



## **SURVEYOR'S REPORT**

**Specific Purpose Survey of the  
United States Geological Survey  
Recorder Well G-3702  
in  
Miami-Dade County, Florida**

**Prepared for:**

### **South Florida Water Management District**

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Field Date: March 28, 2019  
Report Date: April 24, 2019  
BEC Order #: 03-86445

INSPIRED BEYOND MEASURE • SINCE 1898

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## SURVEYOR'S REPORT

### PURPOSE

The purpose of this survey is to set an Elevation Reference Mark (Benchmark) consisting of a mag nail and washer and to establish a North American Vertical Datum of 1988 (NAVD 88) elevation on said Benchmark and on an additional Reference Point with a Brass plate, both at United States Geological Survey Well **G-3702**.

### LOCATION OF PROJECT

The United States Geological Survey's Recorder Well **G-3702** is located in Section 35, Township 56 South, Range 39 East, Miami-Dade County, Florida.



**General Location (Intended Display scale is "Not to Scale")**

**PROJECT VERTICAL DATUM**

The project vertical datum is the North American Vertical Datum (NAVD) of 1988.

To convert the NAVD 88 elevation to the National Geodetic Vertical Datum of 1929 at station **G-3702 add 1.53'**. These values are based on Corpscon 6.0.1 a US. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the US. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.

**PROJECT HORIZONTAL DATUM**

The project horizontal datum is the North American Datum 83 (NAD 83(2011)) (EPOCH:2010.0000).

**LEVELING METHODS**

The leveling for this project was performed in accordance with standard survey practice using conventional third order methods, techniques and equipment.

The allowable error (.05 √ miles) on this project meets or exceeds third order closures as required by SFWMD for this project per executed SOW for 4600003705-WO04 and discussions with SFWMD.

A level loop was run from the Miami-Dade County Benchmark BC-50-1, through the well site, and to the Miami-Dade County Benchmark BC-50-2. The measurements were collected using a Digital Level and were hand written in Biscayne Engineering Co, Inc. Field Book 2995 pages 01-05, dated March 28, 2019, reduced and adjusted electronically. Additional data was manually recorded in the field book.

**GPS METHODS**

Latitude and Longitude for Benchmark G-3700 were established by observing a 3-minute session of GPS data on March 28 2019, using a Trimble R-8-S and The Florida Permanent Reference Network (FPRN). The FPRN network consists of nearly 100 Continuously Operating Reference Stations (CORS) located throughout Florida.


**EQUIPMENT USED**


- Trimble GPS unit R-8-S, Serial Number 5625R066188.
- TOPCON DL-500 digital level Serial Number 512386 and a folding bar code rod.
- TOPCON Total Station GM-103, Serial Number ZQ000748.
- TOPCON Auto-level DL-500, Serial Number 512386.

**SURVEYOR'S REPORT**


**VERTICAL CONTROL POINT**

The Vertical Control point utilized and set as part of this survey is the:

<b>M-DC BM BC-50-1</b>				
25° 33' 33.68" (N)	80° 21' 32.90" (W)	11.09 ft.	(NAVD88) 3.38 m	Published
		12.62 ft.	(NGVD29) 3.85 m	Published
		<p>APPROXIMATELY AT SW 224<sup>TH</sup> STREET                      OLD CUTLER ROAD. APPROXIMATELY SW                      103<sup>RD</sup> COURT. 40 FEET WETS OF THE                      NORTHEAST CORNER OF THE BRIDGE.</p> <p>BRASS BAR IN SIDEWALK ON NORTH SIDE                      OF BRIDGE.</p> <p>SEE BM-50-2 IN SIDEWALK AT                      SOUTHWEST CORNER OF THE BRIDGE.</p>		

<b>M-DC BM BC-50-2</b>				
25° 30' 25.24" (N)	80° 23' 46.50" (W)	12.00 ft.	(NAVD88) 2.30 m	Published
		13.52 ft.	(NGVD29) 4.12 m	Published
		<p>APPROXIMATELY AT SW 224<sup>TH</sup> STREET                      OLD CUTLER ROAD. APPROXIMATELY SW                      103<sup>RD</sup> COURT.</p> <p>BRASS BAR IN SIDEWALK AT SOUTHWEST                      CORNER OF BRIDGE.</p> <p>SEE BM-50-1 IN SIDEWALK AT                      NORTHEAST CORNER OF THE BRIDGE.</p>		

**SURVEYOR'S REPORT**

<b>BM: G-3702 (Set as part of this survey)</b>					
25° 33' 33.64" (N)	80° 21' 34.66" (W)	11.274 ft.	(NAVD88)	3.44 m	Level run
		12.803 ft.	(NGVD29)	3.90 m	Converted
			1.53 ft. (conversion factor)		Corpscon 6.0.1
		SET MAG NAIL AND WASHER BEC 0129 G-3702.			

Field Book 3004, Page 38

<p>                 C. LUNA                  A. LEAL                  6-19-19                  PINK ELECT. LEVEL                  STA BS DIST HL FS DIST                  EC-SO-Z 1.879 122.26 13379                  TOP OF RIM                  SHAPE 9.068 103.6                  WRL G-3272                  SHAPE 9.267 104.07 13514                  BM 1 2.282 62.70             </p>	<p align="center"> <b>BM G-3702                  ELEVATION: 11.271'                  (NAVD88)</b> </p>	<p align="right">2024-38</p> <p>                 ELEVATION BM ELEV DIST IN = IN                  12.00 OLD CUTLER RD (APPROX SW 22AS) SW COR. OF 12028                  BRASS BAR ON CONG. SWL. ELEV = 12.00 NAVD88                  3.968 NORTH RIM                  4.247 WRL G-3272 (TOP OF NORTH 2" PVC PIPE)                  11.271 11.274 SET UNLV BEC 0129 G-3702                  SEE FIG 2921-25                  ELEV = 11.274 NAVD88                  02028 = 01028             </p>
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**PROJECT RESULTS**

Overall Site



**Benchmark "G-3702"**  
El. 11.274' (NAVD88)

**G-3702 Well Site**  
Latitude: 25° 33' 35.28"  
Longitude: 80° 21' 34.60"  
Reference elevation  
4.247' (NAVD88)

(Oblique not to scale)

## SURVEYOR'S REPORT


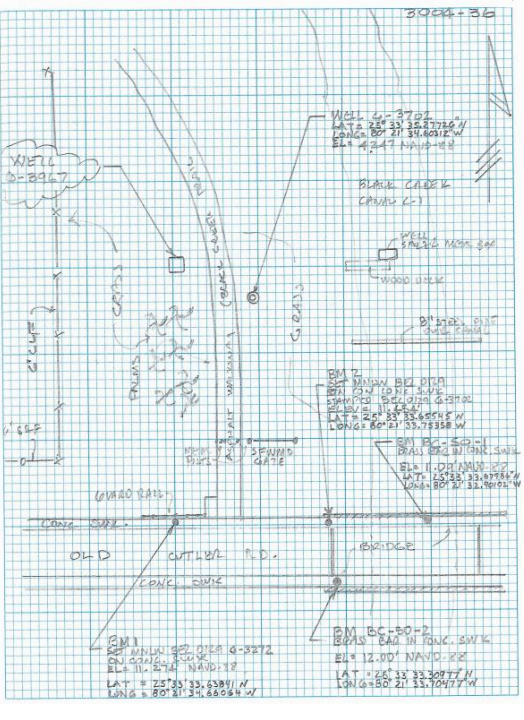
### Tabular Form

Reference and Ground Elevations: (NAVD88)			
Well	Ground Elevation	Reference Elevation	Comments
G-3702	4.87 ft.	4.247 ft.	Top of 2" PVC pipe
Offset to NGVD29: +1.53' (See Project Vertical Datum Notes in Page: 4)			
Well diameter		Casing material	DTW
2"		Metal	3.76 ft. (06/19/19 at 10:00 AM)

USGS Published: (Per USGS Report Site #: 253334080213601 G-3702) (NGVD29)			
Well	Ground Elevation	Reference Elevation	Comments
G-3702	-	5.77 ft.	Top of casing at land surface

Source & Site Benchmark	NAVD88	NGVD29	NGVD29 (Corpscon 6.0.1)
BC-50-1 (M-DC)	11.09 ft. (Published)	12.69 ft. (Published)	
BC-50-2 (M-DC)	12.00 ft. (Published)	13.52 ft. (Published)	
G-3702 (SFWMD)	11.274 ft. (Measured)		12.80 ft. (Converted)

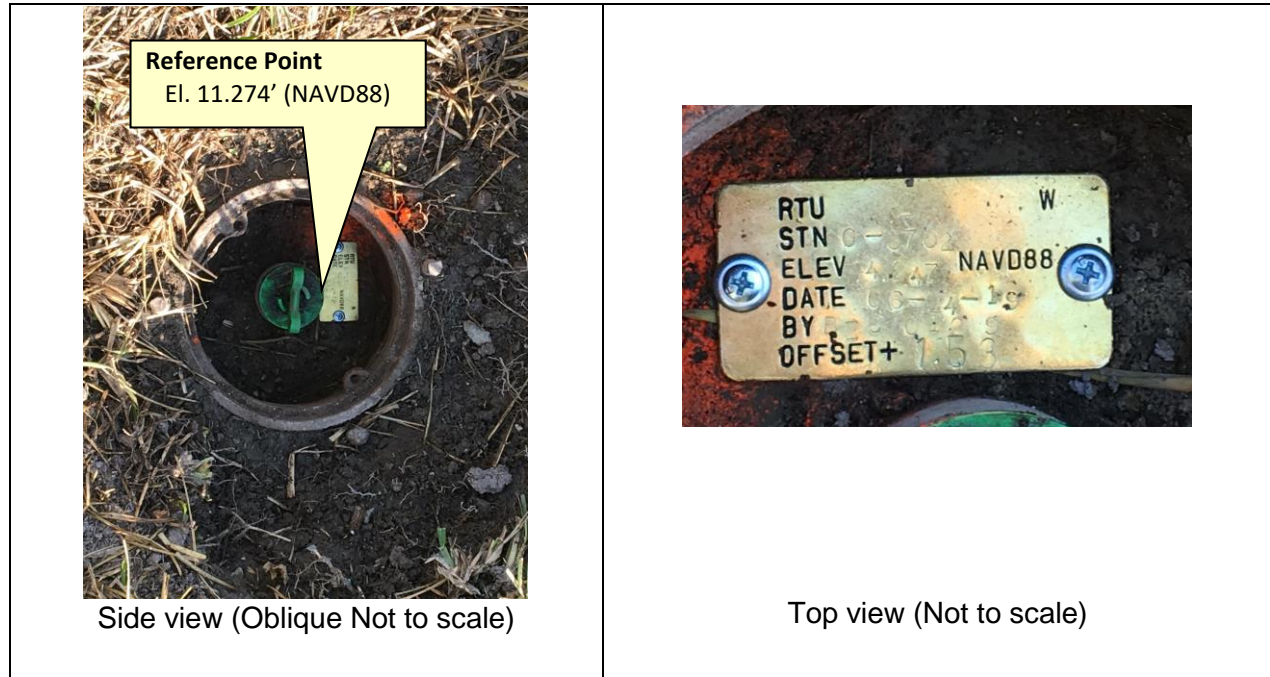
### Well Photos and Diagrams

 <p style="text-align: center;">Diameter</p>	 <p style="text-align: center;">Top view (Not to scale)</p>
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## SURVEYOR'S REPORT

### Well Photos and Diagrams (Continued)



#### **Surveyor's Notes:**

1. All measurements herein are in United States Survey feet and decimal thereof, unless otherwise specified.
2. Underground utilities were not located as part of this survey.
3. This survey report or copies thereof are not valid without the original signature and seal of a Florida licensed Surveyor and Mapper.
4. Additions or deletions to this survey report by other than the signing party (or parties) is prohibited without written consent of the signing party (or parties).
5. To convert from NAVD 88 to NGVD 29 add 1.52 feet. This value is based on Corpscon 6.0.1 a U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville Fl.
6. Date of last field work: March 28, 2019, BEC job No. 03-86445.
7. SFWMD Data records (on file at the District's headquarters):
  - A. Electronic Data files:
    - Miscellaneous picture files
  - B. Conventional reporting
    - Field Book: 2995 pages 01-05

## SURVEYOR'S REPORT

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### Abbreviations:

<b>EI.</b>	-	Elevation
<b>DTW</b>	-	Distance to the water table inside the well
<b>M-DC</b>	-	Miami-Dade County
<b>NAVD88</b>	-	North American Vertical Datum of 1988
<b>NGVD29</b>	-	National Geodetic Vertical Datum of 1929
<b>NGS</b>	-	National Geodetic Survey
<b>PSM</b>	-	Professional Surveyor & Mapper
<b>PID</b>	-	Permanent Identifiers
<b>SFWMD</b>	-	South Florida Water Management District
<b>USGS</b>	-	United States Geological Survey
<b>BEC</b>	-	Biscayne Engineering Company, Inc.

### SURVEYOR'S CERTIFICATION

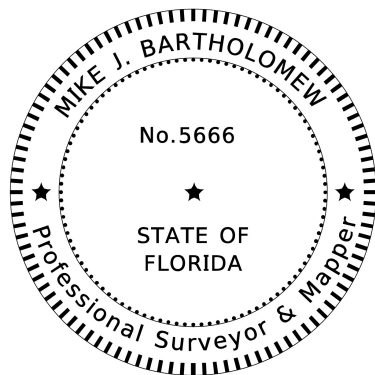
In my professional opinion this Specific Purpose Survey meets applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J-17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

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Last date of Survey  
March 28, 2019

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Mike Bartholomew, PSM, President  
Florida Professional Surveyor and Mapper  
License Number 5666  
State of Florida  
Biscayne Engineering Company, Inc. LB No 0129  
529 West Flagler Street, Miami, FL. 33130  
Tel (305) 324-7671





# SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/18

DESIGNATION: G-3702		PROJECT: G-3702	
ESTABLISHED BY: SOUTH FLORIDA WATER MANAGEMENT DISTRICT		SURVEYOR: Mike Bartholomew	
RECOVERED BY: BISCAYNE ENGINEERING CO.		DATE: 06/20/19	
<b>GEOGRAPHIC POSITION</b>			
SECTION 17	TOWNSHIP 56 SOUTH	RANGE 40 EAST	
COUNTY: MIAMI-DADE	NAME OF QUADRANGLE: PERRINE GEOGRAPHIC INDEX OF QUAD:		
HORIZONTAL DATUM: 1927 <b>(1983)</b> 2022 Other _____ (circle one) ZONE <b>(E)</b> or W			
VERTICAL DATUM: MSL 1929 <b>(1988)</b> 2022 Other _____ (circle one)			
VERTICAL ACCURACY: 1 2 <b>(3)</b>			
STATE PLANE COORDINATE	(N) Y= 446045.548	(E) X= 867278.260	NAVD 88 EL. 11.274' NGVD 29 EL. 12.803'
CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): (A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.) ACTUAL NGS or (ngvd29.txt file) OPUS Ortho Height			
LATITUDE: 25 ° 33' 33.64 " (N)		LONGITUDE: 80 ° 21' 34.66" (W) (Source) GPS RTK (FPRN)	

### RECOVERY DATA

Stamping: G-3700 BEC 0129

To Reach: STATION IS A MAG NAIL AND WASHER STAMPED "BEC 0129 AND G-3702" SET IN CONCRETE SIDEWALK.

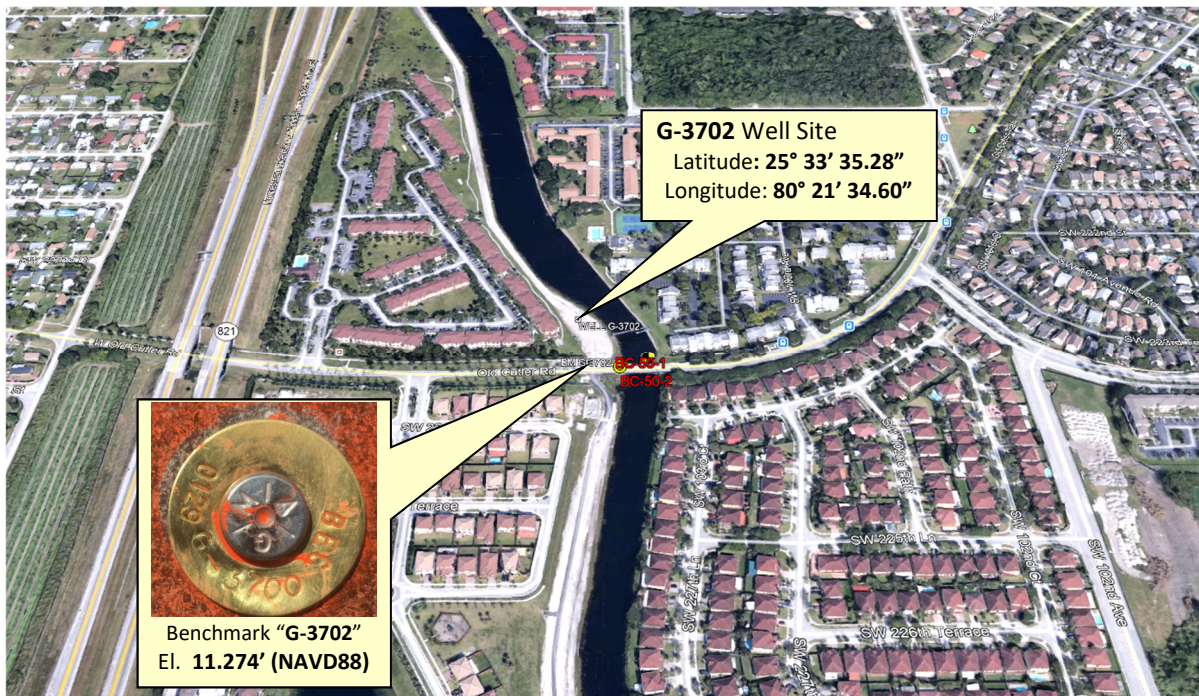
NOTABLE LAND MARKS:

MDC-SOURCE BENCHMARKS: BC-50-1,

FIELD BOOK PAGE 2995-3

### PICTURES

Aerial Overall Site



NOT TO SCALE (Google Earth product)



# SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/18

## Overall Site



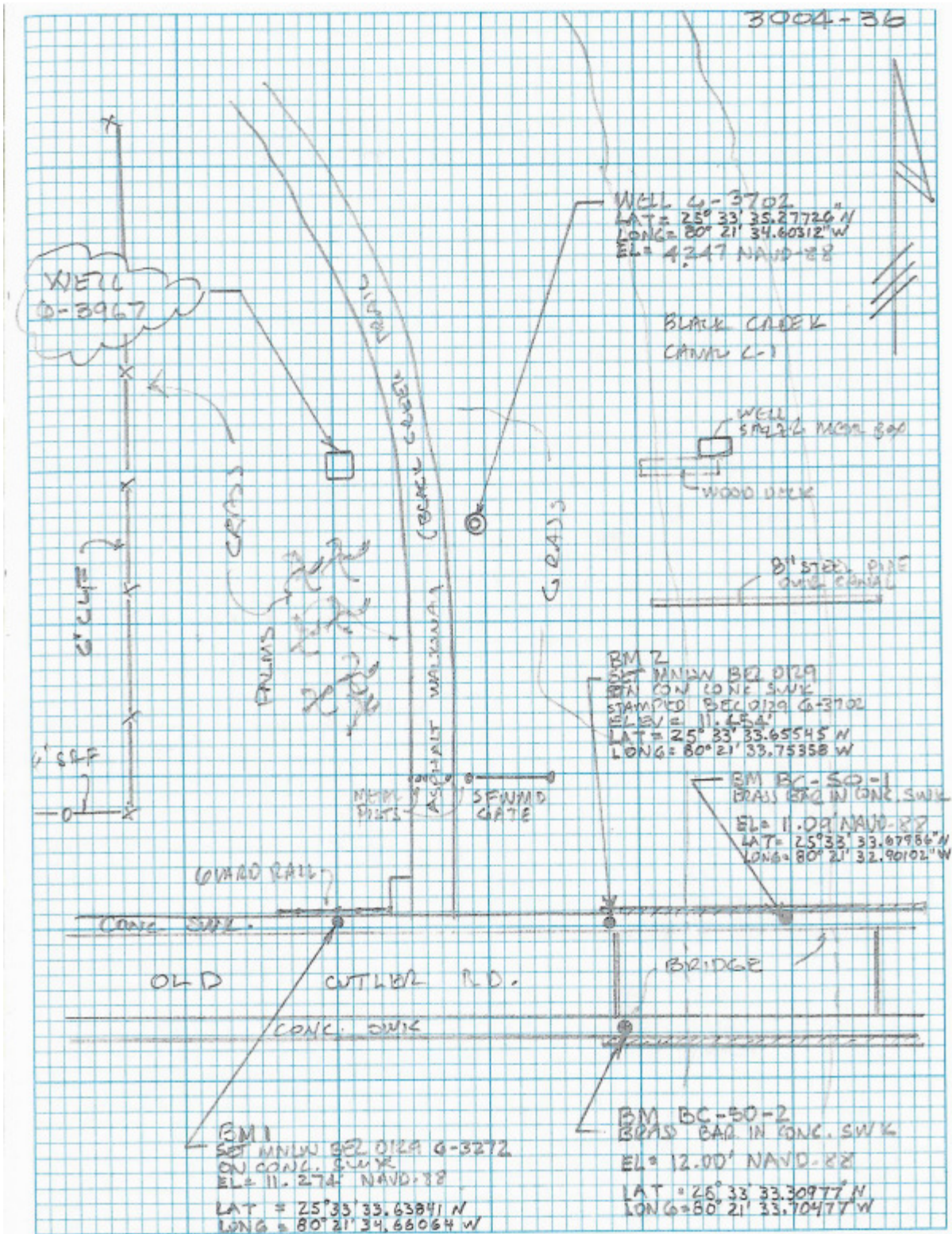
(Oblique not to scale)



# SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 4/18

## SKETCH



# Office

## Project

28 June 2019

### INPUT

Geographic, NAD83  
Vertical - NAVD88, U.S. Feet

### OUTPUT

Geographic, NAD83  
Vertical - NGVD29 (Custom), U.S. Feet

---

**G-3702**

1/1

**Latitude:** 25 33 33.64  
**Longitude:** 80 21 34.66  
**Elevation/Z:** 11.274

**Latitude:** 25 33 33.64000  
**Longitude:** 80 21 34.66000  
**Elevation/Z:** 12.803

---

**Remark:**

# Office

## Project

26 June 2019

### INPUT

Geographic, NAD83  
Vertical - NAVD88, U.S. Feet

### OUTPUT

Geographic, NAD83  
Vertical - NGVD29 (Custom), U.S. Feet

---

## Well G-3702

1/1

**Latitude:** 25 33 35.28  
**Longitude:** 80 21 34.60  
**Elevation/Z:** 4.247

**Latitude:** 25 33 35.28000  
**Longitude:** 80 21 34.60000  
**Elevation/Z:** 5.776

---

Remark:

DLUNA

A LEAL

6-19-19

86445 01 30  
TOPCON 2000074X

DEC N. 03-26445

S. F. W. M. D.

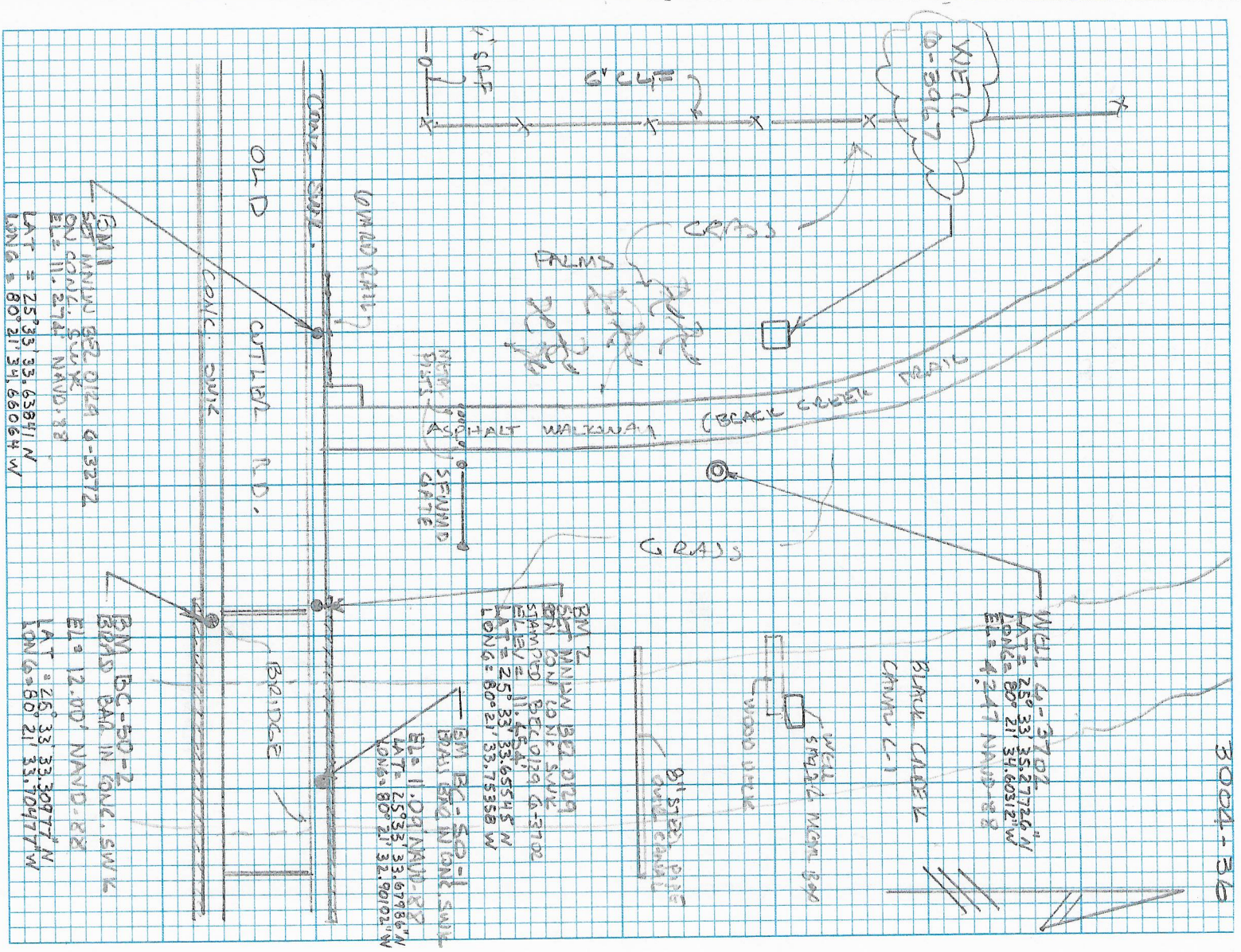
MIAMI DATE (S. W. W. M. D.)

LOCATION AND ELEVATION (MINDY R. R.)

OF USGS 6-3702 (REF FOR 2981)

INST @ BM 1  
HT = 5.35

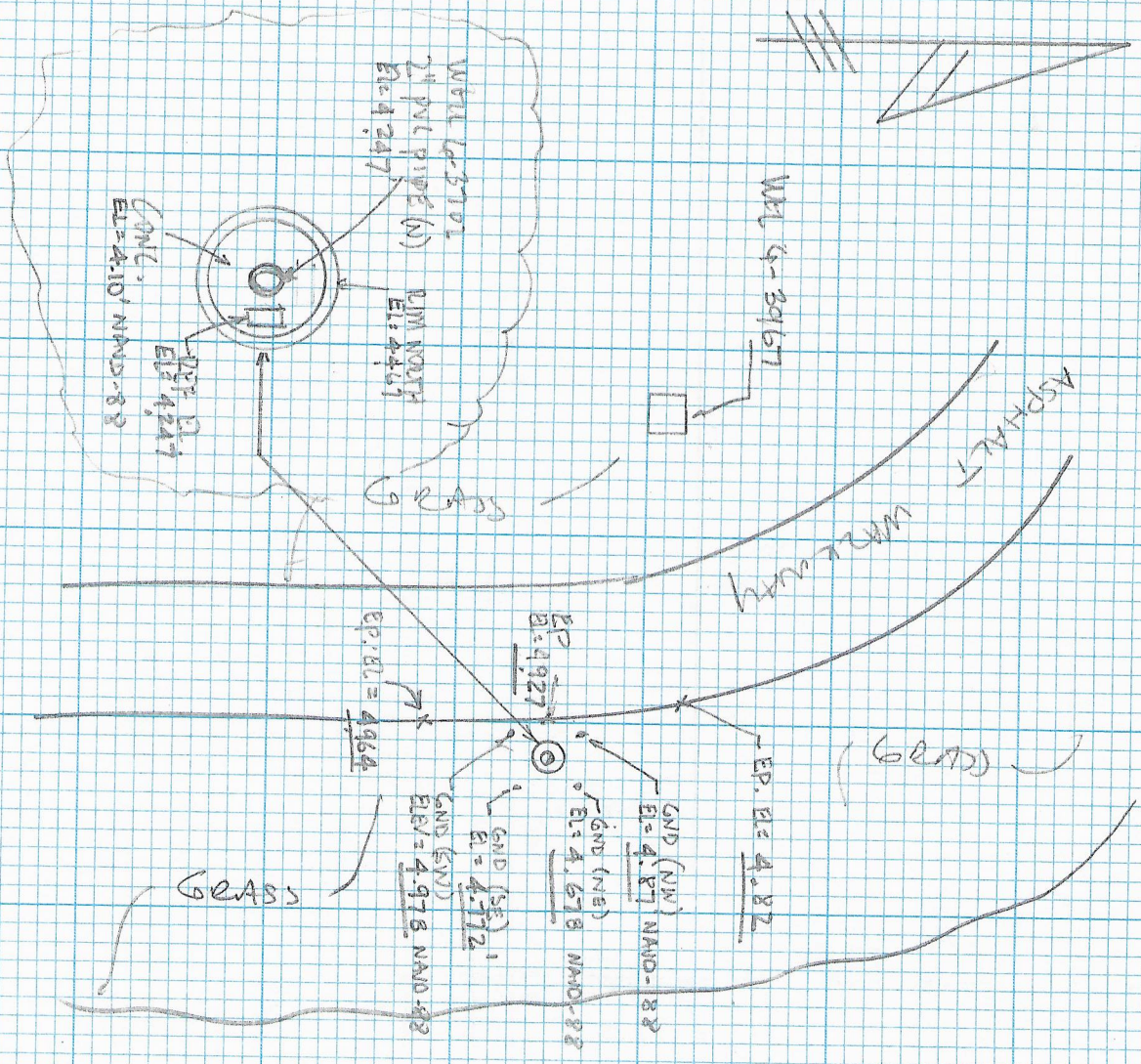
STA	TH	HORIZ. #	VERT. DIST	SLOPE DIST	DESG.
51	4.73	359' 41" 54"	90' 16" 55"	161.200	BM BC-50-1
		INST @ BM 1 HT = 5.35			
STA	TH	HORIZ. #	VERT. #	SLOPE DIST	DESG.
52	4.73	00' 00' 00"	90' 16' 52"	161.200	1051 - 51
53	4.73	22' 14' 54"	89' 56' 13"	93.615	BM BC-50-2
1003	4.73	00' 18' 07"	90' 18' 08"	83.100	1003 = BM 2



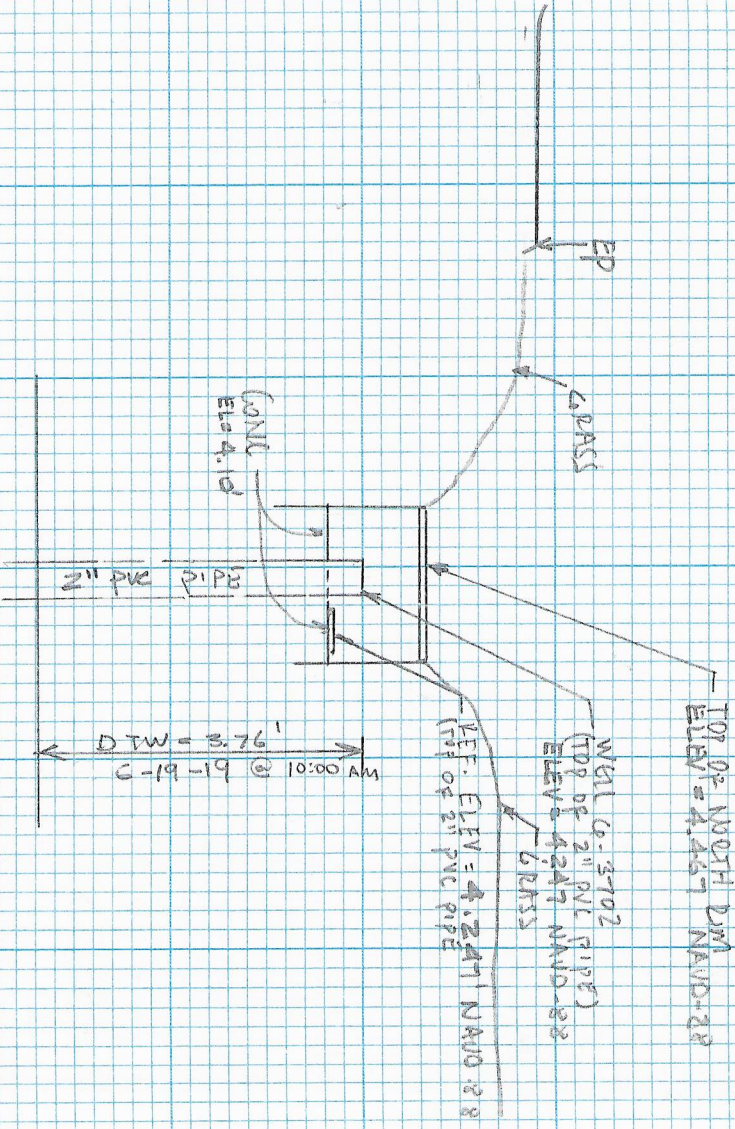


D. LVNA  
 A LERL  
 6-19-19  
 864450130  
 TORCON EQ 00074X

BLK # 03-86443  
 S.F. W.M.D.  
 MIAMI DADE (26 WELLS)  
 LOCATION AND POSITION (NAVD-88)  
 OF USGS WELL G-3702 (REF F18 2981)



WELL G-3702  
 LOOKING NORTH

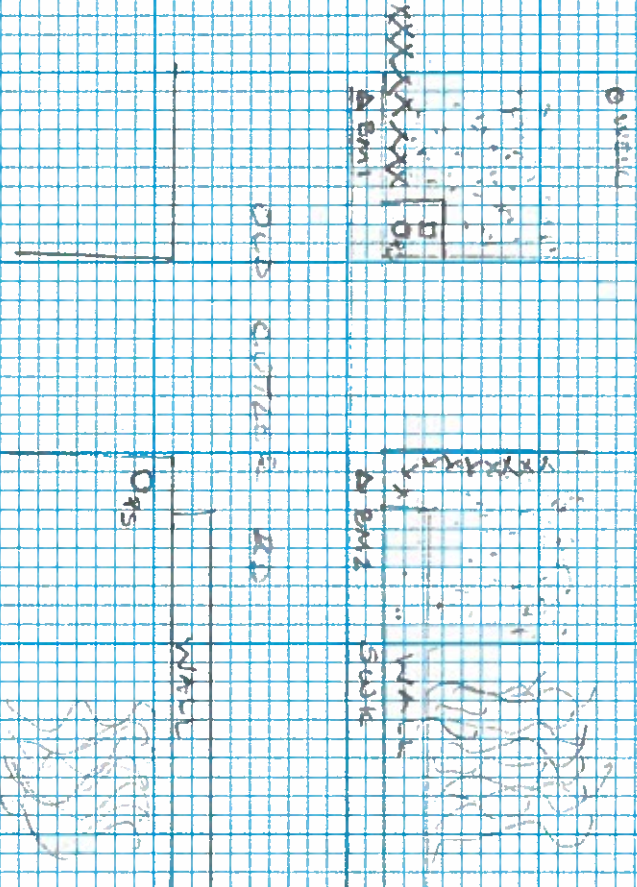


NAVD88

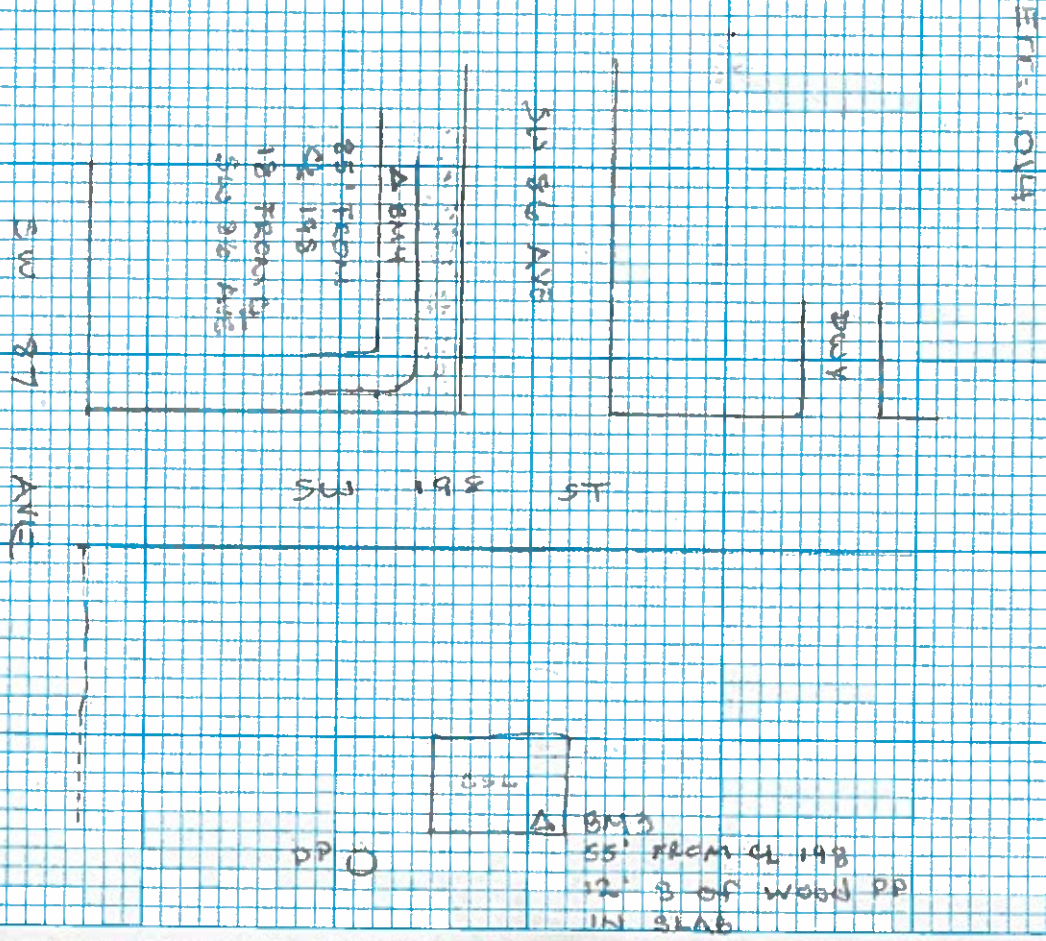
NAVD88

315119  
 A WILLIAMS  
 T. MESSPACH  
 C. JOUCHET  
 BEL OF BOUND  
 BVA LOCATION  
 FIELD AND  
 Dig UNIT 315119  
 G-3702

STA	+	DISF	HT	DIS+
BM 2	41.523	54.40	16.523	
BM 1	41.914	44.206	16.167	5.249
BM 2	41.878	45.41	16.511	4.173
BM 1				28.79
				5.228
				34.61



ELEV	BVA ELEV	DESC
11.00		STND - BC 50+2
11.274		12' SW OF GR 2' S OF BOW (UNCLD)
11.454		3' W E OF WALL 4' S OF WALL (CLD)
11.104	11.09	STND - EX. 50+1



CLUNIA  
 A LEVEL  
 6-19-19  
 DINI ELECT. LEVEL

SEC N. 03-86405  
 S. E. W. M. D.  
 MIAMI DADE (26 WELLS)  
 LOCATION AND ELEVATION (MIAMI-38)  
 OF WELL 6-3192 (DATE FEB 29 1981)

NAVD88

STA	BS	DIST	HT	FS	DISIT
IBC-50-2	1.379	13.26	12.379		
TOP OF RIM				99.11	101.15

SAVVS	9.068	103.67	13.536		
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WELL 6-3212				9.239	103.35
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SHAVE	9.267	104.01	13.514		
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NAVD88

BM 1				2.243	62.30
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DEFINITION

ELEVATION BM ELEV  
 12.00 OLD CULVER RD (APPROX SW 2245) SW COR. OF ROAD  
 PASS BAR ON COR. SWV. ELEV: 12.00 NAVD88

4468 NORTH RIM

4247 WPT 655212 (TOP OF NORTH 2" PVC PIPE)

11271 11274 SET UNLW ISEL CORN 60-3212  
 SEE Pgs 2821-2835

BM 202 = -0.003  
 BUREAU 11274 NAVD88

## Search Address or Control Point



Search for an address or locate on map

Show results within 5 Miles



< PW Vertical Control Points

### BC-50-1 - EXISTING

**Name:** BC-50-1

**Elev(NGVD29):** 12.62

**Elev(NAVD88):** 11.09

**Northing:** 446,052.76

**Easting:** 867,440.55

**Location1:** OLD CUTLER RD (APPROX SW 224 ST)  
--- BRIDGE

**Location2:** BLACK CREEK CANAL (APPROX SW 103 CT) ---

**Location3:** 40' WEST OF NE CORNER OF BRIDGE

**Description1:** BRASS BAR IN SIDEWALK ON NORTH SIDE OF BRIDGE.

**Description2:** \*\* SEE BM BC-50-2 IN SIDEWALK AT SW CORNER OF BRIDGE

**Field Book:** 355-18

**Zones:** VII

**Circuit:** 458

**Set Date:**

**Locator:** 6052 SE

**Last Check:** 07-25-2012

**Adjustment:** EL WAS 12.64

**Adjustment-Date:** 01-19-2011

**Status:** EXISTING

## Search Address or Control Point



Search for an address or locate on map

Show results within 5 Miles



< PW Vertical Control Points

### BC-50-2 - NEW

**Name:** BC-50-2

**Elev(NGVD29):** 13.52

**Elev(NAVD88):** 12.00

**Northing:** 446,052.76

**Easting:** 867,440.55

**Location1:** OLD CUTLER RD (APPROX SW 224 ST)  
--- BRIDGE

**Location2:** BLACK CREEK CANAL (APPROX SW 103 CT) ---

**Location3:**

**Description1:** BRASS BAR IN SIDEWALK AT SOTHWEST CORNER OF BRIDGE.

**Description2:** \*\* SEE BM BC-50-1 IN SIDEWALK AT NE CORNER OF BRIDGE

**Field Book:** 355-18

**Zones:** VII

**Circuit:** 458

**Set Date:** 01-19-2011

**Locator:** 6052 SE

**Last Check:** 07-25-2012

**Adjustment:**

**Adjustment-Date:** 01-19-2011

**Status:** NEW