

LEVY ROAD - COMMERCIAL
251 LEVY ROAD
ATLANTIC BEACH FL, 32233

STORMWATER CALCULATIONS

PREPARED FOR:

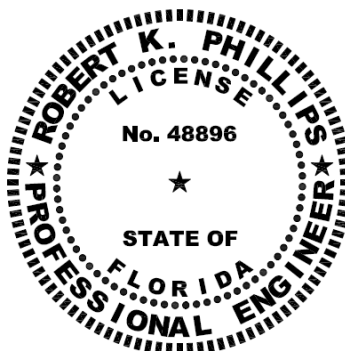
251 LEVY RD GROUP, LLC

PREPARED BY:

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JUNE 28, 2022
JOB #2021-251



This item has been digitally signed and sealed by Robert K. Phillips, PE. on the date adjacent to the seal.

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Section 1
INTRODUCTION &
ATTACHMENTS

Section 1.1

Executive Summary

LEAVY ROAD - COMMERCIAL EXECUTIVE SUMMARY

PROJECT INFO

PROJECT NAME: Levy Road Commercial
PROJECT ACREAGE: 3.37 ac +/-
ADDRESS: 251 Levy Road, Atlantic Beach, FL 32233
COUNTY: DUVAL
PARCEL ID #(S): 172335 0000
SEC - TWP - RNG: 17 - 2 South – 29 East
LATITUDE (DD): 30.3357
LONGITUDE (DD): (-)81.4192
LOCATION: North side of Levy Rd, Approx. 1330 LF West of Mayport Rd
DRY RETENTION: Treatment Volume of 0.085 Ac-Ft at Elev. 11.50NAVD
MAXIMUM POOL: 0.109 AC-FT @ Elev. 12.00 NAVD

GENERAL SITE / PROJECT DESCRIPTION

A developed commercial site is adding a new building and converting a gravel parking lot into a paved parking lot. Proposed development includes an onsite, dry retention stormwater management facility (SMF1) as well as all utilities and grading needed to accommodate the proposed development.

The total disturbed area is expected to be 0.70 acres, all occurring within the 3.37-acre site. The predeveloped and post developed drainage areas are representative of the area inside the limits of disturbance within the property boundaries.

PRE-DEVELOPED DRAINAGE INFORMATION

The site will be considered for onsite stormwater that will contribute to the SMF1.

The site is in flood plain "X" per FEMA Panel 12031C0408J (Dated 11/2/2018).

Onsite stormwater includes the proposed developed area (limits of disturbance) that will be captured in the SMF1.

Soil make-up for this property is #32 Leon Fine Sand and #71 – Urban Land-Leon-Boulogne Complex both with a HSG as type "A/D".

The drainage boundary for this project was established from survey data obtained from survey and site visit investigation.

POST-DEVELOPED DRAINAGE INFORMATION

It is proposed that treatment and attenuation for the proposed developed area, "Site-Post" (0.70-acres) will occur in a single dry retention system, located on the southern property boundary between the proposed building and the Levy Road right-of-way. The treatment volume is designed to percolate into the ground and an outlet control structure with an overflow weir is

used to discharge the remaining volume into a ditch that runs along Levy Road which ultimately discharges into the Intracoastal Waterway.

All runoff from "Site-Post" will be collected and conveyed to the underground retention system through a network of piped flow. The stormwater management facility is designed to treat and attenuate stormwater runoff for the 25-year-24-hour rainfall event by criteria set forth by the St. Johns River Management District (SJRWMD) rule criteria; stormwater calculations have been included to show compliance with COAB and SJRWMD requirements. A peaking factor of 484 is utilized in order to best reflect the proposed site condition.

FEMA FLOOD ZONE

The developed area of the site will not impact the 100-yr floodplain.

TAILWATER CONDITIONS

Tailwater condition is based upon the inverts of a drainage pipe in the ditch located downstream on Levy Road to the southwest of the property. The elevations were collected through survey data, site visits and personal inspection.

SEASONAL HIGH & LOW WATER TABLE

Based upon the Geotechnical report provided by Robert K. Phillips, P.E. the groundwater table and the seasonal high groundwater table were found to be located around 4.5' and 4.0 below the ground surface. The Geotechnical Investigation Report is included with this submittal.

PERCOLATION / RECOVERY CALCULATIONS

To achieve the SJRWMD's criteria for treatment volume recovery (full recovery within 72 hours following a storm event) the stormwater management system was designed per the SJRWMD's rule criteria. A percolation analysis was conducted using ICPR, with hydraulic conductivity data obtained through MDM Services, Inc. geotechnical report, in order to demonstrate the drawdown of the treatment volume in the stormwater management facility within 72 hours. Please see attached drainage calcs and geotechnical investigation reports.

DESIGN ANALYSIS

The drainage calculations demonstrate that the required stormwater treatment for dry detention systems and control structures have been designed to provide the required treatment for the respective drainage areas. Stormwater Calculations and a Pre and Post Analysis are included with this submittal.

In the following sections, the drainage calculations for the SMF-1 provide the weighted curve number, time of concentration, and stormwater management facility treatment volume along with Pre / Post and drawdown models. The hydrologic modeling for this system was accomplished using standard SCS runoff procedures and ICPR version 3.10. The system has been designed and

modeled to provide the required treatment and attenuation for these drainage areas. The control structures have been sized so that discharge rates from each basin during the Mean Annual, 10-Year, 25-Year, and 100-Year 24-hour storm events are maintained or reduced from the pre-developed conditions.

WETLAND IMPACTS

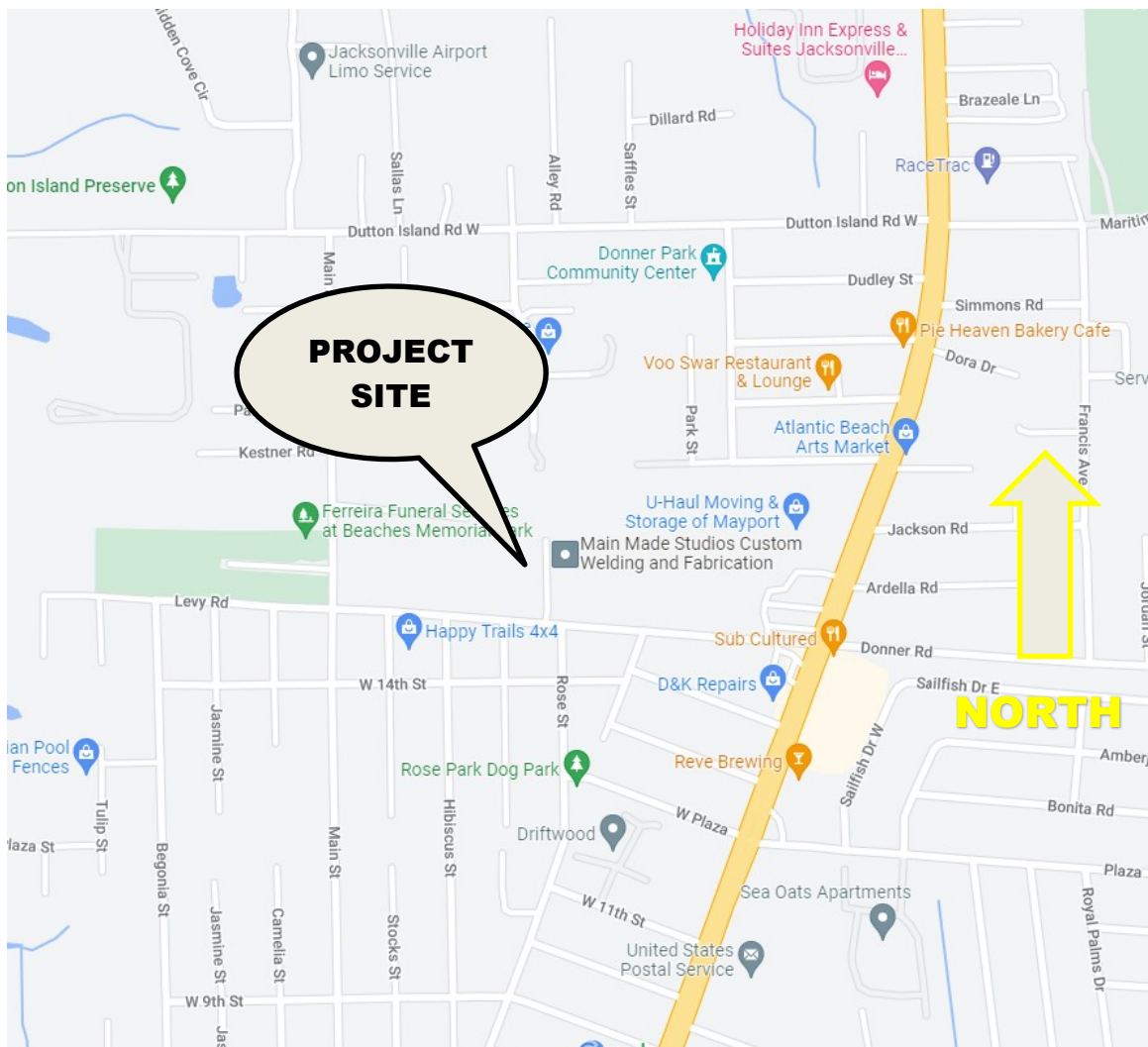
There are no wetland impacts associated with this permit application.

Section 1.2

Project Maps

Vicinity Map

Not to scale

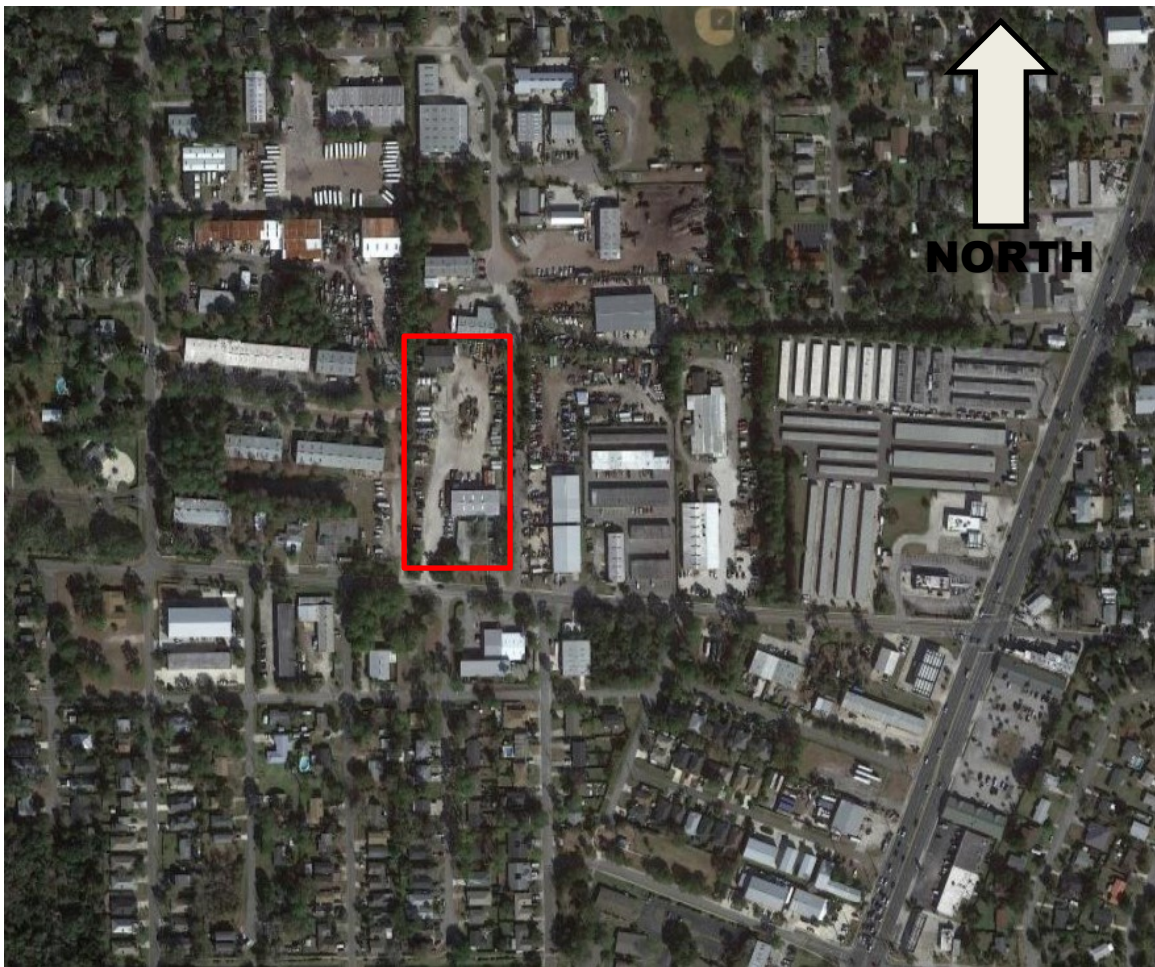


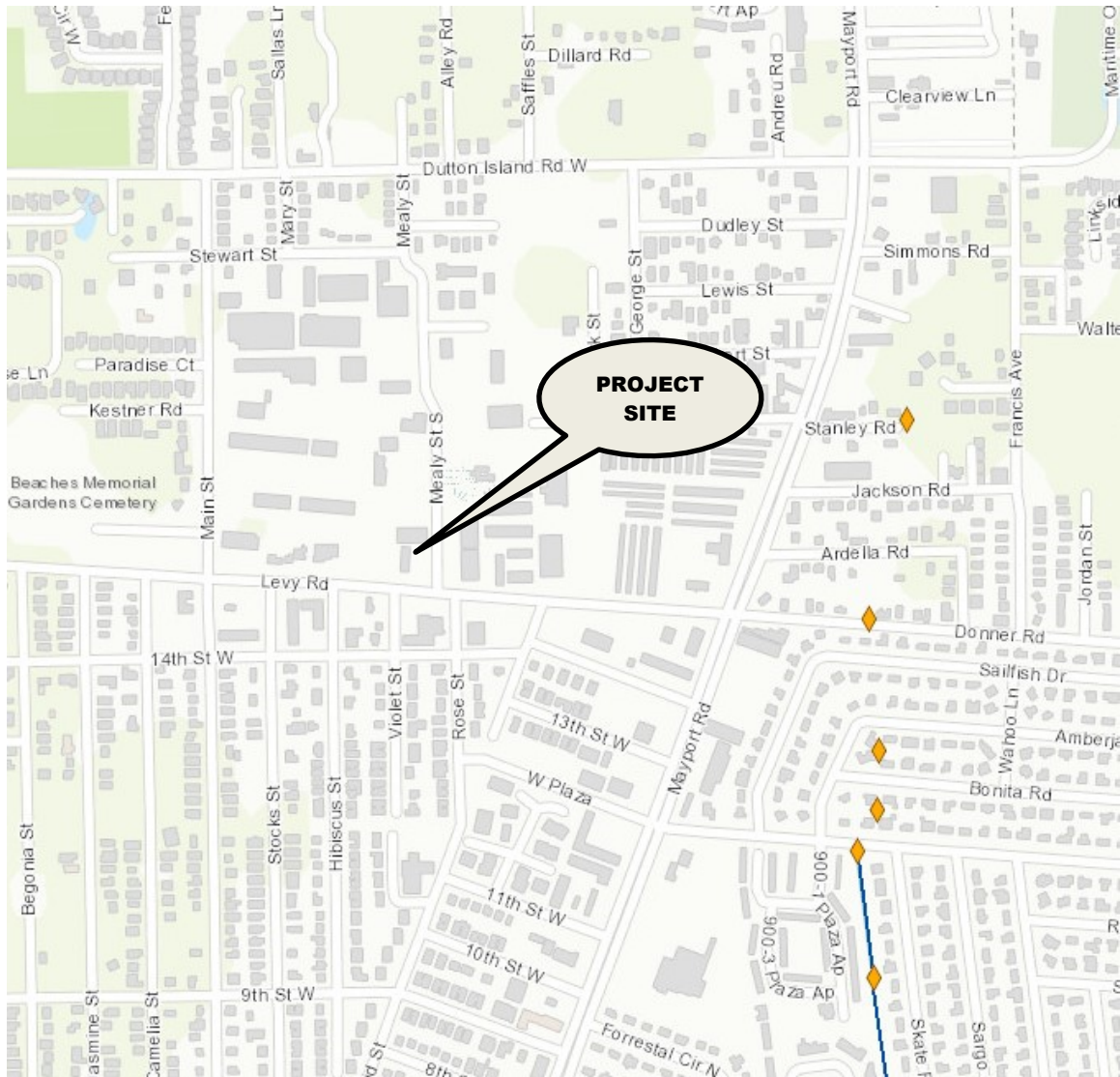
Levy Road - Commercial

Atlantic Beach, Florida 32233

Aerial Map

Not to scale





COJ MSMP Map

Not to scale

Section 2

DRAINAGE

CALCULATIONS

Section 2.1

Stormwater Summary

LEVY ROAD - COMMERCIAL**STORMWATER SUMMARY**

24-HR Design Storms (in):

	MEAN	10-YR	25-YR	100-YR
Source				
SJ88-3	5.1	7.3	9.6	13.0

Peak Stages (ft)(NAVD):

	BOT	MEAN	10-YR	25-YR	100-YR	T.O.P.
Rainstore3	9.00	11.67	11.90	11.99	12.07	12.00

Peak Discharge Comparisons (cfs):

	Pre	Post	Pre	Post	Pre	Post
	Mean	Mean	10-YR	10-YR	25-YR	25-YR
OUTFALL	2.15	0.54	3.18	2.60	4.24	4.23

Section 2.2

Curve Number and Time of Concentration

LEVY ROAD - COMMERCIAL
CURVE NUMBER & TIME OF CONCENTRATION
PRE-DEVELOPMENT DRAINAGE AREAS

DESCRIPTION: **Site Predeveloped Conditions** 30,348 SF
 BASIN NAME: **PreA** 0.70 ac.
 NODE NAME: **BndyA** K = 323

CN:

SF	Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
		32 - Leon Fine Sand 0 to 2 % Slopes	A/D			
		71 - Urban Land-Leon-Boulogne Complex	A/D			
18,400	0.42	Impervious	D	98	60.6%	59.4
11,948	0.27	Open Space - Fair	D	84	39.4%	33.1
					100.0%	

Area: 0.70 OK

Weighted SCS CN = 92.49

SAY **92.5**

T_c:

Total Flow Length	106 ft	Upstream Invert (ft)	Downstream Invert (ft)
Overland Flow Length	100 ft	12.3	11
Shallow Conc. Length	6 ft	11	9.54

Overland Flow Calculations:

$$T_t = (0.007 * (nL)^{0.8}) / (P^{0.5} * S^{0.4})$$

$$P = 4.81 \quad (2yr \ 24 \ hr \ Rain \ Amount) \ inches$$

Overland Flow Length	L (feet)	100	
Upstream Elevation	ft	12.3	
Downstream Elevation	ft	11.0	
Overland Flow Slope	(ft/ft)	0.0130	
Overland Manning's Coefficient	"n"	0.01	Gravel
Overland Flow Time	T _t (hr)	0.02	
	T _t (min)	1.1	

Shallow Conc. Flow:

$$\text{Unpaved: } V = 16.1345 * S^{0.5}$$

$$\text{Paved: } V = 20.3282 * S^{0.5}$$

Shallow Conc. Flow Length	L (feet)	6	
Shallow Conc. Surface (P or U)		U	
Upstream Elevation	ft	11.0	
Downstream Elevation	ft	9.54	
Shallow Conc. Flow Slope	(ft/ft)	0.2433	
Shallow Conc. Flow Velocity	(fps)	7.96	
Shallow Conc. Flow Time	T _t (sec)	0.75	
	T _t (min)	0.01	

Total Time of Concentration T_t (min) 1.10

USE MINIMUM OF **10** MIN

LEVY ROAD - COMMERCIAL

CURVE NUMBER & TIME OF CONCENTRATION POST-DEVELOPMENT DRAINAGE AREAS

DESCRIPTION: **Proposed On-Site Development** 30,348 SF
BASIN NAME: **Site Post** 0.70 ac.
NODE NAME: **SMF1** K = 484

CN:

<u>SF</u>	<u>Ac.</u>	<u>Land Cover</u>	<u>Soil Type</u>	<u>SCS CN</u>	<u>%</u>	<u>Weight %</u>
		32 - Leon Fine Sand 0 to 2 % Slopes	A/D			
		71 - Urban Land-Leon-Boulogne complex	A/D			
23,200	0.53	Impervious (building, pvmt, etc)	D	98	76.4%	74.9
7,148	0.16	Open Space - Fair	D	84	23.6%	19.8
					100.0%	

Area: 0.70 OK

Weighted SCS CN = 94.70

SAY **95**

T_c:

SAY 10 MIN

Section 2.3

Treatment Volume Calculations

LEVY ROAD - COMMERCIAL

SMF-1 Dry Retention

	Elev	Area		Volume (Cumulative)	
	NAVD 88	(SF)	(Ac)	(CF)	(Ac-Ft)
TOP	12.00	2,330	0.053	4,762	0.109
	11.00	1,821	0.042	2,687	0.062
	10.00	1,337	0.031	1,108	0.025
BOT	9.00	878	0.020	-	-

LEVY ROAD - COMMERCIAL

TREATMENT VOLUME CALCULATIONS

SMF-1 Dry Retention

<u>Drainage Area</u>	<u>SF</u>	<u>Acreage</u>
Impervious	23,200	0.53
Pervious	7,148	0.16
Total Area	30,348	0.70

TREATMENT VOLUME REQUIRED (On-Line Retention):

0.5" Over Entire Site: $(\text{Total Area} \times 0.5") / (12"/\text{ft}) =$ 0.029 Ac-ft

or, 1.25" Over Impervious Area: $(\text{Impervious Area})(1.25") / (12"/\text{ft}) =$ 0.055 Ac-ft

, whichever is greater, plus

an additional 0.5" Over Entire Site $(\text{Total Area} \times 0.5") / (12"/\text{ft}) =$ 0.029 Ac-ft

From Pond Configuration:

Use	0.085	Ac-ft
Weir Elevation =	11.48	Ft
SAY 11.50 Ft		

Section 2.4

ICPR Analysis

Section 2.4.1

Nodal Diagram

Levy Road - Commercial
Nodal Diagram

Nodes

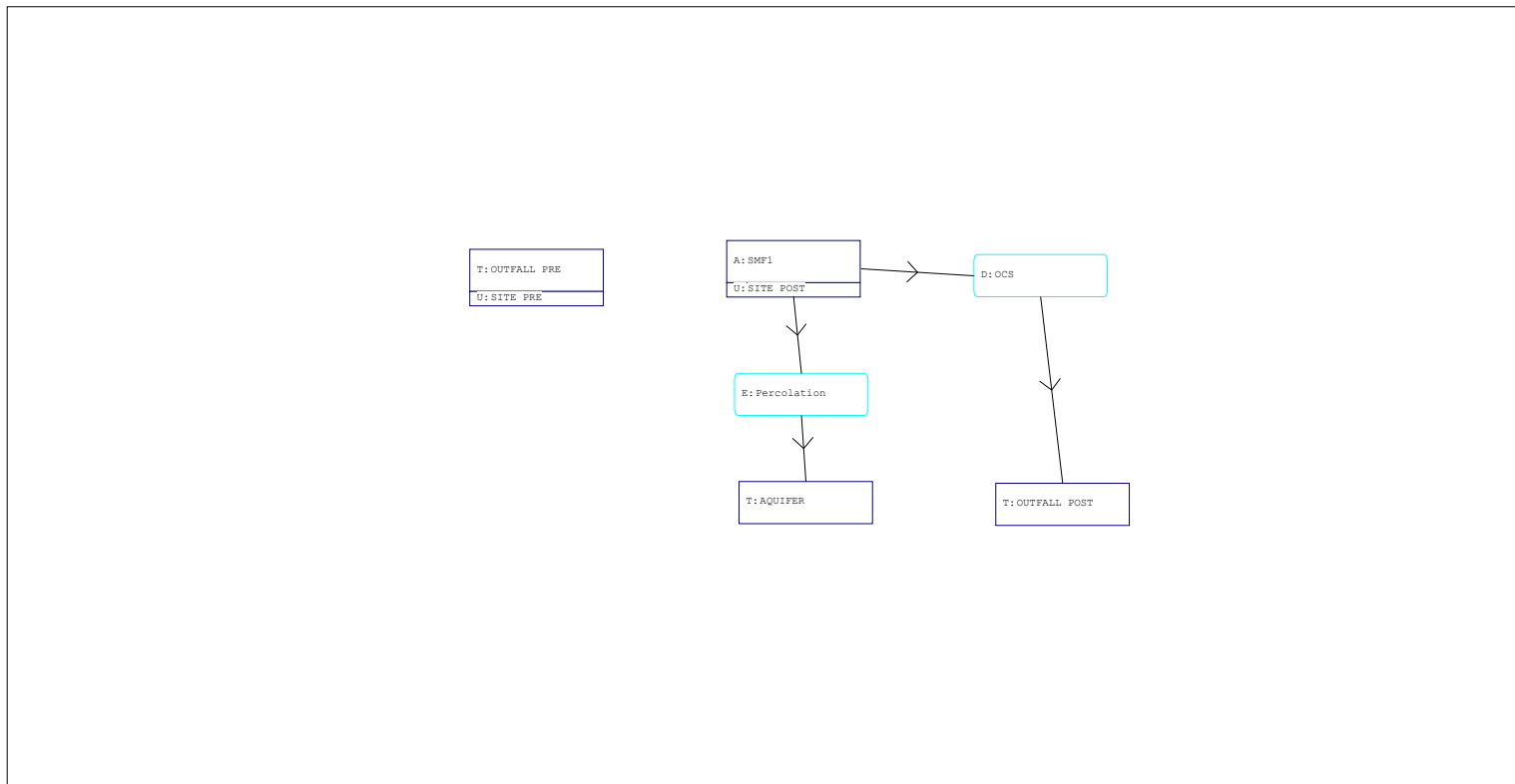
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins

O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links

P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Section 2.4.2

Input Summary

Levy Road - Commercial
Input Summary

==== Basins =====

Name: SITE POST	Node: SMF1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 0.700	Time Shift(hrs): 0.00	
Curve Number: 95.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: SITE PRE	Node: OUTFALL PRE	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh323	Peaking Factor: 323.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 10.00	
Area(ac): 0.700	Time Shift(hrs): 0.00	
Curve Number: 92.50	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

==== Nodes =====

Name: AQUIFER	Base Flow(cfs): 0.000	Init Stage(ft): 8.000
Group: BASE		Warn Stage(ft): 9.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	8.000
96.00	8.000

Name: OUTFALL POST	Base Flow(cfs): 0.000	Init Stage(ft): 9.540
Group: BASE		Warn Stage(ft): 999.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	9.540
12.00	10.000
24.00	9.540

Name: OUTFALL PRE	Base Flow(cfs): 0.000	Init Stage(ft): 9.540
Group: BASE		Warn Stage(ft): 999.000
Type: Time/Stage		

Time(hrs)	Stage(ft)
0.00	9.540
12.00	10.000
24.00	9.540

EcomRadial
 Input Summary

Name: SMF1	Base Flow(cfs): 0.000	Init Stage(ft): 9.000
Group: BASE		Warn Stage(ft): 12.000
Type: Stage/Area		

Stage(ft)	Area(ac)
9.000	0.0200
10.000	0.0310
11.000	0.0420
12.000	0.0530

=====
 Drop Structures
 =====

Name: OCS	From Node: SMF1	Length(ft): 50.00
Group: BASE	To Node: OUTFALL POST	Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 15.00	15.00	Flow: Positive
Rise(in): 15.00	15.00	Entrance Loss Coef: 0.000
Invert(ft): 9.700	9.600	Exit Loss Coef: 1.000
Manning's N: 0.011000	0.011000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure OCS ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 30.00	Invert(ft): 11.500	
Rise(in): 999.00	Control Elev(ft): 11.500	

*** Weir 2 of 2 for Drop Structure OCS ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 24.00	Invert(ft): 11.800	
Rise(in): 12.00	Control Elev(ft): 11.800	

=====
 Percolation Links
 =====

Name: Percolation	From Node: SMF1	Flow: Both
Group: BASE	To Node: AQUIFER	Count: 1

Surface Area Option: Use 1st Point in Stage/Area Table	
Vertical Flow Termination: Horizontal Flow Algorithm	
Aquifer Base Elev(ft): -2.000	Perimeter 1(ft): 222.000

Levy Road
Input Summary

Water Table Elev(ft): 8.000	Perimeter 2(ft): 536.000
Ann Recharge Rate(in/year): 0.000	Perimeter 3(ft): 3363.000
Horiz Conductivity(ft/day): 50.580	Distance 1 to 2(ft): 50.000
Vert Conductivity(ft/day): 16.860	Distance 2 to 3(ft): 450.000
Effective Porosity(dec): 0.200	Num Cells 1 to 2: 10
Suction Head(in): 0.000	Num Cells 2 to 3: 45
Layer Thickness(ft): 10.000	

==== Hydrology Simulations =====

Name: 100YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 13.00

Time(hrs)	Print Inc(min)
24.000	15.00

Name: 10YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\10YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 7.30

Time(hrs)	Print Inc(min)
24.000	15.00

Name: 25YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\25YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 9.60

Time(hrs)	Print Inc(min)
24.000	15.00

Name: MEAN-ANN
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\MEAN-ANN.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 5.10

Time(hrs)	Print Inc(min)
24.000	15.00

==== Routing Simulations =====

Levy Road - Commercial
Input Summary

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\100YR-24HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	15.000

Group	Run
BASE	Yes

Name: 10YR-24HR Hydrology Sim: 10YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\10YR-24HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	15.000

Group	Run
BASE	Yes

Name: 25YR-24HR Hydrology Sim: 25YR-24HR
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\25YR-24HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 96.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	15.000
96.000	30.000

Group	Run
BASE	Yes

Levy Road - Commercial
Input Summary

Name: MEAN-ANN Hydrology Sim: MEAN-ANN
Filename: P:\AE Projects\2022\22-41 Levy Road - Commercial\Calcs\Old\MEAN-ANN.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	15.000

Group	Run
BASE	Yes

Section 2.4.3

Basin Summary

Levy Road - Commercial
Basin Summary

Name: SITE POST	SITE PRE	SITE POST	SITE PRE	SITE POST
Group: BASE	BASE	BASE	BASE	BASE
Simulation: 100YR-24HR	100YR-24HR	10YR-24HR	10YR-24HR	25YR-24HR
Node: SMF1	OUTFALL PRE	SMF1	OUTFALL PRE	SMF1
Type: SCS	SCS	SCS	SCS	SCS
Unit Hydrograph: Uh484	Uh323	Uh484	Uh323	Uh484
Peaking Factor: 484.0	323.0	484.0	323.0	484.0
Spec Time Inc(min): 1.33	1.33	1.33	1.33	1.33
Comp Time Inc(min): 1.33	1.33	1.33	1.33	1.33
Rain File: Flmod	Flmod	Flmod	Flmod	Flmod
Rain Amount(in): 13.000	13.000	7.300	7.300	9.600
Duration(hrs): 24.00	24.00	24.00	24.00	24.00
Status: Onsite	Onsite	Onsite	Onsite	Onsite
TC(min): 10.00	10.00	10.00	10.00	10.00
Time Shift(hrs): 0.00	0.00	0.00	0.00	0.00
Area(ac): 0.700	0.700	0.700	0.700	0.700
Vol of Unit Hyd(in): 1.001	1.001	1.001	1.001	1.001
Curve Num: 95.000	92.500	95.000	92.500	95.000
DCIA(%): 0.000	0.000	0.000	0.000	0.000
Time Max(hrs): 12.00	12.02	12.02	12.02	12.02
Flow Max(cfs): 6.62	5.89	3.68	3.23	4.87
Runoff Volume(in): 12.373	12.080	6.695	6.412	8.984
Runoff Volume(ft3): 31439	30696	17013	16294	22828

Name: SITE PRE	SITE POST	SITE PRE
Group: BASE	BASE	BASE
Simulation: 25YR-24HR	MEAN-ANN	MEAN-ANN
Node: OUTFALL PRE	SMF1	OUTFALL PRE
Type: SCS	SCS	SCS
Unit Hydrograph: Uh323	Uh484	Uh323
Peaking Factor: 323.0	484.0	323.0
Spec Time Inc(min): 1.33	1.33	1.33
Comp Time Inc(min): 1.33	1.33	1.33
Rain File: Flmod	Flmod	Flmod
Rain Amount(in): 9.600	5.100	5.100
Duration(hrs): 24.00	24.00	24.00
Status: Onsite	Onsite	Onsite
TC(min): 10.00	10.00	10.00
Time Shift(hrs): 0.00	0.00	0.00
Area(ac): 0.700	0.700	0.700
Vol of Unit Hyd(in): 1.001	1.001	1.001
Curve Num: 92.500	95.000	92.500
DCIA(%): 0.000	0.000	0.000
Time Max(hrs): 12.02	12.02	12.02
Flow Max(cfs): 4.31	2.54	2.19
Runoff Volume(in): 8.695	4.513	4.243
Runoff Volume(ft3): 22094	11466	10782

Section 2.4.4

25 Year Node

Time Series

Levy Road - Commercial
25-Year Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	0.00	9.00	12.00	871	0.00	0.00	0.0	0.0
25YR-24HR	SMF1	BASE	0.26	9.00	12.00	871	0.00	0.00	0.0	0.0
25YR-24HR	SMF1	BASE	0.50	9.00	12.00	871	0.00	0.00	0.0	0.0
25YR-24HR	SMF1	BASE	0.77	9.00	12.00	871	0.00	0.00	0.0	0.0
25YR-24HR	SMF1	BASE	1.02	9.00	12.00	871	0.00	0.00	0.0	0.0
25YR-24HR	SMF1	BASE	1.27	9.00	12.00	871	0.01	0.01	0.0	0.0
25YR-24HR	SMF1	BASE	1.52	9.00	12.00	871	0.02	0.02	0.0	0.0
25YR-24HR	SMF1	BASE	1.77	9.00	12.00	872	0.02	0.02	0.0	0.0
25YR-24HR	SMF1	BASE	2.02	9.00	12.00	872	0.03	0.03	0.0	0.0
25YR-24HR	SMF1	BASE	2.27	9.00	12.00	872	0.04	0.04	0.0	0.0
25YR-24HR	SMF1	BASE	2.52	9.00	12.00	872	0.04	0.04	0.0	0.0
25YR-24HR	SMF1	BASE	2.77	9.00	12.00	872	0.05	0.05	0.0	0.0
25YR-24HR	SMF1	BASE	3.02	9.00	12.00	872	0.05	0.05	0.0	0.0
25YR-24HR	SMF1	BASE	3.27	9.00	12.00	872	0.06	0.06	0.0	0.0
25YR-24HR	SMF1	BASE	3.52	9.00	12.00	872	0.06	0.06	0.0	0.0
25YR-24HR	SMF1	BASE	3.77	9.00	12.00	872	0.07	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	4.02	9.00	12.00	872	0.07	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	4.27	9.00	12.00	873	0.08	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	4.52	9.01	12.00	874	0.08	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	4.77	9.01	12.00	878	0.09	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	5.02	9.03	12.00	884	0.09	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	5.27	9.05	12.00	893	0.09	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	5.52	9.07	12.00	904	0.10	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	5.77	9.09	12.00	915	0.10	0.07	0.0	0.0
25YR-24HR	SMF1	BASE	6.02	9.11	12.00	926	0.10	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	6.27	9.15	12.00	942	0.12	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	6.52	9.18	12.00	959	0.12	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	6.77	9.22	12.00	977	0.12	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	7.02	9.26	12.00	994	0.12	0.08	0.0	0.0
25YR-24HR	SMF1	BASE	7.27	9.30	12.00	1014	0.14	0.09	0.0	0.0
25YR-24HR	SMF1	BASE	7.52	9.34	12.00	1036	0.14	0.09	0.0	0.0
25YR-24HR	SMF1	BASE	7.77	9.39	12.00	1057	0.15	0.09	0.0	0.0
25YR-24HR	SMF1	BASE	8.02	9.43	12.00	1078	0.15	0.10	0.0	0.0
25YR-24HR	SMF1	BASE	8.27	9.48	12.00	1102	0.17	0.10	0.0	0.0
25YR-24HR	SMF1	BASE	8.52	9.54	12.00	1128	0.18	0.11	0.1	0.0
25YR-24HR	SMF1	BASE	8.77	9.60	12.00	1158	0.20	0.11	0.1	0.0
25YR-24HR	SMF1	BASE	9.02	9.66	12.00	1189	0.20	0.12	0.1	0.0
25YR-24HR	SMF1	BASE	9.27	9.73	12.00	1221	0.21	0.12	0.1	0.0
25YR-24HR	SMF1	BASE	9.52	9.80	12.00	1253	0.22	0.13	0.1	0.1
25YR-24HR	SMF1	BASE	9.75	9.87	12.00	1287	0.25	0.13	0.1	0.1
25YR-24HR	SMF1	BASE	10.01	9.95	12.00	1327	0.26	0.14	0.1	0.1
25YR-24HR	SMF1	BASE	10.25	10.04	12.00	1372	0.32	0.15	0.1	0.1
25YR-24HR	SMF1	BASE	10.51	10.15	12.00	1423	0.33	0.16	0.1	0.1
25YR-24HR	SMF1	BASE	10.75	10.27	12.00	1482	0.41	0.18	0.1	0.1
25YR-24HR	SMF1	BASE	11.00	10.41	12.00	1546	0.42	0.19	0.1	0.1
25YR-24HR	SMF1	BASE	11.26	10.55	12.00	1612	0.46	0.20	0.1	0.1

LeCommodial
25-Year Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	11.50	10.77	12.00	1721	0.85	0.25	0.1	0.1
25YR-24HR	SMF1	BASE	11.75	11.49	12.00	2063	2.83	0.46	0.2	0.1
25YR-24HR	SMF1	BASE	12.00	11.98	12.00	2300	4.83	4.61	0.2	0.1
25YR-24HR	SMF1	BASE	12.25	11.88	12.00	2252	2.27	2.63	0.3	0.2
25YR-24HR	SMF1	BASE	12.50	11.77	12.00	2198	1.02	1.36	0.4	0.3
25YR-24HR	SMF1	BASE	12.75	11.67	12.00	2151	0.59	0.78	0.4	0.3
25YR-24HR	SMF1	BASE	13.01	11.62	12.00	2126	0.46	0.54	0.4	0.3
25YR-24HR	SMF1	BASE	13.26	11.59	12.00	2114	0.38	0.43	0.4	0.3
25YR-24HR	SMF1	BASE	13.51	11.58	12.00	2108	0.37	0.39	0.4	0.3
25YR-24HR	SMF1	BASE	13.76	11.57	12.00	2102	0.30	0.34	0.4	0.3
25YR-24HR	SMF1	BASE	14.01	11.56	12.00	2098	0.29	0.31	0.4	0.3
25YR-24HR	SMF1	BASE	14.26	11.55	12.00	2094	0.26	0.28	0.4	0.3
25YR-24HR	SMF1	BASE	14.51	11.55	12.00	2091	0.25	0.26	0.4	0.3
25YR-24HR	SMF1	BASE	14.76	11.54	12.00	2088	0.22	0.24	0.4	0.3
25YR-24HR	SMF1	BASE	15.01	11.53	12.00	2085	0.22	0.22	0.4	0.3
25YR-24HR	SMF1	BASE	15.26	11.53	12.00	2083	0.20	0.21	0.4	0.3
25YR-24HR	SMF1	BASE	15.51	11.53	12.00	2082	0.20	0.21	0.4	0.4
25YR-24HR	SMF1	BASE	15.76	11.52	12.00	2080	0.18	0.19	0.4	0.4
25YR-24HR	SMF1	BASE	16.01	11.52	12.00	2078	0.17	0.18	0.4	0.4
25YR-24HR	SMF1	BASE	16.26	11.51	12.00	2076	0.16	0.17	0.5	0.4
25YR-24HR	SMF1	BASE	16.51	11.51	12.00	2074	0.16	0.17	0.5	0.4
25YR-24HR	SMF1	BASE	16.76	11.51	12.00	2072	0.15	0.16	0.5	0.4
25YR-24HR	SMF1	BASE	17.01	11.50	12.00	2070	0.15	0.16	0.5	0.4
25YR-24HR	SMF1	BASE	17.26	11.50	12.00	2069	0.15	0.15	0.5	0.4
25YR-24HR	SMF1	BASE	17.51	11.50	12.00	2068	0.15	0.15	0.5	0.4
25YR-24HR	SMF1	BASE	17.76	11.49	12.00	2065	0.12	0.15	0.5	0.4
25YR-24HR	SMF1	BASE	18.01	11.48	12.00	2060	0.12	0.14	0.5	0.4
25YR-24HR	SMF1	BASE	18.26	11.47	12.00	2057	0.13	0.14	0.5	0.4
25YR-24HR	SMF1	BASE	18.51	11.47	12.00	2055	0.13	0.14	0.5	0.4
25YR-24HR	SMF1	BASE	18.76	11.46	12.00	2051	0.11	0.14	0.5	0.4
25YR-24HR	SMF1	BASE	19.01	11.45	12.00	2045	0.11	0.14	0.5	0.4
25YR-24HR	SMF1	BASE	19.26	11.44	12.00	2040	0.12	0.13	0.5	0.4
25YR-24HR	SMF1	BASE	19.51	11.43	12.00	2038	0.12	0.13	0.5	0.4
25YR-24HR	SMF1	BASE	19.76	11.43	12.00	2034	0.11	0.13	0.5	0.4
25YR-24HR	SMF1	BASE	20.01	11.42	12.00	2029	0.11	0.13	0.5	0.4
25YR-24HR	SMF1	BASE	20.26	11.40	12.00	2023	0.10	0.13	0.5	0.4
25YR-24HR	SMF1	BASE	20.51	11.39	12.00	2017	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	20.76	11.38	12.00	2011	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	21.01	11.37	12.00	2005	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	21.26	11.36	12.00	2000	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	21.51	11.34	12.00	1995	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	21.76	11.33	12.00	1990	0.09	0.12	0.5	0.4
25YR-24HR	SMF1	BASE	22.01	11.33	12.00	1986	0.09	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	22.26	11.32	12.00	1981	0.09	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	22.51	11.31	12.00	1977	0.09	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	22.76	11.30	12.00	1972	0.08	0.11	0.5	0.4

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Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	23.01	11.28	12.00	1966	0.08	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	23.26	11.27	12.00	1960	0.08	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	23.51	11.26	12.00	1955	0.08	0.11	0.5	0.4
25YR-24HR	SMF1	BASE	23.76	11.25	12.00	1948	0.07	0.10	0.5	0.4
25YR-24HR	SMF1	BASE	24.01	11.23	12.00	1940	0.00	0.10	0.5	0.4
25YR-24HR	SMF1	BASE	24.26	11.19	12.00	1919	0.00	0.09	0.5	0.5
25YR-24HR	SMF1	BASE	24.76	11.11	12.00	1881	0.00	0.08	0.5	0.5
25YR-24HR	SMF1	BASE	25.26	11.03	12.00	1845	0.00	0.07	0.5	0.5
25YR-24HR	SMF1	BASE	25.76	10.96	12.00	1812	0.00	0.07	0.5	0.5
25YR-24HR	SMF1	BASE	26.26	10.90	12.00	1781	0.00	0.06	0.5	0.5
25YR-24HR	SMF1	BASE	26.76	10.84	12.00	1751	0.00	0.06	0.5	0.5
25YR-24HR	SMF1	BASE	27.26	10.78	12.00	1723	0.00	0.06	0.5	0.5
25YR-24HR	SMF1	BASE	27.76	10.72	12.00	1696	0.00	0.05	0.5	0.5
25YR-24HR	SMF1	BASE	28.26	10.67	12.00	1670	0.00	0.05	0.5	0.5
25YR-24HR	SMF1	BASE	28.76	10.62	12.00	1645	0.00	0.05	0.5	0.5
25YR-24HR	SMF1	BASE	29.26	10.57	12.00	1621	0.00	0.04	0.5	0.5
25YR-24HR	SMF1	BASE	29.76	10.52	12.00	1599	0.00	0.04	0.5	0.5
25YR-24HR	SMF1	BASE	30.26	10.47	12.00	1577	0.00	0.04	0.5	0.5
25YR-24HR	SMF1	BASE	30.76	10.43	12.00	1556	0.00	0.04	0.5	0.5
25YR-24HR	SMF1	BASE	31.26	10.39	12.00	1535	0.00	0.04	0.5	0.5
25YR-24HR	SMF1	BASE	31.76	10.34	12.00	1516	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	32.26	10.31	12.00	1497	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	32.76	10.27	12.00	1479	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	33.26	10.23	12.00	1461	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	33.76	10.20	12.00	1444	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	34.26	10.16	12.00	1428	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	34.76	10.13	12.00	1412	0.00	0.03	0.5	0.5
25YR-24HR	SMF1	BASE	35.26	10.10	12.00	1396	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	35.76	10.06	12.00	1381	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	36.26	10.03	12.00	1367	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	36.76	10.01	12.00	1353	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	37.26	9.98	12.00	1339	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	37.76	9.95	12.00	1326	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	38.26	9.92	12.00	1313	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	38.76	9.90	12.00	1301	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	39.26	9.87	12.00	1289	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	39.76	9.85	12.00	1277	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	40.26	9.82	12.00	1265	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	40.76	9.80	12.00	1254	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	41.26	9.78	12.00	1244	0.00	0.02	0.5	0.5
25YR-24HR	SMF1	BASE	41.76	9.75	12.00	1233	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	42.26	9.73	12.00	1223	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	42.76	9.71	12.00	1213	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	43.26	9.69	12.00	1203	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	43.76	9.67	12.00	1193	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	44.26	9.65	12.00	1184	0.00	0.01	0.5	0.5

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Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	44.76	9.63	12.00	1175	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	45.26	9.62	12.00	1166	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	45.76	9.60	12.00	1157	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	46.26	9.58	12.00	1149	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	46.76	9.56	12.00	1141	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	47.26	9.55	12.00	1133	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	47.76	9.53	12.00	1125	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	48.26	9.51	12.00	1117	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	48.76	9.50	12.00	1110	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	49.26	9.48	12.00	1102	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	49.76	9.47	12.00	1095	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	50.26	9.45	12.00	1088	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	50.76	9.44	12.00	1081	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	51.26	9.42	12.00	1074	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	51.76	9.41	12.00	1067	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	52.26	9.40	12.00	1061	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	52.76	9.38	12.00	1055	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	53.26	9.37	12.00	1048	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	53.76	9.36	12.00	1042	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	54.26	9.34	12.00	1036	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	54.76	9.33	12.00	1030	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	55.26	9.32	12.00	1024	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	55.76	9.31	12.00	1019	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	56.26	9.30	12.00	1013	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	56.76	9.28	12.00	1008	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	57.26	9.27	12.00	1002	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	57.76	9.26	12.00	997	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	58.26	9.25	12.00	992	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	58.76	9.24	12.00	986	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	59.26	9.23	12.00	981	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	59.76	9.22	12.00	976	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	60.26	9.21	12.00	972	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	60.76	9.20	12.00	967	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	61.26	9.19	12.00	962	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	61.76	9.18	12.00	957	0.00	0.01	0.5	0.5
25YR-24HR	SMF1	BASE	62.26	9.17	12.00	953	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	62.76	9.16	12.00	948	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	63.26	9.15	12.00	944	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	63.76	9.14	12.00	940	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	64.26	9.13	12.00	935	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	64.76	9.13	12.00	931	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	65.26	9.12	12.00	927	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	65.76	9.11	12.00	923	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	66.26	9.10	12.00	919	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	66.76	9.09	12.00	915	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	67.26	9.08	12.00	911	0.00	0.00	0.5	0.5

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Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	67.76	9.08	12.00	907	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	68.26	9.07	12.00	903	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	68.76	9.06	12.00	900	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	69.26	9.05	12.00	896	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	69.76	9.04	12.00	892	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	70.26	9.04	12.00	889	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	70.76	9.03	12.00	885	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	71.26	9.02	12.00	882	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	71.76	9.01	12.00	878	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	72.26	9.01	12.00	875	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	72.76	9.00	12.00	872	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	73.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	73.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	74.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	74.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	75.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	75.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	76.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	76.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	77.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	77.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	78.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	78.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	79.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	79.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	80.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	80.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	81.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	81.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	82.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	82.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	83.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	83.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	84.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	84.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	85.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	85.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	86.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	86.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	87.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	87.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	88.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	88.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	89.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	89.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	90.26	9.00	12.00	871	0.00	0.00	0.5	0.5

Levy Road - Commercial
25-Year Node Time Series

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
25YR-24HR	SMF1	BASE	90.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	91.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	91.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	92.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	92.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	93.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	93.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	94.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	94.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	95.26	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	95.76	9.00	12.00	871	0.00	0.00	0.5	0.5
25YR-24HR	SMF1	BASE	96.00	9.00	12.00	871	0.00	0.00	0.5	0.5

Section 2.4.5

Node Max Comparison

Levy Road - Commercial
Node Max Comparison

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
OUTFALL POST	BASE	100YR-24HR	12.00	10.00	999.00	0.0006	0	12.02	6.02	0.00	0.00
OUTFALL POST	BASE	10YR-24HR	12.00	10.00	999.00	0.0006	0	12.08	2.60	0.00	0.00
OUTFALL POST	BASE	25YR-24HR	12.00	10.00	999.00	0.0006	0	12.02	4.23	0.00	0.00
OUTFALL POST	BASE	MEAN-ANN	12.00	10.00	999.00	0.0006	0	12.34	0.54	0.00	0.00
OUTFALL PRE	BASE	100YR-24HR	12.00	10.00	999.00	0.0006	0	12.00	5.79	0.00	0.00
OUTFALL PRE	BASE	10YR-24HR	12.00	10.00	999.00	0.0006	0	12.00	3.18	0.00	0.00
OUTFALL PRE	BASE	25YR-24HR	12.00	10.00	999.00	0.0006	0	12.00	4.24	0.00	0.00
OUTFALL PRE	BASE	MEAN-ANN	12.00	10.00	999.00	0.0006	0	12.00	2.15	0.00	0.00
SMF1	BASE	100YR-24HR	12.02	12.07	12.00	0.0050	2341	12.00	6.59	12.02	6.37
SMF1	BASE	10YR-24HR	12.08	11.90	12.00	0.0050	2260	12.00	3.68	12.07	3.09
SMF1	BASE	25YR-24HR	12.02	11.99	12.00	0.0050	2302	12.00	4.86	12.02	4.66
SMF1	BASE	MEAN-ANN	12.34	11.67	12.00	0.0050	2148	12.00	2.53	12.31	0.96

Section 2.5

Support Documents

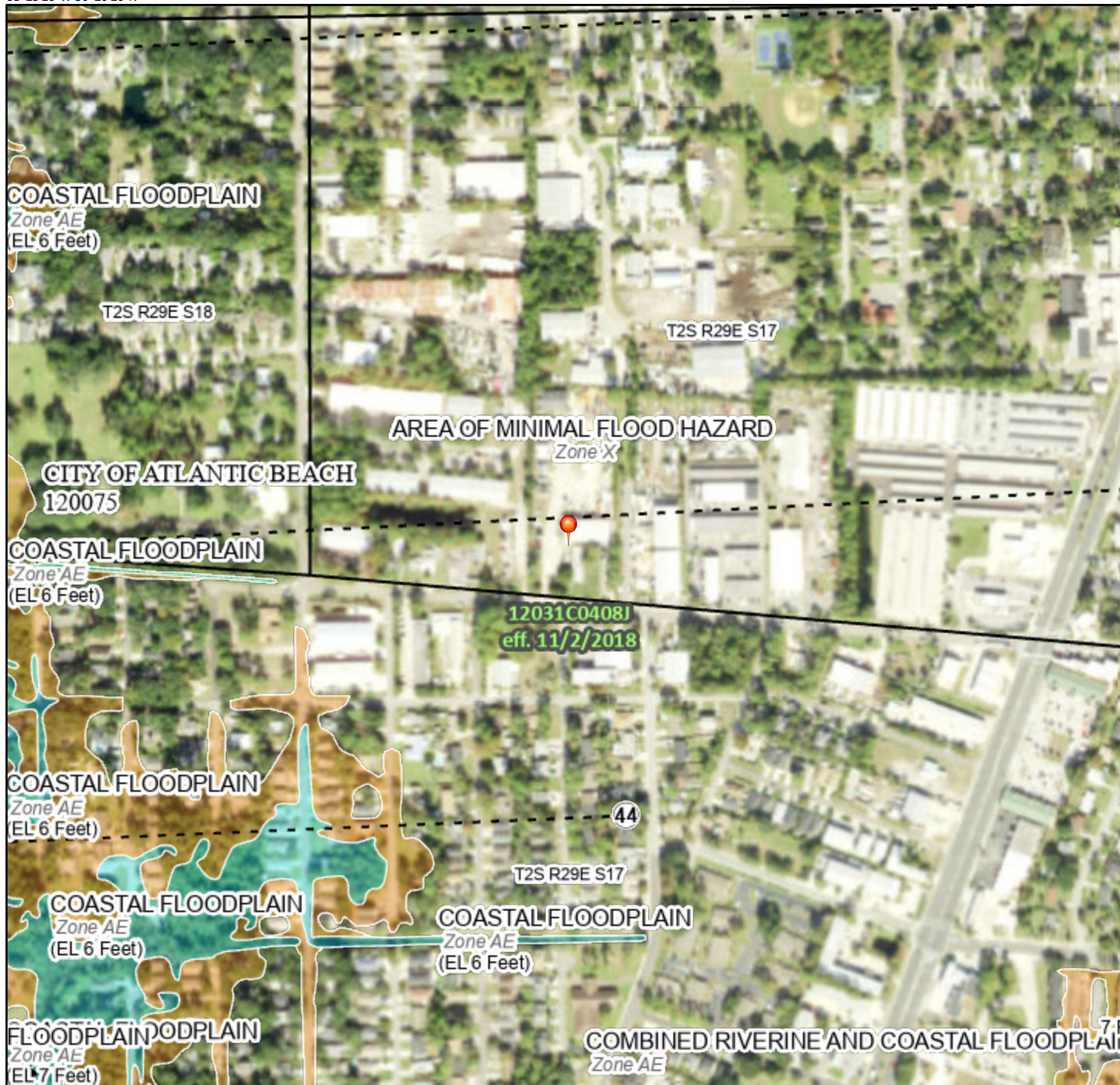
Section 2.5.1

Support Files

National Flood Hazard Layer FIRMette



81°25'28"W 30°20'26"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

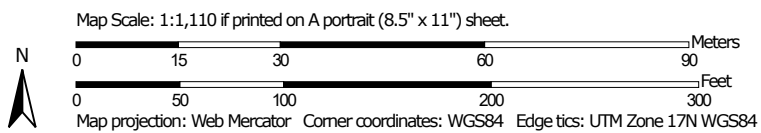
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/25/2022 at 10:23 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Duval County, Florida



Soil Map may not be valid at this scale.



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

3/24/2022
Page 1 of 3

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 1:24,000.

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: Duval County, Florida

Survey Area Data: Version 16, Sep 1, 2021

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

Date(s) aerial images were photographed: Jan 17, 2021—Jan 26, 2021

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
32	Leon fine sand, 0 to 2 percent slopes	2.4	72.1%
71	Urban land-Leon-Boulogne complex, 0 to 2 percent slopes	0.9	27.9%
Totals for Area of Interest		3.4	100.0%

Duval County, Florida

32—Leon fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxqv

Elevation: 0 to 250 feet

Mean annual precipitation: 47 to 61 inches

Mean annual air temperature: 55 to 81 degrees F

Frost-free period: 267 to 347 days

Farmland classification: Not prime farmland

Map Unit Composition

Leon, non-hydric, and similar soils: 89 percent

Minor components: 11 percent

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

Description of Leon, Non-hydric

Setting

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 8 inches: fine sand

E - 8 to 18 inches: fine sand

Bh - 18 to 37 inches: fine sand

E' - 37 to 45 inches: fine sand

B'h - 45 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

Capacity of the most limiting layer to transmit water

(Ksat): Moderately low to high (0.06 to 2.00 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 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Hydric soil rating: No

Minor Components

Leon, hydric

Percent of map unit: 5 percent

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Mascotte

Percent of map unit: 3 percent

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Mandarin

Percent of map unit: 3 percent

Landform: Rises

Landform position (three-dimensional): Rise, talf

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Duval County, Florida

Survey Area Data: Version 16, Sep 1, 2021

Duval County, Florida

71—Urban land-Leon-Boulogne complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: ssvy

Elevation: 0 to 190 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 35 percent

Leon and similar soils: 30 percent

Boulogne and similar soils: 25 percent

Minor components: 10 percent

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

Description of Urban Land

Setting

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified

Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: Unranked

Description of Leon

Setting

Landform: Flats 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 8 inches: fine sand

E - 8 to 18 inches: fine sand

Bh - 18 to 37 inches: fine sand

E' - 37 to 45 inches: fine sand

B'h - 45 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: High

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.20 to 2.00 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: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: No

Description of Boulogne

Setting

Landform: Flats 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 6 inches: fine sand

Bh - 6 to 16 inches: fine sand

E - 16 to 31 inches: fine sand

Bh1 - 31 to 39 inches: fine sand

Bh2 - 39 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 low to moderately high (0.06 to 0.20 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: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: No

Minor Components

Wesconnett

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: Yes

Evergreen

Percent of map unit: 2 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: Yes

Lynn haven

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: Yes

Rutlege, flooded

Percent of map unit: 2 percent

Landform: Flood plains on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Other vegetative classification: Forage suitability group not
assigned (G153AA999FL)

Hydric soil rating: Yes

Pottsburg, high

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Forage suitability group not
assigned (G153AA999FL)

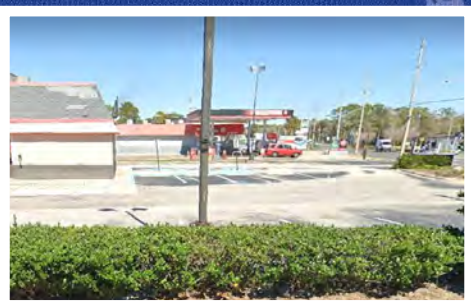
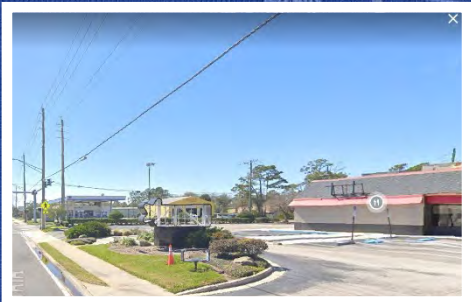
Hydric soil rating: No

Data Source Information

Soil Survey Area: Duval County, Florida

Survey Area Data: Version 16, Sep 1, 2021

Geotechnical Investigation



**Planned Car Wash Property-
Atlantic Beach
1500 Mayport Road
Atlantic Beach, Duval County, Florida**

**MDM Env. Project #210420
MDM Eng. Project #21148**

prepared for:



MDM
Services, Inc.

August 2021

Geotechnical Investigation

Planned Car Wash Property-Atlantic Beach
1500 Mayport Road
Atlantic Beach, Duval County, Florida
MDM Project #210420/Eng#21148
August 18, 2021

On July 27, 2021, MDM Services, Inc. completed four (4) standard penetration test borings (B-1 through B-4) to investigate soil conditions for proposed development of the property referenced above. The SPT borings were performed in general accordance with ASTM Standard D1586. On July 27, 2021, MDM conducted a Double-Ring Infiltration (DRI) Test, in order to evaluate drainage characteristics of site soils at the probable location of a proposed stormwater basin. The test locations are depicted on the proposed development layout on Figure 1 (Appendix A). Logs for each SPT boring are compiled in Appendix B. All depths as referenced are below the existing grade on the date of testing. Results of the DRI test are also compiled in Appendix B. Appendix C contains a map and summary report of the soil distribution on the site, as obtained from the Natural Resources Conservation Service.

Based on the Natural Resources Conservation Service soil survey for Duval County, the property is covered by Leon fine sand, 0 to 2 percent slopes (map unit 32). Leon fine sand is described as poorly drained soils that typically consist of fine sand from the ground surface to a depth of 80 inches or more. The depth to the water table is listed as 6 to 18 inches. The capacity of the most limiting soil layer to transmit water is listed as moderately low to high (0.06 to 2.00 in/hr).

From review of the four standard penetration test logs (Appendix B), the lithology at the site consists of fine-grained, poorly-graded sand extending from the ground surface to the depth limit of the investigation at 16 feet below land surface (bls). From the ground surface to a depth of 4 feet bls each boring was advanced by hand auger to clear the boring location of underground utilities. Density readings were collected in the hand cleared intervals utilizing a static hand cone penetrometer, with readings in kg/cm^2 . The boring logs portray the penetrometer reading, along with an inferred N-value using a conversion factor of $\frac{1}{4}$ of the penetrometer readings. The recorded SPT blow counts and penetrometer readings yielded N-values ranging from 4 to 100 blows per foot, indicating loose to very dense relative densities for the granular soils. The water table was encountered at approximately 3 to 4 feet bls during completion of the SPT borings and DRI test. Based on the characteristics of the site lithology, the site is suitable for the proposed development, provided site soils are adequately compacted and the facility construction is in accordance with the recommendations provided herein.

The following general recommendations for site development are proposed:

SITE PREPARATION

- The majority of the site is currently covered by asphalt pavement or a masonry building. Vegetation in unpaved areas should be stripped from all proposed building areas, proposed pavement areas, and all areas where site drainage features are installed. Although not encountered in more than trace amounts during the geotechnical investigation, organic soils, if encountered during site construction, should also be stripped from these areas. Such stripping should be extended a minimum of 5 feet beyond these areas.
- The proposed building and paved areas of the site should be compacted with the use of a minimum 10 ton vibratory roller. The base of proposed drainage areas should not be compacted.
- Modified Proctor tests should be performed every 2000 ft² per foot of depth at the proposed building areas and every 10,000 ft² per foot of depth in proposed paved areas. A minimum density of 98 percent of the Modified Proctor maximum dry density is required to a depth of 5 feet below the base of proposed building foundation and to a depth of 3 feet below the base course in proposed paved areas. Any areas not achieving a minimum density of 98 percent of the Modified Proctor maximum dry density should be undercut and the material replaced/compacted in lifts not exceeding 1 ft. until a minimum 98 percent of the Modified Proctor maximum dry density is achieved. The proposed building and paved areas of the site may require significant compaction, which may include undercutting/lift compaction, to achieve the optimum densities throughout the recommended depth intervals.
- Imported fill material should consist of fine-grained quartz sand with less than 5% organic fines. The fill should be placed in lifts not exceeding 1 ft. and compacted until a minimum density of 98 percent of the Modified Proctor maximum dry density is achieved to a depth of 5 feet below the base of proposed building foundations, and to a depth of 3 feet below the base course in proposed paved areas. Compaction tests should be performed every 2000 ft² per foot of depth in the proposed building area and every 10,000 ft² per foot of depth in proposed paved areas.

BUILDING FOUNDATIONS

- The building foundation should be installed at least 1.5 feet below the proposed finish grade of the site.
- The building foundation footings should be sized to exert a maximum pressure of 2000 psf on the compacted native sand material and/or structural fill, and should be of minimum 16 inch width. Based on the soil conditions encountered SPT boring B-3, the recorded N-values generally indicate medium dense soils and associated shallow soil bearing capacities ranging from approximately 1,900 psf to approximately 4,000 psf, significant compaction may be required.
- Visqueen of minimum 6 mil thickness, or equivalent vapor retarding material, should be placed beneath all building floor slabs as a means of retarding moisture and subsurface vapors.

- Stormwater drainage features should be placed as far as possible from the proposed building foundation. The minimum recommended distance for such drainage features from the building foundation is 20 feet.

CANOPY FOOTER(S)

- Based on “N” values (i.e. blow counts per foot of depth) below one foot, the bearing capacity of soils from ground surface to eight feet in depth for the canopy area ranges from approximately 1,300 psf to 2,500 psf.
- At minimum, the base of the canopy footer, including a 3 foot perimeter beyond the footprint of the canopy footers, should be compacted using a vibratory plate compactor.
- The canopy footer(s) should be designed to exert a maximum pressure of 2000 psf. Provided the proposed canopy footer(s) area of the site, including the recommended 3 foot perimeter beyond this area, is properly compacted as confirmed by Modified Proctor testing per the above recommendations, the canopy footer(s) will be adequately supported for this recommended maximum pressure.

PAVEMENT AREAS

- Paved areas should have a stabilized subgrade of at least 12 inches.
- The base course above the subgrade should be a minimum thickness of 6 inches, following compaction. Based on availability in the site area, crushed limerock is the recommended base course (if asphaltic concrete is the finished surface course) and should be compacted in maximum 6 inch lifts.
- The surface course of paved areas is recommended to be asphaltic concrete and have a minimum stability of 1500 pounds. The recommended minimum thickness of the surface course (finished asphalt) is 1.5 inches.
- Commercial mix concrete of minimum 3500 psi load bearing capacity may be substituted for asphaltic concrete as the surface course. The minimum recommended slab thickness is 5 inches. Welded wire mesh should be set approximately within the slab center during concrete pouring. Compacted sand may be substituted for the base course if concrete is chosen as the surface course.

INFILTRATION TESTING

A Double-Ring Infiltration (DRI) test was performed in accordance with Water Management District requirements, at the location depicted on Figure 1 (Appendix A). The test results are compiled in Appendix B. As indicated, the vertical hydraulic conductivity was determined to be approximately 16.86 in/hr (3.90×10^{-4} ft/sec). Based on the SPT boring data and a review of published water table data in the area of the subject property, the estimated seasonal high water table is approximately 3 feet below existing grade at the location of the DRI test.

Respectfully submitted,

MDM Services, Inc.



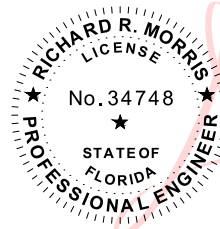
Joel M. Cornwall, P.G.

MDM Services, Inc.

1055 Kathleen Road, Lakeland, FL 33805.

Tel (863)646-9130 ext 105

Fax (863)648-1106



Digitally signed
by Richard R

Morris

Date:

2021.08.18

17:10:30 -04'00'

Richard R. Morris, P.E.

Senior Engineer

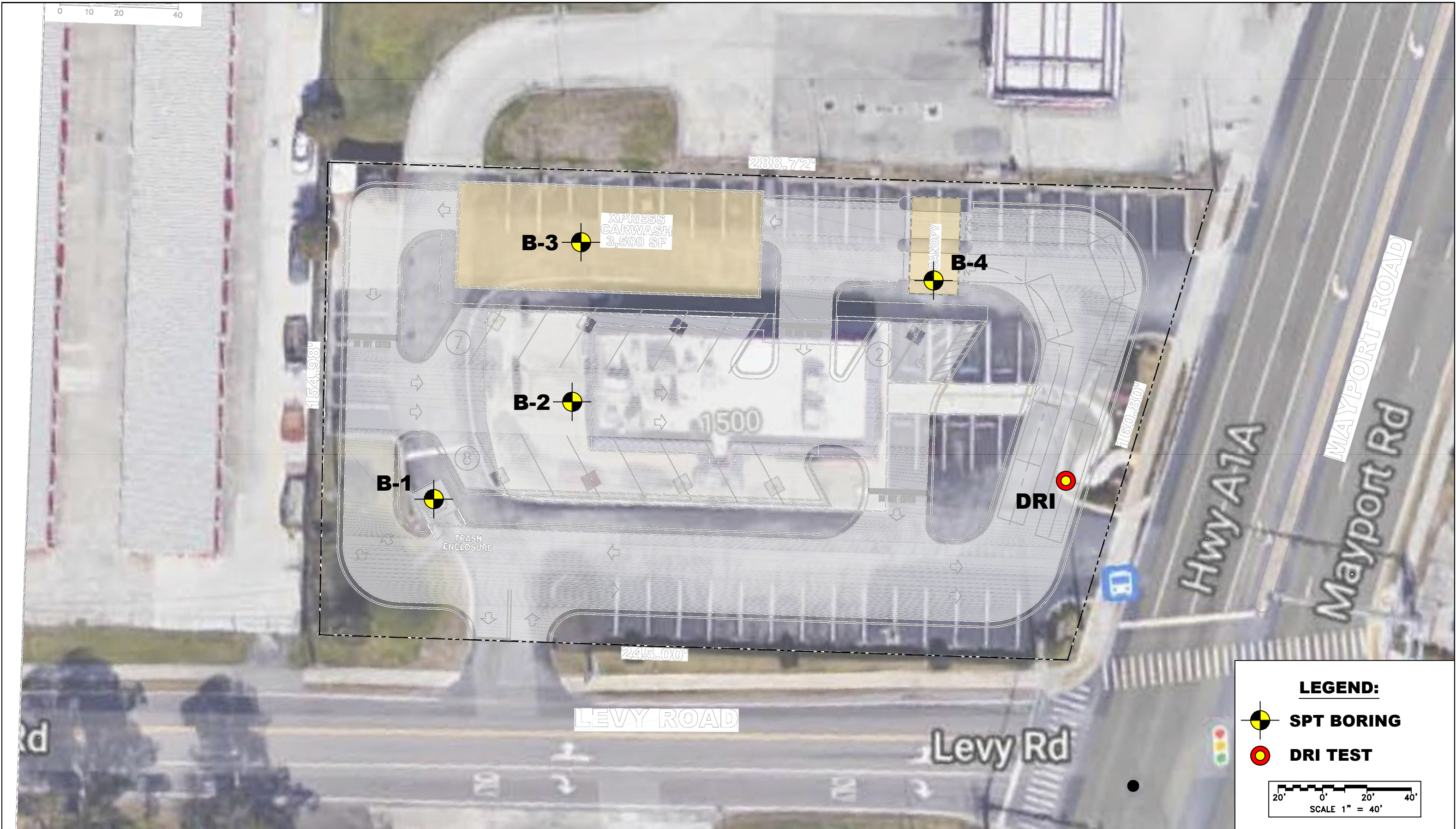
Florida License No. 34748

State of Florida Engineering Business

Certificate of Authorization No. 4857

Richard R. Morris, PE, State of Florida Professional Engineer License No. 34748. This item has been electronically signed and sealed by Richard R. Morris, P.E. using SHA-1 authentication code. Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

APPENDIX A

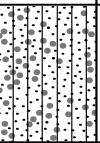
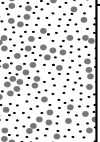


APPENDIX B

BORING LOG B-1

PROJECT NUMBER 210420	DRILLING DATE 7/27/2021	DRILLING CO. MDM Services, Inc.
PROJECT NAME Planned Car Wash Property	DRILLING METHOD SPT	DRILL RIG Geoprobe 6620
CLIENT Magnolia Wash Holdings	TOTAL DEPTH 16 ft.	DRILLER M. Williams
LOCATION 1500 Mayport Rd, Jacksonville, Rd	DIAMETER 3 in.	COMPLETION Backfilled
		LOGGED BY J. Cornwall

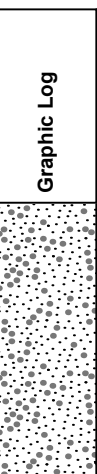
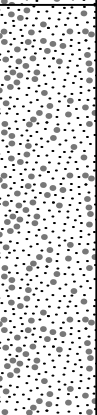
COMMENTS Near the corner of the main shed

Sample Type	Depth (m)	Blow Counts	N-value	Graphic Log	Material Description	USCS	Moisture
Hand Auger	1	45*	11*		SAND with Silt, Black, Fine-grained, Minor Wood Fragments	SP-SM	D
	2	45*	11*				
	3	45*	11*		SAND, Brownish Gray, Fine-grained	SP	D
	4	38*	9*				
SS	5	1,2,2,3	4		SAND, Dark Brown, Fine-grained	SP	W
	6	9,14,25,29	39				
	7						
	8	23,27,27,26	54				
	9						
	10	16,17,16,17	33		SAND, Dark Brown, Yellowish Brown, Fine-grained	SP	W
	11						
	12	13,12,13,12	25		SAND, Yellowish Brown, Fine-grained	SP	W
	13						
	14	8,7,7,7	14				
	15						
	16				Termination Depth at: 16 ft		
	17				*N-value approximated from static hand cone penetrometer		
	18						
	19						

BORING LOG B-2

PROJECT NUMBER 210420	DRILLING DATE 7/27/2021	DRILLING CO. MDM Services, Inc.
PROJECT NAME Planned Car Wash Property	DRILLING METHOD SPT	DRILL RIG Geoprobe 6620
CLIENT Magnolia Wash Holdings	TOTAL DEPTH 16 ft.	DRILLER M. Williams
LOCATION 1500 Mayport Rd, Jacksonville, Rd	DIAMETER 3 in.	COMPLETION Backfilled
		LOGGED BY J. Cornwall

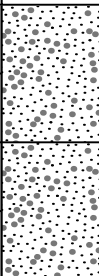
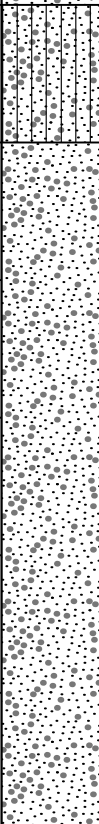
COMMENTS Near the corner of the main shed

Sample Type	Depth (m)	Blow Counts	N-value	Graphic Log	Material Description	USCS	Moisture
Hand Auger	1	63*	16*		SAND, Brownish Gray, Fine-grained	SP	D
	2	63*	16*				
	3	30*	7*				
	4	30*	7*				
SS	5	4,5,11,13	16		SAND, Dark Brown, Fine-grained	SP	W
	6	4,6,13,18	19				
	7						
	8	28,38,50,50	88				
	9						
	10	50,50,50,49	100		SAND, Dark Yellowish Brown, Fine-grained	SP	W
	11						
	12	5,11,11,11	22				
	13						
	14	9,8,8,9	16				
	15						
	16				Termination Depth at: 16 ft		
	17				*N-value approximated from static hand cone penetrometer		
	18						
	19						

BORING LOG B-3

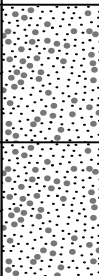
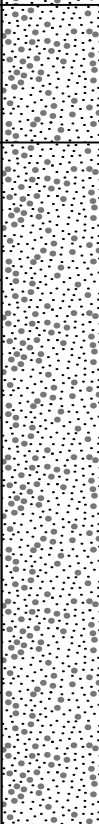
PROJECT NUMBER 210420	DRILLING DATE 7/27/2021	DRILLING CO. MDM Services, Inc.
PROJECT NAME Planned Car Wash Property	DRILLING METHOD SPT	DRILL RIG Geoprobe 6620
CLIENT Magnolia Wash Holdings	TOTAL DEPTH 16 ft.	DRILLER M. Williams
LOCATION 1500 Mayport Rd, Jacksonville, Rd	DIAMETER 3 in.	COMPLETION Backfilled
		LOGGED BY J. Cornwall

COMMENTS Near the corner of the main shed

Sample Type	Depth (m)	Blow Counts	N-value	Graphic Log	Material Description	USCS	Moisture
Hand Auger	1	62*	16*		SAND, Brownish Gray, Fine-grained	SP	D
	2	62*	16*				
	3	52*	13*				
	4	52*	13*				
SS	5	5,8,10,12	18		SAND with Silt, Dark Brown, Fine-grained	SP-SM	W
	6	9,11,14,16	25				
	7						
	8	22,37,40,31	77				
	9						
	10	28,44,35,28	79				
	11						
	12	16,14,14,11	28				
	13						
	14	9,8,8,9	16				
	15						
	16						
	17				Termination Depth at: 16 ft		
	18				*N-value approximated from static hand cone penetrometer		
	19						

PROJECT NUMBER 210420	DRILLING DATE 7/27/2021	DRILLING CO. MDM Services, Inc.
PROJECT NAME Planned Car Wash Property	DRILLING METHOD SPT	DRILL RIG Geoprobe 6620
CLIENT Magnolia Wash Holdings	TOTAL DEPTH 16 ft.	DRILLER M. Williams
LOCATION 1500 Mayport Rd, Jacksonville, Rd	DIAMETER 3 in.	COMPLETION Backfilled
		LOGGED BY J. Cornwall

COMMENTS Near the corner of the main shed

Sample Type	Depth (m)	Blow Counts	N-value	Graphic Log	Material Description	USCS	Moisture
Hand Auger	1	62*	15*		SAND, Very Dark Brown, Fine-grained	SP	D
	2	70*	17*				
	3	56*	14*				
	4	56*	14*				
SS	5	6,5,4,8	9		SAND, Very Dark Brown, Fine-grained	SP	W
	6	6,7,10,13	17				
	7				SAND, Dark Yellowish Brown, Fine-grained	SP	W
	8	38,38,42,42	80				
	9						
	10	19,19,19,17	38				
	11						
	12	11,13,11,12	24				
	13						
	14	9,10,9,10	19				
	15						
	16				Termination Depth at: 16 ft		
	17				*N-value approximated from static hand cone penetrometer		
	18						
	19						

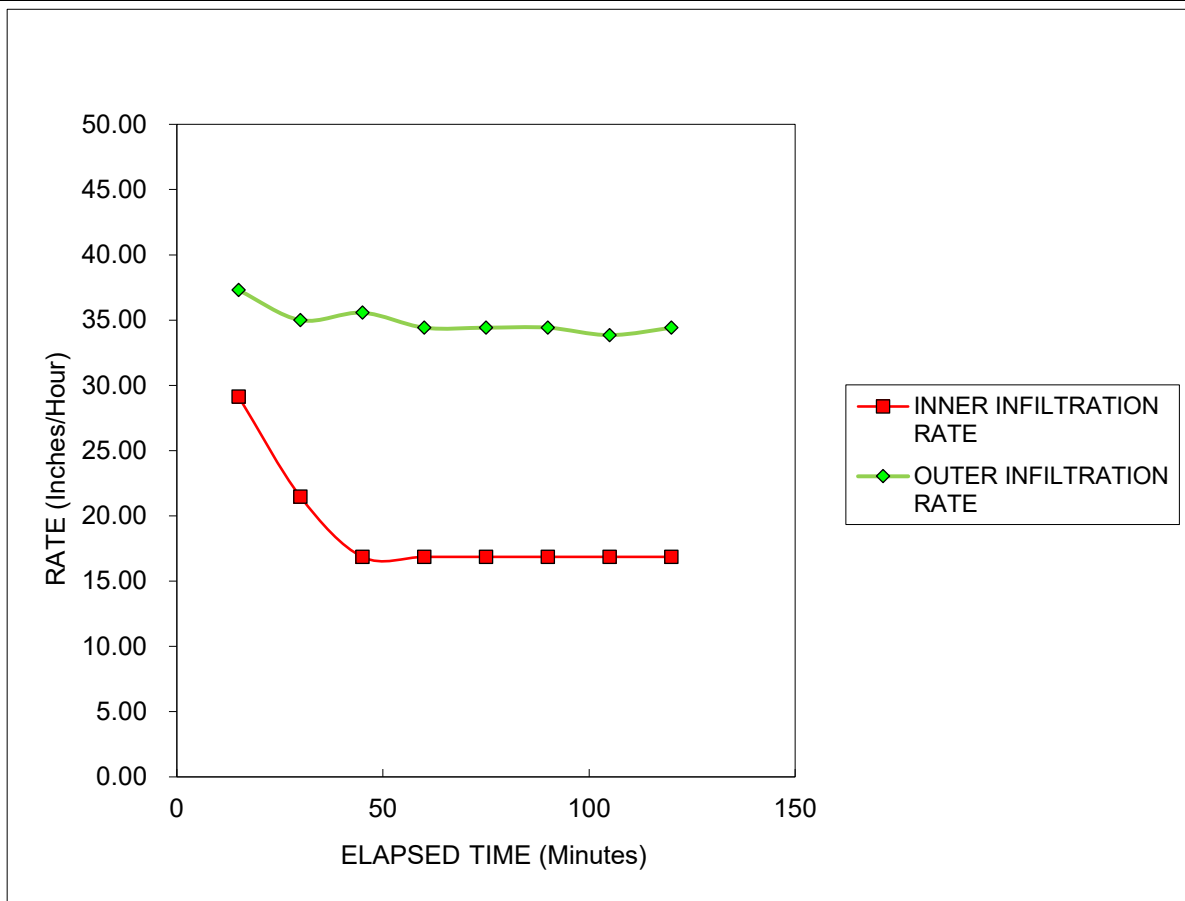
DOUBLE RING INFILTROMETER

Planned Car Wash property - Atlantic Beach
1500 Mayport Rd
Atlantic Beach, FL
DATE: 7/27/21

PROJECT # 210420
WEATHER: Overcast

WATER TABLE(WT): 4 FT
TEST DEPTH: 1' BGS

ELAPSED TIME/MINs	INNER RING		ANNULAR SPACE BETWEEN RINGS	
	WATER QUAN (Cu In)	INFIL. RATE (In/Hr)	WATER QUAN (Cu In)	INFIL. RATE (In/Hr)
15	822.94	29.12	2815.31	37.29
30	606.38	21.46	2642.06	34.99
45	476.44	16.86	2685.38	35.57
60	476.44	16.86	2598.75	34.42
75	476.44	16.86	2598.75	34.42
90	476.44	16.86	2598.75	34.42
105	476.44	16.86	2555.44	33.85
120	476.44	16.86	2598.75	34.42



APPROXIMATE VERTICAL INFILTRATION RATE: 16.86 IN/HR

Lithology: 0'-8' - very dark brown brown, fine-grained sand

APPENDIX C

Custom Soil Resource Report Soil Map



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 1:24,000.

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: Duval County, Florida
Survey Area Data: Version 15, Jun 11, 2020

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

Date(s) aerial images were photographed: Nov 30, 2019—Dec 6, 2019

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
32	Leon fine sand, 0 to 2 percent slopes	1.0	100.0%
Totals for Area of Interest		1.0	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.

Custom Soil Resource Report

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.

Duval County, Florida

32—Leon fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxqv
Elevation: 0 to 250 feet
Mean annual precipitation: 47 to 61 inches
Mean annual air temperature: 55 to 81 degrees F
Frost-free period: 267 to 347 days
Farmland classification: Not prime farmland

Map Unit Composition

Leon, non-hydric, and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leon, Non-hydric

Setting

Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 18 inches: fine sand
Bh - 18 to 37 inches: fine sand
E' - 37 to 45 inches: fine sand
B'h - 45 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
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 2.00 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 capacity: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)
Hydric soil rating: No

Minor Components

Leon, hydric

Percent of map unit: 5 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mascotte

Percent of map unit: 3 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mandarin

Percent of map unit: 3 percent
Landform: Rises
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)
Hydric soil rating: No