

## DRAINAGE REPORT

### Edgewater Park Self Storage Development

4201 US Route 130

Edgewater Park, Burlington County, New Jersey 08010

07/21/2020

Revised: 03/22/2021

WM Project No.: NYC19-0005

Prepared for:

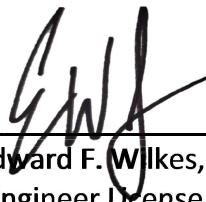
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c/o Treetop Development**

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The purpose of this report is to present the criteria and methods utilized in the design of the stormwater management facilities and the storm sewer collection system for the project known as Edgewater Park Self Storage. This report has been prepared in conjunction with plans titled "Preliminary Site Plan Application" prepared by Ware Malcomb, dated 07/21/2020, and addresses the stormwater management requirements according to the following:

- Township of Edgewater Park;
- Burlington County;
- Standards for Soil Erosion and Sediment Control in New Jersey; and
- N.J.A.C. 7:8 and the NJDEP New Jersey Stormwater Best Management Practices Manual.

## I. GENERAL LOCATION AND DESCRIPTION

### A. Site Location

The property is located at 4201 US Route 130 (Burlington Pike), 2 lots southwest of Mount Holly Road. The property also has frontage on Mount Holly Road, 2 lots northwest of Burlington Pike. The site tract is identified as Block 404, Lot 2.02 in the Edgewater Park Tax Map Sheet, County of Burlington, State of New Jersey. The property is bounded by Mount Holly Road to the east, Burlington Pike to the south, residential lots to the north, and additional commercial sites to the west. The site is located in the C-3 Highway Commercial Zone designation within the township of Edgewater Park. A site location map has been provided in Appendix A of this report for reference.

### B. Description of Property and Improvements

The 7.81-acre property currently consists of undeveloped wooded area. The proposed development to the site includes constructing 10 self-storage buildings totaling 112,810 square feet with surface parking, loading areas, open space, and 2 infiltration basins.

### C. Existing Soil Types

The site soils are classified by the Natural Resources Conservation Service (NRCS) as Gladstone sand, with 0 to 5 percent slopes. Gladstone sand has a designated hydrological soil group (HSG) classification of group A. Group A soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. The NRCS web soil survey has been included in Appendix A of this report for reference.

## D. Existing Topography

The site generally slopes in the southwest direction from a high point along Burlington Pike towards the residential lots at an elevation of 31.00 feet and 33.00 feet. The existing elevations along Burlington Pike and Mount Holly Road are approximately 39.50 feet and 35.00 feet, respectively.

## II. PRE-DEVELOPED DRAINAGE BASINS AND SUB-BASINS

### A. Major Drainage Basins

The site is within the Rancocas Creek Watershed, within the Lower Delaware Drainage Basin.

### B. Minor Drainage Basins

Historically runoff from the southwest side of the site, which includes approximately 0.53± acres of wooded area, sheet flows towards the Burlington Pike right-of-way. The northwest side of the site, which includes approximately 2.37± acres of wooded area, sheet flows west onto the adjacent Lot 8 property. The east-northeast side of the site, which includes approximately 4.91± acres of wooded area, sheet flows onto the adjacent Lot 12 property. The total site includes 7.81± acres of wooded area.

There are two offsite areas which sheet flow onto the east-northeast side of the site, which includes approximately 0.66± acres of grass cover, 0.28± acres of paved area, 0.04± acres of roof, 0.57± acres of gravel, and 1.30± acres of dirt.

A plan entitled “Pre-Developed Watershed Plan” is included in Appendix H of this report. The plan delineates the present drainage area and the time of concentration flow path to the analysis points. The present drainage areas are defined as follows:

- **Pre-Developed Watershed A** – The southwest side of the site that drains into Burlington Pike right-of-way via direct runoff.
- **Pre-Developed Watershed B** – The northwest side of the site that drains onto the adjacent Lot 8 property via direct runoff.
- **Pre-Developed Watershed C** – The east-northeast side of the site that drains onto the adjacent Lot 12 property via direct runoff, as well as the offsite drainage areas.

The peak discharges for the points of analysis are summarized below in Tables 1 through 3. Refer to Appendix B for a complete summary of the present drainage area routing data and hydrographs.

**Table 1: Summary of Pre-Developed Watershed A Peak Discharges**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Required Reduction Factor	Approved Peak Discharge (CFS)
2	0.00	50%	0.00
10	0.01	75%	0.01
100	0.17	80%	0.14

**Table 2: Summary of Pre-Developed Watershed B Peak Discharges**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Required Reduction Factor	Approved Peak Discharge (CFS)
2	0.00	50%	0.00
10	0.04	75%	0.03
100	0.69	80%	0.55

**Table 3: Summary of Pre-Developed Watershed C Peak Discharges**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Required Reduction Factor	Approved Peak Discharge (CFS)
2	1.13	50%	0.57
10	2.69	75%	2.02
100	7.91	80%	6.33

## III. DRAINAGE FACILITY DESIGN

### A. Post-Developed

In the post-developed condition, runoff from the southwest side of the site, which includes approximately 0.42± acres of wooded area and 0.01± acres of open space area, sheet flows towards Burlington Pike right-of-way. The northwest side of the site, which includes approximately 0.56± acres of paved impervious, 0.37± acres of building, 0.93± acres of wooded area and 0.71± acres of open space area, is collected by inlets and drains into proposed infiltration basin B with an outfall location that drains toward the adjacent property. The east-northeast side of the site, which includes approximately 1.50± acres of paved impervious, 1.52± acres of building, 0.00± acres of wooded area and 1.80± acres of open space area, is collected by inlets and drains into proposed infiltration basin A with an outfall location that drains toward the adjacent property. These three proposed watersheds total 3.95± acres of on-site impervious area.

There are two offsite areas which sheet flow onto the east-northeast side of the site, which includes approximately 0.66± acres of grass cover, 0.28± acres of paved area, 0.04± acres of roof, 0.57± acres of gravel, and 1.30± acres of dirt.

### B. General Concept

When fully constructed, the stormwater runoff for watershed B and C will sheet flow or be collected by roof leaders that discharge to the proposed storm sewer system. The storm sewer system will discharge into 2 infiltration basins on-site. Watershed A, the southwest side of the site, will continue to sheet flow into the Burlington Pike right-of-way.

A plan entitled “Post-Developed Watershed Plan” is included in Appendix G of this report. The plan delineates the developed drainage area and the time of concentration flow path to the analysis point.

- **Post-Developed Watershed A** – The southwest side of the site that sheet flows into the Burlington Pike right-of-way.
- **Post-Developed Watershed B** – The northwest side of the site that discharge to the proposed infiltration basin B via the proposed storm sewer system.
- **Post-Developed Watershed C** – The east-northeast side of the site that discharge to the proposed infiltration basin A via the proposed storm sewer system.

Tables 4 and 5 summarize the basin routings and outflows from the proposed infiltration basins A and B, respectively. Refer to Appendix C for a complete summary of the proposed drainage area routing data and hydrographs.

**Table 4: Summary of Proposed Peak Outflows from Infiltration Basin A**

Storm Frequency (year)	Peak Outflow (CFS)	Allowable Peak Discharge (CFS)	Maximum Elevation (ft)
2	0.00	0.57	32.81
10	0.63	2.02	33.28
100	6.20	6.33	34.01

**Table 5: Summary of Proposed Peak Outflows from Infiltration Basin B**

Storm Frequency (year)	Peak Outflow (CFS)	Allowable Peak Discharge (CFS)	Maximum Elevation (ft)
2	0.00	0.00	31.39
10	0.00	0.03	32.03
100	0.37	0.55	32.73

C. Pre-Development and Post-Development Comparisons

The design complies with the requirements of NJAC 7:8-5.4(a)3iii by designing the stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. Tables 6 through 8 below summarize the peak runoff rates that were calculated for the Pre-Developed, allowable, and Post-Developed conditions.

**Table 6: Summary of Post-Developed Watershed A Peak Discharge**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Allowable Peak Discharge (CFS)	Post-Developed Peak Discharge (CFS)
2	0.00	0.00	0.00
10	0.01	0.01	0.01
100	0.14	0.14	0.14

**Table 7: Summary of Post-Developed Watershed B Peak Discharge**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Allowable Peak Discharge (CFS)	Post-Developed Peak Discharge (CFS)
2	0.00	0.00	0.00
10	0.04	0.03	0.00
100	0.69	0.55	0.37

**Table 8: Summary of Post-Developed Watershed C Peak Discharge**

Storm Frequency (year)	Pre-Developed Peak Discharge (CFS)	Allowable Peak Discharge (CFS)	Post-Developed Peak Discharge (CFS)
2	1.13	0.57	0.00
10	2.69	2.02	0.64
100	7.91	6.33	6.29



## IV. DESIGN CRITERIA

### A. Regulations

This drainage report has been prepared in conformance with N.J.A.C. 7:8 Stormwater Management Regulations. Since the improvements include land disturbance in excess of 1.0 acres, the development is considered a “major project” and subject to the state’s water quantity, water quality, and ground water recharge requirements.

### B. Hydrologic Criteria

This report was prepared using the SCS Method as contained in the USDA Soil Conservation Publication Technical Release No. 55 (TR-55) “Urban Hydrology for Small Watersheds”. TR-55 outlines procedures for calculation stormwater runoff volumes and rates resulting from the project site. The TR-55 procedure simulates runoff from a watershed using the drainage area, curve number (CN), and the time of concentration (Tc). Drainage areas were determined based on topography and stormwater conveyance. CN values were determined based on the soil types and land cover type within each watershed. Tc values were determined based on land cover and the flow path from the hydraulically most distant point of the watershed.

The hydrologic model was analyzed and designed with the HydroCAD software program.

#### 1. Water Quantity Design

An applicant must design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100-year storm events are 50, 75, and 80 percent, respectively, of the pre-construction peak runoff rates, according to NJAC 7:8-5.4(a)3iii. Hydrographs have been generated utilizing the Delmarva Unit Hydrograph and regional rainfall data for Burlington County (as contained in the Engineering Field Handbook NJ Supplement dated August 2012, developed from data contained in NOAA Atlas 14 Volume 2). Hydrographs for impervious and pervious areas have been calculated separately, as required in NJAC 7:8-5.6(a)4.

The proposed infiltration basins have been designed to reduce the peak runoff rates under developed conditions, in accordance with NJAC 7:8-5.4. The total peak discharge from the site in post-development conditions are at or below the reduced present peak runoff rates of the analysis point calculated above in Tables 1 through 3. Refer to Appendix C for supporting calculations.

#### 2. Water Quality Design

Stormwater quality management measures for the site were designed to reduce the post-developed average annual total suspended solids (TSS) load by at least 80% for all

developed drainage areas by treating runoff volume generated from the NJDEP Water Quality Storm, per NJAC 7:8-5.5. Hydrographs for impervious and pervious areas have been calculated separately, per NJAC 7:8-5.6(a)4.

Infiltration basins A and B have been designed to meet New Jersey Stormwater Quality Requirements by infiltrating the NJDEP 1.25-inch, 2-hour Water Quality storm runoff volume. The basin is to have a six-inch thick sand bottom, and the bottom of the sand layer is a minimum of two feet above the seasonal high water table. The adopted TSS removal rate for infiltration basins is 80%, per NJAC 7:8-5.5 and the New Jersey Stormwater BMP Manual, Chapter 9.5.

Infiltration basins A and B have been designed with forebays to meet New Jersey Stormwater Quality Requirements by being sized to hold 10% of the Water Quality Design Storm volume.

The runoff that is to be recharged will be infiltrated within 72 hours, and the soil has a design infiltration rate greater than the minimum rate of 0.5 in/hr, per the New Jersey Stormwater BMP Manual, Chapter 9.5.

Refer to Appendix D for supporting calculations.

### 3. Groundwater Recharge Design

Per the NJDEP Stormwater Management Rules, 100 percent of the site's average pre-developed groundwater recharge volume will be maintained after development. Proposed watersheds B and C were used as the groundwater recharge watersheds.

The proposed groundwater recharge facilities were designed to maintain 100 percent of the existing annual groundwater recharge volume, per by NJAC 7:8-5.4 and the New Jersey BMP Manual, Chapter 6. The site was analyzed utilizing the NJ Annual Groundwater Recharge Spreadsheet (based on GSR-32), described in Chapter 6 of the New Jersey Stormwater BMP Manual, along with existing and proposed impervious/pervious coverage information. Refer to Appendix E for the NJDRS.

All impervious areas, including roofs, are being routed via a storm sewer system to on-site infiltration basins.

A preliminary Geotechnical study was performed on site by GEI Consultants on June 22, 2020. Test Pits and permeability tests were performed in the area of the proposed

infiltration basin. The bottom of the 6-inch sand layer bottom of the basins were set 2 feet above the lowest observed seasonal high water elevation. The permeability tests indicated soil infiltration rates between 4.61 and 7.52 inches per hour. A design infiltration rate of 2.31 inches per hour was utilized in design to ensure the basin would drain within 72 hours.

**Table 9: Basin Information**

Basin	Basin A	Basin B
Bottom of Basin	31.40	30.40
Test Pit	4	6
SHWE	28.90	27.90
Infiltration Rate	4.61	5.28

Refer to Appendix F for the Preliminary Geotechnical Report – Test Pit Log.

C. Hydraulic Criteria

The storm sewer system has been designed using the Rational Method in accordance with NJAC 5:21-7.2, 7.3 & 7.4. The site was divided into sub-watersheds, each contributing runoff to an individual catch basin. Values for area and runoff coefficient were calculated from each sub-watershed. An average runoff coefficient was chosen based on the percentage of each type of land cover using the following coefficients:

**Table 10: Runoff Coefficients**

Land Cover	C
Grass/Landscaped	0.65
Paved/Roof	0.98

The Edgewater Park IDF curve, as determined by NOAA Atlas 14 and specified in NJAC 5:21-7.2(c)5, was utilized to determine the storm intensity. A minimum time of concentration of 10 minutes was utilized in the design as specified in NJAC 5:21-7.2(c)5.

All proposed storm sewer has been designed for the 25-year storm event.

All storm sewer calculations are provided in Appendix G of this report. A map titled “Subwatershed Areas” is included in Appendix H section of the report.

## D. Emergency Spillway Design

Basins A and B have an effective height less than or equal to 5 feet. Therefore, Basins A and B are not classified as a dam, per NJAC 7:20-1.8(a)4.

The minimum design storm utilized to calculate the required emergency spillway capacity is the 24-hour, 100-year frequency, Type III storm. The emergency spillway has been designed assuming the principal spillway is malfunctioning and will not allow any discharge or flow.

The minimum width of the spillway for basins A and B at the highest settled embankment height is 35 and 30 feet, respectively. Refer to Appendix I for supporting calculations

## E. Standards for Soil Erosion and Sediment Control

The project has been designed to meet all soil erosion and sediment control criteria including provisions for the prevention of soil erosion during construction, as shown on the Soil Erosion and Sediment Control plan and detail sheets.

Permanent conduit outlet protection has been provided at all flared end discharge points throughout the site. Calculations for all proposed rip rap aprons can be found in Appendix J.

The standards for point of discharge stability have been met by retaining pre-developed runoff rates in each watershed. The standards for downstream stability have been met by reducing peak runoff rates to 50% and 75% of pre-developed peak rates for the 2 and 10-year storms.

## F. Low Impact Development

The NJDEP Low Impact Development checklist has been included in Appendix K to discuss the Low Impact Development strategies incorporated into the design of this project.

## V. CONCLUSIONS

In conclusion, the proposed development has been designed in accordance with NJAC 7:8 (NJDEP Stormwater Management Regulations) and the Township of Edgewater Park Development Ordinance. The proposed stormwater management will safely convey all developed runoff from the project.

# WARE MALCOMB

ARCHITECTURE

INTERIORS

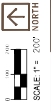
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## Appendix A



VICINITY MAP

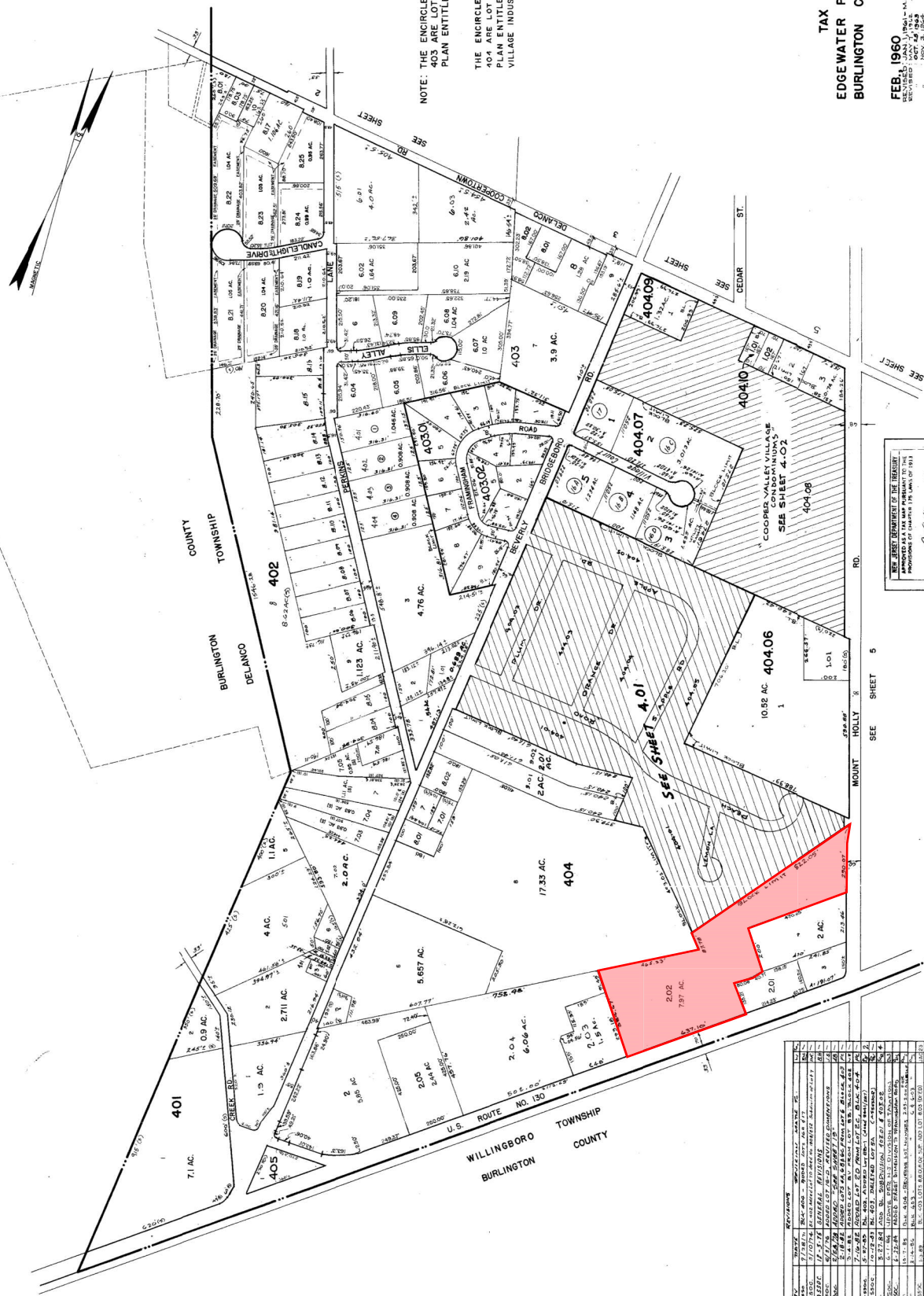
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NOTE: THE ENCIRCLED NUMBERS IN BLOCK 403 ARE LOT DESIGNATIONS OF THE PLAN ENTITLED "FRANKEN SUBDIVISION".

THE ENCIRCLED NUMBERS IN BLOCK 404 ARE LOT DESIGNATIONS OF THE PLAN ENTITLED "COOPER VALLEY VILLAGE INDUSTRIAL AREA".

**TAX MAP**  
**EDGEWATER PARK TOWNSHIP**  
**BURLINGTON COUNTY, N. J.**

FEB. 1960 SCALE: 1"=200'  
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 B. HAROLD WILLS  
 P. E. & L. S.  
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NEW JERSEY DEPARTMENT OF THE TREASURY  
 DIVISION OF TAXATION  
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VICINITY MAP

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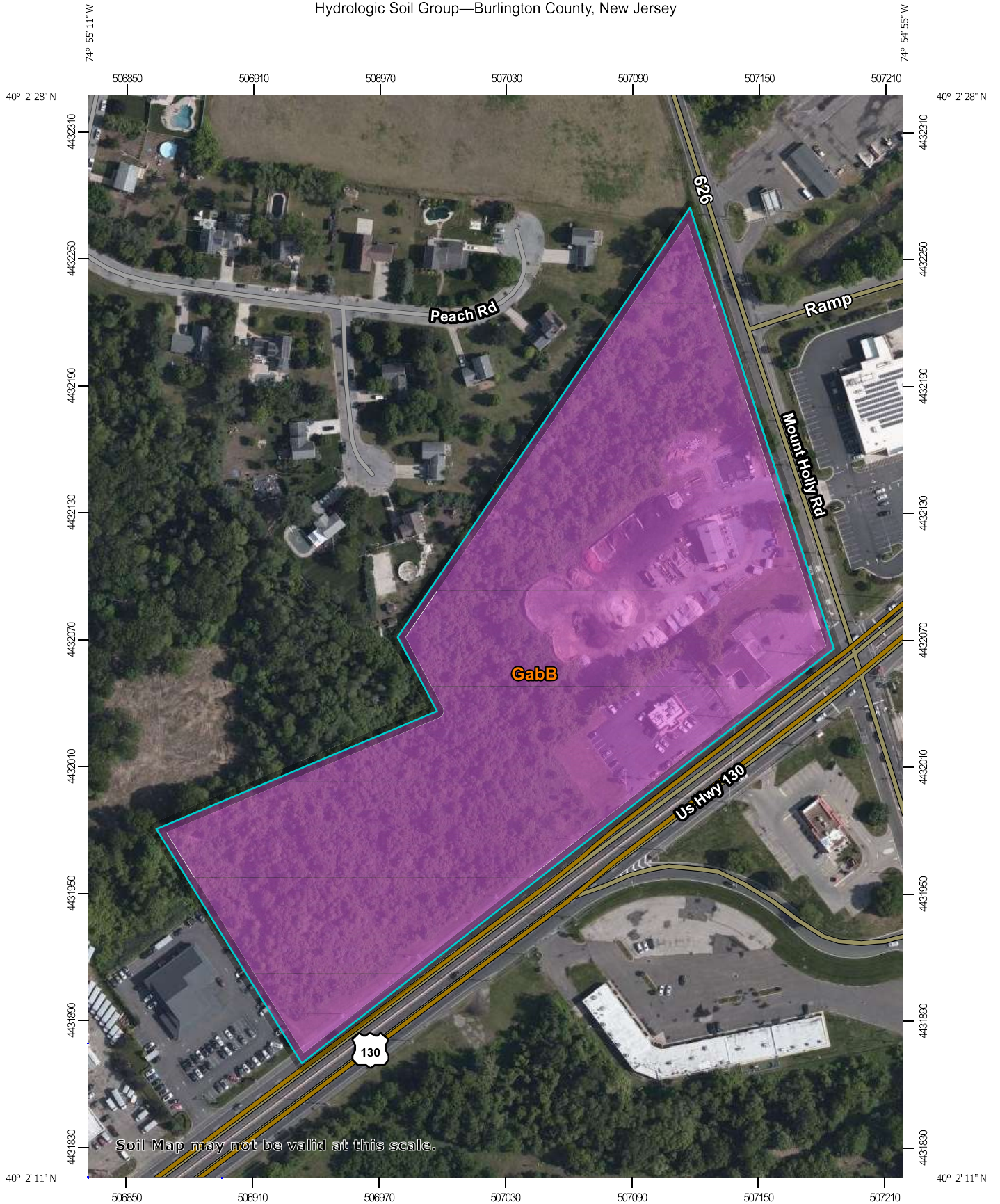
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Hydrologic Soil Group—Burlington County, New Jersey



Map Scale: 1:2,490 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



































Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

1/22/2020  
Page 1 of 4

## MAP LEGEND

<b>Area of Interest (AOI)</b>	 C
 Area of Interest (AOI)	 C/D
<b>Soils</b>	 D
<b>Soil Rating Polygons</b>	 Not rated or not available
 A	<b>Water Features</b>
 A/D	 Streams and Canals
 B	<b>Transportation</b>
 B/D	 Rails
 C	 Interstate Highways
 C/D	 US Routes
 D	 Major Roads
 Not rated or not available	 Local Roads
<b>Soil Rating Lines</b>	<b>Background</b>
 A	 Aerial Photography
 A/D	
 B	
 B/D	
 C	
 C/D	
 D	
 Not rated or not available	
<b>Soil Rating Points</b>	
 A	
 A/D	
 B	
 B/D	

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Burlington County, New Jersey  
 Survey Area Data: Version 15, Sep 16, 2019

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

Date(s) aerial images were photographed: May 14, 2019—May 19, 2019

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GabB	Galestown sand, 0 to 5 percent slopes	A	12.2	100.0%
<b>Totals for Area of Interest</b>			<b>12.2</b>	<b>100.0%</b>

### Description

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

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Rating Options

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# WARE MALCOMB

ARCHITECTURE

INTERIORS

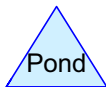
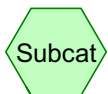
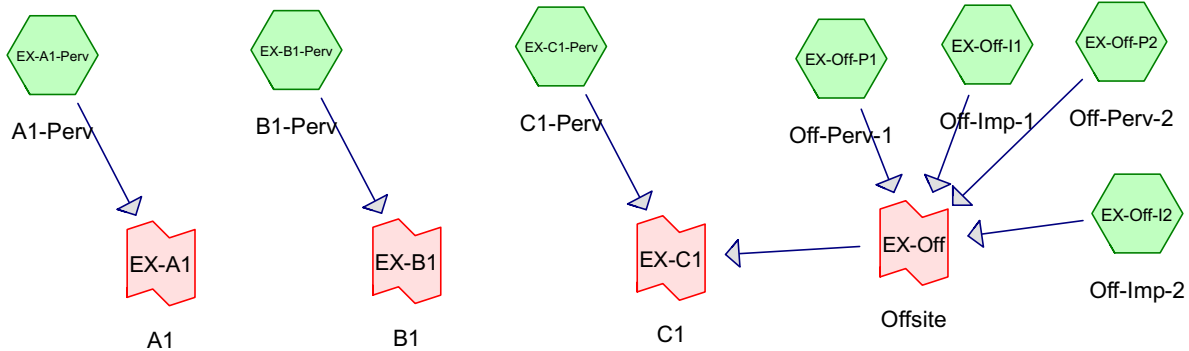
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix B



**NYC19-0005\_offsite\_Final\_2**

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4301 US Route 130, Edgewater Park  
NOAA 24-hr C 2-Year Rainfall=3.36"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment EX-A1-Perv: A1-Perv</b>	Runoff Area=0.528 ac 0.00% Impervious Runoff Depth=0.00" Tc=35.0 min CN=36/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment EX-B1-Perv: B1-Perv</b>	Runoff Area=2.367 ac 0.00% Impervious Runoff Depth=0.00" Tc=42.0 min CN=36/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment EX-C1-Perv: C1-Perv</b>	Runoff Area=4.820 ac 0.00% Impervious Runoff Depth=0.00" Tc=31.0 min CN=36/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment EX-Off-I1: Off-Imp-1</b>	Runoff Area=0.279 ac 100.00% Impervious Runoff Depth=3.13" Tc=15.0 min CN=0/98 Runoff=0.54 cfs 0.073 af
<b>Subcatchment EX-Off-I2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=1.39" Tc=25.0 min CN=76/98 Runoff=0.41 cfs 0.070 af
<b>Subcatchment EX-Off-P1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=0.00" Tc=15.0 min CN=39/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment EX-Off-P2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=0.51" Tc=25.0 min CN=61/0 Runoff=0.29 cfs 0.071 af
<b>Link EX-A1: A1</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link EX-B1: B1</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link EX-C1: C1</b>	Inflow=1.13 cfs 0.214 af Primary=1.13 cfs 0.214 af
<b>Link EX-Off: Offsite</b>	Inflow=1.13 cfs 0.214 af Primary=1.13 cfs 0.214 af

**Total Runoff Area = 10.552 ac Runoff Volume = 0.214 af Average Runoff Depth = 0.24"**  
**96.98% Pervious = 10.233 ac 3.02% Impervious = 0.319 ac**



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**Summary for Subcatchment EX-A1-Perv: A1-Perv**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

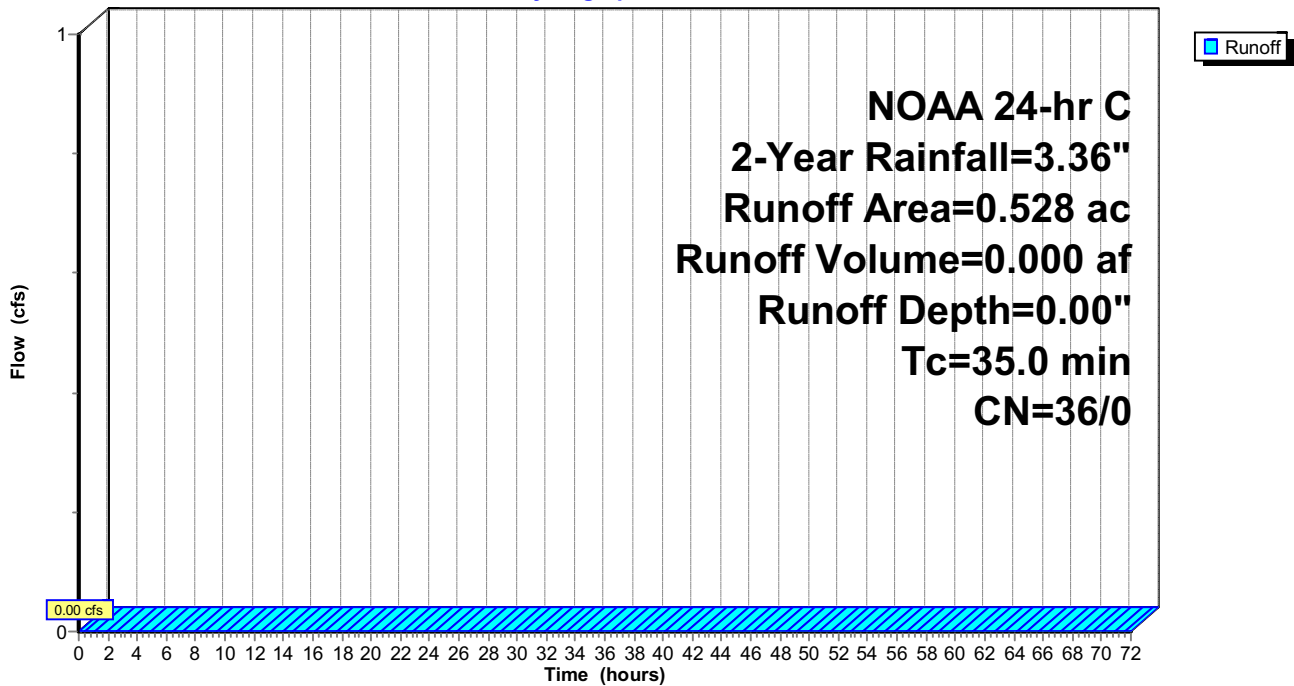
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.528	36	Woods, Fair, HSG A
0.528	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment EX-A1-Perv: A1-Perv**

Hydrograph





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**Summary for Subcatchment EX-B1-Perv: B1-Perv**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

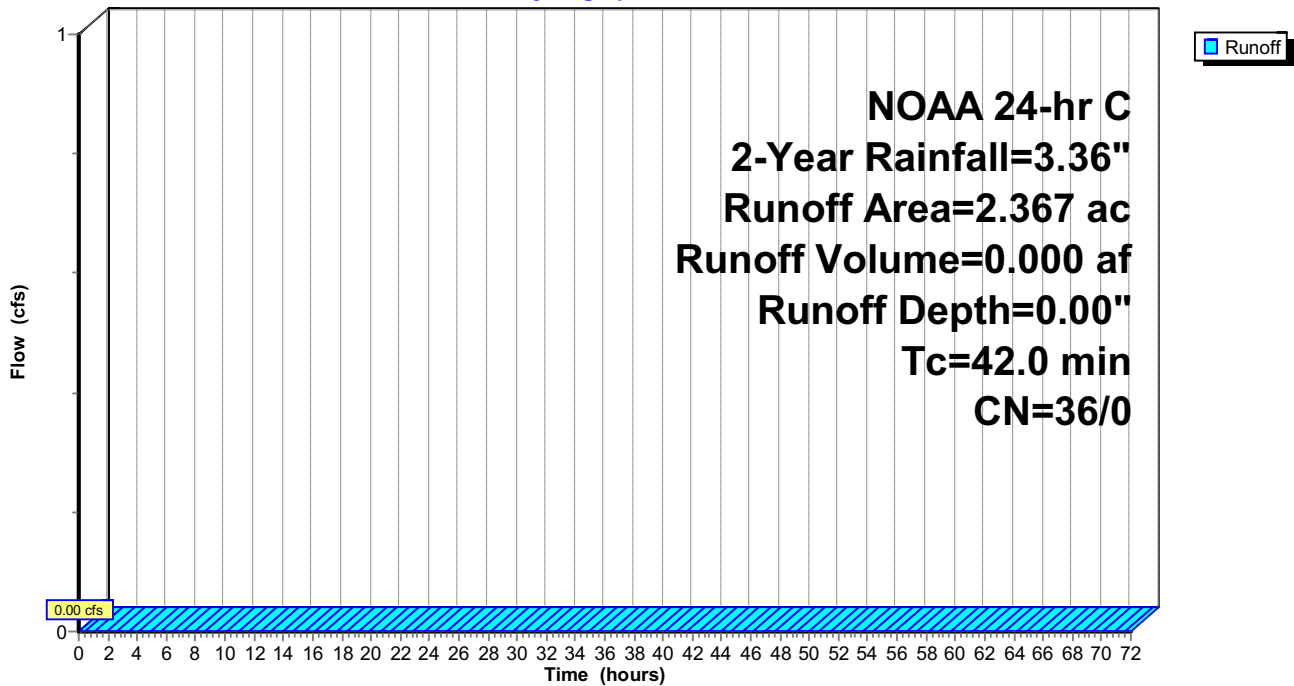
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
2.367	36	Woods, Fair, HSG A
2.367	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0					Direct Entry, TC-PRE-B1 - TC-PRE-B2

**Subcatchment EX-B1-Perv: B1-Perv**

Hydrograph



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NOAA 24-hr C 2-Year Rainfall=3.36"

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**Summary for Subcatchment EX-C1-Perv: C1-Perv**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

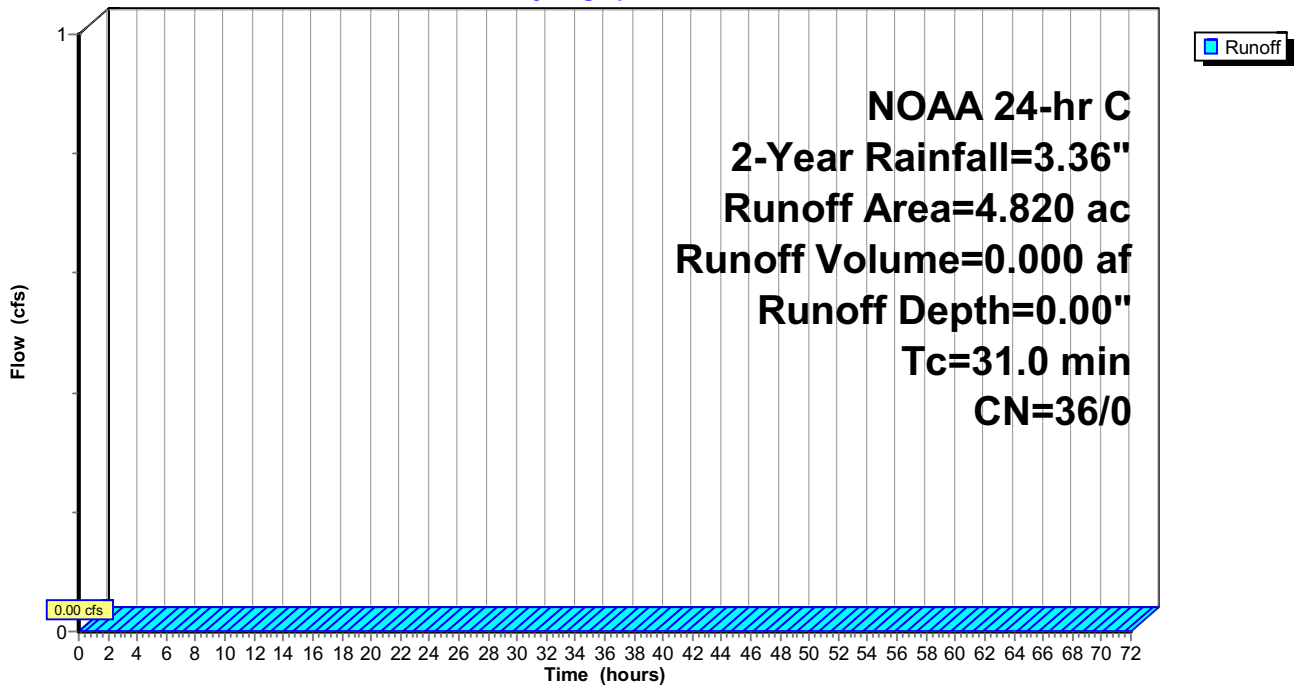
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
4.820	36	Woods, Fair, HSG A
4.820	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					Direct Entry, TC-PRE-C1 - TC-PRE-C2

**Subcatchment EX-C1-Perv: C1-Perv**

Hydrograph



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NOAA 24-hr C 2-Year Rainfall=3.36"

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**Summary for Subcatchment EX-Off-I1: Off-Imp-1**

Runoff = 0.54 cfs @ 12.25 hrs, Volume= 0.073 af, Depth= 3.13"

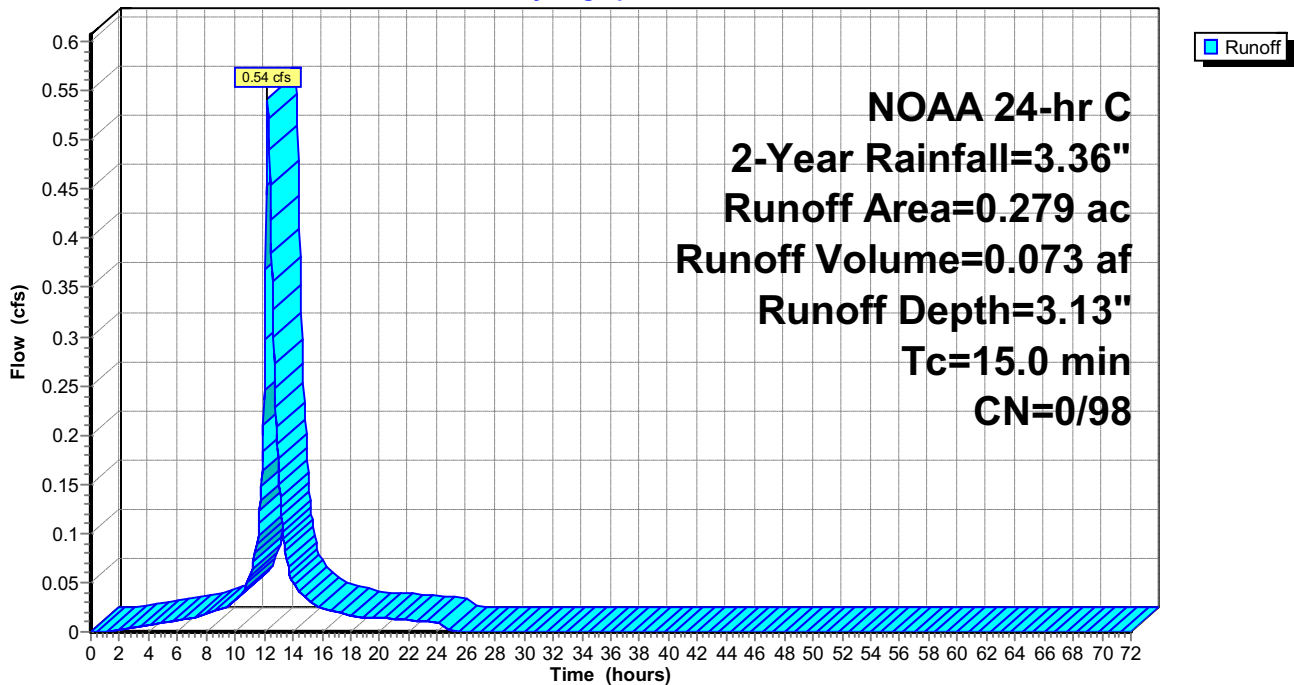
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.279	98	Paved parking, HSG A
0.279	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment EX-Off-I1: Off-Imp-1**

Hydrograph



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**Summary for Subcatchment EX-Off-I2: Off-Imp-2**

Runoff = 0.41 cfs @ 12.42 hrs, Volume= 0.070 af, Depth= 1.39"

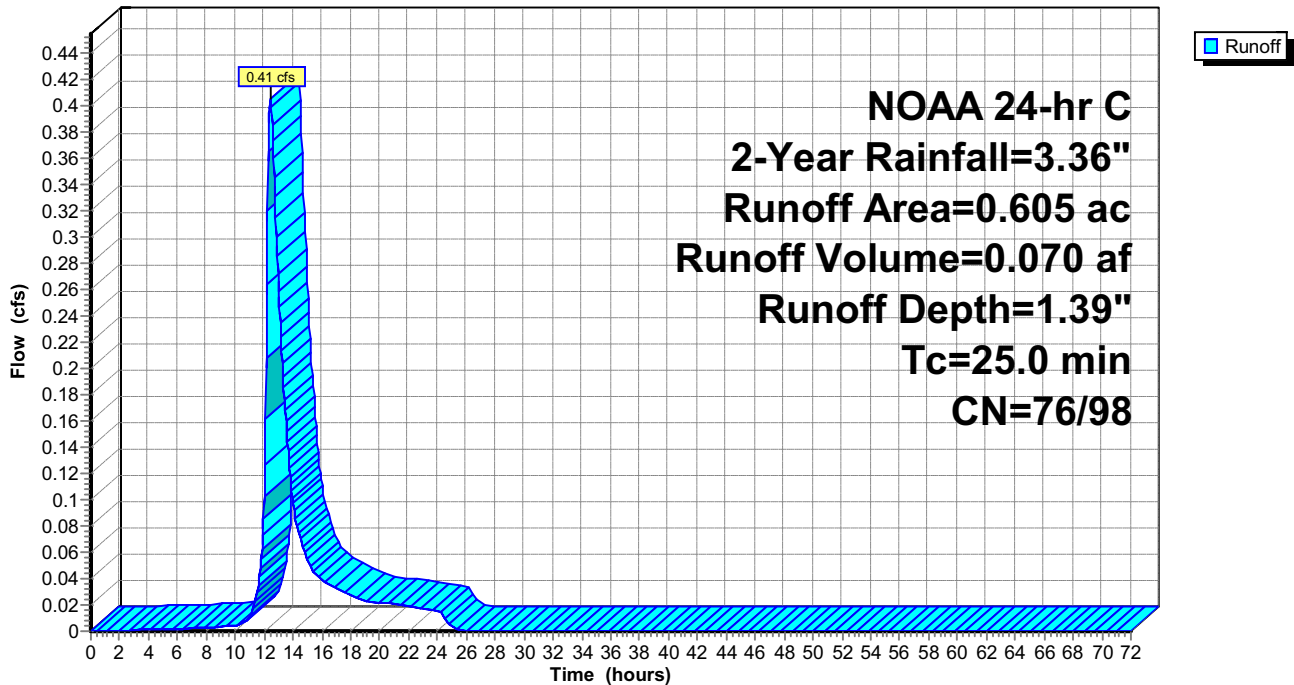
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment EX-Off-I2: Off-Imp-2**

Hydrograph



**Summary for Subcatchment EX-Off-P1: Off-Perv-1**

Runoff = 0.00 cfs @ 24.05 hrs, Volume= 0.000 af, Depth= 0.00"

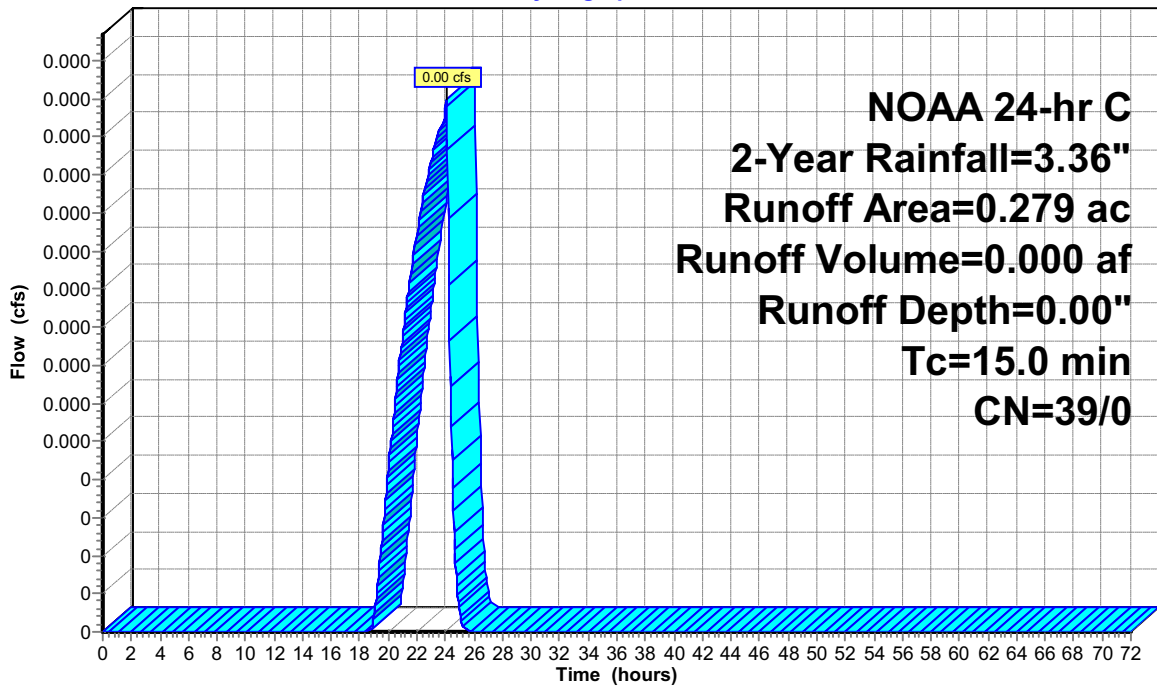
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment EX-Off-P1: Off-Perv-1**

Hydrograph



Runoff

**NOAA 24-hr C  
 2-Year Rainfall=3.36"  
 Runoff Area=0.279 ac  
 Runoff Volume=0.000 af  
 Runoff Depth=0.00"  
 Tc=15.0 min  
 CN=39/0**

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NOAA 24-hr C 2-Year Rainfall=3.36"

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**Summary for Subcatchment EX-Off-P2: Off-Perv-2**

Runoff = 0.29 cfs @ 12.60 hrs, Volume= 0.071 af, Depth= 0.51"

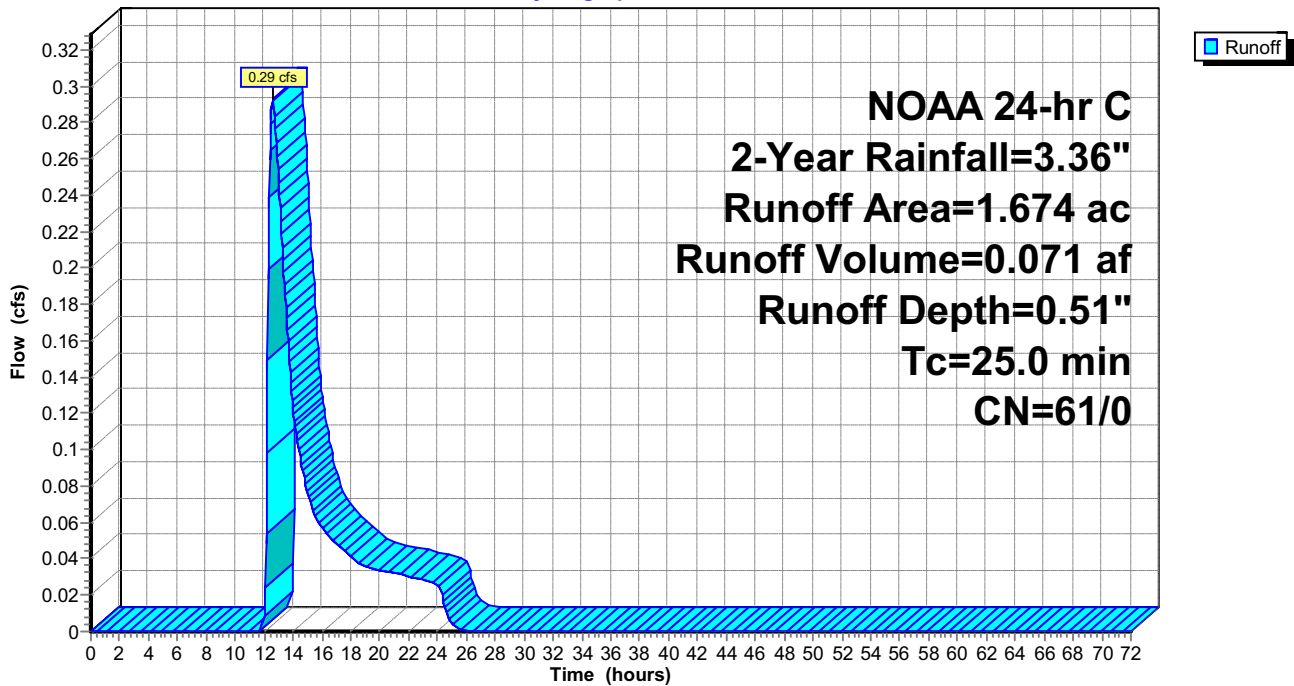
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment EX-Off-P2: Off-Perv-2**

Hydrograph



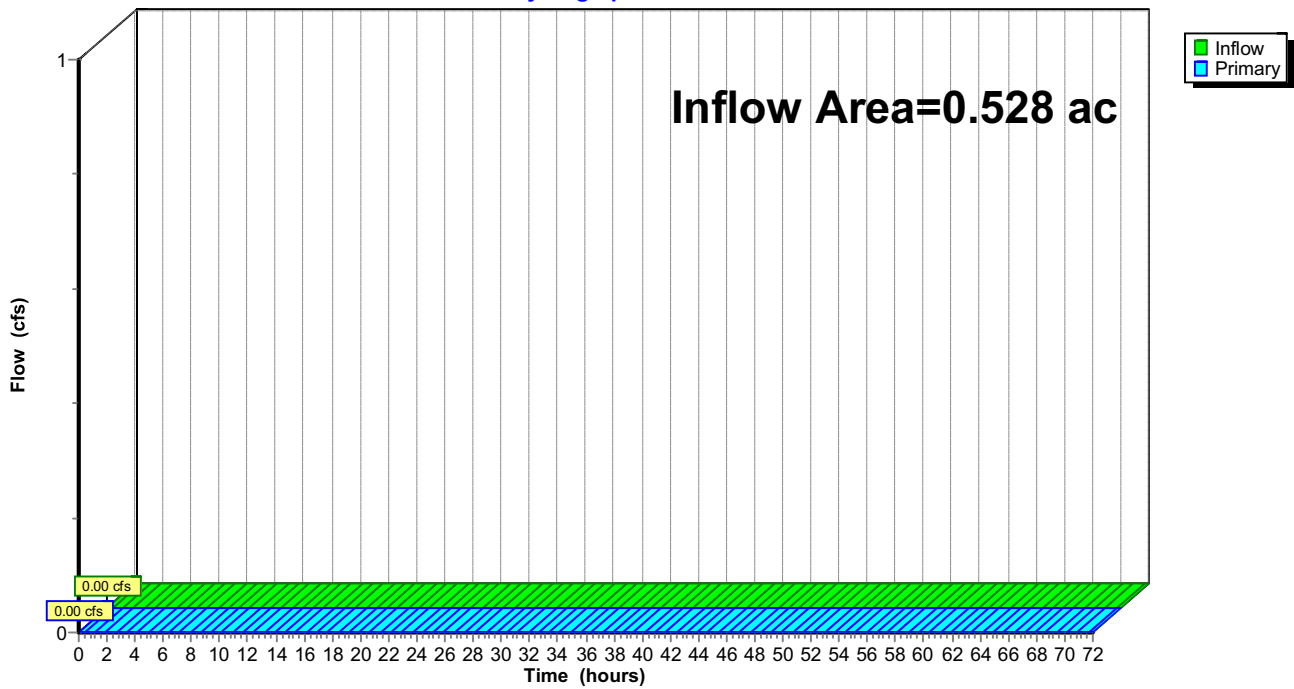
### Summary for Link EX-A1: A1

Inflow Area = 0.528 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link EX-A1: A1

Hydrograph



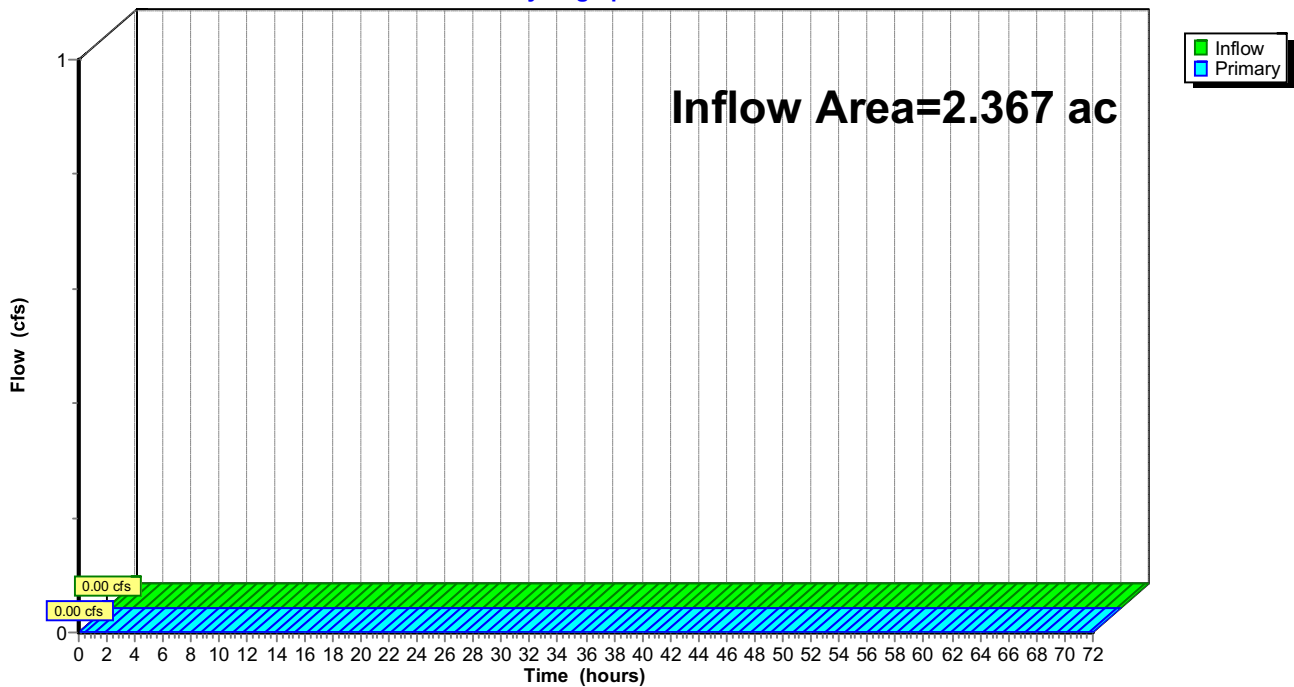
### Summary for Link EX-B1: B1

Inflow Area = 2.367 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link EX-B1: B1

Hydrograph





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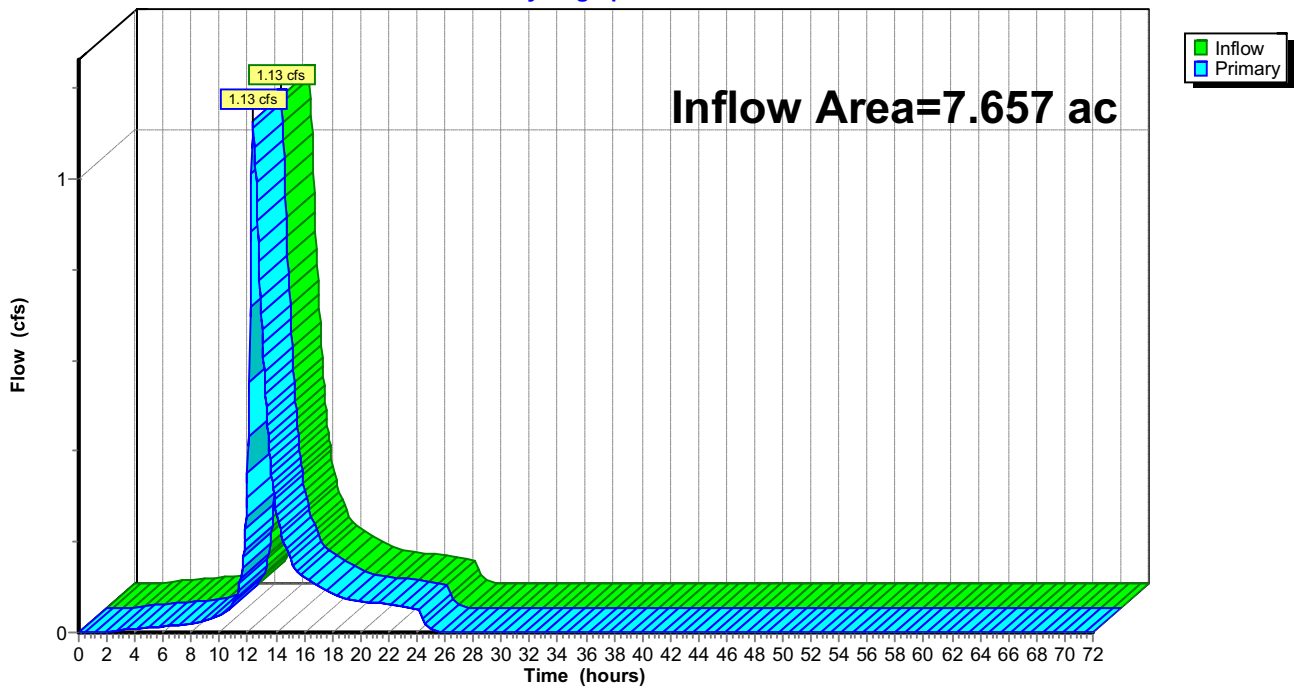
**Summary for Link EX-C1: C1**

Inflow Area = 7.657 ac, 4.17% Impervious, Inflow Depth = 0.34" for 2-Year event  
Inflow = 1.13 cfs @ 12.38 hrs, Volume= 0.214 af  
Primary = 1.13 cfs @ 12.38 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-C1: C1**

Hydrograph



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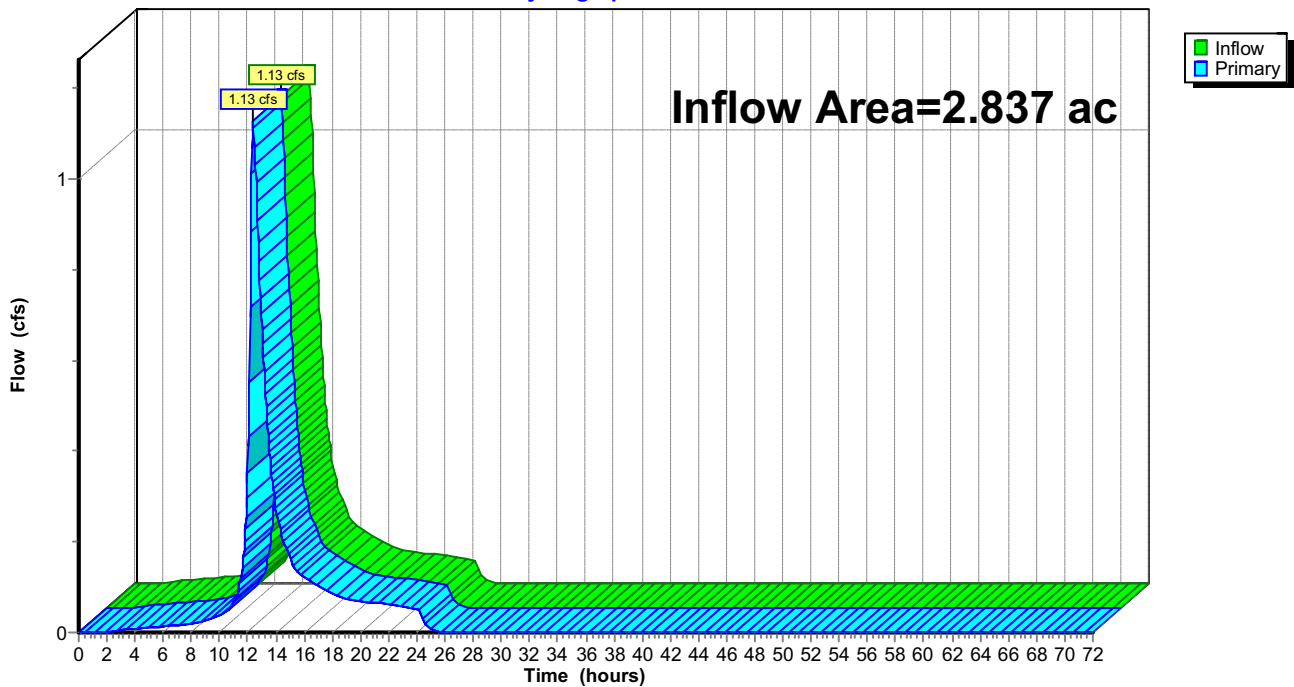
## Summary for Link EX-Off: Offsite

Inflow Area = 2.837 ac, 11.24% Impervious, Inflow Depth = 0.91" for 2-Year event  
Inflow = 1.13 cfs @ 12.38 hrs, Volume= 0.214 af  
Primary = 1.13 cfs @ 12.38 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link EX-Off: Offsite

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment EX-A1-Perv: A1-Perv</b>	Runoff Area=0.528 ac 0.00% Impervious Runoff Depth=0.14" Tc=35.0 min CN=36/0 Runoff=0.01 cfs 0.006 af
<b>Subcatchment EX-B1-Perv: B1-Perv</b>	Runoff Area=2.367 ac 0.00% Impervious Runoff Depth=0.14" Tc=42.0 min CN=36/0 Runoff=0.04 cfs 0.027 af
<b>Subcatchment EX-C1-Perv: C1-Perv</b>	Runoff Area=4.820 ac 0.00% Impervious Runoff Depth=0.14" Tc=31.0 min CN=36/0 Runoff=0.08 cfs 0.055 af
<b>Subcatchment EX-Off-I1: Off-Imp-1</b>	Runoff Area=0.279 ac 100.00% Impervious Runoff Depth=4.94" Tc=15.0 min CN=0/98 Runoff=0.84 cfs 0.115 af
<b>Subcatchment EX-Off-I2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=2.83" Tc=25.0 min CN=76/98 Runoff=0.87 cfs 0.143 af
<b>Subcatchment EX-Off-P1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=0.24" Tc=15.0 min CN=39/0 Runoff=0.01 cfs 0.006 af
<b>Subcatchment EX-Off-P2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=1.48" Tc=25.0 min CN=61/0 Runoff=1.12 cfs 0.206 af
<b>Link EX-A1: A1</b>	Inflow=0.01 cfs 0.006 af Primary=0.01 cfs 0.006 af
<b>Link EX-B1: B1</b>	Inflow=0.04 cfs 0.027 af Primary=0.04 cfs 0.027 af
<b>Link EX-C1: C1</b>	Inflow=2.69 cfs 0.524 af Primary=2.69 cfs 0.524 af
<b>Link EX-Off: Offsite</b>	Inflow=2.69 cfs 0.470 af Primary=2.69 cfs 0.470 af

**Total Runoff Area = 10.552 ac Runoff Volume = 0.557 af Average Runoff Depth = 0.63"**  
**96.98% Pervious = 10.233 ac 3.02% Impervious = 0.319 ac**

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4301 US Route 130, Edgewater Park

NOAA 24-hr C 10-Year Rainfall=5.18"

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**Summary for Subcatchment EX-A1-Perv: A1-Perv**

Runoff = 0.01 cfs @ 14.78 hrs, Volume= 0.006 af, Depth= 0.14"

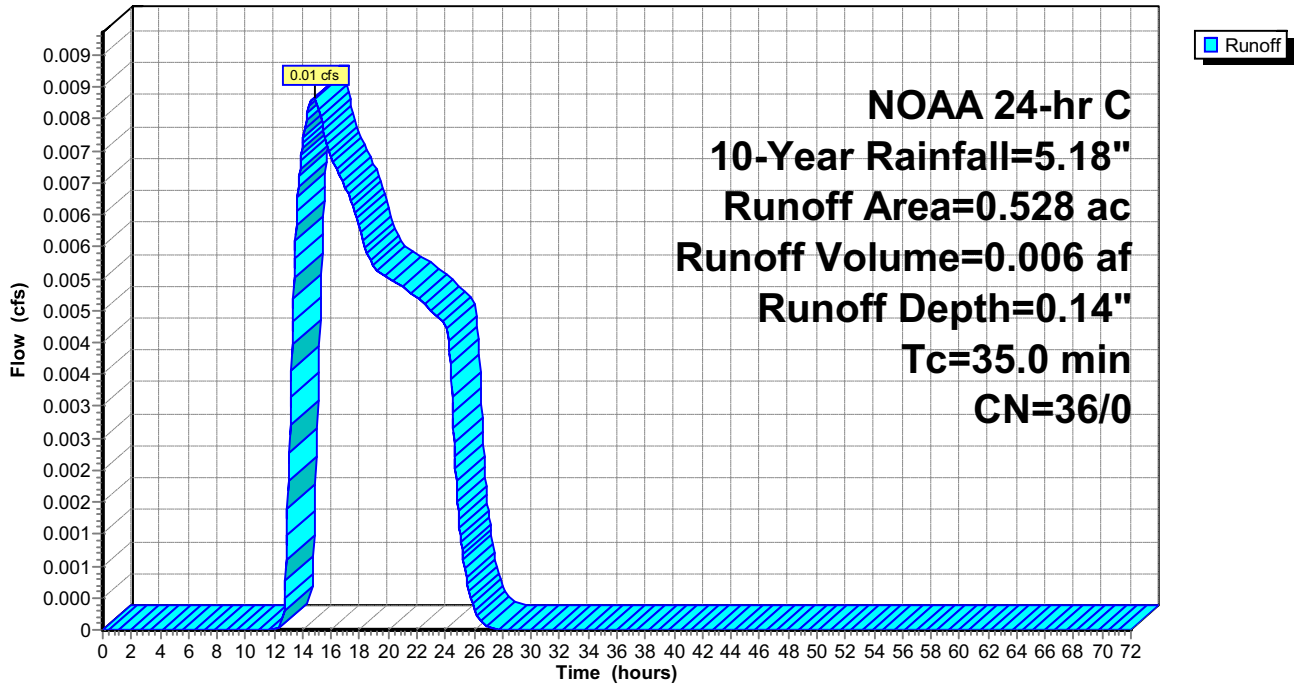
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.528	36	Woods, Fair, HSG A
0.528	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment EX-A1-Perv: A1-Perv**

Hydrograph



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NOAA 24-hr C 10-Year Rainfall=5.18"

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## Summary for Subcatchment EX-B1-Perv: B1-Perv

Runoff = 0.04 cfs @ 14.97 hrs, Volume= 0.027 af, Depth= 0.14"

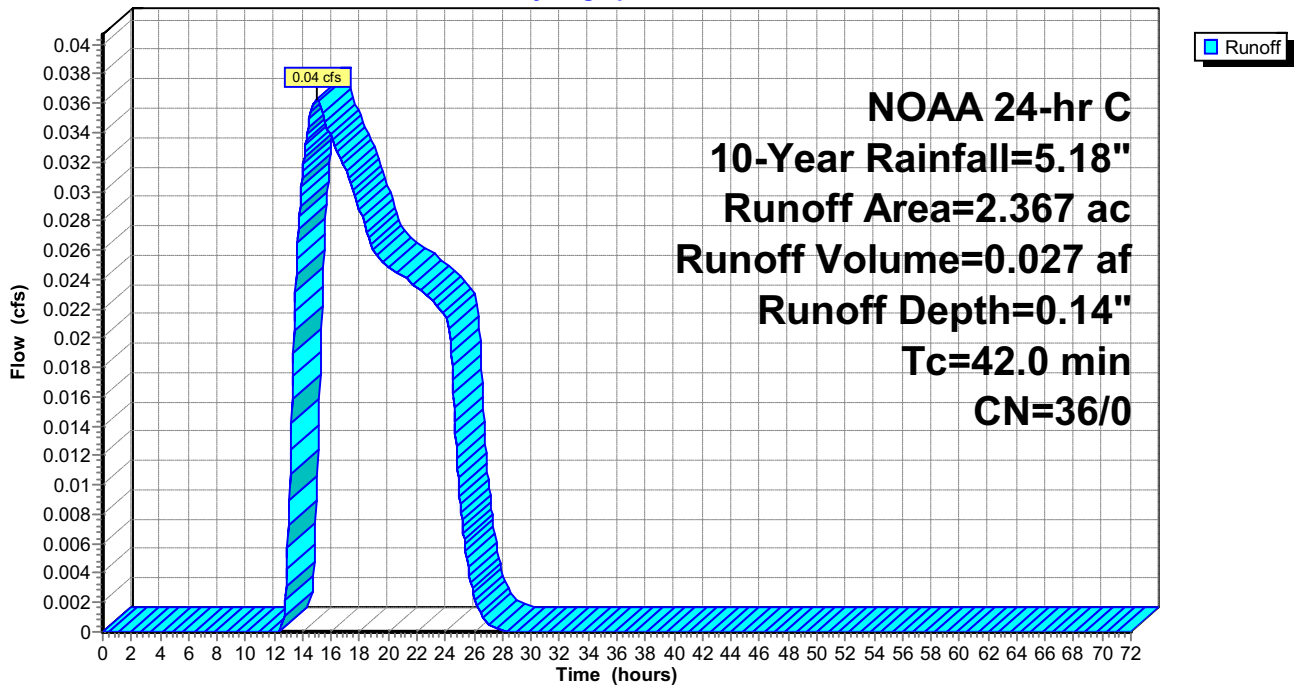
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
2.367	36	Woods, Fair, HSG A
2.367	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0					Direct Entry, TC-PRE-B1 - TC-PRE-B2

## Subcatchment EX-B1-Perv: B1-Perv

Hydrograph



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NOAA 24-hr C 10-Year Rainfall=5.18"

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**Summary for Subcatchment EX-C1-Perv: C1-Perv**

Runoff = 0.08 cfs @ 14.65 hrs, Volume= 0.055 af, Depth= 0.14"

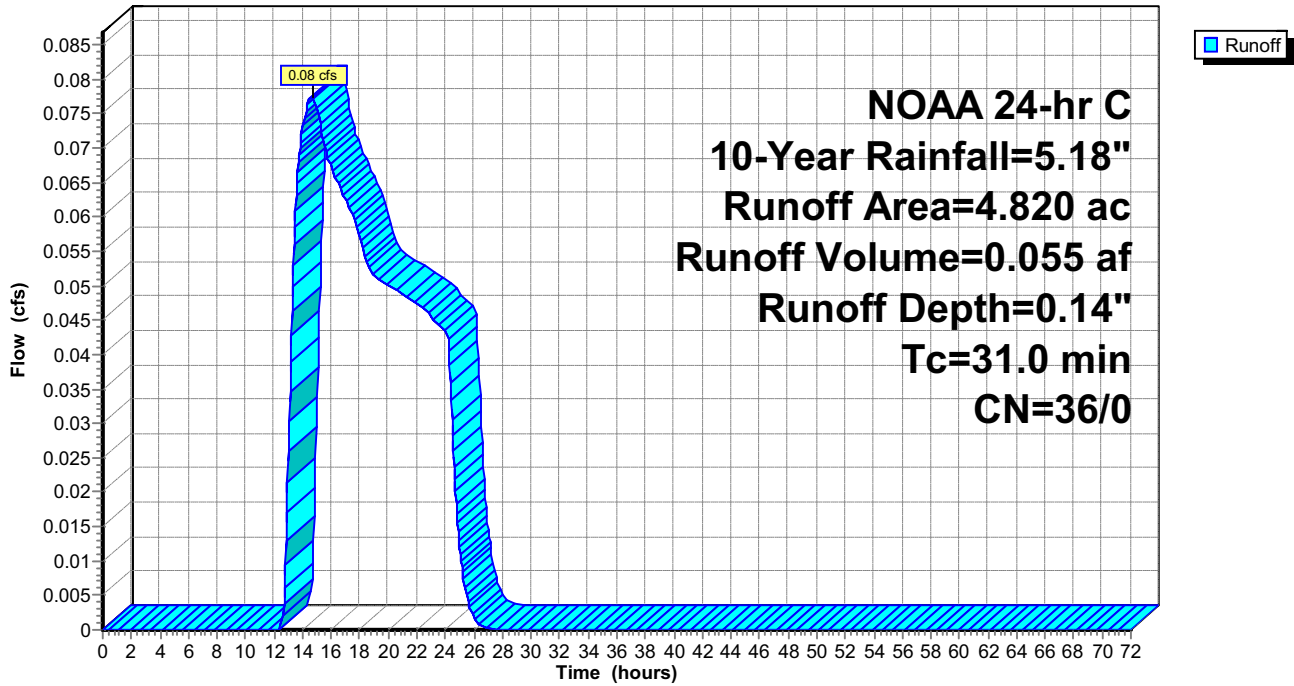
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
4.820	36	Woods, Fair, HSG A
4.820	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					Direct Entry, TC-PRE-C1 - TC-PRE-C2

**Subcatchment EX-C1-Perv: C1-Perv**

Hydrograph



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## Summary for Subcatchment EX-Off-I1: Off-Imp-1

Runoff = 0.84 cfs @ 12.25 hrs, Volume= 0.115 af, Depth= 4.94"

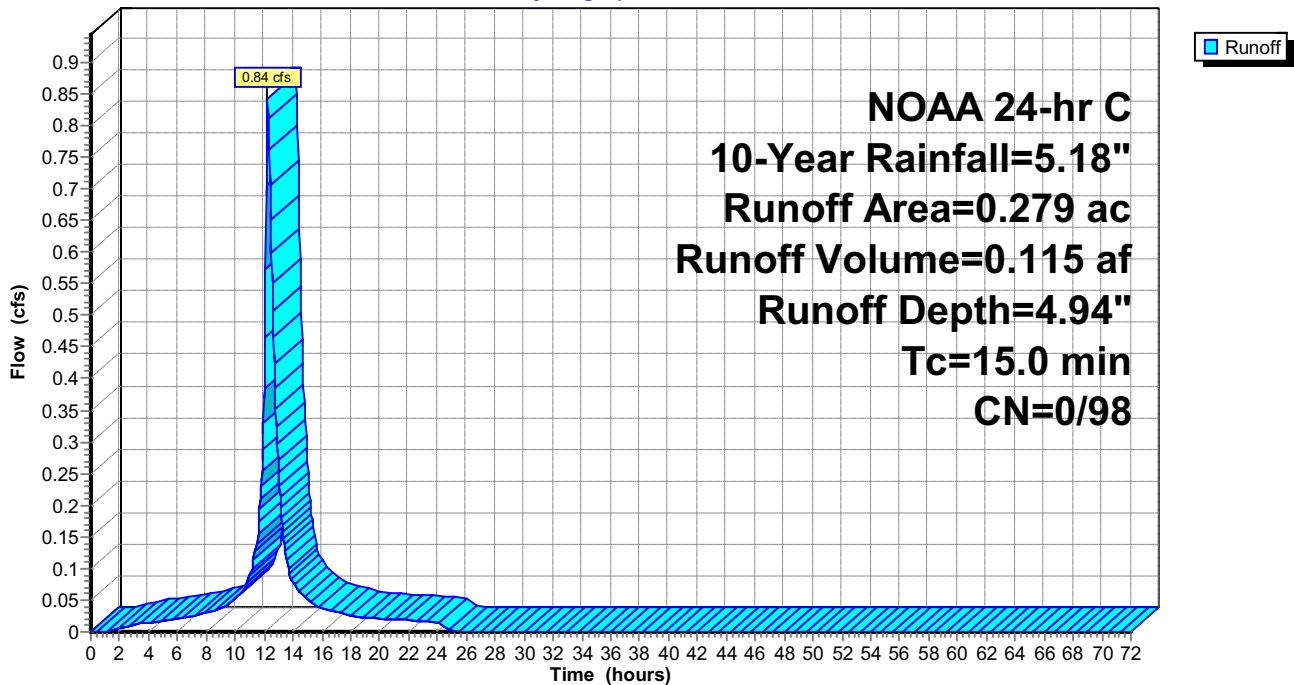
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.279	98	Paved parking, HSG A
0.279	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

## Subcatchment EX-Off-I1: Off-Imp-1

Hydrograph



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**Summary for Subcatchment EX-Off-I2: Off-Imp-2**

Runoff = 0.87 cfs @ 12.40 hrs, Volume= 0.143 af, Depth= 2.83"

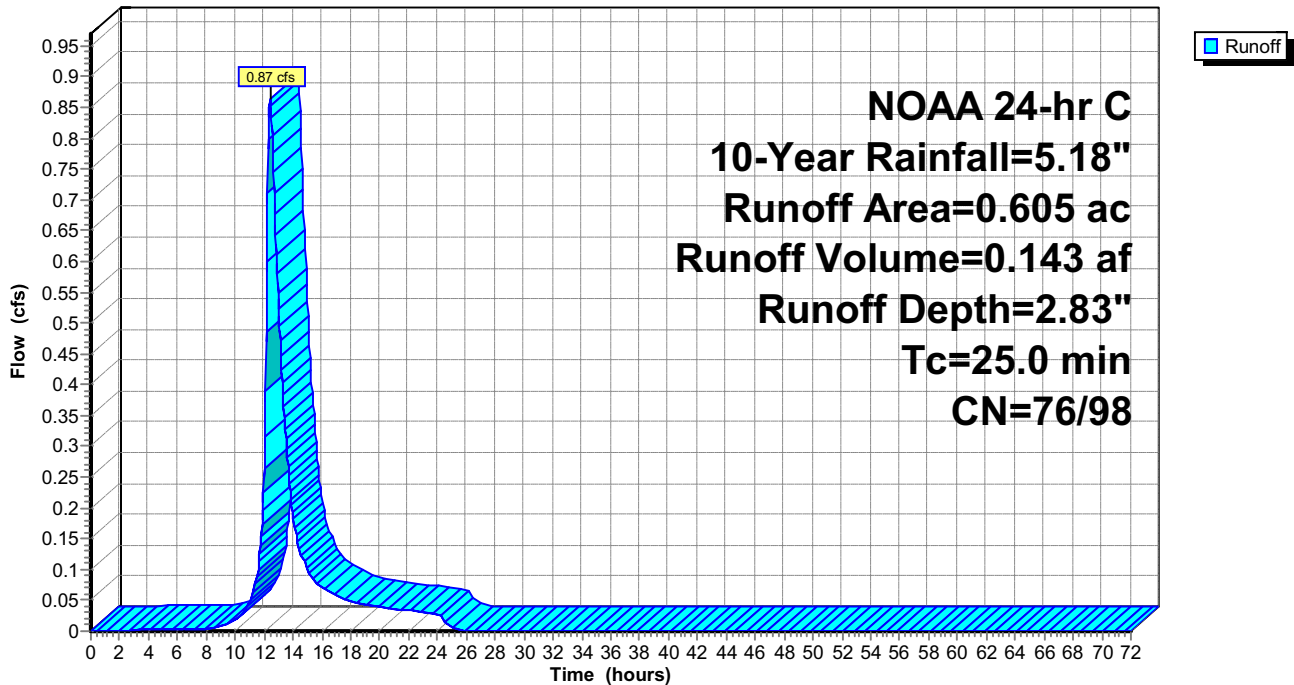
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment EX-Off-I2: Off-Imp-2**

Hydrograph





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**Summary for Subcatchment EX-Off-P1: Off-Perv-1**

Runoff = 0.01 cfs @ 13.05 hrs, Volume= 0.006 af, Depth= 0.24"

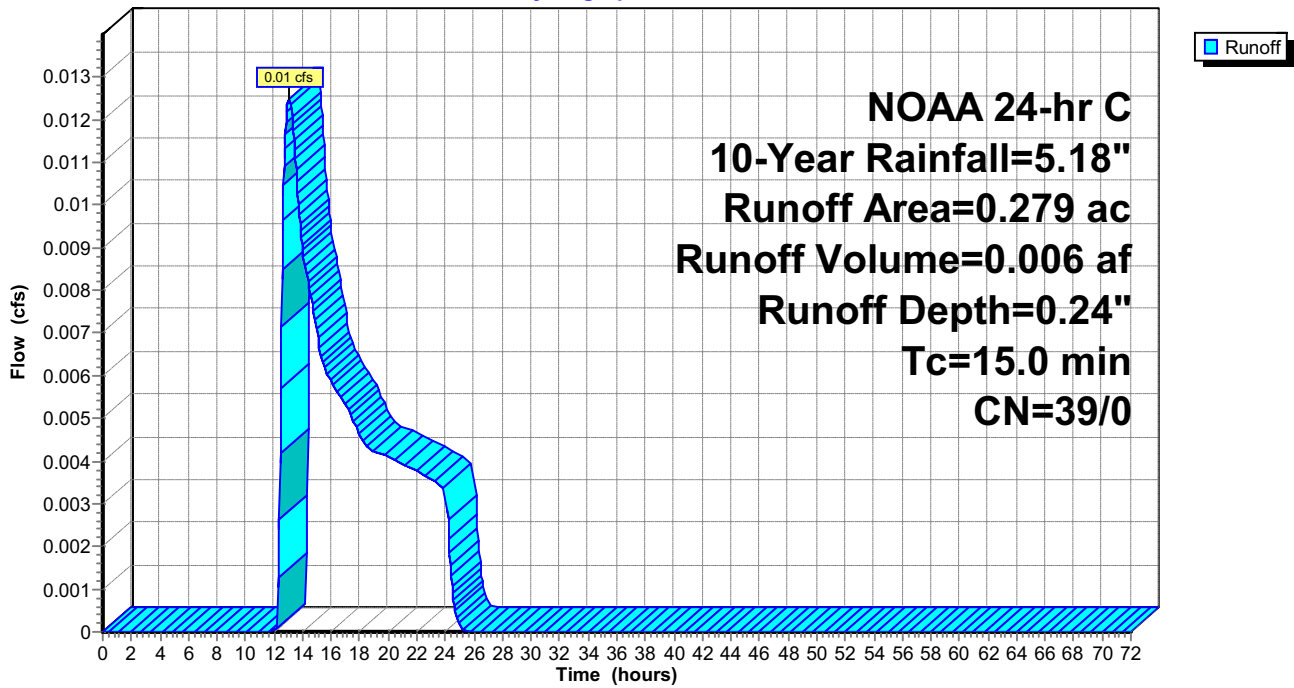
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment EX-Off-P1: Off-Perv-1**

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**Summary for Subcatchment EX-Off-P2: Off-Perv-2**

Runoff = 1.12 cfs @ 12.45 hrs, Volume= 0.206 af, Depth= 1.48"

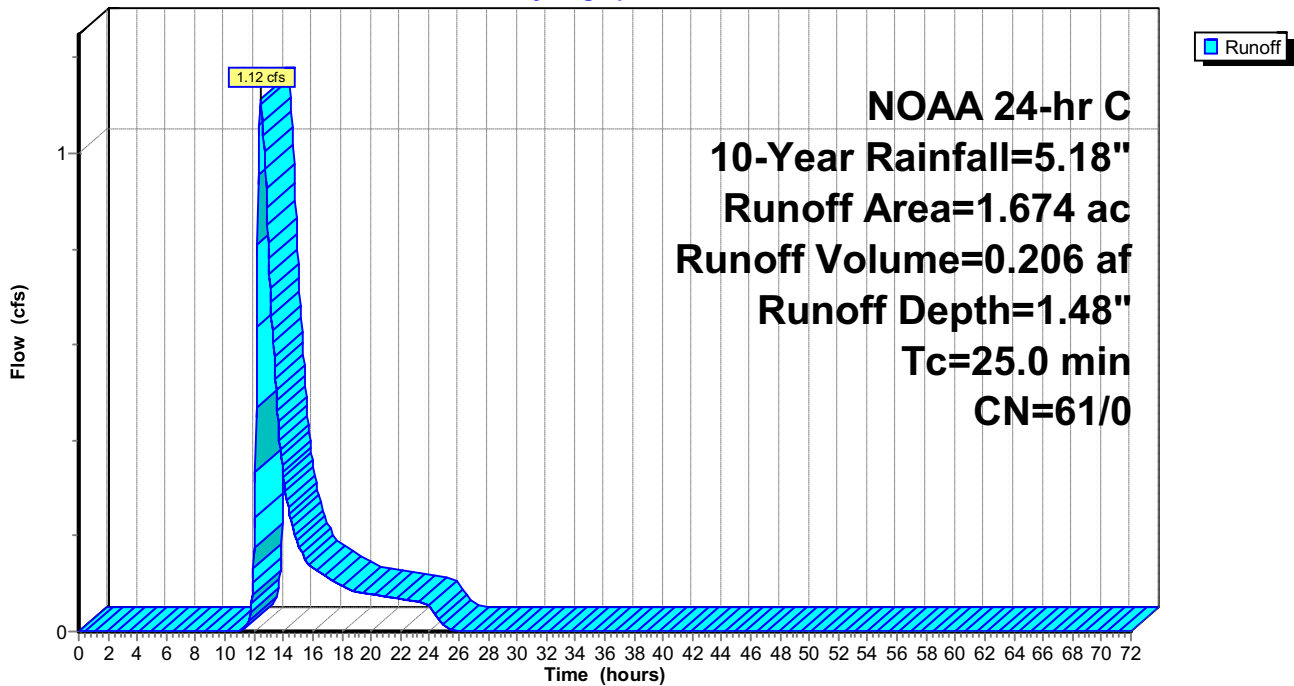
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment EX-Off-P2: Off-Perv-2**

Hydrograph



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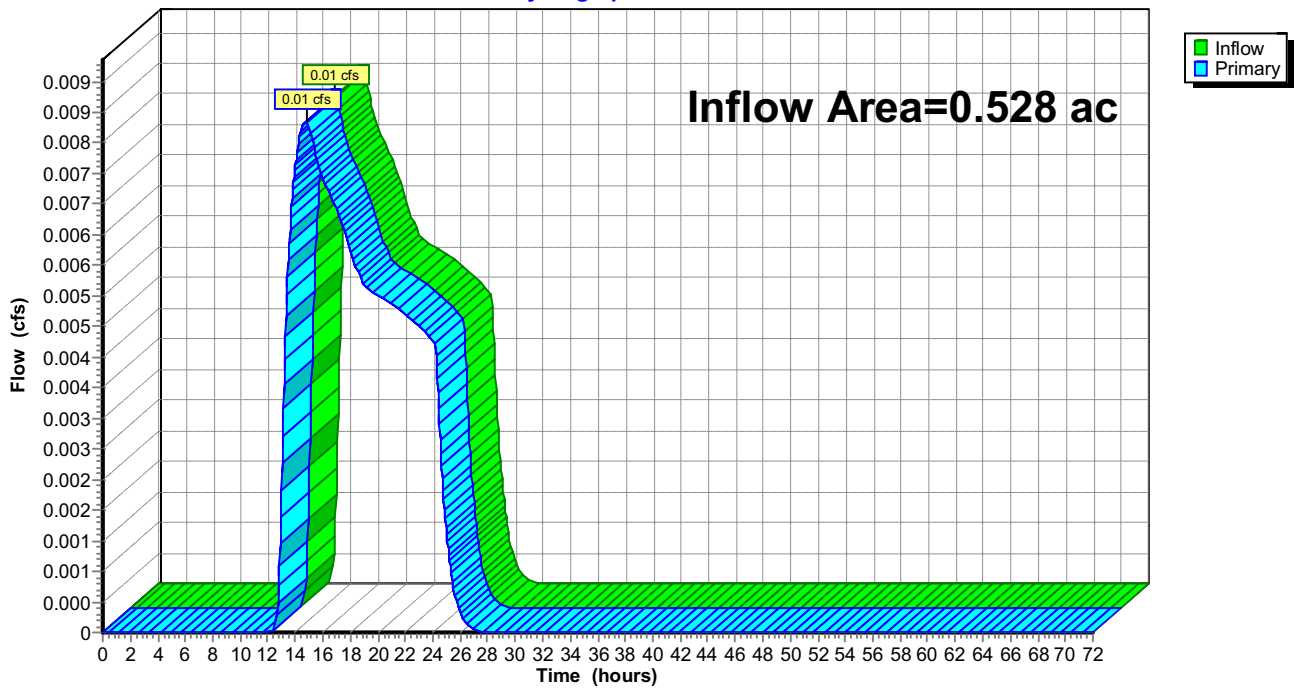
**Summary for Link EX-A1: A1**

Inflow Area = 0.528 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event  
Inflow = 0.01 cfs @ 14.78 hrs, Volume= 0.006 af  
Primary = 0.01 cfs @ 14.78 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-A1: A1**

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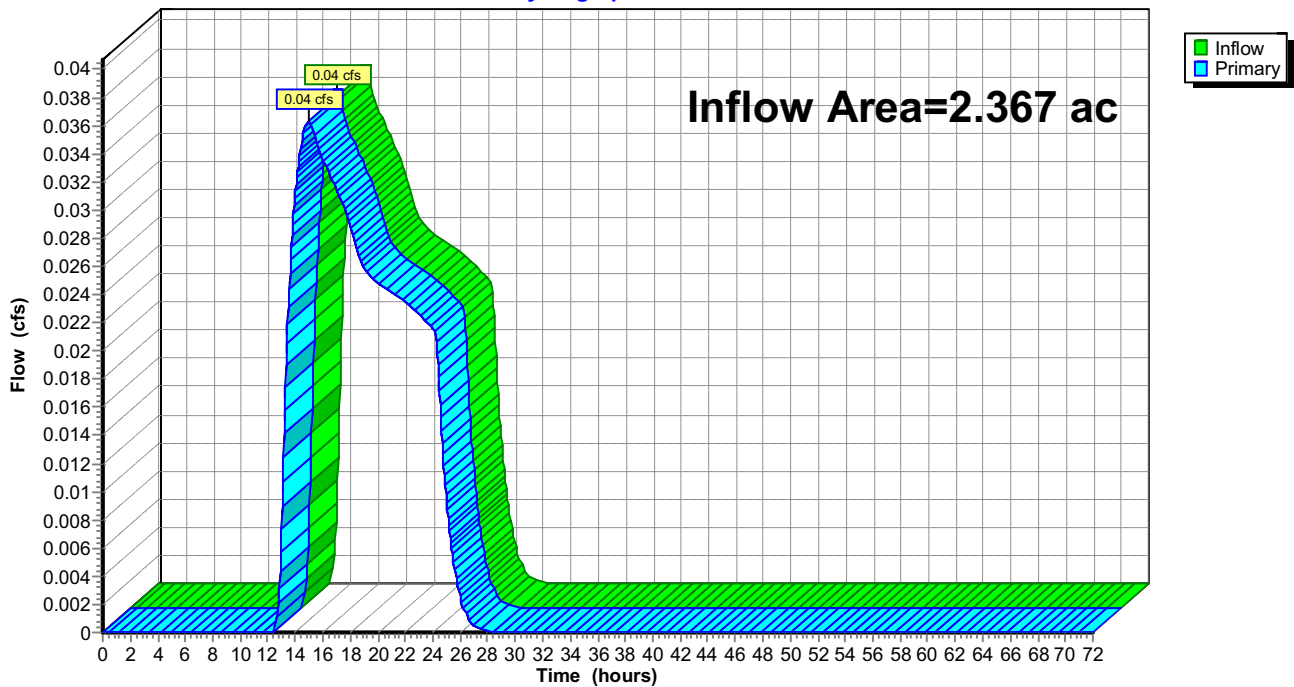
**Summary for Link EX-B1: B1**

Inflow Area = 2.367 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event  
Inflow = 0.04 cfs @ 14.97 hrs, Volume= 0.027 af  
Primary = 0.04 cfs @ 14.97 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-B1: B1**

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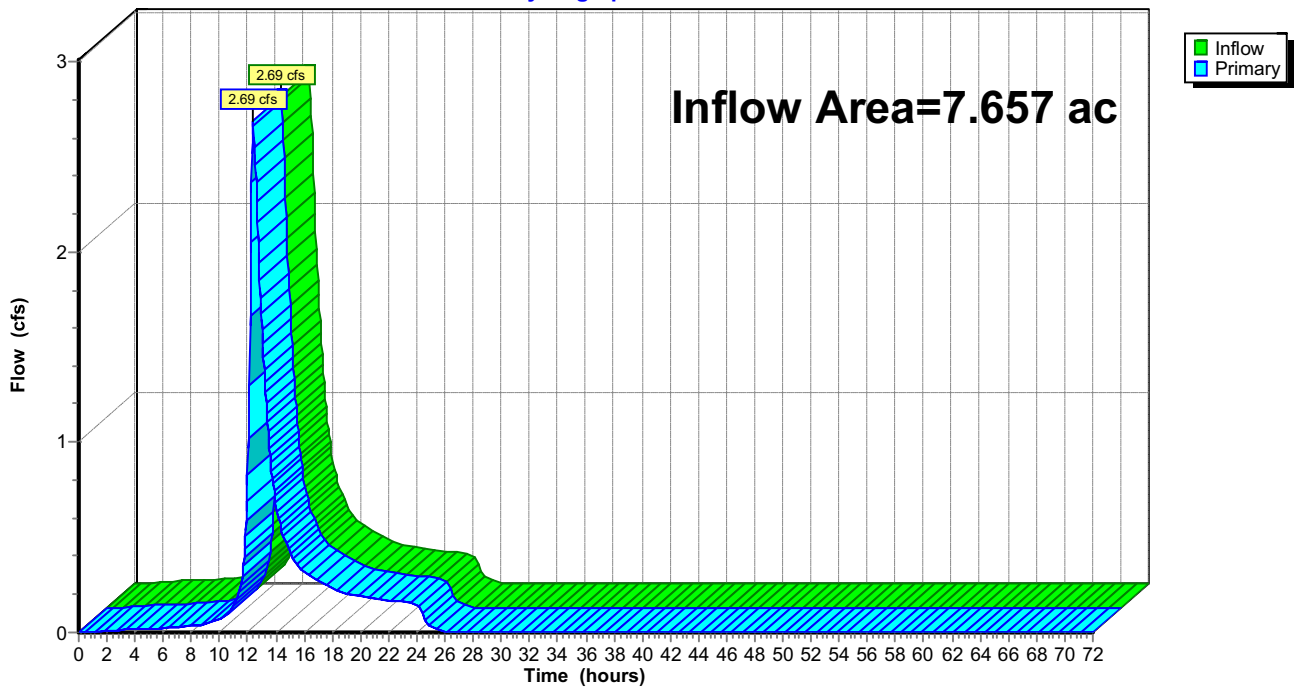
**Summary for Link EX-C1: C1**

Inflow Area = 7.657 ac, 4.17% Impervious, Inflow Depth = 0.82" for 10-Year event  
Inflow = 2.69 cfs @ 12.38 hrs, Volume= 0.524 af  
Primary = 2.69 cfs @ 12.38 hrs, Volume= 0.524 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-C1: C1**

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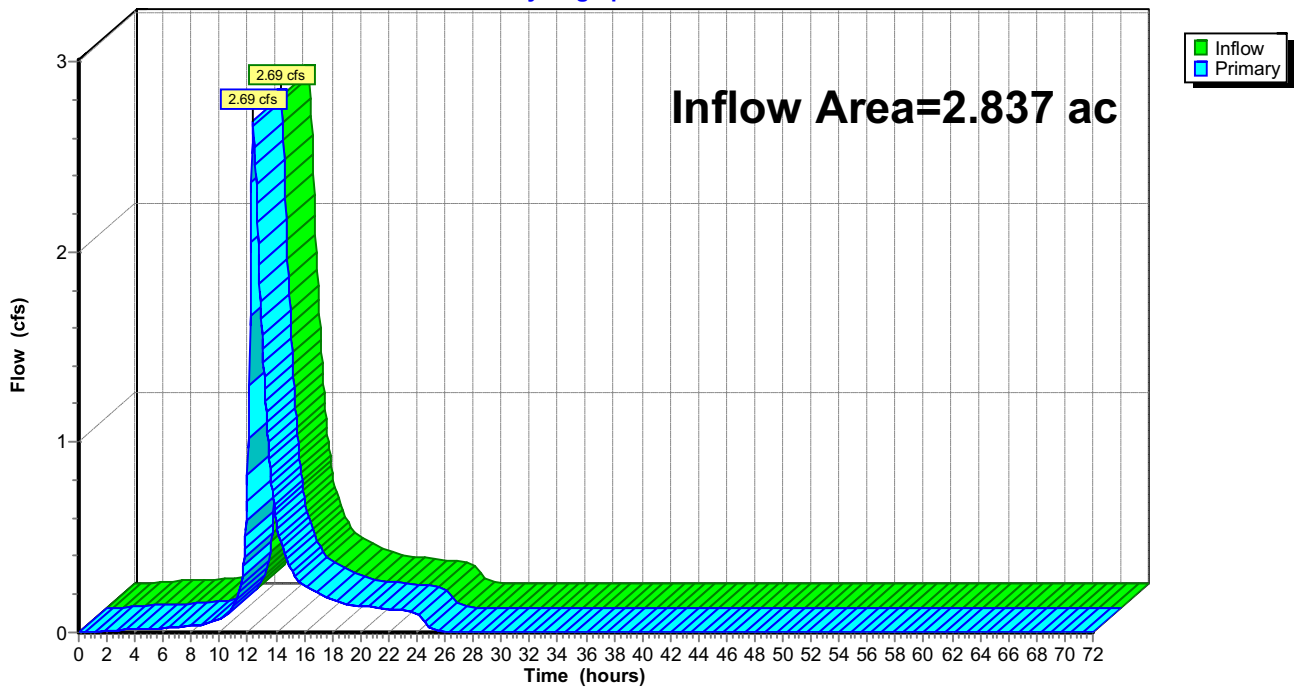
**Summary for Link EX-Off: Offsite**

Inflow Area = 2.837 ac, 11.24% Impervious, Inflow Depth = 1.99" for 10-Year event  
Inflow = 2.69 cfs @ 12.38 hrs, Volume= 0.470 af  
Primary = 2.69 cfs @ 12.38 hrs, Volume= 0.470 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-Off: Offsite**

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
 Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment EX-A1-Perv: A1-Perv</b>	Runoff Area=0.528 ac 0.00% Impervious Runoff Depth=1.20" Tc=35.0 min CN=36/0 Runoff=0.17 cfs 0.053 af
<b>Subcatchment EX-B1-Perv: B1-Perv</b>	Runoff Area=2.367 ac 0.00% Impervious Runoff Depth=1.20" Tc=42.0 min CN=36/0 Runoff=0.69 cfs 0.236 af
<b>Subcatchment EX-C1-Perv: C1-Perv</b>	Runoff Area=4.820 ac 0.00% Impervious Runoff Depth=1.20" Tc=31.0 min CN=36/0 Runoff=1.67 cfs 0.481 af
<b>Subcatchment EX-Off-I1: Off-Imp-1</b>	Runoff Area=0.279 ac 100.00% Impervious Runoff Depth=8.57" Tc=15.0 min CN=0/98 Runoff=1.44 cfs 0.199 af
<b>Subcatchment EX-Off-I2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=6.08" Tc=25.0 min CN=76/98 Runoff=1.87 cfs 0.306 af
<b>Subcatchment EX-Off-P1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=1.51" Tc=15.0 min CN=39/0 Runoff=0.20 cfs 0.035 af
<b>Subcatchment EX-Off-P2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=4.07" Tc=25.0 min CN=61/0 Runoff=3.44 cfs 0.568 af
<b>Link EX-A1: A1</b>	Inflow=0.17 cfs 0.053 af Primary=0.17 cfs 0.053 af
<b>Link EX-B1: B1</b>	Inflow=0.69 cfs 0.236 af Primary=0.69 cfs 0.236 af
<b>Link EX-C1: C1</b>	Inflow=7.91 cfs 1.591 af Primary=7.91 cfs 1.591 af
<b>Link EX-Off: Offsite</b>	Inflow=6.74 cfs 1.109 af Primary=6.74 cfs 1.109 af

**Total Runoff Area = 10.552 ac Runoff Volume = 1.880 af Average Runoff Depth = 2.14"**  
**96.98% Pervious = 10.233 ac 3.02% Impervious = 0.319 ac**

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**Summary for Subcatchment EX-A1-Perv: A1-Perv**

Runoff = 0.17 cfs @ 12.82 hrs, Volume= 0.053 af, Depth= 1.20"

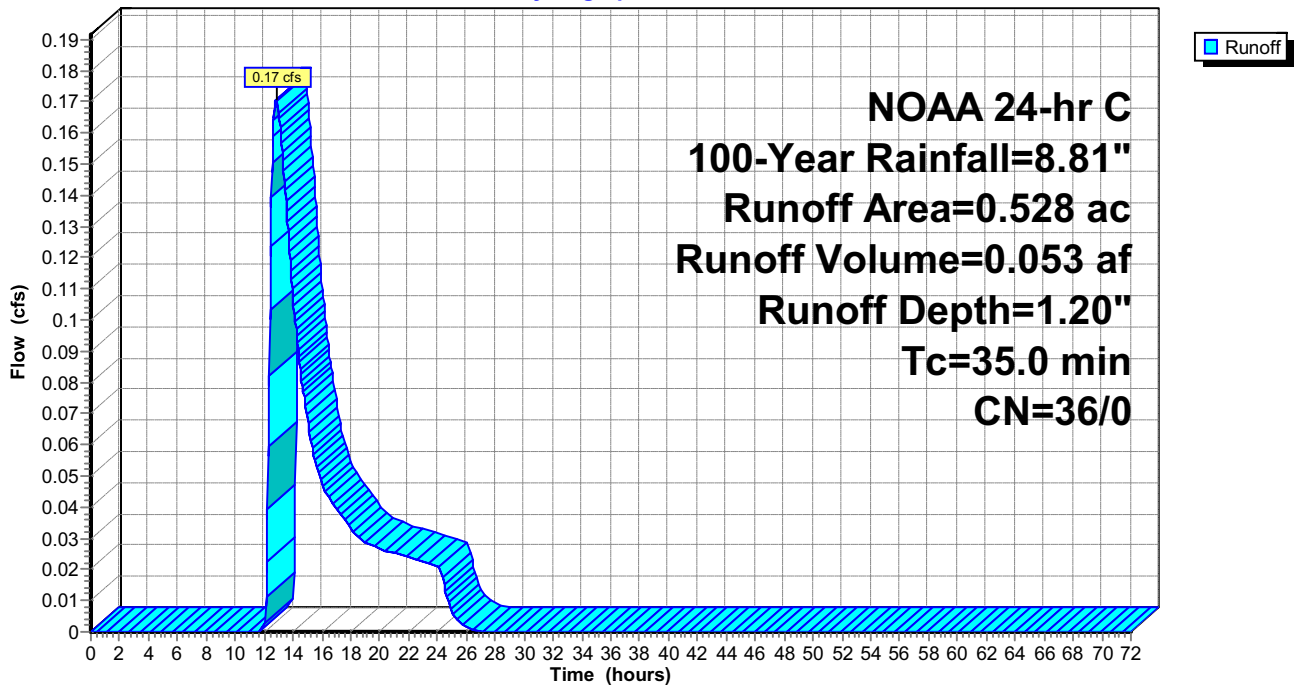
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.528	36	Woods, Fair, HSG A
0.528	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment EX-A1-Perv: A1-Perv**

Hydrograph





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**Summary for Subcatchment EX-B1-Perv: B1-Perv**

Runoff = 0.69 cfs @ 12.95 hrs, Volume= 0.236 af, Depth= 1.20"

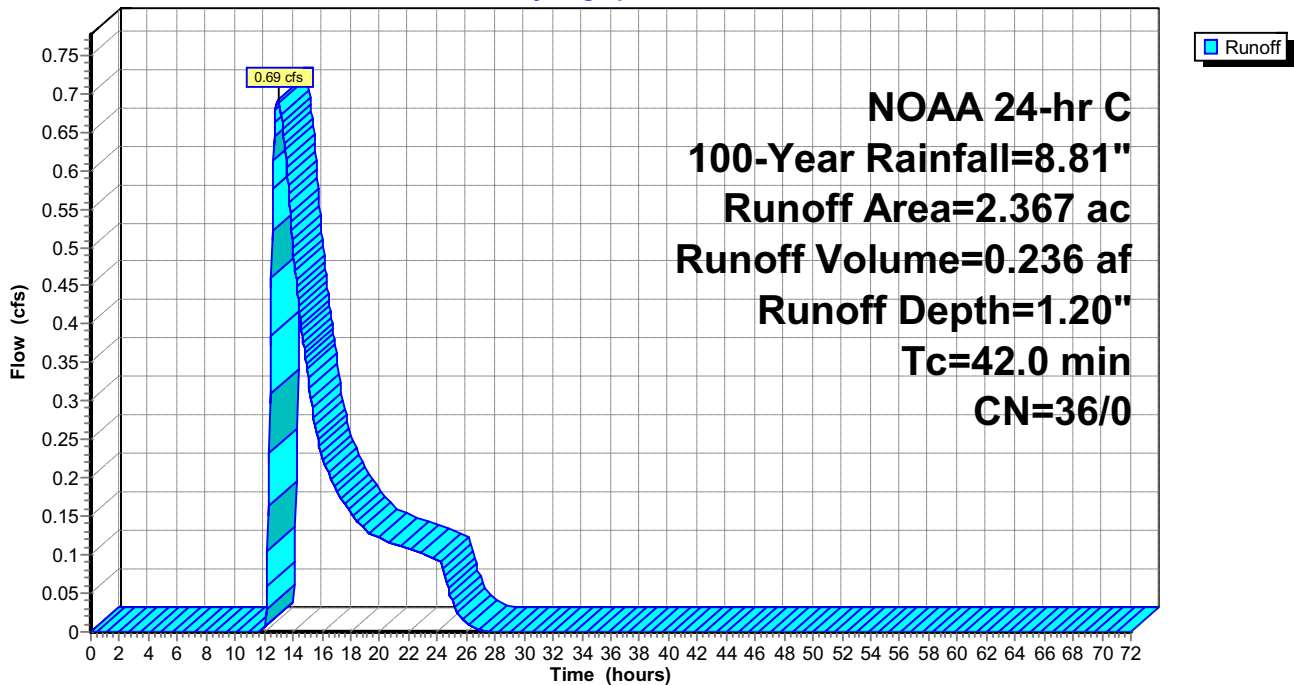
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
2.367	36	Woods, Fair, HSG A
2.367	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0					Direct Entry, TC-PRE-B1 - TC-PRE-B2

**Subcatchment EX-B1-Perv: B1-Perv**

Hydrograph



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## Summary for Subcatchment EX-C1-Perv: C1-Perv

Runoff = 1.67 cfs @ 12.75 hrs, Volume= 0.481 af, Depth= 1.20"

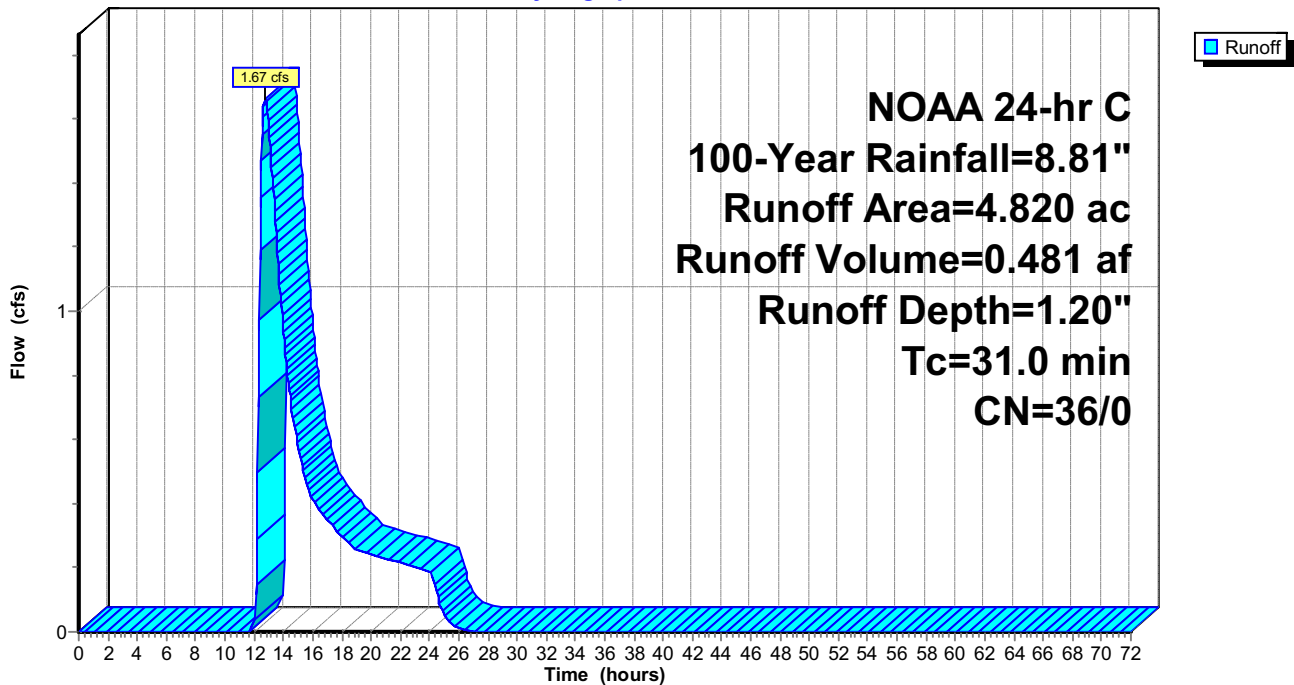
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
4.820	36	Woods, Fair, HSG A
4.820	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					Direct Entry, TC-PRE-C1 - TC-PRE-C2

## Subcatchment EX-C1-Perv: C1-Perv

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**Summary for Subcatchment EX-Off-I1: Off-Imp-1**

Runoff = 1.44 cfs @ 12.25 hrs, Volume= 0.199 af, Depth= 8.57"

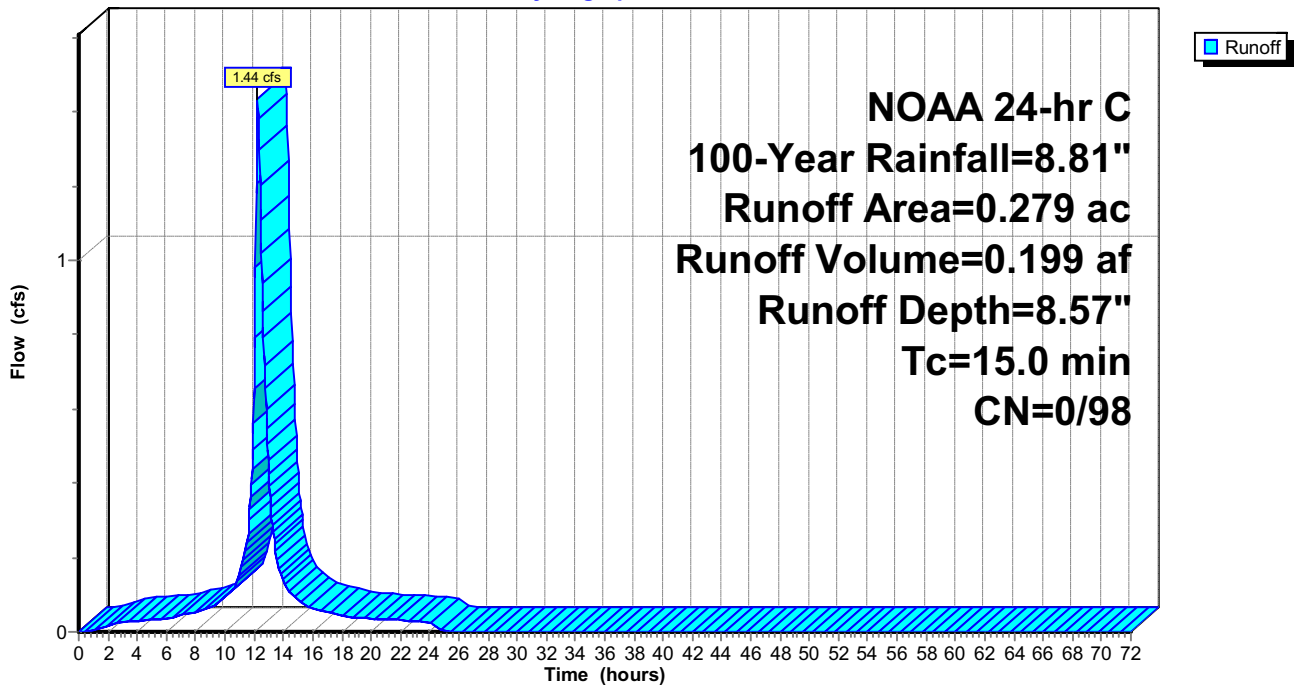
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.279	98	Paved parking, HSG A
0.279	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment EX-Off-I1: Off-Imp-1**

Hydrograph



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**Summary for Subcatchment EX-Off-I2: Off-Imp-2**

Runoff = 1.87 cfs @ 12.39 hrs, Volume= 0.306 af, Depth= 6.08"

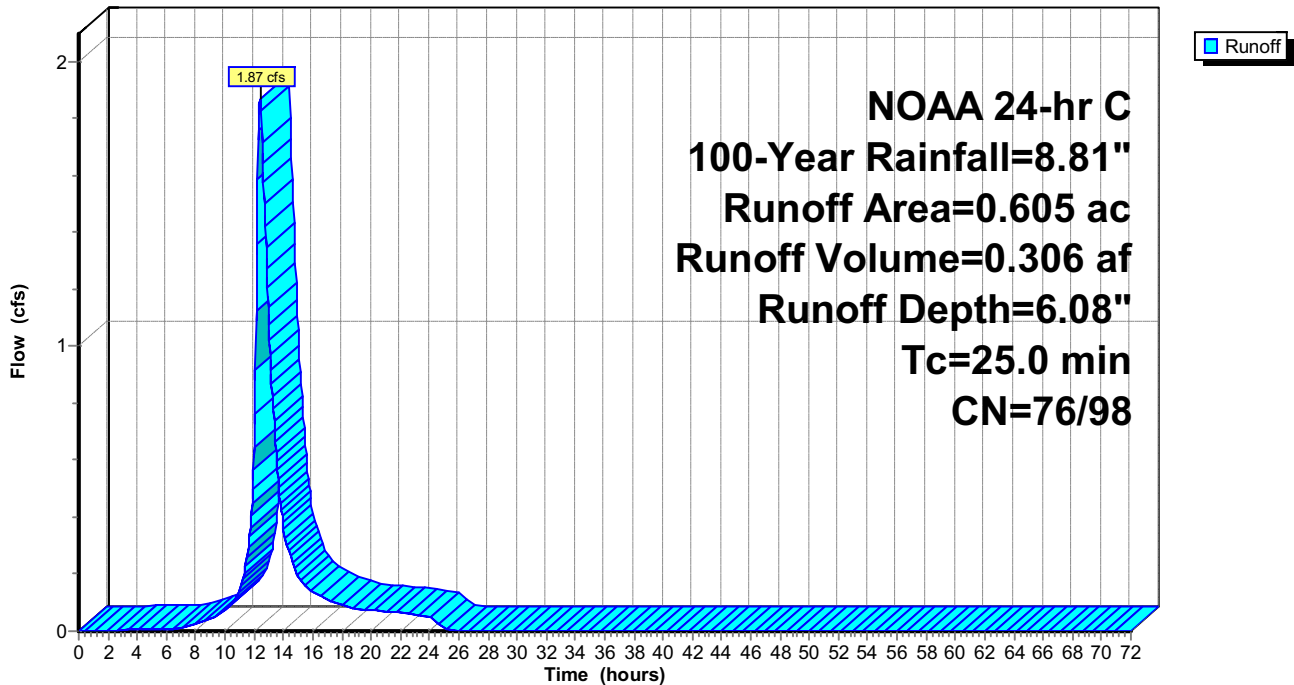
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment EX-Off-I2: Off-Imp-2**

Hydrograph



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**Summary for Subcatchment EX-Off-P1: Off-Perv-1**

Runoff = 0.20 cfs @ 12.35 hrs, Volume= 0.035 af, Depth= 1.51"

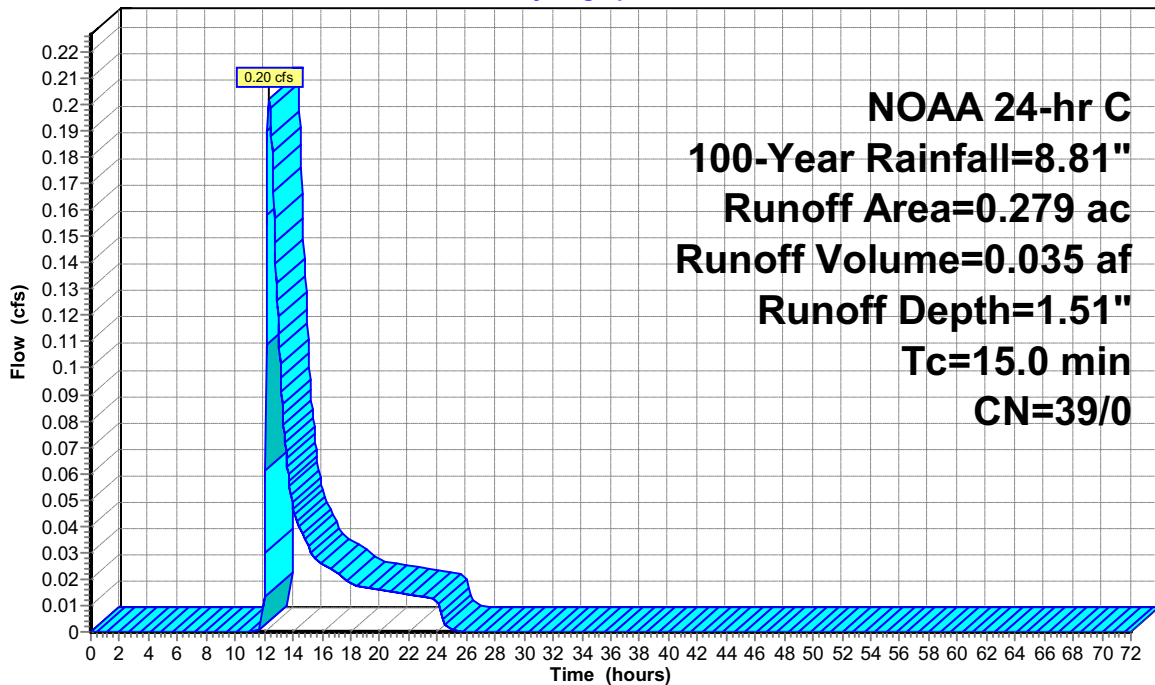
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment EX-Off-P1: Off-Perv-1**

Hydrograph



Runoff

**NOAA 24-hr C  
 100-Year Rainfall=8.81"  
 Runoff Area=0.279 ac  
 Runoff Volume=0.035 af  
 Runoff Depth=1.51"  
 Tc=15.0 min  
 CN=39/0**

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## Summary for Subcatchment EX-Off-P2: Off-Perv-2

Runoff = 3.44 cfs @ 12.41 hrs, Volume= 0.568 af, Depth= 4.07"

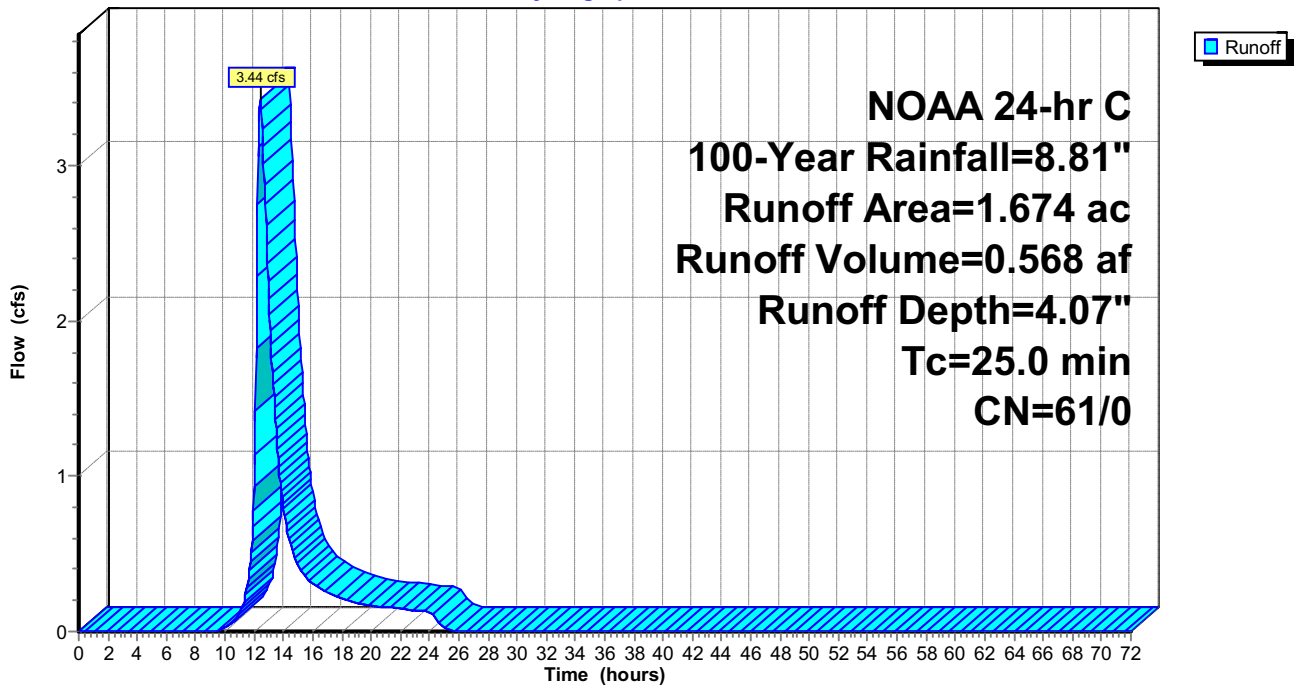
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

## Subcatchment EX-Off-P2: Off-Perv-2

Hydrograph



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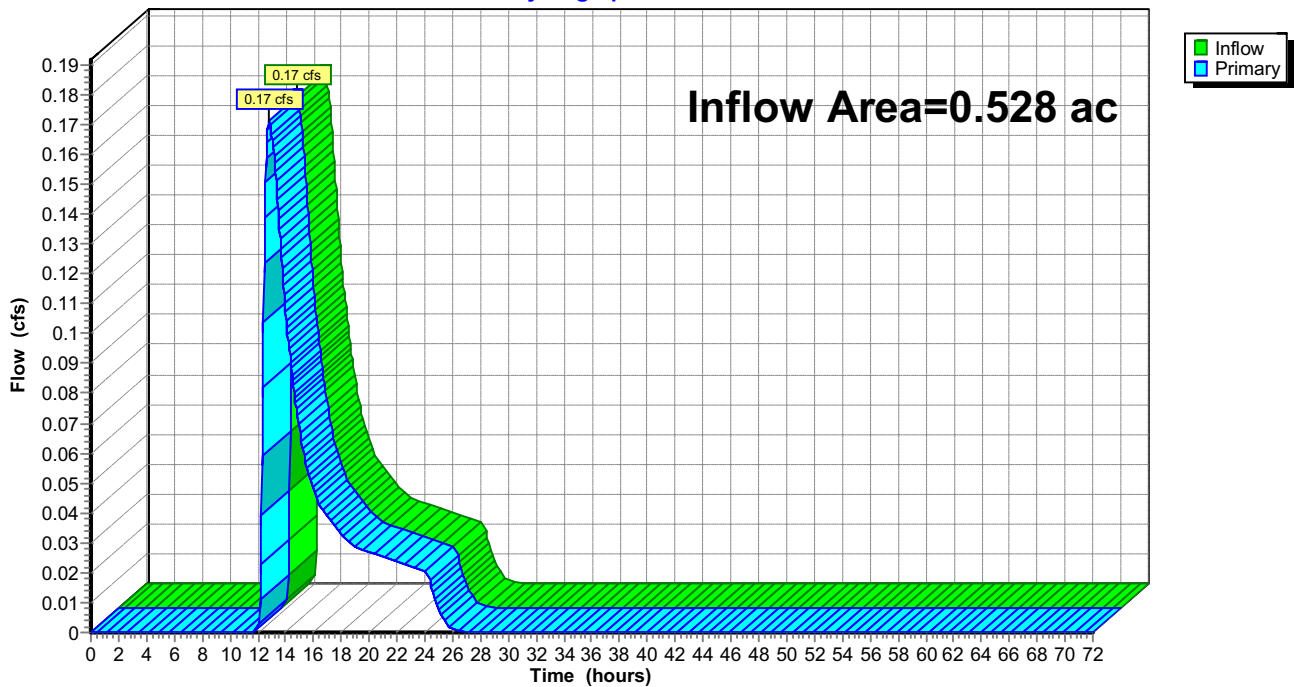
**Summary for Link EX-A1: A1**

Inflow Area = 0.528 ac, 0.00% Impervious, Inflow Depth = 1.20" for 100-Year event  
Inflow = 0.17 cfs @ 12.82 hrs, Volume= 0.053 af  
Primary = 0.17 cfs @ 12.82 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-A1: A1**

Hydrograph



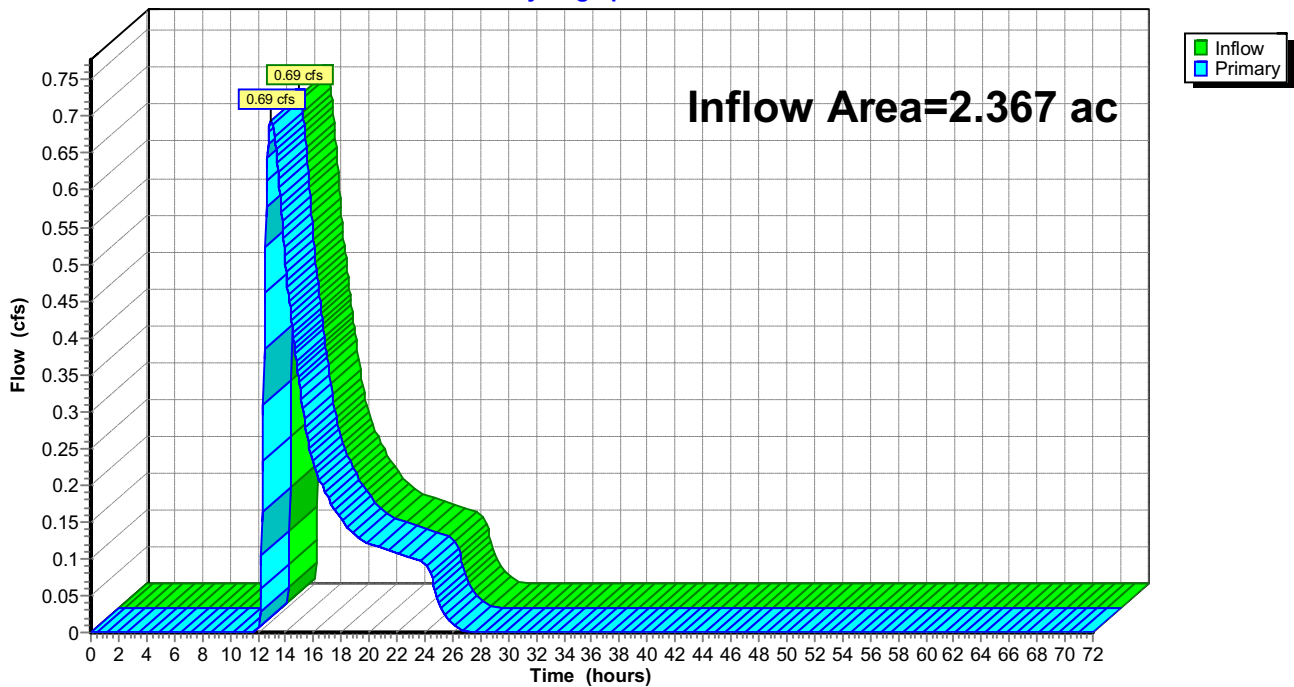
### Summary for Link EX-B1: B1

Inflow Area = 2.367 ac, 0.00% Impervious, Inflow Depth = 1.20" for 100-Year event  
Inflow = 0.69 cfs @ 12.95 hrs, Volume= 0.236 af  
Primary = 0.69 cfs @ 12.95 hrs, Volume= 0.236 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link EX-B1: B1

Hydrograph





**NYC19-0005\_offsite\_Final\_2**

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4301 US Route 130, Edgewater Park  
NOAA 24-hr C 100-Year Rainfall=8.81"

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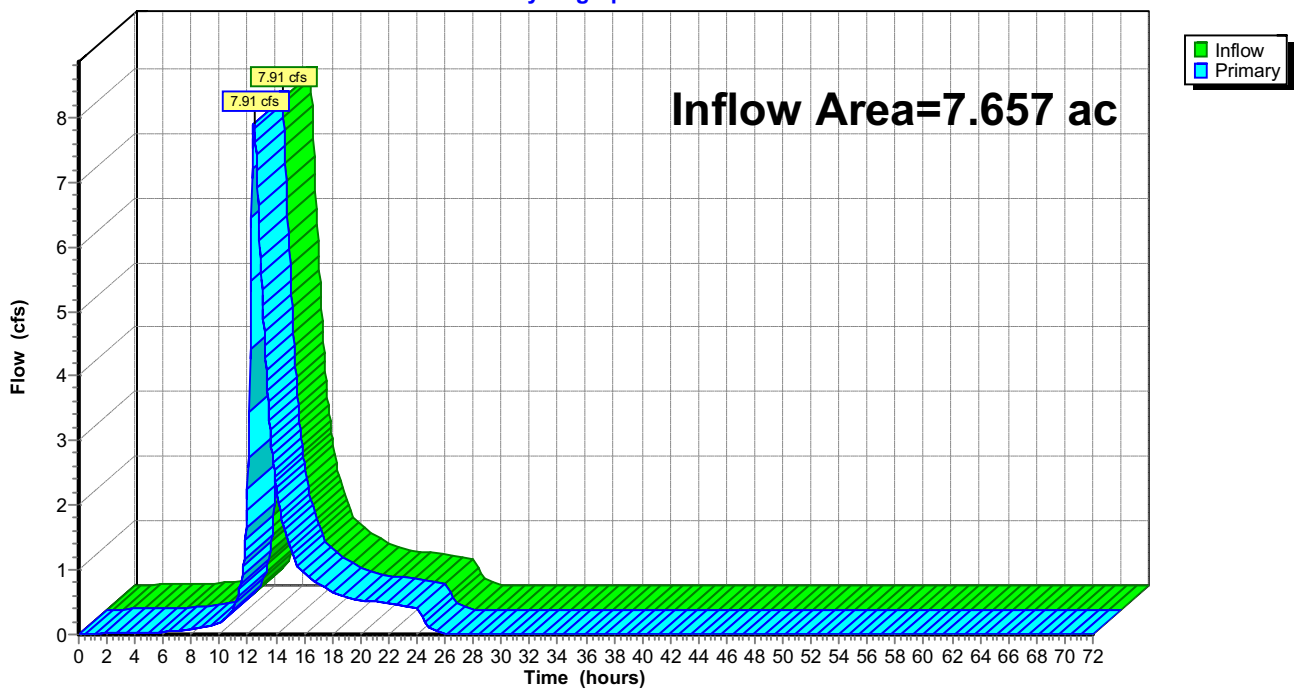
**Summary for Link EX-C1: C1**

Inflow Area = 7.657 ac, 4.17% Impervious, Inflow Depth = 2.49" for 100-Year event  
Inflow = 7.91 cfs @ 12.43 hrs, Volume= 1.591 af  
Primary = 7.91 cfs @ 12.43 hrs, Volume= 1.591 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-C1: C1**

Hydrograph



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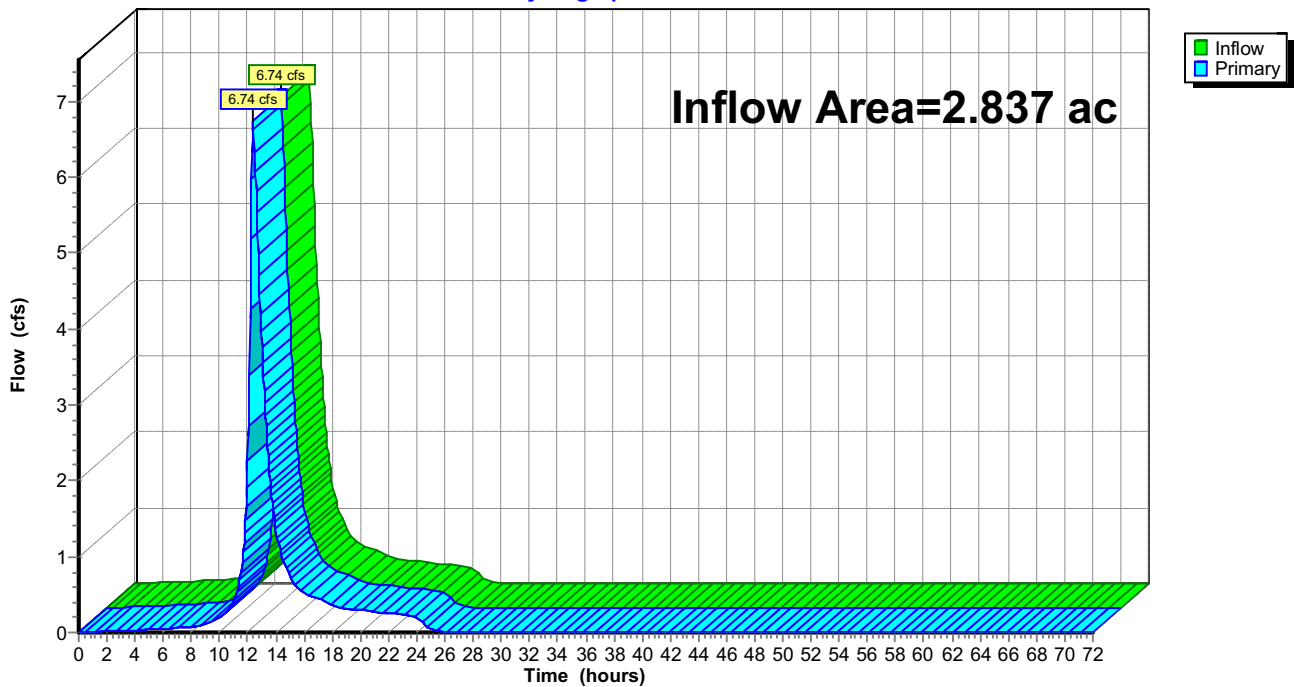
**Summary for Link EX-Off: Offsite**

Inflow Area = 2.837 ac, 11.24% Impervious, Inflow Depth = 4.69" for 100-Year event  
Inflow = 6.74 cfs @ 12.37 hrs, Volume= 1.109 af  
Primary = 6.74 cfs @ 12.37 hrs, Volume= 1.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link EX-Off: Offsite**

Hydrograph



# WARE MALCOMB

ARCHITECTURE

INTERIORS

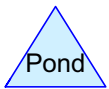
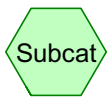
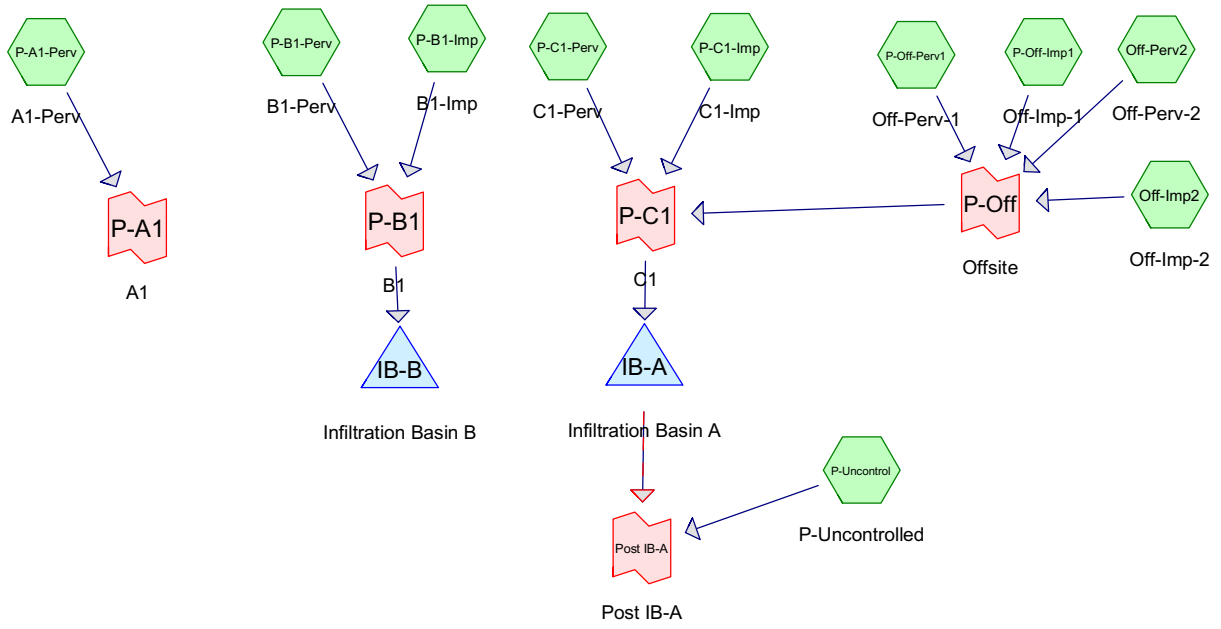
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix C



**Routing Diagram for NYC19-0005\_offsite\_Final\_2**  
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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
 Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment Off-Imp2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=1.39" Tc=25.0 min CN=76/98 Runoff=0.41 cfs 0.070 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=0.51" Tc=25.0 min CN=61/0 Runoff=0.29 cfs 0.071 af
<b>Subcatchment P-A1-Perv: A1-Perv</b>	Runoff Area=0.426 ac 0.00% Impervious Runoff Depth=0.00" Tc=35.0 min CN=36/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment P-B1-Imp: B1-Imp</b>	Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=3.13" Tc=10.0 min CN=0/98 Runoff=2.18 cfs 0.243 af
<b>Subcatchment P-B1-Perv: B1-Perv</b>	Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=0.00" Tc=42.0 min CN=37/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment P-C1-Imp: C1-Imp</b>	Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=3.13" Tc=10.0 min CN=0/98 Runoff=7.02 cfs 0.786 af
<b>Subcatchment P-C1-Perv: C1-Perv</b>	Runoff Area=1.502 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment P-Off-Imp1: Off-Imp-1</b>	Runoff Area=0.100 ac 100.00% Impervious Runoff Depth=3.13" Tc=15.0 min CN=0/98 Runoff=0.19 cfs 0.026 af
<b>Subcatchment P-Off-Perv1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=0.00" Tc=15.0 min CN=39/0 Runoff=0.00 cfs 0.000 af
<b>Subcatchment P-Uncontrol: P-Uncontrolled</b>	Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39/0 Runoff=0.00 cfs 0.000 af
<b>Pond IB-A: Infiltration Basin A</b>	Peak Elev=32.81' Storage=0.954 af Inflow=7.56 cfs 0.954 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
<b>Pond IB-B: Infiltration Basin B</b>	Peak Elev=31.39' Storage=0.243 af Inflow=2.18 cfs 0.243 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
<b>Link P-A1: A1</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link P-B1: B1</b>	Inflow=2.18 cfs 0.243 af Primary=2.18 cfs 0.243 af
<b>Link P-C1: C1</b>	Inflow=7.56 cfs 0.954 af Primary=7.56 cfs 0.954 af
<b>Link P-Off: Offsite</b>	Inflow=0.84 cfs 0.167 af Primary=0.84 cfs 0.167 af

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**Link Post IB-A: Post IB-A**

Inflow=0.00 cfs 0.000 af

Primary=0.00 cfs 0.000 af

**Total Runoff Area = 10.468 ac   Runoff Volume = 1.197 af   Average Runoff Depth = 1.37"**  
**60.93% Pervious = 6.378 ac   39.07% Impervious = 4.090 ac**

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**Summary for Subcatchment Off-Imp2: Off-Imp-2**

Runoff = 0.41 cfs @ 12.42 hrs, Volume= 0.070 af, Depth= 1.39"

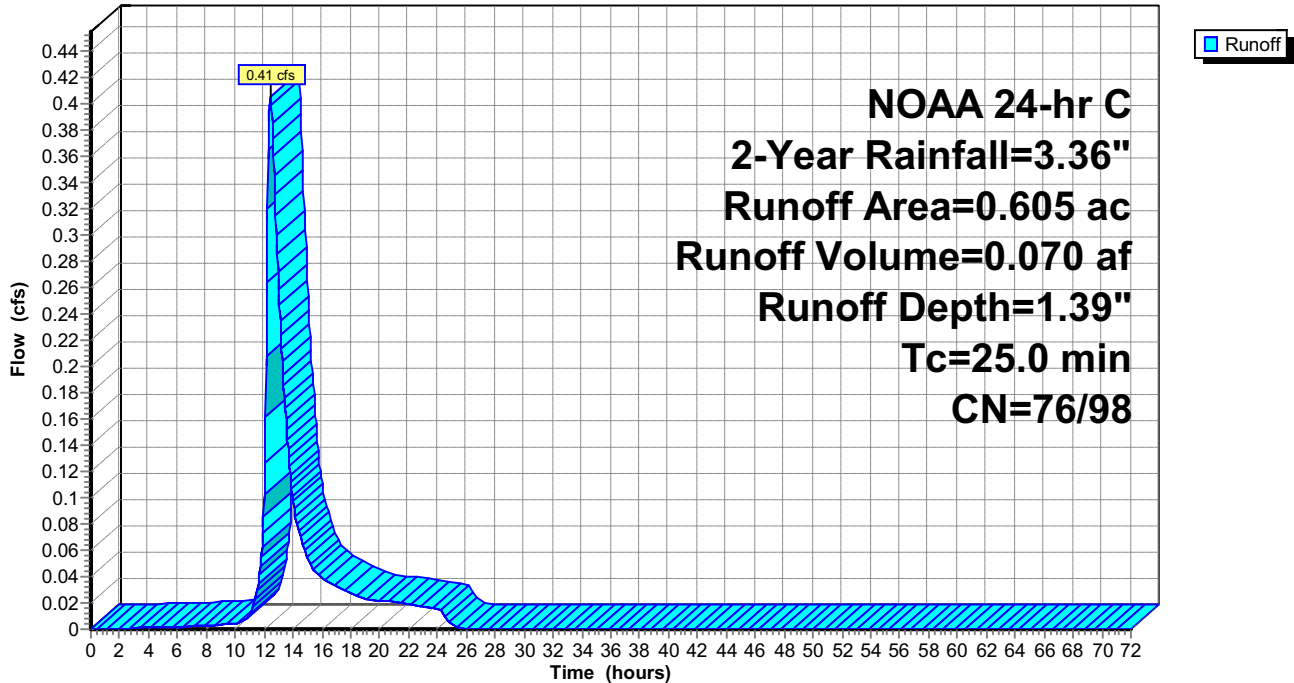
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Imp2: Off-Imp-2**

Hydrograph



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**Summary for Subcatchment Off-Perv2: Off-Perv-2**

Runoff = 0.29 cfs @ 12.60 hrs, Volume= 0.071 af, Depth= 0.51"

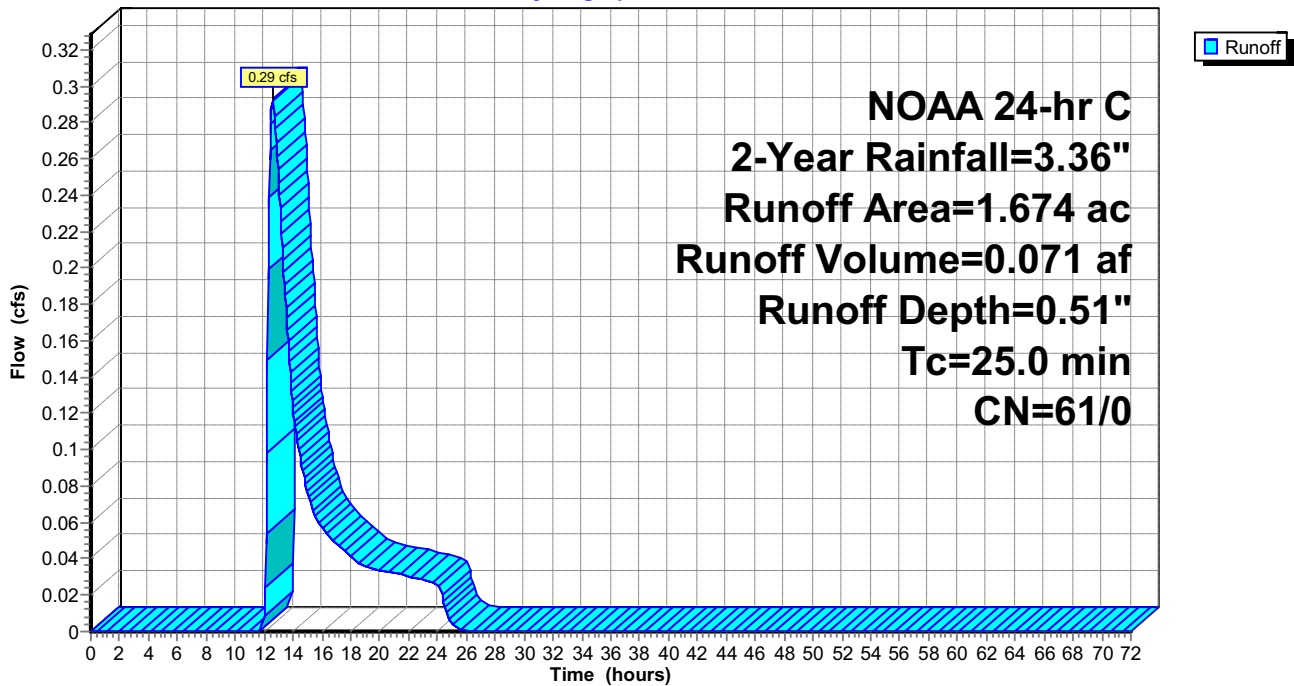
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Perv2: Off-Perv-2**

Hydrograph





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**Summary for Subcatchment P-A1-Perv: A1-Perv**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

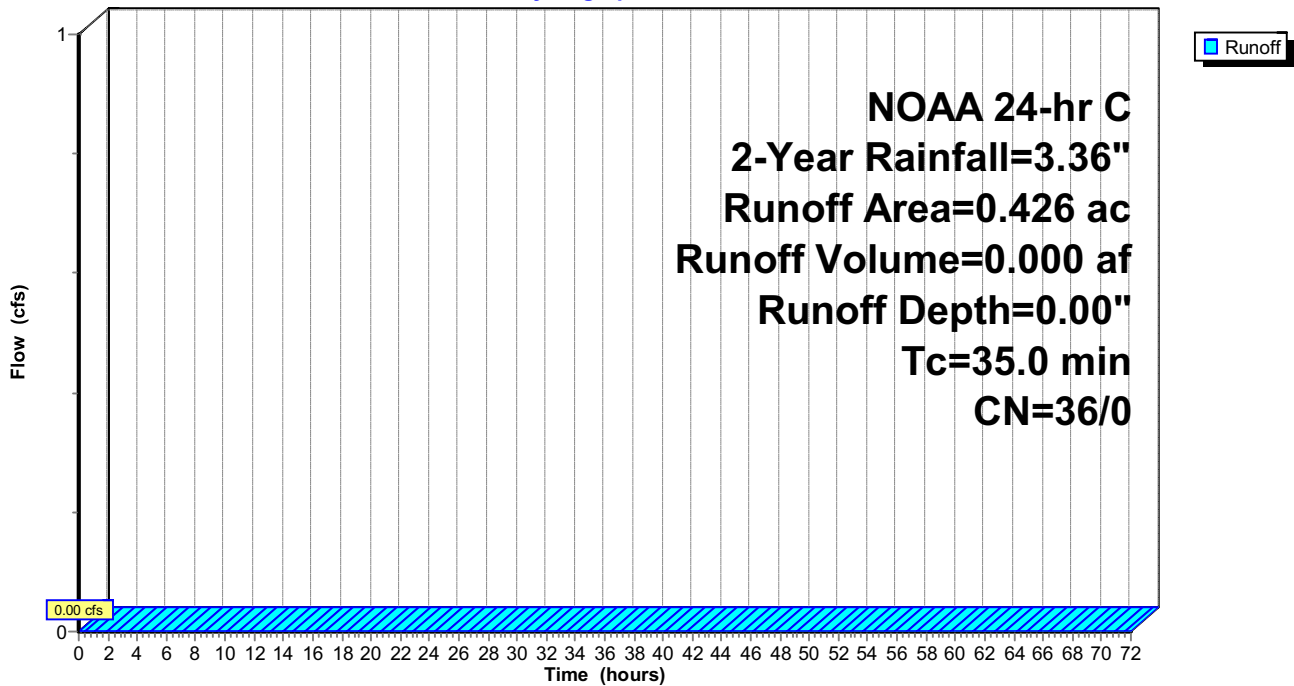
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.419	36	Woods, Fair, HSG A
0.007	39	>75% Grass cover, Good, HSG A
0.426	36	Weighted Average
0.426	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment P-A1-Perv: A1-Perv**

Hydrograph



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## Summary for Subcatchment P-B1-Imp: B1-Imp

Runoff = 2.18 cfs @ 12.19 hrs, Volume= 0.243 af, Depth= 3.13"

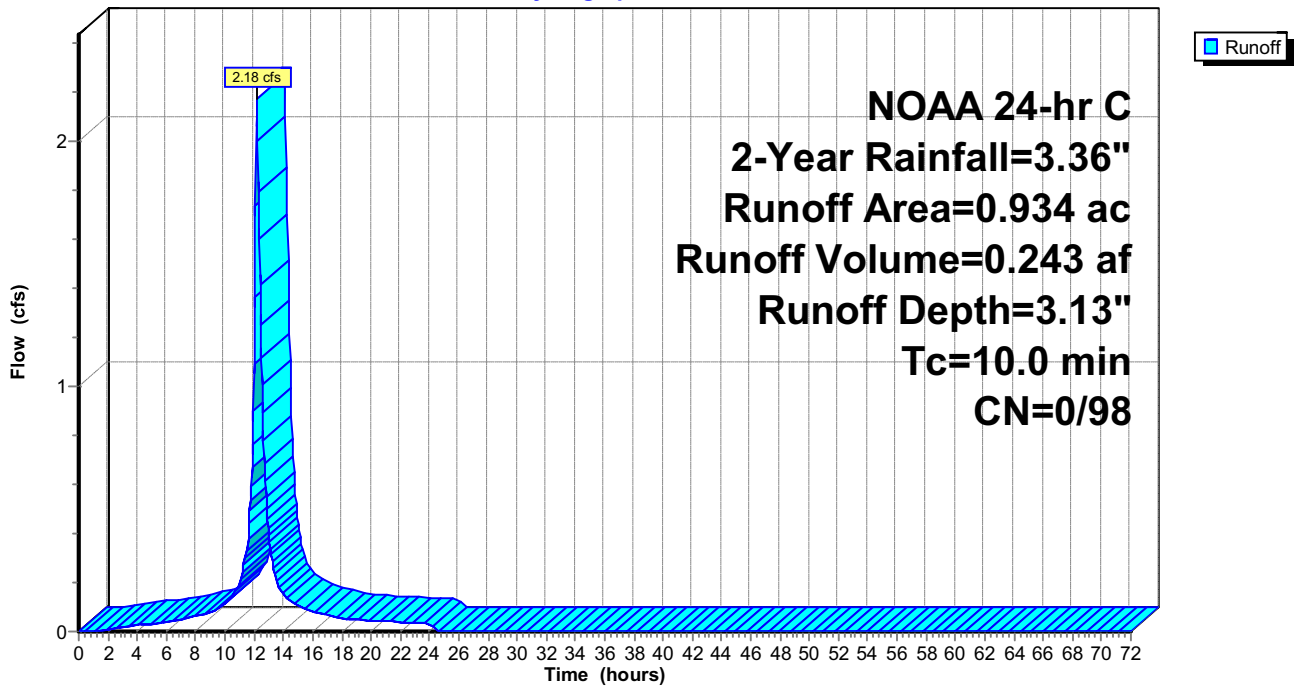
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.563	98	Paved parking, HSG A
0.371	98	Roofs, HSG A
0.934	98	Weighted Average
0.934	98	100.00% Impervious Area

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

## Subcatchment P-B1-Imp: B1-Imp

Hydrograph



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**Summary for Subcatchment P-B1-Perv: B1-Perv**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

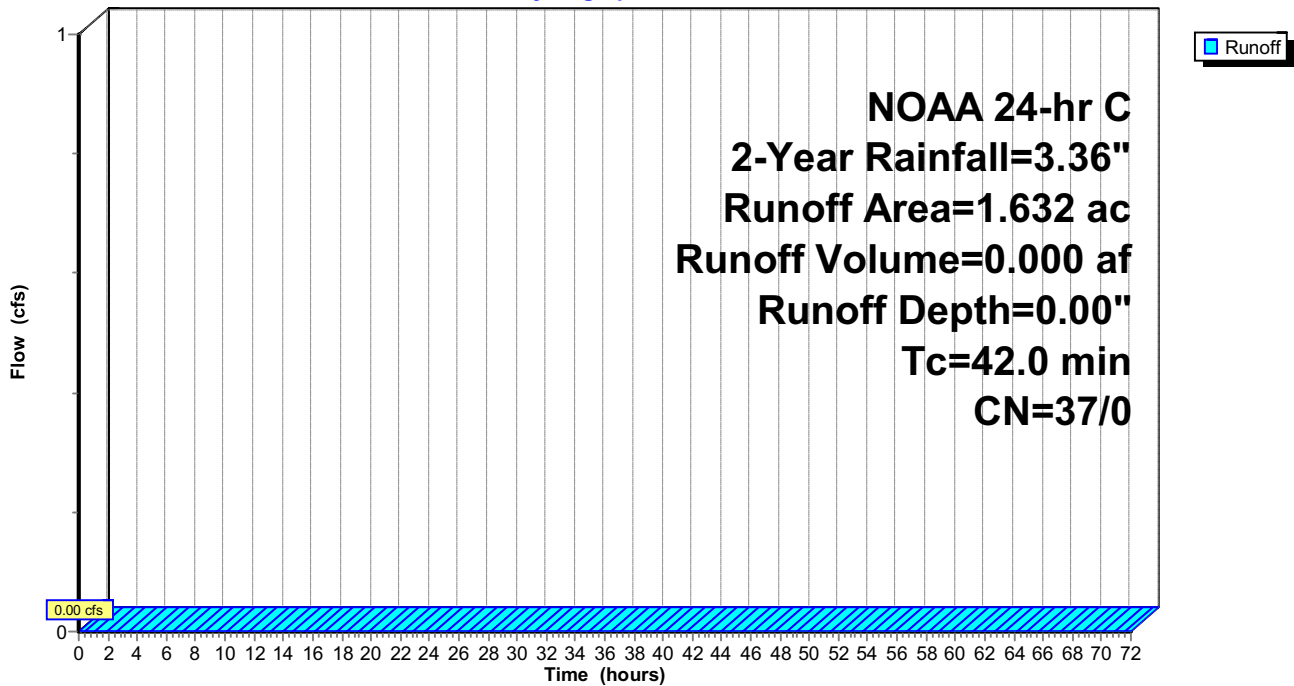
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.926	36	Woods, Fair, HSG A
0.706	39	>75% Grass cover, Good, HSG A
1.632	37	Weighted Average
1.632	37	100.00% Pervious Area

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

**Subcatchment P-B1-Perv: B1-Perv**

Hydrograph



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## Summary for Subcatchment P-C1-Imp: C1-Imp

Runoff = 7.02 cfs @ 12.19 hrs, Volume= 0.786 af, Depth= 3.13"

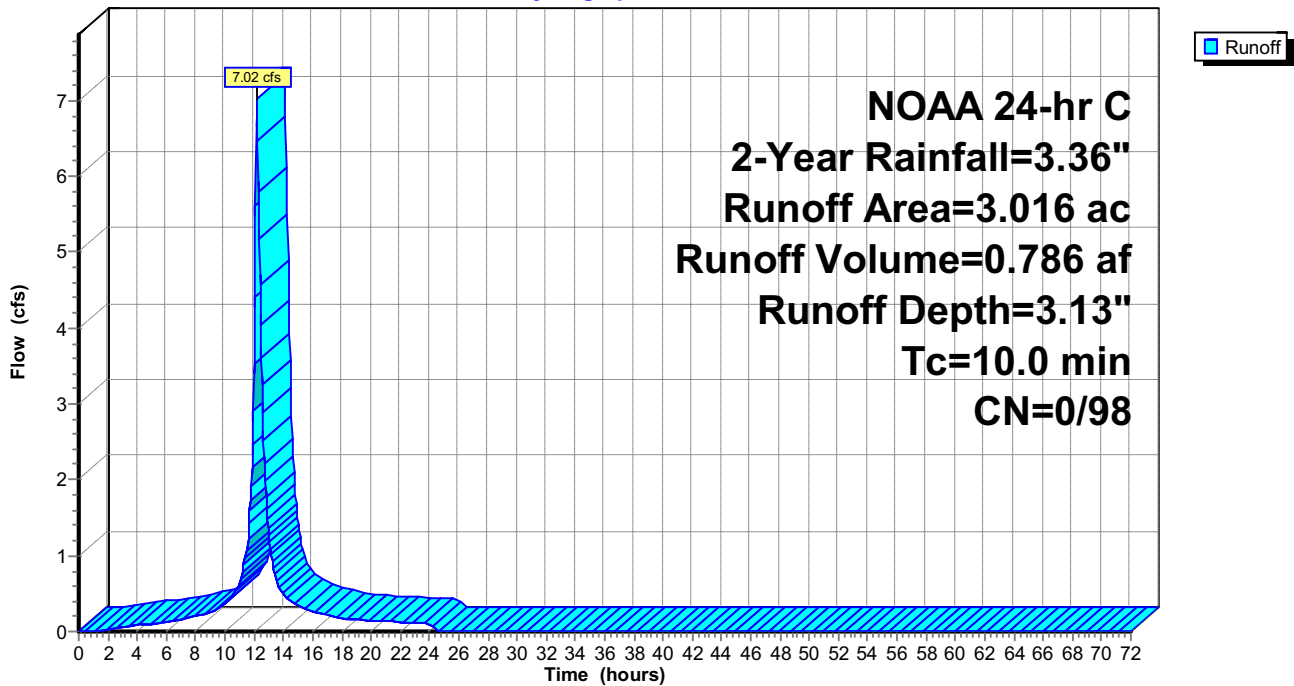
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
1.498	98	Paved parking, HSG A
1.518	98	Roofs, HSG A
3.016	98	Weighted Average
3.016	98	100.00% Impervious Area

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

## Subcatchment P-C1-Imp: C1-Imp

Hydrograph



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**Summary for Subcatchment P-C1-Perv: C1-Perv**

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

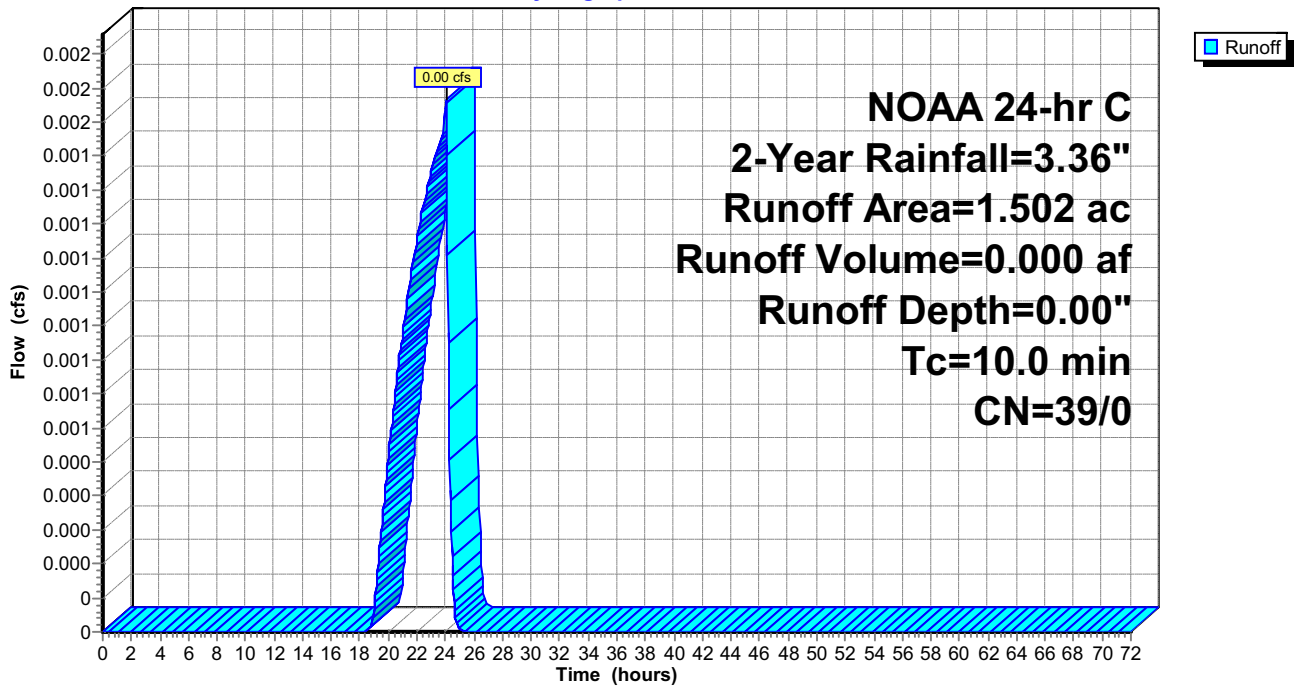
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
1.502	39	>75% Grass cover, Good, HSG A
1.502	39	100.00% Pervious Area

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

**Subcatchment P-C1-Perv: C1-Perv**

Hydrograph



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## Summary for Subcatchment P-Off-Imp1: Off-Imp-1

Runoff = 0.19 cfs @ 12.25 hrs, Volume= 0.026 af, Depth= 3.13"

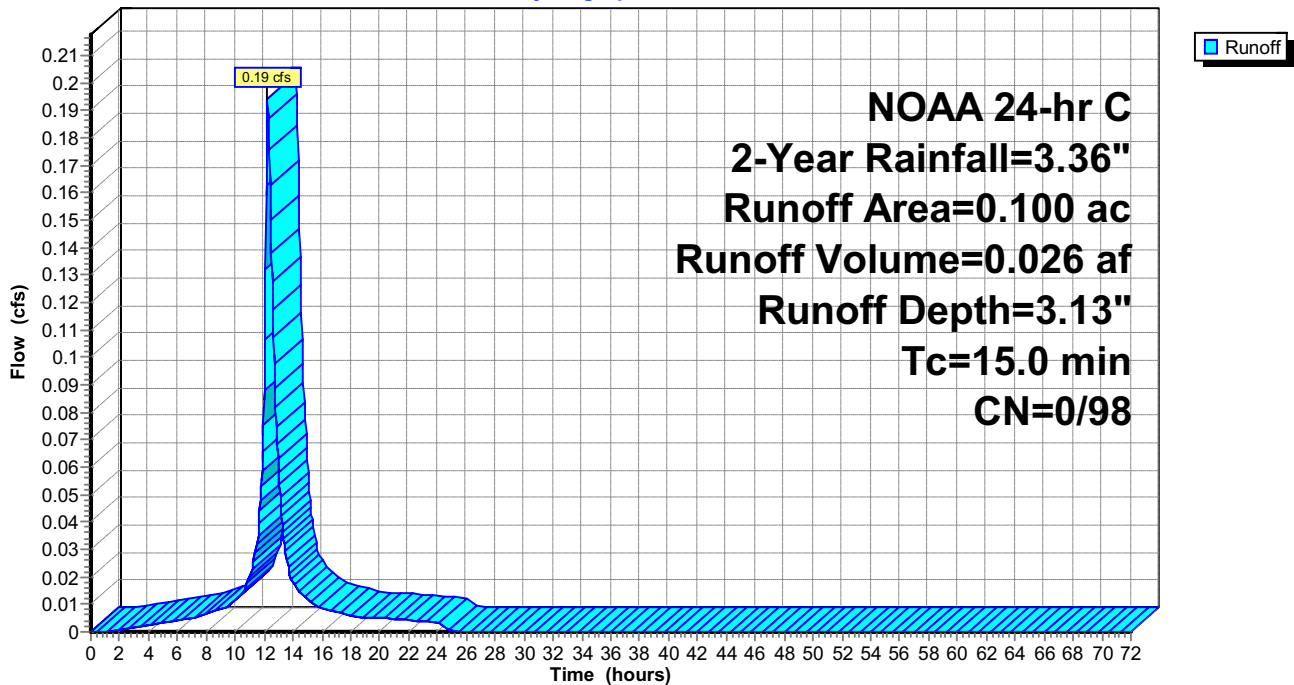
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.100	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

## Subcatchment P-Off-Imp1: Off-Imp-1

Hydrograph



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## Summary for Subcatchment P-Off-Perv1: Off-Perv-1

Runoff = 0.00 cfs @ 24.05 hrs, Volume= 0.000 af, Depth= 0.00"

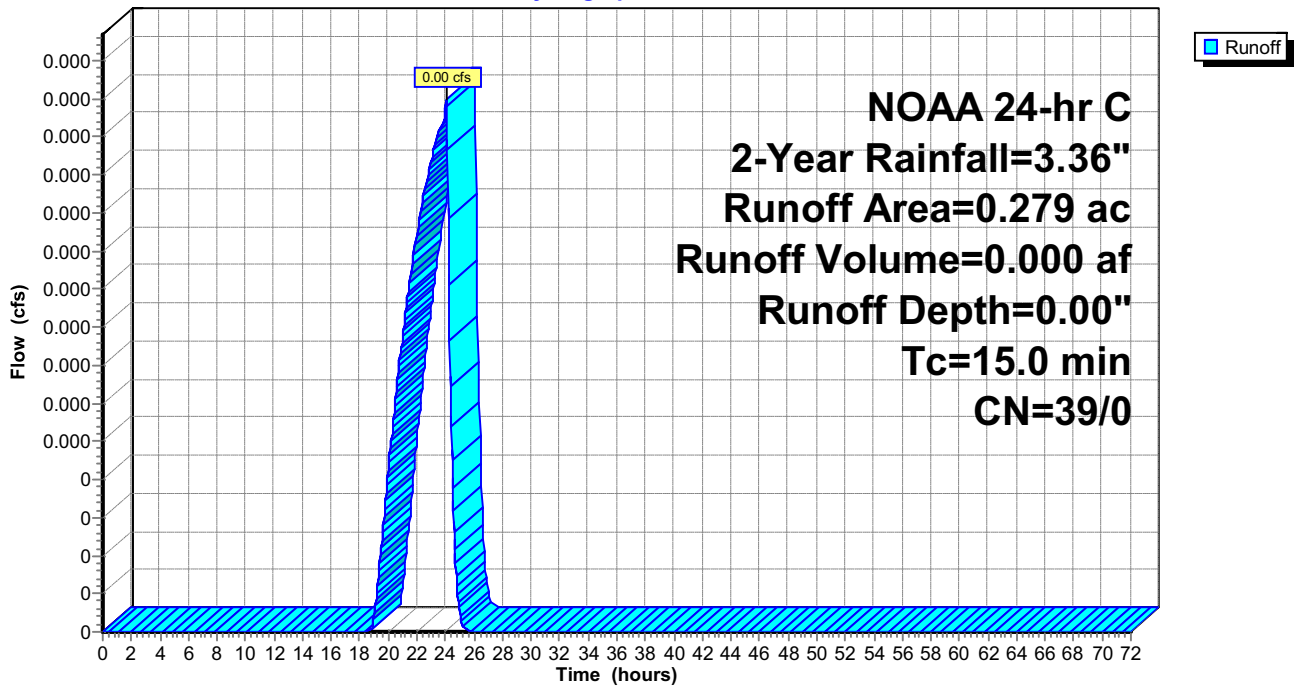
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

## Subcatchment P-Off-Perv1: Off-Perv-1

Hydrograph



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## Summary for Subcatchment P-Uncontrol: P-Uncontrolled

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

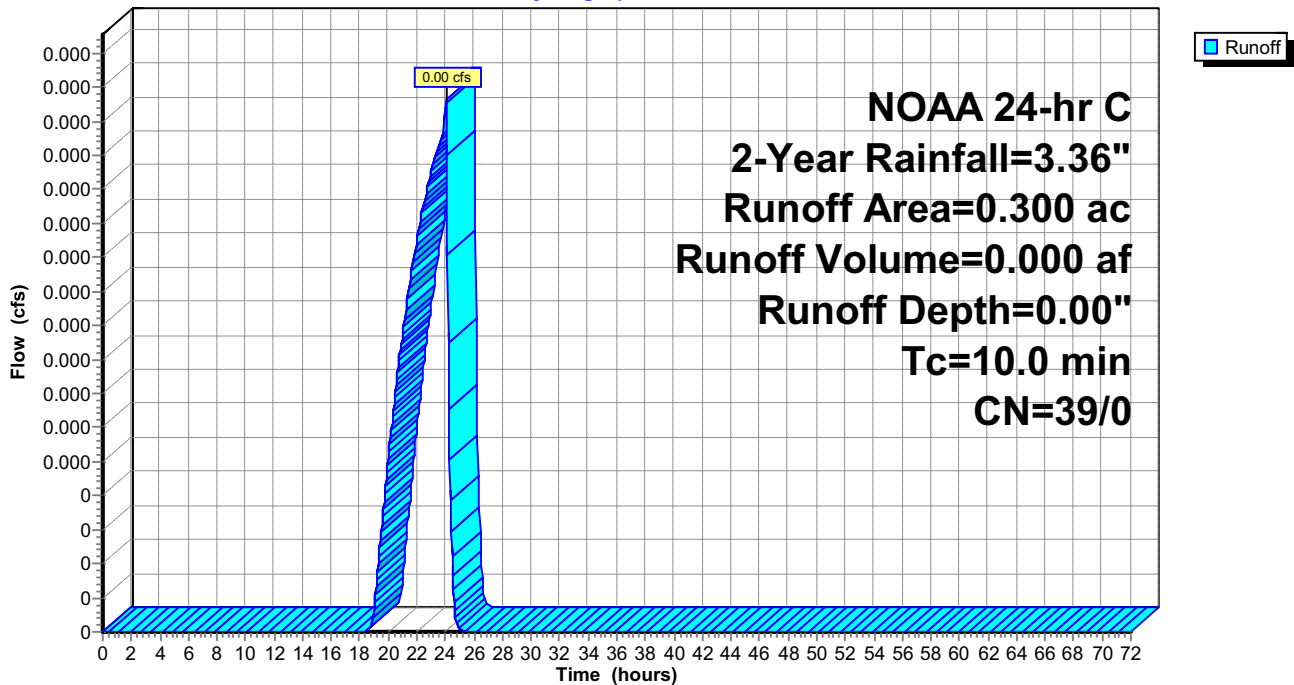
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.300	39	>75% Grass cover, Good, HSG A
0.300	39	100.00% Pervious Area

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

## Subcatchment P-Uncontrol: P-Uncontrolled

Hydrograph





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**Summary for Pond IB-A: Infiltration Basin A**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 1.59" for 2-Year event  
 Inflow = 7.56 cfs @ 12.20 hrs, Volume= 0.954 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.81' @ 26.75 hrs Surf.Area= 0.717 ac Storage= 0.954 af

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	31.40'	2.668 af	<b>Custom Stage Data (Irregular)</b> Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>18.0" W x 12.0" H, R=18.0" Elliptical Culvert X 2.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	34.05'	<b>35.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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
#3	Device 1	33.05'	<b>2.2' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

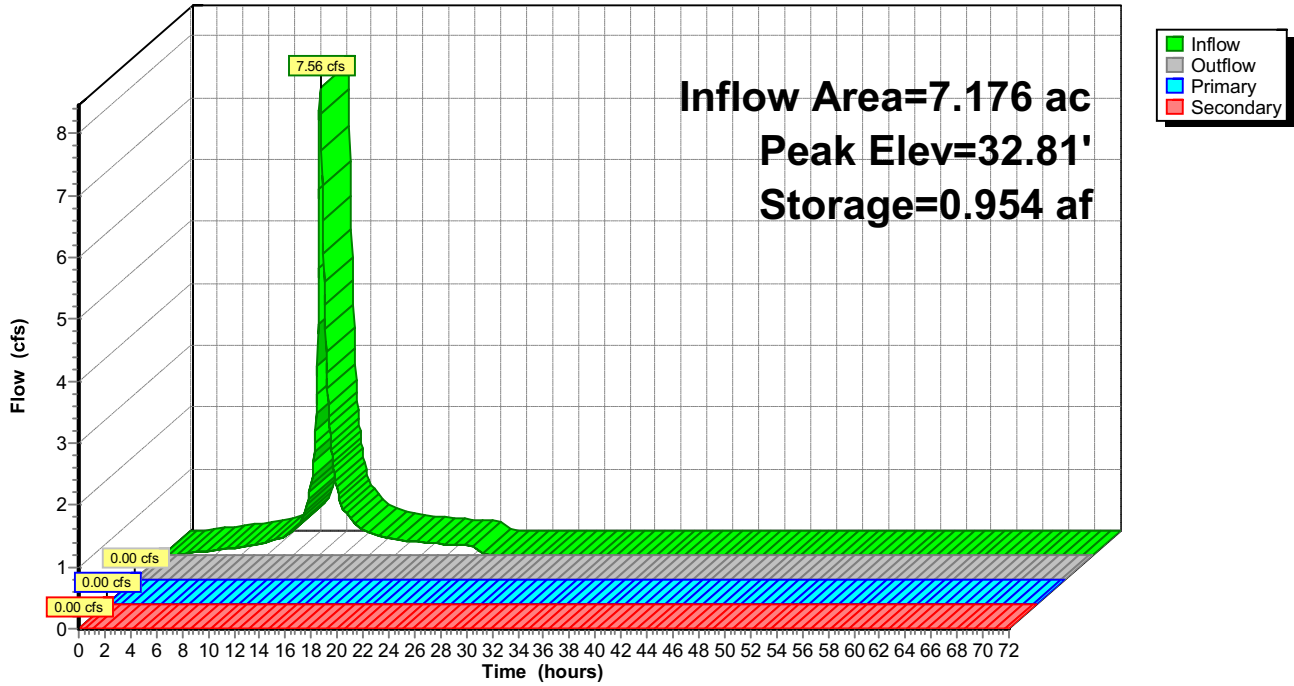
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

- ↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond IB-A: Infiltration Basin A

Hydrograph



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**Summary for Pond IB-B: Infiltration Basin B**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.14" for 2-Year event  
 Inflow = 2.18 cfs @ 12.19 hrs, Volume= 0.243 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 31.39' @ 25.15 hrs Surf.Area= 0.252 ac Storage= 0.243 af

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	30.40'	0.960 af	<b>Custom Stage Data (Irregular)</b> Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
30.40	0.235	491.3	0.000	0.000	0.235
31.00	0.245	498.6	0.144	0.144	0.250
32.00	0.263	510.7	0.254	0.398	0.275
33.00	0.281	522.8	0.272	0.670	0.301
34.00	0.299	535.0	0.290	0.960	0.327

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	<b>15.0" Round Culvert</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.80'	<b>30.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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=30.40' (Free Discharge)

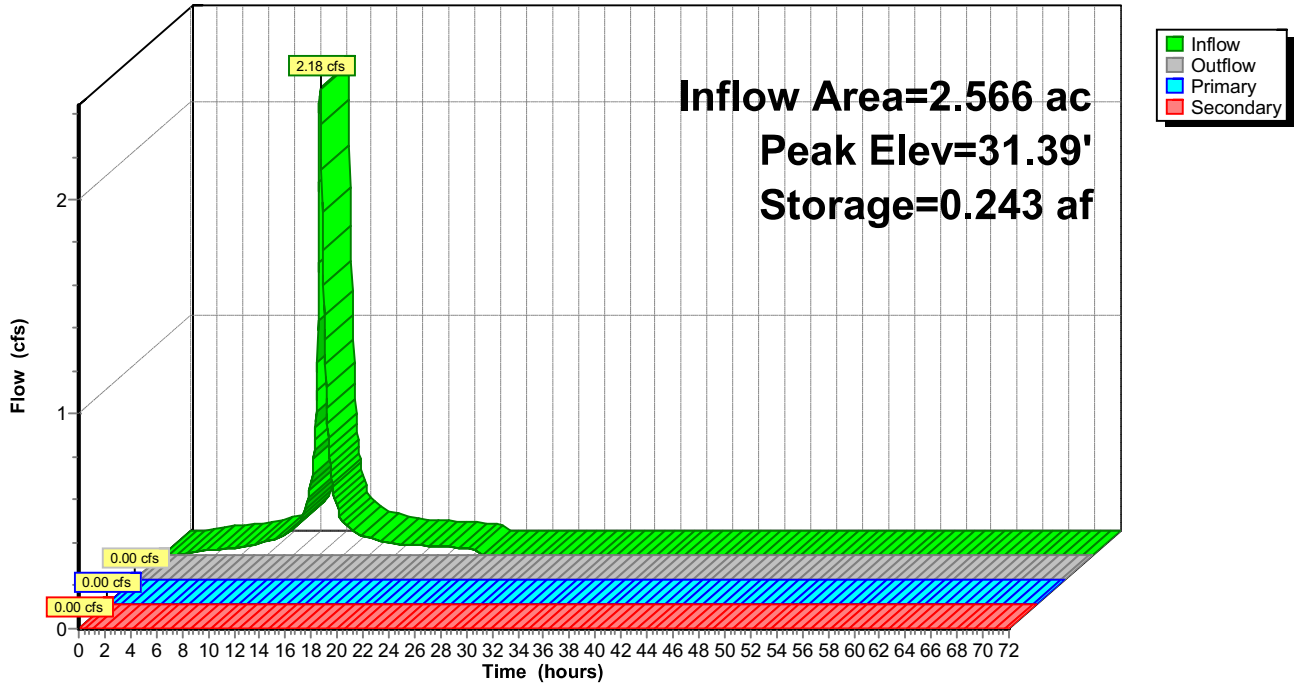
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑2=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=30.40' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond IB-B: Infiltration Basin B

Hydrograph



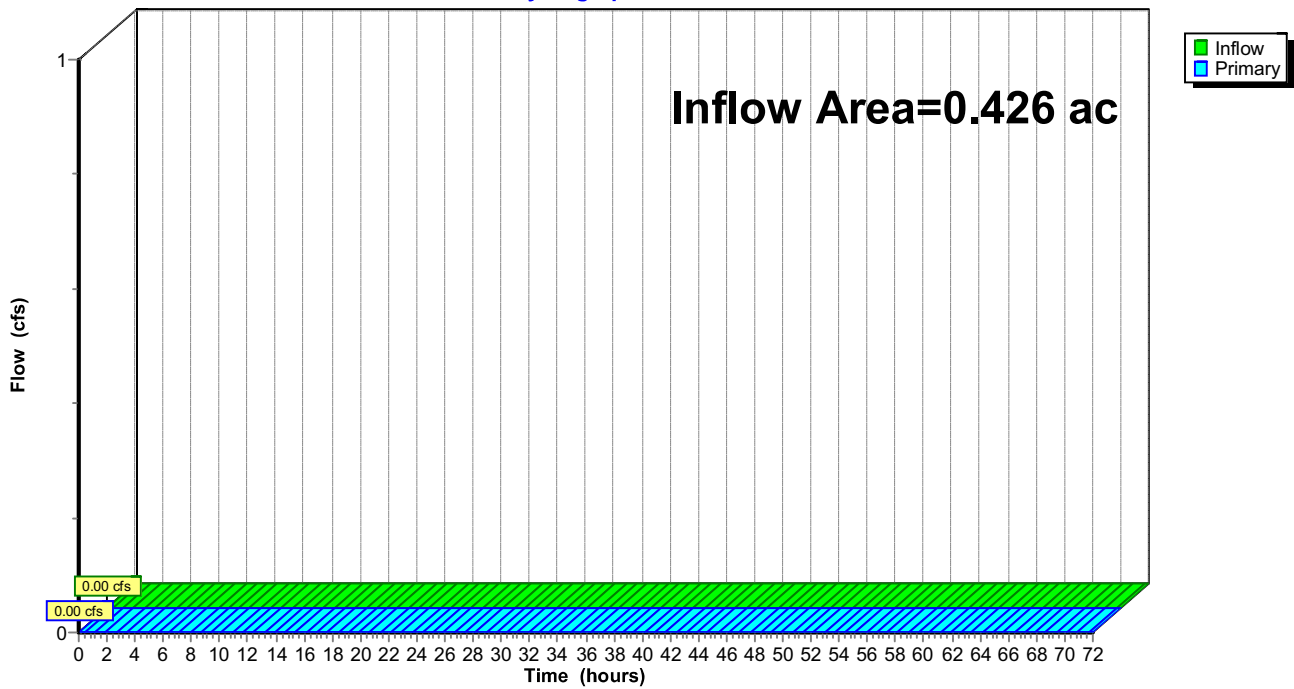
### Summary for Link P-A1: A1

Inflow Area = 0.426 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-A1: A1

Hydrograph



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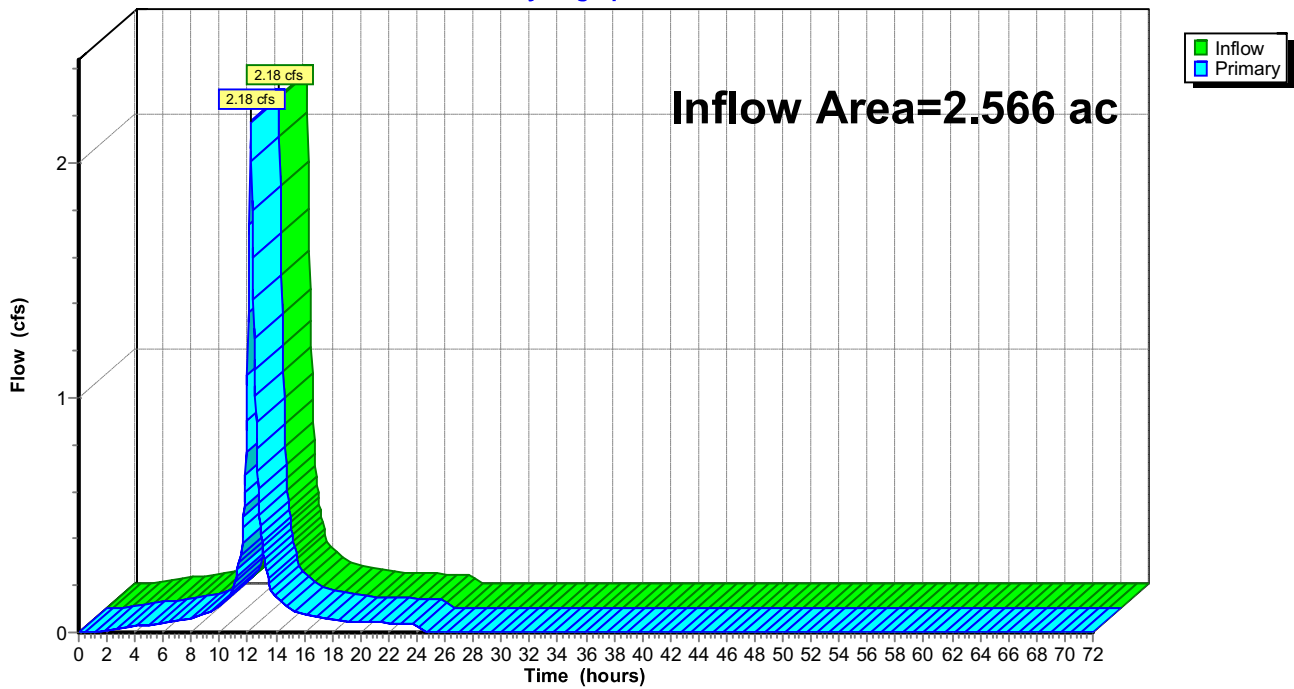
**Summary for Link P-B1: B1**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.14" for 2-Year event  
Inflow = 2.18 cfs @ 12.19 hrs, Volume= 0.243 af  
Primary = 2.18 cfs @ 12.19 hrs, Volume= 0.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link P-B1: B1**

Hydrograph



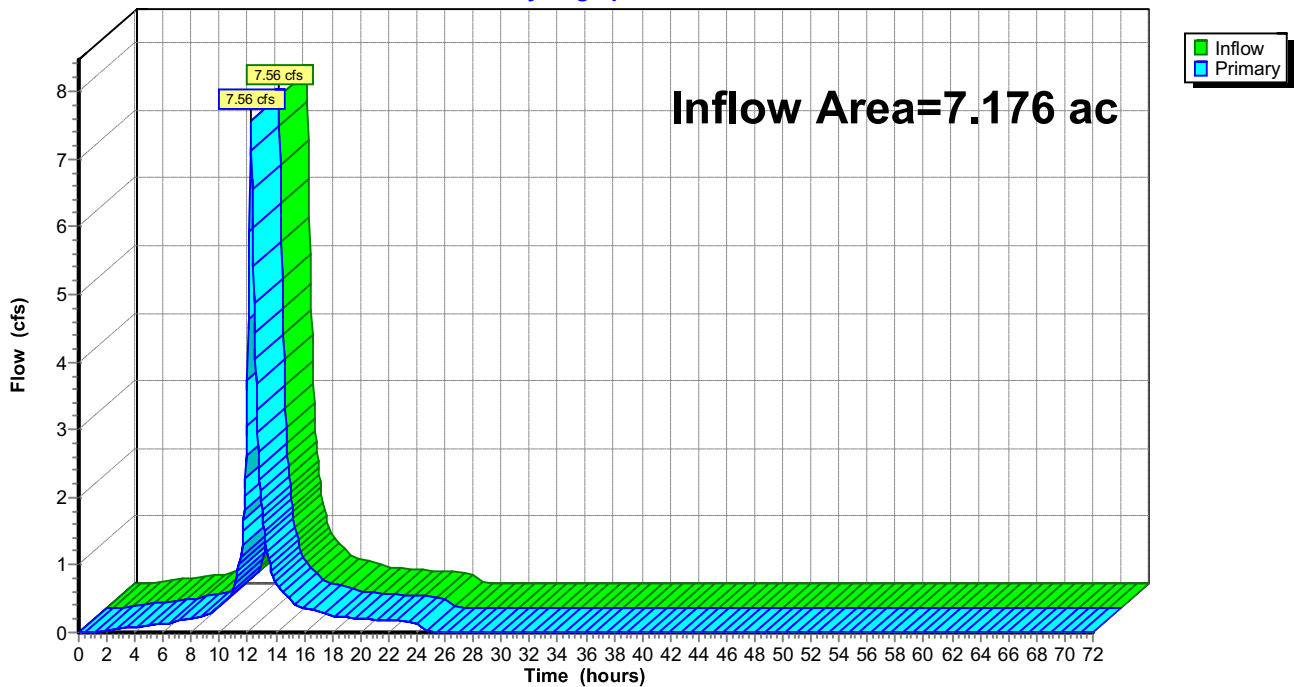
### Summary for Link P-C1: C1

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 1.59" for 2-Year event  
Inflow = 7.56 cfs @ 12.20 hrs, Volume= 0.954 af  
Primary = 7.56 cfs @ 12.20 hrs, Volume= 0.954 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-C1: C1

Hydrograph



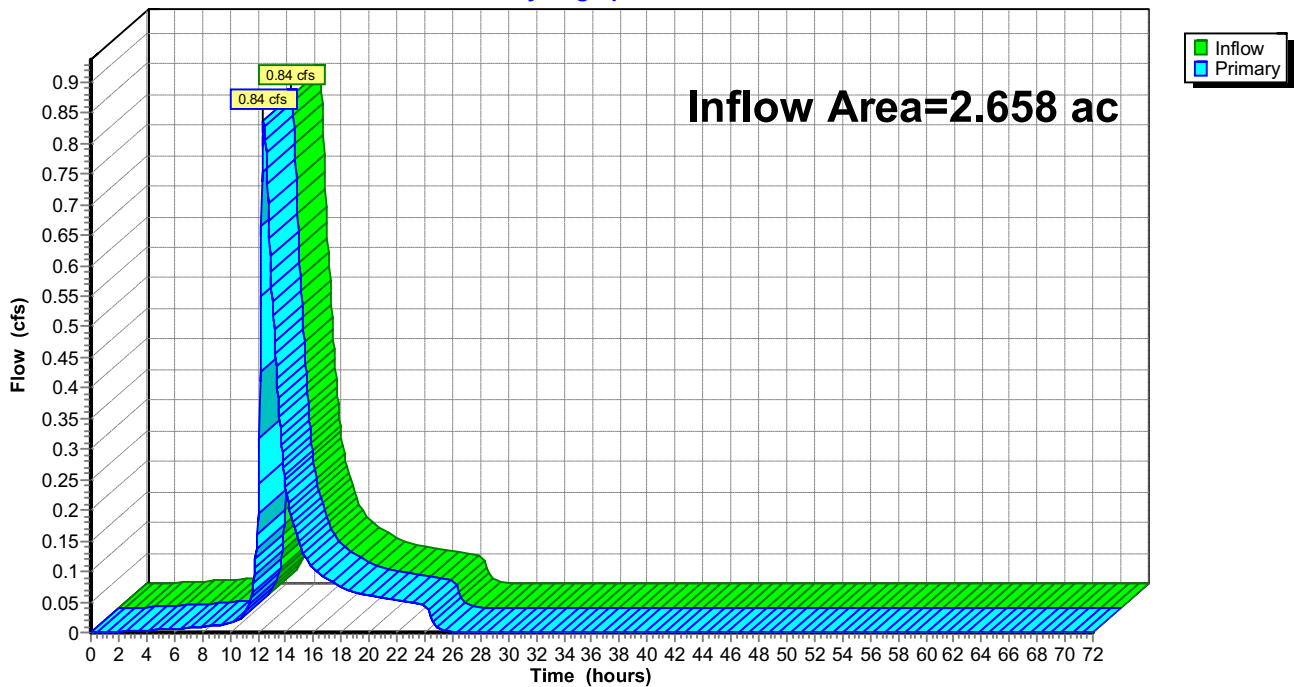
### Summary for Link P-Off: Offsite

Inflow Area = 2.658 ac, 5.27% Impervious, Inflow Depth = 0.76" for 2-Year event  
Inflow = 0.84 cfs @ 12.42 hrs, Volume= 0.167 af  
Primary = 0.84 cfs @ 12.42 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-Off: Offsite

#### Hydrograph





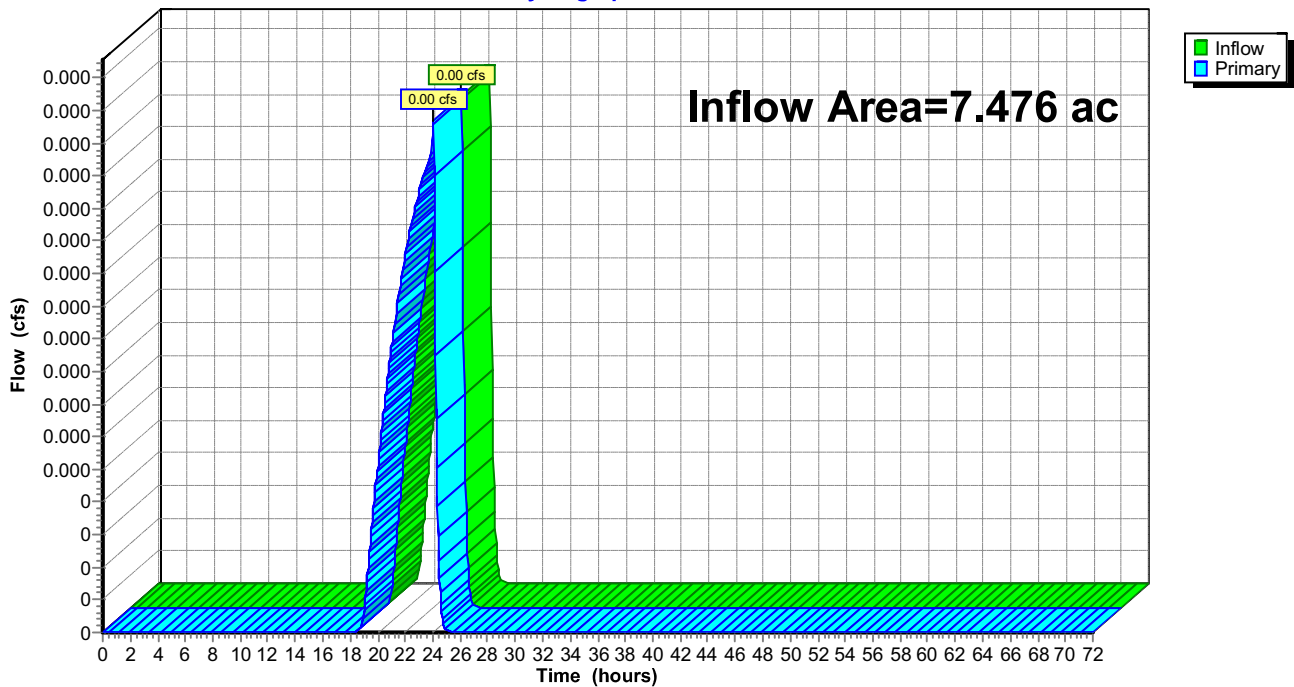
### Summary for Link Post IB-A: Post IB-A

Inflow Area = 7.476 ac, 42.22% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link Post IB-A: Post IB-A

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
 Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment Off-Imp2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=2.83" Tc=25.0 min CN=76/98 Runoff=0.87 cfs 0.143 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=1.48" Tc=25.0 min CN=61/0 Runoff=1.12 cfs 0.206 af
<b>Subcatchment P-A1-Perv: A1-Perv</b>	Runoff Area=0.426 ac 0.00% Impervious Runoff Depth=0.14" Tc=35.0 min CN=36/0 Runoff=0.01 cfs 0.005 af
<b>Subcatchment P-B1-Imp: B1-Imp</b>	Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=4.94" Tc=10.0 min CN=0/98 Runoff=3.38 cfs 0.385 af
<b>Subcatchment P-B1-Perv: B1-Perv</b>	Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=0.17" Tc=42.0 min CN=37/0 Runoff=0.03 cfs 0.023 af
<b>Subcatchment P-C1-Imp: C1-Imp</b>	Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=4.94" Tc=10.0 min CN=0/98 Runoff=10.91 cfs 1.242 af
<b>Subcatchment P-C1-Perv: C1-Perv</b>	Runoff Area=1.502 ac 0.00% Impervious Runoff Depth=0.24" Tc=10.0 min CN=39/0 Runoff=0.07 cfs 0.030 af
<b>Subcatchment P-Off-Imp1: Off-Imp-1</b>	Runoff Area=0.100 ac 100.00% Impervious Runoff Depth=4.94" Tc=15.0 min CN=0/98 Runoff=0.30 cfs 0.041 af
<b>Subcatchment P-Off-Perv1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=0.24" Tc=15.0 min CN=39/0 Runoff=0.01 cfs 0.006 af
<b>Subcatchment P-Uncontrol: P-Uncontrolled</b>	Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=0.24" Tc=10.0 min CN=39/0 Runoff=0.01 cfs 0.006 af
<b>Pond IB-A: Infiltration Basin A</b>	Peak Elev=33.28' Storage=1.299 af Inflow=12.41 cfs 1.668 af Primary=0.63 cfs 0.532 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.532 af
<b>Pond IB-B: Infiltration Basin B</b>	Peak Elev=32.03' Storage=0.407 af Inflow=3.38 cfs 0.408 af Primary=0.00 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.007 af
<b>Link P-A1: A1</b>	Inflow=0.01 cfs 0.005 af Primary=0.01 cfs 0.005 af
<b>Link P-B1: B1</b>	Inflow=3.38 cfs 0.408 af Primary=3.38 cfs 0.408 af
<b>Link P-C1: C1</b>	Inflow=12.41 cfs 1.668 af Primary=12.41 cfs 1.668 af
<b>Link P-Off: Offsite</b>	Inflow=2.23 cfs 0.396 af Primary=2.23 cfs 0.396 af

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**Link Post IB-A: Post IB-A**

Inflow=0.64 cfs 0.538 af

Primary=0.64 cfs 0.538 af

**Total Runoff Area = 10.468 ac   Runoff Volume = 2.086 af   Average Runoff Depth = 2.39"**  
**60.93% Pervious = 6.378 ac   39.07% Impervious = 4.090 ac**

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## Summary for Subcatchment Off-Imp2: Off-Imp-2

Runoff = 0.87 cfs @ 12.40 hrs, Volume= 0.143 af, Depth= 2.83"

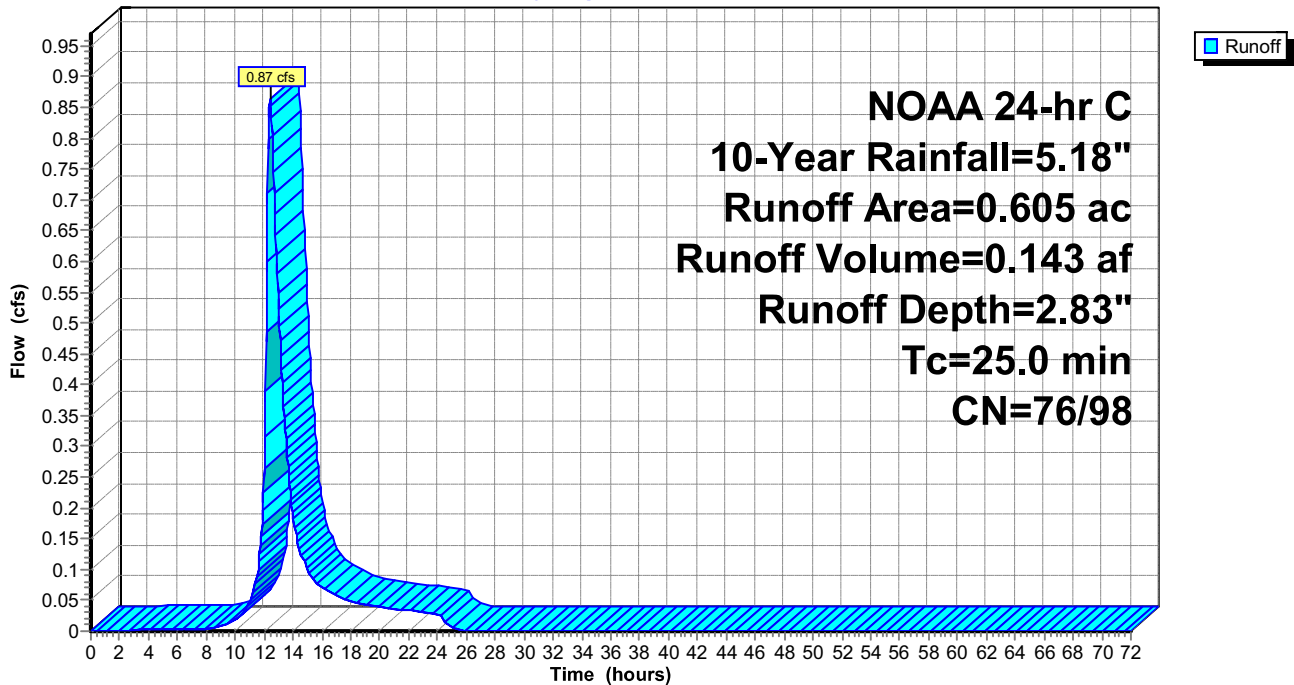
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

## Subcatchment Off-Imp2: Off-Imp-2

Hydrograph



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**Summary for Subcatchment Off-Perv2: Off-Perv-2**

Runoff = 1.12 cfs @ 12.45 hrs, Volume= 0.206 af, Depth= 1.48"

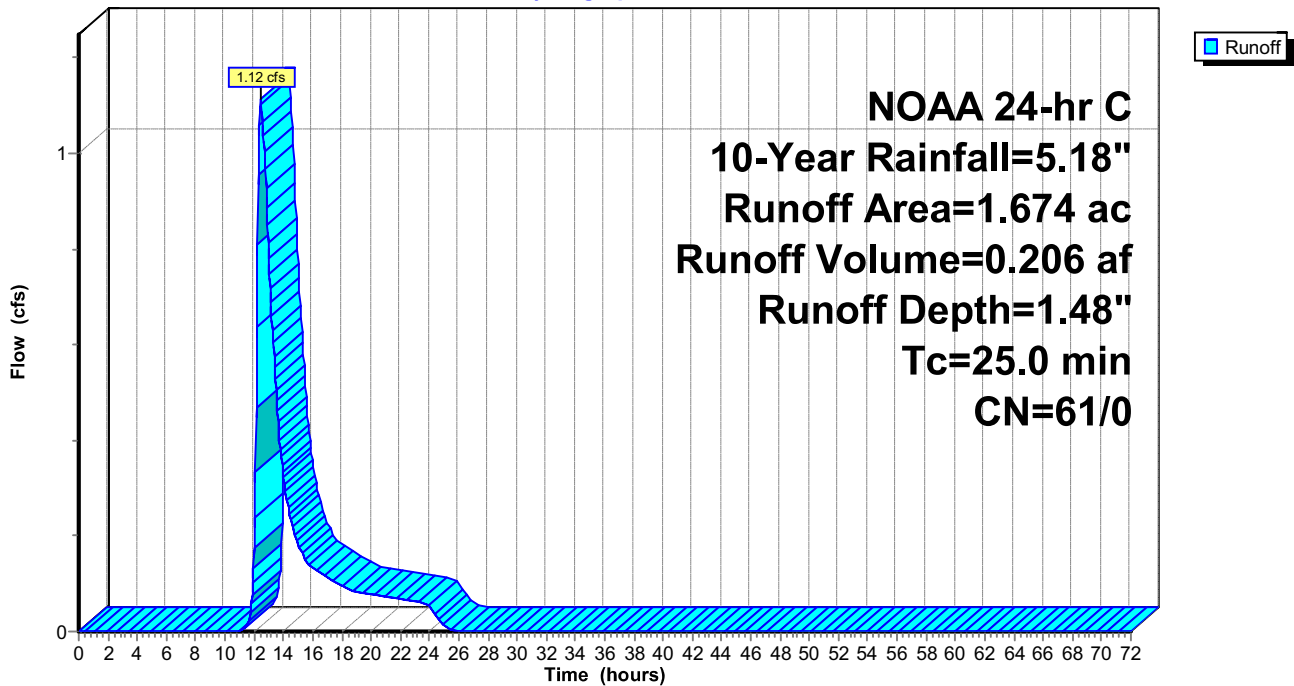
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Perv2: Off-Perv-2**

Hydrograph



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**Summary for Subcatchment P-A1-Perv: A1-Perv**

Runoff = 0.01 cfs @ 14.78 hrs, Volume= 0.005 af, Depth= 0.14"

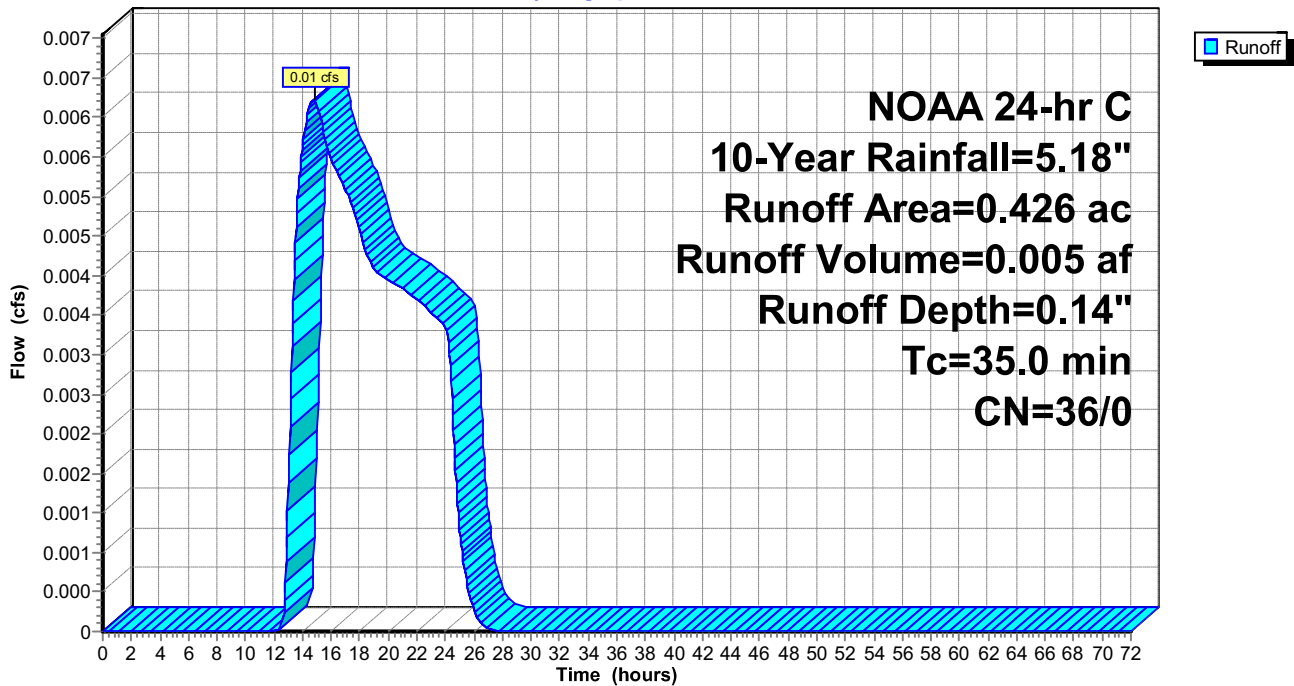
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.419	36	Woods, Fair, HSG A
0.007	39	>75% Grass cover, Good, HSG A
0.426	36	Weighted Average
0.426	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment P-A1-Perv: A1-Perv**

Hydrograph



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## Summary for Subcatchment P-B1-Imp: B1-Imp

Runoff = 3.38 cfs @ 12.19 hrs, Volume= 0.385 af, Depth= 4.94"

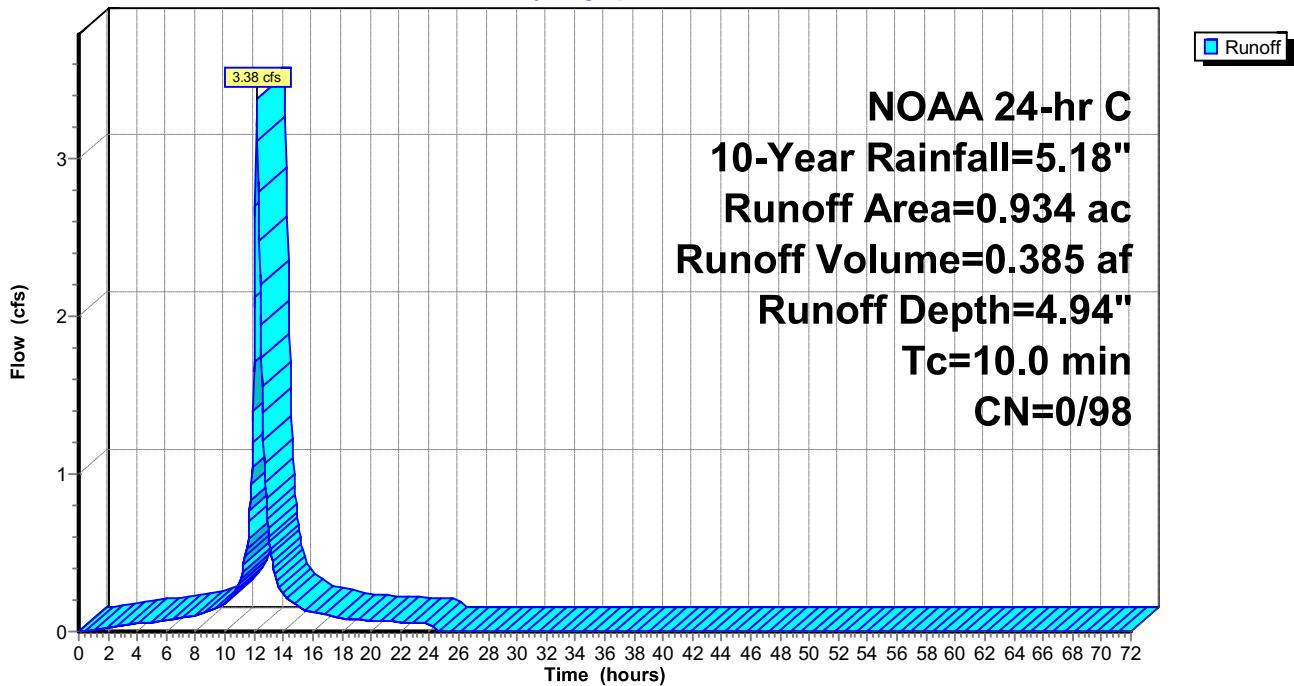
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.563	98	Paved parking, HSG A
0.371	98	Roofs, HSG A
0.934	98	Weighted Average
0.934	98	100.00% Impervious Area

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

## Subcatchment P-B1-Imp: B1-Imp

Hydrograph



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**Summary for Subcatchment P-B1-Perv: B1-Perv**

Runoff = 0.03 cfs @ 14.64 hrs, Volume= 0.023 af, Depth= 0.17"

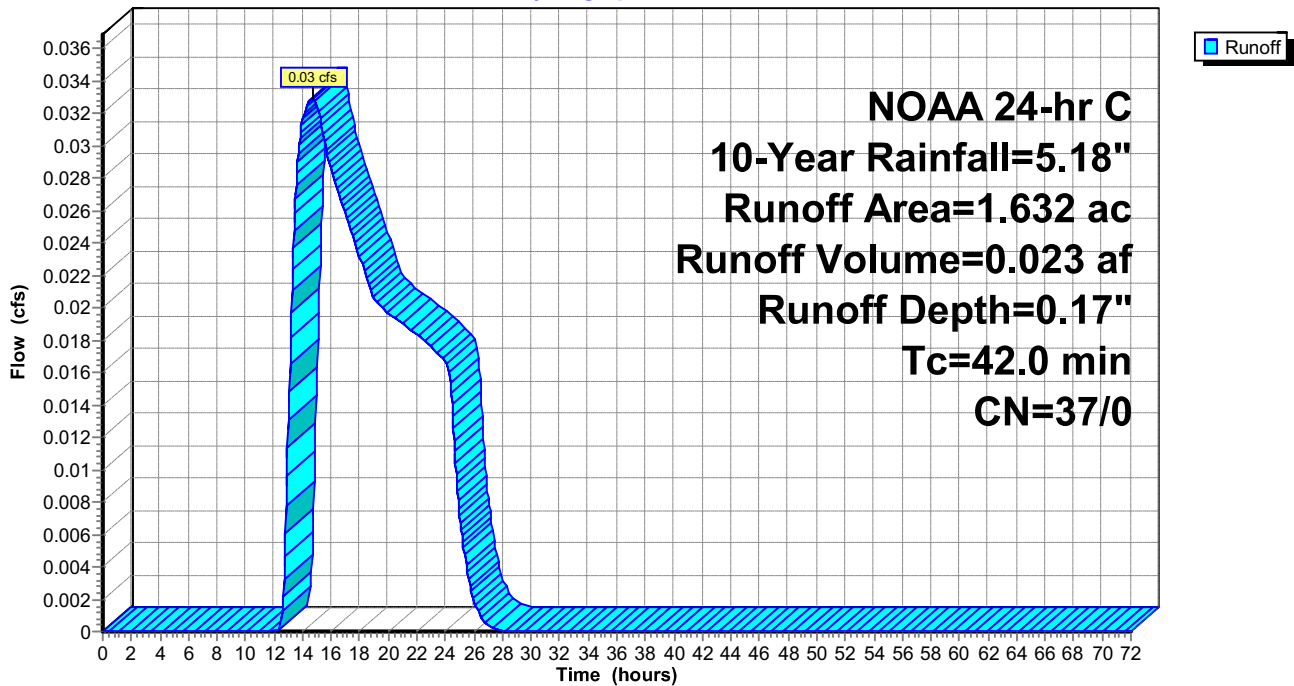
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.926	36	Woods, Fair, HSG A
0.706	39	>75% Grass cover, Good, HSG A
1.632	37	Weighted Average
1.632	37	100.00% Pervious Area

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

**Subcatchment P-B1-Perv: B1-Perv**

Hydrograph





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**Summary for Subcatchment P-C1-Imp: C1-Imp**

Runoff = 10.91 cfs @ 12.19 hrs, Volume= 1.242 af, Depth= 4.94"

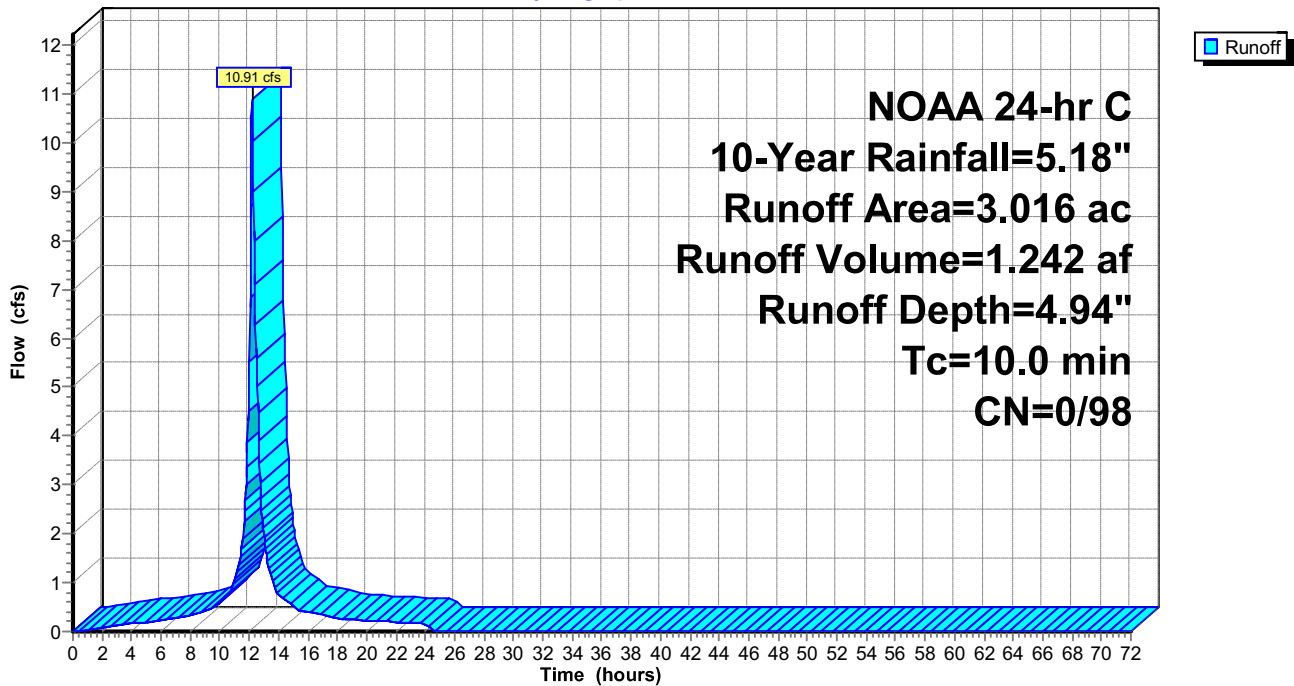
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
1.498	98	Paved parking, HSG A
1.518	98	Roofs, HSG A
3.016	98	Weighted Average
3.016	98	100.00% Impervious Area

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

**Subcatchment P-C1-Imp: C1-Imp**

Hydrograph



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**Summary for Subcatchment P-C1-Perv: C1-Perv**

Runoff = 0.07 cfs @ 12.88 hrs, Volume= 0.030 af, Depth= 0.24"

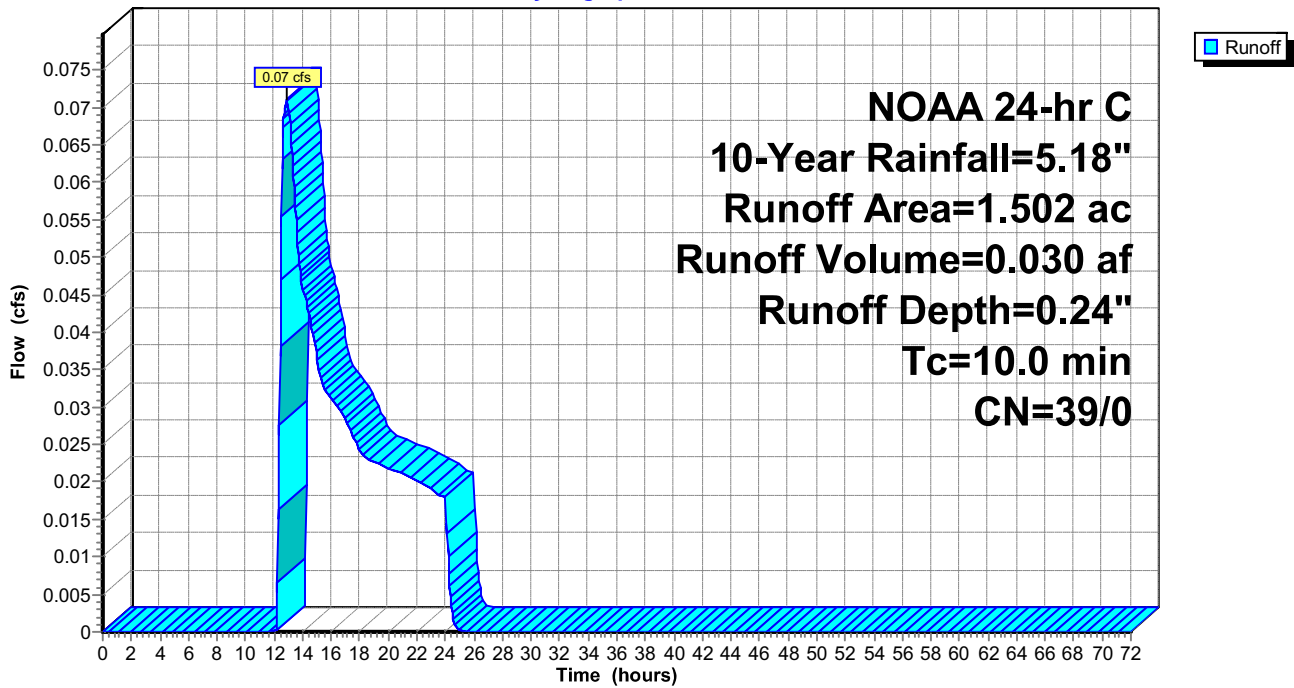
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
1.502	39	>75% Grass cover, Good, HSG A
1.502	39	100.00% Pervious Area

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

**Subcatchment P-C1-Perv: C1-Perv**

Hydrograph



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## Summary for Subcatchment P-Off-Imp1: Off-Imp-1

Runoff = 0.30 cfs @ 12.25 hrs, Volume= 0.041 af, Depth= 4.94"

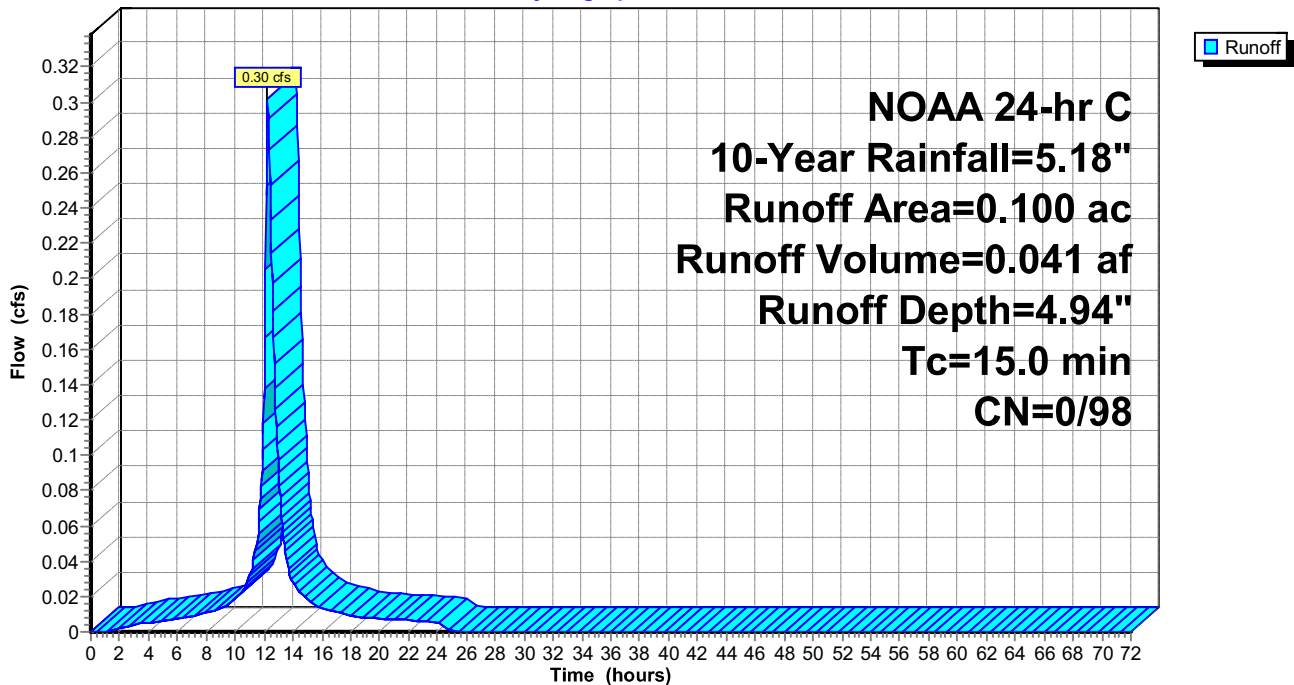
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.100	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

## Subcatchment P-Off-Imp1: Off-Imp-1

Hydrograph



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**Summary for Subcatchment P-Off-Perv1: Off-Perv-1**

Runoff = 0.01 cfs @ 13.05 hrs, Volume= 0.006 af, Depth= 0.24"

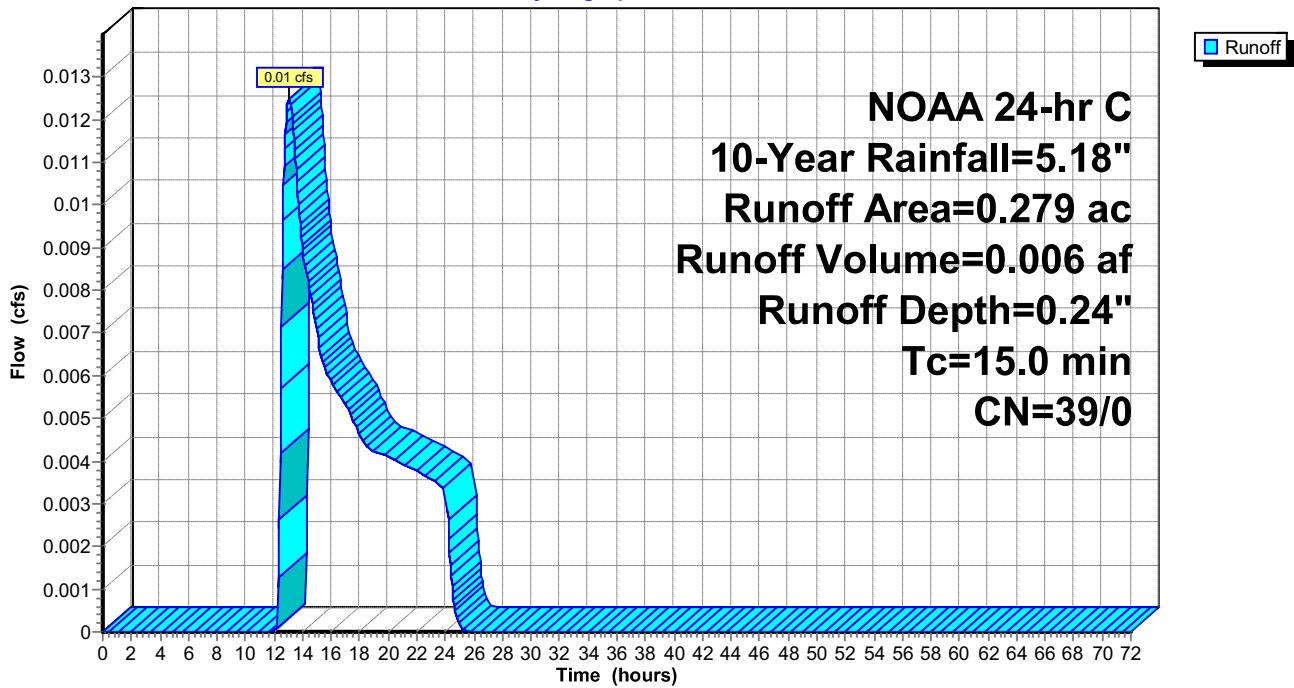
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment P-Off-Perv1: Off-Perv-1**

Hydrograph



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**Summary for Subcatchment P-Uncontrol: P-Uncontrolled**

Runoff = 0.01 cfs @ 12.88 hrs, Volume= 0.006 af, Depth= 0.24"

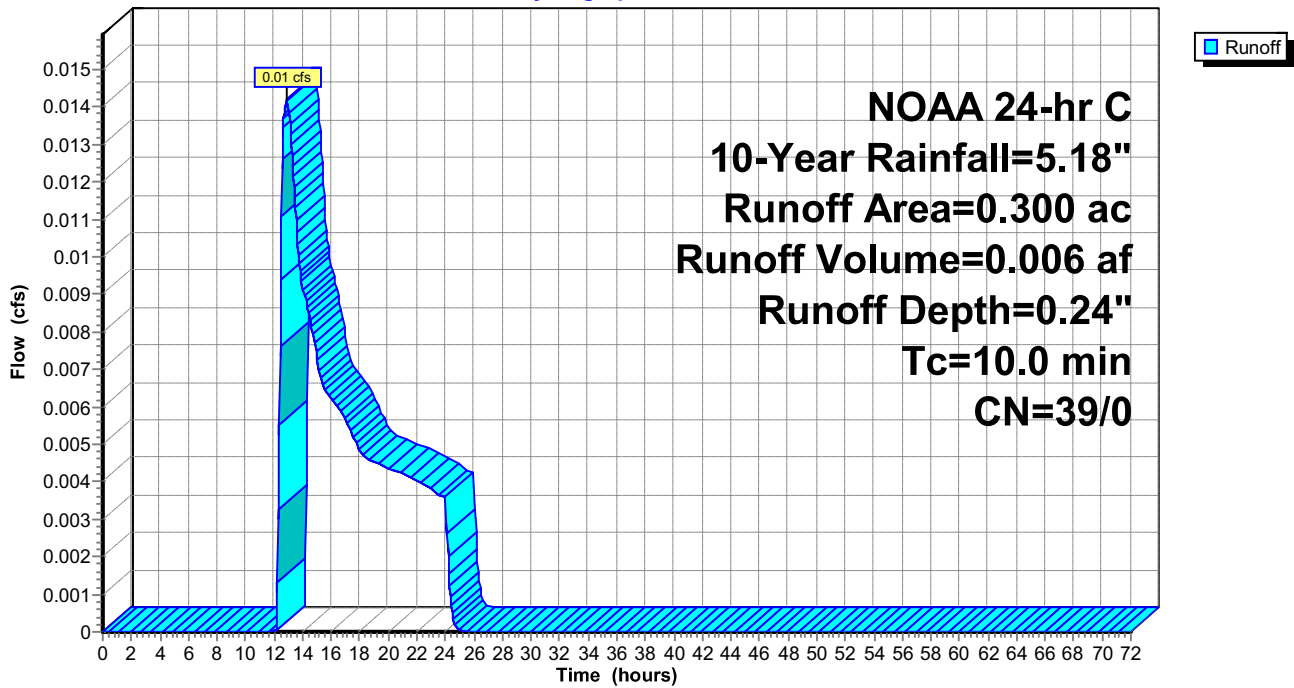
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.300	39	>75% Grass cover, Good, HSG A
0.300	39	100.00% Pervious Area

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

**Subcatchment P-Uncontrol: P-Uncontrolled**

Hydrograph



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**Summary for Pond IB-A: Infiltration Basin A**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 2.79" for 10-Year event  
 Inflow = 12.41 cfs @ 12.20 hrs, Volume= 1.668 af  
 Outflow = 0.63 cfs @ 16.19 hrs, Volume= 0.532 af, Atten= 95%, Lag= 239.5 min  
 Primary = 0.63 cfs @ 16.19 hrs, Volume= 0.532 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 33.28' @ 16.19 hrs Surf.Area= 0.746 ac Storage= 1.299 af

Plug-Flow detention time= 685.1 min calculated for 0.532 af (32% of inflow)  
 Center-of-Mass det. time= 494.3 min ( 1,284.9 - 790.6 )

Volume	Invert	Avail.Storage	Storage Description		
#1	31.40'	2.668 af	<b>Custom Stage Data (Irregular)</b> Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>18.0" W x 12.0" H, R=18.0" Elliptical Culvert X 2.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	34.05'	<b>35.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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
#3	Device 1	33.05'	<b>2.2' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.63 cfs @ 16.19 hrs HW=33.28' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 0.63 cfs @ 1.40 fps)

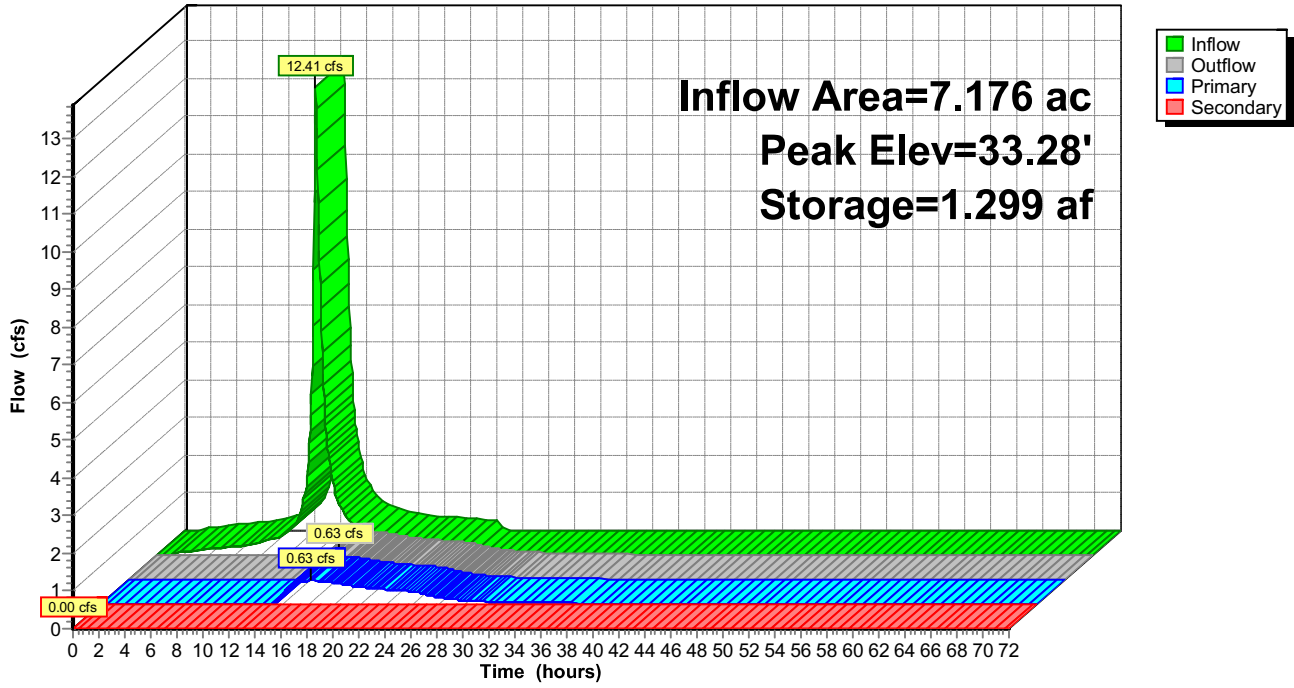
↑3=Sharp-Crested Rectangular Weir (Passes 0.63 cfs of 0.77 cfs potential flow)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond IB-A: Infiltration Basin A

Hydrograph



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**Summary for Pond IB-B: Infiltration Basin B**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.91" for 10-Year event  
 Inflow = 3.38 cfs @ 12.19 hrs, Volume= 0.408 af  
 Outflow = 0.00 cfs @ 25.36 hrs, Volume= 0.007 af, Atten= 100%, Lag= 790.3 min  
 Primary = 0.00 cfs @ 25.36 hrs, Volume= 0.007 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.03' @ 25.36 hrs Surf.Area= 0.264 ac Storage= 0.407 af

Plug-Flow detention time= 2,175.4 min calculated for 0.007 af (2% of inflow)  
 Center-of-Mass det. time= 1,567.1 min ( 2,344.2 - 777.1 )

Volume	Invert	Avail.Storage	Storage Description			
#1	30.40'	0.960 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
30.40	0.235	491.3	0.000	0.000	0.235	
31.00	0.245	498.6	0.144	0.144	0.250	
32.00	0.263	510.7	0.254	0.398	0.275	
33.00	0.281	522.8	0.272	0.670	0.301	
34.00	0.299	535.0	0.290	0.960	0.327	

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	<b>15.0" Round Culvert</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.80'	<b>30.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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 @ 25.36 hrs HW=32.03' (Free Discharge)

- ↑1=Culvert (Passes 0.00 cfs of 3.57 cfs potential flow)
- ↑2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.61 fps)

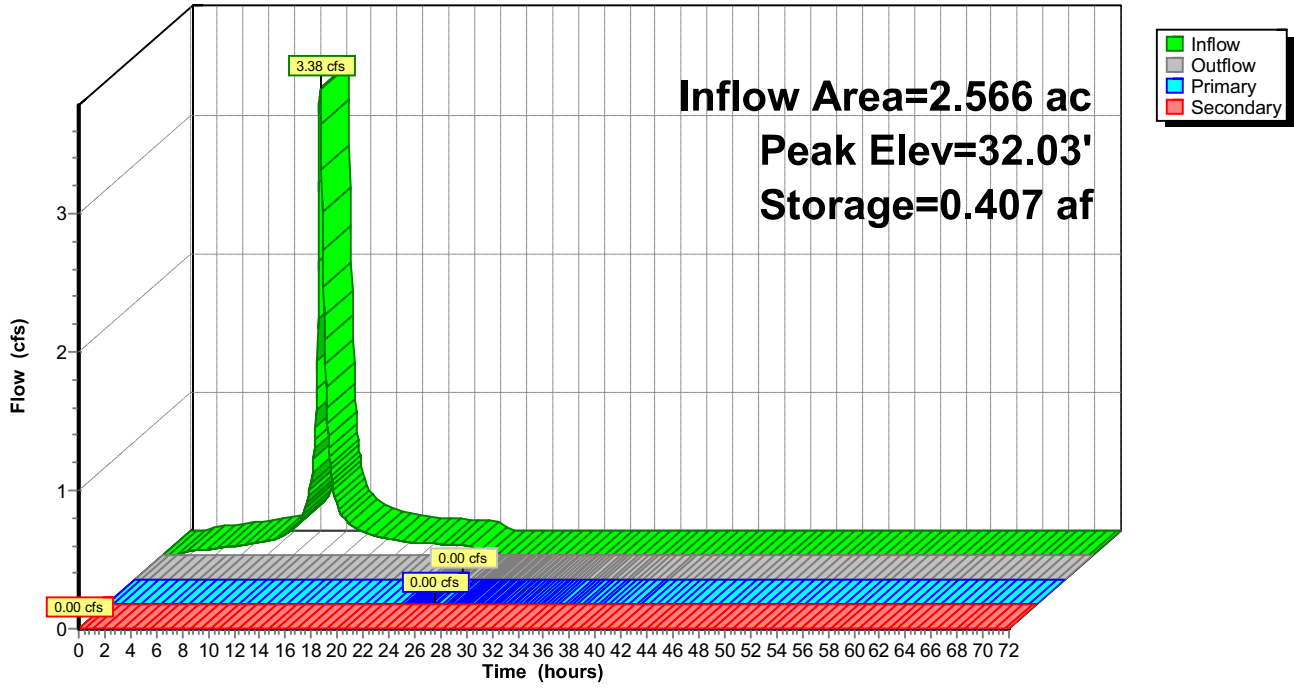
**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=30.40' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



### Pond IB-B: Infiltration Basin B

Hydrograph



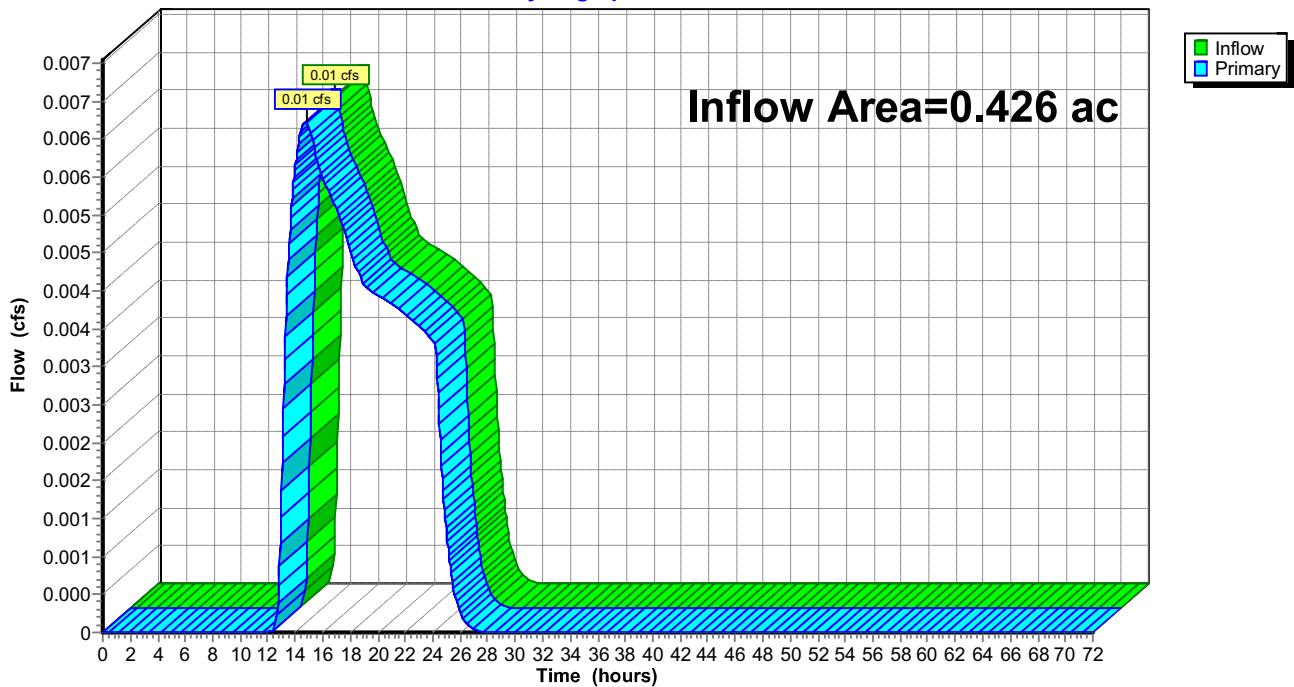
### Summary for Link P-A1: A1

Inflow Area = 0.426 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event  
Inflow = 0.01 cfs @ 14.78 hrs, Volume= 0.005 af  
Primary = 0.01 cfs @ 14.78 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-A1: A1

Hydrograph



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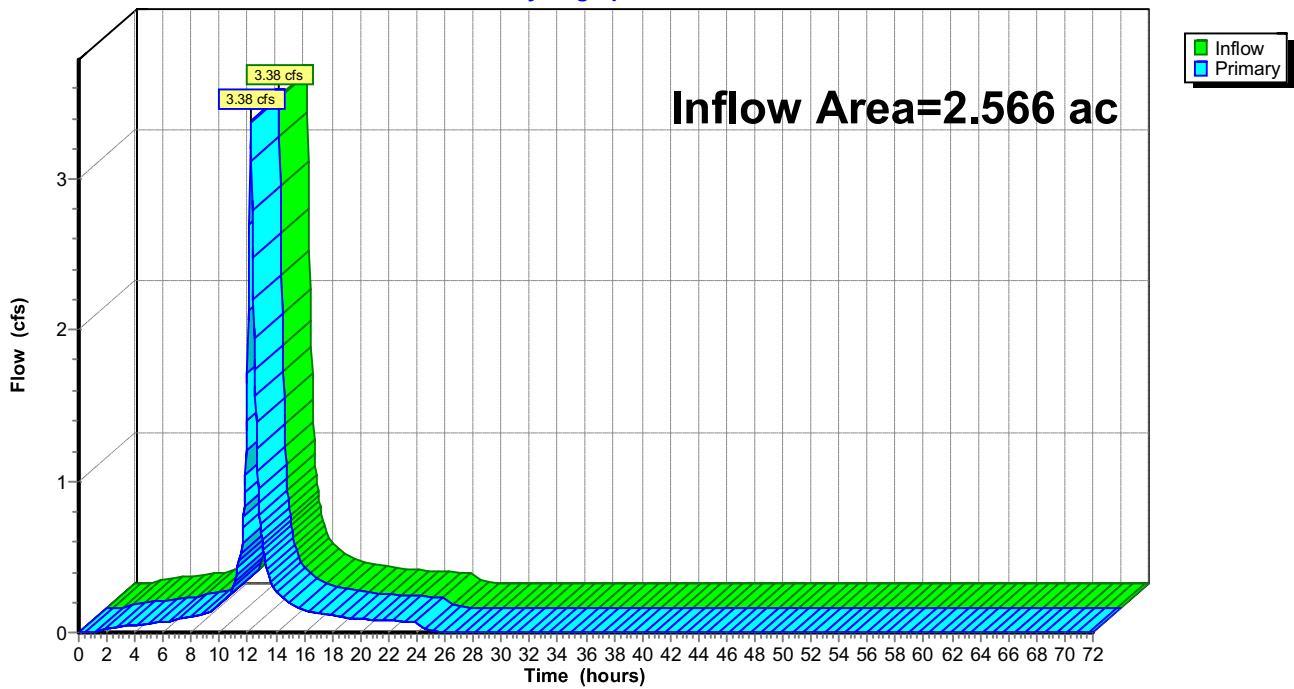
## Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.91" for 10-Year event  
Inflow = 3.38 cfs @ 12.19 hrs, Volume= 0.408 af  
Primary = 3.38 cfs @ 12.19 hrs, Volume= 0.408 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-B1: B1

Hydrograph



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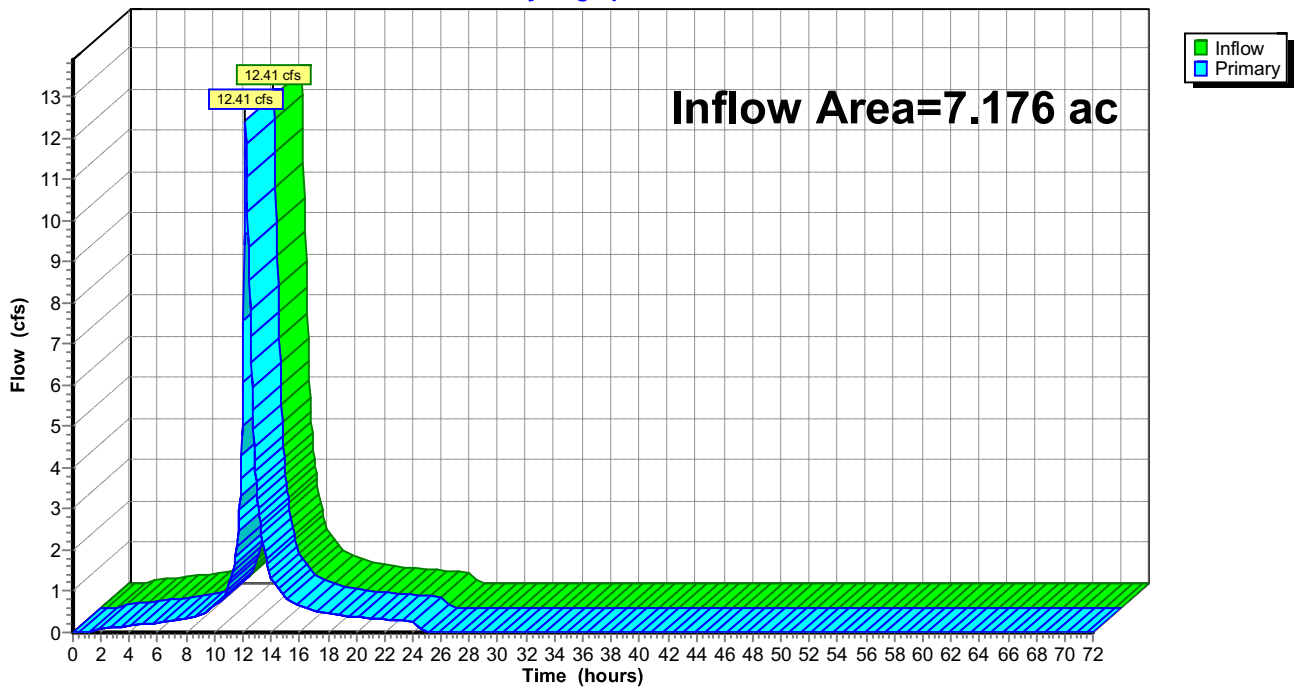
**Summary for Link P-C1: C1**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 2.79" for 10-Year event  
Inflow = 12.41 cfs @ 12.20 hrs, Volume= 1.668 af  
Primary = 12.41 cfs @ 12.20 hrs, Volume= 1.668 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link P-C1: C1**

Hydrograph



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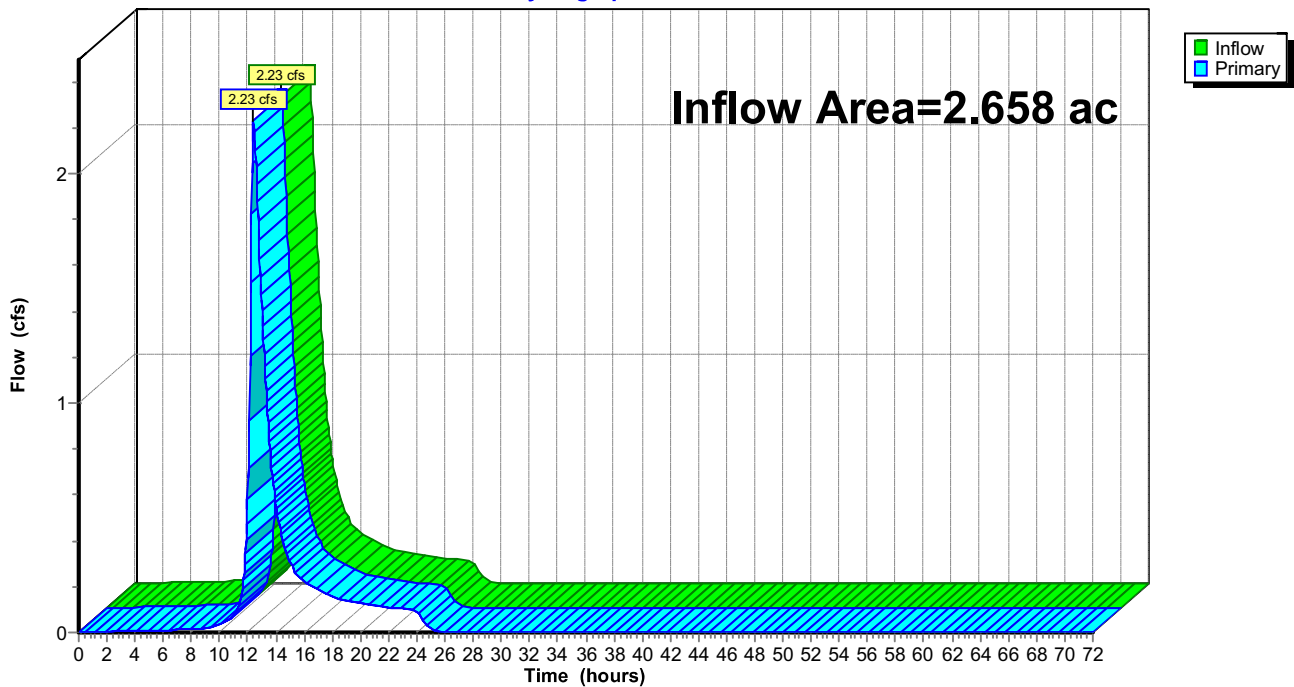
## Summary for Link P-Off: Offsite

Inflow Area = 2.658 ac, 5.27% Impervious, Inflow Depth = 1.79" for 10-Year event  
Inflow = 2.23 cfs @ 12.41 hrs, Volume= 0.396 af  
Primary = 2.23 cfs @ 12.41 hrs, Volume= 0.396 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-Off: Offsite

Hydrograph



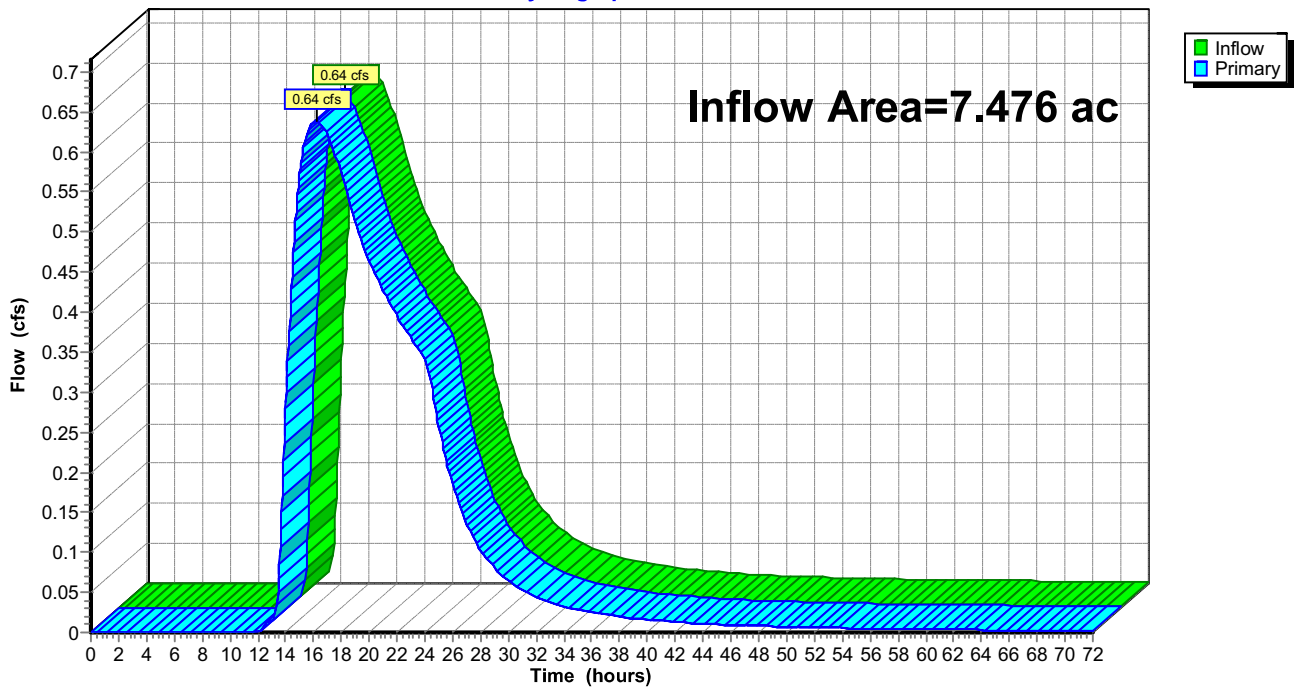
### Summary for Link Post IB-A: Post IB-A

Inflow Area = 7.476 ac, 42.22% Impervious, Inflow Depth > 0.86" for 10-Year event  
Inflow = 0.64 cfs @ 16.19 hrs, Volume= 0.538 af  
Primary = 0.64 cfs @ 16.19 hrs, Volume= 0.538 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link Post IB-A: Post IB-A

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment Off-Imp2: Off-Imp-2</b>	Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=6.08" Tc=25.0 min CN=76/98 Runoff=1.87 cfs 0.306 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=4.07" Tc=25.0 min CN=61/0 Runoff=3.44 cfs 0.568 af
<b>Subcatchment P-A1-Perv: A1-Perv</b>	Runoff Area=0.426 ac 0.00% Impervious Runoff Depth=1.20" Tc=35.0 min CN=36/0 Runoff=0.14 cfs 0.043 af
<b>Subcatchment P-B1-Imp: B1-Imp</b>	Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=8.57" Tc=10.0 min CN=0/98 Runoff=5.77 cfs 0.667 af
<b>Subcatchment P-B1-Perv: B1-Perv</b>	Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=1.30" Tc=42.0 min CN=37/0 Runoff=0.54 cfs 0.177 af
<b>Subcatchment P-C1-Imp: C1-Imp</b>	Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=8.57" Tc=10.0 min CN=0/98 Runoff=18.63 cfs 2.154 af
<b>Subcatchment P-C1-Perv: C1-Perv</b>	Runoff Area=1.502 ac 0.00% Impervious Runoff Depth=1.51" Tc=10.0 min CN=39/0 Runoff=1.35 cfs 0.190 af
<b>Subcatchment P-Off-Imp1: Off-Imp-1</b>	Runoff Area=0.100 ac 100.00% Impervious Runoff Depth=8.57" Tc=15.0 min CN=0/98 Runoff=0.52 cfs 0.071 af
<b>Subcatchment P-Off-Perv1: Off-Perv-1</b>	Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=1.51" Tc=15.0 min CN=39/0 Runoff=0.20 cfs 0.035 af
<b>Subcatchment P-Uncontrol: P-Uncontrolled</b>	Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=1.51" Tc=10.0 min CN=39/0 Runoff=0.27 cfs 0.038 af
<b>Pond IB-A: Infiltration Basin A</b>	Peak Elev=34.01' Storage=1.857 af Inflow=24.26 cfs 3.325 af Primary=6.20 cfs 2.188 af Secondary=0.00 cfs 0.000 af Outflow=6.20 cfs 2.188 af
<b>Pond IB-B: Infiltration Basin B</b>	Peak Elev=32.73' Storage=0.597 af Inflow=5.82 cfs 0.844 af Primary=0.37 cfs 0.442 af Secondary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.442 af
<b>Link P-A1: A1</b>	Inflow=0.14 cfs 0.043 af Primary=0.14 cfs 0.043 af
<b>Link P-B1: B1</b>	Inflow=5.82 cfs 0.844 af Primary=5.82 cfs 0.844 af
<b>Link P-C1: C1</b>	Inflow=24.26 cfs 3.325 af Primary=24.26 cfs 3.325 af
<b>Link P-Off: Offsite</b>	Inflow=5.94 cfs 0.981 af Primary=5.94 cfs 0.981 af

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**Link Post IB-A: Post IB-A**

Inflow=6.29 cfs 2.226 af

Primary=6.29 cfs 2.226 af

**Total Runoff Area = 10.468 ac   Runoff Volume = 4.249 af   Average Runoff Depth = 4.87"**  
**60.93% Pervious = 6.378 ac   39.07% Impervious = 4.090 ac**



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**Summary for Subcatchment Off-Imp2: Off-Imp-2**

Runoff = 1.87 cfs @ 12.39 hrs, Volume= 0.306 af, Depth= 6.08"

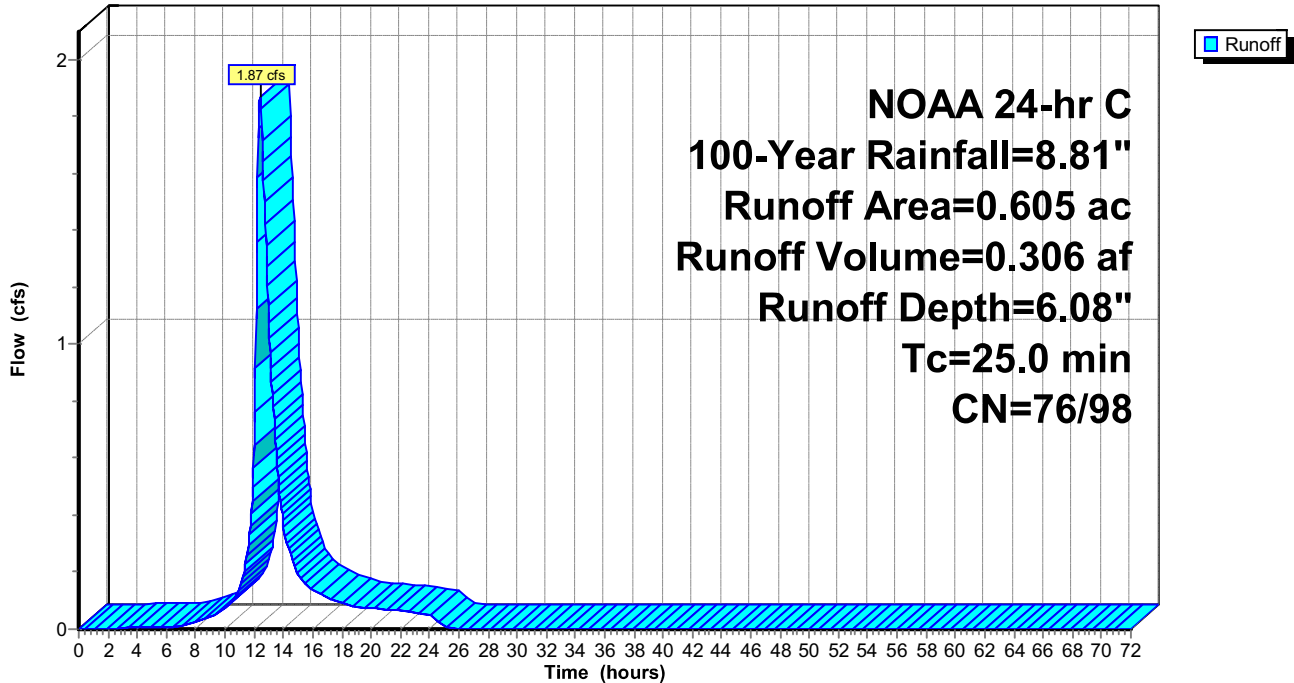
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Imp2: Off-Imp-2**

Hydrograph



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**Summary for Subcatchment Off-Perv2: Off-Perv-2**

Runoff = 3.44 cfs @ 12.41 hrs, Volume= 0.568 af, Depth= 4.07"

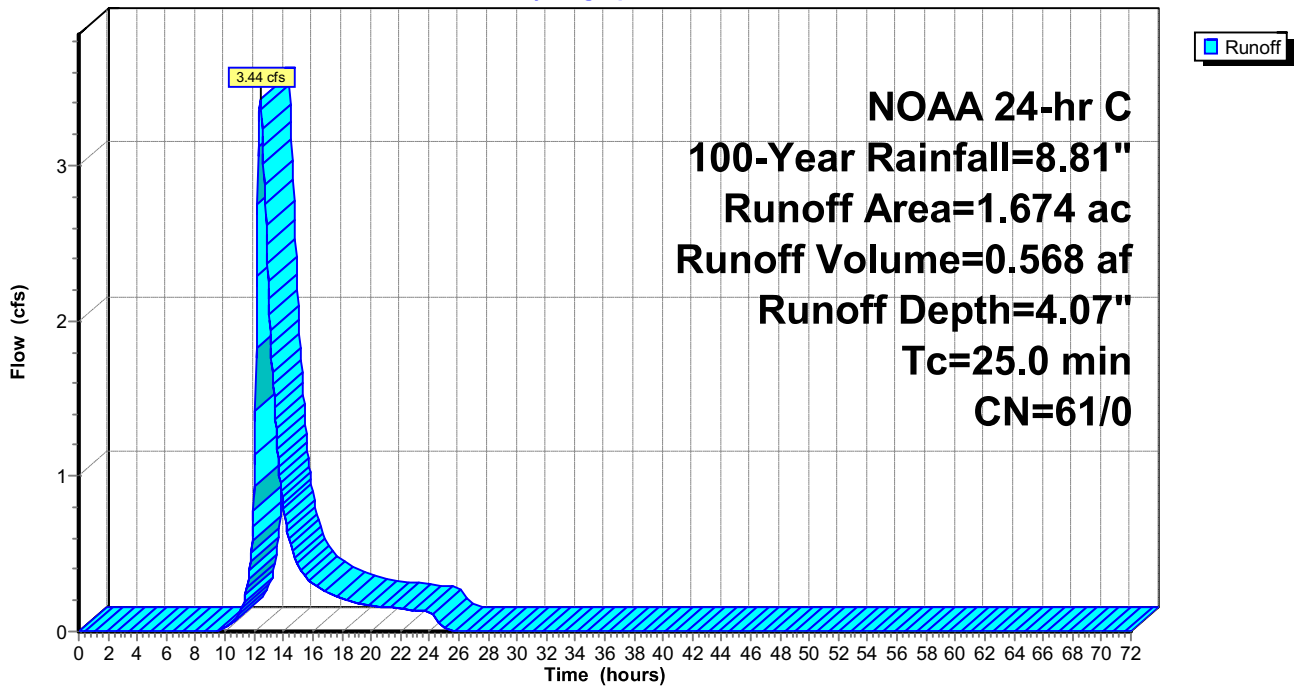
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Perv2: Off-Perv-2**

Hydrograph



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**Summary for Subcatchment P-A1-Perv: A1-Perv**

Runoff = 0.14 cfs @ 12.82 hrs, Volume= 0.043 af, Depth= 1.20"

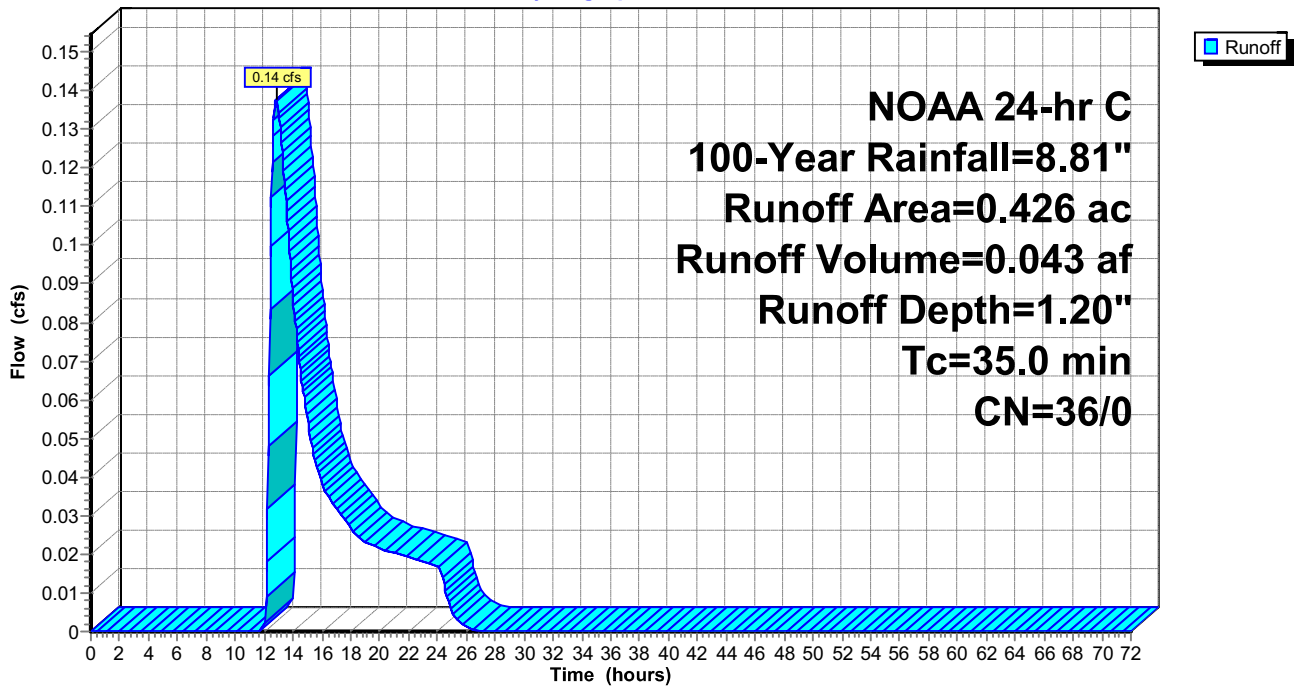
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.419	36	Woods, Fair, HSG A
0.007	39	>75% Grass cover, Good, HSG A
0.426	36	Weighted Average
0.426	36	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.0					Direct Entry, TC-PRE-A1 - TC-PRE-A2

**Subcatchment P-A1-Perv: A1-Perv**

Hydrograph



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**Summary for Subcatchment P-B1-Imp: B1-Imp**

Runoff = 5.77 cfs @ 12.19 hrs, Volume= 0.667 af, Depth= 8.57"

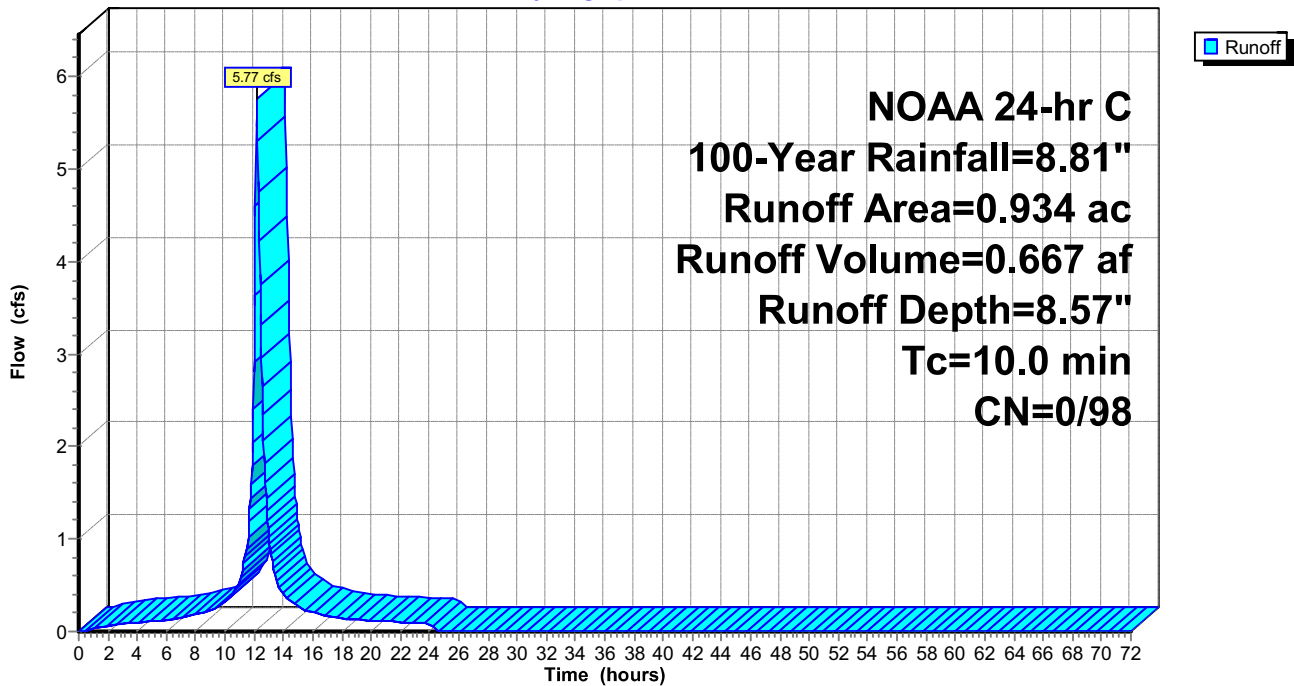
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.563	98	Paved parking, HSG A
0.371	98	Roofs, HSG A
0.934	98	Weighted Average
0.934	98	100.00% Impervious Area

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

**Subcatchment P-B1-Imp: B1-Imp**

Hydrograph



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**Summary for Subcatchment P-B1-Perv: B1-Perv**

Runoff = 0.54 cfs @ 12.92 hrs, Volume= 0.177 af, Depth= 1.30"

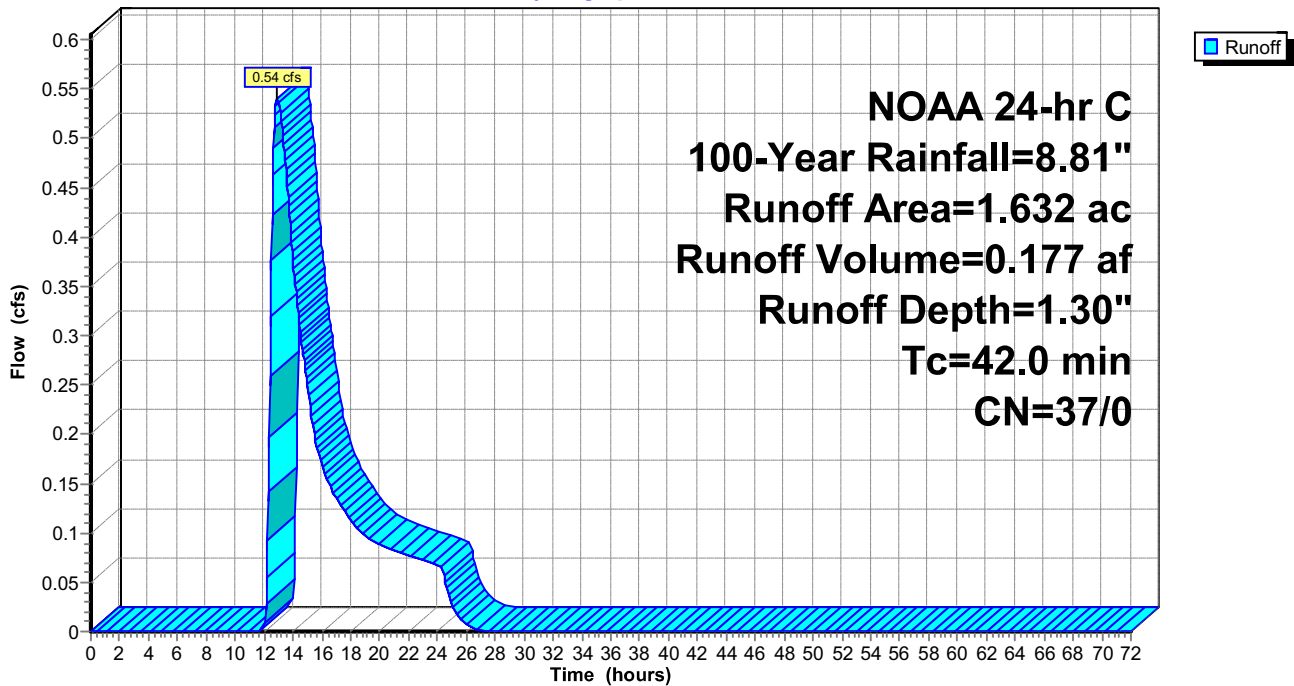
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.926	36	Woods, Fair, HSG A
0.706	39	>75% Grass cover, Good, HSG A
1.632	37	Weighted Average
1.632	37	100.00% Pervious Area

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

**Subcatchment P-B1-Perv: B1-Perv**

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## Summary for Subcatchment P-C1-Imp: C1-Imp

Runoff = 18.63 cfs @ 12.19 hrs, Volume= 2.154 af, Depth= 8.57"

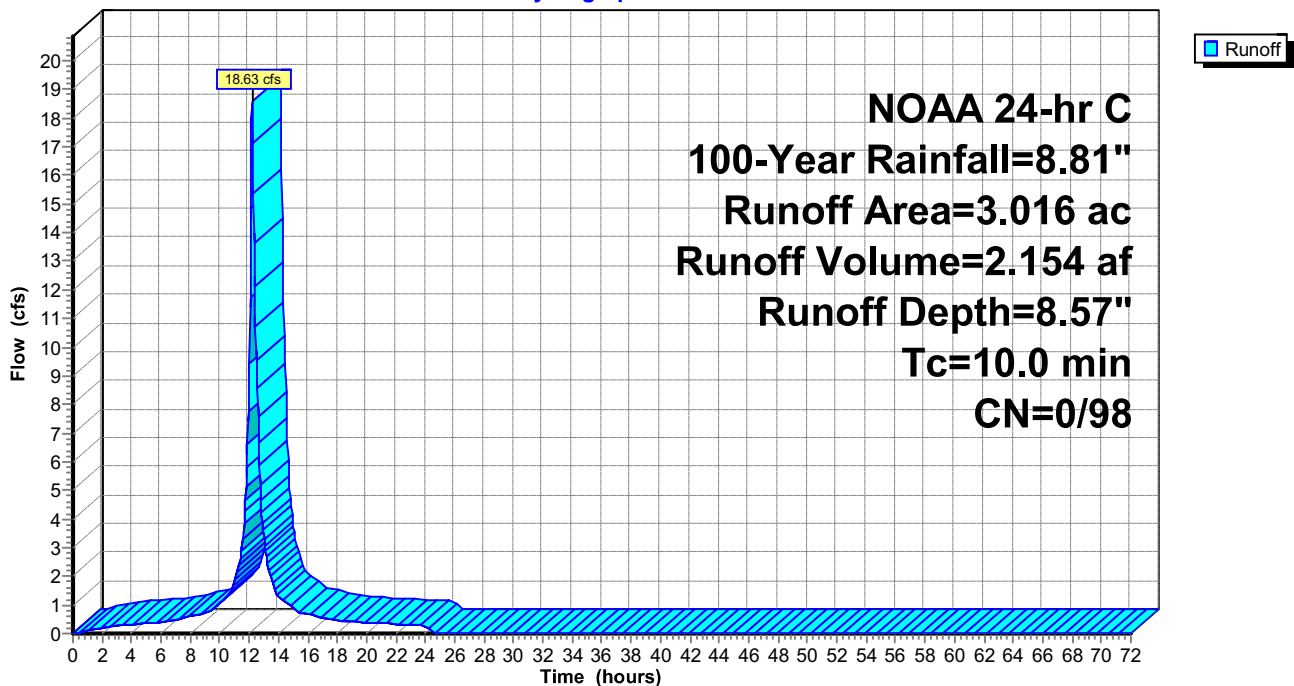
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
1.498	98	Paved parking, HSG A
1.518	98	Roofs, HSG A
3.016	98	Weighted Average
3.016	98	100.00% Impervious Area

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

## Subcatchment P-C1-Imp: C1-Imp

Hydrograph



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**Summary for Subcatchment P-C1-Perv: C1-Perv**

Runoff = 1.35 cfs @ 12.24 hrs, Volume= 0.190 af, Depth= 1.51"

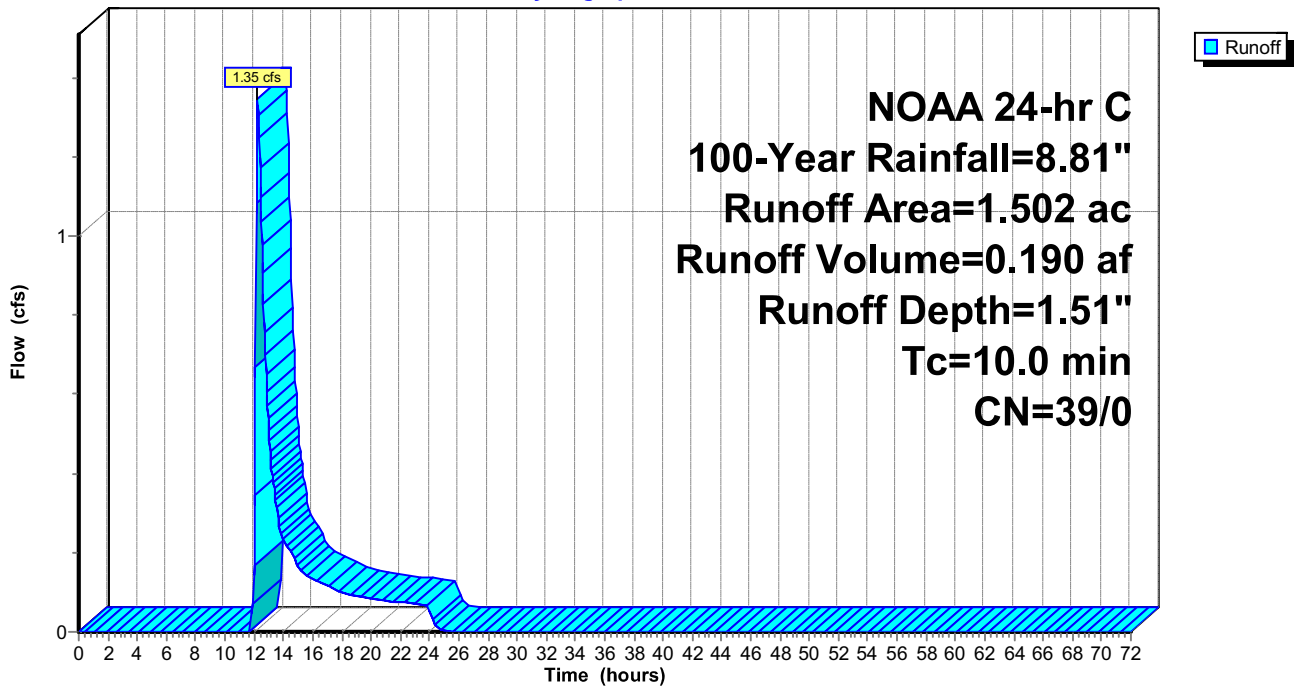
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
1.502	39	>75% Grass cover, Good, HSG A
1.502	39	100.00% Pervious Area

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

**Subcatchment P-C1-Perv: C1-Perv**

Hydrograph



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## Summary for Subcatchment P-Off-Imp1: Off-Imp-1

Runoff = 0.52 cfs @ 12.25 hrs, Volume= 0.071 af, Depth= 8.57"

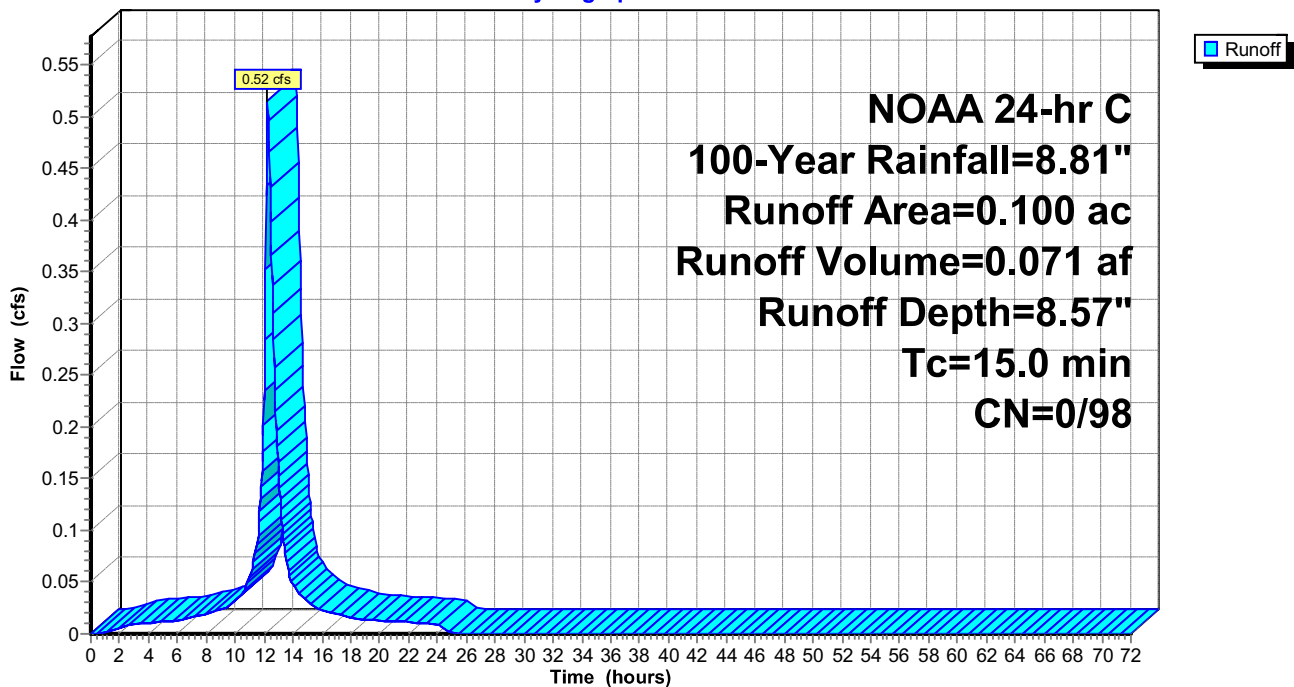
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.100	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

## Subcatchment P-Off-Imp1: Off-Imp-1

Hydrograph





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**Summary for Subcatchment P-Off-Perv1: Off-Perv-1**

Runoff = 0.20 cfs @ 12.35 hrs, Volume= 0.035 af, Depth= 1.51"

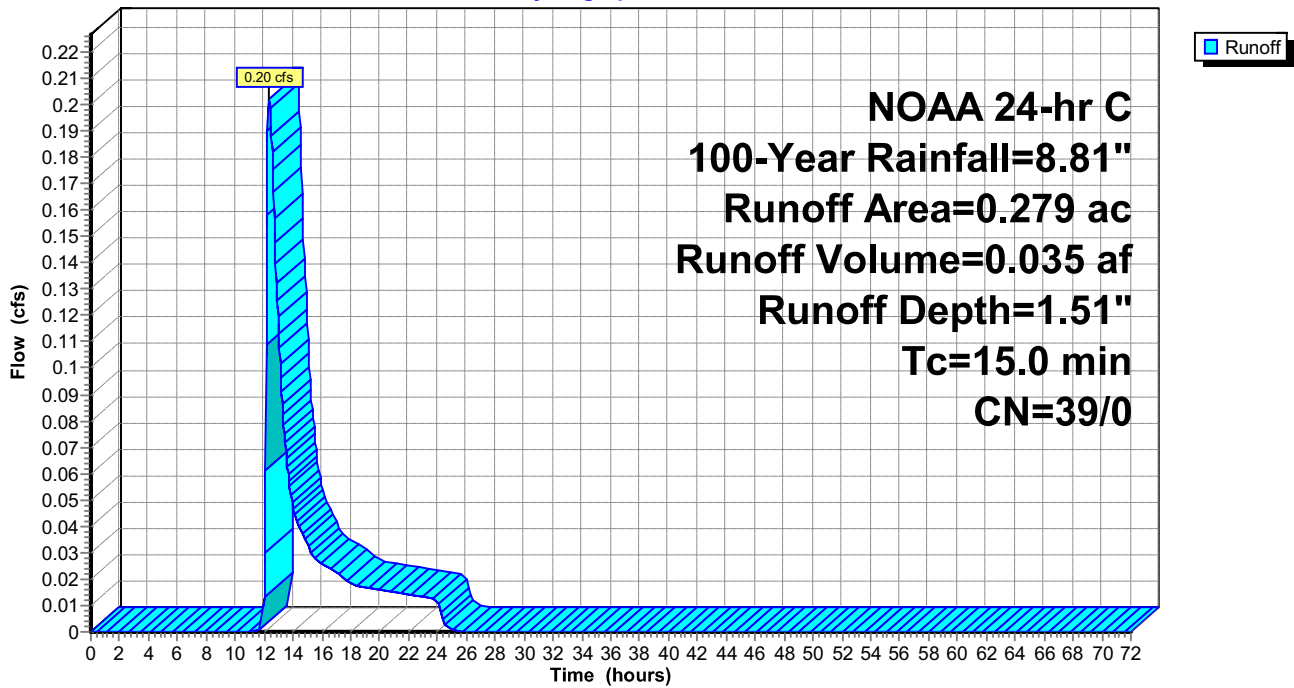
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment P-Off-Perv1: Off-Perv-1**

Hydrograph



**NYC19-0005\_offsite\_Final\_2**

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 NOAA 24-hr C 100-Year Rainfall=8.81"

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**Summary for Subcatchment P-Uncontrol: P-Uncontrolled**

Runoff = 0.27 cfs @ 12.24 hrs, Volume= 0.038 af, Depth= 1.51"

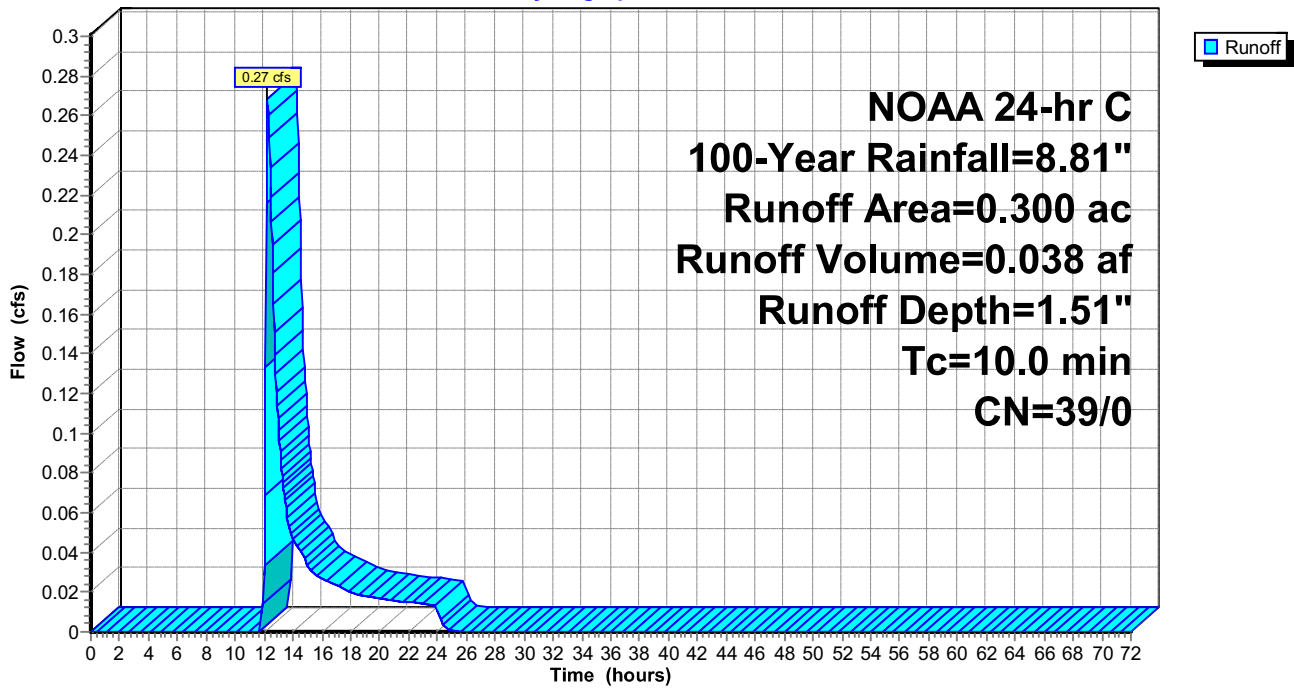
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.300	39	>75% Grass cover, Good, HSG A
0.300	39	100.00% Pervious Area

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

**Subcatchment P-Uncontrol: P-Uncontrolled**

Hydrograph



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**Summary for Pond IB-A: Infiltration Basin A**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 5.56" for 100-Year event  
 Inflow = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af  
 Outflow = 6.20 cfs @ 13.14 hrs, Volume= 2.188 af, Atten= 74%, Lag= 55.6 min  
 Primary = 6.20 cfs @ 13.14 hrs, Volume= 2.188 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 34.01' @ 13.14 hrs Surf.Area= 0.792 ac Storage= 1.857 af

Plug-Flow detention time= 337.6 min calculated for 2.187 af (66% of inflow)  
 Center-of-Mass det. time= 227.1 min ( 1,018.3 - 791.2 )

Volume	Invert	Avail.Storage	Storage Description			
#1	31.40'	2.668 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
31.40	0.630	1,808.1	0.000	0.000	0.630	
32.00	0.667	1,813.4	0.389	0.389	0.673	
33.00	0.729	1,821.3	0.698	1.087	0.740	
34.00	0.791	1,828.1	0.760	1.847	0.802	
35.00	0.853	1,834.8	0.822	2.668	0.863	

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>18.0" W x 12.0" H, R=18.0" Elliptical Culvert X 2.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	34.05'	<b>35.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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
#3	Device 1	33.05'	<b>2.2' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=6.20 cfs @ 13.14 hrs HW=34.01' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Passes 6.20 cfs of 6.80 cfs potential flow)

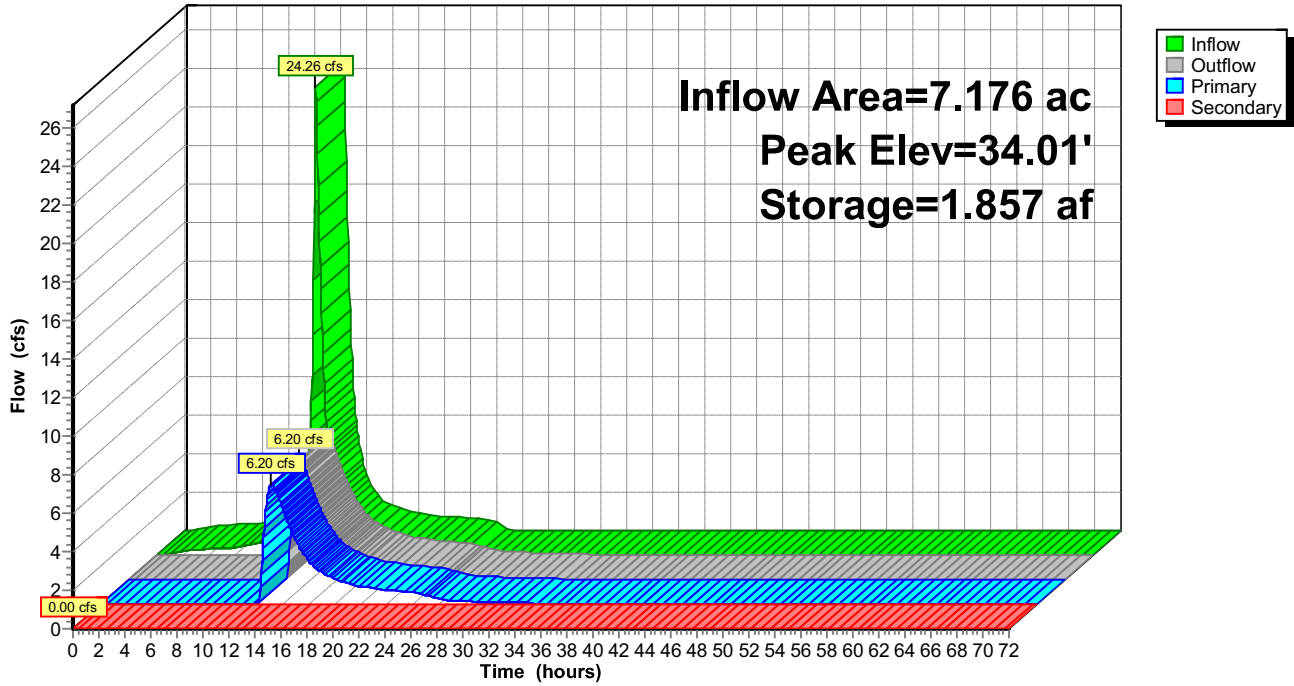
↑3=Sharp-Crested Rectangular Weir (Weir Controls 6.20 cfs @ 3.21 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond IB-A: Infiltration Basin A

Hydrograph



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**Summary for Pond IB-B: Infiltration Basin B**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.95" for 100-Year event  
 Inflow = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af  
 Outflow = 0.37 cfs @ 16.13 hrs, Volume= 0.442 af, Atten= 94%, Lag= 236.4 min  
 Primary = 0.37 cfs @ 16.13 hrs, Volume= 0.442 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.73' @ 16.13 hrs Surf.Area= 0.276 ac Storage= 0.597 af

Plug-Flow detention time= 655.7 min calculated for 0.441 af (52% of inflow)  
 Center-of-Mass det. time= 504.8 min ( 1,302.2 - 797.4 )

Volume	Invert	Avail.Storage	Storage Description			
#1	30.40'	0.960 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
30.40	0.235	491.3	0.000	0.000	0.235	
31.00	0.245	498.6	0.144	0.144	0.250	
32.00	0.263	510.7	0.254	0.398	0.275	
33.00	0.281	522.8	0.272	0.670	0.301	
34.00	0.299	535.0	0.290	0.960	0.327	

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	<b>15.0" Round Culvert</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.80'	<b>30.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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=0.37 cfs @ 16.13 hrs HW=32.73' (Free Discharge)

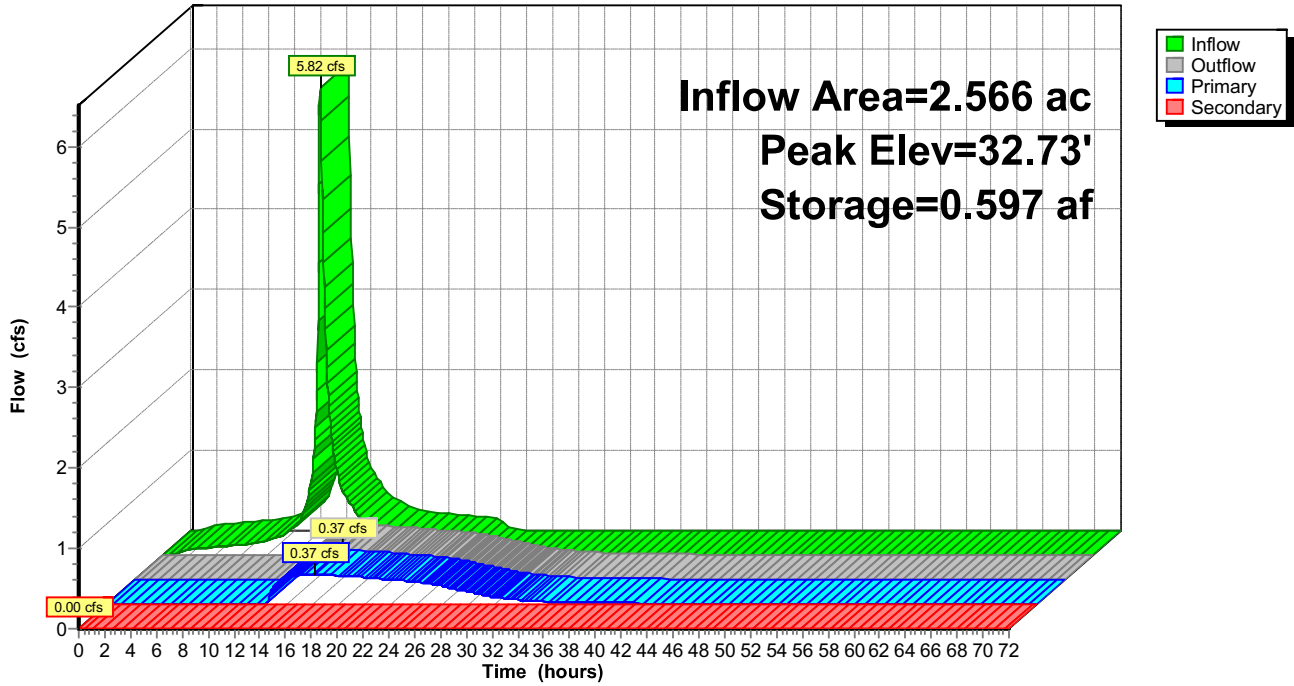
- ↑1=Culvert (Passes 0.37 cfs of 6.35 cfs potential flow)
- ↑2=Orifice/Grate (Orifice Controls 0.37 cfs @ 3.75 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=30.40' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond IB-B: Infiltration Basin B

Hydrograph



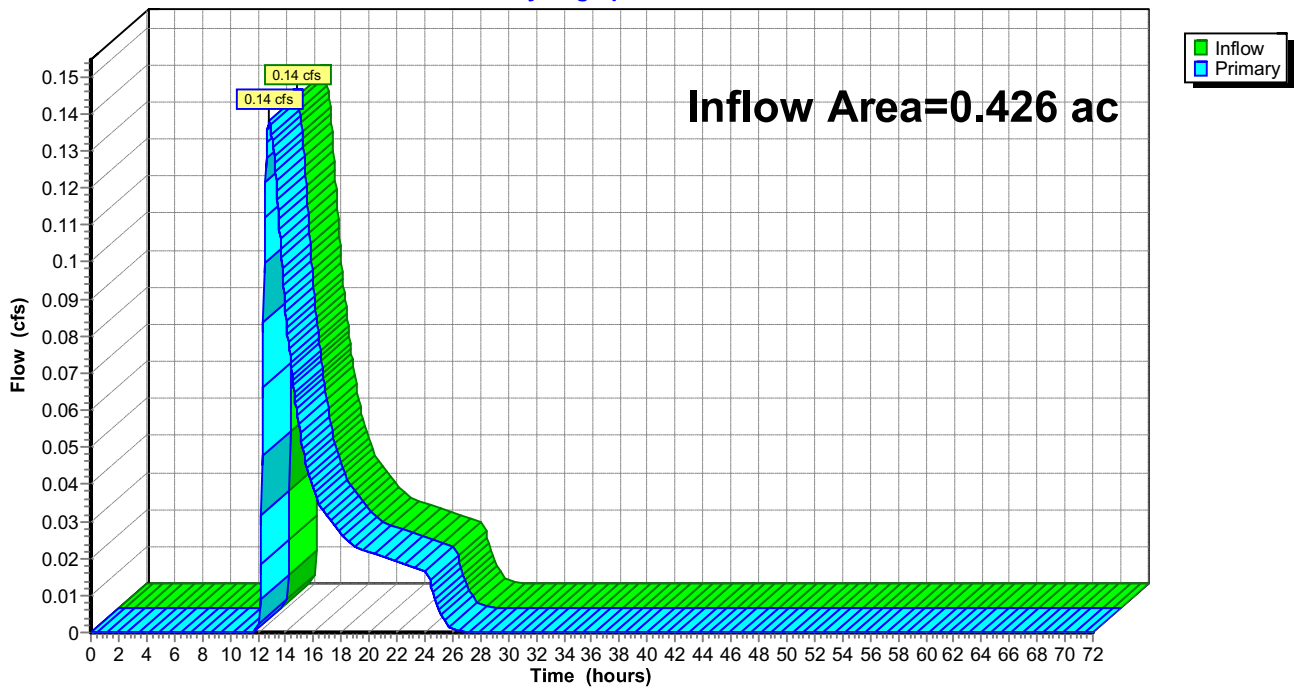
### Summary for Link P-A1: A1

Inflow Area = 0.426 ac, 0.00% Impervious, Inflow Depth = 1.20" for 100-Year event  
Inflow = 0.14 cfs @ 12.82 hrs, Volume= 0.043 af  
Primary = 0.14 cfs @ 12.82 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-A1: A1

Hydrograph



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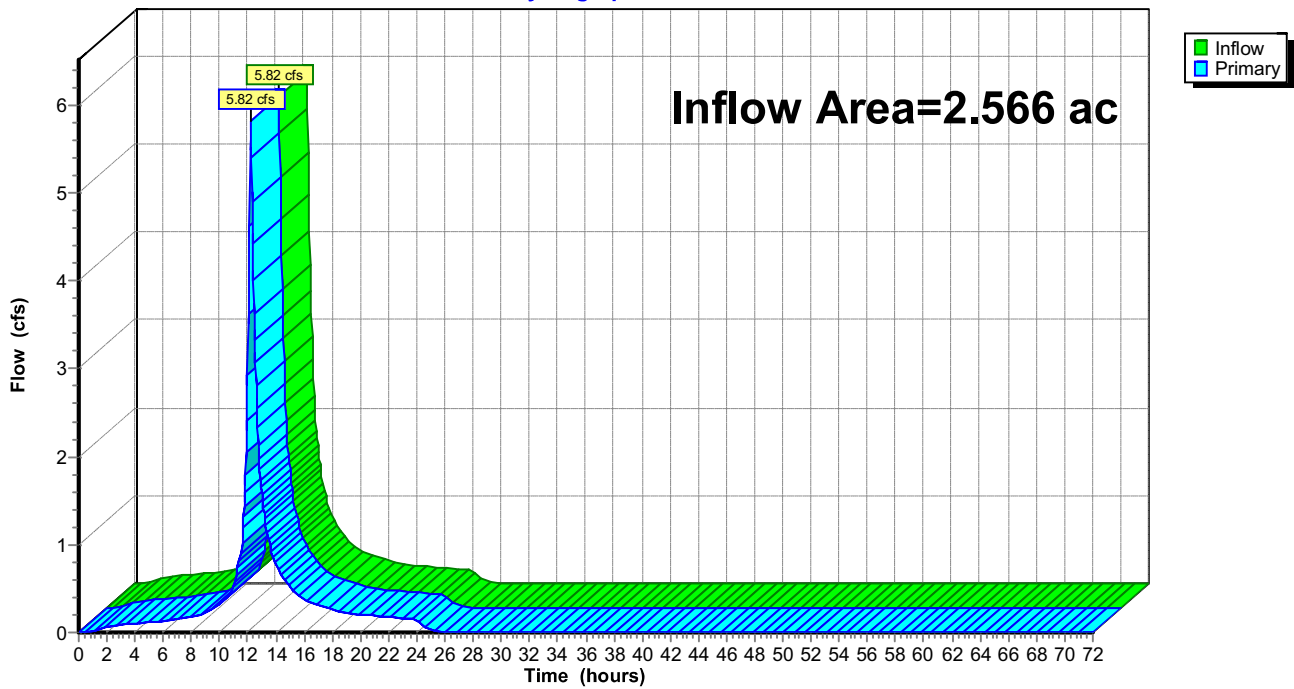
## Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.95" for 100-Year event  
Inflow = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af  
Primary = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-B1: B1

Hydrograph





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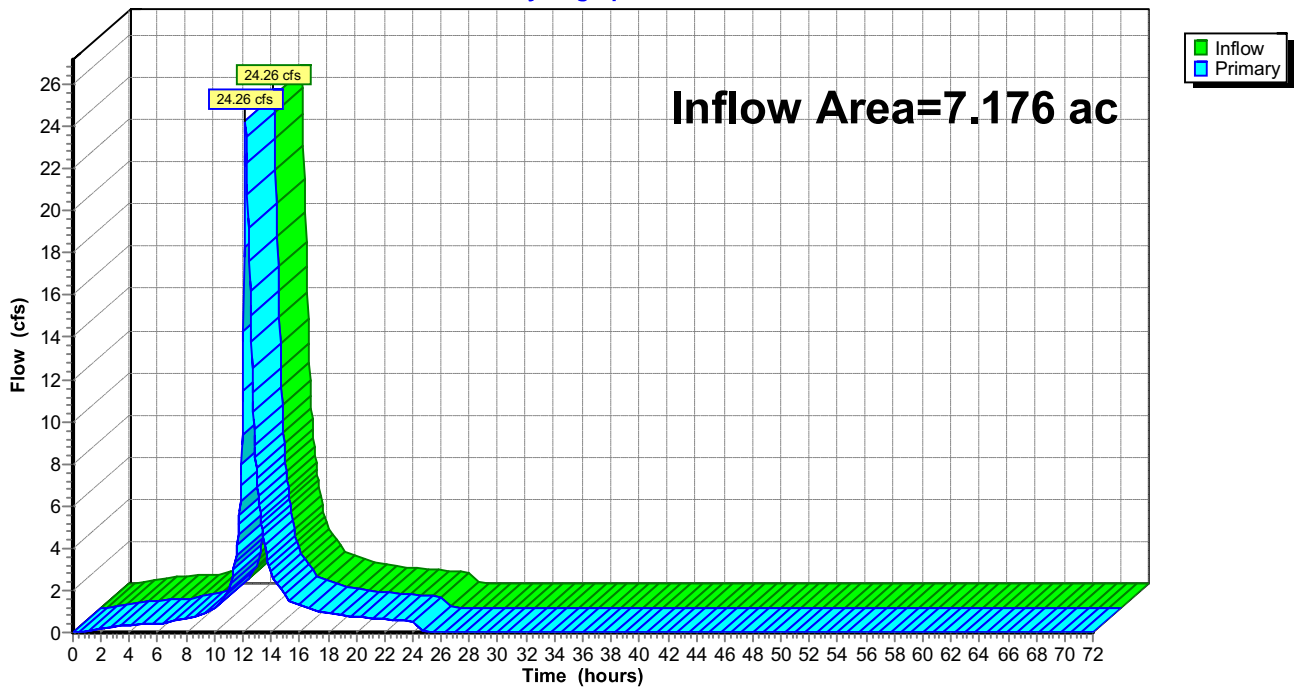
## Summary for Link P-C1: C1

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 5.56" for 100-Year event  
Inflow = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af  
Primary = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-C1: C1

Hydrograph



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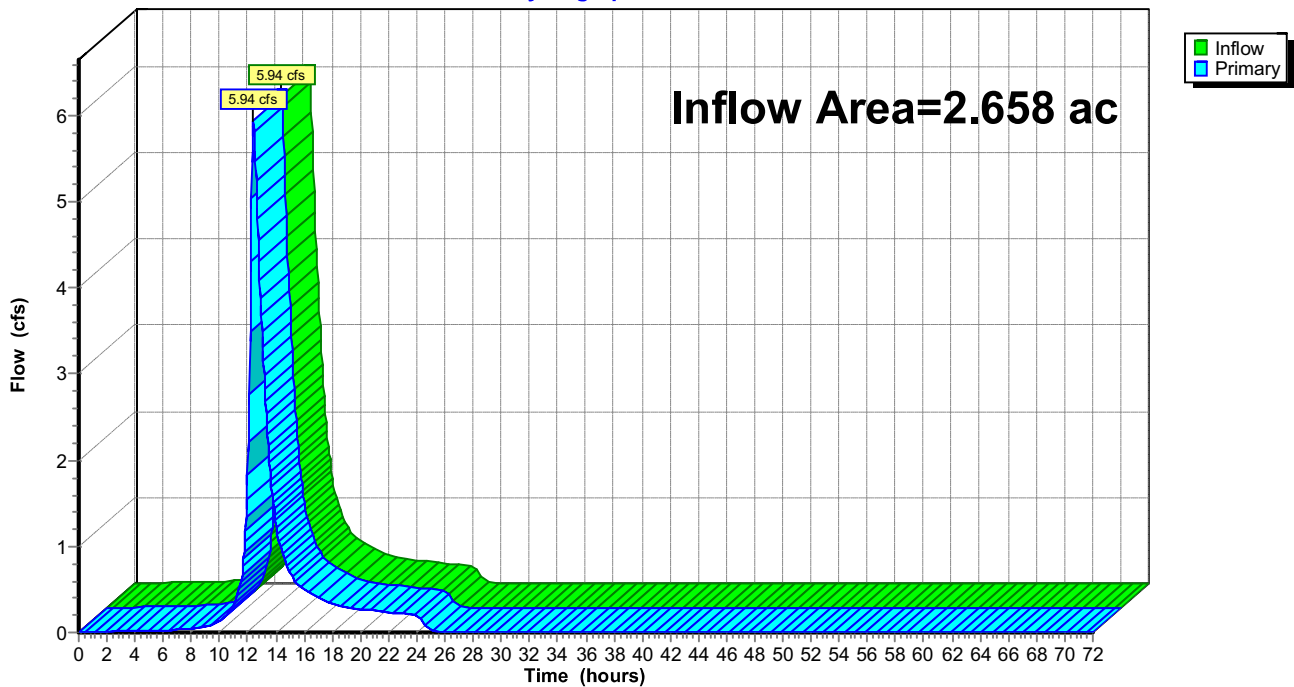
## Summary for Link P-Off: Offsite

Inflow Area = 2.658 ac, 5.27% Impervious, Inflow Depth = 4.43" for 100-Year event  
Inflow = 5.94 cfs @ 12.39 hrs, Volume= 0.981 af  
Primary = 5.94 cfs @ 12.39 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-Off: Offsite

Hydrograph



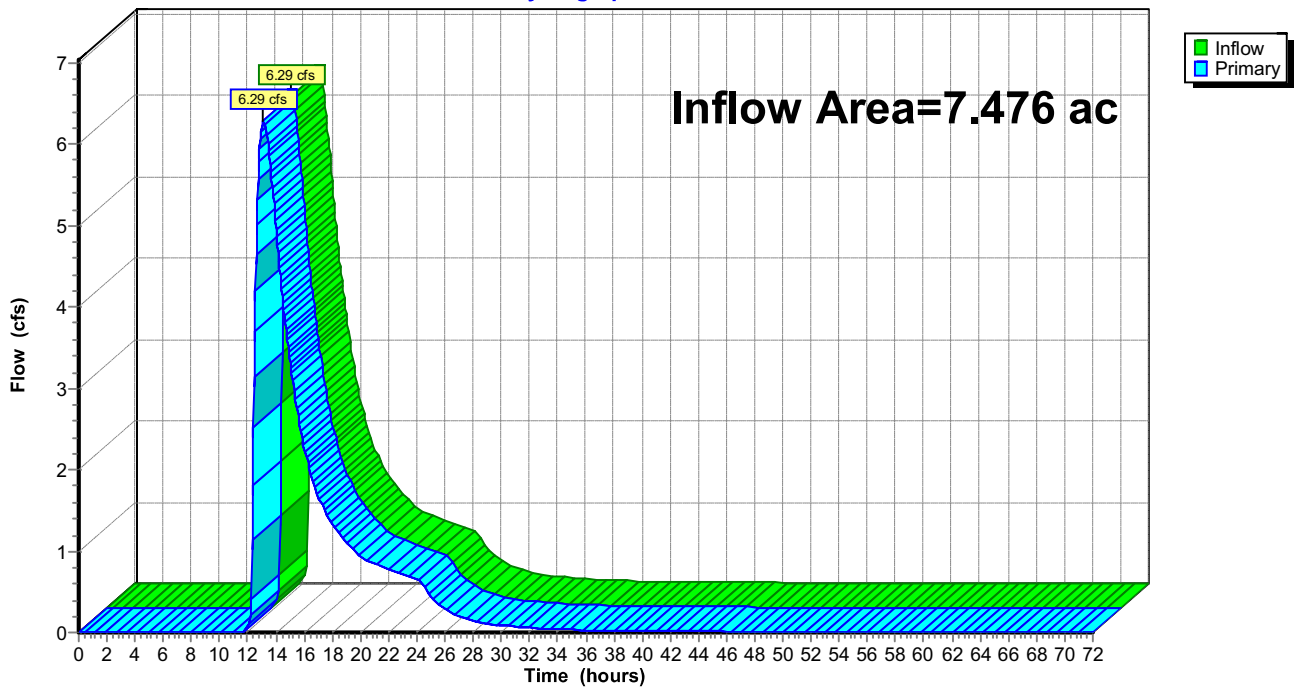
### Summary for Link Post IB-A: Post IB-A

Inflow Area = 7.476 ac, 42.22% Impervious, Inflow Depth > 3.57" for 100-Year event  
Inflow = 6.29 cfs @ 13.12 hrs, Volume= 2.226 af  
Primary = 6.29 cfs @ 13.12 hrs, Volume= 2.226 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link Post IB-A: Post IB-A

Hydrograph



# WARE MALCOMB

ARCHITECTURE

INTERIORS

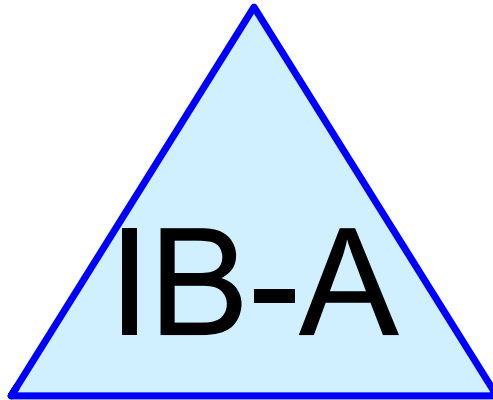
BRANDING

PLANNING

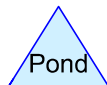
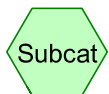
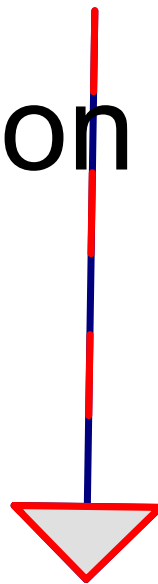
CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix D



# Infiltration Basin A



**NYC19-0005\_offsite\_Final\_2**

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*NJ DEP 2-hr Custom Rainfall=1.25"*

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Page 2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Pond IB-A: Infiltration Basin A**

Peak Elev=31.83' Storage=0.277 af Inflow=5.78 cfs 0.277 af

Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

**NYC19-0005\_offsite\_Final\_2**

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NJ DEP 2-hr Custom Rainfall=1.25"

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**Summary for Pond IB-A: Infiltration Basin A**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 0.46" for Custom event  
 Inflow = 5.78 cfs @ 1.17 hrs, Volume= 0.277 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 31.83' @ 4.75 hrs Surf.Area= 0.656 ac Storage= 0.277 af

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	31.40'	2.668 af	<b>Custom Stage Data (Irregular)</b> Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>18.0" W x 12.0" H, R=18.0" Elliptical Culvert X 2.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	34.05'	<b>35.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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
#3	Device 1	33.05'	<b>2.2' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

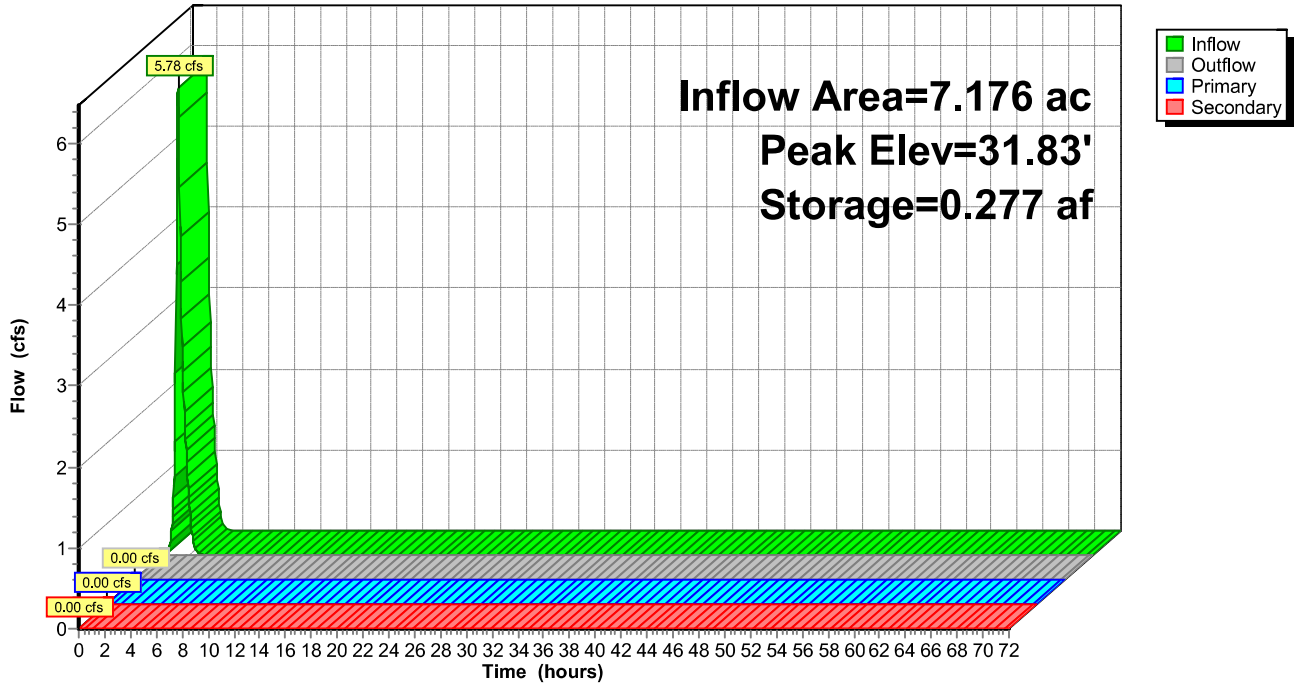
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

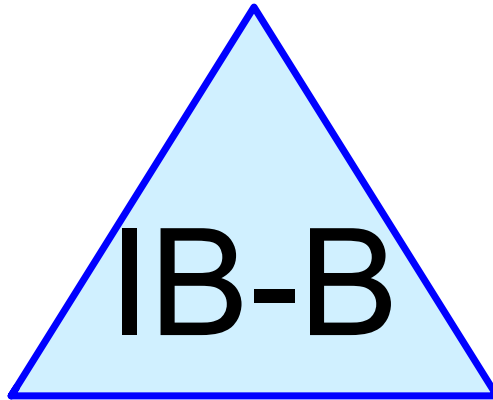
- ↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond IB-A: Infiltration Basin A

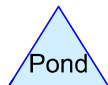
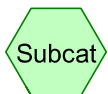
Hydrograph







# Infiltration Basin B



**NYC19-0005\_offsite\_Final\_2**

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Page 2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Pond IB-B: Infiltration Basin B**

Peak Elev=30.74' Storage=0.081 af Inflow=1.74 cfs 0.081 af

Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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NJ DEP 2-hr Custom Rainfall=1.25"

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**Summary for Pond IB-B: Infiltration Basin B**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 0.38" for Custom event  
 Inflow = 1.74 cfs @ 1.17 hrs, Volume= 0.081 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.74' @ 3.15 hrs Surf.Area= 0.241 ac Storage= 0.081 af

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	30.40'	0.960 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
30.40	0.235	491.3	0.000	0.000	0.235	
31.00	0.245	498.6	0.144	0.144	0.250	
32.00	0.263	510.7	0.254	0.398	0.275	
33.00	0.281	522.8	0.272	0.670	0.301	
34.00	0.299	535.0	0.290	0.960	0.327	

Device	Routing	Invert	Outlet Devices	
#1	Primary	30.95'	<b>15.0" Round Culvert</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf	
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads	
#3	Secondary	32.80'	<b>30.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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=30.40' (Free Discharge)

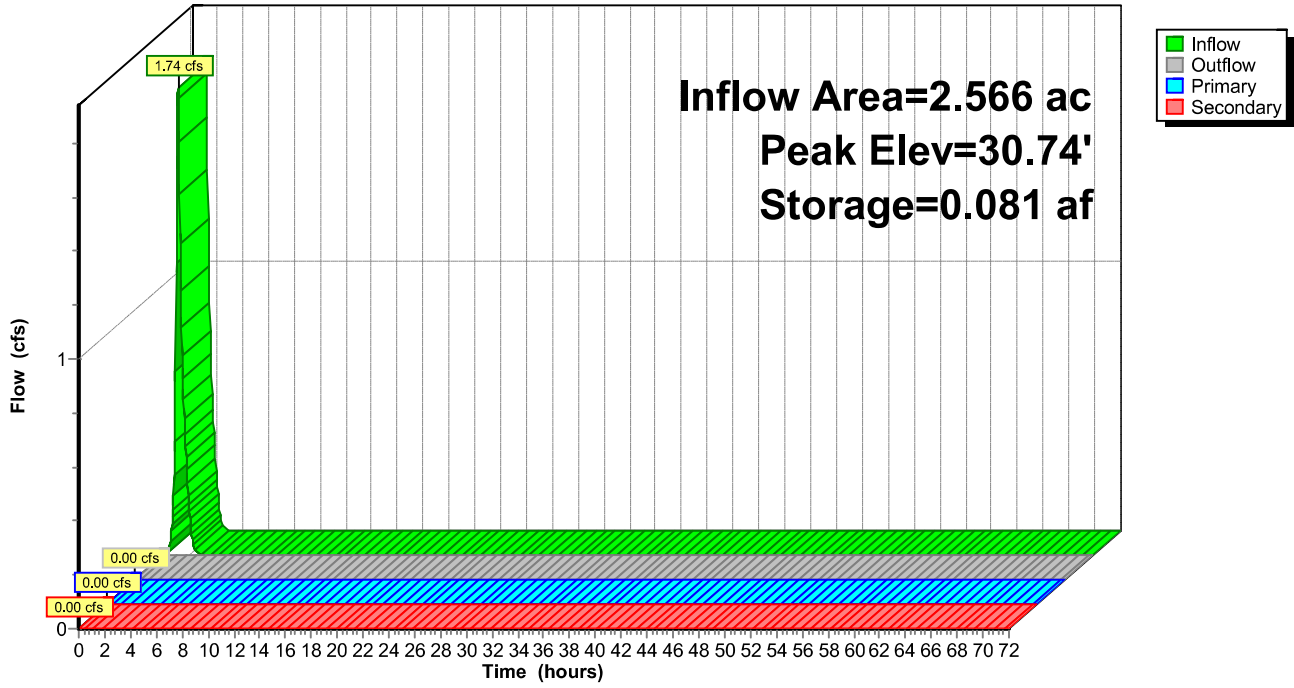
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑2=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=30.40' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond IB-B: Infiltration Basin B

Hydrograph



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## Appendix E

New Jersey  
Groundwater  
Recharge  
Spreadsheet  
Version 2.0  
November 2003

## Annual Groundwater Recharge Analysis (based on GSR-32)

<b>Project Name:</b> Edgewater Park Self Storage	
<b>Description:</b> Self Storage Facility in Edgewater	
<b>Analysis Date:</b> 07/09/202	

Post-Developed Conditions										
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	2.06	Impervious areas	Galestown	0.0	-					
2	1.34	Woods	Galestown	14.1	68,547					
3	2.52	Open space	Galestown	14.9	136,257					
4	1.89	Impervious areas	Galestown	0.0	-					
5	0									
6	0									
7	0									
8	0									
9	0									
10	0									
11	0									
12	0									
13	0									
14	0									
15	0									
<b>Total =</b>	<b>7.8</b>									

Annual Recharge Requirements Calculation ↓									
				Annual Recharge Requirements Calculation ↓					
				% of Pre-Developed Annual Recharge to Preserve = 100%					
				Post-Development Annual Recharge Deficit= 194,714 (cubic feet)					
Recharge Efficiency Parameters Calculations (area averages)									
				RWC= 2.46 (in) DRWC= 2.46 (in)					
				ERWC = 0.73 (in) EDRWC= 0.73 (in)					

### Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name		Description		Analysis Date		BMP or LID Type	
Edgewater Park Self Storage		Self Storage Facility in Edgewater P07/09/202		Infiltration Basin B			
Recharge BMP Input Parameters		Root Zone Water Capacity Calculated Parameters		Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	10243.6	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in
BMP Effective Depth, this is the design variable	dBMP	24.0	in	ERWC Modified to consider dEXC	EDRWC	0.62	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in	Empty Portion of RWC under Infiltr. BMP	RERWC	0.50	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in				
Post-development Land Segment Location of BMP, Input, Zero if Location is distributed or undetermined	SegBMP	3	unitless				
Parameters from Annual Recharge Worksheet		BMP Calculated Size Parameters		BMP Calculated Size Parameters		System Performance Calculated Parameters	
Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft	ABMP/Aimp	Aratio	0.25	unitless
Post-D Impervious Area (or target Impervious Area)	Aimp	40,712	sq.ft	BMP Volume	VBMP	20,487	cu.ft
Root Zone Water Capacity	RWC	2.10	in	Annual BMP Recharge Volume		87,783	cu.ft
RWC Modified to consider dEXC	DRWC	2.10	in	Avg BMP Recharge Efficiency		74.1%	Represents % Infiltration Recharged
Climatic Factor	C-factor	1.41	no units	%Rainfall became Runoff		77.7%	%
Average Annual P	Pavg	44.9	in	%Runoff Infiltrated		100.0%	%
Recharge Requirement over Imp. Area	dr	13.6	in	%Runoff Recharged		17.5%	%
				%Rainfall Recharged		13.6%	%
<p><b>How to solve for different recharge volumes:</b> By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef &amp; Aimp" button.</p>							
CALCULATION CHECK MESSAGES							
Volume Balance-> <b>Solve Problem to satisfy Annual Recharge</b>							
dBMP Check--> <b>OK</b>							
dEXC Check--> <b>OK</b>							
BMP Location--> <b>OK</b>							
OTHER NOTES							
Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For Land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.							

Project Name		Description		Analysis Date		BMP or LID Type	
Edgewater Park Self Storage Facility		Self Storage Facility in Edgewater P07/09/202		Infiltration Basin A			
Recharge BMP Input Parameters		Root Zone Water capacity Calculated Parameters		Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	27454.4	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in
BMP Effective Depth, this is the design variable	dBMP	24.0	in	ERWC Modified to consider dEXC	EDRWC	0.62	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in	Empty Portion of RWC under Infiltr. BMP	RERWC	0.50	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in				
Post-development Land Segment Location of BMP Input, Zero if Location is distributed or undetermined	SegBMP	3	unitless				
		BMP Calculated Size Parameters		BMP Calculated Size Parameters			
		ABMP/Aimp	0.21	Aratio	unitless		
		BMP Volume	54,909	VBMP	cu.ft		
Parameters from Annual Recharge Worksheet		System Performance Calculated Parameters		CALCULATION CHECK MESSAGES			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft	Annual BMP Recharge Volume		235,274	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	131,355	sq.ft	Avg BMP Recharge Efficiency		74.1%	Represents % Infiltration Recharged
Root Zone Water Capacity	RWC	2.10	in	%Rainfall became Runoff		77.7%	%
RWC Modified to consider dEXC	DRWC	2.10	in	%Runoff Infiltrated		83.1%	%
Climatic Factor	C-factor	1.41	no units	%Runoff Recharged		47.0%	%
Average Annual P	Pavg	44.9	in	%Rainfall Recharged		36.5%	%
Recharge Requirement over Imp. Area	dr	13.6	in				
<p><b>How to solve for different recharge volumes:</b> By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef &amp; Aimp" button.</p>							
		BMP Calculated Size Parameters		BMP Calculated Size Parameters			
		ABMP/Aimp	0.21	Aratio	unitless		
		BMP Volume	54,909	VBMP	cu.ft		
		Annual BMP Recharge Volume	235,274	Annual BMP Recharge Volume	cu.ft		
		Avg BMP Recharge Efficiency	74.1%	Avg BMP Recharge Efficiency			
		%Rainfall became Runoff	77.7%	%Rainfall became Runoff			
		%Runoff Infiltrated	83.1%	%Runoff Infiltrated			
		%Runoff Recharged	47.0%	%Runoff Recharged			
		%Rainfall Recharged	36.5%	%Rainfall Recharged			
		<p><b>OTHER NOTES</b></p> <p>Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For Land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.</p>					
		<p>Volume Balance--&gt; <b>Solve Problem to satisfy Annual Recharge</b></p> <p>dBMP Check--&gt; <b>OK</b></p> <p>dEXC Check--&gt; <b>OK</b></p> <p>BMP Location--&gt; <b>OK</b></p>					



# WARE MALCOMB

ARCHITECTURE

INTERIORS

BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

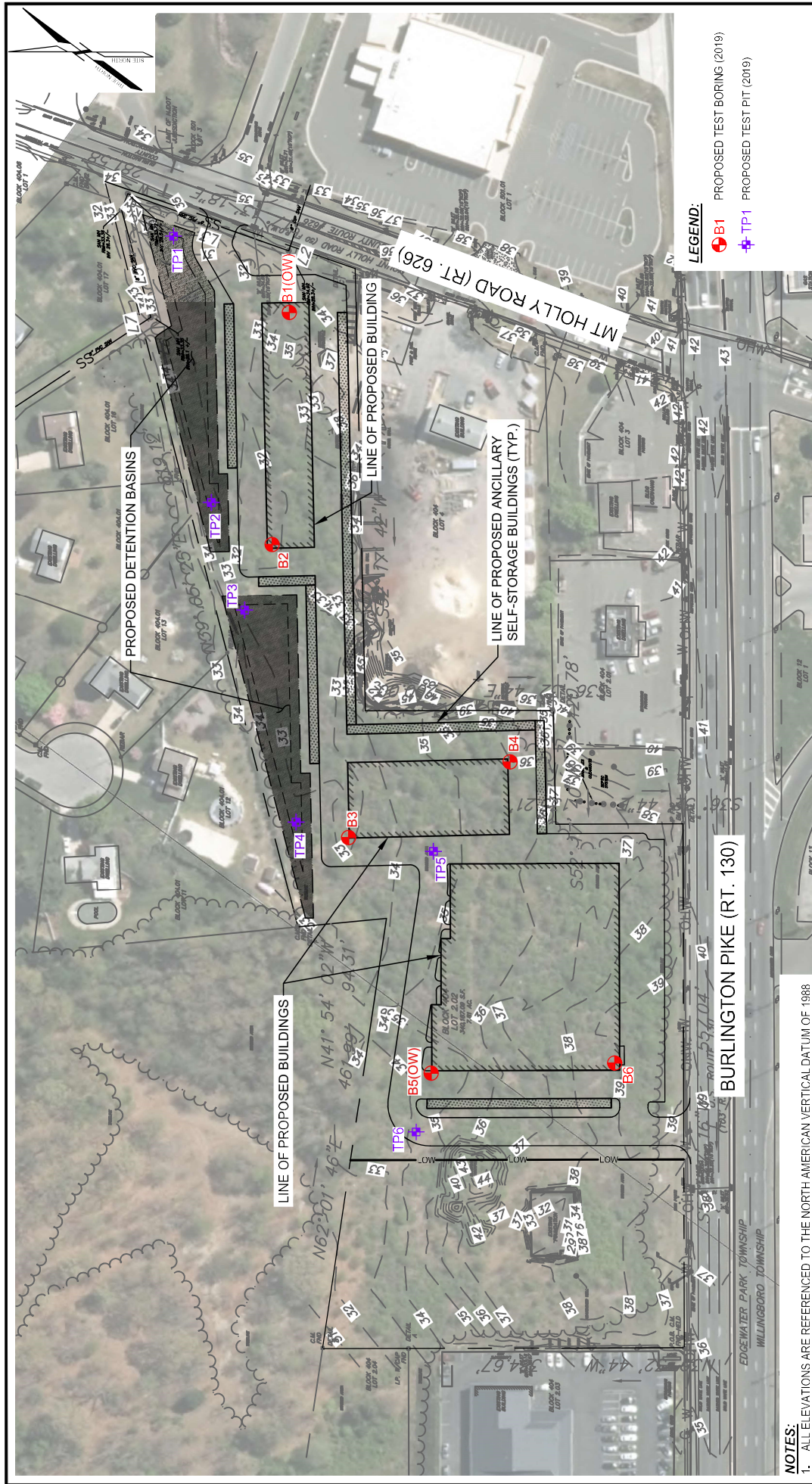
## Appendix F

**Table 3. Constant Head Field Permeameter Data**  
**Phase 1 Geotechnical Evaluation Memo**  
**Edgewater Storage LLC**  
**Edgewater Park, Burlington County, NJ**

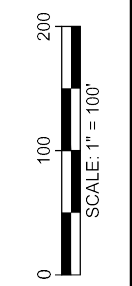
Test Location ID	Date of Test	Estimated SHWT <sup>(1)</sup>		Test Subgrade		Soil Subgrade Tested	Field-Saturated Hydraulic Conductivity <sup>(3)</sup> , $k_{fs}$ (cm/s)	Field-Saturated Infiltration Rate <sup>(4)</sup> (inch/hr)
		Depth, (feet)	Elevation <sup>(2)</sup> , (feet)	Depth, (feet)	Elevation <sup>(2)</sup> , (feet)			
TP1:K1	5/20/2020	4.3	26.1	2.5	27.9	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	3.24E-03	4.61
TP2:K1	5/21/2020	5.7	26.6	2.2	30.1	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	4.58E-03	5.08
TP2:K2	5/27/2020	5.7	26.6	3.0	29.3	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	6.34E-03	5.51
TP3:K1	5/21/2020	4.3	28.2	2.2	30.3	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	4.49E-03	5.04
TP4:K1	5/22/2020	4.3	28.9	2.3	30.9	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	6.83E-03	5.63
TP4:K2	5/22/2020	4.3	28.9	2.3	30.9	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	6.59E-03	5.59
TP4:K3	5/22/2020	4.3	28.9	5.3	27.9	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	1.03E-02	6.30
TP5:K1	5/26/2020	3.5	31.1	1.5	33.1	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	4.22E-03	4.96
TP6:K1	5/26/2020	6.0	27.9	1.0	32.9	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	5.29E-03	5.28
TP6:K2	5/26/2020	6.0	27.9	5.3	28.6	Narrowly Graded Sand with Silt (SP-SM) with ~10% fines	1.98E-02	7.52
<b>Geometric Mean (All Testing Locations above Estimated SHWT) =</b>							<b>5.05E-03</b>	<b>5.20</b>

**Footnotes:**

- Seasonal High Water Table (SHWT) estimated through soil morphology observations in the field.
- Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).
- $k_{fs}$  calculated using data collected in the field from an Aardvark Constant Head Permeameter and equations based on the USBR 7300-89 procedure.
- Infiltration Rate approximated using relationship in OMMAH SB-6 "Percolation Time and Soil Descriptions",  
 $k_{fs}$  [cm/s] =  $6 \times 10^{-11} \cdot (\text{Infiltration Rate [mm/hr]})^{3.7363}$ .



Phase 1 Geotechnical Memorandum Edgewater Self-Storage Development Edgewater Park, Burlington County, New Jersey		EXPLORATION LOCATION PLAN
Edgewater Storage LLC Teaneck, New Jersey	Project 2002331	June 2020
		Fig. 2




# TEST PIT LOG

# TP4

<b>Project</b>	Edgewater Storage Development		<b>PG.</b>	1	<b>OF</b>	3
<b>City/Town</b>	Edgewater Park, Burlington County, NJ		<b>Location</b>	See Plan		
<b>Client</b>	Edgewater Storage, LLC		N: 439,371.01 ft	E: 375,091.91 ft		
<b>Equipment/Reach</b>	CASE 580 Super M Backhoe / ~14-foot Reach		<b>Ground El.</b>	33.2 ft		
<b>Weather</b>	~55 °F, Sunny		<b>Datum</b>	NAD83 NJ / NAVD 88		
<b>Contractor</b>	AmeriDrill	<b>Operator</b>	T. Brown			
<b>Observed By</b>	J. Light	<b>Date</b>	5/22/2020			
<b>Checked By</b>	S. DiBartolo	<b>Date</b>	6/17/2020			

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			0-0.6': Loamy Top Soil; dark brown, roots.
	G1 Bag	1.3	0.6'-1.4': NARROWLY GRADED SAND (SP); ~95% Sand; ~5% low plasticity fines; moist; dark brown; roots.
2			1.4'-4.3': NARROWLY GRADED SAND WITH SILT (SP-SM); 89.5% mostly fine to medium sand; 10.5% low plasticity fines; moist; light brown getting lighter at depth; roots; thin iron banding @ 3.2'. [GRAIN SIZE TEST PERFORMED].
	G2 Bag	2.0	
4			4.3'-9.5': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% mostly fine to medium sand; ~10% low plasticity fines; moist; light gray and red brown; moist; mottling; iron banding @ 5' and 5.4'.
	G3 Bag	3.5	
	G4 Bag	5.2	
6			Bottom of test pit at ~9.5 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
	G5 Bag	9.5	
8			
10			
12			
14			
16			

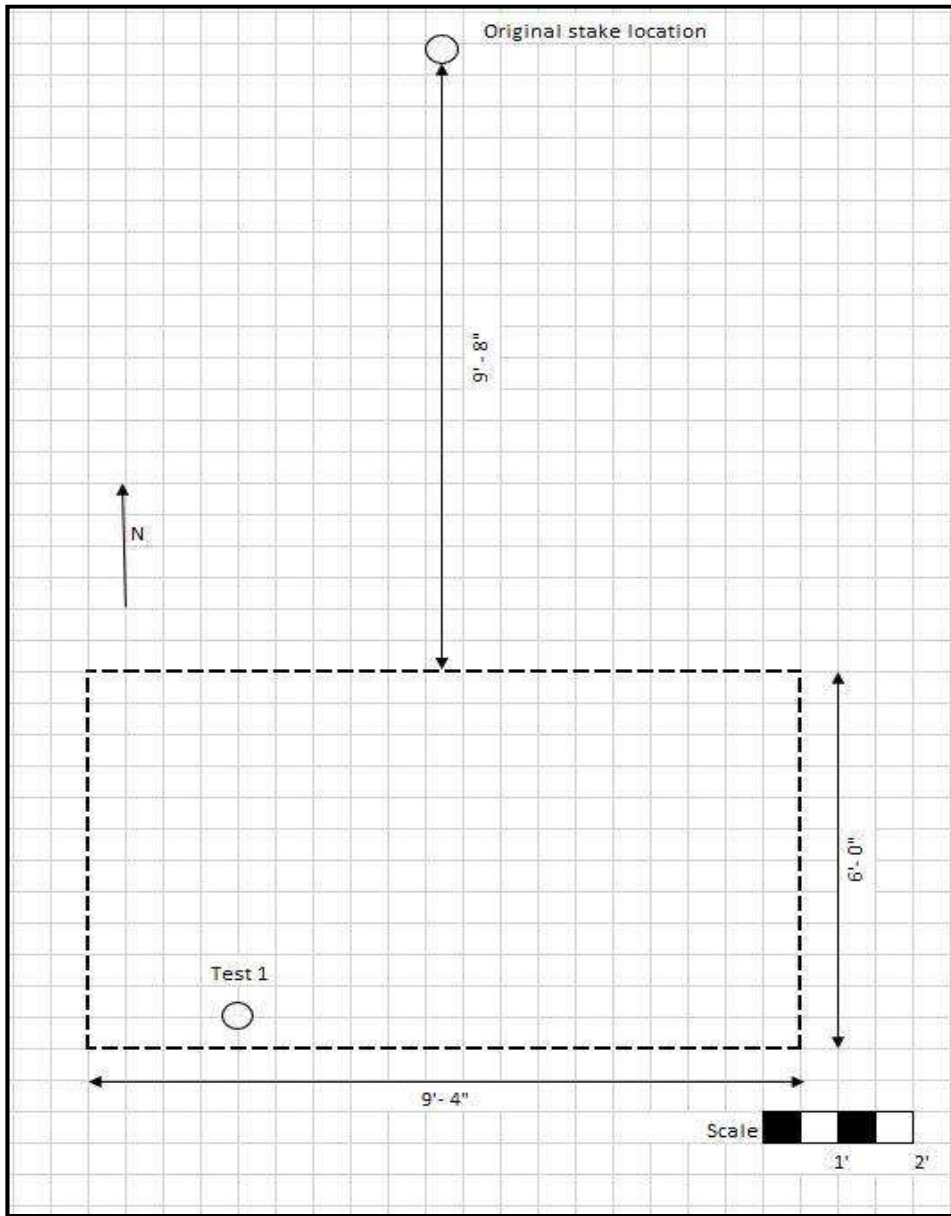
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) Groundwater not encountered.</li> <li>2) Estimated SHWT @ D=4.3'.</li> <li>3) Aardvark Permeameter testing performed at D=2.3' and 5.3'.</li> </ol>	<p><b>Pit Dimensions (ft)</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Length</td> <td style="text-align: center;">9.4</td> </tr> <tr> <td style="text-align: right;">Width</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: right;">Depth</td> <td style="text-align: center;">9.5</td> </tr> </table>	Length	9.4	Width	6	Depth	9.5	
Length	9.4							
Width	6							
Depth	9.5							

# TEST PIT LOG

# TP4

**Project** Edgewater Storage Development  
**City/Town** Edgewater Park, Burlington County, NJ  
**Client** Edgewater Storage, LLC  
**Equipment/Reach** CASE 580 Super M Backhoe / ~14-foot Reach  
**Weather** ~55 °F, Sunny  
**Contractor** AmeriDrill **Operator** T. Brown  
**Observed By** J. Light **Date** 5/22/2020  
**Checked By** S. DiBartolo **Date** 6/17/2020

**PG.** 2 **OF** 3  
**Location** See Plan  
 N: 439,371.01 ft E: 375,091.91 ft  
**Ground El.** 33.2 ft  
**Datum** NAD83 NJ / NAVD 88  
**Project No.** 2002331  
**Start Date** 5/22/2020  
**End Date** 5/22/2020



TP4 PLAN VIEW

**Notes:**

**Pit Dimensions (ft)**

Length 9.4

Width 6

Depth 9.5





# TEST PIT LOG

# TP4

**Project** Edgewater Storage Development  
**City/Town** Edgewater Park, Burlington County, NJ  
**Client** Edgewater Storage, LLC  
**Equipment/Reach** CASE 580 Super M Backhoe / ~14-foot Reach  
**Weather** ~55 °F, Sunny  
**Contractor** AmeriDrill **Operator** T. Brown  
**Observed By** J. Light **Date** 5/22/2020  
**Checked By** S. DiBartolo **Date** 6/17/2020

**PG.** 3 **OF** 3  
**Location** See Plan  
 N: 439,371.01 ft E: 375,091.91 ft  
**Ground El.** 33.2 ft  
**Datum** NAD83 NJ / NAVD 88  
**Project No.** 2002331  
**Start Date** 5/22/2020  
**End Date** 5/22/2020



Photo 1: TP4 Looking Northwest



Photo 2: TP4 Northwestern Side Wall

**Notes:**

**Pit Dimensions (ft)**

Length 9.4


Width 6

Depth 9.5



TEST PIT LOG				TP6	
<b>Project</b>	Edgewater Storage Development			<b>PG.</b>	1 OF 3
<b>City/Town</b>	Edgewater Park, Burlington County, NJ			<b>Location</b>	See Plan
<b>Client</b>	Edgewater Storage, LLC			N: 439,072.64 ft	E: 374,902.48 ft
<b>Equipment/Reach</b>	CASE 580 Super M Backhoe / ~14-foot Reach			<b>Ground El.</b>	33.9 ft
<b>Weather</b>	~70s °F, Sunny			<b>Datum</b>	NAD83 NJ / NAVD 88
<b>Contractor</b>	AmeriDrill	<b>Operator</b>	R. Wintersteen	<b>Project No.</b>	2002331
<b>Observed By</b>	J. Light	<b>Date</b>	5/26/2020	<b>Start Date</b>	5/26/2020
<b>Checked By</b>	S. DiBartolo	<b>Date</b>	6/17/2020	<b>End Date</b>	5/26/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			0-0.8': Fine sandy to soil; dark brown; roots.
			0.8'-3': NARROWLY GRADED SAND WITH SAND (SP-SM); ~90% fine sand; ~10% low plasticity fines; moist; medium brown @ 0.8'-1.4', light brown @ 1.4'-3', some iron banding @ 2.2'; roots.
2	G1 Bag	2	
	G2 Bag	3	
4			3'-4.5': CLAYEY SAND (SC); ~60% sand; ~30% medium to high plasticity fines; ~10% sub-rounded gravel; moist; red brown.
	G3 Bag	5	
6			4.5'-6': WIDELY GRADED SAND (SW); ~95% sand; ~5% subrounded gravel; moist; red brown.
			6'-8': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% medium to fine sand; ~10% low plasticity fines; moist; light gray; mottling.
8	G4 Bag	8	
			Bottom of test pit at ~8 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
10			
12			
14			
16			

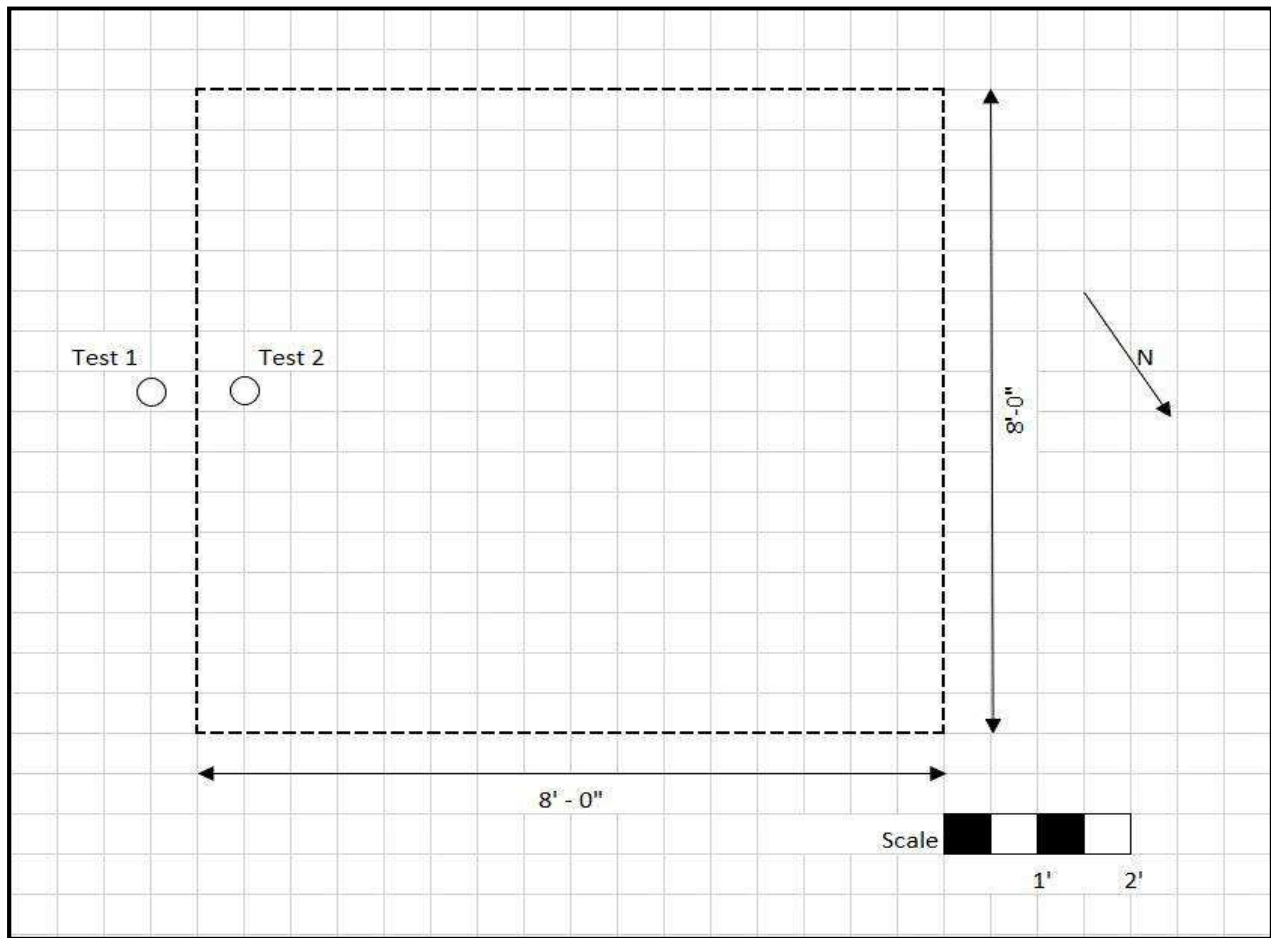
<b>Notes:</b> 1) Groundwater not encountered.	<b>Pit Dimensions (ft)</b>		
	Length	8	
	Width	8	
	Depth	8	

# TEST PIT LOG

# TP6

**Project** Edgewater Storage Development  
**City/Town** Edgewater Park, Burlington County, NJ  
**Client** Edgewater Storage, LLC  
**Equipment/Reach** CASE 580 Super M Backhoe / ~14-foot Reach  
**Weather** ~70s °F, Sunny  
**Contractor** AmeriDrill **Operator** R. Wintersteen  
**Observed By** J. Light **Date** 5/26/2020  
**Checked By** S. DiBartolo **Date** 6/17/2020

**PG.** 2 **OF** 3  
**Location** See Plan  
 N: 439,072.64 ft E: 374,902.48 ft  
**Ground El.** 33.9 ft  
**Datum** NAD83 NJ / NAVD 88  
**Project No.** 2002331  
**Start Date** 5/26/2020  
**End Date** 5/26/2020



TP6 PLAN VIEW

**Notes:**

**Pit Dimensions (ft)**

Length 8

Width 8

Depth 8





# TEST PIT LOG

# TP6

**Project** Edgewater Storage Development  
**City/Town** Edgewater Park, Burlington County, NJ  
**Client** Edgewater Storage, LLC  
**Equipment/Reach** CASE 580 Super M Backhoe / ~14-foot Reach  
**Weather** ~70s °F, Sunny  
**Contractor** AmeriDrill **Operator** R. Wintersteen  
**Observed By** J. Light **Date** 5/26/2020  
**Checked By** S. DiBartolo **Date** 6/17/2020

**PG.** 3 **OF** 3  
**Location** See Plan  
 N: 439,072.64 ft E: 374,902.48 ft  
**Ground El.** 33.9 ft  
**Datum** NAD83 NJ / NAVD 88  
**Project No.** 2002331  
**Start Date** 5/26/2020  
**End Date** 5/26/2020



Photo 1: TP6 Upper Side Wall Looking Southeast



Photo 2: TP6 Lower Side Wall Looking Southeast

**Notes:**

**Pit Dimensions (ft)**

Length 8

Width 8

Depth 8



# WARE MALCOMB

ARCHITECTURE

INTERIORS

BRANDING

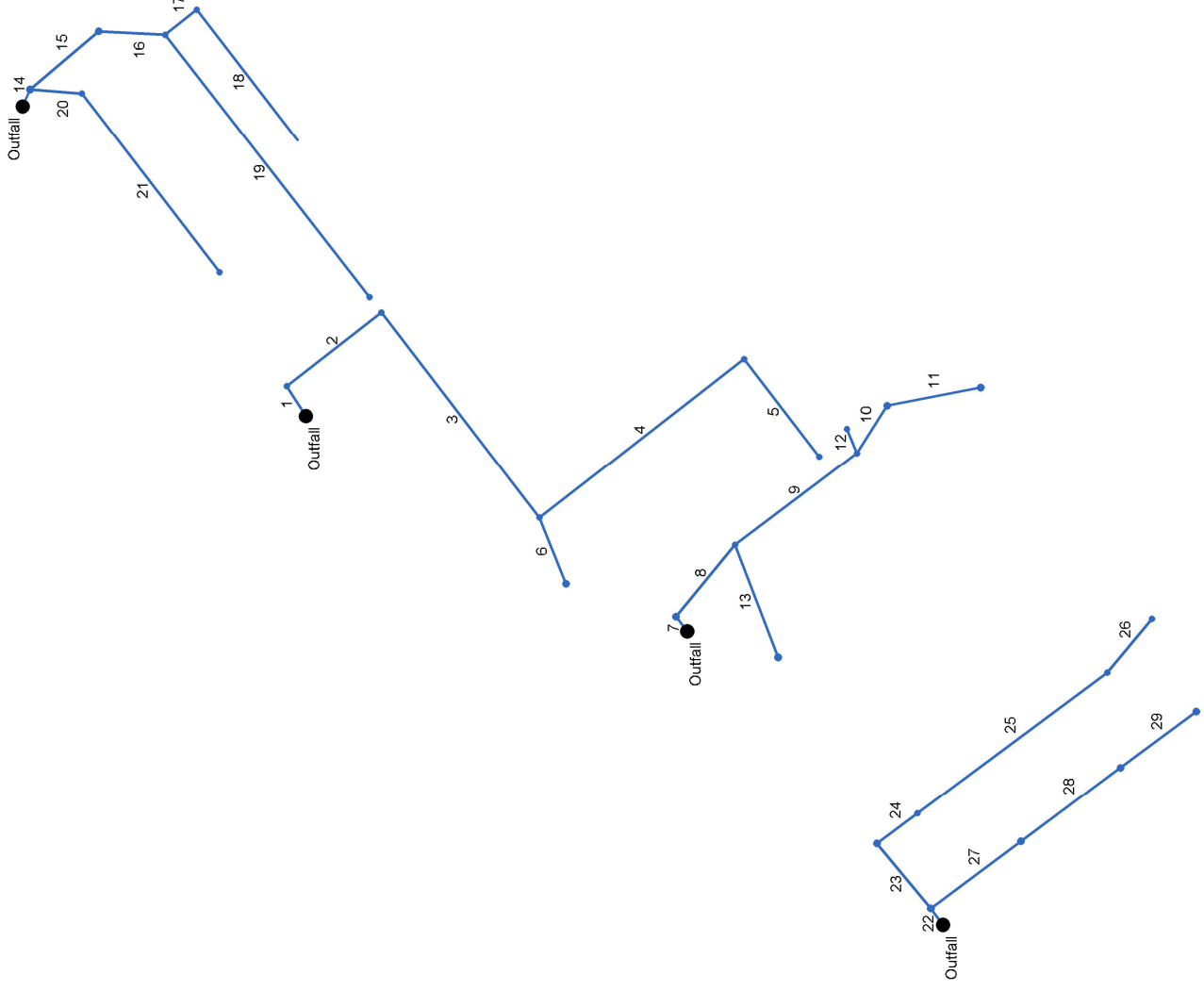
PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## **Appendix G**

# Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



# Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	PIPE-301	4.09	18	Cir	27.335	31.65	31.72	0.256	32.42	32.62	0.21	32.83	End	Manhole
2	PIPE-302	3.77	18	Cir	92.502	31.72	31.97	0.270	32.83	32.95	0.15	33.10	1	Manhole
3	PIPE-303	3.57	15	Cir	199.781	31.97	32.52	0.275	33.10	33.56	0.17	33.73	2	Manhole
4	PIPE-304	2.22	15	Cir	200.000	32.52	33.07	0.275	33.73	33.92	0.10	34.02	3	Manhole
5	PIPE-305	0.54	15	Cir	95.000	33.07	33.33	0.274	34.02	34.03	0.01	34.04	4	Manhole
6	PIPE-306	0.42	15	Cir	55.057	32.52	32.67	0.272	33.73	33.73	0.00	33.73	3	Manhole
7	PIPE-201	7.25	24	Cir	14.300	31.40	31.44	0.280	32.36	32.48	0.30	32.77	End	Manhole
8	PIPE-202	6.62	24	Cir	71.724	31.44	31.68	0.335	32.77	32.82	0.20	33.02	7	Manhole
9	PIPE-203	5.14	18	Cir	117.989	32.47	32.75	0.237	33.61	33.89	0.19	34.08	8	Manhole
10	PIPE-204	3.06	18	Cir	43.483	32.75	32.87	0.276	34.08	34.11	0.05	34.15	9	Manhole
11	PIPE-205	1.49	18	Cir	73.648	32.87	33.05	0.244	34.15	34.16	0.02	34.18	10	Manhole
12	PIPE - 203A	0.63	12	Cir	20.309	33.25	33.30	0.246	34.08	34.09	0.01	34.10	9	Manhole
13	PIPE-206	1.90	18	Cir	92.753	31.68	31.95	0.291	33.02	33.04	0.03	33.07	8	Manhole
14	PIPE-401	9.24	24	Cir	14.300	31.40	31.44	0.280	32.48	32.62	0.34	32.96	End	Manhole
15	PIPE-404	7.87	24	Cir	69.400	31.44	31.63	0.274	32.96	33.02	0.13	33.15	14	Manhole
16	PIPE-405	7.65	24	Cir	51.436	31.63	31.77	0.272	33.15	33.19	0.13	33.32	15	Manhole
17	PIPE - 405A	6.13	18	Cir	31.106	31.77	31.85	0.257	33.32*	33.41*	0.19	33.60	16	Manhole
18	PIPE - 405B	6.19	15	Cir	127.250	31.85	32.17	0.251	33.60*	34.59*	0.40	34.99	17	Manhole
19	PIPE-406	2.32	15	Cir	256.468	31.77	32.48	0.277	33.32	33.58	0.06	33.64	16	Manhole
20	PIPE-402	1.73	15	Cir	40.201	31.44	31.55	0.274	32.96*	32.98*	0.02	33.01	14	Manhole
21	PIPE-403	1.84	15	Cir	174.000	31.55	32.03	0.276	33.01	33.12	0.04	33.16	20	Manhole
22	PIPE-101	4.79	18	Cir	15.800	30.40	30.44	0.253	31.24	31.39	0.25	31.65	End	Manhole
23	PIPE-105	3.92	15	Cir	65.110	30.44	30.70	0.399	31.65	31.81	0.18	31.99	22	Manhole
24	PIPE-106	3.37	15	Cir	38.982	30.70	30.84	0.359	31.99	32.08	0.02	32.10	23	Manhole

Project File: NYC19-0005\_rev 3.stm Run Date: 12/4/2020

Number of lines: 29

NOTES: Return period = 25 Yrs. ; \*Surcharged (HGL above crown).

# Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	PIPE-107	3.48	15	Cir	182.670	30.84	31.33	0.268	32.10	32.51	0.04	32.55	24	Manhole
26	PIPE-108	0.65	15	Cir	53.940	31.33	31.48	0.278	32.55	32.55	0.01	32.56	25	Manhole
27	PIPE-102	1.30	15	Cir	86.610	30.44	30.68	0.277	31.65	31.67	0.00	31.68	22	Manhole
28	PIPE-103	0.85	15	Cir	95.792	30.68	30.94	0.271	31.68	31.69	0.00	31.69	27	Manhole
29	PIPE-104	0.46	15	Cir	72.896	30.94	31.14	0.274	31.69	31.70	0.01	31.71	28	Manhole

Project File: NYC19-0005\_rev 3.stm  
 Number of lines: 29  
 Run Date: 12/4/2020

NOTES: Return period = 25 Yrs. ; \*Surcharged (HGL above crown).

# Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area (ac)		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev (ft)	HGL Elev (ft)		Grnd / Rim Elev (ft)		Line ID
				Incr	Total		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)		Dn	Up	Dn	Up	
1	End		27.335	0.08	0.85	0.98	0.08	0.83	10.0	17.0	4.9	4.09	5.76	4.06	18	0.26	31.65	32.42	33.04	34.86	PIPE-301	
2	1		92.502	0.06	0.77	0.98	0.06	0.75	10.0	16.3	5.0	3.77	5.91	2.88	18	0.27	31.72	32.83	34.86	35.61	PIPE-302	
3	2		199.781	0.22	0.71	0.98	0.22	0.70	10.0	15.3	5.1	3.57	3.67	3.18	15	0.28	31.97	33.10	35.61	35.75	PIPE-303	
4	3		200.000	0.33	0.42	0.98	0.32	0.41	10.0	13.6	5.4	2.22	3.67	2.16	15	0.27	32.52	33.73	35.75	35.75	PIPE-304	
5	4		95.000	0.09	0.09	0.98	0.09	0.09	10.0	10.0	6.1	0.54	3.66	0.65	15	0.27	33.07	34.02	35.75	35.75	PIPE-305	
6	3		55.057	0.07	0.07	0.98	0.07	0.07	10.0	10.0	6.1	0.42	3.65	0.36	15	0.27	32.52	33.73	35.75	35.33	PIPE-306	
7	End		14.300	0.15	1.61	0.98	0.15	1.47	10.0	16.7	4.9	7.25	12.96	4.66	24	0.28	31.40	32.36	33.04	35.33	PIPE-201	
8	7		71.724	0.00	1.46	0.00	0.00	1.32	0.0	16.1	5.0	6.62	14.17	3.28	24	0.33	31.44	32.77	35.33	36.13	PIPE-202	
9	8		117.989	0.36	1.14	0.98	0.35	1.00	10.0	15.4	5.1	5.14	5.54	3.56	18	0.24	32.47	33.61	36.13	36.07	PIPE-203	
10	9		43.483	0.29	0.54	0.98	0.28	0.53	10.0	11.5	5.8	3.06	5.98	1.90	18	0.28	32.75	34.08	36.07	35.66	PIPE-204	
11	10		73.648	0.25	0.25	0.98	0.25	0.25	10.0	10.0	6.1	1.49	5.62	0.99	18	0.24	32.87	34.15	35.66	35.29	PIPE-205	
12	9		20.309	0.24	0.24	0.51	0.12	0.12	15.0	15.0	5.2	0.63	1.91	0.93	12	0.25	33.25	34.08	36.07	36.27	PIPE - 203A	
13	8		92.753	0.32	0.32	0.98	0.31	0.31	10.0	10.0	6.1	1.90	6.14	1.26	18	0.29	31.68	33.02	36.13	35.18	PIPE-206	
14	End		14.300	0.06	3.00	0.98	0.06	2.33	10.0	26.4	4.0	9.24	12.96	5.04	24	0.28	31.40	32.48	33.04	34.81	PIPE-401	
15	14		69.400	0.07	2.63	0.98	0.07	1.97	10.0	25.9	4.0	7.87	12.82	3.22	24	0.27	31.44	32.96	34.81	34.70	PIPE-404	
16	15		51.436	0.00	2.56	0.00	0.00	1.90	0.0	25.6	4.0	7.65	12.78	3.09	24	0.27	31.63	33.15	34.70	35.77	PIPE-405	
17	16		31.106	0.00	2.17	0.00	0.00	1.52	0.0	25.4	4.0	6.13	5.77	3.47	18	0.26	31.77	33.32	35.77	35.07	PIPE - 405A	
18	17		127.250	2.17	2.17	0.70	1.52	1.52	25.0	25.0	4.1	6.19	3.51	5.04	15	0.25	31.85	33.60	35.07	33.64	PIPE - 405B	
19	16		256.468	0.39	0.39	0.98	0.38	0.38	10.0	10.0	6.1	2.32	3.68	1.96	15	0.28	31.77	33.32	35.77	35.75	PIPE-406	
20	14		40.201	0.00	0.31	0.00	0.00	0.30	0.0	11.9	5.7	1.73	3.66	1.41	15	0.27	31.44	32.96	34.81	35.52	PIPE-402	
21	20		174.000	0.31	0.31	0.98	0.30	0.30	10.0	10.0	6.1	1.84	3.67	1.56	15	0.28	31.55	33.01	35.52	35.52	PIPE-403	
22	End		15.800	0.00	1.01	0.00	0.00	0.97	0.0	16.6	5.0	4.79	5.72	4.37	18	0.25	30.40	31.24	32.04	34.73	PIPE-101	

Project File: NYC19-0005\_rev 3.stm

Number of lines: 29

Run Date: 12/4/2020

NOTES: Intensity = 55.73 / (Inlet time + 10.70) ^ 0.73; Return period = Yrs. 25 ; c = cir e = ellip b = box

# Storm Sewer Tabulation

Station	Line	To Line	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
			(ft)		Incr	Total		Inlet	Syst	(in)	Slope (%)					Dn	Up	Dn	Up	Dn	Up	Dn	Up	
23	22	65.110	0.11	0.73	0.95	0.10	0.71	10.0	12.9	5.5	3.92	4.42	3.31	15	0.40	30.44	30.70	31.65	31.81	34.73	35.02	PIPE-105		
24	23	38.982	0.00	0.62	0.00	0.61	0.61	0.0	12.7	5.5	3.37	4.19	2.75	15	0.36	30.70	30.84	31.99	32.08	35.02	36.45	PIPE-106		
25	24	182.670	0.51	0.62	0.98	0.50	0.61	10.0	11.7	5.7	3.48	3.62	2.87	15	0.27	30.84	31.33	32.10	32.51	36.45	36.45	PIPE-107		
26	25	53.940	0.11	0.11	0.98	0.11	0.11	10.0	10.0	6.1	0.65	3.69	0.56	15	0.28	31.33	31.48	32.55	32.55	36.45	35.95	PIPE-108		
27	22	86.610	0.11	0.28	0.90	0.10	0.25	10.0	15.4	5.1	1.30	3.68	1.16	15	0.28	30.44	30.68	31.65	31.67	34.73	35.78	PIPE-102		
28	27	95.792	0.09	0.17	0.89	0.08	0.16	10.0	13.3	5.5	0.85	3.64	0.95	15	0.27	30.68	30.94	31.68	31.69	35.78	35.80	PIPE-103		
29	28	72.896	0.08	0.08	0.94	0.08	0.08	10.0	10.0	6.1	0.46	3.66	0.72	15	0.27	30.94	31.14	31.69	31.70	35.80	37.26	PIPE-104		
Project File: NYC19-0005_rev 3.stm																	Number of lines: 29					Run Date: 12/4/2020		

NOTES: Intensity = 55.73 / (Inlet time + 10.70) ^ 0.73; Return period = Yrs. 25 ; c = cir e = ellip b = box

# WARE MALCOMB

ARCHITECTURE

INTERIORS

BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix H









# WARE MALCOMB

ARCHITECTURE

INTERIORS

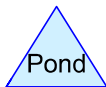
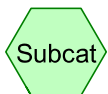
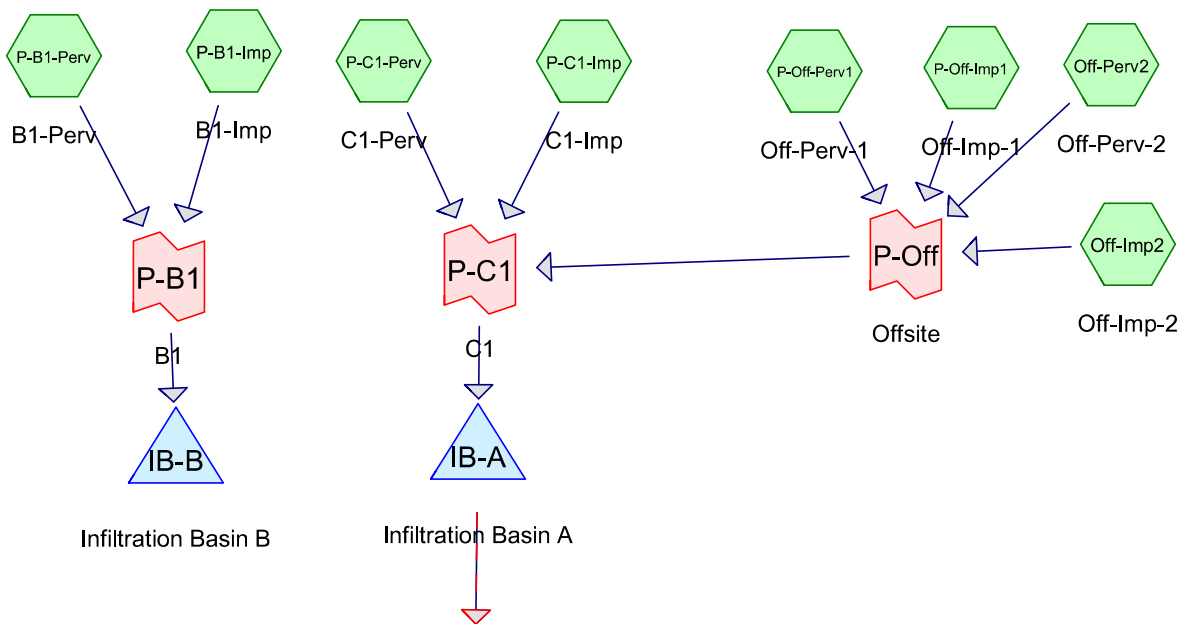
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## **Appendix I**



**Routing Diagram for NYC19-0005\_offsite\_Final\_2**  
 Prepared by Ware Malcomb, Printed 3/23/2021  
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**NYC19-0005\_offsite\_Final\_2**

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NOAA 24-hr C 100-Year Rainfall=8.81"

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Page 2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points  
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment Off-Imp2: Off-Imp-2** Runoff Area=0.605 ac 6.61% Impervious Runoff Depth=6.08"  
Tc=25.0 min CN=76/98 Runoff=1.87 cfs 0.306 af

**Subcatchment Off-Perv2: Off-Perv-2** Runoff Area=1.674 ac 0.00% Impervious Runoff Depth=4.07"  
Tc=25.0 min CN=61/0 Runoff=3.44 cfs 0.568 af

**Subcatchment P-B1-Imp: B1-Imp** Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=8.57"  
Tc=10.0 min CN=0/98 Runoff=5.77 cfs 0.667 af

**Subcatchment P-B1-Perv: B1-Perv** Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=1.30"  
Tc=42.0 min CN=37/0 Runoff=0.54 cfs 0.177 af

**Subcatchment P-C1-Imp: C1-Imp** Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=8.57"  
Tc=10.0 min CN=0/98 Runoff=18.63 cfs 2.154 af

**Subcatchment P-C1-Perv: C1-Perv** Runoff Area=1.502 ac 0.00% Impervious Runoff Depth=1.51"  
Tc=10.0 min CN=39/0 Runoff=1.35 cfs 0.190 af

**Subcatchment P-Off-Imp1: Off-Imp-1** Runoff Area=0.100 ac 100.00% Impervious Runoff Depth=8.57"  
Tc=15.0 min CN=0/98 Runoff=0.52 cfs 0.071 af

**Subcatchment P-Off-Perv1: Off-Perv-1** Runoff Area=0.279 ac 0.00% Impervious Runoff Depth=1.51"  
Tc=15.0 min CN=39/0 Runoff=0.20 cfs 0.035 af

**Pond IB-A: Infiltration Basin A** Peak Elev=34.22' Storage=2.031 af Inflow=24.26 cfs 3.325 af  
Primary=0.00 cfs 0.000 af Secondary=6.33 cfs 1.437 af Outflow=6.33 cfs 1.437 af

**Pond IB-B: Infiltration Basin B** Peak Elev=32.84' Storage=0.626 af Inflow=5.82 cfs 0.844 af  
Primary=0.00 cfs 0.000 af Secondary=0.56 cfs 0.229 af Outflow=0.56 cfs 0.229 af

**Link P-B1: B1** Inflow=5.82 cfs 0.844 af  
Primary=5.82 cfs 0.844 af

**Link P-C1: C1** Inflow=24.26 cfs 3.325 af  
Primary=24.26 cfs 3.325 af

**Link P-Off: Offsite** Inflow=5.94 cfs 0.981 af  
Primary=5.94 cfs 0.981 af

**Total Runoff Area = 9.742 ac Runoff Volume = 4.169 af Average Runoff Depth = 5.13"**  
**58.02% Pervious = 5.652 ac 41.98% Impervious = 4.090 ac**

**NYC19-0005\_offsite\_Final\_2**

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**Summary for Subcatchment Off-Imp2: Off-Imp-2**

Runoff = 1.87 cfs @ 12.39 hrs, Volume= 0.306 af, Depth= 6.08"

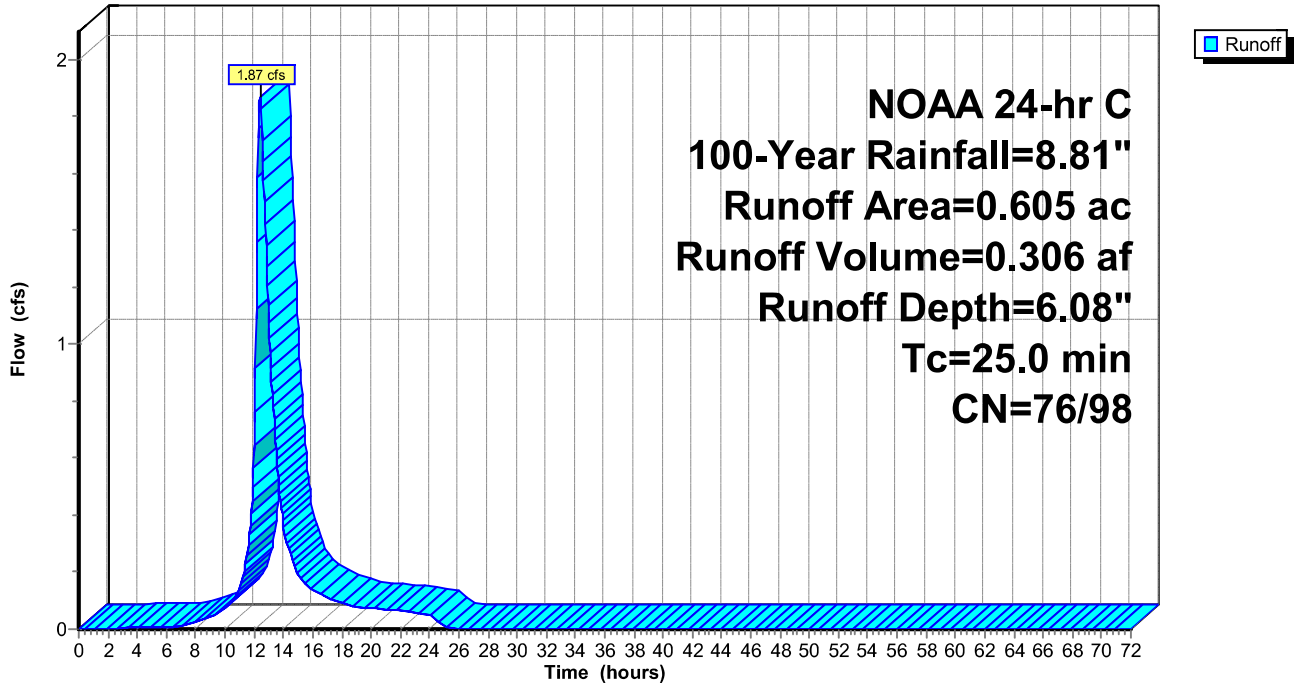
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.565	76	Gravel roads, HSG A
0.605	77	Weighted Average
0.565	76	93.39% Pervious Area
0.040	98	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Imp2: Off-Imp-2**

Hydrograph



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**Summary for Subcatchment Off-Perv2: Off-Perv-2**

Runoff = 3.44 cfs @ 12.41 hrs, Volume= 0.568 af, Depth= 4.07"

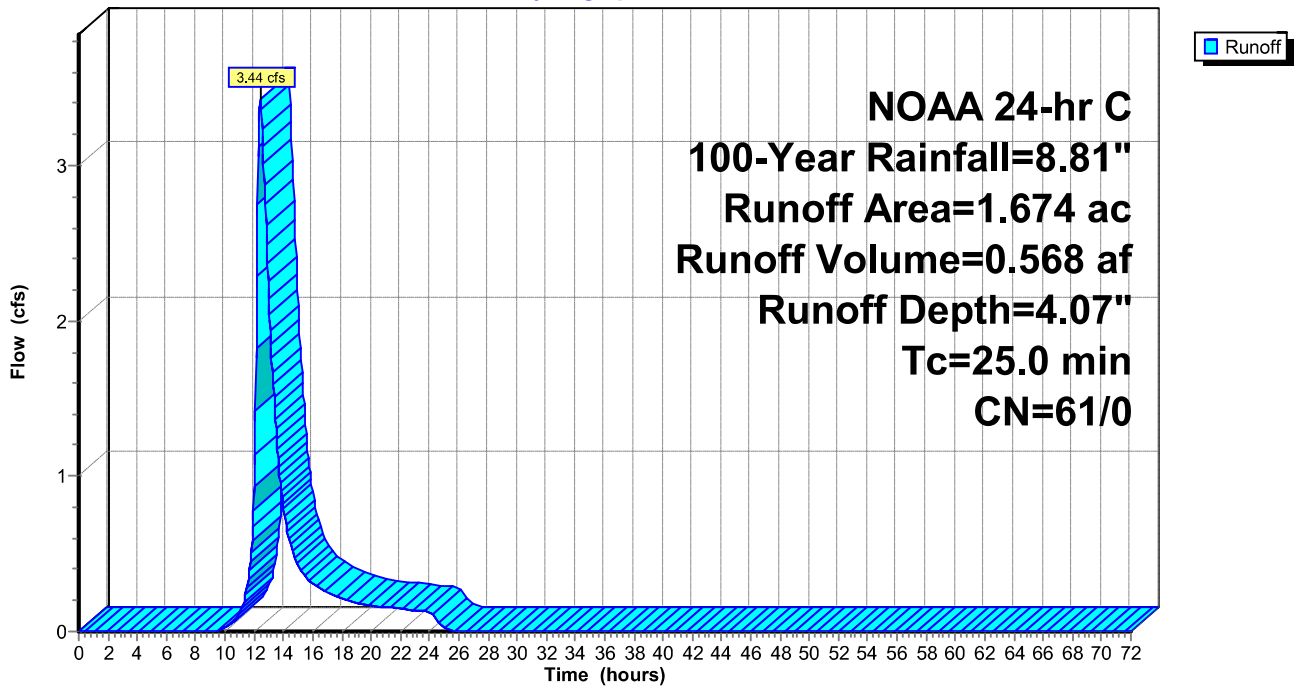
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.376	39	>75% Grass cover, Good, HSG A
1.298	68	<50% Grass cover, Poor, HSG A
1.674	61	Weighted Average
1.674	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0					Direct Entry, 15

**Subcatchment Off-Perv2: Off-Perv-2**

Hydrograph





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## Summary for Subcatchment P-B1-Imp: B1-Imp

Runoff = 5.77 cfs @ 12.19 hrs, Volume= 0.667 af, Depth= 8.57"

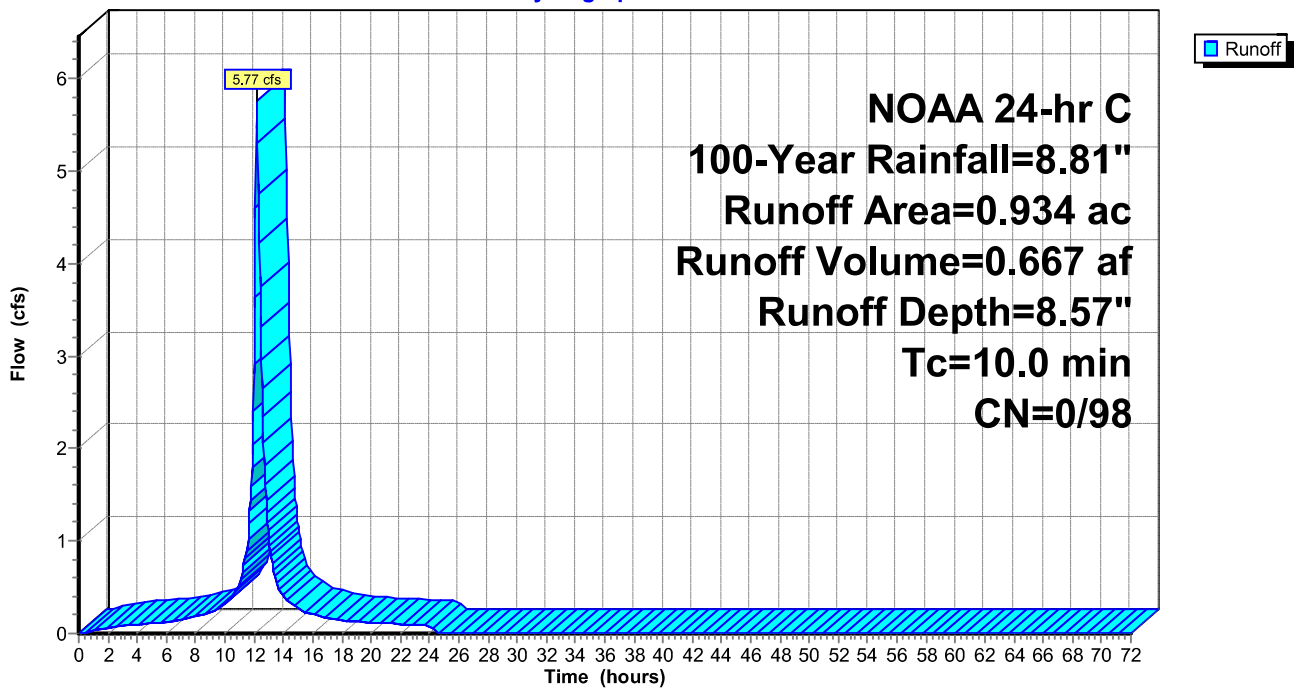
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.563	98	Paved parking, HSG A
0.371	98	Roofs, HSG A
0.934	98	Weighted Average
0.934	98	100.00% Impervious Area

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

## Subcatchment P-B1-Imp: B1-Imp

Hydrograph



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**Summary for Subcatchment P-B1-Perv: B1-Perv**

Runoff = 0.54 cfs @ 12.92 hrs, Volume= 0.177 af, Depth= 1.30"

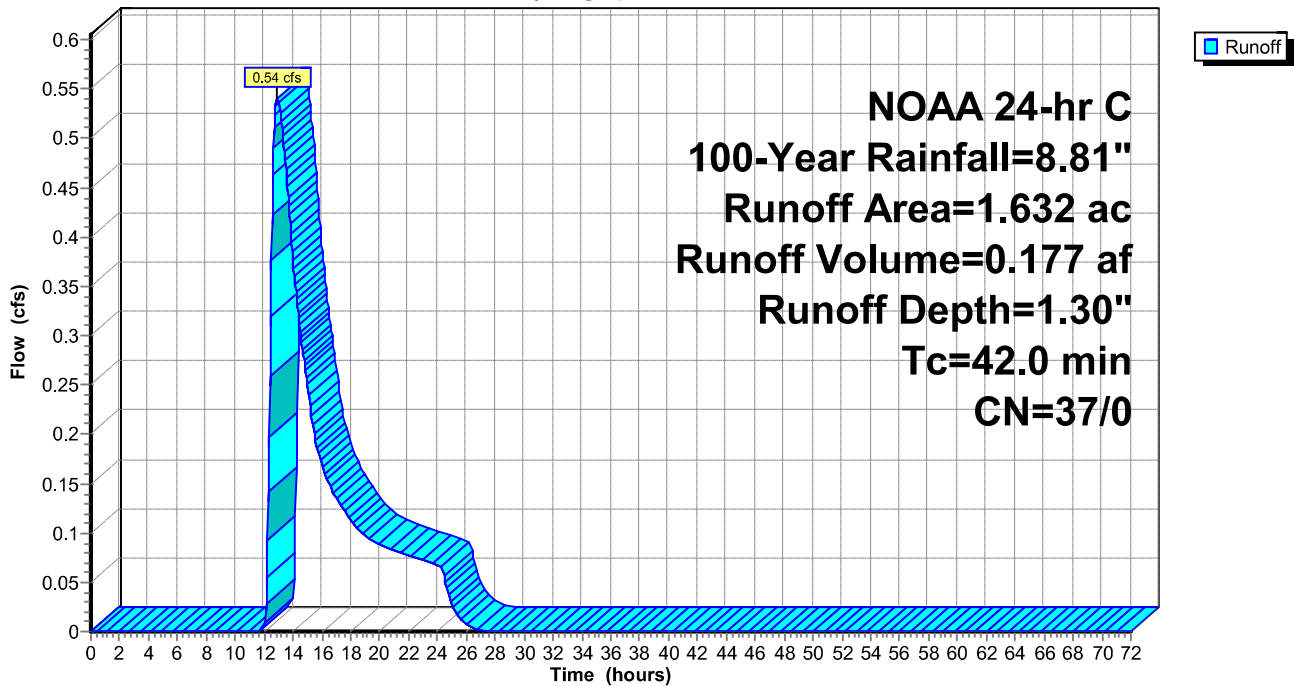
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.926	36	Woods, Fair, HSG A
0.706	39	>75% Grass cover, Good, HSG A
1.632	37	Weighted Average
1.632	37	100.00% Pervious Area

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

**Subcatchment P-B1-Perv: B1-Perv**

Hydrograph



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## Summary for Subcatchment P-C1-Imp: C1-Imp

Runoff = 18.63 cfs @ 12.19 hrs, Volume= 2.154 af, Depth= 8.57"

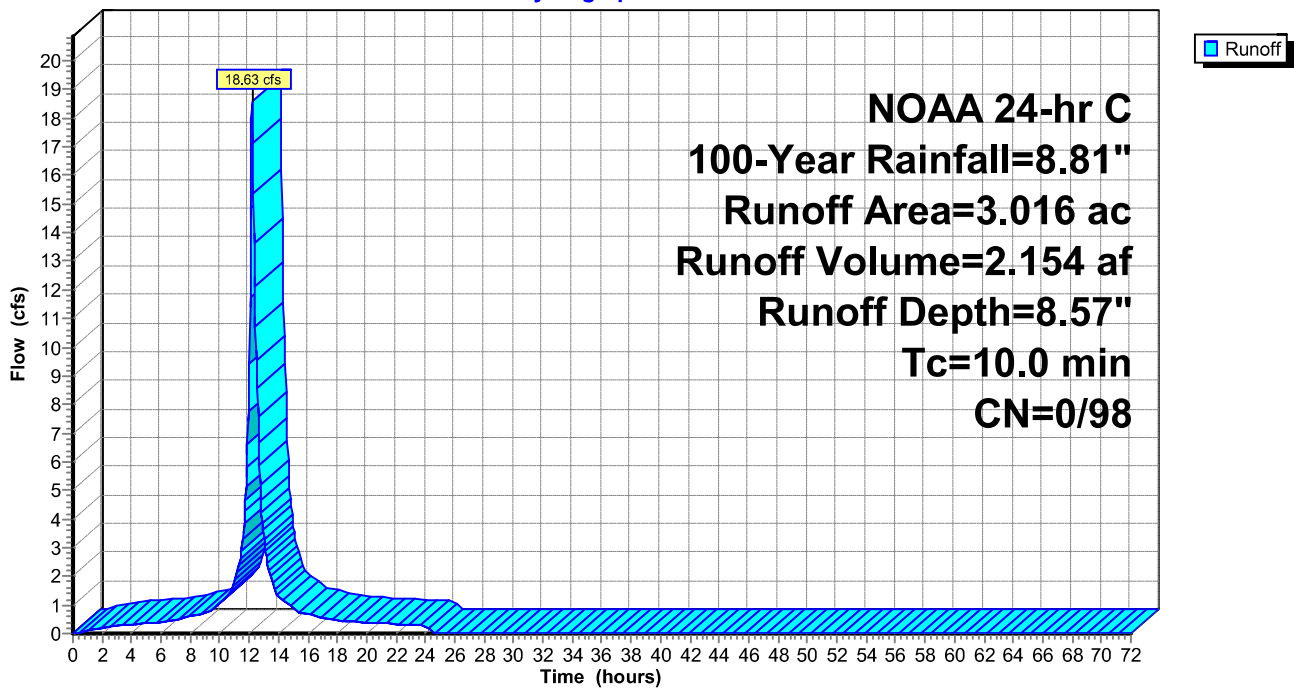
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
1.498	98	Paved parking, HSG A
1.518	98	Roofs, HSG A
3.016	98	Weighted Average
3.016	98	100.00% Impervious Area

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

## Subcatchment P-C1-Imp: C1-Imp

Hydrograph



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**Summary for Subcatchment P-C1-Perv: C1-Perv**

Runoff = 1.35 cfs @ 12.24 hrs, Volume= 0.190 af, Depth= 1.51"

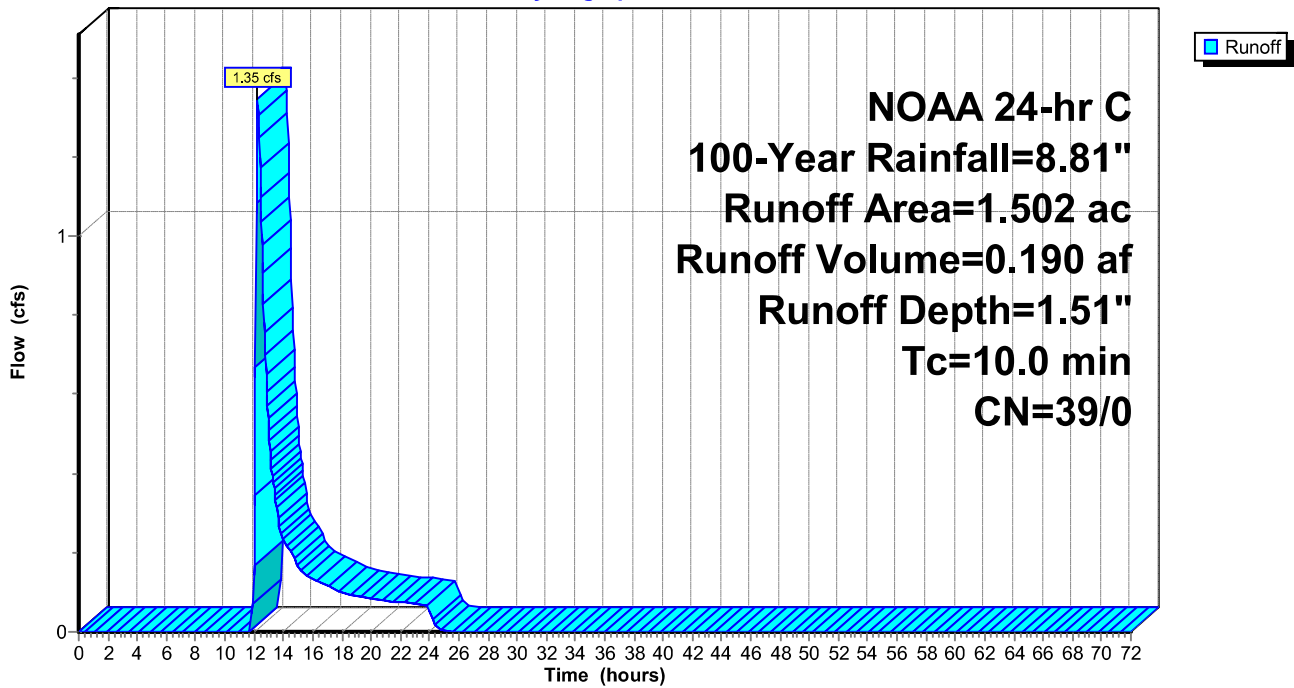
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
1.502	39	>75% Grass cover, Good, HSG A
1.502	39	100.00% Pervious Area

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

**Subcatchment P-C1-Perv: C1-Perv**

Hydrograph



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**Summary for Subcatchment P-Off-Imp1: Off-Imp-1**

Runoff = 0.52 cfs @ 12.25 hrs, Volume= 0.071 af, Depth= 8.57"

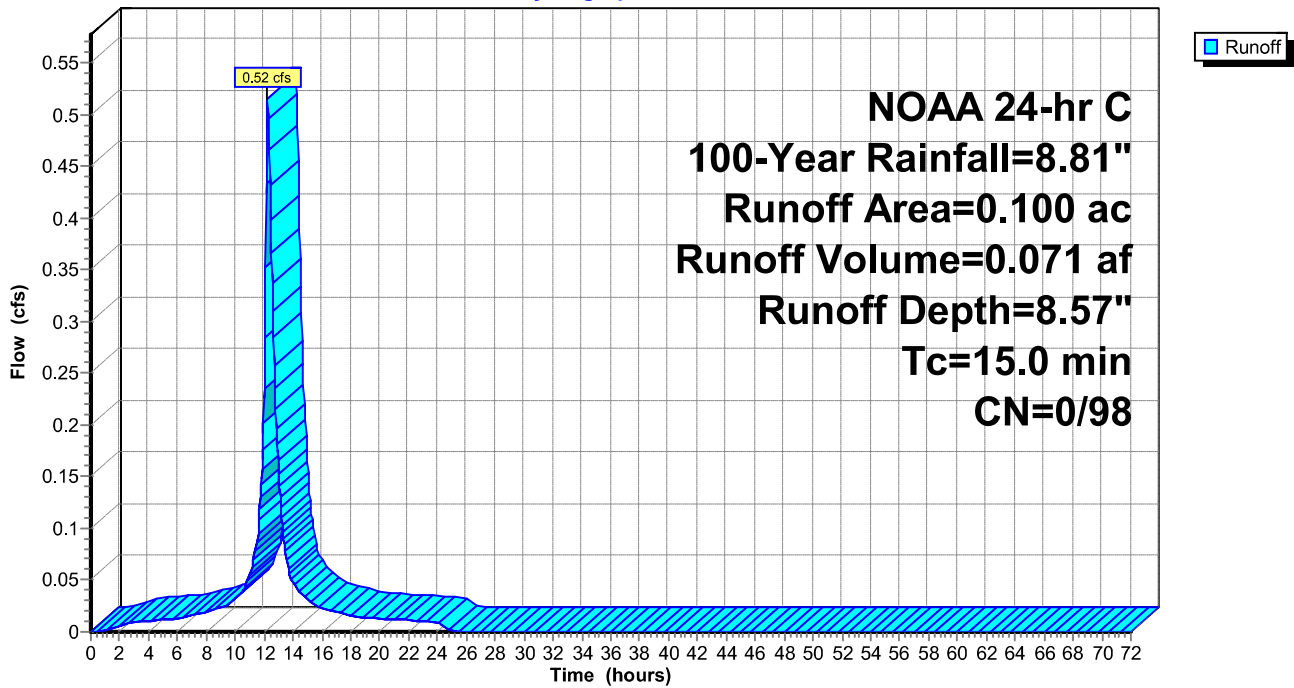
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG A
0.100	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment P-Off-Imp1: Off-Imp-1**

Hydrograph



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**Summary for Subcatchment P-Off-Perv1: Off-Perv-1**

Runoff = 0.20 cfs @ 12.35 hrs, Volume= 0.035 af, Depth= 1.51"

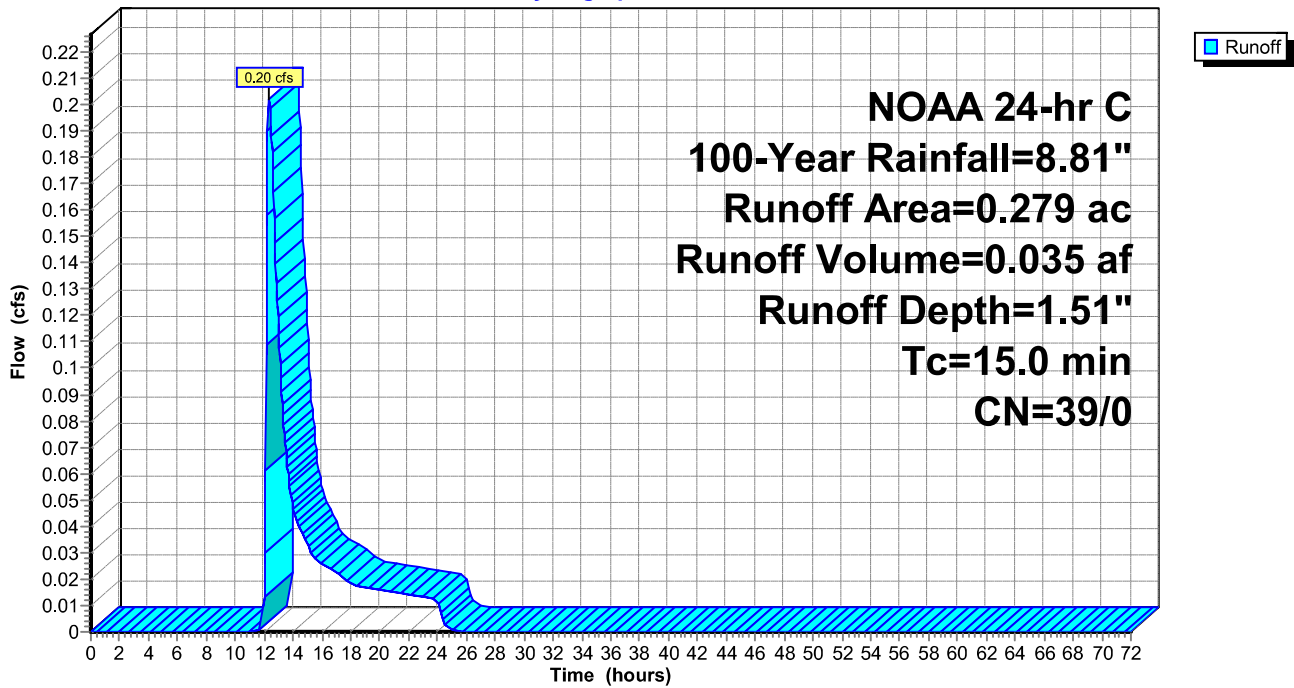
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.279	39	>75% Grass cover, Good, HSG A
0.279	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry, 15

**Subcatchment P-Off-Perv1: Off-Perv-1**

Hydrograph



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**Summary for Pond IB-A: Infiltration Basin A**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 5.56" for 100-Year event  
 Inflow = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af  
 Outflow = 6.33 cfs @ 13.12 hrs, Volume= 1.437 af, Atten= 74%, Lag= 54.6 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 6.33 cfs @ 13.12 hrs, Volume= 1.437 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 34.22' @ 13.12 hrs Surf.Area= 0.805 ac Storage= 2.031 af

Plug-Flow detention time= 348.9 min calculated for 1.436 af (43% of inflow)  
 Center-of-Mass det. time= 194.3 min ( 985.4 - 791.2 )

Volume	Invert	Avail.Storage	Storage Description			
#1	31.40'	2.668 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
31.40	0.630	1,808.1	0.000	0.000	0.630	
32.00	0.667	1,813.4	0.389	0.389	0.673	
33.00	0.729	1,821.3	0.698	1.087	0.740	
34.00	0.791	1,828.1	0.760	1.847	0.802	
35.00	0.853	1,834.8	0.822	2.668	0.863	

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>18.0" W x 12.0" H, R=18.0" Elliptical Culvert X 0.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	34.05'	<b>35.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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
#3	Device 1	33.05'	<b>2.2' long Sharp-Crested Rectangular Weir X 0.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' TW=0.00' (Dynamic Tailwater)

↑1=Culvert ( Controls 0.00 cfs)

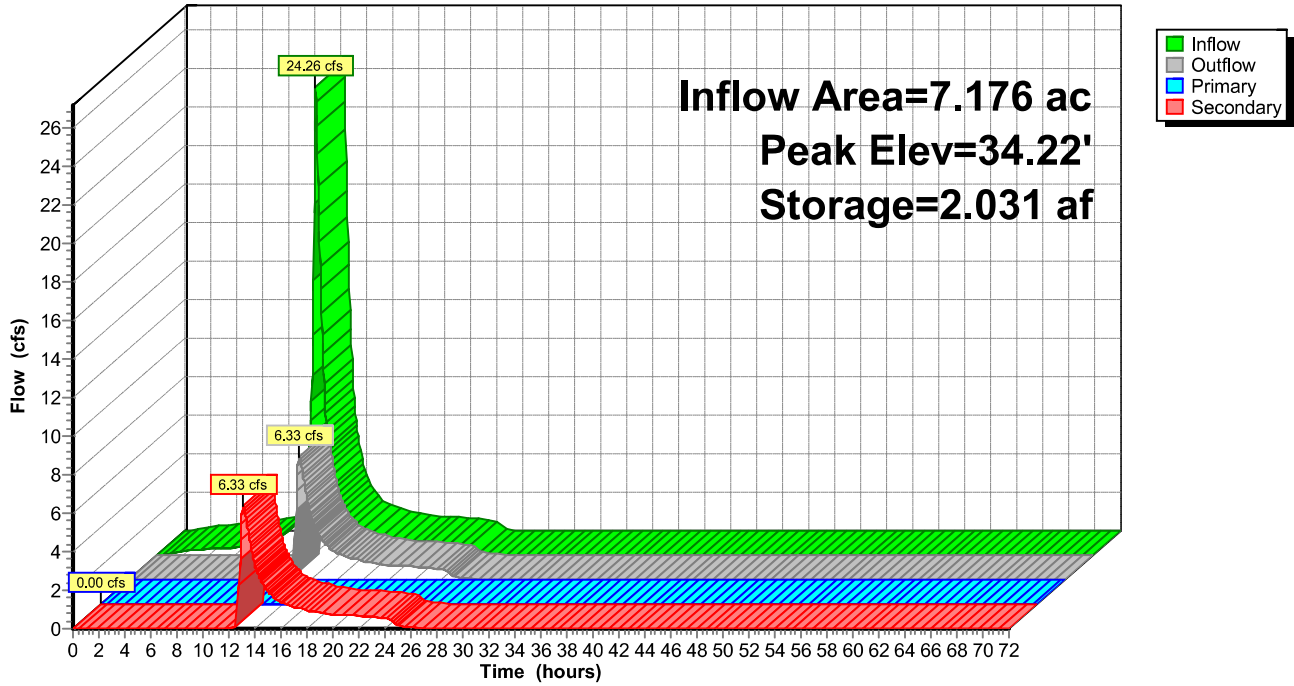
↑3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Secondary OutFlow** Max=6.32 cfs @ 13.12 hrs HW=34.22' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir ( Weir Controls 6.32 cfs @ 1.04 fps)

### Pond IB-A: Infiltration Basin A

Hydrograph





**NYC19-0005\_offsite\_Final\_2**

Prepared by Ware Malcomb

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4301 US Route 130, Edgewater Park  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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**Summary for Pond IB-B: Infiltration Basin B**

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.95" for 100-Year event  
 Inflow = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af  
 Outflow = 0.56 cfs @ 14.81 hrs, Volume= 0.229 af, Atten= 90%, Lag= 157.2 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.56 cfs @ 14.81 hrs, Volume= 0.229 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.84' @ 14.81 hrs Surf.Area= 0.278 ac Storage= 0.626 af

Plug-Flow detention time= 555.0 min calculated for 0.229 af (27% of inflow)  
 Center-of-Mass det. time= 315.2 min ( 1,112.6 - 797.4 )

Volume	Invert	Avail.Storage	Storage Description			
#1	30.40'	0.960 af	<b>Custom Stage Data (Irregular)</b> Listed below			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
30.40	0.235	491.3	0.000	0.000	0.235	
31.00	0.245	498.6	0.144	0.144	0.250	
32.00	0.263	510.7	0.254	0.398	0.275	
33.00	0.281	522.8	0.272	0.670	0.301	
34.00	0.299	535.0	0.290	0.960	0.327	

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	<b>15.0" Round Culvert X 0.00</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 0.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.80'	<b>30.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> 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=30.40' (Free Discharge)

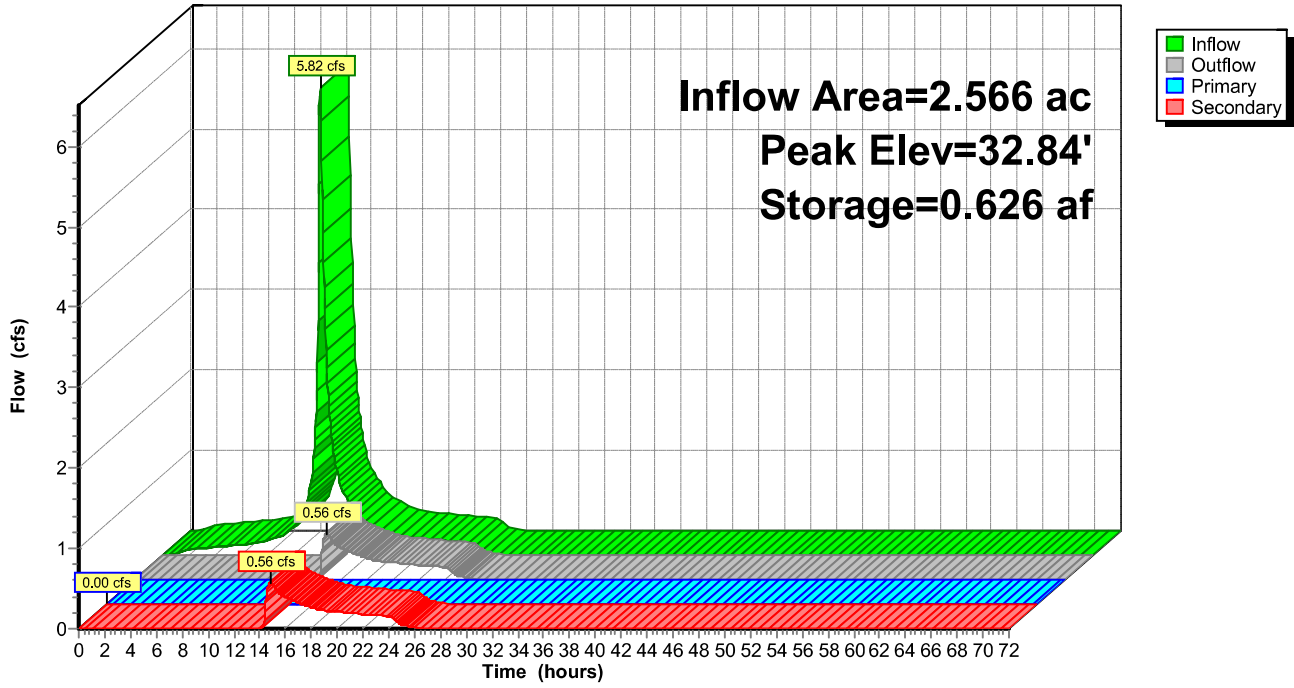
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑2=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.56 cfs @ 14.81 hrs HW=32.84' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir (Weir Controls 0.56 cfs @ 0.49 fps)

### Pond IB-B: Infiltration Basin B

Hydrograph



# NYC19-0005\_offsite\_Final\_2

Prepared by Ware Malcomb

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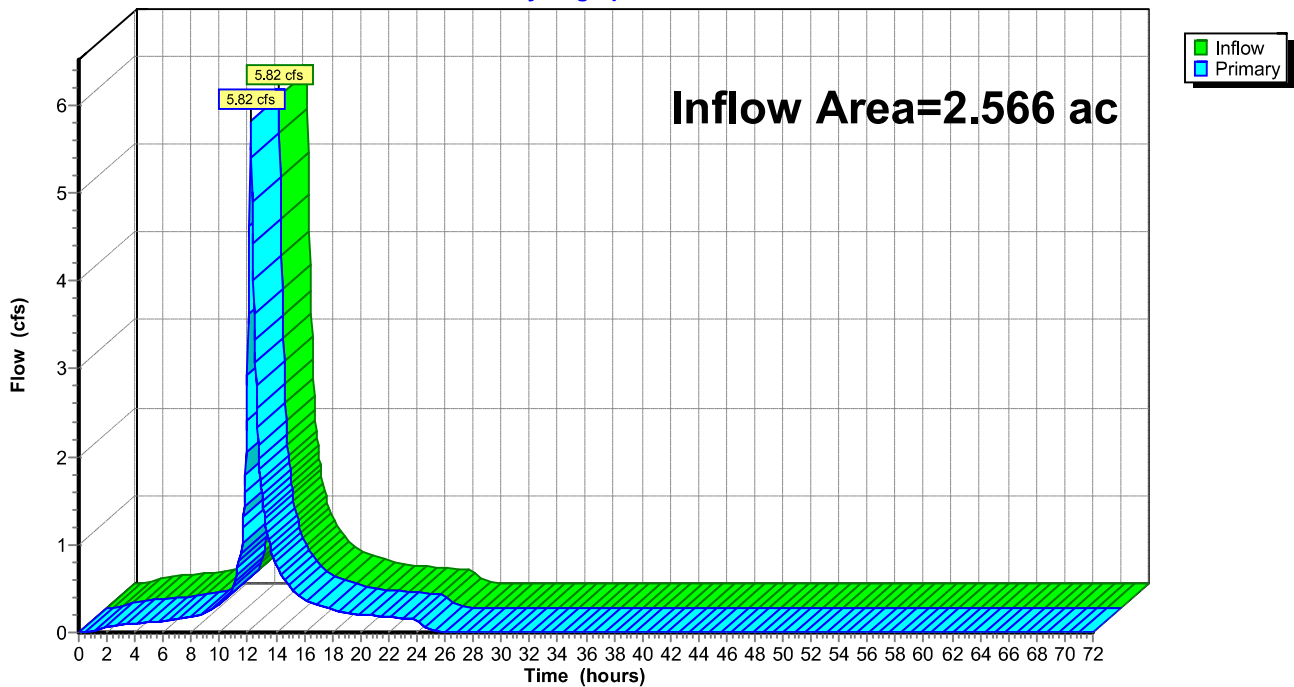
## Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.95" for 100-Year event  
Inflow = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af  
Primary = 5.82 cfs @ 12.19 hrs, Volume= 0.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-B1: B1

Hydrograph



**NYC19-0005\_offsite\_Final\_2**

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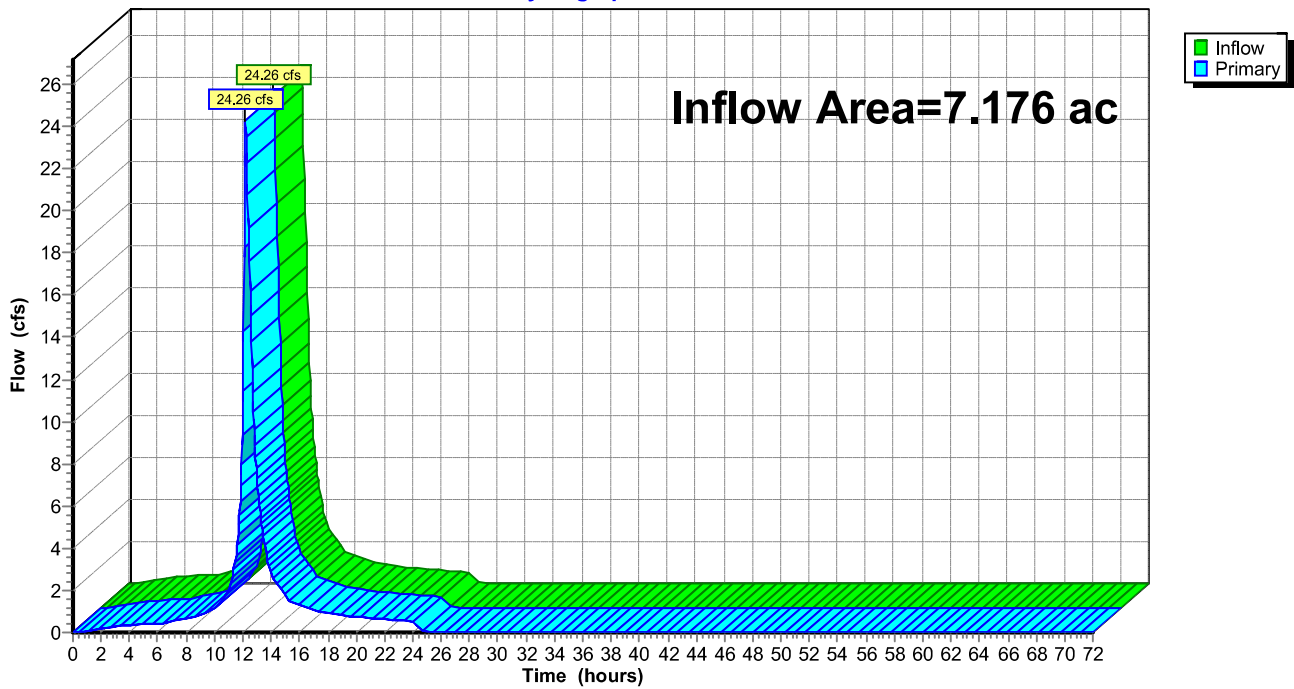
**Summary for Link P-C1: C1**

Inflow Area = 7.176 ac, 43.98% Impervious, Inflow Depth = 5.56" for 100-Year event  
Inflow = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af  
Primary = 24.26 cfs @ 12.21 hrs, Volume= 3.325 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link P-C1: C1**

Hydrograph



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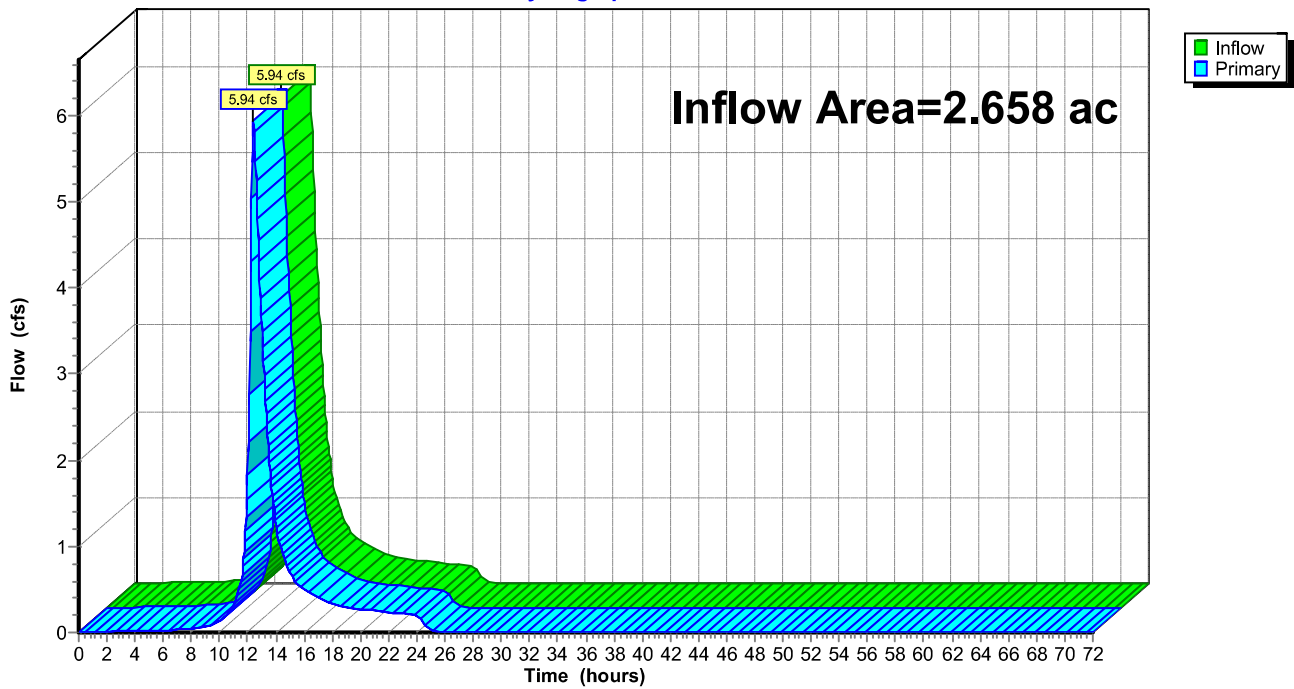
## Summary for Link P-Off: Offsite

Inflow Area = 2.658 ac, 5.27% Impervious, Inflow Depth = 4.43" for 100-Year event  
Inflow = 5.94 cfs @ 12.39 hrs, Volume= 0.981 af  
Primary = 5.94 cfs @ 12.39 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

### Link P-Off: Offsite

Hydrograph



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BUILDING MEASUREMENT

## Appendix J

**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-FES-100**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

Q =	<b>4.79 c.f.s.</b>	W <sub>o</sub> =	<b>1.50 Ft.</b>
D <sub>o</sub> =	<b>1.50 Ft.</b>	q = Q/W <sub>o</sub> =	<b>3.19 c.f.s.</b>
TW =	<b>0.30 Ft.</b>		

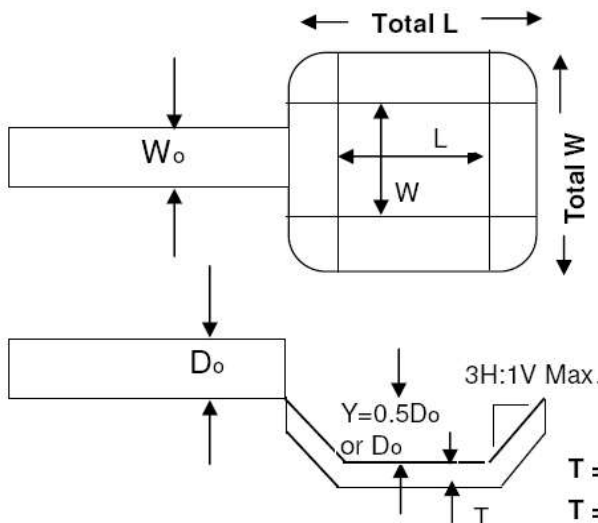
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$	<b>0.31 Ft.</b>	=	<b>4 " Stone Calculated</b>
			<b>4 " Stone Used for Construction</b>
			<b>0.75 ' = Y</b>

<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$	<b>0.13 Ft.</b>	=	<b>2 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>1.50 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>4.50 ' </b>
W = 2 W <sub>o</sub> =	<b>3.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>9.00 , Total W = 7.50</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>13.50 , Total W = 12.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-FES-100 Design Summary</b>	
<b>Select Scour Hole Design</b>	Total L = <b>9 '      L = 4.5 ' </b>
	Total W = <b>7.5 '      W = 3 ' </b>
	Depth of scour hole (Y) = <b>0.75 ' </b>
	d <sub>50</sub> stone size = <b>4 " </b>
	Thickness of riprap (T) = <b>8 " </b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	Volume of riprap (V) = <b>1.67 CY</b>

Notes:

**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-FES-200**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

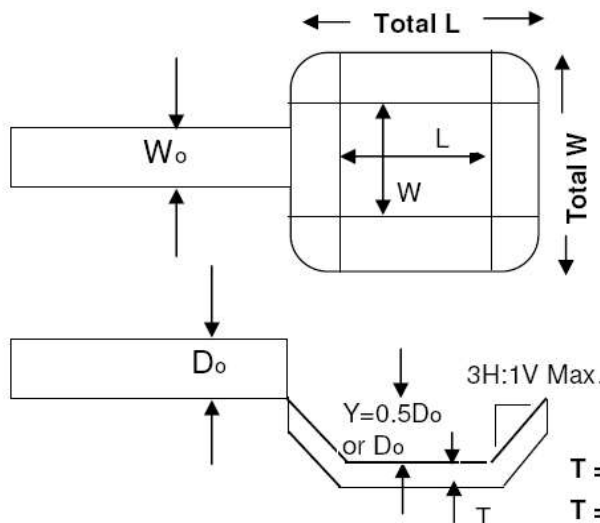
Q =	<b>7.25 c.f.s.</b>	W <sub>o</sub> =	<b>2.00 Ft.</b>
D <sub>o</sub> =	<b>2.00 Ft.</b>	q = Q/W <sub>o</sub> =	<b>3.63 c.f.s.</b>
TW =	<b>0.40 Ft.</b>		

(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$	<b>0.28 Ft.</b>	=	<b>4 " Stone Calculated</b>
			<b>4 " Stone Used for Construction</b>
			<b>1.00 ' = Y</b>
<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$	<b>0.11 Ft.</b>	=	<b>2 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>2.00 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>6.00 ' </b>
W = 2 W <sub>o</sub> =	<b>4.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>12.00 , Total W = 10.00</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>18.00 , Total W = 16.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-FES-200 Design Summary</b>	
<b>Select Scour Hole Design</b>	Total L = 12 '      L = 6 '
	Total W = 10 '      W = 4 '
	Depth of scour hole (Y) = 1 '
	d <sub>50</sub> stone size = 4 "
	Thickness of riprap (T) = 8 "
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	<b>Volume of riprap (V) = 2.96 CY</b>

Notes:



**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-FES-300**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

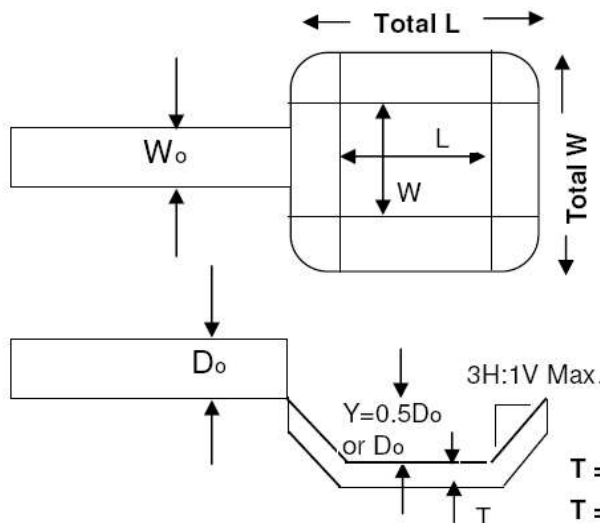
Q =	<b>4.09 c.f.s.</b>	W <sub>o</sub> =	<b>1.50 Ft.</b>
D <sub>o</sub> =	<b>1.50 Ft.</b>	q = Q/W <sub>o</sub> =	<b>2.73 c.f.s.</b>
TW =	<b>0.30 Ft.</b>		

(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$	<b>0.25 Ft.</b>	=	<b>4 " Stone Calculated</b>
			<b>4 " Stone Used for Construction</b>
			<b>0.75 ' = Y</b>
<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$	<b>0.10 Ft.</b>	=	<b>2 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>1.50 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>4.50 ' </b>
W = 2 W <sub>o</sub> =	<b>3.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>9.00 , Total W = 7.50</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>13.50 , Total W = 12.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-FES-300 Design Summary</b>	
<b>Select Scour Hole Design</b>	<b>Total L = 9 '      L = 4.5 ' </b>
	<b>Total W = 7.5 '      W = 3 ' </b>
	<b>Depth of scour hole (Y) = 0.75 ' </b>
	<b>d<sub>50</sub> stone size = 4 " </b>
	<b>Thickness of riprap (T) = 8 " </b>
	<b>Volume of riprap (V) = 1.67 CY </b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	

Notes:

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**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-FES-400**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

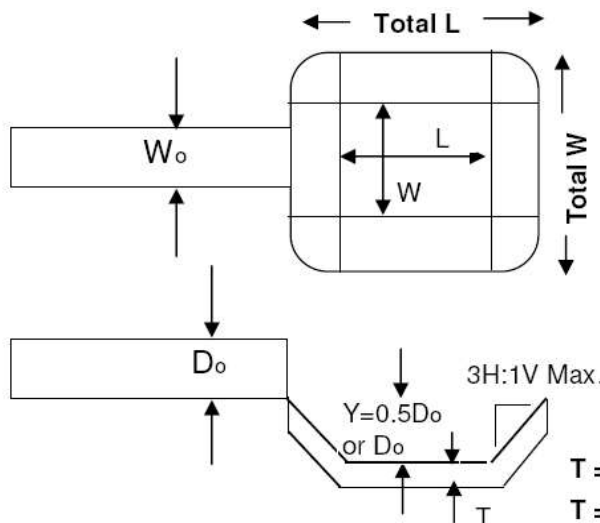
Q =	<b>9.24 c.f.s.</b>	W <sub>o</sub> =	<b>2.00 Ft.</b>
D <sub>o</sub> =	<b>2.00 Ft.</b>	q = Q/W <sub>o</sub> =	<b>4.62 c.f.s.</b>
TW =	<b>0.40 Ft.</b>		

(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW} =$	<b>0.38 Ft.</b>	=	<b>5 " Stone Calculated</b>
			<b>5 " Stone Used for Construction</b>
			<b>1.00 ' = Y</b>
<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW} =$	<b>0.16 Ft.</b>	=	<b>2 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>2.00 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>6.00 ' </b>
W = 2 W <sub>o</sub> =	<b>4.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>12.00 , Total W = 10.00</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>18.00 , Total W = 16.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-FES-400 Design Summary</b>	
<b>Select Scour Hole Design</b>	Total L = 12 '      L = 6 '
	Total W = 10 '      W = 4 '
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	Depth of scour hole (Y) = 1 '
	d <sub>50</sub> stone size = 5 "
	Thickness of riprap (T) = 10 "
	Volume of riprap (V) = 3.7 CY

Notes:

**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-OUT-A**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

Q =	<b>0.37 c.f.s.</b>	W <sub>o</sub> =	<b>1.25 Ft.</b>
D <sub>o</sub> =	<b>1.25 Ft.</b>	q = Q/W <sub>o</sub> =	<b>0.30 c.f.s.</b>
TW =	<b>0.25 Ft.</b>		

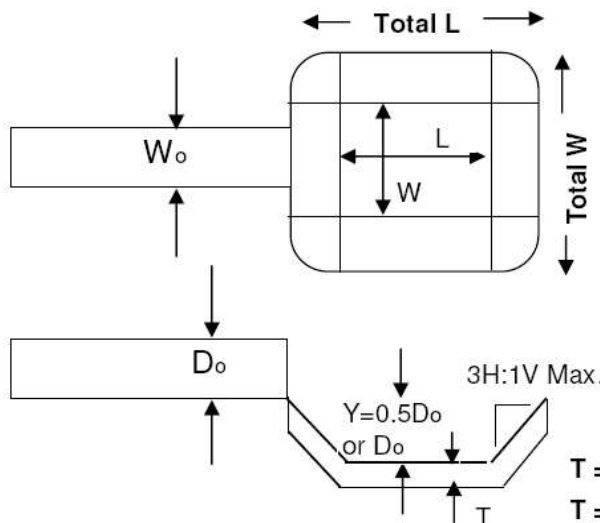
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW} =$	<b>0.02 Ft.</b>	=	<b>1 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>0.63 ' = Y</b>

<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW} =$	<b>0.01 Ft.</b>	=	<b>1 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>1.25 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>3.75 ' </b>
W = 2 W <sub>o</sub> =	<b>2.50 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>7.50 , Total W = 6.25</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>11.25 , Total W = 10.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-OUT-A Design Summary</b>	
<b>Select Scour Hole Design</b>	Total L = <b>7.5 '      L = 3.75 ' </b>
	Total W = <b>6.25 '      W = 2.5 ' </b>
	Depth of scour hole (Y) = <b>0.625 ' </b>
	d <sub>50</sub> stone size = <b>3 " </b>
	Thickness of riprap (T) = <b>6 " </b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	Volume of riprap (V) = <b>0.87 CY</b>

Notes:

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**SCOUR HOLE CALCULATIONS**

NJ Standards for SESC, Ch. 12, January 2014

Structure: **SD-OUT-B**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

Q =	<b>6.20 c.f.s.</b>	W <sub>o</sub> =	<b>3.00 Ft.</b>
D <sub>o</sub> =	<b>1.00 Ft.</b>	q = Q/W <sub>o</sub> =	<b>2.07 c.f.s.</b>
TW =	<b>0.20 Ft.</b>		

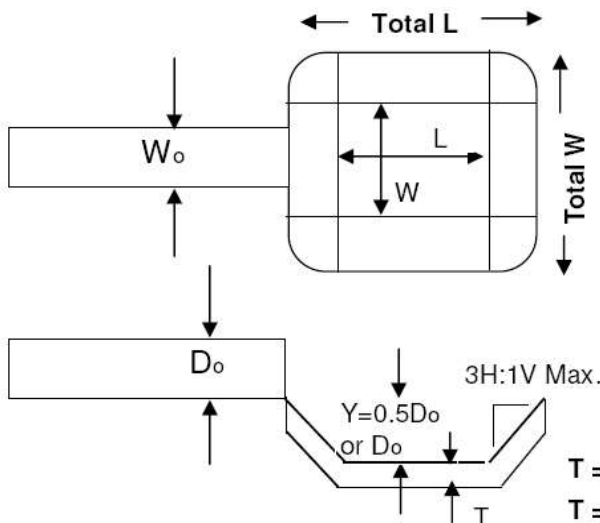
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<b>d50 Stone size formula</b>		<b>When Y = 1/2 D<sub>o</sub></b>	
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$	<b>0.26 Ft.</b>	=	<b>4 " Stone Calculated</b>
			<b>4 " Stone Used for Construction</b>
			<b>0.50 ' = Y</b>

<b>d50 Stone size formula</b>		<b>When Y = D<sub>o</sub></b>	
$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$	<b>0.11 Ft.</b>	=	<b>2 " Stone Calculated</b>
			<b>3 " Stone Used for Construction</b>
			<b>1.00 ' = Y</b>

NJ Standards require d50=3" min, NJDOT requires d50=6" min

Y = Depth of scour hole below culvert invert



L = 3 D <sub>o</sub> =	<b>3.00 ' </b>
W = 2 W <sub>o</sub> =	<b>6.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>	
Total L =	<b>6.00 , Total W = 9.00</b>
<b>If Y = D<sub>o</sub></b>	
Total L =	<b>9.00 , Total W = 12.00</b>

T = d<sub>50</sub> Stone size x 2 if filter fabric is used  
 T = d<sub>50</sub> Stone size x 3 if no filter fabric is used

<b>Structure SD-OUT-B Design Summary</b>	
<b>Select Scour Hole Design</b>	Total L = <b>6 '      L = 3 ' </b>
	Total W = <b>9 '      W = 6 ' </b>
	Depth of scour hole (Y) = <b>0.5 ' </b>
	d <sub>50</sub> stone size = <b>4 " </b>
	Thickness of riprap (T) = <b>8 " </b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	Volume of riprap (V) = <b>1.33 CY</b>

Notes:

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BUILDING MEASUREMENT

## Appendix K

# New Jersey Stormwater Best Management Practices Manual

February 2004

## A P P E N D I X A

# Low Impact Development Checklist

### **A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development**

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

# Low Impact Development Checklist

**A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development**

Municipality: Township of Edgewater Park

County: Burlington Date: 07/21/2020

Review board or agency: Township of Edgewater Park

Proposed land development name: Edgewater Park Self Storage Development

Lot(s): 2.02 Block(s): 404

Project or application number: \_\_\_\_\_

Applicant's name: Aaron Stickney

Applicant's address: The Glenpoint Centre West

500 Frank W Burr Boulevard #47, Teaneck, NJ 07666

Telephone: 973.622.0073 Fax: \_\_\_\_\_

Email address: AStickney@treetopdev.com

Designer's name: Edward F. Wilkes, Jr., P.E.

Designer's address: Ware Malcomb

110 Edison Place, Suite 303, Newark, NJ 07102

Telephone: 732.986.9000 Fax: 732.986.9984

Email address: ewilkes@waremalcomb.com





## Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

Edgewater Township Ordinance Chapter 16.48

Do regulations include nonstructural requirements? Yes: \_\_\_\_\_ No:

If yes, briefly describe: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List LID-BMPs prohibited by local regulations: N/A

\_\_\_\_\_

\_\_\_\_\_

Pre-design meeting held? Yes:  Date: 2/11/2020 No: \_\_\_\_\_

Meeting held with: Board Attorney, Engineer, Planner

\_\_\_\_\_

\_\_\_\_\_

Pre-design site walk held? Yes: \_\_\_\_\_ Date: \_\_\_\_\_ No:

Site walk held with: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Other agencies with stormwater review jurisdiction:

Name: Burlington County Soil Conservation District

Required approval: Yes

Name: Burlington County

Required approval: Yes

Name: \_\_\_\_\_

Required approval: \_\_\_\_\_

## Part 3: Nonstructural Strategies and LID-BMPs in Design

### 3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed? Yes:  No: \_\_\_\_\_

If yes, was this inventory a factor in the site's layout and design? Yes:  No: \_\_\_\_\_

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes:  No: \_\_\_\_\_ If yes, specify % of site: 20%

Native ground cover? Yes:  No: \_\_\_\_\_ If yes, specify % of site: 29%

Vegetated buffers? Yes:  No: \_\_\_\_\_ If yes, specify % of site: 17%

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: \_\_\_\_\_ No:  If yes, specify % of site: \_\_\_\_\_

Native ground cover? Yes: \_\_\_\_\_ No:  If yes, specify % of site: \_\_\_\_\_

Vegetated buffers? Yes:  No: \_\_\_\_\_ If yes, specify % of site: 17%

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient: Yes: \_\_\_\_\_ No:

Reduce runoff pollutant loads through runoff treatment: Yes: \_\_\_\_\_ No:

Maintain groundwater recharge by preserving natural areas: Yes:  No: \_\_\_\_\_

### 3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed? Yes:   x   No: \_\_\_\_\_

If yes, were these inventories factors in the site's layout and design? Yes:   x   No: \_\_\_\_\_

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes:   x   No: \_\_\_\_\_

If yes, how:   Silt fence and tree protection is proposed to ensure no additional wooded areas are cleared.  

Restrict temporary site disturbance during construction? Yes:   x   No: \_\_\_\_\_

If yes, how:   Silt fence and tree protection is proposed to ensure no additional wooded areas are cleared. Material stockpiles will be maintained within the area proposed for development  

Consider soils and slopes in selecting disturbance limits? Yes:   x   No: \_\_\_\_\_

If yes, how:   The areas cleared for the stormwater management basins were specifically selected based on the existing lower elevations and high permeability rates.  

C. Specify percentage of site to be cleared:   80%   Regraded:   80%  

D. Specify percentage of cleared areas done so for buildings:   23.5%  

For driveways and parking:   27.5%   For roadways: \_\_\_\_\_

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

The developer is permitted to proposed up to 60% impervious coverage per ordinance  
however has added a second and third floor to one building to minimize clearing

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: 100% HSG B: \_\_\_\_\_ HSG C: \_\_\_\_\_ HSG D: \_\_\_\_\_

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: 80% HSG B: \_\_\_\_\_ HSG C: \_\_\_\_\_ HSG D: \_\_\_\_\_

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

The entire site is HSG A. The applicant has minimized site disturbance by disturbing only what  
is needed to comply with stormwater management regulations and is preserving 20% of the  
site.

I. Does the site include Karst topography? Yes: \_\_\_\_\_ No: X

If yes, discuss measures taken to limit Karst impacts:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: 0% Proposed: 51%

B. Specify maximum site impervious coverage allowed by regulations: 60%

C. Compare proposed street cartway widths with those required by regulations: N/A

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking		
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: 9' X 18' Regulations: 9' X 18'

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: 15 Regulations: ORDINANCE DOES NOT SPECIFY FOR SELF STORAGE USE

F. Specify percentage of total site impervious cover created by buildings: **23.5%**

By driveways and parking: 27.5% By roadways: 0%

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

Drive aisles have been designed to minimum required to facilitate moving  
trucks and emergency vehicles.

H. Specify percentage of total impervious area that will be unconnected:

Total site: 100% Buildings: \_\_\_\_\_ Driveways and parking: \_\_\_\_\_ Roads: \_\_\_\_\_

I. Specify percentage of total impervious area that will be porous:

Total site: 0% Buildings: \_\_\_\_\_ Driveways and parking: \_\_\_\_\_ Roads: \_\_\_\_\_

J. Specify percentage of total building roof area that will be vegetated: 0%

K. Specify percentage of total parking area located beneath buildings: 0%

L. Specify percentage of total parking located within multi-level parking deck: 0%

### 3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: 70% Vegetated swale: \_\_\_\_\_ Natural channel: \_\_\_\_\_

Stormwater management facility: 30% Other: \_\_\_\_\_

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

The trench drains placed between the storage units would need to be replaced with  
vegetated medians and conveyance swales. Introducing interior medians would result in  
an increase in pavement to facilitate traffic and overall disturbance area

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: The site grading has been designed to provide minimum slopes  
for positive drainage in paved areas (min. 1%)

Increase overland flow roughness: Native plantings are proposed in vegetative areas.

### 3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

- A. Trash Receptacles **N/A - A self storage facility does not provide trash receptacles to discourage patrons from using them as a place to discard their stored belongings.**

Specify the number of trash receptacles provided: \_\_\_\_\_

Specify the spacing between the trash receptacles: \_\_\_\_\_

Compare trash receptacles proposed with those required by regulations:

Proposed: \_\_\_\_\_ Regulations: \_\_\_\_\_

- B. Pet Waste Stations **N/A**

Specify the number of pet waste stations provided: \_\_\_\_\_

Specify the spacing between the pet waste stations: \_\_\_\_\_

Compare pet waste stations proposed with those required by regulations:

Proposed: \_\_\_\_\_ Regulations: \_\_\_\_\_

- C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: 100% of proposed inlets and basin outlet control structures comply with NJDEP requirements

- D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: As needed Regulations: No standard

Litter collection: Proposed: As needed Regulations: No standard

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

The proposed infiltration basins include an outlet control structure equipped with a trash rack over discharge orifices



E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: Oils and pollutants from vehicles will be collected in the infiltration basin and filtered out by the basin sand layer. Location: Paved Areas

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: Pollutants from lawn care and fertilizer will be collected in the infiltration basin and filtered out by the basin sand layer. Location: Vegetated Open Space Areas

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: \_\_\_\_\_ Location: \_\_\_\_\_

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: \_\_\_\_\_ Location: \_\_\_\_\_

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: \_\_\_\_\_ Location: \_\_\_\_\_

## Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.	X	
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.	X	
3.	Maximize the protection of natural drainage features and vegetation.	X	
4.	Minimize the decrease in the pre-construction time of concentration.	X	
5.	Minimize land disturbance including clearing and grading.	X	
6.	Minimize soil compaction.	X	
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.	X	
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.	X	
9.	Provide preventative source controls.	X	

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

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