

STORMWATER MANAGEMENT, GROUNDWATER RECHARGE AND WATER QUALITY ANALYSIS

For

Malvern School Properties, LP

Proposed Day School

**Block 28010, Lot 57 & 58
Township of Montgomery, Somerset County, NJ**

Prepared by:



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A handwritten signature in black ink, appearing to read 'Jeffrey S. Haberman', is written over a horizontal line.

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**April 2023
Last revised August 2023
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I. SITE DESCRIPTION

The subject site is located at 982 Georgetown-Franklin Turnpike (CR 518) in the Township of Montgomery, Somerset County, New Jersey. The site is identified as Block 28010, Lots 57 & 58 on the Township of Montgomery Tax Map Sheet #55. The subject site consists of 2.046 Ac and is currently developed with a residential dwelling unit, and consists mainly of open space, impervious area, and some wooded area. The site is bounded by townhomes in construction and commercial uses to the north, residential uses to the west, residential and agricultural uses to the south, and commercial uses to the east, with Route 206 beyond. The existing conditions of the site have been verified by the ALTA/NSPS Land Title Survey as prepared by Dynamic Survey, dated 08/26/2022, last revised 09/07/2022.

The scope of the study includes the proposed development of the tract with one new approximately 5,666 SF (11,332 SF GFA) Malvern School. Additional improvements include lighting, landscaping, grading, walkways, driveways, utilities, parking, and associated items.

II. DESIGN OVERVIEW

This report has been prepared to define and analyze the stormwater drainage conditions that would occur as a result of the development of the subject site into a Malvern School and medical support building on Block 28010, Lots 57 & 58 in the Township of Montgomery, Somerset County, New Jersey. The scope of the study includes the proposed development of the parcel with a Malvern School with accompanying lighting, landscaping, grading, walkways, driveways, utilities, parking, and other related site improvements.

Based upon the fact that the proposed development will result in more than one (1) acre of land disturbance and increases motor vehicle surfaces by more than ¼ acre, this project is classified as a “major development”. Therefore, the proposed development has been designed to meet the stormwater runoff quantity, quality, and groundwater recharge requirements set forth by the Township of Montgomery Land Use Ordinance and NJAC 7:8.

Accordingly, the following items are addressed within this report:

- Stormwater runoff quality standards (7:8-5.5)
- Stormwater runoff quantity standards (7:8-5.6)
- Calculation of stormwater runoff (7:8-5.7)
- Green Infrastructure Standards (7:8-5.3)

A hydrological evaluation is provided for the NJDEP Water Quality, 2, 10, and 100-year storm events utilizing the Urban Hydrology for Small Watershed TR55 method.

The Township of Montgomery and NJAC 7:8 flow reduction requirements are as follows:

2-year:	50% reduction
10-year:	25% reduction
100-year:	20% reduction

It is the intention of the design of this facility to comply with the Stormwater Management Best Management Practices Manual.

III. EXISTING DRAINAGE CONDITIONS

The area to be analyzed consists of approximately 2.046 acres and is currently developed with a residential dwelling use, comprised mostly of open space, impervious areas, and some wooded area. Currently, all of the stormwater runoff from the subject site drains east via overland flow to the adjacent property to the east, where runoff is collected by a flared end section and conveyed through stormwater conveyance infrastructure in the Brecknell Way R.O.W.

The subject site has been evaluated with the following drainage sub-watershed areas as depicted on the Existing Drainage Area Map included within the Appendix of this report. According to the Somerset County Soil Survey, the existing soils are of Hydrologic Soil Group B and C. However, after thorough analysis and geotechnical testing of the underlying soils, the existing soil is anticipated to be reclassified to Hydrologic Soil Group D. The reclassification of soils is consistent with the Montgomery Crossing project to the north due to the lack of permeability and type of existing soils as evidenced in the soil logs in the Appendix of this report.

Study Area - DA East: This area consists of the entire parcel, which primarily includes open space, impervious area, and wooded area.

Study Area - DA Offsite East.: This area consists of a small offsite portion to the south of the site which primarily includes open space and wooded area. Under existing conditions, stormwater runoff generated by this area is ultimately tributary to the adjacent property to the east via overland flow.

Based upon the Somerset County Soil Survey, the soil types native to the site include:

SOIL TYPE	SOIL TYPE NAME	HYDROLOGIC SOIL GROUP
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	B

*As previously noted, soils within the limit of disturbance are expected be reclassified as Hydrologic Soil Group D.

IV. PROPOSED DRAINAGE CONDITIONS

The proposed development includes the construction of a day school with associated site improvements including driveways, parking areas, stormwater management facilities, landscaping, lighting, utilities and other associated site improvements. The stormwater management system includes one (1) aboveground bioretention basin with underdrains which serves to detain and discharge stormwater runoff generated by the development in order to meet the stormwater management requirements set forth by the Township of Montgomery and NJAC 7:8.

The proposed site conditions have been evaluated using the following drainage sub-watershed areas as depicted on the Proposed Drainage Area Map included within the Appendix of this report.

Study Area - Proposed Basin A: The study area consists of the building via the roof leader conveyance system, open space via overland flow, and the proposed parking lot via the pipe conveyance system. Stormwater runoff is conveyed to the bioretention Basin 'A' where it is detained and is released at a controlled rate through an outlet control structure. Runoff discharged from Basin 'A' is conveyed to the existing stormwater management conveyance system to the east in the Brecknell Way R.O.W.

Study Area – DA East Undetained: The study area consists largely of open space, wooded area, and some impervious area, along the eastern and southern perimeter of the site. Runoff generated by this perimeter area flows undetained to the east.

Study Area – DA Offsite East Undetained: This area consists of impervious area and open space at the southern portion of the property. Runoff generated by this area flows undetained to the east.

V. DESIGN METHODOLOGY

The intention of the design of the proposed stormwater management facilities for this development is to provide measures as required to address the applicable aspects of the Township of Montgomery Land Use Ordinance and NJAC 7:8. In order to prepare the stormwater management design for the subject site, extensive initial investigation of the property and topography was performed. On-site review of the tract was initially performed by Dynamic Engineering Consultants, PC to verify existing site conditions and land cover characteristics. Dynamic Survey, LLC was contracted to prepare the Boundary and Topographic Survey to depict the existing site conditions. Furthermore, Dynamic Earth, LLC performed test pits within the site to establish the seasonal high-water table and soil permeability rates.

Based on our review of the existing site conditions and survey, the Drainage Area Maps for the existing and proposed site conditions as defined within this report were established. A grading plan was developed for the

proposed site improvements with consideration to the existing drainage patterns. The plan was designed to ensure runoff from the proposed development could be directed to the proposed stormwater management facilities in order to address the applicable sections of the Township of Montgomery Stormwater Ordinance and NJAC 7:8.

The rainfall data utilized for the analysis of the existing and proposed drainage conditions is based upon the New Jersey 24 Hour Rainfall Frequency Data for Somerset County as published by the USDA NRCS utilizing the NOAA Region C rainfall distribution.

Under proposed conditions, stormwater runoff from the proposed motor vehicle surface areas and other areas in DA-Proposed Basin 'A' is collected and conveyed by the on-site stormwater conveyance system to the proposed aboveground bioretention Basin 'A' at the eastern portion of the site. The proposed basin is designed to detain and infiltrate the entirety of the water quality storm event through a bio-media to an underlying perforated pipe conveyance network. Therefore, the development will provide a total TSS removal rate of 80% for the site, thereby satisfying the water quality aspect of NJAC 7:8.

Furthermore, an outlet control structure is proposed within Basin 'A' to detain and release runoff from the 2-, 10- and 100-year storm events at a controlled rate which is ultimately tributary to the existing stormwater management infrastructure northeast of the parcel in the Brecknell Way R.O.W. The peak runoff rates for the 2-, 10-, and 100-year storm events have been reduced by 50%, 25%, and 20%, respectively to satisfy the stormwater runoff quantity requirements set forth by NJAC 7:8.

Lastly, as previously noted, Dynamic Earth, LLC performed numerous test pits within the site to establish seasonal high groundwater table characteristics and percolation tests were conducted for on-site soils to confirm soil classification per the County Soil Survey. The soils encountered during this site investigation consisted of clayey silt, and groundwater and evidence of seasonal high water table were not encountered in any test pits. The field investigation recharge map, soil profile pit logs and tube permeameter testing in the Appendix of this Report reveal a restriction within the upper 40 inches of the soil profile consisting of low permeability rate of less than 0.2 in/hr which is consistent with hydrologic soil group (HSG) "D" as specified in the NJ BMP Manual. The New Jersey Groundwater Recharge Spreadsheet (NJGRS) in the Appendix of this Report indicates that no recharge occurs in the existing condition. Therefore, the proposed development satisfies the groundwater recharge requirements set forth by NJAC 7:8.

The overall stormwater management design for the subject site has been evaluated by Dynamic Engineering Consultants to ensure that the overall development satisfies the standards set forth in the Township of Montgomery Land Use Ordinance and NJAC 7:8.

VI. STORMWATER MANAGEMENT SYSTEM DESIGN & GREEN INFRASTRUCTURE COMPLIANCE

As detailed above, in order to meet the stormwater runoff quantity and quality requirements for the proposed development, the stormwater management system design include one (1) aboveground bioretention basin with underdrains. In accordance with the New Jersey Stormwater Best Management Practices Manual, the following design considerations have been satisfied as further identified in the table below:

Aboveground Bioretention Basin (small-scale):

- 2.5-acre maximum contributory drainage area
- 72-hour maximum design storm drain time (utilizing slowest design permeability rate)
- 1-foot minimum separation between basin bottom and seasonal high-water table

VII. RUNOFF RATES

The following is a comparison of the existing and proposed conditions runoff rates:

Existing and Proposed Conditions Peak Runoff Rates Results
Summary (Total)

	EXISTING DISTURBED RUNOFF RATE	NJAC 7:8 REQUIRED REDUCTION	NJAC 7:8 ALLOWABLE RUNOFF RATE	PROPOSED RUNOFF RATE
2 Year	3.51 CFS	50%	1.76 CFS	1.69 CFS
10 Year	6.84 CFS	25%	5.13 CFS	4.53 CFS
100 Year	13.87 CFS	20%	11.10 CFS	10.63 CFS

VIII. WATER QUALITY

As noted previously in this report, the proposed aboveground bioretention basin with underdrains has been designed to retain and infiltrate the entire volume of the NJDEP Water Quality Storm event through a bio-media filter to an underlying perforated pipe underdrain system. In addition, the aboveground small-scale bioretention basin has been designed to comply with the standards set forth by the NJ Stormwater Best Management Practices Manual thereby, providing a TSS removal rate of 80%. As such, the proposed stormwater management facilities for the development will provide a total TSS removal rate of 80% for the site thereby satisfying the water quality aspect of NJAC 7:8.

IX. GROUNDWATER RECHARGE

As previously noted, Dynamic Earth, LLC performed numerous test pits within the site to establish seasonal high groundwater table characteristics and percolation tests were conducted for on-site soils to confirm soil classification per the County Soil Survey. The soils encountered during this site investigation consisted of clayey silt, and groundwater and evidence of seasonal highwater table were not encountered in any test pits. The field investigation recharge map, soil profile pit logs and tube permeameter testing in the Appendix of this Report reveal a restriction within the upper 40 inches of the soil profile consisting of low permeability rate of less than 0.2 in/hr which is consistent with hydrologic soil group (HSG) "D" as specified in the NJ BMP Manual. The New Jersey Groundwater Recharge Spreadsheet (NJGRS) in the Appendix of this Report indicates that no recharge occurs in the existing condition. Therefore, the proposed development satisfies the groundwater recharge requirements set forth by NJAC 7:8.

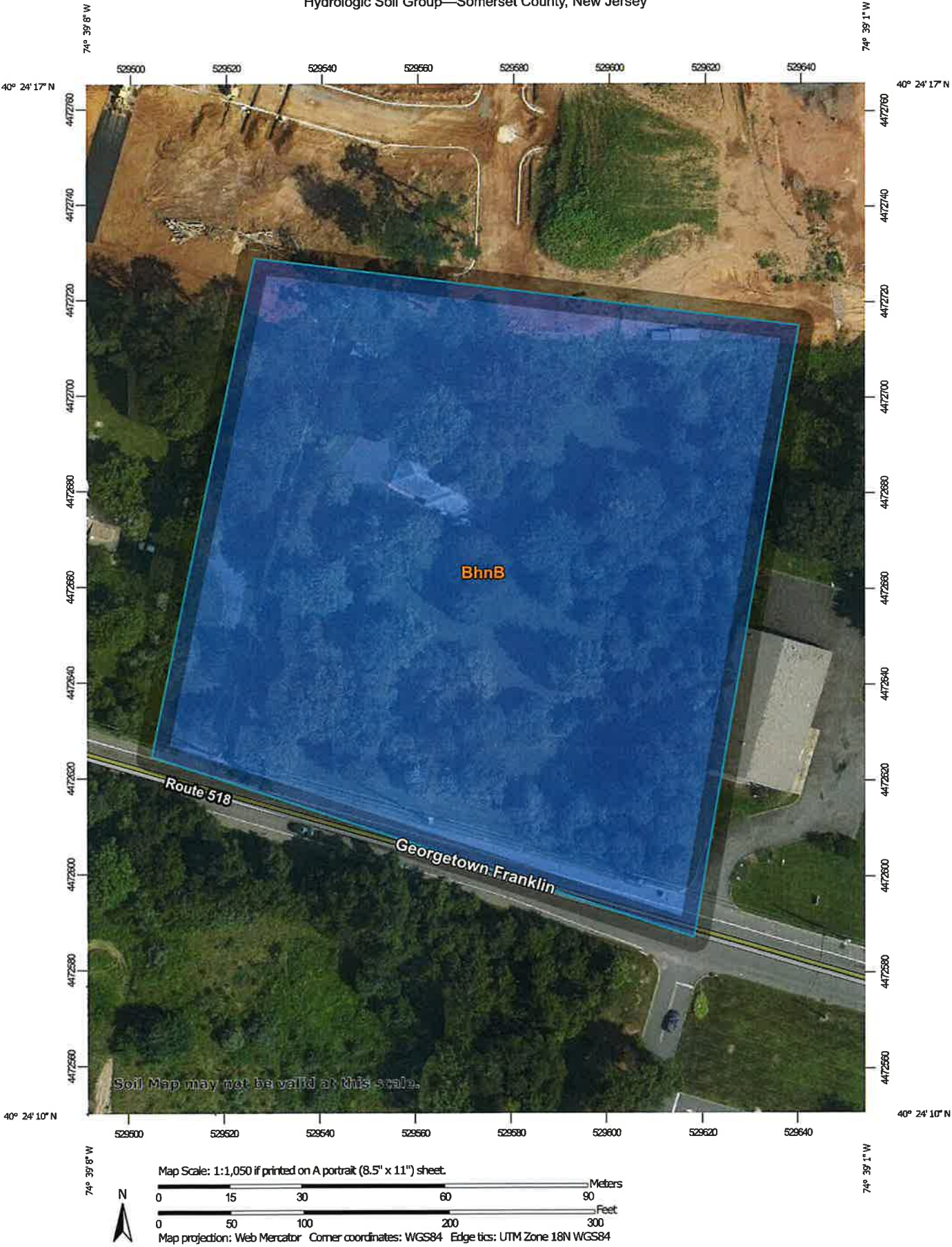
X. CONCLUSION

The proposed development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways, or adjacent parcels. In addition, the proposed development satisfies the runoff quantity and quality requirements set forth by the Township of Montgomery Land Use Ordinance and NJAC 7:8 through the use of a proposed aboveground bioretention basin with underdrains. With this stated, it is evident that the proposed development will not have a negative impact on the existing drainage conditions or water quality on-site or within the vicinity of the subject site.

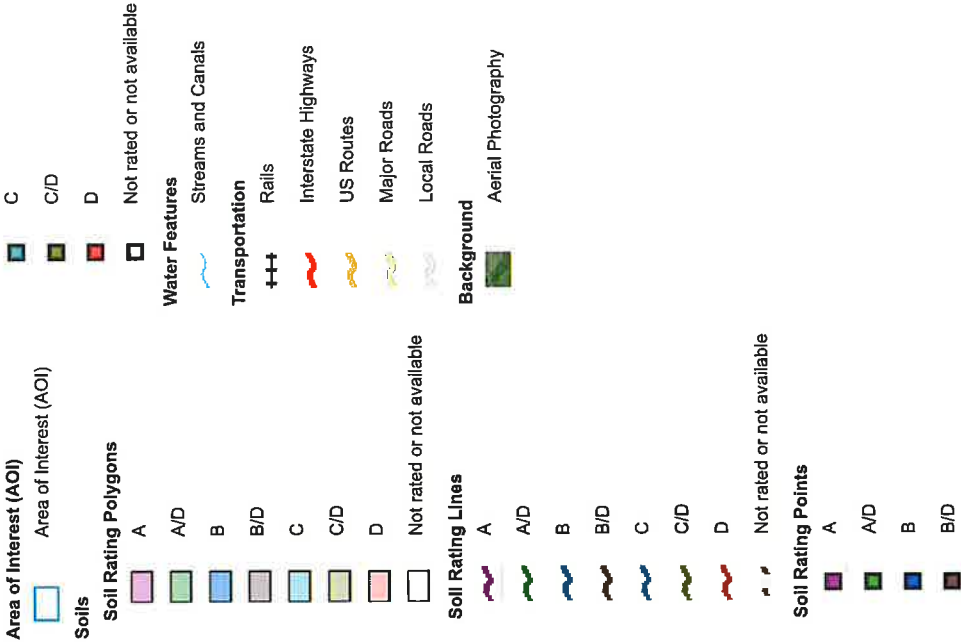
APPENDIX

NRCS WEB SOIL SURVEY

Hydrologic Soil Group—Somerset County, New Jersey



MAP LEGEND



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: Somerset County, New Jersey
Survey Area Data: Version 20, Aug 30, 2022

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

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

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
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	B	3.4	100.0%
Totals for Area of Interest			3.4	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

**HYDROGRAPH SUMMARY REPORTS – EXISTING &
PROPOSED CONDITIONS 2, 10, & 100-YEAR**

2023-08-09 Existing Hydrology

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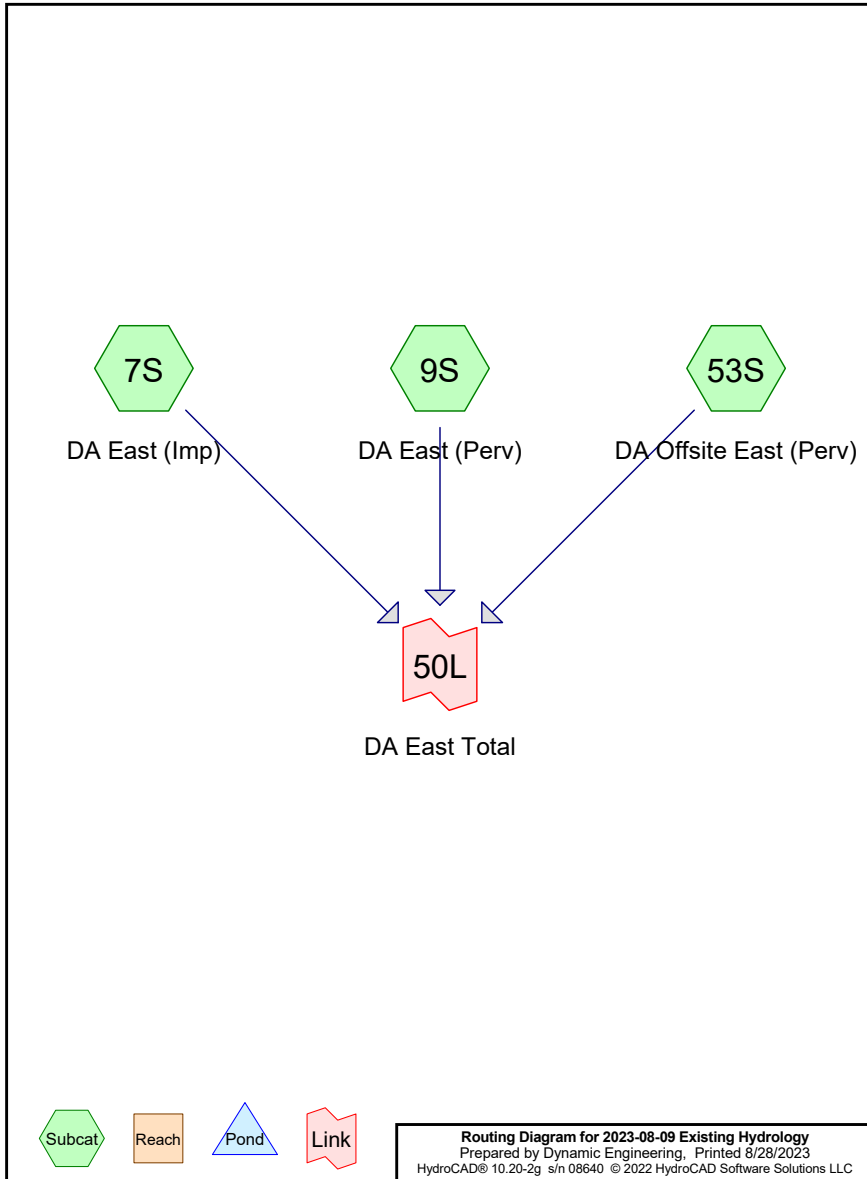
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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C



2023-08-09 Existing Hydrology

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Rainfall Events Listing								
Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year-Current	NOAA 24-hr	C	Default	24.00	1	3.34	2
2	10-Year-Current	NOAA 24-hr	C	Default	24.00	1	5.11	2
3	100-Year-Current	NOAA 24-hr	C	Default	24.00	1	8.66	2

2023-08-09 Existing Hydrology

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Area Listing (all nodes)		
Area (acres)	CN	Description (subcatchment-numbers)
1.380	80	>75% Grass cover, Good, HSG D (9S, 53S)
0.160	98	Paved parking, HSG D (7S)
0.530	77	Woods, Good, HSG D (9S, 53S)
2.070	81	TOTAL AREA

2023-08-09 Existing Hydrology

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Soil Listing (all nodes)		
Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
2.070	HSG D	7S, 9S, 53S
0.000	Other	
2.070		TOTAL AREA

2023-08-09 Existing Hydrology

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Ground Covers (all nodes)							
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.380	0.000	1.380	>75% Grass cover, Good	9S, 53S
0.000	0.000	0.000	0.160	0.000	0.160	Paved parking	7S
0.000	0.000	0.000	0.530	0.000	0.530	Woods, Good	9S, 53S
0.000	0.000	0.000	2.070	0.000	2.070	TOTAL AREA	

Notes Listing (all nodes)		
Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C
2		Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points	
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN	
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method	
Subcatchment 7S: DA East (Imp)	Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=3.11" Flow Length=307' Tc=10.1 min CN=98 Runoff=0.48 cfs 0.041 af
Subcatchment 9S: DA East (Perv)	Runoff Area=1.850 ac 0.00% Impervious Runoff Depth=1.44" Flow Length=307' Tc=10.1 min CN=79 Runoff=2.93 cfs 0.222 af
Subcatchment 53S: DA Offsite East (Perv)	Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=1.51" Flow Length=307' Tc=10.1 min CN=80 Runoff=0.10 cfs 0.008 af
Link 50L: DA East Total	Inflow=3.51 cfs 0.271 af Primary=3.51 cfs 0.271 af
Total Runoff Area = 2.070 ac Runoff Volume = 0.271 af Average Runoff Depth = 1.57"	
92.27% Pervious = 1.910 ac 7.73% Impervious = 0.160 ac	

2023-08-09 Existing Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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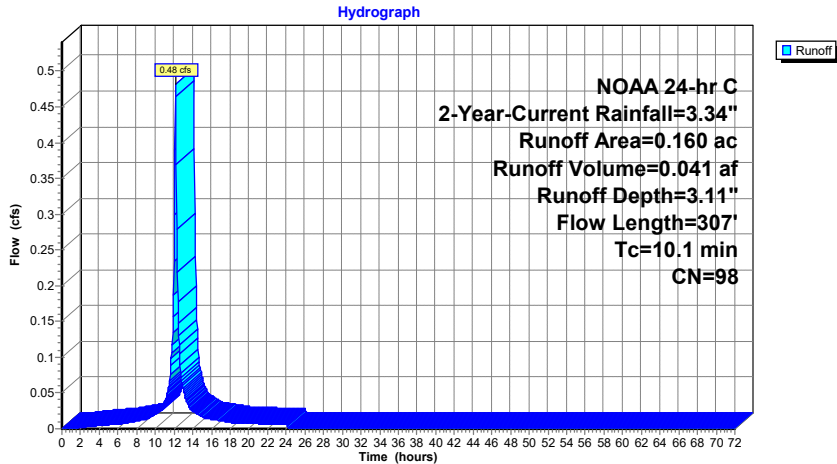
Summary for Subcatchment 7S: DA East (Imp)

Runoff = 0.48 cfs @ 12.17 hrs, Volume= 0.041 af, Depth= 3.11"
 Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.160	98	Paved parking, HSG D
0.160		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2 Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 7S: DA East (Imp)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 7S: DA East (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	3.11	0.00
1.00	0.04	0.00	0.00	53.00	3.34	3.11	0.00
2.00	0.08	0.01	0.00	54.00	3.34	3.11	0.00
3.00	0.12	0.02	0.00	55.00	3.34	3.11	0.00
4.00	0.16	0.05	0.00	56.00	3.34	3.11	0.00
5.00	0.21	0.08	0.01	57.00	3.34	3.11	0.00
6.00	0.26	0.12	0.01	58.00	3.34	3.11	0.00
7.00	0.33	0.17	0.01	59.00	3.34	3.11	0.00
8.00	0.40	0.23	0.01	60.00	3.34	3.11	0.00
9.00	0.49	0.31	0.01	61.00	3.34	3.11	0.00
10.00	0.61	0.42	0.02	62.00	3.34	3.11	0.00
11.00	0.80	0.60	0.04	63.00	3.34	3.11	0.00
12.00	1.59	1.37	0.23	64.00	3.34	3.11	0.00
13.00	2.54	2.31	0.05	65.00	3.34	3.11	0.00
14.00	2.73	2.50	0.02	66.00	3.34	3.11	0.00
15.00	2.85	2.62	0.02	67.00	3.34	3.11	0.00
16.00	2.94	2.71	0.01	68.00	3.34	3.11	0.00
17.00	3.01	2.78	0.01	69.00	3.34	3.11	0.00
18.00	3.08	2.84	0.01	70.00	3.34	3.11	0.00
19.00	3.13	2.90	0.01	71.00	3.34	3.11	0.00
20.00	3.18	2.94	0.01	72.00	3.34	3.11	0.00
21.00	3.22	2.99	0.01				
22.00	3.26	3.03	0.01				
23.00	3.30	3.07	0.01				
24.00	3.34	3.11	0.01				
25.00	3.34	3.11	0.00				
26.00	3.34	3.11	0.00				
27.00	3.34	3.11	0.00				
28.00	3.34	3.11	0.00				
29.00	3.34	3.11	0.00				
30.00	3.34	3.11	0.00				
31.00	3.34	3.11	0.00				
32.00	3.34	3.11	0.00				
33.00	3.34	3.11	0.00				
34.00	3.34	3.11	0.00				
35.00	3.34	3.11	0.00				
36.00	3.34	3.11	0.00				
37.00	3.34	3.11	0.00				
38.00	3.34	3.11	0.00				
39.00	3.34	3.11	0.00				
40.00	3.34	3.11	0.00				
41.00	3.34	3.11	0.00				
42.00	3.34	3.11	0.00				
43.00	3.34	3.11	0.00				
44.00	3.34	3.11	0.00				
45.00	3.34	3.11	0.00				
46.00	3.34	3.11	0.00				
47.00	3.34	3.11	0.00				
48.00	3.34	3.11	0.00				
49.00	3.34	3.11	0.00				
50.00	3.34	3.11	0.00				
51.00	3.34	3.11	0.00				

2023-08-09 Existing Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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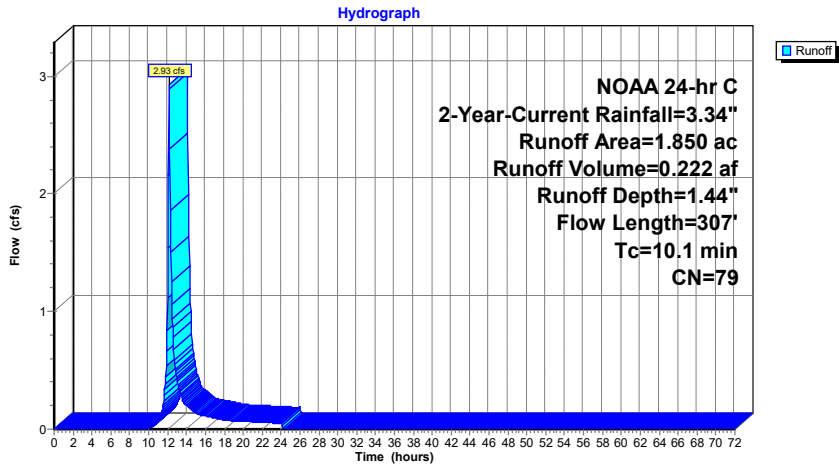
Summary for Subcatchment 9S: DA East (Perv)

Runoff = 2.93 cfs @ 12.18 hrs, Volume= 0.222 af, Depth= 1.44"
 Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
1.330	80	>75% Grass cover, Good, HSG D
0.520	77	Woods, Good, HSG D
1.850	79	Weighted Average
1.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, sheet flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 9S: DA East (Perv)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 9S: DA East (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	1.44	0.00
1.00	0.04	0.00	0.00	53.00	3.34	1.44	0.00
2.00	0.08	0.00	0.00	54.00	3.34	1.44	0.00
3.00	0.12	0.00	0.00	55.00	3.34	1.44	0.00
4.00	0.16	0.00	0.00	56.00	3.34	1.44	0.00
5.00	0.21	0.00	0.00	57.00	3.34	1.44	0.00
6.00	0.26	0.00	0.00	58.00	3.34	1.44	0.00
7.00	0.33	0.00	0.00	59.00	3.34	1.44	0.00
8.00	0.40	0.00	0.00	60.00	3.34	1.44	0.00
9.00	0.49	0.00	0.00	61.00	3.34	1.44	0.00
10.00	0.61	0.00	0.01	62.00	3.34	1.44	0.00
11.00	0.80	0.02	0.07	63.00	3.34	1.44	0.00
12.00	1.59	0.30	1.12	64.00	3.34	1.44	0.00
13.00	2.54	0.86	0.42	65.00	3.34	1.44	0.00
14.00	2.73	1.00	0.20	66.00	3.34	1.44	0.00
15.00	2.85	1.08	0.14	67.00	3.34	1.44	0.00
16.00	2.94	1.14	0.11	68.00	3.34	1.44	0.00
17.00	3.01	1.20	0.10	69.00	3.34	1.44	0.00
18.00	3.08	1.24	0.08	70.00	3.34	1.44	0.00
19.00	3.13	1.28	0.07	71.00	3.34	1.44	0.00
20.00	3.18	1.32	0.07	72.00	3.34	1.44	0.00
21.00	3.22	1.35	0.06				
22.00	3.26	1.39	0.06				
23.00	3.30	1.41	0.05				
24.00	3.34	1.44	0.05				
25.00	3.34	1.44	0.00				
26.00	3.34	1.44	0.00				
27.00	3.34	1.44	0.00				
28.00	3.34	1.44	0.00				
29.00	3.34	1.44	0.00				
30.00	3.34	1.44	0.00				
31.00	3.34	1.44	0.00				
32.00	3.34	1.44	0.00				
33.00	3.34	1.44	0.00				
34.00	3.34	1.44	0.00				
35.00	3.34	1.44	0.00				
36.00	3.34	1.44	0.00				
37.00	3.34	1.44	0.00				
38.00	3.34	1.44	0.00				
39.00	3.34	1.44	0.00				
40.00	3.34	1.44	0.00				
41.00	3.34	1.44	0.00				
42.00	3.34	1.44	0.00				
43.00	3.34	1.44	0.00				
44.00	3.34	1.44	0.00				
45.00	3.34	1.44	0.00				
46.00	3.34	1.44	0.00				
47.00	3.34	1.44	0.00				
48.00	3.34	1.44	0.00				
49.00	3.34	1.44	0.00				
50.00	3.34	1.44	0.00				
51.00	3.34	1.44	0.00				

2023-08-09 Existing Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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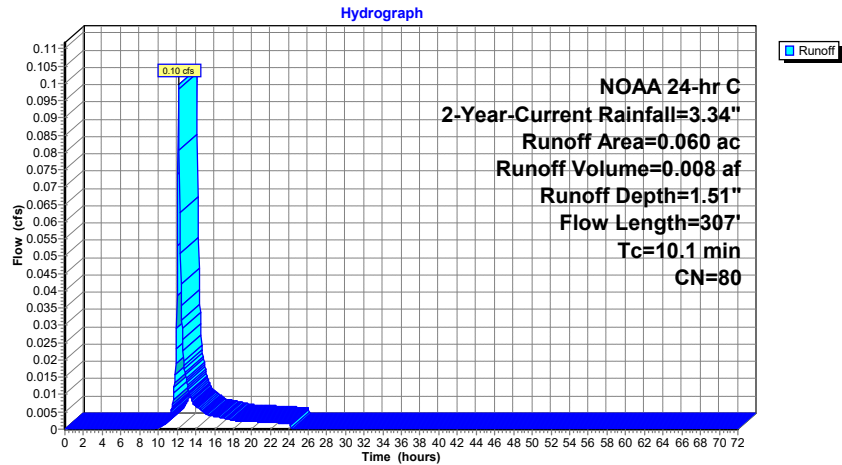
Summary for Subcatchment 53S: DA Offsite East (Perv)

Runoff = 0.10 cfs @ 12.18 hrs, Volume= 0.008 af, Depth= 1.51"
 Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.050	80	>75% Grass cover, Good, HSG D
0.010	77	Woods, Good, HSG D
0.060	80	Weighted Average
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2 Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 53S: DA Offsite East (Perv)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 53S: DA Offsite East (Perv)

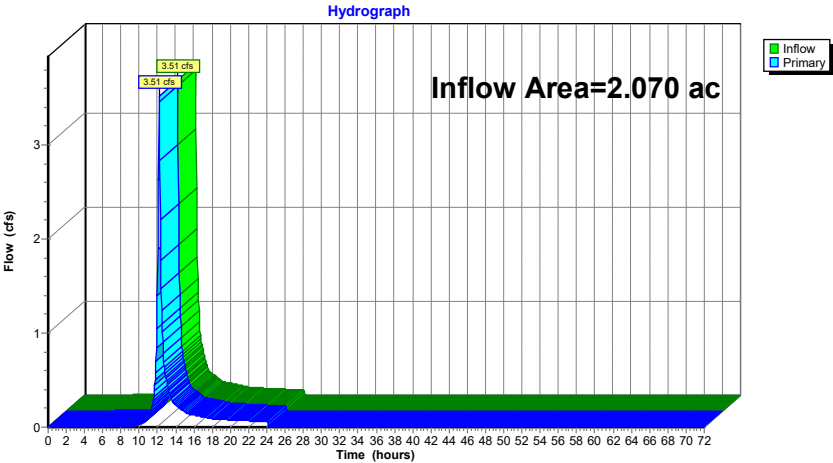
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.26	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.49	0.00	0.00
10.00	0.61	0.00	0.00
11.00	0.80	0.03	0.00
12.00	1.59	0.33	0.04
13.00	2.54	0.92	0.01
14.00	2.73	1.05	0.01
15.00	2.85	1.14	0.00
16.00	2.94	1.21	0.00
17.00	3.01	1.26	0.00
18.00	3.08	1.31	0.00
19.00	3.13	1.35	0.00
20.00	3.18	1.38	0.00
21.00	3.22	1.42	0.00
22.00	3.26	1.45	0.00
23.00	3.30	1.48	0.00
24.00	3.34	1.51	0.00
25.00	3.34	1.51	0.00
26.00	3.34	1.51	0.00
27.00	3.34	1.51	0.00
28.00	3.34	1.51	0.00
29.00	3.34	1.51	0.00
30.00	3.34	1.51	0.00
31.00	3.34	1.51	0.00
32.00	3.34	1.51	0.00
33.00	3.34	1.51	0.00
34.00	3.34	1.51	0.00
35.00	3.34	1.51	0.00
36.00	3.34	1.51	0.00
37.00	3.34	1.51	0.00
38.00	3.34	1.51	0.00
39.00	3.34	1.51	0.00
40.00	3.34	1.51	0.00
41.00	3.34	1.51	0.00
42.00	3.34	1.51	0.00
43.00	3.34	1.51	0.00
44.00	3.34	1.51	0.00
45.00	3.34	1.51	0.00
46.00	3.34	1.51	0.00
47.00	3.34	1.51	0.00
48.00	3.34	1.51	0.00
49.00	3.34	1.51	0.00
50.00	3.34	1.51	0.00
51.00	3.34	1.51	0.00

Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 7.73% Impervious, Inflow Depth = 1.57" for 2-Year-Current event
Inflow = 3.51 cfs @ 12.18 hrs, Volume= 0.271 af
Primary = 3.51 cfs @ 12.18 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 52P

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

Link 50L: DA East Total



Hydrograph for Link 50L: DA East Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.01	0.00	0.01	57.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01	58.00	0.00	0.00	0.00
7.00	0.01	0.00	0.01	59.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01	60.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01	61.00	0.00	0.00	0.00
10.00	0.03	0.00	0.03	62.00	0.00	0.00	0.00
11.00	0.11	0.00	0.11	63.00	0.00	0.00	0.00
12.00	1.39	0.00	1.39	64.00	0.00	0.00	0.00
13.00	0.49	0.00	0.49	65.00	0.00	0.00	0.00
14.00	0.23	0.00	0.23	66.00	0.00	0.00	0.00
15.00	0.16	0.00	0.16	67.00	0.00	0.00	0.00
16.00	0.13	0.00	0.13	68.00	0.00	0.00	0.00
17.00	0.11	0.00	0.11	69.00	0.00	0.00	0.00
18.00	0.09	0.00	0.09	70.00	0.00	0.00	0.00
19.00	0.08	0.00	0.08	71.00	0.00	0.00	0.00
20.00	0.08	0.00	0.08	72.00	0.00	0.00	0.00
21.00	0.07	0.00	0.07				
22.00	0.07	0.00	0.07				
23.00	0.06	0.00	0.06				
24.00	0.06	0.00	0.06				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7S: DA East (Imp)

Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=4.87"

Flow Length=307' Tc=10.1 min CN=98 Runoff=0.74 cfs 0.065 af

Subcatchment 9S: DA East (Perv)

Runoff Area=1.850 ac 0.00% Impervious Runoff Depth=2.90"

Flow Length=307' Tc=10.1 min CN=79 Runoff=5.90 cfs 0.447 af

Subcatchment 53S: DA Offsite East (Perv)

Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=2.99"

Flow Length=307' Tc=10.1 min CN=80 Runoff=0.20 cfs 0.015 af

Link 50L: DA East Total

Inflow=6.84 cfs 0.526 af

Primary=6.84 cfs 0.526 af

Total Runoff Area = 2.070 ac Runoff Volume = 0.526 af Average Runoff Depth = 3.05"

92.27% Pervious = 1.910 ac 7.73% Impervious = 0.160 ac

Summary for Subcatchment 7S: DA East (Imp)

Runoff = 0.74 cfs @ 12.17 hrs, Volume= 0.065 af, Depth= 4.87"

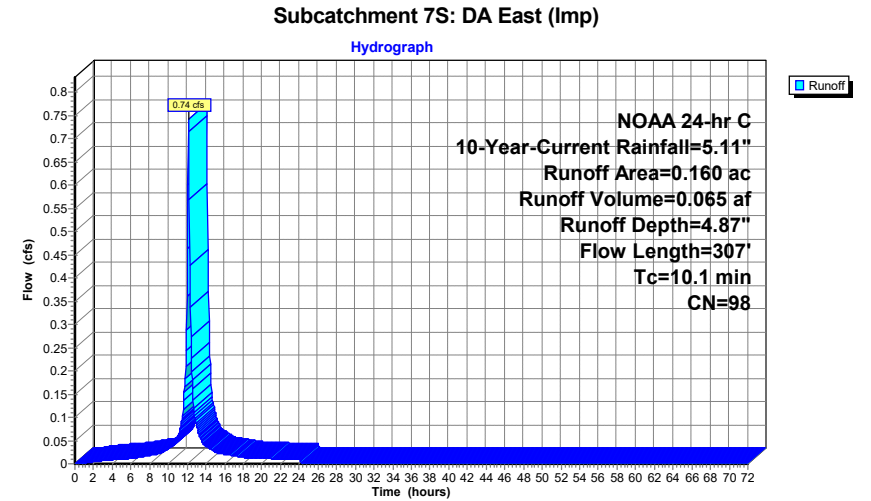
Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.160	98	Paved parking, HSG D
0.160		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow
					Grass: Dense n= 0.240 P2= 3.34"
					Using McCuen-Spiess flow length
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow
					Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2
					Unpaved Kv= 16.1 fps
10.1	307	Total			



2023-08-09 Existing Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Subcatchment 7S: DA East (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	4.87	0.00
1.00	0.06	0.00	0.00	53.00	5.11	4.87	0.00
2.00	0.12	0.02	0.00	54.00	5.11	4.87	0.00
3.00	0.18	0.06	0.01	55.00	5.11	4.87	0.00
4.00	0.25	0.11	0.01	56.00	5.11	4.87	0.00
5.00	0.32	0.17	0.01	57.00	5.11	4.87	0.00
6.00	0.40	0.23	0.01	58.00	5.11	4.87	0.00
7.00	0.50	0.32	0.01	59.00	5.11	4.87	0.00
8.00	0.61	0.42	0.02	60.00	5.11	4.87	0.00
9.00	0.75	0.55	0.02	61.00	5.11	4.87	0.00
10.00	0.93	0.72	0.03	62.00	5.11	4.87	0.00
11.00	1.23	1.01	0.06	63.00	5.11	4.87	0.00
12.00	2.44	2.21	0.36	64.00	5.11	4.87	0.00
13.00	3.88	3.65	0.08	65.00	5.11	4.87	0.00
14.00	4.18	3.94	0.04	66.00	5.11	4.87	0.00
15.00	4.36	4.13	0.03	67.00	5.11	4.87	0.00
16.00	4.50	4.26	0.02	68.00	5.11	4.87	0.00
17.00	4.61	4.38	0.02	69.00	5.11	4.87	0.00
18.00	4.71	4.47	0.01	70.00	5.11	4.87	0.00
19.00	4.79	4.55	0.01	71.00	5.11	4.87	0.00
20.00	4.86	4.62	0.01	72.00	5.11	4.87	0.00
21.00	4.93	4.69	0.01				
22.00	4.99	4.76	0.01				
23.00	5.05	4.82	0.01				
24.00	5.11	4.87	0.01				
25.00	5.11	4.87	0.00				
26.00	5.11	4.87	0.00				
27.00	5.11	4.87	0.00				
28.00	5.11	4.87	0.00				
29.00	5.11	4.87	0.00				
30.00	5.11	4.87	0.00				
31.00	5.11	4.87	0.00				
32.00	5.11	4.87	0.00				
33.00	5.11	4.87	0.00				
34.00	5.11	4.87	0.00				
35.00	5.11	4.87	0.00				
36.00	5.11	4.87	0.00				
37.00	5.11	4.87	0.00				
38.00	5.11	4.87	0.00				
39.00	5.11	4.87	0.00				
40.00	5.11	4.87	0.00				
41.00	5.11	4.87	0.00				
42.00	5.11	4.87	0.00				
43.00	5.11	4.87	0.00				
44.00	5.11	4.87	0.00				
45.00	5.11	4.87	0.00				
46.00	5.11	4.87	0.00				
47.00	5.11	4.87	0.00				
48.00	5.11	4.87	0.00				
49.00	5.11	4.87	0.00				
50.00	5.11	4.87	0.00				
51.00	5.11	4.87	0.00				

2023-08-09 Existing Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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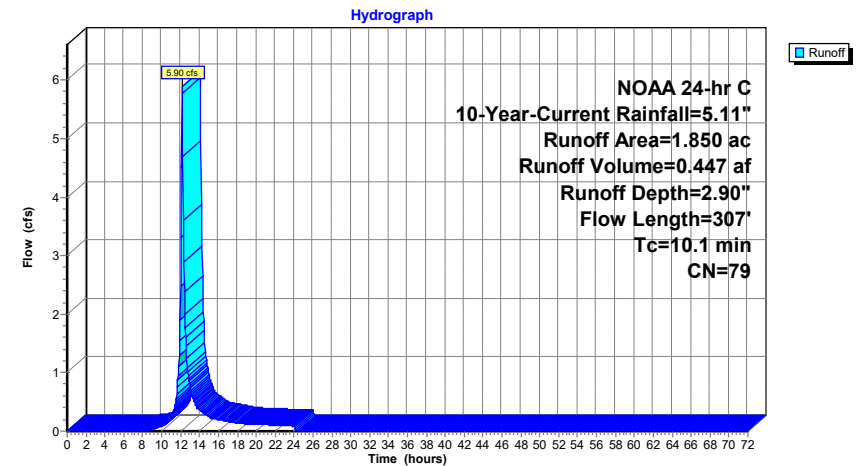
Summary for Subcatchment 9S: DA East (Perv)

Runoff = 5.90 cfs @ 12.18 hrs, Volume= 0.447 af, Depth= 2.90"
 Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
1.330	80	>75% Grass cover, Good, HSG D
0.520	77	Woods, Good, HSG D
1.850	79	Weighted Average
1.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, sheet flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 9S: DA East (Perv)

2023-08-09 Existing Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Subcatchment 9S: DA East (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	2.90	0.00
1.00	0.06	0.00	0.00	53.00	5.11	2.90	0.00
2.00	0.12	0.00	0.00	54.00	5.11	2.90	0.00
3.00	0.18	0.00	0.00	55.00	5.11	2.90	0.00
4.00	0.25	0.00	0.00	56.00	5.11	2.90	0.00
5.00	0.32	0.00	0.00	57.00	5.11	2.90	0.00
6.00	0.40	0.00	0.00	58.00	5.11	2.90	0.00
7.00	0.50	0.00	0.00	59.00	5.11	2.90	0.00
8.00	0.61	0.00	0.01	60.00	5.11	2.90	0.00
9.00	0.75	0.02	0.03	61.00	5.11	2.90	0.00
10.00	0.93	0.05	0.09	62.00	5.11	2.90	0.00
11.00	1.23	0.14	0.24	63.00	5.11	2.90	0.00
12.00	2.44	0.79	2.49	64.00	5.11	2.90	0.00
13.00	3.88	1.87	0.77	65.00	5.11	2.90	0.00
14.00	4.18	2.11	0.36	66.00	5.11	2.90	0.00
15.00	4.36	2.26	0.25	67.00	5.11	2.90	0.00
16.00	4.50	2.37	0.20	68.00	5.11	2.90	0.00
17.00	4.61	2.47	0.17	69.00	5.11	2.90	0.00
18.00	4.71	2.55	0.14	70.00	5.11	2.90	0.00
19.00	4.79	2.62	0.12	71.00	5.11	2.90	0.00
20.00	4.86	2.68	0.12	72.00	5.11	2.90	0.00
21.00	4.93	2.74	0.11				
22.00	4.99	2.80	0.10				
23.00	5.05	2.85	0.09				
24.00	5.11	2.90	0.09				
25.00	5.11	2.90	0.00				
26.00	5.11	2.90	0.00				
27.00	5.11	2.90	0.00				
28.00	5.11	2.90	0.00				
29.00	5.11	2.90	0.00				
30.00	5.11	2.90	0.00				
31.00	5.11	2.90	0.00				
32.00	5.11	2.90	0.00				
33.00	5.11	2.90	0.00				
34.00	5.11	2.90	0.00				
35.00	5.11	2.90	0.00				
36.00	5.11	2.90	0.00				
37.00	5.11	2.90	0.00				
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40.00	5.11	2.90	0.00				
41.00	5.11	2.90	0.00				
42.00	5.11	2.90	0.00				
43.00	5.11	2.90	0.00				
44.00	5.11	2.90	0.00				
45.00	5.11	2.90	0.00				
46.00	5.11	2.90	0.00				
47.00	5.11	2.90	0.00				
48.00	5.11	2.90	0.00				
49.00	5.11	2.90	0.00				
50.00	5.11	2.90	0.00				
51.00	5.11	2.90	0.00				

2023-08-09 Existing Hydrology

Prepared by Dynamic Engineering

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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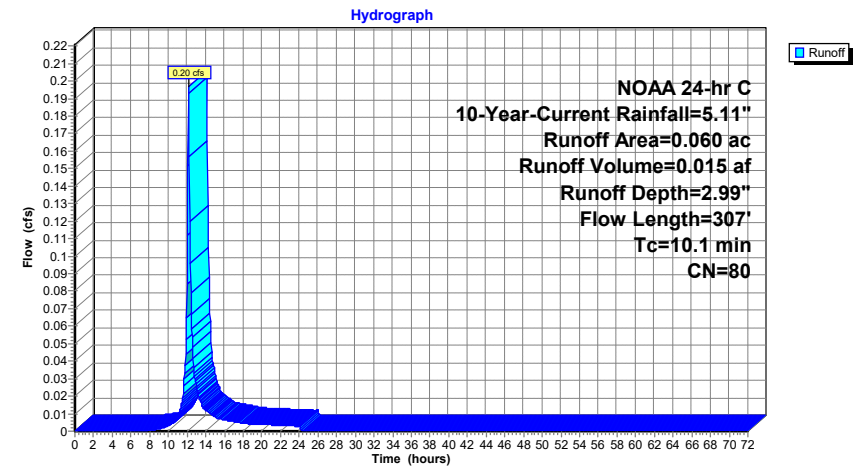
Summary for Subcatchment 53S: DA Offsite East (Perv)

Runoff = 0.20 cfs @ 12.18 hrs, Volume= 0.015 af, Depth= 2.99"
 Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.050	80	>75% Grass cover, Good, HSG D
0.010	77	Woods, Good, HSG D
0.060	80	Weighted Average
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2 Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 53S: DA Offsite East (Perv)

2023-08-09 Existing Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Subcatchment 53S: DA Offsite East (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	2.99	0.00
1.00	0.06	0.00	0.00	53.00	5.11	2.99	0.00
2.00	0.12	0.00	0.00	54.00	5.11	2.99	0.00
3.00	0.18	0.00	0.00	55.00	5.11	2.99	0.00
4.00	0.25	0.00	0.00	56.00	5.11	2.99	0.00
5.00	0.32	0.00	0.00	57.00	5.11	2.99	0.00
6.00	0.40	0.00	0.00	58.00	5.11	2.99	0.00
7.00	0.50	0.00	0.00	59.00	5.11	2.99	0.00
8.00	0.61	0.00	0.00	60.00	5.11	2.99	0.00
9.00	0.75	0.02	0.00	61.00	5.11	2.99	0.00
10.00	0.93	0.06	0.00	62.00	5.11	2.99	0.00
11.00	1.23	0.16	0.01	63.00	5.11	2.99	0.00
12.00	2.44	0.84	0.08	64.00	5.11	2.99	0.00
13.00	3.88	1.95	0.03	65.00	5.11	2.99	0.00
14.00	4.18	2.19	0.01	66.00	5.11	2.99	0.00
15.00	4.36	2.35	0.01	67.00	5.11	2.99	0.00
16.00	4.50	2.46	0.01	68.00	5.11	2.99	0.00
17.00	4.61	2.56	0.01	69.00	5.11	2.99	0.00
18.00	4.71	2.64	0.00	70.00	5.11	2.99	0.00
19.00	4.79	2.71	0.00	71.00	5.11	2.99	0.00
20.00	4.86	2.77	0.00	72.00	5.11	2.99	0.00
21.00	4.93	2.83	0.00				
22.00	4.99	2.89	0.00				
23.00	5.05	2.94	0.00				
24.00	5.11	2.99	0.00				
25.00	5.11	2.99	0.00				
26.00	5.11	2.99	0.00				
27.00	5.11	2.99	0.00				
28.00	5.11	2.99	0.00				
29.00	5.11	2.99	0.00				
30.00	5.11	2.99	0.00				
31.00	5.11	2.99	0.00				
32.00	5.11	2.99	0.00				
33.00	5.11	2.99	0.00				
34.00	5.11	2.99	0.00				
35.00	5.11	2.99	0.00				
36.00	5.11	2.99	0.00				
37.00	5.11	2.99	0.00				
38.00	5.11	2.99	0.00				
39.00	5.11	2.99	0.00				
40.00	5.11	2.99	0.00				
41.00	5.11	2.99	0.00				
42.00	5.11	2.99	0.00				
43.00	5.11	2.99	0.00				
44.00	5.11	2.99	0.00				
45.00	5.11	2.99	0.00				
46.00	5.11	2.99	0.00				
47.00	5.11	2.99	0.00				
48.00	5.11	2.99	0.00				
49.00	5.11	2.99	0.00				
50.00	5.11	2.99	0.00				
51.00	5.11	2.99	0.00				

2023-08-09 Existing Hydrology

Prepared by Dynamic Engineering

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

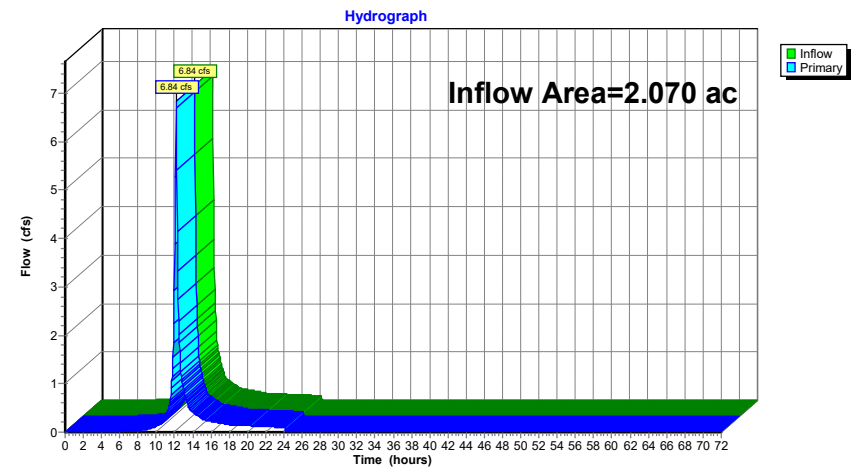
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Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 7.73% Impervious, Inflow Depth = 3.05" for 10-Year-Current event
Inflow = 6.84 cfs @ 12.18 hrs, Volume= 0.526 af
Primary = 6.84 cfs @ 12.18 hrs, Volume= 0.526 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 52P

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

Link 50L: DA East Total

2023-08-09 Existing Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Link 50L: DA East Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.01	0.00	0.01	55.00	0.00	0.00	0.00
4.00	0.01	0.00	0.01	56.00	0.00	0.00	0.00
5.00	0.01	0.00	0.01	57.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01	58.00	0.00	0.00	0.00
7.00	0.01	0.00	0.01	59.00	0.00	0.00	0.00
8.00	0.03	0.00	0.03	60.00	0.00	0.00	0.00
9.00	0.06	0.00	0.06	61.00	0.00	0.00	0.00
10.00	0.13	0.00	0.13	62.00	0.00	0.00	0.00
11.00	0.31	0.00	0.31	63.00	0.00	0.00	0.00
12.00	2.93	0.00	2.93	64.00	0.00	0.00	0.00
13.00	0.88	0.00	0.88	65.00	0.00	0.00	0.00
14.00	0.41	0.00	0.41	66.00	0.00	0.00	0.00
15.00	0.28	0.00	0.28	67.00	0.00	0.00	0.00
16.00	0.23	0.00	0.23	68.00	0.00	0.00	0.00
17.00	0.19	0.00	0.19	69.00	0.00	0.00	0.00
18.00	0.16	0.00	0.16	70.00	0.00	0.00	0.00
19.00	0.14	0.00	0.14	71.00	0.00	0.00	0.00
20.00	0.13	0.00	0.13	72.00	0.00	0.00	0.00
21.00	0.12	0.00	0.12				
22.00	0.11	0.00	0.11				
23.00	0.11	0.00	0.11				
24.00	0.10	0.00	0.10				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

2023-08-09 Existing Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 7S: DA East (Imp)

Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=8.42"

Flow Length=307' Tc=10.1 min CN=98 Runoff=1.26 cfs 0.112 af

Subcatchment 9S: DA East (Perv)

Runoff Area=1.850 ac 0.00% Impervious Runoff Depth=6.13"

Flow Length=307' Tc=10.1 min CN=79 Runoff=12.20 cfs 0.944 af

Subcatchment 53S: DA Offsite East (Perv)

Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=6.25"

Flow Length=307' Tc=10.1 min CN=80 Runoff=0.40 cfs 0.031 af

Link 50L: DA East Total

Inflow=13.87 cfs 1.088 af

Primary=13.87 cfs 1.088 af

Total Runoff Area = 2.070 ac Runoff Volume = 1.088 af Average Runoff Depth = 6.31"**92.27% Pervious = 1.910 ac 7.73% Impervious = 0.160 ac**

2023-08-09 Existing Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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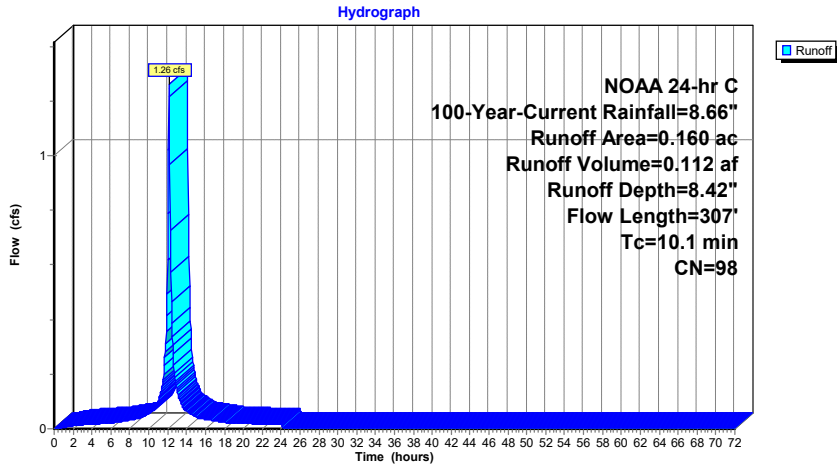
Summary for Subcatchment 7S: DA East (Imp)

Runoff = 1.26 cfs @ 12.17 hrs, Volume= 0.112 af, Depth= 8.42"
Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.160	98	Paved parking, HSG D
0.160		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2 Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 7S: DA East (Imp)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 7S: DA East (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.09	0.01	0.00
2.00	0.20	0.07	0.01
3.00	0.31	0.15	0.01
4.00	0.42	0.25	0.02
5.00	0.55	0.36	0.02
6.00	0.69	0.49	0.02
7.00	0.84	0.64	0.03
8.00	1.04	0.83	0.03
9.00	1.26	1.05	0.04
10.00	1.58	1.36	0.06
11.00	2.08	1.85	0.10
12.00	4.13	3.89	0.62
13.00	6.58	6.34	0.14
14.00	7.08	6.84	0.06
15.00	7.40	7.16	0.04
16.00	7.62	7.38	0.03
17.00	7.82	7.58	0.03
18.00	7.97	7.73	0.02
19.00	8.11	7.87	0.02
20.00	8.24	8.00	0.02
21.00	8.35	8.11	0.02
22.00	8.46	8.22	0.02
23.00	8.57	8.33	0.02
24.00	8.66	8.42	0.02
25.00	8.66	8.42	0.00
26.00	8.66	8.42	0.00
27.00	8.66	8.42	0.00
28.00	8.66	8.42	0.00
29.00	8.66	8.42	0.00
30.00	8.66	8.42	0.00
31.00	8.66	8.42	0.00
32.00	8.66	8.42	0.00
33.00	8.66	8.42	0.00
34.00	8.66	8.42	0.00
35.00	8.66	8.42	0.00
36.00	8.66	8.42	0.00
37.00	8.66	8.42	0.00
38.00	8.66	8.42	0.00
39.00	8.66	8.42	0.00
40.00	8.66	8.42	0.00
41.00	8.66	8.42	0.00
42.00	8.66	8.42	0.00
43.00	8.66	8.42	0.00
44.00	8.66	8.42	0.00
45.00	8.66	8.42	0.00
46.00	8.66	8.42	0.00
47.00	8.66	8.42	0.00
48.00	8.66	8.42	0.00
49.00	8.66	8.42	0.00
50.00	8.66	8.42	0.00
51.00	8.66	8.42	0.00

2023-08-09 Existing Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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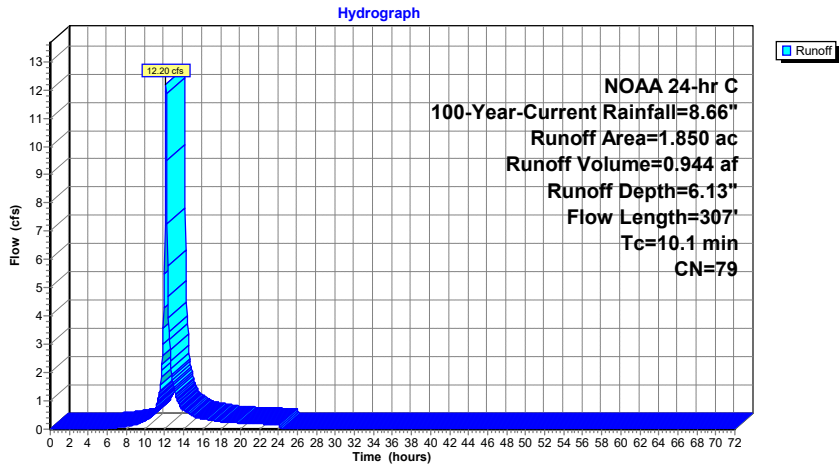
Summary for Subcatchment 9S: DA East (Perv)

Runoff = 12.20 cfs @ 12.17 hrs, Volume= 0.944 af, Depth= 6.13"
Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
1.330	80	>75% Grass cover, Good, HSG D
0.520	77	Woods, Good, HSG D
1.850	79	Weighted Average
1.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, sheet flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, SCF Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 9S: DA East (Perv)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 9S: DA East (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.09	0.00	0.00
2.00	0.20	0.00	0.00
3.00	0.31	0.00	0.00
4.00	0.42	0.00	0.00
5.00	0.55	0.00	0.00
6.00	0.69	0.01	0.02
7.00	0.84	0.03	0.06
8.00	1.04	0.08	0.11
9.00	1.26	0.16	0.17
10.00	1.58	0.30	0.31
11.00	2.08	0.57	0.69
12.00	4.13	2.07	5.51
13.00	6.58	4.20	1.48
14.00	7.08	4.66	0.68
15.00	7.40	4.95	0.46
16.00	7.62	5.16	0.37
17.00	7.82	5.34	0.31
18.00	7.97	5.48	0.25
19.00	8.11	5.61	0.23
20.00	8.24	5.73	0.22
21.00	8.35	5.84	0.20
22.00	8.46	5.94	0.19
23.00	8.57	6.04	0.17
24.00	8.66	6.13	0.17
25.00	8.66	6.13	0.00
26.00	8.66	6.13	0.00
27.00	8.66	6.13	0.00
28.00	8.66	6.13	0.00
29.00	8.66	6.13	0.00
30.00	8.66	6.13	0.00
31.00	8.66	6.13	0.00
32.00	8.66	6.13	0.00
33.00	8.66	6.13	0.00
34.00	8.66	6.13	0.00
35.00	8.66	6.13	0.00
36.00	8.66	6.13	0.00
37.00	8.66	6.13	0.00
38.00	8.66	6.13	0.00
39.00	8.66	6.13	0.00
40.00	8.66	6.13	0.00
41.00	8.66	6.13	0.00
42.00	8.66	6.13	0.00
43.00	8.66	6.13	0.00
44.00	8.66	6.13	0.00
45.00	8.66	6.13	0.00
46.00	8.66	6.13	0.00
47.00	8.66	6.13	0.00
48.00	8.66	6.13	0.00
49.00	8.66	6.13	0.00
50.00	8.66	6.13	0.00
51.00	8.66	6.13	0.00

2023-08-09 Existing Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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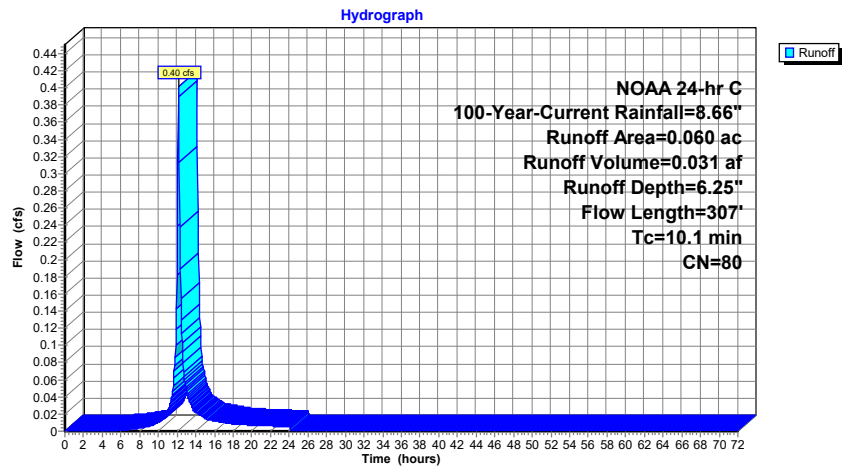
Summary for Subcatchment 53S: DA Offsite East (Perv)

Runoff = 0.40 cfs @ 12.17 hrs, Volume= 0.031 af, Depth= 6.25"
Routed to Link 50L : DA East Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.050	80	>75% Grass cover, Good, HSG D
0.010	77	Woods, Good, HSG D
0.060	80	Weighted Average
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	78	0.0350	0.14		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34"
0.4	88	0.0418	3.29		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
0.5	141	0.0780	4.50		Shallow Concentrated Flow, Shallow Conc Flow 2 Unpaved Kv= 16.1 fps
10.1	307	Total			

Subcatchment 53S: DA Offsite East (Perv)**2023-08-09 Existing Hydrology**

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 53S: DA Offsite East (Perv)

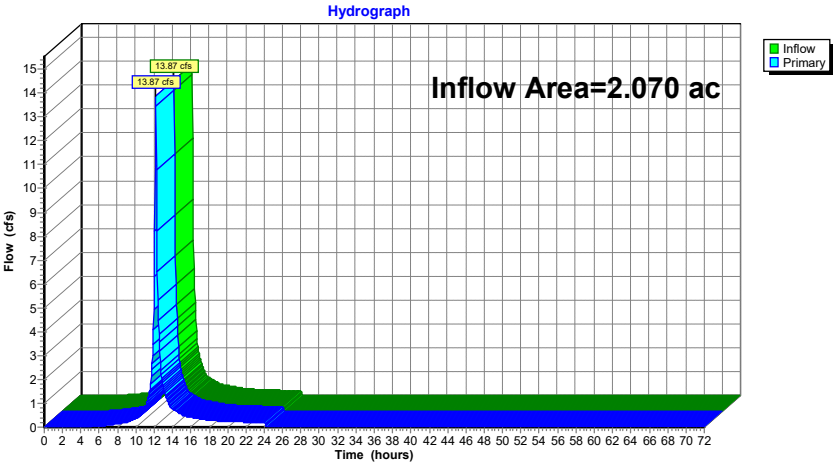
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.09	0.00	0.00
2.00	0.20	0.00	0.00
3.00	0.31	0.00	0.00
4.00	0.42	0.00	0.00
5.00	0.55	0.00	0.00
6.00	0.69	0.01	0.00
7.00	0.84	0.04	0.00
8.00	1.04	0.10	0.00
9.00	1.26	0.18	0.01
10.00	1.58	0.33	0.01
11.00	2.08	0.61	0.02
12.00	4.13	2.15	0.18
13.00	6.58	4.31	0.05
14.00	7.08	4.77	0.02
15.00	7.40	5.06	0.02
16.00	7.62	5.27	0.01
17.00	7.82	5.45	0.01
18.00	7.97	5.60	0.01
19.00	8.11	5.73	0.01
20.00	8.24	5.85	0.01
21.00	8.35	5.96	0.01
22.00	8.46	6.06	0.01
23.00	8.57	6.16	0.01
24.00	8.66	6.25	0.01
25.00	8.66	6.25	0.00
26.00	8.66	6.25	0.00
27.00	8.66	6.25	0.00
28.00	8.66	6.25	0.00
29.00	8.66	6.25	0.00
30.00	8.66	6.25	0.00
31.00	8.66	6.25	0.00
32.00	8.66	6.25	0.00
33.00	8.66	6.25	0.00
34.00	8.66	6.25	0.00
35.00	8.66	6.25	0.00
36.00	8.66	6.25	0.00
37.00	8.66	6.25	0.00
38.00	8.66	6.25	0.00
39.00	8.66	6.25	0.00
40.00	8.66	6.25	0.00
41.00	8.66	6.25	0.00
42.00	8.66	6.25	0.00
43.00	8.66	6.25	0.00
44.00	8.66	6.25	0.00
45.00	8.66	6.25	0.00
46.00	8.66	6.25	0.00
47.00	8.66	6.25	0.00
48.00	8.66	6.25	0.00
49.00	8.66	6.25	0.00
50.00	8.66	6.25	0.00
51.00	8.66	6.25	0.00

Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 7.73% Impervious, Inflow Depth = 6.31" for 100-Year-Current event
Inflow = 13.87 cfs @ 12.17 hrs, Volume= 1.088 af
Primary = 13.87 cfs @ 12.17 hrs, Volume= 1.088 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 52P

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

Link 50L: DA East Total



Hydrograph for Link 50L: DA East Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.01	0.00	0.01	54.00	0.00	0.00	0.00
3.00	0.01	0.00	0.01	55.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02	56.00	0.00	0.00	0.00
5.00	0.02	0.00	0.02	57.00	0.00	0.00	0.00
6.00	0.05	0.00	0.05	58.00	0.00	0.00	0.00
7.00	0.09	0.00	0.09	59.00	0.00	0.00	0.00
8.00	0.14	0.00	0.14	60.00	0.00	0.00	0.00
9.00	0.21	0.00	0.21	61.00	0.00	0.00	0.00
10.00	0.38	0.00	0.38	62.00	0.00	0.00	0.00
11.00	0.81	0.00	0.81	63.00	0.00	0.00	0.00
12.00	6.31	0.00	6.31	64.00	0.00	0.00	0.00
13.00	1.67	0.00	1.67	65.00	0.00	0.00	0.00
14.00	0.77	0.00	0.77	66.00	0.00	0.00	0.00
15.00	0.52	0.00	0.52	67.00	0.00	0.00	0.00
16.00	0.42	0.00	0.42	68.00	0.00	0.00	0.00
17.00	0.35	0.00	0.35	69.00	0.00	0.00	0.00
18.00	0.29	0.00	0.29	70.00	0.00	0.00	0.00
19.00	0.26	0.00	0.26	71.00	0.00	0.00	0.00
20.00	0.24	0.00	0.24	72.00	0.00	0.00	0.00
21.00	0.23	0.00	0.23				
22.00	0.21	0.00	0.21				
23.00	0.19	0.00	0.19				
24.00	0.19	0.00	0.19				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

2023-08-09 Existing Hydrology

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- 33 Link 50L: DA East Total

2023-08-09 Proposed Hydrology

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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C



Rainfall Events Listing (selected events)								
Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year-Current	NOAA 24-hr	C	Default	24.00	1	3.34	2
2	10-Year-Current	NOAA 24-hr	C	Default	24.00	1	5.11	2
3	100-Year-Current	NOAA 24-hr	C	Default	24.00	1	8.66	2

Area Listing (all nodes)		
Area (acres)	CN	Description (subcatchment-numbers)
1.310	80	>75% Grass cover, Good, HSG D (9S, 52S, 53S)
0.130	98	Roofs, HSG D (54S)
0.630	98	Unconnected pavement, HSG D (51S, 54S, 55S)
2.070	87	TOTAL AREA

Soil Listing (all nodes)		
Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
2.070	HSG D	9S, 51S, 52S, 53S, 54S, 55S
0.000	Other	
2.070		TOTAL AREA

Ground Covers (all nodes)								
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover		Subcatchment Numbers
0.000	0.000	0.000	1.310	0.000	1.310	>75% Grass cover, Good		9S, 52S, 53S
0.000	0.000	0.000	0.130	0.000	0.130	Roofs		54S
0.000	0.000	0.000	0.630	0.000	0.630	Unconnected pavement		51S, 54S, 55S
0.000	0.000	0.000	2.070	0.000	2.070	TOTAL AREA		

Pipe Listing (all nodes)									
Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	51P	126.42	126.09	12.0	0.0275	0.013	0.0	15.0	0.0

Notes Listing (all nodes)		
Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C
2		Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

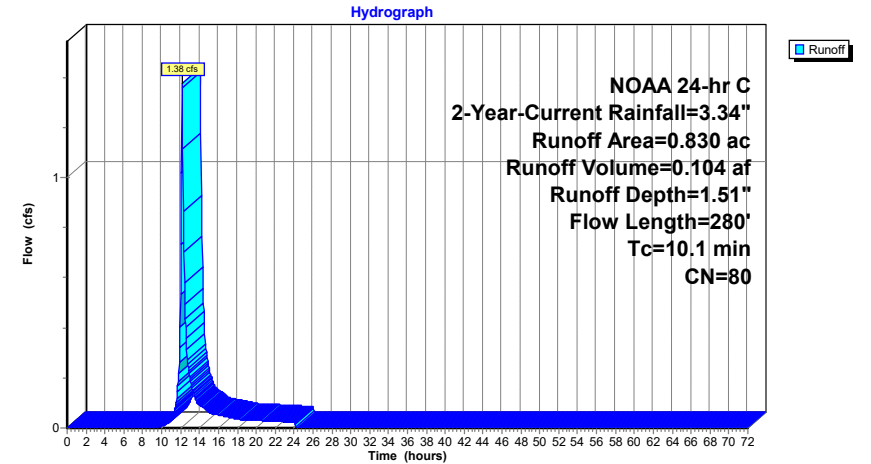
Subcatchment 9S: DA Bioretention Basin	Runoff Area=0.830 ac 0.00% Impervious	Runoff Depth=1.51"	Flow Length=280' Tc=10.1 min CN=80	Runoff=1.38 cfs 0.104 af
Subcatchment 51S: DA East Undetained	Runoff Area=0.020 ac 100.00% Impervious	Runoff Depth=3.11"	Tc=10.0 min CN=98	Runoff=0.06 cfs 0.005 af
Subcatchment 52S: DA Offsite East	Runoff Area=0.040 ac 0.00% Impervious	Runoff Depth=1.51"	Tc=9.7 min CN=80	Runoff=0.07 cfs 0.005 af
Subcatchment 53S: DA East Undetained	Runoff Area=0.440 ac 0.00% Impervious	Runoff Depth=1.51"	Tc=10.0 min CN=80	Runoff=0.73 cfs 0.055 af
Subcatchment 54S: DA Bioretention	Runoff Area=0.720 ac 100.00% Impervious	Runoff Depth=3.11"	Flow Length=280' Tc=10.1 min CN=98	Runoff=2.17 cfs 0.186 af
Subcatchment 55S: DA Offsite East	Runoff Area=0.020 ac 100.00% Impervious	Runoff Depth=3.11"	Tc=10.0 min CN=98	Runoff=0.06 cfs 0.005 af
Pond 51P: Bioretention Basin	Peak Elev=130.84' Storage=6,073 cf	Inflow=3.55 cfs 0.291 af	Outflow=1.09 cfs 0.216 af	
Link 50L: DA East Total		Inflow=1.69 cfs 0.287 af	Primary=1.69 cfs 0.287 af	
Link 51L: DA East Undetained		Inflow=0.92 cfs 0.071 af	Primary=0.92 cfs 0.071 af	

Total Runoff Area = 2.070 ac Runoff Volume = 0.362 af Average Runoff Depth = 2.10"
63.29% Pervious = 1.310 ac 36.71% Impervious = 0.760 ac

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

Runoff	=	1.38 cfs @ 12.18 hrs,	Volume=	0.104 af,	Depth=	1.51"
Routed to Pond 51P : Bioretention Basin						
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs NOAA 24-hr C 2-Year-Current Rainfall=3.34"						
Area (ac)	CN	Description				
0.830	80	>75% Grass cover, Good, HSG D				
0.830		100.00% Pervious Area				
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass	
					Grass: Dense n= 0.240 P2= 3.34"	
					Using McCuen-Spiess flow length	
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass	
					Unpaved Kv= 16.1 fps	
10.1	280	Total				

Subcatchment 9S: DA Bioretention Basin (Perv)



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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	1.51	0.00
1.00	0.04	0.00	0.00	53.00	3.34	1.51	0.00
2.00	0.08	0.00	0.00	54.00	3.34	1.51	0.00
3.00	0.12	0.00	0.00	55.00	3.34	1.51	0.00
4.00	0.16	0.00	0.00	56.00	3.34	1.51	0.00
5.00	0.21	0.00	0.00	57.00	3.34	1.51	0.00
6.00	0.26	0.00	0.00	58.00	3.34	1.51	0.00
7.00	0.33	0.00	0.00	59.00	3.34	1.51	0.00
8.00	0.40	0.00	0.00	60.00	3.34	1.51	0.00
9.00	0.49	0.00	0.00	61.00	3.34	1.51	0.00
10.00	0.61	0.00	0.01	62.00	3.34	1.51	0.00
11.00	0.80	0.03	0.04	63.00	3.34	1.51	0.00
12.00	1.59	0.33	0.54	64.00	3.34	1.51	0.00
13.00	2.54	0.92	0.20	65.00	3.34	1.51	0.00
14.00	2.73	1.05	0.09	66.00	3.34	1.51	0.00
15.00	2.85	1.14	0.06	67.00	3.34	1.51	0.00
16.00	2.94	1.21	0.05	68.00	3.34	1.51	0.00
17.00	3.01	1.26	0.04	69.00	3.34	1.51	0.00
18.00	3.08	1.31	0.04	70.00	3.34	1.51	0.00
19.00	3.13	1.35	0.03	71.00	3.34	1.51	0.00
20.00	3.18	1.38	0.03	72.00	3.34	1.51	0.00
21.00	3.22	1.42	0.03				
22.00	3.26	1.45	0.03				
23.00	3.30	1.48	0.02				
24.00	3.34	1.51	0.02				
25.00	3.34	1.51	0.00				
26.00	3.34	1.51	0.00				
27.00	3.34	1.51	0.00				
28.00	3.34	1.51	0.00				
29.00	3.34	1.51	0.00				
30.00	3.34	1.51	0.00				
31.00	3.34	1.51	0.00				
32.00	3.34	1.51	0.00				
33.00	3.34	1.51	0.00				
34.00	3.34	1.51	0.00				
35.00	3.34	1.51	0.00				
36.00	3.34	1.51	0.00				
37.00	3.34	1.51	0.00				
38.00	3.34	1.51	0.00				
39.00	3.34	1.51	0.00				
40.00	3.34	1.51	0.00				
41.00	3.34	1.51	0.00				
42.00	3.34	1.51	0.00				
43.00	3.34	1.51	0.00				
44.00	3.34	1.51	0.00				
45.00	3.34	1.51	0.00				
46.00	3.34	1.51	0.00				
47.00	3.34	1.51	0.00				
48.00	3.34	1.51	0.00				
49.00	3.34	1.51	0.00				
50.00	3.34	1.51	0.00				
51.00	3.34	1.51	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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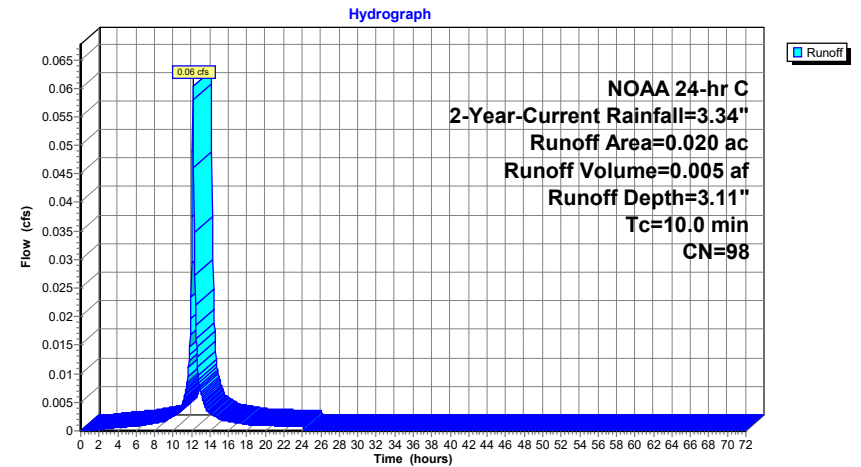
Summary for Subcatchment 51S: DA East Undetained (Imp)

Runoff = 0.06 cfs @ 12.17 hrs, Volume= 0.005 af, Depth= 3.11"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 51S: DA East Undetained (Imp)

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 51S: DA East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	3.11	0.00
1.00	0.04	0.00	0.00	53.00	3.34	3.11	0.00
2.00	0.08	0.01	0.00	54.00	3.34	3.11	0.00
3.00	0.12	0.02	0.00	55.00	3.34	3.11	0.00
4.00	0.16	0.05	0.00	56.00	3.34	3.11	0.00
5.00	0.21	0.08	0.00	57.00	3.34	3.11	0.00
6.00	0.26	0.12	0.00	58.00	3.34	3.11	0.00
7.00	0.33	0.17	0.00	59.00	3.34	3.11	0.00
8.00	0.40	0.23	0.00	60.00	3.34	3.11	0.00
9.00	0.49	0.31	0.00	61.00	3.34	3.11	0.00
10.00	0.61	0.42	0.00	62.00	3.34	3.11	0.00
11.00	0.80	0.60	0.00	63.00	3.34	3.11	0.00
12.00	1.59	1.37	0.03	64.00	3.34	3.11	0.00
13.00	2.54	2.31	0.01	65.00	3.34	3.11	0.00
14.00	2.73	2.50	0.00	66.00	3.34	3.11	0.00
15.00	2.85	2.62	0.00	67.00	3.34	3.11	0.00
16.00	2.94	2.71	0.00	68.00	3.34	3.11	0.00
17.00	3.01	2.78	0.00	69.00	3.34	3.11	0.00
18.00	3.08	2.84	0.00	70.00	3.34	3.11	0.00
19.00	3.13	2.90	0.00	71.00	3.34	3.11	0.00
20.00	3.18	2.94	0.00	72.00	3.34	3.11	0.00
21.00	3.22	2.99	0.00				
22.00	3.26	3.03	0.00				
23.00	3.30	3.07	0.00				
24.00	3.34	3.11	0.00				
25.00	3.34	3.11	0.00				
26.00	3.34	3.11	0.00				
27.00	3.34	3.11	0.00				
28.00	3.34	3.11	0.00				
29.00	3.34	3.11	0.00				
30.00	3.34	3.11	0.00				
31.00	3.34	3.11	0.00				
32.00	3.34	3.11	0.00				
33.00	3.34	3.11	0.00				
34.00	3.34	3.11	0.00				
35.00	3.34	3.11	0.00				
36.00	3.34	3.11	0.00				
37.00	3.34	3.11	0.00				
38.00	3.34	3.11	0.00				
39.00	3.34	3.11	0.00				
40.00	3.34	3.11	0.00				
41.00	3.34	3.11	0.00				
42.00	3.34	3.11	0.00				
43.00	3.34	3.11	0.00				
44.00	3.34	3.11	0.00				
45.00	3.34	3.11	0.00				
46.00	3.34	3.11	0.00				
47.00	3.34	3.11	0.00				
48.00	3.34	3.11	0.00				
49.00	3.34	3.11	0.00				
50.00	3.34	3.11	0.00				
51.00	3.34	3.11	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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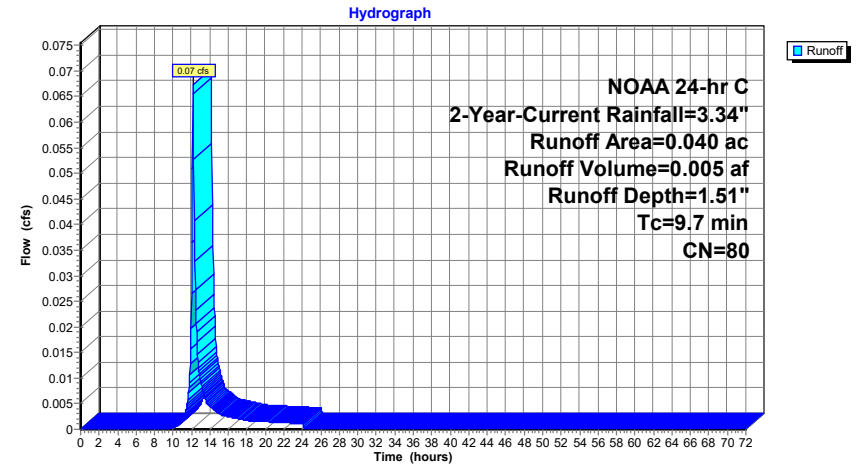
Summary for Subcatchment 52S: DA Offsite East Undetained (Perv)

Runoff = 0.07 cfs @ 12.17 hrs, Volume= 0.005 af, Depth= 1.51"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.040	80	>75% Grass cover, Good, HSG D
0.040		100.00% Pervious Area

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

Subcatchment 52S: DA Offsite East Undetained (Perv)

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 52S: DA Offsite East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	1.51	0.00
1.00	0.04	0.00	0.00	53.00	3.34	1.51	0.00
2.00	0.08	0.00	0.00	54.00	3.34	1.51	0.00
3.00	0.12	0.00	0.00	55.00	3.34	1.51	0.00
4.00	0.16	0.00	0.00	56.00	3.34	1.51	0.00
5.00	0.21	0.00	0.00	57.00	3.34	1.51	0.00
6.00	0.26	0.00	0.00	58.00	3.34	1.51	0.00
7.00	0.33	0.00	0.00	59.00	3.34	1.51	0.00
8.00	0.40	0.00	0.00	60.00	3.34	1.51	0.00
9.00	0.49	0.00	0.00	61.00	3.34	1.51	0.00
10.00	0.61	0.00	0.00	62.00	3.34	1.51	0.00
11.00	0.80	0.03	0.00	63.00	3.34	1.51	0.00
12.00	1.59	0.33	0.03	64.00	3.34	1.51	0.00
13.00	2.54	0.92	0.01	65.00	3.34	1.51	0.00
14.00	2.73	1.05	0.00	66.00	3.34	1.51	0.00
15.00	2.85	1.14	0.00	67.00	3.34	1.51	0.00
16.00	2.94	1.21	0.00	68.00	3.34	1.51	0.00
17.00	3.01	1.26	0.00	69.00	3.34	1.51	0.00
18.00	3.08	1.31	0.00	70.00	3.34	1.51	0.00
19.00	3.13	1.35	0.00	71.00	3.34	1.51	0.00
20.00	3.18	1.38	0.00	72.00	3.34	1.51	0.00
21.00	3.22	1.42	0.00				
22.00	3.26	1.45	0.00				
23.00	3.30	1.48	0.00				
24.00	3.34	1.51	0.00				
25.00	3.34	1.51	0.00				
26.00	3.34	1.51	0.00				
27.00	3.34	1.51	0.00				
28.00	3.34	1.51	0.00				
29.00	3.34	1.51	0.00				
30.00	3.34	1.51	0.00				
31.00	3.34	1.51	0.00				
32.00	3.34	1.51	0.00				
33.00	3.34	1.51	0.00				
34.00	3.34	1.51	0.00				
35.00	3.34	1.51	0.00				
36.00	3.34	1.51	0.00				
37.00	3.34	1.51	0.00				
38.00	3.34	1.51	0.00				
39.00	3.34	1.51	0.00				
40.00	3.34	1.51	0.00				
41.00	3.34	1.51	0.00				
42.00	3.34	1.51	0.00				
43.00	3.34	1.51	0.00				
44.00	3.34	1.51	0.00				
45.00	3.34	1.51	0.00				
46.00	3.34	1.51	0.00				
47.00	3.34	1.51	0.00				
48.00	3.34	1.51	0.00				
49.00	3.34	1.51	0.00				
50.00	3.34	1.51	0.00				
51.00	3.34	1.51	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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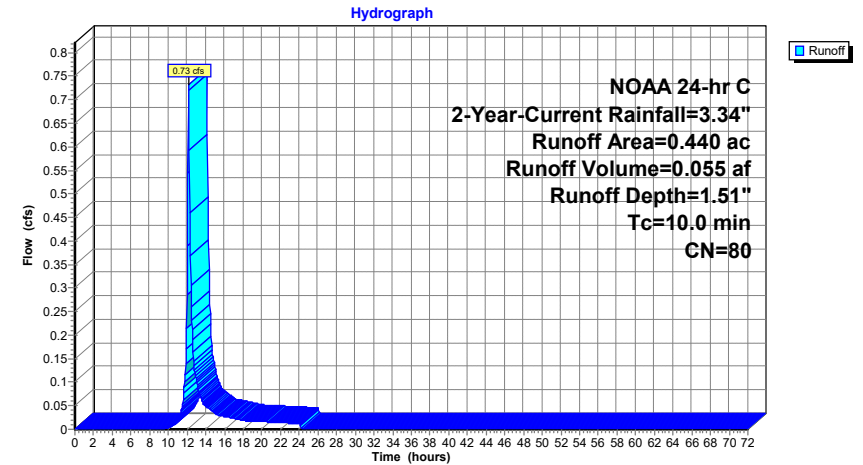
Summary for Subcatchment 53S: DA East Undetained (Perv)

Runoff = 0.73 cfs @ 12.18 hrs, Volume= 0.055 af, Depth= 1.51"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.440	80	>75% Grass cover, Good, HSG D
0.440		100.00% Pervious Area

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

Subcatchment 53S: DA East Undetained (Perv)

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 53S: DA East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	1.51	0.00
1.00	0.04	0.00	0.00	53.00	3.34	1.51	0.00
2.00	0.08	0.00	0.00	54.00	3.34	1.51	0.00
3.00	0.12	0.00	0.00	55.00	3.34	1.51	0.00
4.00	0.16	0.00	0.00	56.00	3.34	1.51	0.00
5.00	0.21	0.00	0.00	57.00	3.34	1.51	0.00
6.00	0.26	0.00	0.00	58.00	3.34	1.51	0.00
7.00	0.33	0.00	0.00	59.00	3.34	1.51	0.00
8.00	0.40	0.00	0.00	60.00	3.34	1.51	0.00
9.00	0.49	0.00	0.00	61.00	3.34	1.51	0.00
10.00	0.61	0.00	0.00	62.00	3.34	1.51	0.00
11.00	0.80	0.03	0.02	63.00	3.34	1.51	0.00
12.00	1.59	0.33	0.29	64.00	3.34	1.51	0.00
13.00	2.54	0.92	0.10	65.00	3.34	1.51	0.00
14.00	2.73	1.05	0.05	66.00	3.34	1.51	0.00
15.00	2.85	1.14	0.03	67.00	3.34	1.51	0.00
16.00	2.94	1.21	0.03	68.00	3.34	1.51	0.00
17.00	3.01	1.26	0.02	69.00	3.34	1.51	0.00
18.00	3.08	1.31	0.02	70.00	3.34	1.51	0.00
19.00	3.13	1.35	0.02	71.00	3.34	1.51	0.00
20.00	3.18	1.38	0.02	72.00	3.34	1.51	0.00
21.00	3.22	1.42	0.02				
22.00	3.26	1.45	0.01				
23.00	3.30	1.48	0.01				
24.00	3.34	1.51	0.01				
25.00	3.34	1.51	0.00				
26.00	3.34	1.51	0.00				
27.00	3.34	1.51	0.00				
28.00	3.34	1.51	0.00				
29.00	3.34	1.51	0.00				
30.00	3.34	1.51	0.00				
31.00	3.34	1.51	0.00				
32.00	3.34	1.51	0.00				
33.00	3.34	1.51	0.00				
34.00	3.34	1.51	0.00				
35.00	3.34	1.51	0.00				
36.00	3.34	1.51	0.00				
37.00	3.34	1.51	0.00				
38.00	3.34	1.51	0.00				
39.00	3.34	1.51	0.00				
40.00	3.34	1.51	0.00				
41.00	3.34	1.51	0.00				
42.00	3.34	1.51	0.00				
43.00	3.34	1.51	0.00				
44.00	3.34	1.51	0.00				
45.00	3.34	1.51	0.00				
46.00	3.34	1.51	0.00				
47.00	3.34	1.51	0.00				
48.00	3.34	1.51	0.00				
49.00	3.34	1.51	0.00				
50.00	3.34	1.51	0.00				
51.00	3.34	1.51	0.00				

2023-08-09 Proposed Hydrology

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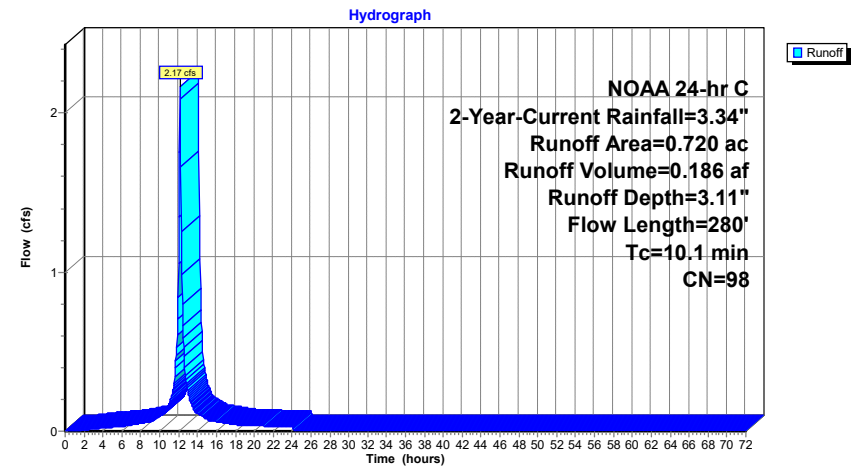
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 2.17 cfs @ 12.17 hrs, Volume= 0.186 af, Depth= 3.11"
 Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	3.11	0.00
1.00	0.04	0.00	0.00	53.00	3.34	3.11	0.00
2.00	0.08	0.01	0.01	54.00	3.34	3.11	0.00
3.00	0.12	0.02	0.01	55.00	3.34	3.11	0.00
4.00	0.16	0.05	0.02	56.00	3.34	3.11	0.00
5.00	0.21	0.08	0.03	57.00	3.34	3.11	0.00
6.00	0.26	0.12	0.03	58.00	3.34	3.11	0.00
7.00	0.33	0.17	0.04	59.00	3.34	3.11	0.00
8.00	0.40	0.23	0.05	60.00	3.34	3.11	0.00
9.00	0.49	0.31	0.06	61.00	3.34	3.11	0.00
10.00	0.61	0.42	0.09	62.00	3.34	3.11	0.00
11.00	0.80	0.60	0.17	63.00	3.34	3.11	0.00
12.00	1.59	1.37	1.05	64.00	3.34	3.11	0.00
13.00	2.54	2.31	0.24	65.00	3.34	3.11	0.00
14.00	2.73	2.50	0.11	66.00	3.34	3.11	0.00
15.00	2.85	2.62	0.08	67.00	3.34	3.11	0.00
16.00	2.94	2.71	0.06	68.00	3.34	3.11	0.00
17.00	3.01	2.78	0.05	69.00	3.34	3.11	0.00
18.00	3.08	2.84	0.04	70.00	3.34	3.11	0.00
19.00	3.13	2.90	0.04	71.00	3.34	3.11	0.00
20.00	3.18	2.94	0.03	72.00	3.34	3.11	0.00
21.00	3.22	2.99	0.03				
22.00	3.26	3.03	0.03				
23.00	3.30	3.07	0.03				
24.00	3.34	3.11	0.03				
25.00	3.34	3.11	0.00				
26.00	3.34	3.11	0.00				
27.00	3.34	3.11	0.00				
28.00	3.34	3.11	0.00				
29.00	3.34	3.11	0.00				
30.00	3.34	3.11	0.00				
31.00	3.34	3.11	0.00				
32.00	3.34	3.11	0.00				
33.00	3.34	3.11	0.00				
34.00	3.34	3.11	0.00				
35.00	3.34	3.11	0.00				
36.00	3.34	3.11	0.00				
37.00	3.34	3.11	0.00				
38.00	3.34	3.11	0.00				
39.00	3.34	3.11	0.00				
40.00	3.34	3.11	0.00				
41.00	3.34	3.11	0.00				
42.00	3.34	3.11	0.00				
43.00	3.34	3.11	0.00				
44.00	3.34	3.11	0.00				
45.00	3.34	3.11	0.00				
46.00	3.34	3.11	0.00				
47.00	3.34	3.11	0.00				
48.00	3.34	3.11	0.00				
49.00	3.34	3.11	0.00				
50.00	3.34	3.11	0.00				
51.00	3.34	3.11	0.00				

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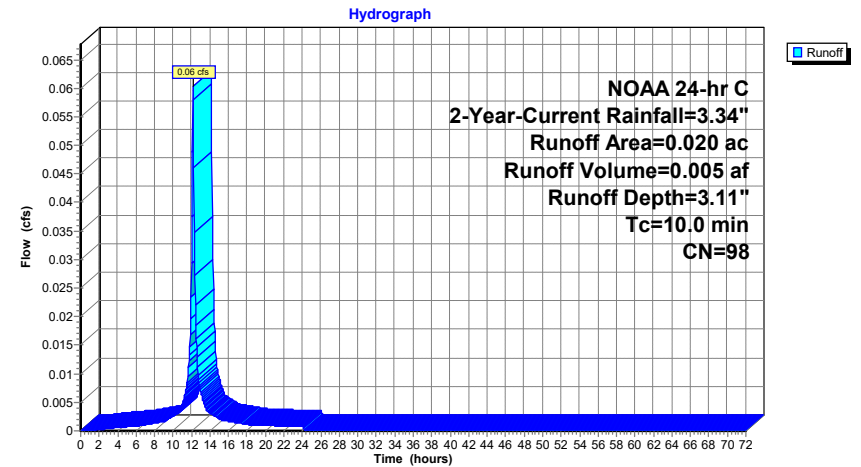
Summary for Subcatchment 55S: DA Offsite East Undetained (Imp)

Runoff = 0.06 cfs @ 12.17 hrs, Volume= 0.005 af, Depth= 3.11"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 55S: DA Offsite East Undetained (Imp)

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Hydrograph for Subcatchment 55S: DA Offsite East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	3.11	0.00
1.00	0.04	0.00	0.00	53.00	3.34	3.11	0.00
2.00	0.08	0.01	0.00	54.00	3.34	3.11	0.00
3.00	0.12	0.02	0.00	55.00	3.34	3.11	0.00
4.00	0.16	0.05	0.00	56.00	3.34	3.11	0.00
5.00	0.21	0.08	0.00	57.00	3.34	3.11	0.00
6.00	0.26	0.12	0.00	58.00	3.34	3.11	0.00
7.00	0.33	0.17	0.00	59.00	3.34	3.11	0.00
8.00	0.40	0.23	0.00	60.00	3.34	3.11	0.00
9.00	0.49	0.31	0.00	61.00	3.34	3.11	0.00
10.00	0.61	0.42	0.00	62.00	3.34	3.11	0.00
11.00	0.80	0.60	0.00	63.00	3.34	3.11	0.00
12.00	1.59	1.37	0.03	64.00	3.34	3.11	0.00
13.00	2.54	2.31	0.01	65.00	3.34	3.11	0.00
14.00	2.73	2.50	0.00	66.00	3.34	3.11	0.00
15.00	2.85	2.62	0.00	67.00	3.34	3.11	0.00
16.00	2.94	2.71	0.00	68.00	3.34	3.11	0.00
17.00	3.01	2.78	0.00	69.00	3.34	3.11	0.00
18.00	3.08	2.84	0.00	70.00	3.34	3.11	0.00
19.00	3.13	2.90	0.00	71.00	3.34	3.11	0.00
20.00	3.18	2.94	0.00	72.00	3.34	3.11	0.00
21.00	3.22	2.99	0.00				
22.00	3.26	3.03	0.00				
23.00	3.30	3.07	0.00				
24.00	3.34	3.11	0.00				
25.00	3.34	3.11	0.00				
26.00	3.34	3.11	0.00				
27.00	3.34	3.11	0.00				
28.00	3.34	3.11	0.00				
29.00	3.34	3.11	0.00				
30.00	3.34	3.11	0.00				
31.00	3.34	3.11	0.00				
32.00	3.34	3.11	0.00				
33.00	3.34	3.11	0.00				
34.00	3.34	3.11	0.00				
35.00	3.34	3.11	0.00				
36.00	3.34	3.11	0.00				
37.00	3.34	3.11	0.00				
38.00	3.34	3.11	0.00				
39.00	3.34	3.11	0.00				
40.00	3.34	3.11	0.00				
41.00	3.34	3.11	0.00				
42.00	3.34	3.11	0.00				
43.00	3.34	3.11	0.00				
44.00	3.34	3.11	0.00				
45.00	3.34	3.11	0.00				
46.00	3.34	3.11	0.00				
47.00	3.34	3.11	0.00				
48.00	3.34	3.11	0.00				
49.00	3.34	3.11	0.00				
50.00	3.34	3.11	0.00				
51.00	3.34	3.11	0.00				

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Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 2.25" for 2-Year-Current event
 Inflow = 3.55 cfs @ 12.17 hrs, Volume= 0.291 af
 Outflow = 1.09 cfs @ 12.48 hrs, Volume= 0.216 af, Atten= 69%, Lag= 18.1 min
 Primary = 1.09 cfs @ 12.48 hrs, Volume= 0.216 af
 Routed to Link 50L : DA East Total

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 130.84' @ 12.48 hrs Surf.Area= 3,384 sf Storage= 6,073 cf

Plug-Flow detention time= 215.9 min calculated for 0.216 af (74% of inflow)
 Center-of-Mass det. time= 123.1 min (914.9 - 791.8)

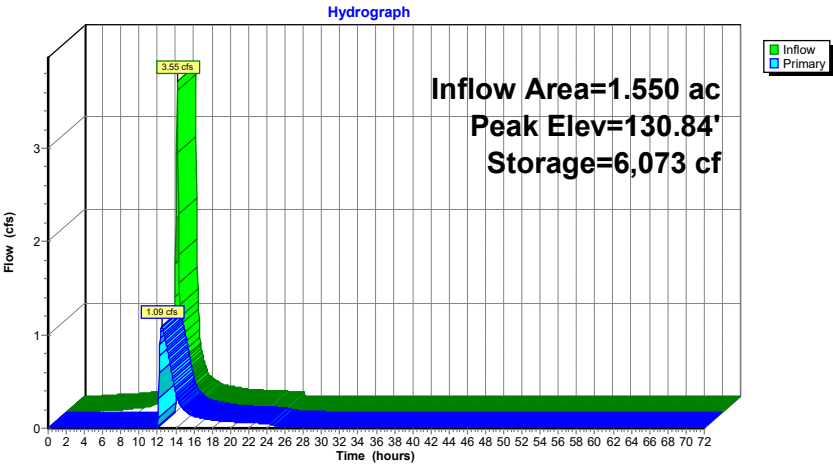
Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

Device	Routing	Invert	Outlet Devices
#1	Primary	126.42'	15.0" Round RCP_Round 15" L= 12.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 126.42' / 126.09' S= 0.0275 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	130.00'	5.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	130.75'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	131.50'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

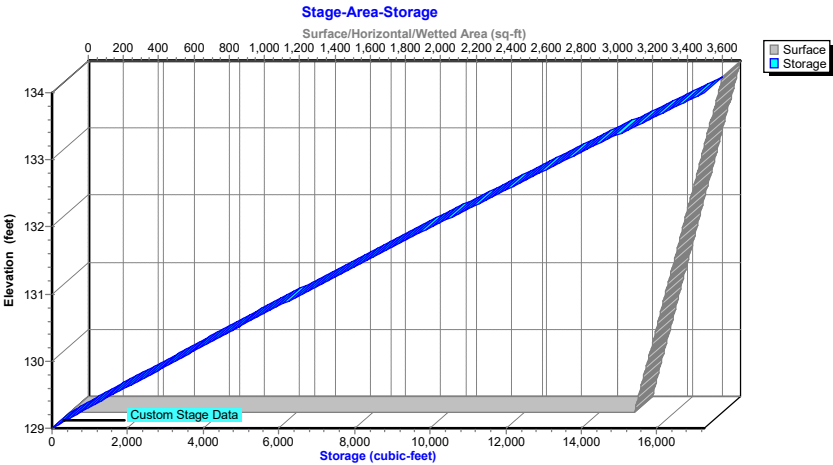
Primary OutFlow Max=1.09 cfs @ 12.48 hrs HW=130.84' (Free Discharge)

- 1=RCP_Round 15" (Passes 1.09 cfs of 14.40 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.05 cfs @ 3.84 fps)
- 3=Orifice/Grate (Orifice Controls 0.04 cfs @ 1.04 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

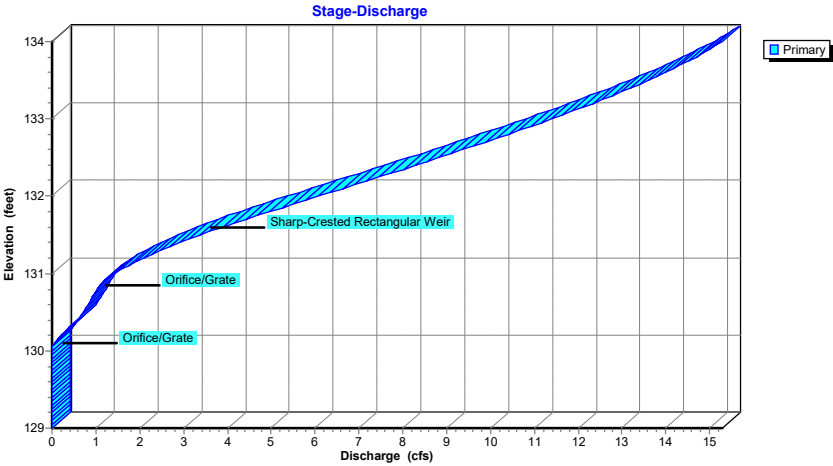
Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	129.00	0.00
2.50	0.01	25	129.01	0.00
5.00	0.03	191	129.06	0.00
7.50	0.04	487	129.15	0.00
10.00	0.10	1,048	129.33	0.00
12.50	1.02	6,070	130.84	1.09
15.00	0.14	3,896	130.20	0.19
17.50	0.09	3,699	130.14	0.10
20.00	0.07	3,621	130.11	0.07
22.50	0.05	3,589	130.10	0.06
25.00	0.00	3,460	130.06	0.03
27.50	0.00	3,344	130.03	0.01
30.00	0.00	3,293	130.01	0.00
32.50	0.00	3,270	130.01	0.00
35.00	0.00	3,259	130.00	0.00
37.50	0.00	3,254	130.00	0.00
40.00	0.00	3,252	130.00	0.00
42.50	0.00	3,251	130.00	0.00
45.00	0.00	3,250	130.00	0.00
47.50	0.00	3,250	130.00	0.00
50.00	0.00	3,250	130.00	0.00
52.50	0.00	3,250	130.00	0.00
55.00	0.00	3,250	130.00	0.00
57.50	0.00	3,250	130.00	0.00
60.00	0.00	3,250	130.00	0.00
62.50	0.00	3,250	130.00	0.00
65.00	0.00	3,250	130.00	0.00
67.50	0.00	3,250	130.00	0.00
70.00	0.00	3,250	130.00	0.00

2023-08-09 Proposed Hydrology

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	3.88
129.05	0.00	131.65	4.17
129.10	0.00	131.70	4.44
129.15	0.00	131.75	4.69
129.20	0.00	131.80	4.97
129.25	0.00	131.85	5.24
129.30	0.00	131.90	5.52
129.35	0.00	131.95	5.80
129.40	0.00	132.00	6.07
129.45	0.00	132.05	6.35
129.50	0.00	132.10	6.63
129.55	0.00	132.15	6.91
129.60	0.00	132.20	7.19
129.65	0.00	132.25	7.46
129.70	0.00	132.30	7.74
129.75	0.00	132.35	8.01
129.80	0.00	132.40	8.29
129.85	0.00	132.45	8.56
129.90	0.00	132.50	8.83
129.95	0.00	132.55	9.10
130.00	0.00	132.60	9.37
130.05	0.01	132.65	9.63
130.10	0.05	132.70	9.89
130.15	0.12	132.75	10.15
130.20	0.20	132.80	10.41
130.25	0.29	132.85	10.66
130.30	0.39	132.90	10.91
130.35	0.49	132.95	11.16
130.40	0.58	133.00	11.40
130.45	0.65	133.05	11.64
130.50	0.71	133.10	11.88
130.55	0.77	133.15	12.11
130.60	0.82	133.20	12.34
130.65	0.87	133.25	12.56
130.70	0.92	133.30	12.78
130.75	0.97	133.35	12.99
130.80	1.02	133.40	13.20
130.85	1.10	133.45	13.40
130.90	1.19	133.50	13.60
130.95	1.30	133.55	13.80
131.00	1.43	133.60	13.99
131.05	1.57	133.65	14.17
131.10	1.73	133.70	14.35
131.15	1.91	133.75	14.52
131.20	2.09	133.80	14.69
131.25	2.29	133.85	14.85
131.30	2.49	133.90	15.00
131.35	2.70	133.95	15.15
131.40	2.92	134.00	15.29
131.45	3.14		
131.50	3.36		
131.55	3.61		

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Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

2023-08-09 Proposed Hydrology

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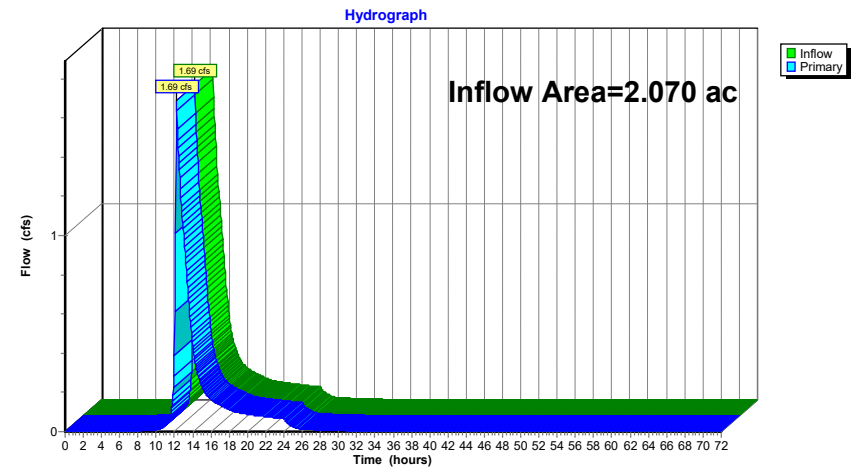
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Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 36.71% Impervious, Inflow Depth = 1.66" for 2-Year-Current event
Inflow = 1.69 cfs @ 12.22 hrs, Volume= 0.287 af
Primary = 1.69 cfs @ 12.22 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min

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

Link 50L: DA East Total

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Link 50L: DA East Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	62.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	63.00	0.00	0.00	0.00
12.00	0.39	0.00	0.39	64.00	0.00	0.00	0.00
13.00	1.01	0.00	1.01	65.00	0.00	0.00	0.00
14.00	0.44	0.00	0.44	66.00	0.00	0.00	0.00
15.00	0.23	0.00	0.23	67.00	0.00	0.00	0.00
16.00	0.16	0.00	0.16	68.00	0.00	0.00	0.00
17.00	0.14	0.00	0.14	69.00	0.00	0.00	0.00
18.00	0.11	0.00	0.11	70.00	0.00	0.00	0.00
19.00	0.10	0.00	0.10	71.00	0.00	0.00	0.00
20.00	0.09	0.00	0.09	72.00	0.00	0.00	0.00
21.00	0.08	0.00	0.08				
22.00	0.08	0.00	0.08				
23.00	0.07	0.00	0.07				
24.00	0.07	0.00	0.07				
25.00	0.03	0.00	0.03				
26.00	0.01	0.00	0.01				
27.00	0.01	0.00	0.01				
28.00	0.01	0.00	0.01				
29.00	0.01	0.00	0.01				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Summary for Link 51L: DA East Undetained

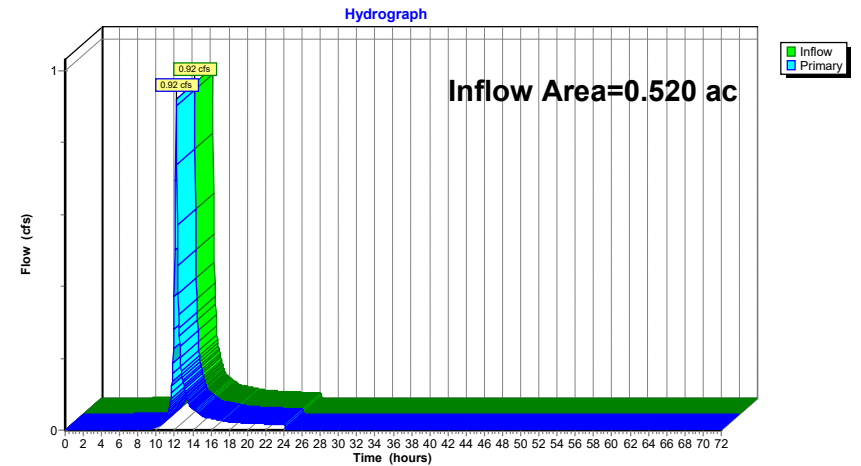
Inflow Area = 0.520 ac, 7.69% Impervious, Inflow Depth = 1.63" for 2-Year-Current event

Inflow = 0.92 cfs @ 12.18 hrs, Volume= 0.071 af

Primary = 0.92 cfs @ 12.18 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Routed to Link 50L : DA East Total

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

Link 51L: DA East Undetained

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Hydrograph for Link 51L: DA East Undetained

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	62.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	63.00	0.00	0.00	0.00
12.00	0.37	0.00	0.37	64.00	0.00	0.00	0.00
13.00	0.13	0.00	0.13	65.00	0.00	0.00	0.00
14.00	0.06	0.00	0.06	66.00	0.00	0.00	0.00
15.00	0.04	0.00	0.04	67.00	0.00	0.00	0.00
16.00	0.03	0.00	0.03	68.00	0.00	0.00	0.00
17.00	0.03	0.00	0.03	69.00	0.00	0.00	0.00
18.00	0.02	0.00	0.02	70.00	0.00	0.00	0.00
19.00	0.02	0.00	0.02	71.00	0.00	0.00	0.00
20.00	0.02	0.00	0.02	72.00	0.00	0.00	0.00
21.00	0.02	0.00	0.02				
22.00	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 9S: DA Bioretention Basin	Runoff Area=0.830 ac 0.00% Impervious Runoff Depth=2.99" Flow Length=280' Tc=10.1 min CN=80 Runoff=2.73 cfs 0.207 af
Subcatchment 51S: DA East Undetained	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=4.87" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment 52S: DA Offsite East	Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=2.99" Tc=9.7 min CN=80 Runoff=0.13 cfs 0.010 af
Subcatchment 53S: DA East Undetained	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=2.99" Tc=10.0 min CN=80 Runoff=1.45 cfs 0.110 af
Subcatchment 54S: DA Bioretention	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=4.87" Flow Length=280' Tc=10.1 min CN=98 Runoff=3.34 cfs 0.292 af
Subcatchment 55S: DA Offsite East	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=4.87" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Pond 51P: Bioretention Basin	Peak Elev=131.50' Storage=8,320 cf Inflow=6.07 cfs 0.499 af Outflow=3.37 cfs 0.425 af
Link 50L: DA East Total	Inflow=4.53 cfs 0.560 af Primary=4.53 cfs 0.560 af
Link 51L: DA East Undetained	Inflow=1.77 cfs 0.136 af Primary=1.77 cfs 0.136 af
Total Runoff Area = 2.070 ac Runoff Volume = 0.635 af Average Runoff Depth = 3.68"	
63.29% Pervious = 1.310 ac 36.71% Impervious = 0.760 ac	

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

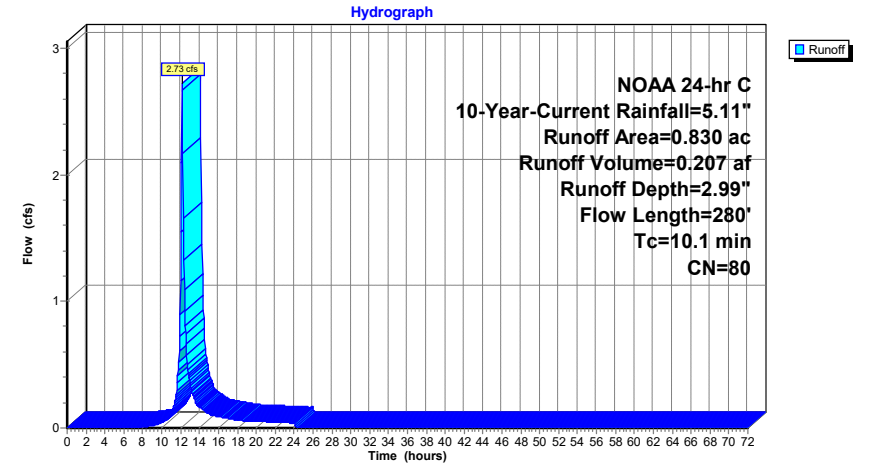
Runoff = 2.73 cfs @ 12.18 hrs, Volume= 0.207 af, Depth= 2.99"
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description			
0.830	80	>75% Grass cover, Good, HSG D			
0.830		100.00% Pervious Area			

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 9S: DA Bioretention Basin (Perv)



Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.06	0.00	0.00
2.00	0.12	0.00	0.00
3.00	0.18	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.32	0.00	0.00
6.00	0.40	0.00	0.00
7.00	0.50	0.00	0.00
8.00	0.61	0.00	0.01
9.00	0.75	0.02	0.02
10.00	0.93	0.06	0.05
11.00	1.23	0.16	0.12
12.00	2.44	0.84	1.16
13.00	3.88	1.95	0.35
14.00	4.18	2.19	0.16
15.00	4.36	2.35	0.11
16.00	4.50	2.46	0.09
17.00	4.61	2.56	0.08
18.00	4.71	2.64	0.06
19.00	4.79	2.71	0.06
20.00	4.86	2.77	0.05
21.00	4.93	2.83	0.05
22.00	4.99	2.89	0.05
23.00	5.05	2.94	0.04
24.00	5.11	2.99	0.04
25.00	5.11	2.99	0.00
26.00	5.11	2.99	0.00
27.00	5.11	2.99	0.00
28.00	5.11	2.99	0.00
29.00	5.11	2.99	0.00
30.00	5.11	2.99	0.00
31.00	5.11	2.99	0.00
32.00	5.11	2.99	0.00
33.00	5.11	2.99	0.00
34.00	5.11	2.99	0.00
35.00	5.11	2.99	0.00
36.00	5.11	2.99	0.00
37.00	5.11	2.99	0.00
38.00	5.11	2.99	0.00
39.00	5.11	2.99	0.00
40.00	5.11	2.99	0.00
41.00	5.11	2.99	0.00
42.00	5.11	2.99	0.00
43.00	5.11	2.99	0.00
44.00	5.11	2.99	0.00
45.00	5.11	2.99	0.00
46.00	5.11	2.99	0.00
47.00	5.11	2.99	0.00
48.00	5.11	2.99	0.00
49.00	5.11	2.99	0.00
50.00	5.11	2.99	0.00
51.00	5.11	2.99	0.00

Summary for Subcatchment 51S: DA East Undetained (Imp)

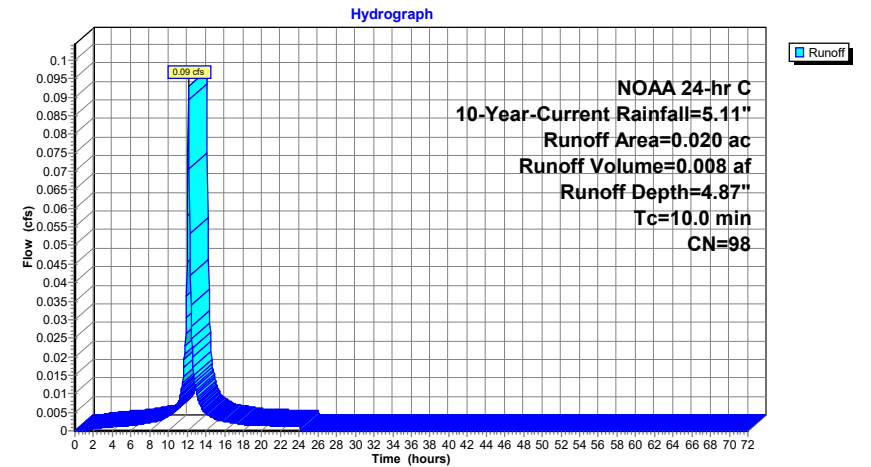
Runoff = 0.09 cfs @ 12.17 hrs, Volume= 0.008 af, Depth= 4.87"
Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 51S: DA East Undetained (Imp)



Hydrograph for Subcatchment 51S: DA East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	4.87	0.00
1.00	0.06	0.00	0.00	53.00	5.11	4.87	0.00
2.00	0.12	0.02	0.00	54.00	5.11	4.87	0.00
3.00	0.18	0.06	0.00	55.00	5.11	4.87	0.00
4.00	0.25	0.11	0.00	56.00	5.11	4.87	0.00
5.00	0.32	0.17	0.00	57.00	5.11	4.87	0.00
6.00	0.40	0.23	0.00	58.00	5.11	4.87	0.00
7.00	0.50	0.32	0.00	59.00	5.11	4.87	0.00
8.00	0.61	0.42	0.00	60.00	5.11	4.87	0.00
9.00	0.75	0.55	0.00	61.00	5.11	4.87	0.00
10.00	0.93	0.72	0.00	62.00	5.11	4.87	0.00
11.00	1.23	1.01	0.01	63.00	5.11	4.87	0.00
12.00	2.44	2.21	0.05	64.00	5.11	4.87	0.00
13.00	3.88	3.65	0.01	65.00	5.11	4.87	0.00
14.00	4.18	3.94	0.00	66.00	5.11	4.87	0.00
15.00	4.36	4.13	0.00	67.00	5.11	4.87	0.00
16.00	4.50	4.26	0.00	68.00	5.11	4.87	0.00
17.00	4.61	4.38	0.00	69.00	5.11	4.87	0.00
18.00	4.71	4.47	0.00	70.00	5.11	4.87	0.00
19.00	4.79	4.55	0.00	71.00	5.11	4.87	0.00
20.00	4.86	4.62	0.00	72.00	5.11	4.87	0.00
21.00	4.93	4.69	0.00				
22.00	4.99	4.76	0.00				
23.00	5.05	4.82	0.00				
24.00	5.11	4.87	0.00				
25.00	5.11	4.87	0.00				
26.00	5.11	4.87	0.00				
27.00	5.11	4.87	0.00				
28.00	5.11	4.87	0.00				
29.00	5.11	4.87	0.00				
30.00	5.11	4.87	0.00				
31.00	5.11	4.87	0.00				
32.00	5.11	4.87	0.00				
33.00	5.11	4.87	0.00				
34.00	5.11	4.87	0.00				
35.00	5.11	4.87	0.00				
36.00	5.11	4.87	0.00				
37.00	5.11	4.87	0.00				
38.00	5.11	4.87	0.00				
39.00	5.11	4.87	0.00				
40.00	5.11	4.87	0.00				
41.00	5.11	4.87	0.00				
42.00	5.11	4.87	0.00				
43.00	5.11	4.87	0.00				
44.00	5.11	4.87	0.00				
45.00	5.11	4.87	0.00				
46.00	5.11	4.87	0.00				
47.00	5.11	4.87	0.00				
48.00	5.11	4.87	0.00				
49.00	5.11	4.87	0.00				
50.00	5.11	4.87	0.00				
51.00	5.11	4.87	0.00				

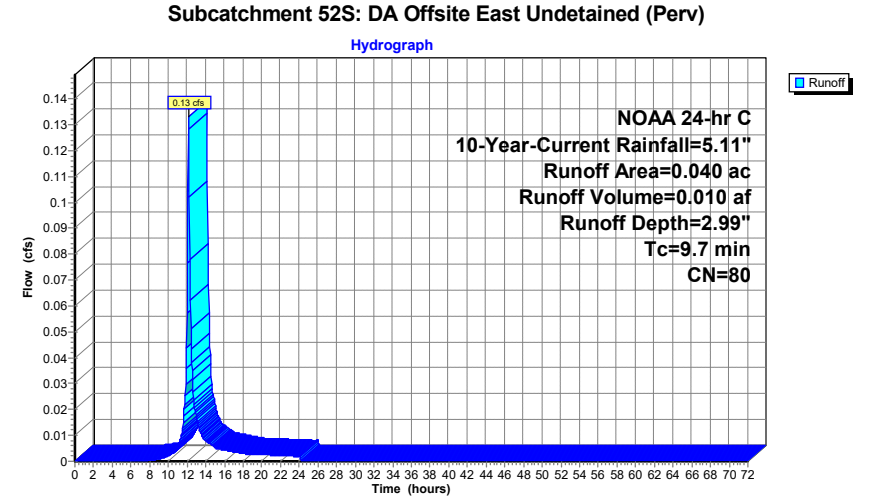
Summary for Subcatchment 52S: DA Offsite East Undetained (Perv)

Runoff = 0.13 cfs @ 12.17 hrs, Volume= 0.010 af, Depth= 2.99"
Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.040	80	>75% Grass cover, Good, HSG D
0.040		100.00% Pervious Area

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



Hydrograph for Subcatchment 52S: DA Offsite East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.06	0.00	0.00
2.00	0.12	0.00	0.00
3.00	0.18	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.32	0.00	0.00
6.00	0.40	0.00	0.00
7.00	0.50	0.00	0.00
8.00	0.61	0.00	0.00
9.00	0.75	0.02	0.00
10.00	0.93	0.06	0.00
11.00	1.23	0.16	0.01
12.00	2.44	0.84	0.06
13.00	3.88	1.95	0.02
14.00	4.18	2.19	0.01
15.00	4.36	2.35	0.01
16.00	4.50	2.46	0.00
17.00	4.61	2.56	0.00
18.00	4.71	2.64	0.00
19.00	4.79	2.71	0.00
20.00	4.86	2.77	0.00
21.00	4.93	2.83	0.00
22.00	4.99	2.89	0.00
23.00	5.05	2.94	0.00
24.00	5.11	2.99	0.00
25.00	5.11	2.99	0.00
26.00	5.11	2.99	0.00
27.00	5.11	2.99	0.00
28.00	5.11	2.99	0.00
29.00	5.11	2.99	0.00
30.00	5.11	2.99	0.00
31.00	5.11	2.99	0.00
32.00	5.11	2.99	0.00
33.00	5.11	2.99	0.00
34.00	5.11	2.99	0.00
35.00	5.11	2.99	0.00
36.00	5.11	2.99	0.00
37.00	5.11	2.99	0.00
38.00	5.11	2.99	0.00
39.00	5.11	2.99	0.00
40.00	5.11	2.99	0.00
41.00	5.11	2.99	0.00
42.00	5.11	2.99	0.00
43.00	5.11	2.99	0.00
44.00	5.11	2.99	0.00
45.00	5.11	2.99	0.00
46.00	5.11	2.99	0.00
47.00	5.11	2.99	0.00
48.00	5.11	2.99	0.00
49.00	5.11	2.99	0.00
50.00	5.11	2.99	0.00
51.00	5.11	2.99	0.00

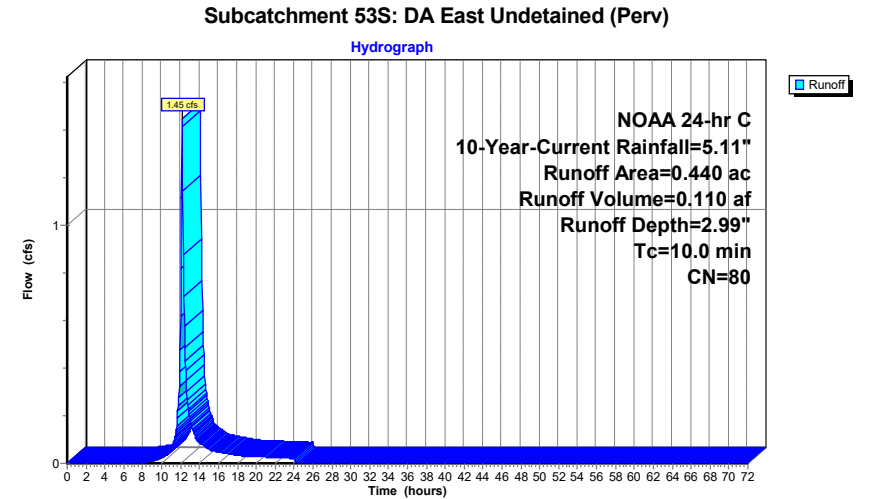
Summary for Subcatchment 53S: DA East Undetained (Perv)

Runoff = 1.45 cfs @ 12.17 hrs, Volume= 0.110 af, Depth= 2.99"
Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.440	80	>75% Grass cover, Good, HSG D
0.440		100.00% Pervious Area

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



Hydrograph for Subcatchment 53S: DA East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.06	0.00	0.00
2.00	0.12	0.00	0.00
3.00	0.18	0.00	0.00
4.00	0.25	0.00	0.00
5.00	0.32	0.00	0.00
6.00	0.40	0.00	0.00
7.00	0.50	0.00	0.00
8.00	0.61	0.00	0.00
9.00	0.75	0.02	0.01
10.00	0.93	0.06	0.02
11.00	1.23	0.16	0.06
12.00	2.44	0.84	0.62
13.00	3.88	1.95	0.19
14.00	4.18	2.19	0.09
15.00	4.36	2.35	0.06
16.00	4.50	2.46	0.05
17.00	4.61	2.56	0.04
18.00	4.71	2.64	0.03
19.00	4.79	2.71	0.03
20.00	4.86	2.77	0.03
21.00	4.93	2.83	0.03
22.00	4.99	2.89	0.02
23.00	5.05	2.94	0.02
24.00	5.11	2.99	0.02
25.00	5.11	2.99	0.00
26.00	5.11	2.99	0.00
27.00	5.11	2.99	0.00
28.00	5.11	2.99	0.00
29.00	5.11	2.99	0.00
30.00	5.11	2.99	0.00
31.00	5.11	2.99	0.00
32.00	5.11	2.99	0.00
33.00	5.11	2.99	0.00
34.00	5.11	2.99	0.00
35.00	5.11	2.99	0.00
36.00	5.11	2.99	0.00
37.00	5.11	2.99	0.00
38.00	5.11	2.99	0.00
39.00	5.11	2.99	0.00
40.00	5.11	2.99	0.00
41.00	5.11	2.99	0.00
42.00	5.11	2.99	0.00
43.00	5.11	2.99	0.00
44.00	5.11	2.99	0.00
45.00	5.11	2.99	0.00
46.00	5.11	2.99	0.00
47.00	5.11	2.99	0.00
48.00	5.11	2.99	0.00
49.00	5.11	2.99	0.00
50.00	5.11	2.99	0.00
51.00	5.11	2.99	0.00

2023-08-09 Proposed Hydrology

Prepared by Dynamic Engineering

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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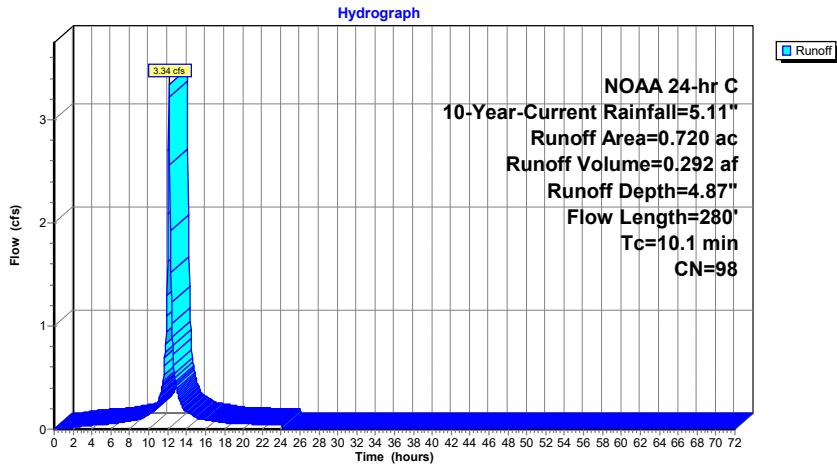
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 3.34 cfs @ 12.17 hrs, Volume= 0.292 af, Depth= 4.87"
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)**2023-08-09 Proposed Hydrology**

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.06	0.00	0.00
2.00	0.12	0.02	0.02
3.00	0.18	0.06	0.03
4.00	0.25	0.11	0.04
5.00	0.32	0.17	0.05
6.00	0.40	0.23	0.05
7.00	0.50	0.32	0.07
8.00	0.61	0.42	0.08
9.00	0.75	0.55	0.10
10.00	0.93	0.72	0.15
11.00	1.23	1.01	0.27
12.00	2.44	2.21	1.63
13.00	3.88	3.65	0.38
14.00	4.18	3.94	0.17
15.00	4.36	4.13	0.12
16.00	4.50	4.26	0.09
17.00	4.61	4.38	0.08
18.00	4.71	4.47	0.06
19.00	4.79	4.55	0.06
20.00	4.86	4.62	0.05
21.00	4.93	4.69	0.05
22.00	4.99	4.76	0.05
23.00	5.05	4.82	0.04
24.00	5.11	4.87	0.04
25.00	5.11	4.87	0.00
26.00	5.11	4.87	0.00
27.00	5.11	4.87	0.00
28.00	5.11	4.87	0.00
29.00	5.11	4.87	0.00
30.00	5.11	4.87	0.00
31.00	5.11	4.87	0.00
32.00	5.11	4.87	0.00
33.00	5.11	4.87	0.00
34.00	5.11	4.87	0.00
35.00	5.11	4.87	0.00
36.00	5.11	4.87	0.00
37.00	5.11	4.87	0.00
38.00	5.11	4.87	0.00
39.00	5.11	4.87	0.00
40.00	5.11	4.87	0.00
41.00	5.11	4.87	0.00
42.00	5.11	4.87	0.00
43.00	5.11	4.87	0.00
44.00	5.11	4.87	0.00
45.00	5.11	4.87	0.00
46.00	5.11	4.87	0.00
47.00	5.11	4.87	0.00
48.00	5.11	4.87	0.00
49.00	5.11	4.87	0.00
50.00	5.11	4.87	0.00
51.00	5.11	4.87	0.00

Summary for Subcatchment 55S: DA Offsite East Undetained (Imp)

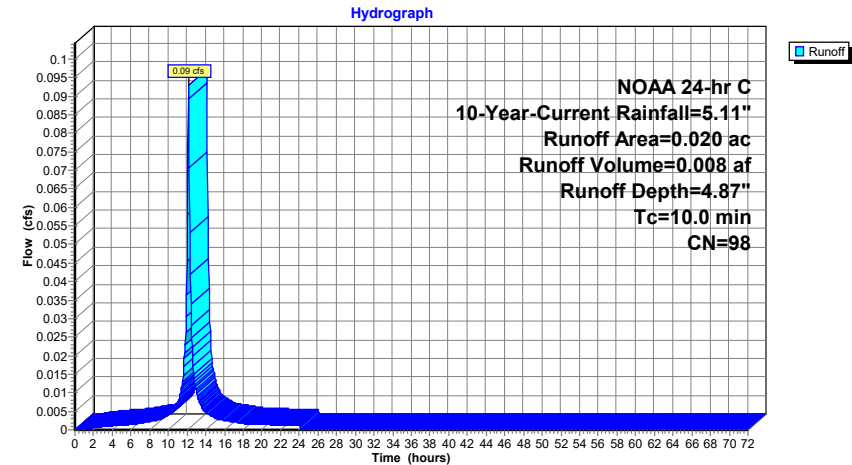
Runoff = 0.09 cfs @ 12.17 hrs, Volume= 0.008 af, Depth= 4.87"
Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 55S: DA Offsite East Undetained (Imp)



Hydrograph for Subcatchment 55S: DA Offsite East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	4.87	0.00
1.00	0.06	0.00	0.00	53.00	5.11	4.87	0.00
2.00	0.12	0.02	0.00	54.00	5.11	4.87	0.00
3.00	0.18	0.06	0.00	55.00	5.11	4.87	0.00
4.00	0.25	0.11	0.00	56.00	5.11	4.87	0.00
5.00	0.32	0.17	0.00	57.00	5.11	4.87	0.00
6.00	0.40	0.23	0.00	58.00	5.11	4.87	0.00
7.00	0.50	0.32	0.00	59.00	5.11	4.87	0.00
8.00	0.61	0.42	0.00	60.00	5.11	4.87	0.00
9.00	0.75	0.55	0.00	61.00	5.11	4.87	0.00
10.00	0.93	0.72	0.00	62.00	5.11	4.87	0.00
11.00	1.23	1.01	0.01	63.00	5.11	4.87	0.00
12.00	2.44	2.21	0.05	64.00	5.11	4.87	0.00
13.00	3.88	3.65	0.01	65.00	5.11	4.87	0.00
14.00	4.18	3.94	0.00	66.00	5.11	4.87	0.00
15.00	4.36	4.13	0.00	67.00	5.11	4.87	0.00
16.00	4.50	4.26	0.00	68.00	5.11	4.87	0.00
17.00	4.61	4.38	0.00	69.00	5.11	4.87	0.00
18.00	4.71	4.47	0.00	70.00	5.11	4.87	0.00
19.00	4.79	4.55	0.00	71.00	5.11	4.87	0.00
20.00	4.86	4.62	0.00	72.00	5.11	4.87	0.00
21.00	4.93	4.69	0.00				
22.00	4.99	4.76	0.00				
23.00	5.05	4.82	0.00				
24.00	5.11	4.87	0.00				
25.00	5.11	4.87	0.00				
26.00	5.11	4.87	0.00				
27.00	5.11	4.87	0.00				
28.00	5.11	4.87	0.00				
29.00	5.11	4.87	0.00				
30.00	5.11	4.87	0.00				
31.00	5.11	4.87	0.00				
32.00	5.11	4.87	0.00				
33.00	5.11	4.87	0.00				
34.00	5.11	4.87	0.00				
35.00	5.11	4.87	0.00				
36.00	5.11	4.87	0.00				
37.00	5.11	4.87	0.00				
38.00	5.11	4.87	0.00				
39.00	5.11	4.87	0.00				
40.00	5.11	4.87	0.00				
41.00	5.11	4.87	0.00				
42.00	5.11	4.87	0.00				
43.00	5.11	4.87	0.00				
44.00	5.11	4.87	0.00				
45.00	5.11	4.87	0.00				
46.00	5.11	4.87	0.00				
47.00	5.11	4.87	0.00				
48.00	5.11	4.87	0.00				
49.00	5.11	4.87	0.00				
50.00	5.11	4.87	0.00				
51.00	5.11	4.87	0.00				

Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 3.86" for 10-Year-Current event
Inflow = 6.07 cfs @ 12.17 hrs, Volume= 0.499 af
Outflow = 3.37 cfs @ 12.32 hrs, Volume= 0.425 af, Atten= 45%, Lag= 8.8 min
Primary = 3.37 cfs @ 12.32 hrs, Volume= 0.425 af
Routed to Link 50L : DA East Total

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 131.50' @ 12.32 hrs Surf.Area= 3,450 sf Storage= 8,320 cf

Plug-Flow detention time= 160.6 min calculated for 0.424 af (85% of inflow)
Center-of-Mass det. time= 92.8 min (876.3 - 783.6)

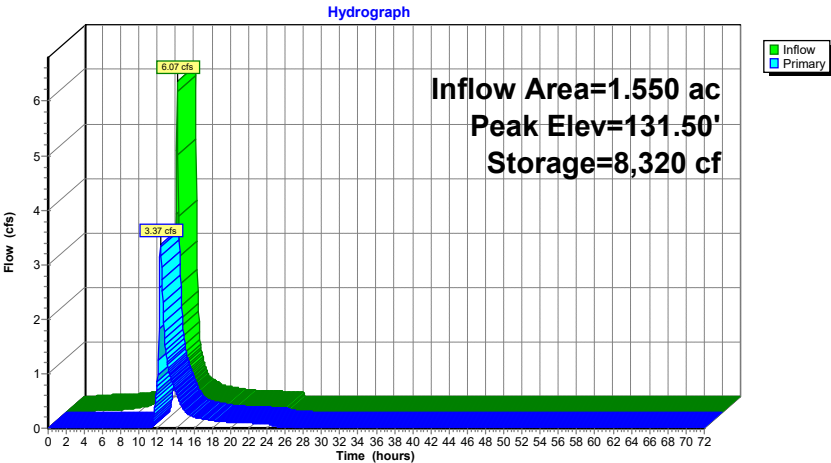
Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

Device	Routing	Invert	Outlet Devices
#1	Primary	126.42'	15.0" Round RCP_Round 15" L= 12.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 126.42' / 126.09' S= 0.0275 ' / ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	130.00'	5.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	130.75'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	131.50'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

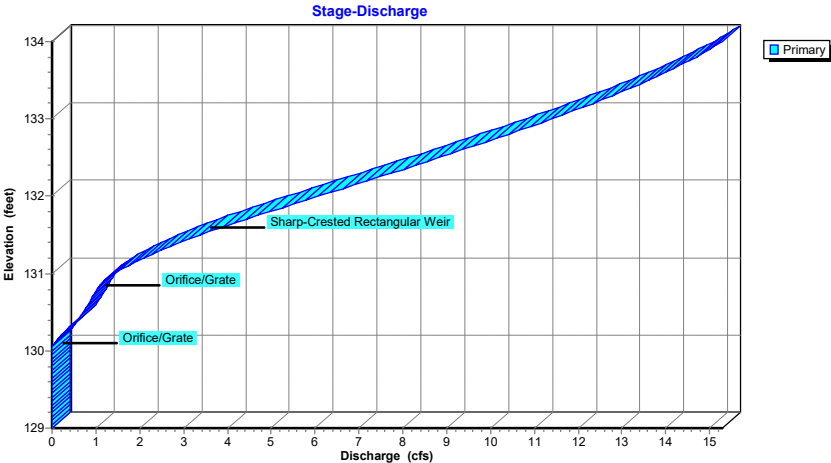
Primary OutFlow Max=3.34 cfs @ 12.32 hrs HW=131.50' (Free Discharge)

- 1=RCP_Round 15" (Passes 3.34 cfs of 15.58 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.49 cfs @ 5.46 fps)
- 3=Orifice/Grate (Orifice Controls 1.85 cfs @ 2.94 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

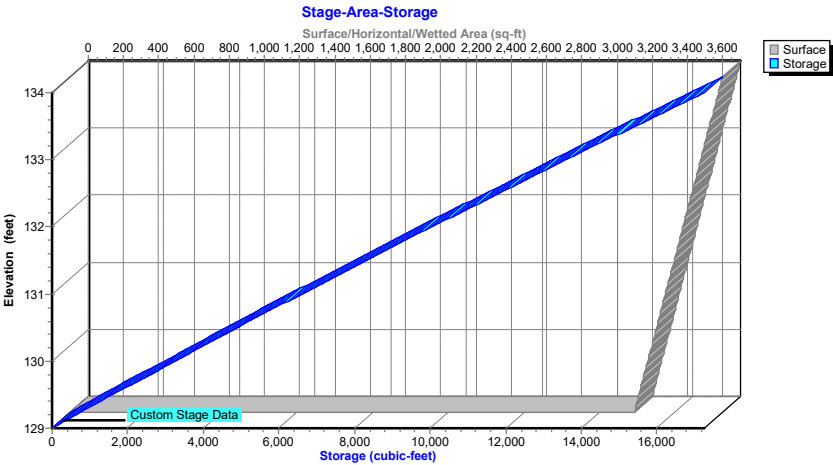
Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	129.00	0.00
2.50	0.02	81	129.03	0.00
5.00	0.05	407	129.13	0.00
7.50	0.08	917	129.29	0.00
10.00	0.19	1,974	129.61	0.00
12.50	1.70	7,816	131.36	2.73
15.00	0.23	4,123	130.26	0.32
17.50	0.14	3,828	130.17	0.16
20.00	0.11	3,733	130.15	0.11
22.50	0.09	3,685	130.13	0.09
25.00	0.00	3,499	130.08	0.03
27.50	0.00	3,355	130.03	0.01
30.00	0.00	3,299	130.01	0.00
32.50	0.00	3,273	130.01	0.00
35.00	0.00	3,260	130.00	0.00
37.50	0.00	3,255	130.00	0.00
40.00	0.00	3,252	130.00	0.00
42.50	0.00	3,251	130.00	0.00
45.00	0.00	3,250	130.00	0.00
47.50	0.00	3,250	130.00	0.00
50.00	0.00	3,250	130.00	0.00
52.50	0.00	3,250	130.00	0.00
55.00	0.00	3,250	130.00	0.00
57.50	0.00	3,250	130.00	0.00
60.00	0.00	3,250	130.00	0.00
62.50	0.00	3,250	130.00	0.00
65.00	0.00	3,250	130.00	0.00
67.50	0.00	3,250	130.00	0.00
70.00	0.00	3,250	130.00	0.00

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	3.88
129.05	0.00	131.65	4.17
129.10	0.00	131.70	4.44
129.15	0.00	131.75	4.69
129.20	0.00	131.80	4.97
129.25	0.00	131.85	5.24
129.30	0.00	131.90	5.52
129.35	0.00	131.95	5.80
129.40	0.00	132.00	6.07
129.45	0.00	132.05	6.35
129.50	0.00	132.10	6.63
129.55	0.00	132.15	6.91
129.60	0.00	132.20	7.19
129.65	0.00	132.25	7.46
129.70	0.00	132.30	7.74
129.75	0.00	132.35	8.01
129.80	0.00	132.40	8.29
129.85	0.00	132.45	8.56
129.90	0.00	132.50	8.83
129.95	0.00	132.55	9.10
130.00	0.00	132.60	9.37
130.05	0.01	132.65	9.63
130.10	0.05	132.70	9.89
130.15	0.12	132.75	10.15
130.20	0.20	132.80	10.41
130.25	0.29	132.85	10.66
130.30	0.39	132.90	10.91
130.35	0.49	132.95	11.16
130.40	0.58	133.00	11.40
130.45	0.65	133.05	11.64
130.50	0.71	133.10	11.88
130.55	0.77	133.15	12.11
130.60	0.82	133.20	12.34
130.65	0.87	133.25	12.56
130.70	0.92	133.30	12.78
130.75	0.97	133.35	12.99
130.80	1.02	133.40	13.20
130.85	1.10	133.45	13.40
130.90	1.19	133.50	13.60
130.95	1.30	133.55	13.80
131.00	1.43	133.60	13.99
131.05	1.57	133.65	14.17
131.10	1.73	133.70	14.35
131.15	1.91	133.75	14.52
131.20	2.09	133.80	14.69
131.25	2.29	133.85	14.85
131.30	2.49	133.90	15.00
131.35	2.70	133.95	15.15
131.40	2.92	134.00	15.29
131.45	3.14		
131.50	3.36		
131.55	3.61		

2023-08-09 Proposed Hydrology

Prepared by Dynamic Engineering

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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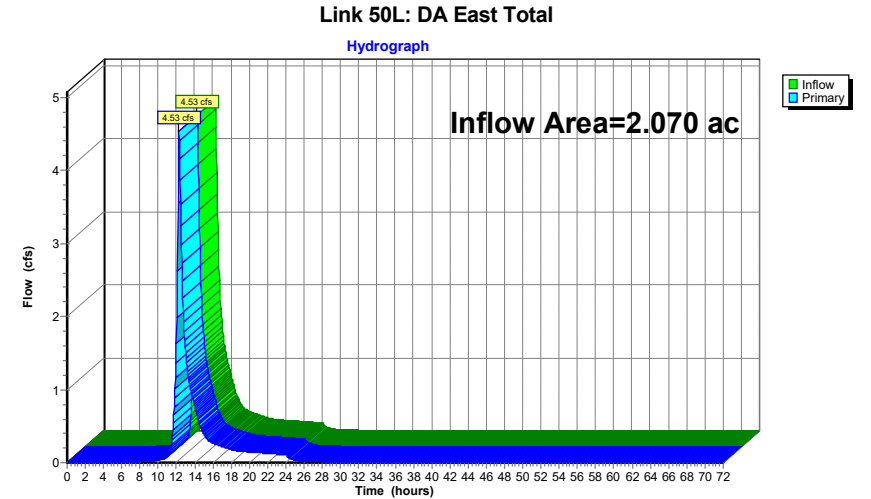
Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 36.71% Impervious, Inflow Depth = 3.25" for 10-Year-Current event
Inflow = 4.53 cfs @ 12.26 hrs, Volume= 0.560 af
Primary = 4.53 cfs @ 12.26 hrs, Volume= 0.560 af, Atten= 0%, Lag= 0.0 min

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



Hydrograph for Link 50L: DA East Total

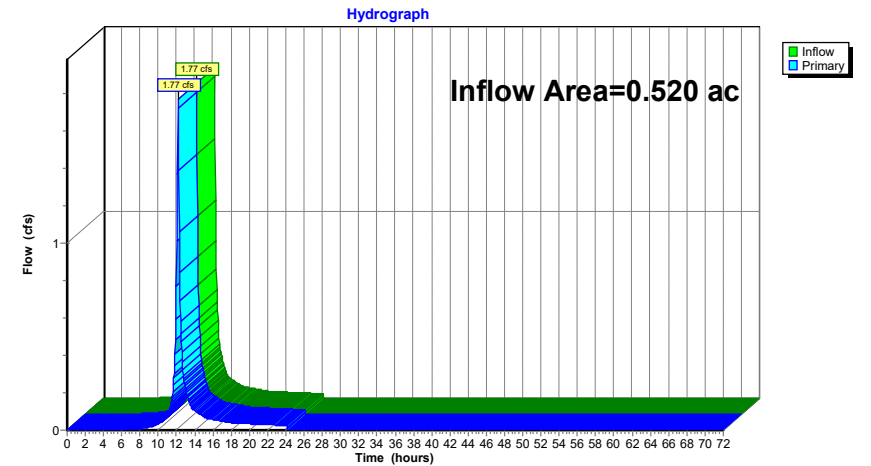
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01	60.00	0.00	0.00	0.00
9.00	0.02	0.00	0.02	61.00	0.00	0.00	0.00
10.00	0.03	0.00	0.03	62.00	0.00	0.00	0.00
11.00	0.08	0.00	0.08	63.00	0.00	0.00	0.00
12.00	1.63	0.00	1.63	64.00	0.00	0.00	0.00
13.00	1.50	0.00	1.50	65.00	0.00	0.00	0.00
14.00	0.77	0.00	0.77	66.00	0.00	0.00	0.00
15.00	0.39	0.00	0.39	67.00	0.00	0.00	0.00
16.00	0.27	0.00	0.27	68.00	0.00	0.00	0.00
17.00	0.22	0.00	0.22	69.00	0.00	0.00	0.00
18.00	0.18	0.00	0.18	70.00	0.00	0.00	0.00
19.00	0.16	0.00	0.16	71.00	0.00	0.00	0.00
20.00	0.15	0.00	0.15	72.00	0.00	0.00	0.00
21.00	0.14	0.00	0.14				
22.00	0.13	0.00	0.13				
23.00	0.12	0.00	0.12				
24.00	0.11	0.00	0.11				
25.00	0.03	0.00	0.03				
26.00	0.01	0.00	0.01				
27.00	0.01	0.00	0.01				
28.00	0.01	0.00	0.01				
29.00	0.01	0.00	0.01				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link 51L: DA East Undetained

Inflow Area = 0.520 ac, 7.69% Impervious, Inflow Depth = 3.13" for 10-Year-Current event
Inflow = 1.77 cfs @ 12.17 hrs, Volume= 0.136 af
Primary = 1.77 cfs @ 12.17 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Routed to Link 50L : DA East Total

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

Link 51L: DA East Undetained



Hydrograph for Link 51L: DA East Undetained

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01	60.00	0.00	0.00	0.00
9.00	0.02	0.00	0.02	61.00	0.00	0.00	0.00
10.00	0.03	0.00	0.03	62.00	0.00	0.00	0.00
11.00	0.08	0.00	0.08	63.00	0.00	0.00	0.00
12.00	0.77	0.00	0.77	64.00	0.00	0.00	0.00
13.00	0.22	0.00	0.22	65.00	0.00	0.00	0.00
14.00	0.10	0.00	0.10	66.00	0.00	0.00	0.00
15.00	0.07	0.00	0.07	67.00	0.00	0.00	0.00
16.00	0.06	0.00	0.06	68.00	0.00	0.00	0.00
17.00	0.05	0.00	0.05	69.00	0.00	0.00	0.00
18.00	0.04	0.00	0.04	70.00	0.00	0.00	0.00
19.00	0.04	0.00	0.04	71.00	0.00	0.00	0.00
20.00	0.03	0.00	0.03	72.00	0.00	0.00	0.00
21.00	0.03	0.00	0.03				
22.00	0.03	0.00	0.03				
23.00	0.03	0.00	0.03				
24.00	0.03	0.00	0.03				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 9S: DA Bioretention Basin	Runoff Area=0.830 ac 0.00% Impervious	Runoff Depth=6.25"	Flow Length=280' Tc=10.1 min CN=80	Runoff=5.56 cfs 0.432 af
Subcatchment 51S: DA East Undetained	Runoff Area=0.020 ac 100.00% Impervious	Runoff Depth=8.42"	Tc=10.0 min CN=98	Runoff=0.16 cfs 0.014 af
Subcatchment 52S: DA Offsite East	Runoff Area=0.040 ac 0.00% Impervious	Runoff Depth=6.25"	Tc=9.7 min CN=80	Runoff=0.27 cfs 0.021 af
Subcatchment 53S: DA East Undetained	Runoff Area=0.440 ac 0.00% Impervious	Runoff Depth=6.25"	Tc=10.0 min CN=80	Runoff=2.96 cfs 0.229 af
Subcatchment 54S: DA Bioretention	Runoff Area=0.720 ac 100.00% Impervious	Runoff Depth=8.42"	Flow Length=280' Tc=10.1 min CN=98	Runoff=5.69 cfs 0.505 af
Subcatchment 55S: DA Offsite East	Runoff Area=0.020 ac 100.00% Impervious	Runoff Depth=8.42"	Tc=10.0 min CN=98	Runoff=0.16 cfs 0.014 af
Pond 51P: Bioretention Basin	Peak Elev=132.31' Storage=11,145 cf	Inflow=11.25 cfs 0.937 af	Outflow=7.80 cfs 0.863 af	
Link 50L: DA East Total		Inflow=10.63 cfs 1.141 af	Primary=10.63 cfs 1.141 af	
Link 51L: DA East Undetained		Inflow=3.54 cfs 0.278 af	Primary=3.54 cfs 0.278 af	

Total Runoff Area = 2.070 ac Runoff Volume = 1.215 af Average Runoff Depth = 7.04"
63.29% Pervious = 1.310 ac 36.71% Impervious = 0.760 ac

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

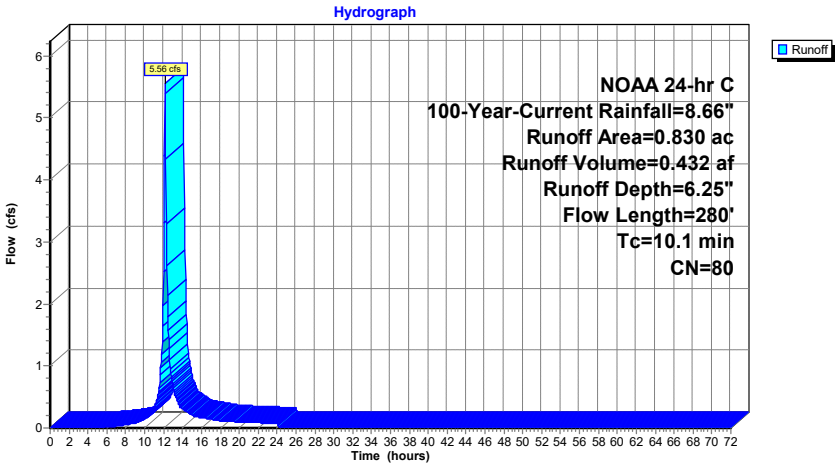
Runoff = 5.56 cfs @ 12.17 hrs, Volume= 0.432 af, Depth= 6.25"
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.830	80	>75% Grass cover, Good, HSG D
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 9S: DA Bioretention Basin (Perv)



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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	6.25	0.00
1.00	0.09	0.00	0.00	53.00	8.66	6.25	0.00
2.00	0.20	0.00	0.00	54.00	8.66	6.25	0.00
3.00	0.31	0.00	0.00	55.00	8.66	6.25	0.00
4.00	0.42	0.00	0.00	56.00	8.66	6.25	0.00
5.00	0.55	0.00	0.00	57.00	8.66	6.25	0.00
6.00	0.69	0.01	0.01	58.00	8.66	6.25	0.00
7.00	0.84	0.04	0.03	59.00	8.66	6.25	0.00
8.00	1.04	0.10	0.05	60.00	8.66	6.25	0.00
9.00	1.26	0.18	0.08	61.00	8.66	6.25	0.00
10.00	1.58	0.33	0.15	62.00	8.66	6.25	0.00
11.00	2.08	0.61	0.32	63.00	8.66	6.25	0.00
12.00	4.13	2.15	2.53	64.00	8.66	6.25	0.00
13.00	6.58	4.31	0.67	65.00	8.66	6.25	0.00
14.00	7.08	4.77	0.31	66.00	8.66	6.25	0.00
15.00	7.40	5.06	0.21	67.00	8.66	6.25	0.00
16.00	7.62	5.27	0.17	68.00	8.66	6.25	0.00
17.00	7.82	5.45	0.14	69.00	8.66	6.25	0.00
18.00	7.97	5.60	0.11	70.00	8.66	6.25	0.00
19.00	8.11	5.73	0.10	71.00	8.66	6.25	0.00
20.00	8.24	5.85	0.10	72.00	8.66	6.25	0.00
21.00	8.35	5.96	0.09				
22.00	8.46	6.06	0.08				
23.00	8.57	6.16	0.08				
24.00	8.66	6.25	0.07				
25.00	8.66	6.25	0.00				
26.00	8.66	6.25	0.00				
27.00	8.66	6.25	0.00				
28.00	8.66	6.25	0.00				
29.00	8.66	6.25	0.00				
30.00	8.66	6.25	0.00				
31.00	8.66	6.25	0.00				
32.00	8.66	6.25	0.00				
33.00	8.66	6.25	0.00				
34.00	8.66	6.25	0.00				
35.00	8.66	6.25	0.00				
36.00	8.66	6.25	0.00				
37.00	8.66	6.25	0.00				
38.00	8.66	6.25	0.00				
39.00	8.66	6.25	0.00				
40.00	8.66	6.25	0.00				
41.00	8.66	6.25	0.00				
42.00	8.66	6.25	0.00				
43.00	8.66	6.25	0.00				
44.00	8.66	6.25	0.00				
45.00	8.66	6.25	0.00				
46.00	8.66	6.25	0.00				
47.00	8.66	6.25	0.00				
48.00	8.66	6.25	0.00				
49.00	8.66	6.25	0.00				
50.00	8.66	6.25	0.00				
51.00	8.66	6.25	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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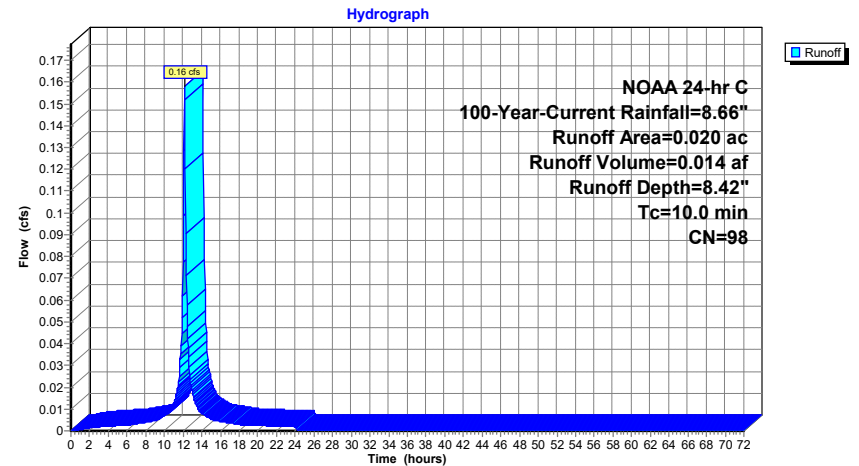
Summary for Subcatchment 51S: DA East Undetained (Imp)

Runoff = 0.16 cfs @ 12.17 hrs, Volume= 0.014 af, Depth= 8.42"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 51S: DA East Undetained (Imp)

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 51S: DA East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	8.42	0.00
1.00	0.09	0.01	0.00	53.00	8.66	8.42	0.00
2.00	0.20	0.07	0.00	54.00	8.66	8.42	0.00
3.00	0.31	0.15	0.00	55.00	8.66	8.42	0.00
4.00	0.42	0.25	0.00	56.00	8.66	8.42	0.00
5.00	0.55	0.36	0.00	57.00	8.66	8.42	0.00
6.00	0.69	0.49	0.00	58.00	8.66	8.42	0.00
7.00	0.84	0.64	0.00	59.00	8.66	8.42	0.00
8.00	1.04	0.83	0.00	60.00	8.66	8.42	0.00
9.00	1.26	1.05	0.00	61.00	8.66	8.42	0.00
10.00	1.58	1.36	0.01	62.00	8.66	8.42	0.00
11.00	2.08	1.85	0.01	63.00	8.66	8.42	0.00
12.00	4.13	3.89	0.08	64.00	8.66	8.42	0.00
13.00	6.58	6.34	0.02	65.00	8.66	8.42	0.00
14.00	7.08	6.84	0.01	66.00	8.66	8.42	0.00
15.00	7.40	7.16	0.01	67.00	8.66	8.42	0.00
16.00	7.62	7.38	0.00	68.00	8.66	8.42	0.00
17.00	7.82	7.58	0.00	69.00	8.66	8.42	0.00
18.00	7.97	7.73	0.00	70.00	8.66	8.42	0.00
19.00	8.11	7.87	0.00	71.00	8.66	8.42	0.00
20.00	8.24	8.00	0.00	72.00	8.66	8.42	0.00
21.00	8.35	8.11	0.00				
22.00	8.46	8.22	0.00				
23.00	8.57	8.33	0.00				
24.00	8.66	8.42	0.00				
25.00	8.66	8.42	0.00				
26.00	8.66	8.42	0.00				
27.00	8.66	8.42	0.00				
28.00	8.66	8.42	0.00				
29.00	8.66	8.42	0.00				
30.00	8.66	8.42	0.00				
31.00	8.66	8.42	0.00				
32.00	8.66	8.42	0.00				
33.00	8.66	8.42	0.00				
34.00	8.66	8.42	0.00				
35.00	8.66	8.42	0.00				
36.00	8.66	8.42	0.00				
37.00	8.66	8.42	0.00				
38.00	8.66	8.42	0.00				
39.00	8.66	8.42	0.00				
40.00	8.66	8.42	0.00				
41.00	8.66	8.42	0.00				
42.00	8.66	8.42	0.00				
43.00	8.66	8.42	0.00				
44.00	8.66	8.42	0.00				
45.00	8.66	8.42	0.00				
46.00	8.66	8.42	0.00				
47.00	8.66	8.42	0.00				
48.00	8.66	8.42	0.00				
49.00	8.66	8.42	0.00				
50.00	8.66	8.42	0.00				
51.00	8.66	8.42	0.00				

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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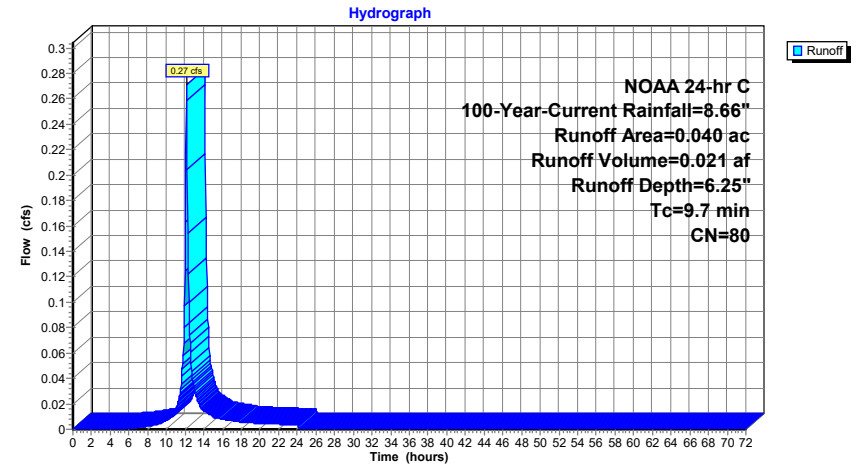
Summary for Subcatchment 52S: DA Offsite East Undetained (Perv)

Runoff = 0.27 cfs @ 12.17 hrs, Volume= 0.021 af, Depth= 6.25"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.040	80	>75% Grass cover, Good, HSG D
0.040		100.00% Pervious Area

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

Subcatchment 52S: DA Offsite East Undetained (Perv)

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 52S: DA Offsite East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	6.25	0.00
1.00	0.09	0.00	0.00	53.00	8.66	6.25	0.00
2.00	0.20	0.00	0.00	54.00	8.66	6.25	0.00
3.00	0.31	0.00	0.00	55.00	8.66	6.25	0.00
4.00	0.42	0.00	0.00	56.00	8.66	6.25	0.00
5.00	0.55	0.00	0.00	57.00	8.66	6.25	0.00
6.00	0.69	0.01	0.00	58.00	8.66	6.25	0.00
7.00	0.84	0.04	0.00	59.00	8.66	6.25	0.00
8.00	1.04	0.10	0.00	60.00	8.66	6.25	0.00
9.00	1.26	0.18	0.00	61.00	8.66	6.25	0.00
10.00	1.58	0.33	0.01	62.00	8.66	6.25	0.00
11.00	2.08	0.61	0.02	63.00	8.66	6.25	0.00
12.00	4.13	2.15	0.12	64.00	8.66	6.25	0.00
13.00	6.58	4.31	0.03	65.00	8.66	6.25	0.00
14.00	7.08	4.77	0.01	66.00	8.66	6.25	0.00
15.00	7.40	5.06	0.01	67.00	8.66	6.25	0.00
16.00	7.62	5.27	0.01	68.00	8.66	6.25	0.00
17.00	7.82	5.45	0.01	69.00	8.66	6.25	0.00
18.00	7.97	5.60	0.01	70.00	8.66	6.25	0.00
19.00	8.11	5.73	0.01	71.00	8.66	6.25	0.00
20.00	8.24	5.85	0.00	72.00	8.66	6.25	0.00
21.00	8.35	5.96	0.00				
22.00	8.46	6.06	0.00				
23.00	8.57	6.16	0.00				
24.00	8.66	6.25	0.00				
25.00	8.66	6.25	0.00				
26.00	8.66	6.25	0.00				
27.00	8.66	6.25	0.00				
28.00	8.66	6.25	0.00				
29.00	8.66	6.25	0.00				
30.00	8.66	6.25	0.00				
31.00	8.66	6.25	0.00				
32.00	8.66	6.25	0.00				
33.00	8.66	6.25	0.00				
34.00	8.66	6.25	0.00				
35.00	8.66	6.25	0.00				
36.00	8.66	6.25	0.00				
37.00	8.66	6.25	0.00				
38.00	8.66	6.25	0.00				
39.00	8.66	6.25	0.00				
40.00	8.66	6.25	0.00				
41.00	8.66	6.25	0.00				
42.00	8.66	6.25	0.00				
43.00	8.66	6.25	0.00				
44.00	8.66	6.25	0.00				
45.00	8.66	6.25	0.00				
46.00	8.66	6.25	0.00				
47.00	8.66	6.25	0.00				
48.00	8.66	6.25	0.00				
49.00	8.66	6.25	0.00				
50.00	8.66	6.25	0.00				
51.00	8.66	6.25	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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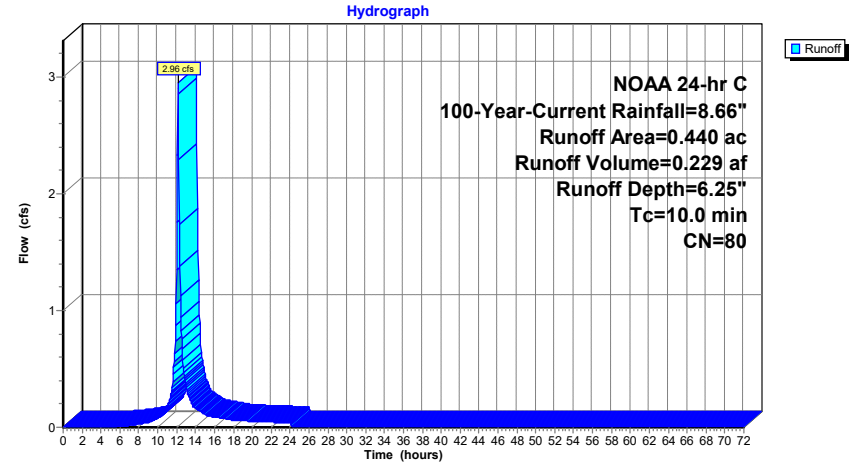
Summary for Subcatchment 53S: DA East Undetained (Perv)

Runoff = 2.96 cfs @ 12.17 hrs, Volume= 0.229 af, Depth= 6.25"
Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.440	80	>75% Grass cover, Good, HSG D
0.440		100.00% Pervious Area

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

Subcatchment 53S: DA East Undetained (Perv)

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 53S: DA East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	6.25	0.00
1.00	0.09	0.00	0.00	53.00	8.66	6.25	0.00
2.00	0.20	0.00	0.00	54.00	8.66	6.25	0.00
3.00	0.31	0.00	0.00	55.00	8.66	6.25	0.00
4.00	0.42	0.00	0.00	56.00	8.66	6.25	0.00
5.00	0.55	0.00	0.00	57.00	8.66	6.25	0.00
6.00	0.69	0.01	0.01	58.00	8.66	6.25	0.00
7.00	0.84	0.04	0.02	59.00	8.66	6.25	0.00
8.00	1.04	0.10	0.03	60.00	8.66	6.25	0.00
9.00	1.26	0.18	0.04	61.00	8.66	6.25	0.00
10.00	1.58	0.33	0.08	62.00	8.66	6.25	0.00
11.00	2.08	0.61	0.17	63.00	8.66	6.25	0.00
12.00	4.13	2.15	1.35	64.00	8.66	6.25	0.00
13.00	6.58	4.31	0.36	65.00	8.66	6.25	0.00
14.00	7.08	4.77	0.16	66.00	8.66	6.25	0.00
15.00	7.40	5.06	0.11	67.00	8.66	6.25	0.00
16.00	7.62	5.27	0.09	68.00	8.66	6.25	0.00
17.00	7.82	5.45	0.08	69.00	8.66	6.25	0.00
18.00	7.97	5.60	0.06	70.00	8.66	6.25	0.00
19.00	8.11	5.73	0.06	71.00	8.66	6.25	0.00
20.00	8.24	5.85	0.05	72.00	8.66	6.25	0.00
21.00	8.35	5.96	0.05				
22.00	8.46	6.06	0.04				
23.00	8.57	6.16	0.04				
24.00	8.66	6.25	0.04				
25.00	8.66	6.25	0.00				
26.00	8.66	6.25	0.00				
27.00	8.66	6.25	0.00				
28.00	8.66	6.25	0.00				
29.00	8.66	6.25	0.00				
30.00	8.66	6.25	0.00				
31.00	8.66	6.25	0.00				
32.00	8.66	6.25	0.00				
33.00	8.66	6.25	0.00				
34.00	8.66	6.25	0.00				
35.00	8.66	6.25	0.00				
36.00	8.66	6.25	0.00				
37.00	8.66	6.25	0.00				
38.00	8.66	6.25	0.00				
39.00	8.66	6.25	0.00				
40.00	8.66	6.25	0.00				
41.00	8.66	6.25	0.00				
42.00	8.66	6.25	0.00				
43.00	8.66	6.25	0.00				
44.00	8.66	6.25	0.00				
45.00	8.66	6.25	0.00				
46.00	8.66	6.25	0.00				
47.00	8.66	6.25	0.00				
48.00	8.66	6.25	0.00				
49.00	8.66	6.25	0.00				
50.00	8.66	6.25	0.00				
51.00	8.66	6.25	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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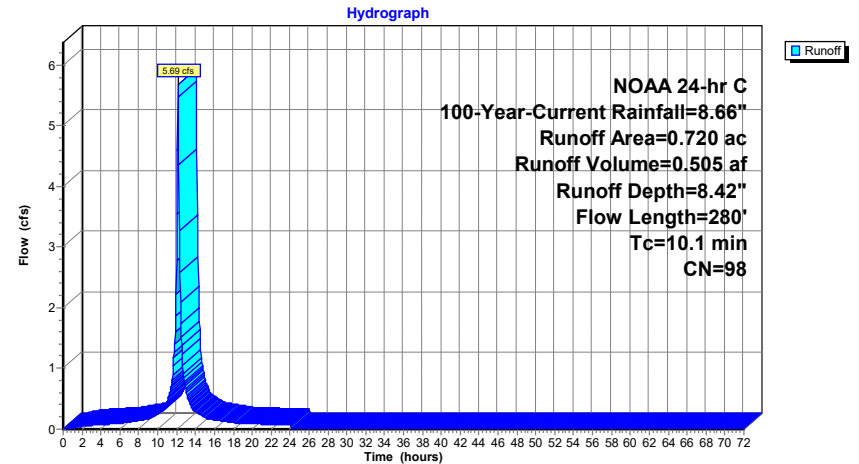
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 5.69 cfs @ 12.17 hrs, Volume= 0.505 af, Depth= 8.42"
 Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	8.42	0.00
1.00	0.09	0.01	0.02	53.00	8.66	8.42	0.00
2.00	0.20	0.07	0.05	54.00	8.66	8.42	0.00
3.00	0.31	0.15	0.07	55.00	8.66	8.42	0.00
4.00	0.42	0.25	0.08	56.00	8.66	8.42	0.00
5.00	0.55	0.36	0.09	57.00	8.66	8.42	0.00
6.00	0.69	0.49	0.09	58.00	8.66	8.42	0.00
7.00	0.84	0.64	0.12	59.00	8.66	8.42	0.00
8.00	1.04	0.83	0.14	60.00	8.66	8.42	0.00
9.00	1.26	1.05	0.17	61.00	8.66	8.42	0.00
10.00	1.58	1.36	0.26	62.00	8.66	8.42	0.00
11.00	2.08	1.85	0.46	63.00	8.66	8.42	0.00
12.00	4.13	3.89	2.78	64.00	8.66	8.42	0.00
13.00	6.58	6.34	0.64	65.00	8.66	8.42	0.00
14.00	7.08	6.84	0.29	66.00	8.66	8.42	0.00
15.00	7.40	7.16	0.20	67.00	8.66	8.42	0.00
16.00	7.62	7.38	0.16	68.00	8.66	8.42	0.00
17.00	7.82	7.58	0.13	69.00	8.66	8.42	0.00
18.00	7.97	7.73	0.11	70.00	8.66	8.42	0.00
19.00	8.11	7.87	0.10	71.00	8.66	8.42	0.00
20.00	8.24	8.00	0.09	72.00	8.66	8.42	0.00
21.00	8.35	8.11	0.08				
22.00	8.46	8.22	0.08				
23.00	8.57	8.33	0.07				
24.00	8.66	8.42	0.07				
25.00	8.66	8.42	0.00				
26.00	8.66	8.42	0.00				
27.00	8.66	8.42	0.00				
28.00	8.66	8.42	0.00				
29.00	8.66	8.42	0.00				
30.00	8.66	8.42	0.00				
31.00	8.66	8.42	0.00				
32.00	8.66	8.42	0.00				
33.00	8.66	8.42	0.00				
34.00	8.66	8.42	0.00				
35.00	8.66	8.42	0.00				
36.00	8.66	8.42	0.00				
37.00	8.66	8.42	0.00				
38.00	8.66	8.42	0.00				
39.00	8.66	8.42	0.00				
40.00	8.66	8.42	0.00				
41.00	8.66	8.42	0.00				
42.00	8.66	8.42	0.00				
43.00	8.66	8.42	0.00				
44.00	8.66	8.42	0.00				
45.00	8.66	8.42	0.00				
46.00	8.66	8.42	0.00				
47.00	8.66	8.42	0.00				
48.00	8.66	8.42	0.00				
49.00	8.66	8.42	0.00				
50.00	8.66	8.42	0.00				
51.00	8.66	8.42	0.00				

2023-08-09 Proposed Hydrology

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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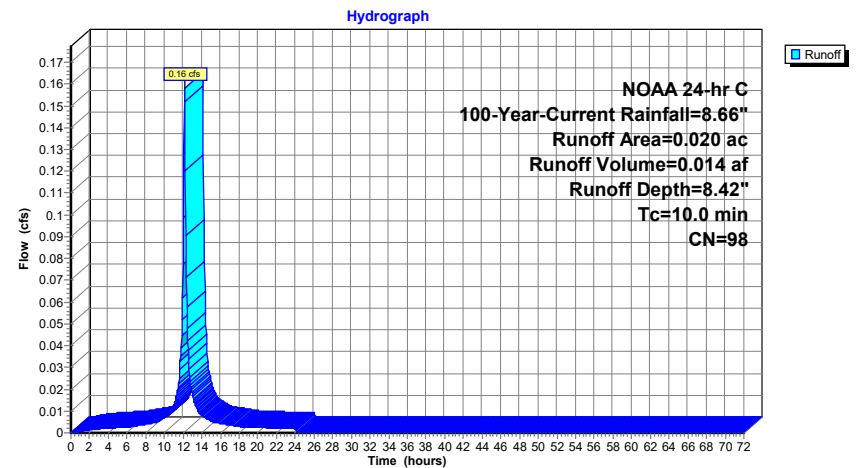
Summary for Subcatchment 55S: DA Offsite East Undetained (Imp)

Runoff = 0.16 cfs @ 12.17 hrs, Volume= 0.014 af, Depth= 8.42"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 100-Year-Current Rainfall=8.66"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 55S: DA Offsite East Undetained (Imp)

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Hydrograph for Subcatchment 55S: DA Offsite East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.66	8.42	0.00
1.00	0.09	0.01	0.00	53.00	8.66	8.42	0.00
2.00	0.20	0.07	0.00	54.00	8.66	8.42	0.00
3.00	0.31	0.15	0.00	55.00	8.66	8.42	0.00
4.00	0.42	0.25	0.00	56.00	8.66	8.42	0.00
5.00	0.55	0.36	0.00	57.00	8.66	8.42	0.00
6.00	0.69	0.49	0.00	58.00	8.66	8.42	0.00
7.00	0.84	0.64	0.00	59.00	8.66	8.42	0.00
8.00	1.04	0.83	0.00	60.00	8.66	8.42	0.00
9.00	1.26	1.05	0.00	61.00	8.66	8.42	0.00
10.00	1.58	1.36	0.01	62.00	8.66	8.42	0.00
11.00	2.08	1.85	0.01	63.00	8.66	8.42	0.00
12.00	4.13	3.89	0.08	64.00	8.66	8.42	0.00
13.00	6.58	6.34	0.02	65.00	8.66	8.42	0.00
14.00	7.08	6.84	0.01	66.00	8.66	8.42	0.00
15.00	7.40	7.16	0.01	67.00	8.66	8.42	0.00
16.00	7.62	7.38	0.00	68.00	8.66	8.42	0.00
17.00	7.82	7.58	0.00	69.00	8.66	8.42	0.00
18.00	7.97	7.73	0.00	70.00	8.66	8.42	0.00
19.00	8.11	7.87	0.00	71.00	8.66	8.42	0.00
20.00	8.24	8.00	0.00	72.00	8.66	8.42	0.00
21.00	8.35	8.11	0.00				
22.00	8.46	8.22	0.00				
23.00	8.57	8.33	0.00				
24.00	8.66	8.42	0.00				
25.00	8.66	8.42	0.00				
26.00	8.66	8.42	0.00				
27.00	8.66	8.42	0.00				
28.00	8.66	8.42	0.00				
29.00	8.66	8.42	0.00				
30.00	8.66	8.42	0.00				
31.00	8.66	8.42	0.00				
32.00	8.66	8.42	0.00				
33.00	8.66	8.42	0.00				
34.00	8.66	8.42	0.00				
35.00	8.66	8.42	0.00				
36.00	8.66	8.42	0.00				
37.00	8.66	8.42	0.00				
38.00	8.66	8.42	0.00				
39.00	8.66	8.42	0.00				
40.00	8.66	8.42	0.00				
41.00	8.66	8.42	0.00				
42.00	8.66	8.42	0.00				
43.00	8.66	8.42	0.00				
44.00	8.66	8.42	0.00				
45.00	8.66	8.42	0.00				
46.00	8.66	8.42	0.00				
47.00	8.66	8.42	0.00				
48.00	8.66	8.42	0.00				
49.00	8.66	8.42	0.00				
50.00	8.66	8.42	0.00				
51.00	8.66	8.42	0.00				

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Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 7.26" for 100-Year-Current event
 Inflow = 11.25 cfs @ 12.17 hrs, Volume= 0.937 af
 Outflow = 7.80 cfs @ 12.27 hrs, Volume= 0.863 af, Atten= 31%, Lag= 6.1 min
 Primary = 7.80 cfs @ 12.27 hrs, Volume= 0.863 af
 Routed to Link 50L : DA East Total

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 132.31' @ 12.27 hrs Surf.Area= 3,531 sf Storage= 11,145 cf

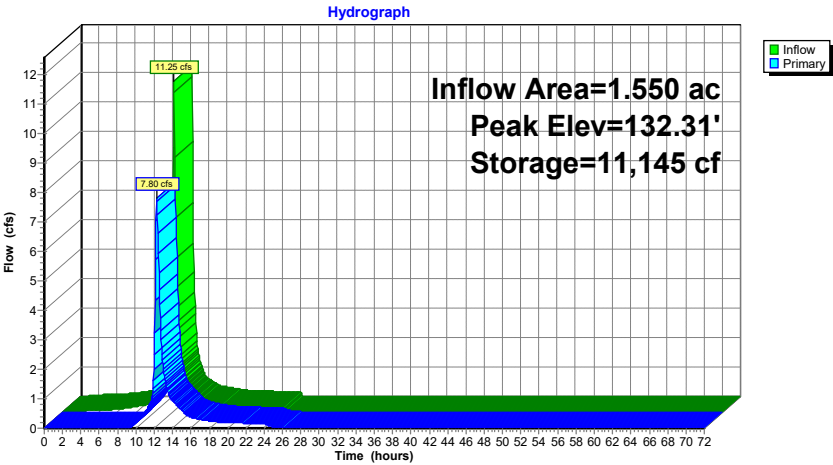
Plug-Flow detention time= 114.0 min calculated for 0.863 af (92% of inflow)
 Center-of-Mass det. time= 69.7 min (842.8 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

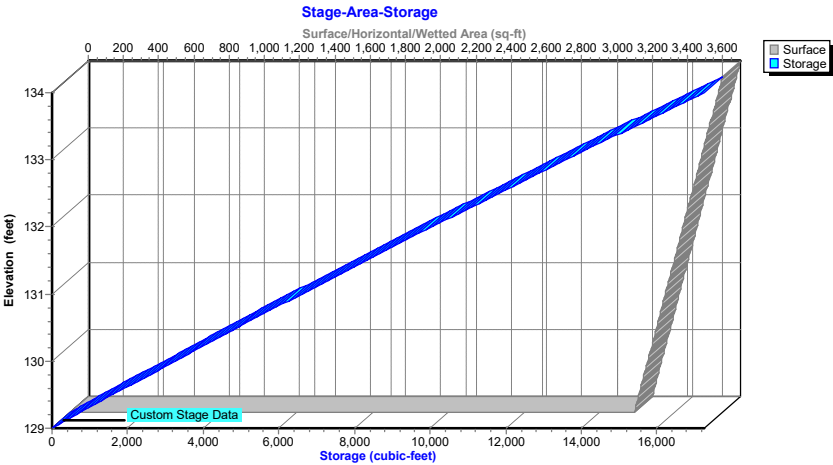
Device	Routing	Invert	Outlet Devices
#1	Primary	126.42'	15.0" Round RCP_Round 15" L= 12.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 126.42' / 126.09' S= 0.0275 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	130.00'	5.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	130.75'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	131.50'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=7.72 cfs @ 12.27 hrs HW=132.30' (Free Discharge)
 1=RCP_Round 15" (Passes 7.72 cfs of 16.92 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.90 cfs @ 6.96 fps)
 3=Orifice/Grate (Orifice Controls 3.87 cfs @ 4.92 fps)
 4=Sharp-Crested Rectangular Weir (Weir Controls 1.95 cfs @ 2.92 fps)

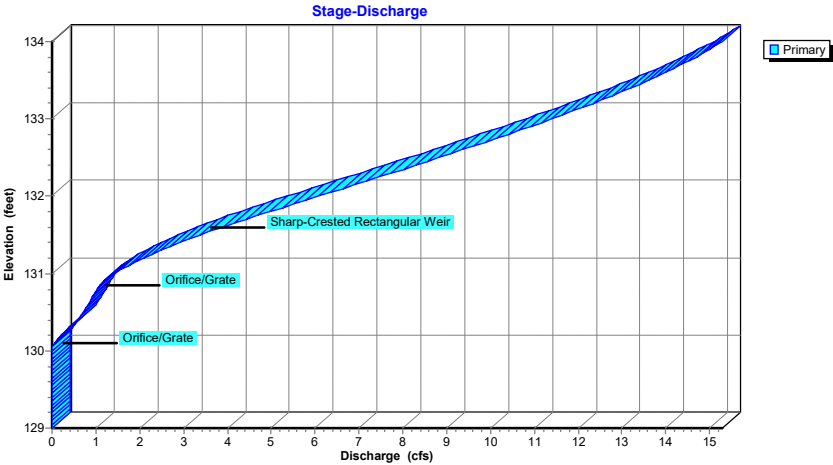
Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



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Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	129.00	0.00
2.50	0.06	243	129.08	0.00
5.00	0.09	904	129.28	0.00
7.50	0.17	2,005	129.62	0.00
10.00	0.41	3,989	130.22	0.24
12.50	3.08	9,547	131.86	5.28
15.00	0.40	4,659	130.42	0.61
17.50	0.25	4,046	130.24	0.27
20.00	0.19	3,907	130.20	0.19
22.50	0.15	3,841	130.18	0.16
25.00	0.00	3,554	130.09	0.05
27.50	0.00	3,368	130.04	0.01
30.00	0.00	3,305	130.02	0.00
32.50	0.00	3,275	130.01	0.00
35.00	0.00	3,262	130.00	0.00
37.50	0.00	3,255	130.00	0.00
40.00	0.00	3,253	130.00	0.00
42.50	0.00	3,251	130.00	0.00
45.00	0.00	3,251	130.00	0.00
47.50	0.00	3,250	130.00	0.00
50.00	0.00	3,250	130.00	0.00
52.50	0.00	3,250	130.00	0.00
55.00	0.00	3,250	130.00	0.00
57.50	0.00	3,250	130.00	0.00
60.00	0.00	3,250	130.00	0.00
62.50	0.00	3,250	130.00	0.00
65.00	0.00	3,250	130.00	0.00
67.50	0.00	3,250	130.00	0.00
70.00	0.00	3,250	130.00	0.00

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	3.88
129.05	0.00	131.65	4.17
129.10	0.00	131.70	4.44
129.15	0.00	131.75	4.69
129.20	0.00	131.80	4.97
129.25	0.00	131.85	5.24
129.30	0.00	131.90	5.52
129.35	0.00	131.95	5.80
129.40	0.00	132.00	6.07
129.45	0.00	132.05	6.35
129.50	0.00	132.10	6.63
129.55	0.00	132.15	6.91
129.60	0.00	132.20	7.19
129.65	0.00	132.25	7.46
129.70	0.00	132.30	7.74
129.75	0.00	132.35	8.01
129.80	0.00	132.40	8.29
129.85	0.00	132.45	8.56
129.90	0.00	132.50	8.83
129.95	0.00	132.55	9.10
130.00	0.00	132.60	9.37
130.05	0.01	132.65	9.63
130.10	0.05	132.70	9.89
130.15	0.12	132.75	10.15
130.20	0.20	132.80	10.41
130.25	0.29	132.85	10.66
130.30	0.39	132.90	10.91
130.35	0.49	132.95	11.16
130.40	0.58	133.00	11.40
130.45	0.65	133.05	11.64
130.50	0.71	133.10	11.88
130.55	0.77	133.15	12.11
130.60	0.82	133.20	12.34
130.65	0.87	133.25	12.56
130.70	0.92	133.30	12.78
130.75	0.97	133.35	12.99
130.80	1.02	133.40	13.20
130.85	1.10	133.45	13.40
130.90	1.19	133.50	13.60
130.95	1.30	133.55	13.80
131.00	1.43	133.60	13.99
131.05	1.57	133.65	14.17
131.10	1.73	133.70	14.35
131.15	1.91	133.75	14.52
131.20	2.09	133.80	14.69
131.25	2.29	133.85	14.85
131.30	2.49	133.90	15.00
131.35	2.70	133.95	15.15
131.40	2.92	134.00	15.29
131.45	3.14		
131.50	3.36		
131.55	3.61		

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Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

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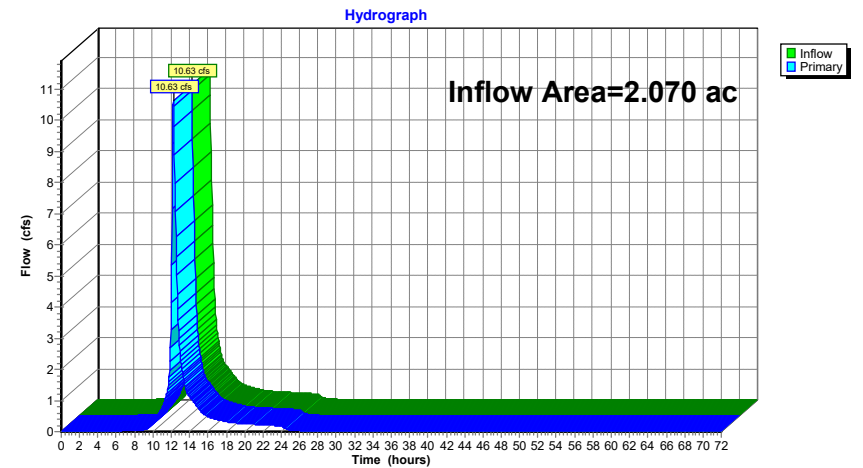
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Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 36.71% Impervious, Inflow Depth = 6.61" for 100-Year-Current event
Inflow = 10.63 cfs @ 12.22 hrs, Volume= 1.141 af
Primary = 10.63 cfs @ 12.22 hrs, Volume= 1.141 af, Atten= 0%, Lag= 0.0 min

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

Link 50L: DA East Total

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Hydrograph for Link 50L: DA East Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.01	0.00	0.01	57.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01	58.00	0.00	0.00	0.00
7.00	0.02	0.00	0.02	59.00	0.00	0.00	0.00
8.00	0.04	0.00	0.04	60.00	0.00	0.00	0.00
9.00	0.06	0.00	0.06	61.00	0.00	0.00	0.00
10.00	0.34	0.00	0.34	62.00	0.00	0.00	0.00
11.00	0.76	0.00	0.76	63.00	0.00	0.00	0.00
12.00	4.14	0.00	4.14	64.00	0.00	0.00	0.00
13.00	2.42	0.00	2.42	65.00	0.00	0.00	0.00
14.00	1.12	0.00	1.12	66.00	0.00	0.00	0.00
15.00	0.74	0.00	0.74	67.00	0.00	0.00	0.00
16.00	0.48	0.00	0.48	68.00	0.00	0.00	0.00
17.00	0.39	0.00	0.39	69.00	0.00	0.00	0.00
18.00	0.32	0.00	0.32	70.00	0.00	0.00	0.00
19.00	0.28	0.00	0.28	71.00	0.00	0.00	0.00
20.00	0.26	0.00	0.26	72.00	0.00	0.00	0.00
21.00	0.24	0.00	0.24				
22.00	0.22	0.00	0.22				
23.00	0.20	0.00	0.20				
24.00	0.19	0.00	0.19				
25.00	0.05	0.00	0.05				
26.00	0.02	0.00	0.02				
27.00	0.01	0.00	0.01				
28.00	0.01	0.00	0.01				
29.00	0.01	0.00	0.01				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

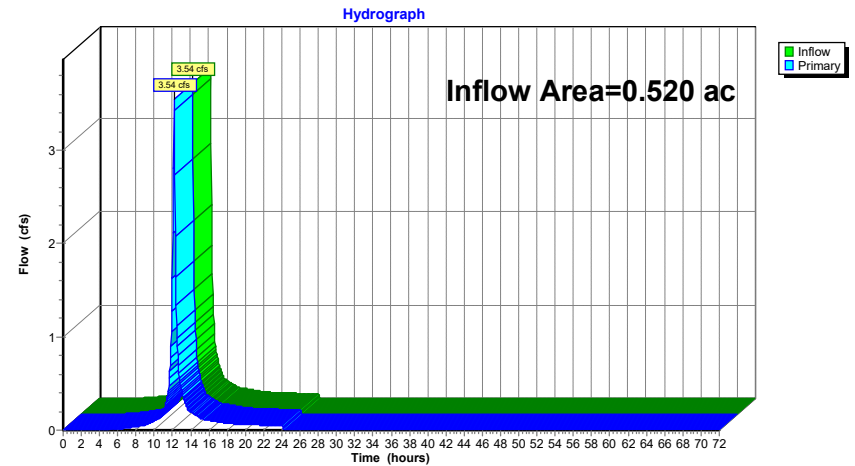
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Summary for Link 51L: DA East Undetained

Inflow Area = 0.520 ac, 7.69% Impervious, Inflow Depth = 6.41" for 100-Year-Current event
Inflow = 3.54 cfs @ 12.17 hrs, Volume= 0.278 af
Primary = 3.54 cfs @ 12.17 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
Routed to Link 50L : DA East Total

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

Link 51L: DA East Undetained

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NOAA 24-hr C 100-Year-Current Rainfall=8.66"

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Hydrograph for Link 51L: DA East Undetained

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.01	0.00	0.01	57.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01	58.00	0.00	0.00	0.00
7.00	0.02	0.00	0.02	59.00	0.00	0.00	0.00
8.00	0.04	0.00	0.04	60.00	0.00	0.00	0.00
9.00	0.06	0.00	0.06	61.00	0.00	0.00	0.00
10.00	0.10	0.00	0.10	62.00	0.00	0.00	0.00
11.00	0.21	0.00	0.21	63.00	0.00	0.00	0.00
12.00	1.63	0.00	1.63	64.00	0.00	0.00	0.00
13.00	0.42	0.00	0.42	65.00	0.00	0.00	0.00
14.00	0.19	0.00	0.19	66.00	0.00	0.00	0.00
15.00	0.13	0.00	0.13	67.00	0.00	0.00	0.00
16.00	0.11	0.00	0.11	68.00	0.00	0.00	0.00
17.00	0.09	0.00	0.09	69.00	0.00	0.00	0.00
18.00	0.07	0.00	0.07	70.00	0.00	0.00	0.00
19.00	0.07	0.00	0.07	71.00	0.00	0.00	0.00
20.00	0.06	0.00	0.06	72.00	0.00	0.00	0.00
21.00	0.06	0.00	0.06				
22.00	0.05	0.00	0.05				
23.00	0.05	0.00	0.05				
24.00	0.05	0.00	0.05				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

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- 74 Link 50L: DA East Total
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**HYDROGRAPH SUMMARY REPORTS –
WATER QUALITY STORM**

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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C



Rainfall Events Listing (selected events)								
Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQ	NJ DEP 2-hr		Default	2.00	1	1.25	2

Area Listing (all nodes)		
Area (acres)	CN	Description (subcatchment-numbers)
1.310	80	>75% Grass cover, Good, HSG D (9S, 52S, 53S)
0.130	98	Roofs, HSG D (54S)
0.630	98	Unconnected pavement, HSG D (51S, 54S, 55S)
2.070	87	TOTAL AREA

Soil Listing (all nodes)		
Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
2.070	HSG D	9S, 51S, 52S, 53S, 54S, 55S
0.000	Other	
2.070		TOTAL AREA

Ground Covers (all nodes)							
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.310	0.000	1.310	>75% Grass cover, Good	9S, 52S, 53S
0.000	0.000	0.000	0.130	0.000	0.130	Roofs	54S
0.000	0.000	0.000	0.630	0.000	0.630	Unconnected pavement	51S, 54S, 55S
0.000	0.000	0.000	2.070	0.000	2.070	TOTAL AREA	

Pipe Listing (all nodes)									
Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	51P	126.42	126.09	12.0	0.0275	0.013	0.0	15.0	0.0

Notes Listing (all nodes)		
Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C
2		Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 9S: DA Bioretention Basin	Runoff Area=0.830 ac 0.00% Impervious Runoff Depth=0.17" Flow Length=280' Tc=10.1 min CN=80 Runoff=0.33 cfs 0.012 af
Subcatchment 51S: DA East Undetained	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=0.05 cfs 0.002 af
Subcatchment 52S: DA Offsite East	Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=0.17" Tc=9.7 min CN=80 Runoff=0.02 cfs 0.001 af
Subcatchment 53S: DA East Undetained	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth=0.17" Tc=10.0 min CN=80 Runoff=0.17 cfs 0.006 af
Subcatchment 54S: DA Bioretention	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=1.03" Flow Length=280' Tc=10.1 min CN=98 Runoff=1.85 cfs 0.062 af
Subcatchment 55S: DA Offsite East	Runoff Area=0.020 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=0.05 cfs 0.002 af
Pond 51P: Bioretention Basin	Peak Elev=129.99' Storage=3,225 cf Inflow=2.11 cfs 0.074 af Outflow=0.00 cfs 0.000 af
Link 50L: DA East Total	Inflow=0.28 cfs 0.010 af Primary=0.28 cfs 0.010 af
Link 51L: DA East Undetained	Inflow=0.28 cfs 0.010 af Primary=0.28 cfs 0.010 af

Total Runoff Area = 2.070 ac Runoff Volume = 0.084 af Average Runoff Depth = 0.49"
63.29% Pervious = 1.310 ac 36.71% Impervious = 0.760 ac

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

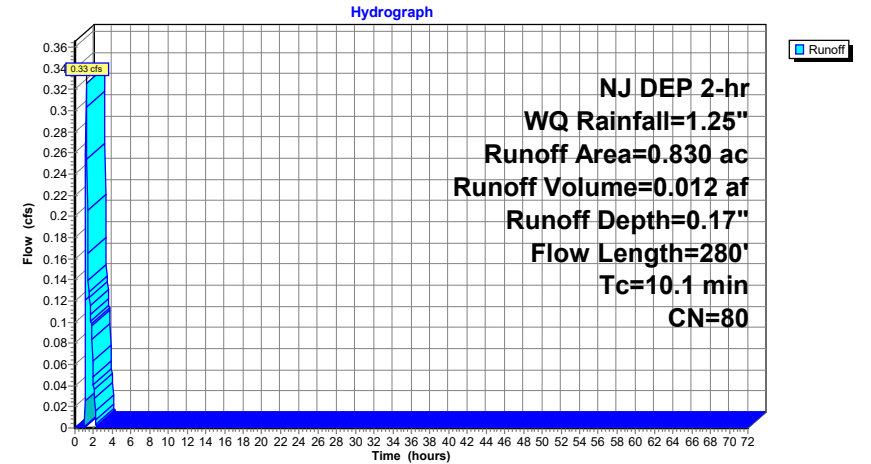
Runoff = 0.33 cfs @ 1.21 hrs, Volume= 0.012 af, Depth= 0.17"
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.830	80	>75% Grass cover, Good, HSG D
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 9S: DA Bioretention Basin (Perv)



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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	0.17	0.00
1.00	0.63	0.01	0.00	53.00	1.25	0.17	0.00
2.00	1.25	0.17	0.04	54.00	1.25	0.17	0.00
3.00	1.25	0.17	0.00	55.00	1.25	0.17	0.00
4.00	1.25	0.17	0.00	56.00	1.25	0.17	0.00
5.00	1.25	0.17	0.00	57.00	1.25	0.17	0.00
6.00	1.25	0.17	0.00	58.00	1.25	0.17	0.00
7.00	1.25	0.17	0.00	59.00	1.25	0.17	0.00
8.00	1.25	0.17	0.00	60.00	1.25	0.17	0.00
9.00	1.25	0.17	0.00	61.00	1.25	0.17	0.00
10.00	1.25	0.17	0.00	62.00	1.25	0.17	0.00
11.00	1.25	0.17	0.00	63.00	1.25	0.17	0.00
12.00	1.25	0.17	0.00	64.00	1.25	0.17	0.00
13.00	1.25	0.17	0.00	65.00	1.25	0.17	0.00
14.00	1.25	0.17	0.00	66.00	1.25	0.17	0.00
15.00	1.25	0.17	0.00	67.00	1.25	0.17	0.00
16.00	1.25	0.17	0.00	68.00	1.25	0.17	0.00
17.00	1.25	0.17	0.00	69.00	1.25	0.17	0.00
18.00	1.25	0.17	0.00	70.00	1.25	0.17	0.00
19.00	1.25	0.17	0.00	71.00	1.25	0.17	0.00
20.00	1.25	0.17	0.00	72.00	1.25	0.17	0.00
21.00	1.25	0.17	0.00				
22.00	1.25	0.17	0.00				
23.00	1.25	0.17	0.00				
24.00	1.25	0.17	0.00				
25.00	1.25	0.17	0.00				
26.00	1.25	0.17	0.00				
27.00	1.25	0.17	0.00				
28.00	1.25	0.17	0.00				
29.00	1.25	0.17	0.00				
30.00	1.25	0.17	0.00				
31.00	1.25	0.17	0.00				
32.00	1.25	0.17	0.00				
33.00	1.25	0.17	0.00				
34.00	1.25	0.17	0.00				
35.00	1.25	0.17	0.00				
36.00	1.25	0.17	0.00				
37.00	1.25	0.17	0.00				
38.00	1.25	0.17	0.00				
39.00	1.25	0.17	0.00				
40.00	1.25	0.17	0.00				
41.00	1.25	0.17	0.00				
42.00	1.25	0.17	0.00				
43.00	1.25	0.17	0.00				
44.00	1.25	0.17	0.00				
45.00	1.25	0.17	0.00				
46.00	1.25	0.17	0.00				
47.00	1.25	0.17	0.00				
48.00	1.25	0.17	0.00				
49.00	1.25	0.17	0.00				
50.00	1.25	0.17	0.00				
51.00	1.25	0.17	0.00				

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NJ DEP 2-hr WQ Rainfall=1.25"

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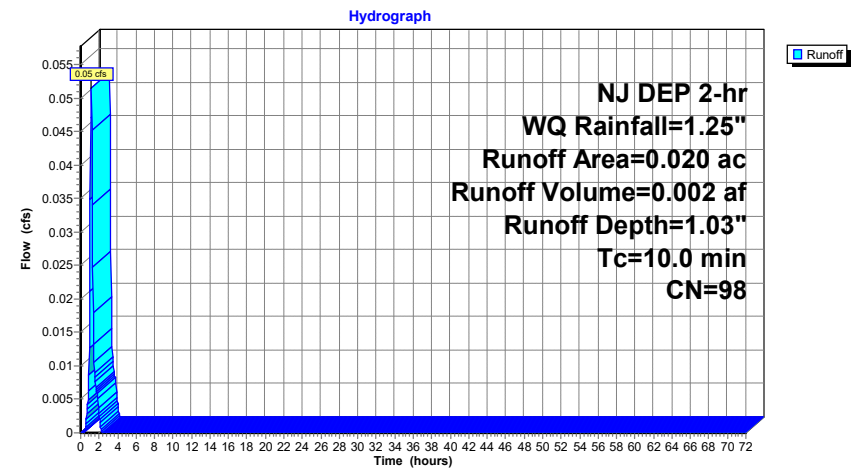
Summary for Subcatchment 51S: DA East Undetained (Imp)

Runoff = 0.05 cfs @ 1.15 hrs, Volume= 0.002 af, Depth= 1.03"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 51S: DA East Undetained (Imp)

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 51S: DA East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	1.03	0.00
1.00	0.63	0.43	0.02	53.00	1.25	1.03	0.00
2.00	1.25	1.03	0.00	54.00	1.25	1.03	0.00
3.00	1.25	1.03	0.00	55.00	1.25	1.03	0.00
4.00	1.25	1.03	0.00	56.00	1.25	1.03	0.00
5.00	1.25	1.03	0.00	57.00	1.25	1.03	0.00
6.00	1.25	1.03	0.00	58.00	1.25	1.03	0.00
7.00	1.25	1.03	0.00	59.00	1.25	1.03	0.00
8.00	1.25	1.03	0.00	60.00	1.25	1.03	0.00
9.00	1.25	1.03	0.00	61.00	1.25	1.03	0.00
10.00	1.25	1.03	0.00	62.00	1.25	1.03	0.00
11.00	1.25	1.03	0.00	63.00	1.25	1.03	0.00
12.00	1.25	1.03	0.00	64.00	1.25	1.03	0.00
13.00	1.25	1.03	0.00	65.00	1.25	1.03	0.00
14.00	1.25	1.03	0.00	66.00	1.25	1.03	0.00
15.00	1.25	1.03	0.00	67.00	1.25	1.03	0.00
16.00	1.25	1.03	0.00	68.00	1.25	1.03	0.00
17.00	1.25	1.03	0.00	69.00	1.25	1.03	0.00
18.00	1.25	1.03	0.00	70.00	1.25	1.03	0.00
19.00	1.25	1.03	0.00	71.00	1.25	1.03	0.00
20.00	1.25	1.03	0.00	72.00	1.25	1.03	0.00
21.00	1.25	1.03	0.00				
22.00	1.25	1.03	0.00				
23.00	1.25	1.03	0.00				
24.00	1.25	1.03	0.00				
25.00	1.25	1.03	0.00				
26.00	1.25	1.03	0.00				
27.00	1.25	1.03	0.00				
28.00	1.25	1.03	0.00				
29.00	1.25	1.03	0.00				
30.00	1.25	1.03	0.00				
31.00	1.25	1.03	0.00				
32.00	1.25	1.03	0.00				
33.00	1.25	1.03	0.00				
34.00	1.25	1.03	0.00				
35.00	1.25	1.03	0.00				
36.00	1.25	1.03	0.00				
37.00	1.25	1.03	0.00				
38.00	1.25	1.03	0.00				
39.00	1.25	1.03	0.00				
40.00	1.25	1.03	0.00				
41.00	1.25	1.03	0.00				
42.00	1.25	1.03	0.00				
43.00	1.25	1.03	0.00				
44.00	1.25	1.03	0.00				
45.00	1.25	1.03	0.00				
46.00	1.25	1.03	0.00				
47.00	1.25	1.03	0.00				
48.00	1.25	1.03	0.00				
49.00	1.25	1.03	0.00				
50.00	1.25	1.03	0.00				
51.00	1.25	1.03	0.00				

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NJ DEP 2-hr WQ Rainfall=1.25"

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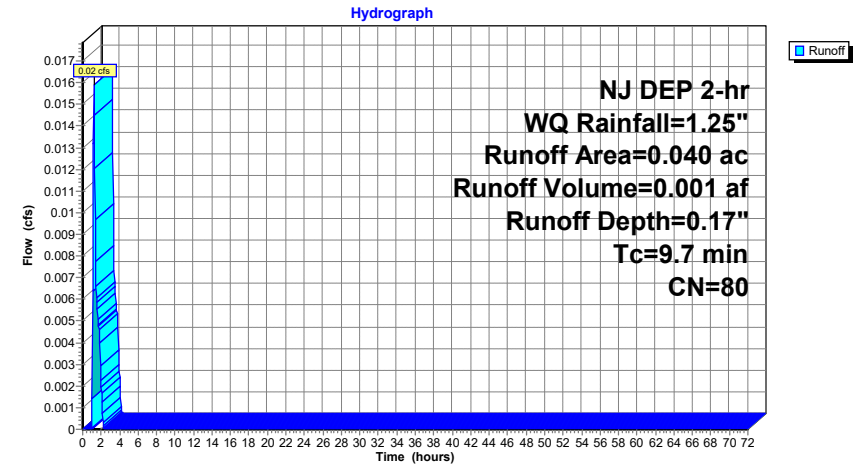
Summary for Subcatchment 52S: DA Offsite East Undetained (Perv)

Runoff = 0.02 cfs @ 1.21 hrs, Volume= 0.001 af, Depth= 0.17"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.040	80	>75% Grass cover, Good, HSG D
0.040		100.00% Pervious Area

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

Subcatchment 52S: DA Offsite East Undetained (Perv)

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 52S: DA Offsite East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	0.17	0.00
1.00	0.63	0.01	0.00	53.00	1.25	0.17	0.00
2.00	1.25	0.17	0.00	54.00	1.25	0.17	0.00
3.00	1.25	0.17	0.00	55.00	1.25	0.17	0.00
4.00	1.25	0.17	0.00	56.00	1.25	0.17	0.00
5.00	1.25	0.17	0.00	57.00	1.25	0.17	0.00
6.00	1.25	0.17	0.00	58.00	1.25	0.17	0.00
7.00	1.25	0.17	0.00	59.00	1.25	0.17	0.00
8.00	1.25	0.17	0.00	60.00	1.25	0.17	0.00
9.00	1.25	0.17	0.00	61.00	1.25	0.17	0.00
10.00	1.25	0.17	0.00	62.00	1.25	0.17	0.00
11.00	1.25	0.17	0.00	63.00	1.25	0.17	0.00
12.00	1.25	0.17	0.00	64.00	1.25	0.17	0.00
13.00	1.25	0.17	0.00	65.00	1.25	0.17	0.00
14.00	1.25	0.17	0.00	66.00	1.25	0.17	0.00
15.00	1.25	0.17	0.00	67.00	1.25	0.17	0.00
16.00	1.25	0.17	0.00	68.00	1.25	0.17	0.00
17.00	1.25	0.17	0.00	69.00	1.25	0.17	0.00
18.00	1.25	0.17	0.00	70.00	1.25	0.17	0.00
19.00	1.25	0.17	0.00	71.00	1.25	0.17	0.00
20.00	1.25	0.17	0.00	72.00	1.25	0.17	0.00
21.00	1.25	0.17	0.00				
22.00	1.25	0.17	0.00				
23.00	1.25	0.17	0.00				
24.00	1.25	0.17	0.00				
25.00	1.25	0.17	0.00				
26.00	1.25	0.17	0.00				
27.00	1.25	0.17	0.00				
28.00	1.25	0.17	0.00				
29.00	1.25	0.17	0.00				
30.00	1.25	0.17	0.00				
31.00	1.25	0.17	0.00				
32.00	1.25	0.17	0.00				
33.00	1.25	0.17	0.00				
34.00	1.25	0.17	0.00				
35.00	1.25	0.17	0.00				
36.00	1.25	0.17	0.00				
37.00	1.25	0.17	0.00				
38.00	1.25	0.17	0.00				
39.00	1.25	0.17	0.00				
40.00	1.25	0.17	0.00				
41.00	1.25	0.17	0.00				
42.00	1.25	0.17	0.00				
43.00	1.25	0.17	0.00				
44.00	1.25	0.17	0.00				
45.00	1.25	0.17	0.00				
46.00	1.25	0.17	0.00				
47.00	1.25	0.17	0.00				
48.00	1.25	0.17	0.00				
49.00	1.25	0.17	0.00				
50.00	1.25	0.17	0.00				
51.00	1.25	0.17	0.00				

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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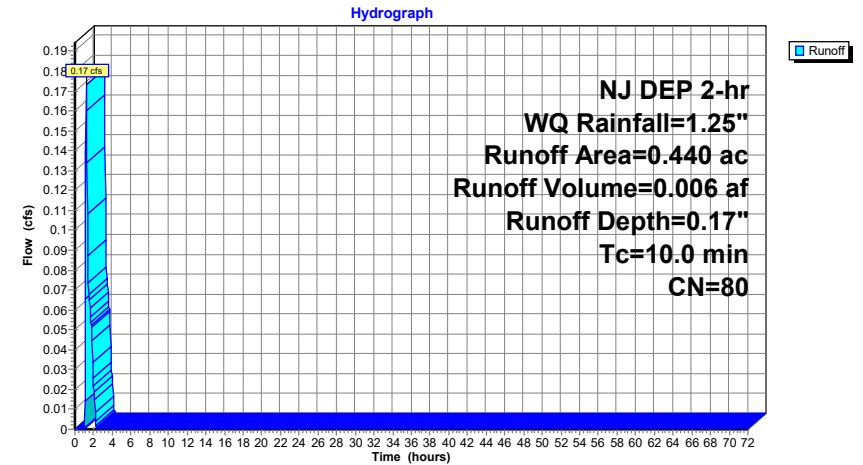
Summary for Subcatchment 53S: DA East Undetained (Perv)

Runoff = 0.17 cfs @ 1.21 hrs, Volume= 0.006 af, Depth= 0.17"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.440	80	>75% Grass cover, Good, HSG D
0.440		100.00% Pervious Area

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

Subcatchment 53S: DA East Undetained (Perv)

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 53S: DA East Undetained (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	0.17	0.00
1.00	0.63	0.01	0.00	53.00	1.25	0.17	0.00
2.00	1.25	0.17	0.02	54.00	1.25	0.17	0.00
3.00	1.25	0.17	0.00	55.00	1.25	0.17	0.00
4.00	1.25	0.17	0.00	56.00	1.25	0.17	0.00
5.00	1.25	0.17	0.00	57.00	1.25	0.17	0.00
6.00	1.25	0.17	0.00	58.00	1.25	0.17	0.00
7.00	1.25	0.17	0.00	59.00	1.25	0.17	0.00
8.00	1.25	0.17	0.00	60.00	1.25	0.17	0.00
9.00	1.25	0.17	0.00	61.00	1.25	0.17	0.00
10.00	1.25	0.17	0.00	62.00	1.25	0.17	0.00
11.00	1.25	0.17	0.00	63.00	1.25	0.17	0.00
12.00	1.25	0.17	0.00	64.00	1.25	0.17	0.00
13.00	1.25	0.17	0.00	65.00	1.25	0.17	0.00
14.00	1.25	0.17	0.00	66.00	1.25	0.17	0.00
15.00	1.25	0.17	0.00	67.00	1.25	0.17	0.00
16.00	1.25	0.17	0.00	68.00	1.25	0.17	0.00
17.00	1.25	0.17	0.00	69.00	1.25	0.17	0.00
18.00	1.25	0.17	0.00	70.00	1.25	0.17	0.00
19.00	1.25	0.17	0.00	71.00	1.25	0.17	0.00
20.00	1.25	0.17	0.00	72.00	1.25	0.17	0.00
21.00	1.25	0.17	0.00				
22.00	1.25	0.17	0.00				
23.00	1.25	0.17	0.00				
24.00	1.25	0.17	0.00				
25.00	1.25	0.17	0.00				
26.00	1.25	0.17	0.00				
27.00	1.25	0.17	0.00				
28.00	1.25	0.17	0.00				
29.00	1.25	0.17	0.00				
30.00	1.25	0.17	0.00				
31.00	1.25	0.17	0.00				
32.00	1.25	0.17	0.00				
33.00	1.25	0.17	0.00				
34.00	1.25	0.17	0.00				
35.00	1.25	0.17	0.00				
36.00	1.25	0.17	0.00				
37.00	1.25	0.17	0.00				
38.00	1.25	0.17	0.00				
39.00	1.25	0.17	0.00				
40.00	1.25	0.17	0.00				
41.00	1.25	0.17	0.00				
42.00	1.25	0.17	0.00				
43.00	1.25	0.17	0.00				
44.00	1.25	0.17	0.00				
45.00	1.25	0.17	0.00				
46.00	1.25	0.17	0.00				
47.00	1.25	0.17	0.00				
48.00	1.25	0.17	0.00				
49.00	1.25	0.17	0.00				
50.00	1.25	0.17	0.00				
51.00	1.25	0.17	0.00				

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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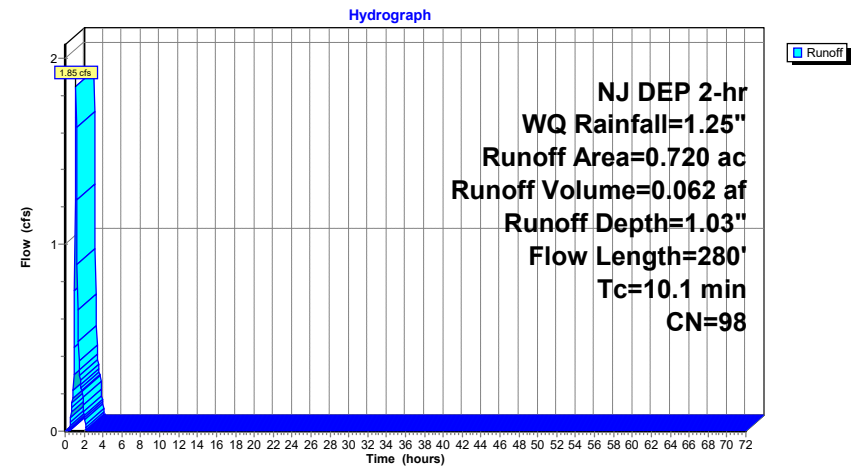
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 1.85 cfs @ 1.15 hrs, Volume= 0.062 af, Depth= 1.03"
 Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	1.03	0.00
1.00	0.63	0.43	0.75	53.00	1.25	1.03	0.00
2.00	1.25	1.03	0.09	54.00	1.25	1.03	0.00
3.00	1.25	1.03	0.00	55.00	1.25	1.03	0.00
4.00	1.25	1.03	0.00	56.00	1.25	1.03	0.00
5.00	1.25	1.03	0.00	57.00	1.25	1.03	0.00
6.00	1.25	1.03	0.00	58.00	1.25	1.03	0.00
7.00	1.25	1.03	0.00	59.00	1.25	1.03	0.00
8.00	1.25	1.03	0.00	60.00	1.25	1.03	0.00
9.00	1.25	1.03	0.00	61.00	1.25	1.03	0.00
10.00	1.25	1.03	0.00	62.00	1.25	1.03	0.00
11.00	1.25	1.03	0.00	63.00	1.25	1.03	0.00
12.00	1.25	1.03	0.00	64.00	1.25	1.03	0.00
13.00	1.25	1.03	0.00	65.00	1.25	1.03	0.00
14.00	1.25	1.03	0.00	66.00	1.25	1.03	0.00
15.00	1.25	1.03	0.00	67.00	1.25	1.03	0.00
16.00	1.25	1.03	0.00	68.00	1.25	1.03	0.00
17.00	1.25	1.03	0.00	69.00	1.25	1.03	0.00
18.00	1.25	1.03	0.00	70.00	1.25	1.03	0.00
19.00	1.25	1.03	0.00	71.00	1.25	1.03	0.00
20.00	1.25	1.03	0.00	72.00	1.25	1.03	0.00
21.00	1.25	1.03	0.00				
22.00	1.25	1.03	0.00				
23.00	1.25	1.03	0.00				
24.00	1.25	1.03	0.00				
25.00	1.25	1.03	0.00				
26.00	1.25	1.03	0.00				
27.00	1.25	1.03	0.00				
28.00	1.25	1.03	0.00				
29.00	1.25	1.03	0.00				
30.00	1.25	1.03	0.00				
31.00	1.25	1.03	0.00				
32.00	1.25	1.03	0.00				
33.00	1.25	1.03	0.00				
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37.00	1.25	1.03	0.00				
38.00	1.25	1.03	0.00				
39.00	1.25	1.03	0.00				
40.00	1.25	1.03	0.00				
41.00	1.25	1.03	0.00				
42.00	1.25	1.03	0.00				
43.00	1.25	1.03	0.00				
44.00	1.25	1.03	0.00				
45.00	1.25	1.03	0.00				
46.00	1.25	1.03	0.00				
47.00	1.25	1.03	0.00				
48.00	1.25	1.03	0.00				
49.00	1.25	1.03	0.00				
50.00	1.25	1.03	0.00				
51.00	1.25	1.03	0.00				

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NJ DEP 2-hr WQ Rainfall=1.25"

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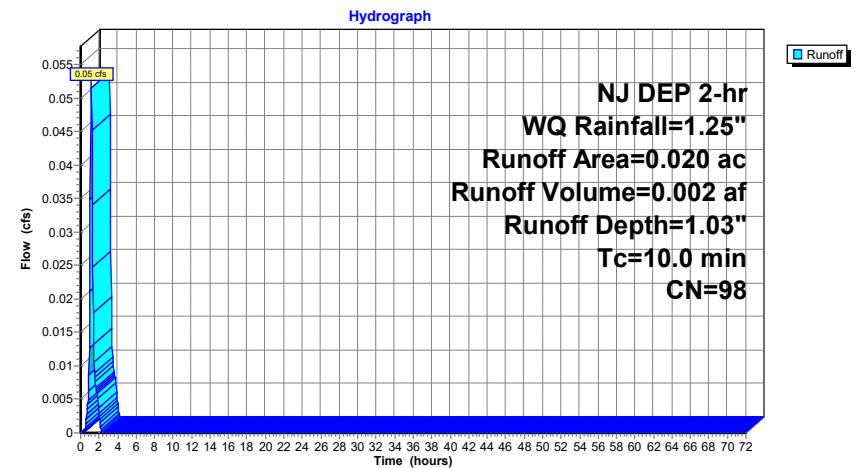
Summary for Subcatchment 55S: DA Offsite East Undetained (Imp)

Runoff = 0.05 cfs @ 1.15 hrs, Volume= 0.002 af, Depth= 1.03"
 Routed to Link 51L : DA East Undetained

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.020	98	Unconnected pavement, HSG D
0.020		100.00% Impervious Area
0.020		100.00% Unconnected

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

Subcatchment 55S: DA Offsite East Undetained (Imp)

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Subcatchment 55S: DA Offsite East Undetained (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.25	1.03	0.00
1.00	0.63	0.43	0.02	53.00	1.25	1.03	0.00
2.00	1.25	1.03	0.00	54.00	1.25	1.03	0.00
3.00	1.25	1.03	0.00	55.00	1.25	1.03	0.00
4.00	1.25	1.03	0.00	56.00	1.25	1.03	0.00
5.00	1.25	1.03	0.00	57.00	1.25	1.03	0.00
6.00	1.25	1.03	0.00	58.00	1.25	1.03	0.00
7.00	1.25	1.03	0.00	59.00	1.25	1.03	0.00
8.00	1.25	1.03	0.00	60.00	1.25	1.03	0.00
9.00	1.25	1.03	0.00	61.00	1.25	1.03	0.00
10.00	1.25	1.03	0.00	62.00	1.25	1.03	0.00
11.00	1.25	1.03	0.00	63.00	1.25	1.03	0.00
12.00	1.25	1.03	0.00	64.00	1.25	1.03	0.00
13.00	1.25	1.03	0.00	65.00	1.25	1.03	0.00
14.00	1.25	1.03	0.00	66.00	1.25	1.03	0.00
15.00	1.25	1.03	0.00	67.00	1.25	1.03	0.00
16.00	1.25	1.03	0.00	68.00	1.25	1.03	0.00
17.00	1.25	1.03	0.00	69.00	1.25	1.03	0.00
18.00	1.25	1.03	0.00	70.00	1.25	1.03	0.00
19.00	1.25	1.03	0.00	71.00	1.25	1.03	0.00
20.00	1.25	1.03	0.00	72.00	1.25	1.03	0.00
21.00	1.25	1.03	0.00				
22.00	1.25	1.03	0.00				
23.00	1.25	1.03	0.00				
24.00	1.25	1.03	0.00				
25.00	1.25	1.03	0.00				
26.00	1.25	1.03	0.00				
27.00	1.25	1.03	0.00				
28.00	1.25	1.03	0.00				
29.00	1.25	1.03	0.00				
30.00	1.25	1.03	0.00				
31.00	1.25	1.03	0.00				
32.00	1.25	1.03	0.00				
33.00	1.25	1.03	0.00				
34.00	1.25	1.03	0.00				
35.00	1.25	1.03	0.00				
36.00	1.25	1.03	0.00				
37.00	1.25	1.03	0.00				
38.00	1.25	1.03	0.00				
39.00	1.25	1.03	0.00				
40.00	1.25	1.03	0.00				
41.00	1.25	1.03	0.00				
42.00	1.25	1.03	0.00				
43.00	1.25	1.03	0.00				
44.00	1.25	1.03	0.00				
45.00	1.25	1.03	0.00				
46.00	1.25	1.03	0.00				
47.00	1.25	1.03	0.00				
48.00	1.25	1.03	0.00				
49.00	1.25	1.03	0.00				
50.00	1.25	1.03	0.00				
51.00	1.25	1.03	0.00				

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 0.57" for WQ event
 Inflow = 2.11 cfs @ 1.16 hrs, Volume= 0.074 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
 Routed to Link 50L : DA East Total

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 129.99' @ 2.65 hrs Surf.Area= 3,299 sf Storage= 3,225 cf

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

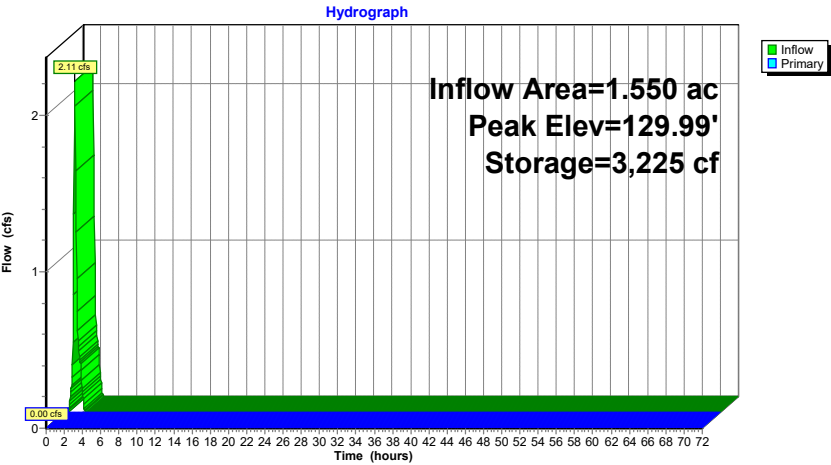
Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

Device	Routing	Invert	Outlet Devices
#1	Primary	126.42'	15.0" Round RCP_Round 15" L= 12.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 126.42' / 126.09' S= 0.0275 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	130.00'	5.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	130.75'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	131.50'	1.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

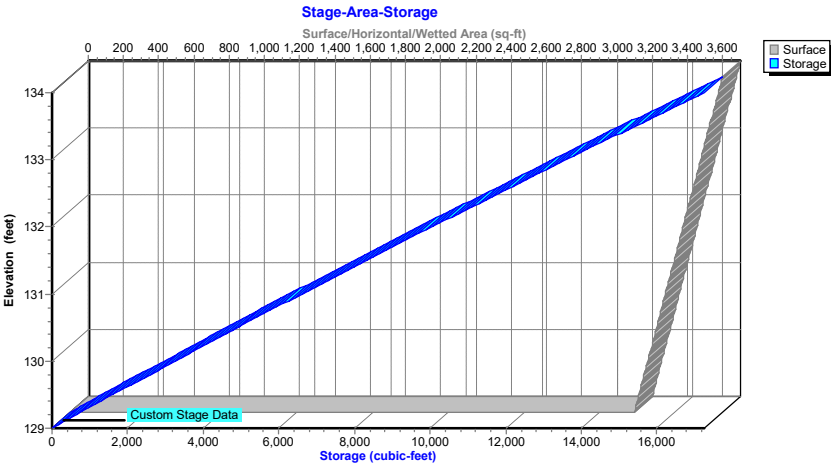
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=129.00' (Free Discharge)

- 1=RCP_Round 15" (Passes 0.00 cfs of 10.33 cfs potential flow)
- 2=Orifice/Grate (Controls 0.00 cfs)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

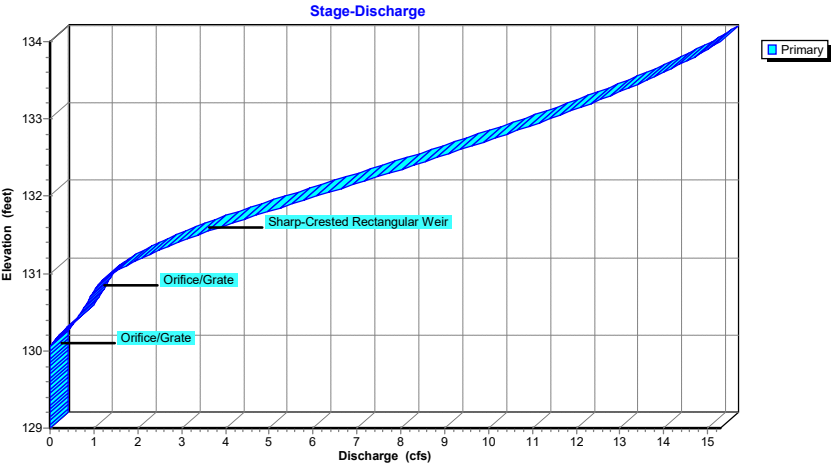
Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	129.00	0.00
2.50	0.00	3,225	129.99	0.00
5.00	0.00	3,225	129.99	0.00
7.50	0.00	3,225	129.99	0.00
10.00	0.00	3,225	129.99	0.00
12.50	0.00	3,225	129.99	0.00
15.00	0.00	3,225	129.99	0.00
17.50	0.00	3,225	129.99	0.00
20.00	0.00	3,225	129.99	0.00
22.50	0.00	3,225	129.99	0.00
25.00	0.00	3,225	129.99	0.00
27.50	0.00	3,225	129.99	0.00
30.00	0.00	3,225	129.99	0.00
32.50	0.00	3,225	129.99	0.00
35.00	0.00	3,225	129.99	0.00
37.50	0.00	3,225	129.99	0.00
40.00	0.00	3,225	129.99	0.00
42.50	0.00	3,225	129.99	0.00
45.00	0.00	3,225	129.99	0.00
47.50	0.00	3,225	129.99	0.00
50.00	0.00	3,225	129.99	0.00
52.50	0.00	3,225	129.99	0.00
55.00	0.00	3,225	129.99	0.00
57.50	0.00	3,225	129.99	0.00
60.00	0.00	3,225	129.99	0.00
62.50	0.00	3,225	129.99	0.00
65.00	0.00	3,225	129.99	0.00
67.50	0.00	3,225	129.99	0.00
70.00	0.00	3,225	129.99	0.00

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	3.88
129.05	0.00	131.65	4.17
129.10	0.00	131.70	4.44
129.15	0.00	131.75	4.69
129.20	0.00	131.80	4.97
129.25	0.00	131.85	5.24
129.30	0.00	131.90	5.52
129.35	0.00	131.95	5.80
129.40	0.00	132.00	6.07
129.45	0.00	132.05	6.35
129.50	0.00	132.10	6.63
129.55	0.00	132.15	6.91
129.60	0.00	132.20	7.19
129.65	0.00	132.25	7.46
129.70	0.00	132.30	7.74
129.75	0.00	132.35	8.01
129.80	0.00	132.40	8.29
129.85	0.00	132.45	8.56
129.90	0.00	132.50	8.83
129.95	0.00	132.55	9.10
130.00	0.00	132.60	9.37
130.05	0.01	132.65	9.63
130.10	0.05	132.70	9.89
130.15	0.12	132.75	10.15
130.20	0.20	132.80	10.41
130.25	0.29	132.85	10.66
130.30	0.39	132.90	10.91
130.35	0.49	132.95	11.16
130.40	0.58	133.00	11.40
130.45	0.65	133.05	11.64
130.50	0.71	133.10	11.88
130.55	0.77	133.15	12.11
130.60	0.82	133.20	12.34
130.65	0.87	133.25	12.56
130.70	0.92	133.30	12.78
130.75	0.97	133.35	12.99
130.80	1.02	133.40	13.20
130.85	1.10	133.45	13.40
130.90	1.19	133.50	13.60
130.95	1.30	133.55	13.80
131.00	1.43	133.60	13.99
131.05	1.57	133.65	14.17
131.10	1.73	133.70	14.35
131.15	1.91	133.75	14.52
131.20	2.09	133.80	14.69
131.25	2.29	133.85	14.85
131.30	2.49	133.90	15.00
131.35	2.70	133.95	15.15
131.40	2.92	134.00	15.29
131.45	3.14		
131.50	3.36		
131.55	3.61		

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

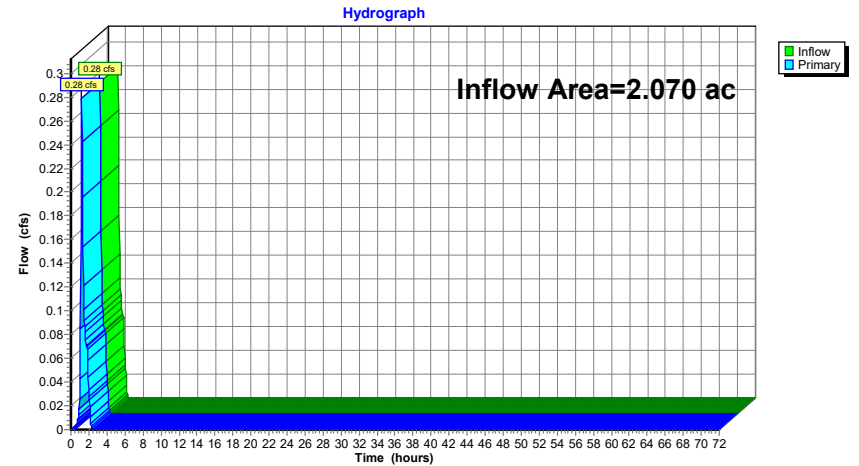
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Summary for Link 50L: DA East Total

Inflow Area = 2.070 ac, 36.71% Impervious, Inflow Depth = 0.06" for WQ event
Inflow = 0.28 cfs @ 1.19 hrs, Volume= 0.010 af
Primary = 0.28 cfs @ 1.19 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

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

Link 50L: DA East Total

Hydrograph for Link 50L: DA East Total

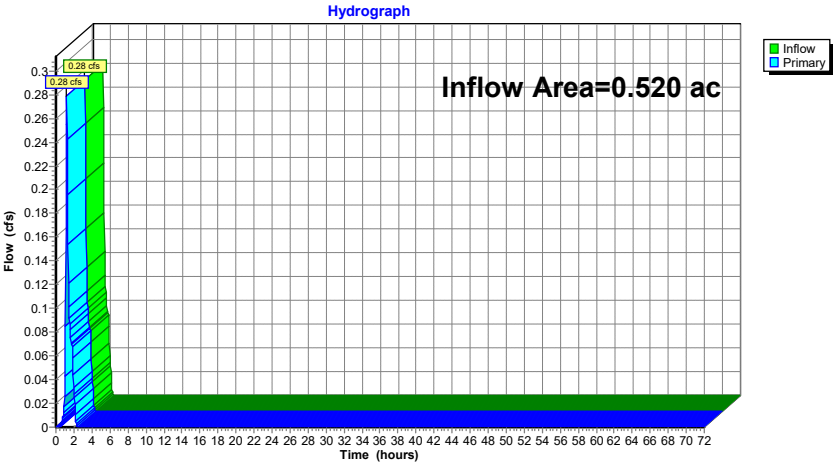
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.04	0.00	0.04	53.00	0.00	0.00	0.00
2.00	0.03	0.00	0.03	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	66.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	67.00	0.00	0.00	0.00
16.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00
17.00	0.00	0.00	0.00	69.00	0.00	0.00	0.00
18.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00
19.00	0.00	0.00	0.00	71.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00	72.00	0.00	0.00	0.00
21.00	0.00	0.00	0.00				
22.00	0.00	0.00	0.00				
23.00	0.00	0.00	0.00				
24.00	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link 51L: DA East Undetained

Inflow Area = 0.520 ac, 7.69% Impervious, Inflow Depth = 0.24" for WQ event
Inflow = 0.28 cfs @ 1.19 hrs, Volume= 0.010 af
Primary = 0.28 cfs @ 1.19 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Routed to Link 50L : DA East Total

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

Link 51L: DA East Undetained



2023-08-09 Proposed Hydrology

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NJ DEP 2-hr WQ Rainfall=1.25"

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Hydrograph for Link 51L: DA East Undetained

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	0.04	0.00	0.04	53.00	0.00	0.00	0.00
2.00	0.03	0.00	0.03	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	66.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	67.00	0.00	0.00	0.00
16.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00
17.00	0.00	0.00	0.00	69.00	0.00	0.00	0.00
18.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00
19.00	0.00	0.00	0.00	71.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00	72.00	0.00	0.00	0.00
21.00	0.00	0.00	0.00				
22.00	0.00	0.00	0.00				
23.00	0.00	0.00	0.00				
24.00	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

2023-08-09 Proposed Hydrology

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STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)



DYNAMIC ENGINEERING

Stormwater Collection System Calculations

Project: Prop. Day School

Job #: 4447-22-01334

Location: Montgomery

Design Storm: 25 YR

Computed By: SS

Checked By: JSH

Date: 8/24/2023

Revised:

NOTES:

1) Design method used is Rational Method

2) Refer to Weighted Runoff Coefficient table for calculation of incremental areas and C values

3) OCS was designed to manage 100-YR storm

PIPE SECTION		SUBCATCH MENT AREA	INCREMENTAL		CUMULATIVE	TIME OF CONCENTRATION			I	PEAK RUNOFF		PIPING INPUT			PIPING DATA			
FROM	TO	Area (Acres)	"C"	A x C Ac	A x C (acres)	Tc to Inlet (min)	Tc in Pipe (min.)	Final Tc (min)	(In/Hr)	Q to Inlet (CFS)	Q cum. for Pipe (CFS)	Dia. (In)	Length (Ft)	Man. "n"	Slope (ft/ft)	Pipe Capacity (cfs)	Full Pipe Velocity (fps)	Actual Pipe Velocity (fps)
Inlet #140	Inlet #130	0.09	0.46	0.04	0.04	10.00	0.14	10.00	6.80	0.27	0.27	12	30.0	0.012	0.0050	2.73	3.48	1.40
Inlet #130	Inlet #120	0.10	0.56	0.06	0.10	10.00	0.52	10.14	6.80	0.41	0.68	12	108.0	0.012	0.0050	2.73	3.48	2.44
Inlet #125	Inlet #120	0.31	0.81	0.25	0.25	10.00	0.04	10.00	6.80	1.70	1.70	12	8.0	0.012	0.0050	2.73	3.48	3.77
Inlet #120	Inlet #110	0.16	0.88	0.14	0.49	10.00	0.41	10.66	6.68	0.94	3.27	15	100.0	0.012	0.0050	4.95	4.04	4.46
Inlet #115	MH #1	0.18	0.35	0.06	0.06	10.00	0.42	10.00	6.80	0.41	0.41	12	45.0	0.012	0.0050	2.73	3.48	1.80
MH #1	Inlet #110	0.00	0.95	0.00	0.06	10.00	0.20	10.42	6.80	0.00	0.41	12	42.0	0.012	0.0050	2.73	3.48	1.80
Inlet #110	Basin A	0.10	0.92	0.09	0.64	10.00	0.17	11.07	6.56	0.59	4.20	15	95.0	0.012	0.0260	11.28	9.20	8.00
OCS A	MH #210					10.00	0.02	10.00	6.80	7.28	7.28	15	12.0	0.012	0.0285	11.81	9.63	10.46
MH #210	MH #220	0.00	0.95	0.00	1.07	10.00	0.11	10.02	6.80	0.00	7.28	15	61.0	0.012	0.0275	11.60	9.46	10.32
MH #220	EX MH #230	0.00	0.95	0.00	1.07	10.00	0.08	10.13	6.80	0.00	7.28	15	88.0	0.012	0.1082	23.01	18.76	15.11

CONDUIT OUTLET PROTECTION CALCULATIONS

Conduit Outlet Protection Calculations

Rip Rap Pad # 1

Design Parameters:

Design Storm Flow for 25 Year, Q	4.20 cfs
Vertical Dimension of Outlet Pipe, D_o	15 in
Horizontal Dimension of Outlet Pipe, W_o	15 in
Tailwater Depth, TW^1	1.84 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/D_o = 3.36$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

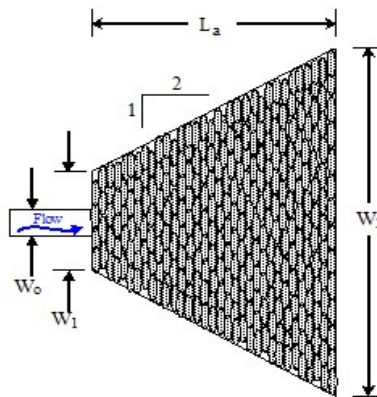
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 9.02 \text{ ft}$$

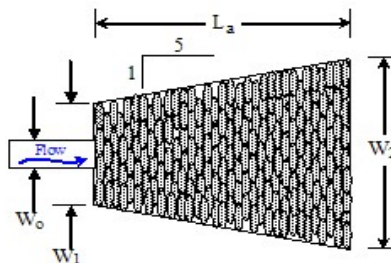
$$\text{Width, } W_1 = 3W_o = 3.75 \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 7.36 \text{ ft}$$

or $L_a = 10 \text{ ft}$

or $W_1 = 4 \text{ ft}$

or $W_2 = 8 \text{ ft}$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.65 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

1. Tailwater depth shall be the 2-year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.
2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

Conduit Outlet Protection Calculations

Rip Rap Pad # 2

Design Parameters:

Design Storm Flow for 25 Year, Q	0.83 cfs
Vertical Dimension of Outlet Pipe, D_o	8 in
Horizontal Dimension of Outlet Pipe, W_o	8 in
Tailwater Depth, TW^1	1.84 ft

Apron Dimension Calculations:

Unit Discharge, $q = Q/D_o = 1.25$ cfs per foot

• Case I: $TW < 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$$

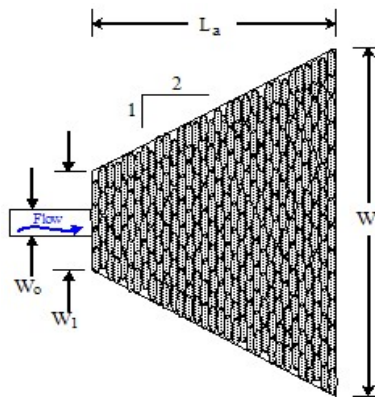
$$\text{Width, } W_1 = 3W_o =$$

$$\text{Width, } W_2 = 3W_o + L_a =$$

$$L_a =$$

$$W_1 =$$

$$W_2 =$$



• Case II: $TW \geq 1/2 D_o$

$$\text{Apron Length, } L_a = \frac{3q}{D_o^{1/2}} = 4.57 \text{ ft}$$

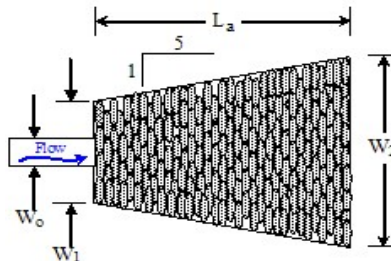
$$\text{Width, } W_1 = 3W_o = 2. \text{ ft}$$

$$\text{Width, } W_2 = 3W_o + 0.4L_a = 3.83 \text{ ft}$$

or $L_a = 6 \text{ ft}$

or $W_1 = 2 \text{ ft}$

or $W_2 = 6 \text{ ft}$



Rip Rap Stone Size Calculations:

$$\text{Median Stone, } d_{50} = \frac{0.02q^{1.33}}{TW} = 0.17 \text{ in}$$

$$d_{50} = 6 \text{ in}$$

Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as d_{50} . The largest stone size in the mixture shall be 1.5 times the d_{50} size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

Footnote:

1. Tailwater depth shall be the 2-year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use $TW = 0.2D_o$.
2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to $1/4W_o$.

OVERFLOW SPILLWAY CALCULATIONS

2023-08-28 overflow spillway

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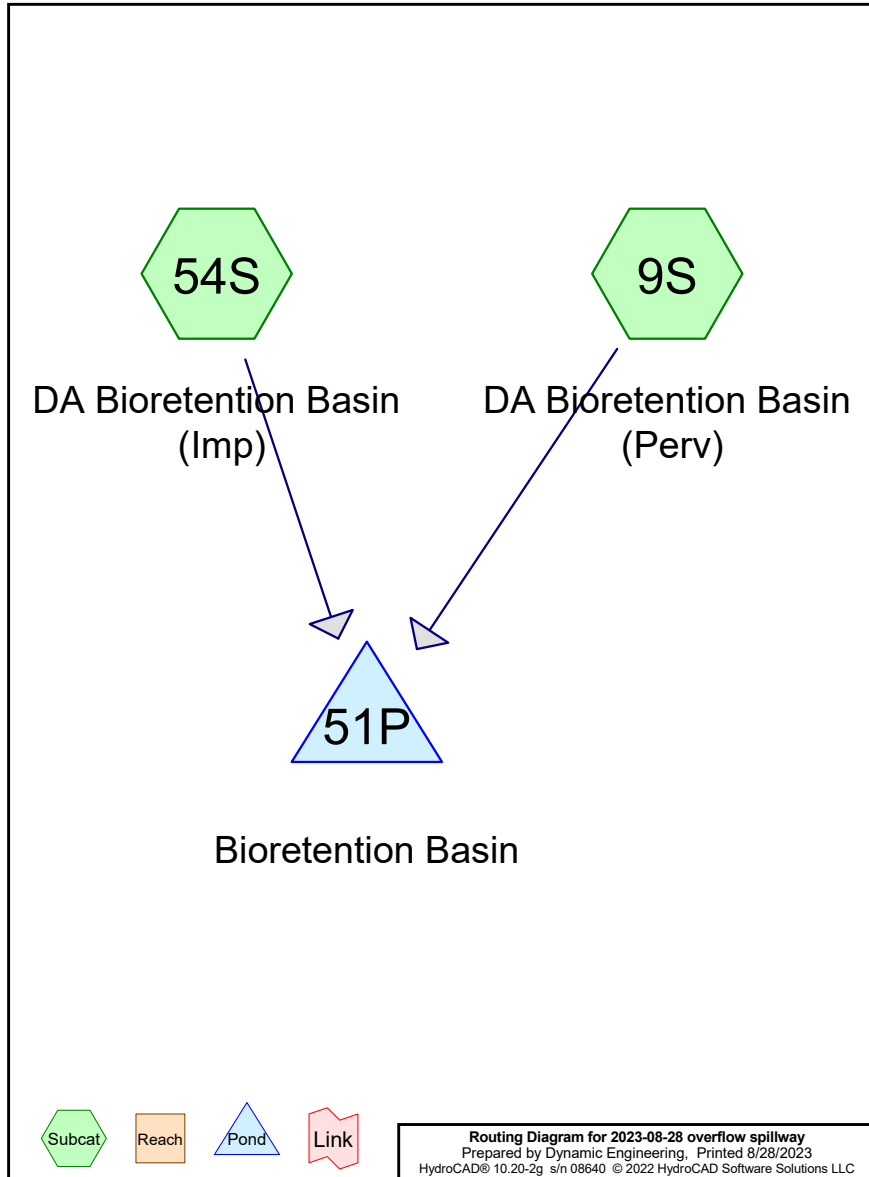
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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C



2023-08-28 overflow spillway

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year-Current	NOAA 24-hr	C	Default	24.00	1	3.34	2
2	10-Year-Current	NOAA 24-hr	C	Default	24.00	1	5.11	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.830	80	>75% Grass cover, Good, HSG D (9S)
0.130	98	Roofs, HSG D (54S)
0.590	98	Unconnected pavement, HSG D (54S)
1.550	88	TOTAL AREA

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Soil Listing (all nodes)		
Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.550	HSG D	9S, 54S
0.000	Other	
1.550		TOTAL AREA

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Ground Covers (all nodes)							
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.830	0.000	0.830	>75% Grass cover, Good	9S
0.000	0.000	0.000	0.130	0.000	0.130	Roofs	54S
0.000	0.000	0.000	0.590	0.000	0.590	Unconnected pavement	54S
0.000	0.000	0.000	1.550	0.000	1.550	TOTAL AREA	

Notes Listing (all nodes)		
Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C
2		Rainfall events imported from "NJ-Rain.txt" for 6610 NJ Mercer-C

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 9S: DA Bioretention Basin	Runoff Area=0.830 ac 0.00% Impervious Runoff Depth=1.51" Flow Length=280' Tc=10.1 min CN=80 Runoff=1.38 cfs 0.104 af
Subcatchment 54S: DA Bioretention	Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=3.11" Flow Length=280' Tc=10.1 min CN=98 Runoff=2.17 cfs 0.186 af
Pond 51P: Bioretention Basin	Peak Elev=133.64' Storage=15,922 cf Inflow=3.55 cfs 0.291 af Outflow=3.43 cfs 0.291 af

Total Runoff Area = 1.550 ac Runoff Volume = 0.291 af Average Runoff Depth = 2.25"
53.55% Pervious = 0.830 ac 46.45% Impervious = 0.720 ac

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

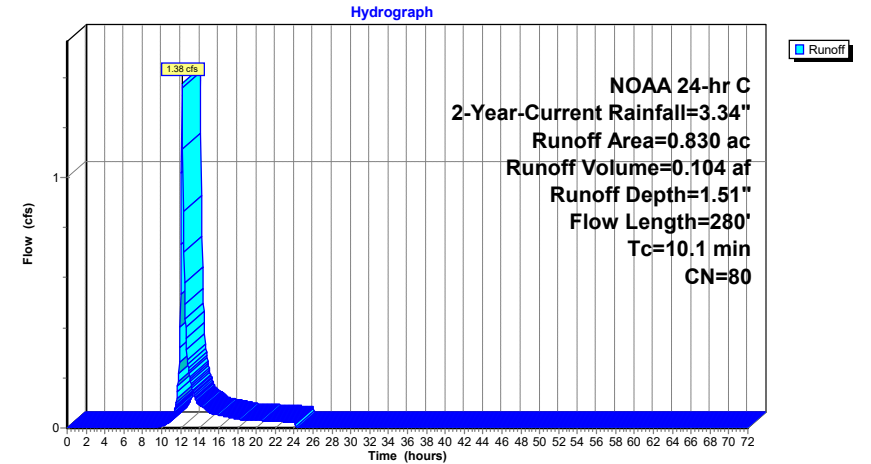
Runoff = 1.38 cfs @ 12.18 hrs, Volume= 0.104 af, Depth= 1.51"
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description			
0.830	80	>75% Grass cover, Good, HSG D			
0.830		100.00% Pervious Area			

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 9S: DA Bioretention Basin (Perv)



Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.26	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.49	0.00	0.00
10.00	0.61	0.00	0.01
11.00	0.80	0.03	0.04
12.00	1.59	0.33	0.54
13.00	2.54	0.92	0.20
14.00	2.73	1.05	0.09
15.00	2.85	1.14	0.06
16.00	2.94	1.21	0.05
17.00	3.01	1.26	0.04
18.00	3.08	1.31	0.04
19.00	3.13	1.35	0.03
20.00	3.18	1.38	0.03
21.00	3.22	1.42	0.03
22.00	3.26	1.45	0.03
23.00	3.30	1.48	0.02
24.00	3.34	1.51	0.02
25.00	3.34	1.51	0.00
26.00	3.34	1.51	0.00
27.00	3.34	1.51	0.00
28.00	3.34	1.51	0.00
29.00	3.34	1.51	0.00
30.00	3.34	1.51	0.00
31.00	3.34	1.51	0.00
32.00	3.34	1.51	0.00
33.00	3.34	1.51	0.00
34.00	3.34	1.51	0.00
35.00	3.34	1.51	0.00
36.00	3.34	1.51	0.00
37.00	3.34	1.51	0.00
38.00	3.34	1.51	0.00
39.00	3.34	1.51	0.00
40.00	3.34	1.51	0.00
41.00	3.34	1.51	0.00
42.00	3.34	1.51	0.00
43.00	3.34	1.51	0.00
44.00	3.34	1.51	0.00
45.00	3.34	1.51	0.00
46.00	3.34	1.51	0.00
47.00	3.34	1.51	0.00
48.00	3.34	1.51	0.00
49.00	3.34	1.51	0.00
50.00	3.34	1.51	0.00
51.00	3.34	1.51	0.00

2023-08-28 overflow spillway

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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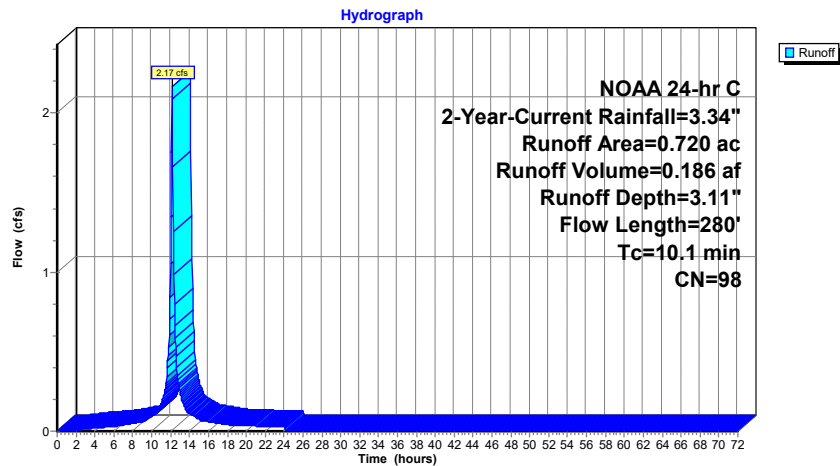
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 2.17 cfs @ 12.17 hrs, Volume= 0.186 af, Depth= 3.11"
 Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 2-Year-Current Rainfall=3.34"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)**2023-08-28 overflow spillway**

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.34	3.11	0.00
1.00	0.04	0.00	0.00	53.00	3.34	3.11	0.00
2.00	0.08	0.01	0.01	54.00	3.34	3.11	0.00
3.00	0.12	0.02	0.01	55.00	3.34	3.11	0.00
4.00	0.16	0.05	0.02	56.00	3.34	3.11	0.00
5.00	0.21	0.08	0.03	57.00	3.34	3.11	0.00
6.00	0.26	0.12	0.03	58.00	3.34	3.11	0.00
7.00	0.33	0.17	0.04	59.00	3.34	3.11	0.00
8.00	0.40	0.23	0.05	60.00	3.34	3.11	0.00
9.00	0.49	0.31	0.06	61.00	3.34	3.11	0.00
10.00	0.61	0.42	0.09	62.00	3.34	3.11	0.00
11.00	0.80	0.60	0.17	63.00	3.34	3.11	0.00
12.00	1.59	1.37	1.05	64.00	3.34	3.11	0.00
13.00	2.54	2.31	0.24	65.00	3.34	3.11	0.00
14.00	2.73	2.50	0.11	66.00	3.34	3.11	0.00
15.00	2.85	2.62	0.08	67.00	3.34	3.11	0.00
16.00	2.94	2.71	0.06	68.00	3.34	3.11	0.00
17.00	3.01	2.78	0.05	69.00	3.34	3.11	0.00
18.00	3.08	2.84	0.04	70.00	3.34	3.11	0.00
19.00	3.13	2.90	0.04	71.00	3.34	3.11	0.00
20.00	3.18	2.94	0.03	72.00	3.34	3.11	0.00
21.00	3.22	2.99	0.03				
22.00	3.26	3.03	0.03				
23.00	3.30	3.07	0.03				
24.00	3.34	3.11	0.03				
25.00	3.34	3.11	0.00				
26.00	3.34	3.11	0.00				
27.00	3.34	3.11	0.00				
28.00	3.34	3.11	0.00				
29.00	3.34	3.11	0.00				
30.00	3.34	3.11	0.00				
31.00	3.34	3.11	0.00				
32.00	3.34	3.11	0.00				
33.00	3.34	3.11	0.00				
34.00	3.34	3.11	0.00				
35.00	3.34	3.11	0.00				
36.00	3.34	3.11	0.00				
37.00	3.34	3.11	0.00				
38.00	3.34	3.11	0.00				
39.00	3.34	3.11	0.00				
40.00	3.34	3.11	0.00				
41.00	3.34	3.11	0.00				
42.00	3.34	3.11	0.00				
43.00	3.34	3.11	0.00				
44.00	3.34	3.11	0.00				
45.00	3.34	3.11	0.00				
46.00	3.34	3.11	0.00				
47.00	3.34	3.11	0.00				
48.00	3.34	3.11	0.00				
49.00	3.34	3.11	0.00				
50.00	3.34	3.11	0.00				
51.00	3.34	3.11	0.00				

Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 2.25" for 2-Year-Current event
Inflow = 3.55 cfs @ 12.17 hrs, Volume= 0.291 af
Outflow = 3.43 cfs @ 12.20 hrs, Volume= 0.291 af, Atten= 3%, Lag= 1.8 min
Primary = 3.43 cfs @ 12.20 hrs, Volume= 0.291 af
Routed to nonexistent node 50L

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Starting Elev= 133.50' Surf.Area= 3,650 sf Storage= 15,413 cf
Peak Elev= 133.64' @ 12.20 hrs Surf.Area= 3,664 sf Storage= 15,922 cf (510 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 3.7 min (795.5 - 791.8)

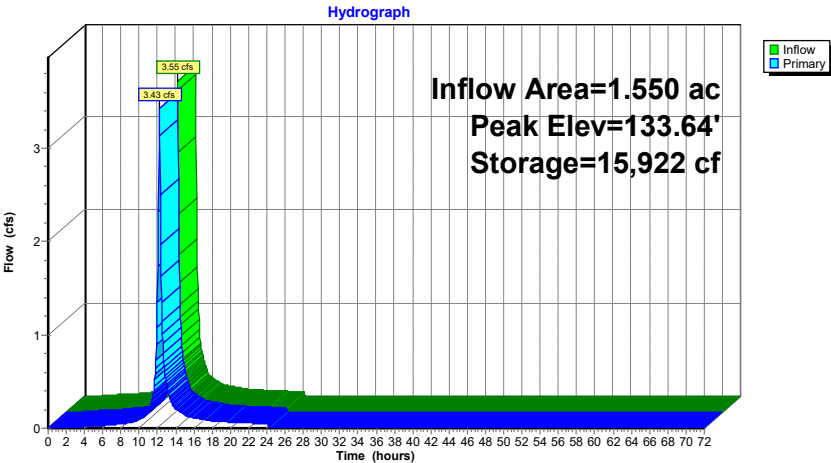
Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

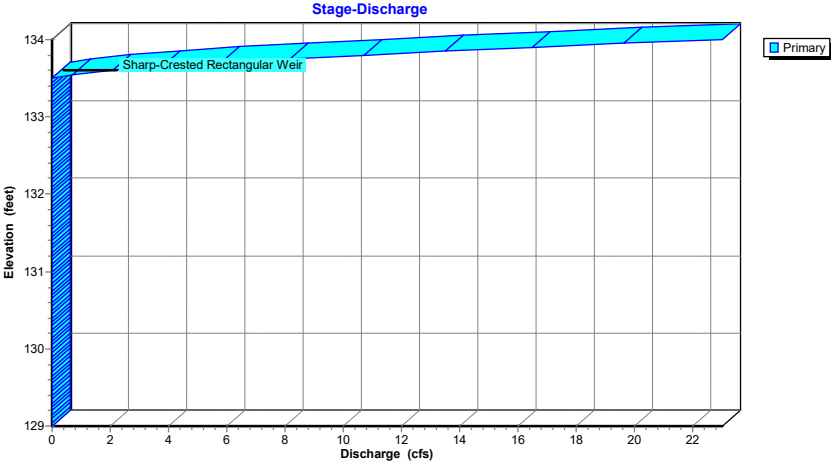
Device	Routing	Invert	Outlet Devices
#1	Primary	133.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.38 cfs @ 12.20 hrs HW=133.64' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 3.38 cfs @ 1.22 fps)

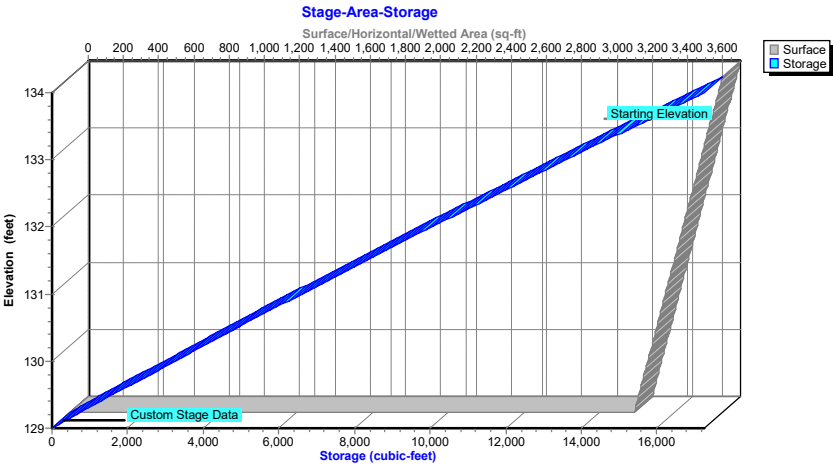
Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Pond 51P: Bioretention Basin



Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,413	133.50	0.00
2.50	0.01	15,415	133.50	0.01
5.00	0.03	15,419	133.50	0.02
7.50	0.04	15,423	133.50	0.04
10.00	0.10	15,437	133.51	0.10
12.50	1.02	15,651	133.57	1.14
15.00	0.14	15,448	133.51	0.14
17.50	0.09	15,434	133.51	0.09
20.00	0.07	15,429	133.50	0.07
22.50	0.05	15,426	133.50	0.05
25.00	0.00	15,413	133.50	0.00
27.50	0.00	15,413	133.50	0.00
30.00	0.00	15,413	133.50	0.00
32.50	0.00	15,413	133.50	0.00
35.00	0.00	15,413	133.50	0.00
37.50	0.00	15,413	133.50	0.00
40.00	0.00	15,413	133.50	0.00
42.50	0.00	15,413	133.50	0.00
45.00	0.00	15,413	133.50	0.00
47.50	0.00	15,413	133.50	0.00
50.00	0.00	15,413	133.50	0.00
52.50	0.00	15,413	133.50	0.00
55.00	0.00	15,413	133.50	0.00
57.50	0.00	15,413	133.50	0.00
60.00	0.00	15,413	133.50	0.00
62.50	0.00	15,413	133.50	0.00
65.00	0.00	15,413	133.50	0.00
67.50	0.00	15,413	133.50	0.00
70.00	0.00	15,413	133.50	0.00

2023-08-28 overflow spillway

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	0.00
129.05	0.00	131.65	0.00
129.10	0.00	131.70	0.00
129.15	0.00	131.75	0.00
129.20	0.00	131.80	0.00
129.25	0.00	131.85	0.00
129.30	0.00	131.90	0.00
129.35	0.00	131.95	0.00
129.40	0.00	132.00	0.00
129.45	0.00	132.05	0.00
129.50	0.00	132.10	0.00
129.55	0.00	132.15	0.00
129.60	0.00	132.20	0.00
129.65	0.00	132.25	0.00
129.70	0.00	132.30	0.00
129.75	0.00	132.35	0.00
129.80	0.00	132.40	0.00
129.85	0.00	132.45	0.00
129.90	0.00	132.50	0.00
129.95	0.00	132.55	0.00
130.00	0.00	132.60	0.00
130.05	0.00	132.65	0.00
130.10	0.00	132.70	0.00
130.15	0.00	132.75	0.00
130.20	0.00	132.80	0.00
130.25	0.00	132.85	0.00
130.30	0.00	132.90	0.00
130.35	0.00	132.95	0.00
130.40	0.00	133.00	0.00
130.45	0.00	133.05	0.00
130.50	0.00	133.10	0.00
130.55	0.00	133.15	0.00
130.60	0.00	133.20	0.00
130.65	0.00	133.25	0.00
130.70	0.00	133.30	0.00
130.75	0.00	133.35	0.00
130.80	0.00	133.40	0.00
130.85	0.00	133.45	0.00
130.90	0.00	133.50	0.00
130.95	0.00	133.55	0.73
131.00	0.00	133.60	2.07
131.05	0.00	133.65	3.79
131.10	0.00	133.70	5.84
131.15	0.00	133.75	8.15
131.20	0.00	133.80	10.71
131.25	0.00	133.85	13.49
131.30	0.00	133.90	16.48
131.35	0.00	133.95	19.65
131.40	0.00	134.00	23.01
131.45	0.00		
131.50	0.00		
131.55	0.00		

2023-08-28 overflow spillway

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NOAA 24-hr C 2-Year-Current Rainfall=3.34"

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Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 9S: DA Bioretention Basin

Runoff Area=0.830 ac 0.00% Impervious Runoff Depth=2.99"

Flow Length=280' Tc=10.1 min CN=80 Runoff=2.73 cfs 0.207 af

Subcatchment 54S: DA Bioretention

Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=4.87"

Flow Length=280' Tc=10.1 min CN=98 Runoff=3.34 cfs 0.292 af

Pond 51P: Bioretention Basin

Peak Elev=133.70' Storage=16,151 cf Inflow=6.07 cfs 0.499 af

Outflow=5.92 cfs 0.499 af

Total Runoff Area = 1.550 ac Runoff Volume = 0.499 af Average Runoff Depth = 3.86"

53.55% Pervious = 0.830 ac 46.45% Impervious = 0.720 ac

Summary for Subcatchment 9S: DA Bioretention Basin (Perv)

Runoff = 2.73 cfs @ 12.18 hrs, Volume= 0.207 af, Depth= 2.99"

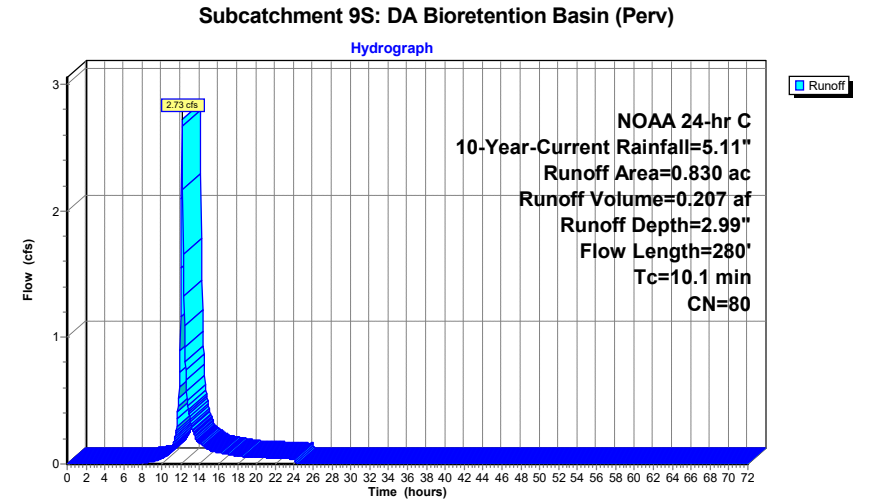
Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.830	80	>75% Grass cover, Good, HSG D
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, SF - Grass
					Grass: Dense n= 0.240 P2= 3.34"
					Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, SCF - Grass
					Unpaved Kv= 16.1 fps
10.1	280	Total			



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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Subcatchment 9S: DA Bioretention Basin (Perv)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	2.99	0.00
1.00	0.06	0.00	0.00	53.00	5.11	2.99	0.00
2.00	0.12	0.00	0.00	54.00	5.11	2.99	0.00
3.00	0.18	0.00	0.00	55.00	5.11	2.99	0.00
4.00	0.25	0.00	0.00	56.00	5.11	2.99	0.00
5.00	0.32	0.00	0.00	57.00	5.11	2.99	0.00
6.00	0.40	0.00	0.00	58.00	5.11	2.99	0.00
7.00	0.50	0.00	0.00	59.00	5.11	2.99	0.00
8.00	0.61	0.00	0.01	60.00	5.11	2.99	0.00
9.00	0.75	0.02	0.02	61.00	5.11	2.99	0.00
10.00	0.93	0.06	0.05	62.00	5.11	2.99	0.00
11.00	1.23	0.16	0.12	63.00	5.11	2.99	0.00
12.00	2.44	0.84	1.16	64.00	5.11	2.99	0.00
13.00	3.88	1.95	0.35	65.00	5.11	2.99	0.00
14.00	4.18	2.19	0.16	66.00	5.11	2.99	0.00
15.00	4.36	2.35	0.11	67.00	5.11	2.99	0.00
16.00	4.50	2.46	0.09	68.00	5.11	2.99	0.00
17.00	4.61	2.56	0.08	69.00	5.11	2.99	0.00
18.00	4.71	2.64	0.06	70.00	5.11	2.99	0.00
19.00	4.79	2.71	0.06	71.00	5.11	2.99	0.00
20.00	4.86	2.77	0.05	72.00	5.11	2.99	0.00
21.00	4.93	2.83	0.05				
22.00	4.99	2.89	0.05				
23.00	5.05	2.94	0.04				
24.00	5.11	2.99	0.04				
25.00	5.11	2.99	0.00				
26.00	5.11	2.99	0.00				
27.00	5.11	2.99	0.00				
28.00	5.11	2.99	0.00				
29.00	5.11	2.99	0.00				
30.00	5.11	2.99	0.00				
31.00	5.11	2.99	0.00				
32.00	5.11	2.99	0.00				
33.00	5.11	2.99	0.00				
34.00	5.11	2.99	0.00				
35.00	5.11	2.99	0.00				
36.00	5.11	2.99	0.00				
37.00	5.11	2.99	0.00				
38.00	5.11	2.99	0.00				
39.00	5.11	2.99	0.00				
40.00	5.11	2.99	0.00				
41.00	5.11	2.99	0.00				
42.00	5.11	2.99	0.00				
43.00	5.11	2.99	0.00				
44.00	5.11	2.99	0.00				
45.00	5.11	2.99	0.00				
46.00	5.11	2.99	0.00				
47.00	5.11	2.99	0.00				
48.00	5.11	2.99	0.00				
49.00	5.11	2.99	0.00				
50.00	5.11	2.99	0.00				
51.00	5.11	2.99	0.00				

2023-08-28 overflow spillway

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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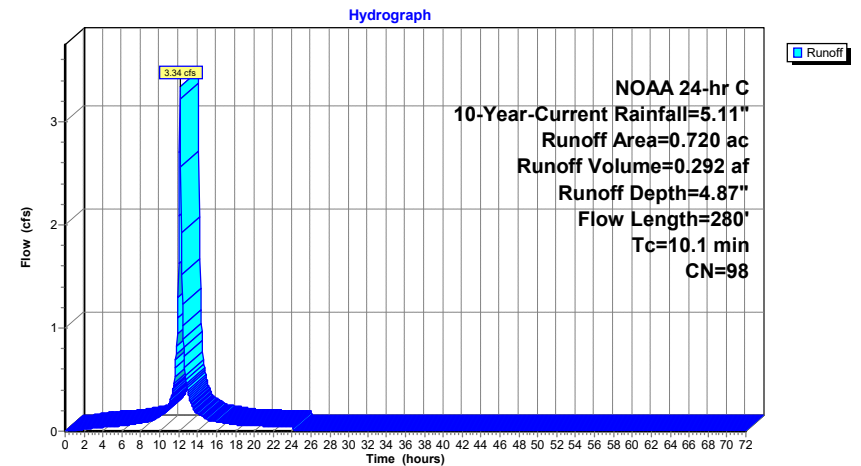
Summary for Subcatchment 54S: DA Bioretention Basin (Imp)

Runoff = 3.34 cfs @ 12.17 hrs, Volume= 0.292 af, Depth= 4.87"
 Routed to Pond 51P : Bioretention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Area (ac)	CN	Description
0.590	98	Unconnected pavement, HSG D
0.130	98	Roofs, HSG D
0.720	98	Weighted Average
0.720		100.00% Impervious Area
0.590		81.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	83	0.0400	0.15		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.34" Using McCuen-Spiess flow length
1.0	197	0.0431	3.34		Shallow Concentrated Flow, Shallow Conc Flow Unpaved Kv= 16.1 fps
10.1	280	Total			

Subcatchment 54S: DA Bioretention Basin (Imp)

2023-08-28 overflow spillway

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Hydrograph for Subcatchment 54S: DA Bioretention Basin (Imp)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.11	4.87	0.00
1.00	0.06	0.00	0.00	53.00	5.11	4.87	0.00
2.00	0.12	0.02	0.02	54.00	5.11	4.87	0.00
3.00	0.18	0.06	0.03	55.00	5.11	4.87	0.00
4.00	0.25	0.11	0.04	56.00	5.11	4.87	0.00
5.00	0.32	0.17	0.05	57.00	5.11	4.87	0.00
6.00	0.40	0.23	0.05	58.00	5.11	4.87	0.00
7.00	0.50	0.32	0.07	59.00	5.11	4.87	0.00
8.00	0.61	0.42	0.08	60.00	5.11	4.87	0.00
9.00	0.75	0.55	0.10	61.00	5.11	4.87	0.00
10.00	0.93	0.72	0.15	62.00	5.11	4.87	0.00
11.00	1.23	1.01	0.27	63.00	5.11	4.87	0.00
12.00	2.44	2.21	1.63	64.00	5.11	4.87	0.00
13.00	3.88	3.65	0.38	65.00	5.11	4.87	0.00
14.00	4.18	3.94	0.17	66.00	5.11	4.87	0.00
15.00	4.36	4.13	0.12	67.00	5.11	4.87	0.00
16.00	4.50	4.26	0.09	68.00	5.11	4.87	0.00
17.00	4.61	4.38	0.08	69.00	5.11	4.87	0.00
18.00	4.71	4.47	0.06	70.00	5.11	4.87	0.00
19.00	4.79	4.55	0.06	71.00	5.11	4.87	0.00
20.00	4.86	4.62	0.05	72.00	5.11	4.87	0.00
21.00	4.93	4.69	0.05				
22.00	4.99	4.76	0.05				
23.00	5.05	4.82	0.04				
24.00	5.11	4.87	0.04				
25.00	5.11	4.87	0.00				
26.00	5.11	4.87	0.00				
27.00	5.11	4.87	0.00				
28.00	5.11	4.87	0.00				
29.00	5.11	4.87	0.00				
30.00	5.11	4.87	0.00				
31.00	5.11	4.87	0.00				
32.00	5.11	4.87	0.00				
33.00	5.11	4.87	0.00				
34.00	5.11	4.87	0.00				
35.00	5.11	4.87	0.00				
36.00	5.11	4.87	0.00				
37.00	5.11	4.87	0.00				
38.00	5.11	4.87	0.00				
39.00	5.11	4.87	0.00				
40.00	5.11	4.87	0.00				
41.00	5.11	4.87	0.00				
42.00	5.11	4.87	0.00				
43.00	5.11	4.87	0.00				
44.00	5.11	4.87	0.00				
45.00	5.11	4.87	0.00				
46.00	5.11	4.87	0.00				
47.00	5.11	4.87	0.00				
48.00	5.11	4.87	0.00				
49.00	5.11	4.87	0.00				
50.00	5.11	4.87	0.00				
51.00	5.11	4.87	0.00				

2023-08-28 overflow spillway

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Summary for Pond 51P: Bioretention Basin

Inflow Area = 1.550 ac, 46.45% Impervious, Inflow Depth = 3.86" for 10-Year-Current event
 Inflow = 6.07 cfs @ 12.17 hrs, Volume= 0.499 af
 Outflow = 5.92 cfs @ 12.20 hrs, Volume= 0.499 af, Atten= 2%, Lag= 1.6 min
 Primary = 5.92 cfs @ 12.20 hrs, Volume= 0.499 af
 Routed to nonexistent node 50L

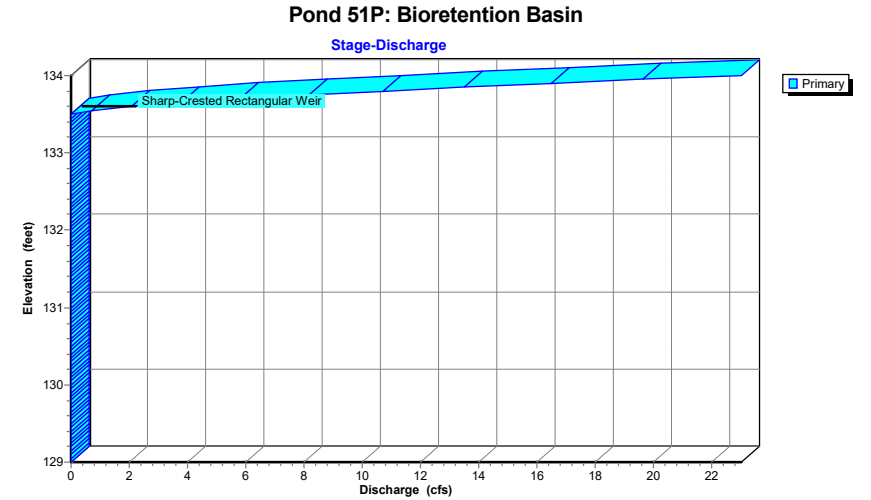
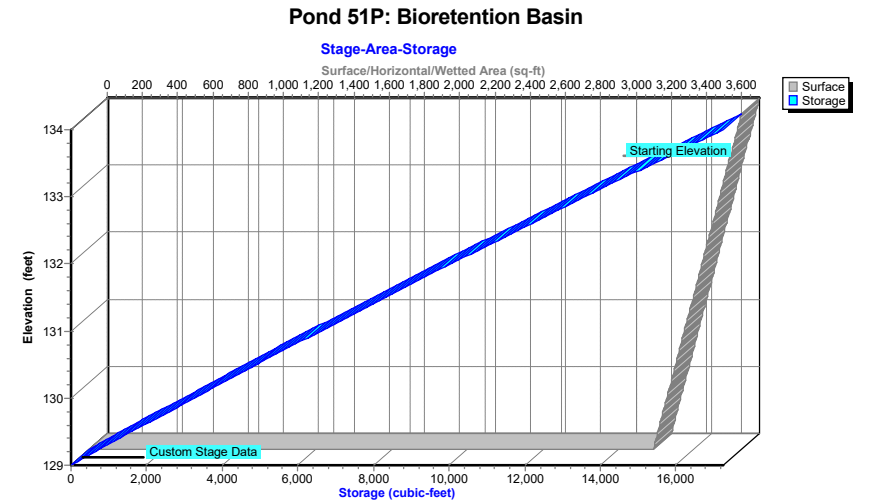
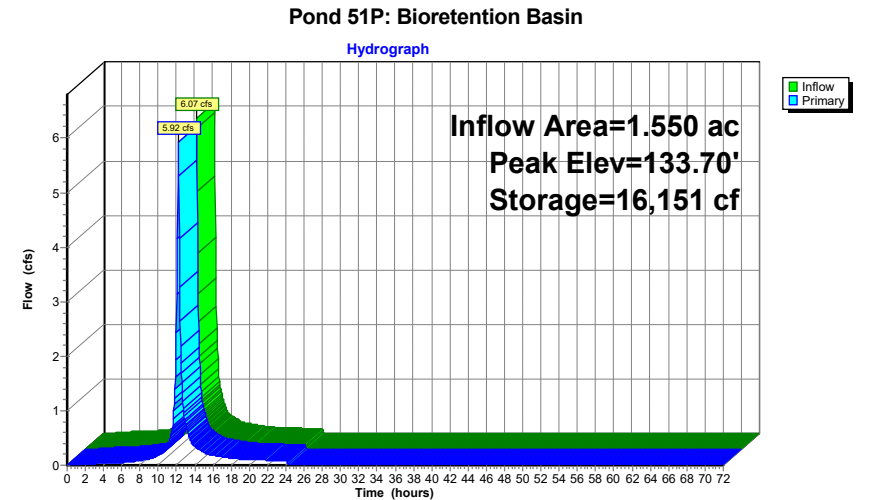
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Starting Elev= 133.50' Surf.Area= 3,650 sf Storage= 15,413 cf
 Peak Elev= 133.70' @ 12.20 hrs Surf.Area= 3,670 sf Storage= 16,151 cf (739 cf above start)

Plug-Flow detention time= 420.2 min calculated for 0.145 af (29% of inflow)
 Center-of-Mass det. time= 3.5 min (787.0 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	17,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
129.00	3,200	0	0
130.00	3,300	3,250	3,250
131.00	3,400	3,350	6,600
132.00	3,500	3,450	10,050
133.00	3,600	3,550	13,600
134.00	3,700	3,650	17,250

Device	Routing	Invert	Outlet Devices
#1	Primary	133.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.90 cfs @ 12.20 hrs HW=133.70' (Free Discharge)
 1=Sharp-Crested Rectangular Weir (Weir Controls 5.90 cfs @ 1.47 fps)



2023-08-28 overflow spillway

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

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Hydrograph for Pond 51P: Bioretention Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,413	133.50	0.00
2.50	0.02	15,419	133.50	0.02
5.00	0.05	15,424	133.50	0.04
7.50	0.08	15,431	133.51	0.07
10.00	0.19	15,459	133.51	0.19
12.50	1.70	15,753	133.59	1.88
15.00	0.23	15,471	133.52	0.24
17.50	0.14	15,448	133.51	0.14
20.00	0.11	15,439	133.51	0.11
22.50	0.09	15,435	133.51	0.09
25.00	0.00	15,413	133.50	0.00
27.50	0.00	15,413	133.50	0.00
30.00	0.00	15,413	133.50	0.00
32.50	0.00	15,413	133.50	0.00
35.00	0.00	15,413	133.50	0.00
37.50	0.00	15,413	133.50	0.00
40.00	0.00	15,413	133.50	0.00
42.50	0.00	15,413	133.50	0.00
45.00	0.00	15,413	133.50	0.00
47.50	0.00	15,413	133.50	0.00
50.00	0.00	15,413	133.50	0.00
52.50	0.00	15,413	133.50	0.00
55.00	0.00	15,413	133.50	0.00
57.50	0.00	15,413	133.50	0.00
60.00	0.00	15,413	133.50	0.00
62.50	0.00	15,413	133.50	0.00
65.00	0.00	15,413	133.50	0.00
67.50	0.00	15,413	133.50	0.00
70.00	0.00	15,413	133.50	0.00

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Stage-Discharge for Pond 51P: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	0.00
129.05	0.00	131.65	0.00
129.10	0.00	131.70	0.00
129.15	0.00	131.75	0.00
129.20	0.00	131.80	0.00
129.25	0.00	131.85	0.00
129.30	0.00	131.90	0.00
129.35	0.00	131.95	0.00
129.40	0.00	132.00	0.00
129.45	0.00	132.05	0.00
129.50	0.00	132.10	0.00
129.55	0.00	132.15	0.00
129.60	0.00	132.20	0.00
129.65	0.00	132.25	0.00
129.70	0.00	132.30	0.00
129.75	0.00	132.35	0.00
129.80	0.00	132.40	0.00
129.85	0.00	132.45	0.00
129.90	0.00	132.50	0.00
129.95	0.00	132.55	0.00
130.00	0.00	132.60	0.00
130.05	0.00	132.65	0.00
130.10	0.00	132.70	0.00
130.15	0.00	132.75	0.00
130.20	0.00	132.80	0.00
130.25	0.00	132.85	0.00
130.30	0.00	132.90	0.00
130.35	0.00	132.95	0.00
130.40	0.00	133.00	0.00
130.45	0.00	133.05	0.00
130.50	0.00	133.10	0.00
130.55	0.00	133.15	0.00
130.60	0.00	133.20	0.00
130.65	0.00	133.25	0.00
130.70	0.00	133.30	0.00
130.75	0.00	133.35	0.00
130.80	0.00	133.40	0.00
130.85	0.00	133.45	0.00
130.90	0.00	133.50	0.00
130.95	0.00	133.55	0.73
131.00	0.00	133.60	2.07
131.05	0.00	133.65	3.79
131.10	0.00	133.70	5.84
131.15	0.00	133.75	8.15
131.20	0.00	133.80	10.71
131.25	0.00	133.85	13.49
131.30	0.00	133.90	16.48
131.35	0.00	133.95	19.65
131.40	0.00	134.00	23.01
131.45	0.00		
131.50	0.00		
131.55	0.00		

2023-08-28 overflow spillway

Prepared by Dynamic Engineering

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NOAA 24-hr C 10-Year-Current Rainfall=5.11"

Printed 8/28/2023

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Stage-Area-Storage for Pond 51P: Bioretention Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	3,200	0	131.60	3,460	8,658
129.05	3,205	160	131.65	3,465	8,831
129.10	3,210	320	131.70	3,470	9,004
129.15	3,215	481	131.75	3,475	9,178
129.20	3,220	642	131.80	3,480	9,352
129.25	3,225	803	131.85	3,485	9,526
129.30	3,230	965	131.90	3,490	9,701
129.35	3,235	1,126	131.95	3,495	9,875
129.40	3,240	1,288	132.00	3,500	10,050
129.45	3,245	1,450	132.05	3,505	10,225
129.50	3,250	1,613	132.10	3,510	10,400
129.55	3,255	1,775	132.15	3,515	10,576
129.60	3,260	1,938	132.20	3,520	10,752
129.65	3,265	2,101	132.25	3,525	10,928
129.70	3,270	2,264	132.30	3,530	11,105
129.75	3,275	2,428	132.35	3,535	11,281
129.80	3,280	2,592	132.40	3,540	11,458
129.85	3,285	2,756	132.45	3,545	11,635
129.90	3,290	2,921	132.50	3,550	11,813
129.95	3,295	3,085	132.55	3,555	11,990
130.00	3,300	3,250	132.60	3,560	12,168
130.05	3,305	3,415	132.65	3,565	12,346
130.10	3,310	3,580	132.70	3,570	12,524
130.15	3,315	3,746	132.75	3,575	12,703
130.20	3,320	3,912	132.80	3,580	12,882
130.25	3,325	4,078	132.85	3,585	13,061
130.30	3,330	4,245	132.90	3,590	13,241
130.35	3,335	4,411	132.95	3,595	13,420
130.40	3,340	4,578	133.00	3,600	13,600
130.45	3,345	4,745	133.05	3,605	13,780
130.50	3,350	4,913	133.10	3,610	13,960
130.55	3,355	5,080	133.15	3,615	14,141
130.60	3,360	5,248	133.20	3,620	14,322
130.65	3,365	5,416	133.25	3,625	14,503
130.70	3,370	5,584	133.30	3,630	14,685
130.75	3,375	5,753	133.35	3,635	14,866
130.80	3,380	5,922	133.40	3,640	15,048
130.85	3,385	6,091	133.45	3,645	15,230
130.90	3,390	6,261	133.50	3,650	15,413
130.95	3,395	6,430	133.55	3,655	15,595
131.00	3,400	6,600	133.60	3,660	15,778
131.05	3,405	6,770	133.65	3,665	15,961
131.10	3,410	6,940	133.70	3,670	16,144
131.15	3,415	7,111	133.75	3,675	16,328
131.20	3,420	7,282	133.80	3,680	16,512
131.25	3,425	7,453	133.85	3,685	16,696
131.30	3,430	7,625	133.90	3,690	16,881
131.35	3,435	7,796	133.95	3,695	17,065
131.40	3,440	7,968	134.00	3,700	17,250
131.45	3,445	8,140			
131.50	3,450	8,313			
131.55	3,455	8,485			

2023-08-28 overflow spillway

Prepared by Dynamic Engineering

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Overflow Spillway Calculations

Project: Proposed Day School
Job #: 4447-22-01334
Location: Montgomery NJ
Computed By: SS
Checked By: JH
Date: 8/28/2023

BASIN NAME

To Size Spillway:

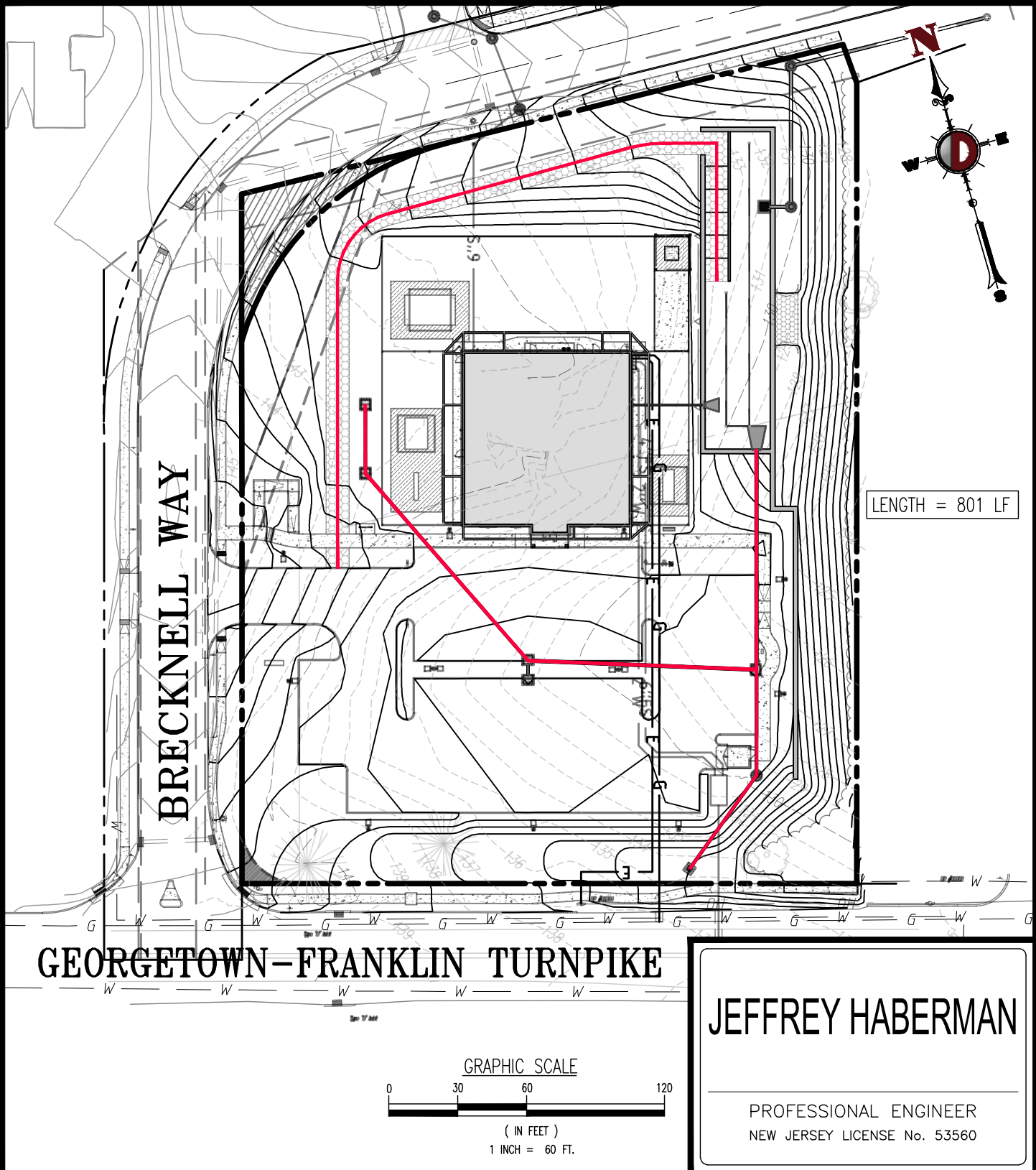
- Assume complete blockage of the outlet control structure and no infiltration
- Route 2 & 10 year storm through basin assuming that the basin is filled with water up to the Emergency Spillway Elevation

	2 Year	10 Year
Spillway Width (ft.)	10.00	10.00
Spillway Elevation (ft.)	133.50	133.50
Flow through Spillway (Q) (cfs)	3.430	5.920
Water Surface Elevation (ft)	133.64	133.70
Depth of Flow (ft)	0.14	0.20
Area of Flow (A) (sf)*	1.42	2.04

Velocity (V) = Q / A (ft/sec) **2.42** **2.90**

✱ V = < 2.0 FPS ✱ Stability Achieved

STORMWATER CONVEYANCE EXHIBIT



JEFFREY HABERMAN

PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 53560



1904 Main Street - Lake Como, NJ 07719
T: 732.974.0198 - F: 732.974.3521
www.dynamicec.com

DRAWN BY: KTK	CHECKED BY: JSH	DATE: 08/28/23
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TITLE: **STORMWATER CONVEYANCE EXHIBIT**

PROJECT: **MALVERN SCHOOL PROPERTIES, LP**
PROPOSED DAY SCHOOL
BLOCK 28010, LOTS 57 & 58
982 GEORGETOWN-FRANKLIN TURNPIKE
TOWNSHIP OF MONTGOMERY, SOMERSET COUNTY, NEW JERSEY

SCALE: (H) 1"=60'
(V)

JOB No:
4447-22-01334

NONSTRUCTURAL STRATEGIES POINTS SYSTEM (NSPS)

NJDEP Nonstructural Strategies Points System (NSPS)

Version: January 31, 2006

Note: Input Values in Yellow Cells Only

Project:	4447-22-01334
Date:	August 22, 2023
User:	Dynamic Engineering Consultants PC
Notes:	Malvern School Properties, LP
	Block 28010, Lots 57 & 58
	982 Georgetown-Franklin Turnpike
	Montgomery Township, Somerset County, NJ

Step 1 - Provide Basic Major Development Site Information

A. Specify Total Area in Acres of Development Site Described in Steps 2 and 3 = 2.1 Acres

B. Specify by Percent the Various Planning Areas Located within the Development Site:

State Plan Planning Area:	PA-1	PA-2	PA-3	PA-4	PA-4B	PA-5	Total % Area
Percent of Each Planning Area within Site:	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%

Note: See User's Guide for Equivalent Zones within Designated Centers and the NJ Meadowlands, Pinelands, and Highlands Districts

Step 2 - Describe Existing or Pre-Developed Site Conditions

A. Specify Existing Land Use/Land Cover Descriptions and Areas:

Site		Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover	Points
Segment	Land Use/Land Cover Description	HSG A	HSG B	HSG C	HSG D	Subtotals	
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space				1.4	1.4	121
3	Brush and Shrub					0.0	0
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0
7	Woods - Indigenous					0.0	0
8	Woods - Planted					0.0	0
9	Woods and Grass Combination				0.5	0.5	56
10	Ponds, Lakes, and Other Open Water					0.0	0
11	Gravel and Dirt					0.0	0
12	Porous and Permeable Paving					0.0	0
13	Directly Connected Impervious				0.2	0.2	0
14	Unconnected Impervious with Small D/S Pervious					0.0	0
15	Unconnected Impervious with Large D/S Pervious					0.0	0
HSG Subtotals (Acres):		0.0	0.0	0.0	2.1		Total Area: 2.1
HSG Subtotals (%):		0.0%	0.0%	0.0%	100.0%		Total % Area: 100.0%
Points Subtotal:							176
Total Existing Site Points:							176

Step 3 - Describe Proposed or Post-Developed Site Conditions

A. Specify Proposed Land Use/Land Cover Descriptions and Areas:

Site		Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover	Points
Segment	Land Use/Land Cover Description	HSG A	HSG B	HSG C	HSG D	Subtotals	
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space				1.3	1.3	109
3	Brush and Shrub					0.0	0
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0

7	Woods - Indigenous				0.0	0
8	Woods - Planted				0.0	0
9	Woods and Grass Combination			0.1	0.1	6
10	Ponds, Lakes, and Other Open Water				0.0	0
11	Gravel and Dirt				0.0	0
12	Porous and Permeable Paving				0.0	0
13	Directly Connected Impervious			0.8	0.8	0
14	Unconnected Impervious with Small D/S Pervious				0.0	0
15	Unconnected Impervious with Large D/S Pervious				0.0	0

HSG Subtotals (Acres):	0.0	0.0	0.0	2.1
HSG Subtotals (%):	0.0%	0.0%	0.0%	100.0%

Total Area:	2.1
Total % Area:	100.0%

Points Subtotal: 115

B. Compare Proposed Impervious Coverage with Maximum Allowable Impervious Coverage:

Total Directly Connected Impervious Coverage =	37%	% of Site
Total Unconnected Impervious Coverage with Small D/S Pervious =	0%	% of Site
Total Unconnected Impervious Coverage with Large D/S Pervious =	0%	% of Site
Total Site Impervious Coverage =	37%	% of Site
Effective Site Impervious Coverage =	37%	% of Site
Specify Source of Maximum Allowable Impervious Coverage:	Table	(None or Table)
Allowable Site Impervious Cover from Maximum Impervious Cover Table:	12%	
Note: See Maximum Impervious Cover Table Worksheet for Details		

Points Subtotal: 0

C. Compare Proposed Site Disturbance with Maximum Allowable Site Disturbance:

Total Proposed Site Disturbance =	100%	% of Site
Maximum Allowable Site Disturbance by Municipal Ordinance =	100%	% of Site

Points Subtotal: 0

D. Describe Proposed Runoff Conveyance System:

Total Length of Runoff Conveyance System =	801	Feet
Length of Vegetated Runoff Conveyance System =	370	Feet
% of Total Runoff Conveyance System That is Vegetated =	46%	

Points Subtotal: 33

E. Residential Lot Clustering:

Percent of Total Site Area that will be Clustered =	0%	% of Site
Minimum Standard Lot Size as Per Zoning (Note: 1/2 Acre or Greater) =	0.000	Acres
Maximum Proposed Cluster Lot Size (Note: 1/4 Acre or Less) =	0.000	Acres
Percent of Clustered Portion of Site to be Preserved as Vegetated Open Space =	0%	% of Clustered Site Portion

Points Subtotal: 0

F. Will the Following be Utilized to Minimize Soil Compaction?

Proposed Lawn Areas will be Graded with Lightweight Construction Equipment:	Yes	(Yes or No)
Percent of Proposed Lawn Areas to be Graded with Such Equipment:	100%	% of Lawn Areas

Points Subtotal: 18

G. Are Any of the Following Stormwater Management Standards Met Using Only Nonstructural Strategies and Measures?

Groundwater Recharge Standards (NJAC 7:8-5.4-a-2):	No	(Yes or No)
Stormwater Runoff Quality Standards (NJAC 7:8-5.5):	No	(Yes or No)
Stormwater Runoff Quantity Standards (NJAC 7:8-5.4-a-3):	No	(Yes or No)

Points Subtotal: 0

Note: If the Answers to All Three Questions at G Above are "Yes", Adequate Nonstructural Measures have been Utilized.

Total Proposed Site Points: 167

Ratio of Proposed to Existing Site Points: 95%

Required Site Points Ratio: 89%

Nonstructural Point System Results: Proposed Nonstructural Measures are Adequate

**STORMWATER BASIN AREA INVESTIGATION
REPORT – SOIL TEST PIT LOGS**



BOREHOLE LOG

Boring No : B-1

Page 1 of 1

Project: Proposed Day School & Medical Office						Proj. No.: 4447-22-01615											
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey						Client: The Malvern School											
Surface Elevation:		137.3 feet				Date Started:		08-10-2022		Groundwater Data		Depth	El.	Additional Groundwater Data		Depth	El.
Termination Depth:		22.0 feet				Date Completed:		08-10-2022				(ft)	(ft)			(ft)	(ft)
Proposed Location:		Proposed Medical Office				Logged by:		M. Mickley		While Drilling: ▽		NE	-				
Drill/Test Method:		HSA/SPT				Contractor:		GPI		At Completion: ▼		NE	-				
Hammer Type:		Auto				Rig Type:		Geoprobe 7822DT									
Sample Information							Depth (ft)	Strata		DESCRIPTION OF MATERIALS (Classification)				Remarks			
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N											
0.0-2.0	S-1	SS	12	--	1	4	12		Surface Cover		8 inches of topsoil						
					8	9					Brown coarse to fine sand, some silt, little coarse to fine gravel, moist (FILL)						
2.0-4.0	S-2	SS	12	--	3	8	16		FILL		Reddish brown silt, some coarse to fine sand, little coarse to fine gravel, moist, (FILL)						
					8	9											
4.0-6.0	S-3	SS	16	--	5	8	18	5			Reddish brown clay, little coarse to fine sand, trace fine gravel, moist, hard (CH)				Qp = 4.5 tsf		
					10	16											
6.0-8.0	S-4	SS	12	--	5	10	20				As above (CH)				Qp = 4.5 tsf		
					10	11											
8.0-10.0	S-5	SS	18	--	9	8	18				As above (CH)				Qp = 4.5 tsf		
					10	8											
10.0-12.0	S-6	SS	14	--	6	4	7	10			As above (CH)				Qp = 4.5 tsf		
					3	3											
12.0-14.0	S-7	SS	20	--	3	3	5		Residual Soils		As above, very stiff (CH)				Qp = 3.5 tsf		
					2	3											
14.0-16.0	S-8	SS	18	--	5	6	11	15			As above (CH)				Qp = 3.5 tsf		
					5	6											
18.0-20.0	S-9	SS	18	--	5	5	7				As above, stiff (CH)				Qp = 2.0 tsf		
					2	3											
20.0-22.0	S-10	SS	18	--	8	9	19	20			As above (CH)				Qp = 3.5 tsf		
					10	13											
											Boring B-1 was terminated at approximately 22 feet below the ground surface.						



BOREHOLE LOG

Boring No : B-2

Page 1 of 1

Project: Proposed Day School & Medical Office						Proj. No.: 4447-22-01615									
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey						Client: The Malvern School									
Surface Elevation:		130.8 feet				Date Started:		08-10-2022		Groundwater Data	Depth	El.	Additional Groundwater Data	Depth	El.
Termination Depth:		22.0 feet				Date Completed:		08-10-2022			(ft)	(ft)		(ft)	(ft)
Proposed Location:		Proposed Medical Office				Logged by:		M. Mickley		While Drilling:	NE	-			
Drill/Test Method:		HSA/SPT				Contractor:		GPI		At Completion:	NE	-			
Hammer Type:		Auto				Rig Type:		Geoprobe 7822DT							
Sample Information							Depth (ft)	Strata		DESCRIPTION OF MATERIALS (Classification)				Remarks	
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N									
0.0-2.0	S-1	SS	3	--	3	5	8	</							

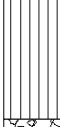


BOREHOLE LOG

Boring No : B-3

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Project: Proposed Day School & Medical Office										Proj. No.: 4447-22-01615									
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey										Client: The Malvern School									
Surface Elevation: 130.4 feet					Date Started: 08-10-2022					Groundwater Data		Depth	El.	Additional Groundwater Data		Depth	El.		
Termination Depth: 14.0 feet					Date Completed: 08-10-2022							(ft)	(ft)			(ft)	(ft)		
Proposed Location: Proposed Day School					Logged by: M. Mickley					While Drilling: ▽		NE	-						
Drill/Test Method: HSA/SPT					Contractor: GPI					At Completion: ▼		NE	-						
Hammer Type: Auto					Rig Type: Geoprobe 7822DT														
Sample Information							Depth (ft)	Strata		DESCRIPTION OF MATERIALS (Classification)					Remarks				
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N													
0.0-2.0	S-1	SS	8	--	3	4	8		Surface Cover	8 inches of topsoil									
					4	4			Reddish brown silt, little coarse to fine sand, moist (FILL)										
2.0-4.0	S-2	SS	16	--	2	2	4		FILL	As above (FILL)									
					2	1				No recovery									
4.0-6.0	S-3	SS	0	--	1	1	1	5											
					WOH	WOH													
6.0-8.0	S-4	SS	22	--	4	4	10		Residual Soils	Reddish brown silt, little coarse to fine sand, moist, very stiff (ML)					Qp=3.0 tsf				
					6	7													
8.0-10.0	S-5	SS	14	--	8	12	25	10		Reddish brown coarse to fine gravel, some coarse to fine sand, some silty clay, moist medium dense (GC)									
					13	13				As above (GC)									
10.0-12.0	S-6	SS	14	--	10	13	26		Residual Soils						Cave-in at 10.5 feet				
					13	7													
12.0-14.0	S-7	SS		--	4	8	16			Reddish brown to purple silt, trace fine sand, moist very stiff (ML)					Qp = 3.0 tsf				
					8	9													
								15		Boring B-3 was terminated at approximately 14 feet below the ground surface.									
								20											

Project:		Proposed Day School & Medical Office										Proj. No.:		4447-22-01615			
Location:		982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey										Client:		The Malvern School			
Surface Elevation:		130.1 feet					Date Started:		08-10-2022		Groundwater Data		Depth	El.	Additional Groundwater Data	Depth	El.
Termination Depth:		16.0 feet					Date Completed:		08-10-2022				(ft)	(ft)		(ft)	(ft)
Proposed Location:		Proposed Day School					Logged by:		M. Mickley		While Drilling: ▽		NE	-			
Drill/Test Method:		HSA/SPT					Contractor:		GPI		At Completion: ▼		NE	-			
Hammer Type:		Auto					Rig Type:		Geoprobe 7822DT								
Sample Information							Depth (ft)	Strata		DESCRIPTION OF MATERIALS (Classification)				Remarks			
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N											
0.0-2.0	S-1	SS	6	--	5	5	11		Surface Cover		8 inches of topsoil						
					6	8					Brown coarse to fine sand, some silt, trace coarse to fine gravel, moist, (FILL)						
2.0-4.0	S-2	SS	4	--	7	9	19		FILL		As above (FILL)						
					10	10											
4.0-6.0	S-3	SS	14	--	7	7	16	5			Reddish brown silt, little coarse to fine sand, moist, very stiff (ML)				Qp = 3.0 tsf		
					9	10											
6.0-8.0	S-4	SS	22	--	8	9	18				As above (ML)				Qp = 3.0 tsf		
					9	10											
8.0-10.0	S-5	SS	24	--	6	7	13				As above, hard (ML)				Qp = 4.0 tsf		
					6	8											
10.0-12.0	S-6	SS	14	--	8	11	22	10	Residual Soils		As above (ML)				Qp = 4.0 tsf		
					11	12											
12.0-14.0	S-7	SS	16	--	9	9	18				Reddish brown coarse to fine gravel, little clay, moist, medium dense (GC)				Qp = 4.0 tsf		
					9	9											
14.0-16.0	S-8	SS	18	--	10	11	22	15			As above (GC)				Qp = 4.0 tsf		
					11	8											
											Boring B-4 was terminated at approximately 16 feet below the ground surface.						



TEST PIT

Test Pit : TP-1

Page 1 of 1

Project: Proposed Day School & Medical Office				Proj. No.: 4447-22-01615					
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey				Client: The Malvern School					
Surface Elevation: 133.9 feet		Date Started: 08-10-2022		Groundwater Data	Depth	El.	Additional Groundwater Data	Depth	El.
Termination Depth: 12.0 feet		Date Completed: 08-10-2022			(ft)	(ft)		(ft)	(ft)
Proposed Location: Proposed Medical Office		Logged by: M. Mickley		First Encountered: ▽	NE	-			
		Contractor: GPI		At Completion: ▼	NE	-			
		Rig Type: Bobcat E-60							
Sample Information			Depth (FT)	Strata	DESCRIPTION OF MATERIALS (Classification)				Remarks
Depth (Feet)	Number	Type							
0.0 - 0.7				Surface Cover	8 inches of topsoil				
0.7 - 12.0	S-1	BAG	2.0	Residual Soils	Reddish brown silt, little coarse to fine sand, trace fine gravel, moist (ML)				
			4.0						
			6.0						
			8.0						
			10.0						
			Test Pit TP-1 was terminated at approximately 12 feet below the ground surface.						

Project:		Proposed Day School & Medical Office										Proj. No.:		4447-22-01615			
Location:		982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey										Client:		The Malvern School			
Surface Elevation:		136.5 feet				Date Started:		08-10-2022		Groundwater Data		Depth	El.	Additional Groundwater Data	Depth	El.	
Termination Depth:		12.0 feet				Date Completed:		08-10-2022				(ft)	(ft)		(ft)	(ft)	
Proposed Location:		Proposed Medical Office				Logged by:		M. Mickley		First Encountered: ▾		NE	-				
						Contractor:		GPI		At Completion: ▼		NE	-				
						Rig Type:		Bobcat E-60									
Sample Information			Depth (FT)	Strata		DESCRIPTION OF MATERIALS (Classification)										Remarks	
Depth (Feet)	Number	Type															
0.0 - 0.7			2.0	Surface Cover		8 inches of topsoil											
0.7 - 1.5				FILL		Brown coarse to fine sand, some silt, little coarse to fine gravel, moist (FILL)											
1.5 - 3.6						Reddish brown silt, little coarse to fine sand, little coarse to fine gravel, moist (FILL)											
3.6 - 12.0			4.0	Residual Soils		Reddish brown silt, little coarse to fine sand, trace fine gravel, moist (ML)											
			6.0														
			8.0														
			10.0														
			Test Pit TP-2 was terminated at approximately 12 feet below the ground surface.														



TEST PIT

Test Pit : TP-3

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Project: Proposed Day School & Medical Office				Proj. No.: 4447-22-01615					
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey				Client: The Malvern School					
Surface Elevation: 127.5 feet		Date Started: 08-10-2022		Groundwater Data	Depth	El.	Additional Groundwater Data	Depth	El.
Termination Depth: 12.3 feet		Date Completed: 08-10-2022			(ft)	(ft)		(ft)	(ft)
Proposed Location: Proposed Day School		Logged by: M. Mickley		First Encountered: ▽	NE	-			
		Contractor: GPI		At Completion: ▼	NE	-			
		Rig Type: Bobcat E-60							
Sample Information			Depth (FT)	Strata	DESCRIPTION OF MATERIALS (Classification)				Remarks
Depth (Feet)	Number	Type							
0.0 - 0.7			2.0	Surface Cover	8 inches of topsoil				
0.7 - 3.0	S-1				Brown coarse to fine sand, some silt, trace coarse to fine gravel, moist (SM)				
			4.0						
			6.0	Residual Soils					
3.0 - 11.3	S-2		8.0		Reddish brown silt, little coarse to fine sand, moist (ML)				
			10.0						
11.3 - 12.3				Weathered Rock	Reddish Brown coarse to fine gravel, some clay, some weathered rock (shale) fragments, moist (GC)				
					Test Pit TP-3 encountered refusal at approximately 12.3 feet below the ground surface.				

Project: Proposed Day School & Medical Office				Proj. No.: 4447-22-01615											
Location: 982 Georgetown-Frankling Turnpike (Route 518) Township of Montgomery, Somerset County, New Jersey				Client: The Malvern School											
Surface Elevation:		131.8 feet		Date Started:		08-10-2022		Groundwater Data		Depth	El.	Additional Groundwater Data	Depth	El.	
Termination Depth:		12.0 feet		Date Completed:		08-10-2022				(ft)	(ft)		(ft)	(ft)	
Proposed Location: Proposed Day School				Logged by:		M. Mickley		First Encountered: ▾		NE	-				
				Contractor:		GPI		At Completion: ▾		NE	-				
				Rig Type:		Bobcat E-60									
Sample Information			Depth (FT)	Strata		DESCRIPTION OF MATERIALS (Classification)								Remarks	
Depth (Feet)	Number	Type													
0.0 - 0.7			2.0	Surface Cover		8 inches of topsoil									
0.7 - 1.4	S-1	BAG			Brown coarse to fine sand, some silt, little coarse to fine gravel, moist (SM)										
1.4 - 4.5	S-2	BAG			Reddish brown silt, little coarse to fine sand, moist (ML)										
4.5 - 6.0	S-3	BAG			Dark reddish silt, little coarse to fine sand, moist (ML)										
6.0 - 12.0	S-4	BAG			Residual Soils	Reddish brown to purple silt and coarse to fine sand, trace fine gravel, moist (ML)									
			10.0												
				Test Pit TP-4 was terminated at approximately 12 feet below the ground surface											



SOIL PROFILE PIT LOG

Soil Profile Pit: **SPP-1**

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 882 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 130.6		Date Started: 8/11/22		Groundwater Data				Depth (ft)		E.L. (ft)		Groundwater Comments											
Termination Depth (ft): 111.2		Date Completed:		Sewage				NE		-													
Proposed Location: SWM		Logged by: M. Mickley		Groundwater				NE		-													
Excavation / Test Method: Visual Observation		Contractor: GPI		Seasonal High Groundwater				NE		-													
Rig Type: Bobcat E-60																							
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-12	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
			<5	0	0	0																	
12-134	Dark Olive Brown (2.5Y 3/4)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC					NONE	BAG TUBE	36	S-1 T-1	A < 0.2 lph B < 0.2 lph	
			15	<5	<5	0																	

Additional Remarks: Soil Profile Pit SPP-1 was terminated at approximately 11.2 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-2

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615														
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School														
Surface Elevation (ft): 127.0		Date Started: 8/11/22		Groundwater Data				Depth (ft)				EL (ft)		Groundwater Comments										
Termination Depth (ft): 12.0		Date Completed: 8/11/22		Seepage				NE				-												
Proposed Location: SWM		Logged by: M. Mickley				Groundwater				NE										-				
Excavation / Test Method: Visual Observation		Contractor: GPI				Seasonal High Groundwater				NE										-				
Rig Type: Bobcat E-60																								
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS	
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.		
0-5	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	BROKEN	FEW (5% MAX)	FINE	NONE						
			<5	0	0	0																		
5-32	Yellowish Red (5YR 4/6)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	FEW (5% MAX)	MEDIUM	NONE			BAG	20	S-1	
			15	<5	<5	0																		
32-140	Dusky Red (10R 3/2)	SANDY CLAY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	SLIGHTLY STICKY	SLIGHTLY PLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	48	S-2 T-1	A < 0.2 iph B < 0.2 iph
			15	<5	<5	0																		
140-144	Dark Reddish Gray (2.5YR 4/1)	FLAGGY SILT LOAM	CHANNERS	FLAGSTONES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC			NONE		NONE						
			15	<5	10	0																		

Additional Remarks: Soil Profile Pit SPP-2 was terminated at approximately 12 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-3

Page 1 of 1

Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 130.9		Date Started: 8/11/22		Groundwater Data		Depth (ft)		E.L. (ft)		Groundwater Comments													
Termination Depth (ft): 10.0		Date Completed: 8/11/22		Seepage		NE		-															
Proposed Location: SWM		Logged by: M. Mickey		Groundwater		NE		-															
Excavation / Test Method: Visual Observation		Contractor: GPI		Seasonal High Groundwater		NE		-															
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-6	TOPSOIL Brown (7.5YR 4/2)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
			<5	0	0	0																	
6-20	Yellowish Red (5YR 4/6)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE		BAG	10	S-1	
			15	<5	<5	0																	
20-120	Dark Reddish Gray (2.5YR 3/1)	SANDY CLAY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC			NONE		NONE		BAG TUBE	30	S-2 T-1	
			15	<5	<5	0																	

Additional Remarks: Soil Profile Pit SPP-3 was terminated at approximately 10 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-4

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 139.2		Date Started: 8/11/22		Groundwater Data		Depth (ft)		EL (ft)		Groundwater Comments													
Termination Depth (ft): 8.5		Date Completed: 8/11/22		Sewage		NE		-															
Proposed Location: SWM		Logged by: M. Mickley		Groundwater		NE		-															
Excavation / Test Method: Visual Observation		Contractor: GPI		Seasonal High Groundwater		NE		-															
Rig Type: Bobcat E-60																							
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-8	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
<5	0	0	0																				
8-48	Yellowish Red (5YR 4/6)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE	BAG	32	S-1		
15	<5	<5	0																				
48-102	Dark Reddish Brown (2.5YR 3/4)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	SLIGHTLY STICKY	NONPLASTIC			NONE	NONE	NONE	BAG TUBE	52	S-2 T-1	A < 0.2 lph B < 0.2 lph	
15	<5	<5	0																				

Additional Remarks: Soil Profile Pit SPP-4 was terminated at approximately 8.5 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: **SPP-5**

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 140.1		Date Started: 8/11/22		Groundwater Data				Depth (ft)		EL (ft)		Groundwater Comments											
Termination Depth (ft): 10.0 SWM		Date Completed:		Sewage:				NE		-													
Proposed Location:		Logged by: M. Mickley		Groundwater:				NE		-													
Excavation / Test Method: Visual Observation		Contractor: GPI		Seasonal High Groundwater:				NE		-													
Rig Type: Bobcat E-60																							
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-10	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
<5	0	0	0																				
10-34	Fill Yellowish Red (5YR 4/6)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE	BAG	18	S-1		
15	<5	<5	0																				
34-120	Dark Reddish Brown (2.5YR 3/4)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC			NONE		NONE	BAG TUBE	40	S-2 T-1	A < 0.2 lph B < 0.2 lph	
15	<5	<5	0																				

Additional Remarks: Fill encountered to 34 inches. Soil Profile Pit SPP-5 was terminated at approximately 10 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: **SPP-6**

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 143.4		Date Started: 8/11/22		Groundwater Data				Depth (ft)		EL (ft)		Groundwater Comments											
Termination Depth (ft): 11.0		Date Completed:		Sewage:				NE		-													
Proposed Location: SWM		Logged by: M. Mickley		Groundwater:				NE		-													
Excavation / Test Method: Visual Observation		Contractor: GPI		Seasonal High Groundwater:				NE		-													
Rig Type: Bobcat E-60																							
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-12	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
			<5	0	0	0																	
12-46	Fill Yellowish Red (5YR 4/6)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	ANGULAR BLOCKY	MODERATE	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE		BAG	24	S-1	
			15	<5	<5	0																	
46-132	Dark Reddish Brown (2.5YR 3/4)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC			NONE		NONE		BAG TUBE	50	S-2 T-1	A < 0.2 lph B < 0.2 lph
			15	<5	<5	0																	

Additional Remarks: Soil Profile Pit SPP-6 was terminated at approximately 11 feet below the ground surface.



SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-7

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Project: Proposed Day School and Medical Office										Project No.: 4447-22-01615													
Location: 982 Georgetown-Franklin Turnpike (Route 518) Township of Montgomery, New Jersey										Client: The Malvern School													
Surface Elevation (ft): 133.9		Date Started: 8/11/22		Groundwater Data				Depth (ft): NE		E.L. (ft):		Groundwater Comments											
Termination Depth (ft): 12.0		Date Completed:		Logged by: M. Mickley				Seepage: NE		Groundwater: -													
Proposed Location: SWM				Contractor: GPI				Groundwater: NE		Groundwater: -													
Excavation / Test Method: Visual Observation				Rig Type: Bobcat E-60				Seasonal High Groundwater: NE		Groundwater: -													
DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS	MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography		Quantity	Size	Contrast	Type	Depth (in)	No.	
0-8	TOPSOIL Brown (7.5YR 4/2)	LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE					
			<5	0	0	0																	
8-26	Fill Yellowish Red (5YR 4/6)	SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	FEW (5% MAX)	FINE	NONE		BAG	12	S-1	
			15	<5	<5	0																	
26-144	Dark Reddish Brown (2.5YR 3/4)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FIRM	NONSTICKY	NONPLASTIC			NONE		NONE		BAG TUBE	36	S-2 T-1	A < 0.2 iph B < 0.2 iph
			15	<5	<5	0																	

Additional Remarks: Soil Profile Pit SPP-7 was terminated at approximately 12 feet below the ground surface.

DRAINAGE AREA MAPS

