

# GPS Calibration Report

Project : r2633ab\_z

<b>TIP Number</b>	r2633 AB	<b>Date &amp; Time</b>	2:04:32 PM 3/27/2006
<b>User name</b>	jneal	<b>Zone</b>	North Carolina 3200(3)
<b>Coordinate System</b>	Site(at ground)	<b>Geoid Model</b>	GEOID03 (Conus)(2)
<b>Horizontal Datum</b>	NAD 1983 (Conus)		
<b>Vertical Datum</b>	NAVD 88		
<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	PHOENIX 2
Latitude	34°17'07.13697"N
Longitude	78°04'45.45174"W
Site Scale Factor	0.9999721010
Height	-51.790sft

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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

Northing coordinate of rotation center	182836.287sft
Easting coordinate of rotation center	2288166.692sft
Rotation about the center point	0°00'00"
Translation north	0.002sft
Translation east	-0.005sft
Scale factor	1.00000010

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## Vertical Adjustment Parameters

Northing coordinate of origin point	155960.007sft
Easting coordinate of origin point	2276068.189sft
Vertical separation at origin	0.143sft
Slope north	-2.970ppm
Slope east	1.302ppm

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# Geoid Model Definition

GEOID03 (Conus)(2)

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

Summary			
	Maximum error	Root Mean Square error	Point
Horizontal	0.001sft	0.000	Crossover_GPS
Vertical	0.099sft	0.013	R2633AB-6_GPS
Three-dimensional	0.099sft	0.013	R2633AB-6_GPS

### Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
Point	r2633ab-3_GPS	Northing	155960.007sft	Point	r2633ab-3
Latitude	34°10'30.06193"N	Easting	2276068.189sft	Northing	155960.007sft
Longitude	78°05'14.41103"W	Elevation	21.233sft	Easting	2276068.190sft
Height	-98.598sft	Horz error	0.000sft	Elevation	21.199sft
		Vert error	0.034sft	Utilized	Horz and Vert
		3D error	0.034sft	Quality	Adjusted quality
Point	r2633ab-2_GPS	Northing	157482.842sft	Point	r2633ab-2
Latitude	34°10'45.05824"N	Easting	2276800.926sft	Northing	157482.842sft
Longitude	78°05'05.52363"W	Elevation	25.248sft	Easting	2276800.927sft
Height	-94.556sft	Horz error	0.000sft	Elevation	25.161sft
		Vert error	0.088sft	Utilized	Horz and Vert
		3D error	0.088sft	Quality	Adjusted quality
Point	r2633ab-4_GPS	Northing	163101.269sft	Point	r2633ab-4
Latitude	34°11'40.19955"N	Easting	2281510.100sft	Northing	163101.269sft
Longitude	78°04'08.84982"W	Elevation	19.484sft	Easting	2281510.101sft
Height	-100.279sft	Horz error	0.000sft	Elevation	19.540sft
		Vert error	0.056sft	Utilized	Horz and Vert
		3D error	0.056sft	Quality	Adjusted quality
Point	r2633ab-5_GPS	Northing	163905.843sft	Point	r2633ab-5
Latitude	34°11'48.03700"N	Easting	2282811.187sft	Northing	163905.842sft
Longitude	78°03'53.27169"W	Elevation	37.147sft	Easting	2282811.188sft
Height	-82.630sft	Horz error	0.000sft	Elevation	37.117sft
		Vert error	0.030sft	Utilized	Horz and Vert
		3D error	0.030sft	Quality	Adjusted quality
Point	R2633AB-6_GPS	Northing	163460.218sft	Point	R2633AB-6
Latitude	34°11'43.86771"N	Easting	2280239.165sft	Northing	163460.218sft
Longitude	78°04'23.93893"W	Elevation	24.964sft	Easting	2280239.165sft
Height	-94.749sft	Horz error	0.000sft	Elevation	25.063sft
		Vert error	0.099sft	Utilized	Horz and Vert
		3D error	0.099sft	Quality	Adjusted quality
Point	r2633ab-7_GPS	Northing	174900.776sft	Point	r2633ab-7
Latitude	34°13'37.13239"N	Easting	2279148.653sft	Northing	174900.776sft

<b>Longitude</b>	78°04'35.65348"W
<b>Height</b>	-60.399sft

<b>Elevation</b>	58.911sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.074sft
<b>3D error</b>	0.074sft

<b>Easting</b>	2279148.653sft
<b>Elevation</b>	58.985sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2633AB-8_GPS
<b>Latitude</b>	34°13'49.27985"N
<b>Longitude</b>	78°04'36.96772"W
<b>Height</b>	-57.664sft

<b>Northing</b>	176127.712sft
<b>Easting</b>	2279026.882sft
<b>Elevation</b>	61.601sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.015sft
<b>3D error</b>	0.015sft

<b>Point</b>	R2633AB-8
<b>Northing</b>	176127.711sft
<b>Easting</b>	2279026.882sft
<b>Elevation</b>	61.586sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	R2633AB-9_GPS
<b>Latitude</b>	34°15'37.79538"N
<b>Longitude</b>	78°05'10.27516"W
<b>Height</b>	-53.064sft

<b>Northing</b>	187071.436sft
<b>Easting</b>	2276129.314sft
<b>Elevation</b>	65.763sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.025sft
<b>3D error</b>	0.025sft

<b>Point</b>	R2633AB-9
<b>Northing</b>	187071.436sft
<b>Easting</b>	2276129.314sft
<b>Elevation</b>	65.788sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	Culvert_GPS
<b>Latitude</b>	34°15'32.42311"N
<b>Longitude</b>	78°04'57.50205"W
<b>Height</b>	-54.435sft

<b>Northing</b>	186538.254sft
<b>Easting</b>	2277206.408sft
<b>Elevation</b>	64.441sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.049sft
<b>3D error</b>	0.049sft

<b>Point</b>	Culvert
<b>Northing</b>	186538.254sft
<b>Easting</b>	2277206.408sft
<b>Elevation</b>	64.490sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	Crossover_GPS
<b>Latitude</b>	34°15'55.81045"N
<b>Longitude</b>	78°05'52.19916"W
<b>Height</b>	-54.717sft

<b>Northing</b>	188860.353sft
<b>Easting</b>	2272593.989sft
<b>Elevation</b>	63.955sft
<b>Horz error</b>	<b>0.001sft</b>
<b>Vert error</b>	<b>0.091sft</b>
<b>3D error</b>	<b>0.091sft</b>

<b>Point</b>	Crossover
<b>Northing</b>	188860.354sft
<b>Easting</b>	2272593.990sft
<b>Elevation</b>	63.865sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	GUARD_GPS
<b>Latitude</b>	34°15'25.90542"N
<b>Longitude</b>	78°03'26.44768"W
<b>Height</b>	-54.114sft

<b>Northing</b>	185950.999sft
<b>Easting</b>	2284855.183sft
<b>Elevation</b>	65.014sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	?
<b>3D error</b>	0.000sft

<b>Point</b>	GUARD
<b>Northing</b>	185950.999sft
<b>Easting</b>	2284855.183sft
<b>Elevation</b>	65.239sft
<b>Utilized</b>	Horizontal
<b>Quality</b>	Adjusted quality

<b>Point</b>	PHOENIX2_GPS
<b>Latitude</b>	34°17'07.13693"N
<b>Longitude</b>	78°04'45.45168"W
<b>Height</b>	-51.829sft

<b>Northing</b>	196121.992sft
<b>Easting</b>	2278129.037sft
<b>Elevation</b>	66.792sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.012sft
<b>3D error</b>	0.012sft

<b>Point</b>	PHOENIX2
<b>Northing</b>	196121.992sft
<b>Easting</b>	2278129.037sft
<b>Elevation</b>	66.805sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-10_GPS
<b>Latitude</b>	34°16'31.31185"N
<b>Longitude</b>	78°02'51.91211"W
<b>Height</b>	-84.996sft

<b>Northing</b>	192590.417sft
<b>Easting</b>	2287690.511sft
<b>Elevation</b>	34.020sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.001sft
<b>3D error</b>	0.001sft

<b>Point</b>	r2633ab-10
<b>Northing</b>	192590.417sft
<b>Easting</b>	2287690.511sft
<b>Elevation</b>	34.021sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-11_GPS
<b>Latitude</b>	34°16'43.95360"N

<b>Northing</b>	193867.094sft
<b>Easting</b>	2287548.981sft

<b>Point</b>	r2633ab-11
<b>Northing</b>	193867.094sft

<b>Longitude</b>	78°02'53.45265"W
<b>Height</b>	-84.502sft

<b>Elevation</b>	34.472sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.002sft
<b>3D error</b>	0.002sft

<b>Easting</b>	2287548.981sft
<b>Elevation</b>	34.474sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-12_GPS
<b>Latitude</b>	34°16'44.15896"N
<b>Longitude</b>	78°01'15.60457"W
<b>Height</b>	-99.959sft

<b>Northing</b>	193967.705sft
<b>Easting</b>	2295759.507sft
<b>Elevation</b>	19.283sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.004sft
<b>3D error</b>	0.004sft

<b>Point</b>	r2633ab-12
<b>Northing</b>	193967.705sft
<b>Easting</b>	2295759.507sft
<b>Elevation</b>	19.279sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-13_GPS
<b>Latitude</b>	34°16'33.95558"N
<b>Longitude</b>	78°01'09.37399"W
<b>Height</b>	-98.107sft

<b>Northing</b>	192941.439sft
<b>Easting</b>	2296292.523sft
<b>Elevation</b>	21.184sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.006sft
<b>3D error</b>	0.006sft

<b>Point</b>	r2633ab-13
<b>Northing</b>	192941.439sft
<b>Easting</b>	2296292.523sft
<b>Elevation</b>	21.178sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-17_GPS
<b>Latitude</b>	34°16'23.05570"N
<b>Longitude</b>	78°00'35.43273"W
<b>Height</b>	-101.746sft

<b>Northing</b>	191867.882sft
<b>Easting</b>	2299151.719sft
<b>Elevation</b>	17.681sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.009sft
<b>3D error</b>	0.009sft

<b>Point</b>	r2633ab-17
<b>Northing</b>	191867.882sft
<b>Easting</b>	2299151.719sft
<b>Elevation</b>	17.672sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-18_GPS
<b>Latitude</b>	34°16'23.17837"N
<b>Longitude</b>	78°00'23.32406"W
<b>Height</b>	-102.285sft

<b>Northing</b>	191890.435sft
<b>Easting</b>	2300167.740sft
<b>Elevation</b>	17.177sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.010sft
<b>3D error</b>	0.010sft

<b>Point</b>	r2633ab-18
<b>Northing</b>	191890.434sft
<b>Easting</b>	2300167.740sft
<b>Elevation</b>	17.167sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-14_GPS
<b>Latitude</b>	34°16'40.27850"N
<b>Longitude</b>	77°58'46.22883"W
<b>Height</b>	-109.282sft

<b>Northing</b>	193701.682sft
<b>Easting</b>	2308298.063sft
<b>Elevation</b>	10.417sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.014sft
<b>3D error</b>	0.014sft

<b>Point</b>	r2633ab-14
<b>Northing</b>	193701.682sft
<b>Easting</b>	2308298.063sft
<b>Elevation</b>	10.403sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-15_GPS
<b>Latitude</b>	34°16'30.35823"N
<b>Longitude</b>	77°58'39.09494"W
<b>Height</b>	-107.854sft

<b>Northing</b>	192705.039sft
<b>Easting</b>	2308907.023sft
<b>Elevation</b>	11.900sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.015sft
<b>3D error</b>	0.015sft

<b>Point</b>	r2633ab-15
<b>Northing</b>	192705.039sft
<b>Easting</b>	2308907.023sft
<b>Elevation</b>	11.885sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633ab-16_GPS
<b>Latitude</b>	34°17'04.26301"N
<b>Longitude</b>	77°57'53.82936"W
<b>Height</b>	-87.494sft

<b>Northing</b>	196171.708sft
<b>Easting</b>	2312669.810sft
<b>Elevation</b>	32.293sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	?
<b>3D error</b>	0.000sft

<b>Point</b>	r2633ab-16
<b>Northing</b>	196171.708sft
<b>Easting</b>	2312669.810sft
<b>Elevation</b>	32.106sft
<b>Utilized</b>	Horizontal
<b>Quality</b>	Adjusted quality

<b>Point</b>	r2633c-79_GPS
<b>Latitude</b>	34°17'14.91148"N

<b>Northing</b>	197241.003sft
<b>Easting</b>	2311975.296sft

<b>Point</b>	r2633c-79
<b>Northing</b>	197241.004sft

<b>Longitude</b>	77°58'01.97309"W
<b>Height</b>	-95.844sft

<b>Elevation</b>	23.884sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.013sft
<b>3D error</b>	0.013sft

<b>Easting</b>	2311975.296sft
<b>Elevation</b>	23.898sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality

<b>Point</b>	Lanvale_GPS
<b>Latitude</b>	34°12'37.26313"N
<b>Longitude</b>	78°05'27.46559"W
<b>Height</b>	-50.203sft

<b>Northing</b>	168808.541sft
<b>Easting</b>	2274853.604sft
<b>Elevation</b>	69.182sft
<b>Horz error</b>	0.000sft
<b>Vert error</b>	0.017sft
<b>3D error</b>	0.017sft

<b>Point</b>	Lanvale
<b>Northing</b>	168808.542sft
<b>Easting</b>	2274853.604sft
<b>Elevation</b>	69.164sft
<b>Utilized</b>	Horz and Vert
<b>Quality</b>	Adjusted quality