STORMWATER MANAGEMENT REPORT

Commercial Site Development

AP 107SE LOT 403
VALLEY ROAD
MIDDLETOWN, RI

DECEMBER, 2022

Prepared for:

Reed Development Corporation
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Prepared by:

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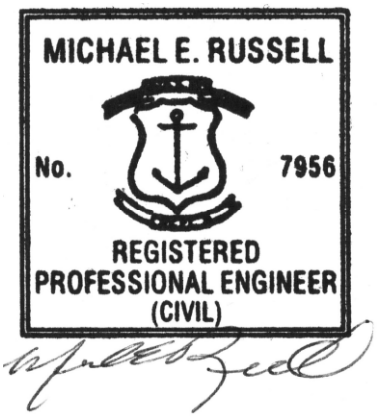

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INTRODUCTION

This report was prepared to address the Stormwater Management System (SMS) for the Commercial Site Development on AP 107SE Lot 403, Valley Road in Middletown. The Development will A 17,243 sf storage building with 8 parking spaces with associated landscaping, lighting, utilities & stormwater management system. This report will outline and summarize the SMS of the proposed development. Said improvements are intended to control peak runoff & volume rates for the new impervious area(s). Additionally, the proposed SMS will provide, at minimum, the water quality & stormwater recharge volumes as required for new development projects. The SMS as proposed will comply with the Town of Middletown's & State of Rhode Island's Stormwater Management Policy (2018).

EXISTING CONDITIONS (SUMMARY)

The subject property is approximately 3.08 acres in area and fronts along Valley Road. The existing ground cover consists mainly of a large grass/brush field with weeds as well as some shrubs/woods just past the rear property line. The site slopes generally towards the Southwest. The elevation change across the site is approximately 11 feet. Currently, most of the Runoff from the site sheet flows across the site to the southwest corner of the lot. The summary of the Pre-Development Analysis is located in Appendix 1 of this report.

PROPOSED CONDITIONS (SUMMARY)

The Development will A 17,243 sf storage building with 8 parking spaces with associated landscaping, lighting, utilities & stormwater management system. Site grading will create the cuts & fills throughout the project limits to create the desired site layout and function and will maintain pre-development runoff patterns. A stormwater collection system will be incorporated into the newly designed parking area to collect runoff from impervious surfaces and landscaped areas within the limit of disturbance. This system consists of a deep sump catch basin, sediment forebay, infiltration chambers and infiltration basin. The catch basin and sediment forebay provide pre-treatment for the infiltration basin and infiltration chambers. The system will accommodate a 100-year storm event, handle the water quality volume (WQv) and provide for total suspended solids (TSS) removal. This overall system is designed to accommodate, at minimum, the water quality volume (WQv) and recharge volume (ReV) required for new development projects. Low impact development practices (LID) will be employed to the maximum extent practicable. Summary of the Post-Development Conditions Analysis is located in Appendix 1 of this report.

SITE SOIL & GROUNDWATER CONDITIONS

The underlying watershed soils within the developed area consist of the Pittstown series (Hydrologic Group C). A soil evaluation and groundwater determination was performed in June 2022. Soil textures consisted primarily of a silt/loam mixture with groundwater elevation approximately 8 feet below original grade.

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METHODOLOGY

HydroCad® Stormwater Modeling System was used to quantify stormwater runoff generated by WQv, 1-year, 2-year, 10-year, 25-year, and 100-year design storms in pre and post development conditions. The calculations were performed using "Dynamic Storage-Indication" to also analyze the impact of the pipe size, material and slope selection in upstream structures. The HydroCad® program utilizes Natural Resource Conservation Service (NRCS) techniques (TR-20) to predict stormwater runoff for given design storms. The calculations performed by HydroCad® are based on the NRCS model return frequency Type III distribution and a user specified design storms. The calculation is also performed using the simple dynamic method which utilizes *Rawls Rate* for infiltration based on soil texture.

The analysis is performed by modeling the drainage area as subcatchments and ponds. A subcatchment is an area that produces runoff and drains into a pond. A pond can be a natural depression, wetland, or manmade structure that detains or retains stormwater runoff. The drainage network pipe design adequacy is evaluated by integrating it in the HydroCad® pond model for drainage structures. The pipes are modeled as the pond outlet-culvert type. Manning's Equation and/or Hazen-Williams hydraulic equations were also utilized to determine the required pipe sizes as well as minimum and maximum pipe slopes.

DRAINAGE SYSTEM MODEL

The proposed development is analyzed by creating an existing condition or pre-development model and a full build-out or post-development model. The models were created to compare the existing and post-development runoff to the abutting properties and existing SMS. The post-development analysis results are also utilized to adequately size the proposed practices. Analysis within the site was performed using WQv, 1, 2, 10, 25 and 100-year design storm projections. All excess stormwater runoff captured on site will be treated and retained/recharged on site. On site post-development runoff rates flowing overland toward abutting properties will not exceed pre-development runoff rates up to the 100-year event.

The pre-development HydroCad® model within the site consists of a single subcatchment. The subcatchment area encompasses the entire lot as well as some offsite area that flows from the back of curb into the site. This was created to determine the existing stormwater runoff originating from the site flowing to the rear of the property.

Post-development subcatchment models were created for the site. Subcatchment models represent the drainage areas to each of the proposed reaches, drainage structures, or storage & treatment areas. Each of these areas provides elements of treatment, storage, and infiltration in order to effectively mitigate flows to the Point of Analysis in each analyzed storm event. See Post-Development output in Appendix B and summary at the end of this narrative.

The majority of the paved & landscaped areas for the developed area discharge into deep sump catch basins before flowing through a stormceptor which then discharges into an underground infiltration system that can overflow into a final infiltration basin.

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STORMWATER TREATMENT

Stormwater runoff will be treated through the use of Best Management Practices (BMP's). The BMP's used within the proposed development include deep sump catch basins, stormceptor units, underground infiltration systems and infiltration basins. These BMP's will aid in the removal of pollutants within the stormwater runoff as well as provide recharge to the groundwater aquifer.

This system will provide pollutant removal and treatment as required for the proposed development.

ANALYSIS DATA

The following information was used in performing the calculations for the drainage system.

RUNOFF SUMMARY AT ANALYSIS POINTS		
Cover Description		
Cover Type	Hydrologic condition	Curve Number (Class: A , B , C, D)
Landscaping, Lawns	Good	39 , 61 , 74 , 80
Woods	Good	30 , 55 , 70 , 77
Gravel	Good	76 , 85 , 89 , 91
Buildings	-	98
Pavement	-	98
Brick Walkways	-	98

Rainfall Data (Type III - 24 Hour Storm Duration*)

Storm Event	Rainfall
WQv	1.2 inches
1 - Year	2.8 inches
2 - Year	3.3 inches
10 - Year	4.9 inches
25 - Year	6.1 inches
100 - Year	8.6 inches

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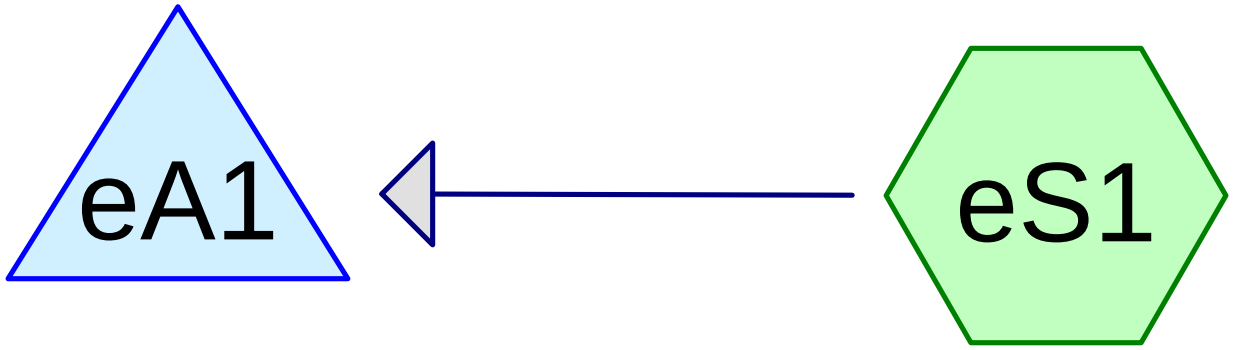


Pre - Analysis Point-1 (new Subcat)

Subcat Reach Pond Link

Routing Diagram for 22048 HydroCAD_V3 9-28-2022
Prepared by {enter your company name here}, Printed 9/30/2022

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
85,744	74	>75% Grass cover, Good, HSG C (eS1)
1,291	98	Unconnected pavement, HSG C (eS1)
87,035	**74**	**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond eA1: Pre - Analysis Point-1 Inflow=4.43 cfs 16,827 cf
Primary=4.43 cfs 16,827 cf

Subcatchment eS1: (new Subcat) Runoff Area=87,035 sf 1.48% Impervious Runoff Depth=2.32"
Flow Length=384' Tc=11.8 min CN=74/98 Runoff=4.43 cfs 16,827 cf

Total Runoff Area = 87,035 sf Runoff Volume = 16,827 cf Average Runoff Depth = 2.32"
98.52% Pervious = 85,744 sf 1.48% Impervious = 1,291 sf

Summary for Pond eA1: Pre - Analysis Point-1

Inflow Area = 87,035 sf, 1.48% Impervious, Inflow Depth = 2.32" for 10-Year event
Inflow = 4.43 cfs @ 12.17 hrs, Volume= 16,827 cf
Primary = 4.43 cfs @ 12.17 hrs, Volume= 16,827 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Summary for Subcatchment eS1: (new Subcat)

Runoff = 4.43 cfs @ 12.17 hrs, Volume= 16,827 cf, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
85,744	74	>75% Grass cover, Good, HSG C
1,291	98	Unconnected pavement, HSG C
87,035	74	Weighted Average
85,744	74	98.52% Pervious Area
1,291	98	1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	11	0.4000	0.16		**Sheet Flow, AB** Grass: Bermuda n= 0.410 P2= 3.30"
6.7	39	0.0560	0.10		**Sheet Flow, BC** Grass: Bermuda n= 0.410 P2= 3.30"
4.0	334	0.0400	1.40		**Shallow Concentrated Flow, CD** Short Grass Pasture Kv= 7.0 fps
11.8	384	Total			

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond eA1: Pre - Analysis Point-1 Inflow=10.56 cfs 39,953 cf
Primary=10.56 cfs 39,953 cf

Subcatchment eS1: (new Subcat) Runoff Area=87,035 sf 1.48% Impervious Runoff Depth=5.51"
Flow Length=384' Tc=11.8 min CN=74/98 Runoff=10.56 cfs 39,953 cf

Total Runoff Area = 87,035 sf Runoff Volume = 39,953 cf Average Runoff Depth = 5.51"
98.52% Pervious = 85,744 sf 1.48% Impervious = 1,291 sf

Summary for Pond eA1: Pre - Analysis Point-1

Inflow Area = 87,035 sf, 1.48% Impervious, Inflow Depth = 5.51" for 100-Year event
Inflow = 10.56 cfs @ 12.16 hrs, Volume= 39,953 cf
Primary = 10.56 cfs @ 12.16 hrs, Volume= 39,953 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Summary for Subcatchment eS1: (new Subcat)

Runoff = 10.56 cfs @ 12.16 hrs, Volume= 39,953 cf, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
85,744	74	>75% Grass cover, Good, HSG C
1,291	98	Unconnected pavement, HSG C
87,035	74	Weighted Average
85,744	74	98.52% Pervious Area
1,291	98	1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	11	0.4000	0.16		**Sheet Flow, AB** Grass: Bermuda n= 0.410 P2= 3.30"
6.7	39	0.0560	0.10		**Sheet Flow, BC** Grass: Bermuda n= 0.410 P2= 3.30"
4.0	334	0.0400	1.40		**Shallow Concentrated Flow, CD** Short Grass Pasture Kv= 7.0 fps
11.8	384	Total			

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond eA1: Pre - Analysis Point-1 Inflow=0.04 cfs 547 cf
Primary=0.04 cfs 547 cf

Subcatchment eS1: (new Subcat) Runoff Area=87,035 sf 1.48% Impervious Runoff Depth=0.08"
Flow Length=384' Tc=11.8 min CN=74/98 Runoff=0.04 cfs 547 cf

Total Runoff Area = 87,035 sf Runoff Volume = 547 cf Average Runoff Depth = 0.08"
98.52% Pervious = 85,744 sf 1.48% Impervious = 1,291 sf

Summary for Pond eA1: Pre - Analysis Point-1

Inflow Area = 87,035 sf, 1.48% Impervious, Inflow Depth = 0.08" for WQv event
Inflow = 0.04 cfs @ 12.48 hrs, Volume= 547 cf
Primary = 0.04 cfs @ 12.48 hrs, Volume= 547 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

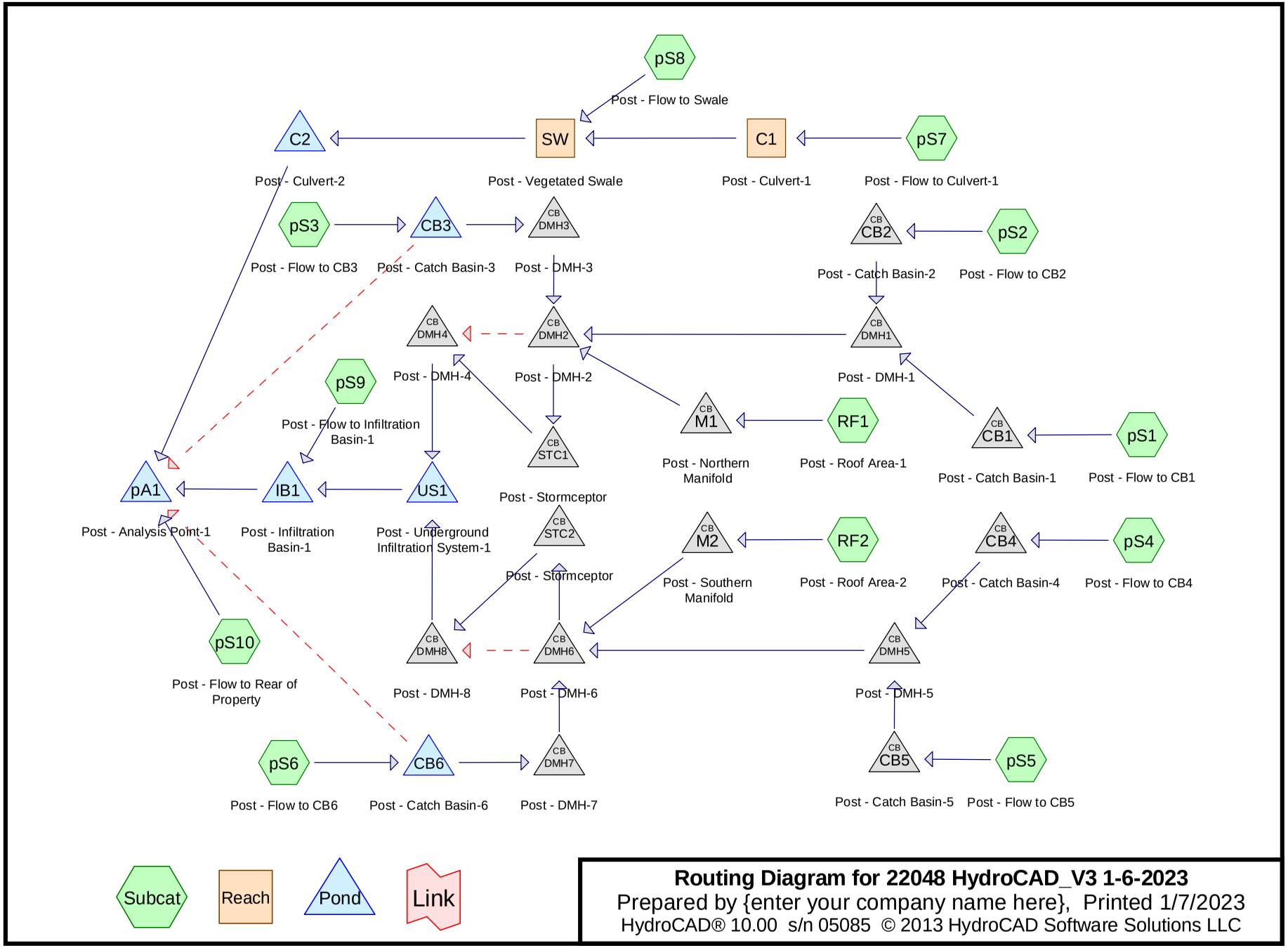
Summary for Subcatchment eS1: (new Subcat)

Runoff = 0.04 cfs @ 12.48 hrs, Volume= 547 cf, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
85,744	74	>75% Grass cover, Good, HSG C
1,291	98	Unconnected pavement, HSG C
87,035	74	Weighted Average
85,744	74	98.52% Pervious Area
1,291	98	1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	11	0.4000	0.16		**Sheet Flow, AB** Grass: Bermuda n= 0.410 P2= 3.30"
6.7	39	0.0560	0.10		**Sheet Flow, BC** Grass: Bermuda n= 0.410 P2= 3.30"
4.0	334	0.0400	1.40		**Shallow Concentrated Flow, CD** Short Grass Pasture Kv= 7.0 fps
11.8	384	Total			



Routing Diagram for 22048 HydroCAD_V3 1-6-2023

Prepared by {enter your company name here}, Printed 1/7/2023

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
33,509	74	>75% Grass cover, Good, HSG C (pS1, pS10, pS2, pS3, pS4, pS5, pS6, pS7, pS8, pS9)
587	98	New Curbing (pS1, pS2, pS3, pS4, pS5, pS6)
499	98	New Walkway (pS1, pS4)
332	98	New Wall (pS3, pS6)
32,545	98	Paved parking, HSG C (pS1, pS2, pS3, pS4, pS5, pS6)
18,886	98	Roofs, HSG C (RF1, RF2)
682	98	Unconnected pavement, HSG C (pS10, pS7)
87,040	**89**	**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Reach C1: Post - Culvert-1 Avg. Flow Depth=0.15' Max Vel=3.58 fps Inflow=0.27 cfs 833 cf
12.0" Round Pipe n=0.013 L=50.0' S=0.0230 '/' Capacity=5.40 cfs Outflow=0.27 cfs 833 cf

Pond C2: Post - Culvert-2 Peak Elev=46.63' Storage=19 cf Inflow=0.59 cfs 1,843 cf
12.0" Round Culvert n=0.013 L=49.0' S=0.0133 '/' Outflow=0.59 cfs 1,838 cf

Pond CB1: Post - Catch Basin-1 Peak Elev=52.64' Inflow=0.25 cfs 857 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.25 cfs 857 cf

Pond CB2: Post - Catch Basin-2 Peak Elev=48.57' Inflow=0.50 cfs 1,713 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.50 cfs 1,713 cf

Pond CB3: Post - Catch Basin-3 Peak Elev=46.63' Storage=61 cf Inflow=1.33 cfs 4,568 cf
Primary=1.32 cfs 4,517 cf Secondary=0.00 cfs 0 cf Outflow=1.32 cfs 4,517 cf

Pond CB4: Post - Catch Basin-4 Peak Elev=52.65' Inflow=0.26 cfs 899 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.26 cfs 899 cf

Pond CB5: Post - Catch Basin-5 Peak Elev=48.53' Inflow=0.41 cfs 1,429 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.41 cfs 1,429 cf

Pond CB6: Post - Catch Basin-6 Peak Elev=46.58' Storage=60 cf Inflow=1.19 cfs 4,104 cf
Primary=1.19 cfs 4,052 cf Secondary=0.00 cfs 0 cf Outflow=1.19 cfs 4,052 cf

Pond DMH1: Post - DMH-1 Peak Elev=48.44' Inflow=0.74 cfs 2,569 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=0.74 cfs 2,569 cf

Pond DMH2: Post - DMH-2 Peak Elev=46.25' Inflow=3.13 cfs 10,760 cf
Primary=1.23 cfs 9,348 cf Secondary=1.96 cfs 1,412 cf Outflow=3.13 cfs 10,760 cf

Pond DMH3: Post - DMH-3 Peak Elev=46.34' Inflow=1.32 cfs 4,517 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.32 cfs 4,517 cf

Pond DMH4: Post - DMH-4 Peak Elev=45.41' Inflow=3.13 cfs 10,760 cf
Outflow=3.13 cfs 10,760 cf

Pond DMH5: Post - DMH-5 Peak Elev=48.41' Inflow=0.67 cfs 2,328 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=0.67 cfs 2,328 cf

Pond DMH6: Post - DMH-6 Peak Elev=46.19' Inflow=2.92 cfs 10,045 cf
Primary=1.19 cfs 8,846 cf Secondary=1.76 cfs 1,199 cf Outflow=2.92 cfs 10,045 cf

Pond DMH7: Post - DMH-7 Peak Elev=46.26' Inflow=1.19 cfs 4,052 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.19 cfs 4,052 cf

Pond DMH8: Post - DMH-8 Peak Elev=45.38' Inflow=2.92 cfs 10,045 cf
Outflow=2.92 cfs 10,045 cf

Pond IB1: Post - Infiltration Basin-1 Peak Elev=43.63' Storage=828 cf Inflow=2.64 cfs 11,481 cf
Discarded=0.01 cfs 605 cf Primary=2.63 cfs 10,566 cf Outflow=2.64 cfs 11,171 cf

Pond M1: Post - Northern Manifold Peak Elev=47.23' Inflow=1.06 cfs 3,674 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=1.06 cfs 3,674 cf

Pond M2: Post - Southern Manifold Peak Elev=47.23' Inflow=1.06 cfs 3,665 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=1.06 cfs 3,665 cf

Pond pA1: Post - Analysis Point-1 Inflow=3.69 cfs 16,543 cf
Primary=3.69 cfs 16,543 cf

Subcatchment pS1: Post - Flow to CB1 Runoff Area=2,266 sf 94.70% Impervious Runoff Depth=4.54"
Tc=5.0 min CN=74/98 Runoff=0.25 cfs 857 cf

Subcatchment pS10: Post - Flow to Rear of Property Runoff Area=21,478 sf 1.17% Impervious Runoff Depth=2.31"
Flow Length=440' Tc=5.3 min CN=74/98 Runoff=1.35 cfs 4,139 cf

Subcatchment pS2: Post - Flow to CB2 Runoff Area=4,450 sf 98.11% Impervious Runoff Depth=4.62"
Tc=5.0 min CN=74/98 Runoff=0.50 cfs 1,713 cf

Subcatchment pS3: Post - Flow to CB3 Runoff Area=12,148 sf 93.66% Impervious Runoff Depth=4.51"
Tc=5.0 min CN=74/98 Runoff=1.33 cfs 4,568 cf

Subcatchment pS4: Post - Flow to CB4 Runoff Area=2,411 sf 92.04% Impervious Runoff Depth=4.47"
Tc=5.0 min CN=74/98 Runoff=0.26 cfs 899 cf

Subcatchment pS5: Post - Flow to CB5 Runoff Area=3,721 sf 97.69% Impervious Runoff Depth=4.61"
Tc=5.0 min CN=74/98 Runoff=0.41 cfs 1,429 cf

Subcatchment pS6: Post - Flow to CB6 Runoff Area=10,915 sf 93.62% Impervious Runoff Depth=4.51"
Tc=5.0 min CN=74/98 Runoff=1.19 cfs 4,104 cf

Subcatchment pS7: Post - Flow to Culvert-1 Runoff Area=3,928 sf 10.97% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=74/98 Runoff=0.27 cfs 833 cf

Subcatchment pS8: Post - Flow to Swale Runoff Area=5,303 sf 0.00% Impervious Runoff Depth=2.28"
Tc=5.0 min CN=74/0 Runoff=0.33 cfs 1,010 cf

Subcatchment pS9: Post - Flow to Infiltration Basin-1 Runoff Area=1,534 sf 0.00% Impervious Runoff Depth=2.28"
Tc=5.0 min CN=74/0 Runoff=0.10 cfs 292 cf

Subcatchment RF1: Post - Roof Area-1 Runoff Area=9,454 sf 100.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=0/98 Runoff=1.06 cfs 3,674 cf

Subcatchment RF2: Post - Roof Area-2 Runoff Area=9,432 sf 100.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=0/98 Runoff=1.06 cfs 3,665 cf

Pond STC1: Post - Stormceptor Peak Elev=45.84' Inflow=1.23 cfs 9,348 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.23 cfs 9,348 cf

Pond STC2: Post - Stormceptor Peak Elev=45.81' Inflow=1.19 cfs 8,846 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.19 cfs 8,846 cf

Reach SW: Post - Vegetated Swale Avg. Flow Depth=0.06' Max Vel=2.12 fps Inflow=0.60 cfs 1,843 cf
n=0.022 L=163.0' S=0.0429 '/' Capacity=92.96 cfs Outflow=0.59 cfs 1,843 cf

Pond US1: Post - Underground Infiltration System-1 Peak Elev=45.17' Storage=8,320 cf Inflow=6.05 cfs 20,806 cf
Discarded=0.07 cfs 7,889 cf Primary=2.59 cfs 11,189 cf Outflow=2.66 cfs 19,078 cf

Total Runoff Area = 87,040 sf Runoff Volume = 27,183 cf Average Runoff Depth = 3.75"
38.50% Pervious = 33,509 sf 61.50% Impervious = 53,531 sf

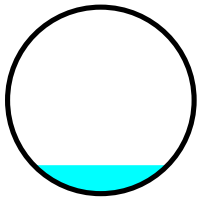
Summary for Reach C1: Post - Culvert-1

Inflow Area = 3,928 sf, 10.97% Impervious, Inflow Depth = 2.55" for 10-Year event
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 833 cf
Outflow = 0.27 cfs @ 12.08 hrs, Volume= 833 cf, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 3.58 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 0.8 min

Peak Storage= 4 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.40 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0230 '/'
Inlet Invert= 57.25', Outlet Invert= 56.10'



Summary for Pond C2: Post - Culvert-2

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 2.40" for 10-Year event
Inflow = 0.59 cfs @ 12.09 hrs, Volume= 1,843 cf
Outflow = 0.59 cfs @ 12.10 hrs, Volume= 1,838 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.59 cfs @ 12.10 hrs, Volume= 1,838 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.63' @ 12.10 hrs Surf.Area= 45 sf Storage= 19 cf

Plug-Flow detention time= 4.8 min calculated for 1,838 cf (100% of inflow)
Center-of-Mass det. time= 2.8 min (835.2 - 832.4)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	356 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	15	0	0
47.00	62	39	39
48.00	136	99	138
49.00	301	219	356

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	**12.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 45.60' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.57 cfs @ 12.10 hrs HW=46.63' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.57 cfs @ 2.10 fps)

Summary for Pond CB1: Post - Catch Basin-1

Inflow Area = 2,266 sf, 94.70% Impervious, Inflow Depth = 4.54" for 10-Year event
Inflow = 0.25 cfs @ 12.07 hrs, Volume= 857 cf
Outflow = 0.25 cfs @ 12.07 hrs, Volume= 857 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.07 hrs, Volume= 857 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.64' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500

Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.07 hrs HW=52.64' TW=48.43' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.24 cfs @ 1.67 fps)

Summary for Pond CB2: Post - Catch Basin-2

Inflow Area = 4,450 sf, 98.11% Impervious, Inflow Depth = 4.62" for 10-Year event
Inflow = 0.50 cfs @ 12.07 hrs, Volume= 1,713 cf
Outflow = 0.50 cfs @ 12.07 hrs, Volume= 1,713 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.07 hrs, Volume= 1,713 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.57' @ 12.08 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.07 hrs HW=48.56' TW=48.43' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.46 cfs @ 2.20 fps)

Summary for Pond CB3: Post - Catch Basin-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 4.51" for 10-Year event
Inflow = 1.33 cfs @ 12.07 hrs, Volume= 4,568 cf
Outflow = 1.32 cfs @ 12.07 hrs, Volume= 4,517 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.07 hrs, Volume= 4,517 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.63' @ 12.10 hrs Surf.Area= 13 sf Storage= 61 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 14.5 min calculated for 4,512 cf (99% of inflow)
Center-of-Mass det. time= 7.1 min (757.5 - 750.3)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.10 cfs @ 12.07 hrs HW=46.61' TW=46.26' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.10 cfs @ 2.59 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB4: Post - Catch Basin-4

Inflow Area = 2,411 sf, 92.04% Impervious, Inflow Depth = 4.47" for 10-Year event
Inflow = 0.26 cfs @ 12.07 hrs, Volume= 899 cf
Outflow = 0.26 cfs @ 12.07 hrs, Volume= 899 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.07 hrs, Volume= 899 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.65' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.26 cfs @ 12.07 hrs HW=52.65' TW=48.41' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.26 cfs @ 1.69 fps)

Summary for Pond CB5: Post - Catch Basin-5

Inflow Area = 3,721 sf, 97.69% Impervious, Inflow Depth = 4.61" for 10-Year event
Inflow = 0.41 cfs @ 12.07 hrs, Volume= 1,429 cf
Outflow = 0.41 cfs @ 12.07 hrs, Volume= 1,429 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.07 hrs, Volume= 1,429 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.53' @ 12.09 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.07 hrs HW=48.53' TW=48.41' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.38 cfs @ 2.07 fps)

Summary for Pond CB6: Post - Catch Basin-6

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 4.51" for 10-Year event
Inflow = 1.19 cfs @ 12.07 hrs, Volume= 4,104 cf
Outflow = 1.19 cfs @ 12.07 hrs, Volume= 4,052 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.07 hrs, Volume= 4,052 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.58' @ 12.09 hrs Surf.Area= 13 sf Storage= 60 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 16.0 min calculated for 4,048 cf (99% of inflow)
Center-of-Mass det. time= 7.9 min (758.2 - 750.3)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.03 cfs @ 12.07 hrs HW=46.57' TW=46.19' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.03 cfs @ 2.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DMH1: Post - DMH-1

Inflow Area = 6,716 sf, 96.96% Impervious, Inflow Depth = 4.59" for 10-Year event
Inflow = 0.74 cfs @ 12.07 hrs, Volume= 2,569 cf
Outflow = 0.74 cfs @ 12.07 hrs, Volume= 2,569 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.07 hrs, Volume= 2,569 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.44' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.73 cfs @ 12.07 hrs HW=48.43' TW=46.24' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.73 cfs @ 2.24 fps)

Summary for Pond DMH2: Post - DMH-2

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 4.56" for 10-Year event
Inflow = 3.13 cfs @ 12.07 hrs, Volume= 10,760 cf
Outflow = 3.13 cfs @ 12.07 hrs, Volume= 10,760 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.04 hrs, Volume= 9,348 cf
Secondary = 1.96 cfs @ 12.08 hrs, Volume= 1,412 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.25' @ 12.08 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.03 cfs @ 12.04 hrs HW=46.17' TW=45.79' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.03 cfs @ 2.97 fps)

Secondary OutFlow Max=1.96 cfs @ 12.08 hrs HW=46.25' TW=45.41' (Dynamic Tailwater)
└**3=Culvert** (Barrel Controls 1.96 cfs @ 3.46 fps)
└**2=Broad-Crested Rectangular Weir** (Passes 1.96 cfs of 3.74 cfs potential flow)

Summary for Pond DMH3: Post - DMH-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 4.46" for 10-Year event
Inflow = 1.32 cfs @ 12.07 hrs, Volume= 4,517 cf
Outflow = 1.32 cfs @ 12.07 hrs, Volume= 4,517 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.07 hrs, Volume= 4,517 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.34' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.07 hrs HW=46.26' TW=46.24' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 0.64 fps)

Summary for Pond DMH4: Post - DMH-4

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 4.56" for 10-Year event
Inflow = 3.13 cfs @ 12.07 hrs, Volume= 10,760 cf
Outflow = 3.13 cfs @ 12.07 hrs, Volume= 10,760 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.13 cfs @ 12.07 hrs, Volume= 10,760 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.41' @ 12.07 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.08 cfs @ 12.07 hrs HW=45.40' TW=44.89' (Dynamic Tailwater)
└**2=Culvert** (Passes 3.08 cfs of 12.88 cfs potential flow)
└**1=Culvert** (Barrel Controls 3.08 cfs @ 3.13 fps)

Summary for Pond DMH5: Post - DMH-5

Inflow Area = 6,132 sf, 95.47% Impervious, Inflow Depth = 4.56" for 10-Year event
Inflow = 0.67 cfs @ 12.07 hrs, Volume= 2,328 cf
Outflow = 0.67 cfs @ 12.07 hrs, Volume= 2,328 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.07 hrs, Volume= 2,328 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 48.41' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.07 hrs HW=48.41' TW=46.18' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.66 cfs @ 2.18 fps)

Summary for Pond DMH6: Post - DMH-6

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 4.55" for 10-Year event
Inflow = 2.92 cfs @ 12.07 hrs, Volume= 10,045 cf
Outflow = 2.92 cfs @ 12.07 hrs, Volume= 10,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.05 hrs, Volume= 8,846 cf
Secondary = 1.76 cfs @ 12.08 hrs, Volume= 1,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.19' @ 12.08 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.05 cfs @ 12.05 hrs HW=46.13' TW=45.74' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.05 cfs @ 3.01 fps)

Secondary OutFlow Max=1.75 cfs @ 12.08 hrs HW=46.19' TW=45.37' (Dynamic Tailwater)
└**3=Culvert** (Barrel Controls 1.75 cfs @ 3.36 fps)
└**2=Broad-Crested Rectangular Weir** (Passes 1.75 cfs of 2.86 cfs potential flow)

Summary for Pond DMH7: Post - DMH-7

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 4.46" for 10-Year event
Inflow = 1.19 cfs @ 12.07 hrs, Volume= 4,052 cf
Outflow = 1.19 cfs @ 12.07 hrs, Volume= 4,052 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.07 hrs, Volume= 4,052 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.26' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.07 hrs HW=46.19' TW=46.18' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.46 cfs @ 0.59 fps)

Summary for Pond DMH8: Post - DMH-8

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 4.55" for 10-Year event
Inflow = 2.92 cfs @ 12.07 hrs, Volume= 10,045 cf
Outflow = 2.92 cfs @ 12.07 hrs, Volume= 10,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.92 cfs @ 12.07 hrs, Volume= 10,045 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 45.38' @ 12.07 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.87 cfs @ 12.07 hrs HW=45.37' TW=44.89' (Dynamic Tailwater)
↑—**2=Culvert** (Passes 2.87 cfs of 12.07 cfs potential flow)
↑—**1=Culvert** (Barrel Controls 2.87 cfs @ 3.07 fps)

Summary for Pond IB1: Post - Infiltration Basin-1

Inflow Area = 56,331 sf, 93.82% Impervious, Inflow Depth = 2.45" for 10-Year event
Inflow = 2.64 cfs @ 12.24 hrs, Volume= 11,481 cf
Outflow = 2.64 cfs @ 12.26 hrs, Volume= 11,171 cf, Atten= 0%, Lag= 1.1 min
Discarded = 0.01 cfs @ 12.26 hrs, Volume= 605 cf
Primary = 2.63 cfs @ 12.26 hrs, Volume= 10,566 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 43.63' @ 12.26 hrs Surf.Area= 696 sf Storage= 828 cf
Flood Elev= 44.00' Surf.Area= 785 sf Storage= 1,101 cf

Plug-Flow detention time= 42.7 min calculated for 11,159 cf (97% of inflow)
Center-of-Mass det. time= 31.1 min (850.8 - 819.7)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	1,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.00	329	0	0
43.00	544	437	437
44.00	785	665	1,101

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	43.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 0.75
			Width (feet) 3.00 5.00

Discarded OutFlow Max=0.01 cfs @ 12.26 hrs HW=43.63' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.62 cfs @ 12.26 hrs HW=43.63' TW=0.00' (Dynamic Tailwater)
└**2=Custom Weir/Orifice** (Weir Controls 2.62 cfs @ 1.96 fps)

Summary for Pond M1: Post - Northern Manifold

Inflow Area = 9,454 sf,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 1.06 cfs @ 12.07 hrs, Volume= 3,674 cf
Outflow = 1.06 cfs @ 12.07 hrs, Volume= 3,674 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.07 hrs, Volume= 3,674 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.23' @ 12.07 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.04 cfs @ 12.07 hrs HW=47.22' TW=46.24' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.04 cfs @ 2.99 fps)

Summary for Pond M2: Post - Southern Manifold

Inflow Area = 9,432 sf,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 1.06 cfs @ 12.07 hrs, Volume= 3,665 cf
Outflow = 1.06 cfs @ 12.07 hrs, Volume= 3,665 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.07 hrs, Volume= 3,665 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.23' @ 12.07 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.04 cfs @ 12.07 hrs HW=47.22' TW=46.18' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.04 cfs @ 2.98 fps)

Summary for Pond pA1: Post - Analysis Point-1

Inflow Area = 87,040 sf, 61.50% Impervious, Inflow Depth = 2.28" for 10-Year event
Inflow = 3.69 cfs @ 12.20 hrs, Volume= 16,543 cf
Primary = 3.69 cfs @ 12.20 hrs, Volume= 16,543 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Summary for Subcatchment pS1: Post - Flow to CB1

Runoff = 0.25 cfs @ 12.07 hrs, Volume= 857 cf, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	120	74	>75% Grass cover, Good, HSG C
*	213	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,266	97	Weighted Average
	120	74	5.30% Pervious Area
	2,146	98	94.70% Impervious Area

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

Summary for Subcatchment pS10: Post - Flow to Rear of Property

Runoff = 1.35 cfs @ 12.08 hrs, Volume= 4,139 cf, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
21,227	74	>75% Grass cover, Good, HSG C
251	98	Unconnected pavement, HSG C
21,478	74	Weighted Average
21,227	74	98.83% Pervious Area
251	98	1.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2000	0.15		**Sheet Flow, AB**
					Grass: Bermuda n= 0.410 P2= 3.30"
1.8	300	0.0350	2.81		**Shallow Concentrated Flow, BC**
					Grassed Waterway Kv= 15.0 fps
0.2	110	0.0350	11.23	190.86	**Channel Flow, CD**
					Area= 17.0 sf Perim= 20.3' r= 0.84'
					n= 0.022 Earth, clean & straight
5.3	440	Total			

Summary for Subcatchment pS2: Post - Flow to CB2

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 1,713 cf, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	4,243	98	Paved parking, HSG C
	84	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	123	98	New Curbing
	0	98	Unconnected pavement, HSG C
	4,450	98	Weighted Average
	84	74	1.89% Pervious Area
	4,366	98	98.11% Impervious Area

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

Summary for Subcatchment pS3: Post - Flow to CB3

Runoff = 1.33 cfs @ 12.07 hrs, Volume= 4,568 cf, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	11,053	98	Paved parking, HSG C
	770	74	>75% Grass cover, Good, HSG C
*	170	98	New Curbing
*	155	98	New Wall
	12,148	96	Weighted Average
	770	74	6.34% Pervious Area
	11,378	98	93.66% Impervious Area

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

Summary for Subcatchment pS4: Post - Flow to CB4

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 899 cf, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	192	74	>75% Grass cover, Good, HSG C
*	286	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,411	96	Weighted Average
	192	74	7.96% Pervious Area
	2,219	98	92.04% Impervious Area

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

Summary for Subcatchment pS5: Post - Flow to CB5

Runoff = 0.41 cfs @ 12.07 hrs, Volume= 1,429 cf, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	3,513	98	Paved parking, HSG C
	86	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	122	98	New Curbing
	0	98	Unconnected pavement, HSG C
	3,721	97	Weighted Average
	86	74	2.31% Pervious Area
	3,635	98	97.69% Impervious Area

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

Summary for Subcatchment pS6: Post - Flow to CB6

Runoff = 1.19 cfs @ 12.07 hrs, Volume= 4,104 cf, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	9,902	98	Paved parking, HSG C
*	140	98	New Curbing
*	177	98	New Wall
	696	74	>75% Grass cover, Good, HSG C
	10,915	96	Weighted Average
	696	74	6.38% Pervious Area
	10,219	98	93.62% Impervious Area

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

Summary for Subcatchment pS7: Post - Flow to Culvert-1

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 833 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
3,497	74	>75% Grass cover, Good, HSG C
431	98	Unconnected pavement, HSG C
3,928	77	Weighted Average
3,497	74	89.03% Pervious Area
431	98	10.97% Impervious Area

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

Summary for Subcatchment pS8: Post - Flow to Swale

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 1,010 cf, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
5,303	74	>75% Grass cover, Good, HSG C
5,303	74	100.00% Pervious Area

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

Summary for Subcatchment pS9: Post - Flow to Infiltration Basin-1

Runoff = 0.10 cfs @ 12.08 hrs, Volume= 292 cf, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
1,534	74	>75% Grass cover, Good, HSG C
1,534	74	100.00% Pervious Area

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

Summary for Subcatchment RF1: Post - Roof Area-1

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 3,674 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
9,454	98	Roofs, HSG C
9,454	98	100.00% Impervious Area

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

Summary for Subcatchment RF2: Post - Roof Area-2

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 3,665 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
9,432	98	Roofs, HSG C
9,432	98	100.00% Impervious Area

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

Summary for Pond STC1: Post - Stormceptor

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 3.96" for 10-Year event
Inflow = 1.23 cfs @ 12.04 hrs, Volume= 9,348 cf
Outflow = 1.23 cfs @ 12.04 hrs, Volume= 9,348 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.04 hrs, Volume= 9,348 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.84' @ 12.07 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.08 cfs @ 12.04 hrs HW=45.79' TW=45.37' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.08 cfs @ 3.10 fps)

Summary for Pond STC2: Post - Stormceptor

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 4.01" for 10-Year event
Inflow = 1.19 cfs @ 12.05 hrs, Volume= 8,846 cf
Outflow = 1.19 cfs @ 12.05 hrs, Volume= 8,846 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.05 hrs, Volume= 8,846 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.81' @ 12.08 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.05 cfs @ 12.05 hrs HW=45.74' TW=45.34' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.05 cfs @ 3.01 fps)

Summary for Reach SW: Post - Vegetated Swale

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 2.40" for 10-Year event
Inflow = 0.60 cfs @ 12.08 hrs, Volume= 1,843 cf
Outflow = 0.59 cfs @ 12.09 hrs, Volume= 1,843 cf, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 2.12 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 3.9 min

Peak Storage= 45 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 92.96 cfs

Custom cross-section, Length= 163.0' Slope= 0.0429 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 56.00', Outlet Invert= 49.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-7.00	1.00	0.00
-2.00	0.00	1.00
2.00	0.00	1.00
7.00	1.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	4.0	0	0.00
1.00	9.0	14.2	1,467	92.96

Summary for Pond US1: Post - Underground Infiltration System-1

Inflow Area = 54,797 sf, 96.45% Impervious, Inflow Depth = 4.56" for 10-Year event
Inflow = 6.05 cfs @ 12.07 hrs, Volume= 20,806 cf
Outflow = 2.66 cfs @ 12.24 hrs, Volume= 19,078 cf, Atten= 56%, Lag= 10.1 min
Discarded = 0.07 cfs @ 6.40 hrs, Volume= 7,889 cf
Primary = 2.59 cfs @ 12.24 hrs, Volume= 11,189 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.17' @ 12.24 hrs Surf.Area= 5,779 sf Storage= 8,320 cf
Flood Elev= 46.50' Surf.Area= 5,779 sf Storage= 11,678 cf

Plug-Flow detention time= 258.8 min calculated for 19,078 cf (92% of inflow)
Center-of-Mass det. time= 215.2 min (967.3 - 752.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	4,210 cf	**44.25'W x 130.60'L x 3.50'H Field A** 20,226 cf Overall - 7,468 cf Embedded = 12,759 cf x 33.0% Voids
#2A	43.50'	7,468 cf	**ADS_StormTech SC-740** x 162 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 9 rows
		11,678 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**0.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	44.25'	**15.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.25' / 44.10' S= 0.0115 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.07 cfs @ 6.40 hrs HW=43.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=2.59 cfs @ 12.24 hrs HW=45.17' TW=43.63' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 2.59 cfs @ 3.71 fps)

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Reach C1: Post - Culvert-1 Avg. Flow Depth=0.23' Max Vel=4.56 fps Inflow=0.61 cfs 1,893 cf
12.0" Round Pipe n=0.013 L=50.0' S=0.0230 '/' Capacity=5.40 cfs Outflow=0.61 cfs 1,893 cf

Pond C2: Post - Culvert-2 Peak Elev=46.87' Storage=31 cf Inflow=1.39 cfs 4,308 cf
12.0" Round Culvert n=0.013 L=49.0' S=0.0133 '/' Outflow=1.39 cfs 4,303 cf

Pond CB1: Post - Catch Basin-1 Peak Elev=52.73' Inflow=0.44 cfs 1,550 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.44 cfs 1,550 cf

Pond CB2: Post - Catch Basin-2 Peak Elev=48.75' Inflow=0.88 cfs 3,080 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.88 cfs 3,080 cf

Pond CB3: Post - Catch Basin-3 Peak Elev=47.59' Storage=73 cf Inflow=2.37 cfs 8,277 cf
Primary=2.34 cfs 8,226 cf Secondary=0.00 cfs 0 cf Outflow=2.34 cfs 8,226 cf

Pond CB4: Post - Catch Basin-4 Peak Elev=52.74' Inflow=0.47 cfs 1,633 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.47 cfs 1,633 cf

Pond CB5: Post - Catch Basin-5 Peak Elev=48.70' Inflow=0.73 cfs 2,572 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.73 cfs 2,572 cf

Pond CB6: Post - Catch Basin-6 Peak Elev=47.35' Storage=70 cf Inflow=2.13 cfs 7,436 cf
Primary=2.11 cfs 7,385 cf Secondary=0.00 cfs 0 cf Outflow=2.11 cfs 7,385 cf

Pond DMH1: Post - DMH-1 Peak Elev=48.61' Inflow=1.32 cfs 4,630 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=1.32 cfs 4,630 cf

Pond DMH2: Post - DMH-2 Peak Elev=47.04' Inflow=5.53 cfs 19,441 cf
Primary=1.53 cfs 14,444 cf Secondary=4.11 cfs 4,998 cf Outflow=5.53 cfs 19,441 cf

Pond DMH3: Post - DMH-3 Peak Elev=47.30' Inflow=2.34 cfs 8,226 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=2.34 cfs 8,226 cf

Pond DMH4: Post - DMH-4 Peak Elev=46.36' Inflow=5.53 cfs 19,441 cf
Outflow=5.53 cfs 19,441 cf

Pond DMH5: Post - DMH-5 Peak Elev=48.57' Inflow=1.20 cfs 4,205 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=1.20 cfs 4,205 cf

Pond DMH6: Post - DMH-6 Peak Elev=46.91' Inflow=5.17 cfs 18,160 cf
Primary=1.48 cfs 13,605 cf Secondary=3.80 cfs 4,555 cf Outflow=5.17 cfs 18,160 cf

Pond DMH7: Post - DMH-7 Peak Elev=47.13' Inflow=2.11 cfs 7,385 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=2.11 cfs 7,385 cf

Pond DMH8: Post - DMH-8 Peak Elev=46.34' Inflow=5.17 cfs 18,160 cf
Outflow=5.17 cfs 18,160 cf

Pond IB1: Post - Infiltration Basin-1 Peak Elev=43.94' Storage=1,052 cf Inflow=6.98 cfs 28,067 cf
Discarded=0.01 cfs 657 cf Primary=6.97 cfs 27,079 cf Outflow=6.98 cfs 27,736 cf

Pond M1: Post - Northern Manifold Peak Elev=48.27' Inflow=1.87 cfs 6,586 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=1.87 cfs 6,586 cf

Pond M2: Post - Southern Manifold Peak Elev=48.19' Inflow=1.87 cfs 6,571 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=1.87 cfs 6,571 cf

Pond pA1: Post - Analysis Point-1 Inflow=10.49 cfs 41,226 cf
Primary=10.49 cfs 41,226 cf

Subcatchment pS1: Post - Flow to CB1 Runoff Area=2,266 sf 94.70% Impervious Runoff Depth=8.21"
Tc=5.0 min CN=74/98 Runoff=0.44 cfs 1,550 cf

Subcatchment pS10: Post - Flow to Rear of Property Runoff Area=21,478 sf 1.17% Impervious Runoff Depth=5.50"
Flow Length=440' Tc=5.3 min CN=74/98 Runoff=3.20 cfs 9,843 cf

Subcatchment pS2: Post - Flow to CB2 Runoff Area=4,450 sf 98.11% Impervious Runoff Depth=8.31"
Tc=5.0 min CN=74/98 Runoff=0.88 cfs 3,080 cf

Subcatchment pS3: Post - Flow to CB3 Runoff Area=12,148 sf 93.66% Impervious Runoff Depth=8.18"
Tc=5.0 min CN=74/98 Runoff=2.37 cfs 8,277 cf

Subcatchment pS4: Post - Flow to CB4 Runoff Area=2,411 sf 92.04% Impervious Runoff Depth=8.13"
Tc=5.0 min CN=74/98 Runoff=0.47 cfs 1,633 cf

Subcatchment pS5: Post - Flow to CB5 Runoff Area=3,721 sf 97.69% Impervious Runoff Depth=8.29"
Tc=5.0 min CN=74/98 Runoff=0.73 cfs 2,572 cf

Subcatchment pS6: Post - Flow to CB6 Runoff Area=10,915 sf 93.62% Impervious Runoff Depth=8.18"
Tc=5.0 min CN=74/98 Runoff=2.13 cfs 7,436 cf

Subcatchment pS7: Post - Flow to Culvert-1 Runoff Area=3,928 sf 10.97% Impervious Runoff Depth=5.78"
Tc=5.0 min CN=74/98 Runoff=0.61 cfs 1,893 cf

Subcatchment pS8: Post - Flow to Swale Runoff Area=5,303 sf 0.00% Impervious Runoff Depth=5.47"
Tc=5.0 min CN=74/0 Runoff=0.79 cfs 2,415 cf

Subcatchment pS9: Post - Flow to Infiltration Basin-1 Runoff Area=1,534 sf 0.00% Impervious Runoff Depth=5.47"
Tc=5.0 min CN=74/0 Runoff=0.23 cfs 699 cf

Subcatchment RF1: Post - Roof Area-1 Runoff Area=9,454 sf 100.00% Impervious Runoff Depth=8.36"
Tc=5.0 min CN=0/98 Runoff=1.87 cfs 6,586 cf

Subcatchment RF2: Post - Roof Area-2 Runoff Area=9,432 sf 100.00% Impervious Runoff Depth=8.36"
Tc=5.0 min CN=0/98 Runoff=1.87 cfs 6,571 cf

Pond STC1: Post - Stormceptor Peak Elev=46.54' Inflow=1.53 cfs 14,444 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.53 cfs 14,444 cf

Pond STC2: Post - Stormceptor Peak Elev=46.49' Inflow=1.48 cfs 13,605 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.48 cfs 13,605 cf

Reach SW: Post - Vegetated Swale Avg. Flow Depth=0.11' Max Vel=2.90 fps Inflow=1.40 cfs 4,308 cf
n=0.022 L=163.0' S=0.0429 '/' Capacity=92.96 cfs Outflow=1.39 cfs 4,308 cf

Pond US1: Post - Underground Infiltration System-1 Peak Elev=46.22' Storage=11,142 cf Inflow=10.70 cfs 37,602 cf
Discarded=0.07 cfs 8,279 cf Primary=6.84 cfs 27,368 cf Outflow=6.90 cfs 35,647 cf

Total Runoff Area = 87,040 sf Runoff Volume = 52,555 cf Average Runoff Depth = 7.25"
38.50% Pervious = 33,509 sf 61.50% Impervious = 53,531 sf

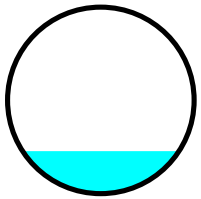
Summary for Reach C1: Post - Culvert-1

Inflow Area = 3,928 sf, 10.97% Impervious, Inflow Depth = 5.78" for 100-Year event
Inflow = 0.61 cfs @ 12.08 hrs, Volume= 1,893 cf
Outflow = 0.61 cfs @ 12.08 hrs, Volume= 1,893 cf, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.6 min

Peak Storage= 7 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.40 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0230 '/'
Inlet Invert= 57.25', Outlet Invert= 56.10'



Summary for Pond C2: Post - Culvert-2

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 5.60" for 100-Year event
Inflow = 1.39 cfs @ 12.09 hrs, Volume= 4,308 cf
Outflow = 1.39 cfs @ 12.09 hrs, Volume= 4,303 cf, Atten= 0%, Lag= 0.3 min
Primary = 1.39 cfs @ 12.09 hrs, Volume= 4,303 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.87' @ 12.09 hrs Surf.Area= 56 sf Storage= 31 cf

Plug-Flow detention time= 2.7 min calculated for 4,303 cf (100% of inflow)
Center-of-Mass det. time= 1.6 min (811.4 - 809.8)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	356 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	15	0	0
47.00	62	39	39
48.00	136	99	138
49.00	301	219	356

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	**12.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 45.60' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.35 cfs @ 12.09 hrs HW=46.87' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.35 cfs @ 2.67 fps)

Summary for Pond CB1: Post - Catch Basin-1

Inflow Area = 2,266 sf, 94.70% Impervious, Inflow Depth = 8.21" for 100-Year event
Inflow = 0.44 cfs @ 12.07 hrs, Volume= 1,550 cf
Outflow = 0.44 cfs @ 12.07 hrs, Volume= 1,550 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.07 hrs, Volume= 1,550 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.73' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500

Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.07 hrs HW=52.73' TW=48.60' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.95 fps)

Summary for Pond CB2: Post - Catch Basin-2

Inflow Area = 4,450 sf, 98.11% Impervious, Inflow Depth = 8.31" for 100-Year event
Inflow = 0.88 cfs @ 12.07 hrs, Volume= 3,080 cf
Outflow = 0.88 cfs @ 12.07 hrs, Volume= 3,080 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.07 hrs, Volume= 3,080 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.75' @ 12.09 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.77 cfs @ 12.07 hrs HW=48.74' TW=48.60' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.77 cfs @ 2.32 fps)

Summary for Pond CB3: Post - Catch Basin-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 8.18" for 100-Year event
Inflow = 2.37 cfs @ 12.07 hrs, Volume= 8,277 cf
Outflow = 2.34 cfs @ 12.07 hrs, Volume= 8,226 cf, Atten= 1%, Lag= 0.0 min
Primary = 2.34 cfs @ 12.07 hrs, Volume= 8,226 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 47.59' @ 12.14 hrs Surf.Area= 13 sf Storage= 73 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 8.6 min calculated for 8,217 cf (99% of inflow)
Center-of-Mass det. time= 4.4 min (746.9 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.30 cfs @ 12.07 hrs HW=47.13' TW=47.12' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.30 cfs @ 0.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB4: Post - Catch Basin-4

Inflow Area = 2,411 sf, 92.04% Impervious, Inflow Depth = 8.13" for 100-Year event
Inflow = 0.47 cfs @ 12.07 hrs, Volume= 1,633 cf
Outflow = 0.47 cfs @ 12.07 hrs, Volume= 1,633 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 12.07 hrs, Volume= 1,633 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.74' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.07 hrs HW=52.74' TW=48.57' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.46 cfs @ 1.98 fps)

Summary for Pond CB5: Post - Catch Basin-5

Inflow Area = 3,721 sf, 97.69% Impervious, Inflow Depth = 8.29" for 100-Year event
Inflow = 0.73 cfs @ 12.07 hrs, Volume= 2,572 cf
Outflow = 0.73 cfs @ 12.07 hrs, Volume= 2,572 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.07 hrs, Volume= 2,572 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.70' @ 12.09 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=48.69' TW=48.57' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.64 cfs @ 2.15 fps)

Summary for Pond CB6: Post - Catch Basin-6

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 8.18" for 100-Year event
Inflow = 2.13 cfs @ 12.07 hrs, Volume= 7,436 cf
Outflow = 2.11 cfs @ 12.07 hrs, Volume= 7,385 cf, Atten= 1%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.07 hrs, Volume= 7,385 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.35' @ 12.14 hrs Surf.Area= 13 sf Storage= 70 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 9.9 min calculated for 7,385 cf (99% of inflow)
Center-of-Mass det. time= 4.8 min (747.3 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.38 cfs @ 12.07 hrs HW=46.98' TW=46.97' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.38 cfs @ 0.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DMH1: Post - DMH-1

Inflow Area = 6,716 sf, 96.96% Impervious, Inflow Depth = 8.27" for 100-Year event
Inflow = 1.32 cfs @ 12.07 hrs, Volume= 4,630 cf
Outflow = 1.32 cfs @ 12.07 hrs, Volume= 4,630 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.07 hrs, Volume= 4,630 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.61' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.07 hrs HW=48.60' TW=47.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.30 cfs @ 2.64 fps)

Summary for Pond DMH2: Post - DMH-2

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 8.24" for 100-Year event
Inflow = 5.53 cfs @ 12.07 hrs, Volume= 19,441 cf
Outflow = 5.53 cfs @ 12.07 hrs, Volume= 19,441 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.53 cfs @ 12.04 hrs, Volume= 14,444 cf
Secondary = 4.11 cfs @ 12.08 hrs, Volume= 4,998 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.04' @ 12.09 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.18 cfs @ 12.04 hrs HW=46.85' TW=46.36' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.18 cfs @ 3.39 fps)

Secondary OutFlow Max=3.67 cfs @ 12.08 hrs HW=47.02' TW=46.08' (Dynamic Tailwater)
└**3=Culvert** (Inlet Controls 3.67 cfs @ 4.67 fps)
└**2=Broad-Crested Rectangular Weir** (Passes 3.67 cfs of 20.39 cfs potential flow)

Summary for Pond DMH3: Post - DMH-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 8.13" for 100-Year event
Inflow = 2.34 cfs @ 12.07 hrs, Volume= 8,226 cf
Outflow = 2.34 cfs @ 12.07 hrs, Volume= 8,226 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.34 cfs @ 12.07 hrs, Volume= 8,226 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.30' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.35 cfs @ 12.07 hrs HW=47.12' TW=46.99' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.35 cfs @ 1.72 fps)

Summary for Pond DMH4: Post - DMH-4

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 8.24" for 100-Year event
Inflow = 5.53 cfs @ 12.07 hrs, Volume= 19,441 cf
Outflow = 5.53 cfs @ 12.07 hrs, Volume= 19,441 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.53 cfs @ 12.07 hrs, Volume= 19,441 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.36' @ 12.18 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.73 cfs @ 12.07 hrs HW=46.04' TW=45.80' (Dynamic Tailwater)
└**2=Culvert** (Passes 3.73 cfs of 14.92 cfs potential flow)
└**1=Culvert** (Inlet Controls 3.73 cfs @ 2.38 fps)

Summary for Pond DMH5: Post - DMH-5

Inflow Area = 6,132 sf, 95.47% Impervious, Inflow Depth = 8.23" for 100-Year event
Inflow = 1.20 cfs @ 12.07 hrs, Volume= 4,205 cf
Outflow = 1.20 cfs @ 12.07 hrs, Volume= 4,205 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.07 hrs, Volume= 4,205 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 48.57' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.18 cfs @ 12.07 hrs HW=48.57' TW=46.88' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.18 cfs @ 2.56 fps)

Summary for Pond DMH6: Post - DMH-6

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 8.23" for 100-Year event
Inflow = 5.17 cfs @ 12.07 hrs, Volume= 18,160 cf
Outflow = 5.17 cfs @ 12.07 hrs, Volume= 18,160 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.48 cfs @ 12.04 hrs, Volume= 13,605 cf
Secondary = 3.80 cfs @ 12.08 hrs, Volume= 4,555 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.91' @ 12.08 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.04 hrs HW=46.76' TW=46.27' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.17 cfs @ 3.35 fps)

Secondary OutFlow Max=3.55 cfs @ 12.08 hrs HW=46.91' TW=46.03' (Dynamic Tailwater)
└**3=Culvert** (Inlet Controls 3.55 cfs @ 4.52 fps)
└**2=Broad-Crested Rectangular Weir** (Passes 3.55 cfs of 17.61 cfs potential flow)

Summary for Pond DMH7: Post - DMH-7

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 8.12" for 100-Year event
Inflow = 2.11 cfs @ 12.07 hrs, Volume= 7,385 cf
Outflow = 2.11 cfs @ 12.07 hrs, Volume= 7,385 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.07 hrs, Volume= 7,385 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 47.13' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.12 cfs @ 12.07 hrs HW=46.97' TW=46.88' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.12 cfs @ 1.43 fps)

Summary for Pond DMH8: Post - DMH-8

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 8.23" for 100-Year event
Inflow = 5.17 cfs @ 12.07 hrs, Volume= 18,160 cf
Outflow = 5.17 cfs @ 12.07 hrs, Volume= 18,160 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.17 cfs @ 12.07 hrs, Volume= 18,160 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.34' @ 12.19 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.20 cfs @ 12.07 hrs HW=45.98' TW=45.80' (Dynamic Tailwater)
↑—**2=Culvert** (Passes 3.20 cfs of 12.81 cfs potential flow)
↑—**1=Culvert** (Inlet Controls 3.20 cfs @ 2.04 fps)

Summary for Pond IB1: Post - Infiltration Basin-1

Inflow Area = 56,331 sf, 93.82% Impervious, Inflow Depth = 5.98" for 100-Year event
Inflow = 6.98 cfs @ 12.16 hrs, Volume= 28,067 cf
Outflow = 6.98 cfs @ 12.17 hrs, Volume= 27,736 cf, Atten= 0%, Lag= 0.7 min
Discarded = 0.01 cfs @ 12.17 hrs, Volume= 657 cf
Primary = 6.97 cfs @ 12.17 hrs, Volume= 27,079 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 43.94' @ 12.17 hrs Surf.Area= 770 sf Storage= 1,052 cf
Flood Elev= 44.00' Surf.Area= 785 sf Storage= 1,101 cf

Plug-Flow detention time= 21.6 min calculated for 27,736 cf (99% of inflow)
Center-of-Mass det. time= 14.4 min (823.8 - 809.5)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	1,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.00	329	0	0
43.00	544	437	437
44.00	785	665	1,101

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	43.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 0.75
			Width (feet) 3.00 5.00

Discarded OutFlow Max=0.01 cfs @ 12.17 hrs HW=43.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=6.89 cfs @ 12.17 hrs HW=43.93' TW=0.00' (Dynamic Tailwater)
└**2=Custom Weir/Orifice** (Weir Controls 6.89 cfs @ 2.58 fps)

Summary for Pond M1: Post - Northern Manifold

Inflow Area = 9,454 sf,100.00% Impervious, Inflow Depth = 8.36" for 100-Year event
Inflow = 1.87 cfs @ 12.07 hrs, Volume= 6,586 cf
Outflow = 1.87 cfs @ 12.07 hrs, Volume= 6,586 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.87 cfs @ 12.07 hrs, Volume= 6,586 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.27' @ 12.08 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.72 cfs @ 12.07 hrs HW=48.21' TW=46.99' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.72 cfs @ 4.93 fps)

Summary for Pond M2: Post - Southern Manifold

Inflow Area = 9,432 sf,100.00% Impervious, Inflow Depth = 8.36" for 100-Year event
Inflow = 1.87 cfs @ 12.07 hrs, Volume= 6,571 cf
Outflow = 1.87 cfs @ 12.07 hrs, Volume= 6,571 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.87 cfs @ 12.07 hrs, Volume= 6,571 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.19' @ 12.08 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=48.15' TW=46.88' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.76 cfs @ 5.04 fps)

Summary for Pond pA1: Post - Analysis Point-1

Inflow Area = 87,040 sf, 61.50% Impervious, Inflow Depth = 5.68" for 100-Year event
Inflow = 10.49 cfs @ 12.13 hrs, Volume= 41,226 cf
Primary = 10.49 cfs @ 12.13 hrs, Volume= 41,226 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Summary for Subcatchment pS1: Post - Flow to CB1

Runoff = 0.44 cfs @ 12.07 hrs, Volume= 1,550 cf, Depth= 8.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	120	74	>75% Grass cover, Good, HSG C
*	213	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,266	97	Weighted Average
	120	74	5.30% Pervious Area
	2,146	98	94.70% Impervious Area

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

Summary for Subcatchment pS10: Post - Flow to Rear of Property

Runoff = 3.20 cfs @ 12.08 hrs, Volume= 9,843 cf, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
21,227	74	>75% Grass cover, Good, HSG C
251	98	Unconnected pavement, HSG C
21,478	74	Weighted Average
21,227	74	98.83% Pervious Area
251	98	1.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2000	0.15		**Sheet Flow, AB**
					Grass: Bermuda n= 0.410 P2= 3.30"
1.8	300	0.0350	2.81		**Shallow Concentrated Flow, BC**
					Grassed Waterway Kv= 15.0 fps
0.2	110	0.0350	11.23	190.86	**Channel Flow, CD**
					Area= 17.0 sf Perim= 20.3' r= 0.84'
					n= 0.022 Earth, clean & straight
5.3	440	Total			

Summary for Subcatchment pS2: Post - Flow to CB2

Runoff = 0.88 cfs @ 12.07 hrs, Volume= 3,080 cf, Depth= 8.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	4,243	98	Paved parking, HSG C
	84	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	123	98	New Curbing
	0	98	Unconnected pavement, HSG C
	4,450	98	Weighted Average
	84	74	1.89% Pervious Area
	4,366	98	98.11% Impervious Area

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

Summary for Subcatchment pS3: Post - Flow to CB3

Runoff = 2.37 cfs @ 12.07 hrs, Volume= 8,277 cf, Depth= 8.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	11,053	98	Paved parking, HSG C
	770	74	>75% Grass cover, Good, HSG C
*	170	98	New Curbing
*	155	98	New Wall
	12,148	96	Weighted Average
	770	74	6.34% Pervious Area
	11,378	98	93.66% Impervious Area

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

Summary for Subcatchment pS4: Post - Flow to CB4

Runoff = 0.47 cfs @ 12.07 hrs, Volume= 1,633 cf, Depth= 8.13"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	192	74	>75% Grass cover, Good, HSG C
*	286	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,411	96	Weighted Average
	192	74	7.96% Pervious Area
	2,219	98	92.04% Impervious Area

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

Summary for Subcatchment pS5: Post - Flow to CB5

Runoff = 0.73 cfs @ 12.07 hrs, Volume= 2,572 cf, Depth= 8.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	3,513	98	Paved parking, HSG C
	86	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	122	98	New Curbing
	0	98	Unconnected pavement, HSG C
	3,721	97	Weighted Average
	86	74	2.31% Pervious Area
	3,635	98	97.69% Impervious Area

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

Summary for Subcatchment pS6: Post - Flow to CB6

Runoff = 2.13 cfs @ 12.07 hrs, Volume= 7,436 cf, Depth= 8.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

	Area (sf)	CN	Description
	9,902	98	Paved parking, HSG C
*	140	98	New Curbing
*	177	98	New Wall
	696	74	>75% Grass cover, Good, HSG C
	10,915	96	Weighted Average
	696	74	6.38% Pervious Area
	10,219	98	93.62% Impervious Area

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

Summary for Subcatchment pS7: Post - Flow to Culvert-1

Runoff = 0.61 cfs @ 12.08 hrs, Volume= 1,893 cf, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
3,497	74	>75% Grass cover, Good, HSG C
431	98	Unconnected pavement, HSG C
3,928	77	Weighted Average
3,497	74	89.03% Pervious Area
431	98	10.97% Impervious Area

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

Summary for Subcatchment pS8: Post - Flow to Swale

Runoff = 0.79 cfs @ 12.08 hrs, Volume= 2,415 cf, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
5,303	74	>75% Grass cover, Good, HSG C
5,303	74	100.00% Pervious Area

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

Summary for Subcatchment pS9: Post - Flow to Infiltration Basin-1

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 699 cf, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
1,534	74	>75% Grass cover, Good, HSG C
1,534	74	100.00% Pervious Area

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

Summary for Subcatchment RF1: Post - Roof Area-1

Runoff = 1.87 cfs @ 12.07 hrs, Volume= 6,586 cf, Depth= 8.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
9,454	98	Roofs, HSG C
9,454	98	100.00% Impervious Area

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

Summary for Subcatchment RF2: Post - Roof Area-2

Runoff = 1.87 cfs @ 12.07 hrs, Volume= 6,571 cf, Depth= 8.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
9,432	98	Roofs, HSG C
9,432	98	100.00% Impervious Area

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

Summary for Pond STC1: Post - Stormceptor

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 6.12" for 100-Year event
Inflow = 1.53 cfs @ 12.04 hrs, Volume= 14,444 cf
Outflow = 1.53 cfs @ 12.04 hrs, Volume= 14,444 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.53 cfs @ 12.04 hrs, Volume= 14,444 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.54' @ 12.12 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.21 cfs @ 12.04 hrs HW=46.36' TW=45.84' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.21 cfs @ 3.47 fps)

Summary for Pond STC2: Post - Stormceptor

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 6.17" for 100-Year event
Inflow = 1.48 cfs @ 12.04 hrs, Volume= 13,605 cf
Outflow = 1.48 cfs @ 12.04 hrs, Volume= 13,605 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.48 cfs @ 12.04 hrs, Volume= 13,605 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.49' @ 12.20 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.19 cfs @ 12.04 hrs HW=46.27' TW=45.77' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.19 cfs @ 3.40 fps)

Summary for Reach SW: Post - Vegetated Swale

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 5.60" for 100-Year event
Inflow = 1.40 cfs @ 12.08 hrs, Volume= 4,308 cf
Outflow = 1.39 cfs @ 12.09 hrs, Volume= 4,308 cf, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 2.90 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 3.5 min

Peak Storage= 78 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 92.96 cfs

Custom cross-section, Length= 163.0' Slope= 0.0429 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 56.00', Outlet Invert= 49.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-7.00	1.00	0.00
-2.00	0.00	1.00
2.00	0.00	1.00
7.00	1.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	4.0	0	0.00
1.00	9.0	14.2	1,467	92.96

Summary for Pond US1: Post - Underground Infiltration System-1

Inflow Area = 54,797 sf, 96.45% Impervious, Inflow Depth = 8.23" for 100-Year event
Inflow = 10.70 cfs @ 12.07 hrs, Volume= 37,602 cf
Outflow = 6.90 cfs @ 12.17 hrs, Volume= 35,647 cf, Atten= 35%, Lag= 5.6 min
Discarded = 0.07 cfs @ 3.12 hrs, Volume= 8,279 cf
Primary = 6.84 cfs @ 12.17 hrs, Volume= 27,368 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.22' @ 12.17 hrs Surf.Area= 5,779 sf Storage= 11,142 cf
Flood Elev= 46.50' Surf.Area= 5,779 sf Storage= 11,678 cf

Plug-Flow detention time= 170.2 min calculated for 35,608 cf (95% of inflow)
Center-of-Mass det. time= 140.7 min (883.7 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	4,210 cf	**44.25'W x 130.60'L x 3.50'H Field A** 20,226 cf Overall - 7,468 cf Embedded = 12,759 cf x 33.0% Voids
#2A	43.50'	7,468 cf	**ADS_StormTech SC-740** x 162 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 9 rows
		11,678 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**0.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	44.25'	**15.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.25' / 44.10' S= 0.0115 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.07 cfs @ 3.12 hrs HW=43.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=6.80 cfs @ 12.17 hrs HW=46.21' TW=43.93' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 6.80 cfs @ 5.54 fps)

Time span=0.00-36.00 hrs, dt=0.04 hrs, 901 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Reach C1: Post - Culvert-1 Avg. Flow Depth=0.03' Max Vel=1.38 fps Inflow=0.01 cfs 53 cf
12.0" Round Pipe n=0.013 L=50.0' S=0.0230 '/' Capacity=5.40 cfs Outflow=0.01 cfs 53 cf

Pond C2: Post - Culvert-2 Peak Elev=46.30' Storage=7 cf Inflow=0.01 cfs 81 cf
12.0" Round Culvert n=0.013 L=49.0' S=0.0133 '/' Outflow=0.01 cfs 75 cf

Pond CB1: Post - Catch Basin-1 Peak Elev=52.51' Inflow=0.06 cfs 177 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.06 cfs 177 cf

Pond CB2: Post - Catch Basin-2 Peak Elev=48.33' Inflow=0.11 cfs 359 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.11 cfs 359 cf

Pond CB3: Post - Catch Basin-3 Peak Elev=46.18' Storage=55 cf Inflow=0.29 cfs 939 cf
Primary=0.29 cfs 887 cf Secondary=0.00 cfs 0 cf Outflow=0.29 cfs 887 cf

Pond CB4: Post - Catch Basin-4 Peak Elev=52.51' Inflow=0.06 cfs 183 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0202 '/' Outflow=0.06 cfs 183 cf

Pond CB5: Post - Catch Basin-5 Peak Elev=48.32' Inflow=0.09 cfs 299 cf
12.0" Round Culvert n=0.013 L=4.5' S=0.0111 '/' Outflow=0.09 cfs 299 cf

Pond CB6: Post - Catch Basin-6 Peak Elev=46.17' Storage=55 cf Inflow=0.26 cfs 843 cf
Primary=0.26 cfs 791 cf Secondary=0.00 cfs 0 cf Outflow=0.26 cfs 791 cf

Pond DMH1: Post - DMH-1 Peak Elev=48.20' Inflow=0.17 cfs 536 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=0.17 cfs 536 cf

Pond DMH2: Post - DMH-2 Peak Elev=45.70' Inflow=0.70 cfs 2,199 cf
Primary=0.70 cfs 2,199 cf Secondary=0.00 cfs 0 cf Outflow=0.70 cfs 2,199 cf

Pond DMH3: Post - DMH-3 Peak Elev=45.72' Inflow=0.29 cfs 887 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.29 cfs 887 cf

Pond DMH4: Post - DMH-4 Peak Elev=44.94' Inflow=0.70 cfs 2,199 cf
Outflow=0.70 cfs 2,199 cf

Pond DMH5: Post - DMH-5 Peak Elev=48.19' Inflow=0.15 cfs 482 cf
12.0" Round Culvert n=0.013 L=116.0' S=0.0216 '/' Outflow=0.15 cfs 482 cf

Pond DMH6: Post - DMH-6 Peak Elev=45.67' Inflow=0.65 cfs 2,048 cf
Primary=0.65 cfs 2,048 cf Secondary=0.00 cfs 0 cf Outflow=0.65 cfs 2,048 cf

Pond DMH7: Post - DMH-7 Peak Elev=45.69' Inflow=0.26 cfs 791 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.26 cfs 791 cf

Pond DMH8: Post - DMH-8 Peak Elev=44.93' Inflow=0.65 cfs 2,048 cf
Outflow=0.65 cfs 2,048 cf

Pond IB1: Post - Infiltration Basin-1 Peak Elev=42.00' Storage=0 cf Inflow=0.00 cfs 8 cf
Discarded=0.00 cfs 8 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 8 cf

Pond M1: Post - Northern Manifold Peak Elev=46.78' Inflow=0.24 cfs 777 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=0.24 cfs 777 cf

Pond M2: Post - Southern Manifold Peak Elev=46.77' Inflow=0.24 cfs 775 cf
8.0" Round Culvert n=0.013 L=32.0' S=0.0125 '/' Outflow=0.24 cfs 775 cf

Pond pA1: Post - Analysis Point-1 Inflow=0.02 cfs 205 cf
Primary=0.02 cfs 205 cf

Subcatchment pS1: Post - Flow to CB1 Runoff Area=2,266 sf 94.70% Impervious Runoff Depth=0.94"
Tc=5.0 min CN=74/98 Runoff=0.06 cfs 177 cf

Subcatchment pS10: Post - Flow to Rear of Property Runoff Area=21,478 sf 1.17% Impervious Runoff Depth=0.07"
Flow Length=440' Tc=5.3 min CN=74/98 Runoff=0.01 cfs 130 cf

Subcatchment pS2: Post - Flow to CB2 Runoff Area=4,450 sf 98.11% Impervious Runoff Depth=0.97"
Tc=5.0 min CN=74/98 Runoff=0.11 cfs 359 cf

Subcatchment pS3: Post - Flow to CB3 Runoff Area=12,148 sf 93.66% Impervious Runoff Depth=0.93"
Tc=5.0 min CN=74/98 Runoff=0.29 cfs 939 cf

Subcatchment pS4: Post - Flow to CB4 Runoff Area=2,411 sf 92.04% Impervious Runoff Depth=0.91"
Tc=5.0 min CN=74/98 Runoff=0.06 cfs 183 cf

Subcatchment pS5: Post - Flow to CB5 Runoff Area=3,721 sf 97.69% Impervious Runoff Depth=0.96"
Tc=5.0 min CN=74/98 Runoff=0.09 cfs 299 cf

Subcatchment pS6: Post - Flow to CB6 Runoff Area=10,915 sf 93.62% Impervious Runoff Depth=0.93"
Tc=5.0 min CN=74/98 Runoff=0.26 cfs 843 cf

Subcatchment pS7: Post - Flow to Culvert-1 Runoff Area=3,928 sf 10.97% Impervious Runoff Depth=0.16"
Tc=5.0 min CN=74/98 Runoff=0.01 cfs 53 cf

Subcatchment pS8: Post - Flow to Swale Runoff Area=5,303 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=74/0 Runoff=0.00 cfs 27 cf

Subcatchment pS9: Post - Flow to Infiltration Basin-1 Runoff Area=1,534 sf 0.00% Impervious Runoff Depth=0.06"
Tc=5.0 min CN=74/0 Runoff=0.00 cfs 8 cf

Subcatchment RF1: Post - Roof Area-1 Runoff Area=9,454 sf 100.00% Impervious Runoff Depth=0.99"
Tc=5.0 min CN=0/98 Runoff=0.24 cfs 777 cf

Subcatchment RF2: Post - Roof Area-2 Runoff Area=9,432 sf 100.00% Impervious Runoff Depth=0.99"
Tc=5.0 min CN=0/98 Runoff=0.24 cfs 775 cf

Pond STC1: Post - Stormceptor Peak Elev=45.37' Inflow=0.70 cfs 2,199 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=0.70 cfs 2,199 cf

Pond STC2: Post - Stormceptor Peak Elev=45.34' Inflow=0.65 cfs 2,048 cf
8.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=0.65 cfs 2,048 cf

Reach SW: Post - Vegetated Swale Avg. Flow Depth=0.00' Max Vel=0.64 fps Inflow=0.01 cfs 81 cf
n=0.022 L=163.0' S=0.0429 '/' Capacity=92.96 cfs Outflow=0.01 cfs 81 cf

Pond US1: Post - Underground Infiltration System-1

Peak Elev=43.73' Storage=2,050 cf Inflow=1.36 cfs 4,248 cf
Discarded=0.07 cfs 4,248 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 4,248 cf

Total Runoff Area = 87,040 sf Runoff Volume = 4,569 cf Average Runoff Depth = 0.63"
38.50% Pervious = 33,509 sf 61.50% Impervious = 53,531 sf

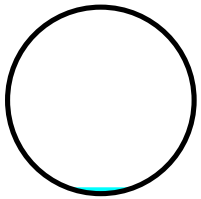
Summary for Reach C1: Post - Culvert-1

Inflow Area = 3,928 sf, 10.97% Impervious, Inflow Depth = 0.16" for WQv event
Inflow = 0.01 cfs @ 12.07 hrs, Volume= 53 cf
Outflow = 0.01 cfs @ 12.08 hrs, Volume= 53 cf, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 1.38 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 1.3 min

Peak Storage= 0 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.40 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0230 '/'
Inlet Invert= 57.25', Outlet Invert= 56.10'



Summary for Pond C2: Post - Culvert-2

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 0.10" for WQv event
Inflow = 0.01 cfs @ 12.13 hrs, Volume= 81 cf
Outflow = 0.01 cfs @ 12.16 hrs, Volume= 75 cf, Atten= 2%, Lag= 1.5 min
Primary = 0.01 cfs @ 12.16 hrs, Volume= 75 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.30' @ 12.16 hrs Surf.Area= 29 sf Storage= 7 cf

Plug-Flow detention time= 62.1 min calculated for 75 cf (93% of inflow)
Center-of-Mass det. time= 29.3 min (931.5 - 902.2)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	356 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	15	0	0
47.00	62	39	39
48.00	136	99	138
49.00	301	219	356

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	**12.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 45.60' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.16 hrs HW=46.30' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.01 cfs @ 1.05 fps)

Summary for Pond CB1: Post - Catch Basin-1

Inflow Area = 2,266 sf, 94.70% Impervious, Inflow Depth = 0.94" for WQv event
Inflow = 0.06 cfs @ 12.07 hrs, Volume= 177 cf
Outflow = 0.06 cfs @ 12.07 hrs, Volume= 177 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.06 cfs @ 12.07 hrs, Volume= 177 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.51' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500

Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.05 cfs @ 12.07 hrs HW=52.51' TW=48.20' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.05 cfs @ 1.14 fps)

Summary for Pond CB2: Post - Catch Basin-2

Inflow Area = 4,450 sf, 98.11% Impervious, Inflow Depth = 0.97" for WQv event
Inflow = 0.11 cfs @ 12.07 hrs, Volume= 359 cf
Outflow = 0.11 cfs @ 12.07 hrs, Volume= 359 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.07 hrs, Volume= 359 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.33' @ 12.07 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.07 hrs HW=48.33' TW=48.20' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.11 cfs @ 1.71 fps)

Summary for Pond CB3: Post - Catch Basin-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.29 cfs @ 12.07 hrs, Volume= 939 cf
Outflow = 0.29 cfs @ 12.08 hrs, Volume= 887 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.29 cfs @ 12.08 hrs, Volume= 887 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 46.18' @ 12.09 hrs Surf.Area= 13 sf Storage= 55 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 50.7 min calculated for 887 cf (95% of inflow)
Center-of-Mass det. time= 19.9 min (801.8 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.27 cfs @ 12.08 hrs HW=46.18' TW=45.68' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.27 cfs @ 2.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB4: Post - Catch Basin-4

Inflow Area = 2,411 sf, 92.04% Impervious, Inflow Depth = 0.91" for WQv event
Inflow = 0.06 cfs @ 12.07 hrs, Volume= 183 cf
Outflow = 0.06 cfs @ 12.07 hrs, Volume= 183 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.06 cfs @ 12.07 hrs, Volume= 183 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 52.51' @ 12.07 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 94.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 50.50' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.07 hrs HW=52.51' TW=48.19' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.06 cfs @ 1.15 fps)

Summary for Pond CB5: Post - Catch Basin-5

Inflow Area = 3,721 sf, 97.69% Impervious, Inflow Depth = 0.96" for WQv event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 299 cf
Outflow = 0.09 cfs @ 12.07 hrs, Volume= 299 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.09 cfs @ 12.07 hrs, Volume= 299 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.32' @ 12.07 hrs
Flood Elev= 53.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.15'	**12.0" Round Culvert** L= 4.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.15' / 48.10' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.09 cfs @ 12.07 hrs HW=48.32' TW=48.19' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.09 cfs @ 1.65 fps)

Summary for Pond CB6: Post - Catch Basin-6

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.26 cfs @ 12.07 hrs, Volume= 843 cf
Outflow = 0.26 cfs @ 12.08 hrs, Volume= 791 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.26 cfs @ 12.08 hrs, Volume= 791 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.17' @ 12.09 hrs Surf.Area= 13 sf Storage= 55 cf
Flood Elev= 48.00' Surf.Area= 313 sf Storage= 94 cf

Plug-Flow detention time= 55.2 min calculated for 791 cf (94% of inflow)
Center-of-Mass det. time= 21.6 min (803.5 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1	41.80'	77 cf	**4.00'D x 6.09'H Vertical Cone/Cylinder**
#2	47.89'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.89	15	0	0
48.00	300	17	17
48.10	881	59	76
48.20	1,745	131	208

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.25' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	48.00'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.24 cfs @ 12.08 hrs HW=46.16' TW=45.66' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.24 cfs @ 2.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.80' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DMH1: Post - DMH-1

Inflow Area = 6,716 sf, 96.96% Impervious, Inflow Depth = 0.96" for WQv event
Inflow = 0.17 cfs @ 12.07 hrs, Volume= 536 cf
Outflow = 0.17 cfs @ 12.07 hrs, Volume= 536 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.07 hrs, Volume= 536 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 48.20' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.16 cfs @ 12.07 hrs HW=48.20' TW=45.69' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.16 cfs @ 1.51 fps)

Summary for Pond DMH2: Post - DMH-2

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf
Outflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.70' @ 12.07 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.07 hrs HW=45.69' TW=45.36' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.69 cfs @ 2.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.10' TW=44.56' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DMH3: Post - DMH-3

Inflow Area = 12,148 sf, 93.66% Impervious, Inflow Depth = 0.88" for WQv event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 887 cf
Outflow = 0.29 cfs @ 12.08 hrs, Volume= 887 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.08 hrs, Volume= 887 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.72' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=45.68' TW=45.69' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond DMH4: Post - DMH-4

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf
Outflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 44.94' @ 12.07 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.07 hrs HW=44.94' TW=43.49' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.69 cfs of 3.17 cfs potential flow)
└**1=Culvert** (Barrel Controls 0.69 cfs @ 2.19 fps)

Summary for Pond DMH5: Post - DMH-5

Inflow Area = 6,132 sf, 95.47% Impervious, Inflow Depth = 0.94" for WQv event
Inflow = 0.15 cfs @ 12.07 hrs, Volume= 482 cf
Outflow = 0.15 cfs @ 12.07 hrs, Volume= 482 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.07 hrs, Volume= 482 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 48.19' @ 12.07 hrs
Flood Elev= 53.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**12.0" Round Culvert** L= 116.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 45.50' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.07 hrs HW=48.19' TW=45.66' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.15 cfs @ 1.47 fps)

Summary for Pond DMH6: Post - DMH-6

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.67' @ 12.07 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.10'	**8.0" Round Culvert** L= 2.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.10' / 45.05' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	45.85'	**5.0' 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
#3	Secondary	45.35'	**12.0" Round Culvert** L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.35' / 45.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=45.66' TW=45.34' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.64 cfs @ 2.76 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.10' TW=44.56' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond DMH7: Post - DMH-7

Inflow Area = 10,915 sf, 93.62% Impervious, Inflow Depth = 0.87" for WQv event
Inflow = 0.26 cfs @ 12.08 hrs, Volume= 791 cf
Outflow = 0.26 cfs @ 12.08 hrs, Volume= 791 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.08 hrs, Volume= 791 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.69' @ 12.11 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.20'	**12.0" Round Culvert** L= 5.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 45.20' / 45.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=45.66' TW=45.66' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond DMH8: Post - DMH-8

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Peak Elev= 44.93' @ 12.07 hrs
Flood Elev= 48.50'

Device	Routing	Invert	Outlet Devices
#1	Device 2	44.60'	**12.0" Round Culvert X 2.00** L= 3.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.60' / 44.56' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	44.56'	**12.0" Round Culvert X 8.00** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.56' / 44.54' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=44.93' TW=43.49' (Dynamic Tailwater)
↑—**2=Culvert** (Passes 0.64 cfs of 2.98 cfs potential flow)
↑—**1=Culvert** (Barrel Controls 0.64 cfs @ 2.15 fps)

Summary for Pond IB1: Post - Infiltration Basin-1

Inflow Area = 56,331 sf, 93.82% Impervious, Inflow Depth = 0.00" for WQv event
Inflow = 0.00 cfs @ 12.40 hrs, Volume= 8 cf
Outflow = 0.00 cfs @ 12.40 hrs, Volume= 8 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 12.40 hrs, Volume= 8 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 42.00' @ 0.00 hrs Surf.Area= 329 sf Storage= 0 cf
Flood Elev= 44.00' Surf.Area= 785 sf Storage= 1,101 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (988.1 - 988.1)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	1,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.00	329	0	0
43.00	544	437	437
44.00	785	665	1,101

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	43.25'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 0.75
			Width (feet) 3.00 5.00

Discarded OutFlow Max=0.00 cfs @ 12.40 hrs HW=42.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.00' TW=0.00' (Dynamic Tailwater)
└**2=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond M1: Post - Northern Manifold

Inflow Area = 9,454 sf,100.00% Impervious, Inflow Depth = 0.99" for WQv event
Inflow = 0.24 cfs @ 12.07 hrs, Volume= 777 cf
Outflow = 0.24 cfs @ 12.07 hrs, Volume= 777 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.07 hrs, Volume= 777 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.78' @ 12.07 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.24 cfs @ 12.07 hrs HW=46.77' TW=45.69' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.24 cfs @ 1.78 fps)

Summary for Pond M2: Post - Southern Manifold

Inflow Area = 9,432 sf,100.00% Impervious, Inflow Depth = 0.99" for WQv event
Inflow = 0.24 cfs @ 12.07 hrs, Volume= 775 cf
Outflow = 0.24 cfs @ 12.07 hrs, Volume= 775 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.07 hrs, Volume= 775 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 46.77' @ 12.07 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**8.0" Round Culvert** L= 32.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.10' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.24 cfs @ 12.07 hrs HW=46.77' TW=45.66' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.24 cfs @ 1.78 fps)

Summary for Pond pA1: Post - Analysis Point-1

Inflow Area = 87,040 sf, 61.50% Impervious, Inflow Depth = 0.03" for WQv event
Inflow = 0.02 cfs @ 12.38 hrs, Volume= 205 cf
Primary = 0.02 cfs @ 12.38 hrs, Volume= 205 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs

Summary for Subcatchment pS1: Post - Flow to CB1

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 177 cf, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	120	74	>75% Grass cover, Good, HSG C
*	213	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,266	97	Weighted Average
	120	74	5.30% Pervious Area
	2,146	98	94.70% Impervious Area

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

Summary for Subcatchment pS10: Post - Flow to Rear of Property

Runoff = 0.01 cfs @ 12.39 hrs, Volume= 130 cf, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
21,227	74	>75% Grass cover, Good, HSG C
251	98	Unconnected pavement, HSG C
21,478	74	Weighted Average
21,227	74	98.83% Pervious Area
251	98	1.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2000	0.15		**Sheet Flow, AB**
					Grass: Bermuda n= 0.410 P2= 3.30"
1.8	300	0.0350	2.81		**Shallow Concentrated Flow, BC**
					Grassed Waterway Kv= 15.0 fps
0.2	110	0.0350	11.23	190.86	**Channel Flow, CD**
					Area= 17.0 sf Perim= 20.3' r= 0.84'
					n= 0.022 Earth, clean & straight
5.3	440	Total			

Summary for Subcatchment pS2: Post - Flow to CB2

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 359 cf, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	4,243	98	Paved parking, HSG C
	84	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	123	98	New Curbing
	0	98	Unconnected pavement, HSG C
	4,450	98	Weighted Average
	84	74	1.89% Pervious Area
	4,366	98	98.11% Impervious Area

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

Summary for Subcatchment pS3: Post - Flow to CB3

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 939 cf, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	11,053	98	Paved parking, HSG C
	770	74	>75% Grass cover, Good, HSG C
*	170	98	New Curbing
*	155	98	New Wall
	12,148	96	Weighted Average
	770	74	6.34% Pervious Area
	11,378	98	93.66% Impervious Area

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

Summary for Subcatchment pS4: Post - Flow to CB4

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 183 cf, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	1,917	98	Paved parking, HSG C
	192	74	>75% Grass cover, Good, HSG C
*	286	98	New Walkway
	0	98	Unconnected pavement, HSG C
*	16	98	New Curbing
	2,411	96	Weighted Average
	192	74	7.96% Pervious Area
	2,219	98	92.04% Impervious Area

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

Summary for Subcatchment pS5: Post - Flow to CB5

Runoff = 0.09 cfs @ 12.07 hrs, Volume= 299 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	3,513	98	Paved parking, HSG C
	86	74	>75% Grass cover, Good, HSG C
*	0	98	New Walkway
*	122	98	New Curbing
	0	98	Unconnected pavement, HSG C
	3,721	97	Weighted Average
	86	74	2.31% Pervious Area
	3,635	98	97.69% Impervious Area

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

Summary for Subcatchment pS6: Post - Flow to CB6

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 843 cf, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	9,902	98	Paved parking, HSG C
*	140	98	New Curbing
*	177	98	New Wall
	696	74	>75% Grass cover, Good, HSG C
	10,915	96	Weighted Average
	696	74	6.38% Pervious Area
	10,219	98	93.62% Impervious Area

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

Summary for Subcatchment pS7: Post - Flow to Culvert-1

Runoff = 0.01 cfs @ 12.07 hrs, Volume= 53 cf, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

	Area (sf)	CN	Description
	3,497	74	>75% Grass cover, Good, HSG C
	431	98	Unconnected pavement, HSG C
	3,928	77	Weighted Average
	3,497	74	89.03% Pervious Area
	431	98	10.97% Impervious Area

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

Summary for Subcatchment pS8: Post - Flow to Swale

Runoff = 0.00 cfs @ 12.40 hrs, Volume= 27 cf, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
5,303	74	>75% Grass cover, Good, HSG C
5,303	74	100.00% Pervious Area

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

Summary for Subcatchment pS9: Post - Flow to Infiltration Basin-1

Runoff = 0.00 cfs @ 12.40 hrs, Volume= 8 cf, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
1,534	74	>75% Grass cover, Good, HSG C
1,534	74	100.00% Pervious Area

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

Summary for Subcatchment RF1: Post - Roof Area-1

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 777 cf, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
9,454	98	Roofs, HSG C
9,454	98	100.00% Impervious Area

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

Summary for Subcatchment RF2: Post - Roof Area-2

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 775 cf, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Type III 24-hr WQv Rainfall=1.20"

Area (sf)	CN	Description
9,432	98	Roofs, HSG C
9,432	98	100.00% Impervious Area

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

Summary for Pond STC1: Post - Stormceptor

Inflow Area = 28,318 sf, 96.56% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf
Outflow = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.07 hrs, Volume= 2,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.37' @ 12.07 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.69 cfs @ 12.07 hrs HW=45.36' TW=44.94' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.69 cfs @ 2.96 fps)

Summary for Pond STC2: Post - Stormceptor

Inflow Area = 26,479 sf, 96.32% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 2,048 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 45.34' @ 12.07 hrs
Flood Elev= 48.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**8.0" Round Culvert** L= 6.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.80' / 44.70' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=45.34' TW=44.93' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.64 cfs @ 2.91 fps)

Summary for Reach SW: Post - Vegetated Swale

Inflow Area = 9,231 sf, 4.67% Impervious, Inflow Depth = 0.10" for WQv event
Inflow = 0.01 cfs @ 12.08 hrs, Volume= 81 cf
Outflow = 0.01 cfs @ 12.13 hrs, Volume= 81 cf, Atten= 16%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Max. Velocity= 0.64 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 4.2 min

Peak Storage= 2 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 92.96 cfs

Custom cross-section, Length= 163.0' Slope= 0.0429 '/'
Constant n= 0.022 Earth, clean & straight
Inlet Invert= 56.00', Outlet Invert= 49.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-7.00	1.00	0.00
-2.00	0.00	1.00
2.00	0.00	1.00
7.00	1.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	4.0	0	0.00
1.00	9.0	14.2	1,467	92.96

Summary for Pond US1: Post - Underground Infiltration System-1

Inflow Area = 54,797 sf, 96.45% Impervious, Inflow Depth = 0.93" for WQv event
Inflow = 1.36 cfs @ 12.07 hrs, Volume= 4,248 cf
Outflow = 0.07 cfs @ 11.32 hrs, Volume= 4,248 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.07 cfs @ 11.32 hrs, Volume= 4,248 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.04 hrs
Peak Elev= 43.73' @ 14.27 hrs Surf.Area= 5,779 sf Storage= 2,050 cf
Flood Elev= 46.50' Surf.Area= 5,779 sf Storage= 11,678 cf

Plug-Flow detention time= 276.8 min calculated for 4,243 cf (100% of inflow)
Center-of-Mass det. time= 276.7 min (1,066.4 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	4,210 cf	**44.25'W x 130.60'L x 3.50'H Field A** 20,226 cf Overall - 7,468 cf Embedded = 12,759 cf x 33.0% Voids
#2A	43.50'	7,468 cf	**ADS_StormTech SC-740** x 162 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 9 rows
		11,678 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**0.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	44.25'	**15.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 44.25' / 44.10' S= 0.0115 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.07 cfs @ 11.32 hrs HW=43.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=42.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)

Valley Road Commercial Development

Valley Road - Middletown, RI

STORMWATER MANAGEMENT

STORMWATER RUNOFF VOLUME & FLOW RATES SUMMARY

SDE Job No.: 22048 Date: 12/30/2022 Revised:

Prepared by: SJE Checked by: MER

PRE-DEVELOPMENT

Analysis Points	Storm Event											
	1.2 inch Storm		1-yr		2-yr		10-yr		25-yr		100-yr	
(Subcatchment/Pond)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)
eA1	**0.04**	547	**1.42**	5,878	**2.07**	8,218	**4.43**	16,827	**6.35**	23,990	**10.56**	39,953.0
Totals	**0.04**	547	**1.42**	5,878	**2.07**	8,218	**4.43**	16,827	**6.35**	23,990	**10.56**	39,953.0

POST-DEVELOPMENT

Analysis Points	Storm Event											
	1.2 inch Storm		1-yr		2-yr		10-yr		25-yr		100-yr	
(Subcatchment/Pond)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)	**Rate (cfs)**	Vol. (cf)
pA1	**0.02**	205	**0.62**	4,162	**0.97**	6,914	**3.69**	16,543	**6.20**	24,325	**10.49**	41,226
Totals	**0.02**	205	**0.62**	4,162	**0.97**	6,914	**3.69**	16,543	**6.20**	24,325	**10.49**	41,226

Notes:

Totals *are the summations of the Analysis points values (Overall combine values leaving the site).*

Analysis points ***eA1*** *&* ***pA1*** *are pre-development and post-development comparisons. (Site's runoff flow to the rear of the site)*

Refer to Hydrocad® calculations for additional information.

Valley Road Commercial Development

Valley Road - Middletown, RI

STORMWATER MANAGEMENT

STORMWATER RECHARGE CALCULATION WORKSHEET

SDE Job No.: 22048 Date: 12/30/2022 Revised:

Prepared by: SJE Checked by: MER

Hydrologic Group	A	B	C	D	ReV
Target Runoff Depth Factor (Inches of Runoff)	0.60	0.35	0.25	0.10	**(cf)**
Total Increase of Impervious Areas, (sf):					
Proposed Driveway & Parking			33,963		
Proposed Buildings			18,886		
X inches of runoff, (cf)	0	0	1,101	0	1,101
Total Recharge Volume Required = 1" x F x Ai / 12 , (ac-ft.)				**Total ReV (cf) =**	**1,101**

Structure	Infiltration Rate (inches / hour)	Recharged Volume (cu.ft.)	ReV Volume Below Outlet Structure (cu.ft.)
Underground Infiltration System-1	0.50	7,302	4,463
Infiltration Basin-1	0.50	557	580
Total Recharge Volume Provided, (cf) =		**7,860**	**5,043**

Note:

1. System Infiltration rates are derived from the 1982 Rawls rates based on field observed soil texture (HSG C).
2. Recharged volume are calculated utilizing Simple Dynamic Method : Automated
3. Calculations are based on 1-Yr , 24-Hr storm event.

Valley Road Commercial Development

Valley Road - Middletown, RI

STORMWATER MANAGEMENT

WATER QUALITY TREATMENT VOLUME CALCULATION WORKSHEET

SDE Job No.: 22048 Date: 12/30/2022 Revised:

Prepared by: SJE Checked by: MER

Impervious Area	**Area sf**		**X in. of runoff 1.0 cf**		
Total Impervious Area Excluding Roof	*33,963*		*2,830*		
Building Roof Area	*18,886*		*1,574*		
1.2 inch rainfall total runoff					
Total Water Quality Volume , (cf) =			***4,404***		
System Water Quality Volume **(volumes below lowest outlet device)**	*Impervious Area to BMP*	WQv	Treatment Required (cf)	Pretreatment Provided (cf)	Extended Treatment (cf)
(STC-1) Stormceptor 2400 Unit =	*27344*	2279	25% = 570	570	
(US1) Underground Infiltraion System-1 =			75% = 1,709		WQv storm contained & infiltrated (3,303 cf)
	25505	2125	75% = 1,594		
(STC-2) Stormceptor 2400 Unit =			25% = 531	531	
Total =				1,101	3,303
Total Water Quality Volume Available , (cf) =			**4,404**		

Note:

1. Total water quality volume (WQV) in the 1.2 inch rainfall event is the inflow volume flowing toward the drainage system.
2. Recharged volume are calculated utilizing Simple Dynamic Method : Automated
3. Refer to HydroCAD report for additional information.

Valley Road Commercial Development

Valley Road - Middletown, RI

STORMWATER MANAGEMENT

TSS REMOVAL CALCULATION WORKSHEET

SDE Job No.: 22048 Date: 12/30/2022 Revised:

Prepared by: SJE Checked by: MER

Design Point pA1

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Stormceptor	25.0%	1.000	0.250	0.750
Infiltration System	90.0%	0.750	0.675	0.075
		0.075	0.000	0.075
		Total TSS Removal =	**92.5%**	

Valley Road Commercial Development

Valley Road - Middletown, RI

STORMWATER MANAGEMENT

REQUIRED RECHARGE VOLUME DRAWDOWN TIME CALCULATION WORKSHEET

SDE Job No.: 22048 Date: 12/30/2022 Revised:

Prepared by: SJE Checked by: MER

Infiltration Chambers

Parameters	Infiltration System-1			
Required Recharge Volume , ***ReV (cf)***	4,463			
Infiltration BMP Bottom Area , ***BA (sf)***	5,779			
Sat. Hydraulic Conductivity , ***K (in./hr)***	0.50			
Drawdown Time , T (hrs.) =	18.5	> 72 hours		

T = ***Rev / (K*** x ***BA)***

Infiltration Basin

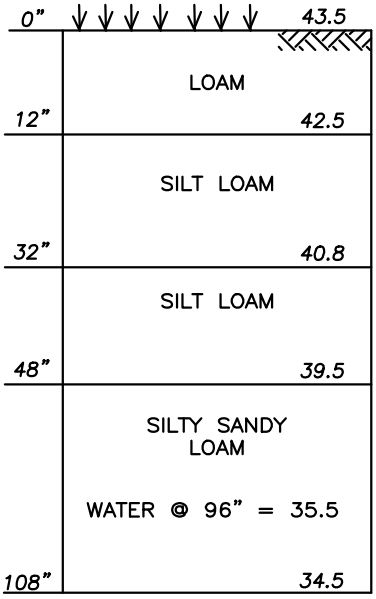
Parameters	Infiltration Basin-1			
Required Recharge Volume , ***ReV (cf)***	580			
Infiltration BMP Bottom Area , ***BA (sf)***	544			
Sat. Hydraulic Conductivity , ***K (in./hr)***	0.50			
Drawdown Time , T (hrs.) =	25.6	> 72 hours		

T = ***Rev / (K*** x ***BA)***

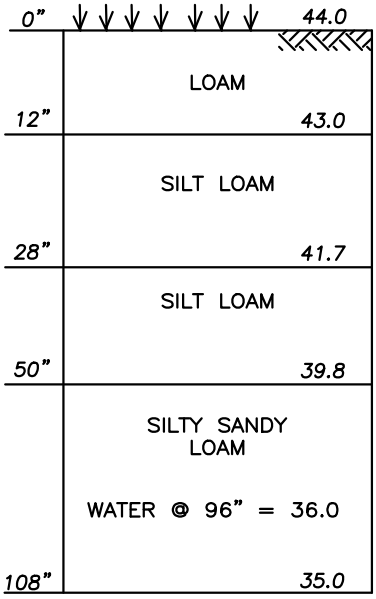
Note:

1. Volume are calculated utilizing Simple Dynamic Method : Automated
2. Required drawdown volume is based on storage volume below outlet pipe.
3. Calculations are based on 1-Yr , 24-Hr storm event.
4. System Infiltration rates are derived from the 1982 Rawls rates based on field observed soil texture (HSG C).
5. System is designed as non-infiltrating, infiltration rates were only applied to determine drawdown.
6. Refer to HydroCAD report for additional information.

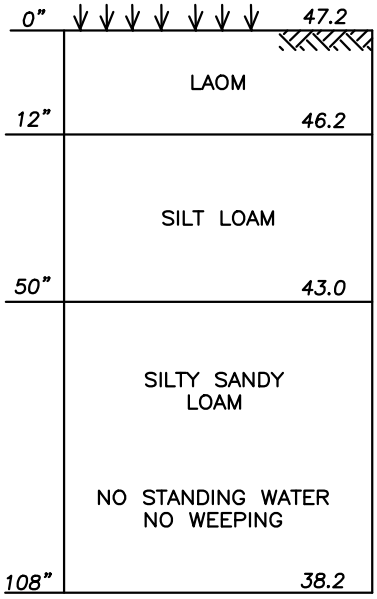
TP–1



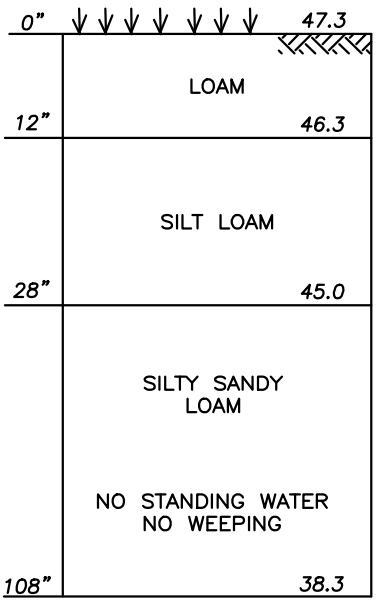
TP–2



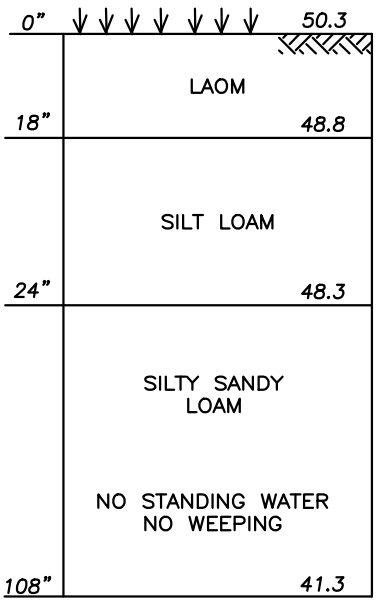
TP–3



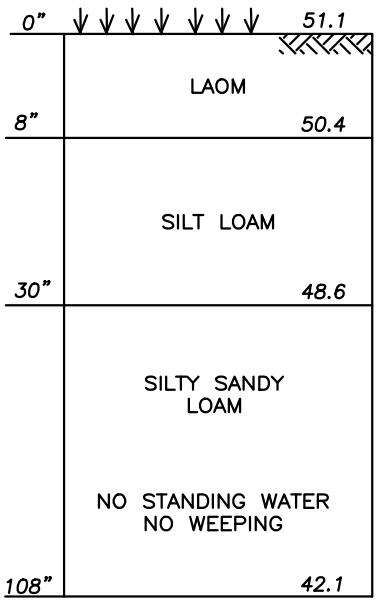
TP–4



TP–5



TP–6



SOIL NOTES

SOIL EVALUATION PERFORMED BT MICHAEL E. RUSSELL ON JUNE 29, 2022

LDEC
Land Development Engineering & Consulting, LLC
207 High Point Avenue, Unit 6
Portsmouth, RI 02871
T: 401-354-2050
F: 401-369-9775
WWW.SDE-LDEC.COM

SOIL LOGS

VALLEY ROAD
MIDDLETOWN, RHODE ISLAND

ASSESSORS MAP 107SE, PARCEL 403

DATE: SEPTEMBER 30, 2022			REV. DATE:
PROJ.#: 22048	SCALE : NTS	DRAWN BY: SJE	CHECK BY: MER
ISSUED FOR : PERMITTING			
PREPARED FOR: Reed Development Corporation			

APPENDIX A: STORMWATER MANAGEMENT PLAN CHECKLIST AND LID PLANNING REPORT – STORMWATER DESIGN SUMMARY

PROJECT NAME **Valley Road Commercial Development**	**(RIDEM USE ONLY)** **STW/WQC File #:** **Date Received:**
TOWN **Middletown**	
BRIEF PROJECT DESCRIPTION: Project proposes to construct a 17,243 sf self-storage building with associated site improvements.	

Stormwater Management Plan (SMP) Elements – Minimum Standards

When submitting a SMP,[1] submit four separately bound documents: Appendix A Checklist; Stormwater Site Planning, Analysis and Design Report with Plan Set/Drawings; Soil Erosion and Sediment Control (SESC) Plan, and Post Construction Operations and Maintenance (O&M) Plan. Please refer to Suggestions to Promote Brevity**.**

Note**: All stormwater construction projects must create a Stormwater Management Plan (SMP). However, not every element listed below is required per the RIDEM Stormwater Rules and the RIPDES Construction General Permit (CGP). This checklist will help identify the required elements to be submitted with an Application for Stormwater Construction Permit & Water Quality Certification.**

PART 1. PROJECT AND SITE INFORMATION

PROJECT TYPE (Check all that apply)

☐ Residential	☒ Commercial	☐ Federal	☐ Retrofit	☐ Restoration
☒ Road	☒ Utility	☐ Fill	☐ Dredge	☐ Mine
☐ Other (specify):				

SITE INFORMATION

☒ Vicinity Map

INITIAL DISCHARGE LOCATION(S): The WQv discharges to: (You may choose more than one answer if several discharge points are associated with the project.)

☒ **Groundwater**	☐ **Surface Water**	☐ **MS4**
☐ GAA	☐ Isolated Wetland	☐ RIDOT
☒ GA	☐ Named Waterbody	☐ RIDOT Alteration Permit is Approved
☐ GB	☐ Unnamed Waterbody Connected to Named Waterbody	☐ Town
		☐ Other (specify):

ULTIMATE RECEIVING WATERBODY LOCATION(S): Include pertinent information that applies to both WQ_v and flow from larger storm events including overflows. Choose all that apply, and repeat table for each waterbody.

☒ Groundwater or Disconnected Wetland	☐ SRWP		
☒ Waterbody Name: Bailey Brook	☐ Coldwater	☒ Warmwater	☐ Unassessed
☒ Waterbody ID: RI0007035R-01	☐ 4th order stream of pond 50 acres or more		
☒ TMDL for: ENTEROCOCCUS	☐ Watershed of flood prone river (e.g., Pocasset River)		
☐ Contributes to a priority outfall listed in the TMDL	☐ Contributes stormwater to a public beach		
☒ 303(d) list – Impairment(s) for: ENTEROCOCCUS; PHOSPHORUS, TOTAL; LEAD	☐ Contributes to shellfishing grounds		

[1] Applications for a Construction General Permit that do not require any other permits from RIDEM and will disturb less than 5 acres over the entire course of the project do not need to submit a SMP. The Appendix A checklist must still be submitted.

PROJECT HISTORY		
☐ RIDEM Pre- Application Meeting	Meeting Date:	☐ Minutes Attached
☐ Municipal Master Plan Approval	Approval Date:	☐ Minutes Attached
☐ Subdivision Suitability Required	Approval #:	
☐ Previous Enforcement Action has been taken on the property	Enforcement #:	

FLOODPLAIN & FLOODWAY See Guidance Pertaining to Floodplain and Floodways	
☐ Riverine 100-year floodplain: **FEMA FLOODPLAIN FIRMETTE** has been reviewed and the 100-year floodplain is on site	
☐ Delineated from FEMA Maps	
NOTE: Per Rule 250-RICR-150-10-8-1.1(B)(5)(d)(3), provide volumetric floodplain compensation calculations for cut and fill/displacement calculated by qualified professional	
☐ Calculated by Professional Engineer	
☐ Calculations are provided for cut vs. fill/displacement volumes proposed within the 100-year floodplain	Amount of Fill (CY):
	Amount of Cut (CY):
☐ Restrictions or modifications are proposed to the flow path or velocities in a floodway	
☐ Floodplain storage capacity is impacted	
☐ Project area is not within 100-year floodplain as defined by RIDEM	

CRMC JURISDICTION
☐ CRMC Assent required
☐ Property subject to a Special Area Management Plan (SAMP). If so, specify which SAMP:
☐ Sea level rise mitigation has been designed into this project

LUHPPL IDENTIFICATION - MINIMUM STANDARD 8:			
1. OFFICE OF Land Revitalization and Sustainable Materials Management (OLRSMM)			
	☐ Known or suspected releases of HAZARDOUS MATERIAL are present at the site (Hazardous Material is defined in Rule 1.4(A)(33) of 250-140-30-1 of the RIDEM Rules and Regulations for Investigation and Remediation of Hazardous Materials (the Remediation Regulations))		**RIDEM CONTACT:**
	☐ Known or suspected releases of PETROLEUM PRODUCT are present at the site (Petroleum Product as defined in Rule 1.5(A)(84) of 250-140-25-1 of the RIDEM Rules and Regulations for Underground Storage Facilities Used for Regulated Substances and Hazardous Materials)		
	☐ This site is identified on the RIDEM Environmental Resources Map as one of the following regulated facilities		**SITE ID#**:
		☐ CERCLIS/Superfund (NPL)	
		☐ State Hazardous Waste Site (SHWS)	
		☐ Environmental Land Usage Restriction (ELUR)	
		☐ Leaking Underground Storage Tank (LUST)	
		☐ Closed Landfill	
Note: If any boxes in 1 above are checked, the applicant must contact the RIDEM OLRSMM Project Manager associated with the Site to determine if subsurface infiltration of stormwater is allowable for the project. Indicate if the infiltration corresponds to "Red," "Yellow" or "Green" as described in Section 3.2.8 of the RISDISM Guidance (Subsurface Contamination Guidance). Also, note and reference approval in PART 3, Minimum Standard 2: Groundwater Recharge/Infiltration**.**			
2. PER MINIMUM STANDARD 8 of RICR 8.14.C.1-6 "LUHPPLS," THE SITE IS/HAS:			
	☐ Industrial Site with RIPDES MSGP, except where No Exposure Certification exists. http://www.dem.ri.gov/programs/water/permits/ripdes/stormwater/status.php		
	☐ Auto Fueling Facility (e.g., gas station)		
	☐ Exterior Vehicles Service, Maintenance, or Equipment Cleaning Area		

	☐ Road Salt Storage and Loading Areas (exposed to rainwater)	
	☐ Outdoor Storage and Loading/Unloading of Hazardous Substances	
3.	**STORMWATER INDUSTRIAL PERMITTING**	
	☐ The site is associated with existing or proposed activities that are considered Land Uses with Higher Potential Pollutant Loads (LUHPPLS) (see RICR 8.14.C)	Activities: Sector:
	☐ Construction is proposed on a site that is subject to THE MULTI-SECTOR GENERAL PERMIT (MSGP) UNDER RULE 31(B)15 OF THE RIPDES REGULATIONS.	MSGP permit #
	☐ Additional stormwater treatment is required by the MSGP Explain:	

REDEVELOPMENT STANDARD – MINIMUM STANDARD 6		
☐ Pre Construction Impervious Area		
	☐ Total Pre-Construction Impervious Area (**TIA**)	
	☐ Total Site Area (**TSA**)	
	☐ Jurisdictional Wetlands (**JW**)	
	☐ Conservation Land (**CL**)	
☐ Calculate the Site Size (defined as contiguous properties under same ownership)		
	☐ Site Size (**SS**) = (**TSA**) – (**JW**) – (**CL**)	
	☐ (**TIA**) / (**SS**) =	☐ (**TIA**) / (**SS**) >**0.4**?
☐ YES, Redevelopment		

PART 2. LOW IMPACT DEVELOPMENT ASSESSMENT – MINIMUM STANDARD 1

(NOT REQUIRED FOR REDEVELOPMENT OR RETROFITS)

This section may be deleted if not required.

Note: A written description must be provided specifying why each method is not being used or is not applicable at the Site. Appropriate answers may include:

- Town requires … (state the specific local requirement)
- Meets Town's dimensional requirement of …
- Not practical for site because …
- Applying for waiver/variance to achieve this (pending/approved/denied)
- Applying for wavier/variance to seek relief from this (pending/approved/denied)

A) PRESERVATION OF UNDISTURBED AREAS, BUFFERS, AND FLOODPLAINS	**IF NOT IMPLEMENTED, EXPLAIN HERE**
☒ Sensitive resource areas and site constraints are identified (required) ☒ Local development regulations have been reviewed (required) ☒ All vegetated buffers and coastal and freshwater wetlands will be protected during and after construction ☒ Conservation Development or another site design technique has been incorporated to protect open space and pre-development hydrology. **Note:** If Conservation Development has been used, check box and skip to Subpart C ☒ As much natural vegetation and pre-development hydrology as possible has been maintained	

B) LOCATE DEVELOPMENT IN LESS SENSITIVE AREAS AND WORK WITH THE NATURAL LANDSCAPE CONDITIONS, HYDROLOGY, AND SOILS ☒ Development sites and building envelopes have been appropriately distanced from wetlands and waterbodies ☒ Development and stormwater systems have been located in areas with greatest infiltration capacity (e.g., soil groups A and B) ☐ Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPA's) ☐ Development sites and building envelopes have been positioned outside of floodplains ☒ Site design positions buildings, roadways and parking areas in a manner that avoids impacts to surface water features ☒ Development sites and building envelopes have been located to minimize impacts to steep slopes (≥15%) ☐ Other (describe):	
C) MINIMIZE CLEARING AND GRADING ☐ Site clearing has been restricted to minimum area needed for building footprints, development activities, construction access, and safety. ☒ Site has been designed to position buildings, roadways, and parking areas in a manner that minimizes grading (cut and fill quantities) ☐ Protection for stands of trees and individual trees and their root zones to be preserved has been specified, and such protection extends at least to the tree canopy drip line(s) ☐ Plan notes specify that public trees removed or damaged during construction shall be replaced with equivalent	
D) REDUCE IMPERVIOUS COVER ☐ Reduced roadway widths (≤22 feet for ADT ≤ 400; ≤ 26 feet for ADT 400 - 2,000) ☐ Reduced driveway areas (length minimized via reduced ROW width (≤ 45 ft.) and/or reduced (or absolute minimum) front yard setback; width minimized to ≤ 9 ft. wide one lane; ≤ 18 ft. wide two lanes; shared driveways; pervious surface) ☐ Reduced building footprint: Explain approach: ☐ Reduced sidewalk area (≤ 4 ft. wide; one side of the street; unpaved path; pervious surface) ☐ Reduced cul-de-sacs (radius < 45 ft; vegetated island; alternative turn-around) ☐ Reduced parking lot area: Explain approach ☐ Use of pervious surfaces for driveways, sidewalks, parking areas/overflow parking areas, etc. ☐ Minimized impervious surfaces (project meets or is less than maximum specified by Zoning Ordinance) ☐ Other (describe):	
E) DISCONNECT IMPERVIOUS AREA ☐ Impervious surfaces have been disconnected, and runoff has been diverted to QPAs to the maximum extent possible ☐ Residential street edges allow side-of-the-road drainage into vegetated open swales ☐ Parking lot landscaping breaks up impervious expanse AND accepts runoff ☐ Other (describe):	
F) MITIGATE RUNOFF AT THE POINT OF GENERATION ☐ Small-scale BMPs have been designated to treat runoff as close as possible to the source	

G) PROVIDE LOW-MAINTENANCE NATIVE VEGETATION ☐ Low-maintenance landscaping has been proposed using native species and cultivars ☐ Plantings of native trees and shrubs in areas previously cleared of native vegetation are shown on site plan ☐ Lawn areas have been limited/minimized, and yards have been kept undisturbed to the maximum extent practicable on residential lots	
H) RESTORE STREAMS/WETLANDS ☐ Historic drainage patterns have been restored by removing closed drainage systems, daylighting buried streams, and/or restoring degraded stream channels and/or wetlands ☐ Removal of invasive species ☐ Other	

PART 3. SUMMARY OF REMAINING STANDARDS

GROUNDWATER RECHARGE – MINIMUM STANDARD 2		
YES	**NO**	
☒	☐	The project has been designed to meet the groundwater recharge standard.
☐	☐	If "No," the justification for groundwater recharge criterion waiver has been explained in the Narrative (e.g., threat of groundwater contamination or physical limitation), if applicable (see RICR 8.8.D);
☐	☐	Your waiver request has been explained in the Narrative, if applicable.
☐	☒	Is this site identified as a Regulated Facility in Part 1, Minimum Standard 8: LUHPPL Identification?
☐	☐	If "Yes," has approval for infiltration by the OLRSMM Site Project Manager, per Part 1, Minimum Standard 8, been requested?

TABLE 2-1: Summary of Recharge (see RISDISM Section 3.3.2)
(Add or Subtract Rows as Necessary)

Design Point	**Impervious Area Treated (sq ft)**	**Total Re_v Required (cu ft)**	**LID Stormwater Credits (see RISDISM Section 4.6.1)**	**Recharge Required by Remaining BMPs (cu ft)**	**Recharge Provided by BMPs (cu ft)**
			Portion of Re_v directed to a QPA (cu ft)		
DP-1:	52,849 sf	1,101 cf		1,101 cf	7,860 cf
DP-2:					
DP-3:					
DP-4:					
TOTALS:					

Notes:
1. Only BMPs listed in RISDISM Table 3-5 "List of BMPs Acceptable for Recharge" may be used to meet the recharge requirement.
2. Recharge requirement must be satisfied for each waterbody ID.

☒ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

See Appendix 2 of the Stormwater Management Report

WATER QUALITY – MINIMUM STANDARD 3		
YES	**NO**	
☒	☐	Does this project meet or exceed the required water quality volume WQv (see RICR 8.9.E-I)?
☒	☐	Is the proposed final impervious cover greater than 20% of the disturbed area (see RICR 8.9.E-I)?
☒	☐	If "Yes," either the Modified Curve Number Method or the Split Pervious/Impervious method in Hydro-CAD was used to calculate WQv; or,
☒	☐	If "Yes," either TR-55 or TR-20 was used to calculate WQv; and,
☐	☐	If "No," the project meets the minimum WQv of 0.2 watershed inches over the entire disturbed area.
☐	☐	Not Applicable
☒	☐	Does this project meet or exceed the ability to treat required water quality flow WQf (see RICR 8.9.I.1-3)?
☒	☐	Does this project propose an increase of impervious cover to a receiving water body with impairments? If "Yes," please indicate below the method that was used to address the water quality requirements of no further degradation to a low-quality water. Fully infiltrates WQv storm event on site
☐	☒	RICR 8.36. A Pollutant Loading Analysis is needed and has been completed.
☒	☐	The Water Quality Guidance Document (Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters) has been followed as applicable.
☐	☒	BMPs are proposed that are on the approved technology list . If "Yes," please provide all required worksheets from the manufacturer.
☐	☒	Additional pollutant-specific requirements and/or pollutant removal efficiencies are applicable to the site as the result of a TMDL, SAMP, or other watershed-specific requirements. If "Yes," please describe:

TABLE 3-1: Summary of Water Quality (see RICR 8.9)

Design Point and WB ID	Impervious area treated (sq ft)	Total WQ_v Required (cu ft)	LID Stormwater Credits (see RICR 8.18) WQv directed to a QPA (cu ft)	Water Quality Treatment Remaining (cu ft)	Water Quality Provided by BMPs (cu ft)
DP-1:	52,849 sf	4,404 cf		4,404 cf	4,404 cf
DP-2:					
DP-3:					
DP-4:					
TOTALS:					

Notes:
1. Only BMPs listed in RICR 8.20 and 8.25 or the Approved Technologies List of BMPs is Acceptable for Water Quality treatment.
2. For each Design Point, the Water Quality Volume Standard must be met for each Waterbody ID.

☒ YES ☐ NO	This project has met the setback requirements for each BMP. If "No," please explain:

☒ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

See Appendix 2 of the Stormwater Management Report

CONVEYANCE AND NATURAL CHANNEL PROTECTION (RICR 8.10) – MINIMUM STANDARD 4			
YES	**NO**		
☒	☐	Is this standard waived? If "Yes," please indicate one or more of the reasons below:	
		☐	The project directs discharge to a large river (i.e., 4th-order stream or larger. See RISDISM Appendix I for State-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.
		☐	The project is a small facility with impervious cover of less than or equal to 1 acre.
		☒	The project has a post-development peak discharge rate from the facility that is less than 2 cfs for the 1-year, 24-hour Type III design storm event (prior to any attenuation). (Note: LID design strategies can greatly reduce the peak discharge rate).
☐	☐	Conveyance and natural channel protection for the site have been met. If "No,' explain why:	

TABLE 4-1: Summary of Channel Protection Volumes (see RICR 8.10)					
Design Point	**Receiving Water Body Name**	**Coldwater Fishery? (Y/N)**	**Total CPv Required (cu ft)**	**Total CPv Provided (cu ft)**	**Average Release Rate Modeled in the 1-yr storm (cfs)**
DP-1:					
DP-2:					
DP-3:					
DP-4:					
TOTALS:					
Note: The Channel Protection Volume Standard must be met in each waterbody ID.					
☐ YES ☐ NO	The CPv is released at roughly a uniform rate over a 24-hour duration (see examples of sizing calculations in Appendix D of the RISDISM).				
☐ YES ☐ NO	Do additional design restrictions apply resulting from any discharge to cold-water fisheries; If "Yes," please indicate restrictions and solutions below.				
☐ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.).					

OVERBANK FLOOD PROTECTION (RICR 8.11) AND OTHER POTENTIAL HIGH FLOWS – MINIMUM STANDARD 5			
YES	**NO**		
☐	☒	Is this standard waived? If yes, please indicate one or more of the reasons below:	
		☐	The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for state-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.
		☐	A Downstream Analysis (see RICR 8.11.D and E) indicates that peak discharge control would not be beneficial or would exacerbate peak flows in a downstream tributary of a particular site (e.g., through coincident peaks).
☐	☒	Does the project flow to an MS4 system or subject to other stormwater requirements? If "Yes," indicate as follows:	
		☐	RIDOT
		☐	Other (specify):
Note: The project could be approved by RIDEM but not meet RIDOT or Town standards. RIDOT's regulations indicate that post-volumes must be **less** than pre-volumes for the 10-yr storm at the design point entering the RIDOT system. If you have not already received approval for the discharge to an MS4, please explain below your strategy to comply with RIDEM and the MS4.			
		Indicate below which model was used for your analysis. ☐ TR-55 ☐ TR-20 ☒ HydroCAD ☐ Bentley/Haestad ☐ Intellisolve ☐ Other (Specify):	
YES	**NO**		
☒	☐	Does the drainage design demonstrate that flows from the 100-year storm event through a BMP will safely manage and convey the 100-year storm? If "No," please explain briefly below and reference where in the application further documentation can be found (i.e., name of report/document, page numbers, appendices, etc.):	
☒	☐	Do off-site areas contribute to the sub-watersheds and design points? If "Yes,"	
☒	☐	Are the areas modeled as "present condition" for both pre- and post-development analysis?	
☒	☐	Are the off-site areas shown on the subwatershed maps?	
☒	☐	Does the drainage design confirm safe passage of the 100-year flow through the site for off-site runoff?	
☐	☒	Is a Downstream Analysis required (see RICR 8.11.E.1)?	
☒	☐	Calculate the following:	
		☒	Area of disturbance within the sub-watershed (areas): 1.63 Acres
		☒	Impervious cover (%): 72%
☐	☒	Is a dam breach analysis required (earthen embankments over six (6) feet in height, or a capacity of 15 acre-feet or more, and contributes to a significant or high hazard dam)?	
☒	☐	Does this project meet the overbank flood protection standard?	

Table 5-1 Hydraulic Analysis Summary								
Subwatershed (Design Point)	**1.2" Peak Flow** (cfs) **		**1-yr Peak Flow** (cfs)		**10-yr Peak Flow** (cfs)		**100-yr Peak Flow** (cfs)	
	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)
DP-1:	0.04	0.02	1.42	0.62	4.43	3.69	10.56	10.49
DP-2:								
DP-3:								
DP-4:								
TOTALS:								

** Utilize modified curve number method or split pervious /impervious method in HydroCAD.

Note: The hydraulic analysis must demonstrate no impact to each individual subwatershed DP unless each DP discharges to the same wetland or water resource.

Indicate as follows where the pertinent calculations and/or information for the items above are provided	**Name of report/document, page numbers, appendices, etc.**
Existing conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, and water surface elevations showing methodologies used and supporting calculations.	See Appendix 1 of the Stormwater Management Report
Proposed conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, water surface elevations, and routing showing the methodologies used and supporting calculations.	See Appendix 1 of the Stormwater Management Report
Final sizing calculations for structural stormwater BMPs, including contributing drainage area, storage, and outlet configuration.	See Appendix 1 of the Stormwater Management Report
Stage-storage, inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities).	See Appendix 1 of the Stormwater Management Report

Table 5-2 Summary of Best Management Practices											
DP #	**BMP ID**	**BMP Type** (e.g., bioretention, tree filter)	**BMP Functions**					**Bypass Type**	**Horizontal Setback Criteria are met per RICR 8.21.B.10, 8.22.D.11, and 8.35.B.4**		
			Pre-Treatment (Y/N/ NA)	Re_v	WQ_v	CP_v (Y/N/ NA)	Overbank Flood Reduction (Y/N/NA)	External (E) Internal (I) or NA	Yes /No	Technical Justification (Design Report page number)	Distance Provided
pA1	STC1	Stormceptor	Y		583			Bypass in DMH upstream	Y	Sheet 4 & 5	
pA1	STC2	Stormceptor	Y		544			Bypass in DMH upstream	Y	Sheet 4 & 5	
pA1	US1	Infiltration Chambers			4,344				Y	Sheet 4 & 5	
pA1	IB1	Infiltration Basin			N/a				Y	Sheet 4 & 5	
		TOTALS:									

Table 5.3 Summary of Soils to Evaluate Each BMP									
DP #	**BMP ID**	**BMP Type** (e.g., bioretention, tree filter)	**Soils Analysis for Each BMP**						
			Test Pit ID# and Ground Elevation		SHWT Elevation (ft)	Bottom of Practice Elevation* (ft)	Separation Distance Provided (ft)	Hydrologic Soil Group (A, B, C, D)	Exfiltration Rate Applied (in/hr)
			Primary	Secondary					
pA1	US1	Infiltration Chambers	TP-2	TP-1	39.0	43.0	4’	C	0.50
pA1	IB1	Infiltration Basin	TP-2	Tp-1	36.0	42.0	6’	C	0.50
		TOTALS:							

* For underground infiltration systems (UICs) bottom equals bottom of stone, for surface infiltration basins bottom equals bottom of basin, for filters bottom equals interface of storage and top of filter layer

LAND USES WITH HIGHER POTENTIAL POLLUTANTS LOADS (LUHPPLs) – MINIMUM STANDARD 8			
YES	**NO**	**N/A**	
☐	☐	☐	Describe any LUHPPLs identified in Part 1, Minimum Standard 8, Section 2. If not applicable, continue to Minimum Standard 9.
☐	☐	☐	Are these activities already covered under an MSGP? If “No,” please explain if you have applied for an MSGP or intend to do so?
☐	☐	☐	List the specific BMPs that are proposed for this project that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in RISDISM Table 3-3, “Acceptable BMPs for Use at LUHPPLs.” Please list BMPs:
☐	☐	☐	Additional BMPs, or additional pretreatment BMP’s if any, that meet RIPDES MSGP requirements; Please list BMPs:
			Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.).

ILLICIT DISCHARGES – MINIMUM STANDARD 9			
Illicit discharges are defined as unpermitted discharges to Waters of the State that do not consist entirely of stormwater or uncontaminated groundwater, except for certain discharges identified in the RIPDES Phase II Stormwater General Permit.			
YES	**NO**	**N/A**	
☒	☐	☐	Have you checked for illicit discharges?
☐	☒	☐	Have any been found and/or corrected? If “Yes,” please identify.
☐	☐	☒	Does your report explain preventative measures that keep non-stormwater discharges out of the Waters of the State (during and after construction)?

SOIL EROSION AND SEDIMENT CONTROL (SESC) – MINIMUM STANDARD 10				
YES	**NO**	**N/A**		
☒	☐	☐	Have you included a Soil Erosion and Sediment Control Plan Set and/or Complete Construction Plan Set?	
☒	☐	☐	Have you provided a **separately-bound** document based upon the SESC Template? If yes, proceed to Minimum Standard 11 (the following items can be assumed to be addressed).	
			If "No," include a document with your submittal that addresses the following elements of an SESC Plan:	
			☐	Soil Erosion and Sediment Control Plan Project Narrative, including a description of how the fifteen (15) Performance Criteria have been met:
			☐	Provide Natural Buffers and Maintain Existing Vegetation
			☐	Minimize Area of Disturbance
			☐	Minimize the Disturbance of Steep Slopes
			☐	Preserve Topsoil
			☐	Stabilize Soils
			☐	Protect Storm Drain Inlets
			☐	Protect Storm Drain Outlets
			☐	Establish Temporary Controls for the Protection of Post-Construction Stormwater Control Measures
			☐	Establish Perimeter Controls and Sediment Barriers
			☐	Divert or Manage Run-On from Up-Gradient Areas
			☐	Properly Design Constructed Stormwater Conveyance Channels
			☐	Retain Sediment On-Site
			☐	Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows
			☐	Apply Construction Activity Pollution Prevention Control Measures
			☐	Install, Inspect, and Maintain Control Measures and Take Corrective Actions
			☐	Qualified SESC Plan Preparer's Information and Certification
			☐	Operator's Information and Certification; if not known at the time of application, the Operator must certify the SESC Plan upon selection and prior to initiating site activities
			☐	Description of Control Measures, such as Temporary Sediment Trapping and Conveyance Practices, including design calculations and supporting documentation, as required

STORMWATER MANAGEMENT SYSTEM OPERATION, MAINTENANCE, AND POLLUTION PREVENTION PLAN – MINIMUM STANDARDS 7 AND 9		
Operation and Maintenance Section		
YES	**NO**	
☐	☐	Have you minimized all sources of pollutant contact with stormwater runoff, to the maximum extent practicable?
☐	☐	Have you provided a **separately-bound** Operation and Maintenance Plan for the site and for all of the BMPs, and does it address each element of RICR 8.17 and RISDISM Appendix C and E?
☐	☐	Lawn, Garden, and Landscape Management meet the requirements of RISDISM Section G.7? If "No," why not?
☐	☐	Is the property owner or homeowner's association responsible for the stormwater maintenance of all BMP's? If "No," you must provide a legally binding and enforceable maintenance agreement (see RISDISM Appendix E, page 26) that identifies the entity that will be responsible for maintenance of the stormwater. Indicate where this agreement can be found in your report (i.e., name of report/document, page numbers, appendices, etc.).
☐	☐	Do you anticipate that you will need legal agreements related to the stormwater structures? (e.g. off-site easements, deed restrictions, covenants, or ELUR per the Remediation Regulations). If "Yes," have you obtained them? Or please explain your plan to obtain them:

☐	☐	Is stormwater being directed from public areas to private property? If "Yes," note the following: Note: This is not allowed unless a funding mechanism is in place to provide the finances for the long-term maintenance of the BMP and drainage, or a funding mechanism is demonstrated that can guarantee the long-term maintenance of a stormwater BMP by an individual homeowner.
Pollution Prevention Section		
☐	☒	Designated snow stockpile locations?
☐	☒	Trash racks to prevent floatables, trash, and debris from discharging to Waters of the State?
☐	☒	Asphalt-only based sealants?
☐	☒	Pet waste stations? (Note: If a receiving water has a bacterial impairment, and the project involves housing units, then this could be an important part of your pollution prevention plan).
☐	☒	Regular sweeping? Please describe:
☐	☒	De-icing specifications, in accordance with RISDISM Appendix G. (NOTE: If the groundwater is GAA, or this area contributes to a drinking water supply, then this could be an important part of your pollution prevention plan).
☐	☒	A prohibition of phosphate-based fertilizers? (Note: If the site discharges to a phosphorus impaired waterbody, then this could be an important part of your pollution prevention plan).

PART 4. SUBWATERSHED MAPPING AND SITE-PLAN DETAILS

Existing and Proposed Subwatershed Mapping (REQUIRED)			
YES	**NO**		
☒	☐		Existing and proposed drainage area delineations
☒	☐		Locations of all streams and drainage swales
☒	☐		Drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in RISDISM Appendix K)
☒	☐		Complete drainage area boundaries; include off-site areas in both mapping and analyses, as applicable
☒	☐		Logs of borings and/or test pit investigations along with supporting soils/geotechnical report
☒	☐		Mapped seasonal high-water-table test pit locations
☒	☐		Mapped locations of the site-specific borings and/or test pits and soils information from the test pits at the locations of the BMPs
☒	☐		Mapped locations of the BMPs, with the BMPs consistently identified on the Site Construction Plans
☒	☐		Mapped bedrock outcrops adjacent to any infiltration BMP
☒	☐		Soils were logged by a:
		☐	DEM-licensed Class IV soil evaluator Name:
		☒	RI-registered P.E. Name: Michael E. Russell

Subwatershed and Impervious Area Summary				
Subwatershed (area to each design point)	**First Receiving Water ID or MS4**	**Area Disturbed (units)**	**Existing Impervious (units)**	**Proposed Impervious (units)**
DP-1:	RI0007035R-01	71,208 SF	0 SF	52,849 SF
DP-2:				
DP-3:				
TOTALS:				

Site Construction Plans (Indicate that the following applicable specifications are provided)		
YES	**NO**	
☒	☐	Existing and proposed plans (scale not greater than 1" = 40') with North arrow
☒	☐	Existing and proposed site topography (with 1 or 2-foot contours); 10-foot contours accepted for off-site areas
☒	☐	Boundaries of existing predominant vegetation and proposed limits of clearing
☒	☐	Site Location clarification
☒	☐	Location and field-verified boundaries of resource protection areas such as: ▸ freshwater and coastal wetlands, including lakes and ponds ▸ coastal shoreline features Perennial and intermittent streams, in addition to Areas Subject to Storm Flowage (ASSFs)
☒	☐	All required setbacks (e.g., buffers, water-supply wells, septic systems)
☒	☐	Representative cross-section and profile drawings, and notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include: ▸ Location and size of the stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) must have labels that correspond to RISDISM Table 5-2; ▸ Design water surface elevations (applicable storms); ▸ Structural details of outlet structures, embankments, spillways, stilling basins, grade-control structures, conveyance channels, etc.; ▸ Existing and proposed structural elevations (e.g., inverts of pipes, manholes, etc.); ▸ Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties or drainage that could be affected by work in the floodplain; ▸ Planting plans for structural stormwater BMPs, including species, size, planting methods, and maintenance requirements of proposed planting
☒	☐	Logs of borings and/or test pit investigations along with supporting soils/geotechnical report and corresponding water tables
☒	☐	Mapping of any OLRSMM-approved remedial actions/systems (including ELURs)
☒	☐	Location of existing and proposed roads, buildings, and other structures including limits of disturbance; ▸ Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements; ▸ Location of existing and proposed conveyance systems, such as grass channels, swales, and storm drains, and location(s) of final discharge point(s) (wetland, waterbody, etc.); ▸ Cross sections of roadways, with edge details such as curbs and sidewalks; ▸ Location and dimensions of channel modifications, such as bridge or culvert crossings
☒	☐	Locations, cross sections, and profiles of all stream or wetland crossings and their method of stabilization

Detailed Stormceptor Sizing Report – 22048 Valley Road Storage STC-1

Project Information & Location			
Project Name	Valley Road Storage	**Project Number**	22048
City	Middletown	**State/ Province**	Rhode Island
Country	United States of America	**Date**	9/18/2022
Designer Information		**EOR Information (optional)**	
Name	Sarah Earle	**Name**	
Company	LDEC	**Company**	
Phone #	774-226-5434	**Phone #**	
Email	searle@sde-ldec.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	22048 Valley Road Storage STC-1
Recommended Stormceptor Model	STC 450i
Target TSS Removal (%)	25.0
TSS Removal (%) Provided	81
PSD	Fine Distribution
Rainfall Station	PROVIDENCE WSO AIRPORT

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	81
STC 900	88
STC 1200	88
STC 1800	88
STC 2400	91
STC 3600	91
STC 4800	93
STC 6000	93
STC 7200	95
STC 11000	96
STC 13000	96
STC 16000	97

Stormceptor
The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology
Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:
• Site parameters
• Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
• Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
• TSS load
• Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Rhode Island	**Total Number of Rainfall Events**	7929
Rainfall Station Name	PROVIDENCE WSO AIRPORT	**Total Rainfall (in)**	2585.3
Station ID #	6698	**Average Annual Rainfall (in)**	44.6
Coordinates	41°43'19"N, 71°25'57"W	**Total Evaporation (in)**	220.6
Elevation (ft)	51	**Total Infiltration (in)**	85.5
Years of Rainfall Data	58	**Total Rainfall that is Runoff (in)**	2279.2

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.65
Imperviousness %	96.6

Water Quality Objective	
TSS Removal (%)	25.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	1.53
Water Quality Flow Rate (CFS)	0.70

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	45.05
Stormceptor Outlet Invert Elev (ft)	44.80
Stormceptor Rim Elev (ft)	48.50
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	8
Pipe Material	HDPE - plastic
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	22048 Valley Road Storage STC-1

Site Details

Drainage Area

Total Area (acres)	0.65
Imperviousness %	96.6

Surface Characteristics

Width (ft)	337.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

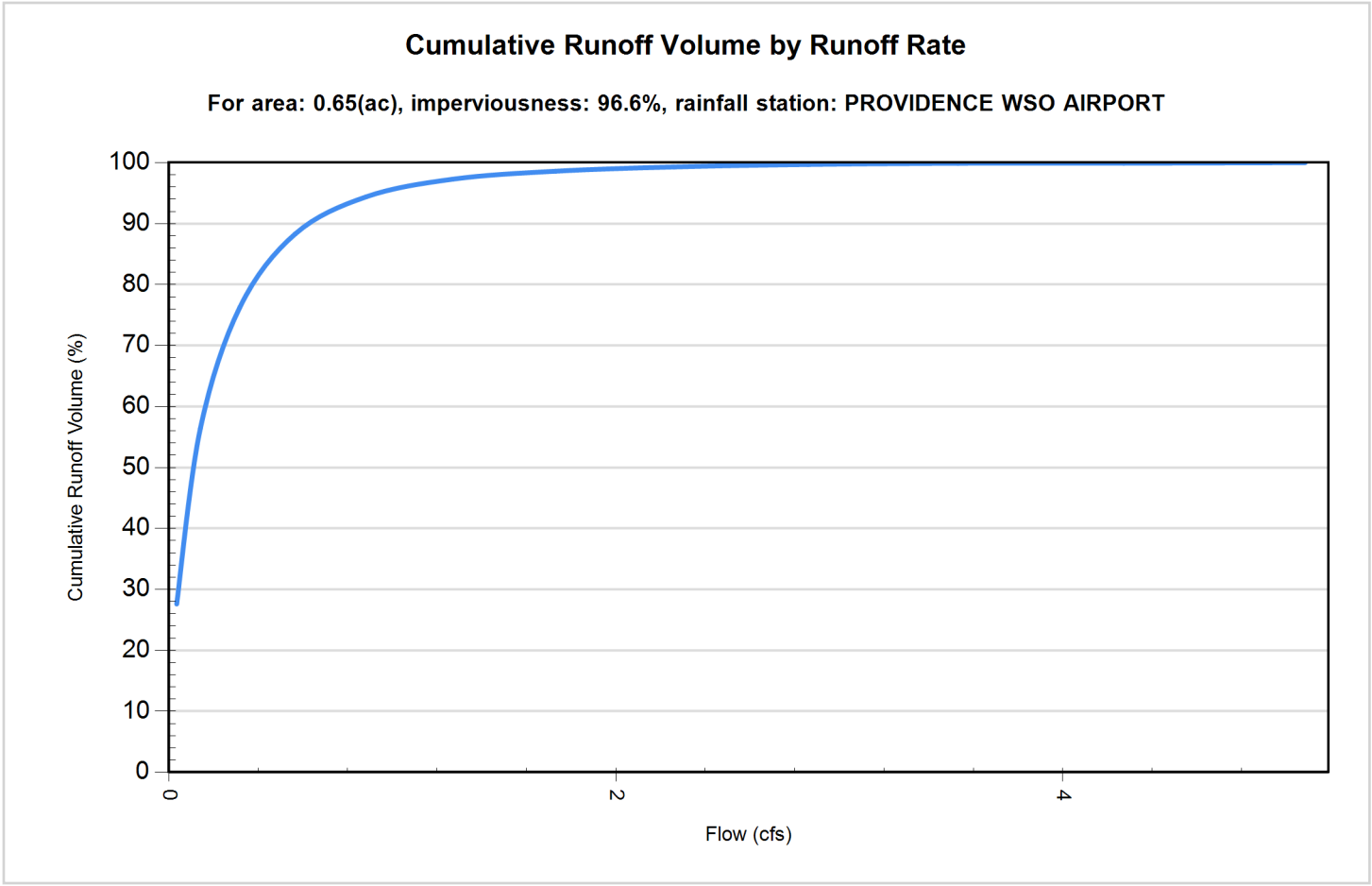
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

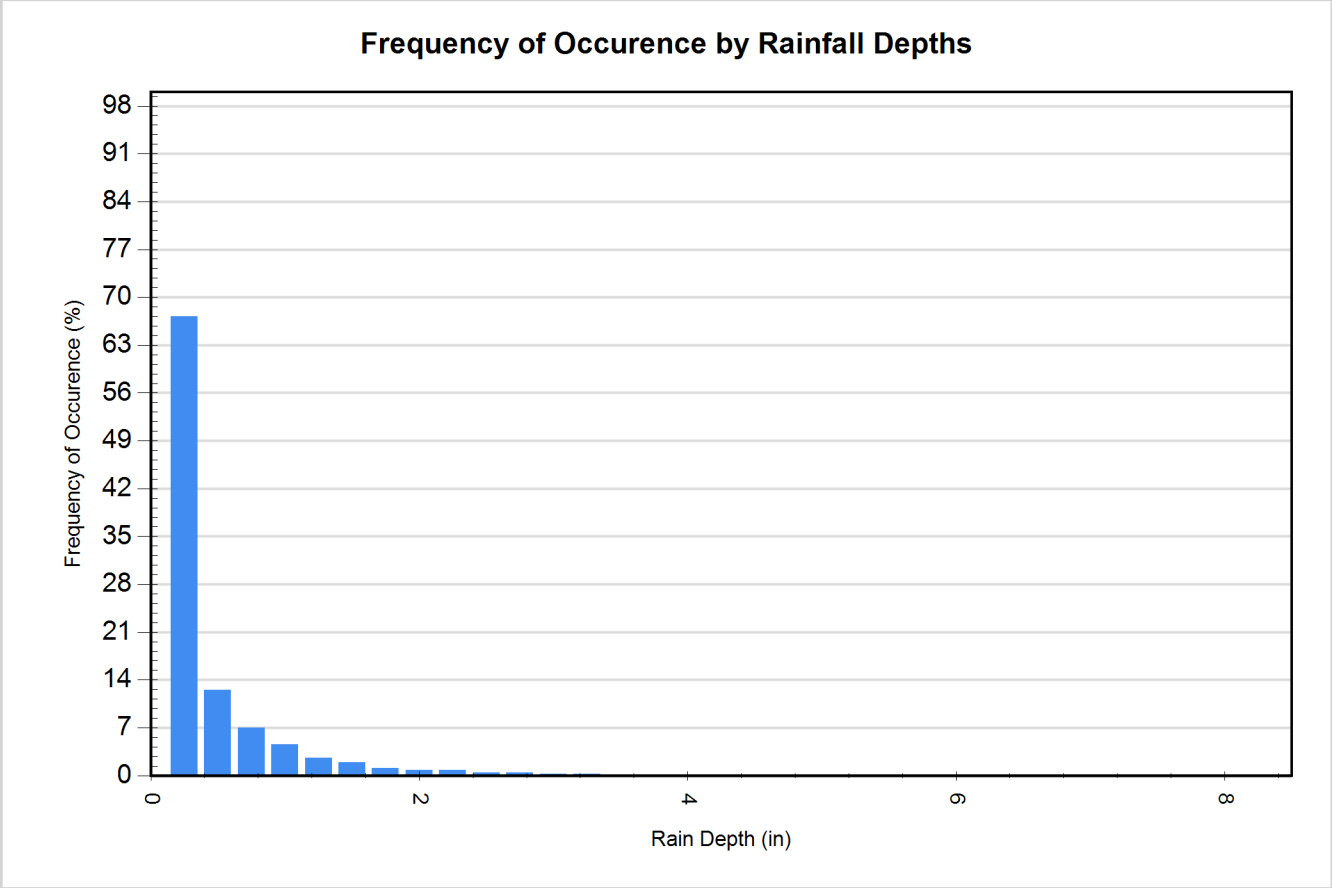
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	1538205	4035501	27.6
0.141	3140182	2433288	56.4
0.318	4252167	1321654	76.3
0.565	4920789	652331	88.3
0.883	5262941	309992	94.4
1.271	5420774	151921	97.3
1.730	5496982	75649	98.6
2.260	5535694	36851	99.3
2.860	5554199	18333	99.7
3.531	5564259	8263	99.9
4.273	5569084	3432	99.9
5.085	5572037	472	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	**No. of Events**	**Percentage of Total Events (%)**	**Total Volume (in)**	**Percentage of Annual Volume (%)**
0.25	5329	67.2	356	13.8
0.50	990	12.5	359	13.9
0.75	553	7.0	344	13.3
1.00	362	4.6	319	12.4
1.25	207	2.6	232	9.0
1.50	151	1.9	208	8.0
1.75	91	1.1	148	5.7
2.00	64	0.8	120	4.6
2.25	60	0.8	128	4.9
2.50	29	0.4	69	2.7
2.75	34	0.4	89	3.5
3.00	16	0.2	46	1.8
3.25	15	0.2	47	1.8
3.50	9	0.1	30	1.2
3.75	4	0.1	14	0.6
4.00	1	0.0	4	0.2
4.25	4	0.1	17	0.6
4.50	3	0.0	13	0.5
4.75	0	0.0	0	0.0
5.00	3	0.0	15	0.6
5.25	1	0.0	5	0.2
5.50	0	0.0	0	0.0
5.75	0	0.0	0	0.0
6.00	0	0.0	0	0.0
6.25	0	0.0	0	0.0
6.50	0	0.0	0	0.0
6.75	1	0.0	7	0.3
7.00	0	0.0	0	0.0
7.25	0	0.0	0	0.0
7.50	1	0.0	7	0.3
7.75	0	0.0	0	0.0
8.00	0	0.0	0	0.0
8.25	1	0.0	8	0.3
8.25	0	0.0	0	0.0



For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

Detailed Stormceptor Sizing Report – 22048 Valley Road Storage STC-2

Project Information & Location			
Project Name	Valley Road Storage	**Project Number**	22048
City	Middletown	**State/ Province**	Rhode Island
Country	United States of America	**Date**	9/18/2022
Designer Information		**EOR Information (optional)**	
Name	Sarah Earle	**Name**	
Company	LDEC	**Company**	
Phone #	774-226-5434	**Phone #**	
Email	searle@sde-ldec.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	22048 Valley Road Storage STC-2
Recommended Stormceptor Model	STC 450i
Target TSS Removal (%)	25.0
TSS Removal (%) Provided	82
PSD	Fine Distribution
Rainfall Station	PROVIDENCE WSO AIRPORT

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	82
STC 900	88
STC 1200	89
STC 1800	89
STC 2400	91
STC 3600	92
STC 4800	94
STC 6000	94
STC 7200	95
STC 11000	96
STC 13000	97
STC 16000	97

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.
Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Rhode Island	**Total Number of Rainfall Events**	7929
Rainfall Station Name	PROVIDENCE WSO AIRPORT	**Total Rainfall (in)**	2585.3
Station ID #	6698	**Average Annual Rainfall (in)**	44.6
Coordinates	41°43'19"N, 71°25'57"W	**Total Evaporation (in)**	222.1
Elevation (ft)	51	**Total Infiltration (in)**	93.1
Years of Rainfall Data	58	**Total Rainfall that is Runoff (in)**	2270.1

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.61
Imperviousness %	96.3

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Water Quality Objective	
TSS Removal (%)	25.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	1.48
Water Quality Flow Rate (CFS)	0.65

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	45.05
Stormceptor Outlet Invert Elev (ft)	44.80
Stormceptor Rim Elev (ft)	48.40
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	8
Pipe Material	HDPE - plastic
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	22048 Valley Road Storage STC-2

Site Details

Drainage Area

Total Area (acres)	0.61
Imperviousness %	96.3

Surface Characteristics

Width (ft)	326.00
Slope %	2
Impervious Depression Storage (in)	0.02
Pervious Depression Storage (in)	0.2
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Maintenance Frequency

Maintenance Frequency (months) >	12

Infiltration Parameters

Horton's equation is used to estimate infiltration

Max. Infiltration Rate (in/hr)	2.44
Min. Infiltration Rate (in/hr)	0.4
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Evaporation

Daily Evaporation Rate (in/day)	0.1

Dry Weather Flow

Dry Weather Flow (cfs)	0

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	

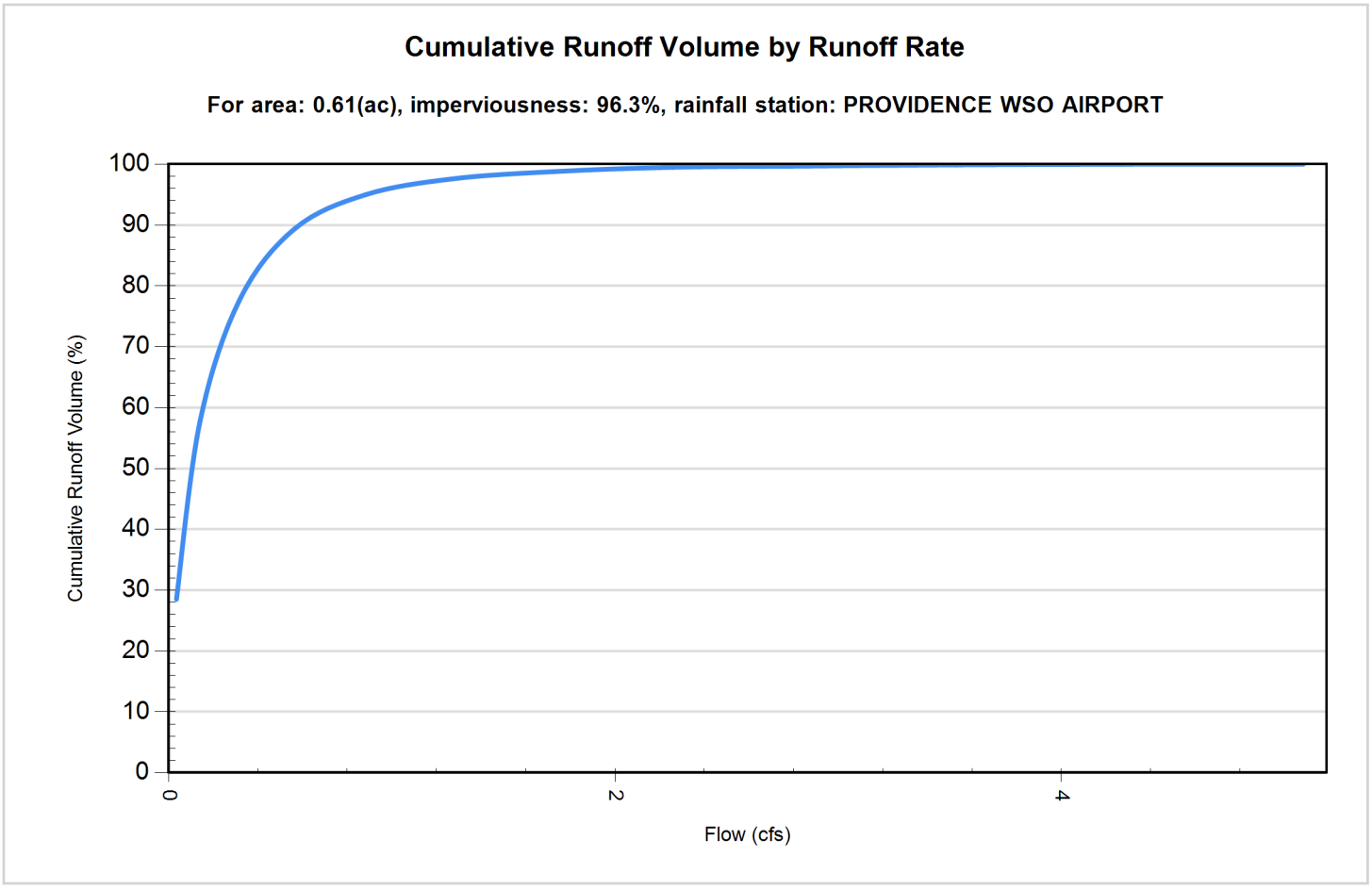
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	
Exponential Buildup Power	
Exponential Washoff Exponent	

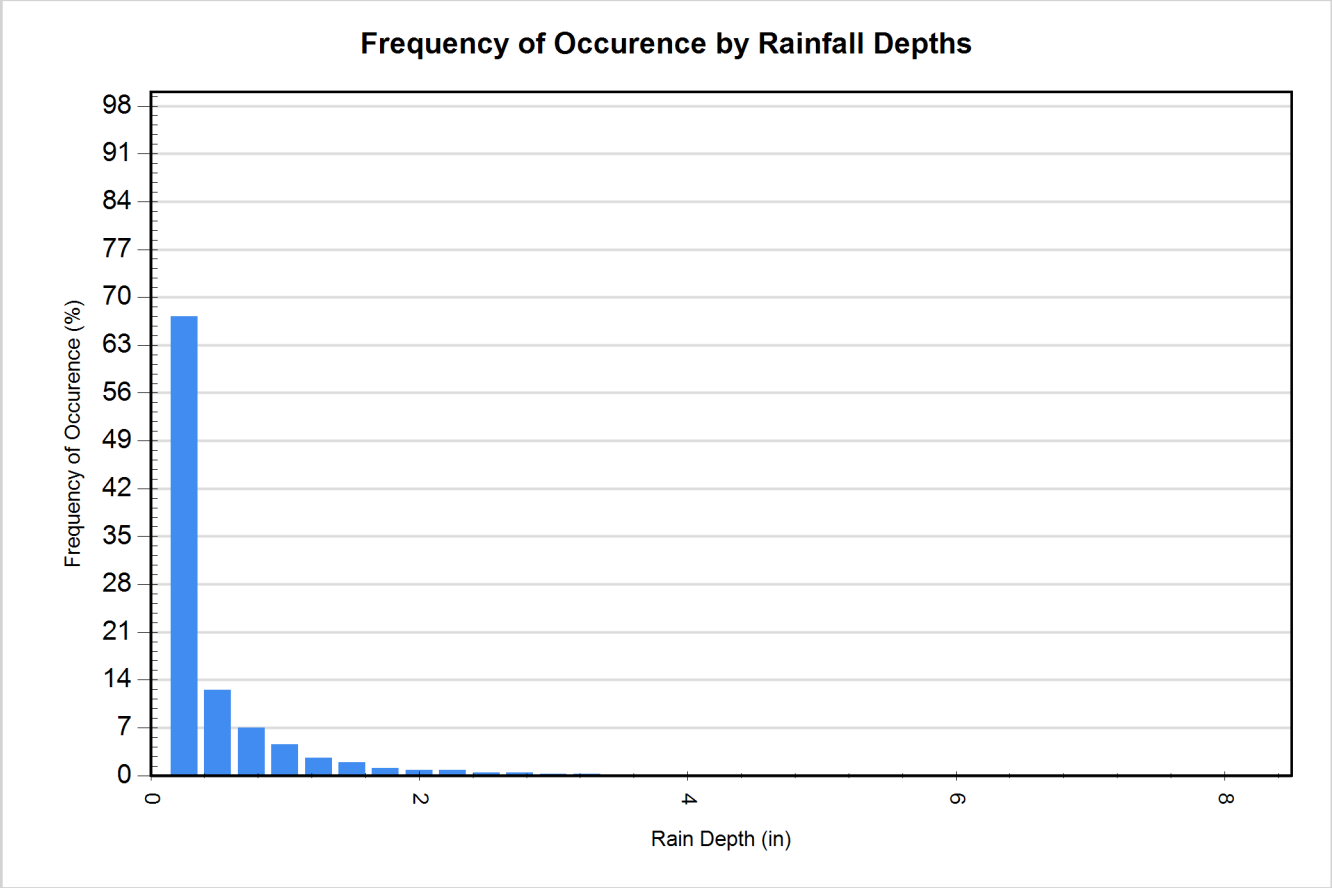
TSS Availability Parameters

Availability Constant A	
Availability Factor B	
Availability Exponent C	
Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	1484275	3733668	28.5
0.141	3012274	2204949	57.8
0.318	4054491	1162008	77.7
0.565	4660162	555482	89.4
0.883	4957278	258439	95.0
1.271	5091407	124226	97.6
1.730	5154993	60649	98.8
2.260	5187140	28474	99.5
2.860	5201611	14015	99.7
3.531	5209575	6050	99.9
4.273	5213680	1944	100.0
5.085	5215560	63	100.0



Rainfall Event Analysis				
Rainfall Depth (in)	**No. of Events**	**Percentage of Total Events (%)**	**Total Volume (in)**	**Percentage of Annual Volume (%)**
0.25	5329	67.2	356	13.8
0.50	990	12.5	359	13.9
0.75	553	7.0	344	13.3
1.00	362	4.6	319	12.4
1.25	207	2.6	232	9.0
1.50	151	1.9	208	8.0
1.75	91	1.1	148	5.7
2.00	64	0.8	120	4.6
2.25	60	0.8	128	4.9
2.50	29	0.4	69	2.7
2.75	34	0.4	89	3.5
3.00	16	0.2	46	1.8
3.25	15	0.2	47	1.8
3.50	9	0.1	30	1.2
3.75	4	0.1	14	0.6
4.00	1	0.0	4	0.2
4.25	4	0.1	17	0.6
4.50	3	0.0	13	0.5
4.75	0	0.0	0	0.0
5.00	3	0.0	15	0.6
5.25	1	0.0	5	0.2
5.50	0	0.0	0	0.0
5.75	0	0.0	0	0.0
6.00	0	0.0	0	0.0
6.25	0	0.0	0	0.0
6.50	0	0.0	0	0.0
6.75	1	0.0	7	0.3
7.00	0	0.0	0	0.0
7.25	0	0.0	0	0.0
7.50	1	0.0	7	0.3
7.75	0	0.0	0	0.0
8.00	0	0.0	0	0.0
8.25	1	0.0	8	0.3
8.25	0	0.0	0	0.0



For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

30 0 15 30 60

SCALE: 1 INCH = 30 FEET

WATERSHED LEGEND

A → B START → END — Tc–FLOWPATH PRE–DEVELOPMENT

PRE–DEVELOPMENT SUBCATCHMENT BOUNDARY

1 — SUBCATCHMENT AREA

1 — POND / STRUCTURE

1 — REACH / CHANNEL

O'NEIL ROAD

TP–1

TP–2

TP–3

TP–4

TP–5

TP–6

DIRT PILE

DIRT PILE

eA1
Analysis Pt.

eS1

DRAIN MANHOLE
RIM=63.51

CATCH BASIN
RIM=57.66

N/F
TOWN OF MIDDLETOWN
MAP 108, PARCEL 554

PRE DEVELOPMENT WATERSHED PLAN

VALLEY ROAD
MIDDLETOWN, RHODE ISLAND

ASSESSORS MAP 107SE, PARCEL 403

DATE:	DECEMBER 30, 2022
REV. DATE:	
PROJ.#:	22048
SCALE :	1" = 30'
DRAWN BY:	SJE
CHECK BY:	MER
ISSUED FOR :	PERMITTING
PREPARED FOR:	Reed Development Corporation

207 High Point Avenue,
Unit 6
Portsmouth, RI 02871
T: 401-354-2050
F: 401-369-9775
WWW.SDE-LDEC.COM

LDEC
Land Development Engineering & Consulting, LLC

30 0 15 30 60

SCALE: 1 INCH = 30 FEET

WATERSHED LEGEND

A → B START → END Tc–FLOWPATH POST–DEVELOPMENT

POSTE–DEVELOPMENT SUBCATCHMENT BOUNDARY

1 SUBCATCHMENT AREA

1 POND / STRUCTURE

1 REACH / CHANNEL

O'NEIL ROAD

pS10 pS8 pS2 pS3 pS7 pS1 pS4 pS6 pS5 pS10 RF1 RF2

CB3 CB2 CB1 CB4 CB6 CB5

DMH4 DMH3 DMH1 DMH2 DMH6 DMH5 DMH8 DMH7

STC1 STC2

US1 US1

IB1

pA1 Analysis Pt

pS9

12"DRAIN 8" DRAIN

DIRT PILE DIRT PILE

PROPOSED 17,243 SF BUILDING

DRAIN MANHOLE RIM=63.51

CATCH BASIN RIM=57.66

CONCRETE CURB

N/F TOWN OF MIDDLETOWN MAP 108, PARCEL 554

N/F G. KAMIN LETOWN LLC. , PARCEL 107

POST DEVELOPMENT WATERSHED PLAN

VALLEY ROAD
MIDDLETOWN, RHODE ISLAND
ASSESSORS MAP 107SE, PARCEL 403

DATE:	REV. DATE:
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