2023 Currituck County Data Acquisition Survey Report

Currituck County, North Carolina

Prepared for:

Coastal Protection Engineering of North Carolina, Inc.

4038 Masonboro Loop Road
Wilmington, NC 28409

Prepared by:

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14 JUNE 2023, revised 21 JULY 2023

McKIM&CREED

I, David L. Jones Jr., NC-PLS L-3672, certify that this project was completed under my direct and responsible charge from an actual survey made under my supervision; that this hydrographic and topographic survey was performed at the 95% percent confidence level to meet Federal Geographic Data Committee Standards; that this survey was performed to meet the requirements for a topographic/planimetric survey to the accuracy of Class III and vertical accuracy to the Class III standard, and that the original data was obtained between 06 June 2023 and 10 June 2023; and all coordinates are based on North Carolina State Plane Coordinates (NAD83 2011) and all elevations are based on North American Vertical Datum of 1988 (NAVD88).

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL

THIS 26th DAY OF July, AD 2023.

DAVID L. JONES, JR.
PROFESSIONAL LAND SURVEYOR L-3672

INTRODUCTION

General scope of work

The work under the Task Order shall consist of performing topographic and hydrographic surveys along 61 beach profile lines in the County of Currituck.

Survey area

The survey area covers the beachfront area of Currituck County from the southern boundary of the county to where the North Beach Access Road transitions from pavement to the beach.

Planning

On May 24th, 2023 a project kickoff meeting was held between CPE and McKim & Creed to go over the scope of work in detail. On June 5th, 2023, McKim & Creed Field Manager held a meeting with field and office crews to discuss the scope of work entailing the 61 beach monitoring profiles survey to be conducted in Currituck and Dare Counties, North Carolina. In the two weeks prior to the meeting, preparations started to get the boat ready, arrange accommodations, create HYPACK project, gather control point information, line files, etc.

FIELD METHODOLOGY

The surveys were conducted in accordance with the Minimum Performance Standards for the U.S. Army Corps of Engineers (USACE), Engineering and Design Hydrographic Surveying Manual (EM 1110-2-1003).

This survey is in accordance with Chapter 56.1606 of the North Carolina Administrative Code (NCAC) specifications established by The North Carolina Engineering and Land Surveying Act (GS89C). In addition, all hydrographic surveying was conducted under the direct supervision of an NSPS-THSOA Certified Hydrographer (CH). Included in the deliverables are 61 cross-section profiles; one (1) plan view map; ground photos in .jpeg; one processed easting, northing, and elevation (xyz) in ASCII file format; and field notes. The plan view maps show reduced true position elevation data collected during the survey, and the location of published control monuments.

Vertical data was collected in the North American Vertical Datum of 1988 (NAVD88) using geoid 18. All Horizontal data is provided in the North Carolina State Plane Coordinate System, North American Datum (NAD) of 1983(2011).

The field survey and data collection activities encompassed four (4) phases. Brief descriptions of each survey phase, including methodologies and quality control/quality assurance procedures, are described below.

Control Reconnaissance/Establishment/Verification

Prior to surveying beach profiles, reconnaissance of the monuments was conducted to confirm that survey control was in place and undisturbed. Real Time Kinematic Global Positioning System (RTK GNSS) was used within the North Carolina virtual reference station (NCVRS) network to locate and confirm survey control for this project using a 3-minute observation at each monument (Table 1,2, and 3). The horizontal and vertical accuracy of control data meets the accuracy requirements as set forth in the Engineering and Design Hydrographic Surveying Manual (EM 1110-2-1003). To achieve required accuracy, the surveys were controlled using 2nd order monuments, specifically Q261, ADRIATIC, RADIO RM1 and CAFFEY all from the National Geodetic Survey (NGS) (Datasheets can be found in appendix A). Horizontal and vertical positioning checks were conducted at the beginning and end of each day using at least two 2nd order monuments in the project area (Tables 7 and 8). The control check shots were acquired using a minimum of five (5) epochs which results in a high accuracy location (Tables 7 and 8).

Beach Profiles

Upon completion of the control reconnaissance survey, beach/upland and nearshore operations were initiated. Cross-sections of the beach in the project area were surveyed using extended rod RTK GNSS rovers, and standard RTK GNSS rovers. Extended rod RTK GNSS rovers were used to augment RTK GNSS survey capability into the nearshore.

Profiles commenced from the baseline and extended seaward overlapping the nearshore/wade data. Nearshore portions of the profiles were surveyed by two (2) surveyors with an Extended Rod Trimble R8 or R10 RTK GNSS rovers who entered the water wearing Personal Floatation Devices (PFD). The nearshore survey extended seaward to a point overlapping the offshore portion of the profiles by at least fifty (50) feet.

Elevations were taken at a maximum of twenty-five (25) foot intervals along each profile line and at all grade breaks. To maintain online accuracy, surveyors utilized the

RTK GNSS feature stakeout point, which allows surveyors to maintain the profile azimuth without relying on survey lathes or conventional compass bearings.

Nearshore/Offshore Profiles

The Nearshore/Offshore profiles were conducted at each required profile station. The profiles were obtained 2,500 feet beyond the shoreline or to the -30 feet NAVD88 contour, whichever is more landward. The landward limits of the nearshore profiles were based on a minimum overlap of fifty (50) feet beyond the seaward extent of beach profiles. Soundings were collected at 200kHz with an Odom Echotrac E20 single beam echosounder, hull-mounted transducer on McKim & Creed's twenty-five (25) foot survey vessel, the S/V Cawood. These soundings were then reduced to 9' spacing, sufficient to provide a smooth and accurate depiction of the seafloor.

Data was digitally stored using HYPACK 2022/2023 Software. An Applanix POSMV Inertia Navigation System was used onboard the survey vessel to provide pitch, roll, heave, and tide corrections. Tide (Table 4), echosounder (Table 5), sound velocity (Table 6), and bar checks were performed daily and as needed to check and calibrate the system. To maintain the vessel navigation along the profile lines, HYPACK navigation software was used.

The AML sound velocity caster was used to measure the sound velocity along the water column, with casts performed inside the project area. Bar-checks were performed from a depth of five (5) feet to a depth of at least twenty-five (25) feet. Analog data showing the results of the bar-check calibration was displayed on the sounder charts at five (5) foot increments during descent of the bar. Offshore data was collected within 2 (two) days of onshore data collection for each line.

Data Processing/Submittals

Upon completion of the field work, data was edited using Trimble Business Center, and HYPACK 2022/2023. The upland and nearshore portions of the beach profile were viewed and edited in Trimble Business Center and a comma delimited XYZ file was created. The raw bathymetry digital data was viewed and edited in HYPACK Single Beam Editor. The collected tide data was compared to NOAA measured tide for Duck, NC (NOAA Station ID: 8651370) and corrected as needed. Tide corrected offshore data was exported and a comma delimited XYZ file was created. All overlapping profile data was

compared in cross section to ensure system accuracy. The edited beach profile data and offshore profile data were merged to create a representative cross-section for each profile line. The cross-sections were developed using HYPACK Cross-section software.

The final plots were edited and reviewed with comparisons to previous years; discrepancies were noted and resolved. Digital data is provided in the vertical datum NAVD88.

Map Preparation

Upon completion of the surveys and data reduction, the plan view map was prepared in Autodesk Civil 3D. Elevations are displayed in NAVD88 and were sorted for display for better visualization. NCOnemap imagery from 2020, and county GIS parcel lines were used for background reference.

Ground Digital Photography

A total of three (3) digital photos were taken at a mid-beach location at each profile line, facing North, West, and South. Additional photographs were taken as needed. Digital files are included with the deliverables in .jpeg format.

FIELD WORK

The field team started monitoring the weather conditions at the end of May to decide when it would be the best time to mobilize to the survey area. Multiple survey crews traveled to the survey area on June 6th, 2023, and recovered control monuments on arrival.

The hydrographic survey crew used Rudee Inlet in Virginia Beach to access the beach profiles.

All profile lines were surveyed from June 6th to June 10th, 2023. Below is the timeline for the field work.

DATE	ACTIVITIES
06/05/2023	Scope Meeting at the office followed by mobilization to the job site.
06/06/2023	Control points were checked into to ensure horizontal and vertical tolerances were within standard.
06/07/2023	Survey was performed on lines: Land – C-059 to C-090 Wade – C-059 to C-097 Hydro nearshore – C-059 to C-095 Hydro offshore – C-059 to C-094
06/08/2023	Survey was performed on lines: Land – C-093 to C-120 Wade – C-061 to C-120 Hydro nearshore – C-096 to C-0120 Hydro offshore – C-096 to C-0120
06/09/2023	Survey was performed on lines: Hydro – C-059 to C-095, extended coverage to meet -30 elevation goal. *No land or wade was surveyed.
06/10/2023	Survey was performed on lines: Land – C-098 Wade – C-098 and C-103 (filling in data gaps) *No hydro was surveyed. * Land survey was completed on all lines.

Special comments:

- Object in line for land survey on lines: C-068, C-074, C-076, C-078, C-080, C-084, C-090, C-120, C-114, C-108, C-106, C-109, C-097, C-096, C-093, C-061, C-065, C-067, C-073, C-077, C-087, C-089, C-103, C-098, C-095, C-092, C-102.
- RTK lost and refixed on lines: C-064, C-066, C-078, C-080, C-086, C-108.
- Collapsed dune on line C-061.

CONTROL

All the NGS Control Monuments provided by the client (Table 1) were found to be in good condition. Using RTK-, a 3-minute observation was performed on all monuments (see Table 2 for measured observations).

Table 1. List of Control Monuments.

CURRITUCK COUNTY, NC - Provided by Client and Comments					
Station	Northing	Easting	Elevation	Comment	Station Description
ADRIATIC	974203.77	2933858.46	6.6	FOUND	GOOD CONDITION AS DESCRIBED
CAFFEY	915308.87	2952084.11	1.99	FOUND	GOOD CONDITION AS DESCRIBED
Q261	975483.22	2933511.61	7.14	FOUND	GOOD CONDITION AS DESCRIBED
RADIO RM1	935113.16	2944087.11	9.22	FOUND	GOOD CONDITION AS DESCRIBED

Table 2. 3-min observation values on NGS control monuments.

Measured			
July 2023 - RTK GNSS (NCVRS) - 3 min. Obs.			
Station	Northing	Easting	Elevation
ADRIATIC	974203.85	2933858.4	6.64
CAFFEY	915308.77	2952084.06	1.95
Q261	975483.36	2933511.67	7.09
RADIO RM1	935113.16	2944087.08	9.25

Upon comparing the published NGS control monuments values and the data measured in the field, the variations (deltas) were determined in Table 3.

Table 3. Difference between published and control verification.

Variations from Client Provided Control to McKim & Creed			
Station	Northing	Easting	Elevation
ADRIATIC	-0.08	0.06	-0.04
CAFFEY	0.1	0.05	0.04
Q261	-0.14	-0.06	0.05
RADIO RM1	0	0.03	-0.03

VESSEL CALIBRATIONS

The Survey Vessel Cawood (a 25' safe boat) was used for this survey. Offsets were measured and calculated on May 15th. , 2023

Daily vessel calibrations were performed in the survey area, values in Table 4-6.

Table 4. Tide checks.

Tide Checks (in feet)	Trimble R8s (in elevation)	Vessel System/Hypack
06/07/2023	-0.86	0.90
06/08/2023	-1.00	0.99
06/09/2023	-0.74	0.80

Table 5. Echosounder Checks using rod reading.

Depth Checks (in feet)	Rod Reading	Vessel Echosounder
06/07/2023	6.95	6.92
06/08/2023	6.90	6.85
06/09/2023	7.00	6.96

Table 6. Sound Velocity Values.

	Average Sound Velocity (in feet/second)
06/07/2023	4965
06/08/2023	4960
06/09/2023	4962

GNSS CALIBRATION CHECKS

Table 7. GNSS calibration checks for Trimble R8 unit.

TRIMBLE R8 UNIT	CONTROL POINT	Δ Horizontal (in US Survey feet)	Δ Vertical (in US Survey feet)
06/07/2023 BEGIN	ADRIATIC	0.053	0.136
06/07/2023 BEGIN	Q261	0.070	0.085
06/07/2023 END	ADRIATIC	0.049	-0.168
06/07/2023 END	Q261	0.013	-0.101
06/08/2023 BEGIN	RADIO RM1	0.108	0.035
06/08/2023 BEGIN	CAFFEY	0.052	-0.019
06/08/2023 END	RADIO RM1	0.069	0.062
06/10/2023 BEGIN	RADIO RM1	0.049	-0.046
06/10/2023 END	RADIO RM1	0.067	-0.004

Table 8. GNSS calibration checks for Trimble R10 unit.

TRIMBLE R10 UNIT	CONTROL POINT	Δ Horizontal (in US Survey feet)	Δ Vertical (in US Survey feet)
06/07/2023 BEGIN	ADRIATIC	0.039	0.070
06/07/2023 BEGIN	Q261	0.061	0.035
06/07/2023 END	ADRIATIC	0.017	0.187
06/07/2023 END	Q261	0.022	0.036
06/08/2023 BEGIN	RADIO RM1	0.021	0.039
06/08/2023 BEGIN	CAFFEY	0.020	0.038
06/08/2023 END	RADIO RM1	0.029	0.055
06/08/2023 END	CAFFEY	0.013	0.023
06/10/2023 BEGIN	RADIO RM1	0.113	0.015
06/10/2023 END	RADIO RM1	0.051	0.027

LIST OF EQUIPMENT USED DURING THE SURVEY

Below is a list of equipment used during the survey:

- 25' Survey Vessel "Cawood"
- Teledyne ECHOTRAC E20 transducer 200 kHz
- Applanix Pos-MV Inertia Navigation System I2NS
- Sound Velocity Profiler AML CTD Base X Profiler
- Hypack 2022/2023 for hydrographic data collection and processing
- Trimble R8 GNSS Receivers/ TSC3 data collectors
- Trimble R10 GNSS Receivers/ TSC5 data collectors
-Trimble Business Center
-AutoDesk Civil 3D

APPENDIX A. CONTROL DATASHEETS

Adriatic

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.5.15
Starting Datasheet Retrieval...
1        National Geodetic Survey,   Retrieval Date = JUNE  5, 2023
 DF5601 ***********************************************************************
 DF5601  DESIGNATION -  ADRIATIC
 DF5601  PID         -  DF5601
 DF5601  STATE/COUNTY-  NC/CURRITUCK
 DF5601  COUNTRY     -  US
 DF5601  USGS QUAD   -  COROLLA (2019)
 DF5601
 DF5601                        *CURRENT SURVEY CONTROL
 DF5601  ______________________________________________________________________
 DF5601* NAD 83(2011) POSITION- 36 23 08.17747(N) 075 49 38.02453(W)   ADJUSTED
 DF5601* NAD 83(2011) ELLIP HT-   -36.580 (meters)        (06/27/12)   ADJUSTED
 DF5601* NAD 83(2011) EPOCH    -  2010.00
 DF5601* NAVD 88 ORTHO HEIGHT -     2.013 (meters)        6.60  (feet) ADJUSTED
 DF5601  ______________________________________________________________________
 DF5601  GEOID HEIGHT    -        -38.614 (meters)                     GEOID18
 DF5601  NAD 83(2011) X  -  1,258,683.882 (meters)                     COMP
 DF5601  NAD 83(2011) Y  - -4,984,229.402 (meters)                     COMP
 DF5601  NAD 83(2011) Z  -  3,762,701.067 (meters)                     COMP
 DF5601  LAPLACE CORR    -          -1.81  (seconds)                   DEFLEC18
 DF5601  DYNAMIC HEIGHT  -          2.011 (meters)        6.60  (feet) COMP
 DF5601  MODELED GRAVITY -    979,809.7   (mgal)                       NAVD 88
 DF5601
 DF5601  VERT ORDER      -  SECOND    CLASS II
 DF5601
 DF5601  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 DF5601  Standards:
 DF5601         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 DF5601            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 DF5601  ----------------------------------------------------------------------
 DF5601  NETWORK    0.50   1.00          0.22   0.19   0.51      0.03010049
 DF5601  ----------------------------------------------------------------------
 DF5601  Click here for local accuracies and other accuracy information.
 DF5601
 DF5601.The horizontal coordinates were established by GPS observations
 DF5601.and adjusted by the National Geodetic Survey in June 2012.
 DF5601
 DF5601.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 DF5601.been affixed to the stable North American tectonic plate. See
 DF5601.NA2011 for more information.
 DF5601
 DF5601.The horizontal coordinates are valid at the epoch date displayed above
 DF5601.which is a decimal equivalence of Year/Month/Day.
 DF5601
 DF5601.The orthometric height was determined by differential leveling and
 DF5601.adjusted by the NATIONAL GEODETIC SURVEY
 DF5601.in March 2006.
 DF5601
 DF5601.Significant digits in the geoid height do not necessarily reflect accuracy.
 DF5601.GEOID18 height accuracy estimate available here.
 DF5601
 DF5601.Click photographs - Photos may exist for this station.
 DF5601
 DF5601.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 DF5601
 DF5601.The Laplace correction was computed from DEFLEC18 derived deflections.
```

```
DF5601
DF5601.The ellipsoidal height was determined by GPS observations
DF5601.and is referenced to NAD 83.
DF5601
DF5601.The dynamic height is computed by dividing the NAVD 88
DF5601.geopotential number by the normal gravity value computed on the
DF5601.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DF5601.degrees latitude (g = 980.6199 gals.).
DF5601
DF5601.The modeled gravity was interpolated from observed gravity values.
DF5601
DF5601. The following values were computed from the NAD 83(2011) position.
DF5601
DF5601;                  North         East     Units Scale Factor Converg.
DF5601;SPC NC       -   296,937.904   894,241.847   MT  1.00006847   +1 49 52.4
DF5601;SPC NC       -   974,203.77  2,933,858.46   sFT  1.00006847   +1 49 52.4
DF5601;UTM  18      - 4,027,036.781   425,807.689   MT  0.99966782   -0 29 26.7
DF5601
DF5601!             -  Elev Factor  x  Scale Factor =   Combined Factor
DF5601!SPC NC       -   1.00000574  x   1.00006847  =   1.00007421
DF5601!UTM  18      -   1.00000574  x   0.99966782  =   0.99967356
DF5601
DF5601:               Primary Azimuth Mark                    Grid Az
DF5601:SPC NC       -  Q 261                                  344 49 49.9
DF5601:UTM  18      -  Q 261                                  347 09 09.0
DF5601
DF5601_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SVF2580727036(NAD 83)
DF5601
DF5601|-----------------------------------------------------------------------|
DF5601| PID    Reference Object                     Distance      Geod. Az  |
DF5601|                                                           dddmmss.s |
DF5601| FW0738 Q 261                               404.020 METERS 3463942.3 |
DF5601|-----------------------------------------------------------------------|
DF5601
DF5601                          SUPERSEDED SURVEY CONTROL
DF5601
DF5601  NAD 83(2007)-  36 23 08.17741(N)    075 49 38.02523(W) AD(2002.00) 0
DF5601  ELLIP H (02/10/07)  -36.566  (m)                       GP(2002.00)
DF5601  NAD 83(2001)-  36 23 08.17795(N)    075 49 38.02488(W) AD(       ) 1
DF5601  ELLIP H (05/07/03)  -36.567  (m)                       GP(       ) 3 1
DF5601  NAD 83(1986)-  36 23 08.19313(N)    075 49 38.04565(W) AD(       ) 1
DF5601  NAVD 88              2.01   (m)           6.6    (f) LEVELING    3
DF5601
DF5601.Superseded values are not recommended for survey control.
DF5601
DF5601.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DF5601.See file dsdata.pdf to determine how the superseded data were derived.
DF5601
DF5601_MARKER: DH = HORIZONTAL CONTROL DISK
DF5601_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
DF5601_STAMPING: ADRIATIC 1996
DF5601_MARK LOGO: NCGS
DF5601_PROJECTION: RECESSED 8 CENTIMETERS
DF5601_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
DF5601_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
DF5601+STABILITY: SURFACE MOTION
DF5601_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DF5601+SATELLITE: SATELLITE OBSERVATIONS - September 07, 2016
DF5601
DF5601  HISTORY     - Date     Condition        Report By
DF5601  HISTORY     - 1996     MONUMENTED       NCGS
DF5601  HISTORY     - 20041201 GOOD             NCGS
DF5601  HISTORY     - 20080506 GOOD             NGS
DF5601  HISTORY     - 20080508 GOOD             NCGS
DF5601  HISTORY     - 20160907 GOOD             USPSQD
```

```
DF5601
DF5601                          STATION DESCRIPTION
DF5601
DF5601'DESCRIBED BY NORTH CAROLINA GEODETIC SURVEY 1996 (WLL)
DF5601'STATION IS LOCATED ABOUT 11.3 MI (18.2 KM) EAST-SOUTHEAST OF CURRITUCK
DF5601'AND 7.6 MI (12.2 KM) EAST-NORTHEAST OF COINJOCK IN COROLLA, ON THE
DF5601'OUTER BANKS.  PROCEED ALONG NC 12 FOR 0.05 MI (0.08 KM) NORTH FROM THE
DF5601'POST OFFICE IN COROLLA (WHICH IS ABOUT 0.25 MI (0.40 KM) NORTH OF THE
DF5601'CURRITUCK BEACH LIGHTHOUSE) TO CORAL LANE, THENCE EAST ALONG CORAL
DF5601'LANE FOR 0.35 MI (0.56 KM) TO ATLANTIC AVENUE, THENCE NORTH ALONG
DF5601'ATLANTIC AVENUE FOR 0.25 MI (0.40 KM) TO ADRIATIC AVENUE AND THE
DF5601'STATION, IN THE SHOULDER AT A PUBLIC ACCESS WALKWAY.  MARK IS ABOUT
DF5601'LEVEL WITH THE INTERSECTION AND RECESSED 3-INCHES BELOW GROUND.
DF5601'LOCATED 14.2 FT (4.3 M) EAST OF THE CENTERLINE OF ATLANTIC AVENUE,
DF5601'15.2 FT (4.6 M) EAST-NORTHEAST OF AN EXISTING PK NAIL IN THE
DF5601'CENTERLINE INTERSECTION, 6 FT (1.8 M) NORTH OF THE CENTER OF A WOODEN
DF5601'WALKWAY (PUBLIC BEACH ACCESS) , 67.3 FT (20.5 M) NORTHEAST OF A
DF5601'TELEPHONE PEDESTAL (2012-2) , AND 4.5 FT (1.4 M) SOUTHWEST OF AN
DF5601'11-INCH LANDSCAPE POST WITH A REFERENCE TAG.
DF5601
DF5601                          STATION RECOVERY (2004)
DF5601
DF5601'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2004 (EJH)
DF5601'RECOVERED IN GOOD CONDITION WITH THE FOLLOWING ADDITION.  STATION IS
DF5601'BETWEEN HOUSE NUMBER 1233 AND 1235.
DF5601
DF5601                          STATION RECOVERY (2008)
DF5601
DF5601'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2008 (RWA)
DF5601'RECOVERED IN GOOD CONDITION.
DF5601
DF5601                          STATION RECOVERY (2008)
DF5601
DF5601'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2008 (EJH)
DF5601'RECOVERED AS DESCRIBED.
DF5601
DF5601                          STATION RECOVERY (2016)
DF5601
DF5601'RECOVERY NOTE BY US POWER SQUADRON 2016 (GS)
DF5601'RECOVERED IN GOOD CONDITION.



*** retrieval complete.
Elapsed Time = 00:00:04
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Caffey

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
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Starting Datasheet Retrieval...
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 FW0713  DESIGNATION -  CAFFEY
 FW0713  PID         -  FW0713
 FW0713  STATE/COUNTY-  NC/DARE
 FW0713  COUNTRY     -  US
 FW0713  USGS QUAD   -  JARVISBURG (2019)
 FW0713
 FW0713                         *CURRENT SURVEY CONTROL
 FW0713  ______________________________________________________________________
 FW0713* NAD 83(2011) POSITION- 36 13 20.30846(N) 075 46 18.67986(W)   ADJUSTED
 FW0713* NAD 83(2011) ELLIP HT-   -38.226 (meters)        (06/27/12)   ADJUSTED
 FW0713* NAD 83(2011) EPOCH    -  2010.00
 FW0713* NAVD 88 ORTHO HEIGHT -     0.606 (meters)        1.99  (feet) ADJUSTED
 FW0713  ______________________________________________________________________
 FW0713  GEOID HEIGHT    -        -38.835 (meters)                     GEOID18
 FW0713  NAD 83(2011) X  -  1,266,136.825 (meters)                     COMP
 FW0713  NAD 83(2011) Y  - -4,993,408.570 (meters)                     COMP
 FW0713  NAD 83(2011) Z  -  3,748,097.353 (meters)                     COMP
 FW0713  LAPLACE CORR    -         -1.03  (seconds)                    DEFLEC18
 FW0713  DYNAMIC HEIGHT  -          0.605 (meters)        1.98  (feet) COMP
 FW0713  MODELED GRAVITY -    979,795.5   (mgal)                       NAVD 88
 FW0713
 FW0713  VERT ORDER      -  FIRST     CLASS II
 FW0713
 FW0713  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 FW0713  Standards:
 FW0713         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 FW0713           Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 FW0713  ------------------------------------------------------------------
 FW0713  NETWORK    0.36   0.57           0.16   0.13   0.29     -0.10159104
 FW0713  ------------------------------------------------------------------
 FW0713  Click here for local accuracies and other accuracy information.
 FW0713
 FW0713.The horizontal coordinates were established by GPS observations
 FW0713.and adjusted by the National Geodetic Survey in June 2012.
 FW0713
 FW0713.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 FW0713.been affixed to the stable North American tectonic plate. See
 FW0713.NA2011 for more information.
 FW0713
 FW0713.The horizontal coordinates are valid at the epoch date displayed above
 FW0713.which is a decimal equivalence of Year/Month/Day.
 FW0713
 FW0713.The orthometric height was determined by differential leveling and
 FW0713.adjusted by the NATIONAL GEODETIC SURVEY
 FW0713.in June 1991.
 FW0713
 FW0713.Significant digits in the geoid height do not necessarily reflect accuracy.
 FW0713.GEOID18 height accuracy estimate available here.
 FW0713
 FW0713.Click photographs - Photos may exist for this station.
 FW0713
 FW0713.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 FW0713
 FW0713.The Laplace correction was computed from DEFLEC18 derived deflections.
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FW0713
FW0713.The ellipsoidal height was determined by GPS observations
FW0713.and is referenced to NAD 83.
FW0713
FW0713.The dynamic height is computed by dividing the NAVD 88
FW0713.geopotential number by the normal gravity value computed on the
FW0713.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
FW0713.degrees latitude (g = 980.6199 gals.).
FW0713
FW0713.The modeled gravity was interpolated from observed gravity values.
FW0713
FW0713. The following values were computed from the NAD 83(2011) position.
FW0713
FW0713;                   North         East     Units Scale Factor Converg.
FW0713;SPC NC       -   278,986.703   899,797.035   MT  1.00001600   +1 51 47.5
FW0713;SPC NC       -   915,308.87  2,952,084.11   sFT  1.00001600   +1 51 47.5
FW0713;UTM  18      - 4,008,882.230   430,629.626   MT  0.99965929   -0 27 22.0
FW0713
FW0713!             -  Elev Factor  x  Scale Factor =   Combined Factor
FW0713!SPC NC       -   1.00000600  x   1.00001600  =   1.00002200
FW0713!UTM  18      -   1.00000600  x   0.99965929  =   0.99966529
FW0713
FW0713:                Primary Azimuth Mark                     Grid Az
FW0713:SPC NC       -  CAFFEY AZ MK RESET                       158 49 53.4
FW0713:UTM  18      -  CAFFEY AZ MK RESET                       161 09 02.9
FW0713
FW0713_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SVF3062908882(NAD 83)
FW0713
FW0713|---------------------------------------------------------------------|
FW0713| PID    Reference Object                      Distance      Geod. Az  |
FW0713|                                                            dddmmss.s |
FW0713| FW1400 CAFFEY INLET CG CUPOLA              111.848 METERS 06650     |
FW0713| FW1401 CAFFEY INLET CG FLAGPOLE            137.439 METERS 07356     |
FW0713| FW1803 CAFFEY RM 1                           9.307 METERS 09006     |
FW0713| FW1802 CAFFEY AZ MK RESET                                 1604140.9 |
FW0713| FW1419 MAMIE NORFOLK AND CAR T T TWR       APPROX.12.7 KM 2054407.1 |
FW0713| FW1805 CAFFEY RM 3                           7.846 METERS 22606     |
FW0713| FW1804 CAFFEY RM 2 AZIMUTH                   7.845 METERS 22607     |
FW0713| FW1415 WATCHMANS HOUSE CENTER CHIMNEY      APPROX. 2.3 KM 2990822.0 |
FW0713| FW1496 PINE IS GUN CLUB CEN CHIMNEY        APPROX. 4.7 KM 3384523.5 |
FW0713|---------------------------------------------------------------------|
FW0713
FW0713                          SUPERSEDED SURVEY CONTROL
FW0713
FW0713  NAD 83(2007)-  36 13 20.30845(N)    075 46 18.68049(W) AD(2002.00) 0
FW0713  ELLIP H (02/10/07)  -38.212  (m)                       GP(2002.00)
FW0713  NAD 83(1986)-  36 13 20.32447(N)    075 46 18.69903(W) AD(       ) 1
FW0713  NAD 83(2001)-  36 13 20.30999(N)    075 46 18.68049(W) AD(       ) 2
FW0713  NAD 83(2001)-  36 13 20.30861(N)    075 46 18.68025(W) AD(       ) 1
FW0713  ELLIP H (05/07/03)  -38.215  (m)                       GP(       ) 3 1
FW0713  NAD 83(1986)-  36 13 20.32447(N)    075 46 18.69903(W) AD(       ) 1
FW0713  NAD 83(1993)-  36 13 20.32269(N)    075 46 18.69129(W) AD(       ) 2
FW0713  NAD 83(1986)-  36 13 20.32706(N)    075 46 18.69772(W) AD(       ) 2
FW0713  NAD 27      -  36 13 19.73958(N)    075 46 20.01888(W) AD(       ) 2
FW0713  NAVD 88              0.61   (m)           2.0    (f) LEVELING    3
FW0713  NGVD 29 (07/19/86)   0.3    (m)           1.     (f) VERT ANG
FW0713
FW0713.Superseded values are not recommended for survey control.
FW0713
FW0713.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FW0713.See file dsdata.pdf to determine how the superseded data were derived.
FW0713
FW0713_MARKER: DS = TRIANGULATION STATION DISK
FW0713_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
FW0713_STAMPING: CAFFEY 1935
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FW0713_MARK LOGO: CGS
FW0713_PROJECTION: PROJECTING 10 CENTIMETERS
FW0713_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
FW0713_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
FW0713+STABILITY: SURFACE MOTION
FW0713_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FW0713+SATELLITE: SATELLITE OBSERVATIONS - November 20, 2019
FW0713
FW0713  HISTORY      - Date     Condition        Report By
FW0713  HISTORY      - 1935     MONUMENTED       CGS
FW0713  HISTORY      - 1962     GOOD             CGS
FW0713  HISTORY      - 1962     GOOD             CGS
FW0713  HISTORY      - 1975     GOOD             NGS
FW0713  HISTORY      - 1983     GOOD             NCGS
FW0713  HISTORY      - 19921223 GOOD             NCGS
FW0713  HISTORY      - 19990609 GOOD             NCDOT
FW0713  HISTORY      - 20050406 GOOD             NCGS
FW0713  HISTORY      - 20150122 GOOD             USGS
FW0713  HISTORY      - 20191120 GOOD             NCGS
FW0713
FW0713                          STATION DESCRIPTION
FW0713
FW0713'DESCRIBED BY COAST AND GEODETIC SURVEY 1935 (KGC)
FW0713'STATION IS ABOUT 350 FEET W OF CAFFEY INLET COAST GUARD STATION,
FW0713'ON A SMALL SAND NECK WHICH EXTENDS INTO THE MARSH ON THE E SHORE
FW0713'OF CURRITUCK SOUND.  THIS NECK IS JUST S OF AN OLD CAN BUOY
FW0713'LYING IN THE MARSH AND IS JUST N OF A SMALL GUT WHICH THE ROAD
FW0713'CROSSES ON A SMALL BRIDGE.  THE STATION IS ABOUT 225 FEET W
FW0713'OF A FLAGPOLE AT THE FENCE LINE W OF THE COAST GUARD STATION,
FW0713'12 FEET W OF THE W FENCE AROUND A GARDEN PATCH, 6 FEET N OF
FW0713'A POINT IN LINE WITH THE S FENCE, AND 179 FEET NW OF THE
FW0713'CENTER OF THE BRIDGE.
FW0713'
FW0713'SURFACE, UNDERGROUND AND REFERENCE MARKS ARE STANDARD BRONZE
FW0713'DISKS SET IN CONCRETE.
FW0713'
FW0713'REFERENCE MARK NO.1 IS E OF THE STATION, 4 FEET S OF THE S
FW0713'FENCE AROUND GARDEN AND 6 FEET SE OF THE CORNER OF THE
FW0713'FENCE.  REFERENCE MARK NO.2, AZIMUTH MARK, IS ABOUT 30 FEET E
FW0713'OF THE ROAD AT A POINT 0.35 MILE S OF THE STATION.  THE ROAD
FW0713'MAKES SEVERAL S TURNS AT THIS POINT.  REFERENCE MARK NO.3 IS
FW0713'SW OF THE STATION ON THE EDGE OF THE MARSH.
FW0713'
FW0713'TO REACH FROM E END OF WRIGHT MEMORIAL BRIDGE, GO 0.6 MILE
FW0713'E, TURN LEFT AND FOLLOW SAND ROAD 9.6 MILES N TO COAST GUARD
FW0713'STATION.
FW0713'
FW0713'HEIGHT OF SIGNAL ABOVE STATION MARK 6 METERS.
FW0713
FW0713                          STATION RECOVERY (1962)
FW0713
FW0713'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1962 (VRS)
FW0713'RECOVERED ALL EXCEPT THE AZIMUTH MARK IN GOOD CONDITION
FW0713'ESSENTIALLY AS DESCRIBED.
FW0713'
FW0713'ABOUT 9 MILES AIR LINE N OF THE E END OF THE CURRITUCK SOUND
FW0713'BRIDGE, OR ABOUT 4 MILES N ALONG THE ONLY SAND ROAD FROM THE
FW0713'HEART OF THE VILLAGE OF DUCK, 122 YARDS S 67 DEG W TRUE FROM
FW0713'THE CUPOLA ON TOP OF CAFFEY INLET COAST GUARD STATION
FW0713'MAIN BUILDING, AN ESTIMATED 40 YARDS W OF THE SAND ROAD, ABOUT
FW0713'25 YARDS E OF THE WATERLINE OF CURRITUCK SOUND, STANDARD
FW0713'DISKS STAMPED CAFFEY 1935, PROJECTING
FW0713'0.5 FOOT ABOVE GROUND IN THICKET OF BRUSH AND POISON OAK.
FW0713'
FW0713'REFERENCE STAMPED CAFFEY NO 1 1935, PROJECTS 0.5 FOOT,
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FW0713'IS 30.5 FEET OF 9.30 METERS E S 89 DEG 55 MIN E. FROM
FW0713'THE STATION, SIMILARLY IN THE THICKET.
FW0713'
FW0713'REFERENCE MARK NO. 2 OR THE AZIMUTH MARK WAS NOT RECOVERED.  IT
FW0713'IS ORIGINALLY DESCRIBED AS 0.35 MILE S S 18 DEG 22 MIN E.
FW0713'43.2 SEC FROM THE STATION AND 30 FEET E OF THE ROAD WHERE
FW0713'ROAD MAKES SEVERAL S-TURNS.  THE ROAD HAS BEEN REBUILT EVIDENTLY
FW0713'SEVERAL TIMES AND MOST RECENTLY FINISHED WITHIN THE WEEK
FW0713'AFTER THE LATEST STORM.
FW0713'
FW0713'REFERENCE STAMPED CAFFEY NO 3 1935, PROJECTS A
FW0713'FOOT, IS 25.8 FEET OR 7.86 METERS SW S 46 DEG 06 MIN W.
FW0713'FROM THE STATION, AND PRESENTLY AT THE SW END OF THE BRUSH AND
FW0713'AT THE EDGE OF THE MARSH.
FW0713
FW0713                          STATION RECOVERY (1962)
FW0713
FW0713'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1962 (SCM)
FW0713'IN THE ORIGINAL DESCRIPTION, THE STATION IS LOCATED IN CURRITUCK
FW0713'COUNTY, BUT ACCORDING TO INFORMATION RECEIVED FROM MR. MELVIN
FW0713'DANIELS, REGISTRAR OF DEEDS OF DARE COUNTY, THE COUNTY LINE
FW0713'IS AN ESTIMATED 1/4 MILE NORTH OF THE STATION.  MR. BRICKHOUSE,
FW0713'CARETAKER OF THE PINE ISLAND GUN CLUB CONFIRMED THIS REPORT,
FW0713'HOWEVER, THE COUNTY LINE MARKER WAS NOT RECOVERED.
FW0713'
FW0713'THE STATION MARK, REFERENCE MARKS NO. 1 AND 3 WERE RECOVERED
FW0713'AND FOUND IN GOOD CONDITION.  REFERENCE MARK NO. 2 (AZIMUTH MARK)
FW0713'WAS NOT RECOVERED AND A NEW AZIMUTH MARK WAS ESTABLISHED
FW0713'AT THIS TIME.  THE DISTANCE TO R.M. NO. 1 AND 3 WAS MEASURED
FW0713'AND FOUND TO CHECK.  THE DIRECTION CHECKED AS SHOWN BELOW.  A
FW0713'COMPLETE NEW DESCRIPTION FOLLOWS--STATION IS LOCATED ON A SMALL
FW0713'BRUSH COVERED NECK OF LAND WHICH EXTENDS INTO THE MARSH ON THE
FW0713'EAST SHORE OF CURRITUCK SOUND.  ABOUT 15 MILES NORTH-NORTHWEST
FW0713'OF KILL DEVIL HILLS, 4.3 MILES NORTH OF THE SMALL VILLAGE OF
FW0713'DUCK, AND ABOUT 350 FEET WEST OF THE CAFFEY INLET COAST
FW0713'GUARD STATION.  IT IS ABOUT 225 FEET WEST OF A FLAG POLE
FW0713'WHICH STANDS AT THE WEST FENCE LINE OF THE COAST GUARD
FW0713'STATION, 78 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A
FW0713'SMALL RED CABIN AND 2 FEET NORTHEAST OF A METAL WITNESS
FW0713'POST AND SIGN.  THE MARK IS A STANDARD DISK, SET IN THE TOP OF
FW0713'A 12X12 INCH CONCRETE MONUMENT PROJECTING 4 INCHES
FW0713'AND IS STAMPED CAFFEY 1935.
FW0713'
FW0713'REFERENCE MARK NO. 1 IS 69 FEET SOUTH OF THE SOUTHWEST
FW0713'CORNER OF THE RED CABIN, 32-1/2 FEET EAST OF THE WITNESS POST
FW0713'AND 2-1/2 FEET NORTH OF A TWIN 2-1/2 INCH TREE.  THE MARK IS
FW0713'A STANDARD DISK, SET IN THE TOP OF A 12X12 INCH CONCRETE
FW0713'MONUMENT PROJECTING 4 INCHES AND IS STAMPED CAFFEY
FW0713'1935 NO 1.  (11A).
FW0713'
FW0713'REFERENCE MARK NO. 3 IS 25.1 FEET SOUTHWEST OF THE WITNESS
FW0713'POST AND ON THE EDGE OF THE MARSH.  THE MARK IS A STANDARD DISK,
FW0713'SET IN THE TOP OF A 12X12 INCH CONCRETE MONUMENT PROJECTING
FW0713'13 INCHES AND IS STAMPED CAFFEY 1935 NO. 3.
FW0713'
FW0713'AZIMUTH MARK IS 0.3 MILE SOUTH OF THE STATION, 43 FEET EAST OF
FW0713'THE CENTER LINE OF A SAND ROAD, 2-1/2 FEET SOUTHEAST OF A METAL
FW0713'WITNESS POST AND SIGN AND ABOUT 3 FEET HIGHER THAN THE SAND
FW0713'ROAD.  THE MARK IS A STANDARD DISK, SET IN THE TOP OF A 12X12
FW0713'INCH CONCRETE MONUMENT PROJECTING 3 INCHES AND IS STAMPED
FW0713'CAFFEY RESET 1962.
FW0713'
FW0713'TO REACH FROM THE SMALL VILLAGE OF DUCK, GO NORTH ON A
FW0713'PAVED AND SAND ROAD FOR 4.3 MILES TO CAFFEY INLET COAST
FW0713'GUARD STATION ON RIGHT AND STATION ON LEFT.
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FW0713
FW0713                          STATION RECOVERY (1975)
FW0713
FW0713'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1975 (EAB)
FW0713'STATION MARK, REFERENCE MARKS NO 1 AND NO 3 AND THE AZIMUTH
FW0713'MARK WERE RECOVERED AND ALL OF THESE MARKS WERE FOUND TO BE
FW0713'IN GOOD CONDITION.
FW0713'
FW0713'TO REACH THE STATION SITE FROM THE TOWN OF DUCK, AT THE
FW0713'DUCK UNITED METHODIST CHURCH, GO NORTHERLY FOLLOWING A CLAY AND
FW0713'SAND ROAD FOR 3.9 MILES TO THE AZIMUTH MARK ON THE RIGHT, 2.5
FW0713'FEET SOUTHEASTERLY OF THE STEEL WITNESS POST.  CONTINUE ON
FW0713'NORTHERLY FOLLOWING A CLAY AND SAND ROAD FOR 0.3 MILE TO THE
FW0713'STATION SITE ON THE LEFT AND THE CAFFEY INLET COAST GUARD
FW0713'STATION BUILDINGS ON THE RIGHT.
FW0713'
FW0713'THE STATION MARK WAS FOUND TO BE 187 FEET WESTERLY OF THE
FW0713'CENTER LINE OF THE SAND AND CLAY ROAD, 2 FEET SOUTHEAST OF A
FW0713'STEEL WITNESS POST AND THE MARK IS PROJECTING ABOUT 4 INCHES.
FW0713
FW0713                          STATION RECOVERY (1983)
FW0713
FW0713'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 1983
FW0713'6.9 KM (4.3 MI) NNW FROM DUCK.
FW0713'ALONG SR 1200, 6.4 KM (3.95 MILES) NORTH-NORTHWEST OF THE
FW0713'UNITED METHODIST CHURCH IN DUCK, DIRECTLY ACROSS ROAD FROM THE
FW0713'OLD CAFFEY INLET COAST GUARD STATION ON A SMALL BRUSHY POINT
FW0713'THAT JUTS INTO CURRITUCK SOUND.  MARK IS UNDER WATER AT HIGH
FW0713'TIDE.  MARK IS 57.00 METERS (187.0 FEET) WEST OF CENTERLINE
FW0713'OF ROAD (THROUGH BRUSH AND POISON IVY).
FW0713'THE MARK IS 2 FT  SE FROM  WITNESS POST
FW0713'THE MARK IS 2 FT BELOW ROAD.
FW0713
FW0713                          STATION RECOVERY (1992)
FW0713
FW0713'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 1992 (MLL)
FW0713'RECOVERED IN GOOD CONDITION WITH THE FOLLOWING CORRECTIONS AND
FW0713'ADDITIONS.  THE BRIDGE AND THE FENCE AROUND A GARDEN PATCH ARE NOW
FW0713'GONE.  LOCATED WEST ACROSS THE ROAD FROM THE FLAGPOLE AT SANDERLING
FW0713'RESTURANT AND BAR SIGN, IN THE BUSHES NEAR THE SOUND.  REFERENCE MARK
FW0713'1 WAS RECOVERED IN GOOD CODITION, EXCEPT TILTED ABOUT 7 DEGREES TO THE
FW0713'NORTH.  REFERENCE MARK 3 WAS SEARCHED FOR BUT NOT FOUND ON MARCH 19,
FW0713'1996.  AZIMUTH MARK RESET 1962 WAS SEARCHED FOR BUT NOT FOUND ON MARCH
FW0713'19, 1996.  FROM MAIN STATION THERE IS NO LINE OF SIGHT POSSIBLE TO
FW0713'AZIMUTH MARK REFERENCE AREA.
FW0713
FW0713                          STATION RECOVERY (1999)
FW0713
FW0713'RECOVERY NOTE BY NC DOT 1999 (RMS)
FW0713'STATION IS ON THE WEST SIDE OF HWY NC 12 ACROSS FROM SANDERLING INN
FW0713'AND SOUTHWEST OF A PAVED PARKING LOT.
FW0713
FW0713                          STATION RECOVERY (2005)
FW0713
FW0713'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2005 (EJH)
FW0713'RECOVERED AS DESCRIBED.
FW0713
FW0713                          STATION RECOVERY (2015)
FW0713
FW0713'RECOVERY NOTE BY US GEOLOGICAL SURVEY 2015
FW0713'RECOVERED IN GOOD CONDITION.
FW0713
FW0713                          STATION RECOVERY (2019)
FW0713
FW0713'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2019 (RLS)
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FW0713'IT IS 46.3 FT (14.1 M) WEST-SOUTHWEST OF THE SOUTHWEST CORNER OF THE
FW0713'ASPHALT PARKING LOT, 48.6 FT (14.8 M) WEST-NORTHWEST OF A GROUND LIGHT
FW0713'AND 43.7 FT (13.3 M) SOUTHWEST OF ANOTHER GROUND LIGHT.

*** retrieval complete.
Elapsed Time = 00:00:04

Q 261

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.5.15
Starting Datasheet Retrieval...
1        National Geodetic Survey,   Retrieval Date = JUNE  5, 2023
 FW0738 ***********************************************************************
 FW0738  DESIGNATION -  Q 261
 FW0738  PID         -  FW0738
 FW0738  STATE/COUNTY-  NC/CURRITUCK
 FW0738  COUNTRY     -  US
 FW0738  USGS QUAD   -  COROLLA (2019)
 FW0738
 FW0738                        *CURRENT SURVEY CONTROL
 FW0738  ______________________________________________________________________
 FW0738* NAD 83(2011) POSITION- 36 23 20.93142(N) 075 49 41.76418(W)   ADJUSTED
 FW0738* NAD 83(2011) ELLIP HT-   -36.425 (meters)        (06/27/12)   ADJUSTED
 FW0738* NAD 83(2011) EPOCH    -  2010.00
 FW0738* NAVD 88 ORTHO HEIGHT -     2.176 (meters)        7.14  (feet) ADJUSTED
 FW0738  ______________________________________________________________________
 FW0738  GEOID HEIGHT    -        -38.609 (meters)                     GEOID18
 FW0738  NAD 83(2011) X  -  1,258,536.448 (meters)                     COMP
 FW0738  NAD 83(2011) Y  - -4,984,026.222 (meters)                     COMP
 FW0738  NAD 83(2011) Z  -  3,763,017.634 (meters)                     COMP
 FW0738  LAPLACE CORR    -         -1.80  (seconds)                    DEFLEC18
 FW0738  DYNAMIC HEIGHT  -          2.174 (meters)        7.13  (feet) COMP
 FW0738  MODELED GRAVITY -    979,810.1   (mgal)                       NAVD 88
 FW0738
 FW0738  VERT ORDER      -  FIRST     CLASS II
 FW0738
 FW0738  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 FW0738  Standards:
 FW0738         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 FW0738            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 FW0738  ----------------------------------------------------------------------
 FW0738  NETWORK    0.47   0.92          0.21   0.17   0.47      0.04071615
 FW0738  ----------------------------------------------------------------------
 FW0738  Click here for local accuracies and other accuracy information.
 FW0738
 FW0738.The horizontal coordinates were established by GPS observations
 FW0738.and adjusted by the National Geodetic Survey in June 2012.
 FW0738
 FW0738.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 FW0738.been affixed to the stable North American tectonic plate. See
 FW0738.NA2011 for more information.
 FW0738
 FW0738.The horizontal coordinates are valid at the epoch date displayed above
 FW0738.which is a decimal equivalence of Year/Month/Day.
 FW0738
 FW0738.The orthometric height was determined by differential leveling and
 FW0738.adjusted by the NATIONAL GEODETIC SURVEY
 FW0738.in June 1991.
 FW0738
 FW0738.Significant digits in the geoid height do not necessarily reflect accuracy.
 FW0738.GEOID18 height accuracy estimate available here.
 FW0738
 FW0738.Click photographs - Photos may exist for this station.
 FW0738
 FW0738.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 FW0738
 FW0738.The Laplace correction was computed from DEFLEC18 derived deflections.
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FW0738
FW0738.The ellipsoidal height was determined by GPS observations
FW0738.and is referenced to NAD 83.
FW0738
FW0738.The dynamic height is computed by dividing the NAVD 88
FW0738.geopotential number by the normal gravity value computed on the
FW0738.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
FW0738.degrees latitude (g = 980.6199 gals.).
FW0738
FW0738.The modeled gravity was interpolated from observed gravity values.
FW0738
FW0738. The following values were computed from the NAD 83(2011) position.
FW0738
FW0738;                   North         East     Units Scale Factor Converg.
FW0738;SPC NC       -   297,327.880   894,136.126   MT  1.00006970   +1 49 50.3
FW0738;SPC NC       -   975,483.22  2,933,511.61   sFT  1.00006970   +1 49 50.3
FW0738;UTM  18      - 4,027,430.561   425,717.890   MT  0.99966798   -0 29 29.1
FW0738
FW0738!             -  Elev Factor  x  Scale Factor =   Combined Factor
FW0738!SPC NC       -   1.00000572  x   1.00006970  =   1.00007542
FW0738!UTM  18      -   1.00000572  x   0.99966798  =   0.99967369
FW0738
FW0738:                Primary Azimuth Mark                    Grid Az
FW0738:SPC NC       -  ADRIATIC                                164 49 49.7
FW0738:UTM  18      -  ADRIATIC                                167 09 09.1
FW0738
FW0738_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SVF2571727430(NAD 83)
FW0738
FW0738|-----------------------------------------------------------------------|
FW0738| PID    Reference Object                    Distance      Geod. Az  |
FW0738|                                                          dddmmss.s |
FW0738| DF5601 ADRIATIC                          404.020 METERS 1663940.0 |
FW0738|-----------------------------------------------------------------------|
FW0738
FW0738                          SUPERSEDED SURVEY CONTROL
FW0738
FW0738  NAD 83(2007)-  36 23 20.93136(N)    075 49 41.76488(W) AD(2002.00) 0
FW0738  ELLIP H (02/10/07)  -36.411  (m)                       GP(2002.00)
FW0738  NAD 83(2001)-  36 23 20.93192(N)    075 49 41.76461(W) AD(       ) 1
FW0738  ELLIP H (03/13/03)  -36.409  (m)                       GP(       ) 4 2
FW0738  NAD 83(1986)-  36 23 20.94688(N)    075 49 41.78563(W) AD(       ) 1
FW0738  NAVD 88              2.18   (m)           7.2    (f) LEVELING    3
FW0738
FW0738.Superseded values are not recommended for survey control.
FW0738
FW0738.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FW0738.See file dsdata.pdf to determine how the superseded data were derived.
FW0738
FW0738_MARKER: F = FLANGE-ENCASED ROD
FW0738_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
FW0738_STAMPING: Q 261 1983
FW0738_MARK LOGO: NGS
FW0738_PROJECTION: FLUSH
FW0738_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
FW0738_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
FW0738+STABILITY: POSITION/ELEVATION WELL
FW0738_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FW0738+SATELLITE: SATELLITE OBSERVATIONS - September 04, 2016
FW0738_ROD/PIPE-DEPTH: 12.1 meters
FW0738_SLEEVE-DEPTH  : 1.0 meters
FW0738
FW0738  HISTORY     - Date     Condition       Report By
FW0738  HISTORY     - 1983     MONUMENTED      NCGS
FW0738  HISTORY     - 19951205 GOOD            NCGS
FW0738  HISTORY     - 19990609 GOOD            NCDOT
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FW0738  HISTORY     - 20011008 GOOD            NCGS
FW0738  HISTORY     - 20041201 GOOD            NCGS
FW0738  HISTORY     - 20080508 GOOD            NCGS
FW0738  HISTORY     - 20160904 GOOD            USPSQD
FW0738
FW0738                          STATION DESCRIPTION
FW0738
FW0738'DESCRIBED BY NORTH CAROLINA GEODETIC SURVEY 1983
FW0738'IN COROLLA.
FW0738'PROCEED ALONG A PAVED PRIVATE ROAD 0.4 KM (0.25 MILE)
FW0738'NORTH-NORTHWEST FROM THE CURRITUCK BEACH LIGHT HOUSE TO
FW0738'INTERSECTION WITH CORAL LANE, THENCE 0.4 KM (0.25 MILE) EAST
FW0738'ALONG CORAL LANE TO INTERSECTION WITH ATLANTIC AVENUE, THENCE
FW0738'0.9 KM (0.55 MILE) NORTH-NORTHWEST ALONG ATLANTIC AVENUE TO A
FW0738'CUL-DU-SAC WEST, IN SOUTHWEST QUADRANT, 7.32 METERS (24.0 FEET)
FW0738'WEST OF CENTERLINE OF STREET, 4.11 METERS (13.5 FEET) SOUTH
FW0738'OF EDGE OF PAVEMENT OF CUL DU SAC, 17.9 METERS (59,0 FEET
FW0738'SOUTH-SOUTHWEST OF PK NAIL DENOTING CENTERLINE OF ROAD.
FW0738'THE MARK IS 2.6 FT  E FROM  WITNESS POST
FW0738'THE MARK IS ABOVE LEVEL WITH STREET.
FW0738
FW0738                          STATION RECOVERY (1995)
FW0738
FW0738'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 1995 (WLL)
FW0738'RECOVERED AS DESCRIBED WITH THE FOLLOWING ADDITION AND CORRECTIONS,
FW0738'ACCESS COVER, PIPE, AND CONCRETE FOUND LYING ON THE GROUND NEARBY WITH
FW0738'LID MISSING.  ACCESS COVER AND PIPE ASSEMBLY WERE REPLACED ON THIS
FW0738'DATE.  LOCATED 54.4 FT (16.6 M) SOUTH OF AN EXISTING PK-NAIL IN THE
FW0738'CENTER OF THE CUL-DE-SAC AND 5.4 FT (1.6 M) EAST-SOUTHEAST OF A
FW0738'TELEPHONE PEDESTAL (2014-2) .
FW0738
FW0738                          STATION RECOVERY (1999)
FW0738
FW0738'RECOVERY NOTE BY NC DOT 1999 (RMS)
FW0738'RECOVERED IN GOOD CONDITION.
FW0738
FW0738                          STATION RECOVERY (2001)
FW0738
FW0738'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2001 (EJH)
FW0738'RECOVERED AS DESCRIBED.
FW0738
FW0738                          STATION RECOVERY (2004)
FW0738
FW0738'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2004 (EJH)
FW0738'RECOVERED AS DESCRIBED.
FW0738
FW0738                          STATION RECOVERY (2008)
FW0738
FW0738'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2008 (EJH)
FW0738'RECOVERED AS DESCRIBED.
FW0738
FW0738                          STATION RECOVERY (2016)
FW0738
FW0738'RECOVERY NOTE BY US POWER SQUADRON 2016 (GS)
FW0738'RECOVERED IN GOOD CONDITION.



*** retrieval complete.
Elapsed Time = 00:00:04
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Radio RM 1

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.15
Starting Datasheet Retrieval...
1        National Geodetic Survey,   Retrieval Date = JUNE  5, 2023
 FW0723 ***********************************************************************
 FW0723  DESIGNATION -  RADIO RM 1
 FW0723  PID         -  FW0723
 FW0723  STATE/COUNTY-  NC/CURRITUCK
 FW0723  COUNTRY     -  US
 FW0723  USGS QUAD   -  MOSSEY ISLANDS (2019)
 FW0723
 FW0723                        *CURRENT SURVEY CONTROL
 FW0723  ______________________________________________________________________
 FW0723* NAD 83(1986) POSITION- 36 16 38.34   (N) 075 47 47.77   (W)   HD_HELD1
 FW0723* NAVD 88 ORTHO HEIGHT -     2.760 (meters)        9.06  (feet) ADJUSTED
 FW0723  ______________________________________________________________________
 FW0723  GEOID HEIGHT    -        -38.774 (meters)                     GEOID18
 FW0723  DYNAMIC HEIGHT  -          2.757 (meters)        9.05  (feet) COMP
 FW0723  MODELED GRAVITY -    979,799.5   (mgal)                       NAVD 88
 FW0723
 FW0723  VERT ORDER      -  FIRST     CLASS II
 FW0723
 FW0723.The horizontal coordinates were determined by differentially corrected
 FW0723.hand held GPS observations or other comparable positioning techniques
 FW0723.and have an estimated accuracy of +/- 3 meters.
 FW0723
 FW0723.The orthometric height was determined by differential leveling and
 FW0723.adjusted by the NATIONAL GEODETIC SURVEY
 FW0723.in June 1991.
 FW0723
 FW0723.Significant digits in the geoid height do not necessarily reflect accuracy.
 FW0723.GEOID18 height accuracy estimate available here.
 FW0723
 FW0723.Click photographs - Photos may exist for this station.
 FW0723
 FW0723.The dynamic height is computed by dividing the NAVD 88
 FW0723.geopotential number by the normal gravity value computed on the
 FW0723.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 FW0723.degrees latitude (g = 980.6199 gals.).
 FW0723
 FW0723.The modeled gravity was interpolated from observed gravity values.
 FW0723
 FW0723;                North         East     Units  Estimated Accuracy
 FW0723;SPC NC       -  285,015.6     897,376.2     MT  (+/- 3 meters HH1 GPS)
 FW0723
 FW0723_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SVF2845515001(NAD 83)
 FW0723
 FW0723                          SUPERSEDED SURVEY CONTROL
 FW0723
 FW0723.No superseded survey control is available for this station.
 FW0723
 FW0723_MARKER: DR = REFERENCE MARK DISK
 FW0723_SETTING: 46 = COPPER-CLAD STEEL ROD W/O SLEEVE (10 FT.+)
 FW0723_STAMPING: RADIO NO 1 1962
 FW0723_MARK LOGO: CGS
 FW0723_MAGNETIC: I = MARKER IS A STEEL ROD
 FW0723_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 FW0723_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
 FW0723+SATELLITE: SATELLITE OBSERVATIONS - September 09, 2016
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FW0723
FW0723  HISTORY     - Date     Condition        Report By
FW0723  HISTORY     - 1962     MONUMENTED       CGS
FW0723  HISTORY     - 1983     GOOD             NCGS
FW0723  HISTORY     - 20021204 GOOD             NCGS
FW0723  HISTORY     - 20041202 GOOD             NCGS
FW0723  HISTORY     - 20160909 GOOD             USPSQD
FW0723
FW0723                          STATION DESCRIPTION
FW0723
FW0723'DESCRIBED BY NORTH CAROLINA GEODETIC SURVEY 1983
FW0723'11.7 KM (7.2 MI) SSE FROM COROLLA.
FW0723'PROCEED ALONG SR 1200, 0.9 KM (0.55 MILE) NORTH-NORTHWEST FROM
FW0723'THE OLD CAFFEY INLET COAST GUARD STATION (NOW SANDERLING
FW0723'SALES OFFICE) TO SECURITY GATE OF OCEAN SANDS, THENCE 5.8 KM
FW0723'(3.6 MILES) NORTHWEST ALONG A PAVED PRIVATE ROAD, OR 0.3 KM
FW0723'(0.2 MILE) NORTH OF A POWER LINE CROSSING, 100.3 METERS
FW0723'329 FEET) SOUTHWEST OF CENTERLINE OF ROAD.
FW0723'THE MARK IS 2 FT ABOVE ROAD.
FW0723
FW0723                          STATION RECOVERY (2002)
FW0723
FW0723'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2002 (EJH)
FW0723'RECOVERED AS DESCRIBED. THE MARK PROJECTS 18 INCHES.
FW0723
FW0723                          STATION RECOVERY (2004)
FW0723
FW0723'RECOVERY NOTE BY NORTH CAROLINA GEODETIC SURVEY 2004 (EJH)
FW0723'RECOVERED AS DESCRIBED.
FW0723
FW0723                          STATION RECOVERY (2016)
FW0723
FW0723'RECOVERY NOTE BY US POWER SQUADRON 2016 (GS)
FW0723'RECOVERED IN GOOD CONDITION.



*** retrieval complete.
Elapsed Time = 00:00:04
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