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SURVEYOR'S REPORT

USGS Wells Phase 4

USGS Station No: 280750081155701

Station Name: CCR-W

Prepared For: South Florida Water Management
District

Work Order No: 4600004161-WO5

Report Date: September 1, 2020



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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 Urquhart
Professional Surveyor & Mapper
Florida Certificate No. 6524

(For the firm – LB 8336)

Date Signed



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 **CCR-W**, 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 Q 506, ran through site benchmark CCR W and closed on National Geodetic Survey Benchmark N 506. 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 $0.02 \times \text{SQRT}(\text{miles})$.

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 CCR-W OPUS Report.

DATES OF FIELD DATA COLLECTION

Field survey work by T2 was performed between July 31st & August 17th, 2020. Field notes are contained in Field Book 556, pages 10-12, 25 and 30.



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U.S.G.S. Station Name: CCR-W	U.S.G.S. Station Number: 280750081155701	Agency: T2 UES, Inc.	Date of Field Work: 8-17-2020
Party Chief: REIDER	Field Book: 556	Page(s): 10-12, 25, 30	Report Prepared by: CHAMBLESS

SITE SPECIFIC DATA

Site Benchmark: CCR-W	Benchmark Elevation(s) (NAVD88): 68.28	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.07	
Well Reference Elevation (NAVD88): 71.40	DTW: 21.53 (08/12/2020 at 10:25 AM)	Ground Elevation (NAVD88): 69.30	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 13	Township 27S	Range 30E
Well Latitude: 28°07'50.83" N	Well Longitude: 81°15'56.33" W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 1380346.516	Easting (X) = 570548.453

Notes: NAVD88 – North American Vertical Datum of 1988; NGVD29- National Geodetic Vertical Datum of 1929; Corpscon 6.0.1 - A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.

PICTURES

Aerial of Overall Well Site



Not to scale (GoogleEarth product)



Well Site and Well Head



Well: "CCR-W"
Reference Point: N. RIM OF 6"
IRON PIPE UNDER ACCESS CAP

Reference Point El. = 71.40
feet NAVD88

Distance to Water = 21.53
feet from reference point
(08/12/2020 at 10:25 AM)



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New Aluminum Tag



RTU W
STN CCR - W
ELEV 71.40 NAVD88
DATE 08-12-2020
BY T2UE
OFFSET + 1.07



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USGS RMs

NO LEVEL REPORT PROVIDED BY DISTRICT



Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: 28°07'51.09" N
Longitude: 81°16'01.02" W
NAVD88 EL = 68.28





Source Benchmarks



NGS Benchmark "Q506" (AJ6658)



Latitude: 28°08'28" N SCALED
Longitude: 81°16'01" W SCALED
NAVD88 EL = 66.34 feet

NGS Benchmark "N506" (AJ6656)



Latitude: 28°06'48" N SCALED
Longitude: 81°16'01" W SCALED
NAVD88 EL = 64.37 feet





"Q506" Benchmark Datasheet (1 of 2)

DATASHEETS

Page 1 of 2

The NGS Data Sheet

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

```

PROGRAM = datasheet95, VERSION = 8.12.5.7
Starting Datasheet Retrieval...
1 National Geodetic Survey, Retrieval Date = MAY 19, 2020
AJ6658 *****
AJ6658 DESIGNATION - Q 506
AJ6658 PID - AJ6658
AJ6658 STATE/COUNTY- FL/OSCEOLA
AJ6658 COUNTRY - US
AJ6658 USGS QUAD - SAINT CLOUD SOUTH (2018)
AJ6658
AJ6658 *CURRENT SURVEY CONTROL
AJ6658
AJ6658* NAD 83(1986) POSITION- 28 08 28. (N) 081 16 01. (W) SCALED
AJ6658* NAVD 88 ORTHO HEIGHT - 20.221 (meters) 66.34 (feet) ADJUSTED
AJ6658
AJ6658 GEOID HEIGHT - -27.817 (meters) GEOID18
AJ6658 DYNAMIC HEIGHT - 20.191 (meters) 66.24 (feet) COMP
AJ6658 MODELED GRAVITY - 979,153.2 (mgal) NAVD 88
AJ6658
AJ6658 VERT ORDER - SECOND CLASS I
AJ6658
AJ6658.The horizontal coordinates were scaled from a map and have
AJ6658.an estimated accuracy of +/- 6 seconds.
AJ6658.
AJ6658.The orthometric height was determined by differential leveling and
AJ6658.adjusted by the NATIONAL GEODETIC SURVEY
AJ6658.in April 2004.
AJ6658
AJ6658.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ6658.GEOID18 height accuracy estimate available here.
AJ6658
AJ6658.Click photographs - Photos may exist for this station.
AJ6658
AJ6658.The dynamic height is computed by dividing the NAVD 88
AJ6658.geopotential number by the normal gravity value computed on the
AJ6658.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ6658.degrees latitude (g = 980.6199 gals.).
AJ6658
AJ6658.The modeled gravity was interpolated from observed gravity values.
AJ6658
AJ6658; North East Units Estimated Accuracy
AJ6658;SPC FL E - 421,880. 173,780. MT (+/- 180 meters Scaled)
AJ6658
AJ6658 U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMM737128(NAD 83)
AJ6658
AJ6658 SUPERSEDED SURVEY CONTROL
AJ6658
AJ6658.No superseded survey control is available for this station.
AJ6658
AJ6658 MARKER: F = FLANGE-ENCASED ROD
AJ6658_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)

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"Q506" Benchmark Datasheet (2 of 2)

DATASHEETS

Page 2 of 2

AJ6658 STAMPING: Q 506 2001
 AJ6658 MARK LOGO: NGS
 AJ6658 PROJECTION: FLUSH
 AJ6658 MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 AJ6658 STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 AJ6658 SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
 AJ6658 SATELLITE: SATELLITE OBSERVATIONS - November 22, 2002
 AJ6658 ROD/PIPE-DEPTH: 25.2 meters

AJ6658	HISTORY	- Date	Condition	Report By
AJ6658	HISTORY	- 2001	MONUMENTED	FLDEP
AJ6658	HISTORY	- 20021122	GOOD	FLDEP

AJ6658

STATION DESCRIPTION

AJ6658

AJ6658 DESCRIBED BY FL DEPT OF ENV PRO 2001 (JLM)
 AJ6658 THE MARK IS ABOUT 23.8 MI (38.3 KM) NORTH OF KENSVILLE, 7.6 MI (12.2
 AJ6658 KM) SOUTH OF ST. CLOUD, IN SECTION 13, TOWNSHIP 27 SOUTH, RANGE 30
 AJ6658 EAST. TO REACH THE MARK FROM THE JUNCTION OF U.S. HIGHWAYS 192, 441
 AJ6658 (13TH STREET) AND COUNTY ROAD 523 (VERMONT AVENUE, CANOE CREEK ROAD)
 AJ6658 IN ST. CLOUD, GO SOUTH ON COUNTY ROAD 523 (VERMONT AVENUE, CANOE
 AJ6658 CREEK ROAD) FOR 7.6 MI (12.2 KM) TO THE MARK ON THE LEFT, A STAINLESS
 AJ6658 STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 82.6 FT (25.2 M) WITH A NGS
 AJ6658 LOGO CAP FLUSH WITH THE GROUND AND 3.0 FT (0.9 M) BELOW THE LEVEL OF
 AJ6658 COUNTY ROAD 523, THE DATUM POINT IS RECESSED 0.6 FT (18.3 CM) BELOW
 AJ6658 THE LEVEL OF THE NGS LOGO CAP. LOCATED 91.0 FT (27.7 M) SOUTH OF POWER
 AJ6658 POLE NUMBER R26EE-1620, 61.0 FT (18.6 M) SOUTHEAST OF THE EAST END OF
 AJ6658 A METAL CULVERT UNDER COUNTY ROAD 523, 59.0 FT (18.0 M) SOUTHEAST OF A
 AJ6658 METAL POST, 6.6 FT (2.0 M) WEST OF A HOG WIRE FENCE AND 1.3 FT (0.4 M)
 AJ6658 WEST OF A CARSONITE WITNESS POST. NOTE ACCESS TO THE DATUM POINT IS
 AJ6658 HAD THROUGH A 5-INCH NGS LOGO CAP. NOTE A BAR MAGNET WAS IMBEDDED IN
 AJ6658 THE MONUMENT ON THE SOUTH SIDE, 0.2 FT (6.1 CM) BELOW THE TOP OF THE
 AJ6658 MONUMENT.

AJ6658

STATION RECOVERY (2002)

AJ6658

AJ6658 RECOVERY NOTE BY FL DEPT OF ENV PRO 2002 (JLM)
 AJ6658 RECOVERED IN GOOD CONDITION.

*** retrieval complete.
 Elapsed Time = 00:00:02



"N506" Benchmark Datasheet (1 of 2)

The NGS Data Sheet

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

PROGRAM = datasheet95, VERSION = 8.12.5.9
Starting Datasheet Retrieval...
1 National Geodetic Survey, Retrieval Date = JULY 28, 2020
AJ6656 *****
AJ6656 DESIGNATION - N 506
AJ6656 PID - AJ6656
AJ6656 STATE/COUNTY- FL/OSCEOLA
AJ6656 COUNTRY - US
AJ6656 USGS QUAD - CYPRESS LAKE (2018)
AJ6656
AJ6656 *CURRENT SURVEY CONTROL
AJ6656
AJ6656* NAD 83(1986) POSITION- 28 06 48. (N) 081 16 01. (W) SCALED
AJ6656* [NAVD 88](#) ORTHO HEIGHT - 19.621 (meters) 64.37 (feet) ADJUSTED
AJ6656
AJ6656 GEOID HEIGHT - -27.756 (meters) GEOID18
AJ6656 DYNAMIC HEIGHT - 19.592 (meters) 64.28 (feet) COMP
AJ6656 MODELED GRAVITY - 979,152.1 (mgal) NAVD 88
AJ6656
AJ6656 VERT ORDER - SECOND CLASS I
AJ6656
AJ6656.The horizontal coordinates were scaled from a map and have
AJ6656.an estimated accuracy of +/- 6 seconds.
AJ6656.
AJ6656.The orthometric height was determined by differential leveling and
AJ6656.adjusted by the NATIONAL GEODETIC SURVEY
AJ6656.in April 2004.
AJ6656
AJ6656.Significant digits in the geoid height do not necessarily reflect accuracy.
AJ6656.GEOID18 height accuracy estimate available [here](#).
AJ6656
AJ6656.Click [photographs](#) - Photos may exist for this station.
AJ6656
AJ6656.The dynamic height is computed by dividing the NAVD 88
AJ6656.geopotential number by the normal gravity value computed on the
AJ6656.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AJ6656.degrees latitude (g = 980.6199 gals.).
AJ6656
AJ6656.The modeled gravity was interpolated from observed gravity values.
AJ6656
AJ6656;
AJ6656;SPC FL E - North East Units Estimated Accuracy
AJ6656; - 418,800. 173,770. MT (+/- 180 meters Scaled)
AJ6656
AJ6656_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMM737097(NAD 83)
AJ6656
AJ6656 SUPERSEDED SURVEY CONTROL
AJ6656
AJ6656.No superseded survey control is available for this station.
AJ6656



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"N506" Benchmark Datasheet (2 of 2)

AJ6656_MARKER: DD = SURVEY DISK
 AJ6656_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 AJ6656_STAMPING: N 506 2001
 AJ6656_MARK LOGO: FLDEP
 AJ6656_PROJECTION: RECESSED 5 CENTIMETERS
 AJ6656_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT
 AJ6656_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 AJ6656+STABILITY: SURFACE MOTION
 AJ6656_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 AJ6656+SATELLITE: SATELLITE OBSERVATIONS - October 23, 2015

AJ6656	HISTORY	- Date	Condition	Report By
AJ6656	HISTORY	- 2001	MONUMENTED	FLDEP
AJ6656	HISTORY	- 20151023	GOOD	FLDEP

AJ6656
 AJ6656 STATION DESCRIPTION
 AJ6656

AJ6656'DESCRIBED BY FL DEPT OF ENV PRO 2001 (JLM)
 AJ6656'THE MARK IS ABOUT 21.8 MI (35.1 KM) NORTH OF KENSVILLE, 9.6 MI (15.4
 AJ6656'KM) SOUTH OF ST. CLOUD, IN SECTION 25, TOWNSHIP 27 SOUTH, RANGE 30
 AJ6656'EAST. TO REACH THE MARK FROM THE JUNCTION OF U.S. HIGHWAYS 192, 441
 AJ6656'(13TH STREET) AND COUNTY ROAD 523 (VERMONT AVENUE, CANOE CREEK ROAD)
 AJ6656'IN ST. CLOUD, GO SOUTH ON COUNTY ROAD 523 (VERMONT AVENUE, CANOE
 AJ6656'CREEK ROAD) FOR 9.6 MI (15.4 KM) TO THE MARK ON THE LEFT, SET IN THE
 AJ6656'TOP OF A ROUND CONCRETE MONUMENT FLUSH WITH THE GROUND AND 1.0 FT (0.3
 AJ6656'M) BELOW THE LEVEL OF COUNTY ROAD 523. LOCATED 213.2 FT (65.0 M) SOUTH
 AJ6656'OF POWER POLE NUMBER B15129, 67.0 FT (20.4 M) NORTH OF POWER POLE
 AJ6656'NUMBER 6-84199, 1.7 FT (0.5 M) WEST OF A BARBWIRE FENCE AND 1.0 FT
 AJ6656'(0.3 M) WEST OF A CARSONITE WITNESS POST. NOTE A BAR MAGNET WAS
 AJ6656'IMBEDDED IN THE MONUMENT ON THE SOUTH SIDE, 0.2 FT (6.1 CM) BELOW THE
 AJ6656'TOP OF THE MONUMENT.

AJ6656
 AJ6656 STATION RECOVERY (2015)
 AJ6656

AJ6656'RECOVERY NOTE BY FL DEPT OF ENV PRO 2015 (BPJ)
 AJ6656'RECOVERED AS DESCRIBED.
 AJ6656'
 AJ6656'NOT LEVELED TO THIS DATE (EXTRA TIE MARK).

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



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Field Notes (1 of 5)

171204.05 SEWMD USGS PH4 WELLS				J. CONNORS	556/10
WELL CCR-W				T. ADT	7/28/20
LEICA DNA 03					
S/N: 347859					
FILE: 171204.05JL 72820					
COLLIMATION					
COLL ERROR OLD = -19.1" COLL ERROR NEW = -14.1"					
DIFF = 5.0" RECTILE = 4.5403					
STA	BS(+)	H.I.	F.S. (-)	EL.	DESC.
	6.6279	72.9679		66.34	Q 506 66.34 (88)
	5.2545	73.6258	4.5966	68.3712	T.P. 1
	5.1262	74.2222	4.5298	69.0960	T.P. 2
	4.7519	73.7137	5.2603	68.9619	T.P. 3
	4.8611	74.1601	4.4147	69.2990	T.P. 4
	4.5894	74.0206	4.7289	69.4312	T.P. 5
	5.1702	74.4205	4.7704	69.2503	T.P. 6



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Field Notes (2 of 5)

STA	BS (+)	H.I.	F.S. (-)	EL.	DESC.
171204.05 SFWMD USGS PH 4 WELLS					
WELL CCR-W					
(CONTINUED FROM PG 10)					
4.0467	73.5871	4.8802	69.5403		T.P. 7
5.9149	74.1952	5.3067	68.2803		FCM "CCRW 688336" N.RIM, NO M.P. UNDER CAP
2.7168	74.1176	2.7945	71.4007		WELL CCR-W N.RIM UNDER CAP. NO M.P. FOUND.
5.0701	74.4177	4.7700	69.3475		T.P. 8
4.5974	74.1808	4.8343	69.5834		T.P. 9
4.3031	73.1579	5.3259	68.8548		T.P. 10
4.1567	72.5767	4.7379	68.4200		P506 (68.54) (88) ENDED 7/28, STARTED 7/29
3.5183	73.4288	2.6662	69.9104		T.P. 11
4.1349	72.7014	4.8623	68.5665		T.P. 12
4.0617	71.9767	4.7863	67.9150		T.P. 13
4.3760	71.5707	4.7820	67.1917		T.P. 14



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Field Notes (3 of 5)

171204.05 SFWMD USGS PH4 WELLS				
WELL CCR-W				
(CONTINUED FROM PG 11)				
STA	B.S. (+)	H.I.	F.S. (-)	EL.
	5.9858	72.6986	4.8579	66.7128
	5.1987	72.2641	5.6332	67.0654
	4.7109	71.5199	5.4462	66.6180 ⁸¹⁸⁰
	4.9583	71.6854	4.7927	66.7272
	3.8876	70.3282	5.2448	66.4406
			5.9667	64.3615

J. CONNORS		
T. AOT	7/29/20	FB556 PG 12
DESC.		
T.P. 15		
T.P. 16		
T.P. 17		
T.P. 18		
T.P. 19		
* N506 FCM (64.37)(88) FOEP 2001		



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Field Notes (4 of 5)

17120405 SFWMID USES/PH. 4 WELLS

WELL CCR-W

Bm CCR-W SET SFWMA Disk in
Poured in Place c. man
8" DIA STAMPED CCR-W
LB 8336 2020

Bm 68.28 ✓ CHECK IN 68.28
CCR-W-08-12-2020
Bm Locⁿ 30010
WELL LOC. ⁿ 30010
GR. SHOTS 30012-30015
30012 EL= 69.21
30013 EL= 69.39
30014 EL= 69.15
30015 EL= 69.24

Pic. # 13 WELL CCR-W
Pic # 14 Looking NORTH
Pic # 15 Looking EAST
Pic # 16 Looking SOUTH
Pic # 17 Looking WEST

WELL IS 6" STEEL CASING w/ FLANGES
SET IN 12" STEEL CASING

B. Retina FB 556 R25

OPUS-CCR-W-08-12-2020

START 10.25

CRW OFF SET +1.07

METERED DOWN TO WATER AT WELL
2/153

Pic 18 Bm
Pic # 19 Looking NORTH
Pic # 20 Looking EAST
Pic # 21 Looking SOUTH
Pic # 22 Looking WEST
Pic # 23 TAB ON NORTH FACE OF WELL
CASING

DITCH

Power Line

NO. CAPPING
CAP # 17 4' BAROWSKA FLOOR

3715 TO CAP wood P.P. GO TO Pole # 8256743
60'

MA16 BOX 30.1 Bm CCR-W
TO FENCE 2'

DIRE DIRECTION



South Florida Water Management District Benchmark Datasheet

Designation: CCR W	Project Name: USGS PHASE 4 WELLS	Type: V	State Plane Zone: FL East
Stamping: CCR W LB 8336	Field Book Name: 556	Field Book Page: 10-12, 25, 30	
Established By: T2ues	Recovered By:	Recovery Date:	
Surveyor: REIDER	Established Date: 08/12/20	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 13	Township: 27S	Range: 30E
County: OSCEOLA	Quadrangle: ST. CLOUD SOUTH	
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983
NGVD88 Elevation (feet): 68.283	NGVD29 Elevation (feet): 69.353	2022 Elevation:
NGVD88 Class:	NGVD29 Class:	Other Elevation:
NGVD88 Order: 3RD	NGVD29 Order:	Other Elevation Type:

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: + 1.07	Actual NGS Elevation or ngvd29.txt file:	OPUS Ortho Height: 20.821 (m)
Northing (Y) (feet): 1380373.171	Easting (X) (feet): 570128.811	Source of Latitude & Longitude: OPUS SOLUTION
Latitude: 28	7	51.08545
DD°	MM'	SS"
Longitude: 81	16	1.01885
DD°	MM'	SS"
Latitude (Decimal Degrees): 28.13085707	Longitude (Decimal Degrees): -81.26694968	

RECOVERY DATA

How to Reach: FROM THE PHYSICAL INTERSECTION OF DEER RUN RD AND CANOE CREEK RD, GO SOUTH ALONG CANOE CREEK RD FOR 3.67 MILES TO THE INTERSECTION OF CANOE CREEK AND A EAST RUNNING DIRT DRIVE, THE MARK IS ON THE LEFT. BENCHMARK CCR W IS A SFVMD DISK SET IN A 1 1/2 INCH PIPE WITH A 10 INCH CONCRETE COLLAR 60.0 FEET SOUTHEAST OF A WOOD POWER POLE, 37.5 FEET EAST OF THE EDGE OF PAVEMENT OF CANOE CREEK RD, 30.1 FEET NORTHEAST OF A MAIL BOX AND 2.0 FEET WEST OF A BARBED WIRE FENCE.

Description/Notes:

Notable Landmarks:

Other Source Benchmarks:

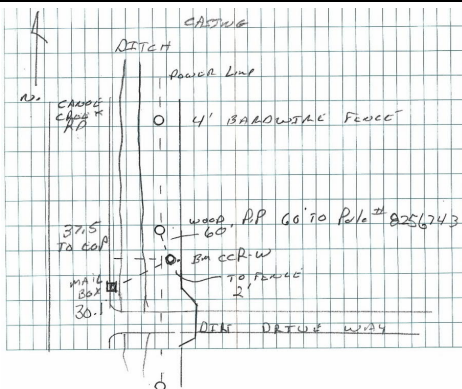
PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



Haywood, Joshua

From: opus <opus@ngs.noaa.gov>
Sent: Friday, August 21, 2020 2:55 PM
To: Haywood, Joshua
Subject: OPUS solution : 33322251.20o OP1598035947761

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

FILE: 33322251.20o OP1598035947761

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%7Cd1893e36a3894462a1d508d84603ae29%7Ce64791d699864645a1a068c1175eda41%7C1%7C0%7C637336328943272473&sr=0&reserved=0

USER: josh.haywood@t2ue.com DATE: August 21, 2020
RINEX FILE: 3332225o.20o TIME: 18:54:38 UTC

SOFTWARE: page5 1801.18 master50.pl 160321 START: 2020/08/12 14:26:00
EPHEMERIS: igr21183.eph [rapid] STOP: 2020/08/12 20:57:00
NAV FILE: brdc2250.20n OBS USED: 14831 / 15992 : 93%
ANT NAME: TRMR8S NONE # FIXED AMB: 76 / 101 : 75%
ARP HEIGHT: 2.000 OVERALL RMS: 0.022(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.6140)

X: 854640.121(m) 0.012(m) 854639.278(m) 0.012(m)
Y: -5563632.283(m) 0.020(m) -5563630.721(m) 0.020(m)
Z: 2989298.386(m) 0.016(m) 2989298.227(m) 0.016(m)

LAT: 28 7 51.08545 0.019(m) 28 7 51.10648 0.019(m)
E LON: 278 43 58.98115 0.009(m) 278 43 58.95934 0.009(m)
W LON: 81 16 1.01885 0.009(m) 81 16 1.04066 0.009(m)
EL HGT: -6.998(m) 0.021(m) -8.547(m) 0.021(m)
ORTHO HGT: 20.797(m) 0.056(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES
UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 3111727.011 420738.584
Easting (X) [meters] 473784.556 173775.609
Convergence [degrees] -0.12586389 -0.12586389
Point Scale 0.99960848 0.99994966
Combined Factor 0.99960958 0.99995076

US NATIONAL GRID DESIGNATOR: 17RMM7378411727(NAD 83)

BASE STATIONS USED
PID DESIGNATION LATITUDE LONGITUDE DISTANCE(m)
DQ7965 FLWE WEDGEFIELD FL CORS ARP N282626.477 W0810533.176 38363.0
DH3757 WACH WAUCHULA CORS ARP N273051.042 W0815256.615 91359.3
DF7990 ZEFR ZEPHYRHILLS CORS ARP N281339.322 W0820952.671 88799.6

NEAREST NGS PUBLISHED CONTROL POINT
AJ6657 P 506 N280736.000 W0811600.000 465.2

BASE STATION INFORMATION

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 -0.1274 -0.0064 0.0223 VEL TIMES 10.6142 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0116 -0.0759 0.0432 ARP TO L1 PHASE CENTER
XYZ 869051.3294 -5544931.7523 3019536.6158 L1 PHS CEN @ 2020.6140
XYZ 0.0000 0.0000 0.0000 + XYZ ADJUSTMENTS

XYZ 869051.3294 -5544931.7523 3019536.6158 NEW L1 PHS CEN @ 2020.6140
XYZ 869051.3177 -5544931.6765 3019536.5726 NEW ARP @ 2020.6140
XYZ 869051.3177 -5544931.6765 3019536.5726 NEW MON @ 2020.6140
LLH 28 26 26.49884 278 54 26.80195 -4.9993 NEW L1 PHS CEN @ 2020.6140
LLH 28 26 26.49880 278 54 26.80196 -5.0873 NEW ARP @ 2020.6140
LLH 28 26 26.49880 278 54 26.80196 -5.0873 NEW MON @ 2020.6140

STATION NAME: wach a 2 (Wauchula; Wauchula, Florida, U.S.A.)

MONUMENT: NO DOMES NUMBER

XYZ 799335.4500 -5604081.2975 2928868.5949 MON @ 2010.0000 (M)
XYZ -0.0116 0.0017 0.0012 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 -0.1234 0.0180 0.0123 VEL TIMES 10.6142 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0148 -0.1091 0.0575 ARP TO L1 PHASE CENTER
XYZ 799335.3414 -5604081.3887 2928868.6648 L1 PHS CEN @ 2020.6140
XYZ -0.0000 -0.0000 -0.0000 + XYZ ADJUSTMENTS
XYZ 799335.3414 -5604081.3887 2928868.6648 NEW L1 PHS CEN @ 2020.6140
XYZ 799335.3266 -5604081.2796 2928868.6072 NEW ARP @ 2020.6140
XYZ 799335.3266 -5604081.2796 2928868.6072 NEW MON @ 2020.6140
LLH 27 30 51.06303 278 7 3.36196 9.2827 NEW L1 PHS CEN @ 2020.6140
LLH 27 30 51.06302 278 7 3.36199 9.1585 NEW ARP @ 2020.6140
LLH 27 30 51.06302 278 7 3.36199 9.1585 NEW MON @ 2020.6140

STATION NAME: zefr a 4 (ZEPHYRHILLS; Zephyrhills, Florida, U.S.A.)

MONUMENT: 495265001

XYZ 766680.6041 -5571328.4431 2998751.0393 MON @ 2010.0000 (M)
XYZ -0.0119 -0.0001 0.0017 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 -0.1260 -0.0006 0.0185 VEL TIMES 10.6142 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0142 -0.1085 0.0589 ARP TO L1 PHASE CENTER
XYZ 766680.4922 -5571328.5521 2998751.1167 L1 PHS CEN @ 2020.6140
XYZ 0.0000 -0.0000 -0.0000 + XYZ ADJUSTMENTS
XYZ 766680.4922 -5571328.5521 2998751.1167 NEW L1 PHS CEN @ 2020.6140
XYZ 766680.4780 -5571328.4436 2998751.0578 NEW ARP @ 2020.6140
XYZ 766680.4780 -5571328.4436 2998751.0578 NEW MON @ 2020.6140
LLH 28 13 39.34326 277 50 7.30549 -1.3738 NEW L1 PHS CEN @ 2020.6140
LLH 28 13 39.34326 277 50 7.30552 -1.4980 NEW ARP @ 2020.6140
LLH 28 13 39.34326 277 50 7.30552 -1.4980 NEW MON @ 2020.6140

REMOTE STATION INFORMATION

STATION NAME: 3332 1

MONUMENT: NO DOMES NUMBER

XYZ 854639.1665 -5563630.8581 2989298.0382 MON @ 2020.6137 (M)
NEU -0.0012 0.0011 2.0000 MON TO ARP (M)
NEU 0.0012 -0.0011 0.0827 ARP TO L1 PHASE CENTER (M)
NEU -0.0003 -0.0009 0.0713 ARP TO L2 PHASE CENTER (M)
XYZ 0.2690 -1.7437 0.9419 MON TO ARP
XYZ 0.0099 -0.0717 0.0400 ARP TO L1 PHASE CENTER
XYZ 854639.4454 -5563632.6735 2989299.0202 L1 PHS CEN @ 2020.6140

BASELINE NAME: flwe 3332

XYZ 0.1081 0.1439 0.1971 + XYZ ADJUSTMENTS
XYZ 854639.5535 -5563632.5296 2989299.2172 NEW L1 PHS CEN @ 2020.6140
XYZ 854639.5436 -5563632.4579 2989299.1772 NEW ARP @ 2020.6140
XYZ 854639.2746 -5563630.7142 2989298.2353 NEW MON @ 2020.6140
LLH 28 7 51.10683 278 43 58.95924 -6.4669 NEW L1 PHS CEN @ 2020.6140
LLH 28 7 51.10680 278 43 58.95929 -6.5495 NEW ARP @ 2020.6140
LLH 28 7 51.10683 278 43 58.95924 -8.5496 NEW MON @ 2020.6140

BASELINE NAME: wach 3332

XYZ 0.1074 0.1426 0.1815 + XYZ ADJUSTMENTS
XYZ 854639.5527 -5563632.5308 2989299.2016 NEW L1 PHS CEN @ 2020.6140
XYZ 854639.5429 -5563632.4592 2989299.1616 NEW ARP @ 2020.6140
XYZ 854639.2739 -5563630.7155 2989298.2197 NEW MON @ 2020.6140
LLH 28 7 51.10637 278 43 58.95921 -6.4732 NEW L1 PHS CEN @ 2020.6140
LLH 28 7 51.10633 278 43 58.95925 -6.5559 NEW ARP @ 2020.6140
LLH 28 7 51.10637 278 43 58.95921 -8.5559 NEW MON @ 2020.6140

BASELINE NAME: zefr 3332

XYZ 0.1195 0.1235 0.1874 + XYZ ADJUSTMENTS
XYZ 854639.5649 -5563632.5500 2989299.2076 NEW L1 PHS CEN @ 2020.6140
XYZ 854639.5550 -5563632.4783 2989299.1675 NEW ARP @ 2020.6140
XYZ 854639.2860 -5563630.7346 2989298.2256 NEW MON @ 2020.6140
LLH 28 7 51.10622 278 43 58.95954 -6.4521 NEW L1 PHS CEN @ 2020.6140
LLH 28 7 51.10618 278 43 58.95958 -6.5348 NEW ARP @ 2020.6140
LLH 28 7 51.10622 278 43 58.95954 -8.5348 NEW MON @ 2020.6140

G-FILES

Axx2020 812 20 812
 B2020 8121425 20 8122057 1 page5 v1801.18IGS 132 1 2 27NGS 2020 821IFDDPX
 ITRF2014_2101 IGS 20200412
 C00090004 144120431 11 186990378 39 302383373 21 X2250A3332X2250AFLWE
 D 1 2 -6382580 1 3 6551704 2 3 -8461524

Axx2020 812 20 812
 B2020 8121425 20 8122057 1 page5 v1801.18IGS 132 1 2 27NGS 2020 821IFDDPX
 ITRF2014_2101 IGS 20200412
 C00090002 -553039473 8 -404505641 35 -604296124 20 X2250A3332X2250AWACH
 D 1 2 -5708835 1 3 7363596 2 3 -8800506

Axx2020 812 20 812
 B2020 8121425 20 8122057 1 page5 v1801.18IGS 132 1 2 27NGS 2020 821IFDDPX
 ITRF2014_2101 IGS 20200412
 C00090001 -879588080 8 -76977090 28 94528323 15 X2250A3332X2250AZEFR
 D 1 2 -5653000 1 3 5163450 2 3 -9396868

POST-FIT RMS BY SATELLITE VS. BASELINE

OVERALL 02 03 05 06 09 12 13 15
 flwe-3332| 0.024 0.023 0.020 0.024 0.037 0.030 0.025 0.023 0.018
 17 18 19 20 24 25 28 29
 flwe-3332| 0.019 0.029 0.025 0.019 0.020 0.030 0.019 0.028

OVERALL 02 03 05 06 09 12 13 15
 wach-3332| 0.021 0.021 ... 0.016 0.021 0.039 0.022 0.024 0.018
 17 18 19 20 24 25 28 29
 wach-3332| 0.018 0.021 0.019 0.028 0.022 0.023 0.042 0.019

OVERALL 02 03 05 06 09 12 13 15
 zeFR-3332| 0.018 0.018 ... 0.016 0.020 0.029 0.021 0.019 0.011
 17 18 19 20 24 25 28 29
 zeFR-3332| 0.016 0.017 0.017 0.019 0.021 0.022 0.020 0.012

OBS BY SATELLITE VS. BASELINE

OVERALL 02 03 05 06 09 12 13 15
 flwe-3332| 5102 745 41 394 137 240 528 347 371
 17 18 19 20 24 25 28 29
 flwe-3332| 306 201 431 150 185 388 195 443
 OVERALL 02 03 05 06 09 12 13 15
 wach-3332| 4781 776 ... 104 384 54 553 328 363
 17 18 19 20 24 25 28 29
 wach-3332| 351 222 429 159 179 421 37 421
 OVERALL 02 03 05 06 09 12 13 15
 zeFR-3332| 4948 757 ... 377 504 156 528 324 371
 17 18 19 20 24 25 28 29
 zeFR-3332| 338 208 67 171 152 390 174 431

ITRF position of 3332 as determined by individual baselines

	X	Y	Z
flwe	854639.275	-5563630.714	2989298.235
wach	854639.274	-5563630.715	2989298.220
zeFR	854639.286	-5563630.735	2989298.226

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
flwe	-0.004	0.007	0.008	-0.002	0.011	-0.003
wach	-0.004	0.006	-0.007	-0.003	-0.003	-0.009
zeFR	0.008	-0.013	-0.001	0.006	-0.008	0.012

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

0.0000004644	-0.0000001209	0.0000000670
-0.0000001209	0.0000076733	-0.0000003760
0.0000000670	-0.0000003760	0.0000023689

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

0.0000005944	0.0000004614	-0.0000008493
0.0000004614	0.0000031909	-0.0000019296
-0.0000008493	-0.0000019296	0.0000067214

Horizontal network accuracy = 0.00362 meters.

Vertical network accuracy = 0.00508 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)
-------	-------	-------

FLWE 869052.16310 -5544933.23543 3019536.72788 2010.00
WACH 799336.16445 -5604082.87126 2928868.78053 2010.00
ZEFR 766681.32066 -5571330.00595 2998751.22097 2010.00

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

	Xr(m)	Yr(m)	Zr(m)	
FLWE	869052.16310	-5544933.23543	3019536.72788	2010.00
WACH	799336.16445	-5604082.87126	2928868.78053	2010.00
ZEFR	766681.32066	-5571330.00595	2998751.22097	2010.00

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

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
FLWE	0.00120	0.00039	-0.00096
WACH	0.00128	0.00265	-0.00157
ZEFR	0.00123	0.00086	-0.00097

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)	
FLWE	14412.04210	18699.04757	30238.34188	2010.00
WACH	-55303.95655	-40450.58826	-60429.60547	2010.00
ZEFR	-87958.80034	-7697.72295	9452.83497	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (0901 FL E)
Northing (Y) [feet] 1380373.171
Easting (X) [feet] 570128.811
Convergence [degrees] -0.12586389
Point Scale 0.99994966
Combined Factor 0.99995076

***** 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%7Cd1893e36a3894462a1d508d84603ae29%7Ce64791d699864645a1a068c1175eda41%7C0%7C637336328943272473&data=%2FdkuFGPE0jdITO83nRHYaPPNPR8%2FUHkYXnmf4OBrt4c%3D&reserved=0>

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

APPROX ORTHO HGT: 20.821 (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.

CCR-W- Raw Level Data.GSI

110001+000000A1 32. . . 7+00327958 331. 27+00045339 390. . . +00000003 391. 27+00000000
 110002+000000B1 32. . . 7+00323876 332. 27+00045388 390. . . +00000003 391. 27+00000001
 110003+000000B2 32. . . 7+00653224 336. 27+00045468 390. . . +00000005 391. 27+00000001
 110004+000000A2 32. . . 7+01308694 335. 27+00045435 390. . . +00000006 391. 27+00000003
 110005+0000Q506 32. . . 7+01627945 331. 07+00066279 390. . . +00000010 391. 07+00000003
 410006+?. 1
 110007+0000Q506 83. . . 17+00663400
 110008+0000Q506 32. . . 7+01627945 331. 07+00066279 390. . . +00000010 391. 07+00000003
 110009+0000TP1 32. . . 7+01628281 332. 07+00045966 390. . . +00000004 391. 07+00000002
 110010+0000TP1 573. . . 7-00000336 574. . . 7+03256227 83. . . 07+00683712
 110011+0000TP1 32. . . 7+03017641 331. 07+00052545 390. . . +00000009 391. 07+00000004
 110012+0000TP2 32. . . 7+03001942 332. 07+00045298 390. . . +00000006 391. 07+00000004
 110013+0000TP2 573. . . 7+00015362 574. . . 7+09275809 83. . . 07+00690960
 110014+0000TP2 32. . . 7+02996380 331. 07+00051262 390. . . +00000008 391. 07+00000002
 110015+0000TP3 32. . . 7+02997381 332. 07+00052603 390. . . +00000005 391. 07+00000004
 110016+0000TP3 573. . . 7+00014361 574. . . 7+15269570 83. . . 07+00689619
 110017+0000TP3 32. . . 7+03009508 331. 07+00047519 390. . . +00000008 391. 07+00000004
 110018+0000TP4 32. . . 7+03009970 332. 07+00044147 390. . . +00000005 391. 07+00000003
 110019+0000TP4 573. . . 7+00013899 574. . . 7+21289048 83. . . 07+00692990
 110020+0000TP4 32. . . 7+03003826 331. 07+00048611 390. . . +00000007 391. 07+00000005
 110021+0000TP5 32. . . 7+03014065 332. 07+00047289 390. . . +00000008 391. 07+00000005
 110022+0000TP5 573. . . 7+00003660 574. . . 7+27306938 83. . . 07+00694312
 110023+0000TP5 32. . . 7+03021794 331. 07+00045894 390. . . +00000005 391. 07+00000004
 110024+0000TP6 32. . . 7+03005331 332. 07+00047704 390. . . +00000007 391. 07+00000005
 110025+0000TP6 573. . . 7+00020124 574. . . 7+33334063 83. . . 07+00692503
 110026+0000TP6 32. . . 7+03006286 331. 07+00051702 390. . . +00000006 391. 07+00000003
 110027+0000TP7 32. . . 7+01341044 332. 07+00048802 390. . . +00000006 391. 07+00000002
 110028+0000TP7 573. . . 7+01685366 574. . . 7+37681392 83. . . 07+00695403
 110029+0000TP7 32. . . 7+01417824 331. 07+00040467 390. . . +00000004 391. 07+00000002
 110030+0000FCM 32. . . 7+01527054 332. 07+00053067 390. . . +00000006 391. 07+00000003
 110031+0000FCM 573. . . 7+01576135 574. . . 7+40626270 83. . . 07+00682803
 110032+0000FCM 32. . . 7+02102739 331. 07+00059149 390. . . +00000003 391. 07+00000003
 110033+WELLCCRW 32. . . 7+02101324 332. 07+00027945 390. . . +00000004 391. 07+00000002
 110034+WELLCCRW 573. . . 7+01577549 574. . . 7+44830333 83. . . 07+00714007
 110035+WELLCCRW 32. . . 7+02983540 331. 07+00027168 390. . . +00000004 391. 07+00000004
 110036+0000TP8 32. . . 7+02520161 332. 07+00047700 390. . . +00000004 391. 07+00000001
 110037+0000TP8 573. . . 7+02040928 574. . . 7+50334034 83. . . 07+00693475
 110038+0000TP8 32. . . 7+03012011 331. 07+00050701 390. . . +00000005 391. 07+00000005
 110039+0000TP9 32. . . 7+03001888 332. 07+00048343 390. . . +00000003 391. 07+00000003
 110040+0000TP9 573. . . 7+02051052 574. . . 7+56347933 83. . . 07+00695834
 110041+0000TP9 32. . . 7+03040829 331. 07+00045974 390. . . +00000005 391. 07+00000005
 110042+0000TP10 32. . . 7+02076166 332. 07+00053259 390. . . +00000004 391. 07+00000002
 110043+0000TP10 573. . . 7+03015716 574. . . 7+61464928 83. . . 07+00688548
 110044+0000TP10 32. . . 7+00379967 331. 07+00043031 390. . . +00000003 391. 07+00000001
 110045+0000P506 32. . . 7+00280907 332. 07+00047379 390. . . +00000003 391. 07+00000000
 110046+0000P506 573. . . 7+03114777 574. . . 7+62125802 83. . . 07+00684200
 110047+0000P506 32. . . 7+00246697 331. 07+00041567 390. . . +00000003 391. 07+00000000
 110048+0000TP11 32. . . 7+00225092 332. 07+00026662 390. . . +00000003 391. 07+00000000
 110049+0000TP11 573. . . 7+03136382 574. . . 7+62597590 83. . . 07+00699104

CCR-W- Raw Level Data.GSI

110050+0000TP11	32. . . 7+02998541	331. 07+00035183	390. . . +00000003	391. 07+00000002
110051+0000TP12	32. . . 7+03003526	332. 07+00048623	390. . . +00000003	391. 07+00000001
110052+0000TP12	573. . 7+03131397	574. . 7+68599658	83. . 07+00685665	
110053+0000TP12	32. . . 7+02987844	331. 07+00041349	390. . . +00000004	391. 07+00000006
110054+0000TP13	32. . . 7+02995179	332. 07+00047863	390. . . +00000006	391. 07+00000007
110055+0000TP13	573. . 7+03124062	574. . 7+74582681	83. . 07+00679150	
110056+0000TP13	32. . . 7+03001629	331. 07+00040617	390. . . +00000004	391. 07+00000004
110057+0000TP14	32. . . 7+02999716	332. 07+00047820	390. . . +00000004	391. 07+00000002
110058+0000TP14	573. . 7+03125975	574. . 7+80584025	83. . 07+00671947	
110059+0000TP14	32. . . 7+02998917	331. 07+00043760	390. . . +00000003	391. 07+00000002
110060+0000TP15	32. . . 7+02973256	332. 07+00048579	390. . . +00000003	391. 07+00000001
110061+0000TP15	573. . 7+03151636	574. . 7+86556199	83. . 07+00667128	
110062+0000TP15	32. . . 7+03050165	331. 07+00059858	390. . . +00000004	391. 07+00000003
110063+0000TP16	32. . . 7+03003124	332. 07+00056332	390. . . +00000003	391. 07+00000002
110064+0000TP16	573. . 7+03198678	574. . 7+92609488	83. . 07+00670654	
110065+0000TP16	32. . . 7+02978435	331. 07+00051987	390. . . +00000003	391. 07+00000002
110066+0000TP17	32. . . 7+02999014	332. 07+00054462	390. . . +00000003	391. 07+00000005
110067+0000TP17	573. . 7+03178099	574. . 7+98586937	83. . 07+00668180	
110068+0000TP17	32. . . 7+02998831	331. 07+00047019	390. . . +00000003	391. 07+00000004
110069+0000TP18	32. . . 7+03003183	332. 07+00047927	390. . . +00000003	391. 07+00000003
110070+0000TP18	573. . 7+03173748	574. . 1+10458895	83. . 07+00667272	
110071+0000TP18	32. . . 7+02990866	331. 07+00049583	390. . . +00000003	391. 07+00000005
110072+0000TP19	32. . . 7+02983362	332. 07+00052448	390. . . +00000004	391. 07+00000005
110073+0000TP19	573. . 7+03181251	574. . 1+11056318	83. . 07+00664406	
110074+0000TP19	32. . . 7+01073659	331. 07+00038876	390. . . +00000004	391. 07+00000001
110075+0000N506	32. . . 7+01162805	332. 07+00059667	390. . . +00000003	391. 07+00000001
110076+0000N506	573. . 7+03092105	574. . 1+11279964	83. . 07+00643615	

Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\CCR-W.vce	Name:	Default
Size:	50 KB	Datum:	WGS 1984
Modified:	8/4/2020 10:07:48 AM (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: [171204.05JC072820.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: -0.00853 ft
Σ BS Distances: 5794.576 ft
Σ FS Distances: 5485.366 ft
Run Length: 11279.942 ft
Reduction: Adjusted Values

Create	Point ID	BS	HI	IS	FS	A Elevation	Raw Elevation	Correction	Adj. Elevation	Type	Distance	Description
✓	Q506	6.62789 ft	72.96775 ft			0.00000 ft	66.33987 ft	0.00000 ft	66.33987 ft	Benchmark	162.794 ft	
✓	TP1				4.59659 ft	2.03130 ft	68.37116 ft	0.00025 ft	68.37141 ft	Computed	162.828 ft	
	TP1	5.25449 ft	73.62565 ft								301.763 ft	
✓	TP2				4.52979 ft	0.72470 ft	69.09586 ft	0.00070 ft	69.09656 ft	Computed	300.194 ft	
	TP2	5.12619 ft	74.22205 ft								299.637 ft	
✓	TP3				5.26029 ft	-0.13410 ft	68.96176 ft	0.00115 ft	68.96292 ft	Computed	299.738 ft	
	TP3	4.75189 ft	73.71365 ft								300.950 ft	
✓	TP4				4.41469 ft	0.33720 ft	69.29896 ft	0.00161 ft	69.30057 ft	Computed	300.996 ft	
	TP4	4.86109 ft	74.16005 ft								300.382 ft	
✓	TP5				4.72889 ft	0.13220 ft	69.43116 ft	0.00206 ft	69.43323 ft	Computed	301.406 ft	
	TP5	4.58939 ft	74.02055 ft								302.179 ft	
✓	TP6				4.77039 ft	-0.18100 ft	69.25016 ft	0.00252 ft	69.25268 ft	Computed	300.532 ft	
	TP6	5.17019 ft	74.42035 ft								300.628 ft	
✓	TP7				4.88019 ft	0.29000 ft	69.54016 ft	0.00285 ft	69.54301 ft	Computed	134.104 ft	
	TP7	4.04669 ft	73.58685 ft								141.782 ft	
✓	BM CCR W				5.30669 ft	-1.26000 ft	68.28016 ft	0.00307 ft	68.28324 ft	Computed	152.705 ft	
	BM CCR W	5.91489 ft	74.19505 ft								210.273 ft	
✓	WELL CCR W MP				2.79449 ft	3.12039 ft	71.40056 ft	0.00339 ft	71.40395 ft	Computed	210.132 ft	
	WELL CCR W MP	2.71679 ft	74.11735 ft								298.353 ft	
✓	TP8				4.76999 ft	-2.05320 ft	69.34736 ft	0.00381 ft	69.35117 ft	Computed	252.016 ft	
	TP8	5.07009 ft	74.41745 ft								301.200 ft	
✓	TP9				4.83429 ft	0.23580 ft	69.58316 ft	0.00426 ft	69.58742 ft	Computed	300.188 ft	
	TP9	4.59739 ft	74.18055 ft								304.082 ft	
✓	TP10				5.32589 ft	-0.72850 ft	68.85466 ft	0.00465 ft	68.85931 ft	Computed	207.616 ft	
	TP10	4.30309 ft	73.15775 ft								37.997 ft	
✓	P506				4.73789 ft	-0.43480 ft	68.41986 ft	0.00470 ft	68.42456 ft	Computed	28.091 ft	
	P506	4.15669 ft	72.57655 ft								24.670 ft	
✓	TP11				2.66619 ft	1.49050 ft	69.91036 ft	0.00473 ft	69.91509 ft	Computed	22.509 ft	
	TP11	3.51829 ft	73.42865 ft								299.854 ft	
✓	TP12				4.86229 ft	-1.34400 ft	68.56636 ft	0.00519 ft	68.57155 ft	Computed	300.352 ft	
	TP12	4.13489 ft	72.70125 ft								298.784 ft	
✓	TP13				4.78629 ft	-0.65140 ft	67.91496 ft	0.00564 ft	67.92060 ft	Computed	299.517 ft	
	TP13	4.06169 ft	71.97666 ft								300.162 ft	
✓	TP14				4.78199 ft	-0.72030 ft	67.19467 ft	0.00609 ft	67.20076 ft	Computed	299.971 ft	
	TP14	4.37599 ft	71.57066 ft								299.891 ft	
✓	TP15				4.85789 ft	-0.48190 ft	66.71277 ft	0.00654 ft	66.71931 ft	Computed	297.325 ft	
	TP15	5.98579 ft	72.69855 ft								305.016 ft	
✓	TP16				5.63319 ft	0.35260 ft	67.06537 ft	0.00700 ft	67.07237 ft	Computed	300.312 ft	
	TP16	5.19869 ft	72.26406 ft								297.843 ft	
✓	TP17				5.44619 ft	-0.24750 ft	66.81787 ft	0.00745 ft	66.82532 ft	Computed	299.901 ft	
	TP17	4.70189 ft	71.51976 ft								299.883 ft	
✓	TP18				4.79269 ft	-0.09080 ft	66.72707 ft	0.00791 ft	66.73497 ft	Computed	300.318 ft	
	TP18	4.95829 ft	71.68536 ft								299.086 ft	

✓	TP19			✓ 5.24479 ft	-0.28650 ft	66.44057 ft	0.00836 ft	66.44893 ft	Computed	298.336 ft	
	TP19	✓ 3.88759 ft	70.32816 ft							107.366 ft	
✓	N506			✓ 5.96669 ft	-2.07910 ft	64.36147 ft	0.00853 ft	64.37000 ft	Benchmark	116.280 ft	

Run - 0002 (N3) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
Q506-TP1 (E25)	Enabled	2.03130 ft	0.00025 ft	2.03154 ft	1	325.622 ft	6.62789 ft	4.59659 ft	0.00072 ft
TP1-TP2 (E26)	Enabled	0.72470 ft	0.00046 ft	0.72515 ft	1	601.957 ft	5.25449 ft	4.52979 ft	0.00098 ft
TP2-TP3 (E27)	Enabled	-0.13410 ft	0.00045 ft	-0.13365 ft	1	599.375 ft	5.12619 ft	5.26029 ft	0.00098 ft
TP3-TP4 (E28)	Enabled	0.33720 ft	0.00046 ft	0.33765 ft	1	601.947 ft	4.75189 ft	4.41469 ft	0.00098 ft
TP4-TP5 (E29)	Enabled	0.13220 ft	0.00046 ft	0.13265 ft	1	601.788 ft	4.86109 ft	4.72889 ft	0.00098 ft
TP5-TP6 (E30)	Enabled	-0.18100 ft	0.00046 ft	-0.18054 ft	1	602.711 ft	4.58939 ft	4.77039 ft	0.00098 ft
TP6-TP7 (E31)	Enabled	0.29000 ft	0.00033 ft	0.29033 ft	1	434.732 ft	5.17019 ft	4.88019 ft	0.00084 ft
TP7-BM CCR W (E32)	Enabled	-1.26000 ft	0.00022 ft	-1.25977 ft	1	294.487 ft	4.04669 ft	5.30669 ft	0.00069 ft
BM CCR W-WELL CCR W MP (E33)	Enabled	3.12039 ft	0.00032 ft	3.12071 ft	1	420.405 ft	5.91489 ft	2.79449 ft	0.00082 ft
WELL CCR W MP-TP8 (E34)	Enabled	-2.05320 ft	0.00042 ft	-2.05278 ft	1	550.369 ft	2.71679 ft	4.76999 ft	0.00094 ft
TP8-TP9 (E35)	Enabled	0.23580 ft	0.00045 ft	0.23625 ft	1	601.389 ft	5.07009 ft	4.83429 ft	0.00098 ft
TP9-TP10 (E36)	Enabled	-0.72850 ft	0.00039 ft	-0.72811 ft	1	511.698 ft	4.59739 ft	5.32589 ft	0.00091 ft
TP10-P506 (E37)	Enabled	-0.43480 ft	0.00005 ft	-0.43475 ft	1	66.087 ft	4.30309 ft	4.73789 ft	0.00033 ft
P506-TP11 (E38)	Enabled	1.49050 ft	0.00004 ft	1.49053 ft	1	47.179 ft	4.15669 ft	2.66619 ft	0.00028 ft
TP11-TP12 (E39)	Enabled	-1.34400 ft	0.00045 ft	-1.34354 ft	1	600.205 ft	3.51829 ft	4.86229 ft	0.00098 ft
TP12-TP13 (E40)	Enabled	-0.65140 ft	0.00045 ft	-0.65095 ft	1	598.301 ft	4.13489 ft	4.78629 ft	0.00098 ft
TP13-TP14 (E41)	Enabled	-0.72030 ft	0.00045 ft	-0.71984 ft	1	600.133 ft	4.06169 ft	4.78199 ft	0.00098 ft
TP14-TP15 (E42)	Enabled	-0.48190 ft	0.00045 ft	-0.48145 ft	1	597.216 ft	4.37599 ft	4.85789 ft	0.00098 ft
TP15-TP16 (E43)	Enabled	0.35260 ft	0.00046 ft	0.35306 ft	1	605.328 ft	5.98579 ft	5.63319 ft	0.00099 ft
TP16-TP17 (E44)	Enabled	-0.24750 ft	0.00045 ft	-0.24705 ft	1	597.744 ft	5.19869 ft	5.44619 ft	0.00098 ft
TP17-TP18 (E45)	Enabled	-0.09080 ft	0.00045 ft	-0.09035 ft	1	600.200 ft	4.70189 ft	4.79269 ft	0.00098 ft
TP18-TP19 (E46)	Enabled	-0.28650 ft	0.00045 ft	-0.28605 ft	1	597.422 ft	4.95829 ft	5.24479 ft	0.00098 ft
TP19-N506 (E47)	Enabled	-2.07910 ft	0.00017 ft	-2.07893 ft	1	223.646 ft	3.88759 ft	5.96669 ft	0.00060 ft

Run - 0002 (N3) Reduced Coordinates

Point ID	Status	Elevation
Q506	Enabled	66.33987 ft
N506	Enabled	64.37000 ft

Date: 8/12/2020 3:43:47 PM	Project: J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\CCR-W.vee	Trimble Business Center
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Office

Project

12 August 2020

INPUT

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

OUTPUT

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

CCR-W-BENCHMARK

1/1

Northing/Y: 1380373.168	Northing/Y: 1380373.168
Easting/X: 570128.851	Easting/X: 570128.851
Elevation/Z: 68.28324	Elevation/Z: 69.353
Convergence: -0 07 33.11016	Convergence: -0 07 33.11016
Scale Factor: 0.999949661	Scale Factor: 0.999949661
Combined Factor: 0.999950756	Combined Factor: 0.999950705

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

Remark: