PRELIMINARY STORMWATER MANAGEMENT PLAN ANALYSIS

MONCKS CONER STORAGE

DATE: JUNE 6,2025

PREPARED BY:

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Consolidated Design Professionals, LLC
2940 Kerry Forest Parkway, Suite 101
Tallahassee, FL 32309

IN CONJUCTION WITH:
Aegis Engineering & Planning, LLC

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Memo

To: Thomas Daniel

From: Gregory Duncan, P.E., LEED-AP

CC:

Memorandum: Moncks Corner SWM

Synopsis:

Aegis has reviewed the proposed site with the direction given to (also) address SWM for the neighboring properties at the front of the complex (Satellite Healthcare – Moncks Corner, Sam's Tobacco & Vape, Sovereign Strength Society). Based on USGS topography there appears to be a 3-5' vertical difference in grade between the properties already developed and the new concept proposed. Consequently, it is recommended that a proposed pond (for the already existing uses) be constructed in a manner to account for the area flowing onsite as well as the proposed development proposed. (as shown in the figure below). The current pattern of the drainage collection system for the existing plaza is unknown and may require modification for direction of runoff to the newly proposed SWM pond. Access rights to the existing plaza may need to be discussed if not owned by the developer.

Schematic of Proposed Drainage Pattern

1.0 Executive Summary and Project Development

The proposed Development is planned for an undeveloped property located in Moncks Corner, South Carolina. The total site drainage area for this study is 12. acres. The undeveloped area will continue to drain into its existing discharge point with no modifications. The site has a high point located midway and this will be maintained in the proposed conditions. The drainage from this pond will be captured and infiltrated onsite and any emergency overflow will be directed into the existing drainage departure point located on the northern portion of the property.

2.0 Pond Design

On the northside of the site, a retention pond with percolation will be used for stormwater management. A total on-site drainage area of 12. acres will be directed to Pond #1. Overall, this volume is to be captured as "dead storage" within a closed basin below the lowest piped outlet and equates to approximately 3.16' column of water during a 100-yr/24-hr storm. Offsite areas on the west and south currently contributing to the site are to be diverted around the site using swales and collection systems.

The pond bottom has been set at elevation 50.00 with the top of the berm set at elevation 5 .50.

Treatment Required is to be the full volume of the 100-yr/24-hr event for closed basins. Recovery is to be achieved by infiltration.

Peak Rate Controls of all storms up to and including the 100-year storm. Water quality for this online retention pond will provide storage for 100-yr/24-hr (post-developed) volume and recovery is estimated to be less than 25 hours. The primary drainage structure for overflow will be an 8" weir plate set at ELEV 5 .25' discharging to a box with an 18" culvert which will direct extreme flows (above 100-yr) to a riprap apron on the southern edge of the project. The emergency Outfall from the pond is also directed to the northern edge of Pond #1 with a crest elevation of 5 .50'.

4.0 Summary & Conclusions

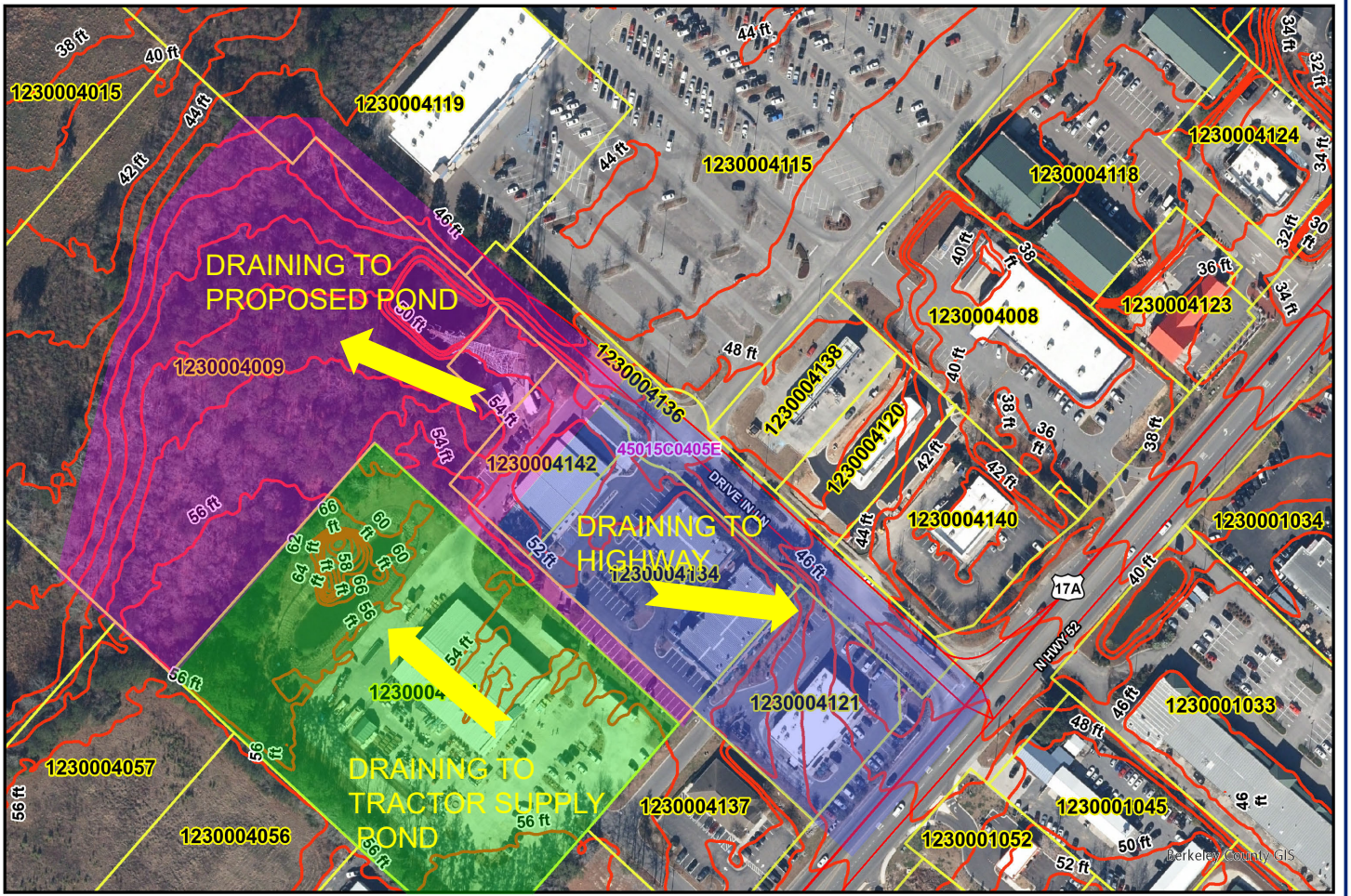
The proposed development should meet the City's level of service requirements with no increase in stormwater released from the site. A wet retention percolation pond has been provided to capture on-site runoff. The pond adequately provides the necessary rate controls to meet the pre/ post development controls and is estimated to achieve the required water quality provisions with some special provisions provided by the design.

For the purposes of this design, it is assumed that infiltration will allow passage of the site runoff volume into the lower into a fine sand layer. Based on this special provision, the infiltration rate (8 ft/day) was used in the MODRET calculation (considering also a safety factor of 2) and subsequently in the HydroCAD pond routing model. MODRET was used to calculate the resulting infiltration loss rate in terms of cubic feet per second (CFS). The volumetric loss rate calculated in MODRET was brought in as a volumetric flow loss rate for Pond #1 in HydroCAD to calculate the time until recovery for the volume stored in dead storage (1'). In consideration of MODRET's estimation of infiltration loss (0.87 cfs), it is calculated that estimated that recovery would occur in 25 hours.
Based on a series of pond routings performed in HydroCAD adequate storage has been provided to provide capture and infiltration of post-developed flow rates up to and including the 100-yr event. Lower flow rates offsite to the north have been achieved by rerouting the majority of the site's drainage area to Pond #1 leaving a small residual drainage area to contribute north thus meeting peak flow rate reductions in that direction by reduced drainage area the same is the case for diverted flows to the south from direct release areas.

A. Drainage & Soils Map

Web Map

THIS MAP WAS CREATED USING BERKLEY COUNTY GOVERNMENT GEOGRAPHIC INFROMATION SYSTEM'S PRINT SERVICE



Berkeley County GIS Department
P.O. Box 6122
Moncks Corner, SC 29461
(843) 719-4049
http://gis.berkeleycountysc.gov

Date: 6/13/2025

0 0.0175 0.035 0.07 0.105 mi

Web Map

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Date: 6/13/2025

0 0.0175 0.035 0.07 0.105 mi

B. Mounding Analysis (MODRET)

MODRET

HYDROGRAPH DATA INPUT - SCS UNIT METHOD

Project Name : SCS Hydrograph (24 hrs)
Rainfall Distribution : SCS (24 hrs)

Contributing Basin Area	12.93 ac.
SCS Curve Number	80.00
Time of Concentration	10.00 min.
Rainfall Depth	12.90 in.
Shape Factor	484
Percent DCIA	0.00 %

Analysis Date: 5/27/2025

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Pond 1
HYDROGRAPH RUNOFF DATA USED
UNSATURATED ANALYSIS EXCLUDED

Pond Bottom Area	3,417.00 ft²
Pond Volume between Bottom & DHWL	103,221.00 ft³
Pond Length to Width Ratio (L/W)	3.70
Elevation of Effective Aquifer Base	35.00 ft
Elevation of Seasonal High Groundwater Table	45.00 ft
Elevation of Starting Water Level	50.00 ft
Elevation of Pond Bottom	50.00 ft
Is there overflow ?	Y
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.30
Unsaturated Vertical Hydraulic Conductivity	8.00 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	12.00 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.30
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00
Time Increment During Storm Event	0.25 hrs
Time Increment After Storm Event	12.00 hrs
Total Number of Increments After Storm Event	50.00

Runoff Hydrograph File Name: SCS Hydrograph (24 hrs).SCS

Time of Peak Runoff: 12.03 hrs

Rate of Peak Runoff: 3.48 cfs

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

Analysis Date: 5/27/2025

MODRET

ELEVATION VS OVERFLOW RELATIONSHIP

PROJECT NAME : Pond 1 Structure
Type: BROAD CRESTED

Crest Elevation	53.50 ft
Crest Length	10.00 ft
Coefficient of Discharge	3.31
Weir Flow Exponent	1.50
Number of Contractions	0.00
Design High Water Level Elevation	54.50 ft

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Pond 1

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 1.98	50.000	0.000 *		
			0.00000	
1.98	50.000	0.86886		
			0.86886	
2.24	50.000	0.86886		0.00
			0.86886	
2.50	50.000	0.86886		0.00
			0.86886	
2.76	50.000	0.86886		0.00
			0.86886	
3.02	50.000	0.86886		0.00
			0.86886	
3.28	50.000	0.86886		0.00
			0.86886	
3.54	50.000	0.86886		0.00
			0.86886	
3.80	50.000	0.86886		0.00
			0.86886	
4.06	50.000	0.86886		0.00
			0.86886	
4.32	50.000	0.86886		0.00
			0.86886	
4.58	50.000	0.86886		0.00
			0.86886	
4.84	50.000	0.86886		0.00
			0.86886	
5.10	50.000	0.86886		0.00
			0.86886	
5.36	50.000	0.86886		0.00

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Pond 1

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.86886	
5.62	50.000	0.86886		0.00
			0.86886	
5.88	50.001	0.86886		0.00
			0.86886	
6.14	50.003	0.86886		0.00
			0.86886	
6.40	50.006	0.86886		0.00
			0.86886	
6.66	50.011	0.86886		0.00
			0.86886	
6.92	50.016	0.86886		0.00
			0.86886	
7.18	50.023	0.86886		0.00
			0.86886	
7.44	50.030	0.86886		0.00
			0.86886	
7.70	50.040	0.86886		0.00
			0.86886	
7.96	50.051	0.86886		0.00
			0.86886	
8.22	50.075	0.86886		0.00
			0.86886	
8.48	50.113	0.86886		0.00
			0.86886	
8.74	50.152	0.86886		0.00
			0.86886	
9.00	50.191	0.86886		0.00

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Pond 1

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.86886	
9.26	50.232	0.86886		0.00
			0.86886	
9.52	50.273	0.86886		0.00
			0.86886	
9.78	50.316	0.86886		0.00
			0.86886	
10.04	50.359	0.86886		0.00
			0.86886	
10.30	50.424	0.86886		0.00
			0.86886	
10.56	50.497	0.86886		0.00
			0.86886	
10.82	50.576	0.86886		0.00
			0.86886	
11.08	50.658	0.86886		0.00
			0.86886	
11.34	50.762	0.86886		0.00
			0.86886	
11.60	50.868	0.86886		0.00
			0.86886	
11.86	50.976	0.86886		0.00
			0.86886	
12.12	51.080	0.86886		0.00
			0.86886	
12.38	51.160	0.86886		0.00
			0.86886	
12.64	51.234	0.86886		0.00

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Pond 1

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			0.86886	
12.90	51.283	0.86886		0.00
			0.86886	
13.16	51.331	0.86886		0.00
			0.86886	
13.42	51.380	0.86886		0.00
			0.86886	
13.68	51.430	0.86886		0.00
			0.86886	
13.94	51.484	0.86886		0.00
			0.86886	
14.20	51.536	0.86886		0.00
			0.86886	
14.46	51.585	0.86886		0.00
			0.86886	
14.72	51.634	0.86886		0.00
			0.86886	
14.98	51.684	0.86886		0.00
			0.86886	
15.24	51.733	0.86886		0.00
			0.86886	
15.50	51.783	0.86886		0.00
			0.86886	
15.76	51.814	0.86886		0.00
			0.86886	
16.02	51.833	0.86886		0.00
			0.86886	
16.28	51.852	0.86886		0.00

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			0.86886	
16.54	51.871	0.86886		0.00
			0.86886	
16.80	51.892	0.86886		0.00
			0.86886	
17.06	51.914	0.86886		0.00
			0.86886	
17.32	51.934	0.86886		0.00
			0.86886	
17.58	51.953	0.86886		0.00
			0.86886	
17.84	51.972	0.86886		0.00
			0.86886	
18.10	51.991	0.86886		0.00
			0.86886	
18.36	52.010	0.86886		0.00
			0.86886	
18.62	52.029	0.86886		0.00
			0.86886	
18.88	52.048	0.86886		0.00
			0.86886	
19.14	52.068	0.86886		0.00
			0.86886	
19.40	52.087	0.86886		0.00
			0.86886	
19.66	52.100	0.86886		0.00
			0.86886	
19.92	52.090	0.86886		0.00

Analysis Date: 5/27/2025

MODRET

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CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.86886	
20.18	52.090	0.86886		0.00
			0.86886	
20.44	52.109	0.86886		0.00
			0.86886	
20.70	52.116	0.86886		0.00
			0.86886	
20.96	52.104	0.86886		0.00
			0.86886	
21.22	52.092	0.86886		0.00
			0.86886	
21.48	52.080	0.86886		0.00
			0.86886	
21.74	52.068	0.86886		0.00
			0.86886	
22.00	52.056	0.86886		0.00
			0.86886	
22.26	52.035	0.86886		0.00
			0.86886	
22.52	52.007	0.86886		0.00
			0.86886	
22.78	51.980	0.86886		0.00
			0.86886	
23.04	51.953	0.86886		0.00
			0.86886	
23.30	51.926	0.86886		0.00
			0.86886	
23.56	51.898	0.86886		0.00

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

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			0.86886	
23.82	51.871	0.86886		0.00
			0.86886	
24.08	51.843	0.86886		0.00
			0.86886	
24.34	51.801	0.85044		0.00
			0.00000	
36.34	51.710	0.00000		0.00
			0.00000	
48.34	51.417	0.00000		0.00
			0.00000	
60.34	51.198	0.00000		0.00
			0.00000	
72.34	51.086	0.00000		0.00
			0.00000	
84.34	51.011	0.00000		0.00
			0.00000	
96.34	50.980	0.00000		0.00
			0.00000	
108.34	50.804	0.00000		0.00
			0.00000	
120.34	50.712	0.00000		0.00
			0.00000	
132.34	50.643	0.00000		0.00
			0.00000	
144.34	50.509	0.00000		0.00
			0.00000	
156.34	50.473	0.00000		0.00

Analysis Date: 5/27/2025

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Pond 1

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.00000	
168.34	50.311	0.00000		0.00
			0.00000	
180.34	50.000	0.00000		0.00
			0.00000	
192.34	50.000	0.00000		0.00
			0.00000	
204.34	50.000	0.00000		0.00
			0.00000	
216.34	50.000	0.00000		0.00
			0.00000	
228.34	50.000	0.00000		0.00
			0.00000	
240.34	50.000	0.00000		0.00
			0.00000	
252.34	50.000	0.00000		0.00
			0.00000	
264.34	50.000	0.00000		0.00
			0.00000	
276.34	50.000	0.00000		0.00
			0.00000	
288.34	50.000	0.00000		0.00
			0.00000	
300.00	50.000	0.00000		0.00

Analysis Date: 5/27/2025

Maximum Water Elevation: 52.116 feet @ 20.70 hours Recovery @ 624.340 hours
* Time increment when there is no runoff
Maximum Infiltration Rate: 4.000 ft/day

Analysis Date: 5/27/2025