

SURVEY CONTROL SHEET U-3109A

GPS Calibration Report

Project : u3109_Control_Sheet_130528

TIP Number	U-3109	Date & Time	10:23:03 AM 5/28/2013
User name	khudson	Zone	North Carolina 3200
Coordinate System	US State Plane 1983(at ground)	Geoid Model	G99NC
Horizontal Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD88		
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

LOCAL SITE INFORMATION

Localized around	U3109-3
Latitude	36°05'55.47807"N
Longitude	79°17'18.68783"W
Site Scale Factor	1.0000447300
Height	560.0355ft

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.

Datum Transformation Parameters

Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center	853689.7835ft
Easting coordinate of rotation center	1915272.0165ft
Rotation about the center point	0°00'00"
Translation north	0.0005ft
Translation east	0.0005ft
Scale factor	0.99999998

Vertical Adjustment Parameters

Northing coordinate of origin point	841207.2445ft
Easting coordinate of origin point	1910433.6695ft
Vertical separation at origin	0.0005ft
Slope north	-0.020ppm
Slope east	0.033ppm

Geoid Model Definition

G99NC

Residual Differences Between GPS (WGS84) And Local Coordinates

	Maximum error	Root Mean Square error	Point
Horizontal	0.0015ft	0.000	U3109-1_GPS
Vertical	0.0005ft	0.000	U3109-1_GPS
Three-dimensional	0.0015ft	0.000	U3109-4_GPS

Point Residuals

Point	WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point U3109-1_GPS	Northing 841207.2445ft Latitude 36°03'39.27530"N Longitude 79°18'10.88159"W Elevation 652.4495ft Height 553.3615ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Northing 841207.2445ft Easting 1910433.6695ft Elevation 652.4495ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Point U3109-1 Northing 841207.2445ft Easting 1910433.6695ft Elevation 652.4495ft Horz and Vert Control quality
Point U3109-2_GPS	Northing 842594.1865ft Latitude 36°03'53.00956"N Longitude 79°18'03.18698"W Elevation 662.3315ft Height 563.2425ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Northing 842594.1865ft Easting 1911069.6665ft Elevation 662.3315ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Point U3109-2 Northing 842594.1865ft Easting 1911069.6655ft Elevation 662.3315ft Horz and Vert Control quality
Point U3109-3_GPS	Northing 854967.9505ft Latitude 36°05'55.47807"N Longitude 79°17'18.68783"W Elevation 659.1665ft Height 560.0315ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Northing 854967.9505ft Easting 1914759.2155ft Elevation 659.1665ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Point U3109-3 Northing 854967.9505ft Easting 1914759.2155ft Elevation 659.1665ft Horz and Vert Control quality
Point U3109-4_GPS	Northing 854859.2375ft Latitude 36°05'54.45332"N Longitude 79°16'57.14966"W Elevation 683.3865ft Height 584.2445ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Northing 854859.2375ft Easting 1916526.5435ft Elevation 683.3865ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Point U3109-4 Northing 854859.2385ft Easting 1916526.5435ft Elevation 683.3865ft Horz and Vert Control quality
Point U3109-5_GPS	Northing 866558.2775ft Latitude 36°07'50.20033"N Longitude 79°16'31.01174"W Elevation 631.1635ft Height 531.8965ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Northing 866558.2775ft Easting 1918704.1305ft Elevation 631.1635ft Horz error 0.0015ft Vert error 0.0005ft 3D error 0.0015ft	Point U3109-5 Northing 866558.2775ft Easting 1918704.1305ft Elevation 631.1635ft Horz and Vert Control quality
Point U3109-6_GPS	Northing 867837.1205ft Latitude 36°08'02.83633"N Longitude 79°16'35.40079"W Elevation 629.0895ft Height 529.8065ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Northing 867837.1205ft Easting 1918347.6255ft Elevation 629.0895ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Point U3109-6 Northing 867837.1205ft Easting 1918347.6255ft Elevation 629.0895ft Horz and Vert Control quality

Point U3109-7_GPS	Northing 850417.1305ft Latitude 36°05'10.51959"N Longitude 79°17'00.16586"W Elevation 633.2265ft Height 534.1035ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Point U3109-7 Northing 850417.1305ft Easting 1916266.3225ft Elevation 633.2265ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft Quality Control quality
Point U3109-8_GPS	Northing 851077.1195ft Latitude 36°05'17.04042"N Longitude 79°17'02.59326"W Elevation 609.1935ft Height 510.0705ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft	Point U3109-8 Northing 851077.1195ft Easting 1916068.9635ft Elevation 609.1935ft Horz error 0.0005ft Vert error 0.0005ft 3D error 0.0005ft Quality Control quality

GPS CALIBRATION REPORT

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 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 SYSTEM) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING NCDOT PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/PAGES/DEFAULT.ASPX](https://connect.ncdot.gov/resources/location/pages/default.aspx)
THE FILES TO BE FOUND ARE AS FOLLOWS:

TIP U3109A_LS.GPSCALIB.HTML
TIP U3109A_LS.WGS84.TXT
TIP U3109A_LS.LOCAL.TXT
TIP U3109A_LS.CONTROL.TXT

THE WGS84 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.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING MONUMENTATION.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3109-3"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 854967.949(ft) EASTING: 1914759.215(ft)
ELEVATION: 659.17'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999952720
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3109-3" TO -L- STATION 9+48.17 IS
S 16°46'43" W 13,048.70'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

6/27/2017 3:44:46 PM F:\Roadway\Projects\U3109a\1s\1c-3.dgn USER: todd.buckner