

SURVEY CONTROL SHEET R-2915A

GPS Calibration Report

Project : r2915abcde

TIP Number	r2915abcde	Date & Time	8:15:20 AM 3/29/2010
User name	rhwagoner	Zone	North Carolina 3200
Coordinate System	US State Plane 1983		
Horizontal Datum	NAD 1983 (Comus)		
Vertical Datum		Geoid Model	G03NC
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

LOCAL SITE INFORMATION

Localized around	
Latitude	N/A
Longitude	N/A
Site Scale Factor	N/A
Height	N/A

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	947934.1223sft
Easting coordinate of rotation center	1262471.3754sft
Rotation about the center point	0°00'00"
Translation north	-0.6128sft
Translation east	0.7058sft
Scale factor	1.00008668

Vertical Adjustment Parameters

Northing coordinate of origin point	916355.6589sft
Easting coordinate of origin point	1255522.7706sft
Vertical separation at origin	0.0728sft
Slope north	2.018ppm
Slope east	-3.981ppm

Geoid Model Definition

G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary			
	Maximum error	Root Mean Square error	Point
Horizontal	0.037sft	0.006	R2915-23_WGS84
Vertical	0.080sft	0.010	R2915-23_WGS84
Three-dimensional	0.088sft	0.011	R2915-23_WGS84

Point Residuals					
WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
Point	R2915-1_WGS84	Northing	916355.6589sft	Point R2915-1 Local	
Latitude	36°14'30.16499"N	Easting	1255522.7706sft	Northing	916355.6590sft
Longitude	81°31'28.80325"W	Elevation	3142.3037sft	Easting	1255522.7760sft
Height	3038.5989sft	Horz error	0.005sft	Elevation	3142.2840sft
		Vert error	0.020sft	Utilized	Horz and Vert
		3D error	0.020sft	Quality	Survey quality
Point	R2915-2_WGS84	Northing	915243.5295sft	Point R2915-2 Local	
Latitude	36°14'19.87328"N	Easting	1258316.3057sft	Northing	915243.5260sft
Longitude	81°30'54.37263"W	Elevation	3035.6772sft	Easting	1258316.3100sft
Height	2931.8298sft	Horz error	0.006sft	Elevation	3035.6720sft
		Vert error	0.005sft	Utilized	Horz and Vert
		3D error	0.008sft	Quality	Survey quality
Point	R2915-3_WGS84	Northing	919149.7074sft	Point R2915-3 Local	
Latitude	36°14'59.39661"N	Easting	1261969.9588sft	Northing	919149.7040sft
Longitude	81°30'10.99416"W	Elevation	2977.4067sft	Easting	1261969.9680sft
Height	2873.5914sft	Horz error	0.010sft	Elevation	2977.4070sft
		Vert error	0.000sft	Utilized	Horz and Vert
		3D error	0.010sft	Quality	Survey quality
Point	R2915-4_WGS84	Northing	920506.4892sft	Point R2915-4 Local	
Latitude	36°15'13.02239"N	Easting	1262832.0488sft	Northing	920506.4880sft
Longitude	81°30'00.89092"W	Elevation	2956.9814sft	Easting	1262832.0570sft
Height	2853.1869sft	Horz error	0.008sft	Elevation	2956.9900sft
		Vert error	0.009sft	Utilized	Horz and Vert
		3D error	0.012sft	Quality	Survey quality
Point	R2915-5_WGS84	Northing	927532.5716sft	Point R2915-5 Local	
Latitude	36°16'22.33517"N	Easting	1262287.7805sft	Northing	927532.5780sft
Longitude	81°30'09.69521"W	Elevation	2902.2729sft	Easting	1262287.7910sft
Height	2798.7405sft	Horz error	0.012sft	Elevation	2902.2770sft
		Vert error	0.004sft	Utilized	Horz and Vert
		3D error	0.013sft	Quality	Survey quality
Point	R2915-6_WGS84	Northing	929551.4461sft	Point R2915-6 Local	
Latitude	36°16'43.05751"N	Easting	1265372.0745sft	Northing	929551.4520sft

Longitude	81°29'32.66468"W	Elevation	3037.6229sft	Easting	1265372.0870sft
Height	2934.0460sft	Horz error	0.014sft	Elevation	3037.6360sft
		Vert error	0.013sft	Utilized	Horz and Vert
		3D error	0.019sft	Quality	Survey quality
Point	R2915-7_WGS84	Northing	934301.5436sft	Point R2915-7 Local	
Latitude	36°17'29.48965"N	Easting	1263283.7338sft	Northing	934301.5570sft
Longitude	81°29'59.61899"W	Elevation	2870.4241sft	Easting	1263283.7320sft
Height	2767.0788sft	Horz error	0.014sft	Elevation	2870.4170sft
		Vert error	0.007sft	Utilized	Horz and Vert
		3D error	0.015sft	Quality	Survey quality
Point	R2915-8_WGS84	Northing	935627.2416sft	Point R2915-8 Local	
Latitude	36°17'42.92890"N	Easting	1264633.5337sft	Northing	935627.2530sft
Longitude	81°29'43.54539"W	Elevation	2872.3172sft	Easting	1264633.5310sft
Height	2768.9685sft	Horz error	0.012sft	Elevation	2872.3310sft
		Vert error	0.014sft	Utilized	Horz and Vert
		3D error	0.018sft	Quality	Survey quality
Point	R2915-9_WGS84	Northing	940641.1693sft	Point R2915-9 Local	
Latitude	36°18'31.45715"N	Easting	1260499.6148sft	Northing	940641.1850sft
Longitude	81°30'35.56934"W	Elevation	2893.9308sft	Easting	1260499.6170sft
Height	2790.8934sft	Horz error	0.016sft	Elevation	2893.9060sft
		Vert error	0.025sft	Utilized	Horz and Vert
		3D error	0.029sft	Quality	Survey quality
Point	R2915-10_WGS84	Northing	941223.4149sft	Point R2915-10 Local	
Latitude	36°18'37.24430"N	Easting	1260628.2994sft	Northing	941223.4310sft
Longitude	81°30'34.17760"W	Elevation	2992.8526sft	Easting	1260628.3040sft
Height	2889.8302sft	Horz error	0.017sft	Elevation	2992.8370sft
		Vert error	0.016sft	Utilized	Horz and Vert
		3D error	0.023sft	Quality	Survey quality
Point	R2915-11_WGS84	Northing	946476.2925sft	Point R2915-11 Local	
Latitude	36°19'28.64133"N	Easting	1258539.4421sft	Northing	946476.3110sft
Longitude	81°31'01.31448"W	Elevation	2961.5603sft	Easting	1258539.4520sft
Height	2858.7761sft	Horz error	0.021sft	Elevation	2961.5280sft
		Vert error	0.032sft	Utilized	Horz and Vert
		3D error	0.039sft	Quality	Survey quality
Point	R2915-12_WGS84	Northing	947042.3574sft	Point R2915-12 Local	
Latitude	36°19'34.13447"N	Easting	1258133.1858sft	Northing	947042.3510sft
Longitude	81°31'06.45218"W	Elevation	2976.4319sft	Easting	1258133.1700sft
Height	2873.6799sft	Horz error	0.017sft	Elevation	2976.4580sft
		Vert error	0.026sft	Utilized	Horz and Vert
		3D error	0.031sft	Quality	Survey quality
Point	R2915-13_WGS84	Northing	951569.5121sft	Point R2915-13 Local	
Latitude	36°20'18.04952"N	Easting	1254826.4800sft	Northing	951569.5120sft
Longitude	81°31'48.25253"W	Elevation	3052.2178sft	Easting	1254826.4650sft
Height	2949.7070sft	Horz error	0.015sft	Elevation	3052.2240sft
		Vert error	0.006sft	Utilized	Horz and Vert
		3D error	0.016sft	Quality	Survey quality
Point	R2915-14_WGS84	Northing	952360.7067sft	Point R2915-14 Local	
Latitude	36°20'25.72331"N	Easting	1254245.9924sft	Northing	952360.7080sft

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2915-15" WITH NAD 83/CORS STATE PLANE GRID COORDINATES OF NORTHING: 954880.7810(++) EASTING: 1254012.2870(++) ELEVATION: 3097.5210(++) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991292 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2915-15" TO -L- STATION 10+00.00 IS S 08°37'17" E 41208.6602 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- 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 STATION) 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 PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R2915A_LS_GPSCALIB.HTML
R2915A_LS_WGS84.TXT
R2915A_LS_LOCAL.TXT
R2915A_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.
- © 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.
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE