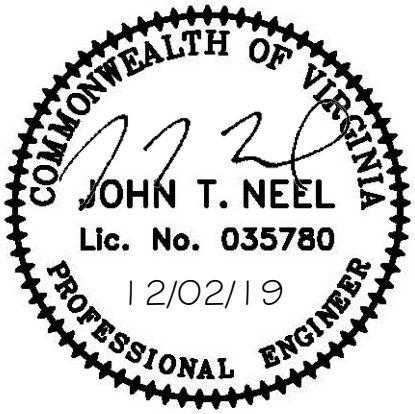
STONEGATE NORTH

STORMWATER MANAGEMENT CONCEPTUAL DESIGN

Located in:
Town of Blacksburg, Virginia



Project Number: 2898.0

Date: December 2, 2019

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Stonegate North

PLAN NARRATIVE

INTRODUCTION

The following concept plan was development to meet the requirements of Sections 18-608, Stormwater Management Concept Plan, of the Code of the Town of Blacksburg, Virginia. The concept plan addresses items (a) through (d) of Section 18-608.

PROJECT DESCRIPTION

The site, which is comprised of Tax Parcels 226-(1)-AA and 226-(1)-BK 4-7A, is 1.39 acres and is proposed to be a Planned Residential Development. The proposed land use will be multi-family residential housing including the associated parking, infrastructure and amenities needed to serve the residents.

EXISTING SITE CONDITIONS

The proposed site is presently a vacant parcel consisting mostly of managed turf with some forested/open space located at the southeastern corner of the site. It is surrounded by other residential parcels, consisting of Stonegate III Apartments to the West and additional multifamily residential properties to the North and East. Slopes average from 2-25 percent. Stormwater on the site is contained in two drainage basins and exits the property to the North and to the Southeast. The bulk of the site area drains to the Southeast to an existing depression which receives discharge from offsite areas through an existing 36” RCP storm drain.

ADJACENT AREAS

There should be no negative effects on any adjacent properties as long as Erosion and Sediment Control Measures are maintained until permanent stabilization is established.

OFFSITE AREAS

Any offsite areas will have their own separate plans.

SOILS

The USDA soils map shows the project area as a mix of Duffield-Ernest complex (11B) on a 2-7% slope, Groseclose and Poplimento soils on a 15-25% slope, and Groseclose-Urban land complex on a 2-7% slope. The soils have a Hydraulic Rating of "B" and "C". A soils map and soils description is included in the appendices.

CRITICAL AREAS

No critical areas have been identified on the site.

STORMWATER RUNOFF CONSIDERATIONS

The disturbed portion of the site drains to two (2) main points: an existing drop inlet on an adjacent property to the North (Analysis Point 2) and an existing low area on the Southeast corner of the site (Analysis Point 1). This Southeast area receives multiple points of offsite drainage including a 36" RCP storm drain that bisects the site from the Northwest to the Southeast. This storm drain brings the Northern drainage area (DA Post 2) to the same outfall point as the Southeastern (DA Post 1).

As the site is developed, the majority of the site's drainage will be routed to the Southeast analysis point which continues to drain offsite to the South through an existing 54" RCP storm drain under Broce Drive. A small portion of the site will continue to sheet flow to the Northern analysis point. However, this drainage area ultimately drains into the Southeastern analysis point through the existing 36" RCP storm drain that bisects the site. The SE drainage area, DA Post 1, will contain the bulk of the developed area of the site which will drain into an underground ADS StormTech system for both water quantity control and some water quality treatment. This StormTech system will ultimately discharge into the Southeastern border of the site. The Northern drainage area, DA Post 2, will continue to sheet flow offsite and ultimately discharge at the Southeastern border of the site as well. A small portion for DA Post 1 will continue to sheet flow to the Southeast area of the site as well. However, given that it will all be managed turf with B and C soils, no significant concentrated runoff will be produced.

Stormwater Quality

In order to meet the phosphorus removal requirements of the Virginia Runoff Reduction Method, a portion will be handled by the underground ADS StormTech system which treats the majority of the impervious area on site. The remainder of the removal requirements will be addressed through the purchase of offsite nutrient credits. Water Quality calculations have been provided in the appendices, which demonstrate that the target phosphorus removal of 1.48 lb/yr. The ADS Stormtech System removes 0.37 lb/yr. The remaining 1.11 lb/yr will be achieved nutrient credit purchasing for a total removal rate of 1.48 lb/yr.

Channel Protection
In order to comply with Channel Protection requirements from 9VAC25-870-66-B, option 3a was chosen. This requires the proposed flow rate for the 1-YR storm to be detained and reduced below the existing 1-YR storm flow rate. The exact requirement accounts for the increase in proposed volume during the 1-YR storm, as well as an improvement factor. Detailed calculations are attached demonstrating what the required flow rate is, and how it is achieved using flow rate reduction via the proposed detention facilities.

Flood Protection
In order to comply with Flood Protection requirements from 9VAC25-870-66-C, option 2b was chosen. This requires the peak flowrate of the 10-YR 24-hour storm post-development to be lower than the predevelopment peak flowrate of the 10-YR event. Downstream stormwater conveyance systems do not require any additional analysis to show compliance with flood protection criteria if this option is utilized. Detailed calculations, including hydrograph modeling, are attached in the appendices. These demonstrate what the required flow rate is, and how it is achieved using flow rate reduction via the proposed detention facilities.

No form of detention was provided for DA Post 2 as the reduction in size of the drainage area was sufficient enough to reduce the post-development peak rates to below the existing conditions for both Channel Protection and Flood Protection.

Peak Flowrate Summary

Study Point	**Pre-Development**			**Post-Development**			
	1-Year		**10-Year**	**1-Year**			**10-Year**
	Runoff (cfs)	*Volume (cf)*	*Runoff (cfs)*	*Target Runoff (cfs)*	*Runoff (cfs)*	*Volume (cf)*	*Runoff (cfs)*
Analysis Point 1	0.06	178	0.41	0.22	0.01	44	0.12
Analysis Point 2	0.57	1,476	2.88	0.12	0.09	5,791	0.94

STORMWATER FACILITY MAINTENANCE CONSIDERATIONS

The ADS StormTech system is located to the South of the proposed apartment building and to the East of the new entrance drive. It will be easily accessible by service vehicles from the drive and parking area. Maintenance for the system will be conducted through the ADS cleanouts and inspection ports.

LOCATION MAP

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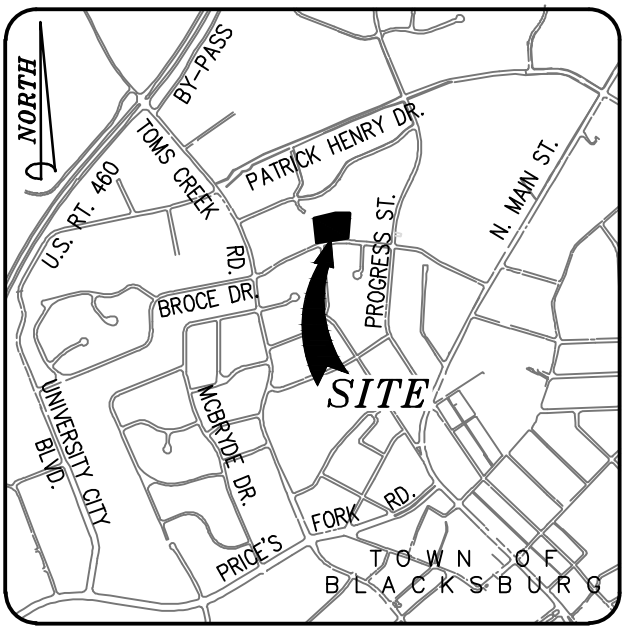

VICINITY MAP:

SCALE: 1"=2000'

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VICINITY MAP

STONEGATE IV
SITE DEVELOPMENT PLAN
TOWN OF BLACKSBURG, VIRGINIA

REVISIONS

PROJECT TEAM	
PIC	JOHN T. NEEL, PE
PM	MATTHEW P. TOMLINSON, PE
DSGN	MBL/HN

DATE	GNI JN	SHEET
06/14/2019	2898.0	1 OF 1

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1 OF 1 VICINITY MAP, 06/14/2019 3:20:50 PM, Mlester, AutoCAD PDF (General Documentation).pc3, 1:1

SOILS MAP

Soil Map—Montgomery County, Virginia
(Stonegate IV Soils Map)

Map Scale: 1:910 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Montgomery County, Virginia
Survey Area Data: Version 11, Aug 28, 2018

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

Date(s) aerial images were photographed: Oct 22, 2012—Feb 5, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
11B	Duffield-Ernest complex, 2 to 7 percent slopes	0.8	40.1%
16D	Groseclose and Poplimento soils, 15 to 25 percent slopes	0.5	28.5%
18B	Groseclose-Urban land complex, 2 to 7 percent slopes	0.6	31.5%
Totals for Area of Interest		**1.9**	**100.0%**

DRAINAGE AREA MAPS

- Existing DA Map (Macro) – SCS
- Post DA Map (Macro) – SCS

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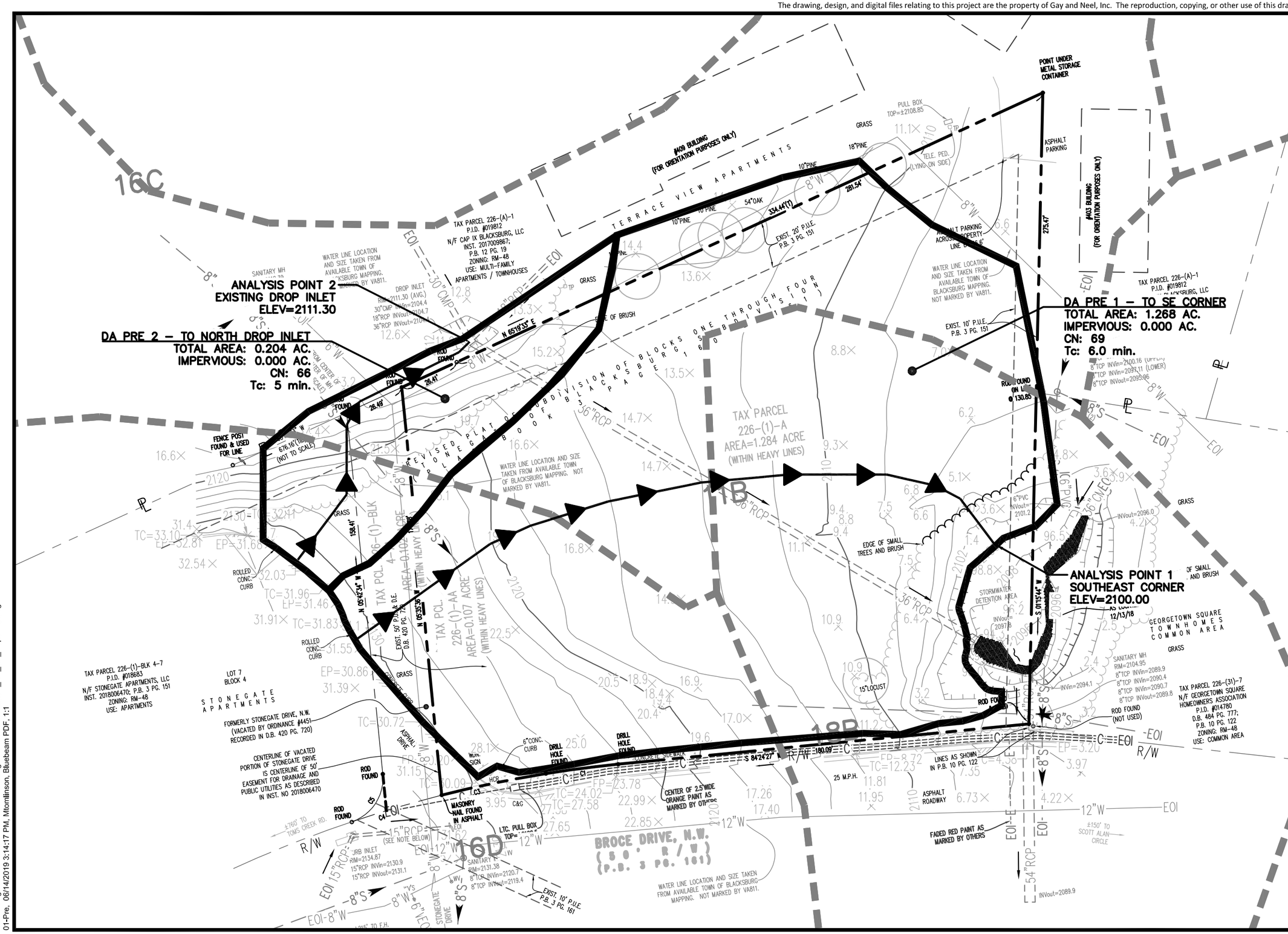

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PRE-DEVELOPMENT DA MAP

STONEGATE IV
SITE DEVELOPMENT PLAN
TOWN OF BLACKSBURG, VIRGINIA

REVISIONS		
NO.	COMMENTS	DATE

PROJECT TEAM	
PIC	JOHN T. NEEL, PE
PM	MATTHEW P. TOMLINSON, PE
DESIGN	MBL/HN

GNI JOB NO.	ISSUE DATE
2898.0	06/14/2019

SHEET NUMBER
1 OF 1

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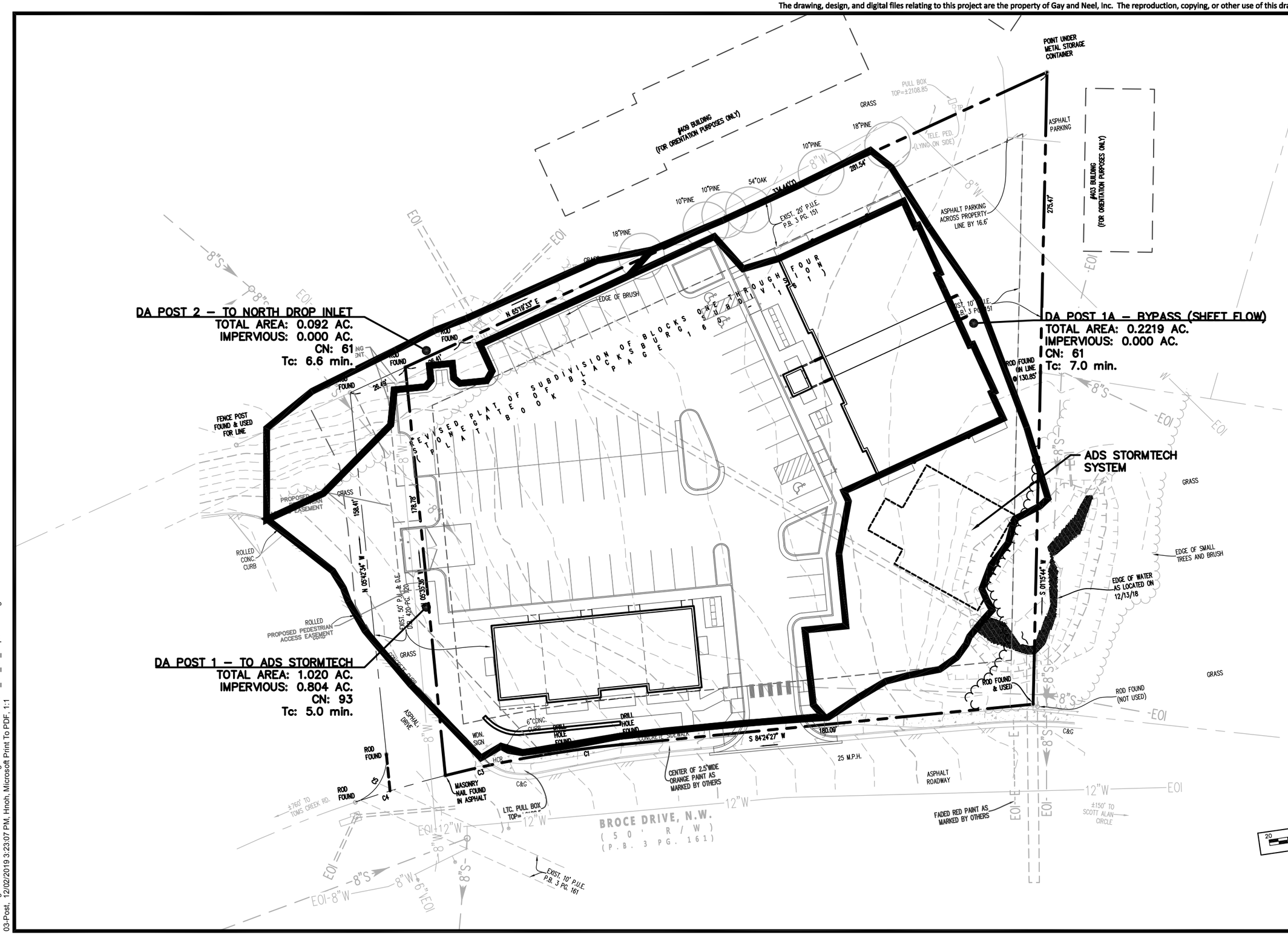

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POST-DEVELOPMENT DA MAP

STONEGATE NORTH
SITE DEVELOPMENT PLAN
TOWN OF BLACKSBURG, VIRGINIA

REVISIONS		
NO.	COMMENTS	DATE

PROJECT TEAM	
PIC	JOHN T. NEEL, PE
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DESIGN	MBL/HN

GNI JOB NO.	ISSUE DATE
2898.0	12/02/2019

SHEET NUMBER
1 OF 1

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STORMWATER QUANTITY CALCULATIONS

- Channel Protection Calculations
- HydroCAD Model
- NOAA Atlas 14 Precipitation Data
- ADS Stormtech Details

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Stonegate Apartments IV
Drainage Area 1

JN: 2898.2
BY: HUN
DATE: 12/02/19

CHANNEL PROTECTION TO A NATURAL WATERWAY CALCULATIONS - 1-YR 24 HOUR STORM

Site Area =	1.268	AC	*Limits of Disturbance (see definition in 9VAC25-870*
Improvement Factor (I.F.) =	0.8		*Based on Site Area*

$Q_{Pre\text{-}developed}$ (Qp) =	0.57	cfs	
$RV_{Pre\text{-}developed}$ (RVp) =	1,476	cf	
			Input from Hydrographs
Q_{Forest} (Qf) =	0.20	cfs	
RV_{Forest} (RVf) =	996	cf	

Target Flow Rate Determined by Pre-development Equation: I.F.*(Qp*RVp)/RVd

$RV_{Developed}$ from Hydrograph	5,791	cf	*Input from Hydrographs*
Runoff Reduction from VRRM		cf	
$RV_{Developed}$ (RVd) =	5,791	cf	

$Q_{Developed}$ Target = 0.12 cfs

$Q_{Developed}$ (Qd) =	0.09	cfs	*Input from Hydrographs*

Qd	IS LESS THAN	I.F.*(Qp*RVp)/RVd
0.09		0.12

$Q_{Developed} \leq$ I.F.*($Q_{Pre\text{-}developed}$* $RV_{Pre\text{-}Developed}$)/$RV_{Developed}$
Under no condition shall $Q_{Developed}$ be greater than $Q_{Pre\text{-}Developed}$ nor shall $Q_{Developed}$ be required to be less than that calculated in the equation (Q_{Forest} * RV_{Forest})/$RV_{Developed}$; where
I.F. (Improvement Factor) equals 0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre.
$Q_{Developed}$ = The allowable peak flow rate of runoff from the developed site.
$RV_{Developed}$ = The volume of runoff from the site in the developed condition.
$Q_{Pre\text{-}Developed}$ = The peak flow rate of runoff from the site in the pre-developed condition.
$RV_{Pre\text{-}Developed}$ = The volume of runoff from the site in pre-developed condition.
Q_{Forest} = The peak flow rate of runoff from the site in a forested condition.
RV_{Forest} = The volume of runoff from the site in a forested condition; or

*Methodology from 9VAC25-870-66-B-3-a

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Stonegate Apartments IV
Drainage Area 2

JN: 2898.2
BY: HUN
DATE: 12/02/19

CHANNEL PROTECTION TO A NATURAL WATERWAY CALCULATIONS - 1-YR 24 HOUR STORM

Site Area =	0.204	AC	*Limits of Disturbance (see definition in 9VAC25-870*
Improvement Factor (I.F.) =	0.9		*Based on Site Area*

$Q_{Pre\text{-}developed}$ (Qp) =	0.06	cfs
$RV_{Pre\text{-}developed}$ (RVp) =	178	cf

Input from Hydrographs

Q_{Forest} (Qf) =	0.01	cfs
RV_{Forest} (RVf) =	85	cf

Target Flow Rate Determined by Pre-development Equation: I.F.*(Qp*RVp)/RVd

$RV_{Developed}$ from Hydrograph	44	cf	*Input from Hydrographs*
Runoff Reduction from VRRM	-	cf	
$RV_{Developed}$ (RVd) =	44	cf	

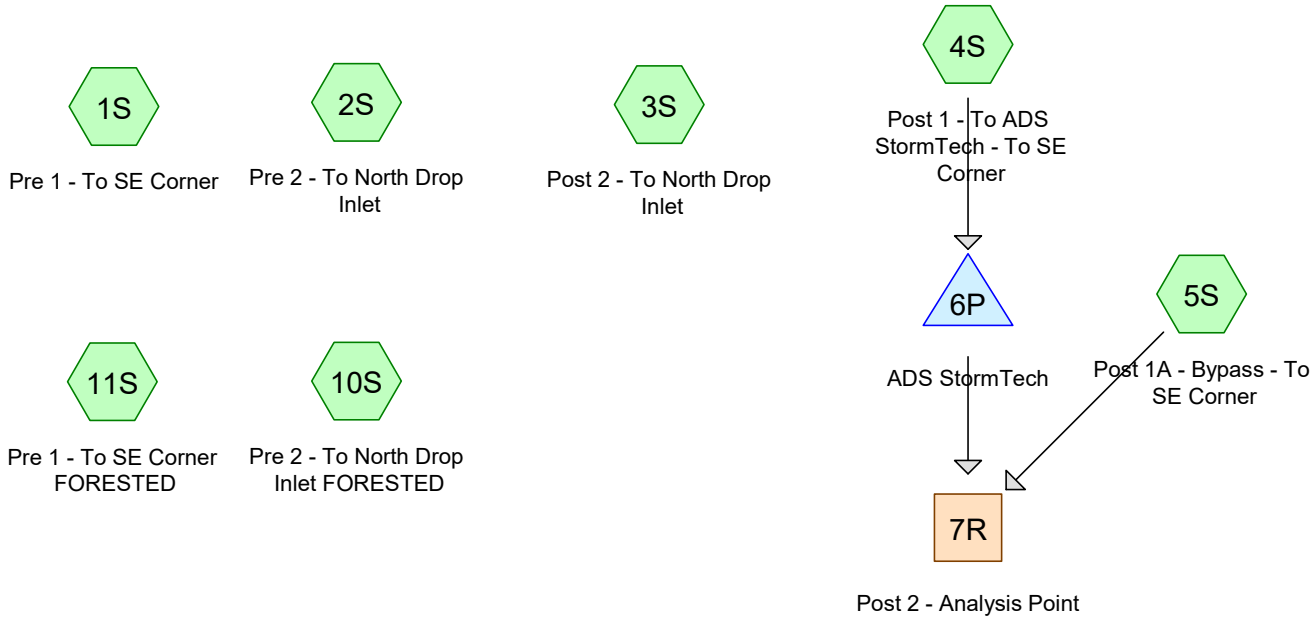
$Q_{Developed}$ Target = 0.22 cfs

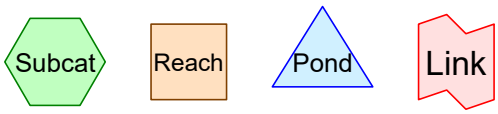
$Q_{Developed}$ (Qd) =	0.01	cfs	*Input from Hydrographs*

Qd	IS LESS THAN	I.F.*(Qp*RVp)/RVd
0.01		0.22

$Q_{Developed} \leq$ I.F.*($Q_{Pre\text{-}developed}$* $RV_{Pre\text{-}Developed}$)/$RV_{Developed}$
Under no condition shall $Q_{Developed}$ be greater than $Q_{Pre\text{-}Developed}$ nor shall $Q_{Developed}$ be required to be less than that calculated in the equation (Q_{Forest} * RV_{Forest})/$RV_{Developed}$; where
I.F. (Improvement Factor) equals 0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre.
$Q_{Developed}$ = The allowable peak flow rate of runoff from the developed site.
$RV_{Developed}$ = The volume of runoff from the site in the developed condition.
$Q_{Pre\text{-}Developed}$ = The peak flow rate of runoff from the site in the pre-developed condition.
$RV_{Pre\text{-}Developed}$ = The volume of runoff from the site in pre-developed condition.
Q_{Forest} = The peak flow rate of runoff from the site in a forested condition.
RV_{Forest} = The volume of runoff from the site in a forested condition; or

*Methodology from 9VAC25-870-66-B-3-a





Routing Diagram for 2898.2_SWM_Analysis
Prepared by {enter your company name here}, Printed 12/2/2019
HydroCAD® 10.00-20 s/n 09081 © 2017 HydroCAD Software Solutions LLC

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

Subcatchment 1S: Pre 1 - To SE Corner Runoff Area=1.268 ac 0.00% Impervious Runoff Depth=0.32"
Flow Length=309' Tc=6.0 min CN=69 Runoff=0.57 cfs 1,476 cf

Subcatchment 2S: Pre 2 - To North Drop Runoff Area=0.204 ac 0.00% Impervious Runoff Depth=0.24"
Flow Length=132' Tc=4.8 min CN=66 Runoff=0.06 cfs 178 cf

Subcatchment 3S: Post 2 - To North Drop Runoff Area=0.092 ac 0.00% Impervious Runoff Depth=0.13"
Flow Length=98' Slope=0.0800 '/' Tc=6.6 min CN=61 Runoff=0.01 cfs 44 cf

Subcatchment 4S: Post 1 - To ADS Runoff Area=1.020 ac 78.82% Impervious Runoff Depth=1.56"
Tc=5.0 min CN=93 Runoff=2.77 cfs 5,791 cf

Subcatchment 5S: Post 1A - Bypass - To SE Runoff Area=0.222 ac 0.00% Impervious Runoff Depth=0.13"
Flow Length=120' Tc=7.0 min CN=61 Runoff=0.01 cfs 107 cf

Subcatchment 10S: Pre 2 - To North Drop Runoff Area=0.204 ac 0.00% Impervious Runoff Depth=0.12"
Flow Length=132' Tc=10.4 min CN=60 Runoff=0.01 cfs 85 cf

Subcatchment 11S: Pre 1 - To SE Corner Runoff Area=1.268 ac 0.00% Impervious Runoff Depth=0.22"
Flow Length=309' Tc=12.3 min CN=65 Runoff=0.20 cfs 996 cf

Reach 7R: Post 2 - Analysis Point Inflow=0.10 cfs 5,898 cf
Outflow=0.10 cfs 5,898 cf

Pond 6P: ADS StormTech Peak Elev=2,100.40' Storage=3,399 cf Inflow=2.77 cfs 5,791 cf
Outflow=0.09 cfs 5,791 cf

Summary for Subcatchment 1S: Pre 1 - To SE Corner

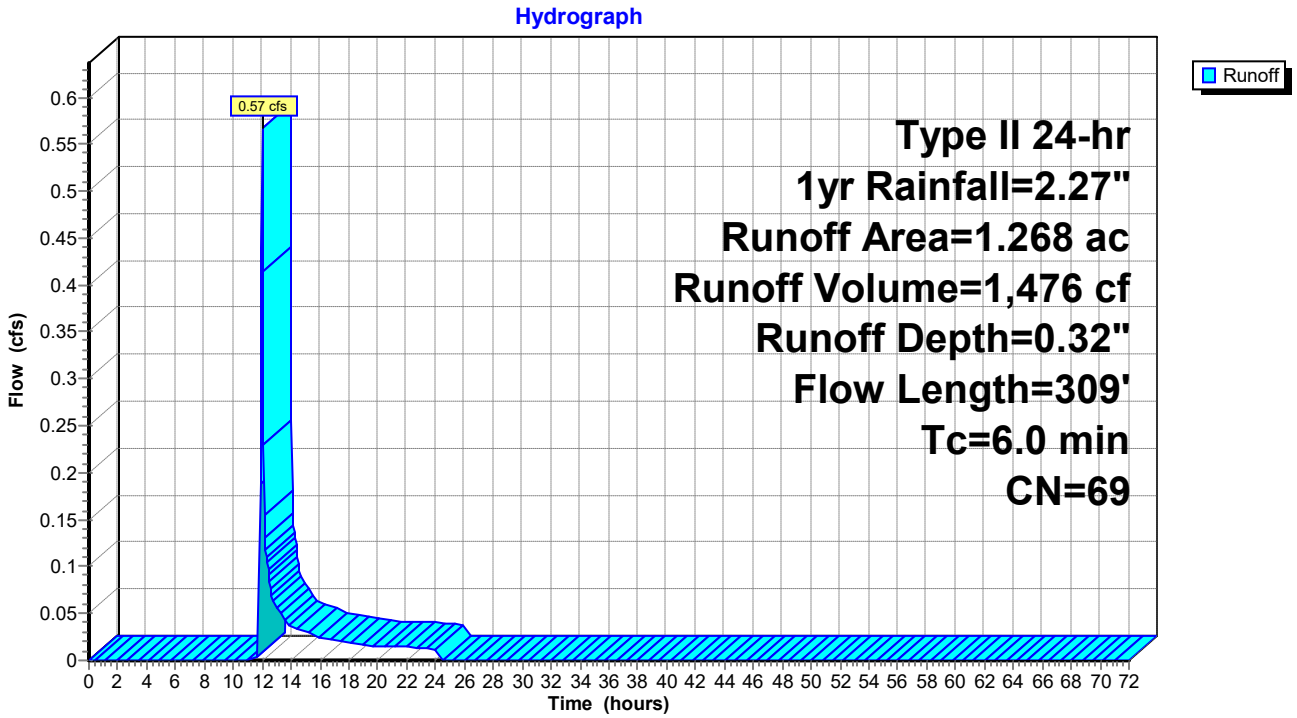
Runoff = 0.57 cfs @ 12.00 hrs, Volume= 1,476 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.424	61	>75% Grass cover, Good, HSG B
0.129	70	Woods, Good, HSG C
0.715	74	>75% Grass cover, Good, HSG C
1.268	69	Weighted Average
1.268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.1475	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.8	209	0.0804	4.57		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.0	309	Total			

Subcatchment 1S: Pre 1 - To SE Corner



Hydrograph for Subcatchment 1S: Pre 1 - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.07	**0.57**
13.00	1.75	0.14	0.06
14.00	1.86	0.17	0.04
15.00	1.94	0.20	0.03
16.00	2.00	0.22	0.02
17.00	2.05	0.23	0.02
18.00	2.09	0.25	0.02
19.00	2.13	0.26	0.02
20.00	2.16	0.28	0.01
21.00	2.19	0.29	0.01
22.00	2.22	0.30	0.01
23.00	2.24	0.31	0.01
24.00	**2.27**	**0.32**	0.01
25.00	2.27	0.32	0.00
26.00	2.27	0.32	0.00
27.00	2.27	0.32	0.00
28.00	2.27	0.32	0.00
29.00	2.27	0.32	0.00
30.00	2.27	0.32	0.00
31.00	2.27	0.32	0.00
32.00	2.27	0.32	0.00
33.00	2.27	0.32	0.00
34.00	2.27	0.32	0.00
35.00	2.27	0.32	0.00
36.00	2.27	0.32	0.00
37.00	2.27	0.32	0.00
38.00	2.27	0.32	0.00
39.00	2.27	0.32	0.00
40.00	2.27	0.32	0.00
41.00	2.27	0.32	0.00
42.00	2.27	0.32	0.00
43.00	2.27	0.32	0.00
44.00	2.27	0.32	0.00
45.00	2.27	0.32	0.00
46.00	2.27	0.32	0.00
47.00	2.27	0.32	0.00
48.00	2.27	0.32	0.00
49.00	2.27	0.32	0.00
50.00	2.27	0.32	0.00
51.00	2.27	0.32	0.00
52.00	2.27	0.32	0.00
53.00	2.27	0.32	0.00
54.00	2.27	0.32	0.00
55.00	2.27	0.32	0.00
56.00	2.27	0.32	0.00
57.00	2.27	0.32	0.00
58.00	2.27	0.32	0.00
59.00	2.27	0.32	0.00
60.00	2.27	0.32	0.00
61.00	2.27	0.32	0.00
62.00	2.27	0.32	0.00
63.00	2.27	0.32	0.00
64.00	2.27	0.32	0.00
65.00	2.27	0.32	0.00
66.00	2.27	0.32	0.00
67.00	2.27	0.32	0.00
68.00	2.27	0.32	0.00
69.00	2.27	0.32	0.00
70.00	2.27	0.32	0.00
71.00	2.27	0.32	0.00
72.00	2.27	0.32	0.00

Summary for Subcatchment 2S: Pre 2 - To North Drop Inlet

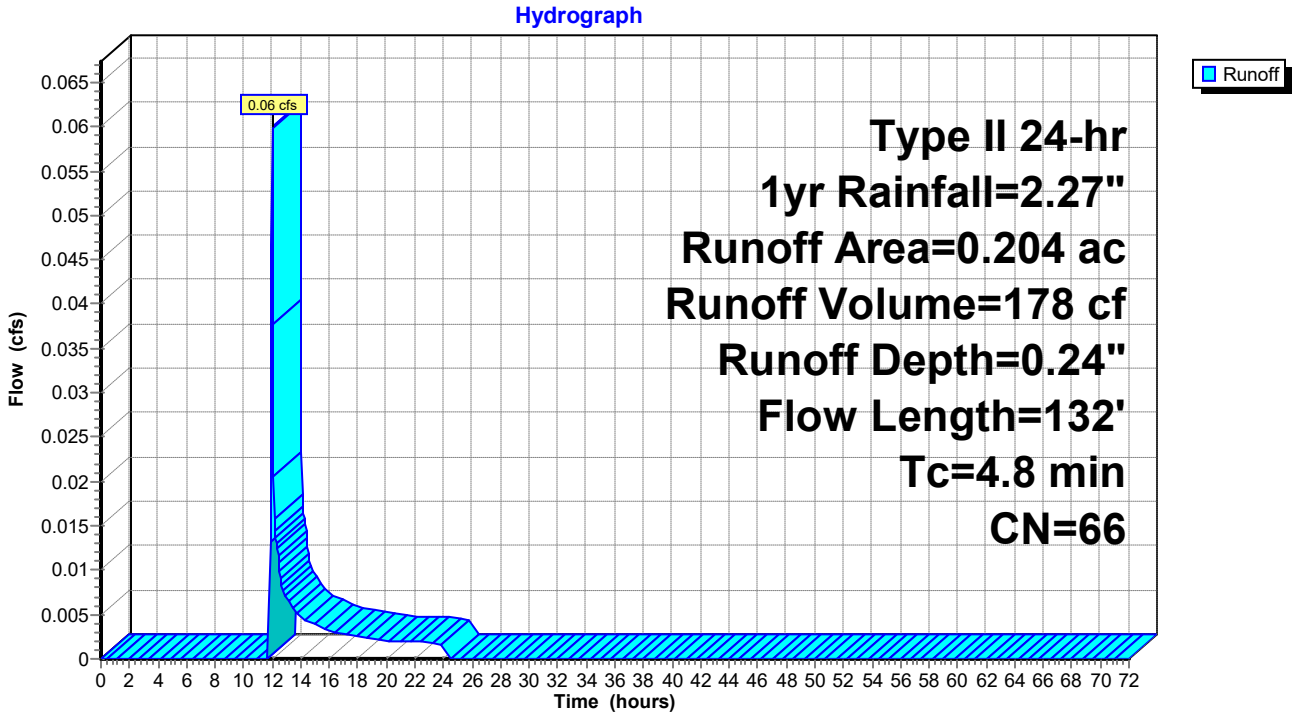
Runoff = 0.06 cfs @ 11.99 hrs, Volume= 178 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.074	74	>75% Grass cover, Good, HSG C
0.204	66	Weighted Average
0.204		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.2000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.2	32	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.8	132	Total			

Subcatchment 2S: Pre 2 - To North Drop Inlet



Hydrograph for Subcatchment 2S: Pre 2 - To North Drop Inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.04	**0.06**
13.00	1.75	0.09	0.01
14.00	1.86	0.12	0.00
15.00	1.94	0.14	0.00
16.00	2.00	0.15	0.00
17.00	2.05	0.17	0.00
18.00	2.09	0.18	0.00
19.00	2.13	0.19	0.00
20.00	2.16	0.20	0.00
21.00	2.19	0.21	0.00
22.00	2.22	0.22	0.00
23.00	2.24	0.23	0.00
24.00	**2.27**	**0.24**	0.00
25.00	2.27	0.24	0.00
26.00	2.27	0.24	0.00
27.00	2.27	0.24	0.00
28.00	2.27	0.24	0.00
29.00	2.27	0.24	0.00
30.00	2.27	0.24	0.00
31.00	2.27	0.24	0.00
32.00	2.27	0.24	0.00
33.00	2.27	0.24	0.00
34.00	2.27	0.24	0.00
35.00	2.27	0.24	0.00
36.00	2.27	0.24	0.00
37.00	2.27	0.24	0.00
38.00	2.27	0.24	0.00
39.00	2.27	0.24	0.00
40.00	2.27	0.24	0.00
41.00	2.27	0.24	0.00
42.00	2.27	0.24	0.00
43.00	2.27	0.24	0.00
44.00	2.27	0.24	0.00
45.00	2.27	0.24	0.00
46.00	2.27	0.24	0.00
47.00	2.27	0.24	0.00
48.00	2.27	0.24	0.00
49.00	2.27	0.24	0.00
50.00	2.27	0.24	0.00
51.00	2.27	0.24	0.00
52.00	2.27	0.24	0.00
53.00	2.27	0.24	0.00
54.00	2.27	0.24	0.00
55.00	2.27	0.24	0.00
56.00	2.27	0.24	0.00
57.00	2.27	0.24	0.00
58.00	2.27	0.24	0.00
59.00	2.27	0.24	0.00
60.00	2.27	0.24	0.00
61.00	2.27	0.24	0.00
62.00	2.27	0.24	0.00
63.00	2.27	0.24	0.00
64.00	2.27	0.24	0.00
65.00	2.27	0.24	0.00
66.00	2.27	0.24	0.00
67.00	2.27	0.24	0.00
68.00	2.27	0.24	0.00
69.00	2.27	0.24	0.00
70.00	2.27	0.24	0.00
71.00	2.27	0.24	0.00
72.00	2.27	0.24	0.00

Summary for Subcatchment 3S: Post 2 - To North Drop Inlet

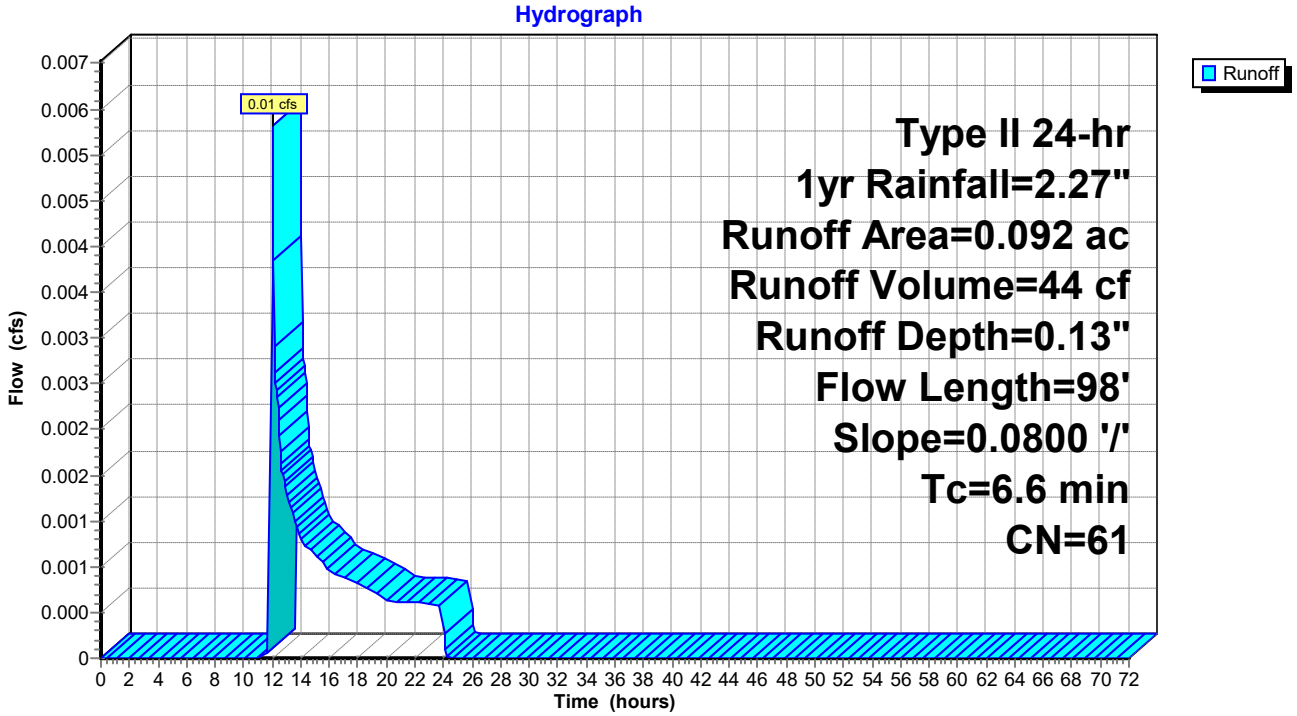
Runoff = 0.01 cfs @ 12.05 hrs, Volume= 44 cf, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.092	61	>75% Grass cover, Good, HSG B
0.092		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	98	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"

Subcatchment 3S: Post 2 - To North Drop Inlet



Hydrograph for Subcatchment 3S: Post 2 - To North Drop Inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.01	**0.00**
13.00	1.75	0.03	**0.00**
14.00	1.86	0.05	0.00
15.00	1.94	0.06	0.00
16.00	2.00	0.07	0.00
17.00	2.05	0.08	0.00
18.00	2.09	0.09	0.00
19.00	2.13	0.10	0.00
20.00	2.16	0.11	0.00
21.00	2.19	0.11	0.00
22.00	2.22	0.12	0.00
23.00	2.24	0.13	0.00
24.00	**2.27**	**0.13**	0.00
25.00	2.27	0.13	0.00
26.00	2.27	0.13	0.00
27.00	2.27	0.13	0.00
28.00	2.27	0.13	0.00
29.00	2.27	0.13	0.00
30.00	2.27	0.13	0.00
31.00	2.27	0.13	0.00
32.00	2.27	0.13	0.00
33.00	2.27	0.13	0.00
34.00	2.27	0.13	0.00
35.00	2.27	0.13	0.00
36.00	2.27	0.13	0.00
37.00	2.27	0.13	0.00
38.00	2.27	0.13	0.00
39.00	2.27	0.13	0.00
40.00	2.27	0.13	0.00
41.00	2.27	0.13	0.00
42.00	2.27	0.13	0.00
43.00	2.27	0.13	0.00
44.00	2.27	0.13	0.00
45.00	2.27	0.13	0.00
46.00	2.27	0.13	0.00
47.00	2.27	0.13	0.00
48.00	2.27	0.13	0.00
49.00	2.27	0.13	0.00
50.00	2.27	0.13	0.00
51.00	2.27	0.13	0.00
52.00	2.27	0.13	0.00
53.00	2.27	0.13	0.00
54.00	2.27	0.13	0.00
55.00	2.27	0.13	0.00
56.00	2.27	0.13	0.00
57.00	2.27	0.13	0.00
58.00	2.27	0.13	0.00
59.00	2.27	0.13	0.00
60.00	2.27	0.13	0.00
61.00	2.27	0.13	0.00
62.00	2.27	0.13	0.00
63.00	2.27	0.13	0.00
64.00	2.27	0.13	0.00
65.00	2.27	0.13	0.00
66.00	2.27	0.13	0.00
67.00	2.27	0.13	0.00
68.00	2.27	0.13	0.00
69.00	2.27	0.13	0.00
70.00	2.27	0.13	0.00
71.00	2.27	0.13	0.00
72.00	2.27	0.13	0.00

Summary for Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner

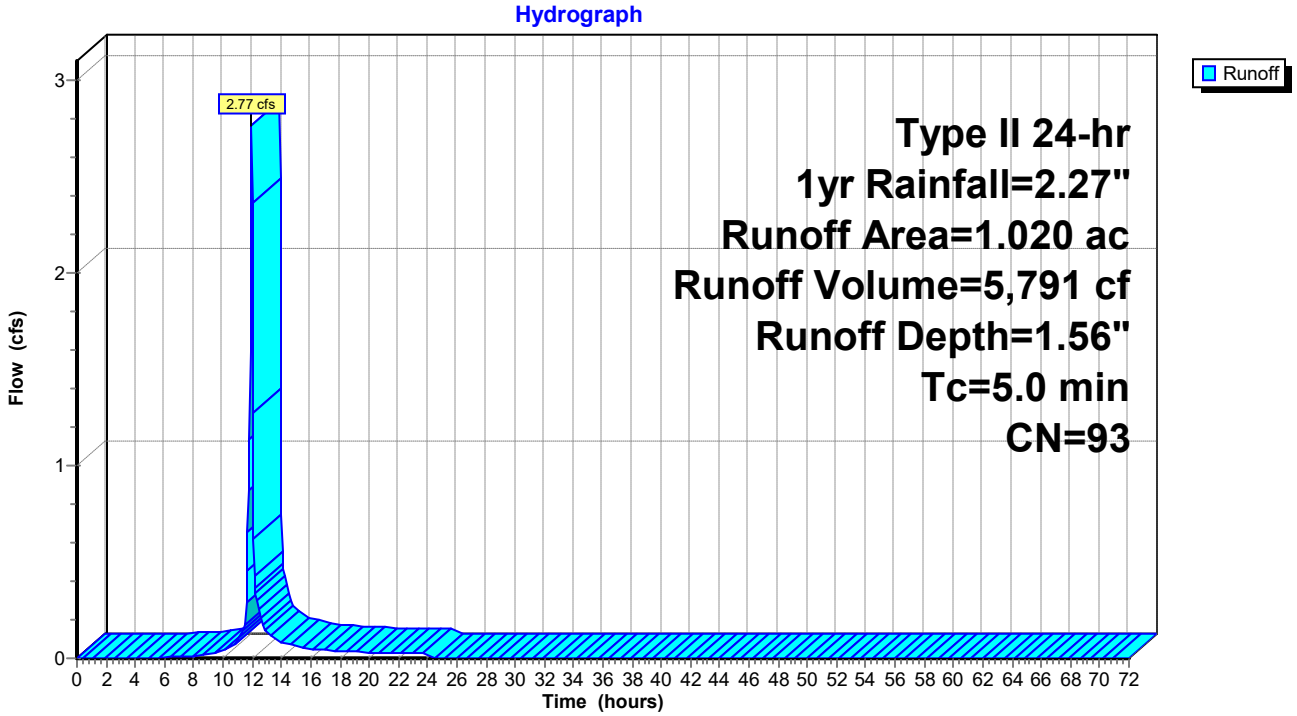
Runoff = 2.77 cfs @ 11.95 hrs, Volume= 5,791 cf, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.804	98	Paved parking, HSG C
0.216	74	>75% Grass cover, Good, HSG C
1.020	93	Weighted Average
0.216		21.18% Pervious Area
0.804		78.82% Impervious Area

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

Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner



Hydrograph for Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.01	0.01
8.00	0.27	0.02	0.01
9.00	0.33	0.04	0.03
10.00	0.41	0.07	0.04
11.00	0.53	0.13	**0.09**
12.00	1.51	0.87	**2.36**
13.00	1.75	1.09	0.14
14.00	1.86	1.19	0.08
15.00	1.94	1.26	0.07
16.00	2.00	1.31	0.05
17.00	2.05	1.36	0.04
18.00	2.09	1.40	0.04
19.00	2.13	1.43	0.03
20.00	2.16	1.46	0.03
21.00	2.19	1.49	0.03
22.00	2.22	1.52	0.03
23.00	2.24	1.54	0.03
24.00	**2.27**	**1.56**	0.02
25.00	2.27	1.56	0.00
26.00	2.27	1.56	0.00
27.00	2.27	1.56	0.00
28.00	2.27	1.56	0.00
29.00	2.27	1.56	0.00
30.00	2.27	1.56	0.00
31.00	2.27	1.56	0.00
32.00	2.27	1.56	0.00
33.00	2.27	1.56	0.00
34.00	2.27	1.56	0.00
35.00	2.27	1.56	0.00
36.00	2.27	1.56	0.00
37.00	2.27	1.56	0.00
38.00	2.27	1.56	0.00
39.00	2.27	1.56	0.00
40.00	2.27	1.56	0.00
41.00	2.27	1.56	0.00
42.00	2.27	1.56	0.00
43.00	2.27	1.56	0.00
44.00	2.27	1.56	0.00
45.00	2.27	1.56	0.00
46.00	2.27	1.56	0.00
47.00	2.27	1.56	0.00
48.00	2.27	1.56	0.00
49.00	2.27	1.56	0.00
50.00	2.27	1.56	0.00
51.00	2.27	1.56	0.00
52.00	2.27	1.56	0.00
53.00	2.27	1.56	0.00
54.00	2.27	1.56	0.00
55.00	2.27	1.56	0.00
56.00	2.27	1.56	0.00
57.00	2.27	1.56	0.00
58.00	2.27	1.56	0.00
59.00	2.27	1.56	0.00
60.00	2.27	1.56	0.00
61.00	2.27	1.56	0.00
62.00	2.27	1.56	0.00
63.00	2.27	1.56	0.00
64.00	2.27	1.56	0.00
65.00	2.27	1.56	0.00
66.00	2.27	1.56	0.00
67.00	2.27	1.56	0.00
68.00	2.27	1.56	0.00
69.00	2.27	1.56	0.00
70.00	2.27	1.56	0.00
71.00	2.27	1.56	0.00
72.00	2.27	1.56	0.00

Summary for Subcatchment 5S: Post 1A - Bypass - To SE Corner

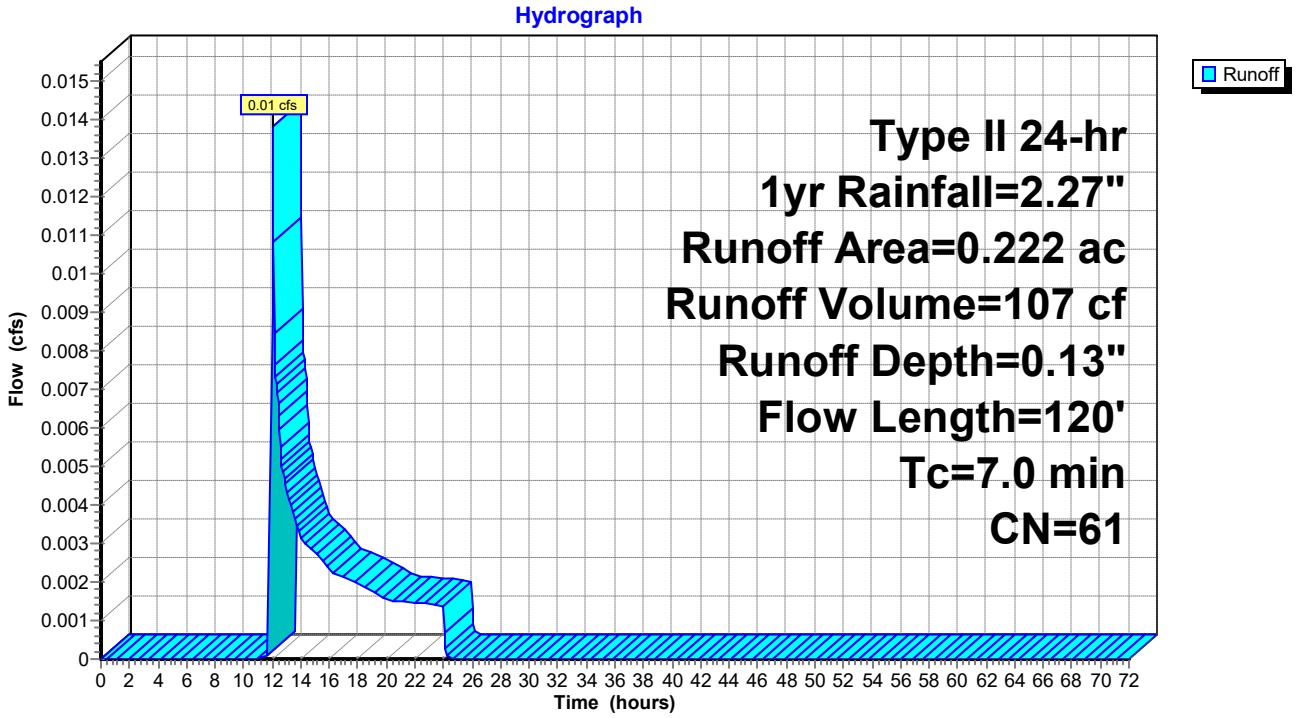
Runoff = 0.01 cfs @ 12.06 hrs, Volume= 107 cf, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.222	61	>75% Grass cover, Good, HSG B
0.222		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.0	120	Total			

Subcatchment 5S: Post 1A - Bypass - To SE Corner



Hydrograph for Subcatchment 5S: Post 1A - Bypass - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.01	**0.01**
13.00	1.75	0.03	**0.00**
14.00	1.86	0.05	0.00
15.00	1.94	0.06	0.00
16.00	2.00	0.07	0.00
17.00	2.05	0.08	0.00
18.00	2.09	0.09	0.00
19.00	2.13	0.10	0.00
20.00	2.16	0.11	0.00
21.00	2.19	0.11	0.00
22.00	2.22	0.12	0.00
23.00	2.24	0.13	0.00
24.00	**2.27**	**0.13**	0.00
25.00	2.27	0.13	0.00
26.00	2.27	0.13	0.00
27.00	2.27	0.13	0.00
28.00	2.27	0.13	0.00
29.00	2.27	0.13	0.00
30.00	2.27	0.13	0.00
31.00	2.27	0.13	0.00
32.00	2.27	0.13	0.00
33.00	2.27	0.13	0.00
34.00	2.27	0.13	0.00
35.00	2.27	0.13	0.00
36.00	2.27	0.13	0.00
37.00	2.27	0.13	0.00
38.00	2.27	0.13	0.00
39.00	2.27	0.13	0.00
40.00	2.27	0.13	0.00
41.00	2.27	0.13	0.00
42.00	2.27	0.13	0.00
43.00	2.27	0.13	0.00
44.00	2.27	0.13	0.00
45.00	2.27	0.13	0.00
46.00	2.27	0.13	0.00
47.00	2.27	0.13	0.00
48.00	2.27	0.13	0.00
49.00	2.27	0.13	0.00
50.00	2.27	0.13	0.00
51.00	2.27	0.13	0.00
52.00	2.27	0.13	0.00
53.00	2.27	0.13	0.00
54.00	2.27	0.13	0.00
55.00	2.27	0.13	0.00
56.00	2.27	0.13	0.00
57.00	2.27	0.13	0.00
58.00	2.27	0.13	0.00
59.00	2.27	0.13	0.00
60.00	2.27	0.13	0.00
61.00	2.27	0.13	0.00
62.00	2.27	0.13	0.00
63.00	2.27	0.13	0.00
64.00	2.27	0.13	0.00
65.00	2.27	0.13	0.00
66.00	2.27	0.13	0.00
67.00	2.27	0.13	0.00
68.00	2.27	0.13	0.00
69.00	2.27	0.13	0.00
70.00	2.27	0.13	0.00
71.00	2.27	0.13	0.00
72.00	2.27	0.13	0.00

Summary for Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED

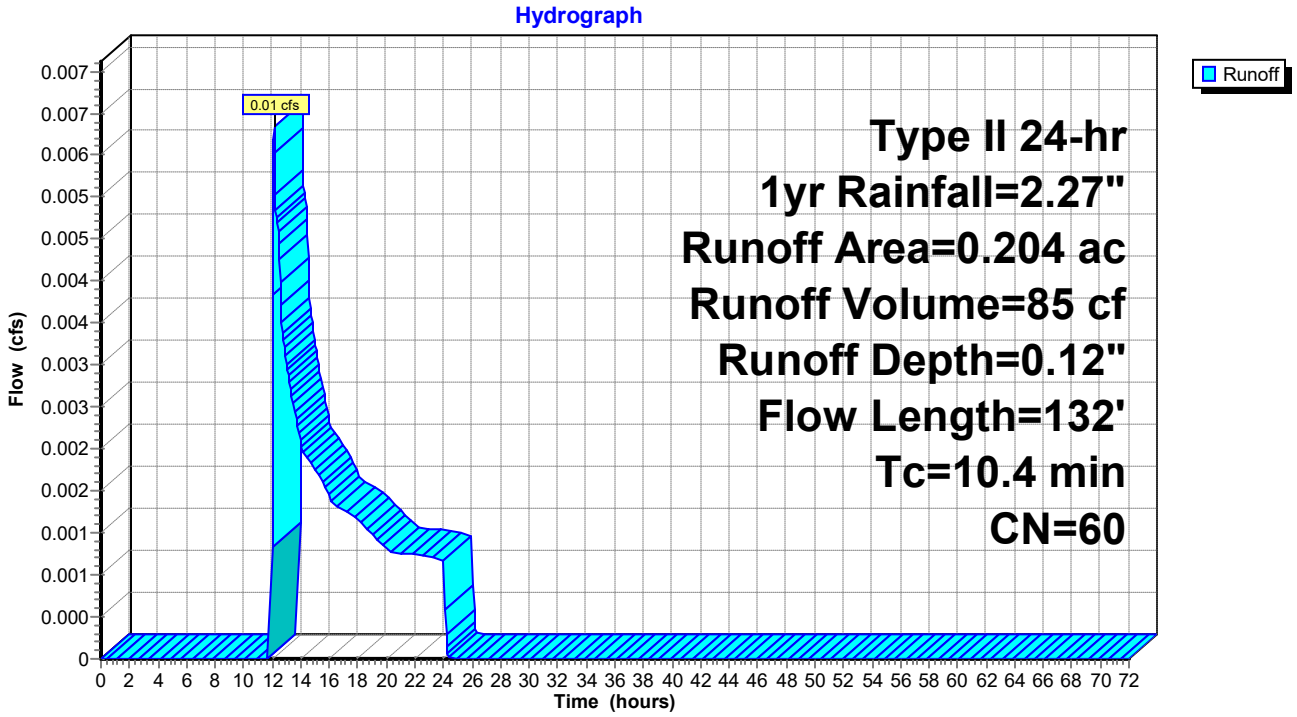
Runoff = 0.01 cfs @ 12.12 hrs, Volume= 85 cf, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.130	55	Woods, Good, HSG B
0.074	70	Woods, Good, HSG C
0.204	60	Weighted Average
0.204		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.2000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.27"
0.2	32	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.4	132	Total			

Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED



Hydrograph for Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.00	**0.00**
13.00	1.75	0.02	**0.00**
14.00	1.86	0.04	0.00
15.00	1.94	0.05	0.00
16.00	2.00	0.06	0.00
17.00	2.05	0.07	0.00
18.00	2.09	0.08	0.00
19.00	2.13	0.08	0.00
20.00	2.16	0.09	0.00
21.00	2.19	0.10	0.00
22.00	2.22	0.10	0.00
23.00	2.24	0.11	0.00
24.00	**2.27**	**0.12**	0.00
25.00	2.27	0.12	0.00
26.00	2.27	0.12	0.00
27.00	2.27	0.12	0.00
28.00	2.27	0.12	0.00
29.00	2.27	0.12	0.00
30.00	2.27	0.12	0.00
31.00	2.27	0.12	0.00
32.00	2.27	0.12	0.00
33.00	2.27	0.12	0.00
34.00	2.27	0.12	0.00
35.00	2.27	0.12	0.00
36.00	2.27	0.12	0.00
37.00	2.27	0.12	0.00
38.00	2.27	0.12	0.00
39.00	2.27	0.12	0.00
40.00	2.27	0.12	0.00
41.00	2.27	0.12	0.00
42.00	2.27	0.12	0.00
43.00	2.27	0.12	0.00
44.00	2.27	0.12	0.00
45.00	2.27	0.12	0.00
46.00	2.27	0.12	0.00
47.00	2.27	0.12	0.00
48.00	2.27	0.12	0.00
49.00	2.27	0.12	0.00
50.00	2.27	0.12	0.00
51.00	2.27	0.12	0.00
52.00	2.27	0.12	0.00
53.00	2.27	0.12	0.00
54.00	2.27	0.12	0.00
55.00	2.27	0.12	0.00
56.00	2.27	0.12	0.00
57.00	2.27	0.12	0.00
58.00	2.27	0.12	0.00
59.00	2.27	0.12	0.00
60.00	2.27	0.12	0.00
61.00	2.27	0.12	0.00
62.00	2.27	0.12	0.00
63.00	2.27	0.12	0.00
64.00	2.27	0.12	0.00
65.00	2.27	0.12	0.00
66.00	2.27	0.12	0.00
67.00	2.27	0.12	0.00
68.00	2.27	0.12	0.00
69.00	2.27	0.12	0.00
70.00	2.27	0.12	0.00
71.00	2.27	0.12	0.00
72.00	2.27	0.12	0.00

Summary for Subcatchment 11S: Pre 1 - To SE Corner FORESTED

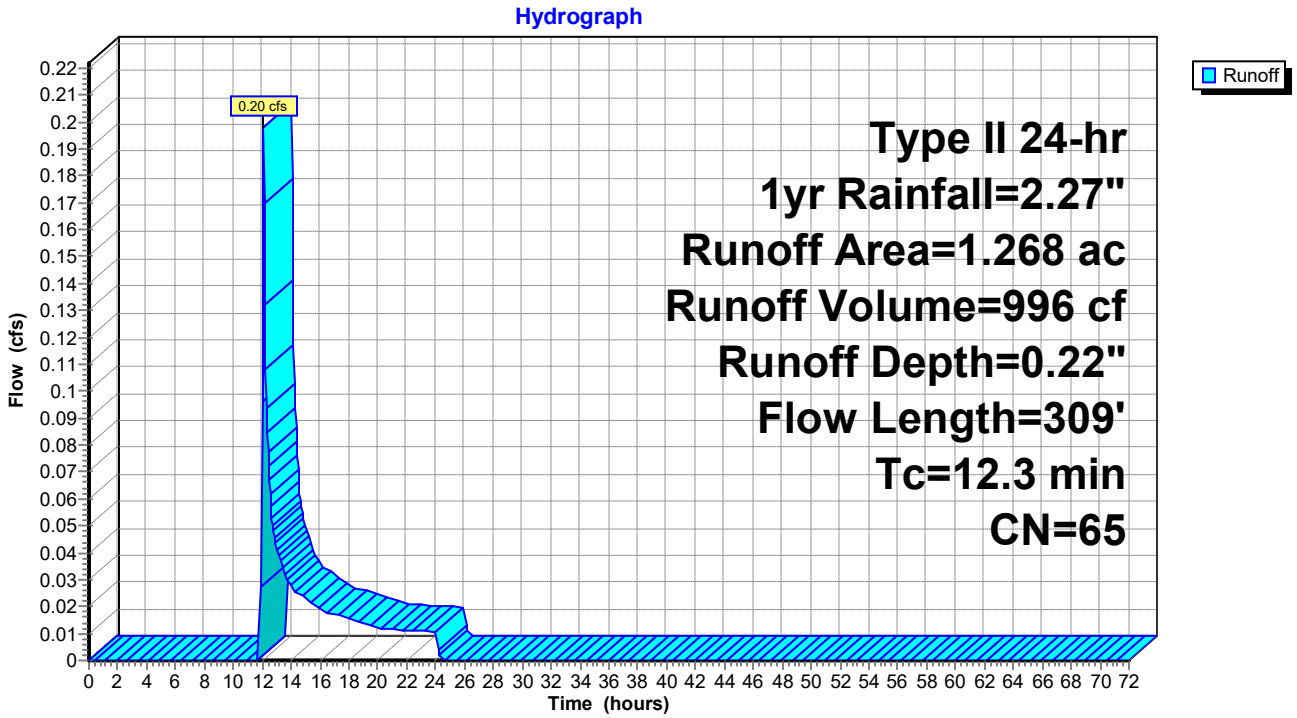
Runoff = 0.20 cfs @ 12.10 hrs, Volume= 996 cf, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Rainfall=2.27"

Area (ac)	CN	Description
0.424	55	Woods, Good, HSG B
0.129	70	Woods, Good, HSG C
0.715	70	Woods, Good, HSG C
1.268	65	Weighted Average
1.268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.1475	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.27"
0.8	209	0.0804	4.57		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.3	309	Total			

Subcatchment 11S: Pre 1 - To SE Corner FORESTED



Hydrograph for Subcatchment 11S: Pre 1 - To SE Corner FORESTED

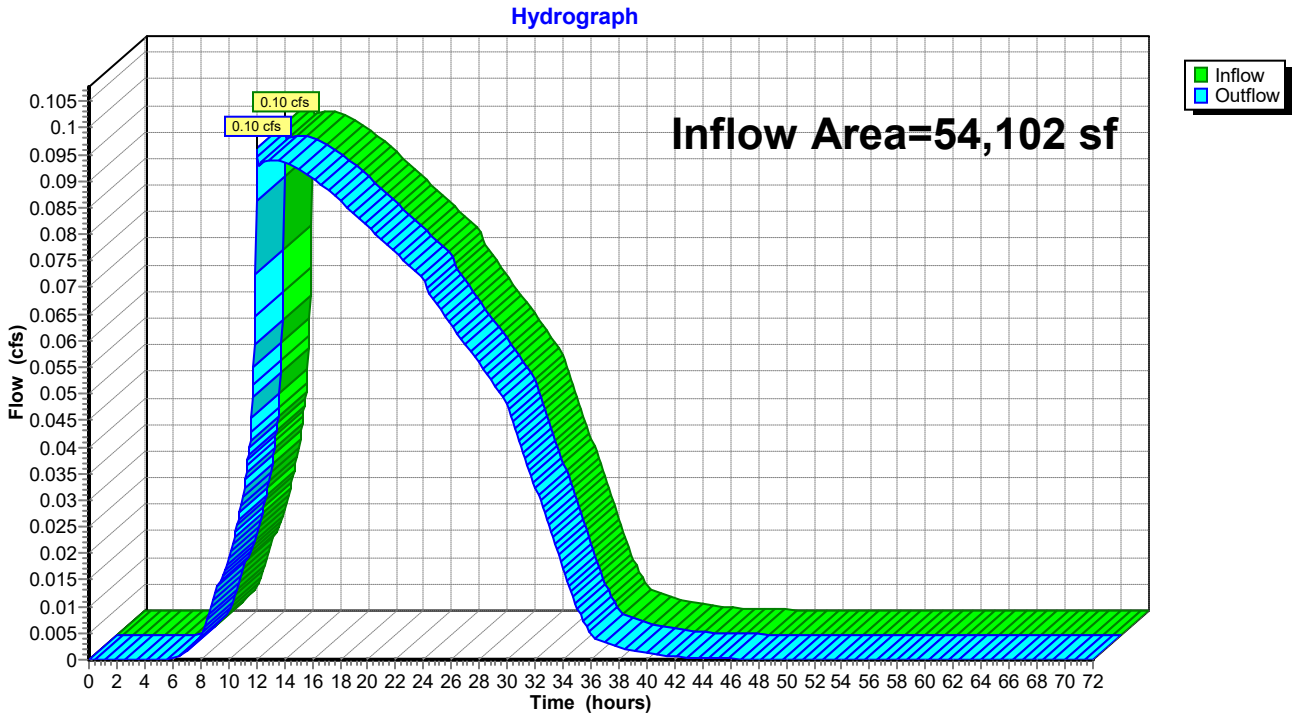
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.05	0.00	0.00
3.00	0.08	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.14	0.00	0.00
6.00	0.18	0.00	0.00
7.00	0.22	0.00	0.00
8.00	0.27	0.00	0.00
9.00	0.33	0.00	0.00
10.00	0.41	0.00	0.00
11.00	0.53	0.00	0.00
12.00	1.51	0.03	**0.10**
13.00	1.75	0.08	**0.04**
14.00	1.86	0.10	0.03
15.00	1.94	0.12	0.02
16.00	2.00	0.13	0.02
17.00	2.05	0.15	0.02
18.00	2.09	0.16	0.02
19.00	2.13	0.17	0.01
20.00	2.16	0.18	0.01
21.00	2.19	0.19	0.01
22.00	2.22	0.20	0.01
23.00	2.24	0.21	0.01
24.00	**2.27**	**0.22**	0.01
25.00	2.27	0.22	0.00
26.00	2.27	0.22	0.00
27.00	2.27	0.22	0.00
28.00	2.27	0.22	0.00
29.00	2.27	0.22	0.00
30.00	2.27	0.22	0.00
31.00	2.27	0.22	0.00
32.00	2.27	0.22	0.00
33.00	2.27	0.22	0.00
34.00	2.27	0.22	0.00
35.00	2.27	0.22	0.00
36.00	2.27	0.22	0.00
37.00	2.27	0.22	0.00
38.00	2.27	0.22	0.00
39.00	2.27	0.22	0.00
40.00	2.27	0.22	0.00
41.00	2.27	0.22	0.00
42.00	2.27	0.22	0.00
43.00	2.27	0.22	0.00
44.00	2.27	0.22	0.00
45.00	2.27	0.22	0.00
46.00	2.27	0.22	0.00
47.00	2.27	0.22	0.00
48.00	2.27	0.22	0.00
49.00	2.27	0.22	0.00
50.00	2.27	0.22	0.00
51.00	2.27	0.22	0.00
52.00	2.27	0.22	0.00
53.00	2.27	0.22	0.00
54.00	2.27	0.22	0.00
55.00	2.27	0.22	0.00
56.00	2.27	0.22	0.00
57.00	2.27	0.22	0.00
58.00	2.27	0.22	0.00
59.00	2.27	0.22	0.00
60.00	2.27	0.22	0.00
61.00	2.27	0.22	0.00
62.00	2.27	0.22	0.00
63.00	2.27	0.22	0.00
64.00	2.27	0.22	0.00
65.00	2.27	0.22	0.00
66.00	2.27	0.22	0.00
67.00	2.27	0.22	0.00
68.00	2.27	0.22	0.00
69.00	2.27	0.22	0.00
70.00	2.27	0.22	0.00
71.00	2.27	0.22	0.00
72.00	2.27	0.22	0.00

Summary for Reach 7R: Post 2 - Analysis Point

Inflow Area = 54,102 sf, 64.73% Impervious, Inflow Depth = 1.31" for 1yr event
Inflow = 0.10 cfs @ 12.07 hrs, Volume= 5,898 cf
Outflow = 0.10 cfs @ 12.07 hrs, Volume= 5,898 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 7R: Post 2 - Analysis Point



Hydrograph for Reach 7R: Post 2 - Analysis Point

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	51.00	0.00		0.00
1.00	0.00		0.00	52.00	0.00		0.00
2.00	0.00		0.00	53.00	0.00		0.00
3.00	0.00		0.00	54.00	0.00		0.00
4.00	0.00		0.00	55.00	0.00		0.00
5.00	0.00		0.00	56.00	0.00		0.00
6.00	0.00		0.00	57.00	0.00		0.00
7.00	0.00		0.00	58.00	0.00		0.00
8.00	0.00		0.00	59.00	0.00		0.00
9.00	0.01		0.01	60.00	0.00		0.00
10.00	0.02		0.02	61.00	0.00		0.00
11.00	0.03		0.03	62.00	0.00		0.00
12.00	**0.09**		**0.09**	63.00	0.00		0.00
13.00	**0.09**		**0.09**	64.00	0.00		0.00
14.00	0.09		0.09	65.00	0.00		0.00
15.00	0.09		0.09	66.00	0.00		0.00
16.00	0.09		0.09	67.00	0.00		0.00
17.00	0.09		0.09	68.00	0.00		0.00
18.00	0.09		0.09	69.00	0.00		0.00
19.00	0.08		0.08	70.00	0.00		0.00
20.00	0.08		0.08	71.00	0.00		0.00
21.00	0.08		0.08	72.00	0.00		0.00
22.00	0.08		0.08				
23.00	0.07		0.07				
24.00	0.07		0.07				
25.00	0.07		0.07				
26.00	0.06		0.06				
27.00	0.06		0.06				
28.00	0.06		0.06				
29.00	0.05		0.05				
30.00	0.05		0.05				
31.00	0.04		0.04				
32.00	0.03		0.03				
33.00	0.02		0.02				
34.00	0.02		0.02				
35.00	0.01		0.01				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				

Summary for Pond 6P: ADS StormTech

Inflow Area = 44,431 sf, 78.82% Impervious, Inflow Depth = 1.56" for 1yr event
Inflow = 2.77 cfs @ 11.95 hrs, Volume= 5,791 cf
Outflow = 0.09 cfs @ 13.79 hrs, Volume= 5,791 cf, Atten= 97%, Lag= 110.0 min
Primary = 0.09 cfs @ 13.79 hrs, Volume= 5,791 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 2,100.40' @ 13.79 hrs Surf.Area= 2,073 sf Storage= 3,399 cf

Plug-Flow detention time= 449.7 min calculated for 5,787 cf (100% of inflow)
Center-of-Mass det. time= 450.4 min (1,251.5 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,098.00'	2,961 cf	**37.08'W x 55.89'L x 5.50'H Field A** 11,399 cf Overall - 3,997 cf Embedded = 7,402 cf x 40.0% Voids
#2A	2,098.75'	3,997 cf	**ADS_StormTech MC-3500 d +Cap** x 35 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		6,958 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,098.00'	**15.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,098.00' / 2,097.80' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	2,098.00'	**1.5" Vert. 1yr Orifice** C= 0.600
#3	Device 1	2,102.75'	**15.0" Horiz. Riser Top** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 13.79 hrs HW=2,100.40' (Free Discharge)
└─**1=Culvert** (Passes 0.09 cfs of 7.88 cfs potential flow)
  ├─**2=1yr Orifice** (Orifice Controls 0.09 cfs @ 7.36 fps)
  └─**3=Riser Top** (Controls 0.00 cfs)

Pond 6P: ADS StormTech - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

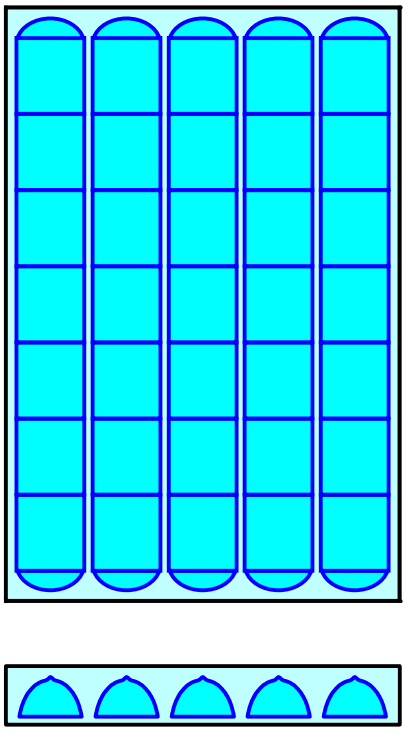
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

35 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 3,997.3 cf Chamber Storage

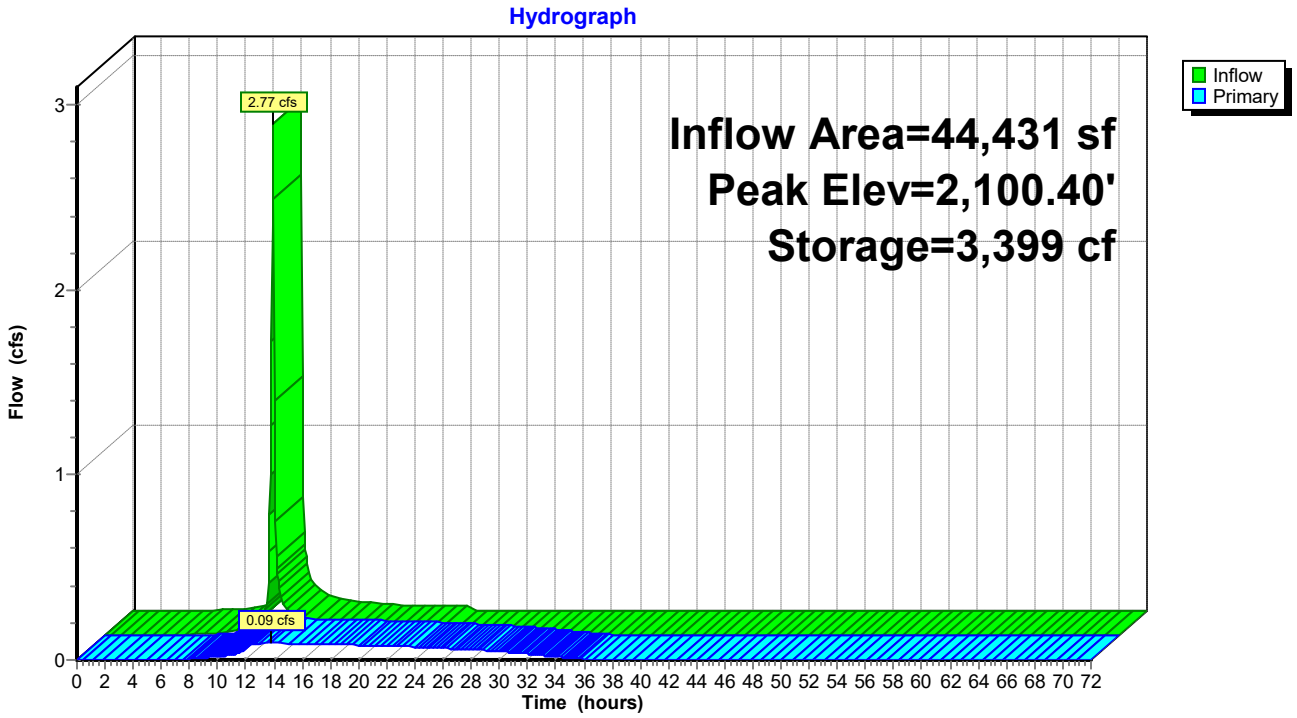
11,399.2 cf Field - 3,997.3 cf Chambers = 7,401.9 cf Stone x 40.0% Voids = 2,960.8 cf Stone Storage

Chamber Storage + Stone Storage = 6,958.1 cf = 0.160 af
Overall Storage Efficiency = 61.0%
Overall System Size = 55.89' x 37.08' x 5.50'

35 Chambers
422.2 cy Field
274.1 cy Stone



Pond 6P: ADS StormTech



Hydrograph for Pond 6P: ADS StormTech

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	2,098.00	0.00
2.50	0.00	0	2,098.00	0.00
5.00	0.00	0	2,098.00	0.00
7.50	0.01	31	2,098.04	0.00
10.00	**0.04**	140	2,098.17	0.02
12.50	**0.22**	**3,204**	**2,100.28**	**0.09**
15.00	0.07	**3,332**	**2,100.36**	**0.09**
17.50	0.04	2,998	2,100.15	0.09
20.00	0.03	2,569	2,099.89	0.08
22.50	0.03	2,120	2,099.62	0.07
25.00	0.00	1,626	2,099.33	0.07
27.50	0.00	1,068	2,099.01	0.06
30.00	0.00	592	2,098.71	0.05
32.50	0.00	248	2,098.30	0.03
35.00	0.00	75	2,098.09	0.01
37.50	0.00	30	2,098.04	0.00
40.00	0.00	13	2,098.02	0.00
42.50	0.00	6	2,098.01	0.00
45.00	0.00	3	2,098.00	0.00
47.50	0.00	1	2,098.00	0.00
50.00	0.00	1	2,098.00	0.00
52.50	0.00	0	2,098.00	0.00
55.00	0.00	0	2,098.00	0.00
57.50	0.00	0	2,098.00	0.00
60.00	0.00	0	2,098.00	0.00
62.50	0.00	0	2,098.00	0.00
65.00	0.00	0	2,098.00	0.00
67.50	0.00	0	2,098.00	0.00
70.00	0.00	0	2,098.00	0.00

Stage-Discharge for Pond 6P: ADS StormTech

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
2,098.00	0.00	2,100.04	0.08	2,102.08	0.12
2,098.04	0.00	2,100.08	0.08	2,102.12	0.12
2,098.08	0.01	2,100.12	0.08	2,102.16	0.12
2,098.12	0.01	2,100.16	0.09	2,102.20	0.12
2,098.16	0.02	2,100.20	0.09	2,102.24	0.12
2,098.20	0.02	2,100.24	0.09	2,102.28	0.12
2,098.24	0.02	2,100.28	0.09	2,102.32	0.12
2,098.28	0.03	2,100.32	0.09	2,102.36	0.12
2,098.32	0.03	2,100.36	0.09	2,102.40	0.12
2,098.36	0.03	2,100.40	0.09	2,102.44	0.12
2,098.40	0.03	2,100.44	0.09	2,102.48	0.12
2,098.44	0.04	2,100.48	0.09	2,102.52	0.12
2,098.48	0.04	2,100.52	0.09	2,102.56	0.13
2,098.52	0.04	2,100.56	0.09	2,102.60	0.13
2,098.56	0.04	2,100.60	0.09	2,102.64	0.13
2,098.60	0.04	2,100.64	0.09	2,102.68	0.13
2,098.64	0.04	2,100.68	0.10	2,102.72	0.13
2,098.68	0.05	2,100.72	0.10	2,102.76	0.14
2,098.72	0.05	2,100.76	0.10	2,102.80	0.27
2,098.76	0.05	2,100.80	0.10	2,102.84	0.48
2,098.80	0.05	2,100.84	0.10	2,102.88	0.73
2,098.84	0.05	2,100.88	0.10	2,102.92	1.03
2,098.88	0.05	2,100.92	0.10	2,102.96	1.37
2,098.92	0.05	2,100.96	0.10	2,103.00	1.74
2,098.96	0.06	2,101.00	0.10	2,103.04	2.14
2,099.00	0.06	2,101.04	0.10	2,103.08	2.57
2,099.04	0.06	2,101.08	0.10	2,103.12	3.02
2,099.08	0.06	2,101.12	0.10	2,103.16	3.50
2,099.12	0.06	2,101.16	0.10	2,103.20	4.01
2,099.16	0.06	2,101.20	0.10	2,103.24	4.27
2,099.20	0.06	2,101.24	0.11	2,103.28	4.44
2,099.24	0.06	2,101.28	0.11	2,103.32	4.60
2,099.28	0.07	2,101.32	0.11	2,103.36	4.75
2,099.32	0.07	2,101.36	0.11	2,103.40	4.90
2,099.36	0.07	2,101.40	0.11	2,103.44	5.05
2,099.40	0.07	2,101.44	0.11	2,103.48	**5.19**
2,099.44	0.07	2,101.48	0.11		
2,099.48	0.07	2,101.52	0.11		
2,099.52	0.07	2,101.56	0.11		
2,099.56	0.07	2,101.60	0.11		
2,099.60	0.07	2,101.64	0.11		
2,099.64	0.07	2,101.68	0.11		
2,099.68	0.08	2,101.72	0.11		
2,099.72	0.08	2,101.76	0.11		
2,099.76	0.08	2,101.80	0.11		
2,099.80	0.08	2,101.84	0.11		
2,099.84	0.08	2,101.88	0.12		
2,099.88	0.08	2,101.92	0.12		
2,099.92	0.08	2,101.96	0.12		
2,099.96	0.08	2,102.00	0.12		
2,100.00	0.08	2,102.04	0.12		

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

Subcatchment 1S: Pre 1 - To SE Corner Runoff Area=1.268 ac 0.00% Impervious Runoff Depth=1.32"
Flow Length=309' Tc=6.0 min CN=69 Runoff=2.88 cfs 6,071 cf

Subcatchment 2S: Pre 2 - To North Drop Runoff Area=0.204 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=132' Tc=4.8 min CN=66 Runoff=0.41 cfs 840 cf

Subcatchment 3S: Post 2 - To North Drop Runoff Area=0.092 ac 0.00% Impervious Runoff Depth=0.85"
Flow Length=98' Slope=0.0800 '/' Tc=6.6 min CN=61 Runoff=0.12 cfs 285 cf

Subcatchment 4S: Post 1 - To ADS Runoff Area=1.020 ac 78.82% Impervious Runoff Depth=3.30"
Tc=5.0 min CN=93 Runoff=5.57 cfs 12,210 cf

Subcatchment 5S: Post 1A - Bypass - To SE Runoff Area=0.222 ac 0.00% Impervious Runoff Depth=0.85"
Flow Length=120' Tc=7.0 min CN=61 Runoff=0.29 cfs 688 cf

Subcatchment 10S: Pre 2 - To North Drop Runoff Area=0.204 ac 0.00% Impervious Runoff Depth=0.80"
Flow Length=132' Tc=10.4 min CN=60 Runoff=0.21 cfs 593 cf

Subcatchment 11S: Pre 1 - To SE Corner Runoff Area=1.268 ac 0.00% Impervious Runoff Depth=1.08"
Flow Length=309' Tc=12.3 min CN=65 Runoff=1.79 cfs 4,949 cf

Reach 7R: Post 2 - Analysis Point Inflow=1.02 cfs 12,898 cf
Outflow=1.02 cfs 12,898 cf

Pond 6P: ADS StormTech Peak Elev=2,102.91' Storage=6,468 cf Inflow=5.57 cfs 12,210 cf
Outflow=0.94 cfs 12,210 cf

Summary for Subcatchment 1S: Pre 1 - To SE Corner

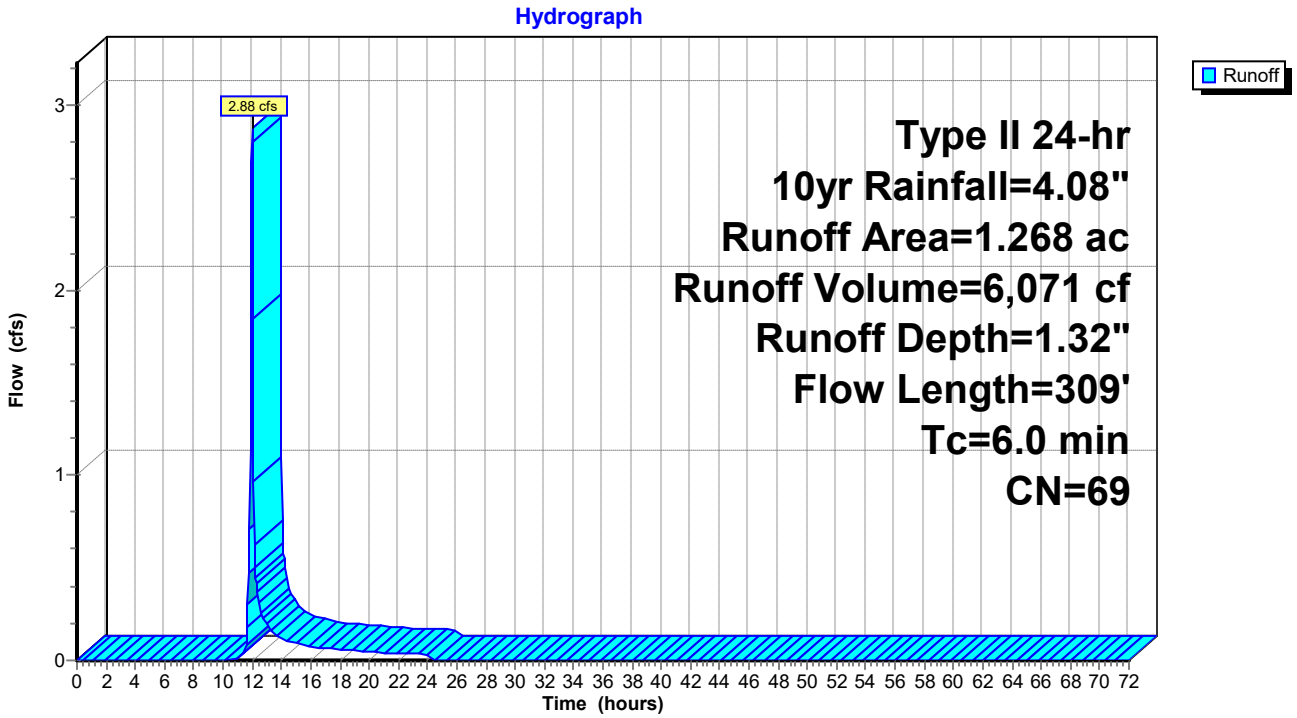
Runoff = 2.88 cfs @ 11.98 hrs, Volume= 6,071 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.424	61	>75% Grass cover, Good, HSG B
0.129	70	Woods, Good, HSG C
0.715	74	>75% Grass cover, Good, HSG C
1.268	69	Weighted Average
1.268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.1475	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.8	209	0.0804	4.57		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.0	309	Total			

Subcatchment 1S: Pre 1 - To SE Corner



Hydrograph for Subcatchment 1S: Pre 1 - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	0.01
12.00	2.71	0.52	**2.80**
13.00	3.15	0.75	0.19
14.00	3.35	0.86	0.12
15.00	3.48	0.94	0.10
16.00	3.59	1.01	0.08
17.00	3.68	1.06	0.07
18.00	3.76	1.11	0.06
19.00	3.83	1.15	0.05
20.00	3.88	1.19	0.04
21.00	3.94	1.23	0.04
22.00	3.99	1.26	0.04
23.00	4.03	1.29	0.04
24.00	**4.08**	**1.32**	0.04
25.00	4.08	1.32	0.00
26.00	4.08	1.32	0.00
27.00	4.08	1.32	0.00
28.00	4.08	1.32	0.00
29.00	4.08	1.32	0.00
30.00	4.08	1.32	0.00
31.00	4.08	1.32	0.00
32.00	4.08	1.32	0.00
33.00	4.08	1.32	0.00
34.00	4.08	1.32	0.00
35.00	4.08	1.32	0.00
36.00	4.08	1.32	0.00
37.00	4.08	1.32	0.00
38.00	4.08	1.32	0.00
39.00	4.08	1.32	0.00
40.00	4.08	1.32	0.00
41.00	4.08	1.32	0.00
42.00	4.08	1.32	0.00
43.00	4.08	1.32	0.00
44.00	4.08	1.32	0.00
45.00	4.08	1.32	0.00
46.00	4.08	1.32	0.00
47.00	4.08	1.32	0.00
48.00	4.08	1.32	0.00
49.00	4.08	1.32	0.00
50.00	4.08	1.32	0.00
51.00	4.08	1.32	0.00
52.00	4.08	1.32	0.00
53.00	4.08	1.32	0.00
54.00	4.08	1.32	0.00
55.00	4.08	1.32	0.00
56.00	4.08	1.32	0.00
57.00	4.08	1.32	0.00
58.00	4.08	1.32	0.00
59.00	4.08	1.32	0.00
60.00	4.08	1.32	0.00
61.00	4.08	1.32	0.00
62.00	4.08	1.32	0.00
63.00	4.08	1.32	0.00
64.00	4.08	1.32	0.00
65.00	4.08	1.32	0.00
66.00	4.08	1.32	0.00
67.00	4.08	1.32	0.00
68.00	4.08	1.32	0.00
69.00	4.08	1.32	0.00
70.00	4.08	1.32	0.00
71.00	4.08	1.32	0.00
72.00	4.08	1.32	0.00

Summary for Subcatchment 2S: Pre 2 - To North Drop Inlet

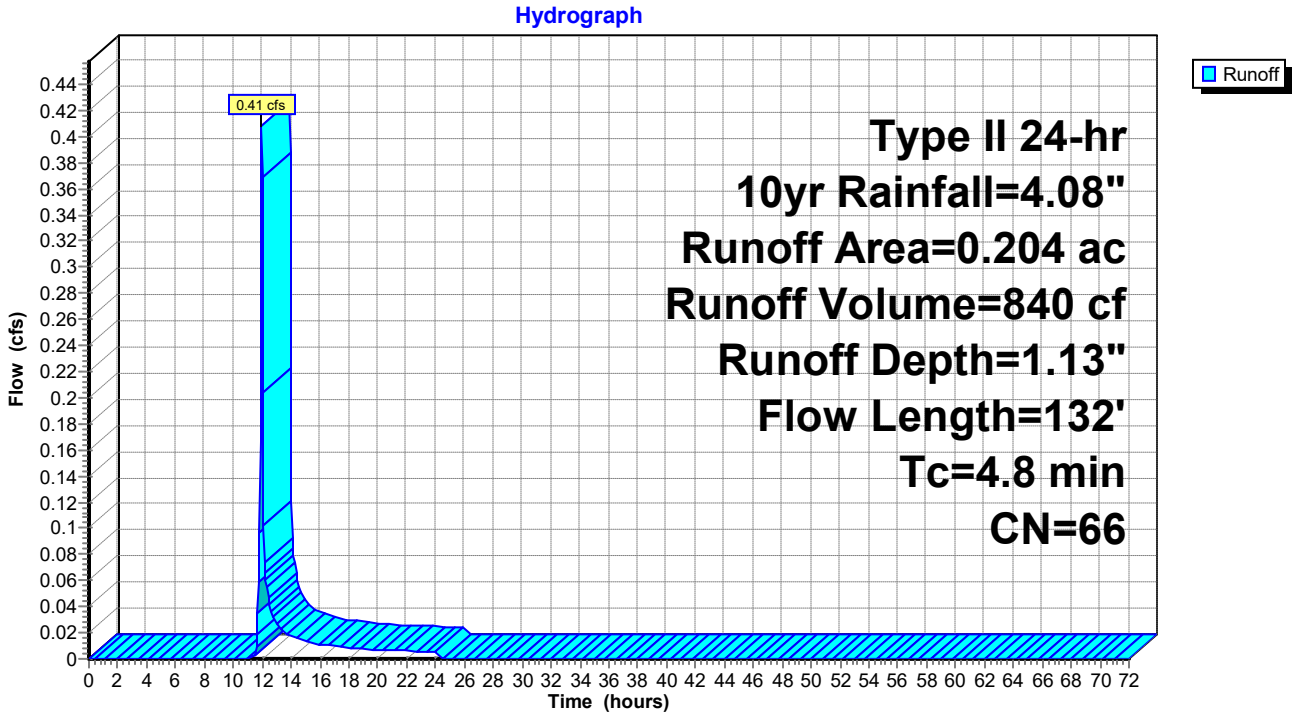
Runoff = 0.41 cfs @ 11.96 hrs, Volume= 840 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.074	74	>75% Grass cover, Good, HSG C
0.204	66	Weighted Average
0.204		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.2000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.2	32	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.8	132	Total			

Subcatchment 2S: Pre 2 - To North Drop Inlet



Hydrograph for Subcatchment 2S: Pre 2 - To North Drop Inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	**0.00**
12.00	2.71	0.41	**0.37**
13.00	3.15	0.62	0.03
14.00	3.35	0.72	0.02
15.00	3.48	0.79	0.01
16.00	3.59	0.85	0.01
17.00	3.68	0.90	0.01
18.00	3.76	0.94	0.01
19.00	3.83	0.98	0.01
20.00	3.88	1.02	0.01
21.00	3.94	1.05	0.01
22.00	3.99	1.08	0.01
23.00	4.03	1.11	0.01
24.00	**4.08**	**1.13**	0.01
25.00	4.08	1.13	0.00
26.00	4.08	1.13	0.00
27.00	4.08	1.13	0.00
28.00	4.08	1.13	0.00
29.00	4.08	1.13	0.00
30.00	4.08	1.13	0.00
31.00	4.08	1.13	0.00
32.00	4.08	1.13	0.00
33.00	4.08	1.13	0.00
34.00	4.08	1.13	0.00
35.00	4.08	1.13	0.00
36.00	4.08	1.13	0.00
37.00	4.08	1.13	0.00
38.00	4.08	1.13	0.00
39.00	4.08	1.13	0.00
40.00	4.08	1.13	0.00
41.00	4.08	1.13	0.00
42.00	4.08	1.13	0.00
43.00	4.08	1.13	0.00
44.00	4.08	1.13	0.00
45.00	4.08	1.13	0.00
46.00	4.08	1.13	0.00
47.00	4.08	1.13	0.00
48.00	4.08	1.13	0.00
49.00	4.08	1.13	0.00
50.00	4.08	1.13	0.00
51.00	4.08	1.13	0.00
52.00	4.08	1.13	0.00
53.00	4.08	1.13	0.00
54.00	4.08	1.13	0.00
55.00	4.08	1.13	0.00
56.00	4.08	1.13	0.00
57.00	4.08	1.13	0.00
58.00	4.08	1.13	0.00
59.00	4.08	1.13	0.00
60.00	4.08	1.13	0.00
61.00	4.08	1.13	0.00
62.00	4.08	1.13	0.00
63.00	4.08	1.13	0.00
64.00	4.08	1.13	0.00
65.00	4.08	1.13	0.00
66.00	4.08	1.13	0.00
67.00	4.08	1.13	0.00
68.00	4.08	1.13	0.00
69.00	4.08	1.13	0.00
70.00	4.08	1.13	0.00
71.00	4.08	1.13	0.00
72.00	4.08	1.13	0.00

Summary for Subcatchment 3S: Post 2 - To North Drop Inlet

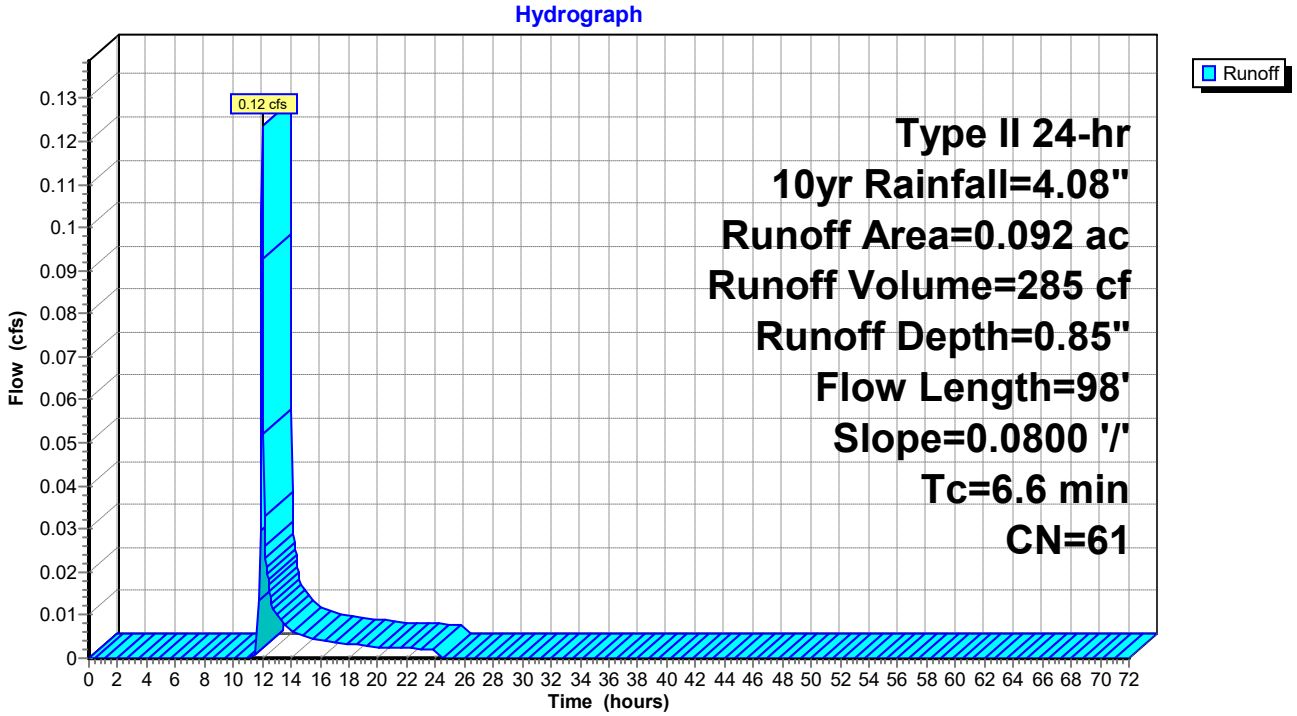
Runoff = 0.12 cfs @ 11.99 hrs, Volume= 285 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.092	61	>75% Grass cover, Good, HSG B
0.092		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	98	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"

Subcatchment 3S: Post 2 - To North Drop Inlet



Hydrograph for Subcatchment 3S: Post 2 - To North Drop Inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.71	0.26	**0.12**
13.00	3.15	0.42	0.01
14.00	3.35	0.50	0.01
15.00	3.48	0.56	0.01
16.00	3.59	0.61	0.00
17.00	3.68	0.66	0.00
18.00	3.76	0.69	0.00
19.00	3.83	0.73	0.00
20.00	3.88	0.75	0.00
21.00	3.94	0.78	0.00
22.00	3.99	0.81	0.00
23.00	4.03	0.83	0.00
24.00	**4.08**	**0.85**	0.00
25.00	4.08	0.85	0.00
26.00	4.08	0.85	0.00
27.00	4.08	0.85	0.00
28.00	4.08	0.85	0.00
29.00	4.08	0.85	0.00
30.00	4.08	0.85	0.00
31.00	4.08	0.85	0.00
32.00	4.08	0.85	0.00
33.00	4.08	0.85	0.00
34.00	4.08	0.85	0.00
35.00	4.08	0.85	0.00
36.00	4.08	0.85	0.00
37.00	4.08	0.85	0.00
38.00	4.08	0.85	0.00
39.00	4.08	0.85	0.00
40.00	4.08	0.85	0.00
41.00	4.08	0.85	0.00
42.00	4.08	0.85	0.00
43.00	4.08	0.85	0.00
44.00	4.08	0.85	0.00
45.00	4.08	0.85	0.00
46.00	4.08	0.85	0.00
47.00	4.08	0.85	0.00
48.00	4.08	0.85	0.00
49.00	4.08	0.85	0.00
50.00	4.08	0.85	0.00
51.00	4.08	0.85	0.00
52.00	4.08	0.85	0.00
53.00	4.08	0.85	0.00
54.00	4.08	0.85	0.00
55.00	4.08	0.85	0.00
56.00	4.08	0.85	0.00
57.00	4.08	0.85	0.00
58.00	4.08	0.85	0.00
59.00	4.08	0.85	0.00
60.00	4.08	0.85	0.00
61.00	4.08	0.85	0.00
62.00	4.08	0.85	0.00
63.00	4.08	0.85	0.00
64.00	4.08	0.85	0.00
65.00	4.08	0.85	0.00
66.00	4.08	0.85	0.00
67.00	4.08	0.85	0.00
68.00	4.08	0.85	0.00
69.00	4.08	0.85	0.00
70.00	4.08	0.85	0.00
71.00	4.08	0.85	0.00
72.00	4.08	0.85	0.00

Summary for Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner

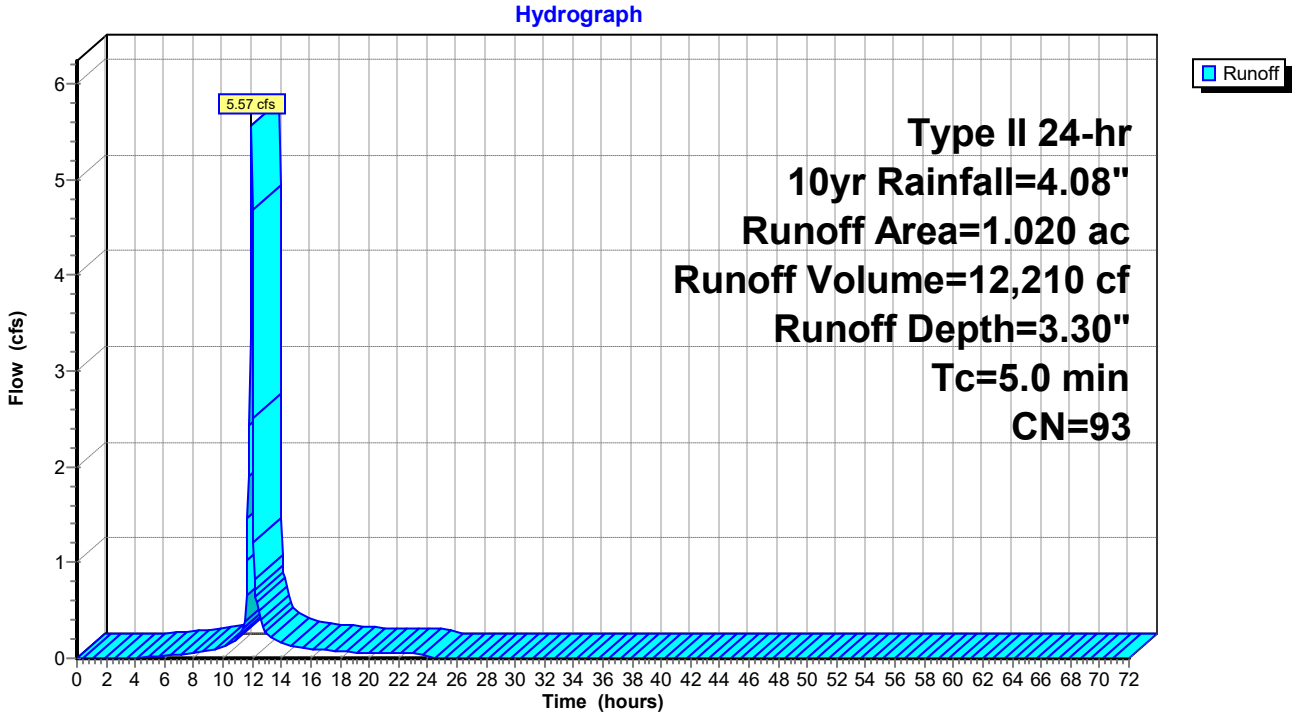
Runoff = 5.57 cfs @ 11.95 hrs, Volume= 12,210 cf, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.804	98	Paved parking, HSG C
0.216	74	>75% Grass cover, Good, HSG C
1.020	93	Weighted Average
0.216		21.18% Pervious Area
0.804		78.82% Impervious Area

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

Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner



Hydrograph for Subcatchment 4S: Post 1 - To ADS StormTech - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.01
5.00	0.26	0.01	0.01
6.00	0.33	0.03	0.03
7.00	0.40	0.06	0.04
8.00	0.49	0.11	0.05
9.00	0.60	0.17	0.08
10.00	0.74	0.26	0.11
11.00	0.96	0.42	**0.22**
12.00	2.71	1.97	**4.69**
13.00	3.15	2.40	0.26
14.00	3.35	2.59	0.16
15.00	3.48	2.72	0.12
16.00	3.59	2.82	0.10
17.00	3.68	2.91	0.08
18.00	3.76	2.98	0.07
19.00	3.83	3.05	0.06
20.00	3.88	3.11	0.05
21.00	3.94	3.16	0.05
22.00	3.99	3.21	0.05
23.00	4.03	3.25	0.05
24.00	**4.08**	**3.30**	0.05
25.00	4.08	3.30	0.00
26.00	4.08	3.30	0.00
27.00	4.08	3.30	0.00
28.00	4.08	3.30	0.00
29.00	4.08	3.30	0.00
30.00	4.08	3.30	0.00
31.00	4.08	3.30	0.00
32.00	4.08	3.30	0.00
33.00	4.08	3.30	0.00
34.00	4.08	3.30	0.00
35.00	4.08	3.30	0.00
36.00	4.08	3.30	0.00
37.00	4.08	3.30	0.00
38.00	4.08	3.30	0.00
39.00	4.08	3.30	0.00
40.00	4.08	3.30	0.00
41.00	4.08	3.30	0.00
42.00	4.08	3.30	0.00
43.00	4.08	3.30	0.00
44.00	4.08	3.30	0.00
45.00	4.08	3.30	0.00
46.00	4.08	3.30	0.00
47.00	4.08	3.30	0.00
48.00	4.08	3.30	0.00
49.00	4.08	3.30	0.00
50.00	4.08	3.30	0.00
51.00	4.08	3.30	0.00
52.00	4.08	3.30	0.00
53.00	4.08	3.30	0.00
54.00	4.08	3.30	0.00
55.00	4.08	3.30	0.00
56.00	4.08	3.30	0.00
57.00	4.08	3.30	0.00
58.00	4.08	3.30	0.00
59.00	4.08	3.30	0.00
60.00	4.08	3.30	0.00
61.00	4.08	3.30	0.00
62.00	4.08	3.30	0.00
63.00	4.08	3.30	0.00
64.00	4.08	3.30	0.00
65.00	4.08	3.30	0.00
66.00	4.08	3.30	0.00
67.00	4.08	3.30	0.00
68.00	4.08	3.30	0.00
69.00	4.08	3.30	0.00
70.00	4.08	3.30	0.00
71.00	4.08	3.30	0.00
72.00	4.08	3.30	0.00

Summary for Subcatchment 5S: Post 1A - Bypass - To SE Corner

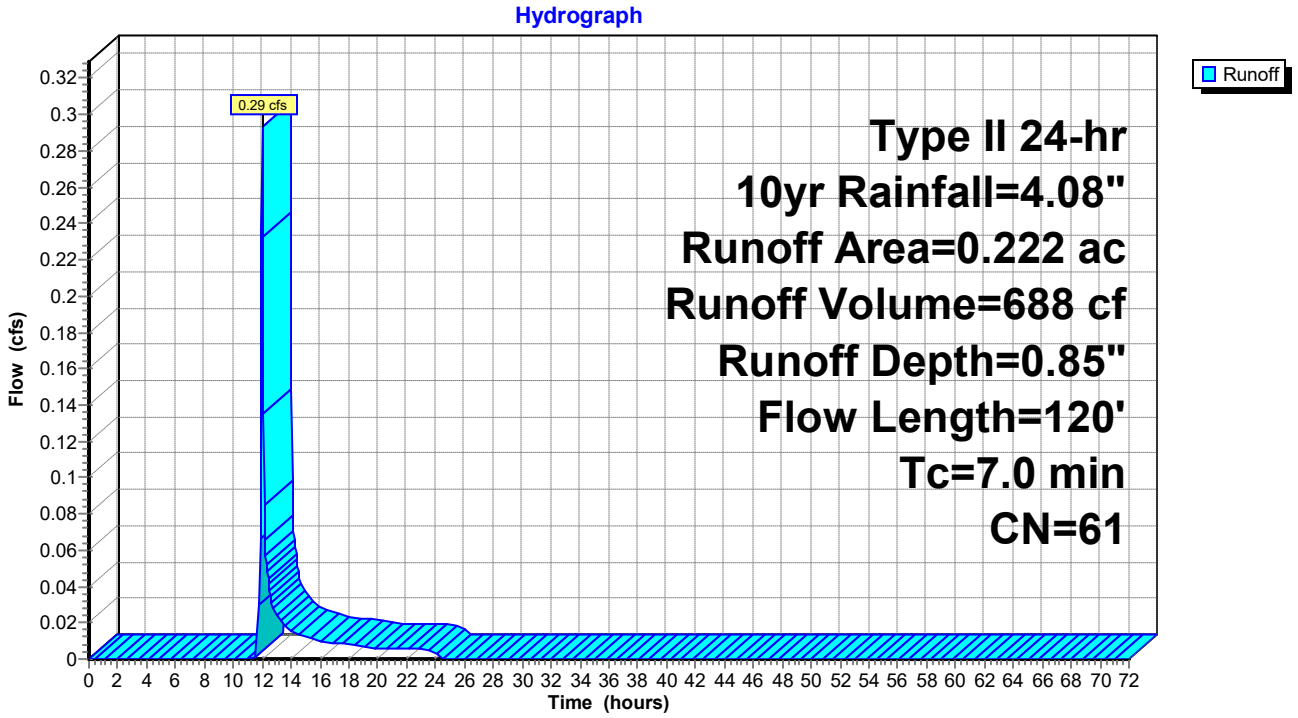
Runoff = 0.29 cfs @ 12.00 hrs, Volume= 688 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.222	61	>75% Grass cover, Good, HSG B
0.222		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.27"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.0	120	Total			

Subcatchment 5S: Post 1A - Bypass - To SE Corner



Hydrograph for Subcatchment 5S: Post 1A - Bypass - To SE Corner

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.71	0.26	**0.29**
13.00	3.15	0.42	0.02
14.00	3.35	0.50	0.02
15.00	3.48	0.56	0.01
16.00	3.59	0.61	0.01
17.00	3.68	0.66	0.01
18.00	3.76	0.69	0.01
19.00	3.83	0.73	0.01
20.00	3.88	0.75	0.01
21.00	3.94	0.78	0.01
22.00	3.99	0.81	0.01
23.00	4.03	0.83	0.01
24.00	**4.08**	**0.85**	0.01
25.00	4.08	0.85	0.00
26.00	4.08	0.85	0.00
27.00	4.08	0.85	0.00
28.00	4.08	0.85	0.00
29.00	4.08	0.85	0.00
30.00	4.08	0.85	0.00
31.00	4.08	0.85	0.00
32.00	4.08	0.85	0.00
33.00	4.08	0.85	0.00
34.00	4.08	0.85	0.00
35.00	4.08	0.85	0.00
36.00	4.08	0.85	0.00
37.00	4.08	0.85	0.00
38.00	4.08	0.85	0.00
39.00	4.08	0.85	0.00
40.00	4.08	0.85	0.00
41.00	4.08	0.85	0.00
42.00	4.08	0.85	0.00
43.00	4.08	0.85	0.00
44.00	4.08	0.85	0.00
45.00	4.08	0.85	0.00
46.00	4.08	0.85	0.00
47.00	4.08	0.85	0.00
48.00	4.08	0.85	0.00
49.00	4.08	0.85	0.00
50.00	4.08	0.85	0.00
51.00	4.08	0.85	0.00
52.00	4.08	0.85	0.00
53.00	4.08	0.85	0.00
54.00	4.08	0.85	0.00
55.00	4.08	0.85	0.00
56.00	4.08	0.85	0.00
57.00	4.08	0.85	0.00
58.00	4.08	0.85	0.00
59.00	4.08	0.85	0.00
60.00	4.08	0.85	0.00
61.00	4.08	0.85	0.00
62.00	4.08	0.85	0.00
63.00	4.08	0.85	0.00
64.00	4.08	0.85	0.00
65.00	4.08	0.85	0.00
66.00	4.08	0.85	0.00
67.00	4.08	0.85	0.00
68.00	4.08	0.85	0.00
69.00	4.08	0.85	0.00
70.00	4.08	0.85	0.00
71.00	4.08	0.85	0.00
72.00	4.08	0.85	0.00

Summary for Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED

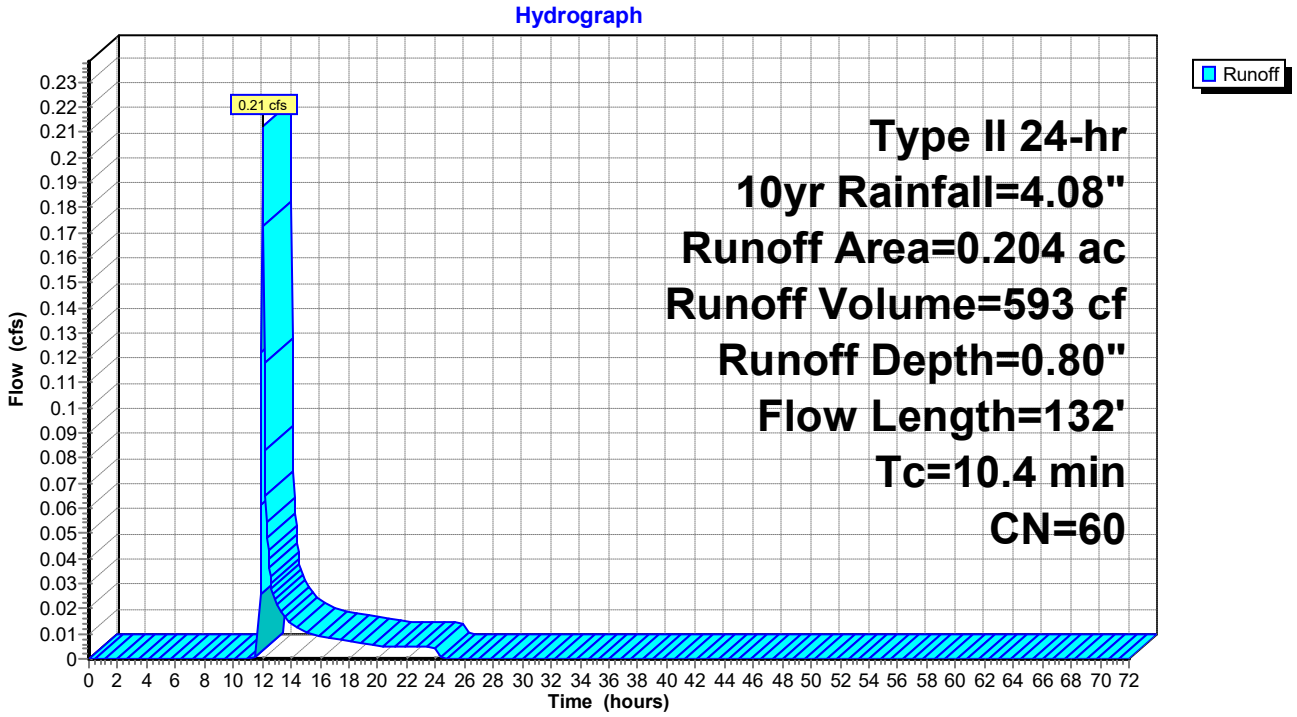
Runoff = 0.21 cfs @ 12.04 hrs, Volume= 593 cf, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.130	55	Woods, Good, HSG B
0.074	70	Woods, Good, HSG C
0.204	60	Weighted Average
0.204		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.2000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.27"
0.2	32	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.4	132	Total			

Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED



Hydrograph for Subcatchment 10S: Pre 2 - To North Drop Inlet FORESTED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.71	0.23	**0.19**
13.00	3.15	0.39	**0.02**
14.00	3.35	0.47	0.01
15.00	3.48	0.52	0.01
16.00	3.59	0.57	0.01
17.00	3.68	0.61	0.01
18.00	3.76	0.65	0.01
19.00	3.83	0.68	0.01
20.00	3.88	0.71	0.01
21.00	3.94	0.73	0.01
22.00	3.99	0.76	0.00
23.00	4.03	0.78	0.00
24.00	**4.08**	**0.80**	0.00
25.00	4.08	0.80	0.00
26.00	4.08	0.80	0.00
27.00	4.08	0.80	0.00
28.00	4.08	0.80	0.00
29.00	4.08	0.80	0.00
30.00	4.08	0.80	0.00
31.00	4.08	0.80	0.00
32.00	4.08	0.80	0.00
33.00	4.08	0.80	0.00
34.00	4.08	0.80	0.00
35.00	4.08	0.80	0.00
36.00	4.08	0.80	0.00
37.00	4.08	0.80	0.00
38.00	4.08	0.80	0.00
39.00	4.08	0.80	0.00
40.00	4.08	0.80	0.00
41.00	4.08	0.80	0.00
42.00	4.08	0.80	0.00
43.00	4.08	0.80	0.00
44.00	4.08	0.80	0.00
45.00	4.08	0.80	0.00
46.00	4.08	0.80	0.00
47.00	4.08	0.80	0.00
48.00	4.08	0.80	0.00
49.00	4.08	0.80	0.00
50.00	4.08	0.80	0.00
51.00	4.08	0.80	0.00
52.00	4.08	0.80	0.00
53.00	4.08	0.80	0.00
54.00	4.08	0.80	0.00
55.00	4.08	0.80	0.00
56.00	4.08	0.80	0.00
57.00	4.08	0.80	0.00
58.00	4.08	0.80	0.00
59.00	4.08	0.80	0.00
60.00	4.08	0.80	0.00
61.00	4.08	0.80	0.00
62.00	4.08	0.80	0.00
63.00	4.08	0.80	0.00
64.00	4.08	0.80	0.00
65.00	4.08	0.80	0.00
66.00	4.08	0.80	0.00
67.00	4.08	0.80	0.00
68.00	4.08	0.80	0.00
69.00	4.08	0.80	0.00
70.00	4.08	0.80	0.00
71.00	4.08	0.80	0.00
72.00	4.08	0.80	0.00

Summary for Subcatchment 11S: Pre 1 - To SE Corner FORESTED

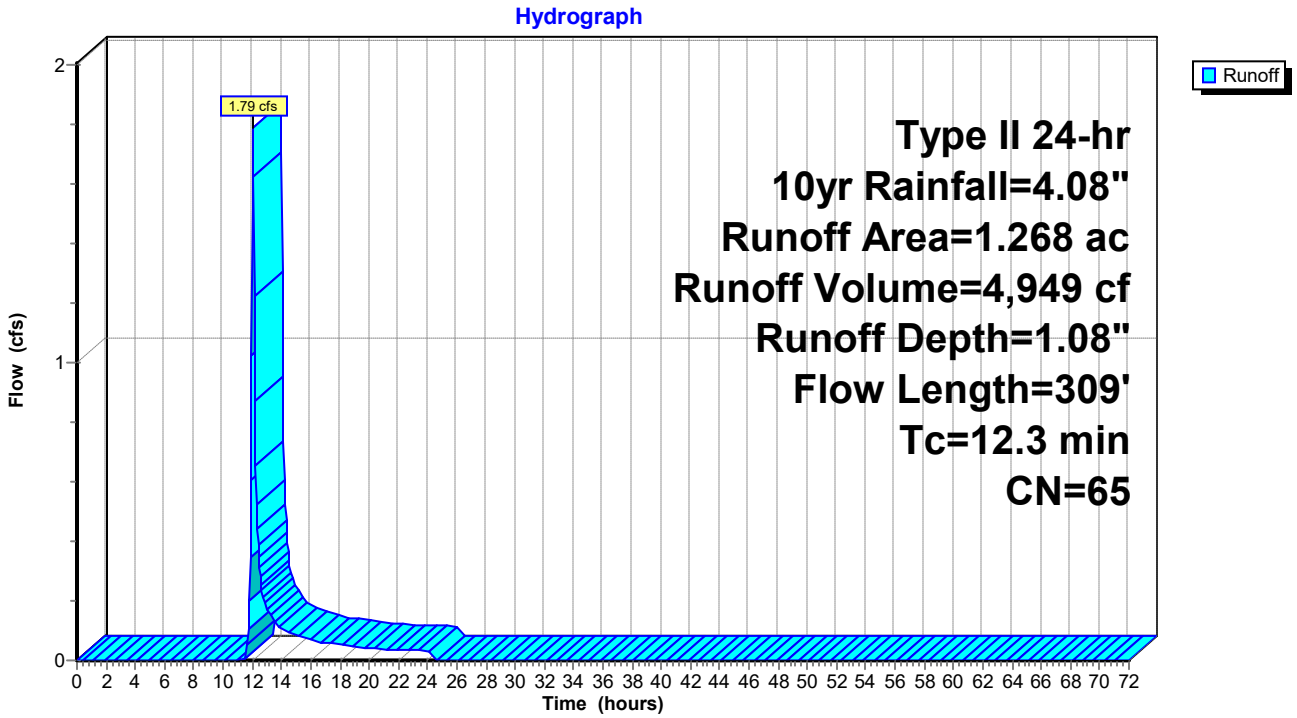
Runoff = 1.79 cfs @ 12.06 hrs, Volume= 4,949 cf, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=4.08"

Area (ac)	CN	Description
0.424	55	Woods, Good, HSG B
0.129	70	Woods, Good, HSG C
0.715	70	Woods, Good, HSG C
1.268	65	Weighted Average
1.268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.1475	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.27"
0.8	209	0.0804	4.57		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.3	309	Total			

Subcatchment 11S: Pre 1 - To SE Corner FORESTED



Hydrograph for Subcatchment 11S: Pre 1 - To SE Corner FORESTED

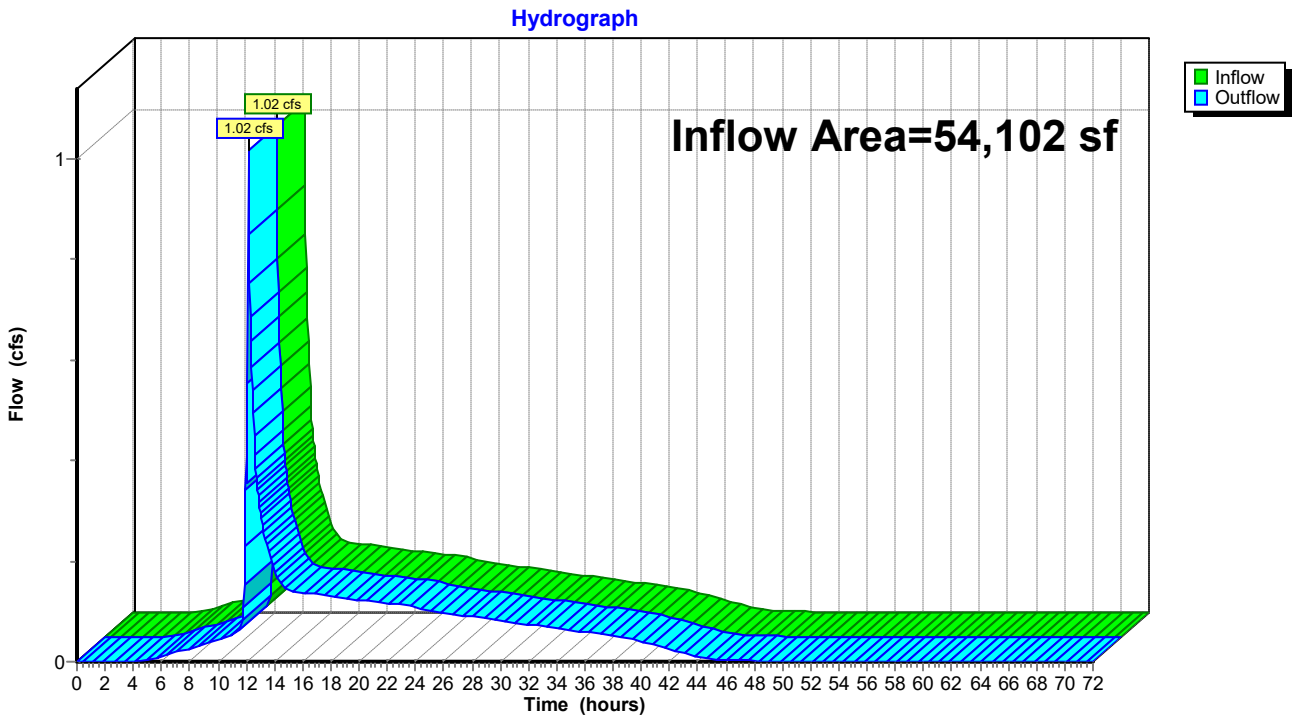
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.60	0.00	0.00
10.00	0.74	0.00	0.00
11.00	0.96	0.00	0.00
12.00	2.71	0.38	**1.52**
13.00	3.15	0.58	**0.17**
14.00	3.35	0.67	0.11
15.00	3.48	0.74	0.08
16.00	3.59	0.80	0.07
17.00	3.68	0.85	0.06
18.00	3.76	0.89	0.05
19.00	3.83	0.93	0.05
20.00	3.88	0.96	0.04
21.00	3.94	0.99	0.04
22.00	3.99	1.02	0.04
23.00	4.03	1.05	0.04
24.00	**4.08**	**1.08**	0.03
25.00	4.08	1.08	0.00
26.00	4.08	1.08	0.00
27.00	4.08	1.08	0.00
28.00	4.08	1.08	0.00
29.00	4.08	1.08	0.00
30.00	4.08	1.08	0.00
31.00	4.08	1.08	0.00
32.00	4.08	1.08	0.00
33.00	4.08	1.08	0.00
34.00	4.08	1.08	0.00
35.00	4.08	1.08	0.00
36.00	4.08	1.08	0.00
37.00	4.08	1.08	0.00
38.00	4.08	1.08	0.00
39.00	4.08	1.08	0.00
40.00	4.08	1.08	0.00
41.00	4.08	1.08	0.00
42.00	4.08	1.08	0.00
43.00	4.08	1.08	0.00
44.00	4.08	1.08	0.00
45.00	4.08	1.08	0.00
46.00	4.08	1.08	0.00
47.00	4.08	1.08	0.00
48.00	4.08	1.08	0.00
49.00	4.08	1.08	0.00
50.00	4.08	1.08	0.00
51.00	4.08	1.08	0.00
52.00	4.08	1.08	0.00
53.00	4.08	1.08	0.00
54.00	4.08	1.08	0.00
55.00	4.08	1.08	0.00
56.00	4.08	1.08	0.00
57.00	4.08	1.08	0.00
58.00	4.08	1.08	0.00
59.00	4.08	1.08	0.00
60.00	4.08	1.08	0.00
61.00	4.08	1.08	0.00
62.00	4.08	1.08	0.00
63.00	4.08	1.08	0.00
64.00	4.08	1.08	0.00
65.00	4.08	1.08	0.00
66.00	4.08	1.08	0.00
67.00	4.08	1.08	0.00
68.00	4.08	1.08	0.00
69.00	4.08	1.08	0.00
70.00	4.08	1.08	0.00
71.00	4.08	1.08	0.00
72.00	4.08	1.08	0.00

Summary for Reach 7R: Post 2 - Analysis Point

Inflow Area = 54,102 sf, 64.73% Impervious, Inflow Depth = 2.86" for 10yr event
Inflow = 1.02 cfs @ 12.16 hrs, Volume= 12,898 cf
Outflow = 1.02 cfs @ 12.16 hrs, Volume= 12,898 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 7R: Post 2 - Analysis Point



Hydrograph for Reach 7R: Post 2 - Analysis Point

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	51.00	0.00		0.00
1.00	0.00		0.00	52.00	0.00		0.00
2.00	0.00		0.00	53.00	0.00		0.00
3.00	0.00		0.00	54.00	0.00		0.00
4.00	0.00		0.00	55.00	0.00		0.00
5.00	0.00		0.00	56.00	0.00		0.00
6.00	0.01		0.01	57.00	0.00		0.00
7.00	0.02		0.02	58.00	0.00		0.00
8.00	0.03		0.03	59.00	0.00		0.00
9.00	0.03		0.03	60.00	0.00		0.00
10.00	0.04		0.04	61.00	0.00		0.00
11.00	0.05		0.05	62.00	0.00		0.00
12.00	**0.41**		**0.41**	63.00	0.00		0.00
13.00	**0.30**		**0.30**	64.00	0.00		0.00
14.00	0.18		0.18	65.00	0.00		0.00
15.00	0.14		0.14	66.00	0.00		0.00
16.00	0.14		0.14	67.00	0.00		0.00
17.00	0.13		0.13	68.00	0.00		0.00
18.00	0.13		0.13	69.00	0.00		0.00
19.00	0.13		0.13	70.00	0.00		0.00
20.00	0.12		0.12	71.00	0.00		0.00
21.00	0.12		0.12	72.00	0.00		0.00
22.00	0.12		0.12				
23.00	0.11		0.11				
24.00	0.11		0.11				
25.00	0.10		0.10				
26.00	0.10		0.10				
27.00	0.09		0.09				
28.00	0.09		0.09				
29.00	0.09		0.09				
30.00	0.08		0.08				
31.00	0.08		0.08				
32.00	0.07		0.07				
33.00	0.07		0.07				
34.00	0.07		0.07				
35.00	0.06		0.06				
36.00	0.06		0.06				
37.00	0.06		0.06				
38.00	0.05		0.05				
39.00	0.05		0.05				
40.00	0.04		0.04				
41.00	0.03		0.03				
42.00	0.02		0.02				
43.00	0.02		0.02				
44.00	0.01		0.01				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				

Summary for Pond 6P: ADS StormTech

Inflow Area = 44,431 sf, 78.82% Impervious, Inflow Depth = 3.30" for 10yr event
Inflow = 5.57 cfs @ 11.95 hrs, Volume= 12,210 cf
Outflow = 0.94 cfs @ 12.16 hrs, Volume= 12,210 cf, Atten= 83%, Lag= 12.8 min
Primary = 0.94 cfs @ 12.16 hrs, Volume= 12,210 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 2,102.91' @ 12.17 hrs Surf.Area= 2,073 sf Storage= 6,468 cf

Plug-Flow detention time= 543.6 min calculated for 12,202 cf (100% of inflow)
Center-of-Mass det. time= 544.5 min (1,324.8 - 780.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	2,098.00'	2,961 cf	**37.08'W x 55.89'L x 5.50'H Field A** 11,399 cf Overall - 3,997 cf Embedded = 7,402 cf x 40.0% Voids
#2A	2,098.75'	3,997 cf	**ADS_StormTech MC-3500 d +Cap** x 35 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		6,958 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	2,098.00'	**15.0" Round Culvert** L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,098.00' / 2,097.80' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	2,098.00'	**1.5" Vert. 1yr Orifice** C= 0.600
#3	Device 1	2,102.75'	**15.0" Horiz. Riser Top** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.87 cfs @ 12.16 hrs HW=2,102.90' (Free Discharge)
└─**1=Culvert** (Passes 0.87 cfs of 12.22 cfs potential flow)
  ├─**2=1yr Orifice** (Orifice Controls 0.13 cfs @ 10.59 fps)
  └─**3=Riser Top** (Weir Controls 0.74 cfs @ 1.26 fps)

Pond 6P: ADS StormTech - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

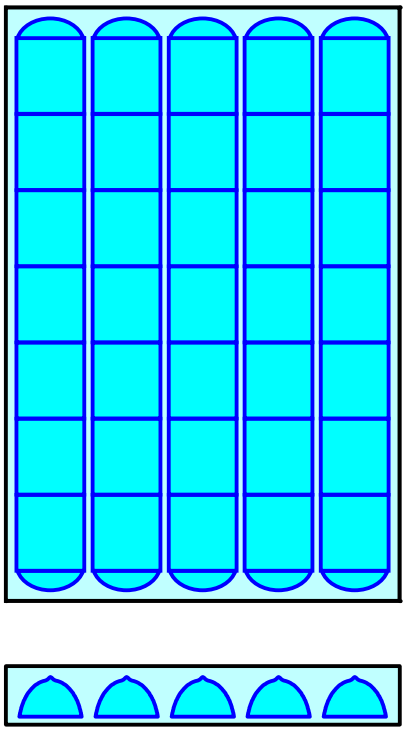
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

35 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 3,997.3 cf Chamber Storage

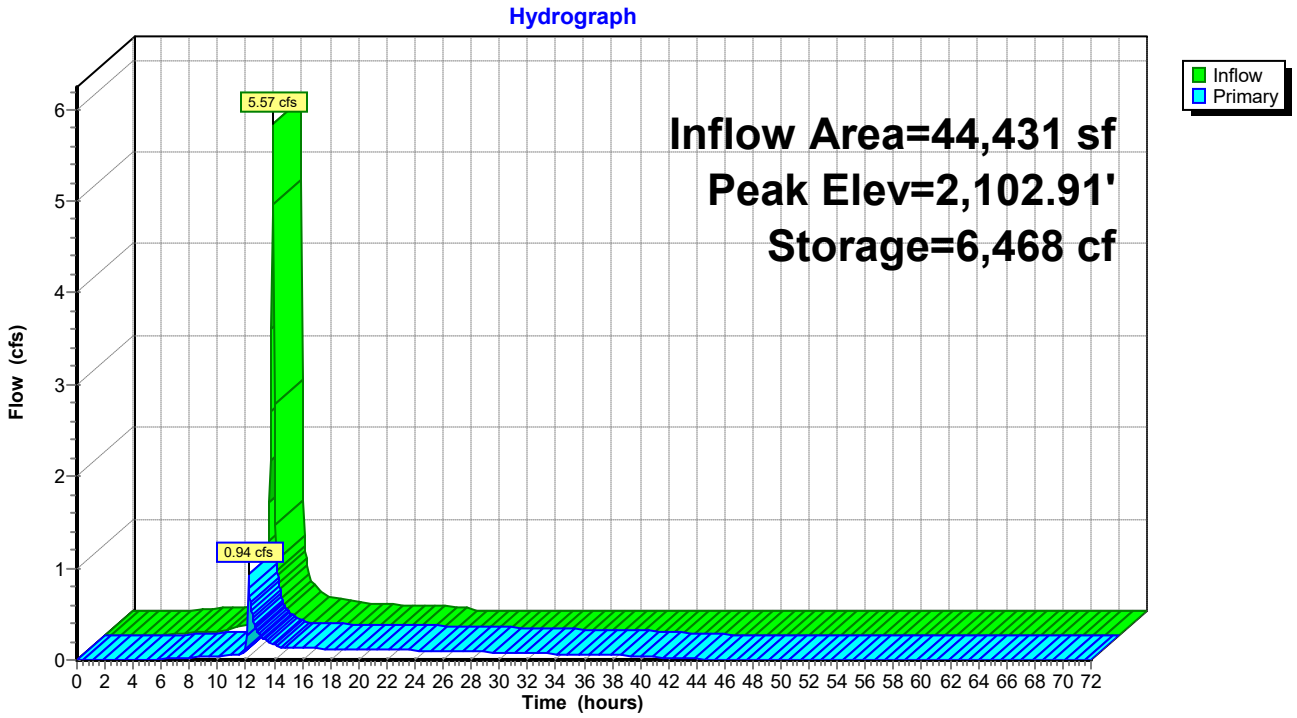
11,399.2 cf Field - 3,997.3 cf Chambers = 7,401.9 cf Stone x 40.0% Voids = 2,960.8 cf Stone Storage

Chamber Storage + Stone Storage = 6,958.1 cf = 0.160 af
Overall Storage Efficiency = 61.0%
Overall System Size = 55.89' x 37.08' x 5.50'

35 Chambers
422.2 cy Field
274.1 cy Stone



Pond 6P: ADS StormTech



Hydrograph for Pond 6P: ADS StormTech

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	2,098.00	0.00
2.50	0.00	0	2,098.00	0.00
5.00	0.01	37	2,098.05	0.00
7.50	0.04	171	2,098.21	0.02
10.00	**0.11**	**510**	**2,098.61**	**0.04**
12.50	**0.42**	**6,407**	**2,102.84**	**0.46**
15.00	0.12	6,336	2,102.75	0.13
17.50	0.08	6,064	2,102.42	0.12
20.00	0.05	5,583	2,101.94	0.12
22.50	0.05	5,024	2,101.50	0.11
25.00	0.00	4,334	2,101.01	0.10
27.50	0.00	3,468	2,100.45	0.09
30.00	0.00	2,691	2,099.96	0.08
32.50	0.00	2,000	2,099.55	0.07
35.00	0.00	1,393	2,099.19	0.06
37.50	0.00	868	2,098.89	0.05
40.00	0.00	434	2,098.52	0.04
42.50	0.00	159	2,098.19	0.02
45.00	0.00	50	2,098.06	0.00
47.50	0.00	22	2,098.03	0.00
50.00	0.00	10	2,098.01	0.00
52.50	0.00	4	2,098.01	0.00
55.00	0.00	2	2,098.00	0.00
57.50	0.00	1	2,098.00	0.00
60.00	0.00	0	2,098.00	0.00
62.50	0.00	0	2,098.00	0.00
65.00	0.00	0	2,098.00	0.00
67.50	0.00	0	2,098.00	0.00
70.00	0.00	0	2,098.00	0.00

Stage-Discharge for Pond 6P: ADS StormTech

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
2,098.00	0.00	2,100.04	0.08	2,102.08	0.12
2,098.04	0.00	2,100.08	0.08	2,102.12	0.12
2,098.08	0.01	2,100.12	0.08	2,102.16	0.12
2,098.12	0.01	2,100.16	0.09	2,102.20	0.12
2,098.16	0.02	2,100.20	0.09	2,102.24	0.12
2,098.20	0.02	2,100.24	0.09	2,102.28	0.12
2,098.24	0.02	2,100.28	0.09	2,102.32	0.12
2,098.28	0.03	2,100.32	0.09	2,102.36	0.12
2,098.32	0.03	2,100.36	0.09	2,102.40	0.12
2,098.36	0.03	2,100.40	0.09	2,102.44	0.12
2,098.40	0.03	2,100.44	0.09	2,102.48	0.12
2,098.44	0.04	2,100.48	0.09	2,102.52	0.12
2,098.48	0.04	2,100.52	0.09	2,102.56	0.13
2,098.52	0.04	2,100.56	0.09	2,102.60	0.13
2,098.56	0.04	2,100.60	0.09	2,102.64	0.13
2,098.60	0.04	2,100.64	0.09	2,102.68	0.13
2,098.64	0.04	2,100.68	0.10	2,102.72	0.13
2,098.68	0.05	2,100.72	0.10	2,102.76	0.14
2,098.72	0.05	2,100.76	0.10	2,102.80	0.27
2,098.76	0.05	2,100.80	0.10	2,102.84	0.48
2,098.80	0.05	2,100.84	0.10	2,102.88	0.73
2,098.84	0.05	2,100.88	0.10	2,102.92	1.03
2,098.88	0.05	2,100.92	0.10	2,102.96	1.37
2,098.92	0.05	2,100.96	0.10	2,103.00	1.74
2,098.96	0.06	2,101.00	0.10	2,103.04	2.14
2,099.00	0.06	2,101.04	0.10	2,103.08	2.57
2,099.04	0.06	2,101.08	0.10	2,103.12	3.02
2,099.08	0.06	2,101.12	0.10	2,103.16	3.50
2,099.12	0.06	2,101.16	0.10	2,103.20	4.01
2,099.16	0.06	2,101.20	0.10	2,103.24	4.27
2,099.20	0.06	2,101.24	0.11	2,103.28	4.44
2,099.24	0.06	2,101.28	0.11	2,103.32	4.60
2,099.28	0.07	2,101.32	0.11	2,103.36	4.75
2,099.32	0.07	2,101.36	0.11	2,103.40	4.90
2,099.36	0.07	2,101.40	0.11	2,103.44	5.05
2,099.40	0.07	2,101.44	0.11	2,103.48	**5.19**
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2,099.56	0.07	2,101.60	0.11		
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2,099.68	0.08	2,101.72	0.11		
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2,099.76	0.08	2,101.80	0.11		
2,099.80	0.08	2,101.84	0.11		
2,099.84	0.08	2,101.88	0.12		
2,099.88	0.08	2,101.92	0.12		
2,099.92	0.08	2,101.96	0.12		
2,099.96	0.08	2,102.00	0.12		
2,100.00	0.08	2,102.04	0.12		

NOAA Atlas 14, Volume 2, Version 3
Location name: Blacksburg, Virginia, USA*
Latitude: 37.242°, Longitude: -80.4246°
Elevation: 2109.03 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.295 (0.267-0.326)	0.352 (0.319-0.390)	0.422 (0.381-0.467)	0.472 (0.425-0.522)	0.534 (0.477-0.590)	0.576 (0.511-0.638)	0.617 (0.543-0.686)	0.654 (0.570-0.731)	0.699 (0.600-0.787)	0.731 (0.620-0.829)
10-min	0.471 (0.427-0.521)	0.563 (0.509-0.623)	0.676 (0.611-0.748)	0.755 (0.680-0.835)	0.851 (0.760-0.940)	0.917 (0.814-1.01)	0.981 (0.863-1.09)	1.04 (0.904-1.16)	1.11 (0.949-1.24)	1.15 (0.976-1.31)
15-min	0.589 (0.534-0.652)	0.708 (0.640-0.784)	0.855 (0.772-0.946)	0.956 (0.861-1.06)	1.08 (0.964-1.19)	1.16 (1.03-1.29)	1.24 (1.09-1.38)	1.31 (1.14-1.46)	1.39 (1.19-1.57)	1.44 (1.23-1.64)
30-min	0.808 (0.731-0.893)	0.978 (0.885-1.08)	1.22 (1.10-1.35)	1.39 (1.25-1.53)	1.60 (1.43-1.77)	1.75 (1.55-1.94)	1.90 (1.67-2.11)	2.04 (1.78-2.27)	2.21 (1.90-2.49)	2.34 (1.98-2.65)
60-min	1.01 (0.912-1.11)	1.23 (1.11-1.36)	1.56 (1.41-1.72)	1.80 (1.62-1.99)	2.13 (1.90-2.35)	2.37 (2.10-2.62)	2.62 (2.30-2.91)	2.86 (2.49-3.19)	3.18 (2.73-3.58)	3.41 (2.90-3.87)
2-hr	1.17 (1.06-1.29)	1.42 (1.29-1.57)	1.81 (1.64-2.00)	2.11 (1.90-2.32)	2.50 (2.24-2.76)	2.80 (2.49-3.10)	3.11 (2.74-3.45)	3.41 (2.98-3.81)	3.82 (3.28-4.31)	4.13 (3.49-4.69)
3-hr	1.25 (1.14-1.38)	1.52 (1.39-1.68)	1.93 (1.75-2.12)	2.24 (2.03-2.46)	2.66 (2.39-2.92)	2.98 (2.66-3.29)	3.31 (2.93-3.67)	3.65 (3.19-4.06)	4.10 (3.52-4.61)	4.44 (3.76-5.04)
6-hr	1.54 (1.42-1.69)	1.86 (1.71-2.03)	2.32 (2.14-2.54)	2.70 (2.47-2.95)	3.22 (2.92-3.52)	3.64 (3.27-3.99)	4.08 (3.62-4.49)	4.54 (3.97-5.02)	5.18 (4.43-5.79)	5.69 (4.77-6.42)
12-hr	1.86 (1.72-2.04)	2.24 (2.07-2.45)	2.80 (2.58-3.05)	3.26 (2.99-3.56)	3.92 (3.56-4.28)	4.48 (4.01-4.89)	5.08 (4.48-5.57)	5.72 (4.96-6.32)	6.66 (5.62-7.45)	7.44 (6.14-8.40)
24-hr	2.27 (2.11-2.45)	2.75 (2.55-2.96)	3.48 (3.23-3.74)	4.08 (3.78-4.39)	4.95 (4.56-5.32)	5.68 (5.20-6.10)	6.47 (5.88-6.94)	7.32 (6.59-7.85)	8.55 (7.60-9.21)	9.59 (8.43-10.3)
2-day	2.70 (2.52-2.90)	3.26 (3.04-3.51)	4.11 (3.82-4.42)	4.80 (4.45-5.15)	5.77 (5.32-6.19)	6.58 (6.04-7.06)	7.44 (6.78-7.99)	8.36 (7.56-8.98)	9.67 (8.64-10.4)	10.7 (9.50-11.6)
3-day	2.86 (2.68-3.08)	3.46 (3.23-3.72)	4.35 (4.06-4.67)	5.07 (4.71-5.44)	6.09 (5.63-6.51)	6.92 (6.37-7.41)	7.81 (7.14-8.37)	8.75 (7.93-9.39)	10.1 (9.04-10.9)	11.2 (9.92-12.1)
4-day	3.03 (2.84-3.25)	3.66 (3.43-3.92)	4.60 (4.29-4.92)	5.34 (4.98-5.72)	6.40 (5.93-6.84)	7.26 (6.70-7.76)	8.17 (7.50-8.75)	9.14 (8.31-9.79)	10.5 (9.44-11.3)	11.6 (10.3-12.6)
7-day	3.53 (3.30-3.79)	4.25 (3.98-4.56)	5.27 (4.92-5.65)	6.08 (5.67-6.52)	7.20 (6.68-7.71)	8.10 (7.48-8.67)	9.03 (8.31-9.69)	10.0 (9.14-10.8)	11.4 (10.3-12.2)	12.5 (11.1-13.5)
10-day	4.07 (3.81-4.34)	4.88 (4.57-5.21)	5.96 (5.58-6.36)	6.79 (6.34-7.24)	7.91 (7.36-8.43)	8.78 (8.15-9.36)	9.67 (8.93-10.3)	10.6 (9.71-11.3)	11.8 (10.7-12.6)	12.7 (11.5-13.7)
20-day	5.53 (5.22-5.86)	6.58 (6.21-6.96)	7.87 (7.43-8.33)	8.88 (8.36-9.39)	10.2 (9.60-10.8)	11.3 (10.6-11.9)	12.3 (11.5-13.1)	13.4 (12.4-14.2)	14.8 (13.6-15.8)	15.9 (14.5-17.0)
30-day	6.87 (6.50-7.26)	8.13 (7.68-8.58)	9.54 (9.02-10.1)	10.6 (10.0-11.2)	12.0 (11.3-12.7)	13.0 (12.2-13.8)	14.1 (13.2-14.9)	15.1 (14.0-15.9)	16.3 (15.2-17.4)	17.3 (16.0-18.4)
45-day	8.70 (8.26-9.16)	10.2 (9.71-10.8)	11.8 (11.2-12.5)	13.0 (12.3-13.7)	14.5 (13.7-15.3)	15.7 (14.8-16.5)	16.7 (15.7-17.6)	17.7 (16.6-18.7)	19.0 (17.7-20.1)	19.9 (18.5-21.1)
60-day	10.5 (9.96-11.0)	12.3 (11.7-12.9)	14.0 (13.3-14.7)	15.3 (14.5-16.0)	16.8 (16.0-17.7)	18.0 (17.0-18.9)	19.0 (18.0-20.0)	20.0 (18.8-21.0)	21.1 (19.9-22.3)	22.0 (20.6-23.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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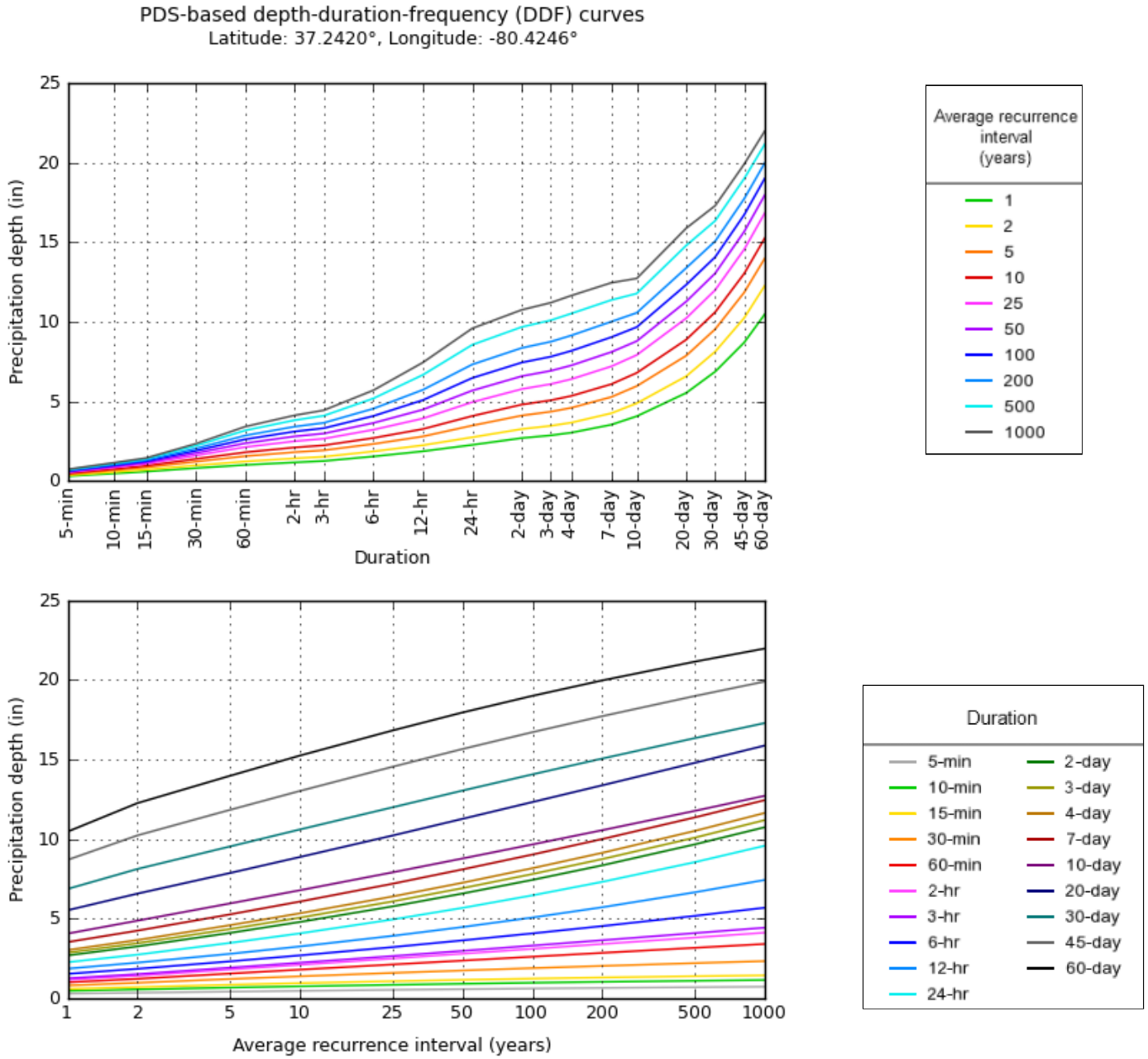
PF graphical



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Tue Jun 11 14:19:33 2019

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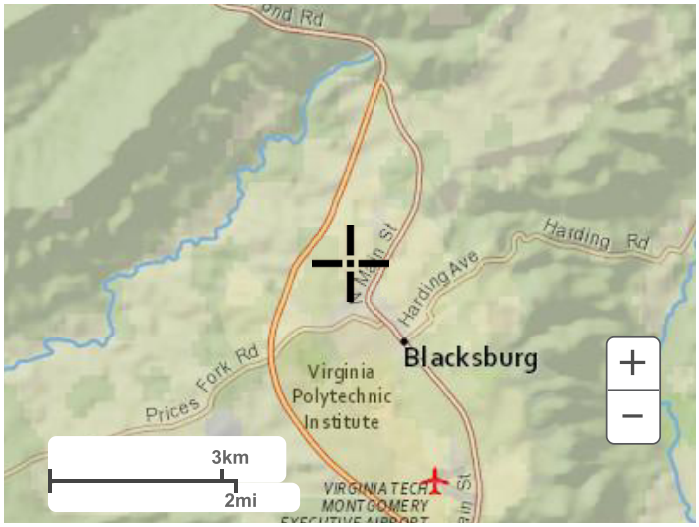
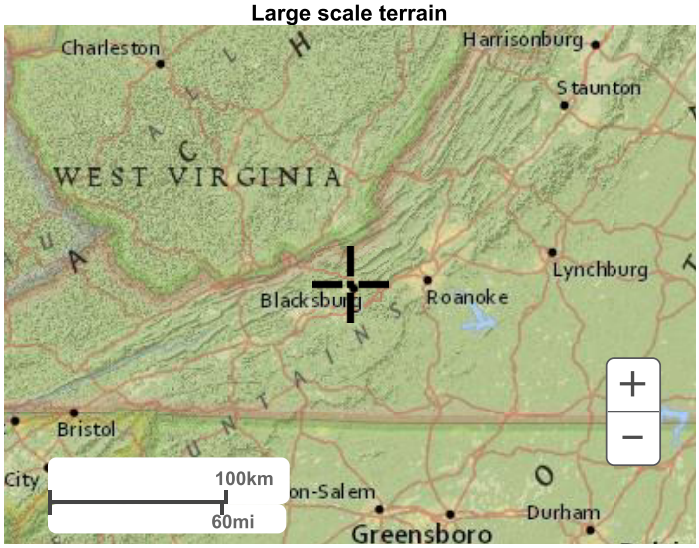
Maps & aerials

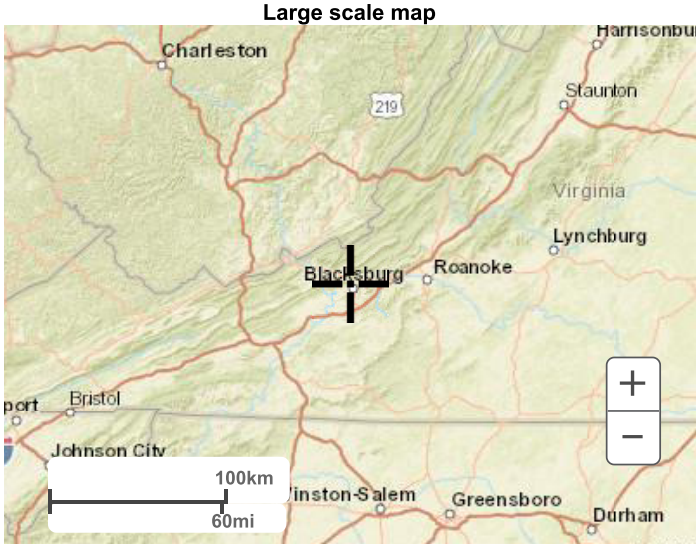
Small scale terrain



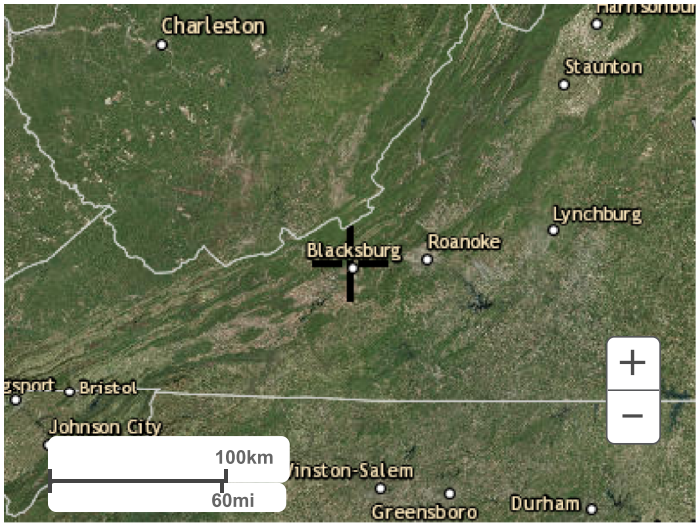
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

PROJECT INFORMATION	
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ADS SALES REP:	DAVID CAMDEN 434-238-4751 DAVID.CAMDEN@ADS-PIPE.COM
PROJECT NO:	S138729

ADVANCED DRAINAGE SYSTEMS, INC.

FOR STORMTECH INSTRUCTIONS, DOWNLOAD THE INSTALLATION APP

STONEGATE IV - BLACKSBURG

BLACKSBURG - VA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - THIS PROJECT REQUIRES COMPACTION OF EMBEDMENT STONE AND REQUIREMENTS FOR STONE HARDNESS AND SHAPE WHICH ARE NOT SPECIFIED IN OTHER STORMTECH DOCUMENTS. CONTRACTORS MUST FOLLOW THE SPECIAL PROVISIONS IN THIS PLAN SET.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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PROPOSED LAYOUT

35	STORMTECH MC-3500 CHAMBERS
12	STORMTECH MC-3500 END CAPS
12	STONE ABOVE (in)
30	STONE BELOW (in)
40	% STONE VOID
7,446	**INSTALLED SYSTEM VOLUME (CF) ABOVE ELEVATION 2098.00(PERIMETER STONE INCLUDED)**
2,286	SYSTEM AREA (ft²)
207	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS

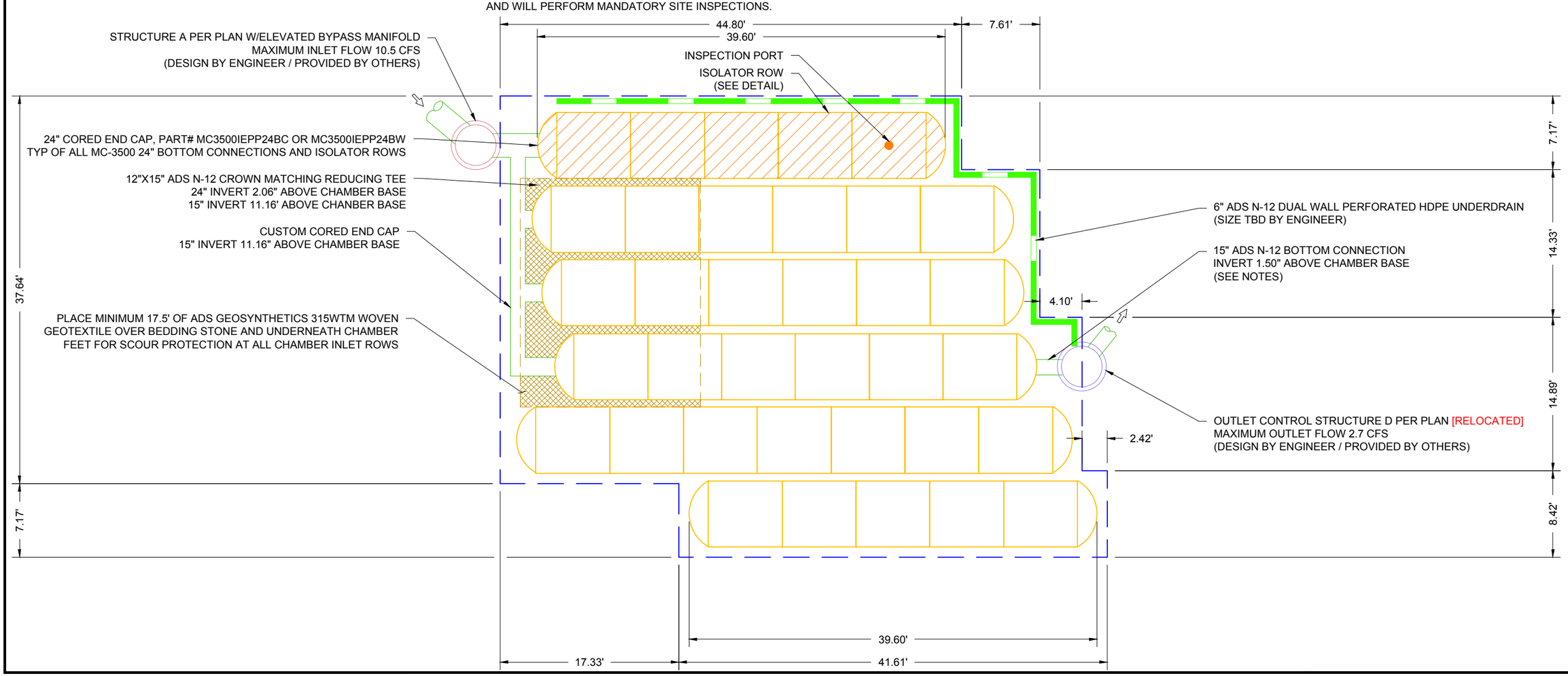
2114.50	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
2105.00	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
2104.00	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
2104.00	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
2104.00	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
2103.50	TOP OF STONE
2102.50	TOP OF MC-3500 CHAMBER
2099.68	15" TOP MANIFOLD INVERT
2098.92	24" ISOLATOR ROW CONNECTION INVERT
2098.90	15" BOTTOM CONNECTION INVERT
2098.75	BOTTOM OF MC-3500 CHAMBER
2098.00	UNDERDRAIN INVERT
2096.25	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE SLOPE AND CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON THE SLOPE'S INTEGRITY.

TIER 1 DEEP COVER SPECIAL PROVISIONS

1. INSTALLATION REQUIREMENTS SHALL BE AS SPECIFIED IN THE STORMTECH DESIGN MANUALS AND CONSTRUCTION GUIDES EXCEPT AS MODIFIED IN THESE SPECIAL PROVISIONS.
2. ATTENTION IS CALLED TO "TABLE 1 - ACCEPTABLE FILL MATERIALS" IN THE STORMTECH CONSTRUCTION GUIDE AND ALL OTHER APPEARANCES OF THE THE "ACCEPTABLE FILL MATERIALS TABLE. FOR AREAS OF THE SYSTEM WITH COVER ABOVE 7 FEET (2.1 m) FOR THE MC-4500 AND ABOVE 8 FEET (2.4 m) FOR THE MC-3500, EMBEDMENT STONE SHALL BE COMPACTED WITH 1 PASS OF A WALK BEHIND VIBRATORY PLATE COMPACTOR OR JUMPING JACK IN 12" (300 mm) LIFTS.
3. STONE SHALL BE GENERALLY UNIFORM IN SHAPE. FLAT OR ELONGATED STONE IS UNACCEPTABLE. FOR DESCRIPTIONS OF ANGULARITY SEE ASTM D2488 “STANDARD PRACTICE FOR DESCRIPTION AND IDENTIFICATION OF SOILS (VISUAL-MANUAL PROCEDURE)”.
4. STONE SHALL BE HARD AND DURABLE. IT IS THE ENGINEER'S OR CONTRACTOR'S RESPONSIBILITY TO SELECT HARD AND DURABLE STONE. STORMTECH CONSIDERS AN LA ABRASION VALUE OF LESS THAN OR EQUAL TO 30 TO BE HARD STONE.
5. FOUNDATION STONE SHALL BE MECHANICALLY COMPACTED WITH A VIBRATORY ROLLER OR VIBRATORY PLATE IN 6” (152 mm) LIFTS.
6. EMBEDMENT STONE MUST BE DUMPED IN PLACE BY A STONE SHOOTER OR CONVEYOR OR EXCAVATOR.
7. MANIFOLD PIPE INSERTION MUST EXTEND A MINIMUM OF 5' INTO CHAMBER END CAPS.
8. INSPECTION DURING THE INSTALLATION BY THE ENGINEER, OWNER OR OTHER REPRESENTATIVE IS RECOMMENDED. THE INSPECTION SHALL INCLUDE OBSERVATIONS OF THE CHAMBER SYMMETRY DURING BACKFILLING TO ENSURE THE CONTRACTOR'S METHODS ARE NOT CAUSING UNACCEPTABLE DISTORTION OF THE CHAMBERS.
9. AN ADS FIELD TECHNICIAN WILL CONDUCT A PRECONSTRUCTION MEETING TO TRAIN ALL REPRESENTATIVES INSPECTING THE PROJECT AND WILL PERFORM MANDATORY SITE INSPECTIONS.



STONEGATE IV - BLACKSBURG
BLACKSBURG - VA

DATE: 6-20-19 DRAWN: RJW
PROJECT #: S138729 CHECKED: ALS

DATE	DRWN	CHKD	DESCRIPTION

StormTech® Detention•Retention•Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
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ADS® ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

0 10' 20'

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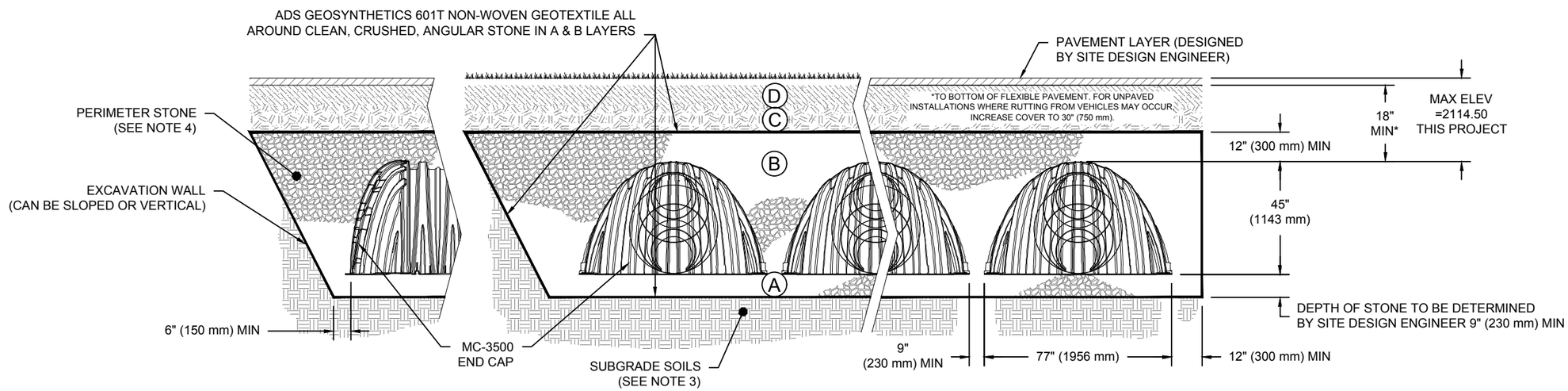
ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	COMPACTION REQUIRED. SEE SPECIAL REQUIREMENTS ON LAYOUT PAGE.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



STONEGATE IV - BLACKSBURG SPECIFIC CROSS SECTION

NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

STONEGATE IV - BLACKSBURG
BLACKSBURG - VA
DATE: 6-20-19 DRAWN: RJW
PROJECT #: S138729 CHECKED: ALS

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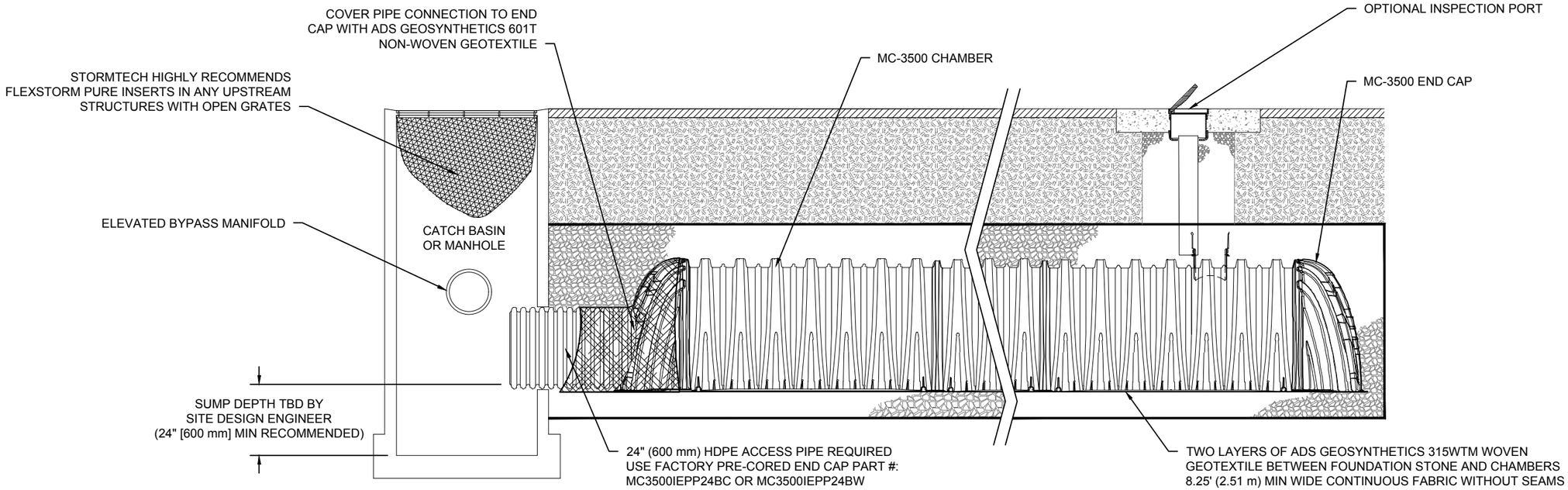


MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

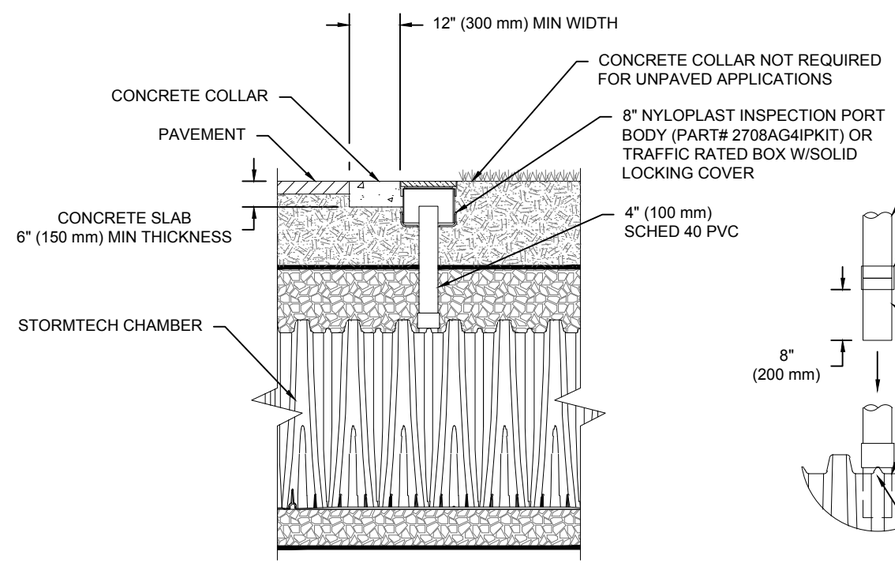
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

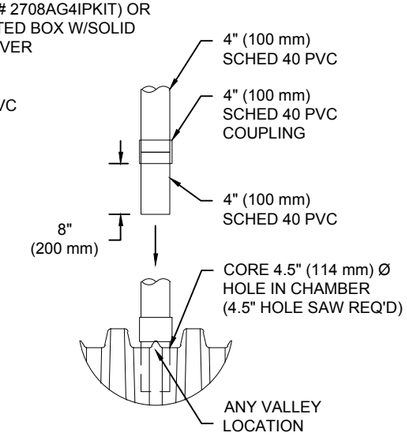
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTES:
1. INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.
2. ALL SCHEDULE 40 FITTINGS TO BE SOLVENT CEMENTED (4" PVC NOT PROVIDED BY ADS).

4" PVC INSPECTION PORT DETAIL
NTS



CONNECTION DETAIL
NTS

STONEGATE IV - BLACKSBURG
BLACKSBURG - VA
DATE: 6-20-19 DRAWN: RJW
PROJECT #: S138729 CHECKED: ALS

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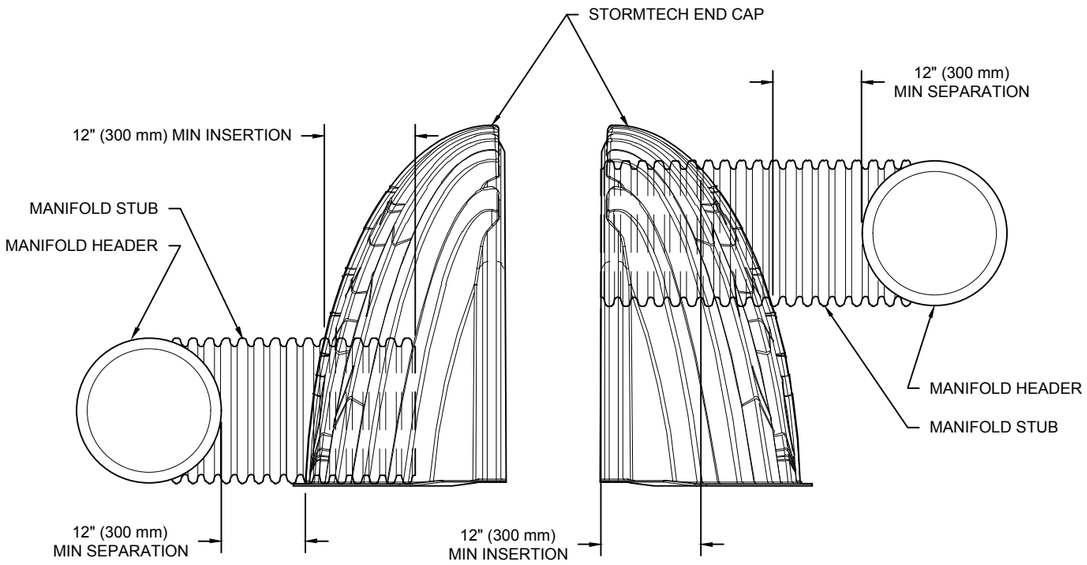
MC-SERIES END CAP INSERTION DETAIL

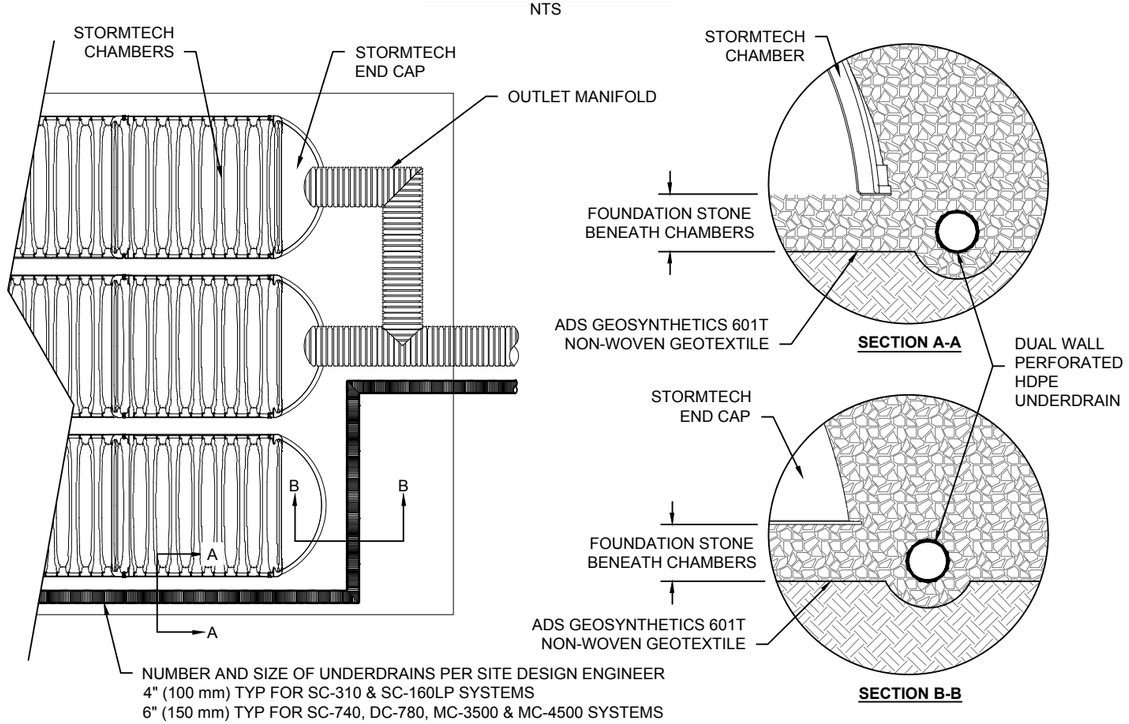
NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

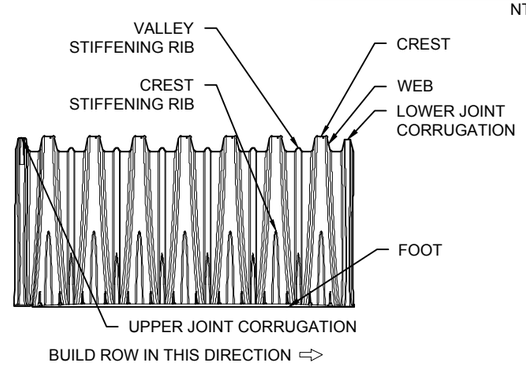
UNDERDRAIN DETAIL

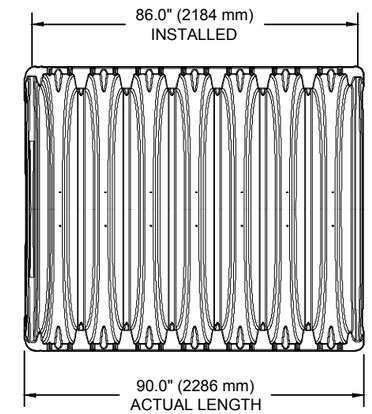
NTS

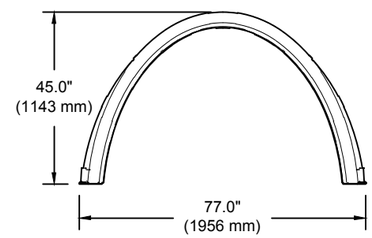


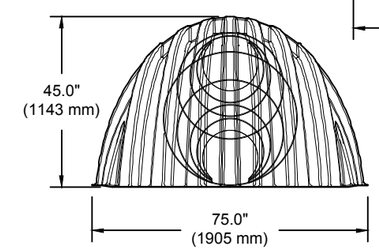
MC-3500 TECHNICAL SPECIFICATION

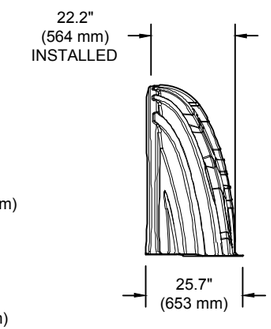
NTS











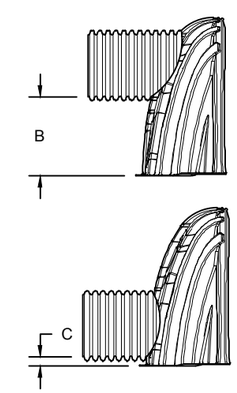
NOMINAL CHAMBER SPECIFICATIONS		
SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	178.9 CUBIC FEET	(5.06 m³)
WEIGHT	134 lbs.	(60.8 kg)
NOMINAL END CAP SPECIFICATIONS		
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	46.0 CUBIC FEET	(1.30 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

STONEGATE IV - BLACKSBURG
BLACKSBURG - VA

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- VRRM Spreadsheet

DEQ Virginia Runoff Reduction Method New Development Compliance Spreadsheet - **Version 3.0**

○ 2011 BMP Standards and Specifications | ⊙ 2013 Draft BMP Standards and Specifications

Project Name:	**Stonegate Apartments IV**
Date:	**12/2/2019**

BMP Design Specifications List: 2013 Draft Stds & Specs

CLEAR ALL

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed			0.69		0.69
Impervious Cover (acres)			0.80		0.80
					1.49

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**1.48**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary

Forest/Open Space Cover (acres)	0.00
Weighted Rv (forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.69
Weighted Rv (turf)	0.22
% Managed Turf	46%
Impervious Cover (acres)	0.80
Rv (impervious)	0.95
% Impervious	54%
Site Area (acres)	**1.49**
Site Rv	**0.61**

Treatment Volume and Nutrient Loads

Treatment Volume (acre-ft)	0.0763
Treatment Volume (cubic feet)	3,324
TP Load (lb/yr)	2.09
TN Load (lb/yr) (Informational Purposes Only)	14.94

Drainage Area A

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)			0.22		0.22	0.22
Impervious Cover (acres)			0.80		0.80	0.95
				Total	1.02	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	1.85
Post Development Treatment Volume in D.A. A (ft^3)	2,945

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
1. Vegetated Roof (RR)													
1.a. Vegetated Roof #1 (Spec #5)	45				0	0	0	0		0.00	0.00	0.00	
1.b. Vegetated Roof #2 (Spec #5)	60				0	0	0	0		0.00	0.00	0.00	
2. Rooftop Disconnection (RR)													
2.a. Simple Disconnection to A/B Soils (Spec #1)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.b. Simple Disconnection to C/D Soils (Spec #1)	25			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.d. To Dry Well or French Drain #1, Micro-Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.e. To Dry Well or French Drain #2, Micro-Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.f. To Rain Garden #1, Micro-Bioretention #1 (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.g. To Rain Garden #2, Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
2.h. To Rainwater Harvesting (Spec #6)	0			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.i. To Stormwater Planter, Urban Bioretention (Spec #9, Appendix A)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45			0	0	0	0	25	0.00	0.00	0.00	0.00	
3.b. Permeable Pavement #2 (Spec #7)	75				0	0	0	25		0.00	0.00	0.00	
4. Grass Channel (RR)													
4.a. Grass Channel A/B Soils (Spec #3)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.b. Grass Channel C/D Soils (Spec #3)	10			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
5. Dry Swale (RR)													
5.a. Dry Swale #1 (Spec #10)	40			0	0	0	0	20	0.00	0.00	0.00	0.00	
5.b. Dry Swale #2 (Spec #10)	60			0	0	0	0	40	0.00	0.00	0.00	0.00	
6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	

	Nitrogen Removal Efficiency (%)	Nitrogen Load from Upstream Practices (lbs)	Untreated Nitrogen Load to Practice (lbs)	Nitrogen Removed By Practice (lbs)	Remaining Nitrogen Load (lbs)
1. Vegetated Roof (RR)					
1.a. Vegetated Roof #1 (Spec #5)	0		0.00	0.00	0.00
1.b. Vegetated Roof #2 (Spec #5)	0		0.00	0.00	0.00
2. Rooftop Disconnection (RR)					
2.a. Simple Disconnection to A/B Soils (Spec #1)	0	0.00	0.00	0.00	0.00
2.b. Simple Disconnection to C/D Soils (Spec #1)	0	0.00	0.00	0.00	0.00
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)	0	0.00	0.00	0.00	0.00
2.d. To Dry Well or French Drain #1, Micro-Infiltration #1 (Spec #8)	15	0.00	0.00	0.00	0.00
2.e. To Dry Well or French Drain #2, Micro-Infiltration #2 (Spec #8)	15	0.00	0.00	0.00	0.00
2.f. To Rain Garden #1, Micro-Bioretention #1 (Spec #9)	40	0.00	0.00	0.00	0.00
2.g. To Rain Garden #2, Micro-Bioretention #2 (Spec #9)	60	0.00	0.00	0.00	0.00
2.h. To Rainwater Harvesting (Spec #6)	0	0.00	0.00	0.00	0.00
2.i. To Stormwater Planter, Urban Bioretention (Spec #9, Appendix A)	40	0.00	0.00	0.00	0.00
3. Permeable Pavement (RR)					
3.a. Permeable Pavement #1 (Spec #7)	25	0.00	0.00	0.00	0.00
3.b. Permeable Pavement #2 (Spec #7)	25		0.00	0.00	0.00
4. Grass Channel (RR)					
4.a. Grass Channel A/B Soils (Spec #3)	20	0.00	0.00	0.00	0.00
4.b. Grass Channel C/D Soils (Spec #3)	20	0.00	0.00	0.00	0.00
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)	20	0.00	0.00	0.00	0.00
5. Dry Swale (RR)					
5.a. Dry Swale #1 (Spec #10)	25	0.00	0.00	0.00	0.00
5.b. Dry Swale #2 (Spec #10)	35	0.00	0.00	0.00	0.00
6. Bioretention (RR)					
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.00	0.00	0.00	0.00
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	60	0.00	0.00	0.00	0.00

7. Infiltration (RR)													
7.a. Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
8. Extended Detention Pond (RR)													
8.a. ED #1 (Spec #15)	0			0	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	15			0	0	0	0	15	0.00	0.00	0.00	0.00	
9. Sheetflow to Filter/Open Space (RR)													
9.a. Sheetflow to Conservation Area, A/B Soils (Spec #2)	75			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.b. Sheetflow to Conservation Area, C/D Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	

7. Infiltration (RR)				
15	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00
8. Extended Detention Pond (RR)				
10	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00
9. Sheetflow to Filter/Open Space (RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL RUNOFF REDUCTION IN D.A. A (ft^3)	0	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	1.85	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	1.85	

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

TOTAL RUNOFF REDUCTION IN D.A. A (ft^3)	0
NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00

SEE WATER QUALITY COMPLIANCE TAB FOR SITE CALCULATIONS (Information Only)

10. Wet Swale (no RR)													
10.a. Wet Swale #1 (Spec #11)	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
10.b. Wet Swale #2 (Spec #11)	0			0	0	0	0	40	0.00	0.00	0.00	0.00	
11. Filtering Practices (no RR)													
11.a.Filtering Practice #1 (Spec #12)	0			0	0	0	0	60	0.00	0.00	0.00	0.00	
11.b. Filtering Practice #2 (Spec #12)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
12. Constructed Wetland (no RR)													
12.a.Constructed Wetland #1 (Spec #13)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
12.b. Constructed Wetland #2 (Spec #13)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13. Wet Ponds (no RR)													
13.a. Wet Pond #1 (Spec #14)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
13.b. Wet Pond #1 (Coastal Plain) (Spec #14)	0			0	0	0	0	45	0.00	0.00	0.00	0.00	
13.c. Wet Pond #2 (Spec #14)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0	0.22	0.80	0	0	2,945	2,945	20	0.00	1.85	0.37	1.48	

10. Wet Swale (Coastal Plain) (no RR)				
25	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00
11. Filtering Practices (no RR)				
30	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00
12. Constructed Wetland (no RR)				
25	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00
13. Wet Ponds (no RR)				
30	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00
14. Manufactured BMP (no RR)				
0	0.00	0.00	0.00	0.00
0	0.00	13.22	0.00	13.22

14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00		0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac)	0.80	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.22	AREA CHECK: OK.
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)	1.48	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	1.85	
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.37	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00	
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)	0.37	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)	1.48	

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)	0.00