



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

April 18, 2017

To: Division Engineers, Division of Highways
Unit Heads, Technical Services

From: Mr. Mike L. Holder, PE
Chief Engineer, Division of Highways

Subject: Mapping Requirements for Transportation Facility Plans

The following concerns have been expressed by the NC Board of Examiners for Engineers and Surveyors (NCBEES) regarding NCDOT highway and Secondary Road plans:

1. Lack of public availability of plans for NCDOT land acquisition.
2. Lack of metadata on plans, including coordinate system, control points set, and closures.
3. Complexity of plans (readability, alignments).
4. Lack of consistency in locating, documenting, and representing property boundaries.
5. Complexity of right of way deeds, based on station/offset.
6. Chain of responsible charge for the PLS doing survey/mapping work.
7. Proper monumentation of the right of way (not part of the committee discussion but as a result of conversation with NCBEES).

The Recommendations to address these concerns are as follows:

Issue #1: Lack of public availability of plans for NCDOT land acquisition.
Recommended Solution: Prepare and record maps for all property acquired by NCDOT through fee simple, easement, or condemnation proceedings.

For property not contiguous with highway/secondary road projects (ex. wetland mitigation properties), this action would require the preparation and recordation of a map meeting the requirements of GS 47-30 (attached). This follows a statewide standard for public/private property acquisition.

For rights of way and easements acquired through fee or condemnation in association with a major or secondary road project (any project going through the Design-Bid-Build or Design-Build process), this would require preparation and recordation of plans. These plans would need to meet certain criteria which will address the other items of concern as listed above.

For new secondary roads accepted onto the NCDOT system and not previously recorded, a set of plans showing as-built road features and as-acquired right of way (by easement

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
OFFICE OF THE CHIEF ENGINEER
MAIL SERVICE CENTER 1536
RALEIGH, NC 27699-1536

Telephone: (919) 707-2500
Fax: (919) 733-9428
Customer Service: 1-877-368-4968

Location:
1 SOUTH WILIMINGTON STREET
RALEIGH, NC 27601

Website: www.ncdot.gov

agreement) should be prepared. These plans should meet the conditions stated in Issues 2, 3, 4, and 7 below.

Issue #2: Lack of metadata on plans, including coordinate system, control points set, and closures.

Recommended Solution: Include basic metadata on all project plans (Sheets 1C-1 thru 1C-7 in attached “B-3159” plans).

This metadata would be defined in the survey control sheets, and should include:

- 1) Horizontal and vertical datum used for project coordinates (datum description, Sheet 1C series of sheets – see attachments) with statement of localized (ground) distances,
- 2) North reference (Sheet 1C series – North Arrow),
- 3) Survey control points, with coordinates, established on each project, both in graphic and tabular form (Sheets 1C series),
- 4) Closure Report (Sheet 1C series) with RMSE of GPS controls set, Error of Closure for primary traverse points set,
Note: RMSE and error of closure not included in the attached examples
- 5) Table of Centerline Alignments: Control Points (Sheet 1D series of sheets – see attachments; Final Alignments),
- 6) Table of Right Of Way/Permanent Easement points set (Sheets E series of sheets – see attachments).

Items 1-4 are typical procedures for most firms that perform survey work for NCDOT.

Items 5-6 are semi-automated functions using an mdl (Microstation Development Language) application developed by NCDOT and available to all in-house and private design/survey personnel.

Issue #3: Complexity of plans (readability, alignments).

Recommended Solution: Provide a coordinate list for key points on projects, along with a separate set of plans showing existing topography, property and proposed rights of way and easements (new design removed).

Items 5 and 6 above (tables of alignment controls and right of way/easement points) will greatly relieve the need to compute entire centerlines. Because any portion of the proposed right of way or design alignments can be isolated, this will reduce the complexity for private industry.

To address the readability, it is recommended that a separate set of “Right Of Way” sheets, including existing topography, property, centerline data, and proposed rights of way and easements (no design information) be developed and included in the plan/profile sheets that are recorded at the appropriate date. These R/W sheets would need to be signed and sealed by a Professional Land Surveyor.

To allow for property sales and development prior to construction, and to allow for public availability of Design-Build property acquisition prior to project completion, these RW sheets could be placed on a public site such as Connect NCDOT (<http://connect.ncdot.gov/>) at the time right of way is approved for purchase. These plans would be labelled as “Preliminary” and revised as necessary during the right of way acquisition phase.

Issue #4: Lack of consistency in location, documentation, and representation of property boundaries.

Recommended Solution: Locate and document front property corners when found.

When NCDOT realigns a road, existing centerlines may be obliterated. In many cases this may or may not be a property line. By inclusion of existing centerlines on plans, private surveyors can determine if in fact a centerline was a boundary, and where it was.

Note: NCDOT should not label this line as a boundary, only as existing centerline. (See Issue #2, Item #3)

During initial surveys, efforts should be made to locate and survey front property corners on all affected properties. This information should be shown on plans, with those corners accurately identified (EIP, Axle, etc.) and related to the appropriate centerline (ex., Sheet RW-6, properties of Bobby R. Callicutt and Richard Purvis, show existing iron pins found, tied to centerline with distance along an extension of the property lines).

Issue #5: Complexity of right of way deeds, based on station/offset.

Recommended Solution: The above mentioned recommendations.

NCDOT provides a metes and bounds description of property obtained for right of way on major projects. Secondary road rights of way may be defined by the road “*as built*.” Publicly available maps and deeds/easement agreements, with those items described above, will provide the property owner, surveyor, or other interested parties with the necessary information to understand the deeds.

Issue #6: Chain of responsible charge for the PLS doing survey/mapping work.

Recommendation: A public facing web address or some other offer of public access, providing signed/sealed *.PDF’s of the original mapping or survey reports provided.

As a part of the process of developing base mapping for any project, the surveyor(s) and mapper(s) involved would be responsible to provide any required sealed *.PDF’s of the CADD files and reports delivered. Once final mapping is compiled, *.PDF’s of individual components would be made available through some publicly accessible source. The address per each project would be included in the notes on plans.

One option could be placing those on the Connect NCDOT site (<https://connect.ncdot.gov/>) as part of the project data. These files could include a complete set of base mapping compiled and signed/sealed by a PLS.

Issue #7: Proper monumentation of the right of way/easement lines.

Recommendation: All right of way / permanent easement monuments will be placed by a PLS prior to construction, with concrete markers identified as “Witness Post” or similar to be placed later by others.

As a part of the process of developing the “Right of Way” sheets for any project, a PLS will set proper monumentation prior to the time that the plans are recorded. This monumentation would be an iron pin and cap. For those Divisions still using concrete markers, the contractor would be responsible for providing a PLS supervising that placement of those concrete markers at the locations previously designated. That surveyor would then need to provide the Resident Engineer and Location & Surveys with a signed/sealed statement of the replacement of iron pin and cap with concrete monuments, as per general survey practices and procedures. One alternative would be the placement of

Mapping Requirements

April 18, 2017

Page 4 of 4

a concrete “Witness Post” which can be placed alongside the previously set monument. This Witness Post may be placed by others, not under the supervision of a PLS.

These requirements should be followed on all projects involving right of way or land acquisition as of **July 1, 2017**, where plan sheets are not in existence. The Location & Surveys Unit has agreed to assist in implementation of these requirements. The Location & Surveys Unit will make available training in the necessary applications and procedures involved in meeting these requirements. Additionally, Location & Surveys personnel in each Division can assist in negotiating with any private firms as to scope and procedures.

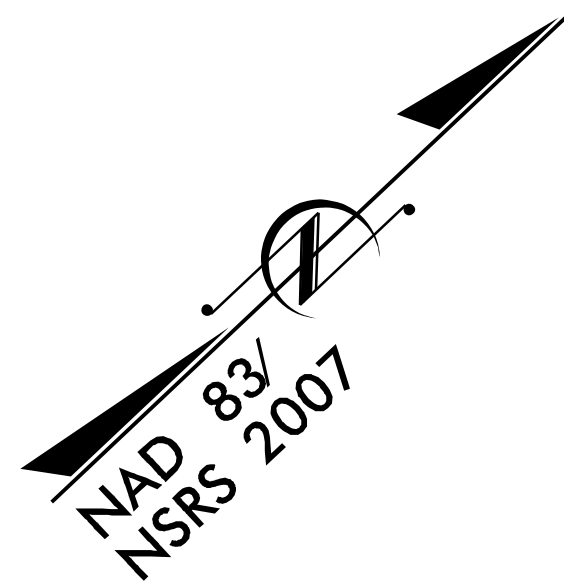
Thank you for your time and consideration in this matter.

MLH/jdb

Attached:

- ❖ Fabricated Plan Sheets: B-3159, showing PLS statements, including:
 1. Cover Sheet
 2. Survey Sheets 1C-1 - 1C-4: Survey Control Data
 3. Survey Sheet 1-D: Proposed Alignment Data
 4. Survey Sheets 1E-1 - 1E-2: Right of Way and Permanent Easement Data
 5. Right Of Way Sheets RW1 Cover Sheet, RW4 - RW7
- ❖ Proposed Standard Index of Sheets for NCDOT Roadway Projects
- ❖ GS 47-30 (mapping law)
- ❖ Proposed 2017 House Bill H 501

TIP PROJECT: B-3159



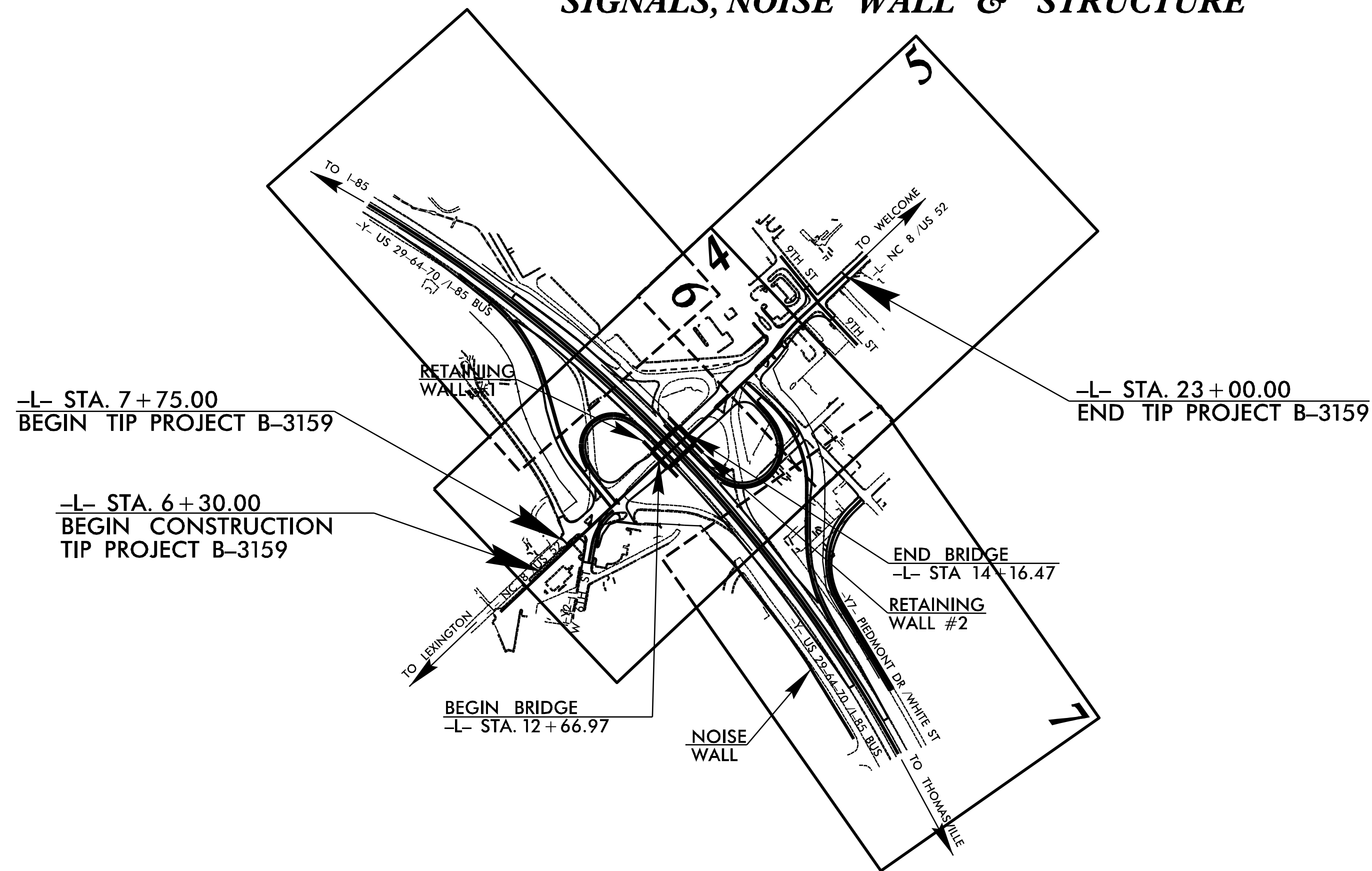
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

 PLAN FOR NEW
 RIGHT OF WAY AND EASEMENTS

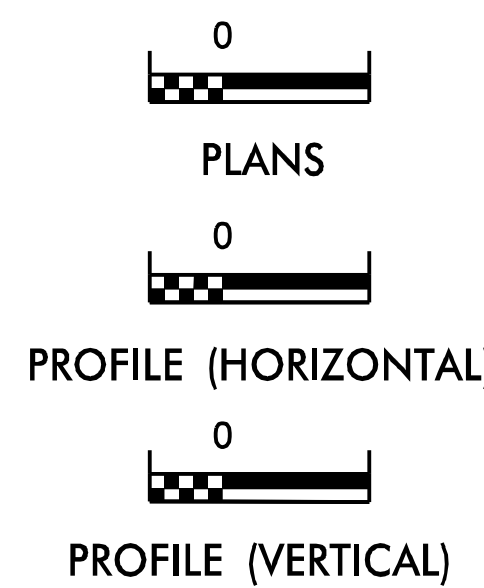
DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3159	RW-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

LOCATION: BRIDGE NO. 27 OVER US. 29-64-70 /I-85 BUS LOOP ON NC 8 /US 52
TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALL, SIGNALS, NOISE WALL & STRUCTURE



GRAPHIC SCALE



DESIGN DATA

ADT 2015 = 25,000
 ADT 2035 = 28,600
 DHV = 10 %
 D = 60 %
 T = 5 % *
 V = 40 MPH
 * TTST = 2 DUAL = 3
 FUNC CLASS = ARTERIAL
 STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY OF TIP PROJECT B-3159 = 0.261 MILES
 LENGTH STRUCTURE OF TIP PROJECT B-3159 = 0.028 MILES
 TOTAL LENGTH OF TIP PROJECT B-3159 = 0.289 MILES

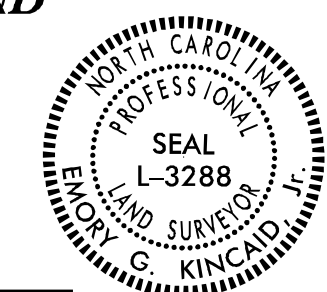
Prepared In the Office of:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 JUNE 30, 2014

LETTING DATE:
 OCTOBER 20, 2015

PROFESSIONAL LAND SURVEYOR



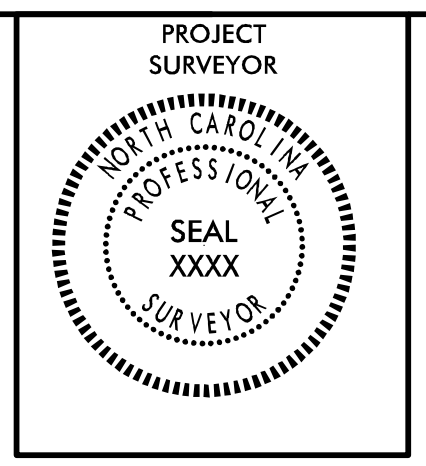
SIGNATURE: _____

8/17/99

NAD 83/NSRS 2007

I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item R/W and Easement Staking, performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.

PROJECT REFERENCE NO.	SHEET NO.
B-3159	RW-4



I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my signature, registration number and seal this ____ day of ____ 20__.

John Doe, Professional Land Surveyor, License # XXXX
 PLS# -L- POT Sta. 17+11.67

BEGIN TIP PROJECT B-3159
 -L- POT STA 7+75.00
 -L- POT Sta. 7+00.00

JOHN L. PALMER
 MADELINE R. PALMER
 DB 224 PG 477
 DB 615 PG 444
 PB 4 PG 68

BEGIN CONSTRUCTION
 TIP PROJECT B-3159
 STA 5+30.00

BODDIE-NOELL ENTERPRISES, INC.
 DB 666 PG 820

MARGIE SWINEGOOD
 DB 584 PG 51

BEGIN CONSTRUCTION
 -Y2- POT Sta. 10+00.00

-L- POT Sta. 10+00.00
 -RPC- POT Sta. 21+22.08
 -Y2- POT Sta. 12+36.06, 14' RT

BILLIE S. PARKER
 DB 1277 PG 1505

JOHNNY LEE BARKER
 PHYLLIS J. BARKER
 DB 449 PG 323
 PB 11 PG 89

CHARLES L. SWINEGOOD
 DB 1253 PG 58

MATCHLINE SHEET 7 -Y- STA. 29+50.00

2 DEBORAH MILKULSKI
 DB 1009 PG 158
 DB 908 PG 161
 PB 14 PG 2

6 THOMAS LEROY LEE
 DB 1758 PG 318
 PB 5 PG 25

7 JOHN MILTON FRITTS
 BETTY F. FRITTS
 DB 507 PG 744
 PB 5 PG 25

8 BRAXTON E. and SARAH S. TROUBLEFIELD
 DB 648 PG 21
 PB 5 PG 25

9 RHONDA B. MILLER
 DB 1340 PG 233
 PB 5 PG 34

15 VIVIAN E. BROADWAY
 DB 514 PG 359
 PB 5 PG 25

MATCHLINE SHEET 7
 -RPA- STA. 17+00.00

J H MANAGEMENT OF N.C., LLC
 DB 1844 PG 127
 PB 5 PG 21

DAVID TODD HUNT
 DB 1206 PG 125
 PB 5 PG 34

HAYES JEWELLERS, INC.
 DB 1063 PG 1658
 PB 5 PG 34

HAYES JEWELLERS, INC.
 DB 1063 PG 1658
 PB 5 PG 34

J H MANAGEMENT OF N.C., LLC
 DB 1844 PG 127
 PB 5 PG 21

DAVID TODD HUNT
 DB 1206 PG 125
 PB 5 PG 34

HAYES JEWELLERS, INC.
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J H MANAGEMENT OF N.C., LLC
 DB 1844 PG 127
 PB 5 PG 21

DAVID TODD HUNT
 DB 1206 PG 125
 PB 5 PG 34

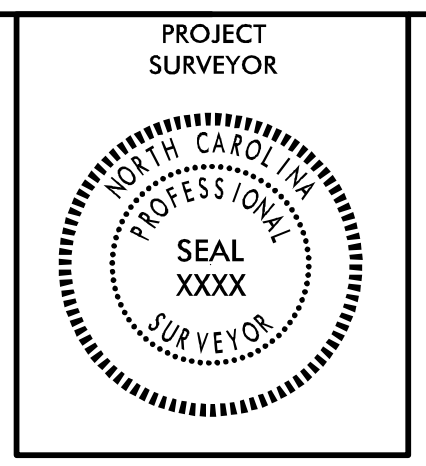
SOMKHUON HOA
 DB 1831 PG 742
 PB 5 PG 21

DAVID TODD HUNT
 DB 1206 PG 125
 PB 5 PG 34

- Notes
- 1) These right of way maps may be a compilation of work from several different sources and/or surveyors. Those individual components can be found electronically by selecting Project Data at: <http://www.ncdot.org/doh/preconstruction/highway/location/project/>
 - 2) New Right Of Way and Easements Subject To Change. Please refer to deeds for final determination.

SYTIME\$\$\$\$
 DIGN\$\$\$\$
 SERNAME\$\$\$\$

NAD 83/NSRS 2007



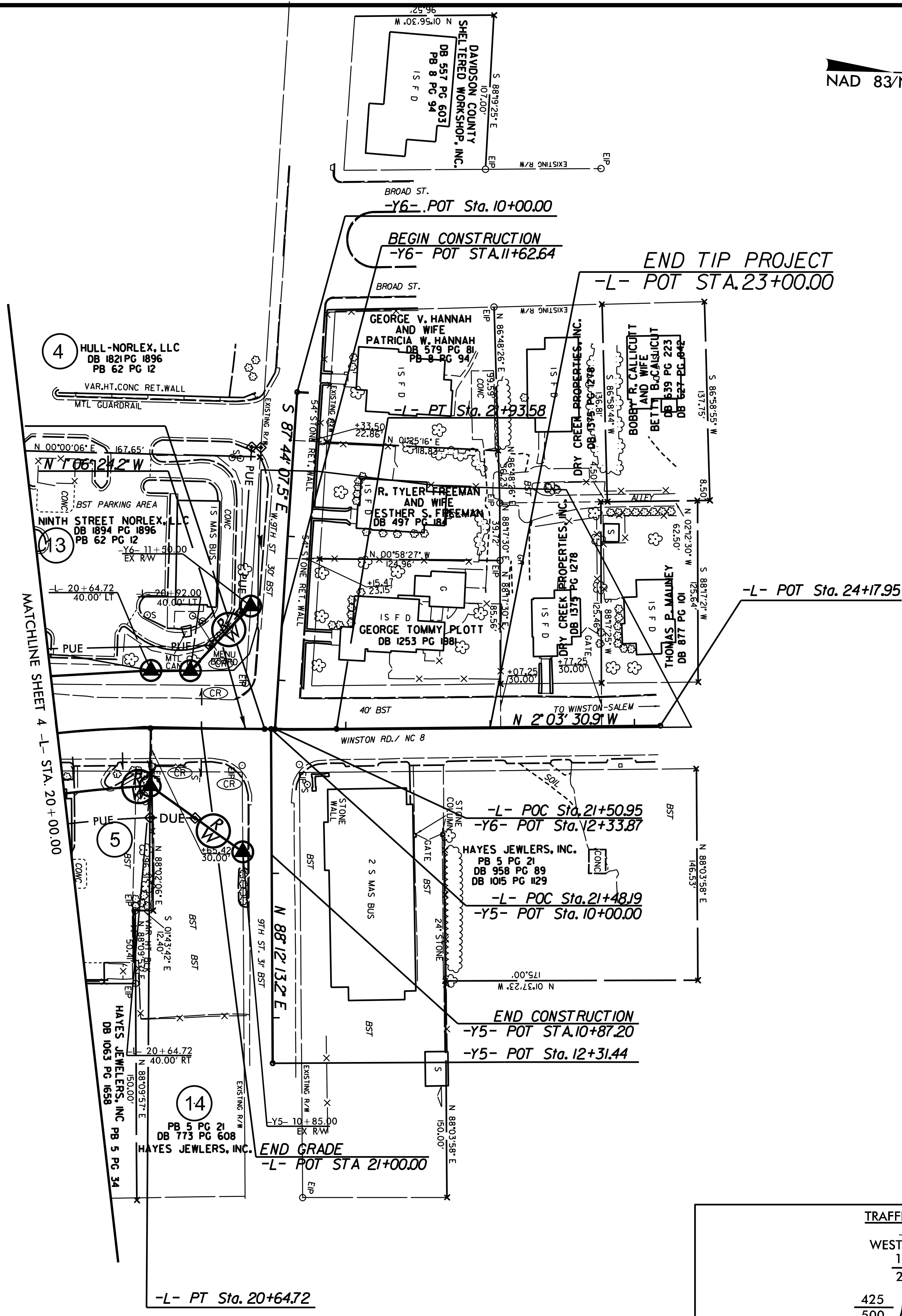
I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item R/W and Easement Staking performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.

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Witness my signature, registration number and seal this ____ day of ____ 20__.

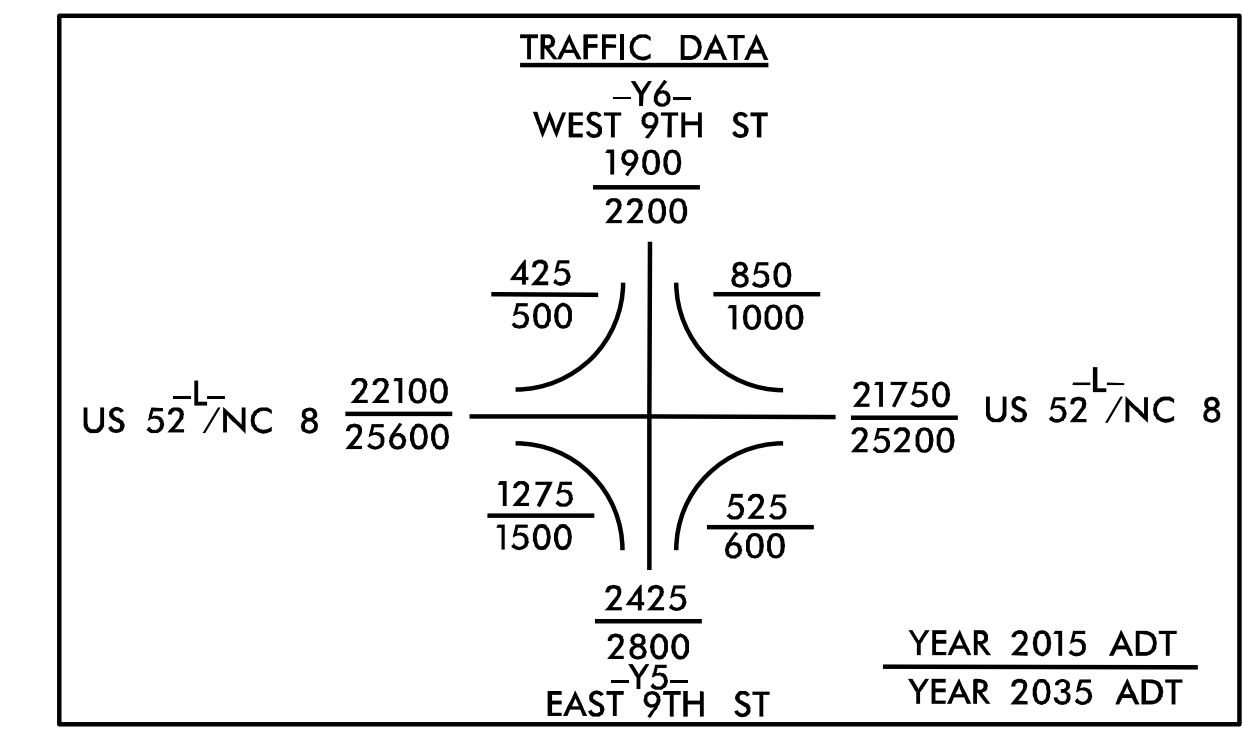
John Doe _____ XXXX
Professional Land Surveyor PLS# _____

-L-	
PI Sta 19+97.13	PI Sta 21+68.66
$\Delta = 14' 36" 42.4" (RT)$	$\Delta = 0' 57" 06.7" (LT)$
$D = 10' 44" 58.8"$	$D = 1' 54" 35.5"$
$L = 135.93'$	$L = 49.84'$
$T = 68.33'$	$T = 24.92'$
$R = 533.00'$	$R = 3,000.00'$
SE = SEE PLANS	SE = SEE PLANS



NOTES:

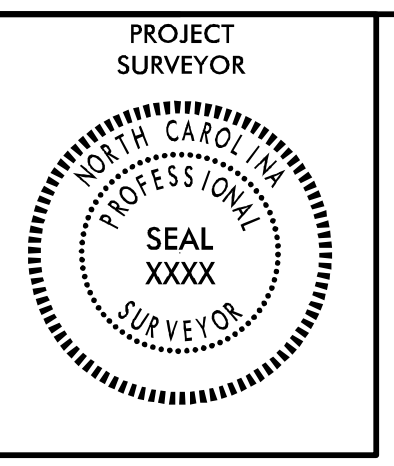
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
TIP####_LS_CONTROL_DATE.HTML
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. 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.



Notes
1) These right of way maps may be a compilation of work from several different sources and/or surveyors. Those individual components can be found electronically by selecting Project Data at: <http://www.ncdot.org/doh/preconstruction/highway/location/project/>
2) New Right Of Way and Easements Subject To Change. Please refer to deeds for final determination.

8/17/99

I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item **R/W and Easement Staking** performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.



I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

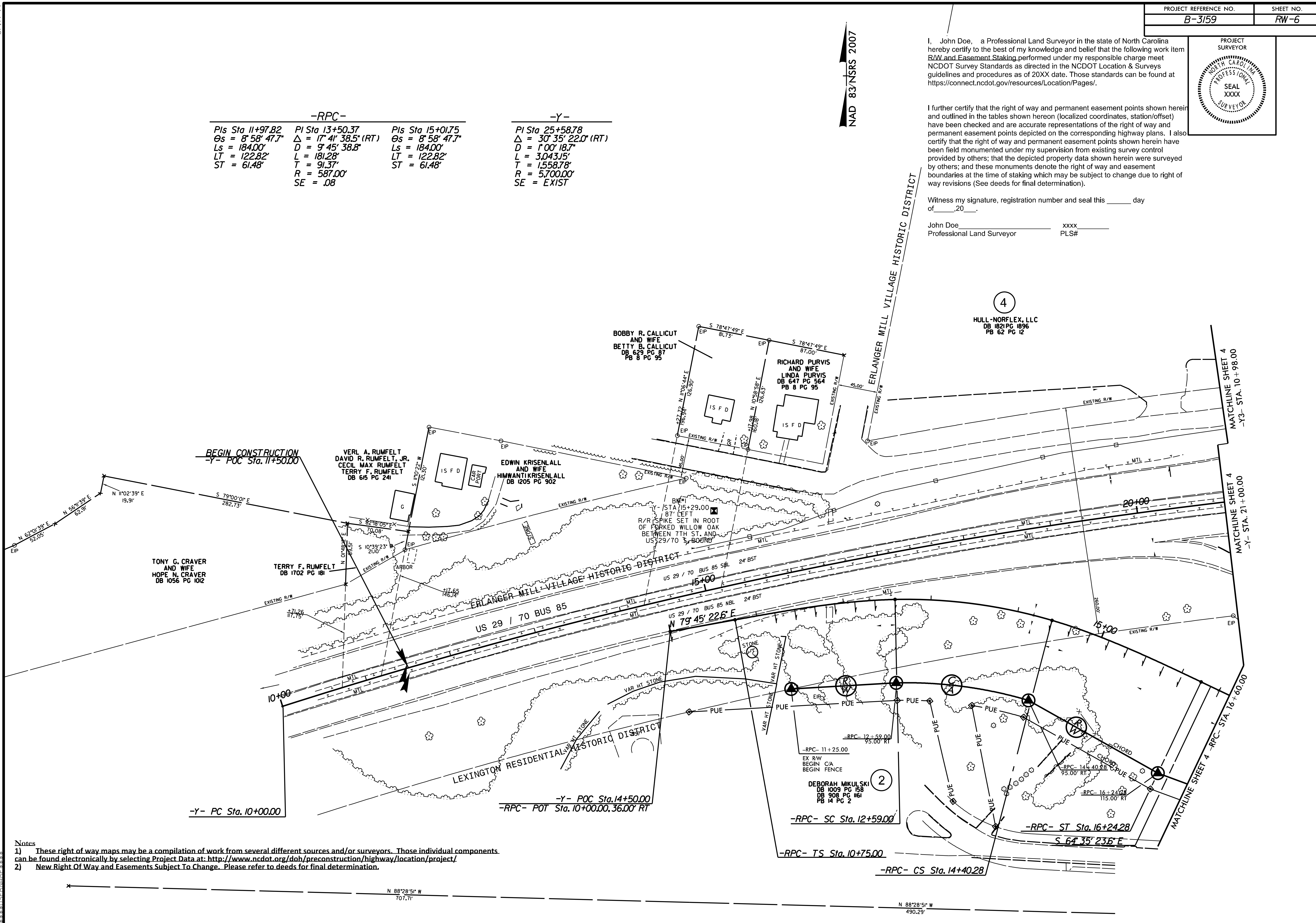
Witness my signature, registration number and seal this ____ day of ____, 20__.

John Doe _____ xxxx
Professional Land Surveyor PLS#

-RPC-			-Y-		
Pis Sta 11+97.82	PI Sta 13+50.37	Pis Sta 15+01.75	PI Sta 25+58.78		
$\Theta_s = 8^\circ 58' 47.7''$	$\Delta = 17^\circ 41' 38.5''$ (RT)	$\Theta_s = 8^\circ 58' 47.7''$	$\Delta = 30^\circ 35' 22.0''$ (RT)		
$L_s = 184.00'$	$D = 9^\circ 45' 38.8''$	$L_s = 184.00'$	$D = 1^\circ 00' 18.7''$		
$LT = 122.82'$	$L = 181.28'$	$LT = 122.82'$	$L = 3,043.15'$		
$ST = 61.48'$	$T = 91.37'$	$ST = 61.48'$	$T = 1,558.78'$		
	$R = 587.00'$		$R = 5,700.00'$		
	$SE = .08$		$SE = EXIST$		

NAD 83/NSRS 2007

SECTION 17, TOWNSHIP 10N, RANGE 10E, COUNTY OF WAKE, STATE OF NORTH CAROLINA



4
HULL-NORFLEX, LLC
DB 1821 PG 1896
PB 62 PG 12

BEGIN CONSTRUCTION
-Y- POC Sta. 11+50.00

TONY G. CRAVER
AND WIFE
HOPE N. CRAVER
DB 1056 PG 1012

TERRY F. RUMFELT
DB 1702 PG 181

VERL A. RUMFELT
DAVID R. RUMFELT, JR.
CECIL MAX RUMFELT
TERRY F. RUMFELT
DB 615 PG 241

EDWIN KRISENALL
AND WIFE
HIMWANTI KRISENALL
DB 1205 PG 902

BOBBY R. CALLICUT
AND WIFE
BETTY B. CALLICUT
DB 629 PG 87
PB 8 PG 95

RICHARD PURVIS
AND WIFE
LINDA PURVIS
DB 647 PG 564
PB 8 PG 95

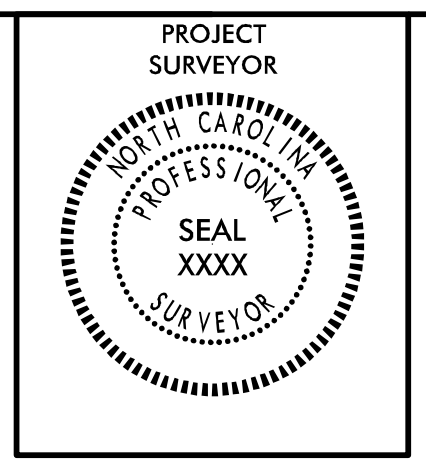
B.M.#1
Y- STA 15+29.00
87' LEFT
R/R SPIKE SET IN ROOT
OF FORKED WILLOW OAK
BETWEEN 7TH ST. AND
US 29/70 BUS 85

2
DEBORAH MIKULSKI
DB 1009 PG 158
DB 908 PG 161
PB 14 PG 2

- Notes
- 1) These right of way maps may be a compilation of work from several different sources and/or surveyors. Those individual components can be found electronically by selecting Project Data at: <http://www.ncdot.org/doh/preconstruction/highway/location/project/>
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N 88°28'51" W
707.71'

N 88°28'51" W
490.29'



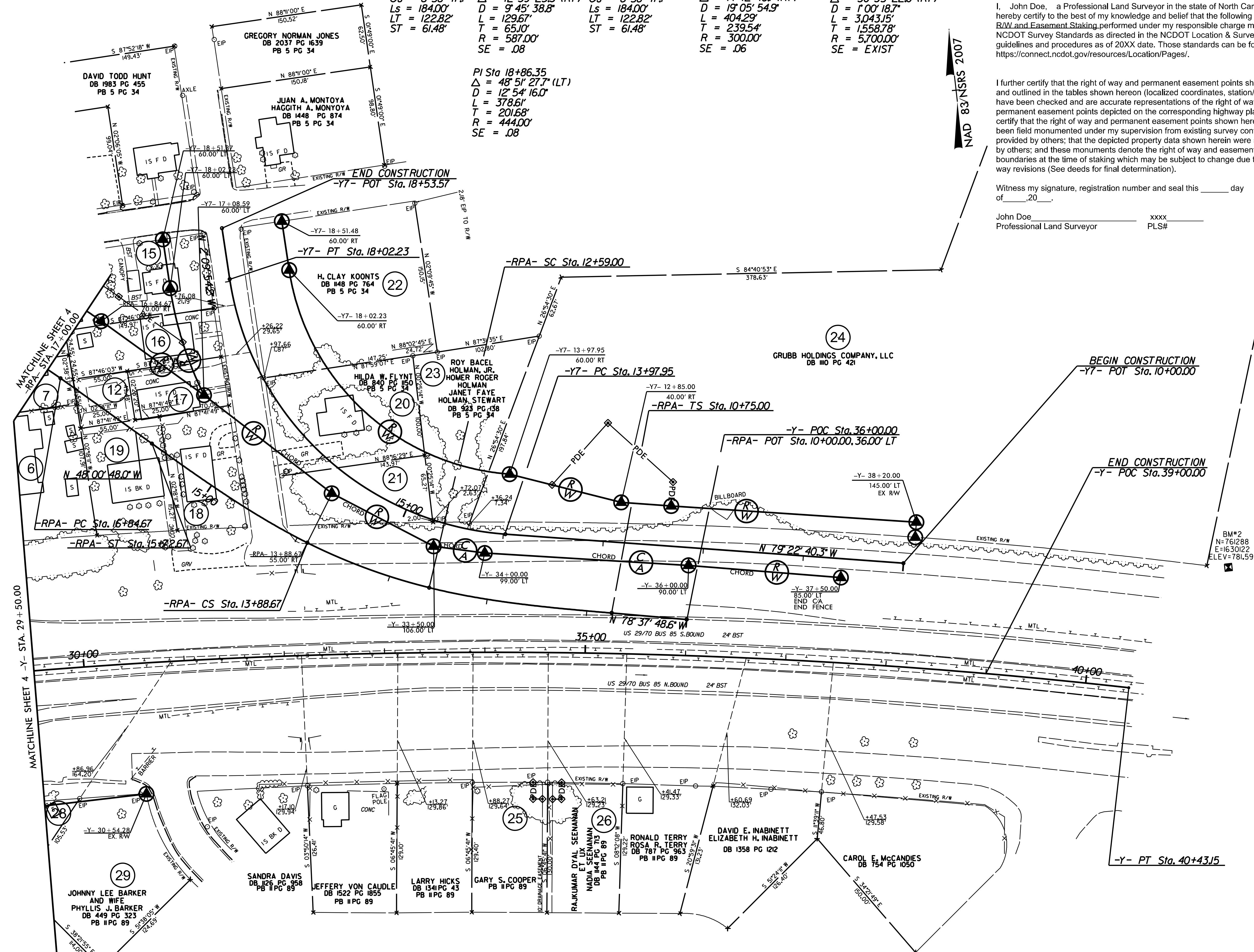
I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item R/W and Easement Staking performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my signature, registration number and seal this ____ day of ____ 20__.

John Doe _____ XXXX
Professional Land Surveyor PLS#

-RPA-	-Y7-	-Y-
Pls Sta 11+97.82 Os = 8' 58" 47.7" Ls = 184.00' LT = 122.82' ST = 61.48'	PI Sta 13+24.10 Δ = 12' 39" 25.3" (RT) D = 9' 45" 38.8" L = 129.67' T = 65.10' R = 587.00' SE = .08	Pls Sta 14+50.15 Os = 8' 58" 47.7" Ls = 184.00' LT = 122.82' ST = 61.48'
	PI Sta 16+37.49 Δ = 77' 12" 46.1" (RT) D = 19' 05" 54.9" L = 404.29' T = 239.54' R = 300.00' SE = .06	PI Sta 25+58.78 Δ = 30' 35" 22.0" (RT) D = 1' 00" 18.7" L = 3,043.15' T = 1,558.78' R = 5,700.00' SE = EXIST
	PI Sta 18+86.35 Δ = 48' 51" 27.7" (LT) D = 12' 54" 16.0" L = 378.61' T = 201.68' R = 444.00' SE = .08	



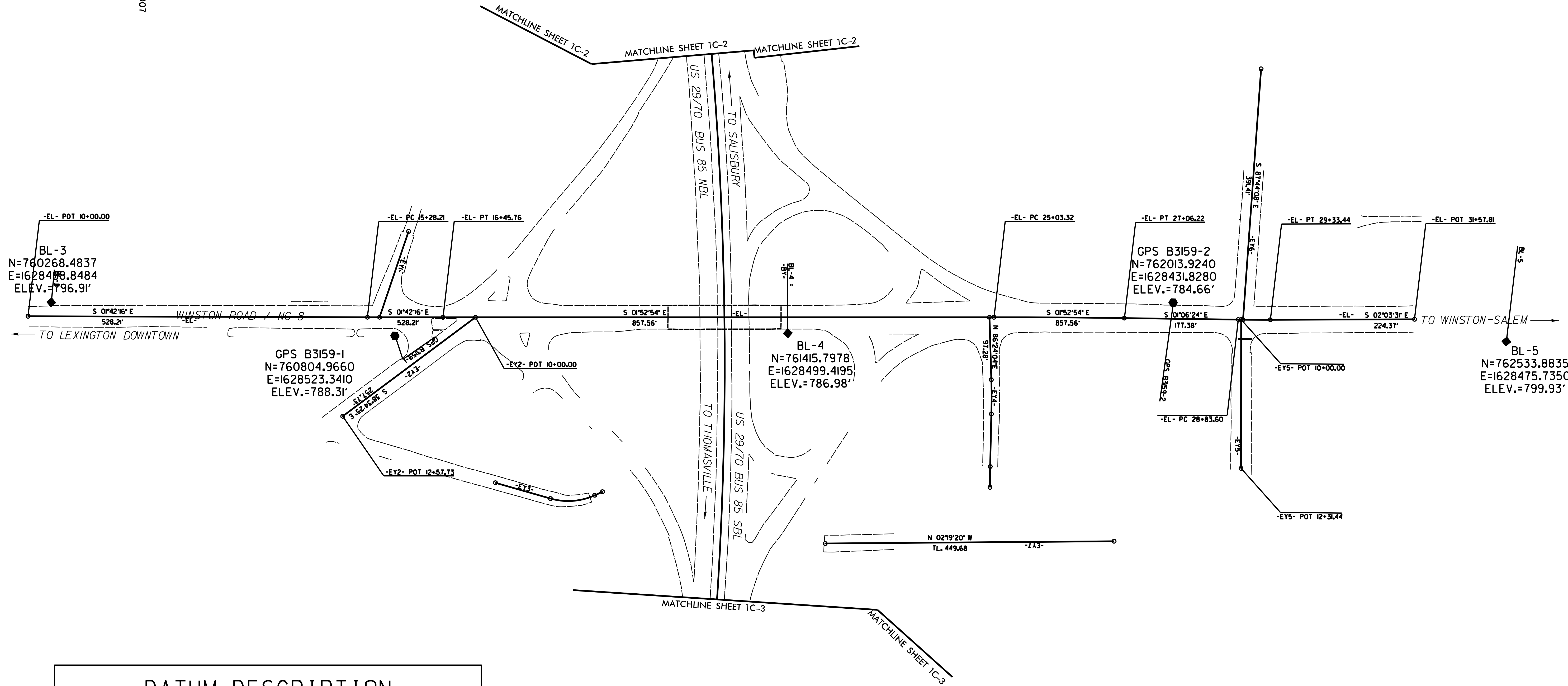
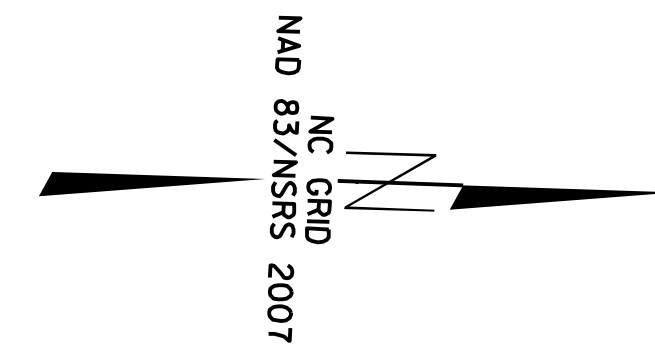
- 6 THOMAS LEROY LEE DB 1758 PG 38 PB 5 PG 25
- 7 JOHN MILTON FRITTS BETTY E FRITTS DB 507 PG 744 PB 5 PG 25
- 12 EVA J. SHAW RALPH SHAW
- 15 VIVIAN E. BROADWAY DB 514 PG 359 PB 5 PG 25
- 16 MARGARET P. SMITH, WIDOW DB 1393 PG 195 PB 5 PG 34
- 17 TODD J. SURRATT DB 2012 PG 2079 PB 5 PG 34
- 18 JAMES EARL LANIER DEBRA LANIER DB 1805 PG 1273 PB 5 PG 34
- 19 HEIH. TAM YIM CHAU WU TAM DB 1235 PG 948 PB 5 PG 34
- 21 ROBERT L. EVERHART, III
- 28 CHARLES L. SWICEGOOD DB 1253 PG 1985

Notes
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8/17/99
 MATCHLINE SHEET 4 -Y- STA. 29 + 50.00
 MATCHLINE SHEET 4 -RPA- STA. 11 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 39 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 40 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 41 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 42 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 43 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 44 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 45 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 46 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 47 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 48 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 49 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 50 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 51 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 52 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 53 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 54 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 55 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 56 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 57 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 58 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 59 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 60 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 61 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 62 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 63 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 64 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 65 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 66 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 67 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 68 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 69 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 70 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 71 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 72 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 73 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 74 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 75 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 76 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 77 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 78 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 79 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 80 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 81 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 82 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 83 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 84 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 85 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 86 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 87 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 88 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 89 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 90 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 91 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 92 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 93 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 94 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 95 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 96 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 97 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 98 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 99 + 00.00
 MATCHLINE SHEET 4 -Y- STA. 100 + 00.00

SURVEY CONTROL SHEET B-3159

PROJECT REFERENCE NO. B-3159	SHEET NO. 1C-1
Location and Surveys	



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-3159-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 760804.9660(ft) EASTING: 1628523.3410(ft) ELEVATION: 788.31(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998914

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-3159-1" TO -L- STATION 7+75.00 IS S 6° 55' 25.3" E 54.10'

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

NOTES:

1. 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:
B3159_LS_CONTROL.TXT

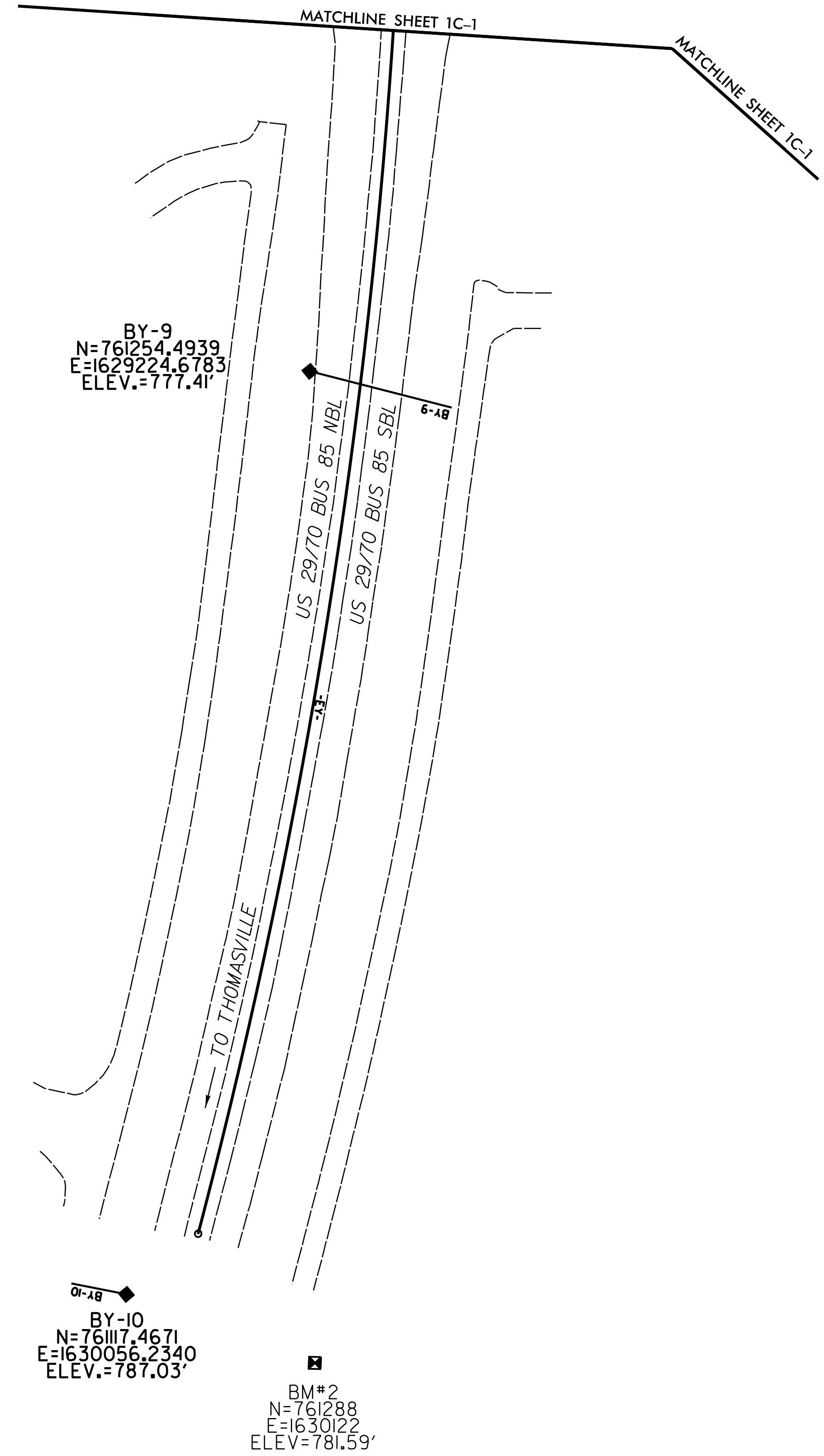
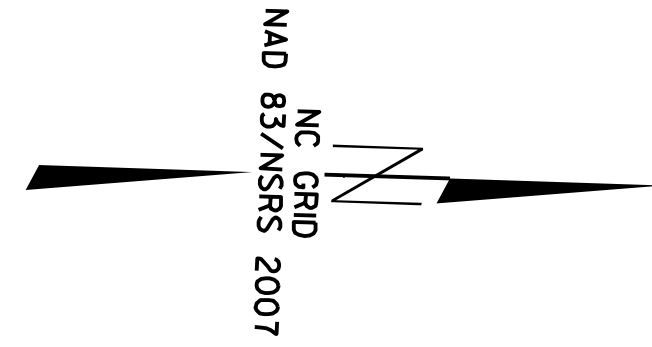
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

● INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
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NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET B-3159

PROJECT REFERENCE NO.	SHEET NO.
B-3159	1C-3
Location and Surveys	



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-3159-1"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 760804.9660(ft) EASTING: 1628523.3410(ft)
 ELEVATION: 788.31(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998914

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-3159-1" TO -L- STATION 7+75.00 IS
 S 6° 55' 25.3" E 54.10'

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

NOTES:

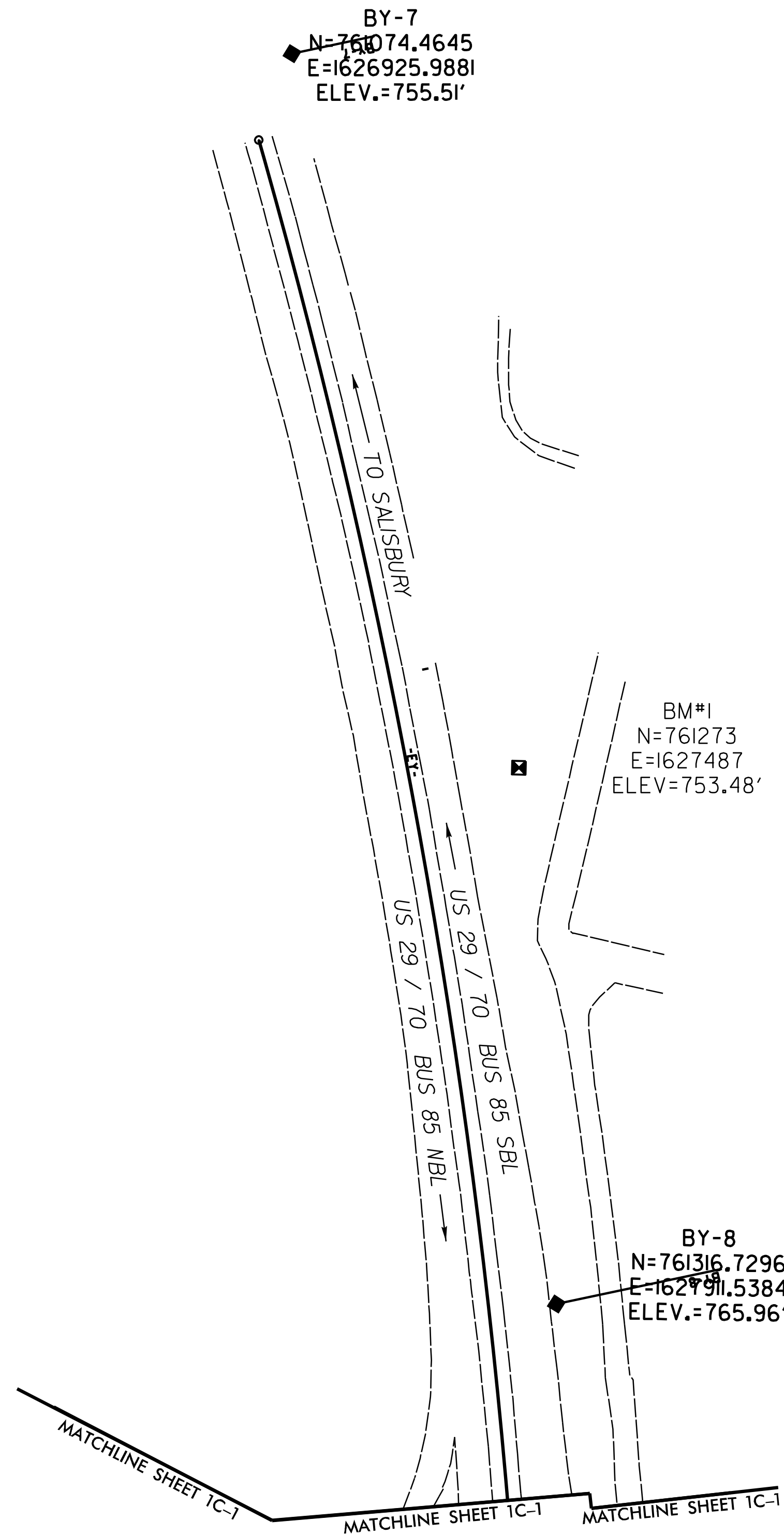
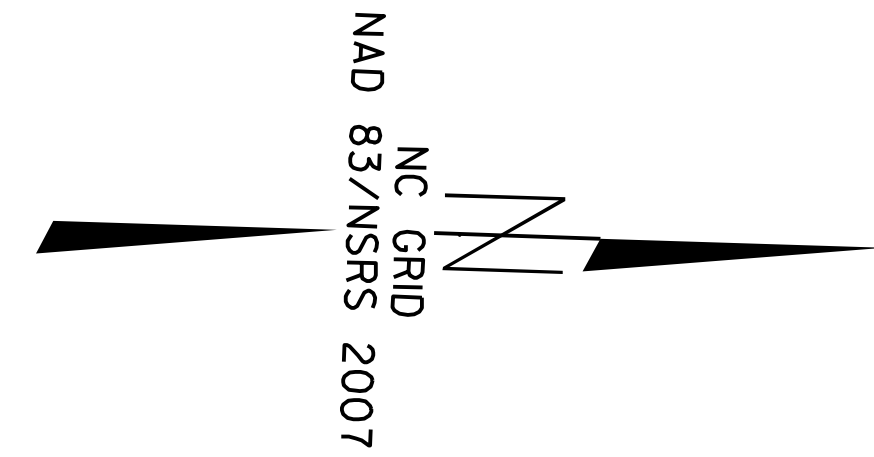
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NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET B-3159



DATUM DESCRIPTION

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SURVEY CONTROL SHEET B-3159

BASELINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3			760268.4837	1628488.8484	796.91	OUTSIDE PROJECT LIMITS	
1			760804.9660	1628523.3410	788.31	8+28.89	4.76 LT
4			761415.7978	1628499.4195	786.98	14+40.18	8.70 LT
2			762013.9240	1628431.8280	784.66	20+43.38	25.93 LT
5			762533.8835	1628475.7350	799.93	OUTSIDE PROJECT LIMITS	
BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
7			761074.4645	1626925.9881	755.51	OUTSIDE PROJECT LIMITS	
8			761316.7296	1627911.5384	765.96	19+49.16	53.83 LT
4			761415.7978	1628499.4195	786.98	25+36.07	98.52 LT
9			761254.4939	1629224.6783	777.41	32+62.04	46.25 RT
10			761117.4671	1630056.2340	787.03	OUTSIDE PROJECT LIMITS	

EXISTING ALIGNMENTS

E1				E4			
TYPE	STATION	NORTH	EAST	TYPE	STATION	NORTH	EAST
POT	10+00.00	760233.8443	1628511.5127	POT	10+00.00	761728.4886	1628464.2982
PC	15+28.21	760761.0188	1628495.9014	PC	10+97.28	761734.5970	1628561.3995
PT	18+45.76	760878.0183	1628492.2232	PT	11+58.71	761736.5149	1628614.7763
PC	25+93.32	761735.0261	1628464.2841	PC	12+32.49	761737.2823	1628596.5556
PT	27+06.22	761938.4430	1628458.7731	PT	12+64.76	761738.0581	1628728.8092
PC	28+83.60	762115.7851	1628456.3473	POT	17+45.85	761756.6783	1629289.5414
PT	29+33.44	762185.6876	1628453.9788				
POT	31+57.81	762389.8289	1628445.9112				
EY				E5			
TYPE	STATION	NORTH	EAST	TYPE	STATION	NORTH	EAST
POT	10+00.00	761050.3842	1628996.4477	POT	10+00.00	762120.2325	1628455.2581
PT	40+43.15	761179.8138	1629999.7979	POT	12+31.44	762127.4876	1628686.5887
EY1				E6			
TYPE	STATION	NORTH	EAST	TYPE	STATION	NORTH	EAST
PC	10+00.00	760934.1282	1627738.8970	POT	10+00.00	762138.4993	1628854.8916
PT	11+21.82	760885.1223	1627847.8151	POT	13+91.41	762122.9932	1628495.1994
PC	12+77.16	760876.5782	1628002.5168				
PT	13+46.58	760866.4547	1628121.4898				
PC	14+35.44	760862.0849	1628168.1811				
PT	16+40.07	760820.5613	1628260.2373				
POT	17+81.17	760779.9520	1628495.3333				
EY2				E7			
TYPE	STATION	NORTH	EAST	TYPE	STATION	NORTH	EAST
POT	10+00.00	760929.0955	1628490.5613	POT	10+00.00	761484.5038	1628824.5939
POT	12+57.73	760727.6820	1628651.2598	POT	14+49.68	761933.8109	1628886.3726
EY3				E8			
TYPE	STATION	NORTH	EAST	TYPE	STATION	NORTH	EAST
POT	10+00.00	760968.6015	1628746.9484	POT	10+00.00	761450.0903	1629163.6637
PC	10+88.94	761054.8411	1628768.8512	POT	14+22.56	761872.3613	1629147.9225
PT	11+59.52	761123.9866	1628761.3111				
POT	11+72.83	761135.5152	1628795.4113				

 BM1 ELEVATION = 753.48'
 N 761273 E 1627487
 Y STATION 15+29.00 87' LEFT
 R/R SPIKE SET IN ROOT OF FORKED WILLOW
 OAK BETWEEN 7TH ST. AND US 29/70 S.
 BOUND

 BM2 ELEVATION = 781.59'
 N 761288 E 1630112
 Y STATION 40+43.00
 N 46°02'38.06" E DIST 155.86'
 R/R SPIKE SET IN ROOT OF 36"3 FORKED
 OAK ON N. SIDE OF PIEDMONT DR. (SR
 1890) SOUTH OF STATE EMPLOYEE'S CREDIT
 UNION

 BM3 ELEVATION = 796.91'
 N 760268 E 1628489
 L STATION 7+00.00
 S 06°03'20.10" W DIST 410.59'
 BL-3

 BM4 ELEVATION = 799.93'
 N 762534 E 1628476
 L STATION 7+00.00
 N 01°44'10.83" W DIST 1858.55'
 BL-5

 BM5 ELEVATION = 755.51'
 N 761075 E 1626926
 Y STATION 40+43.00
 S 88°02'49.28" W DIST 3075.58'
 BY-7

DATUM DESCRIPTION

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 S 6° 55' 25.3" E 54.10'

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

NOTES:

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PROPOSED ALIGNMENT CONTROL SHEET B-3159

L			
TYPE	STATION	NORTH	EAST
POT	4+00.00	760376.4606	1628542.1223
PC	18+00.00	761775.7122	1628496.3530
PRC	19+28.79	761902.6830	1628476.7060
PT	20+64.72	762036.7839	1628456.8735
PC	21+43.74	762115.7852	1628455.3473
PT	21+93.58	762165.6048	1628453.9708
POT	23+00.00	762271.9584	1628450.1480

Y			
TYPE	STATION	NORTH	EAST
PC	10+00.00	761050.3042	1626995.4477
PT	40+43.15	761179.8138	1629999.7980

RPA			
TYPE	STATION	NORTH	EAST
POT	10+00.00	761296.9217	1629569.5565
TS	10+75.00	761311.7073	1629496.0283
SC	12+59.00	761357.2998	1629317.9736
CS	13+88.67	761415.4017	1629202.3416
ST	15+72.67	761531.0553	1629059.4906
PC	16+84.67	761605.9786	1628976.2410
PT	20+63.28	761716.7644	1628626.1059
POT	21+91.53	761701.4219	1628498.7830

Y2			
TYPE	STATION	NORTH	EAST
POT	10+00.00	760766.5197	1628627.8014
PC	10+70.07	760821.2796	1628584.0850
PT	12+07.25	760947.7978	1628537.4414
POT	12+36.06	760976.5975	1628536.4994

RPC			
TYPE	STATION	NORTH	EAST
POT	10+00.00	761135.4976	1627437.2108
TS	10+75.00	761148.8353	1627511.0153
SC	12+59.00	761172.0339	1627693.3446
CS	14+40.28	761148.2066	1627872.3227
ST	16+24.28	761078.1144	1628042.2322
PC	17+36.28	761030.0558	1628143.3972
PT	19+08.96	760987.7639	1628309.6990
POT	21+22.08	760976.1398	1628522.5069

Y5			
TYPE	STATION	NORTH	EAST
POT	10+00.00	762120.2325	1628455.2581
POT	12+31.44	762127.4875	1628686.5886

Y6			
TYPE	STATION	NORTH	EAST
POT	10+00.00	762132.2344	1628221.5081
POT	12+33.87	762122.9931	1628455.1994

Y7			
TYPE	STATION	NORTH	EAST
POT	10+00.00	761328.4367	1629790.5449
PC	13+97.95	761401.7910	1629399.4152
PT	18+02.23	761685.3168	1629154.9287
POT	18+53.57	761736.6167	1629152.9893

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NOTE: DRAWING NOT TO SCALE

RIGHT OF WAY CONTROL SHEET B-3159

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	7+67.51	73.04	760746.1612	1628603.1075
L	7+68.15	73.90	760746.8307	1628603.9470
L	7+95.38	-3.60	760771.5113	1628525.6012
L	8+10.63	40.87	760788.2050	1628569.5427
L	8+53.81	-116.27	760826.2284	1628411.0815
L	18+37.00	42.00	761816.9023	1628535.6425
L	19+17.07	-51.34	761878.5459	1628430.0417
L	19+28.79	42.00	761914.0613	1628517.1354
L	20+64.72	-40.00	762036.0113	1628416.8809
L	20+64.72	40.00	762037.5566	1628496.8709
L	20+92.00	-40.00	762063.2837	1628416.3541

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	12+35.00	40.00	761411.0691	1629566.9451
Y7	12+85.00	40.00	761420.2856	1629517.8018
Y7	13+97.95	60.00	761460.7629	1629410.4751
Y7	17+08.59	-60.00	761573.2311	1629116.5316
Y7	18+02.23	60.00	761687.5835	1629214.8859
Y7	18+02.23	-60.00	761683.0501	1629094.9715
Y7	18+51.37	-60.00	761732.1538	1629093.1152
Y7	18+51.48	60.00	761736.7983	1629213.0253

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	33+50.00	-106.00	761397.7160	1629327.0805
Y	34+00.00	-99.00	761385.3381	1629376.9452
Y	36+00.00	-90.00	761350.3463	1629577.4187
Y	37+50.00	-85.00	761321.2552	1629726.9963
Y	38+20.00	-145.00	761367.6155	1629807.9299
Y	38+20.00	-130.00	761352.8706	1629805.1749

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA	13+88.67	55.00	761461.5250	1629232.3022
RPA	16+84.67	70.00	761658.0081	1629023.0697
RPA	20+63.28	70.00	761786.2616	1628617.7314

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	10+70.07	19.11	760833.2012	1628599.0177
Y2	10+70.07	20.00	760833.7577	1628599.7149
Y2	11+92.47	20.00	760935.0903	1628558.3303

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPC	11+25.00	88.73	761070.0452	1627575.0204
RPC	12+59.00	95.00	761077.0570	1627695.4399
RPC	14+40.28	95.00	761057.0859	1627845.4522
RPC	16+24.28	115.00	760974.2391	1627992.8873
RPC	17+36.28	105.00	760935.2136	1628098.3423
RPC	19+08.96	93.00	760894.9024	1628304.6267
RPC	20+19.00	91.01	760890.8868	1628414.6133

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	10+85.00	20.01	762102.8942	1628540.8437

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	11+50.00	22.42	762103.9065	1628370.5051

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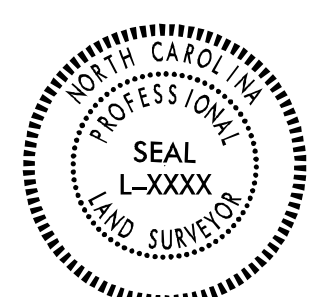
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item R/W and Easement Staking performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my signature, registration number and seal this _____ day of _____, 20____.

John Doe _____ xxxx _____
 Professional Land Surveyor PLS#



- NOTES:**
- 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:
 B3159_LS_CONTROL.TXT
 - SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 - INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

PERMANENT EASEMENT CONTROL SHEET B-3159

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	6+84.80	136.03	760665.5550	1628668.7673
L	7+58.83	-63.70	760733.0147	1628466.7215
L	7+97.03	-73.08	760770.8844	1628456.1057
L	8+00.04	10.00	760776.6163	1628539.0386
L	18+01.78	-83.53	761774.4828	1628412.8145
L	18+58.00	62.00	761842.2086	1628552.6898
L	19+28.79	-72.00	761883.1774	1628407.3984
L	19+28.79	62.00	761919.4783	1628536.3831
L	20+64.72	62.00	762037.9814	1628518.8619
L	20+96.08	62.00	762069.3323	1628518.2563
L	21+05.41	-57.51	762076.3530	1628398.5883

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA	16+06.38	100.00	761627.9321	1629101.3340
RPA	16+84.67	100.00	761680.3071	1629043.1384
RPA	20+63.28	100.00	761816.0462	1628614.1424

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	14+50.00	130.00	761043.9961	1627458.7392
Y	34+49.00	129.39	761152.8466	1629399.2092
Y	34+49.00	146.00	761136.3526	1629397.2267
Y	34+58.69	146.00	761135.2179	1629406.6000
Y	34+68.95	146.00	761133.9986	1629416.5255
Y	34+78.00	129.33	761149.4531	1629427.3472
Y	34+78.00	146.00	761132.9090	1629425.2732

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPC	12+59.00	115.00	761057.0619	1627695.8810
RPC	13+05.00	115.00	761056.4287	1627732.8542
RPC	13+58.93	226.19	760942.0307	1627759.5620
RPC	13+65.00	115.00	761051.2587	1627780.8006
RPC	14+40.28	115.00	761037.9026	1627839.7953
RPC	14+48.24	243.55	760913.2328	1627807.9663
RPC	16+24.28	135.00	760956.1730	1627984.3074
RPC	17+36.28	125.00	760917.1462	1628089.7594
RPC	19+08.96	113.00	760874.9321	1628303.5359
RPC	20+19.00	112.00	760869.9287	1628413.4686

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	10+40.00	22.60	762108.0715	1628260.5838
Y6	10+40.00	29.00	762101.6765	1628260.3310
Y6	11+54.89	29.00	762097.1368	1628375.1299

PERMANENT EASEMENT MARKER-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	12+35.00	64.00	761434.6578	1629571.3690
Y7	13+04.00	118.00	761500.4513	1629513.5053
Y7	13+55.00	52.39	761445.3714	1629451.2861

I, John Doe, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item R/W and Easement Staking performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures as of 20XX date. Those standards can be found at <https://connect.ncdot.gov/resources/Location/Pages/>.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my signature, registration number and seal this _____ day of _____, 20____.

John Doe _____ xxxx _____
Professional Land Surveyor PLS#



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-3159-1"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 760804.9660(ft) EASTING: 1628523.3410(ft)
ELEVATION: 788.31(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998914

THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"B-3159-1" TO -L- STATION 7+75.00 IS
S 6° 55' 25.3" E 54.10'

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

NOTES:

- 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:
B3159_LS_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

Proposed Standard Index of Sheets for NCDOT Roadway Projects

<u>Sheet Number</u>	<u>Name of Sheet</u>
<u>1</u>	Title Sheet
<u>1A</u>	Index of Sheets and General Notes
<u>1B</u>	Conventional Symbols
<u>1C-1 thru 1C-#</u>	Survey Control Sheets
<u>1D-1 thru 1D-#</u>	Centerline Coordinate List
<u>1E-1 thru 1E-#</u>	R/W and Easement Coordinate List
<u>2A-1 thru 2A-#</u>	Pavement Schedule, Typical Sections, and Wedging Details
<u>2C-1 thru 2C-#</u>	Special Details as Needed
<u>3B-1 thru 3B-#</u>	Roadway Summaries
<u>3D-1 thru 3D-#</u>	Drainage Summaries
<u>3G-1 thru 3G-#</u>	Geotechnical Summaries
<u>4 thru #</u>	Plan and Profile Sheets
<u>4R/W thru #R/W</u>	Modified R/W Plan Sheets

Requested changes in Index and Sheet Numbering highlighted in **yellow**.

NOTE: The R/W sheets will be exact copies of the plan sheets without the proposed design. These sheets will only contain base topographic data, proposed CL alignments, Primary Horizontal & Vertical Control Symbols, Baseline Point Symbols, Property Data, Property ties to CL, Proposed R/W lines, R/W Monumentation, PUE Monumentation, and R/W Data.

No changes from this point forward. Everything else stays the same.

G.S. 47-30 Mapping Requirements for Recordable Maps

§ 47-30. Plats and subdivisions; mapping requirements.

(a) Size Requirements. – All land plats presented to the register of deeds for recording in the registry of a county in North Carolina after September 30, 1991, having an outside marginal size of either 18 inches by 24 inches, 21 inches by 30 inches, or 24 inches by 36 inches, and having a minimum one and one-half inch border on the left side and a minimum one-half inch border on the other sides shall be deemed to meet the size requirements for recording under this section. Where size of land areas, or suitable scale to assure legibility require, plats may be placed on two or more sheets with appropriate match lines. Counties may specify either:

- (1) Only 18 inches by 24 inches;
- (2) A combination of 18 inches by 24 inches and 21 inches by 30 inches;
- (3) A combination of 18 inches by 24 inches and 24 inches by 36 inches; or
- (4) A combination of all three sizes.

Provided, that all registers of deeds where specific sizes other than the combination of all three sizes have been specified, shall be required to submit said size specifications to the North Carolina Association of Registers of Deeds for inclusion on a master list of all such counties. The list shall be available in each register of deeds office by October 1, 1991. For purposes of this section, the terms "plat" and "map" are synonymous.

(b) Plats to Be Reproducible. – Each plat presented for recording shall be a reproducible plat, either original ink on polyester film (mylar), or a reproduced drawing, transparent and archival (as defined by the American National Standards Institute), and submitted in this form. The recorded plat must be such that the public may obtain legible copies. A direct or photographic copy of each recorded plat shall be placed in the plat book or plat file maintained for that purpose and properly indexed for use. In those counties in which the register has made a security copy of the plat from which legible copies can be made, the original may be returned to the person indicated on the plat.

(c) Information Contained in Title of Plat. – The title of each plat shall contain the following information: property designation, name of owner (the name of owner shall be shown for indexing purposes only and is not to be construed as title certification), location to include township, county and state, the date or dates the survey was made; scale or scale ratio in words or figures and bar graph; name and address of surveyor or firm preparing the plat.

(d) Certificate; Form. – There shall appear on each plat a certificate by the person under whose supervision the survey or plat was made, stating the origin of the information shown on the plat, including recorded deed and plat references shown thereon. The ratio of precision before any adjustments must be shown. Any lines on the plat that were not actually surveyed must be clearly indicated and a statement included revealing the source of information. Where a plat consists of more than one sheet, only one sheet must contain the certification and all other sheets must be signed and sealed.

The certificate required above shall include the source of information for the survey and data indicating the ratio of precision of the survey before adjustments and shall be in substantially the following form:

"I, _____, certify that this plat was drawn under my supervision from an actual survey made under my supervision (deed description recorded in Book _____, page _____, etc.) (other); that the boundaries not surveyed are clearly indicated as drawn from information found in Book _____, page _____; that the ratio of precision as calculated is 1: _____; that this plat was prepared NC General Statutes - Chapter 47-30 2

in accordance with G.S. 47-30 as amended. Witness my original signature, registration number and seal this ____ day of ____, A.D., ____.

Seal or Stamp

Surveyor

Registration Number"

Nothing in this requirement shall prevent the recording of a map that was prepared in accordance with a previous version of G.S. 47-30 as amended, properly signed, and notarized under the statutes applicable at the time of the signing of the map. However, it shall be the responsibility of the person presenting the map to prove that the map was so prepared.

(e) Method of Computation. – An accurate method of computation shall be used to determine the acreage and ratio of precision shown on the plat. Area by estimation is not acceptable nor is area by planimeter, area by scale, or area copied from another source, except in the case of tracts containing inaccessible sections or areas. In such case the surveyor may make use of aerial photographs or other appropriate aids to determine the acreage of any inaccessible areas when the areas are bounded by natural and visible monuments. In such case the methods used must be stated on the plat and all accessible areas of the tract shall remain subject to all applicable standards of this section.

(f) Plat to Contain Specific Information. – Every plat shall contain the following specific information:

(1) An accurately positioned north arrow coordinated with any bearings shown on the plat. Indication shall be made as to whether the north index is true, magnetic, North Carolina grid ("NAD 83" or "NAD 27"), or is referenced to old deed or plat bearings. If the north index is magnetic or referenced to old deed or plat bearings, the date and the source (if known) the index was originally determined shall be clearly indicated.

(2) The azimuth or course and distance of every property line surveyed shall be shown. Distances shall be in feet or meters and decimals thereof. The number of decimal places shall be appropriate to the class of survey required.

(3) All plat distances shall be by horizontal or grid measurements. All lines shown on the plat shall be correctly plotted to the scale shown. Enlargement of portions of a plat are acceptable in the interest of clarity, where shown as inserts. Where the North Carolina grid system is used the grid factor shall be shown on the face of the plat. If grid distances are used, it must be shown on the plat.

(4) Where a boundary is formed by a curved line, the following data must be given: actual survey data from the point of curvature to the point of tangency shall be shown as standard curve data, or as a traverse of bearings and distances around the curve. If standard curve data is used the bearing and distance of the long chord (from point of curvature to point of tangency) must be shown on the plat.

(5) Where a subdivision of land is set out on the plat, all streets and lots shall be accurately plotted with dimension lines indicating widths and all other information pertinent to reestablishing all lines in the field. This shall include bearings and distances sufficient to form a continuous closure of the entire perimeter.

(6) Where control corners have been established in compliance with G.S. 39-32.1, 39-32.2, 39-32.3, and 39-32.4, as amended, the location and pertinent information as required in the reference statute shall be plotted on the plat. All other corners which are marked by monument or natural object shall be so identified on all plats, and where practical all corners of adjacent owners along the boundary lines of the subject tract which are marked by monument or natural object shall be shown.

(7) The names of adjacent landowners, or lot, block, parcel, subdivision designations or other legal reference where applicable, shall be shown where they could be determined by the surveyor.

(8) All visible and apparent rights-of-way, watercourses, utilities, roadways, and other such improvements shall be accurately located where crossing or forming any boundary line of the property shown.

(9) Where the plat is the result of a survey, one or more corners shall, by a system of azimuths or courses and distances, be accurately tied to and coordinated with a horizontal control monument of some United States or State Agency survey system, such as the North Carolina Geodetic Survey where the monument is within 2,000 feet of the subject property. Where the North Carolina Grid System coordinates of the monument are on file in the North Carolina Geodetic Survey Section in the Division of Land Resources of the Department of Environment and Natural Resources, the coordinates of both the referenced corner and the monuments used shall be shown in X (easting) and Y (northing) coordinates on the plat. The coordinates shall be identified as based on "NAD 83," indicating North American Datum of 1983, or as "NAD 27," indicating North American Datum of 1927. The tie lines to the monuments shall also be sufficient to establish true north or grid north bearings for the plat if the monuments exist in pairs. Within a previously recorded subdivision that has been tied to grid control, control monuments within the subdivision may be used in lieu of additional ties to grid control. Within a previously recorded subdivision that has not been tied to grid control, if horizontal control monuments are available within 2,000 feet, the above requirements shall be met; but in the interest of bearing consistency with previously recorded plats, existing bearing control should be used where practical. In the absence of grid control, other appropriate natural monuments or landmarks shall be used. In all cases, the tie lines shall be sufficient to accurately reproduce the subject lands from the control or reference points used.

(10) A vicinity map (location map) shall appear on the plat.

(11) Notwithstanding any other provision contained in this section, it is the duty of the surveyor, by a certificate on the face of the plat, to certify to one of the following:

- a. That the survey creates a subdivision of land within the area of a county or municipality that has an ordinance that regulates parcels of land;
- b. That the survey is located in a portion of a county or municipality that is unregulated as to an ordinance that regulates parcels of land;
- c. Any one of the following: NC General Statutes - Chapter 47-30 4

1. That the survey is of an existing parcel or parcels of land and does not create a new street or change an existing street;
2. That the survey is of an existing building or other structure, or natural feature, such as a watercourse; or
3. That the survey is a control survey.
- d. That the survey is of another category, such as the recombination of existing parcels, a court-ordered survey, or other exception to the definition of subdivision;
- e. That the information available to the surveyor is such that the surveyor is unable to make a determination to the best of the surveyor's professional ability as to provisions contained in (a) through (d) above.

However, if the plat contains the certificate of a surveyor as stated in a., d., or e. above, then the plat shall have, in addition to said surveyor's certificate, a certification of approval, or no approval required, as may be required by local ordinance from the appropriate government authority before the plat is presented for recordation. If the plat contains the certificate of a surveyor as stated in b. or c. above, nothing shall prevent the recordation of the plat if all other provisions have been met.

(g) Recording of Plat. – In certifying a plat for recording pursuant to G.S. 47-30.2, the Review Officer shall not be responsible for reviewing or certifying as to any of the following requirements of this section:

- (1) Subsection (b) of this section as to archival.
- (2) Repealed by Session Laws 1997-309, s. 2.
- (3) Subsection (e) of this section.
- (4) Subdivisions (1) through (10) of subsection (f) of this section.

A plat, when certified pursuant to G.S. 47-30.2 and presented for recording, shall be recorded in the plat book or plat file and when so recorded shall be duly indexed. Reference in any instrument hereafter executed to the record of any plat herein authorized shall have the same effect as if the description of the lands as indicated on the record of the plat were set out in the instrument.

(h) Nothing in this section shall be deemed to prevent the filing of any plat prepared by a registered land surveyor but not recorded prior to the death of the registered land surveyor. However, it is the responsibility of the person presenting the map to the Review Officer pursuant to G.S. 47-30.2 to prove that the plat was so prepared. For preservation these plats may be filed without signature, notary acknowledgement or probate, in a special plat file.

(i) Nothing in this section shall be deemed to invalidate any instrument or the title thereby conveyed making reference to any recorded plat.

(j) The provisions of this section shall not apply to boundary plats of areas annexed by municipalities nor to plats of municipal boundaries, whether or not required by law to be recorded.

(k) The provisions of this section shall apply to all counties in North Carolina.

(l) This section does not apply to the registration of highway right-of-way plans provided for in G.S. 136-19.4 or G.S. 136-89.184, nor to the registration of roadway corridor official maps provided for in Article 2E of Chapter 136 of the General Statutes.

(m) Maps attached to deeds or other instruments and submitted for recording in that form must be no larger than 8 1/2 inches by 14 inches and comply with either this subsection or subsection (n) of this section. Such a map shall either (i) have the original signature of a NC General Statutes - Chapter 47-30 5

registered land surveyor and the surveyor's seal as approved by the State Board of Registration for Professional Engineers and Land Surveyors, or (ii) be a copy of a map, already on file in the public records, that is certified by the custodian of the public record to be a true and accurate copy of a map bearing an original personal signature and original seal. The presence of the original personal signature and seal shall constitute a certification that the map conforms to the standards of practice for land surveying in North Carolina, as defined in the rules of the North Carolina State Board of Registration for Professional Engineers and Land Surveyors.

(n) A map that does not meet the requirements of subsection (m) of this section may be attached to a deed or other instrument submitted for recording in that form for illustrative purposes only if it meets both of the following requirements:

(1) It is no larger than 8 1/2 inches by 14 inches.

(2) It is conspicuously labelled, "THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS."

(o) The requirements of this section regarding plat size, reproducible form, and evidence of required certifications shall be met with respect to a plat that is an "electronic document," as that term is defined in G.S. 47-16.2(3), if all of the following conditions have been met:

(1) The register of deeds has authorized the submitter to electronically register the electronic document.

(2) The plat is submitted by a United States federal or a state governmental unit or instrumentality or a trusted submitter. For purposes of this subsection, "a trusted submitter" means a person or entity that has entered into a memorandum of understanding regarding electronic recording with the register of deeds in the county in which the electronic document is to be submitted.

(3) Evidence of required certifications appear on the digitized image of the document as it will appear on the public record.

(4) With respect to a plat submitted by a trusted submitter, the digitized image of the document as it will appear on the public record contains the submitter's name in the following completed statement on the first page of the document image: "Submitted electronically by _____ (submitter's name) in compliance with North Carolina statutes governing recordable documents and the terms of the submitter agreement with the _____ (insert county name) County Register of Deeds.

(5) Except as otherwise provided in this subsection, the digitized image of the plat conforms to all other applicable laws and rules that prescribe recordation."

(1911, c. 55, s. 2; C.S., s. 3318; 1923, c. 105; 1935, c. 219; 1941, c. 249; 1953, c. 47, s. 1; 1959, c. 1235, ss. 1, 3A, 3.1; 1961, cc. 7, 111, 164, 199, 252, 660, 687, 932, 1122; 1963, c. 71, ss. 1, 2; cc. 180, 236; c. 361, s. 1; c. 403; 1965, c. 139, s. 1; 1967, c. 228, s. 2; c. 394; 1971, c. 658; 1973, cc. 76, 848, 1171; c. 1262, s. 86; 1975, c. 192; c. 200, s. 1; 1977, c. 50, s. 1; c. 221, s. 1; c. 305, s. 2; c. 771, s. 4; 1979, c. 330, s. 1; 1981, c. 138, s. 1; c. 140, s. 1; c. 479; 1983, c. 473; 1987, c. 747, s. 20; 1989, c. 727, s. 218(6); 1991, c. 268, s. 3; 1993, c. 119, ss. 1, 2; 1997-309, s. 2; 1997-443, s. 11A.119(a); 1998-228, ss. 11, 12; 1999-456, s. 59; 2000-140, s. 93.1(b); 2001-424, s. 12.2(b); 2008-225, s. 9; 2010-180, s. 1; 2011-246, s. 7.)

H 501 (20172018) [DOT/SURVEYING INFORMATION IN PLANS](#). Filed Mar 28 2017, *AN ACT TO REQUIRE THE DEPARTMENT OF TRANSPORTATION TO INCLUDE SURVEYING INFORMATION IN ANY PLANS PREPARED FOR THE PURPOSE OF ACQUIRING CERTAIN PROPERTY RIGHTS*.

Enacts GS 13619.4A, directing the Department of Transportation (DOT) to include in any plan prepared for the purpose of acquiring property rights for a right-of-way a permanent easement, or both, which depict property lines, right-of-way lines, or permanent easements, a set of drawings that clearly identify (1) design alignments, (2) baseline control points, (3) found property related corner markers, and (4) new right-of-way and permanent easement corner markers.

Requires plans subject to the requirements of this statute to document the localized coordinates for each major control point along the design alignments. Requires the coordinates and associated localization metadata to be based upon and tied to the NC State Plane Coordinate system, and to be clearly identified within the plans. Requires all property and corner markers found and surveyed to be clearly identified within the plans in accordance with general surveying standards and procedures. Further requires each property corner marker to be accurately tied to the design alignment or the NC State Plane Coordinate system by either a system of bearings and distances or by station and offset.

Effective July 1, 2017, and applies to plans prepared for acquisitions on or after that date.

Intro. by Brody. [GS 136](#)