777 PROPERTIES

Margate, Broward County, Florida

DRAINAGE CALCULATIONS

November 15, 2023

Lou Campanile

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Date: 2023.11.15 21:41:37-05'00'

This item has been digitally signed and sealed by Lou Campanile, Jr., P.E., P.L.S., on the date and time shown in his digital signature.

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REGISTERED
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DRAINAGE NARRATIVE

The following is a stormwater management report for the proposed **777 PROPERTIES** project. This project is located in Broward County at 787 South State Road 7, Margate, Florida 33068.

The site is mostly vacant, with two existing office buildings (767 S. State Road 7 & 777 South State Road 7) totaling 72,916 square feet. The site consists of the following folio numbers: 494101310011, 494101310010, 494101310020 & 494101330010.

The 767 Building (Folio # 494101310010) is owned by 767 Building, LLC (c/o 777 Properties, Inc., 541 South State Road 7, Suite 11, Margate, FL 33068) and the 777 Building (Folio #494101310011) is owned by 777 Properties, Inc. Both buildings are the same size.

The remaining (vacant) property (Folio #494101310020 & 494101330010) is owned by 777 Properties, Inc. and is being developed by REZ SE LAND, LLC (1000 Brickell Plaza, Suite 4104, Miami, FL 33131) into a 300-unit rental apartment complex.

All elevations shown on our plans and in this report are expressed in NAVD88.

The total site area is 869,681± SF (19.97± acres), of which 156,265 is buildings (existing & proposed), 463,639± SF is other impervious, and 249,777± SF is pervious.

We are proposing exfiltration trench to achieve the required water quality treatment. The K value of the soil is 5.3878×10^{-5} cfs/ft^2/ft-head. We have designed 1,702 feet of exfiltration trench (684 feet required for water quality).

The finish floor elevation for the proposed buildings will be 12.50 feet NAVD, which is 1' above the 100-year Flood Elevation of 11.5 Feet, NAVD, per Broward County Plate WM 13.1 – Future Conditions. The existing finish floor elevation for both existing buildings is 12.93 feet, NAVD.

The design water table elevation used for this project is 5' NAVD.

The following rainfall amounts have been utilized in our calculations:

5-year, 1-day	6.5"
25-year, 3-day	15.0"
100-year, 3-day	18.8"

For this project, the developer and the current owner will be negotiating with Broward County to send (pipe) the water quantity volume from the 777 Properties project to the existing **Herman and Dorothy Shooster Nature Preserve** to help enhance the wetlands located on that site. The Preserve is located immediately adjacent to and West of the 777 Properties project. Broward County personnel have expressed a need for the water quantity stormwater runoff that will be produced by the 777 Properties project. For this reason, we have not prepared full water quantity calculations for the proposed 777 Properties project, as this project will not be retaining any stormwater runoff other than the amount that will be attenuated by the proposed exfiltration trench. Nonetheless, we have provided Water Quantity calculations that show that the 777 Properties project will contribute 16.1 acre-feet of runoff to the Preserve for the 25-Year, 3-Day storm event.

This project proposes to use City water for landscape irrigation.

No dewatering is anticipated for installation of water, sewer or drainage.

WATER QUALITY CALCULATIONS

Campanile & Associates, Inc.
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SHEET NO.	1 of 1
DATE	11/15/2023
PROJECT No.:	5381
Designed By:	LRC Jr.
Checked By:	

Project Name:
777 PROPERTIES

ENTIRE SITE

Project Location
787 S. State Road 7, Margate, FL 33068

DRAINAGE AREAS

		SQ. FT.	ACRES
Impervious Area (Does not include Building Area)	(A_i)	463,639	10.64
Pervious Area	(A_p)	249,777	5.73
Building Area	(A_b)	156,265	3.59
Total Drainage Area	(A_t)	869,681	19.97

SFWMD RETENTION REQUIREMENTS

Percent Impervious = 65.0% Excludes Building Areas

1" x Total Drainage Area = 19.97 (ac-in)
2.5" x Percent Impervious x Total Drainage Area = 32.44 (ac-in)

Volume of WQ Treatment Volume required (V_{wq}) = 32.44 (ac-in)
1.62 (inches)

Volume of WQ Treatment Provided by Retention Areas 1 & 2* = 99993 ft^3
Volume of WQ Treatment Provided by Retention Areas 1 & 2* = 27.55 (ac-in)
1.38 (inches)

Volume of WQ Treatment to be Provided by Exfiltration Trench = 4.89 (ac-in)
Volume of WQ Treatment to be Provided by Exfiltration Trench = 0.24 (inches)

* TO ELEVATION 8.5 NAVD

Additional WQ Volume (V_{add}) = 0.00 (ac-in)
0.0 (inches)

Total Volume Treated by Trench = V_{wq} + V_{add} = 0.24 (inches)
(Max allowed 3.28 inches)

Safety Factor (SF) = 2.0 (Minimum 2.0)

Percent Water Quality Reduction (%WQ) = 50%
(50% for wet or dry retention)

SFWMD EXFILTRATION TRENCH EQUATIONS AND TRENCH LENGTH

If $D_u > D_S$ and $W < 2(D_u + D_s)$ then Eq 1 Applies. If not, Eq 2 Applies

$$Equation1:\quad L_1 = \frac{FS\left[(\%WQ)(V_{wq}) + V_{add}\right]}{K\left(H_2W + 2H_2D_u - D_u^2 + 2H_2D_s\right) + (1.39E-04)WD_u}$$

Trench Length Required for Eq 1 = L_1 683.5 (feet)

$$Equation\ 2:\quad L_2 = \frac{FS\left[(\%WQ)(V_{wq}) + V_{add}\right]}{K\left(2H_2D_u - D_u^2 + 2H_2D_s\right) + (1.39E-04)WD_u}$$

Trench Length Required for Eq 2 = L_2 872.7 (feet)

Trench Length Required = L_{REQ} 683.5 (feet)

Trench Length Provided = L_{PRO} 1,702.0 (feet)

Safety Factor Provided = SF_{PRO} 4.98

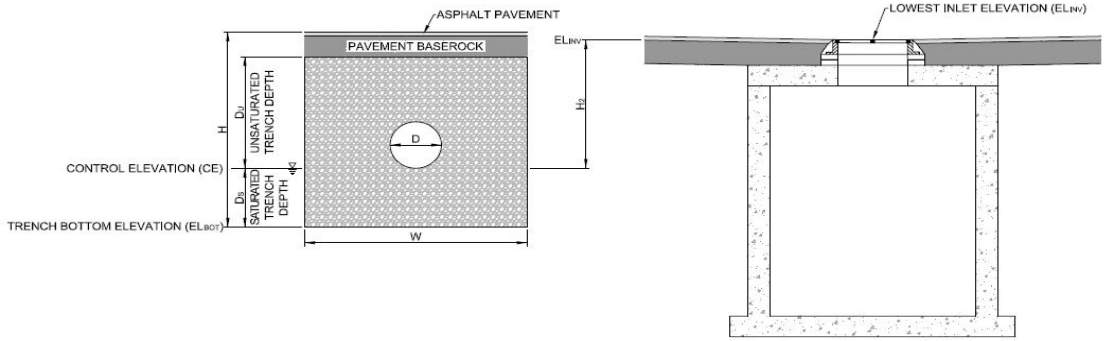
TRENCH DATA - SELF-CONTAINED SYSTEM

Trench Width	W	6.5	(feet)	
Hydraulic Conductivity	K	5.39E-05	(cfs/ft^2-ft head)	
Control Elevation	CE	5.00	(ft-NAVD)	PER BROWARD COUNTY'S ONLINE MAP
Rim Elevation of Lowest Inlet	EL_{inv}	9.43	(ft-NAVD)	Lowest Inlet Elevation
Top Elevation of Trench	EL_{top}	8.50	(ft-NAVD)	Average El
Bottom Elevation of Trench	EL_{bot}	2.00	(ft-NAVD)	Average Bottom El
Pipe Diameter	D	24	(inches)	
Pipe Invert	P_{inv}	5.00	(ft-NAVD)	
Head on Saturated Surface = El_{inv} - CE =	H_2	4.43	(feet)	
Unsaturated Trench Depth = EL_{top} - CE =	D_u	3.50	(feet)	
Saturated Trench Depth = CE - EL_{bot} =	D_S	3.00	(feet)	

Is Du > Ds YES
Is W < 2*(Du + Ds) YES

NOTES: Gray Cells are where data is required, and Blue Cells are where data is calculated.

SELF CONTAINED EXFILTRATION TRENCH



TRENCH SECTION

LOWEST INLET

Campanile & Associates, Inc.
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Tel: (305) 971-1988

SHEET NO.	1 of 1
DATE	11/15/2023
PROJECT No.:	5381
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Project Name:
777 PROPERTIES

Project Location
787 S. STATE ROAD 7
MARGATE, FLORIDA 33068

POST-DEVELOPMENT

Per SFWMD Vol. 4 (insert Depth to DHW in correct range)

depth to DHW (ft)	compacted water storage (in)	depth to DHW Range	Average depth to DHW (ft)	S (inches)
0	0	if 0' - 1'		
1	0.45	if 1' - 2'		
2	1.88	if 2' - 3'		
3	4.05	if 3' - 4'		
4	6.75	if >= 4'	6.11	6.75

Project Data

Site Areas

Area (total)	A_t	19.97	acres	Total Building Area	A_b	3.59 acres
				Total Pavement Area	A_p	10.64 acres
Area (impervious)	A_{imp}	14.23	acres	(A_b + A_p)		
Area (pervious)	A_{perv}	5.73	acres			

Percent Impervious = 71.3%
Percent Pervious = 28.7%

Control Elevation	DHW	5	ft-NAVD
Average Site Elevation (Exist)	EL_{avg}	10.67	ft-NAVD

Rainfall Depth (per SFWMD Maps)

SFWMD 5yr-1d Rainfall Depth	P_5	6.5	inches
SFWMD 25y-3d Rainfall Depth	P_{25}	15.0	inches
SFWMD 100y-3d Rainfall Depth	P_{100}	18.8	inches

Water Quality Volume Retained = 3.28 inches

Adjusted Rainfall Depth (per water quality retained)

SFWMD 5yr-1 hr Rainfall Dept	P_5	3.22	inches
SFWMD 25y-3d Rainfall Depth	P_{25}	11.72	inches
SFWMD 100y-3d Rainfall Depth	P_{100}	15.52	inches

5-year, 1-day Runoff Volume (post-development condition)
Runoff Volume = Area * [(P - 0.2 S)^2 / (P + 0.8 S)]

A_t	19.97	acres	
P_5	3.22	inches	
S	1.94	inches	(based on available pervious area)

Runoff volume = 1.68 Inches
2.7974 Acre-feet

25-year, 3-day Runoff Volume (post-development condition)
Runoff Volume = Area * [(P - 0.2 S)^2 / (P + 0.8 S)]

A_t	19.97	acres	
P_{25}	11.72	inches	
S	1.94	inches	(based on available pervious area)

Runoff volume = 9.68 Inches
16.100 Acre-feet

100-year, 3-day Runoff Volume (post-development condition)
Runoff Volume = Area * [(P - 0.2 S)^2 / (P + 0.8 S)]

A_t	19.97	acres	
P_{100}	15.5	inches	
S	1.94	inches	(based on available pervious area)

Runoff volume = 13.41 Inches
22.317 Acre-feet

APPENDIX

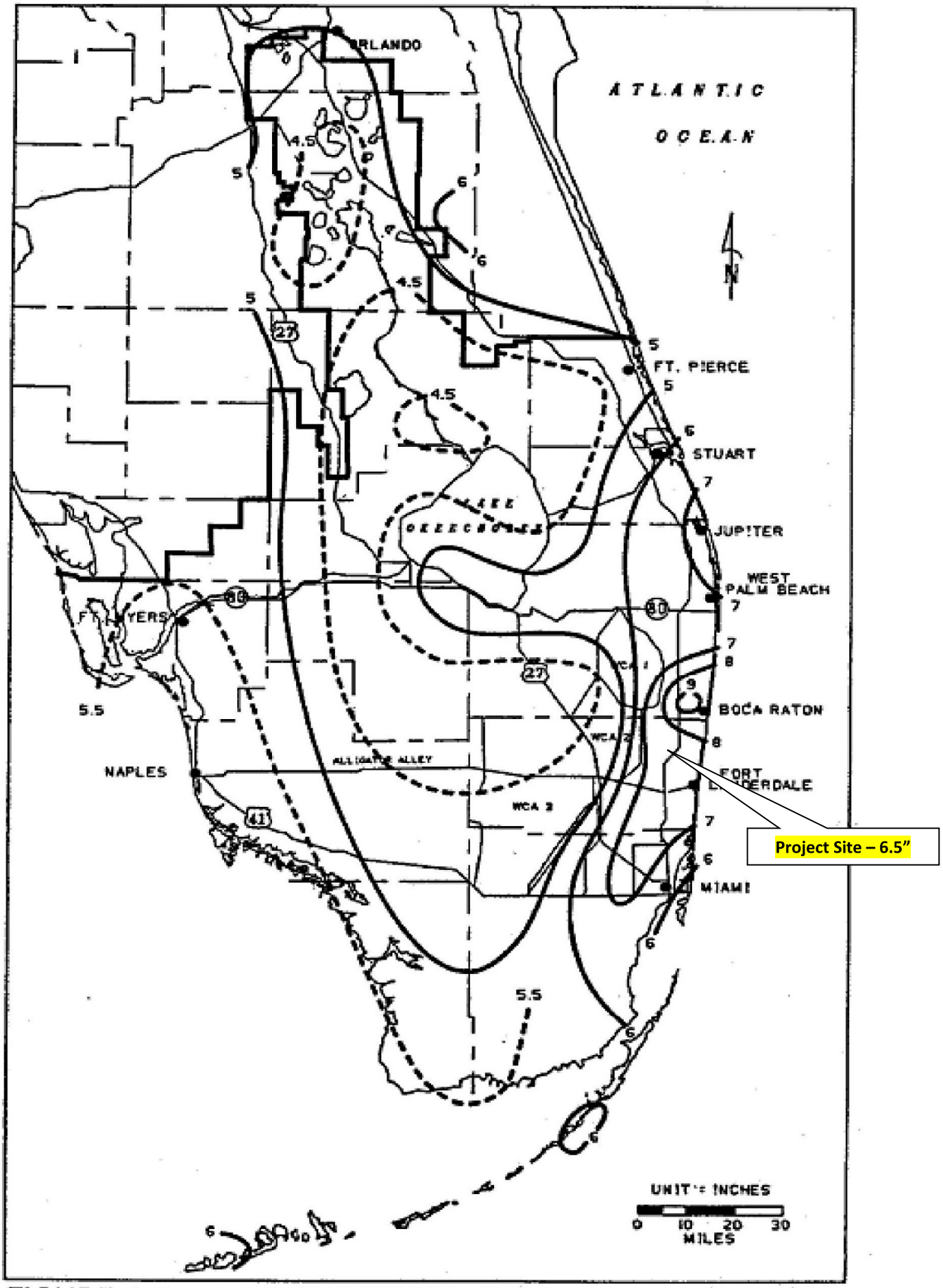

FIGURE C-3. 1-DAY RAINFALL: 5-YEAR RETURN PERIOD

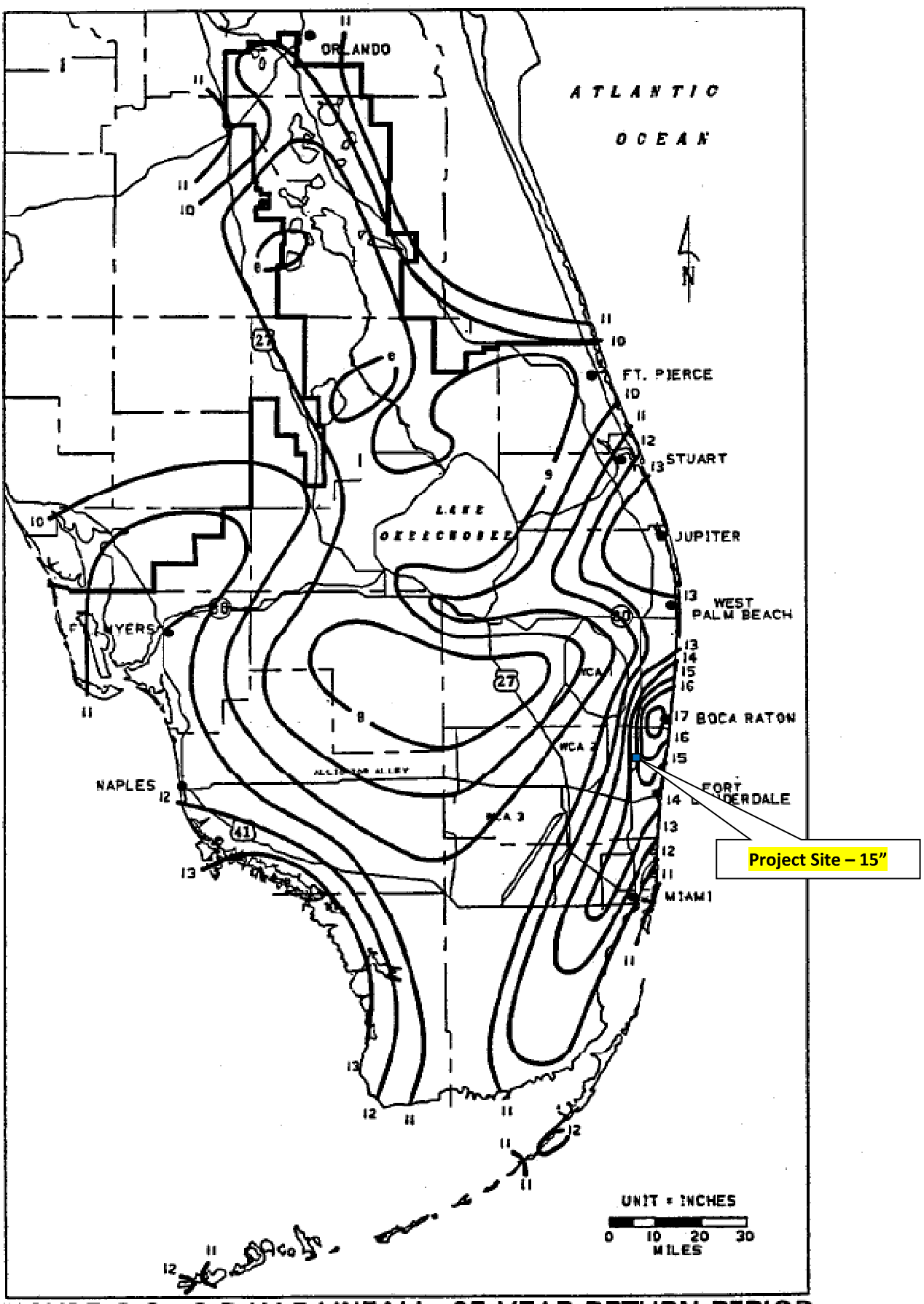

FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

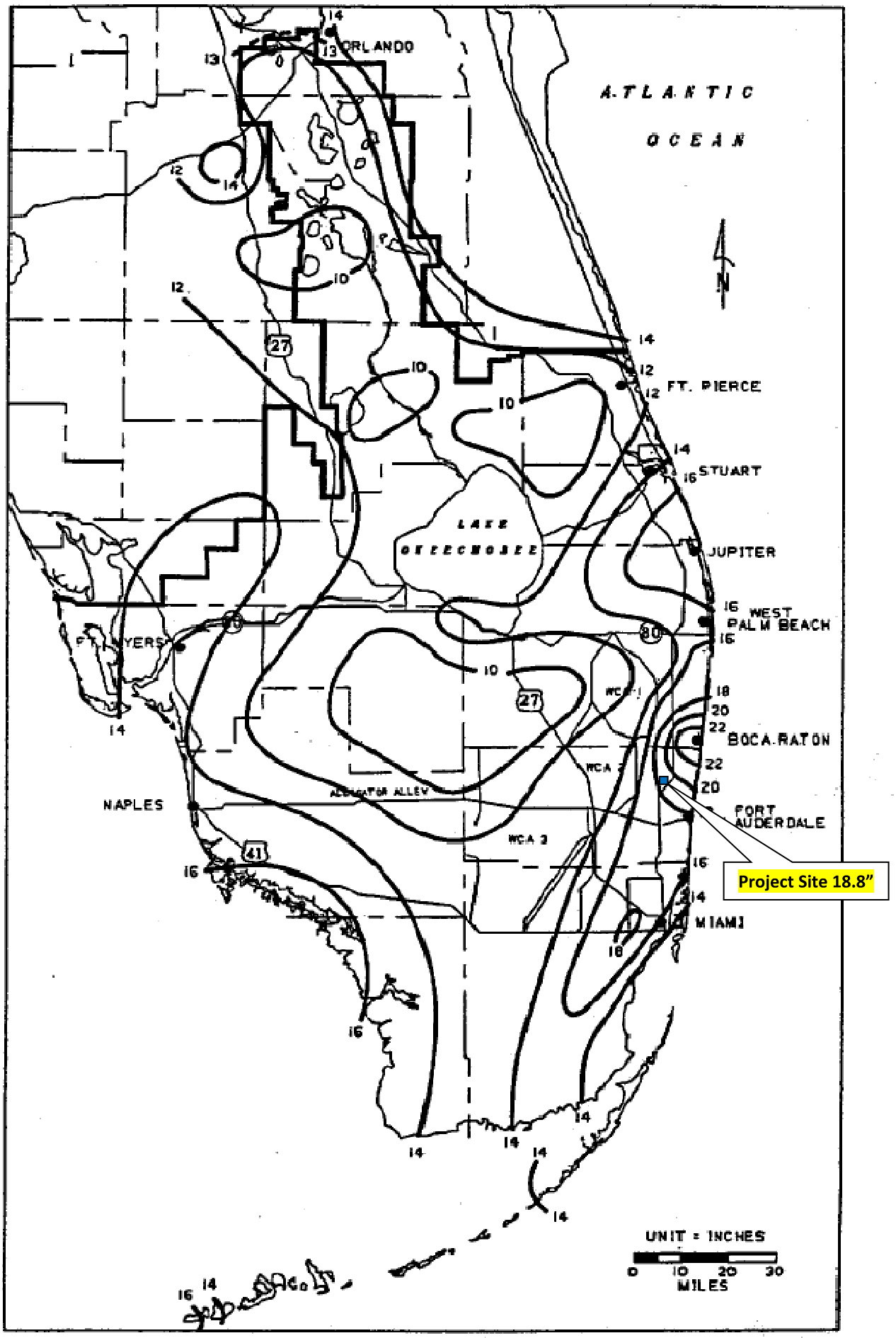

FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD