

# GPS Calibration Report

*Project : R-3612*

<b>TIP Number</b>	R-3612	<b>Date &amp; Time</b>	8:52:48 AM 9/10/2013
<b>User name</b>	gdcarver	<b>Zone</b>	North Carolina 3200
<b>Coordinate System</b>	US State Plane 1983(at ground)	<b>Geoid Model</b>	G12NC
<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	CONE1
Latitude	35°16'19.35225"N
Longitude	81°47'46.26040"W
Site Scale Factor	1.0001273662
Height	717.890sft

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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	566786.052sft
Easting coordinate of rotation center	1165463.399sft
Rotation about the center point	-0°00'01"
Translation north	0.053sft
Translation east	0.002sft
Scale factor	1.00000175

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## Vertical Adjustment Parameters

Northing coordinate of origin point	564040.799sft
Easting coordinate of origin point	1166482.642sft
Vertical separation at origin	0.369sft
Slope north	-3.024ppm
Slope east	-6.240ppm

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## Geoid Model Definition

G12NC

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

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.059sft	0.011	CONE1_GNSS
Vertical	0.055sft	0.010	18_GNSS
Three-dimensional	0.079sft	0.015	CONE1_GNSS

### Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
<b>Point</b>	1_GNSS	<b>Northing</b>	564040.799sft	<b>Point 1</b>	
<b>Latitude</b>	35°16'03.31727"N	<b>Easting</b>	1166482.642sft	<b>Northing</b>	564040.835sft
<b>Longitude</b>	81°47'34.30504"W	<b>Elevation</b>	815.658sft	<b>Easting</b>	1166482.646sft
<b>Height</b>	710.547sft	<b>Horz error</b>	0.036sft	<b>Elevation</b>	815.639sft
		<b>Vert error</b>	0.019sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.041sft	<b>Quality</b>	Survey quality
<b>Point</b>	2_GNSS	<b>Northing</b>	564551.598sft	<b>Point 2</b>	
<b>Latitude</b>	35°16'08.26303"N	<b>Easting</b>	1166108.196sft	<b>Northing</b>	564551.611sft
<b>Longitude</b>	81°47'38.99216"W	<b>Elevation</b>	788.971sft	<b>Easting</b>	1166108.204sft
<b>Height</b>	683.857sft	<b>Horz error</b>	0.015sft	<b>Elevation</b>	788.979sft
		<b>Vert error</b>	0.008sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.017sft	<b>Quality</b>	Survey quality
<b>Point</b>	3_GNSS	<b>Northing</b>	565221.198sft	<b>Point 3</b>	
<b>Latitude</b>	35°16'14.81121"N	<b>Easting</b>	1165850.544sft	<b>Northing</b>	565221.203sft
<b>Longitude</b>	81°47'42.32538"W	<b>Elevation</b>	792.103sft	<b>Easting</b>	1165850.548sft
<b>Height</b>	686.986sft	<b>Horz error</b>	0.007sft	<b>Elevation</b>	792.060sft
		<b>Vert error</b>	0.043sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.044sft	<b>Quality</b>	Survey quality
<b>Point</b>	16_GNSS	<b>Northing</b>	565163.195sft	<b>Point 16</b>	
<b>Latitude</b>	35°16'14.02471"N	<b>Easting</b>	1165085.492sft	<b>Northing</b>	565163.159sft
<b>Longitude</b>	81°47'51.52841"W	<b>Elevation</b>	785.064sft	<b>Easting</b>	1165085.480sft
<b>Height</b>	679.938sft	<b>Horz error</b>	0.037sft	<b>Elevation</b>	785.040sft
		<b>Vert error</b>	0.023sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.044sft	<b>Quality</b>	Survey quality
<b>Point</b>	18_GNSS	<b>Northing</b>	566033.862sft	<b>Point 18</b>	
<b>Latitude</b>	35°16'22.88661"N	<b>Easting</b>	1165998.282sft	<b>Northing</b>	566033.876sft
<b>Longitude</b>	81°47'40.82021"W	<b>Elevation</b>	833.875sft	<b>Easting</b>	1165998.287sft
<b>Height</b>	728.761sft	<b>Horz error</b>	<b>0.015sft</b>	<b>Elevation</b>	833.930sft
		<b>Vert error</b>	<b>0.055sft</b>	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	<b>0.057sft</b>	<b>Quality</b>	Survey quality
<b>Point</b>	22_GNSS	<b>Northing</b>	568348.923sft	<b>Point 22</b>	
<b>Latitude</b>	35°16'45.70152"N	<b>Easting</b>	1165737.685sft	<b>Northing</b>	568348.956sft
<b>Longitude</b>	81°47'44.74783"W	<b>Elevation</b>	798.342sft	<b>Easting</b>	1165737.702sft
<b>Height</b>	693.229sft	<b>Horz error</b>	0.037sft	<b>Elevation</b>	798.349sft
		<b>Vert error</b>	0.007sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.038sft	<b>Quality</b>	Survey quality
<b>Point</b>	25_GNSS	<b>Northing</b>	568728.633sft	<b>Point 25</b>	
<b>Latitude</b>	35°16'49.32275"N	<b>Easting</b>	1165261.201sft	<b>Northing</b>	568728.611sft
<b>Longitude</b>	81°47'50.62148"W	<b>Elevation</b>	832.283sft	<b>Easting</b>	1165261.233sft
<b>Height</b>	727.165sft	<b>Horz error</b>	0.038sft	<b>Elevation</b>	832.250sft
		<b>Vert error</b>	0.033sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.051sft	<b>Quality</b>	Survey quality
<b>Point</b>	24_GNSS	<b>Northing</b>	568561.841sft	<b>Point 24</b>	
<b>Latitude</b>	35°16'47.62628"N	<b>Easting</b>	1165090.663sft	<b>Northing</b>	568561.808sft
<b>Longitude</b>	81°47'52.62088"W	<b>Elevation</b>	819.143sft	<b>Easting</b>	1165090.691sft
<b>Height</b>	714.023sft	<b>Horz error</b>	0.043sft	<b>Elevation</b>	819.100sft
		<b>Vert error</b>	0.043sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.061sft	<b>Quality</b>	Survey quality

<b>Point</b>	GPS1_GNSS	<b>Northing</b>	569253.961sft	<b>Point</b> GPS1	
<b>Latitude</b>	35°16'54.27455"N	<b>Easting</b>	1164393.923sft	<b>Northing</b>	569253.952sft
<b>Longitude</b>	81°48'01.25645"W	<b>Elevation</b>	797.210sft	<b>Easting</b>	1164393.897sft
<b>Height</b>	692.084sft	<b>Horz error</b>	0.027sft	<b>Elevation</b>	797.212sft
		<b>Vert error</b>	0.002sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.027sft	<b>Quality</b>	Survey quality
<b>Point</b>	15_GNSS	<b>Northing</b>	569053.823sft	<b>Point</b> 15	
<b>Latitude</b>	35°16'52.33985"N	<b>Easting</b>	1164551.430sft	<b>Northing</b>	569053.857sft
<b>Longitude</b>	81°47'59.28938"W	<b>Elevation</b>	801.184sft	<b>Easting</b>	1164551.416sft
<b>Height</b>	696.060sft	<b>Horz error</b>	0.036sft	<b>Elevation</b>	801.221sft
		<b>Vert error</b>	0.037sft	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	0.052sft	<b>Quality</b>	Survey quality
<b>Point</b>	CONE1_GNSS	<b>Northing</b>	565689.327sft	<b>Point</b> CONE1	
<b>Latitude</b>	35°16'19.35210"N	<b>Easting</b>	1165537.349sft	<b>Northing</b>	565689.292sft
<b>Longitude</b>	81°47'46.25992"W	<b>Elevation</b>	822.587sft	<b>Easting</b>	1165537.301sft
<b>Height</b>	717.467sft	<b>Horz error</b>	<b>0.059sft</b>	<b>Elevation</b>	822.640sft
		<b>Vert error</b>	<b>0.053sft</b>	<b>Utilized</b>	Horz and Vert
		<b>3D error</b>	<b>0.079sft</b>	<b>Quality</b>	Survey quality