

SURVEY CONTROL SHEET

GPS CALIBRATION REPORT

PROJECT FILE DATA U:\5344\0006P-DrawingsT-Survey\Site_Calibration.vce

TIP NUMBER
 USER NAME SSTRICKLAND DATE & TIME 10/24/2014 1:18:41 PM
 COORDINATE SYSTEM US STATE PLANE 1983(GROUND) ZONE NORTH CAROLINA 3200
 HORIZONTAL DATUM NAD 1983(CONUS)
 VERTICAL DATUM GEOID MODEL GEOID12A (CONUS)
 COORDINATE UNITS US SURVEY FEET
 DISTANCE UNITS US SURVEY FEET
 HEIGHT UNITS US SURVEY FEET

LOCAL SITE INFORMATION
 LOCALIZED AROUND VANDER RM3
 LATITUDE N35°01'38.09322"
 LONGITUDE W78°46'08.05374"
 SITE SCALE FACTOR 1.00012104

THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION USES A LOCALIZED COORDINATE SYSTEM WHICH IS VERY SIMILAR TO NORTH CAROLINA ZONE 3200 FROM WHICH IT WAS 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 COMPUTATIONS NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

ORIGIN NORTHING 478500.0500 FT
 ORIGIN EASTING 030875.5745 FT
 ROTATION ABOUT THE CENTER 0°00'00"
 TRANSLATION NORTH 1.648 FT
 TRANSLATION EAST -4.637 FT
 SCALE FACTOR: 1.000124861

VERTICAL CALIBRATION PARAMETERS

ORIGIN NORTHING 480288.5347 FT
 ORIGIN EASTING 2025528.2196 FT
 VERTICAL SHIFT AT ORIGIN -0.040 FT
 SLOPE NORTH 0.000 PPM
 SLOPE EAST 0.000 PPM

GEOID MODEL DEFINITION

GEOID12A (CONUS)

RESIDUAL DIFFERENCES BETWEEN GPS AND LOCAL COORDINATES

SUMMARY

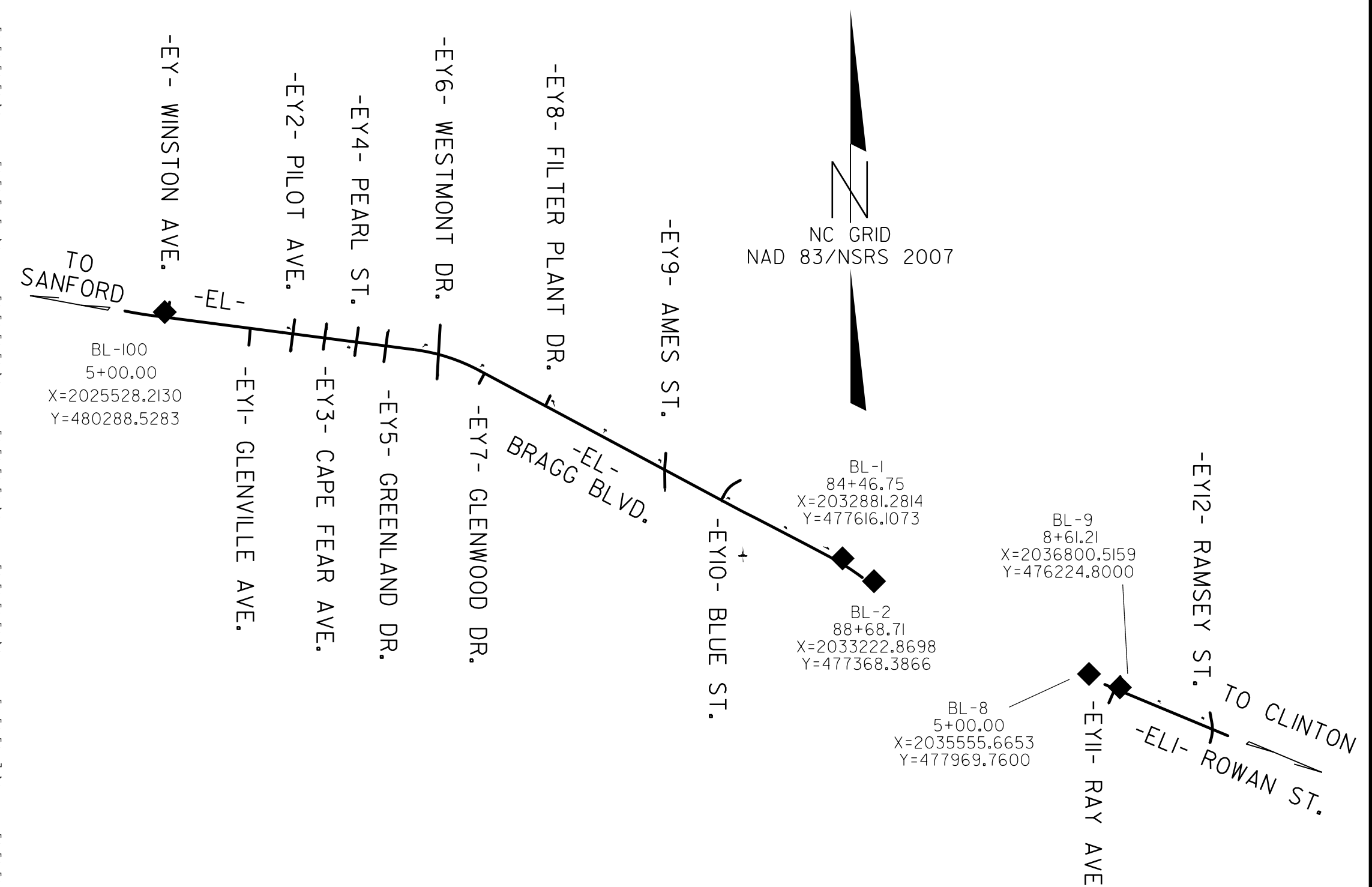
	MAXIMUM RESIDUAL	ROOT MEAN SQUARE	RESIDUAL	POINT
HORIZONTAL	0.047 FT	0.021 FT		2A
VERTICAL	0.076 FT	0.044 FT		8A
THREE-DIMENSIONAL	0.083 FT	0.049 FT		8A

POINT RESIDUALS

RESIDUALS SIGN: CALCULATED-CONTROL

GNSS POINT	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT 101 LATITUDE N35°04'09.40888" LONGITUDE W78°54'45.05560" HEIGHT 44.876 FT	NORTHING 480155.9651 FT EASTING 2026171.2072 FT ELEVATION 54.389 FT HORIZ. RESIDUAL 0.030 FT VERT. RESIDUAL ? 3D RESIDUAL ?	POINT 101L NORTHING 480155.9602 FT EASTING 2026171.2370 FT ELEVATION 154.239 FT UTILIZED HORIZONTAL QUALITY SURVEY QUALITY
POINT 100 LATITUDE N35°04'10.72560" LONGITUDE W78°54'52.78944" HEIGHT 77.382 FT	NORTHING 480288.5347 FT EASTING 2025528.2196 FT ELEVATION 186.873 FT HORIZ. RESIDUAL 0.009 FT VERT. RESIDUAL -0.047 FT 3D RESIDUAL 0.048 FT	POINT 100L NORTHING 480288.5283 FT EASTING 2025528.2130 FT ELEVATION 186.920 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 102 LATITUDE N35°04'08.83728" LONGITUDE W78°54'36.36068" HEIGHT 49.076 FT	NORTHING 480098.8171 FT EASTING 2026894.0230 FT ELEVATION 1 58.613 FT HORIZ. RESIDUAL 0.015 FT VERT. RESIDUAL 0.048 FT 3D RESIDUAL 0.051 FT	POINT 102L NORTHING 480098.8018 FT EASTING 2026894.0240 FT ELEVATION 158.565 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 103 LATITUDE N35°04'07.08898" LONGITUDE W78°54'28.79856" HEIGHT 81.251 FT	NORTHING 479922.6271 FT EASTING 2027522.7875 FT ELEVATION 1 90.810 FT HORIZ. RESIDUAL 0.016 FT VERT. RESIDUAL 0.064 FT 3D RESIDUAL 0.066 FT	POINT 103L NORTHING 479922.6430 FT EASTING 2027522.7880 FT ELEVATION 190.746 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 104 LATITUDE N35°04'06.96020" LONGITUDE W78°54'19.13685" HEIGHT 55.873 FT	NORTHING 479910.3608 FT EASTING 2028325.9334 FT ELEVATION 165.458 FT HORIZ. RESIDUAL 0.009 FT VERT. RESIDUAL ? 3D RESIDUAL ?	POINT 104L NORTHING 479910.3685 FT EASTING 2028325.9290 FT ELEVATION 165.312 FT UTILIZED HORIZONTAL QUALITY SURVEY QUALITY

POINT 105 LATITUDE N35°04'04.85475" LONGITUDE W78°54'11.60983" HEIGHT 32.503 FT	NORTHING 479698.0885 FT EASTING 2028951.8280 FT ELEVATION 142.110 FT HORIZ. RESIDUAL 0.009 FT VERT. RESIDUAL -0.004 FT 3D RESIDUAL 0.010 FT	POINT 105L NORTHING 479698.0908 FT EASTING 2028951.8190 FT ELEVATION 142.114 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 106 LATITUDE N35°04'00.57894" LONGITUDE W78°54'01.91710" HEIGHT 63.499 FT	NORTHING 479266.5728 FT EASTING 2029757.9784 FT ELEVATION 173.136 FT HORIZ. RESIDUAL 0.015 FT VERT. RESIDUAL -0.049 FT 3D RESIDUAL 0.051 FT	POINT 106L NORTHING 479266.5866 FT EASTING 2029757.9740 FT ELEVATION 173.185 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 107 LATITUDE N35°03'57.72888" LONGITUDE W78°53'55.52211" HEIGHT 50.618 FT	NORTHING 478978.9500 FT EASTING 2030289.8700 FT ELEVATION 160.275 FT HORIZ. RESIDUAL 0.014 FT VERT. RESIDUAL 0.007 FT 3D RESIDUAL 0.016 FT	POINT 107L NORTHING 478978.9373 FT EASTING 2030289.8770 FT ELEVATION 160.268 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 108 LATITUDE N35°03'54.48083" LONGITUDE W78°53'48.12637" HEIGHT 28.158 FT	NORTHING 478651.1840 FT EASTING 2030905.0051 FT ELEVATION 137.838 FT HORIZ. RESIDUAL 0.021 FT VERT. RESIDUAL -0.056 FT 3D RESIDUAL 0.060 FT	POINT 108L NORTHING 478651.1811 FT EASTING 2030905.0260 FT ELEVATION 137.894 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 109 LATITUDE N35°03'50.64695" LONGITUDE W78°53'39.50140" HEIGHT 17.600 FT	NORTHING 478264.3081 FT EASTING 2031622.4021 FT ELEVATION 127.306 FT HORIZ. RESIDUAL 0.011 FT VERT. RESIDUAL -0.014 FT 3D RESIDUAL 0.018 FT	POINT 109L NORTHING 478264.3043 FT EASTING 2031622.3920 FT ELEVATION 127.320 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 110 LATITUDE N35°03'47.37876" LONGITUDE W78°53'31.61572" HEIGHT 21.681 FT	NORTHING 477934.5784 FT EASTING 2032278.2971 FT ELEVATION 1 31.411 FT HORIZ. RESIDUAL 0.023 FT VERT. RESIDUAL 0.036 FT 3D RESIDUAL 0.042 FT	POINT 110L NORTHING 477934.5644 FT EASTING 2032278.2790 FT ELEVATION 131.375 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 111 LATITUDE N35°03'45.49045" LONGITUDE W78°53'26.85439" HEIGHT 15.789 FT	NORTHING 477744.0903 FT EASTING 2032674.3210 FT ELEVATION 125.534 FT HORIZ. RESIDUAL 0.019 FT VERT. RESIDUAL 0.033 FT 3D RESIDUAL 0.038 FT	POINT 111L NORTHING 477744.1098 FT EASTING 2032674.3210 FT ELEVATION 125.501 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 112 LATITUDE N35°03'28.63168" LONGITUDE W78°52'42.85311" HEIGHT -8.267 FT	NORTHING 476043.8076 FT EASTING 2 036334.2964 FT ELEVATION 1 01.610 FT HORIZ. RESIDUAL 0.011 FT VERT. RESIDUAL ? 3D RESIDUAL ?	POINT 112L NORTHING 476043.8120 FT EASTING 2036334.3060 FT ELEVATION 101.730 FT UTILIZED HORIZONTAL QUALITY SURVEY QUALITY
POINT 1A LATITUDE N35°03'44.22226" LONGITUDE W78°53'24.36647" HEIGHT 9.165 FT	NORTHING 477616.0963 FT EASTING 2032881.2875 FT ELEVATION 118.918 FT HORIZ. RESIDUAL 0.013 FT VERT. RESIDUAL -0.022 FT 3D RESIDUAL 0.026 FT	POINT 1 NORTHING 477616.1073 FT EASTING 2032881.2814 FT ELEVATION 118.940 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 2A LATITUDE N35°03'41.76842" LONGITUDE W78°53'20.26033" HEIGHT -6.163 FT	NORTHING 477368.3776 FT EASTING 2033222.9155 FT ELEVATION 103.603 FT HORIZ. RESIDUAL 0.047 FT VERT. RESIDUAL -0.067 FT 3D RESIDUAL 0.081 FT	POINT 2 NORTHING 477368.3866 FT EASTING 2033222.8698 FT ELEVATION 103.670 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 8A LATITUDE N35°03'31.78496" LONGITUDE W78°52'52.21465" HEIGHT -3.994 FT	NORTHING 476361.6840 FT EASTING 2035555.6320 FT ELEVATION 105.856 FT HORIZ. RESIDUAL 0.034 FT VERT. RESIDUAL 0.076 FT 3D RESIDUAL 0.083 FT	POINT 8 NORTHING 476361.6800 FT EASTING 2035555.6653 FT ELEVATION 105.780 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY
POINT 9A LATITUDE N35°03'30.42733" LONGITUDE W78°52'48.19547" HEIGHT -6.446 FT	NORTHING 476224.8197 FT EASTING 2035889.9334 FT ELEVATION 1 03.415 FT HORIZ. RESIDUAL 0.020 FT VERT. RESIDUAL -0.005 FT 3D RESIDUAL 0.020 FT	POINT 9 NORTHING 476224.8000 FT EASTING 2035889.9358 FT ELEVATION 103.420 FT UTILIZED HORIZ AND VERT QUALITY SURVEY QUALITY



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "VANDER RM3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 464925.95(ft) EASTING: 2069182.42(ft) ELEVATION: 151.82(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999878975
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "VANDER RM3" TO -L- STATION 10+50.00 IS N 70°37' 52" W 48449.32'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

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:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 TIP####_LS_GPSCALIB_DATE.HTML
 TIP####_LS_WGS84_DATE.TXT
 TIP####_LS_LOCAL_DATE.TXT
 TIP####_LS_CONTROL_DATE.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.

> INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT 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.

NOTE: DRAWING NOT TO SCALE

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