WARE MALCOMB

ARCHITECTURE
INTERIORS
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PLANNING
CIVIL ENGINEERING
BUILDING MEASUREMENT

DRAINAGE REPORT

Edgewater Park Self Storage Development
4201 US Route 130
Edgewater Park, Burlington County, New Jersey 08010
07/21/2020

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.

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.

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	0.13	80%	0.10

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	0.03	75%	0.02
100	0.52	80%	0.42

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	0.00	50%	0.00
10	0.06	75%	0.05
100	1.26	80%	1.01

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.

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	0.00	32.56
10	0.00	0.05	33.21
100	0.72	1.01	33.90

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	0.02	31.99
100	0.33	0.42	32.62

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 an 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	0.13	0.10	0.10

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	0.03	0.02	0.00
100	0.52	0.42	0.33

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	0.00	0.00	0.00
10	0.06	0.05	0.00
100	1.26	1.01	0.72

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.

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	7.52

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 run-off 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.

Appendix A

SCALE: 1" = 200' NORTH

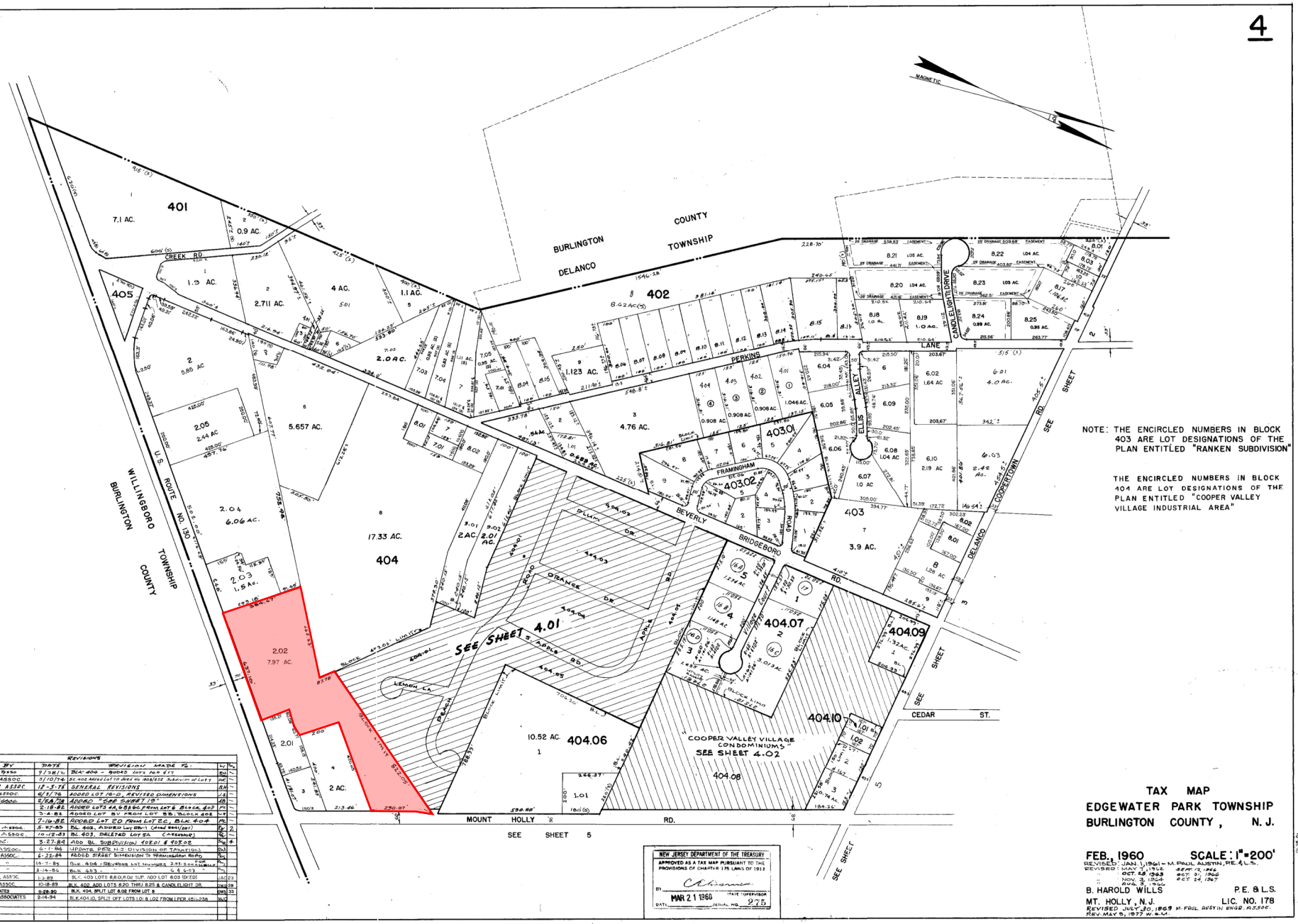
VICINITY MAP

4201 Route 130
Edgewater Park, New Jersey

WARE MALCOMB

NYC19-0005
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"

Revisions				
Revised By	Date	Revision Made To		
W. A. Rising Assoc.	9/28/71	Blk. 404 - Added Lots 16A & 17		
R. A. Alaimo Assoc.	11/10/74	Bl. 402 Added Lot 10 Area No. 808/852 Subdivision of Lots		
Wm. B. Major Assoc.	12-3-76	General Revisions		
Wm. B. Major Assoc.	6/3/76	Added Lot 16-D, Revised Dimensions		
Wm. B. Major Assoc.	2/28/78	Added "See Sheet 19"		
L.A.W.B.	2-18-82	Added Lots 4A, 9B & 9C From Lots 9, Block 403		
L.A.W.B.	5-4-82	Added Lot 8V From Lot 8B, Block 402		
L.A.W.B.	7-16-82	Added Lot 20 From Lot 20, Blk. 404		
R.A. Alaimo, Assoc.	5-27-83	Bl. 403, Added Lot 16A-1 (Now 8041/861)		
R.A. Alaimo, Assoc.	10-12-83	Bl. 403, Deleted Lot 8A (Assessed)		
R.A. Alaimo Assoc.	5-27-84	Add Bl. Subdivision 402.01 & 403.02		
R.A. Alaimo Assoc.	6-1-84	Update Data in 2 Division of Taxmaps		
R. A. Alaimo, Assoc.	6-22-84	Added Street Dimensions To Framingham Realty		
" " "	10-7-85	Blk. 404 - Deletions Lot Numbers 2.03-3 and 3		
" " "	3-19-86	Blk. 403 " " 4 & 5-03 "		
Richard A. Alaimo, Assoc.	1-3-89	Blk. 403 Lots 8A & 9A Now Sub. Add Lot 8.05 (Exed)		
Richard A. Alaimo Assoc.	10-18-89	Blk. 402 Add Lots 8.20 thru 8.25 & Candlelight Dr.		
R.A. Alaimo Associates	11-28-90	Blk. 404, Split Lot 8.02 From Lot 8		
Richard A. Alaimo Associates	2-14-94	Bl. 404-10, Split Off Lots 10.01 & 10.02 From I Per 451-238		

NEW JERSEY DEPARTMENT OF THE TREASURY
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175 LAWS OF 1913
BY _____ STATE SUPERVISOR
DATE MAR 21 1960 SERIAL NO. 975

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

FEB., 1960 SCALE: 1"=200'

REVISED: JAN. 1, 1961 - M. PAUL AUSTIN, RE. & L.S.
REVISED: MAY 1, 1962 SEPT. 13, 1966
" OCT. 15 1963 OCT 31, 1966
" NOV. 3, 1964 OCT 24, 1967
" AUG. 31, 1965

B. HAROLD WILLS P.E. & L.S.
MT. HOLLY, N.J. LIC. NO. 178
REVISED JULY 30, 1969 M. PAUL AUSTIN ENGR. & SURV.
REV. MAY 5, 1977 W.A.A.

SCALE: 1" = 200' NORTH

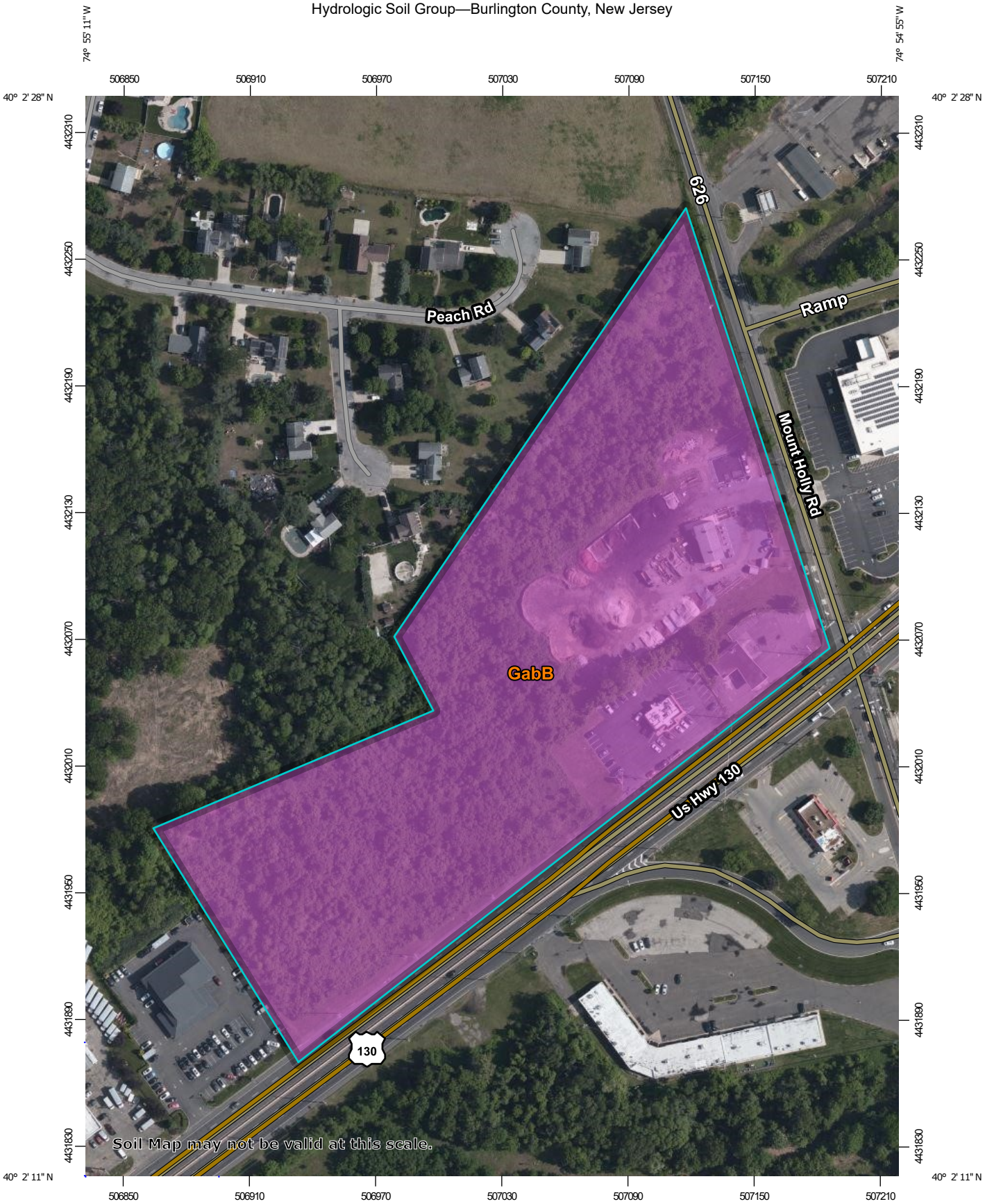
VICINITY MAP

4201 Route 130
Edgewater Park, New Jersey

WARE MALCOMB

NYC19-0005
01.22.2020

SHEET
1



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

N

Meters
0 35 70 140 210

Feet
0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: 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%
Totals for Area of Interest			**12.2**	**100.0%**

Description

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

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

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

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

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

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

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

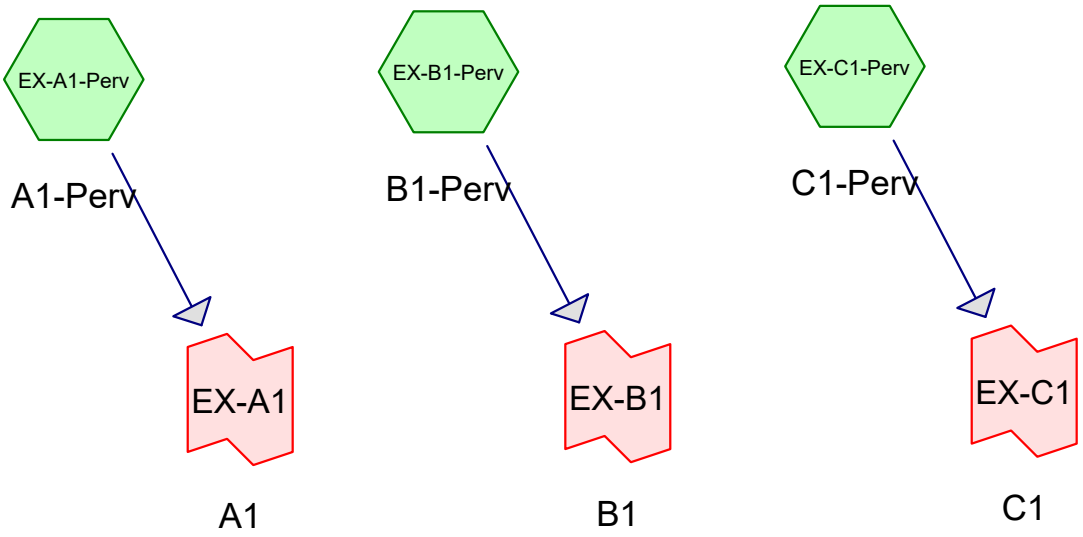
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B



Subcat Reach Pond Link

Routing Diagram for NYC19-0005
Prepared by Ware Malcomb, Printed 7/13/2020

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 EX-A1-Perv: A1-Perv 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

Subcatchment EX-B1-Perv: B1-Perv 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

Subcatchment EX-C1-Perv: C1-Perv Runoff Area=4.914 ac 0.00% Impervious Runoff Depth=0.00"
Tc=31.0 min CN=36/0 Runoff=0.00 cfs 0.000 af

Link EX-A1: A1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link EX-B1: B1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link EX-C1: C1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 7.809 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 7.809 ac 0.00% Impervious = 0.000 ac

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

[45] Hint: Runoff=Zero

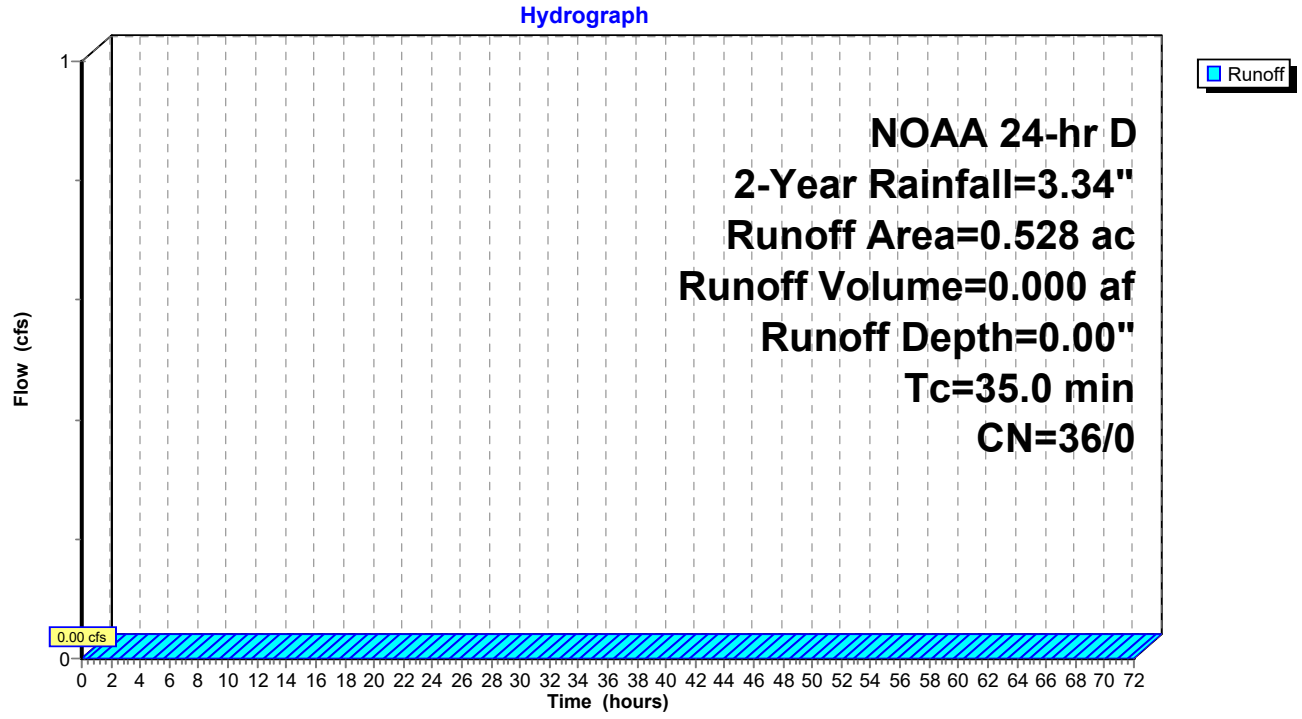
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

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



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

[45] Hint: Runoff=Zero

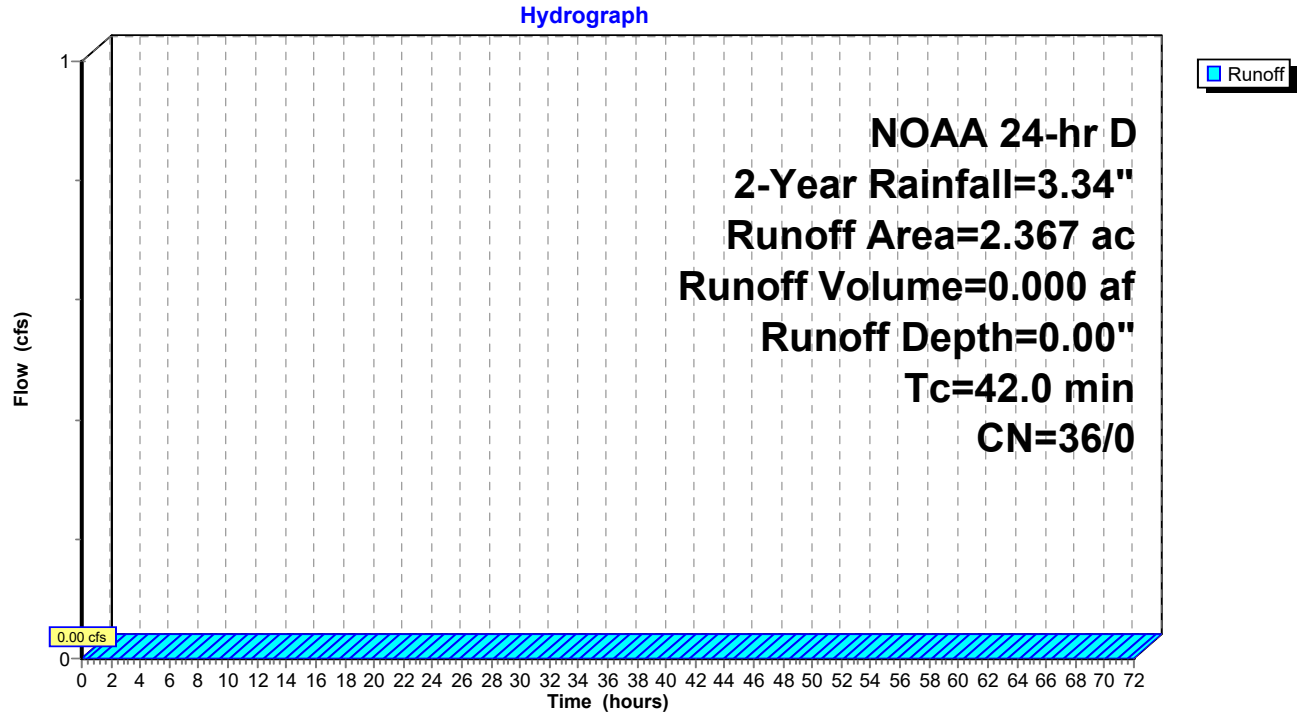
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

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



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

[45] Hint: Runoff=Zero

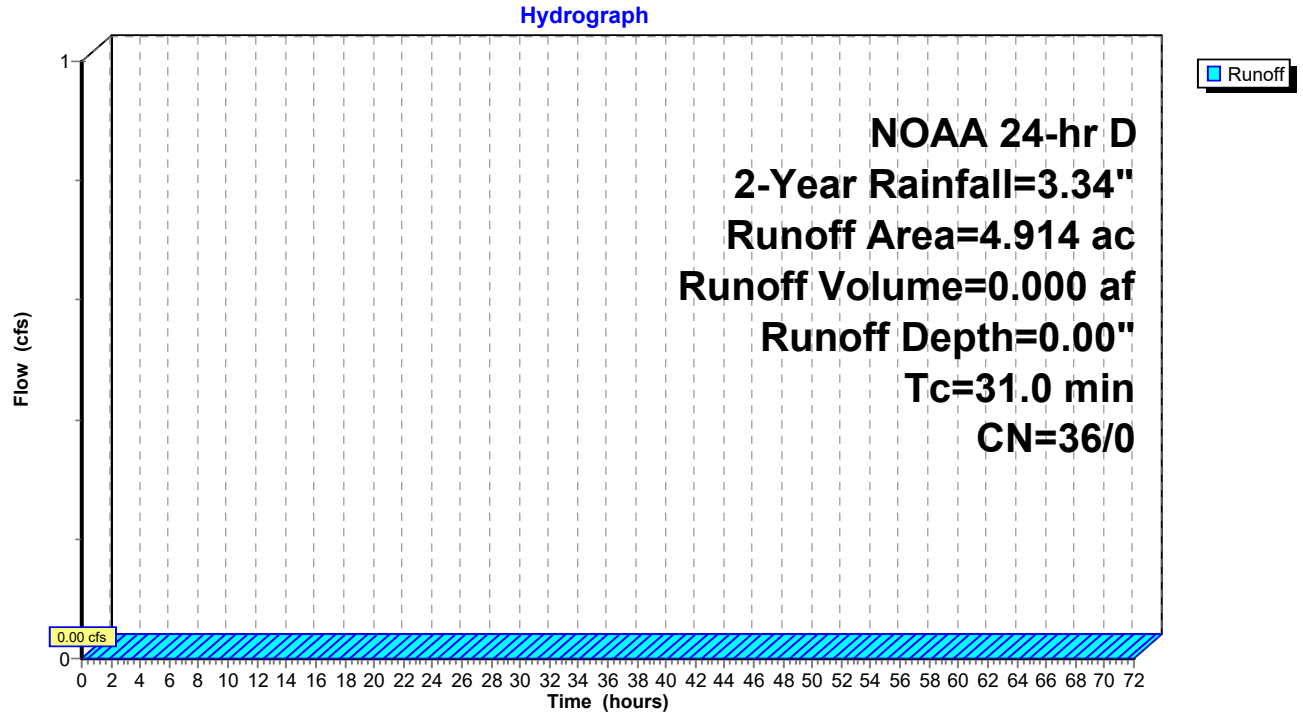
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

Area (ac)	CN	Description
4.914	36	Woods, Fair, HSG A
4.914	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

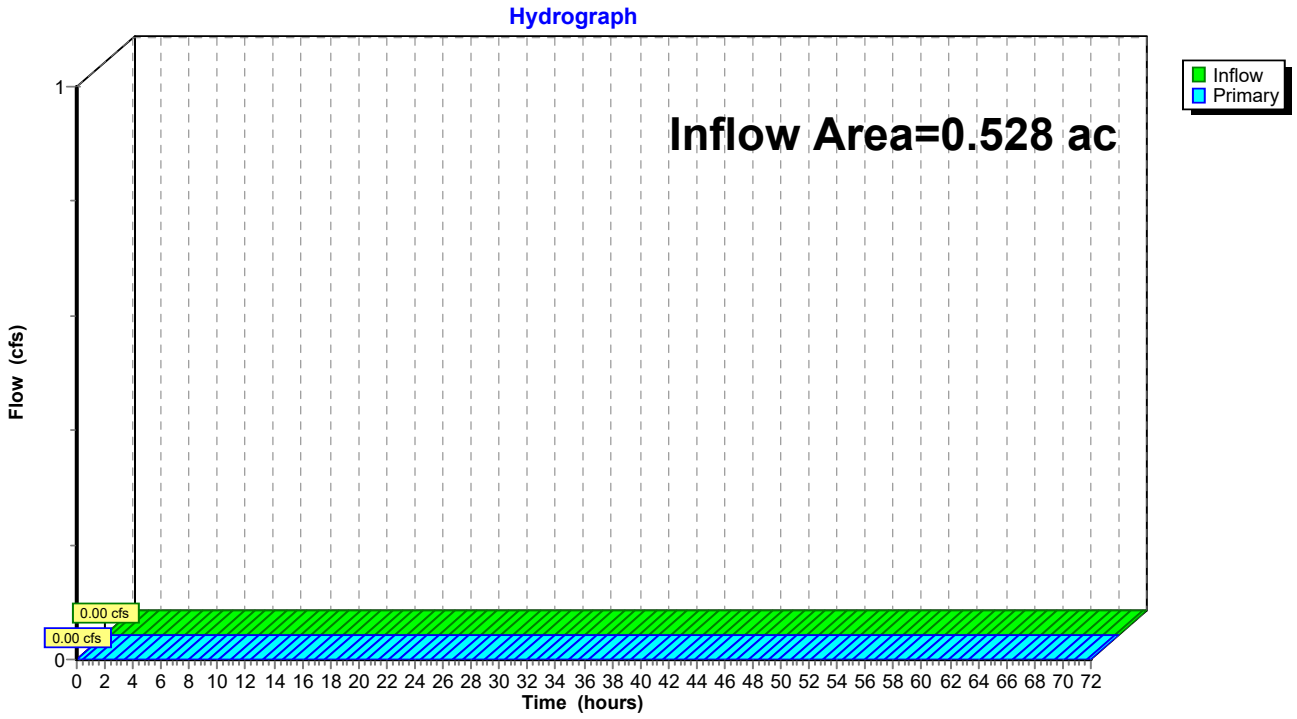


Summary for Link EX-A1: A1

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

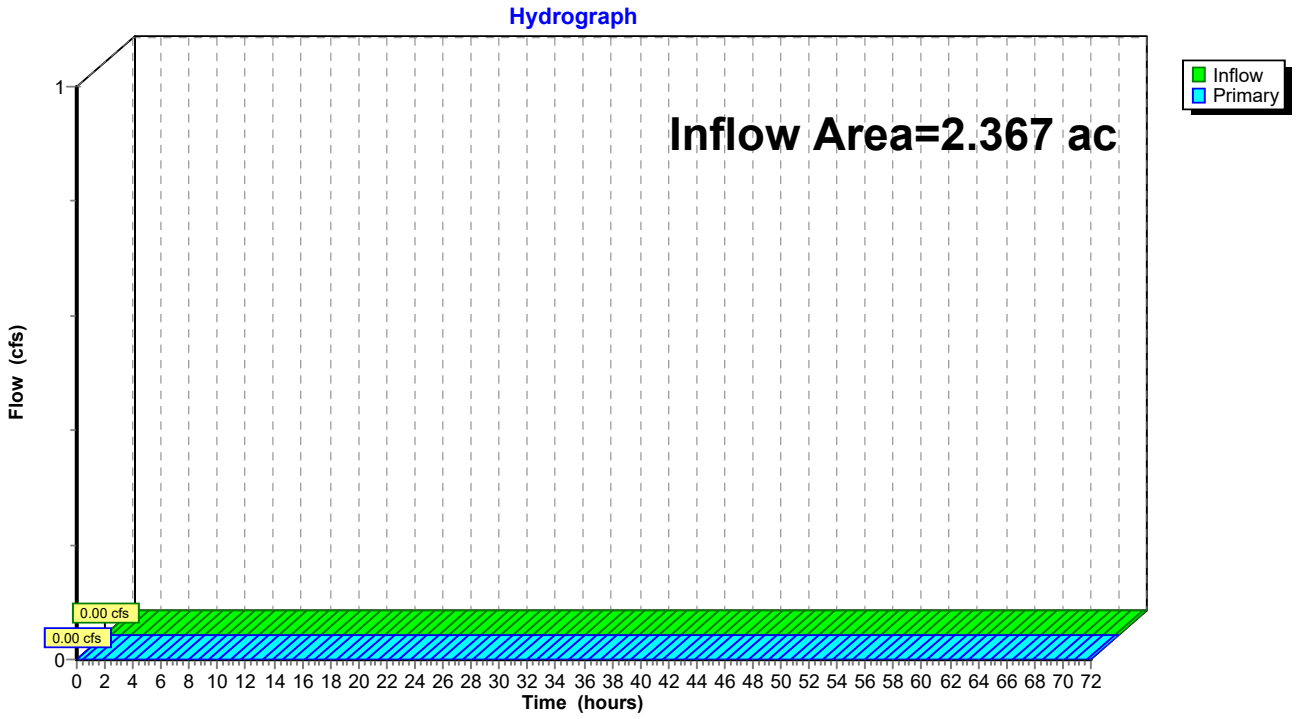


Summary for Link EX-B1: B1

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

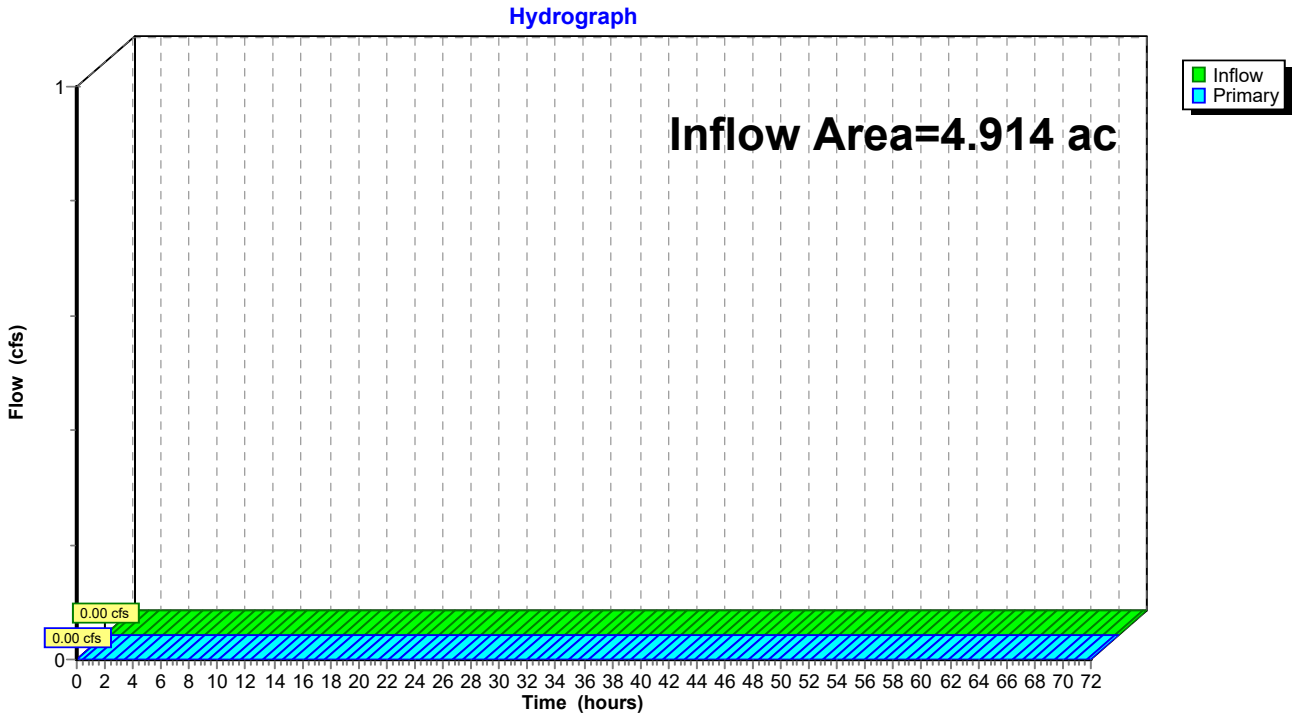


Summary for Link EX-C1: C1

Inflow Area = 4.914 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-C1: C1



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 EX-A1-Perv: A1-Perv Runoff Area=0.528 ac 0.00% Impervious Runoff Depth=0.12"
Tc=35.0 min CN=36/0 Runoff=0.01 cfs 0.005 af

Subcatchment EX-B1-Perv: B1-Perv Runoff Area=2.367 ac 0.00% Impervious Runoff Depth=0.12"
Tc=42.0 min CN=36/0 Runoff=0.03 cfs 0.023 af

Subcatchment EX-C1-Perv: C1-Perv Runoff Area=4.914 ac 0.00% Impervious Runoff Depth=0.12"
Tc=31.0 min CN=36/0 Runoff=0.06 cfs 0.049 af

Link EX-A1: A1 Inflow=0.01 cfs 0.005 af
Primary=0.01 cfs 0.005 af

Link EX-B1: B1 Inflow=0.03 cfs 0.023 af
Primary=0.03 cfs 0.023 af

Link EX-C1: C1 Inflow=0.06 cfs 0.049 af
Primary=0.06 cfs 0.049 af

Total Runoff Area = 7.809 ac Runoff Volume = 0.077 af Average Runoff Depth = 0.12"
100.00% Pervious = 7.809 ac 0.00% Impervious = 0.000 ac

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

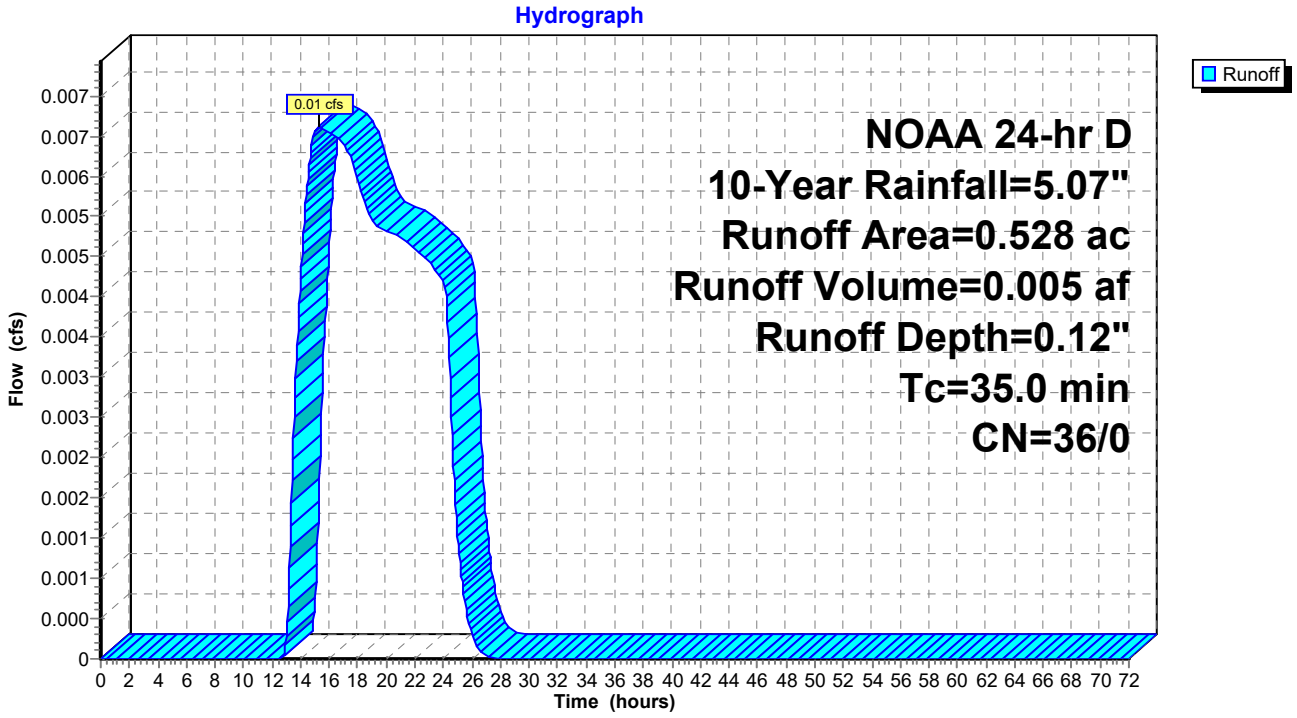
Runoff = 0.01 cfs @ 15.21 hrs, Volume= 0.005 af, Depth= 0.12"

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 10-Year Rainfall=5.07"

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



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

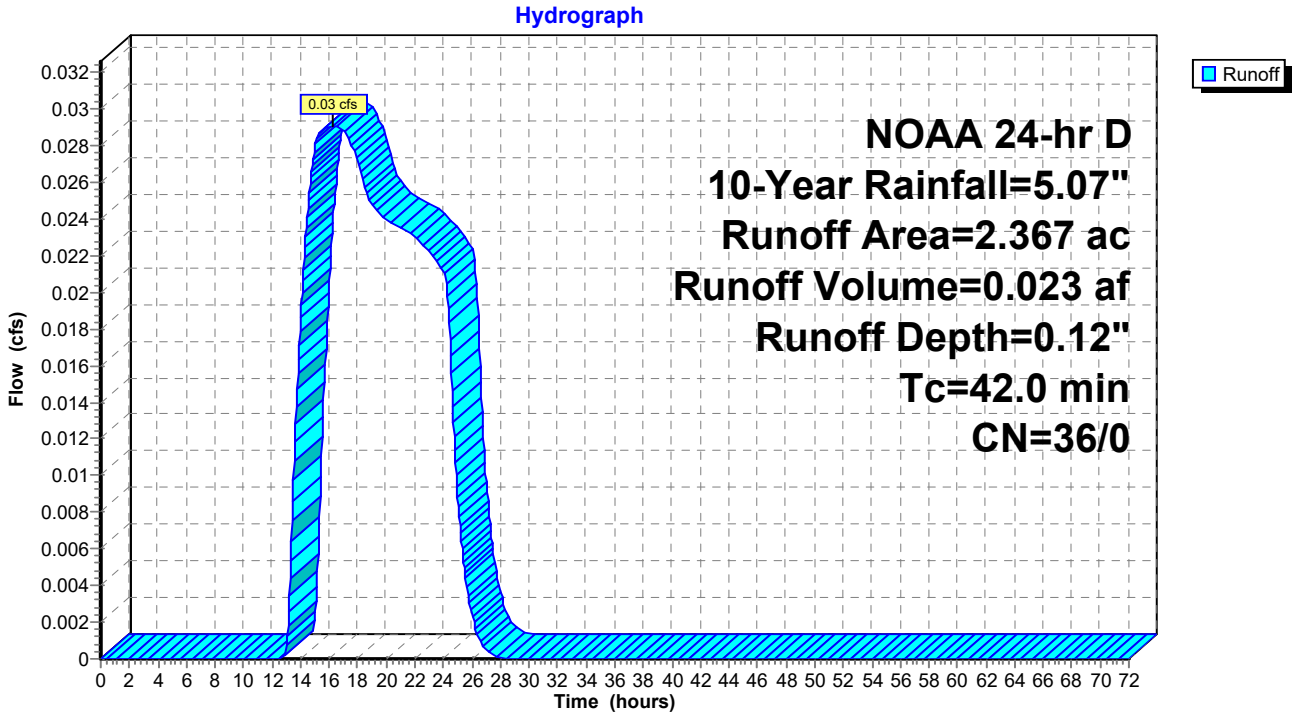
Runoff = 0.03 cfs @ 16.31 hrs, Volume= 0.023 af, Depth= 0.12"

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 10-Year Rainfall=5.07"

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



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

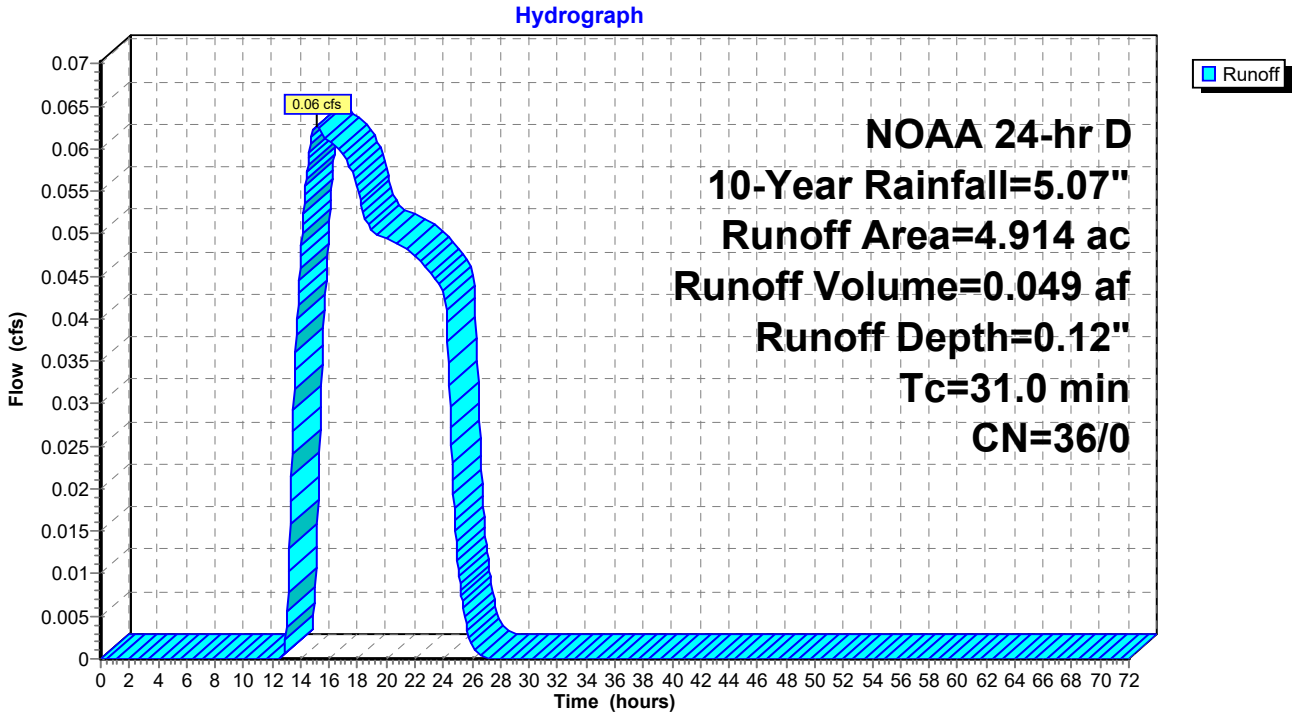
Runoff = 0.06 cfs @ 15.08 hrs, Volume= 0.049 af, Depth= 0.12"

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 10-Year Rainfall=5.07"

Area (ac)	CN	Description
4.914	36	Woods, Fair, HSG A
4.914	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

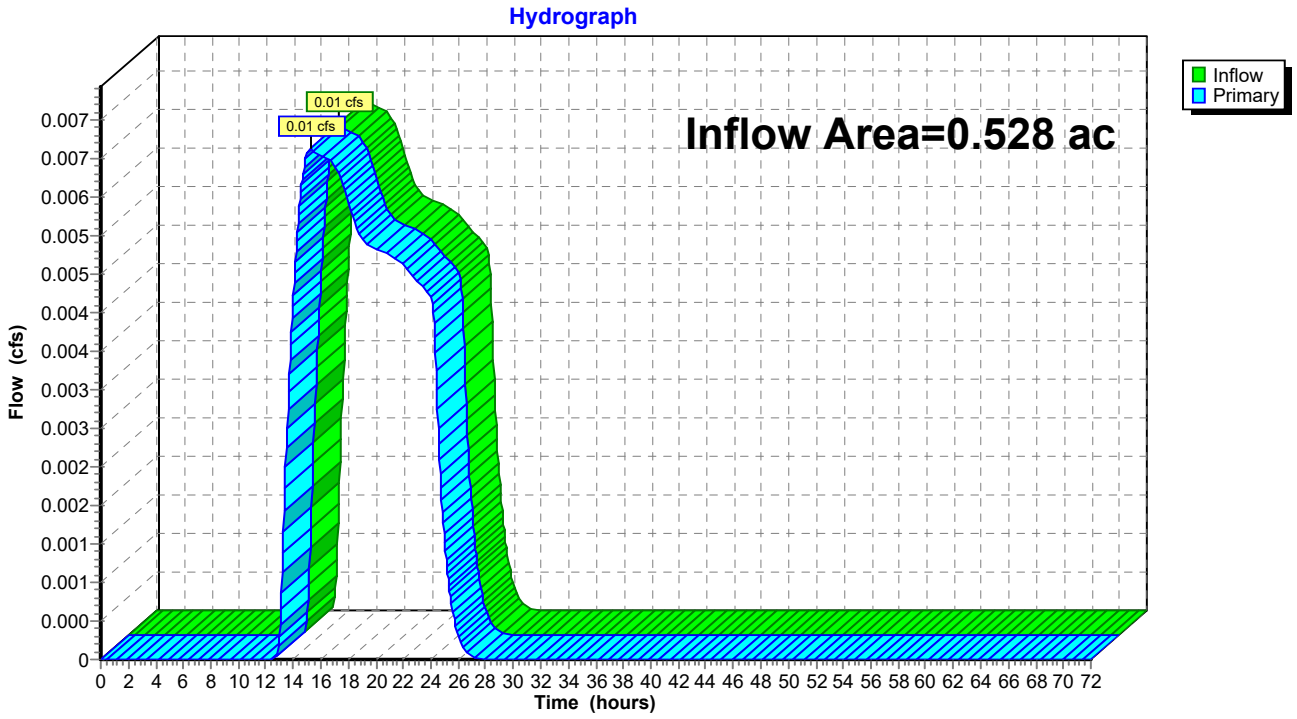


Summary for Link EX-A1: A1

Inflow Area = 0.528 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event
Inflow = 0.01 cfs @ 15.21 hrs, Volume= 0.005 af
Primary = 0.01 cfs @ 15.21 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 EX-A1: A1

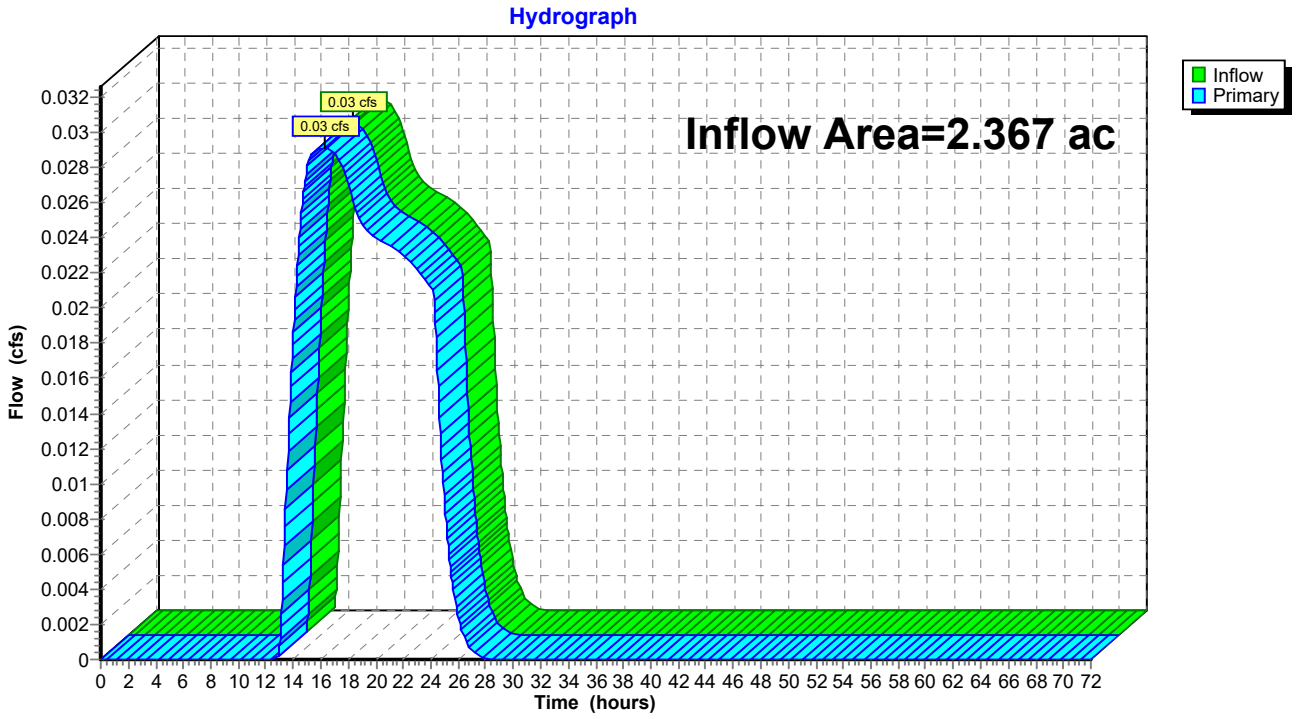


Summary for Link EX-B1: B1

Inflow Area = 2.367 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event
Inflow = 0.03 cfs @ 16.31 hrs, Volume= 0.023 af
Primary = 0.03 cfs @ 16.31 hrs, Volume= 0.023 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

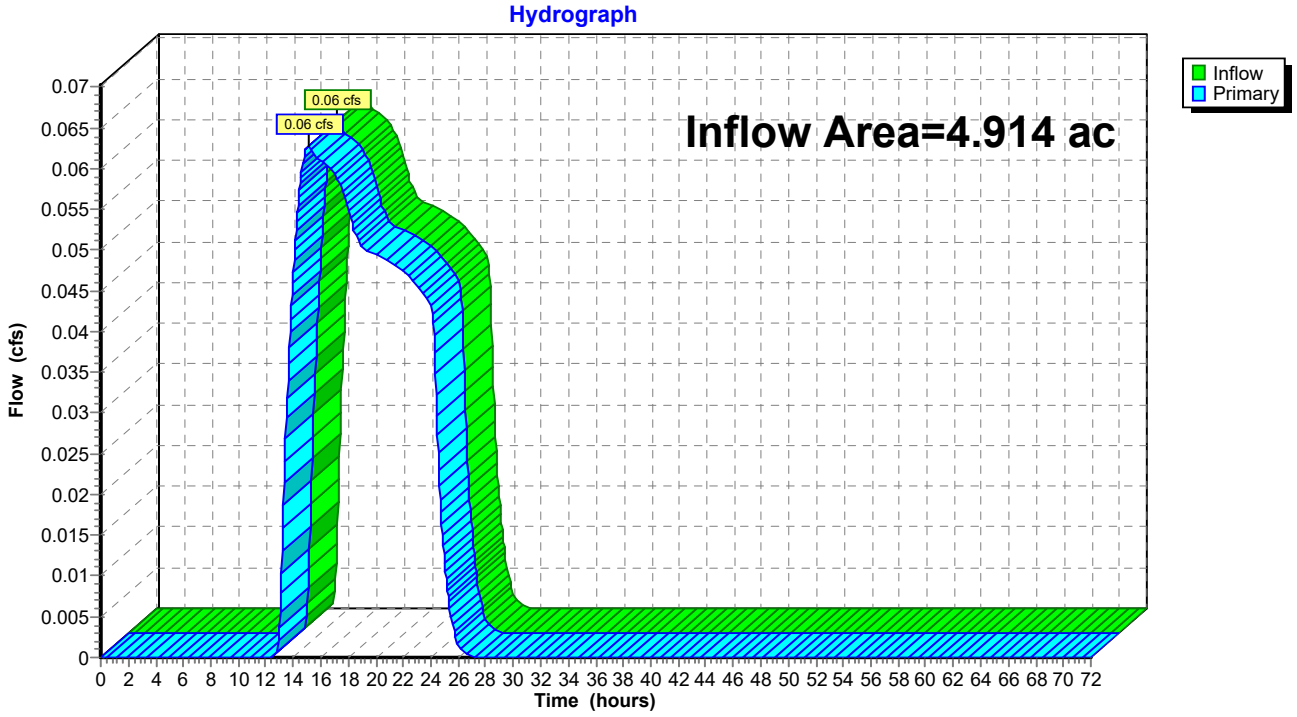


Summary for Link EX-C1: C1

Inflow Area = 4.914 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event
Inflow = 0.06 cfs @ 15.08 hrs, Volume= 0.049 af
Primary = 0.06 cfs @ 15.08 hrs, Volume= 0.049 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



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 EX-A1-Perv: A1-Perv Runoff Area=0.528 ac 0.00% Impervious Runoff Depth=1.06"
Tc=35.0 min CN=36/0 Runoff=0.13 cfs 0.047 af

Subcatchment EX-B1-Perv: B1-Perv Runoff Area=2.367 ac 0.00% Impervious Runoff Depth=1.06"
Tc=42.0 min CN=36/0 Runoff=0.52 cfs 0.210 af

Subcatchment EX-C1-Perv: C1-Perv Runoff Area=4.914 ac 0.00% Impervious Runoff Depth=1.06"
Tc=31.0 min CN=36/0 Runoff=1.26 cfs 0.436 af

Link EX-A1: A1 Inflow=0.13 cfs 0.047 af
Primary=0.13 cfs 0.047 af

Link EX-B1: B1 Inflow=0.52 cfs 0.210 af
Primary=0.52 cfs 0.210 af

Link EX-C1: C1 Inflow=1.26 cfs 0.436 af
Primary=1.26 cfs 0.436 af

Total Runoff Area = 7.809 ac Runoff Volume = 0.693 af Average Runoff Depth = 1.06"
100.00% Pervious = 7.809 ac 0.00% Impervious = 0.000 ac

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

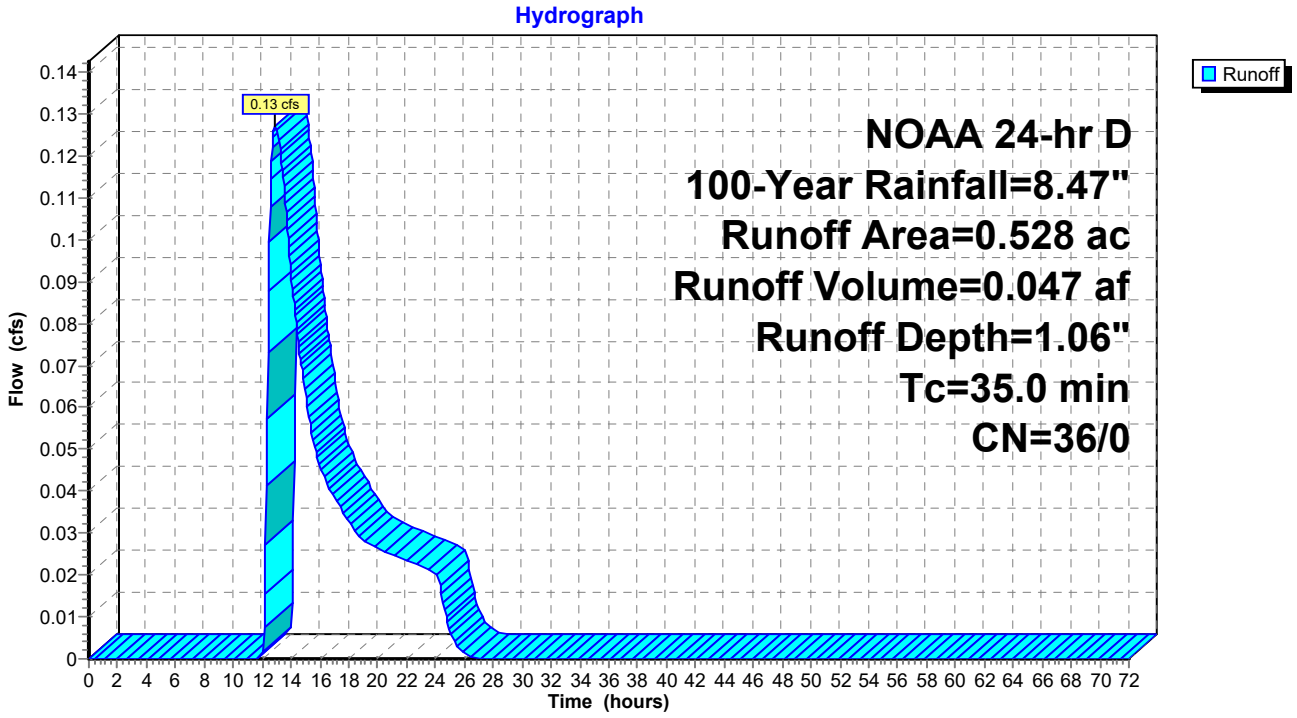
Runoff = 0.13 cfs @ 12.91 hrs, Volume= 0.047 af, Depth= 1.06"

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 D 100-Year Rainfall=8.47"

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



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

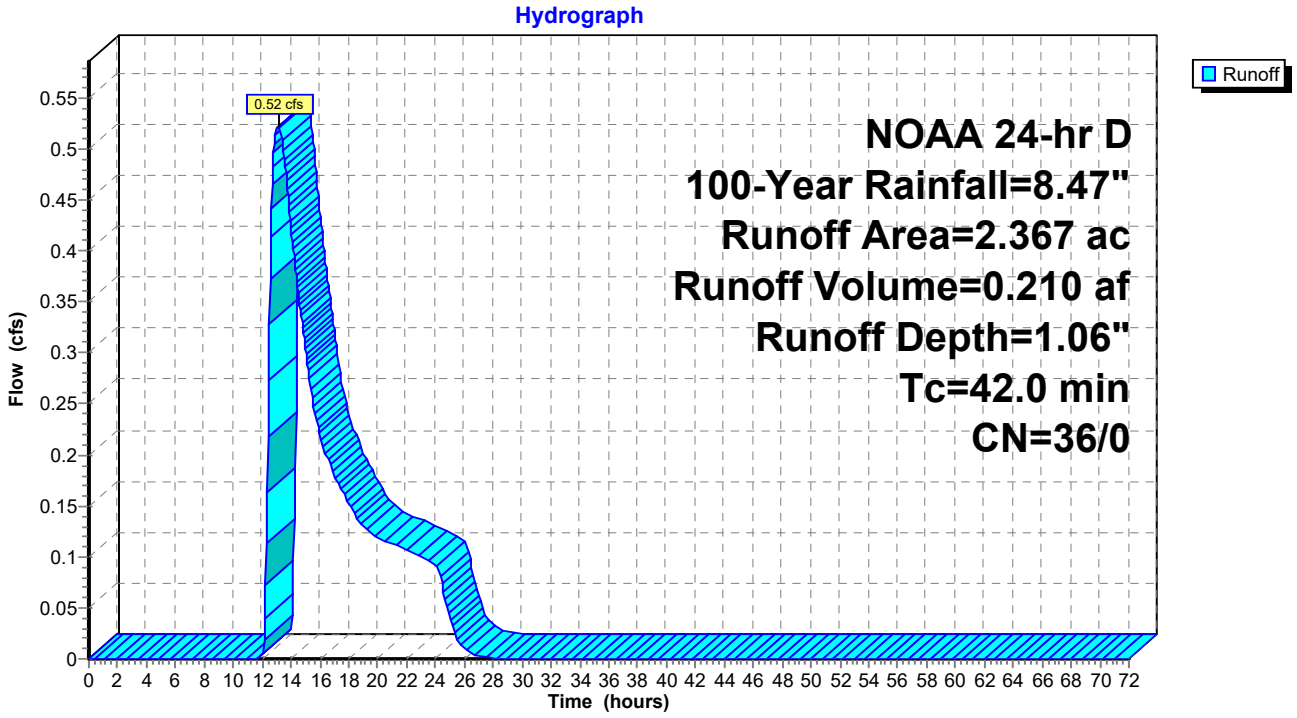
Runoff = 0.52 cfs @ 13.09 hrs, Volume= 0.210 af, Depth= 1.06"

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 D 100-Year Rainfall=8.47"

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



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

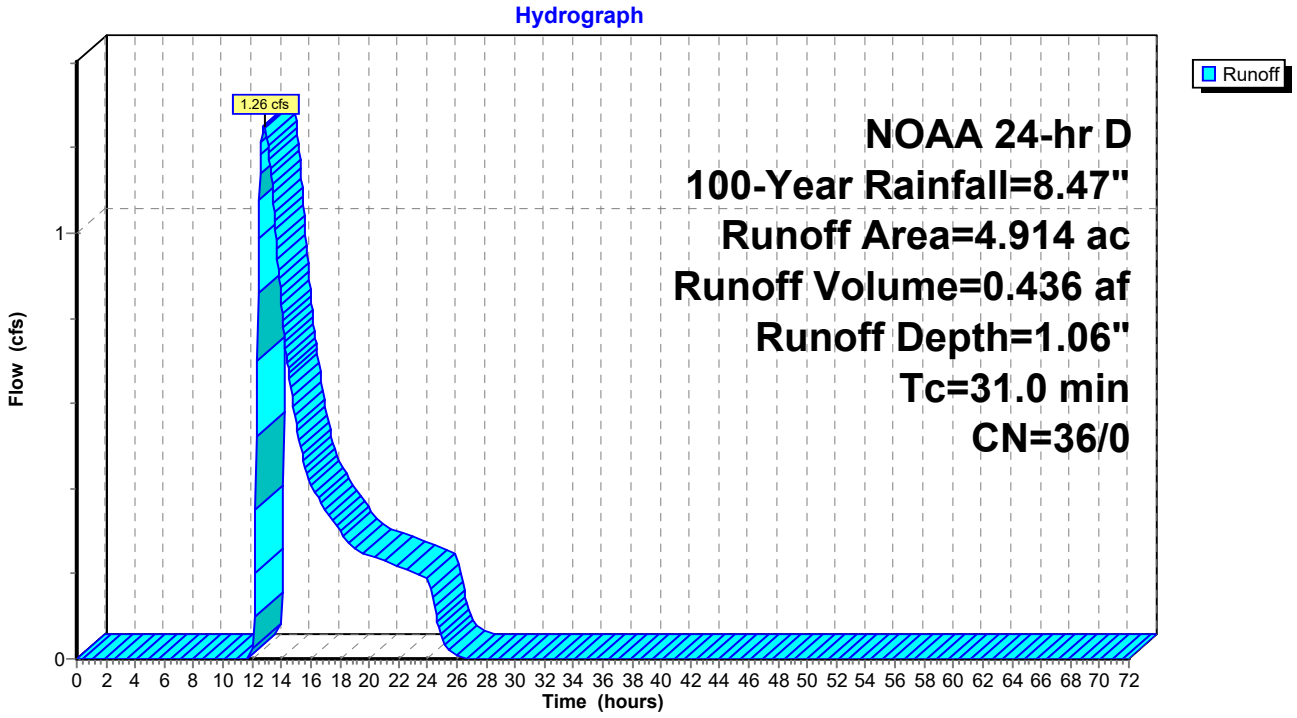
Runoff = 1.26 cfs @ 12.82 hrs, Volume= 0.436 af, Depth= 1.06"

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 D 100-Year Rainfall=8.47"

Area (ac)	CN	Description
4.914	36	Woods, Fair, HSG A
4.914	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

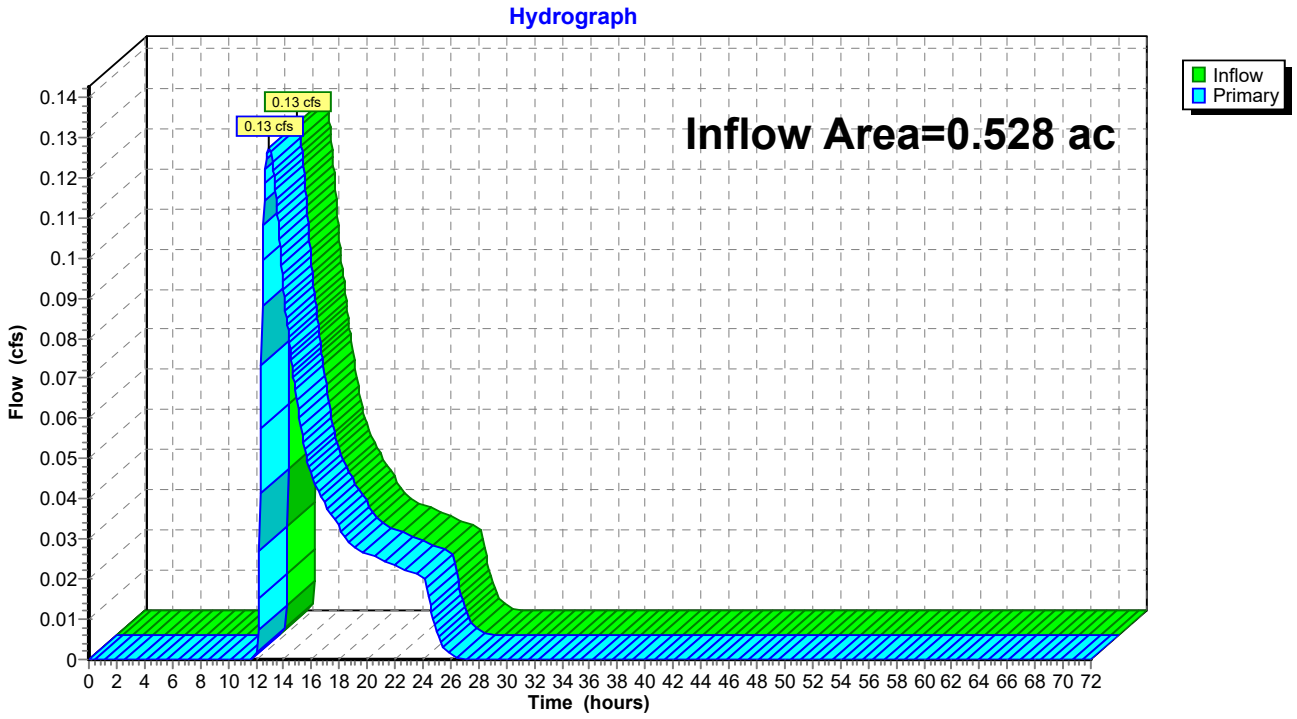


Summary for Link EX-A1: A1

Inflow Area = 0.528 ac, 0.00% Impervious, Inflow Depth = 1.06" for 100-Year event
Inflow = 0.13 cfs @ 12.91 hrs, Volume= 0.047 af
Primary = 0.13 cfs @ 12.91 hrs, Volume= 0.047 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

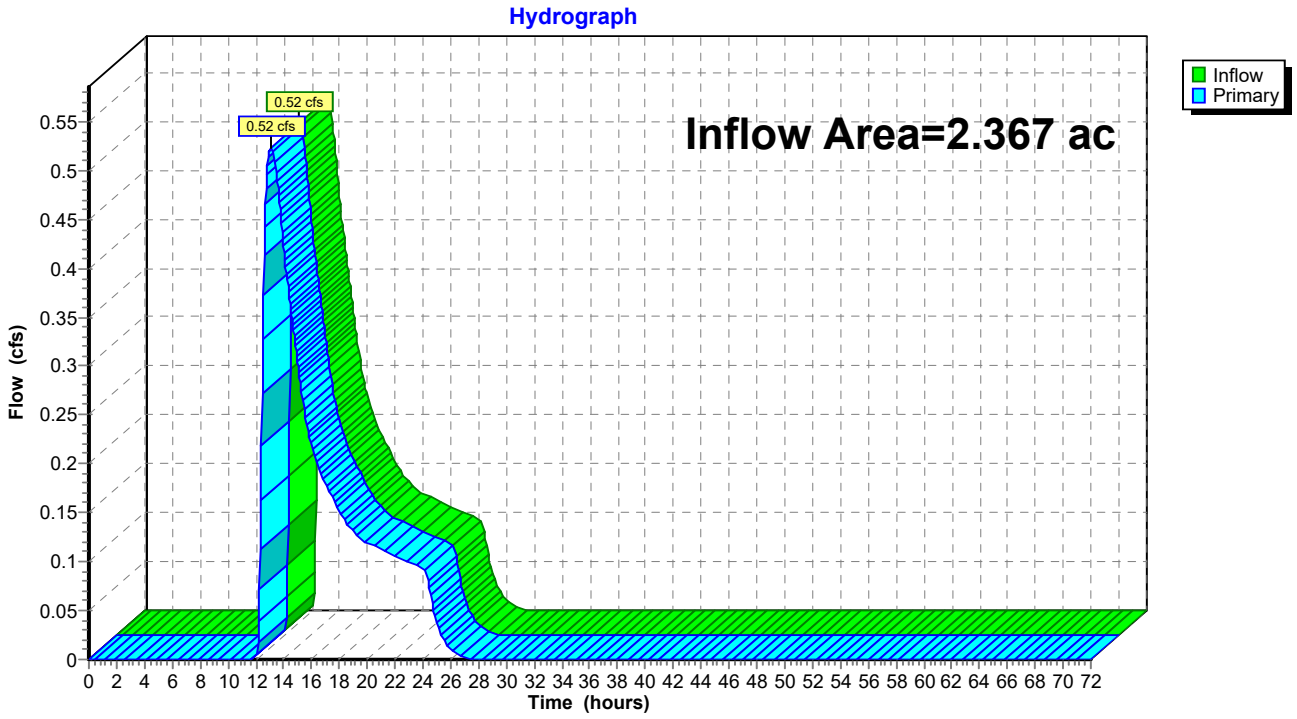


Summary for Link EX-B1: B1

Inflow Area = 2.367 ac, 0.00% Impervious, Inflow Depth = 1.06" for 100-Year event
Inflow = 0.52 cfs @ 13.09 hrs, Volume= 0.210 af
Primary = 0.52 cfs @ 13.09 hrs, Volume= 0.210 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

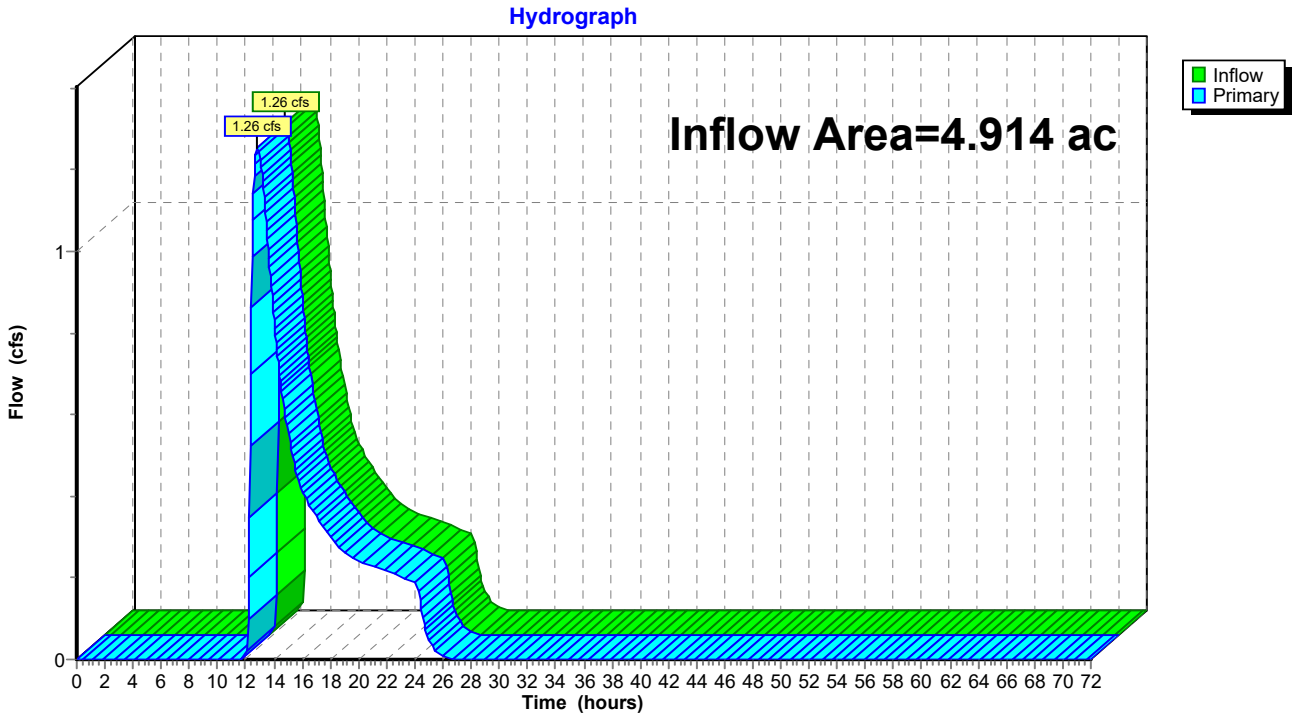


Summary for Link EX-C1: C1

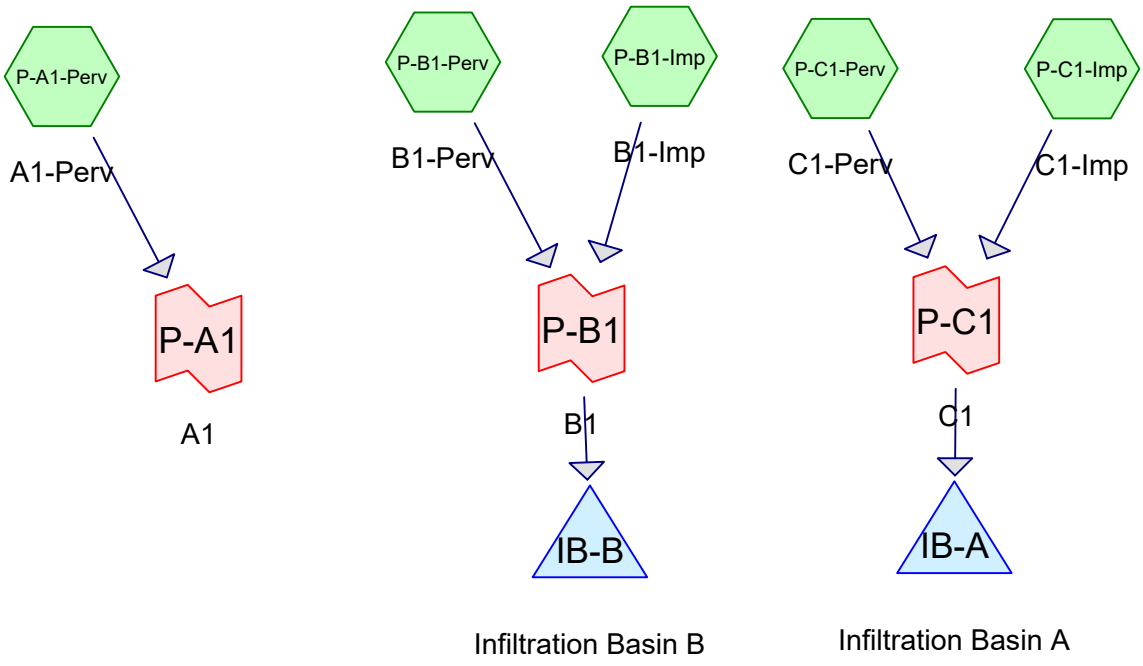
Inflow Area = 4.914 ac, 0.00% Impervious, Inflow Depth = 1.06" for 100-Year event
Inflow = 1.26 cfs @ 12.82 hrs, Volume= 0.436 af
Primary = 1.26 cfs @ 12.82 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min

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

Link EX-C1: C1



Appendix C



Subcat Reach Pond Link

Routing Diagram for NYC19-0005
Prepared by Ware Malcomb, Printed 7/22/2020

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-A1-Perv: A1-Perv 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

Subcatchment P-B1-Imp: B1-Imp Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=3.11"
Tc=10.0 min CN=0/98 Runoff=1.94 cfs 0.242 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

Subcatchment P-C1-Imp: C1-Imp Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=3.11"
Tc=10.0 min CN=0/98 Runoff=6.25 cfs 0.781 af

Subcatchment P-C1-Perv: C1-Perv Runoff Area=1.802 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=32.56' Storage=0.781 af Inflow=6.25 cfs 0.781 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond IB-B: Infiltration Basin B Peak Elev=31.39' Storage=0.242 af Inflow=1.94 cfs 0.242 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link P-A1: A1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link P-B1: B1 Inflow=1.94 cfs 0.242 af
Primary=1.94 cfs 0.242 af

Link P-C1: C1 Inflow=6.25 cfs 0.781 af
Primary=6.25 cfs 0.781 af

Total Runoff Area = 7.810 ac Runoff Volume = 1.023 af Average Runoff Depth = 1.57"
49.42% Pervious = 3.860 ac 50.58% Impervious = 3.950 ac

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

[45] Hint: Runoff=Zero

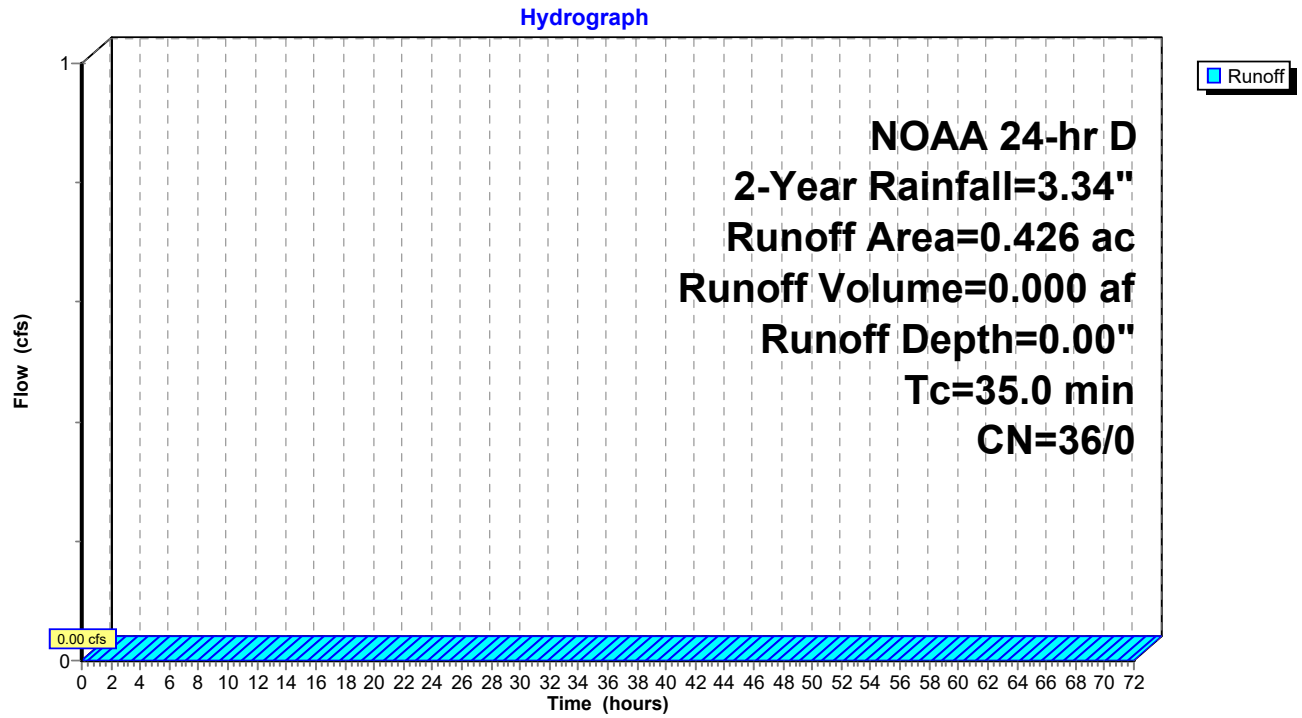
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

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



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

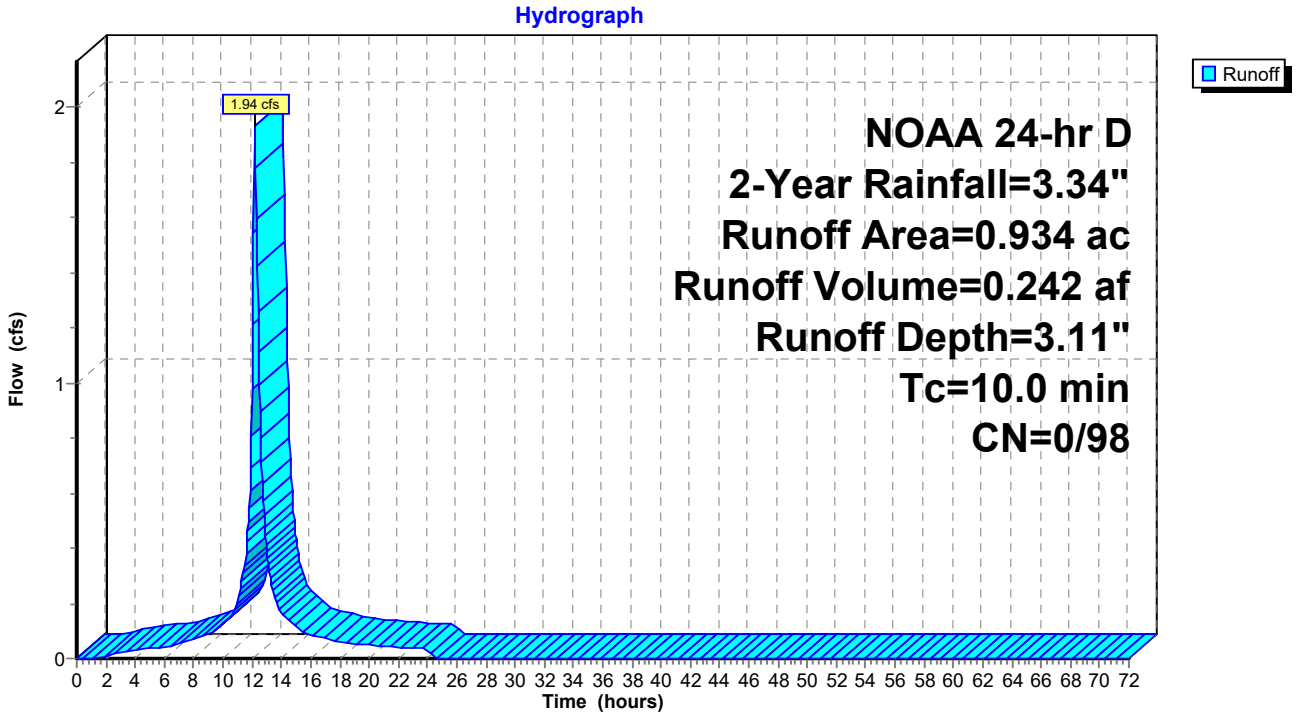
Runoff = 1.94 cfs @ 12.19 hrs, Volume= 0.242 af, Depth= 3.11"

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 2-Year Rainfall=3.34"

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



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

[45] Hint: Runoff=Zero

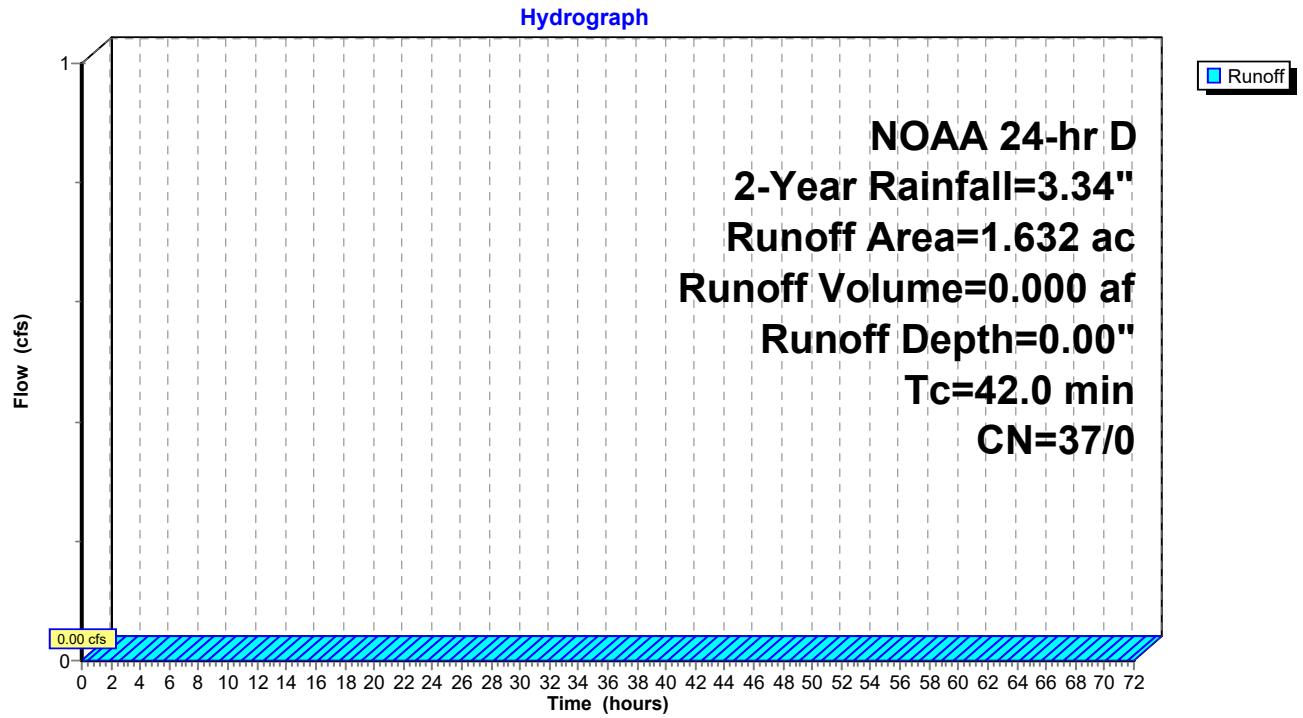
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

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



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

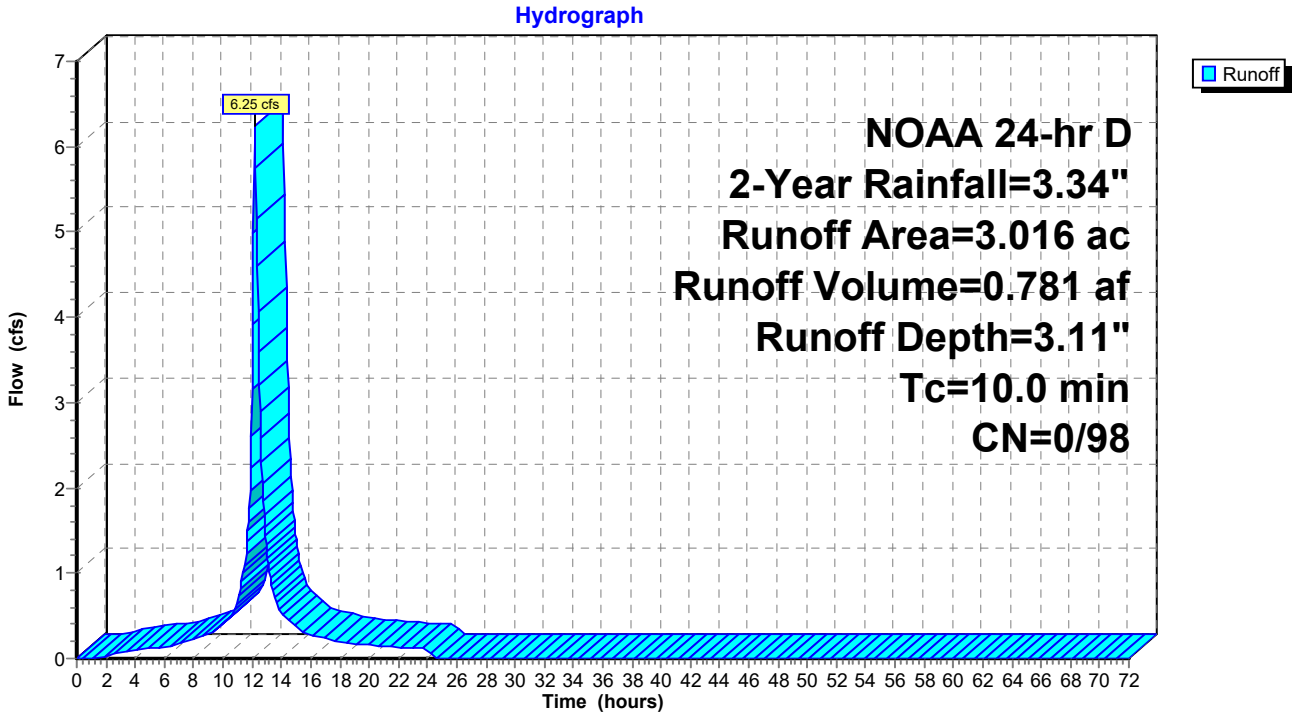
Runoff = 6.25 cfs @ 12.19 hrs, Volume= 0.781 af, Depth= 3.11"

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 2-Year Rainfall=3.34"

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



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

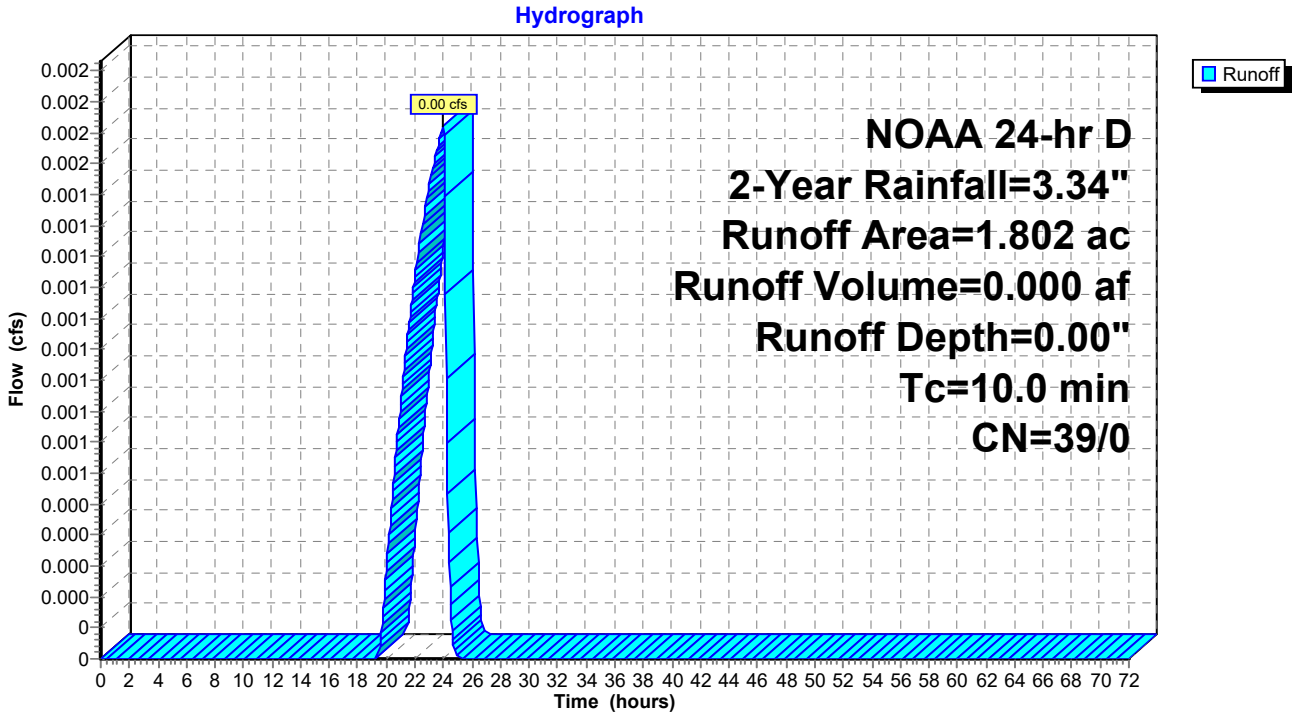
Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Depth= 0.00"

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 D 2-Year Rainfall=3.34"

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



Summary for Pond IB-A: Infiltration Basin A

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 1.95" for 2-Year event
Inflow = 6.25 cfs @ 12.19 hrs, Volume= 0.781 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= 32.56' @ 25.15 hrs Surf.Area= 0.702 ac Storage= 0.781 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	**Custom Stage Data (Irregular)** Listed below

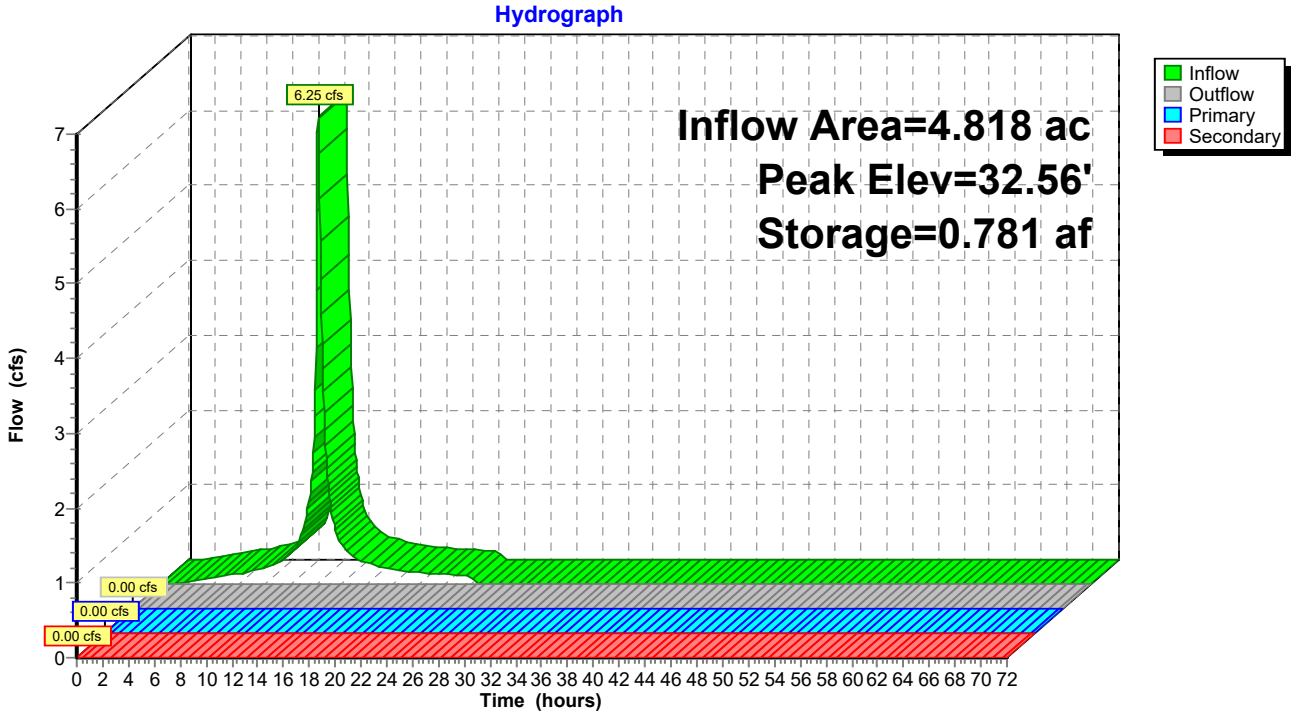
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	**15.0" Round Culvert** 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'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	33.90'	**35.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.40' (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=31.40' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB-A: Infiltration Basin A



Summary for Pond IB-B: Infiltration Basin B

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.13" for 2-Year event
Inflow = 1.94 cfs @ 12.19 hrs, Volume= 0.242 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= 0.242 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	**Custom Stage Data (Irregular)** Listed below

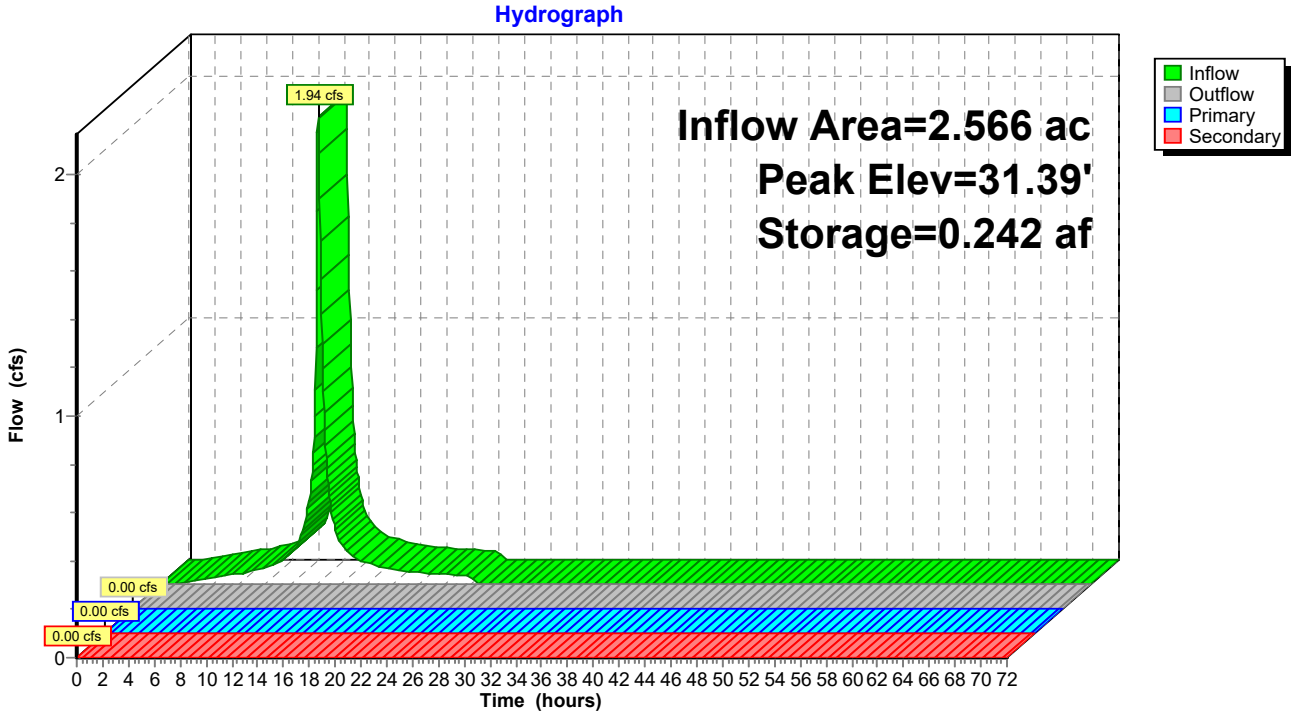
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
30.40	0.235	491.3	0.000	0.000	0.235
31.00	0.245	498.6	0.144	0.144	0.250
32.00	0.263	510.7	0.254	0.398	0.275
33.00	0.281	522.8	0.272	0.670	0.301
34.00	0.299	535.0	0.290	0.960	0.327

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	**15.0" Round Culvert** 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'	**3.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.70'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=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

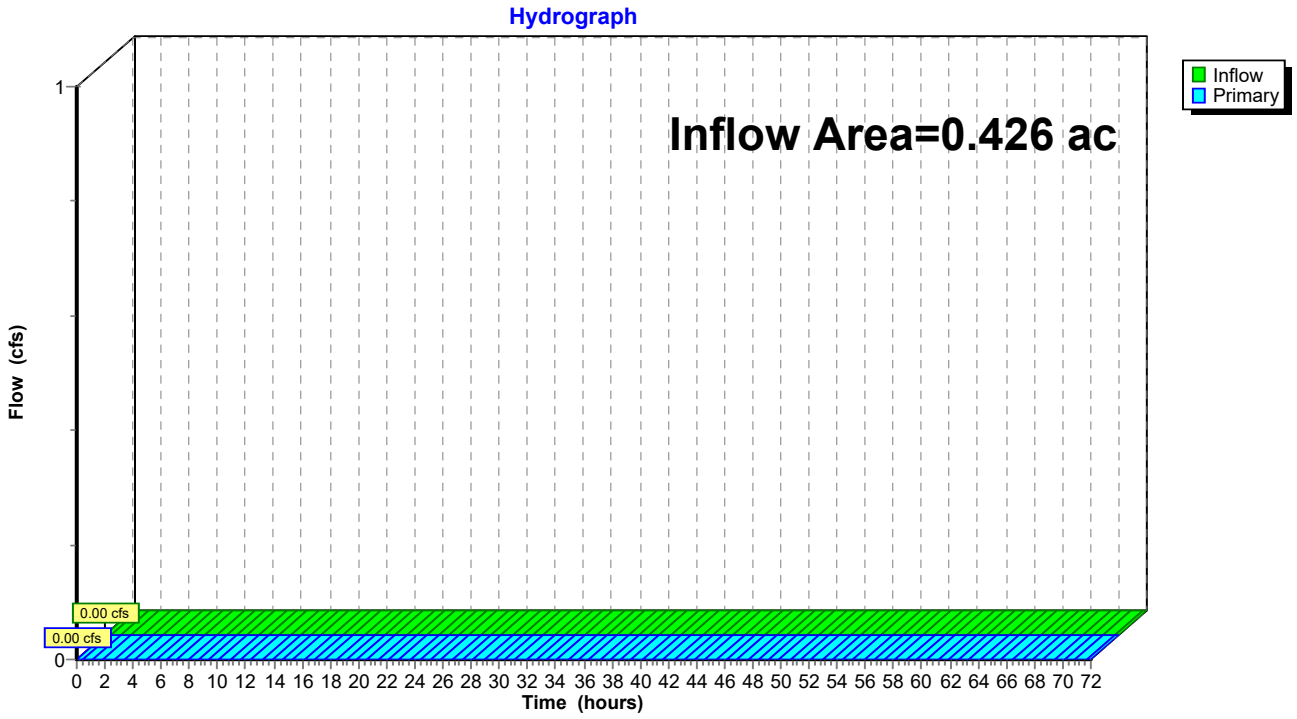


Summary for Link P-A1: A1

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

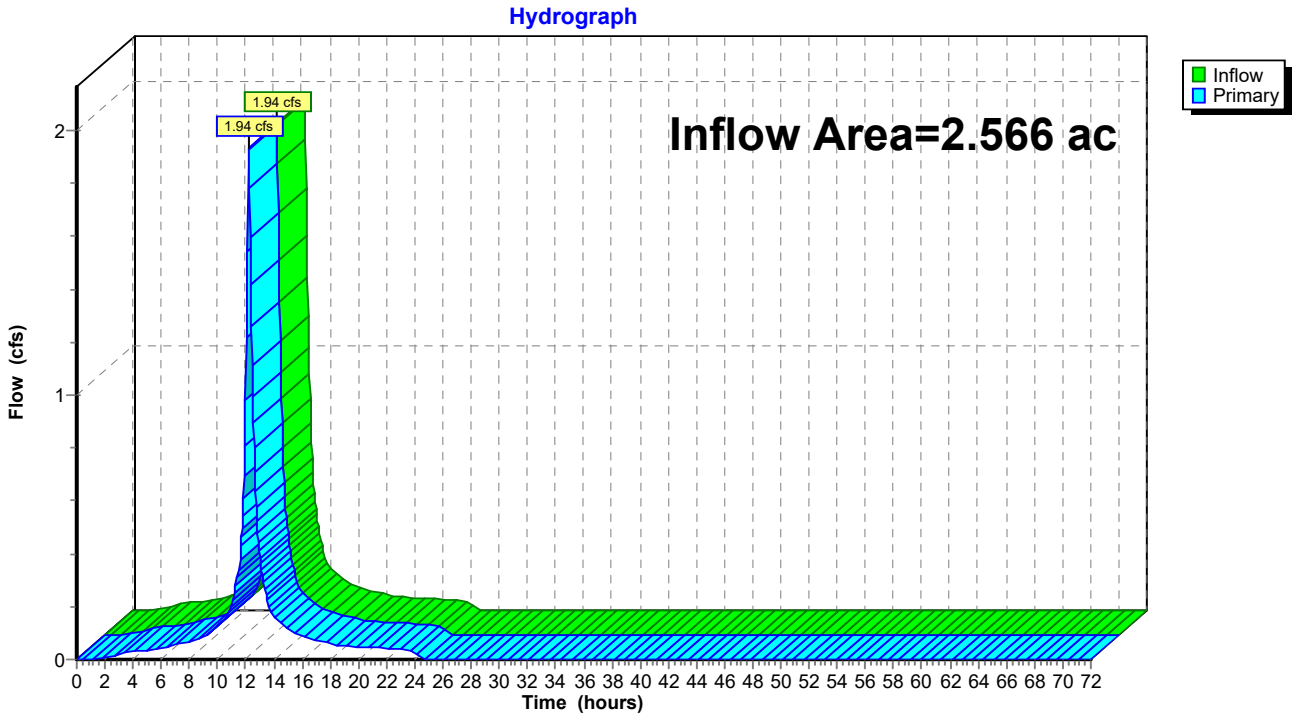


Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.13" for 2-Year event
Inflow = 1.94 cfs @ 12.19 hrs, Volume= 0.242 af
Primary = 1.94 cfs @ 12.19 hrs, Volume= 0.242 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

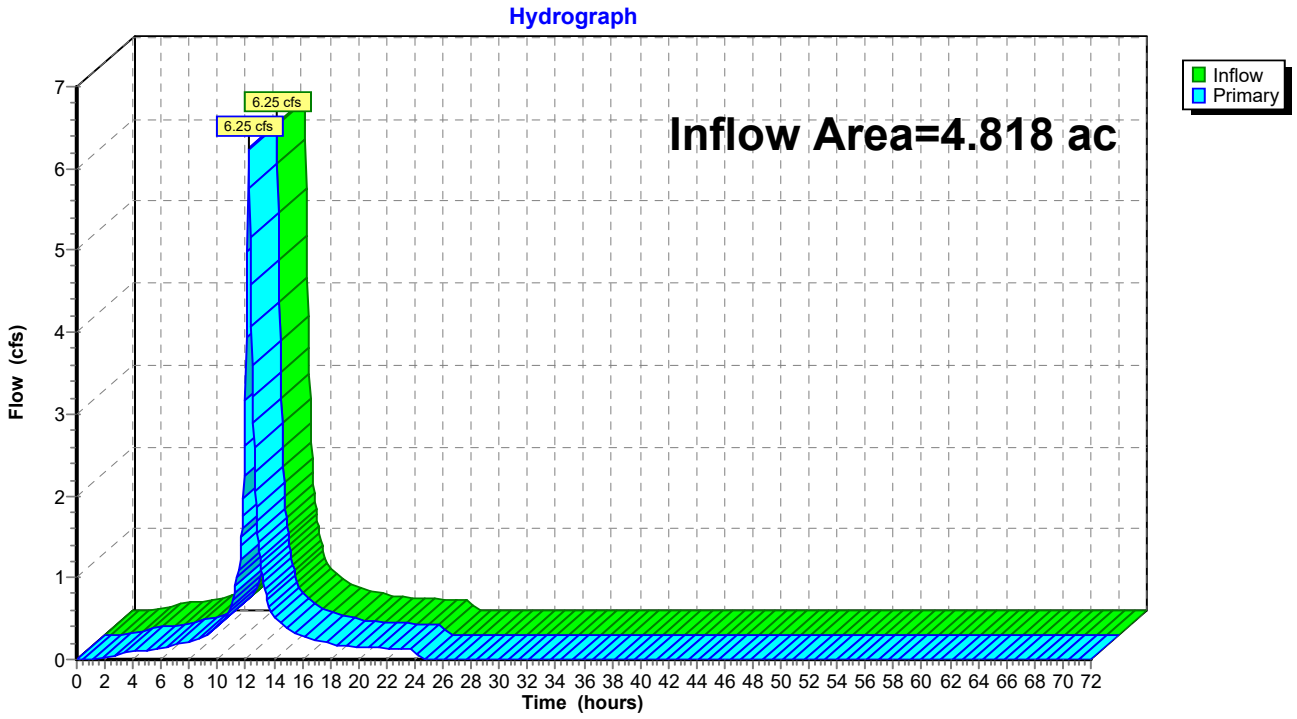


Summary for Link P-C1: C1

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 1.95" for 2-Year event
Inflow = 6.25 cfs @ 12.19 hrs, Volume= 0.781 af
Primary = 6.25 cfs @ 12.19 hrs, Volume= 0.781 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



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-A1-Perv: A1-Perv Runoff Area=0.426 ac 0.00% Impervious Runoff Depth=0.12"
Tc=35.0 min CN=36/0 Runoff=0.01 cfs 0.004 af

Subcatchment P-B1-Imp: B1-Imp Runoff Area=0.934 ac 100.00% Impervious Runoff Depth=4.83"
Tc=10.0 min CN=0/98 Runoff=2.96 cfs 0.376 af

Subcatchment P-B1-Perv: B1-Perv Runoff Area=1.632 ac 0.00% Impervious Runoff Depth=0.15"
Tc=42.0 min CN=37/0 Runoff=0.03 cfs 0.020 af

Subcatchment P-C1-Imp: C1-Imp Runoff Area=3.016 ac 100.00% Impervious Runoff Depth=4.83"
Tc=10.0 min CN=0/98 Runoff=9.56 cfs 1.215 af

Subcatchment P-C1-Perv: C1-Perv Runoff Area=1.802 ac 0.00% Impervious Runoff Depth=0.21"
Tc=10.0 min CN=39/0 Runoff=0.06 cfs 0.032 af

Pond IB-A: Infiltration Basin A Peak Elev=33.21' Storage=1.247 af Inflow=9.56 cfs 1.247 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond IB-B: Infiltration Basin B Peak Elev=31.99' Storage=0.396 af Inflow=2.96 cfs 0.396 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link P-A1: A1 Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af

Link P-B1: B1 Inflow=2.96 cfs 0.396 af
Primary=2.96 cfs 0.396 af

Link P-C1: C1 Inflow=9.56 cfs 1.247 af
Primary=9.56 cfs 1.247 af

Total Runoff Area = 7.810 ac Runoff Volume = 1.647 af Average Runoff Depth = 2.53"
49.42% Pervious = 3.860 ac 50.58% Impervious = 3.950 ac

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

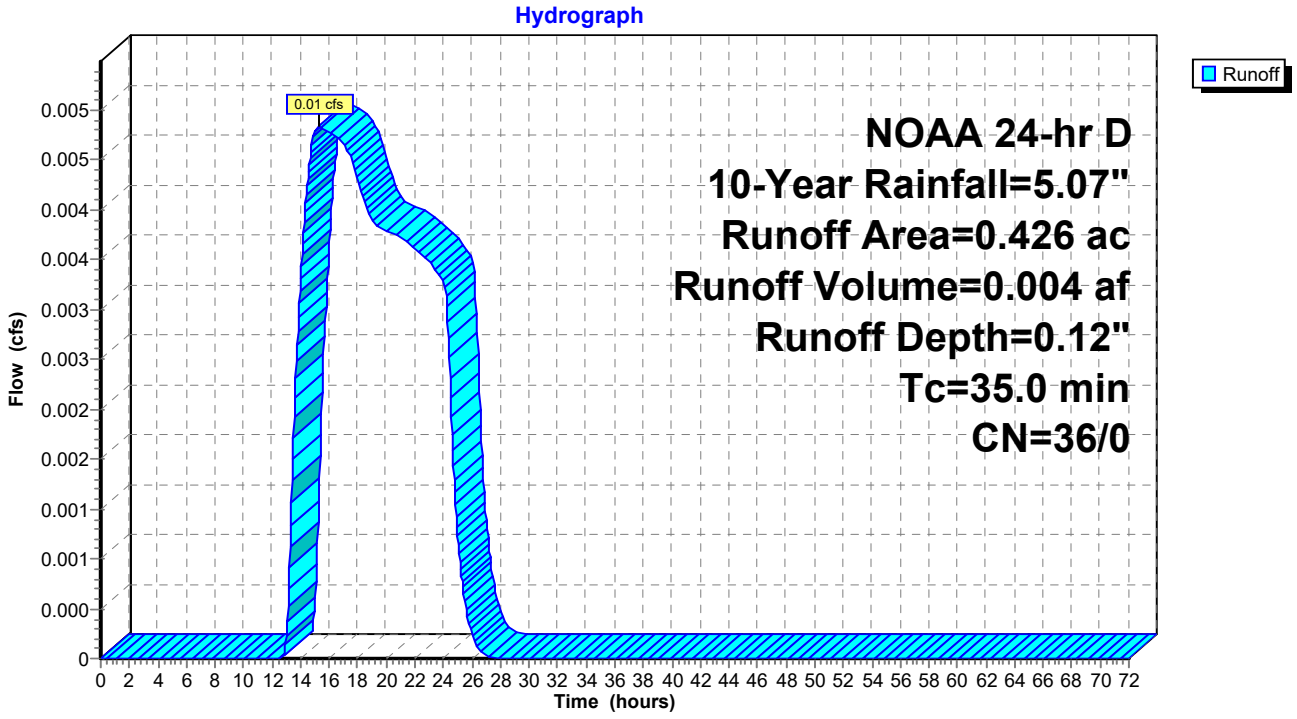
Runoff = 0.01 cfs @ 15.21 hrs, Volume= 0.004 af, Depth= 0.12"

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 10-Year Rainfall=5.07"

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



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

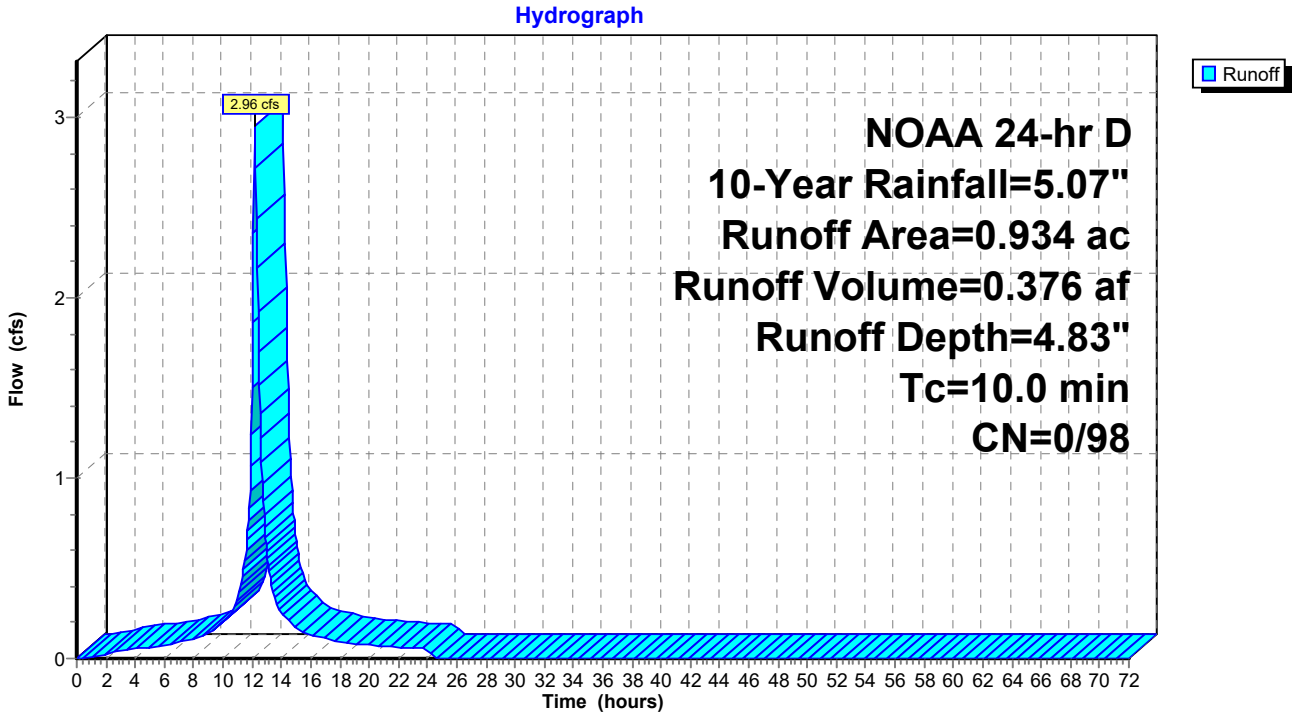
Runoff = 2.96 cfs @ 12.19 hrs, Volume= 0.376 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.07"

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



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

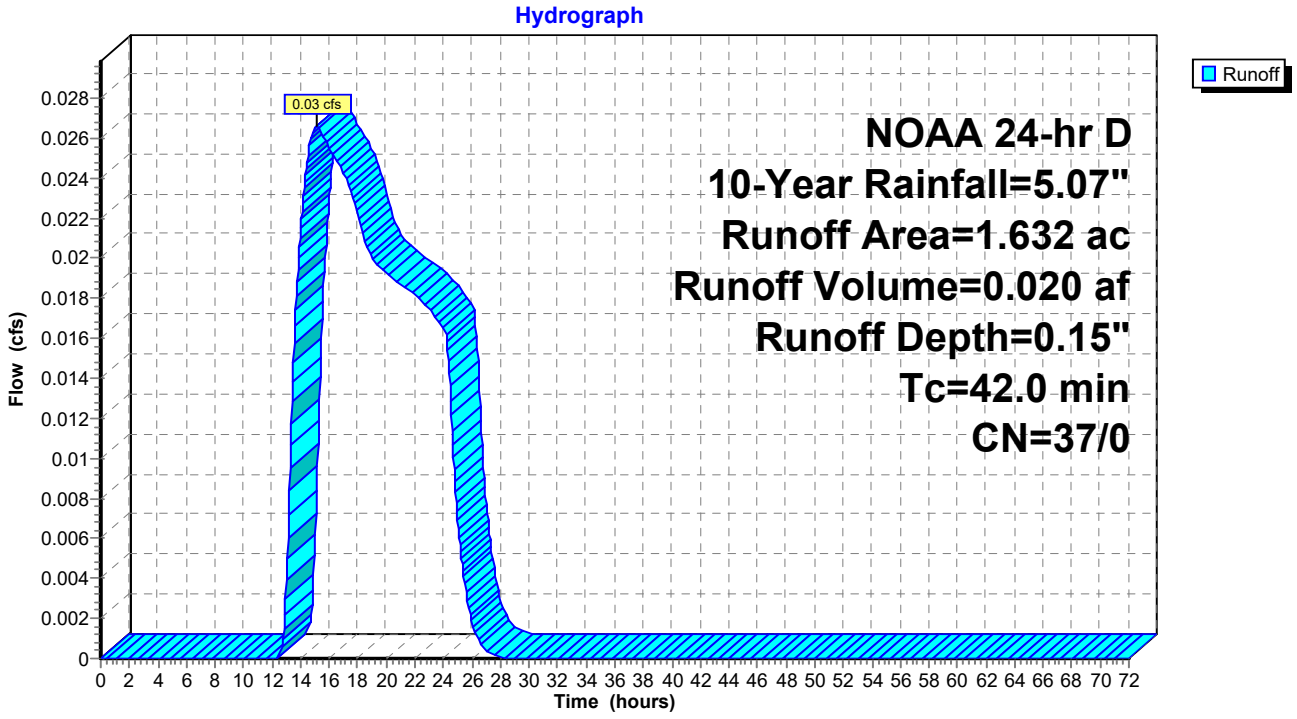
Runoff = 0.03 cfs @ 15.12 hrs, Volume= 0.020 af, Depth= 0.15"

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 10-Year Rainfall=5.07"

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



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

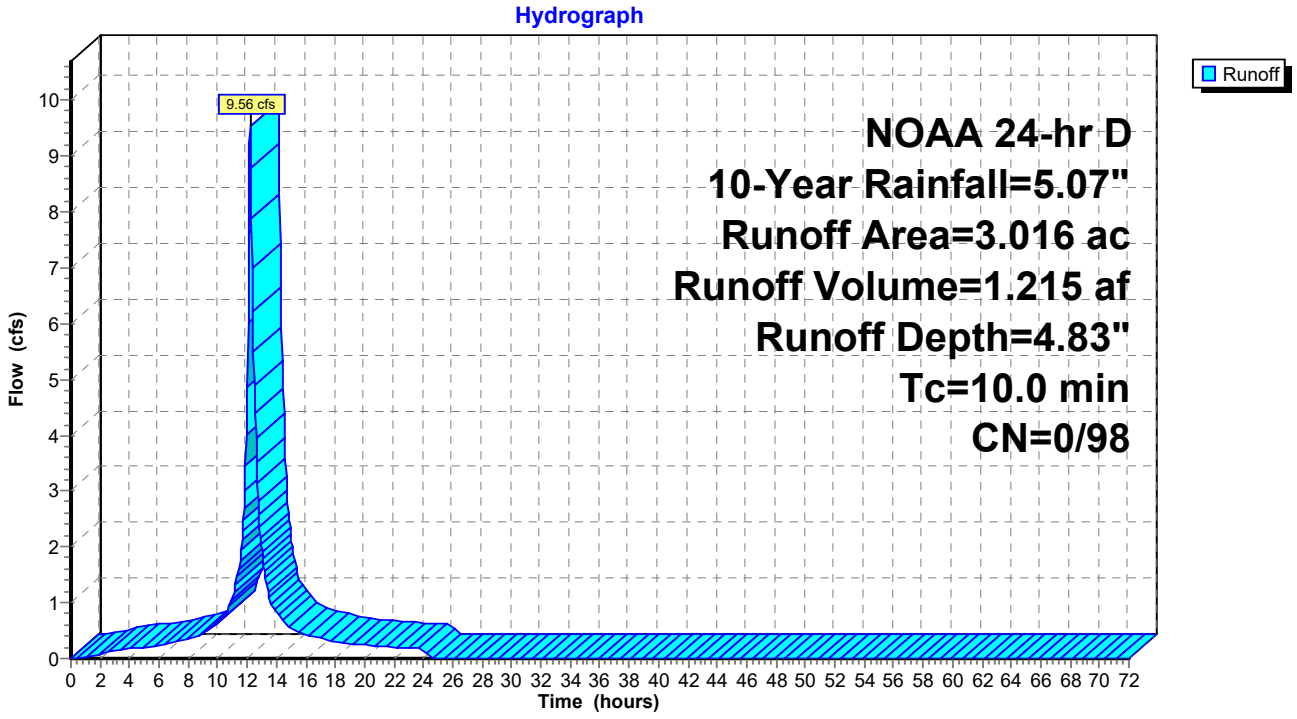
Runoff = 9.56 cfs @ 12.19 hrs, Volume= 1.215 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.07"

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



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

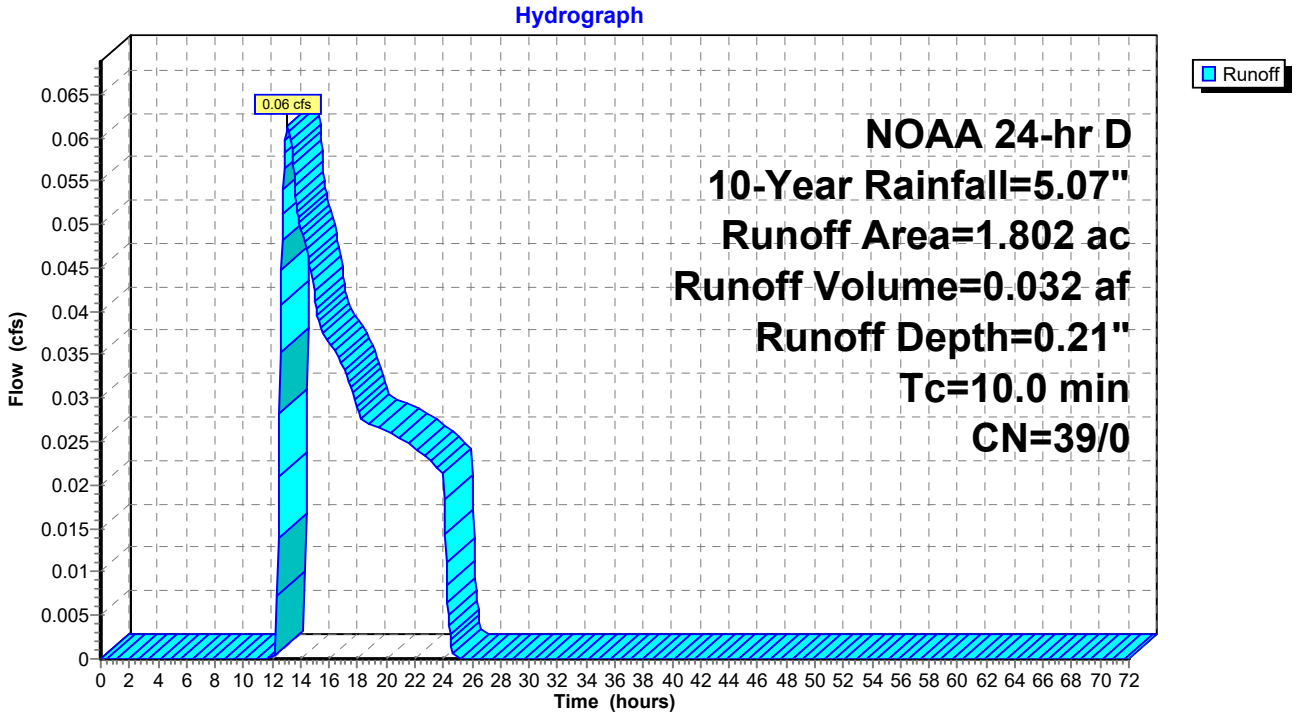
Runoff = 0.06 cfs @ 13.09 hrs, Volume= 0.032 af, Depth= 0.21"

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 10-Year Rainfall=5.07"

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



Summary for Pond IB-A: Infiltration Basin A

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 3.11" for 10-Year event
Inflow = 9.56 cfs @ 12.19 hrs, Volume= 1.247 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= 33.21' @ 25.15 hrs Surf.Area= 0.742 ac Storage= 1.247 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	**Custom Stage Data (Irregular)** Listed below

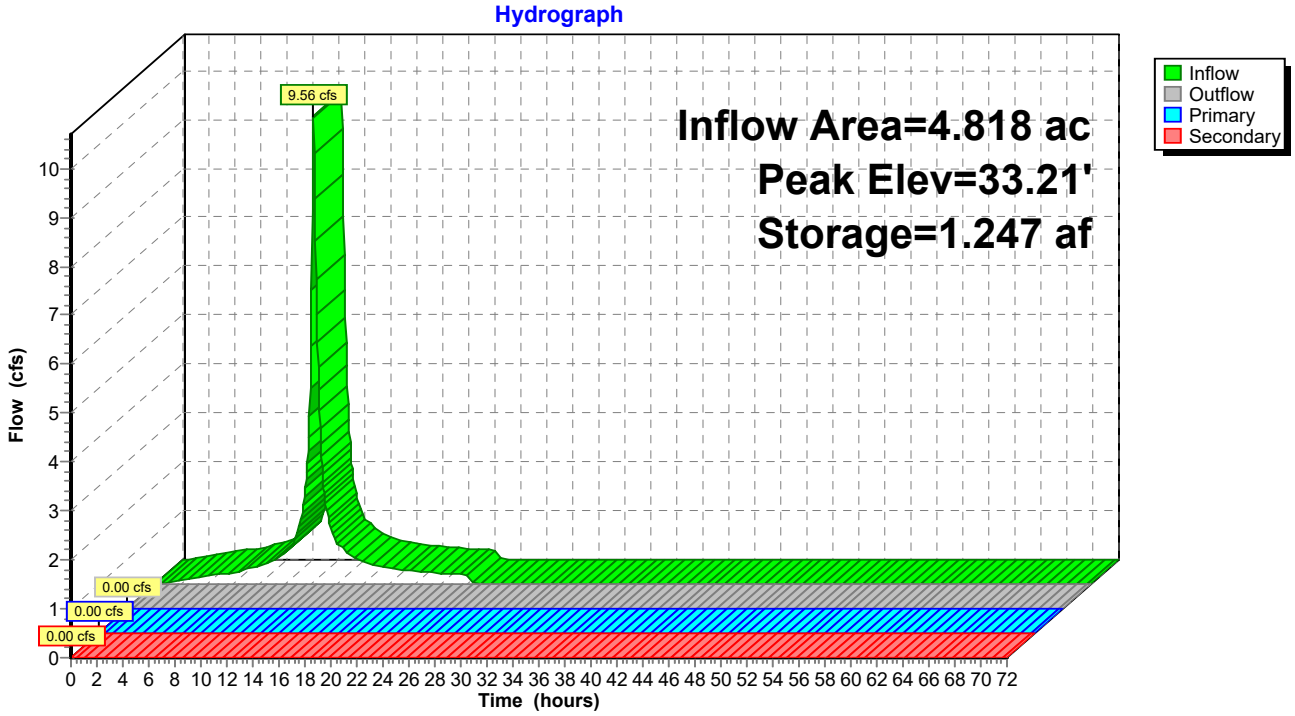
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	**15.0" Round Culvert** 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'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	33.90'	**35.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.40' (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=31.40' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB-A: Infiltration Basin A



Summary for Pond IB-B: Infiltration Basin B

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.85" for 10-Year event
Inflow = 2.96 cfs @ 12.19 hrs, Volume= 0.396 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= 31.99' @ 28.70 hrs Surf.Area= 0.263 ac Storage= 0.396 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	**Custom Stage Data (Irregular)** Listed below

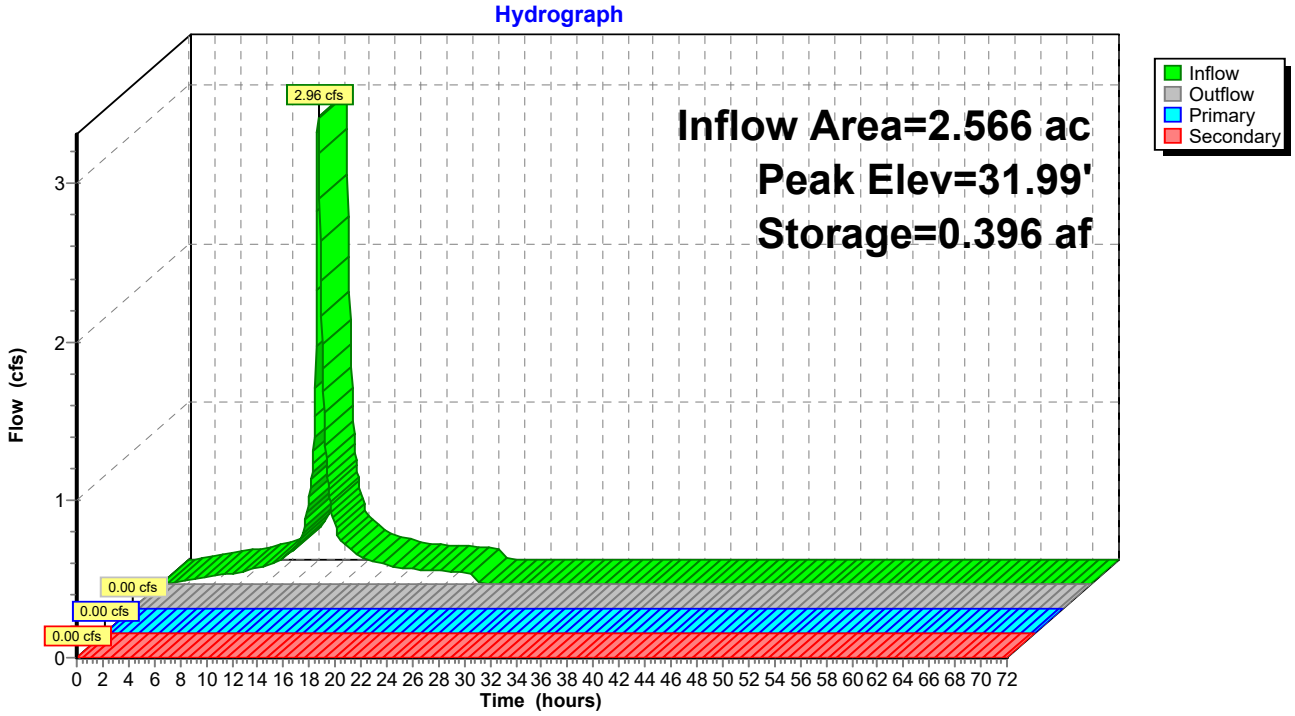
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
30.40	0.235	491.3	0.000	0.000	0.235
31.00	0.245	498.6	0.144	0.144	0.250
32.00	0.263	510.7	0.254	0.398	0.275
33.00	0.281	522.8	0.272	0.670	0.301
34.00	0.299	535.0	0.290	0.960	0.327

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	**15.0" Round Culvert** 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'	**3.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.70'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=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

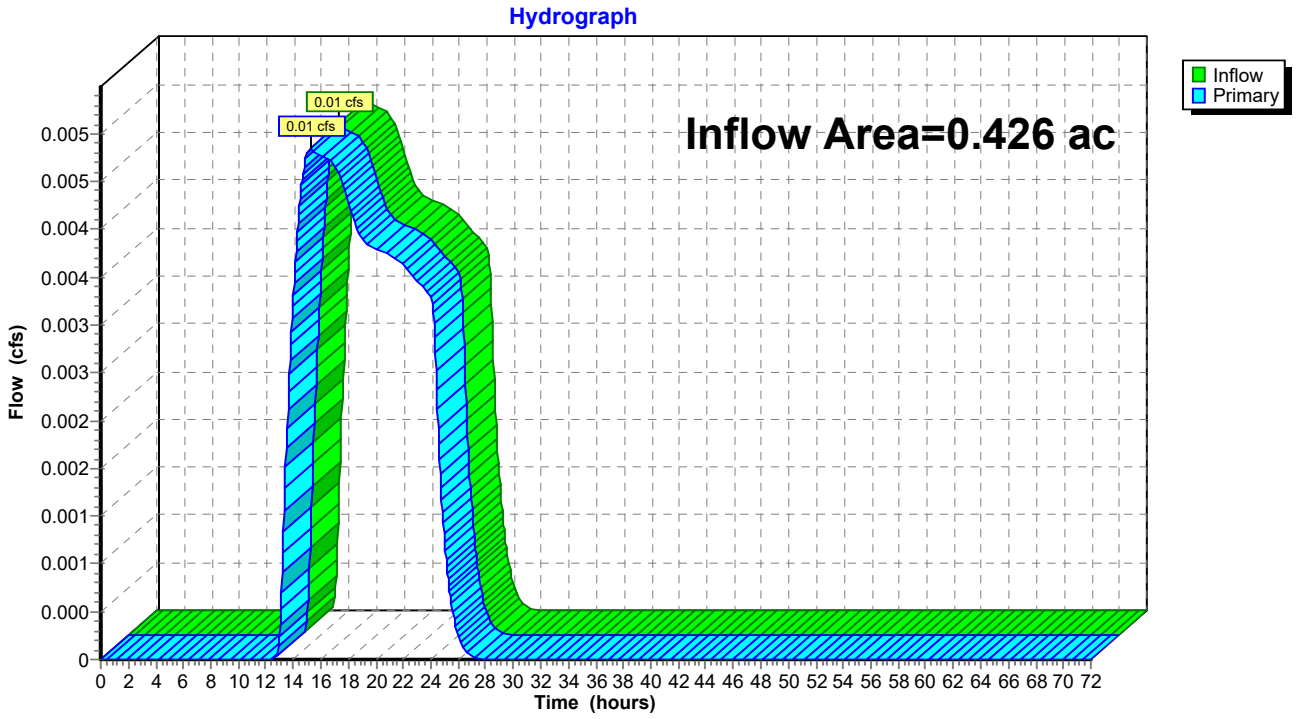


Summary for Link P-A1: A1

Inflow Area = 0.426 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event
Inflow = 0.01 cfs @ 15.21 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 15.21 hrs, Volume= 0.004 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

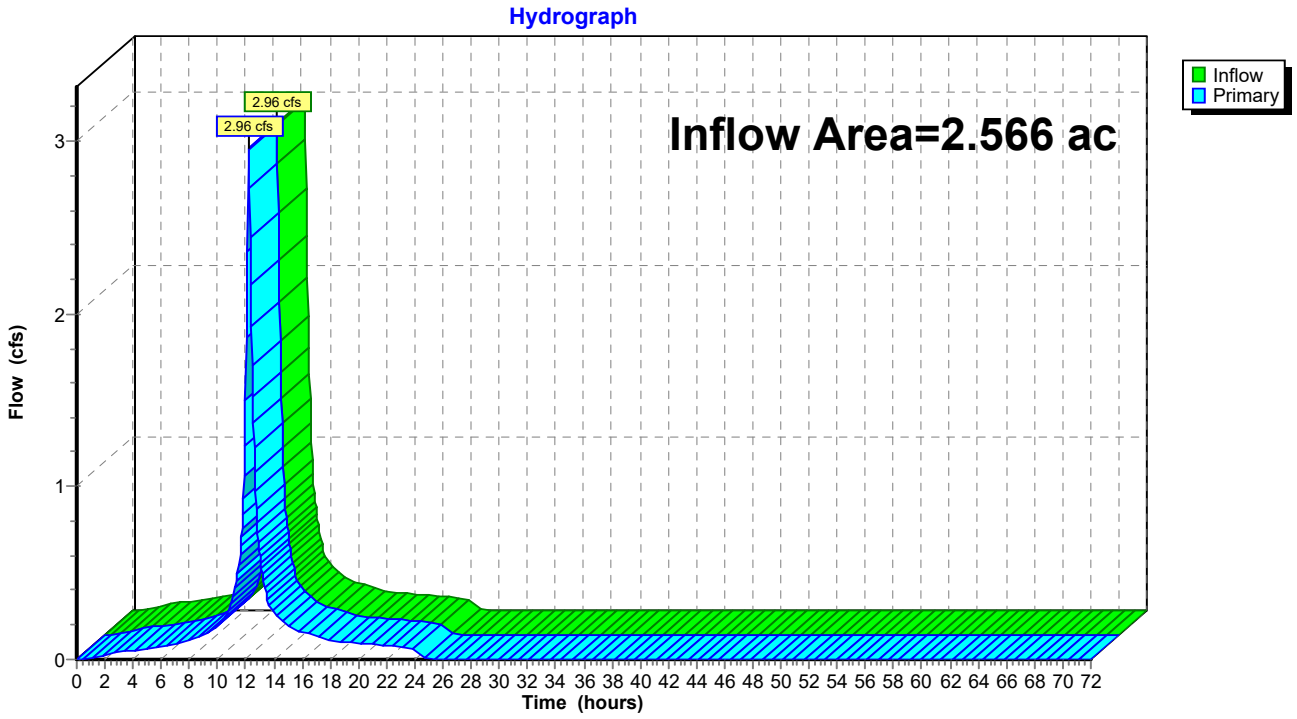


Summary for Link P-B1: B1

Inflow Area = 2.566 ac, 36.40% Impervious, Inflow Depth = 1.85" for 10-Year event
Inflow = 2.96 cfs @ 12.19 hrs, Volume= 0.396 af
Primary = 2.96 cfs @ 12.19 hrs, Volume= 0.396 af, Atten= 0%, Lag= 0.0 min

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

Link P-B1: B1

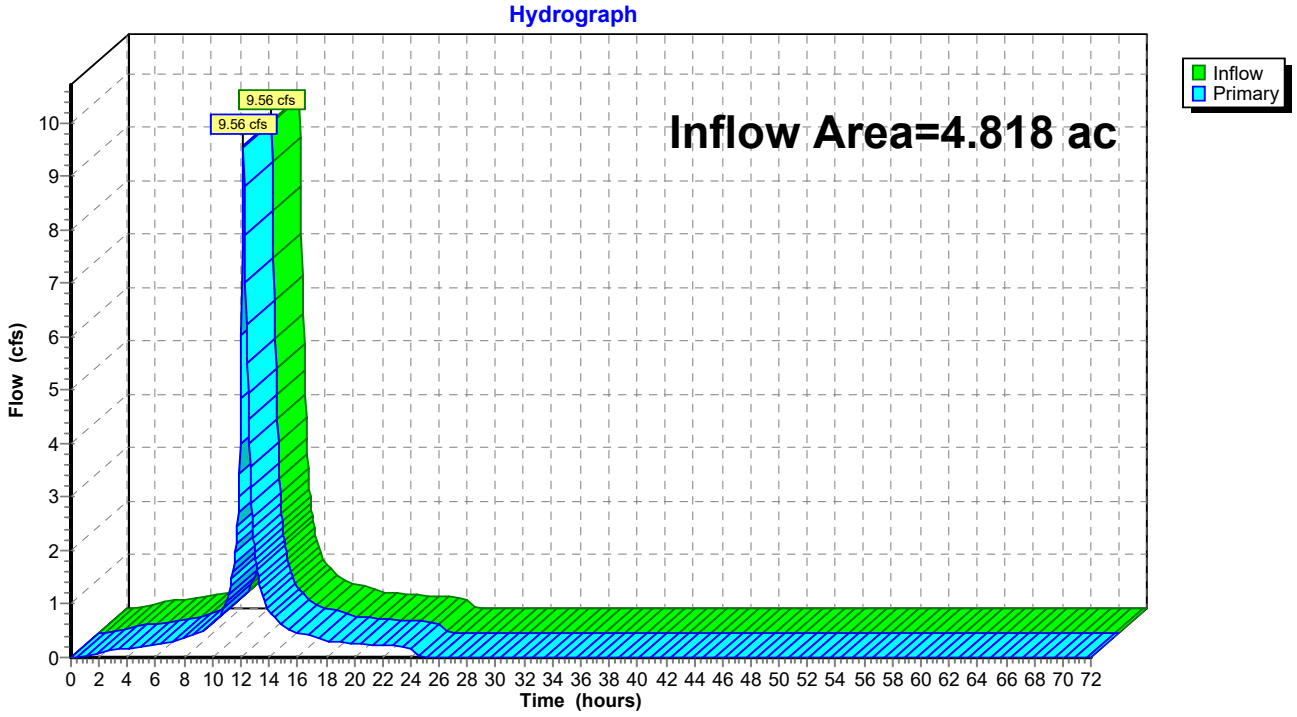


Summary for Link P-C1: C1

Inflow Area = 4.818 ac, 62.60% Impervious, Inflow Depth = 3.11" for 10-Year event
Inflow = 9.56 cfs @ 12.19 hrs, Volume= 1.247 af
Primary = 9.56 cfs @ 12.19 hrs, Volume= 1.247 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



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-A1-Perv: A1-Perv Runoff Area=0.426 ac 0.00% Impervious Runoff Depth=1.06"
Tc=35.0 min CN=36/0 Runoff=0.10 cfs 0.038 af

Subcatchment P-B1-Imp: B1-Imp 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

Subcatchment P-B1-Perv: B1-Perv 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

Subcatchment P-C1-Imp: C1-Imp 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

Subcatchment P-C1-Perv: C1-Perv 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

Pond IB-A: Infiltration Basin A Peak Elev=33.90' Storage=1.768 af Inflow=17.21 cfs 2.273 af
Primary=0.72 cfs 0.863 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 0.863 af

Pond IB-B: Infiltration Basin B Peak Elev=32.62' Storage=0.566 af Inflow=5.00 cfs 0.798 af
Primary=0.33 cfs 0.396 af Secondary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.396 af

Link P-A1: A1 Inflow=0.10 cfs 0.038 af
Primary=0.10 cfs 0.038 af

Link P-B1: B1 Inflow=5.00 cfs 0.798 af
Primary=5.00 cfs 0.798 af

Link P-C1: C1 Inflow=17.21 cfs 2.273 af
Primary=17.21 cfs 2.273 af

Total Runoff Area = 7.810 ac Runoff Volume = 3.109 af Average Runoff Depth = 4.78"
49.42% Pervious = 3.860 ac 50.58% Impervious = 3.950 ac

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

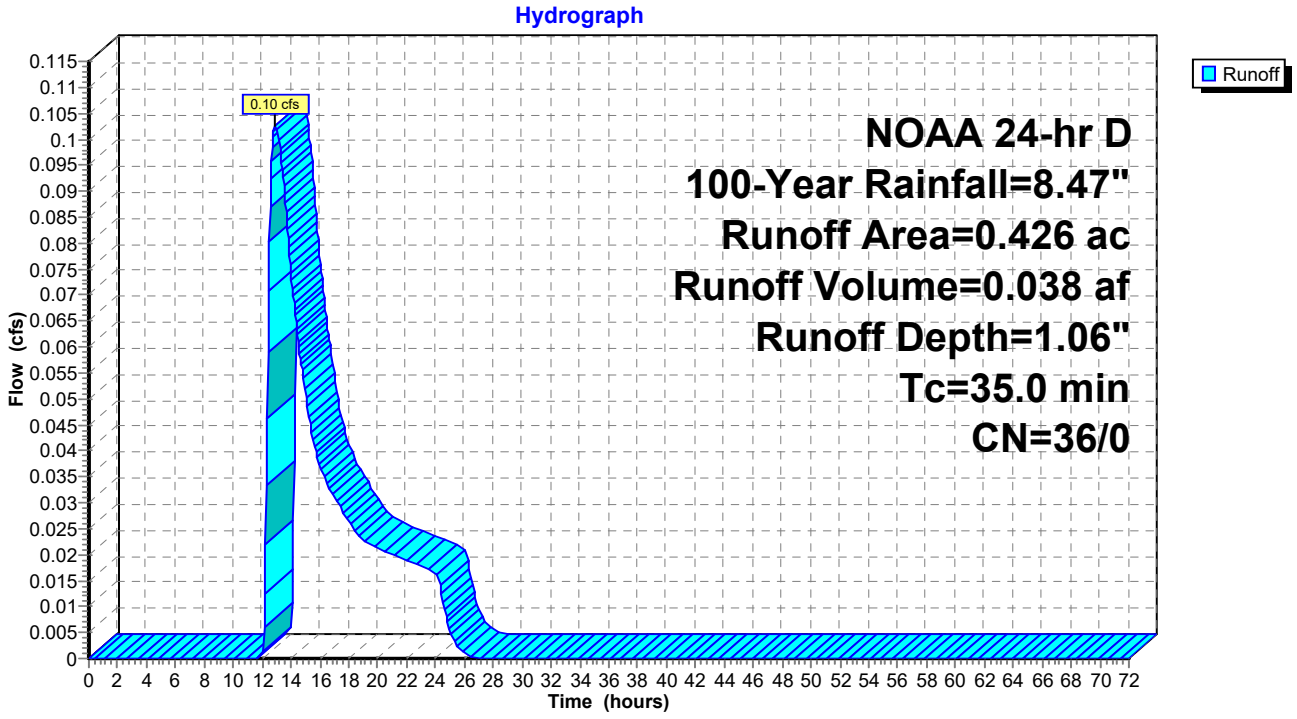
Runoff = 0.10 cfs @ 12.91 hrs, Volume= 0.038 af, Depth= 1.06"

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 D 100-Year Rainfall=8.47"

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



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

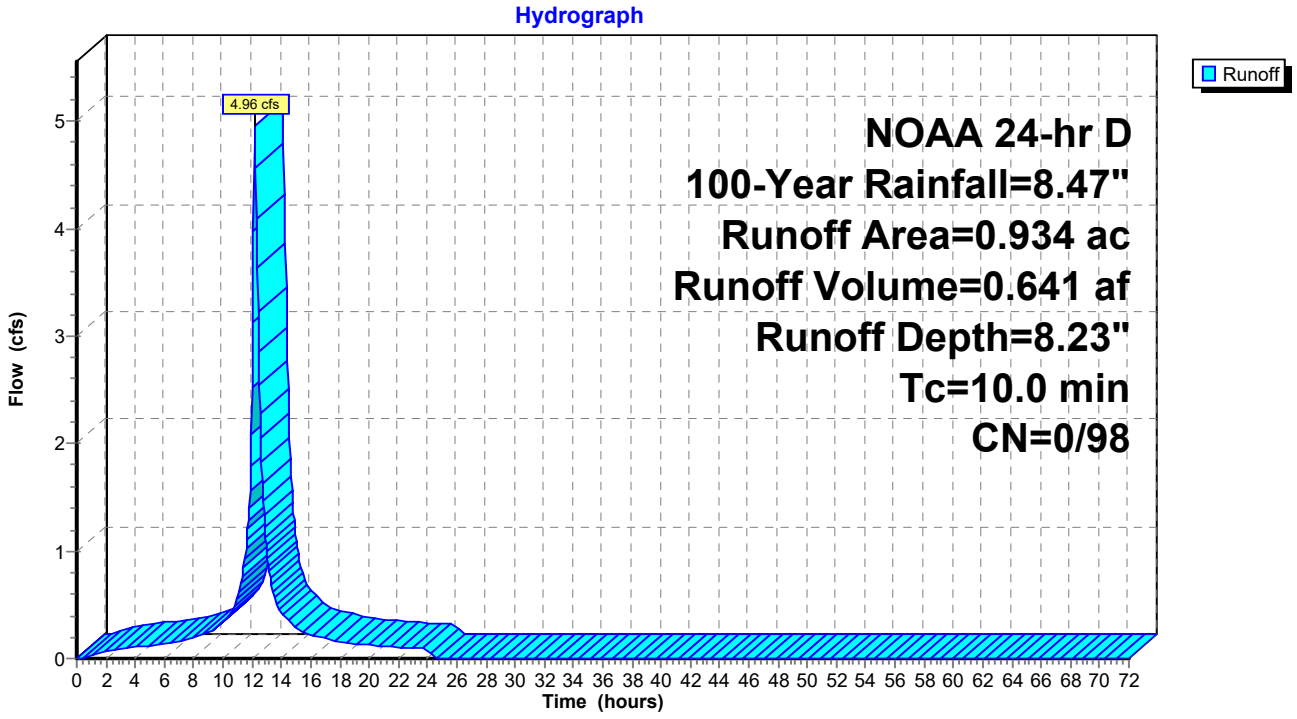
Runoff = 4.96 cfs @ 12.19 hrs, Volume= 0.641 af, Depth= 8.23"

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



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

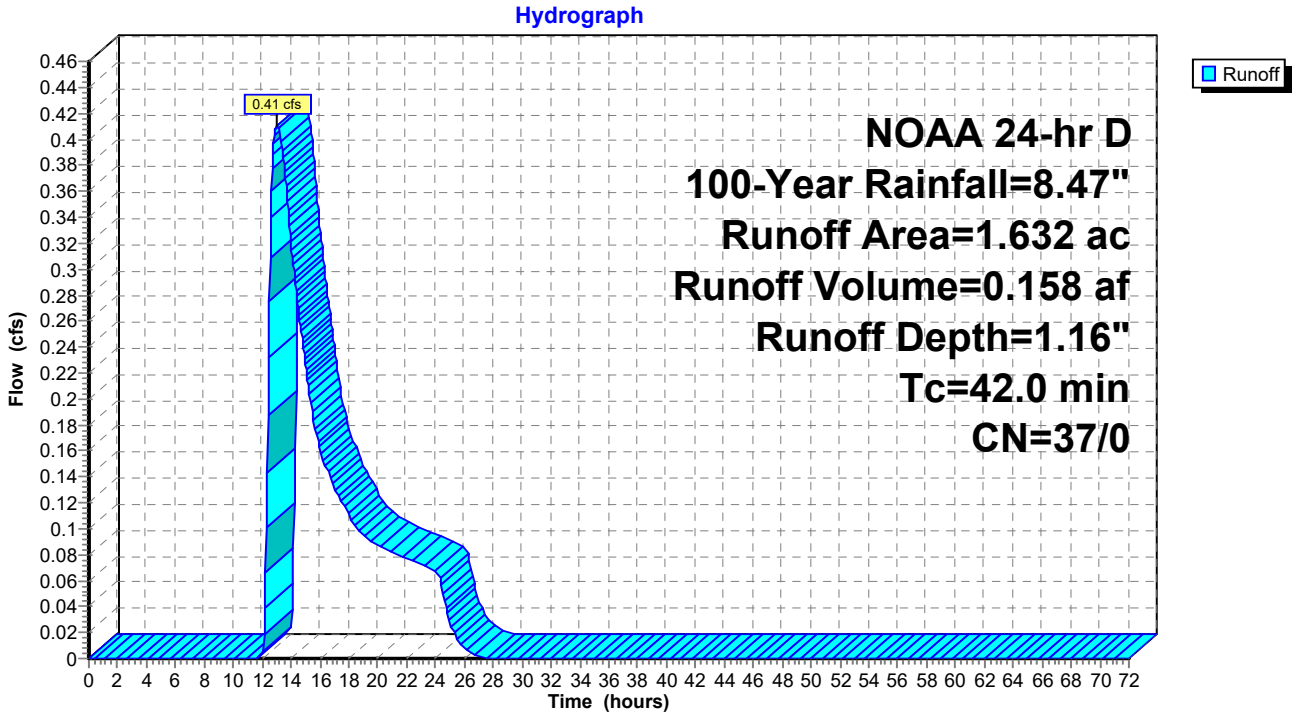
Runoff = 0.41 cfs @ 13.02 hrs, Volume= 0.158 af, Depth= 1.16"

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
0.926	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



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

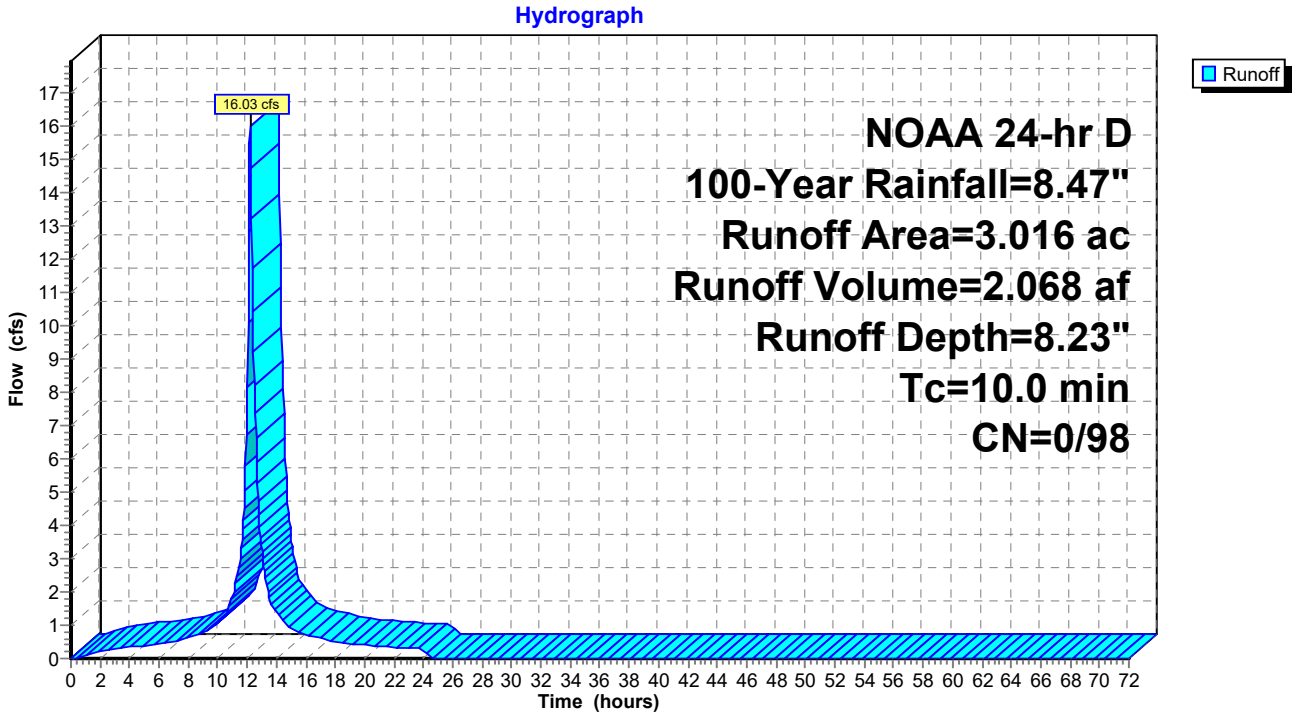
Runoff = 16.03 cfs @ 12.19 hrs, Volume= 2.068 af, Depth= 8.23"

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



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

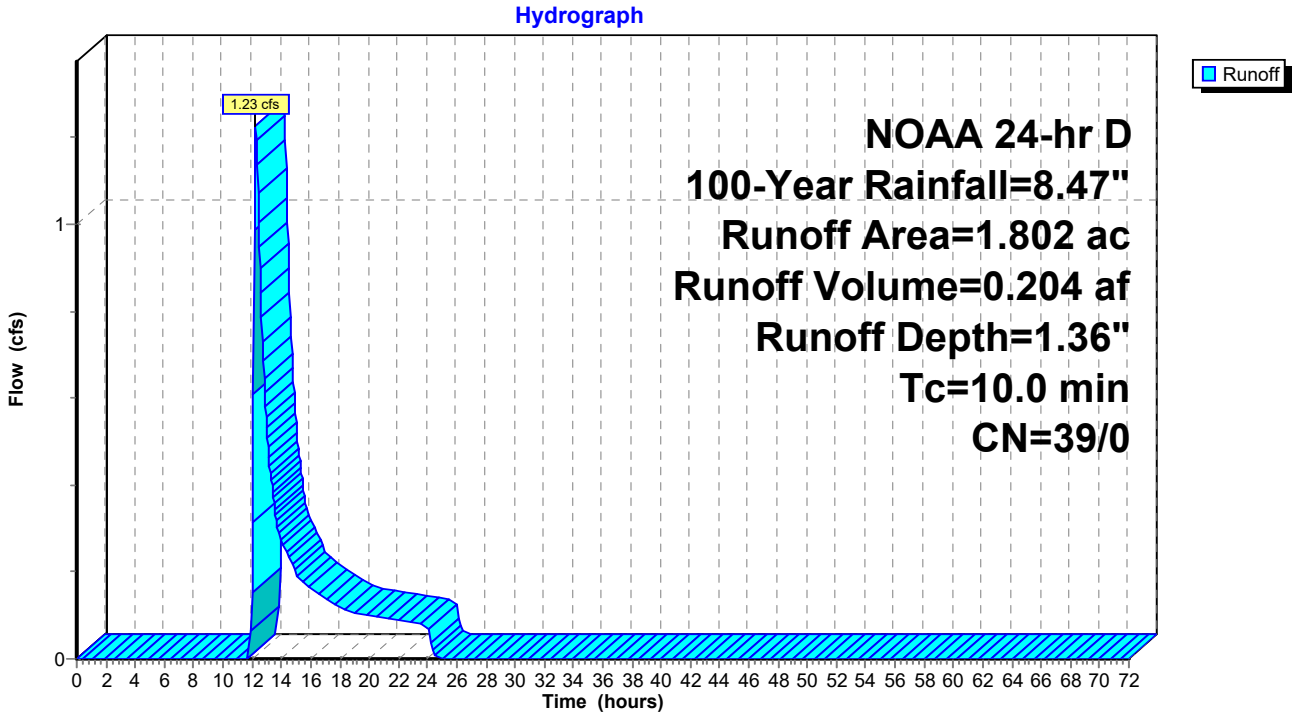
Runoff = 1.23 cfs @ 12.25 hrs, Volume= 0.204 af, Depth= 1.36"

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



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 = 0.72 cfs @ 17.13 hrs, Volume= 0.863 af, Atten= 96%, Lag= 295.9 min
Primary = 0.72 cfs @ 17.13 hrs, Volume= 0.863 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= 33.90' @ 17.13 hrs Surf.Area= 0.785 ac Storage= 1.768 af

Plug-Flow detention time= 775.2 min calculated for 0.863 af (38% of inflow)
Center-of-Mass det. time= 585.9 min (1,353.2 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1	31.40'	2.668 af	**Custom Stage Data (Irregular)** Listed below

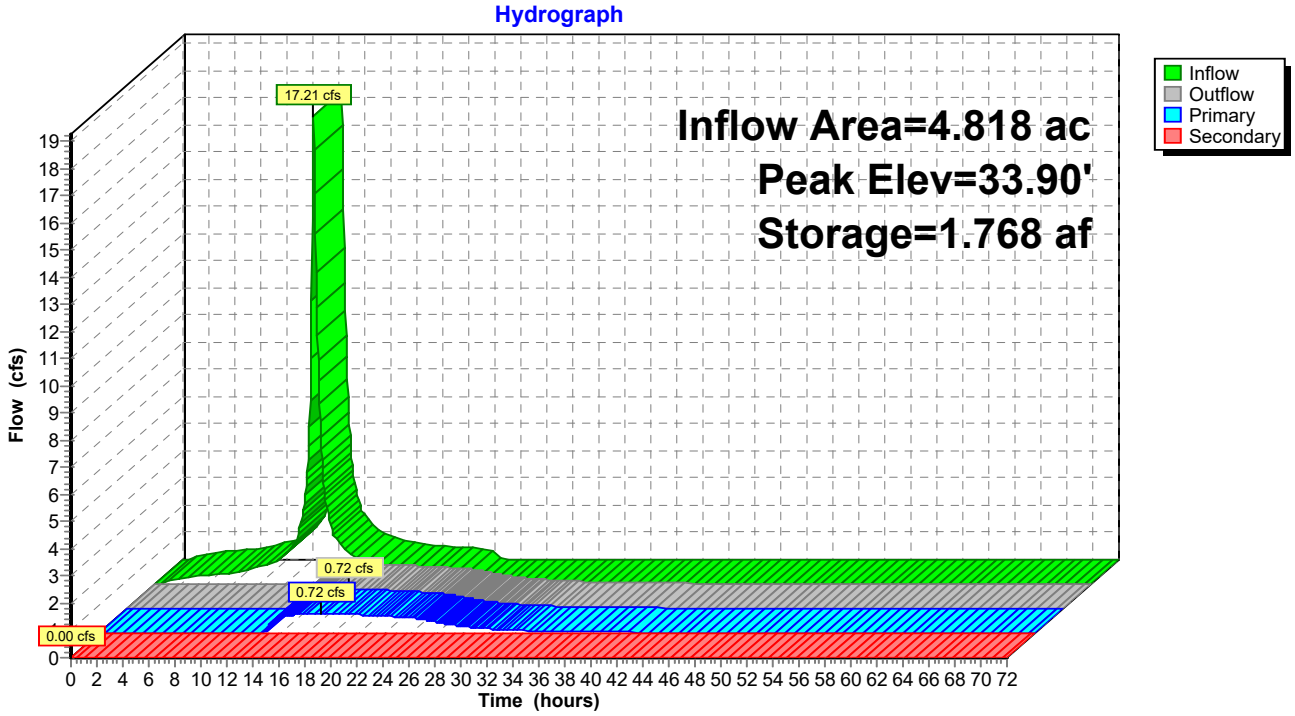
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	**15.0" Round Culvert** 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'	**4.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	33.90'	**35.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.72 cfs @ 17.13 hrs HW=33.90' (Free Discharge)
└**1=Culvert** (Passes 0.72 cfs of 2.13 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 2.77 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.40' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB-A: Infiltration Basin A



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 = 0.33 cfs @ 16.77 hrs, Volume= 0.396 af, Atten= 93%, Lag= 274.9 min
Primary = 0.33 cfs @ 16.77 hrs, Volume= 0.396 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= 32.62' @ 16.77 hrs Surf.Area= 0.274 ac Storage= 0.566 af

Plug-Flow detention time= 683.0 min calculated for 0.396 af (50% of inflow)
Center-of-Mass det. time= 513.2 min (1,312.0 - 798.8)

Volume	Invert	Avail.Storage	Storage Description
#1	30.40'	0.960 af	**Custom Stage Data (Irregular)** Listed below

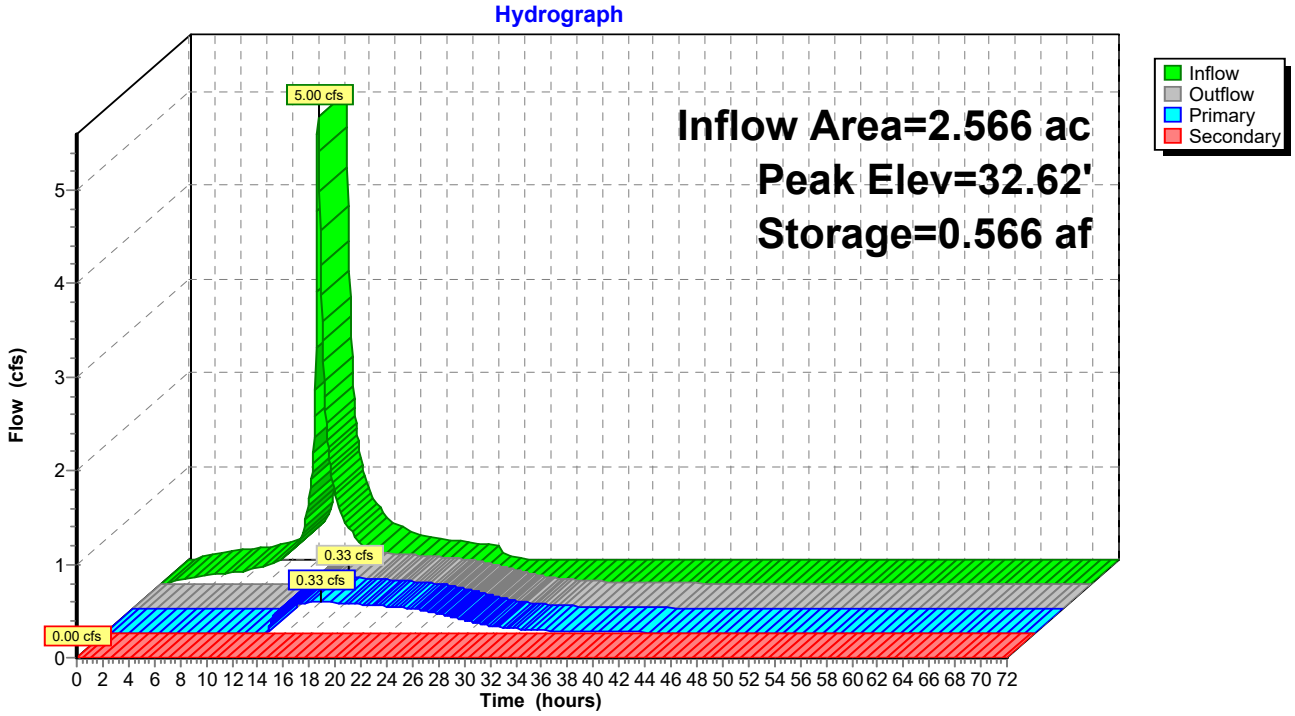
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
30.40	0.235	491.3	0.000	0.000	0.235
31.00	0.245	498.6	0.144	0.144	0.250
32.00	0.263	510.7	0.254	0.398	0.275
33.00	0.281	522.8	0.272	0.670	0.301
34.00	0.299	535.0	0.290	0.960	0.327

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	**15.0" Round Culvert** 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'	**3.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.70'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.33 cfs @ 16.77 hrs HW=32.62' (Free Discharge)
↑—**1=Culvert** (Passes 0.33 cfs of 5.88 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 3.38 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

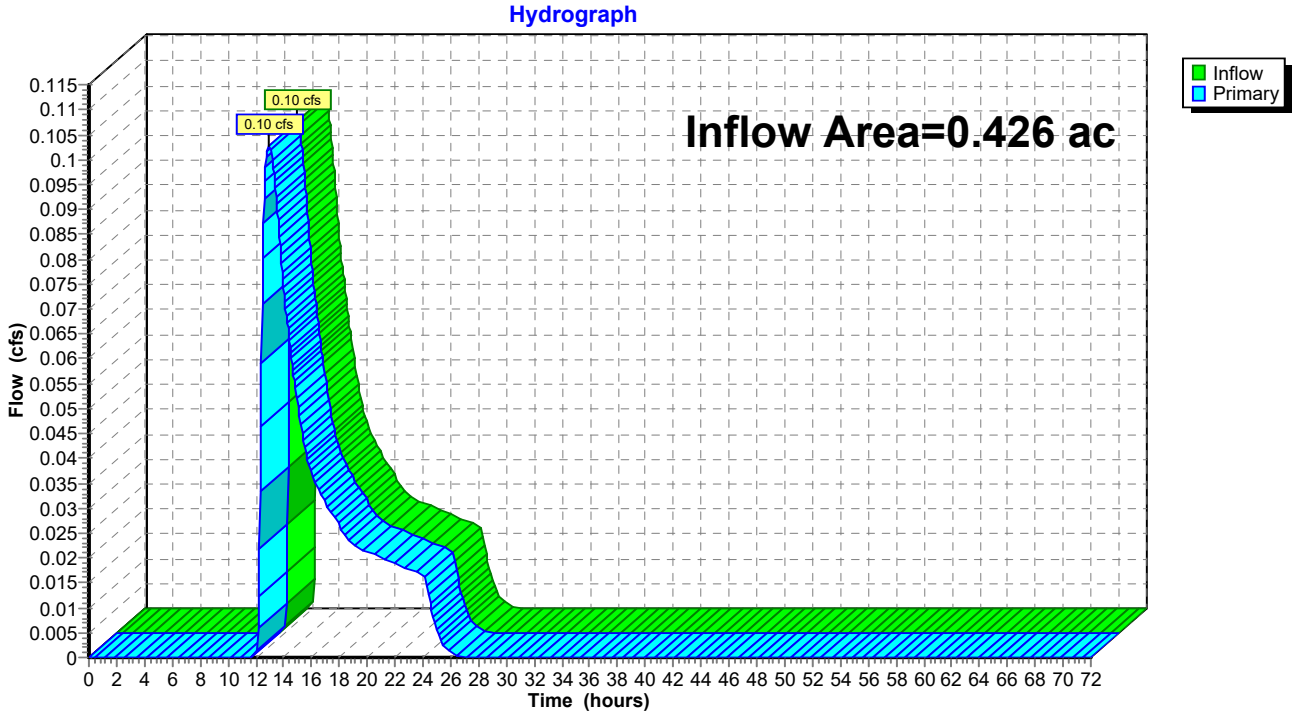


Summary for Link P-A1: A1

Inflow Area = 0.426 ac, 0.00% Impervious, Inflow Depth = 1.06" for 100-Year event
Inflow = 0.10 cfs @ 12.91 hrs, Volume= 0.038 af
Primary = 0.10 cfs @ 12.91 hrs, Volume= 0.038 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

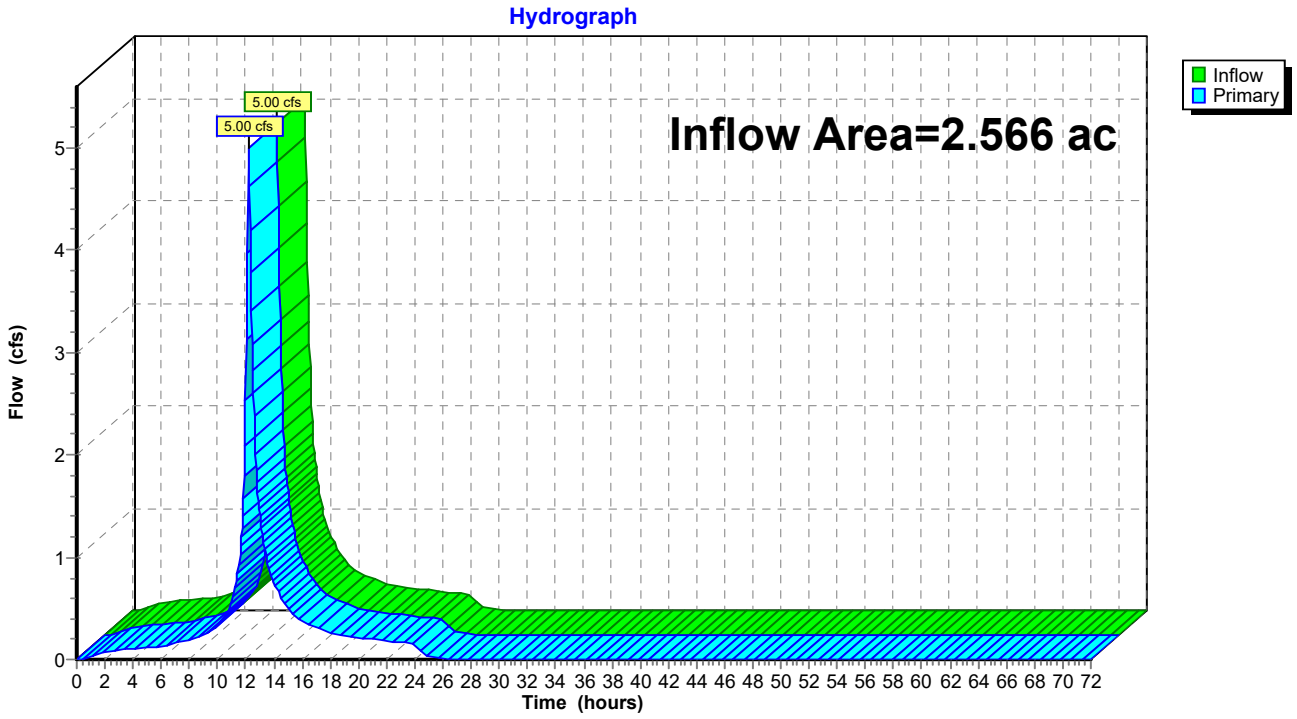


Summary for Link P-B1: B1

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

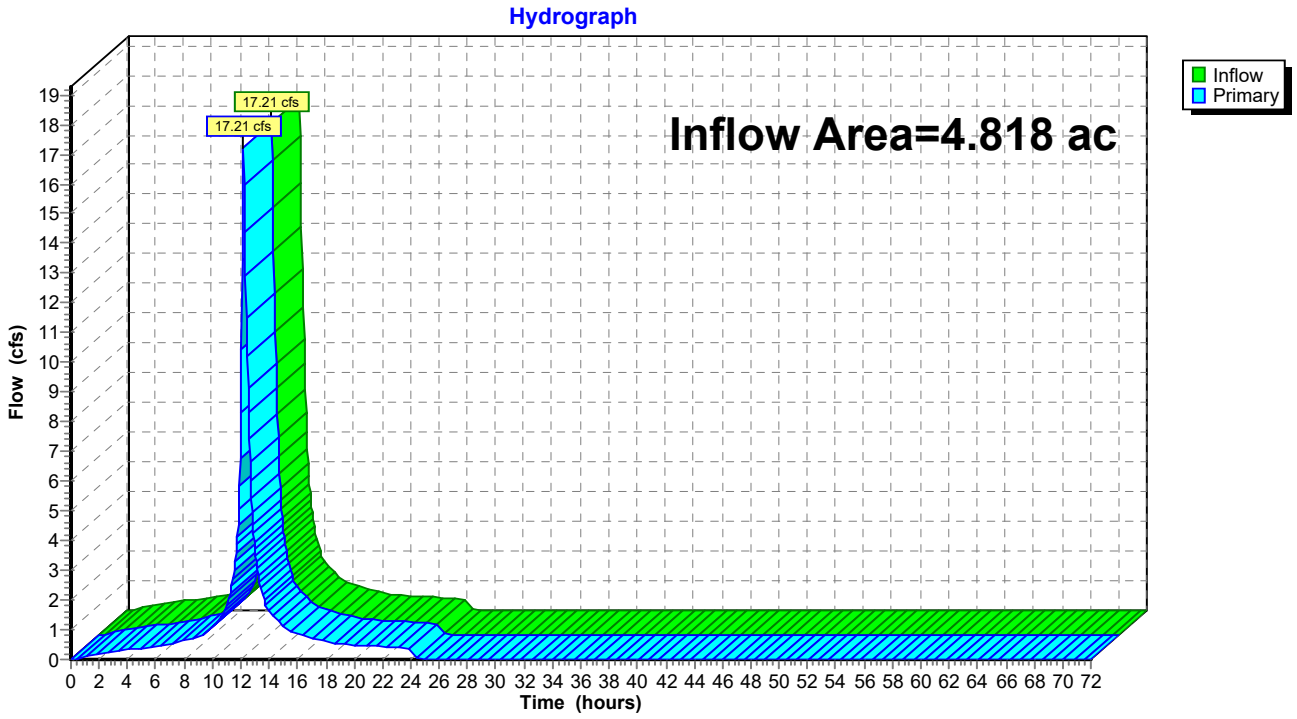


Summary for Link P-C1: C1

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



Appendix D

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)
A	1	4.61	K3	2	2.31	0.19	1.00	27,454	5,216.3	2.5052	20 hr 55 min
B	6	7.52	K4	2	3.76	0.31	1.00	10,244	3,175.5	1.9648	26 hr 57 min

Basin Bottom Elev	Water Elev Reqd for Recharge per GSR-32	NJDEP WQ Stm Elev in Basin	Lowest Inv. of Orif/Weir In Basin
31.40		32.55	33.40
30.40		31.37	32.00

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

$$Q = KIA$$

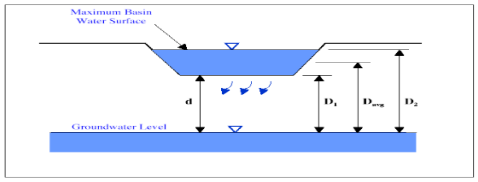
where:

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:

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

Project Name:	Edgewater Park Self Storage
Description:	Self Storage Facility in Edgewater
Analysis Date:	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
				Total Impervious Area (sq.ft)	172,062

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	
Post-Development Annual Recharge Deficit=	*194,714*	(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	2.46	(in)	DRWC= 2.46	(in)
ERWC =	0.73	(in)	EDRWC= 0.73	(in)

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

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

Project Name	Description	Analysis Date	BMP or LID Type
Edgewater Park Self Stora	Self Storage Facility in Edgewater P	07/09/202	Infiltration Basin B

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	10243.6	sq.ft
BMP Effective Depth, this is the design variable	dBMP	24.0	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	3	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in
ERWC Modified to consider dEXC	EDRWC	0.62	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.50	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	2.77	in
Inches of Rainfall to capture	Pdesign	3.00	in
Recharge Provided Avg. over Imp. Area		25.9	in
Runoff Captured Avg. over imp. Area		34.9	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.25	unitless
BMP Volume	VBMP	20,487	cu.ft

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	40,712	sq.ft
Root Zone Water Capacity	RWC	2.10	in
RWC Modified to consider dEXC	DRWC	2.10	in
Climatic Factor	C-factor	1.41	no units
Average Annual P	Pavg	44.9	in
Recharge Requirement over Imp. Area	dr	13.6	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		87,783	cu.ft
Avg BMP Recharge Efficiency		74.1%	Represents % Infiltration Recharged
%Rainfall became Runoff		77.7%	%
%Runoff Infiltrated		100.0%	%
%Runoff Recharged		17.5%	%
%Rainfall Recharged		13.6%	%

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive 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.

How to solve for different recharge volumes: 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 clik the "Default Vdef & Aimp" button.

Project Name	Description	Analysis Date	BMP or LID Type
Edgewater Park Self Stora	Self Storage Facility in Edgewater P	07/09/202	Infiltration Basin A

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	27454.4	sq.ft
BMP Effective Depth, this is the design variable	dBMP	24.0	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-24.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	3	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.62	in
ERWC Modified to consider dEXC	EDRWC	0.62	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.50	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	2.77	in
Inches of Rainfall to capture	Pdesign	3.00	in
Recharge Provided Avg. over Imp. Area		25.9	in
Runoff Captured Avg. over imp. Area		34.9	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.21	unitless
BMP Volume	VBMP	54,909	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	194,714	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	131,355	sq.ft
Root Zone Water Capacity	RWC	2.10	in
RWC Modified to consider dEXC	DRWC	2.10	in
Climatic Factor	C-factor	1.41	no units
Average Annual P	Pavg	44.9	in
Recharge Requirement over Imp. Area	dr	13.6	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		235,274	cu.ft
Avg BMP Recharge Efficiency		74.1%	Represents % Infiltration Recharged
%Rainfall became Runoff		77.7%	%
%Runoff Infiltrated		83.1%	%
%Runoff Recharged		47.0%	%
%Rainfall Recharged		36.5%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive 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.

How to solve for different recharge volumes: 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 clik the "Default Vdef & Aimp" button.

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[1]		Test Subgrade		Soil Subgrade Tested	Field-Saturated Hydraulic Conductivity[3], k_{fs} (cm/s)	Field-Saturated Infiltration Rate[4], (inch/hr)
		Depth, (feet)	Elevation[2], (feet)	Depth, (feet)	Elevation[2], (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
Geometric Mean (All Testing Locations above Estimated SHWT) =							**5.05E-03**	**5.20**

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] = $6x10^{-11} \cdot$ (Infiltration Rate [mm/hr])$^{3.7363}$.

PROPOSED DETENTION BASINS

LINE OF PROPOSED BUILDINGS

LINE OF PROPOSED BUILDING

LINE OF PROPOSED ANCILLARY SELF-STORAGE BUILDINGS (TYP.)

TP1 TP2 TP3 TP4 TP5 TP6

B1(OW) B2 B3 B4 B5(OW) B6

MT HOLLY ROAD (RT. 626)

BURLINGTON PIKE (RT. 130)

EDGEWATER PARK TOWNSHIP

WILLINGBORO TOWNSHIP

TRUE NORTH

SITE NORTH

LEGEND:

B1 PROPOSED TEST BORING (2019)

TP1 PROPOSED TEST PIT (2019)

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.

0 100 200

SCALE: 1" = 100'

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

Edgewater Storage LLC
Teaneck, New Jersey

GEI Consultants

EXPLORATION LOCATION PLAN

Project 2002331 June 2020 Fig. 2

\\geiconsulta B:\Working\WARE MALCOMB\2002331 Edgewater Storage Self Storage Dev\00_CAD\Figures\Geotech\2002331-01.1 EXPLOC.dwg - 6/18/2020

TEST PIT LOG

TP1

Project	Edgewater Storage Development			**PG.**	1 **OF** 3
City/Town	Edgewater Park, Burlington County, NJ			**Location**	See Plan
Client	Edgewater Storage, LLC			N: 439,845.56 ft	E: 375,515.91 ft
Equipment/Reach	CASE 580 Super M Backhoe / ~14-foot Reach			**Ground El.**	30.4 ft
Weather	Low 60's °F, Partly cloudy			**Datum**	NAD83 NJ / NAVD 88
Contractor	AmeriDrill	**Operator**	Tom Brown	**Project No.**	2002331
Observed By	J. Light	**Date**	5/20/2020	**Start Date**	5/20/2020
Checked By	S. DiBartolo	**Date**	6/17/2020	**End Date**	5/20/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			
			0-0.8': Dark Brown Loamy Top Soil.
			0.8'-1.7': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% sand; ~10% nonplastic fines; dry; medium brown; roots.
2	G1 Bag	2	1.7'-4.3': SILTY SAND (SM); 84.4% mostly fine sand; 14.6% medium plasticity fines; dry to moist; light brown (3.3Y 7.0/5.1); minor mottling; roots. [GRAIN SIZE TEST PERFORMED].
4	G2 Bag	4.3	
			4.3'-9': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% Sand; ~10% nonplastic fines; moist; light gray brown (4.7Y 7.3/1.7); mottling and roots.
6			
	G3 Bag	7	
8			
			Bottom of test pit at ~9 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
10			
12			
14			
16			

Notes:

1) Groundwater not encountered.
2) Estimated SHWT @ D=4.3'.
3) Aardvark Permeameter testing performed at D=2.5'.

Pit Dimensions (ft)

Length	11
Width	8
Depth	9

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TEST PIT LOG

TP2

Project	Edgewater Storage Development			**PG.**	1 **OF** 3
City/Town	Edgewater Park, Burlington County, NJ			**Location**	See Plan
Client	Edgewater Storage, LLC			N: 439,645.00 ft	E: 375,311.75 ft
Equipment/Reach	CASE 580 Super M Backhoe / ~14-foot Reach			**Ground El.**	32.3 ft
Weather	~65 °F, Sunny			**Datum**	NAD83 NJ / NAVD 88
Contractor	AmeriDrill	**Operator**	T. Brown	**Project No.**	2002331
Observed By	J. Light	**Date**	5/21/2020	**Start Date**	5/21/2020
Checked By	S. DiBartolo	**Date**	6/17/2020	**End Date**	5/21/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			
			0-0.5': Loamy Top Soil; dark brown; roots.
			0.5'-1.1': NARROWLY GRADED SAND (SP); 95% Sand; ~5% low plasticity fines; dry; medium brown; roots.
2			1.1'-5.7': NARROWLY GRADED SAND WITH SILT (SP-SM); 88.7% mostly fine sand; 11.3% low to medium plasticity fines; dry to moist; light brown (10YR 7/4); roots; 2" bands of darker colored similar material. [GRAIN SIZE TEST PERFORMED].
	G1 Bag	2.5	
4			
	G2 Bag	4.5	
			5.7'-10': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% sand; ~10% low to medium plasticity fines; light gray brown (4.7Y 7.3/1.7); mottling with roots.
6			
	G3 Bag	7	
8			
	G4 Bag	10	
10			Bottom of test pit at ~10 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
12			
14			
16			

Notes:

1) Groundwater not encountered.
2) Estimated SHWT @ D=5.7'.
3) Aardvark Permeameter testing performed at D=2.2' and 3'.

Pit Dimensions (ft)

Length	8
Width	8
Depth	10

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TEST PIT LOG

TP3

Project	Edgewater Storage Development			**PG.**	1 **OF** 3
City/Town	Edgewater Park, Burlington County, NJ			**Location**	See Plan
Client	Edgewater Storage, LLC			N: 439,548.41 ft	E: 375,240.28 ft
Equipment/Reach	CASE 580 Super M Backhoe / ~14-foot Reach			**Ground El.**	32.5 ft
Weather	~65 °F, Sunny			**Datum**	NAD83 NJ / NAVD 88
Contractor	AmeriDrill	**Operator**	T. Brown	**Project No.**	2002331
Observed By	J. Light	**Date**	5/21/2020	**Start Date**	5/21/2020
Checked By	S. DiBartolo	**Date**	6/17/2020	**End Date**	5/21/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			
			0-0.6': Loamy Top Soil; dark brown .
			0.6'-4.7': SILTY SAND (SM); 84.4% mostly fine sand; ~15.6% low plasticity fines; dry @ 0.6'-1.25', dry to moist @ 1.25'-4.7'; light brown with banded dark brown @ 0.9'-1.25' and 1.45'-1.9' and some minor mottling @ 1.9'-4.7'; roots. [GRAIN SIZE TEST PERFORMED].
2	G1 Bag	2	
4	G2 Bag	4.3	
6			4.7'-10': SILTY SAND (SM); ~85% mostly fine sand; ~15% low plasticity fines; moist; light brown and light gray; roots; mottling.
8			
10	G3 Bag	10	
12			Bottom of test pit at ~10 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
14			
16			

Notes:

1) Groundwater not encountered.
2) Estimated SHWT @ D=4.3'.
3) Aardvark Permeameter testing performed at D=2.2'.

Pit Dimensions (ft)

Length	11
Width	5
Depth	10

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TEST PIT LOG

TP4

Project	Edgewater Storage Development			**PG.**	1 **OF** 3
City/Town	Edgewater Park, Burlington County, NJ			**Location**	See Plan
Client	Edgewater Storage, LLC			N: 439,371.01 ft	E: 375,091.91 ft
Equipment/Reach	CASE 580 Super M Backhoe / ~14-foot Reach			**Ground El.**	33.2 ft
Weather	~55 °F, Sunny			**Datum**	NAD83 NJ / NAVD 88
Contractor	AmeriDrill	**Operator**	T. Brown	**Project No.**	2002331
Observed By	J. Light	**Date**	5/22/2020	**Start Date**	5/22/2020
Checked By	S. DiBartolo	**Date**	6/17/2020	**End Date**	5/22/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			
			0-0.6': Loamy Top Soil; dark brown, roots.
	G1 Bag	1.3	0.6'-1.4': NARROWLY GRADED SAND (SP); ~95% Sand; ~5% low plasticity fines; moist; dark brown; roots.
2			1.4'-4.3': NARROWLY GRADED SAND WITH SILT (SP-SM); 89.5% mostly fine to medium sand; 10.5% low plasticity fines; moist; light brown getting lighter at depth; roots; thin iron banding @ 3.2'. [GRAIN SIZE TEST PERFORMED].
	G2 Bag	2.0	
4	G3 Bag	3.5	
			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'.
	G4 Bag	5.2	
6			
8			
	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			

Notes:

1) Groundwater not encountered.
2) Estimated SHWT @ D=4.3'.
3) Aardvark Permeameter testing performed at D=2.3' and 5.3'.

Pit Dimensions (ft)

Length	9.4
Width	6
Depth	9.5

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TEST PIT LOG

TP5

Project	Edgewater Storage Development			**PG.**	1 **OF** 3
City/Town	Edgewater Park, Burlington County, NJ			**Location**	See Plan
Client	Edgewater Storage, LLC			N: 439,235.25 ft	E: 375,153.38 ft
Equipment/Reach	CASE 580 Super M Backhoe / ~14-foot Reach			**Ground El.**	34.6 ft
Weather	~55°F, Overcast/ foggy			**Datum**	NAD83 NJ / NAVD 88
Contractor	AmeriDrill	**Operator**	R Wintersteen	**Project No.**	2002331
Observed By	J. Light	**Date**	5/26/2020	**Start Date**	5/26/2020
Checked By	S. DiBartolo	**Date**	6/17/2020	**End Date**	5/26/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
0			
			0-0.4': Loamy Top Soil; dark brown, roots
			0.4'-3.5': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% mostly fine sand; ~10% low plasticity fines; moist; medium dark brown @ 0.4'-1.3', light brown (2Y 4.7/6.9) with some iron banding @ 1.3'-2.2', light brown and gray (2.6Y 5.7/7.1) @ 2.2'-3.5'; roots.
2	G1 Bag	1.5	
	G2 Bag	3.5	3.5'-9': NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine to medium sand; ~10% low plasticity fines; moist; light gray (1.8Y 7.4/0.4) and red brown iron banding; mottling.
4			
6			
8	G3 Bag	8.5	
			Vein @ 8.5': WIDELY GRADED SAND WITH GRAVEL (SW); ~80% fine to coarse sand; ~15% gravel; ~5% low plasticity fines; wet; red brown.
10			Bottom of test pit at ~9 feet. Backfilled with excavated soil and minimally tamped down with excavator bucket in lifts.
12			
14			
16			

Notes:

1) Groundwater not encountered.
2) Estimated SHWT @ D=3.5'.
3) Aardvark Permeameter testing performed at D=1.5'.

Pit Dimensions (ft)

Length	8
Width	8
Depth	9

GEI Consultants

TEST PIT LOG

TP6

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

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

Notes:

1) Groundwater not encountered.

Pit Dimensions (ft)

Length	8
Width	8
Depth	8

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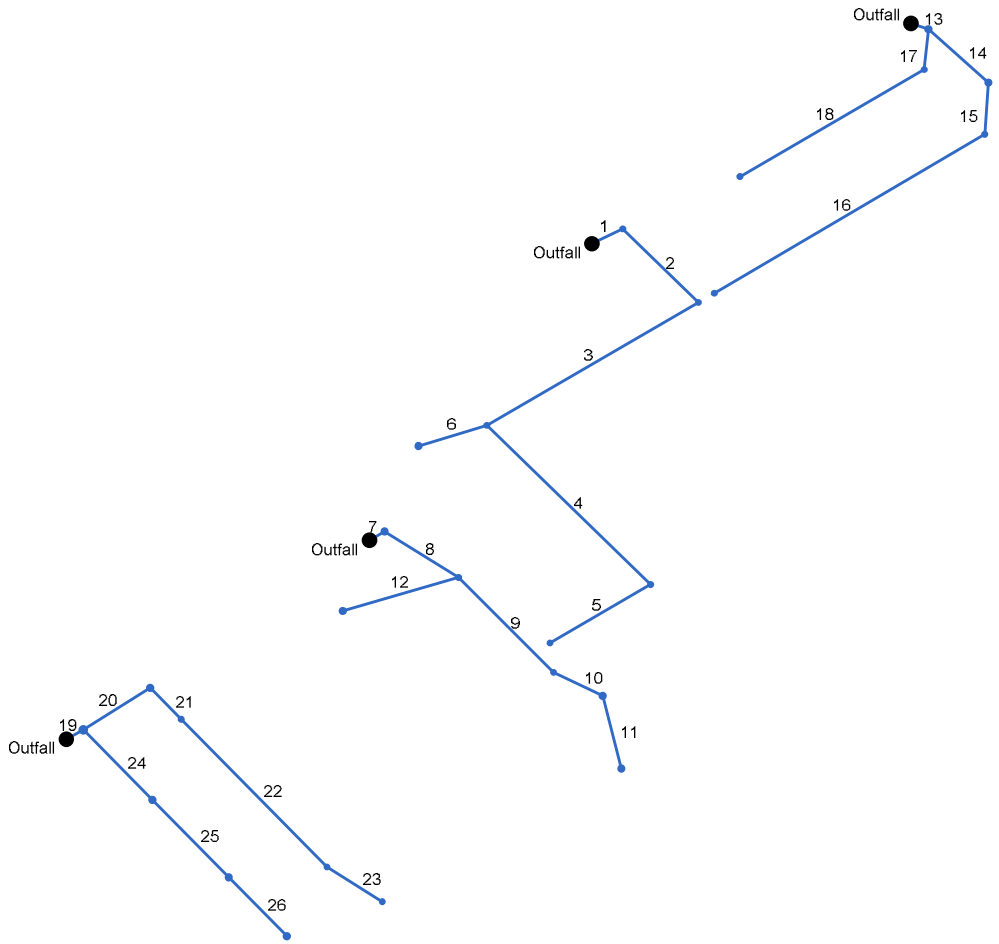
Appendix G

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



Project File: NYC19-0005_rev 1.stm	Number of lines: 26	Date: 7/21/2020

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	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	31.40	31.47	32.17	32.37	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	31.47	31.72	32.58	32.70	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	3.41	15	0.28	31.97	32.52	32.97	33.52	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	2.21	15	0.27	32.52	33.07	33.70	33.90	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	0.66	15	0.27	33.07	33.33	34.00	34.01	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	0.37	15	0.27	32.52	32.67	33.70	33.70	35.75	35.33	PIPE-306
7	End	14.300	0.15	1.37	0.98	0.15	1.34	10.0	13.1	5.5	7.36	12.96	4.67	24	0.28	31.40	31.44	32.36	32.49	33.04	35.33	PIPE-201
8	7	71.724	0.00	1.22	0.00	0.00	1.20	0.0	12.5	5.6	6.67	14.17	3.26	24	0.33	31.44	31.68	32.79	32.83	35.33	36.11	PIPE-202
9	8	117.989	0.36	0.90	0.98	0.35	0.88	10.0	11.9	5.7	5.03	5.54	3.55	18	0.24	32.47	32.75	33.59	33.87	36.11	35.83	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	2.10	18	0.28	32.75	32.87	33.95	33.97	35.83	35.68	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	1.11	18	0.24	32.87	33.05	34.03	34.04	35.68	36.11	PIPE-205
12	8	92.753	0.32	0.32	0.98	0.31	0.31	10.0	10.0	6.1	1.90	6.14	1.60	18	0.29	31.93	32.20	33.03	33.06	36.11	35.18	PIPE-206
13	End	14.300	0.06	0.83	0.98	0.06	0.81	10.0	13.3	5.4	4.43	6.02	4.28	18	0.28	31.40	31.44	32.21	32.34	33.04	34.81	PIPE-401
14	13	69.400	0.07	0.46	0.98	0.07	0.45	10.0	12.7	5.5	2.50	3.66	2.23	15	0.27	31.44	31.63	32.58	32.65	34.81	35.21	PIPE-404
15	14	51.436	0.00	0.39	0.00	0.00	0.38	0.0	12.3	5.6	2.15	3.65	2.00	15	0.27	31.63	31.77	32.71	32.75	35.21	35.77	PIPE-405
16	15	256.468	0.39	0.39	0.98	0.38	0.38	10.0	10.0	6.1	2.32	3.68	2.65	15	0.28	31.77	32.48	32.80	33.20	35.77	35.75	PIPE-406
17	13	40.201	0.00	0.31	0.00	0.00	0.30	0.0	11.9	5.7	1.73	3.66	1.52	15	0.27	31.44	31.55	32.58	32.60	34.81	35.52	PIPE-402
18	17	174.000	0.31	0.31	0.98	0.30	0.30	10.0	10.0	6.1	1.84	3.67	2.04	15	0.28	31.55	32.03	32.63	32.77	35.52	35.52	PIPE-403
19	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	35.63	PIPE-101
20	19	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	35.63	35.75	PIPE-105
21	20	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	35.75	36.45	PIPE-106
22	21	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

Project File: NYC19-0005_rev 1.stm | Number of lines: 26 | Run Date: 7/21/2020

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	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	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
24	19	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	35.63	35.78	PIPE-102
25	24	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
26	25	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 1.stm | Number of lines: 26 | Run Date: 7/21/2020

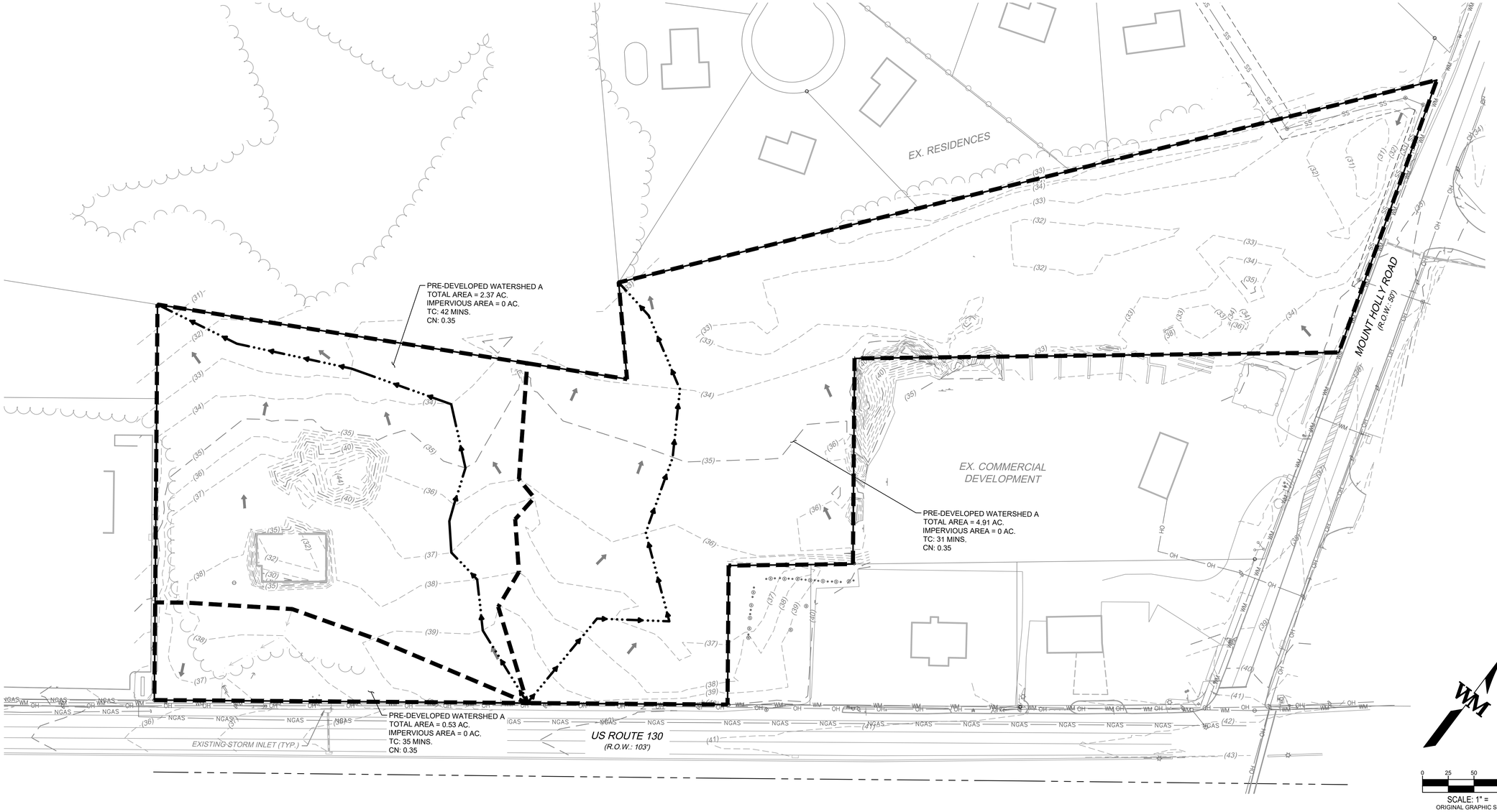
NOTES:Intensity = 55.73 / (Inlet time + 10.70) ^ 0.73; Return period =Yrs. 25 ; c = cir e = ellip b = box

Appendix H

CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

LEGEND:

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



SCALE: 1" = 50'
ORIGINAL GRAPHIC SCALE

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.

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EDWARD F. WILKES JR.
PROFESSIONAL ENGINEER
NJ LIC. NO. 24GE04937200

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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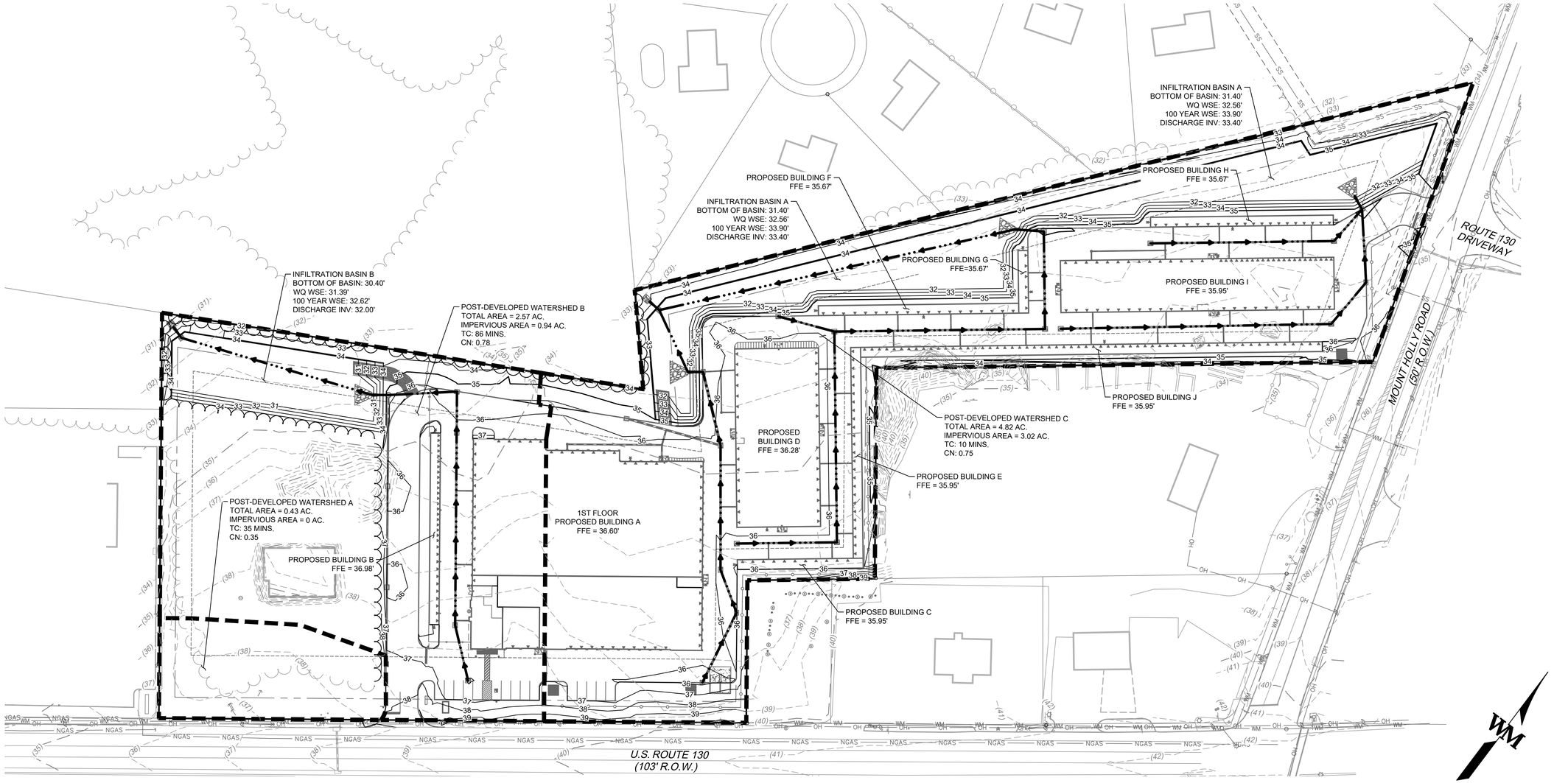
CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

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



0 25 50 100

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FOR AND ON BEHALF
OF WARE MALCOMB

EDGEWATER PARK - SELF STORAGE DEVELOPMENT

PRELIMINARY SITE PLAN APPLICATION

POST DEVELOPMENT WATERSHED PLAN

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 2

Sheet 2 of 3

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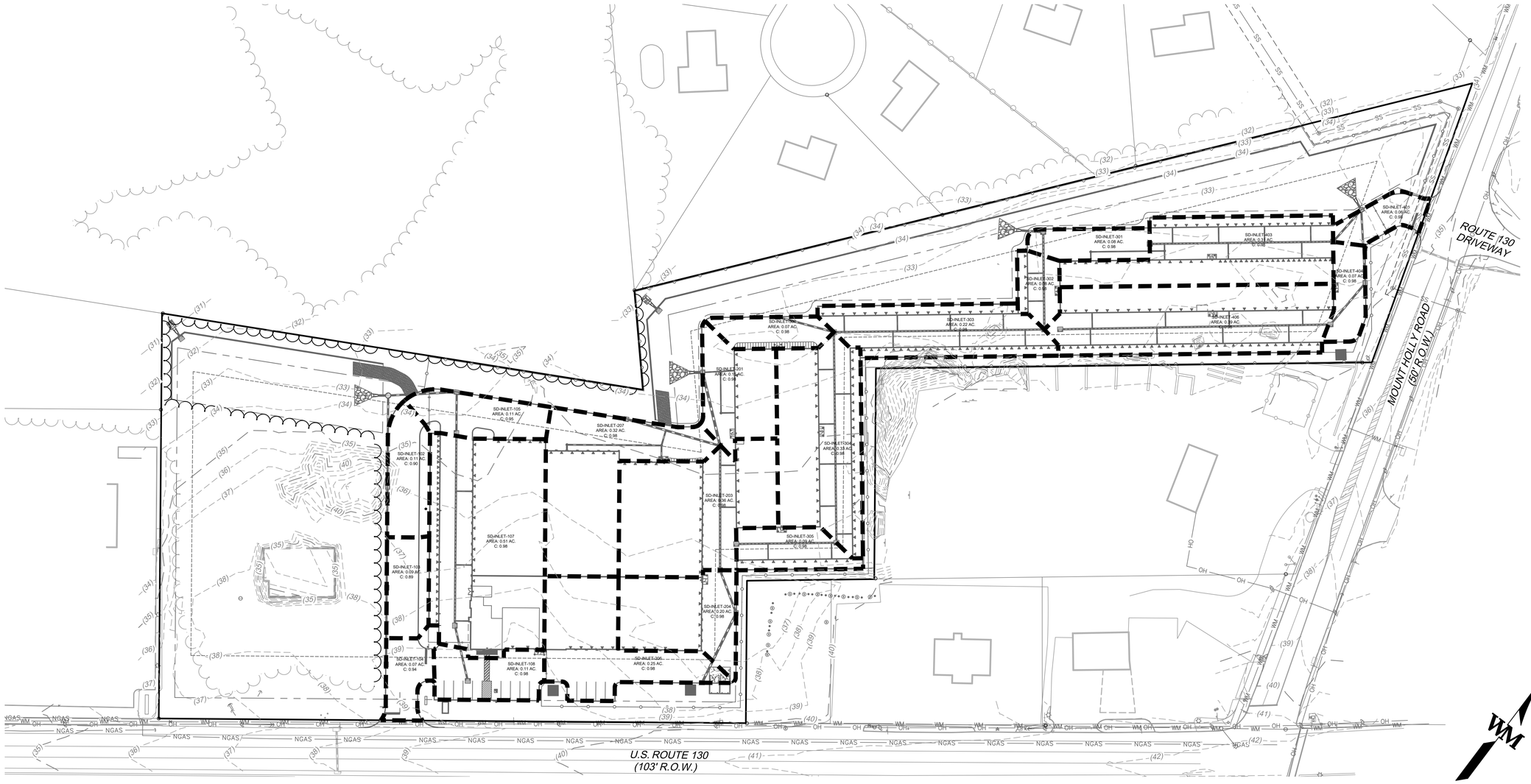
CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

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



0 25 50 100

SCALE: 1" = 50'
ORIGINAL GRAPHIC SCALE

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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, EDGWATER 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

Appendix I

Date 07/10/20

100-Year Rainfall

8.47

Designed By SMR

Checked By EFW

Edgewater Park Self Storage - NYC19-0005

EMERGENCY SPILLWAY SUMMARY

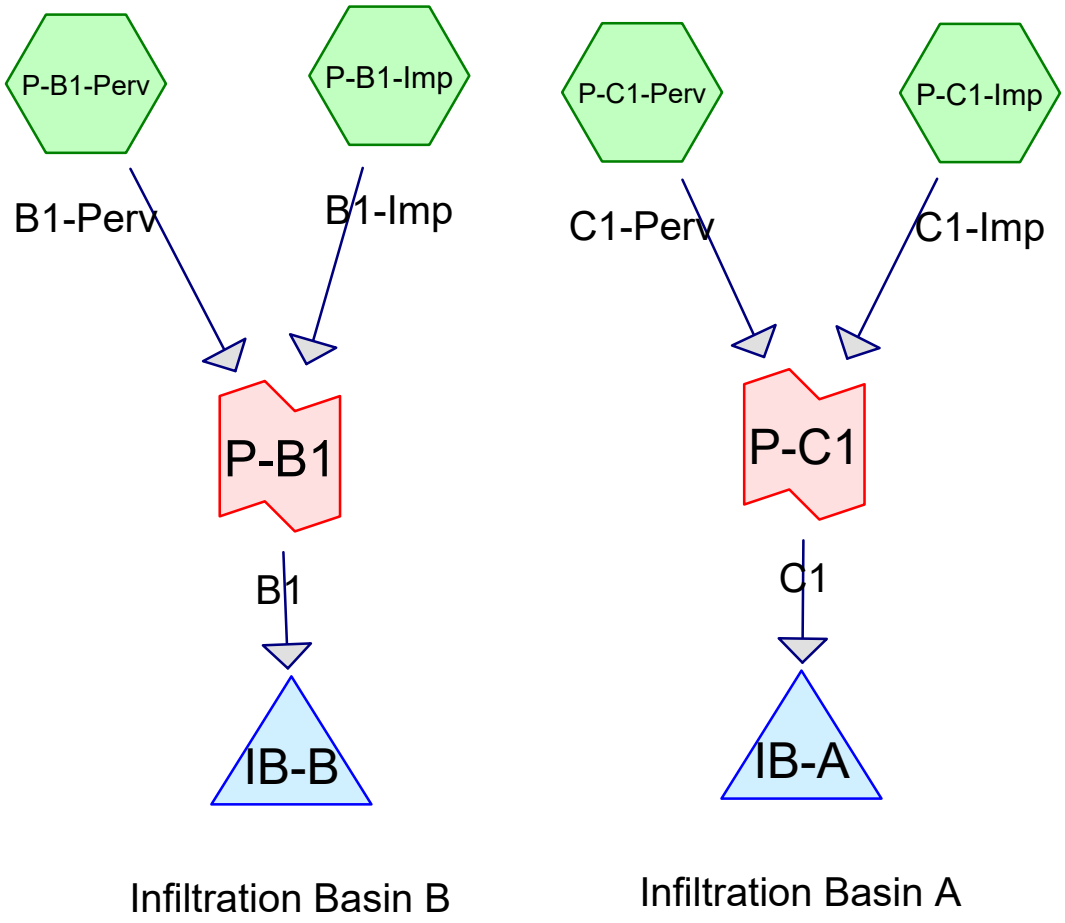
(per Municipal requirements)

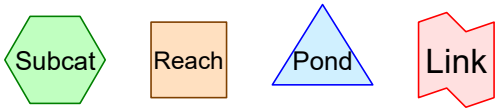
Basin	Drainage Area (Acres)	Effective Height of the Basin (1)	Basin Classified as a Dam?	Basin 100-Year Water Elevation	Spillway Elevation	Spillway Length	Design 24-Hour Rainfall Amount	Water Elevation Through Spillway (1)	Minimum Basin Berm Elevation (2)	Provided Berm Elevation	Provided Freeboard Over 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:





Routing Diagram for NYC19-0005
Prepared by Ware Malcomb, Printed 7/22/2020

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=8.23"
Tc=10.0 min CN=0/98 Runoff=4.96 cfs 0.641 af

Subcatchment P-B1-Perv: B1-Perv 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

Subcatchment P-C1-Imp: C1-Imp 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

Subcatchment P-C1-Perv: C1-Perv 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

Pond IB-A: Infiltration Basin A 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

Pond IB-B: Infiltration Basin 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

Link P-B1: B1 Inflow=5.00 cfs 0.798 af
Primary=5.00 cfs 0.798 af

Link P-C1: C1 Inflow=17.21 cfs 2.273 af
Primary=17.21 cfs 2.273 af

Total Runoff Area = 7.384 ac Runoff Volume = 3.071 af Average Runoff Depth = 4.99"
46.51% Pervious = 3.434 ac 53.49% Impervious = 3.950 ac

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

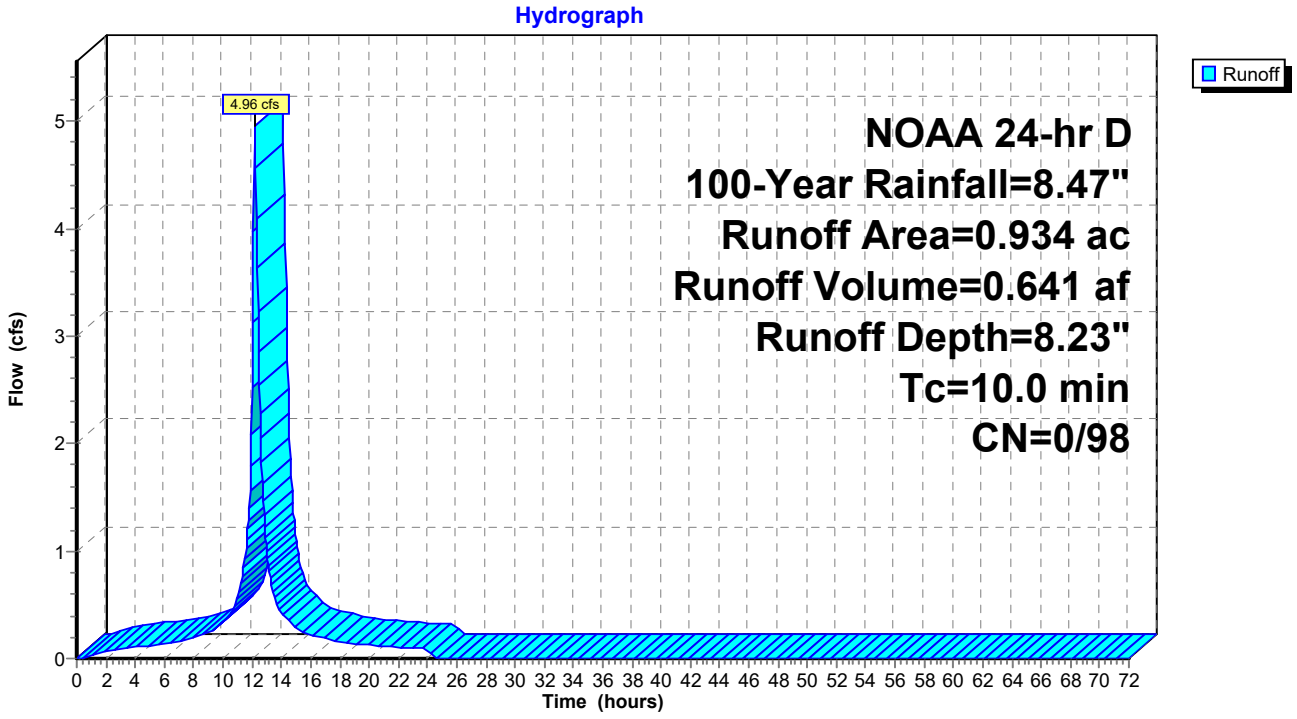
Runoff = 4.96 cfs @ 12.19 hrs, Volume= 0.641 af, Depth= 8.23"

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



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

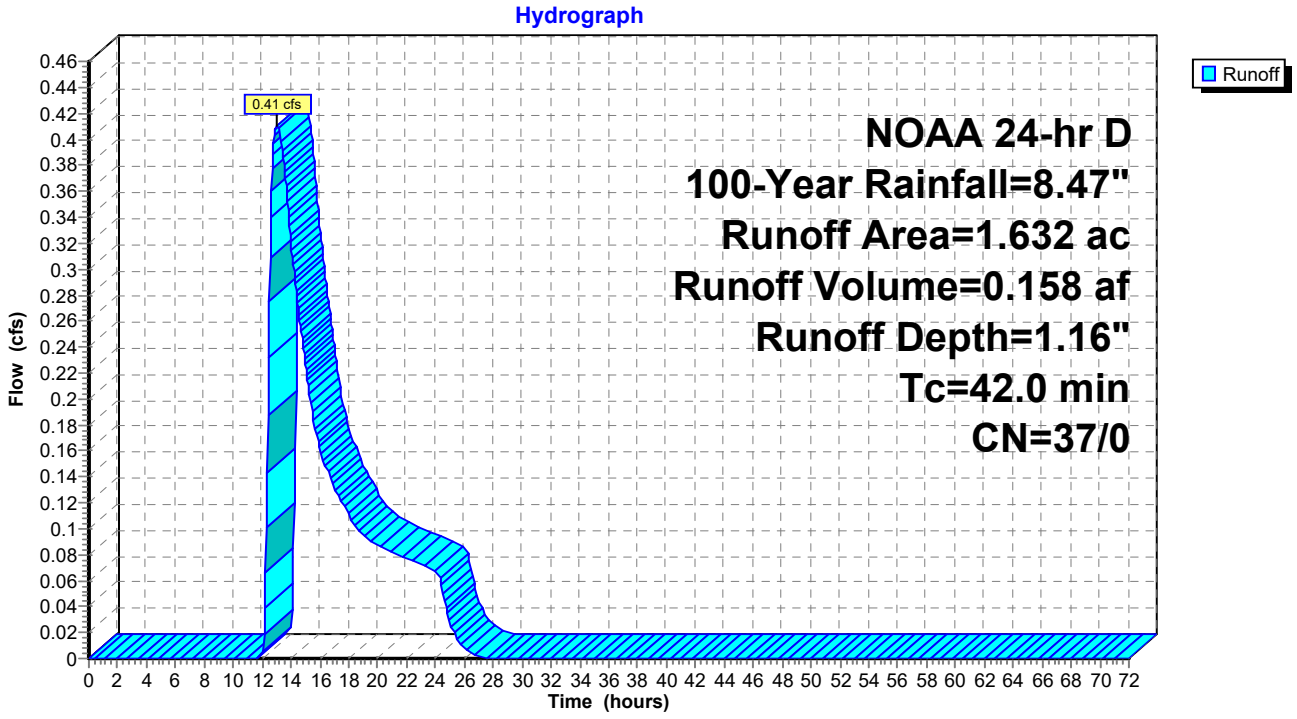
Runoff = 0.41 cfs @ 13.02 hrs, Volume= 0.158 af, Depth= 1.16"

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
0.926	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



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

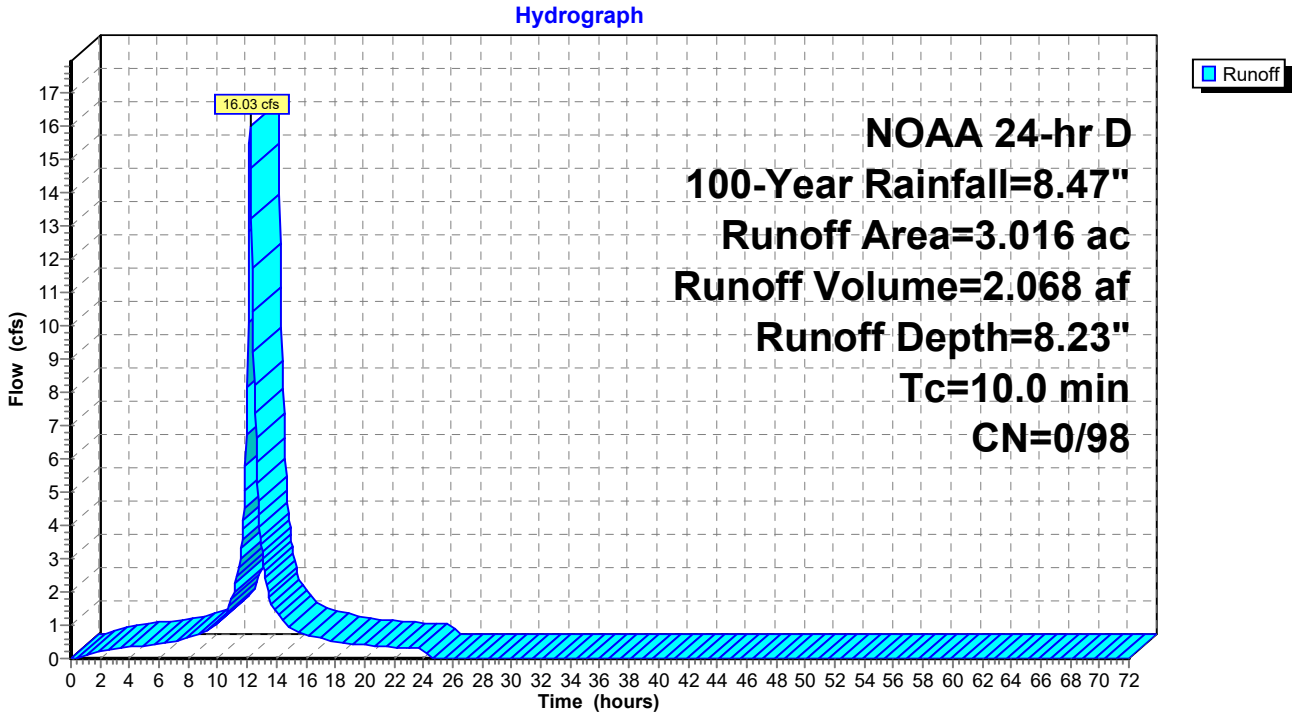
Runoff = 16.03 cfs @ 12.19 hrs, Volume= 2.068 af, Depth= 8.23"

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



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

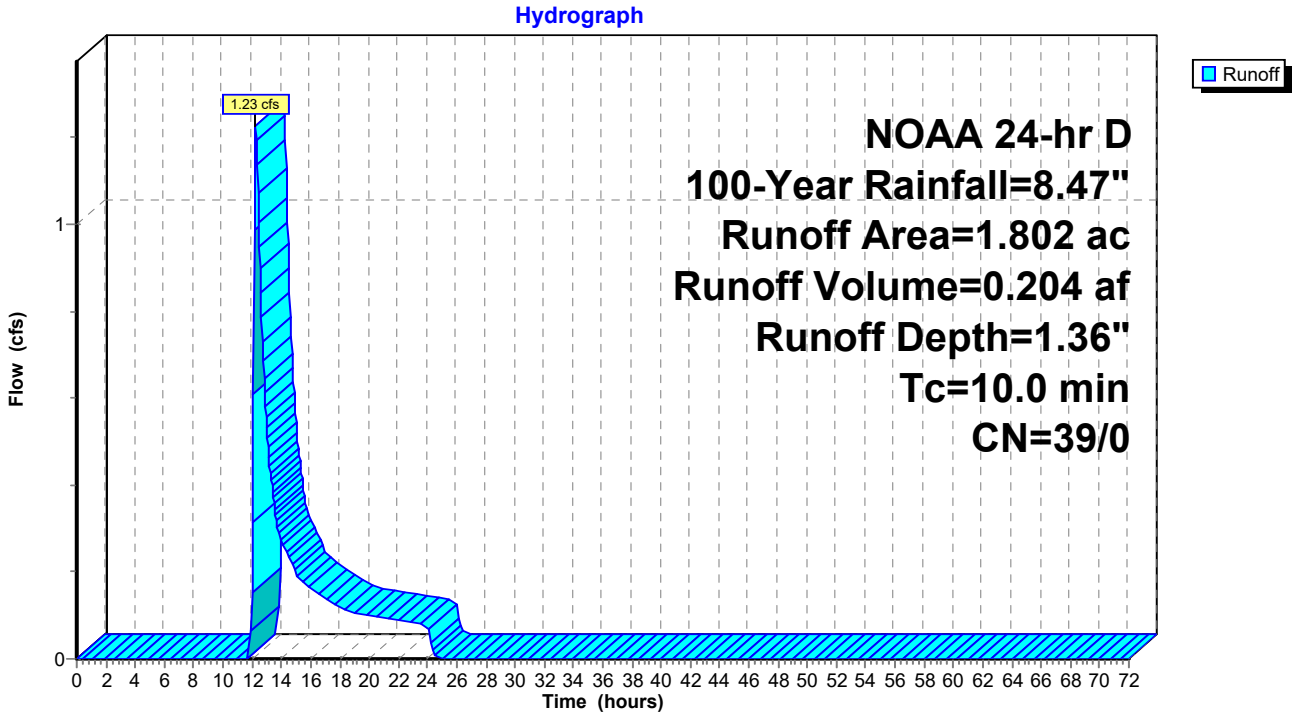
Runoff = 1.23 cfs @ 12.25 hrs, Volume= 0.204 af, Depth= 1.36"

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



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	**Custom Stage Data (Irregular)** Listed below

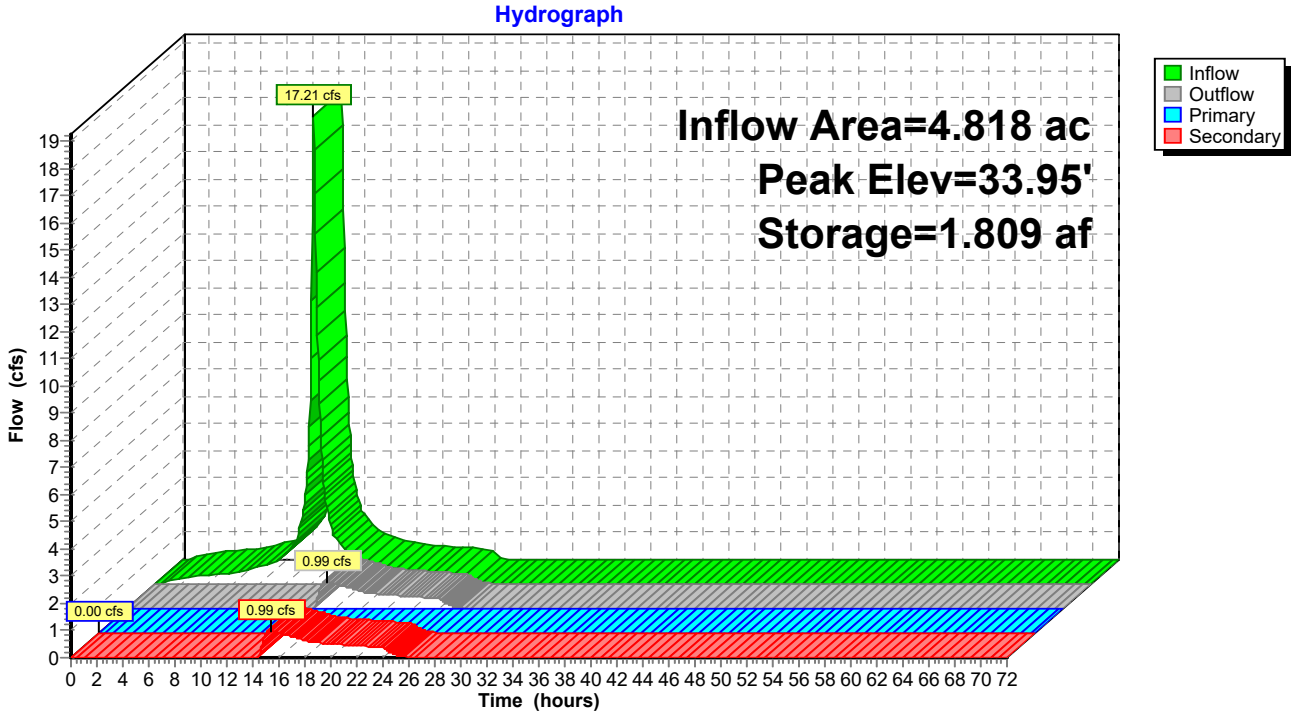
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.40	0.630	1,808.1	0.000	0.000	0.630
32.00	0.667	1,813.4	0.389	0.389	0.673
33.00	0.729	1,821.3	0.698	1.087	0.740
34.00	0.791	1,828.1	0.760	1.847	0.802
35.00	0.853	1,834.8	0.822	2.668	0.863

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	**15.0" Round Culvert** 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'	**4.0" Vert. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	33.90'	**35.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=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



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	**Custom Stage Data (Irregular)** Listed below

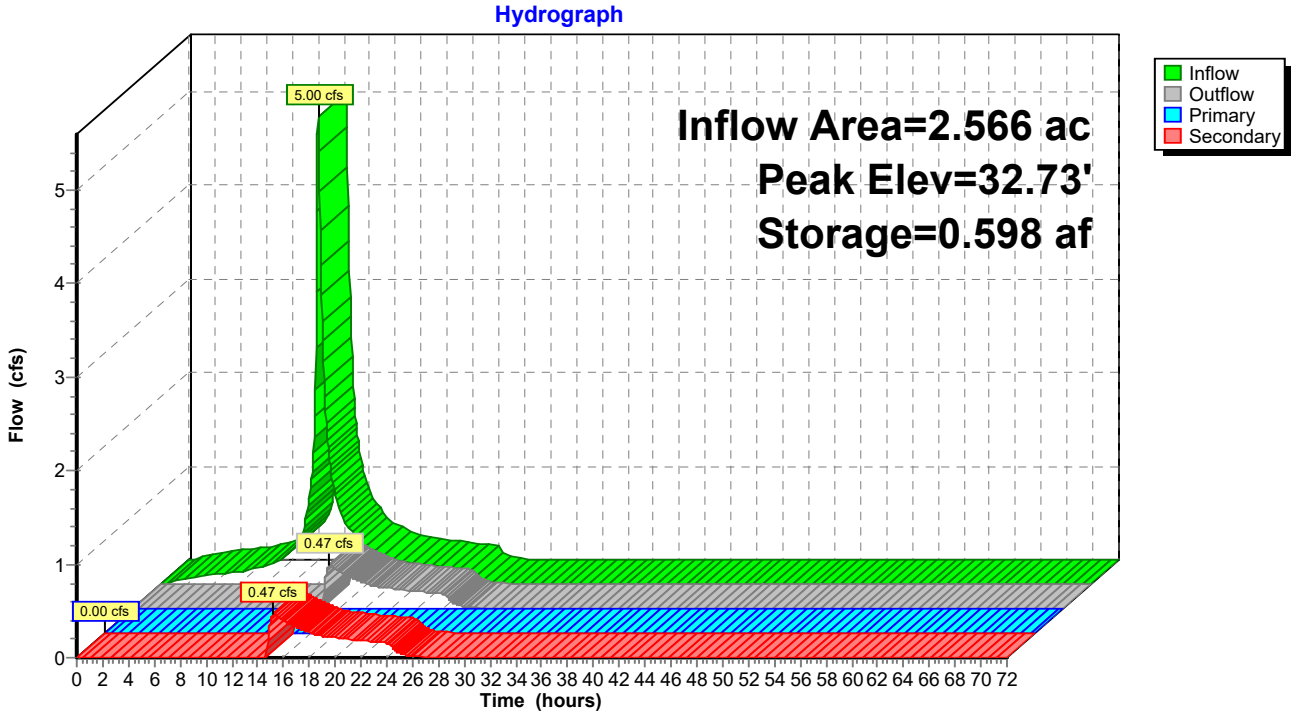
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
30.40	0.235	491.3	0.000	0.000	0.235
31.00	0.245	498.6	0.144	0.144	0.250
32.00	0.263	510.7	0.254	0.398	0.275
33.00	0.281	522.8	0.272	0.670	0.301
34.00	0.299	535.0	0.290	0.960	0.327

Device	Routing	Invert	Outlet Devices
#1	Primary	30.95'	**15.0" Round Culvert** 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'	**3.0" Vert. Orifice/Grate X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	32.70'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=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

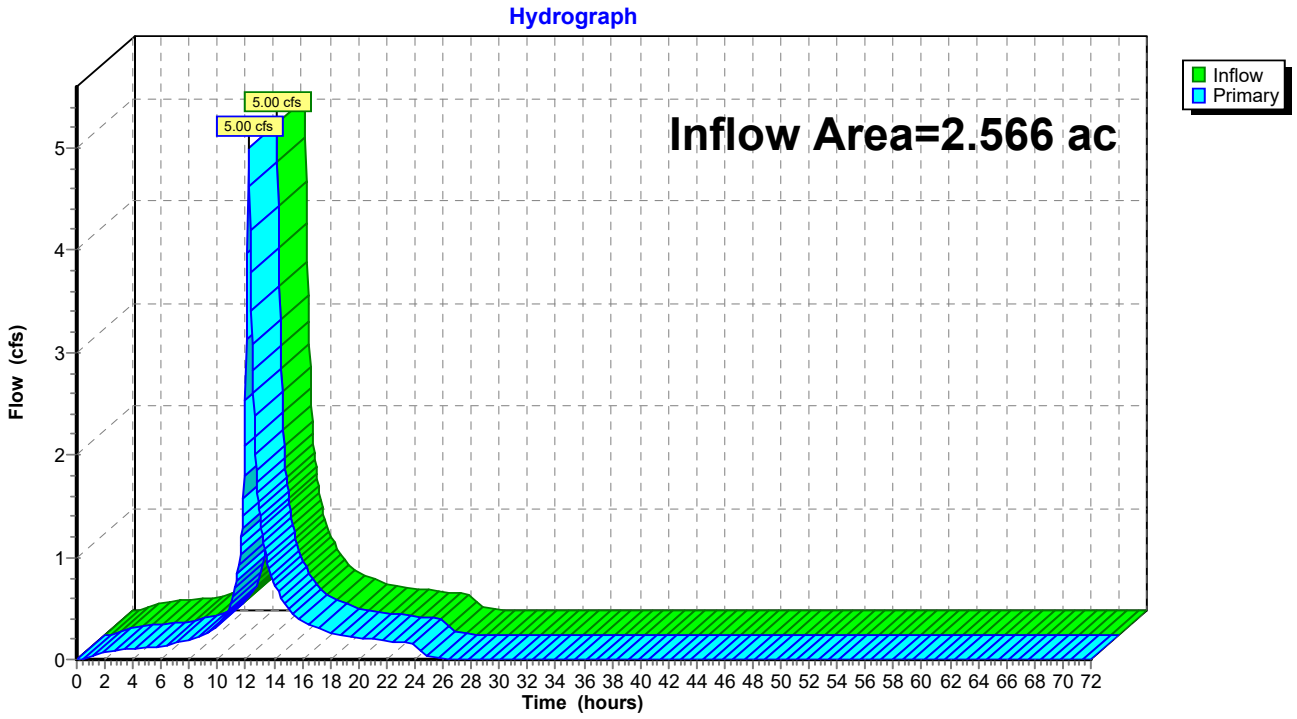


Summary for Link P-B1: B1

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

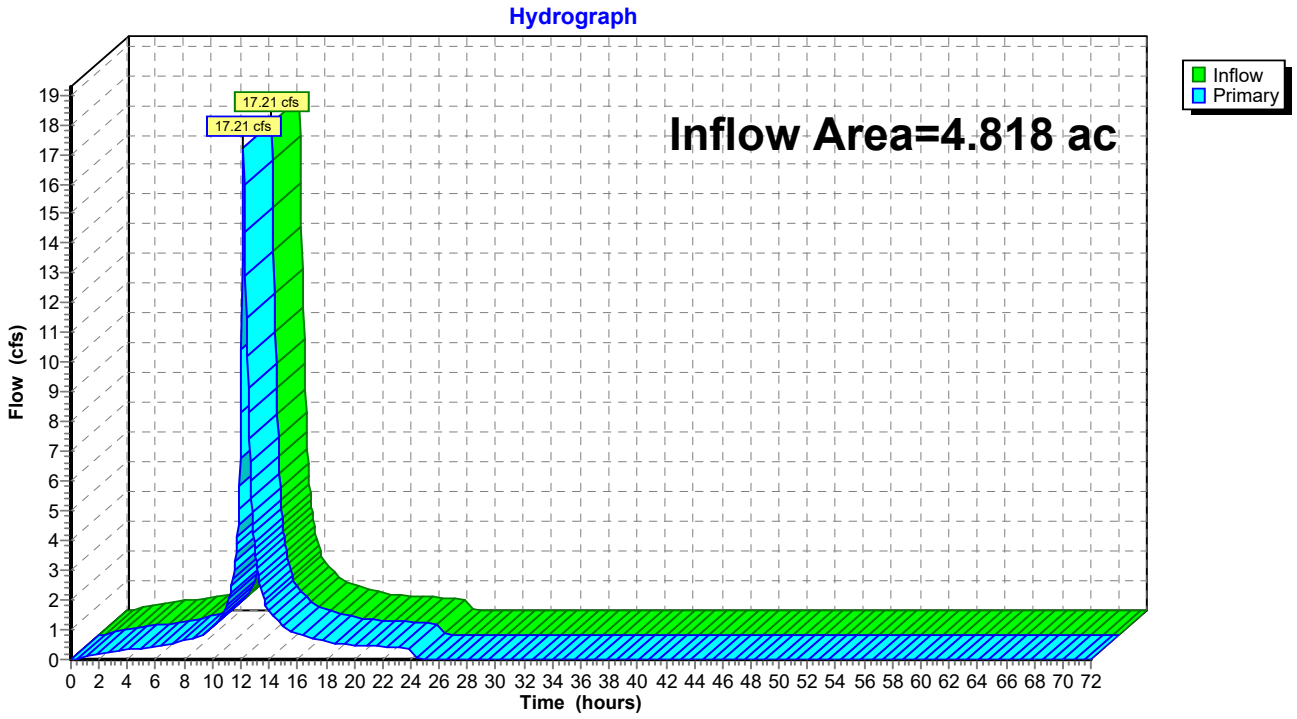


Summary for Link P-C1: C1

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



Appendix J

RIPRAP CALCULATIONS
TW = 0.2Do
NJ Standards for SESC, Ch. 12, January 2014

Job # NYC19-0005
Job Name: Edgewater Park Self Storage
Designed by: SMR
Checked by: EW

Structure: SD-FES-100
Select TW Conditions: TW = 0.2Do

Q =	**4.79 c.f.s.**	W_o=	**1.50 Ft.**
D_o=	**1.50 Ft.**	q=Q/W_o=	**3.19 c.f.s.**
TW= 0.2Do =	**0.30 Ft.**		

Length of apron (La)

$La = \frac{1.8q + 7Do}{Do^{1/2}}$ = **15.2 Ft.** **16 Ft. Provided**

Width of apron (W_1) (downstream end)

W1 = 3Wo + La = **19.7 Ft.** **20 Ft. Provided**

Width of apron (W_2) (outlet end)

$W_2 = 3W_o$ = **4.5 Ft.** **5 Ft. Provided**

d_{50} Stone size

$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = **0.31 Ft.** **4 " Stone Calculated**

4 " Stone Used for Construction

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

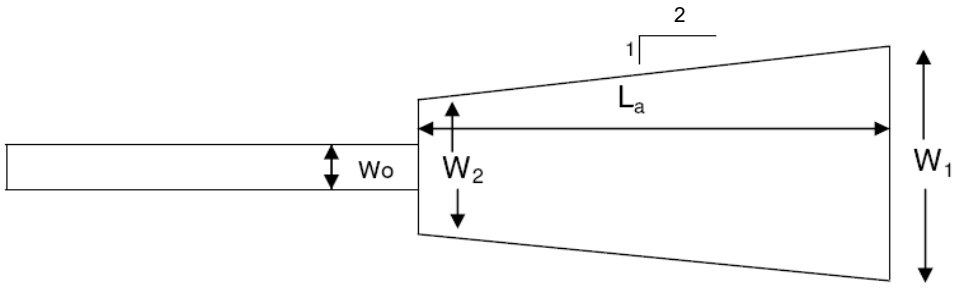
Apron Thickness (T)

T = d_{50} Stone size x 2 if filter fabric is used
T = d_{50} Stone size x 3 if no filter fabric is used

Select Apron Design
Use Filter Fabric

T = 8 " Thick with fabric
Volume of riprap = 4.94 CY

Structure SD-FES-100 Detail



W2 = 5' **La = 16'** **W1 = 20'**

Notes:

RIPRAP CALCULATIONS
TW = 0.2Do
NJ Standards for SESC, Ch. 12, January 2014

Job # NYC19-0005
Job Name: Edgewater Park Self Storage
Designed by: SMR
Checked by: EW

Structure: SD-FES-200
Select TW Conditions: TW = 0.2Do

Q =	**6.60**	**c.f.s.**	W_o=	**1.50** **Ft.**
D_o=	**1.50**	**Ft.**	q=Q/W_o=	**4.40** **c.f.s.**
TW= 0.2Do =	**0.30**	**Ft.**		

Length of apron (La)

$La = \frac{1.8q + 7Do}{Do^{1/2}}$ = **17.0 Ft.** **17 Ft. Provided**

Width of apron (W_1) (downstream end)

W1 = 3Wo + La = **21.5 Ft.** **22 Ft. Provided**

Width of apron (W_2) (outlet end)

$W_2 = 3W_o$ = **4.5 Ft.** **5 Ft. Provided**

d_{50} Stone size

$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = **0.48 Ft.** **6 " Stone Calculated**

6 " Stone Used for Construction

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

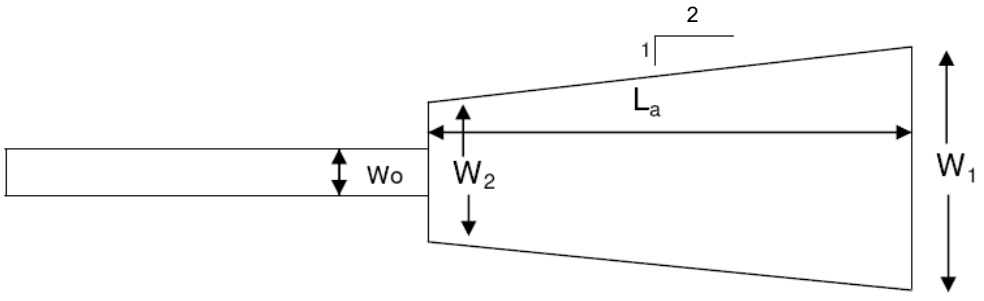
Apron Thickness (T)

T = d_{50} Stone size x 2 if filter fabric is used
T = d_{50} Stone size x 3 if no filter fabric is used

Select Apron Design
Use Filter Fabric

T = 12 " Thick with fabric
Volume of riprap = 8.5 CY

Structure SD-FES-200 Detail



W2 = 5' **La = 17'** **W1 = 22'**

Notes:

RIPRAP CALCULATIONS Job # NYC19-0005

TW = 0.2Do Job Name: Edgewater Park Self Storage

NJ Standards for SESC, Ch. 12, January 2014 Designed by: SMR

Checked by: EW

Structure: SD-FES-300

Select TW Conditions: TW = 0.2Do

Q =	**4.11**	**c.f.s.**	W_o=	**2.00 Ft.**
D_o=	**2.00**	**Ft.**	q=Q/W_o=	**2.06 c.f.s.**
TW= 0.2Do =	**0.40**	**Ft.**		

Length of apron (La)

$La = \frac{1.8q + 7Do}{Do^{1/2}}$ = **16.6 Ft.** **17 Ft. Provided**

Width of apron (W_1) (downstream end)

W1 = 3Wo + La = **22.6 Ft.** **23 Ft. Provided**

Width of apron (W_2) (outlet end)

$W_2 = 3W_o$ = **6.0 Ft.** **6 Ft. Provided**

d_{50} Stone size

$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = **0.13 Ft.** **2 " Stone Calculated**

3 " Stone Used for Construction

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

Apron Thickness (T)

T = d_{50} Stone size x 2 if filter fabric is used

T = d_{50} Stone size x 3 if no filter fabric is used

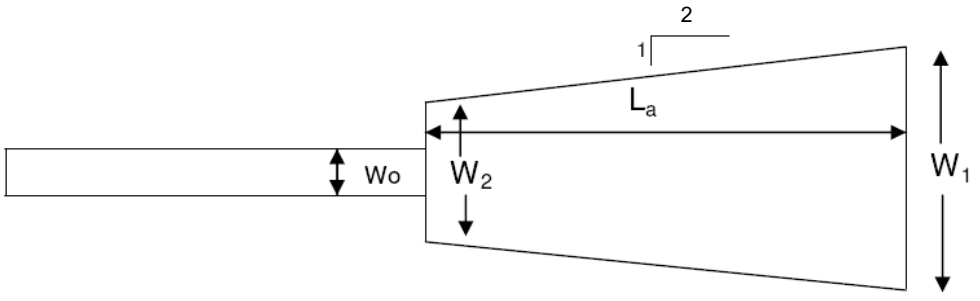
Select Apron Design

Use Filter Fabric

T = 6 " Thick with fabric

Volume of riprap = 4.56 CY

Structure SD-FES-300 Detail



W2 = 6' **La = 17'** **W1 = 23'**

Notes:

RIPRAP CALCULATIONS Job # NYC19-0005

TW = 0.2Do Job Name: Edgewater Park Self Storage

NJ Standards for SESC, Ch. 12, January 2014 Designed by: SMR

Checked by: EW

Structure: SD-FES-400

Select TW Conditions: TW = 0.2Do

Q =	**4.43**	**c.f.s.**	W_o=	**1.50**	**Ft.**
D_o=	**1.50**	**Ft.**	q=Q/W_o=	**2.95**	**c.f.s.**
TW= 0.2Do =	**0.30**	**Ft.**			

Length of apron (La)

$La = \frac{1.8q + 7Do}{Do^{1/2}}$ = **14.8 Ft.** **15 Ft. Provided**

Width of apron (W_1) (downstream end)

W1 = 3Wo + La = **19.3 Ft.** **20 Ft. Provided**

Width of apron (W_2) (outlet end)

$W_2 = 3W_o$ = **4.5 Ft.** **5 Ft. Provided**

d_{50} Stone size

$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = **0.28 Ft.** **4 " Stone Calculated**

4 " Stone Used for Construction

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

Apron Thickness (T)

T = d_{50} Stone size x 2 if filter fabric is used

T = d_{50} Stone size x 3 if no filter fabric is used

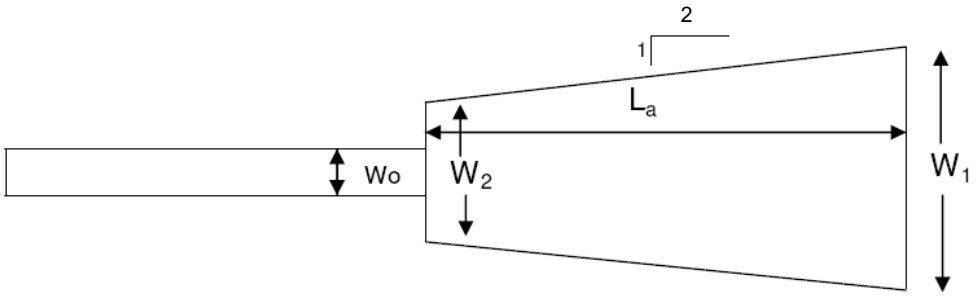
Select Apron Design

Use Filter Fabric

T = 8 " Thick with fabric

Volume of riprap = 4.63 CY

Structure SD-FES-400 Detail



W2 = 5' **La = 15'** **W1 = 20'**

Notes:

7/22/2020

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 =	**0.72 c.f.s.**	W_o=	**1.25 Ft.**
D_o=	**1.25 Ft.**	q=Q/W_o=	**0.58 c.f.s.**
TW=	**0.25 Ft.**		

(For areas where Tw cannot be computed, use Tw = 0.2D_o)

d_{50} Stone size formula **When Y = 1/2 D_o**

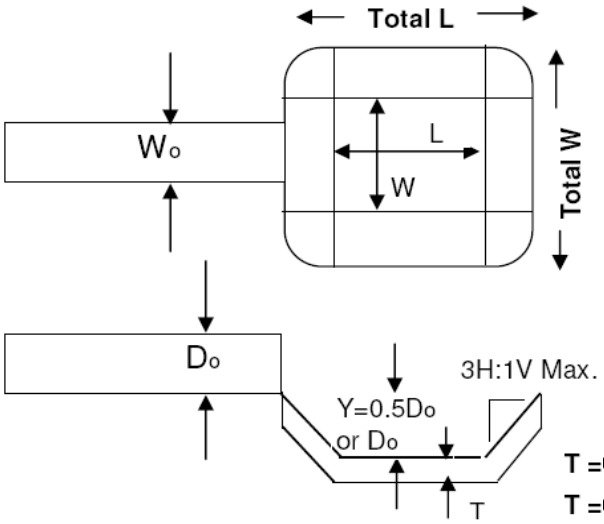
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = **0.04 Ft.** = **1 " Stone Calculated**
3 " Stone Used for Construction
0.63 ' = Y

d_{50} Stone size formula **When Y = D_o**

$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$ = **0.02 Ft.** = **1 " Stone Calculated**
3 " Stone Used for Construction
1.25 ' = Y

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

Y = Depth of scour hole below culvert invert



L = 3 D_o = 3.75 '
W = 2 W_o = 2.50 '

If Y = 1/2D_o
Total L = 7.50 , Total W = 6.25

If Y = D_o
Total L = 11.25 , Total W = 10.00

T = d_{50} Stone size x 2 if filter fabric is used
T = d_{50} Stone size x 3 if *no* filter fabric is used

Structure SD-OUT-A Design Summary

Select Scour Hole Design	**Total L = 7.5 '** **L = 3.75 '**
	Total W = 6.25 ' **W = 2.5 '**
	Depth of scour hole (Y) = 0.625 '
Y = 1/2 Do Use Filter Fabric	**d_{50} stone size = 3 "**
	Thickness of riprap (T) = 6 "
	Volume of riprap (V) = 0.87 CY

Notes:

7/22/2020

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 =	0.33 c.f.s.	W_o=	1.25 Ft.
D_o=	1.25 Ft.	q=Q/W_o=	0.26 c.f.s.
TW=	0.25 Ft.		

(For areas where Tw cannot be computed, use Tw = 0.2D_o)

d_{50} Stone size formula **When Y = 1/2 D_o**

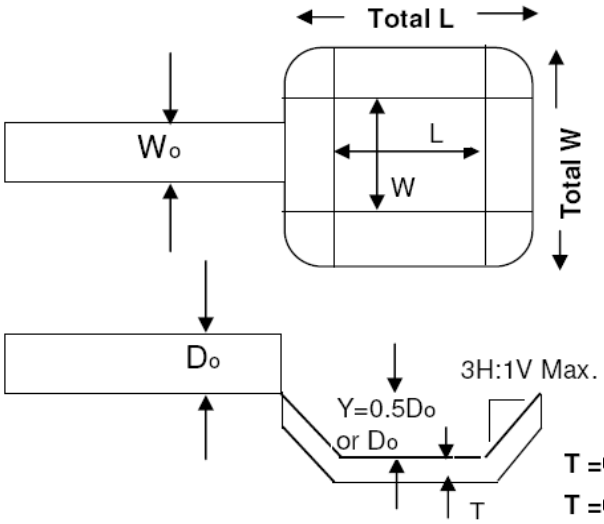
$d_{50} = \frac{0.02 * q^{1.33}}{TW}$ = 0.01 Ft. = 1 " Stone Calculated
3 " Stone Used for Construction
0.63 ' = Y

d_{50} Stone size formula **When Y = D_o**

$d_{50} = \frac{0.0082 * q^{1.33}}{TW}$ = 0.01 Ft. = 1 " Stone Calculated
3 " Stone Used for Construction
1.25 ' = Y

NJ Standards require d_{50}=3" min, NJDOT requires d_{50}=6" min

Y = Depth of scour hole below culvert invert



L = 3 D_o = 3.75 '
W = 2 W_o = 2.50 '

If Y = 1/2D_o
Total L = 7.50 , Total W = 6.25

If Y = D_o
Total L = 11.25 , Total W = 10.00

T = d_{50} Stone size x 2 if filter fabric is used
T = d_{50} Stone size x 3 if *no* filter fabric is used

Structure SD-OUT-B Design Summary

Select Scour Hole Design	Total L = 7.5 '	L =	3.75 '
	Total W = 6.25 '	W =	2.5 '
	Depth of scour hole (Y) =		0.625 '
Y = 1/2 Do Use Filter Fabric	d_{50} stone size =		3 "
	Thickness of riprap (T) =		6 "
	Volume of riprap (V) =		0.87 CY

Notes:

Appendix K

New Jersey Stormwater Best Management Practices Manual

February 2004

APPENDIX 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 1: Description of Nonstructural Approach to Site Design

In narrative form, provide an overall description of the nonstructural stormwater management approach and strategies incorporated into the proposed site's design. Attach additional pages as necessary. Details of each nonstructural strategy are provided in Part 3 below.

The pre-developed site is wooded area. The post-developed site will include 112,810 square feet of self-storage buildings along with the associated drive aisles and parking. Stormwater will be routed to 2 infiltration basins via a series of inlets and storm sewer pipes. 100 percent of the pre-developed groundwater recharge will be met utilizing the infiltration basins. Additionally, the peak runoff rate for each area has been reduced according to NJAC 7:8-5.4(a)3iii.

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: x

If yes, briefly describe: _____

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

Pre-design meeting held? Yes: x Date: 2/11/2020 No: _____

Meeting held with: Board Attorney, Engineer, Planner

Pre-design site walk held? Yes: _____ Date: _____ No: x

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: X No: _____

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

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

Preservation of natural areas? Yes: X No: _____ If yes, specify % of site: 20%

Native ground cover? Yes: X No: _____ If yes, specify % of site: 29%

Vegetated buffers? Yes: X No: _____ If yes, specify % of site: 17%

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

Preservation of natural areas? Yes: _____ No: X If yes, specify % of site: _____

Native ground cover? Yes: _____ No: X If yes, specify % of site: _____

Vegetated buffers? Yes: X 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: X

Reduce runoff pollutant loads through runoff treatment: Yes: _____ No: X

Maintain groundwater recharge by preserving natural areas: Yes: X No: _____

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed? Yes: x No: _____

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

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

Restrict permanent site disturbance by land owners? Yes: x No: _____

If yes, how: Silt fence and tree protection is proposed to ensure no additional wooded areas are cleared.

Restrict temporary site disturbance during construction? Yes: x No: _____

If yes, how: Silt fence and tree protection is proposed to ensure no additional wooded areas are cleared. Material stockpiles will be maintained within the area proposed for development

Consider soils and slopes in selecting disturbance limits? Yes: x No: _____

If yes, how: The areas cleared for the stormwater management basins were specifically selected based on the existing lower elevations and high permeability rates.

C. Specify percentage of site to be cleared: 80% Regraded: 80%

D. Specify percentage of cleared areas done so for buildings: 23.5%

For driveways and parking: 27.5% For roadways: _____

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

The developer is permitted to proposed up to 60% impervious coverage per ordinance however has added a second and third floor to one building to minimize clearing

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: 100% HSG B: _____ HSG C: _____ HSG D: _____

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: 80% HSG B: _____ HSG C: _____ HSG D: _____

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

The entire site is HSG A. The applicant has minimized site disturbance by disturbing only what is needed to comply with stormwater management regulations and is preserving 20% of the site.

I. Does the site include Karst topography? Yes: _____ No: X

If yes, discuss measures taken to limit Karst impacts:

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: 0% Proposed: 51%

B. Specify maximum site impervious coverage allowed by regulations: 60%

C. Compare proposed street cartway widths with those required by regulations: N/A

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking		
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: 9' X 18' Regulations: 9' X 18'

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: 15 Regulations: ORDINANCE DOES NOT SPECIFY FOR SELF STORAGE USE

F. Specify percentage of total site impervious cover created by buildings: 23.5%

By driveways and parking: 27.5% By roadways: 0%

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

Drive aisles have been designed to minimum required to facilitate moving trucks and emergency vehicles.

H. Specify percentage of total impervious area that will be unconnected:

Total site: 100% Buildings: _____ Driveways and parking: _____ Roads: _____

I. Specify percentage of total impervious area that will be porous:

Total site: 0% Buildings: _____ Driveways and parking: _____ Roads: _____

J. Specify percentage of total building roof area that will be vegetated: 0%

K. Specify percentage of total parking area located beneath buildings: 0%

L. Specify percentage of total parking located within multi-level parking deck: 0%

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: 70% Vegetated swale: _____ Natural channel: _____

Stormwater management facility: 30% Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

The trench drains placed between the storage units would need to be replaced with vegetated medians and conveyance swales. Introducing interior medians would result in an increase in pavement to facilitate traffic and overall disturbance area

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: The site grading has been designed to provide minimum slopes for positive drainage in paved areas (min. 1%)

Increase overland flow roughness: Native plantings are proposed in vegetative areas.

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles N/A - A self storage facility does not provide trash receptacles to discourage patrons from using them as a place to discard their stored belongings.

Specify the number of trash receptacles provided: _____

Specify the spacing between the trash receptacles: _____

Compare trash receptacles proposed with those required by regulations:

Proposed: _____ Regulations: _____

B. Pet Waste Stations N/A

Specify the number of pet waste stations provided: _____

Specify the spacing between the pet waste stations: _____

Compare pet waste stations proposed with those required by regulations:

Proposed: _____ Regulations: _____

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: 100% of proposed inlets and basin outlet control structures comply with NJDEP requirements

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: As needed Regulations: No standard

Litter collection: Proposed: As needed Regulations: No standard

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

The proposed infiltration basins include an outlet control structure equipped with a trash rack over discharge orifices

E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: Oils and pollutants from vehicles will be collected in the infiltration basin and filtered out by the basin sand layer. Location: Paved Areas

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: Pollutants from lawn care and fertilizer will be collected in the infiltration basin and filtered out by the basin sand layer. Location: Vegetated Open Space Areas

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.	X	
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.	X	
3.	Maximize the protection of natural drainage features and vegetation.	X	
4.	Minimize the decrease in the pre-construction time of concentration.	X	
5.	Minimize land disturbance including clearing and grading.	X	
6.	Minimize soil compaction.	X	
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.	X	
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.	X	
9.	Provide preventative source controls.	X	

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

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