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ENGINEERS AND PLANNERS
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DRAINAGE CALCULATIONS

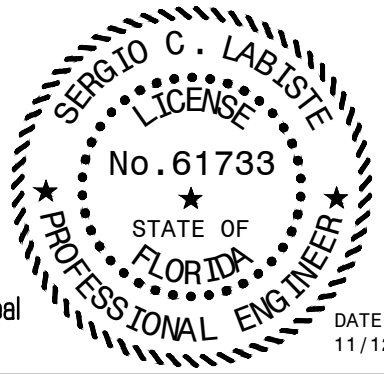
CASA PA' FERNANDA

13125 SW 63 AVE , PINECREST, FL 33156
FOLIO No: 20-5013-005-0370

NOVEMBER 12th,2024

SERGIO LABISTE

Digitally signed by SERGIO LABISTE
Date: 2024.11.12 12:10:50 -05'00'



Seal

DATE: 11/12/2024

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY SERGIO C. LABISTE, P.E. ON THE DATE ADJACENT TO THE SEAL.

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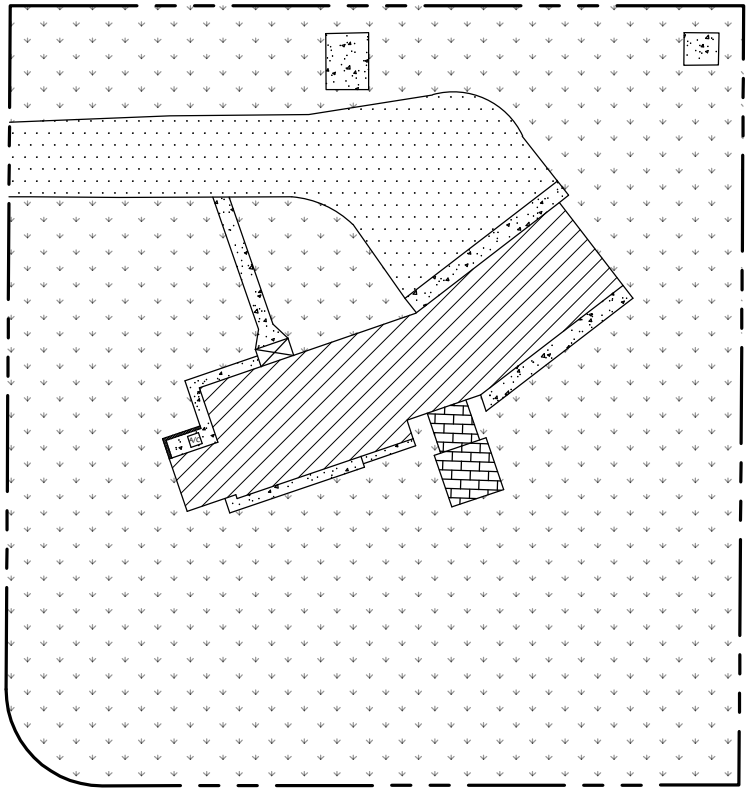
SERGIO C. LABISTE P.E. # 61733

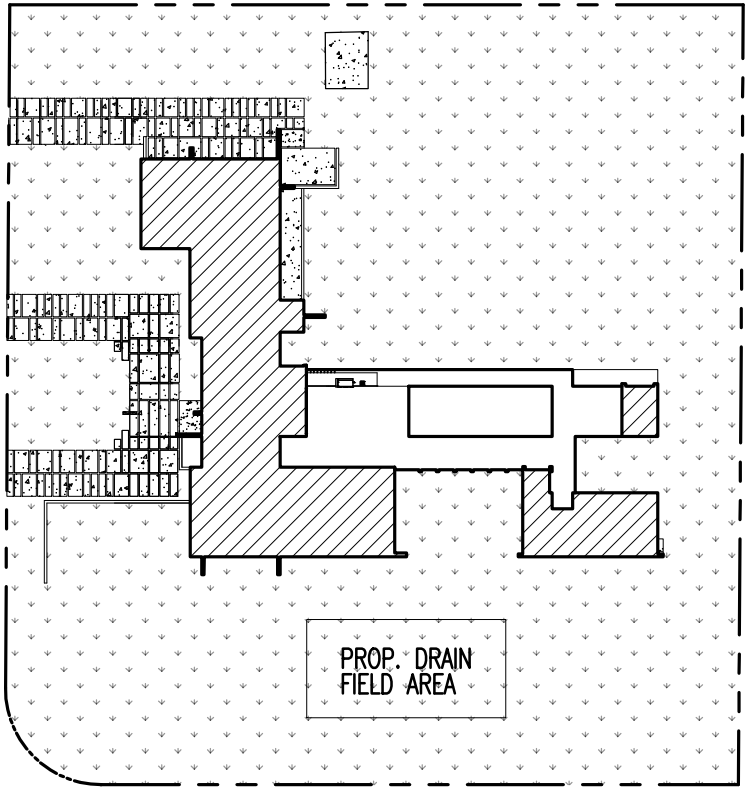
Index of Sheets

AREA BREAKDOWN

PRE - DEVELOPMENT



POST - DEVELOPMENT



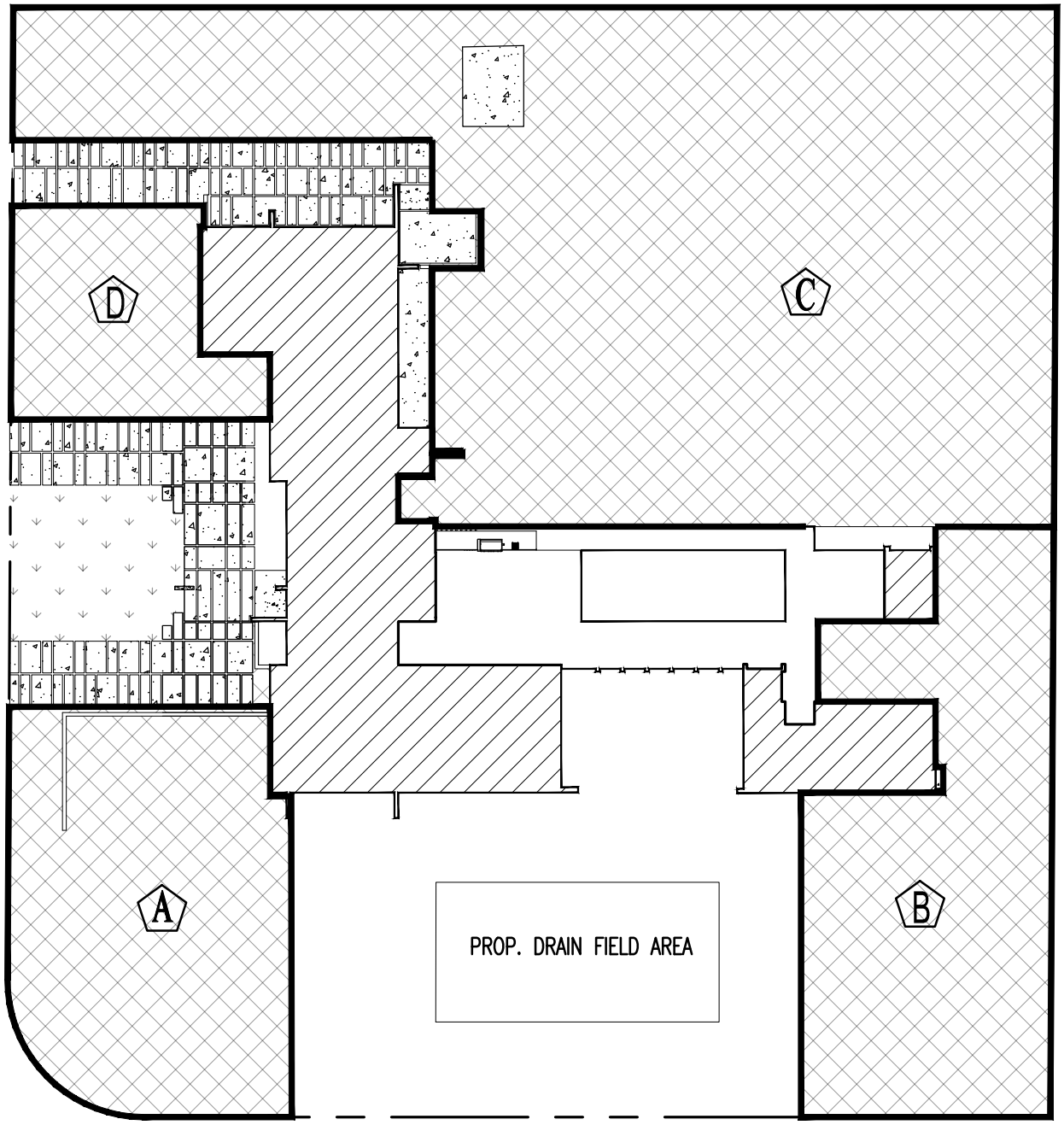
DEVELOPMENT INFORMATION			
PRE-DEVELOPMENT		POST DEVELOPMENT	
TOTAL	38,619.69 ft^2	TOTAL	38,619.69 ft^2
PERVIOUS	29,982.29 ft^2	PERVIOUS	29,204.87 ft^2
IMPERVIOUS	8,637.40 ft^2	IMPERVIOUS	9,414.82 ft^2

* REFER TO DRAINAGE CALCULATION FOR COMPLETE DRAINAGE AREA/BASIN BREAKDOWN

LEGEND

- BUILDING FOOTPRINT
- CONCRETE
- GRASS AREA
- PAVERS
- ASPHALT

RETENTION AREAS SKETCH



VOLUME RETENTION TABLE

AREA NO.	LINEAR AREA (SF)	TOP ELEV (NGVD)	BOTTOM ELEV (NGVD)	TOTAL VOLUME RETAINED (ft^3)
A	3,680.03	15.00'	14.29'	1,306
B	4,072.27	13.10'	12.85'	509
C	12,496.77	15.81'	15.32'	3,062
D	1,504.11	16.80'	16.30'	376
TOTAL SITE RETENTION PROVIDED				5,253

LEGEND

- BUILDING FOOTPRINT
- CONCRETE
- GRASS AREA
- PAVERS

PROJECT DESCRIPTION

The project consists of a proposed single-family residence with a pool, covered bbq, and driveway as shown in plans. Drainage calculations provided showing stormwater to be retained on-site with no runoff to adjacent properties.

DEFINITIONS OF WORKSHEET VARIABLES			
P:	Rainfall depth (Inches)	A:	Total property area (SF)
S_1:	Soil storage capacity (Inches)	AP:	Total property pervious area (SF)
R:	Runoff depth (Inches)	V:	Runoff Volume (CF)
AI:	Total impervious area (roof, pool, pool deck, driveway, walkways, **septic tank and drain field** within property, in square feet)		

PRE DEVELOPMENT CONDITION

$A_{pre} := 38619.69\ ft^2$

$AP_{pre} := 29982.29\ ft^2$

$AI_{pre} := 8637.40\ ft^2$

POST DEVELOPMENT DISTRIBUTION

$A_{post} := 38619.69\ ft^2$

$AP_{post} := 25681.58\ ft^2$

$AI_{post} := 12938.11\ ft^2$

GENERAL SITE CONDITIONS

$P := 9.0\ in$ Rainfall Amount (25-year, 24-hour storm). see attached map

$AE := 15.0\ ft$ Average Elevation of Pervious Areas (NGVD)

$GW := 2.0\ ft$ Average October Water Table Elevation (NGVD) see attached map.

$D = 13.00\ ft$ Average Depth to Water Table (AE-GW)

Distance between groundwater table and average elevation of pervious areas:	S_1
1 ft	0.45 inches
2 ft	1.88 inches
3 ft	4.95 inches
≥4 ft greater	8.18 inches

SFWMD-Management and Storage of Surface Waters Permit Information Manual, Vol. IV sec. 8.4.2

By interpolation when $D = 13.00\ ft$ then $S_1 := 8.18\ in$

PRE DEVELOPMENT VOLUME CALCULATION

$$S_{pre} := \frac{AP_{pre}}{A_{pre}} \cdot S_1 = 6.35 \ in$$

$$R_{pre} := \frac{\left(P - 0.2 \cdot S_{pre}\right)^2}{\left(P + 0.8 \cdot S_{pre}\right)} = 4.24 \ in$$

$$V_{pre} := A_{pre} \cdot R_{pre} = 13657 \ ft^3$$

POST DEVELOPMENT VOLUME CALCULATION

$$S_{post} := \frac{AP_{post}}{A_{post}} \cdot S_1 = 5.44 \ in$$

$$R_{post} := \frac{\left(P - 0.2 \cdot S_{post}\right)^2}{\left(P + 0.8 \cdot S_{post}\right)} = 4.69 \ in$$

$$V_{post} := A_{post} \cdot R_{post} = 15089 \ ft^3$$

VOLUME OF RUNOFF REQUIRED TO MAINTAINED ON SITE

Whichever is the greater:

Water Quantity

Pre/Post Volume difference

$$V_{condition1} := V_{post} - V_{pre} = 1432 \ ft^3$$

Water Quality

Imperviousness percent times 2.5 inch

I = Inches to be treated $\quad I := 2.5 \ in \cdot \frac{AI_{post}}{A_{post}} = 0.84 \ in$

$$V_{condition2} := I \cdot A_{post} = 2695 \ ft^3$$

First inch of runoff

$$V_{condition3} := 1 \ in \cdot A_{post} = 3218 \ ft^3$$

Storage Volume Required

$$V_{req} := \max\left(V_{condition1}, V_{condition2}, V_{condition3}\right)$$

$$V_{req} = 3218 \ ft^3$$

RETENTION VOLUME PROVIDED (V_P)

V_P is computed in cubic feet. **V_P** is the retention volume capacity of swales, retention areas and drains within the property or sub-basin within the property

$$B_A := (15.00\ ft - 14.29\ ft) \cdot (3680.03\ ft^2) \cdot \frac{1}{2} = 1306\ ft^3$$

$$B_B := (13.10\ ft - 12.85\ ft) \cdot (4072.27\ ft^2) \cdot \frac{1}{2} = 509\ ft^3$$

$$B_C := (15.81\ ft - 15.32\ ft) \cdot (12496.77\ ft^2) \cdot \frac{1}{2} = 3062\ ft^3$$

$$B_D := (16.8\ ft - 16.3\ ft) \cdot (1504.11\ ft^2) \cdot \frac{1}{2} = 376\ ft^3$$

Swales Retention Capacity:

$$V_P := B_A + B_B + B_C + B_D$$

$$V_P = 5253\ ft^3$$

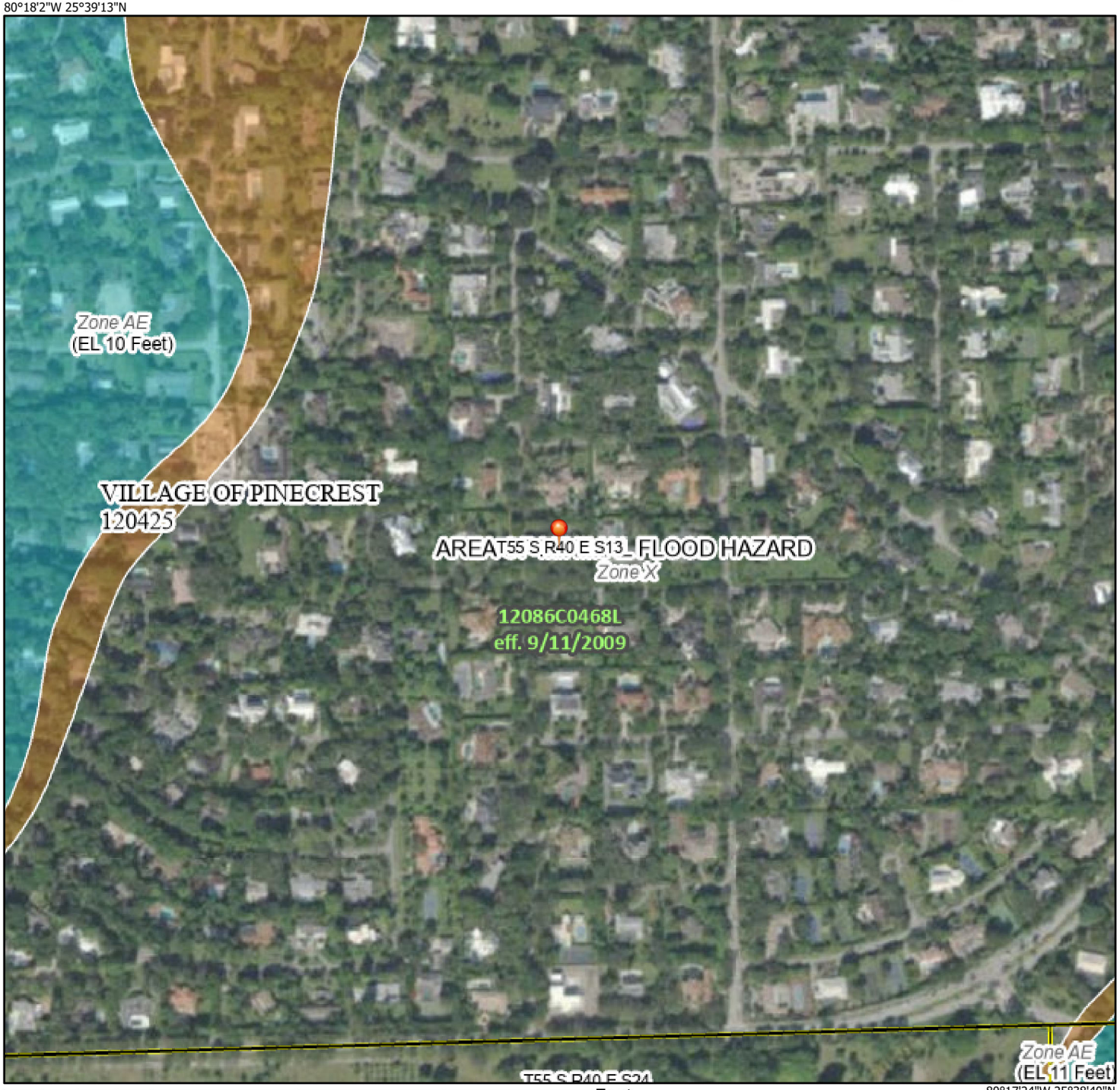
Retention Volume Provided $V_P = 5253\ ft^3$ **>** Storage Volume Required $V_{req} = 3218\ ft^3$

Therefore Sufficient Storage is being Provided

National Flood Hazard Layer FIRMette

FEMA

80°18'2"W 25°39'13"N



80°17'24"W 25°38'40"N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

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
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

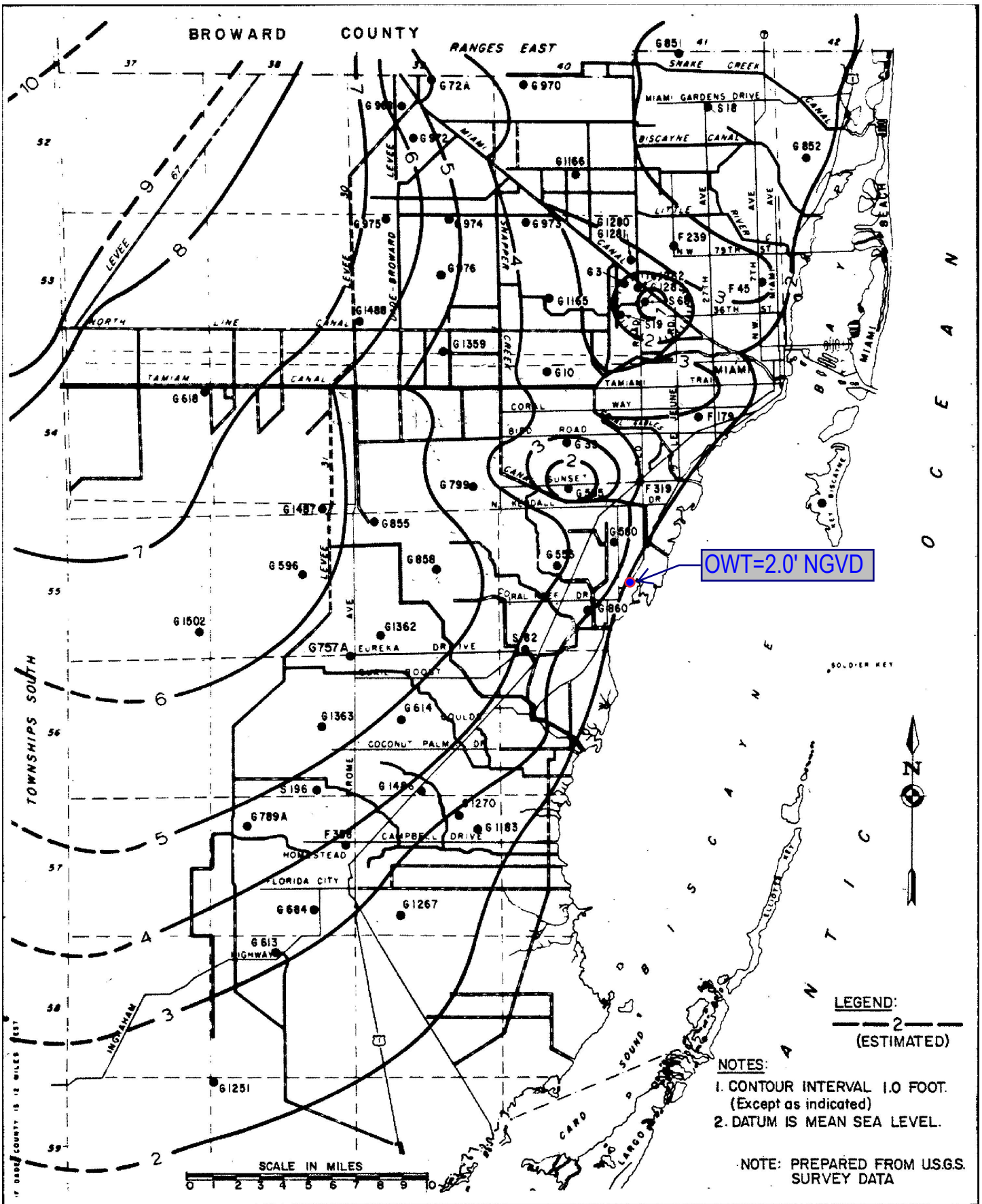
N

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 10/1/2024 at 11:06 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.



METROPOLITAN DADE COUNTY PUBLIC WORKS DEPARTMENT	APPROVED 4/5/72	REVISED 2/19/75 4/14/77	DESIGN STANDARDS AVERAGE OCTOBER GROUND WATER LEVEL 1960–75	W.C. 2.2 SHEET 1 OF 1

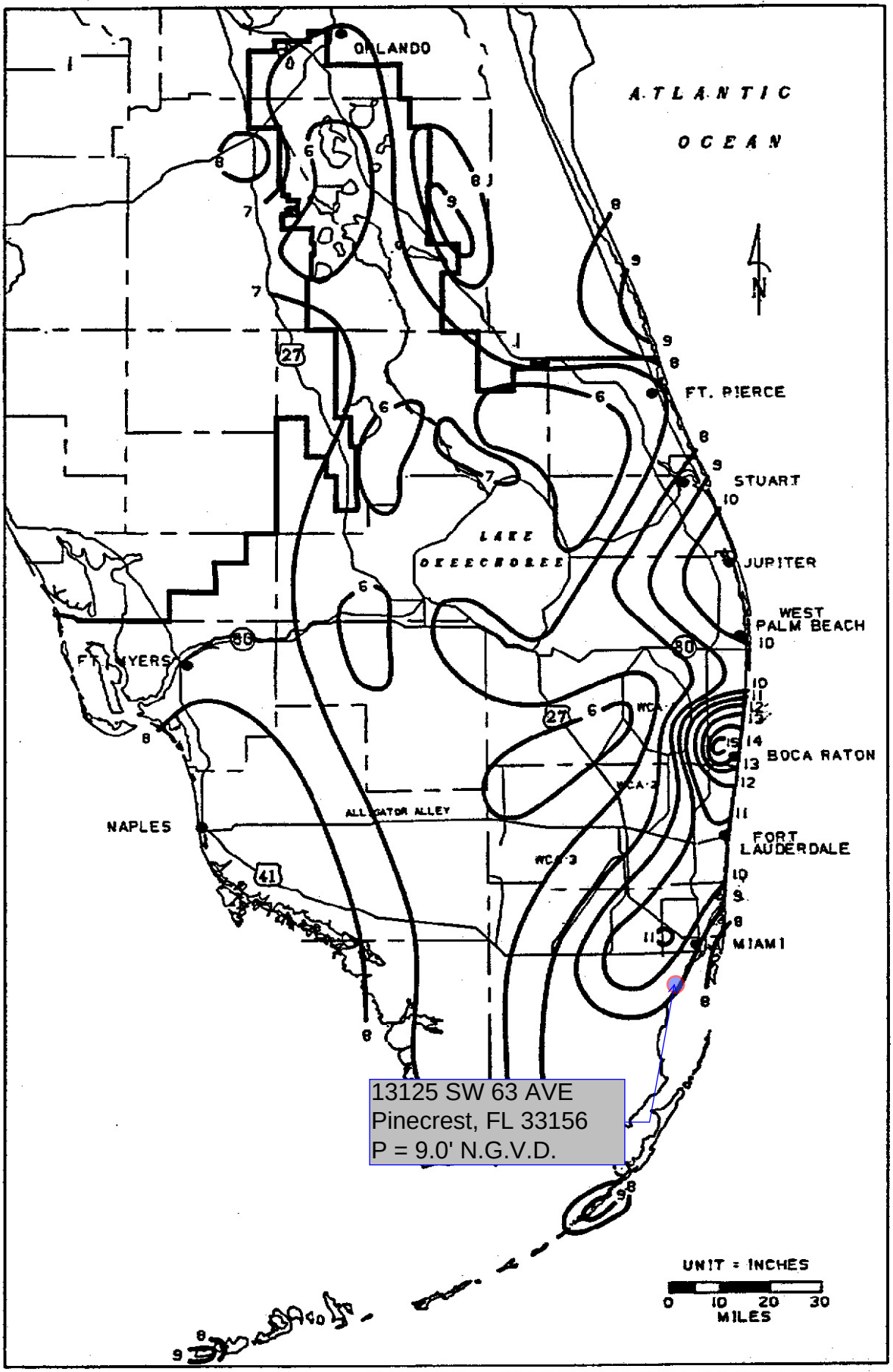


FIGURE C-5. 1-DAY RAINFALL: 25-YEAR RETURN PERIOD