

SURVEY CONTROL SHEET R-4753

-FINAL-

GPS Calibration Report

Project : R4753ZSiteCalibrationEnglish130204

TIP Number	R-4753	Date & Time	12:00:29 PM 2/4/2013
User name	rmdonald	Zone	North Carolina 3200
Coordinate System	US State Plane 1983(at ground)	Geoid Model	G03NC
Horizontal Datum	NAD 1983 (Comus)		
Vertical Datum	NAVD88		
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

LOCAL SITE INFORMATION

Localized around	GPS108
Latitude	35°17'06.06048"N
Longitude	83°07'49.67097"W
Site Scale Factor	1.0002256010
Height	2076.143sft

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	583679.436sft
Easting coordinate of rotation center	764903.446sft
Rotation about the center point	0°00'00"
Translation north	-0.002sft
Translation east	0.008sft
Scale factor	1.00000008

Vertical Adjustment Parameters

Northing coordinate of origin point	588639.079sft
Easting coordinate of origin point	760234.922sft
Vertical separation at origin	-0.019sft
Slope north	0.350ppm
Slope east	-0.390ppm

Geoid Model Definition

G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

	Maximum error	Root Mean Square error	Point
Horizontal	0.012sft	0.001	FRKN_WGS84
Vertical	0.076sft	0.013	GPS108_WGS84
Three-dimensional	0.076sft	0.013	GPS108_WGS84

Point Residuals

WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point GPS101_WGS84	Northing 588639.079sft	Point GPS101_Local
Latitude 35°17'45.85608"N	Easting 760234.922sft	Northing 588639.084sft
Longitude 83°09'22.27735"W	Elevation 2156.984sft	Easting 760234.921sft
Height 2063.198sft	Horz error 0.005sft	Elevation 2157.001sft
	Vert error 0.017sft	Utilized Horz and Vert
	3D error 0.017sft	Quality Survey quality
Point GPS102_WGS84	Northing 588666.979sft	Point GPS102_Local
Latitude 35°17'46.35099"N	Easting 760764.705sft	Northing 588666.984sft
Longitude 83°09'15.90656"W	Elevation 2170.092sft	Easting 760764.701sft
Height 2076.302sft	Horz error 0.007sft	Elevation 2170.101sft
	Vert error 0.009sft	Utilized Horz and Vert
	3D error 0.011sft	Quality Survey quality
Point GPS103_WGS84	Northing 589588.091sft	Point GPS103_Local
Latitude 35°17'56.46514"N	Easting 763215.467sft	Northing 589588.092sft
Longitude 83°08'46.83416"W	Elevation 2142.543sft	Easting 763215.466sft
Height 2048.746sft	Horz error 0.001sft	Elevation 2142.552sft
	Vert error 0.009sft	Utilized Horz and Vert
	3D error 0.009sft	Quality Survey quality
Point GPS104_WGS84	Northing 589097.754sft	Point GPS104_Local
Latitude 35°17'51.68298"N	Easting 763367.259sft	Northing 589097.756sft
Longitude 83°08'44.75776"W	Elevation 2128.936sft	Easting 763367.258sft
Height 2035.130sft	Horz error 0.002sft	Elevation 2128.959sft
	Vert error 0.023sft	Utilized Horz and Vert
	3D error 0.023sft	Quality Survey quality
Point GPS105_WGS84	Northing 585568.221sft	Point GPS105_Local
Latitude 35°17'17.03765"N	Easting 763921.445sft	Northing 585568.223sft
Longitude 83°08'36.30210"W	Elevation 2135.943sft	Easting 763921.444sft
Height 2042.089sft	Horz error 0.002sft	Elevation 2135.921sft
	Vert error 0.022sft	Utilized Horz and Vert
	3D error 0.022sft	Quality Survey quality
Point GPS106_WGS84	Northing 585058.673sft	Point GPS106_Local
Latitude 35°17'12.20054"N	Easting 764400.335sft	Northing 585058.671sft
Longitude 83°08'30.27479"W	Elevation 2140.646sft	Easting 764400.334sft
Height 2046.781sft	Horz error 0.002sft	Elevation 2140.610sft
	Vert error 0.036sft	Utilized Horz and Vert
	3D error 0.036sft	Quality Survey quality
Point GPS107_WGS84	Northing 584523.602sft	Point GPS107_Local
Latitude 35°17'08.13002"N	Easting 767352.754sft	Northing 584523.603sft

Longitude	Elevation	Point
83°07'54.42791"W	2155.921sft	Point GPS108_Local
Height 2062.014sft	Horz error 0.002sft	Northing 584298.106sft
	Vert error 0.072sft	Easting 767738.112sft
	3D error 0.072sft	Utilized Horz and Vert
	Quality	Quality Survey quality
Point GPS108_WGS84	Northing 584298.106sft	Point GPS108_Local
Latitude 35°17'06.06050"N	Easting 767738.112sft	Northing 584298.104sft
Longitude 83°07'49.67105"W	Elevation 2170.157sft	Easting 767738.111sft
Height 2076.243sft	Horz error 0.002sft	Elevation 2170.081sft
	Vert error 0.076sft	Utilized Horz and Vert
	3D error 0.076sft	Quality Survey quality
Point GPS109_WGS84	Northing 581208.691sft	Point GPS109_Local
Latitude 35°16'36.16498"N	Easting 769271.110sft	Northing 581208.692sft
Longitude 83°07'29.65006"W	Elevation 2170.280sft	Easting 769271.111sft
Height 2076.298sft	Horz error 0.002sft	Elevation 2170.229sft
	Vert error 0.051sft	Utilized Horz and Vert
	3D error 0.051sft	Quality Survey quality
Point GPS110_WGS84	Northing 580677.144sft	Point GPS110_Local
Latitude 35°16'30.94762"N	Easting 769355.636sft	Northing 580677.143sft
Longitude 83°07'28.36533"W	Elevation 2176.384sft	Easting 769355.638sft
Height 2082.394sft	Horz error 0.002sft	Elevation 2176.351sft
	Vert error 0.033sft	Utilized Horz and Vert
	3D error 0.033sft	Quality Survey quality
Point GPS111_WGS84	Northing 577195.985sft	Point GPS111_Local
Latitude 35°15'56.67934"N	Easting 769667.963sft	Northing 577195.984sft
Longitude 83°07'22.85904"W	Elevation 2151.075sft	Easting 769667.965sft
Height 2057.033sft	Horz error 0.002sft	Elevation 2151.131sft
	Vert error 0.056sft	Utilized Horz and Vert
	3D error 0.056sft	Quality Survey quality
Point GPS112_WGS84	Northing 576712.813sft	Point GPS112_Local
Latitude 35°15'51.74887"N	Easting 769287.255sft	Northing 576712.809sft
Longitude 83°07'27.20365"W	Elevation 2150.960sft	Easting 769287.256sft
Height 2056.918sft	Horz error 0.004sft	Elevation 2151.030sft
	Vert error 0.070sft	Utilized Horz and Vert
	3D error 0.070sft	Quality Survey quality
Point FRKN_WGS84	Northing 553807.381sft	Point FRKN_Local
Latitude 35°11'30.68647"N	Easting 687370.067sft	Northing 553807.380sft
Longitude 83°23'41.74738"W	Elevation 2130.112sft	Easting 687370.079sft
Height 2037.056sft	Horz error 0.012sft	Elevation 2130.147sft
	Vert error 0.035sft	Utilized Horz and Vert
	3D error 0.037sft	Quality Survey quality
Point HEADY_WGS84	Northing 496058.707sft	Point HEADY_Local
Latitude 35°02'40.79719"N	Easting 783994.889sft	Northing 496058.699sft
Longitude 83°03'50.21033"W	Elevation 3423.854sft	Easting 783994.888sft
Height 3326.998sft	Horz error 0.008sft	Elevation 3423.878sft
	Vert error 0.024sft	Utilized Horz and Vert
	3D error 0.025sft	Quality Survey quality
Point HAYW_WGS84	Northing 669651.235sft	Point HAYW_Local
Latitude 35°31'35.39675"N	Easting 832480.624sft	Northing 669651.233sft
Longitude 82°55'30.12800"W	Elevation 2749.955sft	Easting 832480.625sft
Height 2655.244sft	Horz error 0.003sft	Elevation 2749.995sft
	Vert error 0.040sft	Utilized Horz and Vert
	3D error 0.041sft	Quality Survey quality
Point NCSY_WGS84	Northing 608118.485sft	Point NCSY_Local
Latitude 35°20'52.40718"N	Easting 746032.710sft	Northing 608118.488sft
Longitude 83°12'23.39008"W	Elevation 2210.127sft	Easting 746032.704sft

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R4753 GPS108"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 584298.1040(±) EASTING: 767738.1110(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977445

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R4753 GPS108" TO -L- STATION 15+50.00 IS N 49°21'09.2" W 8,420.43'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM IS BASED ON NGS BENCHMARK N508 (ELEV 2144.97 FT.) (NAVD 88)

GEOID MODEL - GEOID03
NOTE: DRAWING NOT TO SCALE

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:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
R4753_JS_GSPCALIBRHTML
R4753_JS_WGS84.TXT
R4753_JS_LOCAL.TXT
R4753_JS_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 HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.