Stormwater Management Report

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

> December 16, 2022 Revised: February 24, 2023 Revised: March 17, 2023

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ENGINEERING ASSOCIATES

Table of Contents

1.	INTRODUCTION	3	
2.	PURPOSE OF REPORT	3	
3.	BASIS OF DESIGN		
4.	HYDROLOGIC AND HYDRAULIC METHODS	6	
5.	STORMWATER MANAGEMENT	7	
5.1 5.2 5.3 5.4	Existing Condition Drainage Areas and Analysis Points Proposed Condition Drainage Areas Proposed Condition Stormwater Management BMPs Storm Drain System Outlet Locations	7 7 8 15	
6.	SOURCE CONTROL AND POLLUTION PREVENTION MAINTENANCE AND OPERATION	15	
7 .	CONCLUSION	18	



FIGURES

- FIGURE 1 SITE LOCATION MAP
- FIGURE 2 FIRMETTE MAP
- FIGURE 3 PRE-DEVELOPMENT DRAINAGE AREA MAP
- FIGURE 4 POST-DEVELOPMENT DRAINAGE AREA MAP
- FIGURE 5 STORMWATER RUNOFF SUMMARY
- FIGURE 6 STAGE-STORAGE SUMMARIES

TECHNICAL APPENDIX

- APPENDIX A WATER QUALITY VOLUME AND WATER QUALITY FLOW CALCULATIONS
- APPENDIX B RIPRAP APRON DESIGN
- APPENDIX C PRE-DEVELOPMENT HYDROCAD REPORT
- APPENDIX D POST-DEVELOPMENT HYDROCAD REPORT



1. INTRODUCTION

The project is located at 446 Hopmeadow Street (U.S. Route 202/CT Route 10) in Simsbury, Connecticut (hereinafter referred to as the "Site") and is identified as Lot N003C on Tax Assessor's Map G13, Block 142. The Site is located on the east side of Hopmeadow Street, approximately 200 feet north of the intersection of Hopmeadow Street and Powder Forest Drive. The Site is 1.96 acres with 149.9 linear feet of frontage along Hopmeadow Street and is currently developed as a single-family residence (see Figure 1 – Site Location Map). The Site is located in the High Density Residential 'R-15' Zoning District. Adjacent properties are located in the High Density Residential 'R-15' Zone, the Low Density Residential 'R-40' Zone, the Planned Area Development 'PAD' Zone, and the Designed Multiple Residence 'RD' Zone. The Site is not located within a FEMA Flood Hazard Zone (see Figure 2 – Firmette Map). 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 the geotechnical investigation performed by GEI Consultants, Inc., soils on site consist of silty clays and silty loams (Hydrologic Groups 'C' and 'D') below elevation 98, and sandy loams (Hydrologic Group 'A') above elevation 98. For information regarding the geotechnical investigation and soil classifications, refer to the Geotechnical Report.

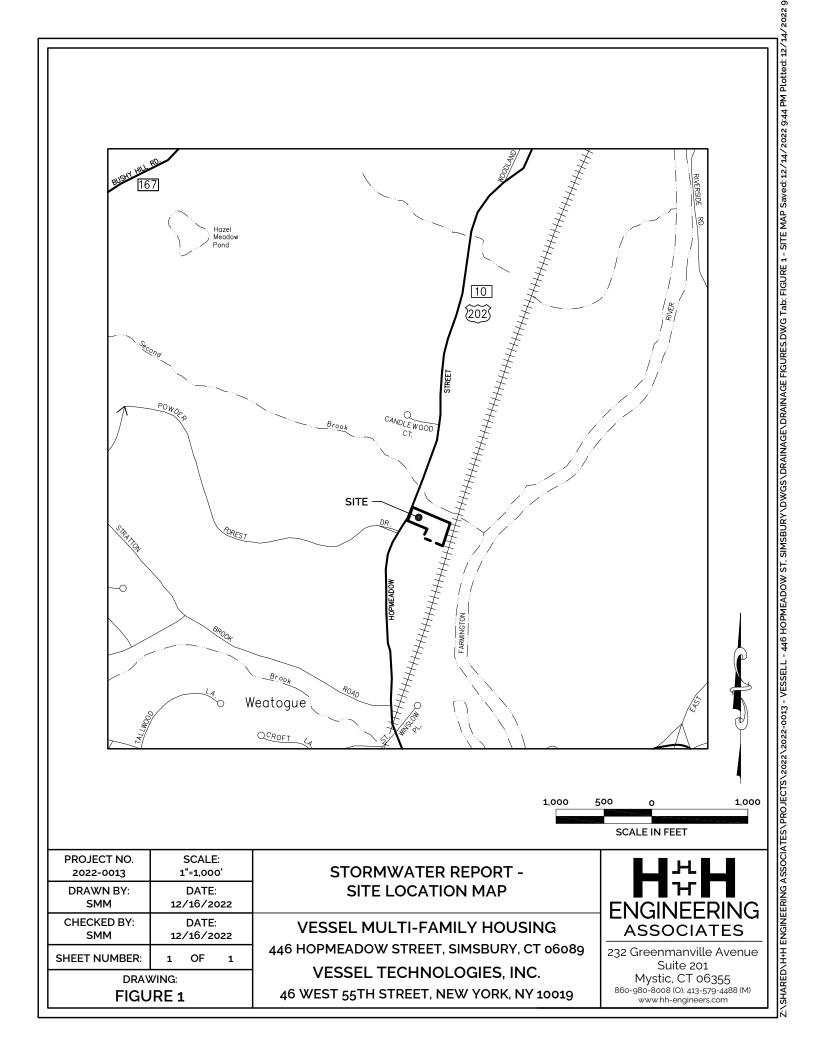
The proposed development consists of the construction of a new four-story 14,063 square-foot multi-family residential building, consisting of 77 one-bedroom units (575 square-feet) and 3 two-bedroom units (1,048 square-feet). Site improvements will include a new two-way access drive from Hopmeadow Street, 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

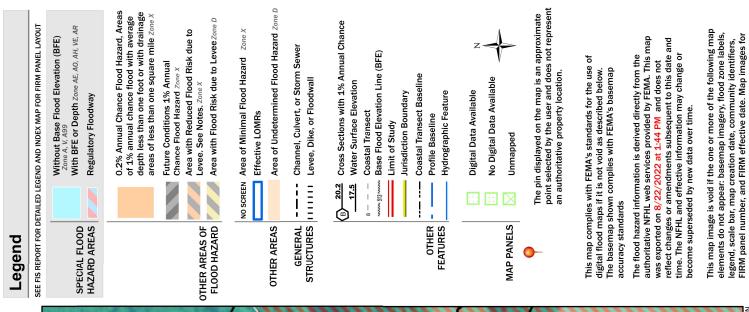
This report presents the basis of design for stormwater management including drainage and stormwater treatment. The report demonstrates that the development:

- 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.



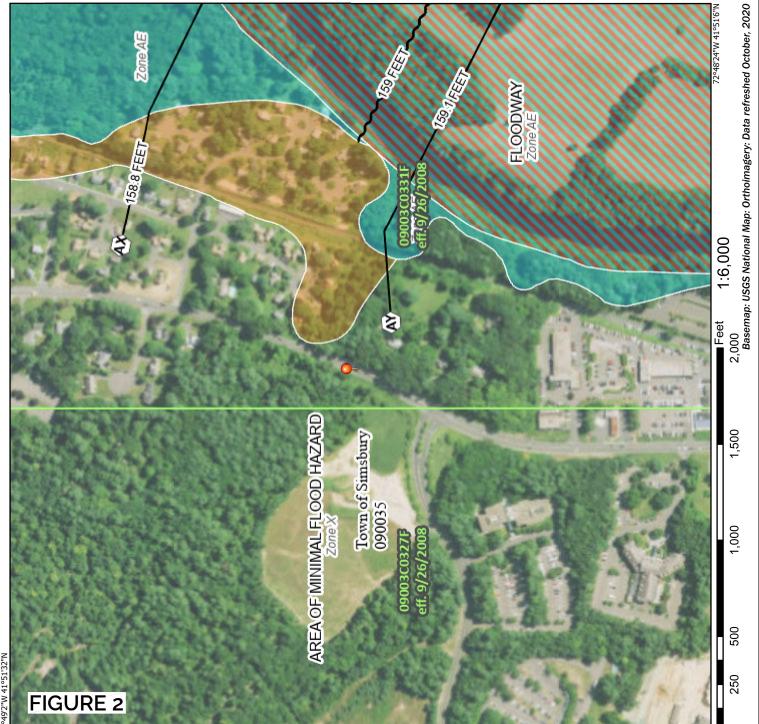
National Flood Hazard Layer FIRMette





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 2004 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 an Infiltration Trench and a drywell/collection basin 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. The existing Drainage Area, DA1, was subdivided into 5 drainage areas and described as follows:

- **DA1**: Approximately 1.67 acres of land, located mostly off-site, consisting of 0.83 acres of lawn, 0.66 acres of woods and 0.20 acres of impervious surfaces that drain to Stormwater Management Area C (Infiltration Trench).
- **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 0.13 acres of land, located on-site, consisting of lawn, that drains to Stormwater Management Area B (Bioretention Basin),
- **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 drains to Stormwater Management Area D (drywell and basin).
- **DA4**: For analysis purposes, the proposed condition DA4 was subdivided into 4 subareas.



- **DA4A**: Approximately 0.22 acres of land consisting of 0.20 acres of new pavement and walkways, and 0.02 acres of landscaping, that is directed to Stormwater Management Area A1 (ADS Stormtech MC-3500).
- DA4B: Approximately 0.17 acres of land consisting of 0.15 acres of new pavement and walkways, and 0.02 acres of landscaping, that is directed to Stormwater Management Area A2 (ADS Stormtech MC-3500).
- **DA4C**: Approximately 0.38 acres of on-site and off-site land, consisting of 0.30 acres of new pavement and walkways, and 0.05 acres of lawn and landscaping, and 0.03 acres of woods, that is directed to Stormwater Management Area A3 (ADS Stormtech MC-3500).
- **DA4D**: Approximately 0.27 acres of land consisting of 0.22 acres of new pavement and walkways, and 0.05 acres of landscaping, that is directed to Stormwater Management Area A4 (ADS Stormtech MC-3500).
- **DA5**: Approximately 1.23 acres of land north and east of the proposed improvements consisting of 0.52 acres of lawn, 0.70 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 (DA4A, DA4B, DA4C and DA4D) into four separate ADS Stormtech MC-3500 infiltration/detention systems (Stormwater Management Area A1, A2, A3, and A4), which will retain, attenuate and infiltrate stormwater runoff from the impervious areas and treat stormwater runoff through filtration using Isolator Rows that are sized to treat inflows exceeding the 100-year storm event and infiltrate through the 2-year storm event. The Isolator Rows are rows 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 on-site lawn (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 up to the 1-year storm event. Overflow from the basin is directed to an outlet pipe with a flared end section and riprap apron located in the northeast corner of the Site. 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 selected by a Landscape Architect and are based on the Plant List found in the 2004 CT DEEP SQM.
- **Stormwater Management Area C:** Curtain Drain and Infiltration Trench Off-site stormwater runoff generated from the properties to the south continue onto the Site. A portion of this runoff (DA1) is collected by a Curtain Drain Infiltration Trench prior to reaching the proposed parking lot and is designed to infiltrate stormwater runoff through the 2-year storm event. Overflow from the infiltration trenchis directed to an outlet pipe and riprap apron located to the north.
- 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.



PEAK RATE OF RUNOFF (CFS) SUMMARY				
	ANALYSIS POINT - EDGE OF WETLAND			
STORM FREQUENCY	EXISTING	PROPOSED	CHANGE	
WQV	0.00	0.00	NO CHANGE	
2-YEAR	0.80	1.12	+0.32	
10-YEAR	4.25	3.16	-1.09	
25-YEAR	7.11	5.28	-1.83	
100-YEAR	12.14	10.77	-1.37	

RUNOFF VOLUME (CF) SUMMARY			
	ANAL	ANALYSIS POINT - EDGE OF WETLAND	
STORM FREQUENCY	EXISTING	PROPOSED	CHANGE
WQV	0	54	+54
2-YEAR	6,523	5,248	-1,275
10-YEAR	23,181	23,095	-86
25-YEAR	36,449	36,731	+282
100-YEAR	59,790	59,728	-62

REVISED: 3/17/2023 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

Г		STORMWATER MANAGEMEN	Γ Δ Ρ ΕΔ 'Δ1'		
		STORMTECH MC-3500 INFILT		1	
	STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOL	LUME (CF)	
	WQV	85.78	362		
	2-YEAR	87.69	2,034	l .	
	10-YEAR	88.03	2,305	5	
	25-YEAR	88.49	2,648	3	
	100-YEAR	89.01	2,990)	
	<u>14</u>	DS STORMTECH MC-3500 INFILTRATION SYS TOP OF STONE ELEV. = 90.50 TOP OF CHAMBER ELEV. = 89.5 BOTTOM OF CHAMBER ELEV. = 89.5 BOTTOM OF CHAMBER ELEV. = 85.	50 5.75		
		OUTLET CONTROL STRUCTURE ELEV TOP OF FRAME (MANHOLE COVER) EL RECTANGULAR WEIR INV. ELEV. = 6" DIA. ORIFICE = 88.50 4" DIA. ORIFICE = 87.70 12" INV. OUT ELEV. = 85.80	EV. = 92.70		
		EXFILTRATION RATE = 0.1 IN/H	IR		
Γ		STORMWATER MANAGEMEN ⁻ STORMTECH MC-3500 INFILTF		1	
	STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOL	LUME (CF)	
	WQV	87.41	270		
	2-YEAR	88.93	1,565	5	
	10-YEAR	89.22	1,805	5	
	25-YEAR	89.53	2,060)	
	100-YEAR	89.91	2,363	3	
	<u>AI</u>	DS STORMTECH MC-3500 INFILTRATION SYS TOP OF STONE ELEV. = 92.30 TOP OF CHAMBER ELEV. = 91.3 BOTTOM OF CHAMBER ELEV. = 8 BOTTOM OF STONE ELEV. = 86.	;o 7.55		
	OUTLET CONTROL STRUCTURE ELEVATIONS: TOP OF FRAME (MANHOLE COVER) ELEV. = 94.20 RECTANGULAR WEIR INV. ELEV. = 91.05 6" DIA. UPPER ORIFICE = 89.55 4" DIA. LOWER ORIFICE = 88.95 12" INV. OUT ELEV. = 87.60				
L		EXFILTRATION RATE = 0.1 IN/H	IK		
REVISED: 3/17 REVISED: 2/24	-				
PROJECT NO 2022-0013	SCALE: N.T.S.	STORMWATER REP			
DRAWN BY: SMM		STORMWATER TREATMEN STAGE-STORAGE SUM			
CHECKED BY SMM	': DATE: 12/16/2022	VESSEL MULTI-FAMILY	HOUSING	ASSOCIATES	
SHEET NUMBE	R: 1 OF 4	446 HOPMEADOW STREET, SIMS		232 Greenmanville Aven Suito 201	
	RAWING: GURE 6	VESSEL TECHNOLOGI 46 WEST 55TH STREET, NEW Y	-	Suite 201 Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (N www.hh-engineers.com	
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			•	
		STORMTECH MC-3500 INFILT	STORAGE VOL	
	STORM FREQUENCY			
		87.47	173	
	2-YEAR	89.54	2,539	
	10-YEAR	89.95	3,034	
	25-YEAR	90.56	3,718	
	100-YEAR			
	AI	DS STORMTECH MC-3500 INFILTRATION SYS TOP OF STONE ELEV. = 92.70 TOP OF CHAMBER ELEV. = 91.7 BOTTOM OF CHAMBER ELEV. = 8 BOTTOM OF STONE ELEV. = 87. OUTLET CONTROL STRUCTURE ELEV	7.95 20	
		TOP OF FRAME (MANHOLE COVER) ELI RECTANGULAR WEIR INV. ELEV. = 6" DIA. ORIFICE = 90.60 4" DIA. ORIFICE = 89.55 12" INV. OUT ELEV. = 88.00	EV. = 94.50 91.45	
		EXFILTRATION RATE = 0.1 IN/F	IR	
		STORMWATER MANAGEMEN STORMTECH MC-3500 INFILTE	=	1
	STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOL	LUME (CF)
	WQV	88.34	173	
	2-YEAR	90.33	1,994	k i i i i i i i i i i i i i i i i i i i
	10-YEAR	90.69	2,344	ļ .
	25-YEAR	91.20	2,799)
	100-YEAR	91.73	3,243	3
	AI	DS STORMTECH MC-3500 INFILTRATION SYS TOP OF STONE ELEV. = 93.50 TOP OF CHAMBER ELEV. = 92.5 BOTTOM OF CHAMBER ELEV. = 8 BOTTOM OF STONE ELEV. = 88. OUTLET CONTROL STRUCTURE ELEV.	0 8.75 00 /ATIONS <u>:</u>	
	TOP OF FRAME (MANHOLE COVER) ELEV. = 96.25 RECTANGULAR WEIR INV. ELEV. = 92.25 6" DIA. UPPER ORIFICE = 91.20 4" DIA. LOWER ORIFICE = 90.35 12" INV. OUT ELEV. = 88.80 EXFILTRATION RATE = 0.1 IN/HR			
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PROJECT N		STORMWATER REP	ORT -	
2022-001 DRAWN B SMM	-	STORMWATER TREATMEN STAGE-STORAGE SUM		
CHECKED E SMM	BY: DATE: 12/16/2022	VESSEL MULTI-FAMILY	HOUSING	ASSOCIATES
SHEET NUM		446 HOPMEADOW STREET, SIMS	BURY, CT 06089	232 Greenmanville Avenue
	DRAWING: FIGURE 6	VESSEL TECHNOLOGI 46 WEST 55TH STREET, NEW Y		Suite 201 Mystic, CT 06355 860-980-8008 (O); 413-579-4488 (M) www.hh-engineers.com
L				, , , , , , , , , , , , , , , , , , ,

STORMWATER MANAGEMENT AREA 'B' BIORETENTION BASIN				
STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)		
WQV	91.62	756		
2-YEAR	92.87	2,810		
10-YEAR	93.26	3,619		
25-YEAR	93.59	4,382		
100-YEAR	93.74	4,757		
TOP OF BERM ELEV. = 94.80 TOP OF SPILLWAY ELEV. = 94.30 BOTTOM OF BASIN ELEV. = 91.00 <u>OUTLET CONTROL STRUCTURE ELEVATIONS:</u> TOP OF FRAME (CB GRATE) ELEV. = 93.60 5" DIA. LOWER ORIFICE = 92.75 12" INV. OUT ELEV. = 89.00 EXFILTRATION RATE = 0.1 IN/HR				
STORMWATER MANAGEMENT AREA 'C' CURTAIN DRAIN INFILTRATION TRENCH				
STORM FREQUENCY	WATER SURFACE ELEVATION (FT.)	STORAGE VOLUME (CF)		
WQV	87.40	0		
2-YEAR	87.68	119		
10-VEAR	89.96	1.069		

	-	-
10-YEAR	89.96	1,069
25-YEAR	90.56	1,321
100-YEAR	90.99	1,503

TOP OF TRENCH ELEV. (MIN.) = 96.0 BOTTOM OF TRENCH ELEV.=87.4 OUTLET CONTROL STRUCTURE ELEVATIONS: TOP OF FRAME (MANHOLE COVER) ELEV. = 96.50 RECTANGULAR WEIR INV. ELEV. = 90.75 4" DIA. ORIFICE = 89.75 8" INV. OUT ELEV. = 87.20

EXFILTRATION RATE = 0.1 IN/HR

REVISED: 3/17/2023 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:	3 OF 4	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 (0): 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	91.60	0		
2-YEAR	91.61	0		
10-YEAR	95.58	169		
25-YEAR	98.12	300		
100-YEAR	98.87	562		
	DRYWELL ELEVATIONS: TOP OF FRAME (CB GRATE) ELEV. = 9 BOTTOM OF DRYWELL ELEV. = 92 BOTTOM OF STONE ELEV. = 91.6	.60		
	COLLECTION BASIN ELEVATION TOP OF BERM ELEV. = 100.10 TOP OF SPILLWAY ELEV. = 99.10 BOTTOM OF BASIN ELEV. = 97.50	 D		
	EXFILTRATION RATE = 5.0 IN/H	R		

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:	4 OF 4	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

5.4 Storm Drain System Outlet Locations

Stormwater Management Area A – Outflow from the ADS Stormtech MC-3500 systems is directed through an outlet control structure and 18" 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 Basin is directed through an outlet control structure and 12" HDPE pipe to a wooded area in the northeast corner of the Site which then sheetflows to the off-site inland wetland. Emergency overflow is directed through a riprap spillway located on the northern slope of the basin and directs flow to the parking lot.

Stormwater Management Area C – Overflow from the Infiltration Trench is directed through an outlet control structure and 8" HDPE pipe to the outlet system identified in 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 eastern slope of the basin and directs flow toward Stormwater Management Area A.

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.



17

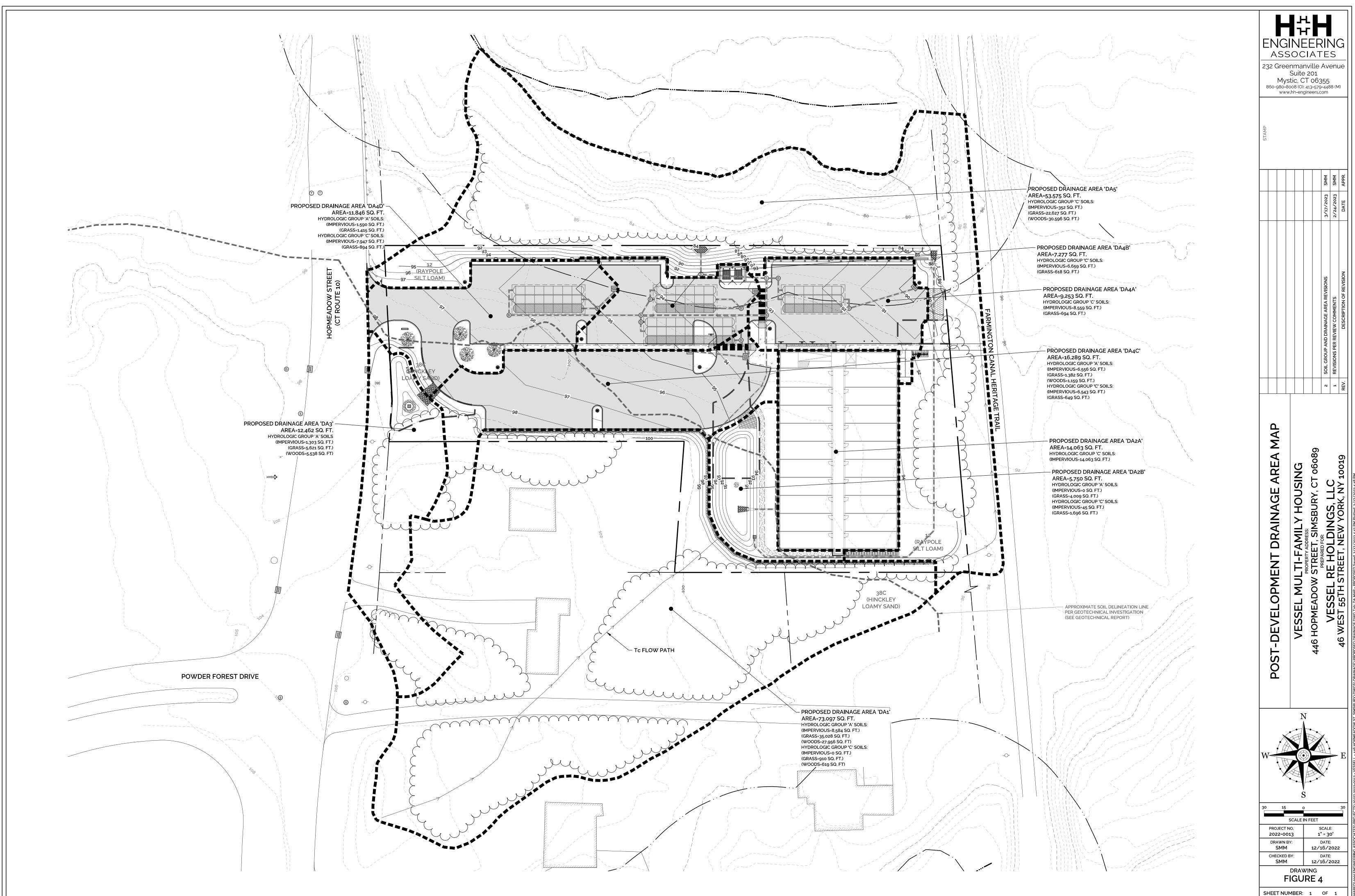
A detailed maintenance logbook shall be kept on-site for the units by the property owner/manager. information is to include, but not be limited to, the date of inspection, record of sediment depth, general observations, and date of cleaning performed.

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 Revised: March 17, 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

	V	VQV & WQF CALCULATIONS - STORMWATER MANA	AGEMENT AREA 'A	1'	
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date	
Client:	Vessel Tech	inologies, Inc.	SMM	12/14/2022	
				Revised 2/24/2023	
				Revised 3/17/2023	
Water Qu					
0.21	ac	A = Area draining to the practice			
0.20	ac	A _I = Impervious area draining to the practice			
0.95	; decimal	I = Percent impervious area draining to the practice, in	decimal form		
0.91	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)			
0.19	ac-in	$WQV = 1" \times R_V \times A$			
692	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")			
	ality Flow (W	/QF) P = amount of rainfall.			
	inches	Q = Water Quality Depth. Q=WQV/A			
	unitless	CN = unit peak discharge curve number. CN=1000/(10+5P+10Q-10*[Q ² +1.25*Q*P] ⁰⁵)			
	l inches	S = potential maximum retention. S = $(1000/CN) - 10$		J & 1] /	
	inches	la = 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 a	nd 4-III	
0.193	cfs	WQF = qu x WQV. Conversion: to convert "cfs/mi²/in '	ac-in" to "cfs" mult	tiply by 1mi²/640ac	
		· ·			
Designer	Stormwater	r Management Area 'A1'			
Notes:	ADS Stormt	ech SC-3500 Infiltration System			
	ADS Stormt	ech SC-740 Isolator Row Sizing:		H H	
	(1) Isolato	r row with 6 units is provided			
	Treated f	low rate = 0.40 CFS / unit X 6 units = 2.40 CFS	ENGIN	IEERING	
		low rate > WQF		CIATES	
		te from 100-year storm event = 1.83 CFS)			
	qu obtained	from exhibit 4-III for NRCS type III rainfall distribution			

	W	VQV & WQF CALCULATIONS - STORMWATER MANA	GEMENT AREA 'A	2'
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date
Client:	Client: Vessel Technologies, Inc.			12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
0.17	ac	A = Area draining to the practice		
0.15	ac	A _I = Impervious area draining to the practice		
0.88	decimal	I = Percent impervious area draining to the practice, in	decimal form	
0.84	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)		
0.14	ac-in	$WQV = 1" \times R_V \times A$		
521	. cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")		
1.00 0.84 99 0.1 0.029 5.0	ality Flow (X inches inches unitless inches inches minutes cfs/mi ² /in cfs	P = amount of rainfall. Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(10 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from T WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in"	R-55 exhibits 4-II a	nd 4-III
Designer	Stormwater	' Management Area 'A2'		
Notes:	ADS Stormt	ech SC-3500 Infiltration System	1	
	ADS Stormt	ech SC-740 Isolator Row Sizing:		H
	(1) Isolato	r row with 6 units is provided		H H
	Treated f	low rate = 0.40 CFS / unit X 6 units = 2.40 CFS	ENGIN	EERING
	Treated f	low rate > WQF		CIATES
	(Inflow ra	te from 100-year storm event = 1.44 CFS)		-
	qu obtained	from exhibit 4-III for NRCS type III rainfall distribution		

	V	VQV & WQF CALCULATIONS - STORMWATER MAN	AGEMENT AREA 'A	\3'
Project:	446 Hopme	adow Street, Simsbury	Calculated By	Date
Client:	Vessel Tech	nologies, Inc.	SMM	12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
0.38	3 ac	A = Area draining to the practice		
0.30) ac	A _I = Impervious area draining to the practice		
0.80	decimal	I = Percent impervious area draining to the practice, in	decimal form	
0.77	v unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)		
0.29) ac-in	$WQV = 1" \times R_V \times A$		
1,051	L Cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")		
1.00 0.77 98 0.2 0.045	ality Flow (X inches unitless inches inches inches minutes cfs/mi ² /in cfs	P = amount of rainfall. Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(10 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from T WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	R-55 exhibits 4-II a	nd 4-III
Designer	Stormwater	r Management Area 'A3'		
Notes:	ADS Stormt	ech SC-3500 Infiltration System	1	
	ADS Stormt	ech SC-740 Isolator Row Sizing:		H
	(1) Isolato	r row with 9 units is provided		H H
	Treated f	low rate = 0.40 CFS / unit X 9 units = 3.60 CFS		EERING
	Treated f	low rate > WQF		CIATES
	(Inflow ra	te from 100-year storm event = 2.55 CFS)		
	qu obtained	from exhibit 4-III for NRCS type III rainfall distribution		

	V	VQV & WQF CALCULATIONS - STORMWATER MANA	AGEMENT AREA 'A	4'
Project:	446 Hopme	adow Street, Simsbury	Calculated By	Date
Client:	Vessel Tech	inologies, Inc.	SMM	12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
0.27	ac 🛛	A = Area draining to the practice		
0.22	ac	A _I = Impervious area draining to the practice		
0.81	. decimal	I = Percent impervious area draining to the practice, in	decimal form	
0.78	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)		
0.21	. ac-in	$WQV = 1" \times R_V \times A$		
768	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")		
98 0.2 0.043 5.0	inches unitless inches inches minutes cfs/mi ² /in	Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(10 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from T WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in"	R-55 exhibits 4-II ai	nd 4-III
	-		-	
Designer		r Management Area 'A4'		
Notes:		ech SC-3500 Infiltration System		
		ech SC-740 Isolator Row Sizing:		H H
		r row with 7 units is provided		
		low rate = 0.40 CFS / unit X 7 units = 2.80 CFS		IEERING
		low rate > WQF	ASSO	CIATES
		te from 100-year storm event = 1.89 CFS)		
	qu obtained	from exhibit 4-III for NRCS type III rainfall distribution		

	V	VQV & WQF CALCULATIONS - STORMWATER MAN	IAGEMENT AREA 'I	3'
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date
Client:	Vessel Tech	nologies, Inc.	SMM	12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
0.46	ac	A = Area draining to the practice		
0.32	ac	A _I = Impervious area draining to the practice		
0.71	decimal	I = Percent impervious area draining to the practice, ir	n decimal form	
0.69	unitless	R _V = Runoff coefficient = 0.05 + (0.9 x I)		
0.31	ac-in	$WQV = 1" \times R_V \times A$		
1,138	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")		
0.69 97 0.3	inches inches unitless inches inches minutes cfs/mi²/in cfs	P = amount of rainfall. Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(10 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from T WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	TR-55 exhibits 4-II ar	nd 4-III
Designer	Ctownstate	· Management Area 'B'	1	
Notes:	Bioretentior		-	
Notes:	Treated vo Contributi	blume (volume stored prior to discharging) = 2,589 CF ng WQV = 1,138 CF olume = 228% of Water Quality Volume	ENGIN	H H EERING CIATES

	V	WQV & WQF CALCULATIONS - STORMWATER MAN	NAGEMENT AREA '	C
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date
Client:	Vessel Tech	inologies, Inc.	SMM	12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
1.68	3 ac	A = Area draining to the practice		
0.20	ac	A _l = Impervious area draining to the practice		
0.12	2 decimal	I = Percent impervious area draining to the practice, i	n decimal form	
0.16	i unitless	R _V = Runoff coefficient = 0.05 + (0.9 x l)		
0.26	ac-in	$WQV = 1" \times R_V \times A$		
958	3 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")		
1.00 0.16 82 1.9	ality Flow (X inches inches unitless inches inches minutes cfs/mi ² /in o cfs	P = amount of rainfall. Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(1 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	TR-55 exhibits 4-II a	nd 4-III
Designer	Stormwater	r Management Area 'C'		
Notes:	Curtain Drai	in Infiltration Trench	7 <u> </u>	
		olume (volume stored prior to discharging) = 982 CF		
		ng WQV = 958 CF		
	Treated v	olume = 103% of Water Quality Volume		EERING ciates

	٧	VQV & WQF CALCULATIONS - STORMWATER MAN	AGEMENT AREA 'I	כ'
Project:	446 Hopmea	adow Street, Simsbury	Calculated By	Date
Client:	Vessel Tech	nologies, Inc.	SMM	12/14/2022
				Revised 2/24/2023
				Revised 3/17/2023
Water Qu	ality Volume	(WQV)		
0.29	ac	A = Area draining to the practice		
0.03	ас	A ₁ = 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")		
0.14 84 2.0	inches inches unitless inches inches minutes cfs/mi ² /in cfs	P = amount of rainfall. Q = Water Quality Depth. Q=WQV/A CN = unit peak discharge curve number. CN=1000/(10 S = potential maximum retention. S = (1000/CN) - 10 Ia = initial abstraction. Ia=0.2S T _c = Time of Concentration qu is the unit peak discharge. Obtain this value from T WQF = qu x WQV. Conversion: to convert "cfs/mi ² /in	R-55 exhibits 4-11 ar	nd 4-III
Designer	<u>C</u> 1		1	
Notes:		Management Area 'D' Collection Basin	4	
Notes:	Treated vo Contributir	blume (volume stored through 100-yr event) = 562 CF ng WQV = 150 CF blume = 375% of Water Quality Volume	ENGIN	H H EERING CIATES

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

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

Peak Q(25yr)=	1.32	cfs	PIPE DIA=	1.25 ft	
A. W ₁ = 3(Sp) = ft					4 ft
B. La = <u>1.8 (Q-5)</u> +1 (Sp) ¹⁵	0 = ft				6 ft
C. W ₂ = 3(Sp) + 0.7(La) = ft				8 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

3.4

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)=	0.53 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.	2 ft
C. W ₂ = 3(Sp) + 0.7(L	.a) = ft		5 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

2.8

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> + (Sp) ¹⁵	10 = ft		5 ft
C. W ₂ = 3(Sp) + 0.7(L	_a) = ft		7 ft

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

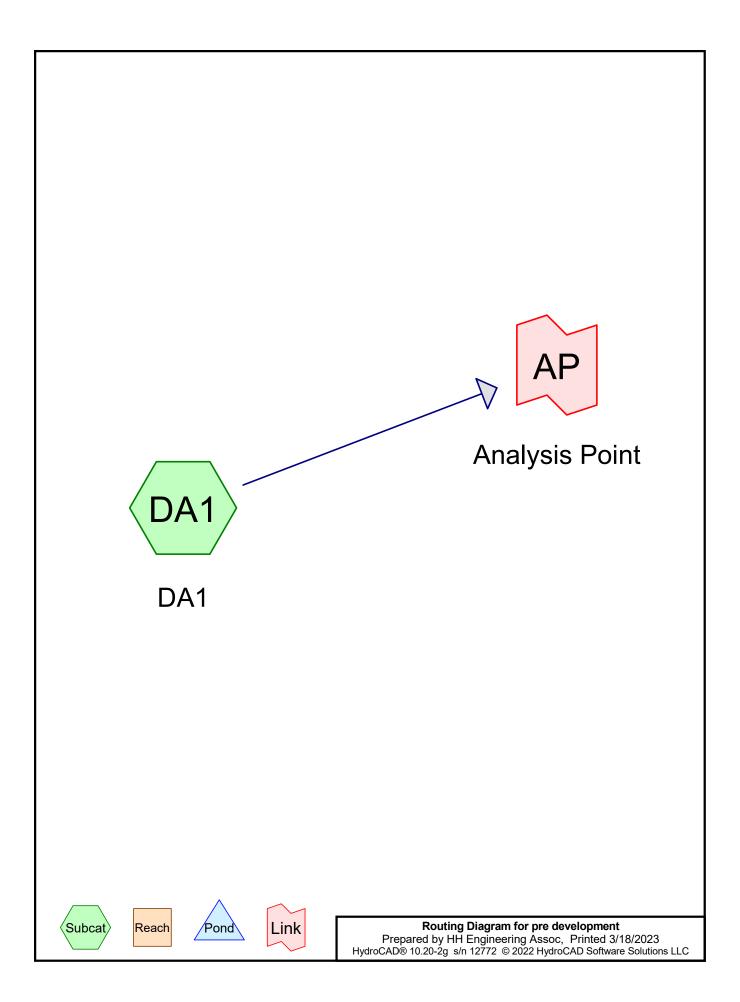
Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=

5.05 fps

Therfore; Use Modified Riprap

Appendix C – Pre-Development HydroCAD Report



Eve	ent#	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)
623	76	Gravel roads, HSG A (DA1)
61	89	Gravel roads, HSG C (DA1)
51,183	39	Pasture/grassland/range, Good, HSG A (DA1)
56,941	74	Pasture/grassland/range, Good, HSG C (DA1)
7,684	98	Paved parking, HSG A (DA1)
4,264	98	Paved parking, HSG C (DA1)
4,055	98	Roofs, HSG A (DA1)
883	98	Roofs, HSG C (DA1)
36,606	30	Woods, Good, HSG A (DA1)
41,312	70	Woods, Good, HSG C (DA1)
203,612	58	TOTAL AREA

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
100,151	HSG A	DA1
0	HSG B	
103,461	HSG C	DA1
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
623	0	61	0	0	684	Gravel roads
51,183	0	56,941	0	0	108,124	Pasture/grasslan
						d/range, Good
7,684	0	4,264	0	0	11,948	Paved parking
4,055	0	883	0	0	4,938	Roofs
36,606	0	41,312	0	0	77,918	Woods, Good
100,151	0	103,461	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=58 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"

A	rea (sf)	CN E	Description		
	7,684	98 F	Paved park	ing, HSG A	
	4,264			ing, HSG C	
	4,055	98 F	Roofs, HSC	βĂ	
	883		Roofs, HSG		
	623		Gravel road		
	61		Gravel road	,	
	51,183				ge, Good, HSG A
	56,941				ge, Good, HSG C
	36,606			od, HSG A	
	41,312			od, HSG C	
	203,612		Veighted A		
-	86,726			vious Area	
	16,886	5	8.29% Impe	ervious Are	а
т.	المربع مرالم	01	\/_l;	0	Description
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(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	55	0.0000	0.90		Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow
0.1		0.00-10	0.11		Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow
	•		• • • •		Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
					Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
					Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow
					Woodland Kv= 5.0 fps
22.5	764	Total			

Summary for Link AP: Analysis Point

Inflow Are	a =	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=0.38" Flow Length=764' Tc=22.5 min CN=58 Runoff=0.80 cfs 6,523 cf

Link AP: Analysis Point

Inflow=0.80 cfs 6,523 cf Primary=0.80 cfs 6,523 cf

Total Runoff Area = 203,612 sf Runoff Volume = 6,523 cf Average Runoff Depth = 0.38" 91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

Summary for Subcatchment DA1: DA1

Runoff = 0.80 cfs @ 12.49 hrs, Volume= Routed to Link AP : Analysis Point 6,523 cf, Depth= 0.38"

Ai	rea (sf)	CN E	Description		
	7,684	98 F	Paved park	ing, HSG A	\
	4,264			ing, HSG C	
	4,055	98 F	Roofs, HSG	βĂ	
	883	98 F	Roofs, HSG	ЭC	
	623	76 C	Gravel road	ls, HSG A	
	61	89 C	Gravel road	ls, HSG C	
	51,183	39 F	Pasture/gra	ssland/ran	ge, Good, HSG A
	56,941				ge, Good, HSG C
	36,606	30 V	Voods, Go	od, HSG A	
	41,312	70 V	Voods, Go	od, HSG C	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	3.29% Impe	ervious Are	а
-		01		0 1	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow
4 4 -	70	0.0405	0.44		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
0.4	20	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
1.J	01	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0450	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
1.0	150	0.0441	1.47		Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow
0.4	200	0.0700	1.57		Woodland Kv= 5.0 fps
22.5	764	Total			
ZZ.J	104	i Utai			

Summary for Link AP: Analysis Point

Inflow Area	a =	203,612 sf,	8.29% Impervious,	Inflow Depth = 0.38"	for 2-Year event
Inflow	=	0.80 cfs @ 1	12.49 hrs, Volume=	6,523 cf	
Primary	=	0.80 cfs @ 1	12.49 hrs, Volume=	6,523 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=1.37" Flow Length=764' Tc=22.5 min CN=58 Runoff=4.25 cfs 23,181 cf

Link AP: Analysis Point

Inflow=4.25 cfs 23,181 cf Primary=4.25 cfs 23,181 cf

Total Runoff Area = 203,612 sf Runoff Volume = 23,181 cf Average Runoff Depth = 1.37" 91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

Summary for Subcatchment DA1: DA1

Runoff = 4.25 cfs @ 12.36 hrs, Volume= Routed to Link AP : Analysis Point 23,181 cf, Depth= 1.37"

Ai	rea (sf)	CN E	Description		
	7,684	98 F	Paved park	ing, HSG A	\
	4,264			ing, HSG C	
	4,055	98 F	Roofs, HSG	βĂ	
	883	98 F	Roofs, HSG	ЭC	
	623	76 C	Gravel road	ls, HSG A	
	61	89 C	Gravel road	ls, HSG C	
	51,183	39 F	Pasture/gra	ssland/ran	ge, Good, HSG A
	56,941				ge, Good, HSG C
	36,606	30 V	Voods, Go	od, HSG A	
	41,312	70 V	Voods, Go	od, HSG C	
	03,612		Veighted A		
	86,726	-		vious Area	
	16,886	8	3.29% Impe	ervious Are	а
-		01		0 1	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
1.7	24	0.0824	0.23		Sheet Flow, Sheetflow
4 4 -	70	0.0405	0.44		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
0.4	20	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
1.J	01	0.0100	0.70		Shallow Concentrated Flow, shallow Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
2.0	121	0.0450	1.00		Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
1.0	150	0.0441	1.47		Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow
0.4	200	0.0700	1.57		Woodland Kv= 5.0 fps
22.5	764	Total			
ZZ.J	104	i Utai			

Summary for Link AP: Analysis Point

Inflow Area =	203,612 sf,	8.29% Impervious,	Inflow Depth = 1.37"	for 10-Year event
Inflow =	4.25 cfs @ 1	2.36 hrs, Volume=	23,181 cf	
Primary =	4.25 cfs @ 1	12.36 hrs, Volume=	23,181 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=2.15" Flow Length=764' Tc=22.5 min CN=58 Runoff=7.11 cfs 36,449 cf

Link AP: Analysis Point

Inflow=7.11 cfs 36,449 cf Primary=7.11 cfs 36,449 cf

Total Runoff Area = 203,612 sf Runoff Volume = 36,449 cf Average Runoff Depth = 2.15" 91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

Summary for Subcatchment DA1: DA1

Runoff = 7.11 cfs @ 12.34 hrs, Volume= Routed to Link AP : Analysis Point 36,449 cf, Depth= 2.15"

A	rea (sf)	CN E	Description		
	7,684	98 F	Paved park	ing, HSG A	\
	4,264		Paved park		
	4,055	98 F	Roofs, HSG	Α Ă	
	883	98 F	Roofs, HSG	G C	
	623	76 (Gravel road	s, HSG A	
	61	89 (Gravel road	s, HSG C	
	51,183	39 F	Pasture/gra	ssland/rang	ge, Good, HSG A
	56,941	74 F	Pasture/gra	ssland/rang	ge, Good, HSG C
	36,606	30 N	Noods, Go	od, HSG A	
	41,312	70 \	Voods, Go	od, HSG C	
	03,612		Veighted A		
	86,726	-	91.71% Per		
	16,886	ξ	3.29% Impe	ervious Are	а
Тс	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	Slope (ft/ft)	(ft/sec)	(cfs)	Description
1.7	24	0.0824	0.23	(013)	Sheet Flow, Sheetflow
1.7	27	0.0024	0.20		Grass: Short $n=0.150$ P2= 3.43"
11.7	76	0.0485	0.11		Sheet Flow, sheetflow
	10	0.0400	0.11		Woods: Light underbrush n= 0.400 P2= 3.43"
0.6	35	0.0368	0.96		Shallow Concentrated Flow, shallow
0.0		0.0000	0.00		Woodland Kv= 5.0 fps
0.1	22	0.0345	3.77		Shallow Concentrated Flow, shallow
••••					Paved Kv= 20.3 fps
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow
					Short Grass Pasture Kv= 7.0 fps
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow
					Woodland Kv= 5.0 fps
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow
					Short Grass Pasture Kv= 7.0 fps
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow
					Woodland Kv= 5.0 fps
22.5	764	Total			

Summary for Link AP: Analysis Point

Inflow Are	a =	203,612 sf,	8.29% Impervious,	Inflow Depth = 2.15"	for 25-Year event
Inflow	=	7.11 cfs @ 1	2.34 hrs, Volume=	36,449 cf	
Primary	=	7.11 cfs @ 1	2.34 hrs, Volume=	36,449 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

> Runoff Area=203,612 sf 8.29% Impervious Runoff Depth=3.52" Flow Length=764' Tc=22.5 min CN=58 Runoff=12.14 cfs 59,790 cf

Link AP: Analysis Point

Subcatchment DA1: DA1

Inflow=12.14 cfs 59,790 cf Primary=12.14 cfs 59,790 cf

Total Runoff Area = 203,612 sf Runoff Volume = 59,790 cf Average Runoff Depth = 3.52" 91.71% Pervious = 186,726 sf 8.29% Impervious = 16,886 sf

Summary for Subcatchment DA1: DA1

Runoff = 12.14 cfs @ 12.32 hrs, Volume= Routed to Link AP : Analysis Point 59,790 cf, Depth= 3.52"

A	rea (sf)	CN E	Description						
	7,684	98 F	Paved park	ing, HSG A	\				
	4,264	98 F	Paved parking, HSG C						
	4,055	98 F	Roofs, HSG A						
	883	98 F	Roofs, HSG	G C					
	623	76 (Gravel road	s, HSG A					
	61		Gravel road	s, HSG C					
	51,183				ge, Good, HSG A				
	56,941				ge, Good, HSG C				
	36,606		Voods, Go						
	41,312	70 V	Voods, Go	od, HSG C					
	03,612		Veighted A						
	86,726	-	01.71% Per						
	16,886	5	8.29% Impe	ervious Are	а				
Та	Longth	Clana	Valaaitu	Consoitu	Description				
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
(min)				(015)	Chaot Flow, Chaotflow				
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				
11.7	70	0.0405	0.11		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		0.00-10	0.11		Paved $Kv = 20.3$ fps				
1.5	61	0.0100	0.70		Shallow Concentrated Flow, shallow				
	0.	0.0100	011 0		Short Grass Pasture Kv= 7.0 fps				
2.0	127	0.0450	1.06		Shallow Concentrated Flow, shallow				
					Woodland Kv= 5.0 fps				
1.5	136	0.0441	1.47		Shallow Concentrated Flow, shallow				
					Short Grass Pasture Kv= 7.0 fps				
3.4	283	0.0750	1.37		Shallow Concentrated Flow, shallow				
					Woodland Kv= 5.0 fps				
22.5	764	Total							

Summary for Link AP: Analysis Point

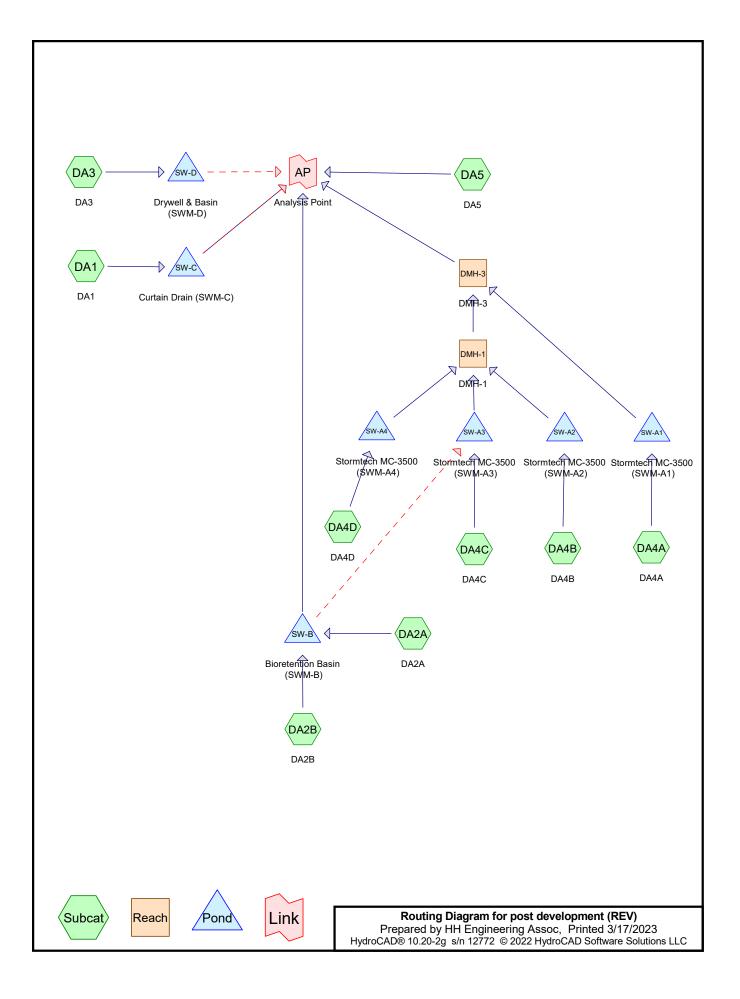
 Inflow Area =
 203,612 sf,
 8.29% Impervious,
 Inflow Depth =
 3.52" for
 100-Year event

 Inflow =
 12.14 cfs @
 12.32 hrs,
 Volume=
 59,790 cf

 Primary =
 12.14 cfs @
 12.32 hrs,
 Volume=
 59,790 cf,

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 (all nodes)

Area	CN	Description
(sq-ft)		(subcatchment-numbers)
47,455	39	>75% Grass cover, Good, HSG A (DA1, DA2B, DA3, DA4C, DA4D)
28,088	74	>75% Grass cover, Good, HSG C (DA1, DA2B, DA4A, DA4B, DA4C, DA4D,
		DA5)
18,033	98	Paved parking, HSG A (DA1, DA3, DA4C, DA4D)
30,105	98	Paved parking, HSG C (DA2B, DA4A, DA4B, DA4C, DA4D, DA5)
14,063	98	Roofs, HSG C (DA2A)
34,653	30	Woods, Good, HSG A (DA1, DA3, DA4C)
31,215	70	Woods, Good, HSG C (DA1, DA5)
203,612	65	TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(sq-ft)	Group	Numbers
100,141	HSG A	DA1, DA2B, DA3, DA4C, DA4D
0	HSG B	
103,471	HSG C	DA1, DA2A, DA2B, DA4A, DA4B, DA4C, DA4D, DA5
0	HSG D	
0	Other	
203,612		TOTAL AREA

Printed 3/17/2023 Page 5

Ground Covers (all nodes)										
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			
47,455	0	28,088	0	0	75,543	>75% Grass				
						cover, Good				
18,033	0	30,105	0	0	48,138	Paved parking				
0	0	14,063	0	0	14,063	Roofs				
34,653	0	31,215	0	0	65,868	Woods, Good				
100,141	0	103,471	0	0	203,612	TOTAL AREA				
	(sq-ft) 47,455 18,033 0 34,653	(sq-ft) (sq-ft) 47,455 0 18,033 0 0 0 34,653 0	HSG-A (sq-ft)HSG-B (sq-ft)HSG-C (sq-ft)47,455028,08818,033030,1050014,06334,653031,215	HSG-A (sq-ft) HSG-B (sq-ft) HSG-C (sq-ft) HSG-D (sq-ft) 47,455 0 28,088 0 18,033 0 30,105 0 0 0 14,063 0 34,653 0 31,215 0	(sq-ft) (sq-ft) (sq-ft) (sq-ft) 47,455 0 28,088 0 0 18,033 0 30,105 0 0 0 0 14,063 0 0 34,653 0 31,215 0 0	HSG-A (sq-ft) HSG-B (sq-ft) HSG-C (sq-ft) HSG-D (sq-ft) Other (sq-ft) Total (sq-ft) 47,455 0 28,088 0 0 75,543 18,033 0 30,105 0 0 48,138 0 0 14,063 0 0 14,063 34,653 0 31,215 0 0 65,868	HSG-A (sq-ft) HSG-B (sq-ft) HSG-C (sq-ft) HSG-D (sq-ft) Other (sq-ft) Total (sq-ft) Ground Cover 47,455 0 28,088 0 0 75,543 >75% Grass cover, Good 18,033 0 30,105 0 0 48,138 Paved parking 0 0 14,063 0 0 14,063 Roofs 34,653 0 31,215 0 0 65,868 Woods, Good			

Ground Covers (all nodes)

L	.ine#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
	1	SW-A1	85.00	84.95	6.0	0.0083	0.012	0.0	12.0	0.0
	2	SW-A2	86.65	84.85	93.0	0.0194	0.012	0.0	15.0	0.0
	3	SW-A3	86.65	84.85	93.0	0.0194	0.012	0.0	15.0	0.0
	4	SW-A4	88.80	86.90	98.0	0.0194	0.012	0.0	12.0	0.0
	5	SW-B	89.00	87.00	361.0	0.0055	0.010	0.0	15.0	0.0
	6	SW-C	87.20	85.45	108.0	0.0162	0.010	0.0	8.0	0.0

Pipe Listing (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=73,097 sf 11.74% Impervious Runoff Depth=0.00" Flow Length=337' Tc=17.4 min CN=43 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=5,750 sf 0.78% Impervious Runoff Depth=0.00" Tc=10.0 min CN=50 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 DA4A: DA4A	Runoff Area=9,253 sf 92.50% Impervious Runoff Depth=0.63" Tc=5.0 min CN=96 Runoff=0.16 cfs 486 cf
Subcatchment DA4B: DA4B	Runoff Area=7,277 sf 91.51% Impervious Runoff Depth=0.63" Tc=5.0 min CN=96 Runoff=0.13 cfs 382 cf
Subcatchment DA4C: DA4C	Runoff Area=16,289 sf 80.42% Impervious Runoff Depth=0.22" Tc=10.0 min CN=87 Runoff=0.07 cfs 304 cf
Subcatchment DA4D: DA4D	Runoff Area=11,846 sf 80.51% Impervious Runoff Depth=0.28" Tc=10.0 min CN=89 Runoff=0.07 cfs 281 cf
Subcatchment DA5: DA5	Runoff Area=53,575 sf 0.66% Impervious Runoff Depth=0.01" Flow Length=332' Tc=11.4 min CN=72 Runoff=0.00 cfs 54 cf
Reach DMH-1: DMH-1	Inflow=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
Reach DMH-3: DMH-3	Inflow=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
Pond SW-A1: Stormtech MC-3500 (SWM- Discarde	A1) Peak Elev=85.78' Storage=362 cf Inflow=0.16 cfs 486 cf ed=0.00 cfs 486 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 486 cf
Pond SW-A2: Stormtech MC-3500 (SWM- Discarde	A2) Peak Elev=87.41' Storage=270 cf Inflow=0.13 cfs 382 cf ed=0.00 cfs 382 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 382 cf
Pond SW-A3: Stormtech MC-3500 (SWM- Discarde	A3) Peak Elev=87.47' Storage=173 cf Inflow=0.07 cfs 304 cf ed=0.00 cfs 304 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 304 cf
Pond SW-A4: Stormtech MC-3500 (SWM- Discarde	A4) Peak Elev=88.34' Storage=173 cf Inflow=0.07 cfs 281 cf ed=0.00 cfs 281 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 281 cf
Pond SW-B: Bioretention Basin (SWM-B) Discarded=0.00 cfs 678 cf Primar	Peak Elev=91.62' Storage=756 cf Inflow=0.30 cfs 927 cf ry=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 678 cf

post development (REV)	Type III 24-hr WQV Rainfall=1.00"
Prepared by HH Engineering Assoc	Printed 3/17/2023
HydroCAD® 10.20-2g s/n 12772 © 2022 HydroCAD Softw	are Solutions LLC Page 8
Pond SW-C: Curtain Drain (SWM-C)	Peak Elev=87.40' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs	0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
Pond SW-D: Drywell & Basin (SWM-D) Discarded=0.00 cfs	Peak Elev=91.60' Storage=0 cf Inflow=0.00 cfs 0 cf 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
Link AP: Analysis Point	Inflow=0.00 cfs 54 cf

Primary=0.00 cfs 54 cf

Total Runoff Area = 203,612 sf Runoff Volume = 2,434 cf Average Runoff Depth = 0.14" 69.45% Pervious = 141,411 sf 30.55% Impervious = 62,201 sf

Summary for Subcatchment DA1: DA1

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

A	rea (sf)	CN D	escription						
	8,584		Paved parking, HSG A						
	35,028		>75% Grass cover, Good, HSG A						
	910	74 >	75% Gras	s cover, Go	ood, HSG C				
	27,956			od, HSG A					
	619	70 V	Voods, Go	od, HSG C					
	73,097	43 V	Veighted A	verage					
	64,513	8	8.26% Per	vious Area					
	8,584	1	1.74% Imp	pervious Ar	ea				
_									
Tc	Length	Slope	Velocity		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				
			o - o		Paved Kv= 20.3 fps				
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow				
4 7	00	0.0004	0.00		Short Grass Pasture Kv= 7.0 fps				
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow				
0.4	00	0.0400	4.00		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 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	G C	
14,063		100.00% In	npervious A	vrea
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						
	45	98	Paved park	ing, HSG C					
	4,009				ood, HSG A				
	1,696	74	>75% Gras	s cover, Go	ood, HSG C				
	5,750	50	Weighted A	verage					
	5,705		99.22% Pei	vious Area					
	45		0.78% Impe	ervious Area	а				
_				.					
Tc	•				Description				
<u>(min)</u>	(feet)	(ft/ft) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct				
(min)	,		0.78% Impe Velocity		a Description				

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						
	1,303	98	Paved park	ing, HSG A	N				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A				
	5,538	30	Woods, Go	od, HSG A	<u> </u>				
	12,462	41	Weighted A	verage					
	11,159		89.54% Pei	vious Area	l				
	1,303		10.46% Imp	pervious Are	ea				
т.	1			0					
Tc	Length	Slope		Capacity	Description				
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct Entry				

Summary for Subcatchment DA4A: DA4A

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 486 cf, Depth= 0.63" Routed to Pond SW-A1 : Stormtech MC-3500 (SWM-A1)

A	rea (sf)	CN	Description			
	8,559	98	Paved parking, HSG C			
	694	74	>75% Grass cover, Good, HSG C			
	9,253 694 8,559	96	Weighted Average 7.50% Pervious Area 92.50% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description	
5.0					Direct Entry, Direct Entry	

Summary for Subcatchment DA4B: DA4B

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 382 cf, Depth= 0.63" Routed to Pond SW-A2 : Stormtech MC-3500 (SWM-A2)

CN	Description				
98	Paved parking, HSG C				
74	>75% Grass cover, Good, HSG C				
96	Weighted Average				
	8.49% Pervious Area				
	91.51% Impervious Area				
	,	Capacity (cfs)	Description		
			Direct Entry, Direct Entry		
	98 74 96 n Slop	98 Paved park 74 >75% Gras 96 Weighted A 8.49% Perv 91.51% Imp	98 Paved parking, HSG C 74 >75% Grass cover, Go 96 Weighted Average 8.49% Pervious Area 91.51% Impervious Ar		

Summary for Subcatchment DA4C: DA4C

Runoff = 0.07 cfs @ 12.16 hrs, Volume= 304 cf, Depth= 0.22" Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

A	rea (sf)	CN	Description					
	6,556	98	Paved parking, HSG A					
	6,543	98	Paved parking, HSG C					
	1,382	39	>75% Grass cover, Good, HSG A					
	649	74	>75% Grass cover, Good, HSG C					
	1,159	30	Woods, Good, HSG A					
	16,289	87	37 Weighted Average					
	3,190		19.58% Pervious Area					
	13,099	80.42% Impervious Area						
Тс	Length	Slope		Capacity	Description			
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)				
10.0					Direct Entry, Direct Entry			

Summary for Subcatchment DA4D: DA4D

Runoff = 0.07 cfs @ 12.15 hrs, Volume= 281 cf, Depth= 0.28" Routed to Pond SW-A4 : Stormtech MC-3500 (SWM-A4)

Ar	ea (sf)	CN	Description				
	1,590	98	Paved parking, HSG A				
	7,947	98	Paved parking, HSG C				
	1,415	39	>75% Grass cover, Good, HSG A				
	894	74	>75% Grass cover, Good, HSG C				
	11,846	89	9 Weighted Average				
	2,309	9 19.49% Pervious Area					
	9,537		80.51% Impervious Area				
Тс	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 @ 15.60 hrs, Volume= Routed to Link AP : Analysis Point 54 cf, Depth= 0.01"

A	rea (sf)	CN D	escription		
	352	98 P	aved park	ing, HSG C	;
	22,627	74 >	75% Gras	s cover, Go	ood, HSG C
	30,596	70 V	Voods, Go	od, HSG C	
	53,575	72 V	Veighted A	verage	
	53,223	9	9.34% Per	vious Area	
	352	0	.66% Impe	rvious 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
					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
	~~~		0.40		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 Reach DMH-1: DMH-1

Inflow Area = 35,412 sf, 82.73% 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 Routed to Reach DMH-3 : DMH-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

# Summary for Reach DMH-3: DMH-3

Inflow Area = 44,665 sf, 84.75% 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 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

# Summary for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Inflow Area = Inflow = Outflow = Discarded = Primary = Routed to	0.16 c 0.00 c 0.00 c	fs @ 12.07 h fs @ 11.02 h fs @ 11.02 h fs @ 0.00 h	nrs, Volume= 486 cf, Atten= 98%, Lag= 0.0 min nrs, Volume= 486 cf
Routing by St	or-Ind metho	od, Time Span	n= 0.00-72.00 hrs, dt= 0.02 hrs
			rea= 1,108 sf Storage= 362 cf
			calculated for 486 cf (100% of inflow) ( 2,172.2 - 813.2 )
Volume	Invert A	vail.Storage	Storage Description
#1A	85.00'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A
#2A	85.75'	2,069 cf	6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids <b>ADS_StormTech MC-3500 d +Cap</b> x 18 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 18 Chambers in 3 Rows Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		3,680 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	12.0" Round Outlet Pipe
			L= 6.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 85.00' / 84.95' S= 0.0083 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	87.70'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	88.50'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.35'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 11.02 hrs HW=85.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 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-A1: Stormtech MC-3500 (SWM-A1) - 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 3 rows = 89.4 cf

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

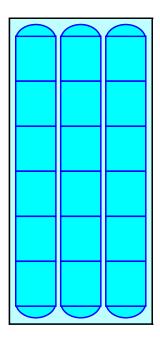
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
85.00	1,108	0	90.20	1,108	3,547
85.10	1,108	44	90.30	1,108	3,591
85.20	1,108	89	90.40	1,108	3,635
85.30	1,108	133	90.50	1,108	3,680
85.40	1,108	177			
85.50	1,108	222			
85.60	1,108	266			
85.70	1,108	310			
85.80	1,108	378			
85.90 86.00	1,108 1,108	470 561			
86.10	1,108	652			
86.20	1,108	743			
86.30	1,108	833			
86.40	1,108	922			
86.50	1,108	1,012			
86.60	1,108	1,101			
86.70	1,108	1,189			
86.80	1,108	1,277			
86.90	1,108	1,364			
87.00	1,108	1,451			
87.10	1,108	1,537			
87.20	1,108	1,623			
87.30 87.40	1,108 1,108	1,708 1,792			
87.50	1,108	1,875			
87.60	1,108	1,958			
87.70	1,108	2,039			
87.80	1,108	2,120			
87.90	1,108	2,200			
88.00	1,108	2,279			
88.10	1,108	2,356			
88.20	1,108	2,432			
88.30	1,108	2,507			
88.40	1,108	2,581			
88.50 88.60	1,108 1,108	2,653			
88.70	1,108	2,724 2,792			
88.80	1,108	2,859			
88.90	1,108	2,923			
89.00	1,108	2,984			
89.10	1,108	3,042			
89.20	1,108	3,094			
89.30	1,108	3,144			
89.40	1,108	3,191			
89.50	1,108	3,236			
89.60	1,108	3,281			
89.70 89.80	1,108 1,108	3,325 3,369			
89.90	1,108	3,309			
90.00	1,108	3,458			
90.10	1,108	3,502			
-	,	-,			

### Summary for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Outflow Discarded Primary	= 0.1 = 0.0 = 0.0 = 0.0	7,277 sf, 91.519 3 cfs @ 12.07 h 0 cfs @ 11.34 h 0 cfs @ 11.34 h 0 cfs @ 0.00 h MH-1 : DMH-1	nrs, Volume= 382 cf, Atten= 98%, Lag= 0.0 min nrs, Volume= 382 cf
			= 0.00-72.00 hrs, dt= 0.02 hrs rea= 1,108 sf Storage= 270 cf
			calculated for 382 cf (100% of inflow) ( 1,854.1 - 813.2 )
Volume	Invert	Avail.Storage	Storage Description
#1A	86.80'	1,611 cf	<b>22.75'W x 48.72'L x 5.50'H Field A</b> 6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids
#2A	87.55'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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 18 Chambers in 3 Rows Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		3,680 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	88.95'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	89.55'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.05'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	86.80'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 11.34 hrs HW=86.86' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.80' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 0.11 cfs potential flow) 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-A2: Stormtech MC-3500 (SWM-A2) - 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 3 rows = 89.4 cf

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

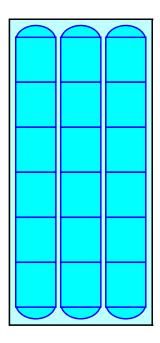
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
86.80	1,108	0	92.00	1,108	3,547
86.90	1,108	44	92.10	1,108	3,591
87.00	1,108	89	92.20	1,108	3,635
87.10	1,108	133	92.30	1,108	3,680
87.20	1,108	177			
87.30	1,108	222			
87.40	1,108	266			
87.50	1,108	310			
87.60 87.70	1,108 1,108	378 470			
87.80	1,108	561			
87.90	1,108	652			
88.00	1,108	743			
88.10	1,108	833			
88.20	1,108	922			
88.30	1,108	1,012			
88.40	1,108	1,101			
88.50	1,108	1,189			
88.60 88.70	1,108 1,108	1,277 1,364			
88.80	1,108	1,304			
88.90	1,108	1,537			
89.00	1,108	1,623			
89.10	1,108	1,708			
89.20	1,108	1,792			
89.30	1,108	1,875			
89.40	1,108	1,958			
89.50	1,108	2,039			
89.60 89.70	1,108	2,120			
89.80	1,108 1,108	2,200 2,279			
89.90	1,108	2,356			
90.00	1,108	2,432			
90.10	1,108	2,507			
90.20	1,108	2,581			
90.30	1,108	2,653			
90.40	1,108	2,724			
90.50	1,108	2,792			
90.60 90.70	1,108 1,108	2,859 2,923			
90.80	1,108	2,923			
90.90	1,108	3,042			
91.00	1,108	3,094			
91.10	1,108	3,144			
91.20	1,108	3,191			
91.30	1,108	3,236			
91.40	1,108	3,281			
91.50 91.60	1,108 1,108	3,325 3,369			
91.70	1,108	3,309 3,414			
91.80	1,108	3,458			
91.90	1,108	3,502			

# Summary for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Outflow Discarded Primary	$\begin{array}{rcl} = & 0.0 \\ = & 0.0 \\ = & 0.0 \\ = & 0.0 \end{array}$	16,289 sf, 80.429 )7 cfs @ 12.16 h )0 cfs @ 12.16 h )0 cfs @ 12.16 h )0 cfs @ 12.16 h )0 cfs @ 0.00 h MH-1 : DMH-1	nrs, Volume= 304 cf, Atten= 95%, Lag= 0.0 min nrs, Volume= 304 cf
Routing by	Stor-Ind me	ethod Time Span	n= 0.00-72.00 hrs, dt= 0.02 hrs
			rea= 1,598 sf Storage= 173 cf
	C		
			alculated for 304 cf (100% of inflow)
Center-of-N	vlass det. tir	me= 528.8 min ( ′	1,417.0 - 888.2 )
Volume	Invert	Avail.Storage	Storage Description
#1A	87.20'		22.75'W x 70.23'L x 5.50'H Field A
			8,788 cf Overall - 3,058 cf Embedded = 5,729 cf x 40.0% Voids
#2A	87.95'	3,058 cf	ADS_StormTech MC-3500 d +Cap x 27 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
			27 Chambers in 3 Rows
		- 050 <i>(</i>	Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		5,350 ct	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.55'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	90.60'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	87.20'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 12.16 hrs HW=87.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.20' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 1.31 cfs potential flow) 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-A3: Stormtech MC-3500 (SWM-A3) - 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 3 rows = 89.4 cf

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

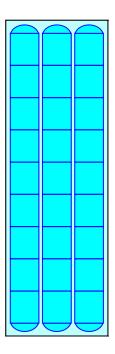
9 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 68.23' Row Length +12.0" End Stone x 2 = 70.23' Base Length
3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

27 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 3,058.1 cf Chamber Storage

8,787.5 cf Field - 3,058.1 cf Chambers = 5,729.4 cf Stone x 40.0% Voids = 2,291.8 cf Stone Storage

Chamber Storage + Stone Storage = 5,349.9 cf = 0.123 afOverall Storage Efficiency = 60.9%Overall System Size =  $70.23' \times 22.75' \times 5.50'$ 

27 Chambers 325.5 cy Field 212.2 cy Stone





# Stage-Area-Storage for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.20	1,598	0	92.40	1,598	5,158
87.30	1,598	64	92.50	1,598	5,222
87.40	1,598	128	92.60	1,598	5,286
87.50	1,598	192	92.70	1,598	<b>5,350</b>
87.60	1,598	256	52.10	1,000	0,000
87.70	1,598	320			
87.80	1,598	383			
		447			
87.90	1,598	546			
88.00 88.10	1,598				
	1,598	680 812			
88.20	1,598	813			
88.30	1,598	946			
88.40	1,598	1,078			
88.50	1,598	1,210			
88.60	1,598	1,341			
88.70	1,598	1,471			
88.80	1,598	1,601			
88.90	1,598	1,730			
89.00	1,598	1,858			
89.10	1,598	1,986			
89.20	1,598	2,113			
89.30	1,598	2,238			
89.40	1,598	2,363			
89.50	1,598	2,487			
89.60	1,598	2,610			
89.70	1,598	2,731			
89.80	1,598	2,852			
89.90	1,598	2,971			
90.00	1,598	3,089			
90.10	1,598	3,205			
90.20	1,598	3,320			
90.30	1,598	3,433			
90.40	1,598	3,544			
90.50	1,598	3,653			
90.60	1,598	3,760			
90.70	1,598	3,865			
90.80	1,598	3,968			
90.90	1,598	4,067			
91.00 91.10	1,598	4,164			
	1,598	4,257			
91.20 91.30	1,598 1,598	4,346 4,430			
91.40	1,598	4,430			
91.50	1,598	4,500			
91.60	1,598	4,645			
91.70	1,598	4,045			
91.80	1,598	4,775			
91.90	1,598	4,839			
92.00	1,598	4,903			
92.10	1,598	4,966			
92.20	1,598	5,030			
92.30	1,598	5,094			
02.00	.,000	0,001			

# Summary for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Outflow Discarded Primary	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	11,846 sf, 80.51 07 cfs @ 12.15 h 00 cfs @ 12.10 h 00 cfs @ 12.10 h 00 cfs @ 0.00 h 00 cfs @ 0.00 h	nrs, Volume= 281 cf, Atten= 96%, Lag= 0.0 min nrs, Volume= 281 cf
Routina by	Stor-Ind m	ethod. Time Spar	n= 0.00-72.00 hrs, dt= 0.02 hrs
		· · ·	rea= 1,271 sf Storage= 173 cf
U U		me= 646.3 min ca me= 646.6 min ( 1	alculated for 281 cf (100% of inflow) 1,520.2 - 873.6)
Volume	Invert	Avail.Storage	Storage Description
#1A	88.00'	1,838 cf	22.75'W x 55.89'L x 5.50'H Field A
			6,993 cf Overall - 2,398 cf Embedded = 4,595 cf x 40.0% Voids
#2A	88.75'	2,398 cf	
			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
			21 Chambers in 3 Rows
		4.000 5	Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		4,236 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	12.0" Round Outlet Pipe
			L= 98.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 88.80' / 86.90' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	90.35'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	91.20'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	92.25'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	88.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 12.10 hrs HW=88.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.00' (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-A4: Stormtech MC-3500 (SWM-A4) - 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 3 rows = 89.4 cf

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

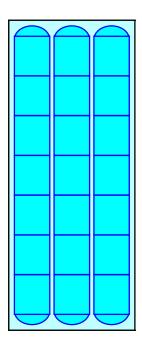
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

21 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,398.4 cf Chamber Storage

6,993.2 cf Field - 2,398.4 cf Chambers = 4,594.8 cf Stone x 40.0% Voids = 1,837.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,236.3 cf = 0.097 afOverall Storage Efficiency = 60.6%Overall System Size =  $55.89' \times 22.75' \times 5.50'$ 

21 Chambers 259.0 cy Field 170.2 cy Stone





# Stage-Area-Storage for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
88.00	1,271	0	93.20	1,271	4,084
88.10	1,271	51	93.30	1,271	4,135
88.20	1,271	102	93.40	1,271	4,185
88.30	1,271	153	93.50	1,271	<b>4,236</b>
88.40	1,271	203	93.30	1,271	4,230
88.50	1,271	203			
88.60	1,271	305			
88.70	1,271	356			
88.80	1,271	434			
88.90	1,271	540			
89.00	1,271	645			
89.10	1,271	750			
89.20	1,271	854			
89.30	1,271	958			
89.40	1,271	1,062			
89.50	1,271	1,165			
89.60	1,271	1,267			
89.70	1,271	1,369			
89.80	1,271	1,471			
89.90	1,271	1,571			
90.00	1,271	1,672			
90.10	1,271	1,771			
90.20	1,271	1,870			
90.30	1,271	1,967			
90.40	1,271	2,064			
90.50	1,271	2,161			
90.60	1,271	2,256			
90.70	1,271	2,350			
90.80	1,271	2,443			
90.90	1,271	2,535			
91.00	1,271	2,626			
91.10	1,271	2,715			
91.20	1,271	2,803			
91.30	1,271	2,889			
91.40	1,271	2,974			
91.50	1,271	3,057			
91.60	1,271	3,138			
91.70	1,271	3,217			
91.80	1,271	3,294			
91.90	1,271	3,368			
92.00	1,271	3,438			
92.10	1,271	3,504			
92.20	1,271	3,565			
92.30	1,271	3,621			
92.40	1,271	3,676			
92.50	1,271	3,728			
92.60	1,271	3,779			
92.70	1,271	3,829			
92.80	1,271	3,880			
92.90	1,271	3,931			
93.00	1,271	3,982			
93.10	1,271	4,033			

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

Inflow Area =	19,813 sf, 71.21% Impervious, Inflov	w Depth = 0.56" for WQV event
Inflow =	0.30 cfs @ 12.07 hrs, Volume=	927 cf
Outflow =	0.00 cfs @ 22.77 hrs, Volume=	678 cf, Atten= 99%, Lag= 642.1 min
Discarded =	0.00 cfs @ 22.77 hrs, Volume=	678 cf
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0 cf
Routed to Link	AP : Analysis Point	
Secondary =	0.00 cfs @ 0.00 hrs, Volume=	0 cf
Routed to Pond	d SW-A3 : Stormtech MC-3500 (SWM-A3	)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 91.62' @ 22.77 hrs Surf.Area= 1,358 sf Storage= 756 cf

Plug-Flow detention time= 1,675.6 min calculated for 678 cf (73% of inflow) Center-of-Mass det. time= 1,588.0 min (2,375.0 - 786.9)

Volume	Invert	Avail.Stor	rage Storage l	Description			
#1	91.00'	7,78	30 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)		
Elevatio	on Su	rf.Area	Inc.Store	Cum.Store			
(fee		(sq-ft)	(cubic-feet)	(cubic-feet)			
91.0		1,079	0				
92.0	-	1,528	1,304	1,304			
93.0	00	2,023	1,776	3,079			
94.0	00	2,663	2,343	5,422			
94.8	30	3,231	2,358	7,780			
Device	Routing	Invert	Outlet Devices	6			
#1	Primary	89.00'	15.0" Round	Outlet Pipe			
			L= 361.0' CMP, square edge headwall, Ke= 0.500				
					7.00' S= 0.0055 '/' Cc= 0.900		
				,	or, Flow Area= 1.23 sf		
#2	Device 1	92.75'		/ Flow Orifice			
				flow at low hea			
#3	Device 1	93.60'	<b>24.0" x 24.0" Horiz. Grate</b> C= 0.600				
ща		04.00	Limited to weir flow at low heads				
#4	Secondary	94.30'			d-Crested Rectangular Weir		
			2.50 3.00 3.5		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		
				2.97 3.07 3			
#5	Discarded	91.00'		filtration over S			
	2.00041404	51100					

**Discarded OutFlow** Max=0.00 cfs @ 22.77 hrs HW=91.62' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 6.41 cfs potential flow) 2=Low Flow Orifice (Controls 0.00 cfs) 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 4=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	1,079	0	93.60	2,407	4,408
91.05	1,101	55	93.65	2,439	4,529
91.10	1,124	110	93.70	2,400	
					4,652
91.15	1,146	167	93.75	2,503	4,776
91.20	1,169	225	93.80	2,535	4,902
91.25	1,191	284	93.85	2,567	5,030
91.30	1,214	344	93.90	2,599	5,159
91.35	1,236	405	93.95	2,631	5,290
91.40	1,259	468	94.00	2,663	5,422
91.45	1,281	531	94.05	2,698	5,556
91.50	1,304	596	94.10	2,734	5,692
91.55	1,326	661	94.15	2,770	5,829
91.60	1,348	728	94.20	2,805	5,969
91.65	1,371	796	94.25	2,841	6,110
91.70	1,393	865	94.30	2,876	6,253
91.75	1,416	936	94.35	2,911	6,398
91.80	1,438	1,007	94.40	2,947	6,544
91.85	1,461	1,079	94.45	2,983	6,692
91.90	1,483	1,153	94.50	3,018	6,842
91.95	1,506	1,228	94.55	3,053	6,994
92.00	1,528	1,304	94.60	3,089	7,148
92.05	1,553	1,381	94.65	3,125	7,303
92.10	1,577	1,459	94.70	3,160	7,460
92.15	1,602	1,538	94.75	3,196	7,619
92.20	1,627	1,619	94.80	3,231	7,780
92.25	1,652	1,701			
92.30	1,676	1,784			
92.35	1,701	1,869			
92.40	1,726	1,954			
92.45	1,751	2,041			
92.50	1,776	2,041			
92.55	1,800	2,129			
92.60					
	1,825	2,309			
92.65	1,850	2,401			
92.70	1,875	2,494			
92.75	1,899	2,589			
92.80	1,924	2,684			
92.85	1,949	2,781			
92.90	1,974	2,879			
92.95	1,998	2,978			
93.00	2,023	3,079			
93.05	2,055	3,181			
93.10	2,087	3,284			
93.15	2,119	3,390			
93.20	2,151	3,496			
93.25	2,183	3,605			
93.30	2,215	3,715			
93.35	2,247	3,826			
93.40	2,279	3,939			
93.45	2,311	4,054			
93.50	2,343	4,171			
93.55	2,343	4,171			
00.00	2,010	7,200			
		I			

### Summary for Pond SW-C: Curtain Drain (SWM-C)

Seconda	$ \begin{array}{rcl} = & 0.00 \\ = & 0.00 \\ ed = & 0.00 \\ = & 0.00 \\ ed to Link AP : A \end{array} $	cfs @ ( cfs @ ( cfs @ ( cfs @ ( cfs @ ( Analysis Pe cfs @ (	0.00 hrs, Volume= 0 cf					
	Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs							
Peak El	Peak Elev= 87.40' @ 0.00 hrs Surf.Area= 1,045 sf Storage= 0 cf							
Plug-Flo	ow detention time	e= (not cal	culated: initial storage exceeds outflow)					
			lculated: no inflow)					
Volume	Invert	Avail.Stor	rage Storage Description					
#1	87.40'		04 cf 2.50'W x 418.00'L x 9.10'H Prismatoid					
		-,	9,509 cf Overall x 40.0% Voids					
Device	Routing	Invort	Outlet Devices					
-								
#1	Primary	87.20'	<b>8.0" Round Outlet Pipe</b> L= 108.0' CMP, end-section conforming to fill, Ke= 0.500					
			Inlet / Outlet Invert= 87.20' / 85.45' S= 0.0162 '/' Cc= 0.900					
	n = 0.010 PVC, smooth interior, Flow Area= 0.35 sf							
#2	Primary	Primary 89.75' <b>4.0" Vert. Low flow orifice</b> C= 0.600						
#2	Limited to weir flow at low heads							
#2	r minary	09.75						
#2 #3	Device 1	90.75	Limited to weir flow at low heads					
			Limited to weir flow at low heads					
#3	Device 1	90.75'	Limited to weir flow at low heads 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28) 0.100 in/hr Exfiltration over Surface area 200.0' long x 0.5' breadth Broad-Crested Rectangular Weir					
#3 #4	Device 1 Discarded	90.75' 87.40'	Limited to weir flow at low heads <b>4.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.62 (C= 3.28) <b>0.100 in/hr Exfiltration over Surface area</b> <b>200.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00					
#3 #4	Device 1 Discarded	90.75' 87.40'	Limited to weir flow at low heads 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28) 0.100 in/hr Exfiltration over Surface area 200.0' long x 0.5' breadth Broad-Crested Rectangular Weir					

**Discarded OutFlow** Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) **4=Exfiltration** (Passes 0.00 cfs of 0.00 cfs potential flow)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) -1=Outlet Pipe (Passes 0.00 cfs of 0.13 cfs potential flow) -3=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

-2=Low flow orifice (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

# Stage-Area-Storage for Pond SW-C: Curtain Drain (SWM-C)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.40	1,045	0	92.60	1,045	2,174
87.50	1,045	42	92.70	1,045	2,215
87.60	1,045	84	92.80	1,045	2,257
87.70	1,045	125	92.90	1,045	2,299
87.80	1,045	167	93.00	1,045	2,341
87.90	1,045	209	93.10	1,045	2,383
88.00	1,045	251	93.20	1,045	2,424
88.10	1,045	293	93.30	1,045	2,466
88.20	1,045	334	93.40	1,045	2,508
88.30	1,045	376	93.50	1,045	2,550
88.40	1,045	418	93.60	1,045	2,592
88.50	1,045	460	93.70	1,045	2,633
88.60	1,045	502	93.80	1,045	2,675
88.70	1,045	543	93.90	1,045	2,717
88.80	1,045	585	94.00	1,045	2,759
88.90	1,045	627	94.10	1,045	2,801
89.00	1,045	669	94.20	1,045	2,842
89.10	1,045	711	94.30	1,045	2,884
89.20	1,045	752	94.40	1,045	2,926
89.30	1,045	794	94.50	1,045	2,968
89.40	1,045	836	94.60	1,045	3,010
89.50	1,045	878	94.70	1,045	3,051
89.60	1,045	920	94.80	1,045	3,093
89.70	1,045	961	94.90	1,045	3,135
89.80	1,045	1,003	95.00	1,045	3,177
89.90	1,045	1,045	95.10	1,045	3,219
90.00	1,045	1,087	95.20	1,045	3,260
90.10	1,045	1,129	95.30	1,045	3,302
90.20	1,045	1,170	95.40	1,045	3,344
90.30	1,045	1,212	95.50	1,045	3,386
90.40	1,045	1,254	95.60	1,045	3,428
90.50	1,045	1,296	95.70	1,045	3,469
90.60	1,045	1,338	95.80	1,045	3,511
90.70	1,045	1,379	95.90	1,045	3,553
90.80	1,045	1,421	96.00	1,045	3,595
90.90	1,045 1,045	1,463	96.10 96.20	1,045	3,637
91.00 91.10		1,505 1,547	96.30	1,045	3,678
91.10	1,045 1,045	1,547 1,588	96.40	1,045 1,045	3,720 3,762
91.30	1,045	1,630	96.50	1,045	3,702 3,804
91.40	1,045	1,672	90.50	1,045	3,004
91.50	1,045	1,714			
91.60	1,045	1,756			
91.70	1,045	1,797			
91.80	1,045	1,839			
91.90	1,045	1,881			
92.00	1,045	1,923			
92.10	1,045	1,965			
92.10	1,045	2,006			
92.30	1,045	2,000			
92.40	1,045	2,040			
92.50	1,045	2,030			
02.00	1,040	2,102			

# 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= 91.60' @ 0.00 hrs Surf.Area= 31 sf Storage= 0 cf

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

Volume	Invert	Avail.Sto	rage	Storage	Description	
#1	91.60'	1,59	95 cf	Drywell	& Basin (Prism	atic) Listed below (Recalc)
_				<b>.</b>	<b>a a</b> <i>i</i>	
Elevatio		ırf.Area		.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic	c-feet)	(cubic-feet)	
91.6	50	31		0	0	
92.6	50	44		38	38	
93.6	50	44		44	82	
94.6	50	44		44	126	
95.6	50	44		44	170	
96.6	50	44		44	214	
97.4	19	4		21	235	
97.5	50	29		0	235	
98.0	00	145		44	279	
99.0	00	560		353	631	
100.0	00	1,135		848	1,479	
100.1	10	1,187		116	1,595	
Device	Routing	Invert	Outle	et Device	S	
#1	Discarded	91.60'	5.000	0 in/hr E	xfiltration over S	Surface area
#2	Secondary	99.10'	10.0'	long x	5.0' breadth Bro	ad-Crested Rectangular Weir
	-		Head	d (feet) (	0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50			
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
			2.65	2.67 2.	66 2.68 2.70 2	.74 2.79 2.88

**Discarded OutFlow** Max=0.00 cfs @ 0.00 hrs HW=91.60' (Free Discharge) **1=Exfiltration** (Passes 0.00 cfs of 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.60' (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 (cubic-feet)	Elevation	Surface	Storage
(feet) 91.60	<u>(sq-ft)</u> 31	(cubic-leet) 0	(feet) 96.80	<u>(sq-ft)</u> 35	(cubic-feet) 221
91.00	31	3	96.90	30	225
91.80	34	6	97.00	26	223
91.90	35	10	97.10	20	230
92.00	36	13	97.20	17	232
92.10	38	17	97.30	13	233
92.20	39	21	97.40	8	234
92.30	40	25	97.50	29	235
92.40	41	29	97.60	52	239
92.50	43	33	97.70	75	245
92.60	44	38	97.80	99	254
92.70	44	42	97.90	122	265
92.80	44	46	98.00	145	279
92.90	44	51	98.10	186	295
93.00	44	55	98.20	228	316
93.10	44	60	98.30	269	341
93.20 93.30	44 44	64 68	98.40 98.50	311 353	370 403
93.30 93.40	44	73	98.60	394	403
93.50	44	73	98.70	435	482
93.60	44	82	98.80	477	527
93.70	44	86	98.90	518	577
93.80	44	90	99.00	560	631
93.90	44	95	99.10	617	690
94.00	44	99	99.20	675	755
94.10	44	104	99.30	732	825
94.20	44	108	99.40	790	901
94.30	44	112	99.50	848	983
94.40	44	117	99.60	905	1,071
94.50	44	121	99.70	962	1,164
94.60	44	126	99.80	1,020	1,263
94.70	44	130	99.90	1,077	1,368
94.80	44 44	134	100.00	1,135	1,479
94.90 95.00	44 44	139 143	100.10	1,187	1,595
95.10	44	143			
95.20	44	152			
95.30	44	156			
95.40	44	161			
95.50	44	165			
95.60	44	170			
95.70	44	174			
95.80	44	178			
95.90	44	183			
96.00	44	187			
96.10	44	192			
96.20	44	196			
96.30	44 44	200			
96.40 96.50	44 44	205 209			
96.60	44	209 214			
96.70	44	214			
00.10		2.5			

# Summary for Link AP: Analysis Point

Inflow Are	a =	191,150 sf, 31.86% Impervic	ous, Inflow Depth = 0.00"	for WQV event
Inflow	=	0.00 cfs @ 15.60 hrs, Volum	ie= 54 cf	
Primary	=	0.00 cfs @ 15.60 hrs, Volum	e= 54 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=73,097 sf 11.74% Impervious Runoff Depth=0.03" Flow Length=337' Tc=17.4 min CN=43 Runoff=0.01 cfs 196 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=5,750 sf 0.78% Impervious Runoff Depth=0.15" Tc=10.0 min CN=50 Runoff=0.00 cfs 74 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 DA4A: DA4A	Runoff Area=9,253 sf 92.50% Impervious Runoff Depth=2.87" Tc=5.0 min CN=96 Runoff=0.68 cfs 2,211 cf
Subcatchment DA4B: DA4B	Runoff Area=7,277 sf 91.51% Impervious Runoff Depth=2.87" Tc=5.0 min CN=96 Runoff=0.54 cfs 1,739 cf
Subcatchment DA4C: DA4C	Runoff Area=16,289 sf 80.42% Impervious Runoff Depth=2.02" Tc=10.0 min CN=87 Runoff=0.77 cfs 2,744 cf
Subcatchment DA4D: DA4D	Runoff Area=11,846 sf 80.51% Impervious Runoff Depth=2.19" Tc=10.0 min CN=89 Runoff=0.61 cfs 2,163 cf
Subcatchment DA5: DA5	Runoff Area=53,575 sf 0.66% Impervious Runoff Depth=1.00" Flow Length=332' Tc=11.4 min CN=72 Runoff=1.12 cfs 4,487 cf
Reach DMH-1: DMH-1	Inflow=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
Reach DMH-3: DMH-3	Inflow=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf
	<b>A1)</b> Peak Elev=87.69' Storage=2,034 cf Inflow=0.68 cfs 2,211 cf ed=0.00 cfs 619 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 619 cf
	<b>A2)</b> Peak Elev=88.93' Storage=1,565 cf Inflow=0.54 cfs 1,739 cf ed=0.00 cfs 616 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 616 cf
	<b>A3)</b> Peak Elev=89.54' Storage=2,539 cf Inflow=0.77 cfs 2,744 cf ed=0.00 cfs 841 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 841 cf
	<b>A4)</b> Peak Elev=90.33' Storage=1,994 cf Inflow=0.61 cfs 2,163 cf ed=0.00 cfs 675 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 675 cf
Pond SW-B: Bioretention Basin (SWM-B) Discarded=0.00 cfs 1,005 cf Primary=0	Peak Elev=92.87' Storage=2,810 cf Inflow=1.08 cfs 3,692 cf .04 cfs 762 cf Secondary=0.00 cfs 0 cf Outflow=0.04 cfs 1,767 cf

post development (REV)	Type III 24-hr	2-Year Rainfall=3.32"
Prepared by HH Engineering Assoc		Printed 3/17/2023
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Pond SW-C: Curtain Drain (SWM-C) Peak Elev=87.68' Storage=119 cf Inflow=0.01 cfs 196 cf Discarded=0.00 cfs 196 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 196 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=91.61' Storage=0 cf Inflow=0.00 cfs 14 cf Discarded=0.00 cfs 14 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 14 cf

Link AP: Analysis Point

Inflow=1.12 cfs 5,248 cf Primary=1.12 cfs 5,248 cf

Total Runoff Area = 203,612 sf Runoff Volume = 17,245 cf Average Runoff Depth = 1.02" 69.45% Pervious = 141,411 sf 30.55% Impervious = 62,201 sf

# Summary for Subcatchment DA1: DA1

Runoff = 0.01 cfs @ 16.88 hrs, Volume= Routed to Pond SW-C : Curtain Drain (SWM-C) 196 cf, Depth= 0.03"

A	rea (sf)	CN D	escription					
	8,584		98 Paved parking, HSG A					
	35,028			,	ood, HSG A			
	910	74 >	75% Gras	s cover, Go	ood, HSG C			
	27,956			od, HSG A				
	619	70 V	Voods, Go	od, HSG C				
	73,097	43 V	Veighted A	verage				
	64,513	8	8.26% Per	vious Area				
	8,584	1	1.74% 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			
					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 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	98 Roofs, HSG C					
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 @ 12.50 hrs, Volume= 74 cf, Depth= 0.15" Routed to Pond SW-B : Bioretention Basin (SWM-B)

A	rea (sf)	CN	Description						
	45	98	Paved park	ing, HSG C	<b>,</b>				
	4,009	39	>75% Ġras	s cover, Go	ood, HSG A				
	1,696	74	>75% Gras	s cover, Go	ood, HSG C				
	5,750	50	Weighted A	verage					
	5,705		99.22% Pervious Area						
	45		0.78% Impervious Area						
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description				
10.0					Direct Entry, Direct				

# **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						
	1,303	98	Paved park	ing, HSG A	N				
	5,621	39	>75% Gras	s cover, Go	bod, HSG A				
	5,538	30	Woods, Go	od, HSG A					
	12,462	41	Weighted Average						
	11,159		89.54% Pe	rvious Area	l de la constante de				
	1,303		10.46% Impervious Area						
_		~		<b>•</b> •	<b>—</b> • • •				
Tc	Length	Slope	,	Capacity	Description				
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct Entry				

# Summary for Subcatchment DA4A: DA4A

Runoff = 0.68 cfs @ 12.07 hrs, Volume= 2,211 cf, Depth= 2.87" Routed to Pond SW-A1 : Stormtech MC-3500 (SWM-A1)

A	rea (sf)	CN	Description					
	8,559	98	Paved park	ing, HSG C				
	694	74	>75% Gras	s cover, Go	bod, HSG C			
	9,253 694 8,559	96	Weighted Average 7.50% Pervious Area 92.50% Impervious Area					
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description			
5.0					Direct Entry, Direct Entry			

# Summary for Subcatchment DA4B: DA4B

Runoff = 0.54 cfs @ 12.07 hrs, Volume= 1,739 cf, Depth= 2.87" Routed to Pond SW-A2 : Stormtech MC-3500 (SWM-A2)

A	rea (sf)	CN	Description					
	6,659	98	Paved park	ing, HSG C	)			
	618	74	>75% Gras	s cover, Go	bod, HSG C			
	7,277	96	Weighted Average					
	618		8.49% Pervious Area					
	6,659		91.51% Impervious Area					
Tc (min)	Length (feet)	Slop (ft/ft		Capacity (cfs)	Description			
5.0					Direct Entry, Direct Entry			

# Summary for Subcatchment DA4C: DA4C

Runoff = 0.77 cfs @ 12.14 hrs, Volume= 2,744 cf, Depth= 2.02" Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

A	rea (sf)	CN	Description						
	6,556	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				
	6,543	98	Paved park	ing, HSG C					
	1,382	39	>75% Gras	s cover, Go	bod, HSG A				
	649	74	>75% Gras	s cover, Go	bod, HSG C				
	1,159	30	Woods, Go	od, HSG A					
	16,289	87	Weighted Average						
	3,190		19.58% Pervious Area						
	13,099		80.42% Impervious Area						
Тс	Length	Slope		Capacity	Description				
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct Entry				

# Summary for Subcatchment DA4D: DA4D

Runoff = 0.61 cfs @ 12.14 hrs, Volume= 2,163 cf, Depth= 2.19" Routed to Pond SW-A4 : Stormtech MC-3500 (SWM-A4)

Ar	ea (sf)	CN	Description						
	1,590	98	Paved park	ing, HSG A	N				
	7,947	98	Paved park	ing, HSG C					
	1,415	39	>75% Gras	s cover, Go	bod, HSG A				
	894	74	>75% Gras	s cover, Go	bod, HSG C				
	11,846	89	Weighted Average						
	2,309		19.49% Pervious Area						
	9,537		80.51% Impervious Area						
Тс	Length	Slope	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft		(cfs)					
10.0					Direct Entry, Direct Entry				

# **Summary for Subcatchment DA5: DA5**

Runoff = 1.12 cfs @ 12.17 hrs, Volume= Routed to Link AP : Analysis Point 4,487 cf, Depth= 1.00"

A	rea (sf)	CN D	escription		
	352	98 P	aved park	ing, HSG C	:
	22,627	74 >	75% Grass	s cover, Go	ood, HSG C
	30,596	70 V	Voods, Go	od, HSG C	
	53,575	72 V	Veighted A	verage	
	53,223	9	9.34% Per	vious Area	
	352	0	.66% Impe	ervious Area	а
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
	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	00	0.0050	0.40		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 Reach DMH-1: DMH-1

Inflow Area = 35,412 sf, 82.73% Impervious, Inflow Depth = 0.00" for 2-Year 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 Routed to Reach DMH-3 : DMH-3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

# Summary for Reach DMH-3: DMH-3

Inflow Area = 44,665 sf, 84.75% Impervious, Inflow Depth = 0.00" for 2-Year 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 Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

### Summary for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

· · · · · · · · · · · · · · · · · · ·	= 0.6 = 0.0 = 0.0 = 0.0	68 cfs @ 12.07 h	nrs, Volume= 619 cf, Atten= 100%, Lag= 0.0 min nrs, Volume= 619 cf
Routina by	Stor-Ind me	ethod. Time Spar	n= 0.00-72.00 hrs, dt= 0.02 hrs
			rea= 1,108 sf Storage= 2,034 cf
Plug-Flow (	letention tir	me= 1 705 8 min	calculated for 619 cf (28% of inflow)
			( 2,308.4 - 772.1 )
Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A
	o		6,096  cf Overall - 2,069  cf Embedded = 4,028  cf  x 40.0%  Voids
#2A	85.75'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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 18 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = $89.4$ cf
		2.690 of	
		3,680 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	12.0" Round Outlet Pipe
			L= 6.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 85.00' / 84.95' S= 0.0083 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	87.70'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	88.50'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.35'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 6.28 hrs HW=85.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 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-A1: Stormtech MC-3500 (SWM-A1) - 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 3 rows = 89.4 cf

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

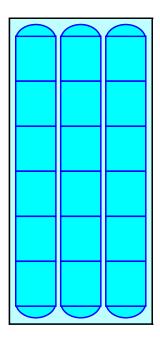
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
85.00	1,108	0	90.20	1,108	3,547
85.10	1,108	44	90.30	1,108	3,591
85.20	1,108	89	90.40	1,108	3,635
85.30	1,108	133	90.50	1,108	3,680
85.40	1,108	177			
85.50	1,108	222			
85.60	1,108	266			
85.70	1,108	310			
85.80 85.90	1,108 1,108	378 470			
86.00	1,108	561			
86.10	1,108	652			
86.20	1,108	743			
86.30	1,108	833			
86.40	1,108	922			
86.50	1,108	1,012			
86.60	1,108	1,101			
86.70	1,108	1,189			
86.80	1,108	1,277			
86.90	1,108	1,364			
87.00	1,108	1,451			
87.10 87.20	1,108 1,108	1,537 1,623			
87.30	1,108	1,708			
87.40	1,108	1,792			
87.50	1,108	1,875			
87.60	1,108	1,958			
87.70	1,108	2,039			
87.80	1,108	2,120			
87.90	1,108	2,200			
88.00	1,108	2,279			
88.10	1,108	2,356			
88.20 88.30	1,108 1,108	2,432			
88.40	1,108	2,507 2,581			
88.50	1,108	2,653			
88.60	1,108	2,724			
88.70	1,108	2,792			
88.80	1,108	2,859			
88.90	1,108	2,923			
89.00	1,108	2,984			
89.10	1,108	3,042			
89.20	1,108	3,094			
89.30 89.40	1,108 1,108	3,144 3,191			
89.50	1,108	3,191			
89.60	1,108	3,281			
89.70	1,108	3,325			
89.80	1,108	3,369			
89.90	1,108	3,414			
90.00	1,108	3,458			
90.10	1,108	3,502			
			I		

#### Summary for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Outflow Discarded Primary	= 0.5 = 0.0 = 0.0 = 0.0	7,277 sf, 91.519 i4 cfs @ 12.07 h i0 cfs @ 6.78 h i0 cfs @ 6.78 h i0 cfs @ 0.00 h MH-1 : DMH-1	nrs, Volume= 616 cf, Atten= 100%, Lag= 0.0 min nrs, Volume= 616 cf				
			n= 0.00-72.00 hrs, dt= 0.02 hrs rea= 1,108 sf Storage= 1,565 cf				
	Plug-Flow detention time= 1,692.1 min calculated for 616 cf (35% of inflow) Center-of-Mass det. time= 1,546.3 min ( 2,318.4 - 772.1 )						
Volume	Invert	Avail.Storage	Storage Description				
#1A	86.80'	1,611 cf	<b>22.75'W x 48.72'L x 5.50'H Field A</b> 6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids				
#2A	87.55'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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 18 Chambers in 3 Rows Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf				
		3,680 cf	Total Available Storage				

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	88.95'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	89.55'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.05'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 6.78 hrs HW=86.86' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.80' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 0.11 cfs potential flow) 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-A2: Stormtech MC-3500 (SWM-A2) - 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 3 rows = 89.4 cf

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

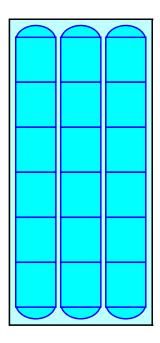
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





### Stage-Area-Storage for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Flowetien	Curfees	Ctowners		Curfees	Chanadra
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
86.80	1,108	0	92.00	1,108	3,547
86.90	1,108	44	92.10	1,108	3,591
87.00	1,108	89	92.20	1,108	3,635
87.10	1,108	133	92.30	1,108	3,680
87.20	1,108	177		,	-,
87.30	1,108	222			
87.40	1,108	266			
87.50	1,108	310			
87.60	1,108	378			
87.70	1,108	470			
87.80	1,108	561			
87.90	1,108	652			
88.00 88.10	1,108 1,108	743 833			
88.20	1,108	922			
88.30	1,108	1,012			
88.40	1,108	1,101			
88.50	1,108	1,189			
88.60	1,108	1,277			
88.70	1,108	1,364			
88.80	1,108	1,451			
88.90	1,108	1,537			
89.00	1,108	1,623			
89.10	1,108	1,708			
89.20	1,108	1,792			
89.30 89.40	1,108 1,108	1,875 1,958			
89.50	1,108	2,039			
89.60	1,108	2,000			
89.70	1,108	2,200			
89.80	1,108	2,279			
89.90	1,108	2,356			
90.00	1,108	2,432			
90.10	1,108	2,507			
90.20	1,108	2,581			
90.30	1,108	2,653			
90.40 90.50	1,108 1,108	2,724 2,792			
90.60	1,108	2,859			
90.70	1,108	2,000			
90.80	1,108	2,984			
90.90	1,108	3,042			
91.00	1,108	3,094			
91.10	1,108	3,144			
91.20	1,108	3,191			
91.30	1,108	3,236			
91.40	1,108	3,281			
91.50 91.60	1,108 1,108	3,325 3,369			
91.70	1,108	3,414			
91.80	1,108	3,458			
91.90	1,108	3,502			
	,	-,			

### Summary for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Primary	$\begin{array}{rcl} = & 0.7 \\ = & 0.0 \\ = & 0.0 \\ = & 0.0 \end{array}$	77 cfs @ 12.14 h 00 cfs @ 9.58 h	nrs, Volume= 841 cf, Atten= 100%, Lag= 0.0 min nrs, Volume= 841 cf				
Routing by	Stor-Ind m	ethod. Time Span	n= 0.00-72.00 hrs, dt= 0.02 hrs				
		· · ·	rea= 1,598 sf Storage= 2,539 cf				
	Plug-Flow detention time= 1,736.0 min calculated for 841 cf (31% of inflow) Center-of-Mass det. time= 1,604.2 min ( 2,425.2 - 821.0 )						
Volume	Invert	Avail.Storage	Storage Description				
#1A	87.20'	2,292 cf	22.75'W x 70.23'L x 5.50'H Field A				
			8,788 cf Overall - 3,058 cf Embedded = 5,729 cf x 40.0% Voids				
#2A	87.95'	3,058 cf	ADS_StormTech MC-3500 d +Cap x 27 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 27 Chambers in 3 Rows				
			Cap Storage= 14.9 cf x 2 x 3 rows = $89.4$ cf				
		5 350 cf	Total Available Storage				
		0,000 01					

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.55'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	90.60'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	87.20'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 9.58 hrs HW=87.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.20' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 1.31 cfs potential flow) 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-A3: Stormtech MC-3500 (SWM-A3) - 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 3 rows = 89.4 cf

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

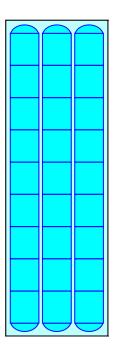
9 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 68.23' Row Length +12.0" End Stone x 2 = 70.23' Base Length
3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

27 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 3,058.1 cf Chamber Storage

8,787.5 cf Field - 3,058.1 cf Chambers = 5,729.4 cf Stone x 40.0% Voids = 2,291.8 cf Stone Storage

Chamber Storage + Stone Storage = 5,349.9 cf = 0.123 afOverall Storage Efficiency = 60.9%Overall System Size =  $70.23' \times 22.75' \times 5.50'$ 

27 Chambers 325.5 cy Field 212.2 cy Stone





# Stage-Area-Storage for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.20	1,598		92.40	1,598	5,158
87.30	1,598	64	92.50	1,598	5,222
87.40	1,598	128	92.60	1,598	5,286
87.50	1,598	192	92.70	1,598	<b>5,350</b>
87.60	1,598	256	92.10	1,590	5,550
87.70	1,598	320			
87.80	1,598	383			
87.90	1,598	447			
88.00	1,598	546			
88.10	1,598	680			
88.20	1,598	813			
88.30	1,598	946			
88.40	1,598	1,078			
88.50	1,598	1,210			
88.60	1,598	1,341			
88.70	1,598	1,471			
88.80	1,598	1,601			
88.90	1,598	1,730			
89.00	1,598	1,858			
89.10	1,598	1,986			
89.20	1,598	2,113			
89.30	1,598	2,238			
89.40	1,598	2,363			
89.50	1,598	2,487			
89.60	1,598	2,610			
89.70	1,598	2,731			
89.80	1,598	2,852			
89.90	1,598	2,971			
90.00	1,598	3,089			
90.10	1,598	3,205			
90.20	1,598	3,320			
90.30	1,598	3,433			
90.40	1,598	3,544			
90.50	1,598	3,653			
90.60	1,598	3,760			
90.70	1,598	3,865			
90.80	1,598	3,968			
90.90	1,598	4,067			
91.00	1,598	4,164			
91.10	1,598	4,257			
91.20	1,598	4,346			
91.30	1,598	4,430			
91.40	1,598	4,506			
91.50	1,598	4,577			
91.60	1,598	4,645			
91.70	1,598	4,711			
91.80	1,598	4,775			
91.90	1,598	4,839			
92.00	1,598	4,903			
92.10	1,598	4,966			
92.20	1,598	5,030			
92.30	1,598	5,094			

### Summary for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Primary =	0.61 cfs @ 12.14	hrs, Volume=         675 cf, Atten= 100%, Lag= 0.0 min           hrs, Volume=         675 cf
Routing by Stor-In	d method. Time Sna	n= 0.00-72.00 hrs, dt= 0.02 hrs
		Area= 1,271 sf Storage= 1,994 cf
	0	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		calculated for 675 cf (31% of inflow)
Center-of-Mass de	et. time= 1,595.4 min	( 2,408.8 - 813.3 )
		Otana na Dagarintian
Volume Inve	ert Avall.Storage	Storage Description
#1A 88.0	00' 1,838 cf	22.75'W x 55.89'L x 5.50'H Field A
		6,993 cf Overall - 2,398 cf Embedded = 4,595 cf x 40.0% Voids
#2A 88.7	'5' 2,398 cf	ADS StormTech MC-3500 d +Cap x 21 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
		21 Chambers in 3 Rows
		Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
	1 000 5	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	12.0" Round Outlet Pipe
			L= 98.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 88.80' / 86.90' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	90.35'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	91.20'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	92.25'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 9.14 hrs HW=88.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.00' (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-A4: Stormtech MC-3500 (SWM-A4) - 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 3 rows = 89.4 cf

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

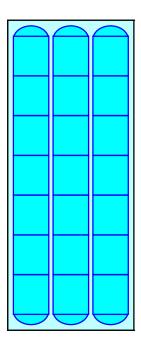
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

21 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,398.4 cf Chamber Storage

6,993.2 cf Field - 2,398.4 cf Chambers = 4,594.8 cf Stone x 40.0% Voids = 1,837.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,236.3 cf = 0.097 afOverall Storage Efficiency = 60.6%Overall System Size =  $55.89' \times 22.75' \times 5.50'$ 

21 Chambers 259.0 cy Field 170.2 cy Stone





# Stage-Area-Storage for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

ElevationSurfaceStorage(feet)(sq-ft)(cubic-feet)(get)(sq-ft)(cubic-feet)88:001.2715193:301.2714.08488:101.27110293:401.2714.18588:301.27120393:501.2714.18588:501.27125493:501.2714.23688:601.27130588:701.2714.23688:901.27145093:501.2714.23689:001.2711.6598:601.2711.6589:001.2711.6598:601.2711.67290:001.2711.67290:001.2711.67290:001.2711.67290:001.2712.53591:001.2712.53591:001.2712.53591:001.2712.62690:701.2712.63591:001.2712.63591:001.2712.63591:001.2712.63591:001.2713.06791:001.2713.6611.2713.66191:001.2713.66192:103.77191:001.2713.66192:001.2713.62192:001.2713.62192:001.2713.62192:001.2713.62192:001.2713.62192:001.2713.62192:001.271 </th <th></th> <th><b>.</b></th> <th><b>O</b>/</th> <th></th> <th><b>.</b></th> <th><i></i></th>		<b>.</b>	<b>O</b> /		<b>.</b>	<i></i>
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$						
88.10       1.271       51       93.30       1.271       4,135         88.20       1.271       102       93.40       1.271       4,135         88.30       1.271       203       93.50       1.271       4,236         88.40       1.271       203       93.50       1.271       4,236         88.60       1.271       305       93.50       1.271       4,236         88.60       1.271       305       93.50       1.271       4,236         88.00       1.271       305       93.50       1.271       4,236         89.00       1.271       645       99.10       1.271       750         99.20       1.271       1.062       93.80       1.271       1.65         99.60       1.271       1.667       93.80       1.271       1.67         99.01       1.271       1.671       90.10       1.271       1.67         90.10       1.271       1.67       90.10       1.271       1.67         90.10       1.271       1.67       90.10       1.271       2.66         90.71       1.271       2.66       91.00       1.271       2.66         90.10						
88.20       1.271       102       93.40       1.271       4.185         88.30       1.271       153       93.50       1.271       4,236         88.40       1.271       203       93.50       1.271       4,236         88.50       1.271       254       93.50       1.271       4,236         88.60       1.271       305       93.50       1.271       4,236         88.70       1.271       356       93.50       1.271       4,236         89.00       1.271       540       93.50       1.271       4,236         89.01       1.271       750       93.50       1.271       1.65         89.01       1.271       1.062       93.50       1.271       1.66         89.70       1.271       1.662       93.50       1.271       1.67         90.00       1.271       1.671       90.50       1.271       1.671         90.00       1.271       1.671       90.50       1.271       1.671         90.60       1.271       2.766       90.70       1.271       2.626         91.00       1.271       2.626       91.10       1.271       2.626       91.10       1.						
88.30       1.271       153       93.50       1.271       4,236         88.40       1.271       203       93.50       1.271       4,236         88.60       1.271       305       93.50       1.271       4,236         88.60       1.271       305       93.50       1.271       4,34         88.90       1.271       645       93.00       1.271       958         89.10       1.271       958       93.50       1.271       1.66         89.30       1.271       1.66       93.50       1.271       1.66         89.60       1.271       1.672       90.00       1.271       1.672         90.00       1.271       1.672       90.10       1.271       1.672         90.10       1.271       1.672       90.10       1.271       2.661         90.50       1.271       2.661       90.60       1.271       2.661         90.71       1.271       2.666       91.10       1.271       2.666         91.10       1.271       2.666       91.10       1.271       2.666         91.60       1.271       2.666       91.10       1.271       3.665         92.					1,271	
88.40       1.271       203         88.50       1.271       305         88.70       1.271       356         88.80       1.271       434         88.90       1.271       540         89.00       1.271       645         89.10       1.271       750         89.20       1.271       1.062         89.30       1.271       1.062         89.50       1.271       1.062         89.50       1.271       1.267         89.70       1.271       1.859         89.80       1.271       1.672         90.10       1.271       1.751         90.00       1.271       1.672         90.10       1.271       1.771         90.20       1.271       1.871         90.00       1.271       1.771         90.20       1.271       1.871         90.40       1.271       2.664         90.50       1.271       2.666         91.00       1.271       2.626         91.00       1.271       2.626         91.00       1.271       2.626         91.00       1.271       3.637 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
88.50       1.271       254         88.60       1.271       305         88.70       1.271       356         88.80       1.271       434         88.90       1.271       645         89.10       1.271       750         89.20       1.271       958         89.30       1.271       1.062         89.50       1.271       1.062         89.50       1.271       1.665         89.60       1.271       1.665         89.60       1.271       1.671         90.00       1.271       1.672         90.10       1.271       1.672         90.10       1.271       1.771         90.20       1.271       1.771         90.20       1.271       2.661         90.50       1.271       2.664         90.50       1.271       2.656         90.70       1.271       2.664         90.50       1.271       2.656         91.00       1.271       2.626         91.10       1.271       2.626         91.10       1.271       3.657         91.60       1.271       3.648 <td></td> <td></td> <td></td> <td>93.50</td> <td>1,271</td> <td>4,230</td>				93.50	1,271	4,230
88.60       1.271       305         88.70       1.271       356         88.80       1.271       540         89.00       1.271       645         89.10       1.271       750         89.20       1.271       958         89.40       1.271       1.062         89.50       1.271       1.65         88.60       1.271       1.665         89.60       1.271       1.67         89.70       1.271       1.67         89.70       1.271       1.67         90.00       1.271       1.67         90.00       1.271       1.67         90.00       1.271       1.67         90.20       1.271       1.67         90.30       1.271       2.64         90.50       1.271       2.64         90.50       1.271       2.64         90.50       1.271       2.626         90.70       1.271       2.626         91.00       1.271       2.633         91.80       1.271       2.626         91.10       1.271       2.626         91.10       1.271       2.603 <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td></tr<>						
88.70 $1.271$ $356$ $88.80$ $1.271$ $540$ $89.00$ $1.271$ $645$ $89.10$ $1.271$ $750$ $89.20$ $1.271$ $854$ $89.30$ $1.271$ $1.662$ $89.50$ $1.271$ $1.662$ $89.50$ $1.271$ $1.662$ $89.60$ $1.271$ $1.662$ $89.70$ $1.271$ $1.672$ $90.00$ $1.271$ $1.672$ $90.00$ $1.271$ $1.672$ $90.10$ $1.271$ $1.672$ $90.10$ $1.271$ $1.672$ $90.10$ $1.271$ $1.672$ $90.30$ $1.271$ $2.664$ $90.50$ $1.271$ $2.664$ $90.60$ $1.271$ $2.656$ $91.70$ $1.271$ $2.626$ $91.10$ $1.271$ $2.626$ $91.10$ $1.271$ $2.674$ $91.50$ $1.271$ $2.626$ $91.10$ $1.271$ $2.635$ $91.00$ $1.271$ $2.636$ $91.10$ $1.271$ $2.626$ $91.10$ $1.271$ $2.626$ $91.10$ $1.271$ $3.661$ $92.20$ $1.271$ $3.661$ $92.20$ $1.271$ $3.661$ $92.20$ $1.271$ $3.621$ $92.30$ $1.271$ $3.621$ $92.40$ $1.271$ $3.621$ $92.40$ $1.271$ $3.621$ $92.40$ $1.271$ $3.621$ $92.40$ $1.271$ $3.621$ $92.50$ $1.271$ $3.621$						
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92.001,2713,43892.101,2713,50492.201,2713,56592.301,2713,62192.401,2713,67692.501,2713,72892.601,2713,77992.701,2713,82992.801,2713,88092.901,2713,93193.001,2713,982						
92.10       1,271       3,504         92.20       1,271       3,565         92.30       1,271       3,621         92.40       1,271       3,676         92.50       1,271       3,728         92.60       1,271       3,779         92.70       1,271       3,829         92.80       1,271       3,880         92.90       1,271       3,931         93.00       1,271       3,982	92.00					
92.301,2713,62192.401,2713,67692.501,2713,72892.601,2713,77992.701,2713,82992.801,2713,93193.001,2713,982						
92.401,2713,67692.501,2713,72892.601,2713,77992.701,2713,82992.801,2713,98092.901,2713,93193.001,2713,982	92.20	1,271	3,565			
92.501,2713,72892.601,2713,77992.701,2713,82992.801,2713,88092.901,2713,93193.001,2713,982	92.30	1,271	3,621			
92.601,2713,77992.701,2713,82992.801,2713,88092.901,2713,93193.001,2713,982	92.40	1,271	3,676			
92.701,2713,82992.801,2713,88092.901,2713,93193.001,2713,982						
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		,				
93.10 1,271 4,033						
	93.10	1,271	4,033			
				l		

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

19,813 sf, 71.21% Impervious, Inflow Depth = 2.24" for 2-Year event Inflow Area = Inflow = 1.08 cfs @ 12.07 hrs, Volume= 3,692 cf 0.04 cfs @ 15.29 hrs, Volume= Outflow 1,767 cf, Atten= 96%, Lag= 193.1 min = Discarded = 0.00 cfs @ 15.29 hrs, Volume= 1,005 cf 0.04 cfs @ 15.29 hrs, Volume= 762 cf Primary = Routed to Link AP : Analysis Point 0 cf Secondary = 0.00 cfs @ 0.00 hrs, Volume= Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 92.87' @ 15.29 hrs Surf.Area= 1,956 sf Storage= 2,810 cf

Plug-Flow detention time= 1,152.0 min calculated for 1,766 cf (48% of inflow) Center-of-Mass det. time= 1,020.1 min (1,779.8 - 759.6)

Volume	Invert	Avail.Stor	age Storage Description			
#1	91.00'	7,78	80 cf Custom	n Stage Data (Pris	matic) Listed below (Recalc)	
Elevatio	on Su	rf.Area	Inc.Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)		
91.0	00	1,079	0	0		
92.0	00	1,528	1,304	1,304		
93.0	00	2,023	1,776	3,079		
94.0	00	2,663	2,343	5,422		
94.8	30	3,231	2,358	7,780		
Device	Routing	Invert	Outlet Device	es		
#1	Primary	89.00'	15.0" Round	l Outlet Pipe		
	2		L= 361.0' CMP, square edge headwall, Ke= 0.500			
			Inlet / Outlet Invert= 89.00' / 87.00' S= 0.0055 '/' Cc= 0.900			
				,	, Flow Area= 1.23 sf	
#2	Device 1	92.75'		w Flow Orifice		
				ir flow at low head		
#3	Device 1	93.60'		Horiz. Grate C:		
	0	04.001		ir flow at low head		
#4	#4 Secondary 94.30'		6.0' long x 3.0' breadth Broad-Crested Rectangular Weir			
			· · ·	50 4.00 4.50 0	.80 1.00 1.20 1.40 1.60 1.80 2.00	
					8 2.67 2.65 2.64 2.64 2.68 2.68	
				92 2.97 3.07 3.3		
#5	Discarded	91.00'		xfiltration over S	· –	
110	Biccardou	51.00				

**Discarded OutFlow** Max=0.00 cfs @ 15.29 hrs HW=92.87' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.04 cfs @ 15.29 hrs HW=92.87' (Free Discharge) 1=Outlet Pipe (Passes 0.04 cfs of 8.31 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.04 cfs @ 1.15 fps) 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 4=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	1,079	0	93.60	2,407	4,408
91.05	1,101	55	93.65	2,439	4,529
91.10	1,124	110	93.70	2,471	4,652
91.15	1,146	167	93.75	2,503	4,776
91.20	1,169	225	93.80	2,535	4,902
91.25	1,191	284	93.85	2,567	5,030
91.30	1,214	344	93.90	2,599	5,159
91.35	1,236	405	93.95	2,631	5,290
91.40	1,259	468	94.00	2,663	5,422
91.45	1,281	531	94.05	2,698	5,556
91.50	1,304	596	94.10	2,734	5,692
91.55	1,326	661	94.15	2,770	5,829
91.60	1,348	728	94.20	2,805	5,969
91.65	1,371	796	94.25	2,841	6,110
91.70	1,393	865	94.30	2,876	6,253
91.75	1,416	936	94.35	2,911	6,398
91.80	1,438	1,007	94.40	2,947	6,544
91.85	1,461	1,079	94.45	2,983	6,692
91.90	1,483	1,153	94.50	3,018	6,842
91.95	1,506	1,228	94.55	3,053	6,994
92.00	1,528	1,304	94.60	3,089	7,148
92.05	1,553	1,381	94.65	3,125	7,303
92.10	1,577	1,459	94.70	3,160	7,460
92.15	1,602	1,538	94.75	3,196	7,619
92.20	1,627	1,619	94.80	<b>3,231</b>	7,780
92.25	1,652	1,701	04.00	0,201	1,100
92.30	1,676	1,784			
92.35	1,701	1,869			
92.40	1,726	1,954			
92.45	1,751	2,041			
92.50	1,776	2,129			
92.55	1,800	2,219			
92.60	1,825	2,309			
92.65	1,850	2,401			
92.70	1,875	2,494			
92.75	1,899	2,589			
92.80	1,924	2,684			
92.85	1,949	2,781			
92.90	1,974	2,879			
92.95	1,998	2,978			
93.00	2,023	3,079			
93.05	2,055	3,181			
93.10	2,087	3,284			
93.15	2,119	3,390			
93.20	2,151	3,496			
93.25	2,183	3,605			
93.30	2,215	3,715			
93.35	2,247	3,826			
93.40	2,279	3,939			
93.45	2,311	4,054			
93.50	2,343	4,171			
93.55	2,375	4,288			

### Summary for Pond SW-C: Curtain Drain (SWM-C)

Inflow Outflow Discarde Primary Rout Seconda	= 0.01 = 0.00 ed = 0.00 = 0.00 ed to Link AP : .	l cfs @ 16 ) cfs @ 16 ) cfs @ 16 ) cfs @ 16 ) cfs @ 16 Analysis Po ) cfs @ 16	0.00 hrs, Volume= 0 cf			
Routing	by Stor-Ind met	thod, Time	Span= 0.00-72.00 hrs, dt= 0.02 hrs			
Peak El	Peak Elev= 87.68' @ 24.24 hrs Surf.Area= 1,045 sf Storage= 119 cf					
Plug-Flo	w detention tim	e= 481 0 m	nin calculated for 196 cf (100% of inflow)			
			nin ( 1,631.1 - 1,149.5 )			
Volume	Invert	Avail Stor	rage Storage Description			
#1	87.40'					
#1	07.40	3,00	04 cf 2.50'W x 418.00'L x 9.10'H Prismatoid 9,509 cf Overall x 40.0% Voids			
			,			
Device	Routing	Invert	Outlet Devices			
#1	Primary	87.20'	<b>8.0" Round Outlet Pipe</b> L= 108.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 87.20' / 85.45' S= 0.0162 '/' Cc= 0.900			
			n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf			
#2	Primary	89.75'				
#2 #3	Primary Device 1	89.75' 90.75'	n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf <b>4.0" Vert. Low flow orifice</b> C= 0.600 Limited to weir flow at low heads			
	2		n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf <b>4.0" Vert. Low flow orifice</b> C= 0.600 Limited to weir flow at low heads			
#3	Device 1	90.75'	n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf <b>4.0" Vert. Low flow orifice</b> C= 0.600 Limited to weir flow at low heads <b>4.0' Iong Sharp-Crested Vee/Trap Weir</b> Cv= 2.62 (C= 3.28)			

**Discarded OutFlow** Max=0.00 cfs @ 16.74 hrs HW=87.49' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) -1=Outlet Pipe (Passes 0.00 cfs of 0.13 cfs potential flow) -3=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

-2=Low flow orifice (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### Stage-Area-Storage for Pond SW-C: Curtain Drain (SWM-C)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.40	1,045	0	92.60	1,045	2,174
87.50	1,045	42	92.70	1,045	2,215
87.60	1,045	84	92.80	1,045	2,257
87.70	1,045	125	92.90	1,045	2,299
87.80	1,045	167	93.00	1,045	2,341
87.90	1,045	209	93.10	1,045	2,383
88.00	1,045	203	93.20	1,045	2,303
88.10	1,045	293	93.30	1,045	2,424 2,466
88.20	1,045	334	93.40 93.50	1,045	2,508
88.30	1,045	376		1,045	2,550
88.40	1,045	418	93.60	1,045	2,592
88.50	1,045	460	93.70	1,045	2,633
88.60	1,045	502	93.80	1,045	2,675
88.70	1,045	543	93.90	1,045	2,717
88.80	1,045	585	94.00	1,045	2,759
88.90	1,045	627	94.10	1,045	2,801
89.00	1,045	669	94.20	1,045	2,842
89.10	1,045	711	94.30	1,045	2,884
89.20	1,045	752	94.40	1,045	2,926
89.30	1,045	794	94.50	1,045	2,968
89.40	1,045	836	94.60	1,045	3,010
89.50	1,045	878	94.70	1,045	3,051
89.60	1,045	920	94.80	1,045	3,093
89.70	1,045	961	94.90	1,045	3,135
89.80	1,045	1,003	95.00	1,045	3,177
89.90	1,045	1,045	95.10	1,045	3,219
90.00	1,045	1,087	95.20	1,045	3,260
90.10	1,045	1,129	95.30	1,045	3,302
90.20	1,045	1,170	95.40	1,045	3,344
90.30	1,045	1,212	95.50	1,045	3,386
90.40	1,045	1,254	95.60	1,045	3,428
90.50	1,045	1,296	95.70	1,045	3,469
90.60	1,045	1,338	95.80	1,045	3,511
90.70	1,045	1,379	95.90	1,045	3,553
90.80	1,045	1,421	96.00	1,045	3,595
90.90	1,045	1,463	96.10	1,045	3,637
91.00	1,045	1,505	96.20	1,045	3,678
91.10	1,045	1,547	96.30	1,045	3,720
91.20			96.40	1,045	3,762
91.30	1,045 1,045	1,588	96.50	1,045	3,702 3,804
		1,630	90.50	1,045	3,004
91.40	1,045	1,672			
91.50	1,045	1,714			
91.60	1,045	1,756			
91.70	1,045	1,797			
91.80	1,045	1,839			
91.90	1,045	1,881			
92.00	1,045	1,923			
92.10	1,045	1,965			
92.20	1,045	2,006			
92.30	1,045	2,048			
92.40	1,045	2,090			
92.50	1,045	2,132			

#### 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 @ 21.91 hrs, Volume=	14 cf, Atten= 0%, Lag= 12.4 min
Discarded =	0.00 cfs @ 21.91 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= 91.61' @ 21.91 hrs Surf.Area= 31 sf Storage= 0 cf

Plug-Flow detention time= 12.0 min calculated for 14 cf (100% of inflow) Center-of-Mass det. time= 12.0 min (1,231.7 - 1,219.6)

Volume	Invert	Avail.Sto	rage Storage	Description		
#1	91.60'			•	<b>c)</b> Listed below (Recalc)	
Elevatio (fee		ırf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
91.6		<u>(34-11)</u> 31	<u>(cubic-icct)</u> 0	0		
91.0		44	38	38		
92.0		44	44	82		
94.6		44	44	126		
95.6		44	44	170		
96.6		44	44	214		
97.4		4	21	235		
97.5		29	0	235		
98.0		145	44	279		
99.0	00	560	353	631		
100.0	00	1,135	848	1,479		
100.1	10	1,187	116	1,595		
Device	Routing	Invert	Outlet Device	es		
#1	Discarded	91.60'	5.000 in/hr E	xfiltration over Sur	face area	
#2	Secondary	99.10'	10.0' long x	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=0.00 cfs @ 21.91 hrs HW=91.61' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.60' (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)
91.60	31 32	0 3	96.80	35 31	221 225
91.70 91.80	32 34	6	96.90 97.00	26	225
91.90	35	10	97.00	20	230
92.00	36	13	97.20	17	230
92.10	38	10	97.30	13	232
92.20	39	21	97.40	8	234
92.30	40	25	97.50	29	235
92.40	41	29	97.60	52	239
92.50	43	33	97.70	75	245
92.60	44	38	97.80	99	254
92.70	44	42	97.90	122	265
92.80	44	46	98.00	145	279
92.90	44	51	98.10	186	295
93.00	44	55	98.20	228	316
93.10	44	60	98.30	269	341
93.20	44	64	98.40	311	370
93.30	44	68	98.50	353	403
93.40	44	73	98.60	394	440
93.50	44	77	98.70	435	482
93.60 93.70	44 44	82 86	98.80 98.90	477 518	527 577
93.70 93.80	44	80 90	98.90 99.00	560	631
93.80	44	90 95	99.00	617	690
94.00	44	99	99.20	675	755
94.10	44	104	99.30	732	825
94.20	44	104	99.40	790	901
94.30	44	112	99.50	848	983
94.40	44	117	99.60	905	1,071
94.50	44	121	99.70	962	1,164
94.60	44	126	99.80	1,020	1,263
94.70	44	130	99.90	1,077	1,368
94.80	44	134	100.00	1,135	1,479
94.90	44	139	100.10	1,187	1,595
95.00	44	143			
95.10	44	148			
95.20	44	152			
95.30	44	156			
95.40 95.50	44 44	161 165			
95.60 95.60	44	165 170			
95.00	44	170			
95.80	44	174			
95.90	44	183			
96.00	44	185			
96.10	44	192			
96.20	44	196			
96.30	44	200			
96.40	44	205			
96.50	44	209			
96.60	44	214			
96.70	40	218			

### Summary for Link AP: Analysis Point

Inflow Area	=	191,150 sf	, 31.86% Impervious	Inflow Depth = 0.33"	for 2-Year event
Inflow =	=	1.12 cfs @	12.17 hrs, Volume=	5,248 cf	
Primary =	=	1.12 cfs @	12.17 hrs, Volume=	5,248 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=73,097 sf 11.74% Impervious Runoff Depth=0.46" Flow Length=337' Tc=17.4 min CN=43 Runoff=0.30 cfs 2,781 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=5,750 sf 0.78% Impervious Runoff Depth=0.84" Tc=10.0 min CN=50 Runoff=0.08 cfs 403 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 DA4A: DA4A	Runoff Area=9,253 sf 92.50% Impervious Runoff Depth=4.88" Tc=5.0 min CN=96 Runoff=1.13 cfs 3,763 cf
Subcatchment DA4B: DA4B	Runoff Area=7,277 sf 91.51% Impervious Runoff Depth=4.88" Tc=5.0 min CN=96 Runoff=0.89 cfs 2,960 cf
Subcatchment DA4C: DA4C	Runoff Area=16,289 sf 80.42% Impervious Runoff Depth=3.90" Tc=10.0 min CN=87 Runoff=1.46 cfs 5,291 cf
Subcatchment DA4D: DA4D	Runoff Area=11,846 sf 80.51% Impervious Runoff Depth=4.11" Tc=10.0 min CN=89 Runoff=1.11 cfs 4,055 cf
Subcatchment DA5: DA5	Runoff Area=53,575 sf 0.66% Impervious Runoff Depth=2.47" Flow Length=332' Tc=11.4 min CN=72 Runoff=2.95 cfs 11,031 cf
Reach DMH-1: DMH-1	Inflow=0.50 cfs 5,446 cf Outflow=0.50 cfs 5,446 cf
Reach DMH-3: DMH-3	Inflow=0.67 cfs 6,957 cf Outflow=0.67 cfs 6,957 cf
	<b>-A1)</b> Peak Elev=88.03' Storage=2,305 cf Inflow=1.13 cfs 3,763 cf 00 cfs 635 cf Primary=0.17 cfs 1,510 cf Outflow=0.17 cfs 2,145 cf
Pond SW-A2: Stormtech MC-3500 (SWM Discarded=0.	<b>-A2)</b> Peak Elev=89.22' Storage=1,805 cf Inflow=0.89 cfs 2,960 cf 00 cfs 633 cf Primary=0.13 cfs 1,165 cf Outflow=0.13 cfs 1,797 cf
	<b>-A3)</b> Peak Elev=89.95' Storage=3,034 cf Inflow=1.46 cfs 5,291 cf 00 cfs 868 cf Primary=0.20 cfs 2,465 cf Outflow=0.21 cfs 3,333 cf
Pond SW-A4: Stormtech MC-3500 (SWM Discarded=0.	<b>-A4)</b> Peak Elev=90.69' Storage=2,344 cf Inflow=1.11 cfs 4,055 cf 00 cfs 697 cf Primary=0.18 cfs 1,817 cf Outflow=0.18 cfs 2,514 cf
Pond SW-B: Bioretention Basin (SWM-B Discarded=0.01 cfs 1,030 cf Primary=0.3	Peak Elev=93.26' Storage=3,619 cf Inflow=1.79 cfs 6,394 cf 36 cfs 3,428 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 4,457 cf

post development (REV)	Type III 24-hr	10-Year Rainfall=5.35"
Prepared by HH Engineering Assoc		Printed 3/17/2023
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Pond SW-C: Curtain Drain (SWM-C) Peak Elev=89.96' Storage=1,069 cf Inflow=0.30 cfs 2,781 cf Discarded=0.00 cfs 521 cf Primary=0.09 cfs 1,680 cf Secondary=0.00 cfs 0 cf Outflow=0.09 cfs 2,201 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=95.58' Storage=169 cf Inflow=0.04 cfs 376 cf Discarded=0.01 cfs 376 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 376 cf

Link AP: Analysis Point

Inflow=3.16 cfs 23,095 cf Primary=3.16 cfs 23,095 cf

Total Runoff Area = 203,612 sf Runoff Volume = 36,652 cf Average Runoff Depth = 2.16" 69.45% Pervious = 141,411 sf 30.55% Impervious = 62,201 sf

### Summary for Subcatchment DA1: DA1

Runoff = 0.30 cfs @ 12.49 hrs, Volume= Routed to Pond SW-C : Curtain Drain (SWM-C) 2,781 cf, Depth= 0.46"

A	rea (sf)	CN D	escription				
	8,584		98 Paved parking, HSG A				
	35,028		9 >75% Grass cover, Good, HSG A				
	910	74 >	75% Gras	s cover, Go	bod, HSG C		
	27,956	30 V	Voods, Go	od, HSG A			
	619	70 V	Woods, Good, HSG C				
	73,097	43 V	Veighted A	verage			
	64,513	8	8.26% Per	vious Area			
	8,584	1	1.74% 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		
					Woods: Light underbrush n= 0.400 P2= 3.43"		
0.6	35	0.0368	0.96		Shallow Concentrated Flow, Shallow		
					Woodland Kv= 5.0 fps		
0.1	22	0.0345	3.77		Shallow Concentrated Flow, Shallow		
					Paved Kv= 20.3 fps		
1.5	61	0.0100	0.70		Shallow Concentrated Flow, Shallow		
					Short Grass Pasture Kv= 7.0 fps		
1.7	99	0.0394	0.99		Shallow Concentrated Flow, Shallow		
					Woodland Kv= 5.0 fps		
0.1	20	0.3400	4.08		Shallow Concentrated Flow, Shallow		
					Short Grass Pasture Kv= 7.0 fps		
17.4	337	Total					

### 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	G C	
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 = 0.08 cfs @ 12.18 hrs, Volume= 403 cf, Depth= 0.84" Routed to Pond SW-B : Bioretention Basin (SWM-B)

A	rea (sf)	CN	Description								
	45	98	Paved parking, HSG C								
	4,009	39	>75% Gras	s cover, Go	ood, HSG A						
	1,696	74	>75% Gras	s cover, Go	ood, HSG C						
	5,750	5,750 50 Weighted Average									
	5,705	5,705 99.22% Pervious Area									
	45	0.78% Impervious Area									
т.	المربية من الم	01	Valasita.	0	Decemination						
Tc	Length	Slope	,	Capacity	Description						
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)							
10.0					Direct Entry, Direct						

### **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							
	1,303	98	Paved parking, HSG A							
	5,621	39	>75% Gras	s cover, Go	bod, HSG A					
	5,538	30	Woods, Go	od, HSG A						
	12,462 41 Weighted Average									
	11,159 89.54% Pervious Area									
	1,303		10.46% Imp	pervious Are	ea					
-		<u>.</u>		<b>o</b>						
Tc	Length	Slope		Capacity	Description					
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)						
10.0					Direct Entry, Direct Entry					

### Summary for Subcatchment DA4A: DA4A

Runoff = 1.13 cfs @ 12.07 hrs, Volume= 3,763 cf, Depth= 4.88" Routed to Pond SW-A1 : Stormtech MC-3500 (SWM-A1)

A	rea (sf)	CN	Description				
	8,559	98	Paved park	ing, HSG C			
	694	74	>75% Gras	s cover, Go	bod, HSG C		
	9,253 694 8,559	96	Weighted Average 7.50% Pervious Area 92.50% Impervious Area				
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description		
5.0					Direct Entry, Direct Entry		

### Summary for Subcatchment DA4B: DA4B

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 2,960 cf, Depth= 4.88" Routed to Pond SW-A2 : Stormtech MC-3500 (SWM-A2)

CN	Description				
98	Paved park	ing, HSG C	2		
74	>75% Gras	s cover, Go	bod, HSG C		
96	Weighted Average				
	8.49% Perv	vious Ārea			
	91.51% Impervious Area				
		Capacity (cfs)	Description		
			Direct Entry, Direct Entry		
	98 74 96 n Slop	98 Paved park 74 >75% Gras 96 Weighted A 8.49% Perv 91.51% Imp	98 Paved parking, HSG C 74 >75% Grass cover, Go 96 Weighted Average 8.49% Pervious Area 91.51% Impervious Ar		

### Summary for Subcatchment DA4C: DA4C

Runoff = 1.46 cfs @ 12.14 hrs, Volume= 5,291 cf, Depth= 3.90" Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

A	rea (sf)	CN	Description						
	6,556	98	Paved park	ing, HSG A	A Contraction of the second se				
	6,543	98	Paved park	ing, HSG C					
	1,382	39	>75% Gras	s cover, Go	bod, HSG A				
	649	74	>75% Gras	s cover, Go	bod, HSG C				
	1,159	30	Woods, Go	od, HSG A					
	16,289	87	87 Weighted Average						
	3,190		19.58% Pervious Area						
	13,099		80.42% Imp	ervious Ar	ea				
Тс	Length	Slope		Capacity	Description				
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct Entry				

### Summary for Subcatchment DA4D: DA4D

Runoff = 1.11 cfs @ 12.14 hrs, Volume= 4,055 cf, Depth= 4.11" Routed to Pond SW-A4 : Stormtech MC-3500 (SWM-A4)

Ar	ea (sf)	CN	Description						
	1,590	98	Paved park	ing, HSG A	N				
	7,947	98	Paved park	ing, HSG C					
	1,415	39	>75% Gras	s cover, Go	bod, HSG A				
	894	74	>75% Gras	s cover, Go	bod, HSG C				
	11,846	46 89 Weighted Average							
	2,309	9 19.49% Pervious Area							
	9,537	80.51% Impervious Area							
Та	Longth	Clan	)/alaaitu	Consoitu	Description				
Tc (maine)	Length	Slope		Capacity	Description				
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)					
10.0					Direct Entry, Direct Entry				

### Summary for Subcatchment DA5: DA5

Runoff = 2.95 cfs @ 12.16 hrs, Volume= Routed to Link AP : Analysis Point 11,031 cf, Depth= 2.47"

A	rea (sf)	CN D	escription		
	352	98 P	aved park	ing, HSG C	:
	22,627	74 >	75% Grass	s cover, Go	ood, HSG C
	30,596	70 V	Voods, Go	od, HSG C	
	53,575	72 V	Veighted A	verage	
	53,223	9	9.34% Per	vious Area	
	352	0	.66% Impe	ervious Area	а
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
	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	00	0.0050	0.40		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 Reach DMH-1: DMH-1

 Inflow Area =
 35,412 sf, 82.73% Impervious, Inflow Depth =
 1.85" for 10-Year event

 Inflow =
 0.50 cfs @
 12.66 hrs, Volume=
 5,446 cf

 Outflow =
 0.50 cfs @
 12.66 hrs, Volume=
 5,446 cf, Atten= 0%, Lag= 0.0 min

 Routed to Reach DMH-3 : DMH-3
 DMH-3
 5,446 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

# Summary for Reach DMH-3: DMH-3

Inflow Area = 44,665 sf, 84.75% Impervious, Inflow Depth = 1.87" for 10-Year event Inflow = 0.67 cfs @ 12.63 hrs, Volume= 6,957 cf Outflow = 0.67 cfs @ 12.63 hrs, Volume= 6,957 cf, Atten= 0%, Lag= 0.0 min Routed to Link AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

### Summary for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Outflow Discarded Primary	= 1 = 0 = 0 = 0	9,253 sf, 92.509 .13 cfs @ 12.07 h .17 cfs @ 12.54 h .00 cfs @ 4.22 h .17 cfs @ 12.54 h DMH-3 : DMH-3	nrs, Volume= 2,145 cf, Atten= 85%, Lag= 28.1 min 635 cf					
			n= 0.00-72.00 hrs, dt= 0.02 hrs					
Peak Elev=	= 88.03' @	12.54 hrs Surf.A	rea= 1,108 sf Storage= 2,305 cf					
Plug-Flow detention time= 671.5 min calculated for 2,145 cf (57% of inflow) Center-of-Mass det. time= 561.0 min(1,320.9 - 759.9)								
Volume	Invert	Avail.Storage	Storage Description					
#1A	85.00'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A					
#2A	85.75'	2,069 cf	6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids ADS_StormTech MC-3500 d +Cap x 18 Inside #1					
#217	00.70	2,009 CI	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					
			18 Chambers in 3 Rows					

Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf

3,680 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	12.0" Round Outlet Pipe
	-		L= 6.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 85.00' / 84.95' S= 0.0083 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	87.70'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	88.50'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.35'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 4.22 hrs HW=85.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.17 cfs @ 12.54 hrs HW=88.03' (Free Discharge) 1=Outlet Pipe (Passes 0.17 cfs of 6.02 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.17 cfs @ 1.97 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

### Pond SW-A1: Stormtech MC-3500 (SWM-A1) - 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 3 rows = 89.4 cf

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

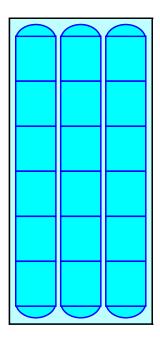
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

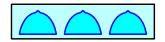
18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

		<b>O</b> (		<b>.</b>	<b>e</b> /
Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
85.00	<b>1,108</b>	0 44	90.20	1,108	3,547
85.10 85.20	1,108 1,108	44 89	90.30 90.40	1,108 1,108	3,591 3,635
85.30	1,108	133	90.50	1,108	<b>3,680</b>
85.40	1,108	177	30.30	1,100	3,000
85.50	1,108	222			
85.60	1,108	266			
85.70	1,108	310			
85.80	1,108	378			
85.90	1,108	470			
86.00	1,108	561			
86.10	1,108	652			
86.20	1,108	743			
86.30	1,108	833			
86.40	1,108	922			
86.50 86.60	1,108 1,108	1,012 1,101			
86.70	1,108	1,189			
86.80	1,108	1,277			
86.90	1,108	1,364			
87.00	1,108	1,451			
87.10	1,108	1,537			
87.20	1,108	1,623			
87.30	1,108	1,708			
87.40	1,108	1,792			
87.50	1,108	1,875			
87.60 87.70	1,108 1,108	1,958 2,039			
87.80	1,108	2,039			
87.90	1,108	2,120			
88.00	1,108	2,279			
88.10	1,108	2,356			
88.20	1,108	2,432			
88.30	1,108	2,507			
88.40	1,108	2,581			
88.50	1,108	2,653			
88.60	1,108	2,724			
88.70 88.80	1,108	2,792			
88.90	1,108 1,108	2,859 2,923			
89.00	1,108	2,984			
89.10	1,108	3,042			
89.20	1,108	3,094			
89.30	1,108	3,144			
89.40	1,108	3,191			
89.50	1,108	3,236			
89.60	1,108	3,281			
89.70	1,108	3,325			
89.80 89.90	1,108 1,108	3,369 3,414			
90.00	1,108	3,458			
90.10	1,108	3,502			
	.,	0,002			
			•		

### Summary for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Primary	= 0.8 = 0.1 = 0.0 = 0.1	39 cfs @ 12.07 h	nrs, Volume= 1,797 cf, Atten= 85%, Lag= 28.5 min 633 cf
Routing by	Stor-Ind m	ethod Time Snar	n= 0.00-72.00 hrs, dt= 0.02 hrs
			rea= 1,108 sf Storage= 1,805 cf
	U U		,
			alculated for 1,797 cf (61% of inflow)
Center-of-N	Mass det. tir	me= 637.3 min ( ′	1,397.1 - 759.9)
Volume	Invert	Avail Storage	Storage Description
#1A	86.80'		22.75'W x 48.72'L x 5.50'H Field A
		.,	6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids
#2A	87.55'	2,069 cf	
			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
			18 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		3,680 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	88.95'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	89.55'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.05'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 4.62 hrs HW=86.86' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.13 cfs @ 12.55 hrs HW=89.22' (Free Discharge) 1=Outlet Pipe (Passes 0.13 cfs of 8.23 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.13 cfs @ 1.75 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

### Pond SW-A2: Stormtech MC-3500 (SWM-A2) - 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 3 rows = 89.4 cf

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

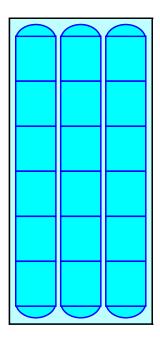
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Flowetien	Curfees	Ctowners		Curfore	Chanadra
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
86.80	1,108	0	92.00	1,108	3,547
86.90	1,108	44	92.10	1,108	3,591
87.00	1,108	89	92.20	1,108	3,635
87.10	1,108	133	92.30	1,108	3,680
87.20	1,108	177		,	,
87.30	1,108	222			
87.40	1,108	266			
87.50	1,108	310			
87.60	1,108	378			
87.70	1,108	470			
87.80	1,108	561			
87.90	1,108	652			
88.00 88.10	1,108 1,108	743 833			
88.20	1,108	922			
88.30	1,108	1,012			
88.40	1,108	1,101			
88.50	1,108	1,189			
88.60	1,108	1,277			
88.70	1,108	1,364			
88.80	1,108	1,451			
88.90	1,108	1,537			
89.00	1,108	1,623			
89.10	1,108	1,708			
89.20	1,108	1,792			
89.30	1,108	1,875			
89.40 89.50	1,108 1,108	1,958 2,039			
89.60	1,108	2,039			
89.70	1,108	2,120			
89.80	1,108	2,279			
89.90	1,108	2,356			
90.00	1,108	2,432			
90.10	1,108	2,507			
90.20	1,108	2,581			
90.30	1,108	2,653			
90.40	1,108	2,724			
90.50	1,108	2,792			
90.60 90.70	1,108 1,108	2,859			
90.80	1,108	2,923 2,984			
90.90	1,108	3,042			
91.00	1,108	3,094			
91.10	1,108	3,144			
91.20	1,108	3,191			
91.30	1,108	3,236			
91.40	1,108	3,281			
91.50	1,108	3,325			
91.60	1,108	3,369			
91.70	1,108	3,414			
91.80 91.90	1,108 1,108	3,458 3,502			
31.30	1,100	5,502			
			I		

#### Summary for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Inflow Area =	16,289 sf, 80.42% Impervious,	Inflow Depth = 3.90" for 10-Year event				
Inflow =	1.46 cfs @ 12.14 hrs, Volume=	5,291 cf				
Outflow =	0.21 cfs @ 12.76 hrs, Volume=	3,333 cf, Atten= 86%, Lag= 37.6 min				
Discarded =	0.00 cfs @ 7.64 hrs, Volume=	868 cf				
Primary =	0.20 cfs @ 12.76 hrs, Volume=	2,465 cf				
Routed to Read	ch DMH-1 : DMH-1					
Routing by Stor-Ind method, Time Span= $0.00-72.00$ brs, dt= $0.02$ brs						

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 89.95' @ 12.76 hrs Surf.Area= 1,598 sf Storage= 3,034 cf

Plug-Flow detention time= 613.9 min calculated for 3,333 cf (63% of inflow) Center-of-Mass det. time= 513.2 min (1,315.6 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.20'	2,292 cf	22.75'W x 70.23'L x 5.50'H Field A
			8,788 cf Overall - 3,058 cf Embedded = 5,729 cf x 40.0% Voids
#2A	87.95'	3,058 cf	ADS_StormTech MC-3500 d +Cap x 27 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
			27 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		5,350 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.55'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	90.60'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	87.20'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 7.64 hrs HW=87.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.20 cfs @ 12.76 hrs HW=89.95' (Free Discharge) 1=Outlet Pipe (Passes 0.20 cfs of 9.67 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.20 cfs @ 2.34 fps) -3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

### Pond SW-A3: Stormtech MC-3500 (SWM-A3) - 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 3 rows = 89.4 cf

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

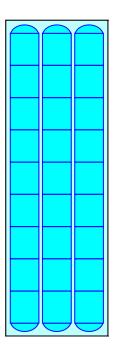
9 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 68.23' Row Length +12.0" End Stone x 2 = 70.23' Base Length
3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

27 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 3,058.1 cf Chamber Storage

8,787.5 cf Field - 3,058.1 cf Chambers = 5,729.4 cf Stone x 40.0% Voids = 2,291.8 cf Stone Storage

Chamber Storage + Stone Storage = 5,349.9 cf = 0.123 afOverall Storage Efficiency = 60.9%Overall System Size =  $70.23' \times 22.75' \times 5.50'$ 

27 Chambers 325.5 cy Field 212.2 cy Stone





# Stage-Area-Storage for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.20	1,598	0	92.40	1,598	5,158
87.30	1,598	64	92.50	1,598	5,222
87.40	1,598	128	92.60	1,598	5,286
87.50	1,598	192	92.70	1,598	5,350
87.60	1,598	256			
87.70	1,598	320			
87.80	1,598	383			
87.90	1,598	447			
88.00 88.10	1,598 1,598	546 680			
88.20	1,598	813			
88.30	1,598	946			
88.40	1,598	1,078			
88.50	1,598	1,210			
88.60	1,598	1,341			
88.70	1,598	1,471			
88.80	1,598	1,601			
88.90	1,598	1,730			
89.00	1,598	1,858			
89.10	1,598	1,986			
89.20 89.30	1,598	2,113			
89.40	1,598 1,598	2,238 2,363			
89.50	1,598	2,303 2,487			
89.60	1,598	2,610			
89.70	1,598	2,731			
89.80	1,598	2,852			
89.90	1,598	2,971			
90.00	1,598	3,089			
90.10	1,598	3,205			
90.20	1,598	3,320			
90.30	1,598	3,433			
90.40 90.50	1,598 1,598	3,544 3,653			
90.60	1,598	3,760			
90.70	1,598	3,865			
90.80	1,598	3,968			
90.90	1,598	4,067			
91.00	1,598	4,164			
91.10	1,598	4,257			
91.20	1,598	4,346			
91.30	1,598	4,430			
91.40	1,598	4,506			
91.50 91.60	1,598 1,598	4,577 4,645			
91.70	1,598	4,711			
91.80	1,598	4,775			
91.90	1,598	4,839			
92.00	1,598	4,903			
92.10	1,598	4,966			
92.20	1,598	5,030			
92.30	1,598	5,094			
			l		

#### Summary for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Inflow Area =	11,846 sf, 80.51% Impervious,	Inflow Depth = 4.11" for 10-Year event				
Inflow =	1.11 cfs @ 12.14 hrs, Volume=	4,055 cf				
Outflow =	0.18 cfs @ 12.68 hrs, Volume=	2,514 cf, Atten= 84%, Lag= 32.8 min				
Discarded =	0.00 cfs @ 7.16 hrs, Volume=	697 cf				
Primary =	0.18 cfs @ 12.68 hrs, Volume=	1,817 cf				
Routed to Read	ch DMH-1 : DMH-1					
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs						

Peak Elev= 90.69' @ 12.68 hrs Surf.Area= 1,271 sf Storage= 2,344 cf

Plug-Flow detention time= 635.4 min calculated for 2,514 cf (62% of inflow) Center-of-Mass det. time= 534.2 min (1,329.9 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.00'	1,838 cf	22.75'W x 55.89'L x 5.50'H Field A
			6,993 cf Overall - 2,398 cf Embedded = 4,595 cf x 40.0% Voids
#2A	88.75'	2,398 cf	ADS_StormTech MC-3500 d +Cap x 21 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
			21 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		4,236 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	12.0" Round Outlet Pipe
	-		L= 98.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 88.80' / 86.90' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	90.35'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	91.20'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	92.25'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	88.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 7.16 hrs HW=88.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.18 cfs @ 12.68 hrs HW=90.69' (Free Discharge) 1=Outlet Pipe (Passes 0.18 cfs of 4.46 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.18 cfs @ 2.03 fps) -3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

### Pond SW-A4: Stormtech MC-3500 (SWM-A4) - 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 3 rows = 89.4 cf

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

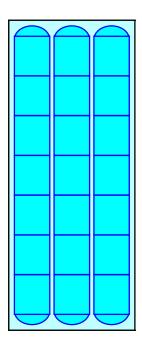
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

21 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,398.4 cf Chamber Storage

6,993.2 cf Field - 2,398.4 cf Chambers = 4,594.8 cf Stone x 40.0% Voids = 1,837.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,236.3 cf = 0.097 afOverall Storage Efficiency = 60.6%Overall System Size =  $55.89' \times 22.75' \times 5.50'$ 

21 Chambers 259.0 cy Field 170.2 cy Stone





# Stage-Area-Storage for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
88.00	1,271	0	93.20	1,271	4,084
88.10	1,271	51	93.30	1,271	4,135
88.20	1,271	102	93.40	1,271	4,185
88.30	1,271	153	93.50	1,271	<b>4,236</b>
88.40	1,271	203	93.30	1,271	4,230
88.50	1,271	203			
88.60	1,271	305			
88.70	1,271	356			
88.80	1,271	434			
88.90	1,271	540			
89.00	1,271	645			
89.10	1,271	750			
89.20	1,271	854			
89.30	1,271	958			
89.40	1,271	1,062			
89.50	1,271	1,165			
89.60	1,271	1,267			
89.70	1,271	1,369			
89.80	1,271	1,471			
89.90	1,271	1,571			
90.00	1,271	1,672			
90.10	1,271	1,771			
90.20	1,271	1,870			
90.30	1,271	1,967			
90.40	1,271	2,064			
90.50	1,271	2,161			
90.60	1,271	2,256			
90.70	1,271	2,350			
90.80	1,271	2,443			
90.90	1,271	2,535			
91.00	1,271	2,626			
91.10	1,271	2,715			
91.20	1,271	2,803			
91.30	1,271	2,889			
91.40	1,271	2,974			
91.50	1,271	3,057			
91.60	1,271	3,138			
91.70	1,271	3,217			
91.80	1,271	3,294			
91.90	1,271	3,368			
92.00	1,271	3,438			
92.10	1,271	3,504			
92.20	1,271	3,565			
92.30	1,271	3,621			
92.40	1,271	3,676			
92.50	1,271	3,728			
92.60	1,271	3,779			
92.70	1,271	3,829			
92.80	1,271	3,880			
92.90	1,271	3,931			
93.00	1,271	3,982			
93.10	1,271	4,033			

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

19,813 sf, 71.21% Impervious, Inflow Depth = 3.87" for 10-Year event Inflow Area = Inflow = 1.79 cfs @ 12.07 hrs, Volume= 6,394 cf 0.36 cfs @ 12.50 hrs, Volume= Outflow 4,457 cf, Atten= 80%, Lag= 25.9 min = Discarded = 0.01 cfs @ 12.50 hrs, Volume= 1,030 cf 0.36 cfs @ 12.50 hrs, Volume= 3,428 cf Primary = Routed to Link AP : Analysis Point Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 93.26' @ 12.50 hrs Surf.Area= 2,187 sf Storage= 3,619 cf

Plug-Flow detention time= 567.3 min calculated for 4,456 cf (70% of inflow) Center-of-Mass det. time= 468.4 min (1,224.7 - 756.3)

Volume	Invert	Avail.Stor	rage Storage	e Description	
#1	91.00'	7,78	30 cf Custon	n Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio	on Su	rf.Area	Inc.Store	Cum.Store	
(fee		(sq-ft)	(cubic-feet)	(cubic-feet)	
91.0	00	1,079	0	0	
92.0	00	1,528	1,304	1,304	
93.0		2,023	1,776	3,079	
94.0		2,663	2,343	5,422	
94.8	30	3,231	2,358	7,780	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	89.00'	15.0" Round	d Outlet Pipe	
			L= 361.0' C	MP, square edge	headwall, Ke= 0.500
					7.00' S= 0.0055 '/' Cc= 0.900
					or, Flow Area= 1.23 sf
#2	Device 1	92.75'			
	<b>D</b> · · · ·			eir flow at low hea	
#3	Device 1	93.60'		'Horiz. Grate	
#4	Secondary	94.30'		eir flow at low hea	ds d-Crested Rectangular Weir
<del>#4</del>	Secondary	94.30			0.80 1.00 1.20 1.40 1.60 1.80 2.00
				.50 4.00 4.50	0.00 1.00 1.20 1.40 1.00 1.00 2.00
					68 2.67 2.65 2.64 2.64 2.68 2.68
				.92 2.97 3.07 3	
#5	Discarded	91.00'	0.100 in/hr E	Exfiltration over S	Surface area
		000			

**Discarded OutFlow** Max=0.01 cfs @ 12.50 hrs HW=93.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.36 cfs @ 12.50 hrs HW=93.26' (Free Discharge) 1=Outlet Pipe (Passes 0.36 cfs of 8.66 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.36 cfs @ 2.63 fps) 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 4=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	1,079	0	93.60	2,407	4,408
91.05	1,101	55	93.65	2,439	4,529
91.10	1,124	110	93.70	2,471	4,652
91.15	1,146	167	93.75	2,503	4,776
91.20	1,169	225	93.80	2,535	4,902
91.25	1,191	284	93.85	2,567	5,030
91.30	1,214	344	93.90	2,599	5,159
91.35	1,236	405	93.95	2,631	5,290
91.40	1,259	468	94.00	2,663	5,422
91.45	1,281	531	94.05	2,698	5,556
91.50	1,304	596	94.10	2,734	5,692
91.55	1,326	661	94.15	2,770	5,829
91.60	1,348	728	94.20	2,805	5,969
91.65	1,371	796	94.25	2,841	6,110
91.70	1,393	865	94.30	2,876	6,253
91.75	1,416	936	94.35	2,911	6,398
91.80	1,438	1,007	94.40	2,947	6,544
91.85	1,461	1,079	94.45	2,983	6,692
91.90	1,483	1,153	94.50	3,018	6,842
91.95	1,506	1,228	94.55	3,053	6,994
92.00	1,528	1,304	94.60	3,089	7,148
92.05	1,553	1,381	94.65	3,125	7,303
92.10	1,557	1,459	94.70	3,160	7,460
92.15	1,602	1,538	94.75	3,196	7,619
92.20	1,627	1,619	94.80	<b>3,231</b>	7,780
92.25	1,652	1,701	54.00	0,201	1,100
92.30	1,676	1,784			
92.35	1,701	1,869			
92.40	1,726	1,954			
92.45	1,751	2,041			
92.50	1,776	2,129			
92.55	1,800	2,120			
92.60	1,825	2,309			
92.65	1,850	2,401			
92.70	1,875	2,494			
92.75	1,899	2,589			
92.80	1,924	2,684			
92.85	1,949	2,781			
92.90	1,974	2,879			
92.95	1,998	2,978			
93.00	2,023	3,079			
93.05	2,055	3,181			
93.10	2,087	3,284			
93.15	2,119	3,390			
93.20	2,151	3,496			
93.25	2,183	3,605			
93.30	2,215	3,715			
93.35	2,247	3,826			
93.40	2,279	3,939			
93.45	2,311	4,054			
93.50	2,343	4,171			
93.55	2,375	4,288			
	,	,			

#### Summary for Pond SW-C: Curtain Drain (SWM-C)

Seconda	= 0.30 = 0.09 ed = 0.00 = 0.09 ed to Link AP : A	cfs @ 12 cfs @ 14 cfs @ 12 cfs @ 14 nalysis Po cfs @ 0	0.00 hrs, Volume= 0 cf				
			Span= 0.00-72.00 hrs, dt= 0.02 hrs				
Peak El	ev= 89.96' @ 14.	55 hrs S	urf.Area= 1,045 sf Storage= 1,069 cf				
Plug-Flo	w detention time	= 547 0 m	nin calculated for 2,200 cf (79% of inflow)				
			nin ( 1,420.9 - 959.6 )				
Volume	Invert	Avail Stor	age Storage Description				
<u>volume</u> #1	87.40'						
<i>#</i> I	87.40	3,80	4 cf <b>2.50'W x 418.00'L x 9.10'H Prismatoid</b> 9,509 cf Overall x 40.0% Voids				
Davias	Deuting	luniant	Outlat Daviasa				
Device	Routing		Outlet Devices				
#1	#1 Primary 87.20' <b>8.0" Round Outlet Pipe</b> L= 108.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 87.20' / 85.45' S= 0.0162 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf						
#2	Primary	89.75'	<b>4.0" Vert. Low flow orifice</b> C= 0.600 Limited to weir flow at low heads				
#3	Device 1	90.75'					
#4	Discarded	87.40'	0.100 in/hr Exfiltration over Surface area				
#5	Secondary	96.00'	<b>200.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				

**Discarded OutFlow** Max=0.00 cfs @ 12.26 hrs HW=87.50' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.09 cfs @ 14.55 hrs HW=89.96' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 2.47 cfs potential flow) 3=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

**2=Low flow orifice** (Orifice Controls 0.09 cfs @ 1.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

#### Stage-Area-Storage for Pond SW-C: Curtain Drain (SWM-C)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.40	1,045	0	92.60	1,045	2,174
87.50	1,045	42	92.70	1,045	2,215
87.60	1,045	84	92.80	1,045	2,257
87.70	1,045	125	92.90	1,045	2,299
87.80	1,045	167	93.00	1,045	2,341
87.90	1,045	209	93.10	1,045	2,383
88.00	1,045	251	93.20	1,045	2,424
88.10	1,045	293	93.30	1,045	2,466
88.20	1,045	334	93.40	1,045	2,508
88.30	1,045	376	93.50	1,045	2,550
88.40	1,045	418	93.60	1,045	2,592
88.50	1,045	460	93.70	1,045	2,633
88.60	1,045	502	93.80	1,045	2,675
88.70	1,045	543	93.90	1,045	2,717
88.80	1,045	585	94.00	1,045	2,759
88.90	1,045	627	94.10	1,045	2,801
89.00	1,045	669	94.20	1,045	2,842
89.10	1,045	711	94.30	1,045	2,884
89.20	1,045	752	94.40	1,045	2,926
89.30	1,045	794	94.50	1,045	2,968
89.40	1,045	836	94.60	1,045	3,010
89.50	1,045	878	94.70	1,045	3,051
89.60	1,045	920	94.80	1,045	3,093
89.70	1,045	961	94.90	1,045	3,135
89.80	1,045	1,003	95.00	1,045	3,177
89.90	1,045	1,045	95.10	1,045	3,219
90.00	1,045	1,087	95.20	1,045	3,260
90.10	1,045	1,129	95.30	1,045	3,302
90.20	1,045	1,170	95.40	1,045	3,344
90.30	1,045	1,212	95.50	1,045	3,386
90.40	1,045	1,254	95.60	1,045	3,428
90.50	1,045	1,296	95.70	1,045	3,469
90.60	1,045	1,338	95.80	1,045	3,511
90.70	1,045	1,379	95.90	1,045	3,553
90.80	1,045	1,421	96.00	1,045	3,595
90.90	1,045 1,045	1,463	96.10 96.20	1,045	3,637
91.00 91.10		1,505 1,547	96.30	1,045	3,678
91.10	1,045 1,045	1,547 1,588	96.40	1,045 1,045	3,720 3,762
91.30	1,045	1,630	96.50	1,045	3,702 3,804
91.40	1,045	1,672	90.50	1,045	3,004
91.50	1,045	1,714			
91.60	1,045	1,756			
91.70	1,045	1,797			
91.80	1,045	1,839			
91.90	1,045	1,881			
92.00	1,045	1,923			
92.10	1,045	1,965			
92.10	1,045	2,006			
92.30	1,045	2,000			
92.40	1,045	2,040			
92.50	1,045	2,030			
02.00	1,040	2,102			

#### 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= 95.58' @ 20.05 hrs Surf.Area= 44 sf Storage= 169 cf

Plug-Flow detention time= 380.3 min calculated for 376 cf (100% of inflow) Center-of-Mass det. time= 380.3 min (1,350.7 - 970.4)

Volume	Invert	Avail.Sto	rage Stora	ge Description			
#1	91.60'	1,59	95 cf <b>Dryw</b>	ell & Basin (Prism	atic) Listed below (Recalc)		
	-	<i>с</i> ,		0 01			
Elevatio		Irf.Area	Inc.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)			
91.6	60	31	0	0			
92.6	60	44	38	38			
93.6	60	44	44	82			
94.6	60	44	44	126			
95.6	60	44	44	170			
96.6	60	44	44	214			
97.4	49	4	21	235			
97.5	50	29	0	235			
98.0	00	145	44	279			
99.0	00	560	353	631			
100.0	00	1,135	848	1,479			
100.1	10	1,187	116	1,595			
Device	Routing	Invert	Outlet Dev	rices			
#1	Discarded	91.60'	5.000 in/h	r 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. (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=92.62' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.60' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Elevation	Surface	Storage	Elevation	Surface	Storage
91.70323 $66.90$ 3122591.80346 $97.00$ 2622891.903510 $97.10$ 2223092.003613 $97.20$ 1723292.103817 $97.30$ 1323392.203921 $97.40$ 823492.304025 $97.50$ 2923592.404129 $97.60$ 5223992.504333 $97.70$ 7524592.604442 $97.90$ 12226592.80444698.0014527992.90445198.1018628593.00446898.2022831693.10446498.4031137093.30446898.5035340393.40447398.6033444093.50447798.7043548293.60448999.0056063193.90449999.2067575594.104410899.4079090194.004412699.801.0771.36894.004412199.709621.16494.004413099.901.0771.36894.004413099.901.0771.36894.00	(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
91.70323 $66.90$ 3122591.80346 $97.00$ 2622891.903510 $97.10$ 2223092.003613 $97.20$ 1723292.103817 $97.30$ 1323392.203921 $97.40$ 823392.304025 $97.50$ 2923592.604333 $97.70$ 7524592.604438 $97.80$ 9925492.704442 $97.90$ 12226592.80444698.0014527992.90445198.1018629593.00445598.2022831493.10446098.3026934193.20446498.4031137093.30446898.9051857793.60447398.6039444093.50447798.7043548293.60449999.2067575594.104410899.4079090194.00449999.2067575594.104411799.609051.07194.504412199.709621.16494.604412699.801.0201.26394.7044<	91.60	31	0	96.80	35	221
91.80346 $97.00$ 2622891.903510 $97.10$ 2223092.103817 $97.30$ 1323392.203921 $97.60$ 823492.304025 $97.50$ 2923592.40412997.605223992.504333 $97.70$ 7524592.604438 $97.80$ 9925692.80444698.0014527992.90445198.1018628593.00446098.3026934193.10446098.3026934193.20446898.5035340393.30446898.5035340393.50447798.6033444093.60448298.8047752793.70448699.9056063193.90449099.0056063193.90449599.1061760094.004411299.5084898394.004412699.801,0201,26394.404411299.5084898394.4044134100.001,1871,59595.504416595.604412695.5044 <td></td> <td>32</td> <td></td> <td>96.90</td> <td>31</td> <td>225</td>		32		96.90	31	225
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						
92.003613 $97.20$ 17 $222$ $92.10$ 3817 $97.30$ 13 $233$ $92.20$ 3921 $97.40$ 8 $234$ $92.30$ 4025 $97.50$ 29 $235$ $92.40$ 4129 $97.60$ 52 $239$ $92.50$ 4333 $97.70$ 75 $245$ $92.60$ 4442 $97.90$ $122$ $265$ $92.70$ 4442 $97.90$ $122$ $265$ $92.80$ 4446 $98.00$ $145$ $279$ $92.90$ 4455 $98.20$ $228$ $316$ $93.10$ 4460 $98.30$ $269$ $341$ $93.20$ 4468 $98.60$ $353$ $403$ $93.30$ 4468 $98.60$ $394$ $440$ $93.50$ 4473 $98.60$ $394$ $440$ $93.50$ 4482 $98.80$ $477$ $527$ $93.70$ 4486 $98.90$ $518$ $577$ $93.80$ 4490 $99.00$ $560$ $631$ $93.90$ 4495 $99.10$ $617$ $690$ $94.00$ 44112 $99.50$ $848$ $983$ $94.40$ 44114 $99.90$ $1.077$ $1.368$ $94.50$ 44126 $99.80$ $1.020$ $1.263$ $94.60$ 44126 $99.80$ $1.020$ $1.263$ $94.60$ 44126						
92.103817 $97.30$ 13 $233$ $92.20$ $39$ $21$ $97.40$ $8$ $234$ $92.30$ $40$ $25$ $97.50$ $29$ $235$ $92.40$ $41$ $29$ $97.60$ $52$ $239$ $92.50$ $43$ $33$ $97.70$ $75$ $245$ $92.60$ $44$ $38$ $97.80$ $99$ $254$ $92.70$ $44$ $42$ $97.90$ $122$ $265$ $92.80$ $44$ $46$ $98.00$ $145$ $279$ $92.90$ $44$ $55$ $98.20$ $228$ $316$ $93.10$ $44$ $60$ $98.30$ $269$ $341$ $93.20$ $44$ $64$ $98.40$ $311$ $370$ $93.30$ $44$ $68$ $98.50$ $353$ $403$ $93.40$ $44$ $73$ $98.60$ $394$ $440$ $93.50$ $44$ $77$ $98.70$ $435$ $482$ $93.60$ $44$ $90$ $99.00$ $560$ $631$ $93.90$ $44$ $95$ $99.10$ $617$ $690$ $94.00$ $44$ $95$ $99.10$ $617$ $690$ $94.00$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $44$ $104$ $99.40$ $790$ $901$ $94.30$ $44$ $117$ $99.60$ $905$ $1,071$ $94.50$ $44$ $126$ $99.80$ $1,077$ $1,368$ $94.60$ $44$ $126$ <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
92.20 $39$ $21$ $97.40$ $8$ $234$ $92.30$ $40$ $25$ $97.50$ $29$ $235$ $92.40$ $41$ $29$ $97.60$ $52$ $239$ $92.50$ $43$ $33$ $97.70$ $75$ $245$ $92.60$ $44$ $42$ $97.90$ $122$ $265$ $92.80$ $44$ $46$ $98.00$ $145$ $279$ $92.90$ $44$ $55$ $98.20$ $228$ $316$ $93.00$ $44$ $60$ $98.30$ $269$ $341$ $93.20$ $44$ $64$ $98.40$ $3111$ $370$ $93.30$ $44$ $68$ $98.50$ $353$ $403$ $93.40$ $44$ $77$ $98.70$ $435$ $482$ $93.60$ $44$ $82$ $98.80$ $477$ $577$ $93.70$ $44$ $86$ $98.90$ $518$ $577$ $93.70$ $44$ $86$ $99.90$ $560$ $631$ $94.00$ $44$ $99$ $99.20$ $675$ $755$ $94.10$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $444$ $117$ $99.60$ $905$ $1.071$ $94.30$ $44$ $121$ $99.70$ $962$ $1.164$ $94.40$ $44$ $122$ $99.80$ $1.020$ $1.263$ $94.40$ $44$ $126$ $99.80$ $1.020$ $1.263$ $94.50$ $44$ $126$ $99.80$ $1.027$ $1.368$ $94.60$ <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>						
92.304025 $97.50$ 29235 $92.50$ 4333 $97.70$ $52$ 239 $92.50$ 4438 $97.80$ 99254 $92.70$ 4442 $97.90$ 122265 $92.80$ 4446 $98.00$ 145279 $92.90$ 4451 $98.10$ 186285 $93.00$ 4460 $98.30$ 269341 $93.20$ 4464 $98.40$ 311370 $93.30$ 4468 $98.50$ 353403 $93.40$ 4477 $98.70$ $435$ 482 $93.60$ 4482 $98.80$ 477527 $93.70$ 4486 $98.90$ 518 $577$ $93.80$ 4490 $99.00$ 560631 $93.90$ 4495 $99.10$ 617690 $94.00$ 44112 $99.50$ $848$ $983$ $94.40$ 44112 $99.50$ $848$ $983$ $94.40$ 44126 $99.80$ $1,020$ $1,263$ $94.50$ 44126 $99.80$ $1,020$ $1,263$ $94.60$ 44134 $100.00$ $1,135$ $1,479$ $94.80$ 44134 $100.00$ $1,135$ $1,479$ $94.80$ 44126 $99.80$ $1,020$ $1,263$ $94.60$ 44126 $99.80$ $1,020$ $1,263$ $94.80$ 44134 $100.10$						
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92.50 $43$ $33$ $97.70$ $75$ $245$ $92.60$ $44$ $38$ $97.80$ $99$ $254$ $92.70$ $44$ $42$ $97.90$ $122$ $265$ $92.80$ $44$ $46$ $98.00$ $145$ $279$ $92.90$ $44$ $51$ $98.10$ $186$ $295$ $93.00$ $44$ $60$ $98.30$ $269$ $341$ $93.20$ $44$ $64$ $98.40$ $311$ $370$ $93.30$ $44$ $68$ $98.50$ $353$ $403$ $93.40$ $44$ $77$ $98.70$ $435$ $482$ $93.60$ $44$ $82$ $98.80$ $477$ $527$ $93.70$ $44$ $86$ $98.90$ $518$ $577$ $93.70$ $44$ $86$ $98.90$ $518$ $577$ $93.80$ $44$ $99$ $99.20$ $675$ $755$ $94.10$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $44$ $126$ $99.80$ $1.020$ $1.263$ $94.40$ $44$ $117$ $99.60$ $905$ $1.071$ $94.50$ $44$ $126$ $99.80$ $1.020$ $1.263$ $94.70$ $44$ $139$ $100.10$ $1.187$ $1.595$ $95.50$ $44$ $139$ $100.10$ $1.187$ $1.595$ $95.50$ $44$ $126$ $99.80$ $1.020$ $1.263$ $96.$						
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96.10       44       192         96.20       44       196         96.30       44       200         96.40       44       205         96.50       44       209         96.60       44       214						
96.20       44       196         96.30       44       200         96.40       44       205         96.50       44       209         96.60       44       214						
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#### Summary for Link AP: Analysis Point

Inflow Area	a =	191,150 sf, 31.86% Impervious, Inflow Depth = 1.45" for 10-Year e	event
Inflow	=	3.16 cfs @ 12.17 hrs, Volume= 23,095 cf	
Primary	=	3.16 cfs @ 12.17 hrs, Volume= 23,095 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 DA1: DA1	Runoff Area=73,097 sf 11.74% Impervious Runoff Depth=0.91" Flow Length=337' Tc=17.4 min CN=43 Runoff=0.82 cfs 5,546 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=5,750 sf 0.78% Impervious Runoff Depth=1.45" Tc=10.0 min CN=50 Runoff=0.16 cfs 697 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 DA4A: DA4A	Runoff Area=9,253 sf 92.50% Impervious Runoff Depth=6.14" Tc=5.0 min CN=96 Runoff=1.41 cfs 4,731 cf
Subcatchment DA4B: DA4B	Runoff Area=7,277 sf 91.51% Impervious Runoff Depth=6.14" Tc=5.0 min CN=96 Runoff=1.11 cfs 3,720 cf
Subcatchment DA4C: DA4C	Runoff Area=16,289 sf 80.42% Impervious Runoff Depth=5.10" Tc=10.0 min CN=87 Runoff=1.89 cfs 6,927 cf
Subcatchment DA4D: DA4D	Runoff Area=11,846 sf 80.51% Impervious Runoff Depth=5.33" Tc=10.0 min CN=89 Runoff=1.42 cfs 5,260 cf
Subcatchment DA5: DA5	Runoff Area=53,575 sf 0.66% Impervious Runoff Depth=3.50" Flow Length=332' Tc=11.4 min CN=72 Runoff=4.21 cfs 15,622 cf
Reach DMH-1: DMH-1	Inflow=0.99 cfs 9,014 cf Outflow=0.99 cfs 9,014 cf
Reach DMH-3: DMH-3	Inflow=1.32 cfs 11,485 cf Outflow=1.32 cfs 11,485 cf
	<b>M-A1)</b> Peak Elev=88.49' Storage=2,648 cf Inflow=1.41 cfs 4,731 cf 0.00 cfs 640 cf Primary=0.33 cfs 2,471 cf Outflow=0.34 cfs 3,111 cf
	<b>M-A2)</b> Peak Elev=89.53' Storage=2,060 cf Inflow=1.11 cfs 3,720 cf 0.00 cfs 638 cf Primary=0.27 cfs 1,918 cf Outflow=0.27 cfs 2,556 cf
	<b>M-A3)</b> Peak Elev=90.56' Storage=3,718 cf Inflow=1.89 cfs 6,927 cf 0.00 cfs 880 cf Primary=0.39 cfs 4,086 cf Outflow=0.39 cfs 4,966 cf
Pond SW-A4: Stormtech MC-3500 (SWM Discarded=0	<b>M-A4)</b> Peak Elev=91.20' Storage=2,799 cf Inflow=1.42 cfs 5,260 cf 0.00 cfs 706 cf Primary=0.35 cfs 3,010 cf Outflow=0.35 cfs 3,717 cf
Pond SW-B: Bioretention Basin (SWM- Discarded=0.01 cfs 1,042 cf Primary=0.	<b>B)</b> Peak Elev=93.59' Storage=4,382 cf Inflow=2.27 cfs 8,164 cf .52 cfs 5,181 cf Secondary=0.00 cfs 0 cf Outflow=0.53 cfs 6,223 cf

post development (REV)	Type III 24-hr 25-Year Rainfall=6.61"
Prepared by HH Engineering Assoc	Printed 3/17/2023
HydroCAD® 10.20-2g s/n 12772 © 2022 HydroCAD Software Solution	ons LLC Page 107

Pond SW-C: Curtain Drain (SWM-C) Peak Elev=90.56' Storage=1,321 cf Inflow=0.82 cfs 5,546 cf Discarded=0.00 cfs 522 cf Primary=0.34 cfs 4,443 cf Secondary=0.00 cfs 0 cf Outflow=0.34 cfs 4,964 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=98.12' Storage=300 cf Inflow=0.12 cfs 798 cf Discarded=0.02 cfs 798 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 798 cf

Link AP: Analysis Point

Inflow=5.28 cfs 36,731 cf Primary=5.28 cfs 36,731 cf

Total Runoff Area = 203,612 sf Runoff Volume = 50,767 cf Average Runoff Depth = 2.99" 69.45% Pervious = 141,411 sf 30.55% Impervious = 62,201 sf

#### Summary for Subcatchment DA1: DA1

Runoff = 0.82 cfs @ 12.35 hrs, Volume= Routed to Pond SW-C : Curtain Drain (SWM-C) 5,546 cf, Depth= 0.91"

A	rea (sf)	CN D	escription		
	8,584			ing, HSG A	
	35,028				ood, HSG A
	910	74 >	75% Gras	s cover, Go	ood, HSG C
	27,956			od, HSG A	
	619	70 V	Voods, Go	od, HSG C	
	73,097	43 V	Veighted A	verage	
	64,513	8	8.26% Per	vious Area	
	8,584	1	1.74% 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
					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 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	G C	
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 = 0.16 cfs @ 12.16 hrs, Volume= 697 cf, Depth= 1.45" Routed to Pond SW-B : Bioretention Basin (SWM-B)

A	rea (sf)	CN	Description				
	45	98	Paved park	ing, HSG C			
	4,009	39	>75% Ġras	s cover, Go	ood, HSG A		
	1,696	74	>75% Gras	s cover, Go	ood, HSG C		
	5,750	50	Weighted A	verage			
	5,705		99.22% Pervious Area				
	45		0.78% Impervious Area				
Тс	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	,	(cfs)	I		
10.0					Direct Entry, Direct		

#### **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				
	1,303	98	Paved park	ing, HSG A	N		
	5,621	39	>75% Gras	s cover, Go	bod, HSG A		
	5,538	30	Woods, Go	od, HSG A			
	12,462	41	Weighted Average				
	11,159		89.54% Pervious Area				
	1,303		10.46% Impervious Area				
-		0		0			
ŢĊ	Length	Slope		Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
10.0					Direct Entry, Direct Entry		

#### Summary for Subcatchment DA4A: DA4A

Runoff = 1.41 cfs @ 12.07 hrs, Volume= 4,731 cf, Depth= 6.14" Routed to Pond SW-A1 : Stormtech MC-3500 (SWM-A1)

A	rea (sf)	CN	Description				
	8,559	98	Paved parking, HSG C				
	694	74	>75% Gras	s cover, Go	bod, HSG C		
	9,253 694 8,559	96	Weighted A 7.50% Perv 92.50% Imp	vious Area	ea		
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description		
5.0					Direct Entry, Direct Entry		

#### Summary for Subcatchment DA4B: DA4B

Runoff = 1.11 cfs @ 12.07 hrs, Volume= 3,720 cf, Depth= 6.14" Routed to Pond SW-A2 : Stormtech MC-3500 (SWM-A2)

Description				
-				

#### Summary for Subcatchment DA4C: DA4C

Runoff = 1.89 cfs @ 12.14 hrs, Volume= 6,927 cf, Depth= 5.10" Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

A	rea (sf)	CN	CN Description					
	6,556	98	Paved park	ing, HSG A	A Contraction of the second se			
	6,543	98	Paved park	ing, HSG C				
	1,382	39	>75% Gras	s cover, Go	bod, HSG A			
	649	74	>75% Gras	s cover, Go	bod, HSG C			
	1,159	30	Woods, Go	od, HSG A				
	16,289	87	87 Weighted Average					
	3,190		19.58% Pervious Area					
	13,099		80.42% Imp	ervious Ar	ea			
Тс	Length	Slope		Capacity	Description			
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)				
10.0					Direct Entry, Direct Entry			

#### Summary for Subcatchment DA4D: DA4D

Runoff = 1.42 cfs @ 12.14 hrs, Volume= 5,260 cf, Depth= 5.33" Routed to Pond SW-A4 : Stormtech MC-3500 (SWM-A4)

Ar	rea (sf)	CN	I Description				
	1,590	98	Paved park	ing, HSG A			
	7,947	98	Paved park	ing, HSG C			
	1,415	39	>75% Gras	s cover, Go	bod, HSG A		
	894	74	>75% Grass cover, Good, HSG C				
	11,846	89	89 Weighted Average				
	2,309		19.49% Pervious Area				
	9,537		80.51% Impervious Area				
Тс	Length	Slope	e Velocity	Capacity	Description		
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)	·		
10.0					Direct Entry, Direct Entry		

#### **Summary for Subcatchment DA5: DA5**

Runoff = 4.21 cfs @ 12.16 hrs, Volume= Routed to Link AP : Analysis Point 15,622 cf, Depth= 3.50"

A	rea (sf)	CN D	escription					
	352	98 P	98 Paved parking, HSG C					
	22,627	74 >	74 >75% Grass cover, Good, HSG C					
	30,596	70 V	70 Woods, Good, HSG C					
	53,575	72 V	Veighted A	verage				
	53,223	9	9.34% Per	vious Area				
	352	0	.66% 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 Reach DMH-1: DMH-1

 Inflow Area =
 35,412 sf, 82.73% Impervious, Inflow Depth =
 3.05" for 25-Year event

 Inflow =
 0.99 cfs @
 12.54 hrs, Volume=
 9,014 cf

 Outflow =
 0.99 cfs @
 12.54 hrs, Volume=
 9,014 cf, Atten= 0%, Lag= 0.0 min

 Routed to Reach DMH-3 : DMH-3
 0.000 cfs
 0.000 cfs
 0.000 cfs

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

# Summary for Reach DMH-3: DMH-3

 Inflow Area =
 44,665 sf, 84.75% Impervious, Inflow Depth = 3.09" for 25-Year event

 Inflow =
 1.32 cfs @
 12.51 hrs, Volume=
 11,485 cf

 Outflow =
 1.32 cfs @
 12.51 hrs, Volume=
 11,485 cf, Atten= 0%, Lag= 0.0 min

 Routed to Link AP : Analysis Point
 Point
 11,485 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

#### Summary for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Outflow Discarded Primary	= 1.4 = 0.3 = 0.0 = 0.3	9,253 sf, 92.50 1 cfs @ 12.07 h 4 cfs @ 12.44 h 0 cfs @ 3.50 h 3 cfs @ 12.44 h MH-3 : DMH-3	nrs, Volume= 3,111 cf, Atten= 76%, Lag= 22.3 min 640 cf				
	Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 88.49' @ 12.44 hrs Surf.Area= 1,108 sf Storage= 2,648 cf						
Plug-Flow detention time= 511.2 min calculated for 3,111 cf (66% of inflow) Center-of-Mass det. time= 411.2 min(1,166.4-755.2)							
Volume	Invert	Avail.Storage	Storage Description				
#1A	85.00'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A				
#2A	85.75'	2,069 cf	6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids <b>ADS_StormTech MC-3500 d +Cap</b> x 18 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 18 Chambers in 3 Rows

Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf

3,680 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	12.0" Round Outlet Pipe
	-		L= 6.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 85.00' / 84.95' S= 0.0083 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	87.70'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	88.50'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.35'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 3.50 hrs HW=85.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.33 cfs @ 12.44 hrs HW=88.49' (Free Discharge) 1=Outlet Pipe (Passes 0.33 cfs of 6.54 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.33 cfs @ 3.81 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

## Pond SW-A1: Stormtech MC-3500 (SWM-A1) - 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 3 rows = 89.4 cf

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

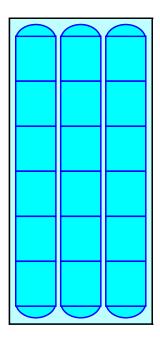
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

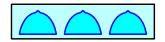
18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Floyetian	Surface	Storage		Surface	Storage
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.00	<u> </u>	0	90.20	1,108	3,547
85.10	1,108	44	90.30	1,108	3,591
85.20	1,108	89	90.40	1,108	3,635
85.30	1,108	133	90.50	1,108	3,680
85.40	1,108	177		.,	-,
85.50	1,108	222			
85.60	1,108	266			
85.70	1,108	310			
85.80	1,108	378			
85.90	1,108	470			
86.00	1,108	561			
86.10	1,108	652			
86.20	1,108	743			
86.30	1,108	833			
86.40	1,108	922			
86.50	1,108	1,012			
86.60 86.70	1,108 1,108	1,101			
86.80	1,108	1,189 1,277			
86.90	1,108	1,364			
87.00	1,108	1,451			
87.10	1,108	1,537			
87.20	1,108	1,623			
87.30	1,108	1,708			
87.40	1,108	1,792			
87.50	1,108	1,875			
87.60	1,108	1,958			
87.70	1,108	2,039			
87.80	1,108	2,120			
87.90	1,108	2,200			
88.00	1,108	2,279			
88.10	1,108	2,356			
88.20	1,108	2,432			
88.30 88.40	1,108 1,108	2,507			
88.50	1,108	2,581 2,653			
88.60	1,108	2,000			
88.70	1,108	2,724			
88.80	1,108	2,859			
88.90	1,108	2,923			
89.00	1,108	2,984			
89.10	1,108	3,042			
89.20	1,108	3,094			
89.30	1,108	3,144			
89.40	1,108	3,191			
89.50	1,108	3,236			
89.60	1,108	3,281			
89.70	1,108	3,325			
89.80 89.90	1,108 1,108	3,369 3,414			
90.00	1,108	3,458			
90.10	1,108	3,502			
55.10	1,100	0,002			
			I		

#### Summary for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Inflow Area =							
Inflow = Outflow =		7 cfs @ 12.07 f	,	-, -		n= 75%,	Lag= 21.8 min
Discarded =	0.0	0 cfs @ 3.84 h	rs, Volume=	638 c	f		
Primary =	0.2	7 cfs @ 12.43 h	rs, Volume=	1,918 c	f		
Routed to	Reach DI	MH-1 : DMH-1					
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 89.53' @ 12.43 hrs Surf.Area= 1,108 sf Storage= 2,060 cf							
Plug-Flow detention time= 566.7 min calculated for 2,556 cf (69% of inflow)							
Center-of-Mass det. time= 470.9 min ( 1,226.1 - 755.2 )							
Volume	Invert	Avail.Storage	Storage Des	cription			
#1 A	06 001	1 611 of	00 75% 4/ 14 40				

#1A	86.80'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A
			6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids
#2A	87.55'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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
			18 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		3,680 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	88.95'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	89.55'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.05'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	86.80'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 3.84 hrs HW=86.86' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.27 cfs @ 12.43 hrs HW=89.53' (Free Discharge) 1=Outlet Pipe (Passes 0.27 cfs of 8.86 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.27 cfs @ 3.08 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

### Pond SW-A2: Stormtech MC-3500 (SWM-A2) - 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 3 rows = 89.4 cf

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

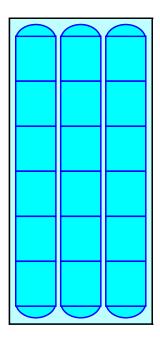
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

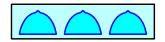
18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
86.80	1,108	0	92.00	1,108	3,547
86.90	1,108	44	92.10	1,108	3,591
87.00	1,108	89	92.20	1,108	3,635
87.10	1,108	133	92.30	1,108	3,680
87.20	1,108	177			
87.30 87.40	1,108 1,108	222 266			
87.50	1,108	310			
87.60	1,108	378			
87.70	1,108	470			
87.80	1,108	561			
87.90	1,108	652			
88.00	1,108	743			
88.10	1,108	833 922			
88.20 88.30	1,108 1,108	1,012			
88.40	1,108	1,101			
88.50	1,108	1,189			
88.60	1,108	1,277			
88.70	1,108	1,364			
88.80	1,108	1,451			
88.90	1,108	1,537			
89.00	1,108	1,623			
89.10 89.20	1,108 1,108	1,708 1,792			
89.30	1,108	1,875			
89.40	1,108	1,958			
89.50	1,108	2,039			
89.60	1,108	2,120			
89.70	1,108	2,200			
89.80	1,108	2,279			
89.90	1,108	2,356			
90.00 90.10	1,108 1,108	2,432 2,507			
90.20	1,108	2,581			
90.30	1,108	2,653			
90.40	1,108	2,724			
90.50	1,108	2,792			
90.60	1,108	2,859			
90.70	1,108	2,923			
90.80 90.90	1,108 1,108	2,984 3,042			
91.00	1,108	3,094			
91.10	1,108	3,144			
91.20	1,108	3,191			
91.30	1,108	3,236			
91.40	1,108	3,281			
91.50	1,108 1,108	3,325			
91.60 91.70	1,108	3,369 3,414			
91.80	1,108	3,458			
91.90	1,108	3,502			
		-			

### Summary for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Inflow Area =	16,289 sf, 80.42% Impervious, Inflow Depth = 5.10" for 25-Year event				
Inflow =	1.89 cfs @ 12.14 hrs, Volume= 6,927 cf				
Outflow =	0.39 cfs @ 12.61 hrs, Volume= 4,966 cf, Atten= 79%, Lag= 28.2 min				
Discarded =	0.00 cfs @ 6.74 hrs, Volume= 880 cf				
Primary =	0.39 cfs @ 12.61 hrs, Volume= 4,086 cf				
Routed to Rea	ch DMH-1 : DMH-1				
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs					
Peak Elev= 90.56' @ 12.61 hrs Surf.Area= 1,598 sf Storage= 3,718 cf					
Plug-Flow detention time= 457.9 min calculated for 4,966 cf (72% of inflow)					
Center-of-Mass det. time= 368.0 min ( 1,163.0 - 795.0 )					

Volume	Invert	Avail.Storage	Storage Description
#1A	87.20'	2,292 cf	22.75'W x 70.23'L x 5.50'H Field A
			8,788 cf Overall - 3,058 cf Embedded = 5,729 cf x 40.0% Voids
#2A	87.95'	3,058 cf	ADS_StormTech MC-3500 d +Cap x 27 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
			27 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		5,350 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.55'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	90.60'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 6.74 hrs HW=87.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.39 cfs @ 12.61 hrs HW=90.56' (Free Discharge) 1=Outlet Pipe (Passes 0.39 cfs of 10.71 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.39 cfs @ 4.42 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

## Pond SW-A3: Stormtech MC-3500 (SWM-A3) - 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 3 rows = 89.4 cf

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

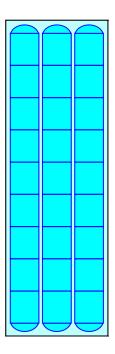
9 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 68.23' Row Length +12.0" End Stone x 2 = 70.23' Base Length
3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

27 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 3,058.1 cf Chamber Storage

8,787.5 cf Field - 3,058.1 cf Chambers = 5,729.4 cf Stone x 40.0% Voids = 2,291.8 cf Stone Storage

Chamber Storage + Stone Storage = 5,349.9 cf = 0.123 afOverall Storage Efficiency = 60.9%Overall System Size =  $70.23' \times 22.75' \times 5.50'$ 

27 Chambers 325.5 cy Field 212.2 cy Stone





# Stage-Area-Storage for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Elevation	Surface	Storage	Elevation	Surface	Storage
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		1.598				
87.50       1,598       192       92.70       1,598       5,350         87.60       1,598       256         87.70       1,598       320         87.80       1,598       383         87.90       1,598       383         87.90       1,598       447         88.00       1,598       546         88.10       1,598       680         88.20       1,598       813         88.30       1,598       1,078         88.50       1,598       1,210         88.60       1,598       1,210         88.60       1,598       1,471         88.70       1,598       1,471         88.90       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,730         89.00       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,610         89.60       1,598       2,610         89.70       1,598       2,731						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$						
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88.20       1,598       813         88.30       1,598       946         88.40       1,598       1,078         88.50       1,598       1,210         88.60       1,598       1,341         88.70       1,598       1,471         88.80       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,363         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
88.30       1,598       946         88.40       1,598       1,078         88.50       1,598       1,210         88.60       1,598       1,341         88.70       1,598       1,471         88.80       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,363         89.40       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$						
88.60       1,598       1,341         88.70       1,598       1,471         88.80       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
88.70       1,598       1,471         88.80       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
88.80       1,598       1,601         88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
88.90       1,598       1,730         89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
89.00       1,598       1,858         89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
89.10       1,598       1,986         89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
89.20       1,598       2,113         89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
89.30       1,598       2,238         89.40       1,598       2,363         89.50       1,598       2,487         89.60       1,598       2,610         89.70       1,598       2,731						
89.50         1,598         2,487           89.60         1,598         2,610           89.70         1,598         2,731						
89.60         1,598         2,610           89.70         1,598         2,731	89.40	1,598				
89.70 1,598 2,731						
	89.80	1,598	2,852			
89.90 1,598 2,971						
90.00 1,598 3,089						
90.10 1,598 3,205 90.20 1,598 3,320						
90.20 1,598 3,433						
90.40 1,598 3,544						
90.50 1,598 3,653						
90.60 1,598 3,760						
90.70 1,598 3,865						
90.80 1,598 3,968	90.80	1,598	3,968			
90.90 1,598 4,067						
91.00 1,598 4,164						
91.10 1,598 4,257						
91.20 1,598 4,346						
91.30 1,598 4,430						
91.40 1,598 4,506 91.50 1,598 4,577						
91.50 1,598 4,577 91.60 1,598 4,645						
91.70 1,598 4,711						
91.80 1,598 4,775						
91.90 1,598 4,839						
92.00 1,598 4,903						
92.10 1,598 4,966						
92.20 1,598 5,030	92.20					
92.30 1,598 5,094	92.30	1,598	5,094			
				l		

## Summary for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Outflow Discarded Primary	= 1.4 = 0.3 = 0.0 = 0.3	42 cfs @ 12.14 h	nrs, Volume= 3,717 cf, Atten= 75%, Lag= 25.6 min 706 cf			
	Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 91.20' @ 12.56 hrs Surf.Area= 1,271 sf Storage= 2,799 cf					
•		me= 473.1 min ca me= 382.0 min ( 1	alculated for 3,717 cf (71% of inflow) 1,170.7 - 788.7)			
Volume	Invert	Avail.Storage	Storage Description			
#1A	88.00'	1,838 cf	22.75'W x 55.89'L x 5.50'H Field A			
#2A	88.75'	2,398 cf	6,993 cf Overall - 2,398 cf Embedded = 4,595 cf x 40.0% Voids <b>ADS_StormTech MC-3500 d +Cap</b> x 21 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 21 Chambers in 3 Rows Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf			

4,236 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	12.0" Round Outlet Pipe
	-		L= 98.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 88.80' / 86.90' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	90.35'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	91.20'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	92.25'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	88.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 6.22 hrs HW=88.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.35 cfs @ 12.56 hrs HW=91.20' (Free Discharge) 1=Outlet Pipe (Passes 0.35 cfs of 5.21 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.35 cfs @ 3.97 fps) 3=Upper Orifice (Controls 0.00 cfs) 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

## Pond SW-A4: Stormtech MC-3500 (SWM-A4) - 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 3 rows = 89.4 cf

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

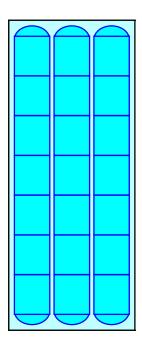
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

21 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,398.4 cf Chamber Storage

6,993.2 cf Field - 2,398.4 cf Chambers = 4,594.8 cf Stone x 40.0% Voids = 1,837.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,236.3 cf = 0.097 afOverall Storage Efficiency = 60.6%Overall System Size =  $55.89' \times 22.75' \times 5.50'$ 

21 Chambers 259.0 cy Field 170.2 cy Stone





# Stage-Area-Storage for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Flowetien	Curfees	Ctorers		Curferer	Ctorers
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	<u> </u>	0	93.20	1,271	4,084
88.10	1,271	51	93.30	1,271	4,135
88.20	1,271	102	93.40	1,271	4,185
88.30	1,271	153	93.50	1,271	4,236
88.40	1,271	203		.,	-,••
88.50	1,271	254			
88.60	1,271	305			
88.70	1,271	356			
88.80	1,271	434			
88.90	1,271	540			
89.00	1,271	645			
89.10	1,271	750			
89.20	1,271	854			
89.30	1,271	958			
89.40	1,271	1,062			
89.50	1,271	1,165			
89.60	1,271	1,267			
89.70	1,271	1,369			
89.80	1,271	1,471			
89.90	1,271	1,571			
90.00	1,271	1,672			
90.10	1,271 1,271	1,771 1,870			
90.20 90.30	1,271	1,967			
90.40	1,271	2,064			
90.50	1,271	2,004			
90.60	1,271	2,256			
90.70	1,271	2,200			
90.80	1,271	2,443			
90.90	1,271	2,535			
91.00	1,271	2,626			
91.10	1,271	2,715			
91.20	1,271	2,803			
91.30	1,271	2,889			
91.40	1,271	2,974			
91.50	1,271	3,057			
91.60	1,271	3,138			
91.70	1,271	3,217			
91.80	1,271	3,294			
91.90	1,271	3,368			
92.00 92.10	1,271 1,271	3,438			
92.10	1,271	3,504 3,565			
92.30	1,271	3,621			
92.40	1,271	3,676			
92.50	1,271	3,728			
92.60	1,271	3,779			
92.70	1,271	3,829			
92.80	1,271	3,880			
92.90	1,271	3,931			
93.00	1,271	3,982			
93.10	1,271	4,033			
			l		

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

19,813 sf, 71.21% Impervious, Inflow Depth = 4.94" for 25-Year event Inflow Area = Inflow = 2.27 cfs @ 12.07 hrs, Volume= 8.164 cf 0.53 cfs @ 12.48 hrs, Volume= Outflow 6,223 cf, Atten= 77%, Lag= 24.3 min = Discarded = 0.01 cfs @ 12.48 hrs, Volume= 1,042 cf 0.52 cfs @ 12.48 hrs, Volume= 5,181 cf Primary = Routed to Link AP : Analysis Point Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 93.59' @ 12.48 hrs Surf.Area= 2,400 sf Storage= 4,382 cf

Plug-Flow detention time= 452.4 min calculated for 6,221 cf (76% of inflow) Center-of-Mass det. time= 364.9 min (1,120.2 - 755.3)

Volume	Invert	Avail.Stor	rage Storage	Description	
#1	91.00'	7,78	80 cf Custom	n Stage Data (Pris	matic) Listed below (Recalc)
Elevatio	on Su	rf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
91.0	00	1,079	0	0	
92.0	00	1,528	1,304	1,304	
93.0	00	2,023	1,776	3,079	
94.0	00	2,663	2,343	5,422	
94.8	30	3,231	2,358	7,780	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	89.00'	15.0" Round	l Outlet Pipe	
	2		L= 361.0' CI	MP, square edge l	headwall, Ke= 0.500
			Inlet / Outlet	Invert= 89.00' / 87	'.00' S= 0.0055 '/' Cc= 0.900
				,	, Flow Area= 1.23 sf
#2	Device 1	92.75'		w Flow Orifice	
				ir flow at low head	
#3	Device 1	93.60'		Horiz. Grate C:	
	0	04.001		ir flow at low head	
#4	Secondary	94.30'			I-Crested Rectangular Weir
			· · ·	50 4.00 4.50 0	.80 1.00 1.20 1.40 1.60 1.80 2.00
					8 2.67 2.65 2.64 2.64 2.68 2.68
				92 2.97 3.07 3.3	
#5	Discarded	91.00'		xfiltration over S	· –
110	Biccardou	51.00			

**Discarded OutFlow** Max=0.01 cfs @ 12.48 hrs HW=93.59' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.52 cfs @ 12.48 hrs HW=93.59' (Free Discharge) 1=Outlet Pipe (Passes 0.52 cfs of 8.94 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.52 cfs @ 3.82 fps) 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 4=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	1,079	0	93.60	2,407	4,408
91.05	1,101	55	93.65	2,439	4,529
91.10	1,124	110	93.70	2,471	4,652
91.15	1,146	167	93.75	2,503	4,776
91.20	1,169	225	93.80	2,535	4,902
91.25	1,191	284	93.85	2,567	5,030
91.30	1,214	344	93.90	2,599	5,159
91.35	1,236	405	93.95	2,631	5,290
91.40	1,259	468	94.00	2,663	5,422
91.45	1,281	531	94.05	2,698	5,556
91.50	1,304	596	94.10	2,734	5,692
91.55	1,326	661	94.15	2,770	5,829
91.60	1,348	728	94.20	2,805	5,969
91.65	1,371	796	94.25	2,841	6,110
91.70	1,393	865	94.30	2,876	6,253
91.75	1,416	936	94.35	2,911	6,398
91.80	1,438	1,007	94.40	2,947	6,544
91.85	1,461	1,079	94.45	2,983	6,692
91.90	1,483	1,153	94.50	3,018	6,842
91.95	1,506	1,228	94.55	3,053	6,994
92.00	1,528	1,304	94.60	3,089	7,148
92.05	1,553	1,381	94.65	3,125	7,303
92.10	1,557	1,459	94.70	3,160	7,460
92.15	1,602	1,538	94.75	3,196	7,619
92.20	1,627	1,619	94.80	3,231	7,780
92.25	1,652	1,701	54.00	0,201	1,100
92.30	1,676	1,784			
92.35	1,701	1,869			
92.40	1,726	1,954			
92.45	1,751	2,041			
92.50	1,776	2,129			
92.55	1,800	2,120			
92.60	1,825	2,309			
92.65	1,850	2,401			
92.70	1,875	2,494			
92.75	1,899	2,589			
92.80	1,924	2,684			
92.85	1,949	2,781			
92.90	1,974	2,879			
92.95	1,998	2,978			
93.00	2,023	3,079			
93.05	2,055	3,181			
93.10	2,087	3,284			
93.15	2,119	3,390			
93.20	2,151	3,496			
93.25	2,183	3,605			
93.30	2,215	3,715			
93.35	2,247	3,826			
93.40	2,279	3,939			
93.45	2,311	4,054			
93.50	2,343	4,171			
93.55	2,375	4,288			
	,	,			

### Summary for Pond SW-C: Curtain Drain (SWM-C)

Inflow Area =73,097 sf, 11.74% Impervious, Inflow Depth =0.91"for 25-Year eventInflow =0.82 cfs @12.35 hrs, Volume=5,546 cfOutflow =0.34 cfs @12.88 hrs, Volume=4,964 cf, Atten= 59%, Lag= 31.4Discarded =0.00 cfs @12.12 hrs, Volume=522 cfPrimary =0.34 cfs @12.88 hrs, Volume=4,443 cfRouted to Link AP : Analysis Point0 cf0 cfRouted to Link AP : Analysis Point0 cf	
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs	
Peak Elev= 90.56' @ 12.88 hrs Surf.Area= 1,045 sf Storage= 1,321 cf	
Plug-Flow detention time= 262.8 min calculated for 4,963 cf (89% of inflow)	
Center-of-Mass det. time= $214.3 \text{ min} (1,140.2 - 925.8)$	
Volume Invert Avail.Storage Storage Description	
#1 87.40' 3,804 cf <b>2.50'W x 418.00'L x 9.10'H Prismatoid</b>	
9,509 cf Overall x 40.0% Voids	
Device Routing Invert Outlet Devices	
#1 Primary 87.20' 8.0" Round Outlet Pipe	
L= 108.0' CMP, end-section conforming to fill, Ke= 0.500	0
Inlet / Outlet Invert= 87.20' / 85.45' S= 0.0162 '/' Cc= 0.90 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf	J
#2 Primary 89.75' <b>4.0" Vert. Low flow orifice</b> C= 0.600	
Limited to weir flow at low heads	
#3 Device 1 90.75' 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28	)
#4 Discarded 87.40' 0.100 in/hr Exfiltration over Surface area	
#5 Secondary 96.00' 200.0' long x 0.5' breadth Broad-Crested Rectangular We	r
Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32	
Cool. (Linguish) 2.00 2.02 0.00 0.02	

**Discarded OutFlow** Max=0.00 cfs @ 12.12 hrs HW=87.50' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.34 cfs @ 12.88 hrs HW=90.56' (Free Discharge) 1=Outlet Pipe (Passes 0.00 cfs of 2.66 cfs potential flow) 3=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

**2=Low flow orifice** (Orifice Controls 0.34 cfs @ 3.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### Stage-Area-Storage for Pond SW-C: Curtain Drain (SWM-C)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.40	1,045	0	92.60	1,045	2,174
87.50	1,045	42	92.70	1,045	2,215
87.60	1,045	84	92.80	1,045	2,257
87.70	1,045	125	92.90	1,045	2,299
87.80	1,045	167	93.00	1,045	2,341
87.90	1,045	209	93.10	1,045	2,383
88.00	1,045	203	93.20	1,045	2,303
88.10	1,045	293	93.30	1,045	
88.20			93.40		2,466
	1,045	334		1,045	2,508
88.30	1,045	376	93.50	1,045	2,550
88.40	1,045	418	93.60	1,045	2,592
88.50	1,045	460	93.70	1,045	2,633
88.60	1,045	502	93.80	1,045	2,675
88.70	1,045	543	93.90	1,045	2,717
88.80	1,045	585	94.00	1,045	2,759
88.90	1,045	627	94.10	1,045	2,801
89.00	1,045	669	94.20	1,045	2,842
89.10	1,045	711	94.30	1,045	2,884
89.20	1,045	752	94.40	1,045	2,926
89.30	1,045	794	94.50	1,045	2,968
89.40	1,045	836	94.60	1,045	3,010
89.50	1,045	878	94.70	1,045	3,051
89.60	1,045	920	94.80	1,045	3,093
89.70	1,045	961	94.90	1,045	3,135
89.80	1,045	1,003	95.00	1,045	3,177
89.90	1,045	1,045	95.10	1,045	3,219
90.00	1,045	1,087	95.20	1,045	3,260
90.10	1,045	1,129	95.30	1,045	3,302
90.20	1,045	1,170	95.40	1,045	3,344
90.30	1,045	1,212	95.50	1,045	3,386
90.40	1,045	1,254	95.60	1,045	3,428
90.50	1,045	1,296	95.70	1,045	3,469
90.60	1,045	1,338	95.80	1,045	3,409
90.70	1,045	1,379	95.90	1,045	3,553
90.80	1,045	1,421	96.00	1,045	3,595
90.90	1,045	1,463	96.10	1,045	3,637
					3,678
91.00	1,045	1,505	96.20	1,045	
91.10	1,045	1,547	96.30	1,045	3,720
91.20	1,045	1,588	96.40	1,045	3,762
91.30	1,045	1,630	96.50	1,045	3,804
91.40	1,045	1,672			
91.50	1,045	1,714			
91.60	1,045	1,756			
91.70	1,045	1,797			
91.80	1,045	1,839			
91.90	1,045	1,881			
92.00	1,045	1,923			
92.10	1,045	1,965			
92.20	1,045	2,006			
92.30	1,045	2,048			
92.40	1,045	2,090			
92.50	1,045	2,132			
			1		

### 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 @ 14.83 hrs, Volume=	798 cf, Atten= 80%, Lag= 156.0 min
Discarded =	0.02 cfs @ 14.83 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= 98.12' @ 14.83 hrs Surf.Area= 197 sf Storage= 300 cf

Plug-Flow detention time= 367.4 min calculated for 798 cf (100% of inflow) Center-of-Mass det. time= 367.6 min (1,298.0 - 930.5)

Volume	Invert	Avail.Stor	rage Stora	ge Description	
#1	91.60'	1,59	95 cf Dryw	ell & Basin (Prism	atic) Listed below (Recalc)
		<i>.</i> .			
Elevatio		ırf.Area	Inc.Store		
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
91.6	50	31	0	0	
92.6	50	44	38	38	
93.6	50	44	44	82	
94.6	50	44	44	126	
95.6	50	44	44	170	
96.6	50	44	44	214	
97.4	49	4	21	235	
97.5	50	29	0	235	
98.0	00	145	44	279	
99.0	00	560	353	631	
100.0	00	1,135	848	1,479	
100.1	10	1,187	116	1,595	
Device	Routing	Invert	Outlet Dev	ices	
#1	Discarded	91.60'	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	.74 2.79 2.88

**Discarded OutFlow** Max=0.02 cfs @ 14.83 hrs HW=98.12' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.60' (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
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92.103817 $97.30$ 13 $233$ $92.20$ $39$ $21$ $97.30$ $8$ $234$ $92.30$ $40$ $25$ $97.50$ $29$ $235$ $92.40$ $41$ $29$ $97.60$ $52$ $239$ $92.50$ $43$ $33$ $97.70$ $75$ $245$ $92.60$ $44$ $38$ $97.80$ $99$ $254$ $92.70$ $44$ $42$ $97.90$ $122$ $265$ $92.80$ $44$ $46$ $98.00$ $145$ $279$ $92.90$ $44$ $55$ $98.20$ $228$ $316$ $93.10$ $44$ $66$ $98.30$ $269$ $341$ $93.20$ $44$ $64$ $98.40$ $311$ $370$ $93.30$ $44$ $68$ $98.50$ $353$ $403$ $93.40$ $44$ $77$ $98.60$ $394$ $440$ $93.50$ $44$ $77$ $98.60$ $394$ $440$ $93.50$ $44$ $95$ $99.10$ $617$ $690$ $94.00$ $44$ $95$ $99.10$ $617$ $690$ $94.00$ $44$ $95$ $99.10$ $617$ $690$ $94.10$ $44$ $108$ $99.40$ $790$ $901$ $94.30$ $44$ $108$ $99.40$ $790$ $901$ $94.40$ $441$ $117$ $99.50$ $848$ $983$ $94.40$ $444$ $196$ $99.90$ $1,027$ $1,368$ $94.40$ $44$ $139$ <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
92.20 $39$ $21$ $97.40$ $8$ $234$ $92.30$ $40$ $25$ $97.50$ $29$ $235$ $92.40$ $41$ $29$ $97.60$ $52$ $239$ $92.50$ $43$ $33$ $97.70$ $75$ $245$ $92.60$ $44$ $42$ $97.90$ $122$ $265$ $92.80$ $44$ $46$ $98.00$ $145$ $279$ $92.90$ $44$ $55$ $98.20$ $228$ $316$ $93.00$ $44$ $65$ $98.20$ $228$ $316$ $93.10$ $44$ $60$ $98.30$ $269$ $341$ $93.20$ $44$ $64$ $98.40$ $311$ $370$ $93.30$ $44$ $68$ $98.50$ $353$ $403$ $93.30$ $44$ $68$ $98.90$ $518$ $577$ $93.70$ $44$ $86$ $98.90$ $518$ $577$ $93.70$ $44$ $90$ $99.00$ $560$ $631$ $93.90$ $44$ $95$ $99.10$ $617$ $690$ $94.10$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $44$ $104$ $99.30$ $732$ $825$ $94.20$ $44$ $104$ $99.90$ $1.077$ $1.586$ $94.40$ $44$ $117$ $99.60$ $905$ $1.071$ $94.50$ $44$ $126$ $99.80$ $1.020$ $1.282$ $94.50$ $44$ $126$ $99.80$ $1.020$ $1.282$ $94.50$ $44$						
92.30       40       25       97.50       29       235         92.40       41       29       97.60       52       239         92.50       43       33       97.70       75       245         92.60       44       38       97.80       99       254         92.70       44       42       97.90       122       265         92.80       44       46       98.00       145       279         92.90       44       55       98.20       228       316         93.10       44       60       98.30       269       341         93.20       44       64       98.40       311       370         93.30       44       68       98.50       353       403         93.50       44       73       98.60       394       440         93.50       44       77       98.70       435       482         93.60       39.40       44       90       99.00       560       631         93.70       44       86       98.90       518       577         93.80       44       90       99.20       675       755						
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93.00       44       55       98.20       228       316         93.10       44       60       98.30       269       341         93.20       44       64       98.40       311       370         93.30       44       68       98.50       353       403         93.40       44       73       98.60       394       440         93.50       44       77       98.70       435       482         93.60       44       82       98.80       477       527         93.70       44       86       98.90       518       577         93.80       44       90       99.00       560       631         93.90       44       95       99.10       617       690         94.00       44       99       99.20       675       755         94.10       44       108       99.40       790       901         94.30       44       117       99.60       905       1,071         94.30       44       126       99.80       1,020       1,263         94.60       44       130       99.90       1,077       1,368     <				98.00		
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94.90       44       139       100.10       1,187       1,595         95.00       44       143         95.10       44       148         95.20       44       152         95.30       44       156         95.40       44       161         95.50       44       165         95.60       44       170         95.70       44       174         95.80       44       183         96.00       44       183         96.10       44       192         96.20       44       196         96.30       44       200         96.40       44       205         96.50       44       209	94.70	44	130	99.90	1,077	
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96.40     44     205       96.50     44     209						
		44				
	96.60	44	214			
96.70 40 218	96.70	40	218			
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### Summary for Link AP: Analysis Point

Inflow Area	a =	191,150 sf, 31.86% Impervious	, Inflow Depth = 2.31" for 25-Year event
Inflow	=	5.28 cfs @ 12.19 hrs, Volume=	= 36,731 cf
Primary	=	5.28 cfs @ 12.19 hrs, Volume=	36,731 cf, Atten= 0%, Lag= 0.0 min

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

post development (REV)	Type III 24-hr	100-Year Rainfall=8.56"
Prepared by HH Engineering Assoc		Printed 3/17/2023
HydroCAD® 10.20-2g s/n 12772 © 2022 HydroCAD Software Soluti	ions LLC	Page 139

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=73,097 sf 11.74% Impervious Runoff Depth=1.82" Flow Length=337' Tc=17.4 min CN=43 Runoff=2.10 cfs 11,097 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=5,750 sf 0.78% Impervious Runoff Depth=2.60" Tc=10.0 min CN=50 Runoff=0.33 cfs 1,245 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 DA4A: DA4A	Runoff Area=9,253 sf 92.50% Impervious Runoff Depth=8.08" Tc=5.0 min CN=96 Runoff=1.83 cfs 6,230 cf
Subcatchment DA4B: DA4B	Runoff Area=7,277 sf 91.51% Impervious Runoff Depth=8.08" Tc=5.0 min CN=96 Runoff=1.44 cfs 4,900 cf
Subcatchment DA4C: DA4C	Runoff Area=16,289 sf 80.42% Impervious Runoff Depth=7.00" Tc=10.0 min CN=87 Runoff=2.55 cfs 9,496 cf
Subcatchment DA4D: DA4D	Runoff Area=11,846 sf 80.51% Impervious Runoff Depth=7.24" Tc=10.0 min CN=89 Runoff=1.89 cfs 7,144 cf
Subcatchment DA5: DA5	Runoff Area=53,575 sf 0.66% Impervious Runoff Depth=5.19" Flow Length=332' Tc=11.4 min CN=72 Runoff=6.24 cfs 23,167 cf
Reach DMH-1: DMH-1	Inflow=2.69 cfs 14,611 cf Outflow=2.69 cfs 14,611 cf
Reach DMH-3: DMH-3	Inflow=3.51 cfs 18,574 cf Outflow=3.51 cfs 18,574 cf
	<b>VM-A1)</b> Peak Elev=89.01' Storage=2,990 cf Inflow=1.83 cfs 6,230 cf =0.00 cfs 645 cf Primary=0.93 cfs 3,964 cf Outflow=0.93 cfs 4,609 cf
	<b>VM-A2)</b> Peak Elev=89.91' Storage=2,363 cf Inflow=1.44 cfs 4,900 cf =0.00 cfs 644 cf Primary=0.68 cfs 3,090 cf Outflow=0.68 cfs 3,734 cf
	<b>VM-A3)</b> Peak Elev=91.27' Storage=4,405 cf Inflow=2.55 cfs 9,496 cf =0.00 cfs 894 cf Primary=1.14 cfs 6,638 cf Outflow=1.14 cfs 7,532 cf
Pond SW-A4: Stormtech MC-3500 (SW Discarded=	<b>VM-A4)</b> Peak Elev=91.73' Storage=3,243 cf Inflow=1.89 cfs 7,144 cf =0.00 cfs 717 cf Primary=0.97 cfs 4,882 cf Outflow=0.97 cfs 5,599 cf
Pond SW-B: Bioretention Basin (SWM Discarded=0.01 cfs 1,055 cf Primary=	<b>I-B)</b> Peak Elev=93.74' Storage=4,757 cf Inflow=3.04 cfs 10,995 cf 1.99 cfs 7,995 cf Secondary=0.00 cfs 0 cf Outflow=2.00 cfs 9,050 cf

post development (REV)	Type III 24-hr	100-Year Rainfall=8.56"
Prepared by HH Engineering Assoc		Printed 3/17/2023
HydroCAD® 10.20-2g s/n 12772 © 2022 HydroCAD Software Solution	ons LLC	Page 140

Pond SW-C: Curtain Drain (SWM-C) Peak Elev=90.99' Storage=1,503 cf Inflow=2.10 cfs 11,097 cf Discarded=0.00 cfs 524 cf Primary=2.04 cfs 9,991 cf Secondary=0.00 cfs 0 cf Outflow=2.05 cfs 10,515 cf

Pond SW-D: Drywell & Basin (SWM-D) Peak Elev=98.87' Storage=562 cf Inflow=0.36 cfs 1,670 cf Discarded=0.06 cfs 1,670 cf Secondary=0.00 cfs 0 cf Outflow=0.06 cfs 1,670 cf

Link AP: Analysis Point

Inflow=10.77 cfs 59,728 cf Primary=10.77 cfs 59,728 cf

Total Runoff Area = 203,612 sf Runoff Volume = 74,700 cf Average Runoff Depth = 4.40" 69.45% Pervious = 141,411 sf 30.55% Impervious = 62,201 sf

### Summary for Subcatchment DA1: DA1

Runoff = 2.10 cfs @ 12.28 hrs, Volume= Routed to Pond SW-C : Curtain Drain (SWM-C) 11,097 cf, Depth= 1.82"

A	rea (sf)	CN D	escription					
	8,584		98 Paved parking, HSG A					
	35,028							
	910	74 >	75% Gras	s cover, Go	ood, HSG C			
	27,956			od, HSG A				
	619	70 V	Voods, Go	od, HSG C				
	73,097	43 V	Veighted A	verage				
	64,513	8	8.26% Per	vious Area				
	8,584	1	1.74% 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			
					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 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 C					
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 = 0.33 cfs @ 12.15 hrs, Volume= 1,245 cf, Depth= 2.60" Routed to Pond SW-B : Bioretention Basin (SWM-B)

A	rea (sf)	CN	Description					
	45	98	Paved parking, HSG C					
	4,009	39	>75% Ġras	s cover, Go	ood, HSG A			
	1,696	74	>75% Gras	s cover, Go	ood, HSG C			
	5,750	50	Weighted Average					
	5,705		99.22% Pervious Area					
	45		0.78% Impervious Area					
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description			
10.0					Direct Entry, Direct			

### **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					
	1,303	98	Paved park	ing, HSG A	N Contraction of the second seco			
	5,621	39	>75% Gras	s cover, Go	bod, HSG A			
	5,538	30	Woods, Go	od, HSG A				
	12,462	41	Weighted A	verage				
	11,159		89.54% Pe	rvious Area				
	1,303		10.46% Im	pervious Are	ea			
_				- ··				
Tc	Length	Slope		Capacity	Description			
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)				
10.0					Direct Entry, Direct Entry			

### Summary for Subcatchment DA4A: DA4A

Runoff = 1.83 cfs @ 12.07 hrs, Volume= 6,230 cf, Depth= 8.08" Routed to Pond SW-A1 : Stormtech MC-3500 (SWM-A1)

Α	rea (sf)	CN	Description				
	8,559	98	Paved park	ing, HSG C			
	694	74	>75% Gras	s cover, Go	bod, HSG C		
	9,253 694 8,559	96	Weighted A 7.50% Perv 92.50% Imp	vious Area	ea		
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description		
5.0					Direct Entry, Direct Entry		

### Summary for Subcatchment DA4B: DA4B

Runoff = 1.44 cfs @ 12.07 hrs, Volume= 4,900 cf, Depth= 8.08" Routed to Pond SW-A2 : Stormtech MC-3500 (SWM-A2)

A	rea (sf)	CN	Description				
	6,659	98	Paved park	ing, HSG C			
	618	74	>75% Gras	s cover, Go	bod, HSG C		
	7,277	96	Weighted Average				
	618		8.49% Pervious Area				
	6,659		91.51% Impervious Area				
Тс	Length	Slope	,	Capacity	Description		
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)			
5.0					Direct Entry, Direct Entry		

### Summary for Subcatchment DA4C: DA4C

Runoff = 2.55 cfs @ 12.13 hrs, Volume= 9,496 cf, Depth= 7.00" Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

A	rea (sf)	CN	Description		
	6,556	98	Paved park	ing, HSG A	A Contraction of the second se
	6,543	98	Paved park	ing, HSG C	
	1,382	39	>75% Gras	s cover, Go	bod, HSG A
	649	74	>75% Gras	s cover, Go	bod, HSG C
	1,159	30	Woods, Go	od, HSG A	
	16,289	87	Weighted A	verage	
	3,190		19.58% Per	vious Area	1
	13,099		80.42% Imp	ervious Ar	ea
Тс	Length	Slope		Capacity	Description
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)	
10.0					Direct Entry, Direct Entry

### Summary for Subcatchment DA4D: DA4D

Runoff = 1.89 cfs @ 12.13 hrs, Volume= 7,144 cf, Depth= 7.24" Routed to Pond SW-A4 : Stormtech MC-3500 (SWM-A4)

Ar	rea (sf)	CN	Description		
	1,590	98	Paved park	ing, HSG A	
	7,947	98	Paved park	ing, HSG C	
	1,415	39	>75% Gras	s cover, Go	bod, HSG A
	894	74	>75% Gras	s cover, Go	bod, HSG C
	11,846	89	Weighted A	verage	
	2,309		19.49% Per	vious Area	
	9,537		80.51% Imp	ervious Ar	ea
Тс	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft	) (ft/sec)	(cfs)	·
10.0					Direct Entry, Direct Entry

### **Summary for Subcatchment DA5: DA5**

Runoff = 6.24 cfs @ 12.16 hrs, Volume= Routed to Link AP : Analysis Point 23,167 cf, Depth= 5.19"

A	rea (sf)	CN D	escription		
	352	98 P	aved park	ing, HSG C	;
	22,627	74 >	75% Gras	s cover, Go	ood, HSG C
	30,596	70 V	Voods, Go	od, HSG C	
	53,575	72 V	Veighted A	verage	
	53,223	9	9.34% Per	vious Area	
	352	0	.66% 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 Reach DMH-1: DMH-1

 Inflow Area =
 35,412 sf, 82.73% Impervious, Inflow Depth =
 4.95" for 100-Year event

 Inflow =
 2.69 cfs @
 12.33 hrs, Volume=
 14,611 cf

 Outflow =
 2.69 cfs @
 12.33 hrs, Volume=
 14,611 cf, Atten= 0%, Lag= 0.0 min

 Routed to Reach DMH-3 : DMH-3
 DMH-3
 14,611 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

## Summary for Reach DMH-3: DMH-3

 Inflow Area =
 44,665 sf, 84.75% Impervious, Inflow Depth =
 4.99" for 100-Year event

 Inflow =
 3.51 cfs @
 12.30 hrs, Volume=
 18,574 cf

 Outflow =
 3.51 cfs @
 12.30 hrs, Volume=
 18,574 cf, Atten= 0%, Lag= 0.0 min

 Routed to Link AP : Analysis Point
 Point
 18,574 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

### Summary for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Outflow = Discarded = Primary =	= 1.8 = 0.9 = 0.0 = 0.9	9,253 sf, 92.509 83 cfs @ 12.07 h 93 cfs @ 12.19 h 00 cfs @ 2.76 h 93 cfs @ 12.19 h 93 cfs @ 12.19 h 0MH-3 : DMH-3	nrs, Volume= 4,609 cf, Atten= 49%, Lag= 7.4 min nrs, Volume= 645 cf
			n= 0.00-72.00 hrs, dt= 0.02 hrs area= 1,108 sf Storage= 2,990 cf
•		me= 389.6 min ca me= 301.3 min ( 1	alculated for 4,609 cf (74% of inflow) 1,051.5 - 750.2)
Volume	Invert	Avail.Storage	Storage Description
#1A	85.00'	1,611 cf	22.75'W x 48.72'L x 5.50'H Field A
			6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids
#2A	85.75'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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
			18 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf

3,680 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	12.0" Round Outlet Pipe
			L= 6.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 85.00' / 84.95' S= 0.0083 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	87.70'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	88.50'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	89.35'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	85.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 2.76 hrs HW=85.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.93 cfs @ 12.19 hrs HW=89.01' (Free Discharge)

-1=Outlet Pipe (Passes 0.93 cfs of 7.08 cfs potential flow)

**2=Low Flow Orifice** (Orifice Controls 0.45 cfs @ 5.15 fps)

-3=Upper Orifice (Orifice Controls 0.48 cfs @ 2.45 fps)

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

## Pond SW-A1: Stormtech MC-3500 (SWM-A1) - 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 3 rows = 89.4 cf

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

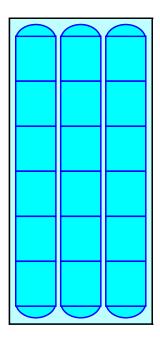
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

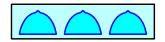
18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A1: Stormtech MC-3500 (SWM-A1)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
85.00	1,108	0	90.20	1,108	3,547
85.10	1,108	44	90.30	1,108	3,591
85.20	1,108	89	90.40	1,108	3,635
85.30	1,108	133	90.50	1,108	3,680
85.40	1,108	177			
85.50	1,108	222			
85.60	1,108	266			
85.70 85.80	1,108 1,108	310 378			
85.90	1,108	470			
86.00	1,108	561			
86.10	1,108	652			
86.20	1,108	743			
86.30	1,108	833			
86.40	1,108	922			
86.50	1,108	1,012			
86.60	1,108	1,101			
86.70	1,108	1,189			
86.80 86.90	1,108 1,108	1,277			
87.00	1,108	1,364 1,451			
87.10	1,108	1,537			
87.20	1,108	1,623			
87.30	1,108	1,708			
87.40	1,108	1,792			
87.50	1,108	1,875			
87.60	1,108	1,958			
87.70	1,108	2,039			
87.80	1,108 1,108	2,120			
87.90 88.00	1,108	2,200 2,279			
88.10	1,108	2,356			
88.20	1,108	2,432			
88.30	1,108	2,507			
88.40	1,108	2,581			
88.50	1,108	2,653			
88.60	1,108	2,724			
88.70	1,108	2,792			
88.80	1,108	2,859			
88.90 89.00	1,108 1,108	2,923 2,984			
89.10	1,108	3,042			
89.20	1,108	3,094			
89.30	1,108	3,144			
89.40	1,108	3,191			
89.50	1,108	3,236			
89.60	1,108	3,281			
89.70	1,108	3,325			
89.80 89.90	1,108 1,108	3,369 3,414			
90.00	1,108	3,414			
90.10	1,108	3,502			
	,	-,			

### Summary for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Outflow Discarded Primary	= 1 = 0 = 0 = 0	7,277 sf, 91.519 1.44 cfs @ 12.07 h 0.68 cfs @ 12.21 h 0.00 cfs @ 3.02 h 0.68 cfs @ 12.21 h DMH-1 : DMH-1	nrs, Volume= 3,734 cf, Atten= 52%, Lag= 8.4 min 644 cf 644 cf		
			n= 0.00-72.00 hrs, dt= 0.02 hrs .rea= 1,108 sf Storage= 2,363 cf		
Plug-Flow detention time= 430.4 min calculated for 3,734 cf (76% of inflow) Center-of-Mass det. time= 346.0 min(1,096.2 - 750.2)					
Volume	Invert	Avail.Storage	Storage Description		
#1A	86.80'	1,611 cf	<b>22.75'W x 48.72'L x 5.50'H Field A</b> 6,096 cf Overall - 2,069 cf Embedded = 4,028 cf x 40.0% Voids		
#2A	87.55'	2,069 cf	ADS_StormTech MC-3500 d +Cap x 18 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		

Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf3,680 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	88.95'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	89.55'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.05'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	86.80'	0.100 in/hr Exfiltration over Surface area

18 Chambers in 3 Rows

**Discarded OutFlow** Max=0.00 cfs @ 3.02 hrs HW=86.86' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.68 cfs @ 12.21 hrs HW=89.91' (Free Discharge)

-1=Outlet Pipe (Passes 0.68 cfs of 9.59 cfs potential flow)

**2=Low Flow Orifice** (Orifice Controls 0.37 cfs @ 4.28 fps)

-3=Upper Orifice (Orifice Controls 0.31 cfs @ 2.04 fps)

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

## Pond SW-A2: Stormtech MC-3500 (SWM-A2) - 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 3 rows = 89.4 cf

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

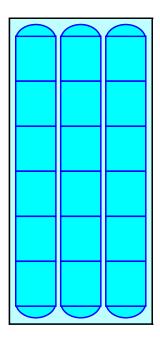
6 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 46.72' Row Length +12.0" End Stone x 2 = 48.72' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

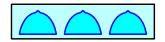
18 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,068.5 cf Chamber Storage

6,096.1 cf Field - 2,068.5 cf Chambers = 4,027.6 cf Stone x 40.0% Voids = 1,611.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,679.6 cf = 0.084 af Overall Storage Efficiency = 60.4%Overall System Size =  $48.72' \times 22.75' \times 5.50'$ 

18 Chambers 225.8 cy Field 149.2 cy Stone





# Stage-Area-Storage for Pond SW-A2: Stormtech MC-3500 (SWM-A2)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
86.80	1,108	0	92.00	1,108	3,547
86.90	1,108	44	92.10	1,108	3,591
87.00	1,108	89	92.20	1,108	3,635
87.10	1,108	133	92.30	1,108	3,680
87.20	1,108	177		,	
87.30	1,108	222			
87.40	1,108	266			
87.50	1,108	310			
87.60	1,108	378			
87.70	1,108	470			
87.80	1,108	561			
87.90	1,108	652			
88.00	1,108	743			
88.10	1,108	833			
88.20	1,108	922			
88.30	1,108	1,012			
88.40	1,108	1,101			
88.50	1,108	1,189			
88.60	1,108	1,277			
88.70	1,108	1,364			
88.80	1,108	1,451			
88.90	1,108	1,537			
89.00	1,108	1,623			
89.10	1,108	1,708			
89.20	1,108	1,792			
89.30	1,108	1,875			
89.40	1,108	1,958			
89.50	1,108	2,039			
89.60	1,108	2,120			
89.70	1,108	2,200			
89.80	1,108	2,279			
89.90	1,108	2,356			
90.00	1,108	2,432			
90.10	1,108	2,507			
90.20	1,108	2,581			
90.30	1,108	2,653			
90.40	1,108	2,724			
90.50	1,108	2,792			
90.60	1,108	2,859			
90.70	1,108	2,923			
90.80	1,108	2,984			
90.90	1,108	3,042			
91.00	1,108	3,094			
91.10 91.20	1,108 1,108	3,144			
91.20	1,108	3,191 3,236			
91.30 91.40	1,108	3,281			
91.50	1,108	3,325			
91.60	1,108	3,369			
91.70	1,108	3,414			
91.80	1,108	3,458			
91.90	1,108	3,502			
	.,	0,002			
			•		

### Summary for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Inflow Area = Inflow = Outflow = Discarded = Primary = Routed to Rea	16,289 sf, 80.42% Impervious, Inflow Depth = 7.00" for 100-Year event         2.55 cfs @ 12.13 hrs, Volume=       9,496 cf         1.14 cfs @ 12.38 hrs, Volume=       7,532 cf, Atten= 55%, Lag= 14.9 min         0.00 cfs @ 5.58 hrs, Volume=       894 cf         1.14 cfs @ 12.38 hrs, Volume=       6,638 cf         ch DMH-1 : DMH-1			
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 91.27' @ 12.38 hrs Surf.Area= 1,598 sf Storage= 4,405 cf				
Plug-Flow detention time= 340.6 min calculated for 7,532 cf (79% of inflow) Center-of-Mass det. time= 263.8 min(1,050.4-786.5)				
	ut Augil Starage Starage Description			

Volume	Invert	Avail.Storage	Storage Description
#1A	87.20'	2,292 cf	22.75'W x 70.23'L x 5.50'H Field A
			8,788 cf Overall - 3,058 cf Embedded = 5,729 cf x 40.0% Voids
#2A	87.95'	3,058 cf	ADS_StormTech MC-3500 d +Cap x 27 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
			27 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		5,350 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	86.65'	15.0" Round Outlet Pipe
			L= 93.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 86.65' / 84.85' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.55'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	90.60'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	91.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded		0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 5.58 hrs HW=87.26' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.14 cfs @ 12.38 hrs HW=91.27' (Free Discharge)

-**1=Outlet Pipe** (Passes 1.14 cfs of 11.81 cfs potential flow)

**2=Low Flow Orifice** (Orifice Controls 0.52 cfs @ 6.00 fps)

-3=Upper Orifice (Orifice Controls 0.61 cfs @ 3.12 fps)

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

## Pond SW-A3: Stormtech MC-3500 (SWM-A3) - 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 3 rows = 89.4 cf

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

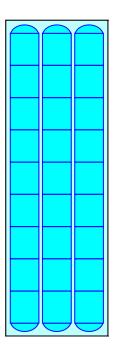
9 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 68.23' Row Length +12.0" End Stone x 2 = 70.23' Base Length
3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

27 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 3,058.1 cf Chamber Storage

8,787.5 cf Field - 3,058.1 cf Chambers = 5,729.4 cf Stone x 40.0% Voids = 2,291.8 cf Stone Storage

Chamber Storage + Stone Storage = 5,349.9 cf = 0.123 afOverall Storage Efficiency = 60.9%Overall System Size =  $70.23' \times 22.75' \times 5.50'$ 

27 Chambers 325.5 cy Field 212.2 cy Stone





# Stage-Area-Storage for Pond SW-A3: Stormtech MC-3500 (SWM-A3)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.20	1,598	0	92.40	1,598	5,158
87.30	1,598	64	92.50	1,598	5,222
87.40	1,598	128	92.60	1,598	5,286
87.50	1,598	192	92.70	1,598	5,350
87.60	1,598	256			
87.70	1,598	320			
87.80	1,598	383			
87.90	1,598	447			
88.00	1,598	546			
88.10	1,598	680			
88.20 88.30	1,598 1,598	813 946			
88.40	1,598	1,078			
88.50	1,598	1,210			
88.60	1,598	1,341			
88.70	1,598	1,471			
88.80	1,598	1,601			
88.90	1,598	1,730			
89.00	1,598	1,858			
89.10	1,598	1,986			
89.20	1,598	2,113			
89.30	1,598	2,238			
89.40	1,598	2,363			
89.50	1,598	2,487			
89.60	1,598	2,610			
89.70	1,598	2,731			
89.80 89.90	1,598 1,598	2,852 2,971			
90.00	1,598	3,089			
90.10	1,598	3,205			
90.20	1,598	3,320			
90.30	1,598	3,433			
90.40	1,598	3,544			
90.50	1,598	3,653			
90.60	1,598	3,760			
90.70	1,598	3,865			
90.80	1,598	3,968			
90.90	1,598	4,067			
91.00 91.10	1,598	4,164			
91.10	1,598 1,598	4,257 4,346			
91.30	1,598	4,340			
91.40	1,598	4,506			
91.50	1,598	4,577			
91.60	1,598	4,645			
91.70	1,598	4,711			
91.80	1,598	4,775			
91.90	1,598	4,839			
92.00	1,598	4,903			
92.10	1,598	4,966			
92.20	1,598	5,030			
92.30	1,598	5,094			
			I		

### Summary for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Inflow Area =	11,846 sf, 80.51% Impervious,	Inflow Depth = 7.24" for 100-Year event
Inflow =	1.89 cfs @ 12.13 hrs, Volume=	7,144 cf
Outflow =	0.97 cfs @ 12.34 hrs, Volume=	5,599 cf, Atten= 49%, Lag= 12.1 min
Discarded =	0.00 cfs @ 5.10 hrs, Volume=	717 cf
Primary =	0.97 cfs @ 12.34 hrs, Volume=	4,882 cf
Routed to Rea	ch DMH-1 : DMH-1	
Pouting by Stor In	nd method. Time Span- 0.00.72.00 k	$r_{\rm c}$ dt = 0.02 bre

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 91.73' @ 12.34 hrs Surf.Area= 1,271 sf Storage= 3,243 cf

Plug-Flow detention time= 351.0 min calculated for 5,598 cf (78% of inflow) Center-of-Mass det. time= 273.2 min (1,054.0 - 780.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.00'	1,838 cf	22.75'W x 55.89'L x 5.50'H Field A
			6,993 cf Overall - 2,398 cf Embedded = 4,595 cf x 40.0% Voids
#2A	88.75'	2,398 cf	ADS_StormTech MC-3500 d +Cap x 21 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
			21 Chambers in 3 Rows
			Cap Storage= 14.9 cf x 2 x 3 rows = 89.4 cf
		4,236 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	12.0" Round Outlet Pipe
			L= 98.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 88.80' / 86.90' S= 0.0194 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	90.35'	4.0" Vert. Low Flow Orifice C= 0.600
			Limited to weir flow at low heads
#3	Device 1	91.20'	<b>6.0" Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	92.25'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#5	Discarded	88.00'	0.100 in/hr Exfiltration over Surface area

**Discarded OutFlow** Max=0.00 cfs @ 5.10 hrs HW=88.06' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.00 cfs)

**Primary OutFlow** Max=0.97 cfs @ 12.34 hrs HW=91.73' (Free Discharge)

-1=Outlet Pipe (Passes 0.97 cfs of 5.90 cfs potential flow)

**2=Low Flow Orifice** (Orifice Controls 0.46 cfs @ 5.31 fps)

-3=Upper Orifice (Orifice Controls 0.50 cfs @ 2.56 fps)

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

## Pond SW-A4: Stormtech MC-3500 (SWM-A4) - 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 3 rows = 89.4 cf

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

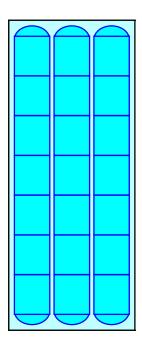
7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length 3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width 9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

21 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 2,398.4 cf Chamber Storage

6,993.2 cf Field - 2,398.4 cf Chambers = 4,594.8 cf Stone x 40.0% Voids = 1,837.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,236.3 cf = 0.097 afOverall Storage Efficiency = 60.6%Overall System Size =  $55.89' \times 22.75' \times 5.50'$ 

21 Chambers 259.0 cy Field 170.2 cy Stone





# Stage-Area-Storage for Pond SW-A4: Stormtech MC-3500 (SWM-A4)

Elevation	Surface	Storage	Elevation	Surface	Storago
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	Storage (cubic-feet)
88.00	1,271	0	93.20	1,271	4,084
88.10	1,271	51	93.30	1,271	4,135
88.20	1,271	102	93.40	1,271	4,185
88.30	1,271	153	93.50	1,271	4,236
88.40	1,271	203		,	
88.50	1,271	254			
88.60	1,271	305			
88.70	1,271	356			
88.80	1,271	434			
88.90	1,271	540			
89.00	1,271	645			
89.10	1,271	750			
89.20	1,271	854			
89.30 89.40	1,271 1,271	958 1,062			
89.50	1,271	1,165			
89.60	1,271	1,103			
89.70	1,271	1,369			
89.80	1,271	1,471			
89.90	1,271	1,571			
90.00	1,271	1,672			
90.10	1,271	1,771			
90.20	1,271	1,870			
90.30	1,271	1,967			
90.40	1,271	2,064			
90.50	1,271	2,161			
90.60	1,271	2,256			
90.70 90.80	1,271 1,271	2,350 2,443			
90.90	1,271	2,443			
91.00	1,271	2,626			
91.10	1,271	2,715			
91.20	1,271	2,803			
91.30	1,271	2,889			
91.40	1,271	2,974			
91.50	1,271	3,057			
91.60	1,271	3,138			
91.70	1,271	3,217			
91.80	1,271	3,294			
91.90	1,271	3,368			
92.00 92.10	1,271 1,271	3,438 3,504			
92.20	1,271	3,565			
92.30	1,271	3,621			
92.40	1,271	3,676			
92.50	1,271	3,728			
92.60	1,271	3,779			
92.70	1,271	3,829			
92.80	1,271	3,880			
92.90	1,271	3,931			
93.00	1,271	3,982			
93.10	1,271	4,033			
			l		

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

Inflow Area = 19,813 sf, 71.21% Impervious, Inflow Depth = 6.66" for 100-Year event Inflow = 3.04 cfs @ 12.07 hrs, Volume= 10,995 cf 2.00 cfs @ 12.17 hrs, Volume= Outflow 9,050 cf, Atten= 34%, Lag= 5.6 min = Discarded = 0.01 cfs @ 12.17 hrs, Volume= 1,055 cf 1.99 cfs @ 12.17 hrs, Volume= 7,995 cf Primary = Routed to Link AP : Analysis Point Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf Routed to Pond SW-A3 : Stormtech MC-3500 (SWM-A3)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs Peak Elev= 93.74' @ 12.17 hrs Surf.Area= 2,498 sf Storage= 4,757 cf

Plug-Flow detention time= 348.2 min calculated for 9,047 cf (82% of inflow) Center-of-Mass det. time= 274.5 min (1,028.7 - 754.2)

Volume	Invert	Avail.Stor	rage Storage	e Description	
#1	91.00'	7,78	30 cf Custon	n Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio	on Su	rf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
91.0	00	1,079	0	0	
92.0	00	1,528	1,304	1,304	
93.0	00	2,023	1,776	3,079	
94.(		2,663	2,343	5,422	
94.8	30	3,231	2,358	7,780	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	89.00'	15.0" Round	d Outlet Pipe	
	-		L= 361.0' C	MP, square edge	headwall, Ke= 0.500
					7.00' S= 0.0055 '/' Cc= 0.900
					or, Flow Area= 1.23 sf
#2	Device 1	92.75'		w Flow Orifice	
	<b>D</b> · · · ·			eir flow at low hea	
#3	Device 1	93.60'		Horiz. Grate	
#1	Secondary	04 201		eir flow at low hea	
#4	Secondary	94.30'			d-Crested Rectangular Weir
			· · ·	.50 4.00 4.50	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
				.92 2.97 3.07 3	
#5	Discarded	91.00'		xfiltration over S	
		5			

**Discarded OutFlow** Max=0.01 cfs @ 12.17 hrs HW=93.74' (Free Discharge) **5=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.97 cfs @ 12.17 hrs HW=93.74' (Free Discharge) 1=Outlet Pipe (Passes 1.97 cfs of 9.06 cfs potential flow) 2=Low Flow Orifice (Orifice Controls 0.58 cfs @ 4.26 fps) 3=Grate (Weir Controls 1.39 cfs @ 1.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.00' (Free Discharge) 4=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	1,079	0	93.60	2,407	4,408
91.05	1,101	55	93.65	2,439	4,529
91.10	1,124	110	93.70	2,471	4,652
91.15	1,146	167	93.75	2,503	4,776
91.20	1,169	225	93.80	2,535	4,902
91.25	1,191	284	93.85	2,567	5,030
91.30	1,131	344	93.90	2,599	5,159
91.35	1,236	405			
			93.95 94.00	2,631	5,290
91.40	1,259	468		2,663	5,422
91.45	1,281	531	94.05	2,698	5,556
91.50	1,304	596	94.10	2,734	5,692
91.55	1,326	661	94.15	2,770	5,829
91.60	1,348	728	94.20	2,805	5,969
91.65	1,371	796	94.25	2,841	6,110
91.70	1,393	865	94.30	2,876	6,253
91.75	1,416	936	94.35	2,911	6,398
91.80	1,438	1,007	94.40	2,947	6,544
91.85	1,461	1,079	94.45	2,983	6,692
91.90	1,483	1,153	94.50	3,018	6,842
91.95	1,506	1,228	94.55	3,053	6,994
92.00	1,528	1,304	94.60	3,089	7,148
92.05	1,553	1,381	94.65	3,125	7,303
92.10	1,577	1,459	94.70	3,160	7,460
92.15	1,602	1,538	94.75	3,196	7,619
92.20	1,627	1,619	94.80	3,231	7,780
92.25	1,652	1,701		-,	-,
92.30	1,676	1,784			
92.35	1,701	1,869			
92.40	1,726	1,954			
92.45	1,751	2,041			
92.50	1,776	2,129			
92.55	1,800	2,123			
92.60	1,800	2,219			
92.65	1,850				
92.00		2,401			
	1,875	2,494			
92.75	1,899	2,589			
92.80	1,924	2,684			
92.85	1,949	2,781			
92.90	1,974	2,879			
92.95	1,998	2,978			
93.00	2,023	3,079			
93.05	2,055	3,181			
93.10	2,087	3,284			
93.15	2,119	3,390			
93.20	2,151	3,496			
93.25	2,183	3,605			
93.30	2,215	3,715			
93.35	2,247	3,826			
93.40	2,279	3,939			
93.45	2,311	4,054			
93.50	2,343	4,171			
93.55	2,375	4,288			

## Summary for Pond SW-C: Curtain Drain (SWM-C)

Seconda	= 2. = 2. ed = 0. = 2. ed to Link AP ary = 0.	10 cfs @ 12 05 cfs @ 12 00 cfs @ 11 04 cfs @ 12 : Analysis Po	.00 hrs, Volume= 0 cf		
Routina	by Stor-Ind m	ethod. Time S	Span= 0.00-72.00 hrs, dt= 0.02 hrs		
			urf.Area= 1,045 sf Storage= 1,503 cf		
Center-o	of-Mass det. ti	ime= 106.1 m	in calculated for 10,515 cf (95% of inflow) in(1,004.2 - 898.2)		
Volume			age Storage Description		
#1	87.40'	3,804	4 cf <b>2.50'W x 418.00'L x 9.10'H Prismatoid</b> 9,509 cf Overall x 40.0% Voids		
Device	Routing	Invert	Outlet Devices		
#1	#1 Primary 87.20' 8.0" Round Outlet Pipe L= 108.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 87.20' / 85.45' S= 0.0162 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf				
#2	Primary		<b>4.0" Vert. Low flow orifice</b> C= 0.600 Limited to weir flow at low heads		
#3	Device 1		4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)		
#4	Discarded	87.40'	0.100 in/hr Exfiltration over Surface area		
#5	Secondary	96.00'	200.0' 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		

**Discarded OutFlow** Max=0.00 cfs @ 11.92 hrs HW=87.49' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=2.01 cfs @ 12.34 hrs HW=90.99' (Free Discharge) 1=Outlet Pipe (Passes 1.58 cfs of 2.78 cfs potential flow) 3=Sharp-Crested Vee/Trap Weir (Weir Controls 1.58 cfs @ 1.62 fps) 2=Low flow orifice (Orifice Controls 0.44 cfs @ 5.00 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=87.40' (Free Discharge) 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### Stage-Area-Storage for Pond SW-C: Curtain Drain (SWM-C)

Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
87.40	1,045	0	92.60	1,045	2,174
87.50	1,045	42	92.70	1,045	2,215
87.60	1,045	84	92.80	1,045	2,257
87.70	1,045	125	92.90	1,045	2,299
87.80	1,045	167	93.00	1,045	2,341
87.90	1,045	209	93.10	1,045	2,383
88.00	1,045	203	93.20	1,045	2,303
88.10	1,045	293	93.30	1,045	2,424 2,466
88.20	1,045	334	93.40 93.50	1,045	2,508
88.30	1,045	376		1,045	2,550
88.40	1,045	418	93.60	1,045	2,592
88.50	1,045	460	93.70	1,045	2,633
88.60	1,045	502	93.80	1,045	2,675
88.70	1,045	543	93.90	1,045	2,717
88.80	1,045	585	94.00	1,045	2,759
88.90	1,045	627	94.10	1,045	2,801
89.00	1,045	669	94.20	1,045	2,842
89.10	1,045	711	94.30	1,045	2,884
89.20	1,045	752	94.40	1,045	2,926
89.30	1,045	794	94.50	1,045	2,968
89.40	1,045	836	94.60	1,045	3,010
89.50	1,045	878	94.70	1,045	3,051
89.60	1,045	920	94.80	1,045	3,093
89.70	1,045	961	94.90	1,045	3,135
89.80	1,045	1,003	95.00	1,045	3,177
89.90	1,045	1,045	95.10	1,045	3,219
90.00	1,045	1,087	95.20	1,045	3,260
90.10	1,045	1,129	95.30	1,045	3,302
90.20	1,045	1,170	95.40	1,045	3,344
90.30	1,045	1,212	95.50	1,045	3,386
90.40	1,045	1,254	95.60	1,045	3,428
90.50	1,045	1,296	95.70	1,045	3,469
90.60	1,045	1,338	95.80	1,045	3,511
90.70	1,045	1,379	95.90	1,045	3,553
90.80	1,045	1,421	96.00	1,045	3,595
90.90	1,045	1,463	96.10	1,045	3,637
91.00	1,045	1,505	96.20	1,045	3,678
91.10	1,045	1,547	96.30	1,045	3,720
91.20			96.40	1,045	3,762
91.30	1,045 1,045	1,588	96.50	1,045	3,702 3,804
		1,630	90.50	1,045	3,004
91.40	1,045	1,672			
91.50	1,045	1,714			
91.60	1,045	1,756			
91.70	1,045	1,797			
91.80	1,045	1,839			
91.90	1,045	1,881			
92.00	1,045	1,923			
92.10	1,045	1,965			
92.20	1,045	2,006			
92.30	1,045	2,048			
92.40	1,045	2,090			
92.50	1,045	2,132			

### 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 =	0.06 cfs @ 13.54 hrs, Volume=	1,670 cf, Atten= 84%, Lag= 82.1 min
Discarded =	0.06 cfs @ 13.54 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= 98.87' @ 13.54 hrs Surf.Area= 506 sf Storage= 562 cf

Plug-Flow detention time= 230.7 min calculated for 1,670 cf (100% of inflow) Center-of-Mass det. time= 230.6 min (1,129.6 - 899.0)

Volume	Invert	Avail.Stor	rage Sto	rage Description		
#1	91.60'	1,59	95 cf Dry	well & Basin (Prisn	natic) Listed below (Recalc)	
	-	<b>C</b> A				
Elevatio		Irf.Area	Inc.Sto			
(fee	et)	(sq-ft)	(cubic-fee	et) (cubic-feet)		
91.6	60	31		0 0		
92.6	60	44	3	38 38		
93.6	60	44	4	14 82		
94.6	60	44	4	14 126		
95.6	60	44	4	14 170		
96.6	60	44	4	4 214		
97.4	49	4	2	21 235		
97.5	50	29		0 235		
98.0	00	145	4	14 279		
99.0	00	560	35	53 631		
100.0	00	1,135	84	1,479		
100.1	10	1,187	11	1,595		
Device	Routing	Invert	Outlet De	evices		
#1	Discarded	91.60'	5.000 in/	hr Exfiltration over	Surface area	
#2	Secondary	99.10'	10.0' lon	g x 5.0' breadth Bre	oad-Crested Rectangular Weir	
	-		Head (fe	et) 0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60 1.80 2.00	
			2.50 3.00 3.50 4.00 4.50 5.00 5.50			
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
				7 2.66 2.68 2.70 2		

**Discarded OutFlow** Max=0.06 cfs @ 13.54 hrs HW=98.87' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.60' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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

	<b>.</b>			o (	<u>.</u>
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.60	31	0	96.80	35	221
91.70	32	3	96.90	31	225
91.80	34	6	97.00	26	228
91.90	35	10	97.10	22	230
92.00	36	13	97.20	17	232
92.10	38	17	97.30	13	233
92.20	39	21	97.40	8	234
92.30	40	25	97.50	29	235
92.40	41	29	97.60	52	239
92.50	43	33	97.70	75	245
92.60	44	38	97.80	99	254
92.70	44	42	97.90	122	265
92.80	44	46	98.00	145	279
92.90	44	51	98.10	186	295
93.00	44	55	98.20	228	316
93.10	44	60	98.30	269	341
93.20 93.30	44 44	64 68	98.40 98.50	311 353	370 403
93.40	44	73	98.60	394	403
93.50	44	73	98.70	435	482
93.60	44	82	98.80	477	527
93.70	44	86	98.90	518	577
93.80	44	90	99.00	560	631
93.90	44	95	99.10	617	690
94.00	44	99	99.20	675	755
94.10	44	104	99.30	732	825
94.20	44	108	99.40	790	901
94.30	44	112	99.50	848	983
94.40	44	117	99.60	905	1,071
94.50	44	121	99.70	962	1,164
94.60	44	126	99.80	1,020	1,263
94.70 94.80	44 44	130	99.90	1,077	1,368
94.80 94.90	44 44	134 139	100.00 100.10	1,135 <b>1,187</b>	1,479 <b>1,595</b>
95.00	44	143	100.10	1,107	1,555
95.10	44	148			
95.20	44	152			
95.30	44	156			
95.40	44	161			
95.50	44	165			
95.60	44	170			
95.70	44	174			
95.80	44	178			
95.90	44	183			
96.00	44	187			
96.10	44	192			
96.20 96.30	44 44	196 200			
96.30 96.40	44 44	200 205			
96.50	44	203			
96.60	44	203			
96.70	40	218			

### Summary for Link AP: Analysis Point

Inflow Area	a =	191,150 sf, 31.86% Impervious, Inflow Depth = 3.75" for 100-Year ev	/ent
Inflow	=	10.77 cfs @ 12.32 hrs, Volume= 59,728 cf	
Primary	=	10.77 cfs @ 12.32 hrs, Volume= 59,728 cf, Atten= 0%, Lag= 0.0 i	min

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