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SURVEYOR'S REPORT

USGS Wells Phase 4

USGS Station No: 282835081305201

Station Name: ORF-32

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 **ORF-32**, 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 P 627, ran through site benchmark ORF 32 and closed on Orange County Benchmark L1293022. All leveling was completed in accordance with standard survey practice utilizing conventional third order methods, techniques, and equipment. The overall closure exceeded allowable project requirements of 0.02 feet times the square root in miles ($0.02 \times \text{SQRT}(\text{miles})$) by 0.009 feet however, substantially exceeding third order accuracies.

See page 25 for SFWMD Benchmark Datasheet.

National Geodetic Survey Benchmark Q 627 was not recovered.

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 26-29 for ORF-32 OPUS Report.

DATES OF FIELD DATA COLLECTION

Field survey work by T2 was performed between August 6th and 25th, 2020. Field notes are contained in Field Book 500, pages 20-25; Field Book 555, pages 66-71, 78; and Field Book 556, pages 35-37.



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U.S.G.S. Station Name: ORF-32	U.S.G.S. Station Number: 282835081305201	Agency: T2 UES, Inc.	Date of Field Work: 8-25-20
Party Chief: DOULE	Field Book: 555; 556	Page(s): 66-71, 78; 35-37	Report Prepared by: CHAMBLESS

SITE SPECIFIC DATA

Site Benchmark: ORF-32	Benchmark Elevation(s) (NAVD88): 156.11	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) +0.88	
Well Reference Elevation (NAVD88): 159.54	DTW: 89.40 (08/25/20 at : 3:30PM)	Ground Elevation (NAVD88): 157.85	Pad Elevation (NAVD88): N/A

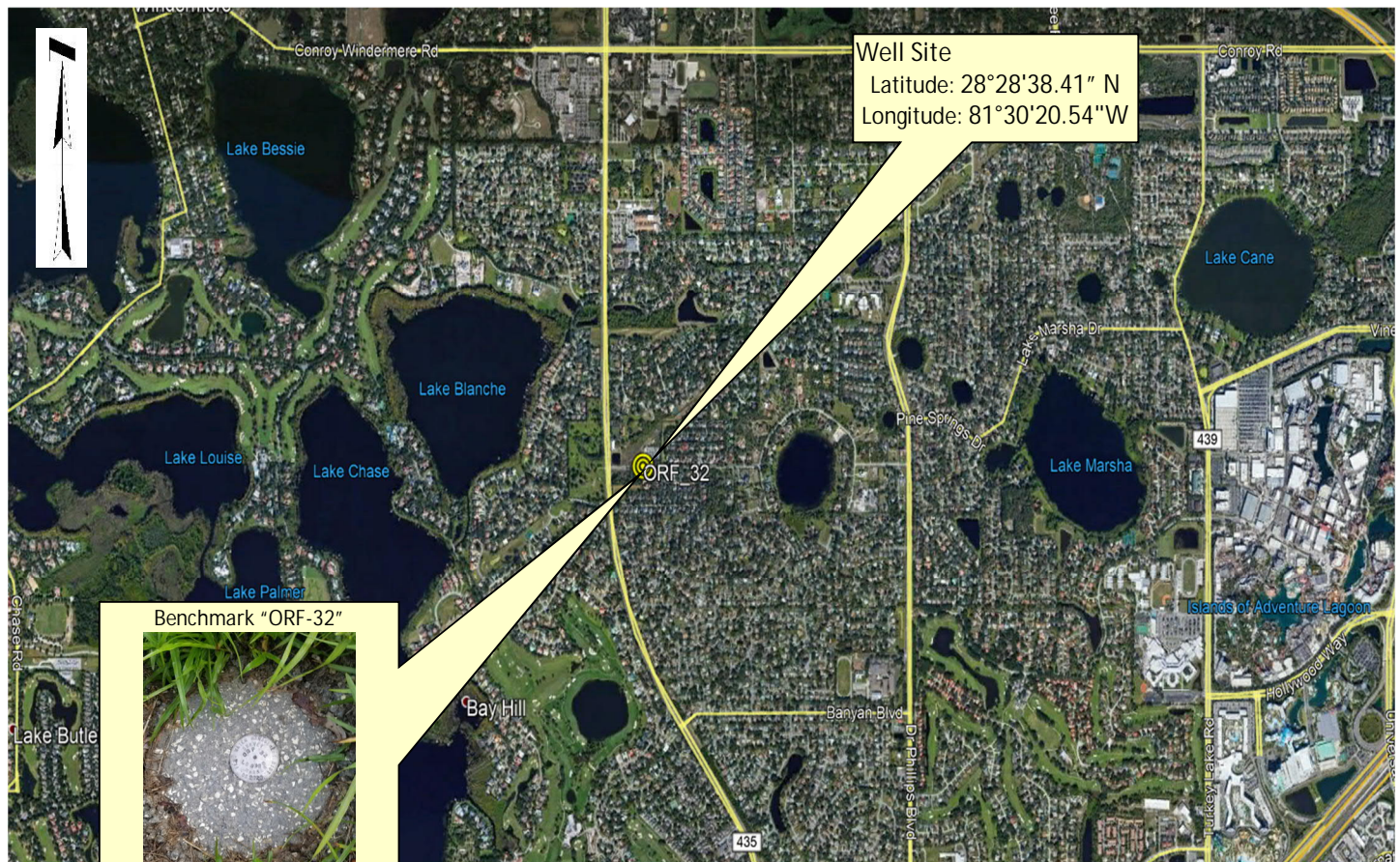
GEOGRAPHIC DATA

Section 22	Township 23S	Range 28E
Well Latitude: 28°28'38.41" N	Well Longitude: 81°30'20.54"W	Location Source: RTK GPS
State Plane Coordinates:	Northing (Y) = 1506591.4820	Easting (X) = 493703.8968

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: "ORF-32"
Reference Point: N.RIM OF 8"
WELL CASING AT PAINT MARK

Reference Point El. = 159.54
feet NAVD88

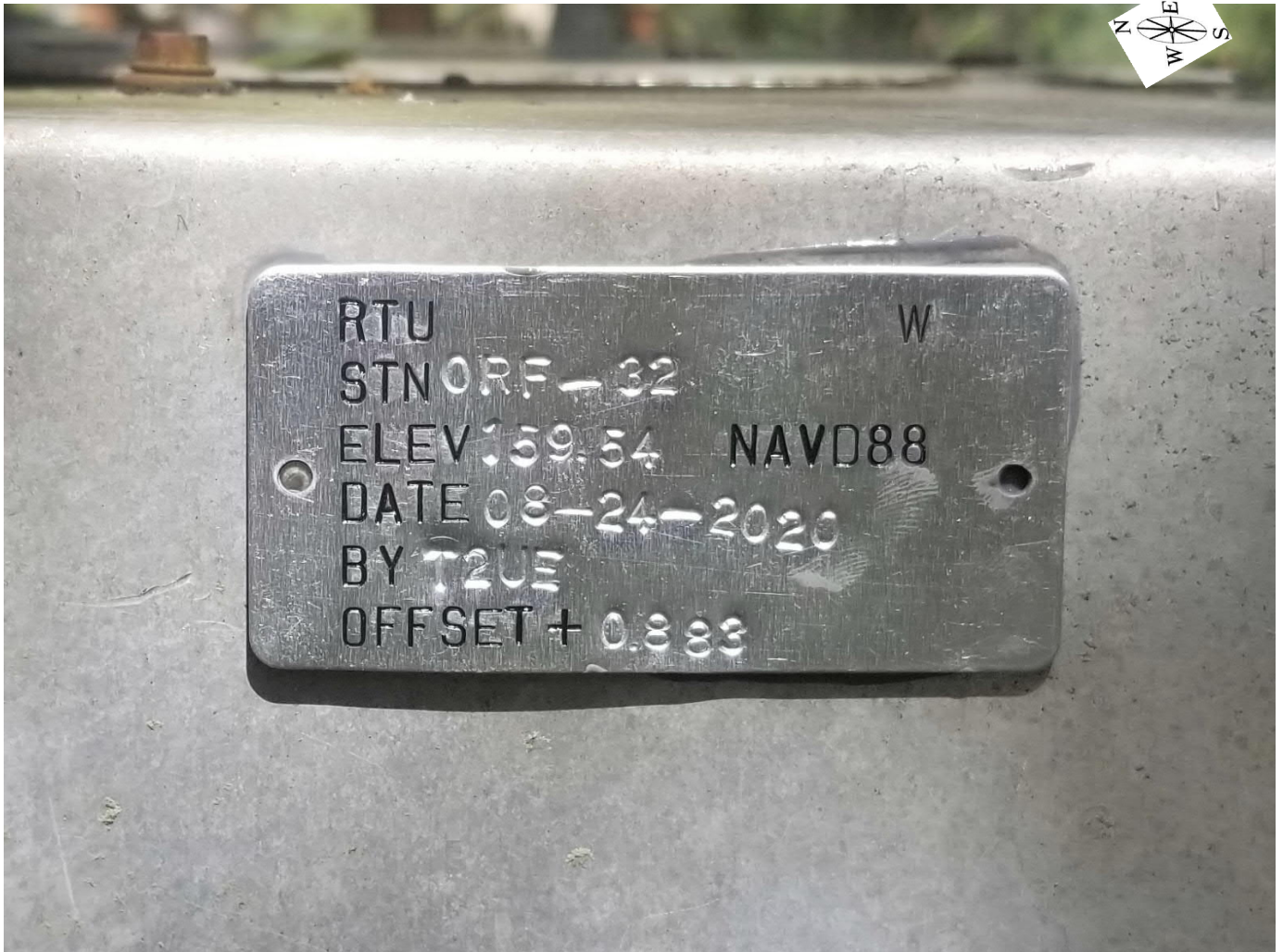
Distance to Water = 89.40
feet from reference point
(08/25/20 at : 3:30PM)



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New Aluminum Tag





USGS RMs



LSD – PK NAIL AND USGS SURVEY DISK



Latitude: 28°28'38.37" N
Longitude: 81°30'20.54" W
NAVD88 EL = 157.80

RM 1 – PK NAIL AND USGS SURVEY DISK



Latitude: 28°28'38.07" N
Longitude: 81°30'20.54" W
NAVD88 EL = 157.63



Site Benchmark

Site Benchmark Overall Photo



Site BM:



Latitude: 28°28'38.24" N
Longitude: 81°30'22.93" W
NAVD88 EL = 156.11





Source Benchmarks



NGS Benchmark "P627" (DI9114)



Latitude: 28°29'27" N SCALED
Longitude: 81°32'00" W SCALED
NAVD88 EL = 118.37



Orange County Benchmark "L1293022"
(DG6229)



Latitude: 28°28'39.0" N SCALED
Longitude: 81°30'30.5" W SCALED
NAVD88 EL = 146.85



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
DI9114 *****
DI9114 DESIGNATION - P 627
DI9114 PID - DI9114
DI9114 STATE/COUNTY- FL/ORANGE
DI9114 COUNTRY - US
DI9114 USGS QUAD - WINDERMERE (2018)
DI9114
DI9114 *CURRENT SURVEY CONTROL
DI9114
DI9114* NAD 83(1986) POSITION- 28 29 27. (N) 081 32 00. (W) SCALED
DI9114* NAVD 88 ORTHO HEIGHT - 36.080 (meters) 118.37 (feet) ADJUSTED
DI9114
DI9114 GEOID HEIGHT - -27.540 (meters) GEOID18
DI9114 DYNAMIC HEIGHT - 36.027 (meters) 118.20 (feet) COMP
DI9114 MODELED GRAVITY - 979,197.2 (mgal) NAVD 88
DI9114
DI9114 VERT ORDER - FIRST CLASS II
DI9114
DI9114.The horizontal coordinates were scaled from a map and have
DI9114.an estimated accuracy of +/- 6 seconds.
DI9114.
DI9114.The orthometric height was determined by differential leveling and
DI9114.adjusted by the NATIONAL GEODETIC SURVEY
DI9114.in April 2010.
DI9114
DI9114.Significant digits in the geoid height do not necessarily reflect accuracy.
DI9114.GEOID18 height accuracy estimate available here.
DI9114
DI9114.Click photographs - Photos may exist for this station.
DI9114
DI9114.The dynamic height is computed by dividing the NAVD 88
DI9114.geopotential number by the normal gravity value computed on the
DI9114.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DI9114.degrees latitude (g = 980.6199 gals.).
DI9114
DI9114.The modeled gravity was interpolated from observed gravity values.
DI9114
DI9114; North East Units Estimated Accuracy
DI9114;SPC FL E - 460,720. 147,780. MT (+/- 180 meters Scaled)
DI9114
DI9114_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMM478516(NAD 83)
DI9114
DI9114 SUPERSEDED SURVEY CONTROL
DI9114
DI9114.No superseded survey control is available for this station.
DI9114
DI9114_MARKER: DD = SURVEY DISK
DI9114_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

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"P627" Benchmark Datasheet (2 of 2)

DATASHEETS

Page 2 of 2

DI9114_STAMPING: P 627 2005
 DI9114_MARK LOGO: FLDEP
 DI9114_PROJECTION: FLUSH
 DI9114_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
 DI9114_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 DI9114+STABILITY: SURFACE MOTION
 DI9114_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
 DI9114+SATELLITE: SATELLITE OBSERVATIONS - May 05, 2005

DI9114	HISTORY	- Date	Condition	Report By
DI9114	HISTORY	- 20050505	MONUMENTED	FLDEP


DI9114
 DI9114 STATION DESCRIPTION


DI9114'DESCRIBED BY FL DEPT OF ENV PRO 2005
 DI9114'THE MARK IS ABOUT 3.3 MI (5.3 KM) SOUTH OF GOTHA, IN WINDERMERE, IN
 DI9114'SECTION 17, TOWNSHIP 23 SOUTH, RANGE 28 EAST.
 DI9114'
 DI9114'TO REACH THE MARK FROM THE JUNCTION OF SIXTH AVENUE (COUNTY ROAD 439,
 DI9114'CONROY WINDERMERE ROAD) AND MAIN STREET (COUNTY ROAD 439 NORTH) IN
 DI9114'WINDERMERE, GO SOUTHEAST ON MAIN STREET FOR 0.35 MI (0.6 KM) TO THE
 DI9114'MARK ON THE RIGHT, SET IN THE TOP OF A ROUND CONCRETE MONUMENT FLUSH
 DI9114'WITH THE GROUND AND ABOUT 0.5 FT (0.2 M) BELOW THE LEVEL OF MAIN
 DI9114'STREET.
 DI9114'
 DI9114'LOCATED 120.0 FT (36.6 M) NORTHWEST OF THE APPROXIMATE CENTERLINE OF
 DI9114'NINTH AVENUE, 23.0 FT (7.0 M) WEST OF THE CENTERLINE OF MAIN STREET,
 DI9114'12.7 FT (3.9 M) SOUTH OF A POWER POLE NUMBER 957407, 11.0 FT (3.4 M)
 DI9114'NORTHEAST OF A 52-INCH (132 CM) OAK TREE AND 1.5 FT (0.5 M) WEST OF
 DI9114'THE WEST EDGE OF THE SIDEWALK.
 DI9114'
 DI9114'NOTE A MAGNET WAS IMBEDDED IN THE GROUND ON THE SOUTH SIDE OF THE
 DI9114'MONUMENT.

*** retrieval complete.
 Elapsed Time = 00:00:01



"L1293022" Benchmark Datasheet (1 of 1)





Navigation
Identification
Search
Selection
Reports
Markup
Tasks
Tool Labels ×

Zoom In

Zoom Out

Pan

Previous Extent

Next Extent

Initial View

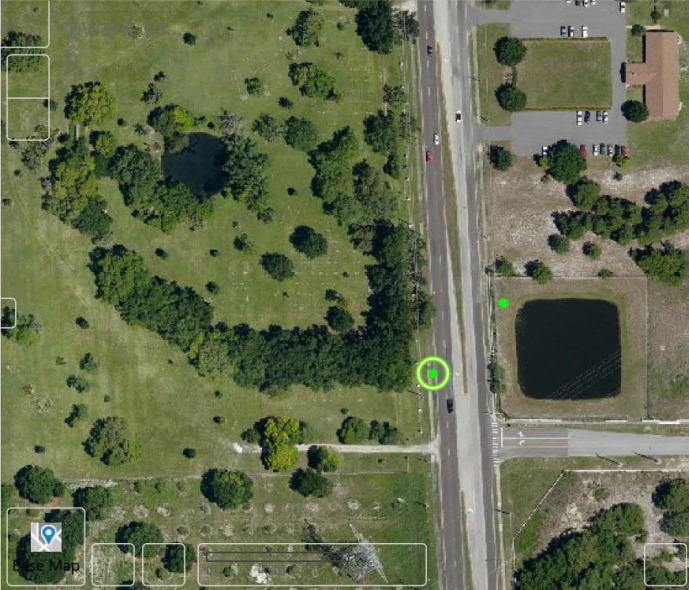
Bookmarks

Plot Coordinates

Benchmarks (88 Datum) (1)

Benchmarks - 88 Datum

Northing 1506655
Easting 492816
Elevation 146.853
Status
Point L1293022
Description REC. ORANGE COUNTY BRASS DISC IN CURB I
NLET +/-35 FT WEST OF C/L OF APOPKA-VINELAND RD. A
ND +/-75 FT NORTH OF C/L OF PALM LAKE BLVD AT SOUT
H END OF DR. PHILLIPS CEMENTERY.



Displaying 1 - 1 (Total: 1)

◀
◀
Page 1 of 1
▶
▶

Layers

Benchmarks (88 Datum...



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Field Notes (1 of 10)

171204.08 SFWMD USGS Wells PH4					E DOULE	8/20/20	FB 555 PG 66
WELL SITE ORF-32					B REIDER		PAGE 1 OF 3
LEVEL RUN FROM P 627 TO OC BM TO SITE							
COLLIMATION							
COLLER OLD 1.8 COLLERR NEW 7.5							
DIFF 5.7 RETICLE 5.37085							
STA	BS	HI	FS	ELV	DSC		
P627	6.786	118.370			P627 NGS PT EL 118.37		
			5.175	119.988	TP 1		
1	3.191	123.171					
			1.909	121.262	TP 2		
2	9.632	130.895					
			4.811	126.084	TP 3		
3	3.581	129.665					
			5.212	124.452	TP 4		
4	5.470	129.923					
			5.164	124.759	TP 5		
5	4.259	129.019					
			3.007	126.011	TP 6		
6	1.455	127.467					



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Field Notes (2 of 10)

171204.05 SFWMD USGS WELLS PH4 LEVEL RUN CONT					E DOYLE B REIDER	8/19/20	FB555 PG 67 PAGE 2 OF 3
STA	BS	HI	FS	ELV	DESC		
6			6.098	121.368	TP7		
7	3.321	124.689					
			8.392	116.296	TP8		
8	0.0473	116.344					
			10.309	106.034	TP9		
9	3.853	109.888					
			-0.5444	110.432	TP10		
10	4.687	115.120					
			5.958	109.161	TP11		
11	13.185	122.347					
			0.9037	121.443	TP12		
12	3.570 6.115	125.014 127.559			TP13		
			9.072	118.486	TP13 TP14		
13	-0.2733	118.213					
			9.547	108.665	TP15		
14	0.3155	108.981					
			6.850	102.130	TP16		
15	6.689	108.820					
			2.710	106.109	TP17		



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Field Notes (3 of 10)

171204.05 SFLWMD USGS WELLS PH4					E DOUCE	8/20/20	FB555 PG 68
STA	BS	HI	FS	ELV	B READER		PAGE 3 OF 3
16	9.545	115.654			Desc		
			114.100	114.100		TP 18	
			1.553				
17	9.857	123.958					
			0.623	123.334		TP 19	
18	13.117	136.452					
			-0.1864	136.638		TP 20	
19	7.558	144.197					
			5.820	138.376		TP 21	
20	3.911	142.288					
			1.771	140.516		TP 22	
21	12.050	152.566					
			1.796	150.770			

AI SET IN SW WEST SIDE OF RD
150' +/- SOUTH OF INTERSECTION OF APOPKA AVENUE
& COURTY WYNDENCAE



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Field Notes (4 of 10)

171204.05 USGS WELLS PH4 SEWARD					E. DOOLE	8/21/20	FB 555 PG 69
LEVEL RUN CONT... GRF-32					BRENDER		PAGE 10FB
STA	BS	HI	FS	ELV	DESC		
A1	8.647	159.417		150.770	A1 DESC PG 68		
			1.779	157.68	TP23		
22	9.903	167.542					
			5.825	161.716	TP24		
23	1.633	163.358					
			9.455	153.894	TP25		
24	1.992	155.887					
			9.637	146.249	TP26		
25	0.1362	146.885					
			10.914	135.471	TP27		
26	-0.057	135.413					
			11.030	124.383	TP28		
27	0.347	124.731					
			10.351	114.379	TP29		
28	5.206	119.586					
			3.409	116.176	TP30		
29	10.560	126.736					
			0.213	126.523	TP31		



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Field Notes (5 of 10)

171204.05 ST WIND USGS WELLS #44					E LIME 8/2/20	FB 555 PG 70
LEVEL RUN CONT					B 20 120	PAGE 2023
STA	BS	HI	FS	SLV	DESC	
30	13.015	139.538				
			139.640	139.649	TP 32	
			-0.114			
31	10.001	149.651				
			2.545	147.105	TP 33	
32	6.870	153.976				
			6.539	147.436	TP 34	
33	5.790	153.227				
			6.329	146.898	OC BM L1293022 EL 146.853	
34	8.168	155.666				
			1.210	154.256	TP 35	
35	6.380	160.637				
			4.490	156.146	BM OCT BY CONC MAN	
36	4.342	160.489				
			6.734	154.755	TP 35 B (2ND SHOT)	
37	1.304	155.539				
			8.661	146.897	2ND SHOT ✓ IN	
					146.898	



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Field Notes (7 of 10)

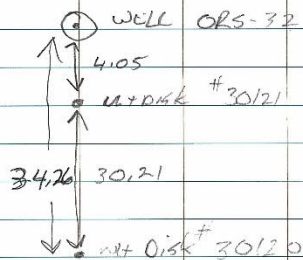
171204.05 SFwmd usgs / PA#4 well

well ORF-32

DT# 30120 FO WL+DISK USGS
SURVEY MARKER 1

DT# 30121 FO WL+DISK USGS
SURVEY MARKER LSU

DT# ~~30122~~ FO WL+DISK USGS
~~SURVEY MARKER~~
WELL



E. DOUBLE

B. REASON

F13555 Pg 78

08-25-2020

FILE# 171204.05 ED 825 C INST 8.15.10

STA	BS	HI	FS	ELV	DESC
LSD REF	5.266	163.108 163.061		157.858 157.795	LSD/REF MAD
			4.916	158.105 158.145	RMZ
		4.981		163.147 163.126	
			5.501	157.665 157.625	RM 1 CHK IN EL 157.66 157.625



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Field Notes (8 of 10)

171204.05	SEWARD USGS / PH 4 WELLS	L. AREU	FD 556/P35
	ORF-32	well	8/24/20
	File: OPUS ORF-32 08-24-20	MATERIAL: PVC	PAGE 1 OF 3
	BM ORF-32 STUMD Alumi Disk in 6" DIA	DIA: 4"	
	COAC STAMPED ORF-32 LB 8336 2020		
	HI: 6.562		
	START: 08:28 AM	DOWN TO WATER: 89.4	TIME: 3:30 PM
	END: 3:58 PM		DATE: 8/25/20
		MEAS POINT EL: 159.54	
		TOP OF WATER EL: 70.14	
		WELL HEAD CASING: 4" WOOD CASE	



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Field Notes (9 of 10)

17120405 SFWMD USGS / PH 4 wells
ORF-32

J. Agre

FB 556 / PG 36

8/24/20

Page 2 of 3

Trimble VRS network

GPS FILE: OPUSORF-32 09-24-20

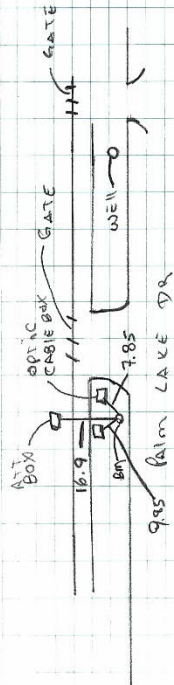
Pt 40,051: PK DALLAN DISK STAMPED USGS
SURVEY MARKER N: 1506587.793 E: 493788.140

Pt 40,050: Bm ORF-32 N: 1506575.629 E: 49349050

* NOTE

SEE FB 555 PG 78

FOR ADDITIONAL REF INFO





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Field Notes (10 of 10)

171204.05	STWMD USGS / PA 4 WELLS	J. ABREV	FB 556 PG 37
	ORF-32		8/24/20
			PAGE 3 OF 3
PICTURES OF BM & WELL			
ORF-32(1)	BM LOOKING NORTH WEST		
ORF-32(2)	BM LOOKING WEST		
ORF-32(3)	BM LOOKING SOUTH		
ORF-32(4)	BM LOOKING EAST		
ORF-32(5)	BM LOOKING NORTH		
ORF-32(6)	BM DISK WAST HIGH		
ORF-32(7)	BM DISK		
ORF-32(1)	WELL LOOKING WEST		
ORF-32(2)	WELL LOOKING SOUTH		
ORF-32(3)	WELL LOOKING EAST		
ORF-32(4)	WELL LOOKING NORTH		
ORF-32(5)	TAG CLOSE UP		
ORF-32(6)	WELL TAG LOCATION		
ORF-32(7)	WELL DIAM MEAS POINT CLOSE UP		
ORF-32(8)	WELL SHOWING DIAM.		



South Florida Water Management District Benchmark Datasheet

Designation: ORF 32	Project Name: USGS PHASE 4 WELLS	Type: V	State Plane Zone: FL East
Stamping: ORF 32 LB 8336 2020	Field Book Name: 500; 555; 556	Field Book Page: 20-25; 66-71,78;35-37	
Established By: T2ues	Recovered By: _____	Recovery Date: _____	
Surveyor: ABREU	Established Date: 08/24/20	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 22	Township: 23S	Range: 28E
County: ORANGE	Quadrangle: WINDERMERE	Quad Index: 3613
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983
NAVD88 Elevation (feet): 156.106	NGVD29 Elevation (feet): 156.986	2022 Elevation: _____
NAVD88 Class: _____	NGVD29 Class: _____	Other Elevation: _____
NAVD88 Order: 3RD	NGVD29 Order: _____	Other Elevation Type: _____
		NGS Source BM(s): P 627
		NGS PID(s): D19114
		NGS NAVD88 Elev (ft): 118.37
		NGS NAVD88 Elev (m): 36.080
		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: + 0.88	Actual NGS Elevation or ngvd29.txt file: _____	OPUS Ortho Height: 47.508
Northing (Y) (feet): 1506575.701	Easting (X) (feet): 493490.539	Source of Latitude & Longitude: OPUS SOLUTION
Latitude: 28	38.24350	Longitude: 81 30 22.93308
DD°	MM'	DD°
Latitude (Decimal Degrees): 28.47728986		Longitude (Decimal Degrees): -81.5063703

RECOVERY DATA

How to Reach: FROM THE PHYSICAL INTERSECTION OF S APOPKA VINELAND RD AND W SAND LAKE RD, GO NORTH ON S APOPKA VINELAND RD FOR 2 MILE TO THE INTERSECTION OF PALM LAKE DRIVE AND SOUTH APOPKA VINELAND RD, PROCEED EAST DOWN PALM LAKE DRIVE FOR APPROXIMATELY 610 FEET, THE MARK IS A SFWMD DISK SET IN A 10 INCH ROUND CONCRETE MONUMENT ON THE NORTH SIDE OF PALM LAKE DRIVE 16.9 FEET SOUTH OF A AT&T BOX, 9.85 FEET SOUTHEAST OF A FIBER OPTIC CABLE BOX AND 7.85 FEET SOUTHWEST OF ANOTHER FIBER OPTIC BOX.

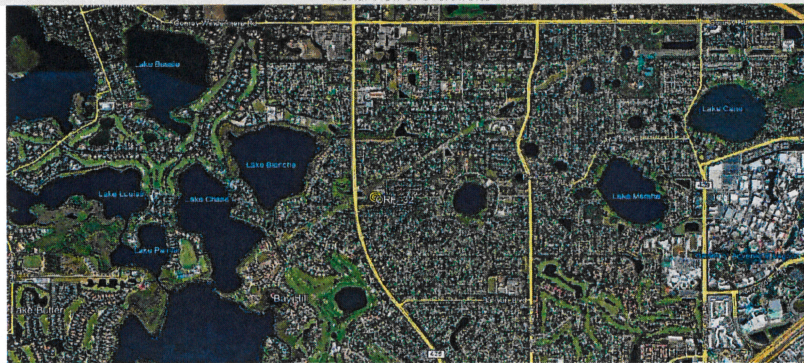
Description/Notes: OTHER SOURCE BENCHMARKS UTILIZED: ORANGE COUNTY BENCHMARK L1293022, ELEVATION = 146.853 (NAVD88)

Notable Landmarks:

Other Source Benchmarks:

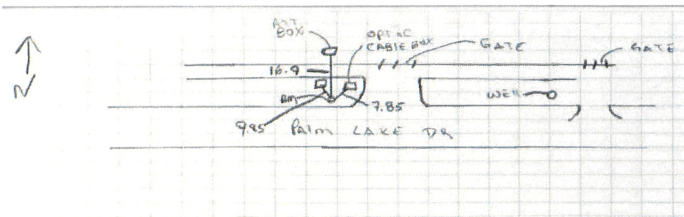
PICTURES

Aerial View of Overall Site



PICTURES

Site Sketch



Haywood, Joshua

From: opus <opus@ngs.noaa.gov>
Sent: Wednesday, August 26, 2020 10:42 AM
To: Haywood, Joshua
Subject: OPUS solution : 42732370.20o OP1598452768985

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: 42732370.20o OP1598452768985

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%7C841bb17b6b0e4944e67108d849ce2f7d%7Ce64791d699864645a1a068c1175eda41%7C1%7C0%7C637340497198710453&data=8ilOT8I3ibZRVsbznF0sYhr7GuDtczWBa3TByTIR0KQ%3D&reserved=0

USER: josh.haywood@t2ue.com DATE: August 26, 2020
RINEX FILE: 4273237m.20o TIME: 14:41:46 UTC

SOFTWARE: page5 1801.18 master53.pl 160321 START: 2020/08/24 12:29:00
EPHEMERIS: igr21201.eph [rapid] STOP: 2020/08/24 19:58:00
NAV FILE: brdc2370.20n OBS USED: 11016 / 15358 : 72%
ANT NAME: TRMR6-3 NONE # FIXED AMB: 163 / 192 : 85%
ARP HEIGHT: 2.000 OVERALL RMS: 0.022(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) ITRF2014 (EPOCH:2020.6466)

X: 828698.856(m) 0.008(m) 828698.012(m) 0.008(m)
Y: -5549173.912(m) 0.017(m) -5549172.355(m) 0.017(m)
Z: 3023114.182(m) 0.018(m) 3023114.024(m) 0.018(m)

LAT: 28 28 38.24350 0.024(m) 28 28 38.26477 0.024(m)
E LON: 278 29 37.06692 0.006(m) 278 29 37.04471 0.006(m)
W LON: 81 30 22.93308 0.006(m) 81 30 22.95529 0.006(m)
EL HGT: 19.928(m) 0.011(m) 18.390(m) 0.011(m)
ORTHO HGT: 47.508(m) 0.051(m) [NAVD88 (Computed using GEOID18)]

UTM COORDINATES STATE PLANE COORDINATES
UTM (Zone 17) SPC (0901 FL E)
Northing (Y) [meters] 3150180.495 459205.192
Easting (X) [meters] 450433.135 150416.217
Convergence [degrees] -0.24144722 -0.24144722
Point Scale 0.99963032 0.99997151
Combined Factor 0.99962719 0.99996838

US NATIONAL GRID DESIGNATOR: 17RMM5043350180(NAD 83)

BASE STATIONS USED
PID DESIGNATION LATITUDE LONGITUDE DISTANCE(m)
DQ7965 FLWE WEDGEFIELD FL CORS ARP N282626.477 W0810533.176 40732.9
DH3757 WACH WAUCHULA CORS ARP N273051.042 W0815256.615 112957.3
DE6005 GNVL GAINESVILLE CORS ARP N294111.557 W0821636.735 153591.4

NEAREST NGS PUBLISHED CONTROL POINT
AK7273 GIS 0138 ED MIZO N282844.535 W0813030.620 285.1

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 -0.1278 -0.0064 0.0224 VEL TIMES 10.6468 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0116 -0.0759 0.0432 ARP TO L1 PHASE CENTER
XYZ 869051.3290 -5544931.7523 3019536.6158 L1 PHS CEN @ 2020.6466
XYZ 0.0000 -0.0000 -0.0000 + XYZ ADJUSTMENTS

XYZ 869051.3290 -5544931.7523 3019536.6158 NEW L1 PHS CEN @ 2020.6466
XYZ 869051.3174 -5544931.6765 3019536.5726 NEW ARP @ 2020.6466
XYZ 869051.3174 -5544931.6765 3019536.5726 NEW MON @ 2020.6466
LLH 28 26 26.49884 278 54 26.80194 -4.9993 NEW L1 PHS CEN @ 2020.6466
LLH 28 26 26.49880 278 54 26.80194 -5.0873 NEW ARP @ 2020.6466
LLH 28 26 26.49880 278 54 26.80194 -5.0873 NEW MON @ 2020.6466

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 -0.1238 0.0180 0.0124 VEL TIMES 10.6468 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0148 -0.1091 0.0575 ARP TO L1 PHASE CENTER
XYZ 799335.3410 -5604081.3886 2928868.6648 L1 PHS CEN @ 2020.6466
XYZ 0.0000 0.0000 -0.0000 + XYZ ADJUSTMENTS
XYZ 799335.3410 -5604081.3886 2928868.6648 NEW L1 PHS CEN @ 2020.6466
XYZ 799335.3262 -5604081.2795 2928868.6073 NEW ARP @ 2020.6466
XYZ 799335.3262 -5604081.2795 2928868.6073 NEW MON @ 2020.6466
LLH 27 30 51.06303 278 7 3.36194 9.2826 NEW L1 PHS CEN @ 2020.6466
LLH 27 30 51.06302 278 7 3.36197 9.1584 NEW ARP @ 2020.6466
LLH 27 30 51.06302 278 7 3.36197 9.1584 NEW MON @ 2020.6466

STATION NAME: gnlv a 3 (Gainesville; Gainesville, Florida, U.S.A.)
MONUMENT: 495925001

XYZ 745247.1963 -5495263.1163 3140246.6326 MON @ 2010.0000 (M)
XYZ -0.0122 0.0002 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 -0.1298 0.0024 0.0183 VEL TIMES 10.6468 YRS
XYZ 0.0000 0.0000 0.0000 MON TO ARP
XYZ 0.0137 -0.1070 0.0617 ARP TO L1 PHASE CENTER
XYZ 745247.0802 -5495263.2209 3140246.7125 L1 PHS CEN @ 2020.6466
XYZ -0.0000 0.0000 0.0000 + XYZ ADJUSTMENTS
XYZ 745247.0802 -5495263.2209 3140246.7126 NEW L1 PHS CEN @ 2020.6466
XYZ 745247.0664 -5495263.1139 3140246.6509 NEW ARP @ 2020.6466
XYZ 745247.0664 -5495263.1139 3140246.6509 NEW MON @ 2020.6466
LLH 29 41 11.57926 277 43 23.24061 22.5654 NEW L1 PHS CEN @ 2020.6466
LLH 29 41 11.57926 277 43 23.24064 22.4411 NEW ARP @ 2020.6466
LLH 29 41 11.57926 277 43 23.24064 22.4411 NEW MON @ 2020.6466

REMOTE STATION INFORMATION

STATION NAME: 4273 1
MONUMENT: NO DOMES NUMBER

XYZ 828698.0337 -5549173.1968 3023114.4850 MON @ 2020.6462 (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 0.2595 -1.7398 0.9517 MON TO ARP
XYZ 0.0112 -0.0733 0.0427 ARP TO L1 PHASE CENTER
XYZ 828698.3045 -5549175.0099 3023115.4794 L1 PHS CEN @ 2020.6466

BASELINE NAME: flwe 4273

XYZ -0.0172 0.8374 -0.4595 + XYZ ADJUSTMENTS
XYZ 828698.2872 -5549174.1725 3023115.0199 NEW L1 PHS CEN @ 2020.6466
XYZ 828698.2760 -5549174.0992 3023114.9772 NEW ARP @ 2020.6466
XYZ 828698.0165 -5549172.3594 3023114.0255 NEW MON @ 2020.6466
LLH 28 28 38.26472 278 29 37.04484 20.4805 NEW L1 PHS CEN @ 2020.6466
LLH 28 28 38.26465 278 29 37.04483 20.3949 NEW ARP @ 2020.6466
LLH 28 28 38.26472 278 29 37.04484 18.3950 NEW MON @ 2020.6466

BASELINE NAME: wach 4273

XYZ -0.0212 0.8357 -0.4704 + XYZ ADJUSTMENTS
XYZ 828698.2833 -5549174.1741 3023115.0090 NEW L1 PHS CEN @ 2020.6466
XYZ 828698.2721 -5549174.1008 3023114.9663 NEW ARP @ 2020.6466
XYZ 828698.0125 -5549172.3611 3023114.0146 NEW MON @ 2020.6466
LLH 28 28 38.26440 278 29 37.04469 20.4762 NEW L1 PHS CEN @ 2020.6466
LLH 28 28 38.26433 278 29 37.04468 20.3907 NEW ARP @ 2020.6466
LLH 28 28 38.26440 278 29 37.04469 18.3907 NEW MON @ 2020.6466

BASELINE NAME: gnlv 4273

XYZ -0.0254 0.8530 -0.4524 + XYZ ADJUSTMENTS
XYZ 828698.2790 -5549174.1568 3023115.0270 NEW L1 PHS CEN @ 2020.6466
XYZ 828698.2678 -5549174.0835 3023114.9843 NEW ARP @ 2020.6466
XYZ 828698.0083 -5549172.3438 3023114.0326 NEW MON @ 2020.6466
LLH 28 28 38.26519 278 29 37.04462 20.4692 NEW L1 PHS CEN @ 2020.6466
LLH 28 28 38.26512 278 29 37.04461 20.3837 NEW ARP @ 2020.6466
LLH 28 28 38.26519 278 29 37.04462 18.3837 NEW MON @ 2020.6466

G-FILES

Axx2020 824 20 824
 B2020 8241229 20 8241958 1 page5 v1801.18IGS 132 1 2 27NGS 2020 826IFDDPX
 IITRF2014_2114 IGS 20200712
 C00090004 403533009 17 42406829 51 -35774528 30 X2370A4273X2370AFLWE
 D 1 2 -5395149 1 3 5245473 2 3 -9640276

Axx2020 824 20 824
 B2020 8241229 20 8241958 1 page5 v1801.18IGS 132 1 2 27NGS 2020 826IFDDPX
 IITRF2014_2114 IGS 20200712
 C00090002 -293626863 11 -549089184 60 -942454073 30 X2370A4273X2370AWACH
 D 1 2 -7253338 1 3 7712941 2 3 -8526140

Axx2020 824 20 824
 B2020 8241229 20 8241958 1 page5 v1801.18IGS 132 1 2 27NGS 2020 826IFDDPX
 IITRF2014_2114 IGS 20200712
 C00090001 -834509418 12 539092299 52 1171326183 33 X2370A4273X2370AGNVL
 D 1 2 -6488266 1 3 2676163 2 3 -8538285

POST-FIT RMS BY SATELLITE VS. BASELINE

OVERALL 01 02 03 05 06 09 12 13
 flwe-4273| 0.022 ... 0.021 0.024 0.020 0.016 0.049 0.025 0.030
 15 17 18 19 20 22 24 25 28
 flwe-4273| 0.028 0.016 0.033 0.032 0.031 ... 0.025 0.024 0.015
 29 30
 flwe-4273| 0.022 0.037

OVERALL 01 02 03 05 06 09 12 13
 wach-4273| 0.022 ... 0.019 0.019 0.020 0.017 ... 0.030 0.028
 15 17 18 19 20 22 24 25 28
 wach-4273| 0.027 0.017 0.023 ... 0.029 ... 0.027 0.031 0.017
 29 30
 wach-4273| 0.022 0.025

OVERALL 01 02 03 05 06 09 12 13
 gnvl-4273| 0.020 ... 0.019 0.024 0.021 0.037 0.075 0.022 0.023
 15 17 18 19 20 22 24 25 28
 gnvl-4273| 0.019 0.017 0.022 0.017 0.022 ... 0.025 0.024 0.014
 29 30
 gnvl-4273| 0.022 0.028

OBS BY SATELLITE VS. BASELINE

OVERALL 01 02 03 05 06 09 12 13
 flwe-4273| 3690 ... 628 92 324 496 7 373 168
 15 17 18 19 20 22 24 25 28
 flwe-4273| 257 371 87 5 65 ... 112 175 191
 29 30
 flwe-4273| 293 46

OVERALL 01 02 03 05 06 09 12 13
 wach-4273| 3575 ... 673 27 313 476 ... 326 183
 15 17 18 19 20 22 24 25 28
 wach-4273| 241 395 75 ... 83 ... 83 193 204
 29 30
 wach-4273| 266 37

OVERALL 01 02 03 05 06 09 12 13
 gnvl-4273| 3751 ... 681 92 316 34 7 395 143
 15 17 18 19 20 22 24 25 28
 gnvl-4273| 224 414 66 462 60 ... 93 235 202
 29 30
 gnvl-4273| 293 34

ITRF position of 4273 as determined by individual baselines

	X	Y	Z
flwe	828698.017	-5549172.359	3023114.025
wach	828698.012	-5549172.361	3023114.015
gnvl	828698.008	-5549172.344	3023114.033

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
flwe	0.004	-0.005	0.001	0.003	-0.001	0.005
wach	0.000	-0.006	-0.010	-0.001	-0.011	0.001
gnvl	-0.004	0.011	0.008	-0.002	0.013	-0.006

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

0.0000010889	-0.0000004482	0.0000001981
-0.0000004482	0.0000316111	-0.0000015249
0.0000001981	-0.0000015249	0.0000097556

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

0.0000016238	0.0000018858	-0.0000035617
--------------	--------------	---------------

0.000018858 0.0000132686 -0.0000080575
-0.0000035617 -0.0000080575 0.0000275631

Horizontal network accuracy = 0.00731 meters.
Vertical network accuracy = 0.01029 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	
GNVL	745247.91692	-5495264.65957	3140246.80430	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	
GNVL	745247.91692	-5495264.65957	3140246.80430	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	
GNVL	0.00143	0.00120	-0.00093	

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	40353.30710	4240.67657	-3577.45412	2010.00	
WACH	-29362.69155	-54908.95926	-94245.40147	2010.00	
GNVL	-83450.93908	53909.25243	117132.62230	2010.00	

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (0901 FLE)
Northing (Y) [feet] 1506575.701
Easting (X) [feet] 493490.539
Convergence [degrees] -0.24144722
Point Scale 0.99997151
Combined Factor 0.99996838

***** 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%7C841bb17b6b0e4944e67108d849ce2f7d%7Ce64791d699864645a1a068c1175eda41%7C1%7C0%7C637340497198710453&data=dRGCP0Y%2FRCFxzJ4wg%2B4jNihEyFRxKemLpsTuzBsmEb4%3D&reserved=0>

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

APPROX ORTHO HGT: 47.494 (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.

ORF-32 Raw Level Data.GSI

*110001+00000000000000001 32...7+0000000000332303 331.27+0000000000047627
390...+00000000000000004 391.27+0000000000000001
*110002+00000000000000002 32...7+0000000000318268 332.27+0000000000044686
390...+00000000000000003 391.27+0000000000000000
*110003+00000000000000003 32...7+0000000000649640 332.27+0000000000050786
390...+00000000000000003 391.27+0000000000000001
*110004+00000000000000004 32...7+0000000001294713 331.27+0000000000053744
390...+00000000000000003 391.27+0000000000000001
*410005+00000000?.....1
*110006+0000000000000P627 83...17+0000000001183700
*110007+0000000000000P627 32...7+0000000000363045 331.07+0000000000067862
390...+00000000000000005 391.07+0000000000000001
*110008+0000000000000TP1 32...7+0000000000340317 332.07+0000000000051757
390...+00000000000000003 391.07+0000000000000000
*110009+0000000000000TP1 573.07+0000000000022728 574.07+0000000000703362
83...07+0000000001199805
*110010+0000000000000TP1 32...7+0000000003484698 331.07+0000000000031914
390...+00000000000000003 391.07+0000000000000004
*110011+0000000000000TP2 32...7+0000000001952954 332.07+0000000000019095
390...+00000000000000003 391.07+0000000000000003
*110012+0000000000000TP2 573.07+0000000001554472 574.07+0000000006141014
83...07+0000000001212624
*110013+0000000000000TP2 32...7+0000000001957466 331.07+0000000000096329
390...+00000000000000003 391.07+0000000000000001
*110014+0000000000000TP3 32...7+0000000001950592 332.07+0000000000048112
390...+00000000000000003 391.07+0000000000000002
*110015+0000000000000TP3 573.07+0000000001561346 574.07+0000000010049072
83...07+0000000001260841
*110016+0000000000000TP3 32...7+0000000002832840 331.07+0000000000035811
390...+00000000000000004 391.07+0000000000000005
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390...+00000000000000003 391.07+0000000000000005
*110018+0000000000000TP4 573.07+0000000001527636 574.07+0000000015748462
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*110019+0000000000000TP4 32...7+000000000425912 331.07+0000000000054710
390...+00000000000000003 391.07+0000000000000001
*110020+0000000000000TP5 32...7+000000000419046 332.07+0000000000051643
390...+00000000000000004 391.07+0000000000000001
*110021+0000000000000TP5 573.07+0000000001534502 574.07+0000000016593420
83...07+0000000001247595
*110022+0000000000000TP5 32...7+0000000001549013 331.07+0000000000042597
390...+00000000000000003 391.07+0000000000000001
*110023+0000000000000TP6 32...7+0000000001462926 332.07+0000000000030077
390...+00000000000000003 391.07+0000000000000002
*110024+0000000000000TP6 573.07+0000000001620590 574.07+0000000019605358
83...07+0000000001260115
*110025+0000000000000TP6 32...7+0000000002059774 331.07+0000000000014556
390...+00000000000000003 391.07+0000000000000002
*110026+0000000000000TP7 32...7+0000000002005668 332.07+0000000000060987

ORF-32 Raw Level Data.GSI

390. . . +000000000000000003 391. 07+0000000000000002
*110027+00000000000000TP7 573. 07+0000000001674696 574. 07+0000000023670801
83. . 07+0000000001213684
*110028+00000000000000TP7 32. . . 7+0000000001697613 331. 07+0000000000033214
390. . . +000000000000000003 391. 07+0000000000000002
*110029+00000000000000TP8 32. . . 7+0000000001697251 332. 07+0000000000083930
390. . . +000000000000000004 391. 07+0000000000000003
*110030+00000000000000TP8 573. 07+0000000001675058 574. 07+0000000027065665
83. . 07+0000000001162968
*110031+00000000000000TP8 32. . . 7+0000000002031774 331. 07+0000000000000474
390. . . +000000000000000003 391. 07+0000000000000003
*110032+00000000000000TP9 32. . . 7+0000000001971164 332. 07+0000000000103096
390. . . +000000000000000004 391. 07+0000000000000004
*110033+00000000000000TP9 573. 07+0000000001735668 574. 07+0000000031068602
83. . 07+0000000001060345
*110034+00000000000000TP9 32. . . 7+0000000002777542 331. 07+0000000000038535
390. . . +000000000000000004 391. 07+0000000000000005
*110035+00000000000000TP10 32. . . 7+0000000002645565 332. 07-0000000000005445
390. . . +000000000000000003 391. 07+0000000000000003
*110036+00000000000000TP10 573. 07+0000000001867645 574. 07+0000000036491709
83. . 07+0000000001104325
*110037+00000000000000TP10 32. . . 7+0000000003063943 331. 07+0000000000046879
390. . . +000000000000000003 391. 07+0000000000000005
*110038+00000000000000TP11 32. . . 7+0000000002961289 332. 07+0000000000059587
390. . . +000000000000000003 391. 07+0000000000000003
*110039+00000000000000TP11 573. 07+0000000001970299 574. 07+0000000042516941
83. . 07+0000000001091617
*110040+00000000000000TP11 32. . . 7+0000000002826227 331. 07+0000000000131856
390. . . +000000000000000003 391. 07+0000000000000004
*110041+00000000000000TP12 32. . . 7+0000000002587813 332. 07+0000000000009037
390. . . +000000000000000003 391. 07+0000000000000004
*110042+00000000000000TP12 573. 07+0000000002208713 574. 07+0000000047930981
83. . 07+0000000001214436
*110043+00000000000000TP12 32. . . 7+0000000001777230 331. 07+0000000000061156
390. . . +000000000000000003 391. 07+0000000000000002
*110044+00000000000000TP14 32. . . 7+0000000001904589 332. 07+0000000000090726
390. . . +000000000000000003 391. 07+0000000000000001
*110045+00000000000000TP14 573. 07+0000000002081354 574. 07+0000000051612800
83. . 07+0000000001184865
*110046+00000000000000TP14 32. . . 7+0000000001113337 331. 07-000000000002734
390. . . +000000000000000003 391. 07+0000000000000001
*110047+00000000000000TP15 32. . . 7+0000000001110422 332. 07+0000000000095476
390. . . +000000000000000004 391. 07+0000000000000002
*110048+00000000000000TP15 573. 07+0000000002084269 574. 07+0000000053836558
83. . 07+0000000001086656
*410049+00000000?. 1
*110050+00000000000000TP15 83. . 07+0000000001086656
*110051+00000000000000TP15 32. . . 7+0000000003487069 331. 07+0000000000003155
390. . . +000000000000000003 391. 07+0000000000000006

ORF-32 Raw Level Data.GSI

*110052+000000000000TP16 32...7+0000000003475882 332.07+0000000000068505
390...+0000000000000003 391.07+0000000000000006
*110053+000000000000TP16 573.07+0000000000011186 574.07+0000000006962951
83..07+0000000001021307
*110054+000000000000TP16 32...7+0000000002968596 331.07+0000000000066897
390...+0000000000000003 391.07+0000000000000005
*110055+000000000000TP17 32...7+0000000002937245 332.07+0000000000027110
390...+0000000000000003 391.07+0000000000000004
*110056+000000000000TP17 573.07+0000000000042537 574.07+0000000012868792
83..07+0000000001061093
*110057+000000000000TP17 32...7+0000000003025610 331.07+0000000000095454
390...+0000000000000003 391.07+0000000000000003
*110058+000000000000TP18 32...7+0000000002893232 332.07+0000000000015538
390...+0000000000000003 391.07+0000000000000003
*110059+000000000000TP18 573.07+0000000000174915 574.07+0000000018787634
83..07+0000000001141009
*110060+000000000000TP18 32...7+0000000001980589 331.07+0000000000098575
390...+0000000000000003 391.07+0000000000000003
*110061+000000000000TP19 32...7+0000000001976184 332.07+0000000000006239
390...+0000000000000004 391.07+0000000000000004
*110062+000000000000TP19 573.07+0000000000179320 574.07+0000000022744407
83..07+0000000001233344
*110063+000000000000TP19 32...7+0000000003488932 331.07+0000000000131177
390...+0000000000000003 391.07+0000000000000006
*110064+000000000000TP20 32...7+0000000002448368 332.07-0000000000001865
390...+0000000000000003 391.07+0000000000000003
*110065+000000000000TP20 573.07+0000000001219884 574.07+0000000028681707
83..07+0000000001366386
*110066+000000000000TP20 32...7+0000000002686811 331.07+0000000000075585
390...+0000000000000003 391.07+0000000000000001
*110067+000000000000TP21 32...7+0000000002713422 332.07+0000000000058205
390...+0000000000000003 391.07+0000000000000004
*110068+000000000000TP21 573.07+0000000001193272 574.07+0000000034081940
83..07+0000000001383766
*110069+000000000000TP21 32...7+0000000003447680 331.07+0000000000039115
390...+0000000000000003 391.07+0000000000000002
*110070+000000000000TP22 32...7+0000000003482531 332.07+0000000000017719
390...+0000000000000003 391.07+0000000000000003
*110071+000000000000TP22 573.07+0000000001158421 574.07+0000000041012151
83..07+0000000001405162
*110072+000000000000TP22 32...7+0000000002707421 331.07+0000000000120502
390...+0000000000000003 391.07+0000000000000004
*110073+00000000000000A1 32...7+0000000001564794 332.07+0000000000017961
390...+0000000000000003 391.07+0000000000000001
*110074+00000000000000A1 573.07+0000000002301048 574.07+0000000045284366
83..07+0000000001507703
*410075+00000000?.....1
*110076+00000000000000A1 83..07+0000000001507703
*110077+00000000000000A1 32...7+0000000002983653 331.07+0000000000086474

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390...+0000000000000003 391.07+0000000000000003
*110078+000000000000TP23 32...7+0000000002981803 332.07+0000000000017793
390...+0000000000000003 391.07+0000000000000002
*110079+000000000000TP23 573.07+0000000000001851 574.07+0000000005965456
83..07+0000000001576384
*110080+000000000000TP23 32...7+0000000003534731 331.07+0000000000099038
390...+0000000000000003 391.07+0000000000000005
*110081+000000000000TP24 32...7+0000000003475760 332.07+0000000000058257
390...+0000000000000003 391.07+0000000000000002
*110082+000000000000TP24 573.07+0000000000060822 574.07+0000000012975946
83..07+0000000001617164
*110083+000000000000TP24 32...7+0000000003510719 331.07+0000000000016339
390...+0000000000000003 391.07+0000000000000003
*110084+000000000000TP25 32...7+0000000003473709 332.07+0000000000094560
390...+0000000000000003 391.07+0000000000000003
*110085+000000000000TP25 573.07+0000000000097832 574.07+0000000019960374
83..07+0000000001538944
*110086+000000000000TP25 32...7+0000000002012567 331.07+0000000000019927
390...+0000000000000004 391.07+0000000000000003
*110087+000000000000TP26 32...7+0000000001995722 332.07+0000000000096380
390...+0000000000000003 391.07+0000000000000002
*110088+000000000000TP26 573.07+0000000000114677 574.07+0000000023968663
83..07+0000000001462491
*110089+000000000000TP26 32...7+0000000001851451 331.07+0000000000001362
390...+0000000000000003 391.07+0000000000000001
*110090+000000000000TP27 32...7+0000000001832407 332.07+0000000000109142
390...+0000000000000004 391.07+0000000000000004
*110091+000000000000TP27 573.07+0000000000133721 574.07+0000000027652521
83..07+0000000001354711
*110092+000000000000TP27 32...7+0000000001526398 331.07-0000000000000578
390...+0000000000000003 391.07+0000000000000002
*110093+000000000000TP28 32...7+0000000001538123 332.07+0000000000110300
390...+0000000000000004 391.07+0000000000000003
*110094+000000000000TP28 573.07+0000000000121995 574.07+0000000030717041
83..07+0000000001243832
*110095+000000000000TP28 32...7+0000000001509505 331.07+0000000000003478
390...+0000000000000003 391.07+0000000000000003
*110096+000000000000TP29 32...7+0000000001569183 332.07+0000000000103514
390...+0000000000000003 391.07+0000000000000002
*110097+000000000000TP29 573.07+0000000000062318 574.07+0000000033795729
83..07+0000000001143796
*110098+000000000000TP29 32...7+0000000002009244 331.07+0000000000052068
390...+0000000000000003 391.07+0000000000000003
*110099+000000000000TP30 32...7+0000000001991899 332.07+0000000000034099
390...+0000000000000003 391.07+0000000000000000
*110100+000000000000TP30 573.07+0000000000079662 574.07+0000000037796872
83..07+0000000001161764
*110101+000000000000TP30 32...7+0000000001965574 331.07+0000000000105602
390...+0000000000000003 391.07+0000000000000002

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*110102+000000000000TP31 32...7+0000000001442319 332.07+0000000000002133
390...+0000000000000003 391.07+0000000000000002
*110103+000000000000TP31 573.07+0000000000602917 574.07+0000000041204766
83..07+0000000001265234
*110104+000000000000TP31 32...7+0000000002025151 331.07+0000000000130150
390...+0000000000000003 391.07+0000000000000003
*110105+000000000000TP32 32...7+0000000001923589 332.07-0000000000001115
390...+0000000000000003 391.07+0000000000000002
*110106+000000000000TP32 573.07+0000000000704479 574.07+0000000045153506
83..07+0000000001396498
*110107+000000000000TP32 32...7+0000000001978517 331.07+0000000000100012
390...+0000000000000004 391.07+0000000000000003
*110108+000000000000TP33 32...7+0000000001996550 332.07+0000000000025457
390...+0000000000000004 391.07+0000000000000004
*110109+000000000000TP33 573.07+0000000000686446 574.07+0000000049128573
83..07+0000000001471053
*110110+000000000000TP33 32...7+0000000002527422 331.07+0000000000068709
390...+0000000000000003 391.07+0000000000000004
*110111+000000000000TP34 32...7+0000000002426444 332.07+0000000000065394
390...+0000000000000003 391.07+0000000000000001
*110112+000000000000TP34 573.07+0000000000787424 574.07+0000000054082439
83..07+0000000001474368
*110113+000000000000TP34 32...7+0000000001331308 331.07+0000000000057907
390...+0000000000000003 391.07+0000000000000002
*110114+000000000000C BM 32...7+0000000001355861 332.07+0000000000063293
390...+0000000000000004 391.07+0000000000000002 71...+0000000EL114.853
*110115+000000000000C BM 573.07+0000000000762871 574.07+0000000056769608
83..07+0000000001468982
*110116+000000000000C BM 32...7+0000000002797816 331.07+0000000000087684
390...+0000000000000004 391.07+0000000000000004
*110117+000000000000TP35 32...7+0000000002726252 332.07+0000000000014100
390...+0000000000000003 391.07+0000000000000004
*110118+000000000000TP35 573.07+0000000000834434 574.07+0000000062293676
83..07+0000000001542566
*110119+000000000000TP35 32...7+0000000000699990 331.07+0000000000063806
390...+0000000000000003 391.07+0000000000000000
*110120+000000000000SF32 32...7+0000000000697585 332.07+0000000000044906
390...+0000000000000005 391.07+0000000000000001
*110121+000000000000SF32 573.07+0000000000836839 574.07+0000000063691251
83..07+0000000001561466
*110122+000000000000SF32 32...7+0000000000703521 331.07+0000000000043428
390...+0000000000000004 391.07+0000000000000001
*110123+000000000000TP35B 32...7+0000000000694465 332.07+0000000000062341
390...+0000000000000003 391.07+0000000000000001
*110124+000000000000TP35B 573.07+0000000000845895 574.07+0000000065089236
83..07+0000000001542554
*110125+000000000000TP35B 32...7+0000000002775796 331.07+0000000000013043
390...+0000000000000003 391.07+0000000000000003
*110126+000000000000C BMB 32...7+0000000002751699 332.07+0000000000086619

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390. . . +000000000000000003 391. 07+000000000000000001
*110127+000000000000C BMB 573. 07+0000000000869992 574. 07+0000000070616732
83. . 07+0000000001468979
*410128+00000000?. 1
*110129+000000000000SF32 83. . 07+0000000001561466
*110130+000000000000SF32 32. . . 7+0000000001040953 331. 07+0000000000060479
390. . . +000000000000000003 391. 07+000000000000000001
*110131+000000000000WELL 32. . . 7+0000000001097909 332. 07+0000000000026186
390. . . +000000000000000004 391. 07+000000000000000002
*110132+000000000000WELL 573. 07-0000000000056957 574. 07+0000000002138862
83. . 07+0000000001595759
*110133+000000000000WELL 32. . . 7+0000000001104263 331. 07+0000000000023203
390. . . +000000000000000003 391. 07+000000000000000001
*110134+000LSD NAIL+DI SC 32. . . 7+0000000001101626 332. 07+0000000000040601
390. . . +000000000000000003 391. 07+000000000000000002
*110135+000LSD NAIL+DI SC 573. 07-00000000000054319 574. 07+0000000004344751
83. . 07+0000000001578361
*110136+000LSD NAIL+DI SC 32. . . 7+0000000001105328 331. 07+0000000000038020
390. . . +000000000000000003 391. 07+000000000000000001
*110137+00LSD NAIL+DI SC1 32. . . 7+0000000001133327 332. 07+0000000000039724
390. . . +000000000000000003 391. 07+000000000000000001
*110138+00LSD NAIL+DI SC1 573. 07-00000000000082318 574. 07+0000000006583406
83. . 07+0000000001576656
*110139+00LSD NAIL+DI SC1 32. . . 7+0000000001131743 331. 07+0000000000041504
390. . . +000000000000000003 391. 07+000000000000000001
*110140+000000000000SF31B 32. . . 7+0000000001033596 332. 07+0000000000056695
390. . . +000000000000000003 391. 07+000000000000000001
*110141+000000000000SF31B 573. 07+0000000000015828 574. 07+0000000008748745
83. . 07+0000000001561465

Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Name:	Default
Size:	56 KB	Datum:	WGS 1984
Modified:	8/23/2020 10:44:07 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: [M 171204.05ED82020.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: 0.04481 ft

Σ BS Distances: 8749.631 ft

Σ FS Distances: 8224.101 ft

Run Length: 16973.732 ft

Reduction: Adjusted Values

Create	Point ID	BS	HI	IS	FS	A Elevation	Raw Elevation	Correction	Adj. Elevation	Type	Distance	Description
✓	P627	6.78619 ft	125.15595 ft			0.00000 ft	118.36976 ft	0.00000 ft	118.36976 ft	Benchmark	36.304 ft	
✓	TP1				5.17569 ft	1.61050 ft	119.98026 ft	0.00000 ft	119.98026 ft	Computed	34.032 ft	
	TP1	3.19139 ft	123.17165 ft								348.469 ft	
✓	TP2				1.90950 ft	1.28190 ft	121.26216 ft	-0.00001 ft	121.26215 ft	Computed	195.295 ft	
	TP2	9.63288 ft	130.89504 ft								195.746 ft	
✓	TP3				4.81119 ft	4.82169 ft	126.08385 ft	-0.00002 ft	126.08383 ft	Computed	195.059 ft	
	TP3	3.58109 ft	129.66494 ft								283.283 ft	
✓	TP4				5.21239 ft	-1.63130 ft	124.45255 ft	-0.00003 ft	124.45252 ft	Computed	286.654 ft	
	TP4	5.47099 ft	129.92354 ft								42.591 ft	
✓	TP5				5.16429 ft	0.30670 ft	124.75925 ft	-0.00003 ft	124.75922 ft	Computed	41.905 ft	
	TP5	4.25969 ft	129.01894 ft								154.901 ft	
✓	TP6				3.00769 ft	1.25200 ft	126.01125 ft	-0.00004 ft	126.01121 ft	Computed	146.292 ft	
	TP6	1.45560 ft	127.46685 ft								205.977 ft	
✓	TP7				6.09869 ft	-4.64309 ft	121.36816 ft	-0.00004 ft	121.36811 ft	Computed	200.566 ft	
	TP7	3.32139 ft	124.68955 ft								169.761 ft	
✓	TP8				8.39298 ft	-5.07159 ft	116.29657 ft	-0.00005 ft	116.29652 ft	Computed	169.725 ft	
	TP8	0.04740 ft	116.34397 ft								203.177 ft	
✓	TP9				10.30958 ft	-10.26218 ft	106.03439 ft	-0.00006 ft	106.03433 ft	Computed	197.116 ft	
	TP9	3.85349 ft	109.88788 ft								277.754 ft	
✓	TP10				-0.54450 ft	4.39799 ft	110.43238 ft	-0.00007 ft	110.43231 ft	Computed	264.556 ft	
	TP10	4.68789 ft	115.12027 ft								306.394 ft	
✓	TP11				5.95869 ft	-1.27080 ft	109.16158 ft	-0.00008 ft	109.16150 ft	Computed	296.128 ft	
	TP11	13.18557 ft	122.34716 ft								282.622 ft	
✓	TP12				0.90370 ft	12.28188 ft	121.44346 ft	-0.00009 ft	121.44337 ft	Computed	258.781 ft	
	TP12	6.11559 ft	127.55904 ft								177.723 ft	
✓	TP14				9.07258 ft	-2.95699 ft	118.48646 ft	-0.00010 ft	118.48637 ft	Computed	190.459 ft	
	TP14	-0.27340 ft	118.21306 ft								111.333 ft	
✓	TP15				9.54758 ft	-9.82098 ft	108.66548 ft	-0.00010 ft	108.66538 ft	Benchmark	111.042 ft	
	TP15	0.31550 ft	108.98098 ft								348.706 ft	
✓	TP16				6.85049 ft	-6.53499 ft	102.13050 ft	-0.00012 ft	102.13038 ft	Computed	347.588 ft	
	TP16	6.68969 ft	108.82018 ft								296.859 ft	
✓	TP17				2.71099 ft	3.97869 ft	106.10919 ft	-0.00013 ft	106.10906 ft	Computed	293.724 ft	
	TP17	9.54538 ft	115.65457 ft								302.560 ft	
✓	TP18				1.55380 ft	7.99158 ft	114.10077 ft	-0.00014 ft	114.10063 ft	Computed	289.323 ft	
	TP18	9.85748 ft	123.95825 ft								198.059 ft	
✓	TP19				0.62390 ft	9.23358 ft	123.33435 ft	-0.00015 ft	123.33420 ft	Computed	197.618 ft	
	TP19	13.11767 ft	136.45203 ft								348.893 ft	
✓	TP20				-0.18650 ft	13.30417 ft	136.63853 ft	-0.00016 ft	136.63836 ft	Computed	244.836 ft	
	TP20	7.55848 ft	144.19701 ft								268.681 ft	
✓	TP21				5.82049 ft	1.73800 ft	138.37652 ft	-0.00018 ft	138.37635 ft	Computed	271.342 ft	
	TP21	3.91149 ft	142.28802 ft								344.767 ft	
✓	TP22				1.77190 ft	2.13960 ft	140.51612 ft	-0.00019 ft	140.51593 ft	Computed	348.252 ft	
	TP22	12.05018 ft	152.56629 ft								270.742 ft	

✓	A1				✓ 1.79610 ft	10.25408 ft	150.77020 ft	-0.00020 ft	150.77000 ft	Benchmark	156.479 ft	
	A1	✓ 8.64738 ft	159.41758 ft								298.365 ft	
✓	TP23				✓ 1.77930 ft	6.86809 ft	157.63828 ft	-0.00397 ft	157.63432 ft	Computed	298.180 ft	
	TP23	✓ 9.90378 ft	167.54206 ft								353.472 ft	
✓	TP24				✓ 5.82569 ft	4.07809 ft	161.71638 ft	-0.00840 ft	161.70798 ft	Computed	347.575 ft	
	TP24	✓ 1.63390 ft	163.35027 ft								351.071 ft	
✓	TP25				✓ 9.45598 ft	-7.82208 ft	153.89429 ft	-0.01281 ft	153.88148 ft	Computed	347.370 ft	
	TP25	✓ 1.99270 ft	155.88699 ft								201.256 ft	
✓	TP26				✓ 9.63798 ft	-7.64528 ft	146.24901 ft	-0.01534 ft	146.23367 ft	Computed	199.572 ft	
	TP26	✓ 0.13620 ft	146.38521 ft								185.145 ft	
✓	TP27				✓ 10.91418 ft	-10.77798 ft	135.47103 ft	-0.01767 ft	135.45336 ft	Computed	183.240 ft	
	TP27	✓ -0.05780 ft	135.41323 ft								152.639 ft	
✓	TP28				✓ 11.02998 ft	-11.08778 ft	124.38325 ft	-0.01960 ft	124.36365 ft	Computed	153.812 ft	
	TP28	✓ 0.34780 ft	124.73105 ft								150.950 ft	
✓	TP29				✓ 10.35138 ft	-10.00358 ft	114.37967 ft	-0.02155 ft	114.35812 ft	Computed	156.918 ft	
	TP29	✓ 5.20679 ft	119.58646 ft								200.924 ft	
✓	TP30				✓ 3.40989 ft	1.79690 ft	116.17657 ft	-0.02408 ft	116.15249 ft	Computed	199.190 ft	
	TP30	✓ 10.56018 ft	126.73675 ft								196.557 ft	
✓	TP31				✓ 0.21330 ft	10.34688 ft	126.52345 ft	-0.02623 ft	126.49722 ft	Computed	144.232 ft	
	TP31	✓ 13.01497 ft	139.53842 ft								202.515 ft	
✓	TP32				✓ -0.11150 ft	13.12647 ft	139.64992 ft	-0.02872 ft	139.62120 ft	Computed	192.359 ft	
	TP32	✓ 10.00118 ft	149.65110 ft								197.851 ft	
✓	TP33				✓ 2.54569 ft	7.45549 ft	147.10541 ft	-0.03123 ft	147.07417 ft	Computed	199.655 ft	
	TP33	✓ 6.87089 ft	153.97629 ft								252.742 ft	
✓	TP34				✓ 6.53939 ft	0.33150 ft	147.43691 ft	-0.03436 ft	147.40254 ft	Computed	242.644 ft	
	TP34	✓ 5.79069 ft	153.22759 ft								133.131 ft	
✓	OC BM				✓ 6.32929 ft	-0.53860 ft	146.89831 ft	-0.03606 ft	146.86225 ft	Computed	135.586 ft	
	OC BM	✓ 8.76838 ft	155.66669 ft								279.781 ft	
✓	TP35				✓ 1.41000 ft	7.35839 ft	154.25669 ft	-0.03955 ft	154.21714 ft	Computed	272.625 ft	
	TP35	✓ 6.38059 ft	160.63728 ft								69.999 ft	
✓	BM OSF-32				✓ 4.49059 ft	1.89000 ft	156.14669 ft	-0.04043 ft	156.10626 ft	Computed	69.758 ft	
	BM OSF-32	✓ 4.34279 ft	160.48948 ft								70.352 ft	
✓	TP35B				✓ 6.23409 ft	-1.89130 ft	154.25539 ft	-0.04131 ft	154.21408 ft	Computed	69.446 ft	
	TP35B	✓ 1.30430 ft	155.55969 ft								277.579 ft	
✓	L1293022 ORANGE COUNTY BM				✓ 8.66188 ft	-7.35759 ft	146.89781 ft	-0.04481 ft	146.85300 ft	Benchmark	275.169 ft	

Run - 0002 (N6) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
P627-TP1 (E46)	Enabled	1.61050 ft	0.00000 ft	1.61050 ft	1	70.336 ft	6.78619 ft	5.17569 ft	0.00034 ft
TP1-TP2 (E47)	Enabled	1.28190 ft	-0.00001 ft	1.28189 ft	1	543.764 ft	3.19139 ft	1.90950 ft	0.00093 ft
TP2-TP3 (E48)	Enabled	4.82169 ft	-0.00001 ft	4.82168 ft	1	390.805 ft	9.63288 ft	4.81119 ft	0.00079 ft
TP3-TP4 (E49)	Enabled	-1.63130 ft	-0.00001 ft	-1.63131 ft	1	569.938 ft	3.58109 ft	5.21239 ft	0.00096 ft
TP4-TP5 (E50)	Enabled	0.30670 ft	0.00000 ft	0.30670 ft	1	84.496 ft	5.47099 ft	5.16429 ft	0.00037 ft
TP5-TP6 (E51)	Enabled	1.25200 ft	-0.00001 ft	1.25199 ft	1	301.193 ft	4.25969 ft	3.00769 ft	0.00070 ft
TP6-TP7 (E52)	Enabled	-4.64309 ft	-0.00001 ft	-4.64310 ft	1	406.543 ft	1.45560 ft	6.09869 ft	0.00081 ft
TP7-TP8 (E53)	Enabled	-5.07159 ft	-0.00001 ft	-5.07160 ft	1	339.486 ft	3.32139 ft	8.39298 ft	0.00074 ft
TP8-TP9 (E54)	Enabled	-10.26218 ft	-0.00001 ft	-10.26219 ft	1	400.293 ft	0.04740 ft	10.30958 ft	0.00080 ft
TP9-TP10 (E55)	Enabled	4.39799 ft	-0.00001 ft	4.39798 ft	1	542.310 ft	3.85349 ft	-0.54450 ft	0.00093 ft
TP10-TP11 (E56)	Enabled	-1.27080 ft	-0.00001 ft	-1.27081 ft	1	602.522 ft	4.68789 ft	5.95869 ft	0.00098 ft
TP11-TP12 (E57)	Enabled	12.28188 ft	-0.00001 ft	12.28187 ft	1	541.403 ft	13.18557 ft	0.90370 ft	0.00093 ft
TP12-TP14 (E58)	Enabled	-2.95699 ft	-0.00001 ft	-2.95700 ft	1	368.181 ft	6.11559 ft	9.07258 ft	0.00077 ft
TP14-TP15 (E59)	Enabled	-9.82098 ft	0.00000 ft	-9.82098 ft	1	222.375 ft	-0.27340 ft	9.54758 ft	0.00060 ft
TP15-TP16 (E60)	Enabled	-6.53499 ft	-0.00002 ft	-6.53500 ft	1	696.294 ft	0.31550 ft	6.85049 ft	0.00106 ft
TP16-TP17 (E61)	Enabled	3.97869 ft	-0.00001 ft	3.97868 ft	1	590.583 ft	6.68969 ft	2.71099 ft	0.00097 ft
TP17-TP18 (E62)	Enabled	7.99158 ft	-0.00001 ft	7.99157 ft	1	591.883 ft	9.54538 ft	1.55380 ft	0.00098 ft
TP18-TP19 (E63)	Enabled	9.23358 ft	-0.00001 ft	9.23357 ft	1	395.677 ft	9.85748 ft	0.62390 ft	0.00080 ft
TP19-TP20 (E64)	Enabled	13.30417 ft	-0.00001 ft	13.30416 ft	1	593.729 ft	13.11767 ft	-0.18650 ft	0.00098 ft
TP20-TP21 (E65)	Enabled	1.73800 ft	-0.00001 ft	1.73798 ft	1	540.022 ft	7.55848 ft	5.82049 ft	0.00093 ft
TP21-TP22 (E66)	Enabled	2.13960 ft	-0.00002 ft	2.13958 ft	1	693.020 ft	3.91149 ft	1.77190 ft	0.00106 ft
TP22-A1 (E67)	Enabled	10.25408 ft	-0.00001 ft	10.25407 ft	1	427.221 ft	12.05018 ft	1.79610 ft	0.00083 ft
A1-TP23 (E68)	Enabled	6.86809 ft	-0.00377 ft	6.86432 ft	1	596.544 ft	8.64738 ft	1.77930 ft	0.00098 ft
TP23-TP24 (E69)	Enabled	4.07809 ft	-0.00443 ft	4.07366 ft	1	701.048 ft	9.90378 ft	5.82569 ft	0.00106 ft
TP24-TP25 (E70)	Enabled	-7.82208 ft	-0.00441 ft	-7.82650 ft	1	698.441 ft	1.63390 ft	9.45598 ft	0.00106 ft
TP25-TP26 (E71)	Enabled	-7.64528 ft	-0.00253 ft	-7.64782 ft	1	400.828 ft	1.99270 ft	9.63798 ft	0.00080 ft
TP26-TP27 (E72)	Enabled	-10.77798 ft	-0.00233 ft	-10.78031 ft	1	368.385 ft	0.13620 ft	10.91418 ft	0.00077 ft
TP27-TP28 (E73)	Enabled	-11.08778 ft	-0.00194 ft	-11.08971 ft	1	306.451 ft	-0.05780 ft	11.02998 ft	0.00070 ft
TP28-TP29 (E74)	Enabled	-10.00358 ft	-0.00194 ft	-10.00552 ft	1	307.868 ft	0.34780 ft	10.35138 ft	0.00070 ft
TP29-TP30 (E75)	Enabled	1.79690 ft	-0.00253 ft	1.79437 ft	1	400.113 ft	5.20679 ft	3.40989 ft	0.00080 ft
TP30-TP31 (E76)	Enabled	10.34688 ft	-0.00215 ft	10.34473 ft	1	340.789 ft	10.56018 ft	0.21330 ft	0.00074 ft
TP31-TP32 (E77)	Enabled	13.12647 ft	-0.00249 ft	13.12398 ft	1	394.873 ft	13.01497 ft	-0.11150 ft	0.00080 ft
	Enabled	7.45549 ft	-0.00251 ft	7.45297 ft	1	397.506 ft	10.00118 ft	2.54569 ft	0.00080 ft

TP32-TP33 (E78)									
TP33-TP34 (E79)	Enabled	0.33150 ft	-0.00313 ft	0.32837 ft	1	495.386 ft	6.87089 ft	6.53939 ft	0.00089 ft
TP34-OC BM (E80)	Enabled	-0.53860 ft	-0.00170 ft	-0.54030 ft	1	268.716 ft	5.79069 ft	6.32929 ft	0.00066 ft
OC BM-TP35 (E81)	Enabled	7.35839 ft	-0.00349 ft	7.35490 ft	1	552.406 ft	8.76838 ft	1.41000 ft	0.00094 ft
TP35-BM OSF-32 (E82)	Enabled	1.89000 ft	-0.00088 ft	1.88911 ft	1	139.757 ft	6.38059 ft	4.49059 ft	0.00047 ft
BM OSF-32-TP35B (E83)	Enabled	-1.89130 ft	-0.00088 ft	-1.89218 ft	1	139.798 ft	4.34279 ft	6.23409 ft	0.00047 ft
TP35B-L1293022 ORANGE COUNTY BM (E84)	Enabled	-7.35759 ft	-0.00349 ft	-7.36108 ft	1	552.748 ft	1.30430 ft	8.66188 ft	0.00094 ft

Run - 0002 (N6) Reduced Coordinates

Point ID	Status	Elevation
P627	Enabled	118.36976 ft
TP15	Enabled	108.66538 ft
A1	Enabled	150.77000 ft
L1293022 ORANGE COUNTY BM	Enabled	146.85300 ft

Date: 8/23/2020 10:44:17 AM	Project: J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Trimble Business Center
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Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Name:	Default
Size:	56 KB	Datum:	WGS 1984
Modified:	8/23/2020 10:44:07 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: [M 171204.05ED82020.GSI](#)

Instrument:

Creation option: Delta elevations

Description usage: Feature codes

Run - 0005 Raw Observations

Standard error per kilometer of double leveling: 0.00230 ft

Standard error per turn/station setup: 0.00000 ft

Raw Misclosure: 0.00026 ft

Σ BS Distances: 438.228 ft

Σ FS Distances: 436.645 ft

Run Length: 874.873 ft

Reduction: Adjusted Values

Create	Point ID	BS	HI	IS	FS	A Elevation	Raw Elevation	Correction	Adj. Elevation	Type	Distance	Description
✓	OSF-32	✓ 6.04789 ft	162.15415 ft			0.00000 ft	156.10626 ft	0.00000 ft	156.10626 ft	Benchmark	104.095 ft	
✓	WELL MP				✓ 2.61859 ft	3.42929 ft	159.53555 ft	-0.00006 ft	159.53549 ft	Computed	109.791 ft	
	WELL MP	✓ 2.32030 ft	161.85585 ft								110.426 ft	
✓	LSD NAIL+DISK				✓ 4.06009 ft	-1.73980 ft	157.79576 ft	-0.00013 ft	157.79563 ft	Computed	110.162 ft	
	LSD NAIL+DISK	✓ 3.80199 ft	161.59775 ft								110.533 ft	
✓	RM 1 NAIL+DISK				✓ 3.97239 ft	-0.17040 ft	157.62536 ft	-0.00020 ft	157.62516 ft	Computed	113.332 ft	
	RM 1 NAIL+DISK	✓ 4.15039 ft	161.77575 ft								113.174 ft	
✓	OSF-31				✓ 5.66949 ft	-1.51910 ft	156.10626 ft	-0.00026 ft	156.10600 ft	Benchmark	103.359 ft	

Run - 0005 (N14) Reduced Observations

Observation	Status	Raw Δ Elevation	Correction	Final Δ Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
OSF-32-WELL MP (E138)	Enabled	3.42929 ft	-0.00006 ft	3.42923 ft	1	213.886 ft	6.04789 ft	2.61859 ft	0.00059 ft
WELL MP-LSD NAIL+DISK (E139)	Enabled	-1.73980 ft	-0.00007 ft	-1.73986 ft	1	220.588 ft	2.32030 ft	4.06009 ft	0.00060 ft
LSD NAIL+DISK-RM 1 NAIL+DISK (E140)	Enabled	-0.17040 ft	-0.00007 ft	-0.17047 ft	1	223.865 ft	3.80199 ft	3.97239 ft	0.00060 ft
RM 1 NAIL+DISK-OSF-31 (E141)	Enabled	-1.51910 ft	-0.00006 ft	-1.51916 ft	1	216.533 ft	4.15039 ft	5.66949 ft	0.00059 ft

Run - 0005 (N14) Reduced Coordinates

Point ID	Status	Elevation
OSF-32	Enabled	156.10626 ft
OSF-31	Enabled	156.10600 ft

Date: 8/23/2020 10:46:41 AM	Project: J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Trimble Business Center
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Project File Data		Coordinate System	
Name:	J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Name:	Default
Size:	57 KB	Datum:	WGS 1984
Modified:	8/27/2020 3:29:39 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_171204.05ED825C.GSI](#)

Instrument:

Creation option: Delta elevations

Description usage: Feature codes

Run - 0001 Raw Observations

Standard error per kilometer of double leveling: 0.00230 ft

Standard error per turn/station setup: 0.00000 ft

Raw Misclosure: -0.00020 ft

Σ BS Distances: 83.998 ft

Σ FS Distances: 95.826 ft

Run Length: 179.824 ft

Reduction: Raw Elevations

Create	Point ID	BS	HI	IS	FS	A Elevation	Raw Elevation	Misclosure	Adj. Elevation	Type	Distance	Description
✓	LSD REF	✓ 5.26609 ft	163.06109 ft			0.00000 ft	157.79500 ft	0.00000 ft	157.79500 ft	Benchmark	34.728 ft	
✓	RM2				✓ 4.91649 ft	0.34960 ft	158.14460 ft			Computed	49.521 ft	
	RM2	✓ 4.98189 ft	163.12649 ft								49.271 ft	
✓	RM1				✓ 5.50169 ft	-0.51980 ft	157.62480 ft	-0.00020 ft	157.62500 ft	Benchmark	46.305 ft	

Run - 0001 (N17) Reduced Observations

Observation	Status	Raw A Elevation	Correction	Final A Elevation	Setups	Length	Σ BS Readings	Σ FS Readings	Std. Error
LSD REF-RM2 (E146)	Enabled	0.34960 ft	0.00000 ft	0.34960 ft	1	84.249 ft	5.26609 ft	4.91649 ft	0.00037 ft
RM2-RM1 (E147)	Enabled	-0.51980 ft	0.00000 ft	-0.51980 ft	1	95.576 ft	4.98189 ft	5.50169 ft	0.00039 ft

Run - 0001 (N17) Reduced Coordinates

Point ID	Status	Elevation
LSD REF	Enabled	157.79500 ft
RM1	Enabled	157.62500 ft

Date: 8/27/2020 3:29:44 PM	Project: J:\2017\171204.05 - SFWMD USGS Phase 4 Wells\TBC\ORF-32.vce	Trimble Business Center
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Office

Project

28 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

OSF-32

1/1

Northing/Y: 1506575.629
Easting/X: 493490.502
Elevation/Z: 156.11
Convergence: -0 14 29.21138
Scale Factor: 0.999971507
Combined Factor: 0.999968365

Northing/Y: 1506575.629
Easting/X: 493490.502
Elevation/Z: 156.993
Convergence: -0 14 29.21138
Scale Factor: 0.999971507
Combined Factor: 0.999968323

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

Remark: