

APPENDIX 1

MONUMENT INFORMATION REPORT

APPENDIX 1: Duck Monument Information

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT NOVEMBER 2017	
DATUMS: NAD83/2011- NAVD1988	
Designation	ARCH
Stamping	ARCH 2005
Northing	854412.25
Easting	2979783.79
Horizontal Root Mean Square Error	0.123
Elevation	11.64
Vertical Root Mean Square Error	0.004
Description	Located about 3.2 miles NW of Kill Devil Hills and 4.1 miles SSW of Southern Shores. On US 158 Bypass , 2.4 miles west from the main entrance to The Wright Brothers Memorial to Arch Street, in the northwest quadrant. 57.2 ft. West-Southwest of the centerline of US 158 Southbound Lanes. The Disk is a commemorative of the Wright Brothers first flight NGS, NCGS, NOAA, and NPS agency inscriptions.



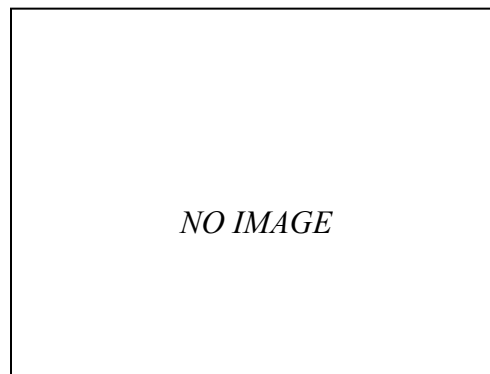
Monument: L230



Location Verification: L230

Mean of Inverse Shots - Published Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
ARCH	16	-0.01	-0.01	-0.06

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT FEBRUARY 2017	
DATUMS: NAD83/2011 - NAVD1988	
Designation	C255
Stamping	C255 1981
Northing	900856.11
Easting	2958600.06
Horizontal Root Mean Square Error	0.106
Elevation	16.89
Vertical Root Mean Square Error	0.014
Description	A National Geodetic Survey pin inside a protective casing with lid approximately 3 inches below ground and located between the two steps on the West side of the Army Corp of Engineer's Field Research Facility (1261 Duck Road), approximately 355 feet East of the main parking lot gate, 15 feet South of the Northerly steps, 15 feet North of the Southerly steps, and 2.7 feet West of the flag pole.



Monument: C255

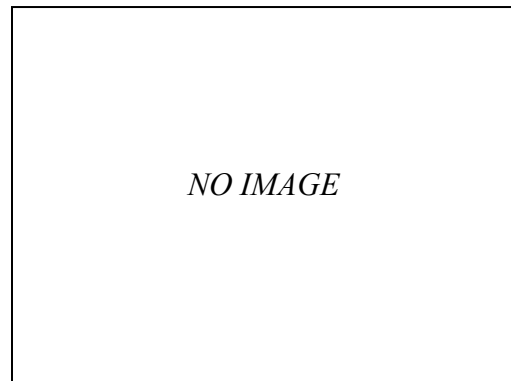
Location Verification: C255

Mean of Inverse Shots - Published Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
C255	28	0.01	0.06	-0.01

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT NOVEMBER 2017	
DATUMS: NAD83/2011 - NAVD1988	
Designation	CAFFEY
Stamping	CAFFEY 1935
Northing	915308.87
Easting	2952084.11
Horizontal Root Mean Square Error	0.254
Elevation	1.99
Vertical Root Mean Square Error	0.051
Description	A U.S. Coast & Geodetic Survey disk in concrete located in thick vegetation approximately 140 feet West of Duck Road and 40 feet South of a parking lot for 1566 Duck Road



Monument: CAFFEY



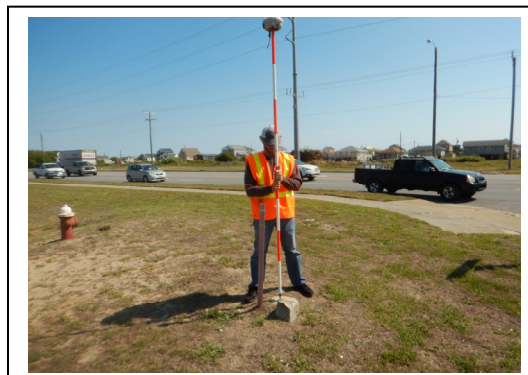
Location Verification: CAFFEY

Mean of Inverse Shots - Published Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
CAFFEY	19	-0.01	0.01	0.05

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT NOVEMBER 2017	
DATUMS: NAD83/2011- NAVD1988	
Designation	KITTY
Stamping	KITTY 1962
Northing	849159.56
Easting	298928.60
Horizontal Root Mean Square Error	0.147
Elevation	9.17
Vertical Root Mean Square Error	0.036
Description	Located about 0.65 miles east of the post office in kitty hawk. A Standard disk set in a 12x12 inch concrete monument and tamped Kitty 1962 is 12 feet east-southeast of the intersection. The mark is flush with ground.



Monument: KITTY



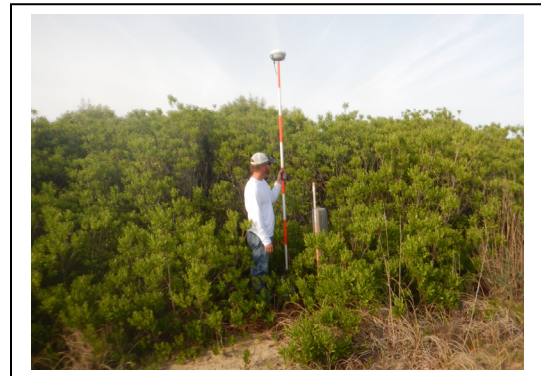
Location Verification: KITTY

Mean of Inverse Shots – OPUS Solution Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
KITTY	18	0.01	0.01	-0.03

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT NOVEMBER 2017	
DATUMS: NAD83/2011 - NAVD1988	
Designation	TIDAL C
Stamping	865 1370 1977
Northing	900621.51
Easting	2957662.02
Horizontal Root Mean Square Error	0.147
Elevation	18.46
Vertical Root Mean Square Error	0.036
Description	A National Ocean Survey disk protected by an open pipe approximately 6 inches above ground and located on the Army Corp of Engineer's Field Research Facility property (1261 Duck Road) approximately 600 feet East of Duck Road, 300 feet West of the gazebo, and 100 feet North of the access road.



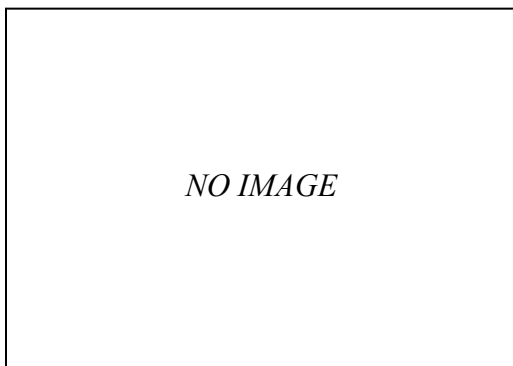
Monument: Tidal C



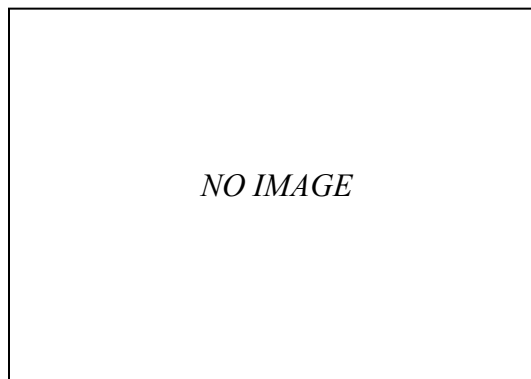
Location Verification: Tidal C

Mean of Inverse Shots – OPUS Solution Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
TIDAL C	12	0.01	-0.01	0.00

CONTROL MONUMENT USED BY APTIM FOR 2017 TOWN OF DUCK BEACH PROFILE TOPOGRAPHIC AND HYDROGRAPHIC SURVEY REPORT NOVEMBER 2017	
DATUMS: NAD83/2011 - NAVD1988	
Designation	TIDAL D
Stamping	1370 D 1979
Northing	900450.64
Easting	2957190.64
Horizontal Root Mean Square Error	2.051
Elevation	18.46
Vertical Root Mean Square Error	0.078
Description	Attached to the top of a stainless steel rod driven into the ground and inside a 4-inch PVC pipe that projects 0.6 meters above ground, the disk is recessed 0.3 meters below the top of the pipe. Used as a vertical check only.



Monument: TIDAL D



Location Verification: TIDAL D

Mean of Inverse Shots – OPUS Solution Versus APTIM Found				
Monument	No. of Shots	ΔN	ΔE	ΔZ
TIDAL D	4	1.82	-0.94	-0.07

TOWN OF DUCK STATION INFORMATION			
NOVEMBER 2017			
DATUMS: NAD83/90 & NAVD88			
STATION	NORTHING	EASTING	AZIMUTH
PI-17	920098.86	2950657.32	70
PI-18	919175.36	2951025.99	70
D-01	918267.75	2951387.52	70
D-02	917384.44	2951733.76	70
D-03	916429.37	2952102.95	70
D-04	915495.29	2952464.03	70
D-05	914597.97	2952849.30	70
D-06	913696.93	2953224.38	70
D-07	912798.76	2953607.33	70
D-08	911897.95	2953983.04	70
D-09	910994.82	2954356.65	70
D-10	910066.74	2954759.12	70
D-11	909133.14	2955158.05	70
D-12	908412.53	2955461.41	70
D-13	907478.35	2955874.29	70
D-14	906578.33	2956252.15	70
D-15	905677.78	2956628.57	70
D-16	904767.65	2956978.72	70
D-17	903863.92	2957333.66	70
D-18	902886.47	2957718.79	70
D-19	902331.03	2957932.45	70
D-20	901760.74	2958139.73	70
D-21	900958.69	2958472.08	70
D-22	900228.83	2958754.03	70
D-23	899515.64	2958992.70	70
D-24	898739.78	2959267.16	70
D-25	897824.26	2959601.68	70
D-26	896902.26	2959928.60	70
D-27	895981.88	2960250.61	70
D-28	895072.97	2960604.07	70
D-29	894166.25	2960963.56	70
D-30	893257.57	2961317.69	70
D-31	892350.69	2961676.73	70
D-32	891379.42	2962078.13	70
D-33	890553.16	2962439.37	70
D-34	889616.07	2962839.65	70

TOWN OF SOUTHERN SHORES STATION INFORMATION			
NOVEMBER 2017			
DATUMS: NAD83/90 & NAVD88			
STATION	NORTHING	EASTING	AZIMUTH
-187+14	888697.70	2963230.40	70.00
-177+13	887775.80	2963619.00	70.00
-170+56	887172.90	2963880.50	66.60
-163+99	886569.90	2964142.00	66.60
-157+41	885966.90	2964403.50	66.60
-150	885364.00	2964665.00	65.31
-140	884444.00	2965116.00	65.31
-130	883452.00	2965239.00	65.31
-120	882604.00	2965920.00	65.31
-110	881697.00	2966366.00	62.57
-100	880778.00	2966790.00	62.57
-90	879895.00	2967110.00	62.57
-80	878988.00	2967533.00	62.57
-70	878106.00	2967951.00	62.57
-60+00	877175.00	2968381.00	62.57
-50+00	876228.00	2968838.00	62.57
-40+00	875440.00	2969249.00	62.57
-30+00	874496.08	2969731.60	62.57
-20+00	873607.16	2970189.67	62.57
-10+00	872720.97	2970653.00	62.57