U–3615B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U–3615B	1C–2
Location and Surveys	

NOTES

1. 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 SYSTEM) 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:
HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/PAGES/DEFAULT.ASPX

THE FILES TO BE FOUND ARE AS FOLLOWS:

U3615B_LS_GPSCALIB_051213.HTML
U3615B_LS_WGS84_051213.TXT
U3615B_LS_LOCAL_051213.TXT
U3615B_LS_CONTROL_051213.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.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING MONUMENTATION.

HAWTHORNE RESET LOCAL,	851336.375,	1722541.082,	890.877
U3615-1 LOCAL,	821044.701,	1693426.266,	881.652
U3615-2 LOCAL,	821561.548,	1693082.272,	867.895
U3615-3 LOCAL,	826260.772,	1691431.697,	906.084
U3615-4 LOCAL,	827046.608,	1691662.175,	906.668
U3615-5 LOCAL,	832942.367,	1696857.603,	878.952
U3615-6 LOCAL,	833228.125,	1697495.262,	860.159
U3615-7 LOCAL,	834872.860,	1704475.562,	812.338
U3615-8 LOCAL,	835158.680,	1705405.132,	847.410
U3615-9 LOCAL,	831996.706,	1712905.892,	857.780
U3615-10 LOCAL,	831317.935,	1713607.338,	891.543

HAWTHORNE RESET WGS84,	36°05′07.81281"N,	79°56′20.42090"W,	787.617
U3615-1 WGS84,	36°00′05.42076"N,	80°02′11.23798"W,	778.414
U3615-2 WGS84,	36°00′10.49593"N,	80°02′15.48986"W,	764.608
U3615-3 WGS84,	36°00′56.79173"N,	80°02′36.17724"W,	802.456
U3615-4 WGS84,	36°01′04.58615"N,	80°02′33.47252"W,	803.007
U3615-5 WGS84,	36°02′03.41932"N,	80°01′30.97717"W,	775.228
U3615-6 WGS84,	36°02′06.30992"N,	80°01′23.25016"W,	756.449
U3615-7 WGS84,	36°02′23.27647"N,	79°59′58.47215"W,	708.883
U3615-8 WGS84,	36°02′26.19511"N,	79°59′47.18968"W,	743.991
U3615-9 WGS84,	36°01′55.66402"N,	79°58′15.49087"W,	754.936
U3615-10 WGS84,	36°01′49.01996"N,	79°58′06.87093"W,	788.771

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY USGS FOR MONUMENT "HAWTHORNE RESET" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 851336.3747(ft) EASTING: 1722541.0825(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .99992779 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAWTHORNE RESET" TO -L- STATION 164+75.00 IS S 54° 16′38" W 31338.96 FT ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

GPS CALIBRATION REPORT

GPS CALIBRATION REPORT

PROJECT: U3615 CONTROL SHEET SITE CAL

TIP NUMBER: U3615
USER NAME: KHUDSON
DATE & TIME: 1:34:25 PM 12/9/2005
COORDINATE SYSTEM: US STATE PLANE 1983(AT GROUND) ZONE NORTH CAROLINA 3200
HORIZONTAL DATUM: NAD 1983 (CONUS)
VERTICAL DATUM: NAVD 88 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 HAWTHORNE RESET
LATITUDE: 36°05′07.81284"N
LONGITUDE: 79°56′20.42091"W
SITE SCALE FACTOR: 1.0000722152
HEIGHT: 787.618SFT

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: 829543.045SFT
EASTING COORDINATE OF ROTATION CENTER: 1700034.937SFT
ROTATION ABOUT THE CENTER POINT: 0°00′00"
TRANSLATION NORTH: -0.015SFT
TRANSLATION EAST: -0.017SFT
SCALE FACTOR: 1.00000054

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT: 821044.700SFT
EASTING COORDINATE OF ORIGIN POINT: 1693426.270SFT
VERTICAL SEPARATION AT ORIGIN: -0.042SFT
SLOPE NORTH: 11.347PPM
SLOPE EAST: -5.055PPM

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:	0.006SFT	0.001	U3615-6 WGS84
VERTICAL:	0.002SFT	0.000	U3615-1 WGS84
THREE-DIMENSIONAL:	0.007SFT	0.001	U3615-6 WGS84

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT: (FOR DISPLAY ONLY)		LOCAL COORDINATES	
POINT:	U3615-1 WGS84	NORTHING:	821044.700SFT	POINT:	U3615-1
LATITUDE:	36°00′05.42076"N	EASTING:	1693426.270SFT	NORTHING:	821044.701SFT
LONGITUDE:	80°02′11.23798"W	ELEVATION:	881.654SFT	EASTING:	1693426.266SFT
HEIGHT:	778.414SFT	HORZ ERROR:	0.004SFT	ELEVATION:	881.652SFT
		VERT ERROR:	0.002SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.005SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-2 WGS84	NORTHING:	821561.548SFT	POINT:	U3615-2
LATITUDE:	36°00′10.49593"N	EASTING:	1693082.273SFT	NORTHING:	821561.548SFT
LONGITUDE:	80°02′15.48986"W	ELEVATION:	867.894SFT	EASTING:	1693082.272SFT
HEIGHT:	764.608SFT	HORZ ERROR:	0.001SFT	ELEVATION:	867.895SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.002SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-3 WGS84	NORTHING:	826260.774SFT	POINT:	U3615-3
LATITUDE:	36°00′56.79173"N	EASTING:	1691431.698SFT	NORTHING:	826260.772SFT
LONGITUDE:	80°02′36.17724"W	ELEVATION:	906.085SFT	EASTING:	1691431.697SFT
HEIGHT:	802.456SFT	HORZ ERROR:	0.003SFT	ELEVATION:	906.084SFT
		VERT ERROR:	0.000SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.003SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-4 WGS84	NORTHING:	827046.610SFT	POINT:	U3615-4
LATITUDE:	36°01′04.58615"N	EASTING:	1691662.175SFT	NORTHING:	827046.608SFT
LONGITUDE:	80°02′33.47252"W	ELEVATION:	906.667SFT	EASTING:	1691662.175SFT
HEIGHT:	803.007SFT	HORZ ERROR:	0.002SFT	ELEVATION:	906.668SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.002SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-5 WGS84	NORTHING:	832942.370SFT	POINT:	U3615-5
LATITUDE:	36°02′03.41932"N	EASTING:	1696857.600SFT	NORTHING:	832942.367SFT
LONGITUDE:	80°01′30.97717"W	ELEVATION:	878.953SFT	EASTING:	1696857.603SFT
HEIGHT:	775.228SFT	HORZ ERROR:	0.005SFT	ELEVATION:	878.952SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.005SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-6 WGS84	NORTHING:	833228.122SFT	POINT:	U3615-6
LATITUDE:	36°02′06.30992"N	EASTING:	1697495.257SFT	NORTHING:	833228.125SFT
LONGITUDE:	80°01′23.25016"W	ELEVATION:	860.157SFT	EASTING:	1697495.262SFT
HEIGHT:	756.449SFT	HORZ ERROR:	0.006SFT	ELEVATION:	860.159SFT
		VERT ERROR:	0.002SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.007SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-7 WGS84	NORTHING:	834872.859SFT	POINT:	U3615-7
LATITUDE:	36°02′23.27647"N	EASTING:	1704475.563SFT	NORTHING:	834872.860SFT
LONGITUDE:	79°59′58.47215"W	ELEVATION:	812.337SFT	EASTING:	1704475.562SFT
HEIGHT:	708.883SFT	HORZ ERROR:	0.001SFT	ELEVATION:	812.338SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.002SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-8 WGS84	NORTHING:	835158.680SFT	POINT:	U3615-8
LATITUDE:	36°02′26.19511"N	EASTING:	1705405.130SFT	NORTHING:	835158.680SFT
LONGITUDE:	79°59′47.18968"W	ELEVATION:	847.412SFT	EASTING:	1705405.132SFT
HEIGHT:	743.991SFT	HORZ ERROR:	0.002SFT	ELEVATION:	847.410SFT
		VERT ERROR:	0.002SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.003SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-9 WGS84	NORTHING:	831996.705SFT	POINT:	U3615-9
LATITUDE:	36°01′55.66402"N	EASTING:	1712905.891SFT	NORTHING:	831996.706SFT
LONGITUDE:	79°58′15.49087"W	ELEVATION:	857.781SFT	EASTING:	1712905.892SFT
HEIGHT:	754.936SFT	HORZ ERROR:	0.001SFT	ELEVATION:	857.780SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.001SFT	QUALITY:	CONTROL QUALITY
POINT:	U3615-10 WGS84	NORTHING:	831317.934SFT	POINT:	U3615-10
LATITUDE:	36°01′49.01996"N	EASTING:	1713607.342SFT	NORTHING:	831317.935SFT
LONGITUDE:	79°58′06.87093"W	ELEVATION:	891.542SFT	EASTING:	1713607.338SFT
HEIGHT:	788.771SFT	HORZ ERROR:	0.004SFT	ELEVATION:	891.543SFT
		VERT ERROR:	0.001SFT	UTILIZED:	HORZ AND VERT
		3D ERROR:	0.004SFT	QUALITY:	CONTROL QUALITY