

# GPS Calibration Report

*Project : r2250z*

<b>TIP Number</b>	R-2250	<b>Date &amp; Time</b>	2:58:19 PM 3/20/2007
<b>User name</b>	rstalls	<b>Zone</b>	North Carolina 3200
<b>Coordinate System</b>	US State Plane 1983(at ground)	<b>Geoid Model</b>	Geoid03 (Conus) NC Sub Grid
<b>Horizontal Datum</b>	NAD 1983 (Conus)		
<b>Vertical Datum</b>	NAVD88		
<b>Coordinate Units</b>	US survey feet		
<b>Distance Units</b>	US survey feet		
<b>Height Units</b>	US survey feet		

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## LOCAL SITE INFORMATION

Localized around	R2250-9
Latitude	35°31'40.40985"N
Longitude	77°27'31.97093"W
Site Scale Factor	1.0001129100
Height	-42.137sft

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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.

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## Datum Transformation Parameters

Datum Transformation computation not requested

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## Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

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## Horizontal Adjustment Parameters

<b>Northing coordinate of rotation center</b>	653399.238sft
<b>Easting coordinate of rotation center</b>	2461326.611sft
<b>Rotation about the center point</b>	0°00'00"
<b>Translation north</b>	0.005sft
<b>Translation east</b>	0.032sft
<b>Scale factor</b>	1.00000005

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## Vertical Adjustment Parameters

<b>Northing coordinate of origin point</b>	620763.937sft
<b>Easting coordinate of origin point</b>	2467298.309sft
<b>Vertical separation at origin</b>	0.040sft
<b>Slope north</b>	-0.103ppm
<b>Slope east</b>	0.167ppm

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## Geoid Model Definition

Geoid03 (Conus) NC Sub Grid

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## Residual Differences Between GPS (WGS84) And Local Coordinates

### Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.005sft	0.001	R2250-1_GPS
Vertical	0.002sft	0.000	R2250-16_GPS
Three-dimensional	0.005sft	0.001	R2250-1_GPS

### Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
<b>Point</b>	R2250-1_GPS	<b>Northing</b>	620763.937sft	<b>Point R2250-1</b>	
<b>Latitude</b>	35°26'43.87377"N	<b>Easting</b>	2467298.309sft	<b>Northing</b>	620763.939sft
<b>Longitude</b>	77°25'51.38994"W	<b>Elevation</b>	63.989sft	<b>Easting</b>	2467298.313sft
<b>Height</b>	-54.449sft	<b>Horz error</b>	<b>0.005sft</b>	<b>Elevation</b>	63.989sft
		<b>Vert error</b>	<b>0.000sft</b>	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	<b>0.005sft</b>	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-2_GPS	<b>Northing</b>	622233.447sft	<b>Point R2250-2</b>	
<b>Latitude</b>	35°26'58.34383"N	<b>Easting</b>	2467692.733sft	<b>Northing</b>	622233.449sft
<b>Longitude</b>	77°25'46.34258"W	<b>Elevation</b>	66.899sft	<b>Easting</b>	2467692.736sft
<b>Height</b>	-51.520sft	<b>Horz error</b>	0.003sft	<b>Elevation</b>	66.898sft
		<b>Vert error</b>	0.001sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.003sft	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-3_GPS	<b>Northing</b>	628501.652sft	<b>Point R2250-3</b>	
<b>Latitude</b>	35°28'00.93965"N	<b>Easting</b>	2463773.547sft	<b>Northing</b>	628501.652sft
<b>Longitude</b>	77°26'32.51754"W	<b>Elevation</b>	63.860sft	<b>Easting</b>	2463773.547sft
<b>Height</b>	-54.342sft	<b>Horz error</b>	0.000sft	<b>Elevation</b>	63.861sft
		<b>Vert error</b>	0.000sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.001sft	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-4_GPS	<b>Northing</b>	628528.859sft	<b>Point R2250-4</b>	
<b>Latitude</b>	35°28'01.00934"N	<b>Easting</b>	2465056.563sft	<b>Northing</b>	628528.860sft
<b>Longitude</b>	77°26'17.00372"W	<b>Elevation</b>	64.844sft	<b>Easting</b>	2465056.563sft
<b>Height</b>	-53.388sft	<b>Horz error</b>	0.001sft	<b>Elevation</b>	64.844sft
		<b>Vert error</b>	0.000sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.001sft	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-5_GPS	<b>Northing</b>	631944.371sft	<b>Point R2250-5</b>	
<b>Latitude</b>	35°28'35.17544"N	<b>Easting</b>	2462538.440sft	<b>Northing</b>	631944.371sft
<b>Longitude</b>	77°26'46.79576"W	<b>Elevation</b>	63.382sft	<b>Easting</b>	2462538.438sft
<b>Height</b>	-54.728sft	<b>Horz error</b>	0.002sft	<b>Elevation</b>	63.382sft
		<b>Vert error</b>	0.000sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.002sft	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-6_GPS	<b>Northing</b>	631877.919sft	<b>Point R2250-6</b>	
<b>Latitude</b>	35°28'34.29637"N	<b>Easting</b>	2463970.199sft	<b>Northing</b>	631877.919sft
<b>Longitude</b>	77°26'29.49973"W	<b>Elevation</b>	65.503sft	<b>Easting</b>	2463970.196sft
<b>Height</b>	-52.641sft	<b>Horz error</b>	0.004sft	<b>Elevation</b>	65.503sft
		<b>Vert error</b>	0.000sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.004sft	<b>Quality</b>	Adjusted quality
<b>Point</b>	R2250-7_GPS	<b>Northing</b>	643911.669sft	<b>Point R2250-7</b>	
<b>Latitude</b>	35°30'34.06846"N	<b>Easting</b>	2458964.128sft	<b>Northing</b>	643911.668sft
<b>Longitude</b>	77°27'27.75815"W	<b>Elevation</b>	66.020sft	<b>Easting</b>	2458964.125sft
<b>Height</b>	-51.798sft	<b>Horz error</b>	0.004sft	<b>Elevation</b>	66.021sft

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<b>Vert error</b>	0.001sft
<b>3D error</b>	0.004sft

<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-8_GPS
<b>Latitude</b>	35°30'30.82714"N
<b>Longitude</b>	77°27'13.15556"W
<b>Height</b>	-50.202sft

<b>Northing</b>	643602.750sft
<b>Easting</b>	2460176.363sft
<b>Elevation</b>	67.647sft
<b>Horz error</b>	0.003sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.003sft

<b>Point</b>	R2250-8
<b>Northing</b>	643602.749sft
<b>Easting</b>	2460176.360sft
<b>Elevation</b>	67.648sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-9_GPS
<b>Latitude</b>	35°31'40.40981"N
<b>Longitude</b>	77°27'31.97128"W
<b>Height</b>	-42.172sft

<b>Northing</b>	650613.437sft
<b>Easting</b>	2458511.715sft
<b>Elevation</b>	75.529sft
<b>Horz error</b>	0.002sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.002sft

<b>Point</b>	R2250-9
<b>Northing</b>	650613.436sft
<b>Easting</b>	2458511.713sft
<b>Elevation</b>	75.529sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-10_GPS
<b>Latitude</b>	35°31'43.12495"N
<b>Longitude</b>	77°27'14.79222"W
<b>Height</b>	-46.967sft

<b>Northing</b>	650910.018sft
<b>Easting</b>	2459927.234sft
<b>Elevation</b>	70.757sft
<b>Horz error</b>	0.002sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.002sft

<b>Point</b>	R2250-10
<b>Northing</b>	650910.017sft
<b>Easting</b>	2459927.232sft
<b>Elevation</b>	70.758sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-11_GPS
<b>Latitude</b>	35°32'49.75690"N
<b>Longitude</b>	77°27'58.69287"W
<b>Height</b>	-42.095sft

<b>Northing</b>	657590.334sft
<b>Easting</b>	2456194.934sft
<b>Elevation</b>	75.461sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.001sft

<b>Point</b>	R2250-11
<b>Northing</b>	657590.333sft
<b>Easting</b>	2456194.934sft
<b>Elevation</b>	75.460sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-12_GPS
<b>Latitude</b>	35°32'45.87740"N
<b>Longitude</b>	77°27'44.19017"W
<b>Height</b>	-42.546sft

<b>Northing</b>	657216.648sft
<b>Easting</b>	2457399.328sft
<b>Elevation</b>	75.037sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.001sft

<b>Point</b>	R2250-12
<b>Northing</b>	657216.648sft
<b>Easting</b>	2457399.327sft
<b>Elevation</b>	75.037sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-13_GPS
<b>Latitude</b>	35°33'26.75678"N
<b>Longitude</b>	77°28'09.93596"W
<b>Height</b>	-42.207sft

<b>Northing</b>	661316.758sft
<b>Easting</b>	2455208.269sft
<b>Elevation</b>	75.279sft
<b>Horz error</b>	0.004sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.004sft

<b>Point</b>	R2250-13
<b>Northing</b>	661316.756sft
<b>Easting</b>	2455208.273sft
<b>Elevation</b>	75.278sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-14_GPS
<b>Latitude</b>	35°33'34.64237"N
<b>Longitude</b>	77°27'55.40115"W
<b>Height</b>	-39.381sft

<b>Northing</b>	662132.548sft
<b>Easting</b>	2456396.763sft
<b>Elevation</b>	78.115sft
<b>Horz error</b>	0.002sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.002sft

<b>Point</b>	R2250-14
<b>Northing</b>	662132.547sft
<b>Easting</b>	2456396.764sft
<b>Elevation</b>	78.115sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-15_GPS
<b>Latitude</b>	35°34'12.40751"N
<b>Longitude</b>	77°26'49.38231"W
<b>Height</b>	-39.258sft

<b>Northing</b>	666035.503sft
<b>Easting</b>	2461791.137sft
<b>Elevation</b>	78.280sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.002sft
<b>3D error</b>	0.002sft

<b>Point</b>	R2250-15
<b>Northing</b>	666035.503sft
<b>Easting</b>	2461791.138sft
<b>Elevation</b>	78.278sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-16_GPS
<b>Latitude</b>	35°34'18.08127"N
<b>Longitude</b>	77°26'38.08441"W
<b>Height</b>	-38.103sft

<b>Northing</b>	666623.747sft
<b>Easting</b>	2462715.392sft
<b>Elevation</b>	79.442sft
<b>Horz error</b>	<b>0.001sft</b>
<b>Vert error</b>	<b>0.002sft</b>
<b>3D error</b>	<b>0.003sft</b>

<b>Point R2250-16</b>	
<b>Northing</b>	666623.749sft
<b>Easting</b>	2462715.392sft
<b>Elevation</b>	79.440sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-17_GPS
<b>Latitude</b>	35°34'40.28156"N
<b>Longitude</b>	77°27'25.45588"W
<b>Height</b>	-37.447sft

<b>Northing</b>	668807.169sft
<b>Easting</b>	2458767.524sft
<b>Elevation</b>	80.002sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.001sft

<b>Point R2250-17</b>	
<b>Northing</b>	668807.169sft
<b>Easting</b>	2458767.525sft
<b>Elevation</b>	80.002sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-18_GPS
<b>Latitude</b>	35°34'41.74110"N
<b>Longitude</b>	77°27'13.80707"W
<b>Height</b>	-36.704sft

<b>Northing</b>	668969.703sft
<b>Easting</b>	2459727.368sft
<b>Elevation</b>	80.760sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.001sft

<b>Point R2250-18</b>	
<b>Northing</b>	668969.703sft
<b>Easting</b>	2459727.369sft
<b>Elevation</b>	80.759sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-19_GPS
<b>Latitude</b>	35°35'59.76318"N
<b>Longitude</b>	77°26'54.82427"W
<b>Height</b>	-34.857sft

<b>Northing</b>	676882.408sft
<b>Easting</b>	2461171.971sft
<b>Elevation</b>	82.530sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.001sft

<b>Point R2250-19</b>	
<b>Northing</b>	676882.408sft
<b>Easting</b>	2461171.971sft
<b>Elevation</b>	82.531sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-20_GPS
<b>Latitude</b>	35°35'59.72065"N
<b>Longitude</b>	77°26'42.27816"W
<b>Height</b>	-34.892sft

<b>Northing</b>	676894.318sft
<b>Easting</b>	2462208.011sft
<b>Elevation</b>	82.511sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.001sft

<b>Point R2250-20</b>	
<b>Northing</b>	676894.318sft
<b>Easting</b>	2462208.011sft
<b>Elevation</b>	82.511sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-21_GPS
<b>Latitude</b>	35°36'26.04565"N
<b>Longitude</b>	77°26'17.34259"W
<b>Height</b>	-4.468sft

<b>Northing</b>	679588.177sft
<b>Easting</b>	2464225.143sft
<b>Elevation</b>	112.933sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.002sft
<b>3D error</b>	0.002sft

<b>Point R2250-21</b>	
<b>Northing</b>	679588.178sft
<b>Easting</b>	2464225.144sft
<b>Elevation</b>	112.935sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2250-22_GPS
<b>Latitude</b>	35°36'28.32169"N
<b>Longitude</b>	77°26'02.20835"W
<b>Height</b>	-30.599sft

<b>Northing</b>	679837.978sft
<b>Easting</b>	2465471.081sft
<b>Elevation</b>	86.820sft
<b>Horz error</b>	0.001sft
<b>Vert error</b>	0.000sft
<b>3D error</b>	0.001sft

<b>Point R2250-22</b>	
<b>Northing</b>	679837.980sft
<b>Easting</b>	2465471.081sft
<b>Elevation</b>	86.819sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality