T2 UES, Inc.

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SURVEYOR'S REPORT

USGS Wells Phase 4

USGS Station No:	281630081024401
Station Name:	OS0052 (OSF-93)
Prepared For:	South Florida Water Management District
Work Order No:	4600004161-WO5
Report Date:	September 1, 2020

TABLE OF CONTENTS

SURVEYOR'S REPORT

According to the:
STATE OF FLORIDA
Standards of Practice
CHAPTER 472.027 Florida Statutes
Chapter 5J-17.050 through 5J-17.052, Florida Administrative Code

This report and copies thereof are not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper. **This report is not valid without the digital files referenced in this report.**

Additions or deletions to the report by other than the signing party are prohibited without written consent of the signing party.

All field work was performed by:

T2 UES, Inc., LB00008336
5670 Zip Drive
Fort Myers, Florida 33905
Phone: (239) 277-0722 Fax: (239) 277-7179
Scott Urquhart, PSM 6524 (Surveyor and Mapper in Responsible Charge)

I hereby certify that as a duly registered Florida Professional Surveyor and Mapper, I have prepared this Report for the specific purpose of providing the **South Florida Water Management District** with the information as outlined. This report is not complete without the referenced information being available during an examination of said Report. I further certify that the precision achieved and the care taken in collecting the data to formulate this Report are adequate for the purpose of the assignment and that the standards set forth in Chapter 5J-17.050 through 5J-17.052 of the Florida Administrative Code have been met.

SCOTT R URQUHART License Number 6524 STATE OF FLORIDA Professional Surveyor and Mapper

Digitally signed by Scott R. Urquhart, P.S.M.
Date: 2020.09.29 14:24:18 -04'00'

Scott Urquhart
Professional Surveyor & Mapper
Florida Certificate No. 6524

Date Signed

(For the firm – LB 8336)

PURPOSE OF SURVEY AND PROJECT OVERVIEW

The specific purpose of this survey is establish North American Vertical Datum of 1988 (NAVD88) elevations for United States Geological Survey (USGS) well site **OS0052 (OSF-93)**, provide a site benchmark and additional well data as follows:

- Establish an elevation on the USGS measuring mark on top of the well(s) at each site.
- Stamp a District provided aluminum tag with the appropriate data in the appropriate spaces on the tag. Including the Corpscon 6.0.1 vertical offset value from NGVD1929 to NAVD1988.
- Establish a North American Datum 83/11 (or higher) State Plane Coordinate on the benchmark and the well head.
- Provide an NAVD88 elevation on each of the USGS benchmarks (in the USGS Reports noted as “Reference Marks” or “RM’s”) recovered at the site.
- Take a typical ground shot near the well.
- Take an elevation shot on all four (4) corners of the concrete well pad.
- Measure the well diameter to determine the casing material (i.e. PVC), include a picture with a ruler on it and state and show in the report.
- Determine distance to the water table inside the well (DTW) (measurement from the well measuring point, along with time and date).Measure the well head size whether it is a manhole or surface casing.
- Complete the standard District benchmark form for each control monument set and submit the form as a .pdf and a .xlsx.

SITE LOCATION

See Page 6 for SFWMD Well Site Form.

PROJECT DATUM

- Horizontal – The project horizontal data is referenced to the North American Datum of 1983, 2011 adjustment, Florida State Plane Coordinate System, East Zone, U.S. Survey Feet.
- Vertical – The project vertical data is referenced to the North American Vertical Datum of 1988 (NAVD88). All data referenced to National Geodetic Vertical Datum of 1929 (NGVD29) was converted utilizing **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.

LEVELING PROCEDURES AND METHODOLOGY

All control leveling for the project was completed utilizing a Leica DNA 03 (serial number 347859) and Leica LS10 digital level (serial number 700874) with barcode level rod. Collimation and adjustment of the instrument was completed prior to leveling. Leveling began on National Geodetic Survey Benchmark E 575, ran through site benchmark OS0052 and closed on National Geodetic Survey Benchmark F 575. All leveling was completed in accordance with standard survey practice utilizing conventional third order methods, techniques, and equipment. The overall closure met or exceeded allowable project requirements of 0.02 feet times the square root in miles (0.02*SQRT(miles)).

See page 21 for SFWMD Benchmark Datasheet.

NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (OPUS)

The site-established benchmark was also occupied collecting positional GPS data for a duration of 6.5 hours. This information was then uploaded to the OPUS site for processing. See pages 22-25 for OS0052 OPUS Report.

DATES OF FIELD DATA COLLECTION

Field survey work by T2 was performed between August 6th and 26th, 2020. Field notes are contained in Field Book 537, page 71; Field Book 555, pages 34-35; and Field Book 556, pages 31-32.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/19

U.S.G.S. Station Name: OS0052 (OSF-93)	U.S.G.S. Station Number: 281630081024401	Agency: T2 UES, Inc.	Date of Field Work: 8-26-2020
Party Chief: DOULE	Field Book: 556; 537, 555	Page(s): **31-32; 71; 34B-35**	Report Prepared by: CHAMBLESS

SITE SPECIFIC DATA			
Site Benchmark: OS0052	Benchmark Elevation(s) *(NAVD88)*: 76.97	Corpscon 6.0.1 Conversion Factor (*NAVD88 to NGVD29*) + 1.14	
Well Reference Elevation (*NAVD88*): 79.21	DTW: 38.60 (08/18/2020 at 9:43 AM)	Ground Elevation *(NAVD88)*: 76.50	Pad Elevation (*NAVD88*): N/A

GEOGRAPHIC DATA		
Section 29	Township 25S	Range 33E
Well Latitude: 28°16'30.73"N	Well Longitude: 81°02'43.20"W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 1432761.13	Easting (X) = 641575.76

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

Benchmark "OS0052"

Latitude: 28°16'30.70" N
Longitude: 81°02'43.64" W
El. = 76.97 feet NAVD88

Not to scale (GoogleEarth product)

Well Site and Well Head

Well: “OS0052”
Reference Point: S. RIM OF 4” PVC PIPE

Reference Point El. = 79.21 feet NAVD88

Distance to Water = 38.60 feet from reference point (08/18/2020 at 9:43 AM)

New Aluminum Tag

USGS RMs

RM 1 – SQUARE CUT IN CONCRETE CULVERT

Latitude: N 28°16'30.71" N
Longitude: W 81°02'43.57" W
NAVD88 EL = 76.94

RM 2 – REBAR AT WELLHEAD

Latitude: N 28°16'30.72" N
Longitude: W 81°02'43.20" W
NAVD88 EL = 76.71

Site Benchmark

Site Benchmark Overall Photo

Site BM:

Latitude: 28°16'30.70" N
Longitude: 81°02'43.64" W
NAVD88 EL = 76.97

Source Benchmarks

NGS Benchmark "E575"

Latitude: 28°16'31" SCALED
Longitude: 81°02'12" SCALED
NAVD88 EL = 76.52 feet

NGS Benchmark "F575"

Latitude: 28°16'31" SCALED
Longitude: 81°03'03" SCALED
NAVD88 EL = 76.69 feet

"E575" Benchmark Datasheet (1 of 2)

DATASHEETS Page 1 of 2

The NGS Data Sheet

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

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PROGRAM = datasheet95, VERSION = 8.12.5.7
Starting Datasheet Retrieval...
1        National Geodetic Survey,   Retrieval Date = MAY 19, 2020
 DG6214 ***********************************************************************
 DG6214  DESIGNATION -  E 575
 DG6214  PID         -  DG6214
 DG6214  STATE/COUNTY-  FL/OSCEOLA
 DG6214  COUNTRY     -  US
 DG6214  USGS QUAD   -  NARCOOSSEE SE (2018)
 DG6214
 DG6214                        *CURRENT SURVEY CONTROL
 DG6214  ______________________________________________________________________
 DG6214* NAD 83(1986) POSITION- 28 16 31.     (N) 081 02 12.      (W)    SCALED
 DG6214* NAVD 88 ORTHO HEIGHT -    23.323 (meters)       76.52  (feet) ADJUSTED
 DG6214  ______________________________________________________________________
 DG6214  GEOID HEIGHT    -        -28.151 (meters)                     GEOID18
 DG6214  DYNAMIC HEIGHT  -         23.289 (meters)       76.41  (feet) COMP
 DG6214  MODELED GRAVITY -    979,171.1   (mgal)                       NAVD 88
 DG6214
 DG6214  VERT ORDER      -  SECOND    CLASS I
 DG6214
 DG6214.The horizontal coordinates were scaled from a map and have
 DG6214.an estimated accuracy of +/- 6 seconds.
 DG6214.
 DG6214.The orthometric height was determined by differential leveling and
 DG6214.adjusted by the NATIONAL GEODETIC SURVEY
 DG6214.in September 2004.
 DG6214
 DG6214.Significant digits in the geoid height do not necessarily reflect accuracy.
 DG6214.GEOID18 height accuracy estimate available here.
 DG6214
 DG6214.Click photographs - Photos may exist for this station.
 DG6214
 DG6214.The dynamic height is computed by dividing the NAVD 88
 DG6214.geopotential number by the normal gravity value computed on the
 DG6214.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DG6214.degrees latitude (g = 980.6199 gals.).
 DG6214
 DG6214.The modeled gravity was interpolated from observed gravity values.
 DG6214
 DG6214;                   North         East     Units  Estimated Accuracy
 DG6214;SPC FL E     -   436,710.      196,400.      MT  (+/- 180 meters Scaled)
 DG6214
 DG6214_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMM964276(NAD 83)
 DG6214
 DG6214                          SUPERSEDED SURVEY CONTROL
 DG6214
 DG6214.No superseded survey control is available for this station.
 DG6214
 DG6214_MARKER: DD = SURVEY DISK
 DG6214_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
```

"E575" Benchmark Datasheet (2of 2)

DATASHEETS Page 2 of 2

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DG6214_STAMPING: E 575 2002
DG6214_MARK LOGO: FLDEP
DG6214_PROJECTION: FLUSH
DG6214_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DG6214_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
DG6214+STABILITY: SURFACE MOTION
DG6214_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DG6214+SATELLITE: SATELLITE OBSERVATIONS - December 21, 2002
DG6214
DG6214  HISTORY     - Date     Condition        Report By
DG6214  HISTORY     - 20021221 MONUMENTED       FLDEP
DG6214
DG6214                          STATION DESCRIPTION
DG6214
DG6214'DESCRIBED BY FL DEPT OF ENV PRO 2002 (JLM)
DG6214'THE MARK IS ABOUT 18.7 MI SOUTHWEST OF COCOA, 12.0 MI EAST-NORTHEAST
DG6214'OF ST. CLOUD, 9.9 MI  NORTHEAST OF ASHTON, IN SECTION 29, TOWNSHIP 25
DG6214'SOUTH, RANGE 33 EAST.
DG6214'
DG6214'TO REACH THE MARK FROM THE JUNCTION OF U.S. HIGHWAY 192, 441 (13TH
DG6214'STREET) AND COUNTY  ROAD 523 (VERMONT AVENUE, CANOE CREEK ROAD) IN ST.
DG6214'CLOUD, GO EAST ON U.S. HIGHWAY 192, 441  (13TH STREET, EAST BRONSON
DG6214'HIGHWAY) FOR 3.0 MI TO THE INTERSECTION OF STATE ROAD 15,  CONTINUE
DG6214'EAST ON U.S. HIGHWAY 192,441 (BRONSON HIGHWAY) FOR 1.25 MI TO THE
DG6214'JUNCTION OF  NOVA ROAD (COUNTY ROAD 532) ON THE LEFT, TURN LEFT ON
DG6214'NOVA ROAD (COUNTY ROAD 532) AND  GO NORTHEAST FOR 3.65 MI TO CANAL
DG6214'C-32C, CONTINUE EAST ON NOVA ROAD FOR 3.1 MI TO THE  WEST END OF
DG6214'BRIDGE NUMBER 924115 OVER ECONLOCKHATCHEE RIVER SWAMP, CONTINUE EAST
DG6214'ON  NOVA ROAD (COUNTY ROAD 532) FOR 4.4 MI TO THE MARK ON THE LEFT,
DG6214'SET IN THE TOP OF A ROUND  CONCRETE MONUMENT FLUSH WITH THE GROUND AND
DG6214'ABOUT 2.0 FT BELOW THE LEVEL OF COUNTY  ROAD 532.
DG6214'
DG6214'LOCATED 155.7 FT EAST OF AND ACROSS THE ROAD FROM POWER POLE NUMBER
DG6214'8-71252, 67.8 FT  EAST-SOUTHEAST OF THE CENTERLINE OF COUNTY ROAD 532,
DG6214'25.0 FT SOUTH-SOUTHWEST OF THE  CENTER OF A GATE AND 1.6 FT
DG6214'SOUTH-SOUTHWEST OF A BARBWIRE FENCE
DG6214'
DG6214'NOTE A BAR MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE
DG6214'MONUMENT.

*** retrieval complete.
Elapsed Time = 00:00:01
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DATASHEETS Page 1 of 2

The NGS Data Sheet

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

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PROGRAM = datasheet95, VERSION = 8.12.5.7
Starting Datasheet Retrieval...
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 DG6213  DESIGNATION -  F 575
 DG6213  PID         -  DG6213
 DG6213  STATE/COUNTY-  FL/OSCEOLA
 DG6213  COUNTRY     -  US
 DG6213  USGS QUAD   -  NARCOOSSEE SE (2018)
 DG6213
 DG6213                        *CURRENT SURVEY CONTROL
 DG6213  ______________________________________________________________________
 DG6213* NAD 83(1986) POSITION- 28 16 31.     (N) 081 03 03.     (W)    SCALED
 DG6213* NAVD 88 ORTHO HEIGHT -    23.374 (meters)       76.69  (feet) ADJUSTED
 DG6213  ______________________________________________________________________
 DG6213  GEOID HEIGHT    -        -28.145 (meters)                     GEOID18
 DG6213  DYNAMIC HEIGHT  -         23.340 (meters)       76.57  (feet) COMP
 DG6213  MODELED GRAVITY -    979,170.4   (mgal)                       NAVD 88
 DG6213
 DG6213  VERT ORDER      -  SECOND    CLASS I
 DG6213
 DG6213.The horizontal coordinates were scaled from a map and have
 DG6213.an estimated accuracy of +/- 6 seconds.
 DG6213.
 DG6213.The orthometric height was determined by differential leveling and
 DG6213.adjusted by the NATIONAL GEODETIC SURVEY
 DG6213.in September 2004.
 DG6213
 DG6213.Significant digits in the geoid height do not necessarily reflect accuracy.
 DG6213.GEOID18 height accuracy estimate available here.
 DG6213
 DG6213.Click photographs - Photos may exist for this station.
 DG6213
 DG6213.The dynamic height is computed by dividing the NAVD 88
 DG6213.geopotential number by the normal gravity value computed on the
 DG6213.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DG6213.degrees latitude (g = 980.6199 gals.).
 DG6213
 DG6213.The modeled gravity was interpolated from observed gravity values.
 DG6213
 DG6213;                   North         East     Units  Estimated Accuracy
 DG6213;SPC FL E     -   436,720.      195,010.      MT  (+/- 180 meters Scaled)
 DG6213
 DG6213_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMM950276(NAD 83)
 DG6213
 DG6213                          SUPERSEDED SURVEY CONTROL
 DG6213
 DG6213.No superseded survey control is available for this station.
 DG6213
 DG6213_MARKER: DD = SURVEY DISK
 DG6213_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
```

"F575" Benchmark Datasheet (2 of 2)

DATASHEETS


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DG6213_STAMPING: F 575 2002
DG6213_MARK LOGO: FLDEP
DG6213_PROJECTION: FLUSH
DG6213_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DG6213_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
DG6213+STABILITY: SURFACE MOTION
DG6213_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DG6213+SATELLITE: SATELLITE OBSERVATIONS - December 21, 2002
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DG6213  HISTORY     - Date     Condition        Report By
DG6213  HISTORY     - 20021221 MONUMENTED       FLDEP
DG6213
DG6213                          STATION DESCRIPTION
DG6213
DG6213'DESCRIBED BY FL DEPT OF ENV PRO 2002 (JLM)
DG6213'THE MARK IS ABOUT 19.5 MI SOUTHWEST OF COCOA, 11.1 MI EAST-NORTHEAST
DG6213'OF ST. CLOUD, 9.0 MI  NORTHEAST OF ASHTON, IN SECTION 30, TOWNSHIP 25
DG6213'SOUTH, RANGE 33 EAST.
DG6213'
DG6213'TO REACH THE MARK FROM THE JUNCTION OF U.S. HIGHWAY 192, 441 (13TH
DG6213'STREET) AND COUNTY  ROAD 523 (VERMONT AVENUE, CANOE CREEK ROAD) IN ST.
DG6213'CLOUD, GO EAST ON U.S. HIGHWAY 192, 441  (13TH STREET, EAST BRONSON
DG6213'HIGHWAY) FOR 3.0 MI TO THE INTERSECTION OF STATE ROAD 15,  CONTINUE
DG6213'EAST ON U.S. HIGHWAY 192,441 (BRONSON HIGHWAY) FOR 1.25 MI TO THE
DG6213'JUNCTION OF  NOVA ROAD (COUNTY ROAD 532) ON THE LEFT, TURN LEFT ON
DG6213'NOVA ROAD (COUNTY ROAD 532) AND  GO NORTHEAST FOR 3.65 MI TO CANAL
DG6213'C-32C, CONTINUE EAST ON NOVA ROAD FOR 3.1 MI TO THE  WEST END OF
DG6213'BRIDGE NUMBER 924115 OVER ECONLOCKHATCHEE RIVER SWAMP, CONTINUE EAST
DG6213'ON  NOVA ROAD (COUNTY ROAD 532) FOR 3.55 MI TO THE MARK ON THE RIGHT,
DG6213'SET IN THE TOP OF A  ROUND CONCRETE MONUMENT RECESSED 0.2 FT BELOW THE
DG6213'LEVEL OF THE GROUND AND ABOUT 3.0  FT BELOW THE LEVEL OF COUNTY ROAD
DG6213'532.
DG6213'
DG6213'LOCATED 86.8 FT NORTH OF A BARBWIRE FENCE, 46.6 FT SOUTH OF THE
DG6213'CENTERLINE OF COUNTY  ROAD 532, 6.9 FT WEST OF POWER POLE NUMBER
DG6213'6-71239 AND 1.6 FT WEST OF A CARSONITE WITNESS  POST.
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DG6213'NOTE A BAR MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE
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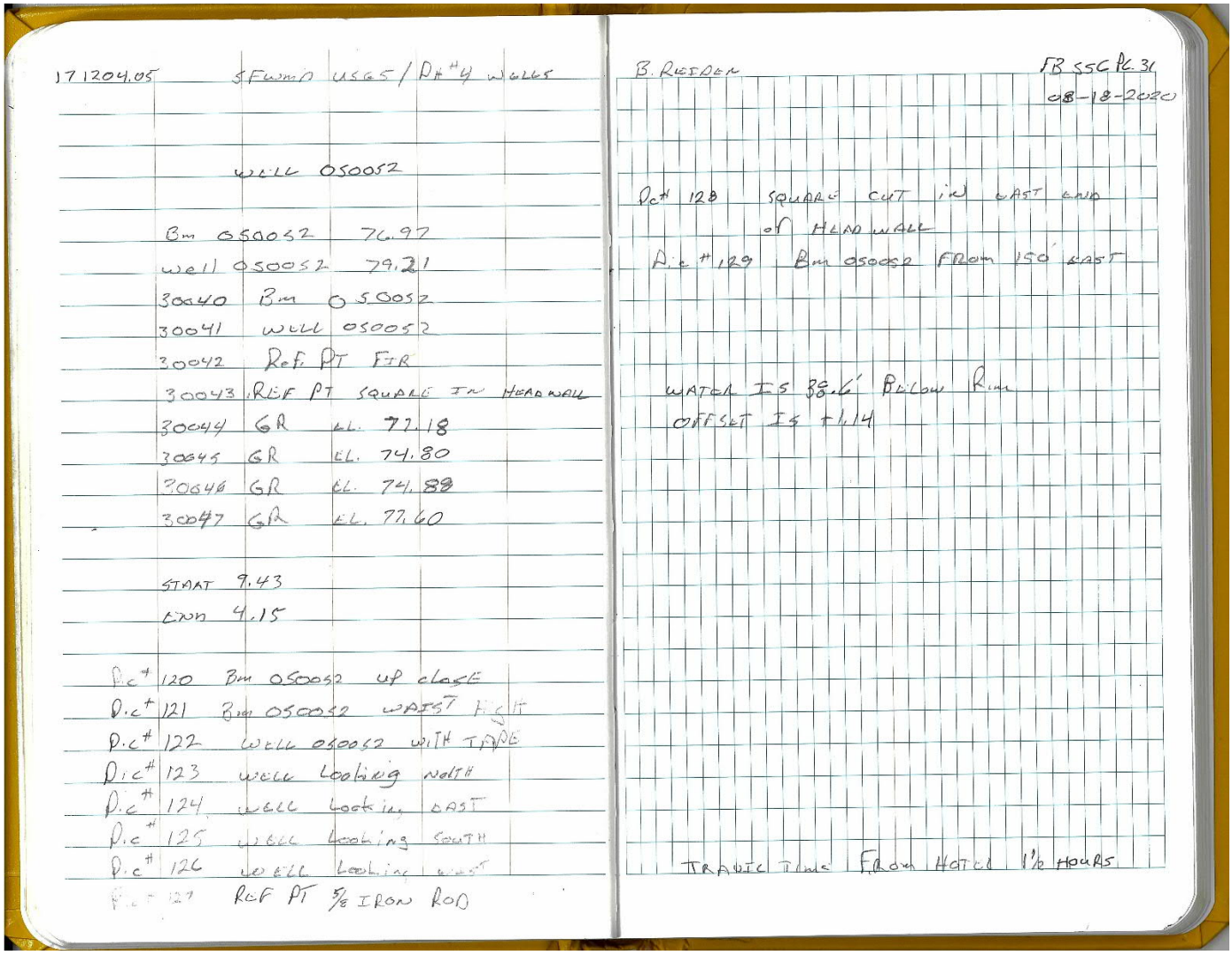
Field Notes (1 of 5)



171204.05 SFWMD USGS / PH#4 WELLS

WELL 050052

Bm 050052 76.97
well 050052 79.21
30040 Bm 050052
30041 WELL 050052
30042 Ref. PT FIR
30043 REF PT SQUARE IN HEADWALL
30044 GR EL. 72.18
30045 GR EL. 74.80
30046 GR EL. 74.88
30047 GR EL. 77.60

START 9.43
END 4.15

P.c# 120 Bm 050052 up close
P.c# 121 Bm 050052 WAIST HIGH
P.c# 122 WELL 050052 WITH TAPE
P.c# 123 WELL Looking NORTH
P.c# 124 WELL Looking EAST
P.c# 125 WELL Looking SOUTH
P.c# 126 WELL Looking WEST
P.c# 127 REF PT 5/8 IRON ROD

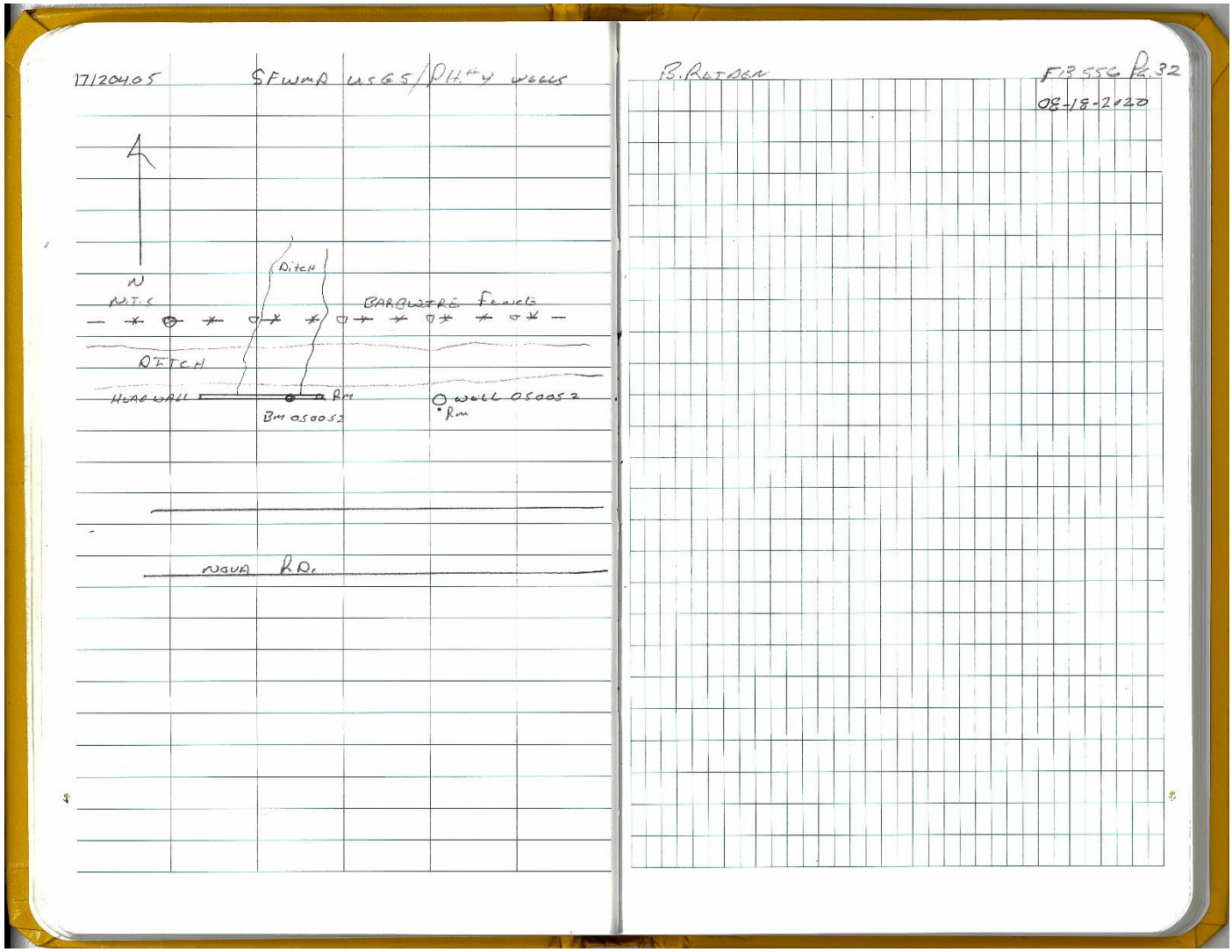
B. RIEDER FB 55C Pg. 31
08-18-2020

P.c# 128 SQUARE CUT IN EAST END of HEAD WALL
P.c# 129 Bm 050052 FROM 150' EAST

WATER IS 88.6' BELOW RIM
OFFSET IS +1.14

TRAVEL TIME FROM HOTEL 1½ HOURS

Field Notes (2 of 5)



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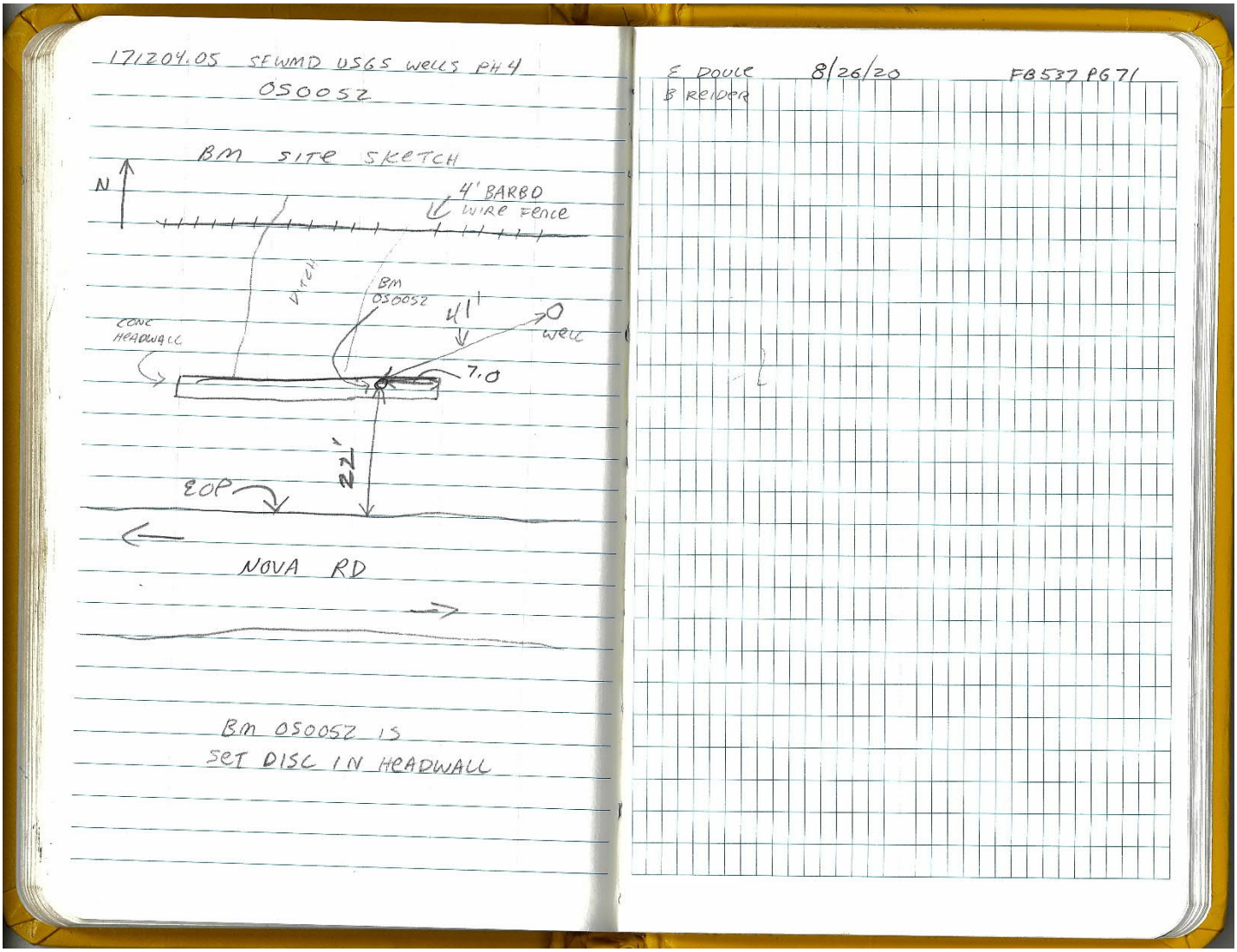

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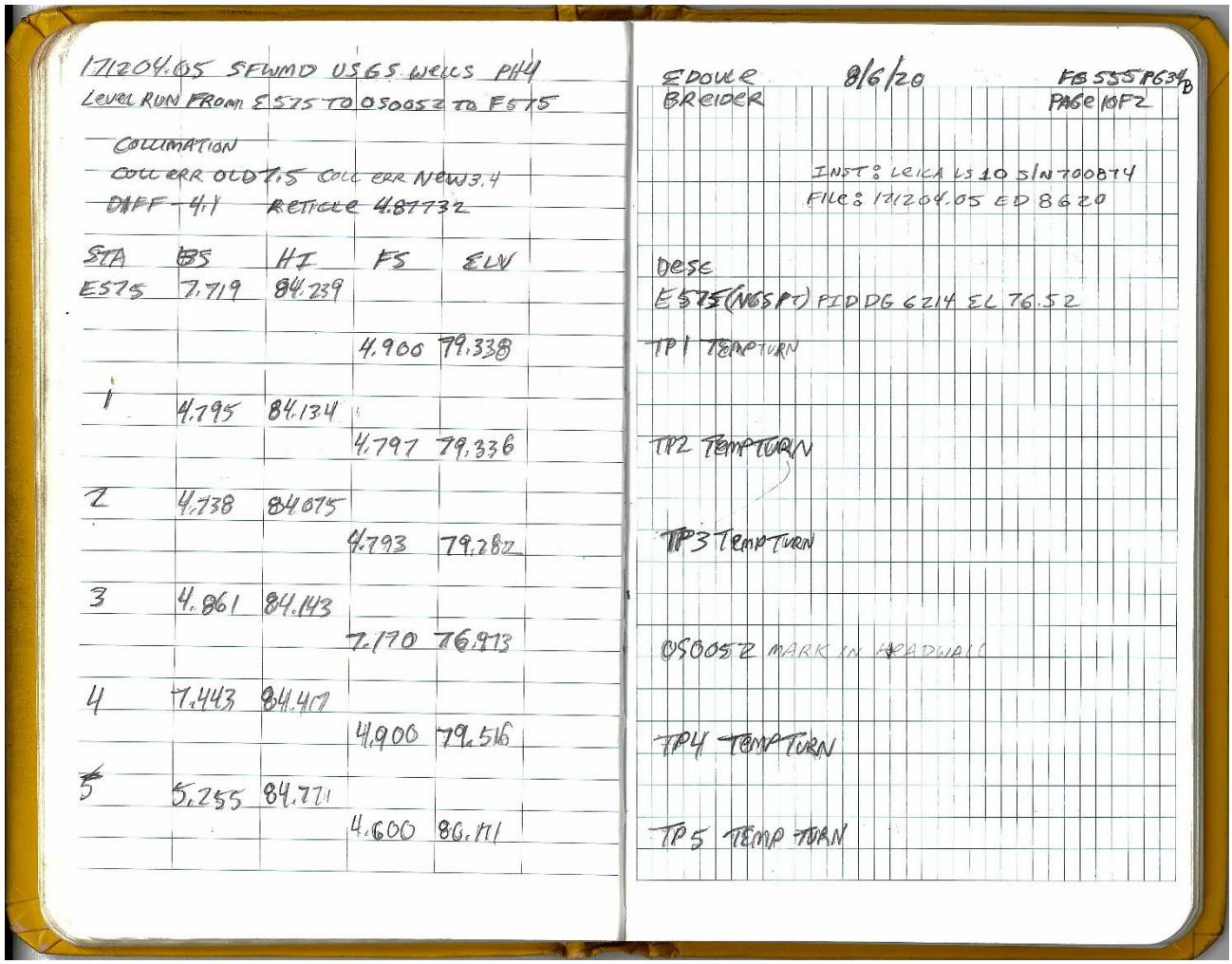


171204.05 SFWMD USGS WELLS PH4
LEVEL RUN FROM E575 TO OS0052 TO E675
COLLIMATION
COLL ERR OLD 7.5 COLL ERR NEW 3.4
DIFF -4.1 RETICLE 4.87732

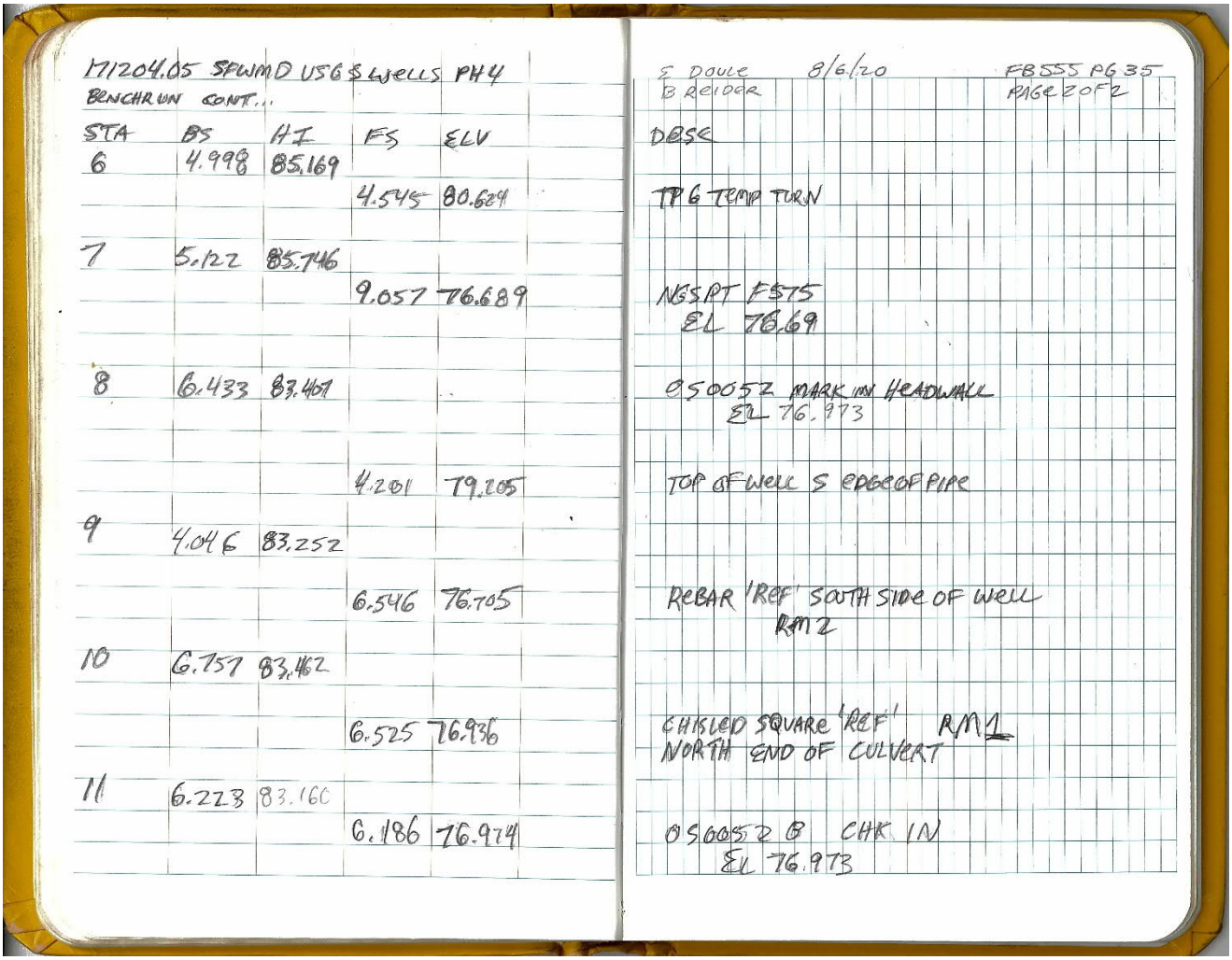
STA	BS	HI	FS	ELV
E575	7.719	84.239		
			4.900	79.338
1	4.795	84.134		
			4.797	79.336
2	4.738	84.075		
			4.793	79.282
3	4.861	84.143		
			7.170	76.973
4	7.443	84.417		
			4.900	79.516
5	5.255	84.771		
			4.600	80.171

EDOUE BREIDER 8/6/20 FB 555 PG 34 D PAGE 1 OF 2

INST: LEICA LS 10 S/N 700874
FILE: 171204.05 ED 8620

DESC
E575 (NGS PT) PID DG 6214 EL 76.52
TP1 TEMP TURN
TP2 TEMP TURN
TP3 TEMP TURN
OS0052 MARK IN HEADWALL
TP4 TEMP TURN
TP5 TEMP TURN

Field Notes (5 of 5)



M1204.05 SFWMD USGS WELLS PH4
BENCHRUN CONT...

STA	BS	HI	FS	ELV
6	4.998	85.169		
			4.545	80.624
7	5.122	85.746		
			9.057	76.689
8	6.433	83.461		
			4.201	79.205
9	4.046	83.252		
			6.546	76.705
10	6.757	83.462		
			6.525	76.936
11	6.223	83.160		
			6.186	76.974

E DOULE 8/6/20 FB555 PG 35
B REIDER PAGE 2 OF 2

DBSE

TP 6 TEMP TURN

NGSRT FS75
EL 76.69

05005Z MARK IN HEADWALL
EL 76.973

TOP OF WELL S EDGE OF PIPE

REBAR 'REF' SOUTH SIDE OF WELL
RM 2

CHISLED SQUARE 'REF' RM 1
NORTH END OF CULVERT

05005Z B CHK IN
EL 76.973

South Florida Water Management District Benchmark Datasheet

Designation: OS0052	Project Name: USGS PHASE 4 WELLS	Type: V	State Plane Zone: FL East
Stamping: OS0052 LB 8336 2020	Field Book Name: 555; 556	Field Book Page: 34-35; 31-32	
Established By: T2ues	Recovered By:	Recovery Date:	
Surveyor: REIDER	Established Date: 08/18/20	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 29	Township: 25S	Range: 33E	
County: OSCEOLA	Quadrangle: NARCOOSSEE SE	Quad Index: 3509	NGS Source BM(s): E 575, F 575
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983	NGS PID(s): DG6214, DG6213
NAVD88 Elevation (feet): 76.973	NGVD29 Elevation (feet): 78.113	2022 Elevation:	NGS NAVD88 Elev (ft): 76.52, 76.69
NAVD88 Class:	NGVD29 Class:	Other Elevation:	NGS NAVD88 Elev (m): 23.323, 23.374
NAVD88 Order: 3RD	NGVD29 Order:	Other Elevation Type:	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: +	1.14	Actual NGS Elevation or ngvd29.txt file:		OPUS Ortho Height:	23.447		
Northing (Y) (feet):	1432758.585	Easting (X) (feet):	641535.541	Source of Latitude & Longitude:	OPUS SOLUTION		
Latitude:	28	16	30.70492	Longitude:	81	2	43.64570
	DD°	MM'	SS"		DD°	MM'	SS"
Latitude (Decimal Degrees):	28.27519581			Longitude (Decimal Degrees):	-81.04545714		

RECOVERY DATA

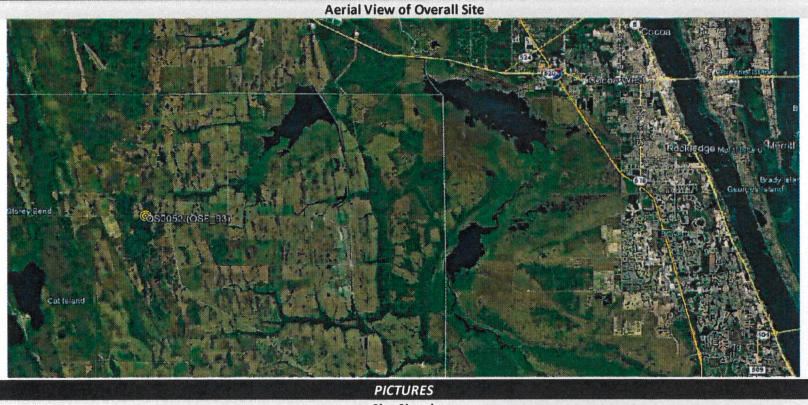
How to Reach:	FROM THE PHYSICAL INTERSECTION OF E IRLO BRONSON MEMORIAL HWY AND NOVA RD, GO NORTHEAST ALONG NOVA RD FOR 11.68 MILE TO THE MARK ON THE NORTH SIDE OF NOVA RD. THE MARK IS SFWMD DISK SET IN THE EAST SIDE OF A HEADWALL FOR A BOX CULVERT RUNNING UNDERMEATH NOVA RD. THE MARK IS 22 FEET NORTH OF NOVA ROADS EDGE OF PAVEMENT, 41 FEET SOUTHWEST OF WELL OS0052 AND 7 FEET FROM THE END OF THE HEADWALL IT IS SET IN.
Description/Notes:	

Notable Landmarks:

Other Source Benchmarks:

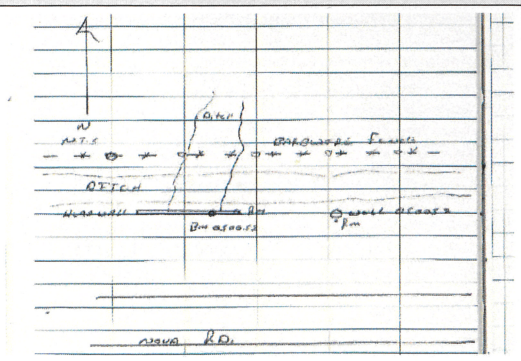
PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



Haywood, Joshua

From: opus <opus@ngs.noaa.gov>
Sent: Tuesday, August 25, 2020 3:02 PM
To: Haywood, Joshua
Subject: OPUS solution : 42732310.20o OP1598381973555

FILE: 42732310.20o OP1598381973555

NGS OPUS SOLUTION REPORT
==========

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information:
https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.ngs.noaa.gov%2FOPUS%2Fabout.jsp%23accuracy&data=02%7C01%7Cjosh.haywood%40t2ue.com%7Cbe4068471b3449f70f1908d849294fc2%7Ce64791d699864645a1a068c1175eda41%7C1%7C0%7C637339789070497660&sdata=pY9%2FyP%2Fkvu21rtdiVh7sRbNuFc09cf2ptg%2Fo9v3jFMk%3D&reserved=0

USER: josh.haywood@t2ue.com DATE: August 25, 2020
RINEX FILE: 4273231n.20o TIME: 19:01:34 UTC

SOFTWARE: page5 1801.18 master57.pl 160321 START: 2020/08/18 13:43:00
EPHEMERIS: igr21192.eph [rapid] STOP: 2020/08/18 20:16:00
NAV FILE: brdc2310.20n OBS USED: 14501 / 15951 : 91%
ANT NAME: TRMR6-3 NONE # FIXED AMB: 105 / 124 : 85%
ARP HEIGHT: 2.000 OVERALL RMS: 0.024(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.6303)

X:	874965.074(m)	0.001(m)	874964.229(m)	0.001(m)
Y:	-5552821.346(m)	0.011(m)	-5552819.784(m)	0.011(m)
Z:	3003396.398(m)	0.010(m)	3003396.242(m)	0.010(m)

LAT:	28 16 30.70492	0.004(m)	28 16 30.72619	0.004(m)
E LON:	278 57 16.35430	0.003(m)	278 57 16.33259	0.003(m)
W LON:	81 2 43.64570	0.003(m)	81 2 43.66741	0.003(m)
EL HGT:	-4.700(m)	0.015(m)	-6.248(m)	0.015(m)
ORTHO HGT:	23.447(m)	0.056(m)	[NAVD88 (Computed using GEOID18)]	

	UTM COORDINATES (UTM (Zone 17))	STATE PLANE COORDINATES (SPC (0901 FL E))
Northing (Y) [meters]	3127688.670	436705.690
Easting (X) [meters]	495541.945	195540.424
Convergence [degrees]	-0.02153333	-0.02153333
Point Scale	0.99960025	0.99994142
Combined Factor	0.99960099	0.99994216

US NATIONAL GRID DESIGNATOR: 17RMM9554127688(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DE9138	OKCB OKEECHOBEE CORS ARP	N271557.715	W0805119.181	113389.0
DQ7965	FLWE WEDGEFIELD FL CORS ARP	N282626.477	W0810533.176	18912.8
DG9757	DLND DELAND CORS ARP	N290322.897	W0811547.480	89153.6

NEAREST NGS PUBLISHED CONTROL POINT

DG6213	F 575	N281631.000	W0810303.000	527.5

BASE STATION INFORMATION

STATION NAME: okcb a 4 (Okeechobee; Okeechobee, Florida, U.S.A.)
MONUMENT: 49587S001

XYZ	901665.5395	-5601320.7260	2904442.8976	MON @ 2010.0000 (M)
XYZ	-0.0116	0.0012	0.0016	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0001	-0.0008	0.1242	ARP TO L1 PHASE CENTER (M)
NEU	-0.0000	-0.0008	0.1337	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1233	0.0124	0.0172	VEL TIMES 10.6305 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0168	-0.1091	0.0570	ARP TO L1 PHASE CENTER
XYZ	901665.4330	-5601320.8227	2904442.9719	L1 PHS CEN @ 2020.6303
XYZ	0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS

XYZ 901665.4330 -5601320.8227 2904442.9719 NEW L1 PHS CEN @ 2020.6303
XYZ 901665.4162 -5601320.7136 2904442.9148 NEW ARP @ 2020.6303
XYZ 901665.4162 -5601320.7136 2904442.9148 NEW MON @ 2020.6303
LLH 27 15 57.73632 279 8 40.79741 -15.2077 NEW L1 PHS CEN @ 2020.6303
LLH 27 15 57.73631 279 8 40.79743 -15.3319 NEW ARP @ 2020.6303
LLH 27 15 57.73631 279 8 40.79743 -15.3319 NEW MON @ 2020.6303

STATION NAME: flwe a 1 (Wedgefield FL; Wedgefield, Florida USA)
MONUMENT: NO DOMES NUMBER
XYZ 869051.4451 -5544931.6701 3019536.5503 MON @ 2010.0000 (M)
XYZ -0.0120 -0.0006 0.0021 VEL (M/YR)
NEU 0.0000 0.0000 0.0000 MON TO ARP (M)
NEU 0.0014 -0.0002 0.0880 ARP TO L1 PHASE CENTER (M)
NEU 0.0006 0.0002 0.0812 ARP TO L2 PHASE CENTER (M)
XYZ -0.1276 -0.0064 0.0223 VEL TIMES 10.6305 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0116 -0.0759 0.0432 ARP TO L1 PHASE CENTER
XYZ 869051.3292 -5544931.7523 3019536.6158 L1 PHS CEN @ 2020.6303
XYZ -0.0000 -0.0000 -0.0000 + XYZ ADJUSTMENTS
XYZ 869051.3292 -5544931.7523 3019536.6158 NEW L1 PHS CEN @ 2020.6303
XYZ 869051.3175 -5544931.6765 3019536.5726 NEW ARP @ 2020.6303
XYZ 869051.3175 -5544931.6765 3019536.5726 NEW MON @ 2020.6303
LLH 28 26 26.49884 278 54 26.80194 -4.9993 NEW L1 PHS CEN @ 2020.6303
LLH 28 26 26.49880 278 54 26.80195 -5.0873 NEW ARP @ 2020.6303
LLH 28 26 26.49880 278 54 26.80195 -5.0873 NEW MON @ 2020.6303

STATION NAME: dlnd a 3 (DELAND; Deland, Florida, U.S.A.)
MONUMENT: NO DOMES NUMBER
XYZ 847548.9489 -5515060.4257 3079363.2140 MON @ 2010.0000 (M)
XYZ -0.0120 0.0012 0.0015 VEL (M/YR)
NEU 0.0000 0.0000 0.0000 MON TO ARP (M)
NEU 0.0001 -0.0008 0.1242 ARP TO L1 PHASE CENTER (M)
NEU -0.0000 -0.0008 0.1337 ARP TO L2 PHASE CENTER (M)
XYZ -0.1280 0.0127 0.0163 VEL TIMES 10.6305 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0157 -0.1074 0.0605 ARP TO L1 PHASE CENTER
XYZ 847548.8367 -5515060.5204 3079363.2907 L1 PHS CEN @ 2020.6303
XYZ -0.0000 0.0000 0.0000 + XYZ ADJUSTMENTS
XYZ 847548.8367 -5515060.5204 3079363.2907 NEW L1 PHS CEN @ 2020.6303
XYZ 847548.8209 -5515060.4130 3079363.2303 NEW ARP @ 2020.6303
XYZ 847548.8209 -5515060.4130 3079363.2303 NEW MON @ 2020.6303
LLH 29 3 22.91916 278 44 12.49708 -1.1443 NEW L1 PHS CEN @ 2020.6303
LLH 29 3 22.91915 278 44 12.49710 -1.2685 NEW ARP @ 2020.6303
LLH 29 3 22.91915 278 44 12.49710 -1.2685 NEW MON @ 2020.6303

REMOTE STATION INFORMATION

STATION NAME: 4273 1
MONUMENT: NO DOMES NUMBER
XYZ 874964.3070 -5552819.9143 3003396.1564 MON @ 2020.6300 (M)
NEU -0.0022 -0.0003 2.0000 MON TO ARP (M)
NEU 0.0022 0.0003 0.0855 ARP TO L1 PHASE CENTER (M)
NEU 0.0017 -0.0018 0.0828 ARP TO L2 PHASE CENTER (M)
XYZ 0.2740 -1.7409 0.9455 MON TO ARP
XYZ 0.0118 -0.0734 0.0424 ARP TO L1 PHASE CENTER
XYZ 874964.5929 -5552821.7286 3003397.1443 L1 PHS CEN @ 2020.6303

BASELINE NAME: okcb 4273
XYZ -0.0779 0.1287 0.0880 + XYZ ADJUSTMENTS
XYZ 874964.5150 -5552821.5998 3003397.2323 NEW L1 PHS CEN @ 2020.6303
XYZ 874964.5031 -5552821.5265 3003397.1899 NEW ARP @ 2020.6303
XYZ 874964.2291 -5552819.7856 3003396.2444 NEW MON @ 2020.6303
LLH 28 16 30.72625 278 57 16.33259 -4.1604 NEW L1 PHS CEN @ 2020.6303
LLH 28 16 30.72618 278 57 16.33258 -4.2460 NEW ARP @ 2020.6303
LLH 28 16 30.72625 278 57 16.33259 -6.2459 NEW MON @ 2020.6303

BASELINE NAME: flwe 4273
XYZ -0.0782 0.1254 0.0894 + XYZ ADJUSTMENTS
XYZ 874964.5147 -5552821.6032 3003397.2337 NEW L1 PHS CEN @ 2020.6303
XYZ 874964.5028 -5552821.5298 3003397.1913 NEW ARP @ 2020.6303
XYZ 874964.2288 -5552819.7889 3003396.2458 NEW MON @ 2020.6303
LLH 28 16 30.72624 278 57 16.33256 -4.1569 NEW L1 PHS CEN @ 2020.6303
LLH 28 16 30.72617 278 57 16.33255 -4.2424 NEW ARP @ 2020.6303
LLH 28 16 30.72624 278 57 16.33256 -6.2424 NEW MON @ 2020.6303

BASELINE NAME: dlnd 4273
XYZ -0.0768 0.1368 0.0791 + XYZ ADJUSTMENTS
XYZ 874964.5161 -5552821.5918 3003397.2234 NEW L1 PHS CEN @ 2020.6303
XYZ 874964.5043 -5552821.5185 3003397.1810 NEW ARP @ 2020.6303
XYZ 874964.2302 -5552819.7775 3003396.2355 NEW MON @ 2020.6303
LLH 28 16 30.72611 278 57 16.33267 -4.1714 NEW L1 PHS CEN @ 2020.6303
LLH 28 16 30.72604 278 57 16.33266 -4.2570 NEW ARP @ 2020.6303
LLH 28 16 30.72611 278 57 16.33267 -6.2569 NEW MON @ 2020.6303

G-FILES

Axx2020 818 20 818
B2020 8181342 20 8182015 1 page5 v1801.18IGS 132 1 2 27NGS 2020 825IFDDPX
IITRF2014_2114 IGS 20200712
C00090005 267011871 7 -485009281 33 -989533295 18 X2310A4273X2310AOKCB
D 1 2 -7161447 1 3 4792134 2 3 -8170288

Axx2020 818 20 818
B2020 8181342 20 8182015 1 page5 v1801.18IGS 132 1 2 27NGS 2020 825IFDDPX
IITRF2014_2114 IGS 20200712
C00090004 -59129112 7 78881124 33 161403268 18 X2310A4273X2310AFLWE
D 1 2 -6998487 1 3 4649825 2 3 -8348781

Axx2020 818 20 818
B2020 8181342 20 8182015 1 page5 v1801.18IGS 132 1 2 27NGS 2020 825IFDDPX
IITRF2014_2114 IGS 20200712
C00090003 -274154093 10 377593645 42 759669948 23 X2310A4273X2310ADLND
D 1 2 -7147105 1 3 5228869 2 3 -8558383

POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	12	13	15
okcb-4273	0.022	0.032	0.012	0.018	0.024	0.030	0.021	0.023	0.020
	17	18	19	20	24	25	28	29	
okcb-4273	0.017	0.021	0.019	0.029	0.022	0.026	0.017	0.023	

	OVERALL	02	03	05	06	09	12	13	15
flwe-4273	0.022	0.024	0.027	0.021	0.021	0.024	0.018	0.021	0.022
	17	18	19	20	24	25	28	29	
flwe-4273	0.015	0.028	0.016	0.030	0.026	0.033	0.016	0.023	

	OVERALL	02	03	05	06	09	12	13	15
dlnd-4273	0.027	0.032	0.028	0.025	0.020	0.028	0.021	0.030	0.032
	17	18	19	20	24	25	28	29	
dlnd-4273	0.012	0.035	0.017	0.051	0.021	0.049	0.014	0.038	

OBS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	12	13	15
okcb-4273	4859	48	30	676	547	235	515	287	330
	17	18	19	20	24	25	28	29	
okcb-4273	367	153	455	100	134	398	204	380	
	OVERALL	02	03	05	06	09	12	13	15
flwe-4273	4960	49	73	684	514	238	499	298	323
	17	18	19	20	24	25	28	29	
flwe-4273	371	172	446	115	187	403	191	397	
	OVERALL	02	03	05	06	09	12	13	15
dlnd-4273	4682	25	57	652	489	215	500	286	325
	17	18	19	20	24	25	28	29	
dlnd-4273	376	156	464	75	171	335	204	352	

ITRF position of 4273 as determined by individual baselines

	X	Y	Z
okcb	874964.229	-5552819.786	3003396.244
flwe	874964.229	-5552819.789	3003396.246
dlnd	874964.230	-5552819.777	3003396.235

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up	
okcb	-0.000	-0.002	0.002	-0.001	0.001	0.003	
flwe	-0.001	-0.005	0.004	-0.001	0.001	0.006	
dlnd	0.001	0.007	-0.006	0.002	-0.003	-0.009	

Covariance Matrix for the xyz OPUS Position (meters^2).

0.0000005533	-0.0000001585	0.0000000803
-0.0000001585	0.0000110422	-0.0000004976
0.0000000803	-0.0000004976	0.0000029711

Covariance Matrix for the enu OPUS Position (meters^2).

0.0000007587	0.0000006906	-0.0000012886
0.0000006906	0.0000042988	-0.0000029891
-0.0000012886	-0.0000029891	0.0000095091

Horizontal network accuracy = 0.00421 meters.
Vertical network accuracy = 0.00605 meters.

Derivation of NAD 83 vector components

Position of reference station ARP in NAD_83(2011)(EPOCH:2010.0000).

Xa(m)	Ya(m)	Za(m)

OKCB	901666.25422	-5601322.30851	2904443.08260	2010.00
FLWE	869052.16310	-5544933.23543	3019536.72788	2010.00
DLND	847549.66841	-5515061.98181	3079363.38792	2010.00

Position of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Xr(m)	Yr(m)	Zr(m)	
OKCB	901666.25422	-5601322.30851	2904443.08260	2010.00
FLWE	869052.16310	-5544933.23543	3019536.72788	2010.00
DLND	847549.66841	-5515061.98181	3079363.38792	2010.00

Velocity of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
OKCB	0.00118	0.00217	-0.00155
FLWE	0.00120	0.00039	-0.00096
DLND	0.00141	0.00220	-0.00149

Vectors from unknown station monument to reference station monument
in NAD_83(2011)(EPOCH:2010.0000).

	Xr-X= DX(m)	Yr-Y= DY(m)	Zr-Z= DZ(m)	
OKCB	26701.18022	-48500.96251	-98953.31540	2010.00
FLWE	-5912.91090	7888.11057	16140.32988	2010.00
DLND	-27415.40559	37759.36419	75966.98992	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (0901 FL E)

Northing (Y) [feet]	1432758.585
Easting (X) [feet]	641535.541
Convergence [degrees]	-0.02153333
Point Scale	0.99994142
Combined Factor	0.99994216

********** New Reference Frame Preview **********

We are replacing the nation's NAD 83 and NAVD 88 datums, to improve access and accuracy of the National Spatial Reference System. More at https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgeodesy.noaa.gov%2Fdatums%2Fnewdatums%2F&data=02%7C01%7Cjosh.haywood%40t2ue.com%7Cbe4068471b3449f70f1908d849294fc2%7Ce64791d699864645a1a068c1175eda41%7C1%7C0%7C637339789070507654&sdata=nbCqZrvBkTB9s5bnnSeDnSDOLocdPMAwiUTjrn7LwDY%3D&reserved=0

Below are approximate coordinates for this solution in the new frames:

APPROX ORTHO HGT: 23.457 (m) [PROTOTYPE (Computed using xGeoid19B,GRS80,ITRF2014)]

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+0000000000000001 32...7+0000000000322104 331.27+0000000000048429
390...+0000000000000003 391.27+0000000000000000
*110002+0000000000000002 32...7+0000000000323731 332.27+0000000000046957
390...+0000000000000003 391.27+0000000000000000
*110003+0000000000000003 32...7+0000000000646431 332.27+0000000000047288
390...+0000000000000004 391.27+0000000000000001
*110004+0000000000000004 32...7+0000000001290744 331.27+0000000000048748
390...+0000000000000004 391.27+0000000000000002
*410005+00000000?......1
*110006+000000000000E575 83..17+0000000000765200
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390...+0000000000000003 391.07+0000000000000004
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390...+0000000000000004 391.07+0000000000000006
*110009+0000000000000TP1 573.07-0000000000007746 574.07+0000000006747487
83..07+0000000000793389
*110010+0000000000000TP1 32...7+0000000003421938 331.07+0000000000047954
390...+0000000000000005 391.07+0000000000000006
*110011+0000000000000TP2 32...7+0000000003475151 332.07+0000000000047974
390...+0000000000000004 391.07+0000000000000006
*110012+0000000000000TP2 573.07-0000000000060960 574.07+0000000013644576
83..07+0000000000793369
*110013+0000000000000TP2 32...7+0000000003458997 331.07+0000000000047384
390...+0000000000000003 391.07+0000000000000004
*110014+0000000000000TP3 32...7+0000000003487962 332.07+0000000000047932
390...+0000000000000003 391.07+0000000000000005
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83..07+0000000000792821
*110016+0000000000000TP3 32...7+0000000002304918 331.07+0000000000048614
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*110017+000000000OS0052 32...7+0000000002241107 332.07+0000000000071702
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390...+0000000000000004 391.07+0000000000000006
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*110021+0000000000000TP4 573.07+0000000000006362 574.07+0000000032071893
83..07+0000000000795163
*110022+0000000000000TP4 32...7+0000000003492499 331.07+0000000000052552
390...+0000000000000003 391.07+0000000000000006
*110023+0000000000000TP5 32...7+0000000003488460 332.07+0000000000046002
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83..07+0000000000801713
*110025+0000000000000TP5 32...7+0000000002041372 331.07+0000000000049980
390...+0000000000000003 391.07+0000000000000003
*110026+0000000000000TP6 32...7+0000000002003675 332.07+0000000000045451
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390...+0000000000000003 391.07+0000000000000001
*110027+0000000000000TP6 573.07+0000000000048098 574.07+0000000043097899
83..07+0000000000806242
*110028+0000000000000TP6 32...7+0000000000823635 331.07+0000000000051228
390...+0000000000000003 391.07+0000000000000000
*110029+000000000000F575 32...7+0000000000828803 332.07+0000000000090571
390...+0000000000000004 391.07+0000000000000001 71....+000000000EL76.69
*110030+000000000000F575 573.07+0000000000042931 574.07+0000000044750337
83..07+0000000000766899
*410031+00000000?......1
*110032+0000000000OS0052 83..07+0000000000769733
*110033+0000000000OS0052 32...7+0000000000244662 331.07+0000000000064338
390...+0000000000000003 391.07+0000000000000000
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83..07+0000000000792057
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390...+0000000000000003 391.07+0000000000000000
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390...+0000000000000003 391.07+0000000000000000
*110038+0000000000REBAR 573.07+0000000000037761 574.07+0000000000879824
83..07+0000000000767056
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*110040+00CHISLED SQUARE 32...7+0000000000186253 332.07+0000000000065260
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*110041+00CHISLED SQUARE 573.07+0000000000055589 574.07+0000000001270158
83..07+0000000000769369
*110042+00CHISLED SQUARE 32...7+0000000000190609 331.07+0000000000062238
390...+0000000000000003 391.07+0000000000000000
*110043+000000000OS0052B 32...7+0000000000249659 332.07+0000000000061864
390...+0000000000000003 391.07+0000000000000000
*110044+000000000OS0052B 573.07-0000000000003460 574.07+0000000001710425
83..07+0000000000769742
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Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\OS0052.vce	Name:	Default
Size:	48 KB	Datum:	WGS 1984
Modified:	8/11/2020 4:20:58 PM (UTC:-4)	Zone:	Default
Time zone:	Eastern Standard Time	Geoid:	
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Level Report

Imported file: M_171204.05ED8620.GSI
Instrument:
Creation option: Delta elevations
Description usage: Feature codes

Run - 0002 Raw Observations

Standard error per kilometer of double leveling: 0.00230 ft
Standard error per turn/station setup: 0.00000 ft
Raw Misclosure: -0.00025 ft
Σ BS Distances: 2239.659 ft
Σ FS Distances: 2235.366 ft
Run Length: 4475.025 ft
Reduction: Raw Elevations

Create	Point ID	BS	HI	IS	FS	Δ Elevation	Raw Elevation	Misclosure	Adj. Elevation	Type	Distance	Description
✓	E575	✓ 7.71958 ft	84.23943 ft			0.00000 ft	76.51985 ft	0.00000 ft	76.51985 ft	Benchmark	336.986 ft	
✓	TP1				✓ 4.90069 ft	2.81889 ft	79.33874 ft			Computed	337.761 ft	
	TP1	✓ 4.79539 ft	84.13413 ft								342.193 ft	
✓	TP2				✓ 4.79739 ft	-0.00200 ft	79.33674 ft			Computed	347.514 ft	
	TP2	✓ 4.73839 ft	84.07513 ft								345.899 ft	
✓	TP3				✓ 4.79319 ft	-0.05480 ft	79.28194 ft			Computed	348.796 ft	
	TP3	✓ 4.86139 ft	84.14333 ft								230.491 ft	
✓	OS0052				✓ 7.17019 ft	-2.30880 ft	76.97315 ft			Computed	224.110 ft	
	OS0052	✓ 7.44379 ft	84.41693 ft								348.340 ft	
✓	TP4				✓ 4.90079 ft	2.54299 ft	79.51614 ft			Computed	345.092 ft	
	TP4	✓ 5.25519 ft	84.77133 ft								349.249 ft	
✓	TP5				✓ 4.60019 ft	0.65500 ft	80.17114 ft			Computed	348.845 ft	
	TP5	✓ 4.99799 ft	85.16913 ft								204.137 ft	
✓	TP6				✓ 4.54509 ft	0.45290 ft	80.62404 ft			Computed	200.367 ft	
	TP6	✓ 5.12279 ft	85.74683 ft								82.363 ft	
✓	F575				✓ 9.05708 ft	-3.93429 ft	76.68975 ft	-0.00025 ft	76.69000 ft	Benchmark	82.880 ft	

Run - 0002 (N4) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
E575-TP1 (E15)	Enabled	2.81889 ft	0.00000 ft	2.81889 ft	1	674.747 ft	7.71958 ft	4.90069 ft	0.00104 ft
TP1-TP2 (E16)	Enabled	-0.00200 ft	0.00000 ft	-0.00200 ft	1	689.708 ft	4.79539 ft	4.79739 ft	0.00105 ft
TP2-TP3 (E17)	Enabled	-0.05480 ft	0.00000 ft	-0.05480 ft	1	694.695 ft	4.73839 ft	4.79319 ft	0.00106 ft
TP3-OS0052 (E18)	Enabled	-2.30880 ft	0.00000 ft	-2.30880 ft	1	454.602 ft	4.86139 ft	7.17019 ft	0.00085 ft
OS0052-TP4 (E19)	Enabled	2.54299 ft	0.00000 ft	2.54299 ft	1	693.432 ft	7.44379 ft	4.90079 ft	0.00106 ft
TP4-TP5 (E20)	Enabled	0.65500 ft	0.00000 ft	0.65500 ft	1	698.095 ft	5.25519 ft	4.60019 ft	0.00106 ft
TP5-TP6 (E21)	Enabled	0.45290 ft	0.00000 ft	0.45290 ft	1	404.504 ft	4.99799 ft	4.54509 ft	0.00081 ft
TP6-F575 (E22)	Enabled	-3.93429 ft	0.00000 ft	-3.93429 ft	1	165.243 ft	5.12279 ft	9.05708 ft	0.00052 ft

Run - 0002 (N4) Reduced Coordinates

Point ID	Status	Elevation
E575	Enabled	76.51985 ft
F575	Enabled	76.69000 ft

Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\OS0052.vce	Name:	Default
Size:	48 KB	Datum:	WGS 1984
Modified:	8/11/2020 4:20:58 PM (UTC:-4)	Zone:	Default
Time zone:	Eastern Standard Time	Geoid:	
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Level Report

Imported file: M_171204.05ED8620.GSI
Instrument:
Creation option: Delta elevations
Description usage: Feature codes

Run - 0003 Raw Observations

Standard error per kilometer of double leveling: 0.00230 ft
Standard error per turn/station setup: 0.00000 ft
Raw Misclosure: 0.00105 ft
Σ BS Distances: 85.348 ft
Σ FS Distances: 85.694 ft
Run Length: 171.042 ft
Reduction: Raw Elevations

Create	Point ID	BS	HI	IS	FS	Δ Elevation	Raw Elevation	Misclosure	Adj. Elevation	Type	Distance	Description
✓	OS0052	✓ 6.43379 ft	83.40693 ft			0.00000 ft	76.97315 ft	0.00000 ft	76.97315 ft	Benchmark	24.466 ft	
✓	TOP OF WELL MP				✓ 4.20149 ft	2.23230 ft	79.20544 ft			Computed	21.111 ft	
	TOP OF WELL MP	✓ 4.04639 ft	83.25183 ft								21.413 ft	
✓	RM2 REBAR				✓ 6.54639 ft	-2.50000 ft	76.70545 ft			Computed	20.992 ft	
	RM2 REBAR	✓ 6.75719 ft	83.46263 ft								20.408 ft	
✓	RM1 CHISLED SQUARE				✓ 6.52599 ft	0.23120 ft	76.93665 ft			Computed	18.625 ft	
	RM1 CHISLED SQUARE	✓ 6.22379 ft	83.16043 ft								19.061 ft	
✓	OS0052B				✓ 6.18639 ft	0.03740 ft	76.97405 ft	0.00105 ft	76.97300 ft	Benchmark	24.966 ft	

Run - 0003 (N8) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
OS0052-TOP OF WELL MP (E37)	Enabled	2.23230 ft	0.00000 ft	2.23230 ft	1	45.578 ft	6.43379 ft	4.20149 ft	0.00027 ft
TOP OF WELL MP-RM2 REBAR (E38)	Enabled	-2.50000 ft	0.00000 ft	-2.50000 ft	1	42.405 ft	4.04639 ft	6.54639 ft	0.00026 ft
RM2 REBAR-RM1 CHISLED SQUARE (E39)	Enabled	0.23120 ft	0.00000 ft	0.23120 ft	1	39.033 ft	6.75719 ft	6.52599 ft	0.00025 ft
RM1 CHISLED SQUARE-OS0052B (E40)	Enabled	0.03740 ft	0.00000 ft	0.03740 ft	1	44.027 ft	6.22379 ft	6.18639 ft	0.00027 ft

Run - 0003 (N8) Reduced Coordinates

Point ID	Status	Elevation
OS0052	Enabled	76.97315 ft
OS0052B	Enabled	76.97300 ft

Office

Project

25 August 2020

INPUT	OUTPUT
State Plane, NAD83	State Plane, NAD83
0901 - Florida East, U.S. Feet	0901 - Florida East, U.S. Feet
Vertical - NAVD88, U.S. Feet	Vertical - NGVD29 (Vertcon94), U.S. Feet

OS0052

1/1

Northing/Y:	1432758.557	**Northing/Y:**	1432758.557
Easting/X:	641535.625	**Easting/X:**	641535.625
Elevation/Z:	76.97	**Elevation/Z:**	78.112
Convergence:	-0 01 17.51967	**Convergence:**	-0 01 17.51967
Scale Factor:	0.999941422	**Scale Factor:**	0.999941422
Combined Factor:	0.999942153	**Combined Factor:**	0.999942099

Grid Shift (U.S. ft.): X/Easting = 0.0, Y/Northing = 0.0

Remark: