

Stormwater Management Report

Vessel Multi-Family Development

446 Hopmeadow Street
Simsbury, CT 06089

December 16, 2022
Revised: February 24, 2023

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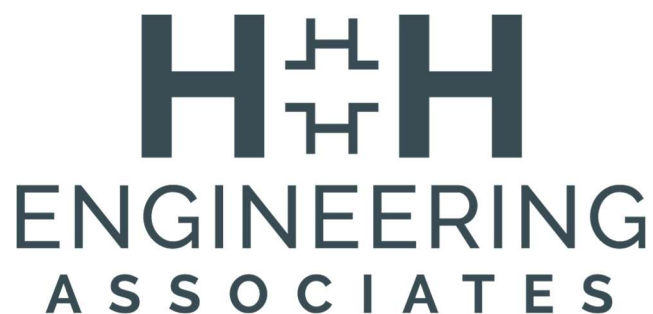


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1. INTRODUCTION

The project is located at 446 Hopmeadow Street (U.S. Route 202/CT Route 10) in Simsbury, Connecticut (hereinafter referred to as the "Site") and is identified as Lot N003C on Tax Assessor's Map G13, Block 142. The Site is located on the east side of Hopmeadow Street, approximately 200 feet north of the intersection of Hopmeadow Street and Powder Forest Drive. The Site is 1.96 acres with 149.9 linear feet of frontage along Hopmeadow Street and is currently developed as a single-family residence (see Figure 1 – Site Location Map). The Site is located in the High Density Residential 'R-15' Zoning District. Adjacent properties are located in the High Density Residential 'R-15' Zone, the Low Density Residential 'R-40' Zone, the Planned Area Development 'PAD' Zone, and the Designed Multiple Residence 'RD' Zone. Existing topography on site is moderate with contours ranging from elevation 102 along the southern property line, to elevation 84 along the northern property line. Per NRCS soil mapping, the underlying soil consists of Hinckley loamy sand (Hydrologic Group A). The Site is not located within a FEMA Flood Hazard Zone (see Figure 2 – Firmette Map).

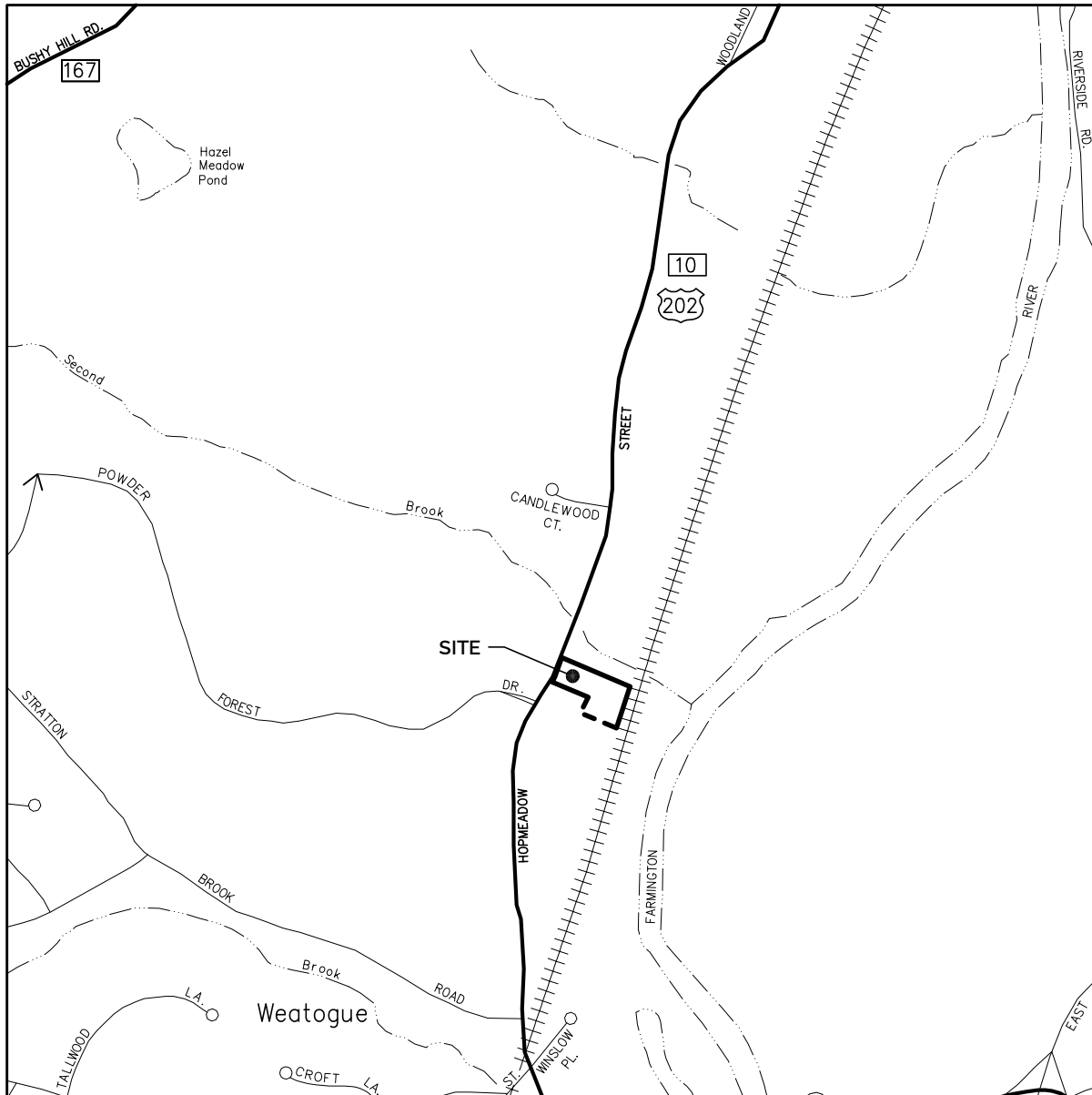
The proposed development consists of the construction of a new four-story 14,063 square-foot multi-family residential building, consisting of 77 one-bedroom units (575 square-feet) and 3 two-bedroom units (1,048 square-feet). Site improvements will include a new two-way access drive from Hopmeadow Street, a new 95 vehicle parking lot, new sanitary sewer, water, and electrical service connections, new landscaping improvements, and a new stormwater management system.

This report presents the basis of the project hydrologic and hydraulic analysis of the site, the design for the new site drainage systems, and Best Management Practices (BMPs) incorporated into the site design to manage and treat stormwater runoff in accordance with the 2004 CT DEEP Stormwater Quality Manual (SQM) and the Town of Simsbury Zoning Regulations.

2. PURPOSE OF REPORT

This report presents the basis of design for stormwater management including drainage and stormwater treatment. The report demonstrates that the development:

- Does not increase peak rates of runoff from watersheds encompassing the new buildings and parking areas.
- Does not degrade the quality of receiving groundwater, waterbodies, or watercourses.
- Complies with the 2004 CT DEEP SQM and the Town of Simsbury Stormwater Management Standards to the greatest extent practicable.



PROJECT NO. 2022-0013	SCALE: 1"=1,000'
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**STORMWATER REPORT -
SITE LOCATION MAP**

VESSEL MULTI-FAMILY HOUSING
446 HOPMEADOW STREET, SIMSBURY, CT 06089

VESSEL TECHNOLOGIES, INC.
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ENGINEERING
ASSOCIATES**

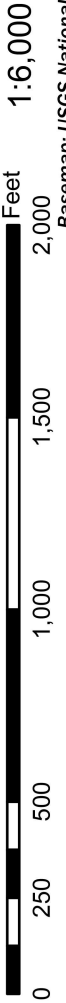
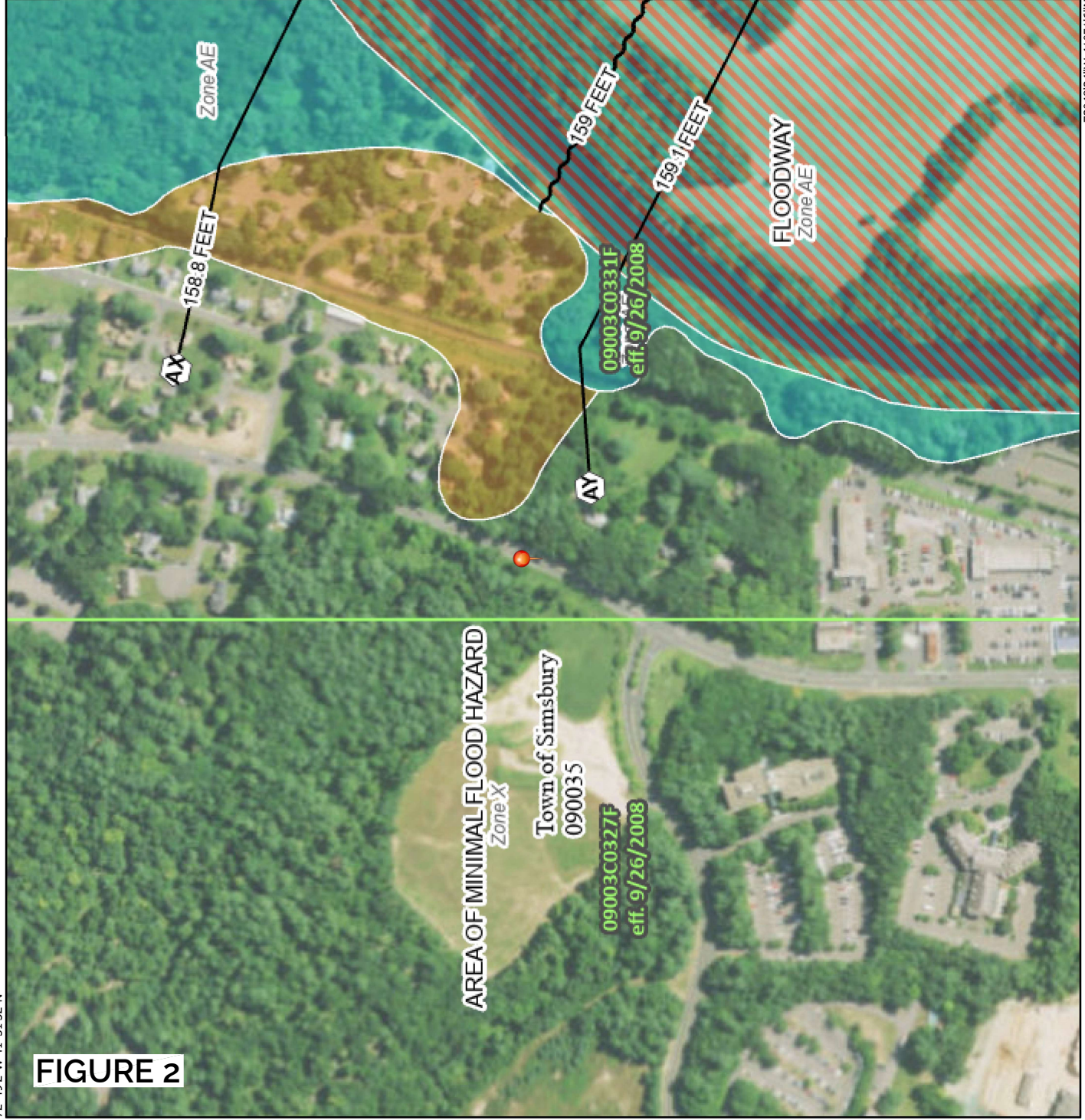
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National Flood Hazard Layer FIRMette



72°49'2"W 41°51'32"N

FIGURE 2



72°48'24"W 41°51'16"N

Basemap: USGS National Map; Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
Zone A, V, A99
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN *Zone X*
- Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs *Zone D*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **8/22/2022 at 1:44 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

3. BASIS OF DESIGN

The layout, grading and drainage design for the project are shown on the Site Development Plans. The basis of the grading and drainage design is as follows:

1. Rainfall data is from the National Weather Service NOAA Atlas 14, Volume 10, Version 3.
2. Drainage systems are designed to meet or exceed the water quality and peak rate of runoff goals established in the CT DEEP SQM.
3. Stormwater treatment Best Management Practices (BMPs) are designed to remove pollutants, such as nutrients, solids, metals, pathogens, pesticides, and hydrocarbons from stormwater runoff and to reduce temperatures of runoff from paved surfaces during hot weather.
4. Pretreatment of runoff for the removal of sediments, oil and grease will be accomplished using deep sump catch basins and outlet hoods.
5. BMPs for this project include an underground infiltration system with isolator rows designed to infiltrate the runoff generated from the proposed parking lot, a bioretention basin designed to treat and infiltrate the runoff generated from the building rooftop, and two separate drywells/basins designed to capture and infiltrate off-site runoff entering the Site.

4. HYDROLOGIC AND HYDRAULIC METHODS

The methods described in Urban Hydrology for Small Watersheds, 2nd Edition, (Technical Release Number 55 [TR-55]) from the Natural Resources Conservation Service (formerly the Soil Conservation Service – [SCS], 1986) were used to calculate stormwater peak-flow generated from pre- and post-development conditions. These methods, which are incorporated into the HydroCAD computer software program, use well documented procedures to calculate stormwater runoff volume, peak-flow rate of discharge, hydrographs and storage volumes required for floodwater reservoirs in small watersheds. The method uses the SCS Runoff Curve Number method to estimate runoff volume, calculate times of concentration, produce tabular hydrographs, and estimate basin storage capacity. Output data from all computer analysis and design are provided in the Technical Appendix.

This report presents the basis of the hydrologic and hydraulic analysis and design of the stormwater management including drainage and stormwater treatment systems completed in accordance with the Connecticut Department of Transportation Drainage Manual (Drainage Manual). The report also presents a Stormwater Management Plan prepared in accordance, to the greatest extent practical, with the 2004 CT DEEP SQM. Times of concentration applicable to the pre- and post-development were developed using the NRCS-velocity method. A minimum time of concentration of 5 minutes was used for paved surfaces and 10 minutes for vegetated areas.

5. STORMWATER MANAGEMENT

The existing site is developed as a single-family residence and includes buildings, a paved driveway, walkways, and lawn and wooded areas. Site improvements will increase impervious areas, resulting in rate and volume increases of stormwater runoff from the Site. Hydrologic analyses of pre- and post-development conditions were completed to assess these increases and to design mitigation measures for water quality and to reduce post-development discharges.

5.1 Existing Condition Drainage Areas and Analysis Points

The existing drainage pattern for the site in the vicinity of the proposed improvements is characterized by one drainage area that drains to the north toward Second Brook and the associated wetland, as shown on Figure 3 – Pre-Development Drainage Area Map, and described as follows:

- **DA1:** Approximately 4.67 acres of land, currently developed as multiple single-family residences, and includes 2.48 acres of lawn, 1.78 acres of woods, 0.39 acres of impervious surfaces (rooftops, pavement), and 0.02 acres of gravel.
- **Drainage Analysis Point 1:** The drainage analysis point is the southern edge of the off-site wetland to the north of the Site.

5.2 Proposed Condition Drainage Areas

The proposed development results in the modification of the drainage areas along with changes in impervious coverage (building rooftop, pavement surfaces and concrete surfaces). These conditions are shown on Figure 4 – Post-Development Drainage Area Map, and described as follows:

- **DA1:** For analysis purposes, the proposed condition DA1 was subdivided into 2 subareas.
 - **DA1A:** Approximately 1.37 acres of land, located mostly offsite, consisting of 0.67 acres of lawn, 0.55 acres of woods and 0.15 acres of impervious surfaces that drain to Stormwater Management Area C (drywell and basin).
 - **DA1B:** Approximately 0.31 acres of land, located mostly offsite, consisting of 0.20 acres of lawn, 0.07 acres of woods and 0.05 acres of impervious surfaces that is captured on site by a new curtain and directed to Stormwater Management Area C.
- **DA2:** For analysis purposes, the proposed condition DA2 was subdivided into 2 subareas.
 - **DA2A:** Approximately 0.32 acres of new building rooftop that is directed to Stormwater Management Area B (bioretention basin).
 - **DA2B:** Approximately 0.26 acres of land, located partially offsite, consisting of 0.23 acres of lawn, and 0.03 of wood that drains to Stormwater Management Area B,

- **DA3:** Approximately 0.29 acres of land, located mostly offsite and along Hopmeadow Street, consisting of 0.13 acres of lawn, 0.13 acres of woods, and 0.03 acres of impervious surfaces that drain to Stormwater Management Area D (drywell and basin).
- **DA4:** Approximately 1.02 acres of land consisting of 0.87 acres of new pavement and walkways, 0.13 acres of lawn, and 0.03 acres of woods that drain to Stormwater Management Area A (ADS Stormtech SC-3500).
- **DA5:** Approximately 1.09 acres of land north and east of the proposed improvements consisting of 0.44 acres of lawn, 0.64 acres of woods and 0.01 acres of impervious surfaces that drain to the wetland.

Modeling results for the existing and proposed conditions drainage areas are provided in Figure 5 – Stormwater Runoff Summary, and the hydrologic and hydraulic modeling parameters are provided in the HydroCAD printouts (Technical Appendix).

5.3 Proposed Condition Stormwater Management BMPs

For the post-development conditions, the intent of the proposed stormwater management improvements is to route stormwater runoff from new impervious surfaces through the proposed stormwater BMPs to provide water quality treatment, peak rate reduction, and promote groundwater recharge through infiltration. Additionally, runoff generated off-site that crosses onto the Site will be captured and infiltrated. Four separate Stormwater Management Areas are included in the design and are described below:

- **Stormwater Management Area A:** ADS Stormtech MC-3500 Underground Infiltration/Detention System with Isolator Rows – Catch basins within the parking lot direct the runoff from the parking area and roof (DA4) into the proposed ADS Stormtech MC-3500 infiltration/detention system, which will retain, attenuate and infiltrate stormwater runoff from the impervious areas and treat stormwater runoff through filtration using two isolator rows that are sized to treat in excess of the Water Quality Flow (WQF) and infiltrate through the 2-year storm event. The flow is directed into three separate Isolator Rows, which are a row of chambers wrapped in filter fabric which allow for sediment settling as stormwater fills the chamber and flows through the filter fabric and into the other chambers. The retained water in these chambers is then infiltrated back into the ground. Overflow from the chambers is directed to an outlet pipe and riprap apron located to the north.
- **Stormwater Management Area B:** Bioretention Basin – The stormwater runoff generated from the proposed building rooftop (DA2A) and a portion of the off-site runoff (DA2B) will be collected and discharged into the proposed Bioretention Basin which will retain, attenuate, and infiltrate stormwater runoff and treat stormwater runoff through plant filtration and infiltration. The Bioretention Basin is designed to infiltrate through the 50-year storm event. Overflow from the basin is directed to an outlet pipe and riprap apron located to the north. An overflow spillway is proposed to direct runoff away from the

building in case of emergency. The bioretention basin plantings are native and have been designed by a Landscape Architect.

- **Stormwater Management Area C:** Drywell and Collection Basin – Off-site stormwater runoff generated from the properties to the south continue onto the Site. A portion of this runoff (DA1A) is collected by a shallow detention basin surrounding a 6'(dia.) x 2'(h) concrete drywell which is designed to infiltrate stormwater runoff. The detention basin also provides stormwater storage capacity for larger storm events. Also within this Stormwater Management Area, a Curtain Drain is proposed to infiltrate off-site stormwater runoff entering the Site (DA1B) prior to reaching the proposed parking lot. The Drywell, Collection Basin and Curtain Drain are designed to infiltrate through the 100-year storm event. An overflow spillway is proposed to direct runoff away from the building in case of emergency.
- **Stormwater Management Area D:** Drywell and Collection Basin – Off-site stormwater runoff generated from the properties to the south (DA3) continue onto the Site. This runoff is collected by a shallow detention basin surrounding a 6'(dia.) x 4'(h) concrete drywell which is designed to infiltrate stormwater runoff. The detention basin also provides stormwater storage capacity for larger storm events. The Drywell and Collection Basin is designed to infiltrate through the 100-year storm event. An overflow spillway is proposed to direct runoff toward the on-site catchment system.

The Water Quality Volume & Water Quality Flow Calculations for Stormwater Management Areas A and B are included in the Technical Appendix. A summary of the stage and storage volume for Stormwater Management Areas A, B, C and D is included in Figure 6 – Stage-Storage Summaries.

5.4 Storm Drain System Outlet Locations

Stormwater Management Area A – Outflow from the ADS Stormtech MC-3500 system is directed through an outlet control structure and 12" HDPE pipe to a wooded area to the north which then sheetflows to the off-site inland wetland.

Stormwater Management Area B – Overflow from the bioretention pond is directed through an outlet control structure and 12" HDPE pipe to a wooded area to the north which then sheetflows to the off-site inland wetland. Emergency overflow is directed through a riprap spillway located on the eastern slope of the basin and directs flow to the east, away from the proposed building.

Stormwater Management Area C – Emergency overflow from the drywell and collection basin is directed through a riprap spillway located on the northern slope of the basin and directs flow toward Stormwater Management Area A.

Stormwater Management Area D – Emergency overflow from the drywell and collection basin is directed through a riprap spillway located on the western slope of the basin and directs flow toward Stormwater Management Area A.

PEAK RATE OF RUNOFF (CFS) SUMMARY			
STORM FREQUENCY	ANALYSIS POINT - EDGE OF WETLAND		
	EXISTING	PROPOSED	CHANGE
WQV	0.00	0.00	NO CHANGE
2-YEAR	0.01	0.00	NO CHANGE
10-YEAR	0.50	0.49	-0.01
25-YEAR	1.61	0.82	-0.79
100-YEAR	4.45	4.00	-0.45

RUNOFF VOLUME (CF) SUMMARY			
STORM FREQUENCY	ANALYSIS POINT - EDGE OF WETLAND		
	EXISTING	PROPOSED	CHANGE
WQV	0	0	NO CHANGE
2-YEAR	223	102	-121
10-YEAR	6,149	4,086	-2,063
25-YEAR	13,040	8,142	-4,898
100-YEAR	27,291	17,164	-10,127

REVISED: 2/24/2023

PROJECT NO. 2022-0013	SCALE: N.T.S.	STORMWATER REPORT - STORMWATER RUNOFF SUMMARY VESSEL MULTI-FAMILY HOUSING 446 HOPMEADOW STREET, SIMSBURY, CT 06089 VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	 232 Greenmanville Avenue Suite 201 Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com
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STORMWATER MANAGEMENT AREA 'A'
ADS STORMTECH SC-3500 INFILTRATION SYSTEM

STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)
WQV	85.05	47
2-YEAR	86.50	2,666
10-YEAR	87.67	5,342
25-YEAR	88.61	7,222
100-YEAR	89.50	8,559

ADS STORMTECH SC-3500 INFILTRATION SYSTEM ELEVATIONS:

TOP OF STONE ELEV. = 90.50
TOP OF CHAMBER ELEV. = 89.50
BOTTOM OF CHAMBER ELEV. = 85.75
BOTTOM OF STONE ELEV. = 85.00

OUTLET CONTROL STRUCTURE ELEVATIONS:
TOP OF FRAME (MANHOLE COVER) ELEV. = 92.65
RECTANGULAR WEIR INV. ELEV. = 89.30
4"x11" UPPER ORIFICE = 88.65
4" DIA. LOW-FLOW ORIFICE = 86.50
12" INV. OUT ELEV. = 85.80

EXFILTRATION RATE = 5.0 IN/HR

STORMWATER MANAGEMENT AREA 'B'
BIORETENTION BASIN

STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)
WQV	91.11	197
2-YEAR	91.66	1,310
10-YEAR	92.20	2,566
25-YEAR	92.60	3,580
100-YEAR	93.04	4,815

BIORETENTION BASIN ELEVATIONS:

TOP OF BERM ELEV. = 94.10
TOP OF SPILLWAY ELEV. = 93.25
BOTTOM OF BASIN ELEV. = 91.00

OUTLET CONTROL STRUCTURE ELEVATIONS:
TOP OF FRAME (CB GRATE) ELEV. = 93.00
12" INV. OUT ELEV. = 88.50

EXFILTRATION RATE = 2.0 IN/HR

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PROJECT NO. 2022-0013	SCALE: N.T.S.	STORMWATER REPORT - STORMWATER TREATMENT PRACTICES STAGE-STORAGE SUMMARIES VESSEL MULTI-FAMILY HOUSING 446 HOPMEADOW STREET, SIMSBURY, CT 06089 VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	 HHH ENGINEERING ASSOCIATES 232 Greenmanville Avenue Suite 201 Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com
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**STORMWATER MANAGEMENT AREA 'C'
DRYWELL AND COLLECTION BASIN**

STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)
WQV	88.60	0
2-YEAR	88.66	2
10-YEAR	92.62	240
25-YEAR	92.93	727
100-YEAR	93.62	2,536

DRYWELL ELEVATIONS:
 TOP OF FRAME (CB GRATE) ELEV. = 92.50
 BOTTOM OF DRYWELL ELEV. = 89.60
 BOTTOM OF STONE ELEV. = 88.60

COLLECTION BASIN ELEVATIONS:
 TOP OF BERM ELEV. = 94.80
 TOP OF SPILLWAY ELEV. = 93.80
 BOTTOM OF BASIN ELEV. = 92.50

EXFILTRATION RATE = 5.0 IN/HR

**STORMWATER MANAGEMENT AREA 'D'
DRYWELL AND COLLECTION BASIN**

STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)
WQV	90.10	0
2-YEAR	90.11	0
10-YEAR	94.08	169
25-YEAR	97.00	335
100-YEAR	98.05	635

DRYWELL ELEVATIONS:
 TOP OF FRAME (CB GRATE) ELEV. = 96.00
 BOTTOM OF DRYWELL ELEV. = 91.10
 BOTTOM OF STONE ELEV. = 90.10

COLLECTION BASIN ELEVATIONS:
 TOP OF BERM ELEV. = 100.10
 TOP OF SPILLWAY ELEV. = 99.10
 BOTTOM OF BASIN ELEV. = 96.00

EXFILTRATION RATE = 5.0 IN/HR

REVISED: 2/24/2023

PROJECT NO. 2022-0013	SCALE: N.T.S.	STORMWATER REPORT - STORMWATER TREATMENT PRACTICES STAGE-STORAGE SUMMARIES VESSEL MULTI-FAMILY HOUSING 446 HOPMEADOW STREET, SIMSBURY, CT 06089 VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	 232 Greenmanville Avenue Suite 201 Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com
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6. SOURCE CONTROL AND POLLUTION PREVENTION MAINTENANCE AND OPERATION

Source control and pollution prevention practices for this project are intended to eliminate the generation of pollutants at their source, reduce the types and concentration of pollutants in stormwater runoff and to assure that the BMPs continue to function to remove oil and grease and TSS. The site property managers will be responsible for maintaining the stormwater management system and the goal of this section is to inform managers about system operations.

The following maintenance and operation measures are recommended for source control.

Parking Lots

The access drive and parking areas shall be swept once per year, preferably after the end of the winter sanding season.

Landscaping

Normal landscaping maintenance shall consist of pruning, mulching, planting, mowing lawns, raking leaves, etc. Use of fertilizers and pesticides will be controlled and limited to minimal amounts necessary for healthy landscape maintenance.

Trees will be fertilized no more than once in the spring with an organic fertilizer. Shrubs and lawn will be fertilized with an organic slow-release fertilizer each spring. Liming of lawn areas to control pH will also be done in the spring if soil testing indicates that it is necessary.

Pesticides will only be used as a control method when a problem has been clearly identified and other natural control methods are not successful. All pesticide applications shall be by licensed applicators, where necessary.

Trash Collection

Trash receptacles service the facility, and dumpsters exist on-site. The pickup of trash will occur on a regular basis and all trash will be disposed of legally off-site.

Outdoor Storage

There will be no outdoor storage of hazardous chemicals, fertilizer, pesticides, or herbicides anywhere on site.

Snow Removal & Storage

Snow shall be shoveled and plowed from sidewalk and parking areas as soon as practical during and after winter storms and deposited in snow storage areas on the site or removed.

Catch Basins and Manholes

A Connecticut-Licensed hauler shall pump the sumps of onsite catch basins and manholes and shall dispose of the sand legally. Road sand may be reused for winter sanding but may not be

stored on-site. As part of the hauling contract, the hauler shall notify the property owner in writing where the material is being disposed.

For the first three years each catch basin and manhole shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. After the first three years the inspection schedule may be adjusted to meet actual operating conditions, however, one inspection shall always be conducted in April.

Stormtech underground infiltration systems and Isolator Rows

The Isolator rows shall be cleaned at the end of construction once the contributing areas are fully stabilized. For the first year of operation following construction, the chamber rows shall be inspected once every 6 months.

After the first year of operation, the chambers shall be inspected a minimum of once per year. If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of the sediment. When the average depth of accumulation exceeds 3", a clean-out should be performed and properly disposed off-site. Clean-out should be accomplished using a Jetvac process.

A detailed maintenance logbook shall be kept on-site for the units by the property owner/manager. Information is to include, but not be limited to, the date of inspection, record of sediment depth, general observations, and date of cleaning performed.

Maintenance of all Stormtech systems should follow all manufacturers' recommendations.

Bioretention Basin

The bioretention basin shall be inspected every six months and/or after storm events of 2 inches of rainfall or greater. Inspections shall include the following:

- Inspect filter media standing water or other evidence of clogging.
- Check for sediment accumulation, trash, and debris.
- Check for blockages, structural integrity, and evidence of erosion at inlets, outlets, and overflow spillways.

Regular maintenance includes the following:

- Prune trees and shrubs as needed.
- Basin floor/side slopes shall be mowed 6" to 8" as needed. grass clippings, leaves and accumulated sediment and debris shall be removed during the summer; however, plant matter shall be left in place over winter months to insulate the soil and add organic matter to the soil. removal criteria shall include when plant matter is smothering or killing vegetation and aesthetics.
- Remove sediment greater than 1.0 inch deep in March-April in the filter media bed in a manner to minimize damage to vegetation.
- Inspect soil and repair eroded areas seasonally or as necessary.

- Remove any invasive species (including roots) that have become established within the basin and embankments.
- If there is an accumulation of organic debris or sediment on the floor of the basin, or if ponded water is regularly observed more than 48 hours after a rainfall event, the top 6" shall be removed and the exposed soil surface rototilled to a depth of 12". Sedimentation should be removed when it is visibly dry and readily separates from the basin floor to minimize smearing. After this work has been done, the bottom of the basin shall be restored to its original condition.
- No pesticides or non-organic fertilizers shall be used in areas draining to the bioretention basin.

Drywells and Collection Basins

The drywells shall be cleaned at the end of construction once the contributing areas are fully stabilized. For the first year of operation following construction, the drywells shall be inspected once every 6 months.

After the first year of operation, the drywells shall be inspected a minimum of once per year. If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of the sediment. When the average depth of accumulation exceeds 3", a clean-out should be performed and properly disposed off-site. Clean-out should be accomplished using a Jetvac process.

Collection Basins shall be routinely checked for sediment accumulation, trash, and debris. Basin shall be mowed to 4-6" as needed. Grass clippings, leaves and accumulated sediment and debris shall be removed. Remove any invasive species (including roots) that have become established within the basin and embankments.

A detailed maintenance logbook shall be kept on-site for the units by the property owner/manager. Information is to include, but not be limited to, the date of inspection, record of sediment depth, general observations, and date of cleaning performed.

7. CONCLUSION

The new stormwater management improvements were designed in accordance with the 2004 CT DEEP SQM and Simsbury regulations. BMPs were incorporated in the site design that attenuate post-development runoff rates, treat in excess of the WQV/WQF and infiltrate in excess of the WQV and GRV from the development. Overall, the stormwater management system provides quantitative and qualitative improvements for the site.

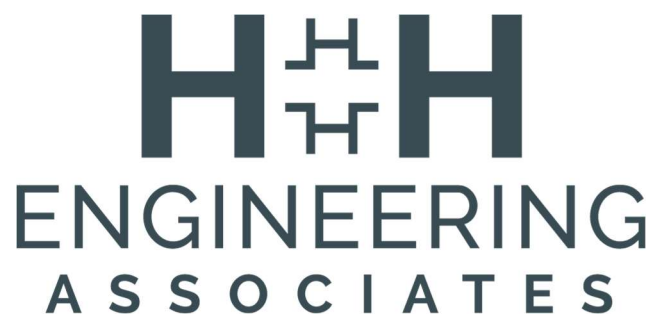
Technical Appendices for Stormwater Management Report

Vessel Multi-Family Development
446 Hopmeadow Street
Simsbury, CT 06089

December 16, 2022
Revised: February 24, 2023

Prepared for:
Vessel Technologies, Inc.
46 West 55th Street
New York, NY 10019

Prepared by:
H+H Engineering Associates, LLC
232 Greenmanville Avenue
Suite 201
Mystic, CT 06355



**Appendix A –
Water Quality Volume
and Water Quality Flow
Calculations**

WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA 'A'

Project: 446 Hopmeadow Street, Simsbury

Calculated By

Date

Client: Vessel Technologies, Inc.

SMM

12/14/2022

Revised 2/24/2023

Water Quality Volume (WQV)

1.02 ac	A = Area draining to the practice
0.87 ac	A _i = Impervious area draining to the practice
0.85 decimal	I = Percent impervious area draining to the practice, in decimal form
0.82 unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)
0.83 ac-in	WQV = I" x R _v x A
3,027 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

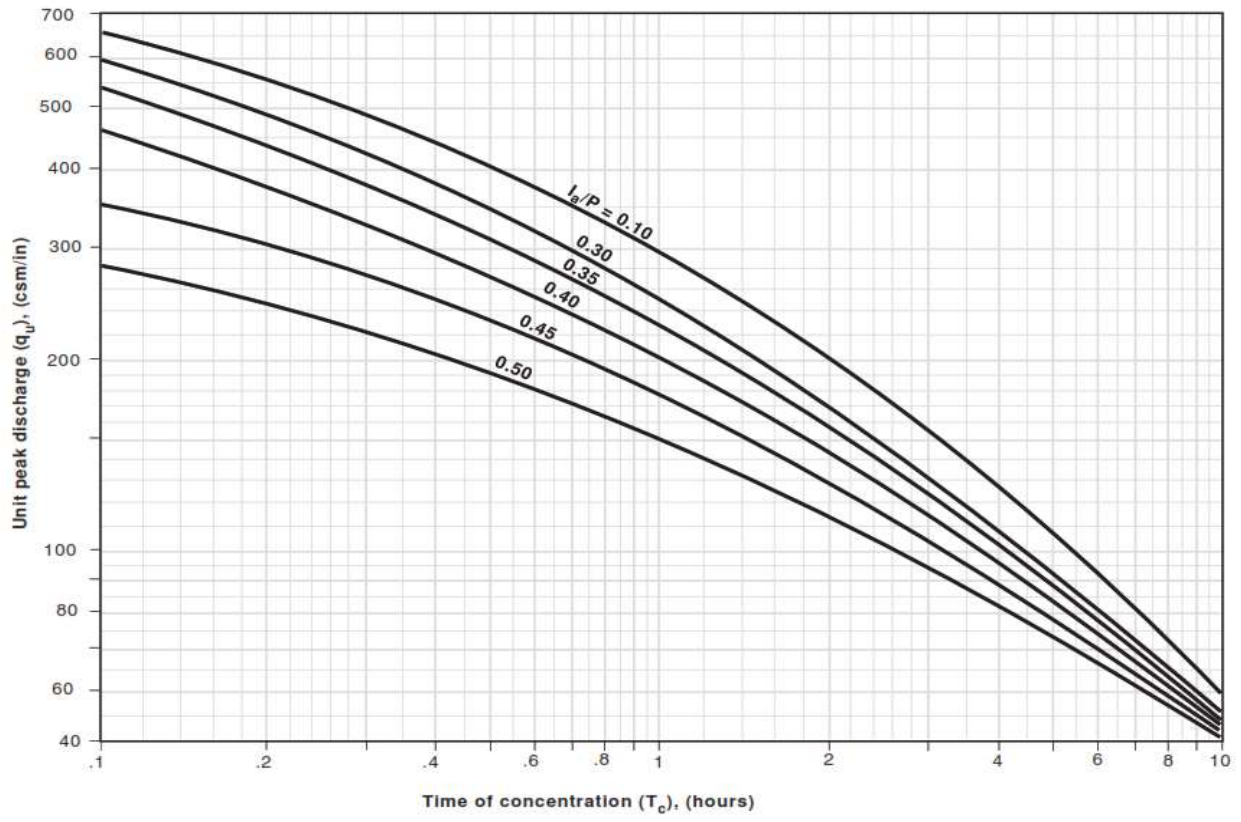
1.00 inches	P = amount of rainfall.
0.82 inches	Q = Water Quality Depth. Q=WQV/A
98 unitless	CN = unit peak discharge curve number. CN=1000/(10+5P+10Q-10*[Q ² +1.25*Q*P] ^{0.5})
0.2 inches	S = potential maximum retention. S = (1000/CN) - 10
0.035 inches	I _a = initial abstraction. I _a =0.2S
10.0 minutes	T _c = Time of Concentration
590.0 cfs/mi ² /in	q _u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.769 cfs	WQF = q _u x WQV. Conversion: to convert "cfs/mi ² /in" * ac-in" to "cfs" multiply by 1mi ² /640ac

Designer Stormwater Management Area 'A'

Notes: **ADS Stormtech SC-3500 Infiltration System**
 ADS Stormtech SC-740 Isolator Row Sizing:
 Three isolator rows are provided (total units = 20).
 Treated flow rate = 0.40 CFS / unit X 20 units = 8.00 CFS
 Treated flow rate > WQF
 (Inflow rate from 100-year storm event = 7.11 CFS)
 q_u obtained from exhibit 4-III for NRCS type III rainfall distribution



Exhibit 4-III Unit peak discharge (q_u) for NRCS (SCS) type III rainfall distribution



WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA 'B'

Project: 446 Hopmeadow Street, Simsbury

Calculated By

Date

Client: Vessel Technologies, Inc.

SMM

12/14/2022

Revised 2/24/2023

Water Quality Volume (WQV)

0.59 ac	A = Area draining to the practice
0.32 ac	A_i = Impervious area draining to the practice
0.55 decimal	I = Percent impervious area draining to the practice, in decimal form
0.55 unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times I)$
0.32 ac-in	$WQV = 1" \times R_v \times A$
1,162 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.55 inches	Q = Water Quality Depth. $Q = WQV / A$
95 unitless	CN = unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 \cdot [Q^2 + 1.25 \cdot Q \cdot P]^{0.5})$
0.6 inches	S = potential maximum retention. $S = (1000 / CN) - 10$
0.112 inches	I_a = initial abstraction. $I_a = 0.2S$
minutes	T_c = Time of Concentration
cfs/mi ² /in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.000 cfs	$WQF = q_u \times WQV$. Conversion: to convert "cfs/mi ² /in * ac-in" to "cfs" multiply by 1mi ² /640ac

Designer Stormwater Management Area 'B'

Notes:

Bioretention Basin

Treated volume (volume stored prior to discharging) = 4,700 CF

Contributing WQV = 1,162 CF

Treated volume = 404% of Water Quality Volume



WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA 'C'

Project: 446 Hopmeadow Street, Simsbury	Calculated By	Date
Client: Vessel Technologies, Inc.	SMM	12/14/2022
		Revised 2/24/2023

Water Quality Volume (WQV)

1.37 ac	A = Area draining to the practice
0.15 ac	A_i = Impervious area draining to the practice
0.11 decimal	I = Percent impervious area draining to the practice, in decimal form
0.15 unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times I)$
0.20 ac-in	$WQV = 1" \times R_v \times A$
739 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.15 inches	Q = Water Quality Depth. $Q = WQV / A$
84 unitless	CN = unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 \cdot [Q^2 + 1.25 \cdot Q \cdot P]^{0.5})$
1.9 inches	S = potential maximum retention. $S = (1000 / CN) - 10$
0.386 inches	I_a = initial abstraction. $I_a = 0.2S$
minutes	T_c = Time of Concentration
cfs/mi ² /in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.000 cfs	$WQF = q_u \times WQV$. Conversion: to convert "cfs/mi ² /in" * ac-in" to "cfs" multiply by 1mi ² /640ac

Designer	Stormwater Management Area 'C'
Notes:	<p>Drywell and Collection Basin</p> <p>Treated volume (volume stored through 100-yr event) = 2,536 CF</p> <p>Contributing WQV = 739 CF</p> <p>Treated volume = 343% of Water Quality Volume</p>



WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA 'D'

Project: 446 Hopmeadow Street, Simsbury	Calculated By	Date
Client: Vessel Technologies, Inc.	SMM	12/14/2022
		Revised 2/24/2023

Water Quality Volume (WQV)

0.29 ac	A = Area draining to the practice
0.03 ac	A_i = Impervious area draining to the practice
0.10 decimal	l = Percent impervious area draining to the practice, in decimal form
0.14 unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times l)$
0.04 ac-in	$WQV = 1" \times R_v \times A$
150 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1.00 inches	P = amount of rainfall.
0.14 inches	Q = Water Quality Depth. $Q = WQV / A$
84 unitless	CN = unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 \cdot [Q^2 + 1.25 \cdot Q \cdot P]^{0.5})$
2.0 inches	S = potential maximum retention. $S = (1000 / CN) - 10$
0.391 inches	la = initial abstraction. $la = 0.2S$
minutes	T_c = Time of Concentration
cfs/mi ² /in	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.000 cfs	$WQF = qu \times WQV$. Conversion: to convert "cfs/mi ² /in * ac-in" to "cfs" multiply by 1mi ² /640ac

Designer	Stormwater Management Area 'C'
Notes:	<p>Drywell and Collection Basin</p> <p>Treated volume (volume stored through 100-yr event) = 635 CF</p> <p>Contributing WQV = 150 CF</p> <p>Treated volume = 423% of Water Quality Volume</p>



Appendix B – Riprap Apron Design

Outlet Protection Design

Outlet EW-1

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end (W_1) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) = $\frac{1.8(Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)= cfs PIPE DIA= ft

A. $W_1 = 3(Sp) =$ ft

B. $La = \frac{1.8(Q-5)}{(Sp)^{1.5}} + 10 =$ ft Use 5' min.

C. $W_2 = 3(Sp) + 0.7(La) =$ ft

Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)= fps Therefore; Use Modified Riprap

Outlet Protection Design

Outlet FES-1

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end (W_1) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) = $\frac{1.8(Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)= cfs PIPE DIA= ft

A. $W_1 = 3(Sp) =$ ft

B. La = $\frac{1.8(Q-5)}{(Sp)^{1.5}} + 10 =$ ft Use 5' min.

C. $W_2 = 3(Sp) + 0.7(La) =$ ft Use 5' min.

Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)= fps Therefore; Use Modified Riprap

Outlet Protection Design

Outlet FES-2

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end (W_1) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) = $\frac{1.8(Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)= cfs PIPE DIA= ft

A. $W_1 = 3(Sp) =$ ft

B. La = $\frac{1.8(Q-5)}{(Sp)^{1.5}} + 10 =$ ft

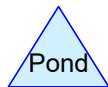
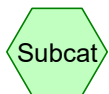
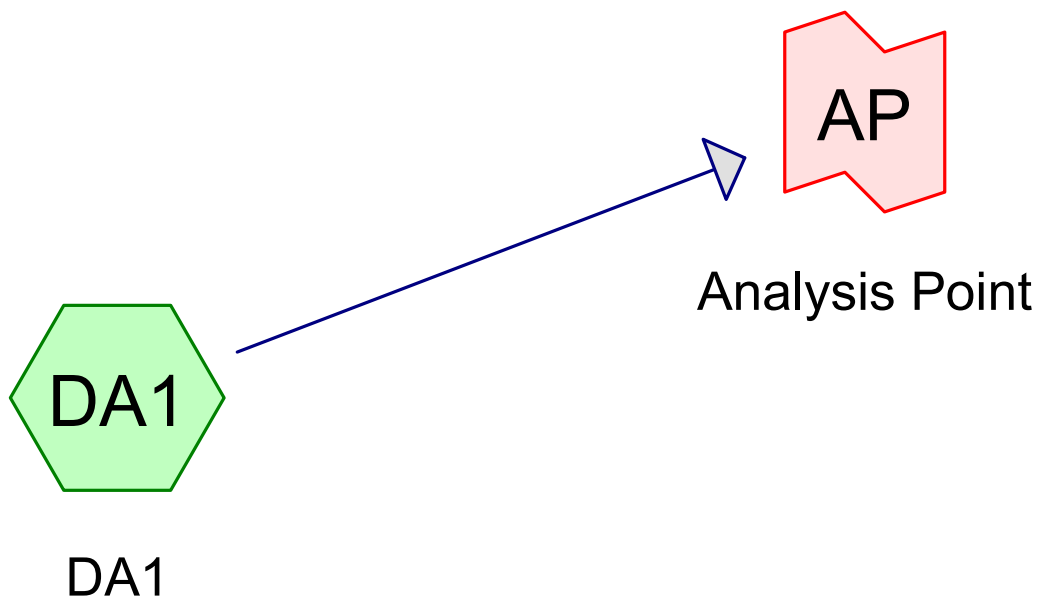
C. $W_2 = 3(Sp) + 0.7(La) =$ ft

Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)= fps Therefore; Use Modified Riprap

**Appendix C –
Pre-Development
HydroCAD Report**



pre development

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	Type III 24-hr		Default	24.00	1	1.00	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.32	2
3	10-Year	Type III 24-hr		Default	24.00	1	5.35	2
4	25-Year	Type III 24-hr		Default	24.00	1	6.61	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.56	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
684	76	Gravel roads, HSG A (DA1)
108,124	39	Pasture/grassland/range, Good, HSG A (DA1)
11,948	98	Paved parking, HSG A (DA1)
4,938	98	Roofs, HSG A (DA1)
77,918	30	Woods, Good, HSG A (DA1)
203,612	41	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
203,612	HSG A	DA1
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
203,612		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
684	0	0	0	0	684	Gravel roads
108,124	0	0	0	0	108,124	Pasture/grassland/range, Good
11,948	0	0	0	0	11,948	Paved parking
4,938	0	0	0	0	4,938	Roofs
77,918	0	0	0	0	77,918	Woods, Good
203,612	0	0	0	0	203,612	TOTAL AREA

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Type III 24-hr WQV Rainfall=1.00"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1: DA1

Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=0.00"
Flow Length=764' Tc=22.5 min CN=41 Runoff=0.00 cfs 0 cf

Link AP: Analysis Point

Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 203,612 sf Runoff Volume = 0 cf Average Runoff Depth = 0.00"
91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA1: DA1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
108,124	39	Pasture/grassland/range, Good, HSG A
11,948	98	Paved parking, HSG A
77,918	30	Woods, Good, HSG A
4,938	98	Roofs, HSG A
684	76	Gravel roads, HSG A
203,612	41	Weighted Average
186,726		91.71% Pervious Area
16,886		8.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
22.5	764	Total			

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Link AP: Analysis Point

Inflow Area = 203,612 sf, 8.29% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 2-Year Rainfall=3.32"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1: DA1

Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=0.01"
Flow Length=764' Tc=22.5 min CN=41 Runoff=0.01 cfs 223 cf

Link AP: Analysis Point

Inflow=0.01 cfs 223 cf
Primary=0.01 cfs 223 cf

Total Runoff Area = 203,612 sf Runoff Volume = 223 cf Average Runoff Depth = 0.01"
91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA1: DA1

Runoff = 0.01 cfs @ 21.88 hrs, Volume= 223 cf, Depth= 0.01"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
108,124	39	Pasture/grassland/range, Good, HSG A
11,948	98	Paved parking, HSG A
77,918	30	Woods, Good, HSG A
4,938	98	Roofs, HSG A
684	76	Gravel roads, HSG A
203,612	41	Weighted Average
186,726		91.71% Pervious Area
16,886		8.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
22.5	764	Total			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Link AP: Analysis Point

Inflow Area = 203,612 sf, 8.29% Impervious, Inflow Depth = 0.01" for 2-Year event
Inflow = 0.01 cfs @ 21.88 hrs, Volume= 223 cf
Primary = 0.01 cfs @ 21.88 hrs, Volume= 223 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 10-Year Rainfall=5.35"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1: DA1

Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=0.36"
Flow Length=764' Tc=22.5 min CN=41 Runoff=0.50 cfs 6,149 cf

Link AP: Analysis Point

Inflow=0.50 cfs 6,149 cf
Primary=0.50 cfs 6,149 cf

Total Runoff Area = 203,612 sf Runoff Volume = 6,149 cf Average Runoff Depth = 0.36"
91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

pre development

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA1: DA1

Runoff = 0.50 cfs @ 12.61 hrs, Volume= 6,149 cf, Depth= 0.36"
 Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
108,124	39	Pasture/grassland/range, Good, HSG A
11,948	98	Paved parking, HSG A
77,918	30	Woods, Good, HSG A
4,938	98	Roofs, HSG A
684	76	Gravel roads, HSG A
203,612	41	Weighted Average
186,726		91.71% Pervious Area
16,886		8.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
22.5	764	Total			

Summary for Link AP: Analysis Point

Inflow Area = 203,612 sf, 8.29% Impervious, Inflow Depth = 0.36" for 10-Year event
Inflow = 0.50 cfs @ 12.61 hrs, Volume= 6,149 cf
Primary = 0.50 cfs @ 12.61 hrs, Volume= 6,149 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

pre development

Type III 24-hr 25-Year Rainfall=6.61"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1: DA1

Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=0.77"
Flow Length=764' Tc=22.5 min CN=41 Runoff=1.61 cfs 13,040 cf

Link AP: Analysis Point

Inflow=1.61 cfs 13,040 cf
Primary=1.61 cfs 13,040 cf

Total Runoff Area = 203,612 sf Runoff Volume = 13,040 cf Average Runoff Depth = 0.77"
91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Subcatchment DA1: DA1

Runoff = 1.61 cfs @ 12.49 hrs, Volume= 13,040 cf, Depth= 0.77"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
108,124	39	Pasture/grassland/range, Good, HSG A
11,948	98	Paved parking, HSG A
77,918	30	Woods, Good, HSG A
4,938	98	Roofs, HSG A
684	76	Gravel roads, HSG A
203,612	41	Weighted Average
186,726		91.71% Pervious Area
16,886		8.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
22.5	764	Total			

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Link AP: Analysis Point

Inflow Area = 203,612 sf, 8.29% Impervious, Inflow Depth = 0.77" for 25-Year event
Inflow = 1.61 cfs @ 12.49 hrs, Volume= 13,040 cf
Primary = 1.61 cfs @ 12.49 hrs, Volume= 13,040 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 100-Year Rainfall=8.56"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1: DA1

Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=1.61"
Flow Length=764' Tc=22.5 min CN=41 Runoff=4.45 cfs 27,291 cf

Link AP: Analysis Point

Inflow=4.45 cfs 27,291 cf
Primary=4.45 cfs 27,291 cf

Total Runoff Area = 203,612 sf Runoff Volume = 27,291 cf Average Runoff Depth = 1.61"
91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

pre development

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Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA1: DA1

Runoff = 4.45 cfs @ 12.39 hrs, Volume= 27,291 cf, Depth= 1.61"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
108,124	39	Pasture/grassland/range, Good, HSG A
11,948	98	Paved parking, HSG A
77,918	30	Woods, Good, HSG A
4,938	98	Roofs, HSG A
684	76	Gravel roads, HSG A
203,612	41	Weighted Average
186,726		91.71% Pervious Area
16,886		8.29% Impervious Area

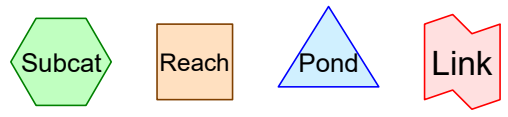
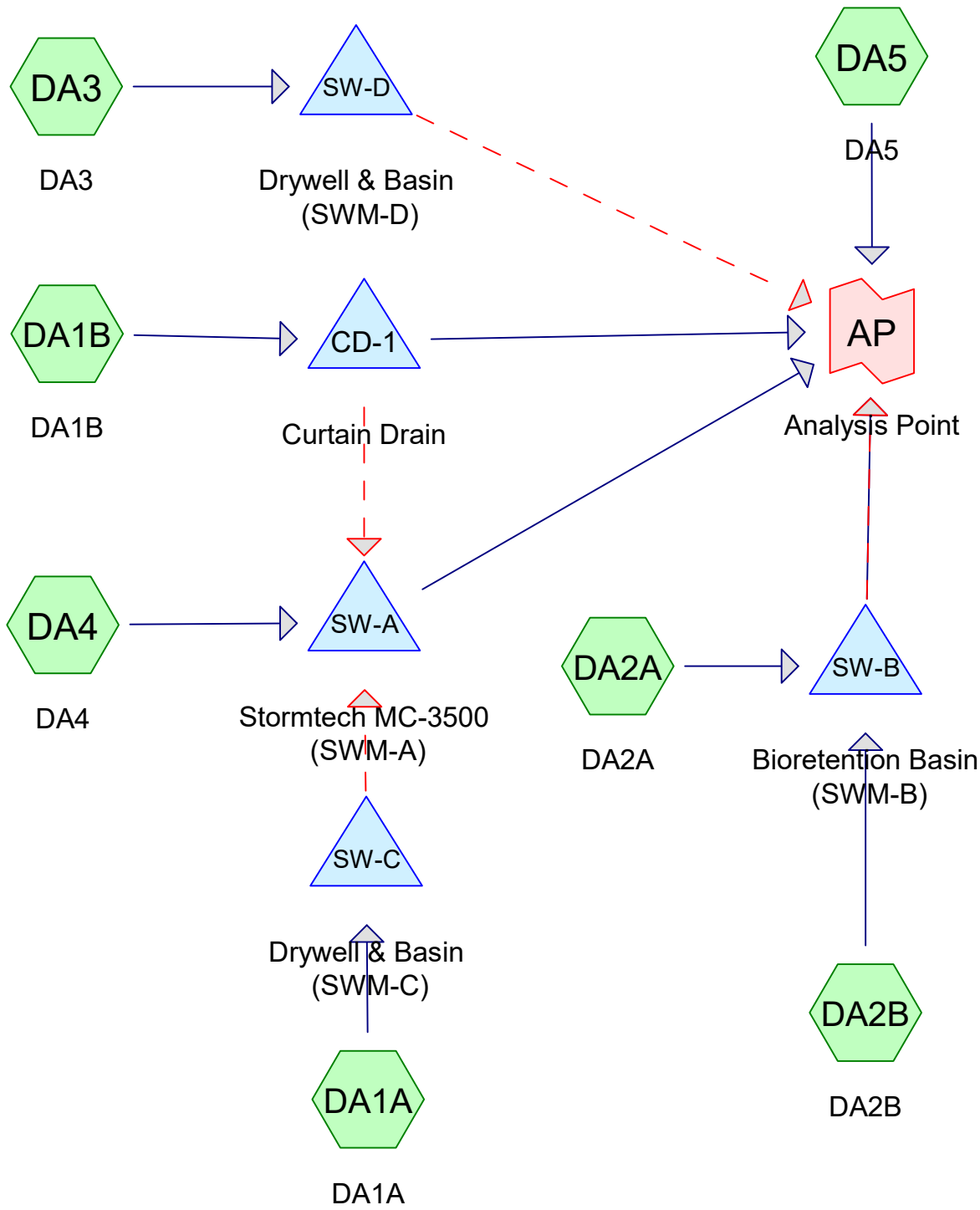
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
22.5	764	Total			

Summary for Link AP: Analysis Point

Inflow Area = 203,612 sf, 8.29% Impervious, Inflow Depth = 1.61" for 100-Year event
Inflow = 4.45 cfs @ 12.39 hrs, Volume= 27,291 cf
Primary = 4.45 cfs @ 12.39 hrs, Volume= 27,291 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

**Appendix D –
Post-Development
HydroCAD Report**



Routing Diagram for post development (REV)
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post development (REV)

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	Type III 24-hr		Default	24.00	1	1.00	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.32	2
3	10-Year	Type III 24-hr		Default	24.00	1	5.35	2
4	25-Year	Type III 24-hr		Default	24.00	1	6.61	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.56	2

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
78,037	39	>75% Grass cover, Good, HSG A (DA1A, DA1B, DA2B, DA3, DA4, DA5)
48,138	98	Paved parking, HSG A (DA1A, DA1B, DA3, DA4, DA5)
14,063	98	Roofs, HSG A (DA2A)
63,375	30	Woods, Good, HSG A (DA1A, DA1B, DA2B, DA3, DA4, DA5)
203,613	54	TOTAL AREA

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Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
203,613	HSG A	DA1A, DA1B, DA2A, DA2B, DA3, DA4, DA5
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
203,613		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
78,037	0	0	0	0	78,037	>75% Grass cover, Good
48,138	0	0	0	0	48,138	Paved parking
14,063	0	0	0	0	14,063	Roofs
63,375	0	0	0	0	63,375	Woods, Good
203,613	0	0	0	0	203,613	TOTAL AREA

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	CD-1	86.30	84.90	110.0	0.0127	0.010	0.0	8.0	0.0
2	SW-A	85.80	84.10	76.0	0.0224	0.012	0.0	12.0	0.0
3	SW-B	88.50	87.00	104.0	0.0144	0.010	0.0	12.0	0.0

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Type III 24-hr WQV Rainfall=1.00"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1A: DA1A Runoff Area=59,794 sf 10.59% Impervious Runoff Depth=0.00"
Flow Length=337' Tc=17.4 min CN=42 Runoff=0.00 cfs 0 cf

Subcatchment DA1B: DA1B Runoff Area=13,662 sf 16.80% Impervious Runoff Depth=0.00"
Tc=10.0 min CN=47 Runoff=0.00 cfs 0 cf

Subcatchment DA2A: DA2A Runoff Area=14,063 sf 100.00% Impervious Runoff Depth=0.79"
Tc=5.0 min CN=98 Runoff=0.30 cfs 927 cf

Subcatchment DA2B: DA2B Runoff Area=11,484 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=189' Tc=11.5 min CN=38 Runoff=0.00 cfs 0 cf

Subcatchment DA3: DA3 Runoff Area=12,462 sf 10.46% Impervious Runoff Depth=0.00"
Tc=10.0 min CN=41 Runoff=0.00 cfs 0 cf

Subcatchment DA4: DA4 Runoff Area=44,474 sf 85.11% Impervious Runoff Depth=0.28"
Tc=10.0 min CN=89 Runoff=0.27 cfs 1,056 cf

Subcatchment DA5: DA5 Runoff Area=47,674 sf 0.74% Impervious Runoff Depth=0.00"
Flow Length=332' Tc=11.4 min CN=34 Runoff=0.00 cfs 0 cf

Pond CD-1: Curtain Drain Peak Elev=87.35' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond SW-A: Stormtech MC-3500 (SWM-A) Peak Elev=85.04' Storage=47 cf Inflow=0.27 cfs 1,056 cf
Discarded=0.25 cfs 1,056 cf Primary=0.00 cfs 0 cf Outflow=0.25 cfs 1,056 cf

Pond SW-B: Bioretention Basin (SWM-B) Peak Elev=91.11' Storage=197 cf Inflow=0.30 cfs 927 cf
Discarded=0.09 cfs 927 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.09 cfs 927 cf

Pond SW-C: Drywell & Basin (SWM-C) Peak Elev=88.60' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=90.10' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Link AP: Analysis Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 203,613 sf Runoff Volume = 1,983 cf Average Runoff Depth = 0.12"
69.45% Pervious = 141,412 sf 30.55% Impervious = 62,201 sf

post development (REV)

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA1A: DA1A

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Pond SW-C : Drywell & Basin (SWM-C)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
29,175	39	>75% Grass cover, Good, HSG A
24,285	30	Woods, Good, HSG A
6,334	98	Paved parking, HSG A
59,794	42	Weighted Average
53,460		89.41% Pervious Area
6,334		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
17.4	337	Total			

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Summary for Subcatchment DA1B: DA1B

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Pond CD-1 : Curtain Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
8,478	39	>75% Grass cover, Good, HSG A
2,889	30	Woods, Good, HSG A
2,295	98	Paved parking, HSG A
13,662	47	Weighted Average
11,367		83.20% Pervious Area
2,295		16.80% Impervious Area

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

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA2A: DA2A

Runoff = 0.30 cfs @ 12.07 hrs, Volume= 927 cf, Depth= 0.79"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
14,063	98	Roofs, HSG A
14,063		100.00% Impervious Area

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

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA2B: DA2B

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
10,005	39	>75% Grass cover, Good, HSG A
1,479	30	Woods, Good, HSG A
11,484	38	Weighted Average
11,484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0150	0.16		Sheet Flow, Sheetflow
					Grass: Short n= 0.150 P2= 3.43"
0.9	89	0.0550	1.64		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
11.5	189	Total			

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA3: DA3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Pond SW-D : Drywell & Basin (SWM-D)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
5,621	39	>75% Grass cover, Good, HSG A
5,538	30	Woods, Good, HSG A
1,303	98	Paved parking, HSG A
12,462	41	Weighted Average
11,159		89.54% Pervious Area
1,303		10.46% Impervious Area

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

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA4: DA4

Runoff = 0.27 cfs @ 12.15 hrs, Volume= 1,056 cf, Depth= 0.28"

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
5,461	39	>75% Grass cover, Good, HSG A
37,854	98	Paved parking, HSG A
1,159	30	Woods, Good, HSG A
44,474	89	Weighted Average
6,620		14.89% Pervious Area
37,854		85.11% Impervious Area

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

post development (REV)

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Subcatchment DA5: DA5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr WQV Rainfall=1.00"

Area (sf)	CN	Description
19,297	39	>75% Grass cover, Good, HSG A
28,025	30	Woods, Good, HSG A
352	98	Paved parking, HSG A
47,674	34	Weighted Average
47,322		99.26% Pervious Area
352		0.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
7.5	82	0.0240	0.18		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
11.4	332	Total			

post development (REV)

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Pond CD-1: Curtain Drain

Inflow Area = 13,662 sf, 16.80% Impervious, Inflow Depth = 0.00" for WQV event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.35' @ 0.00 hrs Surf.Area= 324 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	87.35'	1,296 cf	2.00'W x 162.00'L x 10.00'H Prismatic 3,240 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	86.30'	8.0" Round Outlet Pipe L= 110.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 86.30' / 84.90' S= 0.0127 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Discarded	87.35'	5.000 in/hr Exfiltration over Surface area
#3	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	87.40'	4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **2=Exfiltration** (Passes 0.00 cfs of 0.04 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **1=Outlet Pipe** (Passes 0.00 cfs of 1.42 cfs potential flow)
 ↳ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
87.35	324	0	92.55	324	674
87.45	324	13	92.65	324	687
87.55	324	26	92.75	324	700
87.65	324	39	92.85	324	713
87.75	324	52	92.95	324	726
87.85	324	65	93.05	324	739
87.95	324	78	93.15	324	752
88.05	324	91	93.25	324	765
88.15	324	104	93.35	324	778
88.25	324	117	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	156	93.75	324	829
88.65	324	168	93.85	324	842
88.75	324	181	93.95	324	855
88.85	324	194	94.05	324	868
88.95	324	207	94.15	324	881
89.05	324	220	94.25	324	894
89.15	324	233	94.35	324	907
89.25	324	246	94.45	324	920
89.35	324	259	94.55	324	933
89.45	324	272	94.65	324	946
89.55	324	285	94.75	324	959
89.65	324	298	94.85	324	972
89.75	324	311	94.95	324	985
89.85	324	324	95.05	324	998
89.95	324	337	95.15	324	1,011
90.05	324	350	95.25	324	1,024
90.15	324	363	95.35	324	1,037
90.25	324	376	95.45	324	1,050
90.35	324	389	95.55	324	1,063
90.45	324	402	95.65	324	1,076
90.55	324	415	95.75	324	1,089
90.65	324	428	95.85	324	1,102
90.75	324	441	95.95	324	1,115
90.85	324	454	96.05	324	1,128
90.95	324	467	96.15	324	1,140
91.05	324	480	96.25	324	1,153
91.15	324	492	96.35	324	1,166
91.25	324	505	96.45	324	1,179
91.35	324	518	96.55	324	1,192
91.45	324	531	96.65	324	1,205
91.55	324	544	96.75	324	1,218
91.65	324	557	96.85	324	1,231
91.75	324	570	96.95	324	1,244
91.85	324	583	97.05	324	1,257
91.95	324	596	97.15	324	1,270
92.05	324	609	97.25	324	1,283
92.15	324	622	97.35	324	1,296
92.25	324	635			
92.35	324	648			
92.45	324	661			

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Summary for Pond SW-A: Stormtech MC-3500 (SWM-A)

Inflow Area = 44,474 sf, 85.11% Impervious, Inflow Depth = 0.28" for WQV event
 Inflow = 0.27 cfs @ 12.15 hrs, Volume= 1,056 cf
 Outflow = 0.25 cfs @ 12.21 hrs, Volume= 1,056 cf, Atten= 9%, Lag= 3.1 min
 Discarded = 0.25 cfs @ 12.21 hrs, Volume= 1,056 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 85.04' @ 12.21 hrs Surf.Area= 2,870 sf Storage= 47 cf

Plug-Flow detention time= 3.2 min calculated for 1,056 cf (100% of inflow)
 Center-of-Mass det. time= 3.2 min (876.8 - 873.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	4,056 cf	37.08'W x 77.40'L x 5.50'H Field A 15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids
#2A	85.75'	5,647 cf	ADS_StormTech MC-3500 d +Cap x 50 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 50 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		9,703 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.80'	12.0" Round Outlet Pipe L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 85.80' / 84.10' S= 0.0224 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	86.50'	4.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.65'	11.0" W x 4.0" H Vert. Upper Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	5.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 12.21 hrs HW=85.04' (Free Discharge)
 ↳ **5=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.00' (Free Discharge)
 ↳ **1=Outlet Pipe** (Controls 0.00 cfs)
 ↳ **2=Low Flow Orifice** (Controls 0.00 cfs)
 ↳ **3=Upper Orifice** (Controls 0.00 cfs)
 ↳ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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Pond SW-A: Stormtech MC-3500 (SWM-A) - 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

10 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 75.40' Row Length +12.0" End Stone x 2 = 77.40' 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" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

50 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 5,646.6 cf Chamber Storage

15,786.4 cf Field - 5,646.6 cf Chambers = 10,139.8 cf Stone x 40.0% Voids = 4,055.9 cf Stone Storage

Chamber Storage + Stone Storage = 9,702.5 cf = 0.223 af

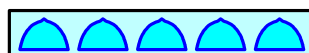
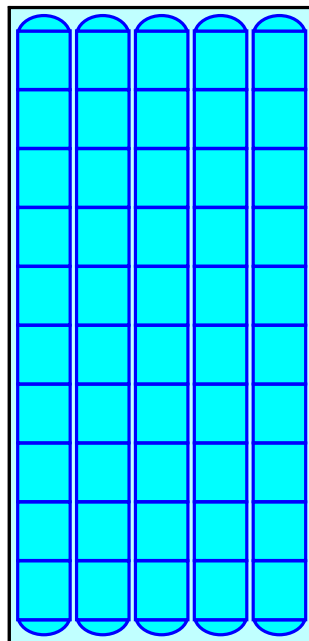
Overall Storage Efficiency = 61.5%

Overall System Size = 77.40' x 37.08' x 5.50'

50 Chambers

584.7 cy Field

375.5 cy Stone



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Stage-Area-Storage for Pond SW-A: Stormtech MC-3500 (SWM-A)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	2,870	0	90.20	2,870	9,358
85.10	2,870	115	90.30	2,870	9,473
85.20	2,870	230	90.40	2,870	9,588
85.30	2,870	344	90.50	2,870	9,703
85.40	2,870	459			
85.50	2,870	574			
85.60	2,870	689			
85.70	2,870	804			
85.80	2,870	983			
85.90	2,870	1,227			
86.00	2,870	1,470			
86.10	2,870	1,712			
86.20	2,870	1,952			
86.30	2,870	2,192			
86.40	2,870	2,431			
86.50	2,870	2,669			
86.60	2,870	2,905			
86.70	2,870	3,140			
86.80	2,870	3,374			
86.90	2,870	3,606			
87.00	2,870	3,837			
87.10	2,870	4,066			
87.20	2,870	4,293			
87.30	2,870	4,519			
87.40	2,870	4,742			
87.50	2,870	4,963			
87.60	2,870	5,182			
87.70	2,870	5,399			
87.80	2,870	5,613			
87.90	2,870	5,825			
88.00	2,870	6,033			
88.10	2,870	6,239			
88.20	2,870	6,441			
88.30	2,870	6,640			
88.40	2,870	6,834			
88.50	2,870	7,025			
88.60	2,870	7,211			
88.70	2,870	7,392			
88.80	2,870	7,567			
88.90	2,870	7,736			
89.00	2,870	7,898			
89.10	2,870	8,048			
89.20	2,870	8,186			
89.30	2,870	8,314			
89.40	2,870	8,437			
89.50	2,870	8,554			
89.60	2,870	8,669			
89.70	2,870	8,784			
89.80	2,870	8,899			
89.90	2,870	9,014			
90.00	2,870	9,128			
90.10	2,870	9,243			

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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area = 25,547 sf, 55.05% Impervious, Inflow Depth = 0.44" for WQV event
 Inflow = 0.30 cfs @ 12.07 hrs, Volume= 927 cf
 Outflow = 0.09 cfs @ 12.39 hrs, Volume= 927 cf, Atten= 71%, Lag= 19.1 min
 Discarded = 0.09 cfs @ 12.39 hrs, Volume= 927 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 91.11' @ 12.39 hrs Surf.Area= 1,873 sf Storage= 197 cf

Plug-Flow detention time= 17.8 min calculated for 927 cf (100% of inflow)
 Center-of-Mass det. time= 17.8 min (804.8 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	8,231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	1,817	0	0
92.00	2,343	2,080	2,080
93.00	2,896	2,620	4,700
94.00	3,466	3,181	7,881
94.10	3,539	350	8,231

Device	Routing	Invert	Outlet Devices
#1	Primary	88.50'	12.0" Round Outlet Pipe L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.50' / 87.00' S= 0.0144 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	93.00'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	93.25'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#4	Discarded	91.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.09 cfs @ 12.39 hrs HW=91.11' (Free Discharge)
 ↑4=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑1=Outlet Pipe (Passes 0.00 cfs of 5.35 cfs potential flow)
 ↑2=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-B: Bioretention Basin (SWM-B)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.00	1,817	0	93.60	3,238	6,540
91.05	1,843	92	93.65	3,267	6,702
91.10	1,870	184	93.70	3,295	6,866
91.15	1,896	278	93.75	3,324	7,032
91.20	1,922	374	93.80	3,352	7,199
91.25	1,949	471	93.85	3,380	7,367
91.30	1,975	569	93.90	3,409	7,537
91.35	2,001	668	93.95	3,438	7,708
91.40	2,027	769	94.00	3,466	7,881
91.45	2,054	871	94.05	3,503	8,055
91.50	2,080	974	94.10	3,539	8,231
91.55	2,106	1,079			
91.60	2,133	1,185			
91.65	2,159	1,292			
91.70	2,185	1,401			
91.75	2,212	1,511			
91.80	2,238	1,622			
91.85	2,264	1,734			
91.90	2,290	1,848			
91.95	2,317	1,964			
92.00	2,343	2,080			
92.05	2,371	2,198			
92.10	2,398	2,317			
92.15	2,426	2,438			
92.20	2,454	2,560			
92.25	2,481	2,683			
92.30	2,509	2,808			
92.35	2,537	2,934			
92.40	2,564	3,061			
92.45	2,592	3,190			
92.50	2,620	3,321			
92.55	2,647	3,452			
92.60	2,675	3,585			
92.65	2,702	3,720			
92.70	2,730	3,856			
92.75	2,758	3,993			
92.80	2,785	4,131			
92.85	2,813	4,271			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,924	4,845			
93.10	2,953	4,992			
93.15	2,982	5,140			
93.20	3,010	5,290			
93.25	3,039	5,441			
93.30	3,067	5,594			
93.35	3,095	5,748			
93.40	3,124	5,904			
93.45	3,153	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			

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Summary for Pond SW-C: Drywell & Basin (SWM-C)

Inflow Area = 59,794 sf, 10.59% Impervious, Inflow Depth = 0.00" for WQV event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 88.60' @ 0.00 hrs Surf.Area= 31 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	88.60'	6,382 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.60	31	0	0
89.60	44	38	38
90.60	44	44	82
91.60	44	44	126
92.49	15	26	152
92.50	477	2	154
93.00	2,477	739	893
93.80	2,977	2,182	3,074
94.00	3,101	608	3,682
94.80	3,649	2,700	6,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	93.80'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑1=Exfiltration (Passes 0.00 cfs of 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-C: Drywell & Basin (SWM-C)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.60	31	0	93.80	2,977	3,074
88.70	32	3	93.90	3,039	3,375
88.80	34	6	94.00	3,101	3,682
88.90	35	10	94.10	3,169	3,996
89.00	36	13	94.20	3,238	4,316
89.10	38	17	94.30	3,306	4,643
89.20	39	21	94.40	3,375	4,977
89.30	40	25	94.50	3,444	5,318
89.40	41	29	94.60	3,512	5,666
89.50	43	33	94.70	3,580	6,021
89.60	44	38	94.80	3,649	6,382
89.70	44	42			
89.80	44	46			
89.90	44	51			
90.00	44	55			
90.10	44	60			
90.20	44	64			
90.30	44	68			
90.40	44	73			
90.50	44	77			
90.60	44	82			
90.70	44	86			
90.80	44	90			
90.90	44	95			
91.00	44	99			
91.10	44	104			
91.20	44	108			
91.30	44	112			
91.40	44	117			
91.50	44	121			
91.60	44	126			
91.70	41	130			
91.80	37	134			
91.90	34	137			
92.00	31	140			
92.10	28	143			
92.20	24	146			
92.30	21	148			
92.40	18	150			
92.50	477	154			
92.60	877	222			
92.70	1,277	330			
92.80	1,677	477			
92.90	2,077	665			
93.00	2,477	893			
93.10	2,539	1,144			
93.20	2,602	1,401			
93.30	2,664	1,664			
93.40	2,727	1,934			
93.50	2,790	2,209			
93.60	2,852	2,491			
93.70	2,914	2,780			

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Summary for Pond SW-D: Drywell & Basin (SWM-D)

Inflow Area = 12,462 sf, 10.46% Impervious, Inflow Depth = 0.00" for WQV event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 90.10' @ 0.00 hrs Surf.Area= 31 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	90.10'	2,250 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.10	31	0	0
91.10	44	38	38
92.10	44	44	82
93.10	44	44	126
94.10	44	44	170
95.10	44	44	214
95.99	4	21	235
96.00	39	0	235
97.00	161	100	335
98.00	394	278	613
99.00	757	576	1,188
100.00	1,135	946	2,134
100.10	1,187	116	2,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.10'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	99.10'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑1=Exfiltration (Passes 0.00 cfs of 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-D: Drywell & Basin (SWM-D)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.10	31	0	95.30	35	221
90.20	32	3	95.40	31	225
90.30	34	6	95.50	26	228
90.40	35	10	95.60	22	230
90.50	36	13	95.70	17	232
90.60	38	17	95.80	13	233
90.70	39	21	95.90	8	234
90.80	40	25	96.00	39	235
90.90	41	29	96.10	51	240
91.00	43	33	96.20	63	245
91.10	44	38	96.30	76	252
91.20	44	42	96.40	88	260
91.30	44	46	96.50	100	270
91.40	44	51	96.60	112	280
91.50	44	55	96.70	124	292
91.60	44	60	96.80	137	305
91.70	44	64	96.90	149	320
91.80	44	68	97.00	161	335
91.90	44	73	97.10	184	352
92.00	44	77	97.20	208	372
92.10	44	82	97.30	231	394
92.20	44	86	97.40	254	418
92.30	44	90	97.50	278	445
92.40	44	95	97.60	301	474
92.50	44	99	97.70	324	505
92.60	44	104	97.80	347	538
92.70	44	108	97.90	371	574
92.80	44	112	98.00	394	613
92.90	44	117	98.10	430	654
93.00	44	121	98.20	467	699
93.10	44	126	98.30	503	747
93.20	44	130	98.40	539	799
93.30	44	134	98.50	576	855
93.40	44	139	98.60	612	914
93.50	44	143	98.70	648	977
93.60	44	148	98.80	684	1,044
93.70	44	152	98.90	721	1,114
93.80	44	156	99.00	757	1,188
93.90	44	161	99.10	795	1,266
94.00	44	165	99.20	833	1,347
94.10	44	170	99.30	870	1,432
94.20	44	174	99.40	908	1,521
94.30	44	178	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	187	99.70	1,022	1,811
94.60	44	192	99.80	1,059	1,915
94.70	44	196	99.90	1,097	2,022
94.80	44	200	100.00	1,135	2,134
94.90	44	205	100.10	1,187	2,250
95.00	44	209			
95.10	44	214			
95.20	40	218			

post development (REV)

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Type III 24-hr WQV Rainfall=1.00"

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Summary for Link AP: Analysis Point

Inflow Area = 131,357 sf, 41.54% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

post development (REV)

Type III 24-hr 2-Year Rainfall=3.32"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1A: DA1A Runoff Area=59,794 sf 10.59% Impervious Runoff Depth=0.02"
Flow Length=337' Tc=17.4 min CN=42 Runoff=0.00 cfs 108 cf

Subcatchment DA1B: DA1B Runoff Area=13,662 sf 16.80% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=47 Runoff=0.00 cfs 105 cf

Subcatchment DA2A: DA2A Runoff Area=14,063 sf 100.00% Impervious Runoff Depth=3.09"
Tc=5.0 min CN=98 Runoff=1.08 cfs 3,618 cf

Subcatchment DA2B: DA2B Runoff Area=11,484 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=189' Tc=11.5 min CN=38 Runoff=0.00 cfs 0 cf

Subcatchment DA3: DA3 Runoff Area=12,462 sf 10.46% Impervious Runoff Depth=0.01"
Tc=10.0 min CN=41 Runoff=0.00 cfs 14 cf

Subcatchment DA4: DA4 Runoff Area=44,474 sf 85.11% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=89 Runoff=2.27 cfs 8,122 cf

Subcatchment DA5: DA5 Runoff Area=47,674 sf 0.74% Impervious Runoff Depth=0.00"
Flow Length=332' Tc=11.4 min CN=34 Runoff=0.00 cfs 0 cf

Pond CD-1: Curtain Drain Peak Elev=87.35' Storage=0 cf Inflow=0.00 cfs 105 cf
Discarded=0.00 cfs 3 cf Primary=0.00 cfs 102 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 105 cf

Pond SW-A: Stormtech MC-3500 (SWM-A) Peak Elev=86.50' Storage=2,666 cf Inflow=2.27 cfs 8,122 cf
Discarded=0.33 cfs 8,122 cf Primary=0.00 cfs 0 cf Outflow=0.33 cfs 8,122 cf

Pond SW-B: Bioretention Basin (SWM-B) Peak Elev=91.66' Storage=1,310 cf Inflow=1.08 cfs 3,618 cf
Discarded=0.10 cfs 3,618 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.10 cfs 3,618 cf

Pond SW-C: Drywell & Basin (SWM-C) Peak Elev=88.66' Storage=2 cf Inflow=0.00 cfs 108 cf
Discarded=0.00 cfs 108 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 108 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=90.11' Storage=0 cf Inflow=0.00 cfs 14 cf
Discarded=0.00 cfs 14 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 14 cf

Link AP: Analysis Point Inflow=0.00 cfs 102 cf
Primary=0.00 cfs 102 cf

Total Runoff Area = 203,613 sf Runoff Volume = 11,966 cf Average Runoff Depth = 0.71"
69.45% Pervious = 141,412 sf 30.55% Impervious = 62,201 sf

post development (REV)

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA1A: DA1A

Runoff = 0.00 cfs @ 17.42 hrs, Volume= 108 cf, Depth= 0.02"

Routed to Pond SW-C : Drywell & Basin (SWM-C)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
29,175	39	>75% Grass cover, Good, HSG A
24,285	30	Woods, Good, HSG A
6,334	98	Paved parking, HSG A
59,794	42	Weighted Average
53,460		89.41% Pervious Area
6,334		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
17.4	337	Total			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA1B: DA1B

Runoff = 0.00 cfs @ 14.64 hrs, Volume= 105 cf, Depth= 0.09"

Routed to Pond CD-1 : Curtain Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
8,478	39	>75% Grass cover, Good, HSG A
2,889	30	Woods, Good, HSG A
2,295	98	Paved parking, HSG A
13,662	47	Weighted Average
11,367		83.20% Pervious Area
2,295		16.80% Impervious Area

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

post development (REV)

Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA2A: DA2A

Runoff = 1.08 cfs @ 12.07 hrs, Volume= 3,618 cf, Depth= 3.09"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
14,063	98	Roofs, HSG A
14,063		100.00% Impervious Area

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

post development (REV)

Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA2B: DA2B

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
10,005	39	>75% Grass cover, Good, HSG A
1,479	30	Woods, Good, HSG A
11,484	38	Weighted Average
11,484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0150	0.16		Sheet Flow, Sheetflow
					Grass: Short n= 0.150 P2= 3.43"
0.9	89	0.0550	1.64		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
11.5	189	Total			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA3: DA3

Runoff = 0.00 cfs @ 21.70 hrs, Volume= 14 cf, Depth= 0.01"

Routed to Pond SW-D : Drywell & Basin (SWM-D)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
5,621	39	>75% Grass cover, Good, HSG A
5,538	30	Woods, Good, HSG A
1,303	98	Paved parking, HSG A
12,462	41	Weighted Average
11,159		89.54% Pervious Area
1,303		10.46% Impervious Area

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

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA4: DA4

Runoff = 2.27 cfs @ 12.14 hrs, Volume= 8,122 cf, Depth= 2.19"

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
5,461	39	>75% Grass cover, Good, HSG A
37,854	98	Paved parking, HSG A
1,159	30	Woods, Good, HSG A
44,474	89	Weighted Average
6,620		14.89% Pervious Area
37,854		85.11% Impervious Area

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

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Subcatchment DA5: DA5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr 2-Year Rainfall=3.32"

Area (sf)	CN	Description
19,297	39	>75% Grass cover, Good, HSG A
28,025	30	Woods, Good, HSG A
352	98	Paved parking, HSG A
47,674	34	Weighted Average
47,322		99.26% Pervious Area
352		0.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
7.5	82	0.0240	0.18		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
11.4	332	Total			

post development (REV)

Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Pond CD-1: Curtain Drain

Inflow Area = 13,662 sf, 16.80% Impervious, Inflow Depth = 0.09" for 2-Year event
 Inflow = 0.00 cfs @ 14.64 hrs, Volume= 105 cf
 Outflow = 0.00 cfs @ 14.64 hrs, Volume= 105 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 14.64 hrs, Volume= 3 cf
 Primary = 0.00 cfs @ 14.64 hrs, Volume= 102 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.35' @ 14.64 hrs Surf.Area= 324 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 105 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (1,046.9 - 1,046.8)

Volume	Invert	Avail.Storage	Storage Description
#1	87.35'	1,296 cf	2.00'W x 162.00'L x 10.00'H Prismatic 3,240 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	86.30'	8.0" Round Outlet Pipe L= 110.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 86.30' / 84.90' S= 0.0127 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Discarded	87.35'	5.000 in/hr Exfiltration over Surface area
#3	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	87.40'	4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.04 cfs @ 14.64 hrs HW=87.35' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.42 cfs @ 14.64 hrs HW=87.35' (Free Discharge)
 ↳ **1=Outlet Pipe** (Inlet Controls 1.42 cfs @ 4.08 fps)
 ↳ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

post development (REV)

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Type III 24-hr 2-Year Rainfall=3.32"

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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
87.35	324	0	92.55	324	674
87.45	324	13	92.65	324	687
87.55	324	26	92.75	324	700
87.65	324	39	92.85	324	713
87.75	324	52	92.95	324	726
87.85	324	65	93.05	324	739
87.95	324	78	93.15	324	752
88.05	324	91	93.25	324	765
88.15	324	104	93.35	324	778
88.25	324	117	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	156	93.75	324	829
88.65	324	168	93.85	324	842
88.75	324	181	93.95	324	855
88.85	324	194	94.05	324	868
88.95	324	207	94.15	324	881
89.05	324	220	94.25	324	894
89.15	324	233	94.35	324	907
89.25	324	246	94.45	324	920
89.35	324	259	94.55	324	933
89.45	324	272	94.65	324	946
89.55	324	285	94.75	324	959
89.65	324	298	94.85	324	972
89.75	324	311	94.95	324	985
89.85	324	324	95.05	324	998
89.95	324	337	95.15	324	1,011
90.05	324	350	95.25	324	1,024
90.15	324	363	95.35	324	1,037
90.25	324	376	95.45	324	1,050
90.35	324	389	95.55	324	1,063
90.45	324	402	95.65	324	1,076
90.55	324	415	95.75	324	1,089
90.65	324	428	95.85	324	1,102
90.75	324	441	95.95	324	1,115
90.85	324	454	96.05	324	1,128
90.95	324	467	96.15	324	1,140
91.05	324	480	96.25	324	1,153
91.15	324	492	96.35	324	1,166
91.25	324	505	96.45	324	1,179
91.35	324	518	96.55	324	1,192
91.45	324	531	96.65	324	1,205
91.55	324	544	96.75	324	1,218
91.65	324	557	96.85	324	1,231
91.75	324	570	96.95	324	1,244
91.85	324	583	97.05	324	1,257
91.95	324	596	97.15	324	1,270
92.05	324	609	97.25	324	1,283
92.15	324	622	97.35	324	1,296
92.25	324	635			
92.35	324	648			
92.45	324	661			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Pond SW-A: Stormtech MC-3500 (SWM-A)

Inflow Area = 44,474 sf, 85.11% Impervious, Inflow Depth = 2.19" for 2-Year event
 Inflow = 2.27 cfs @ 12.14 hrs, Volume= 8,122 cf
 Outflow = 0.33 cfs @ 11.74 hrs, Volume= 8,122 cf, Atten= 85%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.74 hrs, Volume= 8,122 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 86.50' @ 12.77 hrs Surf.Area= 2,870 sf Storage= 2,666 cf

Plug-Flow detention time= 57.6 min calculated for 8,119 cf (100% of inflow)
 Center-of-Mass det. time= 57.6 min (871.0 - 813.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	4,056 cf	37.08'W x 77.40'L x 5.50'H Field A 15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids
#2A	85.75'	5,647 cf	ADS_StormTech MC-3500 d +Cap x 50 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 50 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		9,703 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.80'	12.0" Round Outlet Pipe L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 85.80' / 84.10' S= 0.0224 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	86.50'	4.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.65'	11.0" W x 4.0" H Vert. Upper Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	5.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.74 hrs HW=85.06' (Free Discharge)
 ↳ **5=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.00' (Free Discharge)
 ↳ **1=Outlet Pipe** (Controls 0.00 cfs)
 ↳ **2=Low Flow Orifice** (Controls 0.00 cfs)
 ↳ **3=Upper Orifice** (Controls 0.00 cfs)
 ↳ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 2-Year Rainfall=3.32"

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Pond SW-A: Stormtech MC-3500 (SWM-A) - 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

10 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 75.40' Row Length +12.0" End Stone x 2 = 77.40' 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" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

50 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 5,646.6 cf Chamber Storage

15,786.4 cf Field - 5,646.6 cf Chambers = 10,139.8 cf Stone x 40.0% Voids = 4,055.9 cf Stone Storage

Chamber Storage + Stone Storage = 9,702.5 cf = 0.223 af

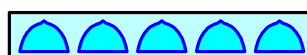
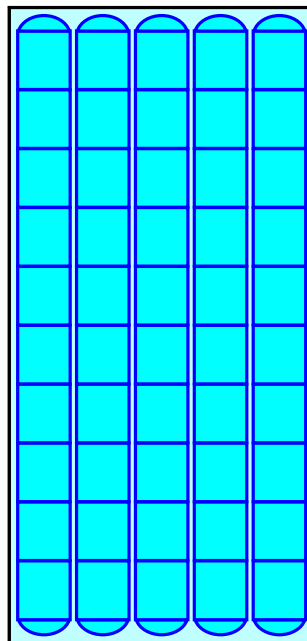
Overall Storage Efficiency = 61.5%

Overall System Size = 77.40' x 37.08' x 5.50'

50 Chambers

584.7 cy Field

375.5 cy Stone



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Type III 24-hr 2-Year Rainfall=3.32"

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Stage-Area-Storage for Pond SW-A: Stormtech MC-3500 (SWM-A)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	2,870	0	90.20	2,870	9,358
85.10	2,870	115	90.30	2,870	9,473
85.20	2,870	230	90.40	2,870	9,588
85.30	2,870	344	90.50	2,870	9,703
85.40	2,870	459			
85.50	2,870	574			
85.60	2,870	689			
85.70	2,870	804			
85.80	2,870	983			
85.90	2,870	1,227			
86.00	2,870	1,470			
86.10	2,870	1,712			
86.20	2,870	1,952			
86.30	2,870	2,192			
86.40	2,870	2,431			
86.50	2,870	2,669			
86.60	2,870	2,905			
86.70	2,870	3,140			
86.80	2,870	3,374			
86.90	2,870	3,606			
87.00	2,870	3,837			
87.10	2,870	4,066			
87.20	2,870	4,293			
87.30	2,870	4,519			
87.40	2,870	4,742			
87.50	2,870	4,963			
87.60	2,870	5,182			
87.70	2,870	5,399			
87.80	2,870	5,613			
87.90	2,870	5,825			
88.00	2,870	6,033			
88.10	2,870	6,239			
88.20	2,870	6,441			
88.30	2,870	6,640			
88.40	2,870	6,834			
88.50	2,870	7,025			
88.60	2,870	7,211			
88.70	2,870	7,392			
88.80	2,870	7,567			
88.90	2,870	7,736			
89.00	2,870	7,898			
89.10	2,870	8,048			
89.20	2,870	8,186			
89.30	2,870	8,314			
89.40	2,870	8,437			
89.50	2,870	8,554			
89.60	2,870	8,669			
89.70	2,870	8,784			
89.80	2,870	8,899			
89.90	2,870	9,014			
90.00	2,870	9,128			
90.10	2,870	9,243			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area = 25,547 sf, 55.05% Impervious, Inflow Depth = 1.70" for 2-Year event
 Inflow = 1.08 cfs @ 12.07 hrs, Volume= 3,618 cf
 Outflow = 0.10 cfs @ 12.86 hrs, Volume= 3,618 cf, Atten= 91%, Lag= 47.2 min
 Discarded = 0.10 cfs @ 12.86 hrs, Volume= 3,618 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 91.66' @ 12.86 hrs Surf.Area= 2,163 sf Storage= 1,310 cf

Plug-Flow detention time= 99.5 min calculated for 3,617 cf (100% of inflow)
 Center-of-Mass det. time= 99.5 min (854.2 - 754.7)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	8,231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	1,817	0	0
92.00	2,343	2,080	2,080
93.00	2,896	2,620	4,700
94.00	3,466	3,181	7,881
94.10	3,539	350	8,231

Device	Routing	Invert	Outlet Devices
#1	Primary	88.50'	12.0" Round Outlet Pipe L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.50' / 87.00' S= 0.0144 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	93.00'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	93.25'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#4	Discarded	91.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.10 cfs @ 12.86 hrs HW=91.66' (Free Discharge)
 ↑4=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑1=Outlet Pipe (Passes 0.00 cfs of 5.35 cfs potential flow)
 ↑2=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2-Year Rainfall=3.32"

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Stage-Area-Storage for Pond SW-B: Bioretention Basin (SWM-B)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.00	1,817	0	93.60	3,238	6,540
91.05	1,843	92	93.65	3,267	6,702
91.10	1,870	184	93.70	3,295	6,866
91.15	1,896	278	93.75	3,324	7,032
91.20	1,922	374	93.80	3,352	7,199
91.25	1,949	471	93.85	3,380	7,367
91.30	1,975	569	93.90	3,409	7,537
91.35	2,001	668	93.95	3,438	7,708
91.40	2,027	769	94.00	3,466	7,881
91.45	2,054	871	94.05	3,503	8,055
91.50	2,080	974	94.10	3,539	8,231
91.55	2,106	1,079			
91.60	2,133	1,185			
91.65	2,159	1,292			
91.70	2,185	1,401			
91.75	2,212	1,511			
91.80	2,238	1,622			
91.85	2,264	1,734			
91.90	2,290	1,848			
91.95	2,317	1,964			
92.00	2,343	2,080			
92.05	2,371	2,198			
92.10	2,398	2,317			
92.15	2,426	2,438			
92.20	2,454	2,560			
92.25	2,481	2,683			
92.30	2,509	2,808			
92.35	2,537	2,934			
92.40	2,564	3,061			
92.45	2,592	3,190			
92.50	2,620	3,321			
92.55	2,647	3,452			
92.60	2,675	3,585			
92.65	2,702	3,720			
92.70	2,730	3,856			
92.75	2,758	3,993			
92.80	2,785	4,131			
92.85	2,813	4,271			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,924	4,845			
93.10	2,953	4,992			
93.15	2,982	5,140			
93.20	3,010	5,290			
93.25	3,039	5,441			
93.30	3,067	5,594			
93.35	3,095	5,748			
93.40	3,124	5,904			
93.45	3,153	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Pond SW-C: Drywell & Basin (SWM-C)

Inflow Area = 59,794 sf, 10.59% Impervious, Inflow Depth = 0.02" for 2-Year event
 Inflow = 0.00 cfs @ 17.42 hrs, Volume= 108 cf
 Outflow = 0.00 cfs @ 17.55 hrs, Volume= 108 cf, Atten= 0%, Lag= 8.1 min
 Discarded = 0.00 cfs @ 17.55 hrs, Volume= 108 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 88.66' @ 17.55 hrs Surf.Area= 32 sf Storage= 2 cf

Plug-Flow detention time= 8.8 min calculated for 108 cf (100% of inflow)
 Center-of-Mass det. time= 8.8 min (1,193.2 - 1,184.4)

Volume	Invert	Avail.Storage	Storage Description
#1	88.60'	6,382 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.60	31	0	0
89.60	44	38	38
90.60	44	44	82
91.60	44	44	126
92.49	15	26	152
92.50	477	2	154
93.00	2,477	739	893
93.80	2,977	2,182	3,074
94.00	3,101	608	3,682
94.80	3,649	2,700	6,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	93.80'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 17.55 hrs HW=88.66' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2-Year Rainfall=3.32"

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Stage-Area-Storage for Pond SW-C: Drywell & Basin (SWM-C)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.60	31	0	93.80	2,977	3,074
88.70	32	3	93.90	3,039	3,375
88.80	34	6	94.00	3,101	3,682
88.90	35	10	94.10	3,169	3,996
89.00	36	13	94.20	3,238	4,316
89.10	38	17	94.30	3,306	4,643
89.20	39	21	94.40	3,375	4,977
89.30	40	25	94.50	3,444	5,318
89.40	41	29	94.60	3,512	5,666
89.50	43	33	94.70	3,580	6,021
89.60	44	38	94.80	3,649	6,382
89.70	44	42			
89.80	44	46			
89.90	44	51			
90.00	44	55			
90.10	44	60			
90.20	44	64			
90.30	44	68			
90.40	44	73			
90.50	44	77			
90.60	44	82			
90.70	44	86			
90.80	44	90			
90.90	44	95			
91.00	44	99			
91.10	44	104			
91.20	44	108			
91.30	44	112			
91.40	44	117			
91.50	44	121			
91.60	44	126			
91.70	41	130			
91.80	37	134			
91.90	34	137			
92.00	31	140			
92.10	28	143			
92.20	24	146			
92.30	21	148			
92.40	18	150			
92.50	477	154			
92.60	877	222			
92.70	1,277	330			
92.80	1,677	477			
92.90	2,077	665			
93.00	2,477	893			
93.10	2,539	1,144			
93.20	2,602	1,401			
93.30	2,664	1,664			
93.40	2,727	1,934			
93.50	2,790	2,209			
93.60	2,852	2,491			
93.70	2,914	2,780			

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Summary for Pond SW-D: Drywell & Basin (SWM-D)

Inflow Area = 12,462 sf, 10.46% Impervious, Inflow Depth = 0.01" for 2-Year event
 Inflow = 0.00 cfs @ 21.70 hrs, Volume= 14 cf
 Outflow = 0.00 cfs @ 21.93 hrs, Volume= 14 cf, Atten= 0%, Lag= 14.1 min
 Discarded = 0.00 cfs @ 21.93 hrs, Volume= 14 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 90.11' @ 21.93 hrs Surf.Area= 31 sf Storage= 0 cf

Plug-Flow detention time= 14.1 min calculated for 14 cf (100% of inflow)
 Center-of-Mass det. time= 14.1 min (1,233.7 - 1,219.6)

Volume	Invert	Avail.Storage	Storage Description
#1	90.10'	2,250 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.10	31	0	0
91.10	44	38	38
92.10	44	44	82
93.10	44	44	126
94.10	44	44	170
95.10	44	44	214
95.99	4	21	235
96.00	39	0	235
97.00	161	100	335
98.00	394	278	613
99.00	757	576	1,188
100.00	1,135	946	2,134
100.10	1,187	116	2,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.10'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	99.10'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.00 cfs @ 21.93 hrs HW=90.11' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2-Year Rainfall=3.32"

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Stage-Area-Storage for Pond SW-D: Drywell & Basin (SWM-D)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.10	31	0	95.30	35	221
90.20	32	3	95.40	31	225
90.30	34	6	95.50	26	228
90.40	35	10	95.60	22	230
90.50	36	13	95.70	17	232
90.60	38	17	95.80	13	233
90.70	39	21	95.90	8	234
90.80	40	25	96.00	39	235
90.90	41	29	96.10	51	240
91.00	43	33	96.20	63	245
91.10	44	38	96.30	76	252
91.20	44	42	96.40	88	260
91.30	44	46	96.50	100	270
91.40	44	51	96.60	112	280
91.50	44	55	96.70	124	292
91.60	44	60	96.80	137	305
91.70	44	64	96.90	149	320
91.80	44	68	97.00	161	335
91.90	44	73	97.10	184	352
92.00	44	77	97.20	208	372
92.10	44	82	97.30	231	394
92.20	44	86	97.40	254	418
92.30	44	90	97.50	278	445
92.40	44	95	97.60	301	474
92.50	44	99	97.70	324	505
92.60	44	104	97.80	347	538
92.70	44	108	97.90	371	574
92.80	44	112	98.00	394	613
92.90	44	117	98.10	430	654
93.00	44	121	98.20	467	699
93.10	44	126	98.30	503	747
93.20	44	130	98.40	539	799
93.30	44	134	98.50	576	855
93.40	44	139	98.60	612	914
93.50	44	143	98.70	648	977
93.60	44	148	98.80	684	1,044
93.70	44	152	98.90	721	1,114
93.80	44	156	99.00	757	1,188
93.90	44	161	99.10	795	1,266
94.00	44	165	99.20	833	1,347
94.10	44	170	99.30	870	1,432
94.20	44	174	99.40	908	1,521
94.30	44	178	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	187	99.70	1,022	1,811
94.60	44	192	99.80	1,059	1,915
94.70	44	196	99.90	1,097	2,022
94.80	44	200	100.00	1,135	2,134
94.90	44	205	100.10	1,187	2,250
95.00	44	209			
95.10	44	214			
95.20	40	218			

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Type III 24-hr 2-Year Rainfall=3.32"

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Summary for Link AP: Analysis Point

Inflow Area = 131,357 sf, 41.54% Impervious, Inflow Depth = 0.01" for 2-Year event
Inflow = 0.00 cfs @ 14.64 hrs, Volume= 102 cf
Primary = 0.00 cfs @ 14.64 hrs, Volume= 102 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 10-Year Rainfall=5.35"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1A: DA1A Runoff Area=59,794 sf 10.59% Impervious Runoff Depth=0.41"
Flow Length=337' Tc=17.4 min CN=42 Runoff=0.20 cfs 2,035 cf

Subcatchment DA1B: DA1B Runoff Area=13,662 sf 16.80% Impervious Runoff Depth=0.67"
Tc=10.0 min CN=47 Runoff=0.12 cfs 759 cf

Subcatchment DA2A: DA2A Runoff Area=14,063 sf 100.00% Impervious Runoff Depth=5.11"
Tc=5.0 min CN=98 Runoff=1.75 cfs 5,992 cf

Subcatchment DA2B: DA2B Runoff Area=11,484 sf 0.00% Impervious Runoff Depth=0.24"
Flow Length=189' Tc=11.5 min CN=38 Runoff=0.01 cfs 226 cf

Subcatchment DA3: DA3 Runoff Area=12,462 sf 10.46% Impervious Runoff Depth=0.36"
Tc=10.0 min CN=41 Runoff=0.04 cfs 376 cf

Subcatchment DA4: DA4 Runoff Area=44,474 sf 85.11% Impervious Runoff Depth=4.11"
Tc=10.0 min CN=89 Runoff=4.16 cfs 15,224 cf

Subcatchment DA5: DA5 Runoff Area=47,674 sf 0.74% Impervious Runoff Depth=0.10"
Flow Length=332' Tc=11.4 min CN=34 Runoff=0.01 cfs 410 cf

Pond CD-1: Curtain Drain Peak Elev=87.35' Storage=1 cf Inflow=0.12 cfs 759 cf
Discarded=0.00 cfs 19 cf Primary=0.12 cfs 740 cf Secondary=0.00 cfs 0 cf Outflow=0.12 cfs 759 cf

Pond SW-A: Stormtech MC-3500 (SWM-A) Peak Elev=87.67' Storage=5,342 cf Inflow=4.16 cfs 15,224 cf
Discarded=0.33 cfs 12,288 cf Primary=0.42 cfs 2,936 cf Outflow=0.75 cfs 15,224 cf

Pond SW-B: Bioretention Basin (SWM-B) Peak Elev=92.20' Storage=2,566 cf Inflow=1.75 cfs 6,218 cf
Discarded=0.11 cfs 6,218 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.11 cfs 6,218 cf

Pond SW-C: Drywell & Basin (SWM-C) Peak Elev=92.62' Storage=240 cf Inflow=0.20 cfs 2,035 cf
Discarded=0.11 cfs 2,035 cf Secondary=0.00 cfs 0 cf Outflow=0.11 cfs 2,035 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=94.08' Storage=169 cf Inflow=0.04 cfs 376 cf
Discarded=0.01 cfs 376 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 376 cf

Link AP: Analysis Point Inflow=0.49 cfs 4,086 cf
Primary=0.49 cfs 4,086 cf

Total Runoff Area = 203,613 sf Runoff Volume = 25,023 cf Average Runoff Depth = 1.47"
69.45% Pervious = 141,412 sf 30.55% Impervious = 62,201 sf

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA1A: DA1A

Runoff = 0.20 cfs @ 12.51 hrs, Volume= 2,035 cf, Depth= 0.41"

Routed to Pond SW-C : Drywell & Basin (SWM-C)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
29,175	39	>75% Grass cover, Good, HSG A
24,285	30	Woods, Good, HSG A
6,334	98	Paved parking, HSG A
59,794	42	Weighted Average
53,460		89.41% Pervious Area
6,334		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
17.4	337	Total			

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA1B: DA1B

Runoff = 0.12 cfs @ 12.21 hrs, Volume= 759 cf, Depth= 0.67"

Routed to Pond CD-1 : Curtain Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
8,478	39	>75% Grass cover, Good, HSG A
2,889	30	Woods, Good, HSG A
2,295	98	Paved parking, HSG A
13,662	47	Weighted Average
11,367		83.20% Pervious Area
2,295		16.80% Impervious Area

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

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA2A: DA2A

Runoff = 1.75 cfs @ 12.07 hrs, Volume= 5,992 cf, Depth= 5.11"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
14,063	98	Roofs, HSG A
14,063		100.00% Impervious Area

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

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA2B: DA2B

Runoff = 0.01 cfs @ 12.54 hrs, Volume= 226 cf, Depth= 0.24"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
10,005	39	>75% Grass cover, Good, HSG A
1,479	30	Woods, Good, HSG A
11,484	38	Weighted Average
11,484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0150	0.16		Sheet Flow, Sheetflow
					Grass: Short n= 0.150 P2= 3.43"
0.9	89	0.0550	1.64		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
11.5	189	Total			

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA3: DA3

Runoff = 0.04 cfs @ 12.43 hrs, Volume= 376 cf, Depth= 0.36"

Routed to Pond SW-D : Drywell & Basin (SWM-D)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
5,621	39	>75% Grass cover, Good, HSG A
5,538	30	Woods, Good, HSG A
1,303	98	Paved parking, HSG A
12,462	41	Weighted Average
11,159		89.54% Pervious Area
1,303		10.46% Impervious Area

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

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA4: DA4

Runoff = 4.16 cfs @ 12.14 hrs, Volume= 15,224 cf, Depth= 4.11"

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
5,461	39	>75% Grass cover, Good, HSG A
37,854	98	Paved parking, HSG A
1,159	30	Woods, Good, HSG A
44,474	89	Weighted Average
6,620		14.89% Pervious Area
37,854		85.11% Impervious Area

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

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Subcatchment DA5: DA5

Runoff = 0.01 cfs @ 15.06 hrs, Volume= 410 cf, Depth= 0.10"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=5.35"

Area (sf)	CN	Description
19,297	39	>75% Grass cover, Good, HSG A
28,025	30	Woods, Good, HSG A
352	98	Paved parking, HSG A
47,674	34	Weighted Average
47,322		99.26% Pervious Area
352		0.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
7.5	82	0.0240	0.18		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
11.4	332	Total			

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Pond CD-1: Curtain Drain

Inflow Area = 13,662 sf, 16.80% Impervious, Inflow Depth = 0.67" for 10-Year event
 Inflow = 0.12 cfs @ 12.21 hrs, Volume= 759 cf
 Outflow = 0.12 cfs @ 12.21 hrs, Volume= 759 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 12.21 hrs, Volume= 19 cf
 Primary = 0.12 cfs @ 12.21 hrs, Volume= 740 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.35' @ 12.21 hrs Surf.Area= 324 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 758 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (925.8 - 925.7)

Volume	Invert	Avail.Storage	Storage Description
#1	87.35'	1,296 cf	2.00'W x 162.00'L x 10.00'H Prismatic 3,240 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	86.30'	8.0" Round Outlet Pipe L= 110.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 86.30' / 84.90' S= 0.0127 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Discarded	87.35'	5.000 in/hr Exfiltration over Surface area
#3	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	87.40'	4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.04 cfs @ 12.21 hrs HW=87.35' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.43 cfs @ 12.21 hrs HW=87.35' (Free Discharge)
 ↳ **1=Outlet Pipe** (Inlet Controls 1.43 cfs @ 4.09 fps)
 ↳ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 10-Year Rainfall=5.35"

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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
87.35	324	0	92.55	324	674
87.45	324	13	92.65	324	687
87.55	324	26	92.75	324	700
87.65	324	39	92.85	324	713
87.75	324	52	92.95	324	726
87.85	324	65	93.05	324	739
87.95	324	78	93.15	324	752
88.05	324	91	93.25	324	765
88.15	324	104	93.35	324	778
88.25	324	117	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	156	93.75	324	829
88.65	324	168	93.85	324	842
88.75	324	181	93.95	324	855
88.85	324	194	94.05	324	868
88.95	324	207	94.15	324	881
89.05	324	220	94.25	324	894
89.15	324	233	94.35	324	907
89.25	324	246	94.45	324	920
89.35	324	259	94.55	324	933
89.45	324	272	94.65	324	946
89.55	324	285	94.75	324	959
89.65	324	298	94.85	324	972
89.75	324	311	94.95	324	985
89.85	324	324	95.05	324	998
89.95	324	337	95.15	324	1,011
90.05	324	350	95.25	324	1,024
90.15	324	363	95.35	324	1,037
90.25	324	376	95.45	324	1,050
90.35	324	389	95.55	324	1,063
90.45	324	402	95.65	324	1,076
90.55	324	415	95.75	324	1,089
90.65	324	428	95.85	324	1,102
90.75	324	441	95.95	324	1,115
90.85	324	454	96.05	324	1,128
90.95	324	467	96.15	324	1,140
91.05	324	480	96.25	324	1,153
91.15	324	492	96.35	324	1,166
91.25	324	505	96.45	324	1,179
91.35	324	518	96.55	324	1,192
91.45	324	531	96.65	324	1,205
91.55	324	544	96.75	324	1,218
91.65	324	557	96.85	324	1,231
91.75	324	570	96.95	324	1,244
91.85	324	583	97.05	324	1,257
91.95	324	596	97.15	324	1,270
92.05	324	609	97.25	324	1,283
92.15	324	622	97.35	324	1,296
92.25	324	635			
92.35	324	648			
92.45	324	661			

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Pond SW-A: Stormtech MC-3500 (SWM-A)

Inflow Area = 44,474 sf, 85.11% Impervious, Inflow Depth = 4.11" for 10-Year event
 Inflow = 4.16 cfs @ 12.14 hrs, Volume= 15,224 cf
 Outflow = 0.75 cfs @ 12.64 hrs, Volume= 15,224 cf, Atten= 82%, Lag= 30.4 min
 Discarded = 0.33 cfs @ 11.32 hrs, Volume= 12,288 cf
 Primary = 0.42 cfs @ 12.64 hrs, Volume= 2,936 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.67' @ 12.64 hrs Surf.Area= 2,870 sf Storage= 5,342 cf

Plug-Flow detention time= 76.2 min calculated for 15,220 cf (100% of inflow)
 Center-of-Mass det. time= 76.2 min (871.9 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	4,056 cf	37.08'W x 77.40'L x 5.50'H Field A 15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids
#2A	85.75'	5,647 cf	ADS_StormTech MC-3500 d +Cap x 50 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 50 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		9,703 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.80'	12.0" Round Outlet Pipe L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 85.80' / 84.10' S= 0.0224 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	86.50'	4.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.65'	11.0" W x 4.0" H Vert. Upper Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	5.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.32 hrs HW=85.06' (Free Discharge)
 ↳5=Exfiltration (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.42 cfs @ 12.64 hrs HW=87.67' (Free Discharge)
 ↳1=Outlet Pipe (Passes 0.42 cfs of 4.43 cfs potential flow)
 ↳2=Low Flow Orifice (Orifice Controls 0.42 cfs @ 4.83 fps)
 ↳3=Upper Orifice (Controls 0.00 cfs)
 ↳4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10-Year Rainfall=5.35"

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Pond SW-A: Stormtech MC-3500 (SWM-A) - 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

10 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 75.40' Row Length +12.0" End Stone x 2 = 77.40' 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" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

50 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 5,646.6 cf Chamber Storage

15,786.4 cf Field - 5,646.6 cf Chambers = 10,139.8 cf Stone x 40.0% Voids = 4,055.9 cf Stone Storage

Chamber Storage + Stone Storage = 9,702.5 cf = 0.223 af

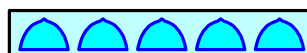
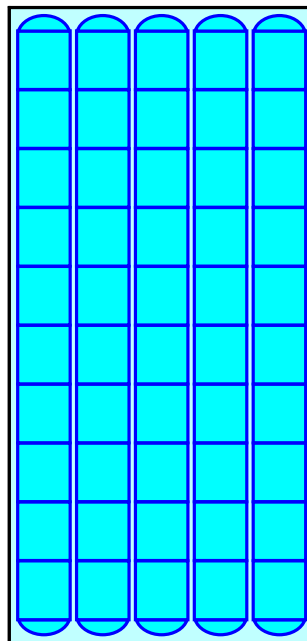
Overall Storage Efficiency = 61.5%

Overall System Size = 77.40' x 37.08' x 5.50'

50 Chambers

584.7 cy Field

375.5 cy Stone



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Type III 24-hr 10-Year Rainfall=5.35"

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Stage-Area-Storage for Pond SW-A: Stormtech MC-3500 (SWM-A)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	2,870	0	90.20	2,870	9,358
85.10	2,870	115	90.30	2,870	9,473
85.20	2,870	230	90.40	2,870	9,588
85.30	2,870	344	90.50	2,870	9,703
85.40	2,870	459			
85.50	2,870	574			
85.60	2,870	689			
85.70	2,870	804			
85.80	2,870	983			
85.90	2,870	1,227			
86.00	2,870	1,470			
86.10	2,870	1,712			
86.20	2,870	1,952			
86.30	2,870	2,192			
86.40	2,870	2,431			
86.50	2,870	2,669			
86.60	2,870	2,905			
86.70	2,870	3,140			
86.80	2,870	3,374			
86.90	2,870	3,606			
87.00	2,870	3,837			
87.10	2,870	4,066			
87.20	2,870	4,293			
87.30	2,870	4,519			
87.40	2,870	4,742			
87.50	2,870	4,963			
87.60	2,870	5,182			
87.70	2,870	5,399			
87.80	2,870	5,613			
87.90	2,870	5,825			
88.00	2,870	6,033			
88.10	2,870	6,239			
88.20	2,870	6,441			
88.30	2,870	6,640			
88.40	2,870	6,834			
88.50	2,870	7,025			
88.60	2,870	7,211			
88.70	2,870	7,392			
88.80	2,870	7,567			
88.90	2,870	7,736			
89.00	2,870	7,898			
89.10	2,870	8,048			
89.20	2,870	8,186			
89.30	2,870	8,314			
89.40	2,870	8,437			
89.50	2,870	8,554			
89.60	2,870	8,669			
89.70	2,870	8,784			
89.80	2,870	8,899			
89.90	2,870	9,014			
90.00	2,870	9,128			
90.10	2,870	9,243			

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Type III 24-hr 10-Year Rainfall=5.35"

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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area = 25,547 sf, 55.05% Impervious, Inflow Depth = 2.92" for 10-Year event
 Inflow = 1.75 cfs @ 12.07 hrs, Volume= 6,218 cf
 Outflow = 0.11 cfs @ 13.61 hrs, Volume= 6,218 cf, Atten= 93%, Lag= 92.5 min
 Discarded = 0.11 cfs @ 13.61 hrs, Volume= 6,218 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 92.20' @ 13.61 hrs Surf.Area= 2,455 sf Storage= 2,566 cf

Plug-Flow detention time= 198.0 min calculated for 6,216 cf (100% of inflow)
 Center-of-Mass det. time= 197.9 min (953.4 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	8,231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	1,817	0	0
92.00	2,343	2,080	2,080
93.00	2,896	2,620	4,700
94.00	3,466	3,181	7,881
94.10	3,539	350	8,231

Device	Routing	Invert	Outlet Devices
#1	Primary	88.50'	12.0" Round Outlet Pipe L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.50' / 87.00' S= 0.0144 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	93.00'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	93.25'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#4	Discarded	91.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.11 cfs @ 13.61 hrs HW=92.20' (Free Discharge)
 ↑4=Exfiltration (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑1=Outlet Pipe (Passes 0.00 cfs of 5.35 cfs potential flow)
 ↑2=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10-Year Rainfall=5.35"

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Stage-Area-Storage for Pond SW-B: Bioretention Basin (SWM-B)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.00	1,817	0	93.60	3,238	6,540
91.05	1,843	92	93.65	3,267	6,702
91.10	1,870	184	93.70	3,295	6,866
91.15	1,896	278	93.75	3,324	7,032
91.20	1,922	374	93.80	3,352	7,199
91.25	1,949	471	93.85	3,380	7,367
91.30	1,975	569	93.90	3,409	7,537
91.35	2,001	668	93.95	3,438	7,708
91.40	2,027	769	94.00	3,466	7,881
91.45	2,054	871	94.05	3,503	8,055
91.50	2,080	974	94.10	3,539	8,231
91.55	2,106	1,079			
91.60	2,133	1,185			
91.65	2,159	1,292			
91.70	2,185	1,401			
91.75	2,212	1,511			
91.80	2,238	1,622			
91.85	2,264	1,734			
91.90	2,290	1,848			
91.95	2,317	1,964			
92.00	2,343	2,080			
92.05	2,371	2,198			
92.10	2,398	2,317			
92.15	2,426	2,438			
92.20	2,454	2,560			
92.25	2,481	2,683			
92.30	2,509	2,808			
92.35	2,537	2,934			
92.40	2,564	3,061			
92.45	2,592	3,190			
92.50	2,620	3,321			
92.55	2,647	3,452			
92.60	2,675	3,585			
92.65	2,702	3,720			
92.70	2,730	3,856			
92.75	2,758	3,993			
92.80	2,785	4,131			
92.85	2,813	4,271			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,924	4,845			
93.10	2,953	4,992			
93.15	2,982	5,140			
93.20	3,010	5,290			
93.25	3,039	5,441			
93.30	3,067	5,594			
93.35	3,095	5,748			
93.40	3,124	5,904			
93.45	3,153	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			

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Summary for Pond SW-C: Drywell & Basin (SWM-C)

Inflow Area = 59,794 sf, 10.59% Impervious, Inflow Depth = 0.41" for 10-Year event
 Inflow = 0.20 cfs @ 12.51 hrs, Volume= 2,035 cf
 Outflow = 0.11 cfs @ 12.96 hrs, Volume= 2,035 cf, Atten= 44%, Lag= 27.0 min
 Discarded = 0.11 cfs @ 12.96 hrs, Volume= 2,035 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 92.62' @ 12.96 hrs Surf.Area= 957 sf Storage= 240 cf

Plug-Flow detention time= 80.6 min calculated for 2,035 cf (100% of inflow)
 Center-of-Mass det. time= 80.6 min (1,048.6 - 968.0)

Volume	Invert	Avail.Storage	Storage Description
#1	88.60'	6,382 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.60	31	0	0
89.60	44	38	38
90.60	44	44	82
91.60	44	44	126
92.49	15	26	152
92.50	477	2	154
93.00	2,477	739	893
93.80	2,977	2,182	3,074
94.00	3,101	608	3,682
94.80	3,649	2,700	6,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	93.80'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.11 cfs @ 12.96 hrs HW=92.62' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-C: Drywell & Basin (SWM-C)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.60	31	0	93.80	2,977	3,074
88.70	32	3	93.90	3,039	3,375
88.80	34	6	94.00	3,101	3,682
88.90	35	10	94.10	3,169	3,996
89.00	36	13	94.20	3,238	4,316
89.10	38	17	94.30	3,306	4,643
89.20	39	21	94.40	3,375	4,977
89.30	40	25	94.50	3,444	5,318
89.40	41	29	94.60	3,512	5,666
89.50	43	33	94.70	3,580	6,021
89.60	44	38	94.80	3,649	6,382
89.70	44	42			
89.80	44	46			
89.90	44	51			
90.00	44	55			
90.10	44	60			
90.20	44	64			
90.30	44	68			
90.40	44	73			
90.50	44	77			
90.60	44	82			
90.70	44	86			
90.80	44	90			
90.90	44	95			
91.00	44	99			
91.10	44	104			
91.20	44	108			
91.30	44	112			
91.40	44	117			
91.50	44	121			
91.60	44	126			
91.70	41	130			
91.80	37	134			
91.90	34	137			
92.00	31	140			
92.10	28	143			
92.20	24	146			
92.30	21	148			
92.40	18	150			
92.50	477	154			
92.60	877	222			
92.70	1,277	330			
92.80	1,677	477			
92.90	2,077	665			
93.00	2,477	893			
93.10	2,539	1,144			
93.20	2,602	1,401			
93.30	2,664	1,664			
93.40	2,727	1,934			
93.50	2,790	2,209			
93.60	2,852	2,491			
93.70	2,914	2,780			

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Summary for Pond SW-D: Drywell & Basin (SWM-D)

Inflow Area = 12,462 sf, 10.46% Impervious, Inflow Depth = 0.36" for 10-Year event
 Inflow = 0.04 cfs @ 12.43 hrs, Volume= 376 cf
 Outflow = 0.01 cfs @ 12.58 hrs, Volume= 376 cf, Atten= 86%, Lag= 9.2 min
 Discarded = 0.01 cfs @ 12.58 hrs, Volume= 376 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 94.08' @ 20.05 hrs Surf.Area= 44 sf Storage= 169 cf

Plug-Flow detention time= 380.5 min calculated for 376 cf (100% of inflow)
 Center-of-Mass det. time= 380.5 min (1,350.9 - 970.4)

Volume	Invert	Avail.Storage	Storage Description
#1	90.10'	2,250 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.10	31	0	0
91.10	44	38	38
92.10	44	44	82
93.10	44	44	126
94.10	44	44	170
95.10	44	44	214
95.99	4	21	235
96.00	39	0	235
97.00	161	100	335
98.00	394	278	613
99.00	757	576	1,188
100.00	1,135	946	2,134
100.10	1,187	116	2,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.10'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	99.10'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.01 cfs @ 12.58 hrs HW=91.12' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-D: Drywell & Basin (SWM-D)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.10	31	0	95.30	35	221
90.20	32	3	95.40	31	225
90.30	34	6	95.50	26	228
90.40	35	10	95.60	22	230
90.50	36	13	95.70	17	232
90.60	38	17	95.80	13	233
90.70	39	21	95.90	8	234
90.80	40	25	96.00	39	235
90.90	41	29	96.10	51	240
91.00	43	33	96.20	63	245
91.10	44	38	96.30	76	252
91.20	44	42	96.40	88	260
91.30	44	46	96.50	100	270
91.40	44	51	96.60	112	280
91.50	44	55	96.70	124	292
91.60	44	60	96.80	137	305
91.70	44	64	96.90	149	320
91.80	44	68	97.00	161	335
91.90	44	73	97.10	184	352
92.00	44	77	97.20	208	372
92.10	44	82	97.30	231	394
92.20	44	86	97.40	254	418
92.30	44	90	97.50	278	445
92.40	44	95	97.60	301	474
92.50	44	99	97.70	324	505
92.60	44	104	97.80	347	538
92.70	44	108	97.90	371	574
92.80	44	112	98.00	394	613
92.90	44	117	98.10	430	654
93.00	44	121	98.20	467	699
93.10	44	126	98.30	503	747
93.20	44	130	98.40	539	799
93.30	44	134	98.50	576	855
93.40	44	139	98.60	612	914
93.50	44	143	98.70	648	977
93.60	44	148	98.80	684	1,044
93.70	44	152	98.90	721	1,114
93.80	44	156	99.00	757	1,188
93.90	44	161	99.10	795	1,266
94.00	44	165	99.20	833	1,347
94.10	44	170	99.30	870	1,432
94.20	44	174	99.40	908	1,521
94.30	44	178	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	187	99.70	1,022	1,811
94.60	44	192	99.80	1,059	1,915
94.70	44	196	99.90	1,097	2,022
94.80	44	200	100.00	1,135	2,134
94.90	44	205	100.10	1,187	2,250
95.00	44	209			
95.10	44	214			
95.20	40	218			

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Summary for Link AP: Analysis Point

Inflow Area = 131,357 sf, 41.54% Impervious, Inflow Depth = 0.37" for 10-Year event
Inflow = 0.49 cfs @ 12.50 hrs, Volume= 4,086 cf
Primary = 0.49 cfs @ 12.50 hrs, Volume= 4,086 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 25-Year Rainfall=6.61"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1A: DA1A Runoff Area=59,794 sf 10.59% Impervious Runoff Depth=0.84"
Flow Length=337' Tc=17.4 min CN=42 Runoff=0.58 cfs 4,179 cf

Subcatchment DA1B: DA1B Runoff Area=13,662 sf 16.80% Impervious Runoff Depth=1.21"
Tc=10.0 min CN=47 Runoff=0.30 cfs 1,381 cf

Subcatchment DA2A: DA2A Runoff Area=14,063 sf 100.00% Impervious Runoff Depth=6.37"
Tc=5.0 min CN=98 Runoff=2.16 cfs 7,467 cf

Subcatchment DA2B: DA2B Runoff Area=11,484 sf 0.00% Impervious Runoff Depth=0.57"
Flow Length=189' Tc=11.5 min CN=38 Runoff=0.06 cfs 545 cf

Subcatchment DA3: DA3 Runoff Area=12,462 sf 10.46% Impervious Runoff Depth=0.77"
Tc=10.0 min CN=41 Runoff=0.12 cfs 798 cf

Subcatchment DA4: DA4 Runoff Area=44,474 sf 85.11% Impervious Runoff Depth=5.33"
Tc=10.0 min CN=89 Runoff=5.32 cfs 19,746 cf

Subcatchment DA5: DA5 Runoff Area=47,674 sf 0.74% Impervious Runoff Depth=0.34"
Flow Length=332' Tc=11.4 min CN=34 Runoff=0.09 cfs 1,335 cf

Pond CD-1: Curtain Drain Peak Elev=87.36' Storage=1 cf Inflow=0.30 cfs 1,381 cf
Discarded=0.01 cfs 34 cf Primary=0.29 cfs 1,347 cf Secondary=0.00 cfs 0 cf Outflow=0.30 cfs 1,381 cf

Pond SW-A: Stormtech MC-3500 (SWM-A) Peak Elev=88.61' Storage=7,222 cf Inflow=5.32 cfs 19,746 cf
Discarded=0.33 cfs 14,286 cf Primary=0.59 cfs 5,460 cf Outflow=0.92 cfs 19,746 cf

Pond SW-B: Bioretention Basin (SWM-B) Peak Elev=92.60' Storage=3,580 cf Inflow=2.16 cfs 8,012 cf
Discarded=0.12 cfs 8,012 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.12 cfs 8,012 cf

Pond SW-C: Drywell & Basin (SWM-C) Peak Elev=92.93' Storage=727 cf Inflow=0.58 cfs 4,179 cf
Discarded=0.25 cfs 4,179 cf Secondary=0.00 cfs 0 cf Outflow=0.25 cfs 4,179 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=97.00' Storage=335 cf Inflow=0.12 cfs 798 cf
Discarded=0.02 cfs 798 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 798 cf

Link AP: Analysis Point Inflow=0.82 cfs 8,142 cf
Primary=0.82 cfs 8,142 cf

Total Runoff Area = 203,613 sf Runoff Volume = 35,451 cf Average Runoff Depth = 2.09"
69.45% Pervious = 141,412 sf 30.55% Impervious = 62,201 sf

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Subcatchment DA1A: DA1A

Runoff = 0.58 cfs @ 12.37 hrs, Volume= 4,179 cf, Depth= 0.84"

Routed to Pond SW-C : Drywell & Basin (SWM-C)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
29,175	39	>75% Grass cover, Good, HSG A
24,285	30	Woods, Good, HSG A
6,334	98	Paved parking, HSG A
59,794	42	Weighted Average
53,460		89.41% Pervious Area
6,334		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
17.4	337	Total			

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Summary for Subcatchment DA1B: DA1B

Runoff = 0.30 cfs @ 12.17 hrs, Volume= 1,381 cf, Depth= 1.21"

Routed to Pond CD-1 : Curtain Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
8,478	39	>75% Grass cover, Good, HSG A
2,889	30	Woods, Good, HSG A
2,295	98	Paved parking, HSG A
13,662	47	Weighted Average
11,367		83.20% Pervious Area
2,295		16.80% Impervious Area

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

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Summary for Subcatchment DA2A: DA2A

Runoff = 2.16 cfs @ 12.07 hrs, Volume= 7,467 cf, Depth= 6.37"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
14,063	98	Roofs, HSG A
14,063		100.00% Impervious Area

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

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Summary for Subcatchment DA2B: DA2B

Runoff = 0.06 cfs @ 12.40 hrs, Volume= 545 cf, Depth= 0.57"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
10,005	39	>75% Grass cover, Good, HSG A
1,479	30	Woods, Good, HSG A
11,484	38	Weighted Average
11,484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0150	0.16		Sheet Flow, Sheetflow
					Grass: Short n= 0.150 P2= 3.43"
0.9	89	0.0550	1.64		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
11.5	189	Total			

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Summary for Subcatchment DA3: DA3

Runoff = 0.12 cfs @ 12.23 hrs, Volume= 798 cf, Depth= 0.77"

Routed to Pond SW-D : Drywell & Basin (SWM-D)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
5,621	39	>75% Grass cover, Good, HSG A
5,538	30	Woods, Good, HSG A
1,303	98	Paved parking, HSG A
12,462	41	Weighted Average
11,159		89.54% Pervious Area
1,303		10.46% Impervious Area

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

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Subcatchment DA4: DA4

Runoff = 5.32 cfs @ 12.14 hrs, Volume= 19,746 cf, Depth= 5.33"

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
5,461	39	>75% Grass cover, Good, HSG A
37,854	98	Paved parking, HSG A
1,159	30	Woods, Good, HSG A
44,474	89	Weighted Average
6,620		14.89% Pervious Area
37,854		85.11% Impervious Area

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

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Subcatchment DA5: DA5

Runoff = 0.09 cfs @ 12.51 hrs, Volume= 1,335 cf, Depth= 0.34"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.61"

Area (sf)	CN	Description
19,297	39	>75% Grass cover, Good, HSG A
28,025	30	Woods, Good, HSG A
352	98	Paved parking, HSG A
47,674	34	Weighted Average
47,322		99.26% Pervious Area
352		0.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
7.5	82	0.0240	0.18		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
11.4	332	Total			

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Summary for Pond CD-1: Curtain Drain

Inflow Area = 13,662 sf, 16.80% Impervious, Inflow Depth = 1.21" for 25-Year event
 Inflow = 0.30 cfs @ 12.17 hrs, Volume= 1,381 cf
 Outflow = 0.30 cfs @ 12.17 hrs, Volume= 1,381 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.01 cfs @ 12.17 hrs, Volume= 34 cf
 Primary = 0.29 cfs @ 12.17 hrs, Volume= 1,347 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.36' @ 12.17 hrs Surf.Area= 324 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 1,381 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (900.5 - 900.5)

Volume	Invert	Avail.Storage	Storage Description
#1	87.35'	1,296 cf	2.00'W x 162.00'L x 10.00'H Prismatic 3,240 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	86.30'	8.0" Round Outlet Pipe L= 110.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 86.30' / 84.90' S= 0.0127 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Discarded	87.35'	5.000 in/hr Exfiltration over Surface area
#3	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	87.40'	4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.04 cfs @ 12.17 hrs HW=87.36' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.43 cfs @ 12.17 hrs HW=87.36' (Free Discharge)
 ↳ **1=Outlet Pipe** (Inlet Controls 1.43 cfs @ 4.10 fps)
 ↳ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
87.35	324	0	92.55	324	674
87.45	324	13	92.65	324	687
87.55	324	26	92.75	324	700
87.65	324	39	92.85	324	713
87.75	324	52	92.95	324	726
87.85	324	65	93.05	324	739
87.95	324	78	93.15	324	752
88.05	324	91	93.25	324	765
88.15	324	104	93.35	324	778
88.25	324	117	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	156	93.75	324	829
88.65	324	168	93.85	324	842
88.75	324	181	93.95	324	855
88.85	324	194	94.05	324	868
88.95	324	207	94.15	324	881
89.05	324	220	94.25	324	894
89.15	324	233	94.35	324	907
89.25	324	246	94.45	324	920
89.35	324	259	94.55	324	933
89.45	324	272	94.65	324	946
89.55	324	285	94.75	324	959
89.65	324	298	94.85	324	972
89.75	324	311	94.95	324	985
89.85	324	324	95.05	324	998
89.95	324	337	95.15	324	1,011
90.05	324	350	95.25	324	1,024
90.15	324	363	95.35	324	1,037
90.25	324	376	95.45	324	1,050
90.35	324	389	95.55	324	1,063
90.45	324	402	95.65	324	1,076
90.55	324	415	95.75	324	1,089
90.65	324	428	95.85	324	1,102
90.75	324	441	95.95	324	1,115
90.85	324	454	96.05	324	1,128
90.95	324	467	96.15	324	1,140
91.05	324	480	96.25	324	1,153
91.15	324	492	96.35	324	1,166
91.25	324	505	96.45	324	1,179
91.35	324	518	96.55	324	1,192
91.45	324	531	96.65	324	1,205
91.55	324	544	96.75	324	1,218
91.65	324	557	96.85	324	1,231
91.75	324	570	96.95	324	1,244
91.85	324	583	97.05	324	1,257
91.95	324	596	97.15	324	1,270
92.05	324	609	97.25	324	1,283
92.15	324	622	97.35	324	1,296
92.25	324	635			
92.35	324	648			
92.45	324	661			

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Summary for Pond SW-A: Stormtech MC-3500 (SWM-A)

Inflow Area = 44,474 sf, 85.11% Impervious, Inflow Depth = 5.33" for 25-Year event
 Inflow = 5.32 cfs @ 12.14 hrs, Volume= 19,746 cf
 Outflow = 0.92 cfs @ 12.65 hrs, Volume= 19,746 cf, Atten= 83%, Lag= 31.1 min
 Discarded = 0.33 cfs @ 10.88 hrs, Volume= 14,286 cf
 Primary = 0.59 cfs @ 12.65 hrs, Volume= 5,460 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 88.61' @ 12.65 hrs Surf.Area= 2,870 sf Storage= 7,222 cf

Plug-Flow detention time= 84.2 min calculated for 19,741 cf (100% of inflow)
 Center-of-Mass det. time= 84.2 min (872.9 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	4,056 cf	37.08'W x 77.40'L x 5.50'H Field A 15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids
#2A	85.75'	5,647 cf	ADS_StormTech MC-3500 d +Cap x 50 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 50 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		9,703 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.80'	12.0" Round Outlet Pipe L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 85.80' / 84.10' S= 0.0224 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	86.50'	4.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.65'	11.0" W x 4.0" H Vert. Upper Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	5.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 10.88 hrs HW=85.06' (Free Discharge)
 ↳ **5=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.59 cfs @ 12.65 hrs HW=88.61' (Free Discharge)
 ↳ **1=Outlet Pipe** (Passes 0.59 cfs of 5.74 cfs potential flow)
 ↳ **2=Low Flow Orifice** (Orifice Controls 0.59 cfs @ 6.71 fps)
 ↳ **3=Upper Orifice** (Controls 0.00 cfs)
 ↳ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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Pond SW-A: Stormtech MC-3500 (SWM-A) - 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

10 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 75.40' Row Length +12.0" End Stone x 2 = 77.40' 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" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

50 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 5,646.6 cf Chamber Storage

15,786.4 cf Field - 5,646.6 cf Chambers = 10,139.8 cf Stone x 40.0% Voids = 4,055.9 cf Stone Storage

Chamber Storage + Stone Storage = 9,702.5 cf = 0.223 af

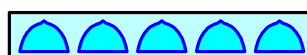
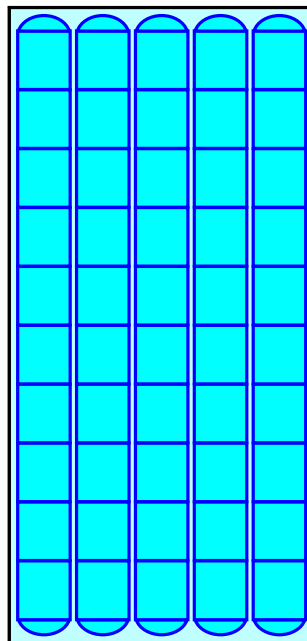
Overall Storage Efficiency = 61.5%

Overall System Size = 77.40' x 37.08' x 5.50'

50 Chambers

584.7 cy Field

375.5 cy Stone



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Stage-Area-Storage for Pond SW-A: Stormtech MC-3500 (SWM-A)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	2,870	0	90.20	2,870	9,358
85.10	2,870	115	90.30	2,870	9,473
85.20	2,870	230	90.40	2,870	9,588
85.30	2,870	344	90.50	2,870	9,703
85.40	2,870	459			
85.50	2,870	574			
85.60	2,870	689			
85.70	2,870	804			
85.80	2,870	983			
85.90	2,870	1,227			
86.00	2,870	1,470			
86.10	2,870	1,712			
86.20	2,870	1,952			
86.30	2,870	2,192			
86.40	2,870	2,431			
86.50	2,870	2,669			
86.60	2,870	2,905			
86.70	2,870	3,140			
86.80	2,870	3,374			
86.90	2,870	3,606			
87.00	2,870	3,837			
87.10	2,870	4,066			
87.20	2,870	4,293			
87.30	2,870	4,519			
87.40	2,870	4,742			
87.50	2,870	4,963			
87.60	2,870	5,182			
87.70	2,870	5,399			
87.80	2,870	5,613			
87.90	2,870	5,825			
88.00	2,870	6,033			
88.10	2,870	6,239			
88.20	2,870	6,441			
88.30	2,870	6,640			
88.40	2,870	6,834			
88.50	2,870	7,025			
88.60	2,870	7,211			
88.70	2,870	7,392			
88.80	2,870	7,567			
88.90	2,870	7,736			
89.00	2,870	7,898			
89.10	2,870	8,048			
89.20	2,870	8,186			
89.30	2,870	8,314			
89.40	2,870	8,437			
89.50	2,870	8,554			
89.60	2,870	8,669			
89.70	2,870	8,784			
89.80	2,870	8,899			
89.90	2,870	9,014			
90.00	2,870	9,128			
90.10	2,870	9,243			

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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area = 25,547 sf, 55.05% Impervious, Inflow Depth = 3.76" for 25-Year event
 Inflow = 2.16 cfs @ 12.07 hrs, Volume= 8,012 cf
 Outflow = 0.12 cfs @ 14.10 hrs, Volume= 8,012 cf, Atten= 94%, Lag= 122.1 min
 Discarded = 0.12 cfs @ 14.10 hrs, Volume= 8,012 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 92.60' @ 14.10 hrs Surf.Area= 2,674 sf Storage= 3,580 cf

Plug-Flow detention time= 269.1 min calculated for 8,010 cf (100% of inflow)
 Center-of-Mass det. time= 269.1 min (1,026.2 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	8,231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	1,817	0	0
92.00	2,343	2,080	2,080
93.00	2,896	2,620	4,700
94.00	3,466	3,181	7,881
94.10	3,539	350	8,231

Device	Routing	Invert	Outlet Devices
#1	Primary	88.50'	12.0" Round Outlet Pipe L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.50' / 87.00' S= 0.0144 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	93.00'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	93.25'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#4	Discarded	91.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 14.10 hrs HW=92.60' (Free Discharge)
 ↑4=Exfiltration (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑1=Outlet Pipe (Passes 0.00 cfs of 5.35 cfs potential flow)
 ↑2=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-B: Bioretention Basin (SWM-B)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.00	1,817	0	93.60	3,238	6,540
91.05	1,843	92	93.65	3,267	6,702
91.10	1,870	184	93.70	3,295	6,866
91.15	1,896	278	93.75	3,324	7,032
91.20	1,922	374	93.80	3,352	7,199
91.25	1,949	471	93.85	3,380	7,367
91.30	1,975	569	93.90	3,409	7,537
91.35	2,001	668	93.95	3,438	7,708
91.40	2,027	769	94.00	3,466	7,881
91.45	2,054	871	94.05	3,503	8,055
91.50	2,080	974	94.10	3,539	8,231
91.55	2,106	1,079			
91.60	2,133	1,185			
91.65	2,159	1,292			
91.70	2,185	1,401			
91.75	2,212	1,511			
91.80	2,238	1,622			
91.85	2,264	1,734			
91.90	2,290	1,848			
91.95	2,317	1,964			
92.00	2,343	2,080			
92.05	2,371	2,198			
92.10	2,398	2,317			
92.15	2,426	2,438			
92.20	2,454	2,560			
92.25	2,481	2,683			
92.30	2,509	2,808			
92.35	2,537	2,934			
92.40	2,564	3,061			
92.45	2,592	3,190			
92.50	2,620	3,321			
92.55	2,647	3,452			
92.60	2,675	3,585			
92.65	2,702	3,720			
92.70	2,730	3,856			
92.75	2,758	3,993			
92.80	2,785	4,131			
92.85	2,813	4,271			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,924	4,845			
93.10	2,953	4,992			
93.15	2,982	5,140			
93.20	3,010	5,290			
93.25	3,039	5,441			
93.30	3,067	5,594			
93.35	3,095	5,748			
93.40	3,124	5,904			
93.45	3,153	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			

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Summary for Pond SW-C: Drywell & Basin (SWM-C)

Inflow Area = 59,794 sf, 10.59% Impervious, Inflow Depth = 0.84" for 25-Year event
 Inflow = 0.58 cfs @ 12.37 hrs, Volume= 4,179 cf
 Outflow = 0.25 cfs @ 12.88 hrs, Volume= 4,179 cf, Atten= 56%, Lag= 30.5 min
 Discarded = 0.25 cfs @ 12.88 hrs, Volume= 4,179 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 92.93' @ 12.88 hrs Surf.Area= 2,194 sf Storage= 727 cf

Plug-Flow detention time= 55.9 min calculated for 4,179 cf (100% of inflow)
 Center-of-Mass det. time= 55.9 min (987.2 - 931.3)

Volume	Invert	Avail.Storage	Storage Description
#1	88.60'	6,382 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.60	31	0	0
89.60	44	38	38
90.60	44	44	82
91.60	44	44	126
92.49	15	26	152
92.50	477	2	154
93.00	2,477	739	893
93.80	2,977	2,182	3,074
94.00	3,101	608	3,682
94.80	3,649	2,700	6,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	93.80'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.25 cfs @ 12.88 hrs HW=92.93' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.25 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-C: Drywell & Basin (SWM-C)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.60	31	0	93.80	2,977	3,074
88.70	32	3	93.90	3,039	3,375
88.80	34	6	94.00	3,101	3,682
88.90	35	10	94.10	3,169	3,996
89.00	36	13	94.20	3,238	4,316
89.10	38	17	94.30	3,306	4,643
89.20	39	21	94.40	3,375	4,977
89.30	40	25	94.50	3,444	5,318
89.40	41	29	94.60	3,512	5,666
89.50	43	33	94.70	3,580	6,021
89.60	44	38	94.80	3,649	6,382
89.70	44	42			
89.80	44	46			
89.90	44	51			
90.00	44	55			
90.10	44	60			
90.20	44	64			
90.30	44	68			
90.40	44	73			
90.50	44	77			
90.60	44	82			
90.70	44	86			
90.80	44	90			
90.90	44	95			
91.00	44	99			
91.10	44	104			
91.20	44	108			
91.30	44	112			
91.40	44	117			
91.50	44	121			
91.60	44	126			
91.70	41	130			
91.80	37	134			
91.90	34	137			
92.00	31	140			
92.10	28	143			
92.20	24	146			
92.30	21	148			
92.40	18	150			
92.50	477	154			
92.60	877	222			
92.70	1,277	330			
92.80	1,677	477			
92.90	2,077	665			
93.00	2,477	893			
93.10	2,539	1,144			
93.20	2,602	1,401			
93.30	2,664	1,664			
93.40	2,727	1,934			
93.50	2,790	2,209			
93.60	2,852	2,491			
93.70	2,914	2,780			

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Pond SW-D: Drywell & Basin (SWM-D)

Inflow Area = 12,462 sf, 10.46% Impervious, Inflow Depth = 0.77" for 25-Year event
 Inflow = 0.12 cfs @ 12.23 hrs, Volume= 798 cf
 Outflow = 0.02 cfs @ 15.64 hrs, Volume= 798 cf, Atten= 84%, Lag= 204.9 min
 Discarded = 0.02 cfs @ 15.64 hrs, Volume= 798 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.00' @ 15.64 hrs Surf.Area= 161 sf Storage= 335 cf

Plug-Flow detention time= 390.7 min calculated for 798 cf (100% of inflow)
 Center-of-Mass det. time= 390.8 min (1,321.3 - 930.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.10'	2,250 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.10	31	0	0
91.10	44	38	38
92.10	44	44	82
93.10	44	44	126
94.10	44	44	170
95.10	44	44	214
95.99	4	21	235
96.00	39	0	235
97.00	161	100	335
98.00	394	278	613
99.00	757	576	1,188
100.00	1,135	946	2,134
100.10	1,187	116	2,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.10'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	99.10'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.02 cfs @ 15.64 hrs HW=97.00' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 25-Year Rainfall=6.61"

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Stage-Area-Storage for Pond SW-D: Drywell & Basin (SWM-D)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.10	31	0	95.30	35	221
90.20	32	3	95.40	31	225
90.30	34	6	95.50	26	228
90.40	35	10	95.60	22	230
90.50	36	13	95.70	17	232
90.60	38	17	95.80	13	233
90.70	39	21	95.90	8	234
90.80	40	25	96.00	39	235
90.90	41	29	96.10	51	240
91.00	43	33	96.20	63	245
91.10	44	38	96.30	76	252
91.20	44	42	96.40	88	260
91.30	44	46	96.50	100	270
91.40	44	51	96.60	112	280
91.50	44	55	96.70	124	292
91.60	44	60	96.80	137	305
91.70	44	64	96.90	149	320
91.80	44	68	97.00	161	335
91.90	44	73	97.10	184	352
92.00	44	77	97.20	208	372
92.10	44	82	97.30	231	394
92.20	44	86	97.40	254	418
92.30	44	90	97.50	278	445
92.40	44	95	97.60	301	474
92.50	44	99	97.70	324	505
92.60	44	104	97.80	347	538
92.70	44	108	97.90	371	574
92.80	44	112	98.00	394	613
92.90	44	117	98.10	430	654
93.00	44	121	98.20	467	699
93.10	44	126	98.30	503	747
93.20	44	130	98.40	539	799
93.30	44	134	98.50	576	855
93.40	44	139	98.60	612	914
93.50	44	143	98.70	648	977
93.60	44	148	98.80	684	1,044
93.70	44	152	98.90	721	1,114
93.80	44	156	99.00	757	1,188
93.90	44	161	99.10	795	1,266
94.00	44	165	99.20	833	1,347
94.10	44	170	99.30	870	1,432
94.20	44	174	99.40	908	1,521
94.30	44	178	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	187	99.70	1,022	1,811
94.60	44	192	99.80	1,059	1,915
94.70	44	196	99.90	1,097	2,022
94.80	44	200	100.00	1,135	2,134
94.90	44	205	100.10	1,187	2,250
95.00	44	209			
95.10	44	214			
95.20	40	218			

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Type III 24-hr 25-Year Rainfall=6.61"

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Summary for Link AP: Analysis Point

Inflow Area = 131,357 sf, 41.54% Impervious, Inflow Depth = 0.74" for 25-Year event
Inflow = 0.82 cfs @ 12.46 hrs, Volume= 8,142 cf
Primary = 0.82 cfs @ 12.46 hrs, Volume= 8,142 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

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Type III 24-hr 100-Year Rainfall=8.56"

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Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment DA1A: DA1A Runoff Area=59,794 sf 10.59% Impervious Runoff Depth=1.71"
Flow Length=337' Tc=17.4 min CN=42 Runoff=1.58 cfs 8,543 cf

Subcatchment DA1B: DA1B Runoff Area=13,662 sf 16.80% Impervious Runoff Depth=2.26"
Tc=10.0 min CN=47 Runoff=0.65 cfs 2,574 cf

Subcatchment DA2A: DA2A Runoff Area=14,063 sf 100.00% Impervious Runoff Depth=8.32"
Tc=5.0 min CN=98 Runoff=2.80 cfs 9,750 cf

Subcatchment DA2B: DA2B Runoff Area=11,484 sf 0.00% Impervious Runoff Depth=1.30"
Flow Length=189' Tc=11.5 min CN=38 Runoff=0.22 cfs 1,242 cf

Subcatchment DA3: DA3 Runoff Area=12,462 sf 10.46% Impervious Runoff Depth=1.61"
Tc=10.0 min CN=41 Runoff=0.36 cfs 1,670 cf

Subcatchment DA4: DA4 Runoff Area=44,474 sf 85.11% Impervious Runoff Depth=7.24"
Tc=10.0 min CN=89 Runoff=7.11 cfs 26,821 cf

Subcatchment DA5: DA5 Runoff Area=47,674 sf 0.74% Impervious Runoff Depth=0.91"
Flow Length=332' Tc=11.4 min CN=34 Runoff=0.48 cfs 3,609 cf

Pond CD-1: Curtain Drain Peak Elev=87.37' Storage=3 cf Inflow=0.65 cfs 2,574 cf
Discarded=0.02 cfs 64 cf Primary=0.63 cfs 2,510 cf Secondary=0.00 cfs 0 cf Outflow=0.65 cfs 2,574 cf

Pond SW-A: Stormtech MC-3500 (SWM-A) Peak Elev=89.50' Storage=8,559 cf Inflow=7.11 cfs 26,821 cf
Discarded=0.33 cfs 16,566 cf Primary=3.12 cfs 10,255 cf Outflow=3.45 cfs 26,821 cf

Pond SW-B: Bioretention Basin (SWM-B) Peak Elev=93.04' Storage=4,815 cf Inflow=2.89 cfs 10,993 cf
Discarded=0.14 cfs 10,202 cf Primary=0.22 cfs 791 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 10,993 cf

Pond SW-C: Drywell & Basin (SWM-C) Peak Elev=93.62' Storage=2,536 cf Inflow=1.58 cfs 8,543 cf
Discarded=0.33 cfs 8,543 cf Secondary=0.00 cfs 0 cf Outflow=0.33 cfs 8,543 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=98.05' Storage=635 cf Inflow=0.36 cfs 1,670 cf
Discarded=0.05 cfs 1,670 cf Secondary=0.00 cfs 0 cf Outflow=0.05 cfs 1,670 cf

Link AP: Analysis Point Inflow=4.00 cfs 17,164 cf
Primary=4.00 cfs 17,164 cf

Total Runoff Area = 203,613 sf Runoff Volume = 54,210 cf Average Runoff Depth = 3.19"
69.45% Pervious = 141,412 sf 30.55% Impervious = 62,201 sf

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA1A: DA1A

Runoff = 1.58 cfs @ 12.29 hrs, Volume= 8,543 cf, Depth= 1.71"
 Routed to Pond SW-C : Drywell & Basin (SWM-C)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
29,175	39	>75% Grass cover, Good, HSG A
24,285	30	Woods, Good, HSG A
6,334	98	Paved parking, HSG A
59,794	42	Weighted Average
53,460		89.41% Pervious Area
6,334		10.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
17.4	337	Total			

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Summary for Subcatchment DA1B: DA1B

Runoff = 0.65 cfs @ 12.16 hrs, Volume= 2,574 cf, Depth= 2.26"

Routed to Pond CD-1 : Curtain Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
8,478	39	>75% Grass cover, Good, HSG A
2,889	30	Woods, Good, HSG A
2,295	98	Paved parking, HSG A
13,662	47	Weighted Average
11,367		83.20% Pervious Area
2,295		16.80% Impervious Area

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

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA2A: DA2A

Runoff = 2.80 cfs @ 12.07 hrs, Volume= 9,750 cf, Depth= 8.32"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
14,063	98	Roofs, HSG A
14,063		100.00% Impervious Area

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

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA2B: DA2B

Runoff = 0.22 cfs @ 12.21 hrs, Volume= 1,242 cf, Depth= 1.30"

Routed to Pond SW-B : Bioretention Basin (SWM-B)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
10,005	39	>75% Grass cover, Good, HSG A
1,479	30	Woods, Good, HSG A
11,484	38	Weighted Average
11,484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0150	0.16		Sheet Flow, Sheetflow
					Grass: Short n= 0.150 P2= 3.43"
0.9	89	0.0550	1.64		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
11.5	189	Total			

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA3: DA3

Runoff = 0.36 cfs @ 12.17 hrs, Volume= 1,670 cf, Depth= 1.61"

Routed to Pond SW-D : Drywell & Basin (SWM-D)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
5,621	39	>75% Grass cover, Good, HSG A
5,538	30	Woods, Good, HSG A
1,303	98	Paved parking, HSG A
12,462	41	Weighted Average
11,159		89.54% Pervious Area
1,303		10.46% Impervious Area

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

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA4: DA4

Runoff = 7.11 cfs @ 12.13 hrs, Volume= 26,821 cf, Depth= 7.24"

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
5,461	39	>75% Grass cover, Good, HSG A
37,854	98	Paved parking, HSG A
1,159	30	Woods, Good, HSG A
44,474	89	Weighted Average
6,620		14.89% Pervious Area
37,854		85.11% Impervious Area

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

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Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Subcatchment DA5: DA5

Runoff = 0.48 cfs @ 12.34 hrs, Volume= 3,609 cf, Depth= 0.91"

Routed to Link AP : Analysis Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-Year Rainfall=8.56"

Area (sf)	CN	Description
19,297	39	>75% Grass cover, Good, HSG A
28,025	30	Woods, Good, HSG A
352	98	Paved parking, HSG A
47,674	34	Weighted Average
47,322		99.26% Pervious Area
352		0.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
7.5	82	0.0240	0.18		Sheet Flow, Sheetflow Grass: Short n= 0.150 P2= 3.43"
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
11.4	332	Total			

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Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Pond CD-1: Curtain Drain

Inflow Area = 13,662 sf, 16.80% Impervious, Inflow Depth = 2.26" for 100-Year event
 Inflow = 0.65 cfs @ 12.16 hrs, Volume= 2,574 cf
 Outflow = 0.65 cfs @ 12.16 hrs, Volume= 2,574 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.02 cfs @ 12.16 hrs, Volume= 64 cf
 Primary = 0.63 cfs @ 12.16 hrs, Volume= 2,510 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 87.37' @ 12.16 hrs Surf.Area= 324 sf Storage= 3 cf

Plug-Flow detention time= 0.1 min calculated for 2,573 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (878.3 - 878.2)

Volume	Invert	Avail.Storage	Storage Description
#1	87.35'	1,296 cf	2.00'W x 162.00'L x 10.00'H Prismatic 3,240 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	86.30'	8.0" Round Outlet Pipe L= 110.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 86.30' / 84.90' S= 0.0127 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Discarded	87.35'	5.000 in/hr Exfiltration over Surface area
#3	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Primary	87.40'	4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.04 cfs @ 12.16 hrs HW=87.37' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.44 cfs @ 12.16 hrs HW=87.37' (Free Discharge)
 ↳ **1=Outlet Pipe** (Inlet Controls 1.44 cfs @ 4.14 fps)
 ↳ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.35' (Free Discharge)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 100-Year Rainfall=8.56"

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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
87.35	324	0	92.55	324	674
87.45	324	13	92.65	324	687
87.55	324	26	92.75	324	700
87.65	324	39	92.85	324	713
87.75	324	52	92.95	324	726
87.85	324	65	93.05	324	739
87.95	324	78	93.15	324	752
88.05	324	91	93.25	324	765
88.15	324	104	93.35	324	778
88.25	324	117	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	156	93.75	324	829
88.65	324	168	93.85	324	842
88.75	324	181	93.95	324	855
88.85	324	194	94.05	324	868
88.95	324	207	94.15	324	881
89.05	324	220	94.25	324	894
89.15	324	233	94.35	324	907
89.25	324	246	94.45	324	920
89.35	324	259	94.55	324	933
89.45	324	272	94.65	324	946
89.55	324	285	94.75	324	959
89.65	324	298	94.85	324	972
89.75	324	311	94.95	324	985
89.85	324	324	95.05	324	998
89.95	324	337	95.15	324	1,011
90.05	324	350	95.25	324	1,024
90.15	324	363	95.35	324	1,037
90.25	324	376	95.45	324	1,050
90.35	324	389	95.55	324	1,063
90.45	324	402	95.65	324	1,076
90.55	324	415	95.75	324	1,089
90.65	324	428	95.85	324	1,102
90.75	324	441	95.95	324	1,115
90.85	324	454	96.05	324	1,128
90.95	324	467	96.15	324	1,140
91.05	324	480	96.25	324	1,153
91.15	324	492	96.35	324	1,166
91.25	324	505	96.45	324	1,179
91.35	324	518	96.55	324	1,192
91.45	324	531	96.65	324	1,205
91.55	324	544	96.75	324	1,218
91.65	324	557	96.85	324	1,231
91.75	324	570	96.95	324	1,244
91.85	324	583	97.05	324	1,257
91.95	324	596	97.15	324	1,270
92.05	324	609	97.25	324	1,283
92.15	324	622	97.35	324	1,296
92.25	324	635			
92.35	324	648			
92.45	324	661			

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Type III 24-hr 100-Year Rainfall=8.56"

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Summary for Pond SW-A: Stormtech MC-3500 (SWM-A)

Inflow Area = 44,474 sf, 85.11% Impervious, Inflow Depth = 7.24" for 100-Year event
 Inflow = 7.11 cfs @ 12.13 hrs, Volume= 26,821 cf
 Outflow = 3.45 cfs @ 12.36 hrs, Volume= 26,821 cf, Atten= 52%, Lag= 13.3 min
 Discarded = 0.33 cfs @ 10.18 hrs, Volume= 16,566 cf
 Primary = 3.12 cfs @ 12.36 hrs, Volume= 10,255 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 89.50' @ 12.36 hrs Surf.Area= 2,870 sf Storage= 8,559 cf

Plug-Flow detention time= 78.4 min calculated for 26,813 cf (100% of inflow)
 Center-of-Mass det. time= 78.4 min (859.1 - 780.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	4,056 cf	37.08'W x 77.40'L x 5.50'H Field A 15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids
#2A	85.75'	5,647 cf	ADS_StormTech MC-3500 d +Cap x 50 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 50 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf
		9,703 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.80'	12.0" Round Outlet Pipe L= 76.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 85.80' / 84.10' S= 0.0224 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	86.50'	4.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.65'	11.0" W x 4.0" H Vert. Upper Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	5.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 10.18 hrs HW=85.06' (Free Discharge)
 ↳ **5=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=3.11 cfs @ 12.36 hrs HW=89.50' (Free Discharge)
 ↳ **1=Outlet Pipe** (Passes 3.11 cfs of 6.77 cfs potential flow)
 ↳ **2=Low Flow Orifice** (Orifice Controls 0.71 cfs @ 8.11 fps)
 ↳ **3=Upper Orifice** (Orifice Controls 1.22 cfs @ 3.98 fps)
 ↳ **4=Sharp-Crested Rectangular Weir** (Weir Controls 1.18 cfs @ 1.47 fps)

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Pond SW-A: Stormtech MC-3500 (SWM-A) - 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

10 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 75.40' Row Length +12.0" End Stone x 2 = 77.40' 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" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

50 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 5,646.6 cf Chamber Storage

15,786.4 cf Field - 5,646.6 cf Chambers = 10,139.8 cf Stone x 40.0% Voids = 4,055.9 cf Stone Storage

Chamber Storage + Stone Storage = 9,702.5 cf = 0.223 af

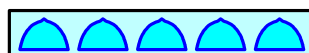
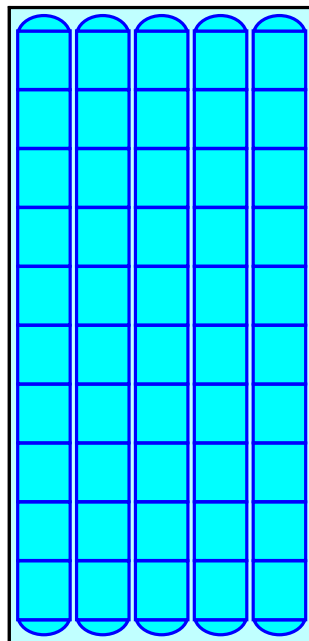
Overall Storage Efficiency = 61.5%

Overall System Size = 77.40' x 37.08' x 5.50'

50 Chambers

584.7 cy Field

375.5 cy Stone



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Stage-Area-Storage for Pond SW-A: Stormtech MC-3500 (SWM-A)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	2,870	0	90.20	2,870	9,358
85.10	2,870	115	90.30	2,870	9,473
85.20	2,870	230	90.40	2,870	9,588
85.30	2,870	344	90.50	2,870	9,703
85.40	2,870	459			
85.50	2,870	574			
85.60	2,870	689			
85.70	2,870	804			
85.80	2,870	983			
85.90	2,870	1,227			
86.00	2,870	1,470			
86.10	2,870	1,712			
86.20	2,870	1,952			
86.30	2,870	2,192			
86.40	2,870	2,431			
86.50	2,870	2,669			
86.60	2,870	2,905			
86.70	2,870	3,140			
86.80	2,870	3,374			
86.90	2,870	3,606			
87.00	2,870	3,837			
87.10	2,870	4,066			
87.20	2,870	4,293			
87.30	2,870	4,519			
87.40	2,870	4,742			
87.50	2,870	4,963			
87.60	2,870	5,182			
87.70	2,870	5,399			
87.80	2,870	5,613			
87.90	2,870	5,825			
88.00	2,870	6,033			
88.10	2,870	6,239			
88.20	2,870	6,441			
88.30	2,870	6,640			
88.40	2,870	6,834			
88.50	2,870	7,025			
88.60	2,870	7,211			
88.70	2,870	7,392			
88.80	2,870	7,567			
88.90	2,870	7,736			
89.00	2,870	7,898			
89.10	2,870	8,048			
89.20	2,870	8,186			
89.30	2,870	8,314			
89.40	2,870	8,437			
89.50	2,870	8,554			
89.60	2,870	8,669			
89.70	2,870	8,784			
89.80	2,870	8,899			
89.90	2,870	9,014			
90.00	2,870	9,128			
90.10	2,870	9,243			

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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area = 25,547 sf, 55.05% Impervious, Inflow Depth = 5.16" for 100-Year event
 Inflow = 2.89 cfs @ 12.07 hrs, Volume= 10,993 cf
 Outflow = 0.35 cfs @ 12.78 hrs, Volume= 10,993 cf, Atten= 88%, Lag= 42.6 min
 Discarded = 0.14 cfs @ 12.78 hrs, Volume= 10,202 cf
 Primary = 0.22 cfs @ 12.78 hrs, Volume= 791 cf
 Routed to Link AP : Analysis Point
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 93.04' @ 12.78 hrs Surf.Area= 2,919 sf Storage= 4,815 cf

Plug-Flow detention time= 319.9 min calculated for 10,993 cf (100% of inflow)
 Center-of-Mass det. time= 319.8 min (1,079.0 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	8,231 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	1,817	0	0
92.00	2,343	2,080	2,080
93.00	2,896	2,620	4,700
94.00	3,466	3,181	7,881
94.10	3,539	350	8,231

Device	Routing	Invert	Outlet Devices
#1	Primary	88.50'	12.0" Round Outlet Pipe L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.50' / 87.00' S= 0.0144 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	93.00'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	93.25'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#4	Discarded	91.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.14 cfs @ 12.78 hrs HW=93.04' (Free Discharge)
 ↑4=Exfiltration (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.21 cfs @ 12.78 hrs HW=93.04' (Free Discharge)
 ↑1=Outlet Pipe (Passes 0.21 cfs of 7.60 cfs potential flow)
 ↑2=Grate (Weir Controls 0.21 cfs @ 0.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-B: Bioretention Basin (SWM-B)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.00	1,817	0	93.60	3,238	6,540
91.05	1,843	92	93.65	3,267	6,702
91.10	1,870	184	93.70	3,295	6,866
91.15	1,896	278	93.75	3,324	7,032
91.20	1,922	374	93.80	3,352	7,199
91.25	1,949	471	93.85	3,380	7,367
91.30	1,975	569	93.90	3,409	7,537
91.35	2,001	668	93.95	3,438	7,708
91.40	2,027	769	94.00	3,466	7,881
91.45	2,054	871	94.05	3,503	8,055
91.50	2,080	974	94.10	3,539	8,231
91.55	2,106	1,079			
91.60	2,133	1,185			
91.65	2,159	1,292			
91.70	2,185	1,401			
91.75	2,212	1,511			
91.80	2,238	1,622			
91.85	2,264	1,734			
91.90	2,290	1,848			
91.95	2,317	1,964			
92.00	2,343	2,080			
92.05	2,371	2,198			
92.10	2,398	2,317			
92.15	2,426	2,438			
92.20	2,454	2,560			
92.25	2,481	2,683			
92.30	2,509	2,808			
92.35	2,537	2,934			
92.40	2,564	3,061			
92.45	2,592	3,190			
92.50	2,620	3,321			
92.55	2,647	3,452			
92.60	2,675	3,585			
92.65	2,702	3,720			
92.70	2,730	3,856			
92.75	2,758	3,993			
92.80	2,785	4,131			
92.85	2,813	4,271			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,924	4,845			
93.10	2,953	4,992			
93.15	2,982	5,140			
93.20	3,010	5,290			
93.25	3,039	5,441			
93.30	3,067	5,594			
93.35	3,095	5,748			
93.40	3,124	5,904			
93.45	3,153	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			

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Summary for Pond SW-C: Drywell & Basin (SWM-C)

Inflow Area = 59,794 sf, 10.59% Impervious, Inflow Depth = 1.71" for 100-Year event
 Inflow = 1.58 cfs @ 12.29 hrs, Volume= 8,543 cf
 Outflow = 0.33 cfs @ 13.31 hrs, Volume= 8,543 cf, Atten= 79%, Lag= 61.4 min
 Discarded = 0.33 cfs @ 13.31 hrs, Volume= 8,543 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Pond SW-A : Stormtech MC-3500 (SWM-A)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 93.62' @ 13.31 hrs Surf.Area= 2,862 sf Storage= 2,536 cf

Plug-Flow detention time= 87.0 min calculated for 8,541 cf (100% of inflow)
 Center-of-Mass det. time= 87.1 min (989.0 - 901.9)

Volume	Invert	Avail.Storage	Storage Description
#1	88.60'	6,382 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.60	31	0	0
89.60	44	38	38
90.60	44	44	82
91.60	44	44	126
92.49	15	26	152
92.50	477	2	154
93.00	2,477	739	893
93.80	2,977	2,182	3,074
94.00	3,101	608	3,682
94.80	3,649	2,700	6,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	93.80'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.33 cfs @ 13.31 hrs HW=93.62' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.33 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.60' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-C: Drywell & Basin (SWM-C)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.60	31	0	93.80	2,977	3,074
88.70	32	3	93.90	3,039	3,375
88.80	34	6	94.00	3,101	3,682
88.90	35	10	94.10	3,169	3,996
89.00	36	13	94.20	3,238	4,316
89.10	38	17	94.30	3,306	4,643
89.20	39	21	94.40	3,375	4,977
89.30	40	25	94.50	3,444	5,318
89.40	41	29	94.60	3,512	5,666
89.50	43	33	94.70	3,580	6,021
89.60	44	38	94.80	3,649	6,382
89.70	44	42			
89.80	44	46			
89.90	44	51			
90.00	44	55			
90.10	44	60			
90.20	44	64			
90.30	44	68			
90.40	44	73			
90.50	44	77			
90.60	44	82			
90.70	44	86			
90.80	44	90			
90.90	44	95			
91.00	44	99			
91.10	44	104			
91.20	44	108			
91.30	44	112			
91.40	44	117			
91.50	44	121			
91.60	44	126			
91.70	41	130			
91.80	37	134			
91.90	34	137			
92.00	31	140			
92.10	28	143			
92.20	24	146			
92.30	21	148			
92.40	18	150			
92.50	477	154			
92.60	877	222			
92.70	1,277	330			
92.80	1,677	477			
92.90	2,077	665			
93.00	2,477	893			
93.10	2,539	1,144			
93.20	2,602	1,401			
93.30	2,664	1,664			
93.40	2,727	1,934			
93.50	2,790	2,209			
93.60	2,852	2,491			
93.70	2,914	2,780			

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Summary for Pond SW-D: Drywell & Basin (SWM-D)

Inflow Area = 12,462 sf, 10.46% Impervious, Inflow Depth = 1.61" for 100-Year event
 Inflow = 0.36 cfs @ 12.17 hrs, Volume= 1,670 cf
 Outflow = 0.05 cfs @ 14.14 hrs, Volume= 1,670 cf, Atten= 87%, Lag= 118.5 min
 Discarded = 0.05 cfs @ 14.14 hrs, Volume= 1,670 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.05' @ 14.14 hrs Surf.Area= 414 sf Storage= 635 cf

Plug-Flow detention time= 276.9 min calculated for 1,670 cf (100% of inflow)
 Center-of-Mass det. time= 276.9 min (1,175.9 - 899.0)

Volume	Invert	Avail.Storage	Storage Description
#1	90.10'	2,250 cf	Drywell & Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.10	31	0	0
91.10	44	38	38
92.10	44	44	82
93.10	44	44	126
94.10	44	44	170
95.10	44	44	214
95.99	4	21	235
96.00	39	0	235
97.00	161	100	335
98.00	394	278	613
99.00	757	576	1,188
100.00	1,135	946	2,134
100.10	1,187	116	2,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.10'	5.000 in/hr Exfiltration over Surface area
#2	Secondary	99.10'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.05 cfs @ 14.14 hrs HW=98.05' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.10' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Stage-Area-Storage for Pond SW-D: Drywell & Basin (SWM-D)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.10	31	0	95.30	35	221
90.20	32	3	95.40	31	225
90.30	34	6	95.50	26	228
90.40	35	10	95.60	22	230
90.50	36	13	95.70	17	232
90.60	38	17	95.80	13	233
90.70	39	21	95.90	8	234
90.80	40	25	96.00	39	235
90.90	41	29	96.10	51	240
91.00	43	33	96.20	63	245
91.10	44	38	96.30	76	252
91.20	44	42	96.40	88	260
91.30	44	46	96.50	100	270
91.40	44	51	96.60	112	280
91.50	44	55	96.70	124	292
91.60	44	60	96.80	137	305
91.70	44	64	96.90	149	320
91.80	44	68	97.00	161	335
91.90	44	73	97.10	184	352
92.00	44	77	97.20	208	372
92.10	44	82	97.30	231	394
92.20	44	86	97.40	254	418
92.30	44	90	97.50	278	445
92.40	44	95	97.60	301	474
92.50	44	99	97.70	324	505
92.60	44	104	97.80	347	538
92.70	44	108	97.90	371	574
92.80	44	112	98.00	394	613
92.90	44	117	98.10	430	654
93.00	44	121	98.20	467	699
93.10	44	126	98.30	503	747
93.20	44	130	98.40	539	799
93.30	44	134	98.50	576	855
93.40	44	139	98.60	612	914
93.50	44	143	98.70	648	977
93.60	44	148	98.80	684	1,044
93.70	44	152	98.90	721	1,114
93.80	44	156	99.00	757	1,188
93.90	44	161	99.10	795	1,266
94.00	44	165	99.20	833	1,347
94.10	44	170	99.30	870	1,432
94.20	44	174	99.40	908	1,521
94.30	44	178	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	187	99.70	1,022	1,811
94.60	44	192	99.80	1,059	1,915
94.70	44	196	99.90	1,097	2,022
94.80	44	200	100.00	1,135	2,134
94.90	44	205	100.10	1,187	2,250
95.00	44	209			
95.10	44	214			
95.20	40	218			

post development (REV)

Type III 24-hr 100-Year Rainfall=8.56"

Prepared by HH Engineering Assoc

Printed 2/24/2023

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Summary for Link AP: Analysis Point

Inflow Area = 131,357 sf, 41.54% Impervious, Inflow Depth = 1.57" for 100-Year event
Inflow = 4.00 cfs @ 12.35 hrs, Volume= 17,164 cf
Primary = 4.00 cfs @ 12.35 hrs, Volume= 17,164 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs