

STORMWATER REPORT

EDGEWATER MARINA City of Edgewater, Florida

PREPARED FOR:
INDIAN RIVER SHORELINE, LLC

JULY 2026

PREPARED BY:



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FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER: 32771

Nicholas A Peet



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o=Qualifier=AO141000000197829752250000999E,
c=Unaffiliated, C=US
Date: 2026.07.08 08:06:33-04'00'

Nicholas Alexander Peet, P.E.
Florida Professional Engineer
Number 92061

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Project Narrative

Introduction

The purpose of this document is to provide technical information for the stormwater management system for Edgewater Marina. The project was previously mass graded under Application # 183840-5 and this modification will be for full stormwater system for Basins 1 & 4 (per App #183840-5) Which includes boat storage facility, Marina and parking. The project is in the City of Edgewater northeast of US Highway 1 (S Ridgewood Avenue) and Jones Fish Camp Road intersection. The project is also located in Volusia County and in Section 38, Township 18S, Range 35E. The acreage of the project consists of 18.18 acres. This report shall show that the proposed stormwater management system reflects the design as it was in the conceptual permit.

The proposed basin layout has some minor modifications to the shape and size of Basin 1 and 2, IRL basin and basin associated with Jones Fish Camp Road. All changes have been modeled and compared to the mass grading permit.

Existing Conditions & Flow Patterns

In the current condition, the site is mass graded, and the pond has been excavated with a control structure that discharges to the Indian River Lagoon.

Soils

According to the USDA Soil Conservation Service's Web Soil Survey, the soil types identified within the proposed project limits are classified as Myakka-Myakka soils with a Hydrologic Group of A/D, as well as Quartzipsamments and Tavares fine sand soils with a Hydrologic Group of A. Per the Geotechnical Report, the site has a seasonal high groundwater level approximately 1.0 to 2.0 feet above the measured groundwater levels or between 5.0 to 6.0 feet below the existing ground surface. The existing site grades are mostly near 9.0 - 12.0 feet, not including the areas grading down to the ditch and Indian River Lagoon.

The pre-developed condition for the site would function as both group A soils and group D soils, therefore, some areas have high infiltration rates and low runoff potential, and other areas have very slow infiltration rate and high runoff potential.

Floodplain

The project site lies within Flood Zone “X” and Zone “AE” as demonstrated on the included Flood Insurance Rate Map (FIRMette) Panel 12127C07151.

Nutrient Impairment

The site discharges into the Indian River Lagoon and net improvement from the Mass graded condition (183840-5) is required for nitrogen or phosphorus. All Pre development data in the BMPTrains report is directly from the Mass Grading Post development Basin Data. Basin1, Basin 2 , & Basin 4 South Flow into the wet detention pond where the runoff is treated then discharged to JFC retention pond before ultimately discharging to the Indian River Lagoon. Basin 1 and 2 are pre-treated with permeable pavement before it discharging into the wet pond. Basin 4 North flows into retention and then into a wetland on the north property boundary. Basin JFC 3 treats a portion of Jones Fish Camp Road with a small dry retention pond. See BMP Trains full treatment report and associated maps in Section 6 of report.

Stormwater Management System

The enclosed Stormwater Management Plan for Edgewater Marina has been developed to provide treatment for stormwater runoff in accordance with SJRWMD and City of Edgewater Land Development Code, Article 5 Section 21-53. The drainage sub-basins have been analyzed using an SCS Florida Type III rainfall distribution with a shape factor of 484 for post development.

The existing wet pond discharges upland of the mangrove line with a spreader swale to the Indian River Lagoon with a tail water elevation of 0.12 (Mean Sea Level). Permeable pavement will be used as pre-treatment for the runoff in Basin 1 before it discharges into the wet pond.

In addition, a small dry retention pond has been designed in the southern portion of the site to provide stormwater storage and treatment for runoff generated from a portion of the site and from Jones Fish Camp Road. Treated runoff from this retention area will discharge to the Indian River Lagoon, which has a tailwater elevation of 0.12 feet.

With the modifications to the stormwater design, the site continues to discharge less than the pre-development conditions from Mass Grading Application #183840-5. A comparison table for pre-development versus post-development flows is shown in Section 5 of this report.

Water Quantity

The post-development peak discharge rates for the 25-year, 24-hour and 100-year, 24-hour storm events have been attenuated to levels less than or equal to the corresponding pre-development rates. This report demonstrates that the proposed improvements to the basins comply with the same design criteria established under Mass Grading Application #183840-5. A comparison table is shown on Page 114 of the report, comparing the flows for pre-development and post-development.

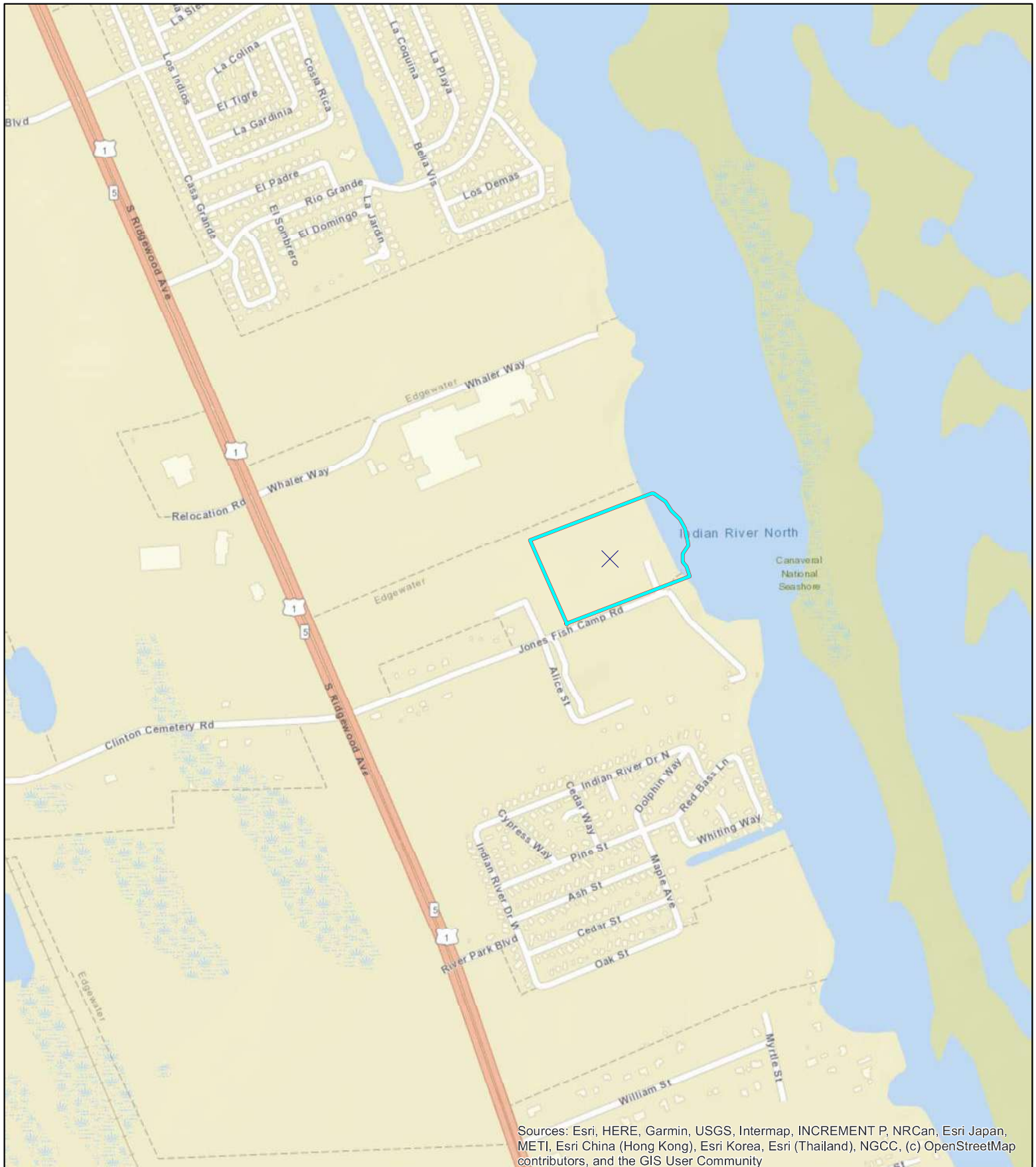
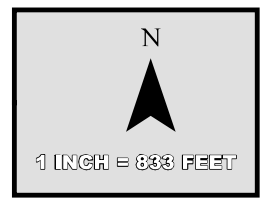
SECTION 1:

Maps and Exhibits



Edgewater Marina Project Location Map

Client: Fusilier Realty Group

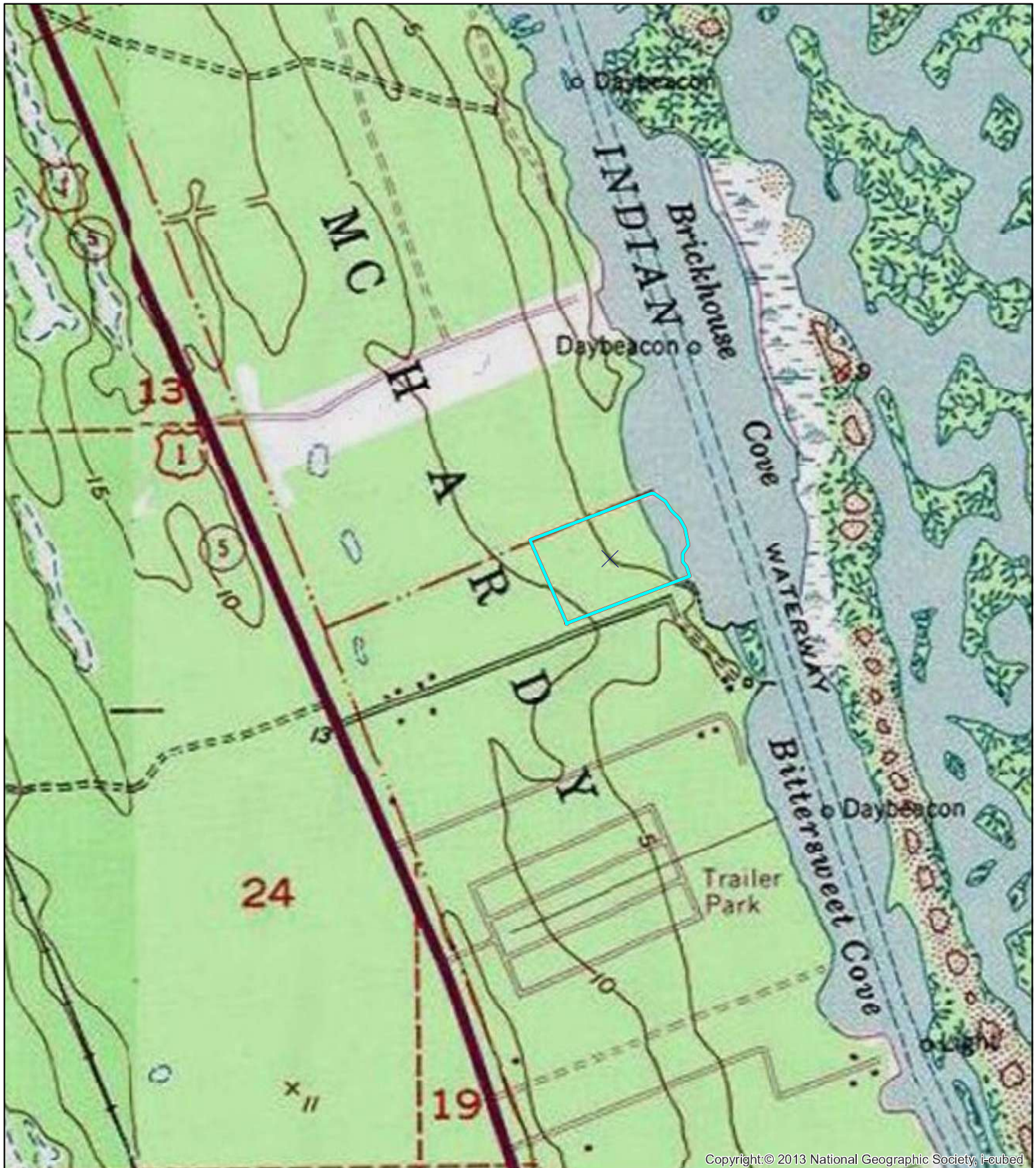
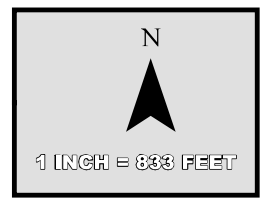


Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Edgewater Marina Quadrangle Map

Client: Fusilier Realty Group

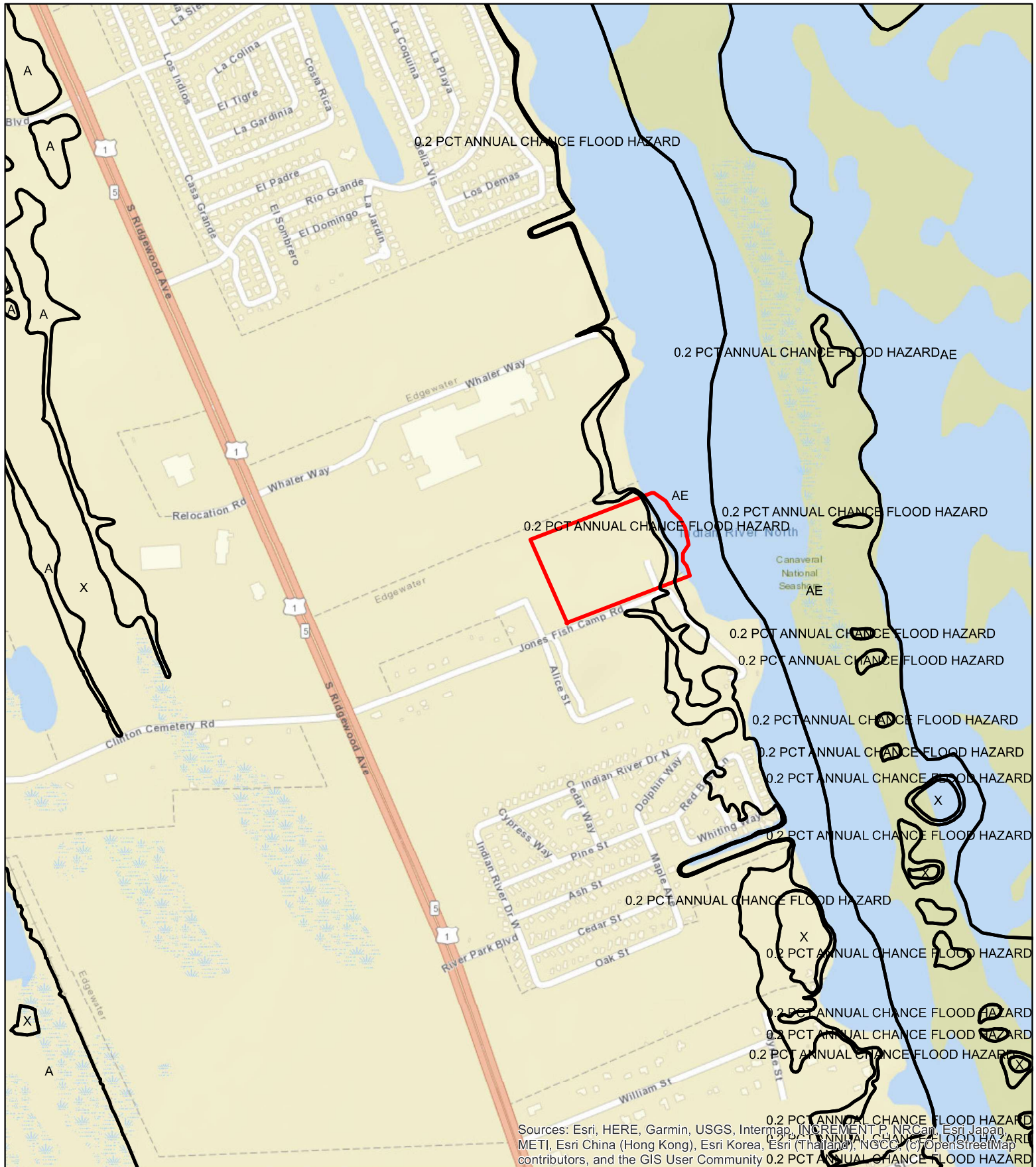
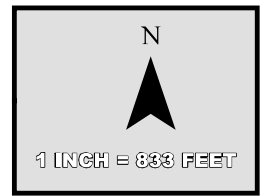


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Edgewater Marina FEMA Map

Client: Fusilier Realty Group



T:\Projects\199-01 Edgewater\Engineering\Stormwater\Current\Stormwater Management Report\Section 1 - Maps and Exhibits\Soil Exhibit\NRCS Soil Map.dwg
12/13/2023 4:23:52 PM PLOTTED BY: dmitrii ishchenko



Custom Soil Resource Report

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
17	Daytona sand, 0 to 5 percent slopes	16.6	24.2%
29	Immokalee sand	0.9	1.3%
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	21.9	31.9%
37	Orsino fine sand, 0 to 5 percent slopes	6.4	9.4%
53	Pompano-Placid complex	4.2	6.1%
54	Quartzipsamments, gently sloping	6.2	9.1%
63	Tavares fine sand, 0 to 5 percent slopes	12.4	18.1%
Totals for Area of Interest		68.5	100.0%

PROJECT NAME:
YARDLY EDGEWATER
RIVER OAKS

DRAWING TITLE:
NRCS SOIL DATA MAP

PREPARED FOR:
TM BTR OF FLORIDA, LLC

PROJECT No.
SCALE
SHEET

199-01-E01
NTS

LEVELUP
CONSULTING, LLC



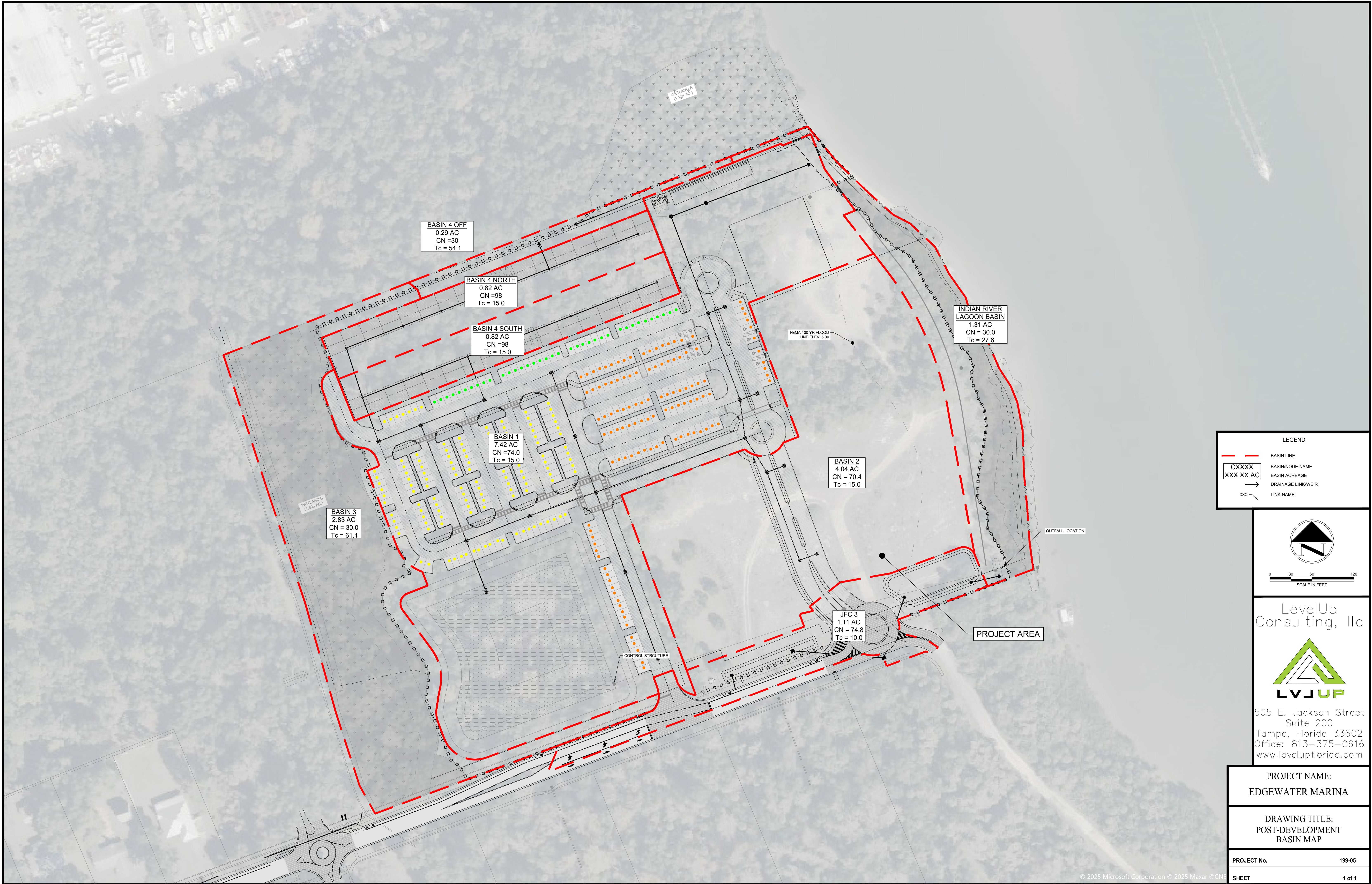
505 E. JACKSON STREET
SUITE 200
TAMPA, FLORIDA 33602
OFFICE: 813-375-0616
WWW.LEVELUPFLORIDA.COM

SECTION 2:

Proposed Basin Map and Data

Post-Developed Basin Map

T:\Projects\199-05 - Phase 1 of the Marina Development\Engineering\Stormwater\Current\Bassin Maps\Post-Development Basin Map.dwg
3/17/2025 9:45:26 PM RJC:CTD B11 Post-Dev



Post-Developed Basin Data



EDGEWATER MARINA

WET POND

STAGE (FT)	AREA (AC.)	DEPTH INTERVAL (FT)	STORAGE SUB-TOTAL (AC-FT)	STORAGE TOTAL (AC-FT)	STORAGE ABOVE NWL (AC-FT)	REMARKS
-4.31	0.54	0.00	0.00	0.00	0.00	BOTTOM OF TREATMENT
3.00	0.87	7.31	5.15	5.15	0.00	6:1 TO 2:1 GRADE BREAK (LITTORAL ZONE)
5.00	1.11	2.00	1.98	7.13	0.00	NORMAL WATER ELEVATION (NWL)
8.00	1.38	3.00	3.74	10.87	3.74	WEIR ELEVATION
9.00	1.47	1.00	1.43	12.29	5.16	DESIGN HIGH WATER ELEVATION
10.00	1.56	1.00	1.52	13.81	6.68	TOP OF BANK

TOTAL DRAINAGE AREA: 11.46 ac. (SUM OF BASIN 1 AND BASIN 2)

PROVIDED WEIR: 8.00 ft

RUNOFF COEFFICIENT © 0.90 (Based on Runoff coefficient for parking lot)

WET SEASON RAINFALL 34.00 inches

WET SEASON LENGTH 153.00 days

PPV REQ FOR 21 DAYS 4.01 ac-ft

PPV PROVIDED 7.13 ac-ft $PPV = 21 \text{ days} \times (\text{Drainage Area} \times C \times (\text{Wet season rainfall}/12\text{in/ft})) / 153$



Retention within pervious pavers (recovery analysis only)

Stage (ft)	Area (Ac.)	Depth Interval (ft)	Voids	Storage Sub-Total (ac-ft)(40% Voids)	Storage Total (ac-ft)	Remarks
6.00	2.50	0.00	-	0.00	0.00	Bottom of Storage
8.17	2.50	2.17	21%	1.14	1.14	Top of Base (AASHTO #2 or #3)
8.67	2.50	0.50	21%	0.26	1.40	Top of #57 Stone
9.00	2.50	0.33	25%	0.21	1.61	Top of Pavers

Additional retention under Boat Stack house Basin 4 North

Stage (ft)	Area (Ac.)	Depth Interval (ft)	Voids	Storage Sub-Total (ac-ft)(40% Voids)	Storage Total (ac-ft)	Remarks
7.83	0.38	0.00	0.00	0.00	0.00	Bottom of Storage
8.00	0.38	0.17	0.40	0.03	0.03	
9.00	0.38	1.00	0.40	0.15	0.18	
9.60	0.38	0.60	0.40	0.09	0.27	4" of Retention for 1/2 Stack House
10.00	0.38	1.00	0.40	0.15	0.33	
10.85	0.38	0.85	0.40	0.13	0.46	Top of Storage

Additional retention under Boat Stack house Basin 4 South

Stage (ft)	Area (Ac.)	Depth Interval (ft)	Voids	Storage Sub-Total (ac-ft)(40% Voids)	Storage Total (ac-ft)	Remarks
7.83	0.38	0.00	0.00	0.00	0.00	Bottom of Storage
8.00	0.38	0.17	0.40	0.03	0.03	
9.00	0.38	1.00	0.40	0.15	0.18	
9.60	0.38	0.60	0.40	0.09	0.27	4" of Retention for 1/2 Stack House
10.00	0.38	1.00	0.40	0.15	0.33	
10.85	0.38	0.85	0.40	0.13	0.46	Top of Storage

Note:

- Void coefficient value (0.40) obtained from FDOT Drainage Manual
- Area Calculation = LxW = 530 foot x 31 foot trench = 16,430 SF = 0.38 Acres
- storage sub total = 0.40 x area x depth interval

	<u>ANOXIC DEPTH (FT)</u>
TP LOADING	2.50 kg TP/yr From BMP trains loading
REMOVAL % FROM WET DETENTION AT 14 DAYS	65% All Equations are from FDEP Stormwater Quality applicants hand book
TOTAL VOLUMETRIC OUTFLOW FROM POND 25/24	4.05 ac-ft
MASS OF TP AFTER TREATMENT	0.87 kg TP/yr 13.4(C),
MEAN TP CONCENTRATION	63.34 µg TP/liter
CHYL-A CONCENTRATION	31.66 mg/m ³
MEAN SECCHI DISK DEPTH	2.94 ft
DEPTH OF DO<1	9.31 ft

THE POND WILL BE DUG TO -22 FEET FOR FILL. ALL VOLUME BELOW THE PHOTIC ZONE DEPTH OF 10.08 WILL BE CONSIDERED DEAD STORAGE.

$$\text{Depth of DO} < 1 = 3.035 * \text{Secchi} + 0.02164 * (\text{chyl-a}) - 0.004979 * \text{Total P}$$

Where: DO = dissolved oxygen (mg/L)
 Secchi = estimated Secchi depth (meters)
 Chyl a = estimated chlorophyll a (mg/m³)
 Total P = estimated total phosphorus (ug/L)

$$\frac{\text{mass of TP}}{\text{yr}} \times \frac{1 \text{ yr}}{(\text{ppv} + \text{pond outflow}) \text{ ac} - \text{ft}} \times \frac{1 \text{ ac}}{43,560 \text{ ft}^2} \times \frac{1 \text{ ft}^3}{7.48 \text{ gal}} \times \frac{1 \text{ gal}}{3.785 \text{ L}} \times \frac{10^6 \mu\text{g}}{\text{kg}} = \text{Mean Pond Concentration } \mu\text{g TP/Liter}$$

$$\ln(\text{chyl-a}) = 1.058 \ln(\text{TP}) - 0.934$$

where: chyl-a = chlorophyll-a concentration (mg/m³)

TP = total P concentration (µg/l)

$$SD = \frac{24.2386 + [(0.3041)(\text{chyl} - a)]}{(6.0632 + \text{chyl} - a)}$$

where: SD = Secchi disk depth (m)

chyl-a = chlorophyll-a (mg/m³)



PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: Edgewater, FL
 DRAINAGE AREA: 7.42 Ac.
 BASIN NAME/NO.: Wet Pond

Post
 Developed

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Impervious	A	98.0	0.33	32.34
Pervious Pavers	A	53.0	1.99	105.47
Roadway/Curb	A	98.0	1.91	187.18
Sidewalk	A	98.0	0.17	16.66
Open Space (Grass cover >75%)	A	39.0	1.55	60.45
Pond at 25 Year DHW	A	100.0	1.47	147

Time of Concentration = 15 min.

Sum = 549.10

At = 7.42

Composite CN Value = 74.0



PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: Edgewater, FL
 DRAINAGE AREA: 4.04 Ac.
 BASIN NAME/NO.: Basin 2

Post
 Developed

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Future Commercial (85% imp.)	A	89.0	1.83	162.87
Future Pervious Pavers	A	53.0	0.50	26.5
Future Roadway/Curb	A	98.0	0.23	22.54
Future Sidewalk	A	98.0	0.25	24.5
Open Space (Grass cover >75%)	A	39.0	1.23	47.97

Time of Concentration = 15 min.

Sum = 284.38

At = 4.04

Composite CN Value = 70.4

PROJECT TITLE:
 PROJECT LOCATION:
 DRAINAGE AREA:
 BASIN NAME/NO.:

Edgewater Marina
Edgewater, FL
0.82 Ac.
Basin 4 North

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Impervious	A	98.0	0.82	80.36

Time of Concentration = 15 min.

Sum =	80.36
At =	0.82
Composite CN Value =	98.0

*Basin 4 North will have 4" of retention for treatment. This 4" of retention will surpass the required treatment volume.

** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 INCHES OVER THE BASIN AREA
 (DRAINAGE AREA X 4 IN X (1/12 FT/IN.)

0.27 AC-FT

PROJECT TITLE:
 PROJECT LOCATION:
 DRAINAGE AREA:
 BASIN NAME/NO.:

Edgewater Marina
Edgewater, FL
0.82 Ac.
Basin 4 South

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Impervious	A	98.0	0.82	80.36
Time of Concentration = 15 min.		Sum = 80.36 At = 0.82 Composite CN Value = 98.0		

*Basin 4 North will have 4" of retention for treatment. This 4" of retention will surpass the required treatment volume.
 ** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 INCHES OVER THE BASIN AREA
 (DRAINAGE AREA X 4 IN X (1/12 FT/IN.)

0.27 AC-FT



JONES FISH CAMP RD.

JFC RETENTION (BASIN JFC 3)

STAGE (FT)	AREA (AC.)	DEPTH INTERVAL (FT)	STORAGE SUB-TOTAL (AC-FT)	STORAGE TOTAL (AC-FT)	REMARKS
4.00	0.11	0.00	0.00	0.000	NORMAL WATER ELEVATION (NWL)
4.93	0.14	0.93	0.12	0.116	TREATMENT VOL.
5.00	0.15	0.07	0.01	0.126	
6.00	0.19	1.00	0.17	0.296	TOB

DRAINAGE AREA: 1.11 AC.
 ADDTL. ROAD WIDENING IMPERVIOUS AREA: 0.32 AC.
 TOTAL IMPERVIOUS AREA: 0.50 AC.

Treatment Volume Required JFC 3.1		
Weir Elev.	4.93	Feet
Vol Provided	0.12	Ac-Ft
Inches over Catchment*	1.26	inches

*Inches over catchment = (Volume provided/Drainage area)*12 in/ft



SCS RUNOFF CURVE NUMBER

PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: City of Edgewater
 DRAINAGE AREA: 1.11 Ac.
 BASIN NAME/NO.: JFC 3

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Open Space (Grass cover >75%)	A	39.0	0.36	14.0
Open Space (Grass cover >75%)	D	80.0	0.25	20.0
Impervious	A	98.0	0.50	49.0

Sum =	83.0
At =	1.1
DCIA %	45%
Non DCIA CN =	55.8
Composite CN Value =	74.8

PERVIOUS PAVEMENT REVIEW AID:

THIS IS A DRAFT DOCUMENT SUBJECT TO REVISION

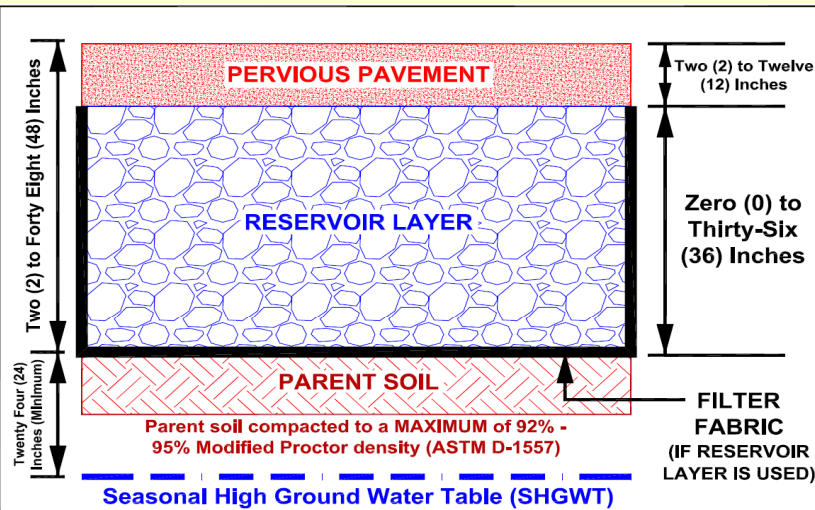


Figure 1:
Typical Pervious Pavement Cross Section

Disclaimer: These workbooks were created to assist in the review of commonplace calculations. These are not District approved or required. All users are responsible for validating the accuracy of the internal calculations. If errors or omissions are noted within this workbook, please e-mail Christopher Kuzlo, E.I. at christopher.kuzlo@watermatters.org or Hank Higginbotham, P.E. at hank.higginbotham@watermatters.org with specific information so that revisions can be made.



<http://stormwater.ucf.edu/>

Acknowledgement: This document is a continuation of a Technical Memorandum dated 07/26/08 by Dr. Marty Wanielista entitled "Retention for Pollution Control and Estimated Runoff for Flood Control as a Function of the Maximum Water Storage Capacity of Pervious Pavement Systems".

Product Disclaimer:

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Beta Version 1.00	25-Aug-08	Initial public release
Beta Version 1.01	27-Aug-08	Added Bold and Gold™ and other Sub Base Options
Beta Version 1.02	28-Aug-08	Revised Figure 1 to comply with the current recommendation of a MAXIMUM Parent soil compaction of 92% - 95% Modified Proctor density (ASTM D-1557)
Beta Version 1.03	29-Sep-08	Revised recommended effective porosity in the storage calculator per Dr. Chopra's 09/15/08 presentation to the statewide storm water Rule Technical Advisory Committee (TAC).
Beta Version 1.04	27-Jul-09	Changed "Bold & Gold" name to "B&G"
Beta Version 1.05	24-Jan-11	Changed name to "review aid".
		Added FilterPave® and FirmaPave® with appropriate sustainable void space values per Dr. Chopra's technical memorandum "Pervious Pavement Evaluation of FILTERPAVE and FIRMAPAVE Systems at the Stormwater Management Academy Field Laboratory at the University of Central Florida" dated December 12, 2010.

**C (% OF RAINFALL), CN VALUES AS A FUNCTION OF PERVIOUS PAVEMENT SYSTEM
STORAGE AND RAINFALL EVENT VOLUME**

Note: Design Storm Rainfall amount should range
between 4.0 and 15.0 inches.

Design Storm Rainfall Amount:
(Hit "Enter" after input).

9.50

USER INSTRUCTIONS: INSERT THE DESIGN STORM RAINFALL AMOUNT FIRST, AND HIT
"ENTER" AFTER INPUT (see above), THEN PRESS VIEW RUNOFF PERCENT AND CN VALUE
BUTTON (see above right) TO SEE THE CHART WITH APPROPRIATE CURVES

Notes: **1)** An S value of 1.2 inches is equal to 6 inches of pervious pavement with a porosity of 0.2 and 12 inches would be a 6 inch pervious over 3 feet of sub base with a porosity of 0.30. Thus there are many pervious pavement situations that can be modeled within the range of **S**.) Runoff coefficient on graphs is % of rainfall, thus divide by 100. Peak Runoff $Q_p = (C/100)iA$ where i (in/hr) and A (Acres) and the attenuation factor is 1 for parking areas and the 1.008 constant is not used.

S'	CN	C * 100
0.5	95	93.95
0.8	93	90.56
1	91	88.39
1.2	89	86.29
1.5	87	83.27
2	83	78.53
2.5	80	74.14
3	77	70.07
3.5	74	66.27
4	71	62.74
4.5	69	59.43
5	67	56.34
5.5	65	53.43
6	63	50.71
6.5	61	48.15
7	59	45.74
7.5	57	43.46
8	56	41.32
8.5	54	39.29
9	53	37.37
10	50	33.83
11	48	30.65
12	45	27.78
13	43	25.18
14	42	22.83
15	40	20.69
17	37	16.96
19	34	13.85

Blue Numbers =	Input data
Red Numbers =	Answers

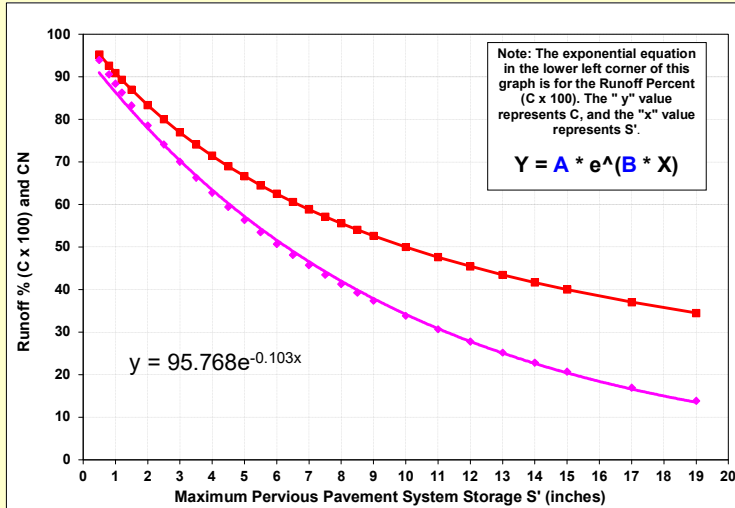
Predictive Equations:

Rainfall Excess (in) $R = [P - 0.2S']^2 / [P + 0.8S']$ If $P > 0.2S'$
 Maximum Storage (in) $S' = [1000/CN] - 10$ and $CN = 1000/(S' + 10)$
 Runoff Coefficient $C = R/P$

Variables:

Maximum Storage S' (inches) = 0.5 to 19 inches
 Precipitation Event Volume P (inches) = 4.0 to 15 inches

Runoff Percent and Curve Number(CN) for the: 9.50 inch Design Storm Event



Note #1: For other pervious pavement sections and / or other sub base sections, the User must supply the appropriate certified "[Sustainable Void space percentages](#)" from a licensed geotechnical laboratory.

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Blue Numbers	= Input data
Red Numbers	= Answers

Calculator for Pervious Pavement Section Storage (S')

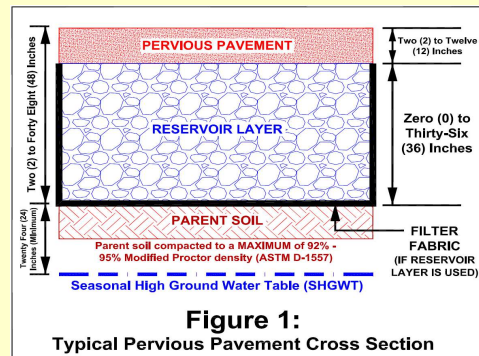
Layer	Thickness (in)	SUSTAINABLE Void Space (%)	Storage (in)
Permeable Pavers	0	10	0
Other Perv. Pvmt. (see Note #1 above)	4	25	1
#57 rock	6	25	1.5
#89 pea rock	0	25	0
#4 rock	0	30	0
Recycled (crushed) concrete	0	25	0
B&G	0	9	0
Other Sub Base (see Note #1 above)	26	25	6.5

Automatic input of the "Best Fit" Exponential Equation Coefficients A and B (lower left corner of the above graph). $y = C$ and $x = S'$

$$Y = A * e^{(B * X)}$$

A value: 95.768
B value: -0.1031

S' =	9
CN =	53
C =	0.38

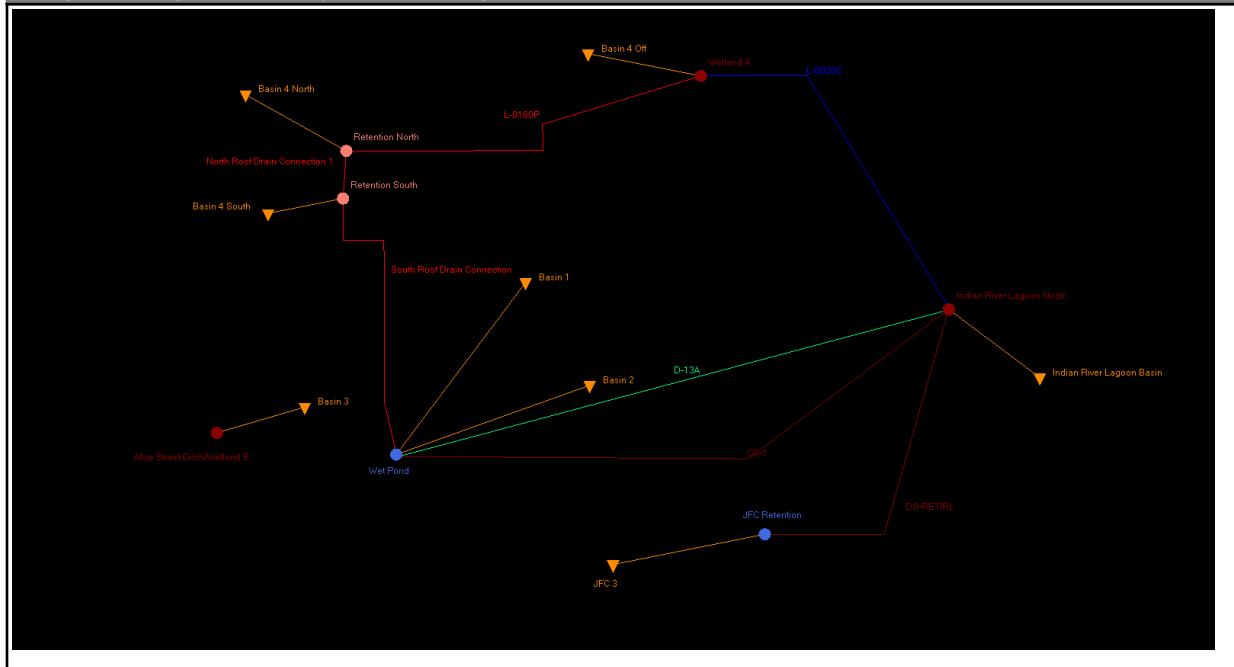


SECTION 3:

Post Development ICPR Model

Post-Developed Nodal Diagram

Background Image: Post Development Nodal Diagram



Post-Developed Input Report

Simple Basin: Basin 1

Scenario: Post
Node: Wet Pond
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 15.0000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 7.4200 ac
Curve Number: 74.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Basin 2

Scenario: Post
Node: Wet Pond
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 15.0000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 4.0400 ac
Curve Number: 70.4
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Basin 3

Scenario: Post
Node: Alice Street Ditch/Wetland B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number

Time of Concentration: 61.1000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 2.8000 ac
Curve Number: 30.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Basin 4 North

Scenario: Post
Node: Retention North
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 15.0000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 0.8200 ac
Curve Number: 98.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Basin 4 Off

Scenario: Post
Node: Wetland A
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 54.1000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0

Area: 0.2900 ac
Curve Number: 30.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Basin 4 South

Scenario: Post
Node: Retention South
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 15.0000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 0.8200 ac
Curve Number: 98.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: Indian River Lagoon Basin

Scenario: Post
Node: Indian River Lagoon Node
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 27.6000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 1.3100 ac
Curve Number: 30.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00

% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: JFC 3

Scenario: Post
Node: JFC Retention
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 1.1100 ac
Curve Number: 74.8
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Node: Alice Street Ditch/Wetland B

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 0.00 ft
Warning Stage: 0.00 ft
Alert Stage: 0.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	12.0000	0.00
0	0	0	24.0000	0.00

Comment:

Node: Indian River Lagoon Node

Scenario: Post
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 0.00 ft
 Warning Stage: 0.00 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.12
0	0	0	999.0000	0.12

Comment:

Node: JFC Retention

Scenario: Post
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 4.00 ft
 Warning Stage: 6.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.1100	4792
5.00	0.1500	6534
6.00	0.1900	8276

Comment:

Node: Retention North

Scenario: Post
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 7.83 ft
 Warning Stage: 7.83 ft
 Alert Stage: 0.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
7.83	0.00	0
9.60	0.27	11761
10.85	0.46	20038

Comment:

Node: Retention South

Scenario: Post
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 7.83 ft
 Warning Stage: 7.83 ft
 Alert Stage: 0.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
7.83	0.00	0
9.60	0.27	11761
10.85	0.46	20038

Comment: Retention Under Boat Stack
 57 Stone with 40% voids

Node: Wet Pond

Scenario: Post
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 5.00 ft
 Warning Stage: 9.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
5.00	1.1100	48352
10.00	1.5600	67954

Comment:

Node: Wetland A

Scenario: Post
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 0.00 ft
 Warning Stage: 0.00 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	999.0000	0.00

Comment:

Drop Structure Link: CS-1		Upstream Pipe	Downstream Pipe
Scenario:	Post	Invert: 5.00 ft	Invert: 2.00 ft
From Node:	Wet Pond	Manning's N: 0.0120	Manning's N: 0.0120
To Node:	Indian River Lagoon	Geometry: Circular	Geometry: Circular
	Node	Max Depth: 2.00 ft	Max Depth: 2.00 ft
Link Count:	1	Bottom Clip	
Pipe Flow Direction:	Both	Default: 0.00 ft	Default: 0.00 ft
Solution:	Combine	Op Table:	Op Table:
Increments:	0	Ref Node:	Ref Node:
Pipe Count:	1	Manning's N: 0.0000	Manning's N: 0.0000
Damping:	0.0000 ft	Top Clip	
Length:	652.00 ft	Default: 0.00 ft	Default: 0.00 ft
FHWA Code:	0	Op Table:	Op Table:
Entr Loss Coef:	1	Ref Node:	Ref Node:
Exit Loss Coef:	1	Manning's N: 0.0000	Manning's N: 0.0000
Bend Loss Coef:	0		
Bend Location:	0.00 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	5.00 ft	Op Table:	
Control Elevation:	5.00 ft	Ref Node:	
Max Depth:	0.33 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	8.00 ft	Op Table:	
Control Elevation:	8.00 ft	Ref Node:	
Max Depth:	1.00 ft	Discharge Coefficients	
Max Width:	1.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: 4.8 inches

Weir Component	
Weir: 3	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 9.80 ft	Op Table:
Control Elevation: 9.80 ft	Ref Node:
Max Depth: 3.10 ft	Discharge Coefficients
Max Width: 2.00 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Weir Link: D-13A

Scenario: Post	Bottom Clip
From Node: Wet Pond	Default: 0.00 ft
To Node: Indian River Lagoon Node	Op Table:
Link Count: 1	Ref Node:
Flow Direction: Both	Top Clip
Damping: 0.0000 ft	Default: 0.00 ft
Weir Type: Sharp Crested Vertical	Op Table:
Geometry Type: Trapezoidal	Ref Node:
Invert: 8.75 ft	Discharge Coefficients
Control Elevation: 8.75 ft	Weir Default: 2.800
Max Depth: 1.00 ft	Weir Table:
Extrapolation Method: Normal Projection	Orifice Default: 0.600
Bottom Width: 0.00 ft	Orifice Table:
Left Slope: 0.020 (h:v)	
Right Slope: 0.020 (h:v)	

Comment:

Drop Structure Link: DS-RETIRL

Scenario: Post	Upstream Pipe	Downstream Pipe
From Node: JFC Retention	Invert: 0.00 ft	Invert: -1.00 ft
To Node: Indian River Lagoon Node	Manning's N: 0.0120	Manning's N: 0.0120
Link Count: 1	Geometry: Circular	Geometry: Circular
Pipe Flow Direction: Both	Max Depth: 1.50 ft	Max Depth: 1.50 ft
	Bottom Clip	
	Default: 0.00 ft	Default: 0.00 ft

Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	71.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	1	Ref Node:		Ref Node:	
Exit Loss Coef:	1	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	4.93 ft
Control Elevation:	4.93 ft
Max Depth:	2.10 ft
Max Width:	3.10 ft
Fillet:	0.00 ft
Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Channel Link: L-0020C	Upstream	Downstream			
Scenario:	Post	Invert:	5.00 ft	Invert:	0.00 ft
From Node:	Wetland A	Manning's N:	0.8000	Manning's N:	0.8000
To Node:	Indian River	Geometry:	Trapezoidal	Geometry:	Trapezoidal
	Lagoon Node	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Link Count:	1	Extrapolation:	Normal	Extrapolation:	Normal
Flow Direction:	Both	Bottom Width:	0.00 ft	Bottom Width:	0.00 ft
Damping:	0.0000 ft	Left Slope:	17.000 (h:v)	Left Slope:	10.000 (h:v)
Length:	320.00 ft	Right Slope:	17.000 (h:v)	Right Slope:	10.000 (h:v)
Contraction Coef:	0	Bottom Clip			
Expansion Coef:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0	Op Table:		Op Table:	
Exit Loss Coef:	0	Ref Node:		Ref Node:	
Bend Loss Coef:	0	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec	Top Clip			
Energy Switch:	Energy	Default:	0.00 ft	Default:	0.00 ft

Op Table:
Ref Node:
Manning's N: 0.0000

Op Table:
Ref Node:
Manning's N: 0.0000

Comment:

Pipe Link: L-0160P		Upstream	Downstream
Scenario:	Post	Invert: 9.60 ft	Invert: 8.76 ft
From Node:	Retention North	Manning's N: 0.0130	Manning's N: 0.0130
To Node:	Wetland A	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction:	Both	Bottom Clip	
Damping:	0.0000 ft	Default: 0.00 ft	Default: 0.00 ft
Length:	43.00 ft	Op Table:	Op Table:
FHWA Code:	0	Ref Node:	Ref Node:
Entr Loss Coef:	1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef:	1	Top Clip	
Bend Loss Coef:	0	Default: 0.00 ft	Default: 0.00 ft
Bend Location:	0.00 dec	Op Table:	Op Table:
Energy Switch:	Energy	Ref Node:	Ref Node:
		Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Pipe Link: North Roof Drain Connection 1		Upstream	Downstream
Scenario:	Post	Invert: 8.33 ft	Invert: 8.33 ft
From Node:	Retention North	Manning's N: 0.0130	Manning's N: 0.0130
To Node:	Retention South	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction:	Both	Bottom Clip	
Damping:	0.0000 ft	Default: 0.00 ft	Default: 0.00 ft
Length:	80.00 ft	Op Table:	Op Table:
FHWA Code:	0	Ref Node:	Ref Node:
Entr Loss Coef:	1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef:	1	Top Clip	
Bend Loss Coef:	0	Default: 0.00 ft	Default: 0.00 ft
Bend Location:	0.00 dec	Op Table:	Op Table:
Energy Switch:	Energy	Ref Node:	Ref Node:
		Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Pipe Link: South Roof Drain Connection		Upstream	Downstream
Scenario:	Post	Invert: 9.60 ft	Invert: 5.00 ft
From Node:	Retention South	Manning's N: 0.0130	Manning's N: 0.0130

To Node: Wet Pond	Geometry: Circular	Geometry: Circular
Link Count: 2	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.00 ft	Default: 0.00 ft
Length: 70.00 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef: 1	Top Clip	
Bend Loss Coef: 0	Default: 0.00 ft	Default: 0.00 ft
Bend Location: 0.00 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000
Comment:		

Simulation: 100YR24HR

Scenario: Post
Run Date/Time: 7/6/2026 3:32:19 PM
Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources	Lookup Tables
Rainfall Folder:	Boundary Stage Set:
Unit Hydrograph Folder:	Extern Hydrograph Set:
	Curve Number Set:
	Green-Ampt Set:
	Vertical Layers Set:
	Impervious Set:

Tolerances & Options	
Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 6	
Over-Relax Weight: 0.5 dec	Ia/S: 0.20 dec
Fact:	
dZ Tolerance: 0.0010 ft	
Max dZ: 1.0000 ft	Smp/Man Basin Rain Global
	Opt:
Link Optimizer Tol: 0.0001 ft	
	Rainfall Name: ~FLMOD
	Rainfall Amount: 13.00 in
	Storm Duration: 24.0000 hr
	Dflt Damping (1D): 0.0050 ft
	Min Node Srf Area 100 ft2
	(1D):
	Energy Switch (1D): Energy

Comment:

Simulation: 10YR24HR

Scenario: Post
 Run Date/Time: 7/6/2026 3:35:15 PM
 Program Version: StormWise 4.08.03

General				
Run Mode:	Normal			
	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	336.0000
	Hydrology [sec]	Surface Hydraulics [sec]		
Min Calculation Time:	60.0000	0.1000		
Max Calculation Time:		30.0000		

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR
 Max Iterations: 6
 Over-Relax Weight: 0.5 dec
 Fact:
 dZ Tolerance: 0.0010 ft
 Max dZ: 1.0000 ft
 Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Ia/S: 0.20 dec

Smp/Man Basin Rain: Global
 Opt:

Rainfall Name: ~FLMOD
 Rainfall Amount: 7.50 in
 Storm Duration: 24.0000 hr
 Dflt Damping (1D): 0.0050 ft
 Min Node Srf Area: 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

Simulation: 25YR24HR

Scenario: Post
 Run Date/Time: 7/6/2026 3:56:10 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:
 Extern Hydrograph Set:
 Curve Number Set:

Green-Ampt Set:
 Vertical Layers Set:
 Impervious Set:

Tolerances & Options

Time Marching: SAOR
 Max Iterations: 6
 Over-Relax Weight 0.5 dec
 Fact:
 dZ Tolerance: 0.0010 ft
 Max dZ: 1.0000 ft

IA Recovery Time: 24.0000 hr
 Ia/S: 0.20 dec
 Smp/Man Basin Rain Global

Link Optimizer Tol: 0.0001 ft

Opt:

Rainfall Name: ~FLMOD
 Rainfall Amount: 9.50 in
 Storm Duration: 24.0000 hr
 Dflt Damping (1D): 0.0050 ft
 Min Node Srf Area 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

Simulation: Mean Annual

Scenario: Post
 Run Date/Time: 7/6/2026 4:01:25 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Lookup Tables

Rainfall Folder:

Unit Hydrograph
Folder:

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight 0.5 dec
Fact:
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Ia/S: 0.20 dec

Smp/Man Basin Rain Global
Opt:

Rainfall Name: ~FLMOD
Rainfall Amount: 5.00 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2
(1D):
Energy Switch (1D): Energy

Comment:

Post-Developed Basin Report

Simple Basin : Multi Item | (sim, name) : Runoff Summary [Post]

Sim Name	Basin Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]
100YR24HR	Basin 1	57.06	12.0667	13.00	9.58	7.4200
100YR24HR	Basin 2	29.66	12.0667	13.00	9.05	4.0400
100YR24HR	Basin 3	1.19	12.9333	13.00	2.19	2.8000
100YR24HR	Basin 4 North	7.36	12.0500	13.00	12.78	0.8200
100YR24HR	Basin 4 Off	0.13	12.8333	13.00	2.19	0.2900
100YR24HR	Basin 4 South	7.36	12.0500	13.00	12.78	0.8200
100YR24HR	Indian River Lagoon Basin	1.46	12.3167	13.00	2.20	1.3100
100YR24HR	JFC 3	9.25	12.0167	13.00	9.70	1.1100
10YR24HR	Basin 1	27.46	12.0667	7.50	4.49	7.4200
10YR24HR	Basin 2	13.66	12.0667	7.50	4.09	4.0400
10YR24HR	Basin 3	0.08	15.8167	7.50	0.31	2.8000
10YR24HR	Basin 4 North	4.24	12.0500	7.50	7.27	0.8200
10YR24HR	Basin 4 Off	0.01	15.5000	7.50	0.31	0.2900
10YR24HR	Basin 4 South	4.24	12.0500	7.50	7.27	0.8200
10YR24HR	Indian River Lagoon Basin	0.06	12.7500	7.50	0.31	1.3100
10YR24HR	JFC 3	4.52	12.0333	7.50	4.58	1.1100
25YR24HR	Basin 1	38.17	12.0667	9.50	6.30	7.4200
25YR24HR	Basin 2	19.41	12.0667	9.50	5.84	4.0400
25YR24HR	Basin 3	0.32	13.2000	9.50	0.83	2.8000
25YR24HR	Basin 4 North	5.37	12.0500	9.50	9.28	0.8200
25YR24HR	Basin 4 Off	0.04	13.0667	9.50	0.83	0.2900
25YR24HR	Basin 4 South	5.37	12.0500	9.50	9.28	0.8200
25YR24HR	Indian River Lagoon Basin	0.37	12.4500	9.50	0.83	1.3100
25YR24HR	JFC 3	6.23	12.0167	9.50	6.40	1.1100
Mean Annual	Basin 1	14.50	12.0667	5.00	2.37	7.4200
Mean Annual	Basin 2	6.85	12.0833	5.00	2.07	4.0400
Mean Annual	Basin 3	0.00	24.1167	5.00	0.00	2.8000
Mean Annual	Basin 4 North	2.82	12.0500	5.00	4.77	0.8200
Mean Annual	Basin 4 Off	0.00	24.0667	5.00	0.00	0.2900
Mean Annual	Basin 4 South	2.82	12.0500	5.00	4.77	0.8200
Mean Annual	Indian River Lagoon Basin	0.00	23.6333	5.00	0.00	1.3100
Mean Annual	JFC 3	2.44	12.0333	5.00	2.44	1.1100

Post-Developed Node Max Report

Node Max Conditions : Multi Item | (sim, name) [Post]

Sim Name	Node Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
100YR24HR	Alice Street Ditch/Wetland B	0.00	0.00	0.00	0.0000	1.19	0.00	0
100YR24HR	Indian River Lagoon Node	0.00	0.00	0.12	0.0000	10.25	0.00	0
100YR24HR	JFC Retention	6.00	0.00	5.34	0.0010	9.25	8.81	7131
100YR24HR	Retention North	7.83	0.00	10.63	0.0010	7.36	4.53	6684
100YR24HR	Retention South	7.83	0.00	10.52	0.0010	8.03	6.13	6691
100YR24HR	Wet Pond	9.00	0.00	9.72	0.0010	91.31	6.14	66853
100YR24HR	Wetland A	0.00	0.00	0.00	0.0000	3.49	0.00	0
10YR24HR	Alice Street Ditch/Wetland B	0.00	0.00	0.00	0.0000	0.08	0.00	0
10YR24HR	Indian River Lagoon Node	0.00	0.00	0.12	0.0000	3.80	0.00	0
10YR24HR	JFC Retention	6.00	0.00	5.15	0.0010	4.52	3.38	6791
10YR24HR	Retention North	7.83	0.00	9.97	0.0010	4.24	0.82	6684
10YR24HR	Retention South	7.83	0.00	9.96	0.0010	4.24	1.08	6684
10YR24HR	Wet Pond	9.00	0.00	8.03	0.0010	41.12	0.69	60220
10YR24HR	Wetland A	0.00	0.00	0.00	0.0000	0.56	0.00	0
25YR24HR	Alice Street Ditch/Wetland B	0.00	0.00	0.00	0.0000	0.32	0.00	0
25YR24HR	Indian River Lagoon Node	0.00	0.00	0.12	0.0000	6.32	0.00	0
25YR24HR	JFC Retention	6.00	0.00	5.24	0.0010	6.23	5.74	6953
25YR24HR	Retention North	7.83	0.00	10.24	0.0010	5.37	2.22	6684
25YR24HR	Retention South	7.83	0.00	10.21	0.0010	5.48	2.91	6684
25YR24HR	Wet Pond	9.00	0.00	8.63	0.0010	58.22	2.29	62565
25YR24HR	Wetland A	0.00	0.00	0.00	0.0000	1.64	0.00	0
Mean Annual	Alice Street Ditch/Wetland B	0.00	0.00	0.00	0.0000	0.00	0.00	0
Mean	Indian River	0.00	0.00	0.12	0.0000	0.68	0.00	0

Sim Name	Node Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Annual	Lagoon Node							
Mean Annual	JFC Retention	6.00	0.00	4.97	0.0010	2.44	0.31	6489
Mean Annual	Retention North	7.83	0.00	9.70	0.0010	2.82	0.07	6684
Mean Annual	Retention South	7.83	0.00	9.70	0.0010	2.82	0.10	6684
Mean Annual	Wet Pond	9.00	0.00	6.51	0.0010	21.34	0.46	54299
Mean Annual	Wetland A	0.00	0.00	0.00	0.0000	0.05	0.00	0

Post-Developed Link Max Report

Link Min/Max Conditions : Multi Item | (sim, name) [Post]

Sim Name	Link Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
100YR24HR	CS-1 - Pipe	6.10	0.00	0.01	0.00	0.00	0.00
100YR24HR	CS-1 - Weir: 2	0.79	0.00	0.01	9.23	9.23	9.23
100YR24HR	CS-1 - Weir: 4	5.31	0.00	0.00	5.31	5.31	5.31
100YR24HR	CS-1 - Weir: 5	0.00	0.00	0.00	0.00	0.00	0.00
100YR24HR	D-13A	0.04	0.00	0.00	0.00	0.00	0.00
100YR24HR	DS-RETIRL - Pipe	8.81	0.00	0.02	0.00	0.00	0.00
100YR24HR	DS-RETIRL - Weir: 1	8.81	0.00	0.01	2.05	2.05	2.05
100YR24HR	L-0020C	0.00	0.00	0.00	0.00	0.00	0.00
100YR24HR	L-0160P	3.43	0.00	0.11	5.02	6.90	5.96
100YR24HR	North Roof Drain Connection 1	1.12	0.00	-0.02	1.43	1.43	1.43
100YR24HR	South Roof Drain Connection	6.13	0.00	0.29	4.85	10.48	7.66
10YR24HR	CS-1 - Pipe	0.69	0.00	0.00	0.00	0.00	0.00
10YR24HR	CS-1 - Weir: 2	0.68	0.00	0.01	7.91	7.91	7.91
10YR24HR	CS-1 - Weir: 4	0.01	0.00	0.00	0.00	0.00	0.00
10YR24HR	CS-1 - Weir: 5	0.00	0.00	0.00	0.00	0.00	0.00
10YR24HR	D-13A	0.00	0.00	0.00	0.00	0.00	0.00
10YR24HR	DS-RETIRL - Pipe	3.38	0.00	0.02	0.00	0.00	0.00
10YR24HR	DS-RETIRL - Weir: 1	3.38	0.00	0.01	1.49	1.49	1.49
10YR24HR	L-0020C	0.00	0.00	0.00	0.00	0.00	0.00
10YR24HR	L-0160P	0.56	0.00	0.01	2.69	4.20	3.44
10YR24HR	North Roof Drain Connection 1	0.26	0.00	0.00	0.33	0.33	0.33
10YR24HR	South Roof Drain Connection	1.08	0.00	0.03	2.66	0.69	1.68
25YR24HR	CS-1 - Pipe	2.29	0.00	0.00	0.00	0.00	0.00
25YR24HR	CS-1 - Weir: 2	0.71	0.00	0.01	8.34	8.34	8.34
25YR24HR	CS-1 - Weir: 4	1.58	0.00	0.00	2.53	2.53	2.53
25YR24HR	CS-1 - Weir: 5	0.00	0.00	0.00	0.00	0.00	0.00

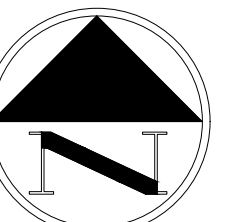
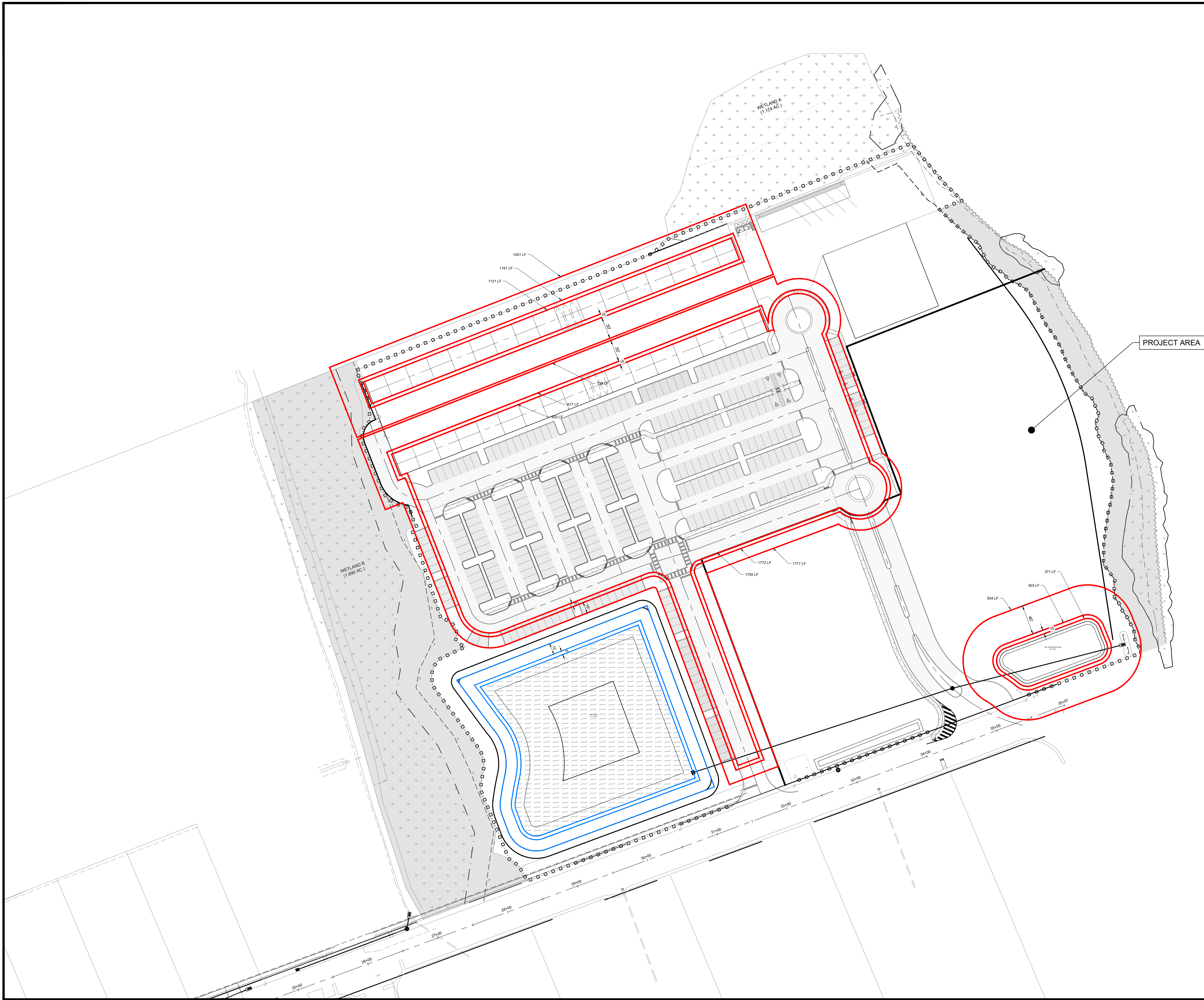
Sim Name	Link Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
	5						
25YR24HR	D-13A	0.00	0.00	0.00	0.00	0.00	0.00
25YR24HR	DS-RETIRL - Pipe	5.74	0.00	0.02	0.00	0.00	0.00
25YR24HR	DS-RETIRL - Weir: 1	5.75	0.00	0.01	1.78	1.78	1.78
25YR24HR	L-0020C	0.00	0.00	0.00	0.00	0.00	0.00
25YR24HR	L-0160P	1.62	0.00	0.01	3.74	5.67	4.71
25YR24HR	North Roof Drain Connection 1	0.61	0.00	0.00	0.78	0.78	0.78
25YR24HR	South Roof Drain Connection	2.91	0.00	0.03	3.60	1.85	2.73
Mean Annual	CS-1 - Pipe	0.46	0.00	0.00	0.00	0.00	0.00
Mean Annual	CS-1 - Weir: 2	0.46	0.00	0.01	5.38	5.38	5.38
Mean Annual	CS-1 - Weir: 4	0.00	0.00	0.00	0.00	0.00	0.00
Mean Annual	CS-1 - Weir: 5	0.00	0.00	0.00	0.00	0.00	0.00
Mean Annual	D-13A	0.00	0.00	0.00	0.00	0.00	0.00
Mean Annual	DS-RETIRL - Pipe	0.31	0.00	0.01	0.00	0.00	0.00
Mean Annual	DS-RETIRL - Weir: 1	0.31	0.00	0.00	0.00	0.00	0.00
Mean Annual	L-0020C	0.00	0.00	0.00	0.00	0.00	0.00
Mean Annual	L-0160P	0.05	0.00	0.00	0.00	0.00	0.00
Mean Annual	North Roof Drain Connection 1	0.02	0.00	0.00	0.03	0.03	0.03
Mean Annual	South Roof Drain Connection	0.10	0.00	0.01	0.00	0.06	0.03

SECTION 4:

Recovery Analysis

Perimeter Ring Exhibit

T:\Projects\199-05 - Phase 1 of the Marina Development\Drawings\199-05-ED1 - Perimeter Ring Exhibit\Current Plans\Perimeter Ring Exhibit LFC.dwg
2/7/2025 10:47 AM PLotted by: rcs-jpet



0 30 60 120
SCALE IN FEET

LEVELUP
CONSULTING, LLC



505 E. JACKSON STREET
SUITE 200
TAMPA, FLORIDA 33602
OFFICE: 813-375-0616
WWW.LEVELUPFLORIDA.COM

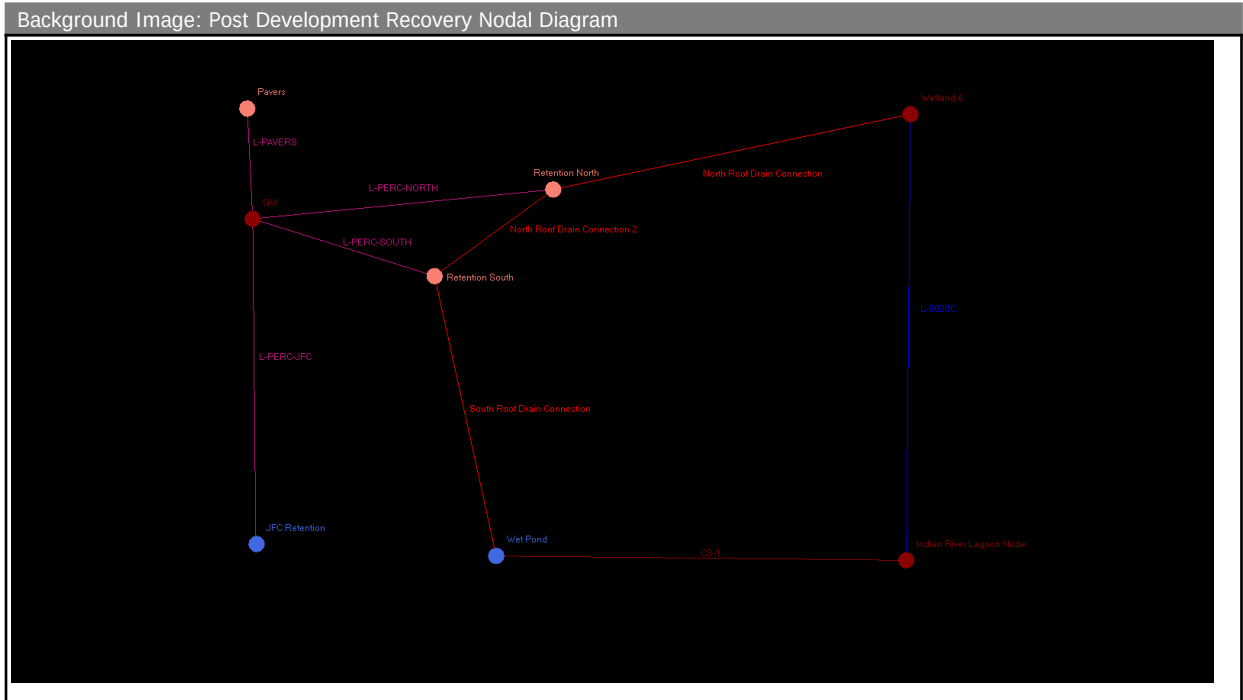
PROJECT NAME:
EDGEWATER MARINA

DRAWING TITLE:
PERIMETER RING
EXHIBIT

PROJECT No. 199-05

SHEET 1 of 1

Recovery Nodal Diagram



Recovery Input Data

Node: GW

Scenario: Recovery
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 0.00 ft
Warning Stage: 0.00 ft
Alert Stage: 0.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	999.0000	0.00

Comment:

Node: Indian River Lagoon Node

Scenario: Recovery
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 0.00 ft
Warning Stage: 0.00 ft
Alert Stage: 0.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.12
0	0	0	999.0000	0.12

Comment:

Node: JFC Retention

Scenario: Recovery
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 4.93 ft
Warning Stage: 4.00 ft
Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.1100	4792
5.00	0.1500	6534
6.00	0.1900	8276

Comment:

Node: Pavers

Scenario: Recovery
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 9.00 ft
 Warning Stage: 9.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
6.00	0.00	0
6.50	0.26	11326
8.67	1.14	49658
9.00	1.61	70132

Comment:

Node: Retention North

Scenario: Recovery
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 9.60 ft
 Warning Stage: 10.85 ft
 Alert Stage: 0.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
7.83	0.00	0
9.60	0.27	11761
10.85	0.46	20038

Comment:

Node: Retention South

Scenario: Recovery
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 9.60 ft
 Warning Stage: 10.85 ft
 Alert Stage: 0.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
7.83	0.00	0
9.60	0.27	11761
10.85	0.46	20038

Comment: Retention Under Boat Stack

57 Stone with 40% voids

Node: Wet Pond

Scenario: Recovery
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 8.62 ft
 Warning Stage: 9.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
5.00	1.1100	48352
10.00	1.5600	67954

Comment:

Node: Wetland A

Scenario: Recovery
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 0.00 ft
 Warning Stage: 0.00 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	999.0000	0.00

Comment:

Drop Structure Link: CS-1

Scenario: Recovery
 From Node: Wet Pond
 To Node: Indian River Lagoon
 Node
 Link Count: 1
 Pipe Flow Direction: Both
 Solution: Combine
 Increments: 0
 Pipe Count: 1
 Damping: 0.0000 ft

Upstream Pipe

Invert: 5.00 ft
 Manning's N: 0.0120
 Geometry: Circular
 Max Depth: 2.00 ft
 Default: 0.00 ft
 Op Table:
 Ref Node:
 Manning's N: 0.0000

Downstream Pipe

Invert: 2.00 ft
 Manning's N: 0.0120
 Geometry: Circular
 Max Depth: 2.00 ft
 Default: 0.00 ft
 Op Table:
 Ref Node:
 Manning's N: 0.0000

Bottom Clip

Top Clip

Length:	652.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	1	Ref Node:		Ref Node:	
Exit Loss Coef:	1	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir: 1	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Circular	Default: 0.00 ft
Invert: 5.00 ft	Op Table:
Control Elevation: 5.00 ft	Ref Node:
Max Depth: 0.33 ft	Discharge Coefficients
	Weir Default: 3.200
	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment: Orifice sized using 26.2.1. 24 hours to recover half the volume = 4 inches

Weir Component	
Weir: 2	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 8.00 ft	Op Table:
Control Elevation: 8.00 ft	Ref Node:
Max Depth: 1.00 ft	Discharge Coefficients
Max Width: 1.00 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Weir Component	
Weir: 3	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 9.80 ft	Op Table:
Control Elevation: 9.80 ft	Ref Node:

Max Depth: 3.10 ft
 Max Width: 2.00 ft
 Fillet: 0.00 ft

Discharge Coefficients

Weir Default: 3.200
 Weir Table:
 Orifice Default: 0.600
 Orifice Table:

Weir Comment:

Drop Structure Comment:

Channel Link: L-0020C

	Upstream	Downstream
Scenario: Recovery	Invert: 5.00 ft	Invert: 0.00 ft
From Node: Wetland A	Manning's N: 0.8000	Manning's N: 0.8000
To Node: Indian River	Geometry: Trapezoidal	Geometry: Trapezoidal
Lagoon Node	Max Depth: 5.00 ft	Max Depth: 5.00 ft
Link Count: 1	Extrapolation: Normal	Extrapolation: Normal
Flow Direction: Both	Bottom Width: 0.00 ft	Bottom Width: 0.00 ft
Damping: 0.0000 ft	Left Slope: 17.000 (h:v)	Left Slope: 10.000 (h:v)
Length: 320.00 ft	Right Slope: 17.000 (h:v)	Right Slope: 10.000 (h:v)
Contraction Coef: 0	Bottom Clip	
Expansion Coef: 0	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef: 0	Op Table:	Op Table:
Exit Loss Coef: 0	Ref Node:	Ref Node:
Bend Loss Coef: 0	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location: 0.00 dec	Top Clip	
Energy Switch: Energy	Default: 0.00 ft	Default: 0.00 ft
	Op Table:	Op Table:
	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Percolation Link: L-PAVERS

Scenario: Recovery	Surface Area Option: Vary Based on Stage/Area Table
From Node: Pavers	
To Node: GW	Vertical Flow Termination: Horizontal Flow Algorithm
Link Count: 1	Perimeter 1: 1755.00 ft
Flow Direction: Both	Perimeter 2: 1772.00 ft
Aquifer Base Elevation: -0.50 ft	Perimeter 3: 1777.00 ft
Water Table Elevation: 4.38 ft	Distance P1 to P2: 5.00 ft
Annual Recharge Rate: 0 ipy	Distance P2 to P3: 10.00 ft
Horizontal Conductivity: 13.800 fpd	# of Cells P1 to P2: 1
Vertical Conductivity: 6.840 fpd	# of Cells P2 to P3: 2
Fillable Porosity: 0.250	
Layer Thickness: 1.00 ft	

Comment: Water Table Elevation of 4.375 was estimated using the average seasonal high water elevation of all roadway

borings.

A Kv value of 13.68 ft/day was used for vertical conductivity (Average of all Kv taken on site)

Percolation Link: L-PERC-JFC

Scenario:	Recovery	Surface Area Option:	Vary Based on Stage/Area
From Node:	JFC Retention		Table
To Node:	GW	Vertical Flow Termination:	Horizontal Flow Algorithm
Link Count:	1	Perimeter 1:	371.00 ft
Flow Direction:	Both	Perimeter 2:	403.00 ft
Aquifer Base Elevation:	-0.50 ft	Perimeter 3:	654.00 ft
Water Table Elevation:	2.52 ft	Distance P1 to P2:	5.00 ft
Annual Recharge Rate:	0 ipy	Distance P2 to P3:	40.00 ft
Horizontal Conductivity:	12.500 fpd	# of Cells P1 to P2:	1
Vertical Conductivity:	6.250 fpd	# of Cells P2 to P3:	4
Fillable Porosity:	0.250		
Layer Thickness:	1.48 ft		

Comment: Water Table Elevation of 2.52 was estimated using boring B-10 (from Geotech UES Report No. 207368R) as a reference to determine the seasonal high water table elevation (3.8 feet below existing grade). The three point within the bottom of pond footprint used to determine the SHWT elevation are 8.58', 5.40' and 4.99'. Subtracting 3.8' from these value and calculating the average results in a average SHWT elevation of 2.52 feet.

A Kv value of 12.5 ft/day was used for vertical conductivity (the lowest value among all the Kv was used as a factor of safety).

A factor of safety of 2 was used to the vertical and horizontal conductivity.

Percolation Link: L-PERC-NORTH

Scenario:	Recovery	Surface Area Option:	Vary Based on Stage/Area
From Node:	Retention North		Table
To Node:	GW	Vertical Flow Termination:	Horizontal Flow Algorithm
Link Count:	1	Perimeter 1:	1121.00 ft
Flow Direction:	Both	Perimeter 2:	1161.00 ft
Aquifer Base Elevation:	-0.50 ft	Perimeter 3:	1401.00 ft
Water Table Elevation:	4.30 ft	Distance P1 to P2:	5.00 ft
Annual Recharge Rate:	0 ipy	Distance P2 to P3:	20.00 ft
Horizontal Conductivity:	10.000 fpd	# of Cells P1 to P2:	1
Vertical Conductivity:	5.000 fpd	# of Cells P2 to P3:	2
Fillable Porosity:	0.250		
Layer Thickness:	4.80 ft		

Comment: Per boring B-1 dated 4232024 #2067368R

Percolation Link: L-PERC-SOUTH

Scenario:	Recovery	
From Node:	Retention South	Surface Area Option:
To Node:	GW	Vary Based on Stage/Area Table
Link Count:	1	Vertical Flow Termination:
Flow Direction:	Both	Horizontal Flow Algorithm
Aquifer Base Elevation:	-0.50 ft	Perimeter 1:
Water Table Elevation:	4.30 ft	Perimeter 2:
Annual Recharge Rate:	0 ipy	Perimeter 3:
Horizontal Conductivity:	10.000 fpd	Distance P1 to P2:
Vertical Conductivity:	5.000 fpd	Distance P2 to P3:
Fillable Porosity:	0.250	# of Cells P1 to P2:
Layer Thickness:	4.80 ft	# of Cells P2 to P3:

Comment: Per boring B-1 dated 4232024 #2067368R

Pipe Link: North Roof Drain Connection	Upstream	Downstream
Scenario: Recovery	Invert: 9.60 ft	Invert: 8.75 ft
From Node: Retention North	Manning's N: 0.0130	Manning's N: 0.0130
To Node: Wetland A	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.00 ft	Default: 0.00 ft
Length: 42.00 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef: 1	Top Clip	
Bend Loss Coef: 0	Default: 0.00 ft	Default: 0.00 ft
Bend Location: 0.00 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Pipe Link: North Roof Drain Connection 2	Upstream	Downstream
Scenario: Recovery	Invert: 8.33 ft	Invert: 8.33 ft
From Node: Retention North	Manning's N: 0.0130	Manning's N: 0.0130
To Node: Retention South	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.00 ft	Default: 0.00 ft
Length: 80.00 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef: 1	Top Clip	
Bend Loss Coef: 0	Default: 0.00 ft	Default: 0.00 ft
Bend Location: 0.00 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:

Manning's N: 0.0000

Manning's N: 0.0000

Comment:

Pipe Link: South Roof Drain Connection

Upstream

Downstream

Scenario: Recovery

Invert: 9.60 ft

Invert: 5.00 ft

From Node: Retention South

Manning's N: 0.0130

Manning's N: 0.0130

To Node: Wet Pond

Geometry: Circular

Geometry: Circular

Link Count: 1

Max Depth: 1.00 ft

Max Depth: 1.00 ft

Flow Direction: Both

Bottom Clip

Damping: 0.0000 ft

Default: 0.00 ft

Default: 0.00 ft

Length: 70.00 ft

Op Table:

Op Table:

FHWA Code: 0

Ref Node:

Ref Node:

Entr Loss Coef: 1

Manning's N: 0.0000

Manning's N: 0.0000

Exit Loss Coef: 1

Top Clip

Bend Loss Coef: 0

Default: 0.00 ft

Default: 0.00 ft

Bend Location: 0.00 dec

Op Table:

Op Table:

Energy Switch: Energy

Ref Node:

Ref Node:

Manning's N: 0.0000

Manning's N: 0.0000

Comment:

Simulation: Recovery

Scenario: Recovery

Run Date/Time: 7/6/2026 4:04:01 PM

Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	360.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph

Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight 0.5 dec

Fact:

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Ia/S: 0.20 dec

Smp/Man Basin Rain No Rainfall
Opt:

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area 100 ft2

(1D):

Energy Switch (1D): Energy

Comment:

Recovery Analysis – 14 Day Recovery & 72 Hour

Scenario	Node Name	Relative Time [hrs]	Stage [ft]
Recovery	JFC Retention	71.7508	4.00
Recovery	Pavers	71.7508	6.00
Recovery	Retention North	71.7508	7.83
Recovery	Retention South	71.7508	7.83

Scenario	Node Name	Relative Time [hrs]	Stage [ft]
Recovery	Wet Pond	335.7508	5.03

SECTION 5:

Pre vs. Post Comparison

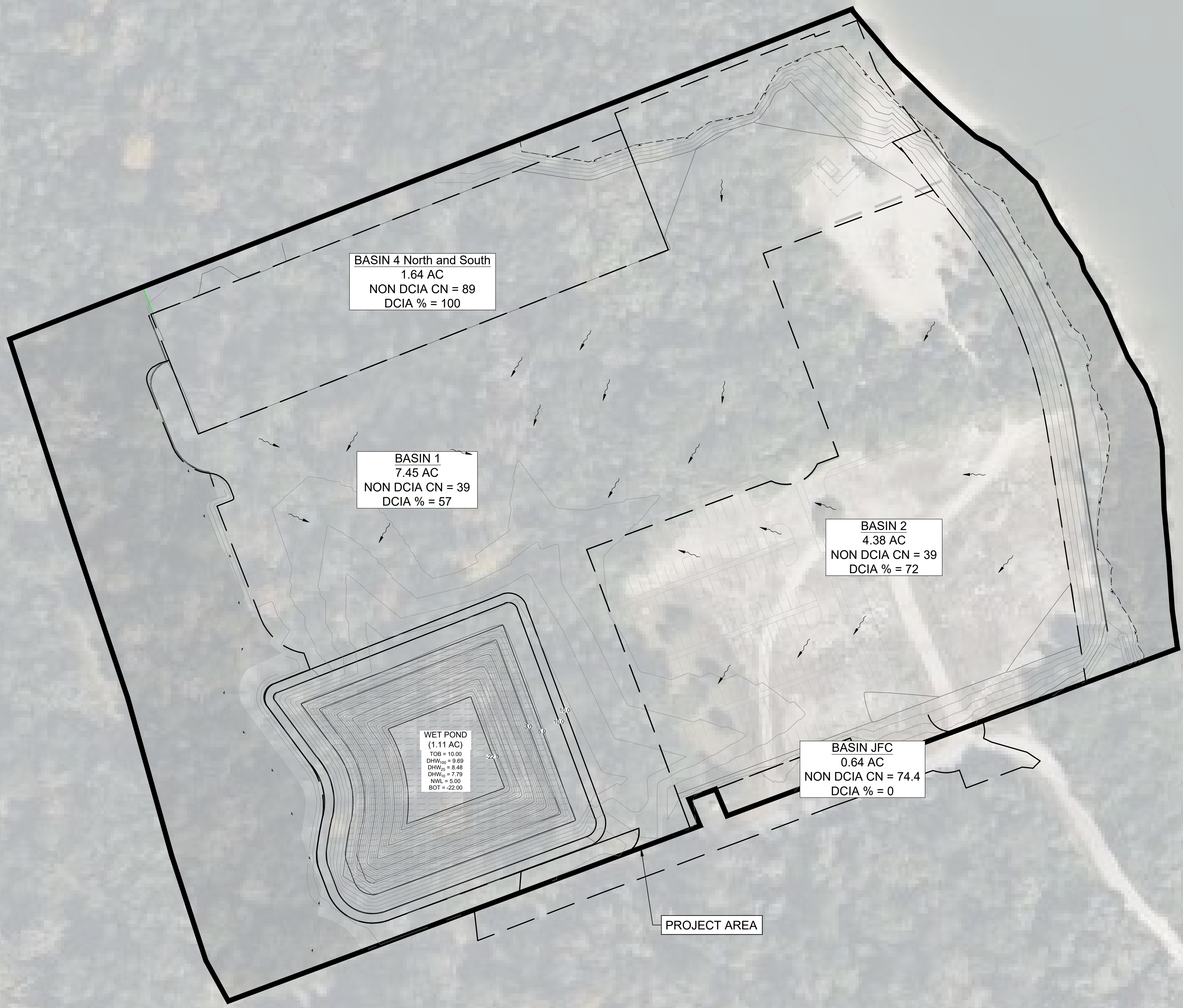
Permitted vs. Post Development Flow Rates						
Node	Pre-Developed* Flow (Natural State - App.183840-5)		Permitted* Flow (Mass Grading - App.183840-5)		Post-Developed Flow (Proposed - App.183840-7)	
	25 year 24 hour (cfs)	100 year 24 hour (cfs)	25 year 24 hour (cfs)	100 year 24 hour (cfs)	25 year 24 hour (cfs)	100 year 24 hour (cfs)
ALICE STREET DITCH\WETLAND B	1.00	3.13	0.32	1.19	0.32	1.19
WETLAND A	2.89	5.54	1.17	3.85	1.64	3.49
IRL	6.37	10.34	4.03	9.46	6.31	10.24

SECTION 6:

Appendix

Nutrient Removal Maps, Calculations and Report

T:\Projects\199-02 - Phase 1 of the Marina Development\Engineering\Stormwater\Current\Map\BMP Trains Pre-Development Basin Map.dwg
3/2/2024 11:14 AM C:\Users\j...
3/2/2024 11:14 AM C:\Users\j...



BASIN 4 North and South
1.64 AC
NON DCIA CN = 89
DCIA % = 100

BASIN 1
7.45 AC
NON DCIA CN = 39
DCIA % = 57

BASIN 2
4.38 AC
NON DCIA CN = 39
DCIA % = 72

BASIN JFC
0.64 AC
NON DCIA CN = 74.4
DCIA % = 0

WET POND
(1.11 AC)
TOB = 10.00
DHW₁₀₀ = 9.69
DHW₅₀ = 9.48
DHW₁₀ = 7.79
NWL = 5.00
BOT = -22.00

PROJECT AREA

LEGEND

	BASIN LINE
	BASIN/NODE NAME BASIN ACREAGE
	DRAINAGE LINK/WEIR
	LINK NAME

SCALE IN FEET

LevelUp
Consulting, llc

505 E. Jackson Street
Suite 200
Tampa, Florida 33602
Office: 813-375-0616
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PROJECT NAME: EDGEWATER MARINA	
DRAWING TITLE: BMP TRAINS PRE-DEVELOPMENT BASIN MAP	
PROJECT No.	199-02
SHEET	1 of 1



PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: Edgewater, FL
 DRAINAGE AREA: 7.45 Ac.
 BASIN NAME/NO.: Wet Pond

Post
 Developed

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Commercial and Business	A	89.0	0.33	29.37
Pervious Pavers	A	68.0	1.60	108.8
Roadway/Curb	A	98.0	2.29	224.42
Sidewalk	A	98.0	0.17	16.66
Open Space (Grass cover >75%)	A	39.0	1.69	65.91
Pond at 25 Year DHW	A	100.0	1.37	137

Time of Concentration = 15 min.

Sum = 582.16

At = 7.45

Composite CN Value = 78.1

DCIA = 57%

NON DCIA CN = 39.0



PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: Edgewater, FL
 DRAINAGE AREA: 4.38 Ac.
 BASIN NAME/NO.: Basin 2

Post
 Developed

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Commercial and Business	A	89.0	1.29	114.81
Pervious Pavers	A	68.0	0.90	61.2
Roadway/Curb	A	98.0	0.71	69.58
Sidewalk	A	98.0	0.25	24.5
Open Space (Grass cover >75%)	A	39.0	1.23	47.97

Time of Concentration = 15 min.

Sum = 318.06

At = 4.38

Composite CN Value = 72.6

DCIA % = 72%

NON DCIA CN = 39.0

PROJECT TITLE:	Edgewater Marina	
PROJECT LOCATION:	Edgewater, FL	
DRAINAGE AREA:	0.82 Ac.	
BASIN NAME/NO.:	Basin 4 North	Post Developed

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Commercial and Business	A	89.0	0.82	72.98
Time of Concentration = 15 min.		Sum = 72.98 At = 0.82 Composite CN Value = 89.0		

*Basin 4 North will require 4" of retention for Nutrient Removal. This 4" of retention will surpass the required treatment volume.
 ** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 inches over the basin area 0.27 ac-ft

PROJECT TITLE:
 PROJECT LOCATION:
 DRAINAGE AREA:
 BASIN NAME/NO.:

Edgewater Marina
Edgewater, FL
0.82 Ac.
Basin 4 South

Post
 Developed

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Commercial and Business	A	89.0	0.82	72.98
Time of Concentration = 15 min.		Sum = 72.98		
		At = 0.82		
		Composite CN Value = 89.0		

*Basin 4 North will require 4" of retention for Nutrient Removal. This 4" of retention will surpass the required treatment volume.
 ** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 inches over the basin area 0.27 ac-ft



SCS RUNOFF CURVE NUMBER

PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: City of Edgewater
 DRAINAGE AREA: 0.64 Ac.
 BASIN NAME/NO.: JFC 3

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Woods (Good)	A	30.0	0.05	1.5
Open Space (Grass cover <50%)	D	89.0	0.06	5.3
Open Space (Grass cover <50%)	A	68.0	0.07	4.8
Residential 1/8 acre or less	D	92.0	0.16	14.7
Residential 1/8 acre or less	A	77.0	0.3	23.1

Sum =	44.7
At =	0.6
Non DCIA CN =	74.4
Composite CN Value =	78.4

Complete Report (not including cost) Ver 4.3.5

Project: Mass Grading

Date: 3/17/2026 11:10:42 AM

Site and Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin 1	Outfall 1 - Basin 4 South	Outfall 2 - Basin 4 North	Basin 2	JFC 3
Rainfall Zone	Florida Zone 2	Florida Zone 2	Florida Zone 2	Florida Zone 2	Florida Zone 2
Annual Mean Rainfall	51.50	51.50	51.50	51.50	51.50

Pre-Condition Landuse Information

Landuse					
Area (acres)	0.00	0.00	0.00	0.00	0.00
Rational Coefficient (0-1)	0.00	0.00	0.00	0.00	0.00
Non DCIA Curve Number	29.90	29.90	29.90	29.90	29.90
DCIA Percent (0-100)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.130	1.200	1.200	1.130	0.000
Phosphorus EMC (mg/l)	0.188	0.260	0.260	0.188	0.000
Runoff Volume (ac-ft/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	0.000	0.000	0.000	0.000	0.000
Phosphorus Loading (kg/yr)	0.000	0.000	0.000	0.000	0.000

Post-Condition Landuse Information

Landuse	Low-Intensity Commercial: TN=1.13 TP=0.188	Light Industrial: TN=1.200 TP=0.260	Light Industrial: TN=1.200 TP=0.260	Low-Intensity Commercial: TN=1.13 TP=0.188	Highway: TN=1.520 TP=0.200
Area (acres)	7.45	0.82	0.82	4.38	0.64
Rational Coefficient (0-1)	0.46	0.81	0.81	0.58	0.08
Non DCIA Curve Number	39.00	89.00	89.00	39.00	74.40
DCIA Percent (0-100)	57.00	100.00	100.00	72.00	0.00
Wet Pond Area (ac)	1.11	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.130	1.200	1.200	1.130	1.520
Phosphorus EMC (mg/l)	0.188	0.260	0.260	0.188	0.200
Runoff Volume (ac-ft/yr)	12.620	2.847	2.847	10.993	0.210
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	17.583	4.212	4.212	15.316	0.393
Phosphorus Loading (kg/yr)	2.925	0.913	0.913	2.548	0.052

Catchment Number: 1 Name: Basin 1

Project: Mass Grading

Date: 3/17/2026

Pervious Pavement Design

Surface Area of Pavement (acres) 2.500

Treatment Volume (in over watershed) 2.591

Pavement Type	Thickness (in)	Storage (in)	Storage (ac-ft)
PaveDrainTM	4.00	1.000	0.208

Recycled (crushed) concrete	32.00	6.720	1.400
Total		7.720	1.608

Watershed Characteristics

Catchment Area (acres)	7.45
Contributing Area (acres)	4.950
Non-DCIA Curve Number	39.00
DCIA Percent	57.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	98
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	98

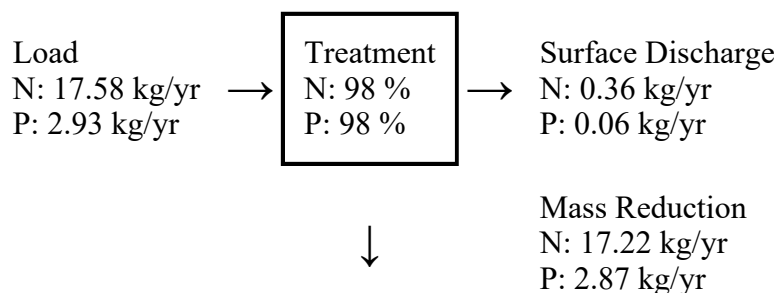
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

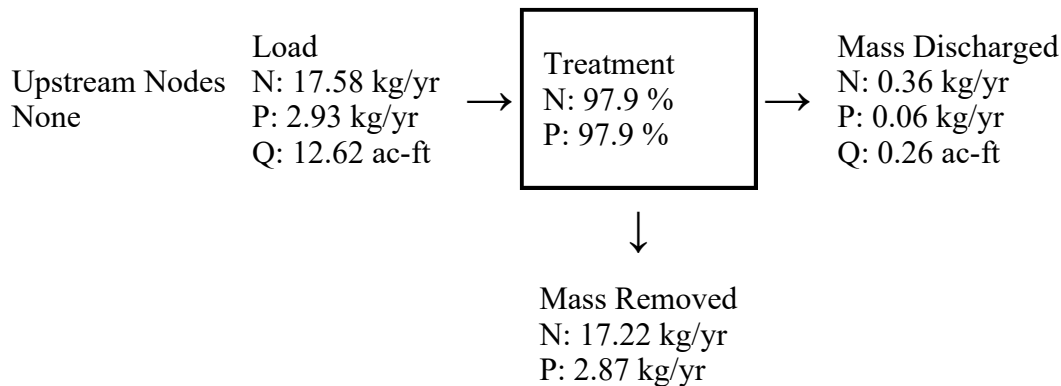
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	17.221
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	2.865
TP Concentration (mg/L)	0.000

Load Diagram for Pervious Pavement (stand-alone)



Load Diagram for Pervious Pavement (As Used In Routing)



Catchment Number: 2 Name: Outfall 1 - Basin 4 South

Project: Mass Grading

Date: 3/17/2026

Retention Design

Retention Depth (in) 4.000

Retention Volume (ac-ft) 0.273

Watershed Characteristics

Catchment Area (acres) 0.82

Contributing Area (acres) 0.820

Non-DCIA Curve Number 89.00

DCIA Percent 100.00

Rainfall Zone Florida Zone 2

Rainfall (in) 51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)

Provided TN Treatment Efficiency (%) 98

Required TP Treatment Efficiency (%)

Provided TP Treatment Efficiency (%) 98

Media Mix Information

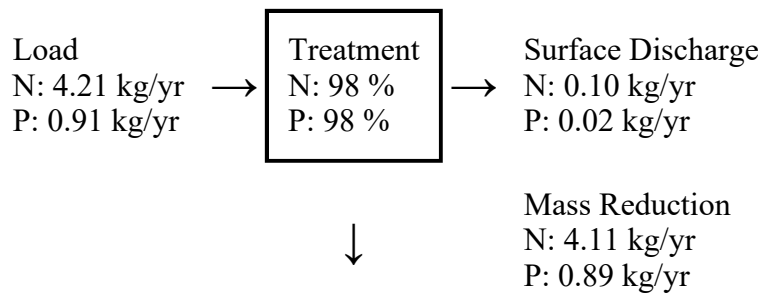
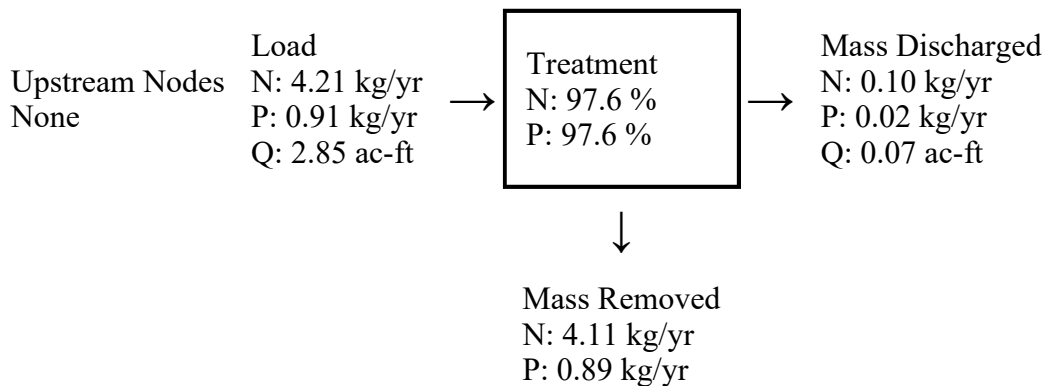
Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 4.111
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.891
 TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)**Load Diagram for Retention (As Used In Routing)****Catchment Number: 3 Name: Outfall 2 - Basin 4 North**

Project: Mass Grading

Date: 3/17/2026

Retention Design

Retention Depth (in) 4.000

Retention Volume (ac-ft) 0.273

Watershed Characteristics

Catchment Area (acres) 0.82
 Contributing Area (acres) 0.820
 Non-DCIA Curve Number 89.00
 DCIA Percent 100.00
 Rainfall Zone Florida Zone 2
 Rainfall (in) 51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)
 Provided TN Treatment Efficiency (%) 98
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%) 98

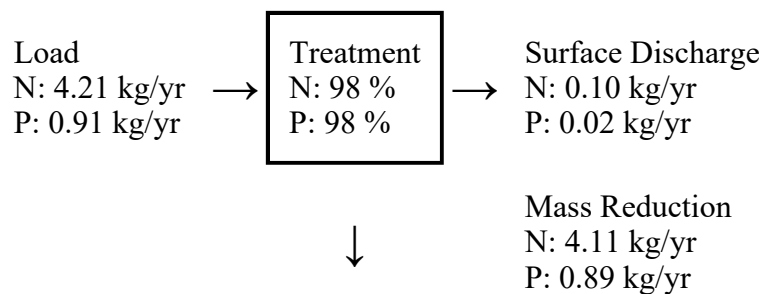
Media Mix Information

Type of Media Mix Not Specified
 Media N Reduction (%)
 Media P Reduction (%)

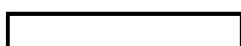
Groundwater Discharge (Stand-Alone)

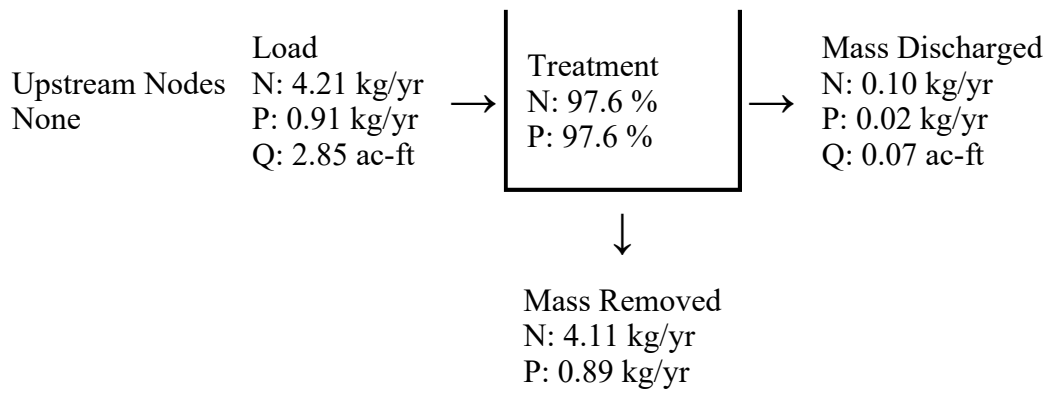
Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 4.111
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.891
 TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)





Catchment Number: 4 Name: Basin 2

Project: Mass Grading

Date: 3/17/2026

Wet Detention Design

Permanent Pool Volume (ac-ft) 5.810

Permanent Pool Volume (ac-ft) for 31 days residence 0.934

Annual Residence Time (days) 193

Littoral Zone Efficiency Credit

Wetland Efficiency Credit

Watershed Characteristics

Catchment Area (acres) 4.38

Contributing Area (acres) 4.380

Non-DCIA Curve Number 39.00

DCIA Percent 72.00

Rainfall Zone Florida Zone 2

Rainfall (in) 51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)

Provided TN Treatment Efficiency (%) 43

Required TP Treatment Efficiency (%)

Provided TP Treatment Efficiency (%) 79

Media Mix Information

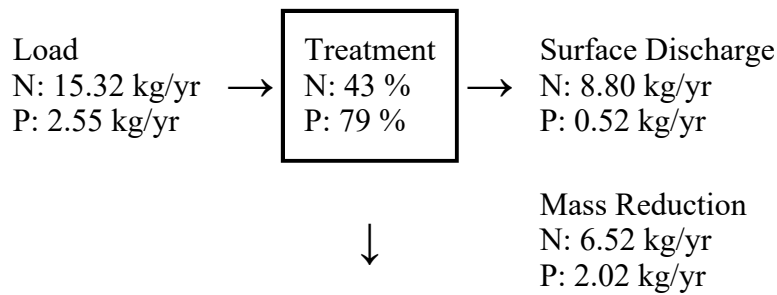
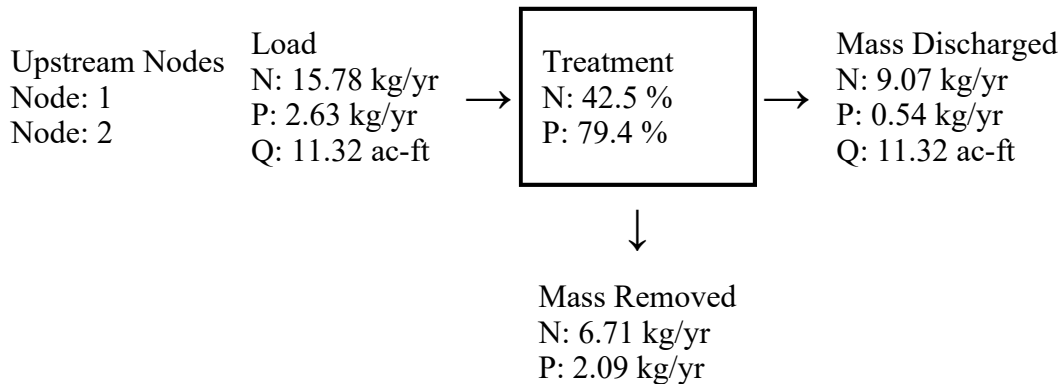
Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention (stand-alone)**Load Diagram for Wet Detention (As Used In Routing)****Catchment Number: 5 Name: JFC 3****Project:** Mass Grading**Date:** 3/17/2026**None Design****Watershed Characteristics**

Catchment Area (acres) 0.64
 Contributing Area (acres) 0.640

Non-DCIA Curve Number 74.40
 DCIA Percent 0.00
 Rainfall Zone Florida Zone 2
 Rainfall (in) 51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)
 Provided TN Treatment Efficiency (%)
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%)

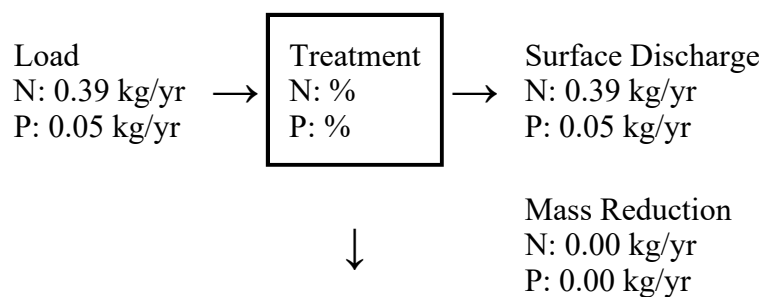
Media Mix Information

Type of Media Mix Not Specified
 Media N Reduction (%) 0.000
 Media P Reduction (%) 0.000

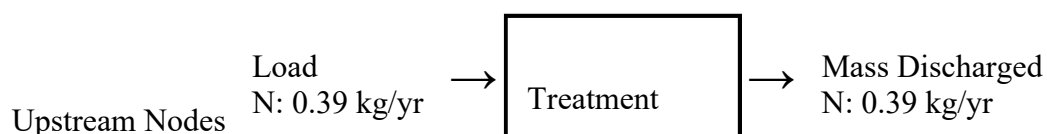
Groundwater Discharge (Stand-Alone)

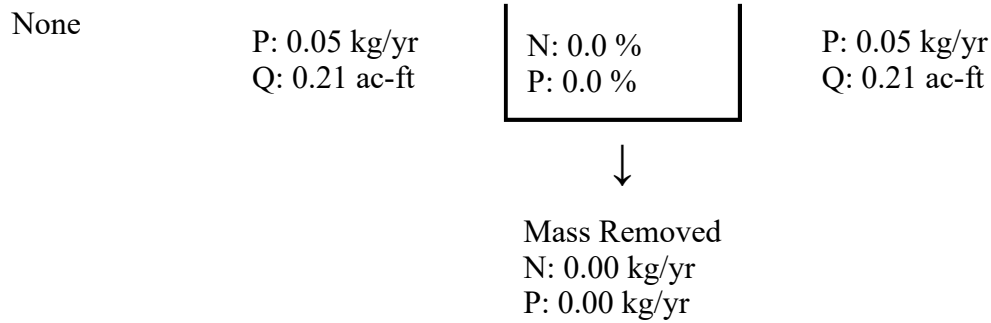
Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)





Summary Treatment Report Version: 4.3.5

Project: Mass Grading

Analysis Type: BMP Analysis

BMP Types:

Date:3/17/2026

Catchment 1 - (Basin 1) Pervious
Pavement

Catchment 2 - (Outfall 1 - Basin 4
South) Retention

Catchment 3 - (Outfall 2 - Basin 4
North) Retention

Catchment 4 - (Basin 2) Wet
Detention

Catchment 5 - (JFC 3) None
Based on % removal values to the
nearest percent

Routing Summary

Catchment 1 Routed to Catchment 4

Catchment 2 Routed to Catchment 4

Catchment 3 Routed to Outlet

Catchment 4 Routed to Outlet

Catchment 5 Routed to Outlet

Summary Report

Nitrogen

Surface Water Discharge

Total N post load	41.72 kg/yr	
Percent N load reduction	77 %	
Provided N discharge load	9.56 kg/yr	21.08 lb/yr
Provided N load removed	32.16 kg/yr	70.91 lb/yr

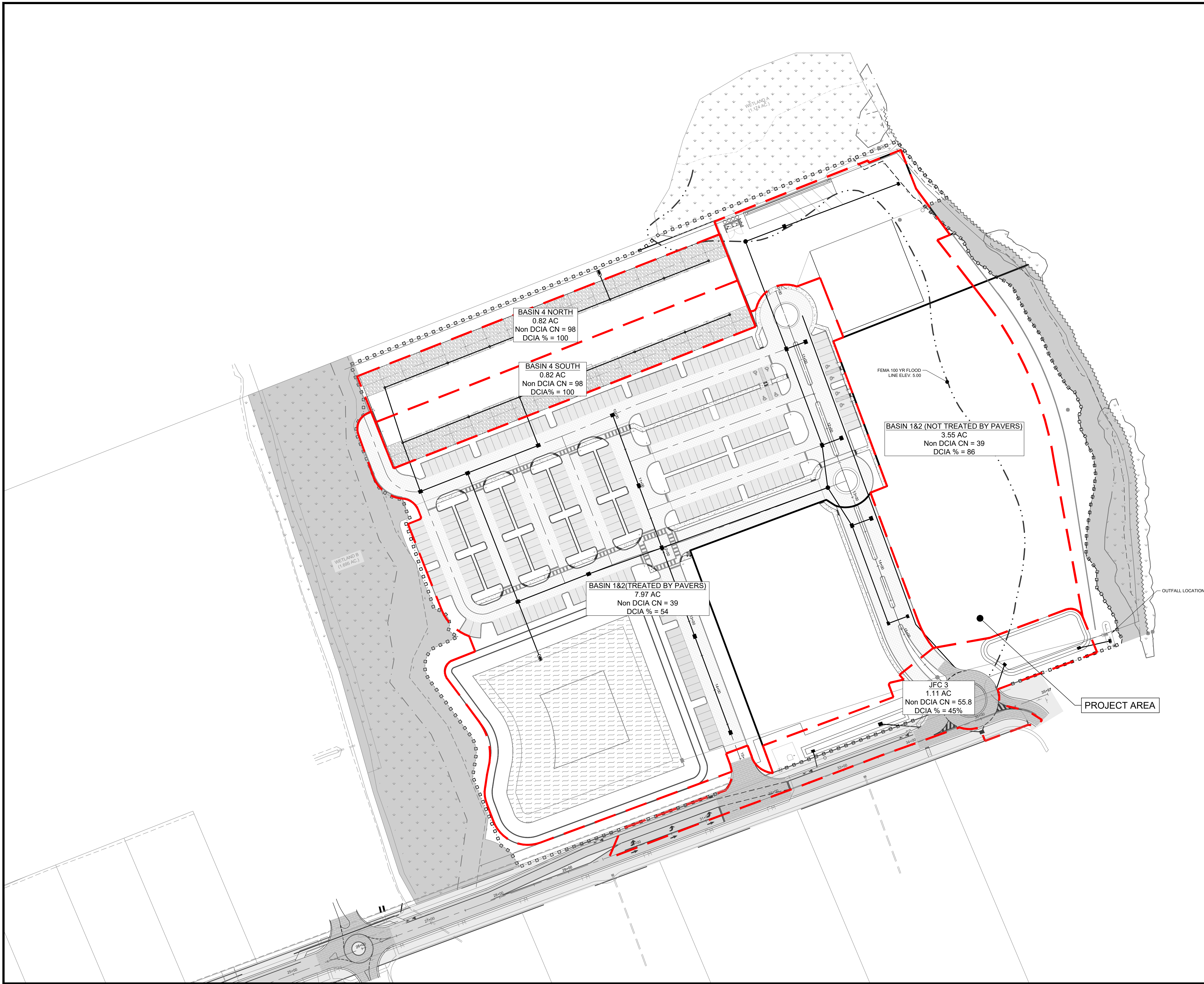
Phosphorus

Surface Water Discharge

Total P post load	7.351 kg/yr	
Percent P load reduction	92 %	
Provided P discharge load	.614 kg/yr	1.35 lb/yr

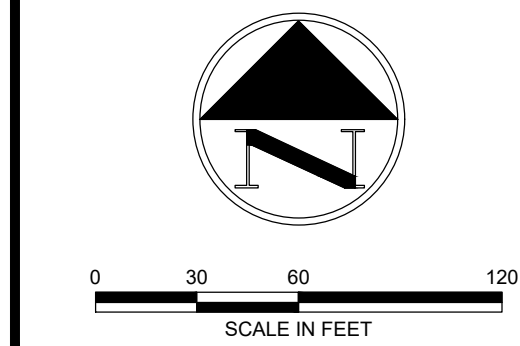
Provided P load removed	6.736 kg/yr	14.853 lb/yr
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LEGEND

	PERVIOUS PAVERS
	ASPHALT
	BASIN LINE
	BASIN NODE NAME
	BASIN ACREAGE
	NON DCIA CURVE NUMBER
	DCIA %



LevelUp
Consulting, LLC



505 E. Jackson Street
Suite 200
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www.levelupflorida.com

PROJECT NAME:
EDGEWATER MARINA

DRAWING TITLE:
POST-DEVELOPMENT
BASIN MAP

PROJECT No. 199-05

SHEET 1 of 1



PROJECT TITLE: Edgewater Marina
PROJECT LOCATION: Edgewater, FL
DRAINAGE AREA: 7.97 Ac.
BASIN NAME/NO.: Basin 1 & 2 (Treated by Pavers)

**Post
Developed**

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Impervious	A	98.0	1.71	167.58
Pervious Pavers	A	54.0	2.20	118.8
Curb	A	98.0	0.41	40.18
Pond at 25 Year DHW	A	100.0	1.47	147
Open Space (Grass cover >75%)	A	39.0	2.18	85.02
Time of Concentration = 15 min.		Sum = 558.58		
		At = 7.97		
		Composite CN Value = 70.1		
		*DCIA = 54%		
		NON DCIA CN = 39.0		

*DCIA %= (impervious + pervious pavers + Curb)/ Total Area



PROJECT TITLE: Edgewater Marina
PROJECT LOCATION: Edgewater, FL
DRAINAGE AREA: 3.55 Ac.
BASIN NAME/NO.: Basin 1 & 2 (Not Treated by Pavers)

**Post
Developed**

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Impervious	A	98.0	0.61	59.78
Open Space (Grass cover >75%)	A	39.0	0.49	19.11
Commercial and Business	A	89.0	2.45	218.05
Time of Concentration = 15 min.			Sum =	296.94
			At =	3.55
			Composite CN Value =	83.6
			DCIA =	86%
			NON DCIA CN =	39.0

*DCIA %= (impervious + Commercial and Business)/ Total Area

PROJECT TITLE:
 PROJECT LOCATION:
 DRAINAGE AREA:
 BASIN NAME/NO.:

Edgewater Marina
Edgewater, FL
0.82 Ac.
Basin 4 North

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Impervious	A	98.0	0.82	80.36

Time of Concentration = 15 min.

Sum =	80.36
At =	0.82
Composite CN Value =	98.0

*Basin 4 North will have 4" of retention for treatment. This 4" of retention will surpass the required treatment volume.

** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 INCHES OVER THE BASIN AREA
 (DRAINAGE AREA X 4 IN X (1/12 FT/IN.)

0.27 AC-FT

PROJECT TITLE:
 PROJECT LOCATION:
 DRAINAGE AREA:
 BASIN NAME/NO.:

Edgewater Marina
Edgewater, FL
0.82 Ac.
Basin 4 South

Land	Hydrologic	SCS Curve	Area Covered	Weighted
Use Type	Soil Group	Number Value	by CN Value	CN Value
Impervious	A	98.0	0.82	80.36
Time of Concentration = 15 min.		Sum = 80.36 At = 0.82 Composite CN Value = 98.0		

*Basin 4 North will have 4" of retention for treatment. This 4" of retention will surpass the required treatment volume.
 ** This treatment volume will need 50% recovered in 24-30 hours, and the full volume in 72 hours.

4 INCHES OVER THE BASIN AREA
 (DRAINAGE AREA X 4 IN X (1/12 FT/IN.)

0.27 AC-FT



SCS RUNOFF CURVE NUMBER

PROJECT TITLE: Edgewater Marina
 PROJECT LOCATION: City of Edgewater
 DRAINAGE AREA: 1.11 Ac.
 BASIN NAME/NO.: JFC 3

Land Use Type	Hydrologic Soil Group	SCS Curve Number Value	Area Covered by CN Value	Weighted CN Value
Open Space (Grass cover >75%)	A	39.0	0.36	14.0
Open Space (Grass cover >75%)	D	80.0	0.25	20.0
Impervious	A	98.0	0.50	49.0

Sum =	83.0
At =	1.1
DCIA %	45%
Non DCIA CN =	55.8
Composite CN Value =	74.8

Complete Report (not including cost) Ver 4.3.5

Project: Marina

Date: 4/27/2026 2:18:41 PM

Site and Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin 1 and 2 (w/ pavers)	Outfall 1 - Basin 4 South	Outfall 2 - Basin 4 North	Basin 1 _2 (No Pavers)	JFC 3
Rainfall Zone	Florida Zone 2	Florida Zone 2	Florida Zone 2	Florida Zone 2	Florida Zone 2
Annual Mean Rainfall	51.50	51.50	51.50	51.50	51.50

Pre-Condition Landuse Information

Landuse					
Area (acres)	0.00	0.00	0.00	0.00	0.00
Rational Coefficient (0-1)	0.00	0.00	0.00	0.00	0.00
Non DCIA Curve Number	29.90	29.90	29.90	29.90	29.90
DCIA Percent (0-100)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.130	1.200	1.200	1.130	0.000
Phosphorus EMC (mg/l)	0.188	0.260	0.260	0.188	0.000
Runoff Volume (ac-ft/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	0.000	0.000	0.000	0.000	0.000
Phosphorus Loading (kg/yr)	0.000	0.000	0.000	0.000	0.000

Post-Condition Landuse Information

Landuse	Low-Intensity Commercial: TN=1.13 TP=0.188	Light Industrial: TN=1.200 TP=0.260	Light Industrial: TN=1.200 TP=0.260	Low-Intensity Commercial: TN=1.13 TP=0.188	Highway: TN=1.520 TP=0.200
Area (acres)	7.97	0.82	0.82	3.55	1.11
Rational Coefficient (0-1)	0.44	0.81	0.81	0.70	0.38
Non DCIA Curve Number	39.00	89.00	89.00	39.00	55.80
DCIA Percent (0-100)	54.00	100.00	100.00	86.00	45.00
Wet Pond Area (ac)	1.11	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.130	1.200	1.200	1.130	1.520
Phosphorus EMC (mg/l)	0.188	0.260	0.260	0.188	0.200
Runoff Volume (ac-ft/yr)	12.948	2.847	2.847	10.619	1.795
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	18.040	4.212	4.212	14.795	3.364
Phosphorus Loading (kg/yr)	3.001	0.913	0.913	2.462	0.443

Catchment Number: 1 Name: Basin 1 and 2 (w/ pavers)

Project: Marina

Date: 4/27/2026

Pervious Pavement Design

Surface Area of Pavement (acres) 2.500

Treatment Volume (in over watershed) 2.422

Pavement Type	Thickness (in)	Storage (in)	Storage (ac-ft)
PaveDrainTM	4.00	1.000	0.208

#57 rock(non-calcareous)	6.00	1.260	0.263
Recycled (crushed) concrete	26.00	5.460	1.138
Total		7.720	1.608

Watershed Characteristics

Catchment Area (acres)	7.97
Contributing Area (acres)	5.470
Non-DCIA Curve Number	39.00
DCIA Percent	54.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	98
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	98

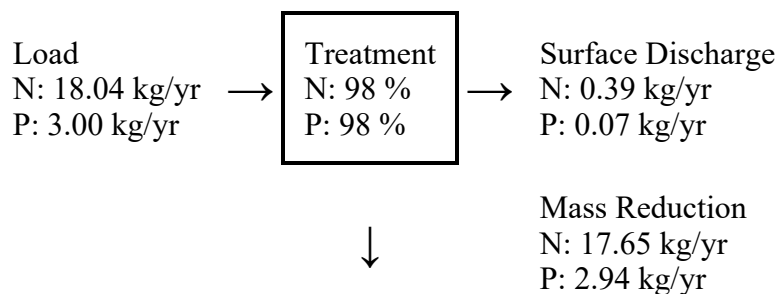
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

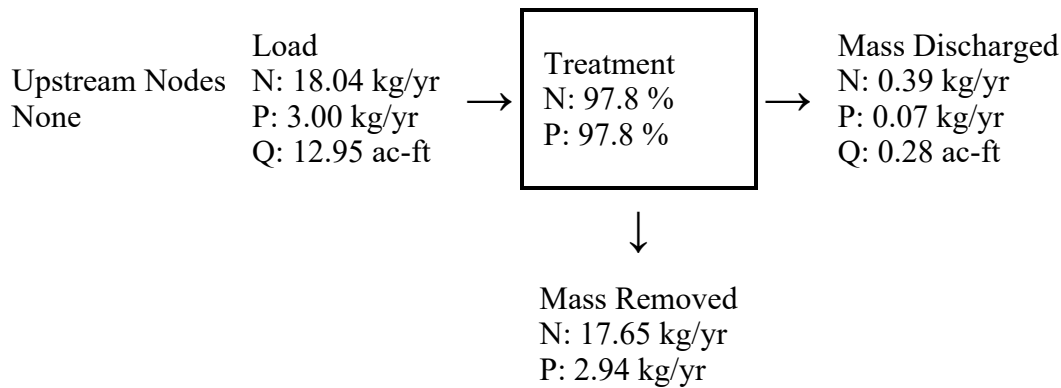
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	17.648
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	2.936
TP Concentration (mg/L)	0.000

Load Diagram for Pervious Pavement (stand-alone)



Load Diagram for Pervious Pavement (As Used In Routing)



Catchment Number: 2 Name: Outfall 1 - Basin 4 South

Project: Marina

Date: 4/27/2026

Retention Design

Retention Depth (in) 4.000

Retention Volume (ac-ft) 0.273

Watershed Characteristics

Catchment Area (acres) 0.82

Contributing Area (acres) 0.820

Non-DCIA Curve Number 89.00

DCIA Percent 100.00

Rainfall Zone Florida Zone 2

Rainfall (in) 51.50

Surface Water Discharge

Required TN Treatment Efficiency (%)

Provided TN Treatment Efficiency (%) 98

Required TP Treatment Efficiency (%)

Provided TP Treatment Efficiency (%) 98

Media Mix Information

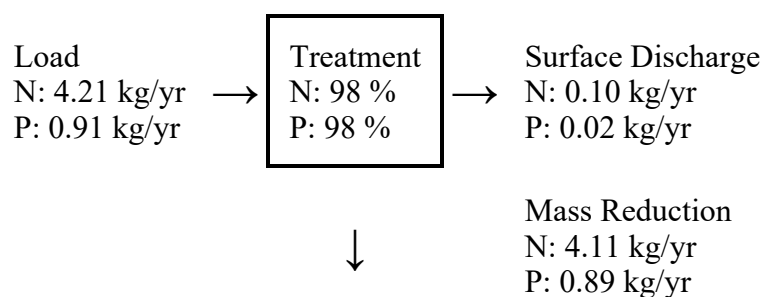
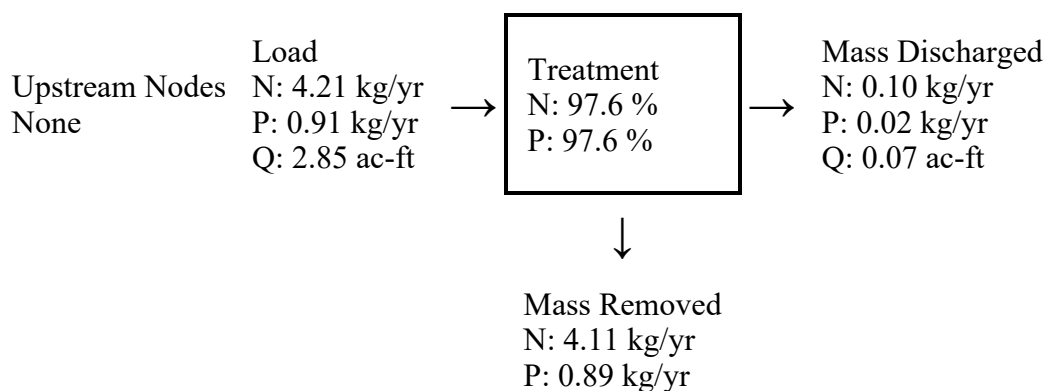
Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 4.111
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.891
 TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)**Load Diagram for Retention (As Used In Routing)****Catchment Number: 3 Name: Outfall 2 - Basin 4 North**

Project: Marina
Date: 4/27/2026

Retention Design

Retention Depth (in) 4.000
 Retention Volume (ac-ft) 0.273

Watershed Characteristics

Catchment Area (acres) 0.82
 Contributing Area (acres) 0.820
 Non-DCIA Curve Number 89.00
 DCIA Percent 100.00
 Rainfall Zone Florida Zone 2
 Rainfall (in) 51.50

Surface Water Discharge

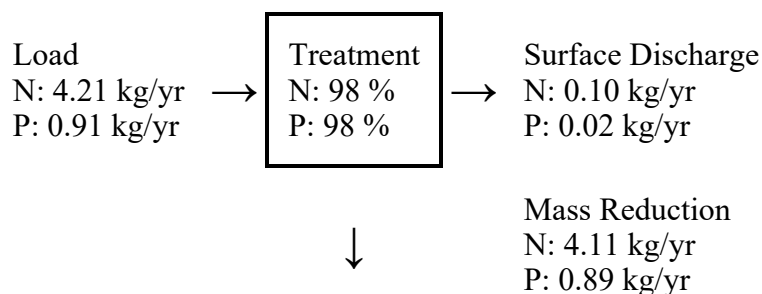
Required TN Treatment Efficiency (%)
 Provided TN Treatment Efficiency (%) 98
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%) 98

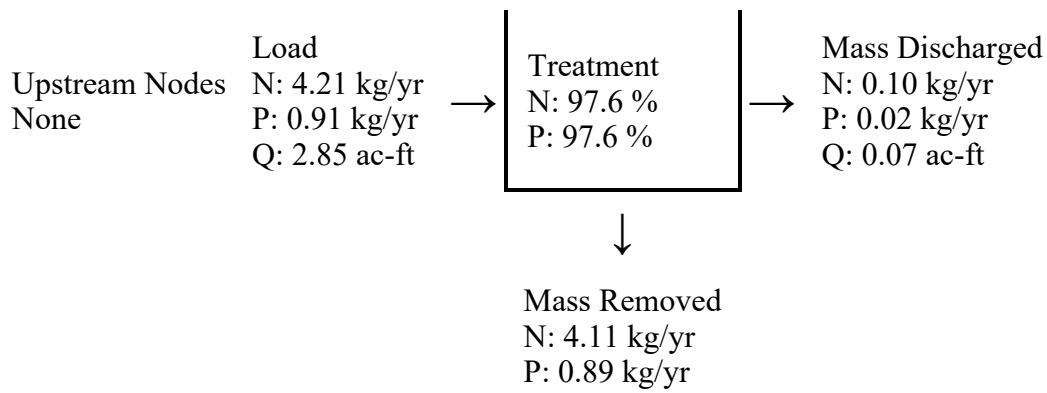
Media Mix Information

Type of Media Mix Not Specified
 Media N Reduction (%)
 Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 4.111
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.891
 TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)**Load Diagram for Retention (As Used In Routing)**



Catchment Number: 4 Name: Basin 1_2 (No Pavers)

Project: Marina

Date: 4/27/2026

Wet Detention with Littoral Shelf Design

Permanent Pool Volume (ac-ft)	5.810
Permanent Pool Volume (ac-ft) for 31 days residence	0.902
Annual Residence Time (days)	200
Littoral Zone Efficiency Credit	10
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	3.55
Contributing Area (acres)	3.550
Non-DCIA Curve Number	39.00
DCIA Percent	86.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	51.50

Surface Water Discharge

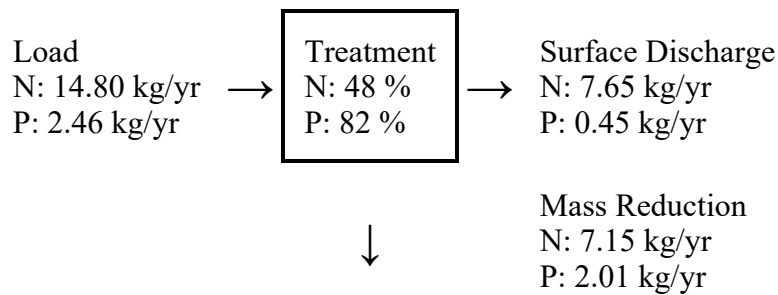
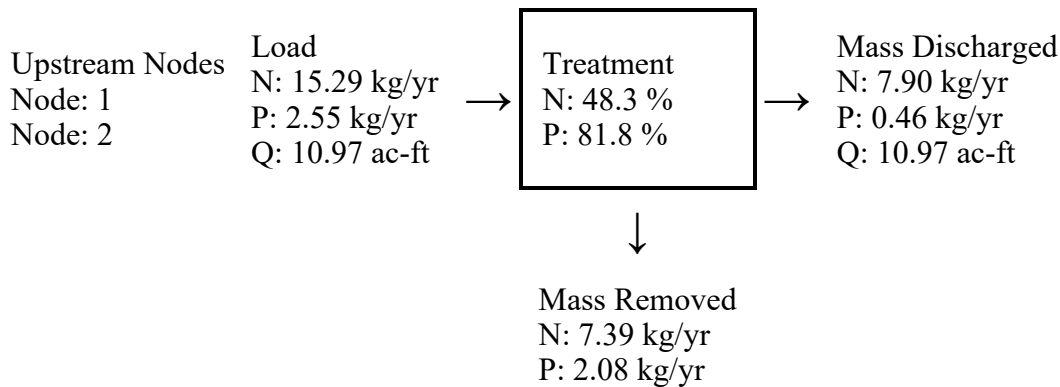
Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	48
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	82

Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention with Littoral Shelf (stand-alone)**Load Diagram for Wet Detention (As Used In Routing)****Catchment Number: 5 Name: JFC 3****Project:** Marina**Date:** 4/27/2026**Retention Design**

Retention Depth (in) 1.250
 Retention Volume (ac-ft) 0.116

Watershed Characteristics

Catchment Area (acres) 1.11
 Contributing Area (acres) 1.110
 Non-DCIA Curve Number 55.80
 DCIA Percent 45.00
 Rainfall Zone Florida Zone 2
 Rainfall (in) 51.50

Surface Water Discharge

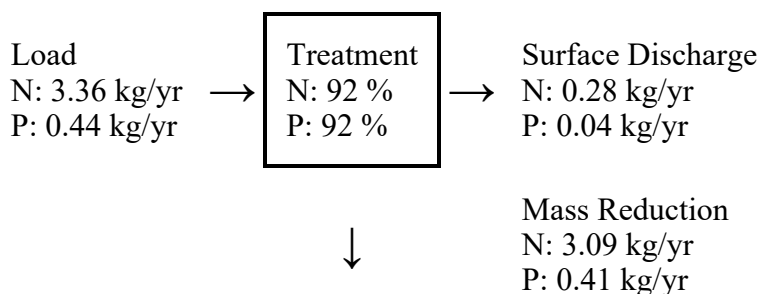
Required TN Treatment Efficiency (%)
 Provided TN Treatment Efficiency (%) 92
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%) 92

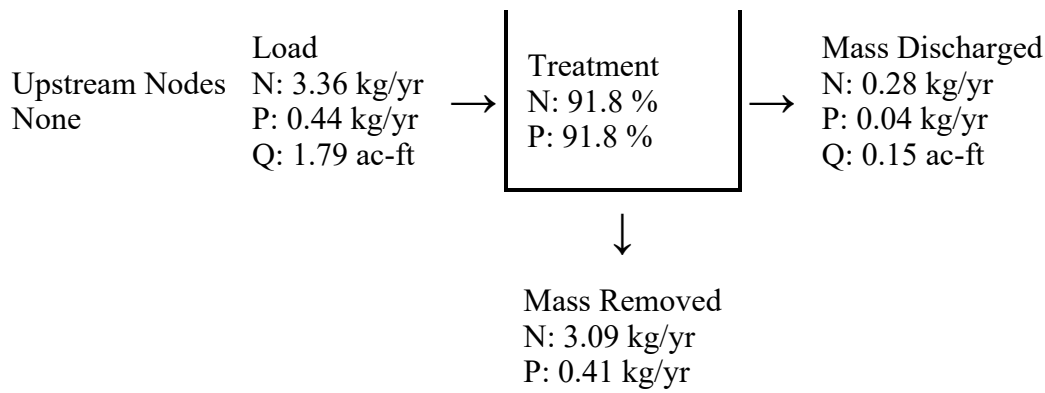
Media Mix Information

Type of Media Mix Not Specified
 Media N Reduction (%)
 Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 3.088
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.406
 TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)**Load Diagram for Retention (As Used In Routing)**



Summary Treatment Report Version: 4.3.5

Project: Marina

Analysis Type: BMP Analysis

BMP Types:

Catchment 1 - (Basin 1 and 2 (w/ pavers)) Pervious Pavement

Catchment 2 - (Outfall 1 - Basin 4 South) Retention

Catchment 3 - (Outfall 2 - Basin 4 North) Retention

Catchment 4 - (Basin 1_2 (No Pavers)) Wet Detention with Littoral Shelf

Catchment 5 - (JFC 3) Retention

Based on % removal values to the nearest percent

Date:4/27/2026

Routing Summary

Catchment 1 Routed to Catchment 4

Catchment 2 Routed to Catchment 4

Catchment 3 Routed to Outlet

Catchment 4 Routed to Outlet

Catchment 5 Routed to Outlet

Summary Report

Nitrogen

Surface Water Discharge

Total N post load	44.62 kg/yr	
Percent N load reduction	81 %	
Provided N discharge load	8.28 kg/yr	18.26 lb/yr
Provided N load removed	36.35 kg/yr	80.14 lb/yr

Phosphorus

Surface Water Discharge

Total P post load	7.731 kg/yr
-------------------	-------------

Percent P load reduction 93 %
 Provided P discharge load .523 kg/yr 1.15 lb/yr
 Provided P load removed 7.208 kg/yr 15.894 lb/yr

<u>Nutrient Removal Summary</u>				
<u>Scenario</u>	<u>Nutrient Type</u>	<u>Loading</u>	<u>%removed</u>	<u>Post load</u>
<i>Mass Grading</i>	<i>N</i>	42.1	76%	9.94
<i>Mass Grading</i>	<i>P</i>	7.401	91%	0.67
<i>Post Development</i>	<i>N</i>	44.62	81%	8.28
<i>Post Development</i>	<i>P</i>	7.731	93%	0.52

Geotechnical Report



Materials Testing
Geotechnical Engineering
Environmental
Building Sciences & Safety
Inspections & Code Compliance
Virtual Design Consulting

March 18, 2024
Revised: April 24, 2024

Mr. Steve Fusilier
Fulsilier Realty Group
100016 Wellness Way, Suite 100
Orlando, Florida 32832

Reference: Geotechnical Evaluation
Edgewater Marina
Edgewater, Volusia County, Florida
UES Project No. 0430.2400030.0000
UES Report No. 2067368R

Dear Mr. Fusilier:

UES has completed the geotechnical evaluation for the subject project. This report contains the results of our evaluation, an engineering interpretation of these with respect to the project characteristics described to us, and recommendations for foundation, pavement support, site preparation, and stormwater management design.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully Submitted,
UNIVERSAL ENGINEERING SCIENCES, LLC
Certificate of Authorization No. 549

Michael Mohny, M.S.
Geotechnical Staff Engineer



Brian C. Pohl, P.E.
Branch Manager
Florida Registration No. 60216



GEOTECHNICAL EVALUATION

**Edgewater Marina
Edgewater, Volusia County, Florida**

**UES Project No. 0430.2400030.0000
UES Report No. 207368R**

**March 18, 2024
Revised: April 24, 2024**

Prepared For:

**Fulsilier Realty Group
100016 Wellness Way, Suite 100
Orlando, Florida 32832**

Attention: Mr. Steve Fulsilier

Prepared By:

**UES
911 Beville Road, Suite 3
South Daytona, Florida 32119
(386) 756-1105**

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APPENDIX B

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1.0 PROJECT DESCRIPTION

Project information has been provided to us in correspondence with LevelUp Consulting, LLC and PMJS Development Solutions, LLC. We have been provided with a conceptual site plan which shows the layout of the proposed construction and requested boring locations.

We understand the proposed project will consist of constructing three (3) one-story dry boat storage structures with associated flexible asphalt and rigid concrete parking/drive areas, an underground stormwater exfiltration system, and a wet detention stormwater pond. We also understand that the rigid concrete pavement areas will sustain a boat lift carrying boats on the order of 30 feet in length. We have not been provided with the specific fork lift loading information at this time. We anticipate that approximately two to three feet of fill be placed within the structure and parking/drive areas.

We assume that the maximum column and slab loads will not exceed 75 kips and 300 pounds per square foot (psf), respectively, within the proposed dry boat storage and that the maximum column and wall loads will not exceed 50 kips and 6 kips per linear foot, respectively, within the proposed retail and restaurant buildings.

Our recommendations are based upon the above considerations. If any of this information is incorrect, or if you anticipate any changes, inform UES so that we may review our recommendations.

2.0 PURPOSE AND SCOPE

2.1 PURPOSE

The purposes of this investigation were:

- to investigate the general subsurface conditions at the site;
- to interpret and review the subsurface conditions with respect to the proposed construction;
- to provide geotechnical engineering recommendations for foundation support, pavement design and site preparation; and,
- to provide recommendations for stormwater management design.

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. UES would be pleased to perform these services, at your request.

Our investigation was confined to the zone of soil likely to be influenced by the proposed construction. Our work did not address the potential for surface expression of deep geological conditions, such as sinkhole development related to karst activity. A deep geological evaluation requires a more extensive range of field services than performed in this study.

2.2 FIELD INVESTIGATION

2.2.1 BORINGS

The subsurface conditions were investigated with:

- Six (6) Standard Penetration Test (SPT) borings advanced to a depth of approximately 40 feet each below existing grade within the proposed boat storage structures (designated B-1 through B-6);
- Four (4) SPT borings advanced to depths of either approximately 20 or 25 feet each below existing grade within the proposed retail and restaurant buildings (designated B-7 through B-10);
- Seven (7) SPT borings advanced to a depth of approximately 20 feet each below existing grade within the proposed stormwater management facilities (designated EX-1 through EX-5, P-1, and P-2); and
- Sixteen (16) auger borings advanced to a depth of approximately 6 feet each below existing grade within the proposed pavement areas (designated R-1 through R-16).

We performed the SPT and auger borings according to the procedures of ASTM D-1586 and ASTM D-1452, respectively.

The borings were located by our field personnel using measurements from established landmarks and should be considered accurate only to the degree implied by the method used. The location of the borings is presented on the attached Boring Location Plan in Appendix A.

Samples obtained from the borings were transported to our laboratory for further evaluation. Samples of the soils encountered will be held in our laboratory for your inspection for 60 days unless we are notified otherwise.

2.3 LABORATORY TESTING

2.3.1 INDEX TESTING

The soil samples recovered from the soil borings were returned to our laboratory and then a UES Engineer visually examined and reviewed the field descriptions. The soils were classified in accordance with the Unified Soil Classification System (USCS). Tests consisting of percent passing a No. 200 sieve determination were performed to aid in classification of the soils.

3.0 FINDINGS

3.1 SUBSURFACE CONDITIONS

The boring locations and detailed subsurface conditions are illustrated in Appendix A: Boring Location Plan and Subsurface Profiles. The classifications and descriptions shown on the profiles are based upon visual characterizations of the recovered soil samples. Also, see Appendix A: Key to Boring Log, for further explanation of the symbols and placement of data on the Subsurface Profiles. The following discussion summarizes the soil conditions encountered.

The results of the SPT borings generally indicated the presence of very loose to medium dense fine sand (SP), fine sand with silt (SP-SM), and sandy shell in the upper approximate 10 feet underlain by medium dense to dense fine sand (SP) and sandy shell to the deepest boring termination depth of approximately 40 feet below existing grade.

The results of the auger borings generally indicated the presence of fine sand (SP) to the boring termination depth of 6 feet below existing grade.

3.2 GROUNDWATER

We recorded groundwater subsequent to drilling at depths varying approximately between 1.5 and 11.0 feet below existing grade. As an exception, groundwater was not encountered at Boring locations R-9 and R-11 through R-16. Based on available published literature, existing site features, and the results of the borings, we estimate the normal seasonal high groundwater level to be approximately at the levels indicated on the Subsurface Profiles. The ground surface elevations at the boring locations were interpolated from a topographic survey provided by PMJS Development Solutions, LLC. It should be noted that the estimated seasonal high water level does not provide any assurance that groundwater levels will not exceed these estimated levels during any given year in the future. Should impediments to surface water drainage be present, or should rainfall intensity and duration, or total rainfall quantities, exceed the normally anticipated rainfall quantities, groundwater levels might once again exceed our seasonal high estimates. The depths of the groundwater levels encountered at the boring locations are presented on the Subsurface Profiles.

We recommend positive drainage be established and maintained on the site during construction. We further recommend permanent measures be constructed to maintain positive drainage from the site throughout the life of the project.

4.0 FOUNDATION AREA RECOMMENDATIONS

4.1 GENERAL

The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. As discussed, we have assumed that the maximum column and slab loads will not exceed 75 kips and 300 pounds per square foot (psf), respectively, within the proposed dry boat storage structures and that the maximum column and wall loads will not exceed 50 kips and 6 kips per linear foot, respectively, within the proposed retail and restaurant buildings

If the structural loadings, construction locations, or grading information change from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to those changes.

Additionally, if subsurface conditions are encountered during construction, which were not encountered in the borings, report those conditions immediately to us for observation and recommendations.

4.2 STRUCTURE FOUNDATIONS

Based on the results of our subsurface exploration, we consider the subsurface conditions at the site favorable for support of the proposed structures when constructed on a properly designed shallow foundation system. Provided the soils are prepared in accordance with the Site Preparation Section of this report, the following parameters may be used for foundation design.

4.2.1 BEARING PRESSURE

The maximum allowable net soil bearing pressure for shallow foundations should not exceed 3,000 pounds per square foot (p.s.f.). Net bearing pressure is defined as the soil bearing pressure at the base

of the foundation in excess of the natural overburden pressure. The foundations should be designed based upon the maximum load that could be imposed by all loading conditions.

4.2.2 FOUNDATION SIZE

The minimum widths recommended for any isolated column footing and continuous wall footings are 24 inches and 18 inches, respectively. Even though the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the size of the foundations.

4.2.3 BEARING DEPTH

The exterior foundations should bear at a depth of at least 12 inches below the exterior final grades and the interior footings should bear at a depth of at least 12 inches below the finish floor elevation to provide confinement to the bearing level soils. We recommend stormwater and surface water be diverted away from the building exterior, both during and after construction, to reduce the possibility of erosion beneath the exterior footings.

4.2.4 BEARING MATERIAL

The foundations may bear on either the compacted suitable natural soils or compacted structural fill. The bearing level soils, after compaction, should exhibit densities of at least 95 percent of the maximum dry density of the bearing soils as determined by ASTM D-1557 (Modified Proctor), to the depth described subsequently in the Site Preparation section of the report. In addition to compaction, the bearing soils must exhibit stability and be free of "pumping" conditions.

4.2.5 SETTLEMENT ESTIMATES

Post-construction settlement of the structures will be influenced by several interrelated factors, such as (1) subsurface stratification and strength/compressibility characteristics of the bearing soils; (2) footing size, bearing level, applied loads, and resulting bearing pressures beneath the foundations; (3) site preparation and earthwork construction techniques used by the contractor, and (4) external factors, including but not limited to vibration from offsite sources and groundwater fluctuations beyond those normally anticipated for the naturally-occurring site and soil conditions which are present.

Our settlement estimates for the structures are based upon the use of successful adherence to the site preparation recommendations presented later in this report. Any deviation from these recommendations could result in an increase in the estimated post-construction settlement of the structures.

Due to the sandy nature of the surficial soils, following the compaction operations, we expect a significant portion of settlement to be elastic in nature. This settlement is expected to occur relatively quickly, upon application of the loads, during and immediately following construction. Using the recommended maximum bearing pressure, the assumed maximum structural loads, and the field test data, which we have correlated to the strength and compressibility characteristics of the subsurface soils, we estimate the total settlements of the structures to be approximately one inch or less.

Differential settlement results from differences in applied bearing pressures and the variations in the compressibility characteristics of the subsurface soils. Based on the subsurface conditions as determined by our borings, it is anticipated that differential settlements will be within tolerable limits.

4.3 SITE PREPARATION FOR SHALLOW FOUNDATIONS

We recommend the following site preparation procedures for the building areas:

- 1) Prior to construction, the location of existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations. It should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which may subsequently lead to excessive settlement of overlying structures.
- 2) Strip the proposed construction limits of all grass, roots, topsoil, and other deleterious materials within and 5 feet beyond the perimeter of the proposed structures. Expect initial clearing and grubbing to depths of approximately 6 to 12 inches.
- 3) Compact the exposed surface using tracked dozer or vibratory equipment. We recommend that vibratory equipment be operated in static mode within 75 feet of any existing structures. The upper two feet of soils below the exposed surface within the building areas should be improved to achieve a minimum compaction requirement of 95% of the Modified Proctor Test (ASTM D-1557). We recommend the compacted soils exhibit moisture content within 2 percent of the soils optimum moisture content as determined by the Modified Proctor Test (ASTM D-1557). Should the soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess moisture content within the disturbed soils allowed to dissipate before recompacting.
- 4) Test the compacted surface for compliance at a minimum of one location per 2,500 square feet of each building area, or at a minimum of 3 locations.
- 5) Place the fill material, as required. The fill should consist of "clean," fine sand with less than 5 percent soil fines. You may use fill materials with soil fines between 5 percent and 10 percent, but strict moisture control may be required. Place fill in uniform 10 to 12-inch loose lifts and compact each lift to a minimum density of 95 percent of the Modified Proctor maximum dry density. We recommend the compacted soils exhibit moisture content within 2 percent of the soils optimum moisture content as determined by the Modified Proctor Test (ASTM D-1557). If light compaction equipment is used, we recommend the lift thickness be reduced to 8 inch thick lifts.
- 6) Perform compliance tests within each lift of fill at a minimum of one location per lift per 2,500 square feet of each building area, or at a minimum of 3 locations.
- 7) Compact and test footing cuts for compaction to a depth of two feet below bearing level. We recommend that you test one out of every four (25 percent) column footings and perform one test per every 50 linear feet of wall footing. Compaction operations in confined areas, such as footing excavations, can best be performed with a lightweight vibratory sled or other hand-held compaction equipment.

5.0 PAVEMENT RECOMMENDATIONS

5.1 GENERAL

We understand that flexible asphaltic and rigid concrete pavement sections will be utilized for the subject project.

5.2 FLEXIBLE ASPHALTIC PAVEMENT

Because traffic loadings are commonly unavailable, we have generalized our pavement design into two groups. The group descriptions and the recommended component thicknesses are presented in Table 1 below.

TABLE I
Pavement Component Recommendations

Traffic Group	Component Thickness		
	Stabilized Subgrade	Base Course	Surface Course
Parking Lots – light duty	12	6	1.5
Parking lots – heavy duty	12	8	2.0

5.3 STABILIZED SUBGRADE

We recommend that subgrade materials be compacted in place according to the requirements in the "Site Preparation" section of this report. Further, stabilize the subgrade materials to a minimum Limerock Bearing Ratio (LBR) of 40 percent as specified by Florida Department of Transportation (FDOT) requirements for Type B Stabilized Subgrade.

Further, the stabilized subgrade can be imported material or a blend of on-site soils and imported materials. If a blend is proposed, we recommend that the contractor perform a mix design to find the optimum mix proportions.

The primary function of stabilized subgrade beneath the base course is to provide a stable and firm subgrade so that the base course can be properly placed and compacted. Depending upon the soil type, the subgrade material may have sufficient stability to provide the needed support without additional stabilizing material. Generally speaking, sands with silt or clay typically have sufficient stability and may not require additional stabilizing material. Conversely, relatively "clean" sands may not provide sufficient stability in order to adequately construct the base course.

5.4 BASE COURSE

We recommend that the base course consist of either limerock or graded crushed aggregate (crushed concrete).

5.4.1 LIMEROCK

Limerock should have a minimum LBR of 100 percent and should be mined from an FDOT approved source. Place limerock in maximum 6-inch lifts and compact each lift to a minimum density of 98 percent of the Modified Proctor maximum dry density.

5.4.2 CRUSHED CONCRETE BASE

Crushed concrete should be supplied by an approved plant with quality control procedures. The crushed concrete stockpiled should be free of sandy pockets, foreign materials, and uncrushed particles. We recommend the following specifications be enforced.

- a) Crushed concrete shall not contain lumps, balls or pockets of sand or clay sized material in sufficient quantity as to be detrimental to the proper binding, finishing or strength of the crushed concrete base.
- b) Samples of base course materials shall be supplied to the engineer prior to use in the work. Additional samples shall be furnished during construction, as necessary.
- c) At least 97 percent (by weight) of the material shall pass a 3-1/2 inch sieve and the material shall be graded uniformly down to dust. The fine material shall consist entirely of dust or fracture. All crushing or breaking-up which might be necessary in order to meet such size requirements shall be done before the material is placed on the road.
- d) The base shall be bladed and shaped to conform to the typical sections shown on the plans. Then the base shall be compacted by rolling with a combination of steel wheel and rubber tired rollers until an average density of 98 percent of the maximum density obtainable under AASHTO Method T-180 is reached. The base shall have an average LBR of not less than 150. The LBR value of material produced at a particular source shall be determined in accordance with an approved quality control procedure.

Testing shall be performed at the following frequency:

- 1) Perform in-place density tests on crushed concrete base at a minimum frequency of 2 tests per pavement area or 1 test per 300 linear feet whichever is greater.
- 2) Perform Limerock Bearing Ratio tests at a frequency of 1 test per visual change in material and a minimum of 1 test per pavement area or every 15,000 square feet whichever is greater.
- 3) Engineer should perform a final visual base inspection prior to placement of prime or tack coat and paving.

5.5 SURFACE COURSE

In light duty areas where there is occasional truck traffic, but primarily passenger cars, we recommend using an asphaltic concrete, FDOT Type SP 9.5 mix. In heavy duty areas where truck traffic is predominant, we recommend using an asphaltic concrete, FDOT Type SP 12.5 mix.

It should be noted that if a more aesthetically pleasing asphalt surface is required a layer of Friction Course (FC) (finer aggregate) can be placed. A 1/2 inch layer of FC asphalt can be placed above the SP asphaltic concrete. However this may result in increased costs.

Asphaltic concrete mixes should be a current FDOT approved design of the materials actually used. Samples of the materials delivered to the project should be tested to verify that the aggregate gradation and asphalt content satisfies the mix design requirements. Compact the asphalt to a minimum of 90 percent of the Gmm (maximum voidless specific gravity).

After placement and field compaction, core the wearing surface to evaluate material thickness and to perform laboratory densities. Obtain cores at frequencies of at least one core per 3,000 square feet of placed pavement or a minimum of two cores per day's production.

In roadways, for extended life expectancy of the surface course, we recommend applying a coal tar emulsion sealer at least six months after placement of the surface course. The seal coat will help to patch cracks and voids, and protect the surface from damaging ultraviolet light and automobile liquid spillage. Please note that applying the seal coat prior to six months after placement may hinder the "curing" of the surface course, leading to its early deterioration.

5.6 CURBING

We recommend that curbing around landscaped sections adjacent to the parking roadways and driveways be constructed with full-depth curb sections. Using extruded curb sections which lie directly on top of the final asphalt level, or eliminating the curbing entirely, may not significantly impede the migration of irrigation water from the landscape areas to the interface between the asphalt and the base. This migration often causes separation of the wearing surface from the base and subsequent rippling and pavement deterioration. It is recommended that the subgrade below the curbing be stabilized to a minimum LBR of 40.

5.7 CONSTRUCTION TRAFFIC

Light duty roadways and incomplete pavement sections will not perform satisfactorily under construction traffic loadings. We recommend that construction traffic (construction equipment, concrete trucks, sod trucks, garbage trucks, dump trucks, etc.) be re-routed away from these roadways or that the pavement section be designed for these loadings.

5.8 EFFECTS OF GROUNDWATER

We recommend that all pavement sections analyses incorporate the seasonal high groundwater conditions. Based on the groundwater level at the site, the below separations will be maintained.

TABLE II
Recommended Minimum Clearance Between Pavement Base and Wet Season Water Table

Type of Base	Separation (inches)
Limerock	18
Crushed Concrete	12

One of the most critical influences on the pavement performance in Central Florida is the relationship between the pavement subgrade and the seasonal high groundwater level. Many roadways and parking areas have been destroyed as a result of deterioration of the base and the base/surface course bond resulting from a high water table. **Regardless of the type of base selected, we recommend that the seasonal high groundwater and the bottom of the base course be separated by at least the amount presented in Table 2 above.**

5.9 CONCRETE "RIGID" PAVEMENT

Concrete pavement is a rigid pavement that is strong, durable and handles heavy loads more effectively than asphalt pavement

We recommend using the existing surficial sands or approved structural fill densified to at least 98 percent of Modified Proctor test maximum dry density (ASTM D 1557) without additional stabilization under concrete pavement, with the following stipulations:

1. Prior to placement of concrete, the subgrade soils should be densified as recommended in Section 5.10 of this report.
2. The surface of the subgrade soils must be smooth, and any disturbances or wheel rutting corrected prior to placement of concrete.
3. The subgrade soils must be moistened prior to placement of concrete.
4. Concrete pavement thickness should be uniform throughout, with exception to the thickened edges (curb or footing).
5. The bottom of the pavement should be separated from the seasonal high groundwater level by at least 12 Inches.

Based on review of the FDOT Rigid Pavement Design Manual and provided that the site is prepared as recommended in this report, we recommend using at least the minimum design shown in the following table for concrete pavements.

TABLE III
Minimum Concrete Pavement Thickness

Minimum Pavement Thickness	Maximum Control Joint Spacing	Recommended Saw Cut Depth
7 inches	14 feet x 14 feet	2.3 inches

For loading conditions greater than those presented in the project information, we recommend that you have a complete pavement design performed based on projected traffic data.

We recommend using concrete with a minimum 28-day compressive strength of at least 4000 pounds per square inch. Layout of the saw cut control joints should form square panels, and the depth of Saw cut joints should be made to a depth of $\frac{1}{3}$ of the concrete slab thickness.

We recommend allowing Universal to review and comment on the final concrete pavement design, including section and joint details (type of joints, joint spacing, etc.), prior to the start of construction.

For further details on concrete pavement construction, please reference the "Guide to Jointing of Non-Reinforced Concrete Pavements" published by the Florida Concrete and Products Association, Inc., and "Building Quality Concrete Parking Areas", published by the Portland Cement Association.

Specimens should be obtained to verify the compressive strength of the pavement concrete at least every 50 cubic yards, or at least once for each day's placement, whichever is greater.

5.10 SITE PREPARATION FOR PAVEMENT AREAS

We recommend the following site preparation procedures:

- 1) Strip the proposed construction limits of all grass, roots, topsoil and other deleterious materials within, and 3 feet beyond, the proposed pavement limits. Expect initial clearing and grubbing to depths of approximately 6 to 12 inches.
- 2) Proof-compact the exposed surface with the light to medium roller until you maintain density of at least 98 percent should be obtained in the upper 12 inches below base course. We recommend the compacted soils exhibit moisture content within 2 percent of the soils optimum moisture content as determined by the Modified Proctor Test (ASTM D-1557). Vibratory equipment should be operated in static mode within 75 feet of adjacent structures.
- 3) Should the soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess moisture content within the disturbed soils allowed to dissipate before recompacting.
- 4) Test the compacted surface for density at a frequency of not less than one test per 10,000 square feet of pavement area (minimum three locations per pavement area).
- 5) Place and compact backfill material, as required. The fill should consist of "clean," fine sand with less than 5 percent soil fines. You may use fill materials with soil fines between 5 percent and 10 percent, but strict moisture control may be required. Place fill in uniform 10 to 12-inch loose lifts and compact each lift to a minimum density of 95 percent of the Modified Proctor maximum dry density with the exception that densities of at least 98 percent should be obtained within the upper one foot below base course. We recommend the compacted soils exhibit moisture content within 2 percent of the soils optimum moisture content as determined by the Modified Proctor Test (ASTM D-1557).
- 6) Perform compliance tests within each lift of fill at a frequency of not less than one test per 10,000 square feet of pavement area (minimum of three locations per pavement area).

6.0 STORMWATER MANAGEMENT RECOMMENDATIONS

6.1 GENERAL

For a dry bottom retention facility, performance will be significantly influenced by the soil permeability and the vertical separation between the bottom and the seasonal high groundwater level. A wet retention facility should be excavated to a depth necessary to obtain a sufficient water depth to limit growth of aquatic vegetation.

If requested, UES can assist in evaluating the facility design exfiltration rates, underdrains and/or groundwater baseflow as pond geometry and stormwater volume requirements become available.

6.2 SOIL PERMEABILITY

Seven (7) Laboratory Falling-head Saturated Vertical Permeability Tests were performed on relatively undisturbed soil samples. The samples were obtained using thin-walled tube sampling techniques

(Shelby Tube). The results of the tests, in feet per day, describe the coefficients of hydraulic conductivity (Permeability) of the soils and are presented on the attached Subsurface Profiles. The measured permeability rates should not be construed to represent the actual pond exfiltration rates.

Upon evaluation of regional and local geology, we have evaluated that the characteristics of the soils within the vicinity of this project are comprised of sedimentary soils which often exhibit thin, alternating layers. Generally, in relatively homogeneous natural deposits where stratification may result from particle orientation, the Permeability in the Horizontal direction can be somewhat greater than that in the Vertical direction. Based on our experience, the estimated coefficient of Horizontal Permeability typically is on the order of 1.5 and 2.0 times greater than the Vertical Permeability for SP-SM and SP soil types, respectively.

The dense sandy soils, as encountered, is generally considered to have poor drainage characteristics. Partial removal of these soils may be required for pond recovery purposes. All pond backfill material should be clean sandy soils having 5 percent or less fines passing the No. 200 sieve.

6.3 BORROW SUITABILITY

The borings were performed, in part, to provide an indication of the suitability of excavated soils from the proposed pond locations for use as structural fill soil. The fine sand (SP) and fine sand with silt (SP-SM), as encountered, are suitable for use as structural fill soil. Because the fine sand with silt (SP-SM) significantly retains moisture, strict moisture control may be required during placement and compaction operations to avoid moisture related instability.

It should be anticipated the soils that are below the groundwater level will have moisture contents in excess of the Modified Proctor optimum moisture content and will require stockpiling or spreading to bring the moisture content within 2 percent of the soil's optimum moisture content corresponding to the required degree of compaction.

7.0 CONSTRUCTION RELATED SERVICES

We recommend the owner retain UES to perform construction materials tests and observations on this project. Field tests and observations include verification of foundation subgrades by monitoring filling operations and performing quality assurance tests on the placement of compacted natural soils and structural fill. We can also perform concrete testing, pavement section testing, structural steel testing and other construction materials testing services.

The geotechnical engineering design does not end with the advertisement of the construction documents. The design is an on-going process throughout construction. Because of our familiarity with the site conditions and the intent of the engineering design, we are most qualified to address problems that might arise during construction in a timely and cost-effective manner.

8.0 LIMITATIONS

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information about Your Geotechnical Engineering Report" appears in Appendix B, and will help explain the nature of geotechnical issues.

Further, we present documents in Appendix B: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

* * * * *

APPENDIX A



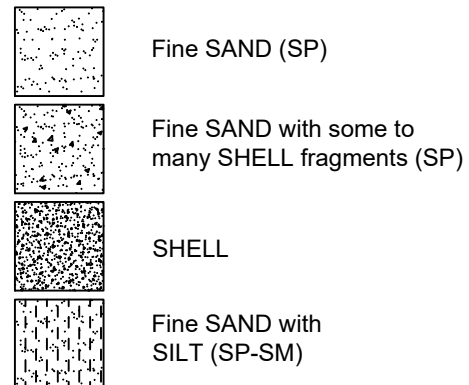
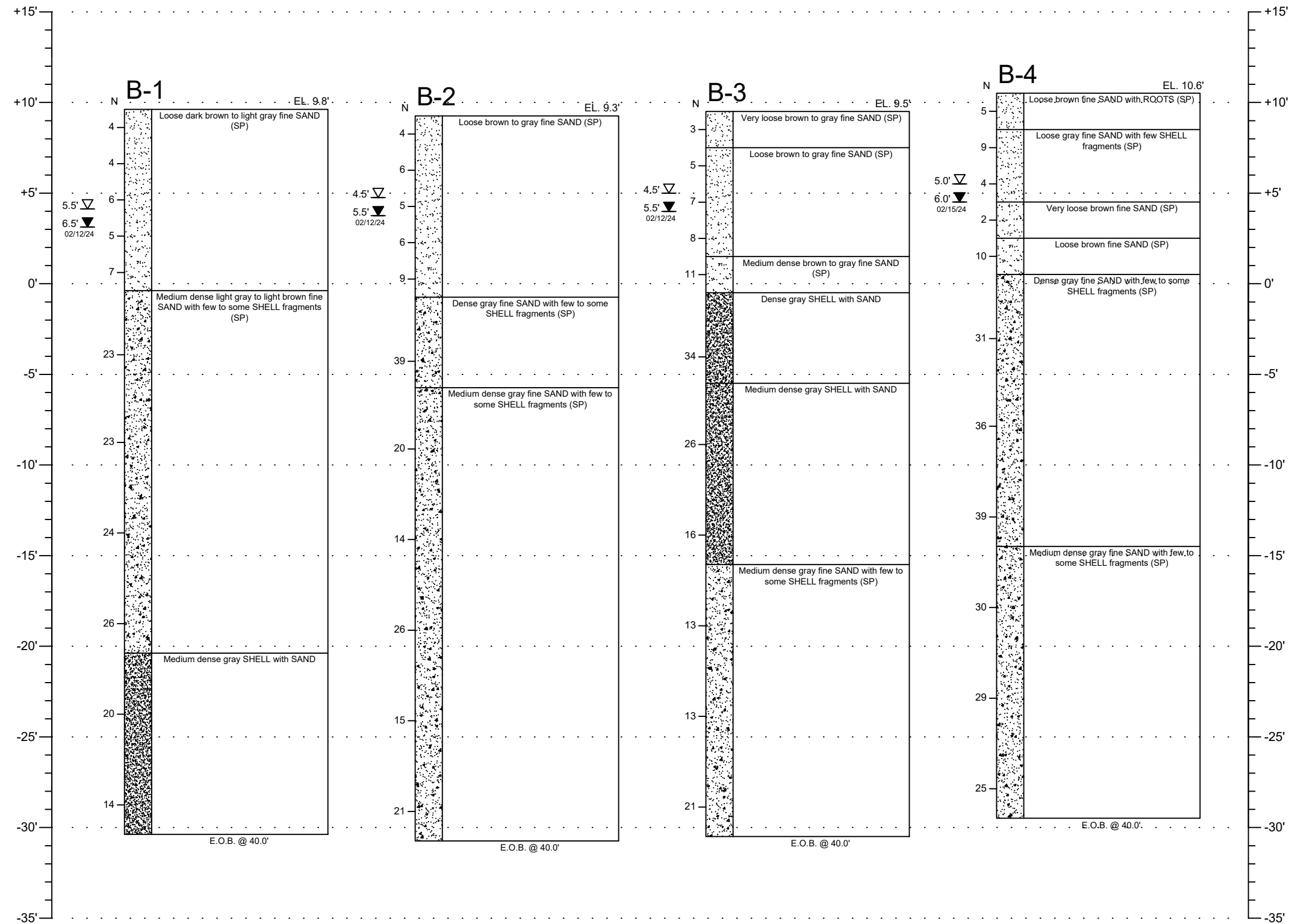


LEGEND

- △ APPROXIMATE LOCATION OF AUGER BORING
- ⊕ APPROXIMATE LOCATION OF STANDARD PENETRATION TEST (SPT) BORING

GRAPHIC SCALE
0 90 180
(IN FEET)
1 INCH ≈ 180 ft.

	TITLE:	BORING LOCATION PLAN		SCALE:	1" ≈ 180'
	PROJECT:	GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA		PAGE/FIG. NO.:	A-1
	DRAWN BY:	MKL	DATE:	02/27/24	PROJECT NO.: 0430.2400030.0000
	CHECKED BY:	BP	DATE:	02/27/24	REPORT NO.: 2067368

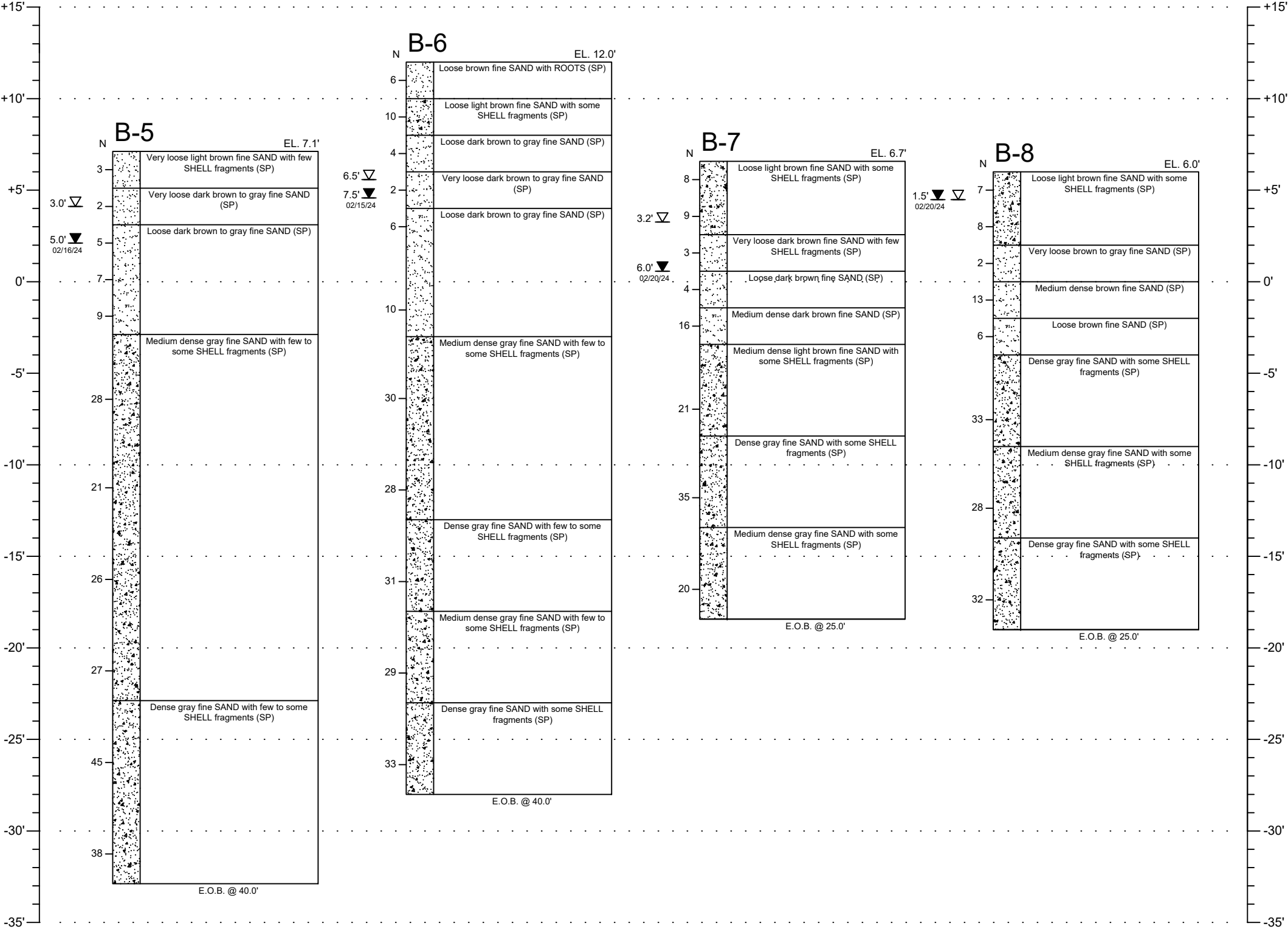


NOTES:

- Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)
- Seasonal High Water Level (feet below existing grade)
- Unified Soil Classification System
- End of Boring
- Penetr. Resistance, Blows/ft.
- Hand Auger Method
- Weight of Hammer
- Coefficient of Permeability, (ft/day)
- % Passing No. 200 Sieve



PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA				TITLE: SUBSURFACE PROFILE	
DRAWN BY:	MKL	DATE:	04/19/24	PROJECT NO.:	0430.2400030.0000
CHECKED BY:	BP	DATE:	04/19/24	REPORT NO.:	2067368
SCALE: NA (in feet)				PAGE/FIG. NO.: A-2	



Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)

SHELL

Fine SAND with SILT (SP-SM)

NOTES:

Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)

Seasonal High Water Level (feet below existing grade)

(SP) Unified Soil Classification System

EOB End of Boring

N Penetr. Resistance, Blows/ft.

HA Hand Auger Method

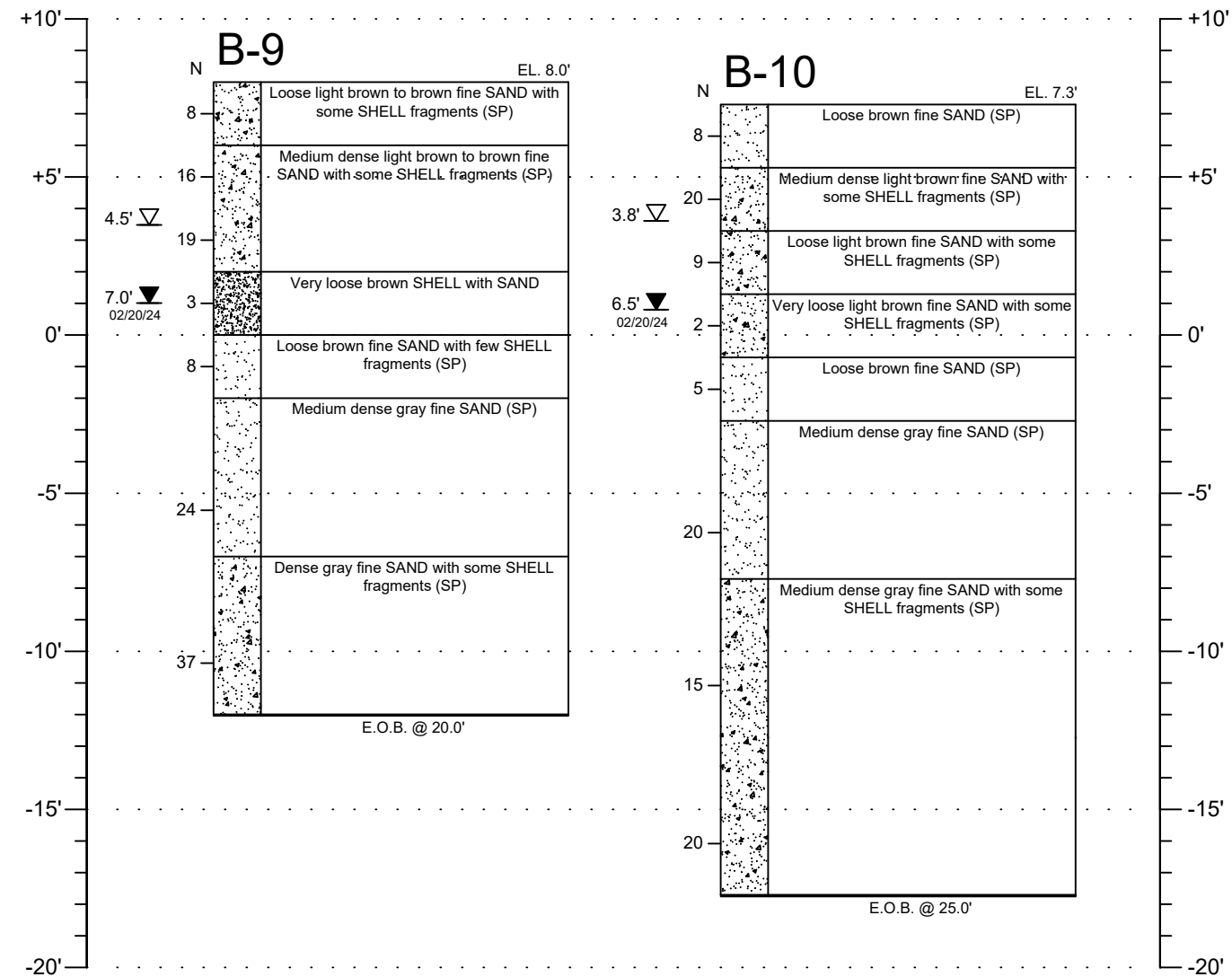
WOH Weight of Hammer

Kv Coefficient of Permeability, (ft/day)

-200 % Passing No. 200 Sieve



PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA				TITLE: SUBSURFACE PROFILE	
DRAWN BY:	MKL	DATE:	04/19/24	PROJECT NO.:	0430.2400030.0000
CHECKED BY:	BP	DATE:	04/19/24	REPORT NO.:	2067368
				SCALE: NA (in feet)	PAGE/FIG. NO.: A-3



Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)

SHELL

Fine SAND with SILT (SP-SM)

NOTES:



Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)



Seasonal High Water Level (feet below existing grade)



Unified Soil Classification System



End of Boring



Penetr. Resistance, Blows/ft.



Hand Auger Method



Weight of Hammer



Coefficient of Permeability, (ft/day)



% Passing No. 200 Sieve



PROJECT:

GEOTECHNICAL EVALUATION
EDGEWATER MARINA
JONES FISH CAMP ROAD
EDGEWATER, FLORIDA

TITLE:

SUBSURFACE PROFILE

DRAWN BY:

MKL

DATE:

04/19/24

PROJECT NO.:

0430.2400030.0000

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DATE:

04/19/24

REPORT NO.:

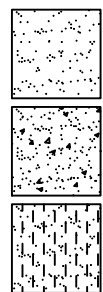
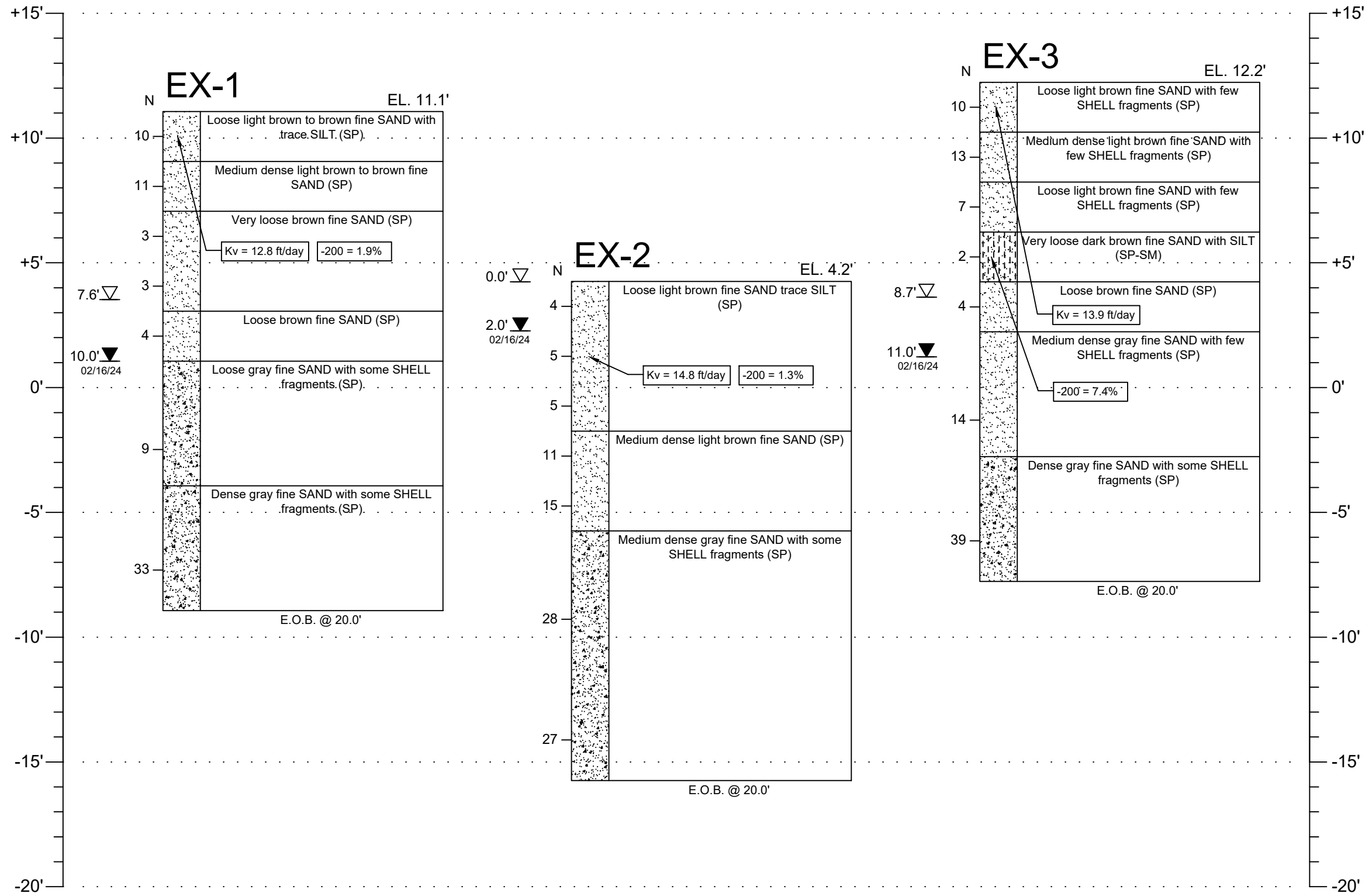
2067368

SCALE:

NA (in feet)

PAGE/FIG. NO.:

A-4



Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)

Fine SAND with SILT (SP-SM)

NOTES:

Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)

Seasonal High Water Level (feet below existing grade)

(SP) Unified Soil Classification System

EOB End of Boring

N Penetr. Resistance, Blows/ft.

HA Hand Auger Method

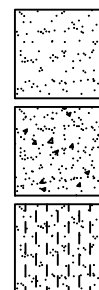
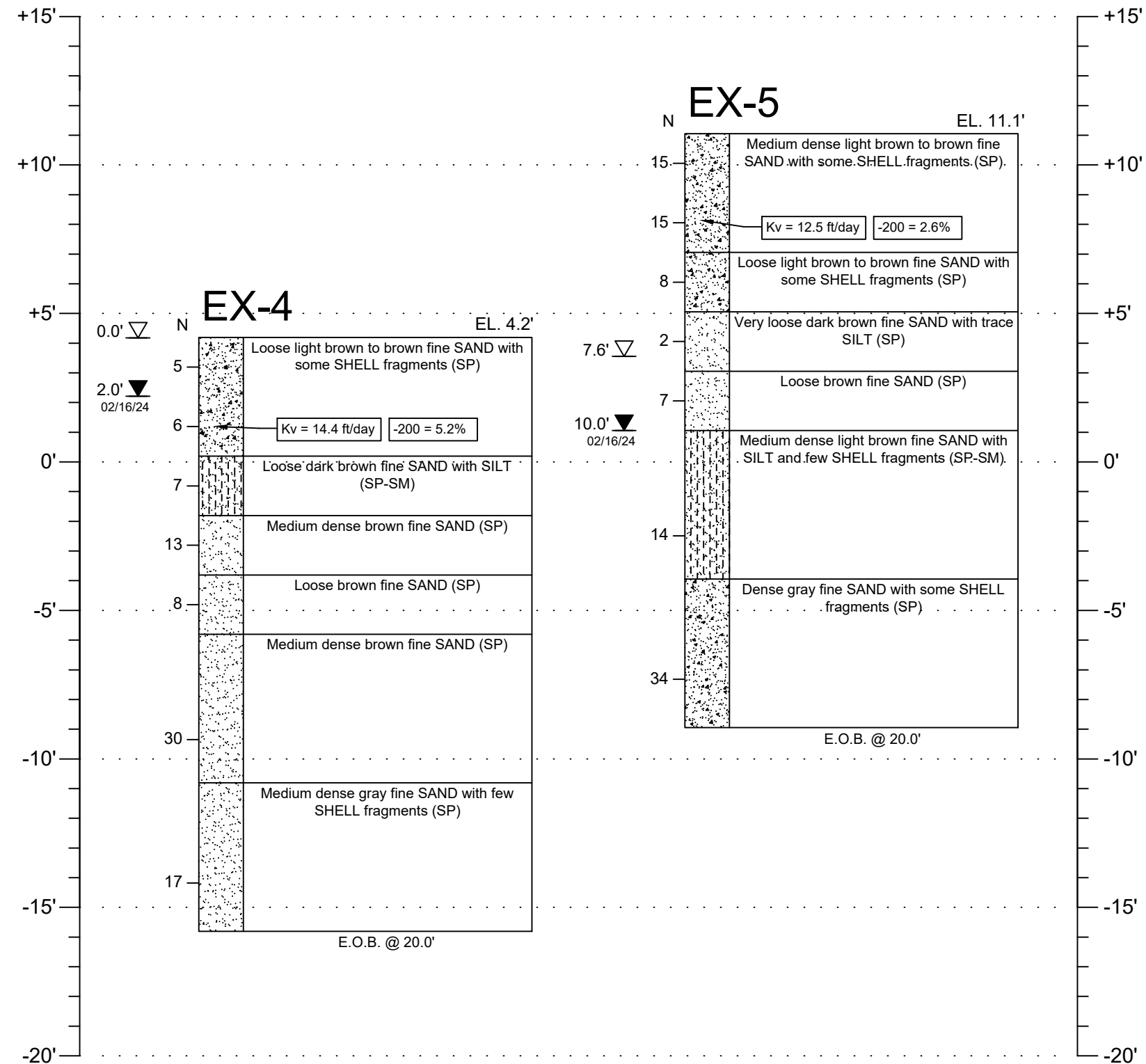
WOH Weight of Hammer

Kv Coefficient of Permeability, (ft/day)

-200 % Passing No. 200 Sieve



PROJECT:				TITLE:	
GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA				SUBSURFACE PROFILE	
DRAWN BY:	MKL	DATE:	04/19/24	PROJECT NO.:	0430.2400030.0000
CHECKED BY:	BP	DATE:	04/19/24	REPORT NO.:	2067368
				SCALE:	PAGE/FIG. NO.:
				NA (in feet)	A-5



Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)

Fine SAND with SILT (SP-SM)

NOTES:

▼ Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)

▽ Seasonal High Water Level (feet below existing grade)

(SP) Unified Soil Classification System

EOB End of Boring

N Penetr. Resistance, Blows/ft.

HA Hand Auger Method

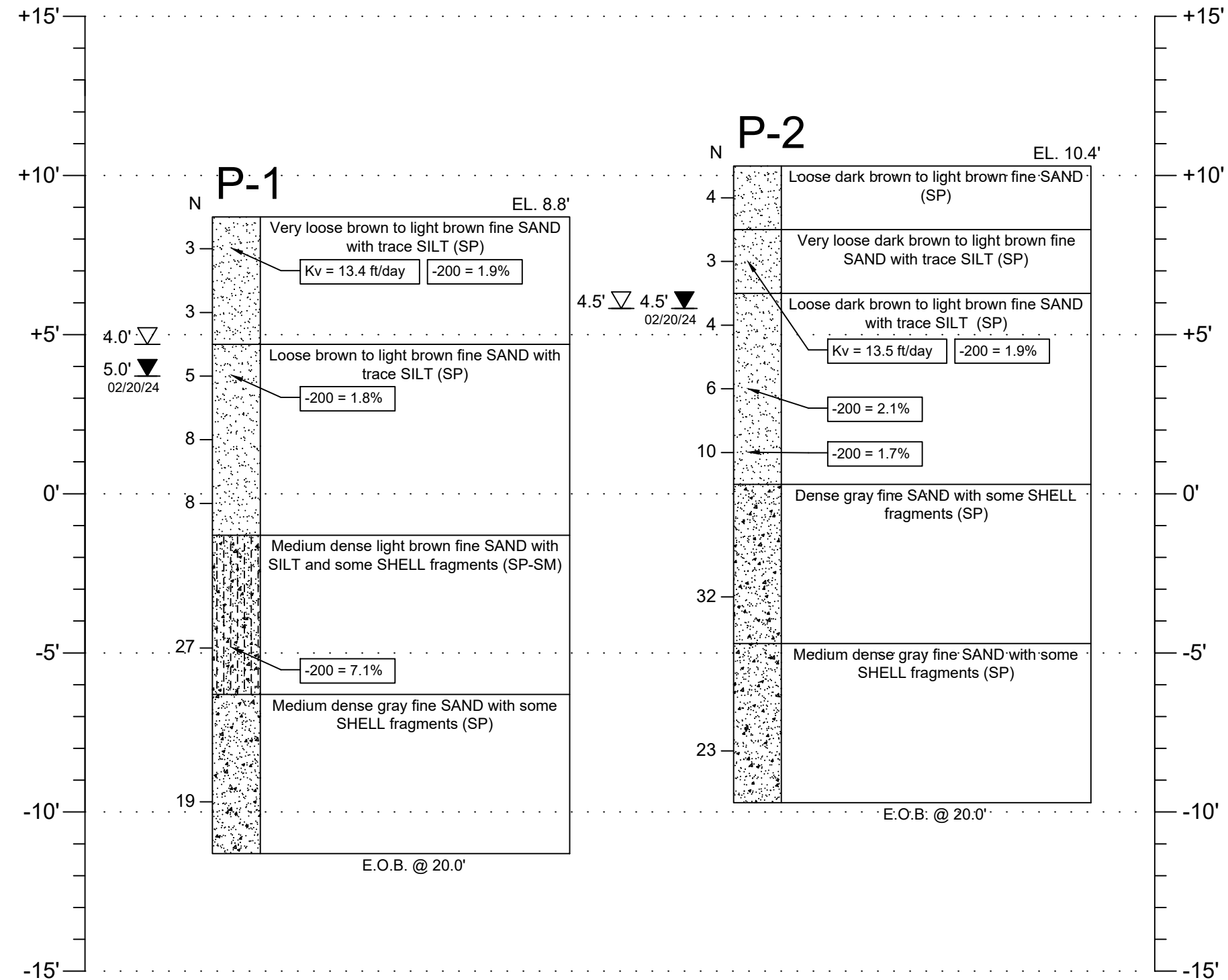
WOH Weight of Hammer

Kv Coefficient of Permeability, (ft/day)

-200 % Passing No. 200 Sieve



PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA				TITLE: SUBSURFACE PROFILE	
DRAWN BY: MKL	DATE: 04/19/24	PROJECT NO.: 0430.2400030.0000	SCALE: NA (in feet)		PAGE/FIG. NO.: A-6
CHECKED BY: BP	DATE: 04/19/24	REPORT NO.: 2067368			



NOTES:

- ▼ Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)
- ▽ Seasonal High Water Level (feet below existing grade)
- (SP) Unified Soil Classification System
- EOB End of Boring
- N Penetr. Resistance, Blows/ft.
- HA Hand Auger Method
- WOH Weight of Hammer
- Kv Coefficient of Permeability, (ft/day)
- 200 % Passing No. 200 Sieve



Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)



PROJECT:

GEOTECHNICAL EVALUATION
EDGEWATER MARINA
JONES FISH CAMP ROAD
EDGEWATER, FLORIDA

TITLE:

SUBSURFACE PROFILE

DRAWN BY:

MKL

DATE:

04/23/24

PROJECT NO.:

0430.2400030.0000

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DATE:

04/23/24

REPORT NO.:

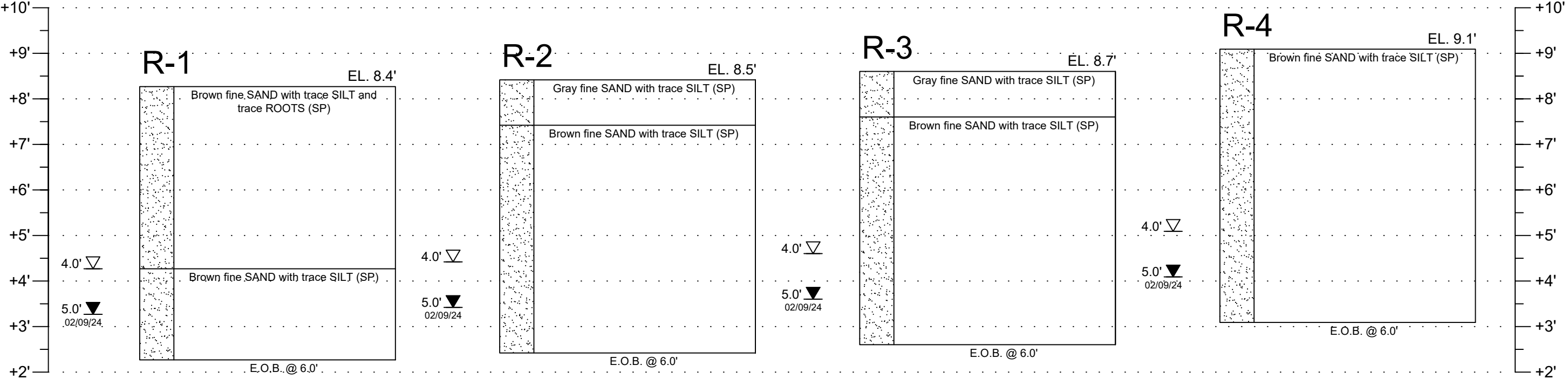
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SCALE:

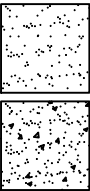
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PAGE/FIG. NO.:

A-7



NOTES:



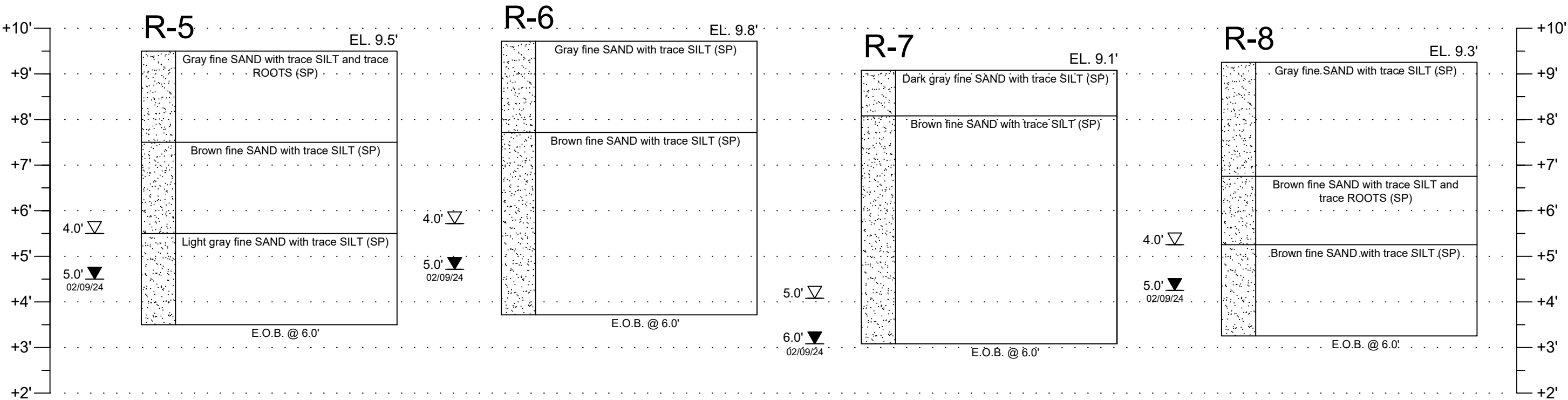
Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)

- ▼ Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)
- ▽ Seasonal High Water Level (feet below existing grade)
- (SP) Unified Soil Classification System
- EOB End of Boring
- N Penetr. Resistance, Blows/ft.
- HA Hand Auger Method
- WOH Weight of Hammer
- Kv Coefficient of Permeability, (ft/day)
- 200 % Passing No. 200 Sieve

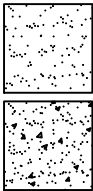


PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA				TITLE: SUBSURFACE PROFILE	
DRAWN BY:	MKL	DATE:	04/19/24	PROJECT NO.:	0430.2400030.0000
CHECKED BY:	BP	DATE:	04/19/24	REPORT NO.:	2067368
				SCALE: NA (in feet)	PAGE/FIG. NO.: A-8



NOTES:

▼ Measured Groundwater Level 24 (+)
Hours Subsequent to Time of Drilling
(feet below existing grade)
▽ Seasonal High Water Level
(feet below existing grade)
(SP) Unified Soil Classification System
EOB End of Boring
N Penetr. Resistance, Blows/ft.
HA Hand Auger Method
WOH Weight of Hammer
Kv Coefficient of Permeability, (ft/day)
-200 % Passing No. 200 Sieve

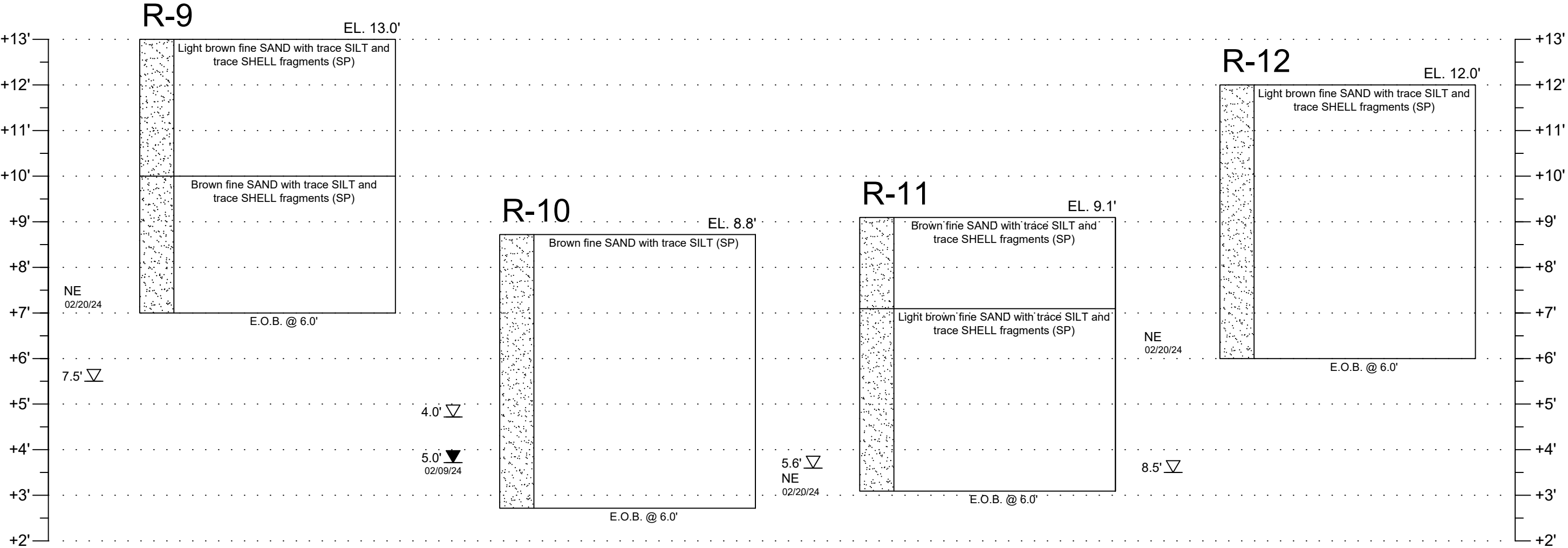


Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)



PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA			TITLE: SUBSURFACE PROFILE	
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CHECKED BY: BP	DATE: 04/19/24	REPORT NO.: 2067368		



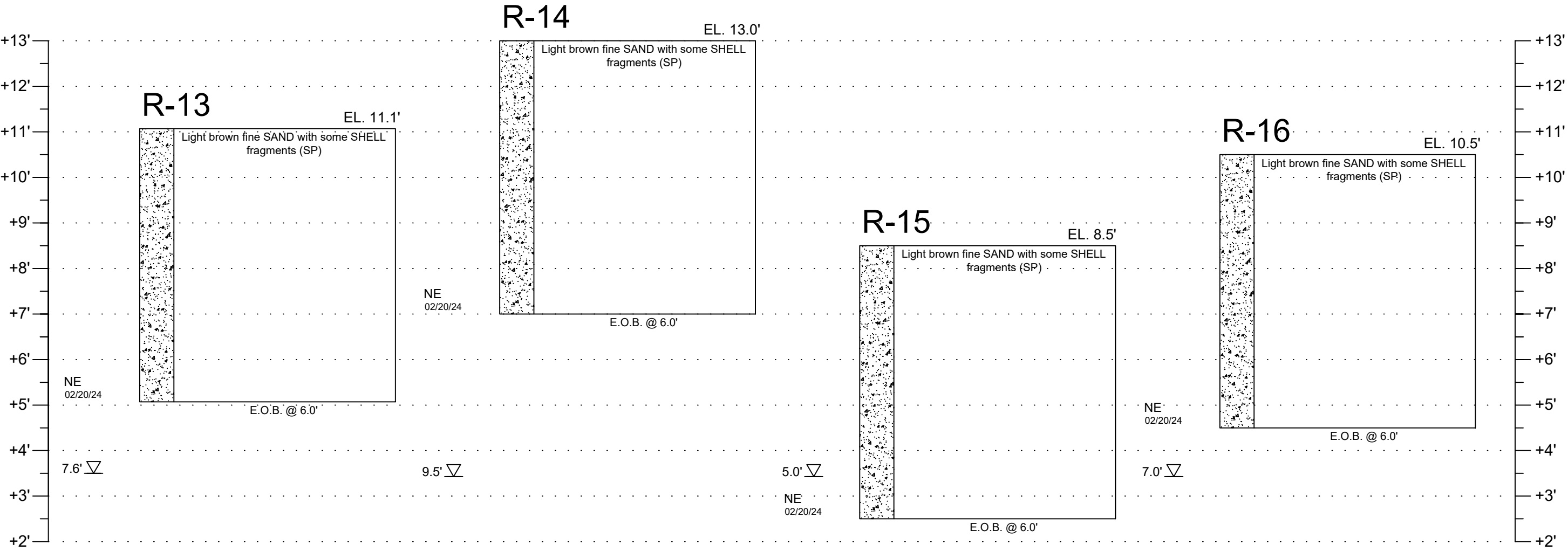
- NOTES:**
- ▼ Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)
 - ∇ Seasonal High Water Level (feet below existing grade)
 - (SP) Unified Soil Classification System
 - EOB End of Boring
 - N Penetr. Resistance, Blows/ft.
 - HA Hand Auger Method
 - WOH Weight of Hammer
 - Kv Coefficient of Permeability, (ft/day)
 - 200 % Passing No. 200 Sieve

Fine SAND (SP)

Fine SAND with some to many SHELL fragments (SP)



PROJECT: GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA			TITLE: SUBSURFACE PROFILE	
DRAWN BY: MKL	DATE: 04/19/24	PROJECT NO.: 0430.2400030.0000	SCALE: NA (in feet)	PAGE/FIG. NO.: A-10
CHECKED BY: BP	DATE: 04/19/24	REPORT NO.: 2067368		



NOTES:

- ▼ Measured Groundwater Level 24 (+) Hours Subsequent to Time of Drilling (feet below existing grade)
- ▽ Seasonal High Water Level (feet below existing grade)
- (SP) Unified Soil Classification System
- EOB End of Boring
- N Penetr. Resistance, Blows/ft.
- HA Hand Auger Method
- WOH Weight of Hammer
- Kv Coefficient of Permeability, (ft/day)
- 200 % Passing No. 200 Sieve

 Fine SAND (SP)

 Fine SAND with some to many SHELL fragments (SP)



PROJECT:			TITLE:	
GEOTECHNICAL EVALUATION EDGEWATER MARINA JONES FISH CAMP ROAD EDGEWATER, FLORIDA			SUBSURFACE PROFILE	
DRAWN BY:	MKL	DATE: 04/19/24	PROJECT NO.: 0430.2400030.0000	SCALE:
CHECKED BY:	BP	DATE: 04/19/24	REPORT NO.: 2067368	NA (in feet)
				PAGE/FIG. NO.: A-11

SYMBOLS AND ABBREVIATIONS

SYMBOL	DESCRIPTION
N-Value	No. of Blows of a 140-lb. Weight Falling 30 Inches Required to Drive a Standard Spoon 1 Foot
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
	Sample from Auger Cuttings
	Standard Penetration Test Sample
	Thin-wall Shelby Tube Sample (Undisturbed Sampler Used)
RQD	Rock Quality Designation
	Stabilized Groundwater Level
	Seasonal High Groundwater Level (also referred to as the W.S.W.T.)
NE	Not Encountered
GNE	Groundwater Not Encountered
BT	Boring Terminated
-200 (%)	Fines Content or % Passing No. 200 Sieve
MC (%)	Moisture Content
LL	Liquid Limit (Atterberg Limits Test)
PI	Plasticity Index (Atterberg Limits Test)
NP	Non-Plastic (Atterberg Limits Test)
K	Coefficient of Permeability
Org. Cont.	Organic Content
G.S. Elevation	Ground Surface Elevation

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than 50% retained on the No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels and gravel-sand-silt mixtures
			GC	Clayey gravels and gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS 5% or less passing No. 200 sieve	SW**	Well-graded sands and gravelly sands, little or no fines
			SP**	Poorly graded sands and gravelly sands, little or no fines
		SANDS with 12% or more passing No. 200 sieve	SM**	Silty sands, sand-silt mixtures
			SC**	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays	
		OL	Organic silts and organic silty clays of low plasticity	
	SILTS AND CLAYS Liquid limit greater than 50%	MH	Inorganic silts, micaceous or diamictaceous fine sands or silts, elastic silts	
		CH	Inorganic clays or clays of high plasticity, fat clays	
		OH	Organic clays of medium to high plasticity	
		PT	Peat, muck and other highly organic soils	

*Based on the material passing the 3-inch (75 mm) sieve

** Use dual symbol (such as SP-SM and SP-SC) for soils with more than 5% but less than 12% passing the No. 200 sieve

RELATIVE DENSITY

(Sands and Gravels)

Very loose – Less than 4 Blow/Foot
Loose – 4 to 10 Blows/Foot
Medium Dense – 11 to 30 Blows/Foot
Dense – 31 to 50 Blows/Foot
Very Dense – More than 50 Blows/Foot

CONSISTENCY

(Silts and Clays)

Very Soft – Less than 2 Blows/Foot
Soft – 2 to 4 Blows/Foot
Firm – 5 to 8 Blows/Foot
Stiff – 9 to 15 Blows/Foot
Very Stiff – 16 to 30 Blows/Foot
Hard – More than 30 Blows/Foot

RELATIVE HARDNESS

(Limestone)

Soft – 100 Blows for more than 2 Inches
Hard – 100 Blows for less than 2 Inches

MODIFIERS

These modifiers Provide Our Estimate of the Amount of Minor Constituents (Silt or Clay Size Particles) in the Soil Sample

Trace – 5% or less
With Silt or With Clay – 6% to 11%
Silty or Clayey – 12% to 30%
Very Silty or Very Clayey – 31% to 50%

These Modifiers Provide Our Estimate of the Amount of Organic Components in the Soil Sample

Trace – Less than 3%
Few – 3% to 4%
Some – 5% to 8%
Many – Greater than 8%

These Modifiers Provide Our Estimate of the Amount of Other Components (Shell, Gravel, Etc.) in the Soil Sample

Trace – 5% or less
Few – 6% to 12%
Some – 13% to 30%
Many – 31% to 50%

APPENDIX B



Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time to perform additional study.* Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



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CONSTRAINTS & RESTRICTIONS

The intent of this document is to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of exploration. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.



NRCS Soil Report



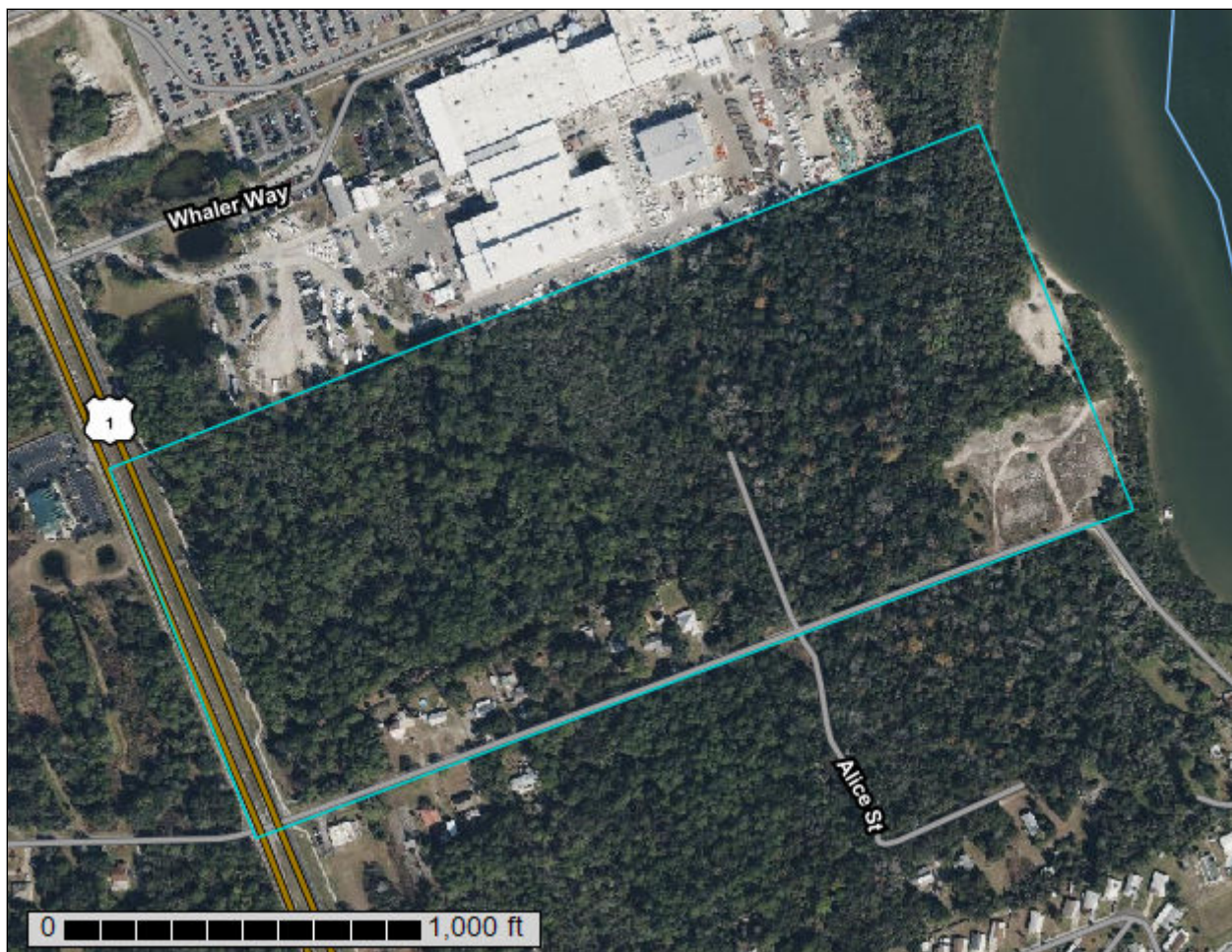
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Volusia County, Florida**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

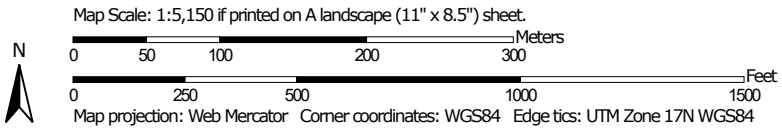
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 22, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 19, 2022—Mar 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
17	Daytona sand, 0 to 5 percent slopes	16.6	24.2%
29	Immokalee sand	0.9	1.3%
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	21.9	31.9%
37	Orsino fine sand, 0 to 5 percent slopes	6.4	9.4%
53	Pompano-Placid complex	4.2	6.1%
54	Quartzipsammments, gently sloping	6.2	9.1%
63	Tavares fine sand, 0 to 5 percent slopes	12.4	18.1%
Totals for Area of Interest		68.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not

mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Volusia County, Florida

17—Daytona sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2x9dl

Elevation: 0 to 200 feet

Mean annual precipitation: 46 to 61 inches

Mean annual air temperature: 68 to 77 degrees F

Frost-free period: 340 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Daytona and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Daytona

Setting

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread, rise

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits and/or eolian deposits

Typical profile

A - 0 to 5 inches: sand

E - 5 to 36 inches: sand

Bh - 36 to 47 inches: sand

C - 47 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 42 to 60 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Custom Soil Resource Report

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Minor Components

Immokalee

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Cassia

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Satellite

Percent of map unit: 2 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

St. Lucie

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, ridges on marine terraces, dunes on marine terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluvium, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R155XY230FL - Sandy Scrub on Ridges, Knolls, and Dunes of Xeric Uplands
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Orsino

Percent of map unit: 2 percent

Custom Soil Resource Report

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluvium, tread, rise

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G156BC121FL)

Hydric soil rating: No

Pompano

Percent of map unit: 1 percent

Landform: Drainageways on marine terraces

Landform position (three-dimensional): Tread, dip

Down-slope shape: Linear

Across-slope shape: Linear, concave

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: Yes

29—Immokalee sand

Map Unit Setting

National map unit symbol: 1ntsn

Elevation: 0 to 150 feet

Mean annual precipitation: 53 to 61 inches

Mean annual air temperature: 66 to 73 degrees F

Frost-free period: 285 to 315 days

Farmland classification: Not prime farmland

Map Unit Composition

Immokalee, non-hydric, and similar soils: 65 percent

Immokalee, hydric, and similar soils: 10 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee, Non-hydric

Setting

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 10 inches: sand

E - 10 to 34 inches: sand

Custom Soil Resource Report

Bh - 34 to 43 inches: sand

C - 43 to 85 inches: sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: B/D

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)

Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy
soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: No

Description of Immokalee, Hydric

Setting

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 10 inches: sand

E - 10 to 34 inches: sand

Bh - 34 to 43 inches: sand

C - 43 to 85 inches: sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Minor Components

Basinger, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Daytona

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Myakka, non-hydric

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: No

Satellite

Percent of map unit: 3 percent

Landform: Rises on marine terraces, flats on marine terraces

Landform position (three-dimensional): Rise, talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

Smyrna, non-hydric

Percent of map unit: 3 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: No

St. Johns, hydric

Percent of map unit: 3 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: Yes

32—Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tw7

Elevation: 0 to 160 feet

Mean annual precipitation: 38 to 68 inches

Mean annual air temperature: 68 to 77 degrees F

Frost-free period: 310 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Myakka and similar soils: 70 percent

Myakka, wet, and similar soils: 15 percent

Custom Soil Resource Report

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka

Setting

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

E - 6 to 20 inches: fine sand

Bh - 20 to 36 inches: fine sand

C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very high

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 5.95 in/hr)*

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

*Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)*

*Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy
soils on flats of mesic or hydric lowlands (G155XB141FL)*

Hydric soil rating: No

Description of Myakka, Wet

Setting

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand

E - 6 to 20 inches: fine sand

Bh - 20 to 36 inches: fine sand

C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 5 percent
Landform: Drainageways on marine terraces, depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Eaugallie

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear

Custom Soil Resource Report

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: No

37—Orsino fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2x9dn

Elevation: 0 to 130 feet

Mean annual precipitation: 43 to 63 inches

Mean annual air temperature: 66 to 77 degrees F

Frost-free period: 335 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Orsino and similar soils: 82 percent

Minor components: 18 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Orsino

Setting

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits and/or eolian deposits

Typical profile

A - 0 to 2 inches: fine sand

E - 2 to 23 inches: fine sand

Bw and Bh/E - 23 to 43 inches: fine sand

Bw - 43 to 62 inches: fine sand

C - 62 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)

Depth to water table: About 42 to 60 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Custom Soil Resource Report

Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Hydric soil rating: No

Minor Components

Paola

Percent of map unit: 6 percent

Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope, riser

Down-slope shape: Convex, linear

Across-slope shape: Linear

Ecological site: R155XY230FL - Sandy Scrub on Ridges, Knolls, and Dunes of Xeric Uplands

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)

Hydric soil rating: No

Cassia

Percent of map unit: 4 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Tread, talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

Tavares

Percent of map unit: 3 percent

Landform: Hills on marine terraces, flats on marine terraces, knolls on marine terraces, ridges on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, side slope, tread, rise

Down-slope shape: Linear, convex

Across-slope shape: Convex, linear

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Hydric soil rating: No

Daytona

Percent of map unit: 3 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, tread, rise

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands

Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)

Hydric soil rating: No

Immokalee

Percent of map unit: 1 percent

Landform: Flatwoods on marine terraces

Landform position (three-dimensional): Riser, talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: No

Basinger

Percent of map unit: 1 percent

Landform: Flats on marine terraces, drainageways on marine terraces

Landform position (three-dimensional): Tread, talf, dip

Down-slope shape: Convex, concave

Across-slope shape: Linear, concave

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: Yes

53—Pompano-Placid complex

Map Unit Setting

National map unit symbol: 1nttj

Elevation: 0 to 100 feet

Mean annual precipitation: 53 to 61 inches

Mean annual air temperature: 66 to 73 degrees F

Frost-free period: 285 to 315 days

Farmland classification: Not prime farmland

Map Unit Composition

Pompano, depressional, and similar soils: 55 percent

Placid and similar soils: 25 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pompano, Depressional

Setting

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand

C - 7 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: A/D

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)

Hydric soil rating: Yes

Description of Placid

Setting

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy marine deposits

Typical profile

A - 0 to 15 inches: fine sand

C - 15 to 75 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Custom Soil Resource Report

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: A/D

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)

Hydric soil rating: Yes

Minor Components

Holopaw, hydric

Percent of map unit: 4 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: Yes

Samsula

Percent of map unit: 4 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps

Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)

Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps

Custom Soil Resource Report

Other vegetative classification: Organic soils in depressions and on flood plains
(G155XB645FL)

Hydric soil rating: Yes

Riviera, hydric

Percent of map unit: 4 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes
and Swamps

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic
lowlands (G155XB241FL)

Hydric soil rating: Yes

Malabar, hydric

Percent of map unit: 4 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)

Hydric soil rating: Yes

54—Quartzipsamments, gently sloping

Map Unit Setting

National map unit symbol: 1nttk

Elevation: 0 to 100 feet

Mean annual precipitation: 53 to 61 inches

Mean annual air temperature: 66 to 73 degrees F

Frost-free period: 285 to 315 days

Farmland classification: Not prime farmland

Map Unit Composition

Quartzipsamments and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quartzipsamments

Setting

Landform: Rises on marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

C - 0 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Forage suitability group: Forage suitability group not assigned (G155XB999FL)

Other vegetative classification: Forage suitability group not assigned (G155XB999FL)

Hydric soil rating: No

63—Tavares fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2sw00

Elevation: 0 to 130 feet

Mean annual precipitation: 42 to 63 inches

Mean annual air temperature: 66 to 77 degrees F

Frost-free period: 340 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Tavares and similar soils: 83 percent

Minor components: 17 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tavares

Setting

Landform: Knolls on marine terraces, ridges on marine terraces, hills on marine terraces, flats on marine terraces

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluvium, side slope, tread, rise

Down-slope shape: Linear, convex

Across-slope shape: Convex, linear

Parent material: Eolian or sandy marine deposits

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Typical profile

A - 0 to 6 inches: fine sand
C - 6 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Minor Components

Cassia

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Pomello

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluvium, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Custom Soil Resource Report

Hydric soil rating: No

Astatula

Percent of map unit: 3 percent

Landform: Knolls on marine terraces, ridges on marine terraces, hills on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope, riser, rise

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: R155XY230FL - Sandy Scrub on Ridges, Knolls, and Dunes of Xeric Uplands

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)

Hydric soil rating: No

Apopka

Percent of map unit: 3 percent

Landform: Ridges on marine terraces, hills on marine terraces

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope, riser

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F154XA004FL - Moist Sandy Pine-Hardwood Woodlands

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)

Hydric soil rating: No

Adamsville

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Tread, rise

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls

Other vegetative classification: Upland Hardwood Hammock (R155XY008FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)

Hydric soil rating: No

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