

SURVEYOR'S REPORT

Specific Purpose Survey of the United States Geological Survey Recorder Well S-196A in Miami-Dade County, Florida

Prepared for:

South Florida Water Management District

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Prepared by:

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Biscayne Engineering Company, Inc. LB No 0129 529 West Flagler Street, Miami, FL. 33130 Tel (305) 324-7671

> Field Date: March 30, 2019 Report Date: April, 2019 BEC Order #: 03-86445

CORPORATE HEADQUARTERS 529 West Flagler Street, Miami, FL 33130 Tel. 305.324.7671 Fax 305.324.0809 INSPIRED BEYOND MEASURE • SINCE 1898

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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 **S-196A**.

LOCATION OF PROJECT

The United States Geological Survey's Recorder Well **S-196A** is located in Section 35, Township 56 South, Range 38 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 **S-196A add 1.52**'. 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 \checkmark 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 CF-11-R, through the well site, and to the Miami-Dade County Benchmark CE-153-R. The measurements were collected using a Digital Level and were hand written in Biscayne Engineering Co, Inc. Field Book 2995 Pages 11-15, dated March 30, 2019 reduced and adjusted electronically. Additional data was manually recorded in the field book.

GPS METHODS

Latitude and Longitude for Benchmark S-196A were established by observing a 3-minute session of GPS data on March 30, 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.

VERTICAL CONTROL POINT

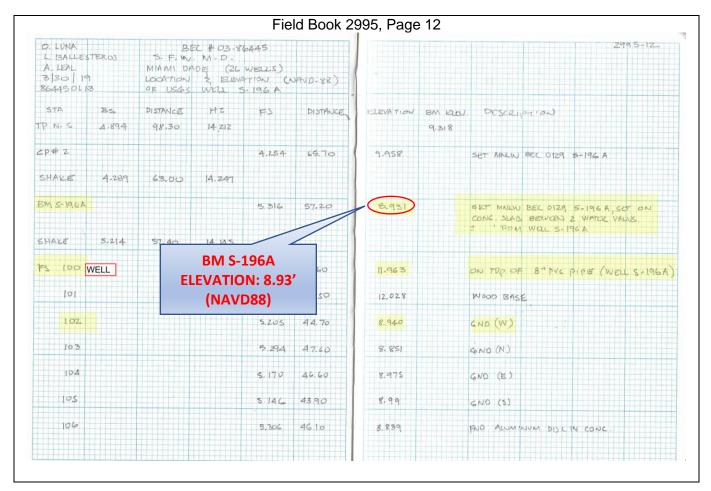
The Vertical Control point utilized and set as part of this survey is the:

M-DC CF-11-R				
25° 30' 22.57" (N) 80° 29' 38.34" (W)	9.10 ft.	(NAVD88)	2.77 m	Published
	10.61 ft.	(NGVD29)	3.23 m	Published
		K IS LOCATE	D: SW 28	0 ST ON
A A A A A A A A A A A A A A A A A A A	C/L			
	SW 187 A	VE ON C/L		
100 1 5 1 3 C 1 5 C). BRASS DISC		C MON AND
	IS THE SI	E COR 35-56-3	38.	
antenan () managem				

M-DC CE-153-R				
25° 30' 21.93" (N) 80° 30' 06.83" (W)	8.37 ft.	(NAVD88)	2.55 m	Published
	9.89 ft.	(NGVD29)	3.01 m	Published
COL SULLA COL SEEG 65 L COL SEEG 65 L COL SEC 65 L COL SE	C/L SW 192 A		-	0 ST ON D IS THE S 1/4

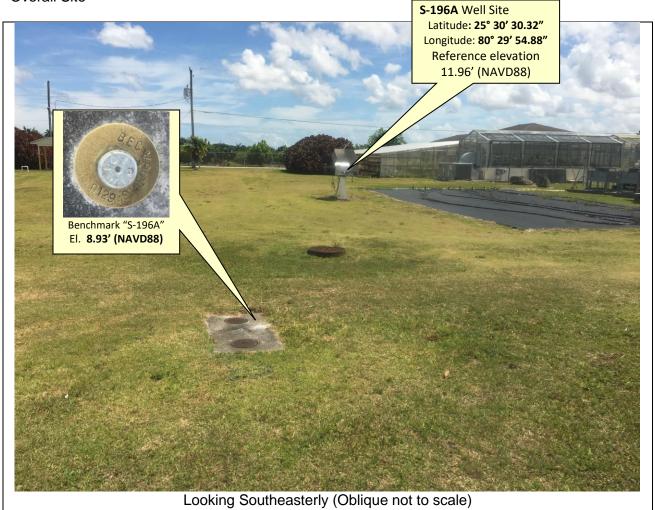
SURVEYOR'S REPORT

BM: S-196A (Set as part of this survey)				
25° 30' 30.47" (N) 80° 29' 55.39" (W) Published	8.93 ft.	(NAVD88)	2.72 m	Level run
	10.45 ft.	(NGVD29)	3.19 m	
	STATION STAMPEI CONCRE VALVES. LOCATEI CENTER	1.52 ft. (conversion factor) IS A MAG NA D "BEC 0129 A TE SLAB BET D: SW 189 TH A LINE STREET 1	IL AND V AND S-19 WEEN T\ VE 20	6A" SET IN WO WATER 95' WEST OF



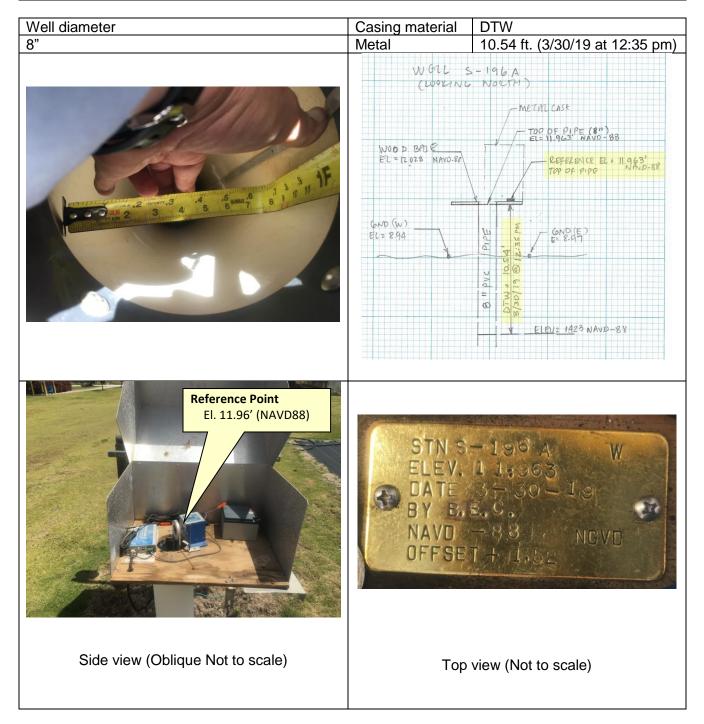
PROJECT RESULTS

Overall Site



Tabular Form

Reference and Ground Elevations: (NAVD 88)									
Well	Well Ground Elevation Reference Elevation Comments								
S-196A	S-196A 8.94 ft. 11.96 ft. Top of 8" PVC Pipe.								
Offset to NGV	D29: +1.52' (See Pro	pject Vertical Datum No	tes in Page: 4)						



SURVEYOR'S REPORT

Source & Site	NAVD88	NGVD29 (Published)	NGVD29 (Corpscon)
Benchmark			
CF-11-R (M-DC)	9.10 ft. (Published)	10.62 ft	
CE-153-R (M-DC)	8.37 ft. (Published)	9.89 ft.	
S-196A (SFWMD)	8.93 ft. (Measured)		10.45 ft. (Converted)
RM-1	8.842 ft. (Measured)		
RM-2	13.049 ft. (Measured)		
RM-3	9.824 ft. (Measured)		

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 30, 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 11-15

Abbreviations:

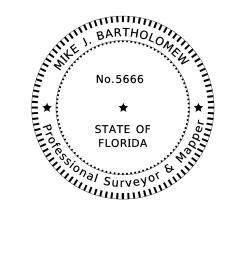
El	Elevation
DTW -	Distance to the water table inside the well
M-DC -	Miami-Dade County
NAVD88 -	North American Vertical Datum of 1988
NGVD29 -	National Geodetic Vertical Datum of 1929
NGS -	National Geodetic Survey
PSM -	Professional Surveyor & Mapper
PID -	Permanent Identifiers
SFWMD -	South Florida Water Management District
USGS -	United States Geological Survey

BEC - 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.

Last date of Survey March 30, 2019



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

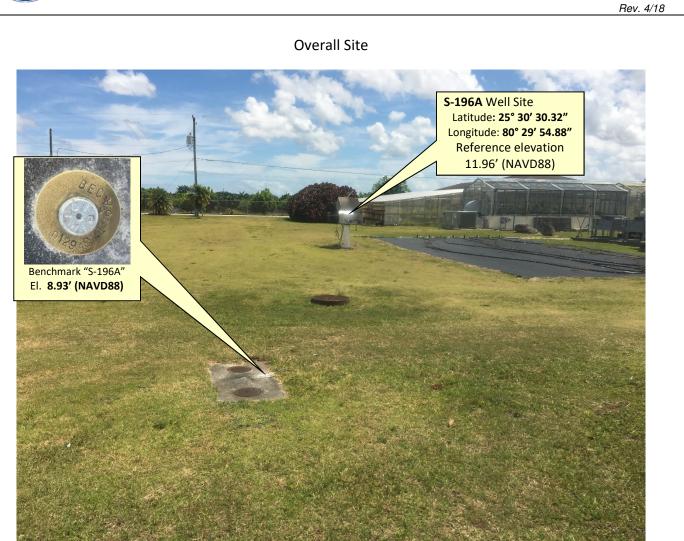


SOUTH FLORIDA WATER MANAGEMENT DISTRICT

			<i>Rev. 4/18</i>	
DESIGNATION: S-196A		PROJECT: S-196A		
ESTABLISHED BY: SOUTH FLORIDA V DISTRICT	WATER MANAGEMENT	SURVEYOR: Mike Bartholomew DATE: 03/30/19		
RECOVERED BY: BISCAYNE ENG				
	GEOGRAPH	IC POSITION		
SECTION 35	TOWNSHIP 56 SOUTH	RANGE 38 EAST		
COUNTY:MIAMI-DADE	NAME OF QUADRANG			
HORIZONTAL DATUM: 1927		circle one) ZONE (E) or W		
VERTICAL DATUM: MSL 1929	(1988) 2022 Other	(circle one)		
VERTICAL ACCURACY: 1 2 3				
VENTICAL ACCONACT. 1 2 2				
STATE PLANE COORDINATE	(N) Y= 427356.17	(E) X= 821492.92	NAVD 88 EL.8.93' NGVD 29 EL. 10.45'	
CORPSCON 6.0.1 CONVERSION F Development Center Topographic Engineering Ce vertcon05.txt and vertcon05.05 files supplied by ACTUAL NGS or (ngvd29.txt file) OPUS Ortho Height	nter Alexandria, Virginia Windows	-based program to convert coordinates an		
LATITUDE: 25 ° 30' 30.47 " (N)	LONGITUDE: 80° 29'	55.39" (W) (Source) GPS R	TK (FPRN)	
	RECOVE	RY DATA		
Stamping: S-196A BEC 0129				
To Reach: STATION IS A MAG NAII BETWEEN TWO WATER VALVES. 150' NORTH OF CENTERLINE				
NOTABLE LAND MARKS: UF/IFAS		AND EDUCATION CENTER		
MDC-SOURCE BENCHMARK: CF-1	1-R, CE-153-R			
FIELD BOOK PAGE <u>2995-12</u>	DIOTI			
	PICT			
Renchmark E. 8.93' (S-196A Well Latitude: 2:	Soo 29' 54.88"	
		NOT TO SCALE	(Google Earth product)	



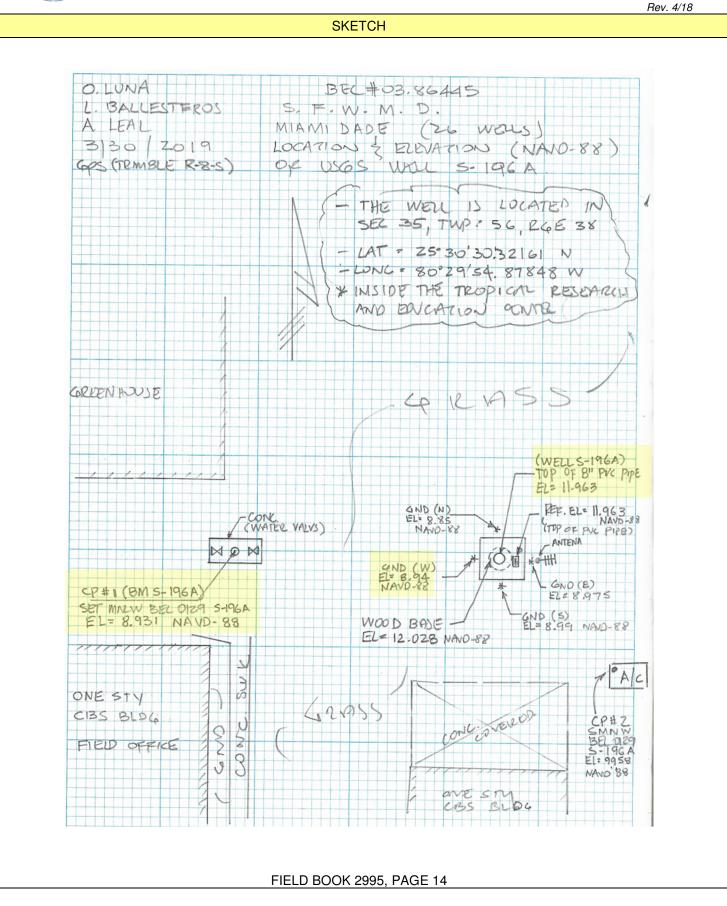
SOUTH FLORIDA WATER MANAGEMENT DISTRICT



Looking Southeasterly (Oblique not to scale)



SOUTH FLORIDA WATER MANAGEMENT DISTRICT



Office

Project

20 May 2019

INPUT

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

OUTPUT

Geographic, NAD83 Vertical - NGVD29 (Vertcon94), U.S. Feet

BM S-196A

Latitude: 25 30 30.47 Longitude: 80 29 55.39 Elevation/Z: 8.93 1/1 Latitude: 25 30 30.47000 Longitude: 80 29 55.39000 Elevation/Z: 10.446

Office

Project

20 May 2019

INPUT

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

OUTPUT

Geographic, NAD83 Vertical - NGVD29 (Vertcon94), U.S. Feet

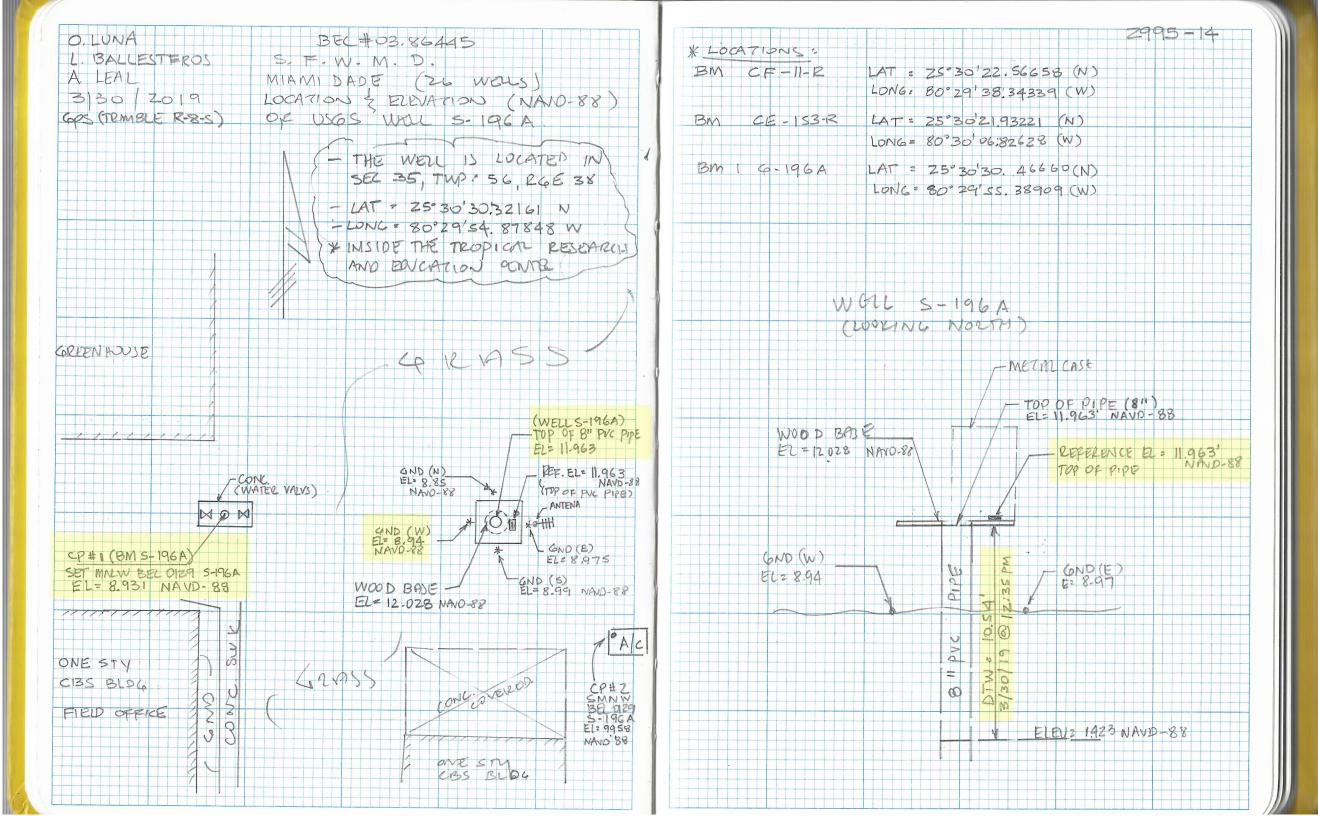
WELL S-196A

Latitude: 25 30 30.32 Longitude: 80 29 54.88 Elevation/Z: 11.96 1/1 Latitude: 25 30 30.32000 Longitude: 80 29 54.88000 Elevation/Z: 13.476

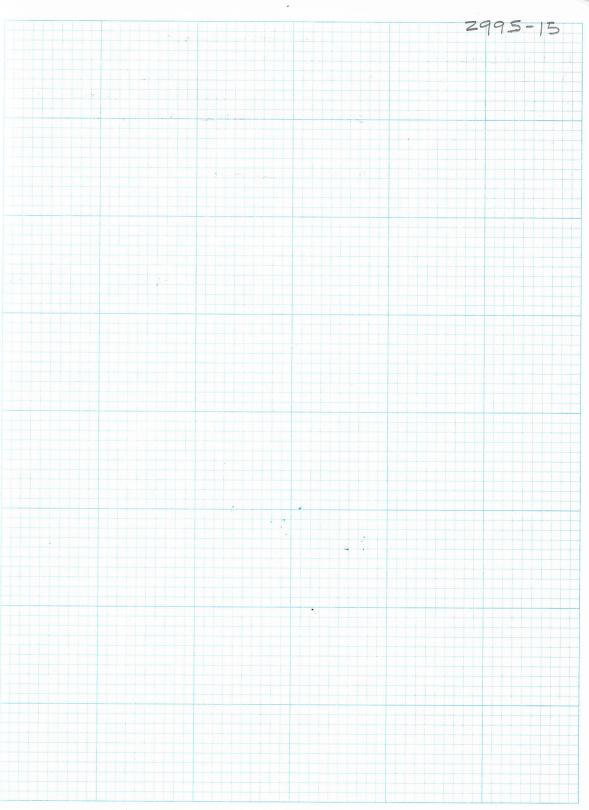
0. LUNA L. BALLES A. LEAL 3/30/19 864450L TOPCON DL	.13	S. F. W.	ADE (26 AND E	WELLS) EVATION	(NAVO-88)		
STA	BS	DISTANCE	HI	FS	DISTANCE	ELEVATION EM ELEV	SW 280-5T ON G/L
CF-11-12	4.681	199.60	13.781			9.10'(88)	SW 187 AU ON C/L PADE COUNTY BRASS DISC IN CONC. MONUMONT, IS THE SW COL OF SECT. 35-56-38 ELEV= 10.62' NGVD-29, ELEV=9.10' NAVD-88 (DIF + 1.52')
TP Nº I				4.387	201.40'	9.394	SET CUT NIL & TT, ± 1'SOUND OF THE NORTH EP OF THESW 280 ST, ± 401'WEST OF BM CF-11-PE
SHAKE	4.54.8	205 50	13.942				
TP Nº 2				5,237	205.70	8.705	SET OUT NL & TT
SHAKE	5.315	266.50	14.02				
TPN. 3				4.742	267,90	9.278	FNO OUT NLY DIS, LOCATOD IN THE & PETHE SW 280 ST, FRONT MAIN INMACICE TO TROPICAL RESERRCH AND EDUCATION CENTER
SHAKE	4.681	187.60	13.959				
TP Nº 4				5.008	186.90	8,951	SET OUT NL & TT, ± 2.70' WOT OF A G' CLF. AND. ± 374.50' NORTH FROM TP No 3
SHAKE	5.206	279.40	14.157				
TP N=5				4.839	198.20	9-318	ON NORTH RIM OF A MHS (X-MARK). 281 ± SW

0. LUNA L. BALLESTEROS A. LEAL 3 30 191 864450213	BEC # C S.F.W. M-I MIAMI DADE LOCATION ZE OF USES WED	(26 WELLS) ELEVATION (1	JAND-88)		
STA BS TP N. S 4.894	PISTANCE HZ 98.30 14.2	1	DISTANCE	ELEVATION BM E 9.318	W. DESCRIPTION
CP# Z SHAKE 4-289	63.00 IA.z	4.254-	65.70	9-958	SET MNLW BEC 0129 5-196 A
BM 5-196A SHALE 5,214	57.40 14.1	5,316	57.20	8.931	SET MNLW BEC 0129 5-196 A, SOS ON CONC. SLAB BETWEEN Z. WATCH VALUS. 2 ' FROM WOLL S-196 A
PS (00 WELL	57.40 14.1	2,18z	45.60	11.963	ON TOP OF 8" IVC PIPE (WELL S-196A)
101		2.117	45,50	12,028	WOOD BASE
102.		5.205	44.70	8.94.0	GND (W)
103		5.294	47.60	8.85)	END (N)
104		5.170	46.60	8.975	GND (E)
105		5.146	43.90	8,99	GND (5)
106		5,306	46.10	8.839	FNO ALUMINUM DIDE IN CONC.

0.2000A L. BALLEST A. LEAL 3/30/20 8644502	>19	S. F. W.	DADE (26 AND BEVA	non (Net	VD-88)	,	2995-13
S 77A	BS	DISTANCE	ΗZ	P.S.	DISMANCE	ELEVATION BY ELE	V. DEDRIGTION.
TPN.8 SHAKE	5,120	224.60	14.351	4.914	71.80	9.231	SET CUTIN IN GOVE MON. MALL, ± 128 SOLATA TROM BM 5-196 A
TP N. 9 SHALE	5, 391	309.60	14.136	5.606	223.90	8.74.5	SET CUT NL & TT
TP Nº 10 SHAKE	4.477	230.90	13.306	5.307	290.00	8.829	SET OUTNUE TT 1'E SUTH OF THE NORTH BY OF SW 280 ST, = 300' PROM TP N. 3
TP N-11 SHAICE	A. 543	226.90	13415	4.434	Z30.60	8.812	SCT OUT NET TT, ± 1' SOUTH OF THE NORTH EP of SW 280 ST, ± 461.50' MOM TP N. 10
TP No 12 SHAKE	4.389	64.70	12.701	5.03	228.50	8.312	SET OTNEST, ± 1'Sound of THE NORTH EP ge sw 280 ST, ± 455.40' prom TPN-11
CE-153-2				4.331	67.80	8.37 8.37	SW 280 ST ON C/L SW 192 AU - ON C/L BRASS DISC IN CONC. MONUMENT AND IS THE S'/4 COR 35-56-38 EL= 9.89 NGV0-29, 8.37 NAVD-88. (DIF=+1.52')



O. LUNA		BEC #03-86445	
	STEROS	5. F.W. M. D.	
A- LEAL	510,005	MIAMI DADE (26 WELLS)	
3/30/10	2		
86445L			
			A
TOPCON Z	9000748		
		1057 @ BM S. 196A (368	1-
		HM = S.IL	
SIA	TH	HORIZ X MALT X SLOPE DI	JOOC.
369 = 2	4.73	00.00'00" 89.36.41" 96.44	MNLW ORG
370	4-72	348 10'02" 90" 32'59" 48.34	KAND ANUM DIV
	-1.1>		IN CONG
			In come



Survey Control Points	B Horizontal
+ Find address or place	ABout
CE-153-R - EXISTING	
Name: CE-153-R	
Elev(NGVD29): 9.89 Elev(NAVD88): 8.37 Northing: 426,490.64 Easting: 820,448.33 Location1: SW 280 ST ON C/L Location2: SW 192 AVE ON C/L Location3: Description1: BRASS DISC IN CONC MOD Description2: Field Book: 469-51 Zones: IV-B Circuit: 508,512 Set Date: Locator: 7810 W Last Check: 01-18-2009 Adjustment: EL. WAS 5.57 Adjustment-Date: 03-09-2011 Status: EXISTING	 layers as well as street maintenance layer and Municipality for Miami-Dade County. It is being used by Public Works Department in Miami-Dade County. The information available in this search has been assembled for the use of Miami-Dade County Public Works for the design and development of Public Works projects. No degree or order of accuracy has been assigned to data in this package unless specifically stated. Although this package has been prepared from the best available information, Miami-Dade County assumes no responsibility for the accuracy or completeness of the information or any errors or omission and makes no warranties, expressed or implied, concerning accuracy, completeness, reliability or suitability of this data.
Zoom to	solving a problem whose incorrect solution could result in injury to person or property. Elevations must be verified consistent with procedures established by Chapter 472 Florida Statutes "Land Surveying and Mapping" and the Florida Administrative Code Chapter 61G17-6 "Minimum Technical Standards". Some of the GIS datasets presented in this website are available for free download. Please visit our <u>Open</u> <u>Data</u> website for more information. For questions, comments or to report a problem with this website, please email <u>Miami-Dade County GIS</u> .

100ft -80.501 25.507 Degrees

Survey Control Points	Horizonta 🕜
+ Find address or place	ABout
CF-11-R - EXISTING	
Name: CF-11-R Elev (NGVD29): 10.62	
Elev(NAVD88): 9.10 Northing: 426,564.53 Easting: 823,057.59	Public Works Survey Control Point
Location1: SW 280 ST ON C/L	Welcome to Miami-Dade County Survey Control Points.
Location2:SW 187 AVE ON C/L Location3: Description1: DADE CO. BRASS DISC IN Description2:	Public Works Survey Control Points is an Web Application that displays the Horizontal and Vertical Control Points I CONC MON AND IS THE SE COR 35-56-38. layers as well as street maintenance layer and Municipality
Field Book: 469-41 Zones: IV-B	for Miami-Dade County. It is being used by Public Works Department in Miami-Dade County.
Circuit: 506,508,512 Set Date: Locator: 7810	The information available in this search has been assembled for the use of Miami-Dade County Public Works for the design and development of Public Works projects. No
Last Check: 01-14-2008 Adjustment: Adjustment-Date: 03-09-2011	degree or order of accuracy has been assigned to data in this package unless specifically stated.
Status: EXISTING SW 280TH ST	
	Although this package has been prepared from the best available information, Miami-Dade County assumes no responsibility for the accuracy or completeness of the information or any errors or omission and makes no warranties, expressed or implied, concerning accuracy, completeness, reliability or suitability of this data.
	This data should not be relied upon as the sole basis for solving a problem whose incorrect solution could result in injury to person or property. Elevations must be verified consistent with procedures established by Chapter 472 Florida Statutes "Land Surveying and Mapping" and the Florida Administrative Code Chapter 61G17-6 "Minimum Technical Standards".
	Some of the GIS datasets presented in this website are available for free download. Please visit our <u>Open</u> <u>Data</u> website for more information.
Zoom to	For questions, comments or to report a problem with this website, please email Miami-Dade County GIS.

100ft -80.494 25.506 Degrees