



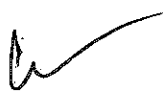
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

July 8, 2010

To: Group Leaders
Area Engineers

From: Charles W. Brown, PE, PLS 
State Location & Surveys Engineer

Subject: Proc 2010-1
Table of Right Of Way/Easement Points

Beginning now, we will implement a new procedure which will involve the creation of a table of right of way monuments and permanent easement, to be included in the TIP plans. These tables will provide station and offset and North/East coordinates. The attached letter to Jay Bennett, PE, State Roadway Design Engineer, provides details as to the process and timeline. The attached plan sheet samples show the full set of pages that L&S is responsible for in plans, including examples of the new tables of points. Emory Kincaid will be sending out instructions on use of an mdl application that will assist in the development of these tables.

You will now receive an LS number associated with preliminary field inspections. Under this number you should review plans for accuracy and completeness, including

- Verify/update planimetrics and any property (property subdivisions, name changes, etc.)
- Create initial monument/easement chart; verify correct placement (computed station/offset vs text).

Any completed or anticipated revisions should be reported at the field inspection.

You already receive an LS number for Right Of Way staking. This will now include creation of the preliminary tables to be included in right of way plans. Any revisions to monuments/easements should be updated as you get them.

You already receive an LS number for final field verification of all right of way monuments. This will now include completion of the final and correct tables of monuments/easements, to be included in recorded plans.

This process should reduce or eliminate a small portion of the work you do. The surveyors that I have spoken to in North Carolina are very excited about this. This will help them in doing their work, and hopefully minimize your involvement. Designers are excited about the use of the program, to help them check point placement, which should minimize your corrections.

Thank you for your assistance in making this happen. If you have questions or comments, please don't hesitate to pass those on to your Regional Engineer or call Dale Burton or me directly.

CWB

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
LOCATION & SURVEYS UNIT
1588 MAIL SERVICE CENTER
RALEIGH NC 27699-1588

TELEPHONE: 919-250-4109
FAX: 919-250-4223

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B - ENTRANCE B4
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610
Proc 2010-1.doc



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 10, 2010

To: Mr. J. A. Bennett, PE
State Roadway Design Engineer

From: Charles W. Brown, PE, PLS
State Location & Surveys Engineer

Subject: Addition of Survey Sheets to Highway Plans
Centerline Control Points Coordinate List
Right Of Way/Easement Points Coordinate List

In addition to the survey control data already included in the highway plans (baseline control, calibration data), Location & Surveys will be adding pages containing charts for coordinates of all centerline control points, right of way monuments, and permanent easement points. These sheets will be included in the Survey Data sheets (1A, 1B, etc.) on highway plans, beginning with the October 2010 Construction Let plans. Attached is a sample set of Survey Data Sheets, with proposed coordinate list included.

The creation of these sheets will be the responsibility of Location & Surveys personnel, with assistance from your staff. The process as defined will be:

Design

- L&S will prepare Project Calibration/Baseline Control sheets at time of RDU sending project to Hydro, for inclusion in plans (this has not changed)

Final Design Field Inspection/Combined Field Inspection (prior to Right Of Way authorization)

- At the time of printing and sending out the Final Design Field Inspection/Combined Field Inspection plans, RDU includes L&S in notification (current procedure). Upon receipt of the preliminary Right Of Way plans for Field Inspection, the L&S field office runs program to check monument locations for accuracy and reports to RDU at field inspection (Project Control sheets should be included at this time - if not, L&S prepares those at this time); RDU makes revisions to right of way based on field inspection comments

Right Of Way Plans Submittal

- RDU provides L&S a link to final R/W plans prior to R/W Plans distribution (email to L&S Unit head is sufficient - this is forwarded to appropriate field office).

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1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610
ROW Coordinate Lists - letter to bennett.doc

Addition of Survey Sheets to Highway Plans

May 3, 2010

Page 2 of 2

- L&S creates file of Centerline and R/W-Easement charts (labeled "Preliminary") for inclusion in plans. These charts go to RDU and to R/W Branch (Grady Morris) within 2 weeks of R/W Plans submittal.
- Grady Morris sends this file along with preliminary plans to County GIS/Tax offices
- RDU includes these sheets in any further transmittals of the R/W Plans

Final/Pre-Let Activities

- 12 weeks prior to Let – RDU sends plans for plan checking, includes L&S in notification (current procedure)
- 10 weeks prior to Let – L&S sends final r/w-easement chart (labeled "Final") to RDU for inclusion in plans
- Right Of Way Branch includes all sheets (1A, 1B, etc.) in plans to be recorded.

The inclusion of these right of way and easement point coordinates will help permanently monument NCDOT rights of way and easements, with or without the existence of monuments in the ground. This information will assist in NCDOT or private surveyors in the re-establishment of rights of way after construction has been completed. As such, it is imperative that an up-to-date and correct set of coordinates be included in future plans recorded in the appropriate Registers of Deeds offices.

The process described above does not alter or replace the intent of the memo dated April 7, 2008 with Subject "Right Of Way Plan Sheet Revisions".

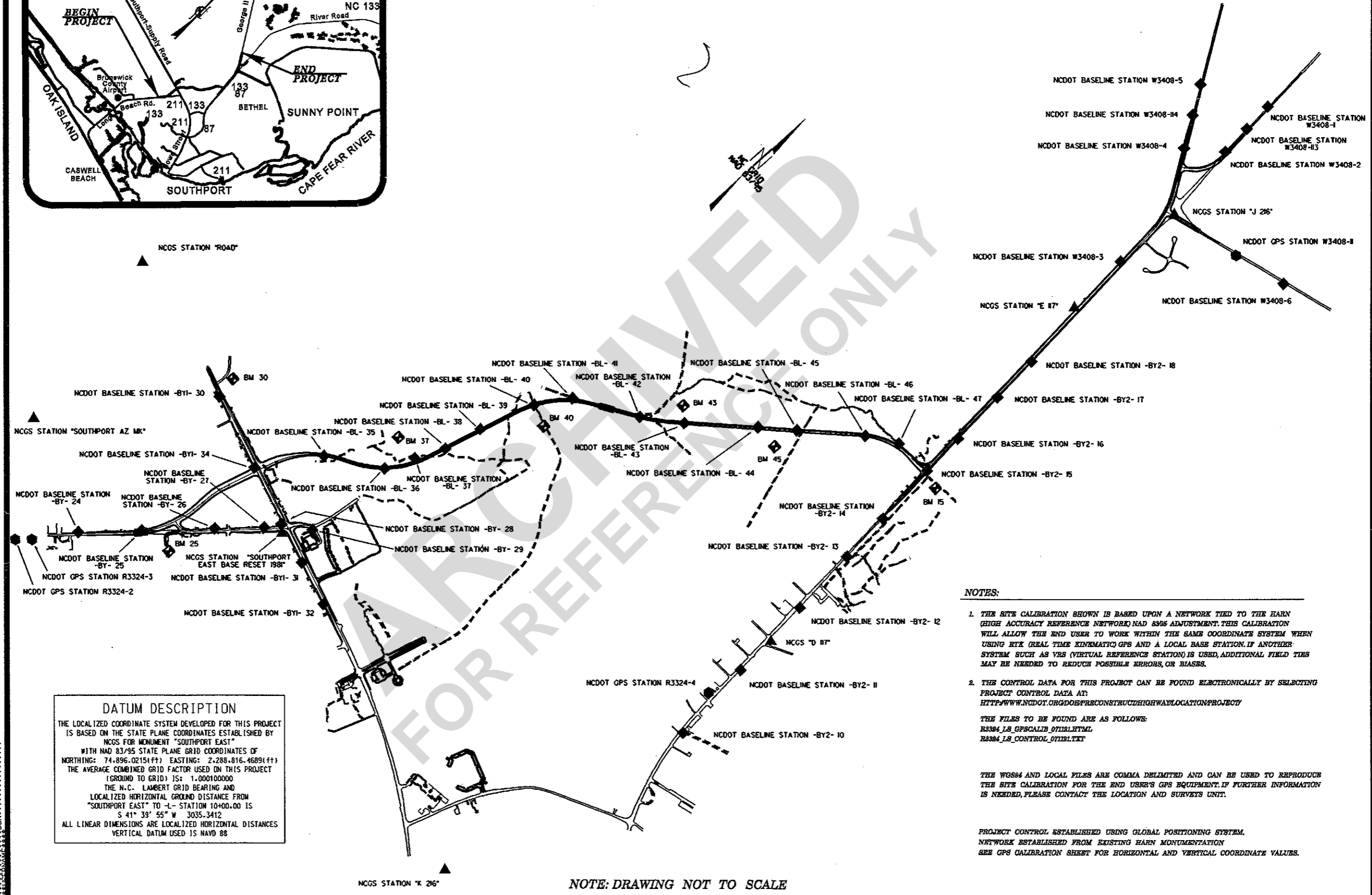
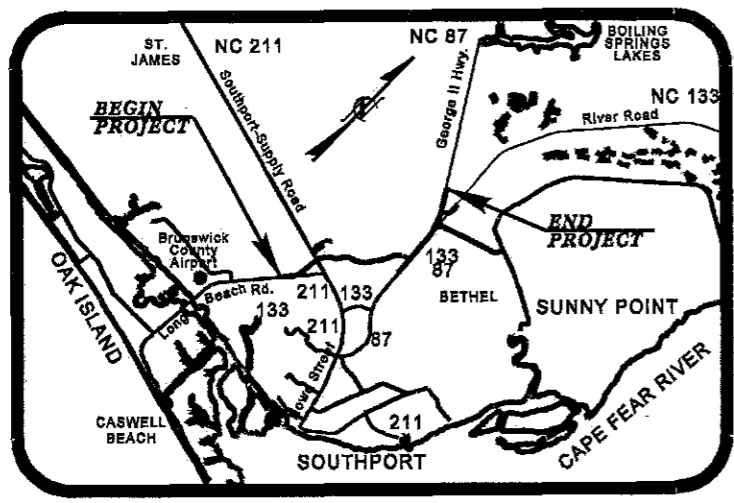
Thank you for your assistance in this matter. Someone from my staff will be available if needed to discuss the intent or actions involved in this procedure with the Roadway Design Unit, upon your request. Please do not hesitate to contact me with any questions or comments.

CWB

Attachment: Sample Survey Control Sheets Pages 1C – 1H

Cc: Mr. Art McMillan, PE
Ms. Judy Joines
Mr. Virgil Pridemore

SURVEY CONTROL SHEET R-3324



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 74,896.0215(ft) EASTING: 2,288,816.4689(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000100000 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST" TO -L- STATION 10+00.00 IS S 41° 39' 55" W 3035.3412 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

- 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 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/DOE/PRECONSTRUCTION/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOE/PRECONSTRUCTION/HIGHWAY/LOCATION/PROJECT/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R3324_LS_GPSCALIB_071817.MTL
R3324_LS_CONTROL_071817.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 HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-3324

GPS CALIBRATION REPORT

PROJECT : R3324

TIP NUMBER R3324
 USER NAME JNEAL DATE & TIME 11:52:31 AM 10/10/2005
 COORDINATE SYSTEM US STATE PLANE ZONE NORTH CAROLINA 3200
 HORIZONTAL DATUM NAD 1983 (CONUS)
 VERTICAL DATUM NAVD 88 GEOID MODEL GEOID03 (CONUS) NC SUB GRID
 COORDINATE UNITS US SURVEY FEET
 DISTANCE UNITS US SURVEY FEET
 HEIGHT UNITS US SURVEY FEET

LOCAL SITE INFORMATION

LOCALIZED AROUND
 LATITUDE 33°57'07.08872"N
 LONGITUDE 78°02'51.95161"W
 SITE SCALE FACTOR 0.9999000100
 HEIGHT -87.88475FT

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 76973.87675FT
 EASTING COORDINATE OF ROTATION CENTER 2288670.71065FT
 ROTATION ABOUT THE CENTER POINT 0°00'00"
 TRANSLATION NORTH -0.00185FT
 TRANSLATION EAST -0.02205FT
 SCALE FACTOR 1.00000183

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT 86560.14855FT
 EASTING COORDINATE OF ORIGIN POINT 2294460.62105FT
 VERTICAL SEPARATION AT ORIGIN -0.05225FT
 SLOPE NORTH -5.209PPM
 SLOPE EAST 0.521PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.041SFT	0.007	K 216_GPS
VERTICAL	0.006SFT	0.001	R3324-3_GPS
THREE-DIMENSIONAL	0.041SFT	0.007	K 216_GPS

POINT RESIDUALS

WGS84 COORDINATES CALCULATED POINT FOR DISPLAY ONLY LOCAL COORDINATES

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT W3408-11_GPS	NORTHING 86560.14855FT	NORTHING 86560.13355FT	POINT W3408-11
LATITUDE 33°59'01.92596"N	EASTING 2294460.62105FT	EASTING 2294460.62215FT	LATITUDE 33°57'07.08872"N
LONGITUDE 78°01'43.60234"W	ELEVATION 36.89645FT	ELEVATION 36.89639FT	LONGITUDE 78°02'51.95161"W
HEIGHT -84.52675FT	HORZ ERROR 0.0155FT	UTILIZED 36.89639FT	HEIGHT -87.89415FT
	VERT ERROR 0.0005FT	UTILIZED	
	3D ERROR 0.0155FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT J 216_GPS	NORTHING 86318.08625FT	NORTHING 86318.06515FT	POINT J 216
LATITUDE 33°58'59.62175"N	EASTING 2293527.01935FT	EASTING 2293527.01875FT	LATITUDE 33°56'37.39808"N
LONGITUDE 78°01'54.71623"W	ELEVATION 39.44485FT	ELEVATION 39.44555FT	LONGITUDE 78°03'24.33096"W
HEIGHT -81.94995FT	HORZ ERROR 0.0215FT	UTILIZED 39.44555FT	HEIGHT -85.95845FT
	VERT ERROR 0.0015FT	UTILIZED	
	3D ERROR 0.0215FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT E 117_GPS	NORTHING 84538.10435FT	NORTHING 84538.09245FT	POINT E 117
LATITUDE 33°58'42.01259"N	EASTING 2293548.44605FT	EASTING 2293548.45025FT	LATITUDE 33°56'28.56678"N
LONGITUDE 78°01'54.66794"W	ELEVATION 35.96345FT	ELEVATION 35.96785FT	LONGITUDE 78°03'33.52993"W
HEIGHT -85.47935FT	HORZ ERROR 0.0135FT	UTILIZED 35.96785FT	HEIGHT -102.41225FT
	VERT ERROR 0.0045FT	UTILIZED	
	3D ERROR 0.0135FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT D 117_GPS	NORTHING 78695.52685FT	NORTHING 78695.52925FT	POINT D 117
LATITUDE 33°57'44.16419"N	EASTING 2294122.02995FT	EASTING 2294122.03915FT	LATITUDE 33°55'30.52359"N
LONGITUDE 78°01'48.53524"W	ELEVATION 31.02035FT	ELEVATION 31.01755FT	LONGITUDE 78°04'44.27846"W
HEIGHT -90.59315FT	HORZ ERROR 0.0105FT	UTILIZED 31.01755FT	HEIGHT -104.39835FT
	VERT ERROR 0.0035FT	UTILIZED	
	3D ERROR 0.0105FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT R3324-4_GPS	NORTHING 77658.07395FT	NORTHING 77658.08725FT	POINT R3324-4
LATITUDE 33°57'30.90333"N	EASTING 2294108.63725FT	EASTING 2294108.64715FT	LATITUDE 33°57'59.35969"N
LONGITUDE 78°01'48.81454"W	ELEVATION 30.85855FT	ELEVATION 30.85595FT	LONGITUDE 78°06'28.58573"W
HEIGHT -90.78045FT	HORZ ERROR 0.0175FT	UTILIZED 30.85595FT	HEIGHT -69.30785FT
	VERT ERROR 0.0035FT	UTILIZED	
	3D ERROR 0.0175FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT K 216_GPS	NORTHING 70153.66785FT	NORTHING 70153.70665FT	POINT K 216
LATITUDE 33°56'19.55166"N	EASTING 2295355.33995FT	EASTING 2295355.35255FT	LATITUDE 33°57'07.08872"N
LONGITUDE 78°01'34.88894"W	ELEVATION 22.62125FT	ELEVATION 22.62135FT	LONGITUDE 78°02'51.95161"W
HEIGHT -99.24815FT	HORZ ERROR 0.0415FT	UTILIZED 22.62135FT	HEIGHT -87.88475FT
	VERT ERROR 0.0005FT	UTILIZED	
	3D ERROR 0.0415FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT SOUTHPORT EB_GPS	NORTHING 74896.01585FT	NORTHING 74896.02155FT	POINT SOUTHPORT EB
LATITUDE 33°57'07.08872"N	EASTING 2288816.44655FT	EASTING 2288816.46895FT	LATITUDE 33°57'07.08872"N
LONGITUDE 78°02'51.95161"W	ELEVATION 33.60795FT	ELEVATION 33.60235FT	LONGITUDE 78°02'51.95161"W
HEIGHT -87.89415FT	HORZ ERROR 0.0235FT	UTILIZED 33.60235FT	HEIGHT -87.89415FT
	VERT ERROR 0.0065FT	UTILIZED	
	3D ERROR 0.0245FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT R3324-3_GPS	NORTHING 71868.66735FT	NORTHING 71868.67315FT	POINT R3324-3
LATITUDE 33°56'37.39808"N	EASTING 2286117.32155FT	EASTING 2286117.32305FT	LATITUDE 33°56'37.39808"N
LONGITUDE 78°03'24.33096"W	ELEVATION 35.50675FT	ELEVATION 35.51325FT	LONGITUDE 78°03'24.33096"W
HEIGHT -85.95845FT	HORZ ERROR 0.0065FT	UTILIZED 35.51325FT	HEIGHT -85.95845FT
	VERT ERROR 0.0065FT	UTILIZED	
	3D ERROR 0.0095FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT R3324-2_GPS	NORTHING 70968.59145FT	NORTHING 70968.59365FT	POINT R3324-2
LATITUDE 33°56'28.56678"N	EASTING 2285350.76075FT	EASTING 2285350.76705FT	LATITUDE 33°56'28.56678"N
LONGITUDE 78°03'33.52993"W	ELEVATION 19.04195FT	ELEVATION 19.04295FT	LONGITUDE 78°03'33.52993"W
HEIGHT -102.41225FT	HORZ ERROR 0.0145FT	UTILIZED 19.04295FT	HEIGHT -102.41225FT
	VERT ERROR 0.0015FT	UTILIZED	
	3D ERROR 0.0145FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT SOUTHPORT AZ MK	NORTHING 65045.31285FT	NORTHING 65045.31045FT	POINT SOUTHPORT AZ MK
LATITUDE 33°55'30.52359"N	EASTING 2279444.56915FT	EASTING 2279444.53125FT	LATITUDE 33°55'30.52359"N
LONGITUDE 78°04'44.27846"W	ELEVATION 16.94235FT	ELEVATION 16.94225FT	LONGITUDE 78°04'44.27846"W
HEIGHT -104.39835FT	HORZ ERROR 0.0385FT	UTILIZED 16.94225FT	HEIGHT -104.39835FT
	VERT ERROR 0.0085FT	UTILIZED	
	3D ERROR 0.0385FT	ADJUSTED	

POINT	WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT ROAD_GPS	NORTHING 80010.42925FT	NORTHING 80010.41115FT	POINT ROAD
LATITUDE 33°57'59.35969"N	EASTING 2270526.36315FT	EASTING 2270526.35455FT	LATITUDE 33°57'59.35969"N
LONGITUDE 78°06'28.58573"W	ELEVATION 51.33325FT	ELEVATION 51.33195FT	LONGITUDE 78°06'28.58573"W
HEIGHT -69.30785FT	HORZ ERROR 0.0205FT	UTILIZED 51.33195FT	HEIGHT -69.30785FT
	VERT ERROR 0.0015FT	UTILIZED	
	3D ERROR 0.0205FT	ADJUSTED	

NOTES:

- 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 WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASH STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
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[HTTP://WWW.NCDOT.ORG/DOT/INFRASTRUCTURE/HIGHWAY/LOCATION/PROJECTS/](http://www.ncdot.org/dot/infrastructure/highway/location/projects/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 R3324_IS_GPSALIB.TXT
 R3324_IS_CONTROL.TXT

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DATUM DESCRIPTION

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 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST" TO "L- STATION 10+00.00 IS S 41°39' 55" W 3035.3412
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-3324

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
A34	BY1-34	75202.5510	2287943.7390	33.71	39-14.83	52.90 LT
35	BL-35	75973.7430	2288432.4490	33.53	48-34.87	11.00 RT
36	BL-36	76455.7410	2289086.9850	33.45	56-50.15	10.71 RT
37	BL-37	76835.2150	2289248.9890	36.71	60-66.63	52.85 LT
38	BL-38	77217.3900	2289426.1850	32.40	64-09.09	7.26 RT
39	BL-39	77730.4660	2289645.0610	33.41	70-15.39	12.40 LT
40	BL-40	78456.1520	2289776.2710	33.09	77-77.62	1.86 RT
41	BL-41	78885.4310	2290045.0910	31.46	82-01.82	20.28 LT
42	BL-42	79375.0050	2290610.7100	30.37	91-05.92	1.06 RT
43	BL-43	79756.2380	2291262.9340	32.36	97-78.07	4.53 RT
44	BL-44	80434.9440	2291943.3550	33.13	107-39.05	6.72 LT
45	BL-45	80783.8300	2292311.0410	36.10	112-45.88	0.00 LT
46	BL-46	81400.4490	2292965.1380	31.50	121-45.44	12.13 RT
47	BL-47	81658.5470	2293330.6540	29.80	125-08.40	36.81 LT
A15	BY2-15	81695.4690	2293846.2790	32.70		OUTSIDE PROJECT LIMITS

BY4 POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
V5	V3408-5	87699.0560	2292504.3530	38.32	86-71.71	17.15 LT
V114	V3408-114	87356.7850	2292730.6580	37.68	82-61.44	17.53 LT
V4	V3408-4	86986.0820	2292975.6170	37.31	78-16.99	17.94 LT

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
24	BY-24	72935.5128	2287028.0702	33.74	13-02.96	24.63 LT
25	BY-25	73562.8979	2287562.0770	11.95	22-09.08	17.22 LT

BY4 POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
J216	NCGS J 216	86318.0650	2293527.0190	39.45	11-07.56	21.91 LT
V11	V3408-11	88560.1340	2294460.6220	36.90		OUTSIDE PROJECT LIMITS
V6	V3408-6	86777.3810	2295147.7760	35.75		OUTSIDE PROJECT LIMITS

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
26	BY-26	74287.8300	2288185.0560	28.52	15-09.53	29.82 LT
27	BY-27	74775.1852	2288600.7110	35.15	22-11.00	25.27 LT
28	BY-28	74968.1233	2288723.3796	35.61	24-36.57	50.63 LT

BM25 ELEVATION = 20.24
N 73647 E 2286003
Y STATION 11-39 333' RIGHT
SQUARE CUT IN CONCRETE CURB

BM30 ELEVATION = 32.34
N 75768 E 2286901
Y1 STATION 12-75 231' LEFT
RR SPIKE IN BASE OF 10' PINE

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
29	BY-29	75222.2089	2289047.3788	34.84	13-26.92	43.08 RT

BM37 ELEVATION = 34.91
N 76861 E 2288905
L STATION 59-13 374' LEFT
RR SPIKE IN BASE OF 10' BAY TREE

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
30	BY1-30	75483.9370	2286957.9690	30.17	14-06.12	20.05 RT
34	BY1-34	75202.5510	2287943.7390	33.71	24-31.23	36.80 RT
A20	BY-20	74968.1233	2288723.3796	35.61	32-45.15	55.17 RT
31	BY1-31	74833.9320	2289272.5890	32.91	38-10.26	38.28 RT
32	BY1-32	74679.9330	2289660.7030	27.99	44-18.15	30.12 RT

BM40 ELEVATION = 34.29
N 78368 E 2290066
L STATION 78-30 301' RIGHT
RR SPIKE IN BASE OF 15' PINE TREE

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
10	BY2-10	77049.6000	2294238.9720	29.07		OUTSIDE PROJECT LIMITS
11	BY2-11	78154.4880	2294137.8630	31.00		OUTSIDE PROJECT LIMITS
D117	NCGS D 117	78695.5290	2294122.0390	31.02		OUTSIDE PROJECT LIMITS
12	BY2-12	79267.9830	2294046.6640	30.89		OUTSIDE PROJECT LIMITS
13	BY2-13	80168.8470	2293969.0540	31.93		OUTSIDE PROJECT LIMITS
14	BY2-14	80859.2390	2293913.9220	30.87	15-22.19	18.55 RT
15	BY2-15	81695.4690	2293846.2790	32.70	23-70.16	18.55 RT
16	BY2-16	82278.9570	2293799.7080	33.16	29-55.50	17.61 RT
17	BY2-17	83015.5630	2293740.3640	33.26	36-94.49	15.87 RT
18	BY2-18	83654.9040	2293688.5810	33.81	43-35.92	14.08 RT
E117	NCGS E 117	84538.0920	2293548.4500	35.97	52-27.35	56.78 LT
V3	V3408-3	85388.3730	2293509.7670	35.49	60-78.06	29.06 LT
J216	NCGS J 116	86318.0650	2293527.0190	39.45	69-78.29	108.37 RT

BM43 ELEVATION = 34.39
N 79097 E 2291083
L STATION 97-48 221' LEFT
RR SPIKE IN BASE OF 10' PINE

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
V2	V3408-2	87353.1690	2293369.5530	38.78	16-02.03	18.56 LT
V113	V3408-113	87759.5650	2293338.6700	38.79	20-09.59	18.50 LT
V1	V3408-1	88157.1400	2293308.4580	39.01	24-08.31	18.44 LT

BM45 ELEVATION = 34.27
N 80429 E 2292273
L STATION 109-71 228' RIGHT
RR SPIKE IN BASE OF 12' PINE

BM15 ELEVATION = 40.92
N 81634 E 2294082
Y2 STATION 22-98 249' RIGHT
RR SPIKE IN BASE OF 14' PINE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST BASE RESET 1981" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 74,896,0215(fft) EASTING: 2,288,816.4689(fft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000100000 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST" TO -L- STATION 10+00.00 IS S 41°39' 55" W 3035.3412 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: [HTTP://WWW.NCDOT.ORG/DOE/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOE/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R3324_LS_GPSALIB_071121.HTM
R3324_LS_CONTROL_071121.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 HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-3324

Design Alignments

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	72628.4940	2286798.6440
TS	19+73.00	73367.8553	2287431.1579
SC	21+23.00	73483.4874	2287526.6769
CS	29+54.28	74248.1507	2287822.6445
SRS	31+04.28	74397.9589	2287829.8658
SC	32+54.28	74547.7246	2287837.7323
CS	33+78.60	74678.6048	2287856.1991
ST	35+28.60	74816.0672	2287892.7005
TS	40+48.60	75317.5858	2288030.1015
SC	41+98.60	75461.3727	2288072.7340
CS	49+94.47	76077.9146	2288552.7393
SRS	51+44.47	76154.5059	2288681.6810
SC	52+94.47	76230.9328	2288810.7238
CS	61+55.68	76898.3353	2289329.0413
ST	63+05.68	77042.2814	2289371.1443
TS	74+82.68	78178.1927	2289679.4207
SC	76+32.68	78322.1728	2289721.4136
CS	84+56.05	78976.6564	2290199.1746
ST	86+06.05	79060.5282	2290323.6096
PC	91+55.55	79359.2146	2290784.7434
PT	96+10.38	79642.4574	2291139.6637
TS	120+07.19	81315.1268	2292856.3089
SC	121+57.19	81417.2592	2292966.1234
CS	127+63.10	81661.5256	2293511.8751
ST	129+13.10	81675.3786	2293661.2014
POT	130+00.63	81686.9712	2293828.3326

Y2			
TYPE	STATION	NORTH	EAST
POT	10+00.00	80328.2317	2293937.1030
POT	23+63.09	81686.9712	2293828.3326
TS	65+86.68	85897.7176	2293499.0912
SC	67+36.68	86046.9467	2293484.1812
CS	71+74.68	86458.6423	2293342.4850
ST	73+24.68	86585.4376	2293262.3937
POT	97+44.52	88602.9923	2291926.3106

Y3			
TYPE	STATION	NORTH	EAST
POT	10+00.00	86265.0834	2293430.8853
POT	18+00.00	86503.6319	2294194.4917

Y4			
TYPE	STATION	NORTH	EAST
POT	10+00.00	86794.1431	2293124.1828
PC	10+56.44	86825.3070	2293171.2420
PT	15+87.38	87280.1451	2293393.7314
POT	30+87.38	88775.8158	2293279.8493

Y5			
TYPE	STATION	NORTH	EAST
POT	10+00.00	74997.3110	2288824.9153
PC	11+25.00	75109.7115	2288879.6065
PT	12+02.33	75171.0652	2288925.8779
POT	13+43.00	75265.5481	2289031.1767

Y			
TYPE	STATION	NORTH	EAST
POT	10+81.68	74070.8509	2287796.8501
PC	12+51.59	74080.2776	2287966.5033
PT	14+14.13	74150.7248	2288108.0370
POT	25+23.46	74997.3110	2288824.9153

Y1			
TYPE	STATION	NORTH	EAST
POT	10+00.00	75619.1169	2288573.9762
POT	51+00.00	74527.4095	2290525.9599

DATUM DESCRIPTION

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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 STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
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[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 R3324_LS_GPSCALIB_071121.TXT
 R3324_LS_CONTROL_071121.TXT

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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

SURVEY CONTROL SHEET R-3324

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+74.69	-50.00	72793.7386	2286874.2085
L	11+74.71	-28.04	72779.4820	2286890.9060
L	13+04.55	31.86	72839.2062	2287020.8269
L	13+04.57	65.00	72817.6741	2287046.0230
L	14+90.00	65.00	72958.8600	2287166.5683
L	16+00.27	86.00	73028.7196	2287254.2078
L	17+60.00	95.00	73144.2450	2287364.8823
L	18+25.00	70.00	73209.8898	2287388.1397
L	19+32.57	-50.00	73369.6350	2287366.8804
L	19+73.00	70.00	73322.3507	2287484.3494
L	19+92.61	-63.00	73423.6727	2287395.9933
L	21+00.00	-63.00	73504.5182	2287463.1547
L	21+23.00	-63.00	73521.9128	2287476.7499
L	21+35.00	100.00	73432.6942	2287613.7055
L	21+35.00	110.00	73426.6620	2287621.6791
L	21+97.50	110.00	73481.1477	2287661.0824
L	22+00.00	-68.00	73584.2807	2287515.9846
L	22+10.00	61.23	73519.6155	2287628.3132
L	22+88.59	-137.19	73690.9260	2287502.4198
L	23+00.10	-119.92	73755.2634	2287558.2047
L	24+53.34	-101.86	73808.1512	2287604.0619
L	27+50.00	-120.00	74073.0274	2287674.5042
L	28+50.00	-105.00	74160.7902	2287706.5593
L	28+85.00	85.00	74168.2156	2287899.5548
L	29+54.28	80.00	74241.5462	2287902.3714
L	29+54.28	-110.00	74257.2318	2287713.0200
L	29+89.00	75.73	74278.1288	2287900.7173
L	29+94.00	68.84	74283.7215	2287894.1471
L	31+04.28	-114.00	74401.4838	2287715.9187
L	31+04.28	65.00	74395.9496	2287894.8335
L	31+04.38	58.00	74396.2660	2287887.8399
L	31+70.00	66.50	74460.7570	2287898.6056
L	32+30.00	67.00	74518.4239	2287902.4577
L	32+54.28	-120.00	74559.1763	2287718.2799
L	32+54.28	44.00	74543.5254	2287881.5298
L	33+10.00	40.00	74597.3163	2287883.9663
L	33+15.00	-115.00	74624.9376	2287731.3603
L	33+78.60	75.00	74655.5028	2287929.6612
L	33+78.67	-108.99	74692.6206	2287749.4597
L	34+22.00	98.00	74690.1649	2287960.9673
L	34+29.85	-106.09	74745.7503	2287764.4308
L	34+76.00	99.50	74739.7726	2287975.1060
L	34+76.22	-104.81	74792.4065	2287777.6901
L	35+28.60	100.27	74789.5713	2287989.4108
L	35+30.61	-104.47	74845.6103	2287792.4717
L	38+40.00	101.50	75089.5788	2288072.8794
L	38+50.00	-103.33	75163.3482	2287877.9681
L	41+10.00	-95.00	75402.8069	2287955.1745
L	41+20.00	65.00	75368.2970	2288111.7310
L	41+98.60	63.00	75440.9633	2288132.3365
L	41+98.60	-85.00	75488.9088	2287992.3178
L	43+00.00	-80.00	75588.0150	2288036.3663
L	43+90.98	46.59	75615.6798	2288190.4498
L	45+04.24	54.00	75705.0724	2288252.3373
L	45+50.00	-65.00	75810.4544	2288180.4831
L	46+00.00	55.00	75778.6257	2288306.5815
L	46+53.52	-65.00	75896.2430	2288247.8753
L	47+53.52	-65.00	75973.3044	2288319.7626
L	49+94.47	65.00	76031.8388	2288582.7730
L	49+94.47	-65.00	76132.3677	2288517.2449
L	51+44.47	65.00	76097.9419	2288713.7048
L	51+44.47	-60.00	76206.7185	2288652.1202
L	52+94.47	-70.00	76289.7218	2288772.7258
L	52+94.47	75.00	76167.9446	2288851.4361
L	54+50.00	-70.00	76376.8287	2288891.0471
L	54+50.00	75.00	76265.4986	2288983.9481
L	55+30.00	75.00	76321.7575	2289047.2346
L	55+30.00	115.00	76292.7078	2289074.7321
L	55+50.00	115.00	76307.8170	2289090.4439
L	55+50.00	-70.00	76440.1671	2288961.1828
L	58+28.50	-70.00	76643.0833	2289128.0899
L	59+00.00	115.00	76608.1462	2289323.7157
L	59+75.00	-85.00	76769.7666	2289183.7138

ROW MARKER IRON PIN AND CAP

L	60+00.00	75.00	76721.8031	2289338.3643
L	61+55.68	75.00	76874.4833	2289400.1474
L	61+55.68	-105.00	76931.7282	2289229.4927
L	62+45.68	-105.95	77013.1329	2289253.2659
L	62+45.68	70.95	76965.2003	2289423.5473
L	62+45.68	-208.00	77040.7856	2289155.0291
L	63+05.68	-105.00	77069.7828	2289269.8098
L	63+05.68	70.00	77023.9473	2289438.7007
L	63+06.55	-207.68	77097.5155	2289170.9446
L	63+70.00	-85.00	77126.6191	2289305.9582
L	65+25.00	-85.00	77276.2081	2289346.5553
L	66+00.00	75.00	77306.6832	2289520.6136
L	71+00.00	-60.00	77824.5880	2289521.2835
L	74+82.68	-60.00	78193.9079	2289621.5154
L	74+82.68	60.00	78162.4779	2289737.3262
L	76+32.68	55.00	78304.8017	2289773.5983
L	76+32.68	-65.00	78342.7024	2289659.7408
L	76+94.63	-521.63	78568.0647	2289255.6091
L	77+46.31	-65.00	78454.0393	2289702.1598
L	77+65.30	-537.35	78665.2868	2289279.0540
L	77+66.11	55.00	78423.9467	2289820.0096
L	78+43.17	-65.00	78545.7966	2289745.7018
L	78+72.83	55.00	78515.5221	2289665.5681
L	80+50.00	-73.00	78734.4799	2289853.8446
L	80+70.00	90.03	78652.7265	2289996.2854
L	80+70.00	55.00	78673.9265	2289968.3950
L	83+75.00	-75.00	78984.6317	2290087.3781
L	84+56.05	-80.00	79041.2511	2290151.9780
L	84+56.05	85.00	78900.0245	2290249.3210
L	86+06.05	-85.00	79131.8746	2290277.3067
L	86+06.05	85.00	78989.1817	2290369.7119
L	88+25.00	-85.00	79250.8871	2290461.0868
L	91+55.55	-70.00	79417.9705	2290746.6942
L	91+55.55	85.00	79287.8681	2290830.9460
L	92+10.00	85.00	79319.1168	2290877.9789
L	93+00.00	-70.00	79497.7397	2290861.7829
L	93+00.00	75.00	79381.2177	2290948.0825
L	93+60.00	-70.00	79532.9688	2290908.0746
L	93+60.00	75.00	79418.7376	2290997.3842
L	96+10.38	-70.00	79692.5929	2291090.8126
L	96+10.38	75.00	79588.7408	2291192.0043
L	97+10.00	75.00	79658.2645	2291263.3557
L	97+45.00	90.00	79671.9467	2291298.8916
L	98+90.00	90.00	79773.1384	2291402.7436
L	100+25.00	75.00	79878.0946	2291488.9654
L	103+00.00	75.00	80070.0098	2291685.9262
L	103+00.00	75.00	80070.0098	2291685.9262
L	103+00.00	-70.00	80173.8619	2291584.7345
L	103+60.00	-70.00	80215.7343	2291627.7078
L	103+60.00	75.00	80111.8822	2291728.8994
L	106+50.00	80.00	80310.6844	2291940.0929
L	106+60.00	-75.00	80428.6774	2291839.0848
L	112+10.00	70.00	80708.6557	2292334.1980
L	112+10.00	85.00	80697.9124	2292344.6661
L	112+60.00	-70.00	80843.8204	2292272.3068
L	112+60.00	-80.00	80858.9826	2292265.3280
L	112+95.00	65.00	80771.5561	2292391.5874
L	112+95.00	85.00	80757.2317	2292405.5449
L	113+50.00	-80.00	80913.7912	2292329.7879
L	113+50.00	-65.00	80903.0479	2292340.2561
L	120+07.19	-55.00	81354.5223	2292817.9270
L	120+07.19	60.00	81272.1557	2292898.1836
L	121+57.19	65.00	81367.6578	2293008.1317
L	121+57.19	-65.00	81466.8647	2292924.1199
L	122+50.00	-65.00	81527.1501	2293001.8791
L	122+50.00	65.00	81421.0695	2293077.0237
L	123+10.00	65.00	81452.3533	2293123.9892
L	123+10.00	-65.00	81562.4616	2293054.7994
L	126+90.00	65.00	81585.3316	2293453.2428
L	127+63.10	-65.00	81725.8984	2293502.8680
L	127+63.10	80.00	81582.2973	2293522.9608
L	128+20.00	-49.00	81716.8806	2293563.6883
L	128+20.00	-40.00	81712.9472	2293625.2823
L	129+13.10	80.00	81595.5705	2293666.7394
L	129+20.00	-40.00	81715.7603	2293665.3194
L	129+91.96	-76.14	81756.7911	2293734.6947
L	129+95.00	80.00	81601.2393	2293748.4430

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y	14+14.13	-44.00	74179.1597	2288074.4572
Y	12+51.59	-70.00	74150.1706	2287962.6136
Y	13+00.00	-57.00	74143.2538	2287997.3285
Y	24+04.09	52.00	74872.6866	2288787.4558
Y	23+49.32	-44.00	74892.8485	2288678.8019
Y	18+30.00	38.91	74442.9548	2288406.4886
Y	19+40.00	55.00	74516.5037	2288489.8438
Y	19+67.00	52.00	74539.0474	2288505.0824
Y	13+50.00	-44.00	74146.7761	2288036.6171

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	23+50.00	75.85	75186.5412	2287855.8427
Y1	26+20.00	-95.00	75279.3301	2288160.7857
Y1	23+40.00	-95.00	75353.8858	2287890.8942
Y1	18+05.64	-95.00	75496.1684	2287375.8304
Y1	26+10.00	76.04	75117.1258	2288105.6052
Y1	18+05.50	-74.55	75476.4967	2287370.2516
Y1	26+00.00	76.09	75098.4371	2288173.0643
Y1	23+20.00	75.83	75194.5511	2287826.1300
Y1	19+10.00	-95.00	75468.3814	2287476.4195
Y1	28+00.00	-90.00	75226.5816	2288332.9577
Y1	27+10.00	-95.00	75255.3654	2288247.5382
Y1	35+80.00	-90.00	75018.8909	2289084.7985
Y1	35+80.00	-73.24	75002.7379	2289080.3364
Y1	34+25.00	76.64	74899.5353	2288891.0221
Y1	43+71.90	77.34	74646.7301	2289803.5502
Y1	45+58.91	77.48	74596.8025	2289983.7695
Y1	32+55.00	-73.48	75089.5091	2288767.1339
Y1	29+02.04	-90.00	75199.4135	2288

SURVEY CONTROL SHEET R-3324

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	25+00.00	-60.00	81818.7912	2293757.8423
Y2	71+57.56	171.83	86526.9341	2293581.2278
Y2	77+00.00	75.00	86939.7716	2293117.6960
Y2	16+49.95	50.34	80980.1238	2293935.4192
Y2	83+50.00	-75.00	87398.8923	2292633.7458
Y2	72+33.30	101.53	86562.8624	2293398.2026
Y2	28+85.00	-60.00	82202.6195	2293727.8284
Y2	31+20.00	-60.00	82436.9044	2293789.5095
Y2	26+77.73	50.30	82004.5755	2293053.9496
Y2	26+76.60	75.30	82005.4010	2293878.9629
Y2	22+13.84	-50.04	81534.2040	2293790.3650
Y2	72+44.03	-74.51	86477.9524	2293243.6189
Y2	66+64.54	-74.50	85968.2009	2293418.4099
Y2	63+46.02	-75.59	86651.0891	2293442.4950
Y2	48+84.85	-79.17	84194.8866	2293552.8279
Y2	43+30.44	-78.57	83642.2131	2293596.6455
Y2	63+45.68	74.41	85663.2466	2293592.0644
Y2	48+84.74	70.83	84206.4775	2293702.3796
Y2	43+30.75	71.43	83654.2183	2293746.1643
Y2	33+84.27	74.36	82710.8400	2293822.8628
Y2	31+23.77	-75.30	82439.4739	2293693.9676
Y2	32+65.00	-75.48	82580.2565	2293682.7739
Y2	33+40.00	-85.00	82654.2061	2293667.4360
Y2	34+55.00	-85.00	82768.9362	2293658.4714
Y2	36+00.00	-76.31	82914.1726	2293655.8345
Y2	27+60.00	-60.00	82078.0000	2293737.5746
Y2	26+72.00	-60.00	81990.2678	2293744.4345
Y2	26+12.00	-60.00	81930.4504	2293749.1116
Y2	31+55.00	-75.34	82470.6024	2293691.4921
Y2	32+15.00	-75.42	82530.4136	2293696.7356
Y2	32+75.00	74.51	82601.9179	2293831.5249
Y2	32+15.00	74.58	82542.1067	2293836.2814
Y2	59+99.82	73.57	85318.3729	2293618.1803
Y2	60+59.82	73.71	85378.2014	2293613.6497
Y2	60+00.17	-76.43	85307.0269	2293468.6100
Y2	60+60.19	-76.29	85366.8750	2293464.8780
Y2	37+15.00	73.15	83048.4736	2293795.8769
Y2	37+15.00	275.00	83056.2082	2293997.1103
Y2	37+75.00	275.00	83116.0256	2293992.4331
Y2	37+75.00	73.15	83100.2910	2293791.1997
Y2	68+92.99	101.37	86227.4619	2293549.1031
Y2	70+96.45	194.05	86474.4087	2293553.5469
Y2	69+12.65	127.60	86255.5899	2293568.1828
Y2	70+07.00	163.00	86367.4512	2293566.6816

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+50.38	-60.00	86927.1591	2293202.3538
Y4	12+68.61	60.00	86943.9938	2293369.1805
Y4	11+00.32	60.00	86804.1777	2293244.1016
Y4	15+27.83	-60.00	87223.2269	2293334.7659
Y4	14+48.37	71.87	87127.4362	2293455.4109
Y4	20+00.00	50.00	87695.3739	2293412.2586
Y4	20+00.00	-50.00	87687.7815	2293312.5473
Y4	15+87.38	-60.00	87275.5898	2293333.9046
Y4	16+40.00	-50.00	87328.8194	2293339.8781

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST BASE RESET 1981" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 74,896,0215(FF) EASTING: 2,288,816,4689(FF) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000100000 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST" TO "L" STATION 10+00.00 IS S 41°39' 55" N 3035.3412 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

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 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/PRCONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRCONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 R3324_LS_GPSALIB_071211.TXT
 R3324_LS_CONTROL_071211.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 HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

R12/99

*****SYSTEM*****