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SURVEYOR'S REPORT

Specific Purpose Survey of the United States
Geological Survey Well **PB 99**
in
Palm Beach County, Florida

Prepared for:

South Florida Water Management District

3301 Gun Club Road
West Palm Beach, Florida 33406

Prepared by:

Peter Andersen, PSM, Vice President

Florida Professional Surveyor and Mapper
License Number 5199
State of Florida

GCY, Inc. LB 4108
PO Box 1469/1505 SW Martin Highway
Palm City, Florida 33491/33490
772-286-8083

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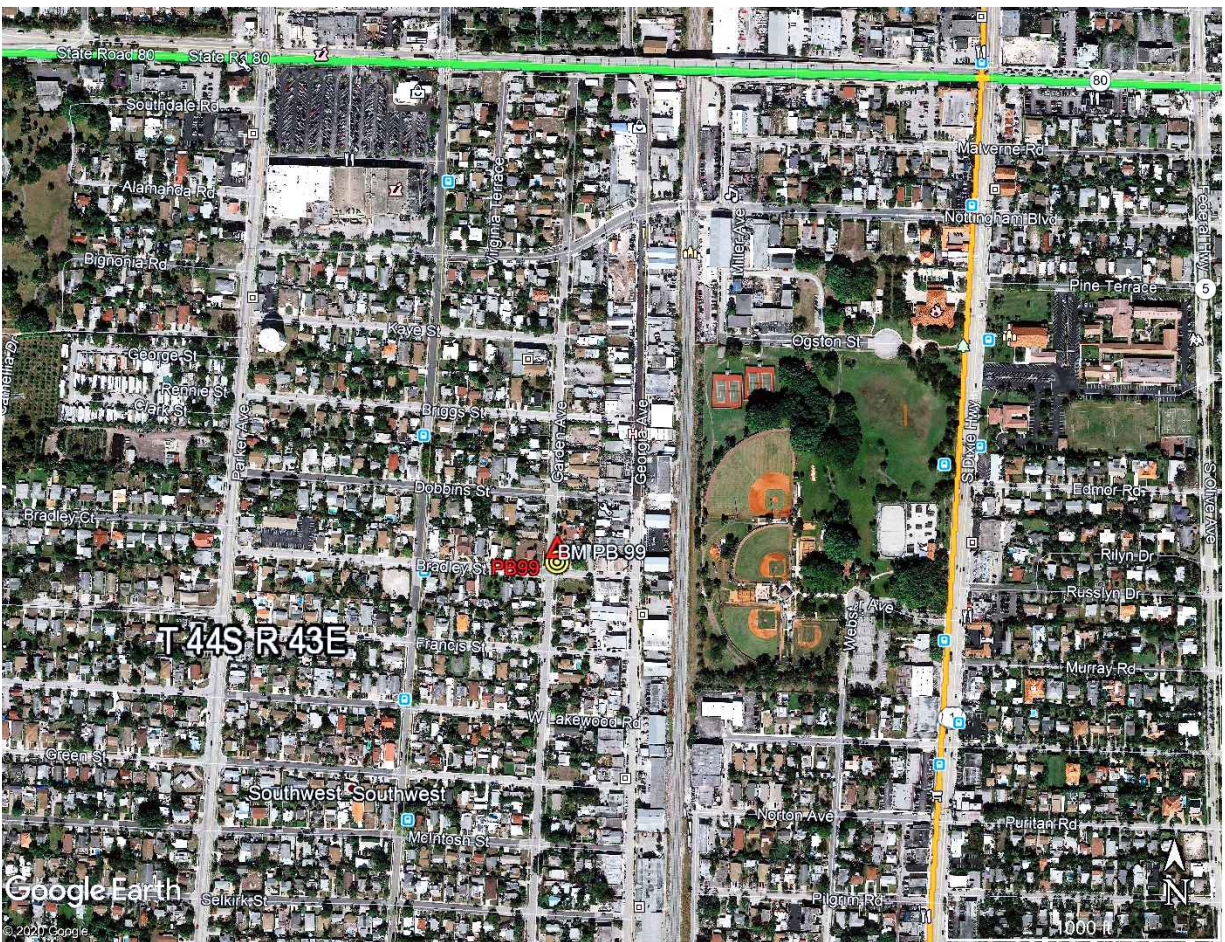
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PURPOSE

The Purpose of this survey is to set an Elevation Referenced Mark (Benchmark) using the guidelines for a National Geodetic Survey (NGS), Class "C" concrete monument and to establish a North American Vertical Datum of 1988 (NAVD 88) on said Benchmark and on an additional Reference Point with a Brass Plate, both at United States Geological Survey Well "PB 99".

LOCATION OF PROJECT

The United States Geological Survey Well "PB 99" is located in the Section 4, Township 44 South, Range 43 East, Martin County, Florida.



General Location (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 (NGVD) of 1929 at **Station PB 99 add 1.522**. These values are based on Corpscon 6.0.1, a U.S. Army Corps of Engineers, Engineering Research and Development Center Windows based program to convert coordinates and elevations between datums using the updated vertcon05.txt and the vertcone.05 files supplied by the U.S Army Corps of Engineers. South Atlantic Division, Jacksonville, Florida.

PROJECT HORIZONTAL DATUM

The project horizontal datum is the State Plane Coordinate System, Florida East Zone, North American Datum 83, adjustment of 2011.

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 on this project meets or exceeds closures as required by SFWMD (.02 √ miles) per executed SOW for 4600003703 WO07.

Leveling was run from National Geodetic Survey (NGS) monument "S 616" (NGSPID DO7632) to National Geodetic Survey (NGS) monument "M 233" (NGSPID AD2804). Leveling continued to the site benchmark and on to National Geodetic Survey (NGS) monument "L 233" (NGSPID AD2805) and looped back to National Geodetic Survey (NGS) monument "M 233" (NGSPID AD2804) because L 233 seemed to be 0.05 feet low. Leveling was done using a Leica DNA 10 digital level S/N 331745

GPS METHODS

Latitude and longitude for the New Benchmark "PB 99" were established by observing a 4.5 hour Static Session on March 24, 2020 using a Trimble 5700 dual frequency receiver S/N 0220381397. The data from this session was sent to the NGS "OPUS" site for post processing on April 29, 2020 and a report was received from the "OPUS" site the same day.



Surveyors' 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 1.522 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 24, 2020, GCY job No. 18-1020-07.
7. SFWMD Data records (on file at the District's headquarters):
 - A. Electronic Data files:
Miscellaneous picture files
Digital level run
File names: XXXXXX.DAT
 - B. Conventional reporting
Field Book: 1862 pages 18-23

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.

March 24, 2020

Last date of Survey

Peter Andersen, PSM, Vice President
Florida Professional Surveyor and Mapper
License Number 5199
State of Florida
GCY, Inc. LB No 4108



NOTE:

This is an electronically signed and sealed document pursuant to Chapter 5J-17.062, Florida Administrative Code. The printed survey map or report or copies thereof are not valid without the original signature and seal of a Florida licensed surveyor or mapper.





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U.S.G.S. Station Name: PB 99	U.S.G.S. Station Number: 263656080033502	Agency: GCY, INC.	Date of Field Work: 3/24/2020
Party Chief: LAPOLLA	Field Book: GCY 1862	Page(s): 18-23	Report Prepared by: ANDERSEN

SITE SPECIFIC DATA

Site Benchmark: PB 99	Benchmark Elevation(s) (NAVD88): 12.637	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.522	
Well Reference Elevation (NAVD88): 15.109	DTW: 8.83 (03/ 24/ 2020 at 14:41 PM)	Ground Elevation (NAVD88): 13.2	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 4	Township 44 S	Range 43 E
Well Latitude: 26° 40' 14.9739" N	Well Longitude: 80° 03' 34.5335" W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 850648.744	Easting (X) = 963276.589

Notes: NAVD88 – North American Vertical Datum of 1988; NGVD29- National Geodetic Vertical Datum of 1929; 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.

PICTURES

Aerial of Overall Well Site



Not to scale (GoogleEarth product)



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Well Site and Well Head





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New Aluminum Tag





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USGS RMs PB 99 1999





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Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: 26° 40' 15.66077" N
Longitude: 80° 03' 34.49308" W
NAVD88 EL = 12.637





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Source Benchmarks – NONE AVAILABLE



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"M 233" Benchmark Datasheet (1 of 3)

4/29/2020

DATASHEETS

The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

PROGRAM = datasheet95, VERSION = 8.12.5.7

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = APRIL 29, 2020

AD2804 *****

AD2804 DESIGNATION - M 233
AD2804 PID - AD2804
AD2804 STATE/COUNTY- FL/PALM BEACH
AD2804 COUNTRY - US
AD2804 USGS QUAD - PALM BEACH (2018)

AD2804 *CURRENT SURVEY CONTROL

AD2804
AD2804* NAD 83(1986) POSITION- 26 39 53. (N) 080 03 27. (W) SCALED
AD2804* NAVD 88 ORTHO HEIGHT - 5.147 (meters) 16.89 (feet) ADJUSTED
AD2804
AD2804 GEOID HEIGHT - -26.385 (meters) GEOID18
AD2804 DYNAMIC HEIGHT - 5.139 (meters) 16.86 (feet) COMP
AD2804 MODELED GRAVITY - 979,116.2 (mgal) NAVD 88
AD2804

AD2804 VERT ORDER - FIRST CLASS II

AD2804
AD2804.The horizontal coordinates were scaled from a map and have
AD2804.an estimated accuracy of +/- 6 seconds.

AD2804.
AD2804.The orthometric height was determined by differential leveling and
AD2804.adjusted by the NATIONAL GEODETIC SURVEY
AD2804.in January 2014.

AD2804
AD2804.Significant digits in the geoid height do not necessarily reflect accuracy.
AD2804.GEOID18 height accuracy estimate available [here](#).

AD2804
AD2804.Click [photographs](#) - Photos may exist for this station.

AD2804
AD2804.The dynamic height is computed by dividing the NAVD 88
AD2804.geopotential number by the normal gravity value computed on the
AD2804.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AD2804.degrees latitude (g = 980.6199 gals.).

AD2804
AD2804.The modeled gravity was interpolated from observed gravity values.

AD2804
AD2804;
AD2804;SPC FL E - North East Units Estimated Accuracy
AD2804; 258,600. 293,820. MT (+/- 180 meters Scaled)

AD2804
AD2804 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMK937496(NAD 83)

AD2804
AD2804 SUPERSEDED SURVEY CONTROL

AD2804
AD2804 NAVD 88 (09/04/92) 5.150 (m) 16.90 (f) SUPERSEDED 1 1
AD2804 NAVD 88 (06/15/91) 5.150 (m) 16.90 (f) SUPERSEDED 1 1
AD2804 NGVD 29 (??/??/92) 5.615 (m) 18.42 (f) SUPERSEDED 1 1
AD2804 NGVD 29 (09/01/92) 5.615 (m) 18.42 (f) ADJUSTED 1 1

AD2804
AD2804.Superseded values are not recommended for survey control.

AD2804
AD2804.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AD2804.See file [dsdata.pdf](#) to determine how the superseded data were derived.



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"M 233" Benchmark Datasheet (2 of 3)

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DATASHEETS

AD2804

AD2804_MARKER: DB = BENCH MARK DISK
 AD2804_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AD2804_STAMPING: M 233 1965
 AD2804_MARK LOGO: CGS
 AD2804_PROJECTION: FLUSH
 AD2804_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 AD2804_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AD2804+STABILITY: SURFACE MOTION
 AD2804_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AD2804+SATELLITE: SATELLITE OBSERVATIONS - August 16, 2006

AD2804

AD2804	HISTORY	- Date	Condition	Report By
AD2804	HISTORY	- 1965	MONUMENTED	CGS
AD2804	HISTORY	- 1973	GOOD	NGS
AD2804	HISTORY	- 1983	GOOD	USPSQD
AD2804	HISTORY	- 1987	GOOD	USPSQD
AD2804	HISTORY	- 19910114	GOOD	NGS
AD2804	HISTORY	- 19920317	GOOD	NGS
AD2804	HISTORY	- 20030401	GOOD	USPSQD
AD2804	HISTORY	- 20040405	GOOD	USPSQD
AD2804	HISTORY	- 20041117	GOOD	FLDEP
AD2804	HISTORY	- 20050408	GOOD	USPSQD
AD2804	HISTORY	- 20060425	GOOD	USPSQD
AD2804	HISTORY	- 20060816	GOOD	FLDEP

AD2804

STATION DESCRIPTION

AD2804

AD2804'DESCRIBED BY COAST AND GEODETIC SURVEY 1965
 AD2804'AT WEST PALM BEACH.
 AD2804'AT WEST PALM BEACH, ABOUT 3.7 MILES SOUTH ALONG THE FLORIDA EAST
 AD2804'COAST RAILWAY FROM THE PASSENGER STATION, ABOUT 0.35 MILE NORTH
 AD2804'OF MILEPOST 303, NEAR THE CROSSING OF BUNKER ROAD, IN SECTION
 AD2804'3, R 43 E, T 44 S, BETWEEN THE SIDEWALK AND THE CURB OF BUNKER
 AD2804'ROAD, 149.0 FEET EAST OF THE EAST RAIL OF THE NORTHBOUND MAIN
 AD2804'TRACK, 120.0 FEET NORTH-NORTHWEST OF THE NORTHWEST CORNER OF THE
 AD2804'BUILDING HOUSING GERMAN MOTORS INC., 2.5 FEET SOUTH OF THE SOUTH
 AD2804'CURB OF THE ROAD, 3.3 FEET NORTH OF THE NORTH EDGE OF THE
 AD2804'SIDEWALK, 1.2 FEET SOUTH OF A SIGN READING NO PARKING, ABOUT LEVEL
 AD2804'WITH THE CURB AND SET IN THE TOP OF A CONCRETE POST FLUSH WITH
 AD2804'THE GROUND. NOTE-- THE RAILWAY PASSENGER STATION NO LONGER
 AD2804'EXISTS.

AD2804

STATION RECOVERY (1973)

AD2804

AD2804'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1973
 AD2804'RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (1983)

AD2804

AD2804'RECOVERY NOTE BY US POWER SQUADRON 1983
 AD2804'RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (1987)

AD2804

AD2804'RECOVERY NOTE BY US POWER SQUADRON 1987 (JSS)
 AD2804'RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (1991)

AD2804

AD2804'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1991
 AD2804'IN WEST PALM BEACH, AT THE INTERSECTION OF THE FLORIDA EAST COAST
 AD2804'RAILROAD AND BUNKER ROAD, 45.3 M (148.6 FT) EAST OF THE NEAR RAIL,
 AD2804'36.7 M (120.4 FT) WEST OF THE NORTHWEST CORNER OF THE PALM BEACH BODY
 AD2804'SHOP, 26.9 M (88.3 FT) EAST OF THE EXTENDED CENTER OF NORTON AVENUE,



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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"M 233" Benchmark Datasheet (3 of 3)

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DATASHEETS

AD2804' 21.6 M (70.9 FT) EAST OF A CHAIN-LINK FENCE CORNER, 7.5 M (24.6 FT) SOUTH OF AND LEVEL WITH THE ROAD CENTERLINE, 2.6 M (8.5 FT) NORTH OF AD2804' A WITNESS POST AND FENCE, 1.1 M (3.6 FT) NORTH OF THE NORTH EDGE OF A AD2804' SIDEWALK, 0.9 M (3.0 FT) SOUTH OF A CURB, AND THE MONUMENT IS FLUSH WITH THE GROUND SURFACE.

AD2804

STATION RECOVERY (1992)

AD2804

AD2804' RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992

AD2804' IN WEST PALM BEACH, AT THE INTERSECTION OF THE FLORIDA EAST COAST RAILROAD AND BUNKER ROAD, 45.3 M (148.6 FT) EAST OF THE NEAR RAIL, 36.7 M (120.4 FT) WEST OF THE NORTHWEST CORNER OF THE PALM BEACH BODY SHOP, 26.9 M (88.3 FT) EAST OF THE EXTENDED CENTER OF NORTON AVENUE, 21.6 M (70.9 FT) EAST OF A CHAIN-LINK FENCE CORNER, 7.5 M (24.6 FT) SOUTH OF AND LEVEL WITH THE ROAD CENTERLINE, 2.6 M (8.5 FT) NORTH OF AD2804' A WITNESS POST AND FENCE, 1.1 M (3.6 FT) NORTH OF THE NORTH EDGE OF A AD2804' SIDEWALK, 0.9 M (3.0 FT) SOUTH OF THE SOUTH CURB OF THE ROAD, AND THE MONUMENT IS FLUSH WITH THE GROUND SURFACE.

AD2804

STATION RECOVERY (2003)

AD2804

AD2804' RECOVERY NOTE BY US POWER SQUADRON 2003 (AAS)

AD2804' RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (2004)

AD2804

AD2804' RECOVERY NOTE BY US POWER SQUADRON 2004 (AAS)

AD2804' RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (2004)

AD2804

AD2804' RECOVERY NOTE BY FL DEPT OF ENV PRO 2004 (JLM)

AD2804' RECOVERED IN GOOD CONDITION.

AD2804'

NOTE A MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE MONUMENT.

AD2804

STATION RECOVERY (2005)

AD2804

AD2804' RECOVERY NOTE BY US POWER SQUADRON 2005 (AAS)

AD2804' RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (2006)

AD2804

AD2804' RECOVERY NOTE BY US POWER SQUADRON 2006 (AAS)

AD2804' RECOVERED IN GOOD CONDITION.

AD2804

STATION RECOVERY (2006)

AD2804

AD2804' RECOVERY NOTE BY FL DEPT OF ENV PRO 2006 (JRH)

AD2804' RECOVERED AS DESCRIBED.

*** retrieval complete.

Elapsed Time = 00:00:01



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"S 616" Benchmark Datasheet (1 of 2)

3/19/2020

DATASHEETS

The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

PROGRAM = datasheet95, VERSION = 8.12.5.6

Starting Datasheet Retrieval...

1 National Geodetic Survey, Retrieval Date = MARCH 19, 2020

D07632 *****

D07632 DESIGNATION - S 616
D07632 PID - D07632
D07632 STATE/COUNTY- FL/PALM BEACH
D07632 COUNTRY - US
D07632 USGS QUAD - PALM BEACH (2018)

D07632
D07632 *CURRENT SURVEY CONTROL

D07632* NAD 83(1986) POSITION- 26 39 57. (N) 080 04 14. (W) SCALED
D07632* [NAVD 88](#) ORTHO HEIGHT - 8.343 (meters) 27.37 (feet) ADJUSTED

D07632 GEOID HEIGHT - -26.328 (meters) GEOID18
D07632 DYNAMIC HEIGHT - 8.330 (meters) 27.33 (feet) COMP
D07632 MODELED GRAVITY - 979,117.0 (mgal) NAVD 88

D07632 VERT ORDER - FIRST CLASS II
D07632

D07632.The horizontal coordinates were scaled from a map and have
D07632.an estimated accuracy of +/- 6 seconds.

D07632.
D07632.The orthometric height was determined by differential leveling and
D07632.adjusted by the NATIONAL GEODETIC SURVEY
D07632.in January 2014.

D07632
D07632.Significant digits in the geoid height do not necessarily reflect accuracy.
D07632.GEOID18 height accuracy estimate available [here](#).

D07632
D07632.Click [photographs](#) - Photos may exist for this station.

D07632
D07632.The dynamic height is computed by dividing the NAVD 88
D07632.geopotential number by the normal gravity value computed on the
D07632.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
D07632.degrees latitude (g = 980.6199 gals.).

D07632
D07632.The modeled gravity was interpolated from observed gravity values.

D07632
D07632;
D07632;SPC FL E - North East Units Estimated Accuracy
258,720. 292,520. MT (+/- 180 meters Scaled)

D07632
D07632_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNK924497(NAD 83)

D07632
D07632 SUPERSEDED SURVEY CONTROL

D07632
D07632.No superseded survey control is available for this station.

D07632
D07632_MARKER: DD = SURVEY DISK
D07632_SETTING: 38 = SET IN THE ABUTMENT OR PIER OF A LARGE BRIDGE
D07632_SP_SET: BRIDGE ABUTMENT
D07632_STAMPING: S 616 2004
D07632_MARK LOGO: FLDEP
D07632_MAGNETIC: N = NO MAGNETIC MATERIAL
D07632_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

https://www.ngs.noaa.gov/cgi-bin/ds_mark.pl?PidBox=D07632

1/2



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"S 616" Benchmark Datasheet (2 of 2)

3/19/2020

DATASHEETS

D07632_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR

D07632+SATELLITE: SATELLITE OBSERVATIONS - November 18, 2004

D07632

D07632 HISTORY - Date Condition Report By

D07632 HISTORY - 20041118 MONUMENTED FLDEP

D07632

D07632 STATION DESCRIPTION

D07632

D07632'DESCRIBED BY FL DEPT OF ENV PRO 2004 (JLM)

D07632'THE MARK IS IN WEST PALM BEACH, IN SECTION 4, TOWNSHIP 44 SOUTH, RANGE

D07632'43 EAST.

D07632'

D07632'TO REACH THE MARK FROM THE INTERSECTION OF U.S. HIGHWAY 98, STATE

D07632'HIGHWAY 80 (SOUTHERN BOULEVARD) AND U.S. HIGHWAY 1 (SOUTH DIXIE

D07632'HIGHWAY) IN WEST PALM BEACH, GO WEST ON U.S. HIGHWAY 98, STATE

D07632'HIGHWAY 80 (SOUTHERN BOULEVARD) FOR 0.9 MI (1.4 KM) TO THE INTERSTATE

D07632'95 UNDERPASS (EXIT 68). CONTINUE WEST ON U.S. HIGHWAY 98, STATE

D07632'HIGHWAY 80 (SOUTHERN BOULEVARD) FOR 0.6 MI (1.0 KM) TO THE Y-JUNCTION

D07632'OF CONGRESS AVENUE, BEAR LEFT ON CONGRESS AVENUE AND GO SOUTHERLY FOR

D07632'0.7 MI (1.1 KM) TO THE INTERSECTION OF SUMMIT BOULEVARD. TURN LEFT ON

D07632'SUMMIT BOULEVARD AND GO EAST FOR 0.85 MI (1.4 KM) TO THE INTERSECTION

D07632'OF INTERSTATE 95 OVERPASS AND THE MARK ON THE RIGHT, SET FLUSH IN THE

D07632'TOP OF THE SOUTHEAST ABUTMENT OF INTERSTATE 95 BRIDGE, 5.0 FT (1.5 M)

D07632'BELOW THE LEVEL OF NORTHBOUND LANES OF THE INTERSTATE 95.

D07632'

D07632'LOCATED 1.0 FT (0.3 M) SOUTH OF THE NORTH FACE OF THE ABUTMENT AND 0.5

D07632'FT (15 CM) WEST OF THE EAST FACE OF THE ABUTMENT.

*** retrieval complete.

Elapsed Time = 00:00:01



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Field Notes (1 of 6)

GARDEN AVE, P.B.C.

SFWMD - USGS / PWS WELLS

Bentley Rd For NEW BM "PB 99"
(NOV 88)

REG TEST:

Core Box old: 3" 3.1' Core Box NEW = 3" 3.1'

Drop = 2.2' - .1" RETAIN - 5.088' 4.886'

STA	TOTAL DEPT	ELEV	DATE
M223	0	16.886'	
8	2927.79'	12.964'	
NEW BM PB 99	3028.14'	12.637'	
L233	5165.08'	18.589'	

16

1863 18

18-10-07-02

85° Sunny

LEICA DISTO

TO: WELL PB 99

LINE: PB 99

DESC:

NGS BM M 233 PID: AD2804

NOV 88 EL 16.886'

Bm 1843-18A Fwd ALONG DECK on TOP of CURB 5' WEST OF WELL PB 99. "SFWMD SURVEY MARKER BM PB 99 1999"

NEW BM PB 99 (Bm 1843-18B)

SET 1" (12) IRON PIPE + ALUMI CAP

"SFWMD PB 99 L04108 2020" I.R. IS 3' LONG w/ GRATED CAP + CONC. CURB 10.19" N. OF WELL PB 99, BETWEEN STREET + SIDEWALK IN GRASS.

- 0 049 BUST NGS L233

(SEE PG 19)

(SEE PG 20)

- .05

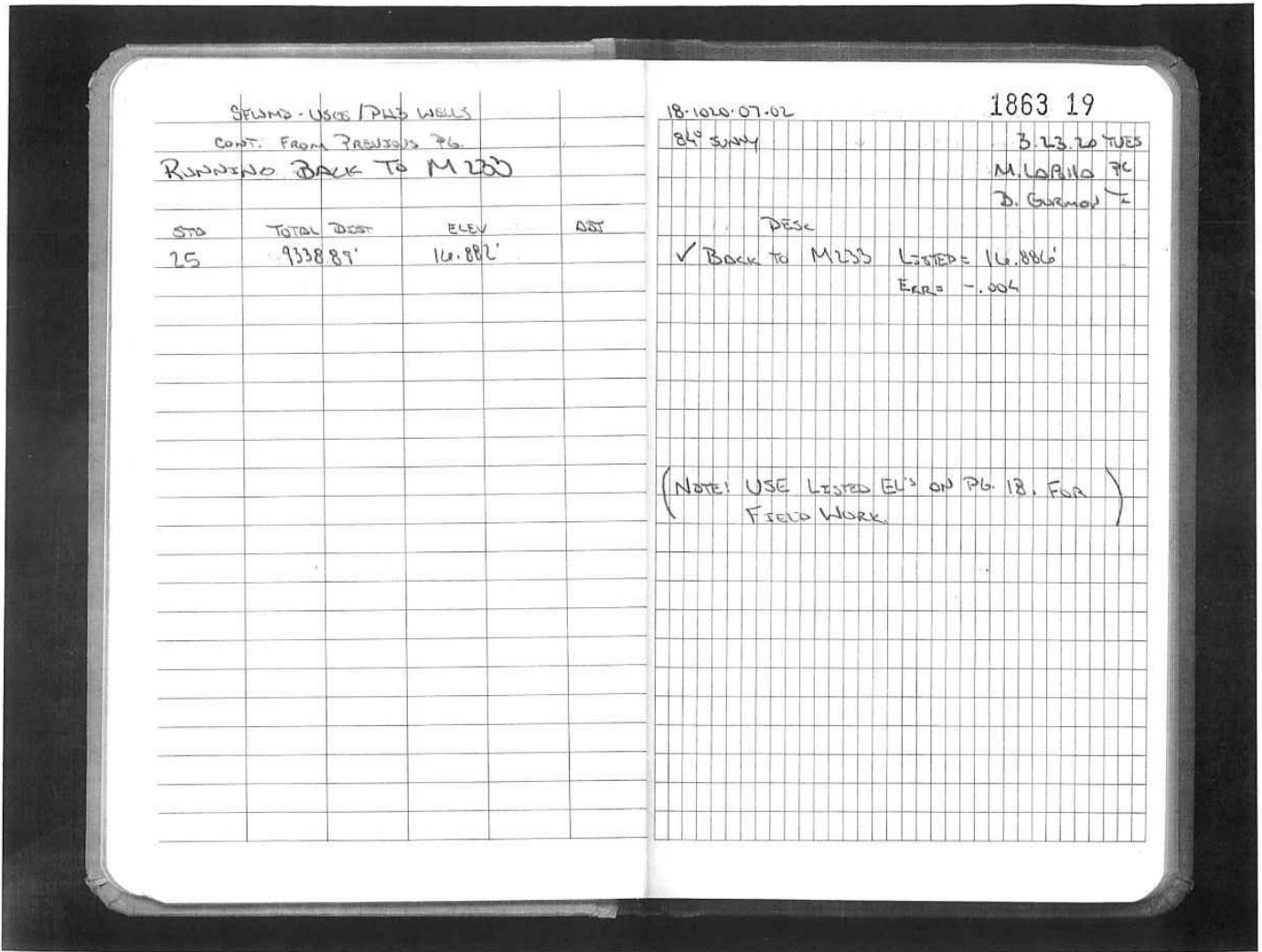
L233
18.638'



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (2 of 6)

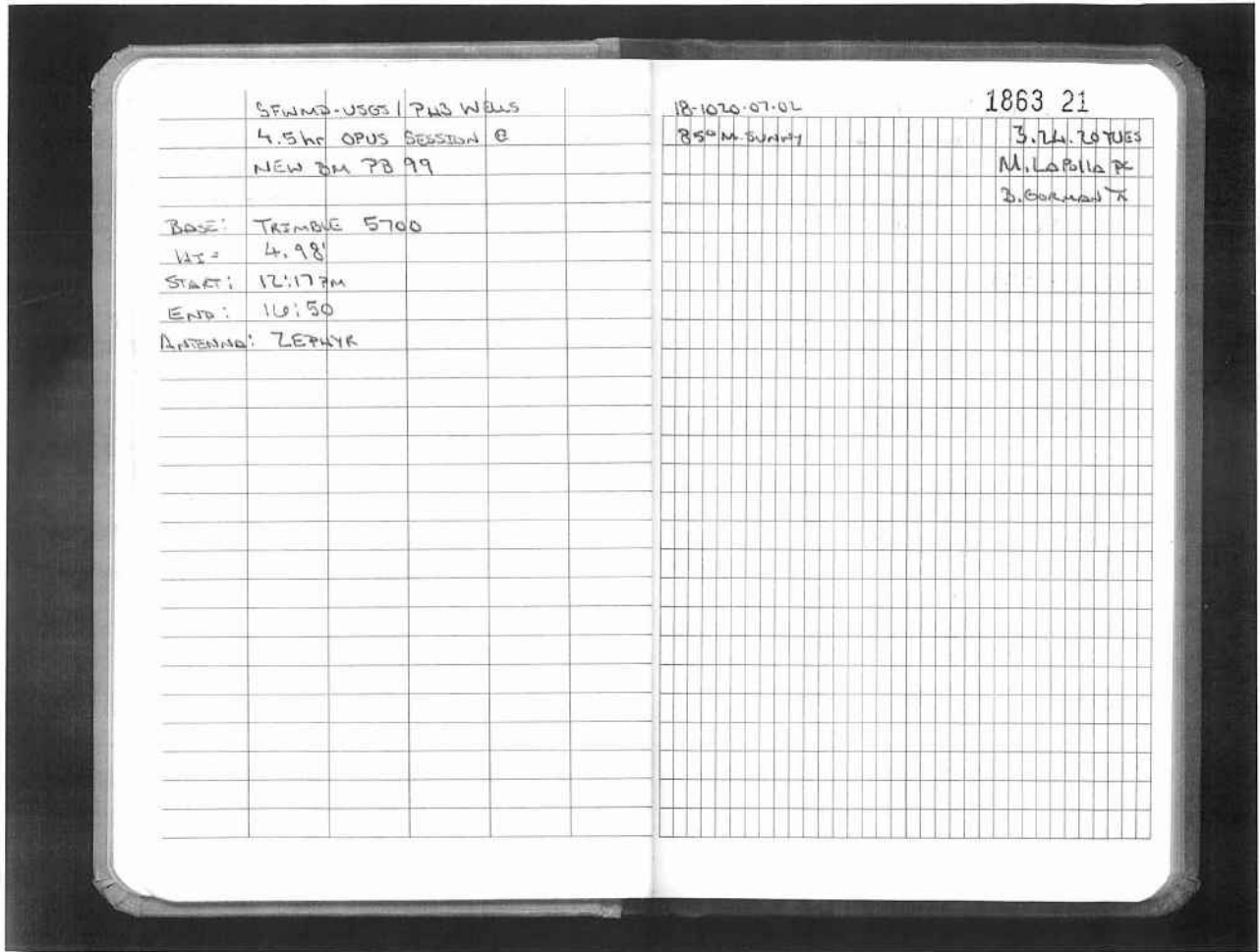




SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (4 of 6)





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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Field Notes (6 of 6)

GARDEN + BRADLEY, P.D.C.

SFWMD - USGS (PIED WELLS)

"M.P." + No Bench Run @

WELL PB 99 (NAVD 88)

STA	+	HT	-	EL	ADJ
0	4.213			12.944'	
	4.186				
	4.158				
	(4.185)	17.129'			
S.S.1			3.95'	13.179'	
			2.054		
			2.02		
			1.984		
1			(2.019)	15.109'	
	1.804				
	1.768				
	1.73				
	(1.767)	16.877'	3.904		
			3.934		
			3.904		
2			(3.934)	12.943'	

1863 23

18-1020-07-02

85° P CLOUDY

3.24.20 TUES

M. LaPelle PC

B. Gorman T

DESC

Bm 1803-18A

NAVD 88 EL: 12.944'

NO @ WELL PB 99

OLD MEASURING POINT (Bm 1803-18A)

BLACK MARKER BOX ON EAST SIDE OF WELL

OPENING, ON TOP OF PLYWOOD BASE.

✓ Back To Bm 1803-18A Error = 7.001

* End Run *



South Florida Water Management District Benchmark Datasheet

Designation: PB 99	Project Name: USGS PHASE 3 WELLS	Type: V	State Plane Zone: FL East
Stamping: PB 99 LB4108 2020	Field Book Name: GCY 1863	Field Book Page: 18-23	
Established By: GCY, INC.	Recovered By: _____	Recovery Date: _____	
Surveyor: ANDERSEN	Established Date: 03/24/20	Status: _____	

GEOGRAPHIC POSITION INFORMATION

Section: 4	Township: 44 SOUTH	Range: 43 EAST
County: PALM BEACH	Quadrangle: PALM BEACH	Quad Index: 1345
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983
NGVD88 Elevation (feet): 12.637	NGVD29 Elevation (feet): 14.159	2022 Elevation: _____
NGVD88 Class: 3RD	NGVD29 Class: 3RD	Other Elevation: _____
NGVD88 Order: _____	NGVD29 Order: _____	Other Elevation Type: _____
		NGS Source BM(s): M 233, S 616
		NGS PID(s): AD2804, DO7632
		NGS NAVD88 Elev (ft): 16.886, 27.371
		NGS NAVD88 Elev (m): 5.147, 8.343
		NGS 2022 Elev (ft): _____

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)

Vertical Datum Offset: + 1.522	Actual NGS Elevation or ngvd29.txt file: _____	OPUS Ortho Height: 12.592
Northing (Y) (feet): 850718.128	Easting (X) (feet): 963279.743	Source of Latitude & Longitude: OPUS SOLUTION
Latitude: 26	40	15.66077
DD°	MM'	SS"
Longitude (Decimal Degrees): 26.67101688		Longitude (Decimal Degrees): -80.05958141
		DD°
		MM'
		SS"

RECOVERY DATA

How to Reach: FROM THE INTERSECTION OF GEORGIA AVE AND SOUTHERN BLVD GO SOUTH ON GEORGIA AVE FOR 0.35 MILES TO BRADLEY STREET; THENCE WEST ON BRADLEY STREET TO GARDEN AVE.; THENCE NORTH ON GARDEN APPROX. 100.0 FEET TO THE MARK ON THE RIGHT. MARK SITS BETWEEN THE CURB AND THE SIDEWALK IN FRONT OF A MULTI UNIT RESIDENCE AT THE CORNER OF GARDEN AND BRADLEY. MARK IS 69.1 FEET NORTH OF WELL PB 99.

Description/Notes:

Notable Landmarks:
Other Source Benchmarks:

PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



From: opus
To: Pete Andersen
Subject: OPUS solution : 13970840.t01 OP1588165908774
Date: Wednesday, April 29, 2020 9:15:55 AM

FILE: 13970840.t01 OP1588165908774

NGS OPUS SOLUTION REPORT
=====

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <https://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: petea@gcyinc.com DATE: April 29, 2020
RINEX FILE: 1397084q.20o TIME: 13:15:39 UTC

SOFTWARE: page5 1801.18 master91.pl 160321 START: 2020/03/24 16:17:00
EPHEMERIS: igs20982.eph [precise] STOP: 2020/03/24 20:50:00
NAV FILE: brdc0840.20n OBS USED: 9820 / 10497 : 94%
ANT NAME: TRM39105.00 NONE # FIXED AMB: 65 / 72 : 90%
ARP HEIGHT: 1.518 OVERALL RMS: 0.016(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.2289)

X: 984530.119(m) 0.010(m) 984529.291(m) 0.010(m)
Y: -5617702.090(m) 0.019(m) -5617700.502(m) 0.019(m)
Z: 2845679.475(m) 0.010(m) 2845679.312(m) 0.010(m)

LAT: 26 40 15.66077 0.003(m) 26 40 15.68096 0.003(m)
E LON: 279 56 25.50692 0.009(m) 279 56 25.48734 0.009(m)
W LON: 80 3 34.49308 0.009(m) 80 3 34.51266 0.009(m)
EL HGT: -22.552(m) 0.023(m) -24.151(m) 0.023(m)
ORTHO HGT: 3.838(m) 0.057(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 2950342.913 259299.404
Easting (X) [meters] 593576.314 293608.253
Convergence [degrees] 0.42215278 0.42215278
Point Scale 0.99970810 1.00004932
Combined Factor 0.99971164 1.00005286

US NATIONAL GRID DESIGNATOR: 17RNK9357650342(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9798	PBCH WEST PALM CORS ARP	N265046.638	W0801309.300	25087.0
DP6859	FLF1 FL FOUNDATION 1 CORS ARP	N253655.240	W0802309.913	121427.3
DF7050	MTNT MIAMI TNT CORS ARP	N255156.760	W0805425.186	122978.8

NEAREST NGS PUBLISHED CONTROL POINT

AD6569 WEST PALM BEACH STANDPIPE N264022.915 W0800345.953 387.6

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

*110001+00000000000000A1 32...1+0000000000049811 331.21+0000000000004731
390...+0000000000000005 391.21+0000000000000000
*110002+00000000000000B1 32...1+00000000000100415 332.21+0000000000004368
390...+0000000000000005 391.21+0000000000000000
*110003+00000000000000B2 32...1+0000000000049712 336.21+0000000000004474
390...+0000000000000005 391.21+0000000000000000
*110004+00000000000000A2 32...1+00000000000100487 335.21+0000000000004838
390...+0000000000000005 391.21+0000000000000000
*410005+00000000?.....1
*110006+000000000000M233 83..51+0000000000016886
*110007+000000000000M233 32...1+00000000000118673 331.21+0000000000004558
390...+0000000000000005 391.21+0000000000000000
*110008+0000000000000001 32...1+00000000000119621 332.21+0000000000005270
390...+0000000000000005 391.21+0000000000000000
*110009+0000000000000001 573..1-0000000000000948 574..1+00000000000238294
83..21+00000000000016173
*110010+0000000000000001 32...1+00000000000210448 331.21+0000000000003271
390...+0000000000000005 391.21+0000000000000000
*110011+0000000000000002 32...1+00000000000219152 332.21+0000000000004897
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*110012+0000000000000002 573..1-00000000000009653 574..1+00000000000667894
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*110014+0000000000000003 32...1+0000000000063111 332.21+0000000000004841
390...+0000000000000005 391.21+0000000000000000
*110015+0000000000000003 573..1-00000000000007309 574..1+00000000000796459
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*110017+0000000000000004 32...1+00000000000259715 332.21+0000000000005872
390...+0000000000000005 391.21+0000000000000000
*110018+0000000000000004 573..1-0000000000015901 574..1+0000000001307297
83..21+00000000000012864
*110019+0000000000000004 32...1+00000000000261883 331.21+0000000000004504
390...+0000000000000005 391.21+0000000000000000
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390...+0000000000000005 391.21+0000000000000001
*110024+0000000000000006 573..1-0000000000015431 574..1+0000000002331610
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83..21+00000000000016898

Palm City

28 April 2020

INPUT

Geographic, fhpgn - Florida HPGN
Vertical - NAVD88, U.S. Feet

OUTPUT

State Plane, fhpgn - Florida HPGN
0901 - Florida East, U.S. Feet
Vertical - NGVD29 (Custom), U.S. Feet

PB 99

1/1

Latitude: 26 40 15.1
Longitude: 080 03 34.5
Elevation/Z: 0

Northing/Y: 850661.497
Easting/X: 963279.533
Elevation/Z: 1.522
Convergence: 0 25 19.74184
Scale Factor: 1.000049317
Combined Factor: 1.000053383

Remark: