PROJECT REFERENCE NO.	SHEET NO.
35609.1.1	1C-2
Location and Surveys	

SURVEY CONTROL SHEET R-2519B

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "R2519A-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 803347.2483 (ft) EASTING: 1007340.1900(ft)
ELEVATION: 2561.45(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99982200
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"R2519A-1" TO -L- STATION 10+00.00 IS
S 87-53-26 E 38202.00
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

GPS CALIBRATION REPORT

PROJECT : R-2519B

TIP NUMBER	R-2519B		
USER NAME	JGORDON	DATE & TIME	9:48:19 AM 3/4/2008
COORDINATE SYSTEM	US STATE PLANE 1983(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM		GEOID MODEL	GEOID99 (CONUS) NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION

LOCALIZED AROUND	R2519A-1
LATITUDE	35°54'40.40569"N
LONGITUDE	82°21'10.08524"W
SITE SCALE FACTOR	1.0001750300
HEIGHT	2462.2613SFT

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	800313.0555SFT
EASTING COORDINATE OF ROTATION CENTER	1070553.7449SFT
ROTATION ABOUT THE CENTER POINT	0°00'01"
TRANSLATION NORTH	0.2056SFT
TRANSLATION EAST	0.0149SFT
SCALE FACTOR	0.99999930

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	803620.8757SFT
EASTING COORDINATE OF ORIGIN POINT	1040695.7653SFT
VERTICAL SEPARATION AT ORIGIN	-0.1990SFT
SLOPE NORTH	-5.824PPM
SLOPE EAST	2.364PPM

GEOID MODEL DEFINITION

GEOID99 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.078SFT	0.011	MORRISON_WGS84
VERTICAL	0.149SFT	0.017	R-2519-1_WGS84
THREE-DIMENSIONAL	0.154SFT	0.020	R-2519-1_WGS84

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	WINDOM_WGS84	NORTHING	803620.8757SFT	POINT	WINDOM_LOCAL
LATITUDE	35°54'54.05760"N	EASTING	1040695.7653SFT	NORTHING	803620.8862SFT
LONGITUDE	82°14'24.97763"W	ELEVATION	2517.3402SFT	EASTING	1040695.7565SFT
HEIGHT	2417.7576SFT	HORZ ERROR	0.014SFT	ELEVATION	2517.3398SFT
		VERT ERROR	0.060SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.061SFT	QUALITY	SURVEY QUALITY
POINT	CRABTREE_WGS84	NORTHING	801990.1987SFT	POINT	CRABTREE_LOCAL
LATITUDE	35°54'38.02563"N	EASTING	1043438.2131SFT	NORTHING	801990.2222SFT
LONGITUDE	82°13'51.01463"W	ELEVATION	2490.8131SFT	EASTING	1043438.1932SFT
HEIGHT	2391.1665SFT	HORZ ERROR	0.059SFT	ELEVATION	2490.8874SFT
		VERT ERROR	0.074SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.094SFT	QUALITY	SURVEY QUALITY
POINT	R-2519A-119_WGS8	NORTHING	801319.7154SFT	POINT	R-2519A-119_LOCA
LATITUDE	35°54'33.85092"N	EASTING	1048584.4543SFT	NORTHING	801319.7130SFT
LONGITUDE	82°12'48.23207"W	ELEVATION	2454.6084SFT	EASTING	1048584.4514SFT
HEIGHT	2354.7984SFT	HORZ ERROR	0.004SFT	ELEVATION	2454.6244SFT
		VERT ERROR	0.016SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.016SFT	QUALITY	SURVEY QUALITY
POINT	R-2519A-118_WGS8	NORTHING	800965.5875SFT	POINT	R-2519A-118_LOCA
LATITUDE	35°54'30.02333"N	EASTING	1047560.8523SFT	NORTHING	800965.5897SFT
LONGITUDE	82°13'00.52754"W	ELEVATION	2478.6404SFT	EASTING	1047560.8708SFT
HEIGHT	2378.8666SFT	HORZ ERROR	0.019SFT	ELEVATION	2478.6335SFT
		VERT ERROR	0.002SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.020SFT	QUALITY	SURVEY QUALITY
POINT	MICA SCHOOL_WGS8	NORTHING	800074.9713SFT	POINT	MICA SCHOOL_LOCA
LATITUDE	35°54'21.33698"N	EASTING	1047921.4939SFT	NORTHING	800074.9418SFT
LONGITUDE	82°12'55.79584"W	ELEVATION	2463.8322SFT	EASTING	1047921.5343SFT
HEIGHT	2364.0504SFT	HORZ ERROR	0.054SFT	ELEVATION	2463.8468SFT
		VERT ERROR	0.015SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.056SFT	QUALITY	SURVEY QUALITY
POINT	GPS-124_WGS84	NORTHING	799364.8398SFT	POINT	GPS-124_LOCAL
LATITUDE	35°54'18.03226"N	EASTING	1059588.2018SFT	NORTHING	799364.8350SFT
LONGITUDE	82°10'33.79428"W	ELEVATION	2584.9844SFT	EASTING	1059588.2028SFT
HEIGHT	2484.7818SFT	HORZ ERROR	0.005SFT	ELEVATION	2584.9358SFT
		VERT ERROR	0.019SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.019SFT	QUALITY	SURVEY QUALITY
POINT	GPS-123_WGS84	NORTHING	799104.1322SFT	POINT	GPS-123_LOCAL
LATITUDE	35°54'15.34908"N	EASTING	1059251.2853SFT	NORTHING	799104.1259SFT
LONGITUDE	82°10'37.78564"W	ELEVATION	2571.0657SFT	EASTING	1059251.2903SFT
HEIGHT	2470.9039SFT	HORZ ERROR	0.007SFT	ELEVATION	2571.0611SFT
		VERT ERROR	0.005SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.009SFT	QUALITY	SURVEY QUALITY
POINT	COXCOMB_WGS84	NORTHING	798189.3245SFT	POINT	COXCOMB_LOCAL
LATITUDE	35°54'07.61511"N	EASTING	1063391.1261SFT	NORTHING	798189.2796SFT
LONGITUDE	82°09'47.14205"W	ELEVATION	2740.6791SFT	EASTING	1063391.1114SFT
HEIGHT	2640.3786SFT	HORZ ERROR	0.047SFT	ELEVATION	2740.6572SFT
		VERT ERROR	0.022SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.052SFT	QUALITY	SURVEY QUALITY
POINT	GPS-125_WGS84	NORTHING	797924.5850SFT	POINT	GPS-125_LOCAL
LATITUDE	35°54'06.56653"N	EASTING	1068381.0844SFT	NORTHING	797924.5885SFT
LONGITUDE	82°08'46.42509"W	ELEVATION	2563.1344SFT	EASTING	1068381.0883SFT
HEIGHT	2462.6722SFT	HORZ ERROR	0.005SFT	ELEVATION	2563.0756SFT
		VERT ERROR	0.058SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.059SFT	QUALITY	SURVEY QUALITY
POINT	GPS-126_WGS84	NORTHING	797428.4842SFT	POINT	GPS-126_LOCAL
LATITUDE	35°54'01.70889"N	EASTING	1068525.9675SFT	NORTHING	797428.4675SFT
LONGITUDE	82°08'44.47410"W	ELEVATION	2540.4653SFT	EASTING	1068525.9633SFT
HEIGHT	2439.9951SFT	HORZ ERROR	0.017SFT	ELEVATION	2540.4378SFT
		VERT ERROR	0.027SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.032SFT	QUALITY	SURVEY QUALITY
POINT	7_WGS84	NORTHING	795385.9212SFT	POINT	P-7_LOCAL
LATITUDE	35°53'41.47573"N	EASTING	1068378.5767SFT	NORTHING	795385.8961SFT
LONGITUDE	82°08'45.47785"W	ELEVATION	2555.7355SFT	EASTING	1068378.5785SFT
HEIGHT	2455.2576SFT	HORZ ERROR	0.025SFT	ELEVATION	2555.7331SFT
		VERT ERROR	0.003SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.025SFT	QUALITY	SURVEY QUALITY
POINT	GPS-128_WGS84	NORTHING	798793.9197SFT	POINT	GPS-128_LOCAL
LATITUDE	35°54'18.12418"N	EASTING	1077893.9617SFT	NORTHING	798793.9470SFT
LONGITUDE	82°06'51.15908"W	ELEVATION	2691.5023SFT	EASTING	1077893.9630SFT
HEIGHT	2590.7264SFT	HORZ ERROR	0.027SFT	ELEVATION	2691.4480SFT
		VERT ERROR	0.054SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.061SFT	QUALITY	SURVEY QUALITY
POINT	GPS-127_WGS84	NORTHING	798089.6160SFT	POINT	GPS-127_LOCAL
LATITUDE	35°54'11.74478"N	EASTING	1077995.2014SFT	NORTHING	798089.6177SFT
LONGITUDE	82°06'49.70074"W	ELEVATION	2688.0994SFT	EASTING	1077995.2029SFT
HEIGHT	2587.3111SFT	HORZ ERROR	0.002SFT	ELEVATION	2688.0885SFT
		VERT ERROR	0.011SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.011SFT	QUALITY	SURVEY QUALITY
POINT	1_JS_6_OS_WGS84	NORTHING	807882.1894SFT	POINT	1_JS_6_OS_LOCAL
LATITUDE	35°55'50.04450"N	EASTING	1084684.6005SFT	NORTHING	807882.2195SFT
LONGITUDE	82°05'32.14422"W	ELEVATION	2642.1412SFT	EASTING	1084684.7991SFT
HEIGHT	2541.2974SFT	HORZ ERROR	0.030SFT	ELEVATION	2642.0715SFT
		VERT ERROR	0.070SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.076SFT	QUALITY	SURVEY QUALITY
POINT	GPS-129_WGS84	NORTHING	801481.4122SFT	POINT	GPS-129_LOCAL
LATITUDE	35°54'46.73828"N	EASTING	1084536.1014SFT	NORTHING	801481.4712SFT
LONGITUDE	82°05'31.52743"W	ELEVATION	2777.3734SFT	EASTING	1084536.1065SFT
HEIGHT	2676.3956SFT	HORZ ERROR	0.053SFT	ELEVATION	2777.2812SFT
		VERT ERROR	0.092SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.110SFT	QUALITY	SURVEY QUALITY
POINT	GPS-130_WGS84	NORTHING	801179.2264SFT	POINT	GPS-130_LOCAL
LATITUDE	35°54'43.86838"N	EASTING	1084915.0646SFT	NORTHING	801179.2539SFT
LONGITUDE	82°05'26.80896"W	ELEVATION	2756.8084SFT	EASTING	1084915.0677SFT
HEIGHT	2655.8116SFT	HORZ ERROR	0.028SFT	ELEVATION	2756.7891SFT
		VERT ERROR	0.019SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.034SFT	QUALITY	SURVEY QUALITY
POINT	1_JS_2_WGS84	NORTHING	802536.8505SFT	POINT	1_JS_2_LOCAL
LATITUDE	35°54'59.25835"N	EASTING	1091343.8205SFT	NORTHING	802536.9021SFT
LONGITUDE	82°04'09.21486"W	ELEVATION	2538.9065SFT	EASTING	1091343.8212SFT
HEIGHT	2437.7084SFT	HORZ ERROR	0.052SFT	ELEVATION	2538.8762SFT
		VERT ERROR	0.030SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.060SFT	QUALITY	SURVEY QUALITY
POINT	16_WGS84	NORTHING	794826.9608SFT	POINT	P-16_LOCAL
LATITUDE	35°53'42.45981"N	EASTING	1089386.5023SFT	NORTHING	794826.9668SFT
LONGITUDE	82°04'30.03306"W	ELEVATION	2629.0096SFT	EASTING	1089386.5123SFT
HEIGHT	2527.7016SFT	HORZ ERROR	0.011SFT	ELEVATION	2629.0203SFT
		VERT ERROR	0.011SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.015SFT	QUALITY	SURVEY QUALITY
POINT	R-2519-1_WGS84	NORTHING	791852.5159SFT	POINT	R-2519-1_LOCAL
LATITUDE	35°53'14.14765"N	EASTING	1092537.8950SFT	NORTHING	791852.4780SFT
LONGITUDE	82°03'45.84035"W	ELEVATION	2591.1711SFT	EASTING	1092537.9060SFT
HEIGHT	2489.6308SFT	HORZ ERROR	0.039SFT	ELEVATION	2591.3203SFT
		VERT ERROR	0.149SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.154SFT	QUALITY	SURVEY QUALITY
POINT	MORRISON_WGS84	NORTHING	814253.8953SFT	POINT	MORRISON_LOCAL
LATITUDE	35°57'01.20615"N	EASTING	1111664.8272SFT	NORTHING	814253.8210SFT
LONGITUDE	82°00'06.61923"W	ELEVATION	2679.1365SFT	EASTING	1111664.8042SFT
HEIGHT	2577.6031SFT	HORZ ERROR	0.078SFT	ELEVATION	2679.2302SFT
		VERT ERROR	0.092SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.122SFT	QUALITY	SURVEY QUALITY

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN 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.*

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R2519B_LS_GPSCALIB_080710.HTML
   R2519B_LS_WGS84_080710.TXT
   R2519B_LS_LOCAL_080710.TXT
   R2519B_LS_CONTROL_080710.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

6/2/99
18-AUG-2014 12:12
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$$$$USERNAME$$$$