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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 Noo3C 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.

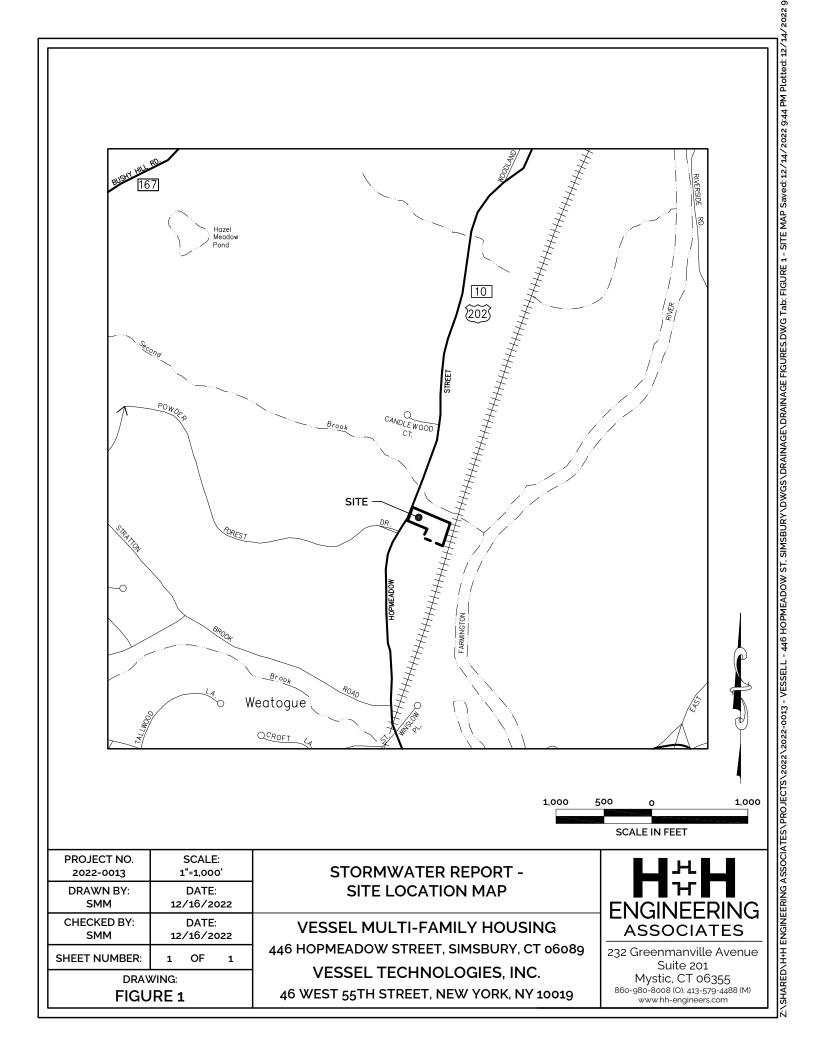
This report presents the basis of the project hydrologic and hydraulic analysis of the site, the design for the new site drainage systems, and Best Management Practices (BMPs) incorporated into the site design to manage and treat stormwater runoff in accordance with the 2004 CT DEEP Stormwater Quality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

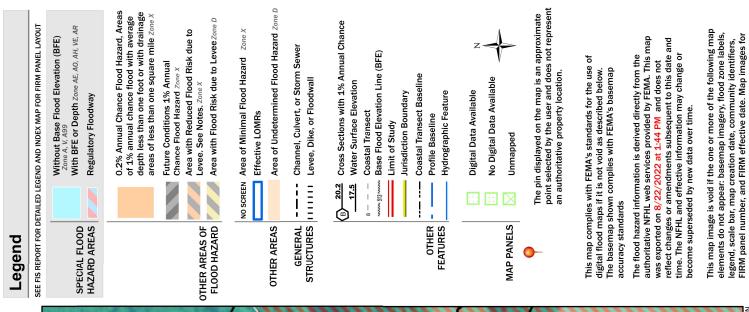
- Does not increase peak rates of runoff from watersheds encompassing the new buildings and parking areas.
- Does not degrade the quality of receiving groundwater, waterbodies, or watercourses.
- Complies with the 2004 CT DEEP SQM and the Town of Simsbury Stormwater Management Standards to the greatest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





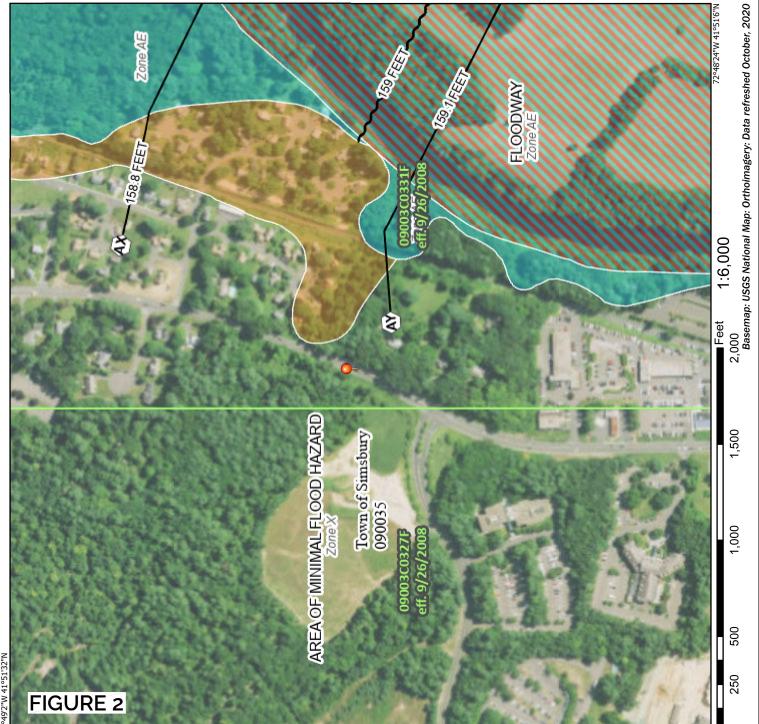
National Flood Hazard Layer FIRMette





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 offsite 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					
Pt	[
STORM FREQUENCY	ANA	LYSIS POINT - EDGE OF WET	LAND		
	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	ANAI	YSIS POINT - EDGE OF WET	LAND	
STORM FREQUENCY	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 -	┠┛╨┠┛
DRAWN BY: SMM	DATE: 12/16/2022	STORMWATER RUNOFF SUMMARY	
CHECKED BY: SMM	DATE: 12/16/2022	VESSEL MULTI-FAMILY HOUSING	ASSOCIATES
SHEET NUMBER:	1 OF 1	446 HOPMEADOW STREET, SIMSBURY, CT 06089	232 Greenmanville Avenue Suite 201
DRAWING: FIGURE 5		VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com

	TORMWATER MANAGEMENT FORMTECH SC-3500 INFILTR/	
TORM 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
S	TOP OF FRAME (MANHOLE COVER) ELEV RECTANGULAR WEIR INV. ELEV. = 8 4*x11" UPPER ORIFICE = 88.65 4" DIA. LOW-FLOW ORIFICE = 86.5 12" INV. OUT ELEV. = 85.80 EXFILTRATION RATE = 5.0 IN/HF	9.30 30 2 AREA 'B'
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
1		

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

EXFILTRATION RATE = 2.0 IN/HR

REVISED: 2/24/2023

PROJECT NO. 2022-0013	SCALE: N.T.S.	STORMWATER REPORT - STORMWATER TREATMENT PRACTICES	┗┛╨┗┛
DRAWN BY: SMM	DATE: 12/16/2022	STAGE-STORAGE SUMMARIES	
CHECKED BY: SMM	DATE: 12/16/2022	VESSEL MULTI-FAMILY HOUSING	ASSOCIATES
SHEET NUMBER:	1 OF 2	446 HOPMEADOW STREET, SIMSBURY, CT 06089	232 Greenmanville Avenue Suite 201
DRAWING: FIGURE 6		VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com

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	
DRAWN BY: SMM	DATE: 12/16/2022	STAGE-STORAGE SUMMARIES	
CHECKED BY: SMM	DATE: 12/16/2022	VESSEL MULTI-FAMILY HOUSING	ASSOCIATES
SHEET NUMBER:	2 OF 2	446 HOPMEADOW STREET, SIMSBURY, CT 06089	232 Greenmanville Avenue Suite 201
DRAWING: FIGURE 6		VESSEL TECHNOLOGIES, INC. 46 WEST 55TH STREET, NEW YORK, NY 10019	Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com

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

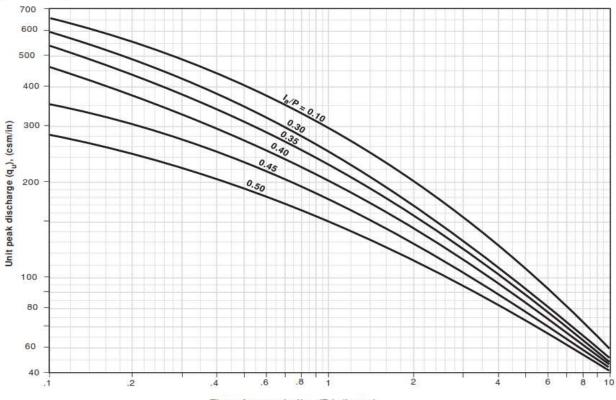
> December 16, 2022 Revised: February 24, 2023

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

ENGINEERING ASSOCIATES

Appendix A – Water Quality Volume and Water Quality Flow Calculations

	WQV & WQF CALCULATIONS - STORMWATER MANAGEMENT AREA 'A'						
Project:	446 Hopme	adow Street, Simsbury	Calculated By	Date			
Client:	Vessel Tech	inologies, Inc.	SMM	12/14/2022			
				Revisd 2/24/2023			
Water Qu	ality Volume	(WQV)					
1.02 ac A = Area draining to the practice							
0.87	0.87 ac A ₁ = Impervious area draining to the practice						
0.85	0.85 decimal I = Percent impervious area draining to the practice, in de						
0.82	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x l)					
0.83	ac-in	$WQV = 1" \times R_V \times A$					
3,027	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")					
Water Qu	ality Flow (W	/QF)					
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	la = initial abstraction. la=0.2S					
10.0	minutes	T _c = Time of Concentration					
590.0	cfs/mi²/in	qu is the unit peak discharge. Obtain this value from T	R-55 exhibits 4-II ar	nd 4-III			
0.769	cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi²/in *	ac-in" to "cfs" multi	ply by 1mi²/640ac			
Designer	Stormwater	' Management Area 'A'					
Notes:	ADS Stormt	ech SC-3500 Infiltration System					
	ADS Stormtech SC-740 Isolator Row Sizing:			╡			
	Three iso	lator rows are provided (total units = 20).		⊢┎▋▋			
	Treated flow rate = 0.40 CFS / unit X 20 units = 8.00 CFS			EERING			
	Treated flow rate > WQF			CIATES			
	(Inflow ra	te from 100-year storm event = 7.11 CFS)		_			
	qu obtained	from exhibit 4-III for NRCS type III rainfall distribution					



 $\label{eq:constraint} \textbf{Exhibit 4-III} ~~ \textbf{Unit peal discharge}~(q_u)~ for NRCS~(SCS)~ type~ \textbf{III}~ rainfall~ distribution$

Time of concentration (T_c), (hours)

	Ň	WQV & WQF CALCULATIONS - STORMWATER MAN	AGEMENT AREA 'E	3'		
Project:	446 Hopme	adow Street, Simsbury	Calculated By	Date		
Client:	Vessel Tech	nnologies, Inc.	SMM	12/14/2022		
				Revisd 2/24/2023		
Water Qu	ality 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	n decimal form			
0.55	; unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)				
0.32	ac-in	$WQV = 1" \times R_V \times A$				
1,162	2 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")				
Water Qu	ality Flow (W	/QF)				
	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*[Q ² +1.25*Q*P] ^{0.5})				
0.6	inches	S = potential maximum retention. S = (1000/CN) - 10				
0.112	inches	la = initial abstraction. la=0.2S				
	minutes	T _c = Time of Concentration				
	cfs/mi²/in	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III				
0.000	o cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	* ac-in" to "cfs" multi	iply by 1mi²/640ac		
		·				
Designer	Stormwater	r Management Area 'B'				
Notes:	Bioretentio	n Basin				
	Treated v	olume (volume stored prior to discharging) = 4,700 CF				
	Contributi	ng WQV = 1,162 CF		H		
	Treated v	olume = 404% of Water Quality Volume	ENGIN	EERING		

	V	WQV & WQF CALCULATIONS - STORMWATER MAN	AGEMENT AREA 'C			
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date		
Client:	Vessel Technologies, Inc.		SMM	12/14/2022		
				Revisd 2/24/2023		
Water Qu	ality Volume	(WQV)				
1.37	ac	A = Area draining to the practice				
0.15	ac	A _l = Impervious area draining to the practice				
0.11	0.11 decimal I = Percent impervious area draining to the practice, in d					
0.15	0.15 unitless R_V = Runoff coefficient = 0.05 + (0.9 x I)					
0.20	0.20 ac-in WQV = 1" x R _V x A					
739	cf	WQV conversion (ac-in x 43.560 sf/ac x 1ft/12")				
	ality Flow (W					
	inches	P = amount of rainfall.				
U U	inches	Q = Water Quality Depth. Q=WQV/A				
	unitless		unit peak discharge curve number. CN=1000/(10+5P+10Q-10*[Q ² +1.25*Q*P] ^{0.5})			
	inches	S = potential maximum retention. S = (1000/CN) - 10				
0.386	inches	la = initial abstraction. la=0.2S				
	minutes	T _c = Time of Concentration				
	cfs/mi²/in	qu is the unit peak discharge. Obtain this value from T				
0.000	cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in "	`ac-in" to "cfs" multi	ply by 1mi²/640ac		
			1			
Designer		' Management Area 'C'	4			
Notes:	-	l Collection Basin				
		olume (volume stored through 100-yr event) =2,536 CF		╬┣┫		
		ng WQV = 739 CF	·			
	I reated v	olume = 343% of Water Quality Volume		EERING		
			ASSOC	CIATES		

	N	WQV & WQF CALCULATIONS - STORMWATER MAN	AGEMENT AREA 'D)'				
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date				
Client:	Vessel Tech	inologies, Inc.	SMM	12/14/2022				
				Revisd 2/24/2023				
Water Qu	ality 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	I = Percent impervious area draining to the practice, in	decimal form					
0.14	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x 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 Qu	ality Flow (W	/QF)						
	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*[Q ² +1.25	5 [*] Q [*] P] ^{0.5})				
2.0	inches	S = potential maximum retention. S = (1000/CN) - 10						
0.391	inches	Ia = initial abstraction. Ia=0.2S						
	minutes	T _c = Time of Concentration						
	cfs/mi²/in	qu is the unit peak discharge. Obtain this value from T	R-55 exhibits 4-II ar	nd 4-III				
0.000	cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	* ac-in" to "cfs" multi	ply by 1mi²/640ac				
Designer	Stormwater	' Management Area 'C'						
Notes:	Drywell and	l Collection Basin						
	Treated v	olume (volume stored through 100-yr event) = 635 CF		≝ ⊢				
	Contributi	ng WQV = 150 CF						
	Treated v	olume = 423% of Water Quality Volume	FNGIN	EERING				

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) = <u>1.8 (Q-5)</u> + 10

(Sp)^{3/2}

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)=	0.92	cfs	PIPE DIA=	1	ft	
A. W ₁ = 3(Sp) = ft						3 ft
B. La = <u>1.8 (Q-5)</u> + (Sp) ¹⁵	10 = ft				Use 5' min.	3 ft
C. W ₂ = 3(Sp) + 0.7(L	_a) = ft					6 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)= 5.3

fps

Therfore; 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) = <u>1.8 (Q-5)</u> + 10

(Sp)^{3/2}

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)=	0 cfs	PIPE DIA=	1 ft	
A. W ₁ = 3(Sp) = ft				3 ft
B. La = <u>1.8 (Q-5)</u> + (Sp) ¹⁵	10 = ft		Use 5' min.	1 ft
C. W ₂ = 3(Sp) + 0.7(L	_a) = ft		Use 5' min.	4 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)=

0

fps

Therfore; 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) = <u>1.8 (Q-5)</u> + 10

(Sp)^{3/2}

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)=	2.16	cfs	PIPE DIA=	1 ft	
A. W ₁ = 3(Sp) = ft					3 ft
B. La = <u>1.8 (Q-5)</u> +10 (Sp) ¹⁵	D = ft				5 ft
C. W ₂ = 3(Sp) + 0.7(La) = ft				7 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

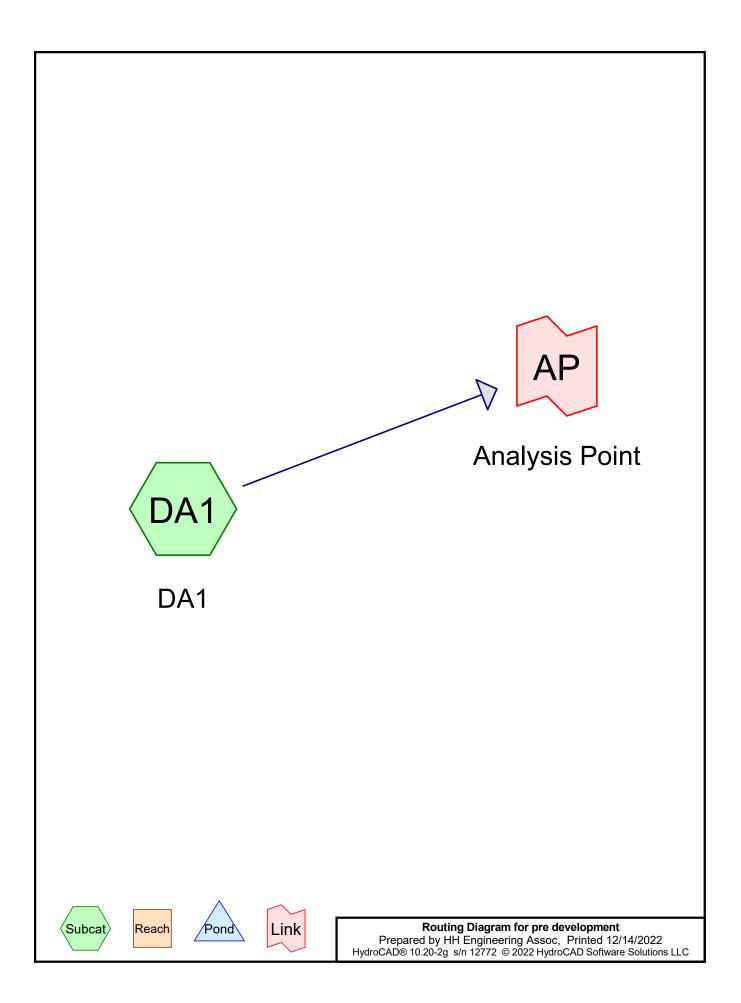
V(25yr)=

fps

5.05

Therfore; Use Modified Riprap

Appendix C – Pre-Development HydroCAD Report



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

Rainfall Events Listing (selected events)

Area Listing (all nodes)

Area	CN	Description
(sq-ft)		(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

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

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/grasslan
						d/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

Ground Covers (all nodes)

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

Summary for Subcatchment DA1: DA1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link AP : Analysis Point 0 cf, Depth= 0.00"

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"

A	rea (sf)	CN D	escription						
1	08,124	39 P	39 Pasture/grassland/range, Good, HSG A						
	11,948	98 P	Paved parking, HSG A						
	77,918	30 V	Voods, Go	od, HSG A					
	4,938	98 R	loofs, HSC	βA					
	684	<u>76</u>	Gravel road	ls, HSG A					
2	203,612	41 V	Veighted A	verage					
1	86,726	9	1.71% Per	vious Area					
	16,886	8	.29% Impe	ervious Area	a				
_				_					
Tc	Length	Slope		Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
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				
	0.5	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"				
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow				
0.1	22	0.0245	0 77		Woodland Kv= 5.0 fps				
0.1	22	0.0345	3.11						
15	61	0.0100	0 70						
1.5	01	0.0100	0.70						
20	127	0.0450	1.06						
2.0	121	0.0400	1.00						
15	136	0 0441	1 47						
	100	0.0111							
3.4	283	0.0750	1.37						
					Woodland Kv= 5.0 fps				
22.5	764	Total			·				
0.1 1.5 2.0 1.5 3.4 22.5			3.77 0.70 1.06 1.47 1.37		Shallow Concentrated Flow, shallow Paved Kv= 20.3 fps Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, shallow				

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, Atter	n= 0%, Lag= 0.0 min

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

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

Summary for Subcatchment DA1: DA1

Runoff = 0.01 cfs @ 21.88 hrs, Volume= Routed to Link AP : Analysis Point 223 cf, Depth= 0.01"

A	rea (sf)	CN D	escription		
1	08,124				ge, Good, HSG A
	11,948			ing, HSG A	
	77,918			od, HSG A	
	4,938		loofs, HSG		
	684	76 G	Fravel road	ls, HSG A	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	.29% Impe	ervious Area	a
-		~		o "	
Tc	Length	Slope		Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
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
0.0	05	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow
0.1	22	0.0245	2 77		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
1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0400	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
		0.0111			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 Are	a =	203,612 sf,	8.29% Impervious,	Inflow Depth = 0.01"	for 2-Year event
Inflow	=	0.01 cfs @ 2	21.88 hrs, Volume=	223 cf	
Primary	=	0.01 cfs @ 2	21.88 hrs, Volume=	223 cf, Atter	n= 0%, Lag= 0.0 min

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

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

Summary for Subcatchment DA1: DA1

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

A	rea (sf)	CN D	escription		
1	08,124				ge, Good, HSG A
	11,948			ing, HSG A	
	77,918			od, HSG A	
	4,938		loofs, HSG		
	684	76 G	Fravel road	ls, HSG A	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	.29% Impe	ervious Area	a
-		~		o "	
Tc	Length	Slope		Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
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
0.0	05	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow
0.1	22	0.0245	2 77		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
1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0400	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
		0.0111			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	a =	203,612 sf,	8.29% Impervious,	Inflow Depth = 0.36"	for 10-Year event
Inflow	=	0.50 cfs @ 1	12.61 hrs, Volume=	6,149 cf	
Primary	=	0.50 cfs @ 1	12.61 hrs, Volume=	6,149 cf, Atter	n= 0%, Lag= 0.0 min

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

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

Summary for Subcatchment DA1: DA1

Runoff = 1.61 cfs @ 12.49 hrs, Volume= Routed to Link AP : Analysis Point 13,040 cf, Depth= 0.77"

A	rea (sf)	CN D	escription		
1	08,124				ge, Good, HSG A
	11,948			ing, HSG A	
	77,918			od, HSG A	
	4,938		loofs, HSG		
	684	76 G	Fravel road	ls, HSG A	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	.29% Impe	ervious Area	a
-		~		o "	
Tc	Length	Slope		Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
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
0.0	05	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow
0.1	22	0.0245	2 77		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
1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0400	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
		0.0111			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 = 0.77 "	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, Atte	n= 0%, Lag= 0.0 min

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

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

Summary for Subcatchment DA1: DA1

Runoff = 4.45 cfs @ 12.39 hrs, Volume= Routed to Link AP : Analysis Point 27,291 cf, Depth= 1.61"

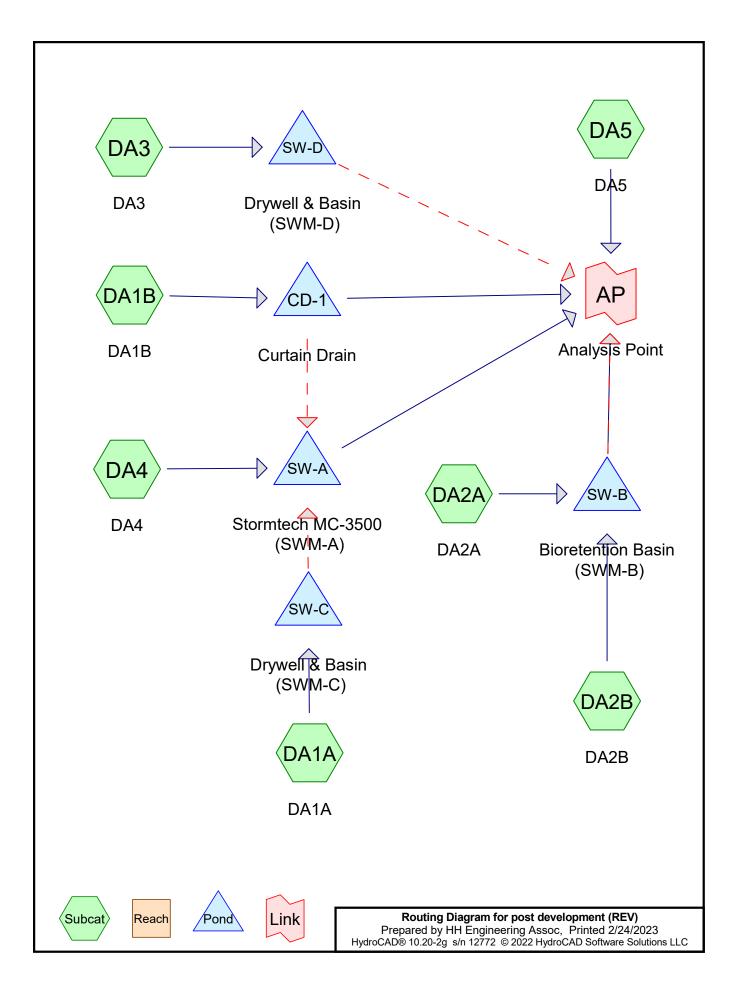
A	rea (sf)	CN D	escription		
1	08,124				ge, Good, HSG A
	11,948			ing, HSG A	
	77,918			od, HSG A	
	4,938		loofs, HSG		
	684	76 G	Fravel road	ls, HSG A	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	.29% Impe	ervious Area	a
-		<u></u>		o "	
Tc	Length	Slope		Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
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
0.0	05	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow
0.1	22	0.0245	2 77		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
1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0400	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
		0.0111			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 Are	a =	203,612 sf,	8.29% Impervious,	Inflow Depth = 1.61"	for 100-Year event
Inflow	=	4.45 cfs @ 1	2.39 hrs, Volume=	27,291 cf	
Primary	=	4.45 cfs @ 1	2.39 hrs, Volume=	27,291 cf, Atter	n= 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



Event#	[£] Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
	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	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
Ę	5 100-Year	Type III 24-hr		Default	24.00	1	8.56	2

Rainfall Events Listing (selected events)

Area Listing (selected nodes)

Area	CN	Description
(sq-ft)		(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

Soil Listing (selected nodes)

Area	Soil	Subcatchment
(sq-ft)	Group	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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HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Su
(sq-ft)	(sq-ft)	(sq-ft)	(sq-ft)	(sq-ft)	(sq-ft)	Cover	Nu
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	
	(sq-ft) 78,037 48,138 14,063 63,375	(sq-ft) (sq-ft) 78,037 0 48,138 0 14,063 0 63,375 0	(sq-ft) (sq-ft) (sq-ft) 78,037 0 0 48,138 0 0 14,063 0 0 63,375 0 0	(sq-ft) (sq-ft) (sq-ft) (sq-ft) 78,037 0 0 0 48,138 0 0 0 14,063 0 0 0 63,375 0 0 0	(sq-ft)(sq-ft)(sq-ft)(sq-ft)78,03700048,13800014,06300063,375000	(sq-ft)(sq-ft)(sq-ft)(sq-ft)(sq-ft)78,037000078,03748,138000048,13814,063000014,06363,375000063,375	(sq-ft) (sq-ft) (sq-ft) (sq-ft) (sq-ft) 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 63,375 Woods, Good

Ground Covers (selected nodes)

Pipe Listing (selected nodes)

Line#	Node	In-Invert	Out-Invert	Length	Slope	n	Width	Diam/Height	Inside-Fill
	Number	(feet)	(feet)	(feet)	(ft/ft)		(inches)	(inches)	(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

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 Discarded=0.00 cfs 0 cf	Peak Elev=87.35' Storage=0 cf Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
	M-A) Peak Elev=85.04' Storage=47 cf Inflow=0.27 cfs 1,056 cf ed=0.25 cfs 1,056 cf Primary=0.00 cfs 0 cf Outflow=0.25 cfs 1,056 cf
	M-B) Peak Elev=91.11' Storage=197 cf Inflow=0.30 cfs 927 cf imary=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 scarded=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 scarded=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

Summary for Subcatchment DA1A: DA1A

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Pond SW-C : Drywell & Basin (SWM-C) 0 cf, Depth= 0.00"

Α	rea (sf)	CN E	escription		
	29,175	39 >	75% Gras	s cover, Go	ood, HSG A
	24,285	30 V	Voods, Go	od, HSG A	
	6,334	98 F	aved park	ing, HSG A	۱ <u>ــــــــــــــــــــــــــــــــــــ</u>
	59,794	42 V	Veighted A	verage	
	53,460	8	9.41% Per	vious Area	
	6,334	1	0.59% Imp	pervious Are	ea
т.	1 11		N/ . I ! f	0	Description
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	<u>(ft/ft)</u>	(ft/sec)	(cfs)	
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow
44 7	70	0.0405	0.44		Grass: Short n= 0.150 P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, Sheetflow
0.6	25	0.0368	0.06		Woods: Light underbrush n= 0.400 P2= 3.43"
0.0	35	0.0300	0.96		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow
0.1	22	0.0343	5.11		Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow
1.0	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow
		0.0001	0.00		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			· · · ·

Summary for Subcatchment DA1B: DA1B

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Pond CD-1 : Curtain Drain 0 cf, Depth= 0.00"

A	rea (sf)	CN	Description				
	8,478	39	>75% Gras	s cover, Go	bod, HSG A		
	2,889	30	Woods, Good, HSG A				
	2,295	98	Paved parking, HSG A				
	13,662	47	Weighted A	verage			
	11,367		83.20% Pe	rvious Area	l		
	2,295		16.80% Imp	pervious Are	ea		
-				0			
Tc	Length	Slope		Capacity	Description		
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

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)

Area (sf)	CN	Description		
14,063	98	Roofs, HSC	βA	
14,063		100.00% In	npervious A	rea
Tc Length (min) (feet)	Slop (ft/f	,	Capacity (cfs)	Description
5.0				Direct Entry, Direct Entry

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)

_	A	rea (sf)	CN	Description		
		10,005	39	>75% Gras	s cover, Go	bod, HSG A
_		1,479	30	Woods, Go	od, HSG A	
11,484 38 Weighted Average						
		11,484		100.00% Pe	ervious Are	a
	Tc	Length	Slope		Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	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			

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)

A	rea (sf)	CN	Description				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go				
	1,303	98	Paved park	ing, HSG A	۱ <u> </u>		
	12,462	41	Weighted A	verage			
	11,159		89.54% Pei	vious Area			
	1,303		10.46% Imp	pervious Are	ea		
-		~		o			
Tc	Length	Slope		Capacity	Description		
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

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)

A	rea (sf)	CN	Description				
	5,461	39	>75% Gras	s cover, Go	bod, HSG A		
	37,854	98	Paved parking, HSG A				
	1,159	30	Woods, Good, HSG A				
	44,474	89	Weighted A	verage			
	6,620		14.89% Per	vious Area			
	37,854		85.11% Imp	pervious Are	ea		
_				-			
Tc	Length	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

Summary for Subcatchment DA5: DA5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link AP : Analysis Point 0 cf, Depth= 0.00"

Area	a (sf)	CN D	escription							
19	,297	39 >75% Grass cover, Good, HSG A								
28	,025	30 Woods, Good, HSG A								
	352	2 98 Paved parking, HSG A								
47	,674	34 V	Veighted A	verage						
47	,322	9	9.26% Per	vious Area						
	352	0	.74% Impe	ervious Area	а					
		<u> </u>								
	ength	Slope	Velocity	Capacity	Description					
	(feet)	(ft/ft)	(ft/sec)	(cfs)						
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					
4.0					Grass: Short n= 0.150 P2= 3.43"					
1.9	118	0.0220	1.04		Shallow Concentrated Flow, Shallow					
0.0		0.0500	4.40		Short Grass Pasture Kv= 7.0 fps					
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow					
0.0	20	0 4 4 0 0	0.00		Woodland Kv= 5.0 fps					
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow					
0.5	68	0.2350	2.42		Short Grass Pasture Kv= 7.0 fps					
0.5	00	0.2300	2.42		Shallow Concentrated Flow, Shallow Woodland Kv= 5.0 fps					
44.4	222	Tatal								
11.4	332	Total								

Summary for Pond CD-1: Curtain Drain

Seconda	= 0.0 = 0.0 ed = 0.0 = 0.0 ed to Link AP : ary = 0.0	0 cfs @ (0 cfs @ (0 cfs @ (0 cfs @ (Analysis P 0 cfs @ (16.80% Impervious, Inflow Depth = 0.00" for WQV event 0.00 hrs, Volume= 0 cf 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min 0.00 hrs, Volume= 0 cf 0.00 hrs, Volume= 0 cf				
			Span= 0.00-72.00 hrs, dt= 0.02 hrs				
Peak El	ev= 87.35' @ 0	0.00 hrs St	urf.Area= 324 sf Storage= 0 cf				
Plug-Elc	w detention tir	ne= (not cal	lculated: initial storage exceeds outflow)				
			Iculated: no inflow)				
-		v	,				
Volume		Avail.Stor	rage Storage Description				
#1	87.35'	1,29	96 cf 2.00'W x 162.00'L x 10.00'H Prismatoid 3,240 cf Overall x 40.0% Voids				
Device	Routing		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'					
#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				
#1	Drimori	07 401	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)

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

Elevation Surface Storage (feet) (sq-ft) (cubic-feet) (feet) (sq-ft) (cubic-feet) (get) (sq-ft) (cubic-feet) (get) (sq-ft) (cubic-feet) (strain) (sq-ft) (cubic-feet) (get) (sq-ft) (cubic-feet) (strain) (strain) (strain) (strain) (strain) (strain) (strain) (.	e /		.	O (
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92.15 324 622 97.35 324 1,296 92.25 324 635 92.35 324 648						
92.25 324 635 92.35 324 648						
92.35 324 648				97.35	324	1,296
92.45 324 661						
	92.45	324	661			

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

Outflow Discarded Primary	= 0.2 = 0.2 = 0.2 = 0.0	27 cfs @ 12.15 h							
	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								
		me= 3.2 min calcu me= 3.2 min (876	ulated for 1,056 cf (100% of inflow) 5.8 - 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						
#2A	85.75'	5,647 cf	15,786 cf Overall - 5,647 cf Embedded = 10,140 cf x 40.0% Voids 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)

2=Low Flow Orifice (Controls 0.00 cfs)

-3=Upper Orifice (Controls 0.00 cfs)

-4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

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 afOverall Storage Efficiency = 61.5%Overall System Size = $77.40' \times 37.08' \times 5.50'$

50 Chambers 584.7 cy Field 375.5 cy Stone

\bigcirc				
	\cup	\cup	\cup	



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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
85.00	2,870		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 86.40	2,870 2,870	2,192 2,431			
86.50	2,870	2,669			
86.60	2,870	2,009			
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 88.30	2,870 2,870	6,441 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 80.00	2,870 2,870	8,899 9.014			
89.90 90.00	2,870 2,870	9,014 9,128			
90.00 90.10	2,870 2,870	9,128 9,243			
50.10	2,070	3,243			
			I		

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 Li	nk AP : Analysis	Point	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0 cf
Routed to Li	nk 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.Stor	rage Storage	Description	
#1	91.00'	8,23	1 cf Custom	Stage Data (Prisma	atic) Listed below (Recalc)
Elevatio (fee		rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
91.0	1	1,817	0	0	
92.0	-	2,343	2,080	2,080	
93.0	0	2,896	2,620	4,700	
94.0		3,466	3,181	7,881	
94.1	0	3,539	350	8,231	
Device	Routing	Invert	Outlet Devices	3	
#1	Primary	88.50'	12.0" Round	Outlet Pipe	
			Inlet / Outlet Ir	IP, square edge hea overt= 88.50' / 87.00 C, smooth interior, 1)' S= 0.0144 '/' Cc= 0.900
#2	Device 1	93.00'		Horiz. Grate C= 0	
			Limited to wei	flow at low heads	
#3	Secondary	93.25'	Head (feet) 0 2.50 3.00 3.5 Coef. (English	20 0.40 0.60 0.80 0 4.00 4.50	Crested Rectangular Weir 0 1.00 1.20 1.40 1.60 1.80 2.00 2.67 2.65 2.64 2.64 2.68 2.68
#4	Discarded	91.00'	2.000 in/hr Ex	filtration over Surf	ace 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	3,409	
		769	94.00		7,708
91.40	2,027			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	3,039	5,594			
93.35	3,007	5,748			
93.40	3,124	5,904			
93.40	3,124	6,060			
93.45 93.50	3,181	6,219			
	,	,			
93.55	3,209	6,379			

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)

Invert	Avail.Sto	rage Storage	e Description		
88.60'	6,38	32 cf Drywe	I & Basin (Prismatic)	₋isted below (Recalc)	
on Su	ırf.Area	Inc.Store	Cum.Store		
et)	(sq-ft)	(cubic-feet)	(cubic-feet)		
60	31	0	0		
60	44	38	38		
50	44	44	82		
60	44	44	126		
19	15	26	152		
50	477	2	154		
00	2,477	739	893		
30	2,977	2,182	3,074		
00	3,101	608	3,682		
30	3,649	2,700	6,382		
Routing	Invert	Outlet Devic	es		
Discarded Secondary	88.60' 93.80'	5.000 in/hr Exfiltration over Surface area 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			
	88.60' on Su et) 60 60 60 60 49 50 50 50 50 50 50 50 50 50 50 50 50 50	88.60' 6,38 on Surf.Area et) (sq-ft) 60 31 60 44 60 44 60 44 60 44 50 477 50 2,977 30 3,101 30 3,649 Routing Invert Discarded 88.60'	88.60' 6,382 cf Drywel on Surf.Area Inc.Store et) (sq-ft) (cubic-feet) 50 31 0 60 44 38 60 44 44 60 44 44 60 44 44 60 44 44 60 44 44 60 44 44 60 477 2 60 2,477 739 30 2,977 2,182 90 3,101 608 80 3,649 2,700 Routing Invert Outlet Device Discarded 88.60' 5.000 in/hr E Secondary 93.80' 6.0' long x f	88.60' 6,382 cf Drywell & Basin (Prismatic) I on Surf.Area Inc.Store Cum.Store et) (sq-ft) (cubic-feet) (cubic-feet) 50 31 0 0 50 44 38 38 50 44 44 82 60 44 44 82 60 44 44 126 49 15 26 152 50 477 2 154 00 2,477 739 893 30 2,977 2,182 3,074 00 3,101 608 3,682 30 3,649 2,700 6,382 30 3,649 2,700 6,382 00 3,649 2,700 6,382 01 608 3,682 02 3,649 2,700 6,382 03 3,649 2,700 6,382 04 93.80'<	

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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	134 137			
91.90	34 31	137			
92.00 92.10	28	140			
92.20	20	143			
92.30	24 21	148			
92.40	18	140			
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			

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)

Invert	Avail.Sto	rage Stor	age Description	
90.10'	2,25	50 cf Dry v	well & Basin (Prism	atic) Listed below (Recalc)
C.			Ourse Otherse	
		(cubic-feet) (cubic-feet)	
	31			
10	44	38		
10	44	44	4 82	
10	44	44	4 126	
10	44	44	4 170	
10	44	44	4 214	
99	4	2 ⁻	1 235	
00	39	() 235	
00		100) 335	
	-			
	,			
	1,101		_,	
Routing	Invert	Outlet De	vices	
Discarded	90.10'	5.000 in/h	r Exfiltration over S	Surface area
,				0.80 1.00 1.20 1.40 1.60 1.80 2.00
		2.00 2.01	2.00 2.00 2.10 2	
	90.10' on Su et) 10 10 10 10 10 10 99 00 00 00 00 00 00 00 00 00 00 00	90.10' 2,25 on Surf.Area et) (sq-ft) 10 31 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 44 10 161 00 394 00 757 00 1,135 10 1,187 Routing Invert Discarded 90.10'	90.10' 2,250 cf Dryve on Surf.Area Inc.Store et) (sq-ft) (cubic-feet) 10 31 (cubic-feet) 10 44 38 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 10 44 44 11 100 101 11 100 101 100 10 1,135 946 100 10 1,187 116 100 10 1,187 100 10.0' long Head (fee 2.50 3.00 Coef. (En	90.10' 2,250 cf Drywell & Basin (Prism on Surf.Area Inc.Store Cum.Store et) (sq-ft) (cubic-feet) (cubic-feet) 10 31 0 0 10 44 38 38 10 44 44 82 10 44 44 126 10 44 44 126 10 44 44 214 10 44 44 214 10 44 44 214 99 4 21 235 00 39 0 235 00 161 100 335 00 757 576 1,188 00 1,135 946 2,134 10 1,187 116 2,250 Routing Invert Outlet Devices Discarded 90.10' 5.000 in/hr Exfiltration over S Secondary <t< td=""></t<>

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)

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

90.203232395.403122590.3034695.502622890.40351095.602223090.50361395.701723290.60381795.801323390.70392195.90823490.80402596.003923590.90412996.105124091.10433396.206324591.10444296.408826091.30444696.5010027091.40445196.6011228091.50445596.7012429291.60446897.0016133591.70446496.9014932091.80446897.4025441892.20448697.4025441892.30449997.7032450592.604410497.8037157492.50449997.7032450592.604411798.1043065493.004412698.3050374793.204413998.6061291493.304413998.6061291493.5044165<						
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94.304417899.509461,61494.404418399.609841,71094.504418799.701,0221,81194.604419299.801,0591,91594.704419699.901,0972,02294.8044200100.001,1352,13494.9044205100.101,1872,25095.004420995.1044214	94.10		170	99.30	870	
94.404418399.609841,71094.504418799.701,0221,81194.604419299.801,0591,91594.704419699.901,0972,02294.8044200100.001,1352,13494.9044205100.101,1872,25095.0044209214214100.101,187	94.20	44	174	99.40	908	
94.504418799.701,0221,81194.604419299.801,0591,91594.704419699.901,0972,02294.8044200100.001,1352,13494.9044205100.101,1872,25095.004420995.1044214100.10	94.30	44	178	99.50	946	1,614
94.604419299.801,0591,91594.704419699.901,0972,02294.8044200100.001,1352,13494.9044205100.101,1872,25095.004420995.1044214	94.40	44	183	99.60	984	1,710
94.704419699.901,0972,02294.8044200100.001,1352,13494.9044205100.101,1872,25095.0044209214100.101,1872,250	94.50	44	187	99.70	1,022	1,811
94.8044200100.001,1352,13494.9044205100.101,1872,25095.0044209214100.101,1872,250		44	192	99.80	1,059	1,915
94.9044205100.101,1872,25095.004420995.1044214						
95.00 44 209 95.10 44 214						
95.10 44 214				100.10	1,187	2,250
95.20 40 218						
	95.20	40	218			

Summary for Link AP: Analysis Point

Inflow Are	a =	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, Atter	n= 0%, Lag= 0.0 min

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

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 Discarded=0.00 cfs 3 cf Primary=0	Peak Elev=87.35' Storage=0 cf Inflow=0.00 cfs 105 cf 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) Discarded=0.	Peak Elev=86.50' Storage=2,666 cf Inflow=2.27 cfs 8,122 cf 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) Discarded=0.10 cfs 3,618 cf Primary=	Peak Elev=91.66' Storage=1,310 cf Inflow=1.08 cfs 3,618 cf 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) Discarded=0	Peak Elev=88.66' Storage=2 cf Inflow=0.00 cfs 108 cf 0.00 cfs 108 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 108 cf
Pond SW-D: Drywell & Basin (SWM-D) Discarded	Peak Elev=90.11' Storage=0 cf Inflow=0.00 cfs 14 cf l=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

Summary for Subcatchment DA1A: DA1A

Runoff = 0.00 cfs @ 17.42 hrs, Volume= Routed to Pond SW-C : Drywell & Basin (SWM-C) 108 cf, Depth= 0.02"

A	rea (sf)	CN E	Description						
	29,175	39 >	39 >75% Grass cover, Good, HSG A						
	24,285	30 V	Voods, Go	od, HSG A					
	6,334	98 F	aved park	ing, HSG A	۱ <u>ــــــــــــــــــــــــــــــــــــ</u>				
	59,794	42 V	Veighted A	verage					
	53,460	8	9.41% Per	vious Area					
	6,334	1	0.59% Imp	pervious Ar	ea				
т.	1 11	01	\/.l!	0					
Tc	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	<u>(ft/ft)</u>	(ft/sec)	(cfs)					
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow				
11.7	76	0.0405	0.11		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				
0.0	00	0.0000	0.50		Woodland Kv= 5.0 fps				
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow				
0.1		0.0010	0.1.1		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							

Summary for Subcatchment DA1B: DA1B

Runoff = 0.00 cfs @ 14.64 hrs, Volume= Routed to Pond CD-1 : Curtain Drain 105 cf, Depth= 0.09"

Α	rea (sf)	CN	Description				
	8,478	39	>75% Gras	s cover, Go	bod, HSG A		
	2,889	30	Woods, Go	od, HSG A			
	2,295	98	Paved park	ing, HSG A	۱ <u> </u>		
	13,662	47	Weighted Average				
	11,367		83.20% Pervious Area				
	2,295		16.80% Imp	pervious Ar	ea		
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description		
10.0					Direct Entry, Direct Entry		

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)

Area (sf)	CN	Description		
14,063	98	Roofs, HSC	βA	
14,063		100.00% In	npervious A	rea
Tc Length (min) (feet)	Slop (ft/f	,	Capacity (cfs)	Description
5.0				Direct Entry, Direct Entry

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)

_	A	rea (sf)	CN I	Description			_		
		10,005	39 :	>75% Grass cover, Good, HSG A					
_		1,479	30	Woods, Go	od, HSG A		-		
		11,484	38	38 Weighted Average					
		11,484		100.00% Pe	ervious Are	a			
	Tc	Length	Slope	,	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		_		
	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						

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)

A	rea (sf)	CN	Description				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go	od, HSG A			
	1,303	98	Paved park	ing, HSG A	ι		
	12,462	41	Weighted Average				
	11,159		89.54% Pei	vious Area	l de la constante de		
	1,303		10.46% Imp	pervious Are	ea		
_				.			
Tc	Length	Slope		Capacity	Description		
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

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)

Area (s	f) CN	Description	Description				
5,46	61 39	>75% Gras	s cover, Go	bod, HSG A			
37,85	64 98	Paved park	ing, HSG A	A Contraction of the second seco			
1,15	59 30	Woods, Go	od, HSG A				
44,47	'4 89	Weighted A	verage				
6,62	20	14.89% Per	vious Area	l			
37,85	54	85.11% lmp	pervious Ar	ea			
			-				
Tc Len		,	Capacity	Description			
(min) (fe	et) (ft/	ft) (ft/sec)	(cfs)				
10.0				Direct Entry, Direct Entry			

Summary for Subcatchment DA5: DA5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link AP : Analysis Point 0 cf, Depth= 0.00"

A	rea (sf)	CN D	escription						
	19,297	39 >	39 >75% Grass cover, Good, HSG A						
	28,025		,	od, HSG A					
	352	98 P	aved park	ing, HSG A					
	47,674		Veighted A	0					
	47,322	-		vious Area					
	352	0	.74% Impe	ervious Area	а				
_									
Tc	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
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				
		0 0 5 0 0	4.40		Short Grass Pasture Kv= 7.0 fps				
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow				
0.0	00	0 4 4 0 0	0.00		Woodland Kv= 5.0 fps				
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow				
0.5	60	0 0050	0.40		Short Grass Pasture Kv= 7.0 fps				
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow				
	000	T ()			Woodland Kv= 5.0 fps				
11.4	332	Total							

Summary for Pond CD-1: Curtain Drain

Seconda	= 0.0 = 0.0 ed = 0.0 = 0.0 ed to Link AP ary = 0.0	00 cfs @ 14 00 cfs @ 14 00 cfs @ 14 00 cfs @ 14 : Analysis Po 00 cfs @ 0	16.80% Impervious, Inflow Depth = 0.09" for 2-Year event 4.64 hrs, Volume= 105 cf 4.64 hrs, Volume= 105 cf, Atten= 0%, Lag= 0.1 min 4.64 hrs, Volume= 3 cf 4.64 hrs, Volume= 102 cf oint 0 cf ech MC-3500 (SWM-A)			
			Span= 0.00-72.00 hrs, dt= 0.02 hrs			
Peak El	ev= 87.35' @	14.64 hrs S	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.Stor	rage Storage Description			
#1	87.35'	1,29	06 cf 2.00'W x 162.00'L x 10.00'H Prismatoid 3,240 cf Overall x 40.0% Voids			
Device	Routing	Invert	Outlet Devices			
#1						
#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			
#1	Drimony	97 40'	Coef. (English) 2.80 2.92 3.08 3.30 3.32			
#4	#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)

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

			I		•
Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.35	324 324	0	92.55	324 324	674
87.45	324 324	13	92.65 92.75	324 324	687
87.55 87.65	324 324	26 39	92.75	324 324	700 713
	324 324			324 324	
87.75 87.85	324 324	52	92.95	324 324	726
		65 79	93.05 93.15		739
87.95	324	78		324	752
88.05 88.15	324 324	91 104	93.25 93.35	324 324	765 778
88.25	324	104	93.45	324	791
88.35	324	130	93.55	324	804
88.45	324	143	93.65	324	816
88.55	324	143	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	94.05	324	881
89.05	324	2207	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			
			l		

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

Outflow Discarded Primary	$\begin{array}{rcrcr} = & 2.2 \\ = & 0.3 \\ = & 0.3 \\ = & 0.0 \end{array}$	44,474 sf, 85.119 27 cfs @ 12.14 h 33 cfs @ 11.74 h 33 cfs @ 11.74 h 33 cfs @ 11.74 h 00 cfs @ 0.00 h : Analysis Point	nrs, Volume= 8,122 cf, Atten= 85%, Lag= 0.0 min nrs, Volume= 8,122 cf				
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)

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 afOverall Storage Efficiency = 61.5%Overall System Size = $77.40' \times 37.08' \times 5.50'$

50 Chambers 584.7 cy Field 375.5 cy Stone

\bigcirc	\bigcirc	\bigcirc	\bigcirc	
	$\overline{}$		$\overline{}$	



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

Levration Surface Storage (feet) (sq.ft) (cubic-feet) (storage) (sq.ft) (cubic-feet) (storage) (sq.ft) (cubic-feet) (storage) (sq.ft) (cubic-feet) (sq.ft) (sq.ft) (sq.ft) (storage) (storage) (storage) (storage) (storage) (s	Elevation	Surface	Storage	Elevation	Surface	Storage
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$						
85.10 2.870 115 90.30 2.870 9.473 85.20 2.870 344 90.50 2.870 9.703 85.40 2.870 649 9.555 2.870 9.703 85.50 2.870 659 855.00 2.870 804 85.60 2.870 804 85.60 2.870 9.703 85.60 2.870 1.227 80.00 2.870 1.712 86.00 2.870 1.712 86.30 2.670 2.192 86.40 2.870 2.469 466 46.60 2.870 2.669 86.60 2.870 2.669 46.60 2.870 3.64 87.00 2.870 3.374 86.60 2.870 3.64 86.70 2.870 3.64 57.0 2.870 4.983 87.30 2.870 4.519 57.50 2.870 5.399 87.80 2.870 5.613 57.50 2.870 5.399 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
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				l		

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.Stor	rage Storage	Description	
#1	91.00'	8,23	1 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio		rf.Area	Inc.Store	Cum.Store	
(fee		(sq-ft)	(cubic-feet)	(cubic-feet)	
91.0	0	1,817	0	0	
92.0	0	2,343	2,080	2,080	
93.0	0	2,896	2,620	4,700	
94.0	0	3,466	3,181	7,881	
94.1	0	3,539	350	8,231	
Device	Routing	Invert	Outlet Devices	3	
#1	Primary	88.50'	12.0" Round	Outlet Pipe	
	,				headwall, Ke= 0.500
					7.00' S= 0.0144 '/' Cc= 0.900
			n= 0.010 PVC	C. smooth interio	r, Flow Area= 0.79 sf
#2	Device 1	93.00'		Horiz Grate C	
				r flow at low hea	
#3	Secondary	93.25'			ad-Crested Rectangular Weir
110	cocorridary	00.20			0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.5		
					68 2.67 2.65 2.64 2.64 2.68 2.68
)2 2.97 3.07 3.	
#4	Discarded	91.00'		filtration over S	
//'1	Discalueu	91.00	2.000 III/III EX		

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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	3,039	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			

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, Atter	n= 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.Stor	rage Storage	Description	
#1	88.60'	6,38	32 cf Drywell	& Basin (Prism	atic) Listed below (Recalc)
Elevatio		ırf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
88.6	50	31	0	0	
89.6	50	44	38	38	
90.6	50	44	44	82	
91.6	50	44	44	126	
92.4	19	15	26	152	
92.5	50	477	2	154	
93.0	00	2,477	739	893	
93.8	30	2,977	2,182	3,074	
94.0	00	3,101	608	3,682	
94.8	30	3,649	2,700	6,382	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Discarded Secondary	88.60' 93.80'	5.000 in/hr Exfiltration over Surface area 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)

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

ElevationSurfaceStorage (sq-ft)ElevationSurfaceStorage (sq-ft) 88.60 310 9.80 2.977 3.074 88.70 323 93.90 3.039 3.375 88.80 346 94.00 3.101 3.682 89.00 3613 94.20 3.238 4.316 89.10 3817 94.30 3.306 4.643 89.20 3921 94.40 3.375 4.643 89.30 4025 94.50 3.444 5.318 89.40 4129 94.60 3.512 5.666 89.50 4333 94.70 3.580 6.021 89.60 4438 94.80 3.649 6.382 89.70 4442 89.80 44 464 90.20 4466 90.40 44 73 90.50 4477 90.60 44 82 90.70 4486 90.80 44 95 91.00 4495 91.00 44 95 91.00 44126 91.70 41 130 91.80 37 134 92.20 2.477 893 92.00 31 140 92.10 28 1.677 92.90 2.077 665 93.00 2.477 92.90 2.602 1.604 1.664 92.20 2.602 1.664 1.664 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
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93.60 2,852 2,491						
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	93.70	2,914	2,780			
				l		

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.Sto	rage Storag	e Description	
#1	90.10'	2,25	50 cf Drywe	II & Basin (Prism	atic) Listed below (Recalc)
	_				
Elevatio		urf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
90. <i>1</i>	10	31	0	0	
91. <i>*</i>	10	44	38	38	
92. <i>*</i>	10	44	44	82	
93.´	10	44	44	126	
94. <i>*</i>	10	44	44	170	
95.´	10	44	44	214	
95.9	99	4	21	235	
96.0	00	39	0	235	
97.0	00	161	100	335	
98.0	00	394	278	613	
99.0	00	757	576	1,188	
100.0	00	1,135	946	2,134	
100.1	10	1,187	116	2,250	
Device	Routing	Invert	Outlet Devic	ces	
#1	Discarded	90.10'	5.000 in/hr l	Exfiltration over	Surface area
#2	Secondary	99.10'	10.0' long >	c 5.0' breadth Bro	oad-Crested Rectangular Weir
	-				0.80 1.00 1.20 1.40 1.60 1.80 2.00
				3.50 4.00 4.50 5	
			Coef. (Engli	sh) 2.34 2.50 2.	70 2.68 2.68 2.66 2.65 2.65 2.65
				2.66 2.68 2.70 2	

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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	13	95.80	13	232
90.70	39	21	95.90	8	233
		21	96.00		234
90.80	40			39	
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	104	97.90	371	574
	44 44				
92.80		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	1,000	2,022
94.80	44	200	100.00	1,135	2,022
94.90	44	200	100.10	1,187	2 ,134 2,250
95.00	44	203	100.10	1,107	2,200
95.10	44	209			
95.20	44 40	214			
95.20	40	210			
			I		

Summary for Link AP: Analysis Point

Inflow Area	a =	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, Atte	n= 0%, Lag= 0.0 min

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

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 Discarded=0.00 cfs 19 cf Primary=	Peak Elev=87.35' Storage=1 cf Inflow=0.12 cfs 759 cf =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 Discarded=0.33 cfs	A) Peak Elev=87.67' Storage=5,342 cf Inflow=4.16 cfs 15,224 cf s 12,288 cf Primary=0.42 cfs 2,936 cf Outflow=0.75 cfs 15,224 cf
Pond SW-B: Bioretention Basin (SWM-B) Discarded=0.11 cfs 6,218 cf Primary	Peak Elev=92.20' Storage=2,566 cf Inflow=1.75 cfs 6,218 cf =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) Discarded=0.1	Peak Elev=92.62' Storage=240 cf Inflow=0.20 cfs 2,035 cf 1 cfs 2,035 cf Secondary=0.00 cfs 0 cf Outflow=0.11 cfs 2,035 cf
Pond SW-D: Drywell & Basin (SWM-D) Discarded=	Peak Elev=94.08' Storage=169 cf Inflow=0.04 cfs 376 cf =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

Summary for Subcatchment DA1A: DA1A

Runoff = 0.20 cfs @ 12.51 hrs, Volume= Routed to Pond SW-C : Drywell & Basin (SWM-C) 2,035 cf, Depth= 0.41"

_	A	rea (sf)	CN E	Description							
		29,175	39 >	39 >75% Grass cover, Good, HSG A							
		24,285	30 V	Voods, Go	od, HSG A						
_		6,334	98 F	aved park	ing, HSG A	۱ <u>ــــــــــــــــــــــــــــــــــــ</u>					
		59,794	42 V	Veighted A	verage						
		53,460	8	9.41% Per	vious Area						
		6,334	1	0.59% Imp	pervious Ar	ea					
	_										
	Tc	Length	Slope	Velocity	Capacity	Description					
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
	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					
	~ ~	0.5	0 0000			Woods: Light underbrush n= 0.400 P2= 3.43"					
	0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow					
	0.4	00	0.0045	0.77		Woodland Kv= 5.0 fps					
	0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow					
	1.5	61	0.0100	0.70		Paved Kv= 20.3 fps Shallow Concentrated Flow, Shallow					
	1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps					
	1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow					
	1.7	55	0.0004	0.55		Woodland Kv= 5.0 fps					
	0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow					
	0.1	20	5.0100			Short Grass Pasture Kv= 7.0 fps					
_	17.4	337	Total								
	17. T	001	, otai								

Summary for Subcatchment DA1B: DA1B

Runoff = 0.12 cfs @ 12.21 hrs, Volume= Routed to Pond CD-1 : Curtain Drain 759 cf, Depth= 0.67"

Α	rea (sf)	CN	Description				
	8,478	39	>75% Gras	s cover, Go	bod, HSG A		
	2,889	30	Woods, Go	od, HSG A			
	2,295	98	Paved park	ing, HSG A	۱ <u> </u>		
	13,662	47	Weighted Average				
	11,367		83.20% Per	rvious Area			
	2,295		16.80% Imp	pervious Ar	ea		
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description		
10.0					Direct Entry, Direct Entry		

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)

Area (sf)	CN	Description		
14,063	98	Roofs, HSC	βA	
14,063		100.00% In	npervious A	rea
Tc Length (min) (feet)	Slop (ft/f	,	Capacity (cfs)	Description
5.0				Direct Entry, Direct Entry

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)

_	A	rea (sf)	CN I	Description			_		
		10,005	39 :						
_		1,479	30	Woods, Go	od, HSG A		-		
		11,484	38	Weighted A	verage				
		11,484		100.00% Pe	ervious Are	a			
	Tc	Length	Slope	,	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		_		
	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						

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)

A	rea (sf)	CN	Description				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go	od, HSG A			
	1,303	98	Paved park	ing, HSG A	۱ <u> </u>		
	12,462	41	Weighted Average				
	11,159		89.54% Pei	vious Area			
	1,303		10.46% Imp	pervious Are	ea		
Тс	Length	Slope	e Velocity	Capacity	Description		
(min)	(feet)	(ft/ft	,	(cfs)	Description		
/	(1991)	וויונ	(1/360)	(013)	Dise of Factors Dise of Factors		
10.0					Direct Entry, Direct Entry		

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)

Are	a (sf)	CN	Description				
Ę	5,461	39	>75% Gras	s cover, Go	bod, HSG A		
37	7,854	98	Paved park	ing, HSG A	A Contraction of the second seco		
	1,159	30	Woods, Go	od, HSG A			
44	1,474	89	Weighted Average				
6	5,620		14.89% Per	vious Area	l		
37	7,854		85.11% Imp	ervious Are	ea		
Τ. Ι		01	\/_l:	O	Description		
	ength	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

Summary for Subcatchment DA5: DA5

Runoff = 0.01 cfs @ 15.06 hrs, Volume= Routed to Link AP : Analysis Point 410 cf, Depth= 0.10"

A	rea (sf)	CN D	escription						
	19,297	39 >	39 >75% Grass cover, Good, HSG A						
	28,025	30 V							
	352	98 P	aved park	ing, HSG A					
	47,674	34 V	Veighted A	verage					
	47,322	9	9.26% Per	vious Area					
	352	0	.74% Impe	ervious Area	a				
Тс	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
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							

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)						
			Span= 0.00-72.00 hrs, dt= 0.02 hrs Surf.Area= 324 sf Storage= 1 cf			
Center-o	of-Mass det. ti	ime= 0.1 min	calculated for 758 cf (100% of inflow) (925.8 - 925.7)			
Volume	Invert	Avail.Stor	rage Storage Description			
#1	#1 87.35' 1,296 cf 2.00'W x 162.00'L x 10.00'H Prismatoid 3,240 cf Overall x 40.0% Voids					
Device	Routing	Invert				
#1	#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	#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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	1,024
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	97.15	324	1,283
92.15	324	622	97.35	324	1,203 1,296
92.15	324	635	91.00	524	1,230
92.25	324	648			
92.35	324	661			
52.75	524	001			
			I		

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

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

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 afOverall Storage Efficiency = 61.5%Overall System Size = $77.40' \times 37.08' \times 5.50'$

50 Chambers 584.7 cy Field 375.5 cy Stone

\bigcirc	\bigcirc	\bigcirc	\square



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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	00.00	2,010	0,100
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 89.20	2,870 2,870	8,048 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			
	_,•.•	0,210			
			•		

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

Inflow Area =	25,547 sf,	55.05% Impervious	s, 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 Li	nk AP : Analysis	Point	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	= 0 cf
Routed to Li	nk 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.Stor	age Storage	Description	
#1	91.00'	8,23	1 cf Custom	Stage Data (Prismatic) Listed below (Recalc)	
Elevatio		rf.Area	Inc.Store	Cum.Store	
(fee	1	(sq-ft)	(cubic-feet)	(cubic-feet)	
91.0	-	1,817	0	0	
92.0	00	2,343	2,080	2,080	
93.0	00	2,896	2,620	4,700	
94.0	00	3,466	3,181	7,881	
94.1	10	3,539	350	8,231	
Device	Routing	Invert	Outlet Devices	S	
#1	Primary	88.50'	12.0" Round	Outlet Pipe	
			L= 104.0' CN	MP, square edge headwall, Ke= 0.500	
			Inlet / Outlet Ir	nvert= 88.50' / 87.00' S= 0.0144 '/' Cc= 0.900	
			n= 0.010 PVC	C, smooth interior, Flow Area= 0.79 sf	
#2	Device 1	93.00'	24.0" x 24.0"	Horiz. Grate C= 0.600	
			Limited to weil	ir flow at low heads	
#3	Secondary	93.25'	10.0' long x 3	3.0' breadth Broad-Crested Rectangular Weir	
	,			0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00	
			2.50 3.00 3.5		
			Coef. (Enalish	n) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68	
				92 2.97 3.07 3.32	
#4	Discarded	91.00'		filtration 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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 93.05	2,896	4,700			
93.10	2,924 2,953	4,845 4,992			
93.10		,			
93.15 93.20	2,982 3,010	5,140 5,290			
93.20	3,010	5,290			
93.30	3,039	5,594			
93.35	3,007	5,748			
93.40	3,124	5,904			
93.45	3,124	6,060			
93.50	3,181	6,219			
93.55	3,209	6,379			
00.00	0,200	0,010			
			1		

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.Sto	rage Storage Description		
#1	88.60'	6,38	32 cf Drywel	l & Basin (Prism	atic) Listed below (Recalc)
Elevatio	on Su	urf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
88.6	60	31	0	0	
89.6	50	44	38	38	
90.6	50	44	44	82	
91.6	60	44	44	126	
92.4	19	15	26	152	
92.5	50	477	2	154	
93.0	00	2,477	739	893	
93.8		2,977	2,182	3,074	
94.0		3,101	608	3,682	
94.8	30	3,649	2,700	6,382	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Discarded Secondary	88.60' 93.80'	6.0' long x 1 Head (feet)	0.20 0.40 0.60	Surface area bad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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 91.20	44 44	104 108			
91.20	44	112			
91.30	44	112			
91.50	44	121			
91.60	44	121			
91.70	41	130			
91.80	37	130			
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			

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.Stor	rage Storag	e Description		
#1	90.10'	2,25	50 cf Drywe	II & Basin (Prismatio	c) Listed below (Recalc)	
- 1	0	5. A.				
Elevatio		Irf.Area	Inc.Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)		
90. <i>*</i>	10	31	0	0		
91.1	10	44	38	38		
92.1	10	44	44	82		
93.1	10	44	44	126		
94. <i>*</i>	10	44	44	170		
95.´	10	44	44	214		
95.9	99	4	21	235		
96.0	00	39	0	235		
97.0	00	161	100	335		
98.0	00	394	278	613		
99.0	00	757	576	1,188		
100.0	00	1,135	946	2,134		
100.1	10	1,187	116	2,250		
		, -		,		
Device	Routing	Invert	Outlet Device	ces		
#1	Discarded	90.10'	5.000 in/hr	Exfiltration over Sur	face area	
#2	Secondary	99.10'	10.0' lona	c 5.0' breadth Broad	-Crested Rectangular Weir	
	,				0 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	10	95.80	13	232
90.70	39	21	95.90	8	233
90.80	40	25	96.00	39	234
90.90	40	29	96.10	51	233
91.00	41	33	96.20	63	240
	43	38			245
91.10			96.30	76	
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	170	99.40	908	1,521
94.30	44	174	99.50	946	1,614
94.40	44	183	99.60	984	1,710
94.50	44	183	99.70	1,022	1,811
94.60	44		99.80		,
94.80 94.70	44 44	192 196		1,059	1,915
		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			

Summary for Link AP: Analysis Point

Inflow Area	=	131,357 sf,	41.54% Impervio	us, Inflow [Depth = 0	.37" fo	r 10-Year event
Inflow =	=	0.49 cfs @	12.50 hrs, Volum	e=	4,086 cf		
Primary =	=	0.49 cfs @	12.50 hrs, Volum	e=	4,086 cf,	Atten= 0	0%, Lag= 0.0 min

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

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 Discarded=0.01 cfs 34 cf Primary=0.2	Peak Elev=87.36' Storage=1 cf Inflow=0.30 cfs 1,381 cf 9 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 Discarded=0.33 cfs	A) Peak Elev=88.61' Storage=7,222 cf Inflow=5.32 cfs 19,746 cf s 14,286 cf Primary=0.59 cfs 5,460 cf Outflow=0.92 cfs 19,746 cf
Pond SW-B: Bioretention Basin (SWM-B Discarded=0.12 cfs 8,012 cf Primary	Peak Elev=92.60' Storage=3,580 cf Inflow=2.16 cfs 8,012 cf =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) Discarded=0.2	Peak Elev=92.93' Storage=727 cf Inflow=0.58 cfs 4,179 cf 5 cfs 4,179 cf Secondary=0.00 cfs 0 cf Outflow=0.25 cfs 4,179 cf
Pond SW-D: Drywell & Basin (SWM-D) Discarded=	Peak Elev=97.00' Storage=335 cf Inflow=0.12 cfs 798 cf =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

Summary for Subcatchment DA1A: DA1A

Runoff = 0.58 cfs @ 12.37 hrs, Volume= Routed to Pond SW-C : Drywell & Basin (SWM-C) 4,179 cf, Depth= 0.84"

A	rea (sf)	CN D	escription					
	29,175	39 >	39 >75% Grass cover, Good, HSG A					
	24,285	30 V	30 Woods, Good, HSG A					
	6,334	98 F	aved park	ing, HSG A				
	59,794	42 V	42 Weighted Average					
	53,460	8	89.41% Pervious Area					
	6,334	1	0.59% Imp	pervious Are	ea			
Tc	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
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			
4 5	04	0.0400	0.70		Paved Kv= 20.3 fps			
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow			
1.7	00	0.0394	0.00		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			
0.1	20	0.3400	4.00		Short Grass Pasture Kv= 7.0 fps			
17.4	337	Total						
17.4	331	Total						

Summary for Subcatchment DA1B: DA1B

Runoff = 0.30 cfs @ 12.17 hrs, Volume= Routed to Pond CD-1 : Curtain Drain 1,381 cf, Depth= 1.21"

A	rea (sf)	CN	Description		
	8,478	39	>75% Gras	s cover, Go	bod, HSG A
	2,889	30	Woods, Go	od, HSG A	
	2,295	98	Paved park	ing, HSG A	
	13,662	47	Weighted A	verage	
	11,367		83.20% Per	vious Area	
	2,295		16.80% Imp	pervious Are	ea
Тс	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft	,	(cfs)	Description
		וויונ) (10360)	(013)	
10.0					Direct Entry, Direct Entry

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)

Area (sf)	CN	Description		
14,063	98	Roofs, HSC	θA	
14,063		100.00% In	npervious A	rea
Tc Length (min) (feet)	Slop (ft/f	,	Capacity (cfs)	Description
5.0				Direct Entry, Direct Entry

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)

 A	rea (sf)	CN	Description					
	10,005	39	39 >75% Grass cover, Good, HSG A					
	1,479	30	30 Woods, Good, HSG A					
11,484 38 Weighted Average								
	11,484		100.00% Pe	ervious Are	a			
Тс	Length	Slope	,	Capacity	Description			
 (min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
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						

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)

A	rea (sf)	CN	Description				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go	od, HSG A			
	1,303	98	Paved park	ing, HSG A	۱ <u> </u>		
	12,462	41	Weighted A	verage			
	11,159		89.54% Per	vious Area	l de la constante d		
	1,303		10.46% Imp	pervious Are	ea		
_							
Тс	Length	Slope		Capacity	Description		
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

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)

Ar	rea (sf)	CN	Description		
	5,461	39	>75% Gras	s cover, Go	bod, HSG A
;	37,854	98	Paved park	ing, HSG A	N N N N N N N N N N N N N N N N N N N
	1,159	30	Woods, Go	od, HSG A	
	44,474	89	Weighted A	verage	
	6,620		14.89% Pe	rvious Area	
	37,854		85.11% Imp	pervious Are	ea
_					
Tc	Length	Slope	,	Capacity	Description
(min)	(feet)	(ft/ft	(ft/sec)	(cfs)	
10.0					Direct Entry, Direct Entry

Summary for Subcatchment DA5: DA5

Runoff = 0.09 cfs @ 12.51 hrs, Volume= Routed to Link AP : Analysis Point 1,335 cf, Depth= 0.34"

A	rea (sf)	CN D	escription					
	19,297	39 >	39 >75% Grass cover, Good, HSG A					
	28,025	30 V	Voods, Go	od, HSG A				
	352	98 P	aved park	ing, HSG A	۱ <u>ــــــــــــــــــــــــــــــــــــ</u>			
	47,674	34 V	Veighted A	verage				
	47,322	9	9.26% Per	vious Area				
	352	0	.74% Impe	ervious Area	а			
Tc	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
1.1	18	0.1330	0.27		Sheet Flow, Sheetflow			
					Grass: Short			
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						

Summary for Pond CD-1: Curtain Drain

Primary Rout Seconda	= 0. = 0. ed = 0. = 0. ed to Link AP ary = 0.	30 cfs @ 12 30 cfs @ 12 01 cfs @ 12 29 cfs @ 12 : Analysis Po 00 cfs @ 0	16.80% Impervious, Inflow Depth = 1.21" for 25-Year event 2.17 hrs, Volume= 1,381 cf 2.17 hrs, Volume= 1,381 cf, Atten= 0%, Lag= 0.1 min 2.17 hrs, Volume= 34 cf 2.17 hrs, Volume= 1,347 cf oint 0 cf ech MC-3500 (SWM-A)
			Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak El	ev= 87.36' @	12.17 hrs S	Surf.Area= 324 sf Storage= 1 cf
			calculated for 1,381 cf (100% of inflow) (900.5 - 900.5)
Volume	Invert	Avail.Stor	rage Storage Description
#1	87.35'	1,29	06 cf 2.00'W x 162.00'L x 10.00'H Prismatoid
			3,240 cf Overall x 40.0% Voids
Б			
Device	Routing		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)
			s @ 12.17 hrs HW=87.36' (Free Discharge) htrols 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	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	324 324	91	93.25	324 324	765
88.15 88.25	324 324	104 117	93.35 93.45	324 324	778 791
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	324 324	298 311	94.85	324 324	972 985
89.75 89.85	324 324	324	94.95 95.05	324	985 998
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	324 324	492	96.35 06.45	324 324	1,166
91.25 91.35	324	505 518	96.45 96.55	324	1,179 1,192
91.45	324	531	96.65	324	1,192
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			
			l		

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	s Point	
Routing by Stor-In	d method, Tir	ne Span= 0.00-72.00	hrs, dt= 0.02 hrs
Peak Elev= 88.61'	@ 12.65 hrs	Surf.Area= 2,870 s	f 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)

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 afOverall Storage Efficiency = 61.5%Overall System Size = $77.40' \times 37.08' \times 5.50'$

50 Chambers 584.7 cy Field 375.5 cy Stone

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	$\overline{}$		$\overline{}$	



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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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			
•	_,	0,=:0			
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Summary for Pond SW-B: Bioretention Basin (SWM-B)

Inflow Area =	25,547 sf,	55.05% Impervie	ous, Inflow Depth =	3.76" for 25-Year event
Inflow =	2.16 cfs @	12.07 hrs, Volun	ne= 8,012 cf	
Outflow =	0.12 cfs @	14.10 hrs, Volun	ne= 8,012 cf	, Atten= 94%, Lag= 122.1 min
Discarded =	0.12 cfs @	14.10 hrs, Volun	ne= 8,012 cf	_
Primary =	0.00 cfs @	0.00 hrs, Volun	ne= 0 cf	
Routed to Link	AP : Analysis	Point		
Secondary =	0.00 cfs @	0.00 hrs, Volun	ne= 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.Stor	rage Storage	Description	
#1	91.00'	8,23	1 cf Custom	Stage Data (Prismat	ic) Listed below (Recalc)
Elevatio (fee		rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
91.0	1	1,817	0	0	
92.0	-	2,343	2,080	2,080	
93.0	0	2,896	2,620	4,700	
94.0		3,466	3,181	7,881	
94.1	0	3,539	350	8,231	
Device	Routing	Invert	Outlet Devices	;	
#1	Primary	88.50'	12.0" Round	Outlet Pipe	
			Inlet / Outlet Ir	IP, square edge heac overt= 88.50' / 87.00' c, smooth interior, Fl	S= 0.0144 '/' Cc= 0.900
#2	Device 1	93.00'		Horiz. Grate C= 0.6	
				flow at low heads	
#3	Secondary	93.25'	Head (feet) 0 2.50 3.00 3.5 Coef. (English	20 0.40 0.60 0.80 0 4.00 4.50	rested Rectangular Weir 1.00 1.20 1.40 1.60 1.80 2.00 67 2.65 2.64 2.64 2.68 2.68
#4	Discarded	91.00'	2.000 in/hr Ex	filtration over Surfac	ce 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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 02.65	2,675 2,702	3,585			
92.65 92.70	2,702	3,720			
92.70	2,758	3,856 3,993			
92.80	2,785	4,131			
92.85	2,813	4,131			
92.90	2,841	4,413			
92.95	2,868	4,555			
93.00	2,896	4,700			
93.05	2,000	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			

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, Atter	n= 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	I 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.Sto	rage Storage	Description	
#1	88.60'	6,38	32 cf Drywell	& Basin (Prism	atic) Listed below (Recalc)
Elevatio		urf.Area	Inc.Store	Cum.Store	
(fee	,	(sq-ft)	(cubic-feet)	(cubic-feet)	
88.6	50	31	0	0	
89.6	50	44	38	38	
90.6	50	44	44	82	
91.6	60	44	44	126	
92.4	49	15	26	152	
92.5	50	477	2	154	
93.0	00	2,477	739	893	
93.8	30	2,977	2,182	3,074	
94.0	00	3,101	608	3,682	
94.8	30	3,649	2,700	6,382	
Device	Routing	Invert	Outlet Device	S	
#1 #2	Discarded Secondary	88.60' 93.80'	6.0' long x 1 Head (feet)	0.20 0.40 0.60	Surface area bad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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 91.20	44 44	104 108			
91.20	44	112			
91.30	44	112			
91.50	44	121			
91.60	44	121			
91.70	41	120			
91.80	37	130			
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			

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.Sto	age Stora	ge Description	
#1	90.10'	2,25	50 cf Dryw	ell & Basin (Prism	atic) Listed below (Recalc)
_		<i>.</i> .			
Elevatio		ırf.Area	Inc.Store	Cum.Store	
(fee	_/	(sq-ft)	(cubic-feet)	(cubic-feet)	
90. <i>1</i>		31	0	0	
91. <i>*</i>	10	44	38	38	
92. <i>1</i>		44	44	82	
93.1	10	44	44	126	
94. <i>*</i>		44	44	170	
95.´	10	44	44	214	
95.9		4	21	235	
96.0		39	0	235	
97.0		161	100	335	
98.0	00	394	278	613	
99.0	00	757	576	1,188	
100.0	00	1,135	946	2,134	
100.1	10	1,187	116	2,250	
Device	Routing	Invert	Outlet Dev	ices	
#1	Discarded	90.10'	5.000 in/hr	Exfiltration over	Surface area
#2	Secondary	99.10'	10.0' long	x 5.0' breadth Bro	oad-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	5.00 5.50
			Coef. (Eng	lish) 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	

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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	13	95.80	13	232
90.70	39	21	95.90	8	233
		21	96.00		234
90.80	40			39	
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	104	97.90	371	574
	44 44				
92.80		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	1,000	2,022
94.80	44	200	100.00	1,135	2,022
94.90	44	200	100.10	1,187	2 ,134 2,250
95.00	44	203	100.10	1,107	2,200
95.10	44	209			
95.20	44 40	214			
95.20	40	210			
			I		

Summary for Link AP: Analysis Point

Inflow Area :	=	131,357 sf	, 41.54% Impervi	ous, Inflow l	Depth = 0	.74" for 2	25-Year event
Inflow =	=	0.82 cfs @	12.46 hrs, Volun	ne=	8,142 cf		
Primary =	=	0.82 cfs @	12.46 hrs, Volun	ne=	8,142 cf,	Atten= 0%	,Lag= 0.0 min

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

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 Discarded=0.02 cfs 64 cf Primary=0.6	Peak Elev=87.37' Storage=3 cf Inflow=0.65 cfs 2,574 cf 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- Discarded=0.33 cfs	A) Peak Elev=89.50' Storage=8,559 cf Inflow=7.11 cfs 26,821 cf s 16,566 cf Primary=3.12 cfs 10,255 cf Outflow=3.45 cfs 26,821 cf
Pond SW-B: Bioretention Basin (SWM-E Discarded=0.14 cfs 10,202 cf Primary=0.	B) Peak Elev=93.04' Storage=4,815 cf Inflow=2.89 cfs 10,993 cf 22 cfs 791 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 10,993 cf
Pond SW-C: Drywell & Basin (SWM-C) Discarded=0.3	Peak Elev=93.62' Storage=2,536 cf Inflow=1.58 cfs 8,543 cf 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) Discarded=0.0	Peak Elev=98.05' Storage=635 cf Inflow=0.36 cfs 1,670 cf 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

Summary for Subcatchment DA1A: DA1A

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

A	rea (sf)	CN D	escription			
	29,175	39 >	75% Gras	s cover, Go	ood, HSG A	
	24,285	30 V	30 Woods, Good, HSG A			
	6,334	98 F	aved park	ing, HSG A		
	59,794	42 V	Veighted A	verage		
	53,460	8	9.41% Per	vious Area		
	6,334	1	0.59% Imp	ervious Ar	ea	
_						
Tc	Length	Slope	Velocity	Capacity	Description	
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
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	
0.0	0.5	0 0000	0.00		Woods: Light underbrush n= 0.400 P2= 3.43"	
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow	
0.4		0.0245	0 77		Woodland Kv= 5.0 fps	
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow	
1.5	61	0.0100	0.70		Paved Kv= 20.3 fps Shallow Concentrated Flow, Shallow	
1.5	01	0.0100	0.70		Short Grass Pasture Kv= 7.0 fps	
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow	
1.7	33	0.0004	0.55		Woodland Kv= 5.0 fps	
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow	
0.1		510 100			Short Grass Pasture Kv= 7.0 fps	
17.4	337	Total				

Summary for Subcatchment DA1B: DA1B

Runoff = 0.65 cfs @ 12.16 hrs, Volume= Routed to Pond CD-1 : Curtain Drain 2,574 cf, Depth= 2.26"

A	rea (sf)	CN	Description				
	8,478	39	>75% Gras	s cover, Go	bod, HSG A		
	2,889	30	Woods, Go	od, HSG A			
	2,295	98	Paved park	ing, HSG A			
	13,662	47	Weighted A	verage			
	11,367		83.20% Per	vious Area			
	2,295		16.80% Imp	pervious Are	ea		
Тс	Length	Slope	e Velocity	Capacity	Description		
(min)	(feet)	(ft/ft	,	(cfs)	Description		
		וויונ) (10360)	(013)			
10.0					Direct Entry, Direct Entry		

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)

Area (sf)	CN	Description			
14,063	98	98 Roofs, HSG A			
14,063		100.00% In	npervious A	rea	
Tc Length (min) (feet)	Slop (ft/f	,	Capacity (cfs)	Description	
5.0				Direct Entry, Direct Entry	

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)

_	A	rea (sf)	CN	Description		
		10,005	39	>75% Gras	s cover, Go	ood, HSG A
_		1,479	30	Woods, Go	od, HSG A	
		11,484	38	Weighted A	verage	
		11,484		100.00% Pe	ervious Are	a
	Тс	Length	Slope	,	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	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			

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)

A	rea (sf)	CN	Description				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go	od, HSG A			
	1,303	98	Paved park	ing, HSG A	۱ <u> </u>		
	12,462	41	Weighted A	verage			
	11,159		89.54% Pei	vious Area			
	1,303		10.46% Imp	pervious Are	ea		
Тс	Length	Slope	e Velocity	Capacity	Description		
(min)	(feet)	(ft/ft	,	(cfs)	Description		
/	(1991)	וויונ	(1/360)	(013)	Dise of Factors Dise of Factors		
10.0					Direct Entry, Direct Entry		

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)

A	rea (sf)	CN	Description				
	5,461	39	>75% Gras	s cover, Go	bod, HSG A		
	37,854	98	Paved park	ing, HSG A	N Contraction of the second seco		
	1,159	30	Noods, Go	od, HSG A			
	44,474	89	Neighted A	verage			
	6,620		14.89% Per	vious Area			
	37,854		35.11% Imp	pervious Are	ea		
Та	l e e este	Clana	Volesity	Conseitu	Description		
Tc	Length	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

Summary for Subcatchment DA5: DA5

Runoff = 0.48 cfs @ 12.34 hrs, Volume= Routed to Link AP : Analysis Point 3,609 cf, Depth= 0.91"

A	rea (sf)	CN D	escription				
	19,297	39 >	39 >75% Grass cover, Good, HSG A				
	28,025		,	od, HSG A			
	352	98 P	aved park	ing, HSG A			
	47,674		Veighted A				
	47,322	-		vious Area			
	352	0	.74% Impe	ervious Area	а		
_							
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
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		
		0 0 5 0 0	4.40		Short Grass Pasture Kv= 7.0 fps		
0.2	14	0.0500	1.12		Shallow Concentrated Flow, Shallow		
0.0	00	0 4 4 0 0	0.00		Woodland Kv= 5.0 fps		
0.2	32	0.1400	2.62		Shallow Concentrated Flow, Shallow		
0.5	60	0.0050	0.40		Short Grass Pasture Kv= 7.0 fps		
0.5	68	0.2350	2.42		Shallow Concentrated Flow, Shallow		
44.4	000	T . 4 . 1			Woodland Kv= 5.0 fps		
11.4	332	Total					

Summary for Pond CD-1: Curtain Drain

Inflow Outflow Discarde Primary Rout Seconda	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)					
			Span= 0.00-72.00 hrs, dt= 0.02 hrs			
Peak El	ev= 87.37' @	12.16 hrs S	urf.Area= 324 sf Storage= 3 cf			
Plug-Flo	w detention t	ime= 0.1 min	calculated for 2,573 cf (100% of inflow)			
			(878.3 - 878.2)			
Volume	Invert	Avail Stor	age Storage Description			
<u>volume</u> #1	87.35		6 cf 2.00'W x 162.00'L x 10.00'H Prismatoid			
#1	07.33	1,29	3,240 cf Overall x 40.0% Voids			
Davias	Deutine	lusionut	Outlet Devices			
Device	Routing		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			
#2	Secondary	97.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir			
110	Coornaary	01.00	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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Stage-Area-Storage for Pond CD-1: Curtain Drain

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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	94.05	324	881
89.05	324	2207	94.15	324	894
89.15	324	233	94.35	324	907
89.25	324	233 246	94.35	324	920
	324			324	933
89.35	324 324	259	94.55 94.65	324 324	
89.45	324 324	272		324 324	946
89.55		285	94.75	324 324	959
89.65 89.75	324 324	298 311	94.85 94.95	324	972 985
	324				
89.85	324 324	324	95.05	324 324	998
89.95		337	95.15		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			
			l		

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'	
#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)

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 afOverall Storage Efficiency = 61.5%Overall System Size = $77.40' \times 37.08' \times 5.50'$

50 Chambers 584.7 cy Field 375.5 cy Stone

\bigcirc	\bigcirc	\bigcirc	\square



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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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			
			l		

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

Inflow Area =	25,547 sf.	, 55.05% Impe	ervious, I	nflow Depth = 5.16"	for 100-Year event
Inflow =	2.89 cfs @	12.07 hrs, Vo	olume=	10,993 cf	
Outflow =	0.35 cfs @	12.78 hrs, Vo	olume=	10,993 cf, Atter	n= 88%, Lag= 42.6 min
Discarded =	0.14 cfs @	12.78 hrs, Vol	olume=	10,202 cf	
Primary =	0.22 cfs @	12.78 hrs, Vol	olume=	791 cf	
Routed to Link AP : Analysis Point					
Secondary =	0.00 cfs @	0.00 hrs, Vo	olume=	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.Stor	age Storage	Description	
#1	91.00'	8,23	1 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio (fee		rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
91.0	1	1,817	0	0	
92.0		2,343	2,080	2,080	
93.0		2,896	2,620	4,700	
94.0	0	3,466	3,181	7,881	
94.1	0	3,539	350	8,231	
Device	Routing	Invert	Outlet Devices	6	
#1	Primary	88.50'	12.0" Round	Outlet Pipe	
			Inlet / Outlet Ir	nvert= 88.50' / 8	headwall, Ke= 0.500 7.00' S= 0.0144 '/' Cc= 0.900
#2	Device 1	93.00'		, smooth interio Horiz. Grate C	or, Flow Area= 0.79 sf
#2	Device	95.00		flow at low hea	
#3	Secondary	93.25'	10.0' long x 3 Head (feet) 0. 2.50 3.00 3.5 Coef. (English	3.0' breadth Bro 20 0.40 0.60 (0 4.00 4.50	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 68 2.67 2.65 2.64 2.64 2.68 2.68
#4	Discarded	91.00'	2.000 in/hr Ex	filtration over S	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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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
			93.95		
91.35	2,001	668 760		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	2,620	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			

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

Inflow Area =	59,794 sf, 10.59% Impervious,	Inflow Depth = 1.71" for 100-Year even	nt		
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.Stor	rage Storage	Description	
#1	88.60'	6,38	32 cf Drywell	& Basin (Prism	atic) Listed below (Recalc)
Elevatio		ırf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
88.6	50	31	0	0	
89.6	50	44	38	38	
90.6	50	44	44	82	
91.6	50	44	44	126	
92.4	19	15	26	152	
92.5	50	477	2	154	
93.0	00	2,477	739	893	
93.8	30	2,977	2,182	3,074	
94.0	00	3,101	608	3,682	
94.8	30	3,649	2,700	6,382	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Discarded Secondary	88.60' 93.80'	5.000 in/hr Exfiltration over Surface area 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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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 91.20	44 44	104 108			
91.20	44	112			
91.30	44	112			
91.50	44	121			
91.60	44	121			
91.70	41	130			
91.80	37	130			
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			

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.Sto	rage Stora	ge Description	
#1	90.10'	2,25	50 cf Dryw	ell & Basin (Prism	atic) Listed below (Recalc)
_					
Elevatio		Irf.Area	Inc.Store		
(fee	/	(sq-ft)	(cubic-feet)	(cubic-feet)	
90. <i>1</i>		31	0		
91. <i>*</i>		44	38		
92. <i>1</i>		44	44		
93.1		44	44		
94.1	10	44	44		
95.´	-	44	44		
95.9		4	21	235	
96.0		39	0		
97.0	00	161	100		
98.0	00	394	278		
99.0	00	757	576	1,188	
100.0	00	1,135	946		
100.1	10	1,187	116	2,250	
Device	Routing	Invert	Outlet Dev	ices	
#1	Discarded	90.10'	5.000 in/hr	r Exfiltration over	Surface area
#2	Secondary	99.10'	10.0' long	x 5.0' breadth Bro	oad-Crested Rectangular Weir
					0.80 1.00 1.20 1.40 1.60 1.80 2.00
				3.50 4.00 4.50 5	
					70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67	2.66 2.68 2.70 2	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)

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

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(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			
			l		

Summary for Link AP: Analysis Point

Inflow Are	a =	131,357 sf, 41.54% Impervious, Inflow Depth = 1.57" for 100-Year eve	ent
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 m	nin

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