STORMWATER MANAGEMENT REPORT

For

Victoria Gardens
Major Site Plan

Neptune Township
Monmouth County, New Jersey

Prepared By:

PROFESSIONAL DESIGN SERVICES, LLC

1245 Airport Road, Unit 1
Lakewood, New Jersey 08701
PDS #321644

WILLIAM A. STEVENS, P.E. LICENSE #39915

June 24, 2021

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1.0 PROJECT DESCRIPTION

It is proposed to develop the Victoria Gardens multi-family residential project at the property located Hovchild Boulevard in Neptune Township. Figure 1, enclosed, is a copy of the Monmouth County Road Map illustrating the site's location.

The project is depicted in detail on the Site Plans, prepared by Professional Design Services, LLC.

This report outlines the methodologies and results for management of the increased stormwater runoff created as a result of the development.

2.0 EXISTING SITE CONDITIONS

The following analysis describes the existing environmental conditions based upon literature review and field investigation.

2.1 Topography and Hydrology

The topography of the site is generally minor relief and the site is surrounded by existing development.

Figure 2 is a copy of the USGS Quadrangle Topography Map with the site located.

2.2 Soils

The project site is underlain by the following soils as depicted by the U.S. Department of Agriculture; Monmouth County Soil Survey. Figure 3 is a copy of the Soil Survey with the site located.

Soil Type	% Slope	Depth to SHWT*
LwB - Lakewood sand	0-5	>6’
TnB - Tinton sand	0-5	>6’
HnB – Hammonton sandy loam	0-3	1.5 – 4’
At – Atsion sand	0-2	0- 1’
Sh – Shrewsbury fine sandy loam	0-2	1-5’

Lakewood Sands are well drained soils mapped along Monmouth Road. Tinton sands are also well drained soils mapped in the central portion of the site. Hammonton sandy loam ranges from moderately well drained to somewhat poorly drained and is mapped in the western portion of the site adjacent to Lot 1. Atsion Sands and Shrewsbury fine sandy loam are poorly drained soils found in depressional areas and on low, broad flats and are mapped within the freshwater wetland areas, Shrewsbury in the front wetland area and Atsion the rear wetland area. Of these soils, only Atsion and Shrewsbury are listed as hydric on the USDA’s Hydric Soils List for Monmouth County, New Jersey (1990).

The Lakewood and Tinton soils are hydrologic soil group "A". Hammonton Sandy loam is HSG "B". No development is proposed within the Atsion and Shrewsbury soils

3.0 REGULATORY STANDARDS

A. Applicable Regulations

All increased stormwater runoff resulting from the proposed development must be managed both qualitatively and quantitatively in accordance with New Jersey and Neptune Township Regulations.

The Stormwater Management Regulations (NJAC 7:8), as administered by the Neptune Township require the utilization of best available technology to minimize the amount of stormwater runoff, maintain existing onsite infiltration, simulate natural drainage systems and minimize the discharge of pollutants to ground or surface waters. The overall goal of the post-construction stormwater management system design shall be to meet the erosion control, groundwater recharge, stormwater runoff quantity and quality standards at N.J.A.C. 7:8-5.4 and 5.5.

The stormwater management must be design to:

1. Reduce flood damage, including damage to life and property;
2. Minimize, to the extent practical, any increase in stormwater runoff from any new development;
3. Reduce soil erosion from any development or construction project;
4. Assure the adequacy of exiting and proposed culverts and bridges, and other in-stream structures;
5. Maintain groundwater recharge;
6. Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
7. Maintain the integrity of stream channels for their biological functions, as well as for drainage;
8. Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values and to enhance the domestic, municipal, recreational, industrial and other uses of water; and
9. Protect public safety through the proper design and operation of stormwater management basins.

B. Design and Performance Standards

1. Erosion Control

   The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.

2. Groundwater Recharge

The minimum design and performance standards for groundwater recharge require compliance with either of the following:

a. Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site.

b. Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.

3. Runoff Quality

In order to control stormwater runoff quantity impacts one of the following must be demonstrated:

a. Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10 and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

b. Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10 and 100-year storm events and that the increase volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

c. Design stormwater management measures so that the post-construction peak runoff rates for the two, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.

4. Water Quality

Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80 percent of the anticipated load from the development site expressed as an annual average.

In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC 14 drainage. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exception water supply significance, and exception fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
    i. A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of bank outwards, or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided.
    ii. Encroachment within the designated special water resource protection area under 1i. above shall only be allowed where previous development or disturbance has occurred. The encroachment shall only be allowed where the project demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined.

All stormwater shall be discharged outside of but may flow through the special water resource protection area and shall comply with the Standard for Offsite Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey."

The NJDEP adopted amendments to the Stormwater Management Regulations , effective March 2, 2021, to require the use of green infrastructure. Green infrastructure refers to a set of stormwater management practices that use or mimic the natural water cycle to capture, filter, absorb

and/or re-use stormwater. The fundamental difference is that the new rules will require decentralized, distributed stormwater management practices that enable stormwater to infiltrate and more closely resemble the natural water cycle. These "best management practices" (BMPs) include vegetated swales, bioretention, green roofs, cisterns, wet ponds, infiltration basins and constructed wetlands.

4.0 PROPOSED STORMWATER MANAGEMENT PLAN

As shown on the Site Plans, the proposed stormwater management plan consists of a series of rain gardens and infiltration/ detention basins to provide green infrastructure and create a decentralized, distributed stormwater management practice to enable stormwater runoff to infiltrate and more closely resemble the natural water cycle. The overall system will perform water quality control, groundwater recharge and flood control to reduce the peak runoff rates of the 2, 10 and 100 year storm events.

5.0 METHODOLOGY

The methodology used to estimate the stormwater runoff peak flows and volumes for the required storm events is the 24 hour storm using the rainfall distribution recommended by the U.S. Department of Agriculture Soil Conservation Service.

The Stormwater Management Rules (NJAC 7:8) require the utilization of best available technology to minimize the amount of stormwater runoff, maintain existing onsite infiltration, simulate natural drainage systems and minimize the discharge of pollutants to ground or surface waters. The overall goal of the post-construction stormwater management system design shall be the reduction to the pre-development level of total suspended solids (TSS) and soluble contaminants in the stormwater, recharge the two year storm volume and provide flood control.

In order to provide adequate control it is necessary to design the stormwater system so that the post-development peak runoff rate for the two year storm event is 50 percent of the pre-development peak runoff rate for the 10 and 100 year storm events are 75 and 80 percent, respectively, of the pre-development peak runoff rate. The predevelopment runoff rate has been calculated with the site in its current condition (forested) which has existed for more than 5 years. The runoff calculations separately tabulate the impervious and pervious contributory drainage areas and sequentially route the inflow through the basin system for each design storm to ensure that each of the design goals are met.

Copies of the computations are contained within the appendices of this report.

6.0 SUMMARY

Erosion Control

The project complies with the "New Jersey Standards for Soil Erosion and Sediment Control." Certification for the project must be granted by the Monmouth County Soil Conservation District.

Groundwater Recharge

The rain gardens and basins will contain adequate volume to recharge and infiltrate the increased runoff volume for the 2 year storm.

Since adequate storage volume is provided it is not required to complete the NJDEP groundwater recharge spreadsheet.

Green Infrasture

The system contains six (6) rain garden and infiltration basins that serve to decentralize and distribute the stormwater runoff consistent with the green infrastructure amendment to the Stormwater Rules.

Runoff Quantity

The following is a summary of the runoff from the project site for the flood storm events:

Storm Event	Pre-Developed Peak Flow	Allowable Peak Flow	Post-Developed Peak Flow
2	0.1	0.05	0.03
10	0.4	0.3	0.3
100	6.2	5.0	2.4

Water Quality

The project site is contributory to surface waters not classified as Category One. It is necessary to provide an 80% TSS removal rate. The proposed basins contain adequate volume to retain the entire water quality storm thereby providing a 100% TSS removal rate, complying with the standards.

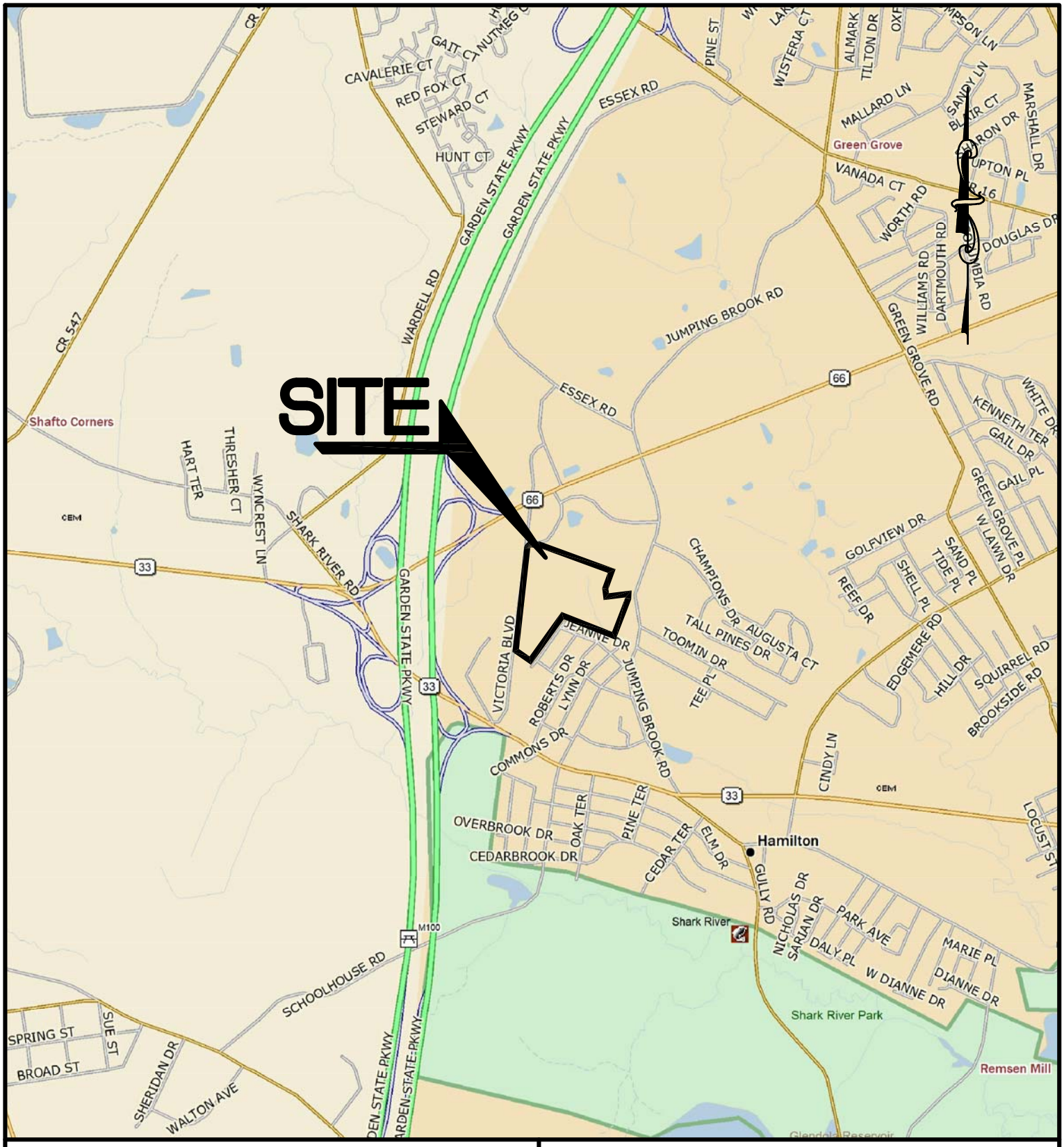
The stormwater management system complies with the design parameters as set forth in the stormwater regulations.

The project complies with applicable NJDEP and Neptune Township regulations.

7.0 MAINTENANCE

All maintenance activities for the stormwater collection system and management basins will be the responsibility of the property owner. A stormwater maintenance plan is included in the site plans which illustrates and describes the required inspection & maintenance activities.

All maintenance and inspection activities must be performed in accordance with the Best Management Practices Manual prepared by NJDEP.



PDS
PROFESSIONAL DESIGN SERVICES, L.L.C.
CONSULTING ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS, CONSTRUCTION SERVICES
1245 AIRPORT ROAD, SUITE 1, LAKEWOOD, NEW JERSEY 08701
PHONE 732 363 0060 FAX 732 363 0073
ENGINEERING @ PDSDOVER.COM
NEW JERSEY STATE BOARD OF P.E. & L.S.

FIGURE #1

LOCATION PLAN

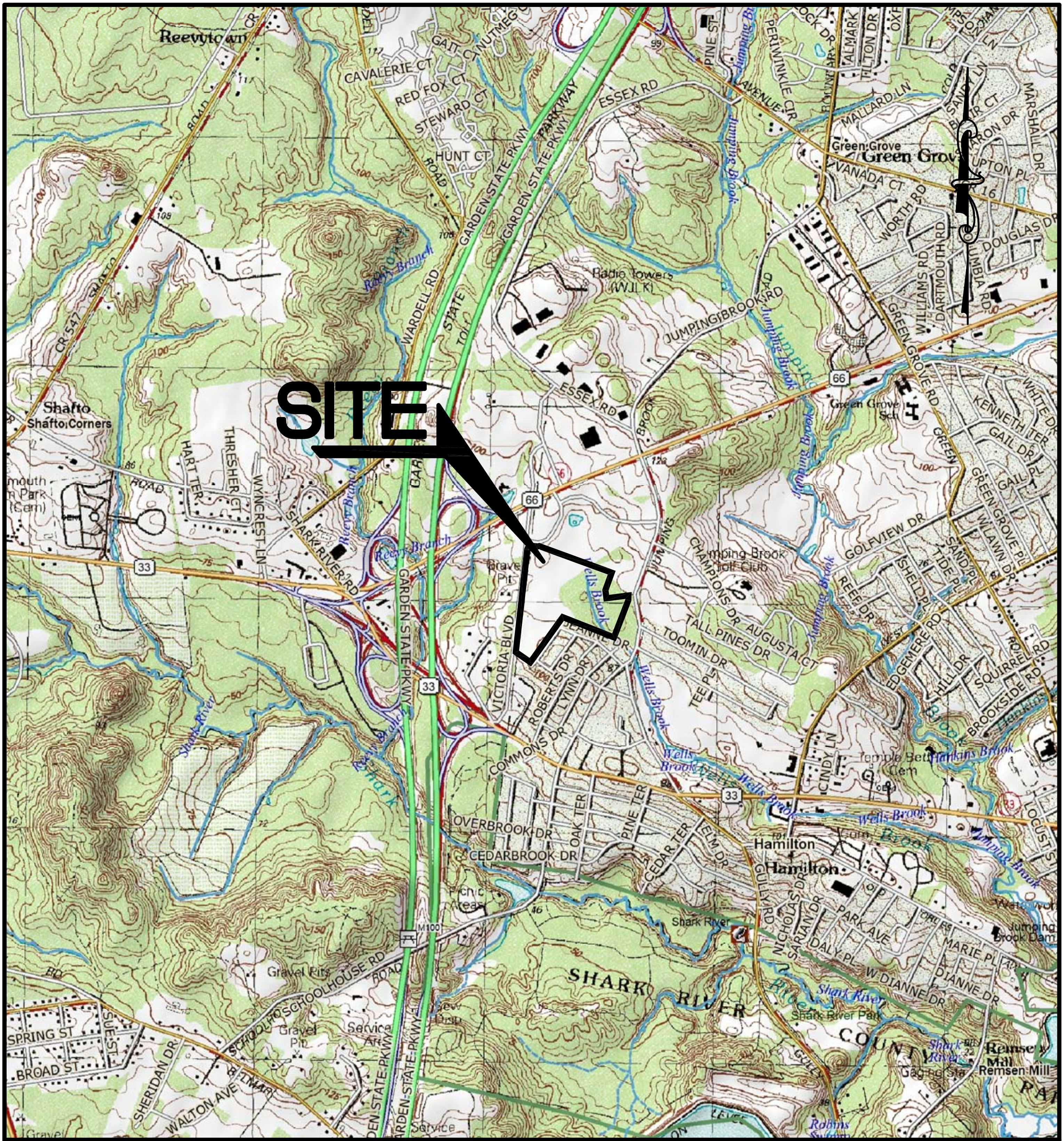
FOR

VICTORIA GARDENS

BLOCK 4001 – LOTS 1, 2 & 3

TOWNSHIP OF NEPTUNE, MONMOUTH COUNTY, NEW JERSEY

PRE PROJECT #321644



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PROFESSIONAL DESIGN SERVICES, L.L.C.
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1245 AIRPORT ROAD, SUITE 1, LAKEWOOD, NEW JERSEY 08701
PHONE 732 363 0060 FAX 732 363 0073
ENGINEERING@PDSDOVER.COM
NEW JERSEY STATE BOARD OF P.E. & L.S.

FIGURE #2

QUAD MAP

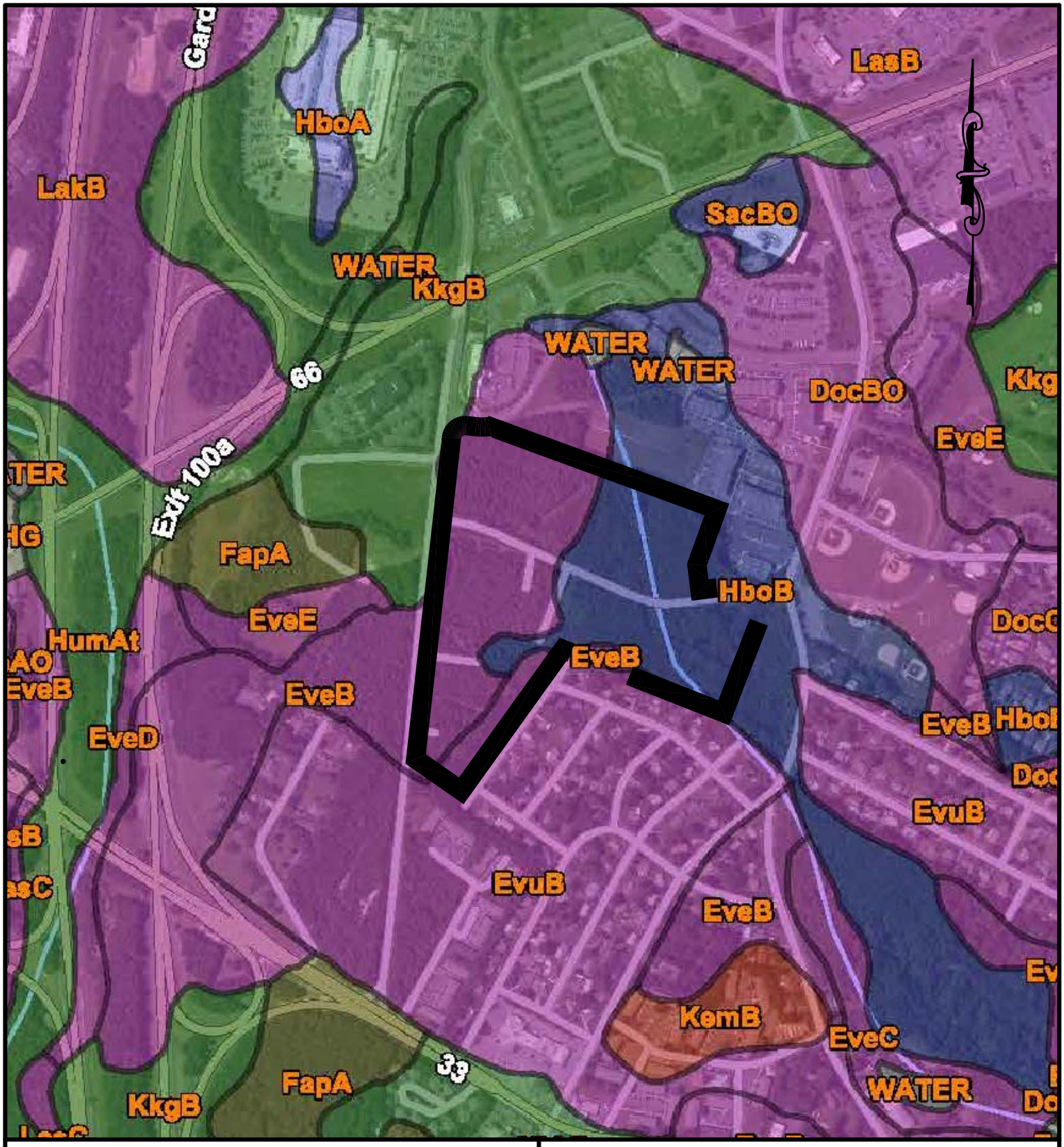
FOR

VICTORIA GARDENS

BLOCK 4001 – LOTS 1, 2 & 3

TOWNSHIP OF NEPTUNE, MONMOUTH COUNTY, NEW JERSEY

PRE PROJECT #321644



PDS

PROFESSIONAL DESIGN SERVICES, L.L.C.

CONSULTING ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS, CONSTRUCTION SERVICES

1245 AIRPORT ROAD, SUITE 1, LAKEWOOD, NEW JERSEY 08701

PHONE 732 363 0060 FAX 732 363 0073

ENGINEERING @ PDSDOVER.COM

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FIGURE #3

SOILS MAP

FOR

VICTORIA GARDENS

BLOCK 4001 – LOTS 1, 2 & 3

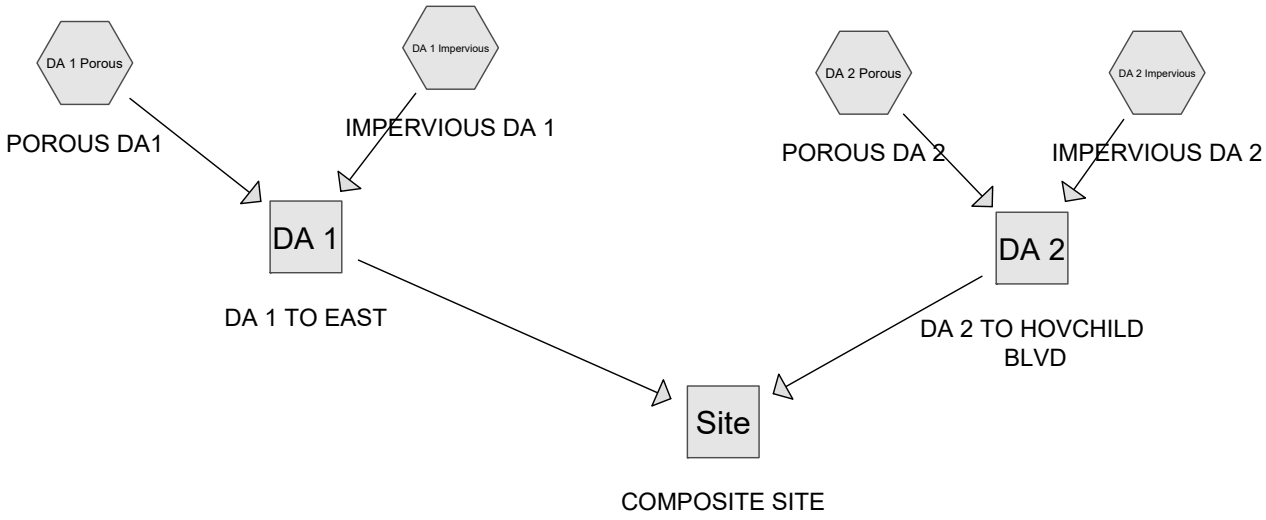
TOWNSHIP OF NEPTUNE, MONMOUTH COUNTY, NEW JERSEY

PRE PROJECT #321644

APPENDIX A

EXISTING CONDITION CALCULATIONS

- **EXISTING RUNOFF HYDROGRAPHS**



Subcat Reach Pond Link

Routing Diagram for PRE DEV

Prepared by {enter your company name here}, Printed 6/25/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA 1 Impervious: Runoff Area=0.040 ac 100.00% Impervious Runoff Depth>2.87"
Tc=22.3 min CN=98 Runoff=0.06 cfs 0.010 af

Subcatchment DA 1 Porous: POROUS DA1 Runoff Area=4.860 ac 0.00% Impervious Runoff Depth>0.00"
Flow Length=100' Slope=0.0170 '/' Tc=22.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 2 Impervious: Runoff Area=0.070 ac 100.00% Impervious Runoff Depth>2.86"
Tc=38.6 min CN=98 Runoff=0.07 cfs 0.017 af

Subcatchment DA 2 Porous: POROUS DA 2 Runoff Area=12.530 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,140' Tc=38.6 min CN=36 Runoff=0.00 cfs 0.000 af

Reach DA 1: DA 1 TO EAST Inflow=0.06 cfs 0.010 af
Outflow=0.06 cfs 0.010 af

Reach DA 2: DA 2 TO HOVCHILD BLVD Inflow=0.07 cfs 0.017 af
Outflow=0.07 cfs 0.017 af

Reach Site: COMPOSITE SITE Inflow=0.13 cfs 0.026 af
Outflow=0.13 cfs 0.026 af

Total Runoff Area = 17.500 ac Runoff Volume = 0.026 af Average Runoff Depth = 0.02"
99.37% Pervious = 17.390 ac 0.63% Impervious = 0.110 ac

Summary for Subcatchment DA 1 Impervious: IMPERVIOUS DA 1

Runoff = 0.06 cfs @ 12.34 hrs, Volume= 0.010 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 YEAR Rainfall=3.38"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.040		100.00% Impervious Area

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

Summary for Subcatchment DA 1 Porous: POROUS DA1

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 YEAR Rainfall=3.38"

Area (ac)	CN	Description
3.380	32	Woods/grass comb., Good, HSG A
0.380	39	>75% Grass cover, Good, HSG A
0.380	58	Woods/grass comb., Good, HSG B
0.720	61	>75% Grass cover, Good, HSG B
4.860	39	Weighted Average
4.860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0170	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"

Summary for Subcatchment DA 2 Impervious: IMPERVIOUS DA 2

Runoff = 0.07 cfs @ 12.55 hrs, Volume= 0.017 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 YEAR Rainfall=3.38"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG A
0.010	98	Paved parking, HSG B
0.070	98	Weighted Average
0.070		100.00% Impervious Area

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

Summary for Subcatchment DA 2 Porous: POROUS DA 2

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 YEAR Rainfall=3.38"

Area (ac)	CN	Description
6.250	32	Woods/grass comb., Good, HSG A
5.920	39	>75% Grass cover, Good, HSG A
0.230	58	Woods/grass comb., Good, HSG B
0.130	61	>75% Grass cover, Good, HSG B
12.530	36	Weighted Average
12.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"
19.0	360	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.8	680		3.00		**Direct Entry,**
38.6	1,140	Total			

Summary for Reach DA 1: DA 1 TO EAST

Inflow Area = 4.900 ac, 0.82% Impervious, Inflow Depth > 0.02" for 2 YEAR event
Inflow = 0.06 cfs @ 12.34 hrs, Volume= 0.010 af
Outflow = 0.06 cfs @ 12.34 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach DA 2: DA 2 TO HOVCHILD BLVD

Inflow Area = 12.600 ac, 0.56% Impervious, Inflow Depth > 0.02" for 2 YEAR event
Inflow = 0.07 cfs @ 12.55 hrs, Volume= 0.017 af
Outflow = 0.07 cfs @ 12.55 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: COMPOSITE SITE

Inflow Area = 17.500 ac, 0.63% Impervious, Inflow Depth > 0.02" for 2 YEAR event
Inflow = 0.13 cfs @ 12.46 hrs, Volume= 0.026 af
Outflow = 0.13 cfs @ 12.46 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA 1 Impervious: Runoff Area=0.040 ac 100.00% Impervious Runoff Depth>4.52"
Tc=22.3 min CN=98 Runoff=0.09 cfs 0.015 af

Subcatchment DA 1 Porous: POROUS DA1 Runoff Area=4.860 ac 0.00% Impervious Runoff Depth>0.18"
Flow Length=100' Slope=0.0170 '/' Tc=22.3 min CN=39 Runoff=0.18 cfs 0.074 af

Subcatchment DA 2 Impervious: Runoff Area=0.070 ac 100.00% Impervious Runoff Depth>4.51"
Tc=38.6 min CN=98 Runoff=0.12 cfs 0.026 af

Subcatchment DA 2 Porous: POROUS DA 2 Runoff Area=12.530 ac 0.00% Impervious Runoff Depth>0.09"
Flow Length=1,140' Tc=38.6 min CN=36 Runoff=0.20 cfs 0.095 af

Reach DA 1: DA 1 TO EAST Inflow=0.21 cfs 0.089 af
Outflow=0.21 cfs 0.089 af

Reach DA 2: DA 2 TO HOVCHILD BLVD Inflow=0.22 cfs 0.122 af
Outflow=0.22 cfs 0.122 af

Reach Site: COMPOSITE SITE Inflow=0.39 cfs 0.210 af
Outflow=0.39 cfs 0.210 af

Total Runoff Area = 17.500 ac Runoff Volume = 0.210 af Average Runoff Depth = 0.14"
99.37% Pervious = 17.390 ac 0.63% Impervious = 0.110 ac

Summary for Subcatchment DA 1 Impervious: IMPERVIOUS DA 1

Runoff = 0.09 cfs @ 12.34 hrs, Volume= 0.015 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 YEAR Rainfall=5.23"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.040		100.00% Impervious Area

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

Summary for Subcatchment DA 1 Porous: POROUS DA1

Runoff = 0.18 cfs @ 13.45 hrs, Volume= 0.074 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 YEAR Rainfall=5.23"

Area (ac)	CN	Description
3.380	32	Woods/grass comb., Good, HSG A
0.380	39	>75% Grass cover, Good, HSG A
0.380	58	Woods/grass comb., Good, HSG B
0.720	61	>75% Grass cover, Good, HSG B
4.860	39	Weighted Average
4.860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0170	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"

Summary for Subcatchment DA 2 Impervious: IMPERVIOUS DA 2

Runoff = 0.12 cfs @ 12.55 hrs, Volume= 0.026 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 YEAR Rainfall=5.23"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG A
0.010	98	Paved parking, HSG B
0.070	98	Weighted Average
0.070		100.00% Impervious Area

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

Summary for Subcatchment DA 2 Porous: POROUS DA 2

Runoff = 0.20 cfs @ 15.10 hrs, Volume= 0.095 af, Depth> 0.09"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 YEAR Rainfall=5.23"

Area (ac)	CN	Description
6.250	32	Woods/grass comb., Good, HSG A
5.920	39	>75% Grass cover, Good, HSG A
0.230	58	Woods/grass comb., Good, HSG B
0.130	61	>75% Grass cover, Good, HSG B
12.530	36	Weighted Average
12.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"
19.0	360	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.8	680		3.00		**Direct Entry,**
38.6	1,140	Total			

Summary for Reach DA 1: DA 1 TO EAST

Inflow Area = 4.900 ac, 0.82% Impervious, Inflow Depth > 0.22" for 10 YEAR event
Inflow = 0.21 cfs @ 13.25 hrs, Volume= 0.089 af
Outflow = 0.21 cfs @ 13.25 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach DA 2: DA 2 TO HOVCHILD BLVD

Inflow Area = 12.600 ac, 0.56% Impervious, Inflow Depth > 0.12" for 10 YEAR event
Inflow = 0.22 cfs @ 14.86 hrs, Volume= 0.122 af
Outflow = 0.22 cfs @ 14.86 hrs, Volume= 0.122 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: COMPOSITE SITE

Inflow Area = 17.500 ac, 0.63% Impervious, Inflow Depth > 0.14" for 10 YEAR event
Inflow = 0.39 cfs @ 13.71 hrs, Volume= 0.210 af
Outflow = 0.39 cfs @ 13.71 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA 1 Impervious: Runoff Area=0.040 ac 100.00% Impervious Runoff Depth>7.81"
Tc=22.3 min CN=98 Runoff=0.15 cfs 0.026 af

Subcatchment DA 1 Porous: POROUS DA1 Runoff Area=4.860 ac 0.00% Impervious Runoff Depth>1.33"
Flow Length=100' Slope=0.0170 '/' Tc=22.3 min CN=39 Runoff=2.66 cfs 0.537 af

Subcatchment DA 2 Impervious: Runoff Area=0.070 ac 100.00% Impervious Runoff Depth>7.80"
Tc=38.6 min CN=98 Runoff=0.20 cfs 0.045 af

Subcatchment DA 2 Porous: POROUS DA 2 Runoff Area=12.530 ac 0.00% Impervious Runoff Depth>1.01"
Flow Length=1,140' Tc=38.6 min CN=36 Runoff=3.58 cfs 1.056 af

Reach DA 1: DA 1 TO EAST Inflow=2.80 cfs 0.563 af
Outflow=2.80 cfs 0.563 af

Reach DA 2: DA 2 TO HOVCHILD BLVD Inflow=3.75 cfs 1.102 af
Outflow=3.75 cfs 1.102 af

Reach Site: COMPOSITE SITE Inflow=6.20 cfs 1.665 af
Outflow=6.20 cfs 1.665 af

Total Runoff Area = 17.500 ac Runoff Volume = 1.665 af Average Runoff Depth = 1.14"
99.37% Pervious = 17.390 ac 0.63% Impervious = 0.110 ac

Summary for Subcatchment DA 1 Impervious: IMPERVIOUS DA 1

Runoff = 0.15 cfs @ 12.34 hrs, Volume= 0.026 af, Depth> 7.81"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 YEAR Rainfall=8.94"

Area (ac)	CN	Description
0.040	98	Paved parking, HSG A
0.040		100.00% Impervious Area

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

Summary for Subcatchment DA 1 Porous: POROUS DA1

Runoff = 2.66 cfs @ 12.47 hrs, Volume= 0.537 af, Depth> 1.33"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 YEAR Rainfall=8.94"

Area (ac)	CN	Description
3.380	32	Woods/grass comb., Good, HSG A
0.380	39	>75% Grass cover, Good, HSG A
0.380	58	Woods/grass comb., Good, HSG B
0.720	61	>75% Grass cover, Good, HSG B
4.860	39	Weighted Average
4.860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0170	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"

Summary for Subcatchment DA 2 Impervious: IMPERVIOUS DA 2

Runoff = 0.20 cfs @ 12.55 hrs, Volume= 0.045 af, Depth> 7.80"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 YEAR Rainfall=8.94"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG A
0.010	98	Paved parking, HSG B
0.070	98	Weighted Average
0.070		100.00% Impervious Area

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

Summary for Subcatchment DA 2 Porous: POROUS DA 2

Runoff = 3.58 cfs @ 12.94 hrs, Volume= 1.056 af, Depth> 1.01"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 YEAR Rainfall=8.94"

Area (ac)	CN	Description
6.250	32	Woods/grass comb., Good, HSG A
5.920	39	>75% Grass cover, Good, HSG A
0.230	58	Woods/grass comb., Good, HSG B
0.130	61	>75% Grass cover, Good, HSG B
12.530	36	Weighted Average
12.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.38"
19.0	360	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.8	680		3.00		**Direct Entry,**
38.6	1,140	Total			

Summary for Reach DA 1: DA 1 TO EAST

Inflow Area = 4.900 ac, 0.82% Impervious, Inflow Depth > 1.38" for 100 YEAR event
Inflow = 2.80 cfs @ 12.47 hrs, Volume= 0.563 af
Outflow = 2.80 cfs @ 12.47 hrs, Volume= 0.563 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach DA 2: DA 2 TO HOVCHILD BLVD

Inflow Area = 12.600 ac, 0.56% Impervious, Inflow Depth > 1.05" for 100 YEAR event
Inflow = 3.75 cfs @ 12.92 hrs, Volume= 1.102 af
Outflow = 3.75 cfs @ 12.92 hrs, Volume= 1.102 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: COMPOSITE SITE

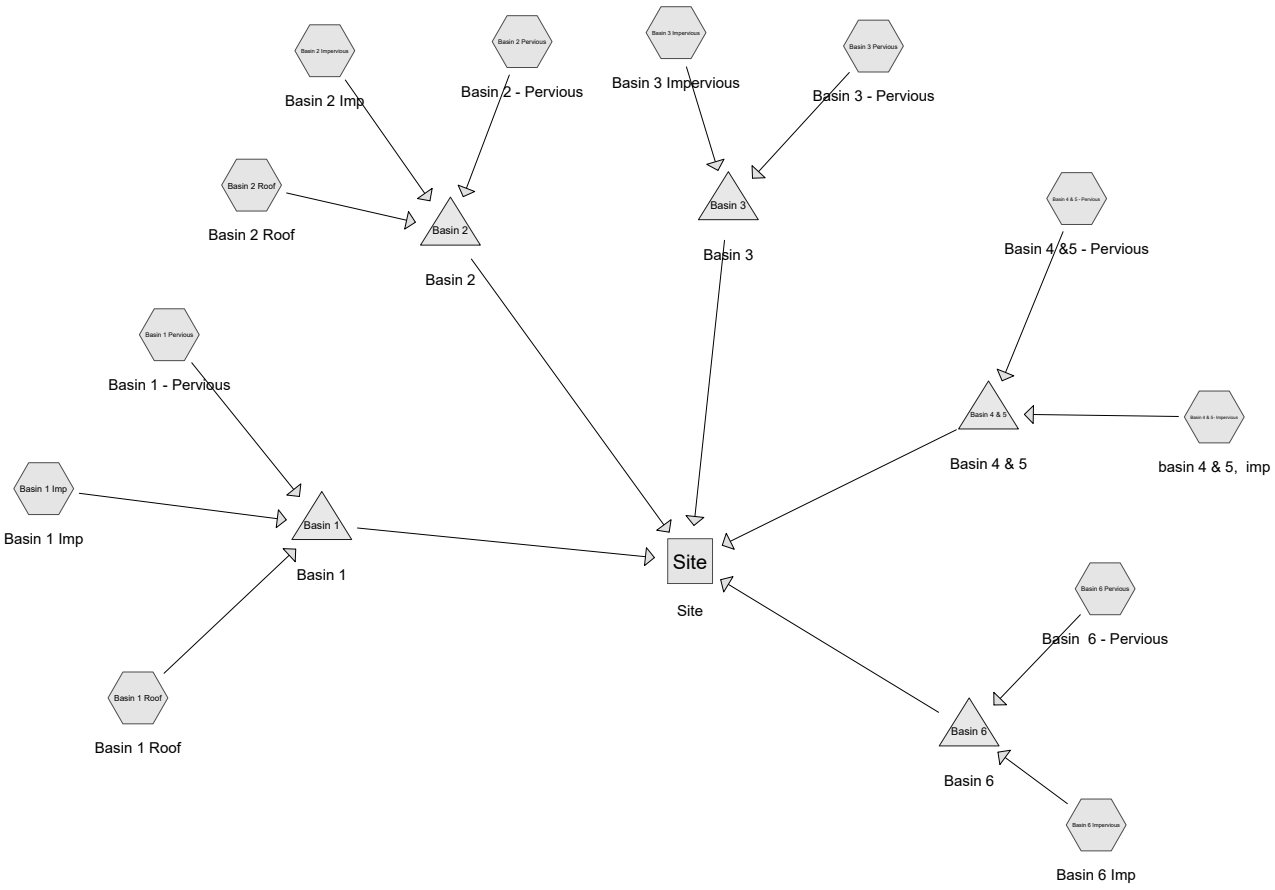
Inflow Area = 17.500 ac, 0.63% Impervious, Inflow Depth > 1.14" for 100 YEAR event
Inflow = 6.20 cfs @ 12.72 hrs, Volume= 1.665 af
Outflow = 6.20 cfs @ 12.72 hrs, Volume= 1.665 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

APPENDIX B

PROPOSED CONDITION CALCULATIONS

- **PROPOSED RUNOFF HYDROGRAPHS**
- **VOLUME CALCULATIONS**
- **OUTLET CALCULATIONS**
- **FLOOD ROUTING CALCULATIONS**
- **TIME TO DRAIN CALCULATIONS**



Subcat Reach Pond Link

Routing Diagram for Post Developed.042721.

Prepared by {enter your company name here}, Printed 6/28/2021

Time span=5.00-30.00 hrs, dt=0.05 hrs, 501 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Basin 1 Imp: Basin 1 Imp Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=0.98 cfs 0.153 af

Subcatchment Basin 1 Pervious: Basin 1 - Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment Basin 1 Roof: Basin 1 Roof Runoff Area=0.500 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=0.82 cfs 0.127 af

Subcatchment Basin 2 Impervious: Basin Runoff Area=0.800 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=1.31 cfs 0.204 af

Subcatchment Basin 2 Pervious: Basin 2 - Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment Basin 2 Roof: Basin 2 Roof Runoff Area=0.350 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=0.57 cfs 0.089 af

Subcatchment Basin 3 Impervious: Basin Runoff Area=1.200 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=1.96 cfs 0.306 af

Subcatchment Basin 3 Pervious: Basin 3 - Runoff Area=3.300 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment Basin 4 & 5 - Pervious: Basin Runoff Area=2.800 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,440' Tc=17.3 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment Basin 4 & 5- Impervious: Runoff Area=0.900 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=1.47 cfs 0.229 af

Subcatchment Basin 6 Impervious: Basin Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>3.06"
Tc=15.0 min CN=98 Runoff=1.14 cfs 0.178 af

Subcatchment Basin 6 Pervious: Basin 6 - Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.001 af

Reach Site: Site Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond Basin 1: Basin 1 Peak Elev=90.46' Storage=0.281 af Inflow=1.80 cfs 0.281 af
Outflow=0.00 cfs 0.000 af

Pond Basin 2: Basin 2 Peak Elev=88.91' Storage=0.294 af Inflow=1.88 cfs 0.294 af
Outflow=0.00 cfs 0.000 af

Pond Basin 3: Basin 3 Peak Elev=89.21' Storage=0.307 af Inflow=1.96 cfs 0.307 af
Outflow=0.00 cfs 0.000 af

Pond Basin 4 & 5: Basin 4 & 5 Peak Elev=86.69' Storage=0.230 af Inflow=1.47 cfs 0.230 af
Outflow=0.00 cfs 0.000 af

Pond Basin 6: Basin 6 Peak Elev=91.80' Storage=0.179 af Inflow=1.14 cfs 0.179 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 17.800 ac Runoff Volume = 1.291 af Average Runoff Depth = 0.87"
71.63% Pervious = 12.750 ac 28.37% Impervious = 5.050 ac

Summary for Subcatchment Basin 1 Imp: Basin 1 Imp

Runoff = 0.98 cfs @ 12.25 hrs, Volume= 0.153 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.350	98	Pavement & Sidewalk
*	0.250	98	Driveways
	0.600	98	Weighted Average
	0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 1 Pervious: Basin 1 - Pervious

Runoff = 0.00 cfs @ 24.08 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	2.100	39	lawn, A soils
	2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 1 Roof: Basin 1 Roof

Runoff = 0.82 cfs @ 12.25 hrs, Volume= 0.127 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.500	98	Roof
	0.500		100.00% Impervious Area

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

Summary for Subcatchment Basin 2 Impervious: Basin 2 Imp

Runoff = 1.31 cfs @ 12.25 hrs, Volume= 0.204 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.500	98	Pavement & Sidewalk
*	0.300	98	Driveways
	0.800	98	Weighted Average
	0.800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 2 Pervious: Basin 2 - Pervious

Runoff = 0.00 cfs @ 24.08 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	2.050	39	lawn, A soils
	2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 2 Roof: Basin 2 Roof

Runoff = 0.57 cfs @ 12.25 hrs, Volume= 0.089 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.350	98	Roof
	0.350		100.00% Impervious Area

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

Summary for Subcatchment Basin 3 Impervious: Basin 3 Impervious

Runoff = 1.96 cfs @ 12.25 hrs, Volume= 0.306 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.550	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.400	98	Roof
	1.200	98	Weighted Average
	1.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 3 Pervious: Basin 3 - Pervious

Runoff = 0.00 cfs @ 24.08 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	3.300	39	lawn, A soils
	3.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 4 & 5 - Pervious: Basin 4 &5 - Pervious

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	2.800	39	Lawn. A Soils
	2.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	640	0.0100	1.61		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
10.7	800	0.0060	1.25		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
17.3	1,440	Total			

Summary for Subcatchment Basin 4 & 5- Impervious: basin 4 & 5, imp

Runoff = 1.47 cfs @ 12.25 hrs, Volume= 0.229 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.200	98	Pavement
*	0.200	98	Driveways
*	0.500	98	Roof
	0.900	98	Weighted Average
	0.900		100.00% Impervious Area

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

Summary for Subcatchment Basin 6 Impervious: Basin 6 Imp

Runoff = 1.14 cfs @ 12.25 hrs, Volume= 0.178 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	0.250	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.200	98	Roof
	0.700	98	Weighted Average
	0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 6 Pervious: Basin 6 - Pervious

Runoff = 0.00 cfs @ 24.08 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2 year Rainfall=3.40"

	Area (ac)	CN	Description
*	2.500	39	lawn, A soils
	2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Reach Site: Site

Inflow Area = 17.800 ac, 28.37% Impervious, Inflow Depth = 0.00" for 2 year event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1: Basin 1

Inflow Area = 3.200 ac, 34.38% Impervious, Inflow Depth > 1.05" for 2 year event
Inflow = 1.80 cfs @ 12.25 hrs, Volume= 0.281 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 90.46' @ 27.05 hrs Surf.Area= 0.173 ac Storage= 0.281 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	0.885 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.050	0.000	0.000
89.00	0.100	0.075	0.075
90.00	0.150	0.125	0.200
91.00	0.200	0.175	0.375
92.00	0.250	0.225	0.600
93.00	0.320	0.285	0.885

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area = 3.200 ac, 35.94% Impervious, Inflow Depth > 1.10" for 2 year event
Inflow = 1.88 cfs @ 12.25 hrs, Volume= 0.294 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 88.91' @ 27.05 hrs Surf.Area= 0.223 ac Storage= 0.294 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1.330 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
87.00	0.090	0.000	0.000
88.00	0.150	0.120	0.120
89.00	0.230	0.190	0.310
90.00	0.300	0.265	0.575
91.00	0.380	0.340	0.915
92.00	0.450	0.415	1.330

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	91.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 4.500 ac, 26.67% Impervious, Inflow Depth > 0.82" for 2 year event
Inflow = 1.96 cfs @ 12.25 hrs, Volume= 0.307 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 89.21' @ 27.05 hrs Surf.Area= 0.297 ac Storage= 0.307 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1.950 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.200	0.000	0.000
89.00	0.280	0.240	0.240
90.00	0.360	0.320	0.560
91.00	0.420	0.390	0.950
92.00	0.500	0.460	1.410
93.00	0.580	0.540	1.950

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 4 & 5: Basin 4 & 5

Inflow Area = 3.700 ac, 24.32% Impervious, Inflow Depth > 0.75" for 2 year event
Inflow = 1.47 cfs @ 12.25 hrs, Volume= 0.230 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 86.69' @ 25.95 hrs Surf.Area= 0.188 ac Storage= 0.230 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	1.690 af	**Rain Garden Basin 4 & 5 (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
85.00	0.080	0.000	0.000
86.00	0.140	0.110	0.110
87.00	0.210	0.175	0.285
88.00	0.280	0.245	0.530
89.00	0.350	0.315	0.845
90.00	0.420	0.385	1.230
91.00	0.500	0.460	1.690

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	90.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 6: Basin 6

Inflow Area = 3.200 ac, 21.88% Impervious, Inflow Depth > 0.67" for 2 year event
Inflow = 1.14 cfs @ 12.25 hrs, Volume= 0.179 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 91.80' @ 27.05 hrs Surf.Area= 0.269 ac Storage= 0.179 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	1.350 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
91.00	0.150	0.000	0.000
92.00	0.300	0.225	0.225
93.00	0.350	0.325	0.550
94.00	0.400	0.375	0.925
95.00	0.450	0.425	1.350

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	94.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.00' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=5.00-30.00 hrs, dt=0.05 hrs, 501 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Basin 1 Imp: Basin 1 Imp Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=1.57 cfs 0.246 af

Subcatchment Basin 1 Pervious: Basin 1 - Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.07 cfs 0.050 af

Subcatchment Basin 1 Roof: Basin 1 Roof Runoff Area=0.500 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=1.31 cfs 0.205 af

Subcatchment Basin 2 Impervious: Basin Runoff Area=0.800 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=2.09 cfs 0.328 af

Subcatchment Basin 2 Pervious: Basin 2 - Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.07 cfs 0.049 af

Subcatchment Basin 2 Roof: Basin 2 Roof Runoff Area=0.350 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=0.91 cfs 0.144 af

Subcatchment Basin 3 Impervious: Basin Runoff Area=1.200 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=3.14 cfs 0.493 af

Subcatchment Basin 3 Pervious: Basin 3 - Runoff Area=3.300 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.12 cfs 0.079 af

Subcatchment Basin 4 & 5 - Pervious: Basin Runoff Area=2.800 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,440' Tc=17.3 min CN=39 Runoff=0.11 cfs 0.067 af

Subcatchment Basin 4 & 5- Impervious: Runoff Area=0.900 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=2.35 cfs 0.370 af

Subcatchment Basin 6 Impervious: Basin Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>4.93"
Tc=15.0 min CN=98 Runoff=1.83 cfs 0.287 af

Subcatchment Basin 6 Pervious: Basin 6 - Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.09 cfs 0.060 af

Reach Site: Site Inflow=0.34 cfs 0.320 af
Outflow=0.34 cfs 0.320 af

Pond Basin 1: Basin 1 Peak Elev=91.32' Storage=0.447 af Inflow=2.88 cfs 0.502 af
Outflow=0.10 cfs 0.089 af

Pond Basin 2: Basin 2 Peak Elev=89.42' Storage=0.422 af Inflow=3.01 cfs 0.521 af
Outflow=0.13 cfs 0.148 af

Pond Basin 3: Basin 3 Peak Elev=90.03' Storage=0.571 af Inflow=3.14 cfs 0.572 af
Outflow=0.00 cfs 0.001 af

Pond Basin 4 & 5: Basin 4 & 5 Peak Elev=87.61' Storage=0.434 af Inflow=2.36 cfs 0.437 af
Outflow=0.02 cfs 0.010 af

Pond Basin 6: Basin 6 Peak Elev=92.24' Storage=0.303 af Inflow=1.83 cfs 0.347 af
Outflow=0.08 cfs 0.072 af

Total Runoff Area = 17.800 ac Runoff Volume = 2.380 af Average Runoff Depth = 1.60"
71.63% Pervious = 12.750 ac 28.37% Impervious = 5.050 ac

Summary for Subcatchment Basin 1 Imp: Basin 1 Imp

Runoff = 1.57 cfs @ 12.25 hrs, Volume= 0.246 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.350	98	Pavement & Sidewalk
*	0.250	98	Driveways
	0.600	98	Weighted Average
	0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 1 Pervious: Basin 1 - Pervious

Runoff = 0.07 cfs @ 13.63 hrs, Volume= 0.050 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	2.100	39	lawn, A soils
	2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 1 Roof: Basin 1 Roof

Runoff = 1.31 cfs @ 12.25 hrs, Volume= 0.205 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.500	98	Roof
	0.500		100.00% Impervious Area

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

Summary for Subcatchment Basin 2 Impervious: Basin 2 Imp

Runoff = 2.09 cfs @ 12.25 hrs, Volume= 0.328 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.500	98	Pavement & Sidewalk
*	0.300	98	Driveways
	0.800	98	Weighted Average
	0.800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 2 Pervious: Basin 2 - Pervious

Runoff = 0.07 cfs @ 13.63 hrs, Volume= 0.049 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	2.050	39	lawn, A soils
	2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 2 Roof: Basin 2 Roof

Runoff = 0.91 cfs @ 12.25 hrs, Volume= 0.144 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.350	98	Roof
	0.350		100.00% Impervious Area

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

Summary for Subcatchment Basin 3 Impervious: Basin 3 Impervious

Runoff = 3.14 cfs @ 12.25 hrs, Volume= 0.493 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.550	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.400	98	Roof
	1.200	98	Weighted Average
	1.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 3 Pervious: Basin 3 - Pervious

Runoff = 0.12 cfs @ 13.63 hrs, Volume= 0.079 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	3.300	39	lawn, A soils
	3.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 4 & 5 - Pervious: Basin 4 &5 - Pervious

Runoff = 0.11 cfs @ 13.32 hrs, Volume= 0.067 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	2.800	39	Lawn. A Soils
	2.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	640	0.0100	1.61		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
10.7	800	0.0060	1.25		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
17.3	1,440	Total			

Summary for Subcatchment Basin 4 & 5- Impervious: basin 4 & 5, imp

Runoff = 2.35 cfs @ 12.25 hrs, Volume= 0.370 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.200	98	Pavement
*	0.200	98	Driveways
*	0.500	98	Roof
	0.900	98	Weighted Average
	0.900		100.00% Impervious Area

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

Summary for Subcatchment Basin 6 Impervious: Basin 6 Imp

Runoff = 1.83 cfs @ 12.25 hrs, Volume= 0.287 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	0.250	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.200	98	Roof
	0.700	98	Weighted Average
	0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 6 Pervious: Basin 6 - Pervious

Runoff = 0.09 cfs @ 13.63 hrs, Volume= 0.060 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10 year Rainfall=5.40"

	Area (ac)	CN	Description
*	2.500	39	lawn, A soils
	2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Reach Site: Site

Inflow Area = 17.800 ac, 28.37% Impervious, Inflow Depth > 0.22" for 10 year event
Inflow = 0.34 cfs @ 24.31 hrs, Volume= 0.320 af
Outflow = 0.34 cfs @ 24.31 hrs, Volume= 0.320 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1: Basin 1

Inflow Area = 3.200 ac, 34.38% Impervious, Inflow Depth > 1.88" for 10 year event
Inflow = 2.88 cfs @ 12.25 hrs, Volume= 0.502 af
Outflow = 0.10 cfs @ 24.18 hrs, Volume= 0.089 af, Atten= 96%, Lag= 716.0 min
Primary = 0.10 cfs @ 24.18 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 91.32' @ 24.18 hrs Surf.Area= 0.216 ac Storage= 0.447 af

Plug-Flow detention time= 879.1 min calculated for 0.089 af (18% of inflow)
Center-of-Mass det. time= 578.2 min (1,400.4 - 822.2)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	0.885 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.050	0.000	0.000
89.00	0.100	0.075	0.075
90.00	0.150	0.125	0.200
91.00	0.200	0.175	0.375
92.00	0.250	0.225	0.600
93.00	0.320	0.285	0.885

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 24.18 hrs HW=91.32' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.13 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area = 3.200 ac, 35.94% Impervious, Inflow Depth > 1.96" for 10 year event
Inflow = 3.01 cfs @ 12.25 hrs, Volume= 0.521 af
Outflow = 0.13 cfs @ 23.97 hrs, Volume= 0.148 af, Atten= 96%, Lag= 703.1 min
Primary = 0.13 cfs @ 23.97 hrs, Volume= 0.148 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 89.42' @ 23.97 hrs Surf.Area= 0.259 ac Storage= 0.422 af

Plug-Flow detention time= 733.5 min calculated for 0.147 af (28% of inflow)
Center-of-Mass det. time= 499.7 min (1,320.2 - 820.5)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1.330 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
87.00	0.090	0.000	0.000
88.00	0.150	0.120	0.120
89.00	0.230	0.190	0.310
90.00	0.300	0.265	0.575
91.00	0.380	0.340	0.915
92.00	0.450	0.415	1.330

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	91.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 23.97 hrs HW=89.42' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.13 cfs @ 2.62 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 4.500 ac, 26.67% Impervious, Inflow Depth > 1.53" for 10 year event
Inflow = 3.14 cfs @ 12.25 hrs, Volume= 0.572 af
Outflow = 0.00 cfs @ 25.65 hrs, Volume= 0.001 af, Atten= 100%, Lag= 804.1 min
Primary = 0.00 cfs @ 25.65 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 90.03' @ 25.65 hrs Surf.Area= 0.362 ac Storage= 0.571 af

Plug-Flow detention time= 1,343.9 min calculated for 0.001 af (0% of inflow)
Center-of-Mass det. time= 786.6 min (1,619.7 - 833.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1.950 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.200	0.000	0.000
89.00	0.280	0.240	0.240
90.00	0.360	0.320	0.560
91.00	0.420	0.390	0.950
92.00	0.500	0.460	1.410
93.00	0.580	0.540	1.950

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 25.65 hrs HW=90.03' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.58 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond Basin 4 & 5: Basin 4 & 5

Inflow Area = 3.700 ac, 24.32% Impervious, Inflow Depth > 1.42" for 10 year event
Inflow = 2.36 cfs @ 12.25 hrs, Volume= 0.437 af
Outflow = 0.02 cfs @ 24.62 hrs, Volume= 0.010 af, Atten= 99%, Lag= 742.2 min
Primary = 0.02 cfs @ 24.62 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 87.61' @ 24.62 hrs Surf.Area= 0.252 ac Storage= 0.434 af

Plug-Flow detention time= 1,232.9 min calculated for 0.010 af (2% of inflow)
Center-of-Mass det. time= 736.7 min (1,571.8 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	1.690 af	**Rain Garden Basin 4 & 5 (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
85.00	0.080	0.000	0.000
86.00	0.140	0.110	0.110
87.00	0.210	0.175	0.285
88.00	0.280	0.245	0.530
89.00	0.350	0.315	0.845
90.00	0.420	0.385	1.230
91.00	0.500	0.460	1.690

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	90.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 24.62 hrs HW=87.61' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.02 cfs @ 1.11 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond Basin 6: Basin 6

Inflow Area = 3.200 ac, 21.88% Impervious, Inflow Depth > 1.30" for 10 year event
Inflow = 1.83 cfs @ 12.25 hrs, Volume= 0.347 af
Outflow = 0.08 cfs @ 24.22 hrs, Volume= 0.072 af, Atten= 96%, Lag= 718.2 min
Primary = 0.08 cfs @ 24.22 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 92.24' @ 24.22 hrs Surf.Area= 0.312 ac Storage= 0.303 af

Plug-Flow detention time= 838.0 min calculated for 0.071 af (21% of inflow)
Center-of-Mass det. time= 550.2 min (1,393.1 - 842.9)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	1.350 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
91.00	0.150	0.000	0.000
92.00	0.300	0.225	0.225
93.00	0.350	0.325	0.550
94.00	0.400	0.375	0.925
95.00	0.450	0.425	1.350

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	94.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 24.22 hrs HW=92.24' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 1.67 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=5.00-30.00 hrs, dt=0.05 hrs, 501 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Basin 1 Imp: Basin 1 Imp Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=1.80 cfs 0.284 af

Subcatchment Basin 1 Pervious: Basin 1 - Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.17 cfs 0.088 af

Subcatchment Basin 1 Roof: Basin 1 Roof Runoff Area=0.500 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=1.50 cfs 0.236 af

Subcatchment Basin 2 Impervious: Basin Runoff Area=0.800 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=2.40 cfs 0.378 af

Subcatchment Basin 2 Pervious: Basin 2 - Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.16 cfs 0.086 af

Subcatchment Basin 2 Roof: Basin 2 Roof Runoff Area=0.350 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=1.05 cfs 0.165 af

Subcatchment Basin 3 Impervious: Basin Runoff Area=1.200 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=3.61 cfs 0.567 af

Subcatchment Basin 3 Pervious: Basin 3 - Runoff Area=3.300 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.26 cfs 0.139 af

Subcatchment Basin 4 & 5 - Pervious: Basin Runoff Area=2.800 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,440' Tc=17.3 min CN=39 Runoff=0.25 cfs 0.118 af

Subcatchment Basin 4 & 5- Impervious: Runoff Area=0.900 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=2.70 cfs 0.425 af

Subcatchment Basin 6 Impervious: Basin Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>5.67"
Tc=15.0 min CN=98 Runoff=2.10 cfs 0.331 af

Subcatchment Basin 6 Pervious: Basin 6 - Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.20 cfs 0.105 af

Reach Site: Site Inflow=0.65 cfs 0.675 af
Outflow=0.65 cfs 0.675 af

Pond Basin 1: Basin 1 Peak Elev=91.54' Storage=0.495 af Inflow=3.33 cfs 0.608 af
Outflow=0.15 cfs 0.169 af

Pond Basin 2: Basin 2 Peak Elev=89.65' Storage=0.482 af Inflow=3.48 cfs 0.630 af
Outflow=0.17 cfs 0.216 af

Pond Basin 3: Basin 3 Peak Elev=90.29' Storage=0.671 af Inflow=3.65 cfs 0.706 af
Outflow=0.09 cfs 0.068 af

Pond Basin 4 & 5: Basin 4 & 5 Peak Elev=87.85' Storage=0.493 af Inflow=2.82 cfs 0.543 af
Outflow=0.11 cfs 0.089 af

Pond Basin 6: Basin 6 Peak Elev=92.38' Storage=0.347 af Inflow=2.13 cfs 0.436 af
Outflow=0.12 cfs 0.133 af

Total Runoff Area = 17.800 ac Runoff Volume = 2.923 af Average Runoff Depth = 1.97"
71.63% Pervious = 12.750 ac 28.37% Impervious = 5.050 ac

Summary for Subcatchment Basin 1 Imp: Basin 1 Imp

Runoff = 1.80 cfs @ 12.25 hrs, Volume= 0.284 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.350	98	Pavement & Sidewalk
*	0.250	98	Driveways
	0.600	98	Weighted Average
	0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 1 Pervious: Basin 1 - Pervious

Runoff = 0.17 cfs @ 13.15 hrs, Volume= 0.088 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	2.100	39	lawn, A soils
	2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 1 Roof: Basin 1 Roof

Runoff = 1.50 cfs @ 12.25 hrs, Volume= 0.236 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.500	98	Roof
	0.500		100.00% Impervious Area

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

Summary for Subcatchment Basin 2 Impervious: Basin 2 Imp

Runoff = 2.40 cfs @ 12.25 hrs, Volume= 0.378 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.500	98	Pavement & Sidewalk
*	0.300	98	Driveways
	0.800	98	Weighted Average
	0.800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 2 Pervious: Basin 2 - Pervious

Runoff = 0.16 cfs @ 13.15 hrs, Volume= 0.086 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	2.050	39	lawn, A soils
	2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 2 Roof: Basin 2 Roof

Runoff = 1.05 cfs @ 12.25 hrs, Volume= 0.165 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.350	98	Roof
	0.350		100.00% Impervious Area

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

Summary for Subcatchment Basin 3 Impervious: Basin 3 Impervious

Runoff = 3.61 cfs @ 12.25 hrs, Volume= 0.567 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.550	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.400	98	Roof
	1.200	98	Weighted Average
	1.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 3 Pervious: Basin 3 - Pervious

Runoff = 0.26 cfs @ 13.15 hrs, Volume= 0.139 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	3.300	39	lawn, A soils
	3.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 4 & 5 - Pervious: Basin 4 &5 - Pervious

Runoff = 0.25 cfs @ 12.71 hrs, Volume= 0.118 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	2.800	39	Lawn. A Soils
	2.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	640	0.0100	1.61		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
10.7	800	0.0060	1.25		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
17.3	1,440	Total			

Summary for Subcatchment Basin 4 & 5- Impervious: basin 4 & 5, imp

Runoff = 2.70 cfs @ 12.25 hrs, Volume= 0.425 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.200	98	Pavement
*	0.200	98	Driveways
*	0.500	98	Roof
	0.900	98	Weighted Average
	0.900		100.00% Impervious Area

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

Summary for Subcatchment Basin 6 Impervious: Basin 6 Imp

Runoff = 2.10 cfs @ 12.25 hrs, Volume= 0.331 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	0.250	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.200	98	Roof
	0.700	98	Weighted Average
	0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 6 Pervious: Basin 6 - Pervious

Runoff = 0.20 cfs @ 13.15 hrs, Volume= 0.105 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25 Year Rainfall=6.20"

	Area (ac)	CN	Description
*	2.500	39	lawn, A soils
	2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Reach Site: Site

Inflow Area = 17.800 ac, 28.37% Impervious, Inflow Depth > 0.46" for 25 Year event
Inflow = 0.65 cfs @ 24.21 hrs, Volume= 0.675 af
Outflow = 0.65 cfs @ 24.21 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1: Basin 1

Inflow Area = 3.200 ac, 34.38% Impervious, Inflow Depth > 2.28" for 25 Year event
Inflow = 3.33 cfs @ 12.25 hrs, Volume= 0.608 af
Outflow = 0.15 cfs @ 24.09 hrs, Volume= 0.169 af, Atten= 95%, Lag= 710.2 min
Primary = 0.15 cfs @ 24.09 hrs, Volume= 0.169 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 91.54' @ 24.09 hrs Surf.Area= 0.227 ac Storage= 0.495 af

Plug-Flow detention time= 741.2 min calculated for 0.169 af (28% of inflow)
Center-of-Mass det. time= 503.1 min (1,331.8 - 828.7)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	0.885 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.050	0.000	0.000
89.00	0.100	0.075	0.075
90.00	0.150	0.125	0.200
91.00	0.200	0.175	0.375
92.00	0.250	0.225	0.600
93.00	0.320	0.285	0.885

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 24.09 hrs HW=91.54' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 3.08 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area = 3.200 ac, 35.94% Impervious, Inflow Depth > 2.36" for 25 Year event
Inflow = 3.48 cfs @ 12.25 hrs, Volume= 0.630 af
Outflow = 0.17 cfs @ 22.83 hrs, Volume= 0.216 af, Atten= 95%, Lag= 634.7 min
Primary = 0.17 cfs @ 22.83 hrs, Volume= 0.216 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 89.65' @ 22.83 hrs Surf.Area= 0.275 ac Storage= 0.482 af

Plug-Flow detention time= 679.8 min calculated for 0.215 af (34% of inflow)
Center-of-Mass det. time= 469.0 min (1,295.7 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1.330 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
87.00	0.090	0.000	0.000
88.00	0.150	0.120	0.120
89.00	0.230	0.190	0.310
90.00	0.300	0.265	0.575
91.00	0.380	0.340	0.915
92.00	0.450	0.415	1.330

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	91.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.17 cfs @ 22.83 hrs HW=89.65' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.17 cfs @ 3.49 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 4.500 ac, 26.67% Impervious, Inflow Depth > 1.88" for 25 Year event
Inflow = 3.65 cfs @ 12.25 hrs, Volume= 0.706 af
Outflow = 0.09 cfs @ 24.43 hrs, Volume= 0.068 af, Atten= 97%, Lag= 730.5 min
Primary = 0.09 cfs @ 24.43 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 90.29' @ 24.43 hrs Surf.Area= 0.377 ac Storage= 0.671 af

Plug-Flow detention time= 1,031.1 min calculated for 0.068 af (10% of inflow)
Center-of-Mass det. time= 642.7 min (1,484.2 - 841.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1.950 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.200	0.000	0.000
89.00	0.280	0.240	0.240
90.00	0.360	0.320	0.560
91.00	0.420	0.390	0.950
92.00	0.500	0.460	1.410
93.00	0.580	0.540	1.950

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 24.43 hrs HW=90.29' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.93 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 4 & 5: Basin 4 & 5

Inflow Area = 3.700 ac, 24.32% Impervious, Inflow Depth > 1.76" for 25 Year event
Inflow = 2.82 cfs @ 12.26 hrs, Volume= 0.543 af
Outflow = 0.11 cfs @ 24.23 hrs, Volume= 0.089 af, Atten= 96%, Lag= 718.0 min
Primary = 0.11 cfs @ 24.23 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 87.85' @ 24.23 hrs Surf.Area= 0.269 ac Storage= 0.493 af

Plug-Flow detention time= 903.3 min calculated for 0.089 af (16% of inflow)
Center-of-Mass det. time= 588.3 min (1,431.4 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	1.690 af	**Rain Garden Basin 4 & 5 (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
85.00	0.080	0.000	0.000
86.00	0.140	0.110	0.110
87.00	0.210	0.175	0.285
88.00	0.280	0.245	0.530
89.00	0.350	0.315	0.845
90.00	0.420	0.385	1.230
91.00	0.500	0.460	1.690

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	90.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.11 cfs @ 24.23 hrs HW=87.85' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.11 cfs @ 2.27 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 6: Basin 6

Inflow Area = 3.200 ac, 21.88% Impervious, Inflow Depth > 1.63" for 25 Year event
Inflow = 2.13 cfs @ 12.25 hrs, Volume= 0.436 af
Outflow = 0.12 cfs @ 24.16 hrs, Volume= 0.133 af, Atten= 94%, Lag= 714.2 min
Primary = 0.12 cfs @ 24.16 hrs, Volume= 0.133 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 92.38' @ 24.16 hrs Surf.Area= 0.319 ac Storage= 0.347 af

Plug-Flow detention time= 717.1 min calculated for 0.133 af (31% of inflow)
Center-of-Mass det. time= 482.1 min (1,334.6 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	1.350 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
91.00	0.150	0.000	0.000
92.00	0.300	0.225	0.225
93.00	0.350	0.325	0.550
94.00	0.400	0.375	0.925
95.00	0.450	0.425	1.350

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	94.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 24.16 hrs HW=92.38' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 2.41 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=5.00-30.00 hrs, dt=0.05 hrs, 501 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Basin 1 Imp: Basin 1 Imp Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=2.68 cfs 0.423 af

Subcatchment Basin 1 Pervious: Basin 1 - Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=1.03 cfs 0.297 af

Subcatchment Basin 1 Roof: Basin 1 Roof Runoff Area=0.500 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=2.23 cfs 0.353 af

Subcatchment Basin 2 Impervious: Basin Runoff Area=0.800 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=3.58 cfs 0.564 af

Subcatchment Basin 2 Pervious: Basin 2 - Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=1.01 cfs 0.290 af

Subcatchment Basin 2 Roof: Basin 2 Roof Runoff Area=0.350 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=1.56 cfs 0.247 af

Subcatchment Basin 3 Impervious: Basin Runoff Area=1.200 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=5.36 cfs 0.846 af

Subcatchment Basin 3 Pervious: Basin 3 - Runoff Area=3.300 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=1.62 cfs 0.467 af

Subcatchment Basin 4 & 5 - Pervious: Basin Runoff Area=2.800 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,440' Tc=17.3 min CN=39 Runoff=1.80 cfs 0.396 af

Subcatchment Basin 4 & 5- Impervious: Runoff Area=0.900 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=4.02 cfs 0.635 af

Subcatchment Basin 6 Impervious: Basin Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>8.46"
Tc=15.0 min CN=98 Runoff=3.13 cfs 0.494 af

Subcatchment Basin 6 Pervious: Basin 6 - Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=1.23 cfs 0.354 af

Reach Site: Site Inflow=1.98 cfs 1.959 af
Outflow=1.98 cfs 1.959 af

Pond Basin 1: Basin 1 Peak Elev=92.07' Storage=0.621 af Inflow=5.55 cfs 1.073 af
Outflow=1.20 cfs 0.558 af

Pond Basin 2: Basin 2 Peak Elev=90.72' Storage=0.819 af Inflow=5.75 cfs 1.101 af
Outflow=0.30 cfs 0.409 af

Pond Basin 3: Basin 3 Peak Elev=91.31' Storage=1.095 af Inflow=6.34 cfs 1.313 af
Outflow=0.26 cfs 0.325 af

Pond Basin 4 & 5: Basin 4 & 5 Peak Elev=88.86' Storage=0.802 af Inflow=5.71 cfs 1.031 af
Outflow=0.26 cfs 0.340 af

Pond Basin 6: Basin 6 Peak Elev=93.20' Storage=0.623 af Inflow=3.90 cfs 0.847 af
Outflow=0.24 cfs 0.326 af

Total Runoff Area = 17.800 ac Runoff Volume = 5.365 af Average Runoff Depth = 3.62"
71.63% Pervious = 12.750 ac 28.37% Impervious = 5.050 ac

Summary for Subcatchment Basin 1 Imp: Basin 1 Imp

Runoff = 2.68 cfs @ 12.25 hrs, Volume= 0.423 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.350	98	Pavement & Sidewalk
*	0.250	98	Driveways
	0.600	98	Weighted Average
	0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 1 Pervious: Basin 1 - Pervious

Runoff = 1.03 cfs @ 12.52 hrs, Volume= 0.297 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	2.100	39	lawn, A soils
	2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 1 Roof: Basin 1 Roof

Runoff = 2.23 cfs @ 12.25 hrs, Volume= 0.353 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.500	98	Roof
	0.500		100.00% Impervious Area

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

Summary for Subcatchment Basin 2 Impervious: Basin 2 Imp

Runoff = 3.58 cfs @ 12.25 hrs, Volume= 0.564 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.500	98	Pavement & Sidewalk
*	0.300	98	Driveways
	0.800	98	Weighted Average
	0.800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 2 Pervious: Basin 2 - Pervious

Runoff = 1.01 cfs @ 12.52 hrs, Volume= 0.290 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	2.050	39	lawn, A soils
	2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 2 Roof: Basin 2 Roof

Runoff = 1.56 cfs @ 12.25 hrs, Volume= 0.247 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.350	98	Roof
	0.350		100.00% Impervious Area

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

Summary for Subcatchment Basin 3 Impervious: Basin 3 Impervious

Runoff = 5.36 cfs @ 12.25 hrs, Volume= 0.846 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.550	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.400	98	Roof
	1.200	98	Weighted Average
	1.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 3 Pervious: Basin 3 - Pervious

Runoff = 1.62 cfs @ 12.52 hrs, Volume= 0.467 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	3.300	39	lawn, A soils
	3.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 4 & 5 - Pervious: Basin 4 &5 - Pervious

Runoff = 1.80 cfs @ 12.35 hrs, Volume= 0.396 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	2.800	39	Lawn. A Soils
	2.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	640	0.0100	1.61		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
10.7	800	0.0060	1.25		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
17.3	1,440	Total			

Summary for Subcatchment Basin 4 & 5- Impervious: basin 4 & 5, imp

Runoff = 4.02 cfs @ 12.25 hrs, Volume= 0.635 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.200	98	Pavement
*	0.200	98	Driveways
*	0.500	98	Roof
	0.900	98	Weighted Average
	0.900		100.00% Impervious Area

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

Summary for Subcatchment Basin 6 Impervious: Basin 6 Imp

Runoff = 3.13 cfs @ 12.25 hrs, Volume= 0.494 af, Depth> 8.46"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	0.250	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.200	98	Roof
	0.700	98	Weighted Average
	0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 6 Pervious: Basin 6 - Pervious

Runoff = 1.23 cfs @ 12.52 hrs, Volume= 0.354 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100 year Rainfall=9.20"

	Area (ac)	CN	Description
*	2.500	39	lawn, A soils
	2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Reach Site: Site

Inflow Area = 17.800 ac, 28.37% Impervious, Inflow Depth > 1.32" for 100 year event
Inflow = 1.98 cfs @ 13.82 hrs, Volume= 1.959 af
Outflow = 1.98 cfs @ 13.82 hrs, Volume= 1.959 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1: Basin 1

Inflow Area = 3.200 ac, 34.38% Impervious, Inflow Depth > 4.02" for 100 year event
Inflow = 5.55 cfs @ 12.27 hrs, Volume= 1.073 af
Outflow = 1.20 cfs @ 13.78 hrs, Volume= 0.558 af, Atten= 78%, Lag= 90.4 min
Primary = 1.20 cfs @ 13.78 hrs, Volume= 0.558 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 92.07' @ 13.78 hrs Surf.Area= 0.255 ac Storage= 0.621 af

Plug-Flow detention time= 464.2 min calculated for 0.558 af (52% of inflow)
Center-of-Mass det. time= 298.6 min (1,140.5 - 841.9)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	0.885 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.050	0.000	0.000
89.00	0.100	0.075	0.075
90.00	0.150	0.125	0.200
91.00	0.200	0.175	0.375
92.00	0.250	0.225	0.600
93.00	0.320	0.285	0.885

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.16 cfs @ 13.78 hrs HW=92.07' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.23 cfs @ 4.69 fps)
└—**2=Orifice/Grate** (Weir Controls 0.93 cfs @ 0.89 fps)

Summary for Pond Basin 2: Basin 2

Inflow Area = 3.200 ac, 35.94% Impervious, Inflow Depth > 4.13" for 100 year event
Inflow = 5.75 cfs @ 12.27 hrs, Volume= 1.101 af
Outflow = 0.30 cfs @ 23.38 hrs, Volume= 0.409 af, Atten= 95%, Lag= 666.7 min
Primary = 0.30 cfs @ 23.38 hrs, Volume= 0.409 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 90.72' @ 23.38 hrs Surf.Area= 0.358 ac Storage= 0.819 af

Plug-Flow detention time= 639.7 min calculated for 0.408 af (37% of inflow)
Center-of-Mass det. time= 441.6 min (1,281.1 - 839.5)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1.330 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
87.00	0.090	0.000	0.000
88.00	0.150	0.120	0.120
89.00	0.230	0.190	0.310
90.00	0.300	0.265	0.575
91.00	0.380	0.340	0.915
92.00	0.450	0.415	1.330

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	91.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.30 cfs @ 23.38 hrs HW=90.72' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.30 cfs @ 6.08 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 4.500 ac, 26.67% Impervious, Inflow Depth > 3.50" for 100 year event
Inflow = 6.34 cfs @ 12.28 hrs, Volume= 1.313 af
Outflow = 0.26 cfs @ 24.30 hrs, Volume= 0.325 af, Atten= 96%, Lag= 721.2 min
Primary = 0.26 cfs @ 24.30 hrs, Volume= 0.325 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 91.31' @ 24.30 hrs Surf.Area= 0.445 ac Storage= 1.095 af

Plug-Flow detention time= 708.0 min calculated for 0.325 af (25% of inflow)
Center-of-Mass det. time= 461.6 min (1,317.8 - 856.2)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1.950 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.200	0.000	0.000
89.00	0.280	0.240	0.240
90.00	0.360	0.320	0.560
91.00	0.420	0.390	0.950
92.00	0.500	0.460	1.410
93.00	0.580	0.540	1.950

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.26 cfs @ 24.30 hrs HW=91.31' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.26 cfs @ 5.25 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 4 & 5: Basin 4 & 5

Inflow Area = 3.700 ac, 24.32% Impervious, Inflow Depth > 3.34" for 100 year event
Inflow = 5.71 cfs @ 12.27 hrs, Volume= 1.031 af
Outflow = 0.26 cfs @ 24.15 hrs, Volume= 0.340 af, Atten= 95%, Lag= 712.7 min
Primary = 0.26 cfs @ 24.15 hrs, Volume= 0.340 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 88.86' @ 24.15 hrs Surf.Area= 0.340 ac Storage= 0.802 af

Plug-Flow detention time= 653.9 min calculated for 0.339 af (33% of inflow)
Center-of-Mass det. time= 445.0 min (1,300.5 - 855.5)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	1.690 af	**Rain Garden Basin 4 & 5 (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
85.00	0.080	0.000	0.000
86.00	0.140	0.110	0.110
87.00	0.210	0.175	0.285
88.00	0.280	0.245	0.530
89.00	0.350	0.315	0.845
90.00	0.420	0.385	1.230
91.00	0.500	0.460	1.690

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	90.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.26 cfs @ 24.15 hrs HW=88.86' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.26 cfs @ 5.36 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 6: Basin 6

Inflow Area = 3.200 ac, 21.88% Impervious, Inflow Depth > 3.18" for 100 year event
Inflow = 3.90 cfs @ 12.30 hrs, Volume= 0.847 af
Outflow = 0.24 cfs @ 24.12 hrs, Volume= 0.326 af, Atten= 94%, Lag= 709.2 min
Primary = 0.24 cfs @ 24.12 hrs, Volume= 0.326 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 93.20' @ 24.12 hrs Surf.Area= 0.360 ac Storage= 0.623 af

Plug-Flow detention time= 624.2 min calculated for 0.325 af (38% of inflow)
Center-of-Mass det. time= 423.9 min (1,291.4 - 867.5)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	1.350 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
91.00	0.150	0.000	0.000
92.00	0.300	0.225	0.225
93.00	0.350	0.325	0.550
94.00	0.400	0.375	0.925
95.00	0.450	0.425	1.350

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	94.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 24.12 hrs HW=93.20' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.24 cfs @ 4.98 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=5.00-30.00 hrs, dt=0.05 hrs, 501 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Basin 1 Imp: Basin 1 Imp Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.34 cfs 0.051 af

Subcatchment Basin 1 Pervious: Basin 1 - Runoff Area=2.100 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment Basin 1 Roof: Basin 1 Roof Runoff Area=0.500 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.28 cfs 0.043 af

Subcatchment Basin 2 Impervious: Basin Runoff Area=0.800 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.45 cfs 0.068 af

Subcatchment Basin 2 Pervious: Basin 2 - Runoff Area=2.050 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment Basin 2 Roof: Basin 2 Roof Runoff Area=0.350 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.20 cfs 0.030 af

Subcatchment Basin 3 Impervious: Basin Runoff Area=1.200 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.68 cfs 0.102 af

Subcatchment Basin 3 Pervious: Basin 3 - Runoff Area=3.300 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment Basin 4 & 5 - Pervious: Basin Runoff Area=2.800 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,440' Tc=17.3 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment Basin 4 & 5- Impervious: Runoff Area=0.900 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.51 cfs 0.077 af

Subcatchment Basin 6 Impervious: Basin Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>1.02"
Tc=15.0 min CN=98 Runoff=0.40 cfs 0.060 af

Subcatchment Basin 6 Pervious: Basin 6 - Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,580' Tc=27.3 min CN=39 Runoff=0.00 cfs 0.000 af

Reach Site: Site Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond Basin 1: Basin 1 Peak Elev=89.15' Storage=0.094 af Inflow=0.62 cfs 0.094 af
Outflow=0.00 cfs 0.000 af

Pond Basin 2: Basin 2 Peak Elev=87.82' Storage=0.098 af Inflow=0.65 cfs 0.098 af
Outflow=0.00 cfs 0.000 af

Pond Basin 3: Basin 3 Peak Elev=88.43' Storage=0.102 af Inflow=0.68 cfs 0.102 af
Outflow=0.00 cfs 0.000 af

Pond Basin 4 & 5: Basin 4 & 5 Peak Elev=85.70' Storage=0.077 af Inflow=0.51 cfs 0.077 af
Outflow=0.00 cfs 0.000 af

Pond Basin 6: Basin 6 Peak Elev=91.27' Storage=0.060 af Inflow=0.40 cfs 0.060 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 17.800 ac Runoff Volume = 0.431 af Average Runoff Depth = 0.29"
71.63% Pervious = 12.750 ac 28.37% Impervious = 5.050 ac

Summary for Subcatchment Basin 1 Imp: Basin 1 Imp

Runoff = 0.34 cfs @ 12.25 hrs, Volume= 0.051 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.350	98	Pavement & Sidewalk
*	0.250	98	Driveways
	0.600	98	Weighted Average
	0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 1 Pervious: Basin 1 - Pervious

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	2.100	39	lawn, A soils
	2.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 1 Roof: Basin 1 Roof

Runoff = 0.28 cfs @ 12.25 hrs, Volume= 0.043 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.500	98	Roof
	0.500		100.00% Impervious Area

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

Summary for Subcatchment Basin 2 Impervious: Basin 2 Imp

Runoff = 0.45 cfs @ 12.25 hrs, Volume= 0.068 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.500	98	Pavement & Sidewalk
*	0.300	98	Driveways
	0.800	98	Weighted Average
	0.800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 2 Pervious: Basin 2 - Pervious

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	2.050	39	lawn, A soils
	2.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 2 Roof: Basin 2 Roof

Runoff = 0.20 cfs @ 12.25 hrs, Volume= 0.030 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.350	98	Roof
	0.350		100.00% Impervious Area

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

Summary for Subcatchment Basin 3 Impervious: Basin 3 Impervious

Runoff = 0.68 cfs @ 12.25 hrs, Volume= 0.102 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.550	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.400	98	Roof
	1.200	98	Weighted Average
	1.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 3 Pervious: Basin 3 - Pervious

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	3.300	39	lawn, A soils
	3.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Subcatchment Basin 4 & 5 - Pervious: Basin 4 &5 - Pervious

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	2.800	39	Lawn. A Soils
	2.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	640	0.0100	1.61		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
10.7	800	0.0060	1.25		**Shallow Concentrated Flow, shallow concentrated** Unpaved Kv= 16.1 fps
17.3	1,440	Total			

Summary for Subcatchment Basin 4 & 5- Impervious: basin 4 & 5, imp

Runoff = 0.51 cfs @ 12.25 hrs, Volume= 0.077 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.200	98	Pavement
*	0.200	98	Driveways
*	0.500	98	Roof
	0.900	98	Weighted Average
	0.900		100.00% Impervious Area

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

Summary for Subcatchment Basin 6 Impervious: Basin 6 Imp

Runoff = 0.40 cfs @ 12.25 hrs, Volume= 0.060 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.250	98	Pavement & Sidewalk
*	0.250	98	Driveways
*	0.200	98	Roof
	0.700	98	Weighted Average
	0.700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, pavement and pipe**

Summary for Subcatchment Basin 6 Pervious: Basin 6 - Pervious

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	2.500	39	lawn, A soils
	2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 3.50"
2.2	300	0.0200	2.28		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
4.6	1,180	0.0030	4.27	13.42	**Pipe Channel, pipe flow** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
27.3	1,580	Total			

Summary for Reach Site: Site

Inflow Area = 17.800 ac, 28.37% Impervious, Inflow Depth = 0.00" for WQ storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1: Basin 1

Inflow Area = 3.200 ac, 34.38% Impervious, Inflow Depth > 0.35" for WQ storm event
Inflow = 0.62 cfs @ 12.25 hrs, Volume= 0.094 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 89.15' @ 25.70 hrs Surf.Area= 0.108 ac Storage= 0.094 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	0.885 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.050	0.000	0.000
89.00	0.100	0.075	0.075
90.00	0.150	0.125	0.200
91.00	0.200	0.175	0.375
92.00	0.250	0.225	0.600
93.00	0.320	0.285	0.885

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area = 3.200 ac, 35.94% Impervious, Inflow Depth > 0.37" for WQ storm event
Inflow = 0.65 cfs @ 12.25 hrs, Volume= 0.098 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 87.82' @ 25.70 hrs Surf.Area= 0.139 ac Storage= 0.098 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1.330 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
87.00	0.090	0.000	0.000
88.00	0.150	0.120	0.120
89.00	0.230	0.190	0.310
90.00	0.300	0.265	0.575
91.00	0.380	0.340	0.915
92.00	0.450	0.415	1.330

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	91.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 4.500 ac, 26.67% Impervious, Inflow Depth > 0.27" for WQ storm event
Inflow = 0.68 cfs @ 12.25 hrs, Volume= 0.102 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 88.43' @ 25.70 hrs Surf.Area= 0.234 ac Storage= 0.102 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1.950 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
88.00	0.200	0.000	0.000
89.00	0.280	0.240	0.240
90.00	0.360	0.320	0.560
91.00	0.420	0.390	0.950
92.00	0.500	0.460	1.410
93.00	0.580	0.540	1.950

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	92.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond Basin 4 & 5: Basin 4 & 5

Inflow Area = 3.700 ac, 24.32% Impervious, Inflow Depth > 0.25" for WQ storm event
Inflow = 0.51 cfs @ 12.25 hrs, Volume= 0.077 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 85.70' @ 25.70 hrs Surf.Area= 0.122 ac Storage= 0.077 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	1.690 af	**Rain Garden Basin 4 & 5 (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
85.00	0.080	0.000	0.000
86.00	0.140	0.110	0.110
87.00	0.210	0.175	0.285
88.00	0.280	0.245	0.530
89.00	0.350	0.315	0.845
90.00	0.420	0.385	1.230
91.00	0.500	0.460	1.690

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	90.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond Basin 6: Basin 6

Inflow Area = 3.200 ac, 21.88% Impervious, Inflow Depth > 0.22" for WQ storm event
Inflow = 0.40 cfs @ 12.25 hrs, Volume= 0.060 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 91.27' @ 25.70 hrs Surf.Area= 0.190 ac Storage= 0.060 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	1.350 af	**Rain Garden Basin (Prismatic)**Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
91.00	0.150	0.000	0.000
92.00	0.300	0.225	0.225
93.00	0.350	0.325	0.550
94.00	0.400	0.375	0.925
95.00	0.450	0.425	1.350

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	94.00'	**42.0" x 42.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.00' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

TIME TO DRAIN CALCULATIONS

Exfiltration Area
: Bottom area
Exfiltration rate at 3 in/hour
= 0.00007 ft/sec

Basin #	Bottom Area	Basin Volume	Rate	Time (hours)
1	2,200	7,400	0.15	14
2	3,900	13,500	0.28	13
3	8,700	24,300	0.60	11
4&5	3,500	18,000	0.25	20
6	6,500	9,800	0.45	7

APPENDIX C

SOIL EROSION CALCULATIONS

- **Conduit Outlet Protection**
- **SCD Flood Routing**

CONDUIT OUTLET DESIGN

Use 25 Year storm, Q (cfs)

Level Apron

Tw(ft) calculated from:

(1) 2 Year flood routing for outlets into stormwater management basins
(2) outlets from basins use 0.2 * D

q = Q/Wo

Calculate length & width of rip rap apron:
For Tw < ½ Pipe Size

- Length = (1.8 q/Do1/2) + 7Do
- Width = 3 Wo + L

For Tw > ½ Pipe Size

- Length = 3 q/Do1/2
- Width = 3 Do + 0.4L

Calculate D50 stone size (in):

$$= \frac{0.02}{Tw} (q)^{1.33}$$

Scour Hole

Depth = 0.5(Do)

Width = 2 Wo
Length = 3 Do

$$D50 = \frac{0.0125\, q^{1.33}}{TW}$$

Outlet #	**Do**	**Wo**	**Q**	**Tw**	**q**	**L**	**W**	**D50**
1-3	18	18	10	0.3 (2)	7.7	22	24	3”
4-7	15	15	7	0.2 (2)	5.6	21	24	3”

OFF-SITE STABILTY

The basins have been designed to comply with the off-site stability standard. The direct discharge must not be more than 10 cfs for a 25 year storm event and the discharge must be less than 2 fps for a ten year storm in the discharge pipe. The flood routing must assume the basin is full to the lowest positive outlet at the start of the storm and cannot utilize infiltration as an outflow. The flood routings eliminating exfiltration outflow and placing the basin bottom at the lowest outlet elevation are enclosed.

Basin #	25 Yr Peak Outflow	10 yr storm pipe velocity
6	0.7	0.2

APPENDIX D

STORM DRAINAGE COLLECTION SYSTEM CALCULATIONS

STORM SEWER TABULATION

PROFESSIONAL DESIGN SERVICES, L.L.C.
1245 AIRPORT ROAD, SUITE 1
LAKEWOOD, NJ 08701
(732) 363-0060

COMPUTED BY: SDC DATE: June 3, 2021

DESIGN STORM FREQUENCY: 25 YEAR

INTENSITY CURVE: RSIS

PDS # 321644

LOCATION		RUNOFF DATA									SEWER DESIGN DATA					
STRUCTURE #						TIME OF CONCENTRATION					PIPE MATERIAL			MANNINGS ΣN@		
UPSTREAM	DOWNSTREAM	AREA	WEIGHT OF RUNOFF COEFFICIENT		TOTAL	OVERLAND THROUGH AREA (T_A)	THROUGH AREA (T_P)	ACCUMULATED	RAINFALL INTENSITY	PEAK RUNOFF	DIAMETER	LENGTH	SLOPE	CAPACITY AT FULL FLOW	VELOCITY AT FULL FLOW	VELOCITY ACTUAL
		(AC)	C	A x C	(ΣA x C)	(MIN)	(MIN)	(MIN)	(IN/HR)	(CFS)	(INCHES)	(FT)	(%)	(CFS)	(FPS)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
1	2	1.12	0.55	0.63	0.63	10		10	6.7	4.22	15		0.50			
2	RG-1	0.64	0.55	0.37	1.00	10		10	6.7	6.70	18		0.50			
3	4	0.23	0.55	0.13	0.13	10		10	6.7	0.81	15		0.30	3.8		
4	MH-5	0.23	0.55	0.13	0.26	10		10	6.7	1.74	15		0.30	3.8		
MH-5	6	0	0.55	0	0.26	10		10	6.7	1.74	15		0.30	3.8		
5	6	1.03	0.55	0.57	0.57	10		10	6.7	3.82	15		0.50	5.9		
6	RG-4	0.13	0.55	0.07	0.90	10		10	6.7	6.03	18		0.50	9.7		
RG-4	8	-	-	-						1.00*						
7	8	0.78	0.55	0.43	0.43	10		10	6.7	2.88	15		0.30			
8	MH-2	0.67	0.55	0.37	0.80	10		10	6.7	6.36	18		0.50			
9	MH-2	0.32	0.55	0.18	0.18	10		10	6.7	1.21	15		0.30			

* 25 YEAR FLOOD ROUTING OUTFLOW

STORM SEWER TABULATION

PROFESSIONAL DESIGN SERVICES, L.L.C.
1245 AIRPORT ROAD, SUITE 1
LAKEWOOD, NJ 08701
(732) 363-0060

COMPUTED BY: SDC DATE: June 3, 2021

DESIGN STORM FREQUENCY: 25 YEAR

INTENSITY CURVE: RSIS

PDS # 321644

LOCATION		RUNOFF DATA									SEWER DESIGN DATA					
STRUCTURE #						TIME OF CONCENTRATION					PIPE MATERIAL			MANNINGS ΔN@		
UPSTREAM	DOWNSTREAM	AREA	WEIGHT OF RUNOFF COEFFICIENT		TOTAL	OVERLAND THROUGH AREA (T_A)	THROUGH AREA (T_P)	ACCUMULATED	RAINFALL INTENSITY	PEAK RUNOFF	DIAMETER	LENGTH	SLOPE	CAPACITY AT FULL FLOW	VELOCITY AT FULL FLOW	VELOCITY ACTUAL
		(AC)	C	A x C	(ΣA x C)	(MIN)	(MIN)	(MIN)	(IN/HR)	(CFS)	(INCHES)	(FT)	(%)	(CFS)	(FPS)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
10	MH-2	0.37	0.55	0.20	0.20	10		10	6.7	1.34	15		0.50	3.8		
MH-2	11	0	0.55	0	1.18	10		10	6.7	8.91	18		0.50	9.7		
11	RG-2	0.02	0.55	0.02	1.20	10		10	6.7	9.04	18		0.50	9.7		
12	RG-6	0.30	0.55	0.17	0.17	10		10	6.7	1.14	15		0.30	3.8		
13	14	0.17	0.55	0.09	0.09	10		10	6.7	0.60	15		0.30	3.8		
14	15	0.17	0.55	0.09	0.18	10		10	6.7	1.21	15		0.30	3.8		
15	16	0.24	0.55	0.13	0.31	10		10	6.7	2.10	15		0.30	3.8		
16	17	0.26	0.55	0.14	0.45	10		10	6.7	3.02	15		0.30	3.8		
17	RG-5	0.13	0.55	0.07	0.52	10		10	6.7	3.48	15		0.30	3.8		
21	22	0.60	0.55	0.33	0.33	10		10	6.7	2.21	15		0.30	3.8		
22	HH-3	0.67	0.55	0.37	0.70	10		10	6.7	4.69	15		0.50	5.9		
18	HH-3	0.38	0.55	0.21	0.21	10		10	6.7	1.41	15		0.30	3.8		

* 25 YEAR FLOOD ROUTING OUTFLOW

STORM SEWER TABULATION

PROFESSIONAL DESIGN SERVICES, L.L.C.
1245 AIRPORT ROAD, SUITE 1
LAKEWOOD, NJ 08701
(732) 363-0060

COMPUTED BY: SDC DATE: June 3, 2021

DESIGN STORM FREQUENCY: 25 YEAR

INTENSITY CURVE: RSIS

PDS # 321644

LOCATION		RUNOFF DATA									SEWER DESIGN DATA					
STRUCTURE #						TIME OF CONCENTRATION					PIPE MATERIAL			MANNINGS ΔN@		
UPSTREAM	DOWNSTREAM	AREA	WEIGHT OF RUNOFF COEFFICIENT		TOTAL	OVERLAND THROUGH AREA (T_A)	THROUGH AREA (T_P)	ACCUMULATED	RAINFALL INTENSITY	PEAK RUNOFF	DIAMETER	LENGTH	SLOPE	CAPACITY AT FULL FLOW	VELOCITY AT FULL FLOW	VELOCITY ACTUAL
		(AC)	C	A x C	(ΣA x C)	(MIN)	(MIN)	(MIN)	(IN/HR)	(CFS)	(INCHES)	(FT)	(%)	(CFS)	(FPS)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
HH-3	23	0	0.55	0	0	10		10	6.7	-	18		0.50	9.7		
23	24	0.33	0.55	0.18	1.09	10		10	6.7	7.30	18		0.50	9.7		
24	25	0.15	0.55	0.08	1.17	10		10	6.7	7.84	18		0.50	9.7		
25	RG-3	0.25	0.55	0.14	1.31	10		10	6.7	8.78	18		0.50	9.7		

* 25 YEAR FLOOD ROUTING OUTFLOW