STORMWATER MANAGEMENT REPORT

For
Major Site Plan

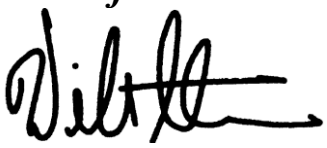
Block 69 Lot 8
Manchester Township
Ocean County, New Jersey

Prepared By:

PROFESSIONAL DESIGN SERVICES, LLC

1245 Airport Unit 1
Lakewood, New Jersey 08701

PDS Ref. No. 322319



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November 13, 2025

TABLE OF CONTENTS

SECTION

1.0 PROJECT DESCRIPTION

2.0 EXISTING SITE CONDITIONS

- A. REGULATORY STANDARDS
- B. APPLICABLE REGULATIONS
- C. DESIGN PERFORMANCE STANDARDS

4.0 PROPOSED STORMWATER MANAGEMENT PLAN

5.0 METHODOLOGY

6.0 SUMMARY

7.0 MAINTENANCE

APPENDIX

A. EXISTING CONDITION CALCULATIONS; CURRENT RAINFALL
B. EXISTING CONDITION CALCULATIONS; FUTURE RAINFALL
C. PROPOSED CONDITION HYDROLOGY
   - HYDROLOGIC DATA
D. WATER QUALITY STORM FLOOD ROUTING
E. PROPOSED CONDITION FLOOD ROUTING; CURRENT RAINFALL
F. PROPOSED CONDITION FLOOD ROUTING; FUTURE RAINFALL
G. TIME TO DRAIN AND MOUNDING CALCULATIONS
H. SOIL EROSION CALCULATIONS
   - CONDUIT OUTLET PROTECTION CALCULATIONS
   - OFF-SITE STABILITY CALCULATIONS
   - SEDIMENT BASIN CALCULATIONS
I. STORM DRAINAGE TABULATION

LIST OF FIGURES

1. LOCATION MAP
2. TOPOGRAPHIC MAP
3. SOILS MAP

1.0 PROJECT DESCRIPTION

Being known as Block 69 Lot 8, the project site is located at the corner of Ridgeway Road (OC Route 547) and South Hope Chapel Road in Manchester Township, Ocean County, New Jersey. Figure 1 is a location map for the project site.

It is proposed to develop the property into a mixed use development including commercial development, townhouse residential units, and affordable housing apartment units as shown on Preliminary & Final Major Subdivision Plans prepared by Professional Design Services, in accordance with Manchester Township Land Use Regulations.

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 project site lies within the outer coastal plain physiographic province. The site is pasture with the topography sloping from the north towards the south. The site is contributory to the Ridgeway Branch of the Toms River located south of the site. Road. There are no freshwater wetlands or riparian areas on the property.

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; Ocean County Soil Survey. Figure 3 is a copy of the Soil Survey with the site located.

Soil Type	% Slope	Depth to SHWT*
HcA –Hammonton Sandy Loam	0-5	1.5 – 4’

**SHWT = Seasonal High Water Table*

The Hammonton soils are hydrologic soil group B.

Soil test pits were performed at stormwater basin locations and other locations to assess soil conditions and seasonal high water table. The location of each test pit and log are shown on the site plans.

3.0 REGULATORY STANDARDS

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

This project proposes Major Development as defined by the NJDEP Stormwater Management Regulations N.J.A.C. 7:8. 7: 8 and the Pinelands Comprehensive Management Plan requires 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.

Stormwater management measures designed to infiltrate stormwater shall be designed, constructed, and maintained to provide a minimum separation of at least two feet between the elevation of the lowest point of infiltration and the seasonal high water table;

Stormwater management measures shall be sited in suitable soils verified by testing to have permeability rates between one and 20 inches per hour. Any stormwater infiltration measure sited in soils having permeability rates in excess of 20 inches per hour, must provide a bioretention system prior to infiltration.

The use of stormwater management measures that are smaller in size and distributed spatially throughout a parcel, rather than the use of a single, larger stormwater management measure, shall be required;

Methods of treating stormwater prior to entering any stormwater management measure shall be incorporated into the design of the stormwater management measure to the maximum extent practical;

B. <u>Design and Performance Standards</u>

1. <u>Erosion Control</u>

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. <u>Groundwater Recharge</u>

The total runoff volume generated from the net increase in impervious surfaces by a 10-year, 24-hour storm shall be retained and infiltrated onsite;

3. <u>Runoff Quantity</u>

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. Stormwater management measures shall be designed to achieve a minimum of 65 percent reduction of the postconstruction total nitrogen load from the developed site, including those permanent lawn or turf areas that are specifically intended for active human use as described at N.J.A.C. 7:50-6.24(c)3, in stormwater runoff generated from the water quality design storm. In achieving a minimum 65 percent reduction of total nitrogen, the design of the site shall include green infrastructure in accordance with the BMP Manual and shall optimize nutrient removal. The minimum 65 percent total nitrogen reduction may be achieved by using a singular stormwater management measure or multiple stormwater management measures in series.

5. Mounding Analysis

Groundwater mounding analysis shall be required for purposes of assessing the hydraulic impacts of mounding of the water table resulting from infiltration of stormwater runoff from the maximum storm designed for infiltration. The mounding analysis shall provide details and supporting documentation on the methodology used. Groundwater mounds shall not cause stormwater or groundwater to breakout to the land surface or cause adverse impacts to adjacent water bodies, wetlands, or subsurface structures, including, but not limited to basements and septic systems.

4.0 PROPOSED STORMWATER MANAGEMENT PLAN

As shown on the Site Plans, the proposed stormwater management plan proposes a de-centralized stormwater management systems which will provide green infrastructure with sufficient volume to retain the increased runoff from impervious surfaces for the 10 year 24 hour storm event and control any increased runoff from the proposed development for the 2, 10 and 100 year 24 hour storm events. A series of drywells for the roofs and small scale infiltration basins for roofs,

pavement and driveways area are proposed to manage the additional runoff generated by the project.

5.0 METHODOLOGY

Low Impact Design techniques will be utilized to interact with the hydrologic process to control stormwater runoff and pollutants closer to their source while providing site design measures that can significantly reduce the overall impact of land development on stormwater runoff as required by the Stormwater Management Rules.

The methodology used to estimate the stormwater runoff peak flows and volumes for the required 2, 10 and 100 year storm events is the 24-hour storm using the NOAA Type D rainfall distribution required by the regulations. The calculations will utilize the current and future projected rainfall amounts for the calculations for both the existing and proposed site conditions.

For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application.

The runoff computations shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.

The management systems proposed contains a series of BMP's including small scale infiltration basins and underground drywell systems. Each BMP contains 2 types of outflows, the first being exfiltration from the various systems and the second being outflow from the system as controlled by the various outlet control structures. The recharge to groundwater is shown as "discarded" flows in the flood routings. The runoff calculations separately tabulate the impervious and pervious contributory drainage areas and sequentially route the inflow through the basin for each design storm to ensure that each of the design goals are met.

The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in the New Jersey Stormwater Rules. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

All hydrologic and flood routing computations will utilize the Haested Methods computer software. The stormwater drainage collection system will be designed in accordance with RSIS standards. The Rational Formula was used to compute peak runoff rates for design of the proposed internal collection system. A 25 year frequency storm was used for design as required by RSIS and the rainfall intensities were obtained from the NJDEP Rainfall Intensity Curves. The sub-areas tributary to each inlet are shown on the Drainage Area Plans. Soil erosion and sediment controls will also be employed as required by the "Standards for Soil Erosion and Sediment Control in New Jersey."

Copies of the hydrologic computations, detention basin routings, and Rational Formula computations for storm drainage pipe design are contained within the appendices of this report.

6.0 SUMMARY

The stormwater management systems have been designed to provide a minimum separation of two (2) feet between each bottom and seasonal high water table. The existing soils have a permeability of less than 20 inches per hour. A forebay has been provided in each infiltration basin as a performance and maintenance standard required to maintain maximum soil infiltration capacity.

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 Ocean County Soil Conservation District prior to commencement of construction.

Green Infrastructure

The green infrastructure requirements have been addressed by providing a series of BMP's. Each BMP will perform water quality, recharge and quantity control.

The following chart summarizes each BMP compliance with the Green Infrastructure Requirements:

		Drainage Area (ac)	
Name	BMP	Maximum	Provided
SSI 1	Sm-scale Infiltration	2.5	0.60
SSI 2	Sm-scale Infiltration	2.5	1.00
SSI 3	Sm-scale Infiltration	2.5	2.00
RD 1	Drywell	1	0.53
RD 2	Drywell	1	0.30

Groundwater Recharge

The increase in runoff volume from the impervious surfaces for the 10 year storm will be retained and exfiltrated in the various BMP's as summarized in the following table.

10 Year Retention Volume Summary			
BMP	Impervious Runoff (ac ft)	Volume Provided (ac ft)	
		Discarded	Volume
SSI 1	0.45	0.14	0.05
SSI 2	0.20	0.17	0.03
SSI 3	0.45	0.18	0.08
RD 1	0.27	0.41	0.08
RD 2	0.25	0.18	0.04
D 1	0.00	0.32	0.05
	1.62	1.73	

(1) Discarded outflow from 10 year flood routing

Runoff Quantity

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

Current Rainfall

Storm Event	Pre-Developed Peak Flow	Allowable Peak Flow	Post-Developed Peak Flow
2	0.2	0.2	0.1
10	1.6	1.2	0.8
100	6.9	5.5	3.8

Future Rainfall

Storm Event	Pre-Developed Peak Flow	Allowable Peak Flow	Post-Developed Peak Flow
2	0.7	0.35	.2
10	2.4	1.8	1.2
100	11.5	9.2	4.4

Water Quality

The system will perform water quality control by the utilization of small scale infiltration basins, which will retain runoff from the stormwater quality design storm thereby promoting pollutant removal through sedimentation and biological processing. The forebay of the basin will retain and infiltrate 10% of the water quality storm runoff volume.The following chart summarizes the water quality storm volumes.

The Pinelands CMP further requires a minimum of 65% reduction of the post-development nitrogen load. The small scale underground infiltration systems provided for each roof provide 50% Total Nitrogen Removal Rate (TNR) individually, each SSI provides 50% TNR individually and all runoff from SSI are also routed thru drywall systems which completes the series at 50% thereby the system provides a minimum total TNR greater than 65%.

Mounding

The mounding analysis for each management system was performed by utilizing the NJDEP Hantush spreadsheet

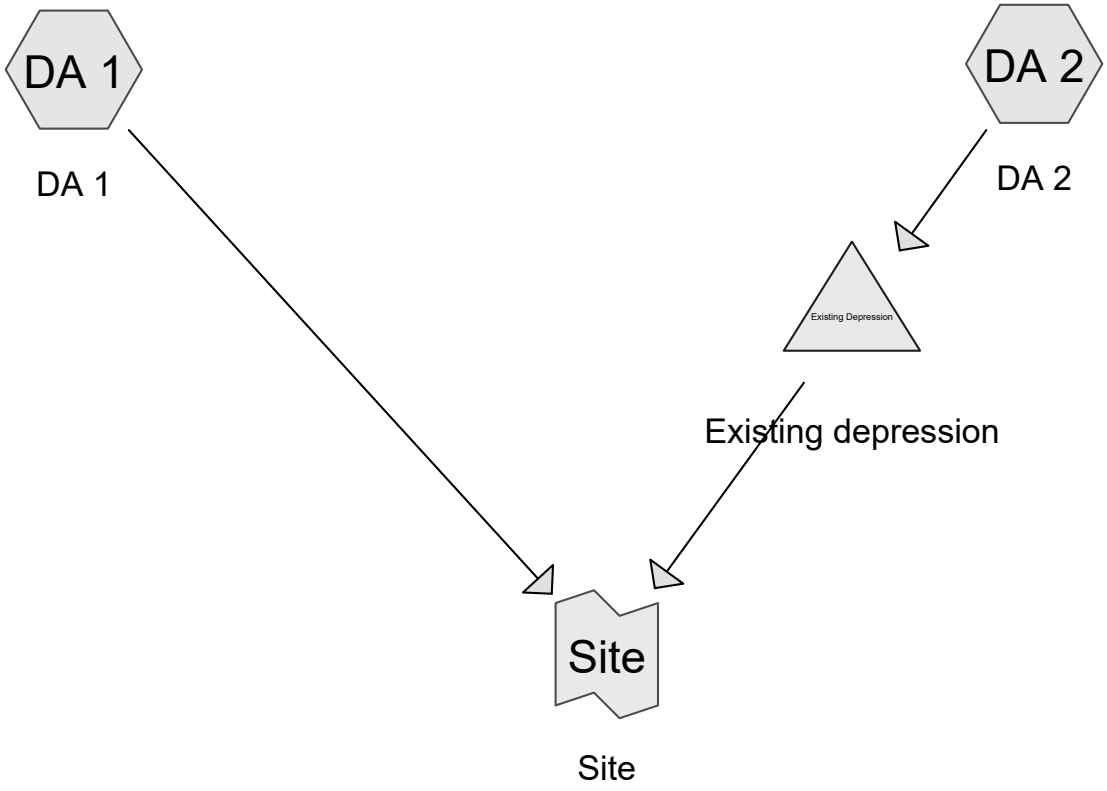
The mounding that will occur beneath and adjacent to each basin will only be temporary after large storm events and will not alter groundwater levels. As a result, the basins will not adversely impact wetlands, surface water bodies, septic systems or man-made structures. The temporary mounding will not affect the functioning of each basin.

7.0 MAINTENANCE

All maintenance activities for the stormwater collection system and retention basins will be the responsibility of the future Homeowners Association.

APPENDIX A

EXISTING CONDITION CALCULATIONS; CURRENT RAINFALL



Subcat Reach Pond Link

Routing Diagram for Existing Conditions.Current Rainfall
Prepared by Professional Design Services, Printed 11/13/2025
HydroCAD® 10.20-5c s/n 02223 © 2023 HydroCAD Software Solutions LLC

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.54"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=0.40 cfs 0.112 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.54"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=0.39 cfs 0.112 af

Pond Existing Depression: Existing Peak Elev=68.69' Storage=4,875 cf Inflow=0.39 cfs 0.112 af
Outflow=0.00 cfs 0.000 af

Link Site: Site Inflow=0.40 cfs 0.112 af
Primary=0.40 cfs 0.112 af

Total Runoff Area = 5.000 ac Runoff Volume = 0.224 af Average Runoff Depth = 0.54"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 0.40 cfs @ 12.61 hrs, Volume= 0.112 af, Depth= 0.54"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.42"

	Area (ac)	CN	Description
*	2.500	61	Pasture B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 0.39 cfs @ 12.64 hrs, Volume= 0.112 af, Depth= 0.54"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.42"

	Area (ac)	CN	Description
*	2.500	61	Pasture, B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 0.54" for 2 year event
Inflow = 0.39 cfs @ 12.64 hrs, Volume= 0.112 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 68.69' @ 27.05 hrs Surf.Area= 7,101 sf Storage= 4,875 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link Site: Site

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 0.27" for 2 year event
Inflow = 0.40 cfs @ 12.61 hrs, Volume= 0.112 af
Primary = 0.40 cfs @ 12.61 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=1.60 cfs 0.334 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=1.56 cfs 0.334 af

Pond Existing Depression: Existing Peak Elev=69.53' Storage=11,942 cf Inflow=1.56 cfs 0.334 af
Outflow=0.13 cfs 0.066 af

Link Site: Site Inflow=1.60 cfs 0.400 af
Primary=1.60 cfs 0.400 af

Total Runoff Area = 5.000 ac Runoff Volume = 0.668 af Average Runoff Depth = 1.60"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 1.60 cfs @ 12.46 hrs, Volume= 0.334 af, Depth= 1.60"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.38"

	Area (ac)	CN	Description
*	2.500	61	Pasture B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 1.56 cfs @ 12.47 hrs, Volume= 0.334 af, Depth= 1.60"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.38"

	Area (ac)	CN	Description
*	2.500	61	Pasture, B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 1.60" for 10 year event
Inflow = 1.56 cfs @ 12.47 hrs, Volume= 0.334 af
Outflow = 0.13 cfs @ 19.76 hrs, Volume= 0.066 af, Atten= 91%, Lag= 437.1 min
Primary = 0.13 cfs @ 19.76 hrs, Volume= 0.066 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.53' @ 19.76 hrs Surf.Area= 8,978 sf Storage= 11,942 cf

Plug-Flow detention time= 566.6 min calculated for 0.066 af (20% of inflow)
Center-of-Mass det. time= 389.3 min (1,306.8 - 917.5)

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.13 cfs @ 19.76 hrs HW=69.53' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.13 cfs @ 0.41 fps)

Summary for Link Site: Site

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 0.96" for 10 year event
Inflow = 1.60 cfs @ 12.46 hrs, Volume= 0.400 af
Primary = 1.60 cfs @ 12.46 hrs, Volume= 0.400 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=4.61"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=5.13 cfs 0.960 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=4.61"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=4.99 cfs 0.960 af

Pond Existing Depression: Existing Peak Elev=69.77' Storage=14,119 cf Inflow=4.99 cfs 0.960 af
Outflow=3.38 cfs 0.692 af

Link Site: Site Inflow=6.88 cfs 1.653 af
Primary=6.88 cfs 1.653 af

Total Runoff Area = 5.000 ac Runoff Volume = 1.920 af Average Runoff Depth = 4.61"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 5.13 cfs @ 12.42 hrs, Volume= 0.960 af, Depth= 4.61"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=9.48"

	Area (ac)	CN	Description
*	2.500	61	Pasture B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 4.99 cfs @ 12.43 hrs, Volume= 0.960 af, Depth= 4.61"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=9.48"

	Area (ac)	CN	Description
*	2.500	61	Pasture, B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 4.61" for 100 year event
Inflow = 4.99 cfs @ 12.43 hrs, Volume= 0.960 af
Outflow = 3.38 cfs @ 13.02 hrs, Volume= 0.692 af, Atten= 32%, Lag= 35.0 min
Primary = 3.38 cfs @ 13.02 hrs, Volume= 0.692 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.77' @ 13.02 hrs Surf.Area= 9,194 sf Storage= 14,119 cf

Plug-Flow detention time= 184.0 min calculated for 0.692 af (72% of inflow)
Center-of-Mass det. time= 80.2 min (962.8 - 882.6)

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.37 cfs @ 13.02 hrs HW=69.77' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.37 cfs @ 1.25 fps)

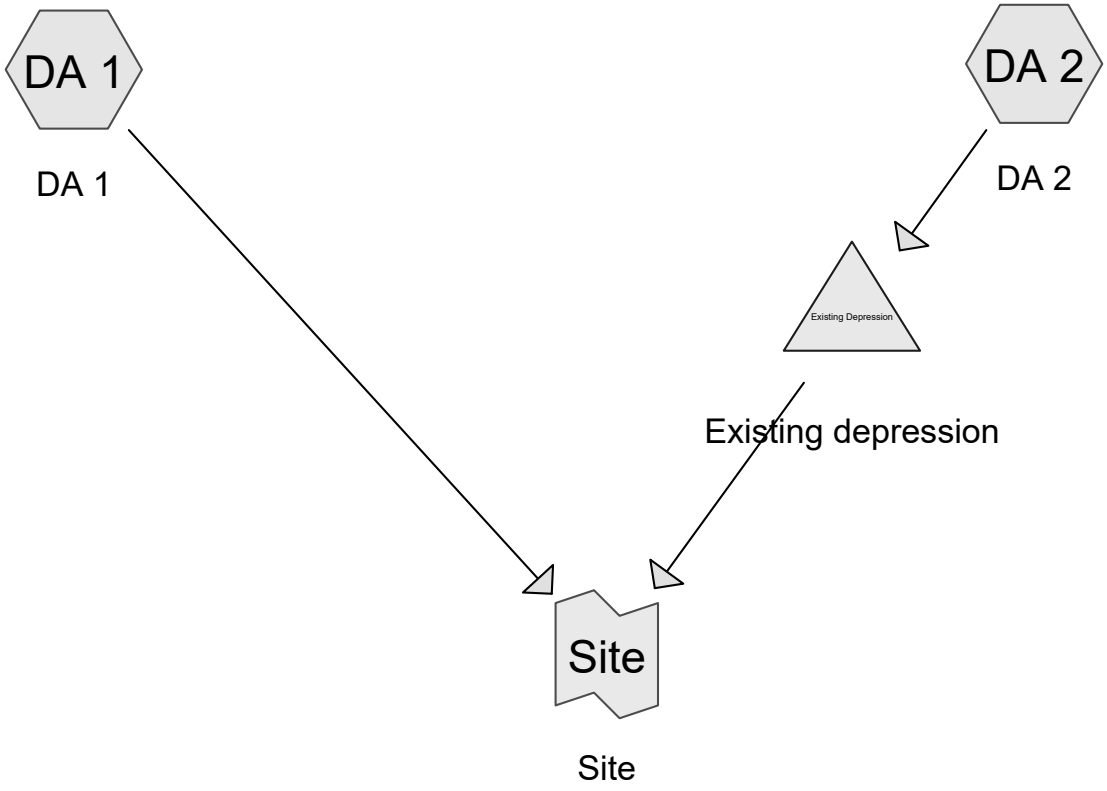
Summary for Link Site: Site

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 3.97" for 100 year event
Inflow = 6.88 cfs @ 12.92 hrs, Volume= 1.653 af
Primary = 6.88 cfs @ 12.92 hrs, Volume= 1.653 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX B

EXISTING CONDITION CALCULATIONS; FUTURE RAINFALL



Subcat Reach Pond Link

Routing Diagram for Existing Conditions.Future Rainfall
Prepared by Professional Design Services, Printed 11/13/2025
HydroCAD® 10.20-5c s/n 02223 © 2023 HydroCAD Software Solutions LLC

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.83"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=0.72 cfs 0.174 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=0.83"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=0.70 cfs 0.174 af

Pond Existing Depression: Existing Peak Elev=69.03' Storage=7,558 cf Inflow=0.70 cfs 0.174 af
Outflow=0.00 cfs 0.000 af

Link Site: Site Inflow=0.72 cfs 0.174 af
Primary=0.72 cfs 0.174 af

Total Runoff Area = 5.000 ac Runoff Volume = 0.347 af Average Runoff Depth = 0.83"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 0.72 cfs @ 12.52 hrs, Volume= 0.174 af, Depth= 0.83"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=4.04"

	Area (ac)	CN	Description
*	2.500	61	Pasture B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 0.70 cfs @ 12.54 hrs, Volume= 0.174 af, Depth= 0.83"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=4.04"

	Area (ac)	CN	Description
*	2.500	61	Pasture, B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 0.83" for 2 year event
Inflow = 0.70 cfs @ 12.54 hrs, Volume= 0.174 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.03' @ 27.05 hrs Surf.Area= 8,527 sf Storage= 7,558 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link Site: Site

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 0.42" for 2 year event
Inflow = 0.72 cfs @ 12.52 hrs, Volume= 0.174 af
Primary = 0.72 cfs @ 12.52 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=2.35 cfs 0.466 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=2.29 cfs 0.466 af

Pond Existing Depression: Existing Peak Elev=69.57' Storage=12,310 cf Inflow=2.29 cfs 0.466 af
Outflow=0.46 cfs 0.198 af

Link Site: Site Inflow=2.35 cfs 0.664 af
Primary=2.35 cfs 0.664 af

Total Runoff Area = 5.000 ac Runoff Volume = 0.932 af Average Runoff Depth = 2.24"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 2.35 cfs @ 12.44 hrs, Volume= 0.466 af, Depth= 2.24"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=6.34"

Area (ac)	CN	Description
* 2.500	61	Pasture B Soils
2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 2.29 cfs @ 12.46 hrs, Volume= 0.466 af, Depth= 2.24"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=6.34"

Area (ac)	CN	Description
* 2.500	61	Pasture, B Soils
2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10 year event
Inflow = 2.29 cfs @ 12.46 hrs, Volume= 0.466 af
Outflow = 0.46 cfs @ 14.92 hrs, Volume= 0.198 af, Atten= 80%, Lag= 147.9 min
Primary = 0.46 cfs @ 14.92 hrs, Volume= 0.198 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.57' @ 14.92 hrs Surf.Area= 9,015 sf Storage= 12,310 cf

Plug-Flow detention time= 360.1 min calculated for 0.198 af (42% of inflow)
Center-of-Mass det. time= 210.3 min (1,116.4 - 906.1)

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.45 cfs @ 14.92 hrs HW=69.57' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.45 cfs @ 0.63 fps)

Summary for Link Site: Site

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 1.59" for 10 year event
Inflow = 2.35 cfs @ 12.44 hrs, Volume= 0.664 af
Primary = 2.35 cfs @ 12.44 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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: DA 1 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=6.21"
Flow Length=450' Slope=0.0100 '/' Tc=26.3 min CN=61 Runoff=6.99 cfs 1.294 af

Subcatchment DA 2: DA 2 Runoff Area=2.500 ac 0.00% Impervious Runoff Depth=6.21"
Flow Length=500' Slope=0.0100 '/' Tc=27.5 min CN=61 Runoff=6.80 cfs 1.294 af

Pond Existing Depression: Existing Peak Elev=69.87' Storage=15,061 cf Inflow=6.80 cfs 1.294 af
Outflow=5.64 cfs 1.026 af

Link Site: Site Inflow=11.47 cfs 2.320 af
Primary=11.47 cfs 2.320 af

Total Runoff Area = 5.000 ac Runoff Volume = 2.588 af Average Runoff Depth = 6.21"
100.00% Pervious = 5.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA 1: DA 1

Runoff = 6.99 cfs @ 12.41 hrs, Volume= 1.294 af, Depth= 6.21"
Routed to Link Site : Site

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=11.41"

	Area (ac)	CN	Description
*	2.500	61	Pasture B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
8.3	350	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
26.3	450	Total			

Summary for Subcatchment DA 2: DA 2

Runoff = 6.80 cfs @ 12.43 hrs, Volume= 1.294 af, Depth= 6.21"
Routed to Pond Existing Depression : Existing depression

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=11.41"

	Area (ac)	CN	Description
*	2.500	61	Pasture, B Soils
	2.500	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	100	0.0100	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
9.5	400	0.0100	0.70		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
27.5	500	Total			

Summary for Pond Existing Depression: Existing depression

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth = 6.21" for 100 year event
Inflow = 6.80 cfs @ 12.43 hrs, Volume= 1.294 af
Outflow = 5.64 cfs @ 12.76 hrs, Volume= 1.026 af, Atten= 17%, Lag= 19.8 min
Primary = 5.64 cfs @ 12.76 hrs, Volume= 1.026 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.87' @ 12.76 hrs Surf.Area= 9,285 sf Storage= 15,061 cf

Plug-Flow detention time= 146.0 min calculated for 1.025 af (79% of inflow)
Center-of-Mass det. time= 60.6 min (933.7 - 873.1)

Volume	Invert	Avail.Storage	Storage Description
#1	67.50'	16,250 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.50	200	0	0
68.00	4,000	1,050	1,050
69.00	8,500	6,250	7,300
70.00	9,400	8,950	16,250

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.63 cfs @ 12.76 hrs HW=69.87' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.63 cfs @ 1.51 fps)

Summary for Link Site: Site

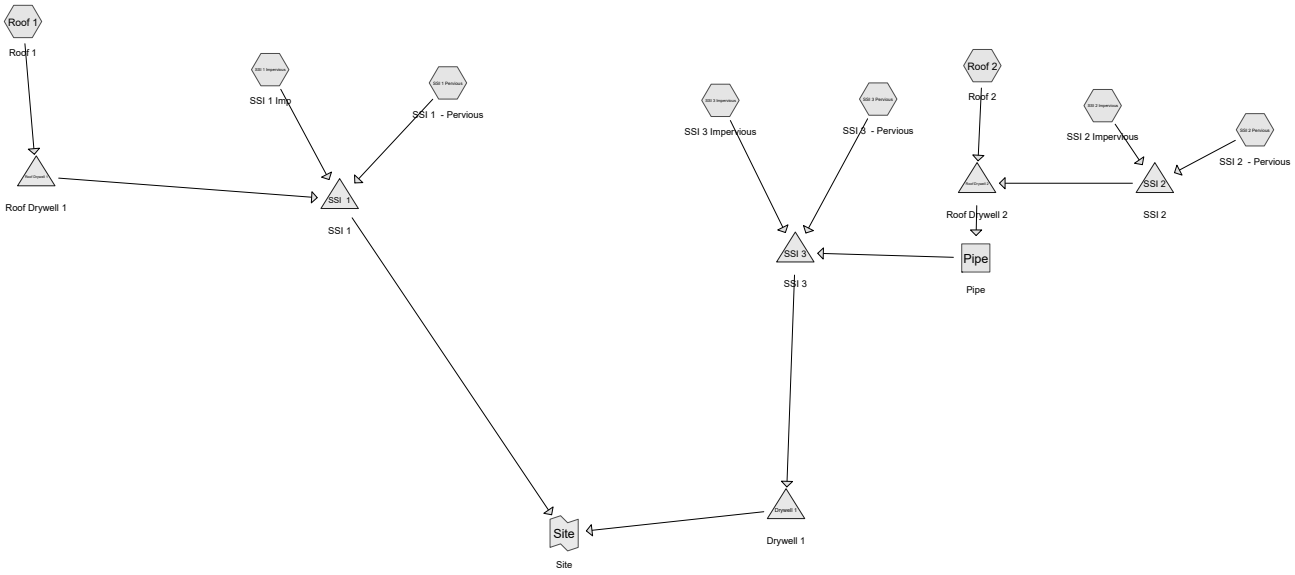
Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth = 5.57" for 100 year event
Inflow = 11.47 cfs @ 12.68 hrs, Volume= 2.320 af
Primary = 11.47 cfs @ 12.68 hrs, Volume= 2.320 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX C

PROPOSED CONDITION HYDROLOGY

- **HYDROLOGIC DATA**



Subcat Reach Pond Link

Routing Diagram for Proposed Condition.Current Rainfall

Prepared by Professional Design Services, Printed 11/13/2025

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 Roof 1: Roof 1 Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=3.25"
Flow Length=40' Slope=0.0100 '/' Tc=0.7 min CN=98 Runoff=1.90 cfs 0.143 af

Subcatchment Roof 2: Roof 2 Runoff Area=0.300 ac 100.00% Impervious Runoff Depth=3.25"
Flow Length=40' Slope=0.0100 '/' Tc=0.7 min CN=98 Runoff=1.08 cfs 0.081 af

Subcatchment SSI 1 Impervious: SSI 1 Imp Runoff Area=0.450 ac 100.00% Impervious Runoff Depth=3.25"
Flow Length=300' Slope=0.0100 '/' Tc=3.1 min CN=98 Runoff=1.42 cfs 0.122 af

Subcatchment SSI 1 Pervious: SSI 1 - Runoff Area=0.550 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=350' Tc=10.7 min CN=61 Runoff=0.15 cfs 0.026 af

Subcatchment SSI 2 Impervious: SSI 2 Runoff Area=0.400 ac 100.00% Impervious Runoff Depth=3.25"
Flow Length=320' Slope=0.0100 '/' Tc=3.2 min CN=98 Runoff=1.25 cfs 0.108 af

Subcatchment SSI 2 Pervious: SSI 2 - Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=420' Tc=6.7 min CN=61 Runoff=0.07 cfs 0.009 af

Subcatchment SSI 3 Impervious: SSI 3 Runoff Area=0.880 ac 100.00% Impervious Runoff Depth=3.25"
Flow Length=320' Slope=0.0100 '/' Tc=3.2 min CN=98 Runoff=2.76 cfs 0.238 af

Subcatchment SSI 3 Pervious: SSI 3 - Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=420' Tc=6.7 min CN=61 Runoff=0.07 cfs 0.009 af

Total Runoff Area = 3.510 ac Runoff Volume = 0.737 af Average Runoff Depth = 2.52"
27.07% Pervious = 0.950 ac 72.93% Impervious = 2.560 ac

Summary for Subcatchment Roof 1: Roof 1

Runoff = 1.90 cfs @ 12.06 hrs, Volume= 0.143 af, Depth= 3.25"
Routed to Pond Roof Drywell 1 : Roof Drywell 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.530	98	Roof
	0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"

Summary for Subcatchment Roof 2: Roof 2

Runoff = 1.08 cfs @ 12.06 hrs, Volume= 0.081 af, Depth= 3.25"
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.300	98	Roof
	0.300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"

Summary for Subcatchment SSI 1 Impervious: SSI 1 Imp

Runoff = 1.42 cfs @ 12.10 hrs, Volume= 0.122 af, Depth= 3.25"
Routed to Pond SSI 1 : SSI 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.450	98	Road, Driveway & Sidewalk
	0.450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	300	Total			

Summary for Subcatchment SSI 1 Pervious: SSI 1 - Pervious

Runoff = 0.15 cfs @ 12.26 hrs, Volume= 0.026 af, Depth= 0.56"
Routed to Pond SSI 1 : SSI 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.550	61	lawn, B soils
	0.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0200	0.11		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.7	350	Total			

Summary for Subcatchment SSI 2 Impervious: SSI 2 Impervious

Runoff = 1.25 cfs @ 12.10 hrs, Volume= 0.108 af, Depth= 3.25"
Routed to Pond SSI 2 : SSI 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.400	98	Road, Driveway & Sidewalk
	0.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	20	0.0100	6.44	11.38	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
3.2	320	Total			

Summary for Subcatchment SSI 2 Pervious: SSI 2 - Pervious

Runoff = 0.07 cfs @ 12.18 hrs, Volume= 0.009 af, Depth= 0.56"
Routed to Pond SSI 2 : SSI 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.200	61	lawn, B soils
	0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	200	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
6.7	420	Total			

Summary for Subcatchment SSI 3 Impervious: SSI 3 Impervious

Runoff = 2.76 cfs @ 12.10 hrs, Volume= 0.238 af, Depth= 3.25"
Routed to Pond SSI 3 : SSI 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

	Area (ac)	CN	Description
*	0.750	98	Road, Driveway & Sidewalk
*	0.130	98	Roof
	0.880	98	Weighted Average
	0.880		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	20	0.0100	6.44	11.38	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
3.2	320	Total			

Summary for Subcatchment SSI 3 Pervious: SSI 3 - Pervious

Runoff = 0.07 cfs @ 12.18 hrs, Volume= 0.009 af, Depth= 0.56"
Routed to Pond SSI 3 : SSI 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.48"

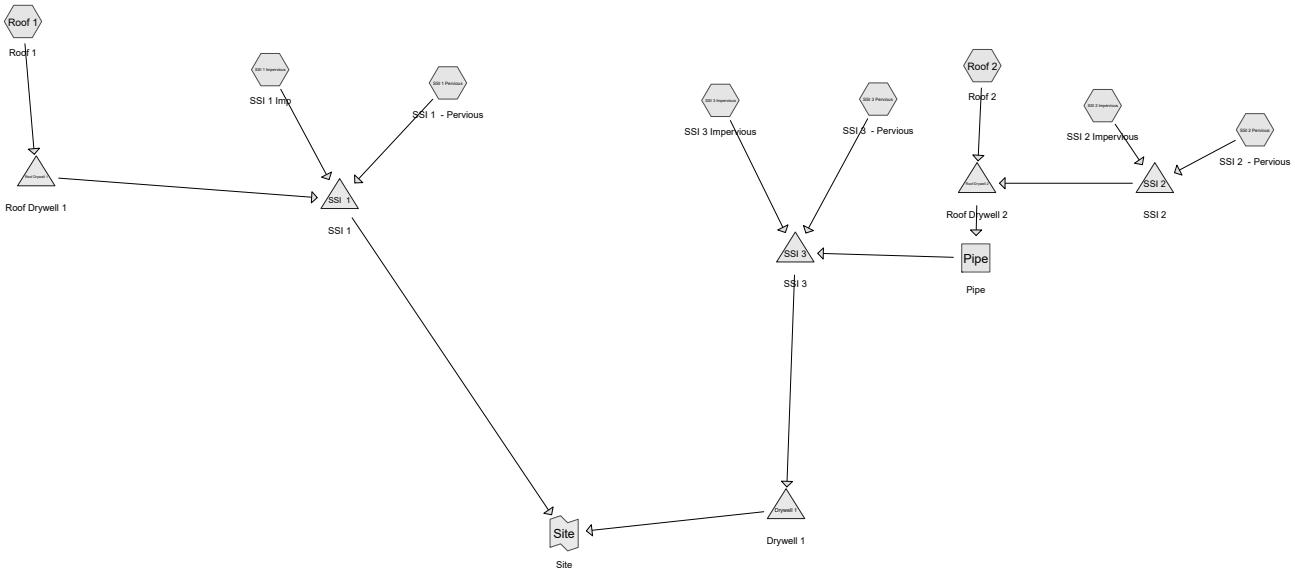
	Area (ac)	CN	Description
*	0.200	61	lawn, B soils
	0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	200	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
6.7	420	Total			

APPENDIX D

WATER QUALITY STORM FLOOD ROUTING

- **Hydrologic Data**
- **Flood routing calculations**



Subcat Reach Pond Link

Routing Diagram for Proposed Condition.Current Rainfall

Prepared by Professional Design Services, Printed 11/13/2025

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 Roof 1: Roof 1 Runoff Area=0.530 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=40' Slope=0.0100 '/' Tc=0.7 min CN=98 Runoff=0.62 cfs 0.046 af

Subcatchment Roof 2: Roof 2 Runoff Area=0.300 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=40' Slope=0.0100 '/' Tc=0.7 min CN=98 Runoff=0.35 cfs 0.026 af

Subcatchment SSI 1 Impervious: SSI 1 Imp Runoff Area=0.450 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=300' Slope=0.0100 '/' Tc=3.1 min CN=98 Runoff=0.46 cfs 0.039 af

Subcatchment SSI 1 Pervious: SSI 1 - Runoff Area=0.550 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=350' Tc=10.7 min CN=61 Runoff=0.00 cfs 0.000 af

Subcatchment SSI 2 Impervious: SSI 2 Runoff Area=0.400 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=320' Slope=0.0100 '/' Tc=3.2 min CN=98 Runoff=0.40 cfs 0.034 af

Subcatchment SSI 2 Pervious: SSI 2 - Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=420' Tc=6.7 min CN=61 Runoff=0.00 cfs 0.000 af

Subcatchment SSI 3 Impervious: SSI 3 Runoff Area=0.880 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=320' Slope=0.0100 '/' Tc=3.2 min CN=98 Runoff=0.89 cfs 0.076 af

Subcatchment SSI 3 Pervious: SSI 3 - Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=420' Tc=6.7 min CN=61 Runoff=0.00 cfs 0.000 af

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

Pond Drywell 1: Drywell 1 Peak Elev=67.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=67.09' Storage=0.004 af Inflow=0.62 cfs 0.046 af
Discarded=0.32 cfs 0.046 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.046 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=67.07' Storage=0.003 af Inflow=0.35 cfs 0.026 af
Discarded=0.20 cfs 0.026 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.026 af

Pond SSI 1: SSI 1 Peak Elev=68.20' Storage=517 cf Inflow=0.46 cfs 0.039 af
Discarded=0.06 cfs 0.039 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.039 af

Pond SSI 2: SSI 2 Peak Elev=68.17' Storage=271 cf Inflow=0.40 cfs 0.034 af
Discarded=0.11 cfs 0.034 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.034 af

Pond SSI 3: SSI 3 Peak Elev=66.40' Storage=1,245 cf Inflow=0.89 cfs 0.076 af
Discarded=0.07 cfs 0.076 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.076 af

Link Site: Site Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 3.510 ac Runoff Volume = 0.221 af Average Runoff Depth = 0.75"
27.07% Pervious = 0.950 ac 72.93% Impervious = 2.560 ac

Summary for Subcatchment Roof 1: Roof 1

Runoff = 0.62 cfs @ 12.06 hrs, Volume= 0.046 af, Depth= 1.03"
Routed to Pond Roof Drywell 1 : Roof Drywell 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.530	98	Roof
	0.530		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"

Summary for Subcatchment Roof 2: Roof 2

Runoff = 0.35 cfs @ 12.06 hrs, Volume= 0.026 af, Depth= 1.03"
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.300	98	Roof
	0.300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0100	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"

Summary for Subcatchment SSI 1 Impervious: SSI 1 Imp

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.039 af, Depth= 1.03"
Routed to Pond SSI 1 : SSI 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.450	98	Road, Driveway & Sidewalk
	0.450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	300	Total			

Summary for Subcatchment SSI 1 Pervious: SSI 1 - Pervious

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond SSI 1 : SSI 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.550	61	lawn, B soils
	0.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0200	0.11		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.7	350	Total			

Summary for Subcatchment SSI 2 Impervious: SSI 2 Impervious

Runoff = 0.40 cfs @ 12.10 hrs, Volume= 0.034 af, Depth= 1.03"
Routed to Pond SSI 2 : SSI 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.400	98	Road, Driveway & Sidewalk
	0.400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	20	0.0100	6.44	11.38	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
3.2	320	Total			

Summary for Subcatchment SSI 2 Pervious: SSI 2 - Pervious

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond SSI 2 : SSI 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.200	61	lawn, B soils
	0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	200	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
6.7	420	Total			

Summary for Subcatchment SSI 3 Impervious: SSI 3 Impervious

Runoff = 0.89 cfs @ 12.10 hrs, Volume= 0.076 af, Depth= 1.03"
Routed to Pond SSI 3 : SSI 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.750	98	Road, Driveway & Sidewalk
*	0.130	98	Roof
	0.880	98	Weighted Average
	0.880		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	20	0.0100	6.44	11.38	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
3.2	320	Total			

Summary for Subcatchment SSI 3 Pervious: SSI 3 - Pervious

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond SSI 3 : SSI 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D WQ storm Rainfall=1.25"

	Area (ac)	CN	Description
*	0.200	61	lawn, B soils
	0.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		**Sheet Flow, sheet flow** Grass: Dense n= 0.240 P2= 3.50"
2.1	200	0.0100	1.61		**Shallow Concentrated Flow, shallow conc** Unpaved Kv= 16.1 fps
0.8	200	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
6.7	420	Total			

Summary for Reach Pipe: Pipe

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 0.00" for WQ storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Pond SSI 3 : SSI 3

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 0.00" for WQ storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.00' @ 0.00 hrs Surf.Area= 0.089 ac Storage= 0.000 af

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

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.27 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 1.03" for WQ storm event
Inflow = 0.62 cfs @ 12.06 hrs, Volume= 0.046 af
Outflow = 0.32 cfs @ 12.05 hrs, Volume= 0.046 af, Atten= 48%, Lag= 0.0 min
Discarded = 0.32 cfs @ 12.05 hrs, Volume= 0.046 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.09' @ 12.14 hrs Surf.Area= 0.106 ac Storage= 0.004 af

Plug-Flow detention time= 4.3 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (790.4 - 786.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 12.05 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 0.34" for WQ storm event
Inflow = 0.35 cfs @ 12.06 hrs, Volume= 0.026 af
Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.026 af, Atten= 41%, Lag= 2.2 min
Discarded = 0.20 cfs @ 12.10 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.07' @ 12.13 hrs Surf.Area= 0.102 ac Storage= 0.003 af

Plug-Flow detention time= 8.2 min calculated for 0.026 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (794.1 - 786.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 12.10 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 0.30" for WQ storm event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.039 af
Outflow = 0.06 cfs @ 12.76 hrs, Volume= 0.039 af, Atten= 87%, Lag= 39.3 min
Discarded = 0.06 cfs @ 12.76 hrs, Volume= 0.039 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.20' @ 12.76 hrs Surf.Area= 2,540 sf Storage= 517 cf

Plug-Flow detention time= 73.2 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 73.0 min (862.8 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.76 hrs HW=68.20' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 0.69" for WQ storm event
Inflow = 0.40 cfs @ 12.10 hrs, Volume= 0.034 af
Outflow = 0.11 cfs @ 12.36 hrs, Volume= 0.034 af, Atten= 74%, Lag= 15.4 min
Discarded = 0.11 cfs @ 12.36 hrs, Volume= 0.034 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.17' @ 12.36 hrs Surf.Area= 1,534 sf Storage= 271 cf

Plug-Flow detention time= 17.5 min calculated for 0.034 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (807.3 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.11 cfs @ 12.36 hrs HW=68.17' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
└**2=Orifice** (Controls 0.00 cfs)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 0.46" for WQ storm event
Inflow = 0.89 cfs @ 12.10 hrs, Volume= 0.076 af
Outflow = 0.07 cfs @ 13.37 hrs, Volume= 0.076 af, Atten= 92%, Lag= 76.0 min
Discarded = 0.07 cfs @ 13.37 hrs, Volume= 0.076 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 66.40' @ 13.37 hrs Surf.Area= 3,080 sf Storage= 1,245 cf

Plug-Flow detention time= 149.5 min calculated for 0.076 af (100% of inflow)
Center-of-Mass det. time= 149.4 min (939.3 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 13.37 hrs HW=66.40' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Grate** (Controls 0.00 cfs)

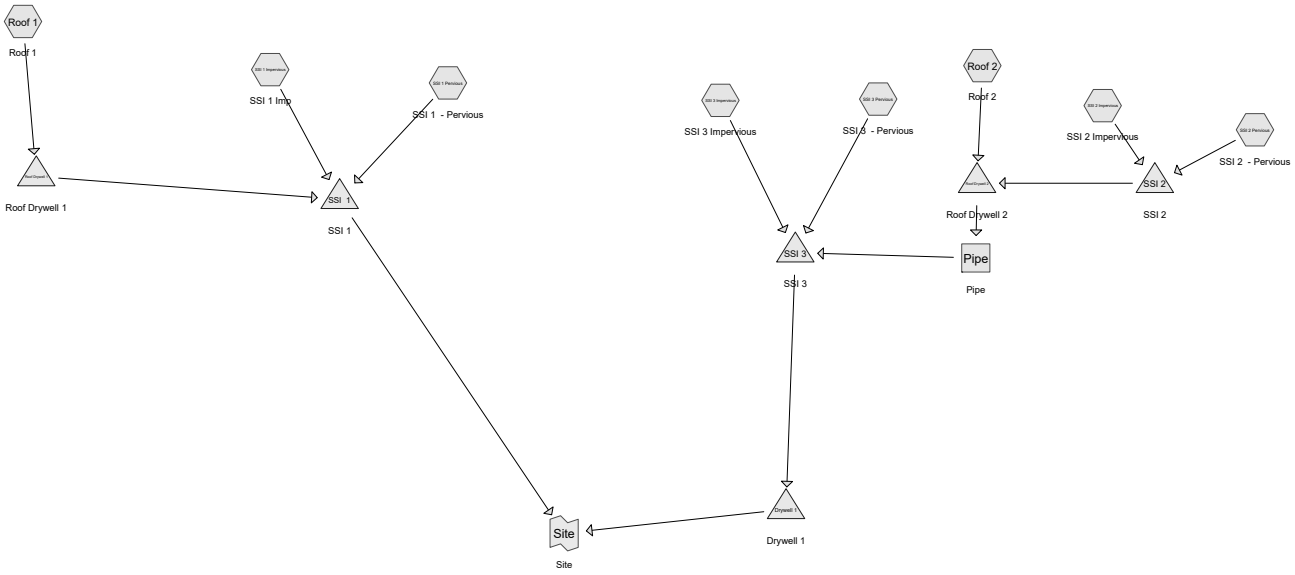
Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.00" for WQ storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX E

PROPOSED CONDITION FLOOD ROUTING; CURRENT RAINFALL



Subcat Reach Pond Link

Routing Diagram for Proposed Condition.Current Rainfall

Prepared by Professional Design Services, Printed 11/13/2025

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=67.32' Storage=0.011 af Inflow=0.42 cfs 0.072 af
Discarded=0.27 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.072 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=67.77' Storage=0.031 af Inflow=1.90 cfs 0.143 af
Discarded=0.32 cfs 0.143 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.143 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=67.42' Storage=0.017 af Inflow=1.08 cfs 0.083 af
Discarded=0.20 cfs 0.083 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.083 af

Pond SSI 1: SSI 1 Peak Elev=69.14' Storage=2,985 cf Inflow=1.49 cfs 0.148 af
Discarded=0.06 cfs 0.117 af Primary=0.06 cfs 0.013 af Outflow=0.12 cfs 0.130 af

Pond SSI 2: SSI 2 Peak Elev=69.09' Storage=1,763 cf Inflow=1.30 cfs 0.118 af
Discarded=0.12 cfs 0.115 af Primary=0.03 cfs 0.002 af Outflow=0.15 cfs 0.118 af

Pond SSI 3: SSI 3 Peak Elev=67.45' Storage=4,576 cf Inflow=2.81 cfs 0.247 af
Discarded=0.08 cfs 0.149 af Primary=0.42 cfs 0.072 af Outflow=0.50 cfs 0.221 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 0.44" for 2 year event
Inflow = 0.42 cfs @ 12.60 hrs, Volume= 0.072 af
Outflow = 0.27 cfs @ 12.35 hrs, Volume= 0.072 af, Atten= 36%, Lag= 0.0 min
Discarded = 0.27 cfs @ 12.35 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.32' @ 13.51 hrs Surf.Area= 0.089 ac Storage= 0.011 af

Plug-Flow detention time= 17.2 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 17.2 min (843.9 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 12.35 hrs HW=67.06' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
↑ **2=Orifice** (Controls 0.00 cfs)
3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 3.25" for 2 year event
Inflow = 1.90 cfs @ 12.06 hrs, Volume= 0.143 af
Outflow = 0.32 cfs @ 11.65 hrs, Volume= 0.143 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.32 cfs @ 11.65 hrs, Volume= 0.143 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.77' @ 12.48 hrs Surf.Area= 0.106 ac Storage= 0.031 af

Plug-Flow detention time= 22.8 min calculated for 0.143 af (100% of inflow)

Center-of-Mass det. time= 22.8 min (774.7 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 11.65 hrs HW=67.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 1.11" for 2 year event
Inflow = 1.08 cfs @ 12.06 hrs, Volume= 0.083 af
Outflow = 0.20 cfs @ 11.80 hrs, Volume= 0.083 af, Atten= 81%, Lag= 0.0 min
Discarded = 0.20 cfs @ 11.80 hrs, Volume= 0.083 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.42' @ 12.37 hrs Surf.Area= 0.102 ac Storage= 0.017 af

Plug-Flow detention time= 22.9 min calculated for 0.083 af (100% of inflow)
Center-of-Mass det. time= 22.9 min (775.9 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 11.80 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 1.16" for 2 year event
Inflow = 1.49 cfs @ 12.11 hrs, Volume= 0.148 af
Outflow = 0.12 cfs @ 13.79 hrs, Volume= 0.130 af, Atten= 92%, Lag= 100.8 min
Discarded = 0.06 cfs @ 13.79 hrs, Volume= 0.117 af
Primary = 0.06 cfs @ 13.79 hrs, Volume= 0.013 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.14' @ 13.79 hrs Surf.Area= 2,727 sf Storage= 2,985 cf

Plug-Flow detention time= 354.9 min calculated for 0.130 af (88% of inflow)
Center-of-Mass det. time= 291.6 min (1,078.3 - 786.6)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 13.79 hrs HW=69.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.06 cfs @ 13.79 hrs HW=69.14' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.06 cfs @ 1.26 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 2.35" for 2 year event
Inflow = 1.30 cfs @ 12.10 hrs, Volume= 0.118 af
Outflow = 0.15 cfs @ 13.07 hrs, Volume= 0.118 af, Atten= 89%, Lag= 58.2 min
Discarded = 0.12 cfs @ 13.07 hrs, Volume= 0.115 af
Primary = 0.03 cfs @ 13.07 hrs, Volume= 0.002 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.09' @ 13.07 hrs Surf.Area= 1,709 sf Storage= 1,763 cf

Plug-Flow detention time= 109.3 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 109.1 min (878.6 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 13.07 hrs HW=69.09' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.03 cfs @ 13.07 hrs HW=69.09' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.03 cfs @ 1.04 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 1.50" for 2 year event
Inflow = 2.81 cfs @ 12.10 hrs, Volume= 0.247 af
Outflow = 0.50 cfs @ 12.60 hrs, Volume= 0.221 af, Atten= 82%, Lag= 29.8 min
Discarded = 0.08 cfs @ 12.60 hrs, Volume= 0.149 af
Primary = 0.42 cfs @ 12.60 hrs, Volume= 0.072 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 67.45' @ 12.60 hrs Surf.Area= 3,289 sf Storage= 4,576 cf

Plug-Flow detention time= 276.6 min calculated for 0.221 af (89% of inflow)
Center-of-Mass det. time= 220.0 min (982.3 - 762.3)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.60 hrs HW=67.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.42 cfs @ 12.60 hrs HW=67.45' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.42 cfs @ 2.28 fps)
└**3=Grate** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=68.46' Storage=0.059 af Inflow=0.94 cfs 0.222 af
Discarded=0.27 cfs 0.153 af Primary=0.44 cfs 0.069 af Outflow=0.71 cfs 0.222 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=68.35' Storage=0.063 af Inflow=2.96 cfs 0.227 af
Discarded=0.32 cfs 0.227 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.227 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=68.38' Storage=0.062 af Inflow=1.68 cfs 0.176 af
Discarded=0.20 cfs 0.159 af Primary=0.12 cfs 0.018 af Outflow=0.32 cfs 0.176 af

Pond SSI 1: SSI 1 Peak Elev=69.61' Storage=4,311 cf Inflow=2.60 cfs 0.266 af
Discarded=0.07 cfs 0.128 af Primary=0.57 cfs 0.108 af Outflow=0.63 cfs 0.236 af

Pond SSI 2: SSI 2 Peak Elev=69.55' Storage=2,567 cf Inflow=2.17 cfs 0.198 af
Discarded=0.12 cfs 0.150 af Primary=0.52 cfs 0.048 af Outflow=0.64 cfs 0.198 af

Pond SSI 3: SSI 3 Peak Elev=68.24' Storage=7,223 cf Inflow=4.51 cfs 0.421 af
Discarded=0.08 cfs 0.162 af Primary=0.94 cfs 0.222 af Outflow=1.02 cfs 0.385 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 1.35" for 10 year event
Inflow = 0.94 cfs @ 12.51 hrs, Volume= 0.222 af
Outflow = 0.71 cfs @ 13.77 hrs, Volume= 0.222 af, Atten= 25%, Lag= 75.2 min
Discarded = 0.27 cfs @ 12.05 hrs, Volume= 0.153 af
Primary = 0.44 cfs @ 13.77 hrs, Volume= 0.069 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.46' @ 13.77 hrs Surf.Area= 0.089 ac Storage= 0.059 af

Plug-Flow detention time= 61.9 min calculated for 0.222 af (100% of inflow)
Center-of-Mass det. time= 61.8 min (903.1 - 841.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 12.05 hrs HW=67.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.44 cfs @ 13.77 hrs HW=68.46' (Free Discharge)
↑—**2=Orifice** (Orifice Controls 0.44 cfs @ 2.31 fps)
└—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 5.14" for 10 year event
Inflow = 2.96 cfs @ 12.06 hrs, Volume= 0.227 af
Outflow = 0.32 cfs @ 11.35 hrs, Volume= 0.227 af, Atten= 89%, Lag= 0.0 min
Discarded = 0.32 cfs @ 11.35 hrs, Volume= 0.227 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.35' @ 12.79 hrs Surf.Area= 0.106 ac Storage= 0.063 af

Plug-Flow detention time= 52.4 min calculated for 0.227 af (100% of inflow)

Center-of-Mass det. time= 52.3 min (795.8 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 11.35 hrs HW=67.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 2.35" for 10 year event
Inflow = 1.68 cfs @ 12.06 hrs, Volume= 0.176 af
Outflow = 0.32 cfs @ 13.26 hrs, Volume= 0.176 af, Atten= 81%, Lag= 71.8 min
Discarded = 0.20 cfs @ 11.55 hrs, Volume= 0.159 af
Primary = 0.12 cfs @ 13.26 hrs, Volume= 0.018 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.38' @ 13.26 hrs Surf.Area= 0.102 ac Storage= 0.062 af

Plug-Flow detention time= 79.9 min calculated for 0.176 af (100% of inflow)
Center-of-Mass det. time= 79.8 min (831.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 11.55 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.12 cfs @ 13.26 hrs HW=68.38' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.12 cfs @ 2.43 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 2.09" for 10 year event
Inflow = 2.60 cfs @ 12.11 hrs, Volume= 0.266 af
Outflow = 0.63 cfs @ 12.65 hrs, Volume= 0.236 af, Atten= 76%, Lag= 32.5 min
Discarded = 0.07 cfs @ 12.65 hrs, Volume= 0.128 af
Primary = 0.57 cfs @ 12.65 hrs, Volume= 0.108 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.61' @ 12.65 hrs Surf.Area= 2,822 sf Storage= 4,311 cf

Plug-Flow detention time= 226.3 min calculated for 0.236 af (89% of inflow)
Center-of-Mass det. time= 166.7 min (953.7 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 12.65 hrs HW=69.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.57 cfs @ 12.65 hrs HW=69.61' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.57 cfs @ 2.89 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 3.96" for 10 year event
Inflow = 2.17 cfs @ 12.11 hrs, Volume= 0.198 af
Outflow = 0.64 cfs @ 12.40 hrs, Volume= 0.198 af, Atten= 70%, Lag= 17.3 min
Discarded = 0.12 cfs @ 12.40 hrs, Volume= 0.150 af
Primary = 0.52 cfs @ 12.40 hrs, Volume= 0.048 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.55' @ 12.40 hrs Surf.Area= 1,755 sf Storage= 2,567 cf

Plug-Flow detention time= 99.3 min calculated for 0.198 af (100% of inflow)
Center-of-Mass det. time= 99.2 min (865.1 - 766.0)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.40 hrs HW=69.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.52 cfs @ 12.40 hrs HW=69.55' (Free Discharge)
└**2=Orifice** (Orifice Controls 0.52 cfs @ 2.65 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 2.55" for 10 year event
Inflow = 4.51 cfs @ 12.10 hrs, Volume= 0.421 af
Outflow = 1.02 cfs @ 12.51 hrs, Volume= 0.385 af, Atten= 77%, Lag= 24.6 min
Discarded = 0.08 cfs @ 12.51 hrs, Volume= 0.162 af
Primary = 0.94 cfs @ 12.51 hrs, Volume= 0.222 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 68.24' @ 12.51 hrs Surf.Area= 3,447 sf Storage= 7,223 cf

Plug-Flow detention time= 197.2 min calculated for 0.384 af (91% of inflow)
Center-of-Mass det. time= 150.1 min (908.9 - 758.8)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.51 hrs HW=68.23' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.94 cfs @ 12.51 hrs HW=68.23' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.94 cfs @ 4.78 fps)
└**3=Grate** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=69.73' Storage=0.138 af Inflow=5.98 cfs 0.689 af
Discarded=0.27 cfs 0.272 af Primary=1.15 cfs 0.418 af Outflow=1.42 cfs 0.689 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=69.40' Storage=0.136 af Inflow=5.24 cfs 0.408 af
Discarded=0.32 cfs 0.360 af Primary=0.21 cfs 0.048 af Outflow=0.53 cfs 0.408 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=70.19' Storage=0.191 af Inflow=5.21 cfs 0.412 af
Discarded=0.20 cfs 0.258 af Primary=0.34 cfs 0.154 af Outflow=0.54 cfs 0.412 af

Pond SSI 1: SSI 1 Peak Elev=71.30' Storage=9,373 cf Inflow=5.40 cfs 0.606 af
Discarded=0.07 cfs 0.143 af Primary=1.35 cfs 0.426 af Outflow=1.43 cfs 0.570 af

Pond SSI 2: SSI 2 Peak Elev=70.18' Storage=3,690 cf Inflow=4.16 cfs 0.385 af
Discarded=0.13 cfs 0.204 af Primary=3.89 cfs 0.181 af Outflow=4.02 cfs 0.385 af

Pond SSI 3: SSI 3 Peak Elev=69.25' Storage=10,816 cf Inflow=8.44 cfs 0.908 af
Discarded=0.08 cfs 0.175 af Primary=5.98 cfs 0.689 af Outflow=6.06 cfs 0.865 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 4.18" for 100 year event
Inflow = 5.98 cfs @ 12.21 hrs, Volume= 0.689 af
Outflow = 1.42 cfs @ 12.90 hrs, Volume= 0.689 af, Atten= 76%, Lag= 41.8 min
Discarded = 0.27 cfs @ 11.05 hrs, Volume= 0.272 af
Primary = 1.15 cfs @ 12.90 hrs, Volume= 0.418 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.73' @ 12.90 hrs Surf.Area= 0.089 ac Storage= 0.138 af

Plug-Flow detention time= 63.3 min calculated for 0.688 af (100% of inflow)
Center-of-Mass det. time= 63.2 min (934.7 - 871.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 11.05 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=1.15 cfs @ 12.90 hrs HW=69.73' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.15 cfs @ 5.87 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 9.24" for 100 year event
Inflow = 5.24 cfs @ 12.06 hrs, Volume= 0.408 af
Outflow = 0.53 cfs @ 12.86 hrs, Volume= 0.408 af, Atten= 90%, Lag= 48.1 min
Discarded = 0.32 cfs @ 10.70 hrs, Volume= 0.360 af
Primary = 0.21 cfs @ 12.86 hrs, Volume= 0.048 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.40' @ 12.86 hrs Surf.Area= 0.106 ac Storage= 0.136 af

Plug-Flow detention time= 95.7 min calculated for 0.408 af (100% of inflow)

Center-of-Mass det. time= 95.6 min (831.1 - 735.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 10.70 hrs HW=67.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.21 cfs @ 12.86 hrs HW=69.40' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.21 cfs @ 4.23 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 5.49" for 100 year event
Inflow = 5.21 cfs @ 12.12 hrs, Volume= 0.412 af
Outflow = 0.54 cfs @ 13.64 hrs, Volume= 0.412 af, Atten= 90%, Lag= 91.2 min
Discarded = 0.20 cfs @ 10.90 hrs, Volume= 0.258 af
Primary = 0.34 cfs @ 13.64 hrs, Volume= 0.154 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 70.19' @ 13.64 hrs Surf.Area= 0.102 ac Storage= 0.191 af

Plug-Flow detention time= 157.0 min calculated for 0.411 af (100% of inflow)
Center-of-Mass det. time= 156.7 min (909.4 - 752.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 10.90 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.34 cfs @ 13.64 hrs HW=70.19' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.34 cfs @ 6.91 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 4.75" for 100 year event
Inflow = 5.40 cfs @ 12.12 hrs, Volume= 0.606 af
Outflow = 1.43 cfs @ 12.74 hrs, Volume= 0.570 af, Atten= 74%, Lag= 37.7 min
Discarded = 0.07 cfs @ 12.74 hrs, Volume= 0.143 af
Primary = 1.35 cfs @ 12.74 hrs, Volume= 0.426 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 71.30' @ 12.74 hrs Surf.Area= 3,161 sf Storage= 9,373 cf

Plug-Flow detention time= 146.1 min calculated for 0.569 af (94% of inflow)
Center-of-Mass det. time= 112.7 min (899.1 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 12.74 hrs HW=71.30' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.35 cfs @ 12.74 hrs HW=71.30' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.35 cfs @ 6.90 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 7.70" for 100 year event
Inflow = 4.16 cfs @ 12.11 hrs, Volume= 0.385 af
Outflow = 4.02 cfs @ 12.16 hrs, Volume= 0.385 af, Atten= 3%, Lag= 2.9 min
Discarded = 0.13 cfs @ 12.16 hrs, Volume= 0.204 af
Primary = 3.89 cfs @ 12.16 hrs, Volume= 0.181 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 70.18' @ 12.16 hrs Surf.Area= 1,818 sf Storage= 3,690 cf

Plug-Flow detention time= 86.8 min calculated for 0.384 af (100% of inflow)
Center-of-Mass det. time= 86.9 min (848.4 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 12.16 hrs HW=70.18' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=3.74 cfs @ 12.16 hrs HW=70.18' (Free Discharge)
└**2=Orifice** (Orifice Controls 0.91 cfs @ 4.64 fps)
└**3=Grate** (Weir Controls 2.83 cfs @ 1.38 fps)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 5.50" for 100 year event
Inflow = 8.44 cfs @ 12.11 hrs, Volume= 0.908 af
Outflow = 6.06 cfs @ 12.21 hrs, Volume= 0.865 af, Atten= 28%, Lag= 6.0 min
Discarded = 0.08 cfs @ 12.21 hrs, Volume= 0.175 af
Primary = 5.98 cfs @ 12.21 hrs, Volume= 0.689 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.25' @ 12.21 hrs Surf.Area= 3,650 sf Storage= 10,816 cf

Plug-Flow detention time= 137.1 min calculated for 0.865 af (95% of inflow)
Center-of-Mass det. time= 110.2 min (888.1 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.21 hrs HW=69.24' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=5.82 cfs @ 12.21 hrs HW=69.24' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.33 cfs @ 6.80 fps)
└**3=Grate** (Weir Controls 4.49 cfs @ 1.61 fps)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=0.06 cfs 0.013 af
Primary=0.06 cfs 0.013 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.04" for 2 year event
Inflow = 0.06 cfs @ 13.79 hrs, Volume= 0.013 af
Primary = 0.06 cfs @ 13.79 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=0.83 cfs 0.177 af
Primary=0.83 cfs 0.177 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.61" for 10 year event
Inflow = 0.83 cfs @ 13.39 hrs, Volume= 0.177 af
Primary = 0.83 cfs @ 13.39 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=2.50 cfs 0.844 af
Primary=2.50 cfs 0.844 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 2.89" for 100 year event
Inflow = 2.50 cfs @ 12.83 hrs, Volume= 0.844 af
Primary = 2.50 cfs @ 12.83 hrs, Volume= 0.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=0.06 cfs 0.013 af
Primary=0.06 cfs 0.013 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.04" for 2 year event
Inflow = 0.06 cfs @ 13.79 hrs, Volume= 0.013 af
Primary = 0.06 cfs @ 13.79 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=0.83 cfs 0.177 af
Primary=0.83 cfs 0.177 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.61" for 10 year event
Inflow = 0.83 cfs @ 13.39 hrs, Volume= 0.177 af
Primary = 0.83 cfs @ 13.39 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=2.50 cfs 0.844 af
Primary=2.50 cfs 0.844 af

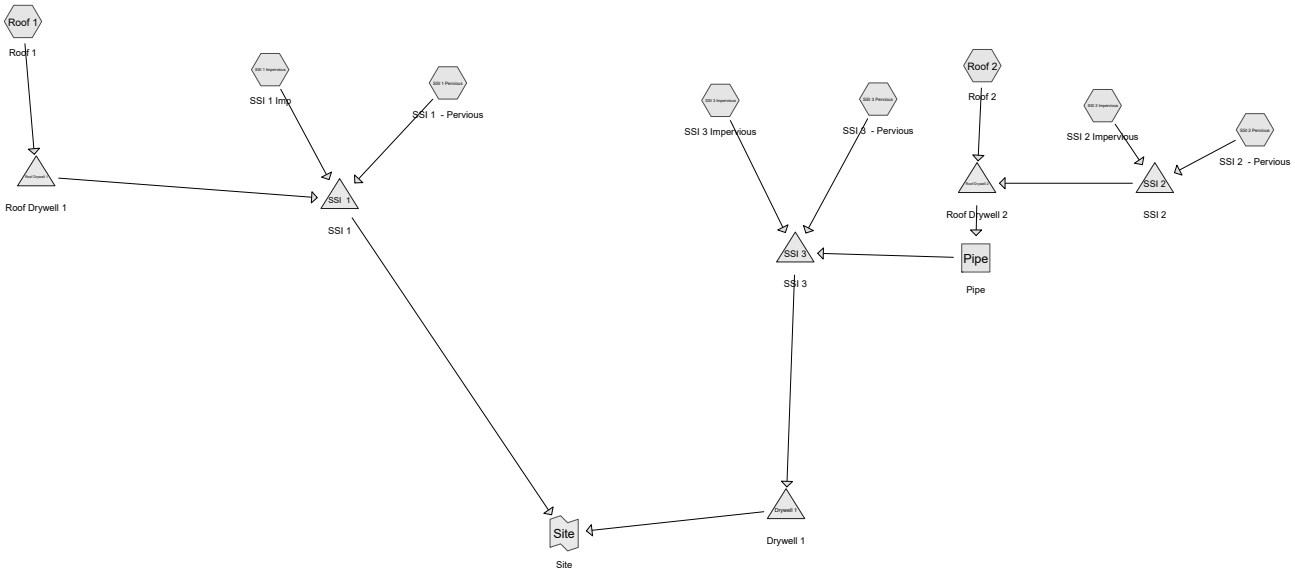
Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 2.89" for 100 year event
Inflow = 2.50 cfs @ 12.83 hrs, Volume= 0.844 af
Primary = 2.50 cfs @ 12.83 hrs, Volume= 0.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX F

PROPOSED CONDITION FLOOD ROUTING; FUTURE RAINFALL



Subcat Reach Pond Link

Routing Diagram for Proposed Condition.Future Rainfall

Prepared by Professional Design Services, Printed 11/13/2025

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Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=67.97' Storage=0.033 af Inflow=0.61 cfs 0.109 af
Discarded=0.27 cfs 0.109 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.109 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=67.96' Storage=0.040 af Inflow=2.22 cfs 0.168 af
Discarded=0.32 cfs 0.168 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.168 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=67.68' Storage=0.027 af Inflow=1.25 cfs 0.109 af
Discarded=0.20 cfs 0.109 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.109 af

Pond SSI 1: SSI 1 Peak Elev=69.27' Storage=3,345 cf Inflow=1.81 cfs 0.181 af
Discarded=0.06 cfs 0.121 af Primary=0.19 cfs 0.037 af Outflow=0.25 cfs 0.158 af

Pond SSI 2: SSI 2 Peak Elev=69.23' Storage=2,005 cf Inflow=1.55 cfs 0.141 af
Discarded=0.12 cfs 0.127 af Primary=0.15 cfs 0.014 af Outflow=0.27 cfs 0.141 af

Pond SSI 3: SSI 3 Peak Elev=67.66' Storage=5,280 cf Inflow=3.30 cfs 0.293 af
Discarded=0.08 cfs 0.153 af Primary=0.61 cfs 0.109 af Outflow=0.68 cfs 0.262 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 0.66" for 2 year event
Inflow = 0.61 cfs @ 12.53 hrs, Volume= 0.109 af
Outflow = 0.27 cfs @ 12.25 hrs, Volume= 0.109 af, Atten= 56%, Lag= 0.0 min
Discarded = 0.27 cfs @ 12.25 hrs, Volume= 0.109 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.97' @ 13.99 hrs Surf.Area= 0.089 ac Storage= 0.033 af

Plug-Flow detention time= 53.1 min calculated for 0.108 af (100% of inflow)
Center-of-Mass det. time= 53.0 min (879.4 - 826.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 12.25 hrs HW=67.08' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 3.81" for 2 year event
Inflow = 2.22 cfs @ 12.06 hrs, Volume= 0.168 af
Outflow = 0.32 cfs @ 11.60 hrs, Volume= 0.168 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.32 cfs @ 11.60 hrs, Volume= 0.168 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.96' @ 12.54 hrs Surf.Area= 0.106 ac Storage= 0.040 af

Plug-Flow detention time= 30.4 min calculated for 0.168 af (100% of inflow)

Center-of-Mass det. time= 30.4 min (779.2 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 11.60 hrs HW=67.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 1.45" for 2 year event
Inflow = 1.25 cfs @ 12.06 hrs, Volume= 0.109 af
Outflow = 0.20 cfs @ 11.70 hrs, Volume= 0.109 af, Atten= 84%, Lag= 0.0 min
Discarded = 0.20 cfs @ 11.70 hrs, Volume= 0.109 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 67.68' @ 13.12 hrs Surf.Area= 0.102 ac Storage= 0.027 af

Plug-Flow detention time= 40.1 min calculated for 0.109 af (100% of inflow)
Center-of-Mass det. time= 40.1 min (793.2 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 11.70 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=67.00' (Free Discharge)
├**2=Orifice** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 1.42" for 2 year event
Inflow = 1.81 cfs @ 12.11 hrs, Volume= 0.181 af
Outflow = 0.25 cfs @ 13.09 hrs, Volume= 0.158 af, Atten= 86%, Lag= 59.1 min
Discarded = 0.06 cfs @ 13.09 hrs, Volume= 0.121 af
Primary = 0.19 cfs @ 13.09 hrs, Volume= 0.037 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.27' @ 13.09 hrs Surf.Area= 2,753 sf Storage= 3,345 cf

Plug-Flow detention time= 305.1 min calculated for 0.158 af (87% of inflow)
Center-of-Mass det. time= 240.8 min (1,027.8 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 13.09 hrs HW=69.27' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.19 cfs @ 13.09 hrs HW=69.27' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.19 cfs @ 1.76 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 2.81" for 2 year event
Inflow = 1.55 cfs @ 12.11 hrs, Volume= 0.141 af
Outflow = 0.27 cfs @ 12.66 hrs, Volume= 0.141 af, Atten= 83%, Lag= 33.4 min
Discarded = 0.12 cfs @ 12.66 hrs, Volume= 0.127 af
Primary = 0.15 cfs @ 12.66 hrs, Volume= 0.014 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.23' @ 12.66 hrs Surf.Area= 1,723 sf Storage= 2,005 cf

Plug-Flow detention time= 107.8 min calculated for 0.141 af (100% of inflow)
Center-of-Mass det. time= 107.7 min (875.9 - 768.2)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.66 hrs HW=69.23' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.15 cfs @ 12.66 hrs HW=69.23' (Free Discharge)
└**2=Orifice** (Orifice Controls 0.15 cfs @ 1.64 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 1.78" for 2 year event
Inflow = 3.30 cfs @ 12.10 hrs, Volume= 0.293 af
Outflow = 0.68 cfs @ 12.53 hrs, Volume= 0.262 af, Atten= 79%, Lag= 25.6 min
Discarded = 0.08 cfs @ 12.53 hrs, Volume= 0.153 af
Primary = 0.61 cfs @ 12.53 hrs, Volume= 0.109 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 67.66' @ 12.53 hrs Surf.Area= 3,332 sf Storage= 5,280 cf

Plug-Flow detention time= 246.1 min calculated for 0.262 af (89% of inflow)
Center-of-Mass det. time= 190.2 min (950.3 - 760.1)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.53 hrs HW=67.66' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.61 cfs @ 12.53 hrs HW=67.66' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.61 cfs @ 3.08 fps)
└**3=Grate** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=68.68' Storage=0.071 af Inflow=1.13 cfs 0.322 af
Discarded=0.27 cfs 0.181 af Primary=0.62 cfs 0.141 af Outflow=0.89 cfs 0.322 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=68.62' Storage=0.082 af Inflow=3.49 cfs 0.269 af
Discarded=0.32 cfs 0.268 af Primary=0.03 cfs 0.002 af Outflow=0.35 cfs 0.269 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=68.77' Storage=0.088 af Inflow=2.17 cfs 0.228 af
Discarded=0.20 cfs 0.184 af Primary=0.19 cfs 0.044 af Outflow=0.39 cfs 0.228 af

Pond SSI 1: SSI 1 Peak Elev=69.96' Storage=5,279 cf Inflow=3.20 cfs 0.333 af
Discarded=0.07 cfs 0.133 af Primary=0.79 cfs 0.168 af Outflow=0.86 cfs 0.301 af

Pond SSI 2: SSI 2 Peak Elev=69.85' Storage=3,083 cf Inflow=2.62 cfs 0.241 af
Discarded=0.12 cfs 0.165 af Primary=0.73 cfs 0.076 af Outflow=0.85 cfs 0.241 af

Pond SSI 3: SSI 3 Peak Elev=68.67' Storage=8,739 cf Inflow=5.38 cfs 0.529 af
Discarded=0.08 cfs 0.167 af Primary=1.13 cfs 0.322 af Outflow=1.21 cfs 0.489 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 1.95" for 10 year event
Inflow = 1.13 cfs @ 12.56 hrs, Volume= 0.322 af
Outflow = 0.89 cfs @ 13.92 hrs, Volume= 0.322 af, Atten= 21%, Lag= 81.9 min
Discarded = 0.27 cfs @ 11.90 hrs, Volume= 0.181 af
Primary = 0.62 cfs @ 13.92 hrs, Volume= 0.141 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.68' @ 13.92 hrs Surf.Area= 0.089 ac Storage= 0.071 af

Plug-Flow detention time= 59.4 min calculated for 0.322 af (100% of inflow)
Center-of-Mass det. time= 59.3 min (914.1 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 11.90 hrs HW=67.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.62 cfs @ 13.92 hrs HW=68.68' (Free Discharge)
↑—**2=Orifice** (Orifice Controls 0.62 cfs @ 3.14 fps)
└—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 6.10" for 10 year event
Inflow = 3.49 cfs @ 12.06 hrs, Volume= 0.269 af
Outflow = 0.35 cfs @ 12.88 hrs, Volume= 0.269 af, Atten= 90%, Lag= 49.0 min
Discarded = 0.32 cfs @ 11.20 hrs, Volume= 0.268 af
Primary = 0.03 cfs @ 12.88 hrs, Volume= 0.002 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.62' @ 12.88 hrs Surf.Area= 0.106 ac Storage= 0.082 af

Plug-Flow detention time= 69.5 min calculated for 0.269 af (100% of inflow)

Center-of-Mass det. time= 69.4 min (810.3 - 740.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 11.20 hrs HW=67.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.03 cfs @ 12.88 hrs HW=68.62' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.03 cfs @ 1.17 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 3.04" for 10 year event
Inflow = 2.17 cfs @ 12.08 hrs, Volume= 0.228 af
Outflow = 0.39 cfs @ 13.39 hrs, Volume= 0.228 af, Atten= 82%, Lag= 78.9 min
Discarded = 0.20 cfs @ 11.35 hrs, Volume= 0.184 af
Primary = 0.19 cfs @ 13.39 hrs, Volume= 0.044 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 68.77' @ 13.39 hrs Surf.Area= 0.102 ac Storage= 0.088 af

Plug-Flow detention time= 95.9 min calculated for 0.228 af (100% of inflow)
Center-of-Mass det. time= 95.8 min (848.5 - 752.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 11.35 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.19 cfs @ 13.39 hrs HW=68.77' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.19 cfs @ 3.87 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 2.61" for 10 year event
Inflow = 3.20 cfs @ 12.11 hrs, Volume= 0.333 af
Outflow = 0.86 cfs @ 12.63 hrs, Volume= 0.301 af, Atten= 73%, Lag= 30.9 min
Discarded = 0.07 cfs @ 12.63 hrs, Volume= 0.133 af
Primary = 0.79 cfs @ 12.63 hrs, Volume= 0.168 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.96' @ 12.63 hrs Surf.Area= 2,891 sf Storage= 5,279 cf

Plug-Flow detention time= 193.6 min calculated for 0.300 af (90% of inflow)
Center-of-Mass det. time= 141.4 min (927.9 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 12.63 hrs HW=69.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.79 cfs @ 12.63 hrs HW=69.96' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.79 cfs @ 4.05 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 4.81" for 10 year event
Inflow = 2.62 cfs @ 12.11 hrs, Volume= 0.241 af
Outflow = 0.85 cfs @ 12.37 hrs, Volume= 0.241 af, Atten= 67%, Lag= 15.7 min
Discarded = 0.12 cfs @ 12.37 hrs, Volume= 0.165 af
Primary = 0.73 cfs @ 12.37 hrs, Volume= 0.076 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.85' @ 12.37 hrs Surf.Area= 1,785 sf Storage= 3,083 cf

Plug-Flow detention time= 96.5 min calculated for 0.241 af (100% of inflow)
Center-of-Mass det. time= 96.3 min (861.0 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.37 hrs HW=69.85' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.73 cfs @ 12.37 hrs HW=69.85' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.73 cfs @ 3.72 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 3.20" for 10 year event
Inflow = 5.38 cfs @ 12.10 hrs, Volume= 0.529 af
Outflow = 1.21 cfs @ 12.56 hrs, Volume= 0.489 af, Atten= 78%, Lag= 27.1 min
Discarded = 0.08 cfs @ 12.56 hrs, Volume= 0.167 af
Primary = 1.13 cfs @ 12.56 hrs, Volume= 0.322 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 68.67' @ 12.56 hrs Surf.Area= 3,534 sf Storage= 8,739 cf

Plug-Flow detention time= 178.5 min calculated for 0.489 af (93% of inflow)
Center-of-Mass det. time= 137.2 min (898.7 - 761.4)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.56 hrs HW=68.67' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.13 cfs @ 12.56 hrs HW=68.67' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.13 cfs @ 5.73 fps)
└**3=Grate** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond Drywell 1: Drywell 1 Peak Elev=70.37' Storage=0.180 af Inflow=9.31 cfs 0.945 af
Discarded=0.27 cfs 0.316 af Primary=2.82 cfs 0.629 af Outflow=3.09 cfs 0.945 af

Pond Roof Drywell 1: Roof Drywell 1 Peak Elev=69.99' Storage=0.174 af Inflow=6.30 cfs 0.493 af
Discarded=0.32 cfs 0.409 af Primary=0.28 cfs 0.084 af Outflow=0.60 cfs 0.493 af

Pond Roof Drywell 2: Roof Drywell 2 Peak Elev=70.79' Storage=0.234 af Inflow=7.73 cfs 0.533 af
Discarded=0.20 cfs 0.288 af Primary=0.87 cfs 0.246 af Outflow=1.07 cfs 0.533 af

Pond SSI 1: SSI 1 Peak Elev=72.13' Storage=12,031 cf Inflow=6.78 cfs 0.787 af
Discarded=0.08 cfs 0.148 af Primary=1.60 cfs 0.602 af Outflow=1.68 cfs 0.750 af

Pond SSI 2: SSI 2 Peak Elev=70.22' Storage=3,756 cf Inflow=5.12 cfs 0.476 af
Discarded=0.13 cfs 0.222 af Primary=4.80 cfs 0.254 af Outflow=4.93 cfs 0.476 af

Pond SSI 3: SSI 3 Peak Elev=69.35' Storage=11,212 cf Inflow=10.33 cfs 1.168 af
Discarded=0.08 cfs 0.178 af Primary=9.31 cfs 0.945 af Outflow=9.40 cfs 1.124 af

Summary for Pond Drywell 1: Drywell 1

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 5.73" for 100 year event
Inflow = 9.31 cfs @ 12.16 hrs, Volume= 0.945 af
Outflow = 3.09 cfs @ 12.46 hrs, Volume= 0.945 af, Atten= 67%, Lag= 18.2 min
Discarded = 0.27 cfs @ 10.40 hrs, Volume= 0.316 af
Primary = 2.82 cfs @ 12.46 hrs, Volume= 0.629 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 70.37' @ 12.46 hrs Surf.Area= 0.089 ac Storage= 0.180 af

Plug-Flow detention time= 61.5 min calculated for 0.944 af (100% of inflow)
Center-of-Mass det. time= 61.4 min (930.0 - 868.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.120 af	**27.13'W x 143.00'L x 5.50'H Field A** 0.490 af Overall - 0.191 af Embedded = 0.299 af x 40.0% Voids
#2A	67.50'	0.159 af	**ADS N-12 48"** x 28 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 28 Chambers in 4 Rows
		0.279 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.27 cfs @ 10.40 hrs HW=67.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=2.81 cfs @ 12.46 hrs HW=70.37' (Free Discharge)
↑—**2=Orifice** (Orifice Controls 1.38 cfs @ 7.02 fps)
└—**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.43 cfs @ 2.00 fps)

Summary for Pond Roof Drywell 1: Roof Drywell 1

Inflow Area = 0.530 ac,100.00% Impervious, Inflow Depth = 11.17" for 100 year event
Inflow = 6.30 cfs @ 12.06 hrs, Volume= 0.493 af
Outflow = 0.60 cfs @ 12.93 hrs, Volume= 0.493 af, Atten= 91%, Lag= 51.9 min
Discarded = 0.32 cfs @ 10.45 hrs, Volume= 0.409 af
Primary = 0.28 cfs @ 12.93 hrs, Volume= 0.084 af
Routed to Pond SSI 1 : SSI 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 69.99' @ 12.93 hrs Surf.Area= 0.106 ac Storage= 0.174 af

Plug-Flow detention time= 112.3 min calculated for 0.492 af (100% of inflow)

Center-of-Mass det. time= 112.1 min (845.5 - 733.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.118 af	**10.42'W x 443.00'L x 4.00'H Field A** 0.424 af Overall - 0.130 af Embedded = 0.294 af x 40.0% Voids
#2A	67.50'	0.099 af	**ADS N-12 30"** x 44 Inside #1 Inside= 30.0"W x 30.0"H => 4.90 sf x 20.00'L = 98.0 cf Outside= 36.0"W x 36.0"H => 6.42 sf x 20.00'L = 128.3 cf 44 Chambers in 2 Rows
		0.217 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	68.50'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 10.45 hrs HW=67.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.28 cfs @ 12.93 hrs HW=69.99' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.28 cfs @ 5.62 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Roof Drywell 2: Roof Drywell 2

Inflow Area = 0.900 ac, 77.78% Impervious, Inflow Depth = 7.11" for 100 year event
Inflow = 7.73 cfs @ 12.09 hrs, Volume= 0.533 af
Outflow = 1.07 cfs @ 13.00 hrs, Volume= 0.533 af, Atten= 86%, Lag= 54.5 min
Discarded = 0.20 cfs @ 10.70 hrs, Volume= 0.288 af
Primary = 0.87 cfs @ 13.00 hrs, Volume= 0.246 af
Routed to Reach Pipe : Pipe

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 70.79' @ 13.00 hrs Surf.Area= 0.102 ac Storage= 0.234 af

Plug-Flow detention time= 162.8 min calculated for 0.532 af (100% of inflow)
Center-of-Mass det. time= 162.6 min (915.8 - 753.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	67.00'	0.136 af	**27.13'W x 163.00'L x 5.50'H Field A** 0.558 af Overall - 0.218 af Embedded = 0.340 af x 40.0% Voids
#2A	67.50'	0.182 af	**ADS N-12 48"** x 32 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 32 Chambers in 4 Rows
		0.318 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	67.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	68.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.50'	**1.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 10.70 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.87 cfs @ 13.00 hrs HW=70.79' (Free Discharge)
├**2=Orifice** (Orifice Controls 0.39 cfs @ 7.86 fps)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.48 cfs @ 1.76 fps)

Summary for Pond SSI 1: SSI 1

Inflow Area = 1.530 ac, 64.05% Impervious, Inflow Depth = 6.18" for 100 year event
Inflow = 6.78 cfs @ 12.12 hrs, Volume= 0.787 af
Outflow = 1.68 cfs @ 12.81 hrs, Volume= 0.750 af, Atten= 75%, Lag= 41.8 min
Discarded = 0.08 cfs @ 12.81 hrs, Volume= 0.148 af
Primary = 1.60 cfs @ 12.81 hrs, Volume= 0.602 af
Routed to Link Site : Site

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 72.13' @ 12.81 hrs Surf.Area= 3,325 sf Storage= 12,031 cf

Plug-Flow detention time= 138.3 min calculated for 0.750 af (95% of inflow)
Center-of-Mass det. time= 110.8 min (899.5 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	15,000 cf	**SSI 1 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	2,500	0	0
69.00	2,700	2,600	2,600
70.00	2,900	2,800	5,400
71.00	3,100	3,000	8,400
72.00	3,300	3,200	11,600
73.00	3,500	3,400	15,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	72.30'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.81 hrs HW=72.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.60 cfs @ 12.81 hrs HW=72.13' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.60 cfs @ 8.17 fps)
└**3=Grate** (Controls 0.00 cfs)

Summary for Pond SSI 2: SSI 2

Inflow Area = 0.600 ac, 66.67% Impervious, Inflow Depth = 9.52" for 100 year event
Inflow = 5.12 cfs @ 12.11 hrs, Volume= 0.476 af
Outflow = 4.93 cfs @ 12.13 hrs, Volume= 0.476 af, Atten= 4%, Lag= 1.5 min
Discarded = 0.13 cfs @ 12.13 hrs, Volume= 0.222 af
Primary = 4.80 cfs @ 12.13 hrs, Volume= 0.254 af
Routed to Pond Roof Drywell 2 : Roof Drywell 2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 70.22' @ 12.13 hrs Surf.Area= 1,822 sf Storage= 3,756 cf

Plug-Flow detention time= 82.0 min calculated for 0.476 af (100% of inflow)
Center-of-Mass det. time= 81.9 min (841.7 - 759.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	7,200 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,500	0	0
69.00	1,700	1,600	1,600
70.00	1,800	1,750	3,350
71.00	1,900	1,850	5,200
72.00	2,100	2,000	7,200

Device	Routing	Invert	Outlet Devices
#1	Discarded	68.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	69.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	70.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 12.13 hrs HW=70.21' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=4.67 cfs @ 12.13 hrs HW=70.21' (Free Discharge)
└**2=Orifice** (Orifice Controls 0.93 cfs @ 4.73 fps)
└**3=Grate** (Weir Controls 3.74 cfs @ 1.52 fps)

Summary for Pond SSI 3: SSI 3

Inflow Area = 1.980 ac, 79.80% Impervious, Inflow Depth = 7.08" for 100 year event
Inflow = 10.33 cfs @ 12.11 hrs, Volume= 1.168 af
Outflow = 9.40 cfs @ 12.16 hrs, Volume= 1.124 af, Atten= 9%, Lag= 3.1 min
Discarded = 0.08 cfs @ 12.16 hrs, Volume= 0.178 af
Primary = 9.31 cfs @ 12.16 hrs, Volume= 0.945 af
Routed to Pond Drywell 1 : Drywell 1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 69.35' @ 12.16 hrs Surf.Area= 3,671 sf Storage= 11,212 cf

Plug-Flow detention time= 119.0 min calculated for 1.122 af (96% of inflow)
Center-of-Mass det. time= 97.9 min (880.5 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	21,600 cf	**SSI 2 (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,000	0	0
67.00	3,200	3,100	3,100
68.00	3,400	3,300	6,400
69.00	3,600	3,500	9,900
70.00	3,800	3,700	13,600
71.00	4,000	3,900	17,500
72.00	4,200	4,100	21,600

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	67.00'	**6.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	69.00'	**27.0" x 42.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.16 hrs HW=69.35' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=9.08 cfs @ 12.16 hrs HW=69.35' (Free Discharge)
├**2=Orifice** (Orifice Controls 1.37 cfs @ 6.97 fps)
└**3=Grate** (Weir Controls 7.71 cfs @ 1.93 fps)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=0.19 cfs 0.037 af
Primary=0.19 cfs 0.037 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 0.13" for 2 year event
Inflow = 0.19 cfs @ 13.09 hrs, Volume= 0.037 af
Primary = 0.19 cfs @ 13.09 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=1.23 cfs 0.309 af
Primary=1.23 cfs 0.309 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 1.06" for 10 year event
Inflow = 1.23 cfs @ 13.24 hrs, Volume= 0.309 af
Primary = 1.23 cfs @ 13.24 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Link Site: Site Inflow=4.37 cfs 1.232 af
Primary=4.37 cfs 1.232 af

Summary for Link Site: Site

Inflow Area = 3.510 ac, 72.93% Impervious, Inflow Depth = 4.21" for 100 year event
Inflow = 4.37 cfs @ 12.47 hrs, Volume= 1.232 af
Primary = 4.37 cfs @ 12.47 hrs, Volume= 1.232 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX G

TIME TO DRAIN & MOUNDING CALCULATIONS

TIME TO DRAIN CALCULATIONS

The soil permeability rate used for these calculations take into account the effects of groundwater mounding by not utilizing the vertical separation of the basin bottom and seasonal high groundwater to increase the infiltration rate as well as a safety factor applied to the permeability rate. Groundwater mounding effects have been assessed by calculation of mounding using the Hantush spreadsheet. While this methodology is conservative since it measures only horizontal permeability, the results for each basin show minimal horizontal mounding and no adverse effects on the ability for each basin to drain after each storm event. The Hantush calculations are attached.

$$\text{Drain Time} = \frac{\text{volume discarded during 100 year storm} \times 12}{\text{Bottom area} \times \text{infiltration rate}}$$

Time to Drain Calculations

BMP	Volume discarded	Bottom Area	Infiltration Rate	Drain Time
	AF	SF	In/Hr	Hours
SSI 1	0.16	2,500	1.0	33
SSI 2	0.22	1,400	3.0	27
SSI 3	0.18	4,500	1.0	21
RD 1	0.40	3,300	3.0	21
RD 2	0.27	4,400	2.0	16
UD 1	0.32	3,800	3.0	15

Mounding Calculations

Utilize Hantush NJDEP Model

Mounding Summary

BMP	Seasonal High Water			Permeability		
	Bottom	SHWT	Separation (ft)	Permeability Test (in/hr)	Kh	Mound Height (ft)
SSI 1	68.0	63.6	4.4	13.5	33.75	2.0
SSI 2	68.0	62.5	5.5	15.0	37.5	3.1
SSI 3	66.0	63.2	2.8	13.0	32.5	2.8
RD 1	67.0	63.0	4.0	13.0	32.5	3.9
RD 2	67.0	63.0	4.0	13.5	33.75	3.5
D 1	67.0	62.9	4.1	13.0	32.5	4.0

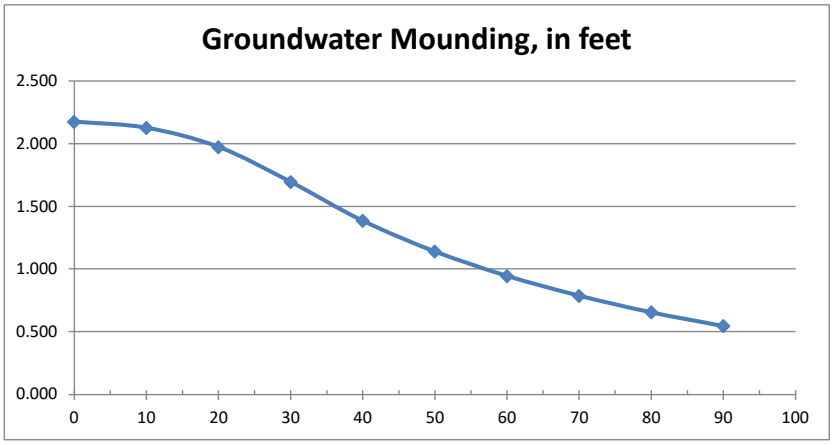
Input Values

1.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
33.75	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
30.000	x	1/2 length of basin (x direction, in feet)
22.000	y	1/2 width of basin (y direction, in feet)
33.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

12.176	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.176	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
2.176	0
2.127	10
1.974	20
1.696	30
1.385	40
1.141	50
0.946	60
0.787	70
0.655	80
0.546	90

Re-Calculate Now



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SSI 3

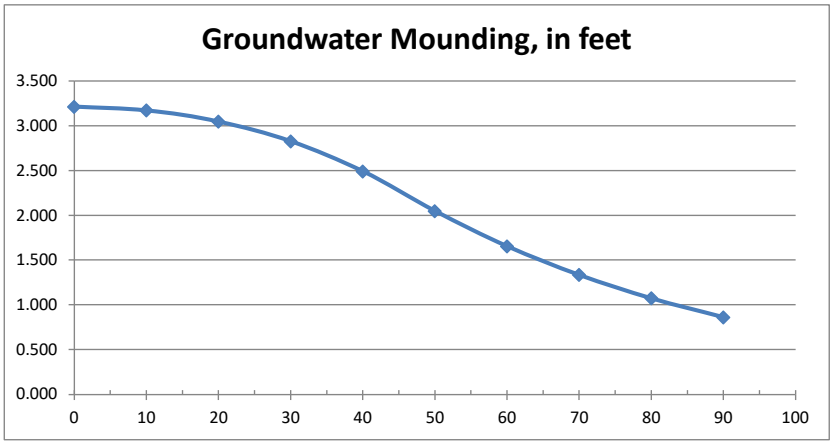
Input Values

1.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
32.50	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
45.000	x	1/2 length of basin (x direction, in feet)
30.000	y	1/2 width of basin (y direction, in feet)
23.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.214	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.214	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.214	0
3.173	10
3.048	20
2.828	30
2.492	40
2.048	50
1.656	60
1.336	70
1.075	80
0.862	90

Re-Calculate Now



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SSI 2

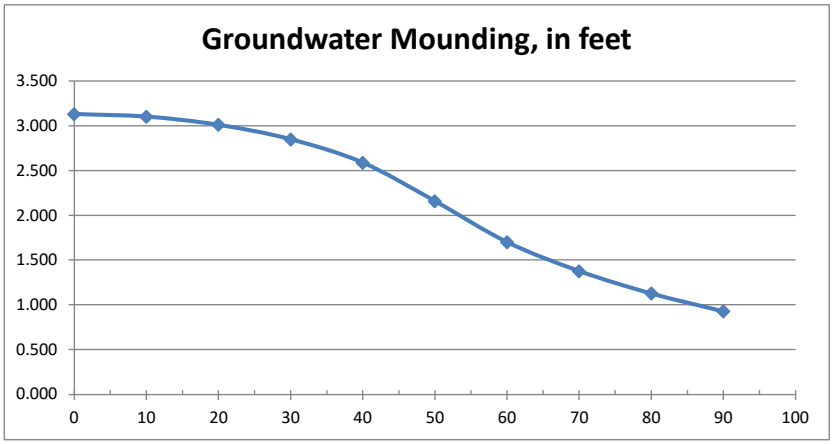
Input Values

3.00	R	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
37.50	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
50.000	x	1/2 length of basin (x direction, in feet)
8.000	y	1/2 width of basin (y direction, in feet)
27.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.131	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.131	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.131	0
3.102	10
3.012	20
2.849	30
2.588	40
2.159	50
1.702	60
1.378	70
1.128	80
0.928	90

Re-Calculate Now



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RD 2

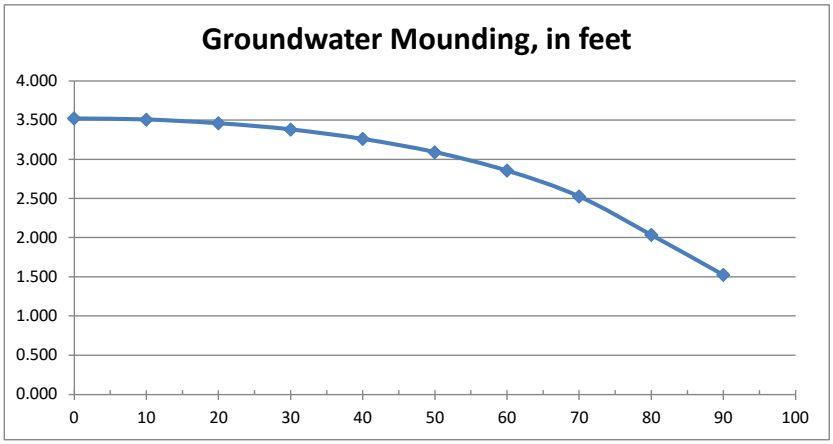
Input Values

2.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
33.75	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
80.000	x	1/2 length of basin (x direction, in feet)
13.000	y	1/2 width of basin (y direction, in feet)
16.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.523	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.523	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.523	0
3.508	10
3.462	20
3.382	30
3.262	40
3.093	50
2.858	60
2.527	70
2.037	80
1.527	90

Re-Calculate Now



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RD 1

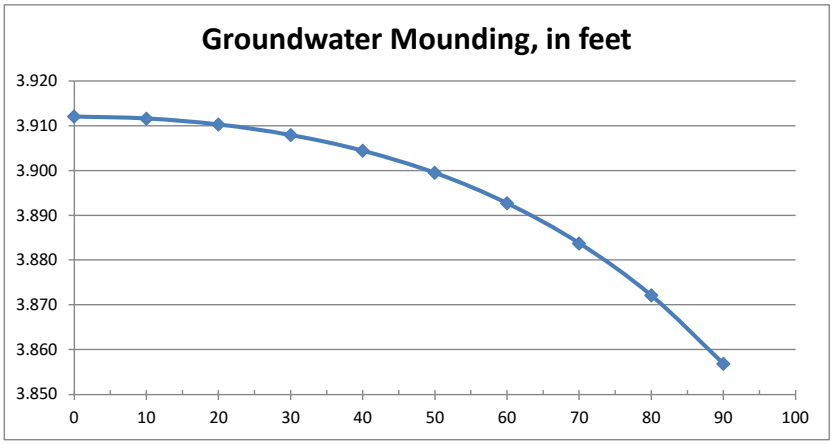
Input Values

3.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
32.50	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
225.000	x	1/2 length of basin (x direction, in feet)
7.000	y	1/2 width of basin (y direction, in feet)
21.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.912	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.912	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.912	0
3.912	10
3.910	20
3.908	30
3.904	40
3.899	50
3.893	60
3.884	70
3.872	80
3.857	90

Re-Calculate Now



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D 1

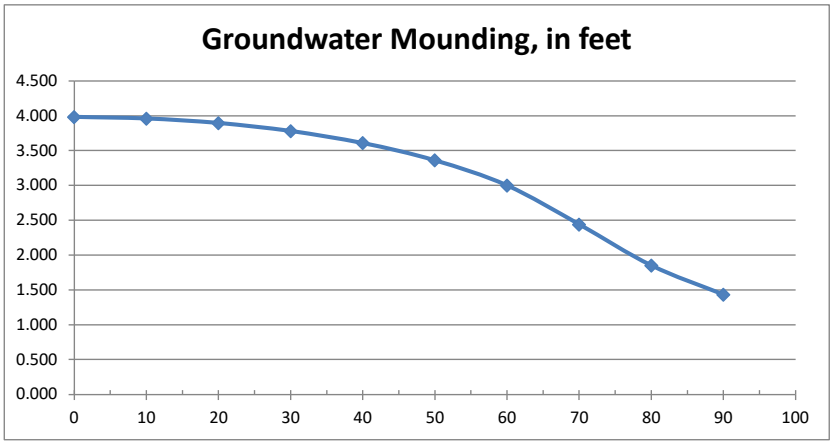
Input Values

3.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
32.50	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
70.000	x	1/2 length of basin (x direction, in feet)
9.000	y	1/2 width of basin (y direction, in feet)
20.00	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.984	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.984	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.984	0
3.963	10
3.897	20
3.783	30
3.610	40
3.362	50
3.001	60
2.441	70
1.852	80
1.435	90

Re-Calculate Now



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APPENDIX H

SOIL EROSION CALCULATIONS

- **CONDUIT OUTLET PROTECTION CALCULATIONS including 2 year Tailwater routing summary**
- **OFF-SITE STABILITY CALCULATIONS**
- **SEDIMENT BASIN CALCULATIONS**

CONDUIT OUTLET DESIGN

Use 25 Year storm, Q (cfs)

Level Apron

Tw(ft) calculated from:

- 2 Year flood routing for outlets into stormwater management basins
- 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

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

Conduit Outlet Protection Calculations
Tw < 1/2 Do

Outlet	BMP	Do	Wo	Q	Tw	q	L	W	d50
1-1	1	18	18	1.7	0.7	1.1	12	17	0
1-2	1	24	24	4.6	0.7	2.3	17	23	1
2-1	2	24	24	0.3	0.4	0.2	14	20	0
2-1	2	18	18	2.0	0.4	1.3	12	17	1
3-1	3	18	18	0.3	0.7	0.2	11	15	0
4-1	4	18	18	1.7	0.4	1.1	12	17	1
4-2	4	18	18	3.1	0.4	2.1	14	18	2
5-1	5	24	24	6.6	0.4	3.3	18	24	3
5-2	5	18	18	4.4	0.4	2.9	15	19	3
5-3	5	18	18	2.2	0.4	1.5	13	17	1
7-1	7	18	18	2.2	0.4	1.5	13	17	1
8-1	8	24	24	3.6	0.6	1.8	16	22	1
8-2	8	18	18	3.5	0.6	2.3	14	18	1
10-1	10	24	24	0.7	0.4	0.4	14	20	0
10-2	10	24	24	2.1	0.4	1.1	15	21	1

10-3	10	24	24	4.2	0.4	2.1	17	23	2
10-4	10	30	30	0.9	0.4	0.4	18	25	0

Tw > 1/2 Do

Outlet	Do	Wo	Q	Tw	q	L	W	d50

Note: Minimum d50 size is 3"

OFF-SITE STABILTY

The stormwater management system has been designed to comply with the off-site stability standard. The flood routing must assume each 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. The flood routing was performed using the same methodology as an outlet to no defined waterway so is conservative. The peak outflow for the 25 year storm is 2.5 cfs. The project site is currently contributory to the Ridgeway Road storm drainage system and the management system has been designed to discharge the system into an existing drainage system in Ridgeway Road with a pipe connection to an existing inlet. The Ridgeway Road drainage system outlets into a stormwater management basin located on the opposite side of Ridgeway Road from the project site that serves as a regional basin constructed by Ocean County to manage runoff from the Ridgeway Road drainage area, of which this site is included. There is no discharge to an undeveloped or unpaved surface so the project meets the requirements for off-site stability. It is not required under the Standards for the project to examine the function of the existing regional basin.

APPENDIX I
STORM DRAINAGE TABULATION

Storm Drainage Pipe Design

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

Major Site Plan

25 Year Design Storm

November 13, 2025

LOCATION											SEWER DESIGN DATA				
STRUCTURE NUMBER		RUNOFF DATA				TIME OF CONCENTRATION					PIPE INFO			PIPE CAPACITY	
UPSTREAM	DOWNSTREAM	AREA	RUNOFF COEFFICIENT		TOTAL	OVERLAND THRU AREA (T)	THROUGH AREA (T_P)	ACCUMULATED	RAINFALL INTENSITY	PEAK RUNOFF	DIAMETER	LENGTH	SLOPE	CAPACITY AT FULL FLOW	VELOCITY AT FULL FLOW
		(AC)	C	A x C	(A 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)
2	1	0.3	0.65	0.195	0.20	10		10	6.7	1.3	18		0.50	9.7	5.5
1	FES 1-1	0.3	0.65	0.195	0.40	10		10	6.7	2.7	18		0.50	9.7	5.5
OCS 1	ex Inlet									1.5	18		0.50	9.7	5.5
10	9	0.4	0.65	0.26	0.26	10		10	6.7	1.7	15		0.20	3.8	3.1
8	9	0.5	0.65	0.325	0.57	10		10	6.7	3.8	15		0.20	3.8	3.1
9	7	0.5	0.65	0.325	0.9	10		10	6.7	6.0	18		0.20	6.1	3.5
6	7	0.5	0.65	0.325	0.33	10		10	6.7	2.2	18		0.50	9.7	5.5
7	5	0.5	0.65	0.325	1.55	10		10	6.7	10.4	24		0.20	13.2	4.2
RD 2	3									3.0	18		0.50	9.7	5.5
3	5	0.5	0.65	0.325	0.33	10		10	6.7	2.2	15		0.50	6.0	4.9
5	FES 3	0.1	0.65	0.065	1.94	10		10	6.7	13.0	24		0.20	13.2	4.2
4	FES 2	0.6	0.65	0.39	0.39	10		10	6.7	2.6	18		0.50	9.7	5.5