

GPS Calibration Report

Project : r2719a_ls_gpscalib_050411

| | | | |
|--------------------------|--------------------------------|------------------------|----------------------|
| TIP Number | R-2719A | Date & Time | 7:42:58 AM 4/12/2005 |
| User name | breigner | Zone | North Carolina 3200 |
| Coordinate System | US State Plane 1983(at ground) | Geoid Model | GEOID99 (Conus) |
| Horizontal Datum | NAD 1983 (Conus) | | |
| Vertical Datum | NGVD29 | | |
| Coordinate Units | US survey feet | | |
| Distance Units | US survey feet | | |
| Height Units | US survey feet | | |

LOCAL SITE INFORMATION

| | |
|-------------------|------------------|
| Localized around | R2719B-1 |
| Latitude | 35°18'35.84314"N |
| Longitude | 77°38'58.70182"W |
| Site Scale Factor | 1.0001254958 |
| Height | -9.854sft |

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 | 560182.137sft |
| Easting coordinate of rotation center | 2397074.194sft |
| Rotation about the center point | 0°00'01" |
| Translation north | 0.143sft |
| Translation east | -0.186sft |

Scale factor 1.00000000

Vertical Adjustment Parameters

Northing coordinate of origin point 574509.380sft
 Easting coordinate of origin point 2400053.914sft
 Vertical separation at origin 0.051sft
 Slope north -7.481ppm
 Slope east -0.754ppm

Geoid Model Definition

GEOID99 (Conus)

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

| | Maximum error | Root Mean Square error | Point |
|-------------------|---------------|------------------------|----------------------------------|
| Horizontal | 0.092sft | 0.014 | R2719AW-4 - WGS8 |
| Vertical | 0.064sft | 0.009 | TRANSIT - WGS84 |
| Three-dimensional | 0.099sft | 0.017 | R2719AW-4 - WGS8 |

Point Residuals

| WGS84 Coordinates | | Calculated point FOR DISPLAY ONLY | | Local Coordinates | |
|-------------------|----------------------------------|--------------------------------------|----------------|-------------------|----------------------------------|
| Point | R2719AW-1 - WGS8 | Northing | 574509.380sft | Point | R2719AW-1 - LOCA |
| Latitude | 35°19'16.11332"N | Easting | 2400053.914sft | Northing | 574509.413sft |
| Longitude | 77°39'31.65736"W | Elevation | 95.532sft | Easting | 2400053.925sft |
| Height | -22.060sft | Horz error | 0.035sft | Elevation | 95.506sft |
| | | Vert error | 0.026sft | Utilized | Horz and Vert |
| | | 3D error | 0.043sft | Quality | Survey quality |
| Point | R2719B-2 - WGS84 | Northing | 571090.836sft | Point | R2719B-2 - LOCAL |
| Latitude | 35°18'41.81550"N | Easting | 2403711.304sft | Northing | 571090.907sft |
| Longitude | 77°38'48.08875"W | Elevation | 104.638sft | Easting | 2403711.339sft |

| | |
|---------------|------------|
| Height | -13.117sft |
|---------------|------------|

| | |
|-------------------|----------|
| Horz error | 0.079sft |
| Vert error | 0.051sft |
| 3D error | 0.095sft |

| | |
|------------------|----------------|
| Elevation | 104.689sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719B-1 - WGS84 |
| Latitude | 35°18'35.84146"N |
| Longitude | 77°38'58.70043"W |
| Height | -9.967sft |

| | |
|-------------------|----------------|
| Northing | 570474.884sft |
| Easting | 2402840.125sft |
| Elevation | 107.786sft |
| Horz error | 0.056sft |
| Vert error | 0.033sft |
| 3D error | 0.065sft |

| | |
|------------------|----------------------------------|
| Point | R2719B-1 - LOCAL |
| Northing | 570474.926sft |
| Easting | 2402840.162sft |
| Elevation | 107.819sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719AW-6 - WGS8 |
| Latitude | 35°18'00.57688"N |
| Longitude | 77°38'41.22518"W |
| Height | 1.716sft |

| | |
|-------------------|----------------|
| Northing | 566929.352sft |
| Easting | 2404336.999sft |
| Elevation | 119.592sft |
| Horz error | 0.032sft |
| Vert error | 0.008sft |
| 3D error | 0.033sft |

| | |
|------------------|----------------------------------|
| Point | R2719AW-6 - LOCA |
| Northing | 566929.383sft |
| Easting | 2404337.010sft |
| Elevation | 119.584sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719A-15 - WGS8 |
| Latitude | 35°17'58.99263"N |
| Longitude | 77°39'34.39384"W |
| Height | -4.170sft |

| | |
|-------------------|----------------|
| Northing | 566709.362sft |
| Easting | 2399932.432sft |
| Elevation | 113.625sft |
| Horz error | 0.017sft |
| Vert error | 0.016sft |
| 3D error | 0.023sft |

| | |
|------------------|----------------------------------|
| Point | R2719A-15 - LOCA |
| Northing | 566709.378sft |
| Easting | 2399932.427sft |
| Elevation | 113.609sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719A-14 - WGS8 |
| Latitude | 35°17'49.15596"N |
| Longitude | 77°39'31.23853"W |
| Height | -4.498sft |

| | |
|-------------------|----------------|
| Northing | 565718.402sft |
| Easting | 2400207.388sft |
| Elevation | 113.328sft |
| Horz error | 0.015sft |
| Vert error | 0.014sft |
| 3D error | 0.021sft |

| | |
|------------------|----------------------------------|
| Point | R2719A-14 - LOCA |
| Northing | 565718.416sft |
| Easting | 2400207.383sft |
| Elevation | 113.314sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|---------------------------------|
| Point | CASWELL - WGS84 |
| Latitude | 35°16'59.48725"N |
| Longitude | 77°37'20.09309"W |
| Height | -9.429sft |

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|-------------------|----------------|
| Northing | 560845.749sft |
| Easting | 2411147.083sft |
| Elevation | 108.744sft |
| Horz error | 0.011sft |
| Vert error | 0.039sft |
| 3D error | 0.040sft |

| | |
|------------------|---------------------------------|
| Point | CASWELL - LOCAL |
| Northing | 560845.748sft |
| Easting | 2411147.093sft |
| Elevation | 108.783sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719A-12 - WGS8 |
| Latitude | 35°16'47.33777"N |
| Longitude | 77°39'55.56650"W |

| | |
|------------------|----------------|
| Northing | 559441.387sft |
| Easting | 2398274.961sft |
| Elevation | 64.514sft |

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|-----------------|----------------------------------|
| Point | R2719A-12 - LOCA |
| Northing | 559441.379sft |
| Easting | 2398274.962sft |

| | |
|---------------|------------|
| Height | -53.438sft |
| | |

| | |
|-------------------|----------|
| Horz error | 0.008sft |
| Vert error | 0.016sft |
| 3D error | 0.018sft |

| | |
|------------------|----------------|
| Elevation | 64.498sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719A-13 - WGS8 |
| Latitude | 35°16'47.19864"N |
| Longitude | 77°39'40.10679"W |
| Height | -36.650sft |
| | |

| | |
|-------------------|----------------|
| Northing | 559444.576sft |
| Easting | 2399556.806sft |
| Elevation | 81.327sft |
| Horz error | 0.015sft |
| Vert error | 0.011sft |
| 3D error | 0.019sft |

| | |
|------------------|----------------------------------|
| Point | R2719A-13 - LOCA |
| Northing | 559444.561sft |
| Easting | 2399556.810sft |
| Elevation | 81.316sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719AW-5 - WGS8 |
| Latitude | 35°16'28.68495"N |
| Longitude | 77°39'36.28909"W |
| Height | -64.091sft |
| | |

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|-------------------|----------------|
| Northing | 557577.109sft |
| Easting | 2399898.564sft |
| Elevation | 53.942sft |
| Horz error | 0.036sft |
| Vert error | 0.008sft |
| 3D error | 0.037sft |

| | |
|------------------|----------------------------------|
| Point | R2719AW-5 - LOCA |
| Northing | 557577.074sft |
| Easting | 2399898.559sft |
| Elevation | 53.934sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719AW-7 - WGS8 |
| Latitude | 35°17'23.87379"N |
| Longitude | 77°41'16.12888"W |
| Height | -36.965sft |
| | |

| | |
|-------------------|----------------|
| Northing | 563046.180sft |
| Easting | 2391547.274sft |
| Elevation | 80.763sft |
| Horz error | 0.037sft |
| Vert error | 0.031sft |
| 3D error | 0.049sft |

| | |
|------------------|----------------------------------|
| Point | R2719AW-7 - LOCA |
| Northing | 563046.161sft |
| Easting | 2391547.242sft |
| Elevation | 80.732sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719AW-8 - WGS8 |
| Latitude | 35°16'29.99480"N |
| Longitude | 77°41'24.23521"W |
| Height | -65.033sft |
| | |

| | |
|-------------------|----------------|
| Northing | 557590.108sft |
| Easting | 2390947.184sft |
| Elevation | 52.825sft |
| Horz error | 0.032sft |
| Vert error | 0.003sft |
| 3D error | 0.032sft |

| | |
|------------------|----------------------------------|
| Point | R2719AW-8 - LOCA |
| Northing | 557590.090sft |
| Easting | 2390947.158sft |
| Elevation | 52.822sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|---------------------------------|
| Point | TRANSIT - WGS84 |
| Latitude | 35°15'36.68715"N |
| Longitude | 77°42'48.31955"W |
| Height | -58.215sft |
| | |

| | |
|-------------------|-----------------|
| Northing | 552109.515sft |
| Easting | 2384045.734sft |
| Elevation | 59.628sft |
| Horz error | 0.053sft |
| Vert error | 0.064sft |
| 3D error | 0.083sft |

| | |
|------------------|---------------------------------|
| Point | TRANSIT - LOCAL |
| Northing | 552109.561sft |
| Easting | 2384045.706sft |
| Elevation | 59.692sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719A-10 - WGS8 |
| Latitude | 35°15'38.49251"N |
| Longitude | 77°41'40.69032"W |
| | |

| | |
|------------------|----------------|
| Northing | 552365.237sft |
| Easting | 2389651.377sft |
| Elevation | 51.723sft |
| | |

| | |
|-----------------|----------------------------------|
| Point | R2719A-10 - LOCA |
| Northing | 552365.249sft |
| Easting | 2389651.368sft |
| | |

| | |
|---------------|------------|
| Height | -66.237sft |
|---------------|------------|

| | |
|-------------------|----------|
| Horz error | 0.015sft |
| Vert error | 0.013sft |
| 3D error | 0.019sft |

| | |
|------------------|----------------|
| Elevation | 51.710sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|---------------------------------|
| Point | TRINITY - WGS84 |
| Latitude | 35°15'41.23928"N |
| Longitude | 77°41'27.26543"W |
| Height | -63.363sft |

| | |
|-------------------|----------------|
| Northing | 552657.593sft |
| Easting | 2390760.944sft |
| Elevation | 54.611sft |
| Horz error | 0.053sft |
| Vert error | 0.021sft |
| 3D error | 0.057sft |

| | |
|------------------|---------------------------------|
| Point | TRINITY - LOCAL |
| Northing | 552657.643sft |
| Easting | 2390760.927sft |
| Elevation | 54.590sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|------------------------------|
| Point | DROP - WGS84 |
| Latitude | 35°15'39.28283"N |
| Longitude | 77°40'24.11721"W |
| Height | -70.495sft |

| | |
|-------------------|----------------|
| Northing | 552529.299sft |
| Easting | 2395999.954sft |
| Elevation | 47.585sft |
| Horz error | 0.047sft |
| Vert error | 0.035sft |
| 3D error | 0.059sft |

| | |
|------------------|------------------------------|
| Point | DROP - LOCAL |
| Northing | 552529.252sft |
| Easting | 2395999.954sft |
| Elevation | 47.550sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|------------------------------|
| Point | DISH - WGS84 |
| Latitude | 35°15'39.44968"N |
| Longitude | 77°40'01.36715"W |
| Height | -69.416sft |

| | |
|-------------------|----------------|
| Northing | 552571.435sft |
| Easting | 2397886.214sft |
| Elevation | 48.701sft |
| Horz error | 0.081sft |
| Vert error | 0.023sft |
| 3D error | 0.084sft |

| | |
|------------------|------------------------------|
| Point | DISH - LOCAL |
| Northing | 552571.353sft |
| Easting | 2397886.213sft |
| Elevation | 48.678sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |

| | |
|------------------|----------------------------------|
| Point | R2719AW-4 - WGS8 |
| Latitude | 35°14'52.46907"N |
| Longitude | 77°42'19.01710"W |
| Height | -70.843sft |

| | |
|-------------------|-----------------|
| Northing | 547670.638sft |
| Easting | 2386533.888sft |
| Elevation | 47.155sft |
| Horz error | 0.092sft |
| Vert error | 0.037sft |
| 3D error | 0.099sft |

| | |
|------------------|----------------------------------|
| Point | R2719AW-4 - LOCA |
| Northing | 547670.549sft |
| Easting | 2386533.906sft |
| Elevation | 47.192sft |
| Utilized | Horz and Vert |
| Quality | Survey quality |