

## DRAINAGE REPORT

### Edgewater Park Self Storage Development

4201 US Route 130

Edgewater Park, Burlington County, New Jersey 08010

07/21/2020

Revised: 12/07/2020

WM Project No.: NYC19-0005

Prepared for:

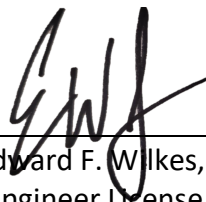
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c/o Treetop Development**

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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 0.36± acres of grass cover, 0.28± acres of paved area, 0.08± acres of roof, 0.62± 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	0.89	50%	0.45
10	1.82	75%	1.37
100	5.45	80%	4.36

## 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.

In addition, there are two offsite areas which sheet flow onto the east-northeast side of the site, which includes approximately 0.36± acres of grass cover, 0.28± acres of paved area, 0.08± acres of roof, 0.62± 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	0.45	32.73
10	0.34	1.37	33.28
100	3.88	4.36	33.96

**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	0.89	0.45	0.00
10	0.061.82	1.37	0.34
100	5.45	4.36	3.88

## 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

BRANDING

PLANNING

CIVIL ENGINEERING

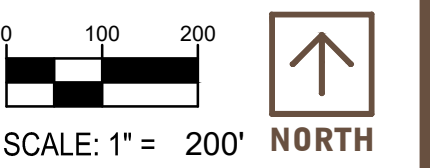
BUILDING MEASUREMENT

## Appendix A



VICINITY MAP

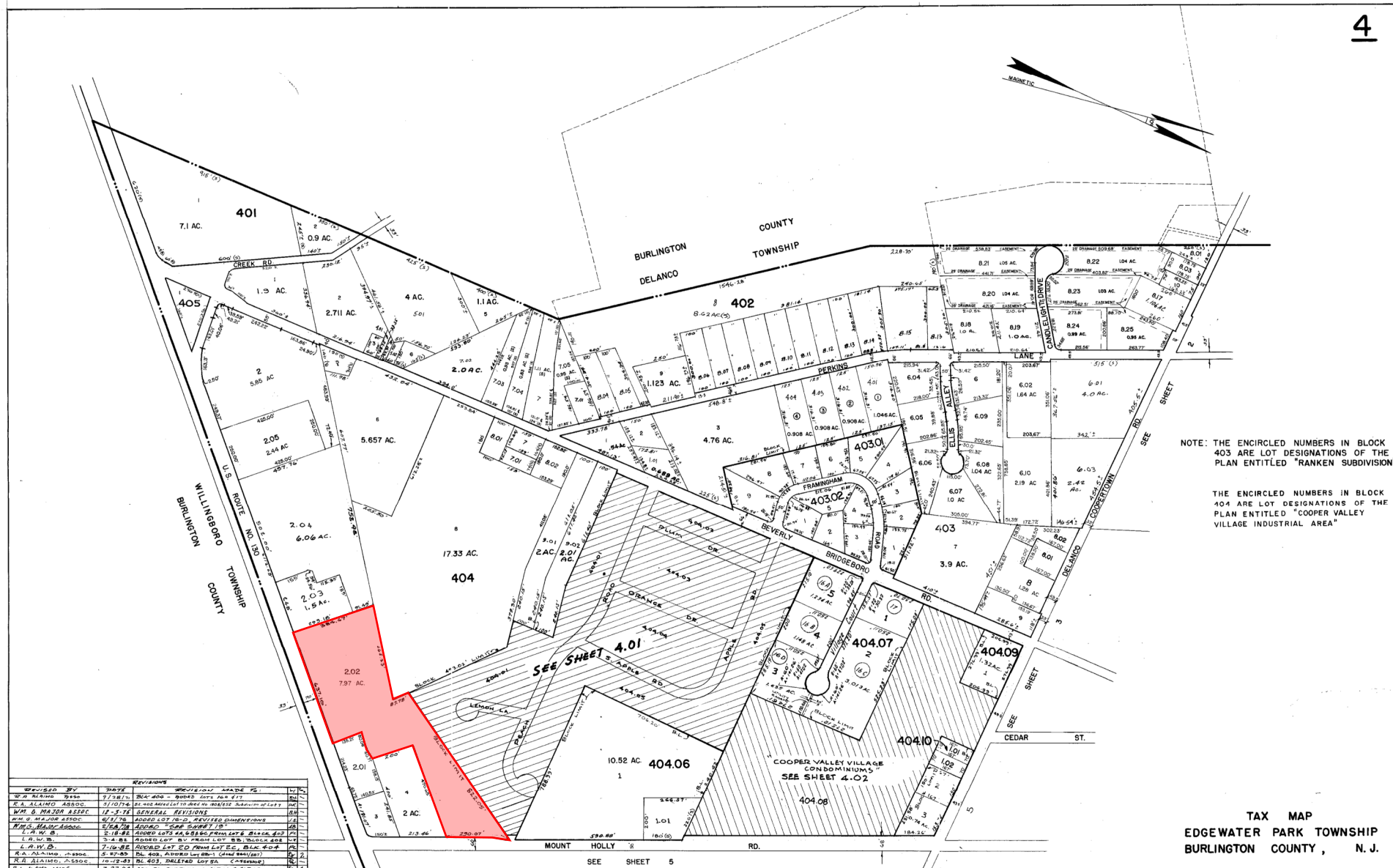
4201 Route 130  
Edgewater Park, New Jersey



**WARE MALCOMB**

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01.22.2020

SHEET  
**1**



NOTE: THE ENCIRCLED NUMBERS IN BLOCK 403 ARE LOT DESIGNATIONS OF THE PLAN ENTITLED "RANKEN 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'  
 REVISED: JAN 11 1961 - M. PAUL AUSTIN, P.E. & L.S.  
 REVISED: NOV 22 1968 - P.E. & L.S.  
 REVISED: MAY 24 1967 - P.E. & L.S.  
 B. HAROLD WILLS P.E. & L.S.  
 MT. HOLLY, N.J. LIC. NO. 178  
 REVISED: JULY 20, 1969 - M. PAUL AUSTIN, P.E. & L.S.  
 REV. MAY 20, 1977 - M. P. A.

REVISED BY	DATE	REVISIONS MADE	BY
R.A. ALAIMO	7-28-54	BLK 404 - BOUND LOTS AND ETS	RA
R.A. ALAIMO ASSOC.	7-27-54	BLK 404 - BOUND LOTS AND ETS	RA
W.M. & MAJOR ASSOC.	12-5-54	GENERAL REVISIONS	WM
W.M. & MAJOR ASSOC.	12-5-54	ADDED LOT 10.1, REVISED DIMENSIONS	WM
W.M. & MAJOR ASSOC.	12-5-54	ADDED LOTS 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.20, 4.21, 4.22, 4.23, 4.24, 4.25, 4.26, 4.27, 4.28, 4.29, 4.30, 4.31, 4.32, 4.33, 4.34, 4.35, 4.36, 4.37, 4.38, 4.39, 4.40, 4.41, 4.42, 4.43, 4.44, 4.45, 4.46, 4.47, 4.48, 4.49, 4.50, 4.51, 4.52, 4.53, 4.54, 4.55, 4.56, 4.57, 4.58, 4.59, 4.60, 4.61, 4.62, 4.63, 4.64, 4.65, 4.66, 4.67, 4.68, 4.69, 4.70, 4.71, 4.72, 4.73, 4.74, 4.75, 4.76, 4.77, 4.78, 4.79, 4.80, 4.81, 4.82, 4.83, 4.84, 4.85, 4.86, 4.87, 4.88, 4.89, 4.90, 4.91, 4.92, 4.93, 4.94, 4.95, 4.96, 4.97, 4.98, 4.99, 5.00, 5.01, 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.09, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 5.32, 5.33, 5.34, 5.35, 5.36, 5.37, 5.38, 5.39, 5.40, 5.41, 5.42, 5.43, 5.44, 5.45, 5.46, 5.47, 5.48, 5.49, 5.50, 5.51, 5.52, 5.53, 5.54, 5.55, 5.56, 5.57, 5.58, 5.59, 5.60, 5.61, 5.62, 5.63, 5.64, 5.65, 5.66, 5.67, 5.68, 5.69, 5.70, 5.71, 5.72, 5.73, 5.74, 5.75, 5.76, 5.77, 5.78, 5.79, 5.80, 5.81, 5.82, 5.83, 5.84, 5.85, 5.86, 5.87, 5.88, 5.89, 5.90, 5.91, 5.92, 5.93, 5.94, 5.95, 5.96, 5.97, 5.98, 5.99, 6.00, 6.01, 6.02, 6.03, 6.04, 6.05, 6.06, 6.07, 6.08, 6.09, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22, 6.23, 6.24, 6.25, 6.26, 6.27, 6.28, 6.29, 6.30, 6.31, 6.32, 6.33, 6.34, 6.35, 6.36, 6.37, 6.38, 6.39, 6.40, 6.41, 6.42, 6.43, 6.44, 6.45, 6.46, 6.47, 6.48, 6.49, 6.50, 6.51, 6.52, 6.53, 6.54, 6.55, 6.56, 6.57, 6.58, 6.59, 6.60, 6.61, 6.62, 6.63, 6.64, 6.65, 6.66, 6.67, 6.68, 6.69, 6.70, 6.71, 6.72, 6.73, 6.74, 6.75, 6.76, 6.77, 6.78, 6.79, 6.80, 6.81, 6.82, 6.83, 6.84, 6.85, 6.86, 6.87, 6.88, 6.89, 6.90, 6.91, 6.92, 6.93, 6.94, 6.95, 6.96, 6.97, 6.98, 6.99, 7.00, 7.01, 7.02, 7.03, 7.04, 7.05, 7.06, 7.07, 7.08, 7.09, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.24, 7.25, 7.26, 7.27, 7.28, 7.29, 7.30, 7.31, 7.32, 7.33, 7.34, 7.35, 7.36, 7.37, 7.38, 7.39, 7.40, 7.41, 7.42, 7.43, 7.44, 7.45, 7.46, 7.47, 7.48, 7.49, 7.50, 7.51, 7.52, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.64, 7.65, 7.66, 7.67, 7.68, 7.69, 7.70, 7.71, 7.72, 7.73, 7.74, 7.75, 7.76, 7.77, 7.78, 7.79, 7.80, 7.81, 7.82, 7.83, 7.84, 7.85, 7.86, 7.87, 7.88, 7.89, 7.90, 7.91, 7.92, 7.93, 7.94, 7.95, 7.96, 7.97, 7.98, 7.99, 8.00, 8.01, 8.02, 8.03, 8.04, 8.05, 8.06, 8.07, 8.08, 8.09, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, 8.19, 8.20, 8.21, 8.22, 8.23, 8.24, 8.25, 8.26, 8.27, 8.28, 8.29, 8.30, 8.31, 8.32, 8.33, 8.34, 8.35, 8.36, 8.37, 8.38, 8.39, 8.40, 8.41, 8.42, 8.43, 8.44, 8.45, 8.46, 8.47, 8.48, 8.49, 8.50, 8.51, 8.52, 8.53, 8.54, 8.55, 8.56, 8.57, 8.58, 8.59, 8.60, 8.61, 8.62, 8.63, 8.64, 8.65, 8.66, 8.67, 8.68, 8.69, 8.70, 8.71, 8.72, 8.73, 8.74, 8.75, 8.76, 8.77, 8.78, 8.79, 8.80, 8.81, 8.82, 8.83, 8.84, 8.85, 8.86, 8.87, 8.88, 8.89, 8.90, 8.91, 8.92, 8.93, 8.94, 8.95, 8.96, 8.97, 8.98, 8.99, 9.00, 9.01, 9.02, 9.03, 9.04, 9.05, 9.06, 9.07, 9.08, 9.09, 9.10, 9.11, 9.12, 9.13, 9.14, 9.15, 9.16, 9.17, 9.18, 9.19, 9.20, 9.21, 9.22, 9.23, 9.24, 9.25, 9.26, 9.27, 9.28, 9.29, 9.30, 9.31, 9.32, 9.33, 9.34, 9.35, 9.36, 9.37, 9.38, 9.39, 9.40, 9.41, 9.42, 9.43, 9.44, 9.45, 9.46, 9.47, 9.48, 9.49, 9.50, 9.51, 9.52, 9.53, 9.54, 9.55, 9.56, 9.57, 9.58, 9.59, 9.60, 9.61, 9.62, 9.63, 9.64, 9.65, 9.66, 9.67, 9.68, 9.69, 9.70, 9.71, 9.72, 9.73, 9.74, 9.75, 9.76, 9.77, 9.78, 9.79, 9.80, 9.81, 9.82, 9.83, 9.84, 9.85, 9.86, 9.87, 9.88, 9.89, 9.90, 9.91, 9.92, 9.93, 9.94, 9.95, 9.96, 9.97, 9.98, 9.99, 10.00	

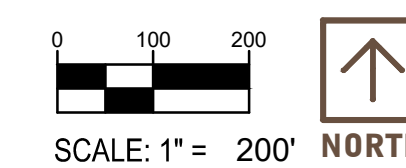
NEW JERSEY DEPARTMENT OF THE TREASURY  
 APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 176, LAWS OF 1913  
 BY: [Signature]  
 DATE: MAR 21 1960  
 TITLE: TAX MAP  
 SERIAL NO. 275



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VICINITY MAP

**4201 Route 130**  
Edgewater Park, New Jersey



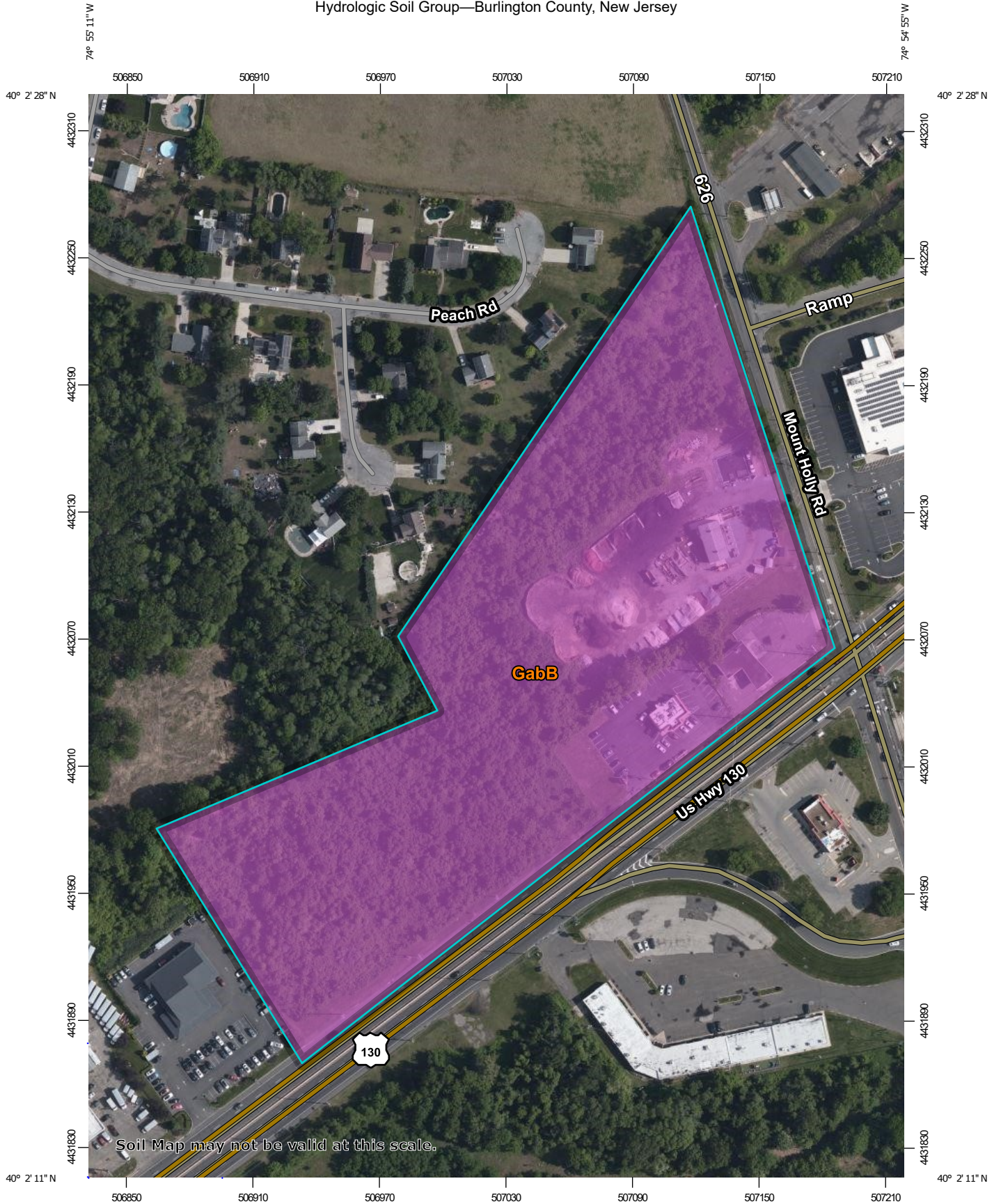
**WARE MALCOMB**

NYC19-0005  
01.22.2020

SHEET  
**1**



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

**Area of Interest (AOI)**









 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Lines**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Points**

-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: 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

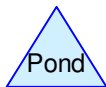
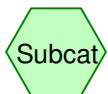
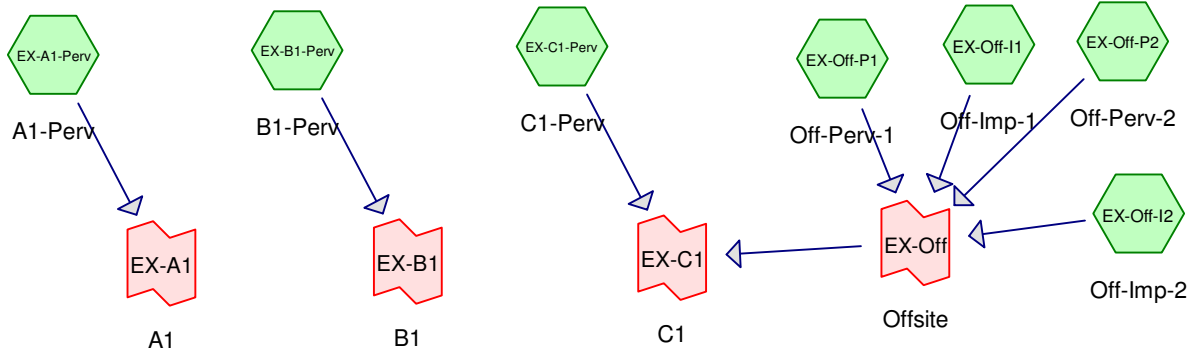
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix B



**NYC19-0005\_offsite\_WQ**

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4201 US Route 130, Edgewater Park

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

Printed 12/7/2020

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

<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=25.0 min CN=0/98 Runoff=0.41 cfs 0.073 af
<b>Subcatchment EX-Off-I2: Off-Imp-2</b>	Runoff Area=0.999 ac 4.00% Impervious Runoff Depth=1.06" Tc=25.0 min CN=71/98 Runoff=0.48 cfs 0.088 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=0.176 ac 0.00% Impervious Runoff Depth=0.00" Tc=25.0 min CN=39/0 Runoff=0.00 cfs 0.000 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=0.89 cfs 0.161 af Primary=0.89 cfs 0.161 af
<b>Link EX-Off: Offsite</b>	Inflow=0.89 cfs 0.161 af Primary=0.89 cfs 0.161 af

**Total Runoff Area = 9.448 ac Runoff Volume = 0.161 af Average Runoff Depth = 0.20"**  
**96.62% Pervious = 9.129 ac 3.38% 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"

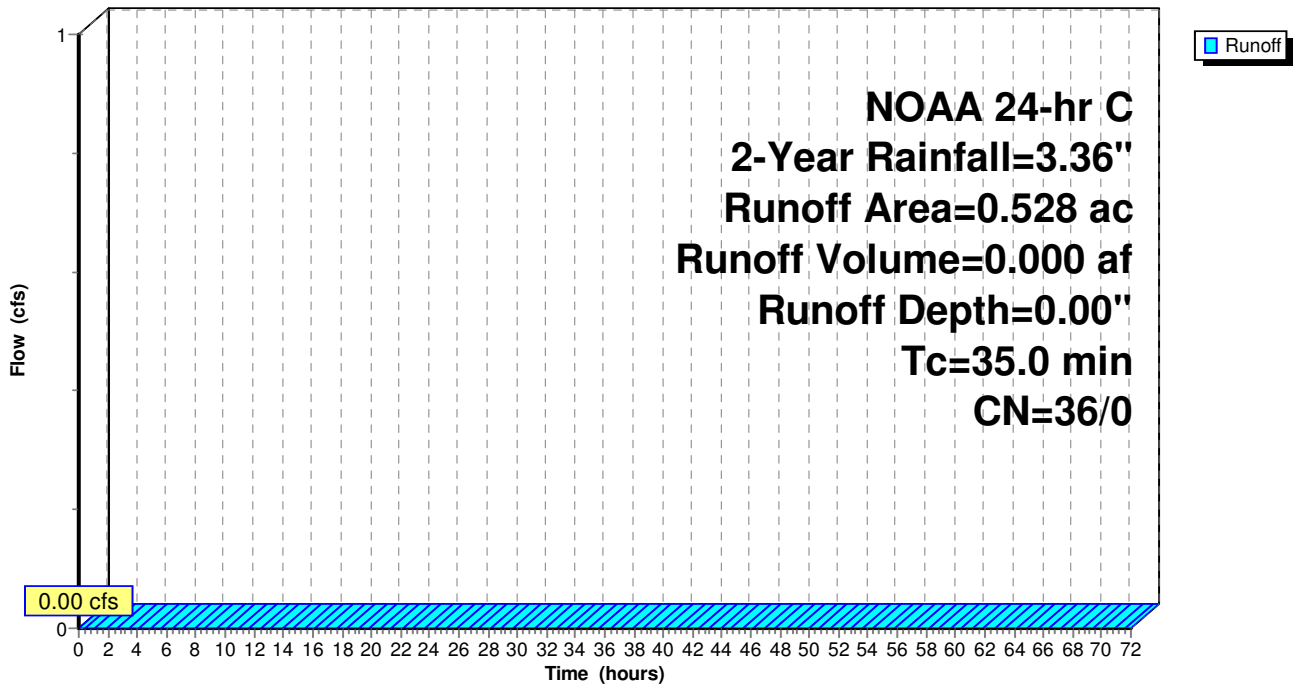
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

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"

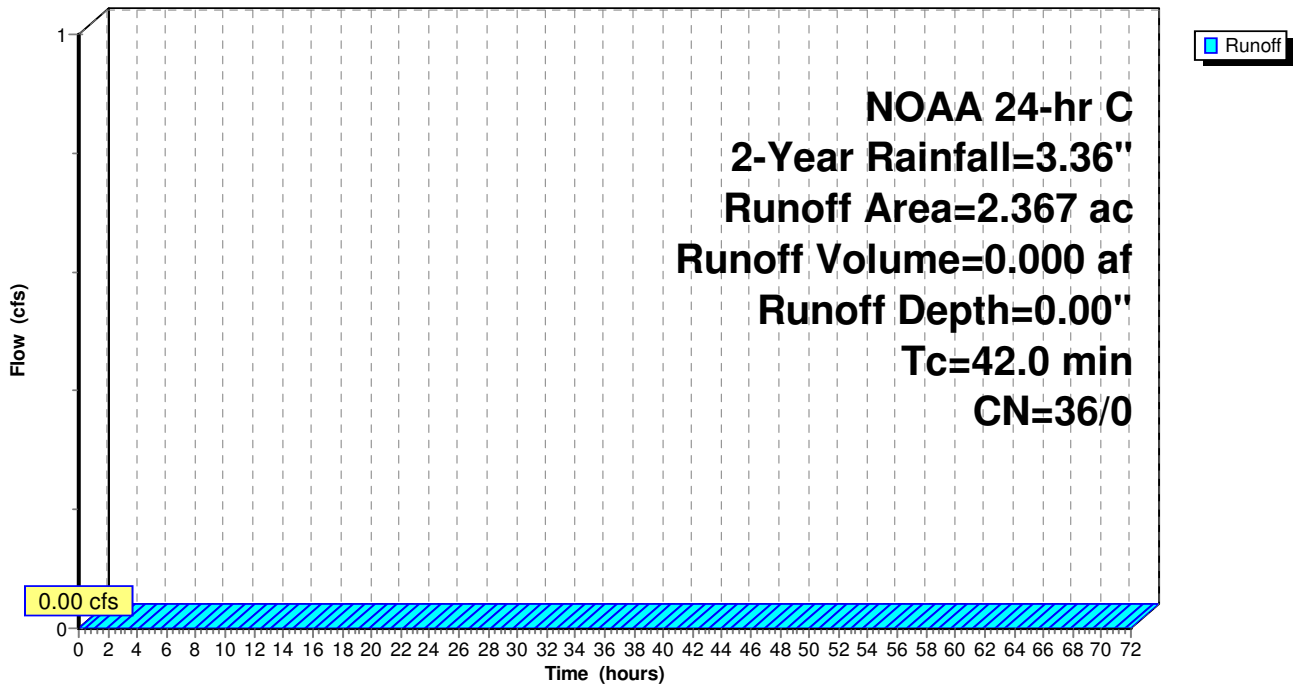
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

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"

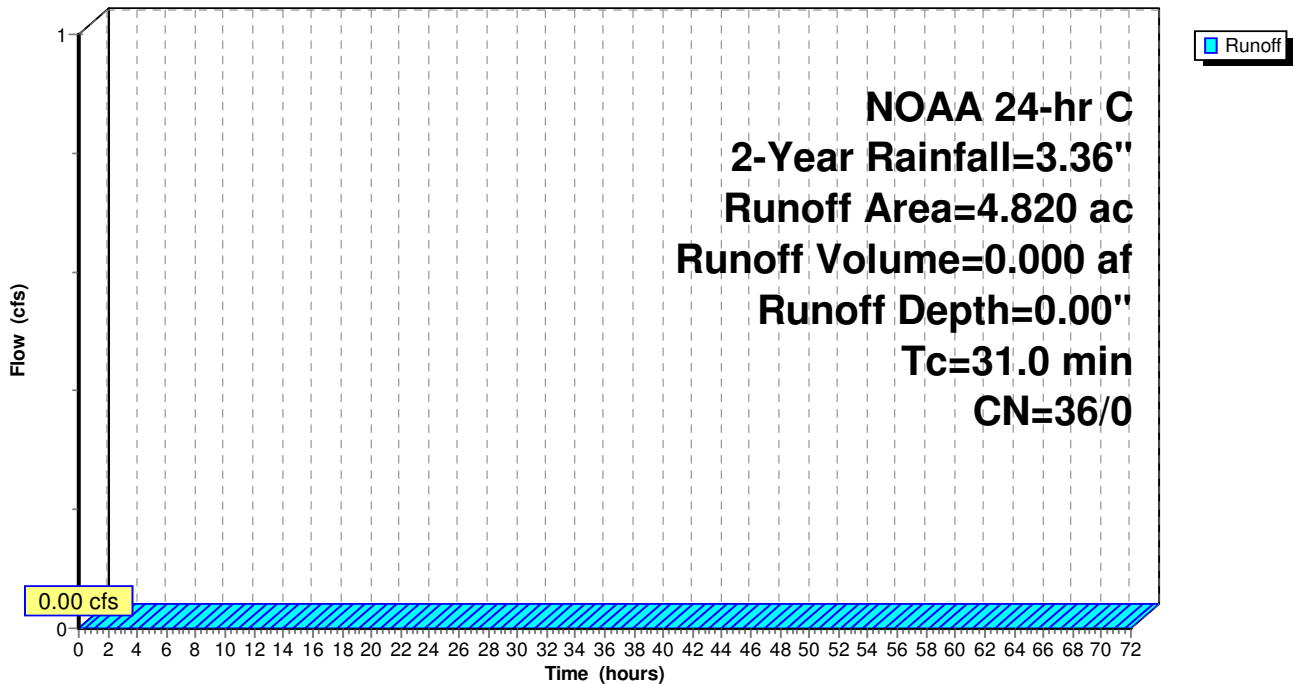
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

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

Runoff = 0.41 cfs @ 12.38 hrs, Volume= 0.073 af, Depth= 3.13"

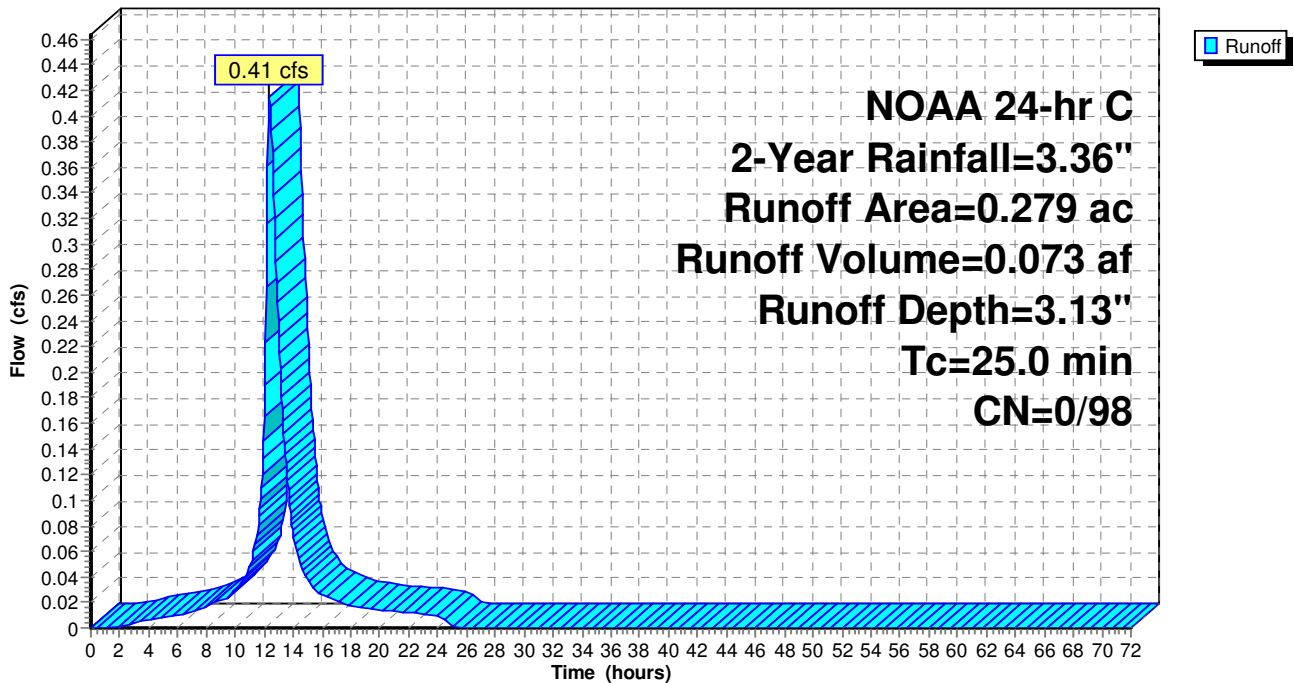
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

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
25.0					Direct Entry, 15

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

Hydrograph



**NYC19-0005\_offsite\_WQ**

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

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

Runoff = 0.48 cfs @ 12.44 hrs, Volume= 0.088 af, Depth= 1.06"

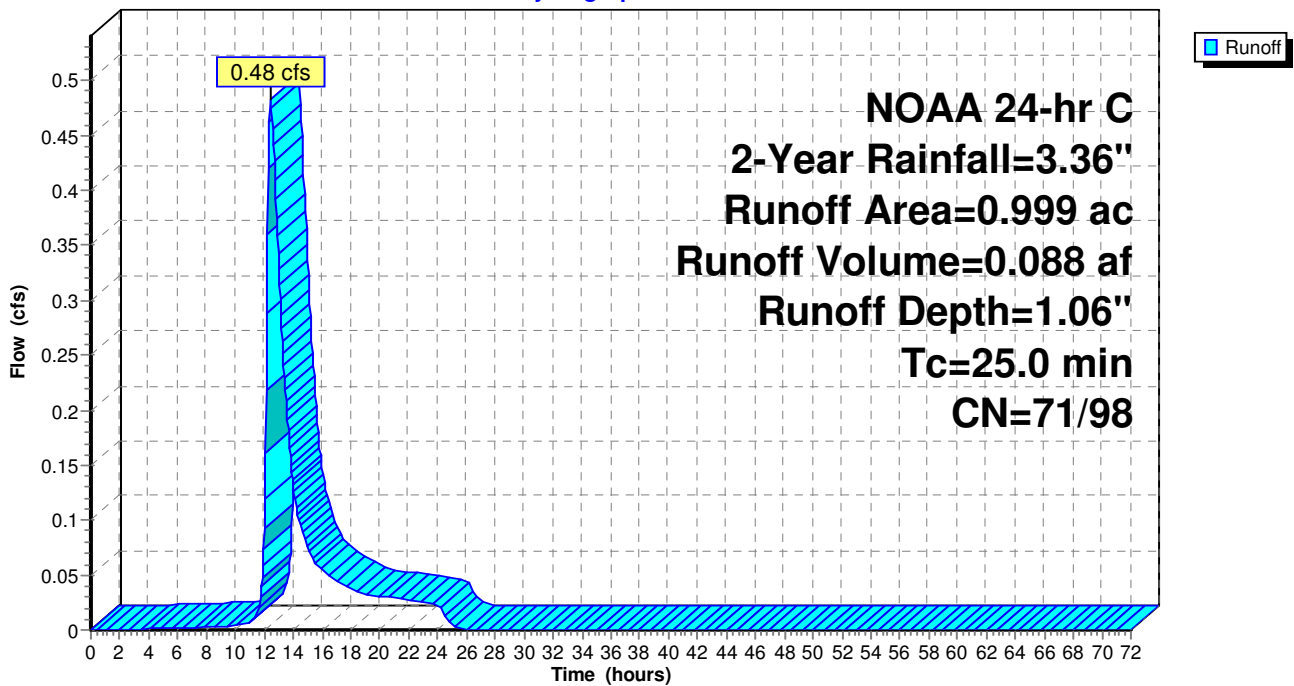
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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





**NYC19-0005\_offsite\_WQ**

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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 = 0.00 cfs @ 24.09 hrs, Volume= 0.000 af, Depth= 0.00"

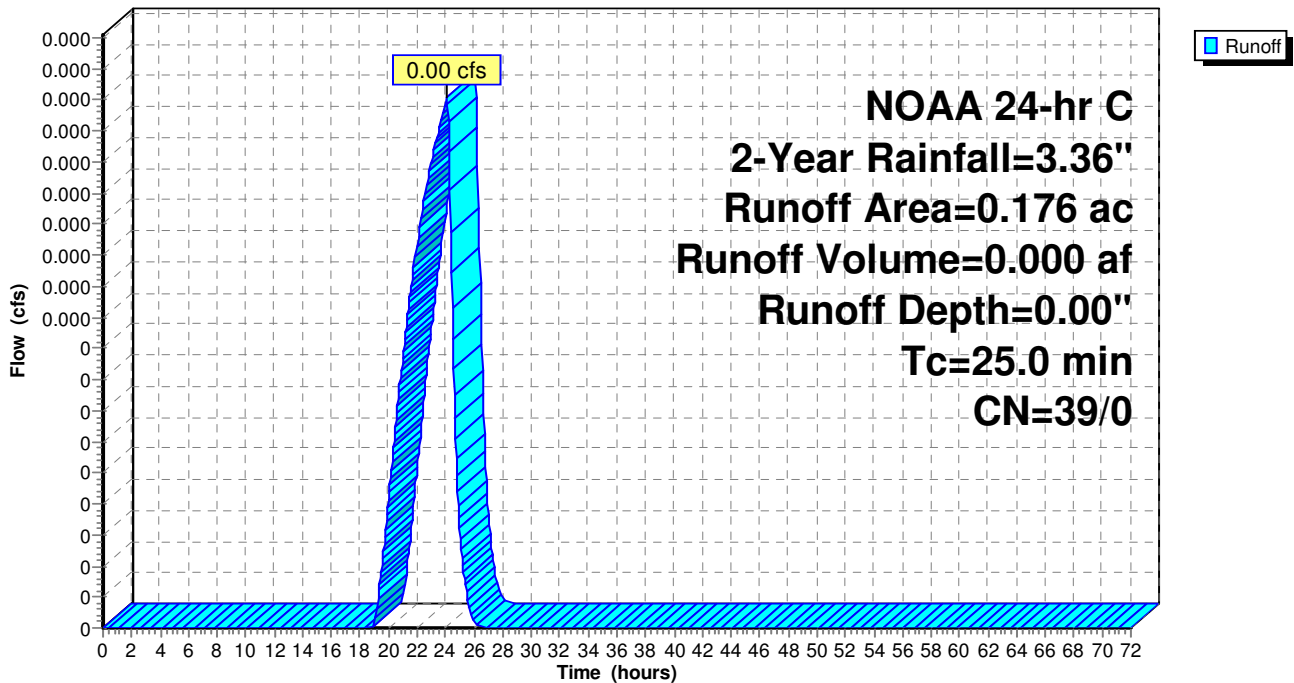
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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



**NYC19-0005\_offsite\_WQ**

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

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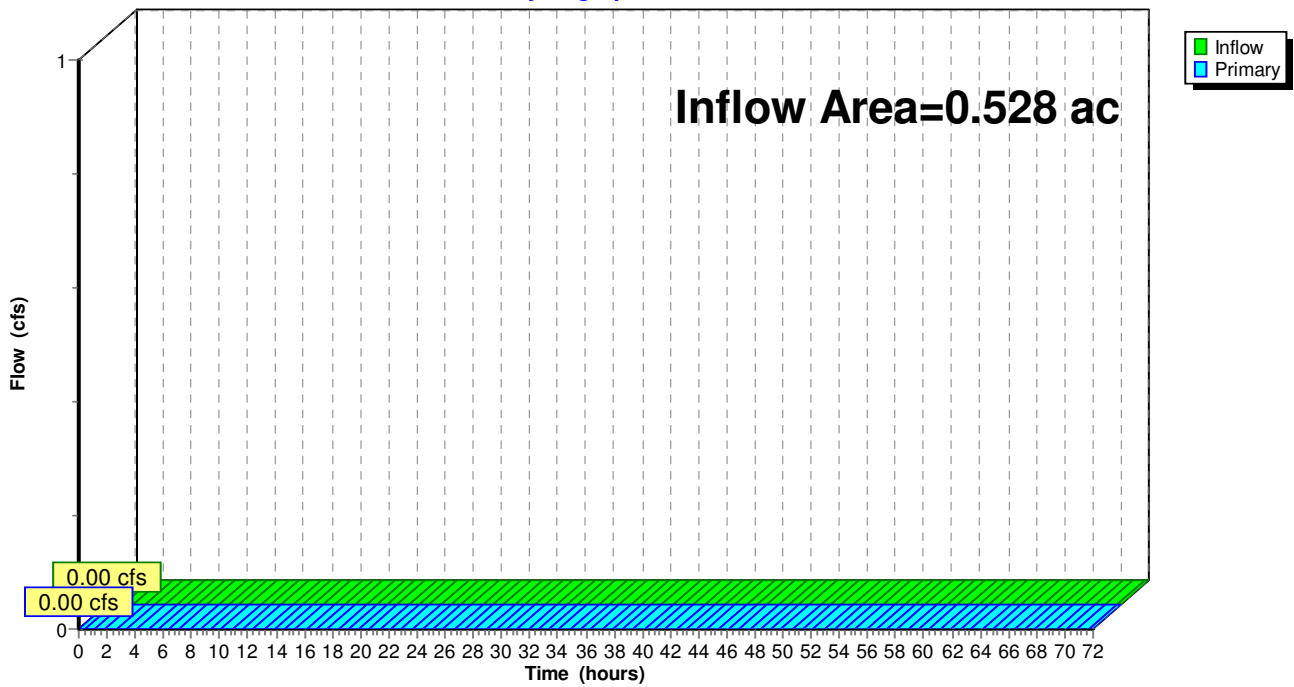
**Summary for Link EX-A1: A1**

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



**NYC19-0005\_offsite\_WQ**

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4201 US Route 130, Edgewater Park

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

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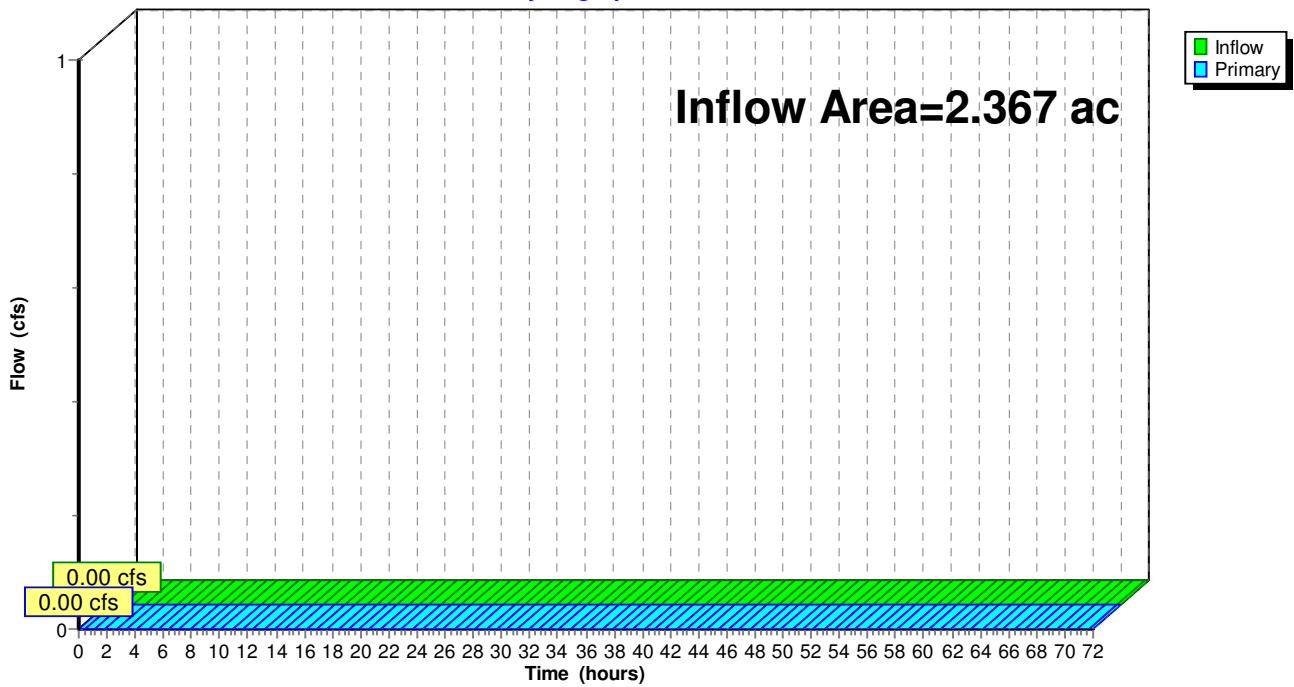
**Summary for Link EX-B1: B1**

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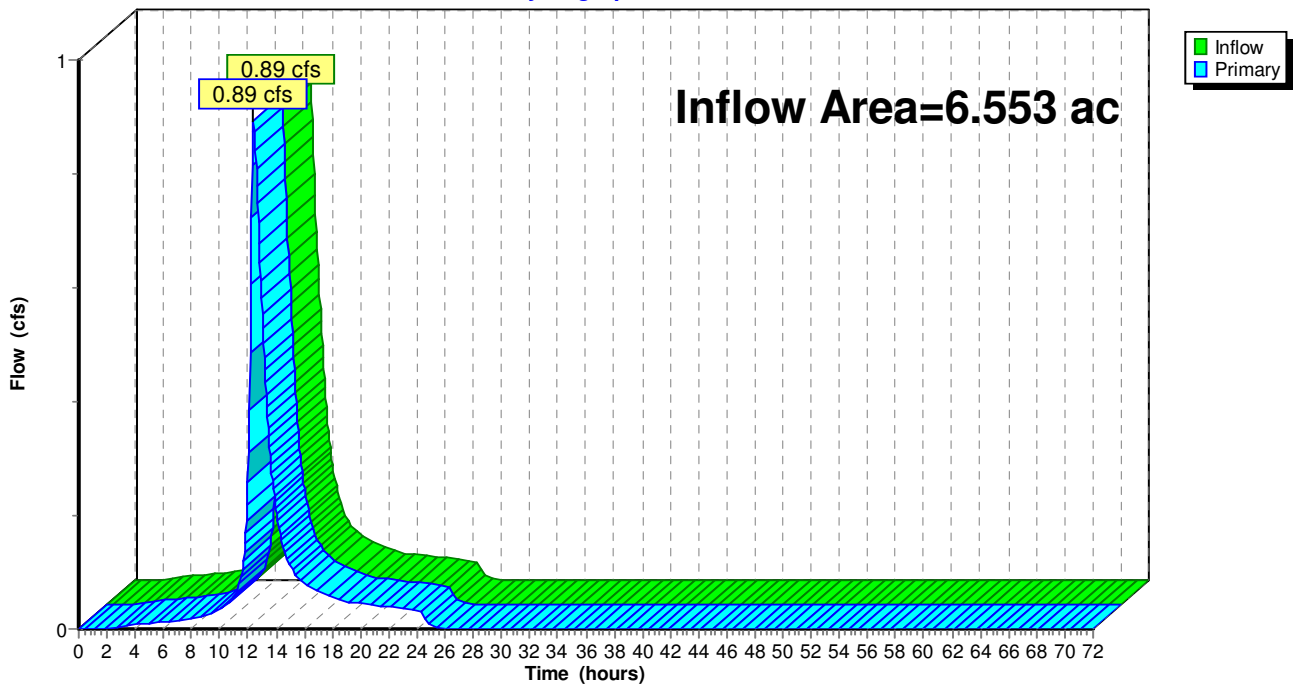
**Summary for Link EX-C1: C1**

Inflow Area = 6.553 ac, 4.87% Impervious, Inflow Depth = 0.30" for 2-Year event  
Inflow = 0.89 cfs @ 12.41 hrs, Volume= 0.161 af  
Primary = 0.89 cfs @ 12.41 hrs, Volume= 0.161 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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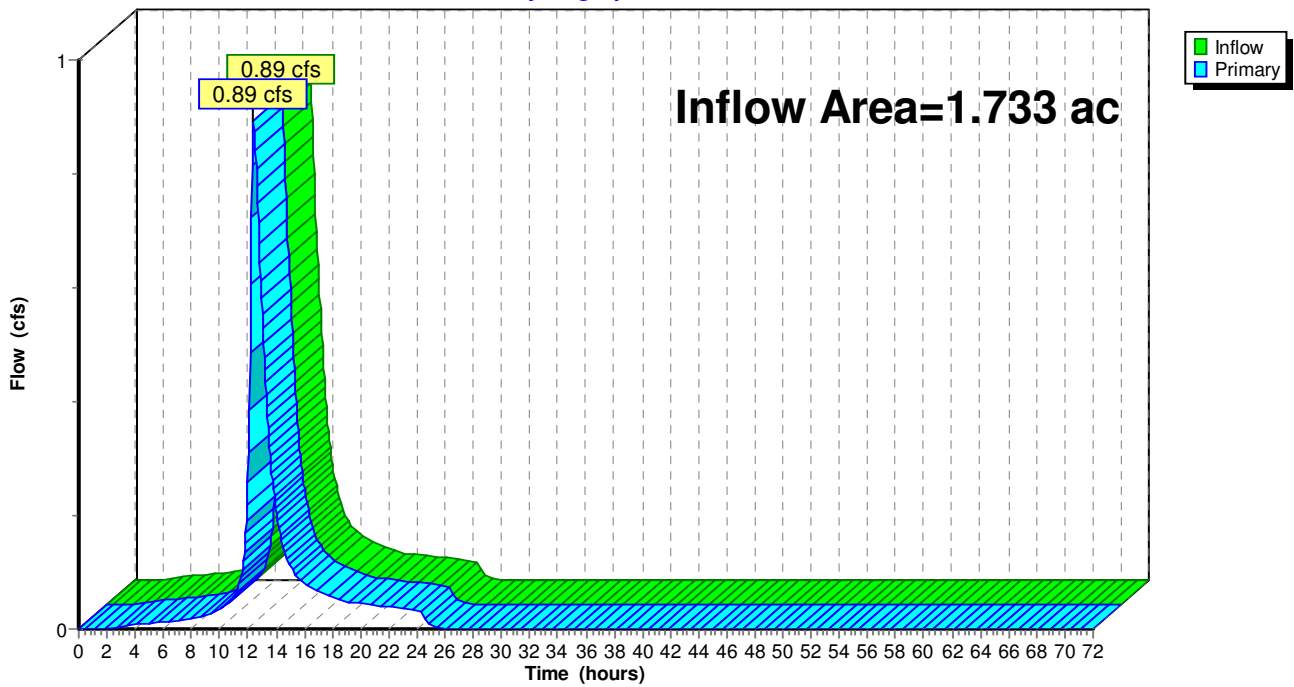
**Summary for Link EX-Off: Offsite**

Inflow Area = 1.733 ac, 18.41% Impervious, Inflow Depth = 1.12" for 2-Year event  
Inflow = 0.89 cfs @ 12.41 hrs, Volume= 0.161 af  
Primary = 0.89 cfs @ 12.41 hrs, Volume= 0.161 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=25.0 min CN=0/98 Runoff=0.64 cfs 0.115 af
<b>Subcatchment EX-Off-I2: Off-Imp-2</b>	Runoff Area=0.999 ac 4.00% Impervious Runoff Depth=2.36" Tc=25.0 min CN=71/98 Runoff=1.17 cfs 0.197 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=0.176 ac 0.00% Impervious Runoff Depth=0.24" Tc=25.0 min CN=39/0 Runoff=0.01 cfs 0.003 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=1.82 cfs 0.375 af Primary=1.82 cfs 0.375 af
<b>Link EX-Off: Offsite</b>	Inflow=1.82 cfs 0.321 af Primary=1.82 cfs 0.321 af

**Total Runoff Area = 9.448 ac Runoff Volume = 0.408 af Average Runoff Depth = 0.52"**  
**96.62% Pervious = 9.129 ac 3.38% Impervious = 0.319 ac**

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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"

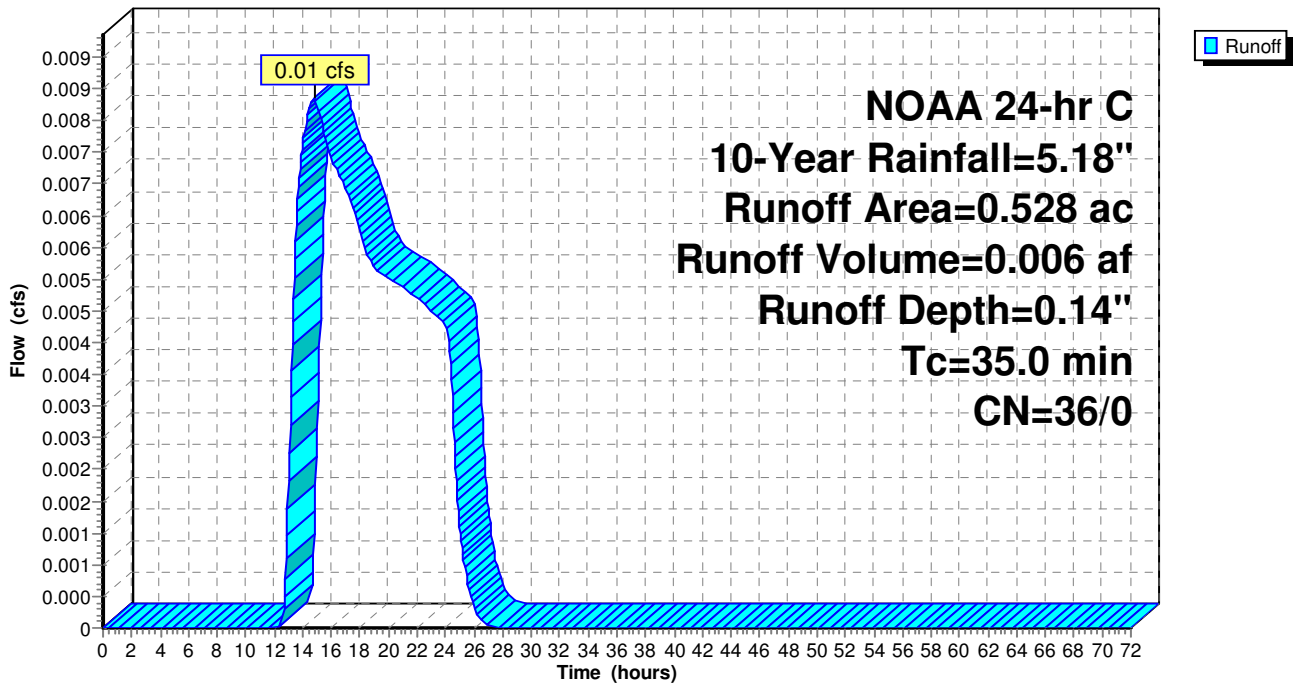
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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

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

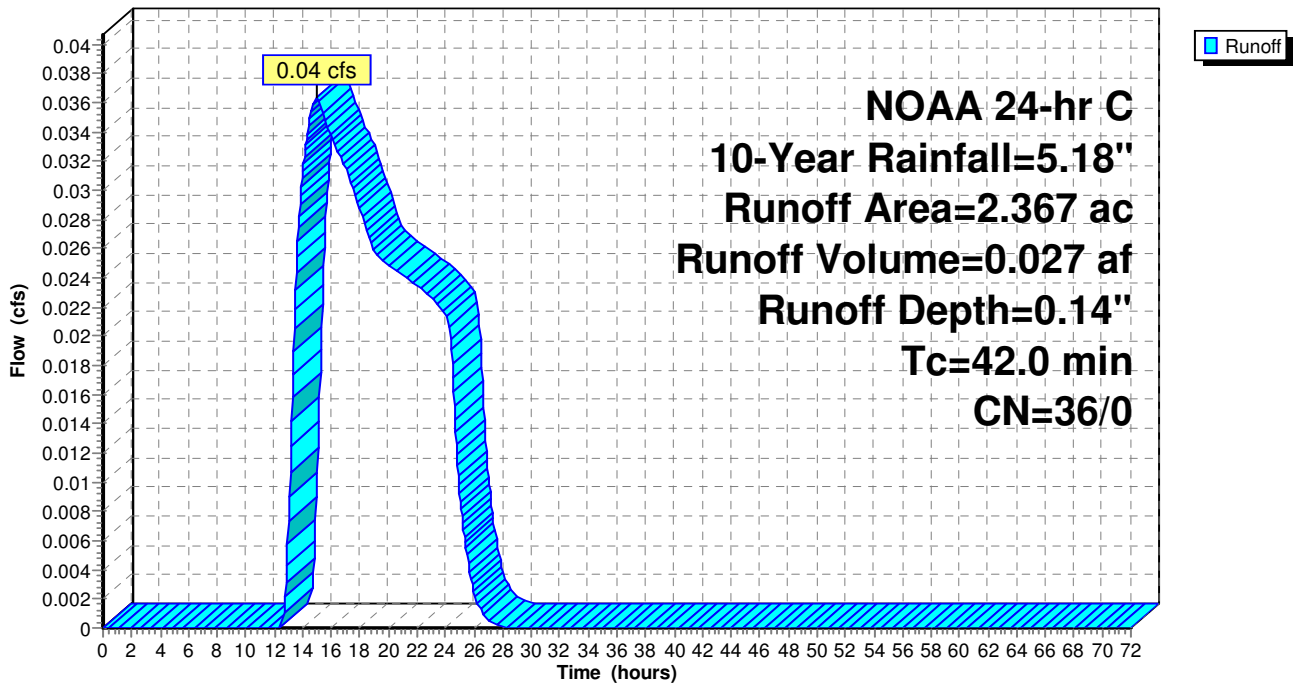
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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

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

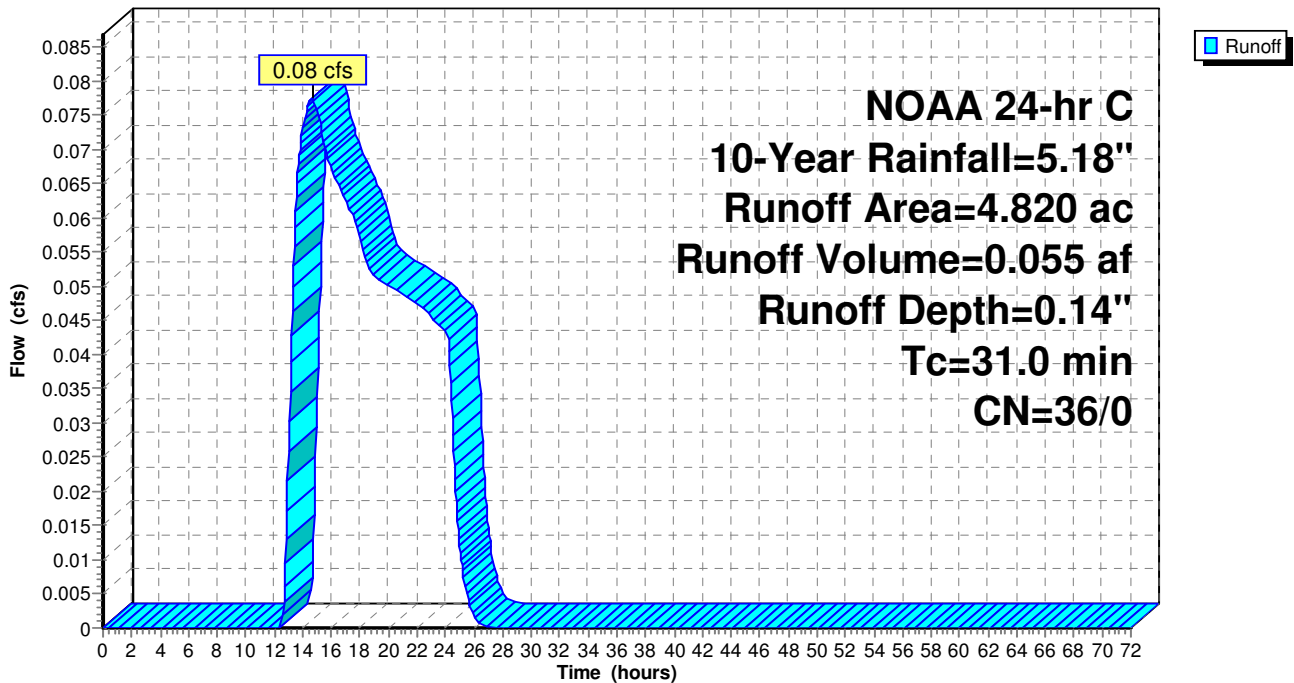
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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**

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

Runoff = 0.64 cfs @ 12.38 hrs, Volume= 0.115 af, Depth= 4.94"

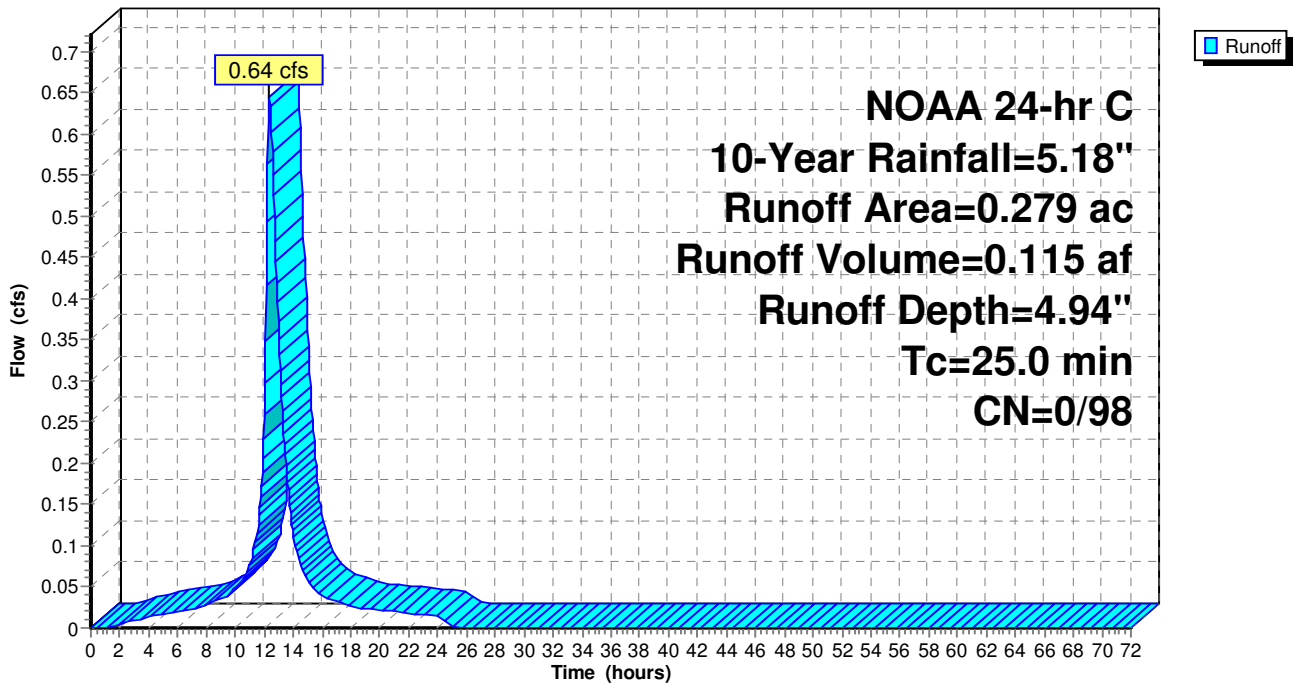
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

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
25.0					Direct Entry, 15

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

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

Runoff = 1.17 cfs @ 12.41 hrs, Volume= 0.197 af, Depth= 2.36"

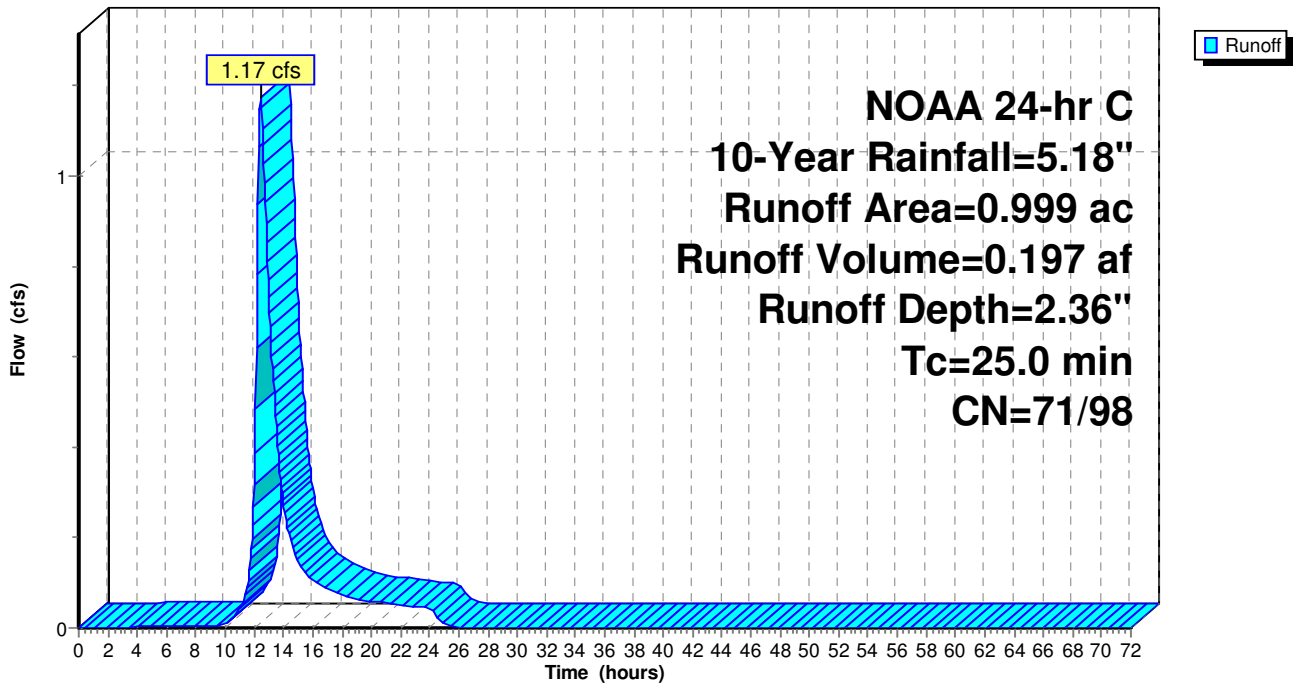
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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"

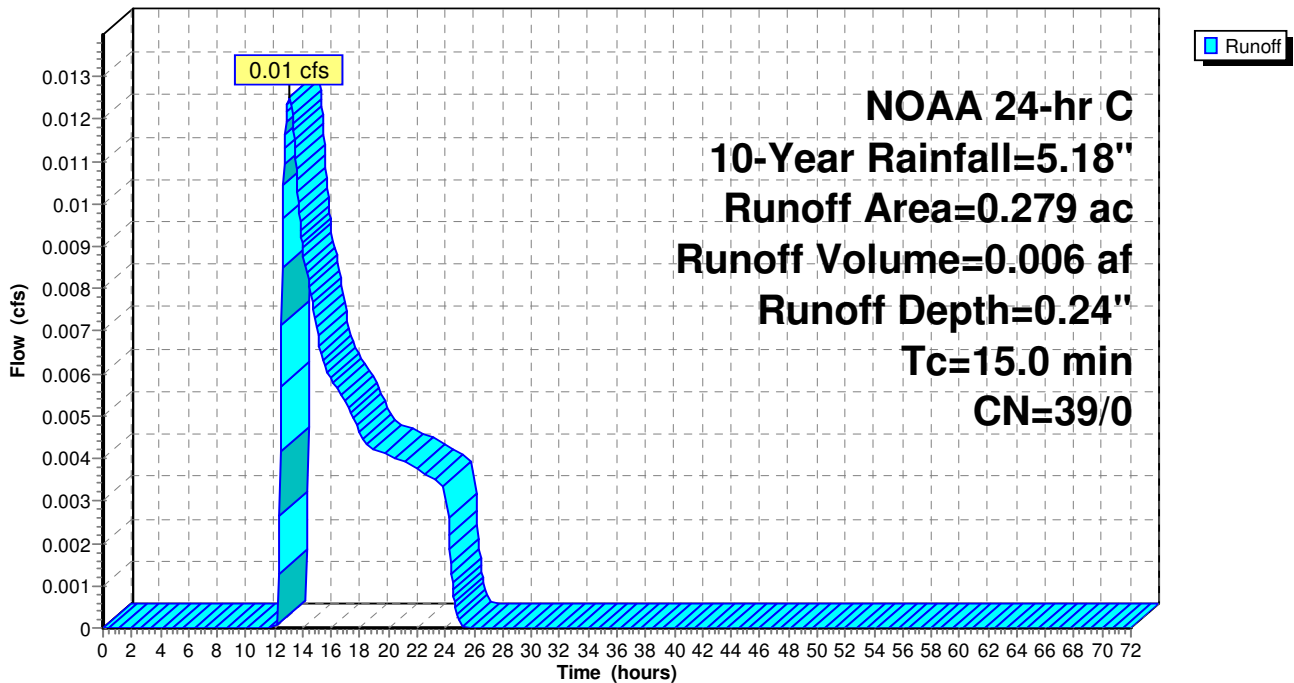
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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**

Hydrograph



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

Runoff = 0.01 cfs @ 13.35 hrs, Volume= 0.003 af, Depth= 0.24"

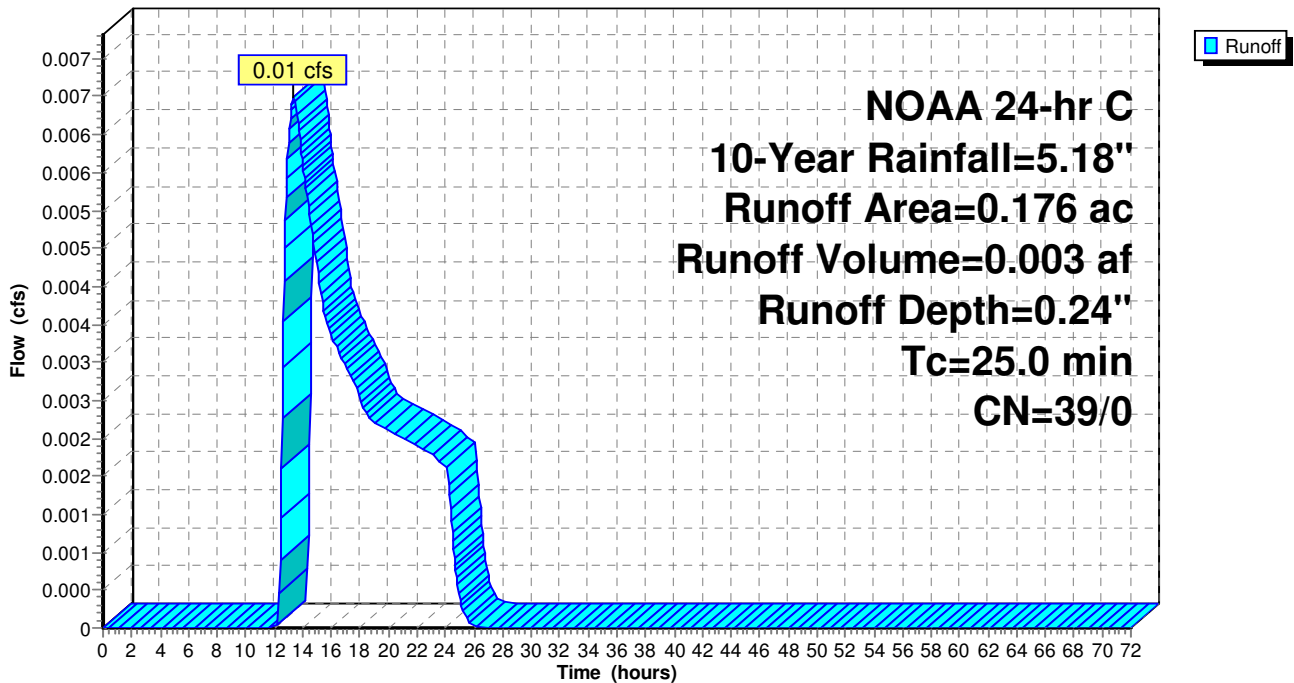
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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**

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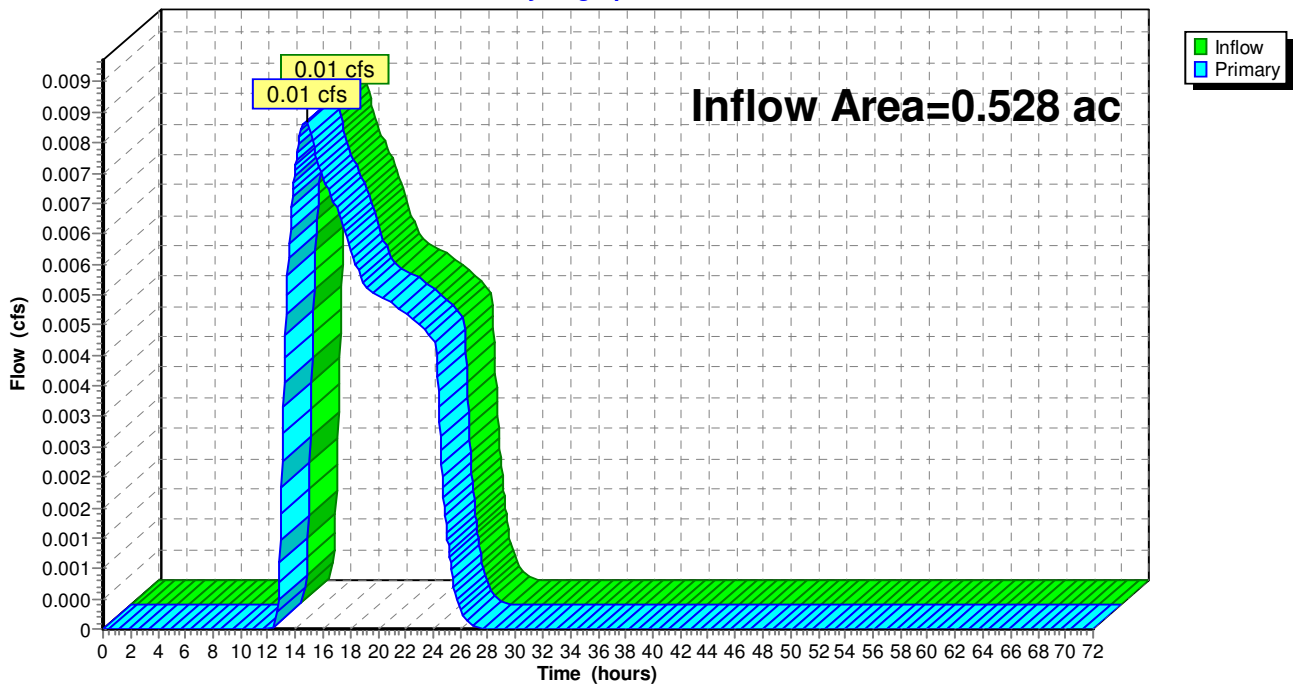
**Summary for Link EX-A1: A1**

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**

Hydrograph



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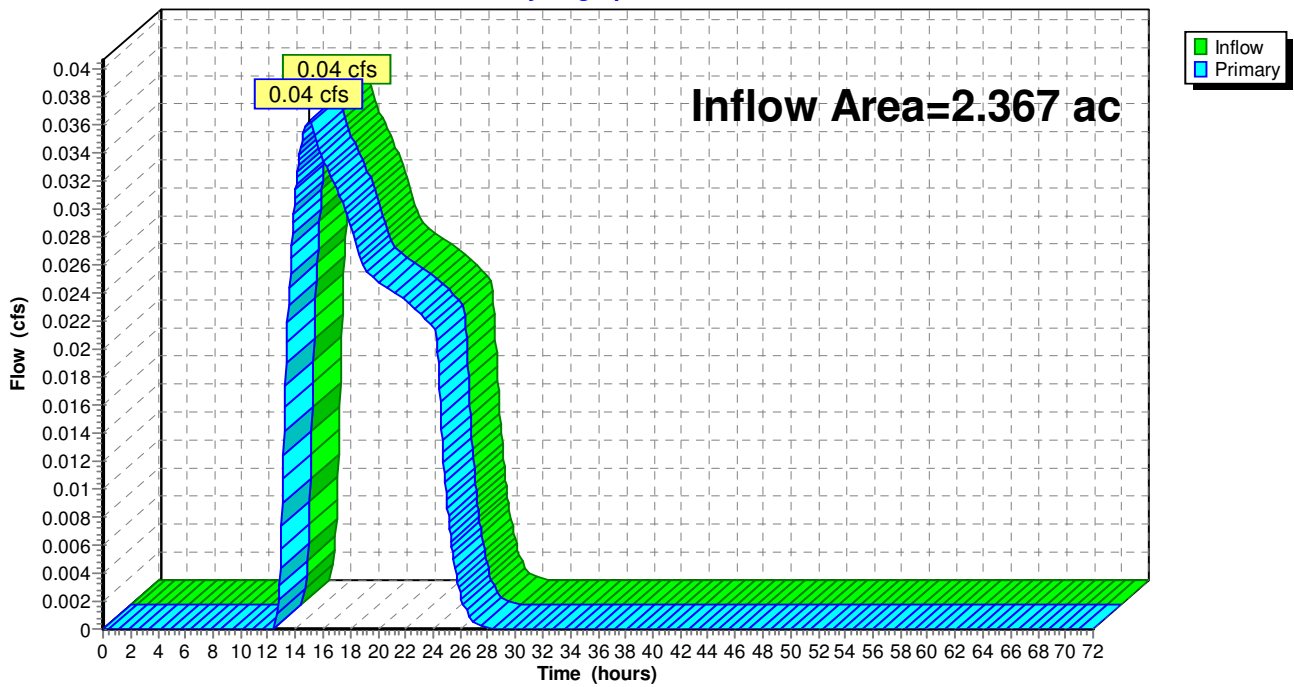
**Summary for Link EX-B1: B1**

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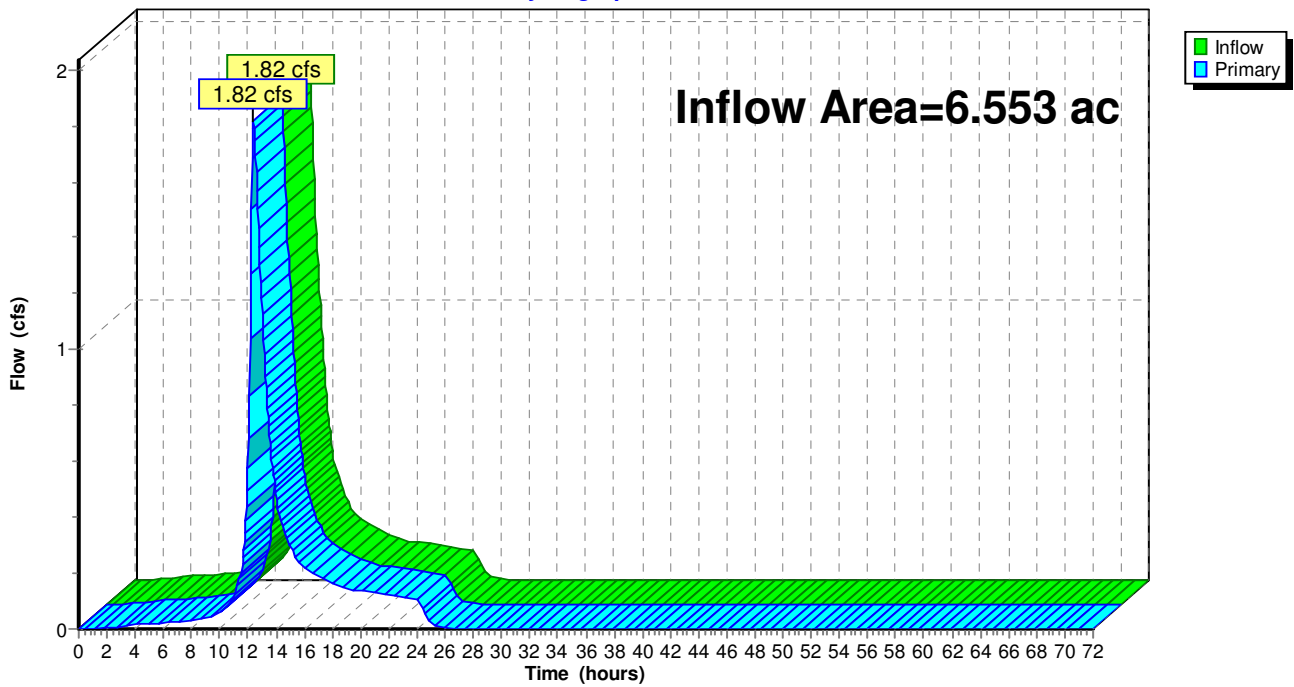
**Summary for Link EX-C1: C1**

Inflow Area = 6.553 ac, 4.87% Impervious, Inflow Depth = 0.69" for 10-Year event  
Inflow = 1.82 cfs @ 12.40 hrs, Volume= 0.375 af  
Primary = 1.82 cfs @ 12.40 hrs, Volume= 0.375 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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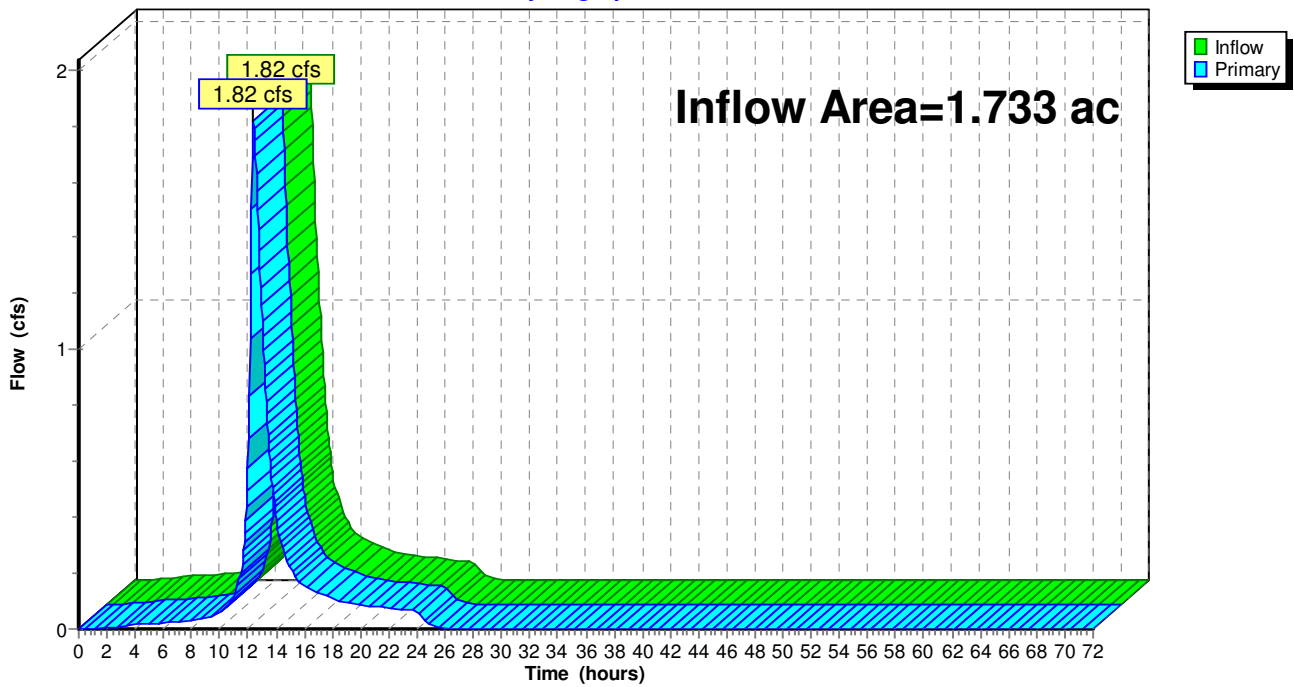
**Summary for Link EX-Off: Offsite**

Inflow Area = 1.733 ac, 18.41% Impervious, Inflow Depth = 2.22" for 10-Year event  
Inflow = 1.82 cfs @ 12.40 hrs, Volume= 0.321 af  
Primary = 1.82 cfs @ 12.40 hrs, Volume= 0.321 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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**Summary for Subcatchment EX-A1-Perv: A1-Perv**

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

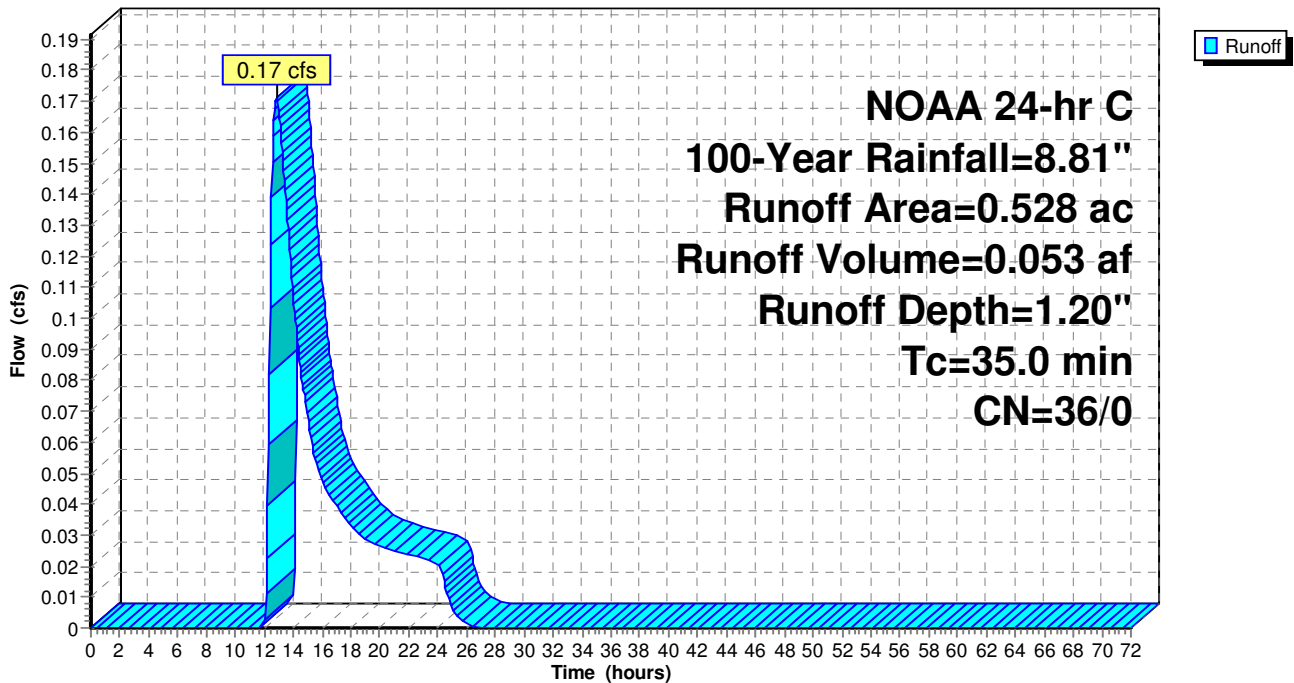
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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"

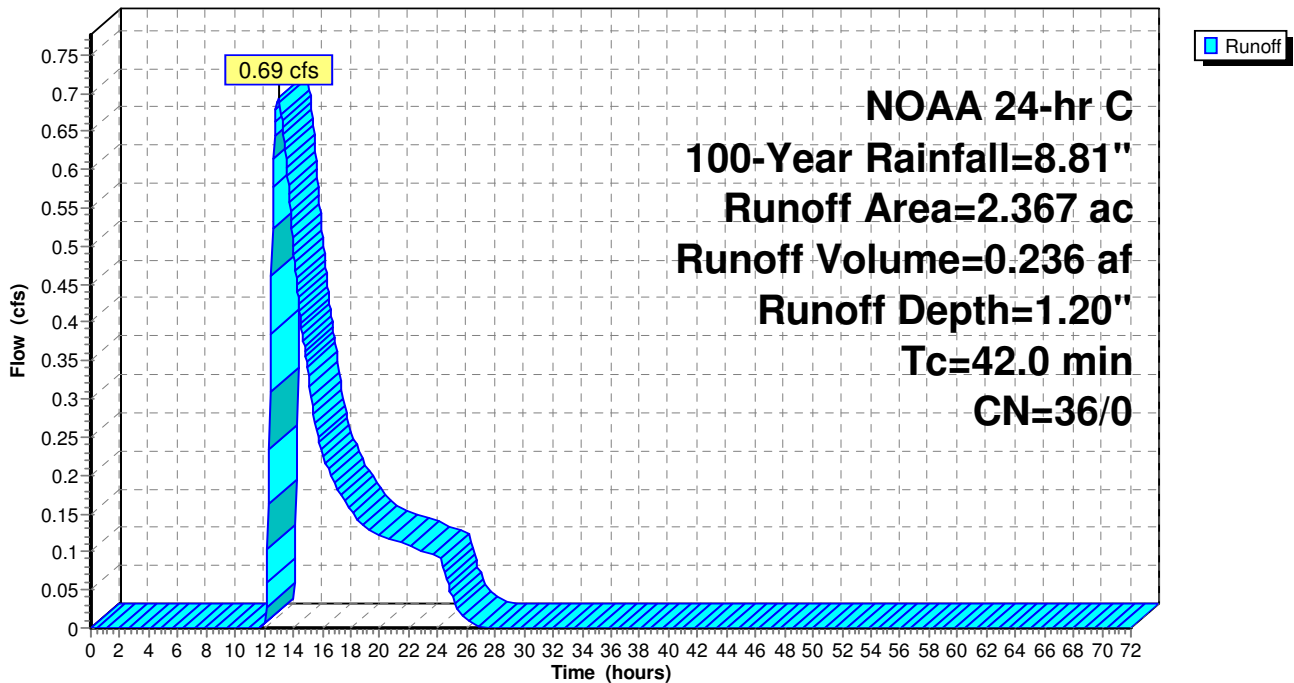
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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"

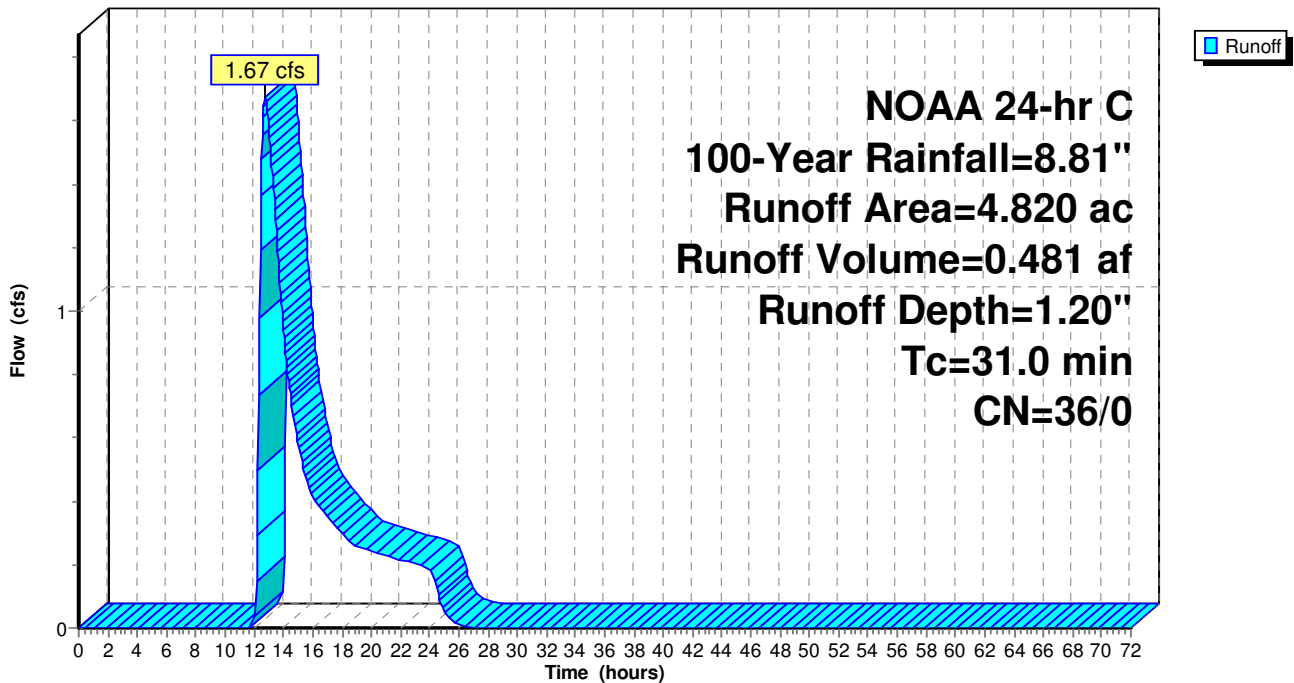
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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**

Hydrograph





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

Runoff = 1.10 cfs @ 12.38 hrs, Volume= 0.199 af, Depth= 8.57"

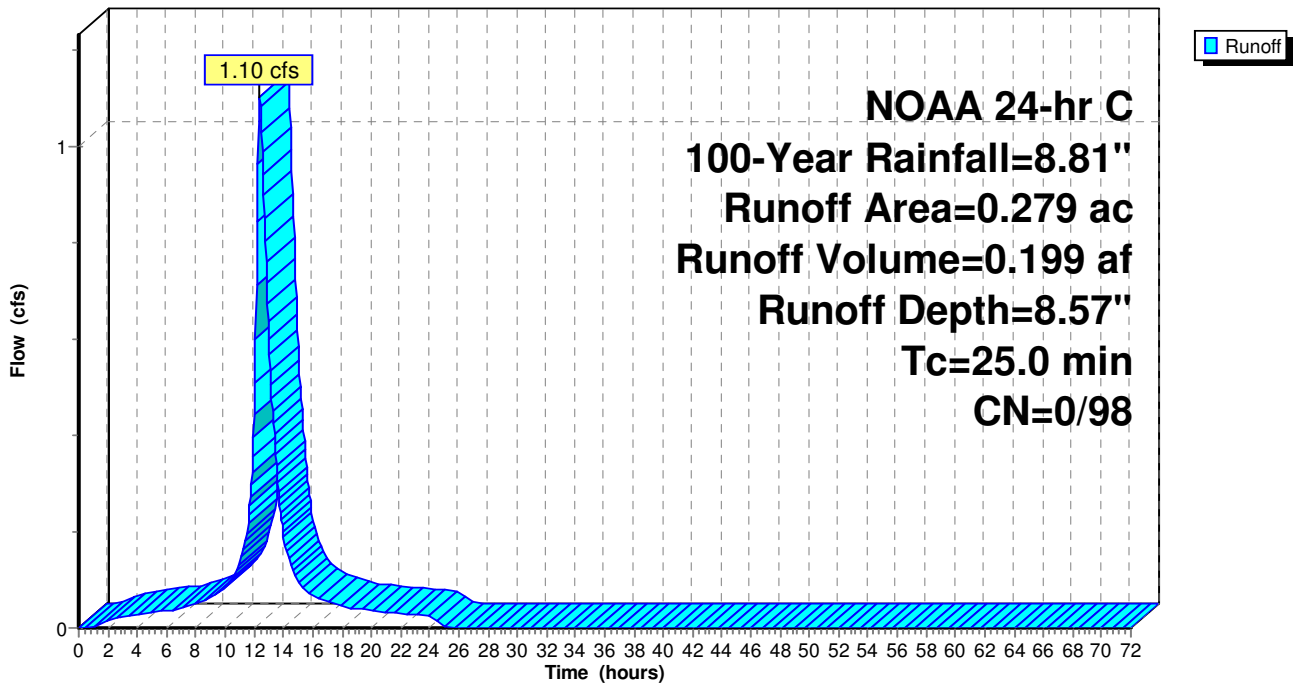
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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
25.0					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 = 2.77 cfs @ 12.40 hrs, Volume= 0.451 af, Depth= 5.42"

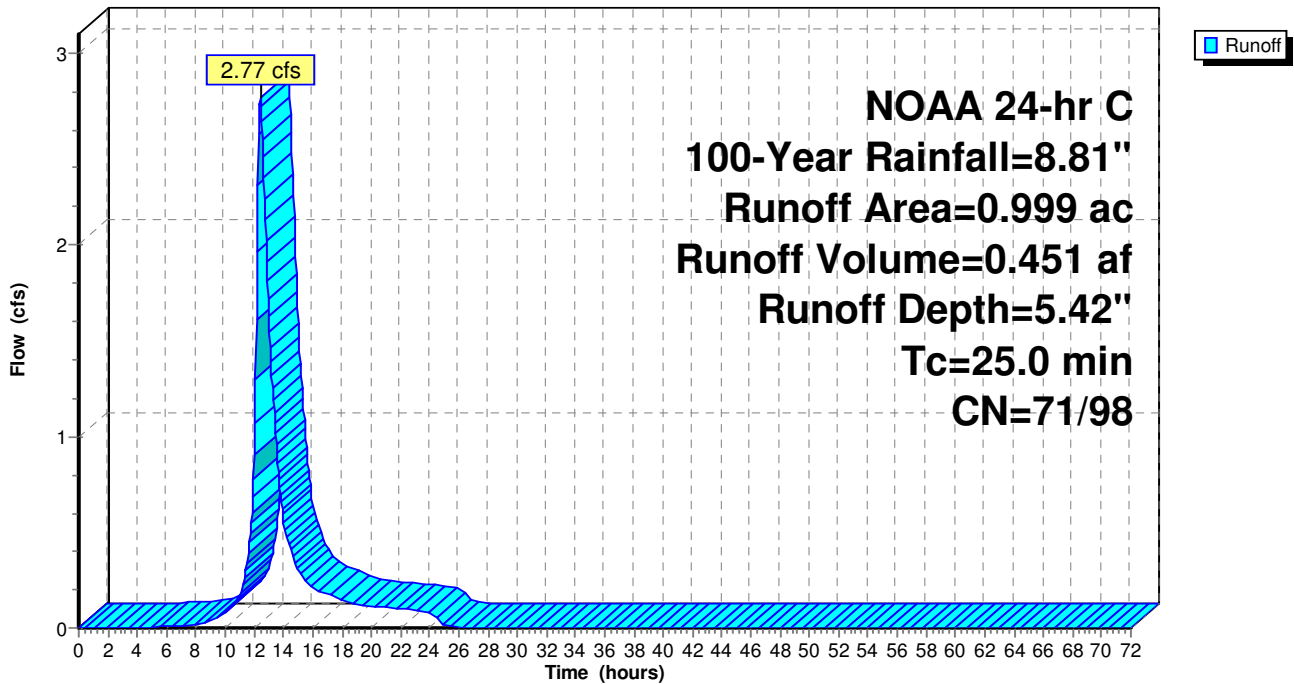
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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



**NYC19-0005\_offsite\_WQ**

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4201 US Route 130, Edgewater Park

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

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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"

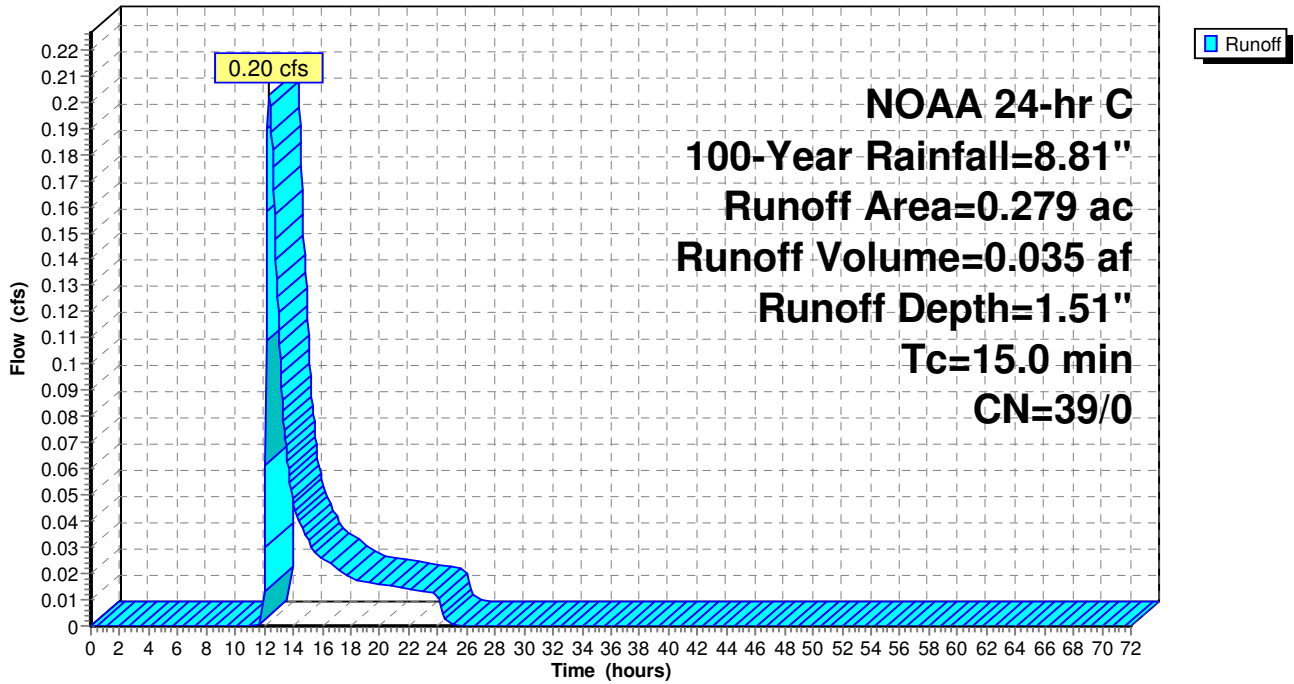
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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**

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

Runoff = 0.10 cfs @ 12.56 hrs, Volume= 0.022 af, Depth= 1.51"

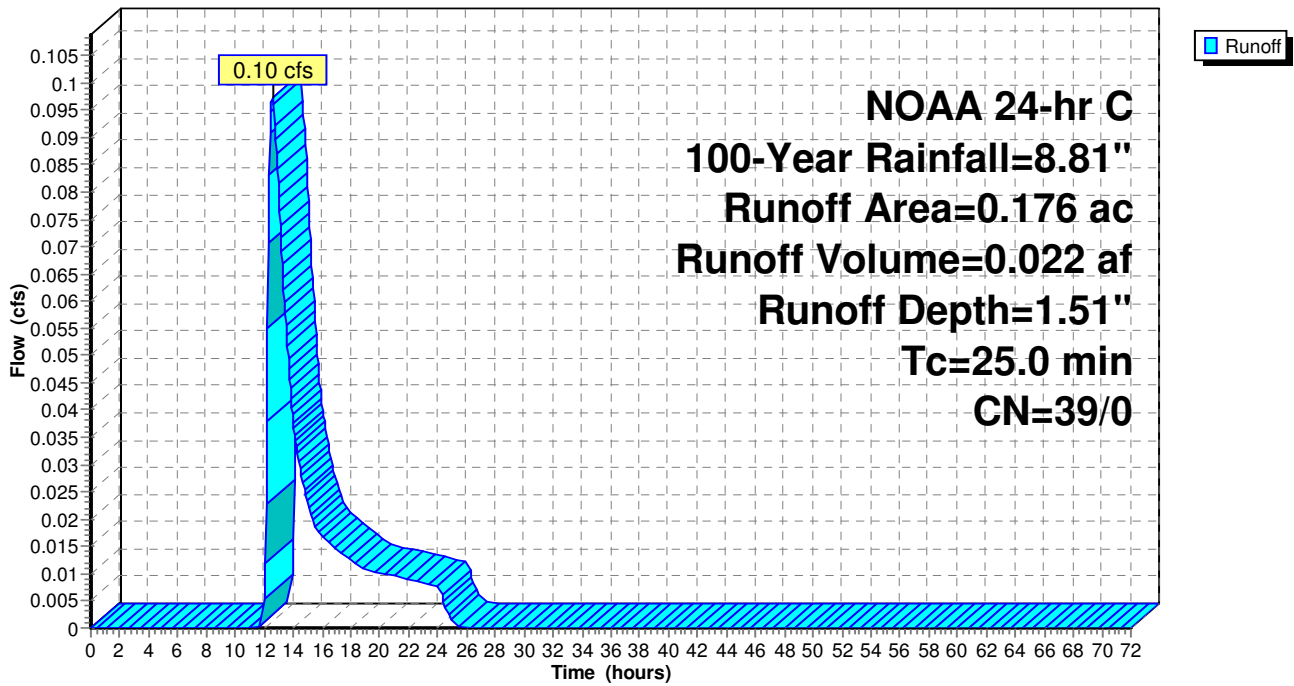
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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**

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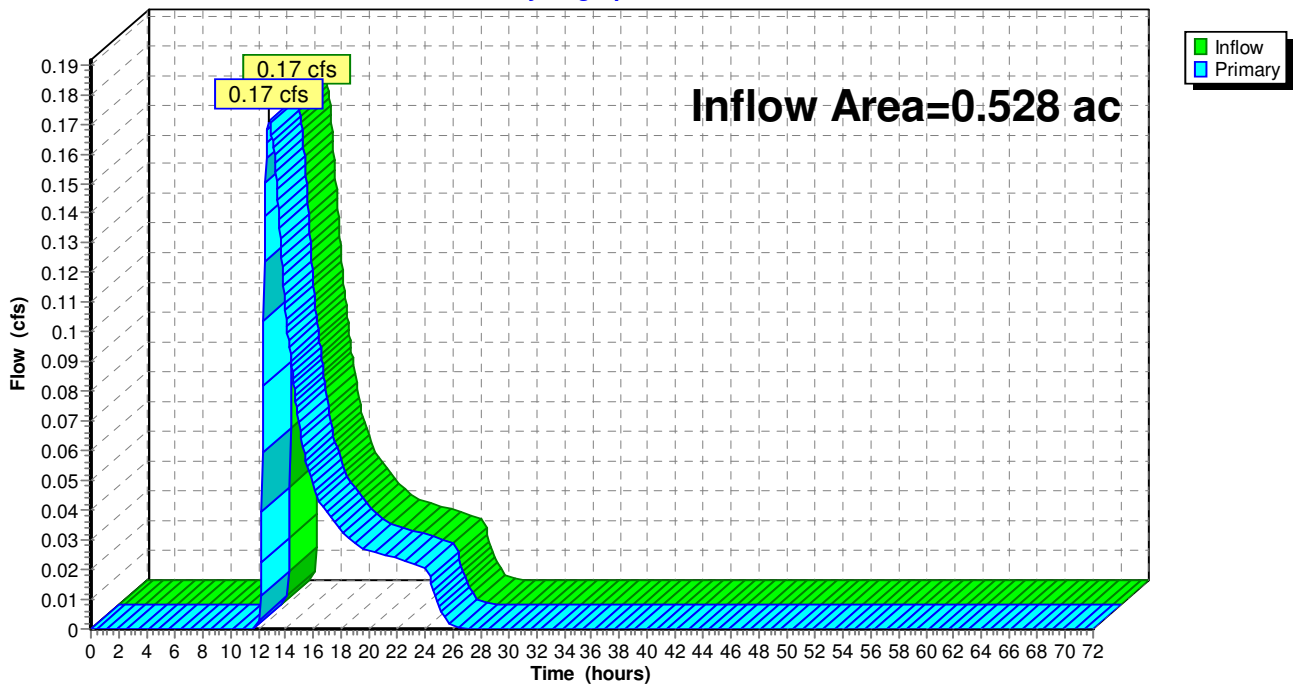
**Summary for Link EX-A1: A1**

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**

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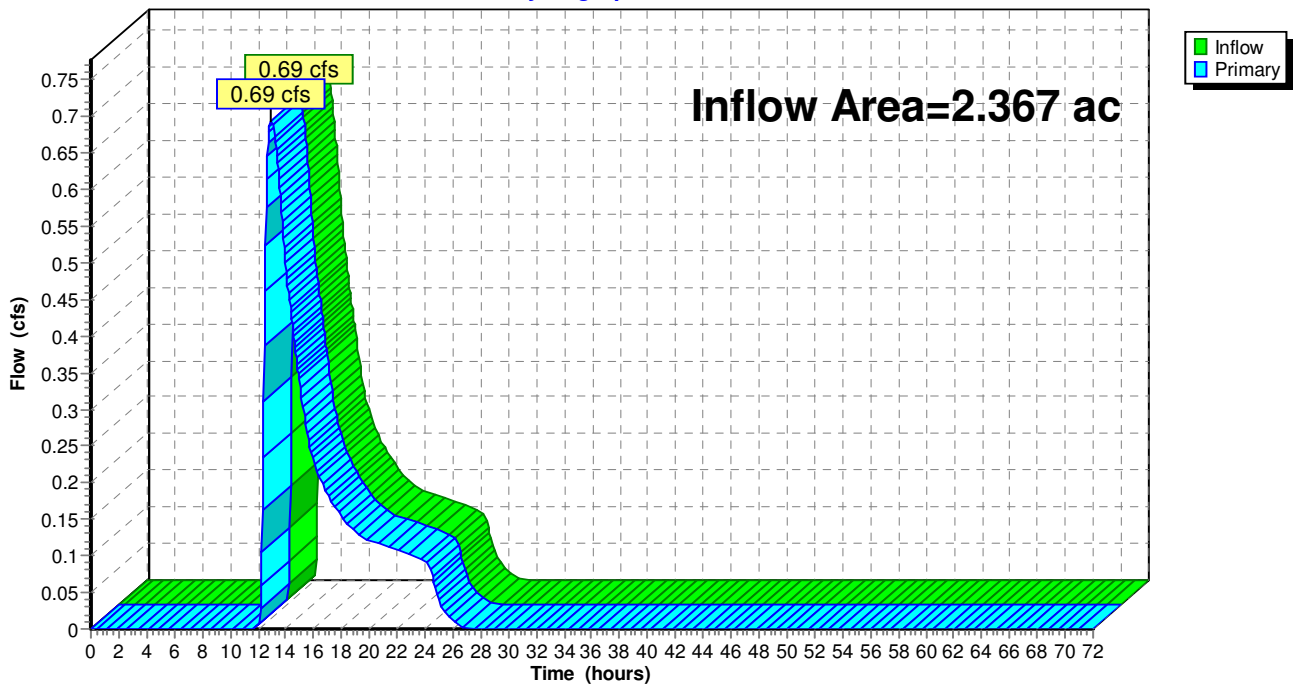
**Summary for Link EX-B1: B1**

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**

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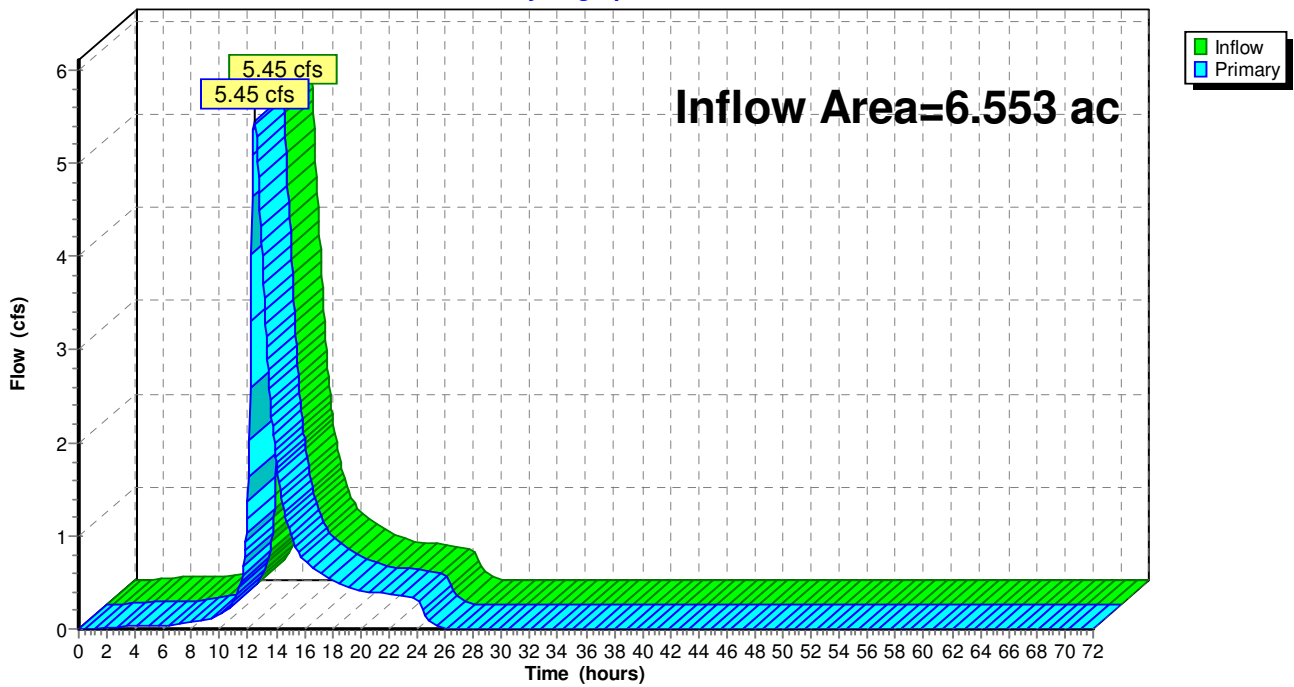
**Summary for Link EX-C1: C1**

Inflow Area = 6.553 ac, 4.87% Impervious, Inflow Depth = 2.18" for 100-Year event  
Inflow = 5.45 cfs @ 12.47 hrs, Volume= 1.189 af  
Primary = 5.45 cfs @ 12.47 hrs, Volume= 1.189 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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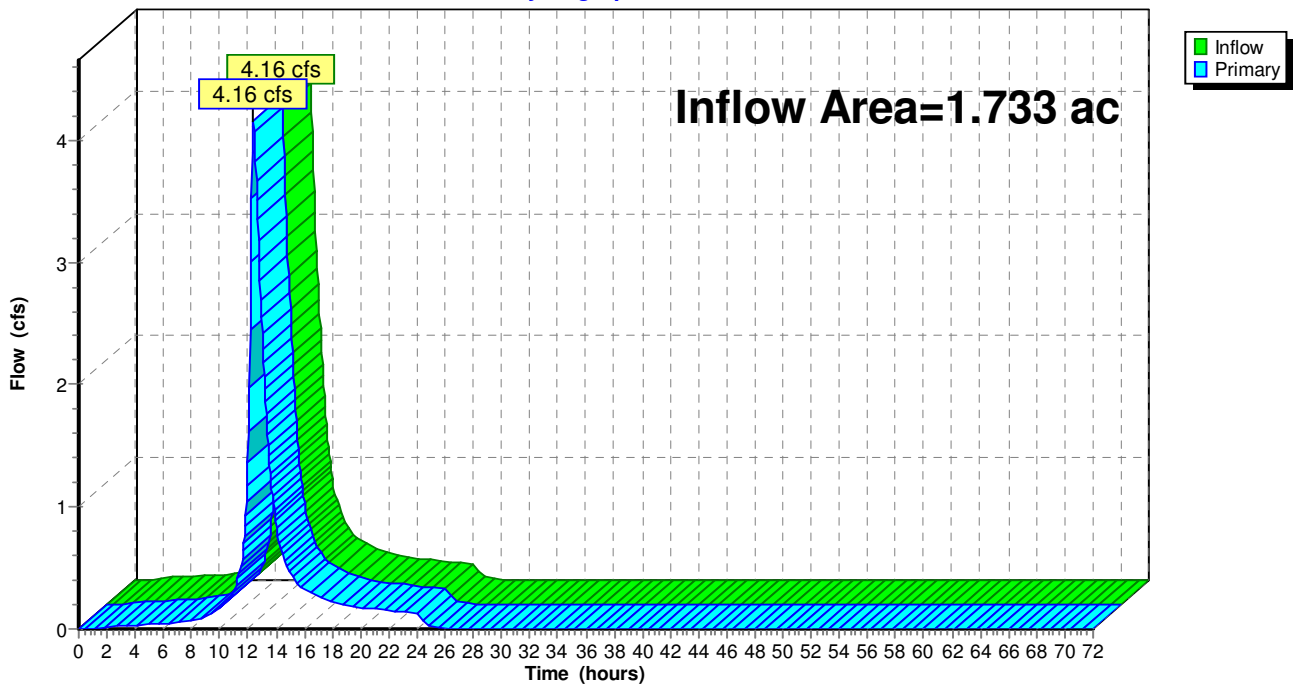
**Summary for Link EX-Off: Offsite**

Inflow Area = 1.733 ac, 18.41% Impervious, Inflow Depth = 4.90" for 100-Year event  
Inflow = 4.16 cfs @ 12.39 hrs, Volume= 0.708 af  
Primary = 4.16 cfs @ 12.39 hrs, Volume= 0.708 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

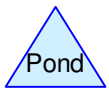
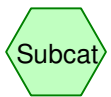
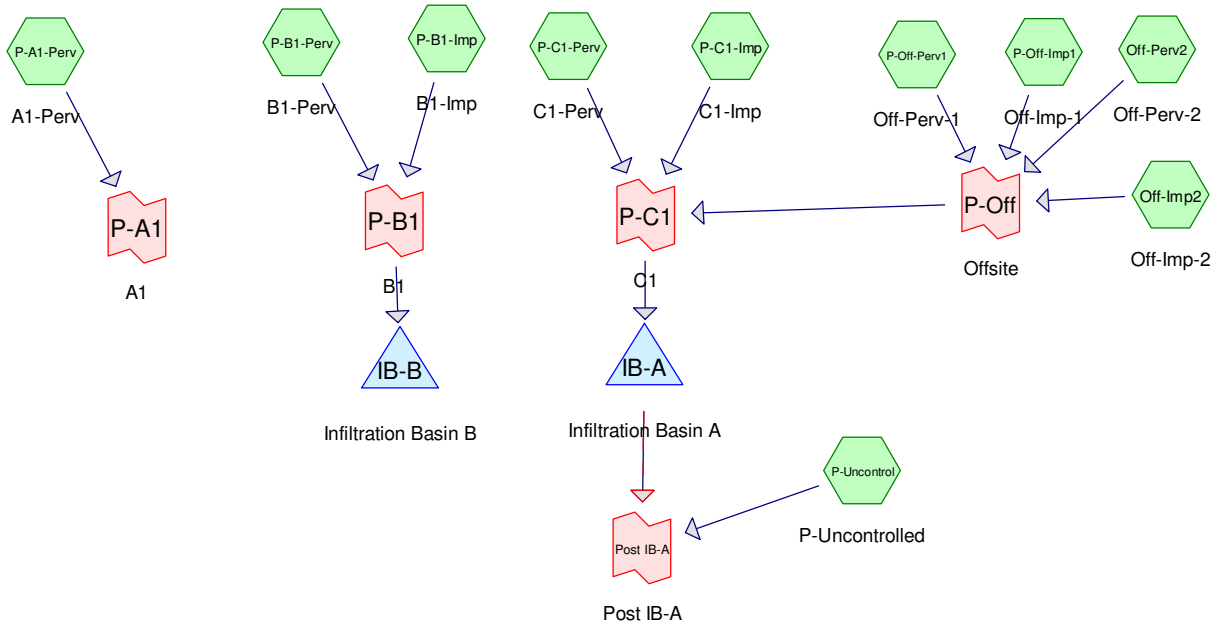
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## Appendix C



**Routing Diagram for NYC19-0005\_offsite\_WQ**  
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**NYC19-0005\_offsite\_WQ**

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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=0.999 ac 4.00% Impervious Runoff Depth=1.06" Tc=25.0 min CN=71/98 Runoff=0.48 cfs 0.088 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=0.176 ac 0.00% Impervious Runoff Depth=0.00" Tc=25.0 min CN=39/0 Runoff=0.00 cfs 0.000 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=32.73' Storage=0.901 af Inflow=7.49 cfs 0.901 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=7.49 cfs 0.901 af Primary=7.49 cfs 0.901 af
<b>Link P-Off: Offsite</b>	Inflow=0.64 cfs 0.115 af Primary=0.64 cfs 0.115 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 = 9.364 ac   Runoff Volume = 1.144 af   Average Runoff Depth = 1.47"**  
**56.32% Pervious = 5.274 ac   43.68% Impervious = 4.090 ac**

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

Runoff = 0.48 cfs @ 12.44 hrs, Volume= 0.088 af, Depth= 1.06"

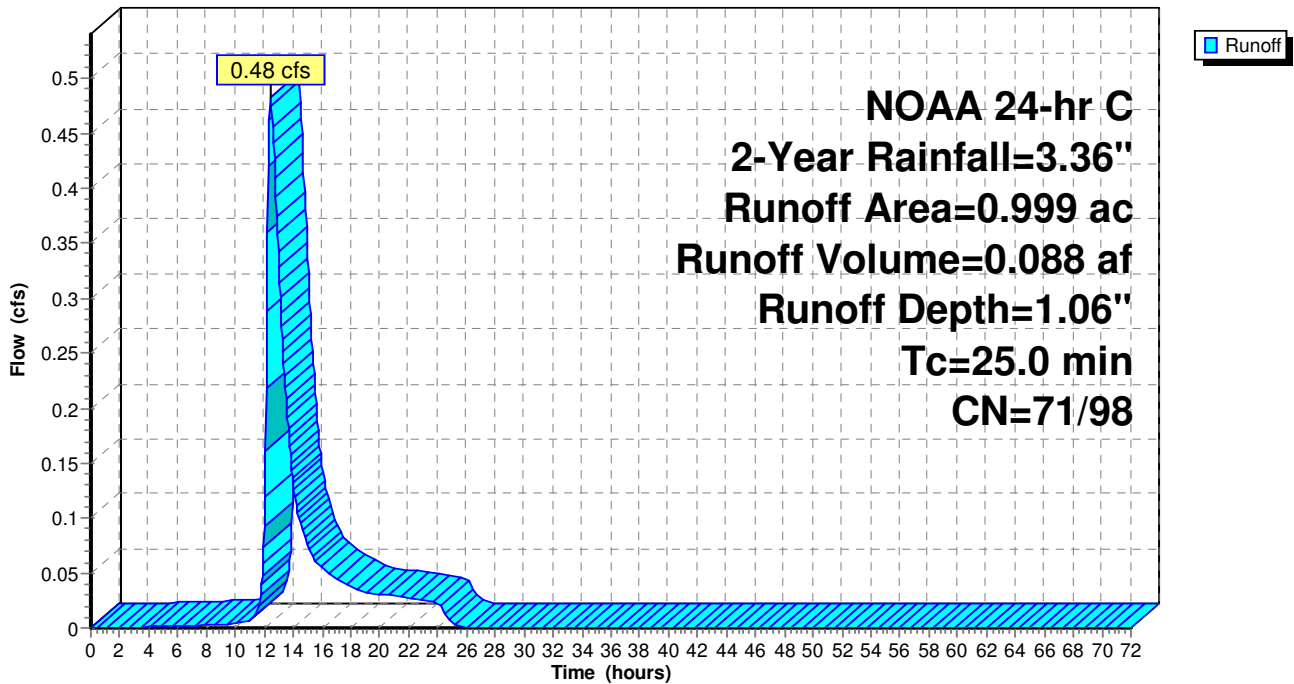
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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 P-A1-Perv: A1-Perv**

[45] Hint: Runoff=Zero

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

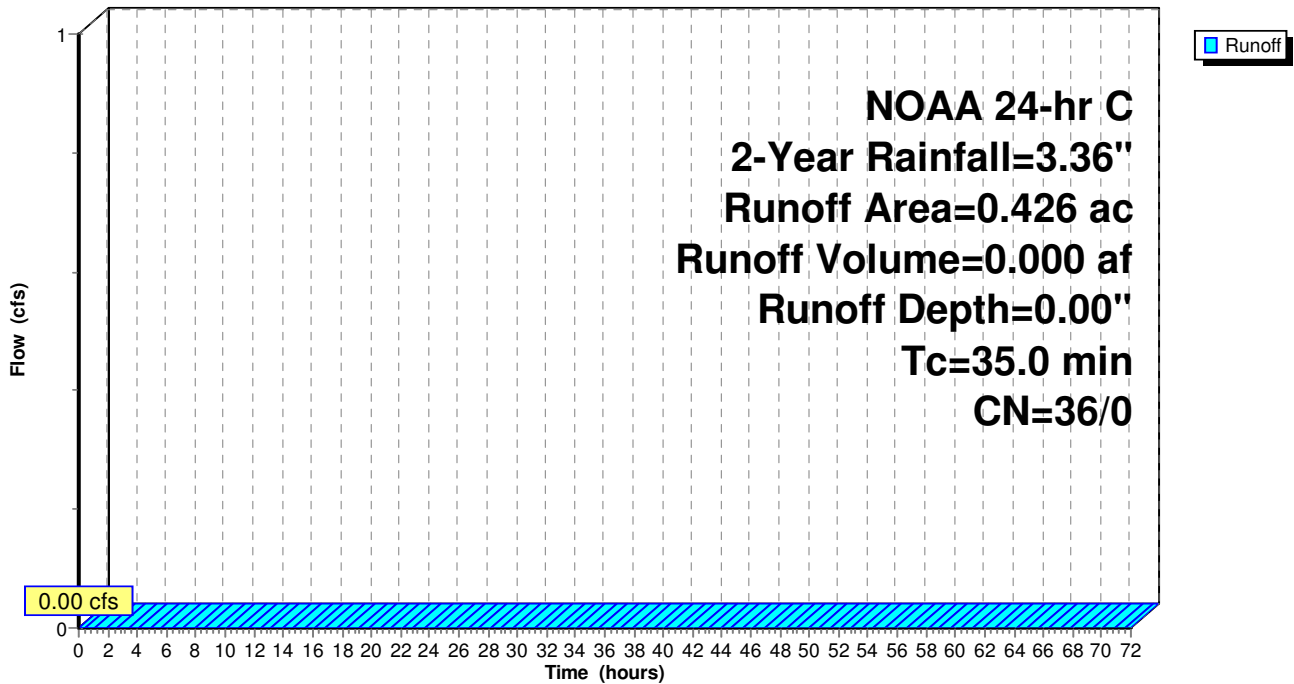
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

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"

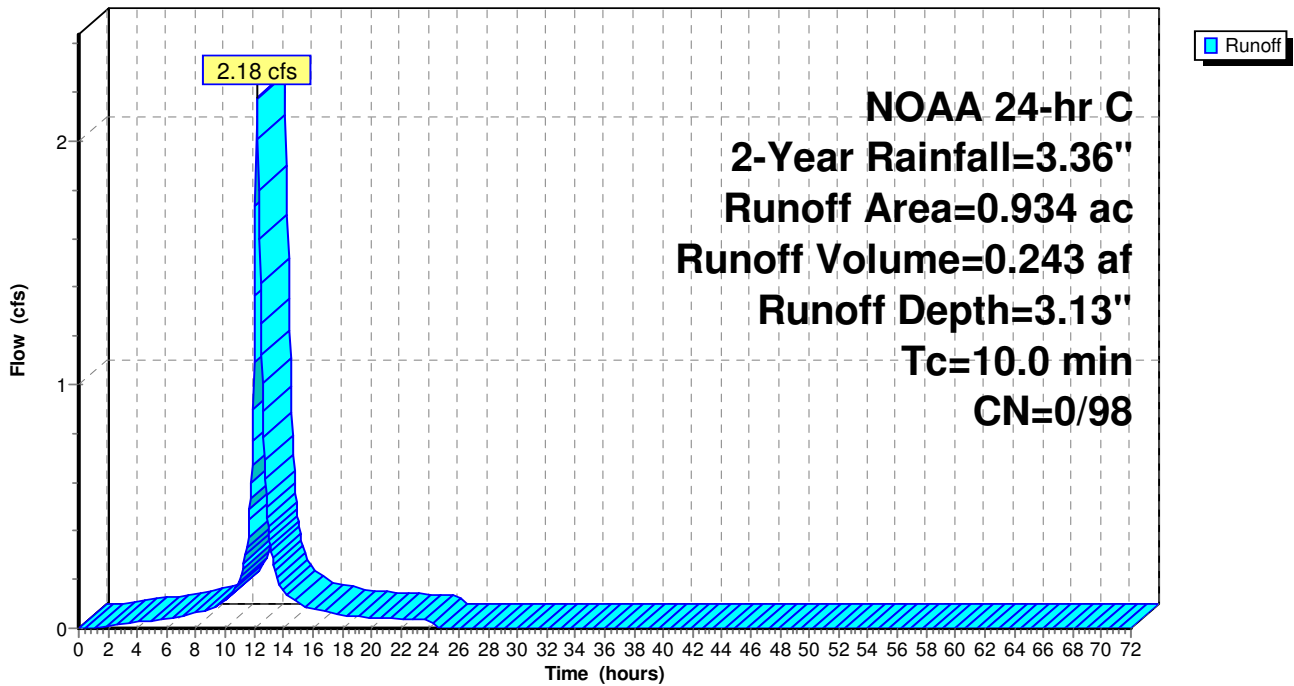
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

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"

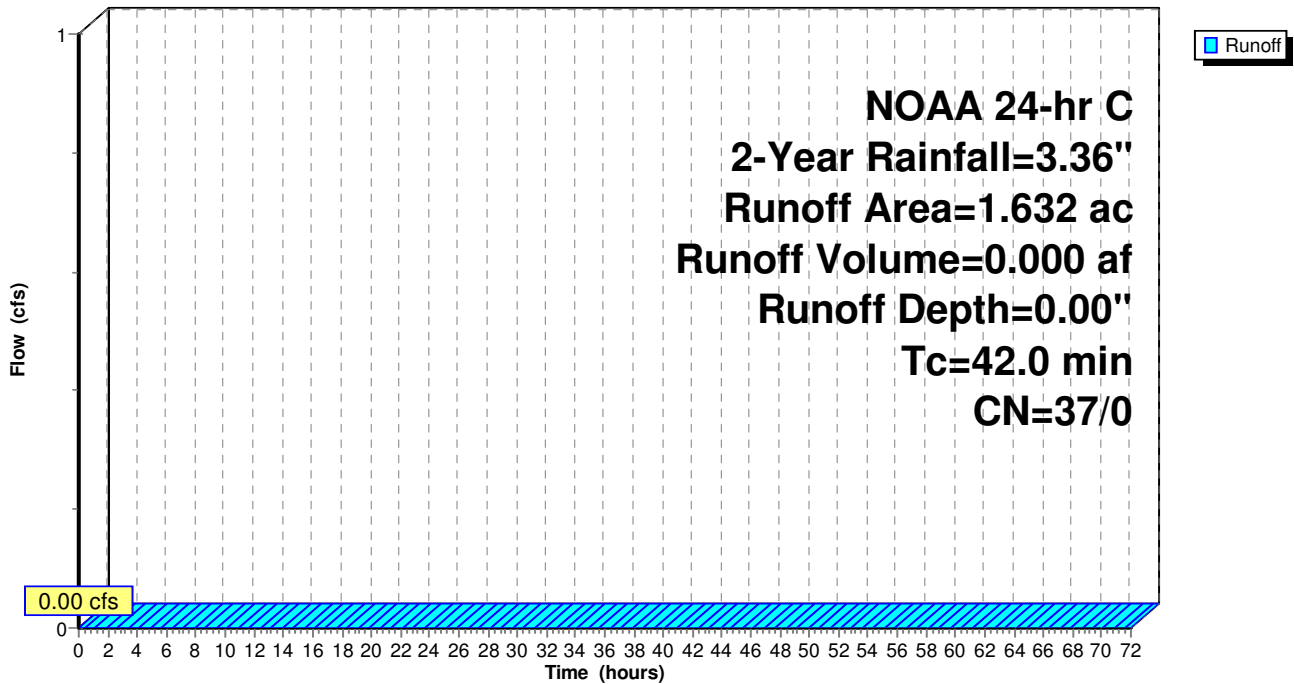
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

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**

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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"

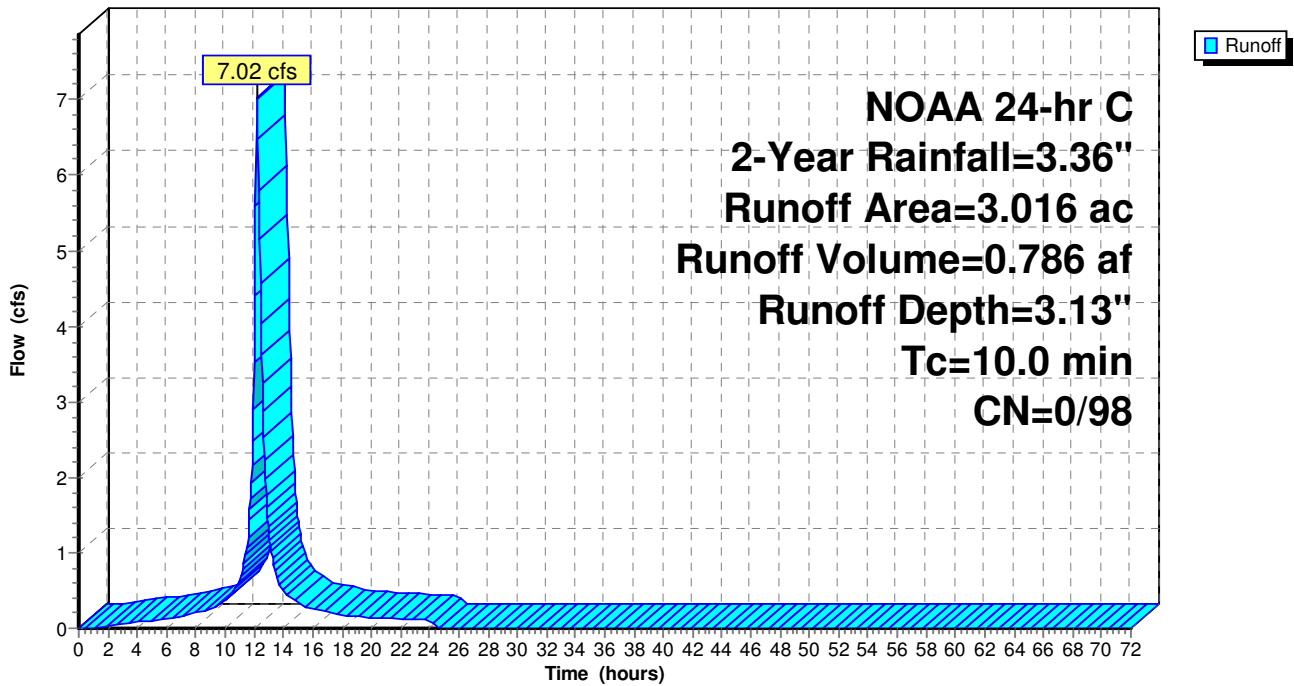
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 2-Year Rainfall=3.36"

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-Off-Imp1: Off-Imp-1**

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

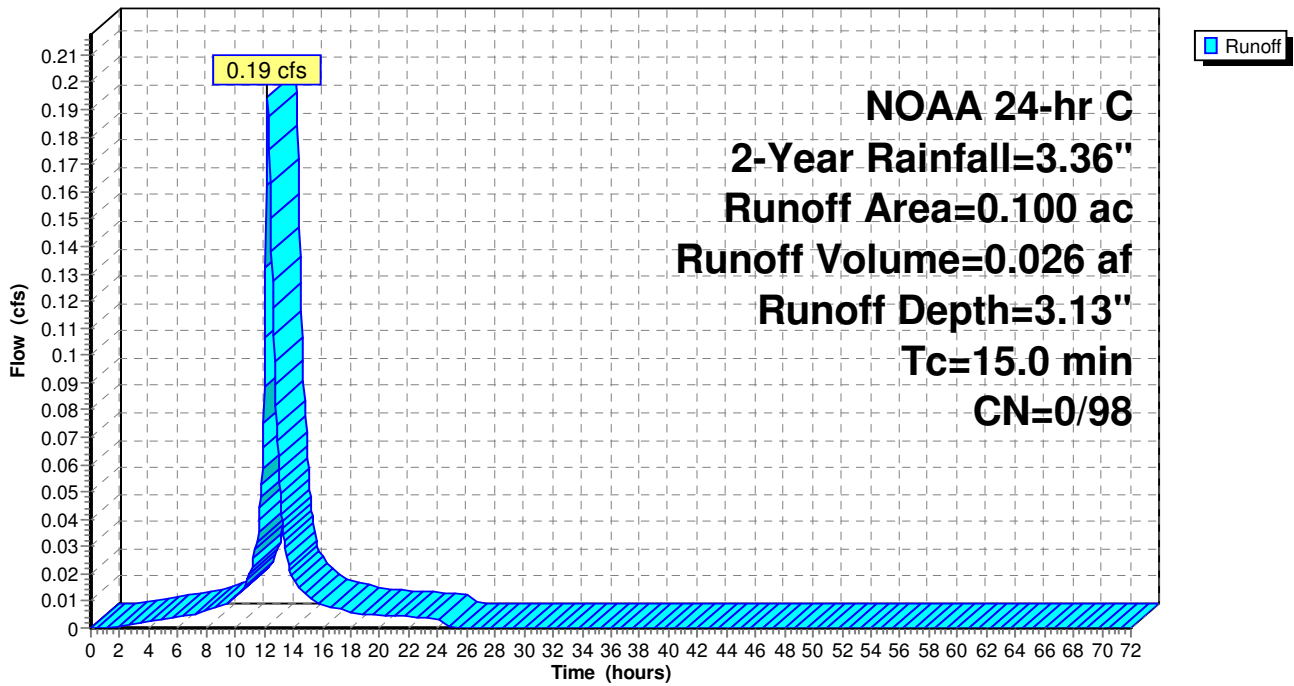
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.36"

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 Pond IB-A: Infiltration Basin A**

Inflow Area = 6.072 ac, 51.98% Impervious, Inflow Depth = 1.78" for 2-Year event  
 Inflow = 7.49 cfs @ 12.20 hrs, Volume= 0.901 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= 32.73' @ 26.75 hrs Surf.Area= 0.712 ac Storage= 0.901 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>23.0" W x 14.0" H, R=22.0" Elliptical RCP_Elliptical 23x14</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= 0.015, Flow Area= 1.83 sf	
#2	Secondary	34.00'	<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	33.10'	<b>3.0' 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=RCP\_Elliptical 23x14 ( Controls 0.00 cfs)

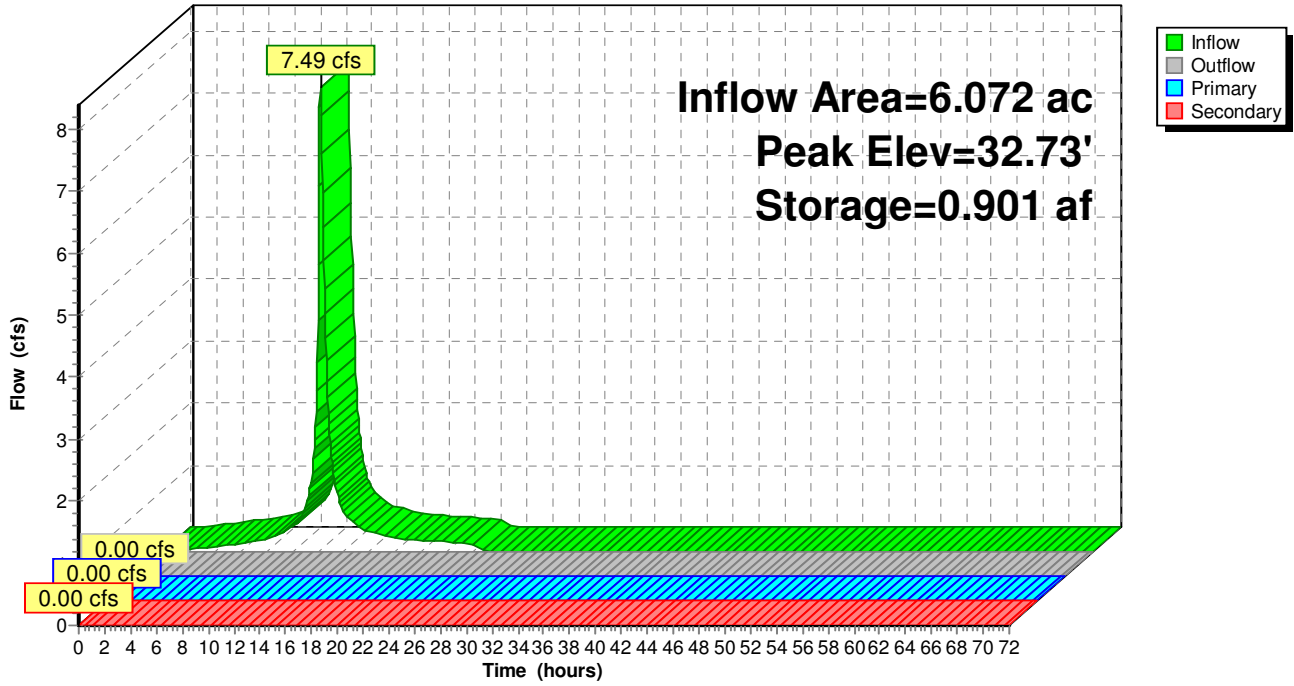
↑3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**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= 0.015, 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	32.75'	<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)

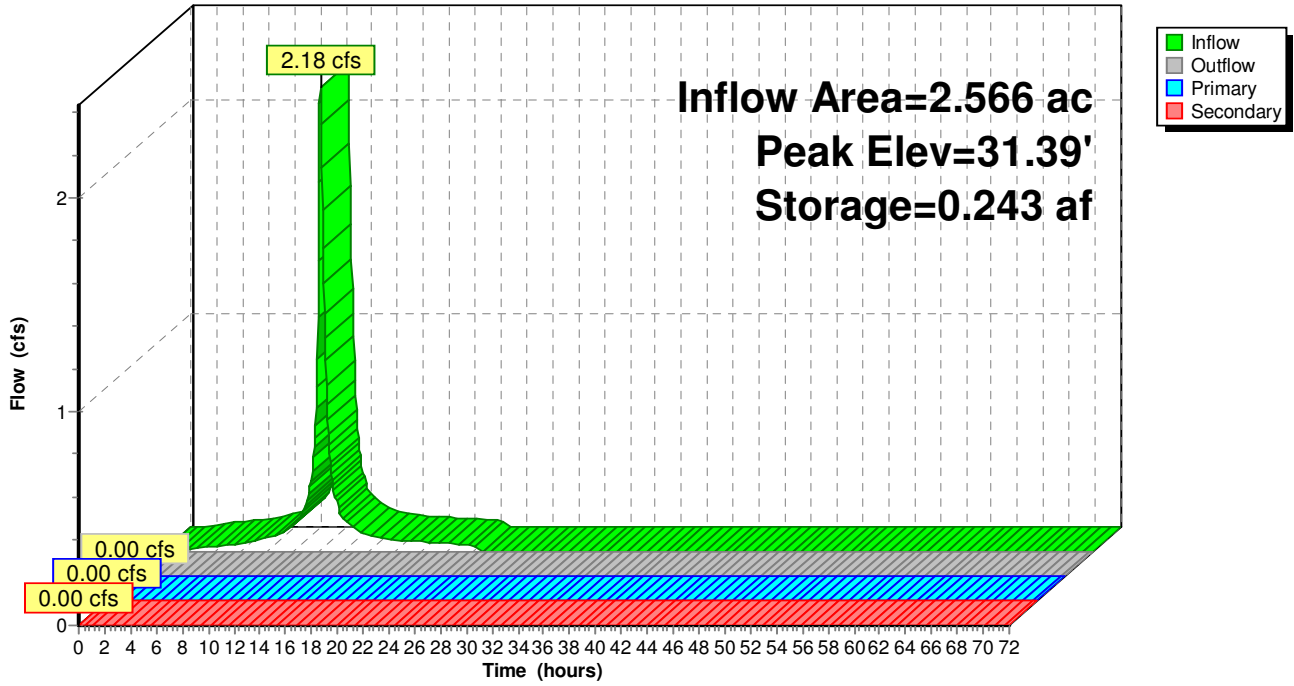
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑2=Orifice/Grate ( Controls 0.00 cfs)

**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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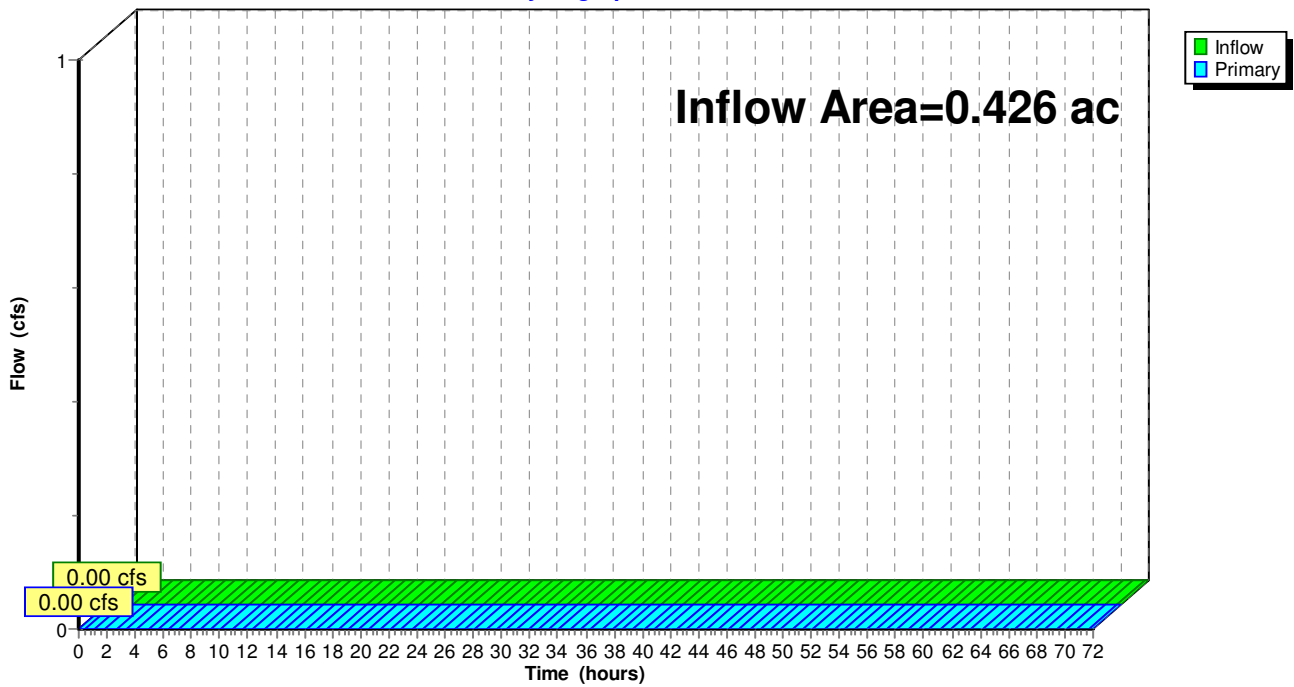
**Summary for Link P-A1: A1**

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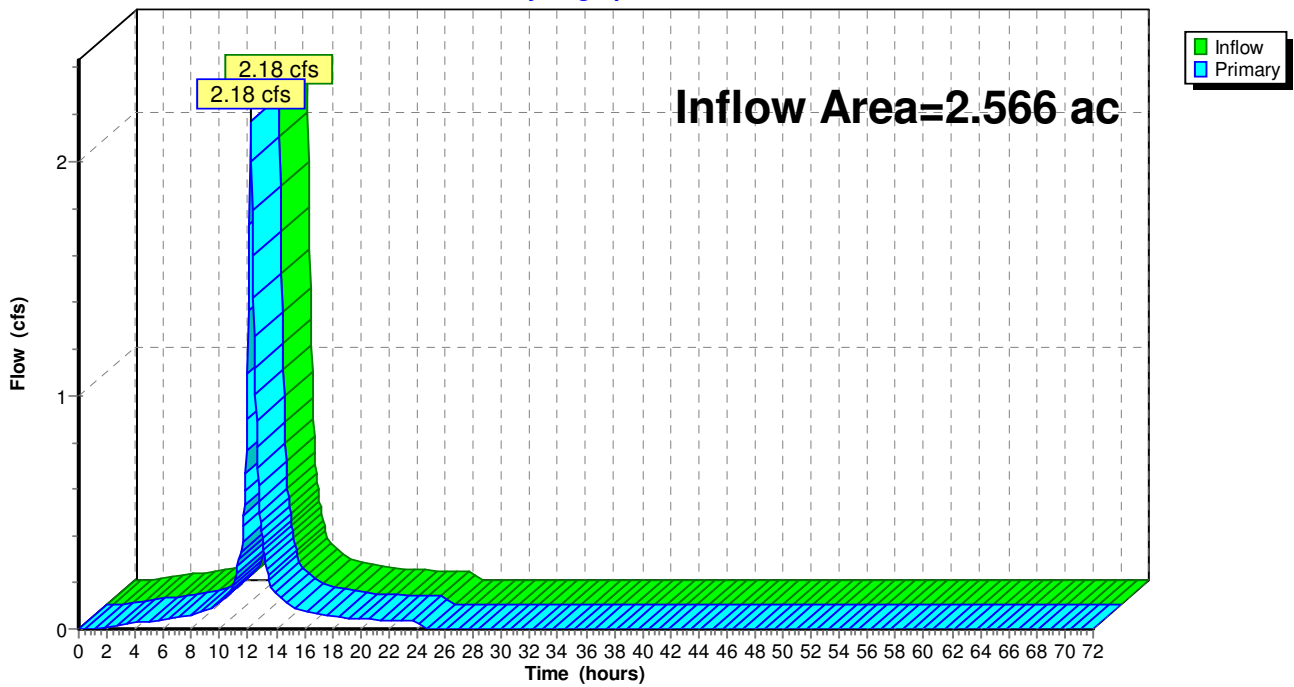
**Summary for Link P-B1: B1**

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



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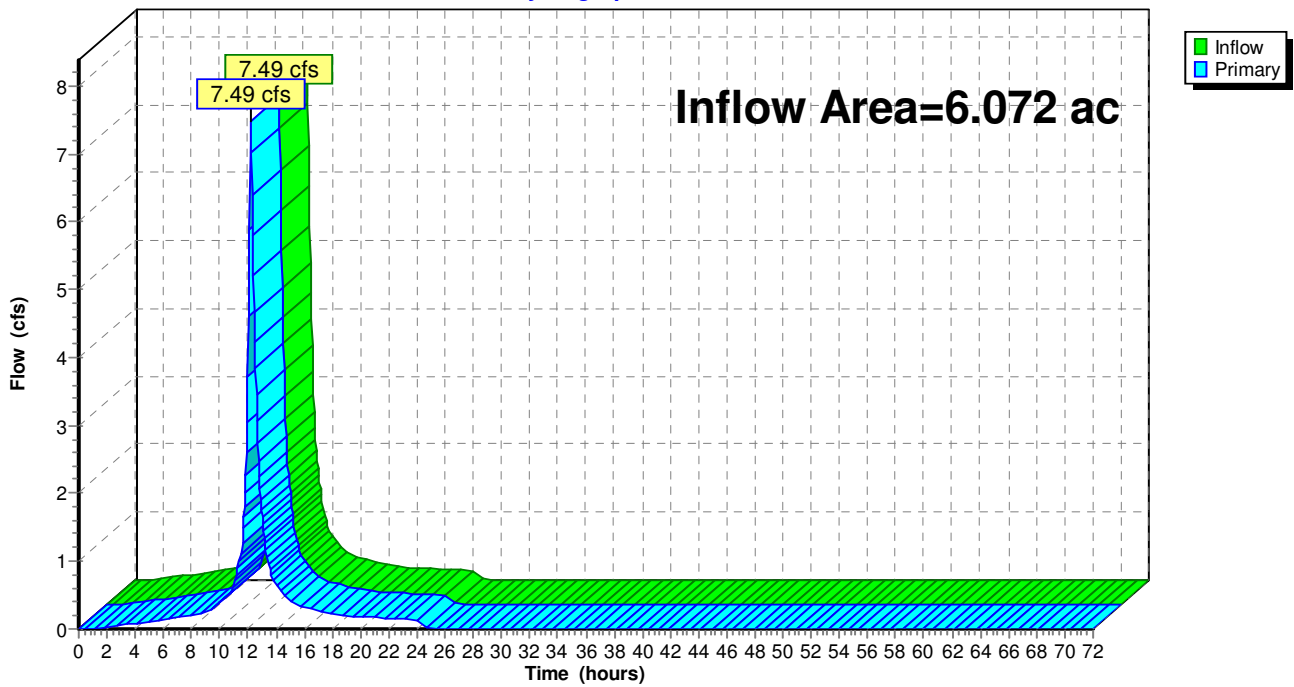
**Summary for Link P-C1: C1**

Inflow Area = 6.072 ac, 51.98% Impervious, Inflow Depth = 1.78" for 2-Year event  
Inflow = 7.49 cfs @ 12.20 hrs, Volume= 0.901 af  
Primary = 7.49 cfs @ 12.20 hrs, Volume= 0.901 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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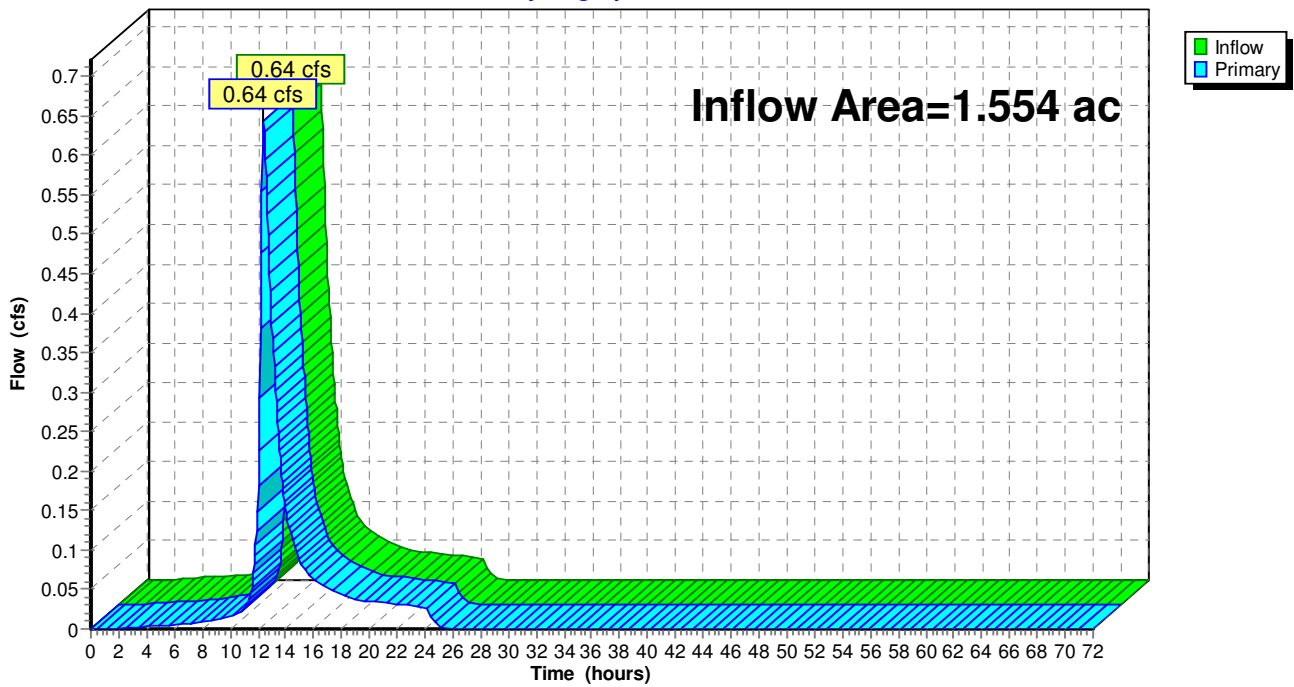
**Summary for Link P-Off: Offsite**

Inflow Area = 1.554 ac, 9.01% Impervious, Inflow Depth = 0.88" for 2-Year event  
Inflow = 0.64 cfs @ 12.39 hrs, Volume= 0.115 af  
Primary = 0.64 cfs @ 12.39 hrs, Volume= 0.115 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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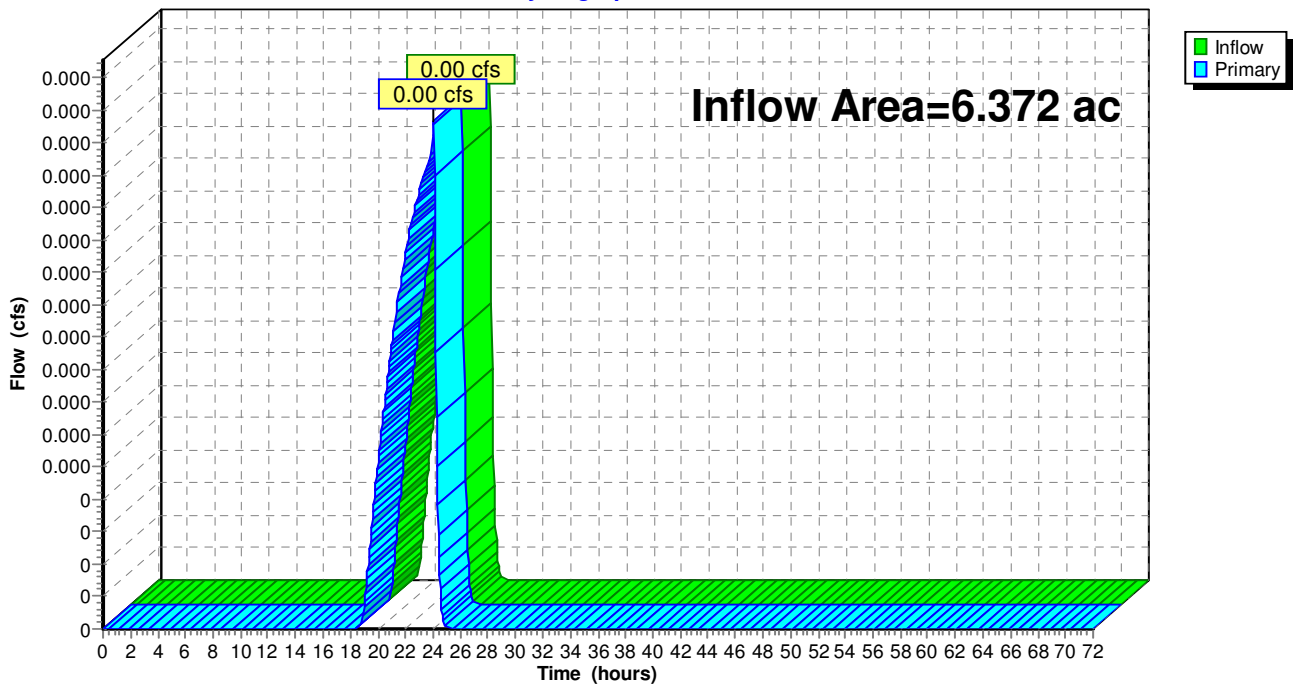
**Summary for Link Post IB-A: Post IB-A**

Inflow Area = 6.372 ac, 49.53% 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=0.999 ac 4.00% Impervious Runoff Depth=2.36" Tc=25.0 min CN=71/98 Runoff=1.17 cfs 0.197 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=0.176 ac 0.00% Impervious Runoff Depth=0.24" Tc=25.0 min CN=39/0 Runoff=0.01 cfs 0.003 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=1.297 af Inflow=11.96 cfs 1.519 af Primary=0.34 cfs 0.355 af Secondary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.355 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=11.96 cfs 1.519 af Primary=11.96 cfs 1.519 af
<b>Link P-Off: Offsite</b>	Inflow=1.43 cfs 0.247 af Primary=1.43 cfs 0.247 af



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

Inflow=0.34 cfs 0.361 af

Primary=0.34 cfs 0.361 af

**Total Runoff Area = 9.364 ac   Runoff Volume = 1.937 af   Average Runoff Depth = 2.48"**  
**56.32% Pervious = 5.274 ac   43.68% Impervious = 4.090 ac**

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

Runoff = 1.17 cfs @ 12.41 hrs, Volume= 0.197 af, Depth= 2.36"

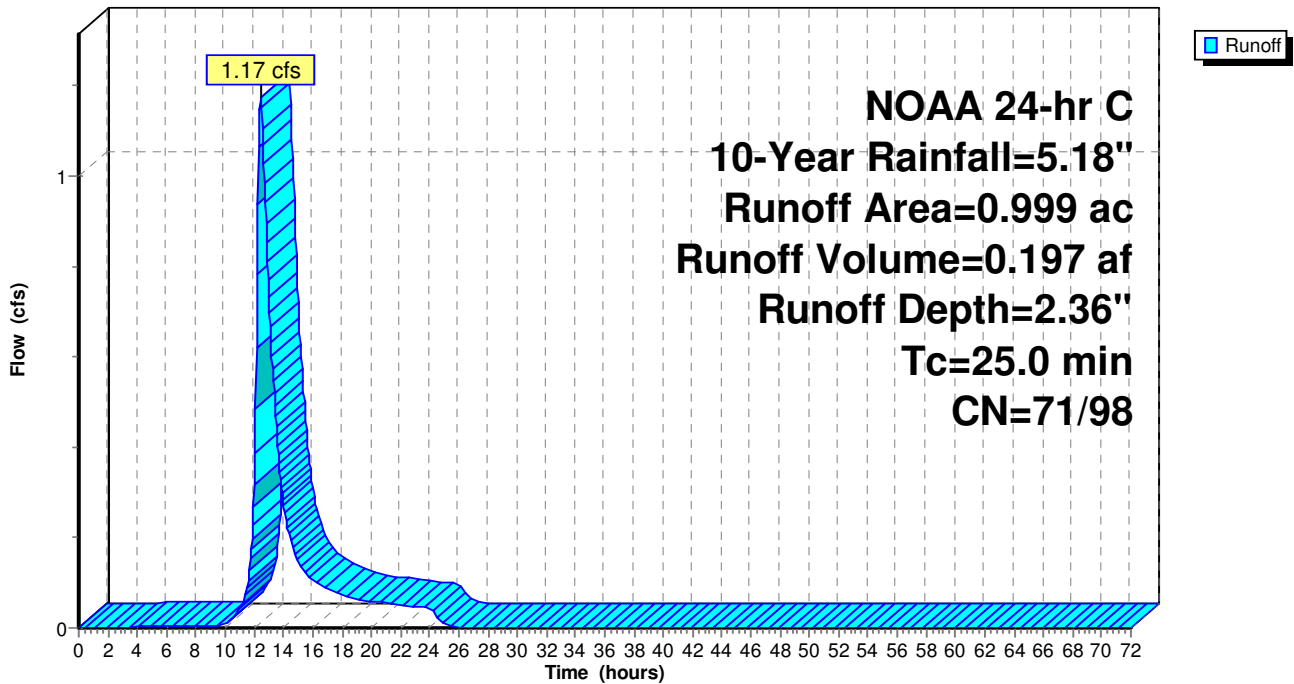
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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 = 0.01 cfs @ 13.35 hrs, Volume= 0.003 af, Depth= 0.24"

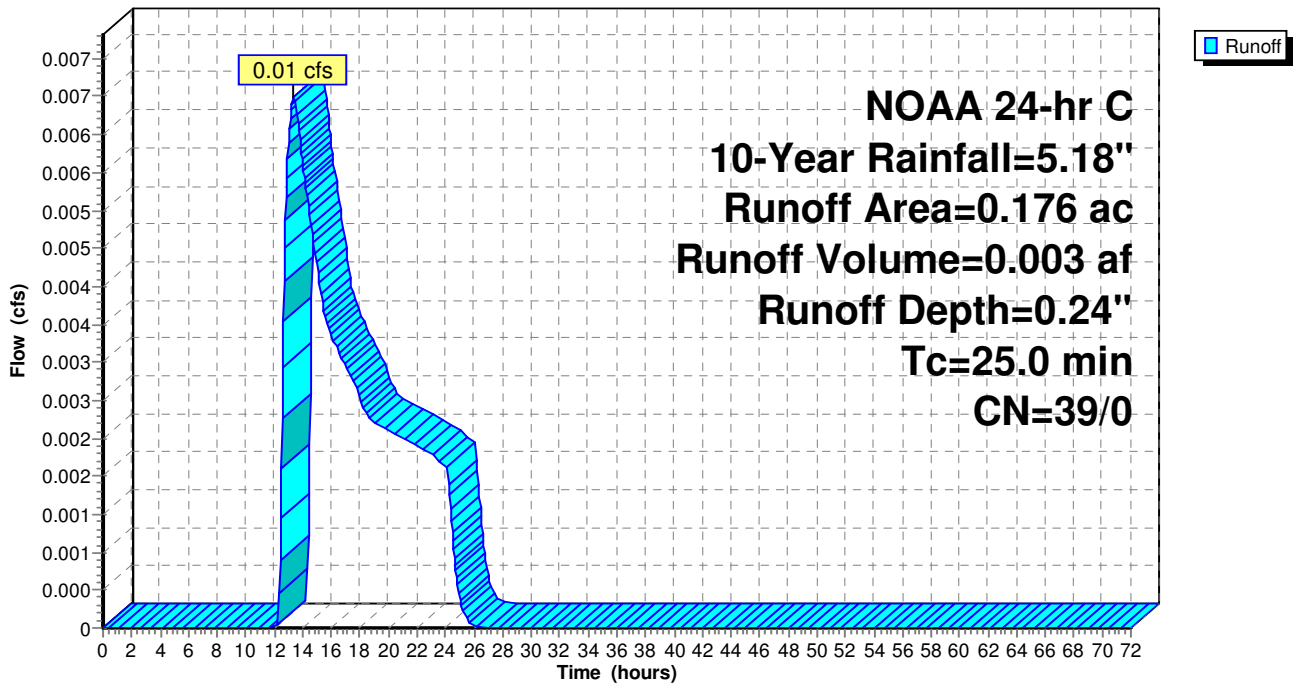
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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"

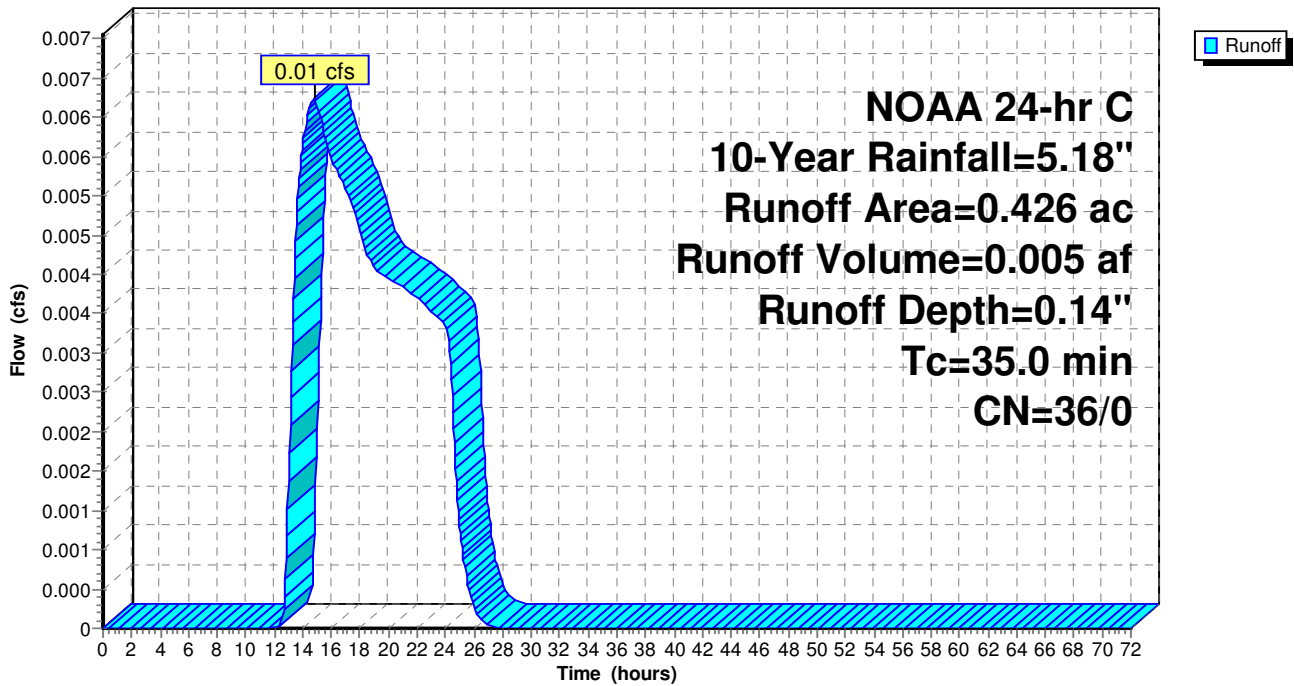
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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"

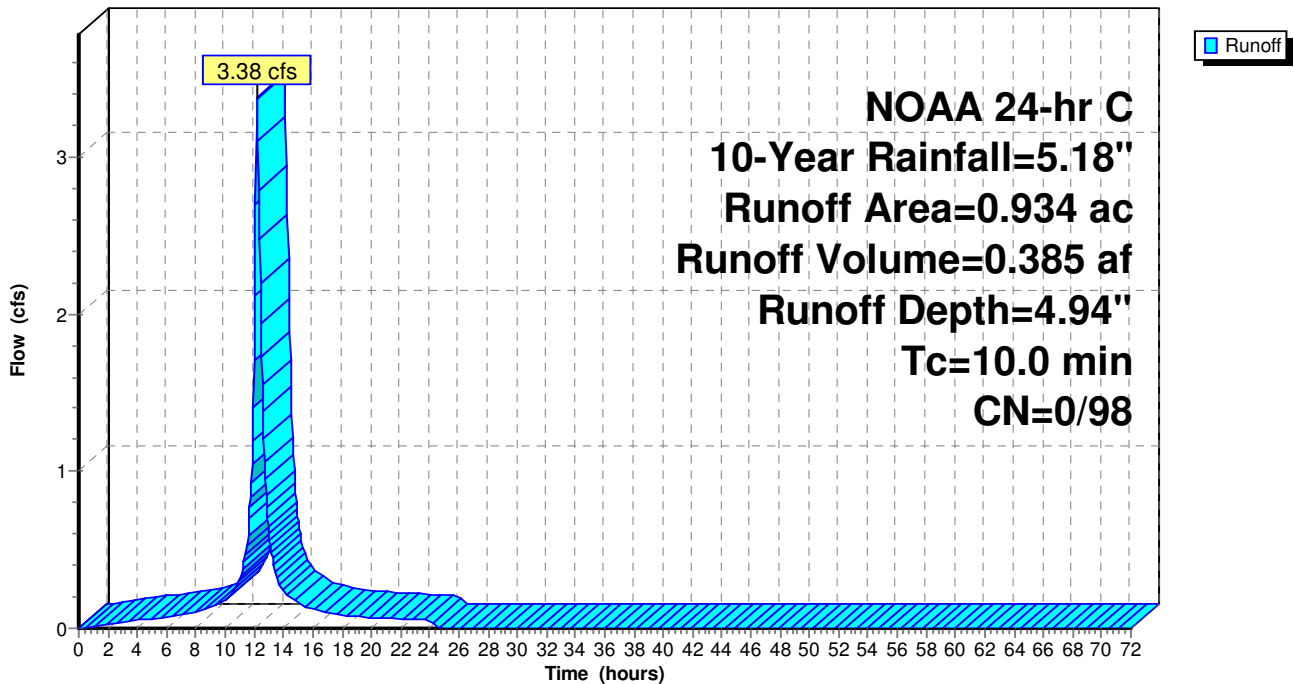
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

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"

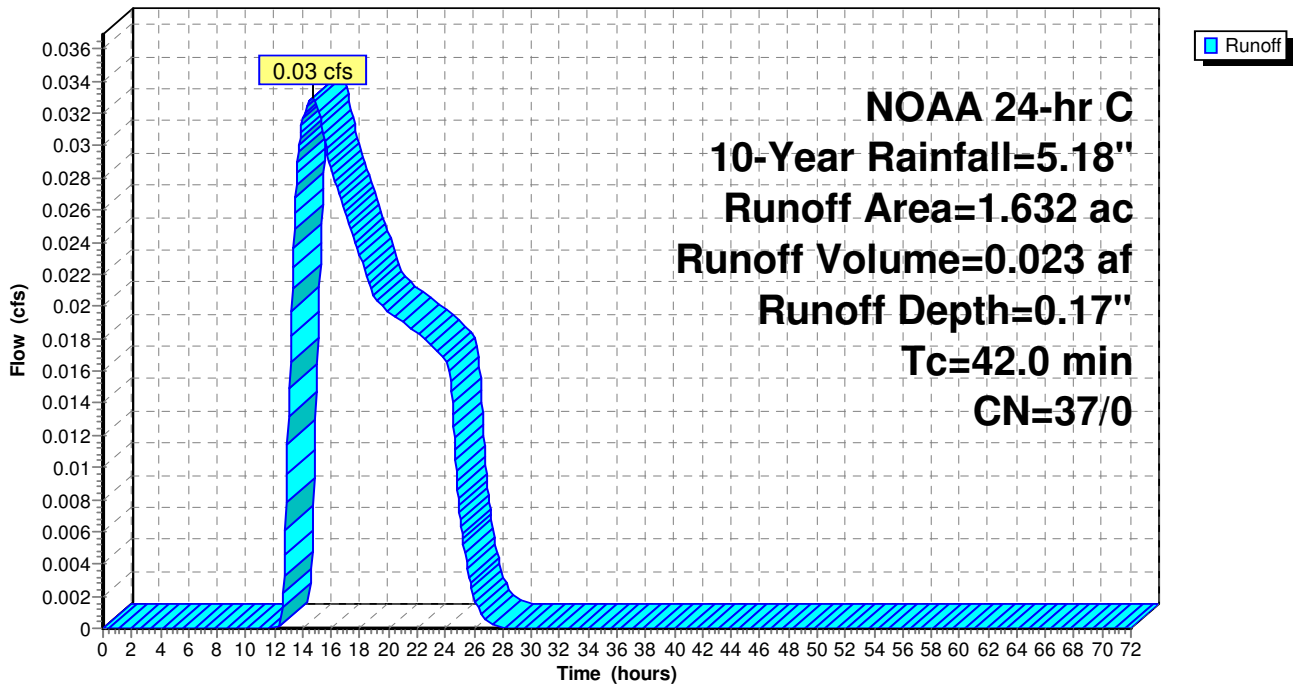
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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"

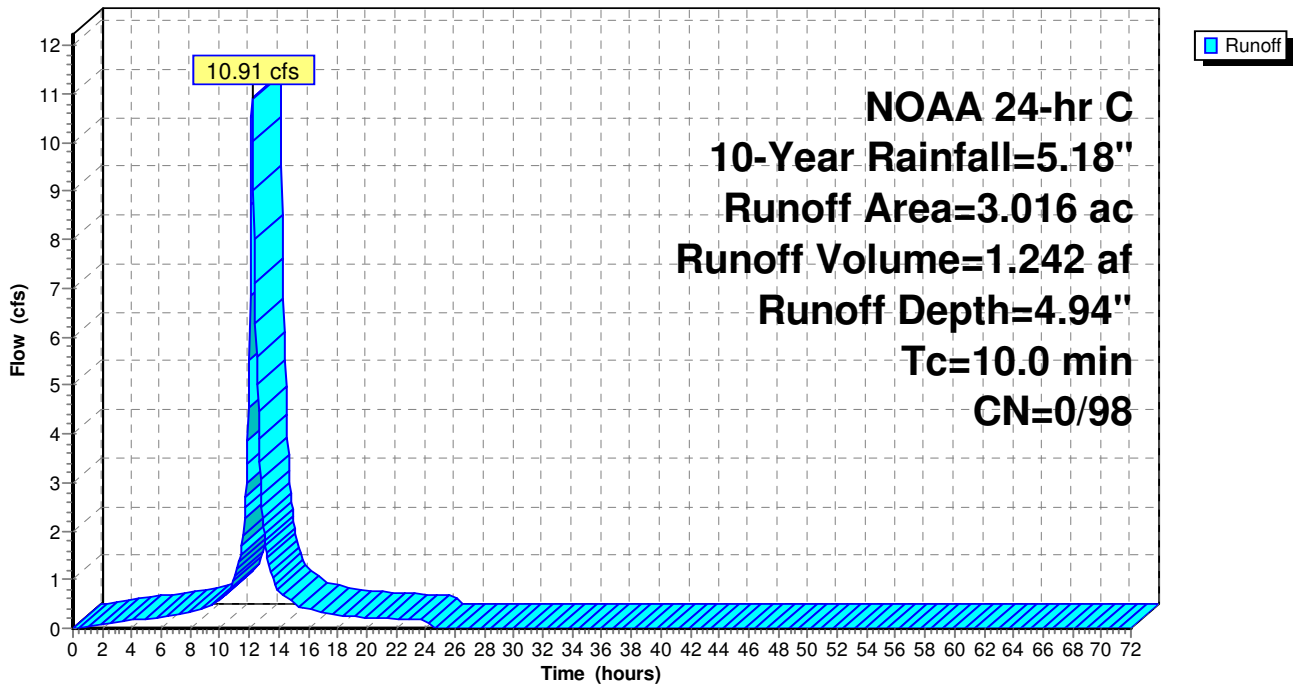
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

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"

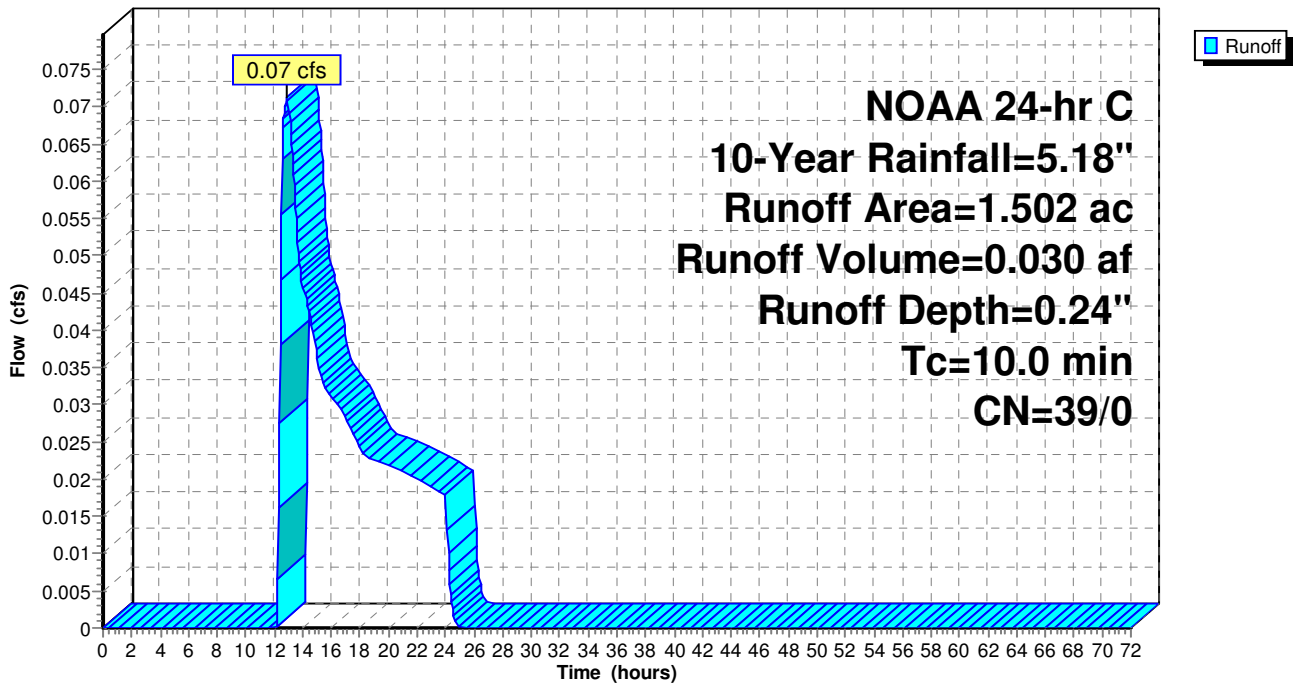
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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"

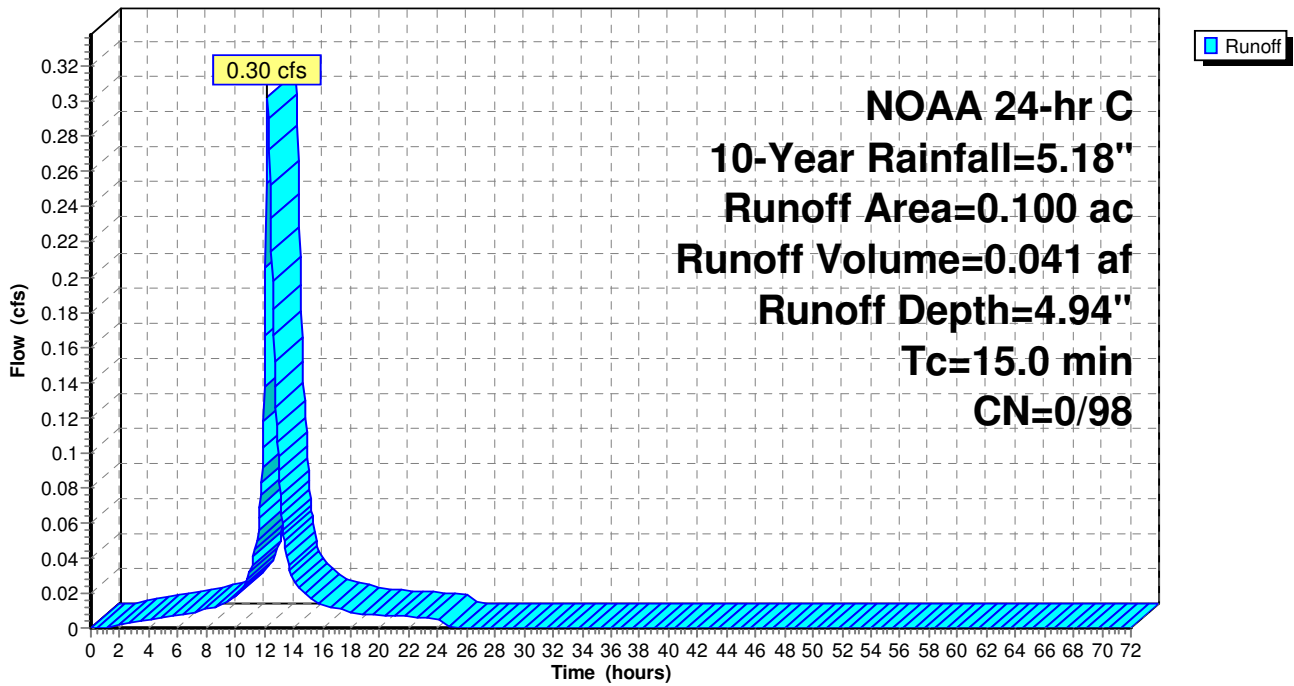
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

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"

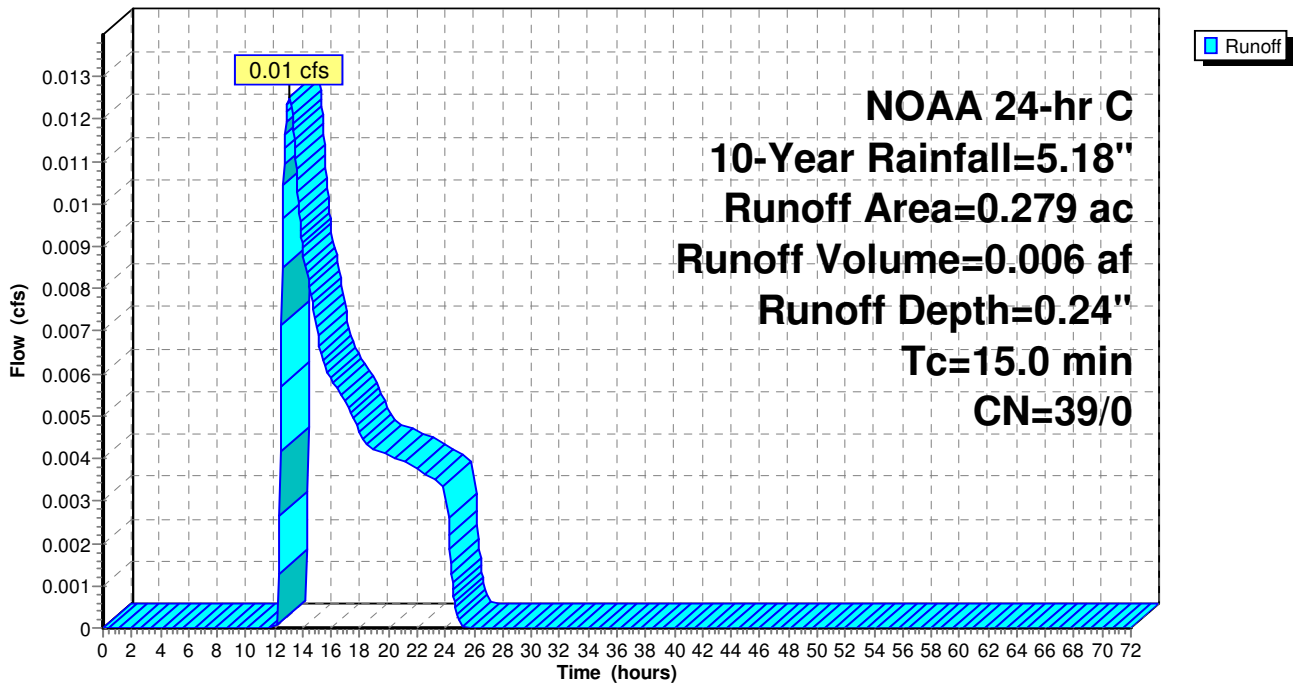
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 10-Year Rainfall=5.18"

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"

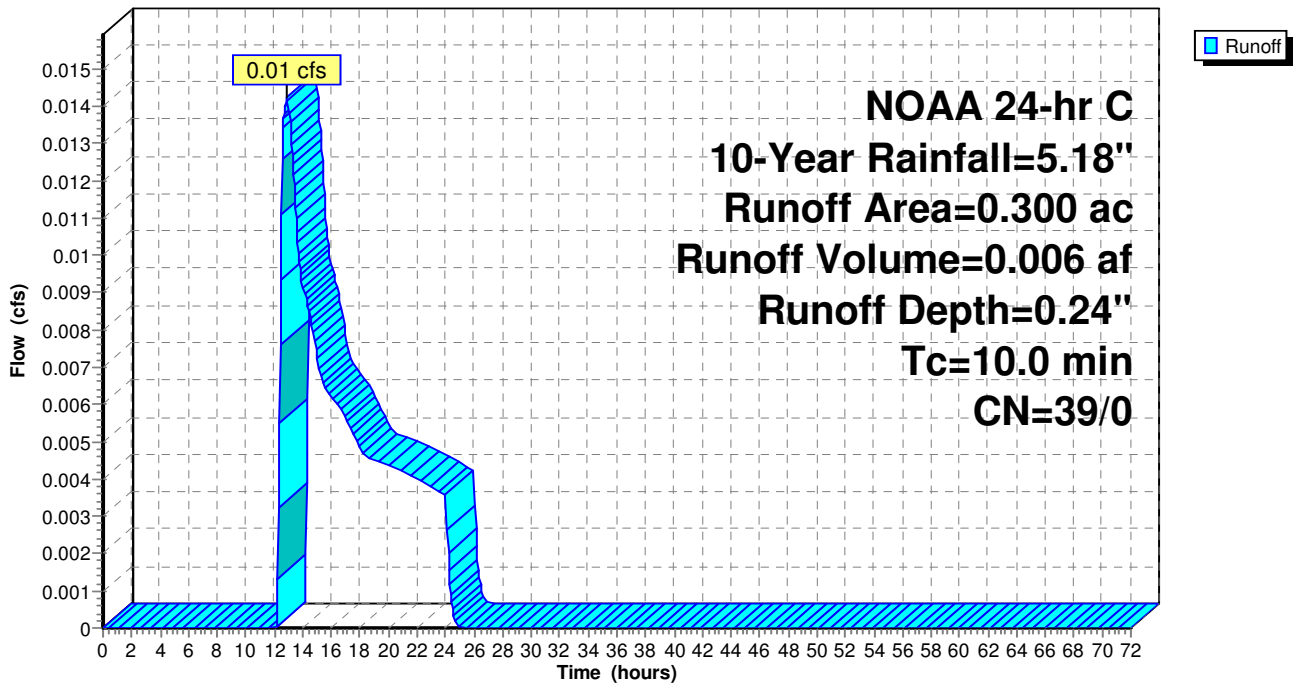
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.18"

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 = 6.072 ac, 51.98% Impervious, Inflow Depth = 3.00" for 10-Year event  
Inflow = 11.96 cfs @ 12.20 hrs, Volume= 1.519 af  
Outflow = 0.34 cfs @ 19.21 hrs, Volume= 0.355 af, Atten= 97%, Lag= 420.7 min  
Primary = 0.34 cfs @ 19.21 hrs, Volume= 0.355 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' @ 19.21 hrs Surf.Area= 0.746 ac Storage= 1.297 af

Plug-Flow detention time= 863.8 min calculated for 0.355 af (23% of inflow)  
Center-of-Mass det. time= 624.9 min ( 1,404.5 - 779.6 )

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>23.0" W x 14.0" H, R=22.0" Elliptical RCP_Elliptical 23x14</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= 0.015, Flow Area= 1.83 sf
#2	Secondary	34.00'	<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	33.10'	<b>3.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.34 cfs @ 19.21 hrs HW=33.28' TW=0.00' (Dynamic Tailwater)

↑1=RCP\_Elliptical 23x14 (Barrel Controls 0.34 cfs @ 1.93 fps)

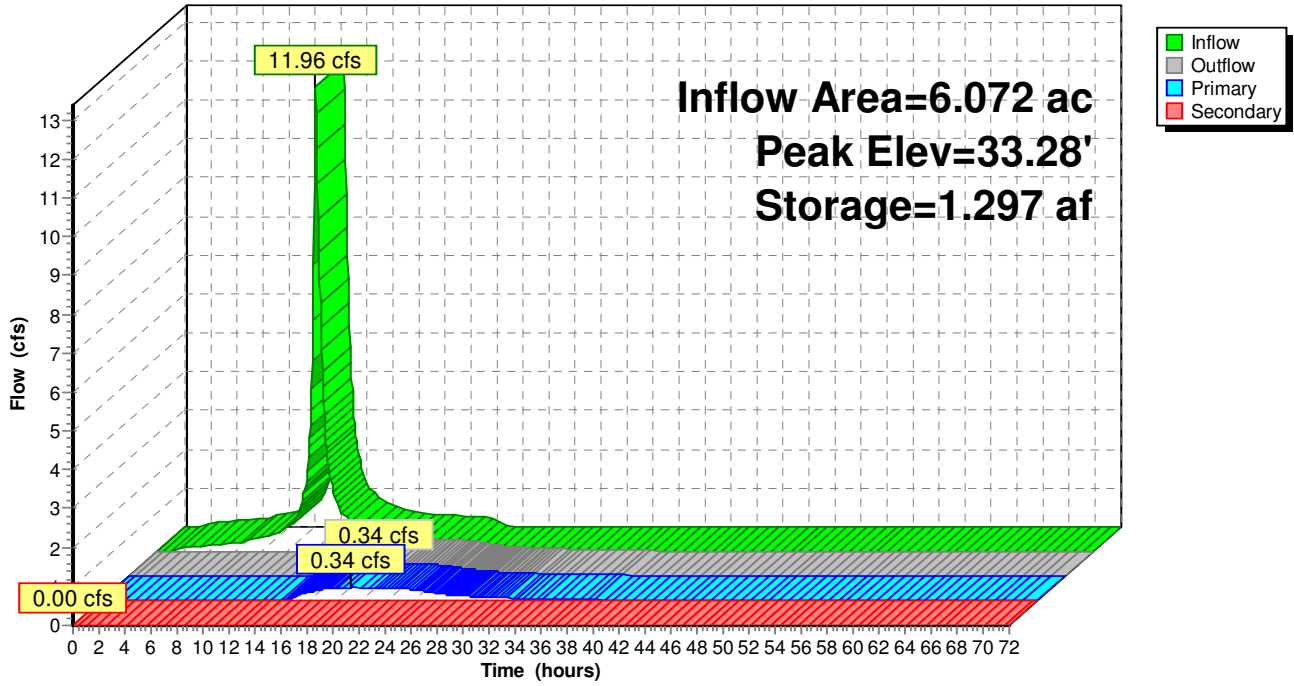
↑3=Sharp-Crested Rectangular Weir (Passes 0.34 cfs of 0.72 cfs potential flow)

**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= 0.015, 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	32.75'	<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)

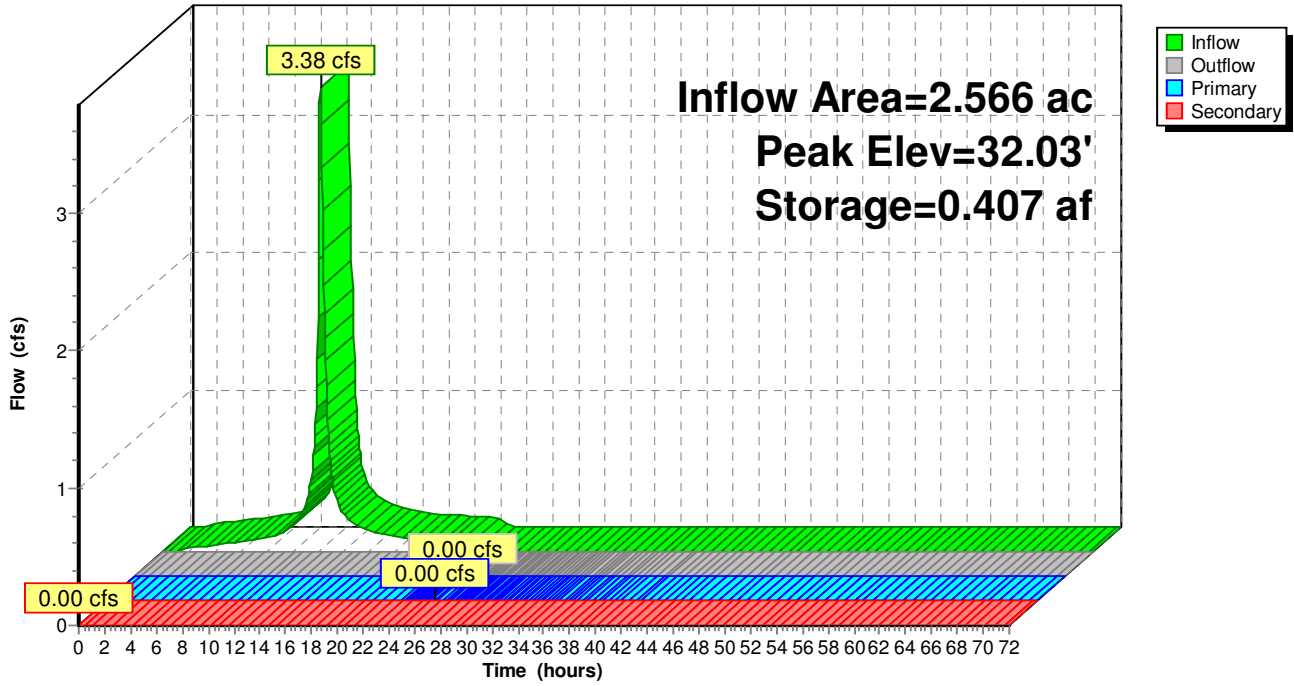
- ↑1=Culvert (Passes 0.00 cfs of 3.50 cfs potential flow)
- ↑2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.61 fps)

**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



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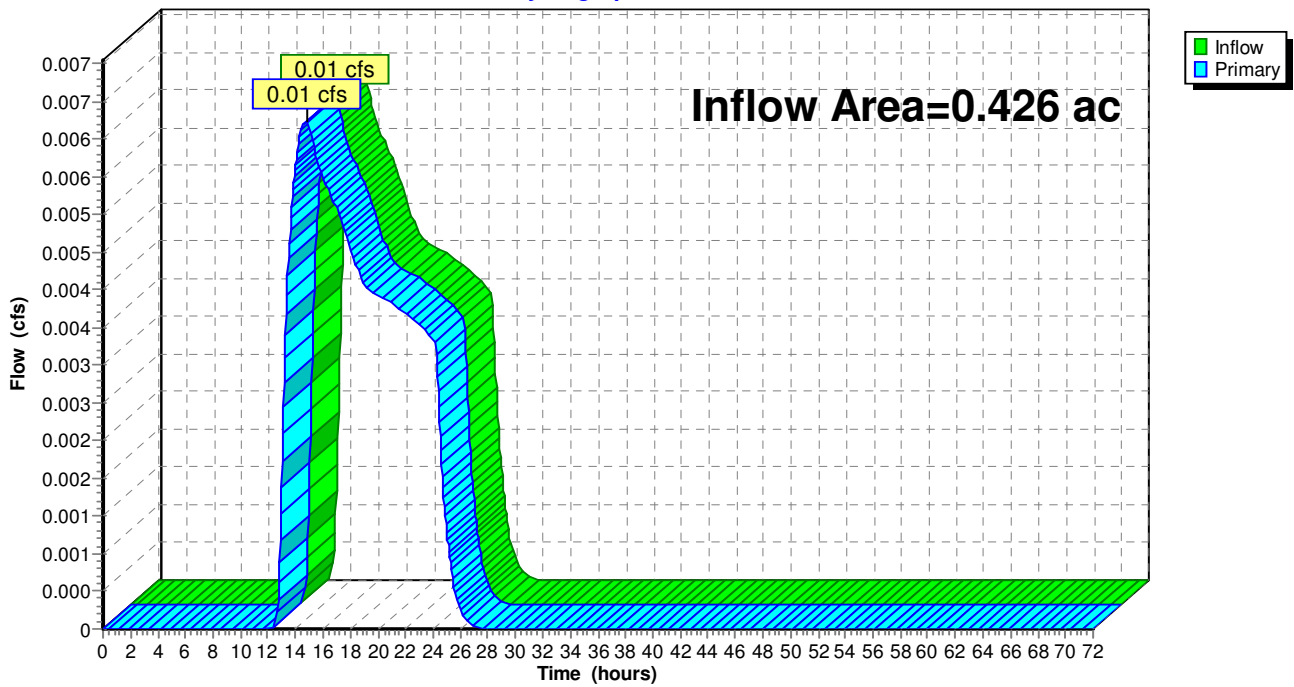
**Summary for Link P-A1: A1**

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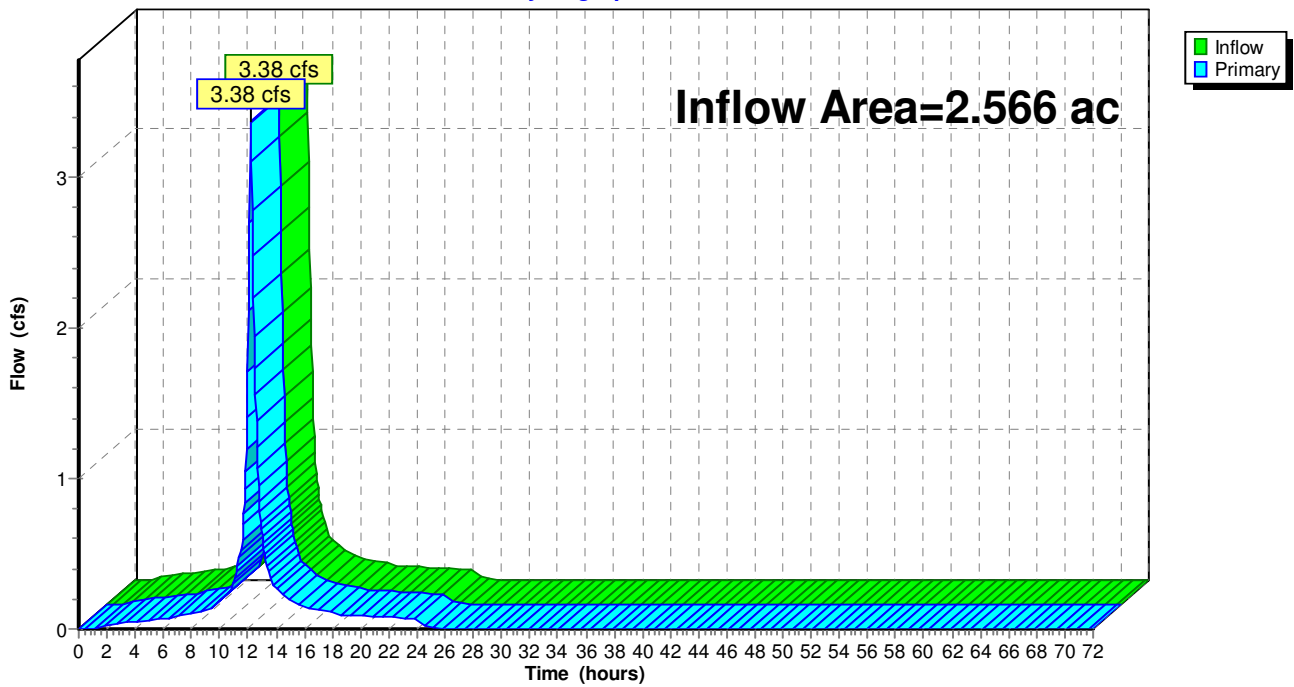
**Summary for Link P-B1: B1**

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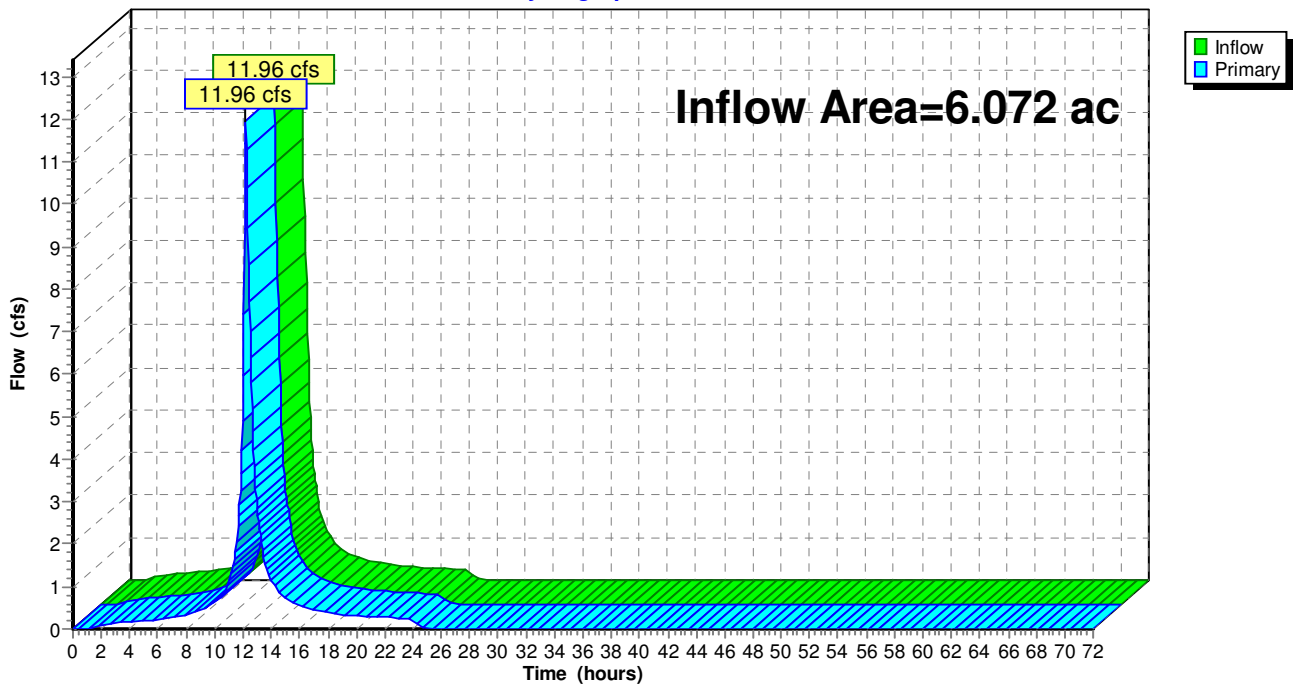
**Summary for Link P-C1: C1**

Inflow Area = 6.072 ac, 51.98% Impervious, Inflow Depth = 3.00" for 10-Year event  
Inflow = 11.96 cfs @ 12.20 hrs, Volume= 1.519 af  
Primary = 11.96 cfs @ 12.20 hrs, Volume= 1.519 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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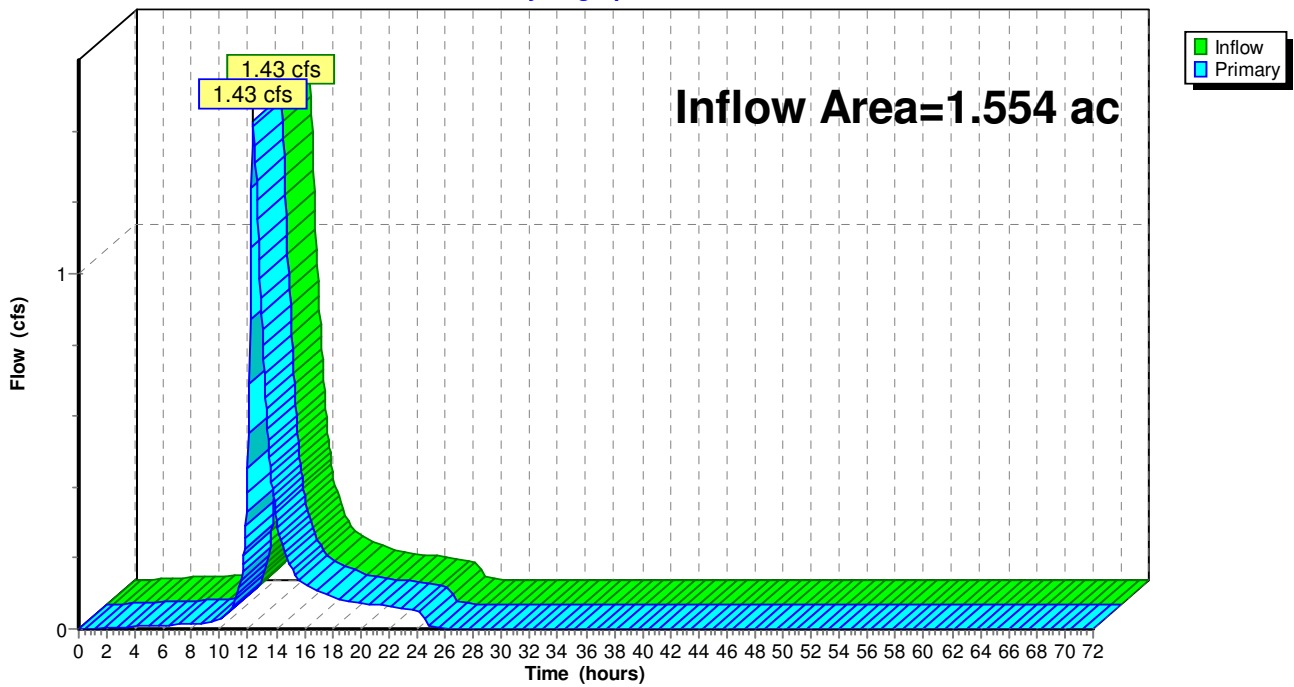
**Summary for Link P-Off: Offsite**

Inflow Area = 1.554 ac, 9.01% Impervious, Inflow Depth = 1.91" for 10-Year event  
Inflow = 1.43 cfs @ 12.39 hrs, Volume= 0.247 af  
Primary = 1.43 cfs @ 12.39 hrs, Volume= 0.247 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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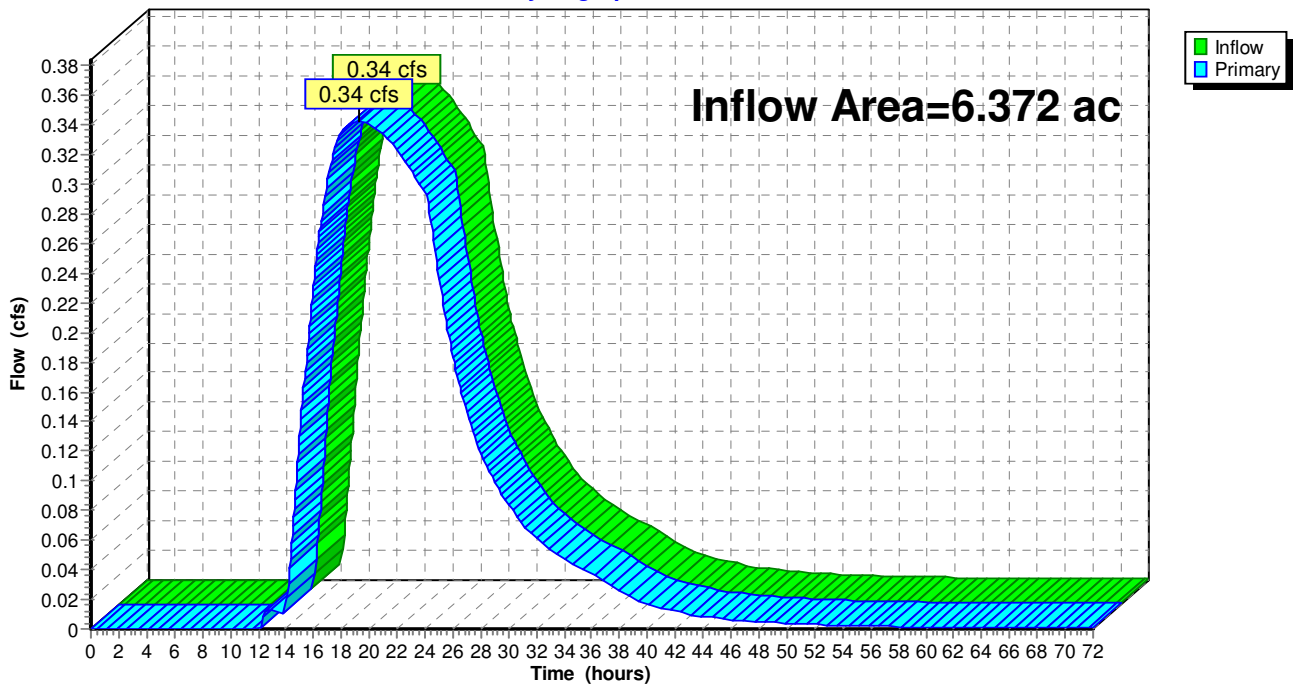
**Summary for Link Post IB-A: Post IB-A**

Inflow Area = 6.372 ac, 49.53% Impervious, Inflow Depth > 0.68" for 10-Year event  
Inflow = 0.34 cfs @ 19.19 hrs, Volume= 0.361 af  
Primary = 0.34 cfs @ 19.19 hrs, Volume= 0.361 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=0.999 ac 4.00% Impervious Runoff Depth=5.42" Tc=25.0 min CN=71/98 Runoff=2.77 cfs 0.451 af
<b>Subcatchment Off-Perv2: Off-Perv-2</b>	Runoff Area=0.176 ac 0.00% Impervious Runoff Depth=1.51" Tc=25.0 min CN=39/0 Runoff=0.10 cfs 0.022 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=33.96' Storage=1.818 af Inflow=22.56 cfs 2.924 af Primary=3.88 cfs 1.759 af Secondary=0.00 cfs 0.000 af Outflow=3.88 cfs 1.759 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=22.56 cfs 2.924 af Primary=22.56 cfs 2.924 af
<b>Link P-Off: Offsite</b>	Inflow=3.50 cfs 0.580 af Primary=3.50 cfs 0.580 af

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

Inflow=3.95 cfs 1.797 af

Primary=3.95 cfs 1.797 af

**Total Runoff Area = 9.364 ac   Runoff Volume = 3.848 af   Average Runoff Depth = 4.93"**  
**56.32% Pervious = 5.274 ac   43.68% Impervious = 4.090 ac**

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

Runoff = 2.77 cfs @ 12.40 hrs, Volume= 0.451 af, Depth= 5.42"

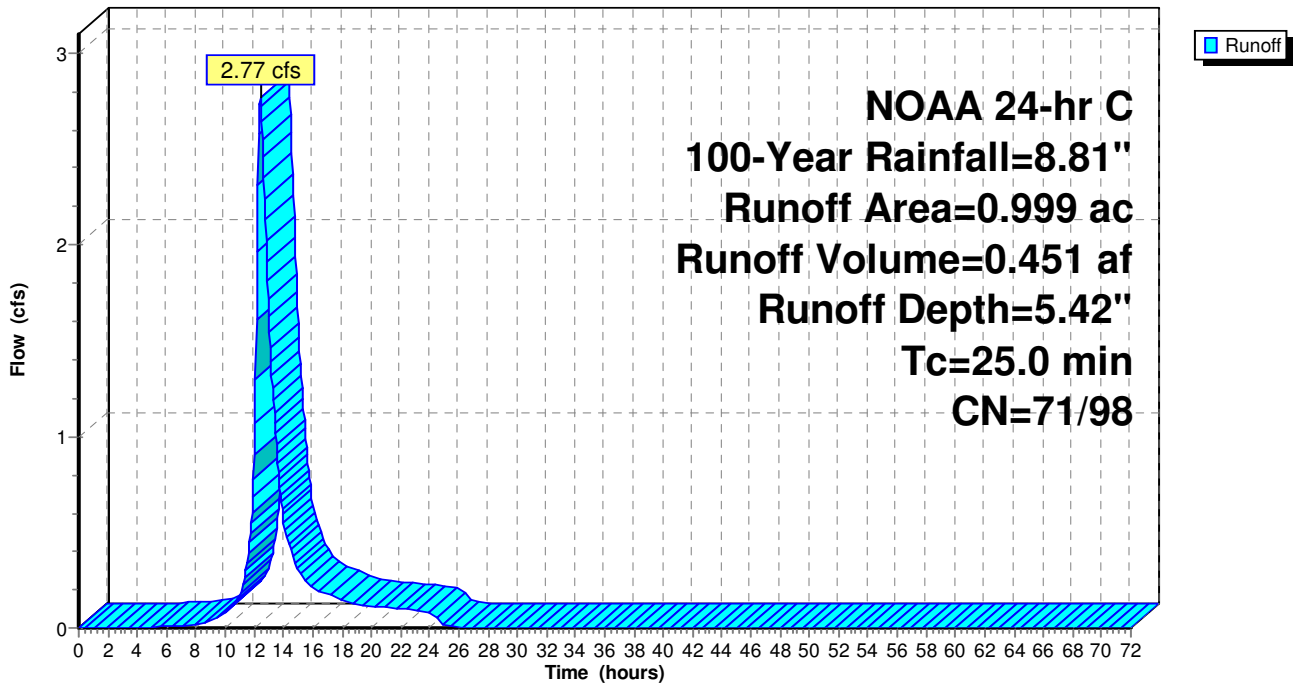
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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 = 0.10 cfs @ 12.56 hrs, Volume= 0.022 af, Depth= 1.51"

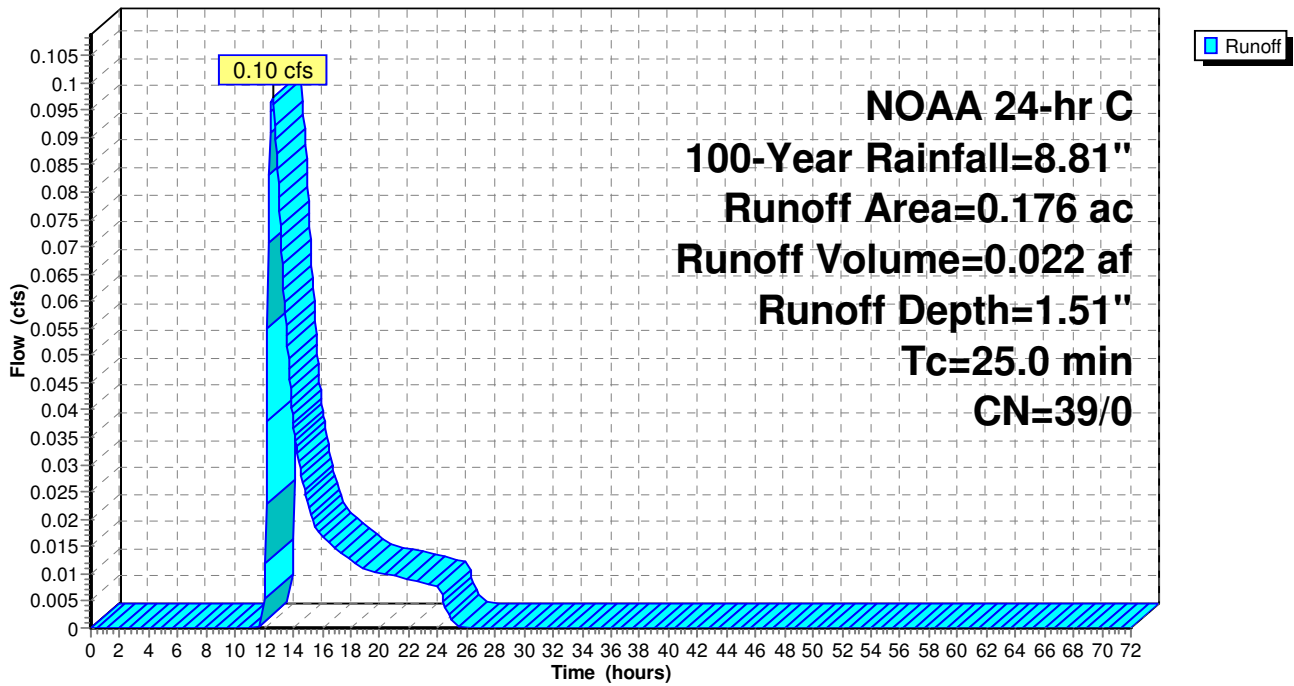
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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"

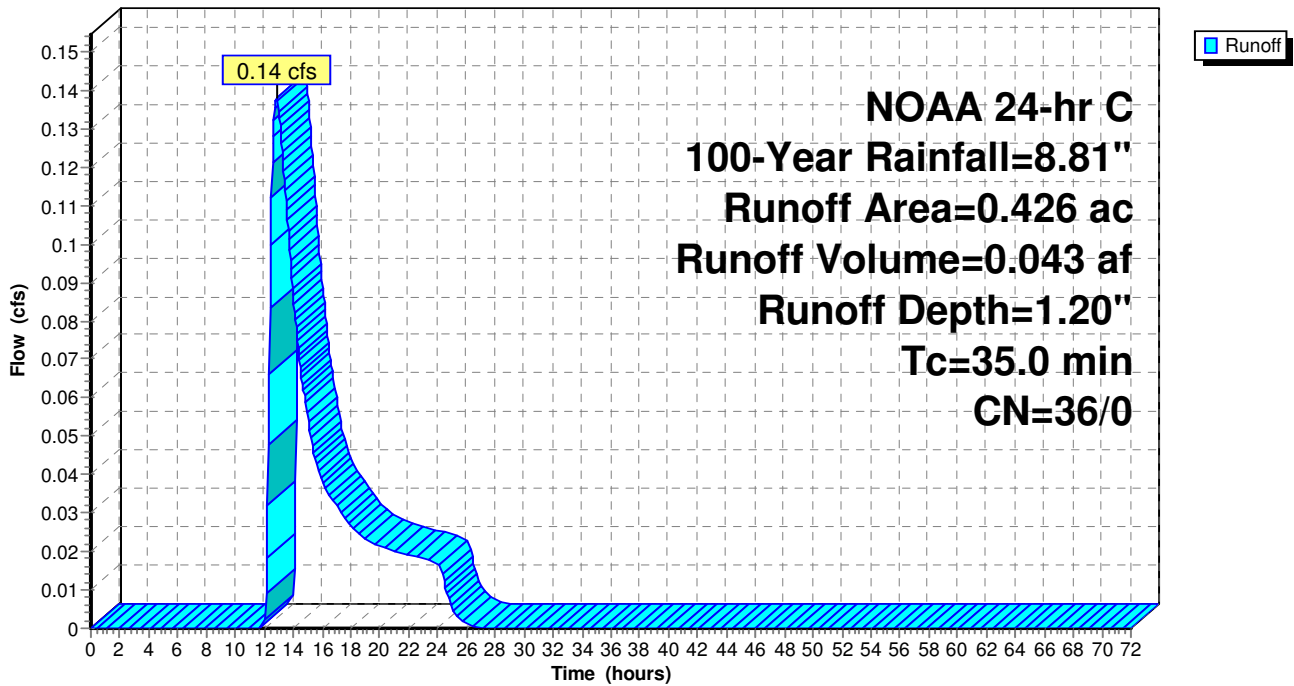
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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"

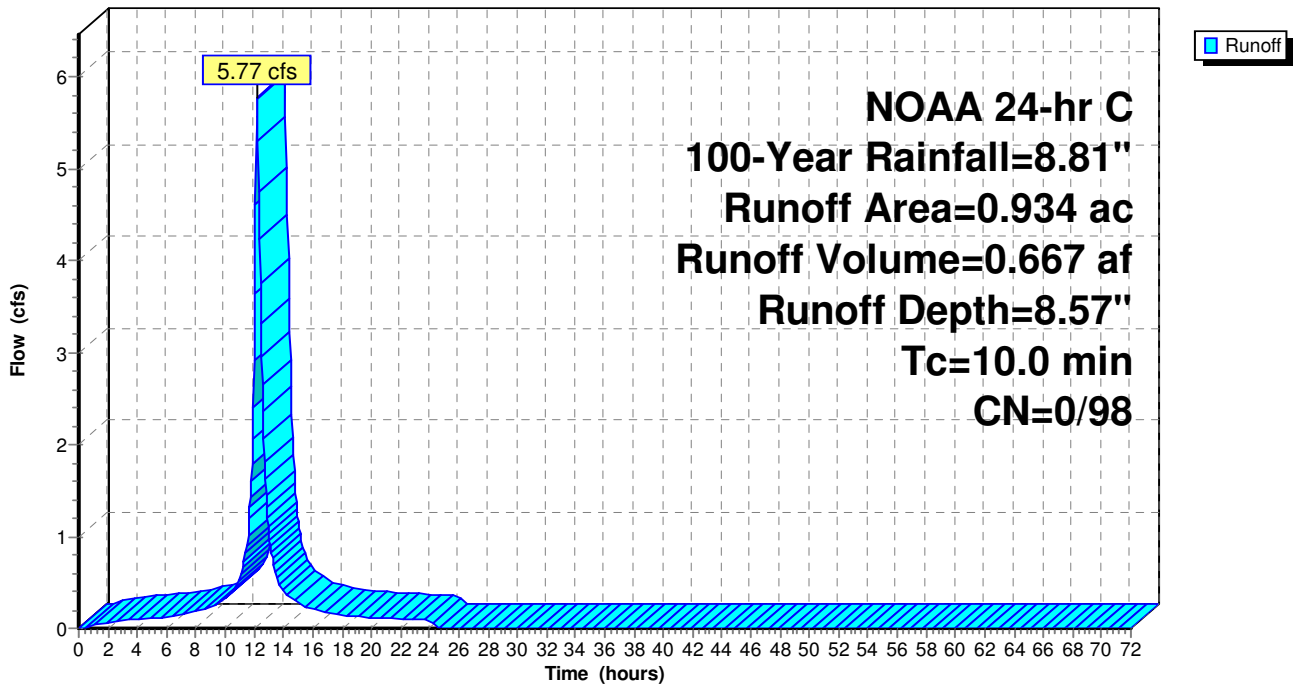
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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"

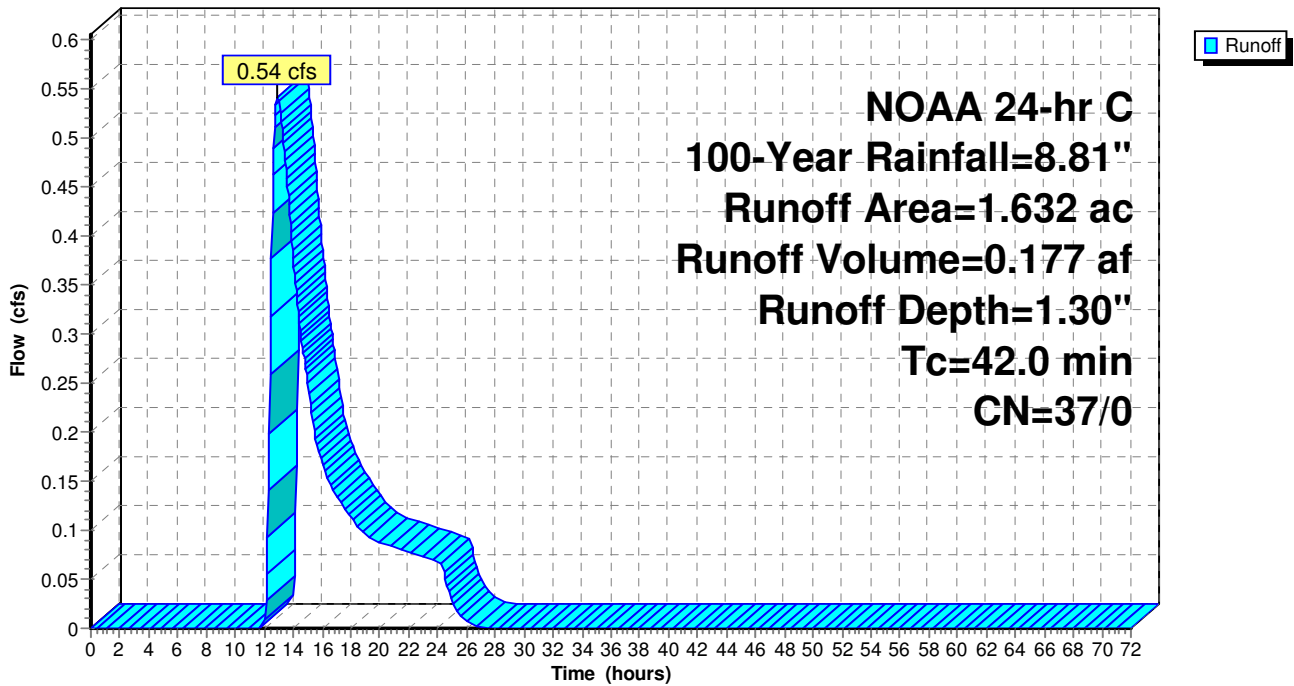
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.81"

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**

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"

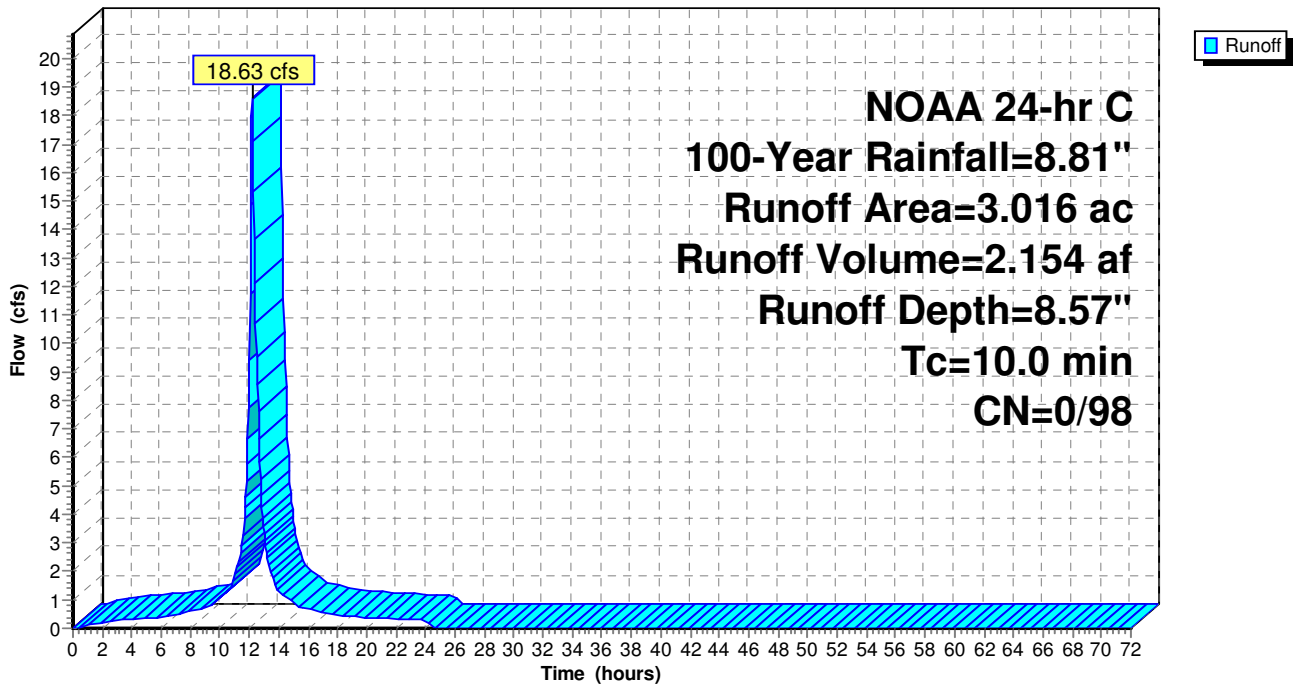
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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"

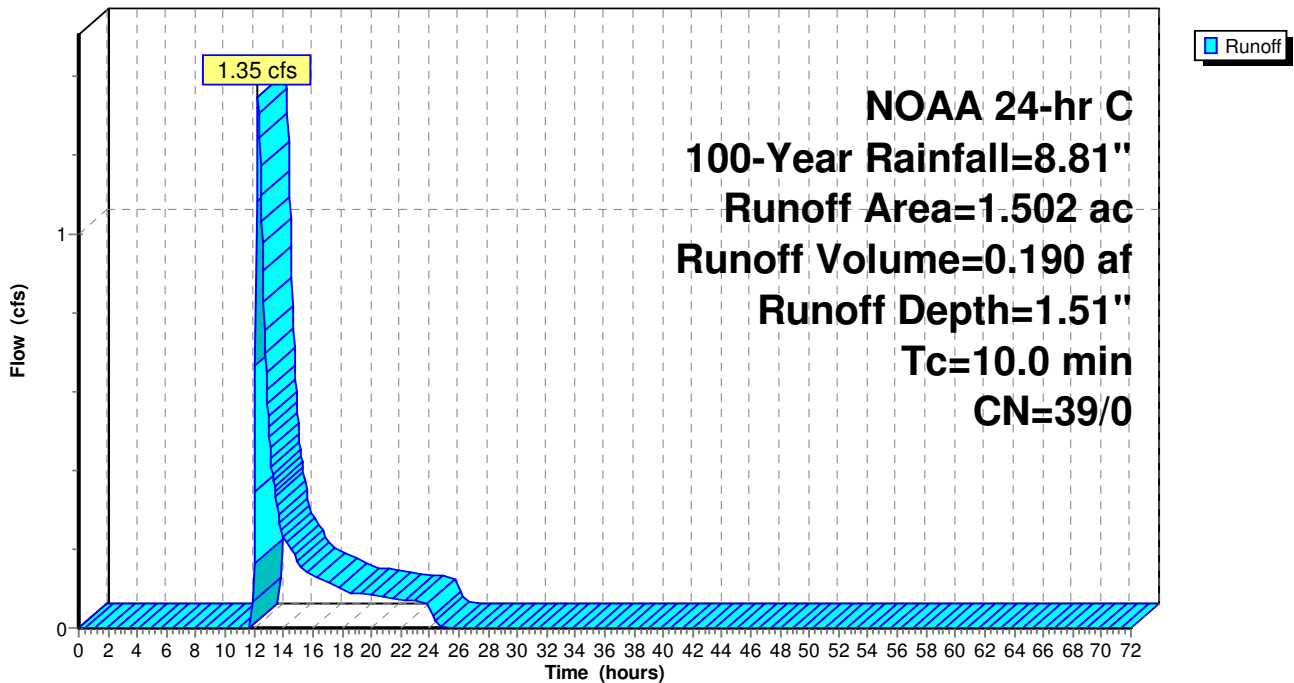
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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"

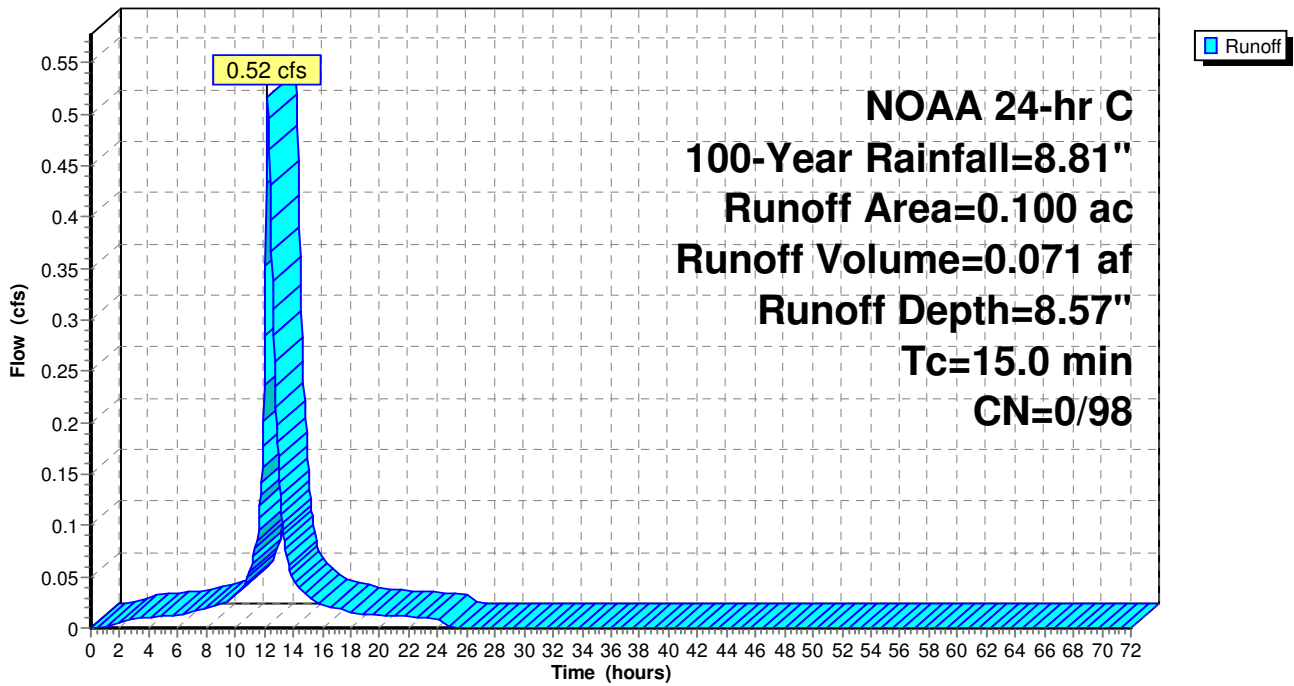
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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



**NYC19-0005\_offsite\_WQ**

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

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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"

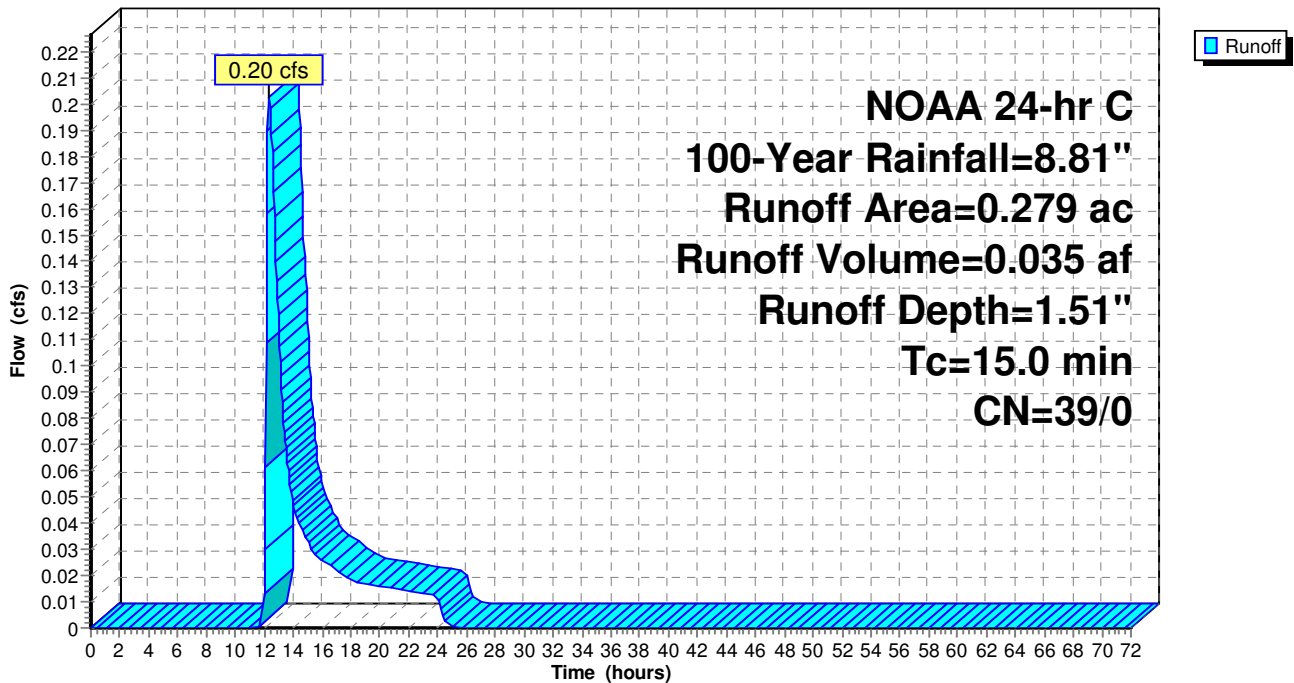
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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 Subcatchment P-Uncontrol: P-Uncontrolled**

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

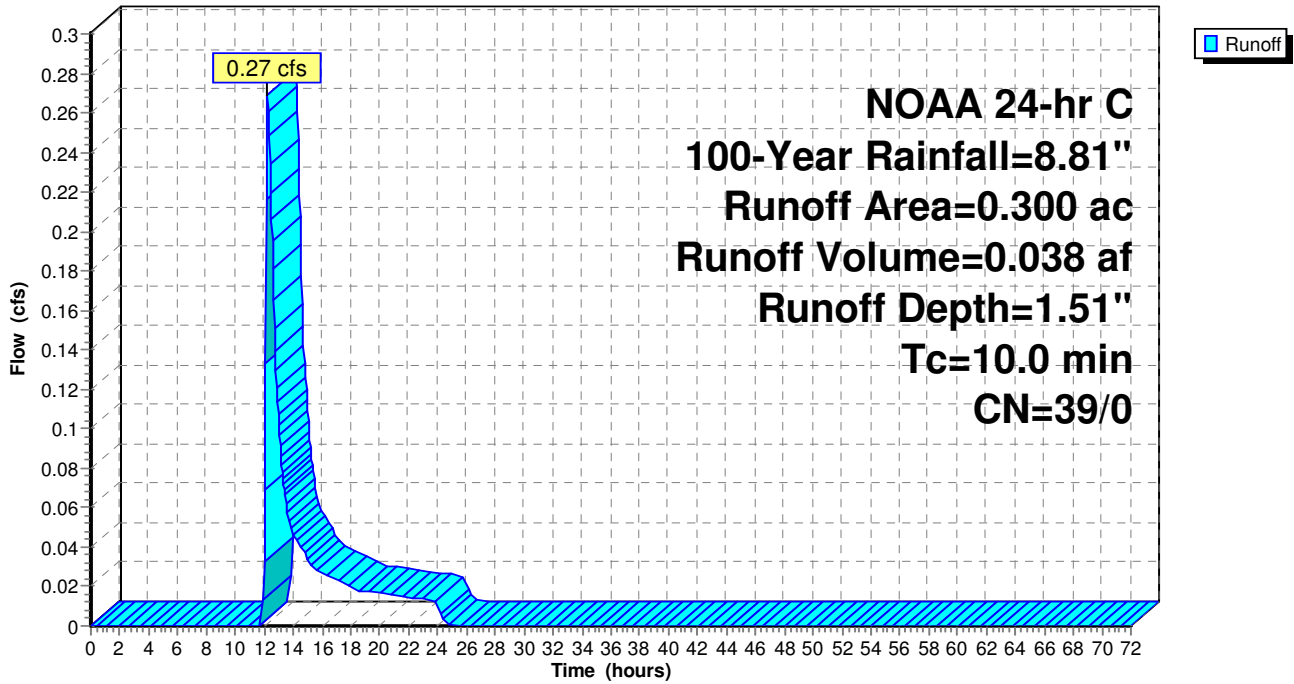
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr C 100-Year Rainfall=8.81"

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 = 6.072 ac, 51.98% Impervious, Inflow Depth = 5.78" for 100-Year event  
 Inflow = 22.56 cfs @ 12.20 hrs, Volume= 2.924 af  
 Outflow = 3.88 cfs @ 13.35 hrs, Volume= 1.759 af, Atten= 83%, Lag= 68.5 min  
 Primary = 3.88 cfs @ 13.35 hrs, Volume= 1.759 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= 33.96' @ 13.35 hrs Surf.Area= 0.789 ac Storage= 1.818 af

Plug-Flow detention time= 408.8 min calculated for 1.758 af (60% of inflow)  
 Center-of-Mass det. time= 289.1 min ( 1,069.1 - 780.1 )

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>23.0" W x 14.0" H, R=22.0" Elliptical RCP_Elliptical 23x14</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= 0.015, Flow Area= 1.83 sf
#2	Secondary	34.00'	<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	33.10'	<b>3.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=3.88 cfs @ 13.35 hrs HW=33.96' TW=0.00' (Dynamic Tailwater)

↑1=RCP\_Elliptical 23x14 (Barrel Controls 3.88 cfs @ 3.51 fps)

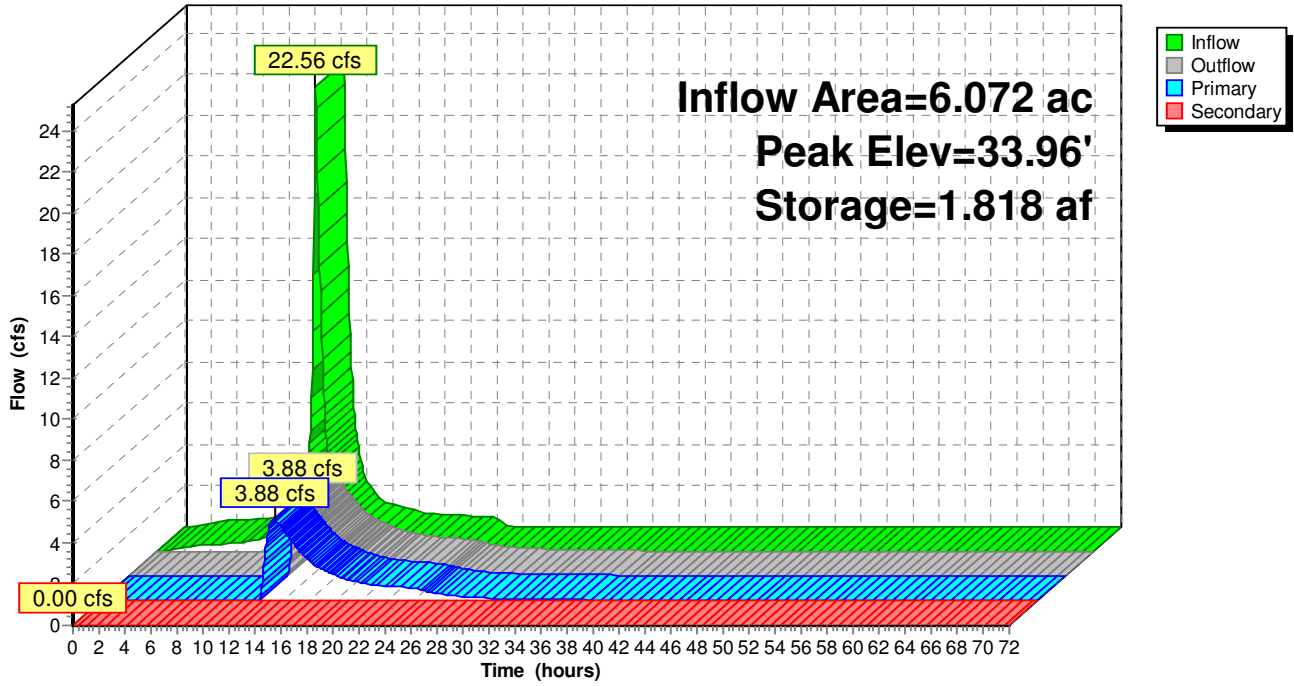
↑3=Sharp-Crested Rectangular Weir (Passes 3.88 cfs of 7.40 cfs potential flow)

**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 = 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= 0.015, 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	32.75'	<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)

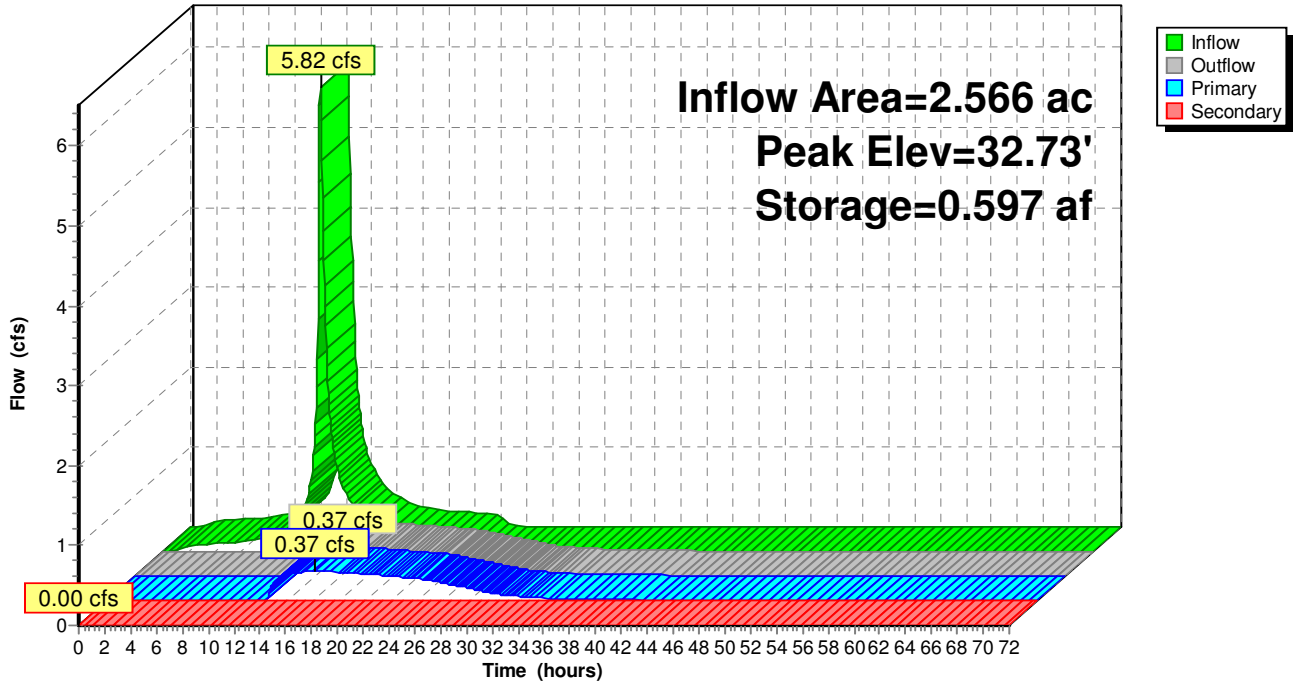
- ↑1=Culvert (Passes 0.37 cfs of 6.26 cfs potential flow)
- ↑2=Orifice/Grate (Orifice Controls 0.37 cfs @ 3.75 fps)

**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



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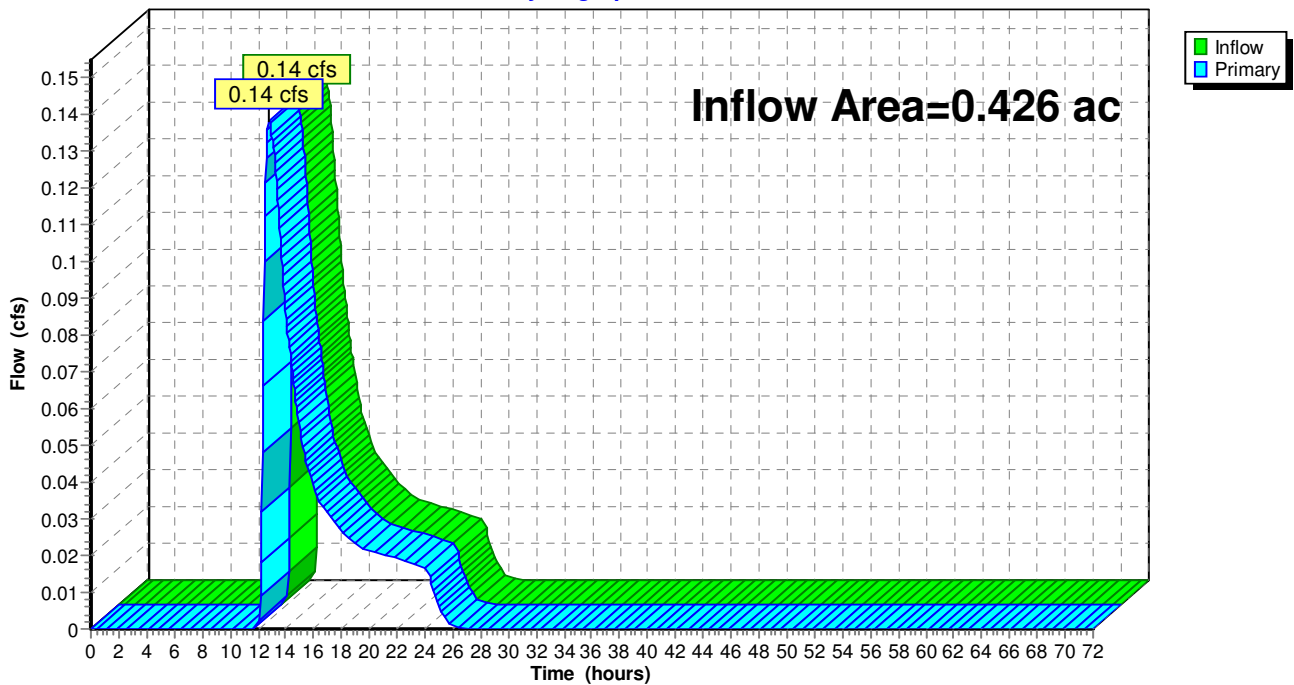
**Summary for Link P-A1: A1**

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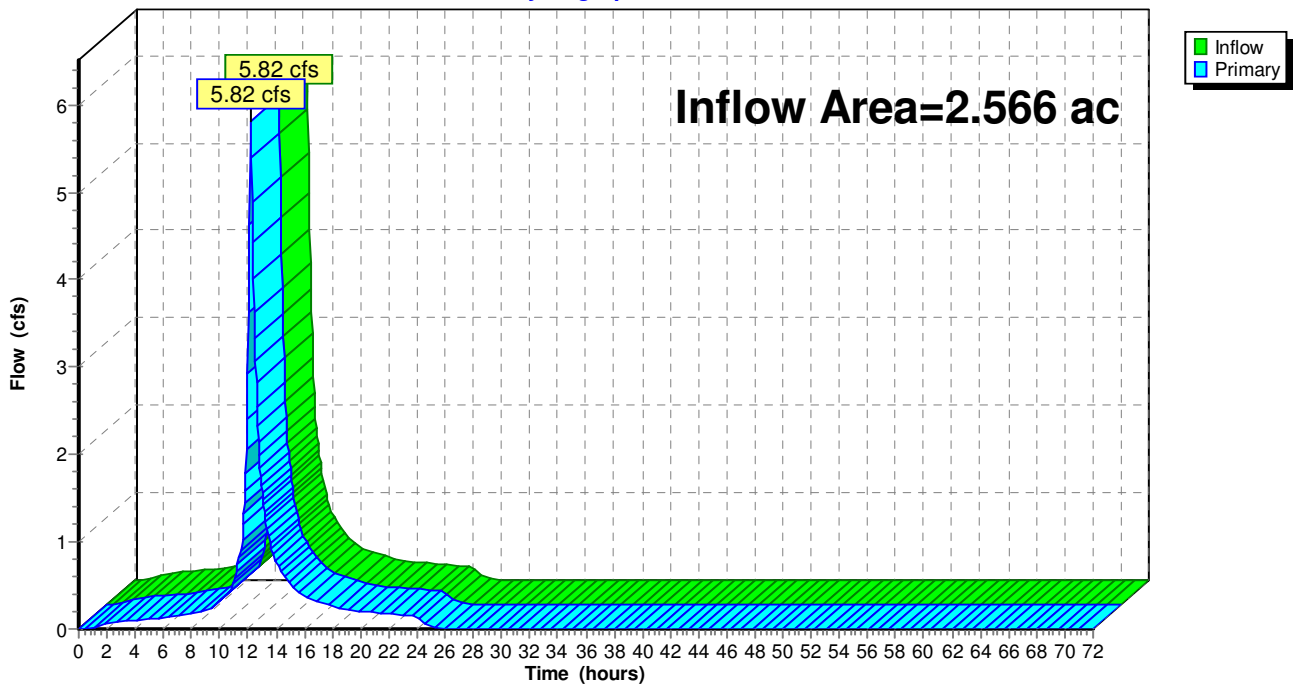
**Summary for Link P-B1: B1**

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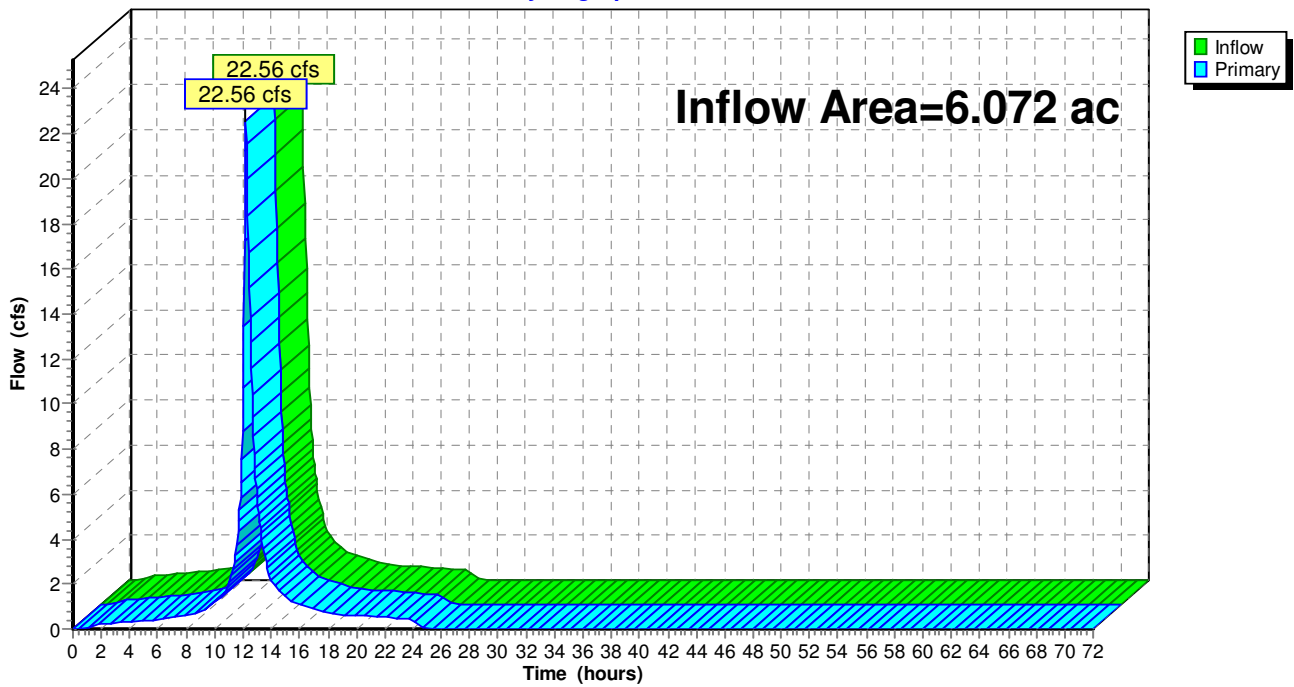
**Summary for Link P-C1: C1**

Inflow Area = 6.072 ac, 51.98% Impervious, Inflow Depth = 5.78" for 100-Year event  
Inflow = 22.56 cfs @ 12.20 hrs, Volume= 2.924 af  
Primary = 22.56 cfs @ 12.20 hrs, Volume= 2.924 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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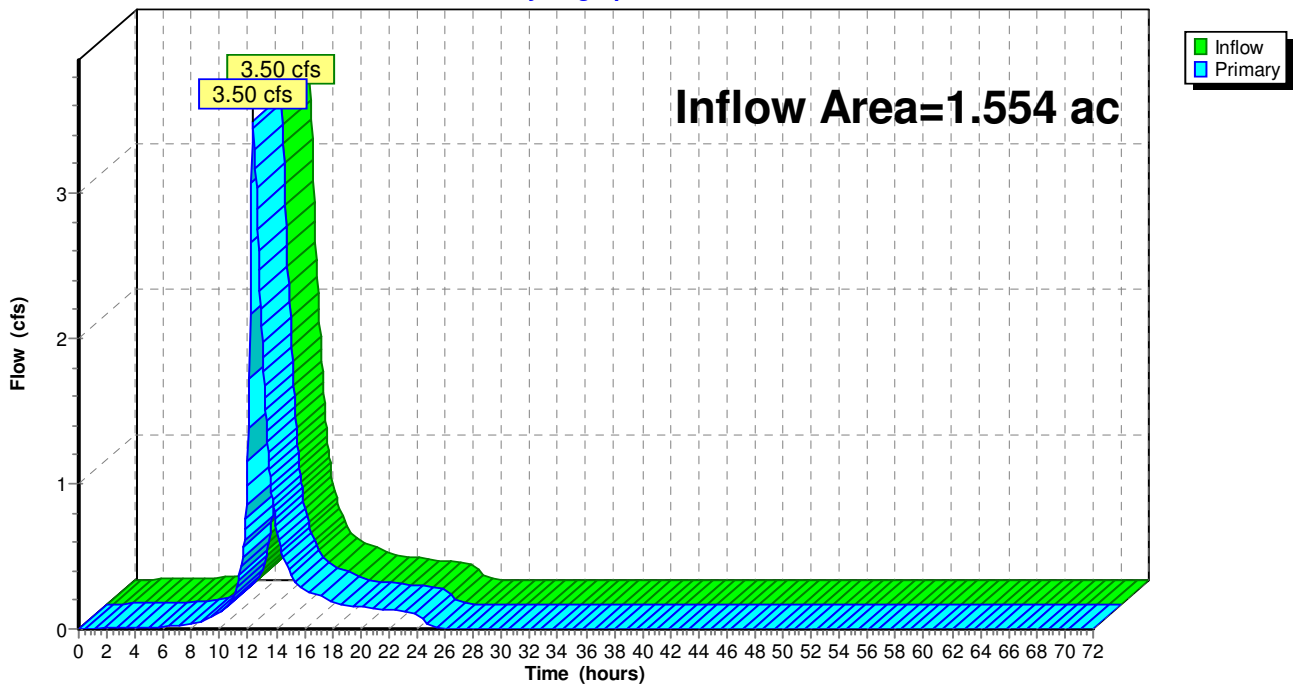
**Summary for Link P-Off: Offsite**

Inflow Area = 1.554 ac, 9.01% Impervious, Inflow Depth = 4.48" for 100-Year event  
Inflow = 3.50 cfs @ 12.38 hrs, Volume= 0.580 af  
Primary = 3.50 cfs @ 12.38 hrs, Volume= 0.580 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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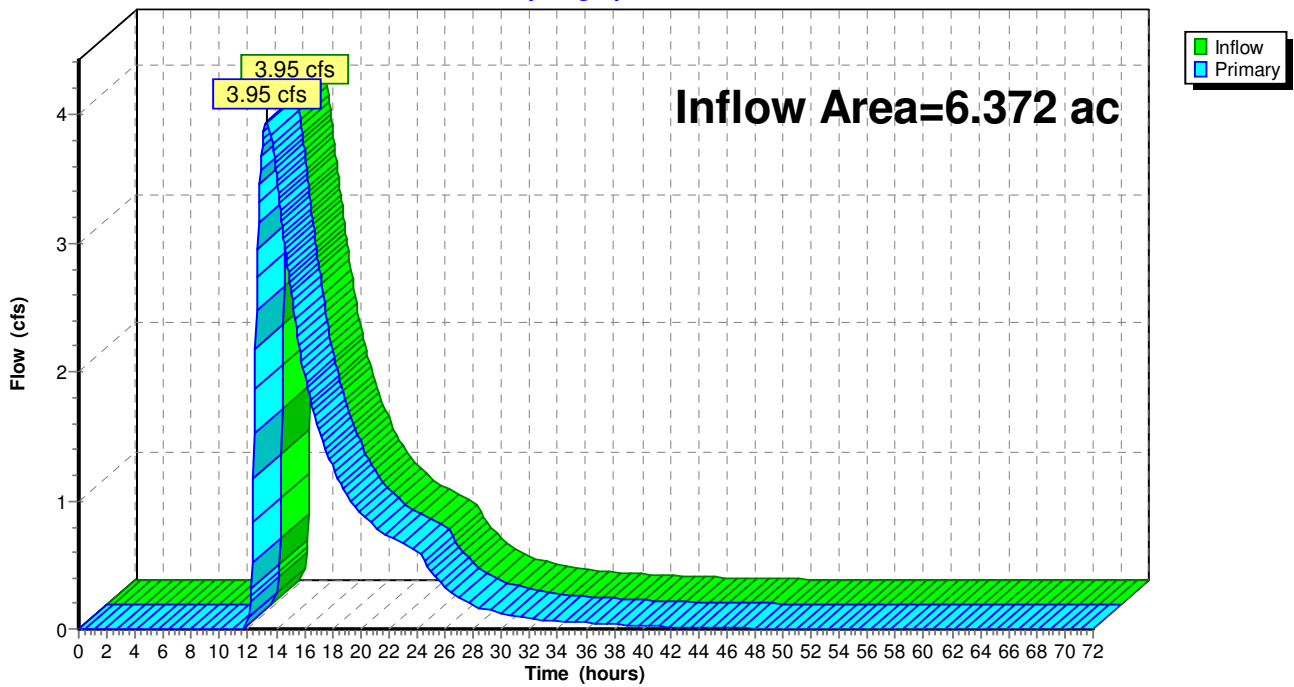
**Summary for Link Post IB-A: Post IB-A**

Inflow Area = 6.372 ac, 49.53% Impervious, Inflow Depth > 3.38" for 100-Year event  
Inflow = 3.95 cfs @ 13.32 hrs, Volume= 1.797 af  
Primary = 3.95 cfs @ 13.32 hrs, Volume= 1.797 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

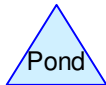
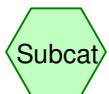
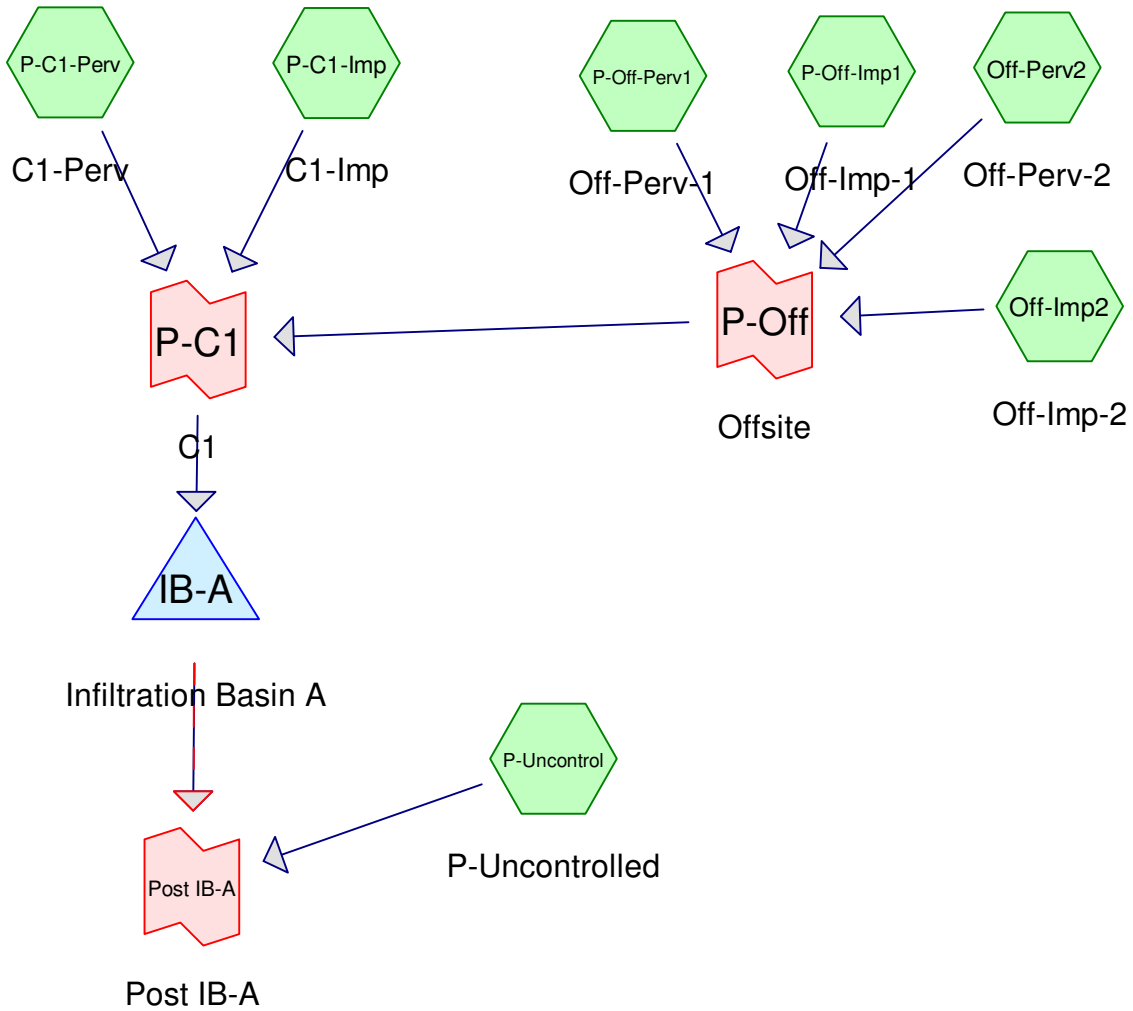
BRANDING

PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

## **Appendix D**



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NJ DEP 2-hr Custom Rainfall=1.25"

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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

**Subcatchment Off-Imp2: Off-Imp-2** Runoff Area=0.999 ac 4.00% Impervious Runoff Depth=0.08"  
Tc=25.0 min CN=71/98 Runoff=0.06 cfs 0.007 af

**Subcatchment Off-Perv2: Off-Perv-2** Runoff Area=0.176 ac 0.00% Impervious Runoff Depth=0.00"  
Tc=25.0 min CN=39/0 Runoff=0.00 cfs 0.000 af

**Subcatchment P-C1-Imp: C1-Imp** Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=1.03"  
Tc=10.0 min CN=0/98 Runoff=5.61 cfs 0.260 af

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

**Subcatchment P-Off-Imp1: Off-Imp-1** Runoff Area=0.100 ac 100.00% Impervious Runoff Depth=1.03"  
Tc=15.0 min CN=0/98 Runoff=0.15 cfs 0.009 af

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

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

**Pond IB-A: Infiltration Basin A** Peak Elev=31.82' Storage=0.275 af Inflow=5.77 cfs 0.275 af  
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

**Link P-C1: C1** Inflow=5.77 cfs 0.275 af  
Primary=5.77 cfs 0.275 af

**Link P-Off: Offsite** Inflow=0.19 cfs 0.015 af  
Primary=0.19 cfs 0.015 af

**Link Post IB-A: Post IB-A** Inflow=0.00 cfs 0.000 af  
Primary=0.00 cfs 0.000 af

**Total Runoff Area = 6.372 ac Runoff Volume = 0.275 af Average Runoff Depth = 0.52"**  
**50.47% Pervious = 3.216 ac 49.53% Impervious = 3.156 ac**

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

Runoff = 0.06 cfs @ 1.66 hrs, Volume= 0.007 af, Depth= 0.08"

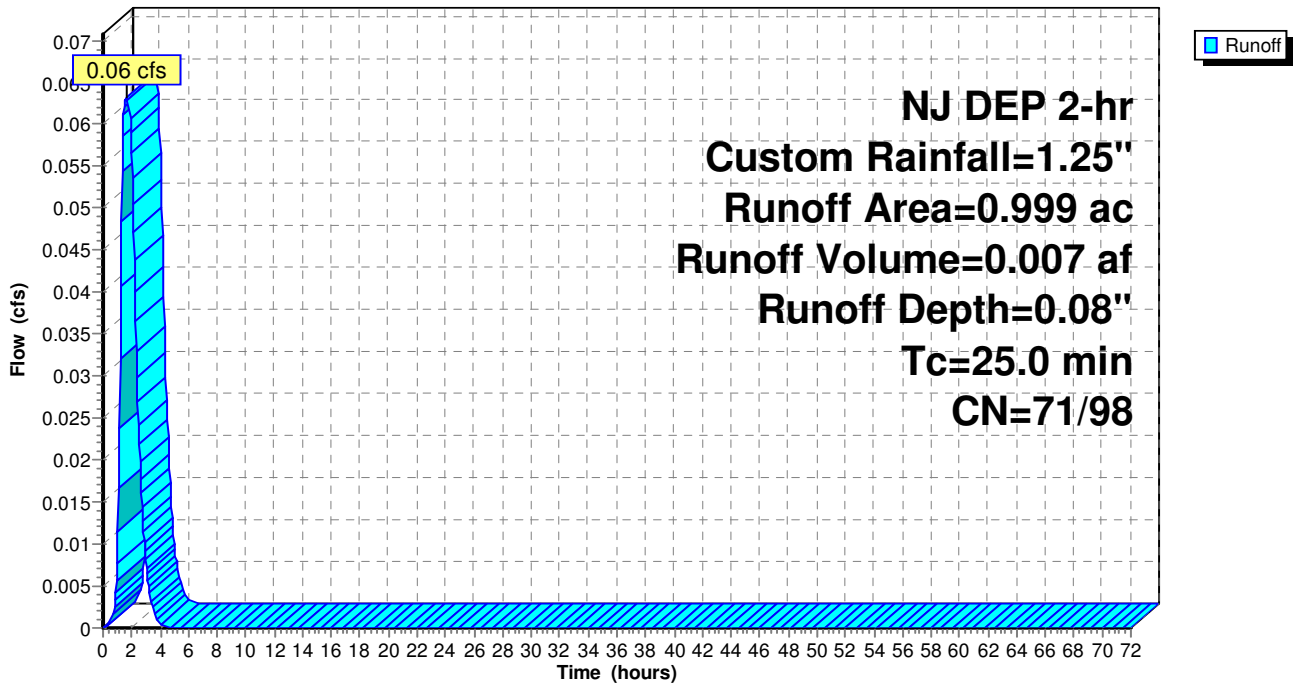
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NJ DEP 2-hr Custom Rainfall=1.25"

Area (ac)	CN	Description
0.040	98	Roofs, HSG A
0.309	76	Gravel roads, HSG A
0.650	68	<50% Grass cover, Poor, HSG A
0.999	72	Weighted Average
0.959	71	96.00% Pervious Area
0.040	98	4.00% 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**

[45] Hint: Runoff=Zero

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

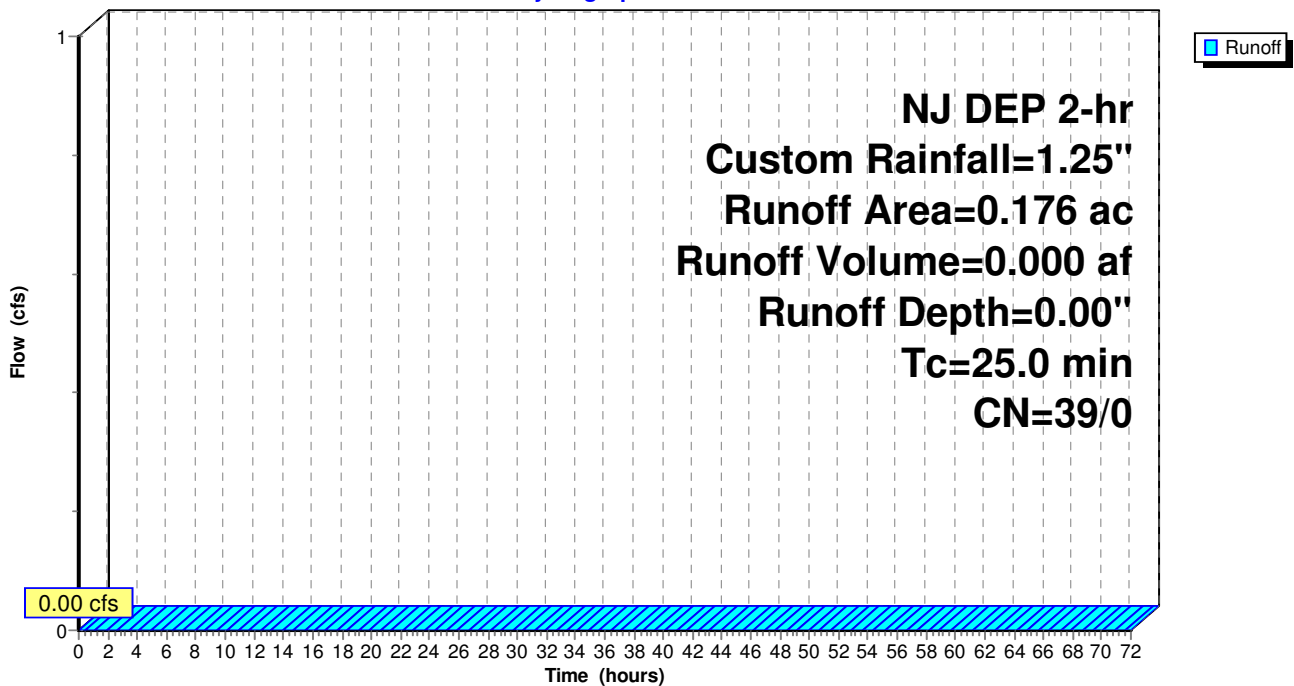
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

Area (ac)	CN	Description
0.176	39	>75% Grass cover, Good, HSG A
0.176	39	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-C1-Imp: C1-Imp**

Runoff = 5.61 cfs @ 1.17 hrs, Volume= 0.260 af, Depth= 1.03"

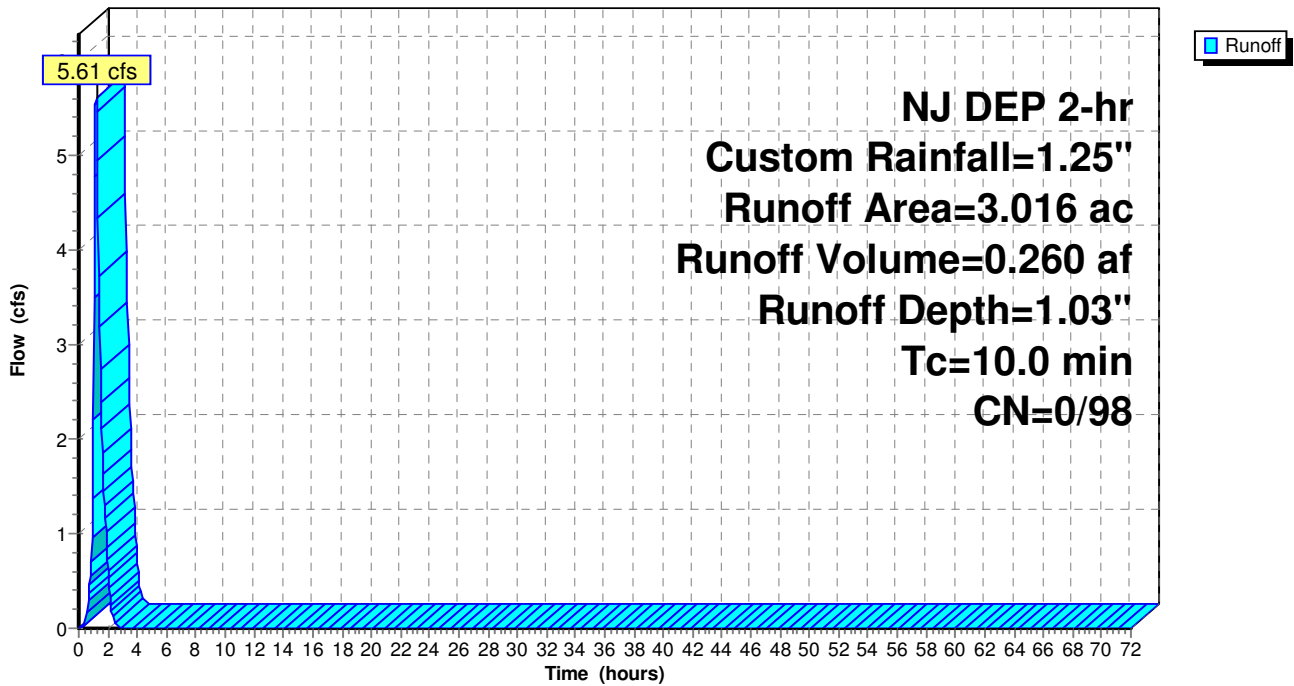
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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**

[45] Hint: Runoff=Zero

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

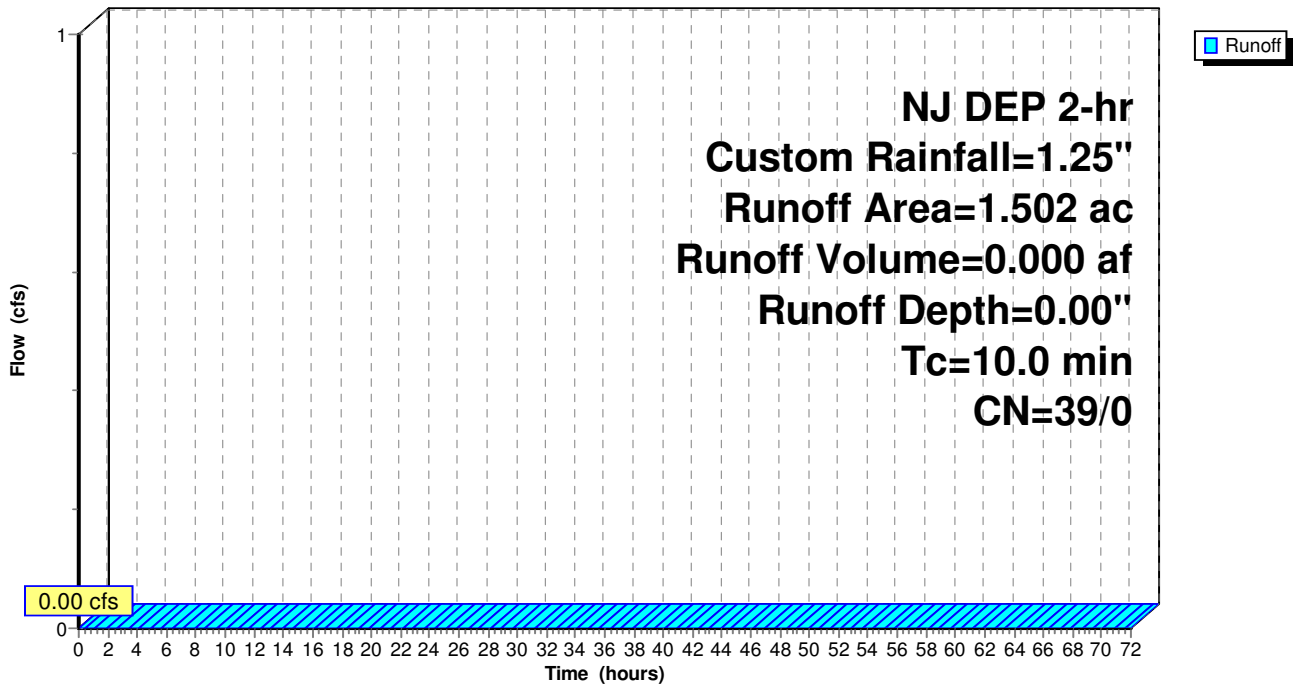
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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 = 0.15 cfs @ 1.24 hrs, Volume= 0.009 af, Depth= 1.03"

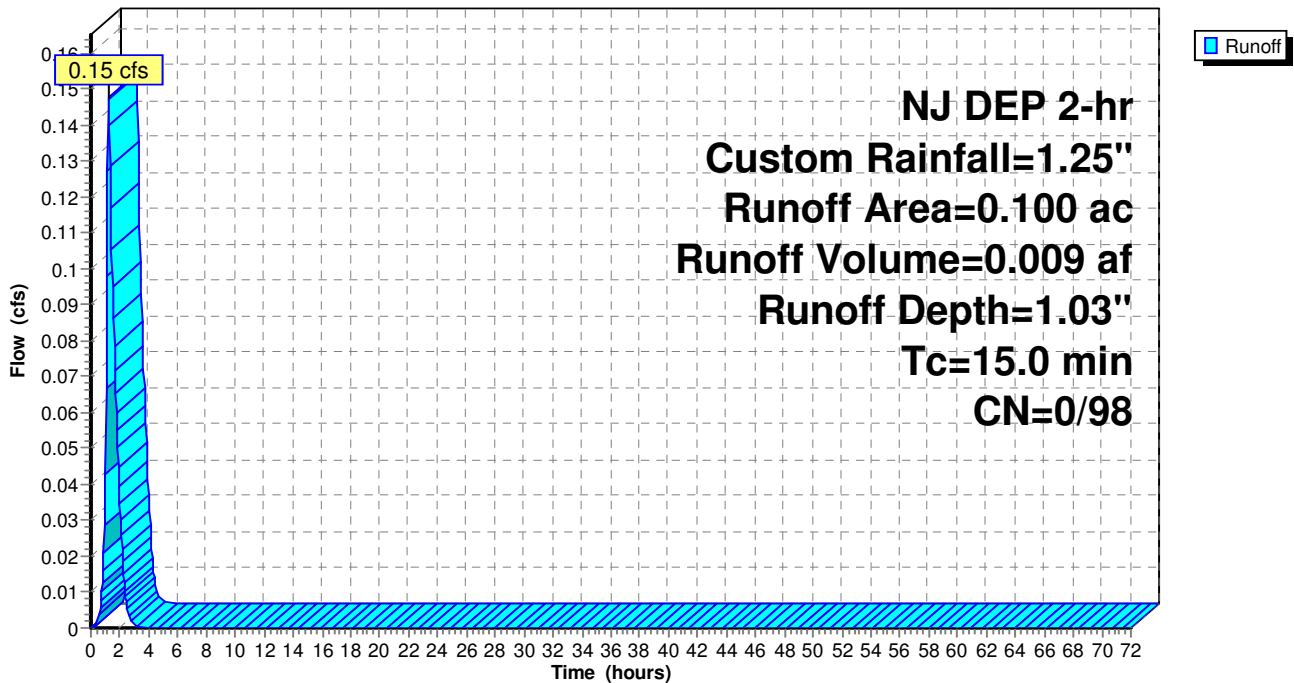
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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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NJ DEP 2-hr Custom Rainfall=1.25"

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

[45] Hint: Runoff=Zero

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

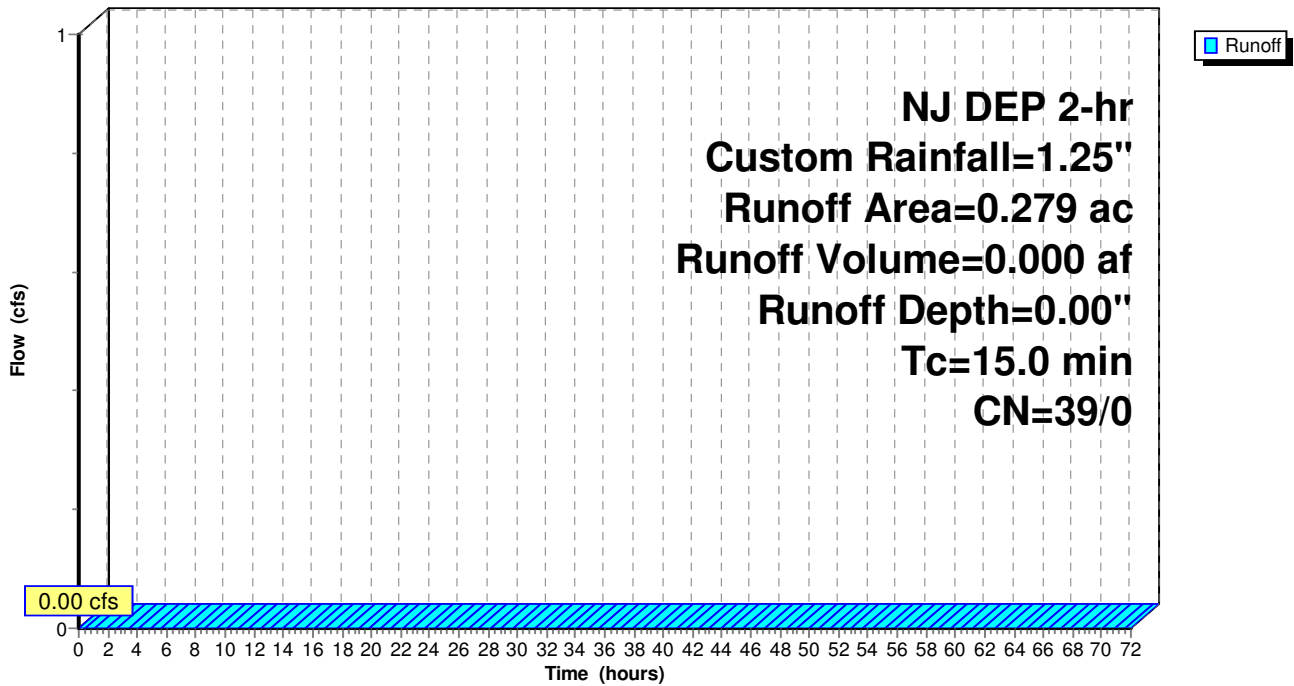
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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\_WQ**

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NJ DEP 2-hr Custom Rainfall=1.25"

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

[45] Hint: Runoff=Zero

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

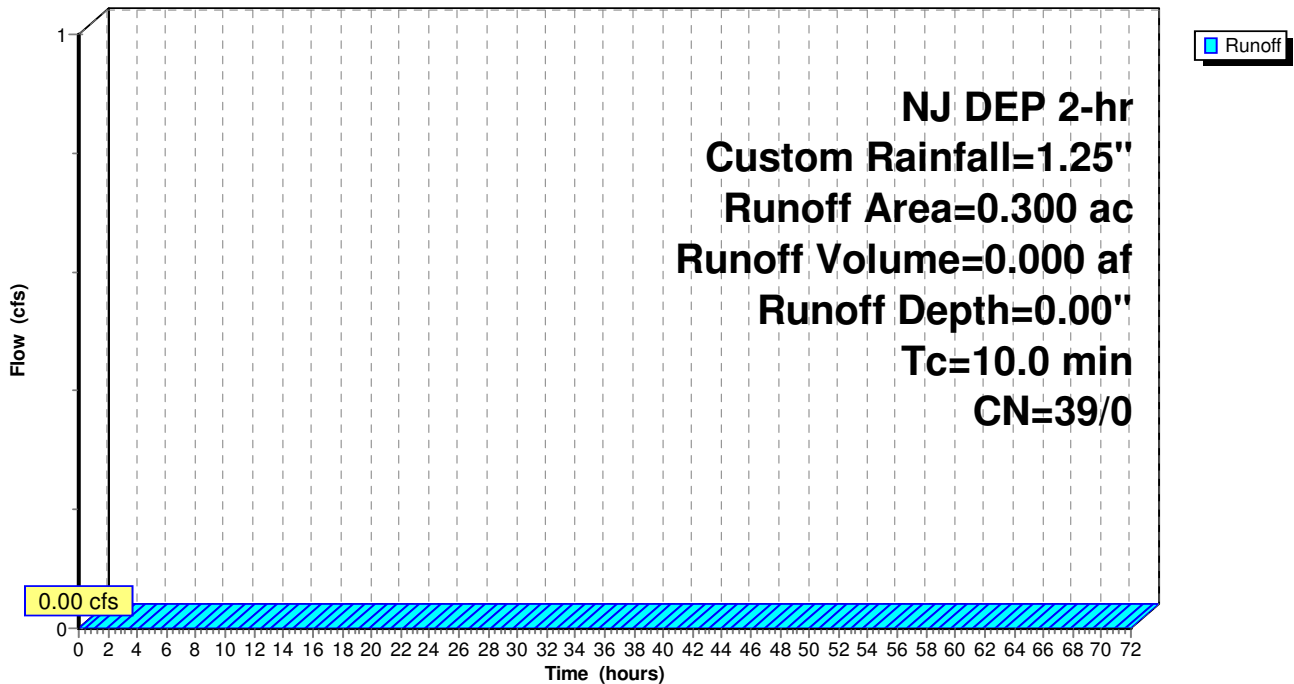
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NJ DEP 2-hr Custom Rainfall=1.25"

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 = 6.072 ac, 51.98% Impervious, Inflow Depth = 0.54" for Custom event  
 Inflow = 5.77 cfs @ 1.17 hrs, Volume= 0.275 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= 31.82' @ 4.75 hrs Surf.Area= 0.656 ac Storage= 0.275 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>23.0" W x 14.0" H, R=22.0" Elliptical RCP_Elliptical 23x14</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= 0.015, Flow Area= 1.83 sf	
#2	Secondary	34.00'	<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	33.10'	<b>3.0' 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=RCP\_Elliptical 23x14 ( Controls 0.00 cfs)

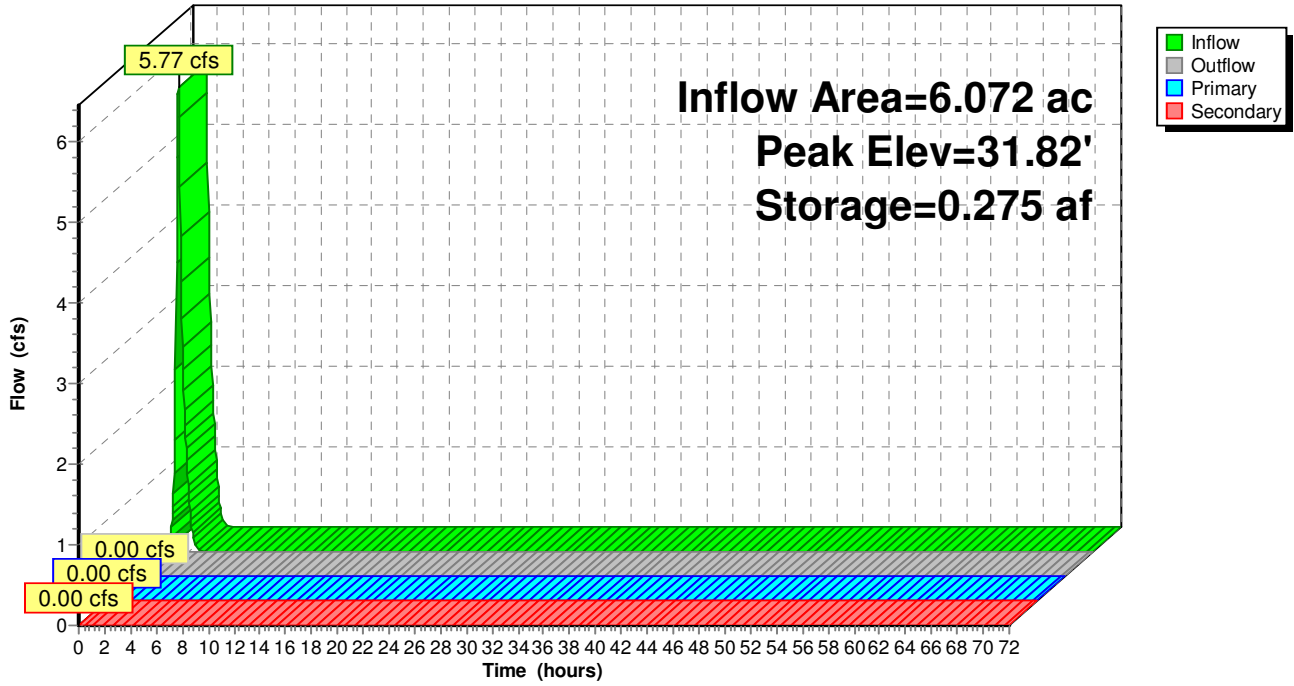
↑3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

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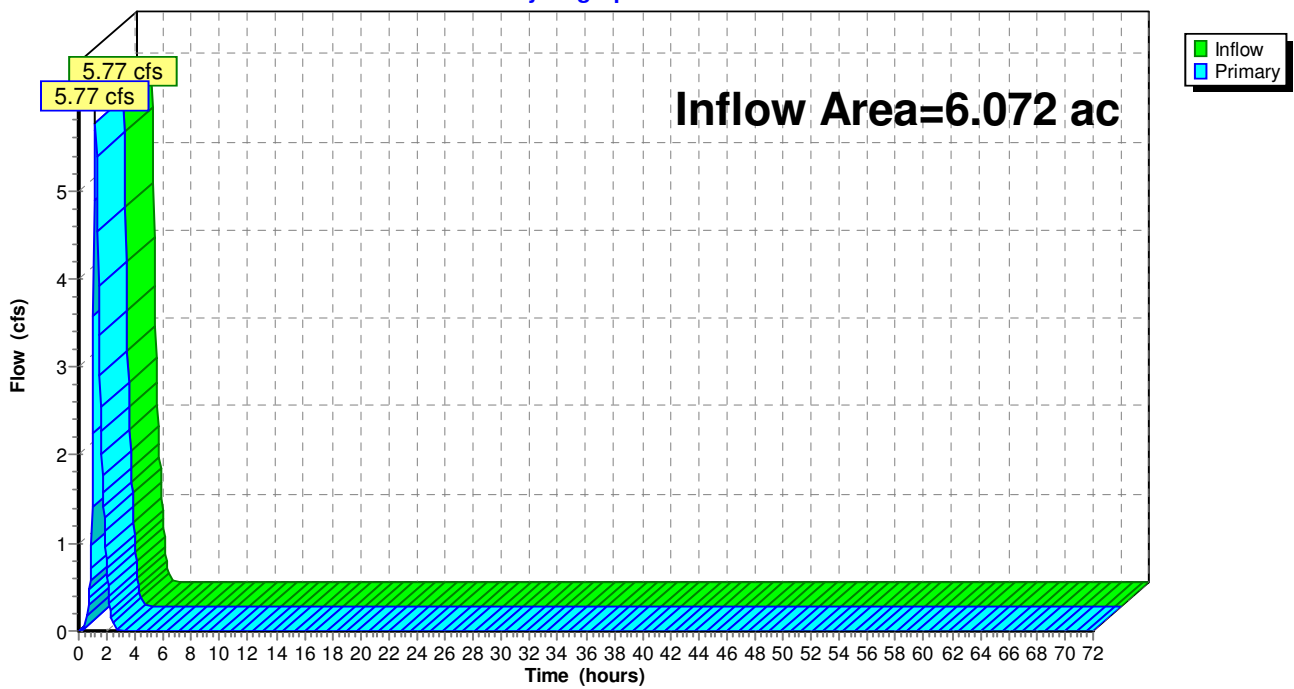
**Summary for Link P-C1: C1**

Inflow Area = 6.072 ac, 51.98% Impervious, Inflow Depth = 0.54" for Custom event  
Inflow = 5.77 cfs @ 1.17 hrs, Volume= 0.275 af  
Primary = 5.77 cfs @ 1.17 hrs, Volume= 0.275 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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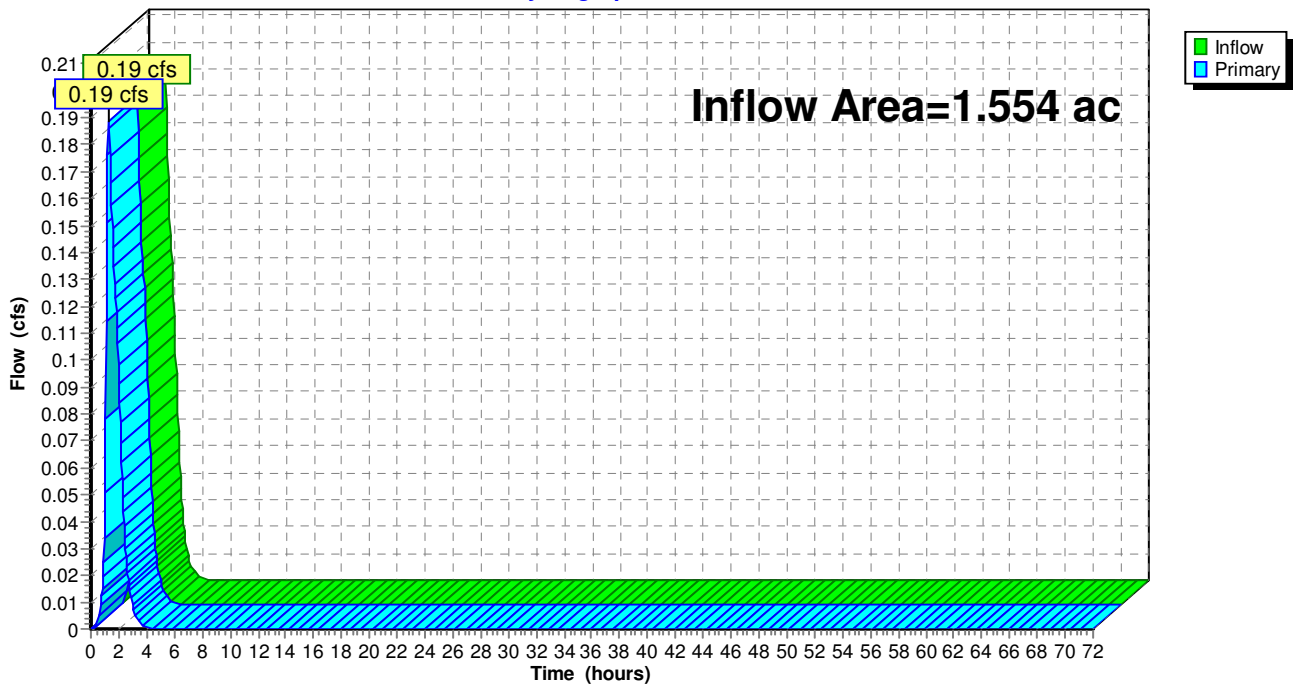
**Summary for Link P-Off: Offsite**

Inflow Area = 1.554 ac, 9.01% Impervious, Inflow Depth = 0.12" for Custom event  
Inflow = 0.19 cfs @ 1.28 hrs, Volume= 0.015 af  
Primary = 0.19 cfs @ 1.28 hrs, Volume= 0.015 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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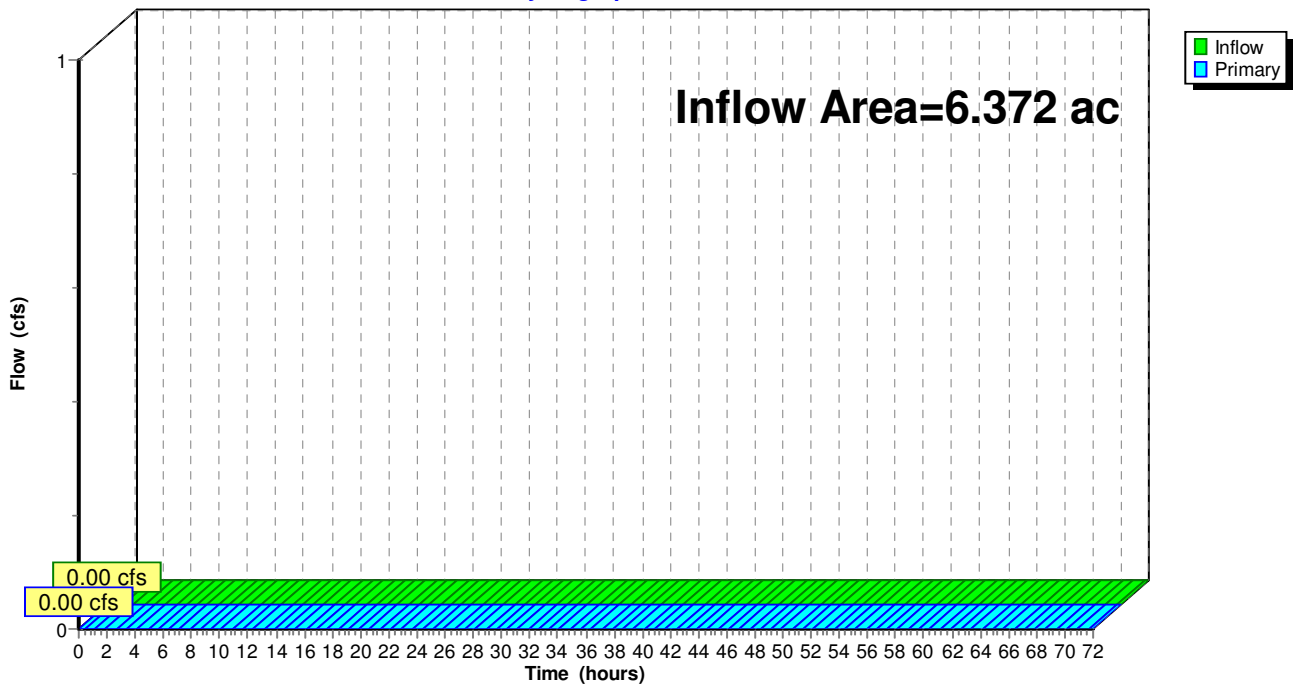
**Summary for Link Post IB-A: Post IB-A**

Inflow Area = 6.372 ac, 49.53% Impervious, Inflow Depth = 0.00" for Custom 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

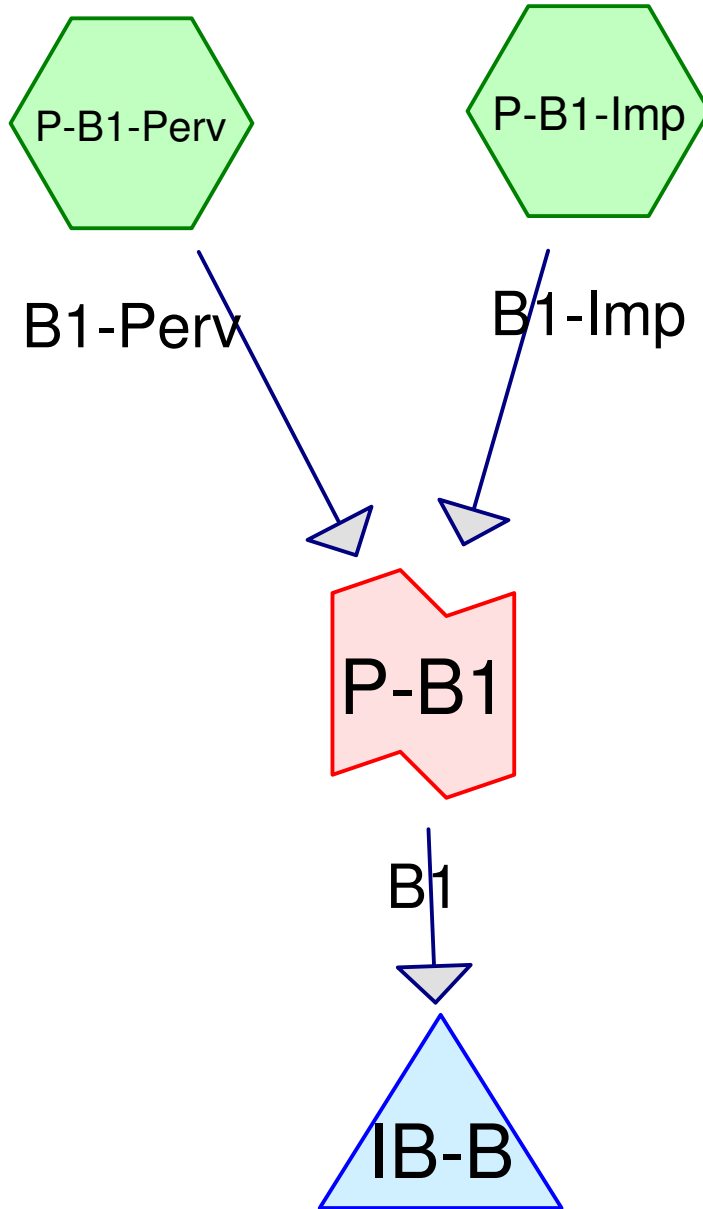
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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

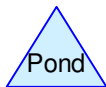
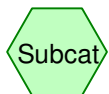
Hydrograph







## Infiltration Basin B



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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

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

Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=1.03"  
Tc=10.0 min CN=0/98 Runoff=1.74 cfs 0.081 af

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

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

**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

**Link P-B1: B1**

Inflow=1.74 cfs 0.081 af  
Primary=1.74 cfs 0.081 af

**Total Runoff Area = 2.566 ac Runoff Volume = 0.081 af Average Runoff Depth = 0.38"**  
**63.60% Pervious = 1.632 ac 36.40% Impervious = 0.934 ac**

**NYC19-0005\_offsite\_WQ**

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NJ DEP 2-hr Custom Rainfall=1.25"

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

Runoff = 1.74 cfs @ 1.17 hrs, Volume= 0.081 af, Depth= 1.03"

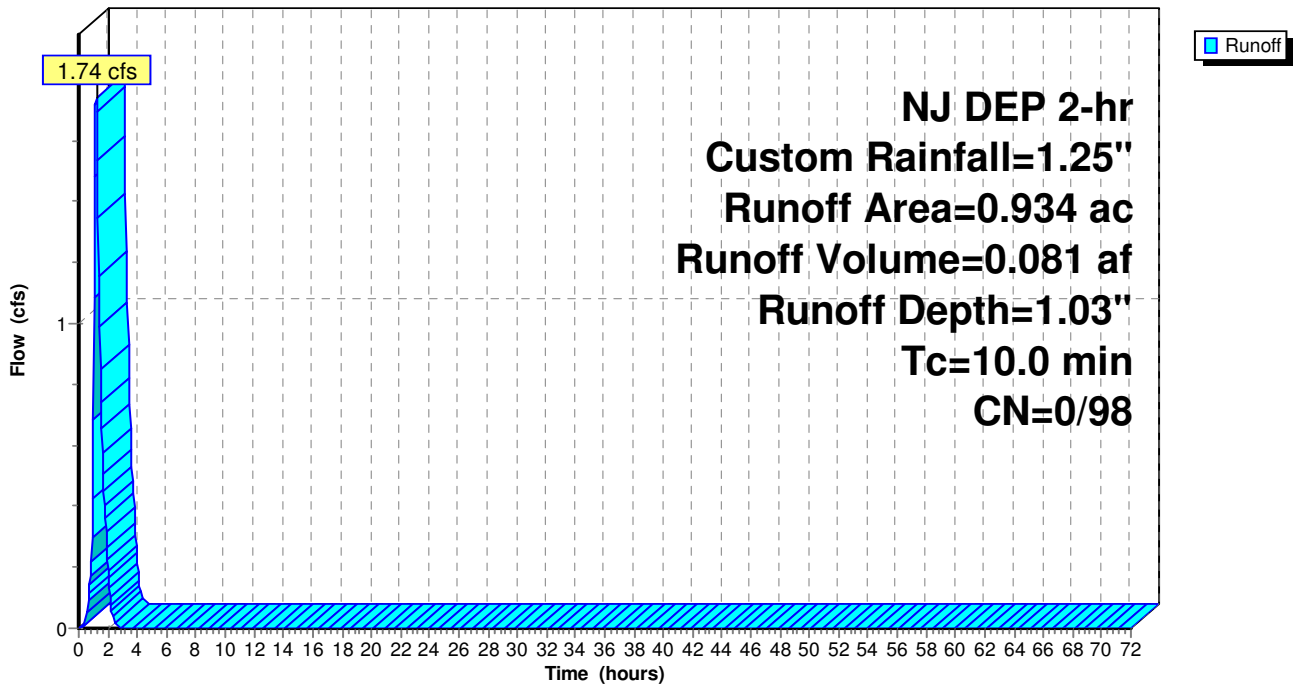
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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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NJ DEP 2-hr Custom Rainfall=1.25"

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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"

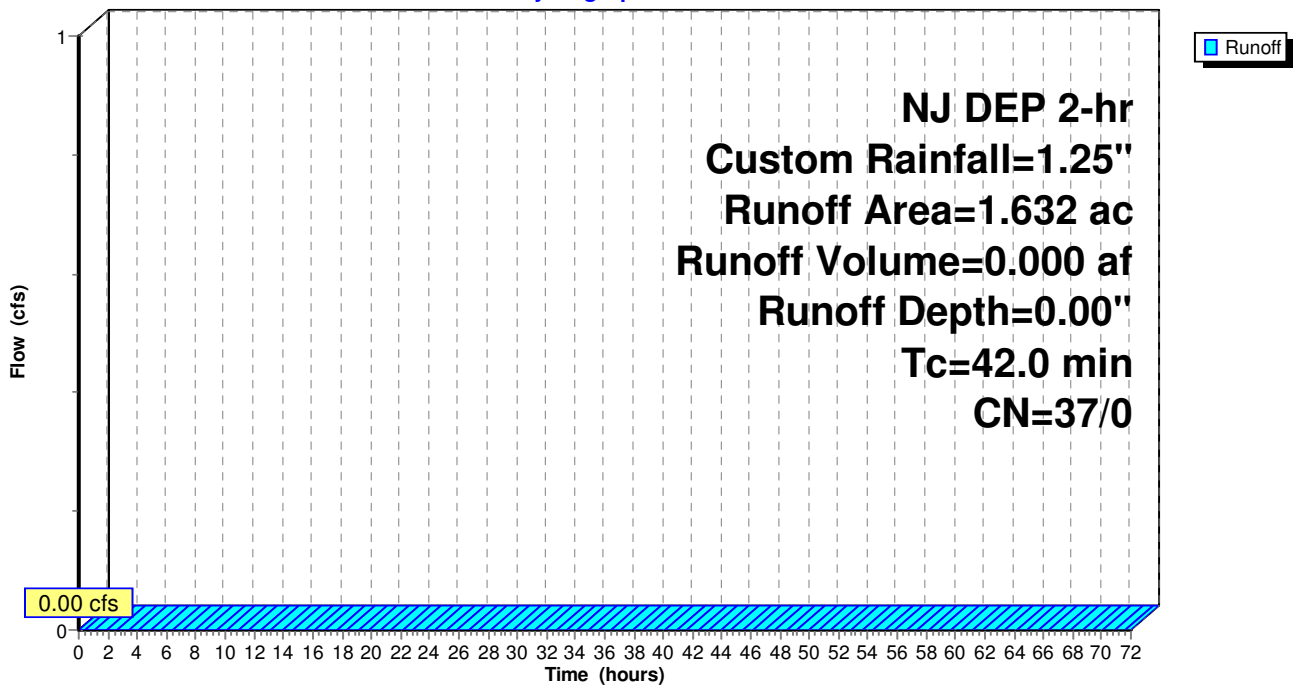
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NJ DEP 2-hr Custom Rainfall=1.25"

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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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= 0.015, 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	32.75'	<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)

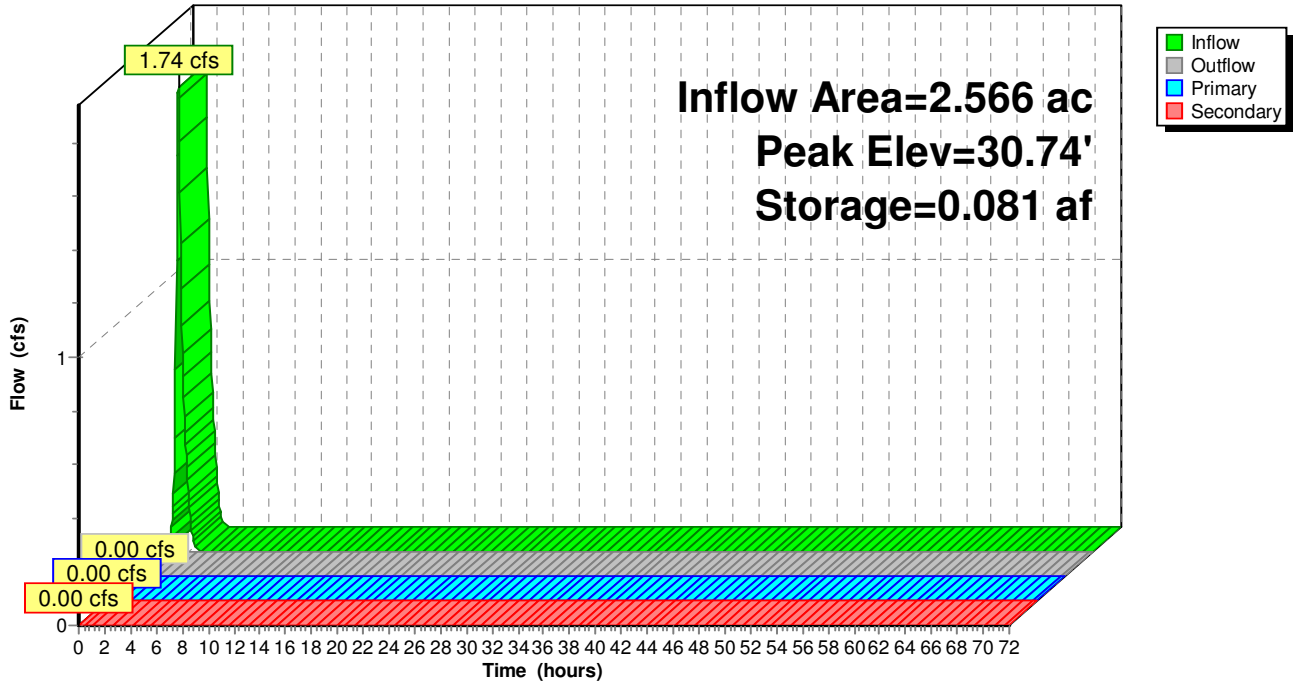
↑2=Orifice/Grate ( Controls 0.00 cfs)

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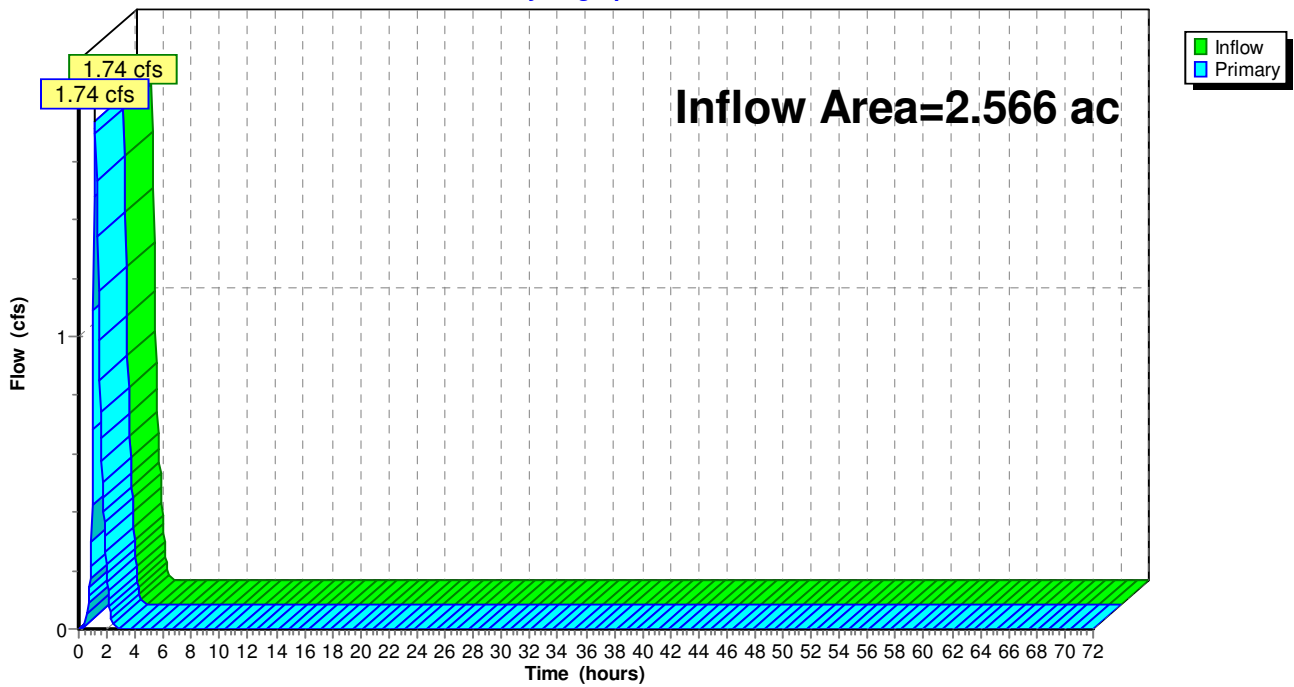
**Summary for Link P-B1: B1**

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  
Primary = 1.74 cfs @ 1.17 hrs, Volume= 0.081 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



## Edgewater Park Self Storage - NYC19-0005

Designed By SMR

Checked By EFW

Date 07/10/20

### INFILTRATION BASIN SUMMARY

Basin	Test Pit #	Tested Infiltration Rate (in/hr)	Soil Class	Factor of Safety	Design Infiltration Rate (in/hr)	Hydraulic Conductivity of Soil (K) (ft/hr)	Minimum Hydraulic Gradient (I)	Area Provided for Infiltration (A) (sf)	Rate of Infiltration (Q) (cf/hr)	Stormwater Volume to Be Infiltrated (V) (ac-ft)	Time to Infiltrate Stormwater (hr)	Basin Bottom Elev	Water Elev Req'd for Recharge per GSR-32	NJDEP WQ Strm Elev in Basin	Lowest Inv. of Orif/Weir In Basin
A	1	4.61	K3	2	2.31	0.19	1.00	27,454	5,216.3	2.5052	20 hr 55 min	31.40		31.82	33.40
B	6	7.52	K4	2	3.76	0.31	1.00	10,244	3,175.5	1.9648	26 hr 57 min	30.40		30.75	32.00

The design of an infiltration basin is based upon Darcy's Law:

$$Q = KIA$$

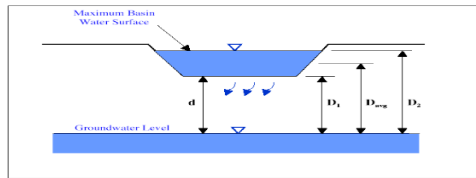
where:

- Q = the rate of infiltration in cubic feet per second (cfs)
- K = the hydraulic conductivity of the soil in feet per second (fps)
- I = the hydraulic gradient
- A = the area of infiltration in square feet (sf)

From the variables shown in Figure 9.5-2 below:

- Average Hydraulic Gradient =  $D_{avg}/d$
- Minimum Hydraulic Gradient =  $D_1/d$
- Maximum Hydraulic Gradient =  $D_2/d$

Figure 9.5-2: Schematic of Darcy's Law



Notes:



# WARE MALCOMB

ARCHITECTURE

INTERIORS

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BUILDING MEASUREMENT

## **Appendix E**

New Jersey  
Groundwater  
Recharge  
Spreadsheet  
Version 2.0  
November 2003

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

Select Township ↓	Average Annual P (in)	Climatic Factor
BURLINGTON CO., EDGEWATER PARK TWP	44.9	1.41

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

Pre-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	7.81	Woods	Galestown	14.1	399,518
2					
3					
4					
5					
6					
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	7.8			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				14.1	399,518

Post-Developed Conditions					
Land Segment	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				
Total =	7.8			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				7.2	204,804

### 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.

<b>Annual Recharge Requirements Calculation ↓</b>			
% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	172,062
<b>Post-Development Annual Recharge Deficit=</b>	<b>194,714</b>	(cubic feet)	
<b>Recharge Efficiency Parameters Calculations (area averages)</b>			
RWC= 2.46	(in)	DRWC= 2.46	(in)
ERWC = 0.73	(in)	EDRWC = 0.73	(in)

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	Parameter	Symbol	Value	Unit
BMP Area	ABMP	10243.6	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in	Inches of Runoff to capture	Qdesign	2.77	in
BMP Effective Depth, this is the design variable	dBMP	24.0	in	ERWC Modified to consider dEXC	EDRWC	0.62	in	Inches of Rainfall to capture	Pdesign	3.00	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in	Empty Portion of RWC under Infiltration	RERWC	0.50	in	Recharge Provided Avg. over Imp. Area		25.9	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in					Runoff Captured Avg. over imp. Area		34.9	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	3	unitless								
				BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES			
				ABMP/Aimp	Aratio	0.25	unitless	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>			
				BMP Volume	VBMP	20,487	cu.ft				
Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters				OTHER NOTES			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft	Annual BMP Recharge Volume		87,783	cu.ft	Pdesign is accurate only after BMP dimensions are updated to make recharge 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.			
Post-D Impervious Area (or target Impervious Area)	Aimp	40,712	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		100.0%	%				
Climatic Factor	C-factor	1.41	no units	%Runoff Recharged		17.5%	%				
Average Annual P	Pavg	44.9	in	%Rainfall Recharged		13.6%	%				
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>											

Project Name		Description		Analysis Date		BMP or LID Type					
Edgewater Park Self Storage		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	Parameter	Symbol	Value	Unit
BMP Area	ABMP	27454.4	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in	Inches of Runoff to capture	Qdesign	2.77	in
BMP Effective Depth, this is the design variable	dBMP	24.0	in	ERWC Modified to consider dEXC	EDRWC	0.62	in	Inches of Rainfall to capture	Pdesign	3.00	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in	Empty Portion of RWC under Infiltration	RERWC	0.50	in	Recharge Provided Avg. over Imp. Area		25.9	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	0.0	in					Runoff Captured Avg. over imp. Area		34.9	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	3	unitless								
				BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES			
				ABMP/Aimp	Aratio	0.21	unitless	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>			
				BMP Volume	VBMP	54,909	cu.ft				
Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters				OTHER NOTES			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft	Annual BMP Recharge Volume		235,274	cu.ft	Pdesign is accurate only after BMP dimensions are updated to make recharge 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.			
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>											

# WARE MALCOMB

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## **Appendix F**

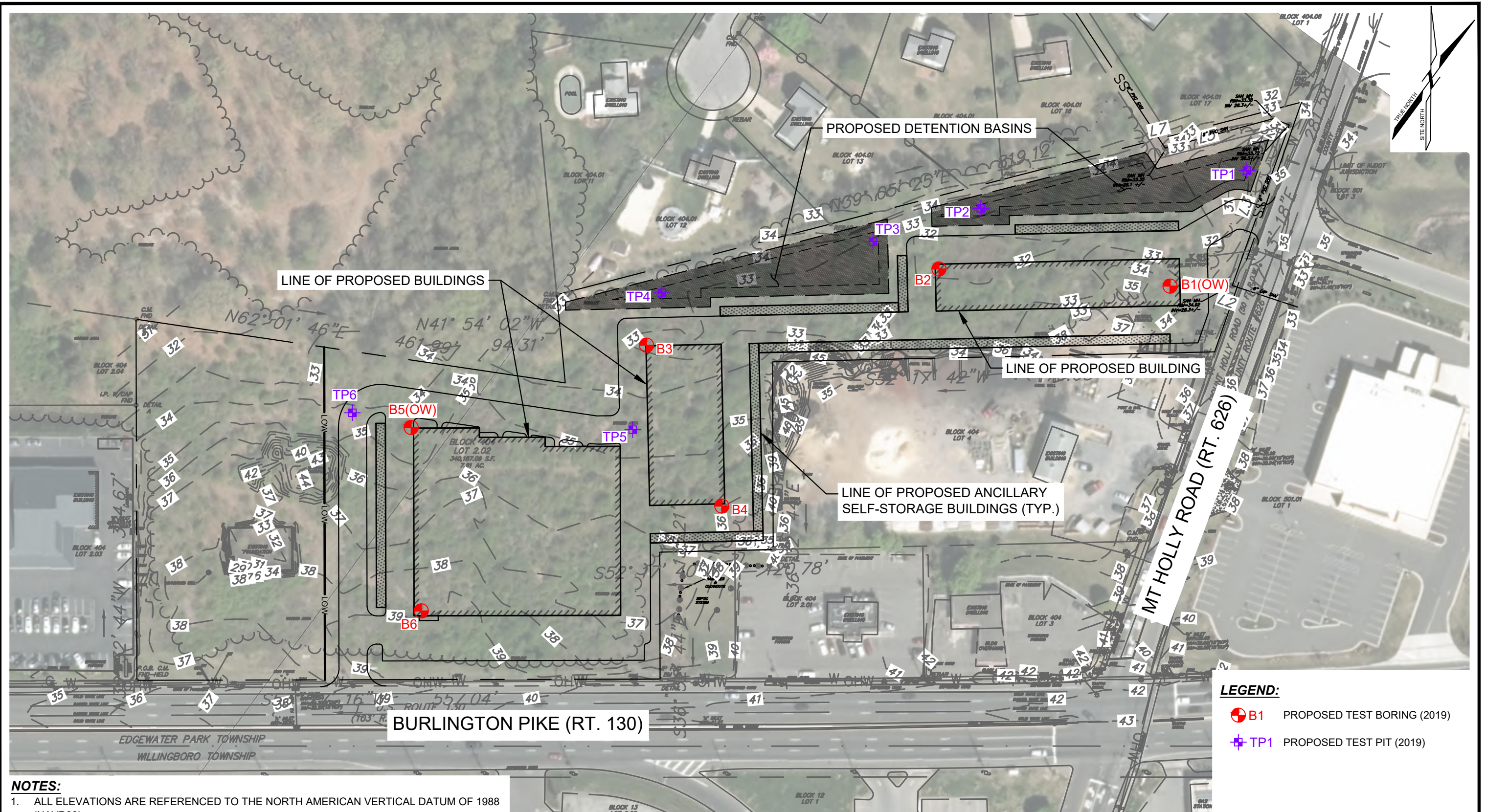
**Table 3. Constant Head Field Permeameter Data**  
**Phase 1 Geotechnical Evaluation Memo**  
**Edgewater Storage LLC**  
**Edgewater Park, Burlington County, NJ**

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:**

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





**NOTES:**  
 1. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

**SOURCE:**  
 1. NJ HIGH RESOLUTION 2015 ORTHOPHOTOGRAPHY MG4 ACCESSED VIA NJGIN ONLINE SERVICES ON APRIL 28, 2020.  
 2. SITE PLAN BASED ON ELECTRONIC DRAWING FILENAME, "20(01-20) email to treetop Dev.dwg", PREPARED BY STOUT & CALDWELL ENGINEERS, LLC AND PROVIDED BY WARE MALCOMB ON APRIL 28, 2020.  
 3. PROPOSED FEATURES BASED ON SITE PLAN PREPARED BY WARE MALCOMB TITLED, "CONCEPTUAL SITE PLAN; SCHEME: 8", DATED MARCH 27, 2020.



Phase 1 Geotechnical Memorandum  
 Edgewater Self-Storage Development  
 Edgewater Park, Burlington County, New Jersey  
 Edgewater Storage LLC  
 Teaneck, New Jersey



EXPLORATION LOCATION PLAN  
 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		<b>N:</b>	439,371.01 ft		<b>E:</b> 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	G2 Bag	2.0	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].
	G3 Bag	3.5	
4	G4 Bag	5.2	
6			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'.
	G5 Bag	9.5	
10			Bottom of test pit at ~9.5 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
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="width: 50%;"><b>Length</b></td> <td style="text-align: center;">9.4</td> </tr> <tr> <td><b>Width</b></td> <td style="text-align: center;">6</td> </tr> <tr> <td><b>Depth</b></td> <td style="text-align: center;">9.5</td> </tr> </table>	<b>Length</b>	9.4	<b>Width</b>	6	<b>Depth</b>	9.5	
<b>Length</b>	9.4							
<b>Width</b>	6							
<b>Depth</b>	9.5							

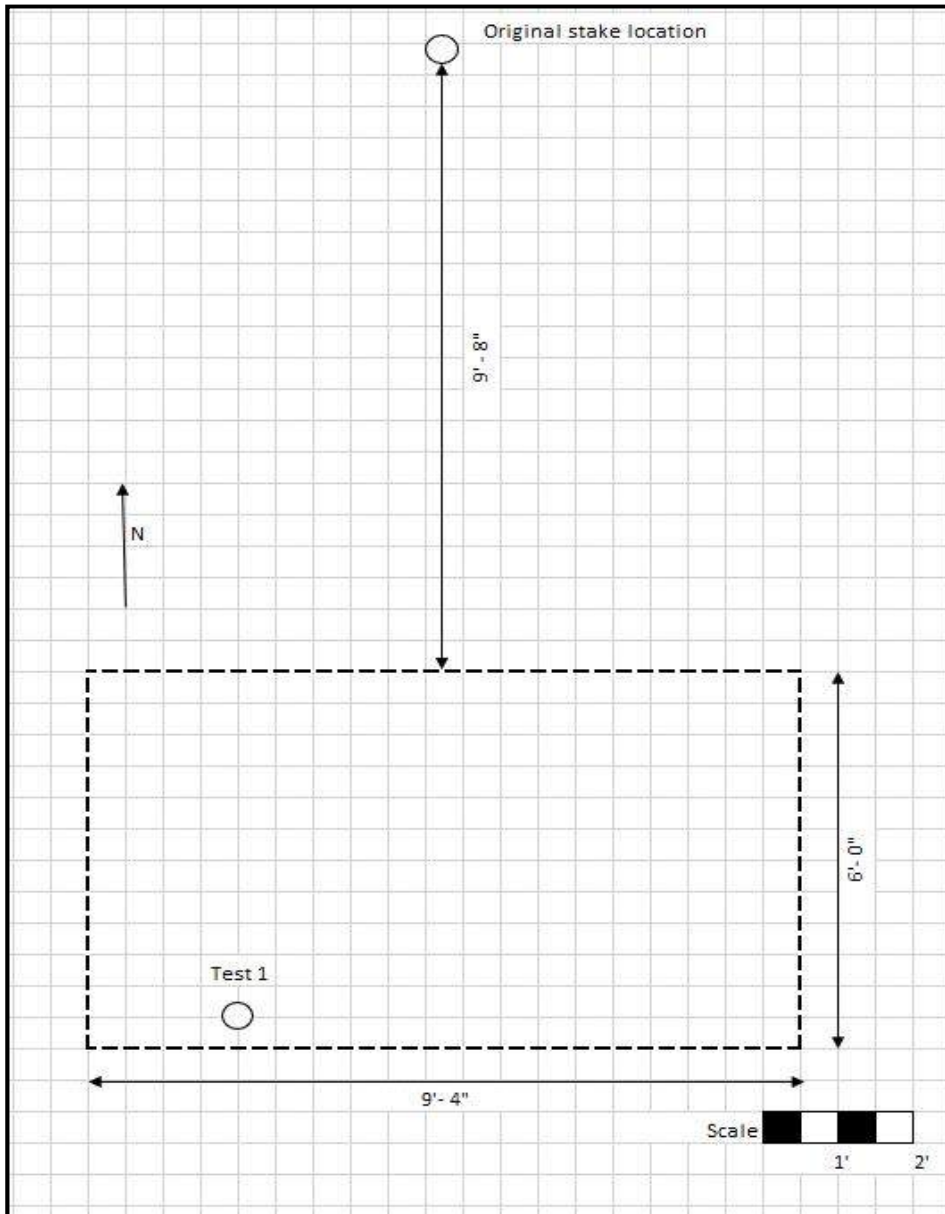


# TEST PIT LOG

# 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

<b>Project</b>	Edgewater Storage Development		
<b>City/Town</b>	Edgewater Park, Burlington County, NJ		
<b>Client</b>	Edgewater Storage, LLC		
<b>Equipment/Reach</b>	CASE 580 Super M Backhoe / ~14-foot Reach		
<b>Weather</b>	~55 °F, Sunny		
<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

<b>PG.</b>	3	<b>OF</b>	3
<b>Location</b>	See Plan		
	N: 439,371.01 ft	E: 375,091.91 ft	
<b>Ground El.</b>	33.2 ft		
<b>Datum</b>	NAD83 NJ / NAVD 88		
<b>Project No.</b>	2002331		
<b>Start Date</b>	5/22/2020		
<b>End Date</b>	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			<b>N:</b>	439,072.64 ft
<b>Equipment/Reach</b>	CASE 580 Super M Backhoe / ~14-foot Reach			<b>E:</b>	374,902.48 ft
<b>Weather</b>	~70s °F, Sunny			<b>Ground El.</b>	33.9 ft
<b>Contractor</b>	AmeriDrill	<b>Operator</b>	R. Wintersteen	<b>Datum</b>	NAD83 NJ / NAVD 88
<b>Observed By</b>	J. Light	<b>Date</b>	5/26/2020	<b>Project No.</b>	2002331
<b>Checked By</b>	S. DiBartolo	<b>Date</b>	6/17/2020	<b>Start Date</b>	5/26/2020
				<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.
2	G1 Bag	2	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.
4	G2 Bag	3	3'-4.5': CLAYEY SAND (SC); ~60% sand; ~30% medium to high plasticity fines; ~10% sub-rounded gravel; moist; red brown.
6	G3 Bag	5	4.5'-6': WIDELY GRADED SAND (SW); ~95% sand; ~5% subrounded gravel; moist; red brown.
8	G4 Bag	8	6'-8': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% medium to fine sand; ~10% low plasticity fines; moist; light gray; mottling.
10			Bottom of test pit at ~8 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
12			
14			
16			

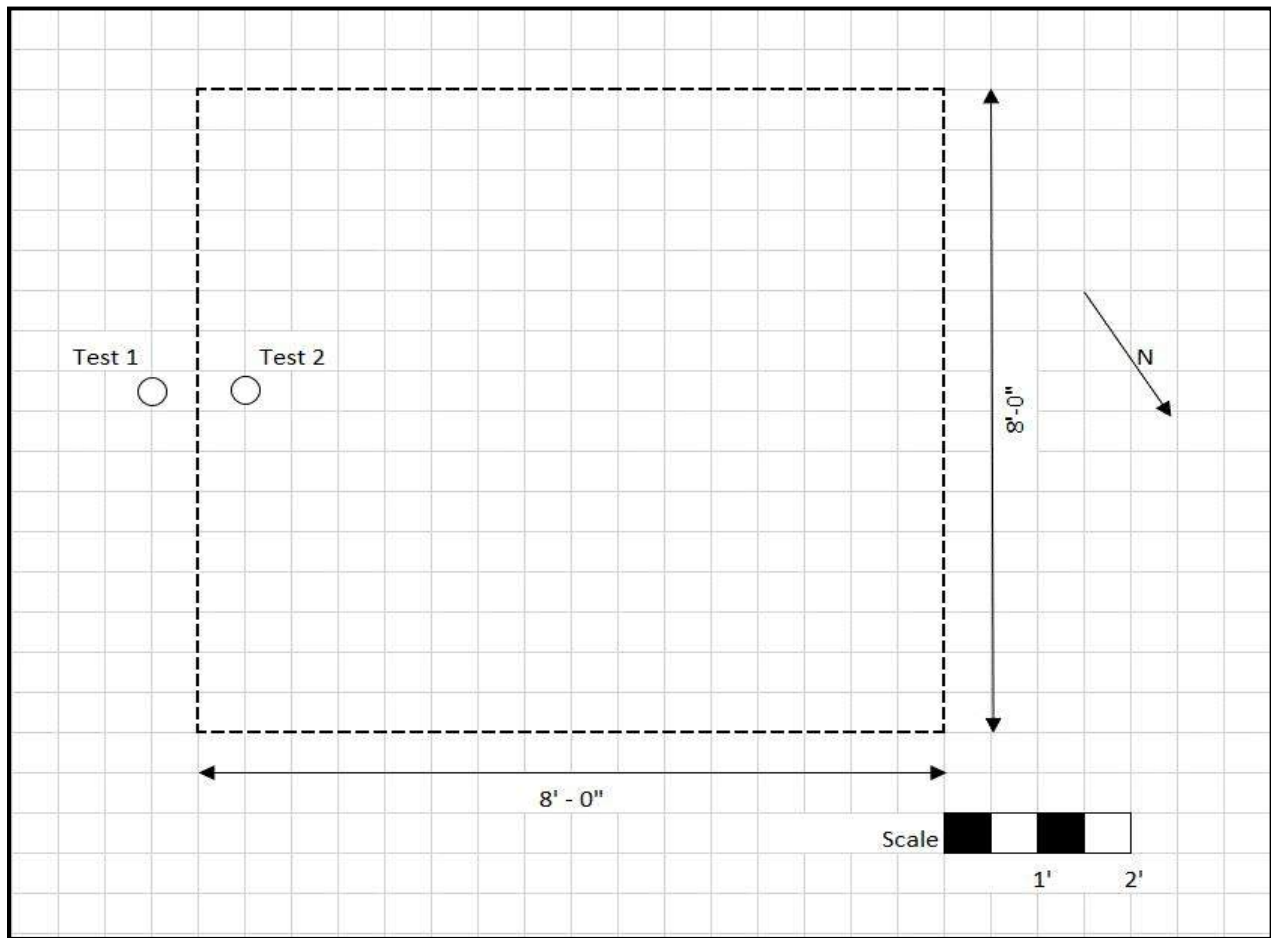
<b>Notes:</b> 1) Groundwater not encountered.	<b>Pit Dimensions (ft)</b>		
	Length	8	
	Width	8	
	Depth	8	

# 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

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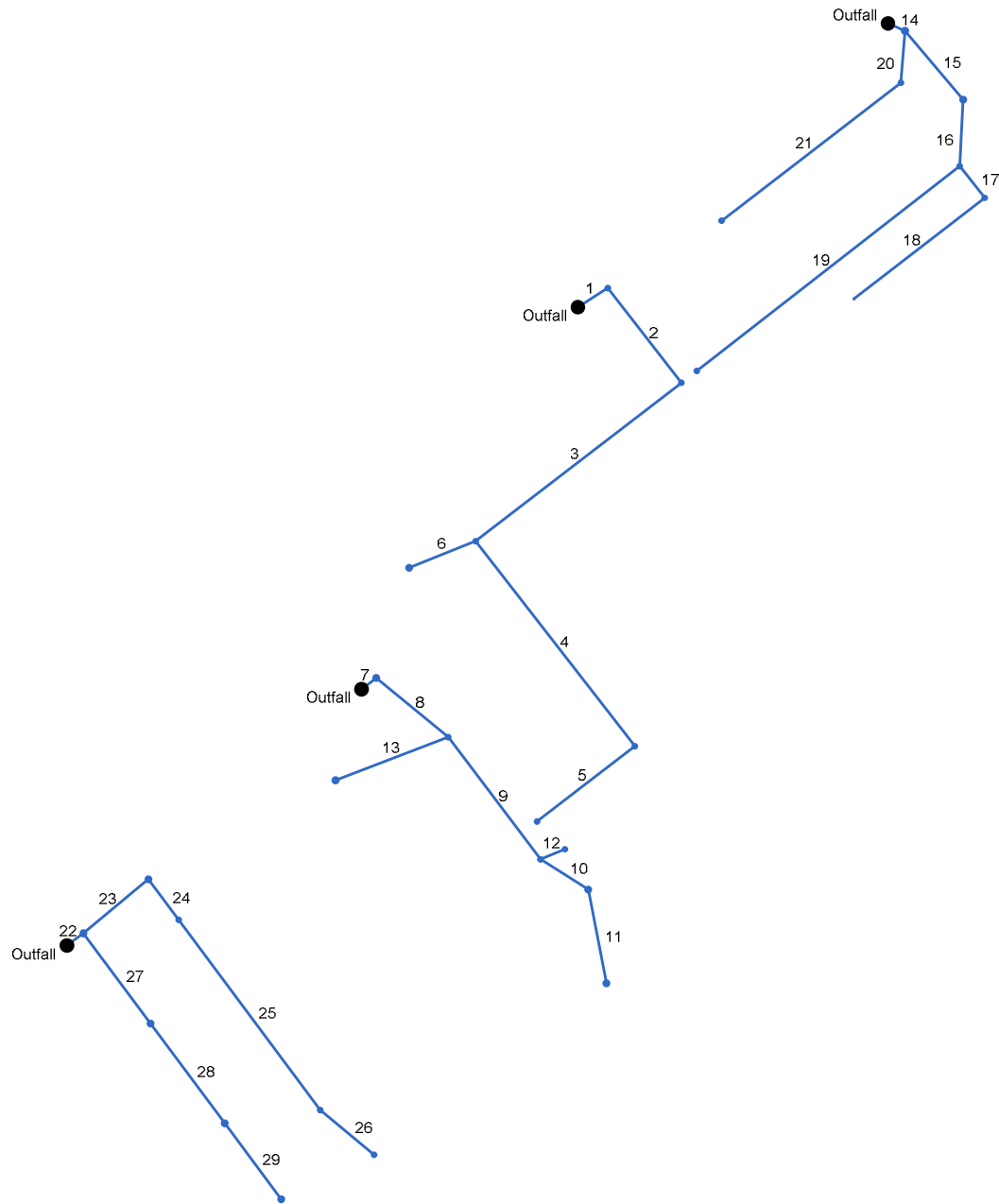
CIVIL ENGINEERING

BUILDING MEASUREMENT

## **Appendix G**



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



Project File: NYC19-0005\_rev 3.stm

Number of lines: 29

Date: 12/4/2020

# 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

Number of lines: 29

Run Date: 12/4/2020

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		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
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	31.72	32.42	32.62	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	31.97	32.83	32.95	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	32.52	33.10	33.56	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	33.07	33.73	33.92	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	33.33	34.02	34.03	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	32.67	33.73	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	31.44	32.36	32.48	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	31.68	32.77	32.82	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	32.75	33.61	33.89	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	32.87	34.08	34.11	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	33.05	34.15	34.16	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	33.30	34.08	34.09	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	31.95	33.02	33.04	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	31.44	32.48	32.62	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	31.63	32.96	33.02	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	31.77	33.15	33.19	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	31.85	33.32	33.41	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	32.17	33.60	34.59	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	32.48	33.32	33.58	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	31.55	32.96	32.98	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	32.03	33.01	33.12	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	30.44	31.24	31.39	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		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	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	0.00	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

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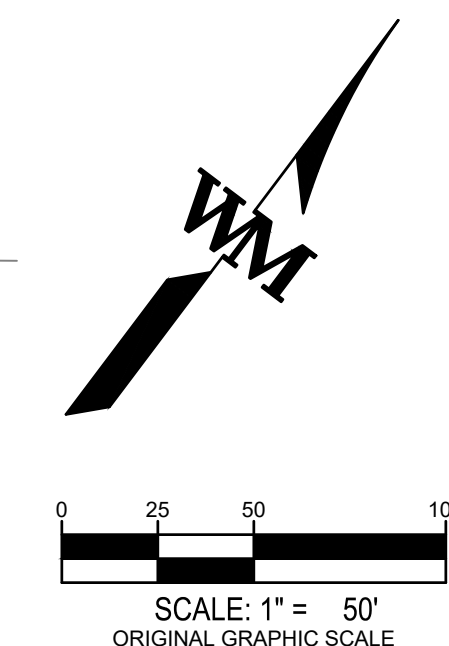
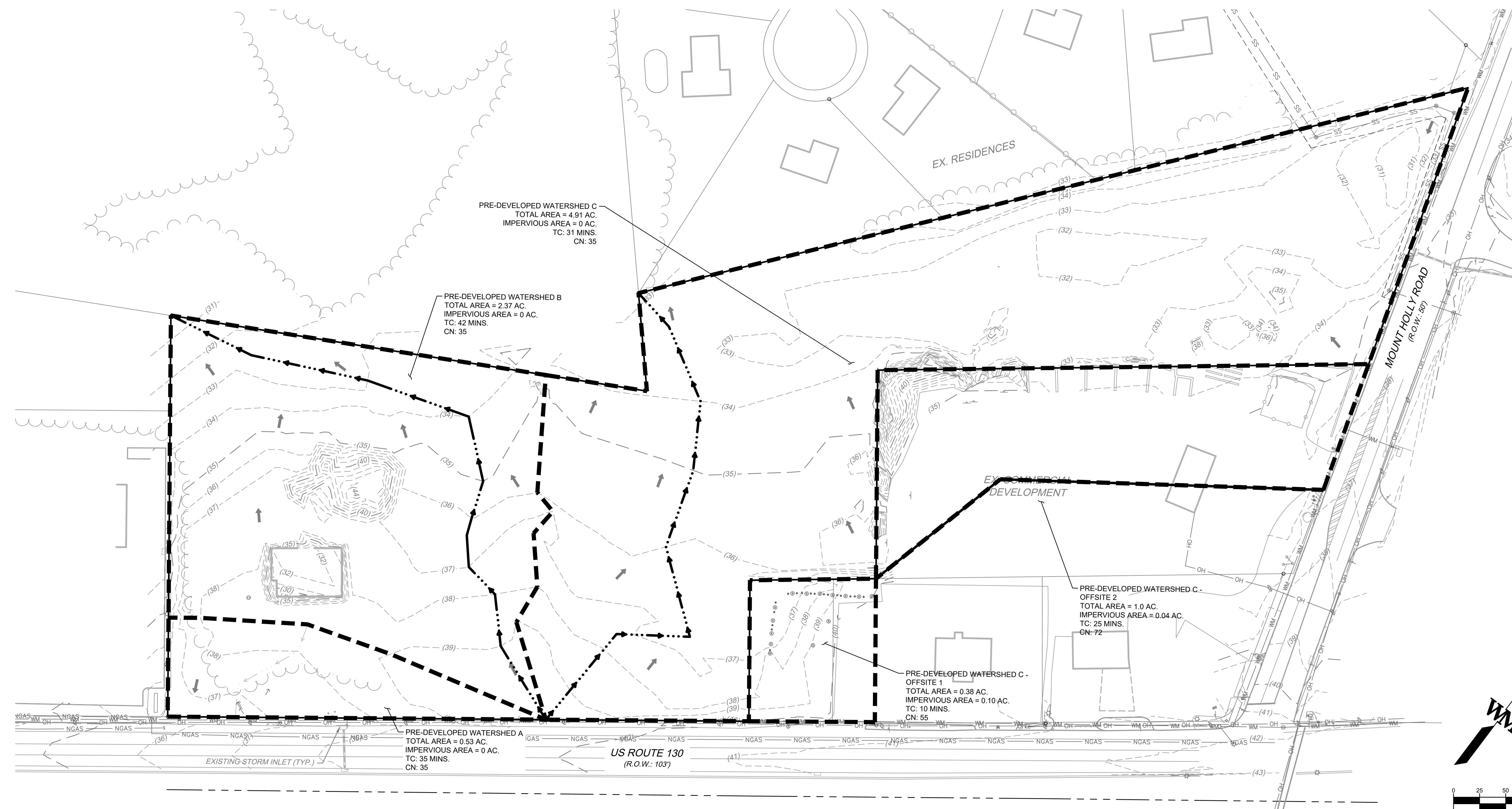
CIVIL ENGINEERING

BUILDING MEASUREMENT

## **Appendix H**

**LEGEND:**

- PROPERTY LINE
- - - EXISTING 5' CONTOUR
- - - EXISTING 1' CONTOUR
- ▣ EXISTING STORM INLET
- EXISTING FLOW DIRECTION
- EXISTING CURB & GUTTER
- NGAS
- WM
- E
- SS
- OH
- EXISTING WATER
- EXISTING ELECTRIC
- EXISTING SANITARY
- EXISTING OVERHEAD UTILITY
- EXISTING BUILDING
- TIME OF CONCENTRATION PATH



WARE MALCOMB assumes no responsibility for utility locations. The utilities shown on this drawing have been plotted from the best available information. It is, however, the contractors responsibility to field verify the location of all utilities prior to the commencement of any construction.

**WARE MALCOMB**  
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EDWARD F. WILKES, JR.  
PROFESSIONAL ENGINEER  
NJ LIC. NO. 24604937200

FOR AND ON BEHALF  
OF WARE MALCOMB

**EDGEWATER PARK - SELF STORAGE DEVELOPMENT**  
**PRELIMINARY SITE PLAN APPLICATION**  
**PRE-DEVELOPED DRAINAGE MAP**  
4201 ROUTE 130, BURLINGTON COUNTY, EDGWATER PARK, NEW JERSEY

NO.	DATE	REMARKS

JOB NO.:	NYC19-0005
PA / PM:	EW
DRAWN BY:	IH
DATE:	07/21/2020

SHEET  
**1**  
Sheet 1 of 3

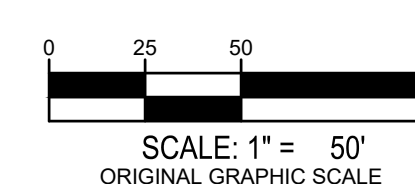
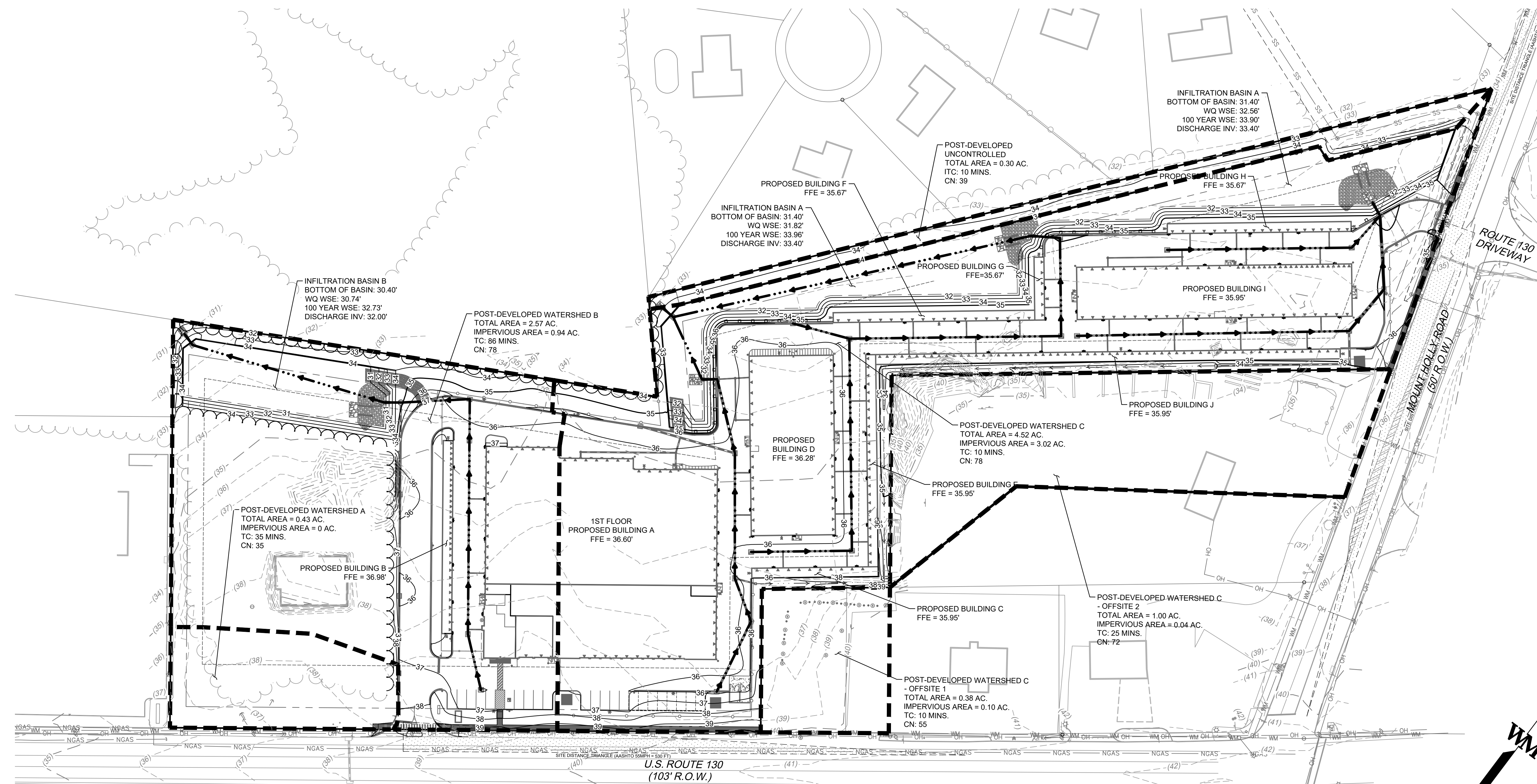
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**LEGEND:**

- PROPERTY LINE
- - - EXISTING 5' CONTOUR
- - - EXISTING 1' CONTOUR
- ▣ EXISTING STORM INLET
- EXISTING FLOW DIRECTION
- EXISTING CURB & GUTTER
- NGAS EXISTING GAS
- WM EXISTING WATER
- E EXISTING ELECTRIC
- SS EXISTING SANITARY
- OH EXISTING OVERHEAD UTILITY
- EXISTING BUILDING
- TIME OF CONCENTRATION PATH



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FOR AND ON BEHALF  
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**EDGEWATER PARK - SELF STORAGE DEVELOPMENT**  
**PRELIMINARY SITE PLAN APPLICATION**  
**POST DEVELOPMENT WATERSHED PLAN**  
4201 ROUTE 130, BURLINGTON COUNTY, EDgewater PARK, NEW JERSEY

NO.	DATE	REMARKS

JOB NO.:	NYC19-0005
PA / PM:	EW
DRAWN BY:	IH
DATE:	07/21/2020

SHEET  
**2**  
Sheet 2 of 3

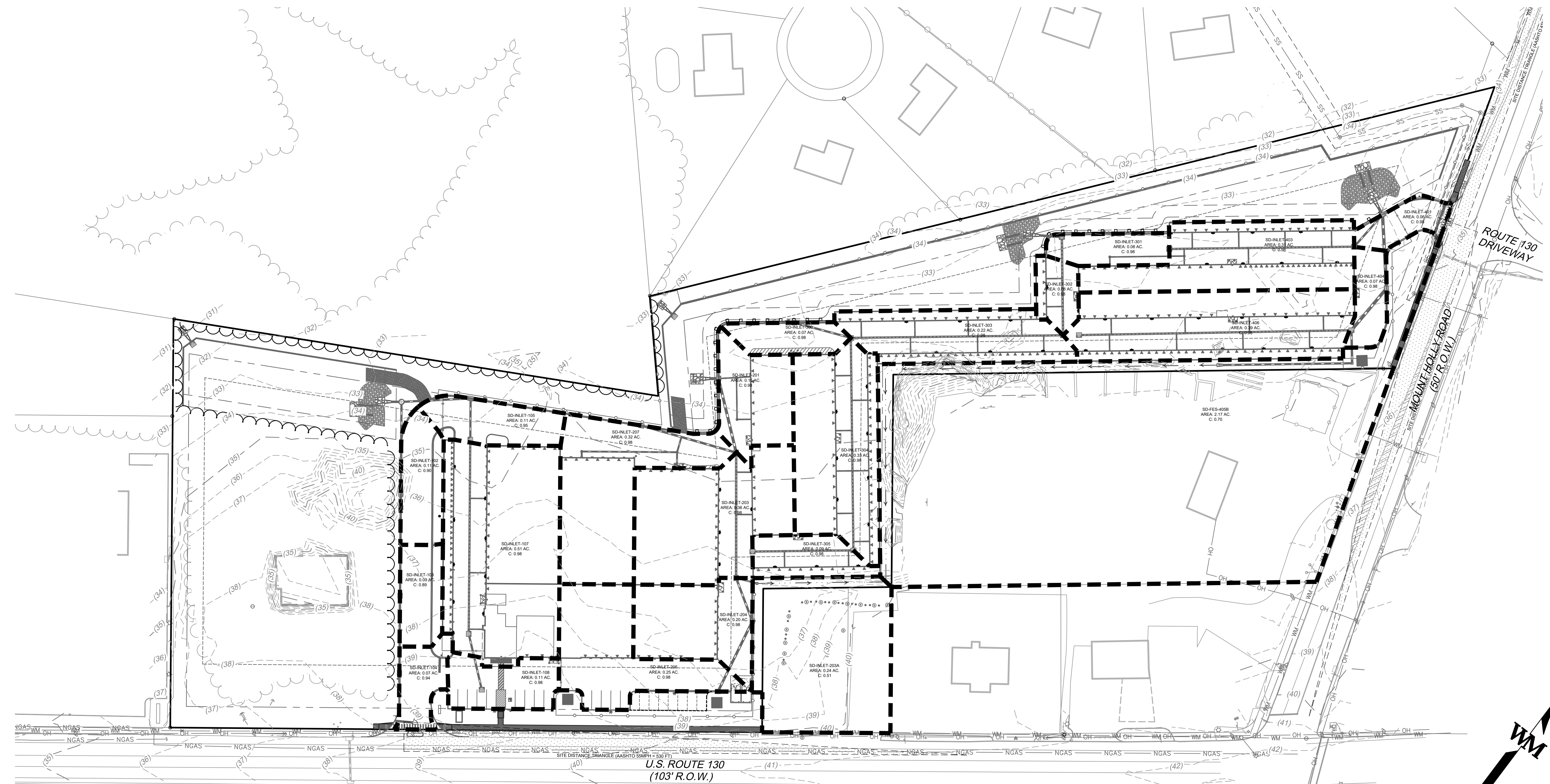
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**LEGEND:**

- PROPERTY LINE
- - - EXISTING 5' CONTOUR
- - - EXISTING 1' CONTOUR
- ▣ EXISTING STORM INLET
- EXISTING FLOW DIRECTION
- ▬ EXISTING CURB & GUTTER
- NGAS — EXISTING GAS
- WM — EXISTING WATER
- E — EXISTING ELECTRIC
- SS — EXISTING SANITARY
- OH — EXISTING OVERHEAD UTILITY
- ▭ EXISTING BUILDING
- → → TIME OF CONCENTRATION PATH



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FOR AND ON BEHALF  
OF WARE MALCOMB

**EDGEWATER PARK - SELF STORAGE DEVELOPMENT**  
**PRELIMINARY SITE PLAN APPLICATION**  
**SUBWATERSHED**  
4201 ROUTE 130, BURLINGTON COUNTY, EDgewater PARK, NEW JERSEY

NO.	DATE	REMARKS

JOB NO.:	NYC19-0005
PA / PM:	EW
DRAWN BY:	IH
DATE:	07/21/2020

SHEET  
**3**  
Sheet 3 of 3

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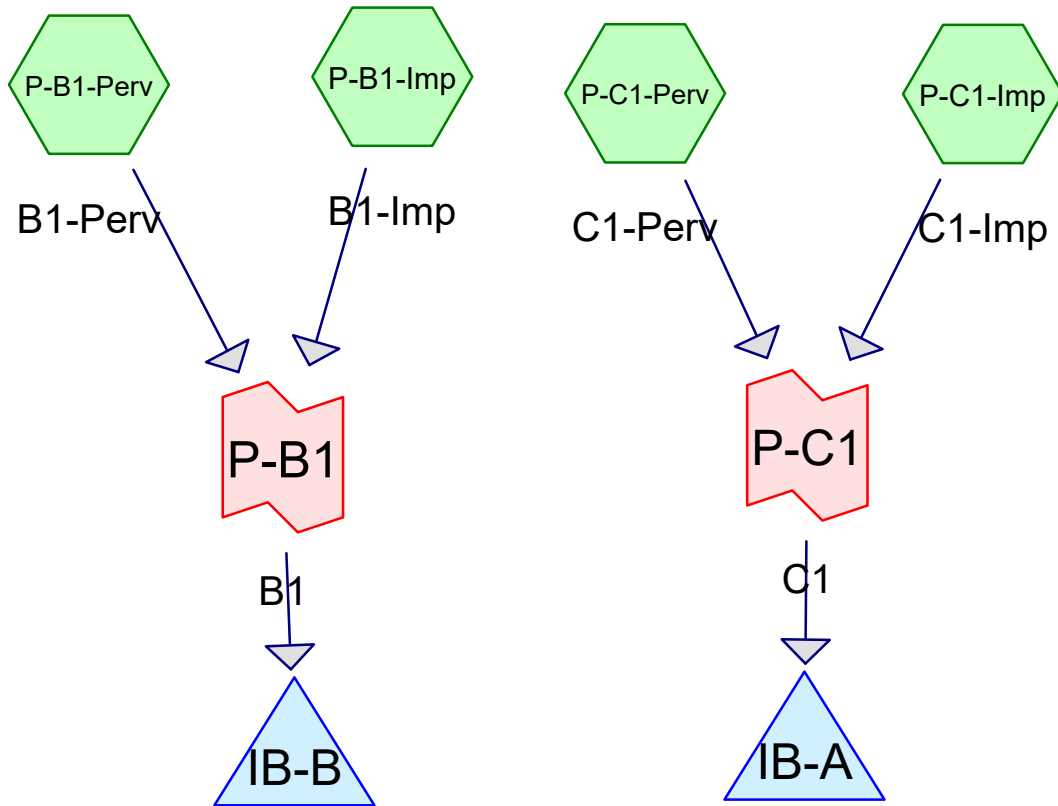
PLANNING

CIVIL ENGINEERING

BUILDING MEASUREMENT

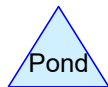
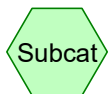
## **Appendix I**





Infiltration Basin B

Infiltration Basin A



**NYC19-0005**

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4201 US Route 130, Edgewater Park  
NOAA 24-hr D 100-Year Rainfall=8.47"

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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

<b>SubcatchmentP-B1-Imp: B1-Imp</b>	Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=8.23" Tc=10.0 min CN=0/98 Runoff=4.96 cfs 0.641 af
<b>SubcatchmentP-B1-Perv: B1-Perv</b>	Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=1.16" Tc=42.0 min CN=37/0 Runoff=0.41 cfs 0.158 af
<b>SubcatchmentP-C1-Imp: C1-Imp</b>	Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=8.23" Tc=10.0 min CN=0/98 Runoff=16.03 cfs 2.068 af
<b>SubcatchmentP-C1-Perv: C1-Perv</b>	Runoff Area=1.802 ac 0.00% Impervious Runoff Depth=1.36" Tc=10.0 min CN=39/0 Runoff=1.23 cfs 0.204 af
<b>Pond IB-A: Infiltration Basin A</b>	Peak Elev=33.95' Storage=1.809 af Inflow=17.21 cfs 2.273 af Primary=0.00 cfs 0.000 af Secondary=0.99 cfs 0.502 af Outflow=0.99 cfs 0.502 af
<b>Pond IB-B: Infiltration Basin B</b>	Peak Elev=32.73' Storage=0.598 af Inflow=5.00 cfs 0.798 af Primary=0.00 cfs 0.000 af Secondary=0.47 cfs 0.210 af Outflow=0.47 cfs 0.210 af
<b>Link P-B1: B1</b>	Inflow=5.00 cfs 0.798 af Primary=5.00 cfs 0.798 af
<b>Link P-C1: C1</b>	Inflow=17.21 cfs 2.273 af Primary=17.21 cfs 2.273 af
<b>Total Runoff Area = 7.384 ac Runoff Volume = 3.071 af Average Runoff Depth = 4.99"</b>	
<b>46.51% Pervious = 3.434 ac 53.49% Impervious = 3.950 ac</b>	

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

Runoff = 4.96 cfs @ 12.19 hrs, Volume= 0.641 af, Depth= 8.23"

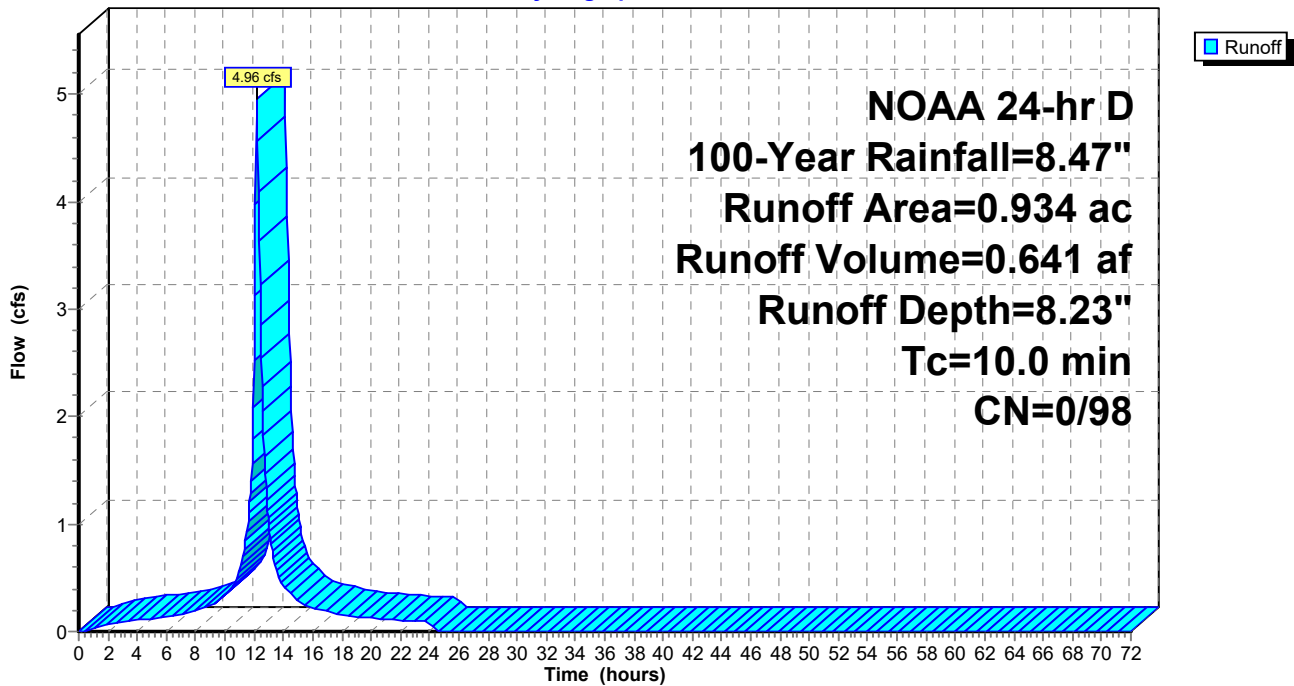
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr D 100-Year Rainfall=8.47"

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 = 0.41 cfs @ 13.02 hrs, Volume= 0.158 af, Depth= 1.16"

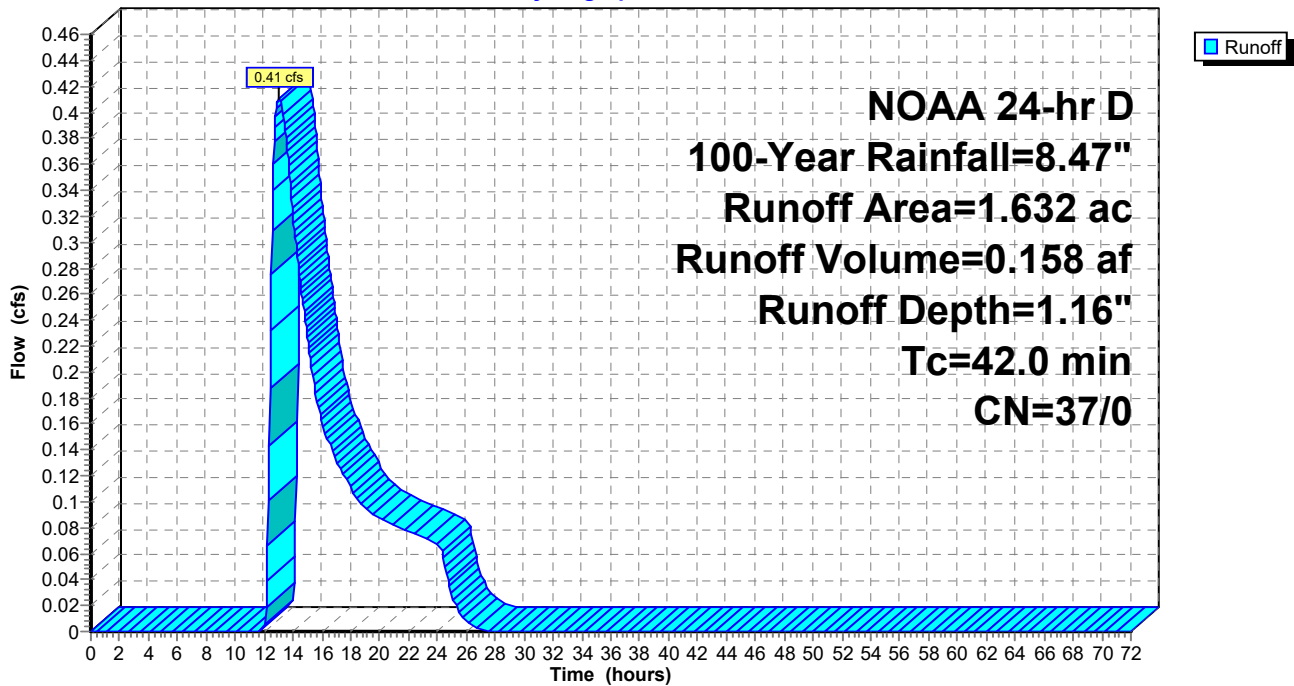
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Area (ac)	CN	Description
0.926	36	Woods, Fair, HSG A
0.706	39	>75% Grass cover, Good, HSG A
1.632	37	Weighted Average
1.632	37	100.00% Pervious Area

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 = 16.03 cfs @ 12.19 hrs, Volume= 2.068 af, Depth= 8.23"

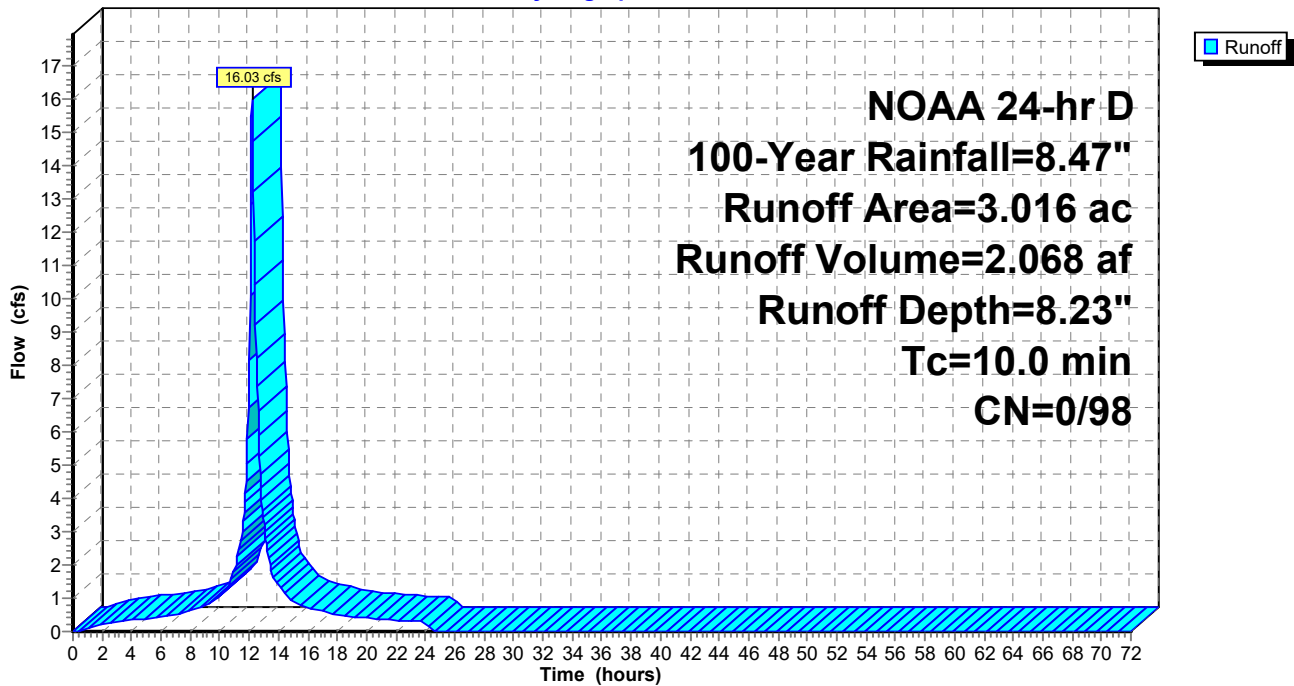
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr D 100-Year Rainfall=8.47"

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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NOAA 24-hr D 100-Year Rainfall=8.47"

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Page 6

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

Runoff = 1.23 cfs @ 12.25 hrs, Volume= 0.204 af, Depth= 1.36"

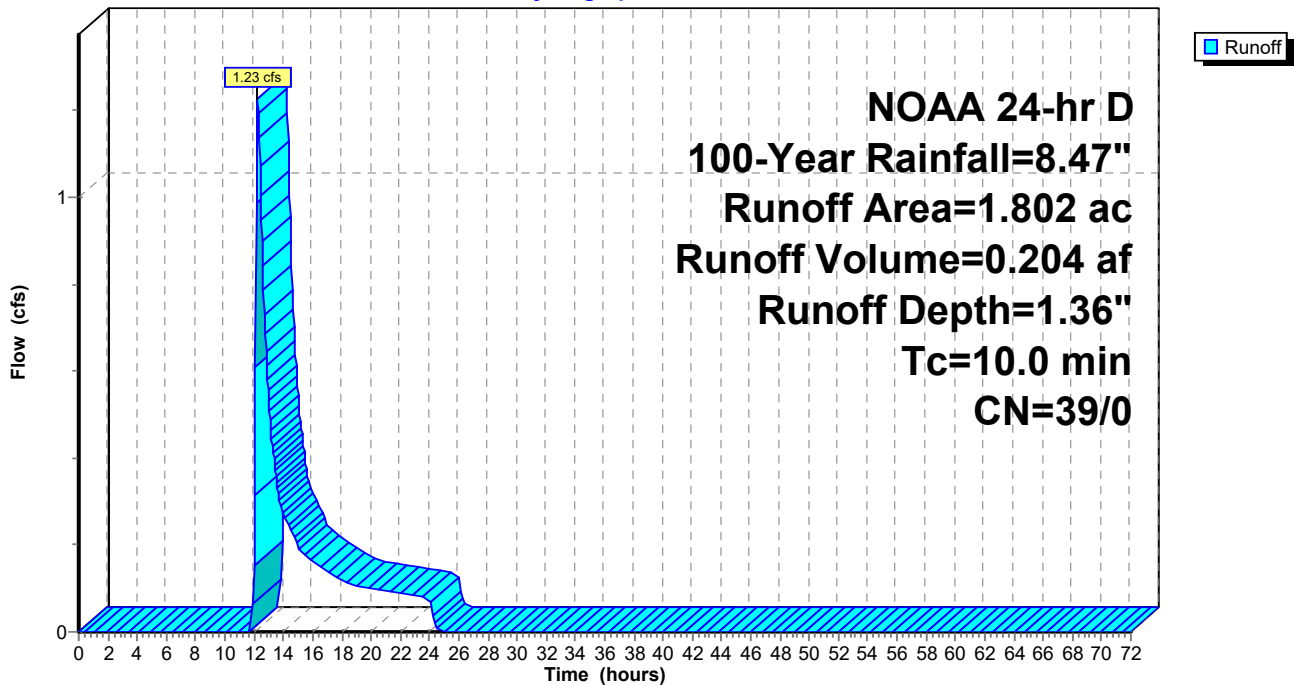
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
NOAA 24-hr D 100-Year Rainfall=8.47"

Area (ac)	CN	Description
1.802	39	>75% Grass cover, Good, HSG A
1.802	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



**NYC19-0005**

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 NOAA 24-hr D 100-Year Rainfall=8.47"

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

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 5.66" for 100-Year event  
 Inflow = 17.21 cfs @ 12.19 hrs, Volume= 2.273 af  
 Outflow = 0.99 cfs @ 15.33 hrs, Volume= 0.502 af, Atten= 94%, Lag= 188.4 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.99 cfs @ 15.33 hrs, Volume= 0.502 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 33.95' @ 15.33 hrs Surf.Area= 0.788 ac Storage= 1.809 af

Plug-Flow detention time= 654.0 min calculated for 0.502 af (22% of inflow)  
 Center-of-Mass det. time= 367.0 min ( 1,134.4 - 767.4 )

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>15.0" Round Culvert</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	Device 1	33.40'	<b>4.0" Vert. Orifice/Grate X 0.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	33.90'	<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

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=31.40' (Free Discharge)

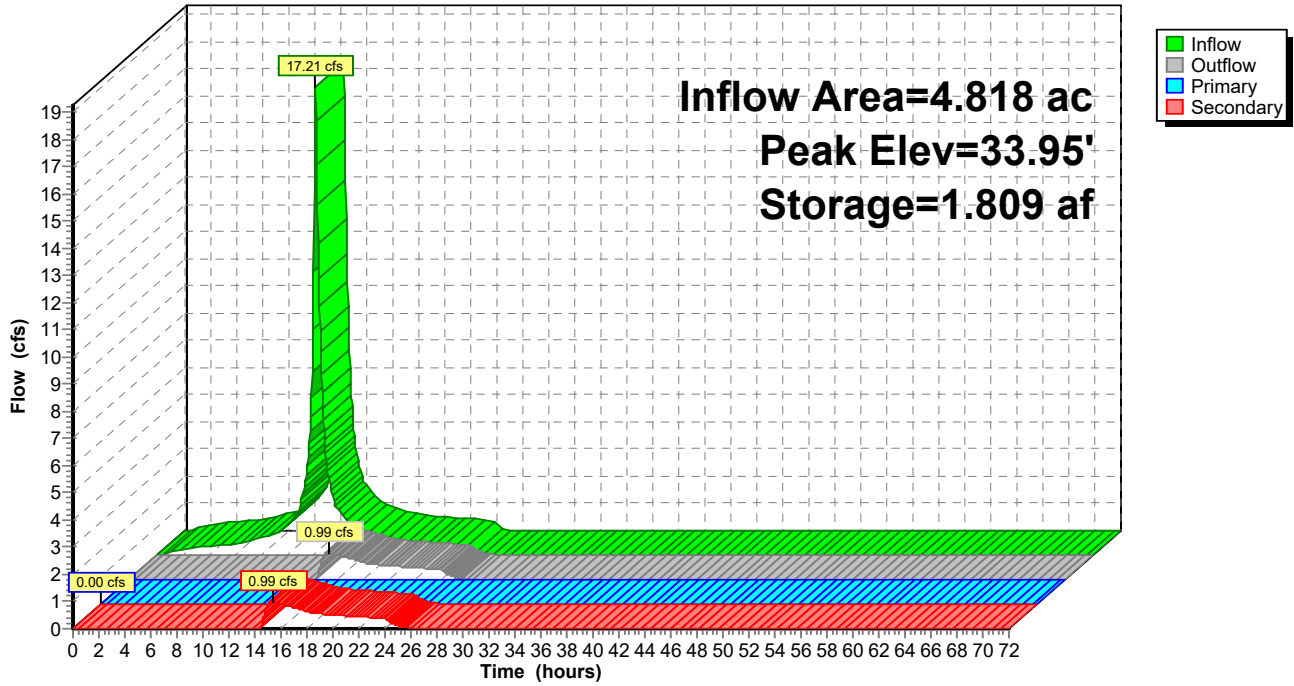
- ↑1=Culvert ( Controls 0.00 cfs)
- ↑2=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.99 cfs @ 15.33 hrs HW=33.95' (Free Discharge)

- ↑3=Broad-Crested Rectangular Weir (Weir Controls 0.99 cfs @ 0.56 fps)

### Pond IB-A: Infiltration Basin A

Hydrograph





**NYC19-0005**

Prepared by Ware Malcomb

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4201 US Route 130, Edgewater Park  
 NOAA 24-hr D 100-Year Rainfall=8.47"

Printed 7/22/2020

Page 9

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

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.73" for 100-Year event  
 Inflow = 5.00 cfs @ 12.19 hrs, Volume= 0.798 af  
 Outflow = 0.47 cfs @ 15.23 hrs, Volume= 0.210 af, Atten= 91%, Lag= 182.2 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 0.47 cfs @ 15.23 hrs, Volume= 0.210 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.73' @ 15.23 hrs Surf.Area= 0.276 ac Storage= 0.598 af

Plug-Flow detention time= 600.1 min calculated for 0.210 af (26% of inflow)  
 Center-of-Mass det. time= 337.0 min ( 1,135.8 - 798.8 )

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	

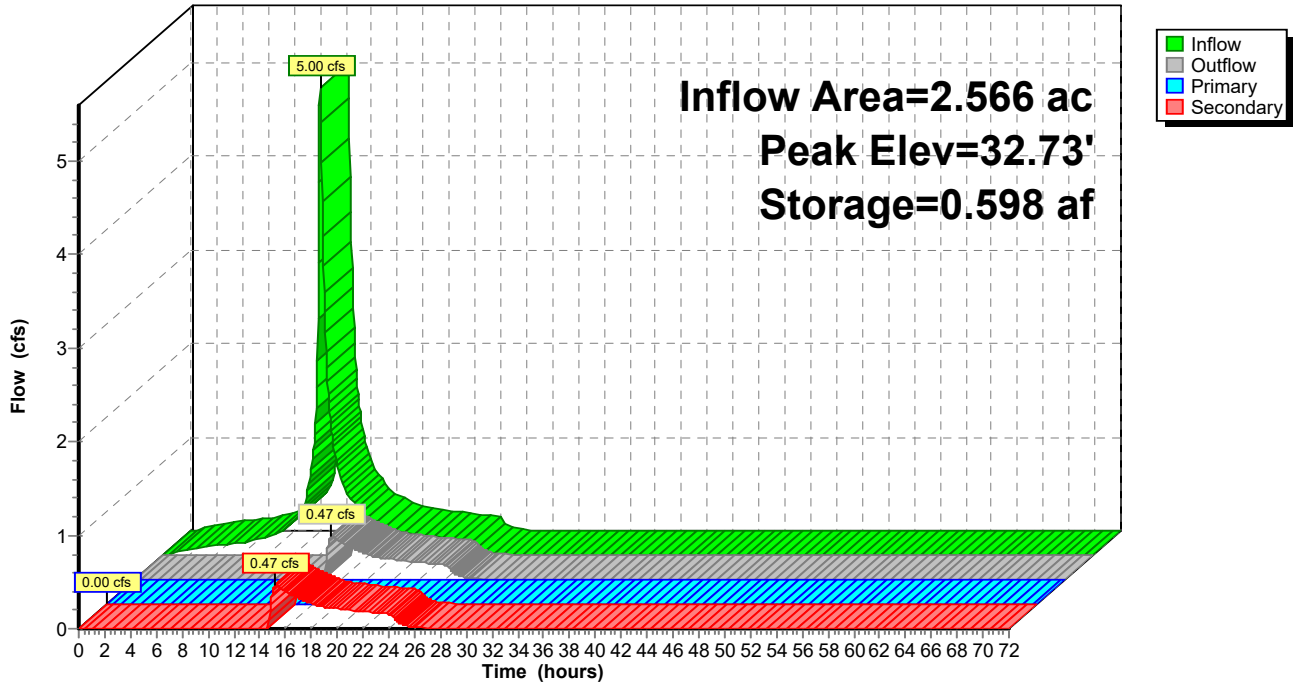
Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	<b>15.0" Round Culvert</b> L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.95' / 30.75' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	32.00'	<b>3.0" Vert. Orifice/Grate X 0.00</b> C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.70'	<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=0.47 cfs @ 15.23 hrs HW=32.73' (Free Discharge)  
 ↑3=Broad-Crested Rectangular Weir (Weir Controls 0.47 cfs @ 0.46 fps)

### Pond IB-B: Infiltration Basin B

Hydrograph



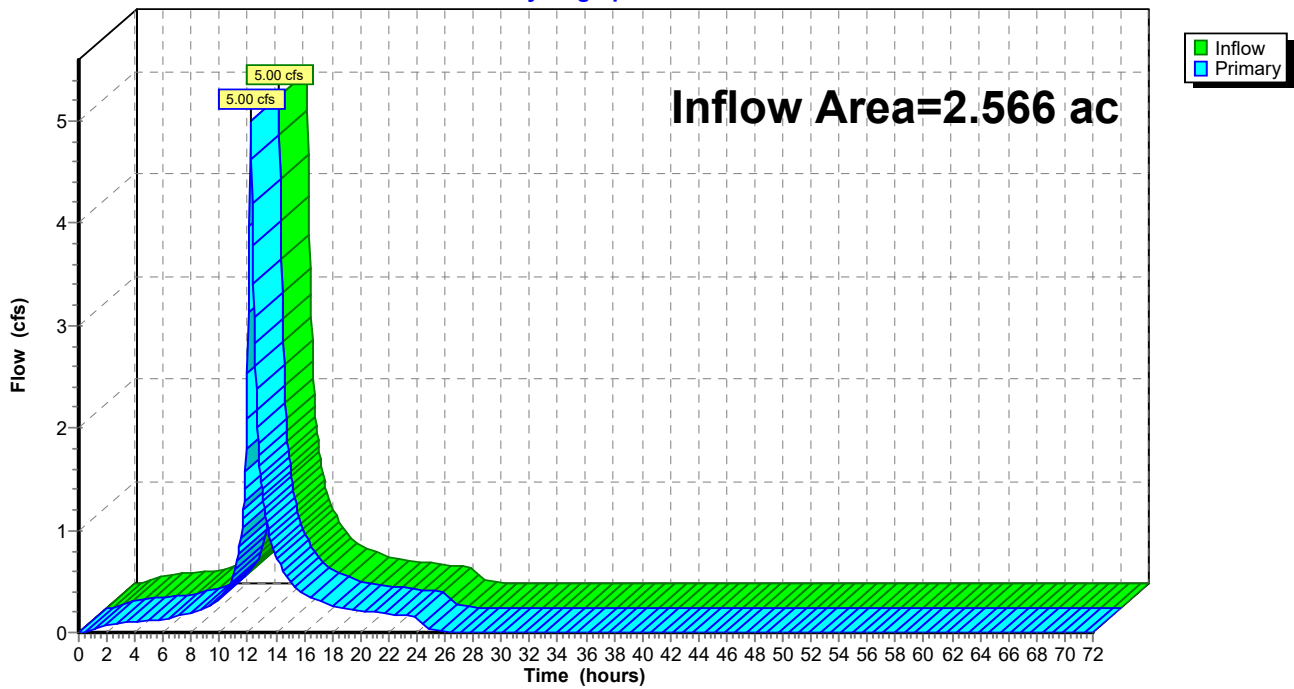
### Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 3.73" for 100-Year event  
Inflow = 5.00 cfs @ 12.19 hrs, Volume= 0.798 af  
Primary = 5.00 cfs @ 12.19 hrs, Volume= 0.798 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



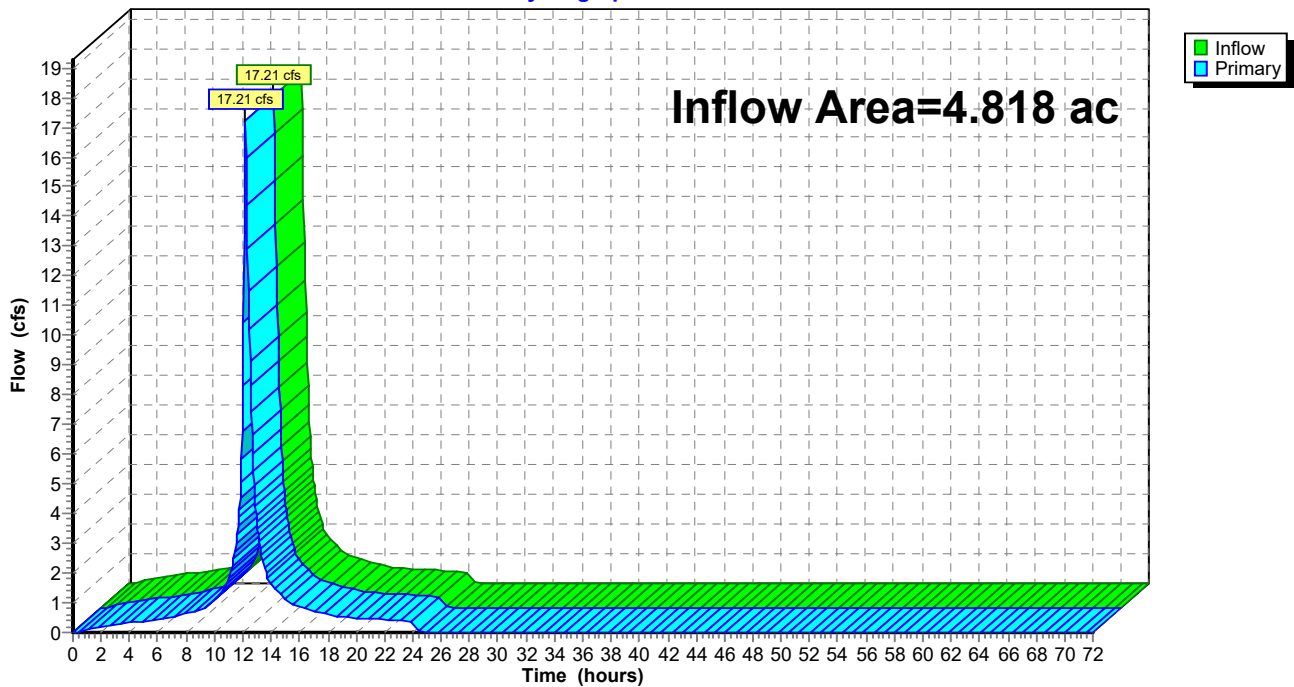
### Summary for Link P-C1: C1

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 5.66" for 100-Year event  
Inflow = 17.21 cfs @ 12.19 hrs, Volume= 2.273 af  
Primary = 17.21 cfs @ 12.19 hrs, Volume= 2.273 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



Date 07/10/20

**100-Year  
Rainfall**

**8.47**

Designed By SMR

**Edgewater Park Self Storage - NYC19-0005**

Checked By EFW

**EMERGENCY SPILLWAY SUMMARY**

(per Municipal requirements)

Basin	Drainage Area (Acres)	Effective Height of the Basin (1)	Basin Classified as a Dam?	Basin 100-Year Water Elevation	Spillway Elevation	Spillway Length	Design 24-Hour Rainfall Amount	Water Elevation Through Spillway (1)	Minimum Basin Berm Elevation (2)	Provided Berm Elevation	Provided Freeboard Over Water Elevation	Flow (Q) Through Spillway (1)	Water Velocity Through Spillway
A	4.82	0.90	NO	33.80	33.90	35	8.47	33.95	34.95	35.00	1.05	0.72	0.41
B	2.57	2.10	NO	32.64	32.70	30	8.47	32.73	33.73	34.00	1.27	0.33	0.37

(1) The emergency spillway for a basin that is classified as a dam, per NJAC 7:20-1.8(a)4, must be analyzed with the 100-year storm + 50%. The effective height of a basin is defined as the vertical distance between the emergency spillway and the junction of the downstream face of a dam with the ground surface or the invert of the outlet pipe, whichever is the lowest point, per NJAC 7:20-1.2. The emergency spillway for a basin that is not classified as a dam is to be analyzed with the 100-year storm. The principal spillway is assumed to be malfunctioning and not allowing any flow in both cases.

(2) The settled embankment for a basin shall be a minimum of 1ft over the water surface with the emergency spillway at design depth.

Notes:

# WARE MALCOMB

ARCHITECTURE

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CIVIL ENGINEERING

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>		

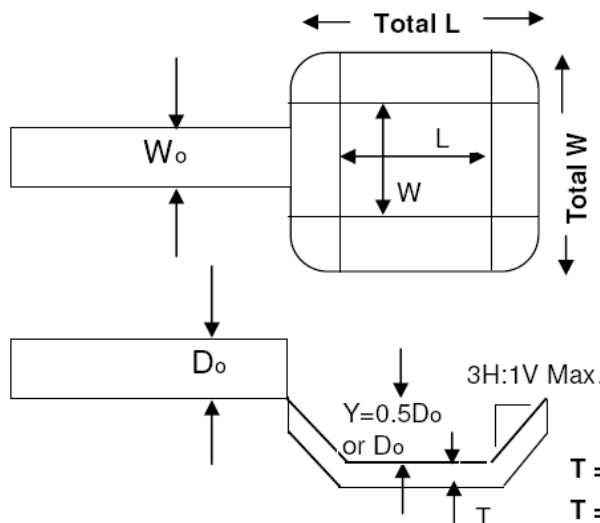
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<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> Volume of riprap (V) = <b>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-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>		

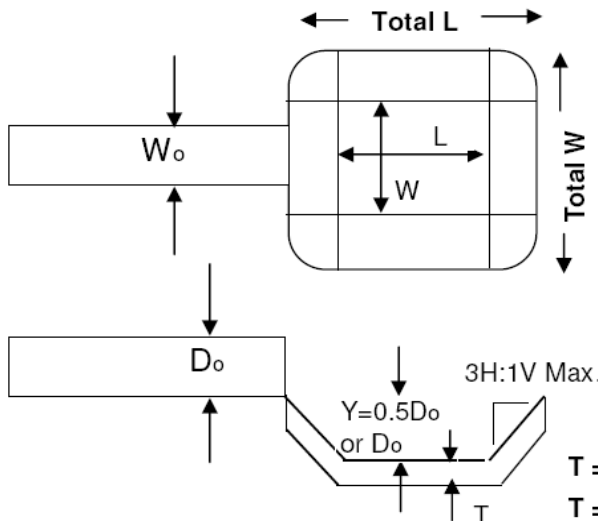
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<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



<b>L = 3 D<sub>o</sub> = 6.00 ' </b>
<b>W = 2 W<sub>o</sub> = 4.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>
<b>Total L = 12.00 , Total W = 10.00</b>
<b>If Y = D<sub>o</sub></b>
<b>Total L = 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>	<b>Total L = 12 '      L = 6 ' </b>
	<b>Total W = 10 '      W = 4 ' </b>
	<b>Depth of scour hole (Y) = 1 ' </b>
	<b>d<sub>50</sub> stone size = 4 " </b>
	<b>Thickness of riprap (T) = 8 " </b>
	<b>Volume of riprap (V) = 2.96 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-300**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

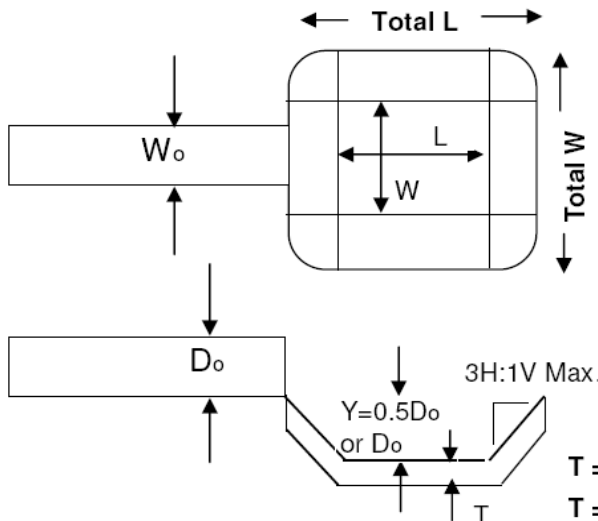
Q =	<b>4.09 c.f.s.</b>	W <sub>o</sub> =	<b>1.50 Ft.</b>
D <sub>o</sub> =	<b>1.50 Ft.</b>	q=Q/W <sub>o</sub> =	<b>2.73 c.f.s.</b>
TW=	<b>0.30 Ft.</b>		

(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 = 1/2 D<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>	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:

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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>		

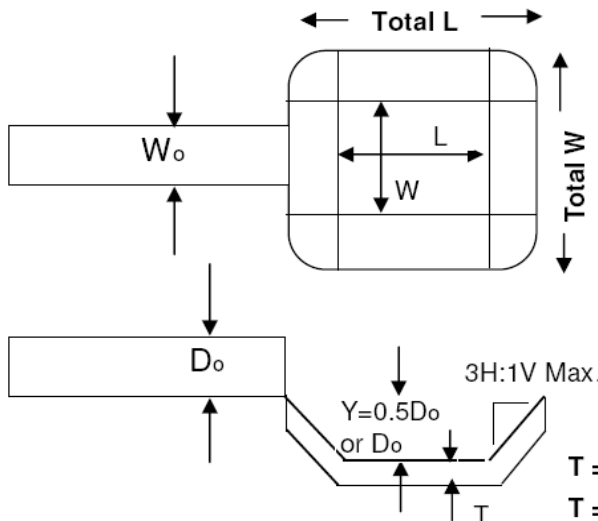
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<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



<b>L = 3 D<sub>o</sub> = 6.00 ' </b>
<b>W = 2 W<sub>o</sub> = 4.00 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>
<b>Total L = 12.00 , Total W = 10.00</b>
<b>If Y = D<sub>o</sub></b>
<b>Total L = 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>	<b>Total L = 12 '      L = 6 ' </b>
	<b>Total W = 10 '      W = 4 ' </b>
	<b>Depth of scour hole (Y) = 1 ' </b>
	<b>d<sub>50</sub> stone size = 5 " </b>
	<b>Thickness of riprap (T) = 10 " </b>
	<b>Volume of riprap (V) = 3.7 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-OUT-A**

Job # NYC19-0005

Job Name: Edgewater Park Self Storage

Designed by: SMR

Checked by: EW

Q =	<b>0.72 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>0.58 c.f.s.</b>
TW =	<b>0.25 Ft.</b>		

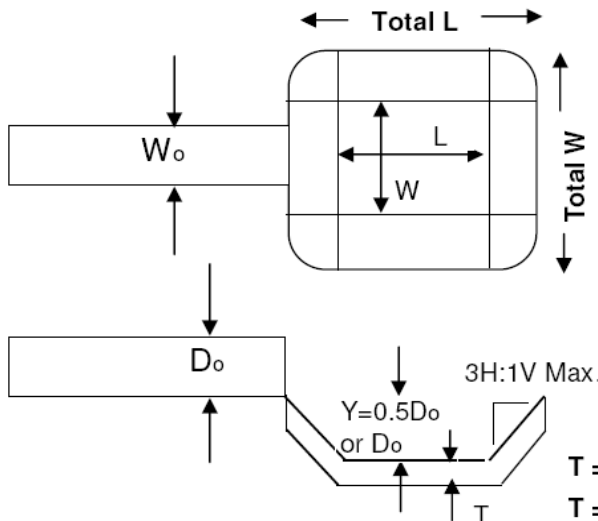
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<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>0.04 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>0.02 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



<b>L = 3 D<sub>o</sub> = 3.75 ' </b>
<b>W = 2 W<sub>o</sub> = 2.50 ' </b>
<b>If Y = 1/2 D<sub>o</sub></b>
<b>Total L = 7.50 , Total W = 6.25</b>
<b>If Y = D<sub>o</sub></b>
<b>Total L = 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>	<b>Total L = 7.5 '      L = 3.75 ' </b>
	<b>Total W = 6.25 '      W = 2.5 ' </b>
	<b>Depth of scour hole (Y) = 0.625 ' </b>
	<b>d<sub>50</sub> stone size = 3 " </b>
	<b>Thickness of riprap (T) = 6 " </b>
	<b>Volume of riprap (V) = 0.87 CY</b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	

Notes:

**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>2.14 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>1.71 c.f.s.</b>
TW =	<b>0.25 Ft.</b>		

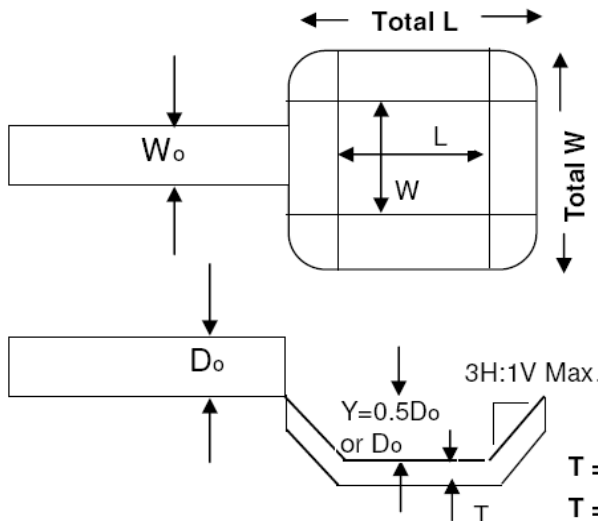
(For areas where Tw cannot be computed, use Tw = 0.2D<sub>o</sub>)

<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>0.16 Ft.</b>	=	<b>2 " 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>0.07 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



<b>L = 3 D<sub>o</sub> = 3.75 ' </b>
<b>W = 2 W<sub>o</sub> = 2.50 ' </b>
<b>If Y = 1/2D<sub>o</sub></b>
<b>Total L = 7.50 , Total W = 6.25</b>
<b>If Y = D<sub>o</sub></b>
<b>Total L = 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-B Design Summary</b>	
<b>Select Scour Hole Design</b>	<b>Total L = 7.5 '      L = 3.75 ' </b>
	<b>Total W = 6.25 '      W = 2.5 ' </b>
	<b>Depth of scour hole (Y) = 0.625 ' </b>
	<b>d<sub>50</sub> stone size = 3 " </b>
	<b>Thickness of riprap (T) = 6 " </b>
	<b>Volume of riprap (V) = 0.87 CY </b>
<b>Y = 1/2 D<sub>o</sub> Use Filter Fabric</b>	

Notes:

# WARE MALCOMB

ARCHITECTURE

INTERIORS

BRANDING

PLANNING

CIVIL ENGINEERING

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:  No: \_\_\_\_\_

If yes, were these inventories factors in the site's layout and design? Yes:  No: \_\_\_\_\_

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes:  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:  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:  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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