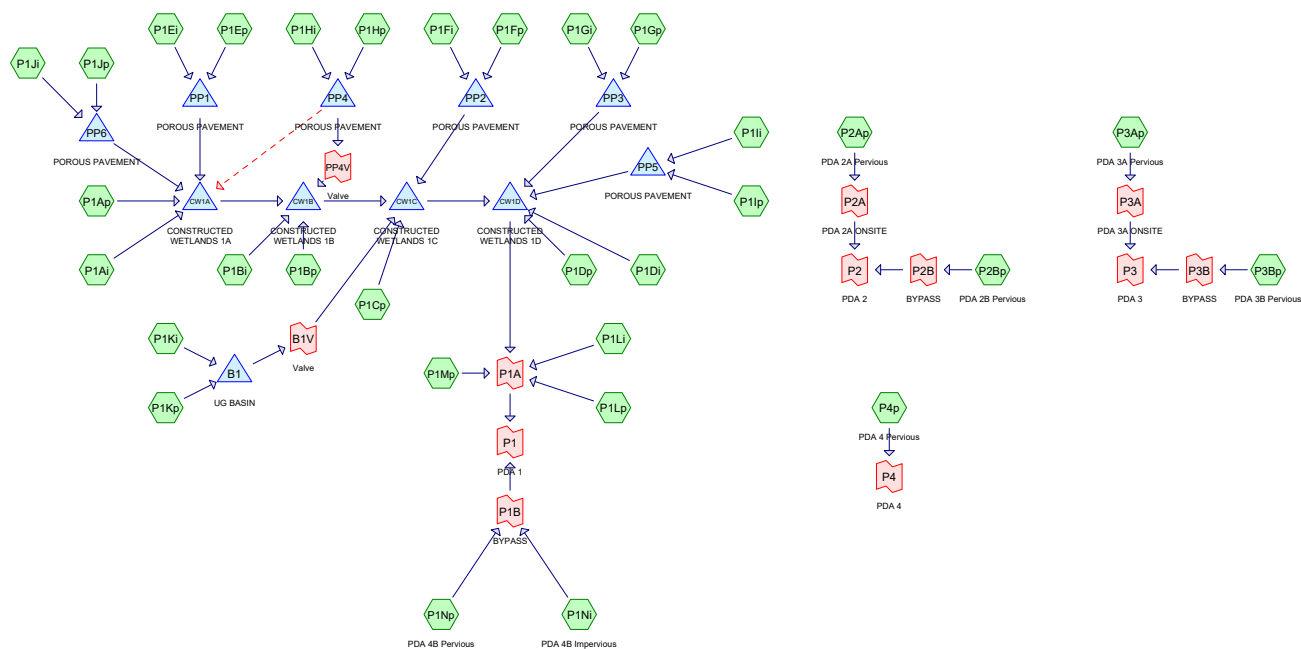


Summary for Link E5: EDA 5

Inflow Area = 330,620 sf, 10.94% Impervious, Inflow Depth = 2.30" for 100-Year Future Adj event
Inflow = 4.30 cfs @ 13.81 hrs, Volume= 63,427 cf
Primary = 4.30 cfs @ 13.81 hrs, Volume= 63,427 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link E5: EDA 5**Hydrograph**



Routing Diagram for Pre vs Post Rev. 3a
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Pre vs Post Rev. 3a

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	11.48	2	3.99

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
228,690	39	>75% Grass cover, Good, HSG A (P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P4p)
405,544	80	>75% Grass cover, Good, HSG D (P1Bp, P1Dp, P1Fp, P1Gp, P1Hp, P1Ip, P1Jp, P1Kp, P1Lp, P1Mp, P1Np, P2Ap, P3Ap, P3Bp)
1,521,986	98	Paved parking, HSG D (P1Ai, P1Bi, P1Di, P1Ei, P1Fi, P1Gi, P1Hi, P1Ii, P1Ji, P1Ki, P1Li, P1Ni)
17,424	30	Woods, Good, HSG A (P3Bp)
484,387	77	Woods, Good, HSG D (P1Mp, P1Np, P2Ap, P2Bp, P3Ap, P3Bp)
2,658,031	86	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
246,114	HSG A	P1Ap, P1Cp, P1Dp, P1Ep, P1Hp, P1Jp, P1Lp, P1Np, P3Bp, P4p
0	HSG B	
0	HSG C	
2,411,917	HSG D	P1Ai, P1Bi, P1Bp, P1Di, P1Dp, P1Ei, P1Fi, P1Fp, P1Gi, P1Gp, P1Hi, P1Hp, P1Ii, P1Ip, P1Ji, P1Jp, P1Ki, P1Kp, P1Li, P1Lp, P1Mp, P1Ni, P1Np, P2Ap, P2Bp, P3Ap, P3Bp
0	Other	
2,658,031		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
228,690	0	0	405,544	0	634,234	>75% Grass cover, Good
0	0	0	1,521,986	0	1,521,986	Paved parking
17,424	0	0	484,387	0	501,811	Woods, Good
246,114	0	0	2,411,917	0	2,658,031	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	9.50	9.35	50.0	0.0030	0.013	0.0	24.0	0.0	
2	CW1A	9.00	8.00	634.0	0.0016	0.012	0.0	36.0	0.0	
3	CW1B	9.00	8.00	312.0	0.0032	0.012	0.0	48.0	0.0	
4	CW1C	9.00	8.00	1,202.0	0.0008	0.012	0.0	36.0	0.0	
5	CW1D	8.90	8.54	72.0	0.0050	0.012	0.0	48.0	0.0	
6	PP1	9.82	9.23	59.0	0.0100	0.013	0.0	15.0	0.0	
7	PP2	9.46	9.00	155.0	0.0030	0.013	0.0	36.0	0.0	
8	PP3	9.28	9.13	49.0	0.0031	0.013	0.0	30.0	0.0	
9	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
10	PP4	9.13	9.00	43.0	0.0030	0.013	0.0	36.0	0.0	
11	PP5	9.60	9.29	105.0	0.0030	0.013	0.0	15.0	0.0	
12	PP6	11.08	11.05	8.0	0.0037	0.013	0.0	15.0	0.0	

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentP1Ai:	Runoff Area=5.210 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=57.18 cfs 212,549 cf
SubcatchmentP1Ap:	Runoff Area=0.940 ac 0.00% Impervious Runoff Depth=2.91" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=39 Runoff=2.57 cfs 9,920 cf
SubcatchmentP1Bi:	Runoff Area=4.410 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=48.40 cfs 179,912 cf
SubcatchmentP1Bp:	Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=8.94" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=80 Runoff=8.74 cfs 32,465 cf
SubcatchmentP1Cp:	Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=2.91" Flow Length=110' Slope=0.1000 '/' Tc=4.7 min CN=39 Runoff=1.89 cfs 7,387 cf
SubcatchmentP1Di:	Runoff Area=7.230 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=188' Slope=0.0050 '/' Tc=2.9 min CN=98 Runoff=79.35 cfs 294,958 cf
SubcatchmentP1Dp:	Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=8.67" Flow Length=100' Slope=0.1000 '/' Tc=4.6 min CN=78 Runoff=7.75 cfs 28,340 cf
SubcatchmentP1Ei:	Runoff Area=0.760 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=125' Tc=1.3 min CN=98 Runoff=9.15 cfs 31,005 cf
SubcatchmentP1Ep:	Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=2.91" Flow Length=76' Tc=3.8 min CN=39 Runoff=0.06 cfs 211 cf
SubcatchmentP1Fi:	Runoff Area=1.680 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=123' Tc=1.1 min CN=98 Runoff=20.22 cfs 68,538 cf
SubcatchmentP1Fp:	Runoff Area=0.120 ac 0.00% Impervious Runoff Depth=8.94" Flow Length=81' Tc=2.9 min CN=80 Runoff=1.19 cfs 3,896 cf
SubcatchmentP1Gi:	Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=117' Tc=1.2 min CN=98 Runoff=8.41 cfs 28,557 cf
SubcatchmentP1Gp:	Runoff Area=0.030 ac 0.00% Impervious Runoff Depth=8.94" Flow Length=92' Tc=3.9 min CN=80 Runoff=0.28 cfs 974 cf
SubcatchmentP1Hi:	Runoff Area=10.630 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=179' Slope=0.0150 '/' Tc=1.7 min CN=98 Runoff=125.36 cfs 433,666 cf
SubcatchmentP1Hp:	Runoff Area=0.370 ac 0.00% Impervious Runoff Depth=6.71" Flow Length=78' Slope=0.0450 '/' Tc=5.2 min CN=64 Runoff=2.45 cfs 9,012 cf
SubcatchmentP1Ii:	Runoff Area=0.740 ac 100.00% Impervious Runoff Depth=11.24" Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=8.93 cfs 30,189 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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SubcatchmentP1Ip: Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=8.94"
Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=80 Runoff=0.22 cfs 649 cf

SubcatchmentP1Ji: Runoff Area=0.870 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=15' Slope=0.0200 '/' Tc=0.2 min CN=98 Runoff=10.50 cfs 35,493 cf

SubcatchmentP1Jp: Runoff Area=0.020 ac 0.00% Impervious Runoff Depth=6.12"
Flow Length=10' Slope=0.0200 '/' Tc=1.4 min CN=60 Runoff=0.16 cfs 445 cf

SubcatchmentP1Ki: Runoff Area=2.410 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=194' Tc=1.4 min CN=98 Runoff=28.89 cfs 98,319 cf

SubcatchmentP1Kp: Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=8.94"
Flow Length=149' Tc=2.7 min CN=80 Runoff=0.60 cfs 1,948 cf

SubcatchmentP1Li: Runoff Area=0.170 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=54' Slope=0.0150 '/' Tc=0.7 min CN=98 Runoff=2.05 cfs 6,935 cf

SubcatchmentP1Lp: Runoff Area=2.450 ac 0.00% Impervious Runoff Depth=6.42"
Flow Length=228' Slope=0.0200 '/' Tc=10.7 min CN=62 Runoff=11.43 cfs 57,079 cf

SubcatchmentP1Mp: Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=8.81"
Flow Length=412' Tc=8.2 min CN=79 Runoff=7.03 cfs 31,978 cf

SubcatchmentP1Ni: PDA 4B Impervious Runoff Area=0.130 ac 100.00% Impervious Runoff Depth=11.24"
Flow Length=861' Tc=18.7 min CN=98 Runoff=0.70 cfs 5,304 cf

SubcatchmentP1Np: PDA 4B Pervious Runoff Area=7.470 ac 0.00% Impervious Runoff Depth=8.67"
Flow Length=861' Tc=18.7 min CN=78 Runoff=34.92 cfs 235,219 cf

SubcatchmentP2Ap: PDA 2A Pervious Runoff Area=0.710 ac 0.00% Impervious Runoff Depth=8.81"
Flow Length=382' Tc=14.3 min CN=79 Runoff=3.85 cfs 22,705 cf

SubcatchmentP2Bp: PDA 2B Pervious Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=8.54"
Flow Length=289' Tc=12.1 min CN=77 Runoff=3.11 cfs 16,738 cf

SubcatchmentP3Ap: PDA 3A Pervious Runoff Area=0.950 ac 0.00% Impervious Runoff Depth=8.81"
Flow Length=218' Tc=2.8 min CN=79 Runoff=9.39 cfs 30,379 cf

SubcatchmentP3Bp: PDA 3B Pervious Runoff Area=6.530 ac 0.00% Impervious Runoff Depth=8.13"
Flow Length=860' Tc=18.7 min CN=74 Runoff=28.86 cfs 192,656 cf

SubcatchmentP4p: PDA 4 Pervious Runoff Area=2.250 ac 0.00% Impervious Runoff Depth=2.91"
Flow Length=636' Tc=10.1 min CN=39 Runoff=4.24 cfs 23,745 cf

Pond B1: UG BASIN Peak Elev=12.32' Storage=1.070 af Inflow=29.48 cfs 100,267 cf
Outflow=13.02 cfs 90,742 cf

Pond CW1A: CONSTRUCTED Peak Elev=16.44' Storage=160,520 cf Inflow=82.77 cfs 352,938 cf
36.0" Round Culvert n=0.012 L=634.0' S=0.0016 '/' Outflow=16.68 cfs 351,016 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Pond CW1B: CONSTRUCTED	Peak Elev=16.32' Storage=147,954 cf Inflow=107.79 cfs 896,739 cf 48.0" Round Culvert n=0.012 L=312.0' S=0.0032 ' /' Outflow=46.48 cfs 894,411 cf
Pond CW1C: CONSTRUCTED	Peak Elev=15.76' Storage=48,327 cf Inflow=64.28 cfs 1,058,420 cf 36.0" Round Culvert x 2.00 n=0.012 L=1,202.0' S=0.0008 ' /' Outflow=57.00 cfs 1,058,098 cf
Pond CW1D: CONSTRUCTED	Peak Elev=13.96' Storage=94,943 cf Inflow=131.44 cfs 1,436,248 cf Outflow=94.64 cfs 1,434,971 cf
Pond PP1: POROUS PAVEMENT	Peak Elev=16.89' Storage=11,864 cf Inflow=9.21 cfs 31,216 cf Outflow=6.28 cfs 28,326 cf
Pond PP2: POROUS PAVEMENT	Peak Elev=16.35' Storage=26,166 cf Inflow=21.39 cfs 72,434 cf Outflow=14.20 cfs 65,880 cf
Pond PP3: POROUS PAVEMENT	Peak Elev=18.36' Storage=11,649 cf Inflow=8.67 cfs 29,531 cf Outflow=6.27 cfs 26,843 cf
Pond PP4: POROUS PAVEMENT	Peak Elev=14.87' Storage=134,596 cf Inflow=127.59 cfs 442,678 cf Primary=46.30 cfs 333,346 cf Secondary=12.66 cfs 69,464 cf Outflow=51.36 cfs 402,809 cf
Pond PP5: POROUS PAVEMENT	Peak Elev=17.11' Storage=8,350 cf Inflow=9.15 cfs 30,839 cf Outflow=5.41 cfs 28,009 cf
Pond PP6: POROUS PAVEMENT	Peak Elev=16.84' Storage=10,527 cf Inflow=10.66 cfs 35,937 cf Outflow=5.61 cfs 32,679 cf
Link B1V: Valve	Inflow=13.02 cfs 90,742 cf Primary=13.02 cfs 90,742 cf
Link P1: PDA 1	Inflow=146.11 cfs 1,771,487 cf Primary=146.11 cfs 1,771,487 cf
Link P1A:	Inflow=113.17 cfs 1,530,964 cf Primary=113.17 cfs 1,530,964 cf
Link P1B: BYPASS	Inflow=35.63 cfs 240,523 cf Primary=35.63 cfs 240,523 cf
Link P2: PDA 2	Inflow=6.92 cfs 39,442 cf Primary=6.92 cfs 39,442 cf
Link P2A: PDA 2A ONSITE	Inflow=3.85 cfs 22,705 cf Primary=3.85 cfs 22,705 cf
Link P2B: BYPASS	Inflow=3.11 cfs 16,738 cf Primary=3.11 cfs 16,738 cf
Link P3: PDA 3	Inflow=31.91 cfs 223,035 cf Primary=31.91 cfs 223,035 cf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Link P3A: PDA 3A ONSITE

Inflow=9.39 cfs 30,379 cf

Primary=9.39 cfs 30,379 cf

Link P3B: BYPASS

Inflow=28.86 cfs 192,656 cf

Primary=28.86 cfs 192,656 cf

Link P4: PDA 4

Inflow=4.24 cfs 23,745 cf

Primary=4.24 cfs 23,745 cf

Link PP4V: Valve

Inflow=46.30 cfs 333,346 cf

Primary=46.30 cfs 333,346 cf

Total Runoff Area = 2,658,031 sf Runoff Volume = 2,131,173 cf Average Runoff Depth = 9.62"
42.74% Pervious = 1,136,045 sf 57.26% Impervious = 1,521,986 sf

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Ai:

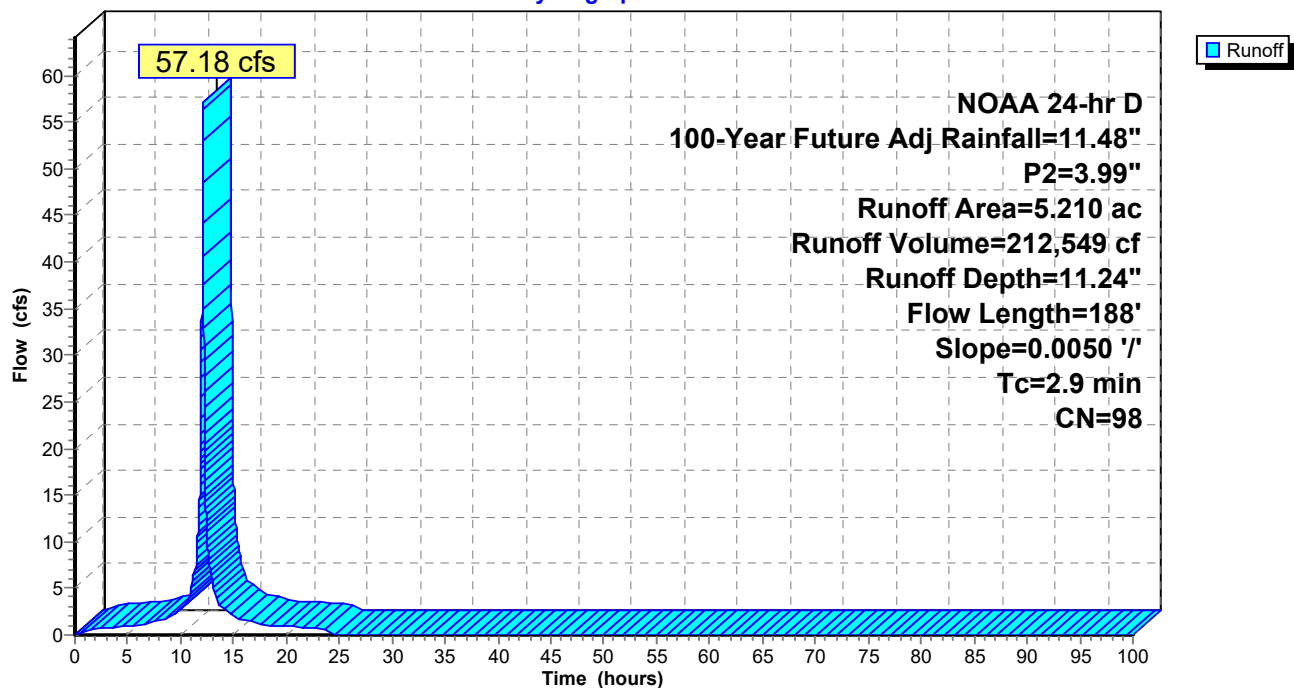
Runoff = 57.18 cfs @ 12.11 hrs, Volume= 212,549 cf, Depth=11.24"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
5.210	98	Paved parking, HSG D
5.210		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Ai:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Ap:

Runoff = 2.57 cfs @ 12.13 hrs, Volume= 9,920 cf, Depth= 2.91"

Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

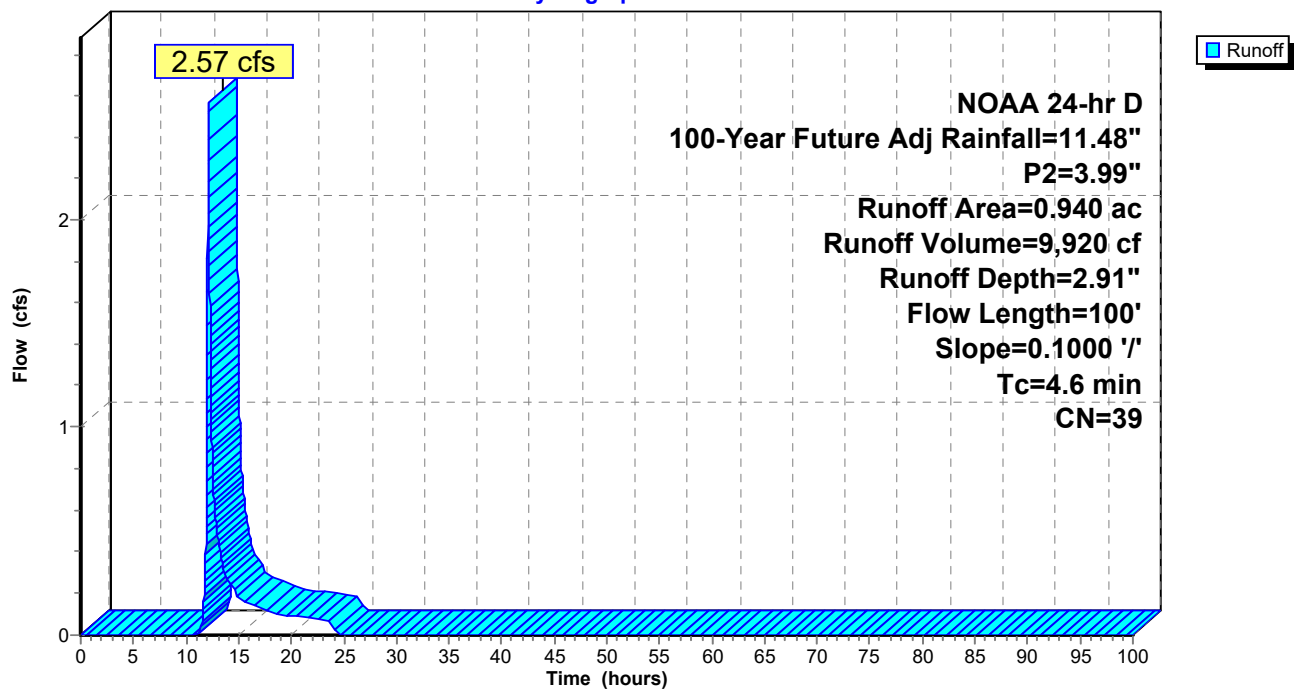
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.940	39	>75% Grass cover, Good, HSG A
0.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Ap:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Bi:

Runoff = 48.40 cfs @ 12.11 hrs, Volume= 179,912 cf, Depth=11.24"

Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

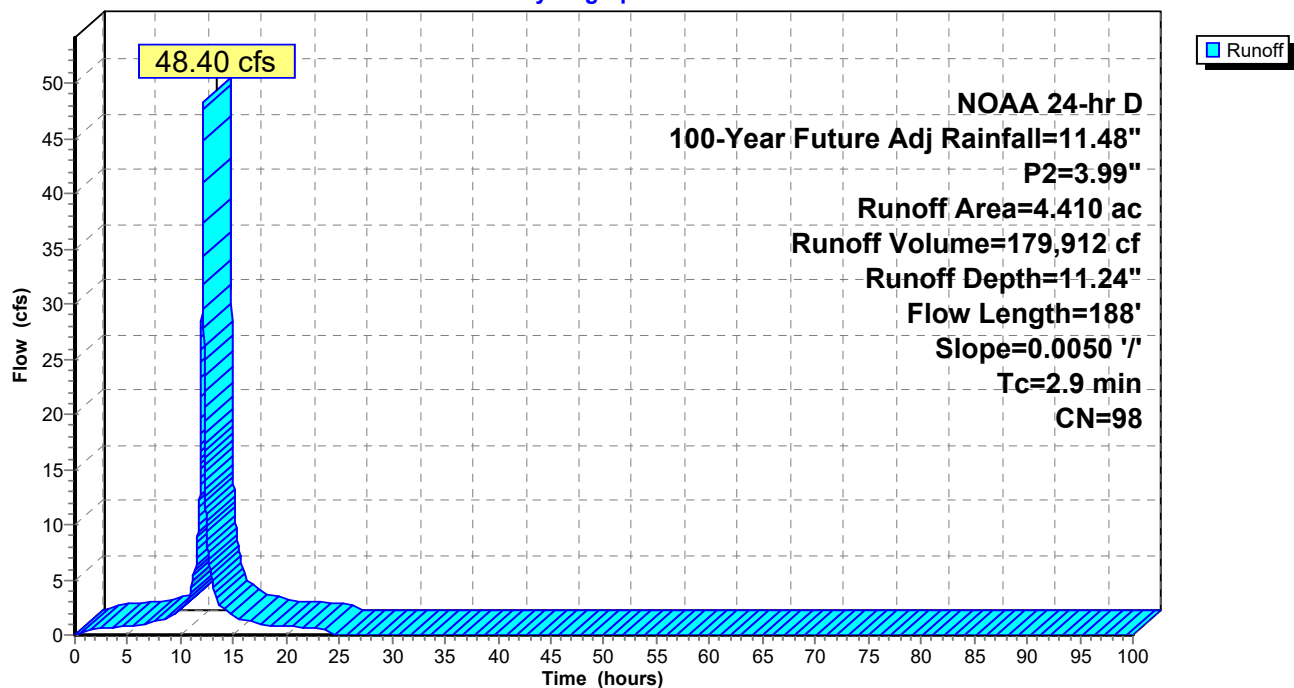
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
4.410	98	Paved parking, HSG D
4.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Bi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Bp:

Runoff = 8.74 cfs @ 12.13 hrs, Volume= 32,465 cf, Depth= 8.94"
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

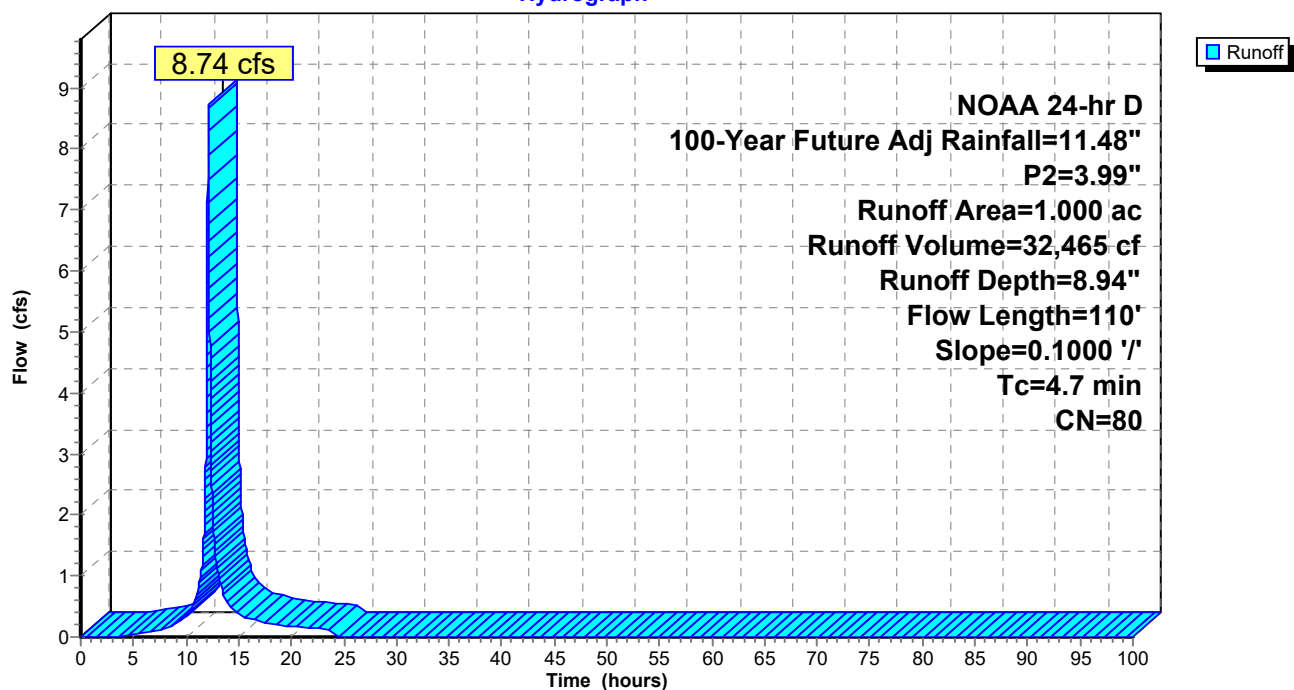
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
1.000	80	>75% Grass cover, Good, HSG D
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Bp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Cp:

Runoff = 1.89 cfs @ 12.13 hrs, Volume= 7,387 cf, Depth= 2.91"
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

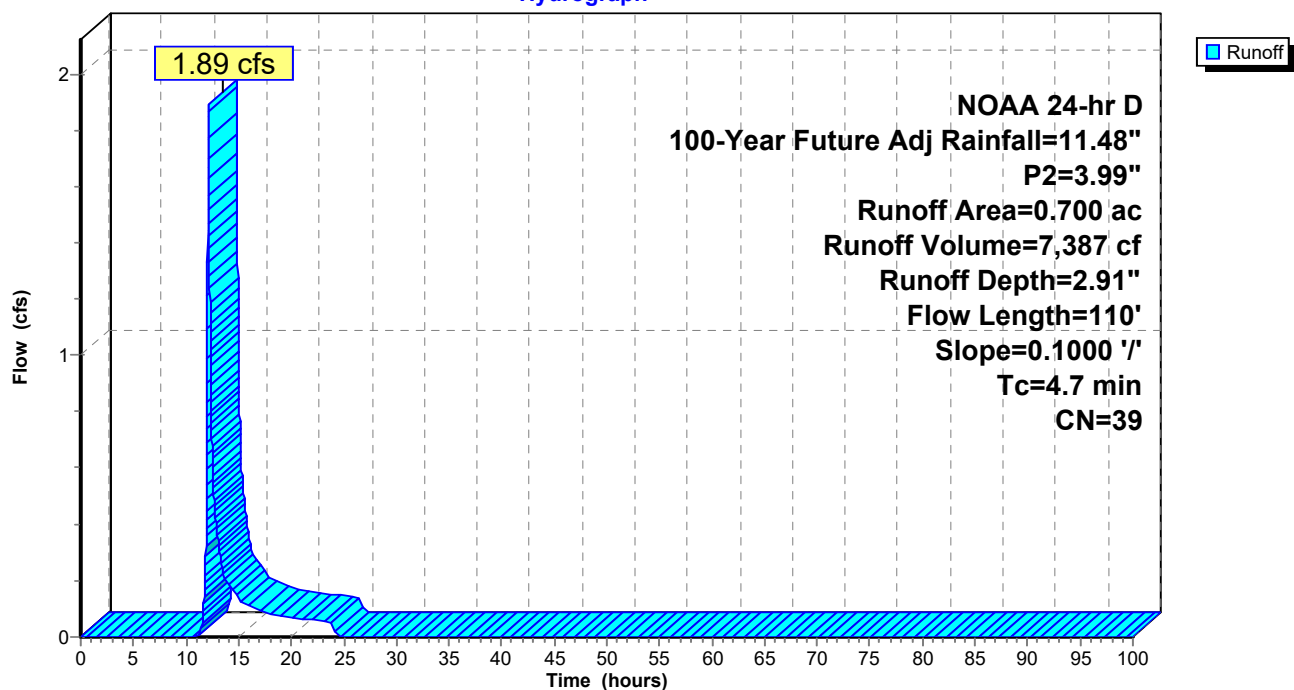
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.700	39	>75% Grass cover, Good, HSG A
0.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	10	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	110	Total			

Subcatchment P1Cp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Di:

Runoff = 79.35 cfs @ 12.11 hrs, Volume= 294,958 cf, Depth=11.24"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

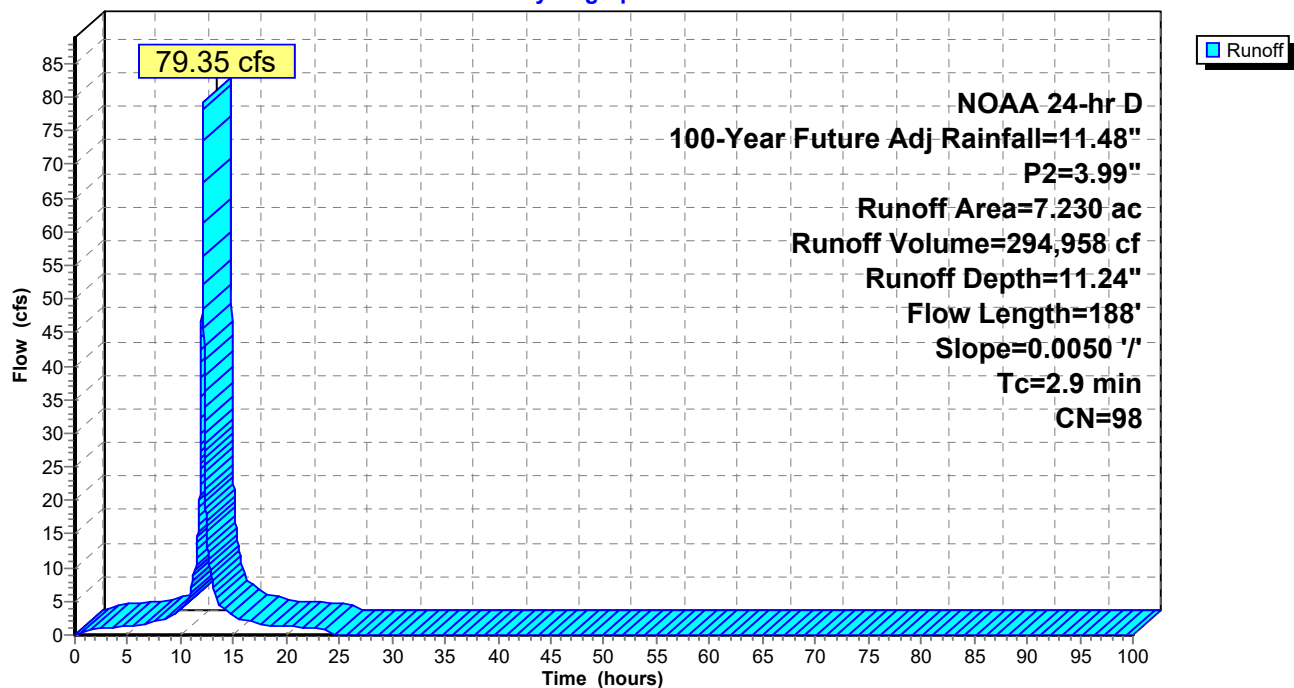
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
7.230	98	Paved parking, HSG D
7.230		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	100	0.0050	0.88		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
1.0	88	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	188	Total			

Subcatchment P1Di:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Dp:

Runoff = 7.75 cfs @ 12.13 hrs, Volume= 28,340 cf, Depth= 8.67"

Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

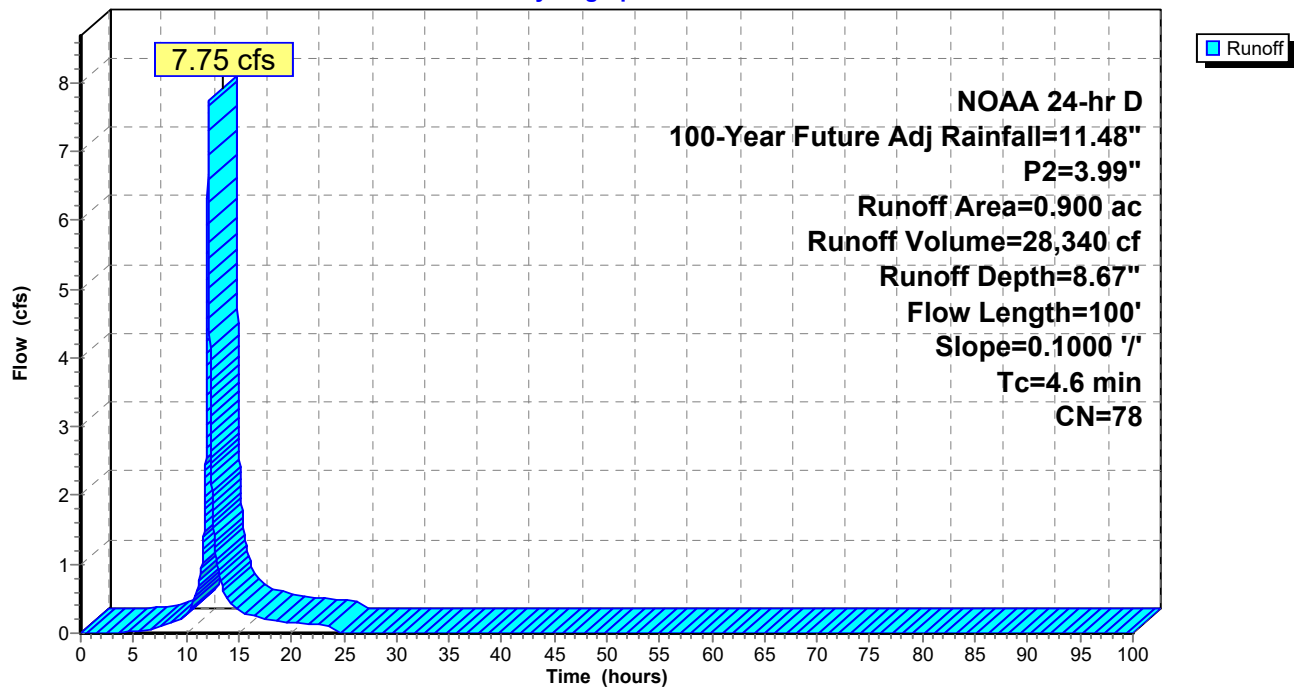
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.040	39	>75% Grass cover, Good, HSG A
0.860	80	>75% Grass cover, Good, HSG D
0.900	78	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Dp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Ei:

Runoff = 9.15 cfs @ 12.10 hrs, Volume= 31,005 cf, Depth=11.24"
Routed to Pond PP1 : POROUS PAVEMENT

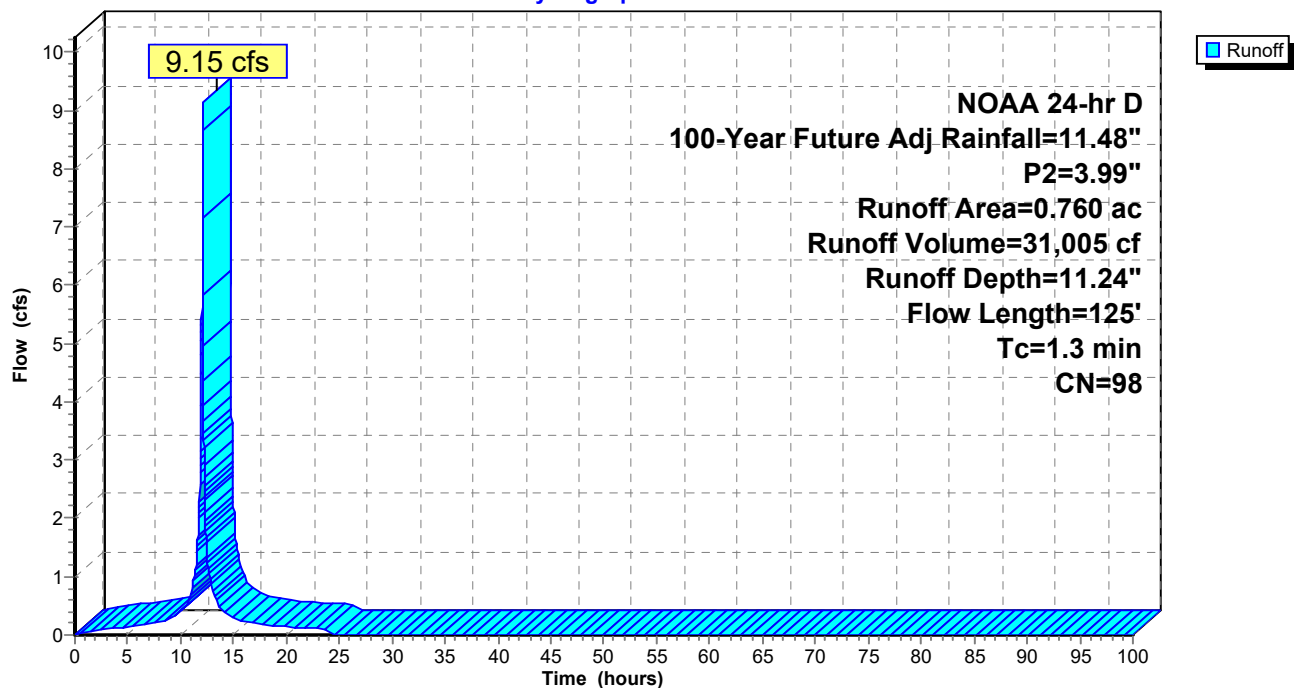
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG D
0.760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	68	0.0200	1.42		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	57	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment P1Ei:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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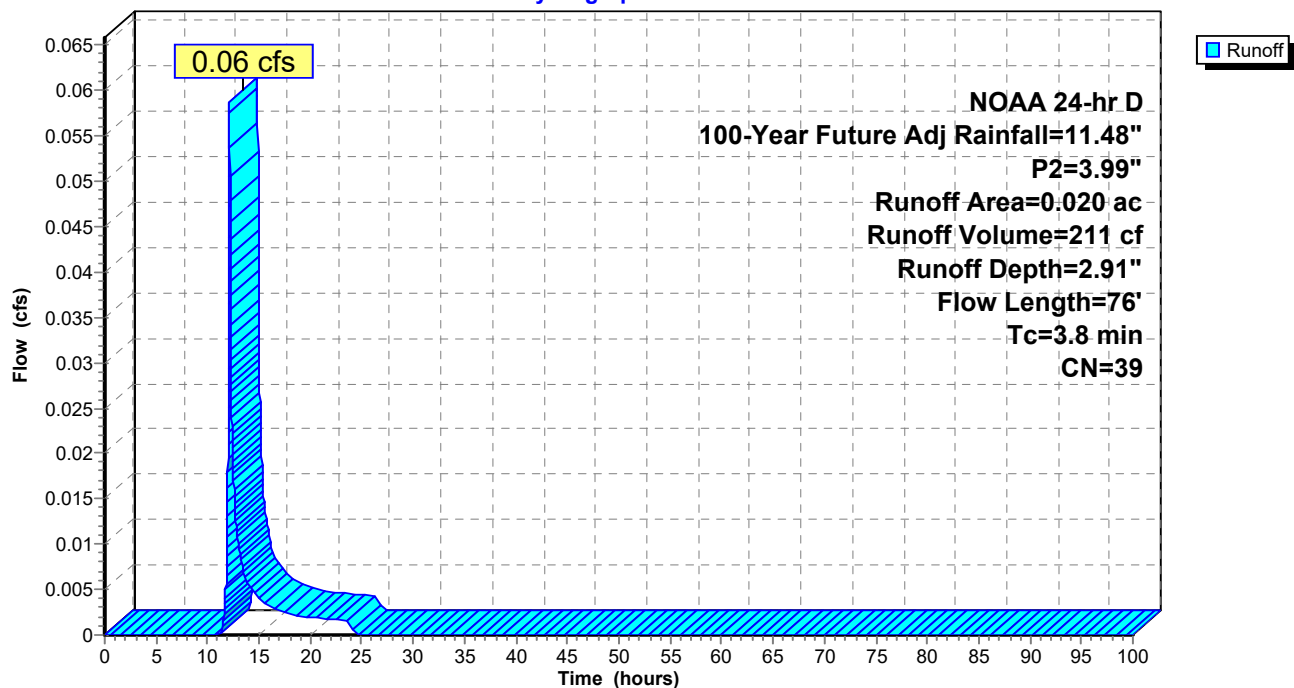
Summary for Subcatchment P1Ep:

Runoff = 0.06 cfs @ 12.13 hrs, Volume= 211 cf, Depth= 2.91"
Routed to Pond PP1 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.020	39	>75% Grass cover, Good, HSG A
0.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	31	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	45	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.8	76	Total			

Subcatchment P1Ep:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Fi:

Runoff = 20.22 cfs @ 12.10 hrs, Volume= 68,538 cf, Depth=11.24"
Routed to Pond PP2 : POROUS PAVEMENT

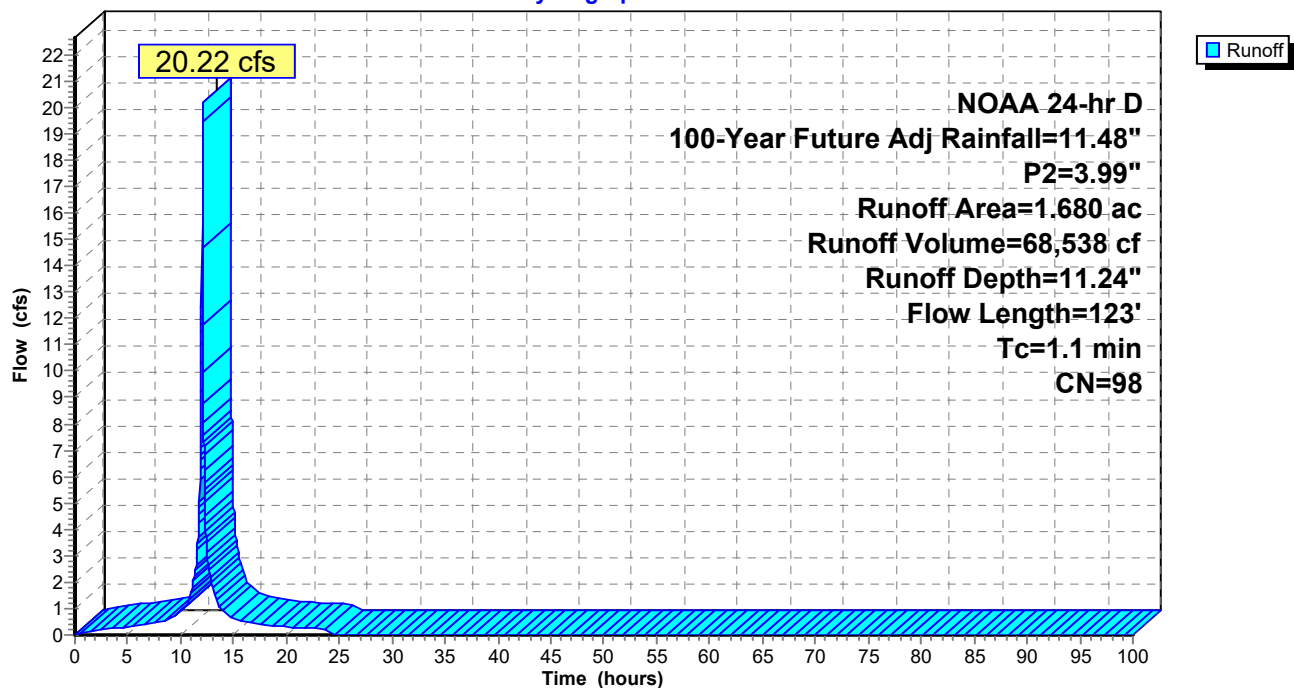
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
1.680	98	Paved parking, HSG D
1.680		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	68	0.0333	1.74		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	123	Total			

Subcatchment P1Fi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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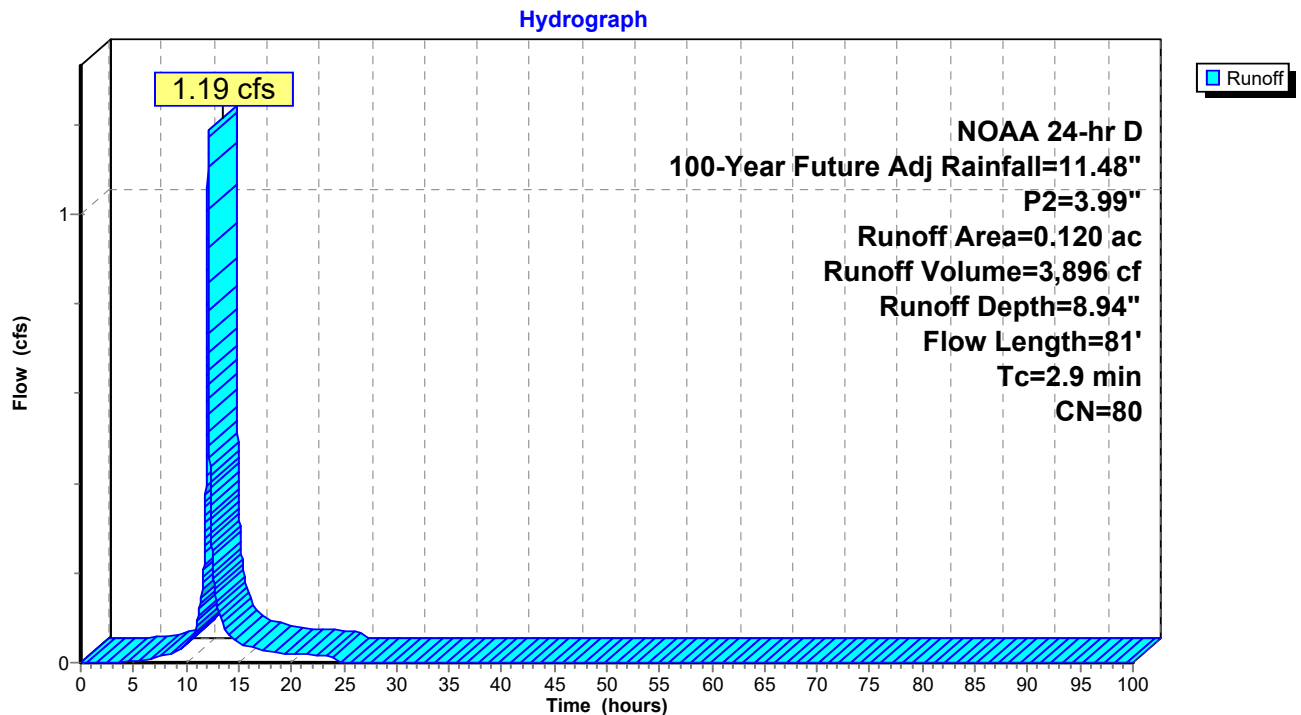
Summary for Subcatchment P1Fp:

Runoff = 1.19 cfs @ 12.11 hrs, Volume= 3,896 cf, Depth= 8.94"
Routed to Pond PP2 : POROUS PAVEMENT

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.120	80	>75% Grass cover, Good, HSG D
0.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	18	0.0200	0.13		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.5	43	0.0333	1.59		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	20	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.9	81	Total			

Subcatchment P1Fp:

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Gi:

Runoff = 8.41 cfs @ 12.10 hrs, Volume= 28,557 cf, Depth=11.24"
Routed to Pond PP3 : POROUS PAVEMENT

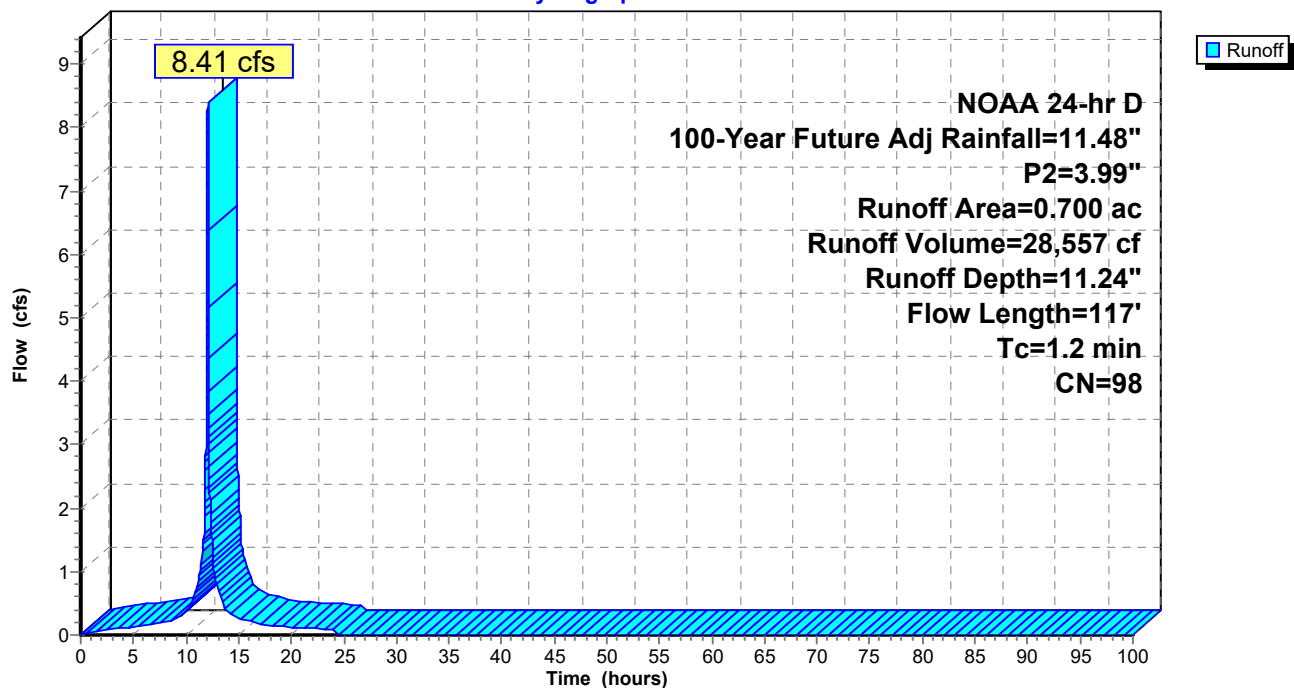
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	69	0.0250	1.56		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	48	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	117	Total			

Subcatchment P1Gi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Gp:

Runoff = 0.28 cfs @ 12.12 hrs, Volume= 974 cf, Depth= 8.94"
Routed to Pond PP3 : POROUS PAVEMENT

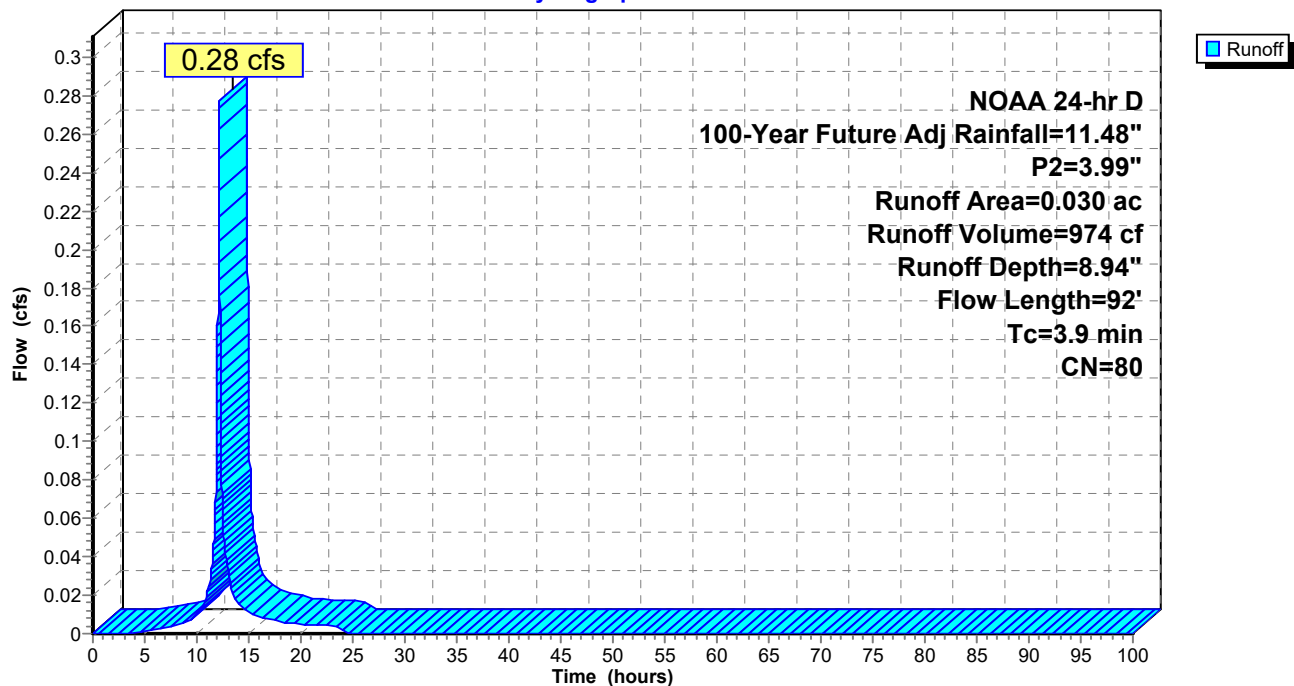
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.030	80	>75% Grass cover, Good, HSG D
0.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	29	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.1	8	0.0250	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	55	0.0075	1.76		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	92	Total			

Subcatchment P1Gp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Hi:

Runoff = 125.36 cfs @ 12.10 hrs, Volume= 433,666 cf, Depth=11.24"
Routed to Pond PP4 : POROUS PAVEMENT

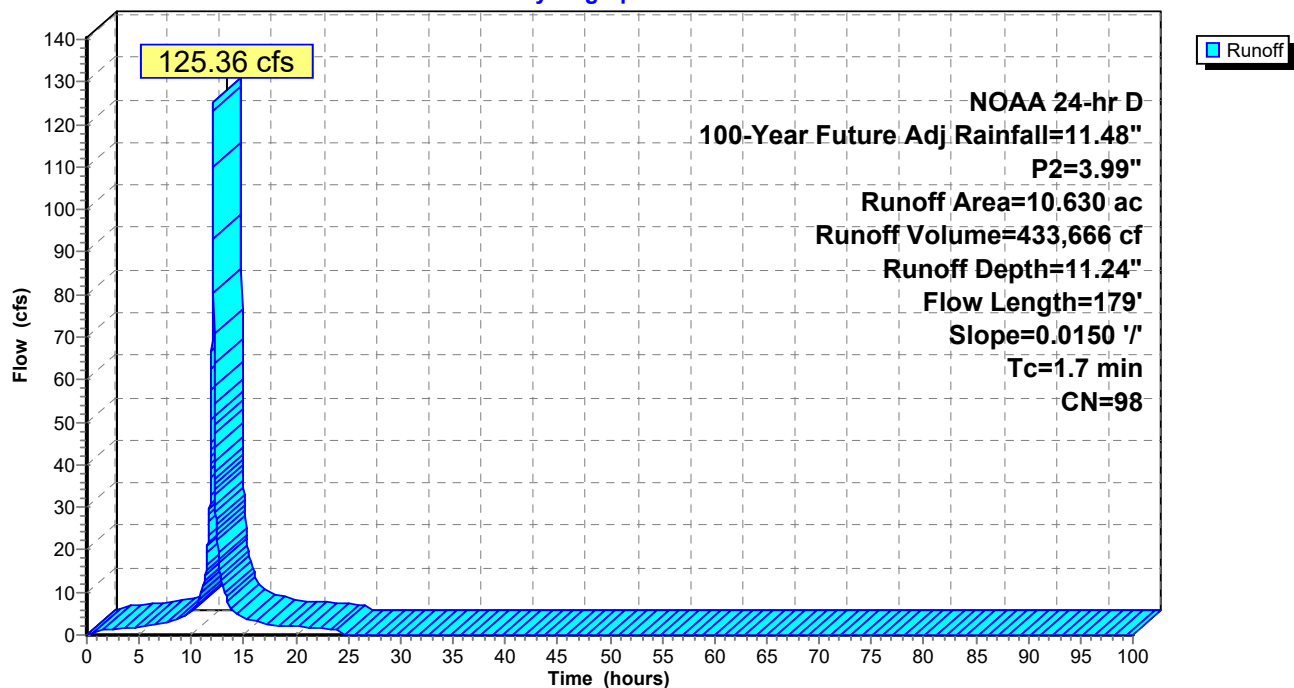
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
10.630	98	Paved parking, HSG D
10.630		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0150	1.37		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	79	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.7	179	Total			

Subcatchment P1Hi:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Hp:

Runoff = 2.45 cfs @ 12.13 hrs, Volume= 9,012 cf, Depth= 6.71"
Routed to Pond PP4 : POROUS PAVEMENT

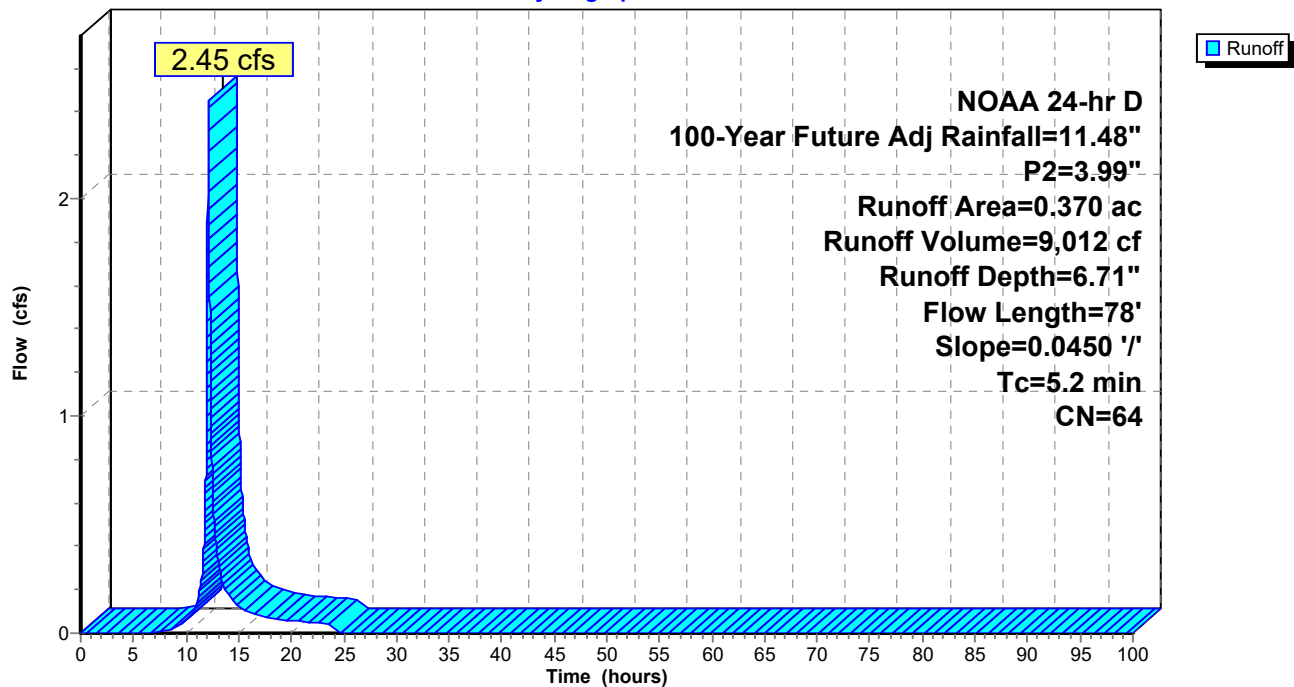
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.230	80	>75% Grass cover, Good, HSG D
0.140	39	>75% Grass cover, Good, HSG A
0.370	64	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	78	0.0450	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Hp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1li:

Runoff = 8.93 cfs @ 12.09 hrs, Volume= 30,189 cf, Depth=11.24"
Routed to Pond PP5 : POROUS PAVEMENT

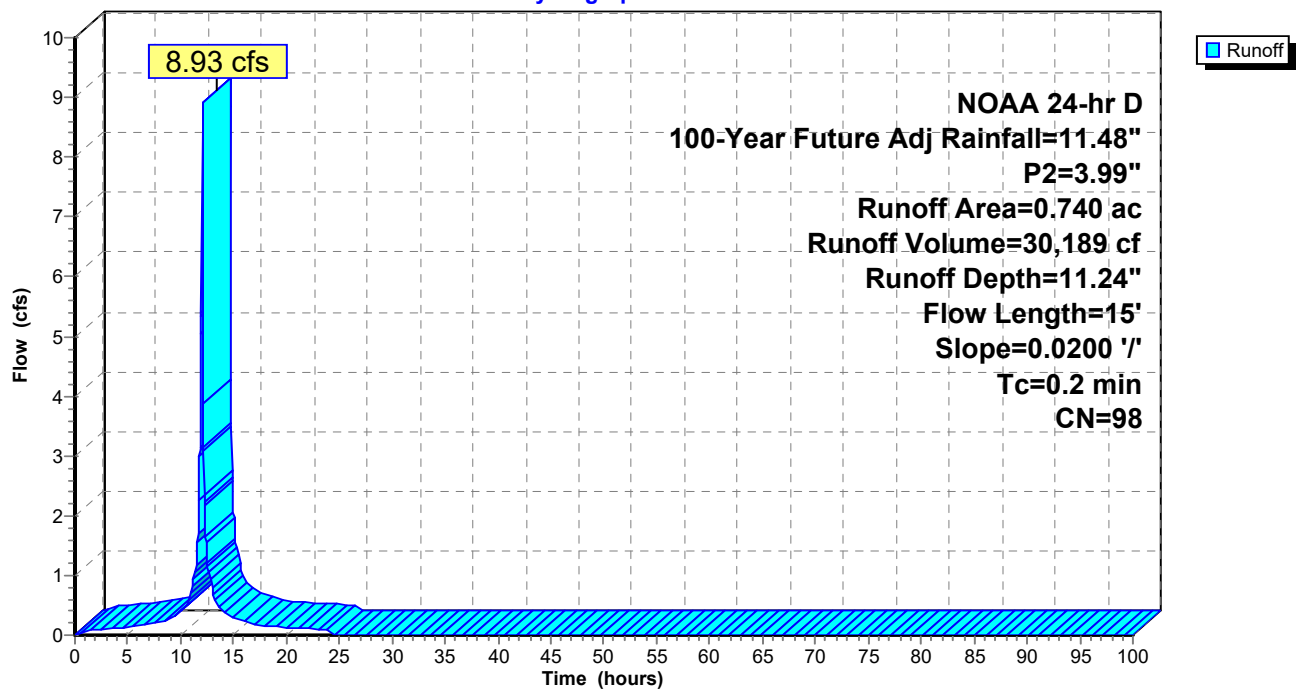
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
0.740		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1li:

Hydrograph



Summary for Subcatchment P1lp:

Runoff = 0.22 cfs @ 12.10 hrs, Volume= 649 cf, Depth= 8.94"
 Routed to Pond PP5 : POROUS PAVEMENT

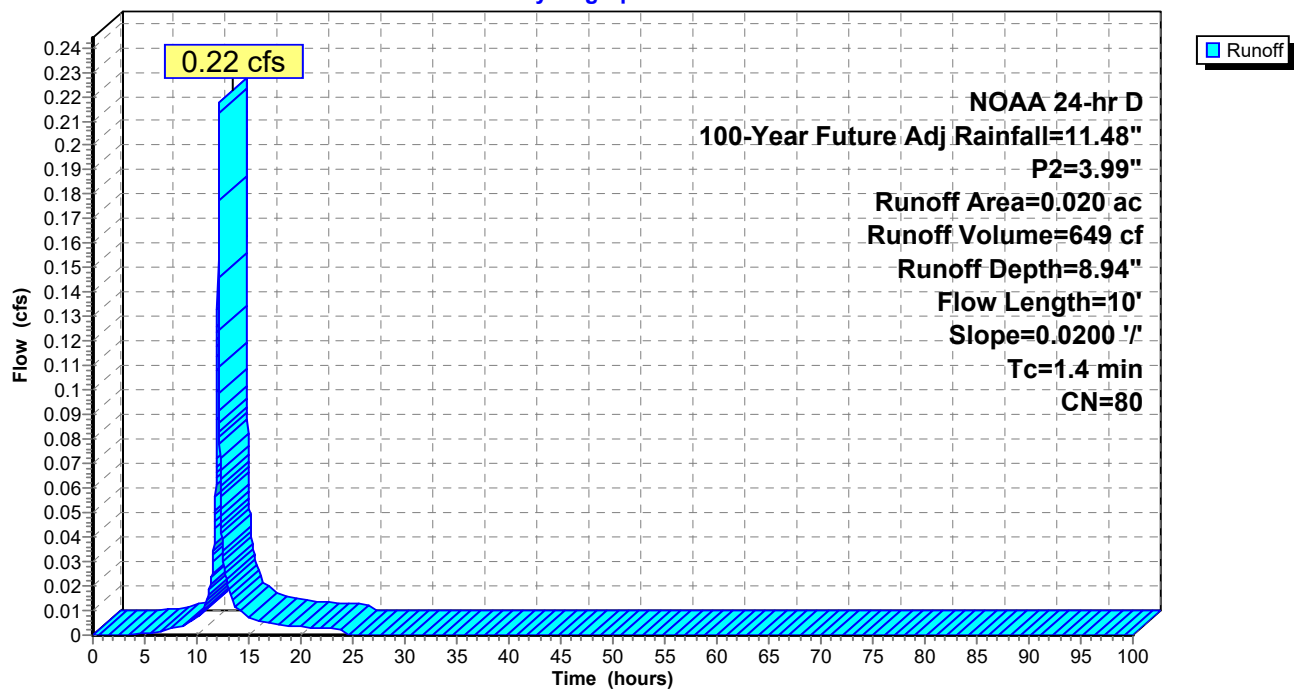
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.020	80	>75% Grass cover, Good, HSG D
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1lp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Ji:

Runoff = 10.50 cfs @ 12.09 hrs, Volume= 35,493 cf, Depth=11.24"
Routed to Pond PP6 : POROUS PAVEMENT

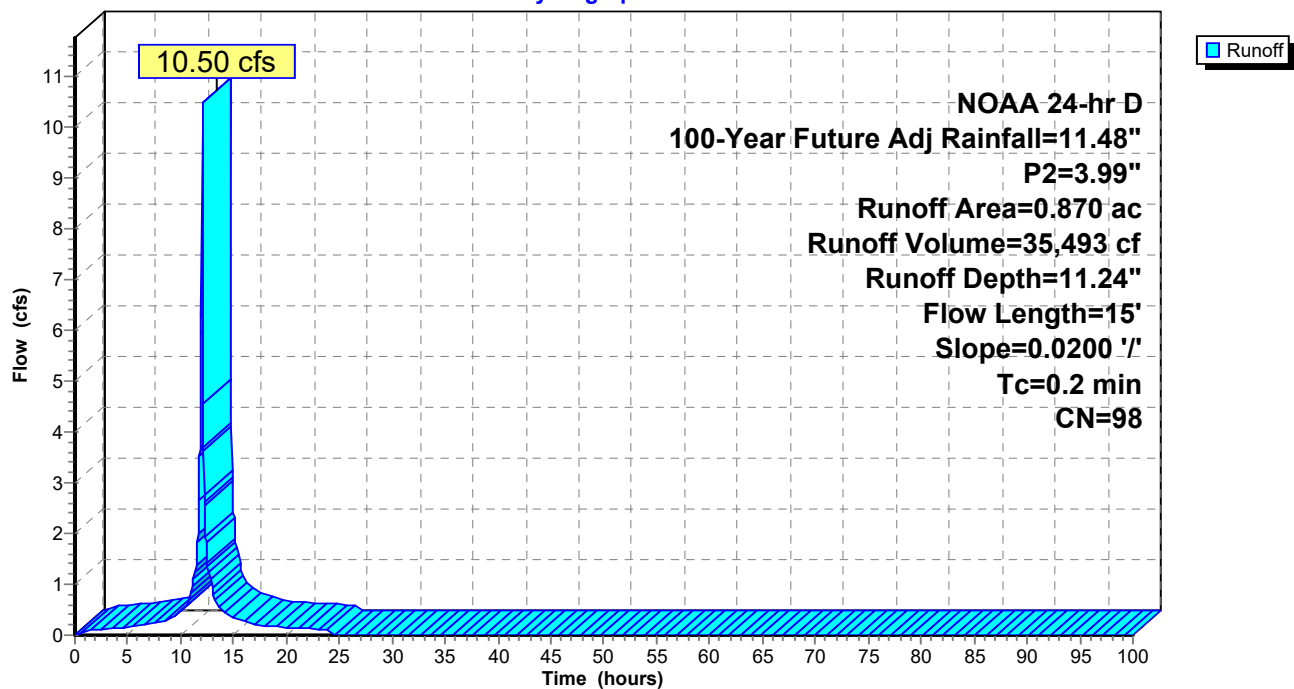
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.870	98	Paved parking, HSG D
0.870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	15	0.0200	1.05		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Ji:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Jp:

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 445 cf, Depth= 6.12"
Routed to Pond PP6 : POROUS PAVEMENT

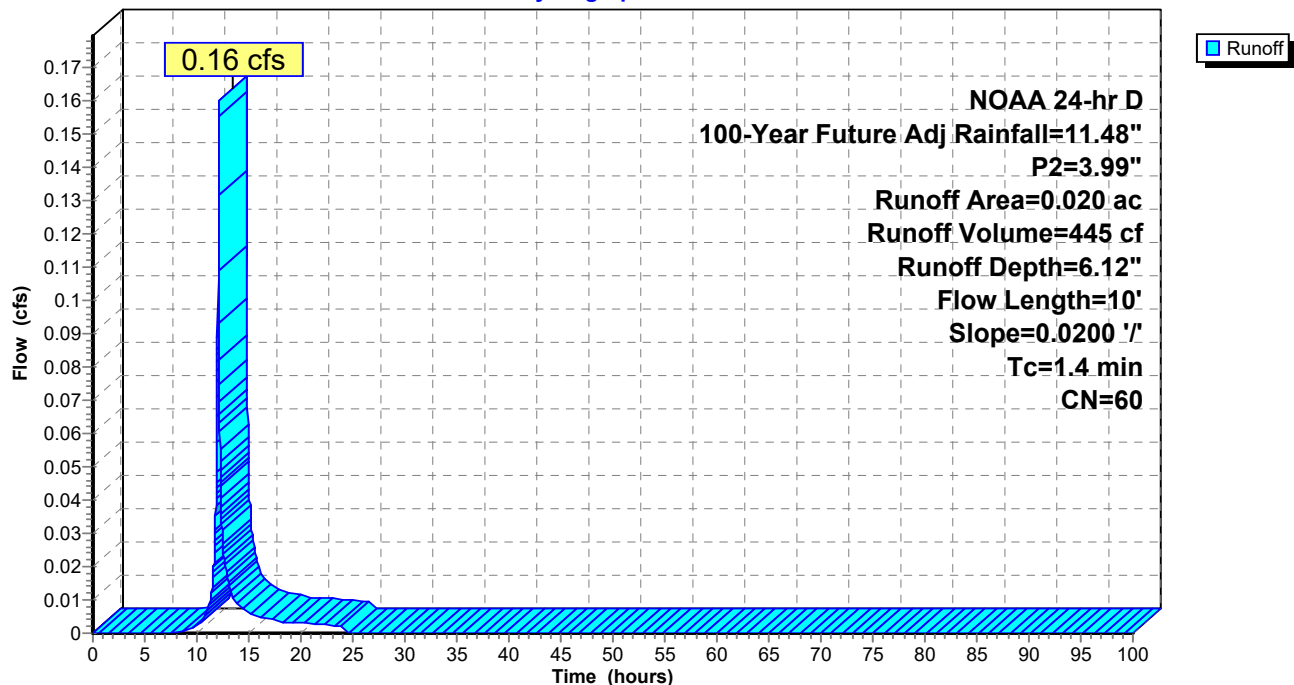
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.010	80	>75% Grass cover, Good, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.020	60	Weighted Average
0.020		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, Grass: Short n= 0.150 P2= 3.99"

Subcatchment P1Jp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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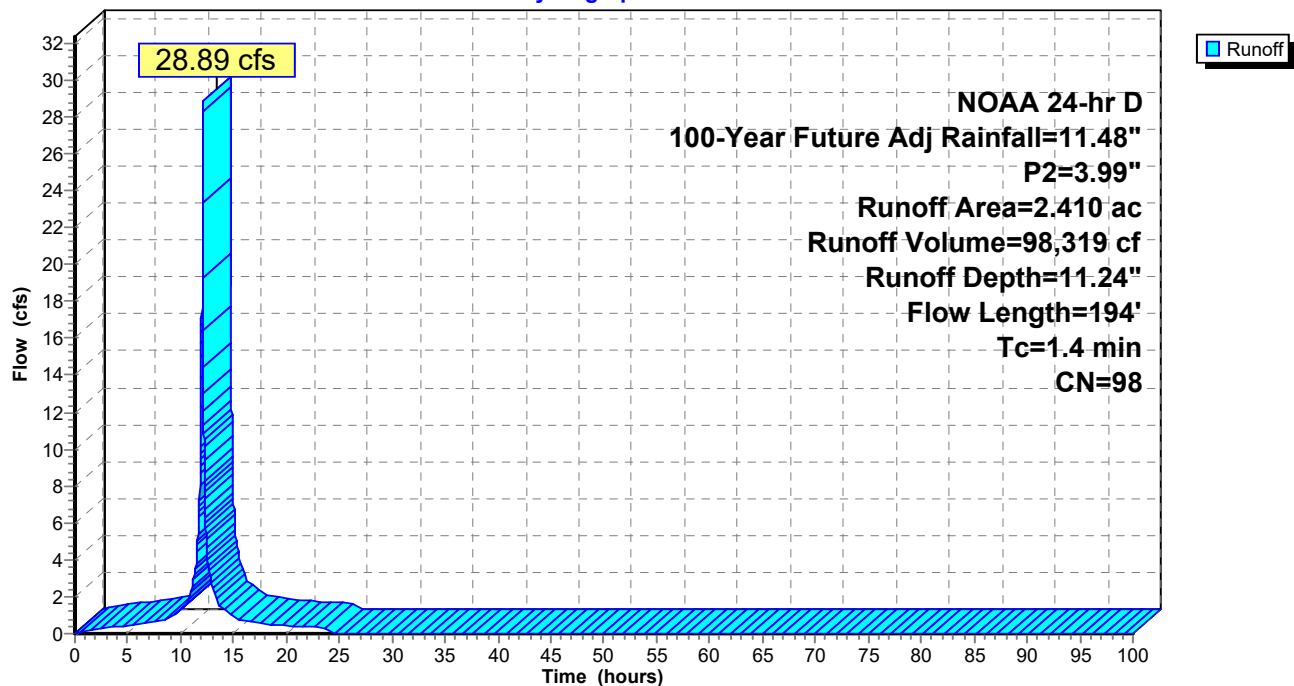
Summary for Subcatchment P1Ki:

Runoff = 28.89 cfs @ 12.10 hrs, Volume= 98,319 cf, Depth=11.24"
Routed to Pond B1 : UG BASIN

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
2.410	98	Paved parking, HSG D
2.410		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	72	0.0250	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.2	55	0.0350	3.80		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	67	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.4	194	Total			

Subcatchment P1Ki:**Hydrograph**

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Kp:

Runoff = 0.60 cfs @ 12.11 hrs, Volume= 1,948 cf, Depth= 8.94"
Routed to Pond B1 : UG BASIN

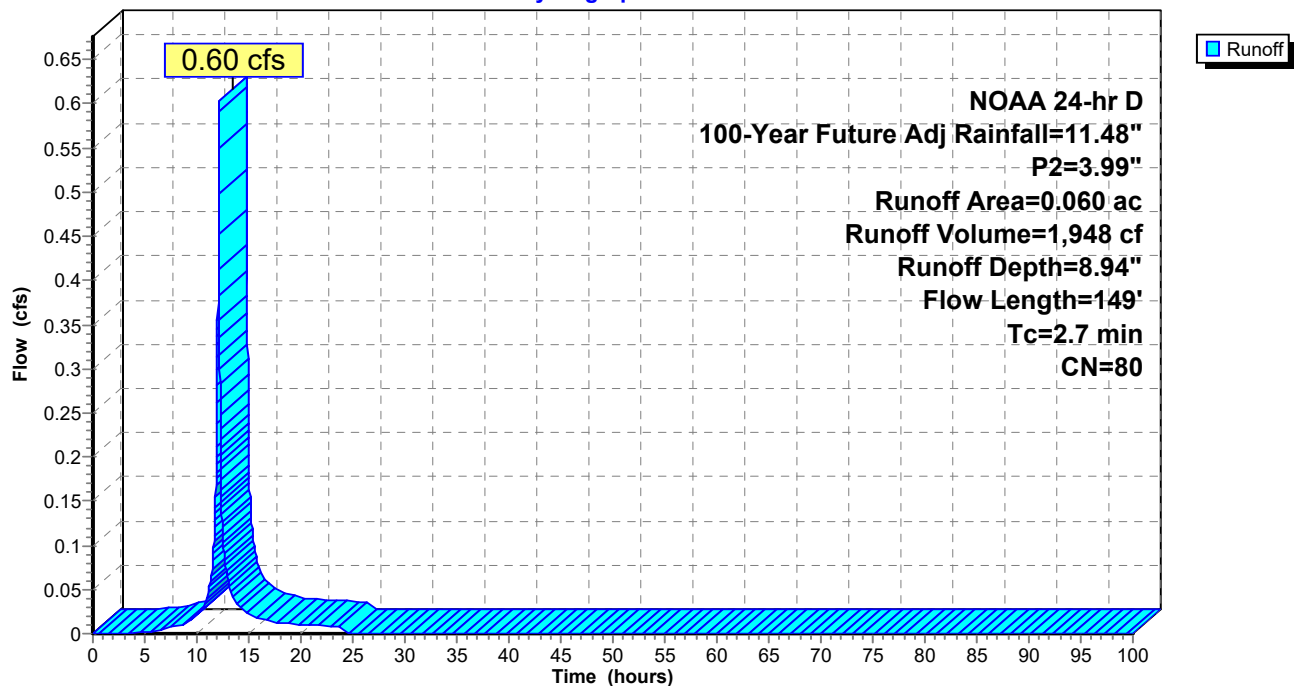
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	13	0.0250	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.7	67	0.0250	1.55		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.4	69	0.0220	3.01		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	149	Total			

Subcatchment P1Kp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Li:

Runoff = 2.05 cfs @ 12.09 hrs, Volume= 6,935 cf, Depth=11.24"
Routed to Link P1A :

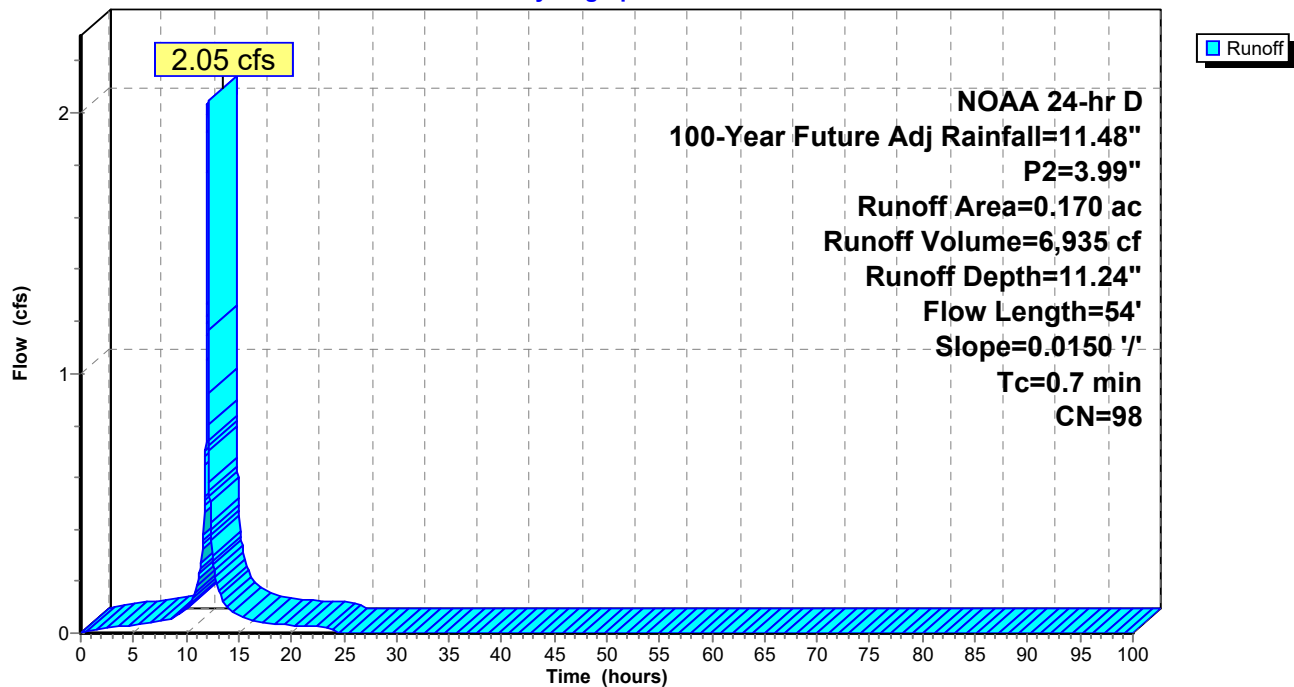
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.170	98	Paved parking, HSG D
0.170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	54	0.0150	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"

Subcatchment P1Li:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Lp:

Runoff = 11.43 cfs @ 12.20 hrs, Volume= 57,079 cf, Depth= 6.42"
Routed to Link P1A :

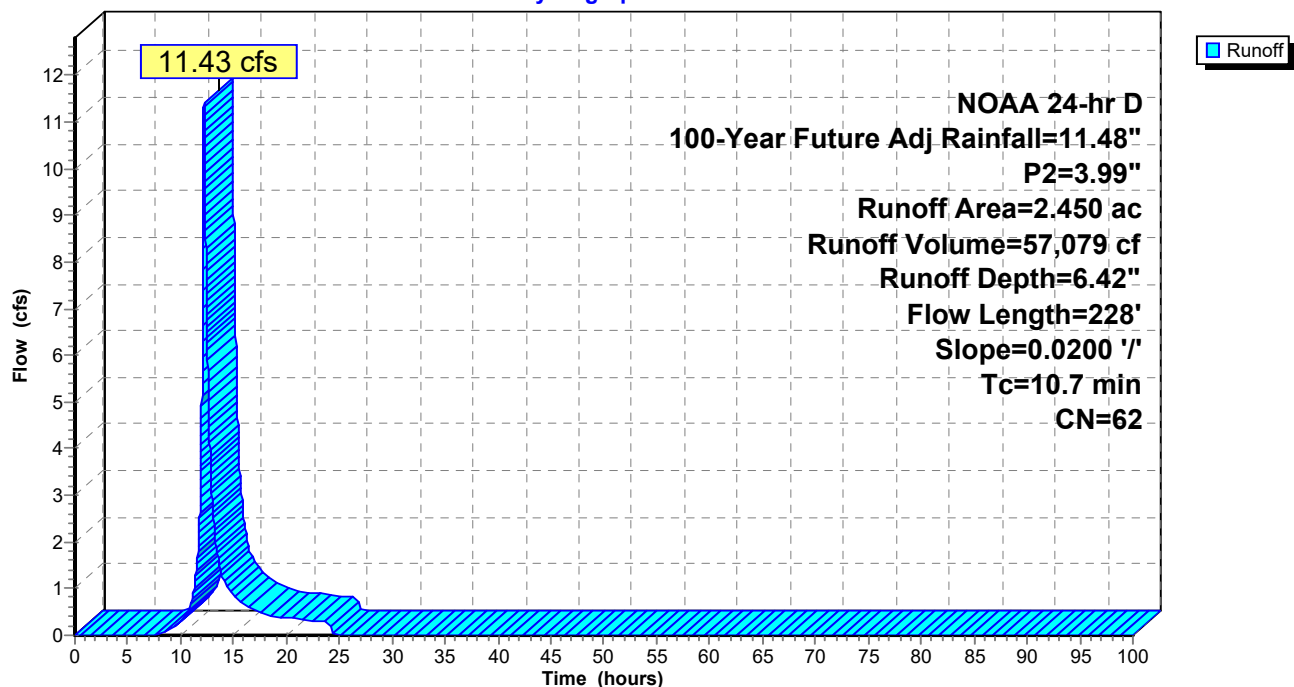
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
1.360	80	>75% Grass cover, Good, HSG D
1.090	39	>75% Grass cover, Good, HSG A
2.450	62	Weighted Average
2.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	94	0.0200	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.99" Using McCuen-Spiess flow length
2.3	134	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.7	228	Total			

Subcatchment P1Lp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Mp:

Runoff = 7.03 cfs @ 12.16 hrs, Volume= 31,978 cf, Depth= 8.81"
Routed to Link P1A :

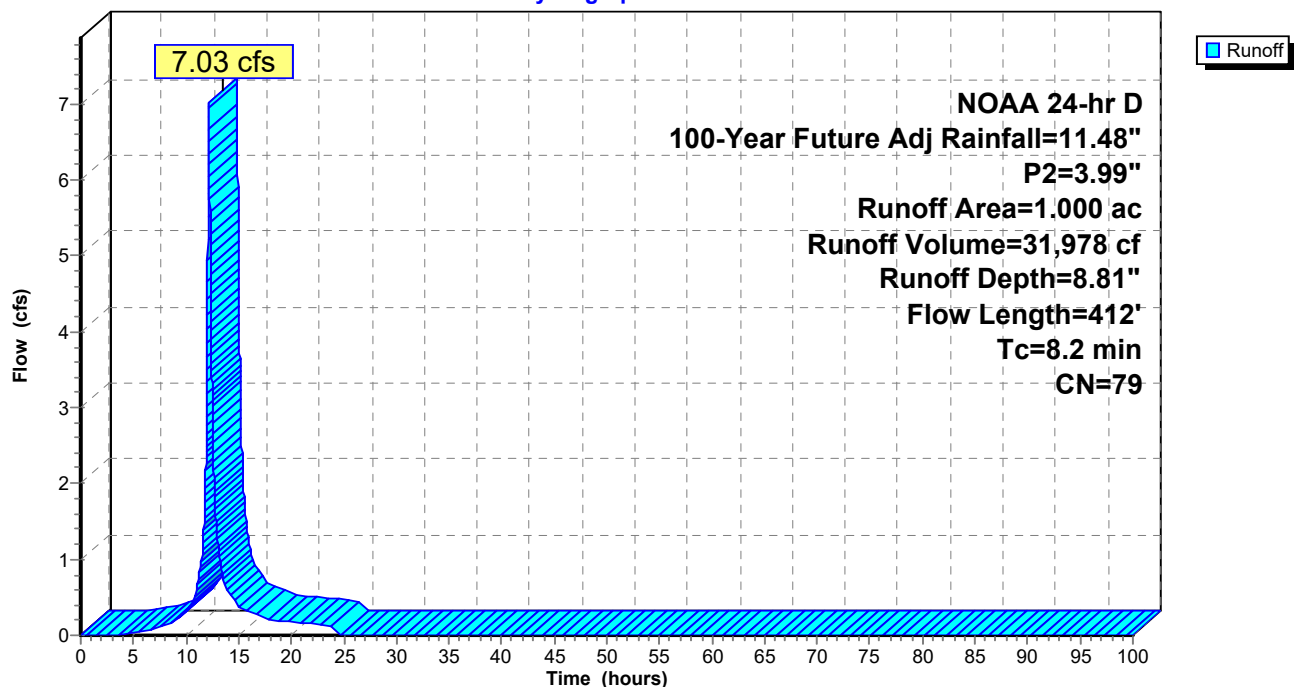
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.570	80	>75% Grass cover, Good, HSG D
0.430	77	Woods, Good, HSG D
1.000	79	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	36	0.1806	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
4.7	376	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
8.2	412	Total			

Subcatchment P1Mp:

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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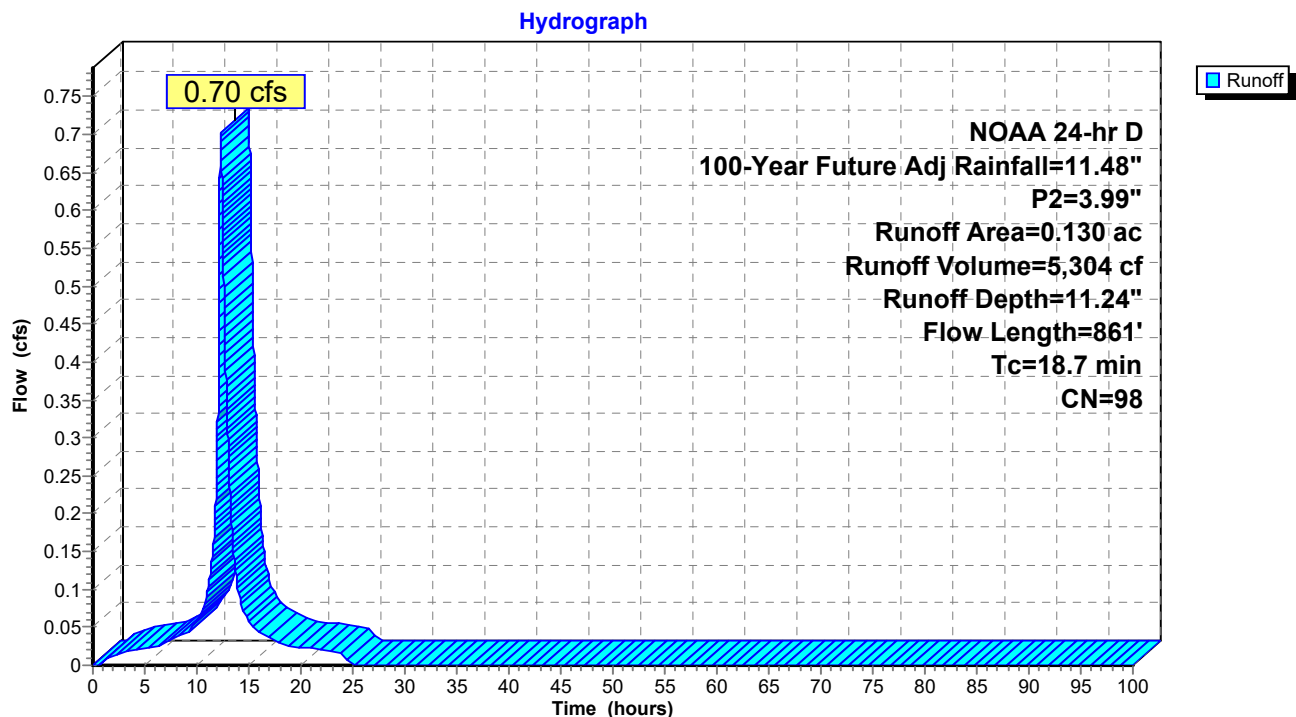
Summary for Subcatchment P1Ni: PDA 4B Impervious

Runoff = 0.70 cfs @ 12.30 hrs, Volume= 5,304 cf, Depth=11.24"
Routed to Link P1B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.130	98	Paved parking, HSG D
0.130		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Ni: PDA 4B Impervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P1Np: PDA 4B Pervious

Runoff = 34.92 cfs @ 12.30 hrs, Volume= 235,219 cf, Depth= 8.67"
Routed to Link P1B : BYPASS

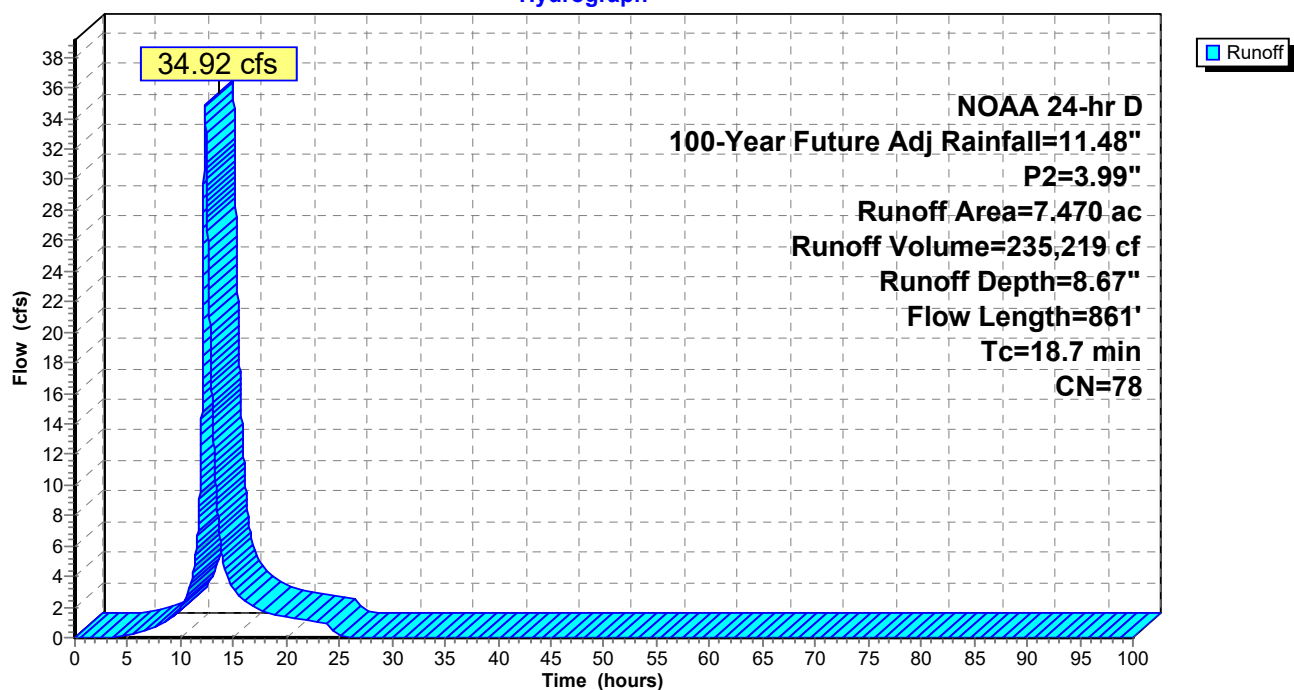
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
3.900	80	>75% Grass cover, Good, HSG D
3.510	77	Woods, Good, HSG D
0.060	39	>75% Grass cover, Good, HSG A
7.470	78	Weighted Average
7.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.1900	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99"
10.1	700	0.0539	1.16		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	61	0.0054	1.32	0.93	Channel Flow, Area= 0.7 sf Perim= 3.2' r= 0.22' n= 0.030 Earth, grassed & winding
18.7	861	Total			

Subcatchment P1Np: PDA 4B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P2Ap: PDA 2A Pervious

Runoff = 3.85 cfs @ 12.24 hrs, Volume= 22,705 cf, Depth= 8.81"
Routed to Link P2A : PDA 2A ONSITE

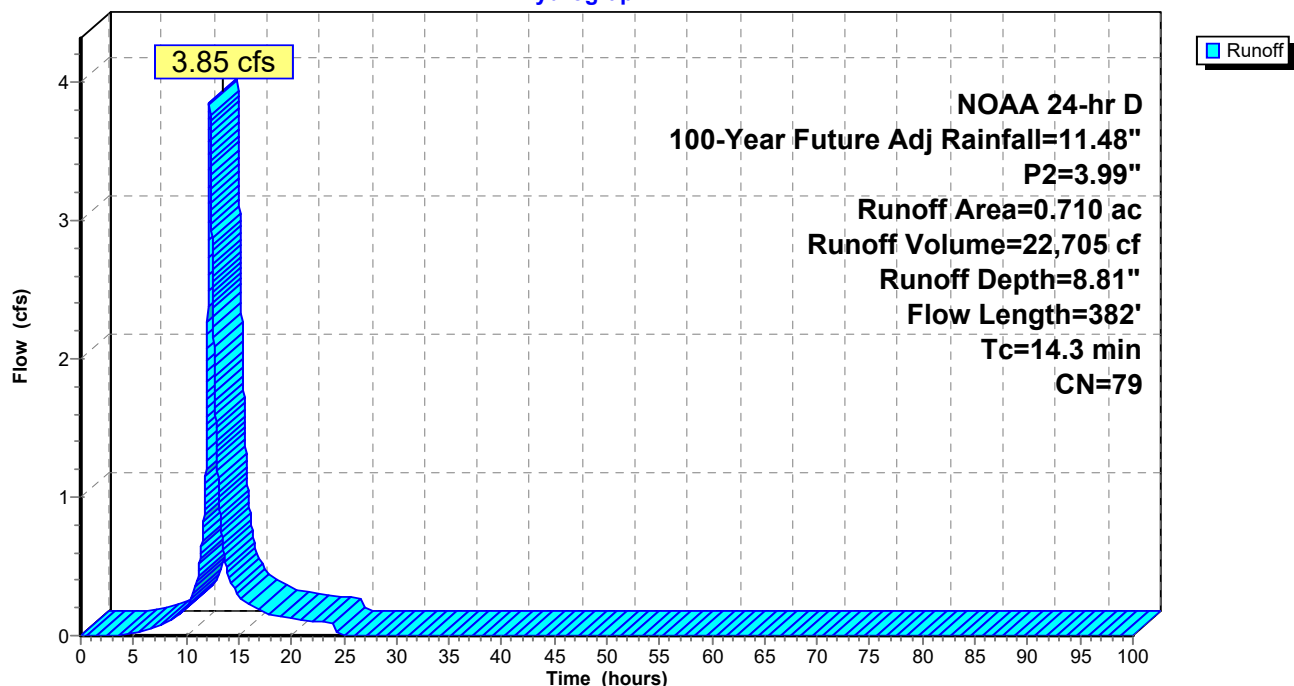
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.360	80	>75% Grass cover, Good, HSG D
0.350	77	Woods, Good, HSG D
0.710	79	Weighted Average
0.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	70	0.0316	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.4	30	0.0167	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.5	43	0.0058	1.55		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.9	239	0.0102	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.3	382	Total			

Subcatchment P2Ap: PDA 2A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P2Bp: PDA 2B Pervious

Runoff = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf, Depth= 8.54"
Routed to Link P2B : BYPASS

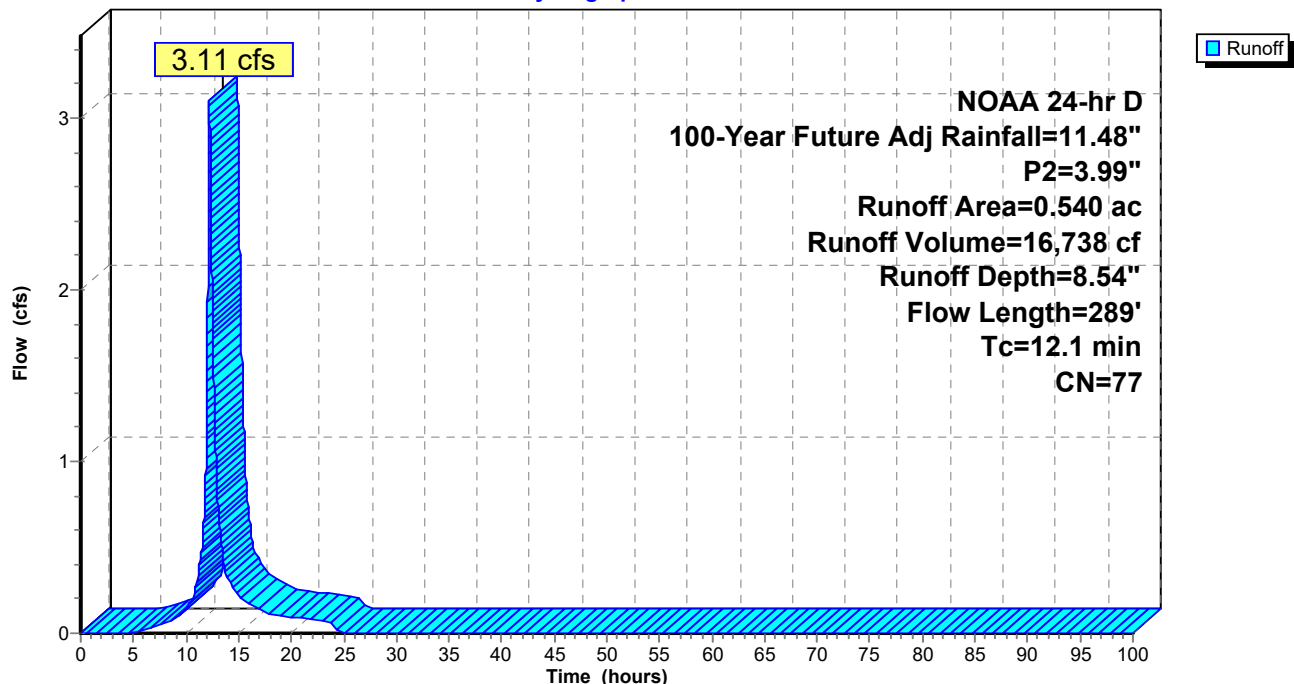
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.540	77	Woods, Good, HSG D
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	46	0.0335	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
3.7	243	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.1	289	Total			

Subcatchment P2Bp: PDA 2B Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Subcatchment P3Ap: PDA 3A Pervious

Runoff = 9.39 cfs @ 12.11 hrs, Volume= 30,379 cf, Depth= 8.81"
Routed to Link P3A : PDA 3A ONSITE

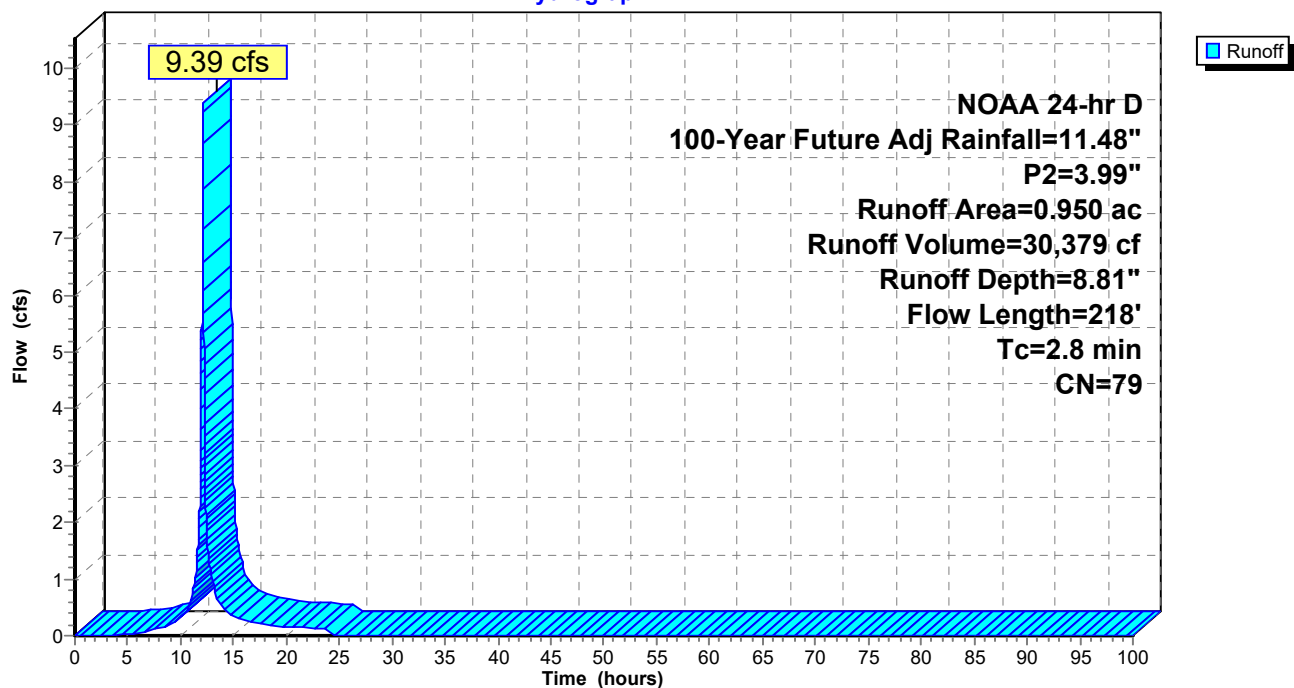
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.430	77	Woods, Good, HSG D
0.520	80	>75% Grass cover, Good, HSG D
0.950	79	Weighted Average
0.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0312	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.99"
0.8	75	0.0067	1.66		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.1	43	0.0177	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	218	Total			

Subcatchment P3Ap: PDA 3A Pervious

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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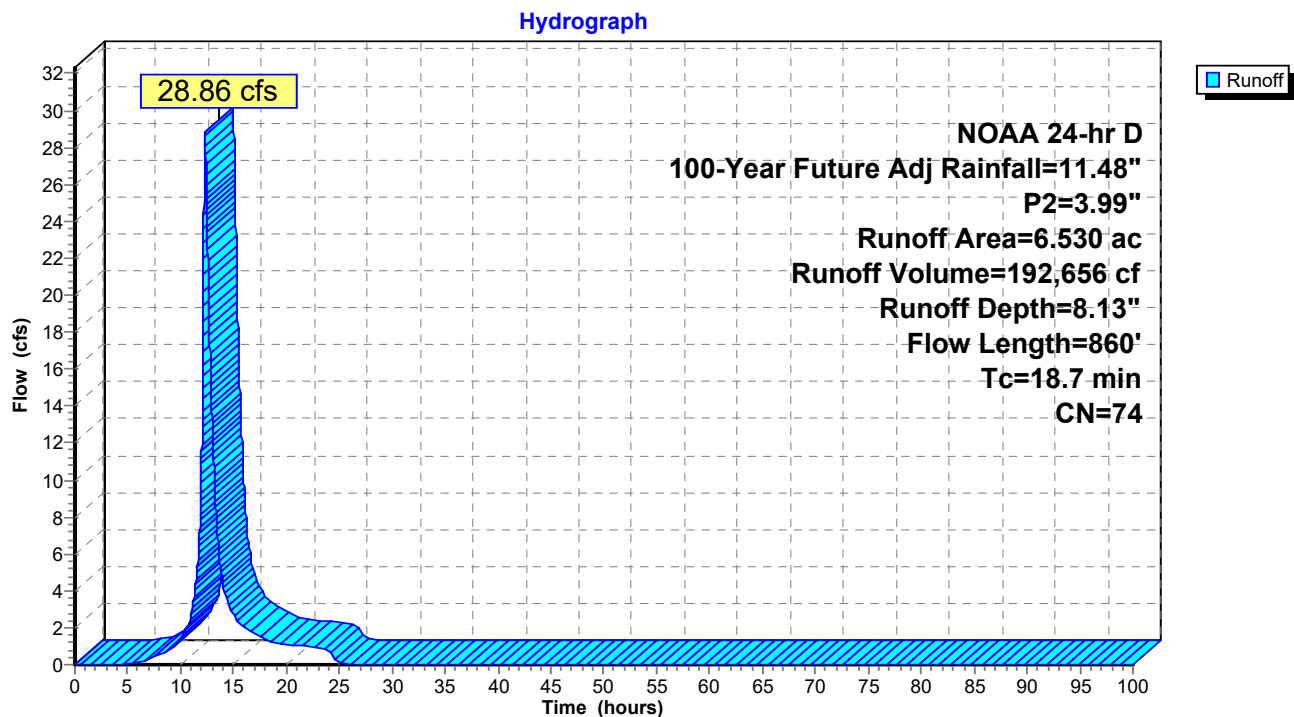
Summary for Subcatchment P3Bp: PDA 3B Pervious

Runoff = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf, Depth= 8.13"
Routed to Link P3B : BYPASS

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
5.860	77	Woods, Good, HSG D
0.400	30	Woods, Good, HSG A
6.530	74	Weighted Average
6.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	59	0.0550	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.99" Using McCuen-Spiess flow length
10.3	801	0.0677	1.30		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.7	860	Total			

Subcatchment P3Bp: PDA 3B Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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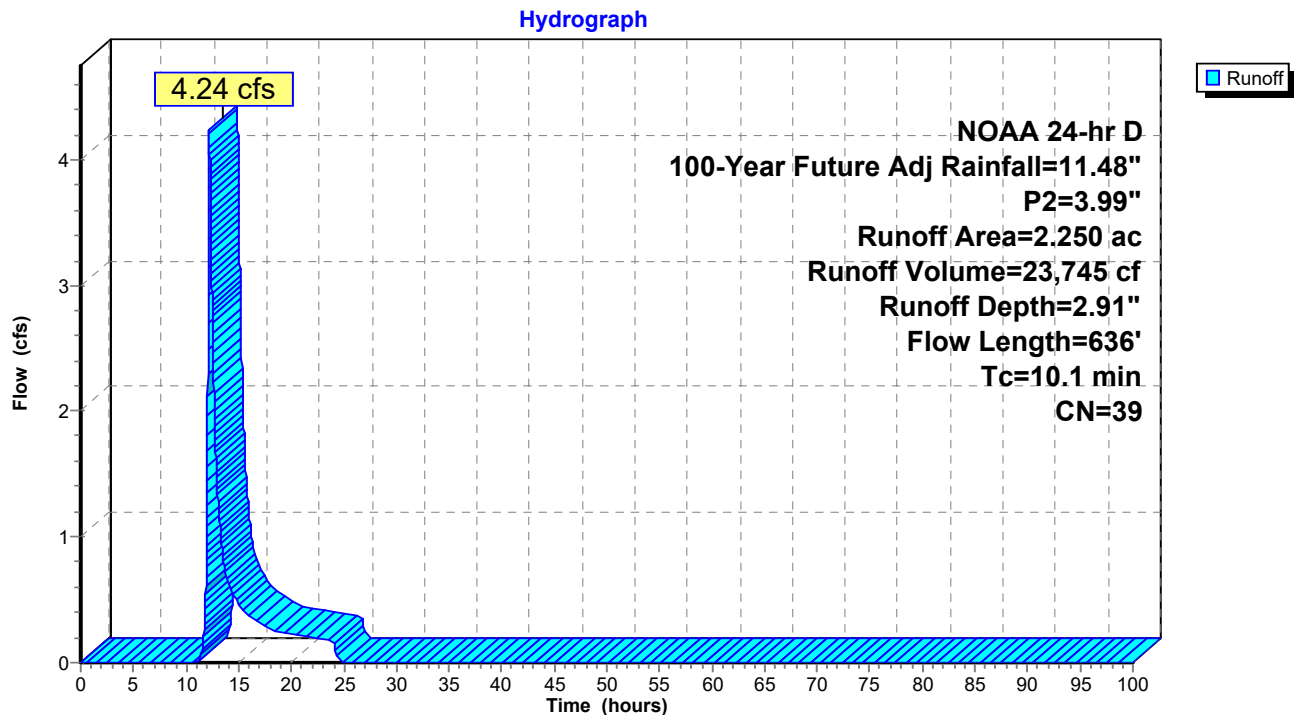
Summary for Subcatchment P4p: PDA 4 Pervious

Runoff = 4.24 cfs @ 12.21 hrs, Volume= 23,745 cf, Depth= 2.91"
Routed to Link P4 : PDA 4

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Area (ac)	CN	Description
2.250	39	>75% Grass cover, Good, HSG A
2.250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	61	0.0088	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.99"
0.3	31	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	544	0.0830	5.85		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.1	636	Total			

Subcatchment P4p: PDA 4 Pervious

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 11.18" for 100-Year Future Adj event
 Inflow = 29.48 cfs @ 12.10 hrs, Volume= 100,267 cf
 Outflow = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf, Atten= 56%, Lag= 4.1 min
 Primary = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.32' @ 12.16 hrs Surf.Area= 0.559 ac Storage= 1.070 af

Plug-Flow detention time= 342.2 min calculated for 90,742 cf (91% of inflow)
 Center-of-Mass det. time= 289.9 min (1,025.5 - 735.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=13.01 cfs @ 12.16 hrs HW=12.32' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 13.01 cfs of 17.05 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.29 cfs @ 6.59 fps)
- 3=Orifice/Grate (Orifice Controls 1.04 cfs @ 5.30 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 10.68 cfs @ 3.10 fps)

Pond B1: UG BASIN - Chamber Wizard Field A**Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

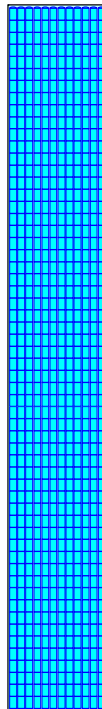
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

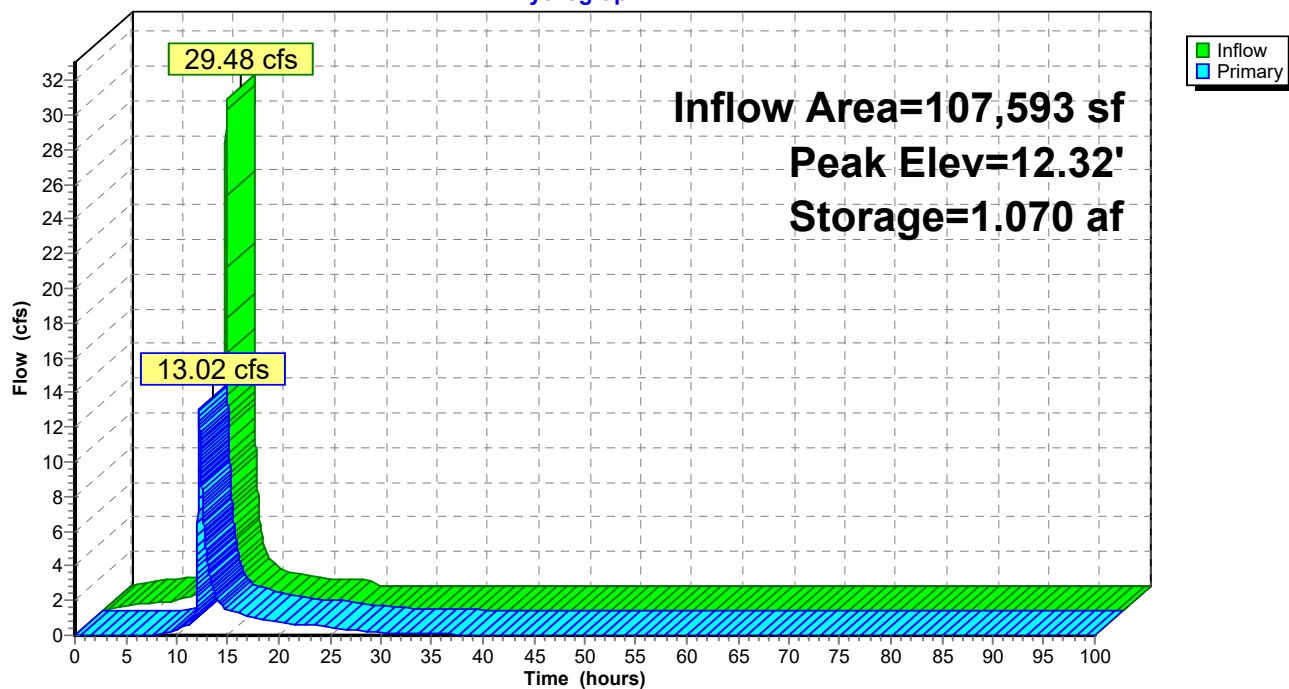
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 12.43" for 100-Year Future Adj event
 Inflow = 82.77 cfs @ 12.11 hrs, Volume= 352,938 cf
 Outflow = 16.68 cfs @ 13.92 hrs, Volume= 351,016 cf, Atten= 80%, Lag= 108.6 min
 Primary = 16.68 cfs @ 13.92 hrs, Volume= 351,016 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 16.44' @ 12.85 hrs Surf.Area= 32,043 sf Storage= 160,520 cf

Plug-Flow detention time= 281.3 min calculated for 351,016 cf (99% of inflow)

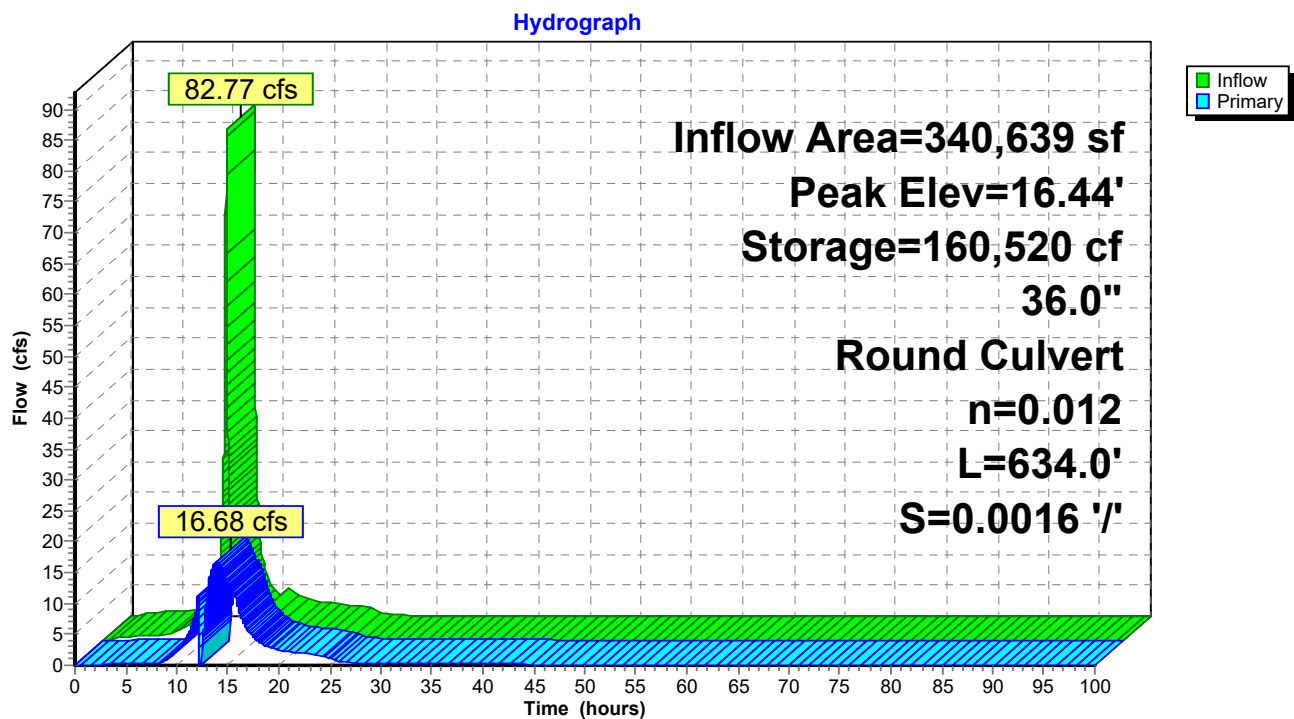
Center-of-Mass det. time= 273.9 min (1,069.6 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=16.94 cfs @ 13.92 hrs HW=15.47' TW=14.98' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 16.94 cfs @ 2.40 fps)

Pond CW1A: CONSTRUCTED WETLANDS 1A

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 10.20" for 100-Year Future Adj event
 Inflow = 107.79 cfs @ 12.12 hrs, Volume= 896,739 cf
 Outflow = 46.48 cfs @ 12.87 hrs, Volume= 894,411 cf, Atten= 57%, Lag= 45.0 min
 Primary = 46.48 cfs @ 12.87 hrs, Volume= 894,411 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 16.32' @ 12.68 hrs Surf.Area= 27,345 sf Storage= 147,954 cf

Plug-Flow detention time= 125.5 min calculated for 894,411 cf (100% of inflow)

Center-of-Mass det. time= 114.6 min (1,015.9 - 901.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

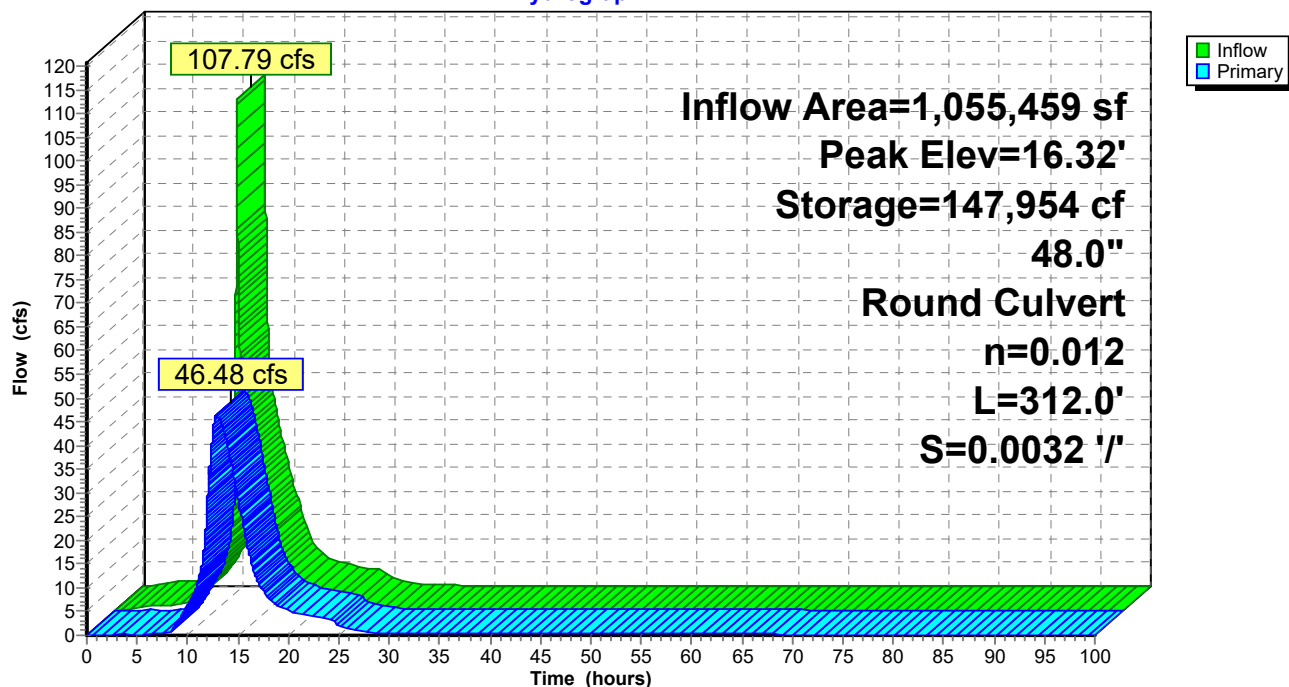
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=46.71 cfs @ 12.87 hrs HW=16.26' TW=15.66' (Dynamic Tailwater)↑ **1=Culvert** (Outlet Controls 46.71 cfs @ 3.72 fps)

Pond CW1B: CONSTRUCTED WETLANDS 1B

Hydrograph



Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 9.99" for 100-Year Future Adj event
 Inflow = 64.28 cfs @ 12.14 hrs, Volume= 1,058,420 cf
 Outflow = 57.00 cfs @ 12.82 hrs, Volume= 1,058,098 cf, Atten= 11%, Lag= 40.9 min
 Primary = 57.00 cfs @ 12.82 hrs, Volume= 1,058,098 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

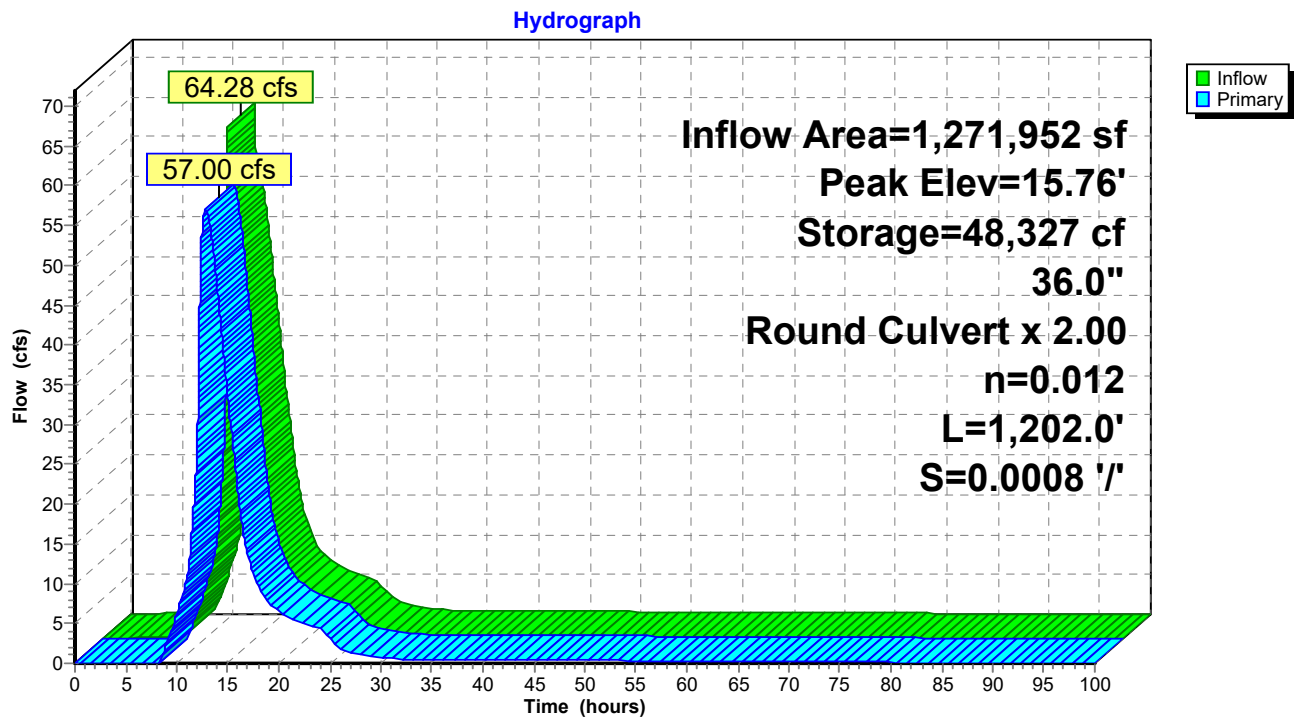
Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.76' @ 12.55 hrs Surf.Area= 12,738 sf Storage= 48,327 cf

Plug-Flow detention time= 24.4 min calculated for 1,057,992 cf (100% of inflow)
 Center-of-Mass det. time= 22.9 min (1,040.2 - 1,017.3)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=57.07 cfs @ 12.82 hrs HW=15.68' TW=13.42' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 57.07 cfs @ 4.04 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 10.19" for 100-Year Future Adj event
 Inflow = 131.44 cfs @ 12.11 hrs, Volume= 1,436,248 cf
 Outflow = 94.64 cfs @ 12.22 hrs, Volume= 1,434,971 cf, Atten= 28%, Lag= 6.6 min
 Primary = 94.64 cfs @ 12.22 hrs, Volume= 1,434,971 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.96' @ 12.22 hrs Surf.Area= 25,414 sf Storage= 94,943 cf

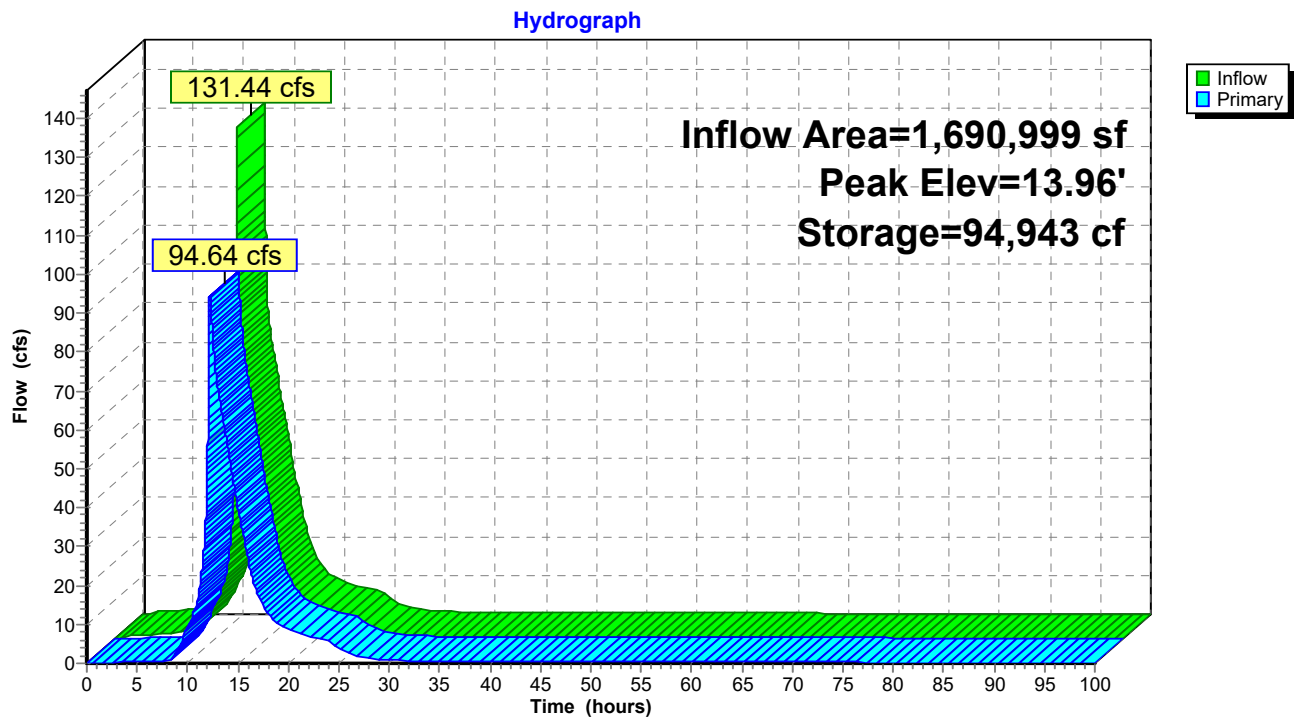
Plug-Flow detention time= 71.9 min calculated for 1,434,971 cf (100% of inflow)
 Center-of-Mass det. time= 67.7 min (1,035.3 - 967.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=94.63 cfs @ 12.22 hrs HW=13.96' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 94.63 cfs of 95.14 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.10 cfs @ 10.58 fps)
- 3=Orifice/Grate (Orifice Controls 48.41 cfs @ 7.75 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 45.12 cfs @ 4.72 fps)

Pond CW1D: CONSTRUCTED WETLANDS 1D

Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 11.03" for 100-Year Future Adj event
 Inflow = 9.21 cfs @ 12.10 hrs, Volume= 31,216 cf
 Outflow = 6.28 cfs @ 12.13 hrs, Volume= 28,326 cf, Atten= 32%, Lag= 1.9 min
 Primary = 6.28 cfs @ 12.13 hrs, Volume= 28,326 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.89' @ 12.13 hrs Surf.Area= 12,680 sf Storage= 11,864 cf

Plug-Flow detention time= 281.0 min calculated for 28,323 cf (91% of inflow)
 Center-of-Mass det. time= 230.1 min (965.4 - 735.3)

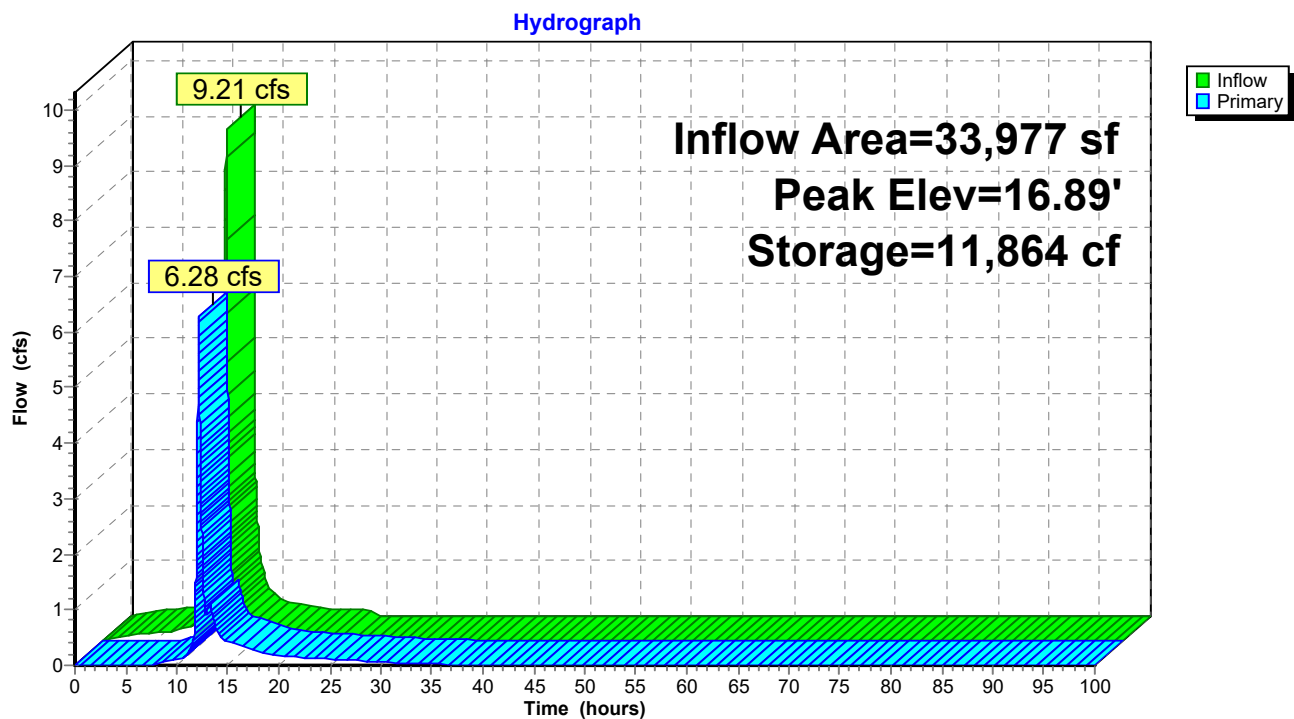
Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.27 cfs @ 12.13 hrs HW=16.89' TW=14.79' (Dynamic Tailwater)

- 1=Culvert (Passes 6.27 cfs of 8.40 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.21 cfs @ 6.23 fps)
- 3=Orifice/Grate (Orifice Controls 0.49 cfs @ 4.94 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 5.57 cfs @ 2.75 fps)

Pond PP1: POROUS PAVEMENT

Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 11.09" for 100-Year Future Adj event
 Inflow = 21.39 cfs @ 12.10 hrs, Volume= 72,434 cf
 Outflow = 14.20 cfs @ 12.13 hrs, Volume= 65,880 cf, Atten= 34%, Lag= 1.5 min
 Primary = 14.20 cfs @ 12.13 hrs, Volume= 65,880 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.35' @ 12.13 hrs Surf.Area= 23,328 sf Storage= 26,166 cf

Plug-Flow detention time= 352.7 min calculated for 65,880 cf (91% of inflow)
 Center-of-Mass det. time= 302.4 min (1,039.6 - 737.2)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

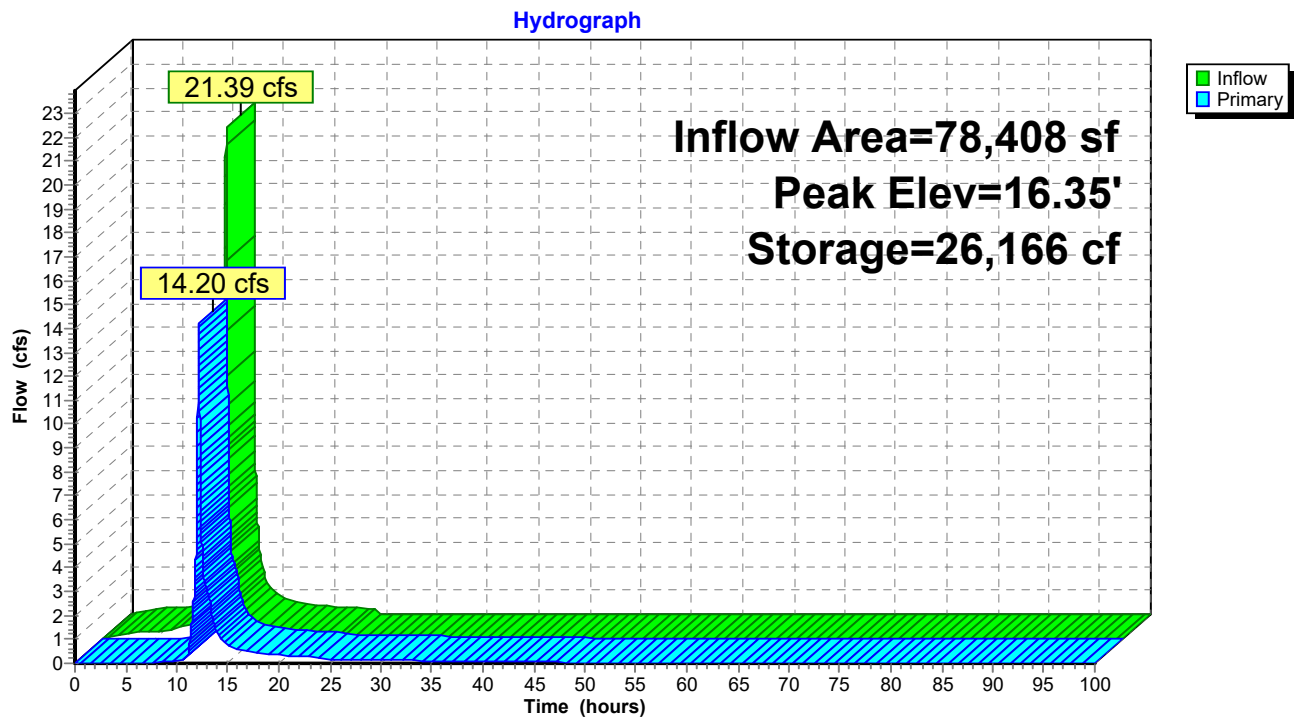
Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=14.17 cfs @ 12.13 hrs HW=16.35' TW=14.47' (Dynamic Tailwater)

1=Culvert (Passes 14.17 cfs of 46.75 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.23 cfs @ 6.61 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 13.94 cfs @ 3.40 fps)

Pond PP2: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 11.14" for 100-Year Future Adj event
 Inflow = 8.67 cfs @ 12.10 hrs, Volume= 29,531 cf
 Outflow = 6.27 cfs @ 12.12 hrs, Volume= 26,843 cf, Atten= 28%, Lag= 1.4 min
 Primary = 6.27 cfs @ 12.12 hrs, Volume= 26,843 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.36' @ 12.12 hrs Surf.Area= 10,368 sf Storage= 11,649 cf

Plug-Flow detention time= 290.1 min calculated for 26,843 cf (91% of inflow)
 Center-of-Mass det. time= 239.5 min (975.6 - 736.1)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

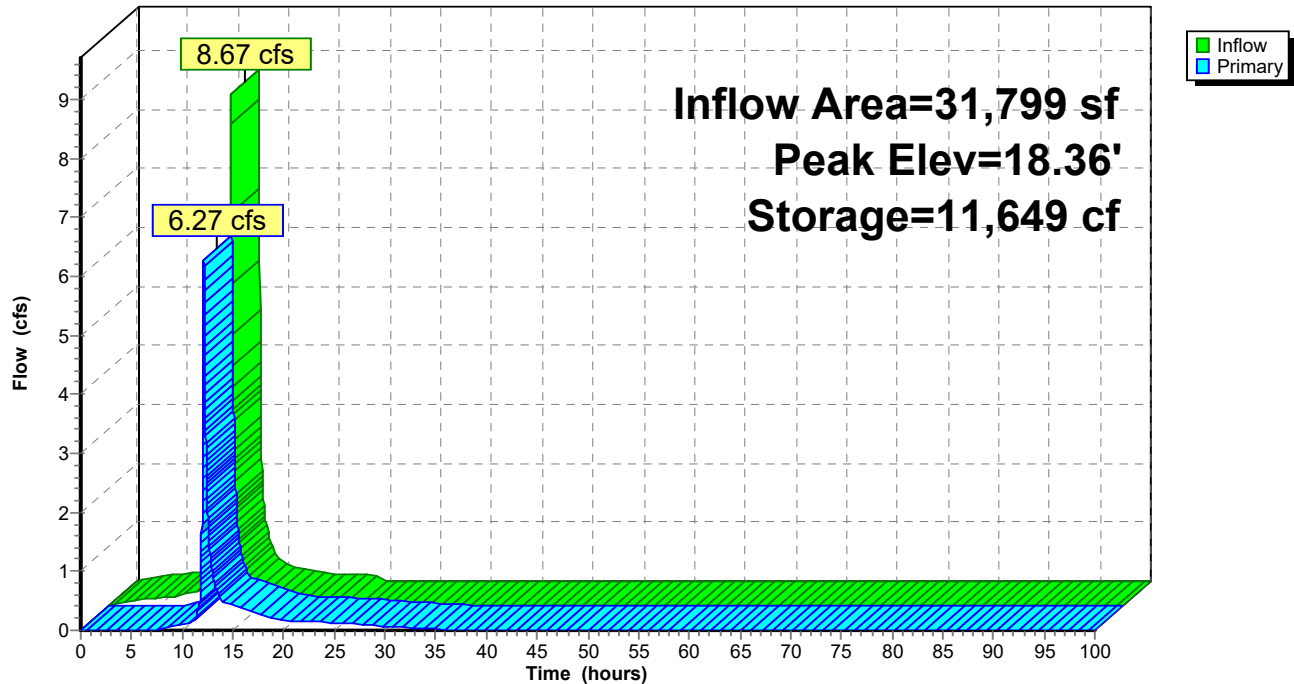
Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / S= 0.0031 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.25 cfs @ 12.12 hrs HW=18.36' TW=13.72' (Dynamic Tailwater)

- 1=Culvert (Passes 6.25 cfs of 50.88 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 6.92 fps)
- 3=Orifice/Grate (Orifice Controls 0.45 cfs @ 5.19 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 5.56 cfs @ 2.75 fps)

Pond PP3: POROUS PAVEMENT

Hydrograph



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 11.09" for 100-Year Future Adj event
 Inflow = 127.59 cfs @ 12.10 hrs, Volume= 442,678 cf
 Outflow = 51.36 cfs @ 12.12 hrs, Volume= 402,809 cf, Atten= 60%, Lag= 1.2 min
 Primary = 46.30 cfs @ 12.22 hrs, Volume= 333,346 cf
 Routed to Link PP4V : Valve
 Secondary = 12.66 cfs @ 12.07 hrs, Volume= 69,464 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.87' @ 12.22 hrs Surf.Area= 181,216 sf Storage= 134,596 cf

Plug-Flow detention time= 146.5 min calculated for 402,809 cf (91% of inflow)
 Center-of-Mass det. time= 96.2 min (833.0 - 736.8)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=46.29 cfs @ 12.22 hrs HW=14.87' TW=0.00' (Dynamic Tailwater)

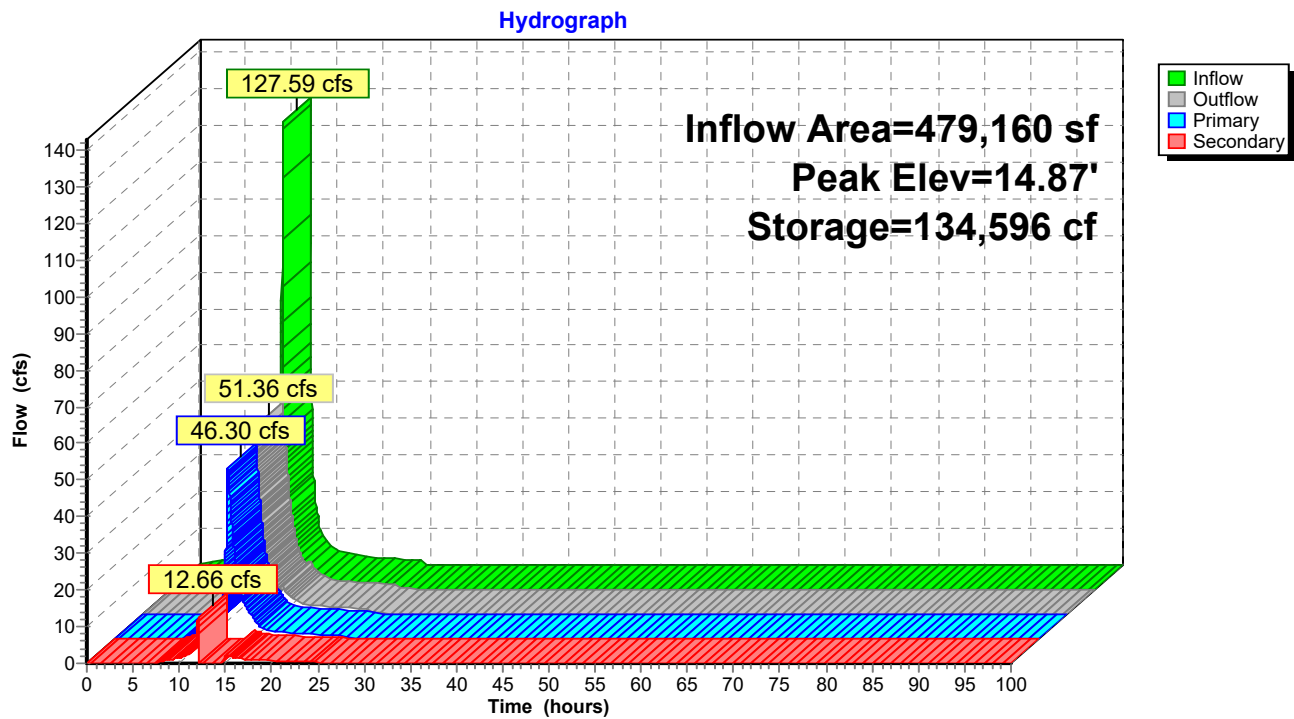
↑ **1=Culvert** (Passes 46.29 cfs of 140.11 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 46.29 cfs @ 3.74 fps)

Secondary OutFlow Max=11.60 cfs @ 12.07 hrs HW=14.59' TW=14.28' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 11.60 cfs of 18.83 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 11.60 cfs @ 2.36 fps)

Pond PP4: POROUS PAVEMENT

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 11.18" for 100-Year Future Adj event
 Inflow = 9.15 cfs @ 12.09 hrs, Volume= 30,839 cf
 Outflow = 5.41 cfs @ 12.11 hrs, Volume= 28,009 cf, Atten= 41%, Lag= 1.1 min
 Primary = 5.41 cfs @ 12.11 hrs, Volume= 28,009 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.11' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 8,350 cf

Plug-Flow detention time= 131.9 min calculated for 28,007 cf (91% of inflow)
 Center-of-Mass det. time= 81.1 min (814.9 - 733.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

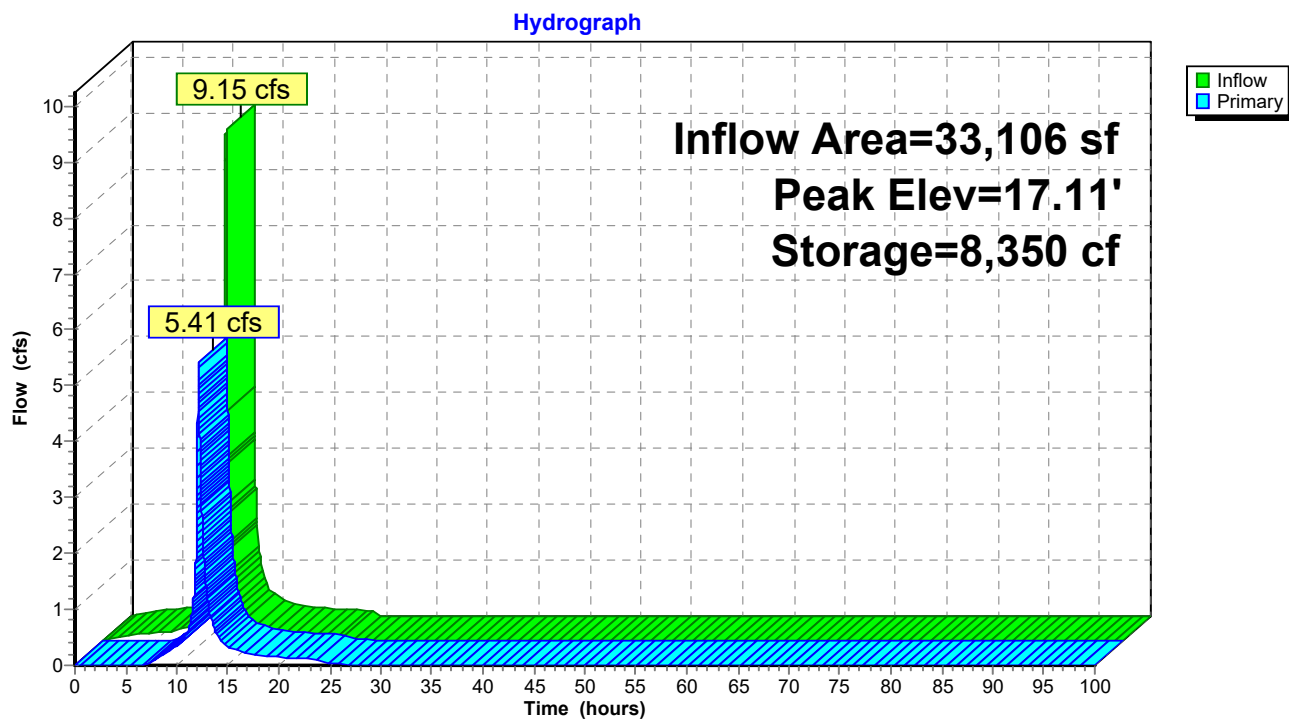
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.40 cfs @ 12.11 hrs HW=17.11' TW=13.62' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 5.40 cfs of 9.25 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.40 cfs @ 2.46 fps)

Pond PP5: POROUS PAVEMENT

Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 11.12" for 100-Year Future Adj event
 Inflow = 10.66 cfs @ 12.09 hrs, Volume= 35,937 cf
 Outflow = 5.61 cfs @ 12.11 hrs, Volume= 32,679 cf, Atten= 47%, Lag= 1.2 min
 Primary = 5.61 cfs @ 12.11 hrs, Volume= 32,679 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.84' @ 12.11 hrs Surf.Area= 31,334 sf Storage= 10,527 cf

Plug-Flow detention time= 140.0 min calculated for 32,679 cf (91% of inflow)
 Center-of-Mass det. time= 89.4 min (823.2 - 733.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

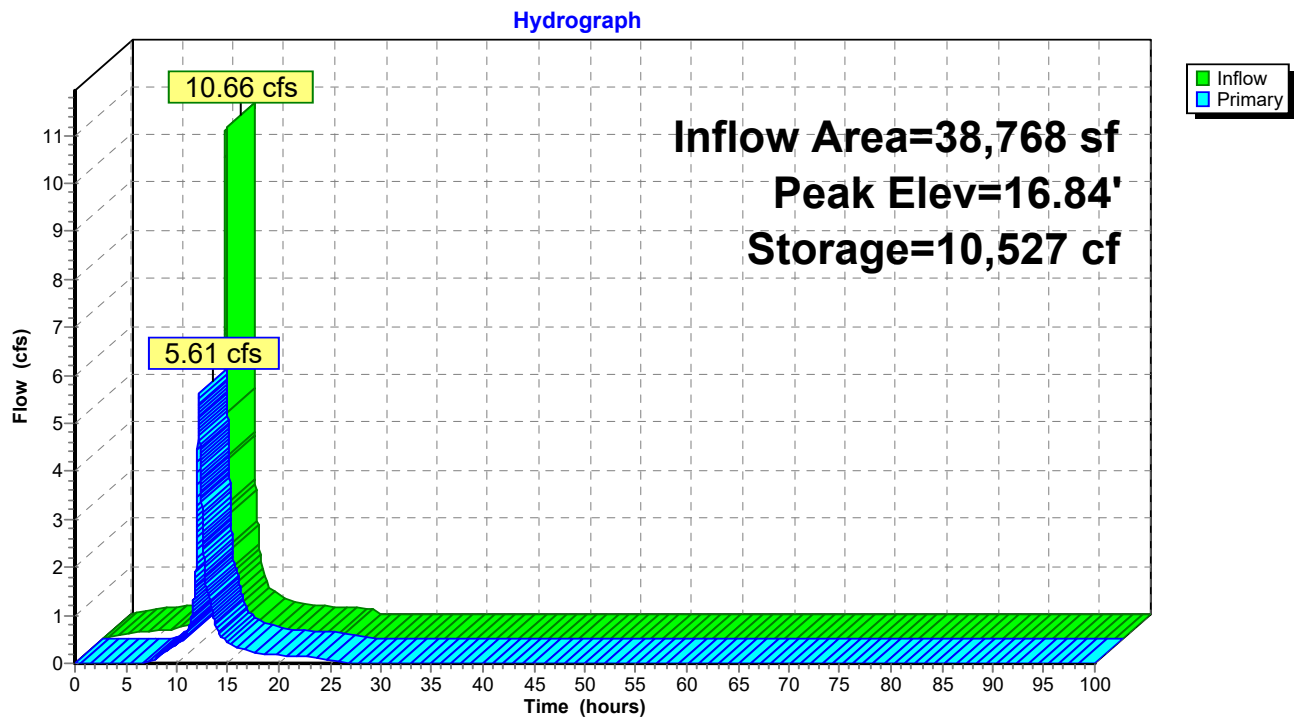
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.60 cfs @ 12.11 hrs HW=16.84' TW=14.64' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 5.60 cfs of 8.77 cfs potential flow)

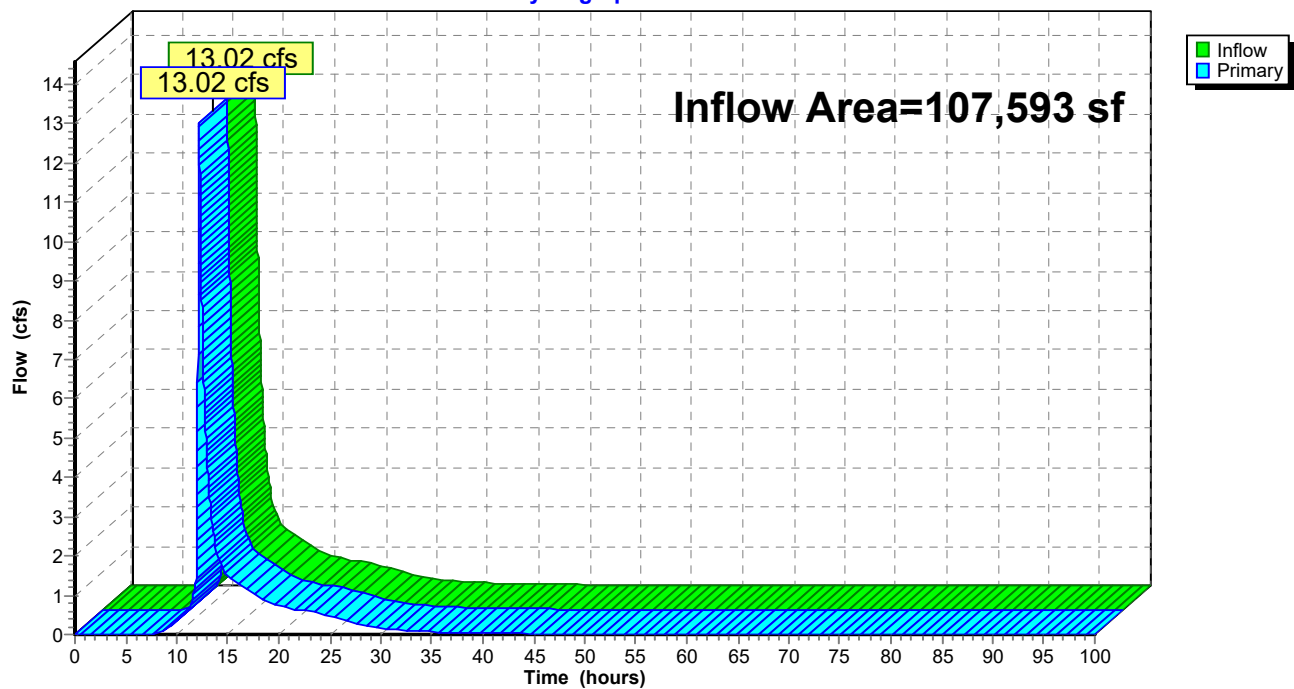
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.60 cfs @ 2.49 fps)

Pond PP6: POROUS PAVEMENT

Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 10.12" for 100-Year Future Adj event
Inflow = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf
Primary = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

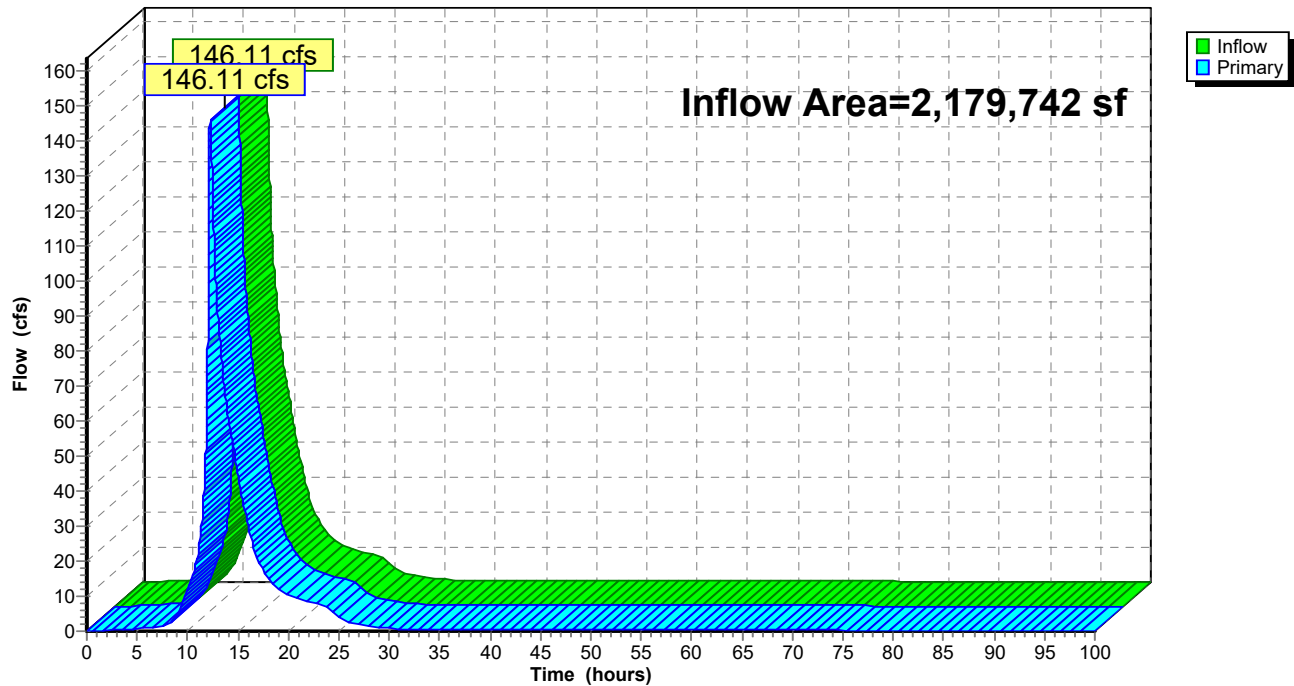
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve**Hydrograph**

Summary for Link P1: PDA 1

Inflow Area = 2,179,742 sf, 69.82% Impervious, Inflow Depth > 9.75" for 100-Year Future Adj event
Inflow = 146.11 cfs @ 12.24 hrs, Volume= 1,771,487 cf
Primary = 146.11 cfs @ 12.24 hrs, Volume= 1,771,487 cf, Atten= 0%, Lag= 0.0 min

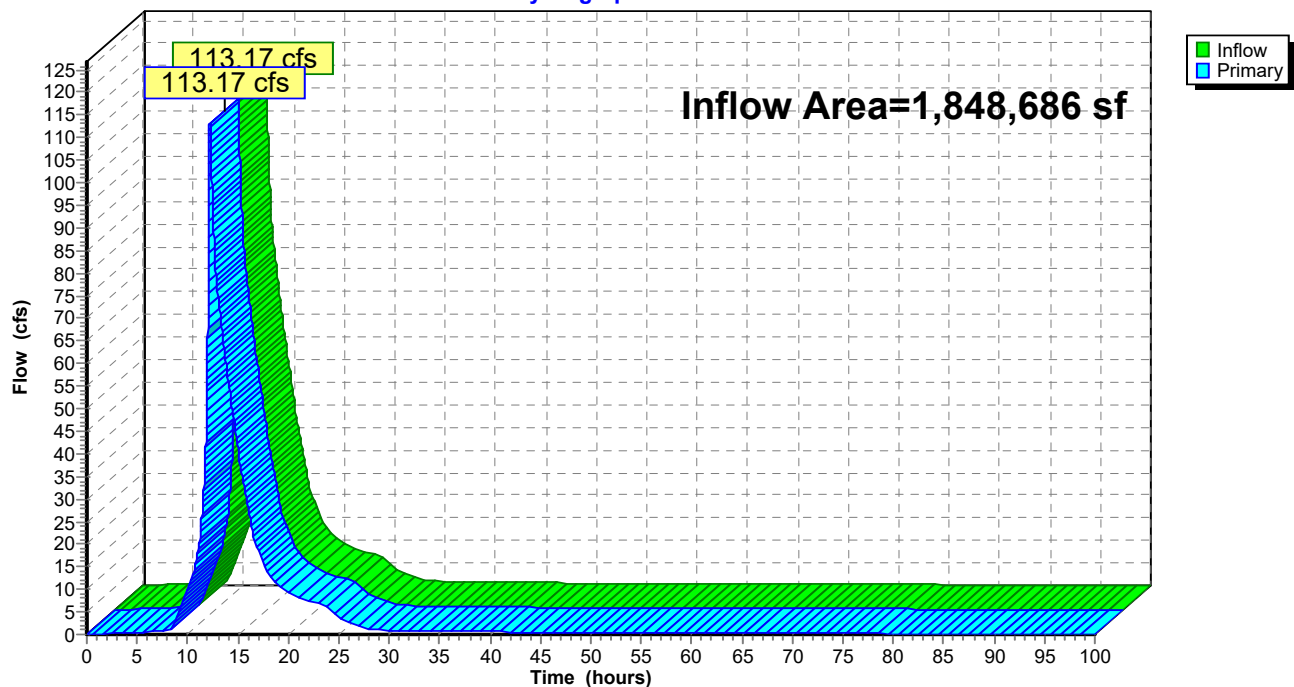
Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1: PDA 1**Hydrograph**

Summary for Link P1A:

Inflow Area = 1,848,686 sf, 82.02% Impervious, Inflow Depth > 9.94" for 100-Year Future Adj event
Inflow = 113.17 cfs @ 12.20 hrs, Volume= 1,530,964 cf
Primary = 113.17 cfs @ 12.20 hrs, Volume= 1,530,964 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:**Hydrograph**

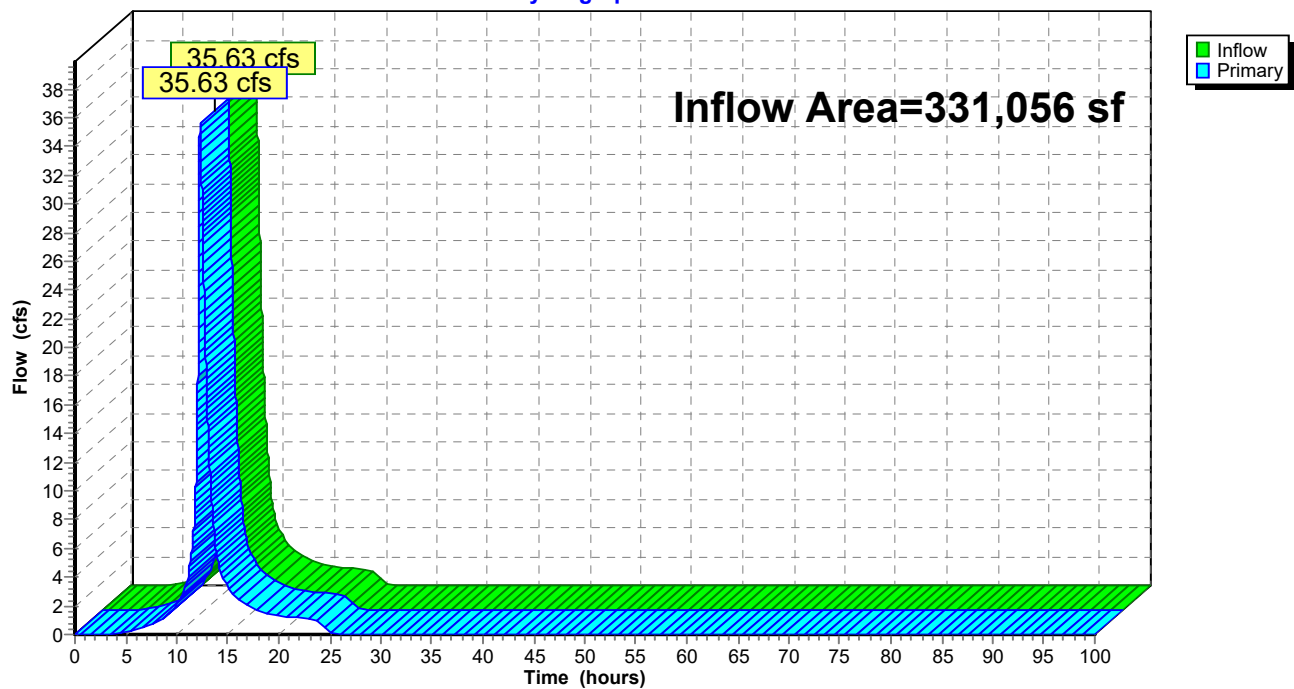
Summary for Link P1B: BYPASS

Inflow Area = 331,056 sf, 1.71% Impervious, Inflow Depth = 8.72" for 100-Year Future Adj event
Inflow = 35.63 cfs @ 12.30 hrs, Volume= 240,523 cf
Primary = 35.63 cfs @ 12.30 hrs, Volume= 240,523 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1B: BYPASS

Hydrograph



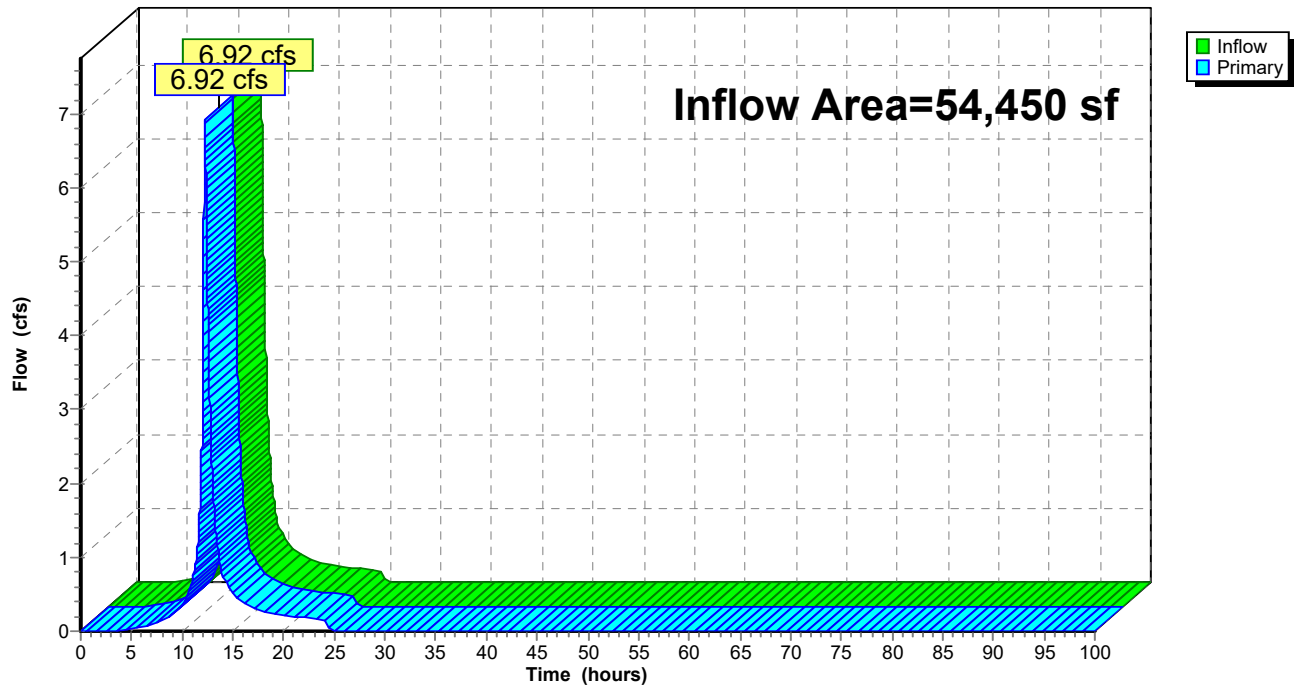
Summary for Link P2: PDA 2

Inflow Area = 54,450 sf, 0.00% Impervious, Inflow Depth = 8.69" for 100-Year Future Adj event
Inflow = 6.92 cfs @ 12.23 hrs, Volume= 39,442 cf
Primary = 6.92 cfs @ 12.23 hrs, Volume= 39,442 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2: PDA 2

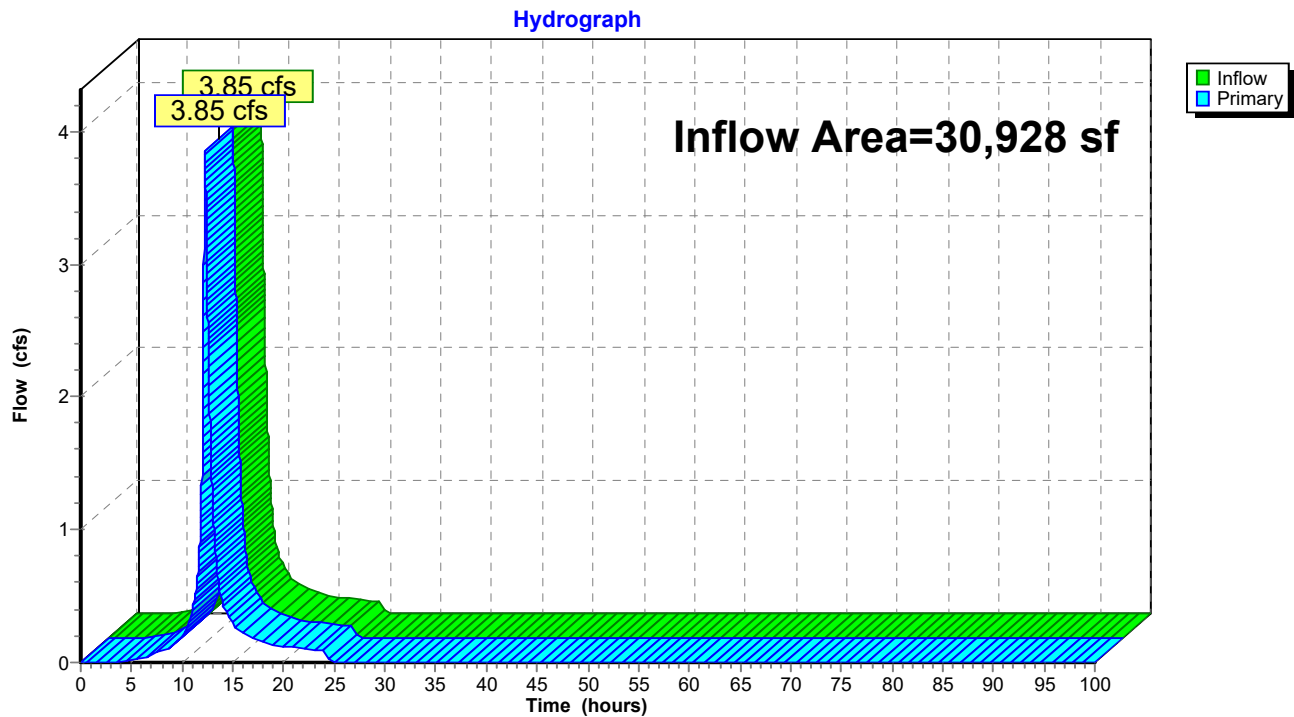
Hydrograph



Summary for Link P2A: PDA 2A ONSITE

Inflow Area = 30,928 sf, 0.00% Impervious, Inflow Depth = 8.81" for 100-Year Future Adj event
Inflow = 3.85 cfs @ 12.24 hrs, Volume= 22,705 cf
Primary = 3.85 cfs @ 12.24 hrs, Volume= 22,705 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2A: PDA 2A ONSITE

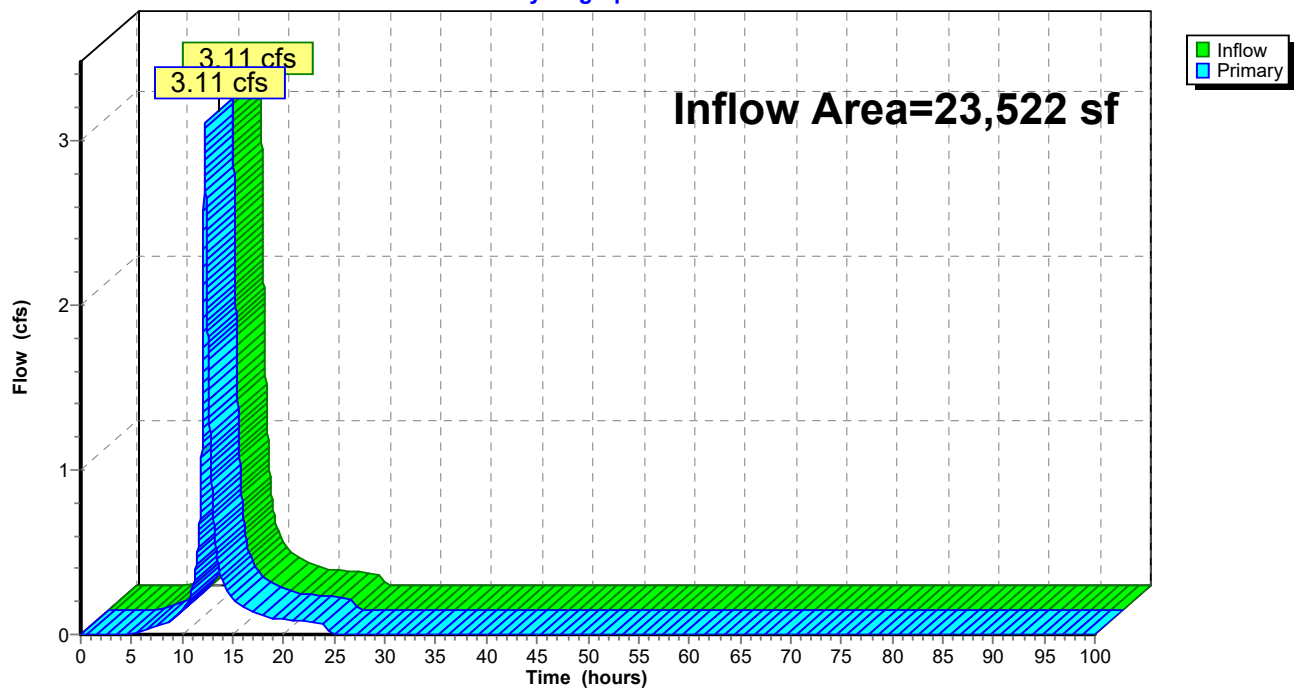
Summary for Link P2B: BYPASS

Inflow Area = 23,522 sf, 0.00% Impervious, Inflow Depth = 8.54" for 100-Year Future Adj event
Inflow = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf
Primary = 3.11 cfs @ 12.21 hrs, Volume= 16,738 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P2 : PDA 2

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P2B: BYPASS

Hydrograph



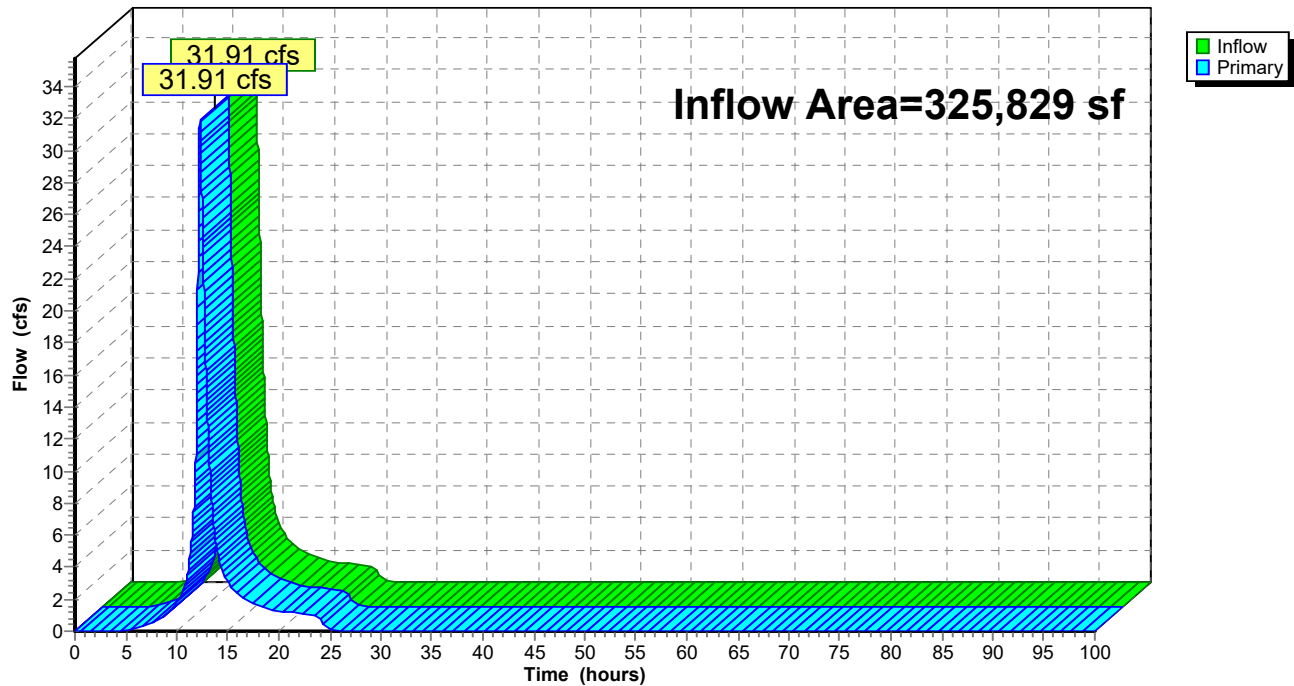
Summary for Link P3: PDA 3

Inflow Area = 325,829 sf, 0.00% Impervious, Inflow Depth = 8.21" for 100-Year Future Adj event
Inflow = 31.91 cfs @ 12.26 hrs, Volume= 223,035 cf
Primary = 31.91 cfs @ 12.26 hrs, Volume= 223,035 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3: PDA 3

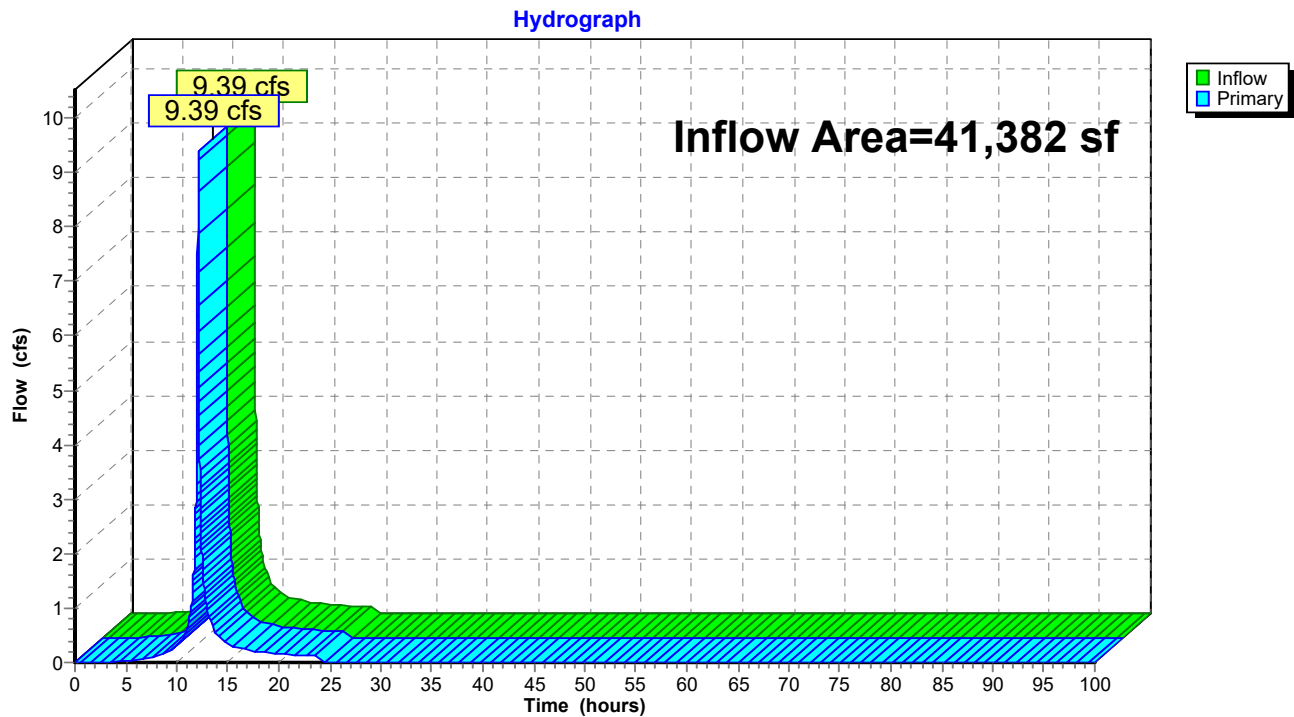
Hydrograph



Summary for Link P3A: PDA 3A ONSITE

Inflow Area = 41,382 sf, 0.00% Impervious, Inflow Depth = 8.81" for 100-Year Future Adj event
Inflow = 9.39 cfs @ 12.11 hrs, Volume= 30,379 cf
Primary = 9.39 cfs @ 12.11 hrs, Volume= 30,379 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3A: PDA 3A ONSITE

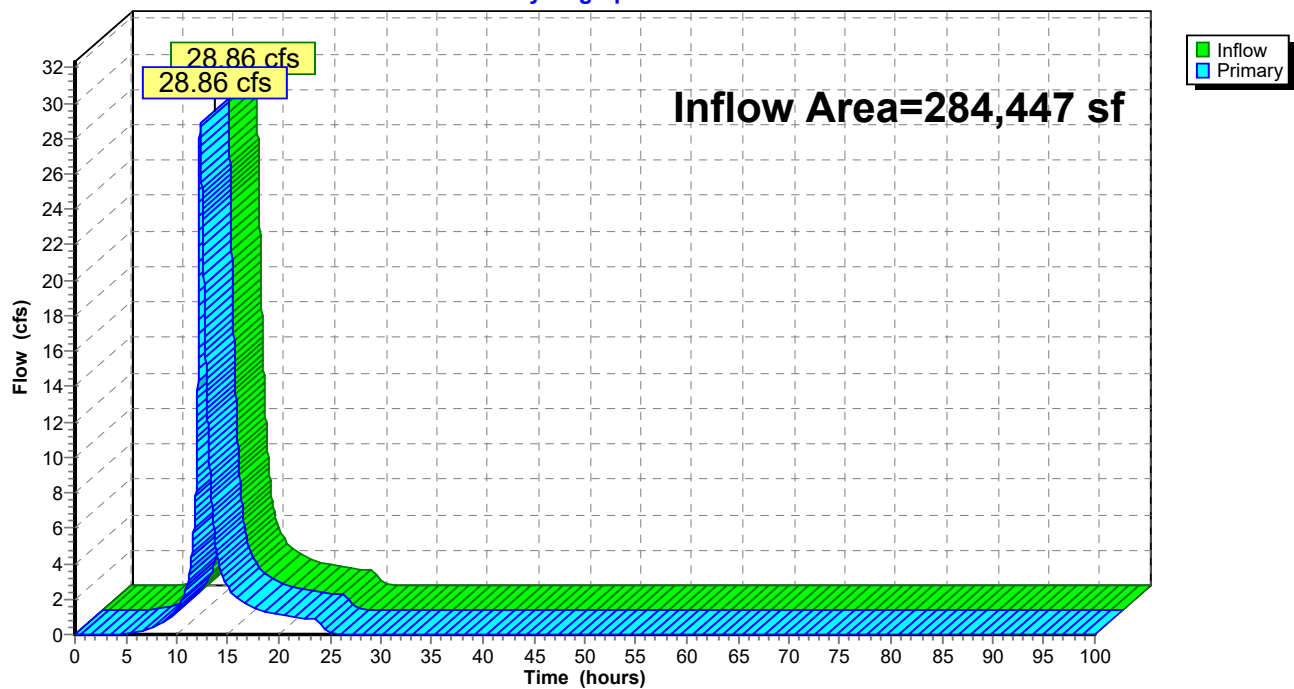
Summary for Link P3B: BYPASS

Inflow Area = 284,447 sf, 0.00% Impervious, Inflow Depth = 8.13" for 100-Year Future Adj event
Inflow = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf
Primary = 28.86 cfs @ 12.30 hrs, Volume= 192,656 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P3 : PDA 3

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P3B: BYPASS

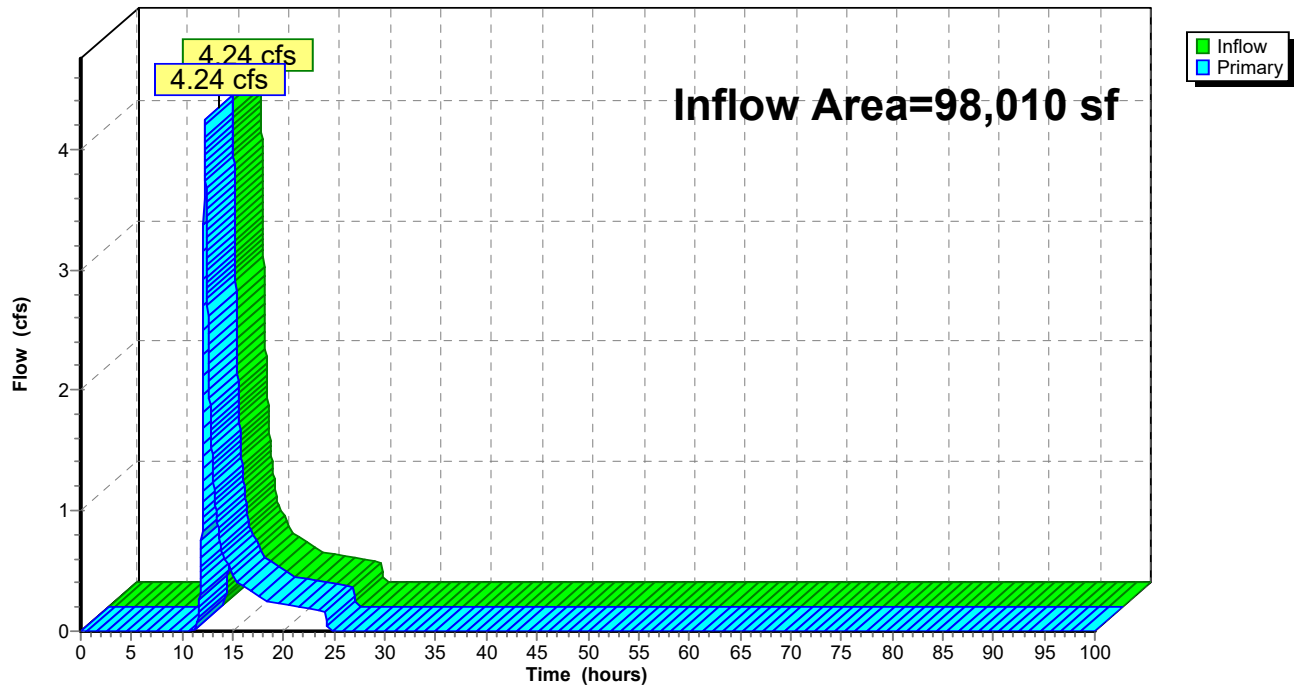
Hydrograph



Summary for Link P4: PDA 4

Inflow Area = 98,010 sf, 0.00% Impervious, Inflow Depth = 2.91" for 100-Year Future Adj event
Inflow = 4.24 cfs @ 12.21 hrs, Volume= 23,745 cf
Primary = 4.24 cfs @ 12.21 hrs, Volume= 23,745 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P4: PDA 4**Hydrograph**

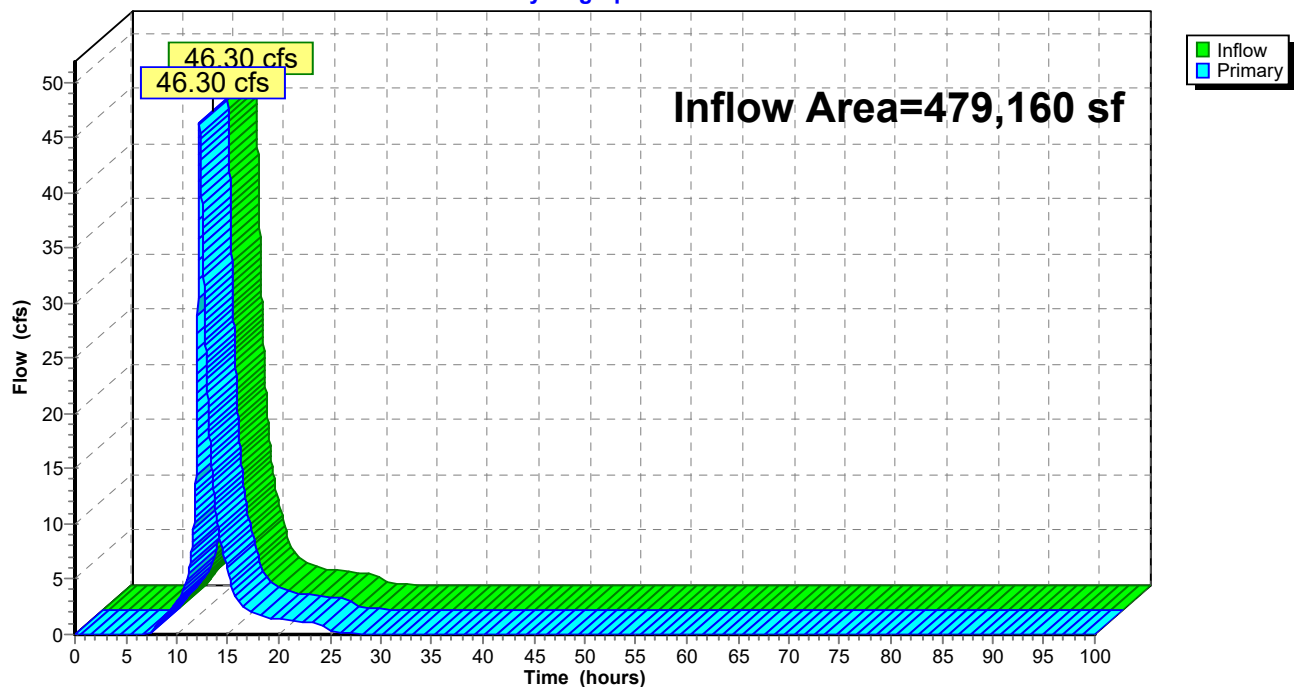
Summary for Link PP4V: Valve

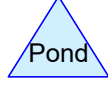
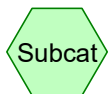
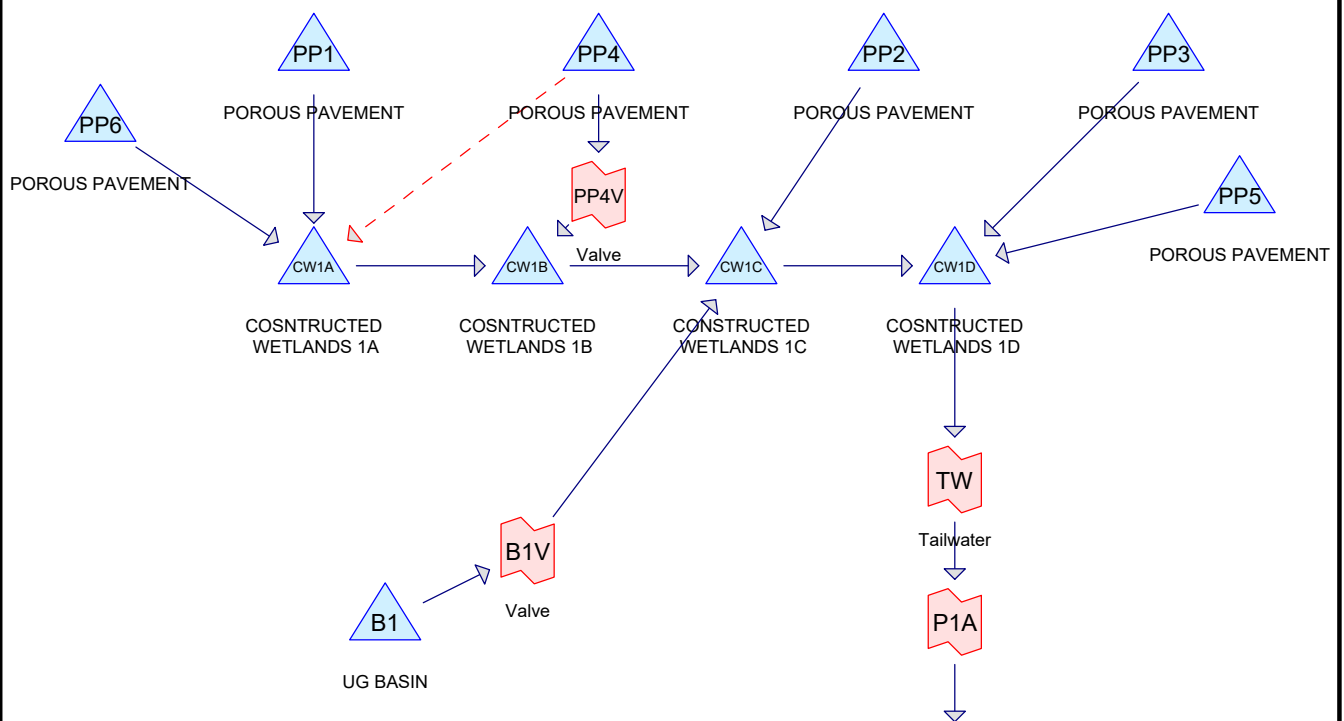
Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 8.35" for 100-Year Future Adj event
Inflow = 46.30 cfs @ 12.22 hrs, Volume= 333,346 cf
Primary = 46.30 cfs @ 12.22 hrs, Volume= 333,346 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph





Routing Diagram for Pre vs Post- 100 yr tailwater Rev. 3a
 Prepared by Bohler Engineering, PC, Printed 8/18/2026
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Pre vs Post- 100 yr tailwater Rev. 3a

Prepared by Bohler Engineering, PC

Printed 8/18/2026

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	100-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	11.48	2	3.99

Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 11.18" for 100-Year Future Adj event
 Inflow = 29.48 cfs @ 12.10 hrs, Volume= 100,267 cf
 Outflow = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf, Atten= 56%, Lag= 4.1 min
 Primary = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 12.32' @ 12.16 hrs Surf.Area= 0.559 ac Storage= 1.070 af

Plug-Flow detention time= 342.2 min calculated for 90,742 cf (91% of inflow)
 Center-of-Mass det. time= 289.9 min (1,025.5 - 735.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=13.01 cfs @ 12.16 hrs HW=12.32' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 13.01 cfs of 17.05 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.29 cfs @ 6.59 fps)
- 3=Orifice/Grate (Orifice Controls 1.04 cfs @ 5.30 fps)
- 4=Sharp-Crested Rectangular Weir(Weir Controls 10.68 cfs @ 3.10 fps)

Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 =
416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

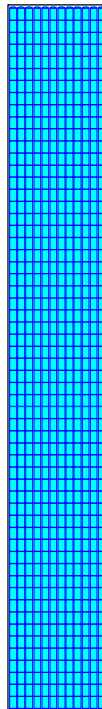
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

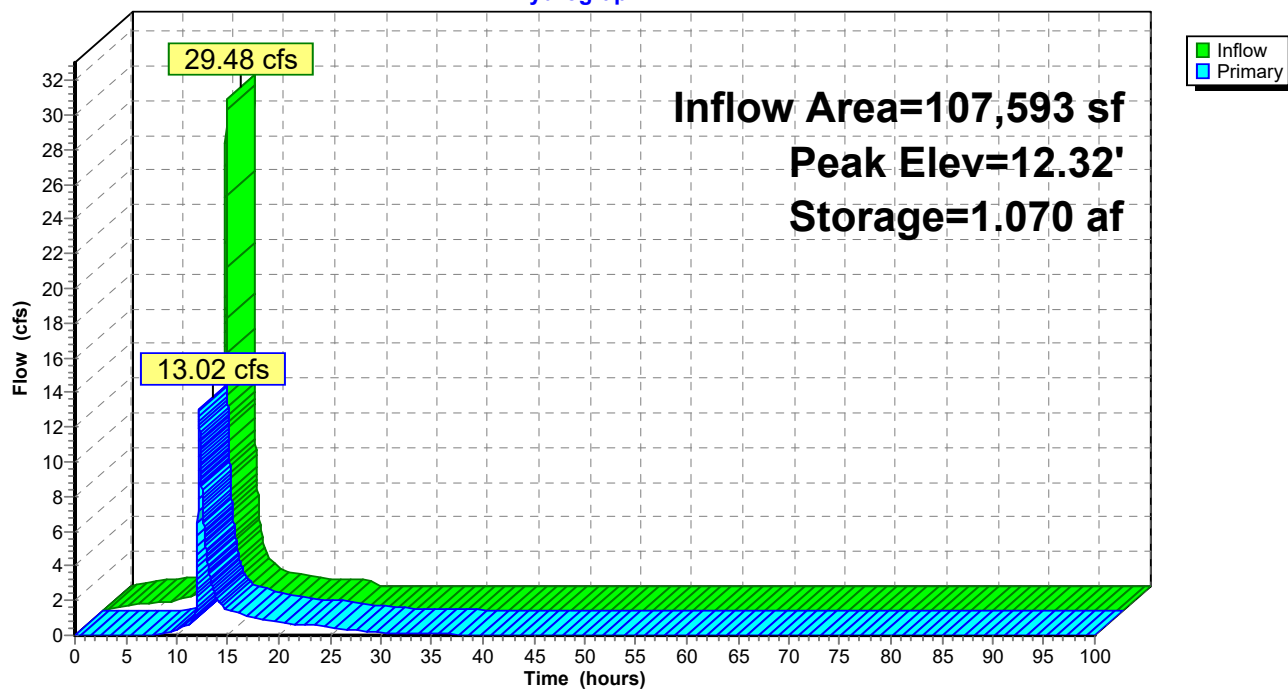
3,159.0 cy Field

1,972.4 cy Stone



Pond B1: UG BASIN

Hydrograph



Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 11.80" for 100-Year Future Adj event
 Inflow = 71.31 cfs @ 12.11 hrs, Volume= 334,876 cf
 Outflow = 16.74 cfs @ 14.11 hrs, Volume= 265,528 cf, Atten= 77%, Lag= 119.7 min
 Primary = 16.74 cfs @ 14.11 hrs, Volume= 265,528 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.58' @ 12.75 hrs Surf.Area= 33,578 sf Storage= 178,959 cf

Plug-Flow detention time= 257.1 min calculated for 265,501 cf (79% of inflow)
 Center-of-Mass det. time= 147.3 min (945.4 - 798.1)

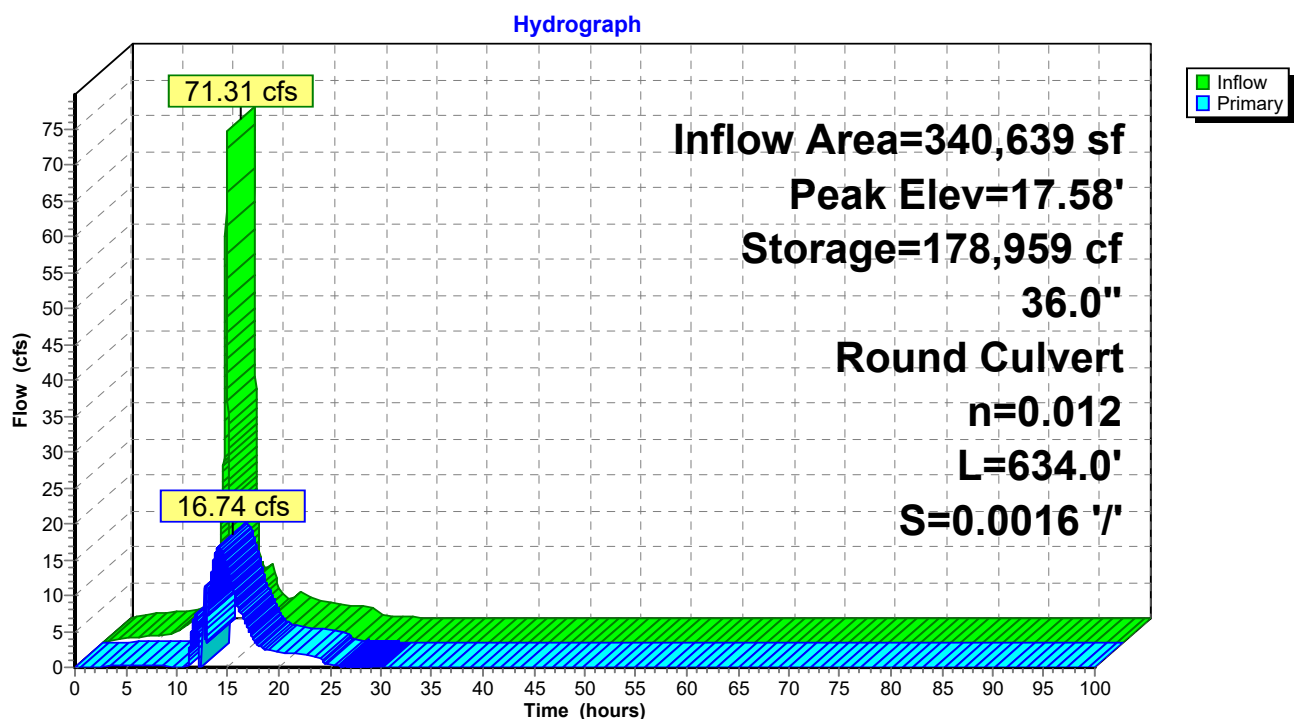
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=16.95 cfs @ 14.11 hrs HW=16.22' TW=15.74' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 16.95 cfs @ 2.40 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,046,311 sf, 90.22% Impervious, Inflow Depth = 9.41" for 100-Year Future Adj event
 Inflow = 102.32 cfs @ 12.11 hrs, Volume= 820,746 cf
 Outflow = 60.64 cfs @ 12.44 hrs, Volume= 750,195 cf, Atten= 41%, Lag= 19.6 min
 Primary = 60.64 cfs @ 12.44 hrs, Volume= 750,195 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.63' @ 12.52 hrs Surf.Area= 28,684 sf Storage= 167,035 cf

Plug-Flow detention time= 102.0 min calculated for 750,195 cf (91% of inflow)
 Center-of-Mass det. time= 53.1 min (896.8 - 843.7)

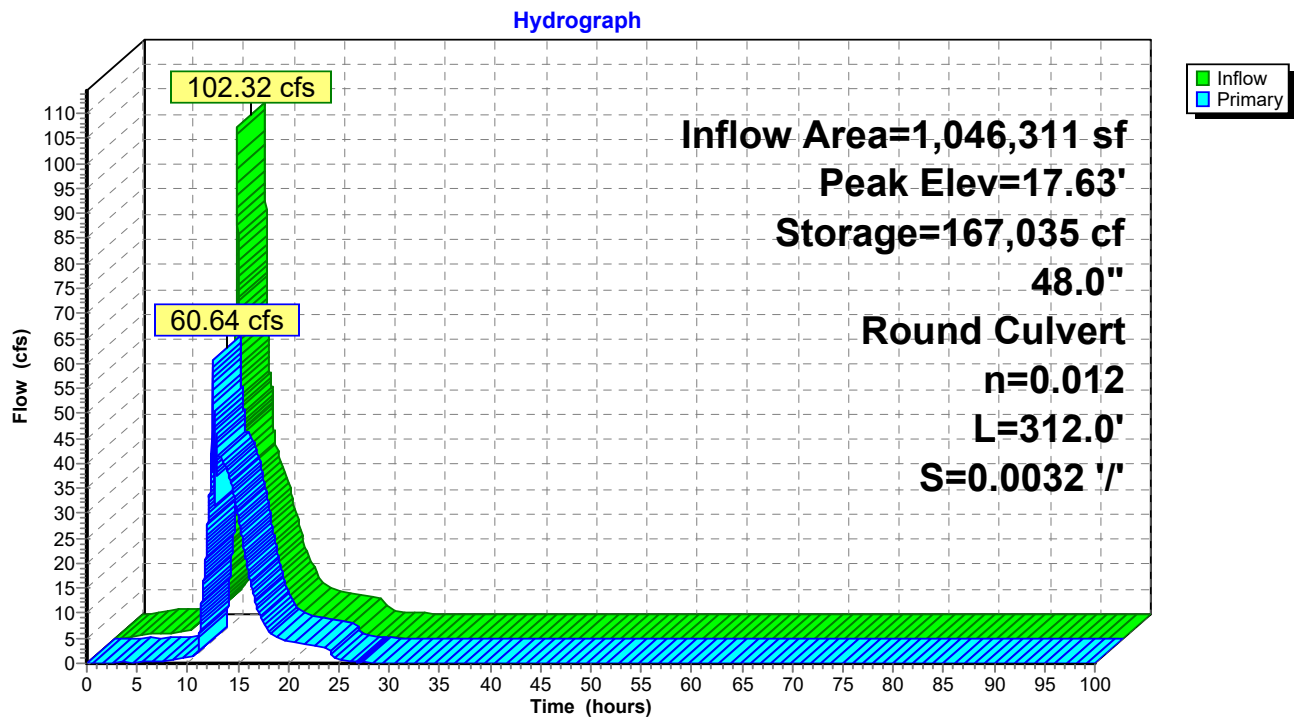
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=58.68 cfs @ 12.44 hrs HW=17.49' TW=16.54' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 58.68 cfs @ 4.67 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,262,804 sf, 88.86% Impervious, Inflow Depth = 8.69" for 100-Year Future Adj event
 Inflow = 74.04 cfs @ 12.48 hrs, Volume= 914,204 cf
 Outflow = 54.75 cfs @ 12.64 hrs, Volume= 893,493 cf, Atten= 26%, Lag= 9.4 min
 Primary = 54.75 cfs @ 12.64 hrs, Volume= 893,493 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.85' @ 12.60 hrs Surf.Area= 14,678 sf Storage= 63,266 cf

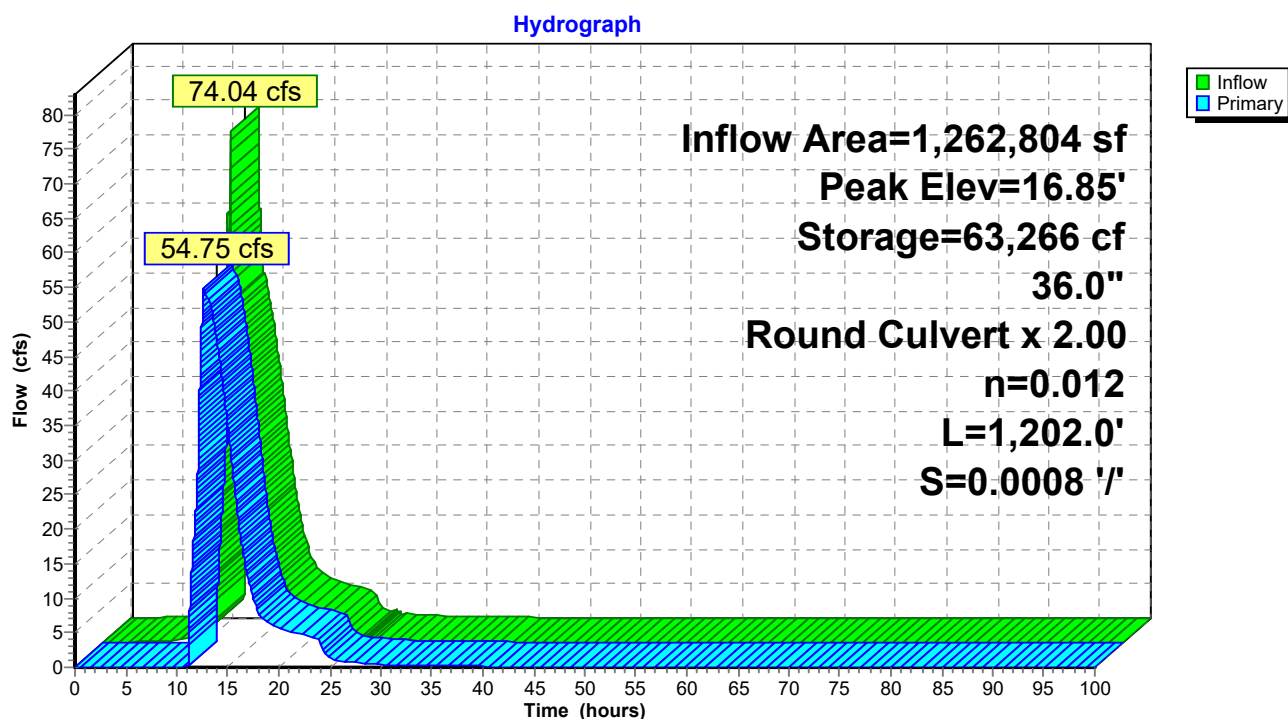
Plug-Flow detention time= 44.6 min calculated for 893,493 cf (98% of inflow)
 Center-of-Mass det. time= 15.4 min (935.9 - 920.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=54.84 cfs @ 12.64 hrs HW=16.84' TW=14.75' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 54.84 cfs @ 3.88 fps)

Pond CW1C: CONSTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth = 9.07" for 100-Year Future Adj event
 Inflow = 128.94 cfs @ 12.11 hrs, Volume= 1,271,643 cf
 Outflow = 83.68 cfs @ 12.26 hrs, Volume= 1,196,866 cf, Atten= 35%, Lag= 8.6 min
 Primary = 83.68 cfs @ 12.26 hrs, Volume= 1,196,866 cf
 Routed to Link TW : Tailwater

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.04' @ 12.26 hrs Surf.Area= 28,103 sf Storage= 124,037 cf

Plug-Flow detention time= 78.7 min calculated for 1,196,747 cf (94% of inflow)
 Center-of-Mass det. time= 31.7 min (916.6 - 884.9)

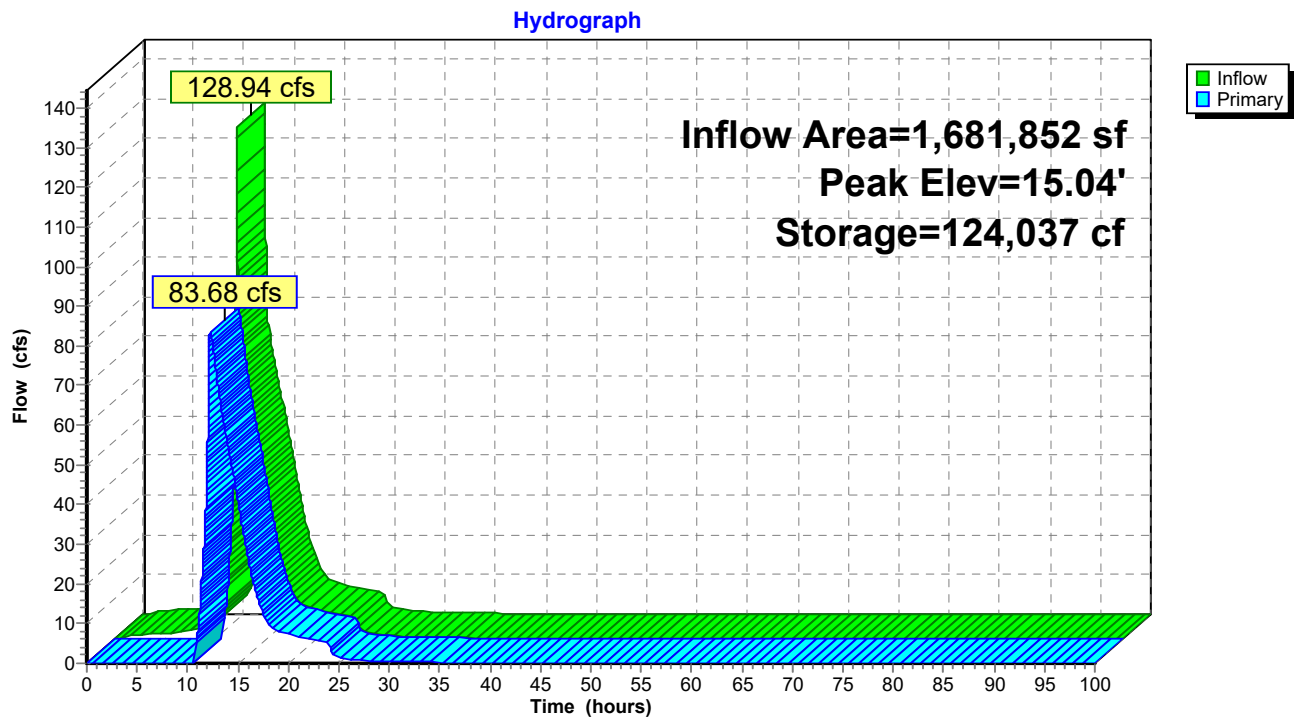
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=83.68 cfs @ 12.26 hrs HW=15.04' TW=13.13' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 83.68 cfs @ 6.66 fps)
- 2=Orifice/Grate (Passes < 0.69 cfs potential flow)
- 3=Orifice/Grate (Passes < 41.62 cfs potential flow)
- 4=Sharp-Crested Rectangular Weir (Passes < 72.20 cfs potential flow)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 11.03" for 100-Year Future Adj event
 Inflow = 9.21 cfs @ 12.10 hrs, Volume= 31,216 cf
 Outflow = 6.27 cfs @ 12.13 hrs, Volume= 28,326 cf, Atten= 32%, Lag= 1.9 min
 Primary = 6.27 cfs @ 12.13 hrs, Volume= 28,326 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.06' @ 13.03 hrs Surf.Area= 12,680 sf Storage= 12,731 cf

Plug-Flow detention time= 291.1 min calculated for 28,326 cf (91% of inflow)
 Center-of-Mass det. time= 239.7 min (975.0 - 735.3)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

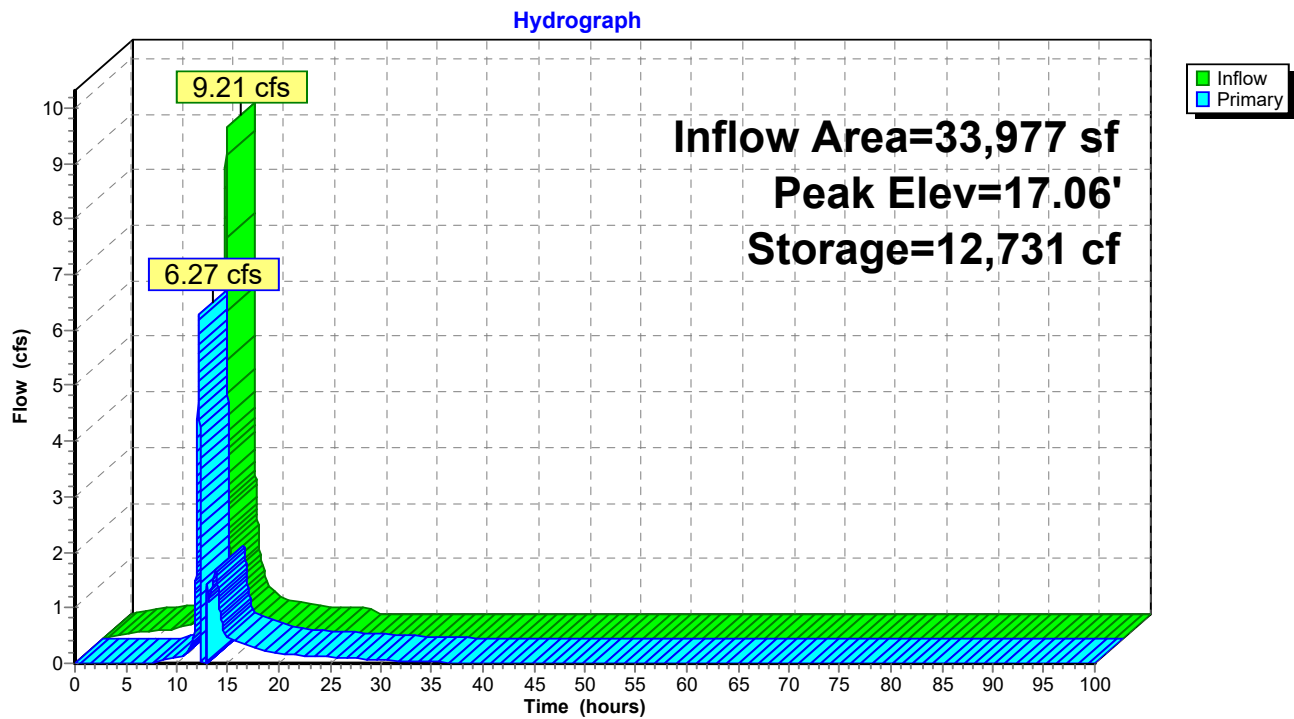
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.25 cfs @ 12.13 hrs HW=16.89' TW=15.48' (Dynamic Tailwater)

- 1=Culvert (Passes 6.25 cfs of 6.88 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.19 cfs @ 5.70 fps)
- 3=Orifice/Grate (Orifice Controls 0.49 cfs @ 4.94 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 5.57 cfs @ 2.75 fps)

Pond PP1: POROUS PAVEMENT



Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 11.09" for 100-Year Future Adj event
 Inflow = 21.39 cfs @ 12.10 hrs, Volume= 72,434 cf
 Outflow = 14.16 cfs @ 12.12 hrs, Volume= 65,880 cf, Atten= 34%, Lag= 1.5 min
 Primary = 14.16 cfs @ 12.12 hrs, Volume= 65,880 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.88' @ 12.60 hrs Surf.Area= 23,328 sf Storage= 27,994 cf

Plug-Flow detention time= 361.4 min calculated for 65,880 cf (91% of inflow)
 Center-of-Mass det. time= 311.0 min (1,048.2 - 737.2)

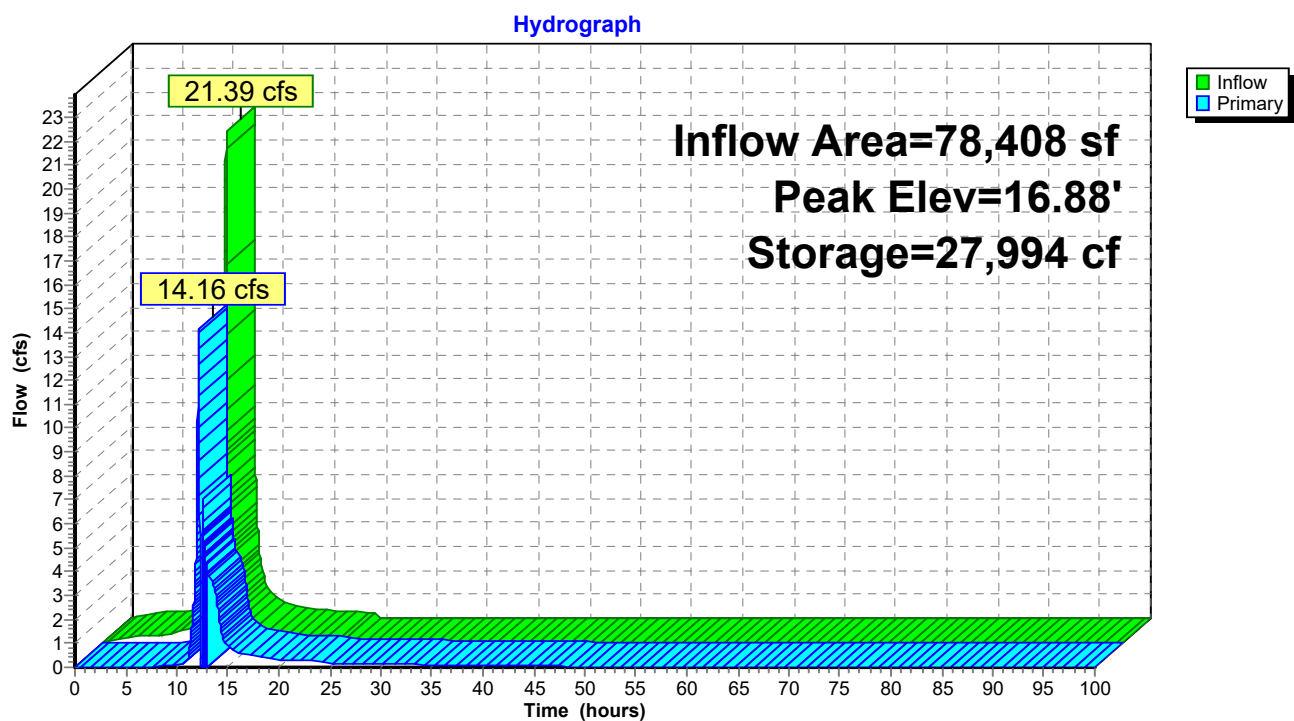
Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=14.05 cfs @ 12.12 hrs HW=16.35' TW=15.33' (Dynamic Tailwater)
 1=Culvert (Passes 14.05 cfs of 34.37 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.17 cfs @ 4.86 fps)
 3=Sharp-Crested Rectangular Weir (Weir Controls 13.88 cfs @ 3.39 fps)

Pond PP2: POROUS PAVEMENT



Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 11.14" for 100-Year Future Adj event
 Inflow = 8.67 cfs @ 12.10 hrs, Volume= 29,531 cf
 Outflow = 6.27 cfs @ 12.12 hrs, Volume= 26,843 cf, Atten= 28%, Lag= 1.4 min
 Primary = 6.27 cfs @ 12.12 hrs, Volume= 26,843 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.36' @ 12.12 hrs Surf.Area= 10,368 sf Storage= 11,649 cf

Plug-Flow detention time= 290.1 min calculated for 26,843 cf (91% of inflow)
 Center-of-Mass det. time= 239.5 min (975.6 - 736.1)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

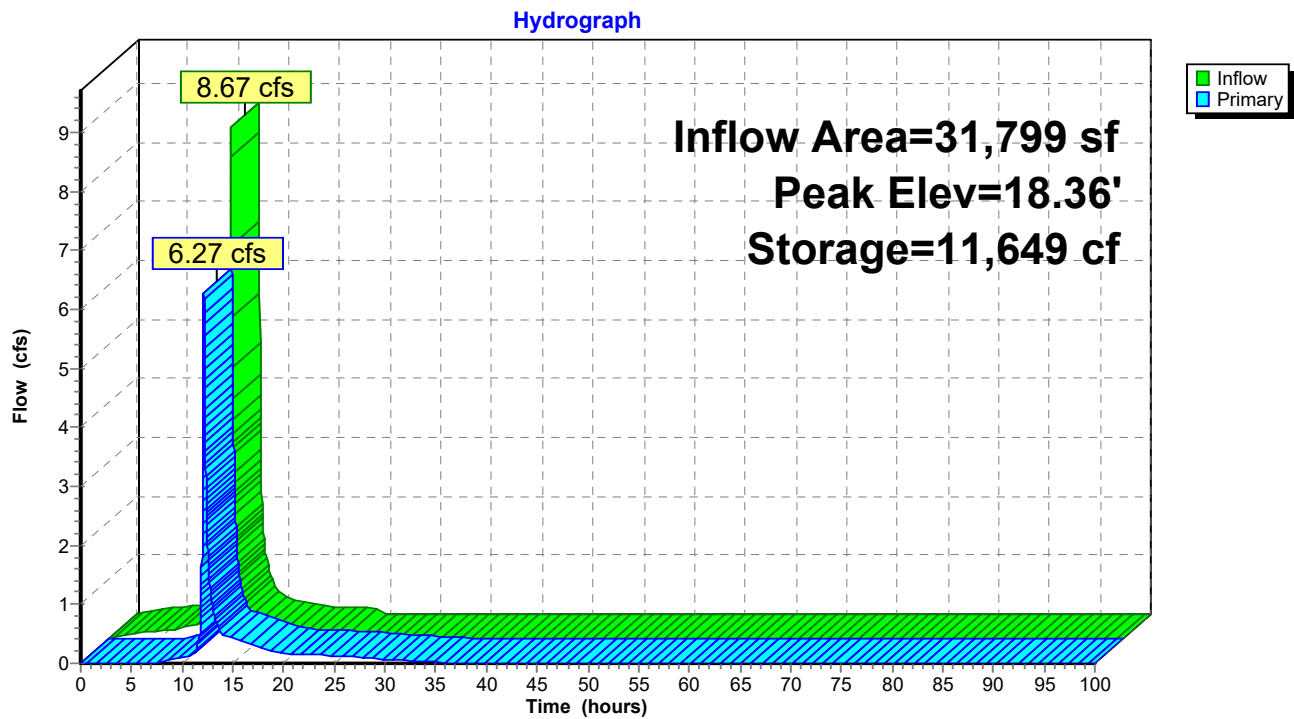
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.25 cfs @ 12.12 hrs HW=18.36' TW=14.72' (Dynamic Tailwater)

- 1=Culvert (Passes 6.25 cfs of 45.07 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 6.92 fps)
- 3=Orifice/Grate (Orifice Controls 0.45 cfs @ 5.19 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 5.56 cfs @ 2.75 fps)

Pond PP3: POROUS PAVEMENT



Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 11.09" for 100-Year Future Adj event
 Inflow = 127.59 cfs @ 12.10 hrs, Volume= 442,678 cf
 Outflow = 51.13 cfs @ 12.20 hrs, Volume= 402,809 cf, Atten= 60%, Lag= 6.1 min
 Primary = 51.13 cfs @ 12.20 hrs, Volume= 351,408 cf
 Routed to Link PP4V : Valve
 Secondary = 4.40 cfs @ 11.66 hrs, Volume= 51,402 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.96' @ 12.20 hrs Surf.Area= 181,216 sf Storage= 141,337 cf

Plug-Flow detention time= 148.1 min calculated for 402,809 cf (91% of inflow)
 Center-of-Mass det. time= 97.8 min (834.6 - 736.8)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

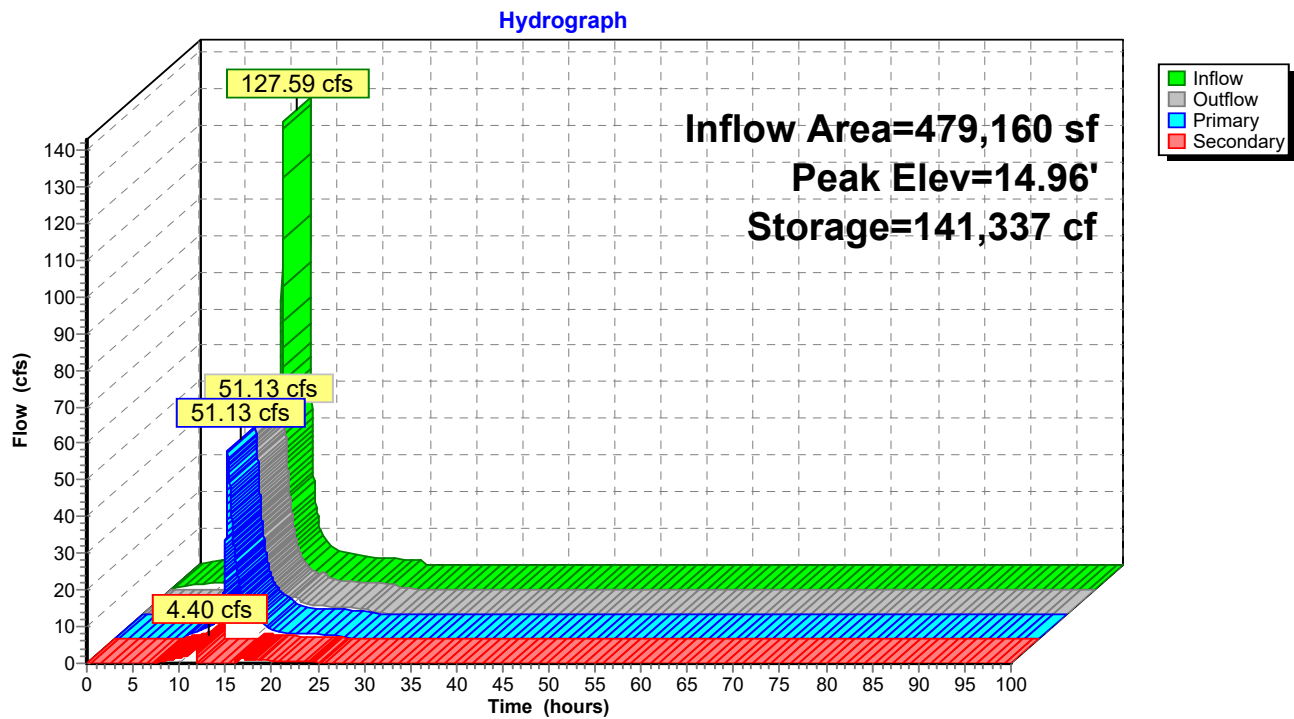
Primary OutFlow Max=51.12 cfs @ 12.20 hrs HW=14.96' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 51.12 cfs of 141.64 cfs potential flow)
 ↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 51.12 cfs @ 3.87 fps)

Secondary OutFlow Max=4.32 cfs @ 11.66 hrs HW=14.02' TW=13.76' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 4.32 cfs of 17.20 cfs potential flow)
 ↑ **4=Sharp-Crested Rectangular Weir**(Weir Controls 4.32 cfs @ 1.93 fps)

Pond PP4: POROUS PAVEMENT



Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 11.18" for 100-Year Future Adj event
 Inflow = 9.15 cfs @ 12.09 hrs, Volume= 30,839 cf
 Outflow = 5.41 cfs @ 12.11 hrs, Volume= 28,009 cf, Atten= 41%, Lag= 1.1 min
 Primary = 5.41 cfs @ 12.11 hrs, Volume= 28,009 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.11' @ 12.11 hrs Surf.Area= 24,388 sf Storage= 8,350 cf

Plug-Flow detention time= 131.9 min calculated for 28,007 cf (91% of inflow)
 Center-of-Mass det. time= 81.1 min (814.9 - 733.8)

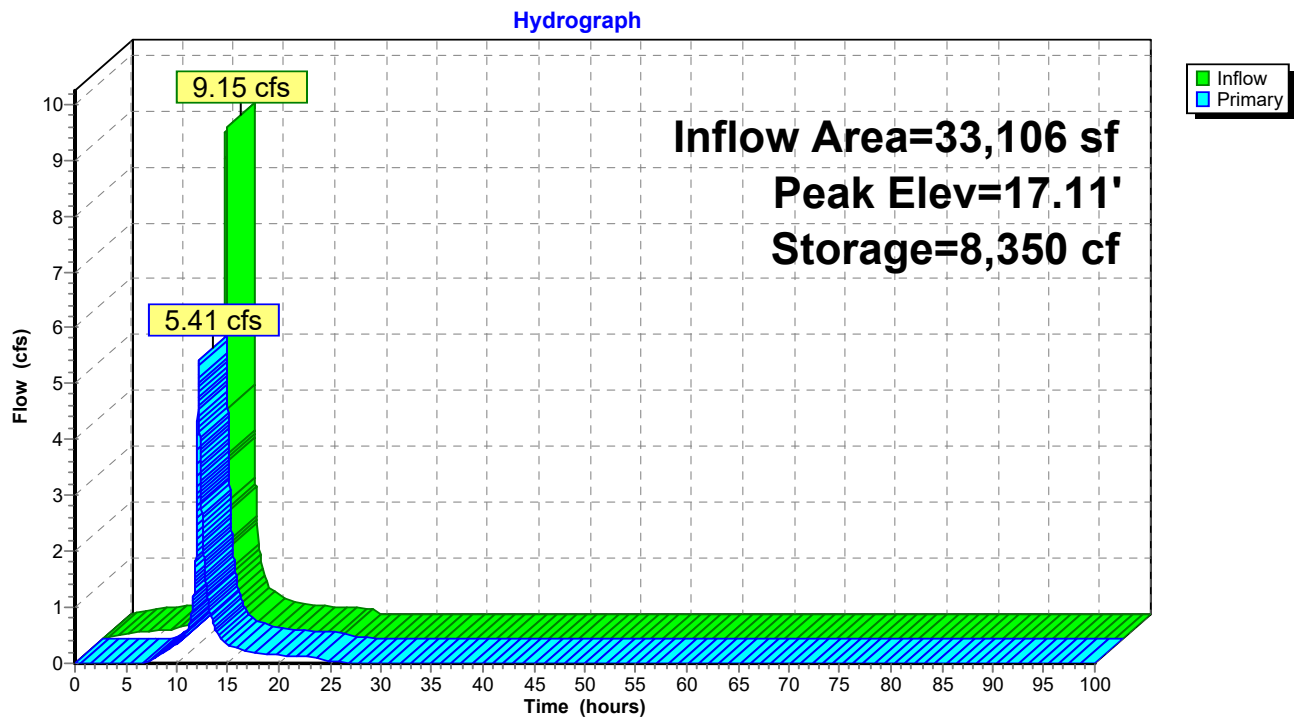
Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.40 cfs @ 12.11 hrs HW=17.11' TW=14.62' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 5.40 cfs of 7.82 cfs potential flow)
 ↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.40 cfs @ 2.46 fps)

Pond PP5: POROUS PAVEMENT



Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 11.12" for 100-Year Future Adj event
 Inflow = 10.66 cfs @ 12.09 hrs, Volume= 35,937 cf
 Outflow = 5.61 cfs @ 12.11 hrs, Volume= 32,679 cf, Atten= 47%, Lag= 1.2 min
 Primary = 5.61 cfs @ 12.11 hrs, Volume= 32,679 cf
 Routed to Pond CW1A : COSNTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.96' @ 13.25 hrs Surf.Area= 31,334 sf Storage= 12,003 cf

Plug-Flow detention time= 154.5 min calculated for 32,679 cf (91% of inflow)
 Center-of-Mass det. time= 103.9 min (837.7 - 733.8)

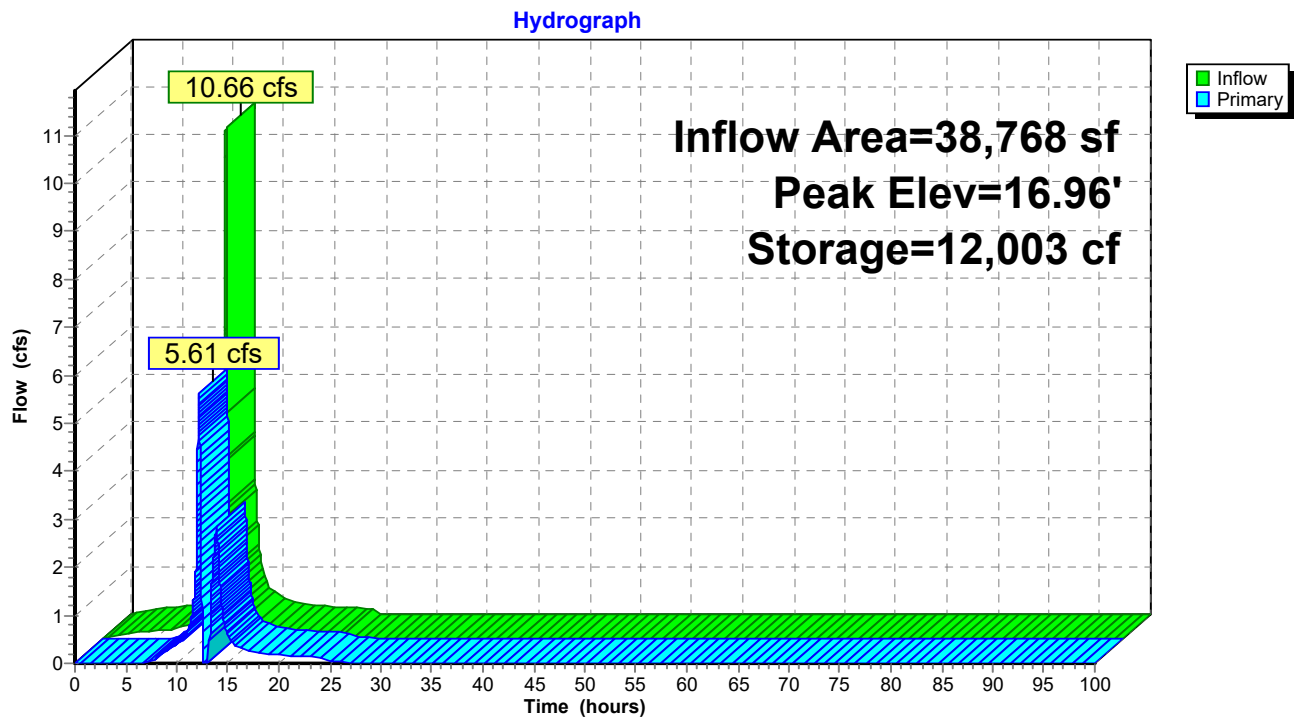
Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.60 cfs @ 12.11 hrs HW=16.84' TW=15.34' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 5.60 cfs of 7.23 cfs potential flow)
 ↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.60 cfs @ 2.49 fps)

Pond PP6: POROUS PAVEMENT



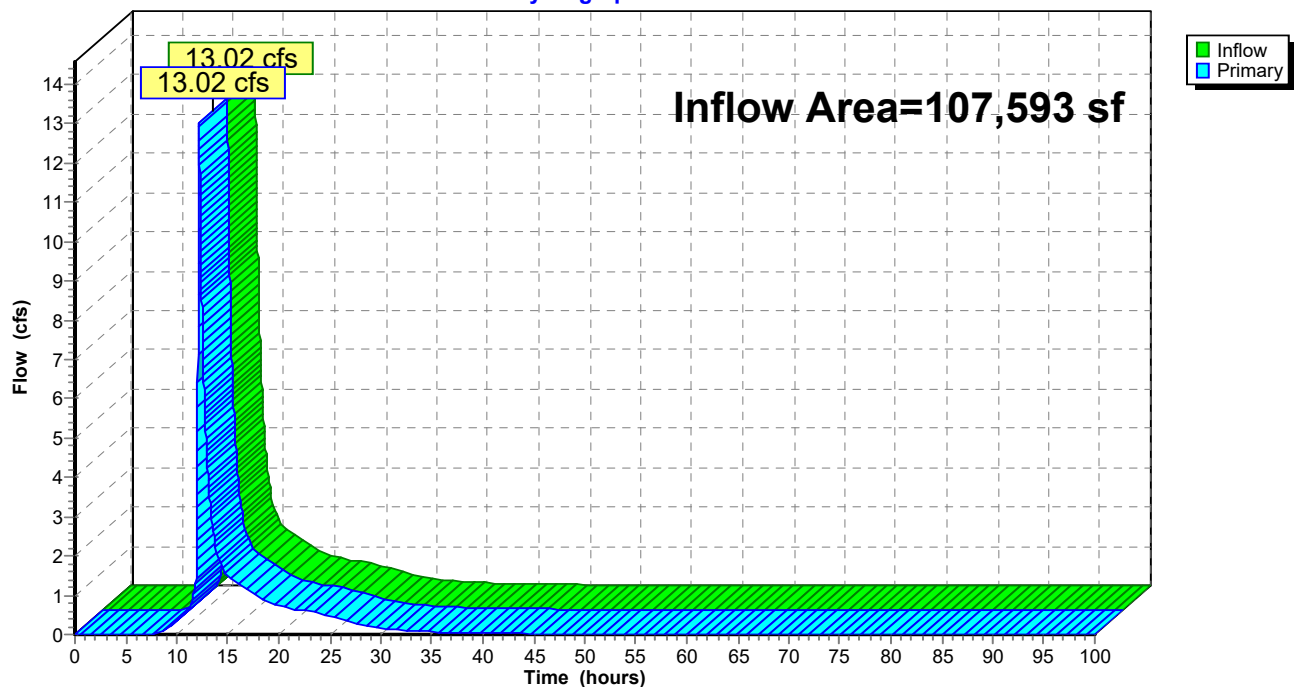
Summary for Link B1V: Valve

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth > 10.12" for 100-Year Future Adj event
Inflow = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf
Primary = 13.02 cfs @ 12.16 hrs, Volume= 90,742 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link B1V: Valve

Hydrograph

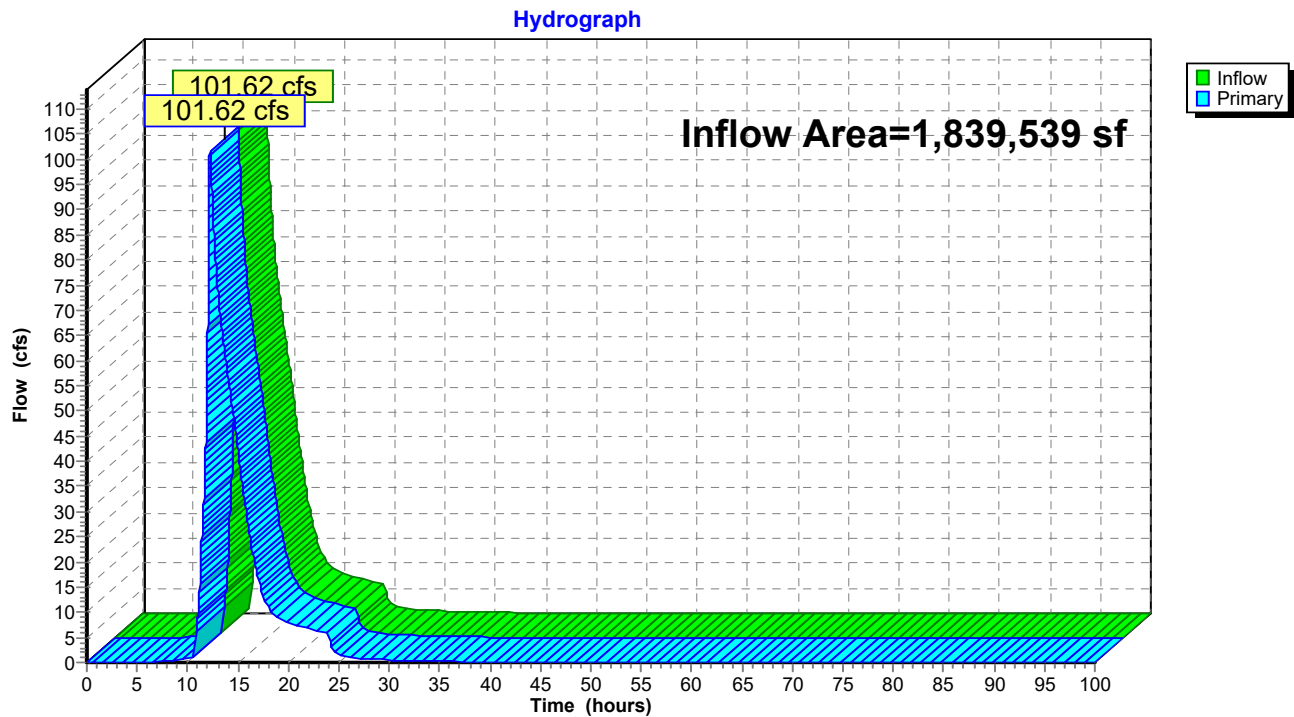


Summary for Link P1A:

Inflow Area = 1,839,539 sf, 81.93% Impervious, Inflow Depth = 8.43" for 100-Year Future Adj event
Inflow = 101.62 cfs @ 12.21 hrs, Volume= 1,292,859 cf
Primary = 101.62 cfs @ 12.21 hrs, Volume= 1,292,859 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1 : PDA 1

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link P1A:



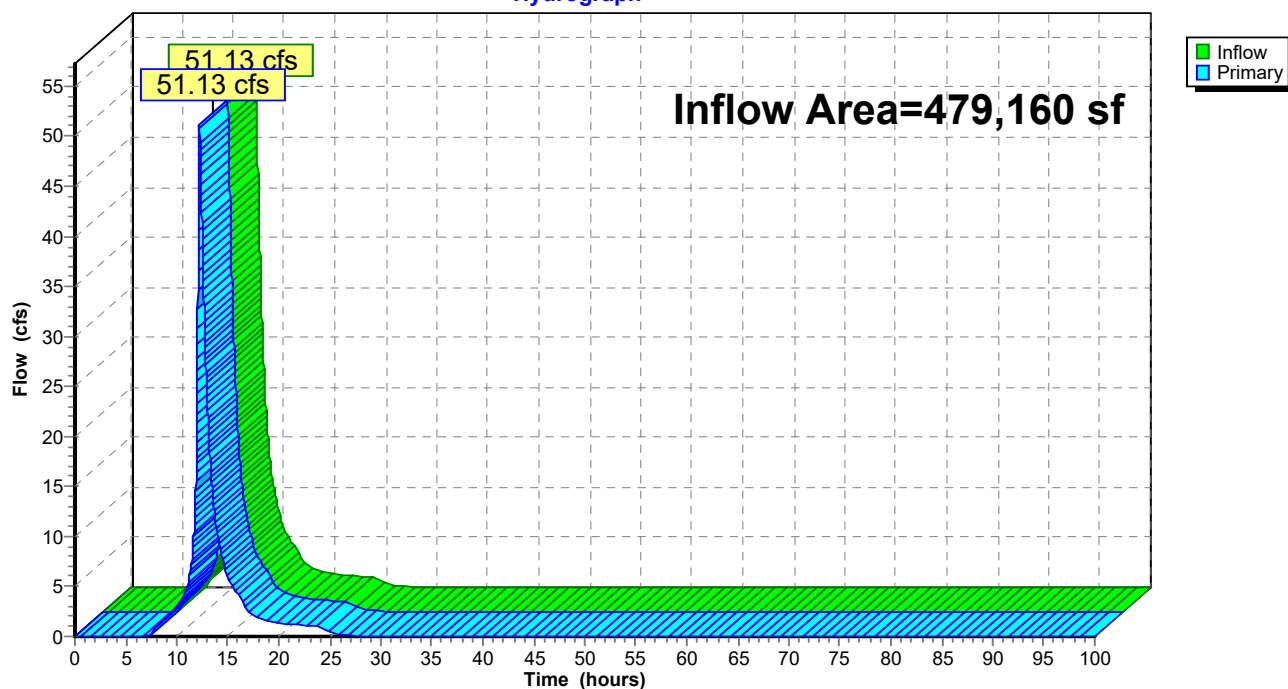
Summary for Link PP4V: Valve

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 8.80" for 100-Year Future Adj event
Inflow = 51.13 cfs @ 12.20 hrs, Volume= 351,408 cf
Primary = 51.13 cfs @ 12.20 hrs, Volume= 351,408 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Link PP4V: Valve

Hydrograph



Summary for Link TW: Tailwater

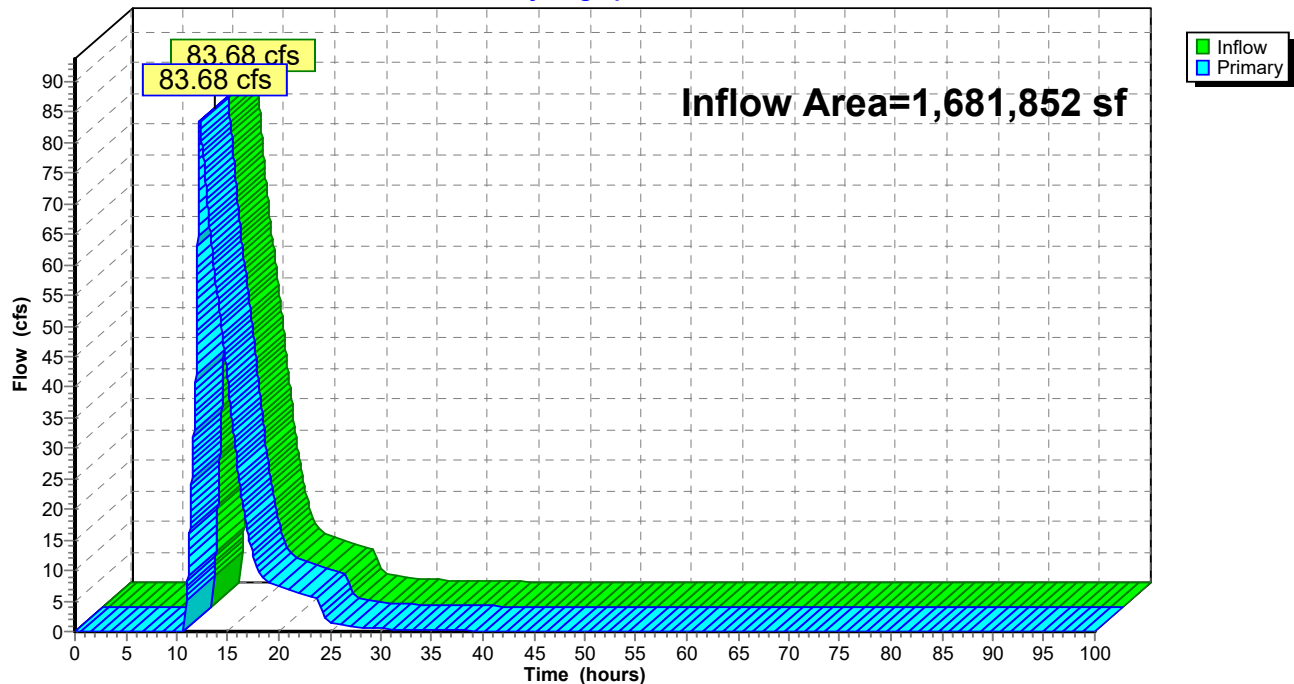
Inflow Area = 1,681,852 sf, 89.17% Impervious, Inflow Depth = 8.54" for 100-Year Future Adj event
Inflow = 83.68 cfs @ 12.26 hrs, Volume= 1,196,866 cf
Primary = 83.68 cfs @ 12.26 hrs, Volume= 1,196,866 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P1A :

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 13.13'

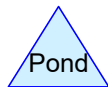
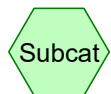
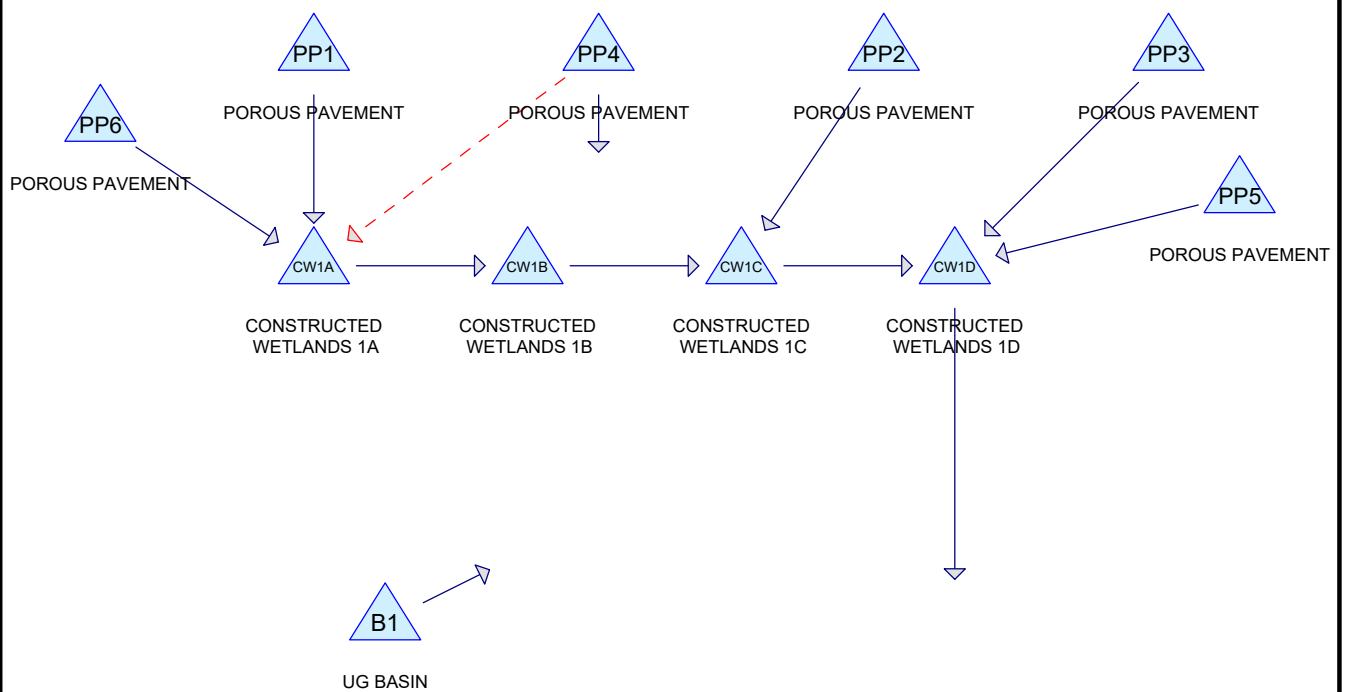
Link TW: Tailwater

Hydrograph



C. WATER QUALITY

- ◆ **Water Quality Storm Hydrograph**



Pre vs Post Rev. 3a

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	WQ	NJ DEP 2-hr		Default	2.00	1	1.25	2	3.35
2	2-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	3.35	2	3.35
3	10-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	5.17	2	3.35
4	100-Year Current Adj	NOAA 24-hr	D	Default	24.00	1	8.89	2	3.35
5	2-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	3.99	2	3.99
6	10-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	6.20	2	3.99
7	100-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	11.48	2	3.99
8	25-Year	NOAA 24-hr	D	Default	24.00	1	6.36	2	3.35
9	150% 100-Year Future Adj	NOAA 24-hr	D	Default	24.00	1	17.22	2	3.99

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond B1: UG BASIN

Inflow Area = 107,593 sf, 97.57% Impervious, Inflow Depth = 1.01" for WQ event
 Inflow = 7.42 cfs @ 1.08 hrs, Volume= 9,088 cf
 Outflow = 0.00 cfs @ 2.24 hrs, Volume= 8 cf, Atten= 100%, Lag= 69.7 min
 Primary = 0.00 cfs @ 2.24 hrs, Volume= 8 cf
 Routed to Link B1V : Valve

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.20' @ 2.24 hrs Surf.Area= 0.559 ac Storage= 0.209 af

Plug-Flow detention time= 2,901.4 min calculated for 8 cf (0% of inflow)
 Center-of-Mass det. time= 2,856.0 min (2,923.0 - 66.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.50'	0.489 af	58.50'W x 416.58'L x 3.50'H Field A 1.958 af Overall - 0.735 af Embedded = 1.223 af x 40.0% Voids
#2A	10.00'	0.735 af	ADS_StormTech SC-740 b +Capx 696 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 696 Chambers in 12 Rows Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf
		1.225 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.50'	24.0" Round Culvert L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.50' / 9.35' S= 0.0030 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	10.20'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.86'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.42'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 2.24 hrs HW=10.20' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.00 cfs of 1.85 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.18 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond B1: UG BASIN - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 b +Cap (ADS StormTech®SC-740 with cap storage)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Cap Storage= 2.7 cf x 2 x 12 rows = 63.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

58 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 414.58' Row Length +12.0" End Stone x 2 = 416.58' Base Length

12 Rows x 51.0" Wide + 6.0" Spacing x 11 + 12.0" Side Stone x 2 = 58.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

696 Chambers x 45.9 cf + 2.7 cf Cap Volume x 2 x 12 Rows = 32,038.0 cf Chamber Storage

85,294.1 cf Field - 32,038.0 cf Chambers = 53,256.1 cf Stone x 40.0% Voids = 21,302.4 cf Stone Storage

Chamber Storage + Stone Storage = 53,340.4 cf = 1.225 af

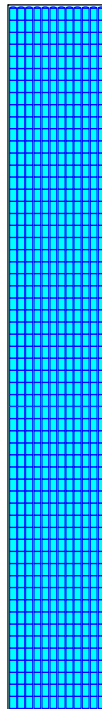
Overall Storage Efficiency = 62.5%

Overall System Size = 416.58' x 58.50' x 3.50'

696 Chambers

3,159.0 cy Field

1,972.4 cy Stone



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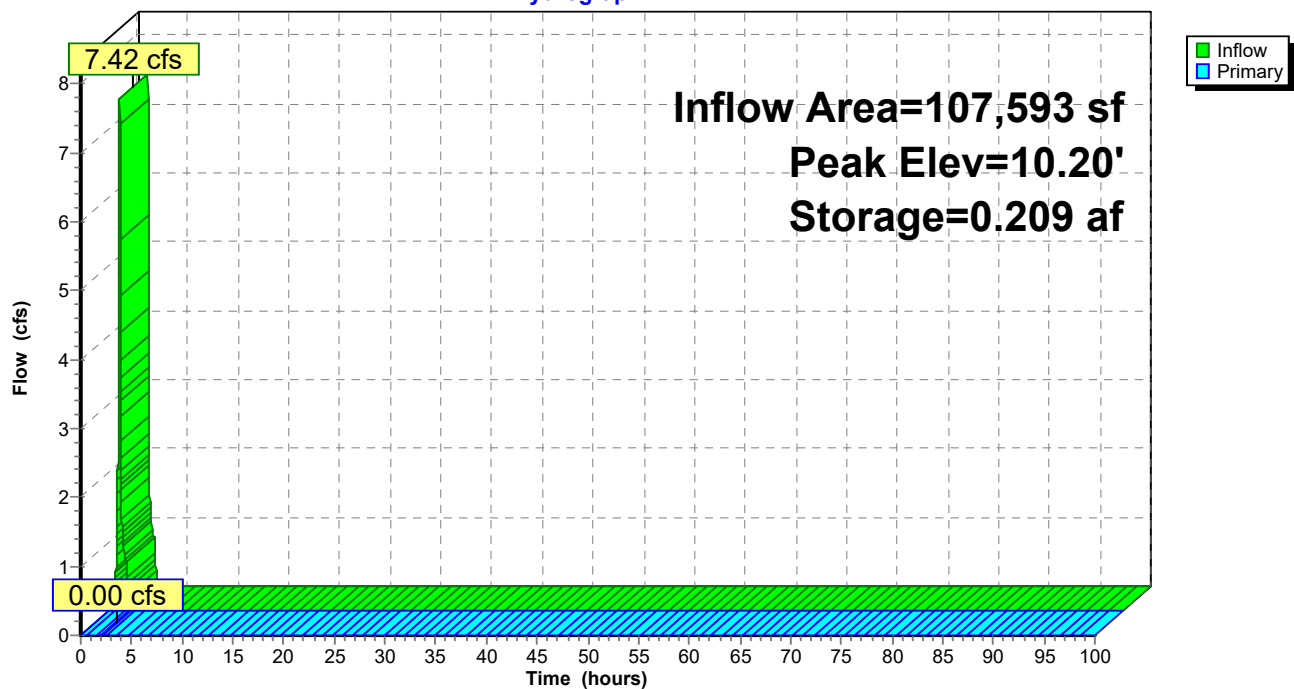
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond B1: UG BASIN

Hydrograph



Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond CW1A: CONSTRUCTED WETLANDS 1A

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 0.69" for WQ event
 Inflow = 15.02 cfs @ 1.09 hrs, Volume= 19,598 cf
 Outflow = 2.39 cfs @ 1.27 hrs, Volume= 18,556 cf, Atten= 84%, Lag= 10.3 min
 Primary = 2.39 cfs @ 1.27 hrs, Volume= 18,556 cf
 Routed to Pond CW1B : CONSTRUCTED WETLANDS 1B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.31' @ 5.41 hrs Surf.Area= 13,961 sf Storage= 15,223 cf

Plug-Flow detention time= 1,092.8 min calculated for 18,554 cf (95% of inflow)
 Center-of-Mass det. time= 1,089.0 min (1,160.4 - 71.5)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=2.33 cfs @ 1.27 hrs HW=10.17' TW=9.94' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 2.33 cfs @ 1.35 fps)

Pre vs Post Rev. 3a

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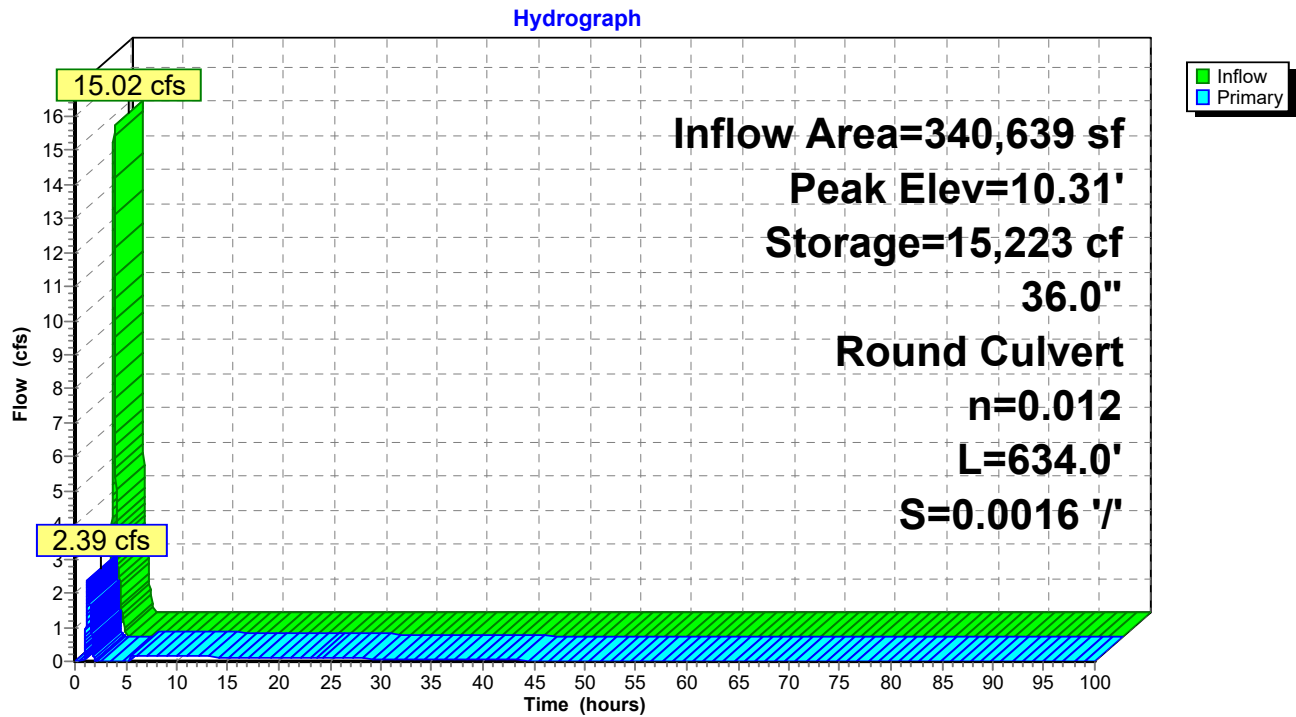
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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond CW1A: CONSTRUCTED WETLANDS 1A



Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond CW1B: CONSTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth > 0.41" for WQ event
 Inflow = 14.27 cfs @ 1.10 hrs, Volume= 35,784 cf
 Outflow = 2.60 cfs @ 1.21 hrs, Volume= 34,535 cf, Atten= 82%, Lag= 6.8 min
 Primary = 2.60 cfs @ 1.21 hrs, Volume= 34,535 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.31' @ 5.39 hrs Surf.Area= 15,246 sf Storage= 18,120 cf

Plug-Flow detention time= 850.1 min calculated for 34,535 cf (97% of inflow)
 Center-of-Mass det. time= 727.4 min (1,364.0 - 636.6)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf

Primary OutFlow Max=2.45 cfs @ 1.21 hrs HW=9.87' TW=9.56' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 2.45 cfs @ 1.84 fps)

Pre vs Post Rev. 3a

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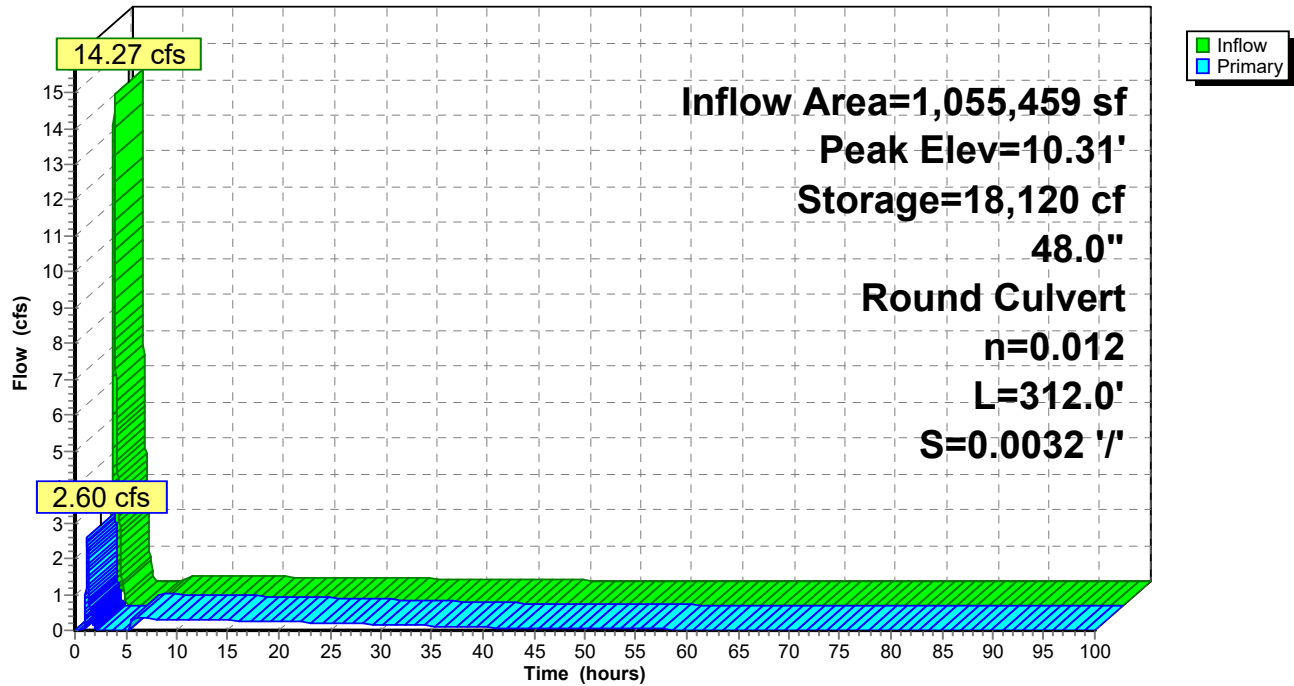
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond CW1B: CONSTRUCTED WETLANDS 1B

Hydrograph



Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond CW1C: CONSTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth > 0.33" for WQ event
 Inflow = 2.60 cfs @ 1.21 hrs, Volume= 34,563 cf
 Outflow = 0.37 cfs @ 5.65 hrs, Volume= 34,401 cf, Atten= 86%, Lag= 266.3 min
 Primary = 0.37 cfs @ 5.65 hrs, Volume= 34,401 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.31' @ 5.37 hrs Surf.Area= 3,601 sf Storage= 3,427 cf

Plug-Flow detention time= 152.3 min calculated for 34,401 cf (100% of inflow)
 Center-of-Mass det. time= 131.5 min (1,496.7 - 1,365.2)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 2.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=0.41 cfs @ 5.65 hrs HW=10.30' TW=10.30' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 0.41 cfs @ 0.10 fps)

Pre vs Post Rev. 3a

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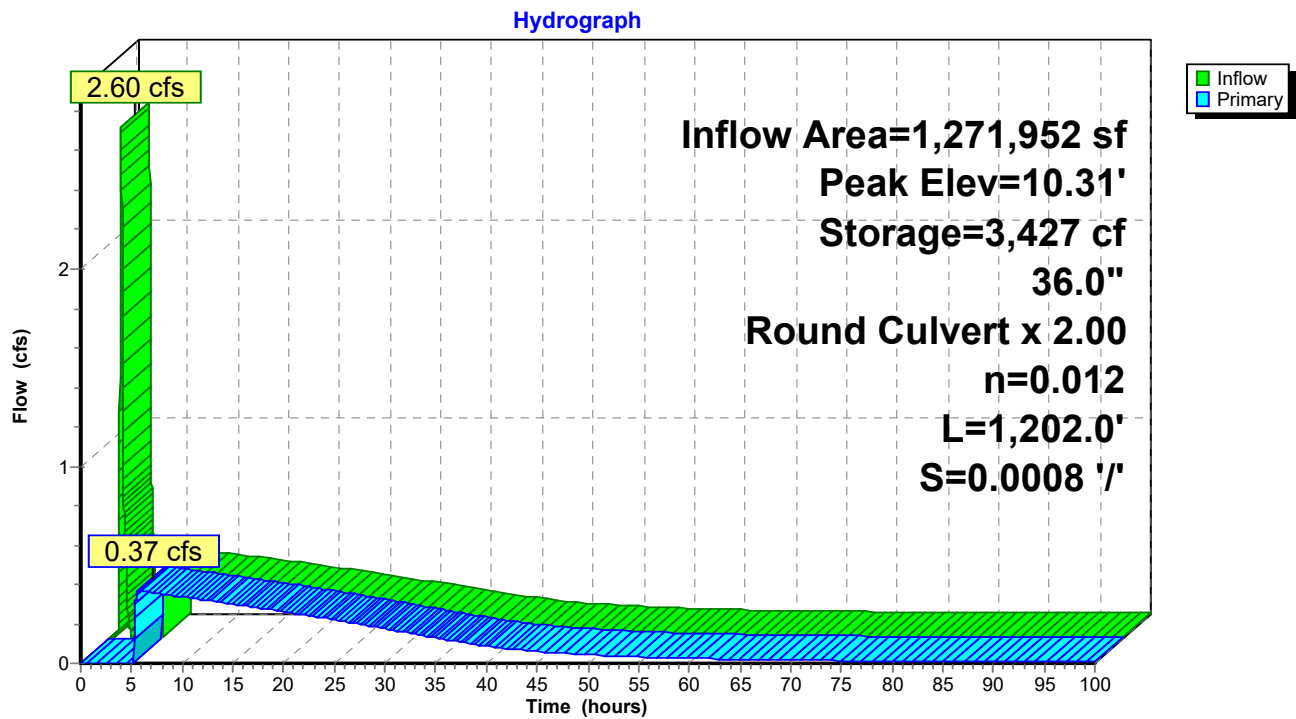
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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond CW1C: CONSTRUCTED WETLANDS 1C



Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond CW1D: CONSTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth > 0.44" for WQ event
 Inflow = 20.98 cfs @ 1.09 hrs, Volume= 61,992 cf
 Outflow = 0.64 cfs @ 2.03 hrs, Volume= 61,561 cf, Atten= 97%, Lag= 56.3 min
 Primary = 0.64 cfs @ 2.03 hrs, Volume= 61,561 cf
 Routed to Link P1A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 10.73' @ 2.03 hrs Surf.Area= 17,518 sf Storage= 25,158 cf

Plug-Flow detention time= 461.7 min calculated for 61,561 cf (99% of inflow)
 Center-of-Mass det. time= 429.1 min (1,290.7 - 861.6)

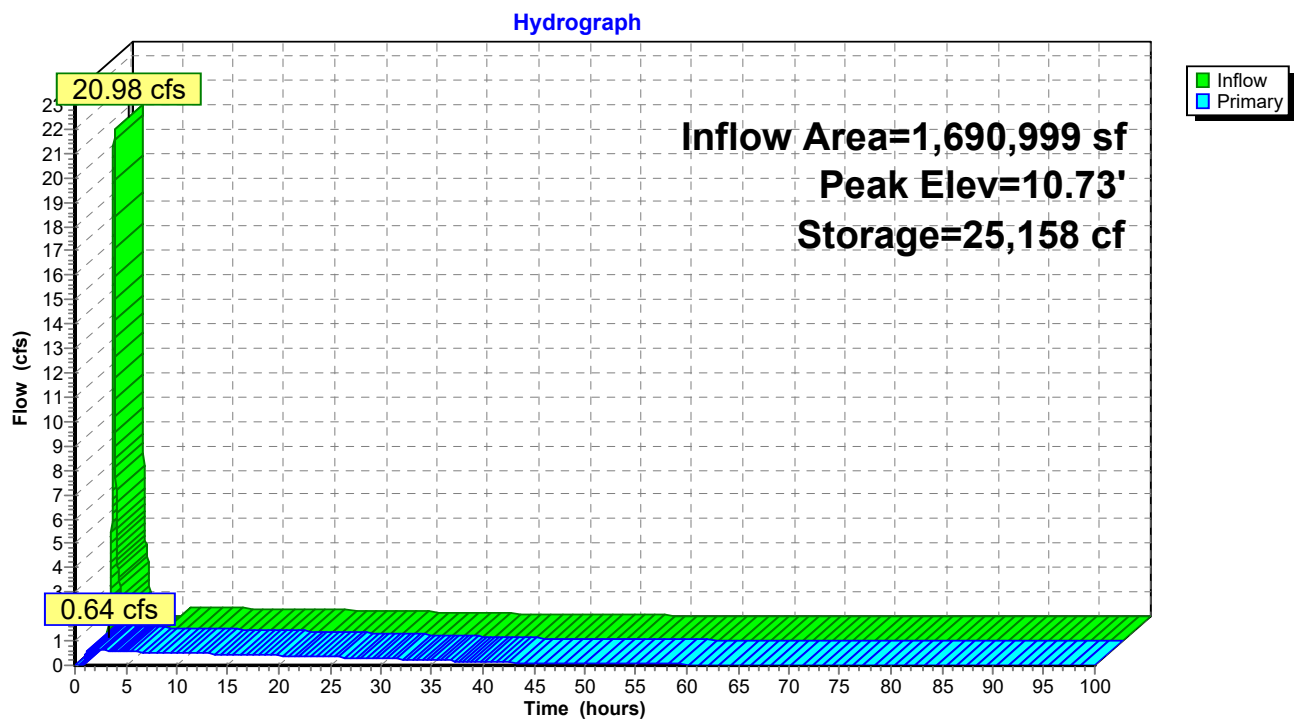
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.64 cfs @ 2.03 hrs HW=10.73' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.64 cfs of 19.94 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.64 cfs @ 6.10 fps)
 3=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.16 fps)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond CW1D: CONSTRUCTED WETLANDS 1D

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Summary for Pond PP1: POROUS PAVEMENT

Inflow Area = 33,977 sf, 97.44% Impervious, Inflow Depth = 1.01" for WQ event
 Inflow = 2.33 cfs @ 1.08 hrs, Volume= 2,854 cf
 Outflow = 0.00 cfs @ 2.02 hrs, Volume= 4 cf, Atten= 100%, Lag= 56.4 min
 Primary = 0.00 cfs @ 2.02 hrs, Volume= 4 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.11' @ 2.15 hrs Surf.Area= 12,680 sf Storage= 2,854 cf

Plug-Flow detention time= 2,714.1 min calculated for 4 cf (0% of inflow)
 Center-of-Mass det. time= 2,669.8 min (2,736.7 - 66.9)

Volume	Invert	Avail.Storage	Storage Description
#1	14.55'	15,216 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 38,040 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.55	12,680	0	0
17.55	12,680	38,040	38,040

Device	Routing	Invert	Outlet Devices
#1	Primary	9.82'	15.0" Round Culvert L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.82' / 9.23' S= 0.0100 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	15.11'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.71'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	16.18'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 2.02 hrs HW=15.11' TW=10.30' (Dynamic Tailwater)

- 1=Culvert (Passes 0.00 cfs of 12.50 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.14 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

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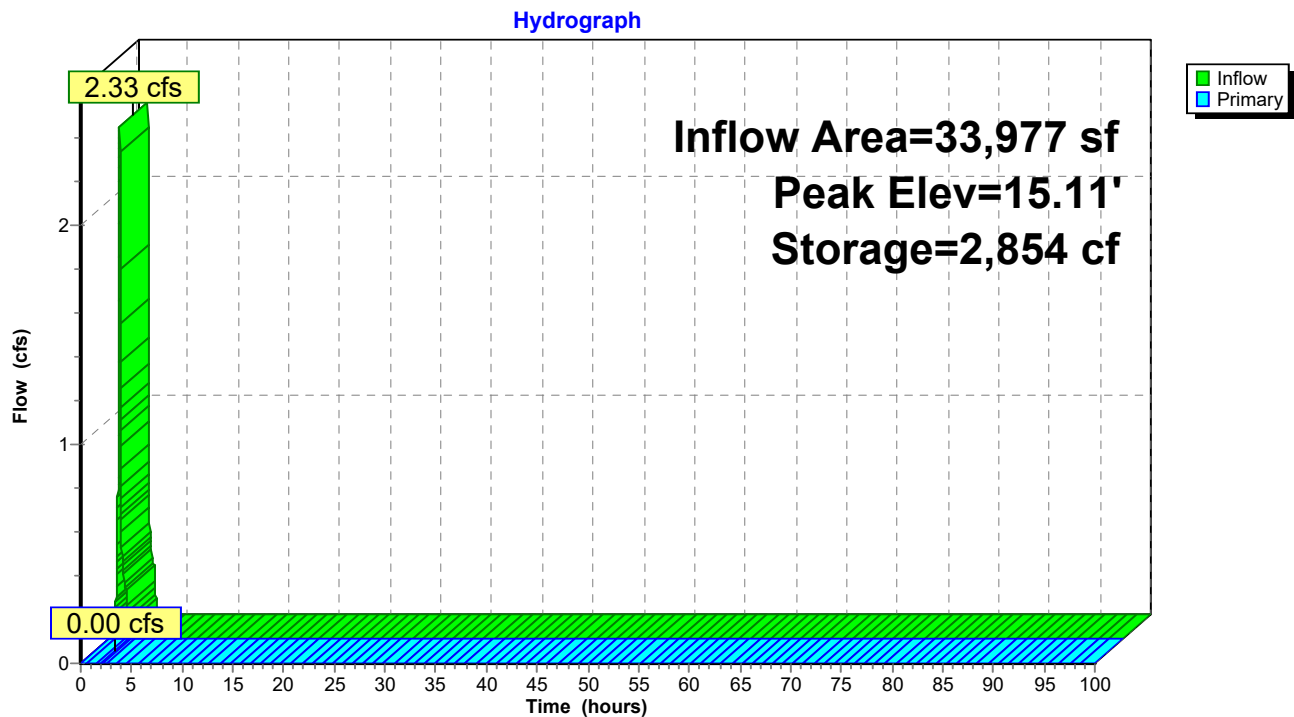
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Pond PP1: POROUS PAVEMENT



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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond PP2: POROUS PAVEMENT

Inflow Area = 78,408 sf, 93.33% Impervious, Inflow Depth = 0.98" for WQ event
 Inflow = 5.21 cfs @ 1.08 hrs, Volume= 6,385 cf
 Outflow = 0.00 cfs @ 2.23 hrs, Volume= 21 cf, Atten= 100%, Lag= 69.3 min
 Primary = 0.00 cfs @ 2.23 hrs, Volume= 21 cf
 Routed to Pond CW1C : CONSTRUCTED WETLANDS 1C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 14.23' @ 2.23 hrs Surf.Area= 23,328 sf Storage= 6,385 cf

Plug-Flow detention time= 2,662.2 min calculated for 21 cf (0% of inflow)
 Center-of-Mass det. time= 2,619.0 min (2,685.7 - 66.7)

Volume	Invert	Avail.Storage	Storage Description
#1	13.55'	27,994 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,984 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.55	23,328	0	0
16.55	23,328	69,984	69,984

Device	Routing	Invert	Outlet Devices
#1	Primary	9.46'	36.0" Round Culvert L= 155.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.46' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	14.23'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	15.27'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 2.23 hrs HW=14.23' TW=10.31' (Dynamic Tailwater)

- 1=Culvert (Passes 0.00 cfs of 52.33 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.22 fps)
- 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

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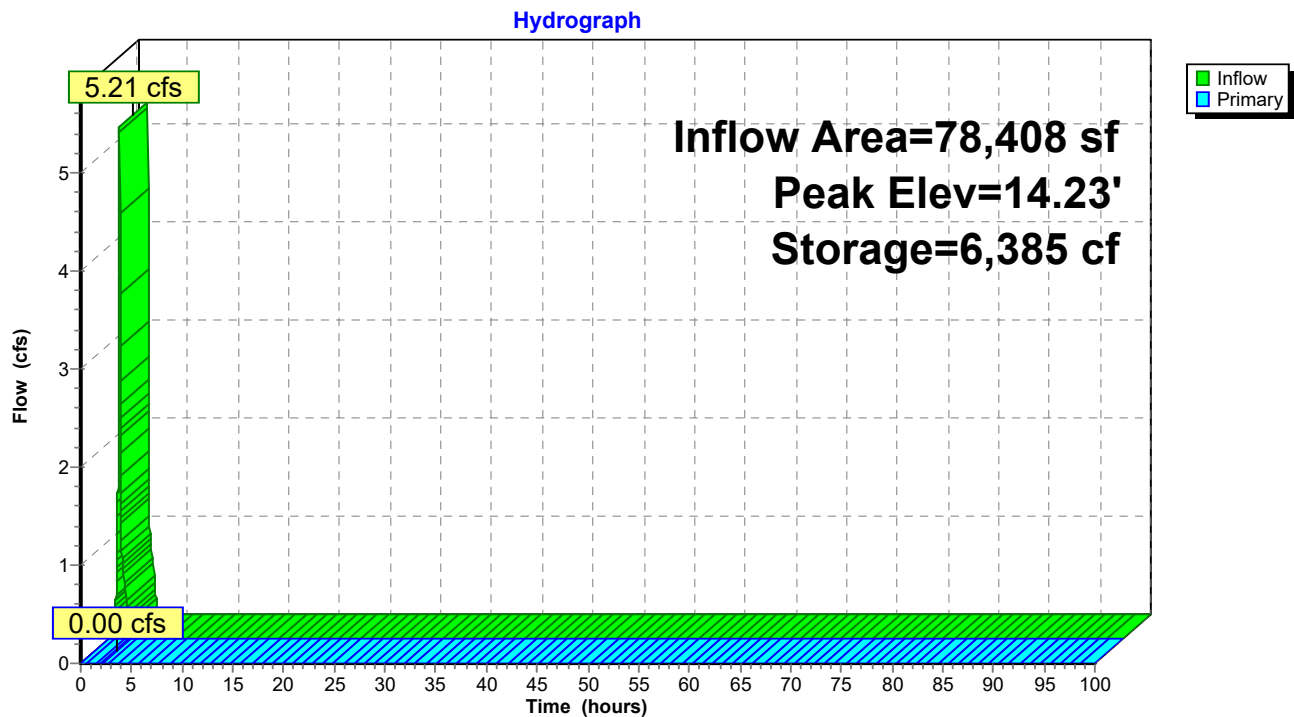
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Pond PP2: POROUS PAVEMENT



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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond PP3: POROUS PAVEMENT

Inflow Area = 31,799 sf, 95.89% Impervious, Inflow Depth = 1.00" for WQ event
 Inflow = 2.16 cfs @ 1.08 hrs, Volume= 2,648 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.19' @ 2.47 hrs Surf.Area= 10,368 sf Storage= 2,648 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	15.55'	12,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 31,104 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.55	10,368	0	0
18.55	10,368	31,104	31,104

Device	Routing	Invert	Outlet Devices
#1	Primary	9.28'	30.0" Round Culvert L= 49.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.28' / 9.13' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	16.19'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.03'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	17.65'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.55' TW=9.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.00 cfs of 52.96 cfs potential flow)
- 2=Orifice/Grate (Controls 0.00 cfs)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pre vs Post Rev. 3a

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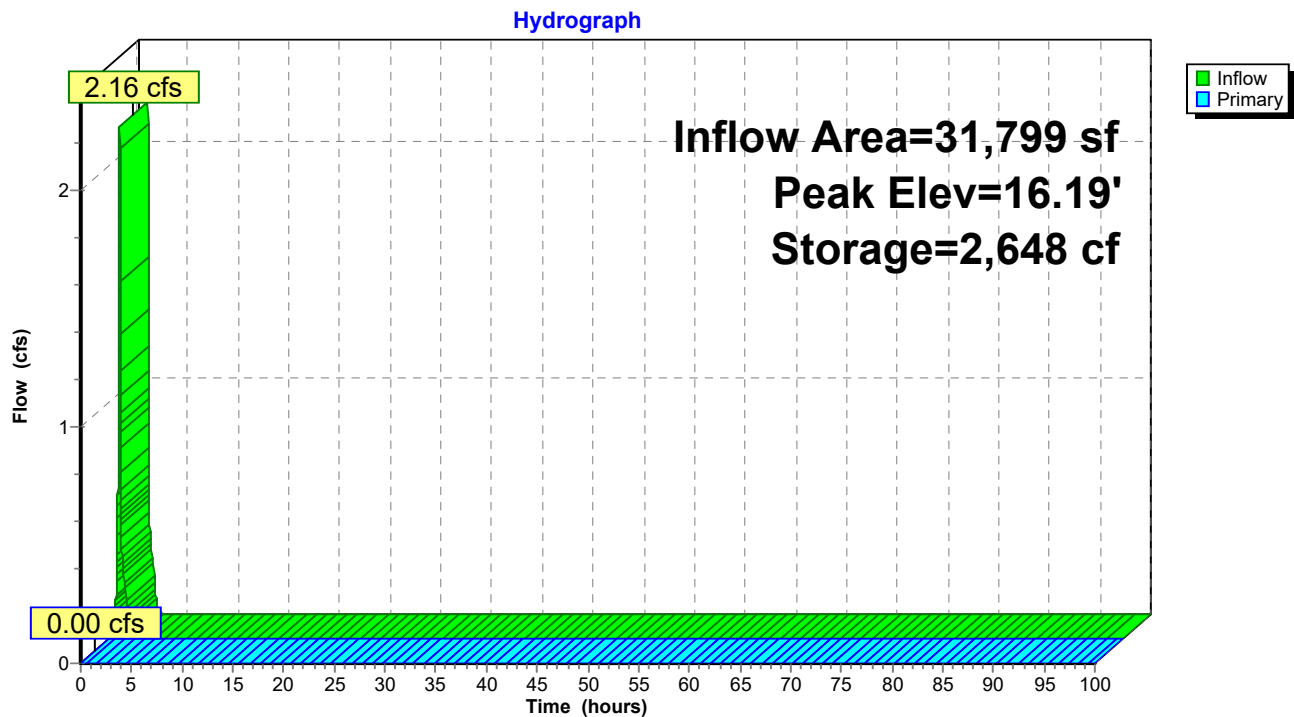
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Pond PP3: POROUS PAVEMENT



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Summary for Pond PP4: POROUS PAVEMENT

Inflow Area = 479,160 sf, 96.64% Impervious, Inflow Depth = 1.00" for WQ event
 Inflow = 32.35 cfs @ 1.08 hrs, Volume= 39,925 cf
 Outflow = 0.00 cfs @ 2.19 hrs, Volume= 57 cf, Atten= 100%, Lag= 66.6 min
 Primary = 0.00 cfs @ 2.19 hrs, Volume= 38 cf
 Routed to Link PP4V : Valve
 Secondary = 0.00 cfs @ 2.19 hrs, Volume= 19 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 13.56' @ 2.19 hrs Surf.Area= 181,216 sf Storage= 39,924 cf

Plug-Flow detention time= 1,121.2 min calculated for 57 cf (0% of inflow)
 Center-of-Mass det. time= 1,076.7 min (1,144.2 - 67.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.01'	143,523 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 358,808 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.01	181,216	0	0
14.99	181,216	358,808	358,808

Device	Routing	Invert	Outlet Devices
#1	Primary	9.13'	36.0" Round Culvert X 2.00 L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	9.13'	36.0" Round Culvert L= 43.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.13' / 9.00' S= 0.0030 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#3	Device 1	13.56'	5.0' long Sharp-Crested Rectangular Weir X 2.00 2 End Contraction(s)
#4	Device 2	13.56'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 2.19 hrs HW=13.56' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 105.29 cfs potential flow)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.09 fps)

Secondary OutFlow Max=0.00 cfs @ 2.19 hrs HW=13.56' TW=10.31' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 0.00 cfs of 52.64 cfs potential flow)

↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.09 fps)

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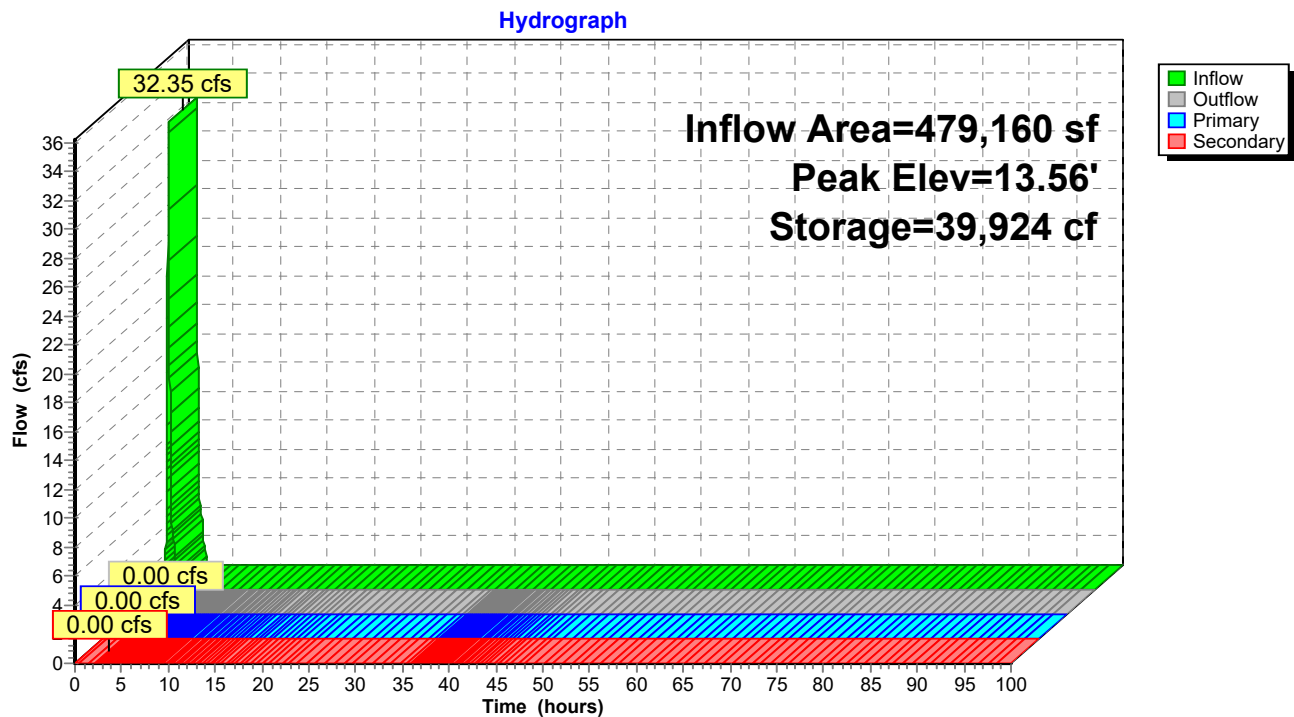
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Pond PP4: POROUS PAVEMENT



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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond PP5: POROUS PAVEMENT

Inflow Area = 33,106 sf, 97.37% Impervious, Inflow Depth = 1.01" for WQ event
 Inflow = 2.30 cfs @ 1.08 hrs, Volume= 2,792 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond CW1D : CONSTRUCTED WETLANDS 1D

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.54' @ 2.17 hrs Surf.Area= 24,388 sf Storage= 2,792 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	16.25'	9,755 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 24,388 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.25	24,388	0	0
17.25	24,388	24,388	24,388

Device	Routing	Invert	Outlet Devices
#1	Primary	9.60'	15.0" Round Culvert L= 105.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.60' / 9.29' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.54'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=16.25' TW=9.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 11.84 cfs potential flow)
 ↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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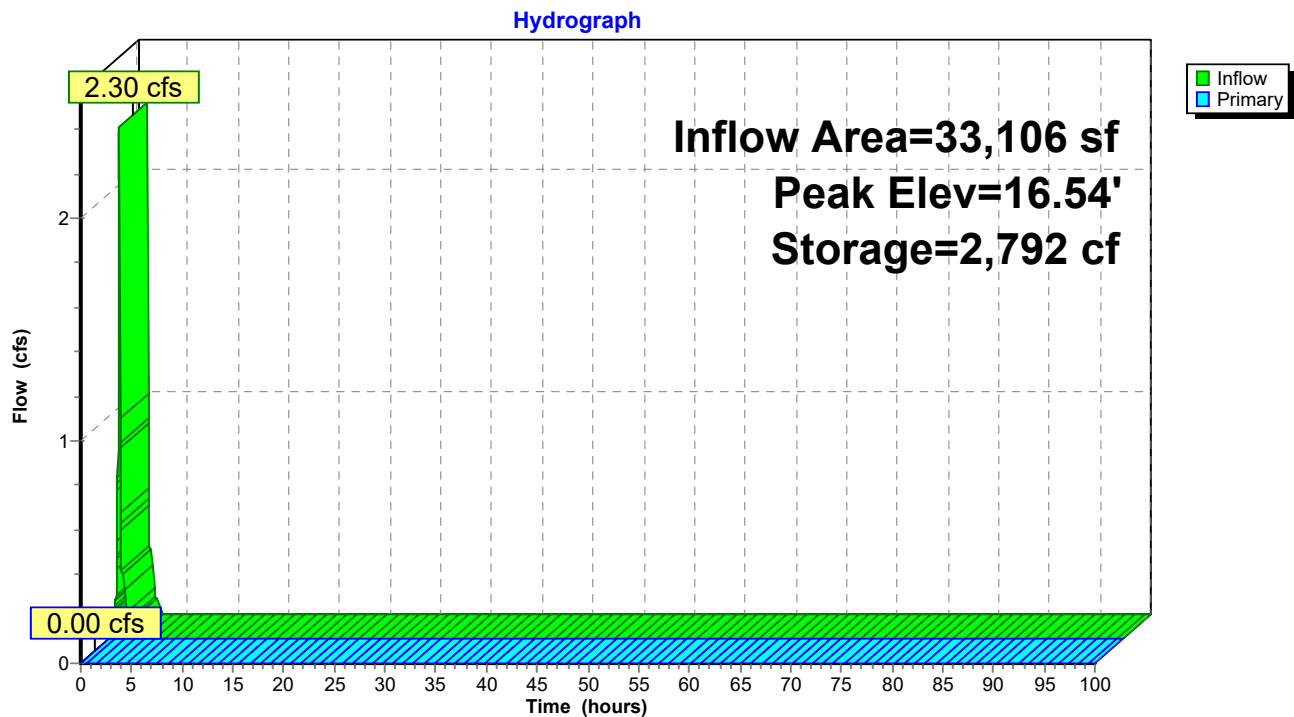
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Pond PP5: POROUS PAVEMENT



Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Pond PP6: POROUS PAVEMENT

Inflow Area = 38,768 sf, 97.75% Impervious, Inflow Depth = 1.01" for WQ event
 Inflow = 2.69 cfs @ 1.08 hrs, Volume= 3,267 cf
 Outflow = 0.00 cfs @ 2.03 hrs, Volume= 9 cf, Atten= 100%, Lag= 57.0 min
 Primary = 0.00 cfs @ 2.03 hrs, Volume= 9 cf
 Routed to Pond CW1A : CONSTRUCTED WETLANDS 1A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.26' @ 2.03 hrs Surf.Area= 31,334 sf Storage= 3,267 cf

Plug-Flow detention time= 970.0 min calculated for 9 cf (0% of inflow)
 Center-of-Mass det. time= 926.6 min (991.8 - 65.2)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	15,667 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 39,168 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	31,334	0	0
17.25	31,334	39,168	39,168

Device	Routing	Invert	Outlet Devices
#1	Primary	11.08'	15.0" Round Culvert L= 8.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.08' / 11.05' S= 0.0037 ' S= 0.0037 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	16.26'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 2.03 hrs HW=16.26' TW=10.31' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 12.61 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.09 fps)

Pre vs Post Rev. 3a

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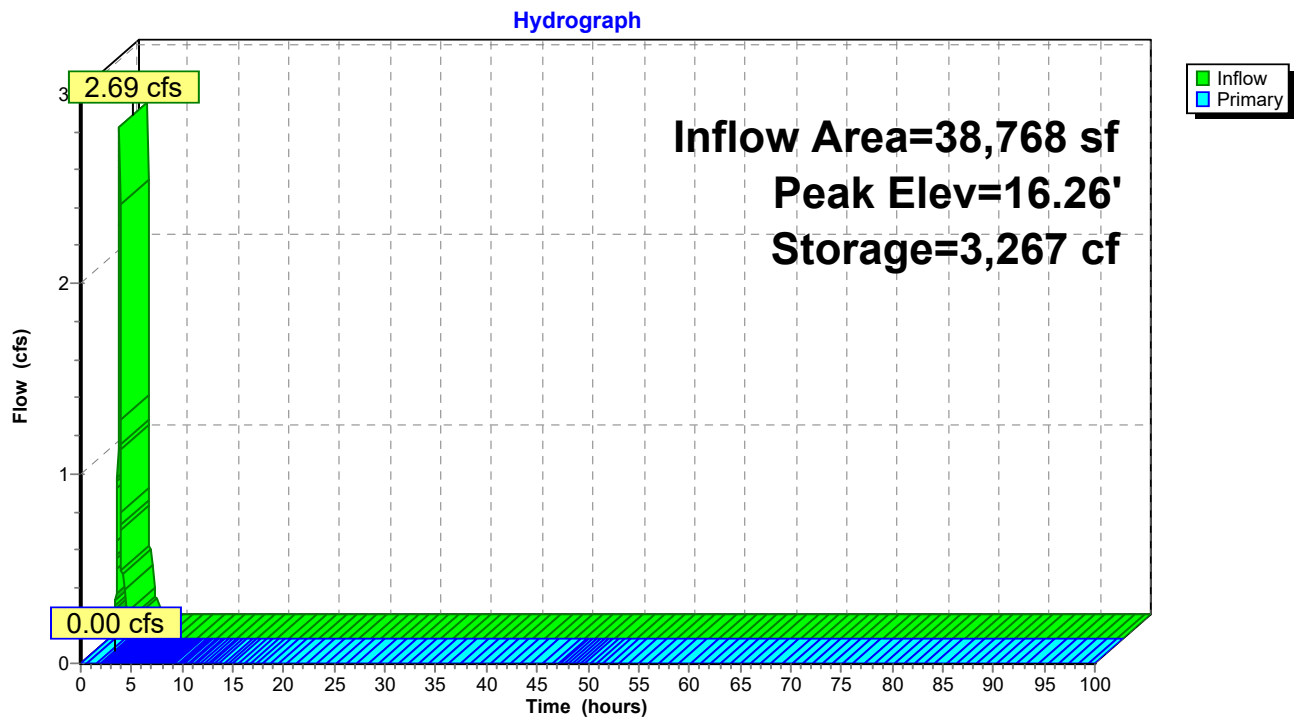
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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Pond PP6: POROUS PAVEMENT



D. DESIGN CALCULATIONS

- ♦ Basin Drain Time
- ♦ Emergency Spillway
- ♦ Groundwater Recharge Worksheet
- ♦ Groundwater Mounding Analysis
- ♦ Constructed Wetlands Detention Time
- ♦ Manufactured Treatment Device Summary
- ♦ Sediment Basin Design
- ♦ Attachment D – Major Development Stormwater Summary

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Page 1

Hydrograph for Pond B1: UG BASIN

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	9.50	0.00
0.50	0.05	0.001	9.50	0.00
1.00	0.17	0.006	9.52	0.00
1.50	0.24	0.014	9.56	0.00
2.00	0.28	0.025	9.61	0.00
2.50	0.32	0.037	9.67	0.00
3.00	0.35	0.051	9.73	0.00
3.50	0.37	0.066	9.79	0.00
4.00	0.40	0.082	9.86	0.00
4.50	0.42	0.098	9.94	0.00
5.00	0.44	0.116	10.01	0.00
5.50	0.46	0.135	10.05	0.00
6.00	0.48	0.154	10.09	0.00
6.50	0.54	0.175	10.13	0.00
7.00	0.61	0.199	10.18	0.00
7.50	0.67	0.225	10.24	0.00
8.00	0.74	0.254	10.30	0.03
8.50	0.80	0.283	10.36	0.07
9.00	0.89	0.314	10.43	0.14
9.50	1.10	0.347	10.50	0.23
10.00	1.32	0.386	10.58	0.34
10.50	1.63	0.430	10.68	0.45
11.00	2.47	0.494	10.82	0.57
11.50	4.36	0.605	11.07	0.87
12.00	15.07	0.893	11.78	4.60
12.50	5.00	1.014	12.12	9.64
13.00	2.67	0.885	11.75	4.31
13.50	1.73	0.830	11.61	2.76
14.00	1.37	0.795	11.52	2.02
14.50	1.15	0.772	11.46	1.64
15.00	0.93	0.751	11.41	1.45
15.50	0.83	0.729	11.36	1.37
16.00	0.77	0.707	11.31	1.30
16.50	0.70	0.685	11.26	1.21
17.00	0.64	0.665	11.21	1.12
17.50	0.57	0.646	11.16	1.03
18.00	0.51	0.627	11.12	0.95
18.50	0.49	0.610	11.08	0.88
19.00	0.47	0.594	11.04	0.83
19.50	0.46	0.580	11.01	0.78
20.00	0.44	0.568	10.98	0.74
20.50	0.42	0.556	10.96	0.70
21.00	0.41	0.545	10.93	0.67
21.50	0.39	0.534	10.91	0.65
22.00	0.38	0.523	10.88	0.62
22.50	0.36	0.513	10.86	0.61
23.00	0.34	0.503	10.84	0.59
23.50	0.33	0.493	10.82	0.57
24.00	0.18	0.480	10.79	0.55
24.50	0.00	0.462	10.75	0.52
25.00	0.00	0.442	10.70	0.47
25.50	0.00	0.423	10.66	0.44

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond B1: UG BASIN (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	0.406	10.62	0.39
26.50	0.00	0.390	10.59	0.35
27.00	0.00	0.377	10.56	0.31
27.50	0.00	0.364	10.53	0.28
28.00	0.00	0.354	10.51	0.24
28.50	0.00	0.344	10.49	0.22
29.00	0.00	0.336	10.47	0.19
29.50	0.00	0.328	10.46	0.17
30.00	0.00	0.321	10.44	0.16
30.50	0.00	0.315	10.43	0.14
31.00	0.00	0.309	10.42	0.13
31.50	0.00	0.304	10.41	0.12
32.00	0.00	0.300	10.40	0.11
32.50	0.00	0.295	10.39	0.10
33.00	0.00	0.292	10.38	0.09
33.50	0.00	0.288	10.37	0.08
34.00	0.00	0.285	10.36	0.08
34.50	0.00	0.282	10.36	0.07
35.00	0.00	0.279	10.35	0.07
35.50	0.00	0.276	10.35	0.06
36.00	0.00	0.274	10.34	0.06
36.50	0.00	0.271	10.34	0.05
37.00	0.00	0.269	10.33	0.05
37.50	0.00	0.267	10.33	0.05
38.00	0.00	0.265	10.32	0.04
38.50	0.00	0.263	10.32	0.04
39.00	0.00	0.262	10.32	0.04
39.50	0.00	0.260	10.31	0.04
40.00	0.00	0.259	10.31	0.04
40.50	0.00	0.257	10.31	0.03
41.00	0.00	0.256	10.30	0.03
41.50	0.00	0.255	10.30	0.03
42.00	0.00	0.253	10.30	0.03
42.50	0.00	0.252	10.29	0.03
43.00	0.00	0.251	10.29	0.03
43.50	0.00	0.250	10.29	0.02
44.00	0.00	0.249	10.29	0.02
44.50	0.00	0.248	10.29	0.02
45.00	0.00	0.247	10.28	0.02
45.50	0.00	0.246	10.28	0.02
46.00	0.00	0.246	10.28	0.02
46.50	0.00	0.245	10.28	0.02
47.00	0.00	0.244	10.28	0.02
47.50	0.00	0.243	10.28	0.02
48.00	0.00	0.243	10.27	0.02
48.50	0.00	0.242	10.27	0.02
49.00	0.00	0.241	10.27	0.02
49.50	0.00	0.241	10.27	0.02
50.00	0.00	0.240	10.27	0.01
50.50	0.00	0.239	10.27	0.01
51.00	0.00	0.239	10.27	0.01
51.50	0.00	0.238	10.27	0.01

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond B1: UG BASIN (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	0.238	10.26	0.01
52.50	0.00	0.237	10.26	0.01
53.00	0.00	0.237	10.26	0.01
53.50	0.00	0.236	10.26	0.01
54.00	0.00	0.236	10.26	0.01
54.50	0.00	0.235	10.26	0.01
55.00	0.00	0.235	10.26	0.01
55.50	0.00	0.234	10.26	0.01
56.00	0.00	0.234	10.26	0.01
56.50	0.00	0.234	10.26	0.01
57.00	0.00	0.233	10.25	0.01
57.50	0.00	0.233	10.25	0.01
58.00	0.00	0.232	10.25	0.01
58.50	0.00	0.232	10.25	0.01
59.00	0.00	0.232	10.25	0.01
59.50	0.00	0.231	10.25	0.01
60.00	0.00	0.231	10.25	0.01
60.50	0.00	0.231	10.25	0.01
61.00	0.00	0.230	10.25	0.01
61.50	0.00	0.230	10.25	0.01
62.00	0.00	0.230	10.25	0.01
62.50	0.00	0.230	10.25	0.01
63.00	0.00	0.229	10.25	0.01
63.50	0.00	0.229	10.25	0.01
64.00	0.00	0.229	10.25	0.01
64.50	0.00	0.229	10.24	0.01
65.00	0.00	0.228	10.24	0.01
65.50	0.00	0.228	10.24	0.01
66.00	0.00	0.228	10.24	0.01
66.50	0.00	0.228	10.24	0.01
67.00	0.00	0.227	10.24	0.01
67.50	0.00	0.227	10.24	0.01
68.00	0.00	0.227	10.24	0.01
68.50	0.00	0.227	10.24	0.01
69.00	0.00	0.226	10.24	0.01
69.50	0.00	0.226	10.24	0.00
70.00	0.00	0.226	10.24	0.00
70.50	0.00	0.226	10.24	0.00
71.00	0.00	0.226	10.24	0.00
71.50	0.00	0.225	10.24	0.00
72.00	0.00	0.225	10.24	0.00
72.50	0.00	0.225	10.24	0.00
73.00	0.00	0.225	10.24	0.00
73.50	0.00	0.225	10.24	0.00
74.00	0.00	0.225	10.24	0.00
74.50	0.00	0.224	10.24	0.00
75.00	0.00	0.224	10.24	0.00
75.50	0.00	0.224	10.24	0.00
76.00	0.00	0.224	10.23	0.00
76.50	0.00	0.224	10.23	0.00
77.00	0.00	0.224	10.23	0.00
77.50	0.00	0.223	10.23	0.00

Pre vs Post Rev. 3a

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Hydrograph for Pond B1: UG BASIN (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	0.223	10.23	0.00
78.50	0.00	0.223	10.23	0.00
79.00	0.00	0.223	10.23	0.00
79.50	0.00	0.223	10.23	0.00
80.00	0.00	0.223	10.23	0.00
80.50	0.00	0.223	10.23	0.00
81.00	0.00	0.222	10.23	0.00
81.50	0.00	0.222	10.23	0.00
82.00	0.00	0.222	10.23	0.00
82.50	0.00	0.222	10.23	0.00
83.00	0.00	0.222	10.23	0.00
83.50	0.00	0.222	10.23	0.00
84.00	0.00	0.222	10.23	0.00
84.50	0.00	0.222	10.23	0.00
85.00	0.00	0.221	10.23	0.00
85.50	0.00	0.221	10.23	0.00
86.00	0.00	0.221	10.23	0.00
86.50	0.00	0.221	10.23	0.00
87.00	0.00	0.221	10.23	0.00
87.50	0.00	0.221	10.23	0.00
88.00	0.00	0.221	10.23	0.00
88.50	0.00	0.221	10.23	0.00
89.00	0.00	0.221	10.23	0.00
89.50	0.00	0.220	10.23	0.00
90.00	0.00	0.220	10.23	0.00
90.50	0.00	0.220	10.23	0.00
91.00	0.00	0.220	10.23	0.00
91.50	0.00	0.220	10.23	0.00
92.00	0.00	0.220	10.23	0.00
92.50	0.00	0.220	10.23	0.00
93.00	0.00	0.220	10.23	0.00
93.50	0.00	0.220	10.23	0.00
94.00	0.00	0.220	10.23	0.00
94.50	0.00	0.220	10.23	0.00
95.00	0.00	0.219	10.23	0.00
95.50	0.00	0.219	10.23	0.00
96.00	0.00	0.219	10.23	0.00
96.50	0.00	0.219	10.23	0.00
97.00	0.00	0.219	10.22	0.00
97.50	0.00	0.219	10.22	0.00
98.00	0.00	0.219	10.22	0.00
98.50	0.00	0.219	10.22	0.00
99.00	0.00	0.219	10.22	0.00
99.50	0.00	0.219	10.22	0.00
100.00	0.00	0.219	10.22	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP1: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	14.55	0.00
0.50	0.02	15	14.55	0.00
1.00	0.05	77	14.57	0.00
1.50	0.07	191	14.59	0.00
2.00	0.09	339	14.62	0.00
2.50	0.10	510	14.65	0.00
3.00	0.11	699	14.69	0.00
3.50	0.12	904	14.73	0.00
4.00	0.12	1,123	14.77	0.00
4.50	0.13	1,353	14.82	0.00
5.00	0.14	1,595	14.86	0.00
5.50	0.14	1,849	14.91	0.00
6.00	0.15	2,114	14.97	0.00
6.50	0.17	2,403	15.02	0.00
7.00	0.19	2,726	15.09	0.00
7.50	0.21	3,082	15.16	0.00
8.00	0.23	3,451	15.23	0.02
8.50	0.25	3,817	15.30	0.05
9.00	0.28	4,186	15.38	0.07
9.50	0.34	4,609	15.46	0.08
10.00	0.41	5,125	15.56	0.10
10.50	0.51	5,762	15.69	0.11
11.00	0.77	6,619	15.86	0.21
11.50	1.35	7,974	16.12	0.41
12.00	4.68	10,307	16.58	3.03
12.50	1.55	10,362	16.59	3.14
13.00	0.83	8,875	16.30	0.90
13.50	0.54	8,673	16.26	0.70
14.00	0.43	8,447	16.22	0.52
14.50	0.36	8,306	16.19	0.42
15.00	0.29	8,127	16.15	0.43
15.50	0.26	7,878	16.10	0.40
16.00	0.24	7,632	16.05	0.37
16.50	0.22	7,400	16.01	0.34
17.00	0.20	7,185	15.97	0.31
17.50	0.18	6,989	15.93	0.28
18.00	0.16	6,816	15.89	0.25
18.50	0.15	6,676	15.87	0.22
19.00	0.15	6,570	15.85	0.20
19.50	0.14	6,487	15.83	0.18
20.00	0.14	6,420	15.82	0.17
20.50	0.13	6,363	15.80	0.16
21.00	0.13	6,313	15.79	0.15
21.50	0.12	6,266	15.79	0.15
22.00	0.12	6,222	15.78	0.14
22.50	0.11	6,178	15.77	0.14
23.00	0.11	6,135	15.76	0.13
23.50	0.10	6,091	15.75	0.13
24.00	0.06	6,010	15.73	0.12
24.50	0.00	5,848	15.70	0.11
25.00	0.00	5,646	15.66	0.11
25.50	0.00	5,452	15.62	0.11

Hydrograph for Pond PP1: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	5,267	15.59	0.10
26.50	0.00	5,091	15.55	0.10
27.00	0.00	4,923	15.52	0.09
27.50	0.00	4,763	15.49	0.09
28.00	0.00	4,613	15.46	0.08
28.50	0.00	4,471	15.43	0.08
29.00	0.00	4,337	15.41	0.07
29.50	0.00	4,213	15.38	0.07
30.00	0.00	4,096	15.36	0.06
30.50	0.00	3,989	15.34	0.06
31.00	0.00	3,890	15.32	0.05
31.50	0.00	3,799	15.30	0.05
32.00	0.00	3,717	15.28	0.04
32.50	0.00	3,645	15.27	0.04
33.00	0.00	3,581	15.26	0.03
33.50	0.00	3,525	15.24	0.03
34.00	0.00	3,475	15.24	0.03
34.50	0.00	3,431	15.23	0.02
35.00	0.00	3,393	15.22	0.02
35.50	0.00	3,358	15.21	0.02
36.00	0.00	3,327	15.21	0.02
36.50	0.00	3,300	15.20	0.01
37.00	0.00	3,275	15.20	0.01
37.50	0.00	3,252	15.19	0.01
38.00	0.00	3,232	15.19	0.01
38.50	0.00	3,213	15.18	0.01
39.00	0.00	3,196	15.18	0.01
39.50	0.00	3,180	15.18	0.01
40.00	0.00	3,166	15.17	0.01
40.50	0.00	3,152	15.17	0.01
41.00	0.00	3,140	15.17	0.01
41.50	0.00	3,129	15.17	0.01
42.00	0.00	3,118	15.16	0.01
42.50	0.00	3,108	15.16	0.01
43.00	0.00	3,099	15.16	0.00
43.50	0.00	3,090	15.16	0.00
44.00	0.00	3,082	15.16	0.00
44.50	0.00	3,074	15.16	0.00
45.00	0.00	3,067	15.15	0.00
45.50	0.00	3,060	15.15	0.00
46.00	0.00	3,054	15.15	0.00
46.50	0.00	3,048	15.15	0.00
47.00	0.00	3,042	15.15	0.00
47.50	0.00	3,037	15.15	0.00
48.00	0.00	3,032	15.15	0.00
48.50	0.00	3,027	15.15	0.00
49.00	0.00	3,022	15.15	0.00
49.50	0.00	3,018	15.14	0.00
50.00	0.00	3,014	15.14	0.00
50.50	0.00	3,010	15.14	0.00
51.00	0.00	3,006	15.14	0.00
51.50	0.00	3,002	15.14	0.00

Hydrograph for Pond PP1: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	2,998	15.14	0.00
52.50	0.00	2,995	15.14	0.00
53.00	0.00	2,992	15.14	0.00
53.50	0.00	2,989	15.14	0.00
54.00	0.00	2,986	15.14	0.00
54.50	0.00	2,983	15.14	0.00
55.00	0.00	2,980	15.14	0.00
55.50	0.00	2,977	15.14	0.00
56.00	0.00	2,975	15.14	0.00
56.50	0.00	2,972	15.14	0.00
57.00	0.00	2,970	15.14	0.00
57.50	0.00	2,968	15.14	0.00
58.00	0.00	2,965	15.13	0.00
58.50	0.00	2,963	15.13	0.00
59.00	0.00	2,961	15.13	0.00
59.50	0.00	2,959	15.13	0.00
60.00	0.00	2,957	15.13	0.00
60.50	0.00	2,955	15.13	0.00
61.00	0.00	2,954	15.13	0.00
61.50	0.00	2,952	15.13	0.00
62.00	0.00	2,950	15.13	0.00
62.50	0.00	2,948	15.13	0.00
63.00	0.00	2,947	15.13	0.00
63.50	0.00	2,945	15.13	0.00
64.00	0.00	2,944	15.13	0.00
64.50	0.00	2,942	15.13	0.00
65.00	0.00	2,941	15.13	0.00
65.50	0.00	2,939	15.13	0.00
66.00	0.00	2,938	15.13	0.00
66.50	0.00	2,937	15.13	0.00
67.00	0.00	2,935	15.13	0.00
67.50	0.00	2,934	15.13	0.00
68.00	0.00	2,933	15.13	0.00
68.50	0.00	2,932	15.13	0.00
69.00	0.00	2,931	15.13	0.00
69.50	0.00	2,929	15.13	0.00
70.00	0.00	2,928	15.13	0.00
70.50	0.00	2,927	15.13	0.00
71.00	0.00	2,926	15.13	0.00
71.50	0.00	2,925	15.13	0.00
72.00	0.00	2,924	15.13	0.00
72.50	0.00	2,923	15.13	0.00
73.00	0.00	2,922	15.13	0.00
73.50	0.00	2,921	15.13	0.00
74.00	0.00	2,920	15.13	0.00
74.50	0.00	2,919	15.13	0.00
75.00	0.00	2,919	15.13	0.00
75.50	0.00	2,918	15.13	0.00
76.00	0.00	2,917	15.13	0.00
76.50	0.00	2,916	15.12	0.00
77.00	0.00	2,915	15.12	0.00
77.50	0.00	2,914	15.12	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP1: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	2,914	15.12	0.00
78.50	0.00	2,913	15.12	0.00
79.00	0.00	2,912	15.12	0.00
79.50	0.00	2,911	15.12	0.00
80.00	0.00	2,911	15.12	0.00
80.50	0.00	2,910	15.12	0.00
81.00	0.00	2,909	15.12	0.00
81.50	0.00	2,909	15.12	0.00
82.00	0.00	2,908	15.12	0.00
82.50	0.00	2,907	15.12	0.00
83.00	0.00	2,907	15.12	0.00
83.50	0.00	2,906	15.12	0.00
84.00	0.00	2,906	15.12	0.00
84.50	0.00	2,905	15.12	0.00
85.00	0.00	2,904	15.12	0.00
85.50	0.00	2,904	15.12	0.00
86.00	0.00	2,903	15.12	0.00
86.50	0.00	2,903	15.12	0.00
87.00	0.00	2,902	15.12	0.00
87.50	0.00	2,902	15.12	0.00
88.00	0.00	2,901	15.12	0.00
88.50	0.00	2,900	15.12	0.00
89.00	0.00	2,900	15.12	0.00
89.50	0.00	2,899	15.12	0.00
90.00	0.00	2,899	15.12	0.00
90.50	0.00	2,898	15.12	0.00
91.00	0.00	2,898	15.12	0.00
91.50	0.00	2,898	15.12	0.00
92.00	0.00	2,897	15.12	0.00
92.50	0.00	2,897	15.12	0.00
93.00	0.00	2,896	15.12	0.00
93.50	0.00	2,896	15.12	0.00
94.00	0.00	2,895	15.12	0.00
94.50	0.00	2,895	15.12	0.00
95.00	0.00	2,894	15.12	0.00
95.50	0.00	2,894	15.12	0.00
96.00	0.00	2,894	15.12	0.00
96.50	0.00	2,893	15.12	0.00
97.00	0.00	2,893	15.12	0.00
97.50	0.00	2,892	15.12	0.00
98.00	0.00	2,892	15.12	0.00
98.50	0.00	2,892	15.12	0.00
99.00	0.00	2,891	15.12	0.00
99.50	0.00	2,891	15.12	0.00
100.00	0.00	2,891	15.12	0.00

Hydrograph for Pond PP2: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	13.55	0.00
0.50	0.04	33	13.55	0.00
1.00	0.12	171	13.57	0.00
1.50	0.17	425	13.60	0.00
2.00	0.20	752	13.63	0.00
2.50	0.22	1,131	13.67	0.00
3.00	0.24	1,550	13.72	0.00
3.50	0.26	2,003	13.76	0.00
4.00	0.28	2,488	13.82	0.00
4.50	0.29	3,002	13.87	0.00
5.00	0.31	3,544	13.93	0.00
5.50	0.32	4,113	13.99	0.00
6.00	0.34	4,711	14.05	0.00
6.50	0.38	5,365	14.12	0.00
7.00	0.43	6,100	14.20	0.00
7.50	0.48	6,912	14.29	0.01
8.00	0.53	7,777	14.38	0.04
8.50	0.57	8,677	14.48	0.06
9.00	0.64	9,636	14.58	0.08
9.50	0.79	10,754	14.70	0.10
10.00	0.95	12,122	14.85	0.12
10.50	1.18	13,808	15.03	0.14
11.00	1.79	16,191	15.29	0.18
11.50	3.18	18,639	15.55	2.07
12.00	10.93	22,604	15.97	7.64
12.50	3.60	22,335	15.94	7.19
13.00	1.93	20,837	15.78	0.00
13.50	1.26	20,187	15.71	3.91
14.00	1.00	17,684	15.45	1.12
14.50	0.83	17,470	15.42	0.94
15.00	0.67	17,272	15.40	0.79
15.50	0.60	17,113	15.38	0.67
16.00	0.56	17,015	15.37	0.60
16.50	0.51	16,939	15.37	0.55
17.00	0.46	16,868	15.36	0.50
17.50	0.42	16,794	15.35	0.46
18.00	0.37	16,719	15.34	0.42
18.50	0.35	16,657	15.34	0.38
19.00	0.34	16,618	15.33	0.36
19.50	0.33	16,590	15.33	0.35
20.00	0.32	16,565	15.33	0.33
20.50	0.31	16,541	15.32	0.32
21.00	0.30	16,518	15.32	0.31
21.50	0.28	16,494	15.32	0.30
22.00	0.27	16,469	15.31	0.29
22.50	0.26	16,444	15.31	0.28
23.00	0.25	16,418	15.31	0.26
23.50	0.24	16,392	15.31	0.25
24.00	0.13	16,299	15.30	0.22
24.50	0.00	16,074	15.27	0.16
25.00	0.00	15,789	15.24	0.16
25.50	0.00	15,510	15.21	0.15

Hydrograph for Pond PP2: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	15,235	15.18	0.15
26.50	0.00	14,965	15.15	0.15
27.00	0.00	14,700	15.13	0.15
27.50	0.00	14,440	15.10	0.14
28.00	0.00	14,184	15.07	0.14
28.50	0.00	13,933	15.04	0.14
29.00	0.00	13,686	15.02	0.14
29.50	0.00	13,445	14.99	0.13
30.00	0.00	13,207	14.97	0.13
30.50	0.00	12,975	14.94	0.13
31.00	0.00	12,747	14.92	0.13
31.50	0.00	12,524	14.89	0.12
32.00	0.00	12,306	14.87	0.12
32.50	0.00	12,092	14.85	0.12
33.00	0.00	11,883	14.82	0.11
33.50	0.00	11,679	14.80	0.11
34.00	0.00	11,479	14.78	0.11
34.50	0.00	11,284	14.76	0.11
35.00	0.00	11,094	14.74	0.10
35.50	0.00	10,908	14.72	0.10
36.00	0.00	10,727	14.70	0.10
36.50	0.00	10,551	14.68	0.10
37.00	0.00	10,380	14.66	0.09
37.50	0.00	10,213	14.64	0.09
38.00	0.00	10,050	14.63	0.09
38.50	0.00	9,893	14.61	0.09
39.00	0.00	9,740	14.59	0.08
39.50	0.00	9,592	14.58	0.08
40.00	0.00	9,448	14.56	0.08
40.50	0.00	9,309	14.55	0.08
41.00	0.00	9,175	14.53	0.07
41.50	0.00	9,046	14.52	0.07
42.00	0.00	8,921	14.51	0.07
42.50	0.00	8,801	14.49	0.07
43.00	0.00	8,685	14.48	0.06
43.50	0.00	8,575	14.47	0.06
44.00	0.00	8,468	14.46	0.06
44.50	0.00	8,367	14.45	0.06
45.00	0.00	8,270	14.44	0.05
45.50	0.00	8,177	14.43	0.05
46.00	0.00	8,090	14.42	0.05
46.50	0.00	8,007	14.41	0.04
47.00	0.00	7,929	14.40	0.04
47.50	0.00	7,856	14.39	0.04
48.00	0.00	7,789	14.38	0.04
48.50	0.00	7,725	14.38	0.03
49.00	0.00	7,667	14.37	0.03
49.50	0.00	7,612	14.37	0.03
50.00	0.00	7,560	14.36	0.03
50.50	0.00	7,512	14.36	0.03
51.00	0.00	7,467	14.35	0.02
51.50	0.00	7,425	14.35	0.02

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP2: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	7,386	14.34	0.02
52.50	0.00	7,349	14.34	0.02
53.00	0.00	7,315	14.33	0.02
53.50	0.00	7,282	14.33	0.02
54.00	0.00	7,251	14.33	0.02
54.50	0.00	7,223	14.32	0.02
55.00	0.00	7,195	14.32	0.01
55.50	0.00	7,169	14.32	0.01
56.00	0.00	7,145	14.32	0.01
56.50	0.00	7,122	14.31	0.01
57.00	0.00	7,100	14.31	0.01
57.50	0.00	7,079	14.31	0.01
58.00	0.00	7,060	14.31	0.01
58.50	0.00	7,041	14.30	0.01
59.00	0.00	7,023	14.30	0.01
59.50	0.00	7,006	14.30	0.01
60.00	0.00	6,990	14.30	0.01
60.50	0.00	6,974	14.30	0.01
61.00	0.00	6,959	14.30	0.01
61.50	0.00	6,945	14.29	0.01
62.00	0.00	6,931	14.29	0.01
62.50	0.00	6,918	14.29	0.01
63.00	0.00	6,906	14.29	0.01
63.50	0.00	6,894	14.29	0.01
64.00	0.00	6,882	14.29	0.01
64.50	0.00	6,871	14.29	0.01
65.00	0.00	6,861	14.29	0.01
65.50	0.00	6,850	14.28	0.01
66.00	0.00	6,841	14.28	0.01
66.50	0.00	6,831	14.28	0.01
67.00	0.00	6,822	14.28	0.00
67.50	0.00	6,813	14.28	0.00
68.00	0.00	6,805	14.28	0.00
68.50	0.00	6,796	14.28	0.00
69.00	0.00	6,788	14.28	0.00
69.50	0.00	6,781	14.28	0.00
70.00	0.00	6,773	14.28	0.00
70.50	0.00	6,766	14.28	0.00
71.00	0.00	6,759	14.27	0.00
71.50	0.00	6,752	14.27	0.00
72.00	0.00	6,746	14.27	0.00
72.50	0.00	6,739	14.27	0.00
73.00	0.00	6,733	14.27	0.00
73.50	0.00	6,727	14.27	0.00
74.00	0.00	6,722	14.27	0.00
74.50	0.00	6,716	14.27	0.00
75.00	0.00	6,711	14.27	0.00
75.50	0.00	6,705	14.27	0.00
76.00	0.00	6,700	14.27	0.00
76.50	0.00	6,695	14.27	0.00
77.00	0.00	6,690	14.27	0.00
77.50	0.00	6,685	14.27	0.00

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Hydrograph for Pond PP2: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	6,681	14.27	0.00
78.50	0.00	6,676	14.27	0.00
79.00	0.00	6,672	14.27	0.00
79.50	0.00	6,668	14.26	0.00
80.00	0.00	6,663	14.26	0.00
80.50	0.00	6,659	14.26	0.00
81.00	0.00	6,655	14.26	0.00
81.50	0.00	6,652	14.26	0.00
82.00	0.00	6,648	14.26	0.00
82.50	0.00	6,644	14.26	0.00
83.00	0.00	6,640	14.26	0.00
83.50	0.00	6,637	14.26	0.00
84.00	0.00	6,633	14.26	0.00
84.50	0.00	6,630	14.26	0.00
85.00	0.00	6,627	14.26	0.00
85.50	0.00	6,624	14.26	0.00
86.00	0.00	6,620	14.26	0.00
86.50	0.00	6,617	14.26	0.00
87.00	0.00	6,614	14.26	0.00
87.50	0.00	6,611	14.26	0.00
88.00	0.00	6,609	14.26	0.00
88.50	0.00	6,606	14.26	0.00
89.00	0.00	6,603	14.26	0.00
89.50	0.00	6,600	14.26	0.00
90.00	0.00	6,598	14.26	0.00
90.50	0.00	6,595	14.26	0.00
91.00	0.00	6,593	14.26	0.00
91.50	0.00	6,590	14.26	0.00
92.00	0.00	6,588	14.26	0.00
92.50	0.00	6,585	14.26	0.00
93.00	0.00	6,583	14.26	0.00
93.50	0.00	6,581	14.26	0.00
94.00	0.00	6,578	14.25	0.00
94.50	0.00	6,576	14.25	0.00
95.00	0.00	6,574	14.25	0.00
95.50	0.00	6,572	14.25	0.00
96.00	0.00	6,570	14.25	0.00
96.50	0.00	6,568	14.25	0.00
97.00	0.00	6,566	14.25	0.00
97.50	0.00	6,564	14.25	0.00
98.00	0.00	6,562	14.25	0.00
98.50	0.00	6,560	14.25	0.00
99.00	0.00	6,558	14.25	0.00
99.50	0.00	6,556	14.25	0.00
100.00	0.00	6,554	14.25	0.00

Hydrograph for Pond PP3: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	15.55	0.00
0.50	0.02	14	15.55	0.00
1.00	0.05	71	15.57	0.00
1.50	0.07	177	15.59	0.00
2.00	0.08	313	15.63	0.00
2.50	0.09	470	15.66	0.00
3.00	0.10	645	15.71	0.00
3.50	0.11	834	15.75	0.00
4.00	0.12	1,035	15.80	0.00
4.50	0.12	1,249	15.85	0.00
5.00	0.13	1,473	15.91	0.00
5.50	0.13	1,709	15.96	0.00
6.00	0.14	1,956	16.02	0.00
6.50	0.16	2,226	16.09	0.00
7.00	0.18	2,529	16.16	0.00
7.50	0.20	2,861	16.24	0.00
8.00	0.22	3,203	16.32	0.03
8.50	0.24	3,535	16.40	0.05
9.00	0.26	3,869	16.48	0.07
9.50	0.32	4,251	16.58	0.09
10.00	0.39	4,719	16.69	0.10
10.50	0.48	5,301	16.83	0.12
11.00	0.73	6,155	17.03	0.14
11.50	1.29	7,537	17.37	0.34
12.00	4.44	10,129	17.99	2.51
12.50	1.47	10,404	18.06	3.10
13.00	0.79	9,017	17.72	0.70
13.50	0.51	8,969	17.71	0.65
14.00	0.40	8,763	17.66	0.49
14.50	0.34	8,573	17.62	0.46
15.00	0.27	8,316	17.56	0.44
15.50	0.24	8,027	17.49	0.40
16.00	0.23	7,751	17.42	0.37
16.50	0.21	7,501	17.36	0.34
17.00	0.19	7,279	17.31	0.30
17.50	0.17	7,090	17.26	0.27
18.00	0.15	6,928	17.22	0.23
18.50	0.14	6,794	17.19	0.21
19.00	0.14	6,686	17.16	0.19
19.50	0.13	6,597	17.14	0.18
20.00	0.13	6,520	17.12	0.17
20.50	0.13	6,451	17.11	0.16
21.00	0.12	6,386	17.09	0.16
21.50	0.12	6,324	17.07	0.15
22.00	0.11	6,261	17.06	0.15
22.50	0.11	6,197	17.04	0.14
23.00	0.10	6,129	17.03	0.14
23.50	0.10	6,056	17.01	0.14
24.00	0.05	5,943	16.98	0.14
24.50	0.00	5,750	16.94	0.13
25.00	0.00	5,518	16.88	0.13
25.50	0.00	5,297	16.83	0.12

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Hydrograph for Pond PP3: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	5,087	16.78	0.11
26.50	0.00	4,887	16.73	0.11
27.00	0.00	4,698	16.68	0.10
27.50	0.00	4,519	16.64	0.10
28.00	0.00	4,350	16.60	0.09
28.50	0.00	4,193	16.56	0.08
29.00	0.00	4,045	16.53	0.08
29.50	0.00	3,908	16.49	0.07
30.00	0.00	3,782	16.46	0.07
30.50	0.00	3,666	16.43	0.06
31.00	0.00	3,561	16.41	0.06
31.50	0.00	3,466	16.39	0.05
32.00	0.00	3,382	16.37	0.04
32.50	0.00	3,309	16.35	0.04
33.00	0.00	3,246	16.33	0.03
33.50	0.00	3,193	16.32	0.03
34.00	0.00	3,147	16.31	0.02
34.50	0.00	3,107	16.30	0.02
35.00	0.00	3,073	16.29	0.02
35.50	0.00	3,043	16.28	0.02
36.00	0.00	3,017	16.28	0.01
36.50	0.00	2,994	16.27	0.01
37.00	0.00	2,973	16.27	0.01
37.50	0.00	2,955	16.26	0.01
38.00	0.00	2,938	16.26	0.01
38.50	0.00	2,923	16.25	0.01
39.00	0.00	2,910	16.25	0.01
39.50	0.00	2,897	16.25	0.01
40.00	0.00	2,886	16.25	0.01
40.50	0.00	2,876	16.24	0.01
41.00	0.00	2,867	16.24	0.01
41.50	0.00	2,858	16.24	0.00
42.00	0.00	2,850	16.24	0.00
42.50	0.00	2,842	16.24	0.00
43.00	0.00	2,836	16.23	0.00
43.50	0.00	2,829	16.23	0.00
44.00	0.00	2,823	16.23	0.00
44.50	0.00	2,817	16.23	0.00
45.00	0.00	2,812	16.23	0.00
45.50	0.00	2,807	16.23	0.00
46.00	0.00	2,803	16.23	0.00
46.50	0.00	2,798	16.22	0.00
47.00	0.00	2,794	16.22	0.00
47.50	0.00	2,790	16.22	0.00
48.00	0.00	2,786	16.22	0.00
48.50	0.00	2,783	16.22	0.00
49.00	0.00	2,780	16.22	0.00
49.50	0.00	2,776	16.22	0.00
50.00	0.00	2,773	16.22	0.00
50.50	0.00	2,770	16.22	0.00
51.00	0.00	2,768	16.22	0.00
51.50	0.00	2,765	16.22	0.00

Hydrograph for Pond PP3: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	2,763	16.22	0.00
52.50	0.00	2,760	16.22	0.00
53.00	0.00	2,758	16.22	0.00
53.50	0.00	2,756	16.21	0.00
54.00	0.00	2,754	16.21	0.00
54.50	0.00	2,752	16.21	0.00
55.00	0.00	2,750	16.21	0.00
55.50	0.00	2,748	16.21	0.00
56.00	0.00	2,746	16.21	0.00
56.50	0.00	2,744	16.21	0.00
57.00	0.00	2,743	16.21	0.00
57.50	0.00	2,741	16.21	0.00
58.00	0.00	2,739	16.21	0.00
58.50	0.00	2,738	16.21	0.00
59.00	0.00	2,736	16.21	0.00
59.50	0.00	2,735	16.21	0.00
60.00	0.00	2,734	16.21	0.00
60.50	0.00	2,732	16.21	0.00
61.00	0.00	2,731	16.21	0.00
61.50	0.00	2,730	16.21	0.00
62.00	0.00	2,729	16.21	0.00
62.50	0.00	2,728	16.21	0.00
63.00	0.00	2,726	16.21	0.00
63.50	0.00	2,725	16.21	0.00
64.00	0.00	2,724	16.21	0.00
64.50	0.00	2,723	16.21	0.00
65.00	0.00	2,722	16.21	0.00
65.50	0.00	2,721	16.21	0.00
66.00	0.00	2,720	16.21	0.00
66.50	0.00	2,719	16.21	0.00
67.00	0.00	2,719	16.21	0.00
67.50	0.00	2,718	16.21	0.00
68.00	0.00	2,717	16.21	0.00
68.50	0.00	2,716	16.20	0.00
69.00	0.00	2,715	16.20	0.00
69.50	0.00	2,714	16.20	0.00
70.00	0.00	2,714	16.20	0.00
70.50	0.00	2,713	16.20	0.00
71.00	0.00	2,712	16.20	0.00
71.50	0.00	2,712	16.20	0.00
72.00	0.00	2,711	16.20	0.00
72.50	0.00	2,710	16.20	0.00
73.00	0.00	2,709	16.20	0.00
73.50	0.00	2,709	16.20	0.00
74.00	0.00	2,708	16.20	0.00
74.50	0.00	2,708	16.20	0.00
75.00	0.00	2,707	16.20	0.00
75.50	0.00	2,706	16.20	0.00
76.00	0.00	2,706	16.20	0.00
76.50	0.00	2,705	16.20	0.00
77.00	0.00	2,705	16.20	0.00
77.50	0.00	2,704	16.20	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP3: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	2,704	16.20	0.00
78.50	0.00	2,703	16.20	0.00
79.00	0.00	2,703	16.20	0.00
79.50	0.00	2,702	16.20	0.00
80.00	0.00	2,702	16.20	0.00
80.50	0.00	2,701	16.20	0.00
81.00	0.00	2,701	16.20	0.00
81.50	0.00	2,700	16.20	0.00
82.00	0.00	2,700	16.20	0.00
82.50	0.00	2,699	16.20	0.00
83.00	0.00	2,699	16.20	0.00
83.50	0.00	2,699	16.20	0.00
84.00	0.00	2,698	16.20	0.00
84.50	0.00	2,698	16.20	0.00
85.00	0.00	2,697	16.20	0.00
85.50	0.00	2,697	16.20	0.00
86.00	0.00	2,697	16.20	0.00
86.50	0.00	2,696	16.20	0.00
87.00	0.00	2,696	16.20	0.00
87.50	0.00	2,695	16.20	0.00
88.00	0.00	2,695	16.20	0.00
88.50	0.00	2,695	16.20	0.00
89.00	0.00	2,694	16.20	0.00
89.50	0.00	2,694	16.20	0.00
90.00	0.00	2,694	16.20	0.00
90.50	0.00	2,693	16.20	0.00
91.00	0.00	2,693	16.20	0.00
91.50	0.00	2,693	16.20	0.00
92.00	0.00	2,692	16.20	0.00
92.50	0.00	2,692	16.20	0.00
93.00	0.00	2,692	16.20	0.00
93.50	0.00	2,691	16.20	0.00
94.00	0.00	2,691	16.20	0.00
94.50	0.00	2,691	16.20	0.00
95.00	0.00	2,691	16.20	0.00
95.50	0.00	2,690	16.20	0.00
96.00	0.00	2,690	16.20	0.00
96.50	0.00	2,690	16.20	0.00
97.00	0.00	2,689	16.20	0.00
97.50	0.00	2,689	16.20	0.00
98.00	0.00	2,689	16.20	0.00
98.50	0.00	2,689	16.20	0.00
99.00	0.00	2,688	16.20	0.00
99.50	0.00	2,688	16.20	0.00
100.00	0.00	2,688	16.20	0.00

Hydrograph for Pond PP4: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	13.01	0.00	0.00	0.00
0.50	0.22	196	13.01	0.00	0.00	0.00
1.00	0.73	1,046	13.02	0.00	0.00	0.00
1.50	1.04	2,633	13.05	0.00	0.00	0.00
2.00	1.25	4,690	13.07	0.00	0.00	0.00
2.50	1.41	7,077	13.11	0.00	0.00	0.00
3.00	1.53	9,723	13.14	0.00	0.00	0.00
3.50	1.65	12,584	13.18	0.00	0.00	0.00
4.00	1.74	15,636	13.23	0.00	0.00	0.00
4.50	1.84	18,859	13.27	0.00	0.00	0.00
5.00	1.92	22,244	13.32	0.00	0.00	0.00
5.50	2.01	25,781	13.37	0.00	0.00	0.00
6.00	2.11	29,488	13.42	0.00	0.00	0.00
6.50	2.37	33,520	13.47	0.00	0.00	0.00
7.00	2.65	38,034	13.53	0.00	0.00	0.00
7.50	2.93	42,714	13.60	0.38	0.25	0.13
8.00	3.22	46,648	13.65	1.40	0.93	0.47
8.50	3.50	49,358	13.69	2.31	1.54	0.77
9.00	3.88	51,208	13.72	3.02	2.01	1.01
9.50	4.78	52,936	13.74	3.73	2.49	1.24
10.00	5.78	54,935	13.77	4.61	3.07	1.54
10.50	7.12	57,253	13.80	5.71	3.80	1.90
11.00	10.78	61,241	13.85	7.76	5.17	2.59
11.50	18.92	69,591	13.97	12.67	8.45	4.22
12.00	66.21	101,430	14.41	37.09	24.72	12.36
12.50	22.72	108,747	14.51	43.71	29.14	14.57
13.00	11.94	86,026	14.20	16.19	16.19	0.00
13.50	7.74	78,117	14.09	12.27	12.27	0.00
14.00	6.10	71,281	13.99	9.17	9.17	0.00
14.50	5.10	66,616	13.93	7.22	7.22	0.00
15.00	4.14	63,146	13.88	5.87	5.87	0.00
15.50	3.68	60,485	13.84	4.90	4.90	0.00
16.00	3.40	57,317	13.80	5.70	3.83	1.87
16.50	3.12	54,204	13.76	4.28	2.85	1.43
17.00	2.84	52,518	13.73	3.55	2.37	1.18
17.50	2.55	51,393	13.72	3.09	2.06	1.03
18.00	2.28	50,501	13.71	2.74	1.83	0.91
18.50	2.16	49,807	13.70	2.48	1.65	0.83
19.00	2.09	49,334	13.69	2.30	1.54	0.77
19.50	2.02	48,999	13.69	2.18	1.45	0.73
20.00	1.95	48,732	13.68	2.09	1.39	0.70
20.50	1.88	48,497	13.68	2.01	1.34	0.67
21.00	1.81	48,276	13.68	1.93	1.29	0.64
21.50	1.74	48,062	13.67	1.86	1.24	0.62
22.00	1.67	47,852	13.67	1.79	1.19	0.60
22.50	1.60	47,642	13.67	1.72	1.14	0.57
23.00	1.53	47,429	13.66	1.65	1.10	0.55
23.50	1.46	47,215	13.66	1.58	1.05	0.53
24.00	0.83	46,608	13.65	1.39	0.92	0.46
24.50	0.00	45,225	13.63	0.98	0.66	0.33
25.00	0.00	43,787	13.61	0.62	0.41	0.21
25.50	0.00	42,863	13.60	0.41	0.27	0.14

Hydrograph for Pond PP4: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
26.00	0.00	42,233	13.59	0.29	0.19	0.10
26.50	0.00	41,784	13.59	0.21	0.14	0.07
27.00	0.00	41,452	13.58	0.16	0.11	0.05
27.50	0.00	41,199	13.58	0.12	0.08	0.04
28.00	0.00	41,003	13.58	0.10	0.06	0.03
28.50	0.00	40,847	13.57	0.08	0.05	0.03
29.00	0.00	40,721	13.57	0.06	0.04	0.02
29.50	0.00	40,618	13.57	0.05	0.03	0.02
30.00	0.00	40,533	13.57	0.04	0.03	0.01
30.50	0.00	40,461	13.57	0.04	0.02	0.01
31.00	0.00	40,401	13.57	0.03	0.02	0.01
31.50	0.00	40,349	13.57	0.03	0.02	0.01
32.00	0.00	40,305	13.57	0.02	0.02	0.01
32.50	0.00	40,266	13.57	0.02	0.01	0.01
33.00	0.00	40,232	13.57	0.02	0.01	0.01
33.50	0.00	40,203	13.56	0.02	0.01	0.01
34.00	0.00	40,176	13.56	0.01	0.01	0.00
34.50	0.00	40,153	13.56	0.01	0.01	0.00
35.00	0.00	40,133	13.56	0.01	0.01	0.00
35.50	0.00	40,114	13.56	0.01	0.01	0.00
36.00	0.00	40,097	13.56	0.01	0.01	0.00
36.50	0.00	40,082	13.56	0.01	0.01	0.00
37.00	0.00	40,069	13.56	0.01	0.00	0.00
37.50	0.00	40,056	13.56	0.01	0.00	0.00
38.00	0.00	40,045	13.56	0.01	0.00	0.00
38.50	0.00	40,035	13.56	0.01	0.00	0.00
39.00	0.00	40,026	13.56	0.00	0.00	0.00
39.50	0.00	40,017	13.56	0.00	0.00	0.00
40.00	0.00	40,009	13.56	0.00	0.00	0.00
40.50	0.00	40,002	13.56	0.00	0.00	0.00
41.00	0.00	39,995	13.56	0.00	0.00	0.00
41.50	0.00	39,989	13.56	0.00	0.00	0.00
42.00	0.00	39,983	13.56	0.00	0.00	0.00
42.50	0.00	39,977	13.56	0.00	0.00	0.00
43.00	0.00	39,972	13.56	0.00	0.00	0.00
43.50	0.00	39,968	13.56	0.00	0.00	0.00
44.00	0.00	39,963	13.56	0.00	0.00	0.00
44.50	0.00	39,959	13.56	0.00	0.00	0.00
45.00	0.00	39,955	13.56	0.00	0.00	0.00
45.50	0.00	39,952	13.56	0.00	0.00	0.00
46.00	0.00	39,948	13.56	0.00	0.00	0.00
46.50	0.00	39,945	13.56	0.00	0.00	0.00
47.00	0.00	39,942	13.56	0.00	0.00	0.00
47.50	0.00	39,939	13.56	0.00	0.00	0.00
48.00	0.00	39,937	13.56	0.00	0.00	0.00
48.50	0.00	39,934	13.56	0.00	0.00	0.00
49.00	0.00	39,932	13.56	0.00	0.00	0.00
49.50	0.00	39,929	13.56	0.00	0.00	0.00
50.00	0.00	39,927	13.56	0.00	0.00	0.00
50.50	0.00	39,925	13.56	0.00	0.00	0.00
51.00	0.00	39,923	13.56	0.00	0.00	0.00
51.50	0.00	39,921	13.56	0.00	0.00	0.00

Hydrograph for Pond PP4: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
52.00	0.00	39,920	13.56	0.00	0.00	0.00
52.50	0.00	39,918	13.56	0.00	0.00	0.00
53.00	0.00	39,916	13.56	0.00	0.00	0.00
53.50	0.00	39,915	13.56	0.00	0.00	0.00
54.00	0.00	39,914	13.56	0.00	0.00	0.00
54.50	0.00	39,912	13.56	0.00	0.00	0.00
55.00	0.00	39,911	13.56	0.00	0.00	0.00
55.50	0.00	39,910	13.56	0.00	0.00	0.00
56.00	0.00	39,908	13.56	0.00	0.00	0.00
56.50	0.00	39,907	13.56	0.00	0.00	0.00
57.00	0.00	39,906	13.56	0.00	0.00	0.00
57.50	0.00	39,905	13.56	0.00	0.00	0.00
58.00	0.00	39,904	13.56	0.00	0.00	0.00
58.50	0.00	39,903	13.56	0.00	0.00	0.00
59.00	0.00	39,902	13.56	0.00	0.00	0.00
59.50	0.00	39,901	13.56	0.00	0.00	0.00
60.00	0.00	39,900	13.56	0.00	0.00	0.00
60.50	0.00	39,899	13.56	0.00	0.00	0.00
61.00	0.00	39,899	13.56	0.00	0.00	0.00
61.50	0.00	39,898	13.56	0.00	0.00	0.00
62.00	0.00	39,897	13.56	0.00	0.00	0.00
62.50	0.00	39,896	13.56	0.00	0.00	0.00
63.00	0.00	39,896	13.56	0.00	0.00	0.00
63.50	0.00	39,895	13.56	0.00	0.00	0.00
64.00	0.00	39,894	13.56	0.00	0.00	0.00
64.50	0.00	39,894	13.56	0.00	0.00	0.00
65.00	0.00	39,893	13.56	0.00	0.00	0.00
65.50	0.00	39,893	13.56	0.00	0.00	0.00
66.00	0.00	39,892	13.56	0.00	0.00	0.00
66.50	0.00	39,892	13.56	0.00	0.00	0.00
67.00	0.00	39,891	13.56	0.00	0.00	0.00
67.50	0.00	39,890	13.56	0.00	0.00	0.00
68.00	0.00	39,890	13.56	0.00	0.00	0.00
68.50	0.00	39,890	13.56	0.00	0.00	0.00
69.00	0.00	39,889	13.56	0.00	0.00	0.00
69.50	0.00	39,889	13.56	0.00	0.00	0.00
70.00	0.00	39,888	13.56	0.00	0.00	0.00
70.50	0.00	39,888	13.56	0.00	0.00	0.00
71.00	0.00	39,887	13.56	0.00	0.00	0.00
71.50	0.00	39,887	13.56	0.00	0.00	0.00
72.00	0.00	39,887	13.56	0.00	0.00	0.00
72.50	0.00	39,886	13.56	0.00	0.00	0.00
73.00	0.00	39,886	13.56	0.00	0.00	0.00
73.50	0.00	39,886	13.56	0.00	0.00	0.00
74.00	0.00	39,885	13.56	0.00	0.00	0.00
74.50	0.00	39,885	13.56	0.00	0.00	0.00
75.00	0.00	39,885	13.56	0.00	0.00	0.00
75.50	0.00	39,884	13.56	0.00	0.00	0.00
76.00	0.00	39,884	13.56	0.00	0.00	0.00
76.50	0.00	39,884	13.56	0.00	0.00	0.00
77.00	0.00	39,883	13.56	0.00	0.00	0.00
77.50	0.00	39,883	13.56	0.00	0.00	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP4: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
78.00	0.00	39,883	13.56	0.00	0.00	0.00
78.50	0.00	39,882	13.56	0.00	0.00	0.00
79.00	0.00	39,882	13.56	0.00	0.00	0.00
79.50	0.00	39,882	13.56	0.00	0.00	0.00
80.00	0.00	39,882	13.56	0.00	0.00	0.00
80.50	0.00	39,881	13.56	0.00	0.00	0.00
81.00	0.00	39,881	13.56	0.00	0.00	0.00
81.50	0.00	39,881	13.56	0.00	0.00	0.00
82.00	0.00	39,881	13.56	0.00	0.00	0.00
82.50	0.00	39,881	13.56	0.00	0.00	0.00
83.00	0.00	39,880	13.56	0.00	0.00	0.00
83.50	0.00	39,880	13.56	0.00	0.00	0.00
84.00	0.00	39,880	13.56	0.00	0.00	0.00
84.50	0.00	39,880	13.56	0.00	0.00	0.00
85.00	0.00	39,880	13.56	0.00	0.00	0.00
85.50	0.00	39,879	13.56	0.00	0.00	0.00
86.00	0.00	39,879	13.56	0.00	0.00	0.00
86.50	0.00	39,879	13.56	0.00	0.00	0.00
87.00	0.00	39,879	13.56	0.00	0.00	0.00
87.50	0.00	39,879	13.56	0.00	0.00	0.00
88.00	0.00	39,879	13.56	0.00	0.00	0.00
88.50	0.00	39,878	13.56	0.00	0.00	0.00
89.00	0.00	39,878	13.56	0.00	0.00	0.00
89.50	0.00	39,878	13.56	0.00	0.00	0.00
90.00	0.00	39,878	13.56	0.00	0.00	0.00
90.50	0.00	39,878	13.56	0.00	0.00	0.00
91.00	0.00	39,878	13.56	0.00	0.00	0.00
91.50	0.00	39,877	13.56	0.00	0.00	0.00
92.00	0.00	39,877	13.56	0.00	0.00	0.00
92.50	0.00	39,877	13.56	0.00	0.00	0.00
93.00	0.00	39,877	13.56	0.00	0.00	0.00
93.50	0.00	39,877	13.56	0.00	0.00	0.00
94.00	0.00	39,877	13.56	0.00	0.00	0.00
94.50	0.00	39,877	13.56	0.00	0.00	0.00
95.00	0.00	39,877	13.56	0.00	0.00	0.00
95.50	0.00	39,876	13.56	0.00	0.00	0.00
96.00	0.00	39,876	13.56	0.00	0.00	0.00
96.50	0.00	39,876	13.56	0.00	0.00	0.00
97.00	0.00	39,876	13.56	0.00	0.00	0.00
97.50	0.00	39,876	13.56	0.00	0.00	0.00
98.00	0.00	39,876	13.56	0.00	0.00	0.00
98.50	0.00	39,876	13.56	0.00	0.00	0.00
99.00	0.00	39,876	13.56	0.00	0.00	0.00
99.50	0.00	39,876	13.56	0.00	0.00	0.00
100.00	0.00	39,875	13.56	0.00	0.00	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP5: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	16.25	0.00
0.50	0.02	16	16.25	0.00
1.00	0.05	80	16.26	0.00
1.50	0.07	193	16.27	0.00
2.00	0.09	338	16.28	0.00
2.50	0.10	506	16.30	0.00
3.00	0.11	692	16.32	0.00
3.50	0.12	892	16.34	0.00
4.00	0.12	1,106	16.36	0.00
4.50	0.13	1,332	16.39	0.00
5.00	0.14	1,569	16.41	0.00
5.50	0.14	1,818	16.44	0.00
6.00	0.15	2,079	16.46	0.00
6.50	0.17	2,364	16.49	0.00
7.00	0.19	2,684	16.53	0.00
7.50	0.21	3,010	16.56	0.03
8.00	0.23	3,262	16.58	0.12
8.50	0.25	3,410	16.60	0.19
9.00	0.28	3,499	16.61	0.23
9.50	0.34	3,589	16.62	0.28
10.00	0.41	3,698	16.63	0.35
10.50	0.51	3,831	16.64	0.43
11.00	0.78	4,076	16.67	0.59
11.50	1.41	4,609	16.72	1.01
12.00	4.65	6,496	16.92	2.96
12.50	1.45	6,577	16.92	3.06
13.00	0.80	4,796	16.74	1.17
13.50	0.52	4,267	16.69	0.74
14.00	0.42	3,978	16.66	0.53
14.50	0.35	3,817	16.64	0.42
15.00	0.28	3,697	16.63	0.35
15.50	0.25	3,606	16.62	0.29
16.00	0.23	3,547	16.61	0.26
16.50	0.21	3,504	16.61	0.24
17.00	0.20	3,464	16.61	0.22
17.50	0.18	3,426	16.60	0.20
18.00	0.16	3,387	16.60	0.18
18.50	0.15	3,355	16.59	0.16
19.00	0.14	3,334	16.59	0.15
19.50	0.14	3,320	16.59	0.15
20.00	0.13	3,307	16.59	0.14
20.50	0.13	3,295	16.59	0.14
21.00	0.13	3,284	16.59	0.13
21.50	0.12	3,272	16.59	0.13
22.00	0.12	3,261	16.58	0.12
22.50	0.11	3,250	16.58	0.12
23.00	0.11	3,238	16.58	0.11
23.50	0.10	3,226	16.58	0.11
24.00	0.05	3,183	16.58	0.09
24.50	0.00	3,094	16.57	0.06
25.00	0.00	3,011	16.56	0.03
25.50	0.00	2,963	16.55	0.02

Hydrograph for Pond PP5: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	2,931	16.55	0.01
26.50	0.00	2,910	16.55	0.01
27.00	0.00	2,894	16.55	0.01
27.50	0.00	2,883	16.55	0.01
28.00	0.00	2,874	16.54	0.00
28.50	0.00	2,868	16.54	0.00
29.00	0.00	2,862	16.54	0.00
29.50	0.00	2,858	16.54	0.00
30.00	0.00	2,855	16.54	0.00
30.50	0.00	2,852	16.54	0.00
31.00	0.00	2,849	16.54	0.00
31.50	0.00	2,847	16.54	0.00
32.00	0.00	2,845	16.54	0.00
32.50	0.00	2,844	16.54	0.00
33.00	0.00	2,843	16.54	0.00
33.50	0.00	2,841	16.54	0.00
34.00	0.00	2,840	16.54	0.00
34.50	0.00	2,840	16.54	0.00
35.00	0.00	2,839	16.54	0.00
35.50	0.00	2,838	16.54	0.00
36.00	0.00	2,837	16.54	0.00
36.50	0.00	2,837	16.54	0.00
37.00	0.00	2,836	16.54	0.00
37.50	0.00	2,836	16.54	0.00
38.00	0.00	2,835	16.54	0.00
38.50	0.00	2,835	16.54	0.00
39.00	0.00	2,835	16.54	0.00
39.50	0.00	2,834	16.54	0.00
40.00	0.00	2,834	16.54	0.00
40.50	0.00	2,834	16.54	0.00
41.00	0.00	2,834	16.54	0.00
41.50	0.00	2,833	16.54	0.00
42.00	0.00	2,833	16.54	0.00
42.50	0.00	2,833	16.54	0.00
43.00	0.00	2,833	16.54	0.00
43.50	0.00	2,833	16.54	0.00
44.00	0.00	2,832	16.54	0.00
44.50	0.00	2,832	16.54	0.00
45.00	0.00	2,832	16.54	0.00
45.50	0.00	2,832	16.54	0.00
46.00	0.00	2,832	16.54	0.00
46.50	0.00	2,832	16.54	0.00
47.00	0.00	2,832	16.54	0.00
47.50	0.00	2,832	16.54	0.00
48.00	0.00	2,831	16.54	0.00
48.50	0.00	2,831	16.54	0.00
49.00	0.00	2,831	16.54	0.00
49.50	0.00	2,831	16.54	0.00
50.00	0.00	2,831	16.54	0.00
50.50	0.00	2,831	16.54	0.00
51.00	0.00	2,831	16.54	0.00
51.50	0.00	2,831	16.54	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP5: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	2,831	16.54	0.00
52.50	0.00	2,831	16.54	0.00
53.00	0.00	2,831	16.54	0.00
53.50	0.00	2,831	16.54	0.00
54.00	0.00	2,831	16.54	0.00
54.50	0.00	2,831	16.54	0.00
55.00	0.00	2,831	16.54	0.00
55.50	0.00	2,830	16.54	0.00
56.00	0.00	2,830	16.54	0.00
56.50	0.00	2,830	16.54	0.00
57.00	0.00	2,830	16.54	0.00
57.50	0.00	2,830	16.54	0.00
58.00	0.00	2,830	16.54	0.00
58.50	0.00	2,830	16.54	0.00
59.00	0.00	2,830	16.54	0.00
59.50	0.00	2,830	16.54	0.00
60.00	0.00	2,830	16.54	0.00
60.50	0.00	2,830	16.54	0.00
61.00	0.00	2,830	16.54	0.00
61.50	0.00	2,830	16.54	0.00
62.00	0.00	2,830	16.54	0.00
62.50	0.00	2,830	16.54	0.00
63.00	0.00	2,830	16.54	0.00
63.50	0.00	2,830	16.54	0.00
64.00	0.00	2,830	16.54	0.00
64.50	0.00	2,830	16.54	0.00
65.00	0.00	2,830	16.54	0.00
65.50	0.00	2,830	16.54	0.00
66.00	0.00	2,830	16.54	0.00
66.50	0.00	2,830	16.54	0.00
67.00	0.00	2,830	16.54	0.00
67.50	0.00	2,830	16.54	0.00
68.00	0.00	2,830	16.54	0.00
68.50	0.00	2,830	16.54	0.00
69.00	0.00	2,830	16.54	0.00
69.50	0.00	2,830	16.54	0.00
70.00	0.00	2,830	16.54	0.00
70.50	0.00	2,830	16.54	0.00
71.00	0.00	2,830	16.54	0.00
71.50	0.00	2,830	16.54	0.00
72.00	0.00	2,830	16.54	0.00
72.50	0.00	2,830	16.54	0.00
73.00	0.00	2,830	16.54	0.00
73.50	0.00	2,830	16.54	0.00
74.00	0.00	2,830	16.54	0.00
74.50	0.00	2,830	16.54	0.00
75.00	0.00	2,830	16.54	0.00
75.50	0.00	2,830	16.54	0.00
76.00	0.00	2,830	16.54	0.00
76.50	0.00	2,830	16.54	0.00
77.00	0.00	2,830	16.54	0.00
77.50	0.00	2,830	16.54	0.00

Pre vs Post Rev. 3a

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Hydrograph for Pond PP5: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	2,830	16.54	0.00
78.50	0.00	2,830	16.54	0.00
79.00	0.00	2,830	16.54	0.00
79.50	0.00	2,829	16.54	0.00
80.00	0.00	2,829	16.54	0.00
80.50	0.00	2,829	16.54	0.00
81.00	0.00	2,829	16.54	0.00
81.50	0.00	2,829	16.54	0.00
82.00	0.00	2,829	16.54	0.00
82.50	0.00	2,829	16.54	0.00
83.00	0.00	2,829	16.54	0.00
83.50	0.00	2,829	16.54	0.00
84.00	0.00	2,829	16.54	0.00
84.50	0.00	2,829	16.54	0.00
85.00	0.00	2,829	16.54	0.00
85.50	0.00	2,829	16.54	0.00
86.00	0.00	2,829	16.54	0.00
86.50	0.00	2,829	16.54	0.00
87.00	0.00	2,829	16.54	0.00
87.50	0.00	2,829	16.54	0.00
88.00	0.00	2,829	16.54	0.00
88.50	0.00	2,829	16.54	0.00
89.00	0.00	2,829	16.54	0.00
89.50	0.00	2,829	16.54	0.00
90.00	0.00	2,829	16.54	0.00
90.50	0.00	2,829	16.54	0.00
91.00	0.00	2,829	16.54	0.00
91.50	0.00	2,829	16.54	0.00
92.00	0.00	2,829	16.54	0.00
92.50	0.00	2,829	16.54	0.00
93.00	0.00	2,829	16.54	0.00
93.50	0.00	2,829	16.54	0.00
94.00	0.00	2,829	16.54	0.00
94.50	0.00	2,829	16.54	0.00
95.00	0.00	2,829	16.54	0.00
95.50	0.00	2,829	16.54	0.00
96.00	0.00	2,829	16.54	0.00
96.50	0.00	2,829	16.54	0.00
97.00	0.00	2,829	16.54	0.00
97.50	0.00	2,829	16.54	0.00
98.00	0.00	2,829	16.54	0.00
98.50	0.00	2,829	16.54	0.00
99.00	0.00	2,829	16.54	0.00
99.50	0.00	2,829	16.54	0.00
100.00	0.00	2,829	16.54	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP6: POROUS PAVEMENT

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	16.00	0.00
0.50	0.02	19	16.00	0.00
1.00	0.06	94	16.01	0.00
1.50	0.09	227	16.02	0.00
2.00	0.10	398	16.03	0.00
2.50	0.12	595	16.05	0.00
3.00	0.13	813	16.06	0.00
3.50	0.14	1,049	16.08	0.00
4.00	0.14	1,299	16.10	0.00
4.50	0.15	1,564	16.12	0.00
5.00	0.16	1,842	16.15	0.00
5.50	0.16	2,133	16.17	0.00
6.00	0.17	2,438	16.19	0.00
6.50	0.20	2,770	16.22	0.00
7.00	0.22	3,143	16.25	0.00
7.50	0.24	3,521	16.28	0.04
8.00	0.26	3,827	16.31	0.13
8.50	0.29	4,031	16.32	0.20
9.00	0.32	4,169	16.33	0.26
9.50	0.40	4,303	16.34	0.31
10.00	0.48	4,459	16.36	0.39
10.50	0.59	4,645	16.37	0.48
11.00	0.91	4,975	16.40	0.66
11.50	1.64	5,687	16.45	1.10
12.00	5.42	8,196	16.65	3.17
12.50	1.69	8,566	16.68	3.53
13.00	0.93	6,336	16.51	1.57
13.50	0.61	5,453	16.44	0.95
14.00	0.49	4,987	16.40	0.66
14.50	0.41	4,725	16.38	0.52
15.00	0.33	4,538	16.36	0.42
15.50	0.30	4,399	16.35	0.36
16.00	0.27	4,307	16.34	0.31
16.50	0.25	4,239	16.34	0.28
17.00	0.23	4,180	16.33	0.26
17.50	0.20	4,123	16.33	0.24
18.00	0.18	4,068	16.32	0.21
18.50	0.17	4,022	16.32	0.20
19.00	0.17	3,989	16.32	0.18
19.50	0.16	3,966	16.32	0.17
20.00	0.16	3,946	16.31	0.17
20.50	0.15	3,929	16.31	0.16
21.00	0.15	3,912	16.31	0.16
21.50	0.14	3,895	16.31	0.15
22.00	0.13	3,879	16.31	0.14
22.50	0.13	3,863	16.31	0.14
23.00	0.12	3,846	16.31	0.13
23.50	0.12	3,830	16.31	0.13
24.00	0.06	3,775	16.30	0.11
24.50	0.00	3,661	16.29	0.08
25.00	0.00	3,552	16.28	0.05
25.50	0.00	3,482	16.28	0.03

Hydrograph for Pond PP6: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.00	3,434	16.27	0.02
26.50	0.00	3,401	16.27	0.02
27.00	0.00	3,376	16.27	0.01
27.50	0.00	3,357	16.27	0.01
28.00	0.00	3,342	16.27	0.01
28.50	0.00	3,331	16.27	0.01
29.00	0.00	3,322	16.27	0.00
29.50	0.00	3,314	16.26	0.00
30.00	0.00	3,308	16.26	0.00
30.50	0.00	3,302	16.26	0.00
31.00	0.00	3,298	16.26	0.00
31.50	0.00	3,294	16.26	0.00
32.00	0.00	3,291	16.26	0.00
32.50	0.00	3,288	16.26	0.00
33.00	0.00	3,285	16.26	0.00
33.50	0.00	3,283	16.26	0.00
34.00	0.00	3,281	16.26	0.00
34.50	0.00	3,280	16.26	0.00
35.00	0.00	3,278	16.26	0.00
35.50	0.00	3,277	16.26	0.00
36.00	0.00	3,276	16.26	0.00
36.50	0.00	3,274	16.26	0.00
37.00	0.00	3,273	16.26	0.00
37.50	0.00	3,273	16.26	0.00
38.00	0.00	3,272	16.26	0.00
38.50	0.00	3,271	16.26	0.00
39.00	0.00	3,270	16.26	0.00
39.50	0.00	3,270	16.26	0.00
40.00	0.00	3,269	16.26	0.00
40.50	0.00	3,269	16.26	0.00
41.00	0.00	3,268	16.26	0.00
41.50	0.00	3,268	16.26	0.00
42.00	0.00	3,267	16.26	0.00
42.50	0.00	3,267	16.26	0.00
43.00	0.00	3,266	16.26	0.00
43.50	0.00	3,266	16.26	0.00
44.00	0.00	3,266	16.26	0.00
44.50	0.00	3,265	16.26	0.00
45.00	0.00	3,265	16.26	0.00
45.50	0.00	3,265	16.26	0.00
46.00	0.00	3,265	16.26	0.00
46.50	0.00	3,264	16.26	0.00
47.00	0.00	3,264	16.26	0.00
47.50	0.00	3,264	16.26	0.00
48.00	0.00	3,264	16.26	0.00
48.50	0.00	3,264	16.26	0.00
49.00	0.00	3,263	16.26	0.00
49.50	0.00	3,263	16.26	0.00
50.00	0.00	3,263	16.26	0.00
50.50	0.00	3,263	16.26	0.00
51.00	0.00	3,263	16.26	0.00
51.50	0.00	3,263	16.26	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

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Hydrograph for Pond PP6: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.00	3,263	16.26	0.00
52.50	0.00	3,262	16.26	0.00
53.00	0.00	3,262	16.26	0.00
53.50	0.00	3,262	16.26	0.00
54.00	0.00	3,262	16.26	0.00
54.50	0.00	3,262	16.26	0.00
55.00	0.00	3,262	16.26	0.00
55.50	0.00	3,262	16.26	0.00
56.00	0.00	3,262	16.26	0.00
56.50	0.00	3,262	16.26	0.00
57.00	0.00	3,262	16.26	0.00
57.50	0.00	3,261	16.26	0.00
58.00	0.00	3,261	16.26	0.00
58.50	0.00	3,261	16.26	0.00
59.00	0.00	3,261	16.26	0.00
59.50	0.00	3,261	16.26	0.00
60.00	0.00	3,261	16.26	0.00
60.50	0.00	3,261	16.26	0.00
61.00	0.00	3,261	16.26	0.00
61.50	0.00	3,261	16.26	0.00
62.00	0.00	3,261	16.26	0.00
62.50	0.00	3,261	16.26	0.00
63.00	0.00	3,261	16.26	0.00
63.50	0.00	3,261	16.26	0.00
64.00	0.00	3,261	16.26	0.00
64.50	0.00	3,261	16.26	0.00
65.00	0.00	3,261	16.26	0.00
65.50	0.00	3,261	16.26	0.00
66.00	0.00	3,261	16.26	0.00
66.50	0.00	3,260	16.26	0.00
67.00	0.00	3,260	16.26	0.00
67.50	0.00	3,260	16.26	0.00
68.00	0.00	3,260	16.26	0.00
68.50	0.00	3,260	16.26	0.00
69.00	0.00	3,260	16.26	0.00
69.50	0.00	3,260	16.26	0.00
70.00	0.00	3,260	16.26	0.00
70.50	0.00	3,260	16.26	0.00
71.00	0.00	3,260	16.26	0.00
71.50	0.00	3,260	16.26	0.00
72.00	0.00	3,260	16.26	0.00
72.50	0.00	3,260	16.26	0.00
73.00	0.00	3,260	16.26	0.00
73.50	0.00	3,260	16.26	0.00
74.00	0.00	3,260	16.26	0.00
74.50	0.00	3,260	16.26	0.00
75.00	0.00	3,260	16.26	0.00
75.50	0.00	3,260	16.26	0.00
76.00	0.00	3,260	16.26	0.00
76.50	0.00	3,260	16.26	0.00
77.00	0.00	3,260	16.26	0.00
77.50	0.00	3,260	16.26	0.00

Pre vs Post Rev. 3a

NOAA 24-hr D 100-Year Future Adj Rainfall=11.48", P2=3.99"

Prepared by Bohler Engineering, PC

Printed 8/11/2026

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Hydrograph for Pond PP6: POROUS PAVEMENT (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.00	3,260	16.26	0.00
78.50	0.00	3,260	16.26	0.00
79.00	0.00	3,260	16.26	0.00
79.50	0.00	3,260	16.26	0.00
80.00	0.00	3,260	16.26	0.00
80.50	0.00	3,260	16.26	0.00
81.00	0.00	3,260	16.26	0.00
81.50	0.00	3,260	16.26	0.00
82.00	0.00	3,260	16.26	0.00
82.50	0.00	3,260	16.26	0.00
83.00	0.00	3,260	16.26	0.00
83.50	0.00	3,260	16.26	0.00
84.00	0.00	3,260	16.26	0.00
84.50	0.00	3,260	16.26	0.00
85.00	0.00	3,260	16.26	0.00
85.50	0.00	3,260	16.26	0.00
86.00	0.00	3,260	16.26	0.00
86.50	0.00	3,260	16.26	0.00
87.00	0.00	3,260	16.26	0.00
87.50	0.00	3,260	16.26	0.00
88.00	0.00	3,260	16.26	0.00
88.50	0.00	3,260	16.26	0.00
89.00	0.00	3,260	16.26	0.00
89.50	0.00	3,259	16.26	0.00
90.00	0.00	3,259	16.26	0.00
90.50	0.00	3,259	16.26	0.00
91.00	0.00	3,259	16.26	0.00
91.50	0.00	3,259	16.26	0.00
92.00	0.00	3,259	16.26	0.00
92.50	0.00	3,259	16.26	0.00
93.00	0.00	3,259	16.26	0.00
93.50	0.00	3,259	16.26	0.00
94.00	0.00	3,259	16.26	0.00
94.50	0.00	3,259	16.26	0.00
95.00	0.00	3,259	16.26	0.00
95.50	0.00	3,259	16.26	0.00
96.00	0.00	3,259	16.26	0.00
96.50	0.00	3,259	16.26	0.00
97.00	0.00	3,259	16.26	0.00
97.50	0.00	3,259	16.26	0.00
98.00	0.00	3,259	16.26	0.00
98.50	0.00	3,259	16.26	0.00
99.00	0.00	3,259	16.26	0.00
99.50	0.00	3,259	16.26	0.00
100.00	0.00	3,259	16.26	0.00

Summary for Pond CW1A: COSNTRUCTED WETLANDS 1A

[93] Warning: Storage range exceeded by 0.14'

[80] Warning: Exceeded Pond PP4 by 3.14' @ 99.99 hrs (60.31 cfs 19,078,777 cf)

[80] Warning: Exceeded Pond PP6 by 0.01' @ 11.96 hrs (0.67 cfs 935 cf)

Inflow Area = 340,639 sf, 87.47% Impervious, Inflow Depth = 16.05" for 150% 100-Year Future Adj event
 Inflow = 162.06 cfs @ 12.10 hrs, Volume= 455,554 cf
 Outflow = 148.78 cfs @ 12.09 hrs, Volume= 286,545 cf, Atten= 8%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond CW1B : COSNTRUCTED WETLANDS 1B
 Secondary = 148.78 cfs @ 12.09 hrs, Volume= 286,545 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.14' @ 12.09 hrs Surf.Area= 33,578 sf Storage= 178,959 cf

Plug-Flow detention time= 240.1 min calculated for 286,517 cf (63% of inflow)
 Center-of-Mass det. time= 119.1 min (861.9 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	178,959 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

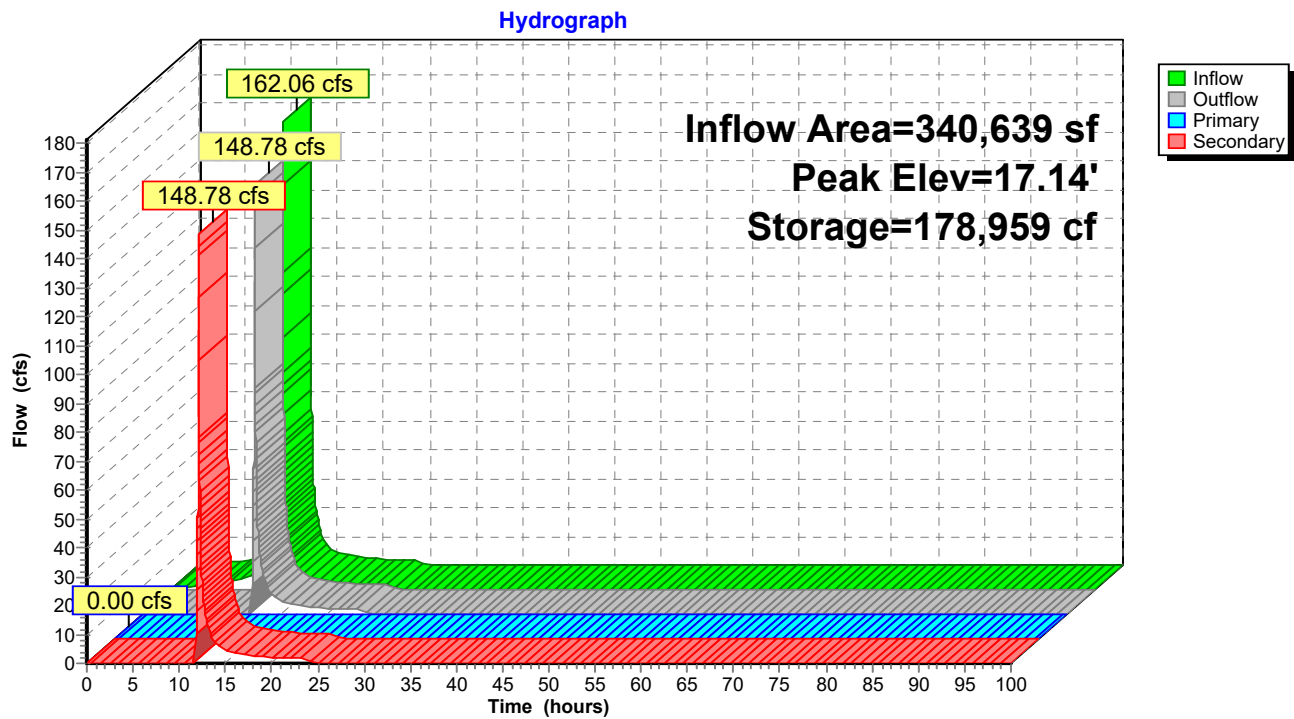
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	9,896	0	0
10.00	12,342	11,119	11,119
11.00	17,531	14,937	26,056
12.00	20,148	18,840	44,895
13.00	22,789	21,469	66,364
14.00	25,436	24,113	90,476
15.00	28,130	26,783	117,259
16.00	30,846	29,488	146,747
17.00	33,578	32,212	178,959

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	36.0" Round Culvert X 0.00 L= 634.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0016 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Secondary	16.70'	200.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

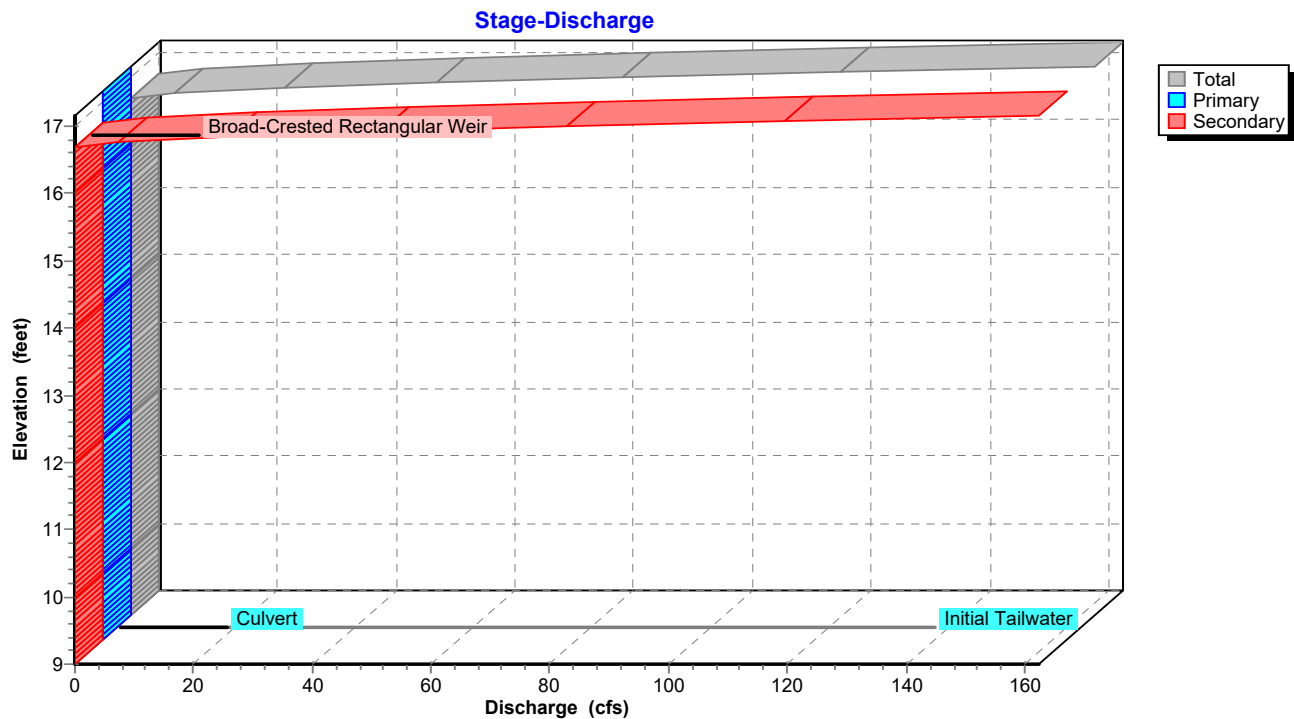
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.00' TW=9.00' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=146.11 cfs @ 12.09 hrs HW=17.13' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 146.11 cfs @ 1.69 fps)

Pond CW1A: COSNTRUCTED WETLANDS 1A



Pond CW1A: COSNTRUCTED WETLANDS 1A



Summary for Pond CW1B: COSNTRUCTED WETLANDS 1B

Inflow Area = 1,055,459 sf, 90.30% Impervious, Inflow Depth = 13.86" for 150% 100-Year Future Adj event
 Inflow = 454.39 cfs @ 12.10 hrs, Volume= 1,218,882 cf
 Outflow = 413.88 cfs @ 12.09 hrs, Volume= 1,063,720 cf, Atten= 9%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond CW1C : COSNTRUCTED WETLANDS 1C
 Secondary = 413.88 cfs @ 12.09 hrs, Volume= 1,063,720 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Peak Elev= 17.14' @ 12.09 hrs Surf.Area= 28,684 sf Storage= 167,035 cf

Plug-Flow detention time= 113.1 min calculated for 1,063,613 cf (87% of inflow)

Center-of-Mass det. time= 46.2 min (860.0 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	167,035 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,745	0	0
10.00	14,274	13,510	13,510
11.00	17,386	15,830	29,340
12.00	19,256	18,321	47,661
13.00	21,027	20,142	67,802
14.00	22,877	21,952	89,754
15.00	24,782	23,830	113,584
16.00	26,718	25,750	139,334
17.00	28,684	27,701	167,035

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert X 0.00 L= 312.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0032 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	16.58'	375.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

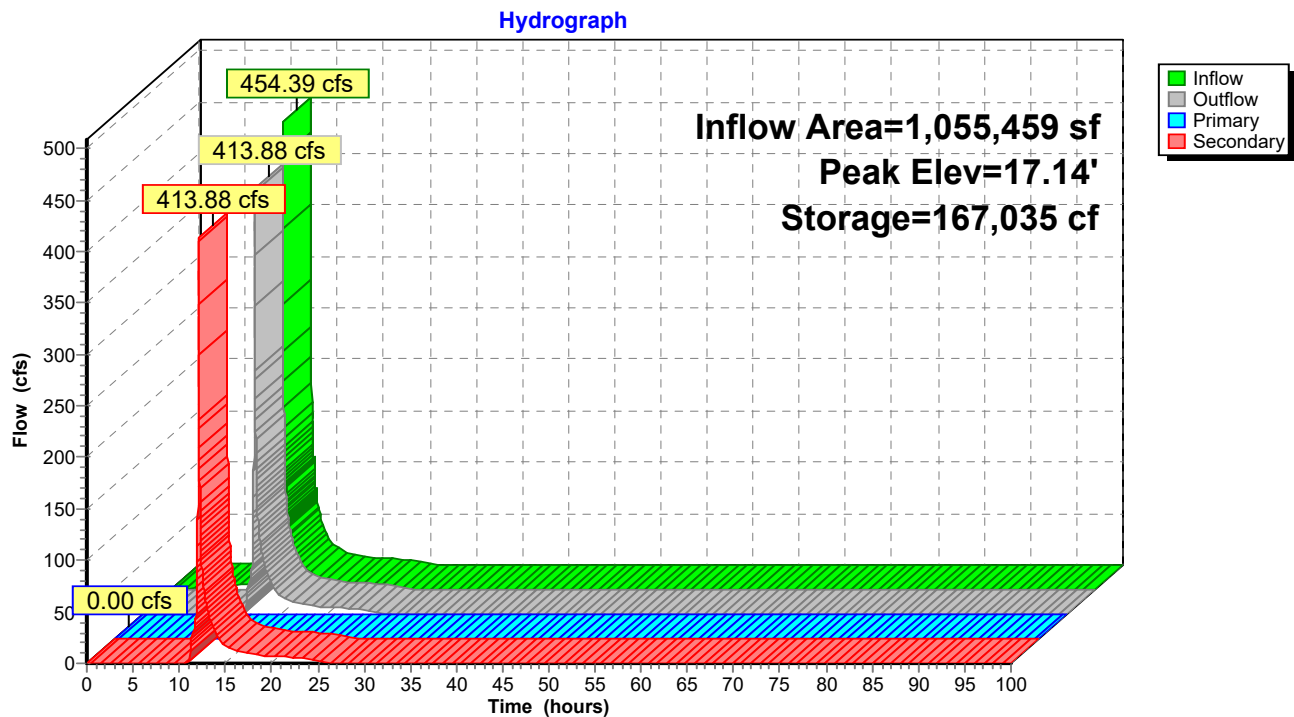
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.00' TW=9.00' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.00 cfs)

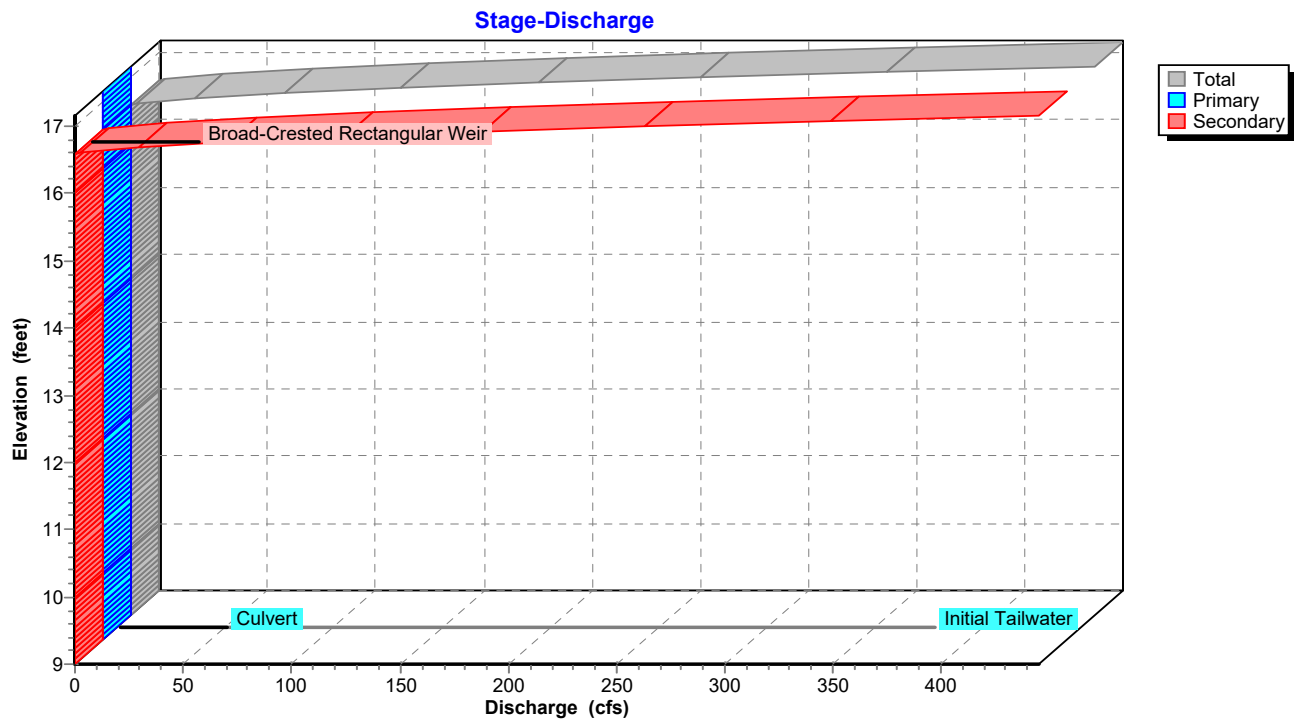
Secondary OutFlow Max=410.54 cfs @ 12.09 hrs HW=17.13' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 410.54 cfs @ 1.98 fps)

Pond CW1B: COSNTRUCTED WETLANDS 1B



Pond CW1B: COSNTRUCTED WETLANDS 1B



Summary for Pond CW1C: COSNTRUCTED WETLANDS 1C

Inflow Area = 1,271,952 sf, 88.94% Impervious, Inflow Depth = 12.00" for 150% 100-Year Future Adj event
 Inflow = 542.98 cfs @ 12.10 hrs, Volume= 1,271,515 cf
 Outflow = 533.13 cfs @ 12.10 hrs, Volume= 1,206,055 cf, Atten= 2%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond CW1D : COSNTRUCTED WETLANDS 1D
 Secondary = 533.13 cfs @ 12.10 hrs, Volume= 1,206,055 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.95' @ 12.10 hrs Surf.Area= 14,943 sf Storage= 65,461 cf

Plug-Flow detention time= 52.4 min calculated for 1,206,055 cf (95% of inflow)
 Center-of-Mass det. time= 15.2 min (879.0 - 863.8)

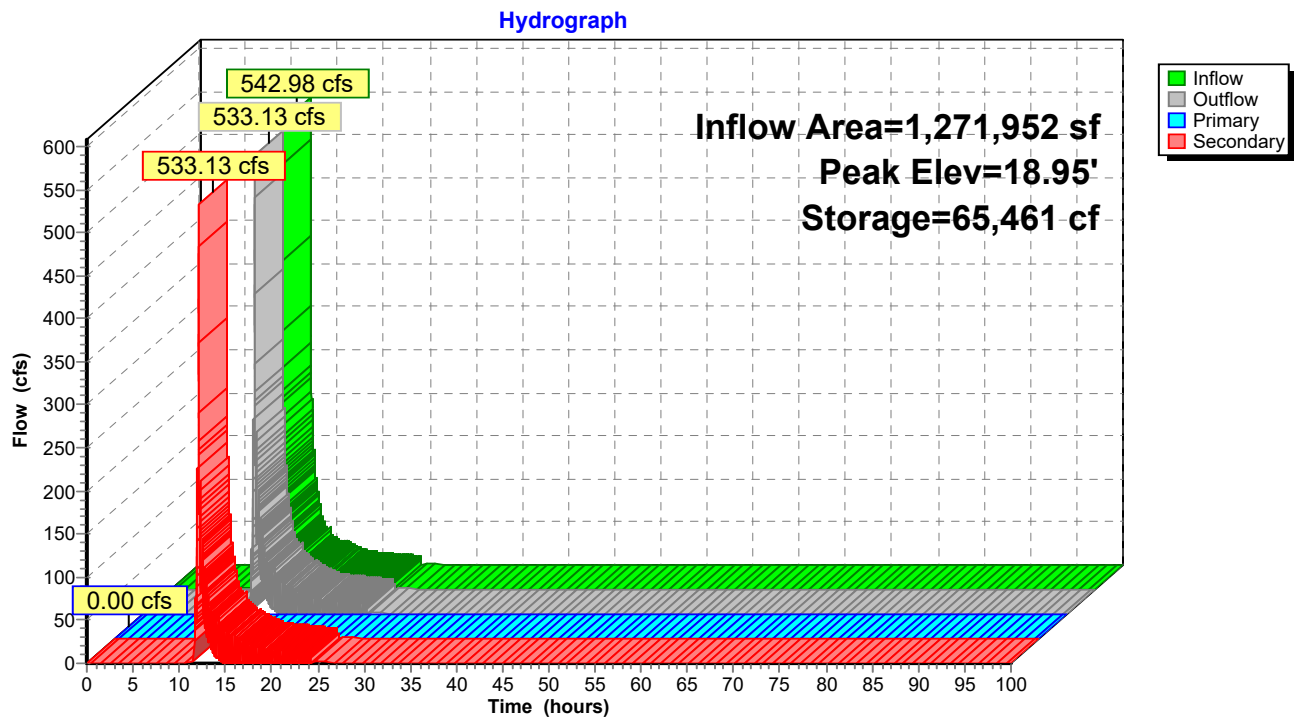
Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	65,461 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	1,932	0	0
10.00	2,892	2,412	2,412
11.00	5,159	4,026	6,438
12.00	6,573	5,866	12,304
13.00	8,107	7,340	19,644
14.00	9,727	8,917	28,561
15.00	11,412	10,570	39,130
16.00	13,153	12,283	51,413
17.00	14,943	14,048	65,461

Device	Routing	Invert	Outlet Devices
#1	Primary	9.00'	48.0" Round Culvert X 0.00 L= 1,202.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.00' / 8.00' S= 0.0008 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Secondary	17.10'	80.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

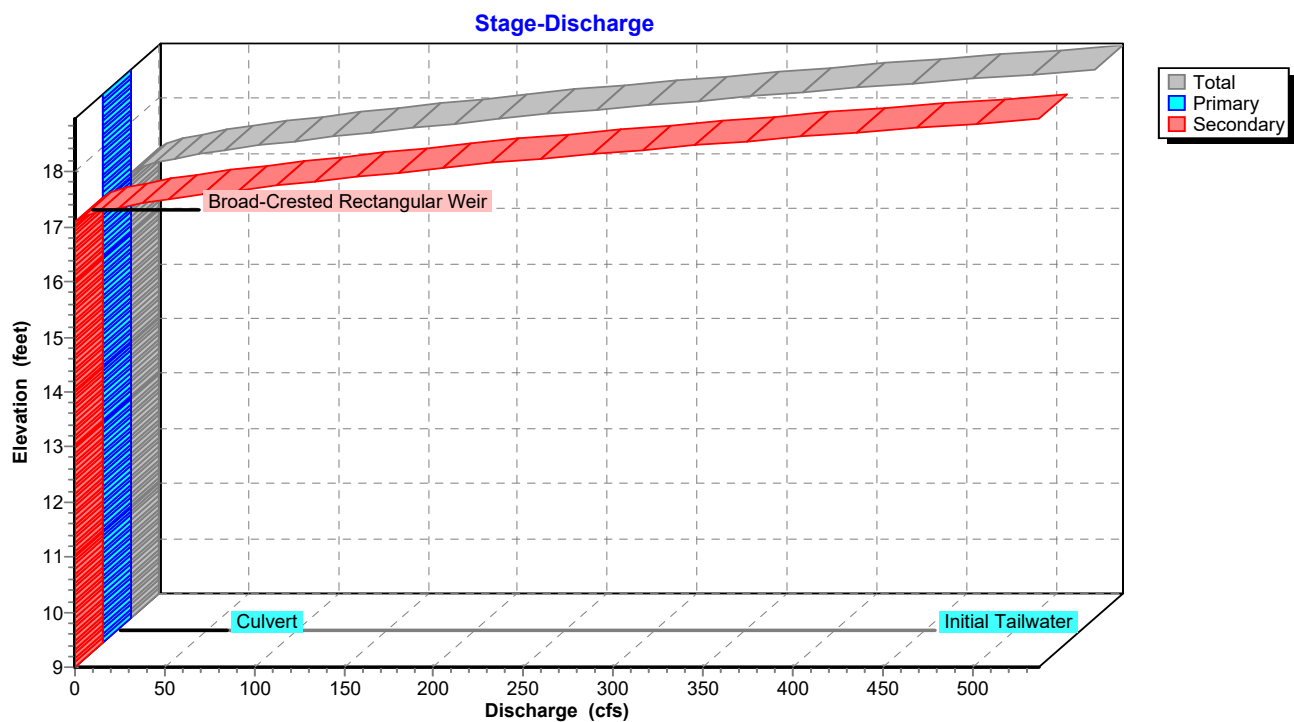
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.00' TW=9.00' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=532.06 cfs @ 12.10 hrs HW=18.95' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir(Weir Controls 532.06 cfs @ 3.59 fps)

Pond CW1C: COSNTRUCTED WETLANDS 1C



Pond CW1C: COSNTRUCTED WETLANDS 1C



Summary for Pond CW1D: COSNTRUCTED WETLANDS 1D

Inflow Area = 1,690,999 sf, 89.23% Impervious, Inflow Depth = 12.96" for 150% 100-Year Future Adj event
 Inflow = 729.10 cfs @ 12.10 hrs, Volume= 1,825,678 cf
 Outflow = 713.12 cfs @ 12.10 hrs, Volume= 1,656,689 cf, Atten= 2%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link P1A :
 Secondary = 713.12 cfs @ 12.10 hrs, Volume= 1,656,689 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.84' @ 12.10 hrs Surf.Area= 33,127 sf Storage= 183,944 cf

Plug-Flow detention time= 94.3 min calculated for 1,656,689 cf (91% of inflow)
 Center-of-Mass det. time= 36.0 min (882.0 - 846.0)

Volume	Invert	Avail.Storage	Storage Description
#1	9.00'	183,944 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.00	12,560	0	0
10.00	14,386	13,473	13,473
11.00	18,661	16,524	29,997
12.00	20,852	19,757	49,753
13.00	23,139	21,996	71,749
14.00	25,520	24,330	96,078
15.00	27,994	26,757	122,835
16.00	30,548	29,271	152,106
17.00	33,127	31,838	183,944

Device	Routing	Invert	Outlet Devices
#1	Primary	8.90'	48.0" Round Culvert X 0.00 L= 72.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.90' / 8.54' S= 0.0050 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 12.57 sf
#2	Device 1	9.00'	5.0" W x 3.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	10.73'	60.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.87'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Secondary	16.54'	180.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

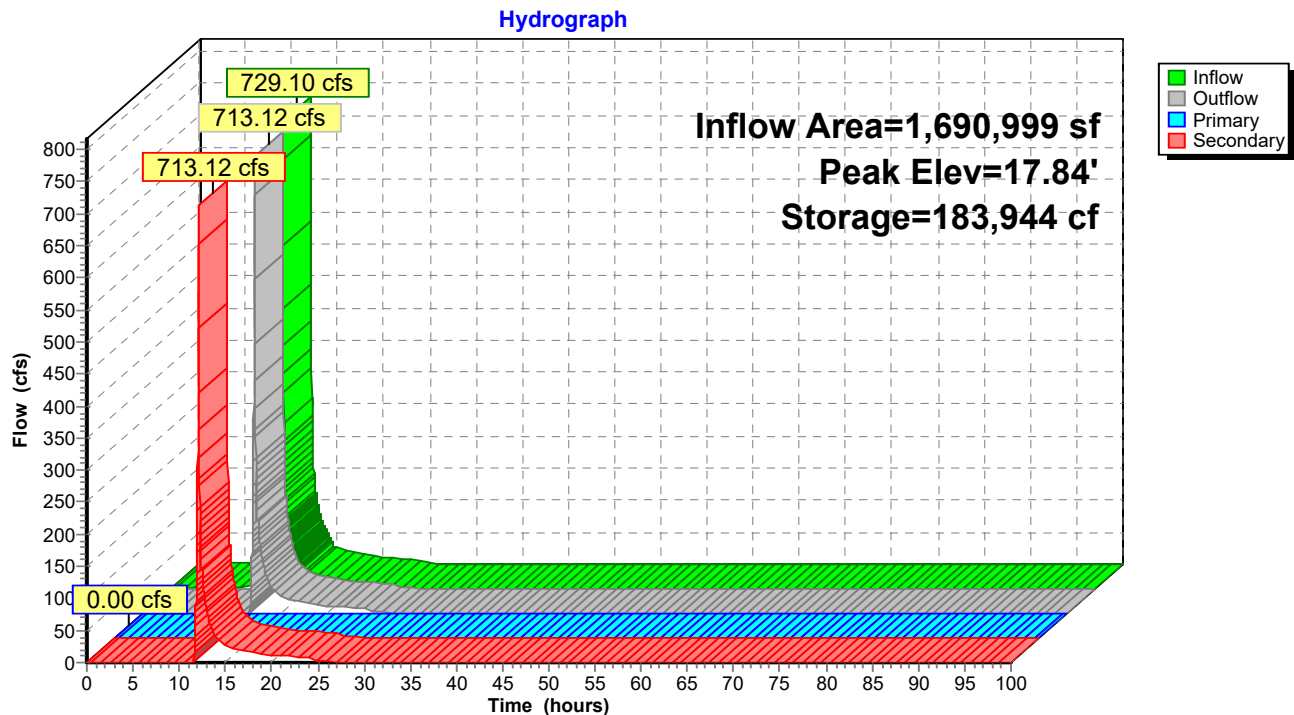
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.00' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Controls 0.00 cfs)
- 2=Orifice/Grate (Controls 0.00 cfs)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

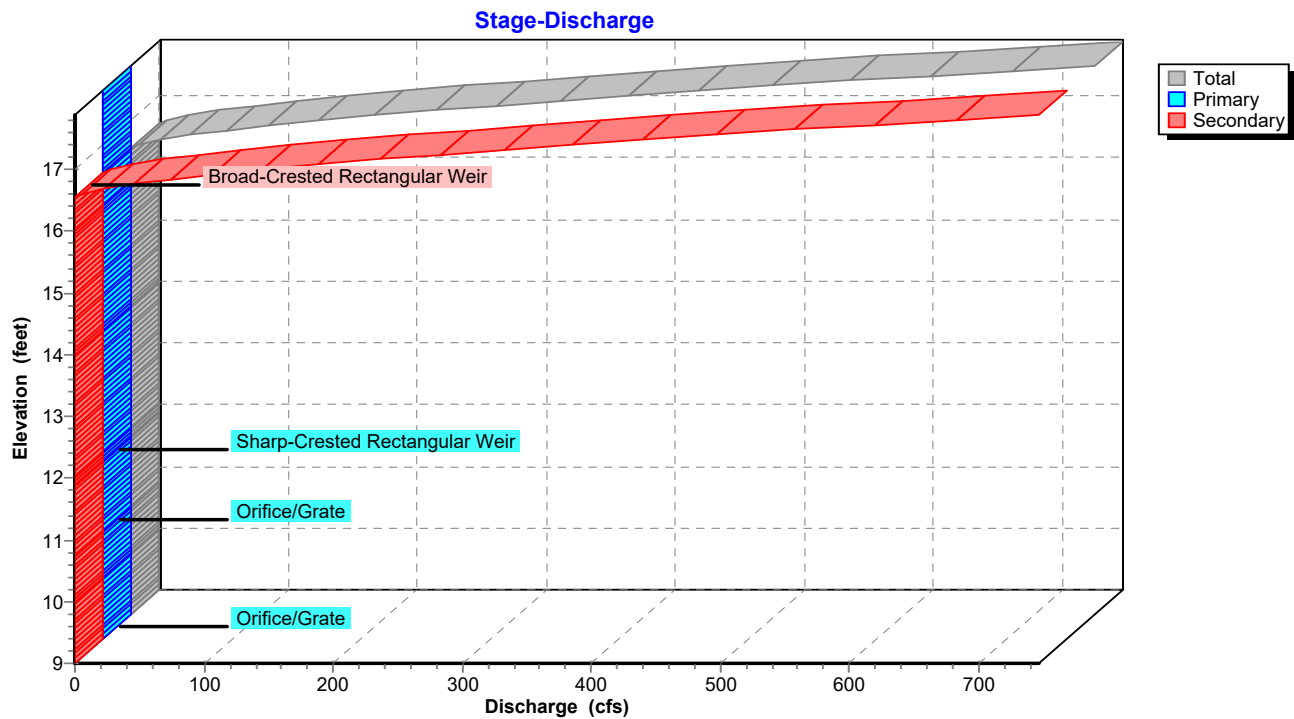
Secondary OutFlow Max=711.34 cfs @ 12.10 hrs HW=17.84' (Free Discharge)

- 5=Broad-Crested Rectangular Weir(Weir Controls 711.34 cfs @ 3.05 fps)

Pond CW1D: COSNTRUCTED WETLANDS 1D



Pond CW1D: COSNTRUCTED WETLANDS 1D



Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
MIDDLESEX CO., SAYREVILLE BORO	45.9	1.48

Project Name: Hanover Bordentown

Description:

Analysis Date: 05/09/25

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	14.45	Open space	PSAMMENTS	0.0	-
2	1.26	Woods	PSAMMENTS	0.0	-
3	1.35	Impervious areas	PSAMMENTS	0.0	-
4	7.65	Open space	Atsion	0.0	-
5	0.78	Gravel, dirt	Atsion	0.0	-
6	11.57	Woods	Atsion	0.0	-
7	23.97	Impervious areas	Atsion	0.0	-
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	61.0			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				0.0	-

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	9.82	Open space	PSAMMENTS	0.0	-
2	11.21	Woods	PSAMMENTS	0.0	-
3	34.92	Impervious areas	PSAMMENTS	0.0	-
4	4.68	Open space	Atsion	0.0	-
5	0.4	Woods	Atsion	0.0	-
6	0		Atsion		
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	61.0			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				0.0	-

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve = 100%

Post-Development Annual Recharge Deficit= 0

Recharge Efficiency Parameters Calculations (area averages)

RWC= 1.93	(in)	DRWC= 1.93	(in)
ERWC = 0.50	(in)	EDRWC= 0.50	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Total Impervious Area (sq.ft) 1,521,115

(cubic feet)

GW Mounding Summary Table

	Discarded Volume (WQ Volume)	Infiltration Area	Exfiltration Rate	Duration of infiltration period
Basin 1	9,088	24,336	0.5	8.96

Duration of infiltration period, t (hr) = $\frac{\text{Discarded Volume via Exfiltration (cf)} \times 12 \text{ in/ft}}{\text{Infiltration area (sf)} \times \text{Exfiltration rate (in/hr)}}$

R	t	Kh	X	Y	Mound Height
0.5	8.96	2.50	29	208	2.429
0.5	8.96	2.50	208	29	2.429

Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the coastal plain; Kh=R outside the coastal plain
29.000	x	1/2 length of basin (x direction, in feet)
208.000	y	1/2 width of basin (y direction, in feet)
8.96	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

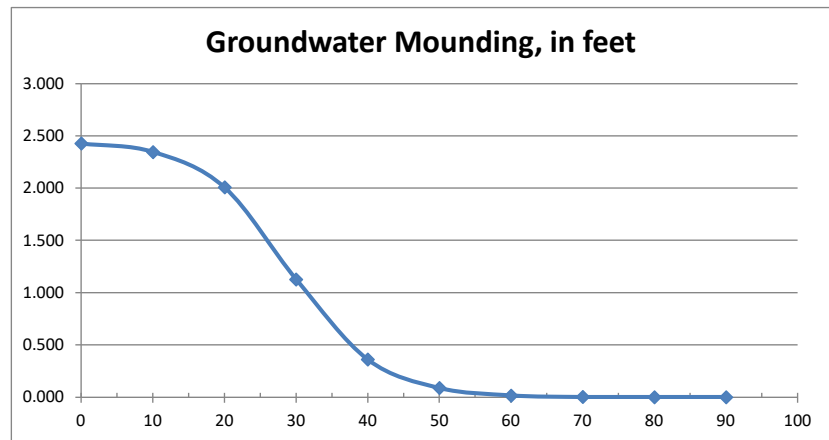
12.429	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.429	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Distance from
center of basin in x
Ground-water
Mounding, in feet direction, in feet

2.429	0
2.348	10
2.009	20
1.128	30
0.361	40
0.088	50
0.017	60
0.003	70
0.001	80
0.001	90



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the coastal plain; Kh=R outside the coastal plain
208.000	x	1/2 length of basin (x direction, in feet)
29.000	y	1/2 width of basin (y direction, in feet)
8.96	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

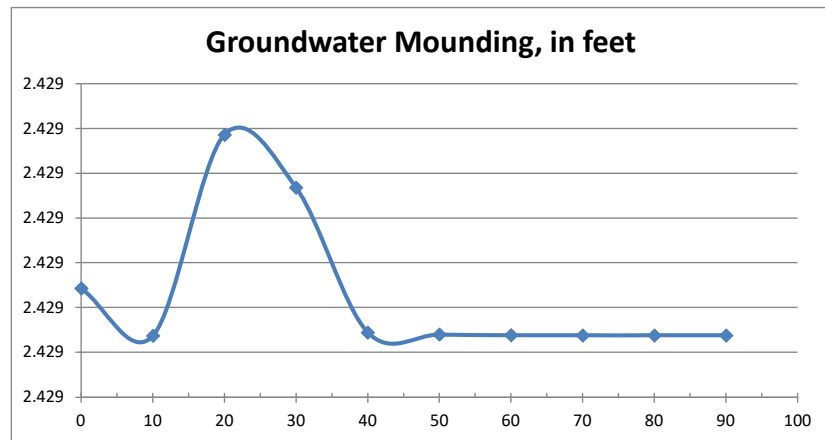
12.429	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.429	$\Delta h(\max)$	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Distance from
center of basin in x
Ground-water Mounding, in feet direction, in feet

2.429	0
2.429	10
2.429	20
2.429	30
2.429	40
2.429	50
2.429	60
2.429	70
2.429	80
2.429	90



Re-Calculate Now



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Pre vs Post Rev. 3a

Prepared by Bohler Engineering, PC

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Hydrograph for Pond CW1D: COSNTRUCTED WETLANDS 1D

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	9.00	0.00
0.50	0.72	634	9.05	0.02
1.00	10.82	10,639	9.80	0.41
1.50	6.07	24,900	10.72	0.63
2.00	0.74	28,604	10.92	2.05
2.50	0.00	26,513	10.81	1.01
3.00	0.00	25,035	10.73	0.63
3.50	0.00	23,905	10.66	0.62
4.00	0.00	22,799	10.60	0.61
4.50	0.00	21,717	10.53	0.59
5.00	0.12	20,762	10.47	0.58
5.50	0.14	19,956	10.42	0.57
6.00	0.07	19,132	10.37	0.56
6.50	0.14	18,327	10.32	0.55
7.00	0.07	17,539	10.27	0.54
7.50	0.13	16,761	10.22	0.52
8.00	0.07	16,003	10.17	0.51
8.50	0.12	15,256	10.12	0.50
9.00	0.06	14,528	10.07	0.49
9.50	0.55	14,207	10.05	0.48
10.00	0.15	13,972	10.03	0.48
10.50	0.42	13,625	10.01	0.47
11.00	0.19	13,331	9.99	0.47
11.50	0.08	12,747	9.95	0.45
12.00	0.38	12,345	9.92	0.45
12.50	0.25	12,108	9.90	0.44
13.00	0.53	12,012	9.90	0.44
13.50	0.06	11,751	9.88	0.44
14.00	0.46	11,445	9.86	0.43
14.50	0.22	11,296	9.85	0.43
15.00	0.27	10,977	9.82	0.42
15.50	0.27	10,709	9.81	0.41
16.00	0.18	10,378	9.78	0.41
16.50	0.45	10,219	9.77	0.40
17.00	0.00	9,903	9.75	0.40
17.50	0.49	9,636	9.73	0.39
18.00	0.26	9,606	9.73	0.39
18.50	0.17	9,301	9.70	0.38
19.00	0.35	9,092	9.69	0.38
19.50	0.00	8,739	9.66	0.37
20.00	0.44	8,477	9.64	0.36
20.50	0.29	8,483	9.65	0.36
21.00	0.06	8,157	9.62	0.35
21.50	0.40	7,943	9.61	0.35
22.00	0.13	7,802	9.60	0.34
22.50	0.22	7,506	9.57	0.33
23.00	0.21	7,296	9.56	0.33
23.50	0.13	7,025	9.54	0.32
24.00	0.31	6,849	9.53	0.32
24.50	0.14	6,686	9.51	0.31
25.00	0.19	6,430	9.49	0.30
25.50	0.24	6,282	9.48	0.30

WQ Volume: 61,596 CF

Peak storage @ 2 hr

Storage reaches 10% of WQ V @ 26 hrs

26 - 2 = 24 hrs

Pre vs Post Rev. 3a

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Hydrograph for Pond CW1D: COSNTRUCTED WETLANDS 1D (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
26.00	0.08	6,043	9.47	0.29
26.50	0.23	5,807	9.45	0.28
27.00	0.19	5,684	9.44	0.28
27.50	0.11	5,466	9.42	0.27
28.00	0.24	5,302	9.41	0.27
28.50	0.15	5,178	9.40	0.26
29.00	0.13	4,961	9.38	0.25
29.50	0.21	4,816	9.37	0.25
30.00	0.12	4,676	9.36	0.24
30.50	0.12	4,467	9.35	0.23
31.00	0.19	4,336	9.34	0.23
31.50	0.11	4,202	9.33	0.22
32.00	0.11	4,009	9.31	0.21
32.50	0.17	3,887	9.30	0.21
33.00	0.10	3,769	9.29	0.20
33.50	0.10	3,598	9.28	0.19
34.00	0.15	3,484	9.27	0.19
34.50	0.10	3,382	9.26	0.18
35.00	0.09	3,236	9.25	0.17
35.50	0.13	3,134	9.25	0.16
36.00	0.09	3,050	9.24	0.16
36.50	0.08	2,932	9.23	0.15
37.00	0.11	2,847	9.22	0.14
37.50	0.09	2,784	9.22	0.14
38.00	0.08	2,697	9.21	0.13
38.50	0.09	2,620	9.21	0.12
39.00	0.09	2,563	9.20	0.12
39.50	0.07	2,498	9.20	0.12
40.00	0.08	2,429	9.19	0.11
40.50	0.08	2,372	9.19	0.11
41.00	0.07	2,317	9.18	0.10
41.50	0.07	2,259	9.18	0.10
42.00	0.07	2,205	9.17	0.10
42.50	0.07	2,155	9.17	0.09
43.00	0.06	2,105	9.17	0.09
43.50	0.06	2,056	9.16	0.09
44.00	0.06	2,010	9.16	0.08
44.50	0.06	1,966	9.15	0.08
45.00	0.06	1,922	9.15	0.08
45.50	0.05	1,881	9.15	0.08
46.00	0.05	1,840	9.14	0.07
46.50	0.05	1,801	9.14	0.07
47.00	0.05	1,764	9.14	0.07
47.50	0.05	1,727	9.14	0.07
48.00	0.05	1,692	9.13	0.07
48.50	0.04	1,658	9.13	0.06
49.00	0.04	1,625	9.13	0.06
49.50	0.04	1,593	9.13	0.06
50.00	0.04	1,562	9.12	0.06
50.50	0.04	1,532	9.12	0.06
51.00	0.04	1,504	9.12	0.05
51.50	0.04	1,475	9.12	0.05

Pre vs Post Rev. 3a

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Hydrograph for Pond CW1D: COSNTRUCTED WETLANDS 1D (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
52.00	0.04	1,448	9.11	0.05
52.50	0.04	1,422	9.11	0.05
53.00	0.03	1,396	9.11	0.05
53.50	0.03	1,371	9.11	0.05
54.00	0.03	1,347	9.11	0.05
54.50	0.03	1,324	9.10	0.05
55.00	0.03	1,301	9.10	0.04
55.50	0.03	1,279	9.10	0.04
56.00	0.03	1,257	9.10	0.04
56.50	0.03	1,236	9.10	0.04
57.00	0.03	1,216	9.10	0.04
57.50	0.03	1,196	9.09	0.04
58.00	0.03	1,177	9.09	0.04
58.50	0.03	1,158	9.09	0.04
59.00	0.03	1,140	9.09	0.04
59.50	0.03	1,122	9.09	0.04
60.00	0.03	1,105	9.09	0.03
60.50	0.02	1,088	9.09	0.03
61.00	0.02	1,072	9.08	0.03
61.50	0.02	1,056	9.08	0.03
62.00	0.02	1,040	9.08	0.03
62.50	0.02	1,025	9.08	0.03
63.00	0.02	1,010	9.08	0.03
63.50	0.02	996	9.08	0.03
64.00	0.02	982	9.08	0.03
64.50	0.02	968	9.08	0.03
65.00	0.02	955	9.08	0.03
65.50	0.02	941	9.07	0.03
66.00	0.02	929	9.07	0.03
66.50	0.02	916	9.07	0.03
67.00	0.02	904	9.07	0.03
67.50	0.02	892	9.07	0.03
68.00	0.02	880	9.07	0.02
68.50	0.02	869	9.07	0.02
69.00	0.02	858	9.07	0.02
69.50	0.02	847	9.07	0.02
70.00	0.02	836	9.07	0.02
70.50	0.02	826	9.07	0.02
71.00	0.02	815	9.06	0.02
71.50	0.02	805	9.06	0.02
72.00	0.02	796	9.06	0.02
72.50	0.02	786	9.06	0.02
73.00	0.02	777	9.06	0.02
73.50	0.02	768	9.06	0.02
74.00	0.01	759	9.06	0.02
74.50	0.01	750	9.06	0.02
75.00	0.01	741	9.06	0.02
75.50	0.01	733	9.06	0.02
76.00	0.01	724	9.06	0.02
76.50	0.01	716	9.06	0.02
77.00	0.01	708	9.06	0.02
77.50	0.01	700	9.06	0.02

Pre vs Post Rev. 3a*NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"*

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Hydrograph for Pond CW1D: COSNTRUCTED WETLANDS 1D (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
78.00	0.01	693	9.05	0.02
78.50	0.01	685	9.05	0.02
79.00	0.01	678	9.05	0.02
79.50	0.01	671	9.05	0.02
80.00	0.01	663	9.05	0.02
80.50	0.01	656	9.05	0.02
81.00	0.01	650	9.05	0.02
81.50	0.01	643	9.05	0.02
82.00	0.01	636	9.05	0.02
82.50	0.01	630	9.05	0.01
83.00	0.01	623	9.05	0.01
83.50	0.01	617	9.05	0.01
84.00	0.01	611	9.05	0.01
84.50	0.01	605	9.05	0.01
85.00	0.01	599	9.05	0.01
85.50	0.01	593	9.05	0.01
86.00	0.01	588	9.05	0.01
86.50	0.01	582	9.05	0.01
87.00	0.01	576	9.05	0.01
87.50	0.01	571	9.05	0.01
88.00	0.01	566	9.04	0.01
88.50	0.01	560	9.04	0.01
89.00	0.01	555	9.04	0.01
89.50	0.01	550	9.04	0.01
90.00	0.01	545	9.04	0.01
90.50	0.01	540	9.04	0.01
91.00	0.01	535	9.04	0.01
91.50	0.01	531	9.04	0.01
92.00	0.01	526	9.04	0.01
92.50	0.01	521	9.04	0.01
93.00	0.01	517	9.04	0.01
93.50	0.01	512	9.04	0.01
94.00	0.01	508	9.04	0.01
94.50	0.01	504	9.04	0.01
95.00	0.01	499	9.04	0.01
95.50	0.01	495	9.04	0.01
96.00	0.01	491	9.04	0.01
96.50	0.01	487	9.04	0.01
97.00	0.01	483	9.04	0.01
97.50	0.01	479	9.04	0.01
98.00	0.01	475	9.04	0.01
98.50	0.01	471	9.04	0.01
99.00	0.01	467	9.04	0.01
99.50	0.01	464	9.04	0.01
100.00	0.01	460	9.04	0.01

Manufactured Treatment Device #	I-80	E-70	A-10	A-50	A-80	G-150
Device	7x13 Filterra	8x14 Filterra	8x14 Kraken	8x14 Kraken	8x14 Kraken	7' AquaPonic
Drainage Area (ac)	0.16	0.09	1.02	0.45	1.01	0.2
Max. Drainage Area for Device (ac)	2.29	2.11	1.368	1.368	1.368	0.59
Water Quality Flow (cfs)	0.49	0.28	2.56	1.13	2.53	0.5
Max. Water Quality Flow for Device (cfs)	0.632	0.583	3.65	3.65	3.65	0.6
TSS Removal Rate (%)	80%	80%	80%	80%	80%	80%

MTDs

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Page 1

Summary for Subcatchment 4S: AP G-150

Runoff = 0.50 cfs @ 1.02 hrs, Volume= 751 cf, Depth= 1.03"

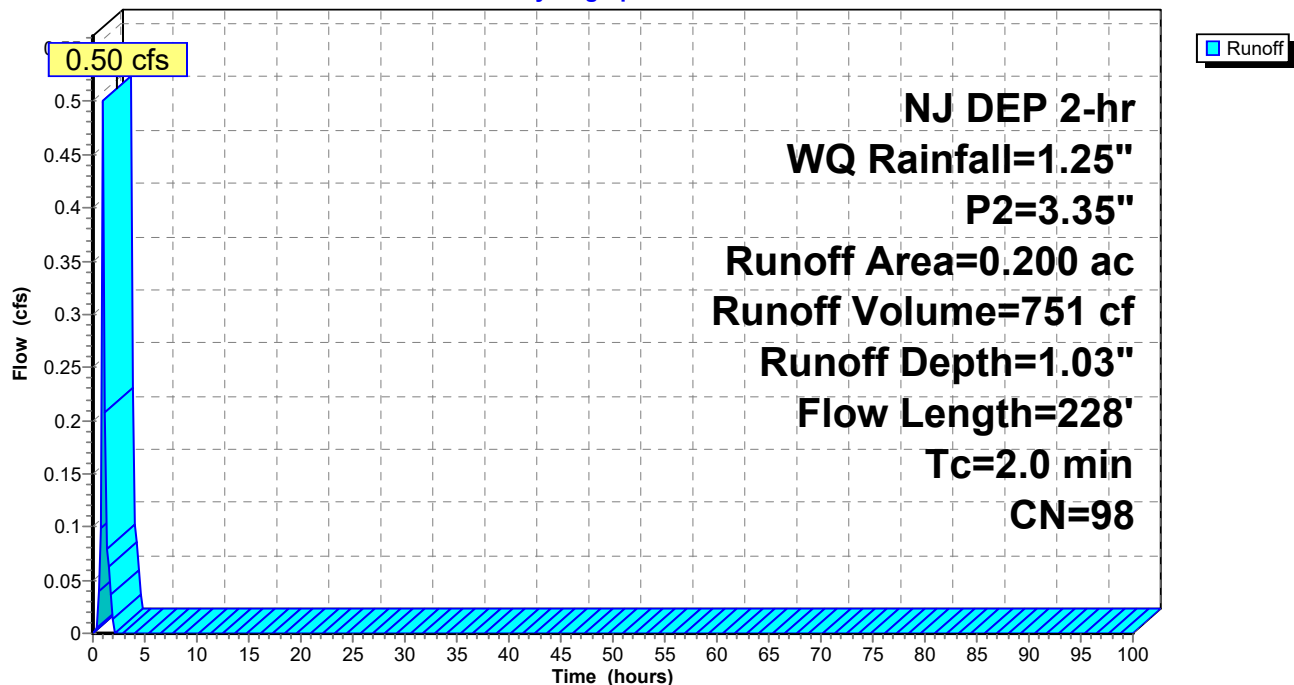
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Area (ac)	CN	Description
0.200	98	Paved parking, HSG D
0.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 4S: AP G-150

Hydrograph



MTDs

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Page 2

Summary for Subcatchment 9S: Filterra E-70

Runoff = 0.23 cfs @ 1.02 hrs, Volume= 338 cf, Depth= 1.03"

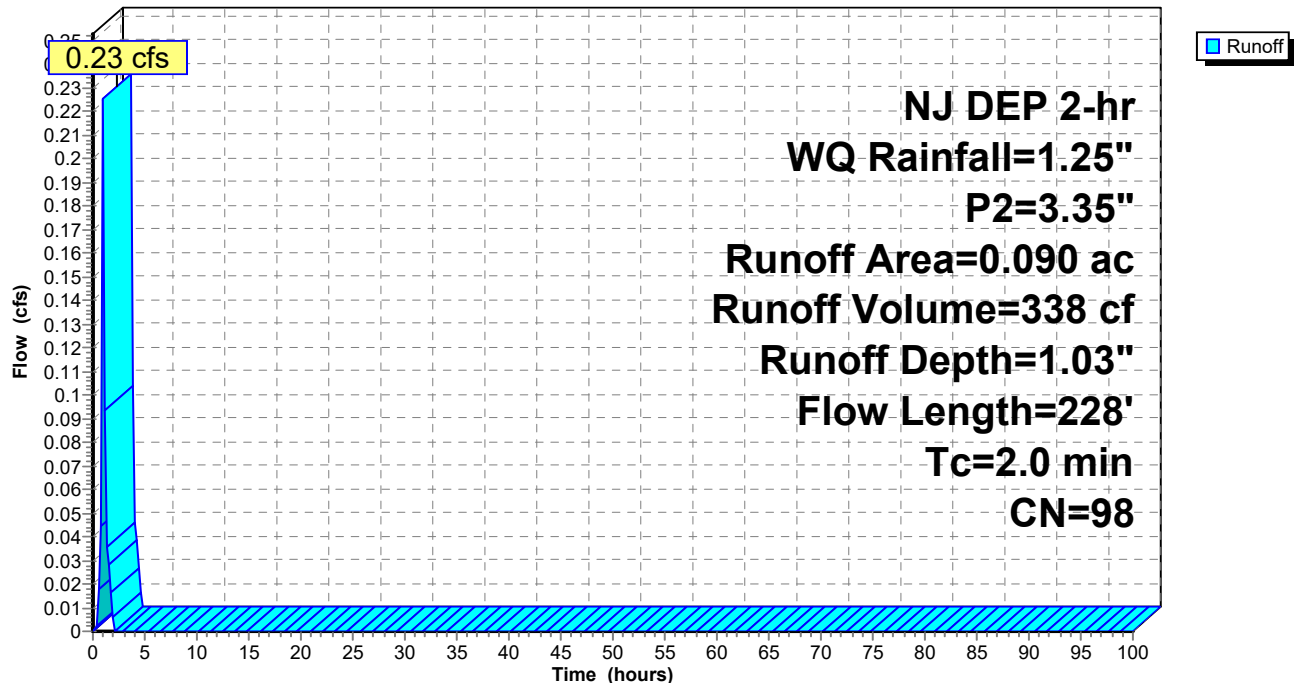
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
0.090		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 9S: Filterra E-70

Hydrograph



MTDs

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Subcatchment 10S: Filtterra I-70

Runoff = 0.40 cfs @ 1.02 hrs, Volume= 601 cf, Depth= 1.03"

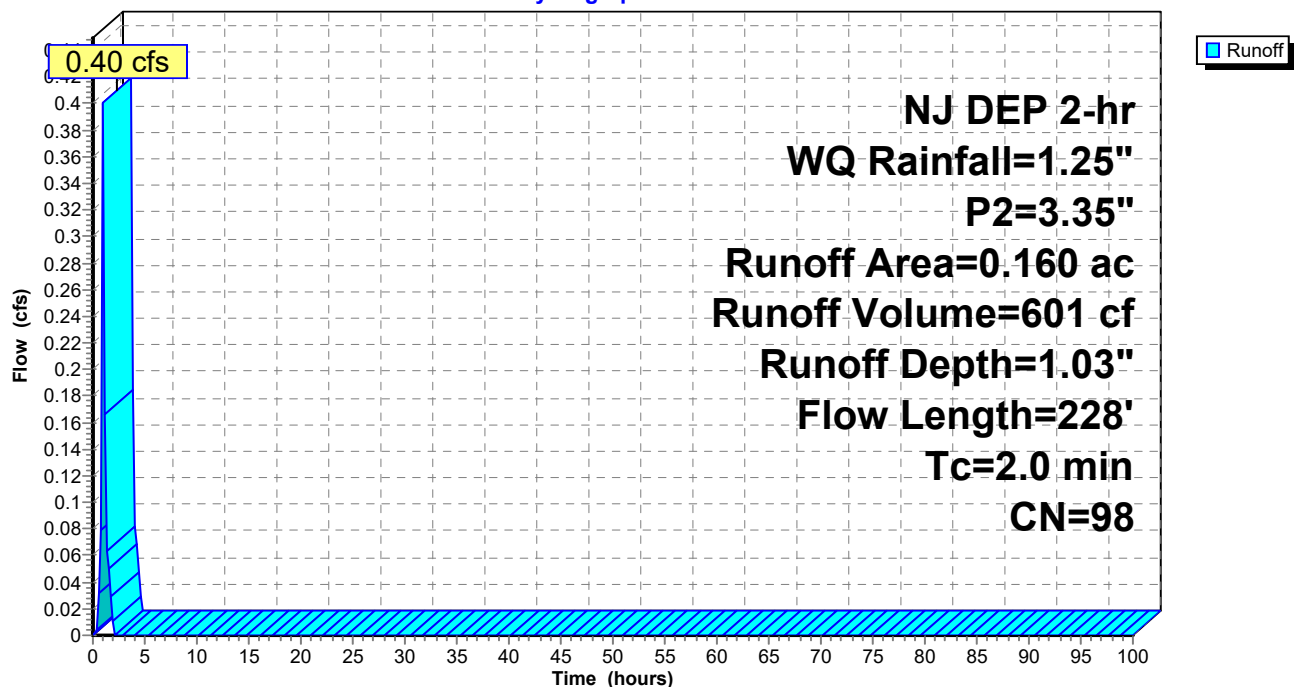
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Area (ac)	CN	Description
0.160	98	Paved parking, HSG D
0.160		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 10S: Filtterra I-70

Hydrograph



MTDs

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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Summary for Subcatchment 11S: Kraken A-10

Runoff = 2.56 cfs @ 1.02 hrs, Volume= 3,831 cf, Depth= 1.03"

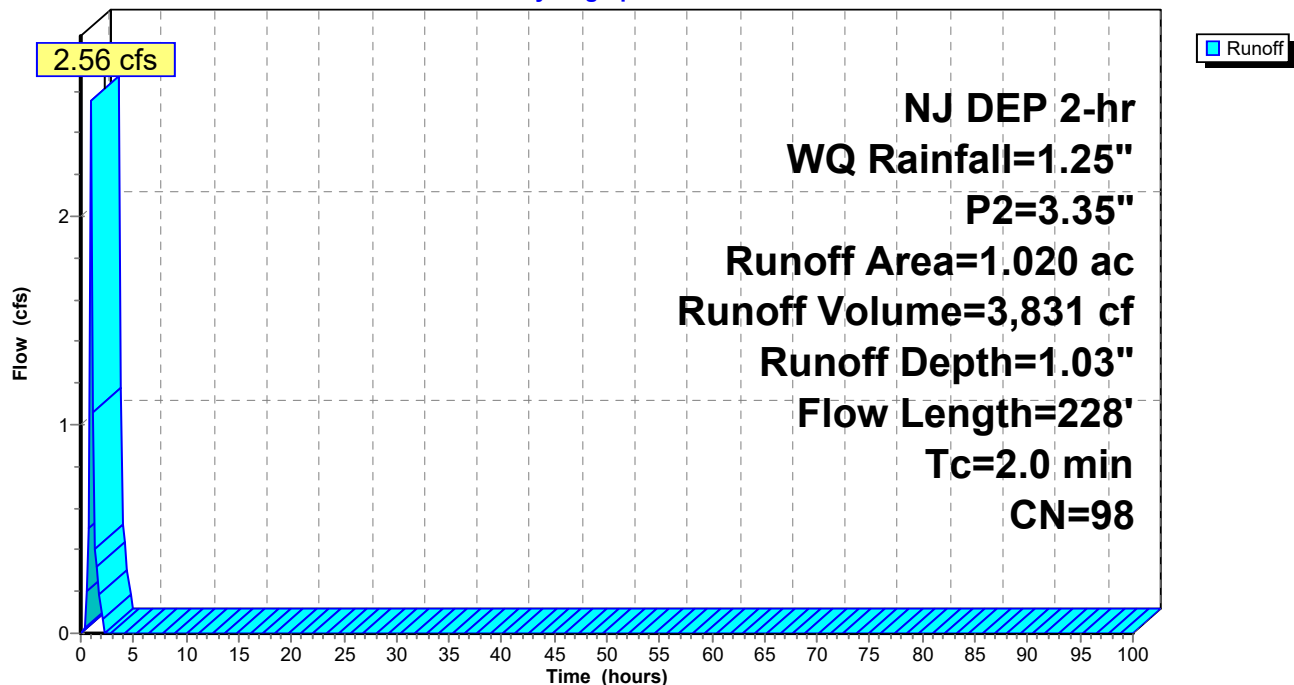
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Area (ac)	CN	Description
1.020	98	Paved parking, HSG D
1.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 11S: Kraken A-10

Hydrograph



MTDs

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NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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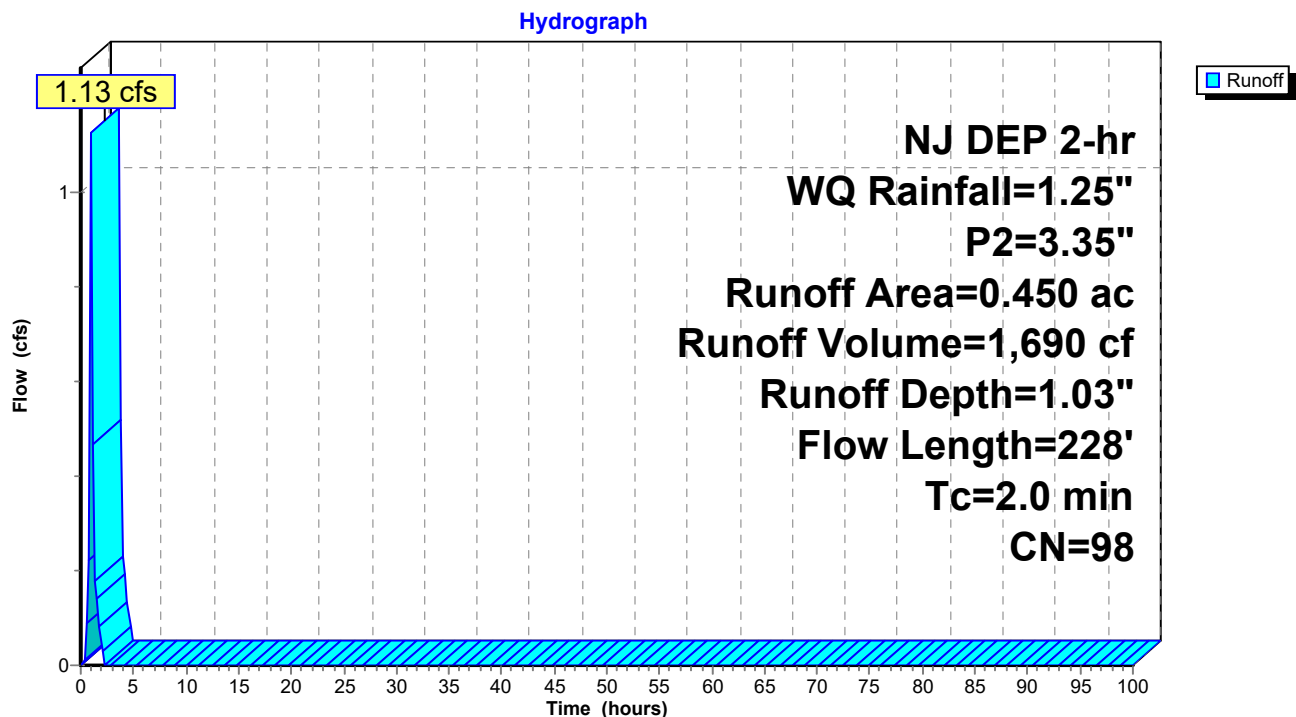
Summary for Subcatchment 12S: Kraken A-50

Runoff = 1.13 cfs @ 1.02 hrs, Volume= 1,690 cf, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Area (ac)	CN	Description
0.450	98	Paved parking, HSG D
0.450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 12S: Kraken A-50

MTDs

Prepared by Bohler Engineering, PC
HydroCAD® 10.20-7a s/n 03478 © 2025 HydroCAD Software Solutions LLC

NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

Printed 10/1/2025

Page 6

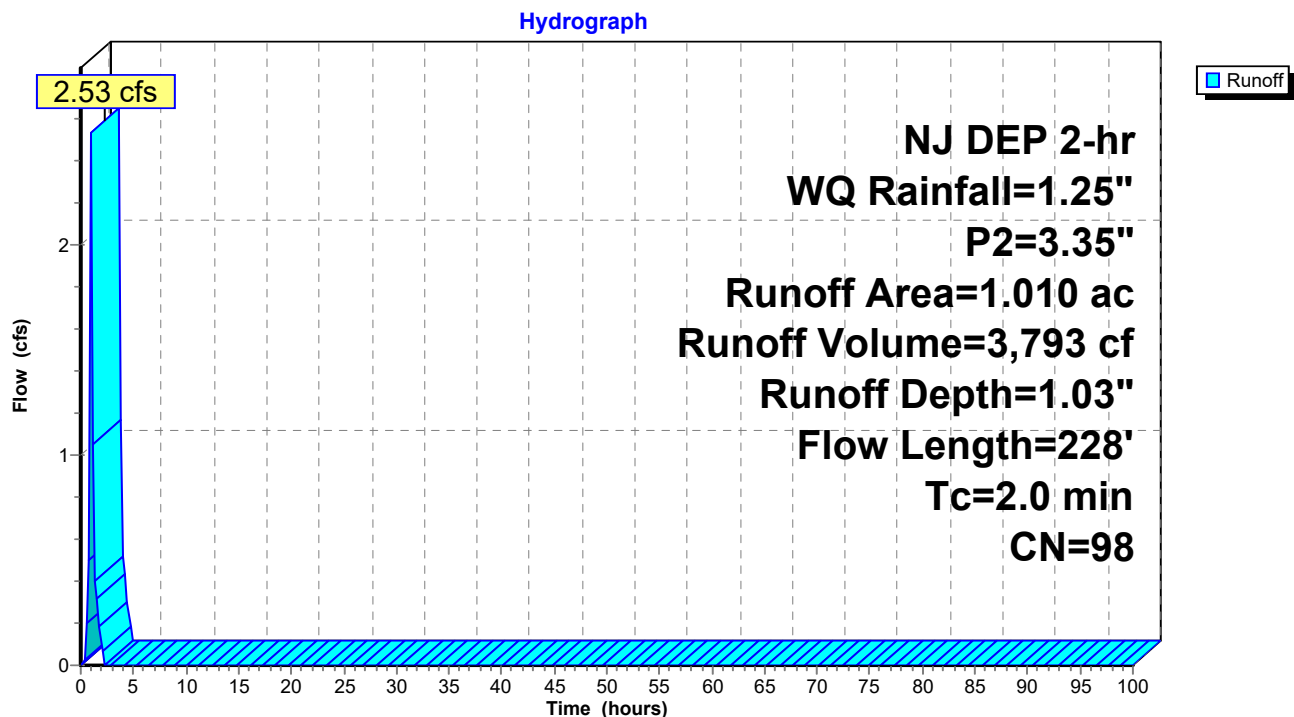
Summary for Subcatchment 13S: Kraken A-80

Runoff = 2.53 cfs @ 1.02 hrs, Volume= 3,793 cf, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.20 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.35"

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

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	70	0.0200	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.4	66	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	46	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	46	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total			

Subcatchment 13S: Kraken A-80

Attachment D – Major Development Stormwater Summary

General Information			
1. Project Name: HCI DP Land Acquisition LLC			Lot & Block Info:
2. Municipality: Sayreville	County: Middlesex		Block 14, Lot 1
3. Site Location (State Plane Coordinates – NAD83)	E: 535,492	N: 582,900	
4. Date of Final Approval for Construction by Municipality (MM/DD/YYYY): _____ Date of Certificate of Occupancy (MM/DD/YYYY): _____			
5. Project Type (place an "x" after all that apply) Residential ☐ Commercial ☐ Industrial ☒ Other (please specify) _____			
6. Soil Conservation District Project #: PSAP0014.06			
7. Did the project require a NJDEP Land Use Permit? Yes ☒ No ☐ Land Use Permit #: 1219-21-0002.1			
8. Did the project require any mitigation measures? Yes ☐ No ☒ If yes, which standard was mitigated? _____			

Site Design Specifications	
1. Site Area (acres): 46.07	Area of Disturbance (acres): 44.14 Area of Proposed Impervious (acres): 34.35
2. List all Hydrologic Soil Groups: A and D	
3. Identify the Quantities of Each Type of Best Management Practices (BMPs) Incorporated into the Site Design: Bioretention Systems _____ Constructed Wetlands ¹ _____ Dry Wells _____ Extended Detention Basins _____ Infiltration Basins ¹ _____ Combination Infiltration/Detention Basins _____ Manufactured Treatment Devices ⁶ _____ Pervious Paving Systems ⁶ _____ Sand Filters _____ Vegetative Filter Strips _____ Wet Ponds _____ Grass Swales _____ Subsurface Gravel Wetlands _____ Other: _____	

Storm Event Information	
1. Storm Event – Rainfall (inches) / Duration (hours) 2 year: 3.35"/24 hr 10 year: 5.12"/24 hr 100 year: 8.63"/24 hr	Water Quality Design Storm: 1.25"/2 hr
2. Runoff Computation Method (mark one): NRCS Dimensionless Unit Hydrograph ☐ NRCS Delmarva Unit Hydrograph ☒ Rational Method ☐ Modified Rational Method ☐ Other (describe): _____	

BMP Specifications (answer all that apply) - If more than one BMP, see reverse side	
1. BMP Name: Constructed Wetlands #1	Type of BMP: Constructed Wetlands
Location (mark one): Surface ☒ Subsurface ☐	Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒ If private, Owner's Name: HCI DP Land Acquisition LLC	Owner's Telephone No.: (240) 503-6522
3. BMP Completion Date (MM/DD/YYYY): _____	
4. Does the BMP have an underdrain? Yes ☐ No ☒	
5. What is the Water Quality Design Storm Drain Down Time (hours)? ⁸⁰ _____ What is the Design Soil Permeability (inches/hour): N/A	
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? ^{2.7} _____ Month Obtained: June	
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐	
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____	
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐	

Name of Person Completing This Form: _____
Title: _____

Signature: _____
Date: _____

Comments: _____

BMP Specifications (answer all that apply) – Attach more pages if necessary

1. BMP Name: <u>Infiltration Basin #1</u>		Type of BMP: <u>Infiltration Basin</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☐ No ☒		
5. What is the Water Quality Design Storm Drain Down Time (hours)? ⁵⁷ _____		
What is the Design Soil Permeability (inches/hour): ^{0.5} _____		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>TBD</u> Month Obtained: <u>TBD</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☒ No ☐ If yes, Methodology: <u>Hantush</u>		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

BMP Specifications (answer all that apply) - Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement 1</u>		Type of BMP: <u>Pervious Pavement</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☒ No ☐		
5. What is the Water Quality Design Storm Drain Down Time (hours)? ^{30.5} _____		
What is the Design Soil Permeability (inches/hour): <u>N/A</u>		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>1.45</u> Month Obtained: <u>June</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

BMP Specifications (answer all that apply) - Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement #2</u>		Type of BMP: <u>Pervious Pavement</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☒ No ☐		
5. What is the Water Quality Design Storm Drain Down Time (hours)? ⁵⁵ _____		
What is the Design Soil Permeability (inches/hour): <u>N/A</u>		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>TBD</u> Month Obtained: <u>TBD</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

Name of Person Completing This Form: _____

Signature: _____

Title: _____

Date: _____

Comments: _____

BMP Specifications (answer all that apply) – Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement 3</u>		Type of BMP: <u>Pervious Pavement</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☐ No ☒		
5. What is the Water Quality Design Storm Drain Down Time (hours)? <u>29</u>		
What is the Design Soil Permeability (inches/hour): <u>N/A</u>		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>TBD</u> Month Obtained: <u>TBD</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

BMP Specifications (answer all that apply) - Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement 4</u>		Type of BMP: <u>Pervious Pavement</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☒ No ☐		
5. What is the Water Quality Design Storm Drain Down Time (hours)? <u>24.5</u>		
What is the Design Soil Permeability (inches/hour): <u>N/A</u>		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>1.0</u> Month Obtained: <u>June</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

BMP Specifications (answer all that apply) - Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement 5</u>		Type of BMP: <u>Pervious Pavement</u>
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒
2. Owner (mark one): Public ☐ Private ☒		
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>
3. BMP Completion Date (MM/DD/YYYY): _____		
4. Does the BMP have an underdrain? Yes ☒ No ☐		
5. What is the Water Quality Design Storm Drain Down Time (hours)? <u>15.5</u>		
What is the Design Soil Permeability (inches/hour): <u>N/A</u>		
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>TBD</u> Month Obtained: <u>TBD</u>		
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐		
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____		
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐		

Name of Person Completing This Form: _____

Signature: _____

Title: _____

Date: _____

Comments: _____

BMP Specifications (answer all that apply) – Attach more pages if necessary

1. BMP Name: <u>Pervious Pavement 6</u>		Type of BMP: <u>Pervious Pavement</u>	
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒	
2. Owner (mark one): Public ☐ Private ☒			
If private, Owner's Name: <u>HCI DP Land Acquisition LLC</u>		Owner's Telephone No.: <u>(240) 503-6522</u>	
3. BMP Completion Date (MM/DD/YYYY): _____			
4. Does the BMP have an underdrain? Yes ☐ No ☒			
5. What is the Water Quality Design Storm Drain Down Time (hours)? <u>16.5</u>			
What is the Design Soil Permeability (inches/hour): <u>N/A</u>			
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? <u>9.25</u> Month Obtained: <u>June</u>			
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐			
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____			
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐			

BMP Specifications (answer all that apply) - Attach more pages if necessary

1. BMP Name: _____		Type of BMP: _____	
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒	
2. Owner (mark one): Public ☐ Private ☒			
If private, Owner's Name: _____		Owner's Telephone No.: _____	
3. BMP Completion Date (MM/DD/YYYY): _____			
4. Does the BMP have an underdrain? Yes ☒ No ☐			
5. What is the Water Quality Design Storm Drain Down Time (hours)? _____			
What is the Design Soil Permeability (inches/hour): _____			
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? _____ Month Obtained: _____			
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐			
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____			
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐			

BMP Specifications (answer all that apply) - Attach more pages if necessary

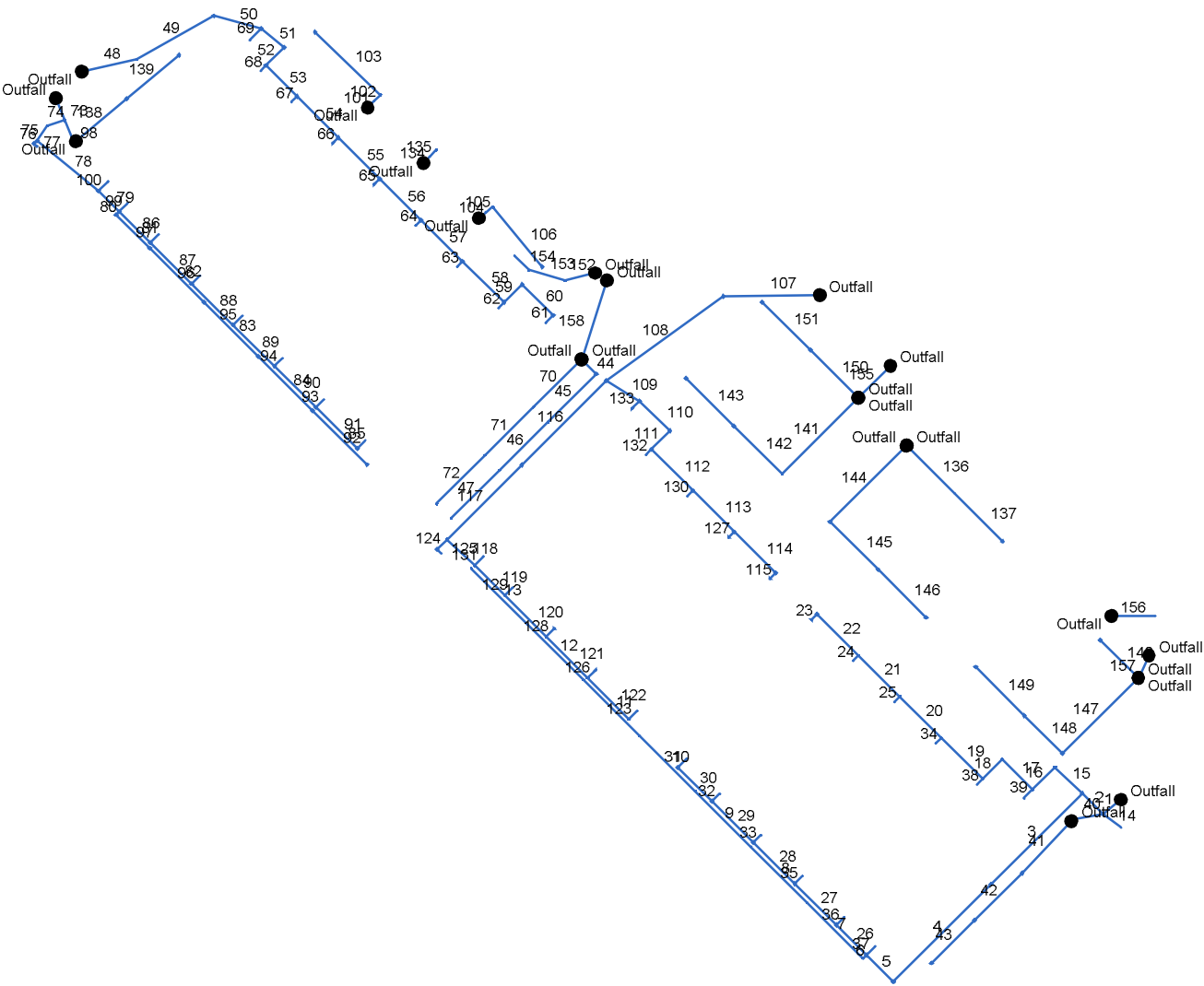
1. BMP Name: _____		Type of BMP: _____	
Location (mark one): Surface ☐ Subsurface ☒		Is forebay part of the design? Yes ☐ No ☒	
2. Owner (mark one): Public ☐ Private ☒			
If private, Owner's Name: _____		Owner's Telephone No.: _____	
3. BMP Completion Date (MM/DD/YYYY): _____			
4. Does the BMP have an underdrain? Yes ☒ No ☐			
5. What is the Water Quality Design Storm Drain Down Time (hours)? _____			
What is the Design Soil Permeability (inches/hour): _____			
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? _____ Month Obtained: _____			
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ☐ NJGRS ☒ Other ☐ N/A ☐			
8. Was Groundwater Mounding analyzed? Yes ☐ No ☒ If yes, Methodology: _____			
9. Was a Maintenance Plan submitted? Yes ☒ No ☐ Is the BMP deed restricted? Yes ☒ No ☐			

Name of Person Completing This Form: _____ Signature: _____
Title: _____ Date: _____

E. CONVEYANCE CALCULATIONS

- ◆ **Pipe Sizing**
- ◆ **Riprap Calculations**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	43.737	0.00	6.20	0.98	0.00	6.08	10.0	21.2	4.7	29.70	45.64	4.05	42	0.21	9.00	9.09	11.52	11.56	12.29	19.40	SD-26
2	1	56.622	0.00	6.10	0.98	0.00	5.98	10.0	21.0	4.7	28.15	44.34	3.54	42	0.19	9.09	9.20	11.82	11.86	19.40	21.65	SD-53
3	2	246.734	0.00	3.42	0.98	0.00	3.35	10.0	19.3	4.9	16.46	29.72	2.49	36	0.20	9.20	9.69	12.06	12.18	21.65	20.50	SD-54
4	3	264.722	0.00	3.42	0.98	0.00	3.35	10.0	17.8	5.1	17.12	29.84	2.94	36	0.20	9.69	10.22	12.20	12.36	20.50	18.60	SD-55
5	4	72.481	0.00	3.42	0.98	0.00	3.35	10.0	17.4	5.2	17.31	30.34	3.05	36	0.21	10.22	10.37	12.52	12.56	18.60	18.00	SD-56
6	5	9.333	0.11	0.96	0.98	0.11	0.94	10.0	17.4	5.2	4.86	3.66	3.96	15	0.32	11.15	11.18	12.72	12.77	18.00	18.00	SD-158
7	6	151.366	0.12	0.85	0.98	0.12	0.83	10.0	15.8	5.4	4.50	12.47	1.59	24	0.30	11.18	11.64	13.14	13.18	18.00	18.00	SD-57
8	7	151.320	0.12	0.73	0.98	0.12	0.72	10.0	14.8	5.6	3.98	5.73	2.45	18	0.30	11.74	12.19	13.20	13.39	18.00	18.00	SD-58
9	8	151.320	0.12	0.61	0.98	0.12	0.60	10.0	13.8	5.7	3.42	5.73	2.70	18	0.30	12.29	12.74	13.44	13.65	18.00	18.00	SD-59
10	9	151.320	0.12	0.49	0.98	0.12	0.48	10.0	13.0	5.9	2.82	5.79	2.97	18	0.30	12.84	13.30	13.72	14.03	18.00	18.00	SD-64
11	10	151.320	0.12	0.37	0.98	0.12	0.36	10.0	12.2	6.0	2.18	3.52	3.03	15	0.30	13.40	13.85	14.11	14.56	18.00	18.00	SD-66
12	11	151.320	0.12	0.25	0.98	0.12	0.25	10.0	11.2	6.2	1.52	3.52	2.55	15	0.30	13.95	14.40	14.63	14.96	18.00	18.00	SD-171
13	12	151.366	0.13	0.13	0.98	0.13	0.13	10.0	10.0	6.5	0.82	3.52	2.13	15	0.30	14.51	14.96	15.02	15.35	18.00	18.00	SD-63
14	1	42.416	0.09	0.09	0.98	0.09	0.09	10.0	10.0	6.5	0.57	9.14	3.37	15	2.00	13.82	14.67	14.03	14.96	19.40	16.12	SD-31
15	2	72.371	0.00	2.68	0.98	0.00	2.63	10.0	13.0	5.9	15.41	28.93	3.14	30	0.50	9.30	9.66	12.06	12.16	21.65	17.00	SD-102
16	15	60.010	0.00	2.68	0.98	0.00	2.63	10.0	12.7	5.9	15.56	31.32	3.20	30	0.58	9.66	10.01	12.31	12.39	17.00	19.00	SD-103
17	16	81.863	0.00	2.40	0.98	0.00	2.35	10.0	12.2	6.0	14.14	26.04	2.94	30	0.40	10.01	10.34	12.55	12.63	19.00	17.10	SD-105
18	17	52.905	0.00	2.40	0.98	0.00	2.35	10.0	11.9	6.1	14.27	22.55	2.97	30	0.30	10.34	10.50	12.77	12.82	17.10	17.75	SD-105 (1)
19	18	112.001	0.00	1.92	0.98	0.00	1.88	10.0	11.4	6.2	11.60	29.00	3.85	30	0.50	10.50	11.06	12.96	12.20	17.75	17.85	SD-107
20	19	112.000	0.00	1.44	0.98	0.00	1.41	10.0	11.1	6.2	8.81	15.99	4.99	24	0.50	11.06	11.62	12.20	12.68	17.85	17.85	SD-109
21	20	112.000	0.00	0.96	0.98	0.00	0.94	10.0	10.6	6.3	5.96	15.99	4.07	24	0.50	11.62	12.18	12.68	13.04	17.85	17.85	SD-111
22	21	112.000	0.00	0.48	0.98	0.00	0.47	10.0	10.1	6.5	3.04	7.43	3.46	18	0.50	12.18	12.74	13.04	13.40	17.85	17.85	SD-113
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	14.985	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	10.51	4.04	18	1.00	12.74	12.89	13.40	13.55	17.85	18.00	SD-114
24	21	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	10.50	3.47	18	1.00	12.18	12.33	13.04	12.99	17.85	18.00	SD-112
25	20	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	10.50	3.16	18	1.00	11.62	11.77	12.68	12.43	17.85	18.00	SD-110
26	5	81.666	0.00	2.25	0.98	0.00	2.21	10.0	14.1	5.7	12.51	18.15	2.65	30	0.20	10.37	10.53	12.72	12.78	18.00	18.00	SD-176
27	26	112.000	0.00	1.80	0.98	0.00	1.76	10.0	13.3	5.8	10.27	18.18	2.19	30	0.20	10.53	10.75	12.89	12.94	18.00	18.00	SD-157
28	27	112.000	0.00	1.35	0.98	0.00	1.32	10.0	12.2	6.0	7.96	18.59	1.76	30	0.21	10.75	10.98	13.02	13.06	18.00	18.00	SD-159
29	28	112.000	0.00	0.90	0.98	0.00	0.88	10.0	11.1	6.2	5.49	10.02	1.75	24	0.20	10.98	11.20	13.11	13.17	18.00	18.00	SD-160
30	29	92.346	0.00	0.45	0.98	0.00	0.44	10.0	10.2	6.4	2.83	4.76	1.60	18	0.21	11.20	11.39	13.22	13.29	18.00	18.00	SD-161
31	30	23.938	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.14	2.32	15	2.01	11.39	11.87	13.33	13.37	18.00	18.00	SD-162
32	29	20.805	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.18	2.32	15	2.02	11.20	11.62	13.22	13.26	18.00	19.00	SD-163
33	28	20.806	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.06	2.32	15	1.97	10.98	11.39	13.11	13.15	18.00	19.00	SD-164
34	19	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	6.46	3.44	15	1.00	11.06	11.21	12.20	11.91	17.85	18.00	SD-108
35	27	20.801	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.18	2.32	15	2.02	10.75	11.17	13.02	13.06	18.00	19.00	SD-165
36	26	20.744	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.08	2.32	15	1.98	10.53	10.94	12.89	12.93	18.00	19.00	SD-166
37	5	23.667	0.21	0.21	0.98	0.21	0.21	10.0	10.0	6.5	1.33	9.10	1.08	15	1.99	10.37	10.84	12.72	12.73	18.00	19.00	SD-167
38	18	15.281	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	7.92	2.48	15	1.51	10.50	10.73	12.96	12.99	17.75	18.00	SD-106
39	16	24.259	0.28	0.28	0.98	0.27	0.27	10.0	10.0	6.5	1.77	5.08	1.45	15	0.62	10.01	10.16	12.55	12.57	19.00	19.36	SD-104
40	1	59.100	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	1.34	6.45	1.09	15	1.00	9.23	9.82	11.82	11.85	19.40	11.27	SD-27
41	End	137.151	0.27	0.67	0.98	0.26	0.66	10.0	11.8	6.1	4.00	6.45	3.26	15	1.00	9.92	11.29	12.80	13.33	11.37	19.25	SD-28
42	41	128.555	0.23	0.40	0.98	0.23	0.39	10.0	10.9	6.3	2.46	6.47	2.30	15	1.00	11.39	12.68	13.41	13.58	19.25	19.25	SD-29
43	42	116.423	0.17	0.17	0.98	0.17	0.17	10.0	10.0	6.5	1.08	7.40	2.15	15	1.31	12.78	14.31	13.63	14.72	19.25	18.30	SD-30
44	End	40.000	0.12	0.82	0.98	0.12	0.80	10.0	12.3	6.0	4.82	6.46	3.93	15	1.00	9.56	9.96	11.35	11.57	11.01	19.70	SD-36

Project File: Pipe Sizing Rev 3a.stm

Number of lines: 158

Run Date: 8/18/2026

NOTES: Intensity = $182.59 / (\text{Inlet time} + 19.10)^{0.99}$; Return period = Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
45	44	129.535	0.22	0.70	0.98	0.22	0.69	10.0	11.7	6.1	4.19	6.47	3.59	15	1.00	10.06	11.36	11.93	12.42	19.70	19.10	SD-37
46	45	131.930	0.36	0.48	0.98	0.35	0.47	10.0	11.1	6.2	2.94	6.46	3.43	15	1.00	11.46	12.78	12.53	13.47	19.10	19.10	SD-38
47	46	130.535	0.12	0.12	0.98	0.12	0.12	10.0	10.0	6.5	0.76	6.44	2.07	15	1.00	12.88	14.18	13.47	14.52	19.10	18.30	SD-39
48	End	107.604	0.00	3.70	0.98	0.00	3.63	10.0	18.0	5.1	18.43	42.16	2.61	36	0.40	9.00	9.43	13.31	13.39	11.79	17.37	SD-184
49	48	169.657	0.00	3.70	0.98	0.00	3.63	10.0	16.9	5.2	18.97	42.22	2.68	36	0.40	9.43	10.11	13.43	13.57	17.37	18.22	SD-183
50	49	94.334	0.00	3.70	0.98	0.00	3.63	10.0	16.4	5.3	19.27	42.33	2.73	36	0.40	10.11	10.49	13.65	13.73	18.22	18.69	SD-182
51	50	56.587	0.00	3.42	0.98	0.00	3.35	10.0	16.0	5.4	18.00	41.59	2.55	36	0.39	10.49	10.71	13.84	13.89	18.69	17.30	SD-92 (1)
52	51	48.939	0.00	3.42	0.98	0.00	3.35	10.0	15.7	5.4	18.16	42.64	2.57	36	0.41	10.71	10.91	13.99	14.02	17.30	17.70	SD-92
53	52	84.001	0.00	3.18	0.98	0.00	3.12	10.0	15.1	5.5	17.17	41.80	2.43	36	0.39	10.91	11.24	14.13	14.18	17.70	17.85	SD-91
54	53	112.000	0.00	2.70	0.98	0.00	2.65	10.0	14.5	5.6	14.84	26.00	3.02	30	0.40	11.24	11.69	14.27	14.42	17.85	17.85	SD-90
55	54	112.000	0.00	2.22	0.98	0.00	2.18	10.0	13.8	5.7	12.47	26.00	2.54	30	0.40	11.69	12.14	14.56	14.64	17.85	17.85	SD-89
56	55	112.000	0.00	1.74	0.98	0.00	1.71	10.0	13.2	5.8	9.95	14.34	3.17	24	0.40	12.14	12.59	14.74	14.96	17.85	17.85	SD-88
57	56	112.000	0.00	1.26	0.98	0.00	1.23	10.0	12.4	6.0	7.39	14.34	2.35	24	0.40	12.59	13.04	15.11	15.23	17.85	18.15	SD-87
58	57	112.001	0.00	0.78	0.98	0.00	0.76	10.0	11.7	6.1	4.68	6.58	2.65	18	0.39	13.04	13.48	15.32	15.54	18.15	18.15	SD-86
59	58	48.805	0.00	0.30	0.98	0.00	0.29	10.0	11.1	6.2	1.83	4.13	1.49	15	0.41	13.48	13.68	15.65	15.69	18.15	17.55	SD-85 (1)
60	59	84.192	0.00	0.30	0.98	0.00	0.29	10.0	10.2	6.4	1.89	4.10	1.54	15	0.40	13.68	14.02	15.72	15.80	17.55	19.00	SD-85
61	60	20.000	0.30	0.30	0.98	0.29	0.29	10.0	10.0	6.5	1.90	4.08	1.55	15	0.40	14.02	14.10	15.83	15.85	19.00	19.50	SD-101
62	58	15.529	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.12	2.48	15	2.00	13.48	13.79	15.65	15.68	18.15	18.00	SD-100
63	57	15.009	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	13.04	13.34	15.32	15.35	18.15	18.00	SD-99
64	56	14.948	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.15	2.48	15	2.01	12.59	12.89	15.11	15.15	17.85	18.00	SD-98
65	55	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	12.14	12.44	14.74	14.77	17.85	18.00	SD-97
66	54	14.954	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.15	2.48	15	2.01	11.69	11.99	14.56	14.59	17.85	14.71	SD-96
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
67	53	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	11.24	11.54	14.27	14.30	17.85	18.00	SD-95
68	52	15.409	0.24	0.24	0.98	0.24	0.24	10.0	10.0	6.5	1.52	9.16	1.24	15	2.01	10.91	11.22	14.13	14.13	17.70	18.00	SD-94
69	50	31.751	0.28	0.28	0.98	0.27	0.27	10.0	10.0	6.5	1.77	9.10	1.45	15	1.98	10.49	11.12	13.84	13.87	18.69	22.00	SD-93
70	End	129.535	0.30	0.63	0.98	0.29	0.62	10.0	15.1	5.5	3.41	10.52	1.93	18	1.00	9.56	10.86	13.97	14.11	11.01	19.10	SD-33
71	70	131.929	0.25	0.33	0.98	0.25	0.32	10.0	13.0	5.9	1.90	10.50	1.07	18	1.00	10.96	12.28	14.14	14.18	19.10	19.10	SD-34
72	71	130.535	0.08	0.08	0.98	0.08	0.08	10.0	10.0	6.5	0.51	6.44	0.72	15	1.00	12.38	13.68	14.19	14.21	19.10	18.60	SD-35
73	End	44.899	0.00	4.45	0.98	0.00	4.36	10.0	23.0	4.5	20.39	29.86	2.89	36	0.20	9.00	9.09	13.04	13.08	11.79	19.20	SD-42
74	73	35.136	0.00	4.44	0.98	0.00	4.35	10.0	22.8	4.5	19.62	29.77	2.78	36	0.20	9.09	9.16	13.21	13.24	19.20	18.00	SD-177
75	74	34.701	0.01	4.44	0.98	0.01	4.35	10.0	22.6	4.5	19.72	29.95	2.79	36	0.20	9.16	9.23	13.32	13.35	18.00	18.00	SD-178
76	75	8.303	0.01	0.20	0.98	0.01	0.20	10.0	10.0	6.5	1.27	19.41	1.03	15	9.03	9.24	9.99	13.47	13.47	18.00	17.27	SD-45
77	76	8.004	0.19	0.19	0.98	0.19	0.19	10.0	10.0	6.5	1.20	6.46	3.61	15	1.00	13.39	13.47	13.76	13.90	17.27	15.85	SD-46
78	75	151.470	0.01	4.23	0.98	0.01	4.15	10.0	21.6	4.6	19.20	29.68	2.72	36	0.20	9.23	9.53	13.47	13.60	18.00	18.00	SD-179
79	78	56.166	0.01	3.99	0.98	0.01	3.91	10.0	21.3	4.7	18.27	29.52	2.58	36	0.20	9.53	9.64	13.71	13.75	18.00	18.00	SD-128
80	79	8.661	0.14	0.79	0.98	0.14	0.77	10.0	21.2	4.7	3.62	3.10	2.95	15	0.23	9.81	9.83	13.86	13.88	18.00	18.00	SD-180
81	80	90.938	0.12	0.65	0.98	0.12	0.64	10.0	20.4	4.8	3.04	7.30	1.72	18	0.48	9.83	10.27	14.09	14.16	18.00	18.00	SD-52
82	81	147.000	0.12	0.53	0.98	0.12	0.52	10.0	18.7	5.0	2.59	5.75	1.47	18	0.30	10.24	10.68	14.19	14.28	18.00	18.00	SD-48
83	82	147.000	0.12	0.41	0.98	0.12	0.40	10.0	16.7	5.3	2.12	5.75	1.20	18	0.30	10.78	11.22	14.29	14.35	18.00	18.00	SD-51
84	83	147.166	0.12	0.29	0.98	0.12	0.28	10.0	14.0	5.7	1.62	5.74	0.91	18	0.30	11.32	11.76	14.36	14.40	18.00	18.00	SD-49
85	84	147.000	0.17	0.17	0.98	0.17	0.17	10.0	10.0	6.5	1.08	5.75	0.61	18	0.30	11.86	12.30	14.41	14.42	18.00	18.00	SD-50
86	79	84.000	0.00	2.97	0.98	0.00	2.91	10.0	15.5	5.4	15.86	30.00	2.24	36	0.20	9.64	9.81	13.86	13.91	18.00	18.00	SD-129
87	86	112.000	0.00	2.52	0.98	0.00	2.47	10.0	14.5	5.6	13.83	30.22	1.96	36	0.21	9.81	10.04	13.98	14.03	18.00	18.00	SD-130
88	87	112.000	0.01	2.07	0.98	0.01	2.03	10.0	13.8	5.7	11.63	18.18	2.37	30	0.20	10.04	10.26	14.09	14.18	18.00	18.00	SD-131
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
89	88	112.000	0.01	1.61	0.98	0.01	1.58	10.0	12.8	5.9	9.32	18.18	1.90	30	0.20	10.26	10.48	14.27	14.33	18.00	18.00	SD-132
90	89	112.000	0.01	1.15	0.98	0.01	1.13	10.0	11.4	6.2	6.94	18.59	1.41	30	0.21	10.48	10.71	14.38	14.41	18.00	18.00	SD-133
91	90	112.000	0.01	0.69	0.98	0.01	0.68	10.0	10.1	6.4	4.36	10.02	1.39	24	0.20	10.71	10.93	14.45	14.49	18.00	18.00	SD-134
92	91	21.839	0.68	0.68	0.98	0.67	0.67	10.0	10.0	6.5	4.31	6.48	3.51	15	1.01	10.93	11.15	14.52	14.61	18.00	19.00	SD-137
93	90	21.839	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.48	2.32	15	1.01	10.71	10.93	14.45	14.49	18.00	19.00	SD-138
94	89	21.839	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.48	2.32	15	1.01	10.48	10.70	14.38	14.43	18.00	19.00	SD-139
95	88	24.673	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.50	2.32	15	1.01	10.26	10.51	14.27	14.32	18.00	19.00	SD-140
96	87	21.839	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.33	2.32	15	0.96	10.04	10.25	14.09	14.13	18.00	19.00	SD-141
97	86	21.840	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.48	2.32	15	1.01	9.81	10.03	13.98	14.03	18.00	19.00	SD-142
98	73	48.882	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	0.88	21.95	0.18	30	0.29	9.14	9.28	13.21	13.21	19.20	12.14	SD-44
99	79	21.840	0.22	0.22	0.98	0.22	0.22	10.0	10.0	6.5	1.39	6.48	1.14	15	1.01	9.64	9.86	13.86	13.87	18.00	19.00	SD-143
100	78	24.673	0.23	0.23	0.98	0.23	0.23	10.0	10.0	6.5	1.46	6.50	1.19	15	1.01	9.53	9.78	13.71	13.72	18.00	19.00	SD-144
101	End	17.671	0.01	1.03	0.98	0.01	1.01	10.0	11.3	6.2	6.26	14.24	1.99	24	0.40	10.00	10.07	12.52	12.53	14.28	15.50	SD-43
102	101	16.830	0.45	1.02	0.98	0.44	1.00	10.0	11.2	6.2	6.21	11.03	3.61	24	0.24	12.44	12.48	13.51	13.56	15.50	15.75	SD-3
103	102	173.612	0.57	0.57	0.98	0.56	0.56	10.0	10.0	6.5	3.61	5.75	2.43	18	0.30	12.48	13.00	13.86	14.05	15.75	15.75	SD-1
104	End	17.285	0.01	1.02	0.98	0.01	1.00	10.0	11.1	6.2	6.22	14.39	1.98	24	0.40	10.00	10.07	12.26	12.27	12.28	15.50	SD-68
105	104	16.830	0.45	1.01	0.98	0.44	0.99	10.0	11.1	6.2	6.18	11.03	3.61	24	0.24	12.44	12.48	13.51	13.55	15.50	15.75	SD-5
106	105	149.085	0.56	0.56	0.98	0.55	0.55	10.0	10.0	6.5	3.55	5.70	2.35	18	0.30	12.48	12.92	13.85	14.00	15.75	15.75	SD-4
107	End	184.484	0.01	4.53	0.98	0.01	4.44	10.0	18.5	5.0	22.27	34.72	3.15	36	0.27	9.00	9.50	14.24	14.45	11.79	14.71	SD-181
108	107	276.159	0.01	4.52	0.98	0.01	4.43	10.0	17.1	5.2	23.07	34.52	3.26	36	0.27	9.50	10.24	14.54	14.87	14.71	20.66	SD-60
109	108	74.359	0.01	2.26	0.98	0.01	2.21	10.0	13.8	5.7	12.69	29.32	2.59	30	0.51	10.24	10.62	15.04	15.11	20.66	17.70	SD-115
110	109	81.451	0.01	1.97	0.98	0.01	1.93	10.0	13.2	5.8	11.26	28.74	2.29	30	0.49	10.62	11.02	15.21	15.28	17.70	17.25	SD-116
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
111	110	49.853	0.01	1.96	0.98	0.01	1.92	10.0	12.8	5.9	11.33	29.04	2.31	30	0.50	11.02	11.27	15.36	15.40	17.25	17.75	SD-116 (1)
112	111	112.000	0.01	1.47	0.98	0.01	1.44	10.0	12.1	6.0	8.68	15.99	2.76	24	0.50	11.27	11.83	15.48	15.64	17.75	17.85	SD-117
113	112	112.000	0.01	0.98	0.98	0.01	0.96	10.0	11.2	6.2	5.97	15.99	1.90	24	0.50	11.83	12.39	15.76	15.84	17.85	17.85	SD-118
114	113	112.000	0.01	0.49	0.98	0.01	0.48	10.0	10.1	6.4	3.09	7.43	1.75	18	0.50	12.39	12.95	15.90	15.99	17.85	17.85	SD-119
115	114	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	12.95	13.25	16.04	16.07	17.85	18.00	SD-120
116	108	229.203	0.00	2.25	0.98	0.00	2.21	10.0	15.5	5.4	12.00	21.33	2.44	30	0.27	10.24	10.86	15.04	15.24	20.66	20.30	SD-61
117	116	202.577	0.00	2.25	0.98	0.00	2.21	10.0	14.2	5.7	12.47	21.37	2.54	30	0.27	10.86	11.41	15.25	15.44	20.30	18.30	SD-62
118	117	72.378	0.00	2.04	0.98	0.00	2.00	10.0	13.7	5.7	11.48	22.61	2.34	30	0.30	11.41	11.63	15.54	15.59	18.30	18.00	SD-146
119	118	81.666	0.00	1.83	98.00	0.00	1.79	10.0	13.1	5.9	10.50	22.23	2.14	30	0.29	11.63	11.87	15.68	15.73	18.00	18.00	SD-147
120	119	112.000	0.01	1.38	0.98	0.01	1.35	10.0	12.3	6.0	8.10	12.46	2.58	24	0.30	11.87	12.21	15.80	15.95	18.00	18.00	SD-148
121	120	112.000	0.01	0.92	0.98	0.01	0.90	10.0	11.3	6.2	5.58	12.28	1.78	24	0.29	12.21	12.54	16.05	16.12	18.00	18.00	SD-149
122	121	112.000	0.01	0.46	0.98	0.01	0.45	10.0	10.2	6.4	2.90	5.79	1.64	18	0.30	12.54	12.88	16.17	16.25	18.00	18.00	SD-150
123	122	21.472	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.14	2.32	15	2.00	12.88	13.31	16.29	16.34	18.00	19.00	SD-151
124	117	26.596	0.01	0.21	0.98	0.01	0.21	10.0	10.1	6.5	1.33	3.76	1.08	15	0.34	11.41	11.50	15.54	15.55	18.30	15.25	SD-145
125	124	11.073	0.20	0.20	0.98	0.20	0.20	10.0	10.0	6.5	1.27	1.26	3.63	8	1.08	13.13	13.25	15.58	15.70	15.25	13.98	SD-65
126	121	21.468	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.14	2.32	15	2.00	12.54	12.97	16.17	16.21	18.00	19.00	SD-152
127	113	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	12.39	12.69	15.90	15.93	17.85	18.00	SD-121
128	120	21.461	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.14	2.32	15	2.00	12.21	12.64	16.05	16.09	18.00	19.00	SD-153
129	119	21.476	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	9.14	2.32	15	2.00	11.87	12.30	15.80	15.85	18.00	19.00	SD-154
130	112	15.000	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.13	2.48	15	2.00	11.83	12.13	15.76	15.80	17.85	18.00	SD-122
131	118	24.340	0.21	0.21	0.98	0.21	0.21	10.0	10.0	6.5	1.33	9.07	1.08	15	1.97	11.63	12.11	15.68	15.69	18.00	19.00	SD-155
132	111	15.177	0.48	0.48	0.98	0.47	0.47	10.0	10.0	6.5	3.04	9.23	2.48	15	2.04	11.27	11.58	15.48	15.51	17.75	18.00	SD-123
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

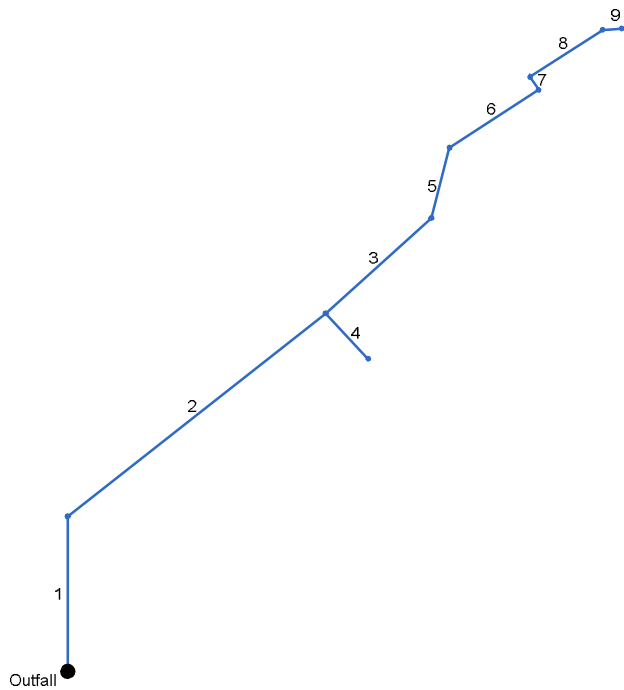
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
133	109	20.726	0.28	0.28	0.98	0.27	0.27	10.0	10.0	6.5	1.77	9.08	1.45	15	1.98	10.62	11.03	15.21	15.23	17.70	19.24	SD-124
134	End	17.671	0.00	0.45	0.00	0.00	0.44	10.0	10.2	6.4	2.84	6.61	1.61	18	0.40	10.00	10.07	13.65	13.66	14.28	14.67	SD-70
135	134	16.830	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	5.12	1.86	18	0.24	12.44	12.48	13.67	13.68	14.67	15.75	SD-69
136	End	130.012	0.42	0.87	0.98	0.41	0.85	10.0	10.9	6.3	5.35	10.50	3.03	18	1.00	10.35	11.65	13.44	13.78	10.80	17.15	SD-9
137	136	130.000	0.45	0.45	0.98	0.44	0.44	10.0	10.0	6.5	2.85	6.46	2.48	15	1.00	11.75	13.05	13.85	14.08	17.15	17.15	SD-10
138	End	127.000	0.31	0.66	0.98	0.30	0.65	10.0	10.8	6.3	4.08	10.50	2.36	18	1.00	9.38	10.65	11.85	12.02	10.83	19.30	SD-40
139	138	130.354	0.35	0.35	0.98	0.34	0.34	10.0	10.0	6.5	2.22	6.47	2.83	15	1.00	10.75	12.06	12.07	12.65	19.30	19.30	SD-41
140	End	102.728	0.34	0.34	0.98	0.33	0.33	10.0	10.0	6.5	2.15	6.47	1.76	15	1.00	9.23	10.26	13.95	14.06	10.68	17.00	SD-12
141	End	206.778	0.82	2.80	0.98	0.80	2.74	10.0	11.8	6.1	16.72	28.95	3.41	30	0.50	9.35	10.38	14.10	14.44	10.80	15.74	SD-16
142	141	130.000	0.82	1.98	0.98	0.80	1.94	10.0	10.9	6.3	12.16	29.00	2.48	30	0.50	10.48	11.13	14.71	14.83	15.74	15.74	SD-15
143	142	130.087	1.16	1.16	0.98	1.14	1.14	10.0	10.0	6.5	7.35	15.99	2.34	24	0.50	11.23	11.88	14.88	15.01	15.74	15.74	SD-14
144	End	206.778	0.82	2.47	0.98	0.80	2.42	10.0	12.4	6.0	14.49	28.95	2.95	30	0.50	9.35	10.38	13.26	13.52	10.80	15.74	SD-17
145	144	130.000	0.82	1.65	0.98	0.80	1.62	10.0	11.3	6.2	10.01	29.00	2.04	30	0.50	10.48	11.13	13.72	13.80	15.74	15.74	SD-18
146	145	130.000	0.83	0.83	0.98	0.81	0.81	10.0	10.0	6.5	5.26	15.99	1.67	24	0.50	11.23	11.88	13.83	13.88	15.74	15.74	SD-19
147	End	205.545	0.65	2.32	0.98	0.64	2.27	10.0	11.0	6.2	14.21	29.03	3.03	30	0.50	9.23	10.26	12.20	12.41	10.68	15.75	SD-22
148	147	102.728	0.82	1.67	0.98	0.80	1.64	10.0	10.6	6.3	10.39	28.90	3.67	30	0.50	10.36	10.87	12.64	11.95	15.75	15.74	SD-21
149	148	132.092	0.85	0.85	0.98	0.83	0.83	10.0	10.0	6.5	5.39	15.99	3.99	24	0.50	10.97	11.63	11.95	12.45	15.74	15.74	SD-20
150	End	129.694	0.42	1.09	0.98	0.41	1.07	10.0	10.6	6.3	6.76	22.64	2.54	24	1.00	9.35	10.65	11.95	12.03	10.80	17.15	SD-7
151	150	130.133	0.67	0.67	0.98	0.66	0.66	10.0	10.0	6.5	4.25	10.50	3.52	18	1.00	10.75	12.05	12.10	12.84	17.15	17.15	SD-6
152	End	59.699	0.00	0.01	0.98	0.00	0.01	10.0	13.5	5.8	1.66	12.42	0.53	24	0.30	9.00	9.18	11.87	11.87	11.79	16.67	SD-71
153	152	71.595	0.00	0.01	0.98	0.00	0.01	10.0	11.2	6.2	1.66	12.25	0.53	24	0.29	9.18	9.39	11.88	11.88	16.67	16.50	SD-72
154	153	39.322	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	1.66	11.96	0.53	24	0.28	9.39	9.50	11.88	11.88	16.50	11.79	SD-72 (1)
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
155	End	82.500	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	10.40	36.71	3.02	36	0.30	9.00	9.25	10.59	10.62	12.29	12.63	SD-23
156	End	82.727	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	10.40	36.66	4.10	36	0.30	9.00	9.25	10.23	10.36	12.29	12.63	SD-24
157	End	43.350	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	0.06	36.52	0.01	36	0.30	9.00	9.13	11.57	11.57	12.29	12.51	SD-25
158	End	154.657	0.01	0.01	0.98	0.01	0.01	10.0	10.0	6.5	4.43	36.37	0.66	36	0.30	9.00	9.46	12.00	12.00	10.46	12.84	SD-32
Project File: Pipe Sizing Rev 3a.stm																Number of lines: 158				Run Date: 8/18/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	180.000	0.00	8.60	0.95	0.00	8.34	10.0	21.3	4.7	84.89	103.7	8.35	48	0.44	5.50	6.30	8.81	9.09	10.00	15.45	
2	1	380.000	0.00	8.60	0.00	0.00	8.34	10.0	20.5	4.8	85.67	87.45	7.93	48	0.32	6.30	7.50	9.51	10.71	15.45	14.80	
3	2	165.000	0.00	8.60	0.95	0.00	8.34	10.0	20.1	4.8	40.15	76.71	6.72	36	1.13	8.31	10.17	11.69	12.23	14.80	20.10	
4	2	72.000	0.00	0.00	0.95	0.00	0.00	10.0	10.0	0.0	45.93	110.0	5.76	48	0.50	8.54	8.90	11.69	10.93	14.80	17.00	
5	3	84.000	0.00	8.60	0.95	0.00	8.34	10.0	19.9	4.8	40.32	31.42	8.22	30	0.50	11.47	11.89	13.97	14.66	20.10	21.45	
6	5	123.000	0.00	8.60	0.95	0.00	8.34	10.0	19.7	4.9	40.58	31.54	8.27	30	0.50	11.89	12.51	15.42	16.44	21.45	17.50	
7	6	18.000	0.00	8.60	0.95	0.00	8.34	10.0	19.6	4.9	40.62	31.42	8.27	30	0.50	12.51	12.60	17.51	17.66	17.50	19.50	
8	7	100.000	0.00	8.60	0.95	0.00	8.34	10.0	19.4	4.9	40.82	31.42	8.32	30	0.50	12.60	13.10	18.72	19.57	19.50	19.50	
9	8	22.000	8.60	8.60	0.97	8.34	8.34	19.4	19.4	4.9	40.87	44.43	8.33	30	1.00	14.53	14.75	20.16	20.34	19.50	19.50	
Project File: Pipe Sizing Rev 3a-Existing Pipe.stm																Number of lines: 9				Run Date: 8/17/2026		
NOTES:Intensity = 182.59 / (Inlet time + 19.10) ^ 0.99 ; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Conduit Outlet Protection Calculations

Rip Rap Pad # **A-120**

Design Parameters:

Design Storm Flow for 25 Year, Q	1.66 cfs
Vertical Dimension of Outlet Pipe, D_o	24 in
Horizontal Dimension of Outlet Pipe, W_o	24 in
Tailwater Depth, TW^1	3.02 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 0.83$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

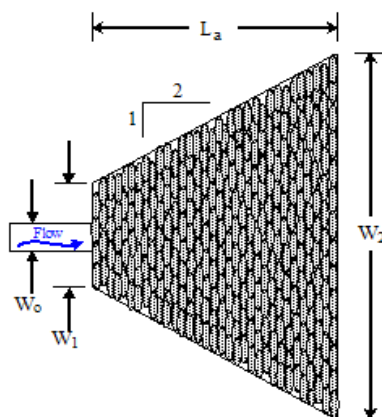
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 1.76 \text{ ft}$$

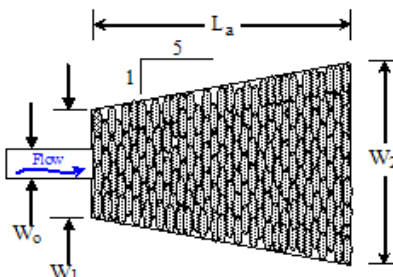
$$\text{Width, } W_1 = 3W_o = 6 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 6.7 \text{ ft}$$

$$\text{or } L_a = 2 \text{ ft}$$

$$\text{or } W_1 = 6 \text{ ft}$$

$$\text{or } W_2 = 7 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.06 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **B-10**

Design Parameters:

Design Storm Flow for 25 Year, Q
Vertical Dimension of Outlet Pipe, D_o
Horizontal Dimension of Outlet Pipe, W_o
Tailwater Depth, TW^1

10.34 cfs
36 in
36 in
3.16 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 3.45$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

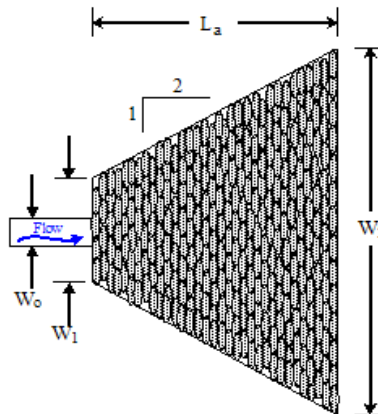
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 5.97 \text{ ft}$$

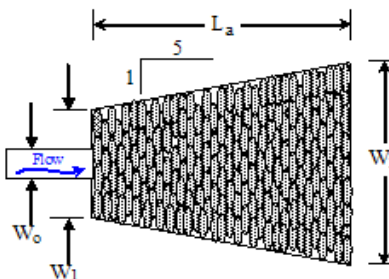
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 11.39 \text{ ft}$$

$$\text{or } L_a = 6 \text{ ft}$$

$$\text{or } W_1 = 9 \text{ ft}$$

$$\text{or } W_2 = 12 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.39 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **C-10**

Design Parameters:

Design Storm Flow for 25 Year, Q
Vertical Dimension of Outlet Pipe, D_o
Horizontal Dimension of Outlet Pipe, W_o
Tailwater Depth, TW^1

10.34 cfs
36 in
36 in
3.16 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 3.45$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

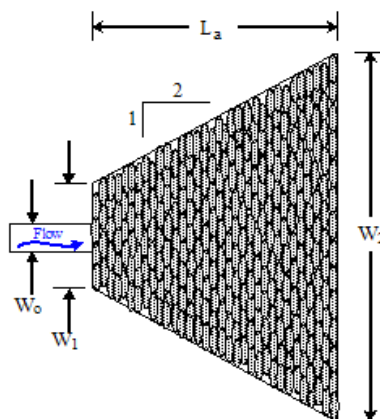
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 5.97 \text{ ft}$$

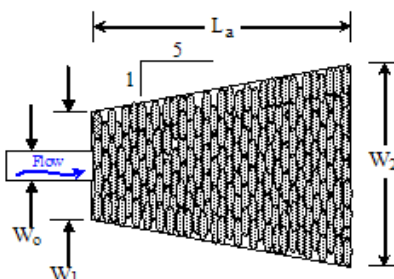
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 11.39 \text{ ft}$$

or $L_a = 6 \text{ ft}$

or $W_1 = 9 \text{ ft}$

or $W_2 = 12 \text{ ft}$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.39 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **D-10**

Design Parameters:

Design Storm Flow for 25 Year, Q
Vertical Dimension of Outlet Pipe, D_o
Horizontal Dimension of Outlet Pipe, W_o
Tailwater Depth, TW^1

10.34 cfs
36 in
36 in
3.23 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 3.45$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

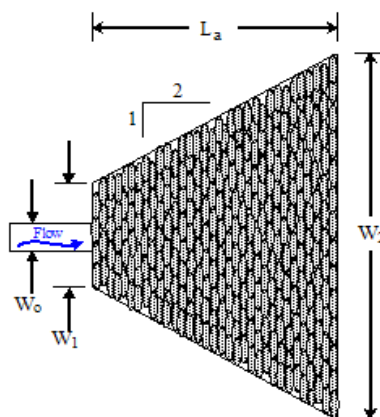
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 5.97 \text{ ft}$$

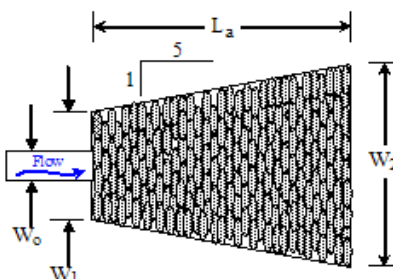
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 11.39 \text{ ft}$$

$$\text{or } L_a = 6 \text{ ft}$$

$$\text{or } W_1 = 9 \text{ ft}$$

$$\text{or } W_2 = 12 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.39 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **E-10**

Design Parameters:

Design Storm Flow for 25 Year, Q	29.70 cfs
Vertical Dimension of Outlet Pipe, D_o	42 in
Horizontal Dimension of Outlet Pipe, W_o	42 in
Tailwater Depth, TW^1	3.23 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 8.49$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

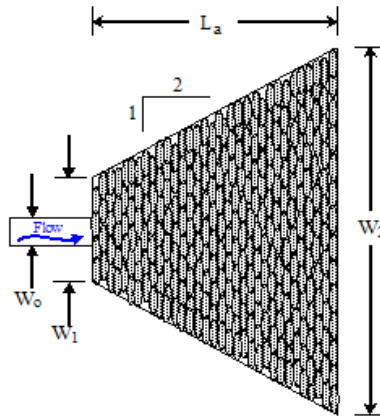
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 13.61 \text{ ft}$$

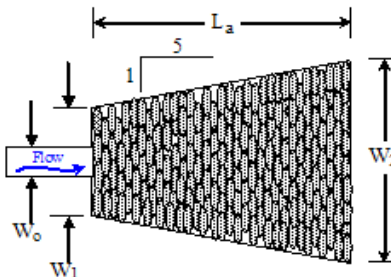
$$\text{Width, } W_1 = 3W_o = 10.5 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 15.94 \text{ ft}$$

$$\text{or } L_a = 14 \text{ ft}$$

$$\text{or } W_1 = 11 \text{ ft}$$

$$\text{or } W_2 = 16 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 1.28 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **G-10**

Design Parameters:

Design Storm Flow for 25 Year, Q	4.43 cfs
Vertical Dimension of Outlet Pipe, D_o	36 in
Horizontal Dimension of Outlet Pipe, W_o	36 in
Tailwater Depth, TW^1	3.02 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 1.48$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

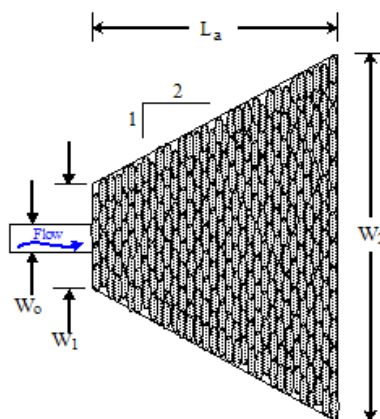
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 2.56 \text{ ft}$$

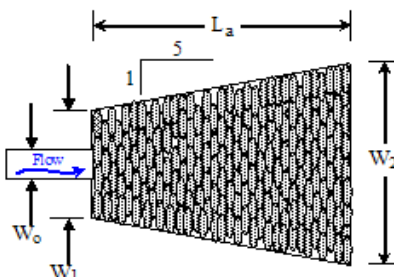
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 10.02 \text{ ft}$$

$$\text{or } L_a = 3 \text{ ft}$$

$$\text{or } W_1 = 9 \text{ ft}$$

$$\text{or } W_2 = 11 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.13 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **G-98**

Design Parameters:

Design Storm Flow for 25 Year, Q	22.27 cfs
Vertical Dimension of Outlet Pipe, D_o	36 in
Horizontal Dimension of Outlet Pipe, W_o	36 in
Tailwater Depth, TW^1	3.16 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 7.42$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

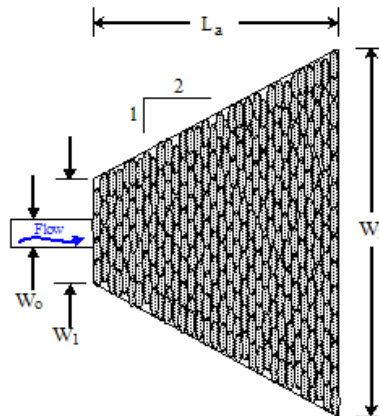
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 12.86 \text{ ft}$$

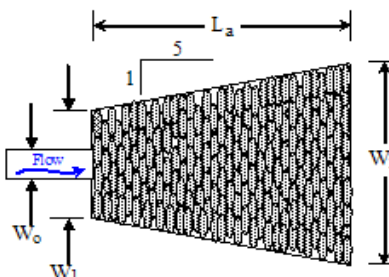
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 14.14 \text{ ft}$$

$$\text{or } L_a = 13 \text{ ft}$$

$$\text{or } W_1 = 9 \text{ ft}$$

$$\text{or } W_2 = 15 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 1.09 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # **I-10**

Design Parameters:

Design Storm Flow for 25 Year, Q	20.39 cfs
Vertical Dimension of Outlet Pipe, D_o	36 in
Horizontal Dimension of Outlet Pipe, W_o	36 in
Tailwater Depth, TW^1	2.83 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/W_o = 6.80$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

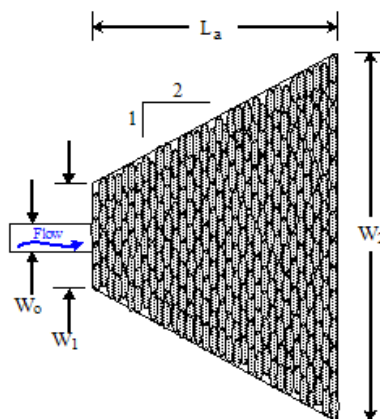
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 11.77 \text{ ft}$$

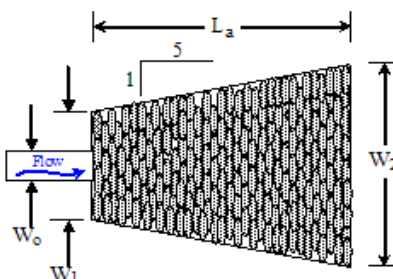
$$\text{Width, } W_1 = 3W_o = 9 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 13.71 \text{ ft}$$

$$\text{or } L_a = 12 \text{ ft}$$

$$\text{or } W_1 = 9 \text{ ft}$$

$$\text{or } W_2 = 14 \text{ ft}$$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 1.08 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.

2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

F. SUPPORTING DOCUMENTS

- ◆ **Geotechnical Report**
- ◆ **Manufactured Treatment Device Certification & Details**
- ◆ **Underground Basin Manufacturer Specifications**



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UPDATED REPORT – PRELIMINARY SOILS AND FOUNDATION INVESTIGATION

Proposed Warehouse Development Sayreville, Middlesex County, New Jersey Bohler

January 29, 2025
File No. 26.0093159.01

PREPARED FOR:

Bohler
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www.gza.com

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January 29, 2025
File No. 26.0093159.01

Bohler
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Warren, New Jersey 07059

Attention: Mr. Tung-To Lam, P.E.
Associate

Updated Report
Preliminary Soils and Foundation Investigation
Proposed Warehouse Development
Sayreville, Middlesex County, New Jersey
Bohler

Introduction

This updated report presents the results of a preliminary soils and foundation investigation performed by GZA GeoEnvironmental Inc. (GZA) for the proposed warehouse development which may be constructed in Sayreville Township, Middlesex County, New Jersey. The site is identified as Block 14, Lot 1 and the existing building has an address of 4000 Bordentown Avenue. The approximate location of the site is shown on the Site Location Map, Plate 1.

This report is an update of GZA's geotechnical report dated September 23, 2024 to reflect additional discussions of the geotechnical related development and construction plans with the design team. This updated report includes recommendations for the use of a ground improvement program consisting of dynamic compaction to prepare the building areas for support of the structure in lieu



of the previously recommended conventional excavation of fill and replacement with controlled compacted fill since additional information was provided to us regarding accommodating potential asbestos containing materials in the ground improvement program.

Proposed Construction

The updated “Concept Plan” prepared by Bohler dated October 10, 2024, indicates the proposed development would consist of demolition of an existing structure and construction of two new warehouses identified as Warehouse #1 and Warehouse #2. Warehouse #1 would be constructed in the northwestern portion of the site and be approximately 308,200 square feet in plan area, while Warehouse #2 would be constructed in the southeastern portion of the site and be approximately 406,300 square feet in plan area. Both warehouses would be surrounded by asphalt pavement and concrete loading docks on the eastern sides of the structures. Several hundred trailer parking spaces are planned to the east of Warehouse #2 beyond the loading docks. There is an existing Conrail rail line to the west of the existing building and two rail spurs are proposed to service the proposed warehouses. As the drawings are conceptual at this time, grading and loading information is not available.

Stormwater management facilities would be required to accommodate the new development, and Bohler indicated four potential areas on the concept plan. Additionally, preliminary discussions have indicated that underground basins and/or porous pavement may be utilized in the car parking spaces, although it is not known if the facilities will rely on infiltration at this time. No further information regarding stormwater basins is known at this time.



Subsurface Explorations

GZA previously performed 10 supervised test borings (B-101 through B-110) and 33 test pit excavations (TP-101 through TP-106, 106A and 107 through 132) within accessible areas of the currently proposed Warehouse #2 and pavement areas in June 2024. From a geotechnical planning perspective, we previously reviewed data in geotechnical, environmental, and stormwater site investigations prepared by Whitestone Associates, Inc. (Whitestone) that were performed between 2019 and 2022 for a different development configuration.

Whitestone's explorations for the prior plan were generally performed in the area of currently proposed Warehouse #2 and its trailer parking. In total, Whitestone performed 47 soil borings and 31 test pits. Five temporary monitoring wells were also installed as part of their work. The geotechnical and stormwater exploration logs prepared by Whitestone are included in Appendix I of this report.

The data above was used to develop our preliminary geotechnical findings at that time. Based on the information available at that time, it was determined that removal of existing fill and replacement with controlled compacted fill was required to allow proposed Warehouse #2 to utilize shallow foundations and be of slab-on-grade construction. However, additional testing by Roux Associates has substantially quantified the location of ACM impacted materials which are expected to be present in more limited volumes such that these materials are expected to be removed and placed as mass fill below proposed Warehouse #2, covered with a few to several feet of fill materials and dynamically compacted for support of the building.



Purpose and Scope of Work

The purpose of our services was to:

- 1) review the prior exploration data and updated plans and environmental information from recent environmental investigations as the extent of potential ACM material has substantially reduced;
- 2) review the updated ACM testing plan prepared by Roux Associates;
- 3) estimate the relevant geotechnical engineering properties of the encountered materials;
- 4) evaluate the site foundation requirements considering the anticipated structural loads and encountered subsurface conditions;
- 5) recommend an appropriate type of foundation for support of the proposed structures, and provide geotechnical-related foundation design and installation criteria, including an estimate of the Site Class as defined by Chapter 20 of ASCE-7 which is referenced in the International Building Code, New Jersey Edition (IBC-NJ), for seismic design purposes;
- 6) provide preliminary recommendations for the support and the need for subdrainage of the ground level floor slabs;
- 7) provide estimated lateral earth pressure and drainage criteria for use in the design of loading dock walls;
- 8) recommend appropriate pavement sections based on design traffic information provided to us; and
- 9) preliminarily discuss earthwork operations or considerations consistent with the proposed construction and encountered subsurface conditions.

To accomplish these purposes, we reviewed our prior subsurface exploration program performed in June of 2024 which consisted of 10 supervised test borings (B-101 through B-110) and 33 test pit excavations (TP-101 through TP-106, 106A and 107 through 132). The test borings were advanced using ATV-mounted drilling equipment (CME 55) and extended to depths ranging from approximately 22 to 27 feet bgs. The test pits were excavated in lawn and other vegetated areas using a track excavator (Case CX



160) and extended to depths ranging from approximately 2 to 13 feet bgs. Most of the test pits were performed strictly for Hydrologic Soil Group (HSG) evaluation purposes and terminated at 40 inches, or were terminated where suspected ACM may have been identified. Explorations were not performed within the existing building. The approximate locations of the explorations performed by GZA and Whitestone are shown on the Plot Plan, Plate 2.

All field work was performed under the direct technical observation of a representative from GZA. Our representative located the explorations in the field, maintained continuous logs of the explorations as the work proceeded, supervised the soil sampling operations during the advancement of the borings, and obtained selected bulk and tube samples of the encountered materials in the test pits to develop the desired subsurface information. No samples of suspected ACM materials were obtained, and the material placed back into the explorations at about the same level they were encountered.

Detailed descriptions of the encountered subsurface conditions are described on the individual Test Boring Logs, Plates 3-1 through 3-10, and Test Pit Logs, Plates 4-1 through 4-6, 4-6A and 4-7 through 4-32. The soils encountered in the test borings were visually classified in general accordance with the procedures of the Unified Soil Classification System (USCS) described on Plate 5, while the soils encountered in the stormwater test pits were visually classified in general accordance with the procedures of the United States Department of Agriculture (USDA) textural triangle described on Plate 6.

All soil samples obtained from the explorations were brought to our office where they were further examined in our soil mechanics laboratory. Laboratory testing consisting of moisture content



determinations and mechanical grain-size analyses was performed on select samples to assist in sample identification. The moisture content results are presented on the individual exploration logs, while the grain size test results are presented on Plates 7A through 7D, Gradation Curves.

The updated plans, prior explorations performed by Whitestone, recent ACM test results provided by Roux and the results of our prior field exploration and laboratory testing programs have provided the basis for our updated engineering analyses and geotechnical design recommendations. The following discussions of our findings and recommendations are subject to the Limitations attached as Appendix II to this report.

Site Conditions

Surface Features: The site is currently occupied by an existing warehouse building constructed during the 1940s. The building is suspected to be occupied by multiple tenants, with loading areas along the northern and eastern portions of the building. The existing warehouse is present within the majority of proposed Warehouse #1 and the western portion of Warehouse #2 and would be demolished to facilitate the new construction. A Conrail rail line traverses the southern and western portions of the site parallel to Jernee Mill Road. The remaining portions of the site consist primarily of asphalt paved driveways, parking lots, and lawn areas. Mapped wetlands are located along the eastern and northern property line.

Subsurface Conditions: The geotechnical related subsurface conditions encountered in the explorations by GZA and others consisted of the following generalized strata, listed in order of increasing depth:



- 1) Surface Materials: The surface materials encountered in the explorations consisted of asphalt pavement or topsoil. The asphalt pavement was measured to be approximately 2 to 4 inches thick and underlain by approximately 2 to 8 inches of stone subbase materials in B-101 through B-103, and B-105 through B-107. Topsoil was encountered in the lawn/vegetated areas and ranged from approximately 5 to 21 inches in thickness in B-104, B-108 through B-110, and all of the stormwater test pits. The thickness of the surface materials should be expected to vary between the explored locations.
- 2) Fill: The surface materials were underlain by fill materials in 7 of the 10 borings and 26 of the 32 test pits. The fill generally consisted of sands and silty sands with variable amounts of construction debris and generally extends to depths ranging from approximately 2 to 9.7 feet bgs. Suspected ACM materials were encountered in B-110, TP-106, TP-112, and TP-131. TP-112 was terminated in the fill. Due to the limited depth excavated at TP-106 within a proposed stormwater management area, an additional test pit (TP-106A) was excavated approximately 20 feet east of TP-106 to offset from suspected ACM. A fine sand soil layer with roots, fibers, and wood fragments which was visually described as organic silt in the Whitestone geotechnical report, was observed within the fill in the majority of the recent GZA and prior Whitestone explorations performed in the eastern portion of the property (within the existing lawn area). The number of the explorations where these materials were encountered are outlined in red on the Plot Plan for planning purposes.
- 3) Sands, Silty Sands, and Silty Clays: The surface and fill materials were primarily underlain by interlayered sand, silty sand, and silty clay soils to the termination depths of the explorations, approximately 5 to 27 feet bgs. The predominantly sandy soils contained high percentages of fine sand. The clayey soils were generally estimated to be medium to hard in consistency, while the sandy soils were typically estimated to be medium dense to very dense in relative density. Loose sandy layers were encountered in B-104, 106 and 109.

Groundwater was encountered in all of the borings and in 16 of the 32 test pit excavations performed for this study, and will vary seasonally. The depth to groundwater varied from approximately 3 to 10 feet bgs in the recent GZA explorations. Where encountered in the test pits, the seepage rates were estimated to be moderate to rapid in intensity. Whitestone reported groundwater at depths of 2 (B-18) to 12 feet with groundwater levels generally encountered at depths of 6 to 10 feet below the ground surface in the test pits and temporary wells.



Preliminary Findings and Recommendations

General: Based on the results of our preliminary subsurface investigation, it is our opinion that:

- 1) The proposed buildings can be supported atop shallow foundations and slabs on-grade following ground improvement consisting of dynamic compaction. However, at the time of this report, only four explorations have been advanced around the limits of proposed Warehouse #1 as the majority of the proposed building is occupied by an existing warehouse structure. In addition, the existing warehouse is present within approximately the western one-third of Warehouse #2, and therefore, the explorations advanced for Warehouse #2 were limited to the eastern approximate two-thirds of the proposed building. Following demolition of the existing building/associated improvements, an additional exploration program will be required to evaluate the subsurface conditions throughout these areas of the building and to confirm the requirements of the ground improvement program. It would be advisable to perform these explorations after Grading Plans have been developed.
- 2) The majority of the explorations advanced to date typically encountered fill that varied in thickness from approximately 2 feet to 9.7 feet. Additionally, existing fill should be expected to be encountered below the existing warehouse structure and in the unexplored areas of the site due to past site development. Suspected ACM was noted in the existing fill in a few of our explorations and some of the explorations performed for Whitestone's Phase II report and has since been delineated and tested in greater detail by Roux. It is our opinion that the existing fill would not be suitable for direct support of the proposed building foundations and floor slabs without appropriate densification by dynamic compaction. Based on recent discussions with the project team, we understand that it is desired to remove ACM as required by grading, from some areas on the property and place them in proposed Warehouse #2. A few feet of cover would be placed atop the ACM materials prior to implementation of dynamic compaction (DC) to prevent and encapsulate exposure during the dynamic compaction work. Details of the fill placement and dynamic compaction operations to prevent environmental exposure of these materials before and after construction would have to be developed with the dynamic compaction specialty contractor and the project environmental consultant.
- 3) DC is a ground improvement method that involves dropping a heavy weight, typically on the order of 10 to 15 tons, from heights of 40 to 60 feet using a large crane in a predetermined grid pattern over the building footprint and 10 feet beyond. DC programs typically involve two high energy passes with the second pass offset from the first pass followed by an ironing pass to help densify the upper fill to 5 feet of soils that result from the craters. It is our recommendation that DC be performed under a design/build contract where the DC contractor designs the program to achieve minimum post-construction building performance criteria, typically an allowable bearing pressure



of at least 4,000 pounds per square foot and maximum post-construction settlements of one inch. Means to prevent exposure to encapsulated ACM materials should be included.

- 4) During each pass of DC, the craters should be backfilled either by leveling the ground around the craters with a bulldozer or by placing granular fill within the craters and compacting the surface with several passes of heavy, self-propelled vibratory compactor. Craters resulting from dynamic compaction should be leveled on a daily basis to prevent collection of water, ice, snow and frost to facilitate subsequent dynamic compaction passes. The ground surface should be compacted with a heavy vibratory roller to maintain a stable surface and pitch to divert surface water.
- 5) DC will impart vibrations which may be noticeable off-site. The contractor should be responsible to monitor vibrations and provide measures to limit vibrations off-site in accordance with the applicable codes and to limit any damage to adjacent improvements. They should also provide measures to limit any airborne debris which results from the dropping of the weight from impacting any off-site improvements or the adjacent roadways. The use of an isolation trench can sometimes be used to help limit off-site vibrations as well as adjusting the size of the weight and height of the drop. It appears that most structures located on adjacent properties are 150 to 200 feet from the proposed building area with the exception of the rail line. If sensitive structures are identified, vibration monitoring and/or preconstruction surveys may be appropriate.
- 6) The effectiveness of DC is typically monitored by field observations that craters from successive passes of the DC are not as deep as from the initial passes, by measuring ground lowering that occurs and by performance of soil check borings after completion of the DC. Methods to address any excessive craters in compacted fill, including ACM materials, should be established prior to the start of the work.
- 7) All exterior building foundations should be established at depths of at least 3 feet below the lowest adjacent exterior ground surface, or as required by local building codes if deeper, to provide protection from frost penetration. Foundation subgrade soils should be recompacted prior to placing rebar and concrete. Interior footings may be established at convenient levels provided they are supported by natural soils or dynamically compacted fill.
- 8) The proposed floor slabs could derive their support from the fill materials subjected to DC or controlled compacted fill installed atop the compacted soils. The proposed floor slabs should be underlain by a minimum 6-inch-thick layer of clean three-quarter inch crushed stone or other porous material to provide a capillary break between the slabs and the subgrade soils. Depending on the actual floor slab loads and future site grading, the need to increase the thickness of the subslab layer may be warranted. If several feet of granular soils (NJDOT DGA or RCA) are used to reach the proposed floor level, the porous stone layer may not be warranted. For design purposes, a modulus of subgrade reaction of 150 pci may be used in the initial floor slab design. If granular soils are not



used near the surface, this value would change. This need would be further evaluated once grading plans are developed and following completion of the supplemental investigation.

- 9) Based on the subsurface conditions encountered in our preliminary study and our review of published data, it is our opinion that the subsurface conditions represent those identified as seismic Site Class D, as defined by Chapter 20 of ASCE-7 referenced in the International Building Code, New Jersey Edition. We plotted the SPT N-values normalized to an energy efficiency of 60 percent versus depth to assess whether liquefaction was required as part of this study. The range of corrected N-values below the water table revealed that liquefaction was not likely and does not need to be considered in design.
- 10) Typically, the initial site preparation activities would include clearing and grubbing of trees, roots and vegetation and stripping of topsoil from within the proposed improvement areas. Variations in the thickness of topsoil should be anticipated between the explorations. At this time, we anticipate that the existing warehouse is supported by conventional shallow spread foundations and of slab-on-grade construction. The existing warehouse should be demolished including complete removal of all structural elements. It is common that foundations are left in-place during demolition, and additional test pits should be performed following demolition as a means to determine if all structural elements have been removed from below the future buildings or may interfere with other improvement work. Following demolition, it may be worthwhile performing an ironing pass in Warehouse #1 in lieu of test pits since the crane would be performing DC in the majority of Warehouse #2 and is useful in finding soft spots, buried debris, or anomalies in the subsurface. Depending on the depths of foundations, they could remain in future pavement areas provided they do not impact future construction, utility installation, and are at least 4 feet below future subgrade grades. However, slabs should be thoroughly fragmented to promote drainage through the slabs. Any ACM materials which are exposed should be accommodated per the project environmental requirements. The resultant excavations from the demolition work should be backfilled with controlled compacted fill as described in a later section of the report. Existing asphalt should be milled and could be reused below future pavement subbase if approved by the environmental consultant.
- 11) Grading information is not available at this time. Therefore, required soil movement across the site is unknown. Any ACM impacted materials present at exposed subgrade levels should be handled in accordance with the environmental consultant's work plan. Typical construction procedures would include proofrolling/recompacting the exposed subgrades, prior to any soil movement. Soils would be moisture conditioned, where necessary, or removed and the subgrades compacted to a relatively dense and stable consistency and to at least 95 percent of their maximum dry density under the observation of a representative from GZA. Proofrolling should be performed using a heavy self-propelled roller (Dynapac CA-252, or equivalent), a loaded tandem axle dump truck, or other approved heavy rubber tire construction equipment as determined at the time of construction with the inspecting geotechnical engineer from GZA. Where subgrade soils become wet, unstable, or



frozen, they may no longer be suitable for fill placement and sufficient time should be provided for drying the soils. If sufficient time is not available, these materials should be excavated and replaced with controlled compacted fill. Subgrade preparation of stormwater infiltration areas should be performed per the stormwater design plan requirements, and would generally not require compaction as this would lower the permeabilities of the infiltrative surfaces.

- 12) Recycled concrete, or other inert demolition rubble composed of durable concrete and brick which is crushed, pulverized or screened to a sand and gravel size gradation could be considered for reuse as structural fill from a geotechnical viewpoint providing there are no project or environmental regulations preventing their reuse and any appropriate approvals and permits are obtained. Excavated sands and silty sands with limited fines would also be a good source of materials from a geotechnical perspective for reuse as controlled compacted fill provided they are conditioned, where necessary, to moisture contents needed to attain the required compaction. However, it should be noted that the fill and natural sandy soils contained a high percentage of fine sand, and these soils may be more difficult to work with during periods of wet weather. Portions of the fill contained wood, roots and fibers and these materials would need to be segregated during the excavation process and should not be reused as fill/backfill in structural areas. Excavated soils with high silt and clay percentages would provide a less desirable source of material from a geotechnical perspective for reuse as controlled compacted fill at the site as they would be susceptible to moisture related stability and compaction problems when exposed to inclement weather and generally require extensive drying to achieve adequate moisture contents suitable for compaction purposes. Moisture content testing was performed on select samples of the fill, and the results ranged from approximately 3 to 33 percent, which is generally below to above the range to permit compaction. Therefore, it should be expected that moisture conditioning will be required to permit their reuse. Clayey soils would be better suited for use in non-structural, landscaped areas where a high degree of compaction is less critical, in the construction of stormwater basin embankments, or if placed and compacted at favorable moisture contents, used as fill in deep fill areas where they can be covered by several feet of granular fill soils. The suitability of the site soils for reuse would have to be evaluated at the time of construction by a geotechnical engineer from GZA. Topsoil would not be suitable for use as structural fill.
- 13) ACM impacted soils are planned for reuse by encapsulation and compacted below the building. The means and methods for treatment of the materials, including potential drying to enable compaction should be developed with the project environmental consultant and an environmental work plan established for these materials when they are to remain on site. A HASP should also be provided to address conditions where these materials may be exposed. Environmental oversight of the reuse of these materials should be provided. All storage or placement of excavated or exposed ACM materials should be treated in accordance with the project environmental requirements relative to the encapsulation, exposure, handling and disposal requirements.



- 14) Imported fill, if required to complete the site grading in non-infiltration areas, should consist of uncontaminated, relatively well graded granular soils containing less than 15 percent by weight of material passing a U.S. Standard No. 200 sieve and a maximum particle size of 4 inches. More select materials may be needed in areas designed for infiltration. Testing should be performed by the contractor to demonstrate that any imported fill sources are environmentally clean.
- 15) All controlled compacted fill and backfill not sufficiently compacted by dynamic compaction or in other structural areas should be placed in horizontal layers of 12 inches or less in loose thickness and uniformly compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557 test procedure. Compaction in non-structural areas should be a minimum of 90 percent of its maximum dry density to limit the potential for settlement. Any fill required below future infiltration, retention, detention or storage areas should be tested and placed in accordance with the NJDEP Best Manages Practice Manual. Moisture conditioning should be performed by the contractor as needed during placement of fill, as well as after, if needed, to recompact and restore subgrades disturbed by weather and construction effects to a dense, stable condition. Backfill placed in confined areas such as foundation or utility trench excavations, or where portable compaction equipment is used, should be spread in thinner lifts and uniformly compacted to similar densities. All fill placement and compaction should be performed under the observation of a geotechnical representative from GZA.
- 16) Groundwater was encountered in the majority of the explorations at depths ranging from approximately 3 to 10 feet bgs, and will vary with season and location. Where encountered, water was typically observed near or slightly below the fill/natural soil interface. Groundwater was typically observed at shallower depths in the southeastern portion of the site where future trailer parking and basins are proposed. Limited information about groundwater in the northern portion of the site and around the existing building is known at this time. Future grading will impact the quantity of dewatering and need for it. The contractor should be required to provide all dewatering as necessary to maintain relatively dry excavations. We recommend that groundwater is maintained at least 2 feet beneath the proposed subgrade levels. We anticipate any dewatering in shallow excavations could likely be accomplished by pumping from sumps located in the excavations. If deeper excavations below the observed water levels are required, the use of a formal dewatering system such as well points could be necessary. Control of runoff should also be provided to prevent inundation of excavations or ponding on subgrades. Dewatering and all surface and groundwater control should be performed in accordance with any environmental requirements.
- 17) All excavations should be performed in accordance with the latest OSHA Safety Requirements assuming the site soils are Type "C" soils as defined by the OSHA Excavation Regulations. Additionally, it should be noted that sloughing of the excavation sidewalls was encountered in some of the test pits near the observed groundwater seepage levels. Excavation sidewalls should be flattened as necessary to maintain safe conditions or excavation support provided, as necessary. Any impacted soils should be addressed per the project environmental requirements.



- 18) Loading dock walls and any site retaining walls or excavation support systems, if planned, should be designed to resist lateral earth pressures imposed by the adjacent soils, as well as surcharge loads due to adjacent construction activity, traffic, floor slab or foundation loads, etc. All walls should be provided drainage to prevent the build-up of hydrostatic pressures. Loading dock walls which are not fixed and thus free to rotate slightly during backfilling should be designed to resist earth pressures assuming an active earth pressure condition, while fixed walls should accommodate an at rest condition. Excavated granular soils or imported sand and gravel soils would be preferred backfill materials. Excavated silty and clayey soils would not be desirable for use as backfill as they are poor draining and impose higher lateral pressures. For design of the walls, a friction factor of 0.45 between mass concrete and the natural soils would be appropriate. Subject to confirmation at the time of construction, we believe the soil properties presented in the table below could be used in design of the systems.

Soil Type	Total Unit Weight (pcf)	Angle of Internal Friction (°)
Compacted Fine Sands or Silty Sands	125	30
Clean 3/4 Inch (No. 57) Stone	105	38
NJDOT Dense Graded Aggregate	145	36

- 19) The exposed subgrade materials in impervious pavement areas should be proofrolled and compacted to a dense and stable condition immediately prior to paving. Any loose, soft, or unstable soils should be removed and replaced with controlled compacted fill. In general, pavements established on recompacted existing fill should be designed for a “poor” subgrade condition, with an estimated California Bearing Ratio (CBR) value of approximately 3 percent. Pavements established on the densely compacted natural sandy soils or at least 18 inches of granular compacted fill should be designed for a “medium” subgrade condition, with an estimated California Bearing Ratio (CBR) value of approximately 7 percent. The actual CBR value and subgrade condition should be confirmed by laboratory and/or testing. The subgrade for pavements areas designed for infiltration should be prepared in accordance with the site plan requirements and generally should not be compacted.

Future Work

Once final building layout, grading and loading information are available, we should review our preliminary findings and recommendations and update this report for the proposed warehouse development. Any environmental testing or treatment or encapsulation requirements established for



ACM materials should also be provided to us. Following demolition of the existing warehouse structure, additional explorations consisting of supplemental test borings and/or test pits would need to be performed to further investigate the site, particularly in areas with a limited number of explorations.

Please feel free to contact us if there are any questions regarding this preliminary information.

The following Plates and Appendices are attached and complete this preliminary report:

Plate 1 – Site Location Map
Plate 2 – Plot Plan
Plates 3-1 through 3-10 – Test Boring Logs
Plates 4-1 through 4-32 – Test Pit Logs
Plate 5 – United Soil Classification System
Plate 6 – USDA Soil Textural Triangle
Plates 7A through 7D – Gradation Curves
Appendix I – Prior Whitestone Boring and Test Pit Logs
Appendix II – Limitations

Respectfully submitted,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "Cory Karinja".

Cory Karinja, P.E.
Senior Project Manager

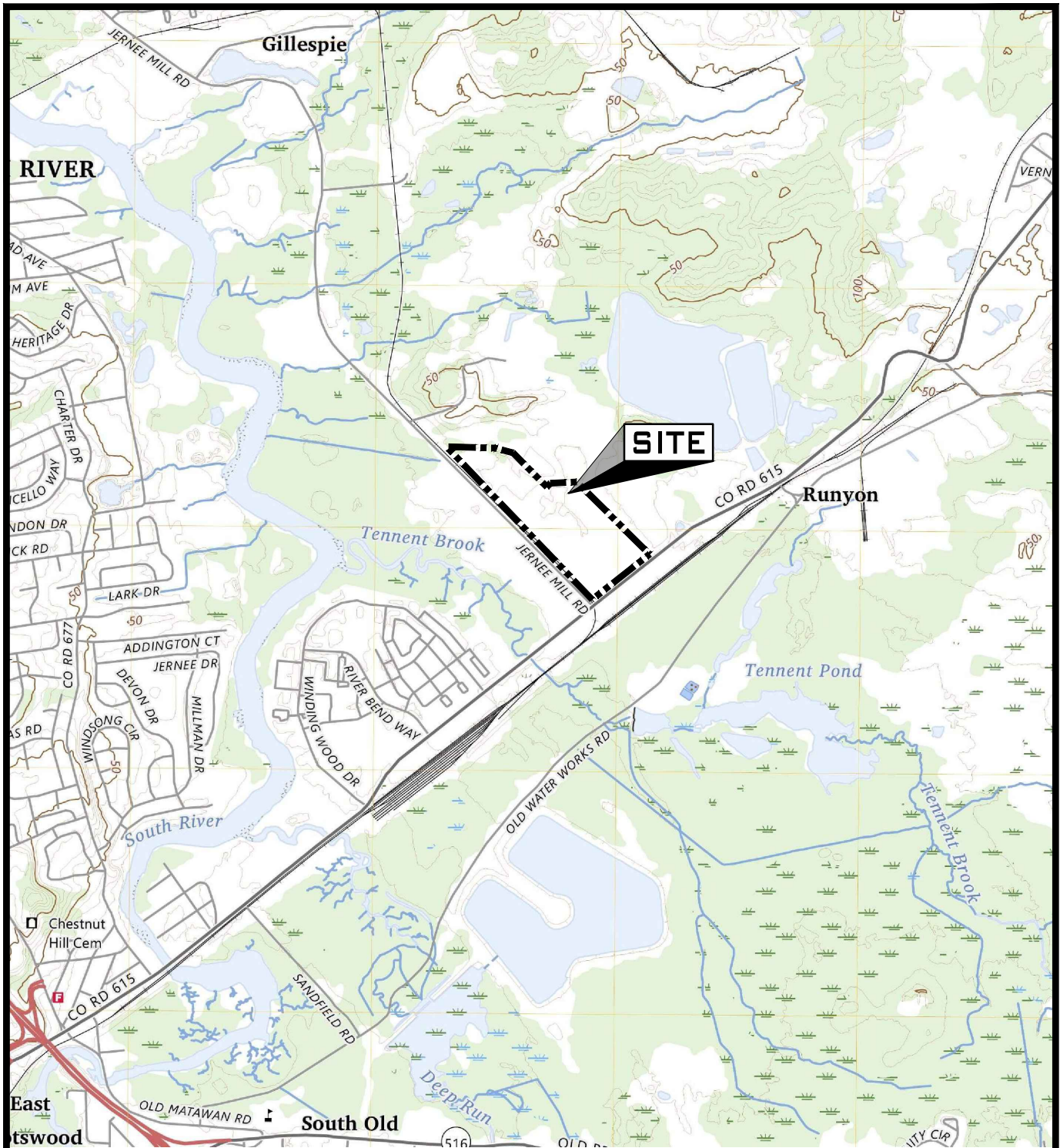
A handwritten signature in blue ink, appearing to read "R. Schwankert".

Robert E. Schwankert, P.E.
Consultant/Reviewer

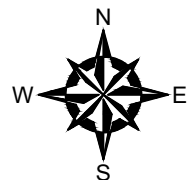
A handwritten signature in blue ink, appearing to read "Christopher P. Tansey".

Christopher P. Tansey, P.E.
Associate Principal

CSK:CPT/csk
(1 copy submitted via email)



SOURCE: "South Amboy Quadrangle, NJ, 7.5 Minute Series (Topographic)," USGS, 2023.



PROJ. MGR.: CSK
 DESIGNED BY: CSK
 DRAWN BY: VJD
 DATE: 1/14/25

SITE LOCATION MAP

PROPOSED WAREHOUSE DEVELOPMENT
 SAYREVILLE, NEW JERSEY
 BOHLER ENGINEERING

JOB NO.
 26.0093159.01

PLATE
1



KEY:

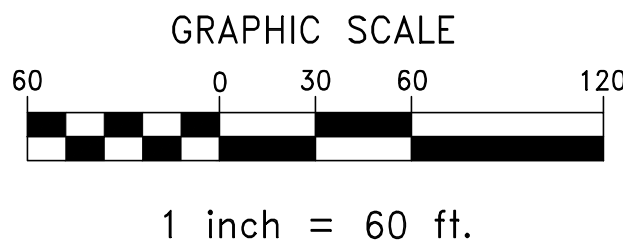
- B-101 NUMBER AND APPROXIMATE LOCATION OF BORINGS PERFORMED FOR THIS STUDY
- TP-101 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY
- SPP-1 NUMBER AND APPROXIMATE LOCATION OF SOIL PROFILE PITS PERFORMED BY WHITESTONE IN 2022

- B-1 NUMBER AND APPROXIMATE LOCATION OF TEST BORINGS PERFORMED BY WHITESTONE IN 2019
- SPP-1 NUMBER AND APPROXIMATE LOCATION OF SOIL PROFILE PITS PERFORMED BY WHITESTONE IN 2019
- TP-101 EXPLORATIONS WHERE BLACK SILT AND FINE SAND SOILS CONTAINING ROOTS, ORGANICS AND/OR WOOD FRAGMENTS WERE ENCOUNTERED IN THE FILL

- (2) APPROXIMATE FILL THICKNESS IN FEET BELOW THE EXISTING GROUND SURFACE
- [8] APPROXIMATE DEPTH TO GROUNDWATER IN FEET BELOW THE EXISTING GROUND SURFACE
- NE NOT ENCOUNTERED

NOTES:

- This drawing is part of GZA GeoEnvironmental, Inc. Report No. 26.0093159.01 and should be read together with the report for complete evaluation.
- General layout was obtained from a drawing prepared by Bohler Eng., entitled "Concept Plan B" dated 5/1/24, scale 1"= 100', and an aerial image provided by ©Microsoft Corp.©2023 MAXAR©CNES (2023) Distribution Airbus DS.



PLOT PLAN

PROPOSED WAREHOUSE DEVELOPMENT
SAYREVILLE, NEW JERSEY
BOHLER ENGINEERING



GZA GeoEnvironmental, Inc.
Engineers and Scientists
Known for excellence. Built on trust.
www.gza.com

JOB NO.		FILE NO.		
26.0093159.01		-		
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	CSK	1/14/25	1"= 60'	2

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TEST BORING LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: B-102
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan
Final Boring Depth (ft.): 27
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/24/2024 - 6/24/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
6/24/24		10	

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
5	S1	0.5-2	15 12 6	18		2" Asphalt over 4" subbase	5	17.5	
	S2	2-4	6 9 8 6	17		Fill - Dark grayish brown fine to medium sand, trace silt (very moist)			
	S3	4-6	3 6 7 7	13					
	S4	6-8	7 8 11 10	19					
10	S5	8-10	3 7 10 5	17		Light gray fine to medium sand, some silt (moist)(medium dense)	10		
	S6	10-12	6 8 10 8	18		- (wet)			
15	S7	15-17	5 9 12 15	21	SM		15		
20	S8	20-22	4 6 6 5	12			20		
25	S9	25-27	7 10 12 18	22	SC	Light gray fine to medium sand, and clayey silt (wet)(medium dense)	25		
30						End of exploration at 27 feet. Groundwater encountered @ 10'			

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-2

TEST BORING LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: B-103
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan
Final Boring Depth (ft.): 22
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/24/2024 - 6/24/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
6/24/24		7.5	

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
5	S1	0.5-2	16 9 6	15	SM	4" Asphalt over 2" stone subbase	5	18.0	
	S2	2-4	9 12 13 23	25		Yellowish brown fine to medium sand, little silt (moist)(medium dense)			
	S3	4-6	22 38 36 45	74		- (very dense)			
	S4	6-8	18 34 37 47	71					
10	S5	8-10	4 12 16 26	28	CL	Very dark gray silty clay, some fine to medium sand, with lignite (wet)(very stiff)	10	30.9	
	S6	10-12	28 30 40 42	70		- (hard)			
15	S7	15-17	10 18 22 32	40			15		
20	S8	20-22	13 21 24 37	45			20		
25						End of exploration at 22 feet. Groundwater encountered @ 7.5'			
30									

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-3

TEST BORING LOG														
GZA GeoEnvironmental, Inc. Engineers and Scientists			Bohler Proposed Warehouse Development Sayreville, NJ			EXPLORATION NO.: B-104 SHEET: 1 of 1 PROJECT NO: 26.0093159.00 REVIEWED BY: Cory Karinja								
Logged By: Cody Lynes			Type of Rig: ATV		Boring Location: See Plan Final Boring Depth (ft.): 27									
Drilling Co.: Boring Brothers			Rig Model: CME 55		Ground Surface Elev. (ft.): N/A									
Driller: Lyle, Joey			Drilling Method: Mud Rotary		Date Start - Finish: 6/24/2024 - 6/24/2024									
Hammer Type: Automatic Hammer Hammer Weight (lb.): 140 Hammer Fall (in.): 30 Auger or Casing O.D./I.D Dia (in.): 4.25/4					Groundwater Depth (ft.)									
					Date	Time	Water Depth	Stab. Time						
					6/24/24		5							
Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark					
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value										
	S1	0-2	6 5 4 3	9							5" Topsoil			
	S2	2-4	5 6 6 5	12							Fill - Pale brown fine to medium sand, trace silt, trace fine gravel (moist)		6.7	
	S3	4-6	3 4 4 6	8						SP	Fill - Dark gray clayey silt, little fine to medium sand (moist) Light gray fine to medium sand, trace silt (moist)(medium dense) -(loose)	5		
	S4	6-8	3 3 3 5	6						CL	Light gray silty clay, little fine to medium sand (wet)(medium)		21.5	
	S5	8-10	2 7 8 7	15						SP	Light brownish gray fine to medium sand, trace silt (wet)(medium dense)	10		
	S6	10-12	6 5 5 5	10						ML	Light brownish gray clayey silt, little fine sand (wet)(stiff)			
	S7	15-17	15 12 12 12	24							Light brownish gray fine to medium sand, trace silt (wet)(medium dense)	15		
	S8	20-22	12 15 13 13	28						SP		20		
S9	25-27	17 12 11 17	23			25								
30					End of exploration at 27 feet. Groundwater encountered @ 5'									
REMARKS														
	See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.													
Plate No.: 3-4														

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TEST BORING LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: B-105
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan
Final Boring Depth (ft.): 27
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/25/2024 - 6/25/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
6/25/24		8	

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
						3" Asphalt over 4" stone subbase			
	S1	0.5-2	10 9 14	23		Brownish yellow fine to medium sand, trace silt (moist)(medium dense)			
	S2	2-4	13 15 12 15	27					
5	S3	4-6	5 7 7 7	14			5		
	S4	6-8	11 15 14 18	29					
	S5	8-10	8 13 12 15	25		- (wet)			
10	S6	10-12	21 20 21 24	41	SP/SM	- grading with some fine gravel (dense)	10		
15	S7	15-17	8 13 13 19	26		- (medium dense)	15		
20	S8	20-22	10 11 14 17	25		Brownish yellow fine to coarse sand, trace silt (wet)(medium dense)	20		
25	S9	25-27	9 10 9 8	19	SP		25		
30						End of exploration at 27 feet. Groundwater encountered @ 8'			

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-5

TEST BORING LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: B-106
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan
Final Boring Depth (ft.): 22
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/24/2024 - 6/24/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
6/24/24		5	

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
5	S1	0-2	9 10 10 11	20		2" Asphalt over 8" stone subbase	5	21.3	
	S2	2-4	11 13 10 11	23		Possible Fill - Brownish yellow fine to medium sand, trace silt (moist)			
	S3	4-6	2 2 3 2	5		Possible Fill - Black fine to coarse sand, trace silt (wet)			
	S4	6-8	2 2 2 4	4	SP/SM	Grayish brown fine to medium and, trace silt (wet)(loose)			
10	S5	8-10	2 3 4 7	7			10	22.0	
	S6	10-12	10 15 14 15	29		Reddish yellow fine to medium sand, little silt, trace fine gravel (wet)(medium dense)			
15	S7	15-17	8 12 14 16	26	SM		15		
20	S8	20-22	6 9 9 11	18			20		
25						End of exploration at 22 feet. Groundwater encountered @ 5'			
30									

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-6

TEST BORING LOG											
GZA GeoEnvironmental, Inc. Engineers and Scientists					Bohler Proposed Warehouse Development Sayreville, NJ			EXPLORATION NO.: B-107 SHEET: 1 of 1 PROJECT NO: 26.0093159.00 REVIEWED BY: Cory Karinja			
Logged By: Cody Lynes					Type of Rig: ATV		Boring Location: See Plan Final Boring Depth (ft.): 22				
Drilling Co.: Boring Brothers					Rig Model: CME 55		Ground Surface Elev. (ft.): N/A				
Driller: Lyle, Joey					Drilling Method: Mud Rotary		Date Start - Finish: 6/25/2024 - 6/25/2024				
Hammer Type: Automatic Hammer Hammer Weight (lb.): 140 Hammer Fall (in.): 30 Auger or Casing O.D./I.D Dia (in.): 4.25/4								Groundwater Depth (ft.)			
								Date	Time	Water Depth	Stab. Time
								6/25/24		6	
Depth (ft)	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value	Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark		
	S1	0.5-2	13 13 14	27		2" Asphalt over 8" stone subbase					
	S2	2-4	12 8 8 8	16		Fill - Yellowish brown fine to medium sand, little silt (moist)					
	S3	4-6	5 4 3 4	7		Fill - Brownish yellow silty clay, and fine to medium sand, trace fine gravel (moist)					
	S4	6-8	6 6 5 6	11		Fill - Black/dark yellowish brown fine to medium sand, little silt (moist)					
	S5	8-10	4 5 10 12	15		Brownish yellow fine to coarse sand, trace silt (wet)(medium dense) - grading with trace fine gravel					
	S6	10-12	12 12 12 15	24		- color change to dark yellowish brown					
	S7	15-17	7 9 9 9	18							
	S8	20-22	14 12 14 13	26							
										End of exploration at 22 feet. Groundwater encountered @ 6'	
REMARKS											
	See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.										
							Plate No.: 3-7				

[illegible]

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TEST BORING LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: B-109
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan
Final Boring Depth (ft.): 22
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/25/2024 - 6/25/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
6/25/24		8	

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
5	S1	0-2	10 42 24 17	66	SM	10" Topsoil	5	20.8	
						Fill - Yellowish brown fine to medium sand, trace silt, little fine gravel (slightly moist)			
	S2	2-4	18 15 11 12	26		Reddish yellow fine to medium sand, little silt, trace fine gravel (moist)(medium dense)			
	S3	4-6	3 3 3 5	6		- (loose)			
	S4	6-8	5 8 7 8	15		- (medium dense)			
	S5	8-10	2 7 9 10	16					
	S6	10-12	9 6 6 9	12					
	S7	15-17	7 8 8 15	16					
10	S8	20-22	8 11 11 20	22			10		
15							15		
20							20		
25						End of exploration at 22 feet. Groundwater encountered @ 8'			
30									

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-9

**Bohler
Proposed Warehouse Development
Sayreville, NJ**

EXPLORATION NO.: B-110
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes
Drilling Co.: Boring Brothers
Driller: Lyle, Joey

Type of Rig: ATV
Rig Model: CME 55
Drilling Method: Mud Rotary

Boring Location: See Plan **Final Boring Depth (ft.):** 22
Ground Surface Elev. (ft.): N/A
Date Start - Finish: 6/25/2024 - 6/25/2024

Hammer Type: Automatic Hammer

Hammer Weight (lb.): 140

Hammer Fall (in.): 30

Auger or Casing O.D./I.D Dia (in.): 4.25/4

Groundwater Depth (ft.)

Date _____

Time

Water Depth

Stab. Time

6/25/24

6

Depth (ft)	Sample				Symbol	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
	No.	Depth (ft.)	Blows (per 6 in.)	SPT Value					
5 10 15 20	S1	0-2	5 7 6 4	13		8" Topsoil	5 10 15 20	19.2	
						Fill - Light brown fine to medium sand, little silt (moist)			
	S2	2-4	1 2 3 4	5		Fill - Dark gray fine to medium sand, little silt, trace fine gravel, with fibers (moist)			
	S3	4-6	1 WOH 1 2	1		- grading with white fibrous material (suspected ACM)			
	S4	6-8	3 4 7 9	11	SP	Yellowish brown fine to coarse sand, trace silt (wet)(medium dense) - grading with trace fine gravel			
	S5	8-10	6 8 7 11	15					
	S6	10-12	10 10 9 9	19					
	S7	15-17	7 13 13 17	26					
20	S8	20-22	5 8 12 14	20	SP/SM	Brown fine to medium sand, some silt (wet)(medium dense)	20		
25 30						End of exploration at 22 feet. Groundwater encountered @ 6'			

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 3-10

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-101
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 10

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/20/2024

9

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-13	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, 10% gravel, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine to medium roots	1	33.3	
2			13-73	Fill - Brownish yellow (10YR, 6/6) fine sand, 5% cobbles, weak medium granular, moist, firm, abrupt smooth boundary, few fine roots,	2		
3					3		
4					4		
5	5						
6	S2, T2	6.5	73-92	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, moist, friable, clear smooth boundary, with roots and trace organics	6		
7					7		
8	S3	8	92-120	Olive (5Y, 4/3) loamy sand, weak medium granular, wet, friable	8		
9					9		
10					10		
11							End of exploration at 10 feet. Moderate groundwater seepage encountered @ 9' Estimated Seasonal High Water @ 108"
12							
13				Tube Permeameter Permeability Test Results: 0.89 in/hr @ 2'			
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-1

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-102
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 11

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

10

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-13	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, 10% gravel, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1	22.6	
2			13-94	Fill - Brownish yellow (10YR, 6/6) fine sand, 5% gravel, weak medium granular, moist, firm, abrupt smooth boundary	2		
3					3		
4					4		
5	5						
6	6						
7	7						
8	S2	8	- large roots @ 7'	8	19.6		
9	S3	10	94-116	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, moist, friable, abrupt smooth boundary, with roots and trace organics		9	
10			116-132	Olive (5YR, 4/3) sand, weak medium granular, wet, loose		10	
11					11		
12				End of exploration at 11 feet. Moderate groundwater seepage encountered @ 10' Estimated Seasonal High Water @ 120"			
13							
14				Tube Permeameter Permeability Test Results: 0.32 in/hr @ 2'			
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-2

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-103
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 9

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

9

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark		
1	S1, T1	1	0-10	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1	6.6			
2	S2, T2	2.5	10-24	Fill - Light yellowish brown (10YR, 6/4) gravelly loamy sand, 20% gravel, 5% asphalt fragments, weak medium granular, slightly moist, loose, clear wavy boundary, few fine roots	2				
3			24-78	Fill - Brownish yellow (10YR, 6/8) fine sand, weak medium granular, moist, friable, abrupt smooth boundary	3				
4				S3, T3	6.5			78-86	Fill - Black (10YR, 2/1) fine sand, 10% gravel, weak medium crumb, friable, clear smooth boundary
5	S4	8				86-108			
6				11.8	7			8	9
7			11.8						
8	11.8	7		8	9				
9			11.8			7		8	9
10	11.8	7		8	9				
11			11.8			7	8	9	
12	11.8	7		8	9				
13			11.8			7	8	9	
14	11.8	7		8	9				
15			11.8			7	8	9	
16	11.8	7		8	9				
17			11.8			7	8	9	
18	11.8	7		8	9				
19			11.8			7	8	9	
20	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8			7	8	9	
	11.8	7		8	9				
			11.8						

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-3

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-104
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 10

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

9

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-16	Topsoil/Fill - Dark gray (10YR, 4/1) gravelly sandy loam, 15% gravel, 10% asphalt, 10% concrete, weak medium crumb, slightly moist, abrupt smooth boundary, many fine roots	1	6.8	
2			16-60	Fill - Brownish yellow (10YR, 6/8) fine sand, 20% asphalt, 10% concrete, weak medium crumb, moist, friable, abrupt smooth boundary	2		
3	S2	5			60-108	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, very moist, firm, clear smooth boundary	3
4			S3	9			108-120
5						End of exploration at 10 feet. Moderate groundwater seepage encountered @ 9' Estimated Seasonal High Water @ 108"	
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-4

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-105
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 8

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-14	Topsoil/Fill - Gray (10YR, 5/1) gravelly sandy loam, 20% gravel, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1	5.0	
2			14-84	Fill - Reddish yellow (7.5YR, 6/6) loamy sand, 5% gravel, moderate fine granular, moist, friable, clear smooth boundary, few fine roots	2		
3		3					
4		4					
5	S2	7	84-96	Brownish yellow (10YR, 6/8) sand, weak medium granular, moist, friable	5	8.2	
6					6		
7		7					
8		8					
9				End of exploration at 8 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
10				Tube Permeameter Permeability Test Results: 2.8 in/hr @ 2'			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-5

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-106
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 2

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/17/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1			0-10	Topsoil - Very dark grayish brown (10YR, 3/2), weak medium crumb, moist, friable, abrupt smooth, many fine roots	1		
2			10-24	Fill - Yellowish brown (10YR, 5/8) loamy sand, weak medium granular, moist, friable - suspected ACM @ 2'	2		
3				End of exploration at 2 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed Note: Test pit terminated due to suspected ACM @ 2'			
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-6

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-106A
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 8

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/17/2024

3.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-10	Topsoil - Very dark greenish brown (10YR, 3/2) sandy loam, weak medium crumb, moist, friable, clear smooth boundary, many fine roots	1	21.4	
2			10-62	Yellowish brown (10YR, 5/8) loamy sand, weak medium granular, moist, friable, clear smooth boundary	2		
3		- (wet)		3			
4				4			
5	S2, T2	6	62-96	Reddish brown (7.5YR, 6/8) fine sand, weak medium granular, wet, firm, many medium distinct light gray (10YR, 7/2) to yellowish brown (10YR, 5/8) mottles encountered throughout layer	5		
6					6		
7		7					
8		8					
9				End of exploration at 8 feet. Moderate groundwater seepage encountered @ 3.5' Estimated Seasonal High Water @ 42" Note: Test pit offset 20' east of TP-106 Test pit sidewalls caving below 4' Tube Permeameter Permeability Test Results: 6.8 in/hr@ 1' <0.06 in/hr @ 6'			
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-6A

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-107
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 8

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/17/2024

3.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil - Very dark grayish brown (10YR, 3/2) sandy loam, weak medium crumb, moist, friable, abrupt smooth boundary, many fine roots	1		
2			9-54	Yellowish brown (10YR, 5/8) loamy sand, weak medium granular, moist, friable, clear smooth boundary - (wet)	2		
3	S2, T2	5			54-96		
4			4				
5			5				
6			6				
7	7						
8	8						
9				End of exploration at 8 feet. Moderate groundwater seepage encountered @ 3.5' Estimated Seasonal High Water @ 42" Note: Test pit caving below 4'			
10				Tube Permeameter Permeability Test Results:0.89 in/hr @ 2' 10.3 in/hr @ 1' 2.9 in/hr @ 5'			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-7

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-108
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 8

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

3.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil/Fill - Very dark gray (10YR, 3/1) sandy loam, weak medium crumb, moist, friable, clear smooth boundary, many fine roots	1		
2			9-42	Fill - Brownish yellow (10YR, 6/6) loamy sand, weak medium crumb, moist, friable, abrupt wavy boundary	2		
3					3		
4	S2, T2	4		- fill layer contains Black (10YR, 2/1) fine sand on northwest corner of test pit sidewall to 6'	4		
5			42-87	Yellow (10YR, 7/6) loamy sand, weak medium granular, wet, friable, clear smooth boundary, few medium distinct light gray (10YR, 7/2) mottles encountered from 62 to 81 inches	5		
6					6		
7					7		
8	S3, T3	7.5	87-96	Dark yellowish brown (10YR, 4/6) gravelly sand, 20% gravel, weak fine granular, wet, loose	8		
9				End of exploration at 8 feet.			
10				Moderate groundwater seepage encountered @ 3.5'			
11				Estimated Seasonal High Water @ 42'			
12				Note: Test pit sidewalls caving below 5'			
13				Tube Permeameter Permeability Test Results:			
14				5.6 in/hr @ 1'			
15				2.3 in/hr @ 4'			
16				18.3 in/hr @ 7.5'			
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-8

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-109
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 10

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

3.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-10	Topsoil/Fill - Dark greenish brown (10YR, 4/2) sandy loam, weak medium crumb, moist, loose, clear smooth boundary, many fine roots	1		
2			10-36	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, moist, friable, abrupt smooth boundary, with roots and organics	2		
3					3		
4	S2, T2	4	36-88	Brownish yellow (10YR, 6/6) loamy sand, weak medium crumb, wet, friable, clear smooth boundary, common coarse faint light gray (10YR, 7/2) mottles encountered from 45 to 88 inches	4		
5					5		
6					6		
7					7		
8	S3, T3	8	88-120	Dark yellowish brown (10YR, 4/6) gravelly sand, 20% gravel, weak fine granular, wet, loose	8		
9					9		
10					10		
11				End of exploration at 10 feet. Moderate groundwater seepage encountered @ 3.5' Estimated Seasonal High Water @ 42" Note: Test pit caving below 7'			
12							
13				Tube Permeameter Permeability Test Results: 8.9 in/hr @ 1' 0.72 in/hr @ 4' 11.6 in/hr @ 8'			
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-9

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-110
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 9

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

3

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-10	Topsoil/Fill - Dark grayish brown (10YR, 4/2) sandy loam, weak medium granular, moist, friable, clear smooth boundary, many fine roots	1		
2	S2, T2	2.5	10-28	Fill - Very dark gray (10YR, 3/1) fine sand, weak medium crumb, moist, friable, abrupt smooth boundary, common fine roots, with organics	2		
3			28-40	Reddish yellow (7.5YR, 6/8) loam, 10% gravel, weak coarse crumb, wet, firm, clear wavy boundary	3		
4	S3, T3	4		- (wet)	4		
5				Yellow (10YR, 7/6) loamy sand, weak medium granular, wet, loose	5		
6			40-108		6		
7					7		
8					8		
9					9		
10				End of exploration at 9 feet.			
11				Rapid groundwater seepage encountered @ 3'			
12				Estimated Seasonal High Water @ 36"			
13				Note: Test pit caving below 6.5'			
14				Tube Permeameter Permeability Test Results:			
15				1.4 in/hr @ 1'			
16				0.14 in/hr @ 2.5'			
17				2.3 in/hr @ 4'			
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-10

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-111
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 9

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

8

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-8	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1	14.9	
2	S2, T2	3	8-32	Fill - Pale brown (10YR, 6/3) fine sand, 15% gravel, weak medium granular, slightly moist, loose, clear smooth boundary, with wood and metal fragments	2		
3			32-60	Fill - Light gray (10YR, 7/1) fine sand, 10% gravel, weak medium granular, moist, friable, abrupt smooth boundary, with black (10YR, 2/1) fine sand containing organics and metal fragments mixed throughout	3		
4					4		
5	S3, T3	6	60-108	Brownish yellow (10YR, 6/8) fine sand, weak medium granular, moist, friable	5		
6					6		
7					7		
8					8		
9				- (wet)	9		
10				End of exploration at 9 feet. Moderate groundwater seepage @ 8' Estimated Seasonal High Water @ 96" Note: Test pit caving below 7'			
11							
12				Tube Permeameter Permeability Test Results: 0.16 in/hr @ 1'			
13				2.7 in/hr @ 3'			
14				1.0 in/hr @ 6'			
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-11

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-112
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 3

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/17/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-11	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, friable, abrupt smooth boundary	1		
2			11-36	Fill - Reddish brown (7.5YR, 6/6) fine sand, moderate fine subangular blocky, moist, cemented	2		
3				- suspected ACM @ 3'	3		
4				End of exploration at 3 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed Note: Test pit terminated due to suspected ACM			
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-12

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-113
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 6

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/17/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-10	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, moist, friable, clear smooth boundary, many fine roots	1		
2			10-34	Fill - Reddish yellow (7.5YR, 6/6) fine sand, moderate medium crumb, moist, firm, clear smooth boundary	2		
3	S2, T2	3	34-42	Fill - Black (10YR, 2/1) silt loam, weak medium crumb, moist, friable, clear smooth boundary, with roots	3		
4			42-60	Fill - Gray (10YR, 6/1) fine sand, weak medium granular, very moist, friable	4		
5					5		
6			60-72	Yellowish brown (10YR, 5/8) loamy sand, weak medium granular, moist, friable	6		
7				End of exploration at 6 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
8							
9				Tube Permeameter Permeability Test Results: 0.27 in/hr @ 1' 0.59 in/hr @ 3'			
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-13

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-114
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/17/2024

4.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, loose, clear smooth boundary, many fine roots, with metal rebar fragments	1		
2			9-42	Fill - Yellowish brown (10YR, 5/8/) loamy sand, weak medium crumb, moist, firm, clear smooth boundary	2		
3					3		
4	S2, T2	3.5	42-52	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, very moist, loose, clear irregular boundary	4		
5			52-60	Light olive brown (5YR, 5/6) loamy sand, weak medium granular, wet, friable	5		
6				End of exploration at 5 feet.			
7				Moderate groundwater seepage @ 4.5'			
8				Estimated Seasonal High Water @ 54"			
9				Tube Permeameter Permeability Test Results:			
10				1.9 in/hr @ 1'			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-14

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-115
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/18/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-10	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, moist, friable, clear smooth boundary, many fine roots	1	8.4	
2			10-34	Fill - Brownish yellow (10YR, 6/8) loamy sand, weak medium granular, moist, loose, abrupt smooth boundary, few fine roots	2		
3	S2, T2	3		- Black (10YR, 2/1) fine sand, with organics mixed throughout	3		
4			34-60	Brownish yellow (10YR, 6/8) fine sand, weak medium granular, moist, friable	4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7							
8				Tube Permeameter Permeability Test Results: 2.4 in/hr @ 1'			
9				1.0 in/hr @ 3'			
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-15

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-116
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 10

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

8

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, friable, clear smooth boundary, many fine to medium roots	1	27.9	
2	S2, T2	4.5	9-52	Fill - Reddish yellow (7.5YR, 6/6) fine sand, moderate medium subangular blocky, cemented, abrupt smooth boundary	2		
3					3		
4			52-60	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, moist, loose	4		
5				Fill - Gray (10YR, 6/1) loamy sand, weak medium granular, very moist, friable, clear smooth boundary	5		
6					6		
7			78-96	Possible Fill - Dark yellowish brown (10YR, 4/6) sandy loam, moderate medium crumb, very moist, friable, clear smooth boundary	7		
8			96-120	Olive (5YR, 5/4) to yellowish brown (10YR, 5/8) loamy sand, weak medium granular, wet, loose, many medium distinct light gray (10YR, 7/1) mottles encountered throughout layer	8		
9					9		
10					10		
11				End of exploration at 10 feet. Moderate groundwater seepage encountered @ 8' Estimated Seasonal High Water @ 96"			
12				Tube Permeameter Permeability Test Results: <0.06 in/hr @ 1'			
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-16

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-117
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 7

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/17/2024

6

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1	30.5	
2	S2, T2	4	9-46	Fill - Reddish yellow (7.5YR, 6/6) loamy sand, 10% gravel, weak medium granular, moist, friable, clear irregular boundary	2		
3					3		
4			46-54	Fill - Black (10YR, 2/1) fine sand, weak medium crumb, very moist, loose, clear irregular boundary, with roots	4		
5			54-62	Fill - Gray (10YR, 6/1) sand, weak medium granular, very moist, friable, clear irregular boundary	5		
6			62-84	Yellowish brown (10YR, 5/8) loamy sand, weak medium granular, very moist, friable	6		
7					7		
8				End of exploration at 7 feet. Moderate groundwater seepage encountered @ 6' Estimated Seasonal High Water @ 72"			
9				Tube Permeameter Permeability Test Results: 10.8 in/hr @ 1'			
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-17

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-118
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/17/2024 - 6/17/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/17/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-9	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1		
2	S2	2	9-48	Fill - Dark brown (10YR, 3/3) loamy sand, weak medium granular, moist, friable, abrupt smooth boundary, with organics	2		
3					3		
4					4		
5			48-60	Reddish yellow (7.5YR, 6/6) loamy sand, weak medium granular, moist, friable	5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7							
8				Tube Permeameter Permeability Test Results: 1.5 in/hr @ 1'			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-18

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-119
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 13

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

9

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2.5	0-9	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1	4.6	
2			9-18	Fill - Light gray (10YR, 7/1) sandy loam, 10% gravel, weak medium granular, slightly moist, loose, clear smooth boundary, common fine roots	2		
3			18-63	Fill - Yellowish brown (10YR, 5/8) gravelly loamy sand, 20% gravel, 15% cobbles, 10% boulders, weak medium granular, moist, friable	3		
4	S2, T2	6	63-93	Fill - Very dark grayish brown (10YR, 3/2) fine sand, weak medium granular, moist, friable, abrupt smooth boundary	4	23.0	
5				- organic odor	5		
6				Light olive brown (2.5Y, 5/6) fine sand, weak fine granular, wet, loose	6		
7	S3, T3	9	93-156		7	15.2	
8					8		
9					9		
10					10		
11					11		
12					12		
13					13		
14				End of exploration at 13 feet. Moderate groundwater seepage encountered @ 9' Estimated Seasonal High Water @ 108"			
15							
16				Tube Permeameter Permeability Test Results: 4.0 in/hr @ 2.5'			
17				2.0 in/hr @ 6'			
18				7.1 in/hr @ 9'			
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-19

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-120
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 6

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1.5	0-14	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1	9.1	
2			14-66	Fill - Reddish yellow (10YR, 6/8) loamy sand, 5% gravel, weak medium granular, moist, friable, clear smooth boundary	2		
3	S2, T2	3			3		
4					4		
5					5		
6			66-72	Reddish yellow (10YR, 6/6) loamy sand, weak medium granular, moist, friable	6		
7				End of exploration at 6 feet.			
8				Groundwater seepage not encountered			
9				Estimated Seasonal High Water not observed			
10				Tube Permeameter Permeability Test Results:			
11				4.4 in/hr @ 1.5'			
12				1.1 in/hr @ 3'			
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-20

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-121
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 11

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

7

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-8	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1	3.1	
2			8-38	Fill - White (10YR, 8/1) sandy clay, 15% gravel, moderate fine subangular blocky, slightly moist, firm, few fine roots	2		
3				- large irregular pockets of sand and clay	3		
4	S2, T2	3.5	38-66	Fill - Reddish yellow (7.5YR, 6/8) sandy loam, 10% gravel, weak medium granular, moist, friable	4		
5				- Black (10YR, 2/1) fine sand with organics observed from 5' to 5.5'	5		
6				Yellowish red (5YR, 5/6) loamy sand, weak medium granular, wet, friable, common medium distinct light gray (10YR, 7/1) mottles encountered from 116 to 132 inches	6		
7					7		
8	S3, T3	7.5	66-132		8		
9					9		
10					10		
11					11		
12				End of exploration at 11 feet.			
13				Moderate groundwater seepage encountered @ 7'			
14				Estimated Seasonal High Water @ 84"			
15				Note: Test pit sidewalls caving			
16				Tube Permeameter Permeability Test Results:			
17				0.29 in/hr @ 1'			
18				0.54 in/hr @ 3.5'			
19				1.9 in/hr @ 7.5'			
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-21

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-122
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-8	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1		
2	S2, T2	2	8-24	Fill - White (10YR, 8/1) sandy clay, 10% gravel, moderate fine subangular blocky, moist, firm, clear irregular boundary, few fine roots	2		
3	S3, T3	3	24-34	Fill - Reddish yellow (7.5YR, 6/6) loamy sand, weak medium granular, moist, firm, abrupt smooth boundary	3		
4			34-60	- wood observed on bottom of layer	4		
5				Brownish yellow (10YR, 6/6) sandy loam, weak medium crumb, moist, firm	5		
6				End of exploration at 5 feet.			
7				Groundwater seepage not encountered			
8				Estimated Seasonal High Water not observed			
9				Tube Permeameter Permeability Test Results:			
10				<0.06 in/hr @ 1'			
11				<0.06 in/hr @ 2'			
12				<0.06 in/hr @ 3'			
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-22

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-123
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 10

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/18/2024 - 6/18/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/18/2024

7

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-8	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, loose, clear smooth boundary, many fine roots	1	25.0	
2			8-23	Fill - White (10YR, 8/1) sandy clay, 10% gravel, moderate medium subangular blocky, moist, firm, clear smooth boundary, few fine roots	2		
3	S2, T2	2.5	23-44	Fill - Reddish yellow (7.5YR, 6/8) loamy sand, weak medium granular, moist, friable, abrupt smooth boundary	3		
4			- Black (10YR, 2/1) fine sand with organics from 3.5' to 3.7'	4			
5	S3, T3	5	44-96	Brownish yellow (10YR, 6/6) loamy sand, weak medium granular, moist, friable, gradual smooth boundary	5		
6					6		
7					7		
8					8		
9	S4, T4	9	96-120	Dark yellowish brown (10YR, 4/6) sand, weak medium granular, wet, loose	9		
10					10		
11				End of exploration at 10 feet. Moderate groundwater seepage encountered @ 7' Rapid groundwater seepage encountered @ 8' Estimated Seasonal High Water @ 84" Note: Test pit sidewalls caving below 2'			
12							
13							
14				Tube Permeameter Permeability Test Results: <0.06 in/hr @ 1' 2.6 in/hr @ 2.5' 1.0 in/hr @ 5'			
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-23

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-124
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 7

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-10	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1	5.6	
2			10-44	Fill - Light yellowish brown (10YR, 6/9) loamy sand, weak medium granular, moist, friable, clear wavy boundary	2		
3				- Black (10YR, 2/1) fine sand observed at bottom of layer	3		
4	S2	7	44-69	Fill - Light gray (10YR, 7/1) loamy sand, weak medium granular, moist, friable, abrupt smooth boundary	4		
5					5		
6			69-84	Brownish yellow (10YR, 6/8) sand, weak medium granular, moist, friable	6		
7					7		
8				End of exploration at 7 feet.			
9				Groundwater seepage not encountered			
10				Estimated Seasonal High Water not observed			
11				Tube Permeameter Permeability Test Results:			
12				7.0 in/hr @ 2'			
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-24

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-125
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 7

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-10	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, clear smooth boundary, many fine roots	1	2.8	
2			10-39	Fill - Reddish yellow (10YR, 6/6) loamy sand, weak medium granular, moist, friable, clear smooth boundary	2		
3			39-70	White (10YR, 5/1) loamy sand, weak medium granular, moist, friable, abrupt smooth boundary	3		
4					4		
5			70-84	Brownish yellow (10YR, 6/6) loamy sand, weak medium granular, moist, friable	5		
6					6		
7				End of exploration at 7 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed Tube Permeameter Permeability Test Results: 17.4 in/hr @ 2'	7		
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-25

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-126
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	1	0-8	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, weak medium granular, slightly moist, loose, clear smooth boundary, many fine roots	1		
2			8-24	Fill - Light gray (10YR, 7/1) sandy clay, 10% gravel, moderate fine subangular blocky, moist, firm, few fine roots	2		
3	S2, T2	2.5	24-40	Fill - Dark yellowish brown (10YR, 3/4) sandy loam, weak medium granular, moist, friable, clear smooth boundary	3		
4			40-60	Reddish yellow (7.5YR, 6/8) loamy sand, weak medium granular, moist, friable	4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7							
8				Tube Permeameter Permeability Test Results: <0.06 in/hr @ 1'			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-26

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-127
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-12	Topsoil/Fill - Dark gray (10YR, 4/1) gravelly sandy loam, 15% gravel, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1		
2			12-60	Reddish yellow (10YR, 6/6) loamy sand, weak medium granular, moist, friable	2		
3					3		
4					4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7				Tube Permeameter Permeability Test Results: 11.9 in/hr @ 2'			
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-27

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-128
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-10	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, loose, clear smooth boundary, many fine roots	1		
2			10-43	Reddish yellow (10YR, 6/6) loamy sand, weak medium granular, slightly moist, friable, clear smooth boundary	2		
3					3		
4			43-60	Brownish yellow (10YR, 6/8) loamy sand, weak medium granular, moist, friable	4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7							
8				Tube Permeameter Permeability Test Results: 17.9 in/hr @ 2'			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-28

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-129
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 8

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab. Time

6/19/2024

7.5

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark						
1	S1, T1	2	0-10	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, slightly moist, loose, clear smooth boundary, many fine roots	1								
2			10-53	Reddish yellow (7.5YR, 6/6) loamy sand, weak medium granular, moist, friable, clear smooth boundary	2								
3	S2, T2	5		53-82	Very pale brown (10YR, 7/3) loamy sand, weak fine granular, moist, friable, clear smooth boundary			3					
4			S3, T3					7	82-96	Dark yellowish brown (10YR, 4/6) sand, weak fine granular, wet, loose	4		
5	5	7		8	End of exploration at 8 feet. Moderate groundwater seepage encountered @ 7.5' Estimated Seasonal High Water @ 53" Note: Test pit sidewalls caving below 4'								
6			7					8	Tube Permeameter Permeability Test Results: 14.2 in/hr @ 2' 5.2 in/hr @ 5' 6.6 in/hr @ 7'				
7	8	9		10	11	12	13					14	15

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-29

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-130
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-11	Topsoil/Fill - Dark gray (10YR, 4/1) gravelly sandy loam, 15% gravel, weak fine crumb, moist, loose, abrupt smooth boundary, many fine roots	1		
2			11-60	Reddish yellow (7.5YR, 6/6) loamy sand, weak coarse granular, moist, friable, few fine roots	2		
3					3		
4					4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7				Tube Permeameter Permeability Test Results: 7.1 in/hr @ 2'			
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-30

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-131
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 4

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/20/2024 - 6/20/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/20/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-15	Topsoil/Fill - Dark gray (10YR, 4/1) sandy loam, 10% gravel, 15% cobbles, weak medium crumb, moist, friable, abrupt smooth boundary, many fine roots	1		
2			15-48	Reddish yellow (7.5YR, 6/8) loamy sand, weak medium granular, moist, friable	2		
3					3		
4				End of exploration at 4 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed Note: Test pit terminated due to suspected ACM in Topsoil/Fill layer	4		
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-31

TEST PIT LOG



GZA GeoEnvironmental, Inc.
Engineers and Scientists

Bohler
Proposed Warehouse Development
Sayreville, NJ

EXPLORATION NO.: TP-132
SHEET: 1 of 1
PROJECT NO: 26.0093159.00
REVIEWED BY: Cory Karinja

Logged By: Cody Lynes

Contractor: Neary

Operator: Paul

Test Pit Location: See Plan

Final Test Pit Depth (ft.): 5

Ground Surface Elev. (ft.): N/A

Date Start - Finish: 6/19/2024 - 6/19/2024

Type of Excavator: Track-mounted

Excavator Model: Case CX 160

Groundwater Depth (ft.)

Date

Time

Water Depth

Stab.Time

6/19/2024

NE

Depth (ft)	Sample No.	Sample Depth (ft.)	Stratum Depth (in.)	Sample Description and Identification	Depth (ft)	Water Content (%)	Remark
1	S1, T1	2	0-21	Topsoil - Dark gray (10YR, 4/1) sandy loam, weak medium crumb, moist, friable, clear smooth boundary, many fine to medium roots	1	9.8	
2			21-60	Reddish yellow (7.5YR, 6/8) fine sand, weak medium granular, moist, friable, few fine to medium roots	2		
3					3		
4					4		
5					5		
6				End of exploration at 5 feet. Groundwater seepage not encountered Estimated Seasonal High Water not observed			
7							
8				Tube Permeameter Permeability Test Results: <6.2 in/hr @ 2'			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Plate No.: 4-32

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is <u>LARGER</u> than No. 200 Sieve	GRAVEL & GRAVELLY SOILS More than 50% of coarse fraction <u>RETAINED</u> on No. 4 Sieve	CLEAN GRAVELS (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS More than 50% of coarse fraction <u>PASSING</u> a No. 4 Sieve	CLEAN SAND (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SP	Poorly-graded sands, gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than 50% of material is <u>SMALLER</u> than No. 200 Sieve.	SILTS AND CLAYS Liquid limit LESS than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	
		OL	Organic silts and organic silty clays of low plasticity.	
	SILTS AND CLAYS Liquid limit GREATER than 50	MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.	
		CH	Inorganic clays of high plasticity, 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.

GRADATION*		COMPACTNESS*		CONSISTENCY*	
		sand and/or gravel		clay and/or silt	
% Finer by Weight		Relative Density		Range of Shearing Strength in Pounds per Square Foot	
Trace	0% to 10%	Loose	0% to 40%	Very Soft	less than 250
Little	10% to 20%	Medium Dense	40% to 70%	Soft	250 to 500
Some	20% to 35%	Dense	70% to 90%	Medium	500 to 1000
And	35% to 50%	Very Dense	90% to 100%	Stiff	1000 to 2000
				Very Stiff	2000 to 4000
				Hard	Greater than 4000

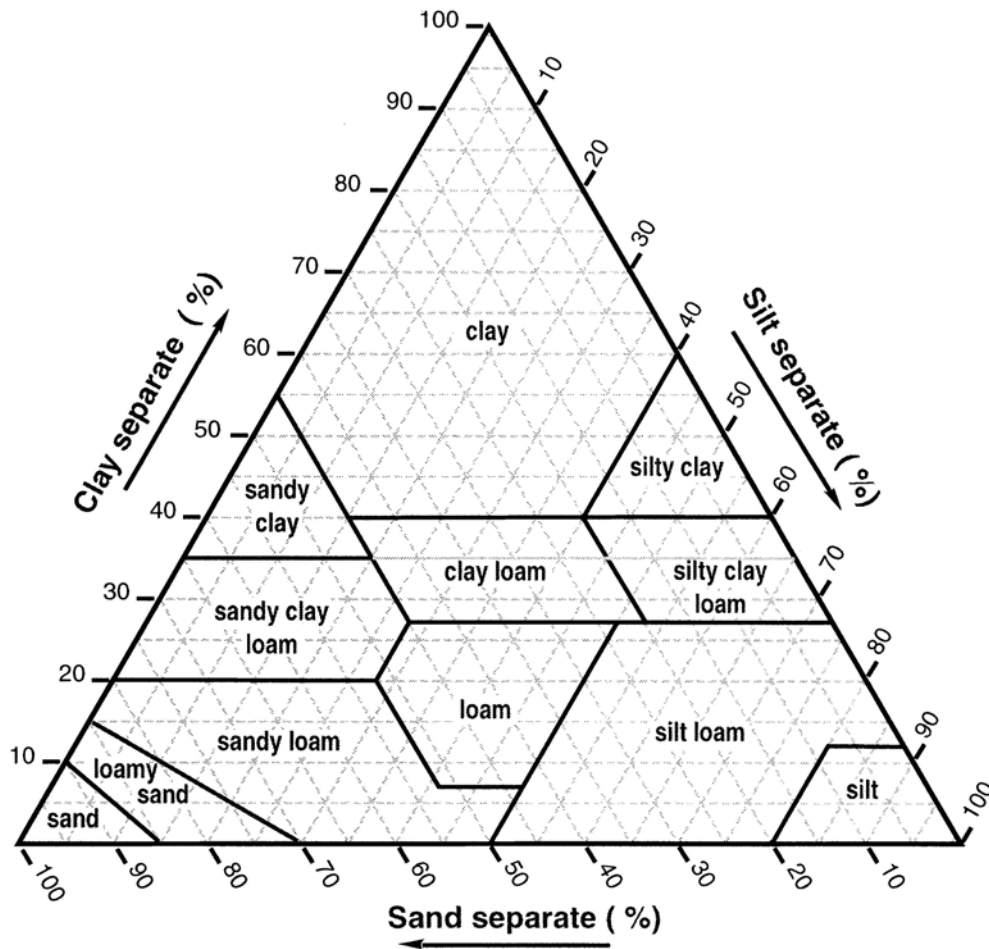
*Values are from laboratory or field test data, where applicable. When no testing was performed, values are estimated.

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

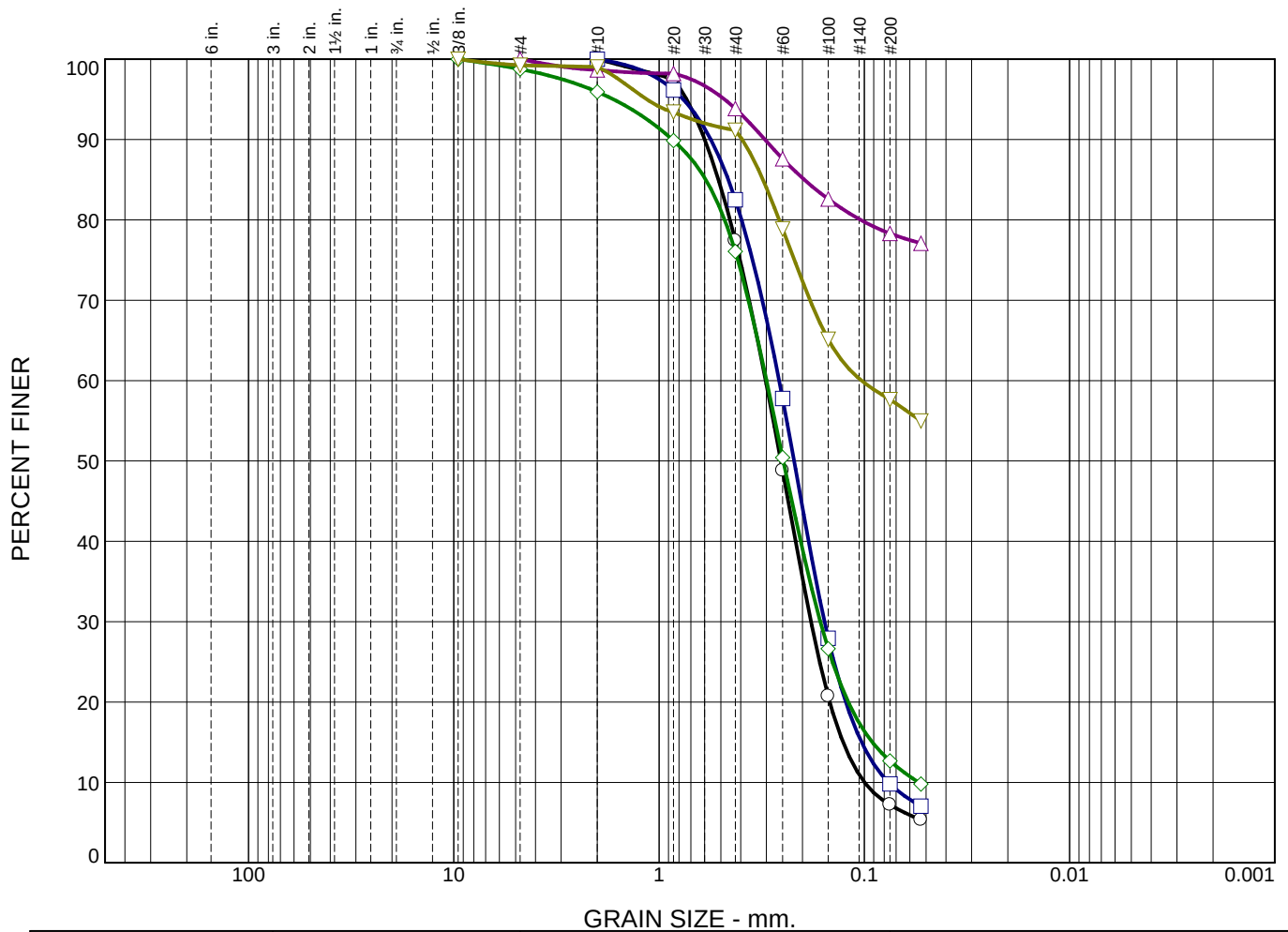
Texture Triangle:

Fine Earth Texture Classes (—)

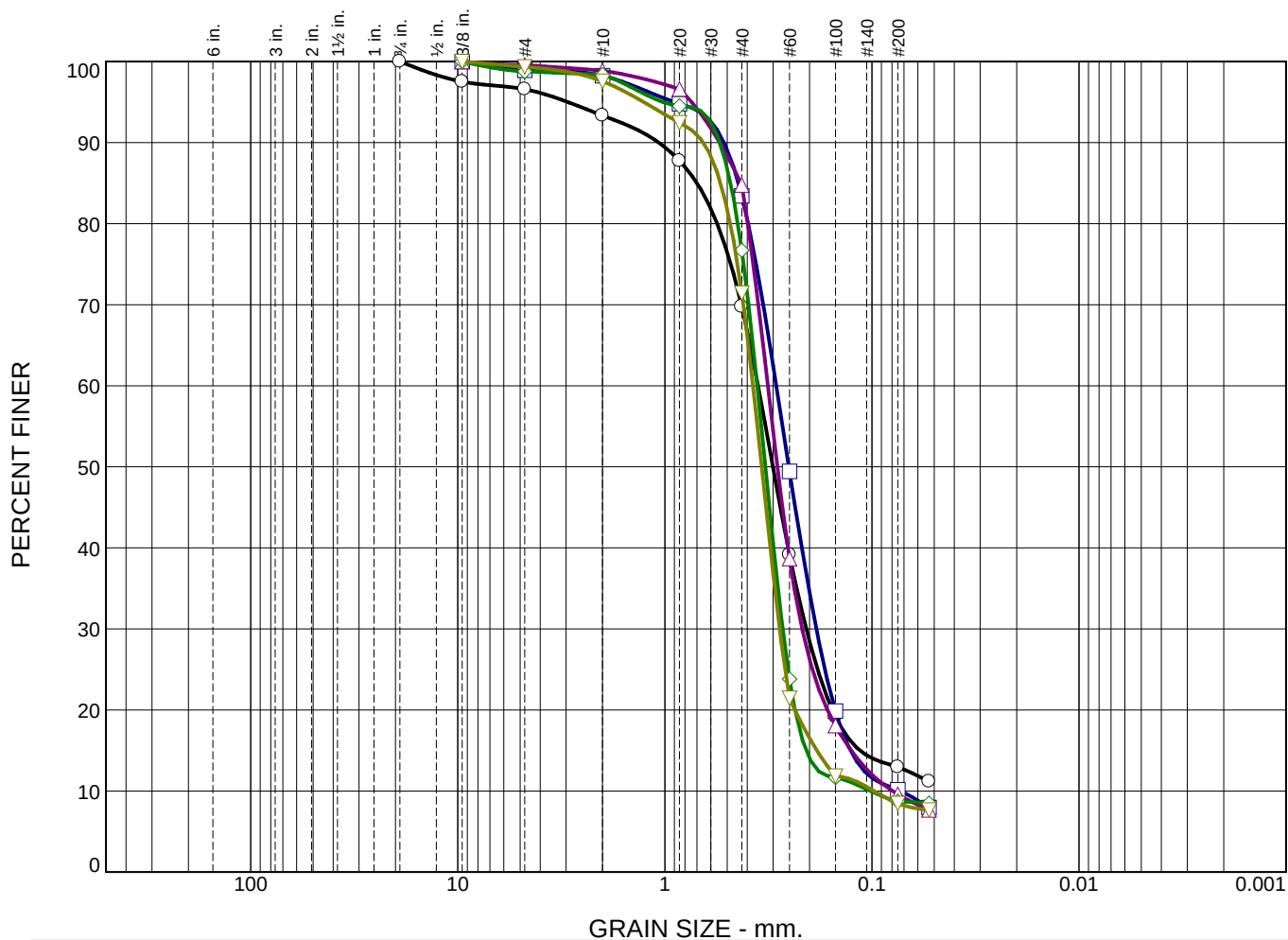


USDA SOIL CLASSIFICATION SYSTEM

Gradation Curve(s)



Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.4	3.3	23.5	56.9	12.9	
□	0.0	0.0	1.1	0.6	14.9	73.2	10.2	
△	0.0	0.0	0.4	0.7	14.1	75.2	9.6	
◇	0.0	0.0	1.2	0.4	21.7	68.0	8.7	
▽	0.0	0.0	0.7	1.7	26.2	62.9	8.5	

SOIL DATA					
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-109	7	15-17	Fine to medium Sand, little Silt, trace fine Gravel (MC=20.8%)	SM
□	B-110	2	2-4	Fine to medium Sand, little Silt, trace fine Gravel (MC=19.2%)	Fill
△	TP-101	2	6.5	Fine Sand (MC=33.3%)	Fill
◇	TP-102	1	2	Fine Sand (MC=22.6%)	Fill
▽	TP-104	2	5	Fine Sand (MC=30.3%)	Fill

GZA GeoEnvironmental, Inc.

Somerset, NJ

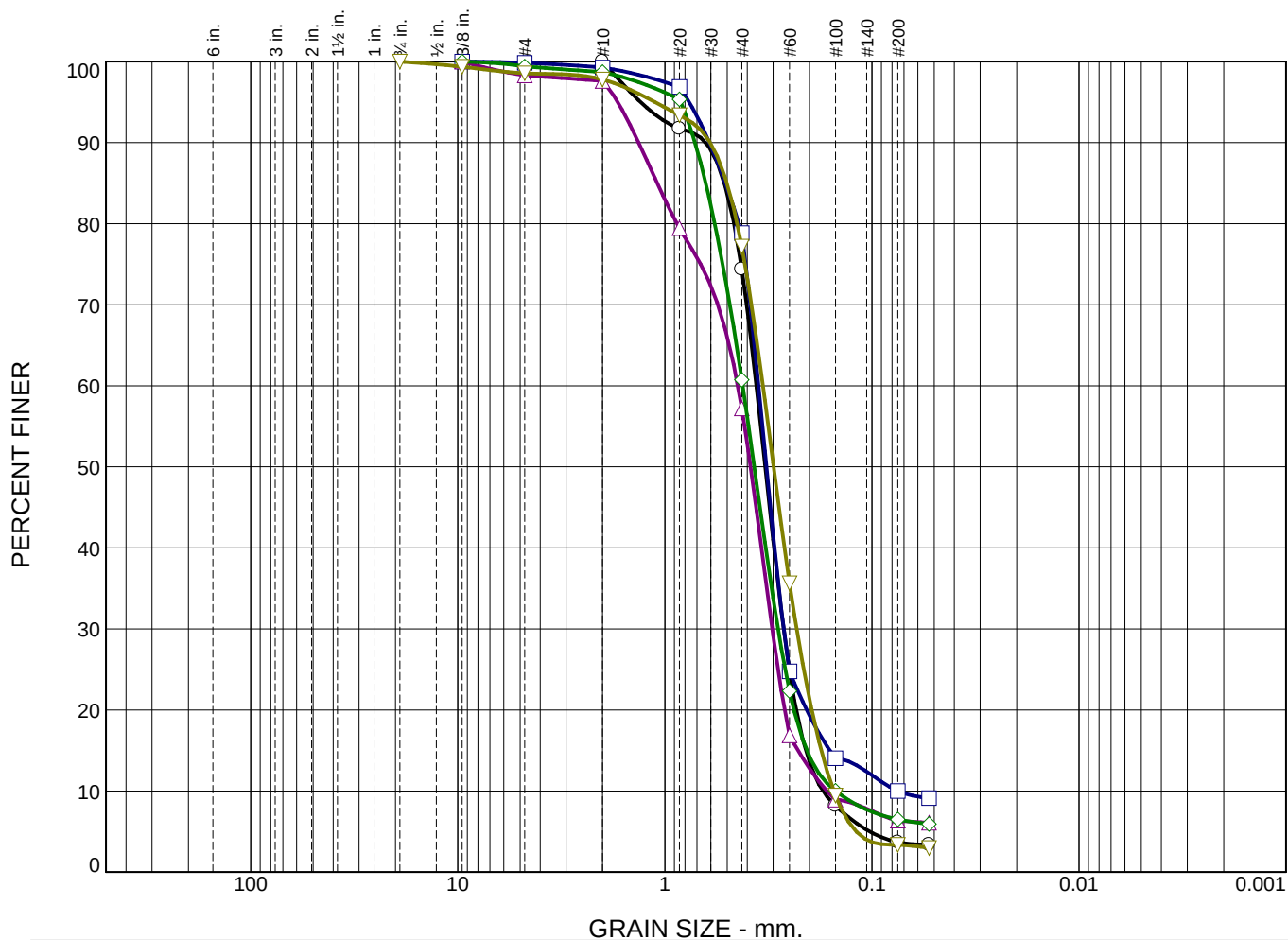
Client: Bohler

Project: Proposed Warehouse Development - Sayreville, New Jersey

Project No.: 26.0093159.00

Plate 7B

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	25.6	70.7	3.7	
□	0.0	0.0	0.2	0.5	20.5	68.8	10.0	
△	0.0	0.0	1.7	0.7	40.4	50.9	6.3	
◇	0.0	0.0	0.6	0.7	38.0	54.2	6.5	
▽	0.0	0.0	1.4	0.8	20.6	73.8	3.4	

SOIL DATA					
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-106A	2	6	Fine Sand (MC=21.4%)	SP
□	TP-111	3	6	Fine Sand (MC=14.9%)	SP-SM
△	TP-116	2	4.5	Fine Sand (MC=27.9%)	Fill
◇	TP-119	2	6	Fine Sand (MC=23.0%)	Fill
▽	TP-119	3	9	Fine Sand (MC=15.2%)	SP

GZA GeoEnvironmental, Inc.

Somerset, NJ

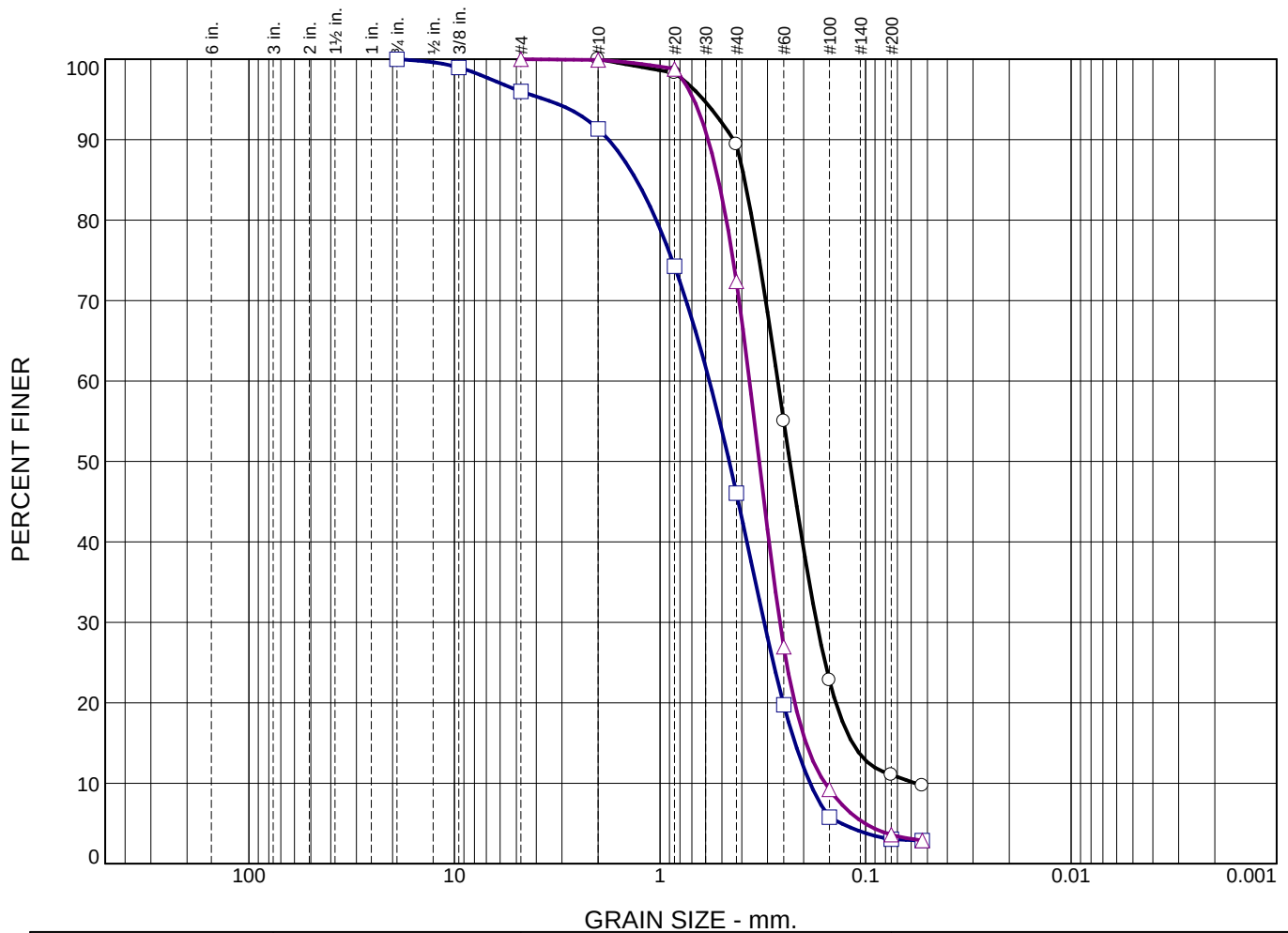
Client: Bohler

Project: Proposed Warehouse Development - Sayreville, New Jersey

Project No.: 26.0093159.00

Plate 7C

Gradation Curve(s)

[illegible]

SOIL DATA					
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-123	3	5	Fine Sand (MC=25.0%)	Fill
□	TP-124	3	7	Sand	SP
△	TP-132	1	2	Fine Sand (MC=9.8%)	SP

GZA GeoEnvironmental, Inc.

Somerset, NJ

Client: Bohler

Project: Proposed Warehouse Development - Sayreville, New Jersey

Project No.: 26.0093159.00

Plate 7D

APPENDIX I – Whitestone Boring and Test Pit Logs

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-1**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000								
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.								
Surface Elevation: ± NS feet						Date Started: 8/5/2019			Water Depth Elevation (feet bgs) (feet)			Cave-In Depth Elevation (feet bgs) (feet)		
Termination Depth: 20.0 feet bgs						Date Completed: 8/5/2019								
Proposed Location: Building						Logged By: MH			During: 8.0 --- ▼					
Drill / Test Method: HSA / SPT						Contractor: AD			At Completion: 7.0 --- ▼			At Completion: 6.0 --- ▼		
						Equipment: CME 45			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			
							TOPSOIL	8" Topsoil	
0 - 2	S-1		5 - 6 - 8 - 8	20	12	0.7	COASTAL PLAIN DEPOSITS	Brown Silty Sand, Moist, Medium Dense (SM)	Trace Gravel
2 - 4	S-2		7 - 8 - 8 - 8	22	16	4.0		As Above (SM)	Clay Lenses
4 - 6	S-3		8 - 5 - 5 - 7	20	10	5.0		Gray to Brown Poorly Graded Sand with Silt, Moist, Medium Dense (SP-SM)	
6 - 8	S-4		3 - 4 - 5 - 8	18	9	8.0		As Above, Very Moist, Loose (SP-SM)	
8 - 10	S-5		8 - 10 - 14 - 13	20	24	10.0		Brown Poorly Graded Sand, Wet, Medium Dense (SP)	
13 - 15	S-6		11 - 13 - 19 - 22	22	32	15.0		As Above, Gravel, Dense (SP)	
18 - 20	S-7		18 - 9 - 11 - 15	20	20	20.0		As Above, Medium Dense (SP)	Running Sand @ 18.0 fbgs
						25.0		Boring Log B-1 Terminated at a Depth of 20.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-2**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/5/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>20.0</u> feet bgs	Date Completed: <u>8/5/2019</u>	During: <u>8.0</u> ---	At Completion: <u>7.0</u> ---
Proposed Location: <u>Building</u>	Logged By: <u>MH</u>	At Completion: <u>8.0</u> ---	24 Hours: --- ---
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- ---	24 Hours: --- ---
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
							TOPSOIL	9" Topsoil	
0 - 2	S-1		6 - 5 - 5 - 5	20	10	0.8	COASTAL PLAIN DEPOSITS	Brown Poorly Graded Sand with Silt, Moist, Medium Dense (SP-SM)	
2 - 4	S-2		4 - 4 - 5 - 5	20	9			As Above, Loose (SP-SM)	
4 - 6	S-3		4 - 6 - 6 - 7	22	12	5.0		Gray to Brown Poorly Graded Sand, Moist, Medium Dense (SP)	
6 - 8	S-4		6 - 7 - 8 - 7	20	15			As Above, Brown, Very Moist (SP)	
8 - 10	S-5		6 - 7 - 8 - 11	22	15			As Above, Gravel, Wet (SP)	
						10.0			
13 - 15	S-6		11 - 12 - 16 - 18	22	28	15.0		As Above (SP)	Coarser Sand
18 - 20	S-7		15 - 17 - 17 - 19	22	34	20.0		As Above, Dense (SP)	More Gravel Content
						25.0			
								Boring Log B-2 Terminated at a Depth of 20.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-4**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/5/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>20.0</u> feet bgs	Date Completed: <u>8/5/2019</u>	During: <u>8.0</u> <u>---</u> ▼	At Completion: <u>---</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>MH</u>	At Completion: <u>7.0</u> <u>---</u> ▼	At Completion: <u>---</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
							TOPSOIL	8" Topsoil	
0 - 2	S-1		2 - 4 - 5 - 6	20	9	0.7			Clay Lenses
						2.0	COASTAL PLAIN DEPOSITS	Brown to Gray Silty Sand, Moist, Loose (SM)	
2 - 4	S-2		9 - 12 - 10 - 11	20	22			Brown Poorly Graded Sand with Silt, Moist, Medium Dense (SP-SM)	
4 - 6	S-3		6 - 4 - 4 - 5	22	6	5.0		As Above, Very Moist, Loose (SP-SM)	
6 - 8	S-4		9 - 10 - 11 - 11	22	21	6.0		Brown Poorly Graded Sand , Very Moist, Medium Dense (SP)	
8 - 10	S-5		15 - 13 - 16 - 16	20	29	10.0		As Above, Gravel, Wet (SP)	
13 - 15	S-6		15 - 16 - 18 - 21	22	34	15.0		As Above, Dense (SP)	Running Sands 13.0 fbg to 20.0 fbg
18 - 20	S-7		10 - 14 - 20 - 26	22	34	20.0		As Above (SP)	
						25.0		Boring Log B-4 Terminated at a Depth of 20.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-5**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000					
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.					
Surface Elevation: ± <u>NS</u> feet						Date Started: <u>8/5/2019</u>		Water Depth Elevation (feet bgs) (feet)		Cave-In Depth Elevation (feet bgs) (feet)	
Termination Depth: <u>20.0</u> feet bgs						Date Completed: <u>8/5/2019</u>					
Proposed Location: <u>Building</u>						Logged By: <u>MH</u>		During: <u>8.0</u> --- ▼			
Drill / Test Method: <u>HSA / SPT</u>						Contractor: <u>AD</u>		At Completion: <u>8.0</u> --- ▼		At Completion: <u>8.0</u> --- ▼	
						Equipment: <u>CME 45</u>		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 - 2	S-1	X	3 - 5 - 7 - 9	1	12	0.5	TOPSOIL		6" Topsoil	
							FILL		Low Recovery, Asphalt Fragments in Spoon Tip, Dry (FILL)	
2 - 4	S-2	X	8 - 12 - 10 - 8	20	22	2.0	COASTAL PLAIN DEPOSITS		Orange Brown Poorly Graded Sand with Silt, Moist, Medium Dense (SP-SM)	
4 - 6	S-3	X	9 - 7 - 10 - 12	22	17	5.0			As Above, Brown (SP-SM)	
6 - 8	S-4	X	8 - 7 - 7 - 9	20	14	6.0			Gray to Brown Poorly Graded Sand, Moist, Medium Dense (SP)	Spoon Tip Wet
8 - 10	S-5	X	7 - 6 - 7 - 11	22	13	10.0			As Above, Wet (SP)	Trace Gravel
13 - 15	S-6	X	9 - 16 - 17 - 23	22	33	15.0			As Above, Dense (SP)	Running Sands 13.0 fbgs to 20.0 fbgs
18 - 20	S-7	X	10 - 13 - 17 - 22	22	30	20.0			As Above (SP)	
						25.0			Boring Log B-5 Terminated at a Depth of 20.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-6**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/6/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/6/2019</u>	During: <u>6.0</u> --- ▼	At Completion: <u>7.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>6.5</u> --- ▼	24 Hours: --- --- ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- ▼	Equipment: <u>CME 45</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
0 - 2	S-1		2 - 6 - 9 - 8	18	15	0.5	TOPSOIL	6" Topsoil	Trace Cobble
							COASTAL PLAIN DEPOSITS	Brown Poorly Graded Sand with Gravel, Dry (FILL)	
2 - 4	S-2		2 - 3 - 2 - 3	12	5	2.0		Orange to Black Poorly Graded Sand, Dry, Loose (SP)	Medium Grain Size
4 - 6	S-3		3 - 3 - 4 - 3	2	7	5.0		As Above (SP)	
6 - 8	S-4		3 - 2 - 2 - 9	24	4			As Above, Wet (SP)	
8 - 10	S-5		8 - 10 - 11 - 10	18	21			As Above, Medium Dense (SP)	
						10.0			Running Sand @ 12.0 fbgs
13 - 15	S-6		11 - 9 - 13 - 13	12	22	15.0		As Above (SP)	
									Coarse Grains
18 - 20	S-7		17 - 14 - 32 - 33	24	46	20.0		As Above, Dense (SP)	
23 - 25	S-8		25 - 10 - 11 - 13	8	21	25.0		As Above (SP)	
								Boring Log B-6 Terminated at a Depth of 25.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-7**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/6/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/6/2019</u>	During: <u>8.0</u> --- ▼	At Completion: <u>10.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>7.0</u> --- ▼	24 Hours: --- --- ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- ▼	Equipment: <u>CME 45</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
0 - 2	S-1	X	3 - 5 - 6 - 5	NR	11	0.5	TOPSOIL	6" Topsoil	
							COASTAL PLAIN DEPOSITS	No Recovery, Presumed As Below (SP)	
2 - 4	S-2	X	3 - 3 - 3 - 3	18	6			Orange Poorly Graded Sand, Slightly Moist, Loose (SP)	Fine Grains
4 - 6	S-3	X	4 - 5 - 4 - 6	12	9	5.0		As Above (SP)	
6 - 8	S-4	X	5 - 4 - 4 - 4	18	8			As Above, Moist (SP)	Trace Cobble Medium Grains
8 - 10	S-5	X	2 - 3 - 5 - 9	12	8			As Above, Wet (SP)	Coarse Grains
						10.0			
13 - 15	S-6	X	18 - 15 - 17 - 13	12	32			As Above, Light Brown to Orange, Dense (SP)	Trace Cobble
						15.0			
18 - 20	S-7	X	19 - 17 - 15 - 17	24	32			As Above (SP)	Higher Cobble Content
						20.0			
23 - 25	S-8	X	22 - 24 - 24 - 22	18	48			As Above (SP)	
						25.0			
Boring Log B-7 Terminated at a Depth of 25.0 Feet Below Ground Surface									

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-8**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/6/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/6/2019</u>	During: <u>13.0</u> --- 	At Completion: <u>5.5</u> --- 
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>NE</u> --- 	At Completion: <u>5.5</u> --- 
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- 	24 Hours: --- --- 
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0			3" Topsoil	
0 - 2	S-1		5 - 10 - 12 - 8	1	22	0.3	TOPSOIL		Orange to Brown Poorly Graded Sand, Slightly Moist, Medium Dense (SP)	Medium Grains
							COASTAL PLAIN DEPOSITS			
2 - 4	S-2		9 - 9 - 9 - 8	12	18				As Above (SP)	
4 - 6	S-3		6 - 6 - 6 - 7	2	12	5.0			As Above, Moist (SP)	
6 - 8	S-4		4 - 5 - 5 - 5	18	10				As Above (SP)	
8 - 10	S-5		8 - 5 - 8 - 10	12	13	10.0			As Above (SP)	
13 - 15	S-6		11 - 7 - 6 - 10	12	13	15.0			As Above, Wet (SP)	
18 - 20	S-7		7 - 22 - 22 - 28	12	44	20.0			As Above, Dense (SP)	High Cobble Content Coarse Grains
23 - 25	S-8		15 - 15 - 24 - 23	4	39	25.0			As Above, Gray to Light Brown (SP)	Fine Grains
Boring Log B-8 Terminated at a Depth of 25.0 Feet Below Ground Surface										

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-10**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/7/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/7/2019</u>	During: <u>8.0</u> --- ▼	At Completion: <u>9.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>7.0</u> --- ▼	At Completion: <u>9.0</u> --- ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- ▼	24 Hours: --- --- ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0	TOPSOIL	4" Topsoil	
0 - 2	S-1		2 - 2 - 4 - 5	8	6	0.3	COASTAL PLAIN DEPOSITS	Orange Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		3 - 3 - 3 - 4	18	6			As Above, Slightly Moist (SP)	
4 - 6	S-3		3 - 3 - 4 - 4	8	7	5.0		As Above, Light Brown (SP)	
6 - 8	S-4		2 - 2 - 5 - 9	12	7			As Above, Orange, Moist (SP)	
8 - 10	S-5		5 - 10 - 9 - 8	12	19			As Above, Wet, Medium Dense (SP)	Medium Grains
						10.0			Running Sand @ 12.0 fbgs
13 - 15	S-6		5 - 7 - 10 - 11	10	17	15.0		As Above (SP)	Coarse Grains
18 - 20	S-7		13 - 15 - 17 - 11	12	32	20.0		As Above, Dense (SP)	High Cobble Content
23 - 25	S-8		5 - 13 - 24 - 28	8	37	25.0		As Above, Gray (SP)	Fine Grains
								Boring Log B-10 Terminated at a Depth of 25.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-11**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/7/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/7/2019</u>	During: <u>6.0</u> <u>---</u> ▼	At Completion: <u>6.0</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>5.5</u> <u>---</u> ▼	At Completion: <u>6.0</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		1 - 2 - 3 - 3	18	5		COASTAL PLAIN DEPOSITS	Dark Brown Poorly Graded Sand with Gravel, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		4 - 6 - 6 - 6	18	12			Orange Poorly Graded Sand, Slightly Moist, Medium Dense (SP)	Fine Grains
4 - 6	S-3		4 - 6 - 9 - 10	12	15	5.0		As Above, Moist (SP)	Medium Grains
6 - 8	S-4		6 - 8 - 8 - 8	18	16			As Above, Wet (SP)	Coarse Grains
8 - 10	S-5		6 - 7 - 8 - 6	18	15			As Above (SP)	
						10.0			Running Sands @ 10.0 fbg
13 - 15	S-6		7 - 12 - 13 - 17	4	25	15.0		As Above (SP)	Some Large Cobbles
18 - 20	S-7		15 - 14 - 19 - 15	12	33	20.0		As Above, Dense (SP)	High Cobble Content
23 - 25	S-8		8 - 13 - 12 - 14	12	25	25.0		As Above (SP)	
								Boring Log B-11 Terminated at a Depth of 25.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

 RECORD OF SUBSURFACE EXPLORATION
 16559logs 8/30/2019

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-12**

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Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/7/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/7/2019</u>	During: <u>8.0</u> <u>---</u> ▼	At Completion: <u>6.0</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>NE</u> <u>---</u> ▼	At Completion: <u>6.0</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		1 - 2 - 3 - 5	8	5		COASTAL PLAIN DEPOSITS	Orange Brown Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		2 - 2 - 2 - 3	12	4			As Above, Slightly Moist (SP)	Clay Lenses @ 4.0 fbgs
4 - 6	S-3		7 - 6 - 6 - 7	NR	12	5.0		No Recovery, Presumed As Above, Medium Dense (SP)	
6 - 8	S-4		10 - 12 - 6 - 4	18	18			As Above, Wet (SP)	
8 - 10	S-5		5 - 6 - 7 - 6	18	13			As Above (SP)	
						10.0			Running Sand @ 10.0 fbgs
13 - 15	S-6		10 - 10 - 15 - 14	6	25	15.0		As Above (SP)	Coarse Grains
18 - 20	S-7		16 - 13 - 7 - 5	10	20	20.0		As Above, Gray (SP)	High Cobble Content
23 - 25	S-8		9 - 7 - 12 - 18	NR	19	25.0		No Recovery, Presumed As Above (SP)	
								Boring Log B-12 Terminated at a Depth of 25.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-13**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000					
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.					
Surface Elevation: ± NS feet						Date Started: 8/7/2019		Water Depth Elevation (feet bgs) (feet)		Cave-In Depth Elevation (feet bgs) (feet)	
Termination Depth: 20.0 feet bgs						Date Completed: 8/7/2019					
Proposed Location: Building						Logged By: RL		During: 8.0 --- ▼			
Drill / Test Method: HSA / SPT						Contractor: AD		At Completion: NE --- ▼		At Completion: 7.0 --- ▼	
						Equipment: CME 45		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			
						0.3	TOPSOIL	4" Topsoil	
0 - 2	S-1		1 - 2 - 2 - 3	12	4		COASTAL PLAIN DEPOSITS	Orange Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		1 - 2 - 2 - 3	18	4			As Above, Light Brown to Orange (SP)	
4 - 6	S-3		5 - 3 - 5 - 4	6	8	5.0		As Above, Gray to Light Brown (SP)	Medium Grains
6 - 8	S-4		3 - 3 - 4 - 4	12	7			As Above, Orange, Moist (SP)	Coarse Grains
8 - 10	S-5		7 - 5 - 8 - 12	12	13			As Above, Wet, Medium Dense (SP)	
						10.0			
									Running Sand @ 12.0 fbgs
13 - 15	S-6		12 - 11 - 11 - 10	12	22			As Above (SP)	
						15.0			
18 - 20	S-7		10 - 14 - 16 - 14	12	30			As Above, Dense (SP)	High Cobble Content
						20.0			
								Boring Log B-13 Terminated at a Depth of 00.0 Feet Below Ground Surface	
						25.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-15**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000					
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.					
Surface Elevation: ± <u>NS</u> feet						Date Started: <u>8/8/2019</u>		Water Depth Elevation (feet bgs) (feet)		Cave-In Depth Elevation (feet bgs) (feet)	
Termination Depth: <u>25.0</u> feet bgs						Date Completed: <u>8/8/2019</u>					
Proposed Location: <u>Building</u>						Logged By: <u>RL</u>		During: <u>10.0</u> --- ▼			
Drill / Test Method: <u>HSA / SPT</u>						Contractor: <u>AD</u>		At Completion: <u>6.0</u> --- ▼		At Completion: <u>9.0</u> --- ▼	
						Equipment: <u>CME 45</u>		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 - 2	S-1	X	1 - 2 - 4 - 5	18	6	0.8	TOPSOIL	9" Topsoil	
2 - 4	S-2	X	4 - 9 - 10 - 10	24	19		FILL	Orange to Black Poorly Graded Sand with Silt and Gravel, Moist (FILL)	Trace Fibers Trace Gravel
4 - 6	S-3	X	8 - 6 - 8 - 7	24	14	4.0	ORGANIC	Light Brown Poorly Graded Sand with Debris, Moist (FILL)	
6 - 8	S-4	X	6 - 7 - 9 - 7	18	16	6.0	COASTAL PLAIN DEPOSITS	Black Organic Silt, Moist (OL)	High Timber Content Trace Cobbles
8 - 10	S-5	X	10 - 12 - 12 - 17	18	24	10.0		Gray to Light Brown Poorly Graded Sand, Moist, Medium Dense (SP)	Fine Grains
13 - 15	S-6	X	6 - 12 - 18 - 23	20	30	15.0		As Above (SP)	Medium Grains
18 - 20	S-7	X	8 - 11 - 17 - 26	12	28	20.0		As Above, Medium Dense (SP)	Coarse Grains
23 - 25	S-8	X	11 - 19 - 24 - 29	NR	43	25.0		As Above, Wet (SP)	Trace Cobbles
								No Recovery, Presumed As Above (SP)	
Boring Log B-15 Terminated at a Depth of 25.0 Feet Below Ground Surface									

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-16**

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Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000					
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.					
Surface Elevation: ± <u>NS</u> feet						Date Started: <u>8/8/2019</u>		Water Depth Elevation (feet bgs) (feet)		Cave-In Depth Elevation (feet bgs) (feet)	
Termination Depth: <u>20.0</u> feet bgs						Date Completed: <u>8/8/2019</u>					
Proposed Location: <u>Building</u>						Logged By: <u>RL</u>		During: <u>6.0</u> --- ▼			
Drill / Test Method: <u>HSA / SPT</u>						Contractor: <u>AD</u>		At Completion: <u>4.0</u> --- ▼		At Completion: <u>7.0</u> --- ▼	
						Equipment: <u>CME 45</u>		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	TOPSOIL	9" Topsoil		
0 - 2	S-1	W O H	2 - 2 - 8	4	4	0.8	FILL	Light Brown to Orange Poorly Graded Sand, Dry (FILL)	Fine Grains Clay Lenses	
2 - 4	S-2		8 - 14 - 14 - 10	6	28	2.0	ORGANIC	Black Organic Silt, Moist, Medium Dense (OL)	Wood Debris	
4 - 6	S-3		10 - 18 - 16 - 17	11	34	4.0	COASTAL PLAIN DEPOSITS	Brown Sand Silt, Moist, Dense (ML)		
6 - 8	S-4		8 - 16 - 16 - 17	18	32	6.0		Orangish-Brown Poorly Graded Sand, Wet, Medium Dense (SP)	Medium Grains	
8 - 10	S-5		17 - 15 - 17 - 23	NR	32	10.0		No Recovery, Presumed As Above (SP)		
13 - 15	S-6		10 - 16 - 22 - 19	8	38	15.0		As Above, Orange (SP)	Coarse Grains	
18 - 20	S-7		19 - 18 - 18 - 17	10	38	20.0		As Above (SP)	High Cobble Content	
							Boring Log B-16 Terminated at a Depth of 20.0 Feet Below Ground Surface			

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-17**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/8/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>20.0</u> feet bgs	Date Completed: <u>8/8/2019</u>	During: <u>8.0</u> --- ▼	At Completion: <u>7.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>5.0</u> --- ▼	At Completion: <u>7.0</u> --- ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- ▼	24 Hours: --- --- ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		2 - 2 - 2 - 3	8	4		FILL	Light Brown Poorly Graded Sand, Dry (FILL)	Fine Grains Trace Cobble
2 - 4	S-2		3 - 3 - 5 - 5	12	8			As Above, Orange to Brown, Slightly Moist (FILL)	
						4.0			
4 - 6	S-3		5 - 4 - 3 - 3	10	7		ORGANIC	Black Organic Silt, Dry, Loose (OL)	Wood Fibers Fine Grains
						5.0			
6 - 8	S-4		7 - 9 - 13 - 13	18	22		COASTAL PLAIN DEPOSITS	Orange to Brown Poorly Graded Sand, Moist, Medium Dense (SP)	Fine Grains
8 - 10	S-5		5 - 8 - 10 - 8	18	18			As Above, Wet (SP)	Medium Grains
						10.0			
13 - 15	S-6		10 - 14 - 14 - 18	24	28			As Above (SP)	Coarse Grains
						15.0			
18 - 20	S-7		2 - 7 - 14 - 18	18	21			As Above (SP)	
						20.0			
								Boring Log B-17 Terminated at a Depth of 20.0 Feet Below Ground Surface	
						25.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-18**

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Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/9/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/9/2019</u>	During: <u>8.0</u> --- ▼	At Completion: <u>6.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>2.0</u> --- ▼	24 Hours: --- --- ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: --- --- ▼	Equipment: <u>CME 45</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
0 - 2	S-1		1 - 3 - 7 - 8	18	10	1.0	TOPSOIL	12" Topsoil	
2 - 4	S-2		6 - 9 - 8 - 8	12	17		COASTAL PLAIN DEPOSITS	Orange to Black Poorly Graded Sand, Dry, Medium Dense (SP)	Fine Grains
4 - 6	S-3		5 - 7 - 9 - 10	18	16	5.0		As Above, Moist (SP)	
6 - 8	S-4		7 - 7 - 9 - 10	24	16			As Above (SP)	Medium Grains
8 - 10	S-5		6 - 9 - 11 - 10	8	20	10.0		As Above (SP)	
								As Above, Wet (SP)	Coarse Grains
13 - 15	S-6		7 - 10 - 13 - 16	10	23	15.0		As Above (SP)	Running Sand @ 10.0 fbs
18 - 20	S-7		16 - 18 - 25 - 28	12	43	20.0		As Above, Dense (SP)	High Cobble Content
23 - 25	S-8		3 - 8 - 8 - 8	8	16	25.0		As Above, Gray to Orange, Medium Dense (SP)	High Cobble Content
Boring Log B-18 Terminated at a Depth of 25.0 Feet Below Ground Surface									

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-20**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/9/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/9/2019</u>	During: <u>4.0</u> <u>---</u> ▼	At Completion: <u>5.0</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>4.0</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	Equipment: <u>CME 45</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		1 - 1 - 3 - 3	18	4		FILL	Brown to Orange Poorly Graded Sand, Dry \ (FILL)	Fine Grains
						2.0			
2 - 4	S-2		2 - 3 - 4 - 4	12	7		ORGANIC	Black Organic Silt, Loose, Dry (OL)	Wood Debris
4 - 6	S-3		1 - 2 - 2 - 4	12	4			As Above, Wet (OL)	Wood Debris
6 - 8	S-4		2 - 2 - 6 - 14	12	8			As Above (OL)	Wood Debris
						8.0			
8 - 10	S-5		9 - 12 - 18 - 17	12	30		COASTAL PLAIN DEPOSITS	Orange Poorly Graded Sand, Wet, Medium Dense (SP)	Medium Grains
						10.0			
13 - 15	S-6		8 - 13 - 16 - 13	8	29			As Above (SP)	
						15.0			
18 - 20	S-7		10 - 15 - 17 - 17	12	32			As Above, Dense (SP)	Coarse Grains
						20.0			
23 - 25	S-8		9 - 6 - 10 - 15		16			As Above, Gray, Medium Dense (SP)	
						25.0			
								Boring Log B-20 Terminated at a Depth of 25.0 Feet Below Ground Surface	

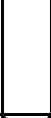
NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-21**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000								
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.								
Surface Elevation: ± NS feet						Date Started: 8/9/2019			Water Depth Elevation (feet bgs) (feet)			Cave-In Depth Elevation (feet bgs) (feet)		
Termination Depth: 20.0 feet bgs						Date Completed: 8/9/2019								
Proposed Location: Building						Logged By: RL			During: 6.0 --- ▼					
Drill / Test Method: HSA / SPT						Contractor: AD			At Completion: 5.0 --- ▼			At Completion: 6.0 --- ▼		
						Equipment: CME 45			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	TOPSOIL		4" Topsoil	
0 - 2	S-1		1 - 1 - 4 - 5	8	5	0.3	COASTAL PLAIN DEPOSITS		Orangish-Brown Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		6 - 8 - 12 - 12	8	20				As Above, Medium Dense (SP)	Clay Lenses
4 - 6	S-3		4 - 5 - 8 - 8	8	13	5.0			As Above, Light Brown, Moist (SP)	
6 - 8	S-4		7 - 8 - 10 - 13	6	18				As Above, Orange, Wet (SP)	Medium Grains
8 - 10	S-5		5 - 7 - 12 - 14	24	19				As Above, Brown (SP)	
13 - 15	S-6		10 - 12 - 12 - 16	8	24	15.0			As Above (SP)	Coarse Grains
18 - 20	S-7		6 - 8 - 12 - 13	9	20	20.0			As Above, Greenish-Gray (SP)	Fine Grains
									Boring Log B-21 Terminated at a Depth of 00.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-22**

 Page 1 of 1

Project: Proposed Industrial Facilities						WAI Project No.: GJ1916559.000					
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ						Client: ARCO Design/Build Northeast, Inc.					
Surface Elevation: ± NS feet						Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Cave-In Depth Elevation (feet bgs) (feet)	
Termination Depth: 20.0 feet bgs						Date Completed: 8/12/2019					
Proposed Location: Building						Logged By: RL		During: 6.0 --- ▼			
Drill / Test Method: HSA / SPT						Contractor: AD		At Completion: NE --- ▼		At Completion: 5.0 --- ▼	
						Equipment: CME 45		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	TOPSOIL	6" Topsoil	
0 - 2	S-1		2 - 2 - 3 - 4	18	5		COASTAL PLAIN DEPOSITS	Orange Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		3 - 2 - 3 - 4	12	5			As Above, Slightly Moist (SP)	Trace Organic Silt
4 - 6	S-3		4 - 5 - 5 - 7	12	10	5.0		As Above, Moist (SP)	
6 - 8	S-4		3 - 3 - 3 - 5	16	6			As Above, Wet (SP)	Medium Grains
8 - 10	S-5		7 - 10 - 9 - 8	12	19			As Above, Medium Dense (SP)	Coarse Grains
						10.0			
13 - 15	S-6		9 - 10 - 12 - 13	18	22			As Above, Light Brown (SP)	Medium Grains
						15.0			
18 - 20	S-7		8 - 13 - 19 - 17	18	32			As Above, Dense (SP)	High Cobble Content
						20.0			
								Boring Log B-22 Terminated at a Depth of 20.0 Feet Below Ground Surface	
						25.0			

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-23**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/12/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/12/2019</u>	During: <u>4.0</u> <u>---</u> ▼	At Completion: <u>7.0</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>4.0</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	Equipment: <u>CME 45</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
							TOPSOIL	9" Topsoil	
0 - 2	S-1		1 - 2 - 2 - 3	18	4	0.8	COASTAL PLAIN DEPOSITS	Orange Poorly Graded Sand, Dry, Loose (SP)	Fine Grains
2 - 4	S-2		2 - 2 - 2 - 5	12	4			As Above, Moist (SP)	
4 - 6	S-3		4 - 4 - 4 - 5	12	8	5.0		As Above, Wet (SP)	
6 - 8	S-4		3 - 9 - 10 - 11	18	19			As Above, Medium Dense (SP)	
8 - 10	S-5		5 - 8 - 12 - 14	12	20	10.0		As Above (SP)	Medium Grains
13 - 15	S-6		6 - 11 - 11 - 13	12	20	15.0		As Above (SP)	
18 - 20	S-7		9 - 13 - 14 - 21	12	27	20.0		As Above, Brown (SP)	High Cobble Content Coarse Grains
23 - 25	S-8		11 - 11 - 18 - 19	12	29	25.0		As Above, Gray (SP)	Clay Lenses Fine Grains
Boring Log B-23 Terminated at a Depth of 25.0 Feet Below Ground Surface									

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

 RECORD OF SUBSURFACE EXPLORATION
 16559logs 8/30/2019

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-24**

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Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/12/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>20.0</u> feet bgs	Date Completed: <u>8/12/2019</u>	During: <u>8.0</u> <u>---</u> ▼	At Completion: <u>7.0</u> <u>---</u> ▼
Proposed Location: <u>Building</u>	Logged By: <u>RL</u>	At Completion: <u>6.0</u> <u>---</u> ▼	At Completion: <u>7.0</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>AD</u>	24 Hours: <u>---</u> <u>---</u> ▼	24 Hours: <u>---</u> <u>---</u> ▼
	Equipment: <u>CME 45</u>		

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
0 - 2	S-1		1 - 1 - 2 - 2	18	3	0.5	TOPSOIL	6" Topsoil	Fine Grains
							FILL	Orange Poorly Graded Sand, Moist (FILL)	
						2.0			
2 - 4	S-2		2 - 4 - 2 - 4	12	6		ORGANIC	Black Organic Silt, Loose, Moist (OL)	
								As Above (OL)	
						5.0			
4 - 6	S-3		3 - 2 - 2 - 2	12	4	6.0	COASTAL PLAIN DEPOSITS	Brownish-Orange Poorly Graded Sand, Moist, Loose (SP)	Medium Grains
								As Above, Wet, Medium Dense (SP)	
						10.0			
6 - 8	S-4		1 - 2 - 7 - 10	18	9			As Above, Orange (SP)	High Cobble Content Coarse Grains
								As Above, Greenish-Brown (SP)	
						15.0			
8 - 10	S-5		3 - 7 - 9 - 12	12	16				
						20.0			
13 - 15	S-6		8 - 12 - 16 - 19	8	28				
18 - 20	S-7		8 - 9 - 10 - 10	8	19				
						25.0			
								Boring Log B-24 Terminated at a Depth of 20.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-26**

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Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/13/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/13/2019</u>	During: <u>7.0</u> ---	At Completion: <u>8.0</u> ---
Proposed Location: <u>Building</u>	Logged By: <u>BS</u>	At Completion: <u>7.0</u> ---	24 Hours: --- ---
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>Traditional</u>	24 Hours: --- ---	Equipment: <u>PC 45 MR</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		1 - 3 - 4 - 4	14	7		COASTAL PLAIN DEPOSITS	Dark Brown Silty Sand, Dry, Loose (SM)	
2 - 4	S-2		2 - 3 - 2 - 4	16	5			As Above, Medium Brown to Orange, Moist (SM)	
4 - 6	S-3		3 - 4 - 3 - 5	18	7	5.0		As Above (SM)	
6 - 8	S-4		7 - 9 - 9 - 10	24	18			As Above, Wet, Medium Dense (SM)	
8 - 10	S-5		7 - 10 - 11 - 12	14	21			As Above (SM)	
						10.0			
13 - 15	S-6		13 - 15 - 19 - 21	18	34			As Above, Wet (SM)	Trace Gravel Layer
						15.0			
18 - 20	S-7		13 - 19 - 21 - 24	12	40			Medium Brown to Brown Coarsely Graded Silty Sand with Gravel, Dense (SM)	
						20.0			
						23.0			
23 - 25	S-8		14 - 17 - 17 - 20	6	34			Poorly Graded Sand, Medium Dense (SP)	High Cobble Content Coarse Grains
						25.0			
Boring Log B-26 Terminated at a Depth of 25.0 Feet Below Ground Surface									

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-27**

 Page 1 of 1

Project: Proposed Industrial Facilities		WAI Project No.: GJ1916559.000	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Northeast, Inc.	
Surface Elevation: ± <u>NS</u> feet	Date Started: <u>8/13/2019</u>	Water Depth Elevation (feet bgs) (feet)	Cave-In Depth Elevation (feet bgs) (feet)
Termination Depth: <u>25.0</u> feet bgs	Date Completed: <u>8/13/2019</u>	During: <u>6.0</u> --- ▼	At Completion: <u>7.0</u> --- ▼
Proposed Location: <u>Building</u>	Logged By: <u>BS</u>	At Completion: <u>6.0</u> --- ▼	24 Hours: <u>---</u> <u>---</u> ▼
Drill / Test Method: <u>HSA / SPT</u>	Contractor: <u>Traditional</u>	24 Hours: <u>---</u> <u>---</u> ▼	Equipment: <u>PC 45 MR</u>

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
						0.5	TOPSOIL	6" Topsoil	
0 - 2	S-1		1 - 3 - 4 - 5	12	7		COASTAL PLAIN DEPOSITS	Medium Brown to Gray Poorly Graded Sand, Dry, Loose (SP)	
2 - 4	S-2		3 - 4 - 2 - 4	18	6			As Above, Medium Brown to Black (SP)	
4 - 6	S-3		6 - 8 - 10 - 11	18	18	5.0		As Above, Orange, Slightly Wet, Medium Dense (SP)	
6 - 8	S-4		7 - 9 - 10 - 11	16	19			As Above, Medium Brown, Wet (SP)	
8 - 10	S-5		8 - 12 - 12 - 15	12	24	10.0		As Above (SP)	Trace Cobbles
13 - 15	S-6		8 - 11 - 14 - 19	12	25	15.0		Medium Brown Coarsely Graded Sand with Gravel , Medium Dense (SP)	
18 - 20	S-7		12 - 16 - 18 - 21	12	34	20.0		As Above (SP)	
23 - 25	S-8		11 - 11 - 17 - 13	12	28	25.0		Medium Brown Poorly Graded Sand with Gravel, Medium Dense (SP)	
								Boring Log B-27 Terminated at a Depth of 25.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Boring No.: **B-28**

 Page 1 of 1

Project: Proposed Industrial Facilities			WAI Project No.: GJ1916559.000		
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Northeast, Inc.		
Surface Elevation: ± <u>NS</u> feet		Date Started: <u>8/13/2019</u>		Water Depth Elevation (feet bgs) (feet)	
Termination Depth: <u>20.0</u> feet bgs		Date Completed: <u>8/13/2019</u>		Cave-In Depth Elevation (feet bgs) (feet)	
Proposed Location: <u>Building</u>		Logged By: <u>BS</u>		During: <u>6.0</u> <u>---</u> ▼	
Drill / Test Method: <u>HSA / SPT</u>		Contractor: <u>Traditional</u>		At Completion: <u>NE</u> <u>---</u> ▼	
		Equipment: <u>PC 45 MR</u>		24 Hours: <u>---</u> <u>---</u> ▼	
				At Completion: <u>5.0</u> <u>---</u> ▼	
				24 Hours: <u>---</u> <u>---</u> ▼	

SAMPLE INFORMATION						DEPTH	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)			
						0.0			
0 - 2	S-1		1 - 3 - 3 - 2	12	6	0.5	TOPSOIL	6" Topsoil	
							COASTAL PLAIN DEPOSITS	Medium Brown Poorly Graded Sand, Dry, Loose (SP)	
2 - 4	S-2		2 - 3 - 4 - 4	18	7			As Above, Orange (SP)	
4 - 6	S-3		3 - 5 - 5 - 4	12	10	5.0		As Above, Moist (SP)	
6 - 8	S-4		5 - 7 - 7 - 8	20	14			As Above, Wet (SP)	
8 - 10	S-5		3 - 6 - 12 - 11	12	18			As Above (SP)	
						10.0			
13 - 15	S-6		7 - 8 - 11 - 13	15	19			As Above (SP)	
						15.0			
18 - 20	S-7		7 - 10 - 11 - 14	12	21			Medium Brown Poorly Graded Sand and Gravel, Medium Dense (SP)	
						20.0			
								Boring Log B-28 Terminated at a Depth of 20.0 Feet Below Ground Surface	
						25.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-1**

 Page 1 of 1

Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 8.0 feet bgs		Date Completed: 8/12/2019		During: 7.0 --- ▼		At Completion: 7.0 --- ▼	
Proposed Location: Proposed Parking		Logged By: RL		At Completion: 7.0 --- ▼		At Completion: 7.0 --- ▼	
Excavating Method: Test Pit Excavation		Contractor: Traditional		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR					

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.75	S-1	BAG	0 - 0.75	TOPSOIL	9" Topsoil	
0.75 - 3	S-2	BAG	1.0 0.75 - 3	COASTAL PLAIN DEPOSITS	Light Yellowish-Brown (10YR 6/4) SAND; No Coarse Fragments; Weak, Fine Granular Structure; Loose; Few Faint Roots; No Mottling; Smooth Gradual Boundary	
3 - 8	S-3	BAG	2.0 3.0 4.0 5.0 6.0 7.0 8.0		Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Boundary; Smooth Boundary	
			9.0 10.0 11.0 12.0 13.0 14.0 15.0		Soil Profile Pit SPP-1 Terminated at a Depth of 8.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-2**

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Project: Proposed Industrial Facilities			WAI Project No.: GJ1916559.000		
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Northeast, Inc.		
Surface Elevation: ± NS feet		Date Started: 8/12/2019	Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)
Termination Depth: 9.0 feet bgs		Date Completed: 8/12/2019			
Proposed Location: Proposed Parking		Logged By: RL	During: 7.5 --- ▼	At Completion: 7.5 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional	At Completion: 7.5 --- ▼		
Test Method: Visual Observation		Rig Type: PC 45 MR	24 Hours: --- --- ▼		

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.5	S-1	BAG	0 - 0.5	TOPSOIL	6" Topsoil	
			1.0			
0.5 - 3	S-2	BAG	0.5 - 3	COASTAL PLAIN DEPOSITS	Light Yellowish-Brown (10YR 6/4) SAND; No Coarse Fragments; Weak, Fine Granular Structure; Loose; Few Faint Roots; No Mottling; Smooth Gradual Boundary	
			2.0			
			3.0			
			4.0			
3 - 8	S-3	BAG	3 - 9		Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Boundary; Smooth Boundary	
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0		Soil Profile Pit SPP-2 Terminated at a Depth of 9.0 Feet Below Ground Surface	
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-3**

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Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High	
Termination Depth: 10.0 feet bgs		Date Completed: 8/12/2019				Groundwater Depth Elevation (feet bgs) (feet)	
Proposed Location: Proposed Parking		Logged By: RL		During: 8.0 --- ▼		At Completion: 8.0 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional		At Completion: 8.0 --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR		24 Hours: --- --- ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.5	S-1	BAG	0 - 0.5	TOPSOIL	6" Topsoil	
0.5 - 5	S-2	BAG	0.5 - 5	FILL	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Boundary; Smooth Boundary	
			1.0			
			2.0			
			3.0			
			4.0			
5 - 6	S-3	BAG	5.0			
			5 - 6	ORGANIC	Very Dark Brown (10YR 2/2) SANDY CLAY LOAM; No Coarse Fragments; Slightly Moist; Moderate, Medium Subangular Blocky Structure; Friable; Many Common Roots; No Mottling; Clear Boundary	
6 - 10	S-4	BAG	6.0			
			6 - 10	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Boundary; Smooth Boundary	
			7.0			
			8.0			
			9.0			
			10.0			
			11.0		Soil Profile Pit SPP-3 Terminated at a Depth of 10.0 Feet Below Ground Surface	
			12.0			
			13.0			
			14.0			
			15.0			

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-4**

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Project: Proposed Industrial Facilities			WAI Project No.: GJ1916559.000												
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Northeast, Inc.												
Surface Elevation: ± <u>NS</u> feet		Date Started: <u>8/12/2019</u>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Water Depth Elevation</th> </tr> <tr> <th>(feet bgs) (feet)</th> <th></th> </tr> <tr> <td>During: <u>7.0</u> <u>---</u></td> <td>▼</td> </tr> <tr> <td>At Completion: <u>7.0</u> <u>---</u></td> <td>▼</td> </tr> <tr> <td>24 Hours: <u>---</u> <u>---</u></td> <td>▼</td> </tr> </table>		Water Depth Elevation		(feet bgs) (feet)		During: <u>7.0</u> <u>---</u>	▼	At Completion: <u>7.0</u> <u>---</u>	▼	24 Hours: <u>---</u> <u>---</u>	▼
Water Depth Elevation															
(feet bgs) (feet)															
During: <u>7.0</u> <u>---</u>	▼														
At Completion: <u>7.0</u> <u>---</u>	▼														
24 Hours: <u>---</u> <u>---</u>	▼														
Termination Depth: <u>8.0</u> feet bgs		Date Completed: <u>8/12/2019</u>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Estimated Seasonal High</th> </tr> <tr> <th>Groundwater Depth Elevation</th> <th></th> </tr> <tr> <td>(feet bgs) (feet)</td> <td></td> </tr> <tr> <td>At Completion: <u>7.0</u> <u>---</u></td> <td></td> </tr> </table>		Estimated Seasonal High		Groundwater Depth Elevation		(feet bgs) (feet)		At Completion: <u>7.0</u> <u>---</u>			
Estimated Seasonal High															
Groundwater Depth Elevation															
(feet bgs) (feet)															
At Completion: <u>7.0</u> <u>---</u>															
Proposed Location: <u>Proposed Parking</u>		Logged By: <u>RL</u>													
Excavating Method: <u>Test Pit Excavation</u>		Contractor: <u>Traditional</u>													
Test Method: <u>Visual Observation</u>		Rig Type: <u>PC 45 MR</u>													

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.5	S-1	BAG	0 - 0.5	TOPSOIL	6" Topsoil	
0.5 - 8	S-2	BAG	0.5 - 8	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			
					Soil Profile Pit SPP-4 Terminated at a Depth of 8.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-6**

 Page 1 of 1

Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± <u>NS</u> feet		Date Started: <u>8/12/2019</u>		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: <u>7.0</u> feet bgs		Date Completed: <u>8/12/2019</u>					
Proposed Location: <u>Proposed Parking</u>		Logged By: <u>RL</u>		During: <u>5.0</u> <u>---</u> ▼		At Completion: <u>5.0</u> <u>---</u>	
Excavating Method: <u>Test Pit Excavation</u>		Contractor: <u>Traditional</u>		At Completion: <u>5.0</u> <u>---</u> ▼			
Test Method: <u>Visual Observation</u>		Rig Type: <u>PC 45 MR</u>		24 Hours: <u>---</u> <u>---</u> ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.5	S-1	BAG	0 - 0.5	TOPSOIL	6" Topsoil	
0.5 - 1.5	S-2	BAG	0.5 - 1.5	ORGANIC	Very Dark Brown (10YR 2/2) SANDY CLAY LOAM; No Coarse Fragments; Slightly Moist; Moderate, Medium Subangular Blocky Structure; Friable; Many Common Roots; No Mottling; Clear Boundary	
1.5 - 7	S-3	BAG	1.5 - 7	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Boundary; Smooth Boundary	
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			
Soil Profile Pit SPP-6 Terminated at a Depth of 7.0 Feet Below Ground Surface						

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-7**

 Page 1 of 1

Project: Proposed Industrial Facilities			WAI Project No.: GJ1916559.000		
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Northeast, Inc.		
Surface Elevation: ± <u>NS</u> feet		Date Started: <u>8/12/2019</u>	Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)
Termination Depth: <u>7.0</u> feet bgs		Date Completed: <u>8/12/2019</u>			
Proposed Location: <u>Proposed Parking</u>		Logged By: <u>RL</u>	During: <u>5.0</u> <u>---</u> ▼	At Completion: <u>5.0</u> <u>---</u>	
Excavating Method: <u>Test Pit Excavation</u>		Contractor: <u>Traditional</u>	At Completion: <u>5.0</u> <u>---</u> ▼		
Test Method: <u>Visual Observation</u>		Rig Type: <u>PC 45 MR</u>	24 Hours: <u>---</u> <u>---</u> ▼		

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 1	S-1	BAG	0 - 1	TOPSOIL	12" Topsoil	
			1.0			
1 - 7	S-2	BAG	1 - 7	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
			2.0			
			3.0			
			4.0			
			5.0			
			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

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-8**

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Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High	
Termination Depth: 9.0 feet bgs		Date Completed: 8/12/2019				Groundwater Depth Elevation (feet bgs) (feet)	
Proposed Location: Proposed Parking		Logged By: RL		During: 7.0 --- ▼		At Completion: 7.0 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional		At Completion: 7.0 --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR		24 Hours: --- --- ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS	
Depth (feet)	Number	Type	feet				
			0.0				
0 - 0.5	S-1	BAG	0 - 0.5	TOPSOIL	6" Topsoil		
0.5 - 3	S-2	BAG	0.5 - 3	FILL	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary		
			1.0				
			2.0				
3 - 7	S-3	BAG	3.0	ORGANIC	Very Dark Brown (10YR 2/2) SANDY CLAY LOAM; No Coarse Fragments; Slightly Moist; Moderate, Medium Subangular Blocky Structure; Friable; Many Common Roots; No Mottling; Clear Boundary	Concrete Slab @ 4.0 fbg	
			4.0				
			5.0				
			6.0				
			7.0				
7 - 9	S-4	BAG	7 - 9	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary		
			10.0		Soil Profile Pit SPP-8 Terminated at a Depth of 7.0 Feet Below Ground Surface		
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-9**

 Page 1 of 1

Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 8.5 feet bgs		Date Completed: 8/12/2019					
Proposed Location: Proposed Parking		Logged By: RL		During: 5.0 --- ▼		At Completion: 5.0 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional		At Completion: 5.0 --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR		24 Hours: --- --- ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
0 - 0.5	S-1	BAG	0.0 0 - 0.5	TOPSOIL	6" Topsoil	Metal Debris @ 3.0 fbg
0.5 - 4	S-2	BAG	1.0 2.0 3.0 4.0	FILL	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
4 - 7	S-3	BAG	5.0 6.0 7.0	ORGANIC	Very Dark Brown (10YR 2/2) SANDY CLAY LOAM; No Coarse Fragments; Slightly Moist; Moderate, Medium Subangular Blocky Structure; Friable; Many Common Roots; No Mottling; Clear Boundary	
7 - 8.5	S-4	BAG	8.0	COASTAL PLAIN DEPOSITS	Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
			9.0 10.0 11.0 12.0 13.0 14.0 15.0		Soil Profile Pit SPP-9 Terminated at a Depth of 8.5 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-10**

 Page 1 of 1

Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 8.0 feet bgs		Date Completed: 8/12/2019					
Proposed Location: Proposed Parking		Logged By: RL		During: 7.0 --- ▼		At Completion: 7.0 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional		At Completion: 7.0 --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR		24 Hours: --- --- ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
0 - 0.5	S-1	BAG	0.0 0 - 0.5	TOPSOIL	6" Topsoil	
0.5 - 3	S-2	BAG	1.0 0.5 - 3	COASTAL PLAIN DEPOSITS	Light Yellowish-Brown (10YR 6/4) SAND; No Coarse Fragments; Weak, Fine Granular Structure; Loose; Few Faint Roots; No Mottling; Smooth Gradual Boundary	
3 - 8	S-3	BAG	3.0 3 - 8		Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
			4.0 5.0 6.0 7.0 8.0			
			9.0 10.0 11.0 12.0 13.0 14.0 15.0		Soil Profile Pit SPP-10 Terminated at a Depth of 8.0 Feet Below Ground Surface	

RECORD OF SUBSURFACE EXPLORATION

 Soil Profile Pit No.: **SPP-11**

 Page 1 of 1

Project: Proposed Industrial Facilities				WAI Project No.: GJ1916559.000			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Northeast, Inc.			
Surface Elevation: ± NS feet		Date Started: 8/12/2019		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 9.0 feet bgs		Date Completed: 8/12/2019					
Proposed Location: Proposed Parking		Logged By: RL		During: 7.0 --- ▼		At Completion: 7.0 ---	
Excavating Method: Test Pit Excavation		Contractor: Traditional		At Completion: 7.0 --- ▼			
Test Method: Visual Observation		Rig Type: PC 45 MR		24 Hours: --- --- ▼			

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
0 - 0.75	S-1	BAG	0 - 0.75	TOPSOIL	9" Topsoil	
0.75 - 2	S-2	BAG	1.0	COASTAL PLAIN DEPOSITS	Light Yellowish-Brown (10YR 6/4) SAND; No Coarse Fragments; Weak, Fine Granular Structure; Loose; Few Faint Roots; No Mottling; Smooth Gradual Boundary	
			0.75 - 2			
			2.0			
2 - 9	S-3	BAG	2 - 9		Strong Brown (7.5YR 5/8) SAND; 5% Cobble; Weak, Fine Granular Structure; Loose; No Roots; No Mottling; Smooth Boundary	
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0		Soil Profile Pit SPP-11 Terminated at a Depth of 9.0 Feet Below Ground Surface	
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-1**Page **1** of **1**

Project: Proposed Warehouse Facility			WAI Project No.: GS1916559.002				
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Industrial				
Surface Elevation: ± 18.0 feet		Date Started: 9/12/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 12.0 feet bgs		Date Completed: 9/12/2022		During: 10.0 8.0 ▼		At Completion: 8.0 10.0 ▼	
Proposed Location: SWM		Logged By: MO		At Completion: 8.0 10.0 ▼		At Completion: 8.0 10.0	
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)		REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
			0 - 1.7	TOPSOIL	20" Topsoil		
			1.0				
			2.0	1.7 - 5	COASTAL PLAIN DEPOSITS	Light Brown (5YR 6/8) SAND; No Gravel; Slightly Moist; Moderate, Granular Structure; Few Roots	
			3.0				
3 - 4	S-1	BAG	4.0				
			5.0	5 - 12	Brown (5YR 4/8) LOAMY SAND; No Gravel; Moist; Moderate, Crumb Structure; Few Roots		
			6.0				
6 - 8	S-2	BAG	7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
					Soil Profile Pit SPP-1 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

RECORD OF SUBSURFACE EXPLORATION
16559_002_SPPlogs 9/29/2022



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-2**Page **1** of **1**

Project: Proposed Warehouse Facility			WAI Project No.: GS1916559.002				
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Industrial				
Surface Elevation: ± 17.0 feet		Date Started: 9/12/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 11.0 feet bgs		Date Completed: 9/12/2022		During: 9.0 8.0		At Completion: 7.5 9.5	
Proposed Location: SWM		Logged By: MO		At Completion: 7.5 9.5		At Completion: 7.5 9.5	
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- ---			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)		REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
			0 - 0.75	TOPSOIL	9" Topsoil		
			1.0	0.75 - 11	COASTAL PLAIN DEPOSITS	Orange Brown (5YR 7/8) SANDY LOAM; No Gravel; Moist; Granular Structure; Loose; No Roots; Clear Boundary	
			2.0				
			3.0				
3 - 4	S-1	BAG	4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				
					Soil Profile Pit SPP-2 Terminated at a Depth of 11.0 Feet Below Ground Surface		

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION
16559_002_SPPlogs 9/29/2022

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-3**

Page 1 of 1

Project: Proposed Warehouse Facility			WAI Project No.: GS1916559.002												
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Industrial												
Surface Elevation: ± 17.0 feet		Date Started: 9/12/2022		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Water Depth Elevation</th> </tr> <tr> <th>(feet bgs) (feet)</th> <th></th> </tr> <tr> <td>During:</td> <td>7.0 10.0 ▼</td> </tr> <tr> <td>At Completion:</td> <td>7.0 10.0 ▼</td> </tr> <tr> <td>24 Hours:</td> <td>--- --- ▼</td> </tr> </table>		Water Depth Elevation		(feet bgs) (feet)		During:	7.0 10.0 ▼	At Completion:	7.0 10.0 ▼	24 Hours:	--- --- ▼
Water Depth Elevation															
(feet bgs) (feet)															
During:	7.0 10.0 ▼														
At Completion:	7.0 10.0 ▼														
24 Hours:	--- --- ▼														
Termination Depth: 10.0 feet bgs		Date Completed: 9/12/2022		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Estimated Seasonal High</th> </tr> <tr> <th>Groundwater Depth Elevation</th> <th></th> </tr> <tr> <td>(feet bgs) (feet)</td> <td></td> </tr> <tr> <td>At Completion:</td> <td>7.0 10.0</td> </tr> </table>		Estimated Seasonal High		Groundwater Depth Elevation		(feet bgs) (feet)		At Completion:	7.0 10.0		
Estimated Seasonal High															
Groundwater Depth Elevation															
(feet bgs) (feet)															
At Completion:	7.0 10.0														
Proposed Location: SWM		Logged By: MO													
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				
1.0	S-1	BAG	0.0				Infiltration Testing @ 5.0 fbgs
			0 - 0.75	TOPSOIL	9" Topsoil		
			1.0	COASTAL PLAIN DEPOSITS	Light Grayish-Brown (5YR 7/4) SAND; No Gravel; Slightly Moist; Blocky, Cemented Structure; Few Roots; Clear Boundary		
			2.0				
			3.0				
2.5 - 4.5	Orange Brown (5YR 7/8) SAND; No Gravel; Moist; Granular Structure; Loose; No Roots; Gradual Boundary						
3 - 4	S-2	BAG	4.0				
5.0	S-3	BAG	5.0	4.5 - 10		Dark Brown (5YR 4/8) LOAMY SAND; No Gravel; Moist to Wet; Crumb Structure; Plastic; No Roots	
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
			11.0			Soil Profile Pit SPP-3 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Continuous Cave-In	
			12.0				
			13.0				
			14.0				
			15.0				



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-4**Page **1** of **1**

Project: Proposed Warehouse Facility				WAI Project No.: GS1916559.002			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Industrial			
Surface Elevation: ± 17.0 feet		Date Started: 9/12/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 10.0 feet bgs		Date Completed: 9/12/2022		During: 9.0 8.0 ▼		At Completion: 8.0 9.0	
Proposed Location: SWM		Logged By: MO		At Completion: 8.0 9.0 ▼			
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS	
Depth (feet)	Number	Type	feet				
1.0	S-1	BAG	0.0	TOPSOIL	9" Topsoil	Infiltration Testing @ 5.0 fbgs	
			0 - 0.75				
4.0	S-2	BAG	1.0	COASTAL PLAIN DEPOSITS	Light Grayish-Brown (5YR 7/4) SAND; No Gravel; Slightly Moist; Blocky, Cemented Structure; Few Roots; Gradual Boundary		
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0		Orange Brown (5YR 7/8) SAND; No Gravel; Moist; Granular Structure; Loose; Few Roots; Clear Boundary		
			10.0				
			11.0		Soil Profile Pit SPP-4 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Continuous Cave-In		
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION
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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-5**Page **1** of **1**

Project: Proposed Warehouse Facility				WAI Project No.: GS1916559.002	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Industrial	
Surface Elevation: ± 16.0 feet		Date Started: 9/12/2022		Water Depth Elevation (feet bgs) (feet)	
Termination Depth: 10.0 feet bgs		Date Completed: 9/12/2022		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Proposed Location: SWM		Logged By: MO		During: 9.5 6.5 ▼	
Excavating Method: Test Pit Excavation		Contractor: MC		At Completion: 8.0 8.0 ▼	
Test Method: Visual Observation		Rig Type: Deere		24 Hours: --- --- ▼	
At Completion: 8.0 8.0					

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
1.0	S-1	BAG	0.0	TOPSOIL	8" Topsoil	
			0 - 0.7			
			1.0			
3.0	S-2	BAG	0.7 - 2	FILL	Light Brown (5YR 7/4) SAND; 10% Gravel; Slightly Moist; Granular Structure, No Roots; Gradual Boundary	
			2.0			
			2 - 4		Orange Brown (5YR 7/8) LOAMY SAND; No Gravel; Moist; Granular Structure; Sticky; No Roots	
5.0	S-3	BAG	3.0	4 - 10	Dark Brown (5YR 4/8) SANDY LOAM, Moist, Granular, Friable, Medium Roots	
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0			Infiltration Testing @ 5.5 fbgs
			13.0			
			14.0			
			15.0			

					Soil Profile Pit SPP-5 Terminated at a Depth of 10.0 Feet Below Ground Surface	
--	--	--	--	--	--	--

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-7**Page **1** of **1**

Project: Proposed Warehouse Facility				WAI Project No.: GS1916559.002			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Industrial			
Surface Elevation: ± 15.0 feet		Date Started: 9/13/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 10.0 feet bgs		Date Completed: 9/13/2022		During: 8.0 7.0 ▼		At Completion: 6.0 9.0 ▼	
Proposed Location: SWM		Logged By: MO		At Completion: 6.0 9.0 ▼		At Completion: 6.0 9.0	
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS	
Depth (feet)	Number	Type	feet				
4.0	S-1	BAG	0.0	TOPSOIL	15" Topsoil		Grass Area
			0 - 1.25				
			1.0	COASTAL PLAIN DEPOSITS	Orange Brown (5YR 6/8) SAND; No Gravel; Moist to Wet; Granular Structure; Loose; No Roots; No Mottling		
			1.25 - 10				
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
8.0							
9.0							
10.0							
					Soil Profile Pit SPP-7 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Continuous Cave-In		
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

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RECORD OF SUBSURFACE EXPLORATION
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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-8**Page **1** of **1**

Project: Proposed Warehouse Facility				WAI Project No.: GS1916559.002			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Industrial			
Surface Elevation: ± 15.0 feet		Date Started: 9/13/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 9.0 feet bgs		Date Completed: 9/13/2022		During: 9.0 6.0 ▼		At Completion: 8.0 7.0 ▼	
Proposed Location: SWM		Logged By: MO		At Completion: 8.0 7.0 ▼		At Completion: 8.0 7.0	
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS	
Depth (feet)	Number	Type	feet				
2.0	S-1	BAG	0.0	TOPSOIL	12" Topsoil		
			0 - 1				
4.0	S-2	BAG	1.0		Multi-Layered Black and White SAND; No Gravel; Moist; Granular Structure; Loose; No Roots; Clear Boundary		
			1 - 3				
			2.0		Orange Brown (5YR 6/8) LOAMY SAND; No Gravel; Moist to Wet; Crumb to Granular Structure; Loose; No Roots		
			3.0				
			3 - 9				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0		Soil Profile Pit SPP-8 Terminated at a Depth of 9.0 Feet Below Ground Surface Due to Continuous Cave-In		
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

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RECORD OF SUBSURFACE EXPLORATION
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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-9**

Page **1** of **1**

Project: Proposed Warehouse Facility		WAI Project No.: GS1916559.002	
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ		Client: ARCO Design/Build Industrial	
Surface Elevation: ± 16.0 feet	Date Started: 9/13/2022	Water Depth Elevation (feet bgs) (feet)	Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)
Termination Depth: 10.0 feet bgs	Date Completed: 9/13/2022		
Proposed Location: SWM	Logged By: MO	During: 9.0 7.0 ▼	At Completion: 9.0 7.0
Excavating Method: Test Pit Excavation	Contractor: MC	At Completion: 9.0 7.0 ▼	
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 - 1	TOPSOIL	12" Topsoil	
			1.0			
			1 - 3.5		Multi-Layered Black and White SAND; No Gravel; Moist; Granular Structure; Loose; No Roots; Clear Boundary	
3.0	S-1	BAG	3.0			
			3.5 - 10		Orange Brown (5YR 6/8) SAND; No Gravel; Moist to Wet; Crumb to Granular Structure; Loose; No Roots	
4.0	S-2	BAG	4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
					Soil Profile Pit SPP-9 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Continuous Cave-In	
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			

Infiltration Testing @
5.5 fbgs



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-10**Page **1** of **1**

Project: Proposed Warehouse Facility			WAI Project No.: GS1916559.002				
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Industrial				
Surface Elevation: ± 16.0 feet		Date Started: 9/13/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High Groundwater Depth Elevation (feet bgs) (feet)	
Termination Depth: 10.0 feet bgs		Date Completed: 9/13/2022		During: NE --- ▼		At Completion: NE --- ▼	
Proposed Location: SWM		Logged By: MO		At Completion: NE --- ▼		At Completion: NE --- ▼	
Excavating Method: Test Pit Excavation		Contractor: MC		24 Hours: --- --- ▼			
Test Method: Visual Observation		Rig Type: Deere					
SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)		REMARKS
Depth (feet)	Number	Type	feet				
4.0	S-1	BAG	0.0				
			0 - 0.8	TOPSOIL	10" Topsoil		
			1.0	0.8 - 10	COASTAL PLAIN DEPOSITS	Orange Brown (5YR 6/8) SAND; No Gravel; Moist; Granular Structure; Loose; No Roots; No Mottling; Clear Boundary	
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
9.0							
10.0							
					Soil Profile Pit SPP-10 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Continuous Cave-In		
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

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RECORD OF SUBSURFACE EXPLORATION
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RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-11**

Page 1 of 1

Project: Proposed Warehouse Facility			WAI Project No.: GS1916559.002												
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ			Client: ARCO Design/Build Industrial												
Surface Elevation: ± 17.0 feet		Date Started: 9/13/2022		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Water Depth Elevation</th> </tr> <tr> <th>(feet bgs) (feet)</th> <th></th> </tr> <tr> <td>During:</td> <td>NE --- ▼</td> </tr> <tr> <td>At Completion:</td> <td>NE --- ▼</td> </tr> <tr> <td>24 Hours:</td> <td>--- --- ▼</td> </tr> </table>		Water Depth Elevation		(feet bgs) (feet)		During:	NE --- ▼	At Completion:	NE --- ▼	24 Hours:	--- --- ▼
Water Depth Elevation															
(feet bgs) (feet)															
During:	NE --- ▼														
At Completion:	NE --- ▼														
24 Hours:	--- --- ▼														
Termination Depth: 10.0 feet bgs		Date Completed: 9/13/2022		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Estimated Seasonal High</th> </tr> <tr> <th>Groundwater Depth Elevation</th> <th></th> </tr> <tr> <td>(feet bgs) (feet)</td> <td></td> </tr> <tr> <td>At Completion:</td> <td>NE ---</td> </tr> </table>		Estimated Seasonal High		Groundwater Depth Elevation		(feet bgs) (feet)		At Completion:	NE ---		
Estimated Seasonal High															
Groundwater Depth Elevation															
(feet bgs) (feet)															
At Completion:	NE ---														
Proposed Location: SWM		Logged By: MO													
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				
4.0	S-1	BAG	0.0				Infiltration Testing @ 4.5 fbgs
				0 - 1.5	TOPSOIL	18" Topsoil	
			1.0				
				1.5 - 2	ASPHALT	Black Gravelly Asphalt Layer	
			2.0				
				2 - 10	COASTAL PLAIN DEPOSITS	Orange Brown (5YR 6/8) SAND; No Gravel; Moist; Granular Structure; No Roots; No Mottling	
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
			10.0				
						Soil Profile Pit SPP-11 Terminated at a Depth of 10.0 Feet Below Ground Surface	
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				



RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-12**Page **1** of **1**

Project: Proposed Warehouse Facility				WAI Project No.: GS1916559.002			
Location: 4000 Bordentown Avenue; Borough of Sayreville, Middlesex County, NJ				Client: ARCO Design/Build Industrial			
Surface Elevation: ± 17.0 feet		Date Started: 9/13/2022		Water Depth Elevation (feet bgs) (feet)		Estimated Seasonal High	
Termination Depth: 11.0 feet bgs		Date Completed: 9/13/2022				Groundwater Depth Elevation (feet bgs) (feet)	
Proposed Location: SWM		Logged By: MO		During: NE --- ▼		At Completion: NE ---	
Excavating Method: Test Pit Excavation		Contractor: MC		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				
4.0	S-1	BAG	0.0	TOPSOIL	11" Topsoil	Infiltration Testing @ 5.0 fbgs	
			0 - 0.9				
			1.0	COASTAL PLAIN DEPOSITS	Orange Brown (5YR 6/8) SAND; No Gravel; Moist; Granular Structure; Loose; No Roots; No Mottling		
			0.9 - 11				
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
			8.0				
			9.0				
10.0							
11.0							
					Soil Profile Pit SPP-12 Terminated at a Depth of 11.0 Feet Below Ground Surface		
			12.0				
			13.0				
			14.0				
			15.0				

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RECORD OF SUBSURFACE EXPLORATION
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APPENDIX II – Limitations

APPENDIX II

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from existing site features. Elevations of the explorations were not available. The locations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of Bohler for specific application to the preliminary design of the proposed warehouse development. No other warranty, expressed or implied, is made.

A more detailed subsurface investigation should be performed at the site prior to proceeding with final design. This investigation should consider the final locations and design features of the proposed facilities and should serve to confirm and/or further define the subsurface conditions and recommendations discussed in this preliminary study.



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHILIP D. MURPHY
Governor

DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT

SHAWN M. LATOURETTE
Commissioner

SHEILA Y. OLIVER
Lt. Governor

P.O. Box 420 Mail Code 501-02A
Trenton, New Jersey 08625-0420
609-633-7021 / Fax: 609-777-0432

www.njstormwater.org

November 18, 2022

Zachariha J. Kent
Vice President of Product Management
Bio Clean Environmental Services, Inc., a Quikrete Company
398 Via El Centro
Oceanside, CA 92058

Re: MTD Lab Certification
Bio Clean High Capacity Kraken Filter Stormwater Treatment Device
Online Installation

TSS Removal Rate 80%

Dear Mr. Kent:

The Stormwater Management rules under N.J.A.C. 7:8-5.2(f) and 5.2(j) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Bio Clean Environmental Services, Inc., a Quikrete company, has requested a Laboratory Certification for the Bio Clean High Capacity Kraken Filter Stormwater Treatment Device (High Capacity Kraken Filter).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated October 2022) for this device is published online at <http://www.njcat.org/uploads/newDocs/HCKrakenFilterNJCATFinalReport.pdf>.

The NJDEP certifies the use of the High Capacity Kraken Filter by Bio Clean Environmental Services, Inc. at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-

5.5. The MTFR is calculated based on a verified loading rate of 0.101 gpm/ft² of effective membrane filter area.

2. The High Capacity Kraken Filter shall be installed using the same configuration reviewed by NJCAT, and sized in accordance with the criteria specified in item 6 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 11.3 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the High Capacity Kraken Filter. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at <https://www.conteches.com/kraken> for any changes to the maintenance requirements.
6. Sizing Requirement:

The example below demonstrates the sizing procedure for the High Capacity Kraken Filter:

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using a High Capacity Kraken Filter. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs or 354.58 gpm.

The selection of the appropriate model of a High Capacity Kraken Filter is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the High Capacity Kraken Filter in this example is 0.25 acres. Based upon the information in Table 1 below, the following number of cartridges are required in a High Capacity Kraken Filter to treat the impervious area without exceeding the maximum allowable drainage area:

- a. Twenty-eight (28) 10" cartridges;
- b. Thirteen (13) 20" cartridges; or
- c. Eight (8) 30" cartridges.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

i = 3.2 in/hr (page 74, Fig. 5-16 of Chapter 5 of the NJ Stormwater BMP Manual)

c = 0.99 (runoff coefficient for impervious)

$Q = ciA = 0.99 \times 3.2 \times 0.25 = 0.79 \text{ cfs (354.58 gpm)}$

(Note: 1 cfs = 448.83 gpm)

Given the site runoff is 0.79 cfs and based on Table 1 below, the following minimum numbers of cartridges are required in a High Capacity Kraken Filter without exceeding the MTFR of the individual model:

- a. Seventy-two (72) 10” cartridges;
- b. Thirty-three (33) 20” cartridges; or
- c. Twenty-one (21) 30” cartridges.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the NJCAT Verification Report in the Verification Appendix under Table A-1.

Table 1. High Capacity Kraken Filter Cartridge MTFRs and Maximum Allowable Drainage Area

Cartridge Height (in)	Cartridge Maximum Treatment Flow Rate (MTFR) (cfs)	Maximum Allowable Drainage Area (acres)
30	0.038	0.032
20	0.024	0.020
10	0.011	0.009

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Changi Wu of my office at chang.i.wu@dep.nj.gov.

Sincerely,



Gabriel Mahon, Chief
Bureau of NJPDES Stormwater Permitting & Water Quality Management
Division of Watershed Protection and Restoration
New Jersey Department of Environmental Protection

Attachment: Maintenance Plan

cc: Richard Magee, NJCAT

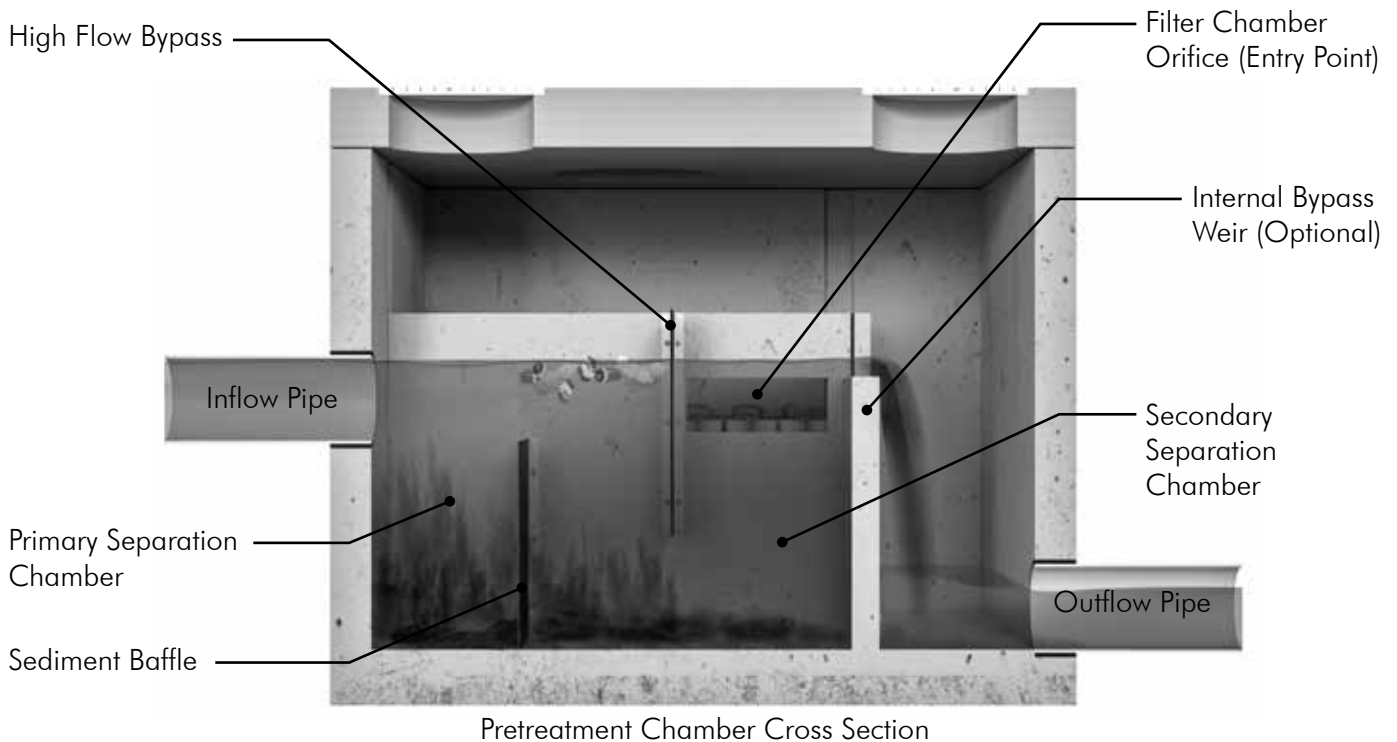
Kraken[®] Filter
Operation & Maintenance Manual



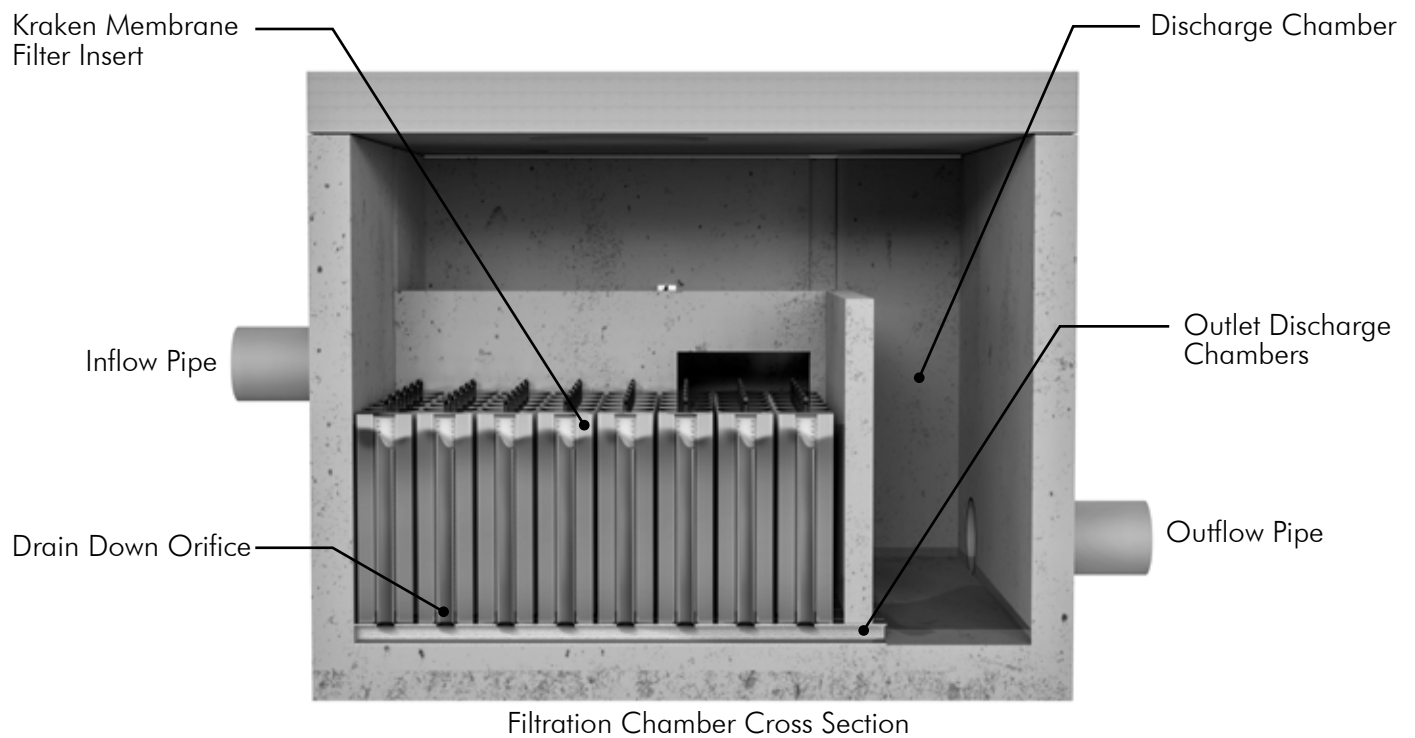
Operation & Maintenance

The Kraken® Filter is designed at a minimal loading rate of only 0.05 gpm/sq ft of media surface to maximize longevity and minimize maintenance requirements. Passive backwash and pretreatment also help to minimize system maintenance requirements. The Kraken® Filter is estimated to be able to handle up to at least 18 months sediment loading with no maintenance or loss of treatment capacity assuming 600 pounds of sediment per acre of impervious surface annually.

Yet, as with all stormwater BMPs, inspection and maintenance on the Kraken® Filter is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and to provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific loading conditions. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system. Observations made during the first year of inspections can be used to estimate inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance, a BMP will exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.



Pre-Treatment Chamber Diagram



Filter Chamber Diagram

Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the Kraken® Filter:

- Contech Inspection Form
- Flashlight
- Manhole hook or appropriate tools to access hatches and covers
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure
- Protective clothing and eye protection



Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the Kraken® Filter are quick and easy. As mentioned above, the first year should be seen as the maintenance interval establishment phase. During the first year, more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to plan future inspection and maintenance intervals.

The Kraken® Filter can be inspected through visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access hatch or manhole. Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system. Once these access covers have been safely opened the inspection process can proceed:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the inside of the system through the access hatches. If minimal light is available and vision into the unit is impaired, utilize a flashlight to see inside the system and all of its chambers.
- Look for any obstructions in the inflow pipe, pre-treatment chamber, filter chambers, discharge chamber or outflow pipe. Write down any observations on the inspection form.
- Through observation and/or digital photographs, estimate the amount of floatable debris accumulated in the pre-treatment chamber. Record this information on the inspection form. Next, utilizing a tape measure or measuring stick, estimate the amount of sediment accumulated in the primary and secondary sedimentation chambers. Record this depth on the inspection form. Through visual observation, inspect the condition of the filter cartridges. Look for excessive build-up of sediments on the surface and any build-up on the top of the cartridges. Record this information on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components or cartridges
- Obstructions in the system or its inlet or outlet
- Accumulation of floatables in the pre-treatment chambers in which the length and width of the chamber behind oil/floatables skimmer is fully impacted
- Accumulation of sediment in the primary sedimentation chamber of more than 18" in depth
- Accumulation of sediment in the secondary sedimentation chamber of more than 6" in depth
- Accumulation of sediment in the filter chambers of more than 3" on average
- Substantial build-up of sediments on the filter membrane of the filter cartridges which will have a very dark appearance indicating the membrane may be fully saturated with sediment

The Kraken Filter vault is a robust system and is designed for treating and bypassing (when required) flow rates calculated by the Engineer of Record. Under the designed conditions with routine maintenance and inspections, the Kraken Filter should function for many years. The Kraken Filter can fail under certain conditions, such as: severe damage and cracking through the vault walls, internal weir and baffle walls falling out of place, blockages of the flow path such as inlet or outlet, filters not reset properly, excessive debris or sediment accumulation within the vault and on the filters. With proper maintenance these risks can be avoided. Contech representatives are also available for troubleshooting.

Maintenance Equipment

While maintenance can be done fully by hand, it is recommended that a vacuum truck be utilized to minimize time required to maintain the Kraken® Filter:

- Contech Maintenance Form
- Flashlight
- Manhole hook or appropriate tools to access hatches and covers
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure
- Protective clothing and eye protection
- Vacuum truck
- Trash can
- Pressure washer

Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system. Entry into the system will be required if it is determined the cartridge filters need washing/cleaning

Maintenance Procedures

It is recommended that maintenance occurs at least three days after the most recent rain event to allow for drain down of the system and any upstream detention systems designed to drain down over an extended period of time. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Cleaning of the pre-treatment chamber can be performed from finish surface without entry into the vault utilizing a vacuum truck. Once all safety measures have been set up, cleaning of the pre-treatment chamber can proceed as follows:

- Following rules for confined space entry, use a gas meter to detect the presence of any hazardous gases. If hazardous gases are present, do not enter the vault. Following appropriate confined space procedures, take steps, such as utilizing a venting system, to address the hazard. Once it is determined to be safe, enter utilizing appropriate entry equipment such as a ladder and tripod with harness.
- Once entry into the system has been established the maintenance technician should position themselves to stand in the pre-treatment chamber. From here, the removal of the cartridges can commence.
- Threaded couplings are used now, but old systems will have the pressure fitted coupling. Each cartridge that is pressure fitted in place will include a handle for easy removal. To remove a cartridge, simply grab the handle and pull straight up. It may be required to gently shift pressure from side to side while pulling up to break the pressure seal. Removal of the cartridge should be done by hand with minimal effort and requires no tools.
- Once the cartridges are removed, they should be lifted out from the vault and brought up to finish surface for cleaning. Using a large garbage can and a standard garden hose (low pressure nozzle), each cartridge should be rinsed off from the outside to remove accumulated sediments and debris. Once each cartridge is rinsed, it should be placed to the side for re-installation.

- Each filter chamber should be power washed and vacuumed clean before re-inserting the cleaned cartridges.
- After all cartridges have been washed, they can be replaced back into the vault. To replace each cartridge, simply slide cartridge over each pressure fitted coupler. Threaded couplings are used now, but old systems will have the pressure fitted coupling. Push down on the handle to ensure the cartridge has been fully seated and the bottom of the cartridge is making contact with the floor.
- The last step is to replace all access hatch lids and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.

Maintenance Sequence



1. Remove access hatches set up vacuum truck to clean the pretreatment chamber.



2. Insert vacuum hose in the sedimentation chamber and vacuum out all trash, sediment and standing water.



3. Assess the condition of the filter cartridges and determine if cleaning is required.



4. To wash cartridges, remove from vault. Place over trash can and use a garden hose to spray clean.



5. Once cleaned, install back into the vault. This completes maintenance. Ensure access lids are properly replaced.



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SUPPORT

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

Kraken Maintenance Guide 08/22



State of New Jersey

Division of Water Quality
Bureau of Stormwater Permitting
401 East State Street

P.O. Box 420 Mail Code 401-02B
Trenton, New Jersey 08625-0420

Phone: 609-633-7021 / Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN M. LATOURETTE
Acting Commissioner

January 21, 2021

Mark B. Miller
Research Scientist
AquaShield™, Inc.
2733 Kanasita Drive, Suite 111
Chattanooga, TN 37343

Re: MTD Lab Certification
Aqua-Ponic™ Stormwater Biofiltration System
Off-line Installation

TSS Removal Rate 80%

Dear Mr. Miller:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). AquaShield™, Inc. has requested a Laboratory Certification for the Aqua-Ponic™ Stormwater Biofiltration System.

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated November 2020) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the Aqua-Ponic™ stormwater treatment unit by AquaShield™ at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 7.0 gpm/ft² of effective filtration treatment area.
2. The Aqua-Ponic™ stormwater treatment unit shall be installed using the same configuration reviewed by NJCAT, and sized in accordance with the criteria specified in item 7 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Aqua-Ponic™. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at [maintenance_manual_aqua-ponic_6-20.pdf\(aquashieldinc.com\)](http://maintenance_manual_aqua-ponic_6-20.pdf(aquashieldinc.com)) for any changes to the maintenance requirements.
6. For an MTD to be considered “green infrastructure” (GI) in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) treat runoff by infiltration into subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil; and/or (3) store stormwater for reuse.

In order for an Aqua-Ponic™ system to meet the definition of GI, the Aqua-Ponic™ system must treat stormwater runoff through filtration by vegetation. To this end, consistent with the vegetative cover requirement for bioretention systems, the minimum vegetative cover in an Aqua-Ponic™ system is 85% in order to qualify as GI under the Stormwater Management rules at N.J.A.C. 7:8. The vegetative cover should be determined based on the expected coverage of the proposed plantings when matured. Plant death or damage shall require replanting to maintain this 85% coverage requirement if the system is installed as GI.

7. Sizing Requirement:

The example below demonstrates the sizing procedure for the Aqua-Ponic™:

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using the Aqua-Ponic™. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

The selection of the appropriate model of Aqua-Ponic™ is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the Aqua-Ponic™ in this example is 0.25 acres. Included in Table 1 below, several Aqua-Ponic™ models are designed with a maximum allowable drainage area greater than 0.25 acres. Specifically, the Aqua-Ponic™ model AP-5 with a maximum drainage area allowable of 0.30 acres would be the smallest model able to treat runoff without exceeding the maximum allowable drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

c = 0.99 (runoff coefficient for impervious)

$Q = ciA = 0.99 \times 3.2 \times 0.25 = 0.79 \text{ cfs}$

Given the site runoff is 0.79 cfs and based on the MTFR's listed in Table 1 below, the AP-8 with an MTFR of 0.79 cfs would be the smallest model that could be used to treat the impervious area without exceeding the MTFR. If using more than one unit for treating runoff, the units should be configured such that the flowrate to each unit does not exceed the design MTFR for each unit and ensuring the entire 0.25 acre area is treated.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below:

Table 1. Aqua-Ponic™ MTFRs and Maximum Allowable Drainage Areas

Model*	Maximum Treatment Flow Rate (MTFR) (cfs)	Drainage Area (acres)
AP-2	0.05	0.05
AP-3	0.11	0.11
AP-4	0.20	0.19
AP-5	0.31	0.30
AP-6	0.44	0.43
AP-7	0.60	0.59
AP-8	0.79	0.77
AP-9	0.99	0.97
AP-10	1.23	1.20
AP-11	1.48	1.45
AP-12	1.77	1.73
AP-13	2.07	2.03

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact our office at (609) 633-7021.

Sincerely,



Gabriel Mahon, Chief
Bureau of Stormwater Permitting

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP – Water & Land Management
Nancy Kempel, NJDEP– BSTP
Keith Stampfel, NJDEP – DLRP
Dennis Contois, NJDEP – DLRP

INSPECTION & MAINTENANCE MANUAL



Aqua-Ponic™ Stormwater Biofiltration System

Manufactured By:



AquaShield,™ Inc.
2733 Kanasita Drive
Suite 111
Chattanooga, TN 37343
(888) 344-9044
www.aquashieldinc.com

June 2020

INTRODUCTION

As the stormwater industry has matured there has been an ever-increasing movement toward the implementation of Low Impact Development (LID) products and practices as the preferred means to implement stormwater control measures within “green infrastructure” (GI) stormwater management programs. The Aqua-Ponic™ Stormwater Biofiltration System is now offered by AquaShield™, Inc. to meet the design challenges of LID principles along with enhanced aesthetics in an urban environment.

This Inspection & Maintenance (I&M) Manual includes information to better assist stakeholders with understanding the importance of implementing an effective program to ensure long-term functionality of an Aqua-Ponic™ system installation. The following aspects of an Aqua-Ponic™ system are described in this I&M manual:

- Aqua-Ponic™ Basics
- Mode of Operation
- Inspection and Maintenance.

AQUA-PONIC™ BASICS

Aqua-Ponic™ technology is a modular proprietary, permanent, post-construction biofiltration system designed to remove total suspended solids (TSS), Total (insoluble) Phosphorus, and heavy metals such as copper and zinc from stormwater runoff. A distinguishing feature of the Aqua-Ponic™ is its combination of filtration with the principles of **hydroponics** - a method of hydroculture for growing plants without soil by instead using mineral nutrient solutions in a water solvent. That is, the Aqua-Ponic™ uses stormwater runoff as a nutrient asset instead of a liability. Terrestrial plants are grown with only their roots exposed to the nutrient liquid while being physically supported by a plant stabilization filter medium. The hydroponic design provides a sustainable water supply to the vegetation during those periods of time when hot and/or dry conditions may prevail.

The Aqua-Ponic™ system utilizes hardy low-profile perennial vegetation such as native grasses, shrub grasses and/or ornamental flowering plants. A facility can utilize a single type or multiple types of plants to enhance the viewscape. It is important to specify plants that demonstrate viability within the climatic zone of a site installation.

MODE of OPERATION

The minimum 12-inch plant stabilization media layer within the Aqua-Ponic™ serves three operational roles by providing (1) pollutant filtration, (2) plant stabilization and (3) nutrient uptake. Figure 1 is an illustration of the Aqua-Ponic™ Biofiltration System. Design elements include a three (3)-inch top layer of pea gravel underlain by the plant stabilization filter bed. Water enters the system as sheet flow and then flows downward under gravity flow conditions through the pea gravel, filter bed and the associated root systems of the vegetation. The pea gravel layer serves to protect the underlying plant stabilization filter bed while dispersing the influent stormwater runoff across the treatment area. The filtered water then percolates further downward into the underlying water sump. A supporting and removeable perforated stainless-steel sheet underlies the filter bed. A post-filtration flow control orifice is placed across the outlet pipe opening in order to facilitate an even distribution of influent runoff across the filter treatment

area. Crushed recycled landscaping glass can be used as an alternative to the top pea gravel layer which further enhances colorful viewscape options for the Aqua-Ponic™.

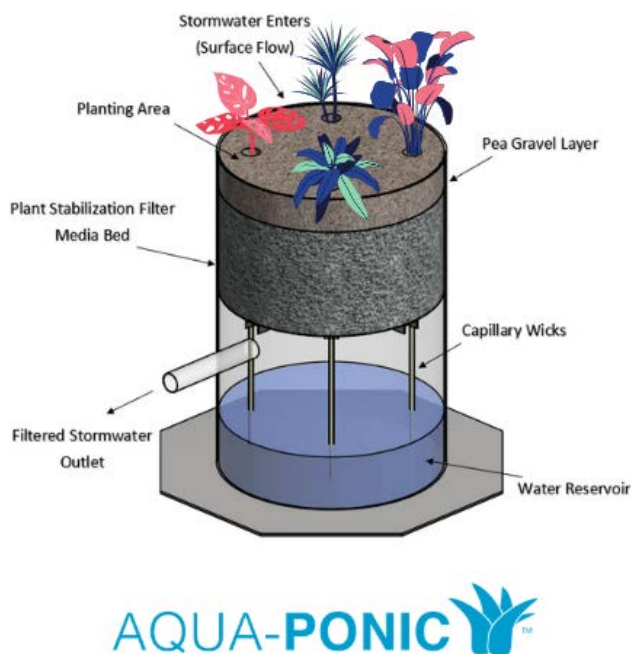


Figure 1. Diagram of Aqua-Ponic™ Biofiltration System.

The sump serves as a water reservoir for the vegetation during quiescent periods. A series of wicks are suspended from the base of the plant stabilization bed via rubber grommets (eyelets). The wicks extend downward to near the base of the sump. Using capillary action, water is wicked up to the plant stabilization filter bed which serves to provide a sustainable supply of water and any soluble nutrients and metals not trapped in the filter bed during a runoff event. Treated water in excess of the sump storage volume exits the system via the outlet opening just below the base of the filter bed.

Each Aqua-Ponic™ unit is constructed of lightweight and durable Polymer Coated Steel (PCS) to provide long term operational and structural functionality. Aqua-Ponic™ units are shipped with the inclusion of any perforated sheets and the capillary wicks in place according to the model size. The plant stabilization filter media is shipped simultaneously in separate containers. For aesthetic reasons it is the responsibility of others to choose either the pea gravel or any recycled glass landscaping stone for the top bed layer. It is also the responsibility of others to specify, acquire and plant the vegetation. AquaShield™ does not specify the plants for Aqua-Ponic™ systems but can assist where warranted.

INSPECTION & MAINTENANCE

Maintenance frequency for the Aqua-Ponic™ will ultimately be determined by site-specific pollutant loading conditions. Inspections of the, plants, top gravel layer and the upper portion of the plant stabilization filter media can be accomplished from the surface without special tools. AquaShield™ recommends periodic inspections following installation to determine a site-specific maintenance cycle to ensure functionality of the media and the vegetation.

We recommend that periodic system inspections be performed to determine the pollutant and trash loading characteristics. In general, quarterly inspections should be performed during the first year of operation to better anticipate maintenance frequency in the first year and subsequent years of operation.

An Aqua-Ponic™ maintenance event should first determine any obvious signs of degradation, displacement, sediment or trash accumulation, or oil in the upper layers of the unit. The top gravel layer should be completely replaced and can be removed by shoveling or vacuuming. The top several inches of the underlying plant stabilization filter media may be replaced at the same time if warranted. Care should be taken not to damage the plants or disturb rootballs during limited media replacement. Care should also be taken when replacing a plant to avoid disturbing remaining plants.

Depending on site conditions, it may be necessary to remove all the media and all the plants and completely replace these components of the system. It is recommended that the wicks be replaced if a system is fully replaced with stabilization media and plants.

Sediment can accumulate in the base of the water supply sump over a period of time. After removing the pea gravel layer, the plants and the plant stabilization filter media bed, the perforated metal plate should be removed to access the water supply sump from the surface for the purpose of vacuuming water and any accumulated sediment. The wicking ropes should also be replaced at this time. The perforated metal plate with the new wicking ropes should be set in place prior to installing the plant stabilization filter media on top of the plate.

AquaShield™ can provide the plant stabilization filter media, wicks and any associated grommets. Although unlikely, the supporting stainless-steel plate can also be supplied by AquaShield™ if its replacement is necessary. While we recommend that the pea gravel be replaced as warranted, it may be feasible to wash the gravel during a maintenance event. However, in most cases it is more efficient to replace the pea gravel or any landscaping glass to avoid disposal of water that was used to clean either of those materials.

All I&M activities can be performed from the surface without the need for AquaShield™ personnel to be present. We recommend that all materials removed during the maintenance process be handled and disposed in accordance with all applicable federal, state and local guidelines. Depending on the influent pollutant characteristics of the facility drainage area, it may be appropriate to perform Toxicity Characteristics Leaching Procedure (TCLP) analyses on representative samples of the spent filter media to ensure that the handling and disposition of materials complies with any applicable environmental regulations and practices.

Attached is a two-page Aqua-Ponic™ I&M Log to document service provider(s), activities and scheduling.

Next two pages include I&M Logs

AQUA-PONIC™ INSPECTION & MAINTENANCE LOG

MAINTENANCE COMPANY INFORMATION

Company Name: _____

Street Address: _____

City: _____ State/Prov.: _____ Zip/Postal Code: _____

Contact: _____ Title: _____

Office Phone: _____ Cell Phone: _____

ACTIVITY LOG

Date of Cleaning: _____

Time of Cleaning: Start: _____ End: _____

Date of Next Inspection: _____

Floatable debris present: Yes No Action taken: _____

Oil present: Yes No Action taken: _____

Filter Media Needs Replacement: Yes No

Structural damage: Yes No Where: _____

Clogging: Yes No Describe: _____

Additional Comments and/or Actions to be Taken	Time Frame



Inspection & Maintenance Schedule Log

First Year Post-Construction

Date Installed/Activated: _____

	Month											
Activity	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as needed			X			X			X			X
Inspect Bypass and maintain as needed			X			X			X			X
Clean System*												X

Second and Subsequent Years Post-Construction

	Month											
Activity	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as needed												X
Inspect Bypass, maintain as needed												X
Clean System												X



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER QUALITY

Bureau of Stormwater Permitting

401 East State Street

P.O. Box 420 Mail Code 401-02B

Trenton, NJ 08625-0420

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www.nj.gov/dep/dwq/bnpc_home.htm

PHILIP D. MURPHY

Governor

SHEILA Y. OLIVER

Lt. Governor

SHAWN M. LATOURETTE

Acting Commissioner

February 12, 2021

Derek M. Berg
Director – Stormwater Regulatory Management - East
Contech Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Lab Certification
Filtterra® HC Bioretention System
Off-line Installation Approved

TSS Removal Rate 80%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions LLC has requested a Laboratory Certification for the Filtterra® HC Bioretention System (Filtterra® HC.)

The project falls under the “Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology” dated January 25, 2013. The applicable protocol is the “New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device” dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated January 2021) for this device is published online at <http://www.njcat.org/uploads/newDocs/NJCATFiltterraTechnologyVerificationReportFinal..pdf>.

The NJDEP certifies the use of the Filterra® HC stormwater treatment unit by Contech Engineered Solutions LLC at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 3.12 gpm/ft² of effective filtration treatment area.
2. The Filterra® HC stormwater treatment unit shall be installed using the same configuration reviewed by NJCAT, and sized in accordance with the criteria specified in item 7 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Filterra® HC. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at <https://www.conteches.com/Portals/0/Documents/Maintenance%20Guides/Filterra%20HC%20OM%20Packet.pdf> for any changes to the maintenance requirements.
6. For an MTD to be considered “green infrastructure” (GI) in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) treat stormwater runoff through infiltration into subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil; or (3) store stormwater runoff for reuse.

The Filterra® HC filters stormwater runoff through an engineered biofiltration soil media and, thus, meets the definition of GI. Filterra® HC can be configured with or without a precast vault. Installations that will not include a precast vault will additionally need to comply the NJDEP Stormwater BMP Manual conditions regarding separation from the seasonal high water table and, if infiltration is proposed as an outlet, minimum vertical saturated hydraulic conductivity of the subsoil. Installations without a precast vault that do not rely on infiltration are required to maintain at least a one-foot separation from the seasonal high water table measured from the lowest point of the system. Installations without a precast vault that utilize infiltration are required to have the most hydraulically restrictive soil layer below the MTD meet the minimum tested vertical saturated hydraulic conductivity of one inch per hour and have at least two feet of separation from the seasonal high water table measured from the lowest point of the system.

7. Sizing Requirement:

The example below demonstrates the sizing procedure for the Filterra® HC:

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using the Filterra® HC. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

The selection of the appropriate model of Filterra® HC is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the Filterra® HC in this example is 0.25 acres. Included in Table 1 below, all of the Filterra® HC models are designed with a maximum allowable drainage area greater than 0.25 acres. Specifically, the Filterra® HC with a 4'x4' media bay and a maximum allowable drainage area of 0.40 acres would be the smallest model able to treat runoff without exceeding the maximum allowable drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:
time of concentration = 10 minutes
 $i = 3.2 \text{ in/hr}$ (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
 $c = 0.99$ (runoff coefficient for impervious)
 $Q = ciA = 0.99 \times 3.2 \times 0.25 = 0.79 \text{ cfs}$

Given the site runoff is 0.79 cfs and based on the MTFR's listed in Table 1 below, the Filterra® HC with a 16'x8' media bay and an MTFR of 0.889 cfs would be the smallest model that could be used to treat the impervious area without exceeding the MTFR. If using more than one unit for treating runoff, the units should be configured such that the flowrate to each unit does not exceed the design MTFR for each unit and ensuring the entire 0.25 acre area is treated.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below:

Table 1. Filterra® HC MTFRs and Maximum Allowable Drainage Areas

	Available Filterra® Media Bay Sizes (feet)	Effective Filtration Treatment Area (ft ²)	Treatment Flow Rate (cfs)	Maximum Allowable Drainage Area (ac)
Standard Configuration Filterra and Filterra Bioscape Vaults	4x4	16	0.111	0.40
	4x6 or 6x4	24	0.167	0.60
	4.5x7.83 or 7.83x4.5 (Nominal 4x8/8x4)	35.24	0.245	0.89
	6x6	36	0.250	0.91
	6x8 or 8x6	48	0.333	1.21
	6x10 or 10x6	60	0.417	1.51
	6x12 or 12x6	72	0.500	1.81
	7x13 or 13x7	91	0.632	2.29
	14x8	112	0.778	2.82
	16x8	128	0.889	3.22
	18x8	144	1.000	3.62
	20x8	160	1.111	4.03
	22x8	176	1.222	4.43
Peak Diversion Filterra Vaults	4x4	16	0.111	0.40
	4.5x5.83 (Nominal 4x6)	26.24	0.182	0.66
	6x4	24	0.167	0.60
	6x6	36	0.250	0.91
	6x8	48	0.333	1.21
	6x10 or 10x6	60	0.417	1.51
	7x10	70	0.486	1.76
	8x10.5	84	0.583	2.11
	8x12.5	100	0.694	2.52
	Custom and/or Filterra Bioscape	Media Area in ft ²	0.00694 * (Media Area in ft ²)	0.0252 * (Media Area in ft ²)

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact me at (609) 633-7021.

Sincerely,

A handwritten signature in blue ink that reads "Gabriel Mahon". The signature is written in a cursive, flowing style.

Gabriel Mahon, Chief
Bureau of Stormwater Permitting

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP – Water & Land Management
Nancy Kempel, NJDEP– BSTP
Keith Stampfel, NJDEP – DLRP
Dennis Contois, NJDEP – DLRP

Filterra HC

Owner's Manual



filterra[®]
Bioretention Systems

C[®]NTECH
ENGINEERED SOLUTIONS

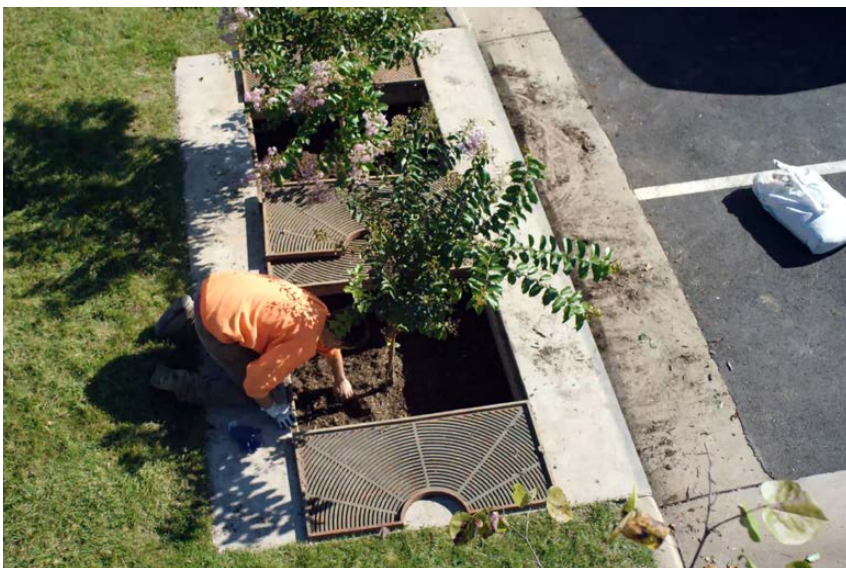




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Introduction

Thank you for your purchase of the Filterra® HC Bioretention System. Filterra HC is a specially engineered stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff. All components of the system work together to provide a sustainable long-term solution for treating stormwater runoff.

The Filterra HC system has been delivered to you with protection in place to resist intrusion of construction related sediment which can contaminate the biofiltration media and result in inadequate system performance. These protection devices are intended as a best practice and cannot fully prevent contamination. It is the purchaser's responsibility to provide adequate measures to prevent construction related runoff from entering the Filterra HC system.

Included with your purchase is Activation of the Filterra HC system by the manufacturer as well as a 1-year warranty from delivery of the system and 1-year of routine maintenance (mulch replacement, debris removal, and pruning of vegetation) up to twice during the first year after activation.

Design and Installation

Each project presents different scopes for the use of Filterra HC systems. Information and help may be provided to the design engineer during the planning process. Correct Filterra HC box sizing (per local regulations) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra HC units as shown in approved plans. A comprehensive installation manual covering all Filterra configurations is available at www.ContechES.com.

Activation Overview

Activation of the Filterra HC system is a procedure completed by the manufacturer to place the system into working condition. This involves the following items:

- Removal of construction runoff protection devices
- Planting of the system's vegetation
- Placement of pretreatment mulch layer using mulch certified for use in Filterra HC systems.

Activation **MUST** be provided by the manufacturer to ensure proper site conditions are met for Activation, proper installation of the vegetation, and use of pretreatment mulch certified for use in Filterra HC systems.



Minimum Requirements

The minimum requirements for Filterra HC Activation are as follows:

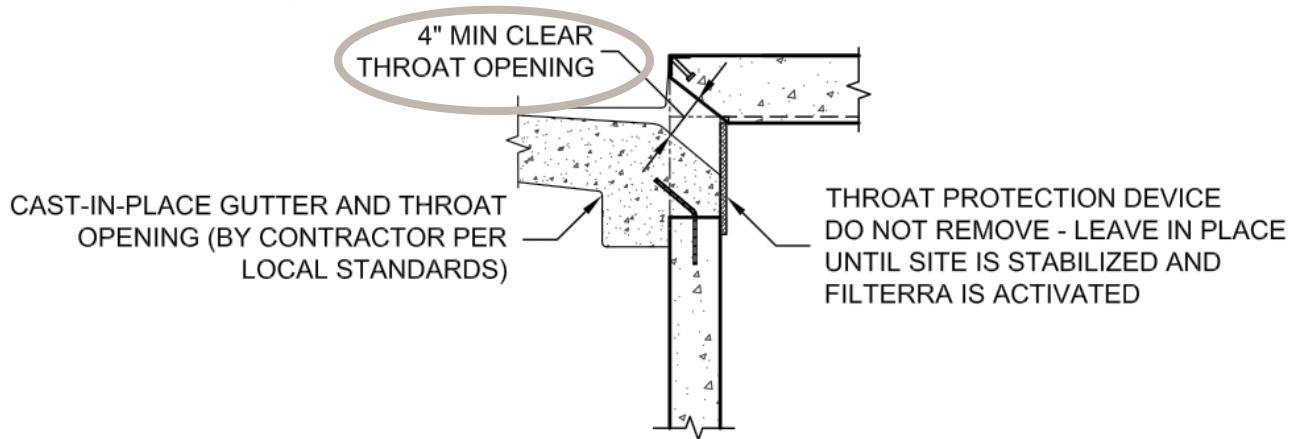
1. The site landscaping must be fully stabilized, i.e. full landscaping installed and some grass cover (not just straw and seed) is required to reduce sediment transport. Construction debris and materials should be removed from surrounding area.



2. Final paving must be completed. Final paving ensures that paving materials will not enter and contaminate the Filterra HC system during the paving process, and that the plant will receive runoff from the drainage area, assisting with plant survival for the Filterra HC system.



3. Filterra HC throat opening (if applicable) should be at least 4" in order to ensure adequate capacity for inflow and debris.



An Activation Checklist is included on page 12 to ensure proper conditions are met for Contech to perform the Activation services. A charge of \$500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation.

Filterra HC Plant Selection Overview

Plant Lists are available on the Contech website highlighting recommended plants for Filterra systems in your area. Keep in mind that plants are subject to availability due to seasonality and required minimum size for the Filterra HC system. Plants installed in the Filterra HC system are container plants (max 15 gallon) from nursery stock and will be immature in height and spread at Activation.

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra HC system.

The “Planting Requirements for Filterra HC Systems” document is included as an appendix and discusses proper selection and care of the plants within Filterra HC systems.

Warranty Overview

Refer to the Contech Engineered Solutions LLC Stormwater Treatment System LIMITED WARRANTY for further information. The following conditions may void the Filterra HC system’s warranty and waive the manufacturer provided Activation and Maintenance services:

- Unauthorized activation or performance of any of the items listed in the activation overview
- Any tampering, modifications or damage to the Filterra HC system or runoff protection devices
- Removal of any Filterra HC system components
- Failure to prevent construction related runoff from entering the Filterra HC system
- Failure to properly store and protect any Filterra HC components (including media and underdrain stone) that may be shipped separately from the vault

Routine Maintenance Guidelines

Routine maintenance is included by the manufacturer on all Filterra HC systems for the first year after activation. This includes a maximum of 2 visits to remove debris, replace pretreatment mulch, and prune the vegetation. More information is provided in the Operations and Maintenance Guidelines. Some Filterra HC systems also contain diversion bypass or outlet bays. Depending on site pollutant loading, these bays may require periodic removal of debris, however this is not included in the first year of maintenance and would likely not be required within the first year of operation.

These services, as well as routine maintenance outside of the included first year, can be provided by certified maintenance providers listed on the Contech website. Training can also be provided to other stormwater maintenance or landscape providers.



Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons to maintain are:

- Avoiding legal challenges from your jurisdiction's maintenance enforcement program.
- Prolonging the expected lifespan the media in the Filterra HC system.
- Avoiding more costly media replacement.
- Helping reduce pollutant loads leaving your property.

Simple maintenance of the Filterra HC is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The Filterra HC system is also subjected to various materials entering the inlet, including trash, silt, leaves, etc. which will be contained above the mulch layer. Too much silt may inhibit the Filterra HC system flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

If the system is not maintained on regular intervals, is subject to a catastrophic spill or other event, or subject to unusual pollutant loading, full media bed replacement could be required. Please contact Contech for further evaluation if you feel this may be necessary.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated.

Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency;

e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing) during the first year.



Exclusion of Services

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra HC (where the cleaned runoff drains to, such as drop inlet) and block off the inlet of the Filterra HC. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra HC and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation & pruning or replacement as necessary
6. Clean area around Filterra HC
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working near traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each media bay size. Mulch should be a double shredded, hardwood variety. Some visits may require additional Filterra engineered soil media for the Filterra HC system, available from the Supplier.

		Available Filterra® HC Media Bay Sizes (feet)	Filter Surface Area (ft²)	Mulch Volume at 3" Depth (ft²)	# of 2 ft² Mulch Bags
Standard Configuration Filterra and Filterra Bioscape Vaults		4x4	16	4	2
		4x6 or 6x4	24	6	3
		4.5x7.83 or 7.83x4.5 (Nominal 4x8/8x4)	35.24	9	5
		6x6	36	9	5
		6x8 or 8x6	48	12	6
		6x10 or 10x6	60	15	8
		6x12 or 12x6	72	18	9
		7x13 or 13x7	91	23	12
		14x8	112	28	14
		16x8	128	32	16
		18x8	144	36	18
		20x8	160	40	20
		22x8	176	44	22
Peak Diversion Filterra Vaults		4x4	16	4	2
		4.5x5.83 or 5.83x4.5 (Nominal 4x6/6x4)	26.24	7	4
		6x6	36	9	5
		6x8	48	12	6
		6x10 or 10x6	60	15	8
		7x10	70	18	9
		8x10.5	84	21	11
		8x12.5	100	25	13
Custom and/or Filterra Bioscape		Media Area in ft²	0.25 x (Media Area in ft²)	0.125 x (Media Area in ft²)	

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.



1. Inspection of Filterra HC and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes	no
Damage to Box Structure	yes	no
Damage to Grate	yes	no
Is Bypass Clear	yes	no

If yes answered to any of these observations, record with close-up photograph (numbered).



2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra HC box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

3. Removal of debris, trash and mulch

Record on Maintenance Report the following:

Silt/Clay	yes	no
Cups/ Bags	yes	no
Leaves	yes	no
Buckets Removed		



- After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the top of the top slab. Compare the measured distance to the distance shown on the approved Contract Drawings for the system. Add Filterra media (not top soil or other) to bring media up as needed to distance indicated on drawings.

Record on Maintenance Report the following:

Distance to Top of Top Slab (inches)	
Inches of Media Added	



4. Mulch replacement

- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Refer to Filterra Mulch Specifications for information on acceptable sources.
- Ensure correct repositioning of erosion control stones by the Filterra HC inlet to allow for entry of trash during a storm event.
- Replace Filterra HC grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.



5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if necessary.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	_____ (ft)
Width at Widest Point	_____ (ft)
Health	healthy unhealthy
Damage to Plant	yes no
Plant Replaced	yes no



6. Clean area around Filterra HC

- Clean area around unit and remove all refuse to be disposed of appropriately.



7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra HC.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra HC HC.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra HC.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.

Maintenance is ideally to be performed twice annually.

Filterra HC Inspection & Maintenance Log

Filterra HC System Size/Model: _____ Location: _____

Date	Mulch & Debris Removed	Depth of Mulch Added	Mulch Brand	Height of Vegetation Above Grate	Vegetation Species	Issues with System	Comments
1/1/17	5 – 5 gal Buckets	3"	Lowe's Premium Brown Mulch	4'	Galaxy Magnolia	- Standing water in downstream structure	- Removed blockage in downstream structure

Appendix 1 – Filterra® Activation Checklist



Project Name: _____ Company: _____

Site Contact Name: _____ Site Contact Phone/Email: _____

Site Owner/End User Name: _____ Site Owner/End User Phone/Email: _____

Preferred Activation Date: _____ (provide 2 weeks minimum from date this form is submitted)

Site Designation	System Size	Final Pavement / Top Coat Complete	Landscaping Complete / Grass Emerging	Construction materials / Piles / Debris Removed	Throat Opening Measures 4" Min. Height	Plant Species Requested
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

Attach additional sheets as necessary.

NOTE: A charge of \$500.00 will be invoiced for each Activation visit requested by Customer where Contech determines that the site does not meet the conditions required for Activation. ONLY Contech authorized representatives can perform Activation of Filterra HC systems; unauthorized Activations will void the system warranty and waive manufacturer supplied Activation and 1st Year Maintenance.

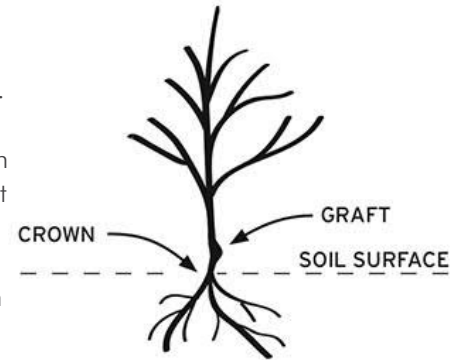
Signature _____

Date _____

Appendix 2 – Planting Requirements for Filterra® HC Systems

Plant Material Selection

- Select plant(s) as specified in the engineering plans and specifications.
- Select plant(s) with full root development but not to the point where root bound.
- Use local nursery container plants only. Ball and burlapped plants are not permitted.
- For precast Filterra HC systems with a tree grate, plant(s) must not have scaffold limbs at least 14 inches from the crown due to spacing between the top of the mulch and the tree grate. Lower branches can be pruned away provided there are sufficient scaffold branches for tree or shrub development.
- For precast Filterra HC systems with a tree grate, at the time of installation, it is required that plant(s) must be at least 6" above the tree grate opening at installation for all Filterra configurations. This DOES NOT apply to Full Grate Cover designs.
- Plant(s) shall not have a mature height greater than 25-30 feet.
- A 7-15 gallon container size shall be used.
- For precast Filterra HC systems, plant(s) should have a single trunk at installation, and pruning may be necessary at activation and maintenance for some of the faster growing species, or species known to produce basal sprouts



Plant Installation

- During transport protect the plant leaves from wind and excessive jostling.
- Prior to removing the plant(s) from the container, ensure the soil moisture is sufficient to maintain the integrity of the root ball. If needed, pre-wet the container plant.
- Cut away any roots which are growing out of the container drain holes. Plants with excessive root growth from the drain holes should be rejected.
- Plant(s) should be carefully removed from the pot by gently pounding on the sides of the container with the fist to loosen root ball. Then carefully slide out. Do not lift plant(s) by trunk as this can break roots and cause soil to fall off. Extract the root ball in a horizontal position and support it to prevent it from breaking apart. Alternatively, the pot can be cut away to minimize root ball disturbance.
- Remove any excess soil from above the root flare after removing plant(s) from container.
- Excavate a hole with a diameter 4" greater than the root ball, gently place the plant(s).
- If plant(s) have any circling roots from being pot bound, gently tease them loose without breaking them.
- If root ball has a root mat on the bottom, it should be shaved off with a knife just above the mat line.
- Plant the tree/shrub/grass with the top of the root ball 1" above surrounding media to allow for settling.
- All plants should have the main stem centered in the tree grate (where applicable) upon completion of installation.
- With all trees/shrubs, remove dead, diseased, crossed/rubbing, sharply crotched branches or branches growing excessively long or in wrong direction compared to majority of branches.
- To prevent transplant shock (especially if planting takes place in the hot season), it may be necessary to prune some of the foliage to compensate for reduced root uptake capacity. This is accomplished by pruning away some of the smaller secondary branches or a main scaffold branch if there are too many. Too much foliage relative to the root ball can dehydrate and damage the plant.
- Plant staking may be required.

Mulch Installation

- Only mulch that has been meeting Contech Engineered Solutions' mulch specifications can be used in the Filterra HC system.
- Mulch must be applied to a depth of 3" evenly over the surface of the media.

Irrigation Requirements

- Each Filterra HC system must receive adequate irrigation to ensure survival of the living system during periods of drier weather.
- Irrigation sources include rainfall runoff from downspouts and/or gutter flow, applied water through the tree grate or in some cases from an irrigation system with emitters installed during construction.
- At Activation: Apply about one (cool climates) to two (warm climates) gallons of water per inch of trunk diameter over the root ball.
- During Establishment: In common with all plants, each Filterra HC plant will require more frequent watering during the establishment period. One inch of applied water per week for the first three months is recommended for cooler climates (2 to 3 inches for warmer climates). If the system is receiving rainfall runoff from the drainage area, then irrigation may not be needed. Inspection of the soil moisture content can be evaluated by gently brushing aside the mulch layer and feeling the soil. Be sure to replace the mulch when the assessment is complete. Irrigate as needed**.
- Established Plants: Established plants have fully developed root systems and can access the entire water column in the media. Therefore, irrigation is less frequent but requires more applied water when performed. For a mature system assume 3.5 inches of available water within the media matrix. Irrigation demand can be estimated as 1" of irrigation demand per week. Therefore, if dry periods exceed 3 weeks, irrigation may be required. It is also important to recognize that plants which are exposed to windy areas and reflected heat from paved surfaces may need more frequent irrigation. Long term care should develop a history which is more site specific.

** Five gallons per square yard approximates 1 inch of water. Therefore, for a 6' by 6' Filterra HC approximately 20-60 gallons of water is needed. To ensure even distribution of water it needs to be evenly sprinkled over the entire surface of the filter bed, with special attention to make sure the root ball is completely wetted. NOTE: if needed, measure the time it takes to fill a five-gallon bucket to estimate the applied water flow rate then calculate the time needed to irrigate the Filterra HC system. For example, if the flow rate of the sprinkler is 5 gallons/minute then it would take 12 minutes to irrigate a 6' by 6' filter.



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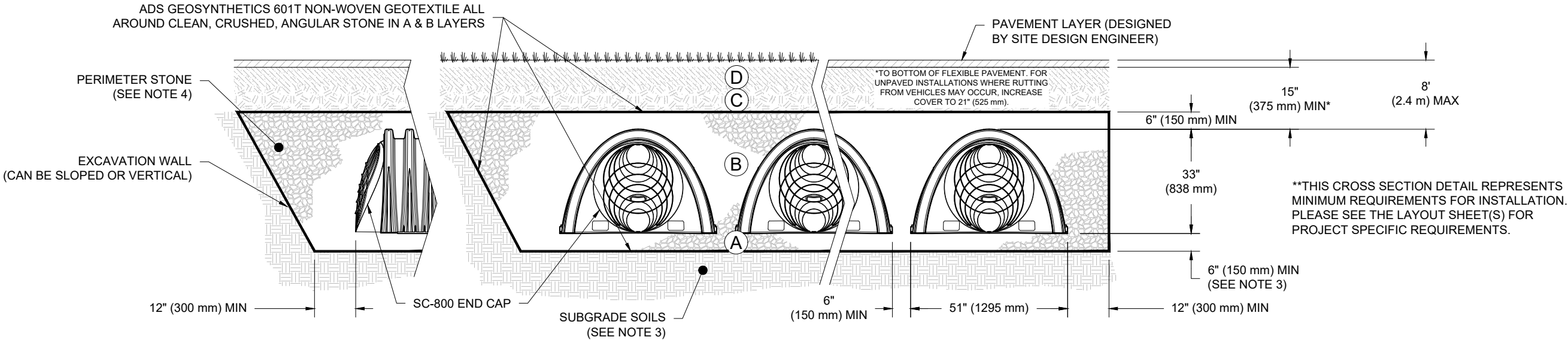
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ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ⁵	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE ⁵	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

PLEASE NOTE:

1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:

TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.

TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".

TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 750 LBS/FT³. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

STANDARD CROSS SECTION

SC-800 CHAMBER

STORMTECH

DATE: 02/17/2025

DRAWN: SMW

CHECKED: JLM

DRAWING #: 721-820

DESCRIPTION

DATE

DRWN

CHKD

StormTech®

Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

ADS

4640 TRUEMAN BLVD
HILLIARD, OH 43026

1

SHEET

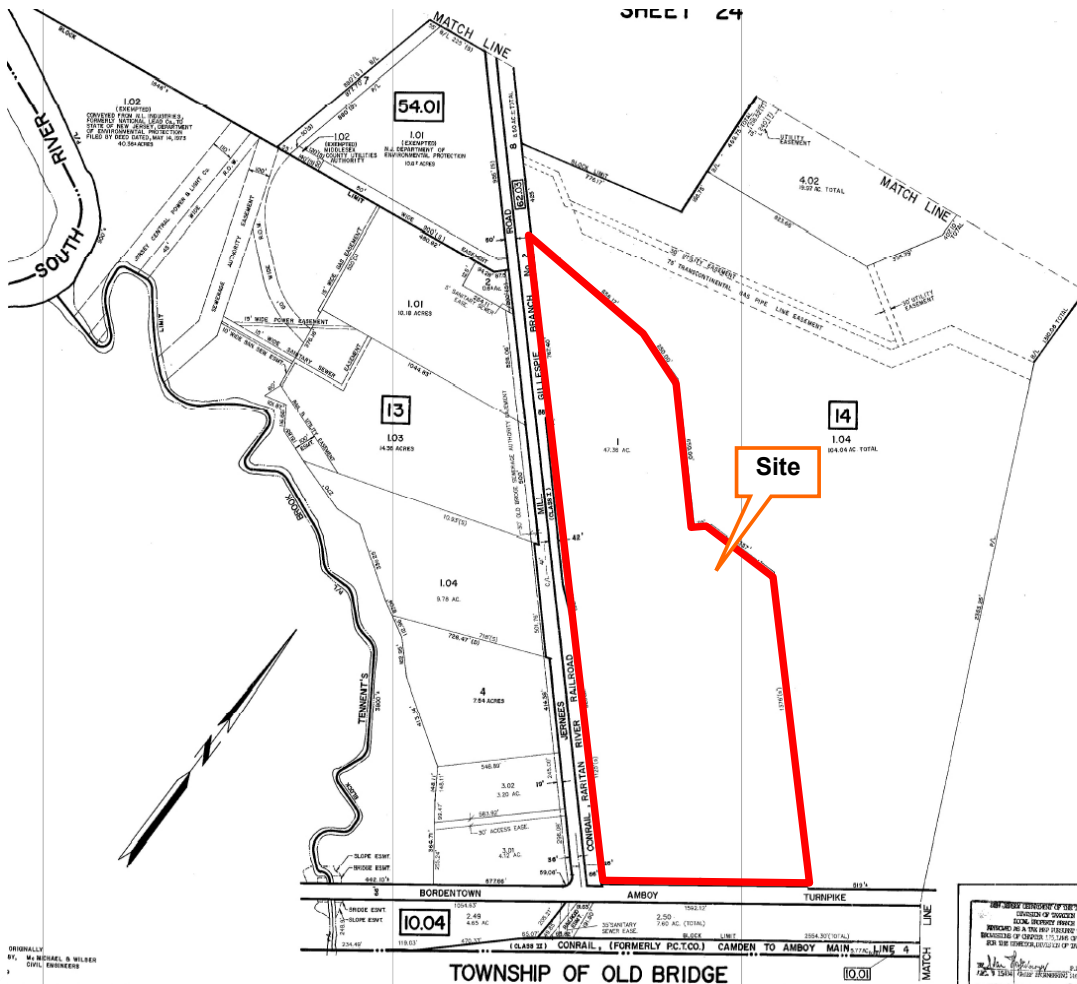
OF

1

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G. MAPS

- ◆ Tax Map
- ◆ Aerial Map
- ◆ Soil Map
- ◆ State Planning Area Map
- ◆ Depth to Water Table Map
- ◆ USGS Map
- ◆ HUC14 Map
- ◆ Drainage Area Maps
 - Existing Drainage Area Map
 - Proposed Drainage Area Map
 - Inlet Drainage Area Map



SHEET 5

Tax Map

Source: Borough of Sayreville Tax Map, Sheet #4

Date Access: 05/08/2025

Hanover Industrial, LLC

4000 Bordentown Avenue
Block 14; Lot 1

Borough of Sayreville, Middlesex County, NJ

BENJ #NJA240049

Prepared by: RF

Date: 5/8/2025

Checked by: VM

Scale: NTS

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Aerial Map

Source: NJ GeoWeb

Date Access: 05/08/2025

Hanover Industrial, LLC

4000 Bordentown Avenue
Block 14; Lot 1

Borough of Sayreville, Middlesex County, NJ

BENJ #NJA240049

Prepared by: RF

Date: 5/8/2025

Checked by: VM

Scale: NTS

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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PHG	Pits, sand and gravel	0.2	0.5%
PssA	Psammments, 0 to 3 percent slopes	16.8	35.5%
UR	Urban land	30.3	64.0%
Totals for Area of Interest		47.4	100.0%

Soils Map

Source: NRCS Web Soil Survey, 2012

Date Access: 05/08/2025

Hanover Industrial, LLC

4000 Bordentown Avenue
Block 14; Lot 1

Borough of Sayreville, Middlesex County, NJ

BENJ #NJA240049

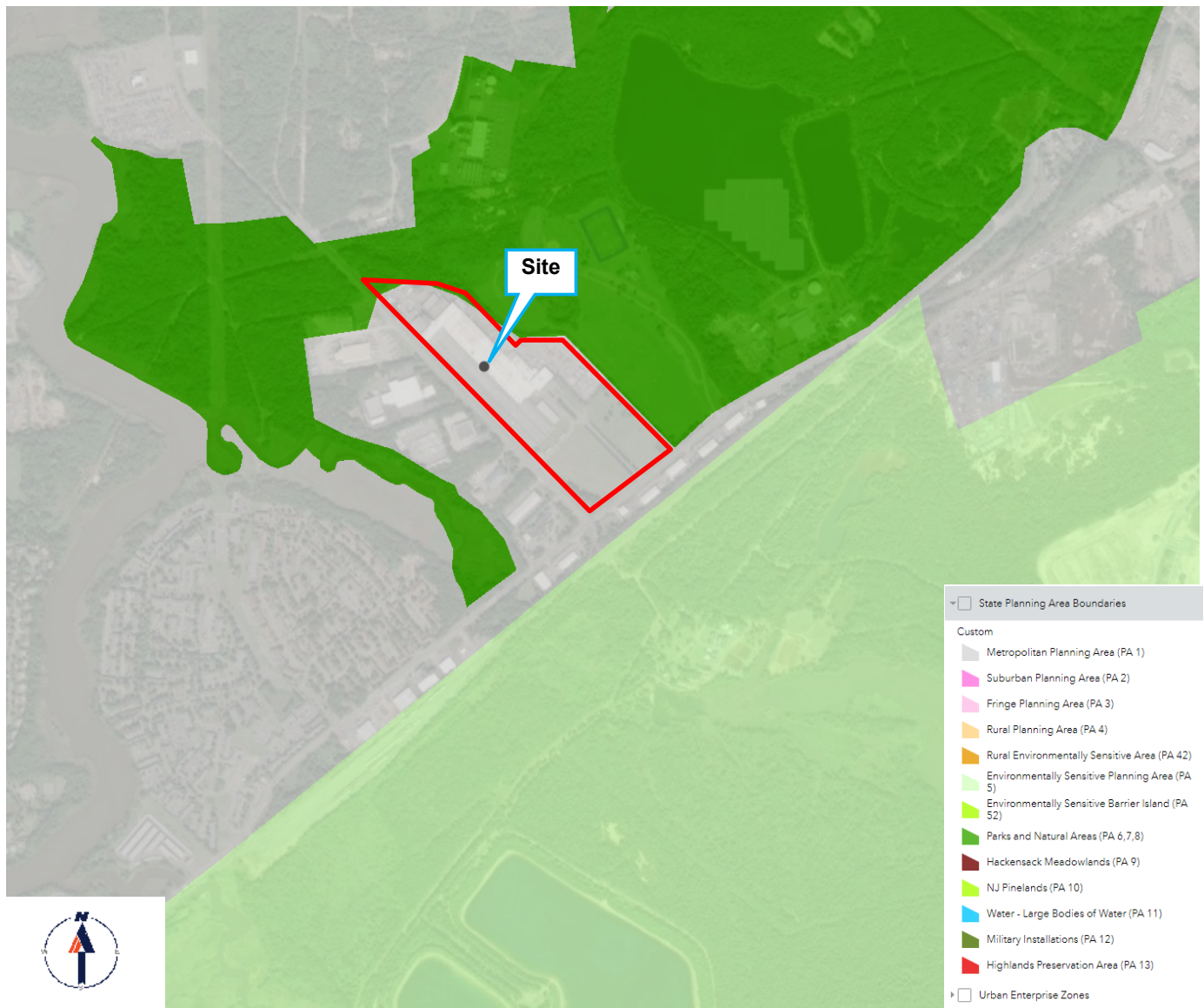
Prepared by: RF

Date: 5/8/2025

Checked by: VM

Scale: NTS

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State Planning Area Map

Source: NJ GeoWeb

Date Access: 05/08/2025

Hanover Industrial, LLC

4000 Bordentown Avenue
Block 14; Lot 1

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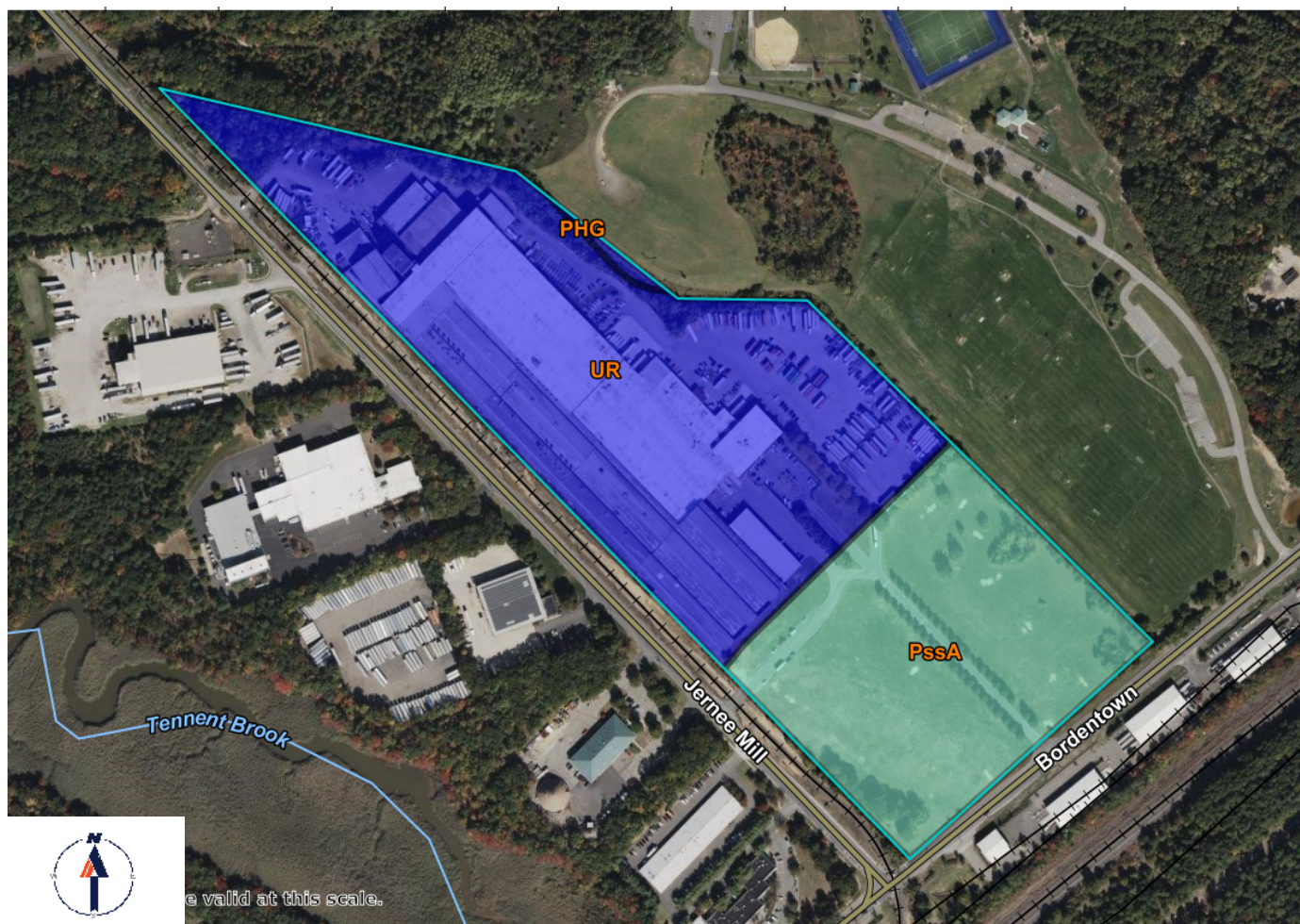
Prepared by: RF

Date: 5/8/2025

Checked by: VM

Scale: NTS

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Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
PHG	Pits, sand and gravel	>200	0.2	0.5%
PssA	Psamments, 0 to 3 percent slopes	122	16.8	35.5%
UR	Urban land	>200	30.3	64.0%
Totals for Area of Interest			47.4	100.0%

Depth to Seasonal High Water Table

Source: NRCS Web Soil Survey, 2012

Date Access: 05/08/2025

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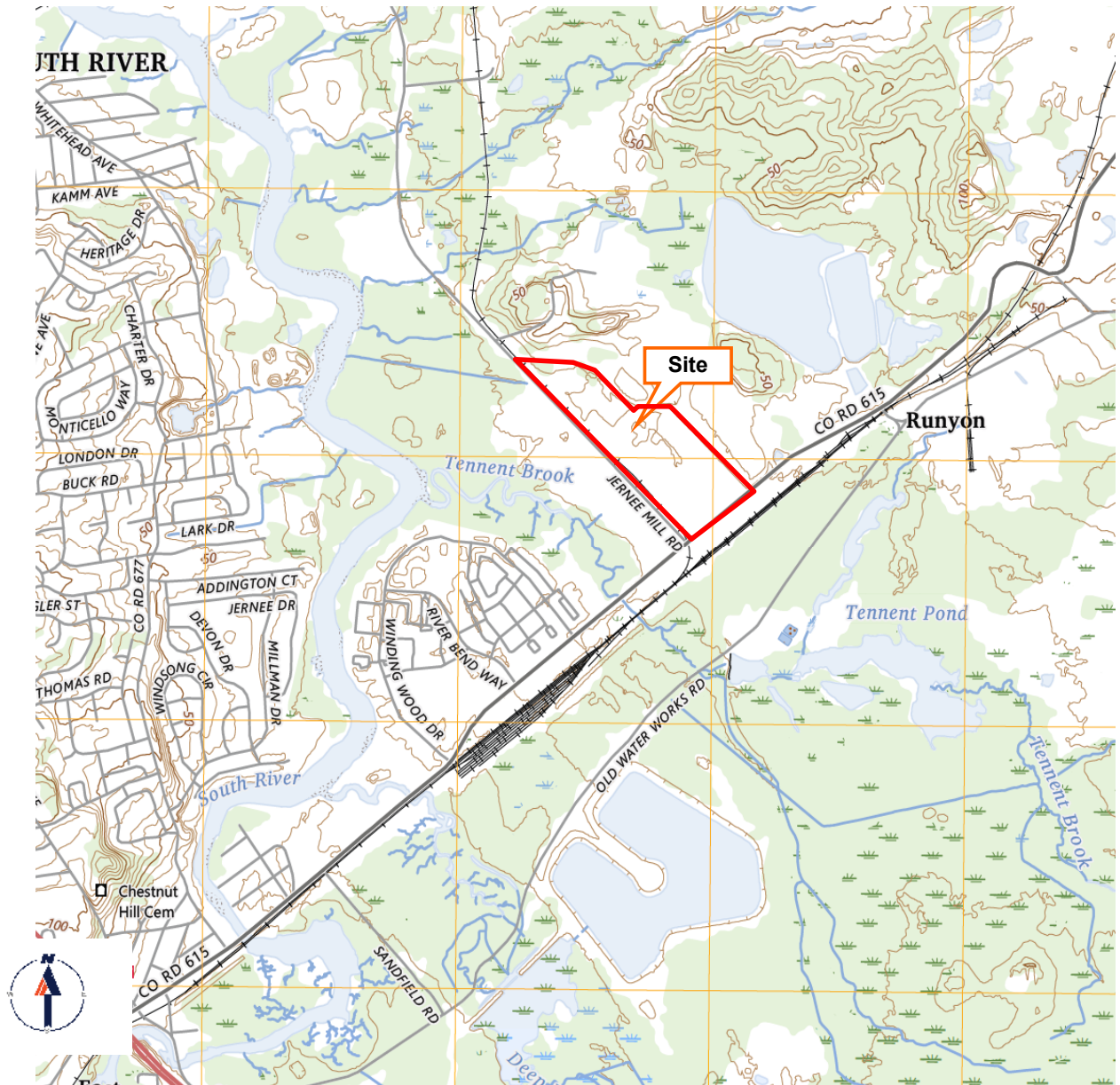
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USGS Map
535,452-ft. E; 582,909-ft. N
South Amboy Quadrangle

Source: USGS, 2023

Date Access: 05/08/2025

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BENJ #NJA240049

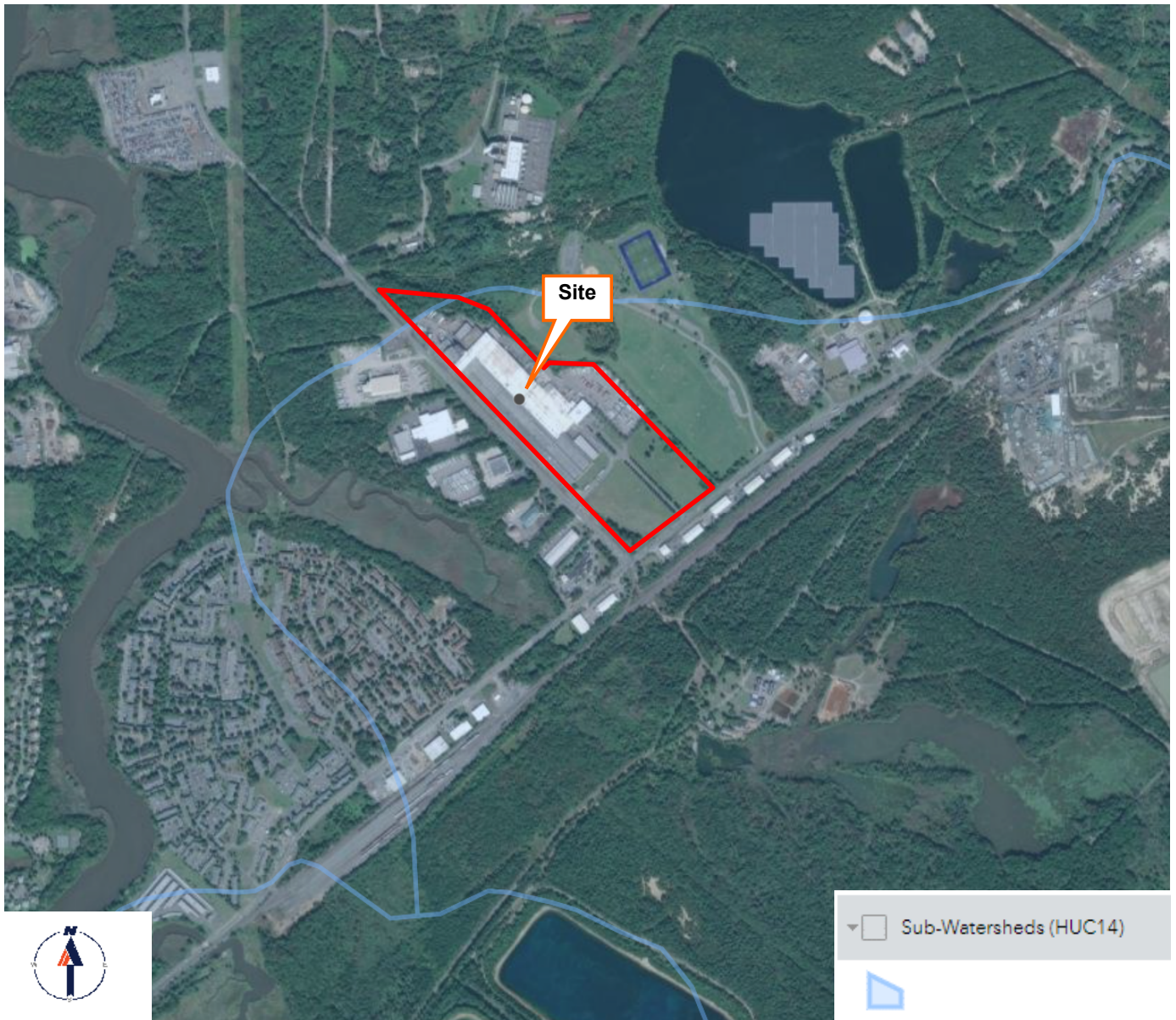
Prepared by: RF

Date: 5/8/2025

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HUC-14 Sub-Watershed Map

Source: NJ GeoWeb

Date Access: 05/08/2025

Hanover Industrial, LLC

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EDA-3B (TO WETLANDS)
WOODS HSG A = 0.40 AC
WOODS HSG D = 5.86 AC
IMPERVIOUS HSG D = 0.27 AC
TOTAL AREA = 6.53 AC

EDA-1F (TO HEADWALL)
GRASS HSG A = 0.06 AC
GRASS HSG D = 3.90 AC
WOODS HSG D = 3.51 AC
IMPERVIOUS HSG D = 0.13 AC
TOTAL AREA = 7.60 AC

EDA-1E (TO HEADWALL)
GRASS HSG A = 0.09 AC
WOODS HSG A = 0.04 AC
IMPERVIOUS HSG A = 0.06 AC
GRASS HSG D = 1.29 AC
WOODS HSG D = 0.65 AC
IMPERVIOUS HSG D = 6.23 AC
TOTAL AREA = 8.36 AC

EDA-1C (TO JERNEES MILL RD)
GRASS HSG D = 0.40 AC
IMPERVIOUS HSG D = 1.28 AC
TOTAL AREA = 1.68 AC

EDA-4 (TO WETLANDS)
GRASS HSG A = 6.39 AC
WOODS HSG A = 0.61 AC
IMPERVIOUS HSG A = 0.42 AC
GRASS HSG D = 0.06 AC
IMPERVIOUS HSG D = 0.01 AC
TOTAL AREA = 7.49 AC

POA #3

POA #5

POA #2

POA #1

EDA-2B (TO RAILROAD)
WOODS HSG D = 0.54 AC
TOTAL AREA = 0.54 AC

EDA-3A (TO WETLANDS)
GRAVEL HSG D = 0.60 AC
WOODS HSG D = 0.66 AC
IMPERVIOUS HSG D = 0.80 AC
TOTAL AREA = 2.06 AC

EDA-1B (TO JERNEES MILL RD)
GRASS HSG D = 0.34 AC
IMPERVIOUS HSG D = 0.41 AC
TOTAL AREA = 0.75 AC

EDA-1A (TO JERNEES MILL RD)
IMPERVIOUS = 14.53 AC
TOTAL AREA = 14.53 AC

EDA-2A (TO RAILROAD)
GRASS HSG D = 0.72 AC
GRAVEL HSG D = 0.18 AC
WOODS HSG D = 0.35 AC
IMPERVIOUS HSG D = 0.14 AC
TOTAL AREA = 1.39 AC

EDA-1D (TO JERNEES MILL RD)
GRASS HSG A = 1.44 AC
WOODS HSG A = 0.21 AC
IMPERVIOUS HSG A = 0.15 AC
GRASS HSG D = 0.64 AC
IMPERVIOUS HSG D = 0.06 AC
TOTAL AREA = 2.50 AC

EDA-5 (TO SOUTH LAWN)
GRASS HSG A = 6.47 AC
IMPERVIOUS HSG A = 0.72 AC
GRASS HSG D = 0.29 AC
IMPERVIOUS HSG D = 0.11 AC
TOTAL AREA = 7.59 AC

JERNEE MILL ROAD
(A.K.A. COUNTY ROUTE 675)
(VARIABLE WIDTH PUBLIC R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)

EveB

BORDENTOWN AMBOY TURNPIKE
(A.K.A. BORDENTOWN AVENUE)
(A.K.A. COUNTY ROUTE 615)
(VARIABLE WIDTH ROADWAY)

100 50 25 0 100
SCALE: 1" = 100'

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2	03/16/2026	REV. PER RAIL UPDATES	DSB
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PROJECT No.: NJA240049-00-3A
DRAWN BY: VLO
CHECKED BY: TXL
DATE: 04/16/2025
CAD ID: P-DMAP-EXST

PROJECT:

DRAINAGE
MAPS

FOR



PROPOSED
WAREHOUSES

MAP: 4 | BLK: 14 | LOT: 1
4000 BORDENTOWN AVENUE
BOROUGH OF SAYREVILLE
MIDDLESEX COUNTY, NEW JERSEY

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BOHLER, LLC

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Fax: (908) 754-4401
www.BohlerEngineering.com
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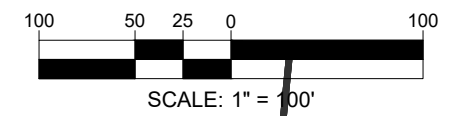
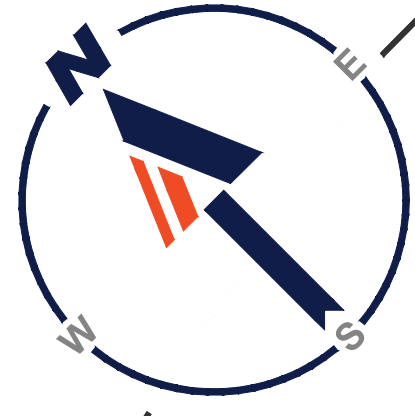
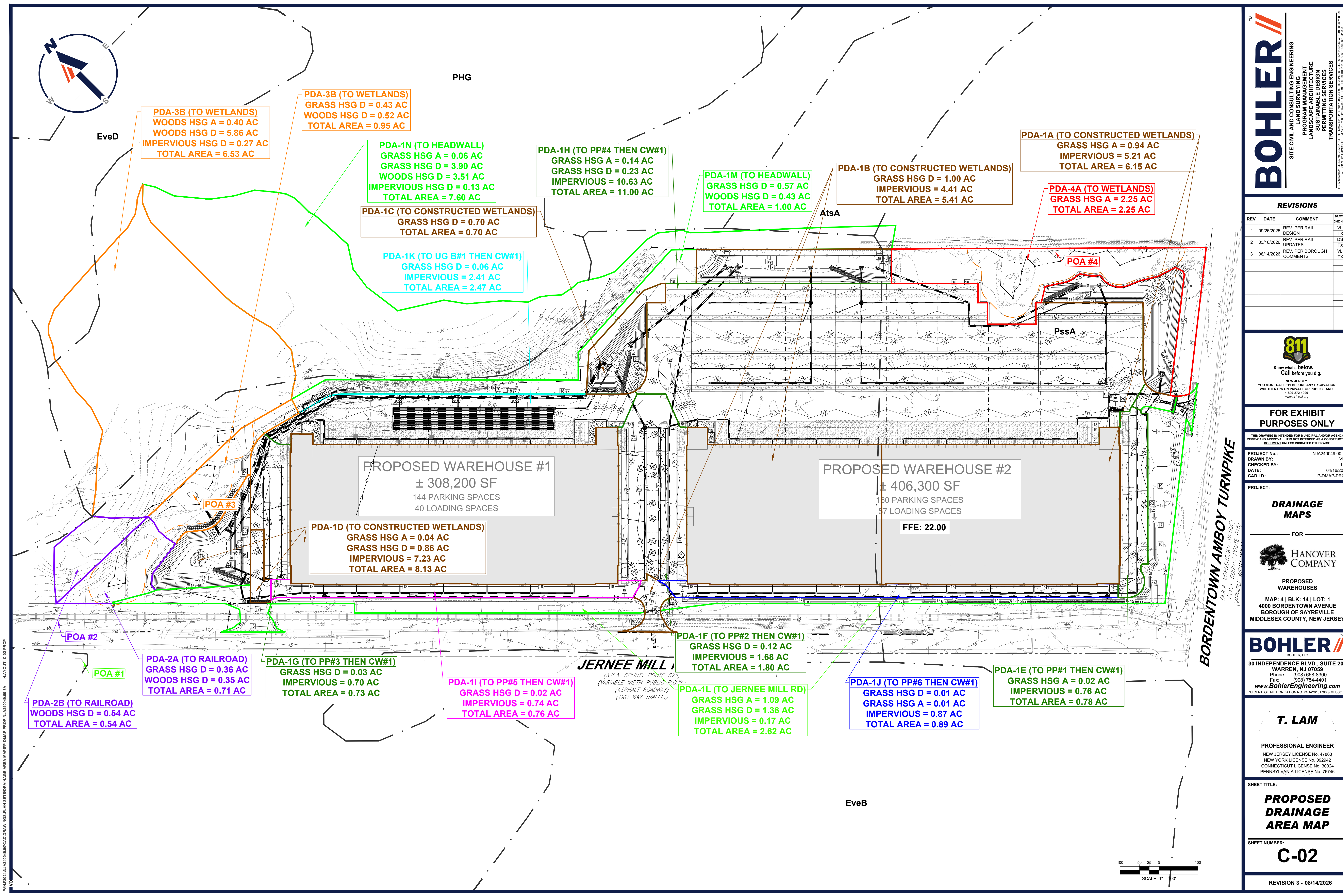
SHEET TITLE:

EXISTING
DRAINAGE
AREA MAP

SHEET NUMBER:

C-01

REVISION 3 - 08/14/2026



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PROJECT No.: NJA240049-00-3A
DRAWN BY: VLO
CHECKED BY: TXL
DATE: 04/16/2025
CAD ID: P-DMAP-PROP

DRAINAGE
MAPS

FOR

HANOVER
COMPANY

PROPOSED
WAREHOUSES

MAP: 4 | BLK: 14 | LOT: 1

4000 BORDENTOWN AVENUE

BOROUGH OF SAYREVILLE

MIDDLESEX COUNTY, NEW JERSEY

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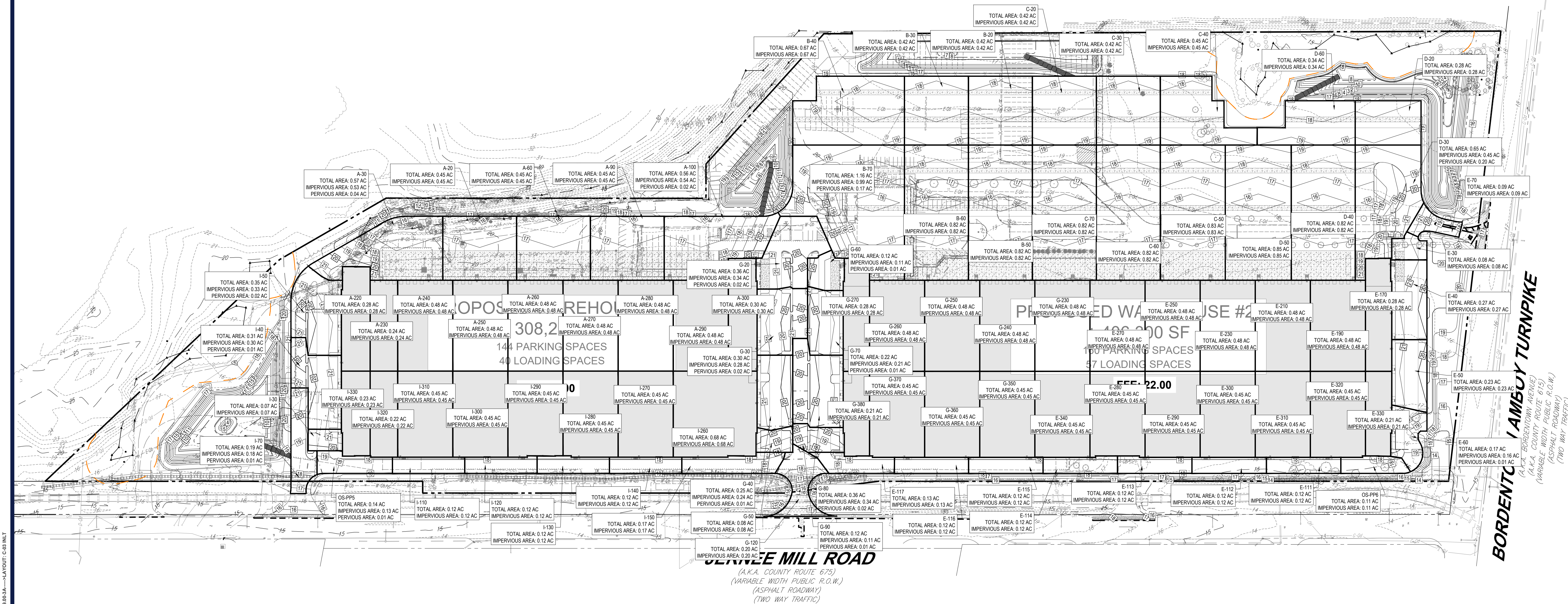
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**PROPOSED
DRAINAGE
AREA MAP**

SHEET NUMBER:
C-02

REVISION 3 - 08/14/2026



P:\1\2024\NJ\240648\90\CAD\DRAWINGS\PLAN SETS\DRAINAGE AREA MAP\SIP-DMAP-INTL.NJA\240648.00-3A.dwg - LAYOUT: C-03 INTL

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PROJECT No.: NJA240049-00-3A
DRAWN BY: VLO
DATE: 04/16/2025
CAD ID: P-DMAP-INTL

PROJECT:
DRAINAGE MAPS
FOR
HANOVER COMPANY
PROPOSED WAREHOUSES
MAP: 4 | BLK: 14 | LOT: 1
4000 BORDENTOWN AVENUE
BOROUGH OF SAYREVILLE
MIDDLESEX COUNTY, NEW JERSEY

BOHLER
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PROPOSED INLET DRAINAGE AREA MAP

SHEET NUMBER:
C-03

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