

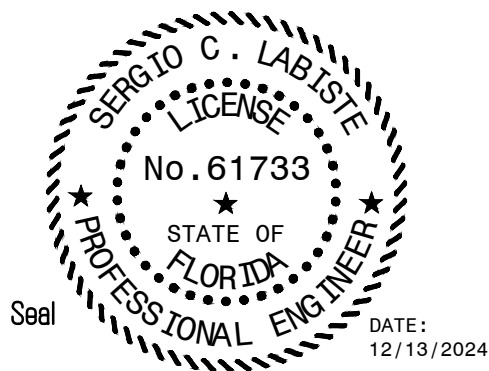
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DRAINAGE CALCULATIONS CASA @63rd AVENUE

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

December 13th, 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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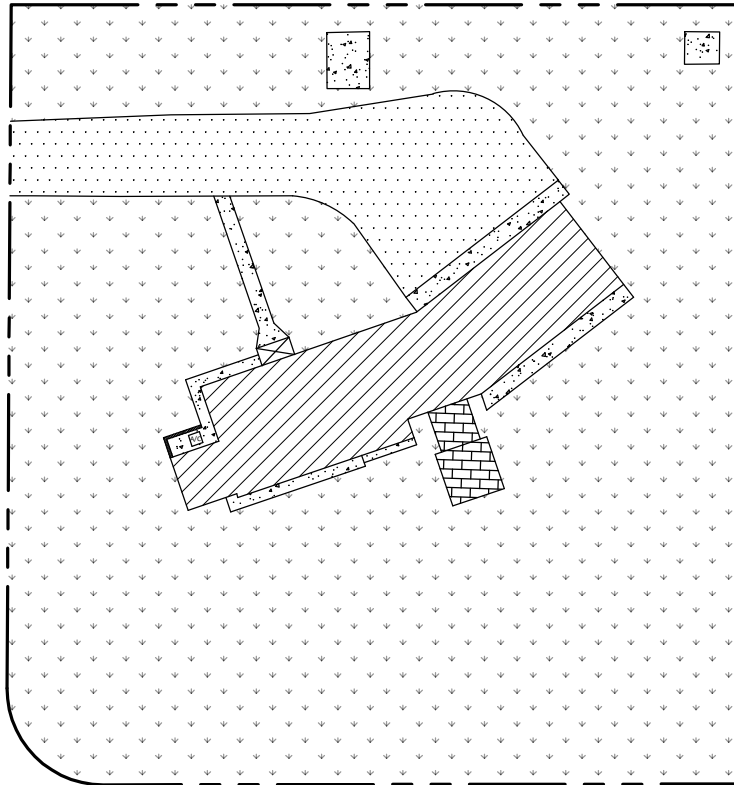
SERGIO C. LABISTE P.E. # 61733

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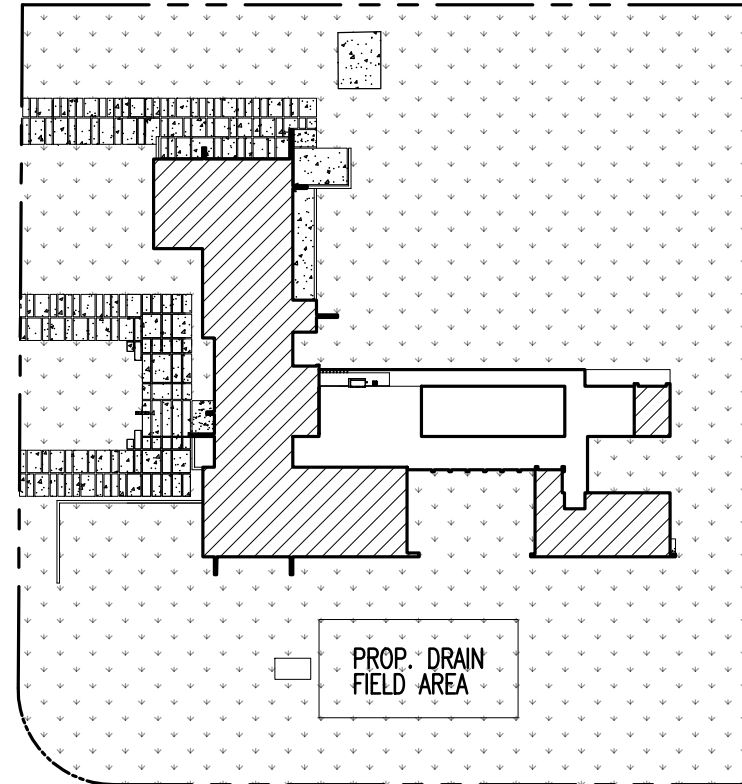
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AREA BREAKDOWN

PRE - DEVELOPMENT



POST - DEVELOPMENT



DEVELOPMENT INFORMATION

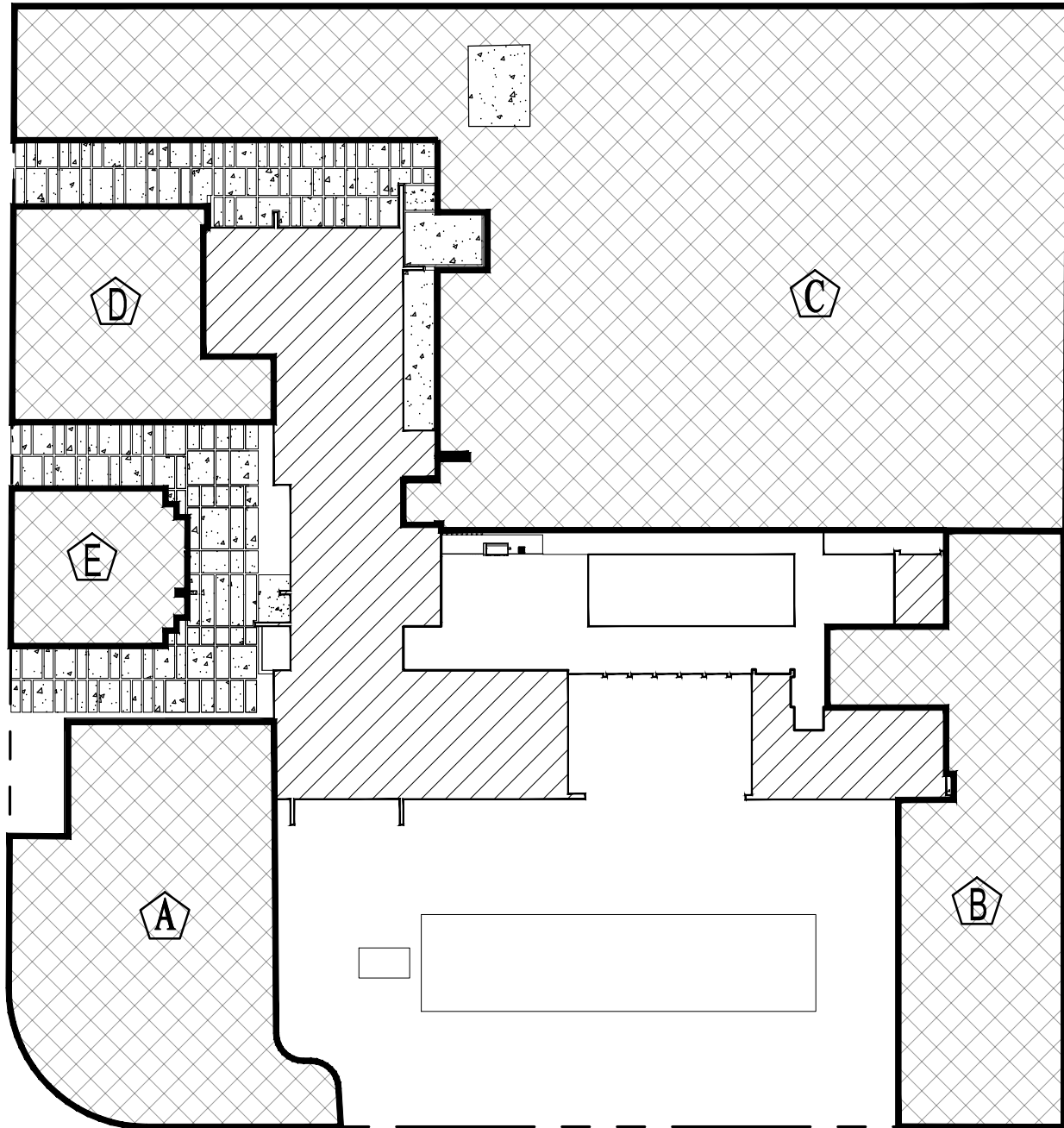
PRE-DEVELOPMENT		POST DEVELOPMENT	
TOTAL	38,619.69 ft^2	TOTAL	38,619.69 ft^2
PERVIOUS	29,982.29 ft^2	PERVIOUS	28,990.07 ft^2
IMPERVIOUS	8,637.40 ft^2	IMPERVIOUS	9,629.62 ft^2

* 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	3,321	14.00'	13.60'	664
B	3,123	13.10'	12.30'	1,249
C	12,497	15.60'	14.60'	3,749
D	1,504	16.90'	16.83'	53
E	878	16.40'	16.23'	75
TOTAL SITE RETENTION PROVIDED				5,790

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

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

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

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

POST DEVELOPMENT DISTRIBUTION

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

$$AP_{post} := 28990.07 \text{ ft}^2$$

$$AI_{post} := 9629.62 \text{ ft}^2$$

GENERAL SITE CONDITIONS

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

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

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

$D = 13.00 \text{ ft}$ 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 $D = 13.00 \text{ ft}$ then $S_1 := 8.18 \text{ in}$

**PRE DEVELOPMENT VOLUME
CALCULATION**

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

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

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

**POST DEVELOPMENT VOLUME
CALCULATION**

$$S_{post} := \frac{AP_{post}}{A_{post}} \cdot S_1 = 6.14 \text{ in}$$

$$R_{post} := \frac{(P - 0.2 \cdot S_{post})^2}{(P + 0.8 \cdot S_{post})} = 4.34 \text{ in}$$

$$V_{post} := A_{post} \cdot R_{post} = 13973 \text{ ft}^3$$

VOLUME OF RUNOFF REQUIRED TO MAINTAINED ON SITE

Whichever is the greater:

Water Quantity

Pre/Post Volume difference

$$V_{condition1} := V_{post} - V_{pre} = 316 \text{ ft}^3$$

Water Quality

Imperviousness percent times 2.5 inch

$$I = \text{Inches to be treated} \quad I := 2.5 \text{ in} \cdot \frac{AI_{post}}{A_{post}} = 0.62 \text{ in}$$

$$V_{condition2} := I \cdot A_{post} = 2006 \text{ ft}^3$$

First inch of runoff

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

Storage Volume Required

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

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

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

$$B_A := (14.00 \text{ ft} - 13.60 \text{ ft}) \cdot (3321 \text{ ft}^2) \cdot \frac{1}{2} = 664 \text{ ft}^3$$

$$B_B := (13.10 \text{ ft} - 12.30 \text{ ft}) \cdot (3123 \text{ ft}^2) \cdot \frac{1}{2} = 1249 \text{ ft}^3$$

$$B_C := (15.20 \text{ ft} - 14.60 \text{ ft}) \cdot (12497 \text{ ft}^2) \cdot \frac{1}{2} = 3749 \text{ ft}^3$$

$$B_D := (16.90 \text{ ft} - 16.83 \text{ ft}) \cdot (1504 \text{ ft}^2) \cdot \frac{1}{2} = 53 \text{ ft}^3$$

$$B_E := (16.40 \text{ ft} - 16.23 \text{ ft}) \cdot (878 \text{ ft}^2) \cdot \frac{1}{2} = 75 \text{ ft}^3$$

Swales Retention Capacity:

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

$$V_P = 5790 \text{ ft}^3$$

Retention Volume Provided
 $V_P = 5790 \text{ ft}^3$

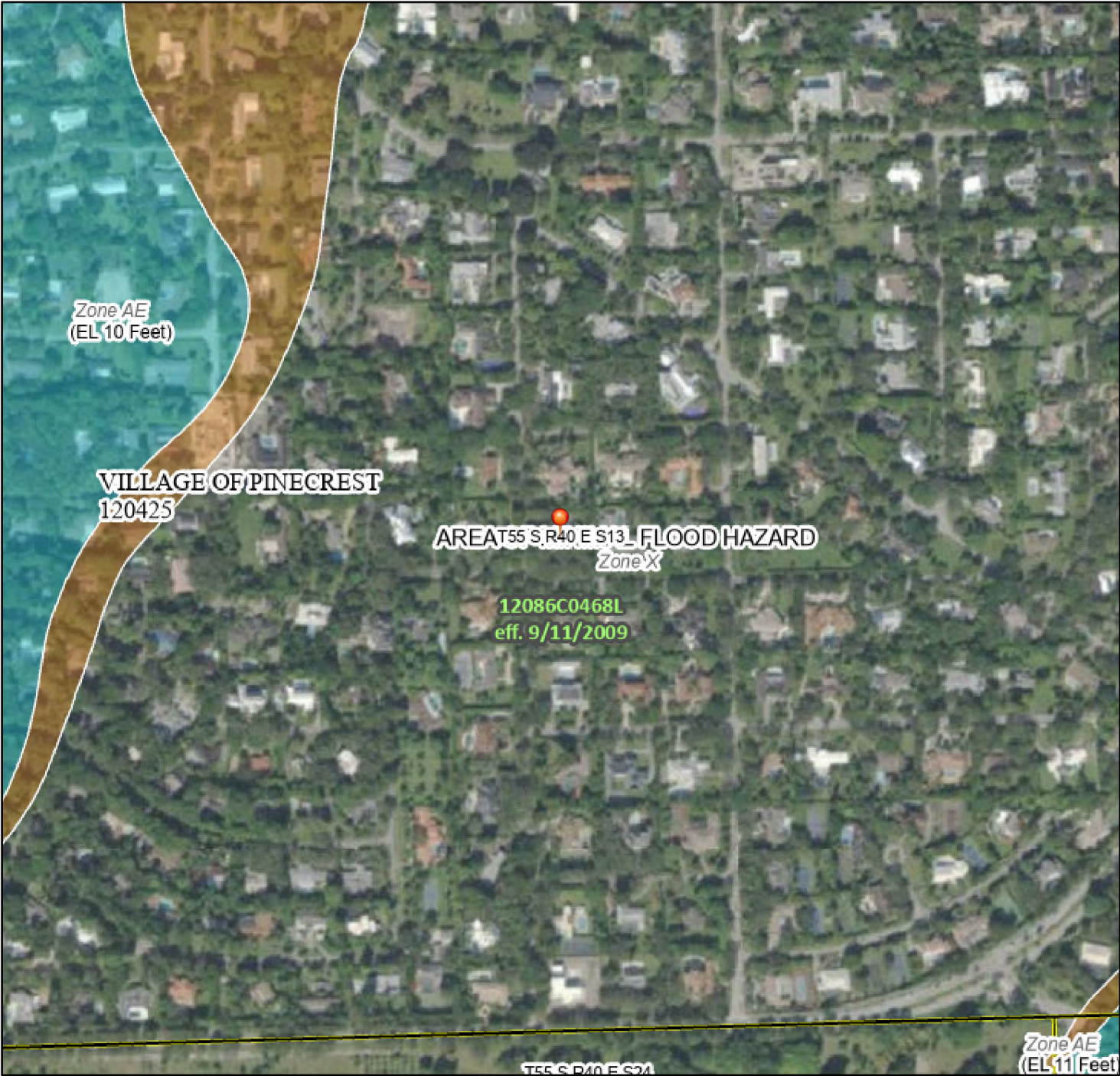
> Storage Volume Required
 $V_{req} = 3218 \text{ ft}^3$

Therefore Sufficient Storage is being Provided

National Flood Hazard Layer FIRMMette



80°18'2"W 25°39'13"N



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 Cross Sections with 1% Annual Chance Water Surface Elevation

17.5 Coastal Transect

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

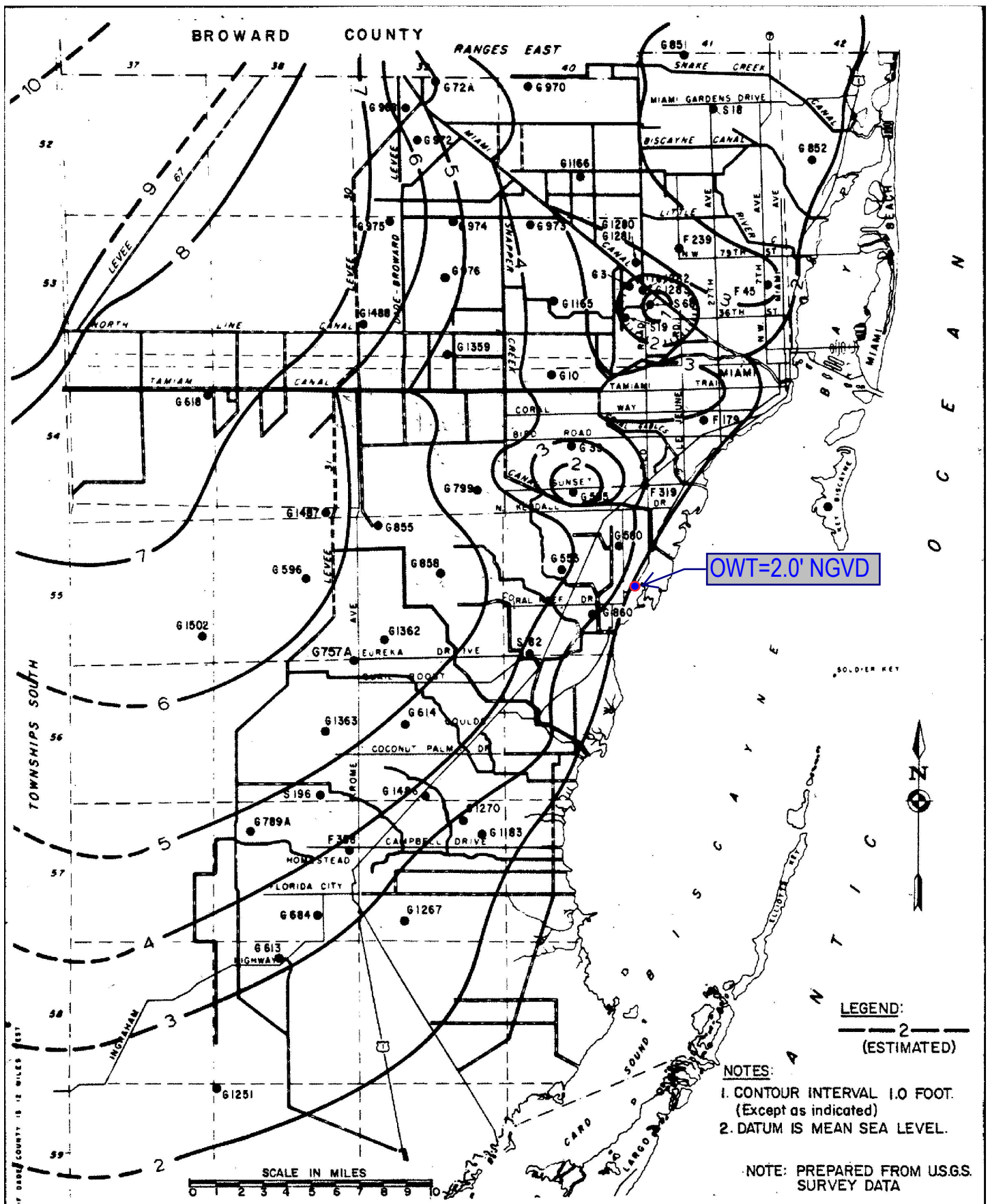
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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
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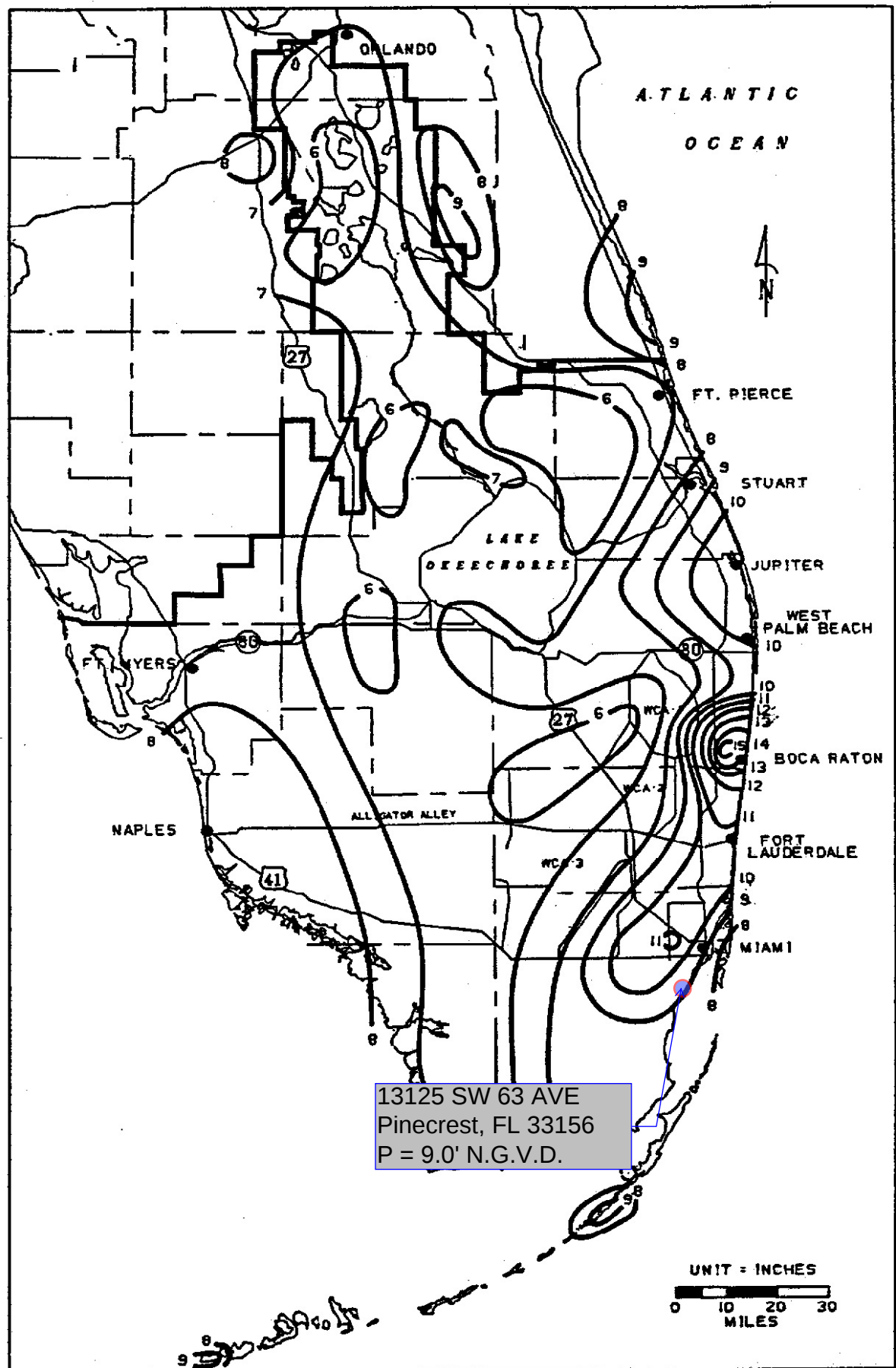


FIGURE C-5. 1-DAY RAINFALL: 25-YEAR RETURN PERIOD