

2015

Prepared For

CivilSurv Design Group, Inc.
2400 Rhode Island Avenue
Fort Pierce, Florida 34950
Ph: (772) 323-2244
Fax: (772) 323-2245
www.civilsurv.com



Report Issue Date: ??/??/2015

SPECIFIC PURPOSE SURVEY



STAFF GAUGE AND REFERENCE ELEVATION REPORT

This document contains a surveyor's report and certification as to the accuracy of the methods used to determine NAVD88 elevations for staff gauges and stilling well reference elevations set by CivilSurv Design Group, Inc.

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
INFRASTRUCTURE MANAGEMENT BUREAU - SURVEY AND MAPPING SECTION
STAFF GAUGE INSTALLATION & RECALIBRATION SERVICES
HYDRAULIC & HYDROLOGY, DISCIPLINES #8, CONTRACT #4600002182**

TABLE OF CONTENTS

OVERVIEW OF THE PROJECT

LOCATION OF THE PROJECT	1
STAFF GAUGE AND REFERENCE ELEVATIONS DETAIL SUMMARY	2-4
PROJECT RESULTS	5
SURVEYOR'S CERTIFICATION	5

STAFF GAUGE DETAILS:

BLSW	6
S385S_T	7
S385W_T	8
S386A_H	9
S386A_T	10
S386B_H	11
S386B_T	12
S387A_H	13
S387A_T	14
S387AS_T	15
S387B_H	16
S387B_T	17
S387C_H	18
S387C_T	19
S650_H	20
S650_TW1	21
S650_TW2	22
S650_TW3	23
S651_H	24
S651_T	25
S652A_H	26
S652A_T	27
S660_H	28
S660_T	29
S653_H	30
S653_T	31
S654A_H	32
S654A_T	33
S655_H	34
S655_T	35
S656A_H	36
S656A_T	37
S61_H	38
S61_T	39
FP2	40
G341_H	41
G341_T	42
LSRW1	43
LSRW2	44
LSRW3	45



LSRW4	46
P6W	47
SSDDMC_H.....	48
SSDDMC_T.....	49
G96_H.....	50
G96_T.....	51
G134_H.....	52
G134_T.....	53
G135_H.....	54
G135_T.....	55
G136_H.....	56
G136_T.....	57
SFCD5E	58
CRS05N_H.....	59
G402A_H.....	60
G402A_T.....	61
S4_H.....	62
S4_T.....	63
S47D_H.....	64
S47D_T.....	65
NNRC SFS (S7Z).....	66
CR501N.....	67
G150_H.....	68
G150_T.....	69
G152_H.....	70
G152_T.....	71
G402B_H.....	72
G402B_T.....	73
G402C_H.....	74
G402C_T.....	75
C139S3.....	76
C139S4.....	77
C139S5.....	78
G57_H.....	79
G57_T.....	80
G65_H.....	81
G65_T.....	82
G373_H.....	83
G373_T.....	84
S190_H.....	85
S190_T.....	86
C139S1.....	87
C139S6.....	88
DFNBV	89
G56_H.....	90
G56_T.....	97
G372_H.....	92
G372_T.....	93
G372S_H.....	94

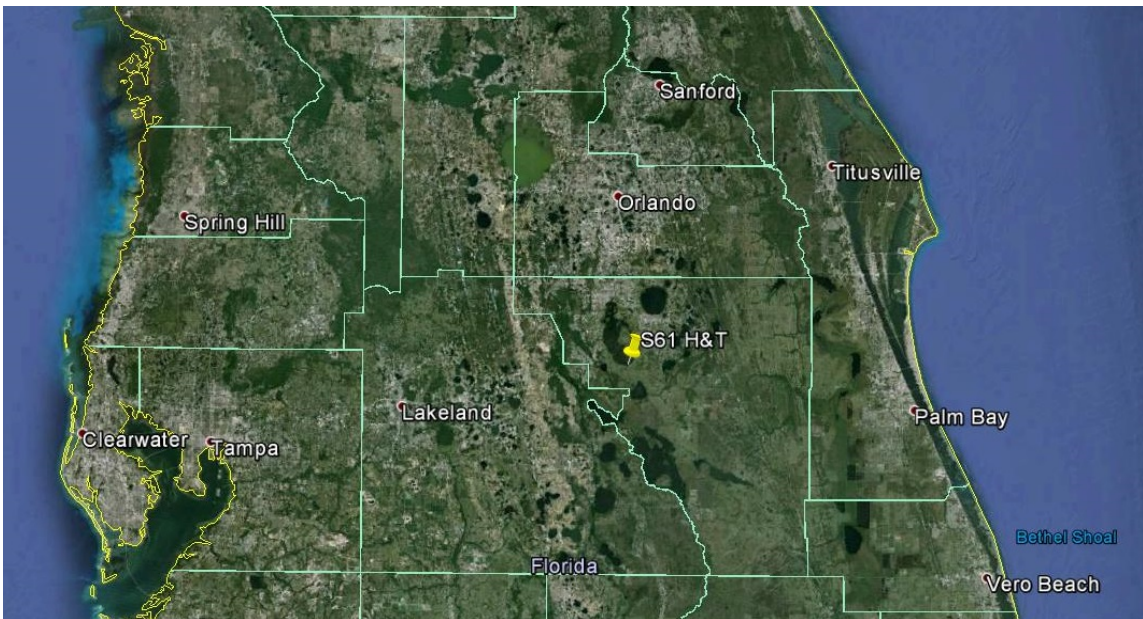
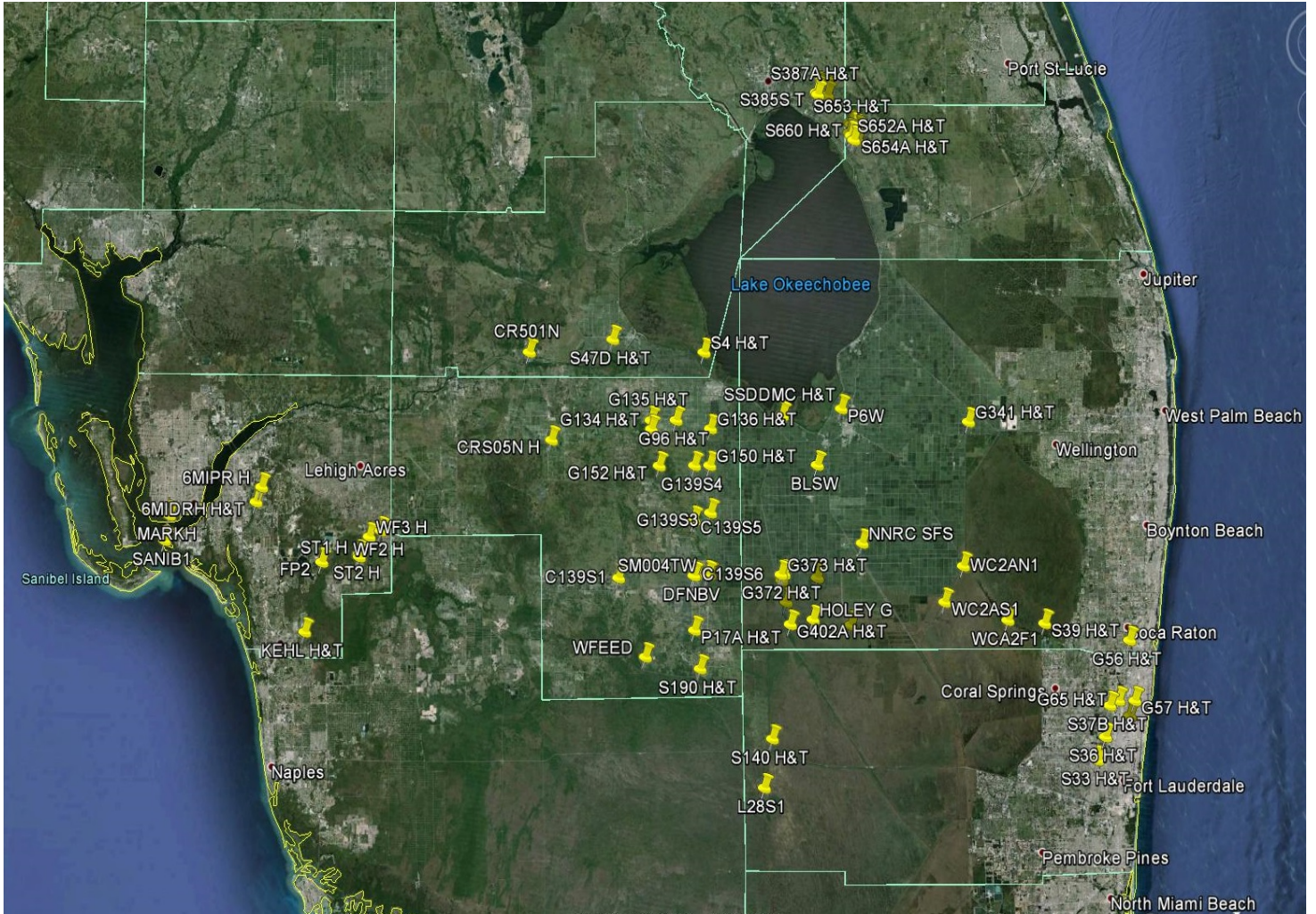


MARKH	95
P17A_H.....	96
P17A_T	97
SANIB1.....	98
S39_H	99
S39_T.....	100
S33_H	101
S33_T.....	102
S36_H	103
S36_T.....	104
SM004TW.....	105
ST1_H	106 - 107
ST2_H	108 - 109
WF2_H.....	110
KEHL_H.....	111
KEHL_T	112
S37A_H	113
S37A_T	114
S37B_H.....	115
S37B_T.....	116
S140_H	117
S140_T.....	118
SMSB	119
WF3_H.....	120
6MIDRH_H.....	121
6MIDRH_T	122
6MIPR_H	123
HOLEY_G	124
HOLEY1	125
HOLEY2	126
L28S1	127
WC2AN1	128
WC2AS1.....	129
WCA2F1.....	130
WFEEED.....	131



PROJECT LOCATION MAP

NOT TO SCALE



www.CivilSurv.com
Small Business Enterprise



STAFF GAUGE AND REFERENCE ELEVATIONS DETAIL SUMMARY:

Gauge information provided by South Florida water management district, except as noted.

Staff Gauge Site	Latitude	Longitude	Benchmark Used	Benchmark Elevation	Datum Offset to NGVD29	Stilling Well Reference Elevations *
BLSW	26 36 35.247	80 44 27.206	F488	13.87	1.43	18.00
S385S T	27 12 20.192	80 44 32.118	S387A	32.48	1.26	24.821
S385W T	27 12 45.12	80 44 10.12	S385S	27.33	1.26	29.932
S386A H	27 12 06.69	80 43 13.38	S386A	34.26	1.27	NA
S386A T	27 12 06.662	80 43 13.423	S386A	34.26	1.27	NA
S386B H	27 12 32.936	80 43 23.971	S386B	33.97	1.27	37.87
S386B T	27 12 32.893	80 43 24.188	S386B	33.97	1.27	NA
S387A H	27 12 10.357	80 44 21.983	S387A	32.48	1.26	36.36
S387A T	27 12 10.38	80 44 22.221	S387A	32.48	1.26	NA
S387AS T	27 12 48.188	80 43 32.656	S386B	33.97	1.27	37.153
S387B H	27 12 35.669	80 44 12.56	S387B	32.61	1.26	36.56
S387B T	27 12 35.757	80 44 12.869	S387B	32.61	1.26	NA
S387C H	27 12 57.316	80 43 58.493	S387C	32.56	1.26	36.49
S387C T	27 12 57.429	80 43 58.729	S387C	32.56	1.26	NA
S650 H	27°09'26.840"	80°40'35.550"	S650	32.93	1.28	30.93
S650 T	27°09'24.800"	80°40'35.700"	S650	32.93	1.28	38.45
S651 H	27°09'16.786"	80°40'25.038"	S651	33.502	1.28	36.342
S651 T	27°09'16.839"	80°40'25.089"	S651	33.502	1.28	36.339
S652A H	27°08'13.565"	80°40'25.289"	S652A	30.056	1.26	32.90
S652A T	27°08'13.601"	80°40'25.340"	S652A	30.056	1.26	32.89
S660 H	27°07'47.830"	80°40'06.451"	S654A	30.001	1.26	22.887
S660 T	27°07'46.670"	80°40'08.255"	S654A	30.001	1.26	22.877
S653 H	27°09'01.303"	80°40'01.622"	S653	33.493	1.28	36.30
S653 T	27°09'01.342"	80°40'01.672"	S653	33.493	1.28	36.31
S654A H	27°07'47.092"	80°40'00.827"	S654A	30.001	1.26	32.90
S654A T	27°07'47.147"	80°40'00.865"	S654A	30.001	1.26	32.88
S655 H	27°08'44.141"	80°39'35.714"	S655	33.511	1.28	36.29
S655 T	27°08'44.177"	80°39'35.758"	S655	33.511	1.28	36.29
S656A H	27°07'46.626"	80°39'37.782"	S656A	29.996	1.26	32.91
S656A T	27°07'46.598"	80°39'37.834"	S656A	29.996	1.26	32.87
S61 H	28 08 25	81 21 07	S61	60.93	1.05	64.56
S61 T	28 08 25	81 21 07	S61	60.93	1.05	64.55
FP2	26 27 04.286	81 42 18.266	LEE6		1.18	
G341 H	26 40 43.351	80 26 45.099	G341	15.225	1.45	16.15
G341 T	26 40 43.36	80 26 41.764	G341	15.225	1.45	16.51
LSRW1	27° 9'19.47"	80°40'38.76"	S651	33.502	1.28	NA
LSRW2	27° 8'57.83"	80°40'38.89"	S651	33.502	1.27	NA
LSRW3	27° 8'38.76"	80°40'38.89"	S651	33.502	1.27	NA
LSRW4	27° 8'29.17"	80°40'38.89"	S651	33.502	1.27	NA
P6W	26 41 59.42	80 41 37.999	L14PC1ABM1	16.91	1.41	15.92
SSDDMC H	26 41 17.672	80 48 29.011	SSDD	15.09	1.41	12.24
SSDDMC T	26 41 16.527	80 48 32.122	SSDD	15.09	1.41	21.49
G96 H	26 40 51.829	81 00 57.611	N554	26.49	1.35	NA
G96 T	26 40 51.864	81 00 54.936	N554	26.49	1.35	NA
G134 H	26 39 58.751	81 03 50.783	G134	20.92	1.35	NA



G134 T	26 40 00.513	81 03 49.635	G134	20.92	1.35	NA
G135 H	26 40 49.782	81 03 51.923	N455H	26.02	1.35	NA
G135 T	26 40 51.033	81 03 51.639	N455H	26.02	1.35	NA
G136 H	26 40 03.112	80 56 58.514	N455	24.37	1.37	18.66
G136 T	26 40 03.292	80 56 55.719	N455	24.37	1.37	18.66
SFCD5E	26 41 20.363	80 48 34.31	SFCD	12.281	1.41	14.921
CRS05N H	26 38 55.69	81 15 30.756	SITE5	29.813	1.33	35.513
G402A H	26 21 17.7	80 47 34.644	G402A2	13.48	1.44	19.19
G402A T	26 21 18.225	80 47 33.082	G402A2	13.48	1.44	20.27
S4 H	26 47 22.661	80 57 43.842	S4	28.23	1.35	34.45
S4 T	26 47 24.693	80 57 42.184	S4	28.23	1.35	34.54
S47D H	26 48 35.837	81 08 21.975	FCE1557	17.388	1.32	23.63
S47D T	26 48 34.41	81 08 22.208	FCE1557	17.388	1.32	23.61
NNRC SFS	26 29 05.263	80 39 11.199	S7Z	16.90	1.44	19.08
CR501N	26 47 19.852	81 18 05.150	HEN49B	23.14	1.21	21.94
G150 H	26 36 31.092	80 57 00.675	HEN28	26.22	1.38	20.31
G150 T	26 36 32.781	80 57 00.593	HEN28	26.22	1.38	20.37
G152 H	26 36 27.264	81 02 56.922	G152	24.45	1.37	NA
G152 T	26 36 27.305	81 02 54.756	G152	24.45	1.37	NA
G402B H	26 23 26.953	80 48 05.616	G402B2	14.23	1.43	20.89
G402B T	26 23 27.38	80 48 03.887	G402B2	14.23	1.43	20.26
G402C H	26 25 32.028	80 48 35.298	G402C2	13.44	1.43	18.79
G402C T	26 25 32.418	80 48 33.372	G402C2	13.44	1.43	18.59
C139S3	26 31 59.407	80 56 54.483	L207		1.39	20.86
C139S4	26 36 30.91	80 58 46.738	C139S4	18.656	1.38	23.34
C139S5	26 31 16.646	80 58 51.174	C139S5A	23.50	1.39	26.24
G57 H	26 13 51.062	80 07 18.785	S665	7.58	1.58	14.37
G57 T	26 13 50.169	80 07 16.799	S665	7.58	1.58	10.77
G65 H	26 13 51.155	80 09 35.314	G65HW	12.787	1.58	15.87
G65 T	26 13 51.471	80 09 11.25	G65TW1	12.787	1.58	20.37
G373 H	26 26 08.143	80 48 41.795	G373	15.40	1.43	17.38
G373 T	26 26 05.883	80 48 41.152	G373	15.40	1.43	17.38
S190 H	26 17 02.056	80 58 04.85	FCE2852	18.96	1.41	22.72
S190 T	26 17 00.623	80 58 04.524	FCE2852	18.96	1.41	22.70
C139S1	26 25 43.205	81 07 36.596	DF11	22.74	1.37	26.87
C139S6	26 25 59.975	80 58 38.228	C139S6	19.577	1.38	22.312
DFNBV	26 25 57.691	80 58 49.219	FLGPS65	19.577	1.38	26.322
G56 H	26 19 40.279	80 07 51.153	FCDBM3	11.622	1.56	15.61
G56 T	26 19 40.278	80 07 50.153	FCDBM3	11.622	1.56	15.62
G372 H	26 26 08.374	80 48 28.084	G372A	15.573	1.43	16.57
G372 T	26 26 07.89	80 48 19.671	G372B	18.48	1.43	21.15
G372S H	26 26 09.71	80 48 18.76	G372B	18.48	1.43	17.06
MARKH	26 31 25.486	82 00 17.391	MARKERH		1.17	
P17A H	26 20 43.262	80 58 46.924	F536	21.29	1.40	23.94
P17A T	26 20 43.207	80 58 45.601	F536	21.29	1.40	21.19
SANIB1	26 28 59.737	82 00 49.216	A		1.17	
S39 H	26 21 22.371	80 17 51.93	FCE3943	22.365	1.52	22.50
S39 T	26 21 20.042	80 17 50.14	FCE3943	22.365	1.52	15.20
S33 H	26 08 08.83	80 11 41.577	FCE789	9.952	1.58	13.815
S33 T	26 08 08.8	80 11 38.476	FCE789	9.952	1.58	13.805
S36 H	26 10 23.401	80 10 45.479	FCE3091	10.072	1.58	16.17
S36 T	26 10 23.498	80 10 43.366	FCE3091	10.072	1.58	16.13
SM004TW	26 26 02.52	80 57 12.78	SW4	14.70	1.38	21.13
ST1 H	26 27 36.662	81 37 55.952	ST1	27.728	1.22	33.348
ST2 H	26 27 52.128	81 37 56.438	ST4	28.504	1.22	33.364



WF2_H	26 30 06.77	81 35 24.16	LC10	30.686	1.22	34.436
KEHL_H	26 20 20.539	81 44 16.003	A005	13.79	1.21	21.41
KEHL_T	26 20 20.545	81 44 16.521	A005	13.79	1.21	21.38
S37A_H	26 12 22.349	80 07 55.126	E664	8.035	1.58	7.66
S37A_T	26 12 22.432	80 07 52.678	E664	8.035	1.58	9.86
S37B_H	26 13 26.802	80 10 13.443	N665	10.075	1.57	13.945
S37B_T	26 13 23.93	80 10 13.196	N665	10.075	1.57	13.955
S140_H	26 10 18.139	80 49 40.479	FCE3119	25.94	1.45	27.35
S140_T	26 10 18.226	80 49 37.021	FCE3119	25.94	1.45	27.35
SMSB	26 26 03.361	80 56 58.779	DFB	14.70	1.38	21.25
WF3_H	26 29 32.73	81 36 46.15	LC4		1.21	33.07
6MIDRH_H	26 32 51.276	81 50 04.295	A027	17.59	1.16	21.13
6MIDRH_T	26 32 45.276	81 50 04.295	A027	17.59	1.16	21.13
6MIPR_H	26 34 13.272	81 49 26.293	6MIPR	17.82	1.15	22.00
HOLEY_G	26 21 45.095	80 44 55.366	HOLEYHL12	14.025	1.44	18.45
HOLEY1	26 25 47.272	80 44 25.207	HOLEY1		1.44	
HOLEY2	26 21 15.12	80 40 30.409	HOLEY2	11.23	1.45	17.81
L28S1	26 05 37.32	80 50 35.224	G501	16.02	1.46	16.84
WC2AN1	26 26 51.93	80 27 21.921	WCA2AN1	14.57	1.40	18.49
WC2AS1	26 23 24.808	80 29 33.081	WCA2AS1	14.48	1.44	18.50
WCA2F1	26 21 39.204	80 22 09.66	WCA2F1		1.48	
WFEED	26 18 08.908	81 04 28.207	L28WF	18.82	1.38	22.52

Note:

***Denotes information developed in this survey by CivilSurv Design Group, Inc.**



Specific Purpose Survey Report

Purpose:

To assemble, install and calibrate 35 staff gauges to NAVD88 datum; and establish a benchmark – also referred to as a reference elevation (RE) – on the platform of associated headwater and tail water telemetry stations. Field Surveys for these gauges completed during the period of _____ through _____.

Leveling methods:

Leveling methods: Conventional differential leveling was performed in accordance with Florida Administrative Code 5J-17.051(3)(b)15.a. The maximum error of closure for this type of leveling is $0.05' \times \sqrt{\text{Distance in miles}}$. The error of closure achieved for the leveling performed meets or exceeds this specification.

Equipment used:

Wild NA-1

Vertical Datum:

The staff gauges listed in this report have been correctly calibrated to the North American Vertical Datum 1988 (NAVD88) as of August 22, 2014.

Sources of Data:

Benchmarks were provided by South Florida Water Management District. Information on the specific benchmarks can be obtained from the S.D.E.R.A. Website: <http://my.sfwmd.gov/sderawebapp/gis/sderamain.jsp>

Surveyor's Note:

Vertical closures obtained by comparison to converted existing NGVD'29 reference elevation tags. Party Chief and Field Book information reported herein is for consultant reference only. Each site had multiple crew visits, and stamping date is one of the on-site days.

Surveyor's Certificate:

This staff gauge elevations and stilling well reference elevations Specific Purpose Survey (consisting of a cover, index and _____ numbered pages) is certified to the South Florida Water Management District. This report is not valid without the original signature and raised seal. All staff gauges contained in this Surveyor's Report were calibrated to a vertical accuracy of $\pm 0.05'$.

This is to certify that this staff gauge elevations and stilling well reference elevations Specific Purpose Survey Report was made under my responsible charge and complies with the applicable standards of practice for surveys set forth by the Florida Board of Professional Surveyors and Mappers in chapter 5J-17, Florida Administrative Code, pursuant to section 472.027, Florida Statutes.

Report Issue Date: _____, 2015

Brian C. Kiernan, PSM No. 6101
Senior Project Surveyor
CivilSurv Design Group, Inc.
Certificate of Authorization Number: LB-7805

Date

www.CivilSurv.com
Small Business Enterprise



Site Name	FP2	Date of Field Work	8/05/2015
Party Chief	CORBETT	Field Book Name/Number	815
Site Benchmark Name	LEE6	Benchmark Elevation (NAVD88)	17.73
		Datum Offset to NGVD29	1.18
Reference Elevation (NAVD 88)	21.68	Existing Tag Elevation (Datum)	N/A (NGVD'29)
Notes: No existing tag.			

Photographs: (Size 2"x2" minimum)

1 – Overall Site
(Recorder Well, Staff Gauge, etc.)



2 – Benchmark Close Up



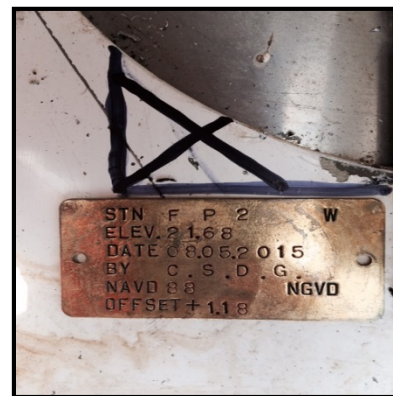
3 – Benchmark Location



4 - Brass Tag Close Up



5 - Brass Tag + Reference Mark

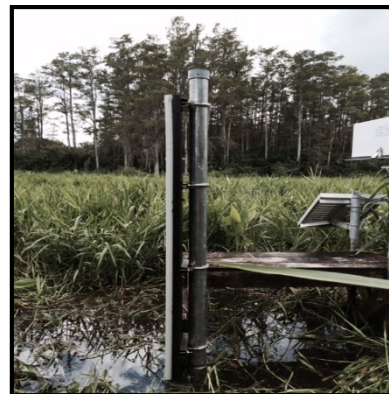


6 – Staff Gauge (Front and Side Views)

Front:



Side:



Field Notes Site: FP2

8/5/50

✓ IN Field 8/5/50

BOTTOM OF OLD GAUGE REARISE 16.80 @ GROUND

21.68' - 516' 16.22 T.O.W - 1.65' @ 15.57'

DATE	NAME	HT	TS	ELEV	DESC
7/15/50	S. DEGRAFF				
	C. ADONALUSER				
	(TORCON AT FP2)				
	BS				
	15.46 (T)		15.09 (T)		
	15.81 (A)		14.84 (A)	17.73	COMMON BDC
	14.96 (B)		14.59 (B)		LEE-6
	5.21 (A)		4.84 (A)		
	14.84 (T)			18.10	TP-1 SET HUB
	14.11 (A)				
	13.38 (B)				
	14.11 (A)				
	17.34 (T)		17.34 (T)		
	16.61 (A)		16.61 (A)	15.60	TP-2 SET HUB
	15.88 (B)		15.88 (B)		NEAR GAUGE (SOUTH)
	6.61 (A)		6.61 (A)		
	0.43 (A)		0.53 (A)	21.68	WELL FP2
	14.74 (T)				
	14.01 (A)				
	3.28 (B)			18.10	TP-1 CHECK
	14.01 (A)				
	15.22 (A)				
	14.99 (T)		13.09		
	14.76 (B)				
	4.99 (A)				
	5.63 (T)			17.73	CHECK INTO BM
	14.34 (A)				
	5.09 (B)				LEE-6
	5.36 (A)				

