

**Surveyor's Report
For**

**Survey #20-199
St. Johns County Topographic and
Hydrographic Pre and Post Construction Monitoring Survey**

Prepared For:

U.S. Army Corps of Engineers, Jacksonville District
Jacksonville, Florida
Survey No. 20-199
Contract No. W912EP-19-D-0006

Prepared By:

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Degrove Surveyors Inc. project No.: 2020180

Jacksonville Corps of Engineers Survey No.: 20-199

Project Title: St. Johns County Topographic and Hydrographic Pre and Post Construction Monitoring Survey

Location: St. Johns County, Florida

Date of Field Survey: 02/02/2021 through 03/19/2021

Date of Report: 03/26/2021

Report:

The purpose of this survey was to perform a topographic and hydrographic survey of the beaches approximately 8.5 miles North of St. Augustine Inlet to 6.5 miles South of St. Augustine Inlet. and to furnish deliverable files of the topographic and hydrographic data.

The information presented in this report and the accompanying data files represents the results of a survey performed by Degrove Surveyors, Inc. during the period of 02/02/2021 through 03/19/2021 and can only be considered as indicating the conditions existing at that time.

Limits of Survey:

The survey was limited to profiles of range monuments and designated intermediate lines beginning, which are as follows:

DEP GIVEN CONTROL				
MON ID	NORTHING	EASTING	AZ	M. ELEV.
R080	2071589.43	553221.69	75	13.21
R081	2070504.14	553451.43	75	15.71
R082	2069511.51	553687.17	75	12.11
R083	2068459.47	553869.00	75	16.81
R084	2067396.82	554120.03	75	14.61
R085	2066379.28	554356.02	75	15.61
R086	2065377.36	554556.60	75	17.31
R087	2064355.48	554819.38	75	18.91
R088	2063334.80	555042.04	75	17.81
R089	2062398.22	555233.72	75	17.01
R090	2061397.66	555472.63	75	15.51
R091	2060368.98	555664.56	75	18.21
R092	2059333.59	555876.17	75	14.01
R093	2058361.01	556112.12	75	13.51
R094	2057355.72	556301.45	75	21.81
R095	2056383.43	556495.90	75	19.11
R096	2055374.38	556760.02	75	15.21
R097	2054378.39	557002.40	75	23.51
R098	2053382.52	557200.08	75	24.71
R099	2052355.00	557425.03	75	23.61
R100	2051340.16	557661.96	75	17.61

DEP GIVEN CONTROL				
MON ID	NORTHING	EASTING	AZ	M. ELEV.
R101	2050324.66	557879.74	75	18.31
R102	2049348.97	558103.42	75	24.51
R103	2048381.47	558321.91	75	18.11
T104	2047420.02	558557.68	75	21.41
R105	2046454.35	558792.65	75	15.31
R106	2045513.26	559073.67	75	22.41
R107	2044435.73	559357.88	75	24.71
R108	2043408.20	559630.27	75	16.7
R109	2042423.61	559870.56	75	21.9
T110	2041337.66	560153.48	75	25.8
R111	2040320.32	560466.29	75	26.5
T112	2039325.32	560768.11	75	24.41
R113	2038355.17	561043.54	75	20.31
T114	2037423.69	561335.16	75	20.01
R115	2036348.78	561648.28	75	13.71
R116	2035333.23	561962.61	75	11.81
R117	2034275.87	562336.86	75	12.81
R118	2033255.76	562719.89	75	15.61
R119	2032233.21	563155.84	75	12.31
R120	2031206.45	563598.70	75	10.82
R121	2030203.64	564004.20	75	15.72
R122	2029152.76	564352.72	75	6.92
R122A	2028353.18	564027.90	155	9.52
R122B	2027938.21	563605.44	155	5.72
R122C	2027699.52	563116.29	155	7.32
R123	2025910.03	564595.34	75	9.32
T124	2025445.27	566349.61	75	17.32
R125	2024572.17	566521.02	75	11.23
T126	2023701.14	567618.67	75	6.93
R127	2022440.60	567880.30	75	5.13
T128	2021737.46	568420.86	75	15.43
T129	2020672.22	568634.55	75	14.43
T130	2019635.87	568894.43	75	11.33
R131A	2018510.58	568697.39	75	7.74
T132	2017594.10	569375.67	75	10.44
R133	2016587.52	569449.82	75	4.84
R134	2016245.15	569858.77	75	15.74
R135	2014709.78	569926.01	75	3.44
R136	2013703.17	570154.23	75	3.25
R137A	2012784.88	570623.68	75	6.25
R138	2011713.58	570920.45	75	6.85

DEP GIVEN CONTROL				
MON ID	NORTHING	EASTING	AZ	M. ELEV.
R139	2010792.36	571042.06	75	5.85
R140	2009936.50	571280.80	75	4.75
R141	2009033.46	571515.13	75	7.45
R142	2008050.00	571987.59	75	10.86
R143T	2006967.50	571758.65	75	8.08
R143	2006234.22	571942.97	75	8.56
R144	2006002.22	571810.73	75	9.96
R145	2004974.90	571833.50	75	9.06
R146	2003979.99	571909.69	75	11.36
R147	2002934.98	571810.82	75	10.96
R148	2001996.63	572107.69	75	8.16
R149	2000990.32	572163.42	75	11.06
R150	2000010.09	572297.74	75	10.75
R151	1999005.19	572276.20	75	7.95
R152	1998020.29	572344.51	75	9.55
R153	1997017.89	572421.62	75	7.95
R154	1996029.08	572459.64	75	8.65
R155	1995031.45	572571.16	75	10.35
T156	1994028.53	572628.97	75	8.95
T157	1993096.49	572704.97	75	12.55

Control:

The following Horizontal and Vertical Control Points were used: Points with a PID number (two letter and four number designation) were obtained from the National Geodetic Survey (NGS)

Control Point Name	Y(Northing) Or Latitude	X(Easting) Or Longitude	Elevations(feet)
D322 (PID #AQ0346)	2008138.08	571956.17	10.07
C322 (PID #AQ0347)	2007863.78	571591.08	7.51
DSI NAIL AND DISK (BM #2)	2028312.67	557987.86	5.82
DSI IRON PIPE SET (BM #5)	2028100.52	557925.439	5.03

Horizontal coordinates are referenced to the North American Datum of 1983 (2011), Florida State Plane Coordinate System, Florida East Zone, U.S. Survey Feet. Horizontal coordinates shown in bold italics were calculated from post-processed GPS static sessions.

Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88) U.S. Survey Feet.

Quality assurance for topographic data was accomplished by comparing daily RTK/GPS check measurements to known values at control points. See Table 1

Field Methodology:

- 1) Elevations for control points were established by a differential level run.
- 2) RTK units were used to collect data along Range lines for the upland and wading portions of the project.
- 3) The Hydrographic Survey was completed utilizing RTK/GPS, Applanix POS MV Surfmaster, Odom CV 100 dual frequency fathometer operating at 200 kHz and 33kHz and Hypack 2019. The vertical component was verified on land twice daily at a control point. Calibration and quality assurance data was collected daily and recorded in Hypack line files. The data files are referenced in the field notes. Sound Velocity profiles were captured using an Odom Digi-Bar Velocimeter.
- 4) In all cases RTK/GPS measurements were verified daily against existing control points for horizontal and vertical accuracy.
- 5) The upland survey overlapped the hydrographic survey to verify accuracy.
- 6) Static sessions were run at the RTK/GPS base station during data collection and were submitted to OPUS for verification and quality assurance.
- 7) ASCII files were formed from the edited Hypack data.

Office Methodology:

Data files were received daily from the field crews. The following procedures were followed:

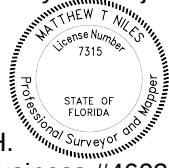
- 1) Daily field checks to control points were reviewed to confirm the horizontal and vertical accuracy.
- 2) RTK infill was collected on base points and processed by OPUS.
- 3) Hypack 2019 was used to process hydrographic data. Hydrographic data was sorted at 5 foot intervals.
- 4) Coordinate files were obtained from the RTK data collectors and converted to ASCII files.
- 5) Hypack files and ASCII files were combined to produce the final data used in producing the ASCII files in DEP format.

Deliverables:

- 1) Raw data including RTK and Static GPS files, and Hypack files
- 2) An ASCII file containing hydrographic data sorted at a -foot interval. File name: 20-199_HYDRO.xyz
- 3) An ASCII file containing topographic data. File name: 20-199_TOPO.xyz
- 4) An ASCII file with merged Topographic and Hydrographic data files. The overlap area between hydro and topo data has been edited to remove hydro data. File name: 20-199_DTM.xyz
- 5) Metadata files: 20-199_SJC.gen and 20-199_SJC.htm
- 6) A PDF file of the Field Book. File name: 20-199_FB.pdf
- 7) OPUS solutions

Certification:

I Certify that this survey meets the requirements of the Standards of Practice for Surveying and Mapping in the State of Florida, pursuant to Chapter 5J17, F.A.C. and the U. S. Army Corps of Engineers Manual for Hydrographic Surveying EM1110-2-1003, dated 30 November 2013, Minimum Performance Standards for Corps of Engineers Hydrographic Surveys - Project Classification / Other General Surveys and Studies



Matthew T. Niles, P.S.M. #7315, C.H.
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Table 1
RTK/GPS Quality Assurance Checks

Base at DSI PT# 5						
Check-in at DSI PT#2						
DSI PT#2		2028312.67	557987.86	5.82		
DSI PT#5		2028100.52	557925.44	5.03		
Point #	Check in @	Northing	Easting	Elevation	Horizontal Check	Vertical Check
30000	DSI #2	2028312.73	557987.90	5.83	0.06	-0.01
30162	DSI #2	2028312.72	557987.84	5.85	0.05	-0.02
60000	DSI #2	2028312.69	557987.85	5.83	0.02	-0.01
60133	DSI #2	2028312.66	557987.90	5.80	0.04	0.02
30163	DSI #2	2028312.70	557987.88	5.83	0.03	-0.01
30335	DSI #2	2028312.72	557987.89	5.81	0.05	0.01
60134	DSI #2	2028312.62	557987.87	5.87	0.06	-0.05
60329	DSI #2	2028312.66	557987.94	5.83	0.08	-0.01
30336	DSI #2	2028312.65	557987.90	5.80	0.05	0.02
30508	DSI #2	2028312.67	557987.89	5.81	0.02	0.01
60331	DSI #2	2028312.64	557987.94	5.81	0.09	0.02
60487	DSI #2	2028312.69	557987.91	5.82	0.04	0.00
34000	DSI #2	2028312.66	557987.91	5.86	0.05	-0.04
34155	DSI #2	2028312.64	557987.89	5.82	0.04	0.00
40000	DSI #2	2028312.67	557987.90	5.81	0.04	0.01
40353	DSI #2	2028312.66	557987.95	5.82	0.08	0.00
64003	DSI #2	2028312.66	557987.94	5.90	0.07	-0.08
64192	DSI #2	2028312.65	557987.90	5.87	0.04	-0.05
70000	DSI #2	2028312.65	557987.94	5.91	0.08	-0.09
70182	DSI #2	2028312.65	557987.89	5.89	0.04	-0.07
34530	DSI #2	2028312.70	557987.93	5.82	0.07	0.00
34595	DSI #2	2028312.68	557987.95	5.82	0.08	0.00
64003	DSI #2	2028312.66	557987.94	5.90	0.07	-0.08
64192	DSI #2	2028312.65	557987.90	5.87	0.04	-0.05
65408	DSI #2	2028312.69	557987.86	5.82	0.01	0.00
AVG					0.05	-0.02
STD DEV					0.02	0.03
95% Confidence Level					0.04	0.07

Base at DSI PT# 5						
Check-in at C322						
C322		2007863.78	571591.08	7.51		
DSI PT#5		2028100.52	557925.44	5.03		
Point #	Check in @	Northing	Easting	Elevation	Horizontal Check	Vertical Check
30509	C322	2007863.76	571591.07	7.53	0.02	-0.02
30998	C322	2007863.80	571591.08	7.58	0.01	-0.07
60488	C322	2007863.74	571591.06	7.55	0.05	-0.04
61110	C322	2007863.79	571591.12	7.55	0.04	-0.04
30999	C322	2007863.77	571591.05	7.52	0.03	-0.01
31439	C322	2007863.81	571591.07	7.64	0.03	-0.13
61111	C322	2007863.69	571591.07	7.50	0.09	0.01
61872	C322	2007863.81	571591.06	7.57	0.04	-0.06
31442	C322	2007863.80	571591.11	7.52	0.03	-0.01
32377	C322	2007863.75	571591.12	7.59	0.05	-0.08
61874	C322	2007863.80	571591.12	7.50	0.04	0.01
62588	C322	2007863.80	571591.11	7.56	0.03	-0.05
32378	C322	2007863.80	571591.10	7.49	0.03	0.02
32504	C322	2007863.69	571590.91	7.55	0.19	-0.04
62589	C322	2007863.81	571591.12	7.52	0.05	-0.01
62601	C322	2007863.71	571591.09	7.53	0.07	-0.02
32506	C322	2007863.78	571591.09	7.57	0.01	-0.06
32598	C322	2007863.76	571591.08	7.55	0.02	-0.04
62603	C322	2007863.82	571591.04	7.56	0.05	-0.05
62825	C322	2007863.79	571591.01	7.55	0.07	-0.04
34156	C322	2007863.76	571591.06	7.52	0.03	-0.01
34181	C322	2007863.76	571591.08	7.53	0.02	-0.02
40356	C322	2007863.80	571591.10	7.51	0.03	0.00
40546	C322	2007863.74	571591.13	7.49	0.06	0.02
64193	C322	2007863.74	571591.08	7.58	0.04	-0.07
64408	C322	2007863.77	571591.09	7.53	0.02	-0.02
70183	C322	2007863.78	571591.13	7.58	0.05	-0.07
70403	C322	2007863.75	571591.20	7.52	0.12	-0.01
AVG					0.05	-0.03
STD DEV					0.04	-0.03
95% Confidence Level					0.07	-0.06