

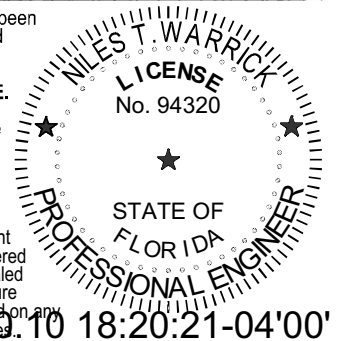
OFFSITE STORMWATER MANAGEMENT CALCULATIONS

911 EAST ATLANTIC BLVD. MULTIFAMILY

911 E. Atlantic Blvd.
Pompano Beach, FL 33060



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**NILES T.
WARRICK, P.E.**
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seal.



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Niles T. Warrick
FL REG. No. 94320
(FOR FIRM)

Project No. 13376.01

10/11/2023

KEITH & ASSOCIATES | 301 E ATLANTIC BLVD, POMPAÑO BEACH, FL

DRC

PZ23-12000043

11/15/2023

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NARRATIVE

1.0 INTRODUCTION

The site is in Section 36 Township 48S, Range 42E within Broward County with address, 911 East Atlantic Blvd., Pompano Beach, FL 33060. The project is located north of East Atlantic Blvd., south of NE 1st Street, and West of NE 10th Avenue. The site is 1.268 acres. The following report details the stormwater analysis done from the property line to the center line of the adjacent streets to the site: NE 1st Street, NE 10th Avenue and East Atlantic Blvd. The offsite analysis area is 0.651 acres.

2.0 PRE-DEVELOPMENT

2.1 Existing Stormwater Management System

Currently the offsite area surrounding the site consists of crown roads which slope half of the respective watershed towards the site on all three sides. There is an existing curb inlet structure on the corner of NE 10th Avenue and East Atlantic Blvd. This structure is linked to another curb inlet structure across East Atlantic Blvd. via a pipe. There is landscape along the north and east side of the site; and on-street parking on the south side of the site.

2.2 Topography

The survey performed by Accurate Land Surveyors, Inc. for the property has been used as a base to compute the attached drainage calculations. All existing topography used within this report is based on NAVD 88 Datum. See Survey included as part of the submittal.

2.3 Existing Drainage Permit

There is no existing permit on our site.

3.0 POST-DEVELOPMENT

3.1 Proposed Development

The proposed development includes offsite drainage along with the new offsite streetscape development on all three streets adjacent to the property. The offsite drainage design will ensure proper stormwater conveyance is maintained along the new curb work on all three sides and to continue the use of the existing curb inlet on East Atlantic Blvd without impacting the East Atlantic Blvd drainage system.

3.2 Stormwater Management System

The stormwater management system proposed for the offsite area for this project consists of 226 LF of exfiltration trench. The exfiltration trenches will provide runoff attenuation and the volume required for water quality per the criteria set forth by SFWMD.

4.0 BASIS OF DESIGN

4.1 Drainage Basin

The drainage basin contributing area of 0.651 acres used is based on existing survey, plans and permit/records. The 0.651 acres was measured as the area between the property line and the centerline of the adjacent streets to the site.

Corporate Office
301 E Atlantic Blvd
Pompano Beach
FL 33060
954.788.3400

Miami-Dade County
5805 Blue Lagoon Drive
Suite 218
Miami, FL 33126
305.667.5474

Broward County
2312 S Andrews Ave
Fort Lauderdale
FL 33316
954.788.3400

Palm Beach County
701 Northpoint Parkway
Suite 218
West Palm Beach, FL 33407
561.469.0992

Orange County
2448 E Livingston Street
Suite 100
Orlando, FL 32803
954.788.3400

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4.2 Site Stage-Storage

The stage – storage calculations were performed using the SFWMD methodology and the proposed site grading. See calculations attached for the post-development analysis.

4.3 Design Storm Rainfall Events

Rainfall depths utilized in the Flood Routing Calculations were obtained from NOAA Point Precipitation Frequency Estimates and supplemented by the SFWMD Rainfall maps. The return periods and storm event are summarized in Table 1.

Table 1. Return Periods, Storm Events and Rainfall Data from NOAA

RETURN PERIODS	STORM EVENT
YEARS	INCHES
100 Year -3 day	19.20
25 Year - 3 day	14.00
5 Year-1 hour	3.10

5.0 RUNOFF FLOWS AND PEAK STAGE SUMMARY

The runoff volume and peak stage calculations for the post-development condition were performed using the Santa Barbara Urban Hydrograph Flood Routing based on the SFWMD program. Table 2 summarizes the flood routing results for the Pre-Development and Post-Development conditions. See calculations attached. Elevations were based on the NAVD 88 datum.

Table 2. Flood Routing Results

STORM EVENT	PRE-DEVELOPMENT MAX.STAGE ELEVATION (NAVD) NO DISCHARGE	POST-DEVELOPMENT MAX.STAGE ELEVATION (NAVD) NO DISCHARGE
100 Year-3 Day	14.29	14.15
25 Year-3 Day	13.85	13.71

6.0 CONCLUSIONS

The volume of storage required for 1/2" of dry pre-treatment is 0.027 ac-ft (Refer to Table 3. Water Quality Storage Requirements) which will be provided within the exfiltration trenches.

The volume required for water quality is 0.116 ac-ft of Equivalent Wet Detention Volume which will be provided within the exfiltration trenches. The trenches provide a total volume of 0.177 ac-ft of Equivalent Wet Detention Volume.

Lastly, the 5 year – 1 hour storm event producing a maximum stage elevation of 11.00' NAVD does not exceed the proposed minimum pavement elevation of 12.90' NAVD.



APPENDIX

- Offsite Pre-Development Analysis
 - Calculations with Zero Discharge
- Offsite Post-Development Analysis
 - Calculations with Zero Discharge
- Rainfall Data and Maps
- Maps & Exhibits
 - Aerial Map
 - Preliminary FEMA FIRM
 - Broward County Future Water Table Elevation
 - Broward County Soil Resource Map
 - Broward County Drainage Districts Map



APPENDIX



Engineering Inspired Design.

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PRE – DEVELOPMENT ANALYSIS



Engineering Inspired Design.

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11/15/2023

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel
 Design Engineer : Niles T. Warrick
 Project Address / Location : 911 East Atlantic Blvd, Pompano Beach, Florida 33060
 Section/Township/Range: 36 48S 42E
 Surfacewater License:
 FEMA FIRM Information: 12011C0376J
 Project Description: Mixed-use development with commercial at the ground level with 95 residential units above integrated parking garage.

Job Number: 13376.01

Total Drainage Basin: 0.651 Acres

Hydrogeologic Information :

Table 1.	1 Day Storm Event			3 Day Storm Event		
RAINFALL DATA	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Rainfall Inches	Runoff Inches	Runoff Ac-Ft
100 Year Return Period	16.7	14.52	0.788	19.2	16.99	0.922
25 Year Return Period	12.1	9.99	0.542	14.0	11.86	0.643
10 Year Return Period	9.5	7.41	0.402	12.8	10.72	0.582
5 Year Return Period	7.7	5.77	0.313	10.5	8.45	0.458
3 Year Return Period	6.4	4.50	0.244	8.7	6.69	0.363
5 Yr Return Period - 1 Hr	3.1	1.58	0.086			

Runoff estimation - USDA SCS formula

$$\text{Runoff (in)} Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

Where: P = accumulated rainfall (in.)
 S = Soil Storage Value

Table 2. SUMMARY OF FLOOD ROUTING	Agency maps	SBUH Calculated with Q-1 Day Storm		SBUH Calculated with Q-3 Day Storm		SBUH Calculated *Zero Q-3 Day Storm		Calc. 5Yr 1 hour Peak Stage (ft)
		Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	
100 Year Return Period		14.08	0.00	14.29	0.00	14.29	0.00	Zero Q
25 Year Return Period		13.68	0.00	13.85	0.00	13.85	0.00	(Water Budget)
10 Year Return Period		13.44	0.00	13.75	0.00	13.75	0.00	
5 Year Return Period		13.25	0.00	13.55	0.00	13.55	0.00	12.57
3 Year Return Period		13.10	0.00	13.36	0.00	13.36	0.00	

For 5 yr - 1 hr rainfall, Calculate 5 yr Vol by subtracting Exfil vol in inches from 5 yr 1 h rainfall, then calc Runoff using SCS formula. From stage storage table find Zero Discharge Stage. Uses Max. Elev of Lookup Stage or highest top of EXFIL trench. If exfil vol exceeds 5 year 1 hour vol. Uses Max. Elev of highest top of EXFIL trench.

* Zero Q indicates there is no offsite discharge included in the calculations (only Exfil Trench and Wells). Hypothetical stage calc. for PRE-POST Analysis.

Table 3. WATER QUALITY STORAGE REQUIREMENTS:

Based on Total Drainage Basin Acreage	Ac-Ft
1" x Basin Area	0.054
2.5" x WQPI x (Basin Area) 1.89 Inches	0.102
Required Wet Detention (Total basin incl Offsite)	
0.5" Pretreatment-Com. Prjs,x(Basin Area - water area)	0.027
Credit for Inlets in Grass Areas, GAC=0.2" x (TDA	0.011
	N

Table 4. WATER QUALITY STORAGE SOURCE	Basin Storage Elev. (Ac-Ft)	WQ Eq WDV (Ac-Ft)	WQ Eq WDV Inches
Retention (RV) @			
Dry Det. (DDV) @			
Wet Det. (WDV) @			
Equiv WDV=WDV+RV/.5+DDV/.75)		0.000	
Exfil Trench Storage	0.000	0.000	
Total WQ EQ WDV - Provided		0.000	
Total WQ EQ WDV - Required		0.102	1.89

Exfil Vol. in Stage Storage =

(Ac-FT)	(Inches)
0.000	0.00

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Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis ZERO Offsite Discharge

Table 6. STAGE - DISCHARGE INFORMATION 100 - YEAR STORM - ZERO Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
4.00	0.02	0.34	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
8.00	0.05	0.69	0.04	0.02	0.01	0.00	0.00	0.00	11.54	0.00	0.00	0.00
12.00	0.07	1.03	0.15	0.03	0.02	0.01	0.00	0.01	11.71	0.00	0.00	0.00
16.00	0.10	1.37	0.32	0.02	0.03	0.01	0.00	0.01	11.98	0.00	0.00	0.00
20.00	0.12	1.72	0.53	0.05	0.03	0.03	0.00	0.03	12.09	0.00	0.00	0.00
24.00	0.15	2.06	0.76	0.05	0.04	0.04	0.00	0.04	12.21	0.00	0.00	0.00
28.00	0.18	2.57	1.13	0.09	0.06	0.06	0.00	0.06	12.38	0.00	0.00	0.00
32.00	0.22	3.07	1.52	0.06	0.07	0.08	0.00	0.08	12.53	0.00	0.00	0.00
36.00	0.25	3.56	1.94	0.06	0.07	0.10	0.00	0.10	12.62	0.00	0.00	0.00
40.00	0.29	4.07	2.37	0.06	0.07	0.12	0.00	0.12	12.71	0.00	0.00	0.00
44.00	0.32	4.58	2.83	0.10	0.07	0.15	0.00	0.15	12.80	0.00	0.00	0.00
48.00	0.36	5.07	3.27	0.07	0.08	0.17	0.00	0.17	12.90	0.00	0.00	0.00
52.00	0.40	5.71	3.86	0.14	0.10	0.20	0.00	0.20	13.01	0.00	0.00	0.00
56.00	0.50	7.01	5.07	0.28	0.23	0.26	0.00	0.26	13.13	0.00	0.00	0.00
58.00	0.57	8.08	6.10	0.39	0.33	0.30	0.00	0.30	13.23	0.00	0.00	0.00
59.00	0.63	8.87	6.86	0.57	0.44	0.33	0.00	0.33	13.30	0.00	0.00	0.00
59.50	0.68	9.58	7.54	0.90	0.59	0.36	0.00	0.36	13.35	0.00	0.00	0.00
59.75	0.85	11.97	9.86	6.10	1.24	0.38	0.00	0.38	13.41	0.00	0.00	0.00
60.00	1.02	14.34	12.19	6.12	2.32	0.43	0.00	0.43	13.51	0.00	0.00	0.00
60.50	1.09	15.37	13.21	1.32	2.34	0.53	0.00	0.53	13.68	0.00	0.00	0.00
61.00	1.13	15.91	13.74	0.70	1.75	0.61	0.00	0.61	13.81	0.00	0.00	0.00
62.00	1.18	16.63	14.45	0.40	0.95	0.71	0.00	0.71	13.98	0.00	0.00	0.00
64.00	1.24	17.50	15.31	0.26	0.37	0.80	0.00	0.80	14.12	0.00	0.00	0.00
68.00	1.31	18.52	16.32	0.15	0.17	0.87	0.00	0.87	14.23	0.00	0.00	0.00
72.00	1.36	19.20	16.99	0.11	0.11	0.91	0.00	0.91	14.29	0.00	0.00	0.00
Peak stage						14.29	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

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Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 7. STAGE - DISCHARGE INFORMATION 25 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
4.00	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
8.00	0.05	0.50	0.01	0.00	0.00	0.00	0.00	0.00	11.50	0.00	0.00	0.00
12.00	0.07	0.75	0.05	0.01	0.01	0.00	0.00	0.00	11.56	0.00	0.00	0.00
16.00	0.10	1.00	0.14	0.01	0.02	0.01	0.00	0.01	11.70	0.00	0.00	0.00
20.00	0.12	1.26	0.26	0.03	0.02	0.01	0.00	0.01	11.89	0.00	0.00	0.00
24.00	0.15	1.50	0.39	0.03	0.02	0.02	0.00	0.02	12.04	0.00	0.00	0.00
28.00	0.18	1.87	0.63	0.05	0.04	0.03	0.00	0.03	12.14	0.00	0.00	0.00
32.00	0.22	2.24	0.88	0.04	0.04	0.04	0.00	0.04	12.27	0.00	0.00	0.00
36.00	0.25	2.60	1.15	0.04	0.04	0.06	0.00	0.06	12.40	0.00	0.00	0.00
40.00	0.29	2.97	1.44	0.04	0.05	0.07	0.00	0.07	12.52	0.00	0.00	0.00
44.00	0.32	3.34	1.75	0.07	0.05	0.09	0.00	0.09	12.58	0.00	0.00	0.00
48.00	0.36	3.70	2.05	0.05	0.05	0.11	0.00	0.11	12.65	0.00	0.00	0.00
52.00	0.40	4.16	2.46	0.10	0.07	0.13	0.00	0.13	12.73	0.00	0.00	0.00
56.00	0.50	5.11	3.31	0.20	0.16	0.17	0.00	0.17	12.88	0.00	0.00	0.00
58.00	0.57	5.89	4.03	0.28	0.24	0.20	0.00	0.20	13.00	0.00	0.00	0.00
59.00	0.63	6.47	4.57	0.41	0.31	0.22	0.00	0.22	13.05	0.00	0.00	0.00
59.50	0.68	6.98	5.05	0.64	0.42	0.24	0.00	0.24	13.09	0.00	0.00	0.00
59.75	0.85	8.73	6.71	4.37	0.88	0.26	0.00	0.25	13.13	0.00	0.00	0.00
60.00	1.02	10.46	8.39	4.40	1.66	0.29	0.00	0.29	13.20	0.00	0.00	0.00
60.50	1.09	11.21	9.12	0.95	1.68	0.36	0.00	0.36	13.37	0.00	0.00	0.00
61.00	1.13	11.60	9.50	0.50	1.25	0.42	0.00	0.42	13.49	0.00	0.00	0.00
62.00	1.18	12.13	10.02	0.29	0.68	0.49	0.00	0.49	13.61	0.00	0.00	0.00
64.00	1.24	12.76	10.64	0.19	0.27	0.56	0.00	0.56	13.72	0.00	0.00	0.00
68.00	1.31	13.51	11.37	0.11	0.12	0.61	0.00	0.61	13.80	0.00	0.00	0.00
72.00	1.36	14.00	11.86	0.08	0.08	0.64	0.00	0.64	13.85	0.00	0.00	0.00
Peak stage						13.85	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 8. STAGE - DISCHARGE INFORMATION 10 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
4.00	0.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
8.00	0.05	0.46	0.00	0.00	0.00	0.00	0.00	0.00	11.50	0.00	0.00	0.00
12.00	0.07	0.69	0.04	0.01	0.01	0.00	0.00	0.00	11.54	0.00	0.00	0.00
16.00	0.10	0.92	0.11	0.01	0.01	0.00	0.00	0.00	11.65	0.00	0.00	0.00
20.00	0.12	1.15	0.21	0.02	0.02	0.01	0.00	0.01	11.81	0.00	0.00	0.00
24.00	0.15	1.38	0.32	0.03	0.02	0.02	0.00	0.02	12.00	0.00	0.00	0.00
28.00	0.18	1.72	0.52	0.05	0.03	0.03	0.00	0.03	12.09	0.00	0.00	0.00
32.00	0.22	2.05	0.75	0.03	0.04	0.04	0.00	0.04	12.20	0.00	0.00	0.00
36.00	0.25	2.38	0.99	0.04	0.04	0.05	0.00	0.05	12.32	0.00	0.00	0.00
40.00	0.29	2.72	1.25	0.04	0.04	0.06	0.00	0.06	12.45	0.00	0.00	0.00
44.00	0.32	3.06	1.52	0.06	0.04	0.08	0.00	0.08	12.54	0.00	0.00	0.00
48.00	0.36	3.39	1.79	0.04	0.05	0.09	0.00	0.09	12.60	0.00	0.00	0.00
52.00	0.40	3.82	2.16	0.09	0.06	0.11	0.00	0.11	12.67	0.00	0.00	0.00
56.00	0.50	4.69	2.92	0.18	0.15	0.15	0.00	0.15	12.80	0.00	0.00	0.00
58.00	0.57	5.41	3.58	0.25	0.21	0.18	0.00	0.18	12.92	0.00	0.00	0.00
59.00	0.63	5.93	4.07	0.37	0.28	0.20	0.00	0.20	13.00	0.00	0.00	0.00
59.50	0.68	6.41	4.51	0.58	0.38	0.21	0.00	0.21	13.03	0.00	0.00	0.00
59.75	0.85	8.00	6.02	3.98	0.80	0.23	0.00	0.23	13.07	0.00	0.00	0.00
60.00	1.02	9.59	7.55	4.01	1.51	0.26	0.00	0.26	13.14	0.00	0.00	0.00
60.50	1.09	10.28	8.22	0.87	1.53	0.33	0.00	0.33	13.29	0.00	0.00	0.00
61.00	1.13	10.64	8.57	0.46	1.14	0.38	0.00	0.38	13.40	0.00	0.00	0.00
62.00	1.18	11.12	9.04	0.27	0.62	0.44	0.00	0.44	13.53	0.00	0.00	0.00
64.00	1.24	11.71	9.61	0.17	0.24	0.50	0.00	0.50	13.63	0.00	0.00	0.00
68.00	1.31	12.39	10.28	0.10	0.11	0.55	0.00	0.55	13.71	0.00	0.00	0.00
72.00	1.36	12.84	10.72	0.07	0.07	0.58	0.00	0.57	13.75	0.00	0.00	0.00
Peak stage						13.75	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 9. STAGE - DISCHARGE INFORMATION 5 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
4.00	0.02	0.19	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
8.00	0.05	0.38	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
12.00	0.07	0.57	0.01	0.01	0.00	0.00	0.00	0.00	11.51	0.00	0.00	0.00
16.00	0.10	0.75	0.05	0.01	0.01	0.00	0.00	0.00	11.57	0.00	0.00	0.00
20.00	0.12	0.94	0.12	0.02	0.01	0.01	0.00	0.01	11.67	0.00	0.00	0.00
24.00	0.15	1.13	0.20	0.02	0.01	0.01	0.00	0.01	11.80	0.00	0.00	0.00
28.00	0.18	1.41	0.34	0.03	0.02	0.02	0.00	0.02	12.01	0.00	0.00	0.00
32.00	0.22	1.68	0.50	0.03	0.03	0.02	0.00	0.02	12.09	0.00	0.00	0.00
36.00	0.25	1.95	0.68	0.03	0.03	0.03	0.00	0.03	12.18	0.00	0.00	0.00
40.00	0.29	2.23	0.87	0.03	0.03	0.04	0.00	0.04	12.27	0.00	0.00	0.00
44.00	0.32	2.51	1.08	0.05	0.03	0.06	0.00	0.06	12.37	0.00	0.00	0.00
48.00	0.36	2.78	1.29	0.03	0.04	0.07	0.00	0.07	12.48	0.00	0.00	0.00
52.00	0.40	3.13	1.57	0.07	0.05	0.08	0.00	0.08	12.55	0.00	0.00	0.00
56.00	0.50	3.84	2.17	0.14	0.11	0.11	0.00	0.11	12.65	0.00	0.00	0.00
58.00	0.57	4.43	2.69	0.20	0.17	0.13	0.00	0.13	12.75	0.00	0.00	0.00
59.00	0.63	4.86	3.08	0.29	0.22	0.15	0.00	0.15	12.81	0.00	0.00	0.00
59.50	0.68	5.25	3.43	0.46	0.30	0.16	0.00	0.16	12.85	0.00	0.00	0.00
59.75	0.85	6.56	4.65	3.19	0.64	0.17	0.00	0.17	12.91	0.00	0.00	0.00
60.00	1.02	7.86	5.88	3.24	1.21	0.20	0.00	0.20	13.00	0.00	0.00	0.00
60.50	1.09	8.42	6.42	0.70	1.23	0.25	0.00	0.25	13.12	0.00	0.00	0.00
61.00	1.13	8.72	6.70	0.37	0.92	0.29	0.00	0.29	13.21	0.00	0.00	0.00
62.00	1.18	9.11	7.08	0.22	0.50	0.35	0.00	0.35	13.33	0.00	0.00	0.00
64.00	1.24	9.59	7.55	0.14	0.20	0.39	0.00	0.39	13.43	0.00	0.00	0.00
68.00	1.31	10.15	8.09	0.08	0.09	0.43	0.00	0.43	13.51	0.00	0.00	0.00
72.00	1.36	10.52	8.45	0.06	0.06	0.45	0.00	0.45	13.55	0.00	0.00	0.00
Peak stage						13.55	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 10. STAGE - DISCHARGE INFORMATION 3 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
4.00	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
8.00	0.05	0.31	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00
12.00	0.07	0.47	0.00	0.00	0.00	0.00	0.00	0.00	11.50	0.00	0.00	0.00
16.00	0.10	0.62	0.02	0.00	0.00	0.00	0.00	0.00	11.53	0.00	0.00	0.00
20.00	0.12	0.78	0.06	0.01	0.01	0.00	0.00	0.00	11.59	0.00	0.00	0.00
24.00	0.15	0.93	0.11	0.01	0.01	0.01	0.00	0.01	11.67	0.00	0.00	0.00
28.00	0.18	1.16	0.21	0.02	0.02	0.01	0.00	0.01	11.82	0.00	0.00	0.00
32.00	0.22	1.39	0.33	0.02	0.02	0.02	0.00	0.02	12.00	0.00	0.00	0.00
36.00	0.25	1.61	0.46	0.02	0.02	0.02	0.00	0.02	12.07	0.00	0.00	0.00
40.00	0.29	1.84	0.61	0.02	0.02	0.03	0.00	0.03	12.14	0.00	0.00	0.00
44.00	0.32	2.07	0.76	0.04	0.03	0.04	0.00	0.04	12.22	0.00	0.00	0.00
48.00	0.36	2.30	0.92	0.02	0.03	0.05	0.00	0.05	12.30	0.00	0.00	0.00
52.00	0.40	2.59	1.14	0.05	0.04	0.06	0.00	0.06	12.40	0.00	0.00	0.00
56.00	0.50	3.17	1.61	0.11	0.09	0.08	0.00	0.08	12.54	0.00	0.00	0.00
58.00	0.57	3.66	2.02	0.16	0.13	0.10	0.00	0.10	12.61	0.00	0.00	0.00
59.00	0.63	4.02	2.33	0.23	0.18	0.11	0.00	0.11	12.67	0.00	0.00	0.00
59.50	0.68	4.34	2.61	0.37	0.24	0.12	0.00	0.12	12.70	0.00	0.00	0.00
59.75	0.85	5.42	3.59	2.57	0.51	0.13	0.00	0.13	12.74	0.00	0.00	0.00
60.00	1.02	6.50	4.59	2.62	0.98	0.15	0.00	0.15	12.82	0.00	0.00	0.00
60.50	1.09	6.96	5.03	0.57	1.00	0.19	0.00	0.19	12.99	0.00	0.00	0.00
61.00	1.13	7.21	5.26	0.30	0.75	0.23	0.00	0.23	13.07	0.00	0.00	0.00
62.00	1.18	7.53	5.57	0.18	0.41	0.27	0.00	0.27	13.16	0.00	0.00	0.00
64.00	1.24	7.93	5.95	0.11	0.16	0.31	0.00	0.31	13.25	0.00	0.00	0.00
68.00	1.31	8.39	6.39	0.06	0.07	0.34	0.00	0.34	13.32	0.00	0.00	0.00
72.00	1.36	8.70	6.69	0.05	0.05	0.36	0.00	0.36	13.36	0.00	0.00	0.00
Peak stage						13.36	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily Date: 10/11/2023
 PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS
 Flood Routing Description:
 Client : Yuri Gurfel Job Number: 13376.01

Total Drainage Basin: 0.651 Acres
 Water Table Elevation = 2.50 Feet
 Time of Conc. (hr.) = 1.00
 Calculated weighted soil (s) 2.00 Soil Storage Value (S) = Storage under pervious area / Total Area
 Calculated CN value 83.3 Soil Storage under pavement and buildings is not considered in computations

Table 16. STAGE STORAGE TABLE			Compacted Ground storage table				
Stage Elevation	Storage	Storage	Depth to water table (Ft)	1.00	2.00	3.00	4.00
(feet)	(Ac-ft)	(CF)		Ground storage(In)	0.45	1.88	4.95
2.50	0.000	0	Mean depth to ground water table (ft)=	10.50	(Pervious Area)		
3.00	0.000	0					
4.50	0.000	0	Soil Storage Type	Ground Storage Values (In Inches)			
6.00	0.000	0	Depth to Ground Water (Ft)	1	2	3	4
7.50	0.000	0	* Depressional	0.45	1.58	3.3	5.1
9.00	0.000	0	Flatwoods	0.45	1.88	4.05	6.75
10.50	0.000	0	Coastal Type	0.45	1.88	4.95	8.18
11.00	0.000	0	* (Low Flatwoods & Costal Lowlands)				
11.50	0.000	0	Ground Storage Values reflect 25% reduction of Available Storage,				
12.00	0.015	673	to take into account compaction of native soils.				
12.50	0.069	2,998					
13.00	0.196	8,557					
13.50	0.423	18,430					
14.00	0.724	31,544					
14.50	1.050	45,723					
15.00	1.375	59,903					
15.50	1.701	74,082					
16.00	2.026	88,261					
16.50	2.352	102,440					

Project: 911 East Atlantic Blvd. Multifamily
PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Table 17. SITE ACREAGE INFORMATION

Input Information							Imperv. Paved Acres	Perv. Acres	Bldgs. Acres	Non Bldgs. Acres	Water Lake Acres	Perv. Area Avg. El.	perv. acres * avg el
LAND USES	Acres	High Elev.	Low Elev.	% Imperv. Paved	% Bldgs.	% Water							
BASIN TOTALS / AVERAG	0.651	14.00	2.50	75.56	0.00	0.00	0.49	0.16	0.00	0.65	0.00	13.00	
1 Pavement NE 1st St.	0.095	14.00	13.50	100	0	0	0.10	0.00	0.00	0.10	0.00	0.00	0.
2 Pavement NE 10th Ave.	0.075	13.50	12.50	100	0	0	0.08	0.00	0.00	0.08	0.00	0.00	0.
3 Pavement Atlantic Blvd.	0.260	13.60	11.50	100	0	0	0.26	0.00	0.00	0.26	0.00	0.00	0.
4 Atlantic Blvd. Sidewalk	0.062	13.10	12.00	100	0	0	0.06	0.00	0.00	0.06	0.00	0.00	0.
5 Existing Row Landscape	0.159	13.50	12.50	0	0	0	0.00	0.16	0.00	0.16	0.00	13.00	2.
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BASIN SUBTOTALS / AVG	0.651	14.00	11.50	75.56	0.00	0.00	0.49	0.16	0.00	0.65	0.00	13.00	2.

Table 18. UNDERGROUND STORAGE INFORMATION

Underground Storage	Area (SF)	Top Elev	Bottom Elev	% Voids
1 Underground Storage 1				
2 Underground Storage 2				
3 Underground Storage 3				
4 Underground Storage 4				
5 Underground Storage 5				
BASIN TOTALS / AVERAGE	0.651	14.00	2.50	75.56

Basin % Imper. for Water Quality Purposes = 75.56

Basin % Impervious (incl. Bldg., No lakes)= 75.56

DRC

Project: 911 East Atlantic Blvd. Multifamily
PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS
Flood Routing Description:
Client : Yuri Gurfel
Detail - Stage - Storage Information

Date: 10/11/2023
Job Number: 13376.01

Table 19. STAGE - STORAGE INFORMATION

Surface storage (Ac-Ft)

LAND USES	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
	2.50	3.00	4.50	6.00	7.50	9.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50
Total Surface Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.069	0.196	0.423
Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.069	0.196	0.423
1 Pavement NE 1st St.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 Pavement NE 10th Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.038
3 Pavement Atlantic Blvd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.062	0.139	0.247
4 Atlantic Blvd. Sidewalk	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.028	0.059
5 Existing Row Landscape	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.080
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40													
Total Surface Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.20	0.42

Underground Storage

	2.50	3.00	4.50	6.00	7.50	9.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50
1 Underground Storage 1													
2 Underground Storage 2													
3 Underground Storage 3													
4 Underground Storage 4													
5 Underground Storage 5													
Total Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.069	0.196	0.423
Stage Elevation	2.50	3.00	4.50	6.00	7.50	9.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50

Project: 911 East Atlantic Blvd. Multifamily
PRE-DEVELOPMENT OFFSITE SWM CALCULATIONS
Flood Routing Description:
Client : Yuri Gurfel

Date: 10/11/2023
Job Number: 13376.01

Table 20. SOIL - STORAGE INFORMATION

Detail - Soil Storage Information

	LAND USES	Depth to Water Table	Ground Storage Under Pervious	
			Inches	Ac-Ft
	TOTAL/AVERAGE		8.18	0.11
1	Pavement NE 1st St.	0.00	0.00	0.000
2	Pavement NE 10th Ave.	0.00	0.00	0.000
3	Pavement Atlantic Blvd.	0.00	0.00	0.000
4	Atlantic Blvd. Sidewalk	0.00	0.00	0.000
5	Existing Row Landscape	10.50	8.18	0.108
6				
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40				
	TOTAL/AVERAGE		8.18	0.108

Soil Storage Value (S) = Storage under pervious area / Total Area

Soil Storage under pavement and buildings is not considered in computations

S= 1.99917102

DRC

POST – DEVELOPMENT ANALYSIS



Engineering Inspired Design.

DRC

PZ23-12000043

11/15/2023

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel
 Design Engineer : Niles T. Warrick
 Project Address / Location : 911 East Atlantic Blvd, Pompano Beach, Florida 33060
 Section/Township/Range: 36 48S 42E
 Surfacewater License:
 FEMA FIRM Information: 12011C0376J
 Project Description: Mixed-use development with commercial at the ground level with 95 residential units above integrated parking garage.

Job Number: 13376.01

Total Drainage Basin: 0.651 Acres

Hydrogeologic Information :

Table 1.	1 Day Storm Event			3 Day Storm Event		
RAINFALL DATA	Rainfall Inches	Runoff Inches	Runoff Ac-Ft	Rainfall Inches	Runoff Inches	Runoff Ac-Ft
100 Year Return Period	16.7	15.37	0.833	19.2	17.86	0.968
25 Year Return Period	12.1	10.79	0.585	14.0	12.68	0.688
10 Year Return Period	9.5	8.17	0.443	12.8	11.53	0.625
5 Year Return Period	7.7	6.49	0.352	10.5	9.23	0.500
3 Year Return Period	6.4	5.18	0.281	8.7	7.43	0.403
5 Yr Return Period - 1 Hr	3.1	0.02	0.001			

Runoff estimation - USDA SCS formula

$$\text{Runoff (in)} Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

Where: P = accumulated rainfall (in.)
 S = Soil Storage Value

Table 2. SUMMARY OF FLOOD ROUTING	Agency maps	SBUH Calculated with Q-1 Day Storm		SBUH Calculated with Q-3 Day Storm		SBUH Calculated *Zero Q-3 Day Storm		Calc. 5Yr 1 hour Peak Stage (ft)
		Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	
100 Year Return Period		13.94	0.00	14.15	0.00	14.15	0.00	Zero Q
25 Year Return Period		13.55	0.00	13.71	0.00	13.71	0.00	(Water Budget)
10 Year Return Period		13.18	0.00	13.62	0.00	13.62	0.00	
5 Year Return Period		12.92	0.00	13.35	0.00	13.35	0.00	11.00
3 Year Return Period		12.71	0.00	13.07	0.00	13.07	0.00	

For 5 yr - 1 hr rainfall, Calculate 5 yr Vol by subtracting Exfil vol in inches from 5 yr 1 h rainfall, then calc Runoff using SCS formula. From stage storage table find Zero Discharge Stage. Uses Max. Elev of Lookup Stage or highest top of EXFIL trench. If exfil vol exceeds 5 year 1 hour vol. Uses Max. Elev of highest top of EXFIL trench.

* Zero Q indicates there is no offsite discharge included in the calculations (only Exfil Trench and Wells). Hypothetical stage calc. for PRE-POST Analysis.

Table 3. WATER QUALITY STORAGE REQUIREMENTS:

Based on Total Drainage Basin Acreage	Ac-Ft
1" x Basin Area	0.054
2.5" x WQPI x (Basin Area) 2.14 Inches	0.116
Required Wet Detention (Total basin incl Offsite)	
0.5" Pretreatment-Com. Prjs,x(Basin Area - water area)	0.027
Credit for Inlets in Grass Areas, GAC=0.2" x (TDA	0.011
	N

Table 4. WATER QUALITY STORAGE SOURCE	Basin Storage Elev. (Ac-Ft)	WQ Eq WDV (Ac-Ft)	WQ Eq WDV Inches
Retention (RV) @			
Dry Det. (DDV) @			
Wet Det. (WDV) @			
Equiv WDV=WDV+RV/.5+DDV/.75)		0.000	
Exfil Trench Storage	0.090	0.180	3.31
Total WQ EQ WDV - Provided		0.180	3.31
Total WQ EQ WDV - Required		0.116	2.14

Exfil Vol. in Stage Storage =

(Ac-FT)	(Inches)
0.148	2.73

DRC

Project: 911 East Atlantic Blvd. Multifamily
Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Table 5. PRE - POST COMPARISON	PRE-DEVELOP. with Q - 3 Day Storm		POST-DEVELOP. with Q - 3 Day Storm		PRE-DEVELOP. *Zero Q - 3 Day Storm		POST-DEVELOP. *Zero Q - 3 Day Storm	
	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)	Peak Stage(ft)	Peak Q (CFS)
100 Year Return Period					14.29		14.15	
25 Year Return Period					13.85		13.71	
10 Year Return Period					13.75		13.62	
5 Year Return Period					13.55		13.35	
3 Year Return Period					13.36		13.07	

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis ZERO Offsite Discharge

Table 6. STAGE - DISCHARGE INFORMATION 100 - YEAR STORM - ZERO Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
4.00	0.02	0.34	0.01	0.01	0.00	0.00	0.00	0.00	6.01	0.00	0.00	0.00
8.00	0.05	0.69	0.13	0.03	0.02	0.00	0.00	0.00	6.24	0.00	0.00	0.00
12.00	0.07	1.03	0.32	0.05	0.03	0.01	0.00	0.01	6.70	0.00	0.00	0.00
16.00	0.10	1.37	0.56	0.03	0.04	0.03	0.00	0.03	7.30	0.00	0.00	0.00
20.00	0.12	1.72	0.83	0.06	0.04	0.04	0.00	0.04	7.99	0.00	0.00	0.00
24.00	0.15	2.06	1.11	0.06	0.05	0.06	0.00	0.06	8.71	0.00	0.00	0.00
28.00	0.18	2.57	1.55	0.10	0.07	0.08	0.00	0.08	9.76	0.00	0.00	0.00
32.00	0.22	3.07	2.00	0.07	0.08	0.10	0.00	0.10	10.93	0.00	0.00	0.00
36.00	0.25	3.56	2.46	0.07	0.07	0.13	0.00	0.13	11.64	0.00	0.00	0.00
40.00	0.29	4.07	2.93	0.07	0.08	0.15	0.00	0.15	11.92	0.00	0.00	0.00
44.00	0.32	4.58	3.42	0.11	0.08	0.18	0.00	0.18	12.21	0.00	0.00	0.00
48.00	0.36	5.07	3.89	0.07	0.08	0.20	0.00	0.20	12.49	0.00	0.00	0.00
52.00	0.40	5.71	4.50	0.14	0.11	0.23	0.00	0.23	12.59	0.00	0.00	0.00
56.00	0.50	7.01	5.77	0.29	0.24	0.29	0.00	0.29	12.76	0.00	0.00	0.00
58.00	0.57	8.08	6.82	0.40	0.34	0.34	0.00	0.34	12.90	0.00	0.00	0.00
59.00	0.63	8.87	7.60	0.58	0.45	0.37	0.00	0.37	13.00	0.00	0.00	0.00
59.50	0.68	9.58	8.30	0.92	0.60	0.40	0.00	0.40	13.06	0.00	0.00	0.00
59.75	0.85	11.97	10.66	6.20	1.26	0.42	0.00	0.42	13.14	0.00	0.00	0.00
60.00	1.02	14.34	13.02	6.19	2.36	0.47	0.00	0.47	13.28	0.00	0.00	0.00
60.50	1.09	15.37	14.04	1.33	2.38	0.58	0.00	0.58	13.55	0.00	0.00	0.00
61.00	1.13	15.91	14.58	0.70	1.77	0.66	0.00	0.66	13.67	0.00	0.00	0.00
62.00	1.18	16.63	15.29	0.41	0.96	0.76	0.00	0.76	13.83	0.00	0.00	0.00
64.00	1.24	17.50	16.17	0.26	0.37	0.85	0.00	0.85	13.98	0.00	0.00	0.00
68.00	1.31	18.52	17.18	0.15	0.17	0.92	0.00	0.92	14.09	0.00	0.00	0.00
72.00	1.36	19.20	17.86	0.11	0.11	0.96	0.00	0.96	14.15	0.00	0.00	0.00
Peak stage						14.15	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 7. STAGE - DISCHARGE INFORMATION 25 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
4.00	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
8.00	0.05	0.50	0.05	0.02	0.01	0.00	0.00	0.00	6.08	0.00	0.00	0.00
12.00	0.07	0.75	0.16	0.03	0.02	0.01	0.00	0.01	6.33	0.00	0.00	0.00
16.00	0.10	1.00	0.30	0.02	0.02	0.01	0.00	0.01	6.69	0.00	0.00	0.00
20.00	0.12	1.26	0.47	0.04	0.03	0.02	0.00	0.02	7.12	0.00	0.00	0.00
24.00	0.15	1.50	0.66	0.04	0.03	0.03	0.00	0.03	7.59	0.00	0.00	0.00
28.00	0.18	1.87	0.95	0.07	0.05	0.05	0.00	0.05	8.29	0.00	0.00	0.00
32.00	0.22	2.24	1.26	0.05	0.05	0.06	0.00	0.06	9.09	0.00	0.00	0.00
36.00	0.25	2.60	1.57	0.05	0.05	0.08	0.00	0.08	9.92	0.00	0.00	0.00
40.00	0.29	2.97	1.91	0.05	0.05	0.10	0.00	0.10	10.77	0.00	0.00	0.00
44.00	0.32	3.34	2.25	0.07	0.06	0.12	0.00	0.12	11.53	0.00	0.00	0.00
48.00	0.36	3.70	2.58	0.05	0.06	0.14	0.00	0.14	11.74	0.00	0.00	0.00
52.00	0.40	4.16	3.02	0.10	0.08	0.16	0.00	0.16	11.97	0.00	0.00	0.00
56.00	0.50	5.11	3.93	0.21	0.17	0.20	0.00	0.20	12.43	0.00	0.00	0.00
58.00	0.57	5.89	4.68	0.29	0.25	0.23	0.00	0.23	12.58	0.00	0.00	0.00
59.00	0.63	6.47	5.24	0.42	0.32	0.26	0.00	0.26	12.65	0.00	0.00	0.00
59.50	0.68	6.98	5.75	0.66	0.43	0.27	0.00	0.27	12.70	0.00	0.00	0.00
59.75	0.85	8.73	7.46	4.49	0.91	0.29	0.00	0.29	12.76	0.00	0.00	0.00
60.00	1.02	10.46	9.16	4.49	1.70	0.33	0.00	0.33	12.86	0.00	0.00	0.00
60.50	1.09	11.21	9.91	0.96	1.72	0.40	0.00	0.40	13.08	0.00	0.00	0.00
61.00	1.13	11.60	10.30	0.51	1.28	0.46	0.00	0.46	13.25	0.00	0.00	0.00
62.00	1.18	12.13	10.82	0.30	0.69	0.53	0.00	0.53	13.47	0.00	0.00	0.00
64.00	1.24	12.76	11.45	0.19	0.27	0.60	0.00	0.60	13.59	0.00	0.00	0.00
68.00	1.31	13.51	12.19	0.11	0.12	0.65	0.00	0.65	13.67	0.00	0.00	0.00
72.00	1.36	14.00	12.68	0.08	0.08	0.68	0.00	0.68	13.71	0.00	0.00	0.00
Peak stage						13.71	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 8. STAGE - DISCHARGE INFORMATION 10 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
4.00	0.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
8.00	0.05	0.46	0.04	0.01	0.01	0.00	0.00	0.00	6.06	0.00	0.00	0.00
12.00	0.07	0.69	0.13	0.02	0.02	0.01	0.00	0.01	6.26	0.00	0.00	0.00
16.00	0.10	0.92	0.25	0.01	0.02	0.01	0.00	0.01	6.57	0.00	0.00	0.00
20.00	0.12	1.15	0.40	0.03	0.02	0.02	0.00	0.02	6.95	0.00	0.00	0.00
24.00	0.15	1.38	0.56	0.04	0.03	0.03	0.00	0.03	7.36	0.00	0.00	0.00
28.00	0.18	1.72	0.83	0.06	0.04	0.04	0.00	0.04	7.98	0.00	0.00	0.00
32.00	0.22	2.05	1.10	0.04	0.05	0.06	0.00	0.06	8.69	0.00	0.00	0.00
36.00	0.25	2.38	1.39	0.04	0.05	0.07	0.00	0.07	9.44	0.00	0.00	0.00
40.00	0.29	2.72	1.69	0.04	0.05	0.09	0.00	0.09	10.21	0.00	0.00	0.00
44.00	0.32	3.06	2.00	0.07	0.05	0.10	0.00	0.10	11.00	0.00	0.00	0.00
48.00	0.36	3.39	2.30	0.05	0.05	0.12	0.00	0.12	11.57	0.00	0.00	0.00
52.00	0.40	3.82	2.70	0.09	0.07	0.14	0.00	0.14	11.79	0.00	0.00	0.00
56.00	0.50	4.69	3.52	0.19	0.16	0.18	0.00	0.18	12.20	0.00	0.00	0.00
58.00	0.57	5.41	4.21	0.26	0.23	0.21	0.00	0.21	12.51	0.00	0.00	0.00
59.00	0.63	5.93	4.72	0.39	0.29	0.23	0.00	0.23	12.58	0.00	0.00	0.00
59.50	0.68	6.41	5.18	0.60	0.40	0.25	0.00	0.25	12.62	0.00	0.00	0.00
59.75	0.85	8.00	6.75	4.10	0.83	0.26	0.00	0.26	12.67	0.00	0.00	0.00
60.00	1.02	9.59	8.31	4.11	1.56	0.30	0.00	0.30	12.77	0.00	0.00	0.00
60.50	1.09	10.28	8.99	0.88	1.58	0.36	0.00	0.36	12.97	0.00	0.00	0.00
61.00	1.13	10.64	9.35	0.47	1.17	0.42	0.00	0.42	13.12	0.00	0.00	0.00
62.00	1.18	11.12	9.82	0.27	0.64	0.48	0.00	0.48	13.32	0.00	0.00	0.00
64.00	1.24	11.71	10.41	0.17	0.25	0.54	0.00	0.54	13.50	0.00	0.00	0.00
68.00	1.31	12.39	11.08	0.10	0.11	0.59	0.00	0.59	13.57	0.00	0.00	0.00
72.00	1.36	12.84	11.53	0.07	0.07	0.62	0.00	0.62	13.62	0.00	0.00	0.00
Peak stage						13.62	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 9. STAGE - DISCHARGE INFORMATION 5 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
4.00	0.02	0.19	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
8.00	0.05	0.38	0.02	0.01	0.00	0.00	0.00	0.00	6.02	0.00	0.00	0.00
12.00	0.07	0.57	0.07	0.02	0.01	0.00	0.00	0.00	6.14	0.00	0.00	0.00
16.00	0.10	0.75	0.16	0.01	0.01	0.01	0.00	0.01	6.35	0.00	0.00	0.00
20.00	0.12	0.94	0.27	0.02	0.02	0.01	0.00	0.01	6.62	0.00	0.00	0.00
24.00	0.15	1.13	0.39	0.03	0.02	0.02	0.00	0.02	6.92	0.00	0.00	0.00
28.00	0.18	1.41	0.59	0.05	0.03	0.03	0.00	0.03	7.39	0.00	0.00	0.00
32.00	0.22	1.68	0.80	0.03	0.04	0.04	0.00	0.04	7.94	0.00	0.00	0.00
36.00	0.25	1.95	1.02	0.03	0.04	0.05	0.00	0.05	8.51	0.00	0.00	0.00
40.00	0.29	2.23	1.25	0.04	0.04	0.06	0.00	0.06	9.12	0.00	0.00	0.00
44.00	0.32	2.51	1.50	0.05	0.04	0.08	0.00	0.08	9.74	0.00	0.00	0.00
48.00	0.36	2.78	1.74	0.04	0.04	0.09	0.00	0.09	10.38	0.00	0.00	0.00
52.00	0.40	3.13	2.05	0.07	0.06	0.11	0.00	0.11	11.14	0.00	0.00	0.00
56.00	0.50	3.84	2.72	0.15	0.12	0.14	0.00	0.14	11.75	0.00	0.00	0.00
58.00	0.57	4.43	3.27	0.21	0.18	0.16	0.00	0.16	12.03	0.00	0.00	0.00
59.00	0.63	4.86	3.69	0.31	0.24	0.18	0.00	0.18	12.22	0.00	0.00	0.00
59.50	0.68	5.25	4.06	0.49	0.32	0.19	0.00	0.19	12.36	0.00	0.00	0.00
59.75	0.85	6.56	5.33	3.33	0.67	0.21	0.00	0.21	12.50	0.00	0.00	0.00
60.00	1.02	7.86	6.60	3.34	1.27	0.23	0.00	0.23	12.58	0.00	0.00	0.00
60.50	1.09	8.42	7.16	0.72	1.28	0.29	0.00	0.29	12.74	0.00	0.00	0.00
61.00	1.13	8.72	7.45	0.38	0.95	0.33	0.00	0.33	12.87	0.00	0.00	0.00
62.00	1.18	9.11	7.83	0.22	0.52	0.39	0.00	0.38	13.03	0.00	0.00	0.00
64.00	1.24	9.59	8.31	0.14	0.20	0.43	0.00	0.43	13.17	0.00	0.00	0.00
68.00	1.31	10.15	8.86	0.08	0.09	0.47	0.00	0.47	13.29	0.00	0.00	0.00
72.00	1.36	10.52	9.23	0.06	0.06	0.50	0.00	0.50	13.35	0.00	0.00	0.00
Peak stage						13.35	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 Flood Routing Description: POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Client : Yuri Gurfel

Job Number: 13376.01

Routing Results from Analysis WITHOUT Offsite Discharge

Table 10. STAGE - DISCHARGE INFORMATION 3 - YEAR STORM - Zero Offsite Discharge

TIME STEP (HOUR)	Rain Fall RATIO	Rain C*P (IN)	Q Scs (IN)	Inst Q In (CFS)	Sbuh Q (CFS)	Tot Q In (AC-FT)	Sumq Out (AC-FT)	Stored Vol (AC-FT)	Stage Lk-Up (FEET)	Inst Q Lkup (CFS)	Avg. Q Out (CFS)	Step Qout (AC-FT)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
4.00	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
8.00	0.05	0.31	0.00	0.00	0.00	0.00	0.00	0.00	6.01	0.00	0.00	0.00
12.00	0.07	0.47	0.04	0.01	0.01	0.00	0.00	0.00	6.07	0.00	0.00	0.00
16.00	0.10	0.62	0.09	0.01	0.01	0.00	0.00	0.00	6.21	0.00	0.00	0.00
20.00	0.12	0.78	0.17	0.02	0.01	0.01	0.00	0.01	6.40	0.00	0.00	0.00
24.00	0.15	0.93	0.26	0.02	0.01	0.01	0.00	0.01	6.62	0.00	0.00	0.00
28.00	0.18	1.16	0.41	0.03	0.02	0.02	0.00	0.02	6.97	0.00	0.00	0.00
32.00	0.22	1.39	0.57	0.02	0.03	0.03	0.00	0.03	7.38	0.00	0.00	0.00
36.00	0.25	1.61	0.74	0.03	0.03	0.04	0.00	0.04	7.83	0.00	0.00	0.00
40.00	0.29	1.84	0.93	0.03	0.03	0.05	0.00	0.05	8.30	0.00	0.00	0.00
44.00	0.32	2.07	1.12	0.04	0.03	0.06	0.00	0.06	8.79	0.00	0.00	0.00
48.00	0.36	2.30	1.31	0.03	0.03	0.07	0.00	0.07	9.30	0.00	0.00	0.00
52.00	0.40	2.59	1.57	0.06	0.04	0.08	0.00	0.08	9.90	0.00	0.00	0.00
56.00	0.50	3.17	2.10	0.12	0.10	0.11	0.00	0.11	11.07	0.00	0.00	0.00
58.00	0.57	3.66	2.55	0.17	0.15	0.13	0.00	0.13	11.63	0.00	0.00	0.00
59.00	0.63	4.02	2.89	0.25	0.19	0.14	0.00	0.14	11.78	0.00	0.00	0.00
59.50	0.68	4.34	3.19	0.40	0.26	0.15	0.00	0.15	11.89	0.00	0.00	0.00
59.75	0.85	5.42	4.23	2.72	0.55	0.16	0.00	0.16	12.02	0.00	0.00	0.00
60.00	1.02	6.50	5.27	2.74	1.03	0.18	0.00	0.18	12.25	0.00	0.00	0.00
60.50	1.09	6.96	5.73	0.59	1.05	0.23	0.00	0.23	12.57	0.00	0.00	0.00
61.00	1.13	7.21	5.96	0.31	0.78	0.26	0.00	0.26	12.67	0.00	0.00	0.00
62.00	1.18	7.53	6.28	0.18	0.42	0.31	0.00	0.31	12.80	0.00	0.00	0.00
64.00	1.24	7.93	6.67	0.12	0.17	0.35	0.00	0.35	12.92	0.00	0.00	0.00
68.00	1.31	8.39	7.13	0.07	0.08	0.38	0.00	0.38	13.02	0.00	0.00	0.00
72.00	1.36	8.70	7.43	0.05	0.05	0.40	0.00	0.40	13.07	0.00	0.00	0.00
Peak stage						13.07	At hour	72.00				
Peak discharge						0.00	At hour	72.00				

DRC

Project: 911 East Atlantic Blvd. Multifamily
 POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Total Drainage Basin: 0.651 Acres
 Water Table Elevation = 2.50 Feet
 Time of Conc. (hr.) = 1.00
 Calculated weighted soil (s) 1.18 Soil Storage Value (S) = Storage under pervious area / Total Area
 Calculated CN value 89.5 Soil Storage under pavement and buildings is not considered in computations

Y	Y/N -Do you want to limit the Exfiltration Trench Vol. to a maximum of 3.28" over the site?
N	Y/N -Deduct EXFIL Vol. from Rainfall amount rather than include Vol. in Stage Storage table
Y	Y/N -Use EXFIL Vol. in Stage Storage, up to Water Quality Vol., without safety Factor of 2.

Table 16. STAGE STORAGE TABLE

Stage Elevation (feet)	Storage (Ac-ft)	Storage (CF)	Depth to water table (Ft)	Compacted Ground storage table			
				1.00	2.00	3.00	4.00
			Ground storage(In)	0.45	1.88	4.95	8.18
6.00	0.000	0	Mean depth to ground water table (ft)=	10.27	(Pervious Area)		
6.50	0.010	451					
7.50	0.031	1,354	Soil Storage Type	Ground Storage Values (In Inches)			
8.50	0.052	2,257	Depth to Ground Water (Ft)	1	2	3	4
9.50	0.073	3,159	* Depressional	0.45	1.58	3.3	5.1
10.50	0.093	4,062	Flatwoods	0.45	1.88	4.05	6.75
11.50	0.114	4,965	Coastal Type	0.45	1.88	4.95	8.18
12.50	0.205	8,919	* (Low Flatwoods & Costal Lowlands)				
13.50	0.545	23,731	Ground Storage Values reflect 25% reduction of Available Storage,				
14.50	1.177	51,292	to take into account compaction of native soils.				
15.50	1.828	79,643					
16.50	2.479	107,994					
17.50	3.130	136,345					
18.50	3.781	164,697					
19.50	4.432	193,048					
20.50	5.083	221,399					
21.50	5.733	249,750					
22.50	6.384	278,101					
23.50	7.035	306,453					

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Project: 911 East Atlantic Blvd. Multifamily
POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Table 17. SITE ACREAGE INFORMATION

Input Information								Imperv. Paved Acres	Perv. Acres	Bldgs. Acres	Non Bldgs. Acres	Water Lake Acres	Perv. Area Avg. El.	perv. acres * avg el
LAND USES	Acres	High Elev.	Low Elev.	% Imperv. Paved	% Bldgs.	% Water								
BASIN TOTALS / AVERAG														
1	Preserved Atlantic Blvd.	0.198	13.60	11.50	100	0	0	0.20	0.00	0.00	0.20	0.00	0.00	0.
2	Preserved NE 10th Ave.	0.040	13.50	12.50	100	0	0	0.04	0.00	0.00	0.04	0.00	0.00	0.
3	Preserved NE 1st St.	0.097	14.00	13.30	100	0	0	0.10	0.00	0.00	0.10	0.00	0.00	0.
4	Landscape North	0.033	13.50	13.00	0	0	0	0.00	0.03	0.00	0.03	0.00	13.25	0.
5	Landscape East	0.031	13.00	12.50	0	0	0	0.00	0.03	0.00	0.03	0.00	12.75	0.
6	Landscape South	0.030	12.50	12.00	0	0	0	0.00	0.03	0.00	0.03	0.00	12.25	0.
7	SE Corner Concrete	0.021	12.50	12.30	100	0	0	0.02	0.00	0.00	0.02	0.00	0.00	0.
8	SW Concrete Corner	0.003	13.00	12.90	100	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.
9	NE Corner Concrete	0.007	13.30	12.20	100	0	0	0.01	0.00	0.00	0.01	0.00	0.00	0.
10	East Proposed Asphalt	0.042	13.15	13.00	100	0	0	0.04	0.00	0.00	0.04	0.00	0.00	0.
11	South Proposed Ashphalt	0.035	12.70	12.50	100	0	0	0.04	0.00	0.00	0.04	0.00	0.00	0.
12	North Proposed Asphalt	0.039	13.40	13.30	100	0	0	0.04	0.00	0.00	0.04	0.00	0.00	0.
13	South Bike Lane	0.034	13.00	12.50	100	0	0	0.03	0.00	0.00	0.03	0.00	0.00	0.
14	Proposed Sidewalk East	0.021	13.50	13.00	100	0	0	0.02	0.00	0.00	0.02	0.00	0.00	0.
15	Prposed Sidewalk North	0.020	13.60	13.30	100	0	0	0.02	0.00	0.00	0.02	0.00	0.00	0.
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BASIN SUBTOTALS / AVG		0.651	14.00	11.50	85.61	0.00	0.00	0.56	0.09	0.00	0.65	0.00	12.77	1.

Table 18. UNDERGROUND STORAGE INFORMATION

Underground Storage		Area (SF)	Top Elev	Bottom Elev	% Voids									
1	Underground Storage 1													
2	Underground Storage 2													
3	Underground Storage 3													
4	Underground Storage 4													
5	Underground Storage 5													
BASIN TOTALS / AVERAGE		0.651	14.00	6.00	85.61	0.00	0.00	0.56	0.09	0.00	0.65	0.00	12.77	1.

Basin % Imper. for Water Quality Purposes = 85.61

Basin % Impervious (incl. Bldg., No lakes)= 85.61

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Project: 911 East Atlantic Blvd. Multifamily
POST-DEVELOPMENT OFFSITE SWM CALCULATIONS

Date: 10/11/2023

Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Detail - Stage - Storage Information

Table 19. STAGE - STORAGE INFORMATION		Surface storage (Ac-Ft)											
LAND USES	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.	Elev.
	6.00	6.50	7.50	8.50	9.50	10.50	11.50	12.50	13.50	14.50	15.50	16.50	17.50
Total Surface Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057	0.397	1.030	1.681	2.331	2.982
Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.010	0.031	0.052	0.073	0.093	0.114	0.148	0.148	0.148	0.148	0.148	0.148
TOTAL Storage	0.000	0.010	0.031	0.052	0.073	0.093	0.114	0.205	0.545	1.177	1.828	2.479	3.130
1 Preserved Atlantic Blvd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047	0.189	0.386	0.584	0.782	0.980
2 Preserved NE 10th Ave.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.059	0.099	0.139	0.178
3 Preserved NE 1st St.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.083	0.180	0.277	0.374
4 Landscape North	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.041	0.074	0.107	0.140
5 Landscape East	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.054	0.085	0.116	0.147
6 Landscape South	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.037	0.067	0.097	0.127	0.157
7 SE Corner Concrete	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.023	0.043	0.064	0.085	0.105
8 SW Concrete Corner	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.009	0.012	0.016
9 NE Corner Concrete	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.012	0.019	0.026	0.033
10 East Proposed Asphalt	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.059	0.101	0.143	0.184
11 South Proposed Asphalt	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.067	0.102	0.137	0.172
12 North Proposed Asphalt	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.045	0.084	0.123	0.162
13 South Bike Lane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.059	0.093	0.127	0.161
14 Proposed Sidewalk East	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.027	0.048	0.069	0.090
15 Prposed Sidewalk North	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.021	0.042	0.062	0.083
16													
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Total Surface Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.40	1.03	1.68	2.33	2.98
Underground Storage													
	6.00	6.50	7.50	8.50	9.50	10.50	11.50	12.50	13.50	14.50	15.50	16.50	17.50
1 Underground Storage 1													
2 Underground Storage 2													
3 Underground Storage 3													
4 Underground Storage 4													
5 Underground Storage 5													
Total Underground Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Exfil Trench Storage	0.000	0.010	0.031	0.052	0.073	0.093	0.114	0.148	0.148	0.148	0.148	0.148	0.148
TOTAL Storage	0.000	0.010	0.031	0.052	0.073	0.093	0.114	0.205	0.545	1.177	1.828	2.479	3.130
Stage Elevation	6.00	6.50	7.50	8.50	9.50	10.50	11.50	12.50	13.50	14.50	15.50	16.50	17.50

Project: 911 East Atlantic Blvd. Multifamily
POST-DEVELOPMENT OFFSITE SWM CALCULATIONS
Flood Routing Description:
Client : Yuri Gurfel

Date: 10/11/2023

Job Number: 13376.01

Table 20. SOIL - STORAGE INFORMATION

Detail - Soil Storage Information

	LAND USES	Depth to Water Table	Ground Storage Under Pervious	
			Inches	Ac-Ft
	TOTAL/AVERAGE		24.54	0.06
1	Preserved Atlantic Blvd.	0.00	0.00	0.000
2	Preserved NE 10th Ave.	0.00	0.00	0.000
3	Preserved NE 1st St.	0.00	0.00	0.000
4	Landscape North	10.75	8.18	0.022
5	Landscape East	10.25	8.18	0.021
6	Landscape South	9.75	8.18	0.020
7	SE Corner Concrete	0.00	0.00	0.000
8	SW Concrete Corner	0.00	0.00	0.000
9	NE Corner Concrete	0.00	0.00	0.000
10	East Proposed Asphalt	0.00	0.00	0.000
11	South Proposed Ashphalt	0.00	0.00	0.000
12	North Proposed Asphalt	0.00	0.00	0.000
13	South Bike Lane	0.00	0.00	0.000
14	Proposed Sidewalk East	0.00	0.00	0.000
15	Prposed Sidewalk North	0.00	0.00	0.000
16				
17				
18				
19				
20				
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29				
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31				
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33				
34				
35				
36				
37				
38				
39				
40				
	TOTAL/AVERAGE		24.54	0.064

Soil Storage Value (S) = Storage under pervious area / Total Area

Soil Storage under pavement and buildings is not considered in computations

S= 1.17746621

DRC

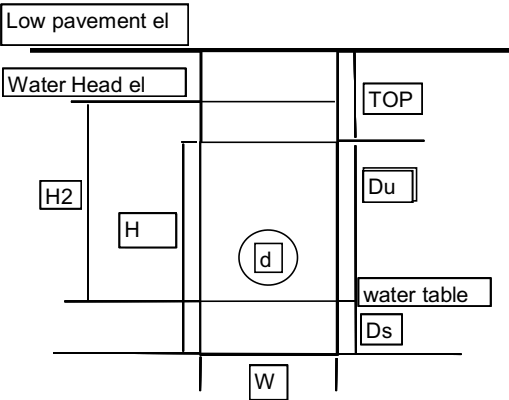
Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Table 22-1 EXILTRATION TRENCH -1 INFORMATION

INPUT INFORMATION	
Trench Width (Ft) (W)	10.00
Trench Height (Ft) (H)	5.00
Diameter of Pipe (inches) (d)	15
Invert of Pipe (Ft) (IE)	8.5
Top of trench elevation	11
Low pavement elevation	12.9
Water Head elevation (Ft)	12.90
Avg. Hydraulic Conductivity (Cfs/Ft^2) (k)	5.33E-05



Length of Exfiltration trench Provided (Ft) (L)	60
Water table elevation (Ft)	2.50
Trench Data	
Depth To Top Of Trench (Ft) (TOP)	1.90
Bottom of trench elevation	6.00
Saturated Trench Depth (Ds)	0.00
Non-Saturated Trench Depth (Du)	5.00
Depth To Water Table or Trench Bottom (Ft) (H2)	6.90
Trench Storage Begins at Higher of Water Table or Trench Bot. Elev.	6.00

= Water head El - Top of Trench El.
= Top of Trench El. - Trench Height (H)
= Trench Height below water Table
= Trench depth above water Table
= Water head El to the water table or bottom of trench

Trench Volumes Stored & Exfiltrated in 1 hour (CF)

1 Hr. Vol by exfil SFWMD Eq.7 (Du > Ds and W < 2H) (CF)	2,825
1 Hr. Vol by exfil SFWMD Eq.8 (Du < Ds or W > 2H) (CF)	0
This Trench Volume with Safety Factor of 2 (V(trnSF))	1,413
Max. Vol allowed in Exfil (3.28" = 0.273 Ac-Ft / Ac) (Val) (CF)	7,749
Total EXFIL Vol Provided ALL EXFIL Trenches (Vtot) (CF)	3,910
Equivalent Wet Detention Vol:50% credit ALL EXFIL (Vwteq) (CF)	7,820
Total System ALL EXFIL WQ Equivalent Wet Det. Vol Provided	7,820
Total System ALL EXFIL Volume Used in Stage-Storage	6,438

Note: 3630 in Eqn. is conversion factor from (Ac-In) to (CF)-> (43560 SF/Ac)(1FT/12In)

$V_{trn} = 3630 * L * [k * ((H2 * W) + (2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V_{trn} = 3630 * L * [k * ((2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V(trnSF) = V_{trn} / (\text{Safety Factor of } 2)$	
$V_{tot} = V_{design} + V_{sto}$	
$V_{tot} = V_{design} + V_{sto}$	
$V_{wteq} = V_{tot} * 2$	

0.032	Ac-Ft	0.39	Ac-In
0.178	Ac-Ft	2.13	Ac-In
0.090	Ac-Ft	1.08	Ac-In
0.180	Ac-Ft	2.15	Ac-In

CF 0.180 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches
CF 0.148 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches

NOTE: For Exfiltration Trench design, a factor of safety of 2 is used for WQ in all conditions (WQ vol & above WQ vol), per the "New" SFWMD formula. Select on the Stage-Storage tab, whether to use the safety factor for the Exfil trench, up to the required WQ amount, in the flood routing Stage-Storage volumes. Because of the built in safety factor of only using the trench discharge for one hour during the 72 hour storm event, some Agencies allow the use of the Exfiltration trench volume, up to the required Water Quality Volume, without a safety factor of 2, for use in storm routing calculations.

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Flood Routing Description:

Client :

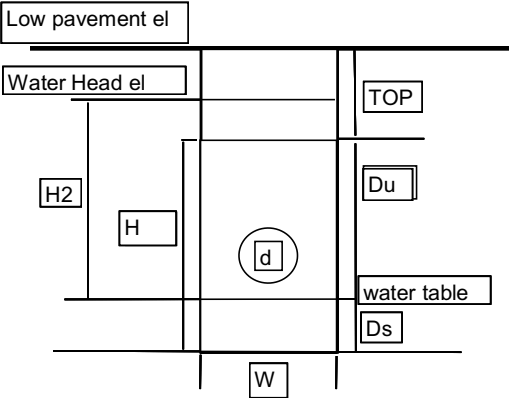
Yuri Gurfel

Job Number:

13376.01

Table 22-2 EXILTRATION TRENCH -2 INFORMATION

INPUT INFORMATION	
Trench Width (Ft) (W)	10.00
Trench Height (Ft) (H)	5.00
Diameter of Pipe (inches) (d)	15
Invert of Pipe (Ft) (IE)	8.5
Top of trench elevation	11
Low pavement elevation	13.1
Water Head elevation (Ft)	13.10
Avg. Hydraulic Conductivity (Cfs/Ft^2) (k)	5.33E-05



Length of Exfiltration trench Provided (Ft) (L)	36
Water table elevation (Ft)	2.50
Trench Data	
Depth To Top Of Trench (Ft) (TOP)	2.10
Bottom of trench elevation	6.00
Saturated Trench Depth (Ds)	0.00
Non-Saturated Trench Depth (Du)	5.00
Depth To Water Table or Trench Bottom (Ft) (H2)	7.10
Trench Storage Begins at Higher of Water Table or Trench Bot. Elev.	6.00

= Water head El - Top of Trench El.

= Top of Trench El. - Trench Height (H)

= Trench Height below water Table

= Trench depth above water Table

= Water head El to the water table or bottom of trench

Trench Volumes Stored & Exfiltrated in 1 hour (CF)

1 Hr. Vol by exfil SFWMD Eq.7 (Du > Ds and W < 2H) (CF)	1,723
1 Hr. Vol by exfil SFWMD Eq.8 (Du < Ds or W > 2H) (CF)	0
This Trench Volume with Safety Factor of 2 (V(trnSF))	862
Max. Vol allowed in Exfil (3.28" = 0.273 Ac-Ft / Ac) (Val) (CF)	7,749
Total EXFIL Vol Provided ALL EXFIL Trenches (Vtot) (CF)	3,910
Equivalent Wet Detention Vol:50% credit ALL EXFIL (Vwteq) (CF)	7,820
Total System ALL EXFIL WQ Equivalent Wet Det. Vol Provided	7,820
Total System ALL EXFIL Volume Used in Stage-Storage	6,438

Note: 3630 in Eqn. is conversion factor from (Ac-In) to (CF)-> (43560 SF/Ac)(1FT/12In)

$V_{trn} = 3630 * L * [k * ((H2 * W) + (2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V_{trn} = 3630 * L * [k * ((2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V(trnSF) = V_{trn} / (\text{Safety Factor of } 2)$	
$V_{tot} = V_{design} + V_{sto}$	
$V_{wteq} = V_{tot} * 2$	

0.020	Ac-Ft	0.24	Ac-In
0.178	Ac-Ft	2.13	Ac-In
0.090	Ac-Ft	1.08	Ac-In
0.180	Ac-Ft	2.15	Ac-In

CF 0.180 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches

CF 0.148 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches

NOTE: For Exfiltration Trench design, a factor of safety of 2 is used for WQ in all conditions (WQ vol & above WQ vol), per the "New" SFWMD formula. Select on the Stage-Storage tab, whether to use the safety factor for the Exfil trench, up to the required WQ amount, in the flood routing Stage-Storage volumes. Because of the built in safety factor of only using the trench discharge for one hour during the 72 hour storm event, some Agencies allow the use of the Exfiltration trench volume, up to the required Water Quality Volume, without a safety factor of 2, for use in storm routing calculations.

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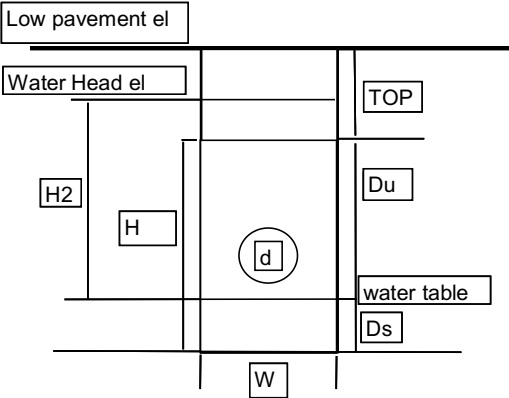
Flood Routing Description:

Client : Yuri Gurfel

Job Number: 13376.01

Table 22-3 EXILTRATION TRENCH - 3 INFORMATION

INPUT INFORMATION	
Trench Width (Ft) (W)	4.00
Trench Height (Ft) (H)	5.00
Diameter of Pipe (inches) (d)	15
Invert of Pipe (Ft) (IE)	8.5
Top of trench elevation	11
Low pavement elevation	13.35
Water Head elevation (Ft)	13.35
Avg. Hydraulic Conductivity (Cfs/Ft^2) (k)	5.33E-05



Length of Exfiltration trench Provided (Ft) (L)	130
Water table elevation (Ft)	2.50
Trench Data	
Depth To Top Of Trench (Ft) (TOP)	2.35
Bottom of trench elevation	6.00
Saturated Trench Depth (Ds)	0.00
Non-Saturated Trench Depth (Du)	5.00
Depth To Water Table or Trench Bottom (Ft) (H2)	7.35
Trench Storage Begins at Higher of Water Table or Trench Bot. Elev.	6.00

= Water head El - Top of Trench El.
= Top of Trench El. - Trench Height (H)
= Trench Height below water Table
= Trench depth above water Table
= Water head El to the water table or bottom of trench

Trench Volumes Stored & Exfiltrated in 1 hour (CF)

1 Hr. Vol by exfil SFWMD Eq.7 (Du > Ds and W < 2H) (CF)	3,271
1 Hr. Vol by exfil SFWMD Eq.8 (Du < Ds or W > 2H) (CF)	0
This Trench Volume with Safety Factor of 2 (V(trnSF))	1,636
Max. Vol allowed in Exfil (3.28" = 0.273 Ac-Ft / Ac) (Val) (CF)	7,749
Total EXFIL Vol Provided ALL EXFIL Trenches (Vtot) (CF)	3,910
Equivalent Wet Detention Vol:50% credit ALL EXFIL (Vwteq) (CF)	7,820
Total System ALL EXFIL WQ Equivalent Wet Det. Vol Provided	7,820
Total System ALL EXFIL Volume Used in Stage-Storage	6,438

Note: 3630 in Eqn. is conversion factor from (Ac-In) to (CF)-> (43560 SF/Ac)(1FT/12In)

$V_{trn} = 3630 * L * [k * ((H2 * W) + (2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V_{trn} = 3630 * L * [k * ((2 * H2 * Du) - Du^2 + (2 * H2 * Ds)) + ((1.39 * 10^{-4}) * (W * Du))]$	
$V(trnSF) = V_{trn} / (\text{Safety Factor of } 2)$	
$V_{tot} = V_{design} + V_{sto}$	
$V_{wteq} = V_{tot} * 2$	

0.038	Ac-Ft	0.45	Ac-In
0.178	Ac-Ft	2.13	Ac-In
0.090	Ac-Ft	1.08	Ac-In
0.180	Ac-Ft	2.15	Ac-In

CF 0.180 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches
CF 0.148 Ac-Ft NOTE: This line is Sum of all Exfiltration Trenches

NOTE: For Exfiltration Trench design, a factor of safety of 2 is used for WQ in all conditions (WQ vol & above WQ vol), per the "New" SFWMD formula. Select on the Stage-Storage tab, whether to use the safety factor for the Exfil trench, up to the required WQ amount, in the flood routing Stage-Storage volumes. Because of the built in safety factor of only using the trench discharge for one hour during the 72 hour storm event, some Agencies allow the use of the Exfiltration trench volume, up to the required Water Quality Volume, without a safety factor of 2, for use in storm routing calculations.

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Table 23. WATER QUALITY CALCULATIONS TABLE

Proposed Project

Project Land Use	Total Basin	Unit
1. Water Area (WA)	0.00	Acres
2. Roof Area (RA)	0.00	Acres
3. Other Impervious Areas, paving, sidewalks, roads, etc. (IA)	0.56	Acres
4. Landscape and Pervious areas (LPA)	0.09	Acres
5. Total Drainage Area (TDA)	0.65	Acres
6. Total % Impervious ($TPI = (WA + RA + IA) / TDA$)	85.6%	
7. Area for Water Quality % Impervious Calculations ($WQA = TDA - WA - RA$)	0.65	Acres
8. Impervious Area for Water Quality % Impervious Calculations ($WQIA = WQA - LPA$)	0.56	Acres
9. Water Quality % Impervious ($WQPI = WQIA / WQA$)	85.6%	
Required Water Quality Volumes per Florida SWERP		
Wet Detention Volume, the greater of the following:	Storage Volume	Unit
10. First inch of runoff from the entire site ($1" \times TDA$)	0.05	Ac-Ft
11. 2.5 in. times the percentage of impervious ($2.5" \times WQPI \times (TDA - WA)$)	0.12	Ac-Ft
12. Required Wet Water Quality Amount (greater of the 1" or 2.5" x % impervious)	0.12	Ac-Ft

The SWERP provides for credits to the Water Quality Volume for Dry Detention and Retention

13. Dry Detention Volume (DDV) (75% of WDV)	0.09	Ac-Ft
14. Retention Volume (RV) (50% of WDV)	0.06	Ac-Ft
15. Required Dry Detention or Retention Volume for Commercial and Industrial Zoned land and Projects greater than 40% Imp., Discharging to certain water bodies ($0.5" \times TDA - WA$)	0.03	Ac-Ft

The SWERP provides for credits to the Water Quality Volume for Inlets in Grass Areas

16. Ratio Impervious Area to Pervious Area, for inlets in Grass Area credit. (Full credit (0.2" wet detention) for Ratios 10:1 or less, proportionately less credit for greater ratios.) ($IAPA = (RA + IA) / LPA$)	5.95	
17. Credit for Inlets in Grass Area ($GAC = 0.2" \times (TDA - WA)$) (reduce for $IAPA > 10$)	0.01	Ac-Ft
18. Required Wet Detention Volume Water Quality with Inlet in Grass area credit	0.11	Ac-Ft
19. Required Dry Detention Volume Water Quality with Inlet in Grass area credit	0.08	Ac-Ft
20. Required Retention Volume Water Quality with Inlet in Grass area credit	0.05	Ac-Ft

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RAINFALL DATA AND MAPS



Engineering Inspired Design.

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11/15/2023



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.571 (0.446-0.729)	0.658 (0.513-0.841)	0.800 (0.622-1.02)	0.918 (0.711-1.18)	1.08 (0.814-1.43)	1.21 (0.891-1.62)	1.33 (0.957-1.84)	1.46 (1.01-2.06)	1.62 (1.10-2.37)	1.75 (1.16-2.60)
10-min	0.836 (0.653-1.07)	0.964 (0.751-1.23)	1.17 (0.911-1.50)	1.34 (1.04-1.73)	1.58 (1.19-2.10)	1.77 (1.30-2.37)	1.95 (1.40-2.69)	2.13 (1.48-3.02)	2.38 (1.60-3.47)	2.56 (1.70-3.80)
15-min	1.02 (0.796-1.30)	1.18 (0.916-1.50)	1.43 (1.11-1.83)	1.64 (1.27-2.11)	1.93 (1.45-2.56)	2.15 (1.59-2.90)	2.38 (1.71-3.28)	2.60 (1.81-3.69)	2.90 (1.96-4.23)	3.13 (2.07-4.64)
30-min	1.62 (1.26-2.07)	1.88 (1.47-2.40)	2.30 (1.79-2.95)	2.65 (2.05-3.41)	3.12 (2.35-4.14)	3.49 (2.58-4.69)	3.85 (2.77-5.30)	4.21 (2.93-5.97)	4.69 (3.16-6.84)	5.05 (3.34-7.50)
60-min	2.23 (1.74-2.84)	2.57 (2.00-3.28)	3.14 (2.45-4.03)	3.63 (2.81-4.68)	4.32 (3.26-5.75)	4.87 (3.60-6.57)	5.42 (3.91-7.50)	6.00 (4.18-8.53)	6.78 (4.58-9.91)	7.39 (4.88-11.0)
2-hr	2.83 (2.23-3.59)	3.26 (2.56-4.14)	3.99 (3.13-5.07)	4.62 (3.60-5.90)	5.52 (4.21-7.32)	6.25 (4.67-8.39)	7.00 (5.09-9.63)	7.79 (5.47-11.0)	8.87 (6.04-12.9)	9.72 (6.46-14.3)
3-hr	3.18 (2.51-4.01)	3.66 (2.89-4.62)	4.50 (3.54-5.70)	5.24 (4.10-6.67)	6.33 (4.86-8.39)	7.23 (5.43-9.70)	8.17 (5.98-11.2)	9.18 (6.49-13.0)	10.6 (7.24-15.4)	11.7 (7.82-17.2)
6-hr	3.72 (2.96-4.66)	4.35 (3.46-5.46)	5.48 (4.34-6.88)	6.49 (5.12-8.20)	8.02 (6.22-10.6)	9.31 (7.06-12.4)	10.7 (7.87-14.6)	12.2 (8.66-17.1)	14.3 (9.83-20.6)	15.9 (10.7-23.3)
12-hr	4.23 (3.39-5.26)	5.08 (4.07-6.32)	6.61 (5.28-8.25)	8.01 (6.36-10.0)	10.1 (7.91-13.3)	11.9 (9.09-15.8)	13.8 (10.2-18.8)	15.8 (11.4-22.2)	18.8 (13.0-27.0)	21.1 (14.3-30.6)
24-hr	4.86 (3.92-5.99)	5.88 (4.75-7.26)	7.74 (6.23-9.58)	9.45 (7.57-11.8)	12.1 (9.52-15.8)	14.3 (11.0-18.9)	16.7 (12.5-22.6)	19.3 (13.9-26.8)	23.0 (16.1-32.9)	26.0 (17.7-37.4)
2-day	5.72 (4.66-7.01)	6.77 (5.51-8.30)	8.72 (7.07-10.7)	10.6 (8.52-13.0)	13.4 (10.7-17.5)	15.8 (12.3-20.9)	18.5 (14.0-25.0)	21.5 (15.7-29.7)	25.7 (18.1-36.6)	29.2 (20.0-41.7)
3-day	6.33 (5.18-7.72)	7.35 (6.00-8.97)	9.27 (7.55-11.3)	11.1 (9.00-13.6)	14.0 (11.2-18.2)	16.5 (12.9-21.6)	19.2 (14.6-25.8)	22.2 (16.3-30.7)	26.6 (18.9-37.8)	30.2 (20.8-43.1)
4-day	6.87 (5.64-8.35)	7.82 (6.41-9.52)	9.66 (7.89-11.8)	11.4 (9.30-14.0)	14.3 (11.5-18.5)	16.8 (13.2-22.0)	19.5 (14.9-26.2)	22.6 (16.6-31.1)	27.1 (19.2-38.3)	30.8 (21.2-43.7)
7-day	8.34 (6.89-10.1)	9.06 (7.47-11.0)	10.6 (8.70-12.8)	12.2 (9.96-14.8)	14.8 (12.1-19.2)	17.3 (13.7-22.6)	20.0 (15.4-26.8)	23.2 (17.2-31.8)	27.8 (20.0-39.3)	31.8 (22.0-44.9)
10-day	9.49 (7.87-11.4)	10.2 (8.45-12.3)	11.7 (9.68-14.1)	13.3 (10.9-16.1)	16.0 (13.0-20.6)	18.4 (14.6-23.9)	21.2 (16.3-28.2)	24.3 (18.1-33.3)	29.0 (20.9-40.8)	33.0 (23.0-46.4)
20-day	12.2 (10.2-14.6)	13.6 (11.4-16.3)	16.0 (13.3-19.2)	18.2 (15.1-21.9)	21.4 (17.4-26.8)	24.1 (19.1-30.6)	26.9 (20.7-35.1)	29.9 (22.2-40.1)	34.1 (24.6-47.2)	37.5 (26.3-52.5)
30-day	14.6 (12.2-17.3)	16.5 (13.8-19.6)	19.7 (16.5-23.5)	22.3 (18.6-26.7)	26.0 (21.0-32.1)	28.8 (22.8-36.1)	31.6 (24.4-40.8)	34.5 (25.6-45.8)	38.3 (27.6-52.4)	41.2 (29.0-57.4)
45-day	17.8 (15.0-21.0)	20.2 (17.0-23.9)	24.0 (20.1-28.5)	27.0 (22.6-32.2)	31.0 (25.0-37.9)	33.9 (26.9-42.2)	36.7 (28.3-46.9)	39.4 (29.4-51.9)	42.8 (30.8-58.1)	45.3 (32.0-62.8)
60-day	20.8 (17.6-24.5)	23.3 (19.7-27.5)	27.3 (23.0-32.3)	30.5 (25.6-36.2)	34.5 (28.0-42.0)	37.5 (29.8-46.4)	40.2 (31.1-51.1)	42.8 (32.0-56.1)	46.0 (33.2-62.1)	48.2 (34.1-66.7)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

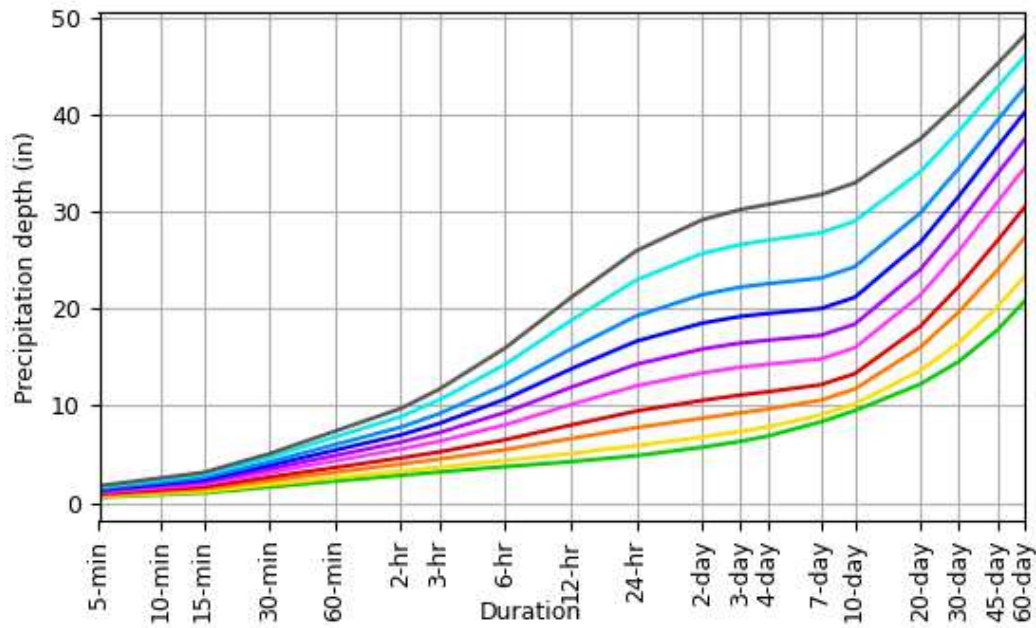
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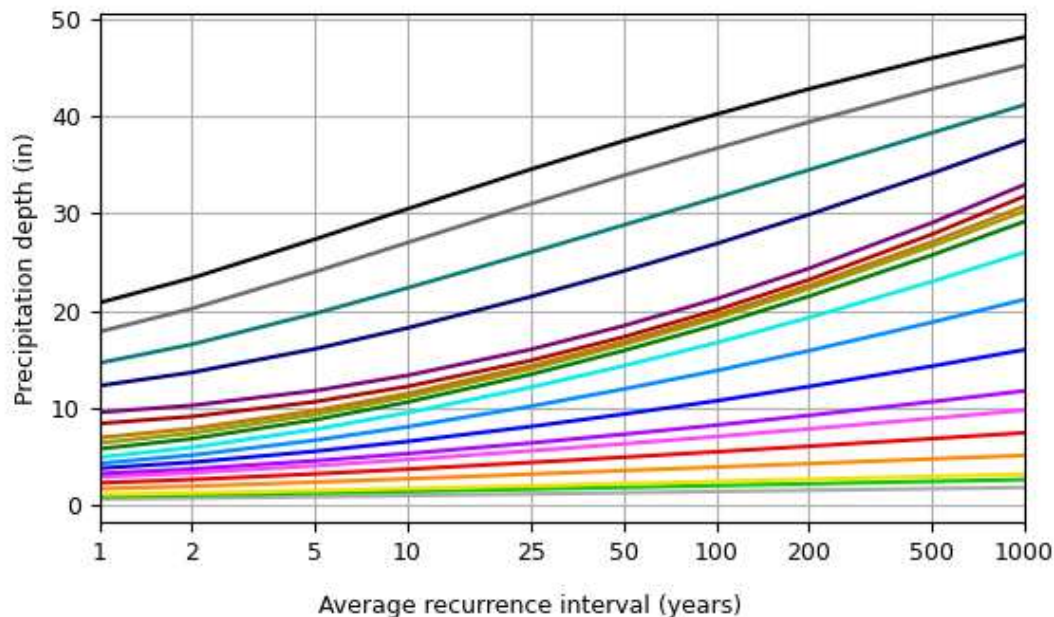
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PDS-based depth-duration-frequency (DDF) curves

Latitude: 26.2321°, Longitude: -80.1138°



Average recurrence interval (years)	
1	2
5	10
25	50
100	200
500	1000



Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

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Maps & aerials

Small scale terrain

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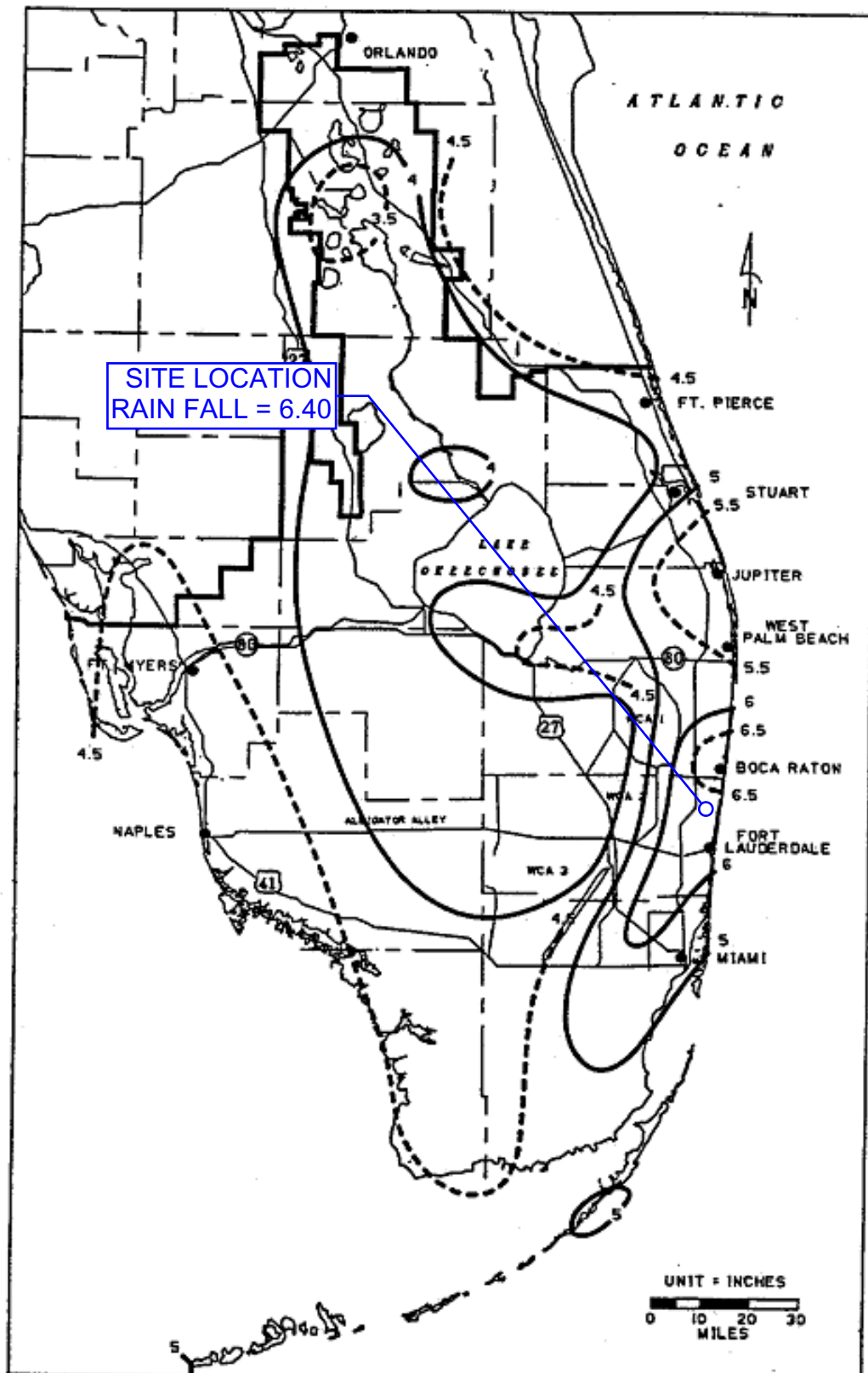


FIGURE C-2. 1-DAY RAINFALL: 3-YEAR RETURN PERIOD

MISC. MAPS & DESIGN EXHIBITS



Engineering Inspired Design.

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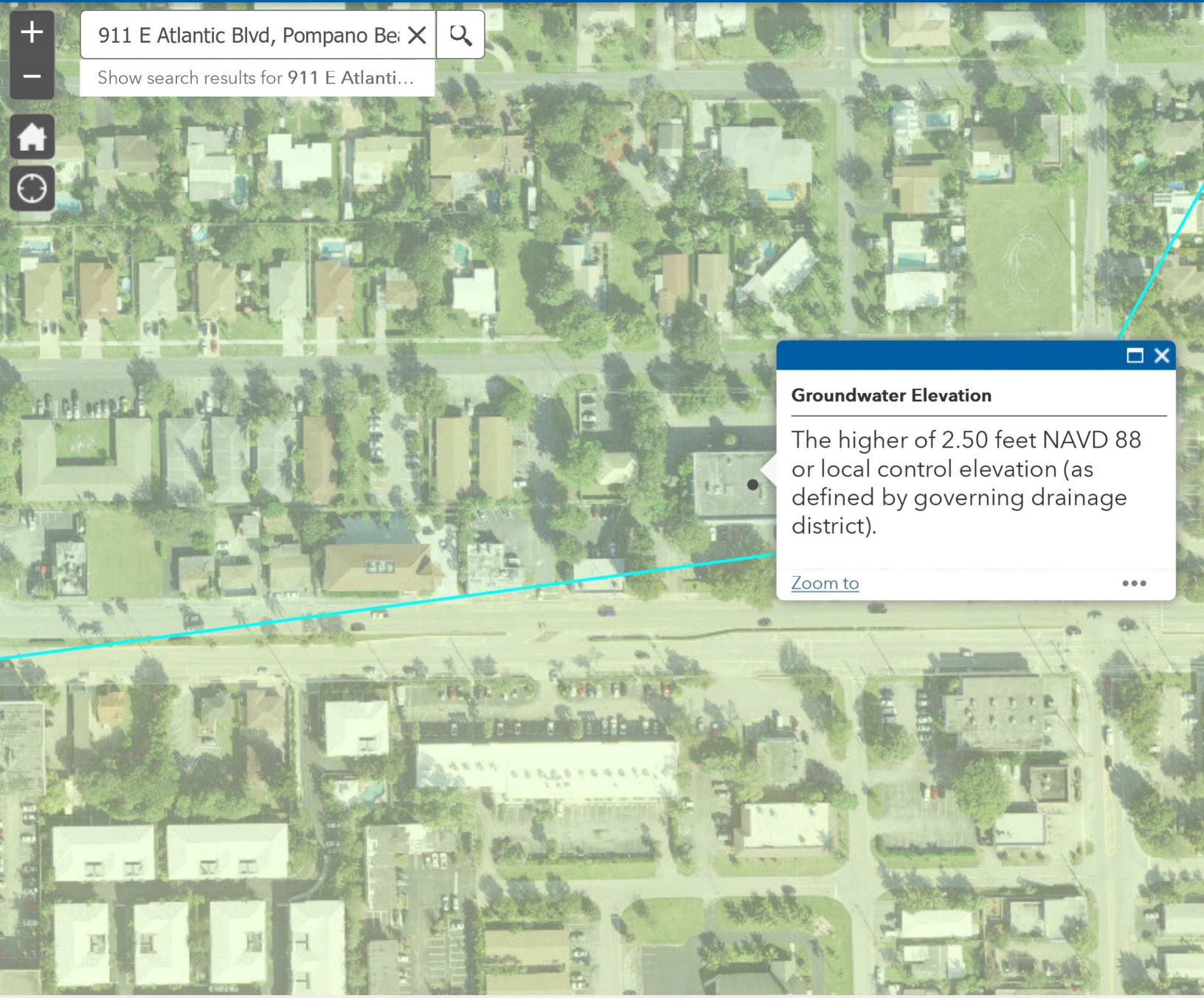


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911 E Atlantic Blvd, Pompano Be: X
Show search results for 911 E Atlanti...



Groundwater Elevation

The higher of 2.50 feet NAVD 88 or local control elevation (as defined by governing drainage district).

[Zoom to](#)

BROWARD COUNTY LAND USE PLAN

Natural Resource Map Series- Eastern Broward County: Soils

Legend

Coastal Ridge Soils

- Paola - Urban Land - St. Lucie Association
- Palm Beach - Urban Land - Beaches Association

Low Ridge Knolls and Flatwoods Soils

- Dade - Urban Land Association
- Duette - Urban Land - Pomello Association**
- Immokalee - Urban Land - Pompano Association
- Immokalee - Urban Land Association

Low Flatwoods, Sloughs and Marshes Soils

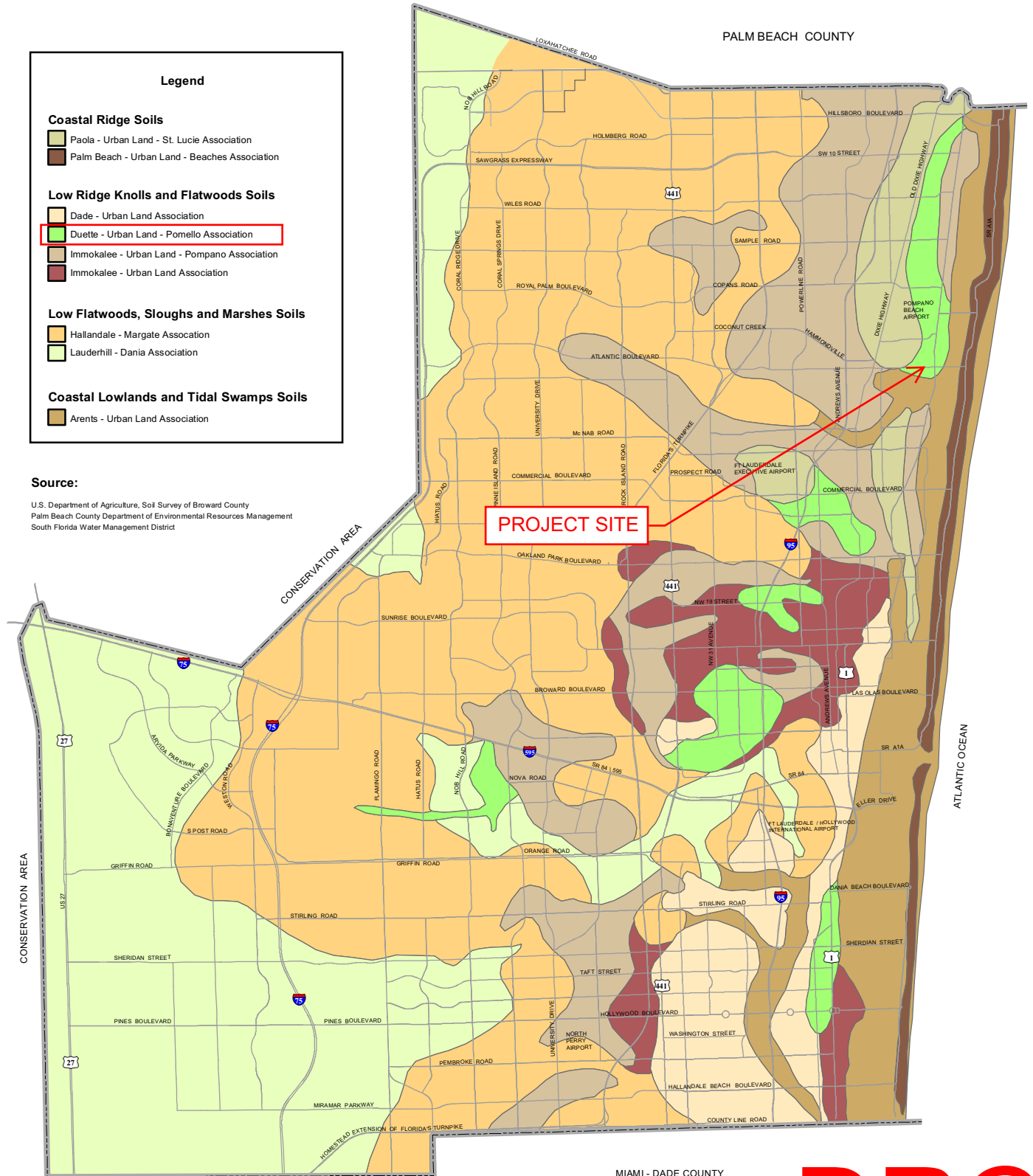
- Hallandale - Margate Association
- Lauderhill - Dania Association

Coastal Lowlands and Tidal Swamps Soils

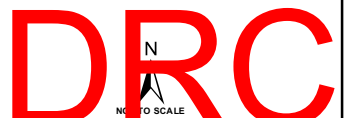
- Arents - Urban Land Association

Source:

U.S. Department of Agriculture, Soil Survey of Broward County
Palm Beach County Department of Environmental Resources Management
South Florida Water Management District

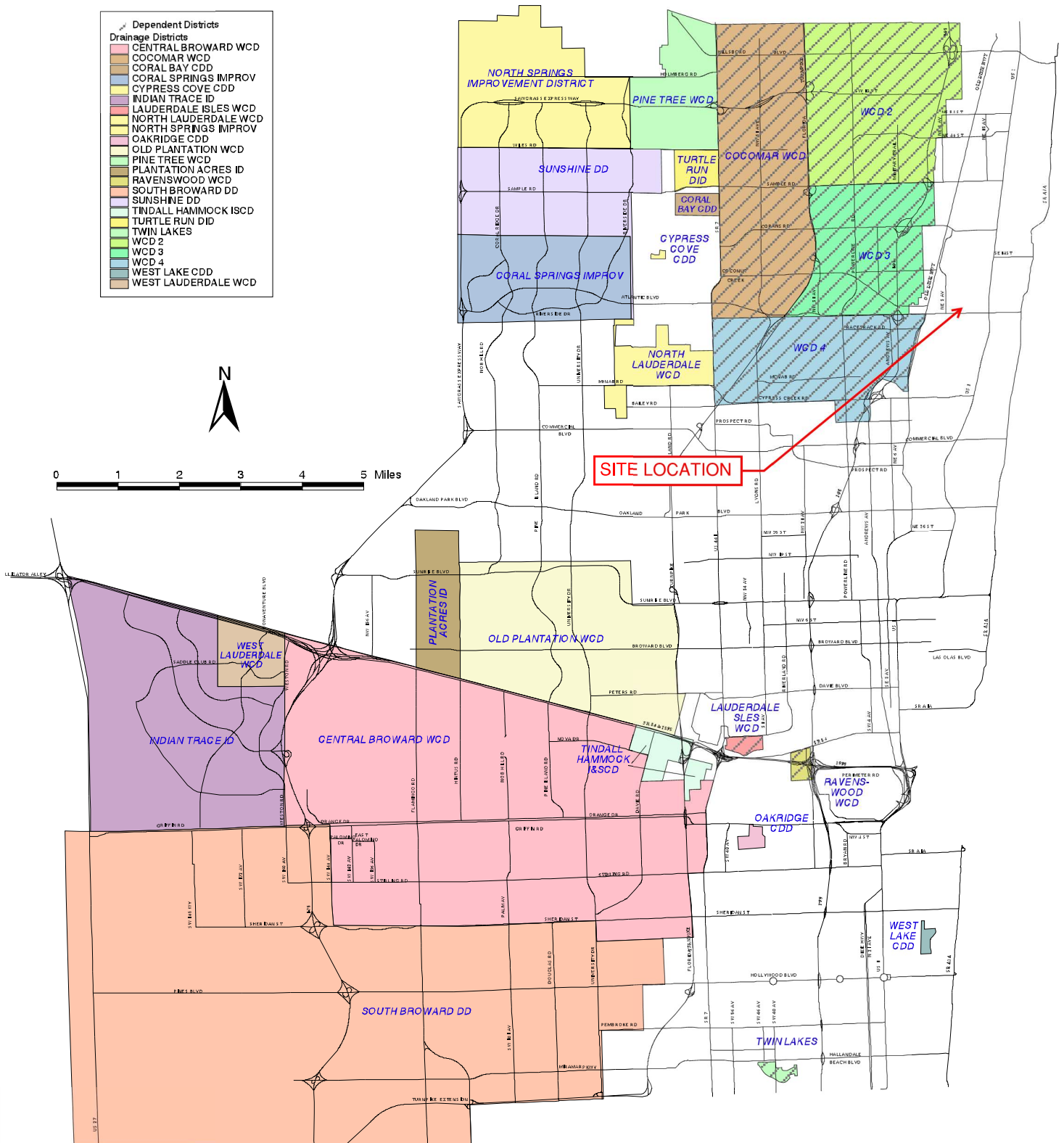


MIAMI - DADE COUNTY



This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning and Development office regarding questions pertaining to parcel boundaries or limits.

Drainage Districts Broward County, Florida



Broward County Department of
Planning and Environmental Protection
Geographic Information Systems
Water Resources Division



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