

# SURVEY CONTROL SHEET W-5313

## GPS Calibration Report

**Project : W5313Z**

**TIP Number**

**User name** tbovender

**Date & Time** 10:05:53 AM 12/16/2013

**Coordinate System** US State Plane 1983(at ground)

**Zone** North Carolina 3200

**Horizontal Datum** NAD 1983 (Conus)

**Vertical Datum** Geoid Model G09NC

**Coordinate Units** US survey feet

**Distance Units** US survey feet

**Height Units** US survey feet

**LOCAL SITE INFORMATION**

**Localized around**

**Latitude** 35°30'11.61315"N

**Longitude** 80°33'44.04363"W

**Site Scale Factor** 1.0001468316

**Height** 607.743sft

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived. Please take care in utilizing these coordinates to eliminate confusion of the two systems.

This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

**Horizontal Adjustment Parameters**

**Northing coordinate of rotation center** 648104.993sft

**Easting coordinate of rotation center** 1557642.997sft

**Rotation about the center point** 0°00'00"

**Translation north** 0.012sft

**Translation east** 0.014sft

**Scale factor** 1.00000004

**Vertical Adjustment Parameters**

**Northing coordinate of origin point** 647341.806sft

**Easting coordinate of origin point** 1578165.310sft

**Vertical separation at origin** -0.018sft

**Slope north** -0.246ppm

**Slope east** -0.164ppm

**Geoid Model Definition**

**G09NC**

**Datum Transformation Parameters**

Datum Transformation computation not requested

**Residual Differences Between GPS (WGSS4) and Local Coordinates**

**Summary**

Maximum error	Root Mean Square error	Point
Horizontal 0.002sft	0.000	W5313-9 GPS
Vertical 0.000sft	0.000	W5313-1 GPS
Three-dimensional 0.002sft	0.000	W5313-9 GPS

WGSS4 Coordinates	Point Residuals Calculated point FOR DISPLAY ONLY	Local Coordinates
Point W5313-1 GPS Latitude 35°31'13.45073"N Longitude 80°25'03.80840"W Height 654.601sft	Northing 647341.806sft Easting 1578165.310sft Elevation 754.874sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-1 Northing 647341.806sft Easting 1578165.309sft Elevation 754.874sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-2 GPS Latitude 35°31'12.12468"N Longitude 80°25'17.80716"W Height 643.105sft	Northing 647224.284sft Easting 1577006.270sft Elevation 743.394sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-2 Northing 647224.284sft Easting 1577006.270sft Elevation 743.394sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-3 GPS Latitude 35°31'23.66952"N Longitude 80°26'19.70284"W Height 632.504sft	Northing 648465.253sft Easting 1571906.958sft Elevation 732.907sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-3 Northing 648465.254sft Easting 1571906.958sft Elevation 732.907sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-4 GPS Latitude 35°31'27.35301"N Longitude 80°26'32.30289"W Height 651.369sft	Northing 648852.791sft Easting 1570870.905sft Elevation 751.801sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-4 Northing 648852.791sft Easting 1570870.905sft Elevation 751.801sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-5 GPS Latitude 35°31'31.21979"N Longitude 80°27'46.81027"W Height 671.581sft	Northing 649333.869sft Easting 1564718.307sft Elevation 772.156sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-5 Northing 649333.870sft Easting 1564719.308sft Elevation 772.156sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-6 GPS Latitude 35°31'32.35598"N Longitude 80°28'03.56318"W Height 693.823sft	Northing 649469.185sft Easting 1563335.324sft Elevation 794.432sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-6 Northing 649469.186sft Easting 1563335.326sft Elevation 794.432sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-7 GPS Latitude 35°31'14.90334"N Longitude 80°29'05.42808"W Height 658.786sft	Northing 647780.675sft Easting 1558195.630sft Elevation 759.480sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-7 Northing 647780.675sft Easting 1558195.630sft Elevation 759.480sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-8 GPS Latitude 35°31'11.26167"N Longitude 80°29'17.89752"W Height 656.861sft	Northing 647427.918sft Easting 1557159.417sft Elevation 757.572sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-8 Northing 647427.917sft Easting 1557159.416sft Elevation 757.572sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-9 GPS Latitude 35°30'47.95816"N Longitude 80°30'41.95844"W Height 603.938sft	Northing 645176.819sft Easting 1550175.200sft Elevation 704.755sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-9 Northing 645176.818sft Easting 1550175.198sft Elevation 704.755sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-10 GPS Latitude 35°30'52.84482"N Longitude 80°30'57.02510"W Height 620.785sft	Northing 645689.877sft Easting 1548937.263sft Elevation 721.638sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-10 Northing 645689.876sft Easting 1548937.261sft Elevation 721.638sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-11 GPS Latitude 35°31'18.15487"N Longitude 80°31'56.35409"W Height 716.891sft	Northing 648324.139sft Easting 1544072.439sft Elevation 817.895sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-11 Northing 648324.139sft Easting 1544072.439sft Elevation 817.895sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-12 GPS Latitude 35°31'21.96724"N Longitude 80°32'13.14814"W Height 727.933sft	Northing 648731.049sft Easting 1542690.279sft Elevation 828.974sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-12 Northing 648731.049sft Easting 1542690.279sft Elevation 828.974sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-13 GPS Latitude 35°31'33.43655"N Longitude 80°32'39.77131"W Height 720.728sft	Northing 649924.804sft Easting 1540507.788sft Elevation 821.843sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-13 Northing 649924.804sft Easting 1540507.789sft Elevation 821.843sft Utilized Horz and Vert Quality Adjusted quality
Point W5313-14 GPS Latitude 35°31'31.29457"N Longitude 80°32'54.81463"W Height 714.336sft	Northing 649727.611sft Easting 1539261.057sft Elevation 815.474sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point W5313-14 Northing 649727.611sft Easting 1539261.058sft Elevation 815.474sft Utilized Horz and Vert Quality Adjusted quality

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "13802-12" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 641735.246(++) EASTING: 1535065.380(++) ELEVATION: 708.81(++)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985319

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "13802-12" TO -L- STATION 10+00.00 IS

13802-12 10,166.40

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

**NOTES:**

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/NSRS 2007 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

THE FILES TO BE FOUND ARE AS FOLLOWS:

- W5313\_LS\_GPSALIB.HTML
- W5313\_LS\_WGSS4.TXT
- W5313\_LS\_LOCAL.TXT
- W5313\_LS\_CONTROL.TXT

THE WGSS4 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.