SURVEYOR'S REPORT

Specific Purpose Survey of the
United States Geological Survey
Recorder Well G-2904
in
Broward County, Florida

Prepared for:

South Florida Water Management District

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Prepared by:

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Florida Professional Surveyor and Mapper
License Number 5381
State of Florida

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131 West Kaley Street, Orlando, FL. 32806
Tel (321) 354-9826

Field Date: September 27, 2019
Report Date: December 4, 2019
PO NO: 9500008146

PURPOSE

The objective of this work order is to supply NAVD 88 elevations on the site benchmark, ground elevation at the site, well monitoring point and any USGS benchmarks at the site. In addition, horizontal positions of each well and benchmark need to be provided in the North American Datum of 1983.

LOCATION OF PROJECT

The United States Geological Survey's Recorder Well **G-2904** is located in Section 17, Township 50 South, Range 42 East, Broward 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-2904 (G2904 2019), add 1.59'**. 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

All horizontal data shall be collected in and based on the North American Datum of 1983, 2011 adjustment (NAD 83/11). Horizontal coordinate control shall be established from existing National Geodetic Survey (NGS) 2nd Order control or higher in the area by using GPS, RTK GPS, network RTK GPS, or OPUS derived solutions.

LEVELING METHODS (Site Benchmark)

The leveling for this project was performed in accordance with standard survey practice using conventional third order methods, techniques and equipment.
The allowable error (.02 √miles) on this project meets or exceeds third order closures as required by SFWMD for this project per executed SOW for 4600003706-WO03 and discussions with SFWMD.
A level loop was run from the NGS Benchmark "DALEY" (AJ8709) through "TP6" (set hub) and closed on NGS Benchmark "X 175 8696 (AJ9700). A second level loop began on "TP6" (set hub), leveled through the site benchmark, and closed on "TP6" (set hub). The measurements were collected using a Digital Level and were hand written in Whidden Surveying & Mapping, Inc. Field Book W 210 Pages 38-42, dated September 18, 2019, reduced and adjusted electronically. Additional data was manually recorded in the field book.

GPS METHODS (horizontal position of site benchmark)

Latitude and Longitude for Benchmark G-2904 (G2904 2019) were established by observing a 3-minute session of GPS data on September 18, 2019 using a Trimble R-8-3 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 R8-3 Serial #: 4615113539
- Trimble GPS unit R6-4 Serial #: 0220266504
- Dini Digital Level Serial #: 735642

LEVELING METHODS (Site: ground elevation-well monitoring point- USGS benchmarks)

A level loop was run from the previously established Site Benchmark G-2904 (G2904 2019), through all corners of concrete slab around well casing, through the ground shot north of the slab around casing (ground elevation), through the well monitoring point, and back to the Site Benchmark. The measurements were collected using an Automatic Level and were hand written in Dewberry Engineering, Inc. Field Book S.F.W.M.D. #1, Pages 25-28, dated September 20, 2019. Additional data was manually recorded.

GPS METHODS (horizontal position of Well G-2904 monitoring point & USGS Benchmarks)

Latitude and Longitude for Well G-2904 monitoring point (North edge of metal casing) and USGS Benchmarks were established by observing a 3-minute session of GPS data on September 27, 2019 using a Spectra SP-80 and The Florida Permanent Reference Network (FPRN). The FPRN network consists of nearly 100 Continuously Operating Reference Stations (CORS) located throughout Florida.

EQUIPMENT USED

- Spectra SP-80 Rover Serial #: 1165
- Topcon AT-G2 Serial #: 1439

VERTICAL CONTROL POINT

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

NGS Benchmark "DALEY" (AJ8709)						
26° 05' 4.77" (N)	80° 11' 35.43" (W)	Published	3.87 ft.	(NAVD88)	1.18 m	Published

THE MARK IS 198.5 FT WEST OF CENTERLINE OF ASPHALT CROSSOVER, 188.3 FT EAST OF A UPRIGHT SIGN SUPPORT FOR OVERHEAD SIGN ACROSS WESTBOUND LANES, 44 FT SOUTH OF CENTERLINE OF WESTBOUND LANES, 5.5 FT EAST OF THE WEST EDGE OF A CONCRETE DROP INLET APRON, 4.5 FT WEST OF THE EAST EDGE OF CONCRETE DROP INLET APRON, AND 1.1 FT SOUTH OF THE NORTH EDGE OF A CONCRETE DROP INLET APRON. THE DISC IS SET FLUSH IN NORTH SIDE OF CONCRETE DROP INLET BASIN.

NGS BENCHMARK DISK, SET IN CONCRETE SLAB OF DRAIN BASIN
STAMPING:DALEY 1996

NGS Benchmark "X 175 8696" (AJ8700)						
26° 05' 07.09" (N)	80° 11' 01.32" (W)	Published	24.65 ft.	(NAVD88)	7.51 m	Published

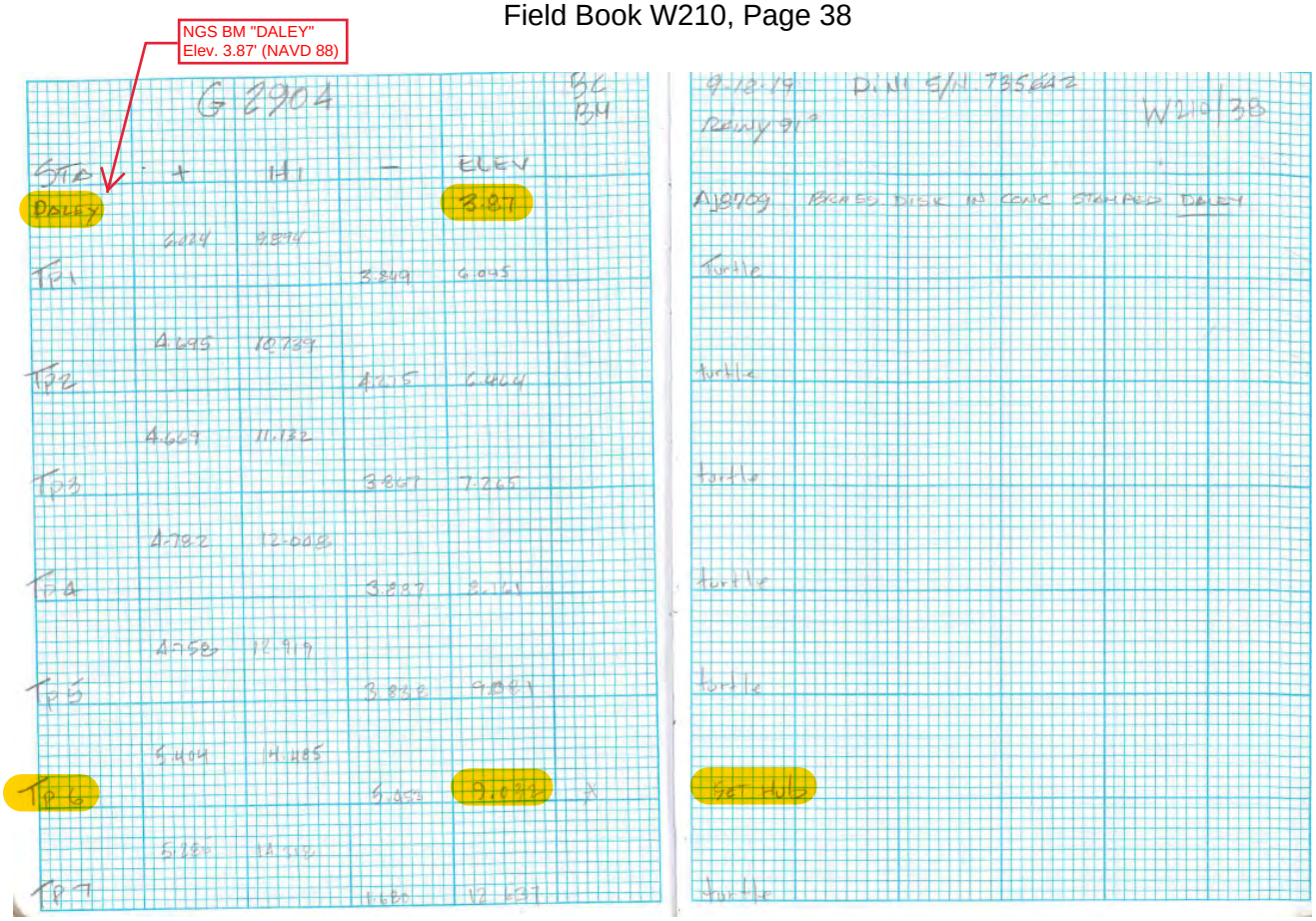
THE MARK IS 89 FT EAST OF THE EAST EDGE OF THE DRAW BRIDGE STEEL GRATING, 14.5 FT NORTH OF THE CENTERLINE OF THE WESTBOUND STATE ROAD 84 AND 0.9 FT WEST OF A EXPANSION JOINT

NGS BENCHMARK DISK SET IN CONCRETE ON WALKWAY OF BRIDGE

STAMPING: FLORIDA D.O.T. SURVEY MARKER 8696 X 175

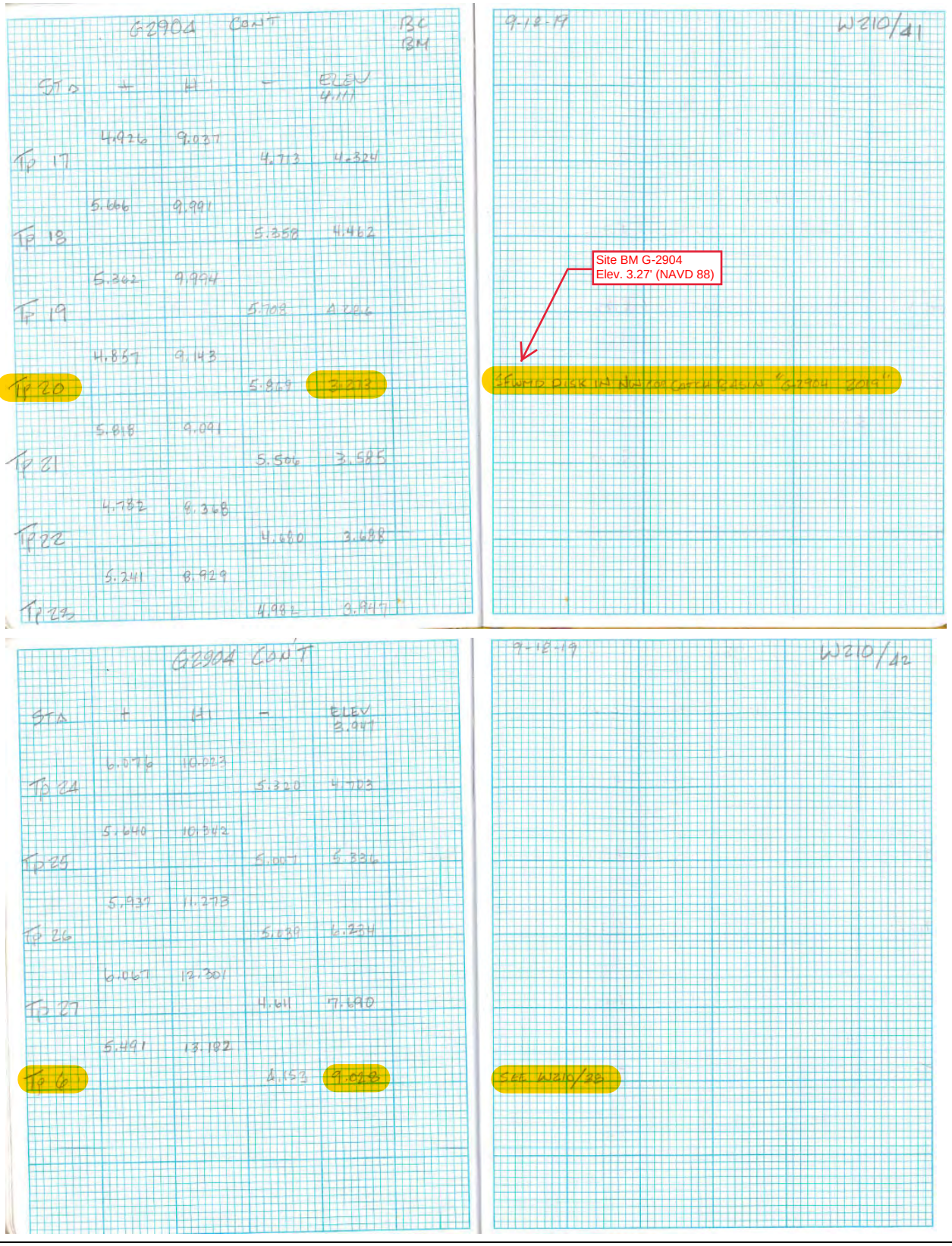
BM: G-2904 (Existing on site benchmark)						
26° 05' 34.99" (N)	80° 11' 08.05" (W)		3.27 ft.	(NAVD88)	1.00 m	Level run
NAD_83(2011)			4.86 ft.	(NGVD29)	1.48 m	Converted
				1.59 ft. (conversion factor)		Corpscon 6.0.1
			STATION IS A S.F.W.M.D. BM STAMPED "G2904 2019" SET IN CONCRETE DRAIN BASIN ON NORTHEAST EDGE OF DRAIN GRATE LOCATED: EAST SIDE OF ROAD AT INTERSECTION OF SW 23RD COURT AND FAIRMONT AVENUE			

Field Book W210, Page 38



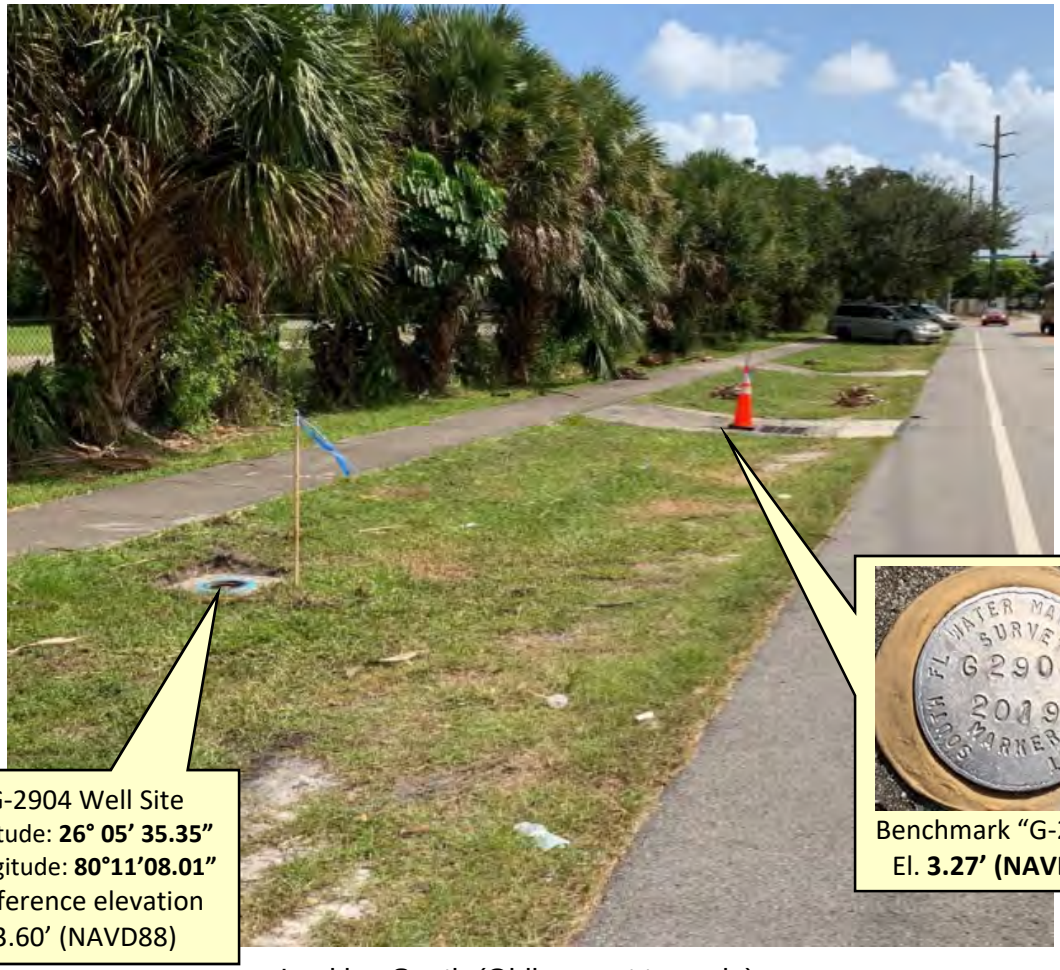
Field Book 210 page 39 & 40

Field Book 210 Pages 41 & 42



PROJECT RESULTS

Overall Site



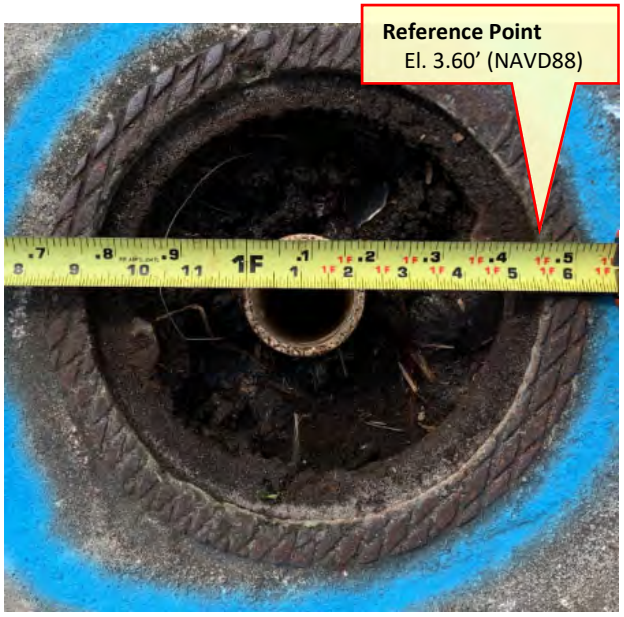
Looking South (Oblique not to scale)

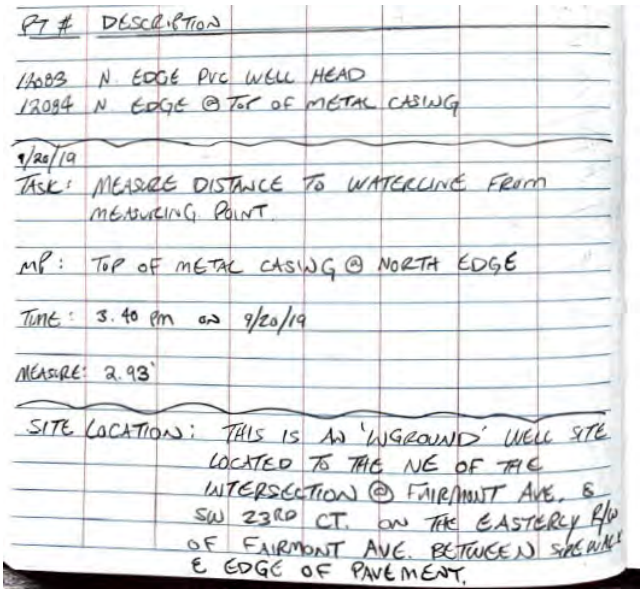
Tabular Form

Reference and Ground Elevations: NAVD88			
Well	Ground Elevation	Reference Elevation	Comments
G-2904	3.64 ft.	3.60 ft.	North top edge of metal casing
Offset to NGVD29: +1.59' (See Project Vertical Datum Notes in Page: 4)			
Well diameter		Casing material	DTW
2" PVC		Metal	-2.93 ft. (9/20/19 at 3:40 PM)

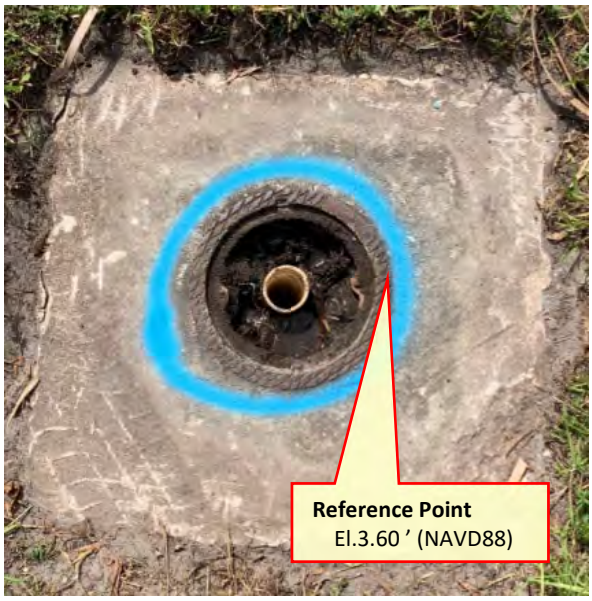
Source & Site Benchmark	NAVD88	NGVD29 (Published)	NGVD29 (Corpscon)
NGS "DALEY" (AJ8709)	3.87 ft. (Published)		
NGS "X 175 8696" (AJ8700)	24.65 ft. (Published)		
BM G-2904 (SFWMD)	3.27 ft. (Measured)		4.86 ft. (Converted)

Well Photos and Diagrams (Continued)





Well Photos and Diagrams (Continued)



Overhead View (Oblique Not to scale)

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 1.59 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: September 27, 2019, PO NO: 9500008146
7. SFWMD Data records (on file at the District's headquarters):
8. A. Electronic Data files:
   Miscellaneous picture files
   B. Conventional reporting
   Field Book: W210 page 38-42

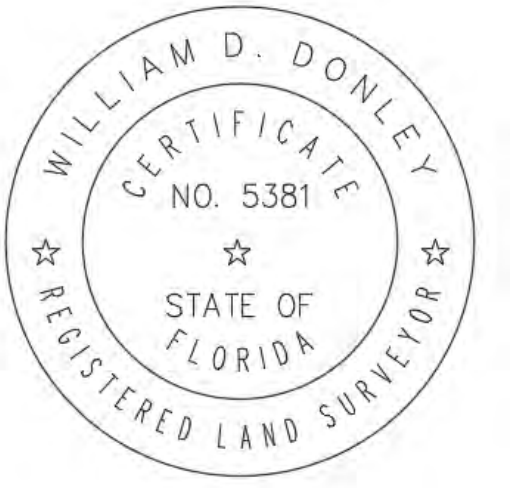
Abbreviations:

Elev.	-	Elevation
DTW	-	Distance to the water table inside the well
BroCo.	-	Broward 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
MP	-	Monitoring Point
GS	-	Ground Shot
BM	-	Benchmark
RM	-	Reference Monument

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
Sept. 27, 2019



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South Florida Water Management District Benchmark Datasheet

Designation: G-2904	Project Name: USGS Ph 2, BROWARD	Type: V	State Plane Zone: FL East
Stamping: G2904 2019	Field Book Name: W210	Field Book Page: 38	
Established By: DEWBERRY / WHIDDEN	Recovered By: N/A	Recovery Date: N/A	
Surveyor: WILLIAM D. DONLEY	Established Date: 09/18/19	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 17	Township: 50 SOUTH	Range: 42 EAST	
County: BROWARD	Quadrangle: FORT LAUDERDALE SOUTH	Quad Index: 1702	NGS Source BM(s): X 175 8696
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983	NGS PID(s): AJ8700
NAVD88 Elevation (feet): 3.27	NGVD29 Elevation (feet): 4.86	2022 Elevation: N/A	NGS NAVD88 Elev (ft): 24.65
NAVD88 Class: N/A	NGVD29 Class: N/A	Other Elevation: N/A	NGS NAVD88 Elev (m): 7.512
NAVD88 Order: 3	NGVD29 Order: N/A	Other Elevation Type: N/A	NGS 2022 Elev (ft): N/A

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: + 1.59	Actual NGS Elevation or ngvd29.txt file: N/A	OPUS Ortho Height: N/A	
Northing (Y) (feet): 640347.2	Easting (X) (feet): 923460.7	Source of Latitude & Longitude: AVERAGED FPRN & TRIMBLE VRSNOW RTK	
Latitude: 26 (DD°)	5 (MM')	34.99 (SS")	Longitude: 80 (DD°) / 11 (MM') / 8.05 (SS")
Latitude (Decimal Degrees): 26.093053		Longitude (Decimal Degrees): -80.185569	

RECOVERY DATA

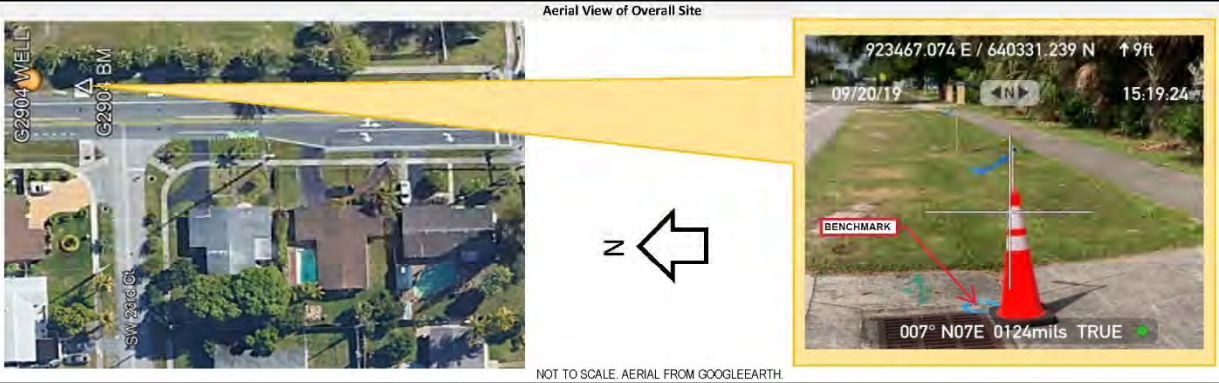
How to Reach:	1. FROM FL-7, HEAD EAST ALONG RIVERLAND RD FOR 1.1 MI 2. TURN LEFT ONTO FAIRMONT AVE, CONTINUE 300 FEET TO THE MARK ON THE RIGHT (IMMEDIATELY AFTER THE INTERSECTION WITH SW 23RD CT
Description/Notes:	2" ALUMINUM SFWMD DISK SET IN CONCRETE SPILLWAY AT THE NORTHEAST CORNER OF METAL GRATE

Notable Landmarks:

Other Source Benchmarks: NGS "DALEY" (AJ8709)

PICTURES

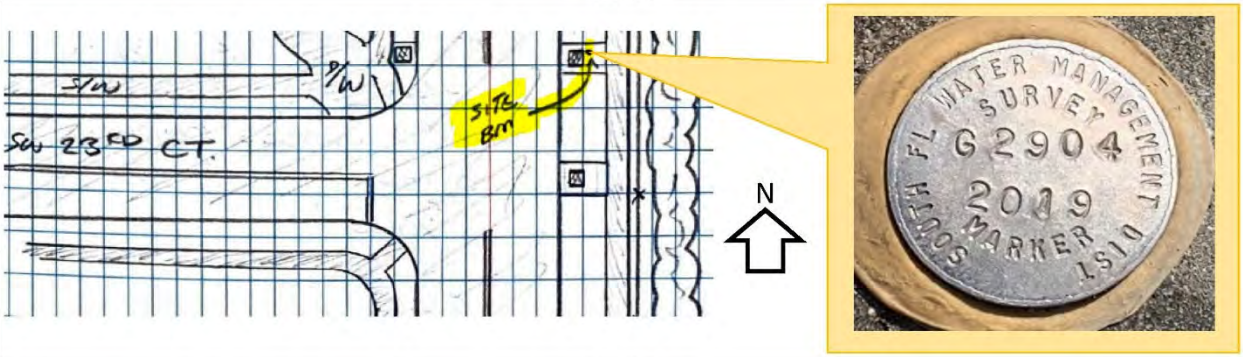
Aerial View of Overall Site



NOT TO SCALE. AERIAL FROM GOOGLEEARTH.

PICTURES

Site Sketch



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Benchmark "**G-2904**"
Latitude**: 26°05'35.0"**
Longitude: **80°11'08.1"**
NAVD88 EL = 3.27 FEET

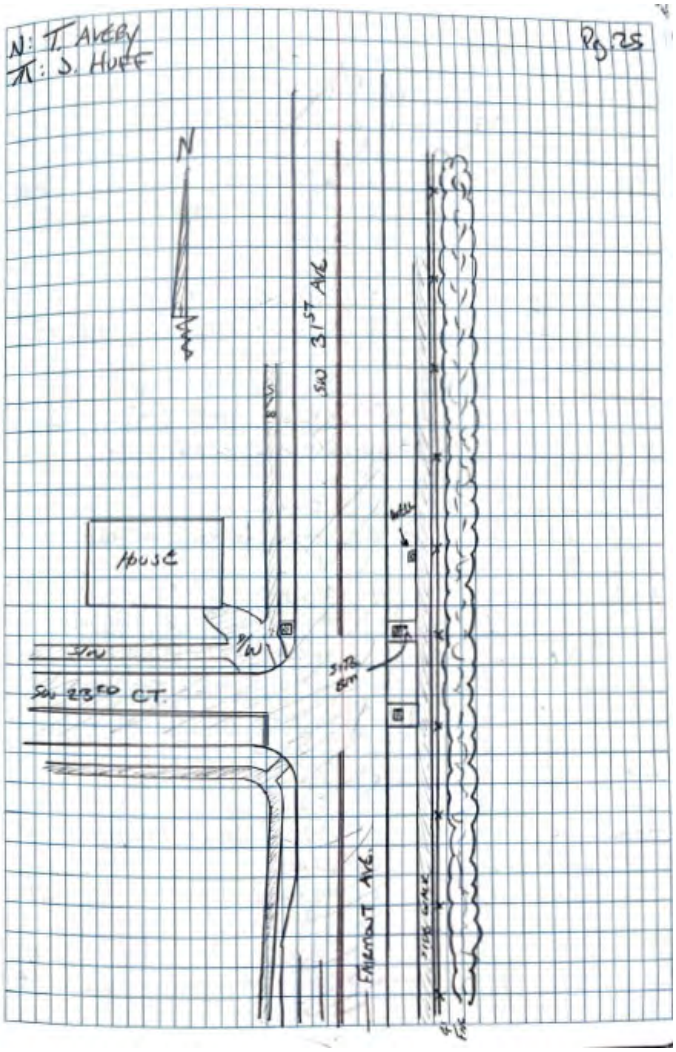
Well Site
Latitude: 26°05'35.35"
Longitude: 80°11'08.01"

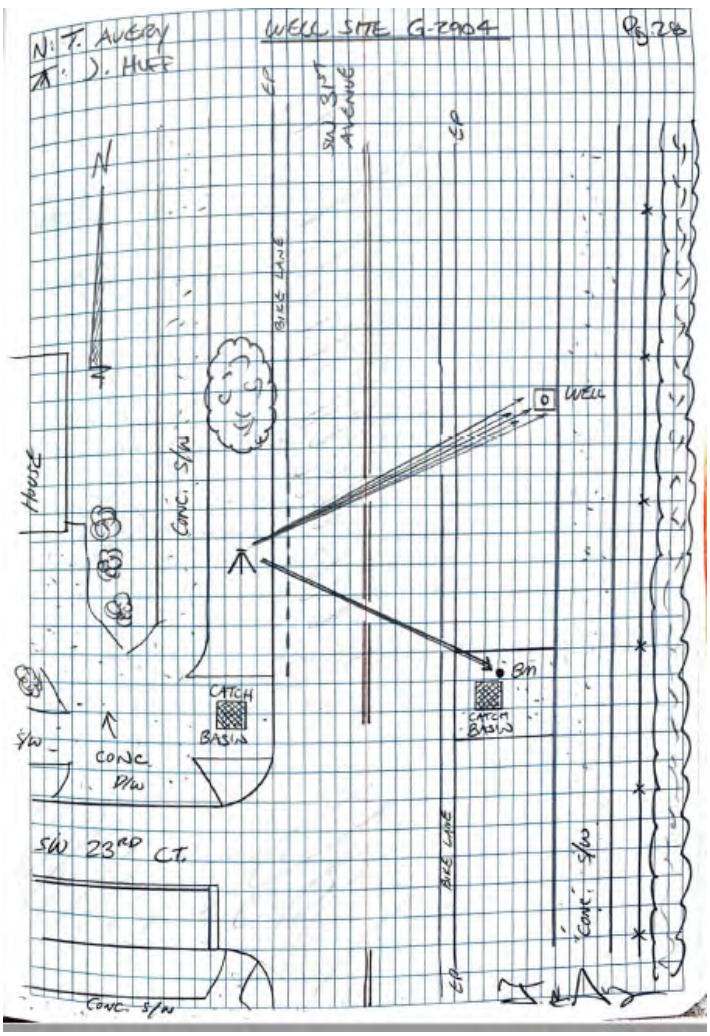
NOT TO SCALE (Google Earth Product)

SOUTH FLORIDA WATER MANAGEMNT DISTRICT

SKETCH

FIELD BOOK SFWMD #1, PAGES 25 & 28





Office

Project

9 December 2019

INPUT

State Plane, NAD83
0901 - Florida East, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

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

WELL G-2904

1/2

Northing/Y: 640383.01
Easting/X: 923464.66
Elevation/Z: 3.60
Convergence: 0 21 29.65481
Scale Factor: 1.000023104
Combined Factor: 1.000026928

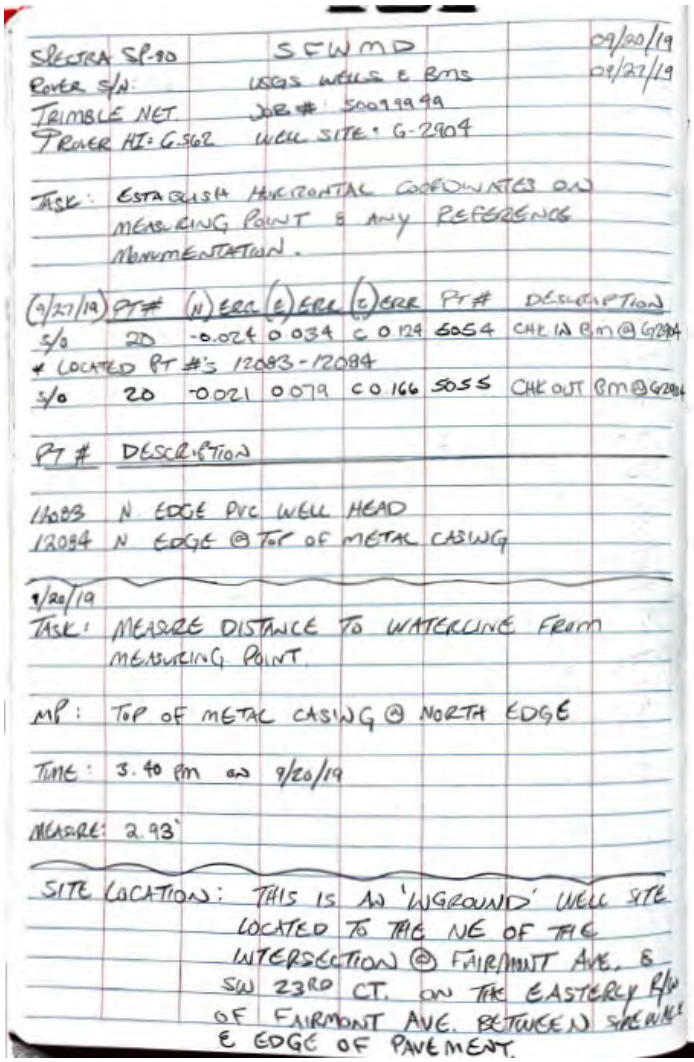
Latitude: 26 05 35.34735
Longitude: 80 11 08.00759
Elevation/Z: 5.194

BM G-2904

2/2

Northing/Y: 640347.2
Easting/X: 923460.7
Elevation/Z: 3.27
Convergence: 0 21 29.63009
Scale Factor: 1.000023101
Combined Factor: 1.000026941

Latitude: 26 05 34.99294
Longitude: 80 11 08.05348
Elevation/Z: 4.864



SPECTRA SP-90 SFWMD 09/20/19
ROVER S/N: USGS WELLS & BMS 09/27/19
TRIMBLE NET JOB #: 50099999
PROVER HT: 6.562 WELL SITE: G-2904

TASK: ESTABLISH HORIZONTAL COORDINATES ON MEASURING POINT & ANY REFERENCE MONUMENTATION.

(9/27/19)	PT#	(N) ERR	(E) ERR	(E) ERR	PT #	DESCRIPTION
S/O	20	-0.024	0.034	C 0.124	5054	CHK IN BM @ G2904
* LOCATED PT #'s 12083-12084						
S/O	20	-0.021	0.079	C 0.166	5055	CHK OUT BM @ G2904

PT #	DESCRIPTION
12083	N EDGE PVC WELL HEAD
12084	N EDGE @ TOP OF METAL CASING

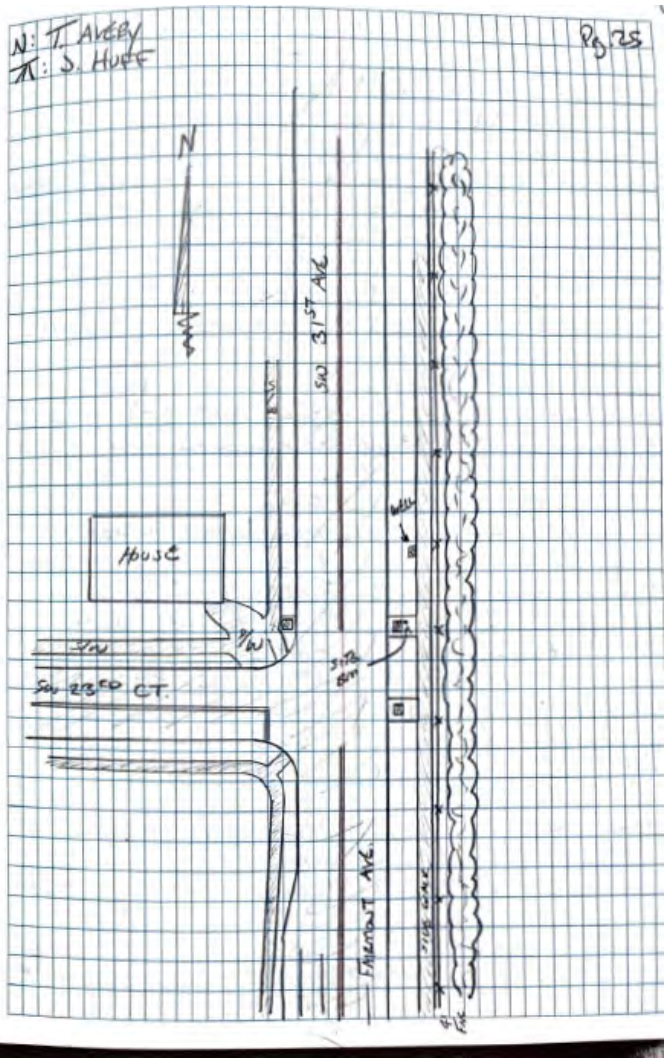
9/20/19
TASK: MEASURE DISTANCE TO WATERLINE FROM MEASURING POINT.

MP: TOP OF METAL CASING @ NORTH EDGE

TIME: 3.40 PM on 9/20/19

MEASURE: 2.93'

SITE LOCATION: THIS IS AN 'INGROUND' WELL SITE LOCATED TO THE NE OF THE INTERSECTION @ FAIRMONT AVE. & SW 23RD CT. ON THE EASTERLY R/W OF FAIRMONT AVE. BETWEEN SIDEWALK & E EDGE OF PAVEMENT.



TIPTON SEWMO 09/20/19
AT-G2 USGS WELLS & BM's
S/N 1429 JOB # 50099999
WELL SITE: G-2904

TASK: ELEVATE MONITORING POINT, GROUND, CORNERS OF CONC. SLAB, & TOP OF WELL CASING @ MEASURING POINT (MP).

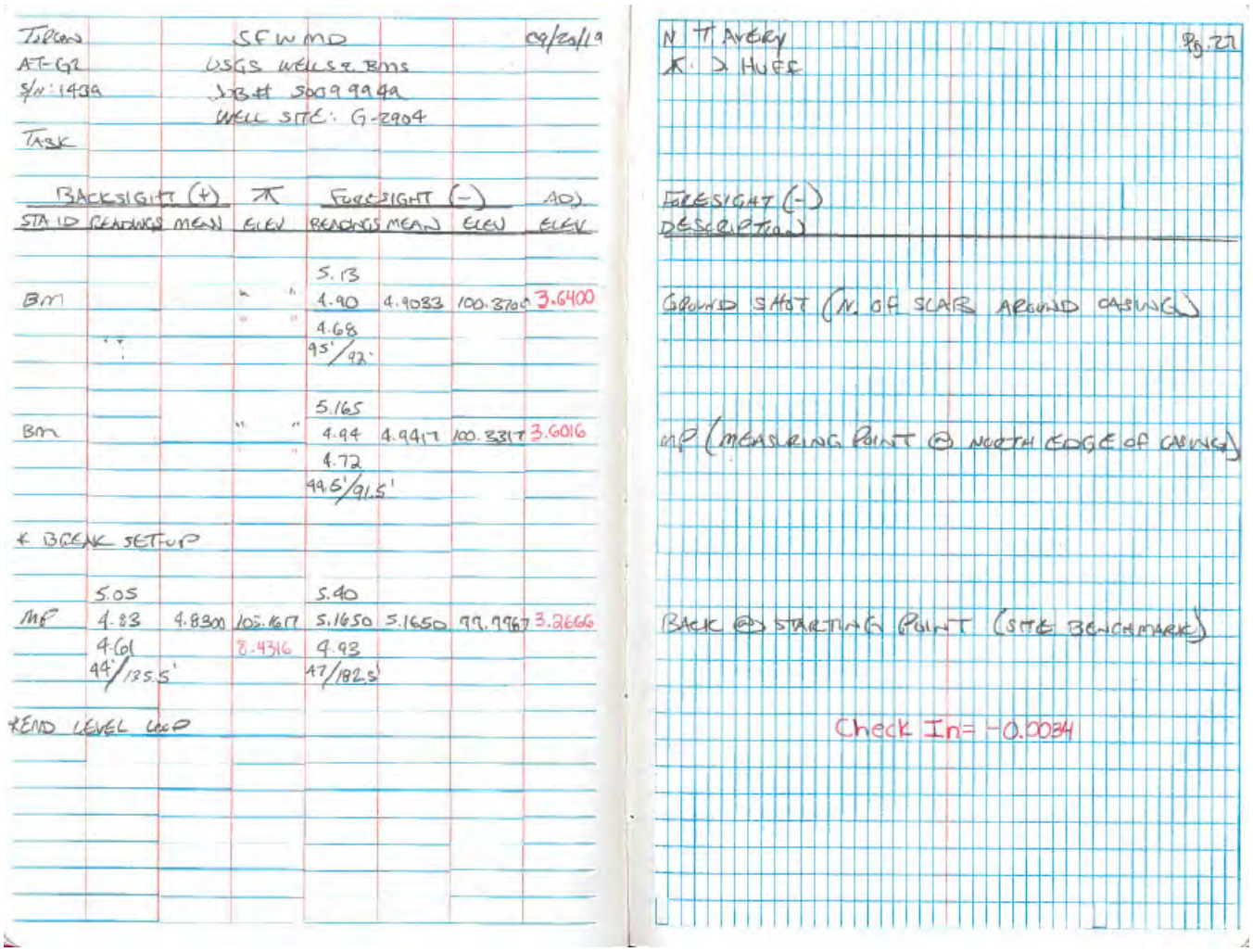
ELEVATION DESCRIPTION

BEGIN @ ~~[illegible]~~ 3.27 (WHIDDEN)(NAVD88) ALUMINUM DISC IN TOP OF CATCH BASIN ON EASTERLY R/W OF S/W 31ST AVENUE

STA ID	BACKSIGHT (+) READINGS	BACKSIGHT (+) MEAN	HI ELEV.	FORESIGHT (−) READINGS	FORESIGHT (−) MEAN	FORESIGHT (−) ELEV.	ADJ ELEV.	FORESIGHT (−) DESCRIPTION
	5.51			5.19				
BM	5.27	5.2733	105.2733	4.96	4.9600	100.3133	3.5833	NE CORNER OF SLAB AROUND CASING
	5.04		8.5433	4.73				
	47'/47'			46'/93'				
				5.21				
BM			" "	4.99	4.9883	100.2850	3.5550	NW CORNER OF SLAB AROUND CASING
			" "	4.765				
				44.5/91.5'				
				5.21				
BM			" "	4.985	4.9867	100.2867	3.5566	SW CORNER OF SLAB AROUND CASING
			" "	4.765				
				44.5'/91.5'				
				5.22				
BM			" "	4.99	4.9900	100.2833	3.5533	SE CORNER OF SLAB AROUND CASING
			" "	4.76				
				46'/93'				

N: T AVERY
J. HOFF

Pg 26



Topcon
AT-G2
S/N: 1439
Task

SFWMD
USGS WELLS & BMs
JOB # 30099949
WELL SITE: G-2904

09/29/19

STA ID	BACKSIGHT (+) READINGS	MEAN	ELEV	FORESIGHT (-) READINGS	MEAN	ELEV	ADJ. ELEV
BM				5.13 4.90 4.68 95'/92'	4.9083	100.3709	3.6400
BM				5.165 4.94 4.72 99.5'/91.5'	4.9417	100.3317	3.6016
* BREAK SET-UP							
MP	5.05 4.83 4.61 44'/135.5'	4.8300	103.1617 8.4316	5.40 5.1650 4.93 47'/182.5'	5.1650	99.9967	3.2666
*END LEVEL LOOP							

N TT AVERY
X: > HUFF

Pg. 27

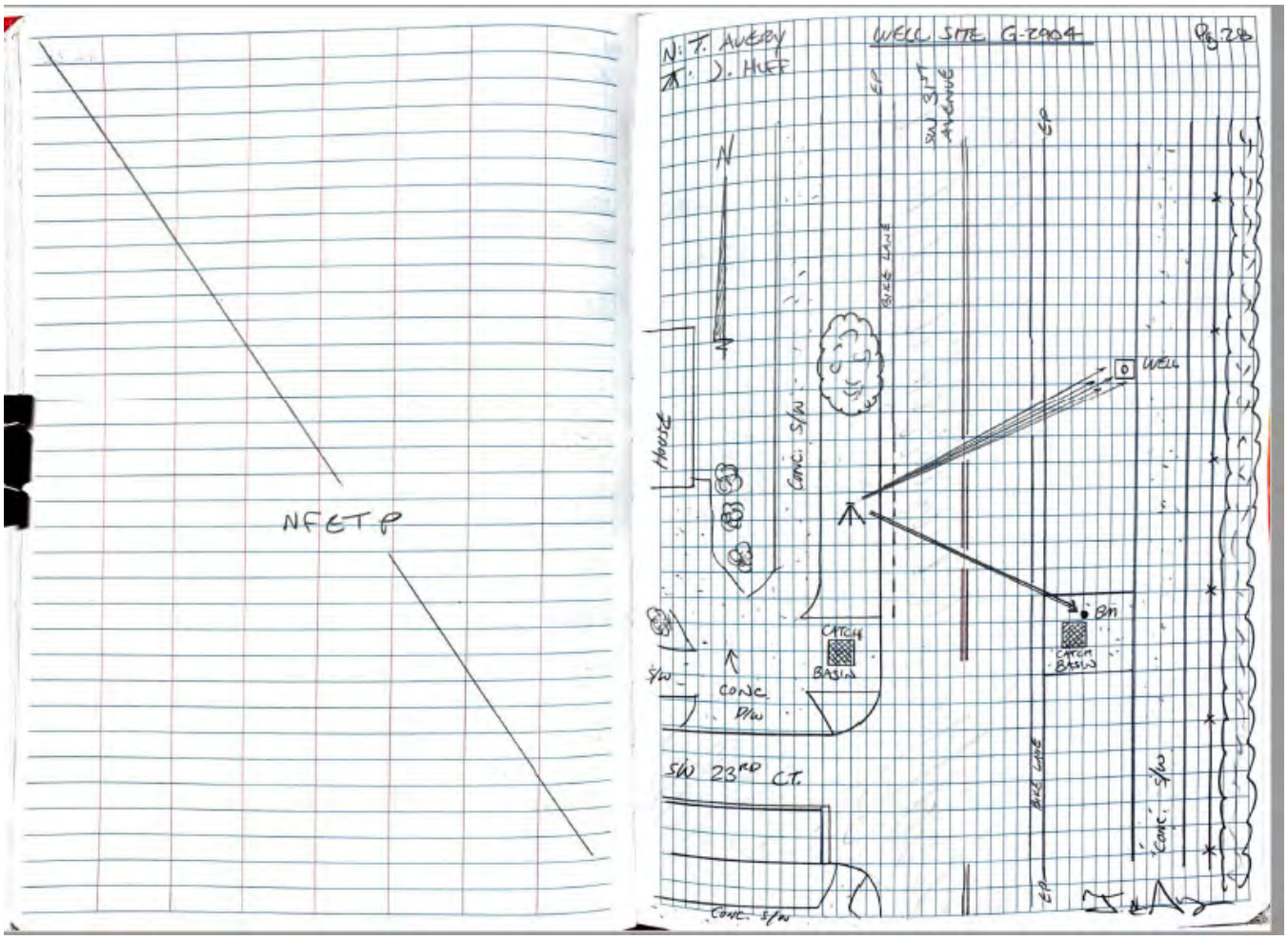
FORESIGHT (-)
DESCRIPTION

GROUND SHOT (N. OF SCAR AROUND CASING)

MP (MEASURING POINT @ NORTH EDGE OF CASING)

BACK @ STARTING POINT (SITE BENCHMARK)

Check In= -0.0034


NFETP
N. T. AVERY
J. HUFF
WELL SITE G-2904
SW 31ST AVENUE
EP
N
House
Conc. S/W
WELL
Bm
CATCH BASIN
Conc. D/W
SW 23RD CT.
BIKE LANE
Conc. S/W

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.5.4
1        National Geodetic Survey,   Retrieval Date = OCTOBER 18, 2019
 AJ8709 ***********************************************************************
 AJ8709  DESIGNATION -  DALEY
 AJ8709  PID         -  AJ8709
 AJ8709  STATE/COUNTY-  FL/BROWARD
 AJ8709  COUNTRY     -  US
 AJ8709  USGS QUAD   -  FORT LAUDERDALE SOUT (1994)
 AJ8709
 AJ8709                        *CURRENT SURVEY CONTROL
 AJ8709  ______________________________________________________________________
 AJ8709* NAD 83(2011) POSITION- 26 05 04.76868(N) 080 11 35.43431(W)   ADJUSTED
 AJ8709* NAD 83(2011) ELLIP HT-   -24.371 (meters)        (06/27/12)   ADJUSTED
 AJ8709* NAD 83(2011) EPOCH    -  2010.00
 AJ8709* NAVD 88 ORTHO HEIGHT -     1.180 (meters)        3.87  (feet) ADJUSTED
 AJ8709  ______________________________________________________________________
 AJ8709  GEOID HEIGHT    -        -25.502 (meters)                     GEOID18
 AJ8709  NAD 83(2011) X  -    976,344.693 (meters)                     COMP
 AJ8709  NAD 83(2011) Y  - -5,648,422.013 (meters)                     COMP
 AJ8709  NAD 83(2011) Z  -  2,787,478.106 (meters)                     COMP
 AJ8709  LAPLACE CORR    -         -3.00  (seconds)                    DEFLEC18
 AJ8709  DYNAMIC HEIGHT  -          1.179 (meters)        3.87  (feet) COMP
 AJ8709  MODELED GRAVITY -    979,056.7   (mgal)                       NAVD 88
 AJ8709
 AJ8709  VERT ORDER      -  FIRST     CLASS II
 AJ8709
 AJ8709  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AJ8709  Standards:
 AJ8709         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AJ8709            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 AJ8709  ------------------------------------------------------------------
 AJ8709  NETWORK    1.87   2.69          0.74   0.77   1.37     -0.28105523
 AJ8709  ------------------------------------------------------------------
 AJ8709  Click here for local accuracies and other accuracy information.
 AJ8709
 AJ8709
 AJ8709.The horizontal coordinates were established by GPS observations
 AJ8709.and adjusted by the National Geodetic Survey in June 2012.
 AJ8709
 AJ8709.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AJ8709.been affixed to the stable North American tectonic plate. See
 AJ8709.NA2011 for more information.
 AJ8709
 AJ8709.The horizontal coordinates are valid at the epoch date displayed above
 AJ8709.which is a decimal equivalence of Year/Month/Day.
 AJ8709
 AJ8709.The orthometric height was determined by differential leveling and
 AJ8709.adjusted by the NATIONAL GEODETIC SURVEY
 AJ8709.in May 2002.
 AJ8709
 AJ8709.Significant digits in the geoid height do not necessarily reflect accuracy.
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AJ8709.GEOID18 height accuracy estimate available here.
AJ8709
AJ8709.Click here to see if photographs exist for this station.
AJ8709
AJ8709.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AJ8709
AJ8709.The Laplace correction was computed from DEFLEC18 derived deflections.
AJ8709
AJ8709.The ellipsoidal height was determined by GPS observations
AJ8709.and is referenced to NAD 83.
AJ8709
AJ8709.The dynamic height is computed by dividing the NAVD 88
AJ8709.geopotential number by the normal gravity value computed on the
AJ8709.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ8709.degrees latitude (g = 980.6199 gals.).
AJ8709
AJ8709.The modeled gravity was interpolated from observed gravity values.
AJ8709
AJ8709. The following values were computed from the NAD 83(2011) position.
AJ8709
AJ8709;                    North         East     Units Scale Factor Converg.
AJ8709;SPC FL E     -   194,243.333   280,716.270   MT  1.00002159   +0 21 17.2
AJ8709;SPC FL E     -   637,280.00    920,983.30    sFT  1.00002159   +0 21 17.2
AJ8709;UTM  17      - 2,885,309.040   580,688.729   MT  0.99968039   +0 21 17.2
AJ8709
AJ8709!             -  Elev Factor  x  Scale Factor =   Combined Factor
AJ8709!SPC FL E     -   1.00000383  x   1.00002159  =   1.00002542
AJ8709!UTM  17      -   1.00000383  x   0.99968039  =   0.99968422
AJ8709
AJ8709_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ8068885309(NAD 83)
AJ8709
AJ8709                          SUPERSEDED SURVEY CONTROL
AJ8709
AJ8709  NAD 83(2007)-  26 05 04.76876(N)     080 11 35.43492(W) AD(2002.00) 0
AJ8709  ELLIP H (02/10/07)  -24.354   (m)                       GP(2002.00)
AJ8709  NAD 83(1999)-  26 05 04.76878(N)     080 11 35.43495(W) AD(       ) 1
AJ8709  ELLIP H (12/12/02)  -24.352   (m)                       GP(       ) 4 1
AJ8709  NAVD 88              1.18    (m)            3.9    (f) LEVELING    3
AJ8709
AJ8709.Superseded values are not recommended for survey control.
AJ8709
AJ8709.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ8709.See file dsdata.pdf to determine how the superseded data were derived.
AJ8709
AJ8709_MARKER: DD = SURVEY DISK
AJ8709_SETTING: 31 = SET IN A PAVEMENT SUCH AS STREET, SIDEWALK, CURB, ETC.
AJ8709_SP_SET: DROP INLET
AJ8709_STAMPING: DALEY 1996
AJ8709_MARK LOGO: NGS
AJ8709_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ8709_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AJ8709_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ8709+SATELLITE: SATELLITE OBSERVATIONS - July 01, 2014
AJ8709
AJ8709  HISTORY     - Date     Condition        Report By
AJ8709  HISTORY     - UNK      MONUMENTED       NGS
AJ8709  HISTORY     - 20011017 GOOD             LDBLS
AJ8709  HISTORY     - 20020512 GOOD             MAPTEC
AJ8709  HISTORY     - 20060619 GOOD             PB
AJ8709  HISTORY     - 20080512 GOOD             FLDT
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AJ8709  HISTORY     - 20090527 GOOD            FLDT
AJ8709  HISTORY     - 20140701 GOOD            INDIV
AJ8709
AJ8709                          STATION DESCRIPTION
AJ8709
AJ8709'DESCRIBED BY LD BRADLEY LAND SURVEYORS 2001 (JCH)
AJ8709'THE MARK IS ABOUT 2.4 KM (1.51 MI) WEST OF FORT LAUDERDALE, ABOUT 6.0
AJ8709'KM (3.74
AJ8709'MI) WEST OF PORT EVERGLADES IN SECTION 19, TOWNSHIP 50 SOUTH, RANGE 42
AJ8709'EAST,
AJ8709'BROWARD COUNTY, FLORIDA. OWNERSHIP - FLORIDA DEPARTMENT OF
AJ8709'TRANSPORTATION
AJ8709'
AJ8709'TO REACH THE MARK FROM THE INTERSECTION OF INTERSTATE HIGHWAY 75 AND
AJ8709'U.S.
AJ8709'HIGHWAY 27 (I-75 EXIT 13, NEAR ANDYTOWN) GO EAST ON INTERSTATE HIGHWAY
AJ8709'75 8.1
AJ8709'KM (5.04 MI) TO THE JUNCTION WITH INTERSTATE HIGHWAY 595 EAST, EXIT
AJ8709'RIGHT ONTO
AJ8709'INTERSTATE HIGHWAY 595 EAST, AND GO EAST ALONG INTERSTATE HIGHWAY 595
AJ8709'16.3 KM
AJ8709'(10.13 MI) TO THE JUNCTION WITH STATE ROAD 84, GO EAST ON STATE ROAD
AJ8709'84 1.5 KM
AJ8709'(0.92 MI) TO THE MARK IN THE MEDIAN ON THE LEFT. ALSO TO REACH THE
AJ8709'MARK FROM
AJ8709'THE INTERSECTION OF STATE ROAD 84 AND EISENHOWER BOULEVARD IN PORT
AJ8709'EVERGLADES,
AJ8709'GO WEST ON STATE ROAD 84 1.0 KM (0.62 MI) TO THE ENTRANCE-EXIT OF PORT
AJ8709'EVERGLADES, CONTINUE WEST ON STATE ROAD 84 6.0 KM (3.74 MI) TO THE
AJ8709'MARK IN THE
AJ8709'MEDIAN ON THE LEFT.
AJ8709'
AJ8709'THE MARK IS 60.50 M (198.5 FT) WEST OF THE CENTERLINE OF AN ASPHALT
AJ8709'CROSS-OVER
AJ8709'(BETWEEN WESTBOUND AND EASTBOUND LANES), 57.39 M (188.3 FT) EAST OF A
AJ8709'UPRIGHT
AJ8709'SIGN SUPPORT FOR A OVERHEAD SIGN ACROSS WESTBOUND LANES, 18.29 M (60.0
AJ8709'FT)
AJ8709'NORTH OF THE CENTERLINE OF THE EASTBOUND LANES, 13.41 M (44.0 FT)
AJ8709'SOUTH OF THE
AJ8709'CENTERLINE OF THE WESTBOUND LANES, 1.68 M (5.5 FT) EAST OF THE WEST
AJ8709'EDGE OF A
AJ8709'CONCRETE DROP INLET APRON, 1.37 M (4.5 FT) WEST OF THE EAST EDGE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON, AND 0.33 M (1.1 FT) SOUTH OF THE NORTH EDGE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON. THE MARK IS A DISK SET FLUSH IN THE NORTH SIDE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON, FLUSH WITH THE LEVEL OF THE GROUND, ABOUT 1.00 M
AJ8709'(3.3 FT)
AJ8709'BELOW THE LEVEL OF THE HIGHWAY.
AJ8709
AJ8709                          STATION RECOVERY (2002)
AJ8709
AJ8709'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
AJ8709'THE MARK IS ABOUT 2.4 KM (1.51 MI) WEST OF FORT LAUDERDALE, ABOUT 6.0
AJ8709'KM (3.74
AJ8709'MI) WEST OF PORT EVERGLADES IN SECTION 19, TOWNSHIP 50 SOUTH, RANGE 42
AJ8709'EAST,
AJ8709'BROWARD COUNTY, FLORIDA. OWNERSHIP - FLORIDA DEPARTMENT OF
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“DALEY” NGS Benchmark Datasheet (4 of 5)

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AJ8709'TRANSPORTATION
AJ8709'
AJ8709'TO REACH THE MARK FROM THE INTERSECTION OF INTERSTATE HIGHWAY 75 AND
AJ8709'U.S.
AJ8709'HIGHWAY 27 (I-75 EXIT 13, NEAR ANDYTOWN) GO EAST ON INTERSTATE HIGHWAY
AJ8709'75 8.1
AJ8709'KM (5.04 MI) TO THE JUNCTION WITH INTERSTATE HIGHWAY 595 EAST, EXIT
AJ8709'RIGHT ONTO
AJ8709'INTERSTATE HIGHWAY 595 EAST, AND GO EAST ALONG INTERSTATE HIGHWAY 595
AJ8709'16.3 KM
AJ8709'(10.13 MI) TO THE JUNCTION WITH STATE ROAD 84, GO EAST ON STATE ROAD
AJ8709'84 1.5 KM
AJ8709'(0.92 MI) TO THE MARK IN THE MEDIAN ON THE LEFT. ALSO TO REACH THE
AJ8709'MARK FROM
AJ8709'THE INTERSECTION OF STATE ROAD 84 AND EISENHOWER BOULEVARD IN PORT
AJ8709'EVERGLADES,
AJ8709'GO WEST ON STATE ROAD 84 1.0 KM (0.62 MI) TO THE ENTRANCE-EXIT OF PORT
AJ8709'EVERGLADES, CONTINUE WEST ON STATE ROAD 84 6.0 KM (3.74 MI) TO THE
AJ8709'MARK IN THE
AJ8709'MEDIAN ON THE LEFT.
AJ8709'
AJ8709'THE MARK IS 60.50 M (198.5 FT) WEST OF THE CENTERLINE OF AN ASPHALT
AJ8709'CROSS-OVER
AJ8709'(BETWEEN WESTBOUND AND EASTBOUND LANES), 57.39 M (188.3 FT) EAST OF A
AJ8709'UPRIGHT
AJ8709'SIGN SUPPORT FOR A OVERHEAD SIGN ACROSS WESTBOUND LANES, 18.29 M (60.0
AJ8709'FT)
AJ8709'NORTH OF THE CENTERLINE OF THE EASTBOUND LANES, 13.41 M (44.0 FT)
AJ8709'SOUTH OF THE
AJ8709'CENTERLINE OF THE WESTBOUND LANES, 1.68 M (5.5 FT) EAST OF THE WEST
AJ8709'EDGE OF A
AJ8709'CONCRETE DROP INLET APRON, 1.37 M (4.5 FT) WEST OF THE EAST EDGE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON, AND 0.33 M (1.1 FT) SOUTH OF THE NORTH EDGE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON. THE MARK IS A DISK SET FLUSH IN THE NORTH SIDE OF A
AJ8709'CONCRETE
AJ8709'DROP INLET APRON, FLUSH WITH THE LEVEL OF THE GROUND, ABOUT 1.00 M
AJ8709'(3.3 FT)
AJ8709'BELOW THE LEVEL OF THE HIGHWAY.
AJ8709'
AJ8709'STATION RECOVERY (2002)
AJ8709'RECOVERY NOTE BY MAPTECH, INCORPORATED 2002 (CP)
AJ8709'RECOVERED AS DESCRIBED.
AJ8709
AJ8709                          STATION RECOVERY (2006)
AJ8709
AJ8709'RECOVERY NOTE BY PBS&J 2006 (DWD)
AJ8709'RECOVERED IN GOOD CONDITION.
AJ8709
AJ8709                          STATION RECOVERY (2008)
AJ8709
AJ8709'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 2008 (PED)
AJ8709'RECOVERED IN GOOD CONDITION.
AJ8709
AJ8709                          STATION RECOVERY (2009)
AJ8709
AJ8709'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 2009 (JS)
AJ8709'RECOVERED AS DESCRIBED
AJ8709'
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AJ8709'THIS MARK MAY BE DESTROYED IN THE NEXT COUPLE OF YEARS DUE TO MAJOR
AJ8709'RECONSTRUCTION ON I-595.
AJ8709
AJ8709                          STATION RECOVERY (2014)
AJ8709
AJ8709'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2014 (PED)
AJ8709'RECOVERD

*** retrieval complete.
Elapsed Time = 00:00:04
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The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.4
1        National Geodetic Survey,   Retrieval Date = OCTOBER 18, 2019
 AJ8700 ***********************************************************************
 AJ8700  DESIGNATION -  X 175 8696
 AJ8700  PID         -  AJ8700
 AJ8700  STATE/COUNTY-  FL/BROWARD
 AJ8700  COUNTRY     -  US
 AJ8700  USGS QUAD   -  FORT LAUDERDALE SOUT (1994)
 AJ8700
 AJ8700                        *CURRENT SURVEY CONTROL
 AJ8700
 AJ8700* NAD 83(2011) POSITION- 26 05 07.08904(N) 080 11 01.32498(W)   ADJUSTED
 AJ8700* NAD 83(2011) ELLIP HT-   -18.066 (meters)        (06/27/12)   ADJUSTED
 AJ8700* NAD 83(2011) EPOCH   -  2010.00
 AJ8700* NAVD 88 ORTHO HEIGHT -     7.512 (meters)       24.65   (feet) ADJUSTED
 AJ8700
 AJ8700  GEOID HEIGHT    -        -25.532 (meters)                     GEOID18
 AJ8700  NAD 83(2011) X  -    977,274.353 (meters)                     COMP
 AJ8700  NAD 83(2011) Y  - -5,648,235.122 (meters)                     COMP
 AJ8700  NAD 83(2011) Z  -  2,787,545.013 (meters)                     COMP
 AJ8700  LAPLACE CORR    -         -3.12  (seconds)                    DEFLEC18
 AJ8700  DYNAMIC HEIGHT  -          7.500 (meters)       24.61   (feet) COMP
 AJ8700  MODELED GRAVITY -    979,056.6   (mgal)                       NAVD 88
 AJ8700
 AJ8700  VERT ORDER      -  FIRST     CLASS II
 AJ8700
 AJ8700  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AJ8700  Standards:
 AJ8700         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AJ8700            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 AJ8700  ------------------------------------------------------------------
 AJ8700  NETWORK    2.47   3.53          0.95   1.04   1.80     -0.31507982
 AJ8700  ------------------------------------------------------------------
 AJ8700  Click here for local accuracies and other accuracy information.
 AJ8700
 AJ8700
AJ8700.The horizontal coordinates were established by GPS observations
AJ8700.and adjusted by the National Geodetic Survey in June 2012.
AJ8700
AJ8700.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AJ8700.been affixed to the stable North American tectonic plate. See
AJ8700.NA2011 for more information.
AJ8700
AJ8700.The horizontal coordinates are valid at the epoch date displayed above
AJ8700.which is a decimal equivalence of Year/Month/Day.
AJ8700
AJ8700.The orthometric height was determined by differential leveling and
AJ8700.adjusted by the NATIONAL GEODETIC SURVEY
AJ8700.in May 2002.
AJ8700
AJ8700.Significant digits in the geoid height do not necessarily reflect accuracy.
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AJ8700.GEOID18 height accuracy estimate available here.
AJ8700
AJ8700.Click here to see if photographs exist for this station.
AJ8700
AJ8700.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AJ8700
AJ8700.The Laplace correction was computed from DEFLEC18 derived deflections.
AJ8700
AJ8700.The ellipsoidal height was determined by GPS observations
AJ8700.and is referenced to NAD 83.
AJ8700
AJ8700.The dynamic height is computed by dividing the NAVD 88
AJ8700.geopotential number by the normal gravity value computed on the
AJ8700.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ8700.degrees latitude (g = 980.6199 gals.).
AJ8700
AJ8700.The modeled gravity was interpolated from observed gravity values.
AJ8700
AJ8700. The following values were computed from the NAD 83(2011) position.
AJ8700
AJ8700;                    North         East      Units Scale Factor Converg.
AJ8700;SPC FL E     -   194,320.646   281,663.741   MT  1.00002349   +0 21 32.2
AJ8700;SPC FL E     -   637,533.65    924,091.79    sFT 1.00002349   +0 21 32.2
AJ8700;UTM  17      - 2,885,386.327   581,635.878   MT  0.99968228   +0 21 32.2
AJ8700
AJ8700!             -  Elev Factor  x  Scale Factor =   Combined Factor
AJ8700!SPC FL E     -   1.00000284  x   1.00002349  =   1.00002633
AJ8700!UTM  17      -   1.00000284  x   0.99968228  =   0.99968512
AJ8700
AJ8700_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ8163585386(NAD 83)
AJ8700
AJ8700                          SUPERSEDED SURVEY CONTROL
AJ8700
AJ8700  NAD 83(2007)-  26 05 07.08912(N)     080 11 01.32559(W) AD(2002.00) 0
AJ8700  ELLIP H (02/10/07)  -18.048   (m)                        GP(2002.00)
AJ8700  NAD 83(1999)-  26 05 07.08915(N)     080 11 01.32563(W) AD(       ) 1
AJ8700  ELLIP H (12/12/02)  -18.045   (m)                        GP(       ) 4 1
AJ8700  NAVD 88               7.51    (m)           24.6    (f) LEVELING    3
AJ8700
AJ8700.Superseded values are not recommended for survey control.
AJ8700
AJ8700.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ8700.See file dsdata.pdf to determine how the superseded data were derived.
AJ8700
AJ8700_MARKER: DD = SURVEY DISK
AJ8700_SETTING: 31 = SET IN A PAVEMENT SUCH AS STREET, SIDEWALK, CURB, ETC.
AJ8700_SP_SET: CONCRETE WALK
AJ8700_STAMPING: 8696 X 175
AJ8700_MARK LOGO: FLDT
AJ8700_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ8700_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AJ8700_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ8700+SATELLITE: SATELLITE OBSERVATIONS - November 19, 2012
AJ8700
AJ8700  HISTORY     - Date     Condition        Report By
AJ8700  HISTORY     - UNK      MONUMENTED       FLDT
AJ8700  HISTORY     - 20011018 GOOD             LDBLS
AJ8700  HISTORY     - 20020512 GOOD             MAPTEC
AJ8700  HISTORY     - 20090527 GOOD             FLDT
AJ8700  HISTORY     - 20121119 GOOD             INDIV
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AJ8700
AJ8700                          STATION DESCRIPTION
AJ8700
AJ8700'DESCRIBED BY LD BRADLEY LAND SURVEYORS 2001 (JCH)
AJ8700'THE MARK IS ABOUT 1.5 KM (0.92 MI) WEST OF FORT LAUDERDALE, ABOUT 5.1
AJ8700'KM (3.15
AJ8700'MI) WEST OF PORT EVERGLADES IN SECTION 20, TOWNSHIP 50 SOUTH, RANGE 42
AJ8700'EAST,
AJ8700'BROWARD COUNTY, FLORIDA. OWNERSHIP - FLORIDA DEPARTMENT OF
AJ8700'TRANSPORTATION
AJ8700'
AJ8700'TO REACH THE MARK FROM THE INTERSECTION OF INTERSTATE HIGHWAY 75 AND
AJ8700'U.S.
AJ8700'HIGHWAY 27 (I-75 EXIT 13, NEAR ANDYTOWN) GO EAST ON INTERSTATE HIGHWAY
AJ8700'75 8.1
AJ8700'KM (5.04 MI) TO THE JUNCTION WITH INTERSTATE HIGHWAY 595 EAST, EXIT
AJ8700'RIGHT ONTO
AJ8700'INTERSTATE HIGHWAY 595 EAST, AND GO EAST ALONG INTERSTATE HIGHWAY 595
AJ8700'16.3 KM
AJ8700'(10.13 MI) TO THE JUNCTION WITH STATE ROAD 84, GO EAST ON STATE ROAD
AJ8700'84 2.4 KM
AJ8700'(1.51 MI) TO THE EAST END OF A DRAW BRIDGE (BRIDGE NUMBER 860008) AND
AJ8700'THE MARK
AJ8700'ON THE LEFT. ALSO TO REACH THE MARK FROM THE INTERSECTION OF STATE
AJ8700'ROAD 84 AND
AJ8700'EISENHOWER BOULEVARD IN PORT EVERGLADES, GO WEST ON STATE ROAD 84 1.0
AJ8700'KM (0.62
AJ8700'MI) TO THE ENTRANCE-EXIT OF PORT EVERGLADES, CONTINUE WEST ON STATE
AJ8700'ROAD 84
AJ8700'5.1 KM (3.15 MI) TO THE EAST END OF A DRAW BRIDGE (BRIDGE NUMBER
AJ8700'860008) AND
AJ8700'THE MARK ON THE RIGHT.
AJ8700'
AJ8700'THE MARK IS 27.13 M (89.0 FT) EAST OF THE EAST EDGE OF THE DRAW BRIDGE
AJ8700'STEEL
AJ8700'GRATING, 4.42 M (14.5 FT) NORTH OF THE CENTERLINE OF THE WESTBOUND
AJ8700'LANES OF
AJ8700'STATE ROAD 84 AND 0.27 M (0.9 FT) WEST OF A EXPANSION JOINT (BETWEEN
AJ8700'BRIDGE
AJ8700'AND ABUTMENT). THE MARK IS A DISK SET FLUSH IN A CONCRETE WALK AT THE
AJ8700'NORTHEAST CORNER OF A DRAW BRIDGE (BRIDGE NUMBER 860008).
AJ8700
AJ8700                          STATION RECOVERY (2002)
AJ8700
AJ8700'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
AJ8700'THE MARK IS ABOUT 1.5 KM (0.92 MI) WEST OF FORT LAUDERDALE, ABOUT 5.1
AJ8700'KM (3.15
AJ8700'MI) WEST OF PORT EVERGLADES IN SECTION 20, TOWNSHIP 50 SOUTH, RANGE 42
AJ8700'EAST,
AJ8700'BROWARD COUNTY, FLORIDA. OWNERSHIP - FLORIDA DEPARTMENT OF
AJ8700'TRANSPORTATION
AJ8700'
AJ8700'TO REACH THE MARK FROM THE INTERSECTION OF INTERSTATE HIGHWAY 75 AND
AJ8700'U.S.
AJ8700'HIGHWAY 27 (I-75 EXIT 13, NEAR ANDYTOWN) GO EAST ON INTERSTATE HIGHWAY
AJ8700'75 8.1
AJ8700'KM (5.04 MI) TO THE JUNCTION WITH INTERSTATE HIGHWAY 595 EAST, EXIT
AJ8700'RIGHT ONTO
AJ8700'INTERSTATE HIGHWAY 595 EAST, AND GO EAST ALONG INTERSTATE HIGHWAY 595
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AJ8700'(10.13 MI) TO THE JUNCTION WITH STATE ROAD 84, GO EAST ON STATE ROAD
AJ8700'84 2.4 KM
AJ8700'(1.51 MI) TO THE EAST END OF A DRAW BRIDGE (BRIDGE NUMBER 860008) AND
AJ8700'THE MARK
AJ8700'ON THE LEFT. ALSO TO REACH THE MARK FROM THE INTERSECTION OF STATE
AJ8700'ROAD 84 AND
AJ8700'EISENHOWER BOULEVARD IN PORT EVERGLADES, GO WEST ON STATE ROAD 84 1.0
AJ8700'KM (0.62
AJ8700'MI) TO THE ENTRANCE-EXIT OF PORT EVERGLADES, CONTINUE WEST ON STATE
AJ8700'ROAD 84
AJ8700'5.1 KM (3.15 MI) TO THE EAST END OF A DRAW BRIDGE (BRIDGE NUMBER
AJ8700'860008) AND
AJ8700'THE MARK ON THE RIGHT.
AJ8700'
AJ8700'THE MARK IS 27.13 M (89.0 FT) EAST OF THE EAST EDGE OF THE DRAW BRIDGE
AJ8700'STEEL
AJ8700'GRATING, 4.42 M (14.5 FT) NORTH OF THE CENTERLINE OF THE WESTBOUND
AJ8700'LANES OF
AJ8700'STATE ROAD 84 AND 0.27 M (0.9 FT) WEST OF A EXPANSION JOINT (BETWEEN
AJ8700'BRIDGE
AJ8700'AND ABUTMENT). THE MARK IS A DISK SET FLUSH IN A CONCRETE WALK AT THE
AJ8700'NORTHEAST CORNER OF A DRAW BRIDGE (BRIDGE NUMBER 860008).
AJ8700'
AJ8700'STATION RECOVERY (2002)
AJ8700'RECOVERY NOTE BY MAPTECH, INCORPORATED 2002 ( CP)
AJ8700'RECOVERD AS DESCRIBED.
AJ8700
AJ8700                          STATION RECOVERY (2009)
AJ8700
AJ8700'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 2009 (JS)
AJ8700'RECOVERED AS DESCRIBED
AJ8700'
AJ8700'THIS MARK MAY BE DESTROYED IN THE NEXT COUPLE OF YEARS DUE TO MAJOR
AJ8700'RECONSTRUCTION ON I-595.
AJ8700
AJ8700                          STATION RECOVERY (2012)
AJ8700
AJ8700'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2012 (ADC)
AJ8700'RECOVERED AS FOUND ON NORTHEAST CORNER OF DRAWBRIDGE IN GOOD
AJ8700'CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:03
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