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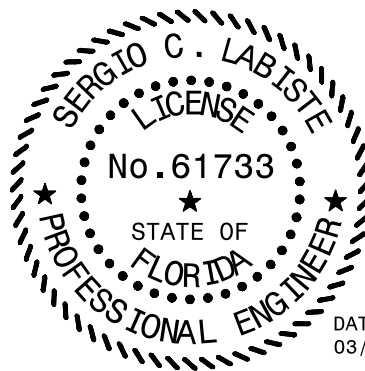
ENGINEERS AND PLANNERS
CERTIFICATE OF AUTHORIZATION 6419
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E-MAIL: SLABISTE@CARLABINC.COM

DRAINAGE CALCULATIONS NEW SINGLE FAMILY RESIDENCE

12700 ROLLING ROAD DR , PINECREST, FL 33156
FOLIO No: 20-5013-003-1080

MARCH 10th, 2025

SERGIO LABISTE
2025.03.10 10:19:11
-04'00'



DATE:
03/10/2025

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

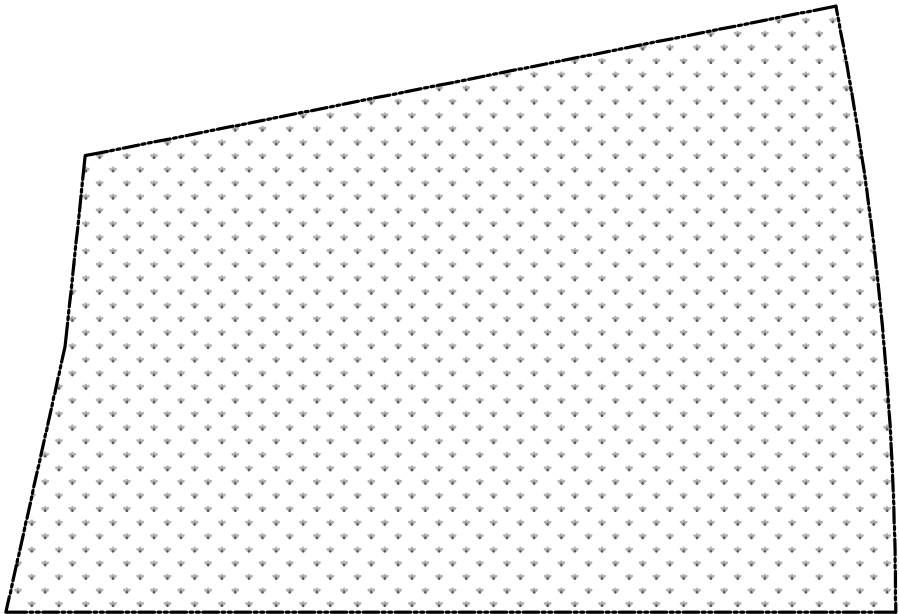
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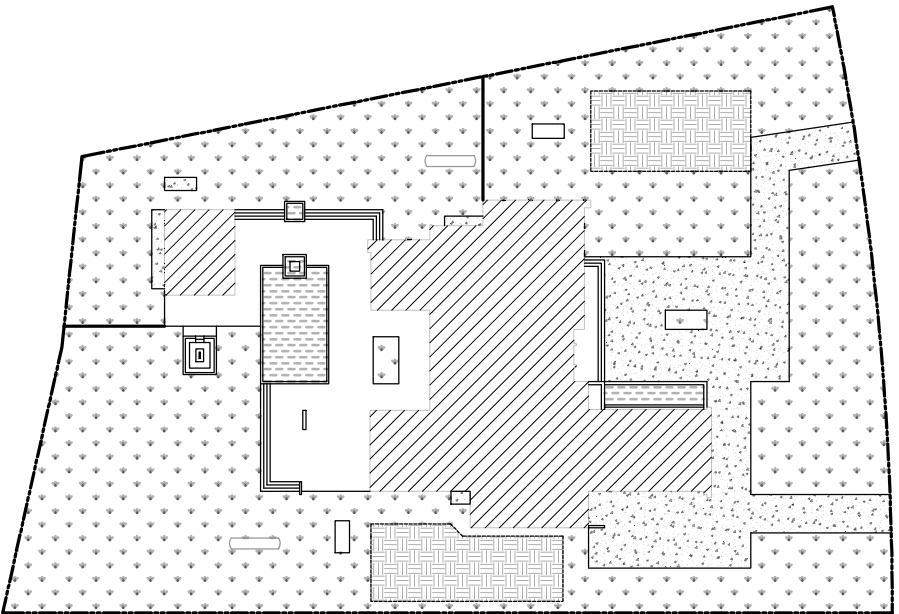
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AREA BREAKDOWN

PRE - DEVELOPMENT



POST - DEVELOPMENT



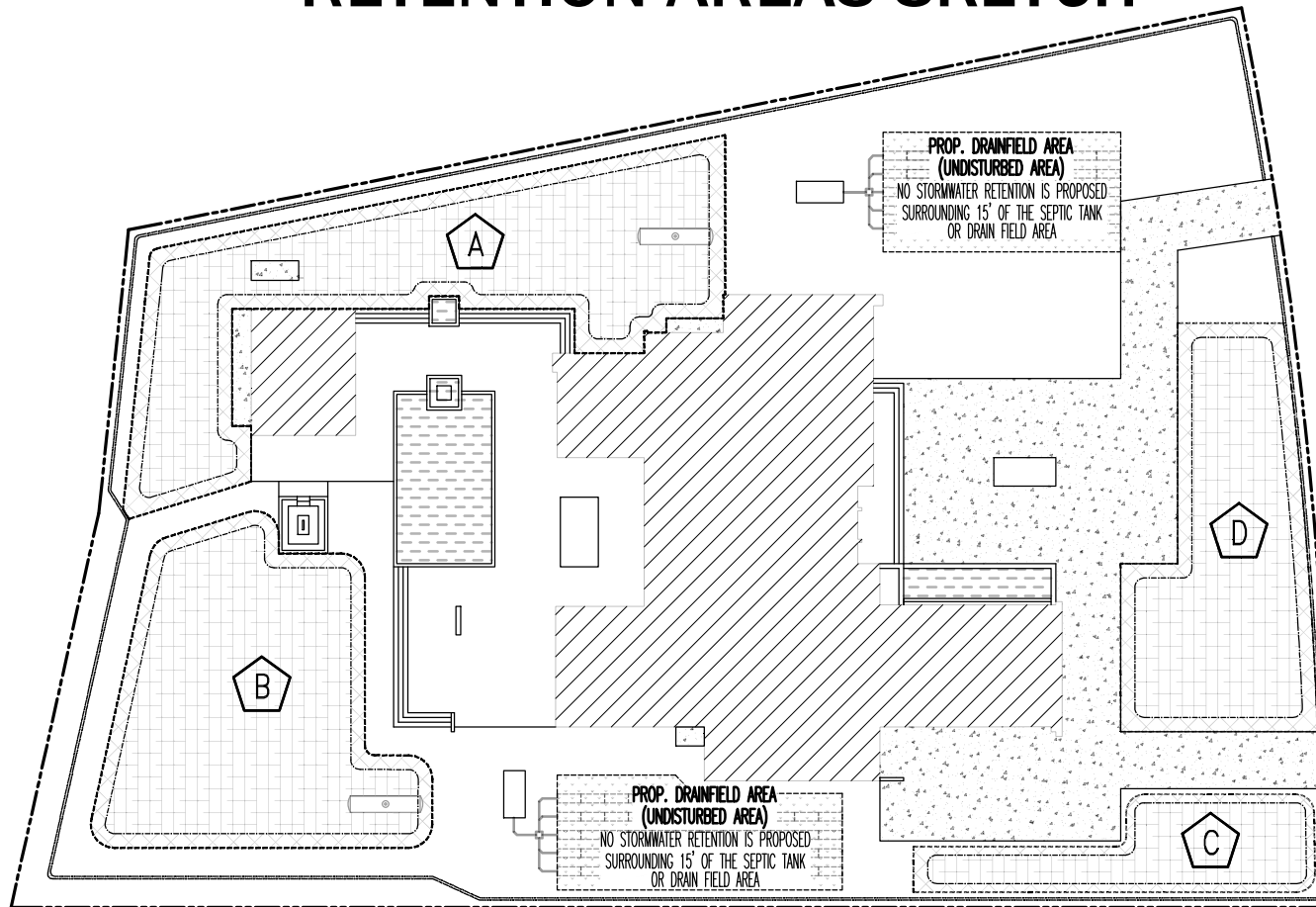
DEVELOPMENT INFORMATION			
PRE-DEVELOPMENT		POST DEVELOPMENT	
TOTAL	42,771.96 ft ²	TOTAL	42,771.96 ft ²
PERVIOUS	42,771.96 ft ²	PERVIOUS	22,788.11 ft ²
IMPERVIOUS	0.00 ft ²	IMPERVIOUS	19,983.85 ft ²

LEGEND

-  BUILDING FOOTPRINT
-  CONCRETE
-  GRASS AREA
-  WATER SURFACE
-  DRAINFIELD AREA

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

RETENTION AREAS SKETCH



VOLUME RETENTION TABLE

AREA NO.	LINEAR AREA (SF)	VERTICAL AREA (SF)	TOP ELEV (NGVD)	BOTTOM ELEV (NGVD)	TOTAL VOLUME RETAINED (CF)
A	1,216.69	2,731.50	17.50'	17.00'	1,670
B	743.68	2,849.67	16.50'	16.00'	1,611
C	367.65	871.56	17.30'	17.00'	317
D	712.17	1,996.77	17.40'	17.20'	471
TOTAL SITE RETENTION PROVIDED					4,069

LEGEND

- BUILDING FOOTPRINT
- CONCRETE
- GRASS AREA
- WATER SURFACE
- DRAINFIELD AREA

PROJECT DESCRIPTION

The project consists of a proposed two story single-family residence with a pool, pool deck, 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

$$A_{pre} := 42771.96 \text{ ft}^2$$

$$AP_{pre} := 42771.96 \text{ ft}^2$$

$$AI_{pre} := 0.00 \text{ ft}^2$$

POST DEVELOPMENT DISTRIBUTION

$$A_{post} := 42771.96 \text{ ft}^2$$

$$AP_{post} := 22788.11 \text{ ft}^2$$

$$AI_{post} := 19983.85 \text{ ft}^2$$

GENERAL SITE CONDITIONS

$P := 9.2 \text{ in}$ Rainfall Amount (25-year, 24-hour storm). see attached map

$AE := 17.10 \text{ ft}$ Average Elevation of Pervious Areas (NGVD)

$GW := 2.00 \text{ ft}$ Average October Water Table Elevation (NGVD) see attached map.

$D = 15.10 \text{ ft}$ 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 $D = 15.10 \text{ ft}$ then $S_1 := 8.18 \text{ in}$

PRE DEVELOPMENT VOLUME CALCULATION

$$S_{pre} := \frac{AP_{pre}}{A_{pre}} \cdot S_1 = 8.18 \text{ in}$$

$$R_{pre} := \frac{(P - 0.2 \cdot S_{pre})^2}{(P + 0.8 \cdot S_{pre})} = 3.63 \text{ in}$$

$$V_{pre} := A_{pre} \cdot R_{pre} = 12953 \text{ ft}^3$$

POST DEVELOPMENT VOLUME CALCULATION

$$S_{post} := \frac{AP_{post}}{A_{post}} \cdot S_1 = 4.36 \text{ in}$$

$$R_{post} := \frac{(P - 0.2 \cdot S_{post})^2}{(P + 0.8 \cdot S_{post})} = 5.47 \text{ in}$$

$$V_{post} := A_{post} \cdot R_{post} = 19487 \text{ ft}^3$$

VOLUME OF RUNOFF REQUIRED TO MAINTAINED ON SITE

Whichever is the greater:

Water Quantity

Pre/Post Volume difference

$$V_{condition1} := V_{post} - V_{pre} = 6535 \text{ ft}^3$$

Water Quality

Imperviousness percent times 2.5 inch

$$I = \text{Inches to be treated} \quad I := 2.5 \text{ in} \cdot \frac{AI_{post}}{A_{post}} = 1.17 \text{ in}$$

$$V_{condition2} := I \cdot A_{post} = 4163 \text{ ft}^3$$

First inch of runoff

$$V_{condition3} := 1 \text{ in} \cdot A_{post} = 3564 \text{ ft}^3$$

Storage Volume Required

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

$$V_{req} = 6535 \text{ ft}^3$$

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

Basin A (B_A)

$$B_A := (17.50 \text{ ft} - 17.00 \text{ ft}) \cdot (1216.69 \text{ ft}^2) \cdot \frac{1}{2} + (17.50 \text{ ft} - 17.00 \text{ ft}) \cdot (2731.50 \text{ ft}^2) = 1670 \text{ ft}^3$$

Basin B (B_B)

$$B_B := (16.50 \text{ ft} - 16.00 \text{ ft}) \cdot (743.68 \text{ ft}^2) \cdot \frac{1}{2} + (16.50 \text{ ft} - 16.00 \text{ ft}) \cdot (2849.67 \text{ ft}^2) = 1611 \text{ ft}^3$$

Basin C (B_C)

$$B_C := (17.30 \text{ ft} - 17.00 \text{ ft}) \cdot (367.65 \text{ ft}^2) \cdot \frac{1}{2} + (17.30 \text{ ft} - 17.00 \text{ ft}) \cdot (871.56 \text{ ft}^2) = 317 \text{ ft}^3$$

Basin D (B_D)

$$B_D := (17.40 \text{ ft} - 17.20 \text{ ft}) \cdot (712.17 \text{ ft}^2) \cdot \frac{1}{2} + (17.40 \text{ ft} - 17.20 \text{ ft}) \cdot (1996.77 \text{ ft}^2) = 471 \text{ ft}^3$$

Swales Retention Capacity:

$$V_{swale} := B_A + B_B + B_C + B_D$$

$$V_{swale} = 4068 \text{ ft}^3$$

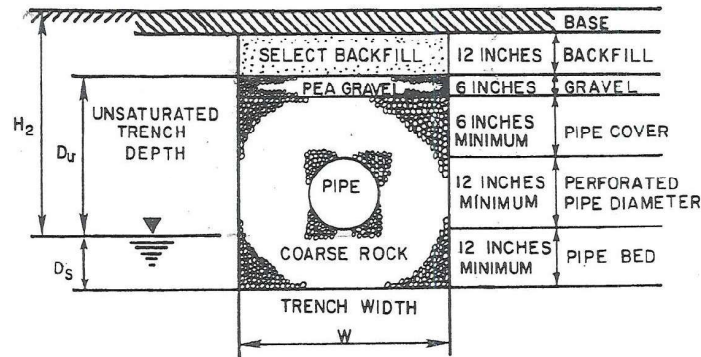
Retention Volume Provided
 $V_{swale} = 4068 \text{ ft}^3$

<

Storage Volume Required
 $V_{req} = 6535 \text{ ft}^3$

***Sufficient Storage is NOT being Provided by retention only,
therefore drainage system is required.***

TRENCH CALCULATION FOR THE STANDARD SFWMD TRENCH



Exfiltration Trench Calculation:

Lowest grade elevation along proposed trench location: $Base := 15.90 \text{ ft}$

Trench Depth: $T_d := 15 \text{ ft}$

$H_2 := Base - GW = 13.90 \text{ ft}$

$W := 4 \text{ ft}$

$D_u := Base - 12 \text{ in} - GW = 12.90 \text{ ft}$

$K := 2.10 \cdot (10^{-4})$

$D_s := GW - (Base - T_d) = 1.10 \text{ ft}$

Exfiltration:

if $D_s > D_u$

$$E = (K \cdot (2 H_2 \cdot D_u - D_u^2 + 2 H_2 \cdot D_s) + (1.39 \cdot 10^{-4}) W \cdot D_u)$$

else

$$E = (K \cdot (H_2 \cdot W + 2 \cdot H_2 \cdot D_u - D_u^2 + 2 \cdot H_2 \cdot D_s) + (1.39 \cdot 10^{-4}) \cdot W \cdot D_u)$$

$$E = 0.06563430 \text{ ft}^2 \text{ cfs/foot of trench}$$

Trench Retention Volume, V_T : $V_T := V_{req} - V_{swale} = 2467 \text{ ft}^3$ $V_T = 0.680 \text{ acre} \cdot \text{in}$

Required Trench Length, L : $L_{req} := \frac{V_T}{E} = 37583 \text{ ft}^2 \cdot \text{ft}$

$$L_{provided} := 15 \text{ ft}$$

$$V_{trench} := L_{provided} \cdot E = 3574 \text{ ft}^3$$

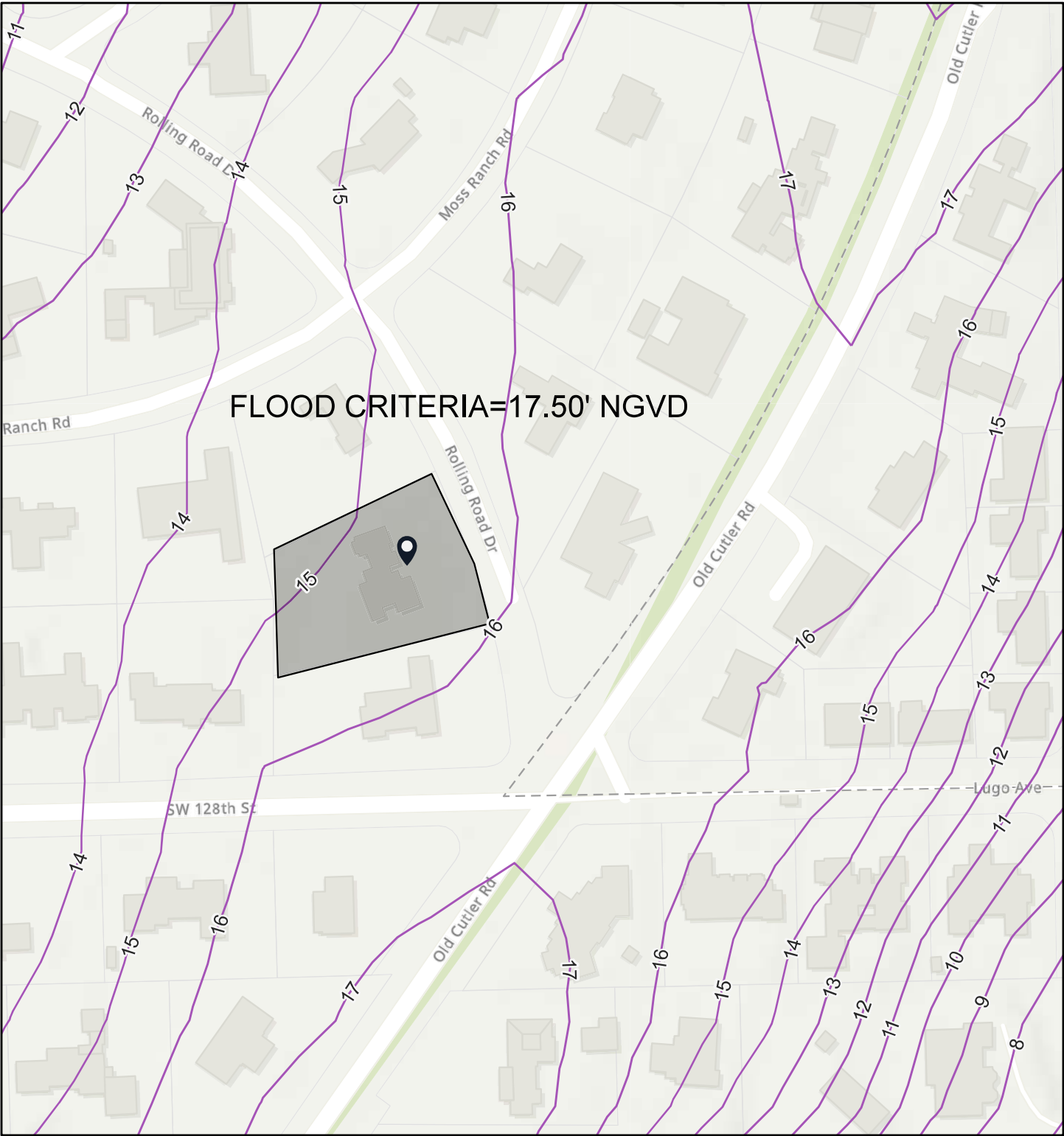
$$V_P := V_{swale} + V_{trench} = 7642 \text{ ft}^3$$

Retention Volume Provided
 $V_P = 7642 \text{ ft}^3$

> Storage Volume Required
 $V_{req} = 6535 \text{ ft}^3$

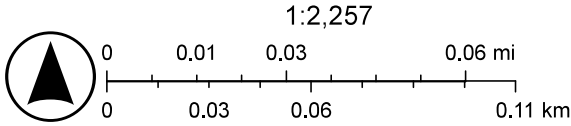
Therefore Sufficient Storage is being Provided

FLOOD CRITERIA MAP



2/18/2025

County Flood Criteria 2022
World Hillshade

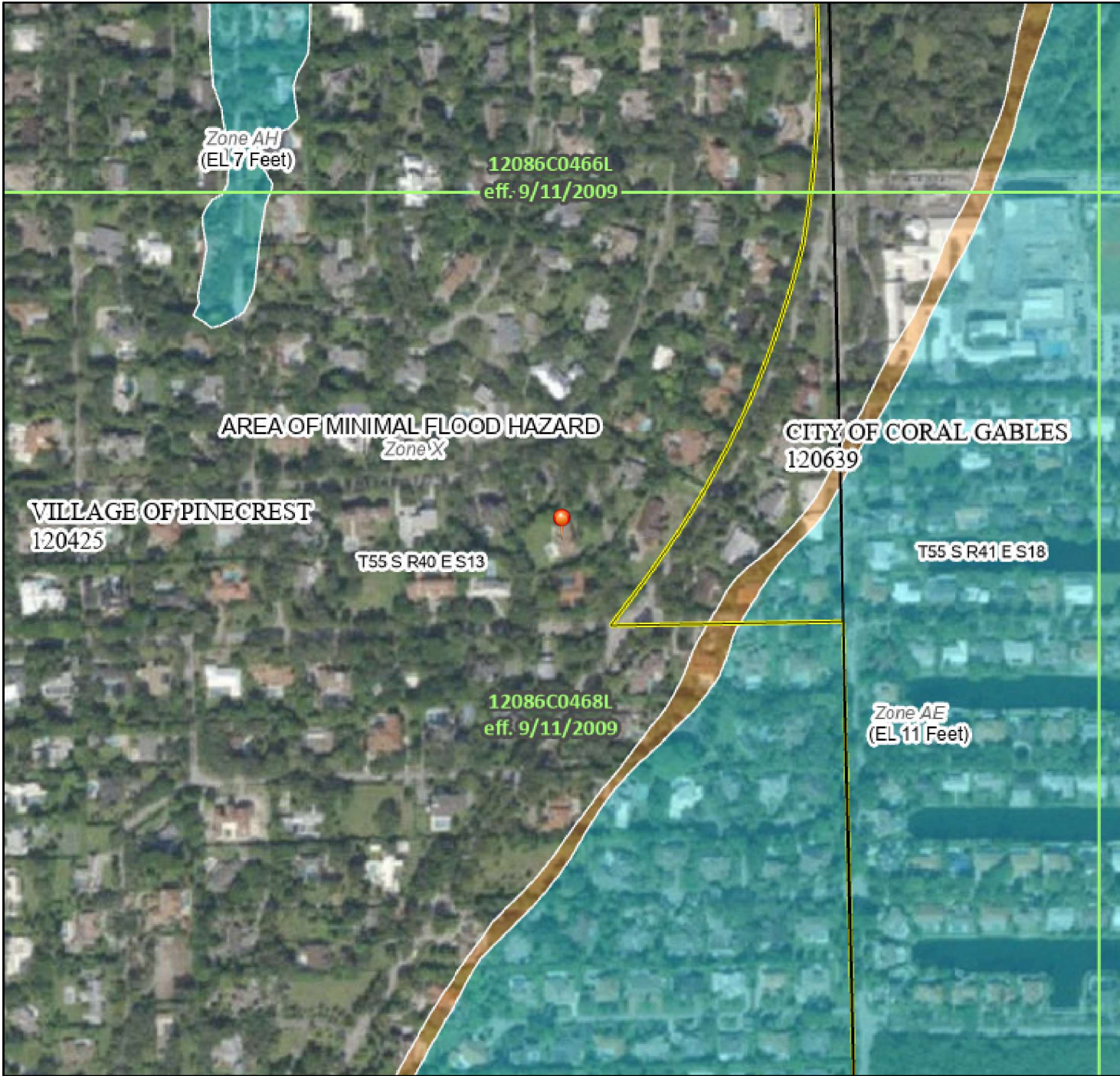


Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Esri Community Maps Contributors, Miami-Dade County, FDEP, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS,

National Flood Hazard Layer FIRMette



80°17'29"W 25°39'28"N



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

1:6,000 10

80°16'52"W 25°38'56"N

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
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

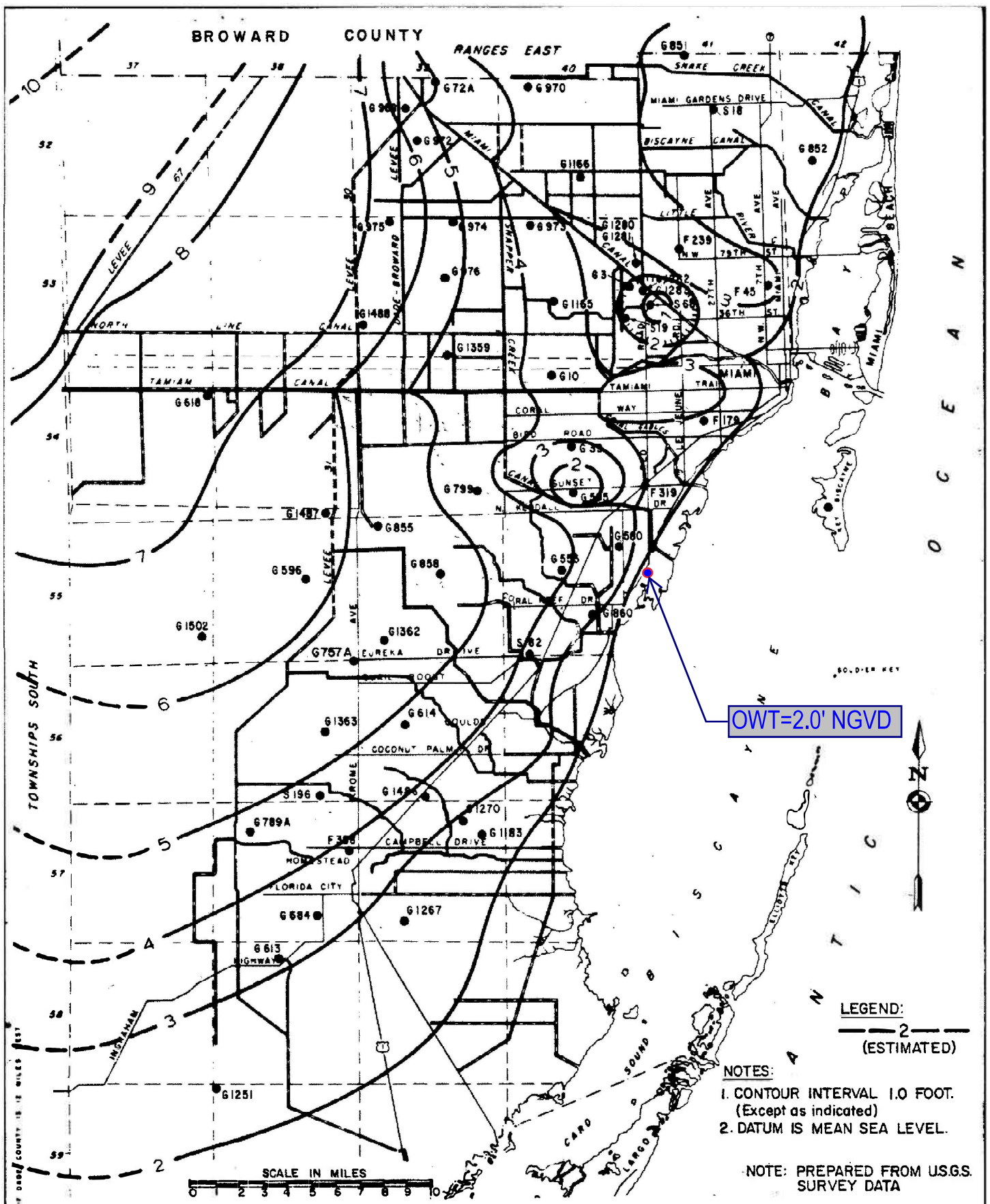


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 2/18/2025 at 3:40 PM 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

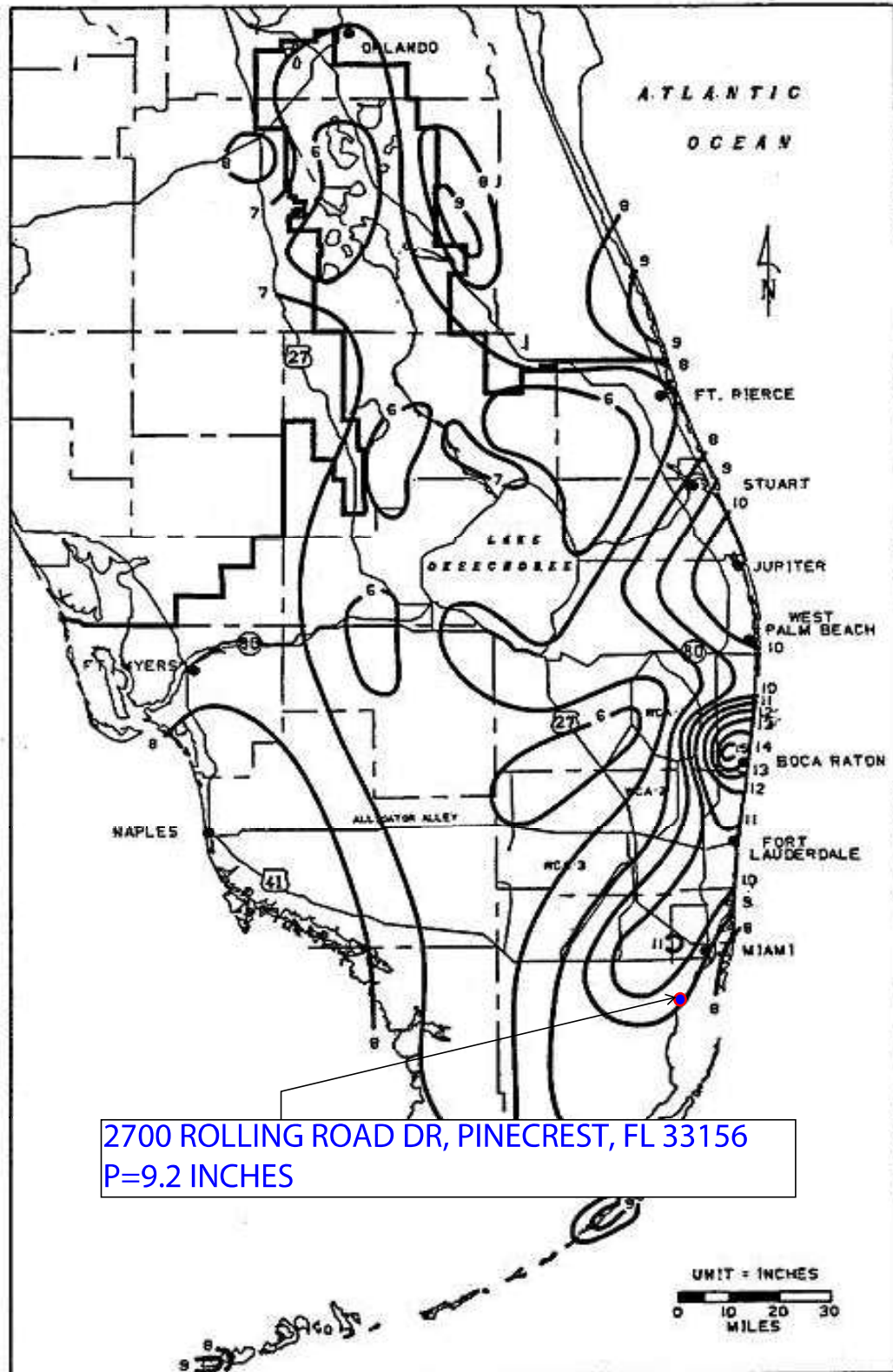
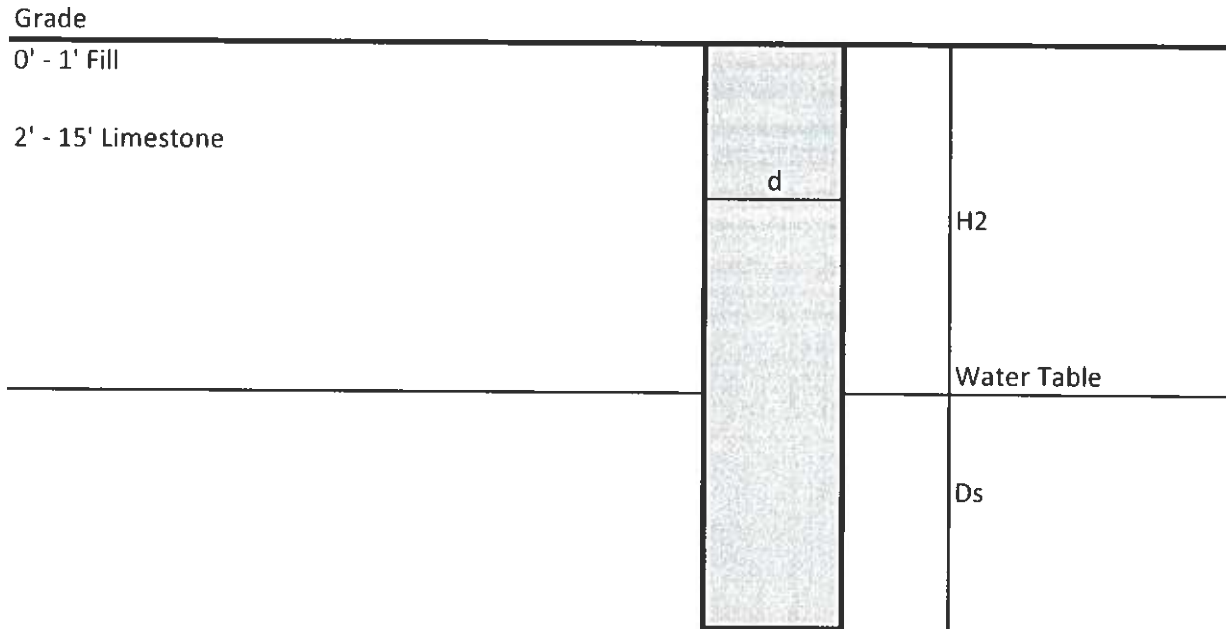


FIGURE C-5. 1-DAY RAINFALL: 25-YEAR RETURN PERIOD

PROPOSED RESIDENCE
 12700 ROLLING ROAD DRIVE, MIAMI, FL
 CONSTANT HEAD PERCOLATION TEST
 SFWMD Usual Open Hole Test
 Test 1, Location EX-1

27-Oct-22
 File No. 22-2609

Location: See Plan



K= Hydraulic Conductivity (cfs/ft ² -ft head)	2.10E-04
Q= Stabilized Flow Rate (cfs)	3.77E-02
d= Diameter of Test Hole (ft)	0.5
H2= Depth of Water Table (ft)	15
Ds= Saturated Hole Depth (ft)	0
H= Test Hole Depth (ft)	15


 11/10/22
 Evelio Horta, Jr., M.S.C.E., P.E.
 Project Engineer
 FL Reg. No. 82209