



NORTH CAROLINA
Department of Transportation



Survey Control Sheets Overview

2018 NCLUG Summer Conference

Location & Surveys Unit

August 2, 2018

Introduction To NCDOT Plan Changes

- NCDOT Responsibilities (Chapter 89C)
- Issues raised by NCBEES & Surveying Industry Leaders concerning NCDOT plans
- New Legislation/Response (HB 501)
- Overview of Individual Sheets (C, D, E,R/W)
- Property Ties (located on R/W sheets)

Transportation Facilities

Our Primary Product

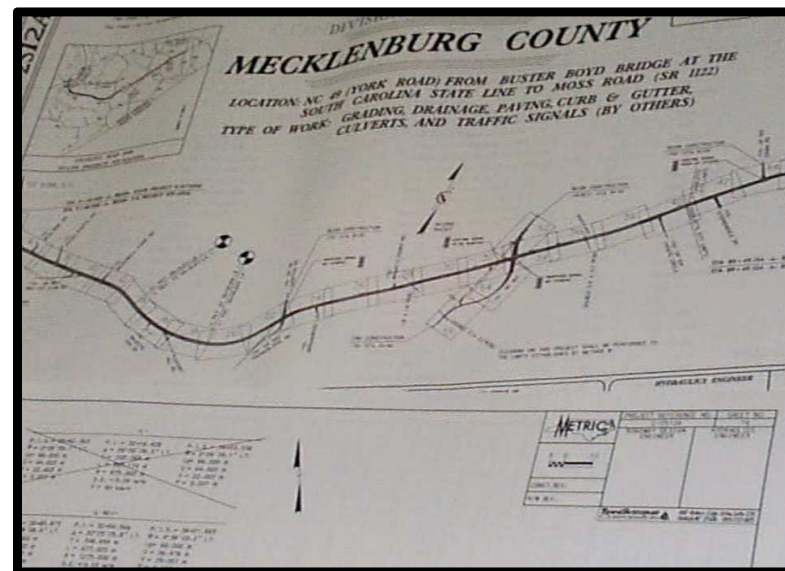
- Built
- Maintained



Our Other Products

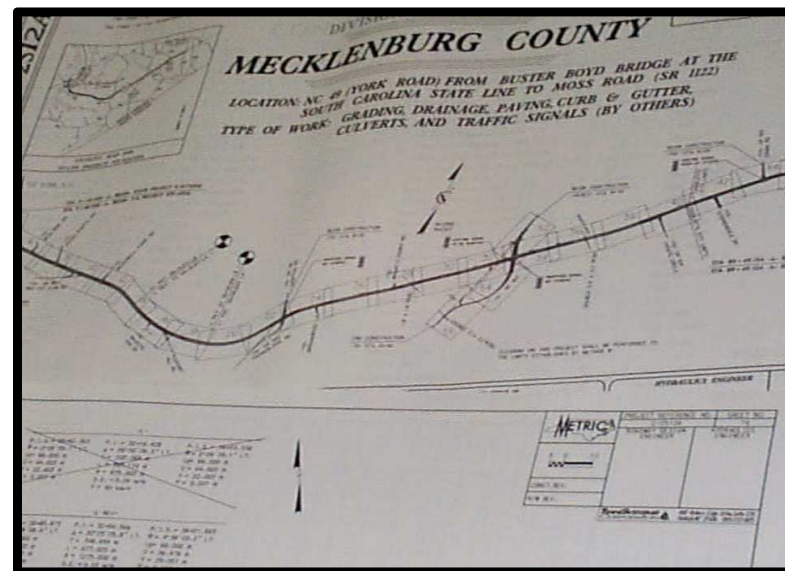
Plan Sheets/ CADD Files Used By

- Geotech, Hydro, Biologists, etc.
- Tax Offices/GIS Departments
- City Planners
- Private Land Developers
- Other Engineers
- Surveyors
- Attorneys



Our Other Products

- Not Just Engineering Plans anymore
- Now Considered as Documentation of Property Purchases
- And Record of Destroyed Property Monumentation



Chapter 89C. Engineering and Land Surveying

§ 89C-2. Declarations; prohibitions

In order to safeguard life, health, and property, and to promote the public welfare, the practice of engineering and the practice of land surveying in this State are hereby declared to be subject to regulation in the public interest. It shall be unlawful for any person to practice or to offer to practice engineering or land surveying in this State, as defined in the provisions of this Chapter, or to use in connection with the person's name or otherwise assume or advertise any title or description tending to convey the impression that the person is either a professional engineer or a professional land surveyor, unless the person has been duly licensed. ...

Chapter 89C. Engineering and Land Surveying

§ 89C-3. Definitions

(6) Practice of engineering. –

b. The term "practice of engineering" shall not be construed to permit the location, description, establishment or reestablishment of property lines or descriptions of land boundaries for conveyance...

Chapter 89C.

Engineering and Land Surveying

§ 89C-3. Definitions

- (7) Practice of land surveying. –
1. Locating, relocating, establishing, laying out, or retracing **any property line, easement, or boundary of any tract of land**;
 2. Locating, relocating, establishing, or laying out the **alignment or elevation** of any of the fixed works embraced within the practice of professional engineering;
 3. Making any survey for the subdivision of any tract of land, including the **topography, alignment and grades of streets** and incidental drainage within the subdivision, and the **preparation and perpetuation of maps, record plats**, field note records, and property descriptions that represent these surveys;

Chapter 89C.

Engineering and Land Surveying

§ 89C-3. Definitions.

- (7) Practice of land surveying. **cont.**
4. Determining, by the use of the principles of land surveying, **the position for any survey monument or reference point**, or setting, resetting, or replacing any survey monument or reference point;
 5. Determining the **configuration or contour of the earth's surface or the position of fixed objects on the earth's surface** by measuring lines and angles and applying the principles of mathematics or photogrammetry;

Chapter 89C. Engineering and Land Surveying

§ 89C-4. State Board of Examiners for Engineers and Surveyors; appointment; terms.

A State Board of Examiners for Engineers and Surveyors, **whose duty it is to administer the provisions of this Chapter**, is created. The Board shall consist of four licensed professional engineers, three licensed professional land surveyors and two public members, who are neither professional engineers nor professional land surveyors. ..

Chapter 89C. Engineering and Land Surveying

§ 89C-19. Public works; requirements where public safety involved.

This State and its political subdivisions such as counties, cities, towns, or other political entities or legally constituted boards,... or officials, or employees of these entities **shall not engage in the practice of engineering or land surveying involving either public or private property where the safety of the public is directly involved without the project being under the responsible charge of a professional engineer for engineering projects, or a professional land surveyor for land surveying** projects, as provided for the practice of the respective professions by this Chapter.

Chapter 89C. Engineering and Land Surveying

§ 89C-19. Public works; requirements where public safety involved **cont.**

Nothing in this section shall be construed to prohibit inspection, maintenance and service **work done by employees of the State of North Carolina**, any political subdivision of the State, or any municipality including construction, installation, servicing, and maintenance by regular full-time employees of, secondary roads and drawings incidental to work on secondary roads, streets, street lighting, traffic-control signals,...

NCBEES & Surveying Industry Leaders

Issues concerning NCDOT 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).

Plan to Resolve Issues

As a result of STRONG inquiries by NC Board of Examiners for Engineers and Land Surveyors (NCBEES) and the Survey Industry Leaders (NC Society of Surveyors), NCDOT formed a Survey Plans Committee:

Representatives from:

- Divisions
- Right Of Way
- Preconstruction
- Design-Build
- Attorney General's Office
- NCBELS (non-voting)

Issues were addressed via two methods:

- NCDOT Internal Procedure Memo
- New Legislation (HB 501)

Chief Engineer's Memo



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

A handwritten signature in black ink, appearing to read "Mike L. Holder", written over the printed name and title.

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).

House Bill 501

10 **"§ 136-19.4A. Required surveying information in certain acquisition plans.**

11 The Department of Transportation shall include in any plan prepared for the purpose of
12 acquiring right-of-way, a permanent easement, or both, that depicts property lines, right-of-way
13 lines, or permanent easements, a set of drawings that clearly identify design alignments,
14 baseline control points, found property-related corner markers, and new right-of-way and
15 permanent easement corner markers. Plans subject to the requirements of this section shall
16 document the localized coordinates for each major control point along the design alignments.
17 The coordinates and associated localization metadata shall be based upon, and tied to, the North
18 Carolina State Plane Coordinate system and shall be clearly identified within the plans. All
19 property corner markers found and surveyed shall be clearly identified within the plans in
20 accordance with general surveying standards and procedures. Each property corner marker
21 shall be accurately tied to the design alignment or the North Carolina State Plane Coordinate
22 system, by either a system of bearings and distances or by station and offset."

Comments On Property

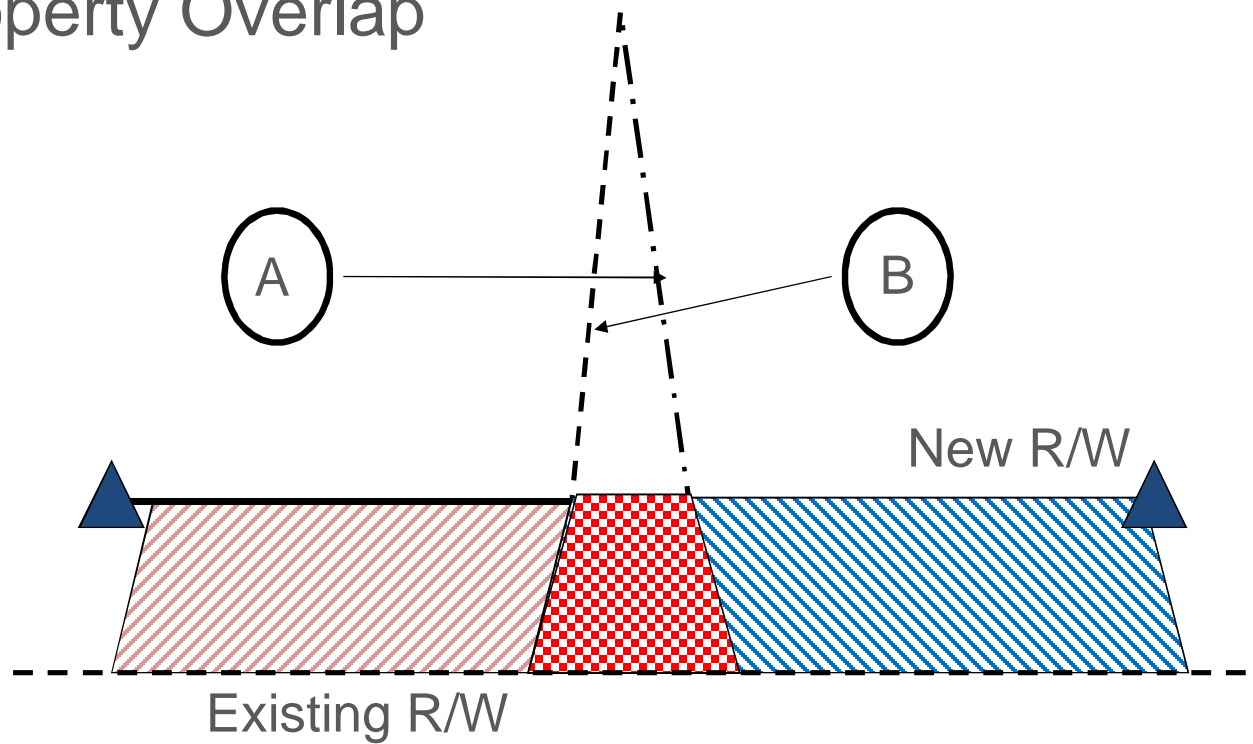
The **NCDOT Surveyor's Role** is to establish the **property line** between **Public** and **Private** ownership, and to document:

- Location of Right Of Way (Bought or Borrowed)
- Evidence of Property Ownership we have used or destroyed

IT IS NOT OUR BUSINESS TO DETERMINE THE LOCATION OF PRIVATE PROPERTY LINES

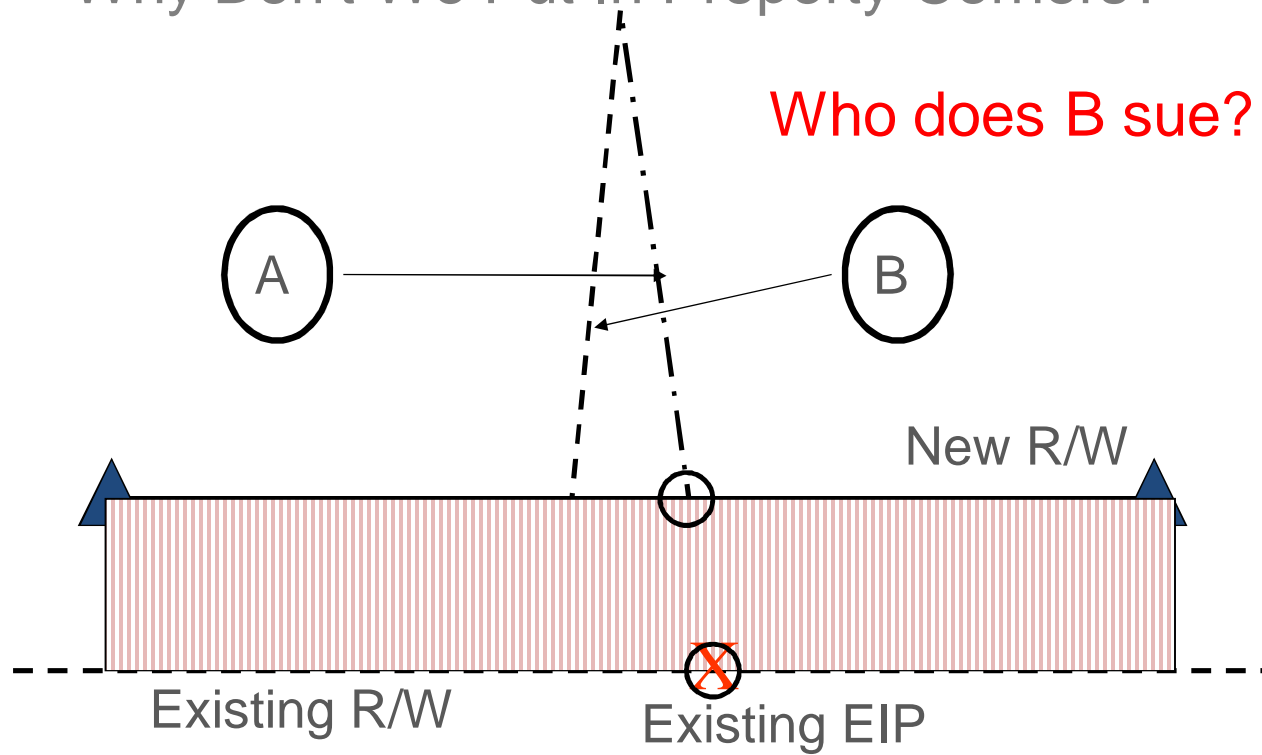
Comments On Property

Property Overlap



Comments On Property

Why Don't We Put In Property Corners?



Survey Control Sheets

- History of Control Sheets
- Overview of Individual Sheets
- Property Ties

Survey Control Sheets History

- 2003 Introduction
- 2010 Addition of R/W Tables
- 2017 Addition of R/W sheets

Survey Control Sheets

Control Sheets Breakdown

- “C” Series (Survey Control and Existing Centerlines)
- “D” Series (Design Alignment Cardinal Stations)
- “E” Series (R/W and Easement Tables)
- “RW” Series (Modified Plan Sheets for Clarity)
- * Note: All Sheets will appear directly behind the Design Plan Sheets as a set.

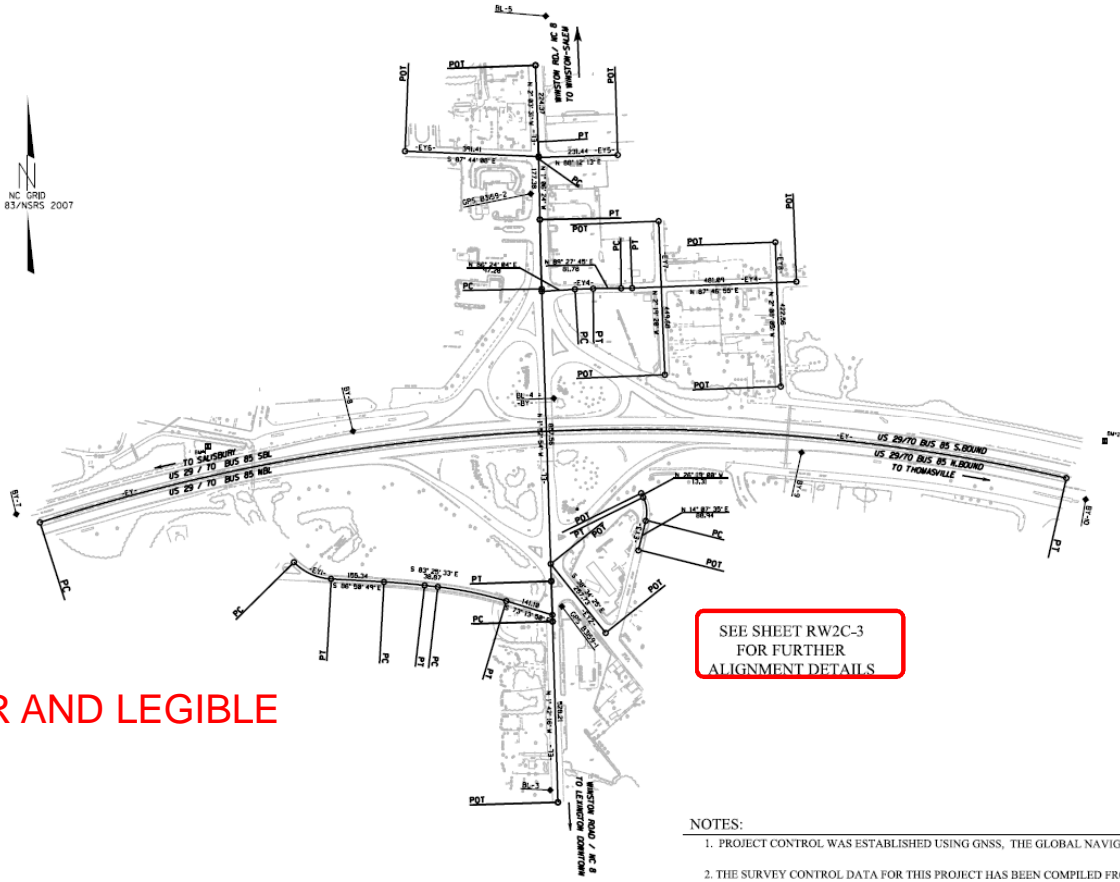
“C” Series Sheets

- Survey Control and Existing Centerlines
- Delivered with Full Surveys
- Produced using ...
 - MicroStation
 - “C” series border cell
 - SurveyTable.ma
 - Other applications

Example Right-Of-Way Plans
July 2018

SURVEY CONTROL SHEET
W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
B-3159	RW02C-1
AAA CONSULTANTS 903 MAIN STREET MIDTOWN, NC 27001	



CLEAR AND LEGIBLE

SEE SHEET RW2C-3
FOR FURTHER
ALIGNMENT DETAILS

- NOTES:
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
 2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/27/18
C:\Users\jmc\OneDrive\Documents\Projects\B-3159\Drawings\RW02C-1.dwg
AAA CONSULTANTS
903 MAIN STREET
MIDTOWN, NC 27001
AAA CONSULTANTS
903 MAIN STREET
MIDTOWN, NC 27001

SURVEY CONTROL SHEET

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
B-3159	MVD10-2
AAA CONSULTANTS 903 MAIN STREET MIDTOWN, NC 27001	



David Stalling
Professional Engineer

BL	POINT	DESC.	NORTH	EAST	ELEVATION
3	BL-3		768269.4937	1628489.0484	796.11
1	B310R-1		768984.9668	1628523.3418	788.33
4	BL-4		761415.7970	1628499.4195	786.98
2	B310V-2		762813.9248	1628431.8288	784.66
5	BL-5		762533.8935	1628476.7358	799.93

BY	POINT	DESC.	NORTH	EAST	ELEVATION
7	BY-7		761874.4645	1628926.9881	795.51
8	BY-8		761316.7296	1627911.5284	765.96
6A	BY-4		761415.7978	1628499.4195	786.98
9	BY-9		761254.4939	1629324.6783	777.41
10	BY-10		761117.4671	1630056.2348	787.83

.....
 BM3 ELEVATION = 753.49
 N 761273 E 1627487
 R/R SPIKE SET IN ROOT OF OPENED WILLOWHAWK BETWEEN 7TH ST. AND US 29/78 S. ROAD

.....
 BM2 ELEVATION = 781.59
 N 761288 E 1638112
 R/R SPIKE SET IN ROOT OF 36"J FORKEDOAK ON N. SIDE OF PIEDMONT DR. (SR1090) SOUTH OF SECU

.....
 BM3 ELEVATION = 796.91
 N 768269 E 1628489
 BL-3

.....
 BM4 ELEVATION = 794.93
 N 762534 E 1628476
 BL-5

.....
 BM5 ELEVATION = 755.51
 N 761875 E 1628926
 BY-7

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

EXTENSIONS

“D” Series Sheets

- Design Alignment Cardinal Stations
- Coordinates for Cardinal Station
- Produced using ...
 - MicroStation
 - “D” series border cell
 - RWTable.ma application for table

Example Right-of-Way Plans
July 2018

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO. B-3119	SHEET NO. ENR0204
AAA CONSULTANTS 903 MAIN STREET MIDTOWN, NC 27001	

TYPE	STATION	NORTH	EAST
POT	4+00.00	768776.4680	1628942.1223
PC	10+00.00	761775.7122	1628476.2538
PI	17+20.77	757982.6038	1628479.7668
PT	26+64.72	762836.7871	1628455.8735
PC	21+43.74	762115.7852	1628455.3473
PT	21+53.58	762165.6848	1628453.5788
POT	24+17.95	762385.8289	1628445.9112

TYPE	STATION	NORTH	EAST
PC	10+00.00	761858.2842	1628995.4477
PT	40+43.15	761176.8128	1627991.7988
POT	48+43.15	761176.8128	1627991.7988

TYPE	STATION	NORTH	EAST
POT	10+00.00	768755.2193	1628927.8814
PC	10+78.87	768821.2796	1628954.8958
PT	12+87.25	768947.7478	1628937.4414
POT	12+36.85	768976.5475	1628938.4984

TYPE	STATION	NORTH	EAST
POT	10+00.00	762108.2755	1628495.2581
POT	12+31.44	762127.4875	1628686.5886

TYPE	STATION	NORTH	EAST
POT	10+00.00	762152.2344	1628921.5881
POT	12+33.87	762122.3531	1628455.1994

TYPE	STATION	NORTH	EAST
POT	10+00.00	761329.4367	1627795.5449
PC	13+97.95	761481.7918	1627399.4152
PT	18+82.23	761685.2168	1627154.4289
POT	18+53.57	761736.8167	1627152.9893

TYPE	STATION	NORTH	EAST
POT	10+00.00	761296.4217	1627929.5565
TS	18+75.80	761211.7873	1627476.8283
SC	12+91.88	761382.4968	1628311.0738
CS	13+88.57	761415.4817	1628282.3416
ST	15+22.87	761531.8553	1628085.4788
PC	16+84.87	761685.5765	1628075.2418
PT	20+83.28	761718.7644	1628628.1894
POT	21+91.53	761781.4219	1628498.7838

TYPE	STATION	NORTH	EAST
POT	10+00.00	761326.4935	1627437.2188
TS	10+75.00	761148.8353	1627511.8153
SC	12+91.00	761125.8391	1627693.2446
CS	14+48.00	761148.8359	1627812.2627
ST	16+24.20	761878.1144	1628042.2322
PC	17+36.40	761836.8558	1628142.2312
PT	19+80.95	761897.7620	1628381.6789
POT	21+22.80	761976.1398	1628522.5869

All Design Alignments With
Coordinates on Cardinal
Stations (PC, PT, etc.)

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMING REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

“E” Series Sheets

- R/W and Easement Tables
- Signed and Sealed by PLS
- Produced using ...
 - MicroStation
 - “E” series border cell & Surveyors Seal
 - RWTable.ma application
 - Surveyors Attestation from NCMAP-Loc

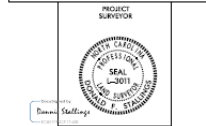


Signed and Sealed

Example Right-of-Way Plans
July 2018

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
5-3109	KW2361
Location and Surveys	
AAA CONSULTANTS 903 MAIN STREET MIDDLETOWN, NC 27001	



I, Dana Stallage, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following were performed in accordance with the standards of the NCOST Survey Standards and procedures in the NCOST Location & Survey Guidelines and procedures.

I further certify that the data compiled came from available surveying performed by others and provided to me by NCOST and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and easement easement points shown herein and callouts in the tables shown herein located coordinates, stationing or other info have been checked and are accurate representations of the right of way and easement easement points located on the corresponding highway plans. I also certify that the right of way and easement easement points shown herein have been field inspected under my supervision from existing survey control provided by others that the depicted property data shown herein were surveyed to other than these monuments above the right of way easement boundaries of the line of standing which may be subject to change due to right of way easement line based on final determinations.

Witness my original signature, registration number and seal this 30th day of July, 2018.

Dana Stallage
Professional Land Surveyor L-2011
P.L.S. Seal

ALIGN	STATION	OFFSET	NORTH	EAST
L	0+53.81	-115.77	762825.2204	1628411.8815
L	1+17.87	-51.54	761878.5459	1628438.8417
L	20+64.72	-48.88	762828.8113	1628416.8889
L	28+52.88	-48.88	762862.7037	1628418.2541
L	28+64.72	48.88	762827.9566	1628416.8789
L	18+37.88	42.88	761816.4823	1628254.4228
L	19+28.78	42.88	761814.8813	1628511.1354
L	7+69.15	73.98	768748.8387	1628683.3478
L	7+67.51	73.84	768748.1812	1628683.1875
L	8+18.63	48.87	768788.2068	1628594.5427
L	8+15.88	-13.58	768791.4569	1628515.8438

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	18+11.48	88.88	761786.2983	1628213.8053
Y7	18+82.23	88.88	761887.5835	1628214.8859
Y7	13+97.35	88.88	761468.2879	1628418.4781
Y7	12+85.88	48.88	761428.2656	1628312.8888
Y7	18+61.14	-18.77	761321.2522	1628728.9883
Y7	12+124.51	-12.75	761288.3483	1628572.4187
Y7	14+15.77	-28.88	761388.3281	1628728.9882
Y7	14+62.39	-25.84	761397.7168	1628327.8885
Y7	15+06.89	-23.71	761481.8889	1628232.8858
Y7	17+88.45	-68.88	761573.2311	1628116.4318
Y7	18+11.37	-68.88	761732.1538	1628893.1182
Y7	18+82.23	-68.88	761887.8881	1628924.9715
Y7	12+28.88	48.88	761411.8891	1628688.9451

ALIGN	STATION	OFFSET	NORTH	EAST
Y	38+28.88	-165.88	761887.8195	1628887.9299
Y	38+28.88	-138.88	761352.8788	1628885.1749
Y	2+88.88	129.88	761191.2488	1628884.2528
Y	2+88.88	738.88	761182.8888	1628884.8788
Y	38+94.28	138.38	761184.8791	1628884.8731

ALIGN	STATION	OFFSET	NORTH	EAST
RPS	10+84.88	81.58	761821.7838	1628884.8838
RPS	20+63.28	78.88	761786.2616	1628817.7314

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	18+78.87	19.11	768833.2812	1628594.8177
Y2	11+82.17	28.88	768788.8888	1628588.3883
Y2	18+78.87	28.88	768833.7577	1628594.2149

ALIGN	STATION	OFFSET	NORTH	EAST
RPC	11+25.88	88.73	761873.8882	1627519.8884
RPC	28+14.88	81.81	768898.8888	1628414.6133
RPC	14+88.28	98.88	761887.8889	1627845.4522
RPC	18+21.28	115.88	768874.2211	1627859.8873
RPC	12+58.13	95.81	761877.8275	1627894.7891
RPC	19+88.76	93.88	768884.8824	1628384.6287
RPC	17+88.28	105.88	768833.2136	1628884.8882

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	10+65.88	28.81	761885.8882	1628884.8437

ALIGN	STATION	OFFSET	NORTH	EAST
R6	11+58.88	22.42	762182.8888	1628798.5881

Statement and Seal

(placement may vary according to available space on sheet)

NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

Example Right-of-Way Plans
July 2018

PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
L-139	PL-12
AAA CONSULTANTS 903 MAIN STREET MIDTOWN, NC 27001	



I, **David S. Williams**, a Professional Land Surveyor in the State of North Carolina hereby certify to the best of my knowledge and belief that the foregoing were based upon a correct and reliable survey performed under my reasonable charge under NCST Survey Statutes as directed in the NCST Location & Survey Submittal and procedure.

I further certify that the acts covered hereon are outside surveys/mapping performed by others and provided to me by NCST and do not certify to the accuracy or validity of the individual's source.

I further certify that the right of way and permanent easement points shown herein are defined in the notes about person, localized coordinates, station or feature have been checked and are accurate representations of the right of way and permanent easement points defined on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been requested under by submission from a surveying survey conducted by others that the indicated property jobs shown herein were surveyed by others and these monuments verify the right of way and easement boundaries of the file or station which may be subject to change due to right of way variations that occur for that information.

***** If original signature, registration number and expires 30th day of July, 2018.

David S. Williams
Professional Land Surveyor L-139
PL-12 1st

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	28+04.72	62.00	762977.8814	162920.86119
L	8+02.04	10.00	760776.6152	16292974.0286
L	10+50.00	60.00	761824.3006	16292594.0530
L	19+20.41	62.00	761111.91617	16293534.5262
L	19+20.79	-72.00	761893.1774	1629407.3984
L	7+92.00	-72.00	760770.0844	1629456.1067
L	7+08.03	-62.70	760733.0147	1629468.7215
L	6+04.02	136.00	760665.5558	1629888.7673
L	10+01.78	-62.50	761174.4968	1629412.8149

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SPA	28+02.20	100.00	761815.2422	1629814.1424
SPA	16+04.67	100.00	761890.2871	1629843.1384

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	34+00.00	146.00	761133.4986	1629416.2620
Y	34+50.00	146.00	761120.2175	1629466.6000
Y	34+49.00	129.30	761152.0460	1629399.2012
Y	34+70.00	146.00	761149.4577	1629424.2472
Y	34+49.00	146.00	761136.3926	1629392.2267
Y	34+70.00	146.00	761132.9090	1629420.2732

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPC	20+51.00	112.00	760894.4521	1629413.4586
RPC	19+00.76	112.00	760874.4321	1629303.5399
RPC	17+30.20	102.00	760811.1452	1629004.2394
RPC	10+24.20	156.00	760956.1708	1627966.3874
RPC	13+05.00	110.00	761001.2587	1627790.6086
RPC	14+08.74	242.00	760813.2378	1627683.9663
RPC	13+08.93	226.14	760842.8387	1627754.5620
RPC	13+00.00	110.00	761096.4287	1627732.0542
RPC	10+04.11	92.07	761053.9761	1627456.7702
RPC	12+50.00	110.00	761007.0619	1627690.0018
RPC	14+04.20	110.00	761037.9826	1627829.2953

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	11+74.15	40.04	762076.9530	1629390.5076
Y6	11+04.00	20.00	762007.1360	1629370.1200
Y6	10+40.00	20.00	762101.6765	1629260.3310
Y6	10+40.00	22.60	762108.0726	1629260.5839

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	13+00.00	52.39	761440.3714	1629491.2961
Y7	12+30.00	84.00	761434.6078	1629571.3690
Y7	13+04.00	110.00	761500.4513	1629512.5053
Y7	17+00.00	160.00	761627.1021	1629180.2340

NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

“RW” Series Sheets

- Modified Plan Sheets for Clarity
- Property Ties Now on RW Sheets
- Produced from original plan sheets using MicroStation filters and cell library
- Each sheet matches area covered by corresponding plan sheet (i.e. 4 = RW4)



Signed and Sealed

8/2/2018

TIP PROJECT: B-3159

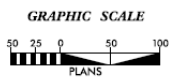
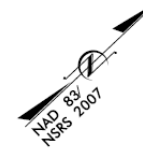
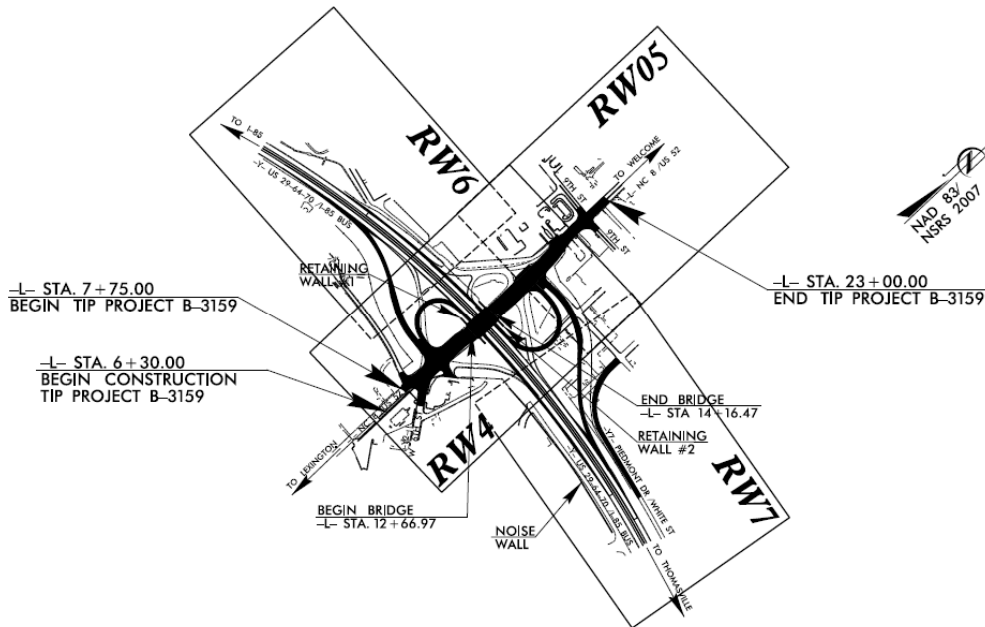
Example Right-Of-Way Plans
July 2018

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT APPROPRIATION NO.	SHEET	TOTAL SHEETS
N.C.		RW01	

SURVEY CONTROL, EXISTING CENTERLINES,
RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

DAVIDSON COUNTY



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "XXXXXX" WITH NAD 83/NGRS XXXX STATE PLANE GRID COORDINATES OF NORTHING: YYY.YYY.YY(Y)(R) EASTING: X.XXXXX.XXX(X)(R) ELEVATION: ZZZZZ(Z)(R) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .XXXXXXX THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "XXXXXX" TO A STATION XXXX IS .XXXXXXX' X XXXX(X) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS XXXXX

Prepared In the Office of:

AAA Consultants
903 Main Street
MIDTOWN, NC 27001

2015 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

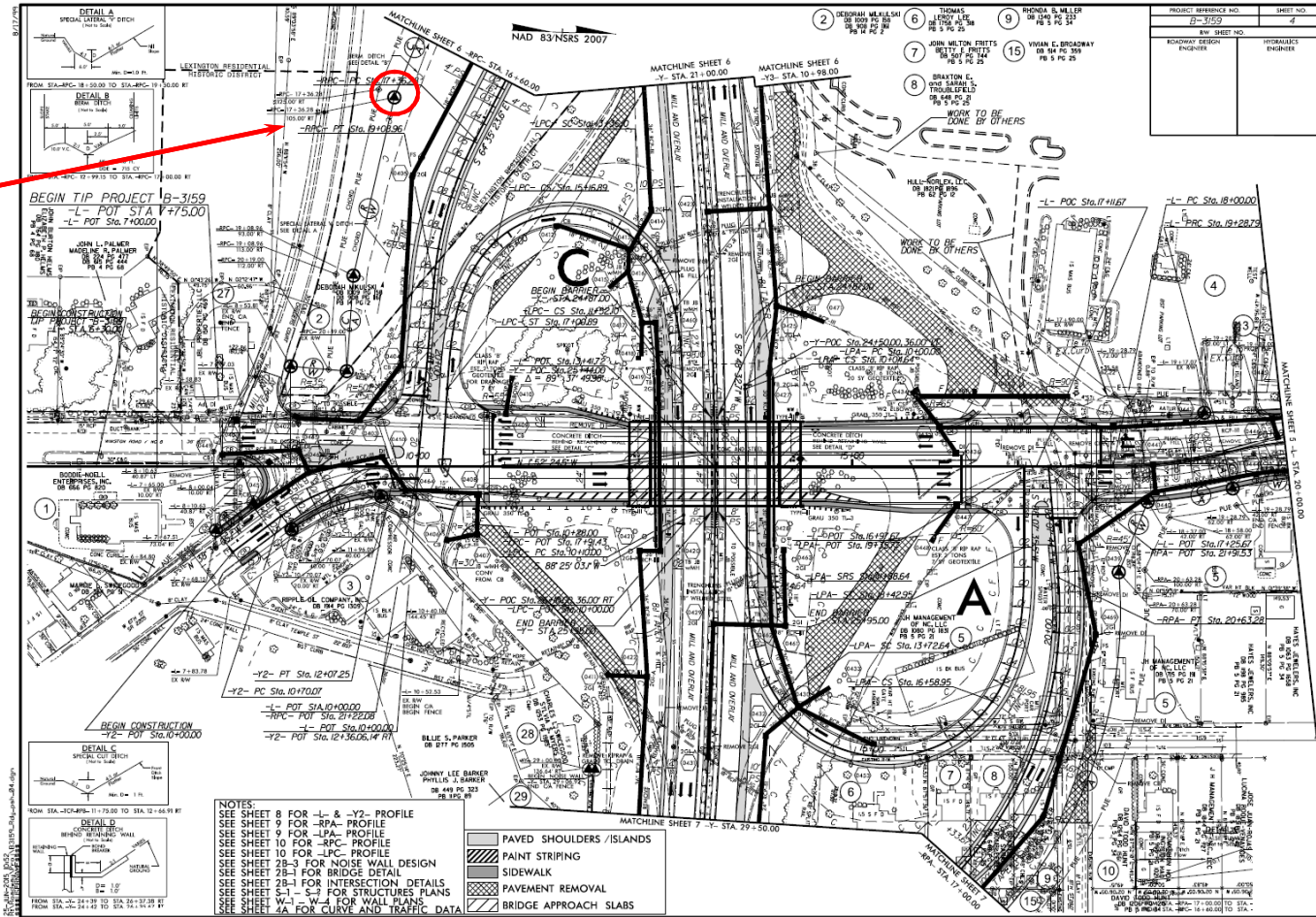
LETTING DATE:

PROFESSIONAL LAND SURVEYOR



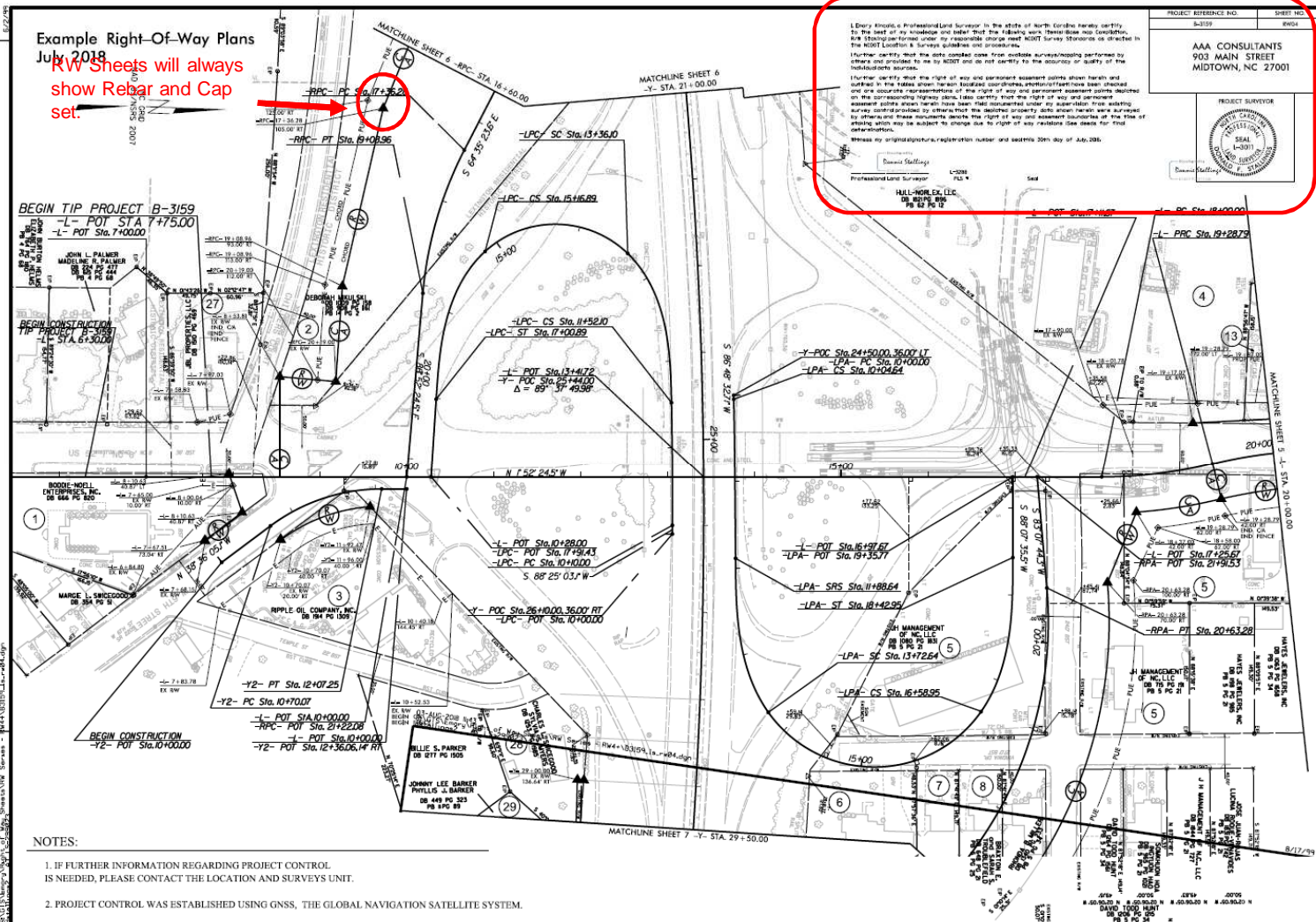
SIGNATURE: _____ DATE: _____

Possible cell replacement to reflect Rebar and Cap



Example Right-Of-Way Plans
July 2018

KW Sheets will always
show Rebar and Cap
set.



NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

Report of Final R/W and Permanent Easement Survey

(Replacement and/or Re-establishing Verification of Right of Way and Permanent Easement Markers for the North Carolina Department of Transportation)

TIP No.:

Project No.:

County:

Project Description:

Plans Recorded in: <County Highway Plan Book designation, i.e. Map Book, Page>

I certify that this survey was done under my responsible charge in accordance with the **NC DOT Survey Standards** as directed in the **NC DOT Location & Surveys Guidelines and Procedures** and the **Manual for Construction Layout** for the purpose of (re-establishing/replacement) of R/W and/or permanent easement markers. That per the Project Plans of Record the following list of markers were either re-established or replaced at the following station/offset locations:

Line Descriptor (-L-, Y-, etc.)	Station	Offset	Northing	Easting	Re-placed or Re-established	Type and Material of Original Marker	Type and Material of New Marker
Examples L	28+56.23	148.66, Rt.	878,948.23	2,456,128.92	Re-placed	R/W, Iron Pin & Cap	R/W, Concrete
Y	58+72.66	167.89, Lt.	868,785.45	2,456,849.88	Re-established	Easement, Iron Pin & Cap	Easement, Iron Pin & Cap

All bearings and coordinates are referenced to the North Carolina State Plane Coordinate System per Plans of Record.

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

Professional Land Surveyor (Print Name)

PLS#



Surveyor's Seal

Signature

21 NCAC 56 .1602 SURVEYING PROCEDURES

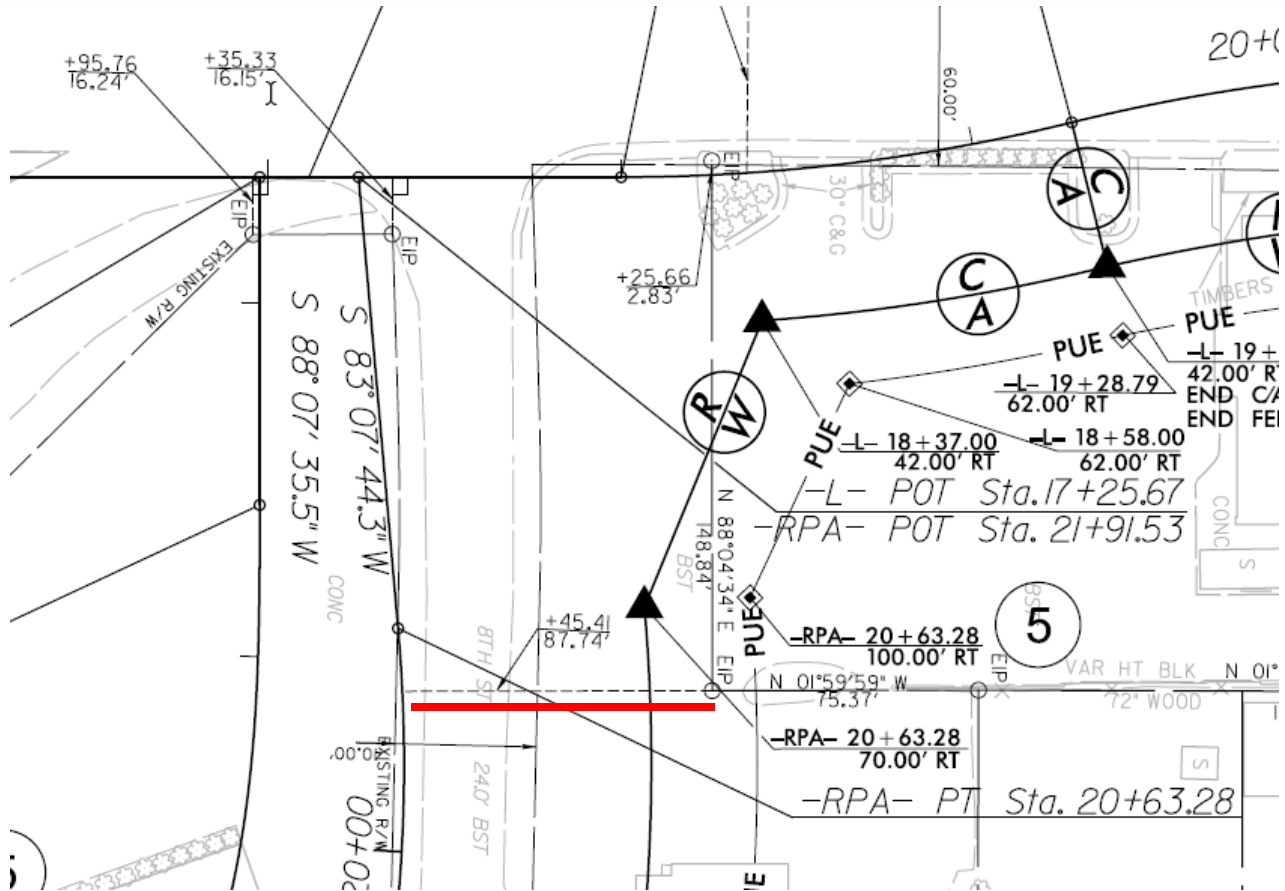
(f) The results of a survey shall be reported to the user of that survey as a map or report of survey and, whether in written or graphic form, shall be prepared in a clear and factual manner. All reference sources shall be identified. Artificial monuments called for in such reports shall be described as found or set. When no monument is found or set for points described in Paragraph (e) of this Rule, that fact shall be noted.

Map or Report of Survey

Table shows monuments replaced or reset along with the type of monument.

Property Ties

- Now located on R/W Sheets
- Using information on “D” sheets, coordinates can be easily computed.

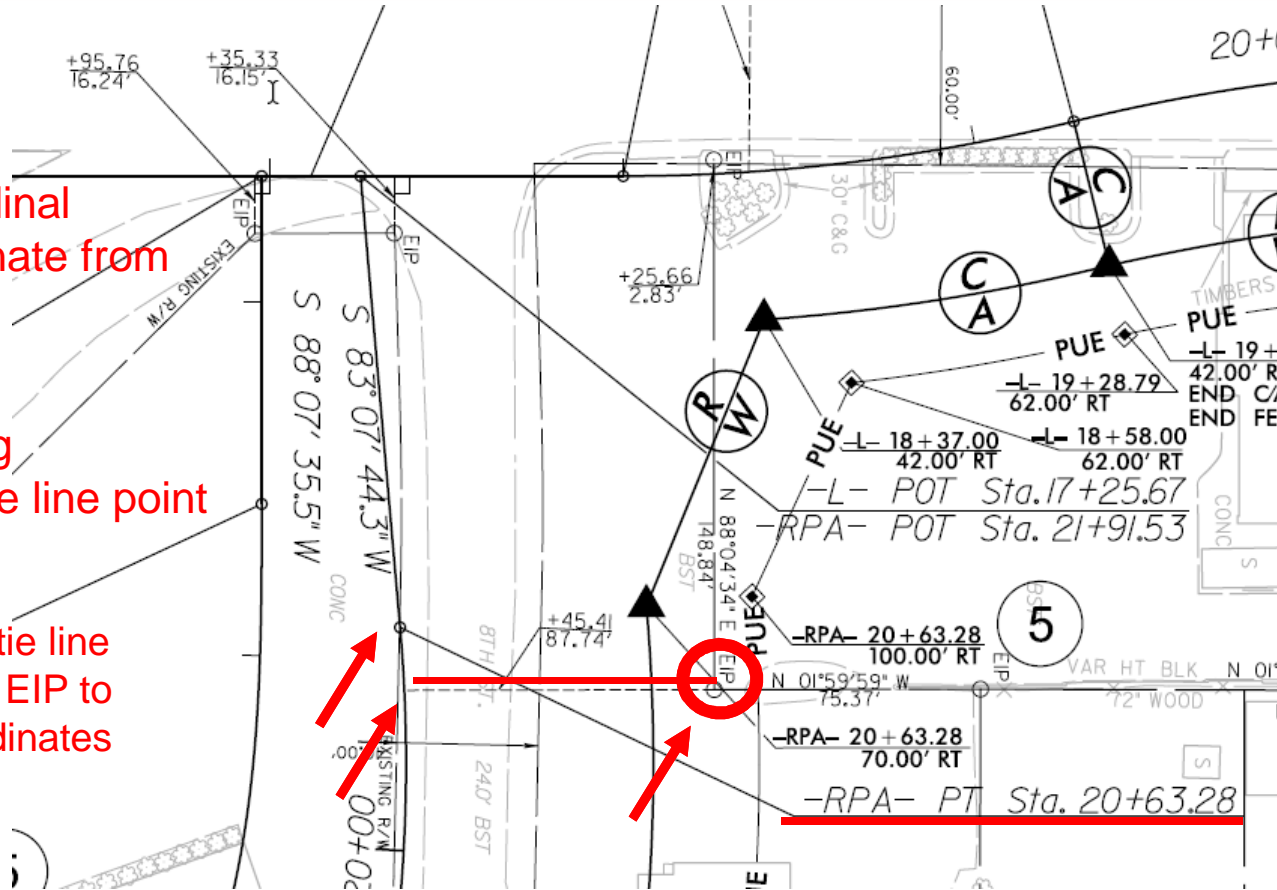


****All Property Ties NOW Shown on RW Sheets - NOT On Plan Sheets**

Start with cardinal station coordinate from D Sheet

Traverse along alignment to tie line point

Traverse along tie line (dashed line) to EIP to determine coordinates



Easily Compute Coordinates For Any Property Corner

Survey Control Sheets Review

- NCDOT Responsibilities (Chapter 89C)
- New Legislation/Response (HB 501)
- Overview of Individual Sheets (C, D, E,R/W)
- Property Ties (located on R/W sheets)

Questions/Discussion

