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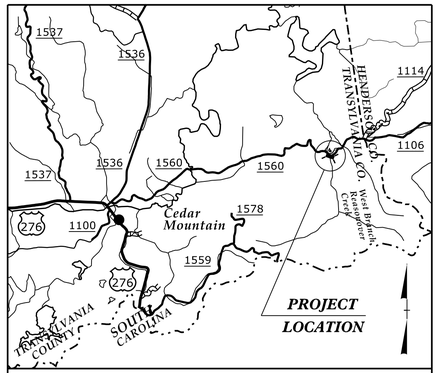
09/08/99

**WBS: 17BP.14.R.118**

**CONTRACT: DN00286**

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols




VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# TRANSYLVANIA COUNTY

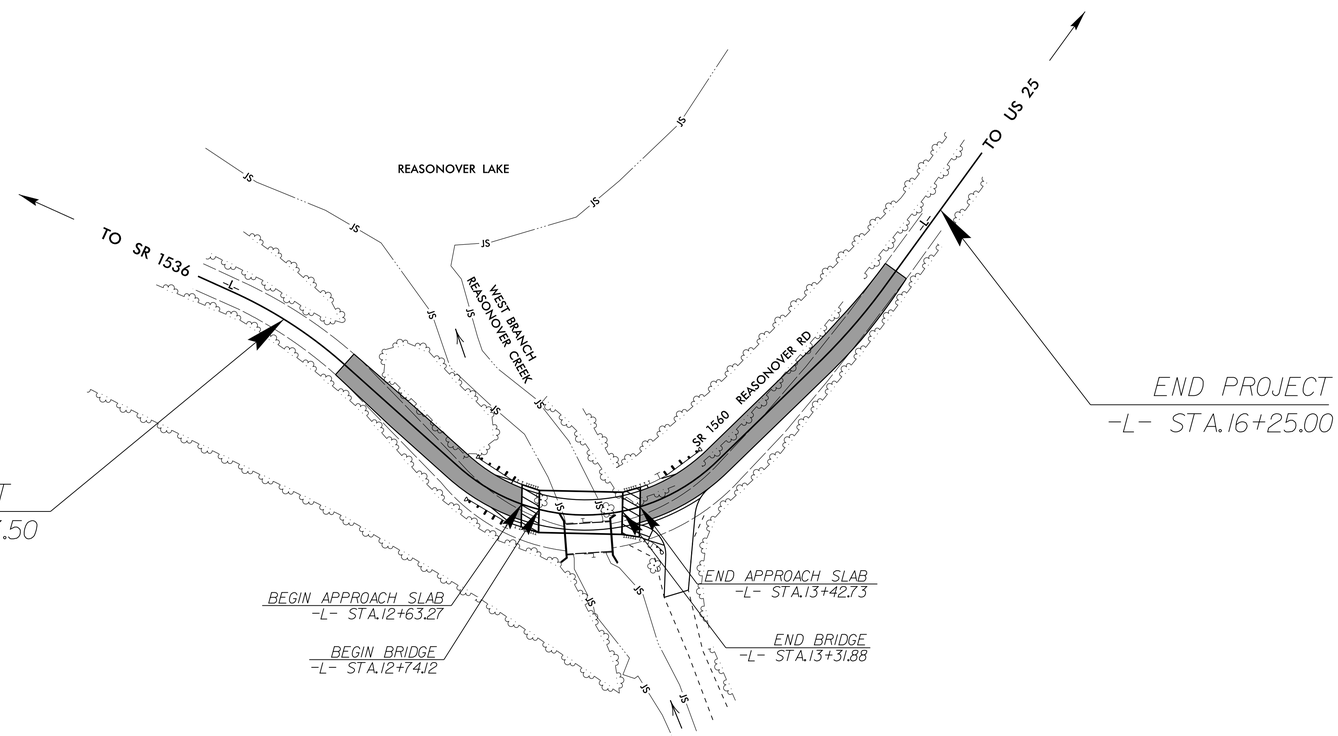
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | 17BP.14.R.118 | 1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 17BP.14.R.118 | N/A | PE |
| 17BP.14.R.118 | N/A | ROW, UTL |
| 17BP.14.R.118 | N/A | CONST. |

**LOCATION: BRIDGE NO. 9 OVER WEST BRANCH REASONOVER CREEK ON SR 1560 (REASONOVER ROAD)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE**

NAD 83/NA 2011

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**GRAPHIC SCALES**

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

**DESIGN DATA**

ADT 2013 = 250

T = 6 %
V = 20 MPH

FUNC CLASS =
LOCAL
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY = 0.095 MILES
LENGTH STRUCTURE = 0.011 MILES
TOTAL LENGTH = 0.106 MILES

PLANS PREPARED BY:
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
704-752-0610

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 28, 2014

LETTING DATE:
2015

JENNIFER FARINO, PE
PROJECT ENGINEER

DREW MORROW, PE
PROJECT DESIGN ENGINEER

JOSH DEYTON, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER
9/12/2017
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER
9/11/2017
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | 1A |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORRISON

DocuSigned by: Drew D. Morrison 6038AA8A0B7B4E0...

9/1/2017

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

REVISIONS

*PLAN REVISION 08-31-17: INDEX OF SHEETS REVISED FOR NEW GUARDRAIL DETAILS.*

# *INDEX OF SHEETS*

| SHEET NUMBER | SHEET |
|---|---|
| 1 | TITLE SHEET |
| 1A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1B | CONVENTIONAL SYMBOLS |
| 1C-1 | SURVEY CONTROL SHEET |
| 2A-1 | PAVEMENT SCHEDULE, TYPICAL SECTIONS |
| 2C-1 | MODIFIED CONCRETE FLUME |
| 2C-2 THRU 2C-3 | GUARDRAIL PLACEMENT DETAILS |
| 2C-4 THRU 2C-5 | GUARDRAIL INSTALLATION DETAILS |
| 2C-6 THRU 2C-7 | STRUCTURE ANCHOR UNITS DETAILS |
| 2C-8 | TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT |
| 3B-1 | SUMMARY OF DRAINAGE QUANTITIES<br>SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY |
| 4 | PLAN AND PROFILE SHEET |
| TMP-1 THRU TMP-4 | TRANSPORTATION MANAGEMENT PLAN |
| PMP-1 THRU PMP-2 | PAVEMENT MARKING PLANS |
| EC-1 THRU EC-5 | EROSION CONTROL PLANS |
| UO-1 THRU UO-2 | UTILITIES BY OTHERS |
| X-1A | CROSS-SECTION SUMMARY SHEET |
| X-1 THRU X-3 | CROSS-SECTIONS |
| S-1 THRU S-21 | STRUCTURE PLANS |
| SN | STRUCTURE STANDARD NOTES SHEET |

# *GENERAL NOTES*

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 07/30/12

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

DUKE ENERGY

COMPORIUM COMMUNICATIONS

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT IN ACCORDANCE WITH SECTION 801 OF THE 2012 NORTH CAROLINA STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

# *STANDARD DRAWINGS*

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

| STD.NO. | TITLE |
|---|---|
| DIVISION 2 - EARTHWORK | |
| 200.02 | Method of Clearing - Method II |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.11 | Reinforced Bridge Approach Fills - Sub Regional Tier |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 8 - INCIDENTALS | |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | 1B |

***Note: Not to Scale***

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

## *BOUNDARIES AND PROPERTY:*

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

## *BUILDINGS AND OTHER CULTURE:*

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

## *HYDROLOGY:*

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

## *RAILROADS:*

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

## *RIGHT OF WAY:*

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

## *ROADS AND RELATED FEATURES:*

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

## *VEGETATION:*

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

## *EXISTING STRUCTURES:*

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

## *UTILITIES:*

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line
- Designated U/G Water Line (S.U.E.*)
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | 1C-1 |
| Location and Surveys | |

# SURVEY CONTROL SHEET 87-0009
## -FINAL-

BL

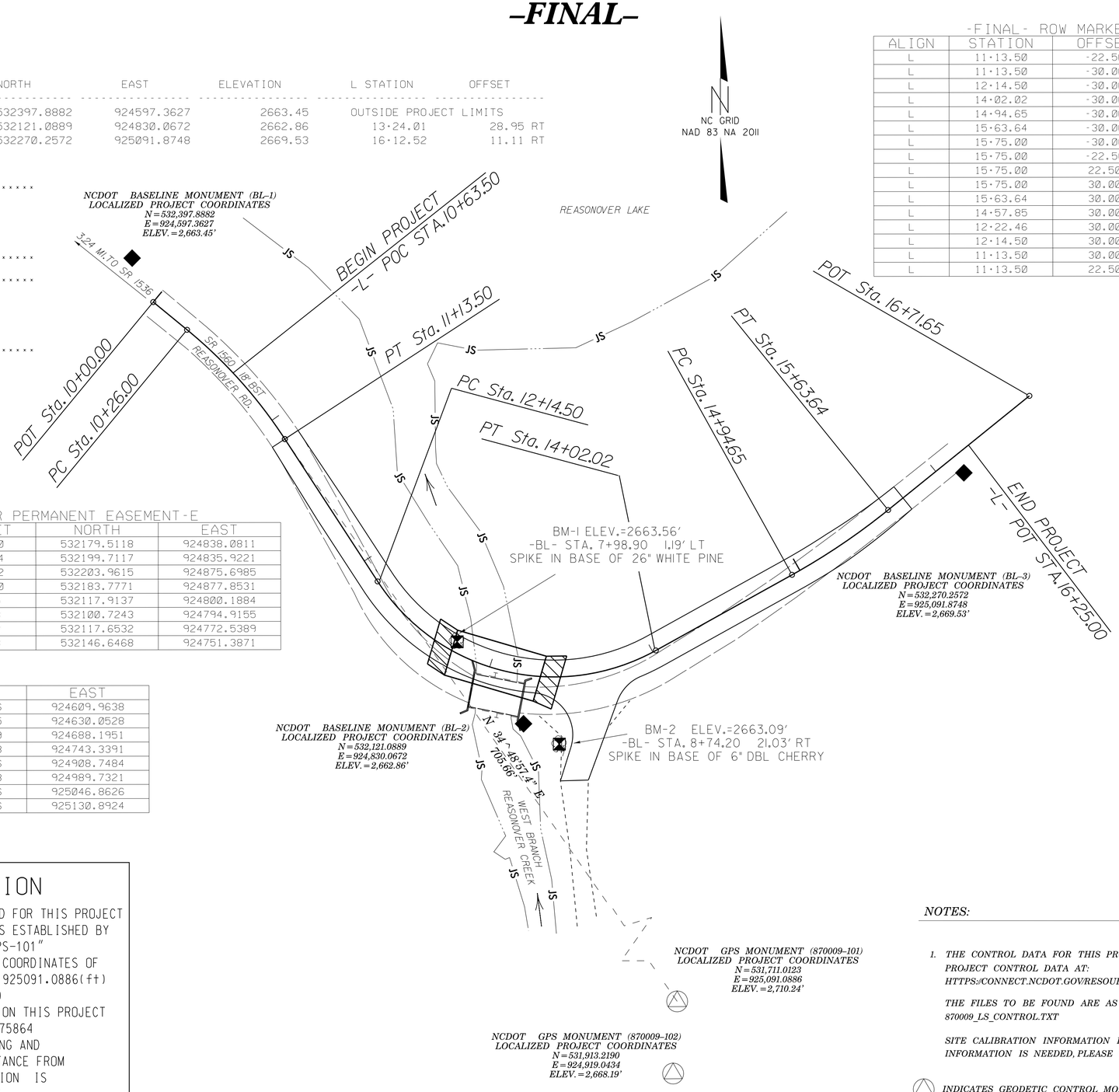
| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 1 | BL-1 | 532397.8882 | 924597.3627 | 2663.45 | OUTSIDE PROJECT LIMITS | |
| 2 | BL-2 | 532121.0889 | 924830.0672 | 2662.86 | 13+24.01 | 28.95 RT |
| 3 | BL-3 | 532270.2572 | 925091.8748 | 2669.53 | 16+12.52 | 11.11 RT |

**********
BM1 ELEVATION = 2663.56
N 532170 E 924791
-L- STATION 12+75.63 6.08 LEFT
SPIKE IN BASE OF 26" WHITE PINE
**********

**********
BM2 ELEVATION = 2663.09
N 532109 E 924851
-L- STATION 13+41.19 39.97 RIGHT
SPIKE IN BASE OF 6" DBL CHERRY
**********

-FINAL- ROW MARKER IRON PIN AND CAP-E

| ALIGN | STATION | OFFSET | NORTH | EAST |
|---|---|---|---|---|
| L | 11+13.50 | -22.50 | 532302.6405 | 924707.0456 |
| L | 11+13.50 | -30.00 | 532306.7353 | 924713.3291 |
| L | 12+14.50 | -30.00 | 532222.1177 | 924768.4731 |
| L | 14+02.02 | -30.00 | 532190.9321 | 924894.1841 |
| L | 14+94.65 | -30.00 | 532235.9028 | 924975.1678 |
| L | 15+63.64 | -30.00 | 532271.5267 | 925028.0136 |
| L | 15+75.00 | -30.00 | 532278.6671 | 925036.8549 |
| L | 15+75.00 | -22.50 | 532272.8324 | 925041.5672 |
| L | 15+75.00 | 22.50 | 532237.8238 | 925069.8408 |
| L | 15+75.00 | 30.00 | 532231.9890 | 925074.5531 |
| L | 15+63.64 | 30.00 | 532224.8485 | 925065.7117 |
| L | 14+57.85 | 30.00 | 532165.5812 | 924972.1220 |
| L | 12+22.46 | 30.00 | 532181.2631 | 924723.8564 |
| L | 12+14.50 | 30.00 | 532189.3589 | 924718.2052 |
| L | 11+13.50 | 30.00 | 532273.9765 | 924663.0612 |
| L | 11+13.50 | 22.50 | 532278.0714 | 924669.3447 |




-FINAL- ROW MARKER PERMANENT EASEMENT-E

| ALIGN | STATION | OFFSET | NORTH | EAST |
|---|---|---|---|---|
| L | 13+25.50 | -30.00 | 532179.5118 | 924838.0811 |
| L | 13+18.40 | -49.74 | 532199.7117 | 924835.9221 |
| L | 13+85.64 | -49.72 | 532203.9615 | 924875.6985 |
| L | 13+78.52 | -30.00 | 532183.7771 | 924877.8531 |
| L | 13+01.45 | 38.25 | 532117.9137 | 924800.1884 |
| L | 13+01.45 | 56.23 | 532100.7243 | 924794.9155 |
| L | 12+82.40 | 48.62 | 532117.6532 | 924772.5389 |
| L | 12+57.48 | 34.88 | 532146.6468 | 924751.3871 |

-L- FINAL

| TYPE | STATION | NORTH | EAST |
|---|---|---|---|
| POT | 10+00.00 | 532371.7956 | 924609.9638 |
| PC | 10+26.00 | 532355.2895 | 924630.0528 |
| PT | 11+13.50 | 532290.3559 | 924688.1951 |
| PC | 12+14.50 | 532205.7383 | 924743.3391 |
| PT | 14+02.02 | 532164.7046 | 924908.7484 |
| PC | 14+94.65 | 532209.6753 | 924989.7321 |
| PT | 15+63.64 | 532248.1876 | 925046.8626 |
| POT | 16+71.65 | 532316.0516 | 925130.8924 |

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "870009 GPS-101" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 531711.0123(ft) EASTING: 925091.0886(ft) ELEVATION: 2710.24(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99975864
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "870009 GPS-101" TO -L- STATION IS N 34°48'57.4 W 705.66'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

*GEOID MODEL - G09NC*
*NOTE: DRAWING NOT TO SCALE*

*NOTES:*

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/*

   *THE FILES TO BE FOUND ARE AS FOLLOWS: 870009_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 PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

*PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.*

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# PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

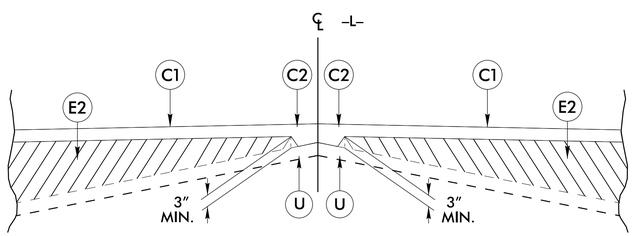
| | |
|---|---|
| C1 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C2 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH. |
| E1 | PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. |
| E2 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH. |
| R1 | SHOULDER BERM GUTTER |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL) |

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

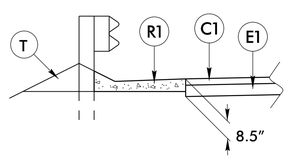
NOTE: FEATHER ASPHALT 0" TO 3" FROM –L– STA 10+63.50 TO –L– STA 11+13.50 AND FROM –L– STA 15+75.00 TO –L– STA 16+25.00

REVISIONS

PLAN REVISION 08-31-17: DIMENSION FOR EXISTING PAVEMENT WIDTH CHANGED FROM VAR.TO 18' ON TYPICAL SECTION NO.1.
PLAN REVISION 08-31-17: DIMENSION FOR C2 PAVEMENT THICKNESS REVISED ON TYPICAL SECTION ON STRUCTURE.




STANDARD WEDGING DETAIL




SHOULDER BERM GUTTER DETAIL

–L– STA. 12+51.44 TO –L– STA. 12+58.81 (BEGIN APPROACH SLAB) LT
–L– STA. 12+61.00 TO –L– STA. 12+67.46 (BEGIN APPROACH SLAB) RT
–L– STA. 13+37.31 (BEGIN APPROACH SLAB) TO L– STA. 13+41.63 RT
–L– STA. 13+47.19 (BEGIN APPROACH SLAB) TO L– STA. 13+52.32 LT

# BRIDGE NO. 9

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | 2A-1 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DAVID W. D. MORROW
DocuSigned by: 9/1/2017
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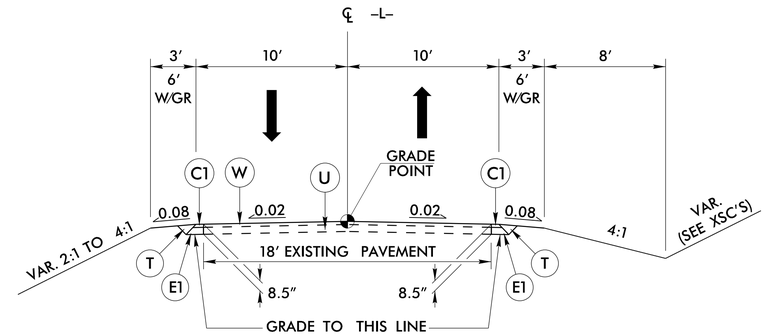
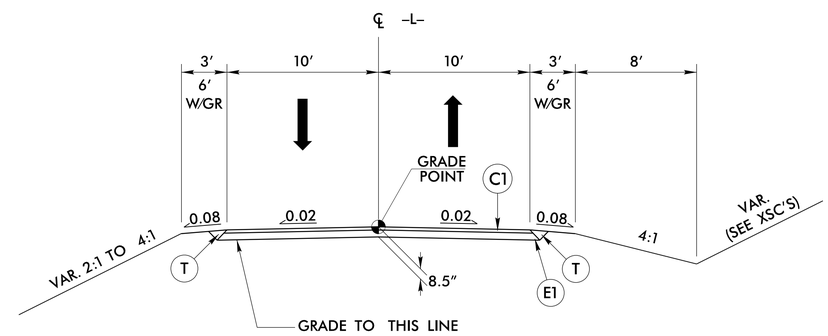
RS&H




TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

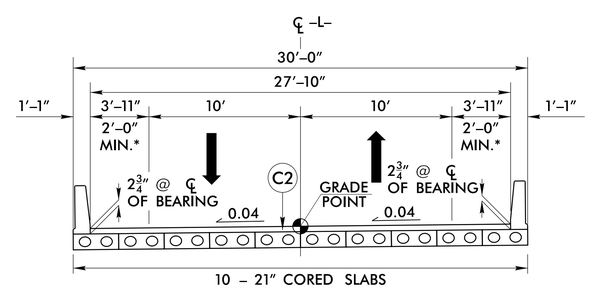
–L– STA. 11+13.50 TO –L– STA. 12+35.98
–L– STA. 14+40.15 TO –L– STA. 15+75.00




TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 12+35.98 TO –L– STA. 12+74.12 (BEGIN BRIDGE)
–L– STA. 13+31.88 (END BRIDGE) TO –L– STA. 14+40.15




TYPICAL SECTION ON STRUCTURE

*MUST MAINTAIN A MINIMUM CLEAR ROADWAY WIDTH OF 24'.

USE TYPICAL SECTION ON STRUCTURE

–L– STA. 12+74.12 TO –L– STA. 13+31.88

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STATE OF NORTH CAROLINA
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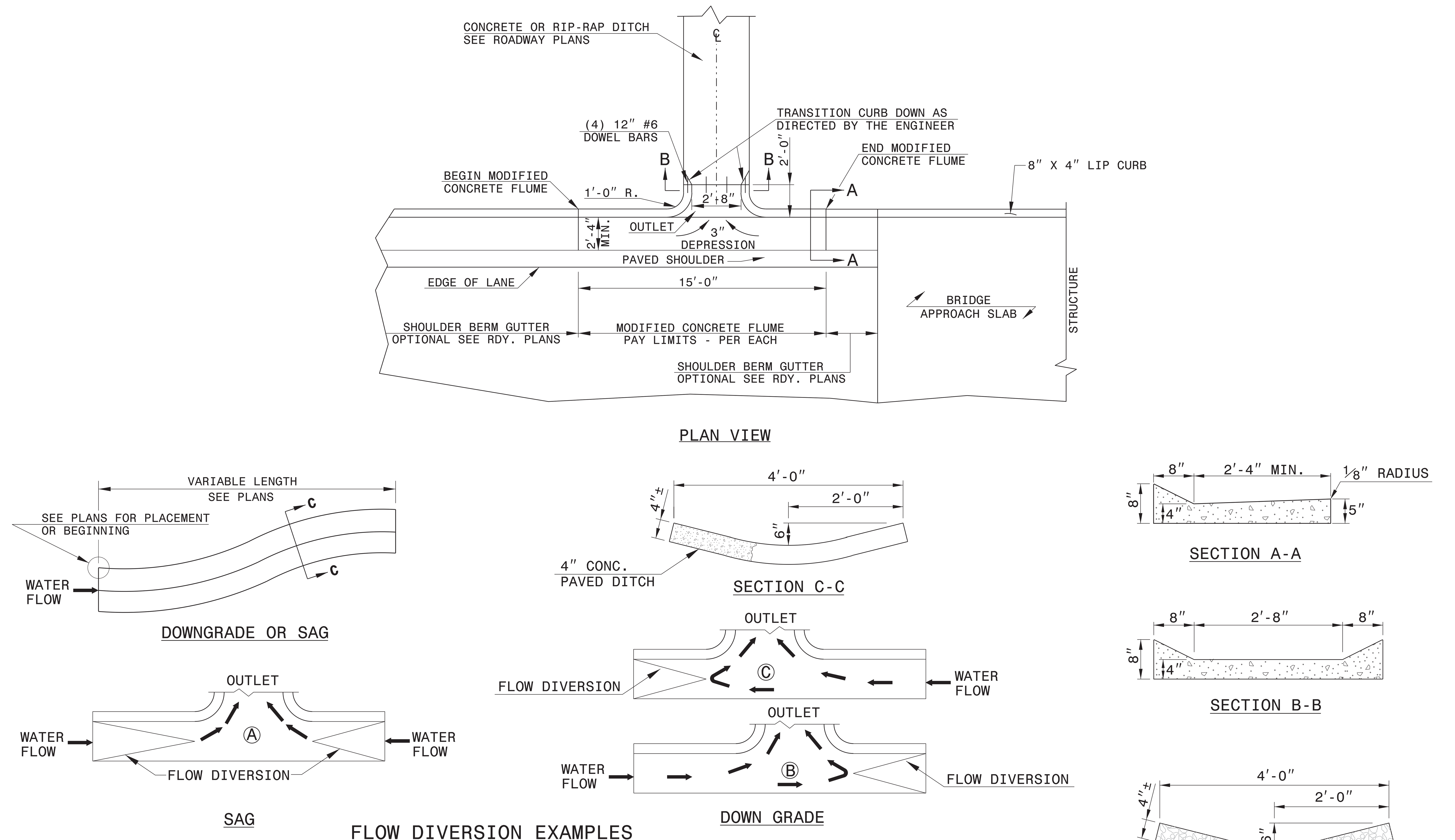
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
# MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH




NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

SHEET 1 OF 1
MODFLMDTCH

STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 9/14/2017

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MODIFIED BY: E.E. Ward DATE: July 2004
CHECKED BY: DATE:
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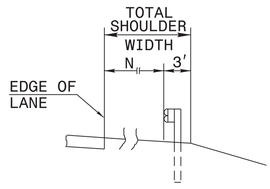
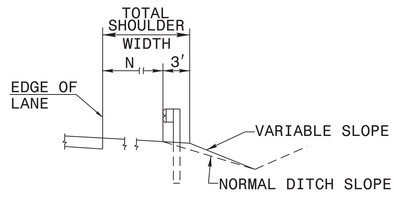
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**

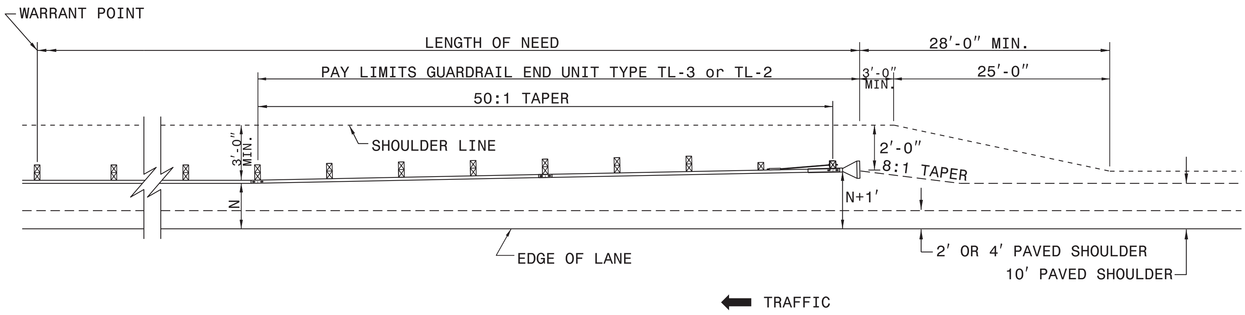



FILL SECTION




CUT SECTION

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.




FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

## DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

SHEET 6 OF 11
**862D01**

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ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**

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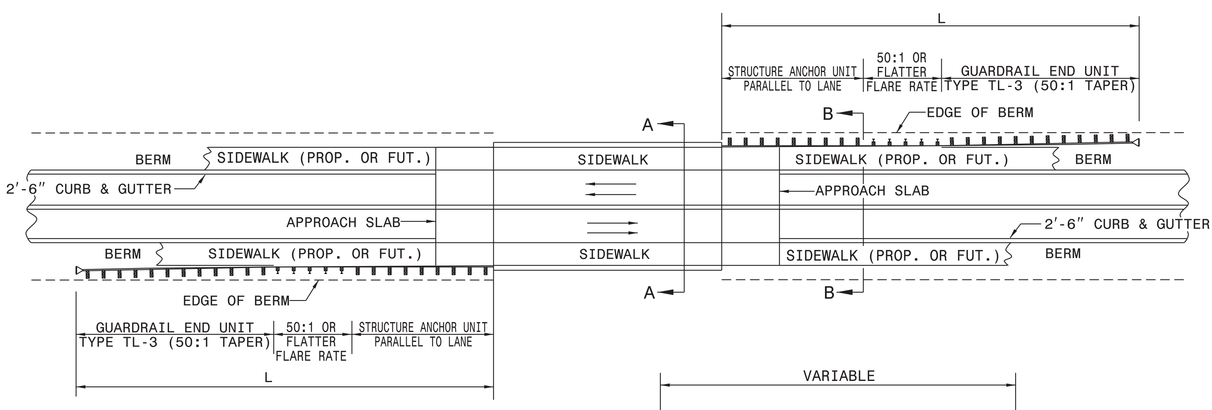
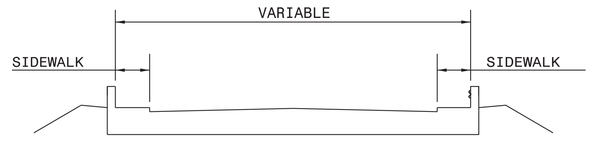
ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**



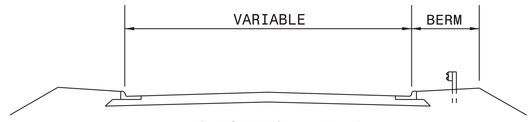

| MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS | |
|---|---|
| DESIGN SPEED (MPH) | "L" |
| 40 | 150' |
| 50 | 225' |

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

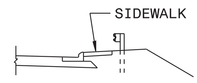
SEE STD. 862D03 FOR STRUCTURE ANCHOR UNITS.




SECTION A-A




SECTION B-B




FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

## STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2'-6" CONCRETE CURB AND GUTTER

SHEET 5 OF 11
**862D01**

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**

SHEET 6 OF 11
**862D01**

SHEET 5 OF 11
**862D01**

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9/14/2017

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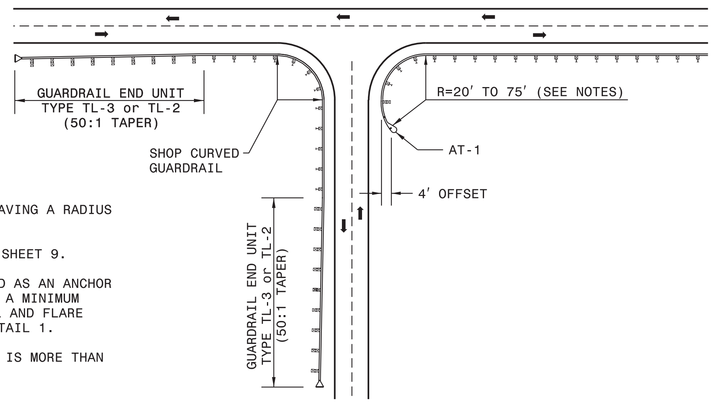
ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**




NOTES:

SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150' OR LESS.

WHEN RADIUS IS LESS THAN 20' REFER TO SHEET 9.

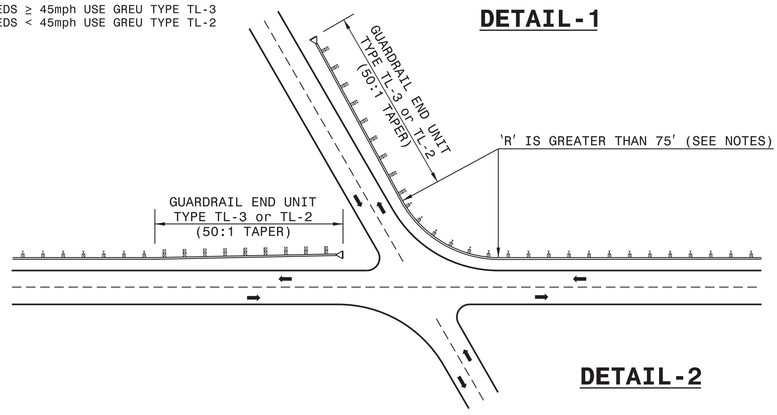
WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20' TO 75', USE A MINIMUM LENGTH OF 50' OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.

WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75', REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

**DETAIL-1**




**DETAIL-2**

## GUARDRAIL TREATMENT AT INTERSECTIONS

SHEET 8 OF 11
**862D01**

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**

SHEET 8 OF 11
**862D01**

STATE OF NORTH CAROLINA
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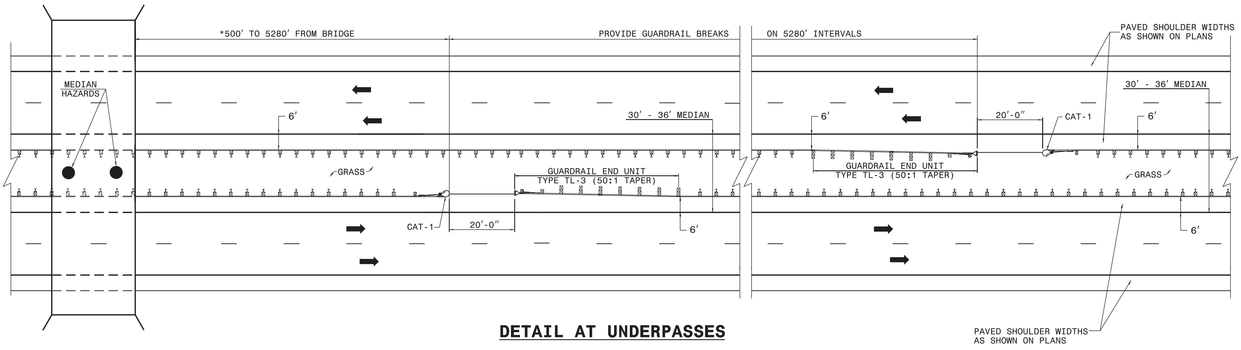
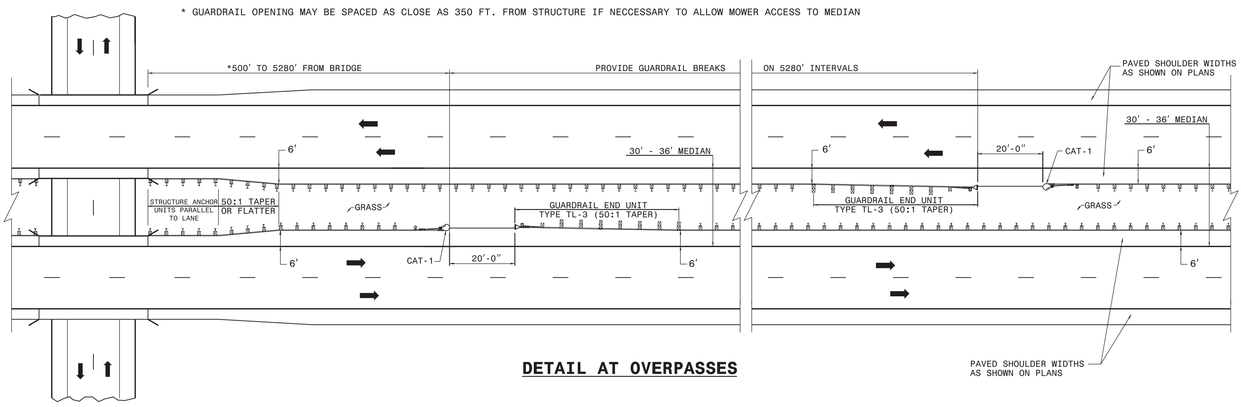
ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**




**DETAIL AT UNDERPASSES**

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECCESSARY TO ALLOW MOWER ACCESS TO MEDIAN




**DETAIL AT OVERPASSES**

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

## GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

SHEET 7 OF 11
**862D01**

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
**GUARDRAIL PLACEMENT**

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**862D01**

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9/14/2012

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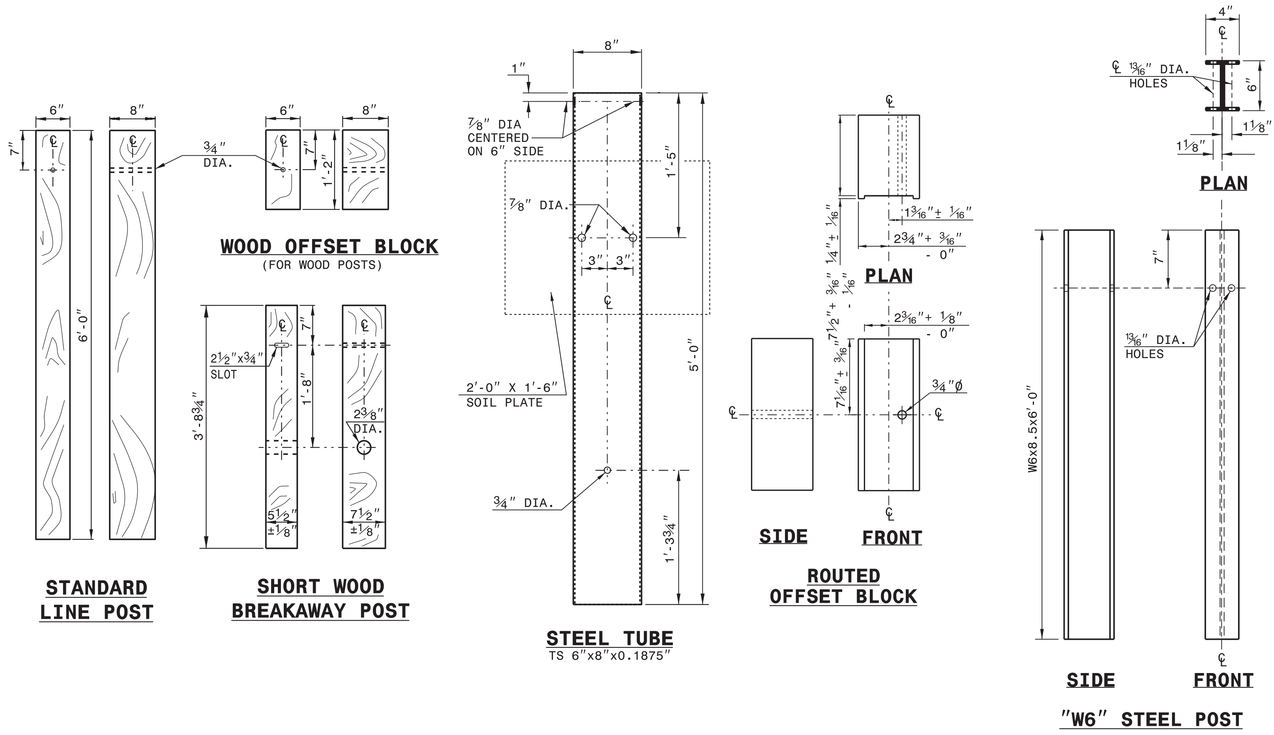
ROADWAY DETAIL DRAWING FOR
**GUARDRAIL INSTALLATION**




## SYSTEM PARTS

SHEET 6 OF 8
**862D02**

STATE OF NORTH CAROLINA
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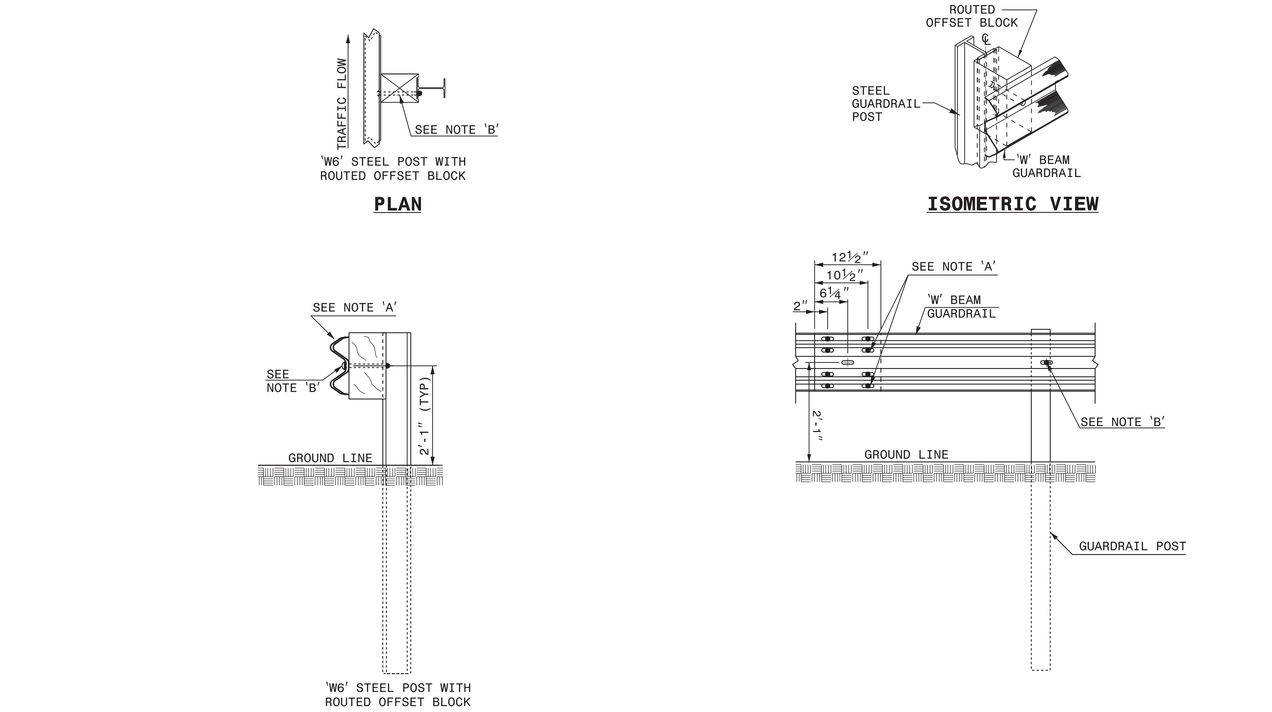
ROADWAY DETAIL DRAWING FOR
**GUARDRAIL INSTALLATION**




NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

## TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

SHEET 5 OF 8
**862D02**

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ROADWAY DETAIL DRAWING FOR
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8
**862D02**

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
**GUARDRAIL INSTALLATION**

SHEET 5 OF 8
**862D02**

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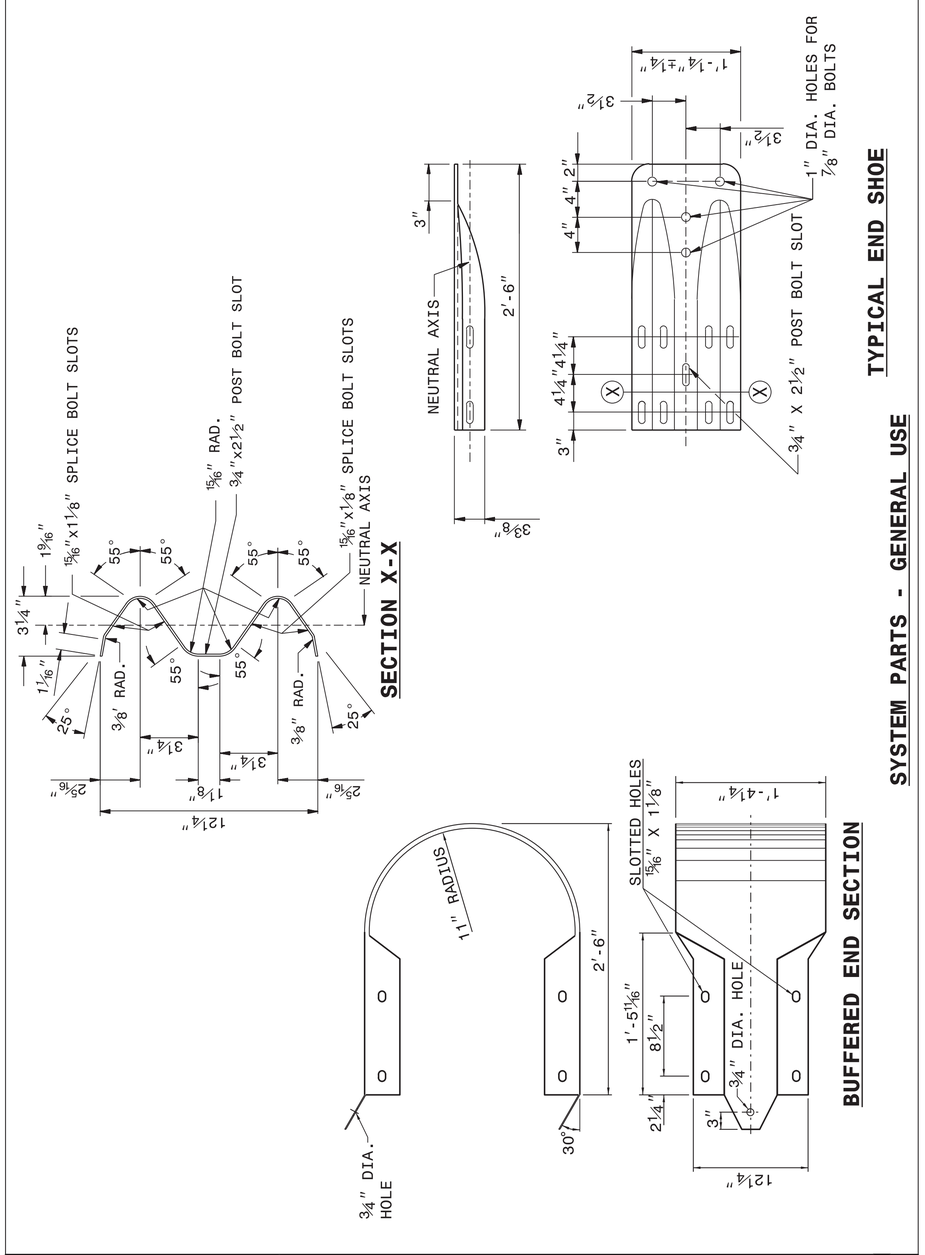


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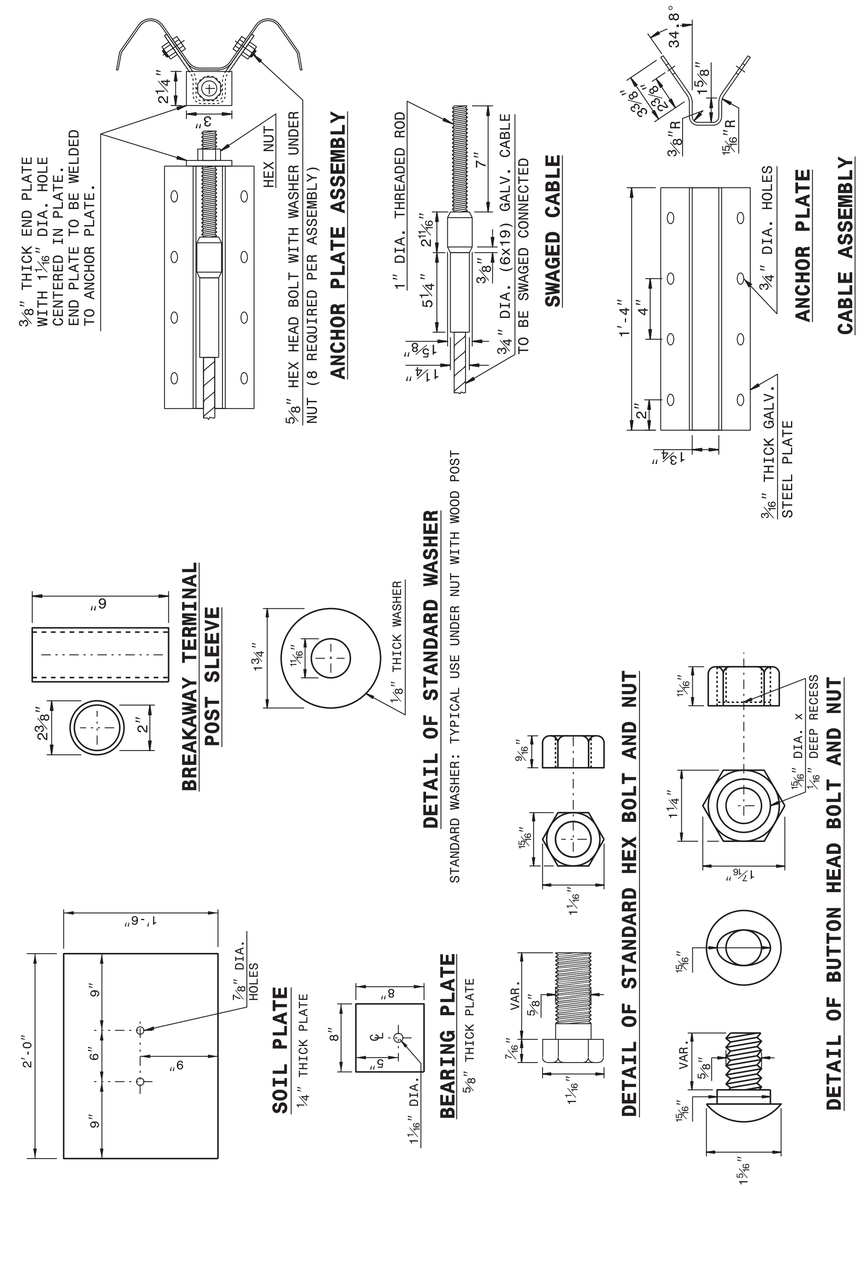
ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 8 OF 8 **862D02**

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ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 7 OF 8 **862D02**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**

SHEET 8 OF 8 **862D02**

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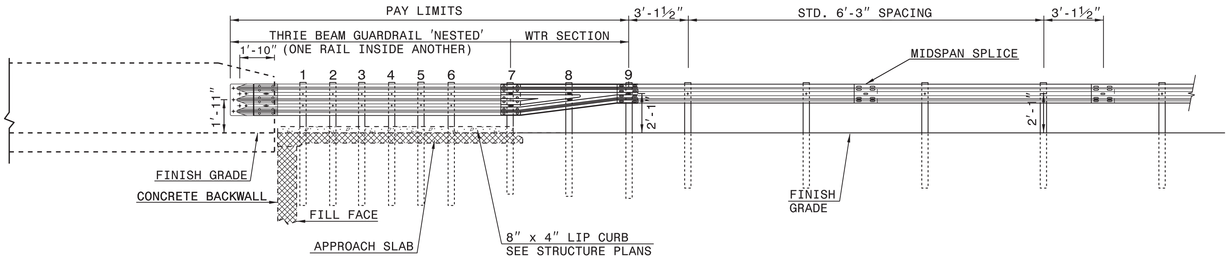
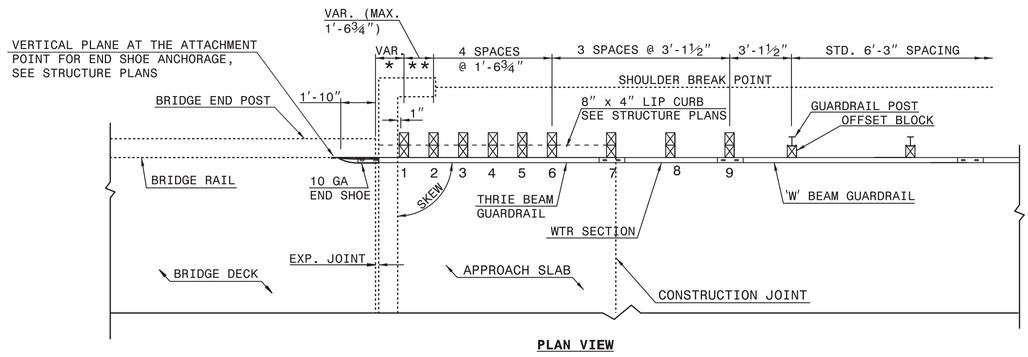
ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNITS**
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
**862D03**




**ELEVATION**

NOTE:
- **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
- -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
- -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
- -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- -SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.




**PLAN VIEW**

## GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNITS**
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 2 OF 7
**862D03**

STATE OF NORTH CAROLINA
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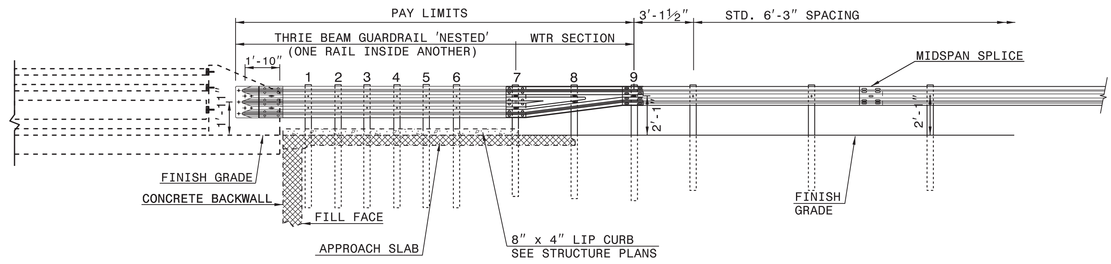
ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNITS**
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
**862D03**

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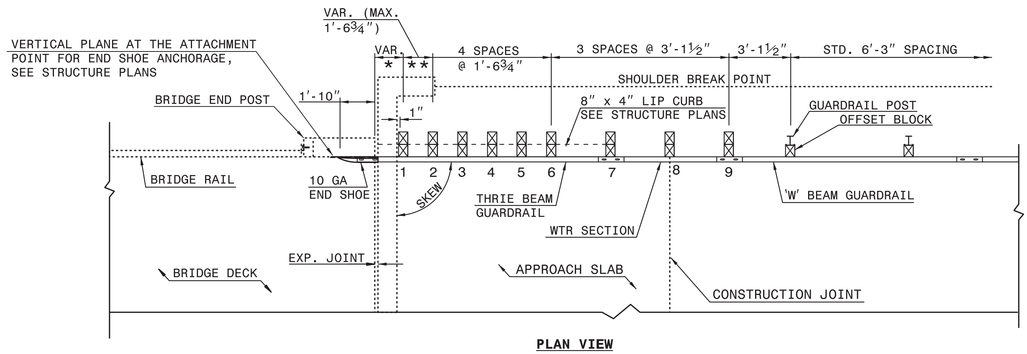


**PLAN VIEW**

## GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNITS**
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
**862D03**

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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNITS**
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
**862D03**




STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**STRUCTURE ANCHOR UNIT**
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7
**862D03**




GENERAL NOTES:
1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS COATED WITH ZINC ALUMINUM ALLOY PER AASHTO M-36 TYPE 1 AND 3. BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL SECURED WITH A $\frac{5}{8}$" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH $\frac{5}{8}$" x 14 LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
4) SEE DETAIL D FOR SUPERELEVATED RUBRAIL BLOCKOUT. RUBRAIL BLOCKOUTS ATTACHED TO RAIL ELEMENT ONLY. USE $\frac{3}{8}$" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F-SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE:
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE $\frac{5}{8}$" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS IS $1\frac{1}{2}$".
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE (SEE STD. DWG. 862.04). A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01).
   (c) AT NEW BRIDGE RAIL, INSTALL THE NESTED W-BEAM ELEMENTS AS DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W6 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
**GUARDRAIL ANCHOR UNIT**
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7
**862D03**

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jhowerton AT CSD-292595

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
DocuSigned by: Jennifer Jones Tennyson
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9/14/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**CONTRACT STANDARDS AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

**SEE TITLE BLOCK**

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
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5/14/99

| PROJECT REFERENCE NO. | SHEET NO. |
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| 17BP.14.R.118 | 2C-8 |

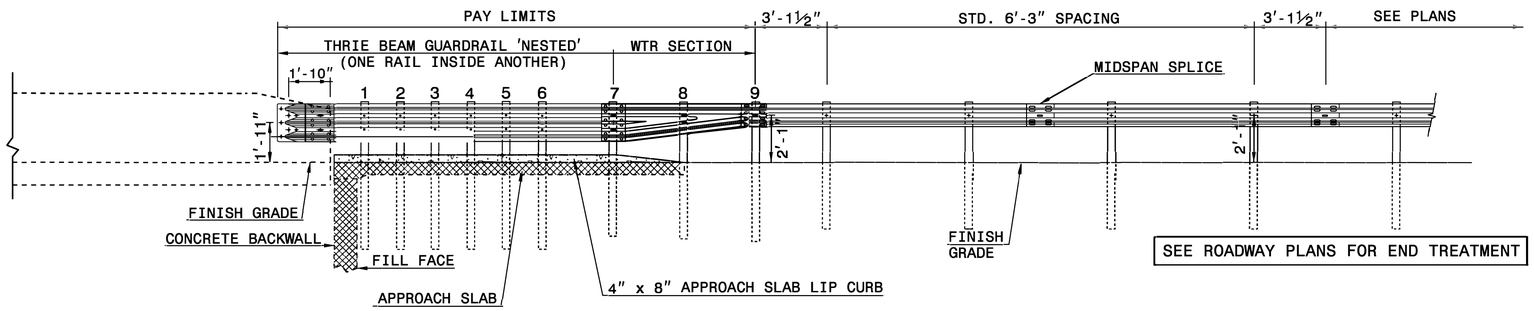
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

**TYPE III - SHOP CURVED**
**STRUCTURE ANCHOR UNIT**

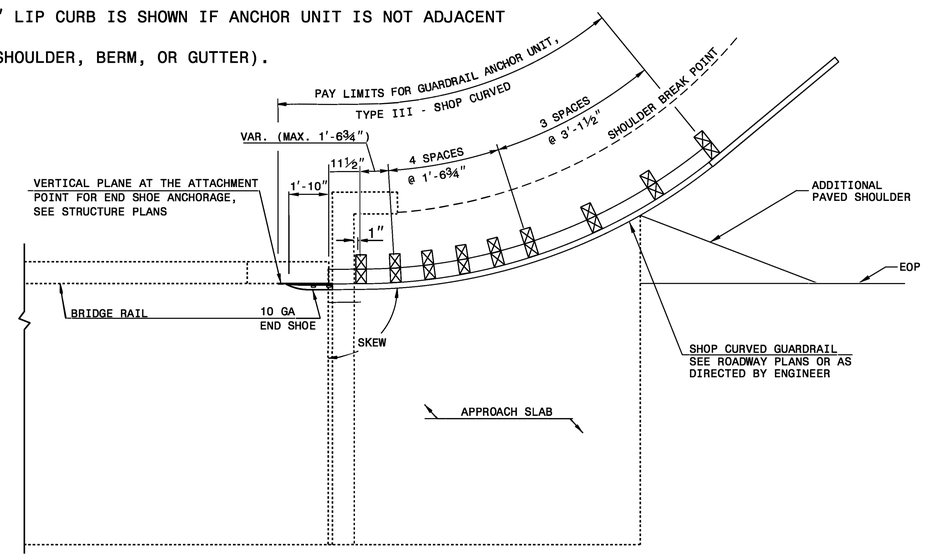
SHEET 1 OF 1

**TYPE III SC**




**ELEVATION**

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.




**PLAN VIEW**

## GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED FOR ATTACHMENT TO RAIL ON BRIDGE

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

**TYPE III - SHOP CURVED**
**STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1

**TYPE III SC**

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jhowerton AT CSD-292595

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
Jason S. Howerton
B73F3D1FD2D8488...
9/14/2017

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACT STANDARDS AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 5-29-09
CHECKED BY: DATE:
FILE SPEC.: ward:\usr\details\stand\862stds\typeiiisc.dgn

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COMPUTED BY: DDM DATE: 6/2015
CHECKED BY: JDF DATE: 6/2015

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BPJ4.RJ18 | 3B-1 |

REVISIONS

PLAN REVISION 08-31-17: TL-2 GUARDRAIL ANCHOR UNIT CHANGED TO GREU TL-2 IN GUARDRAIL SUMMARY.

## SUMMARY OF EARTHWORK

| PHASE | STATION | STATION | UNCL. EXCAV. | EMBANK. +% | BORROW | WASTE |
|---|---|---|---|---|---|---|
| PHASE 1 | -L- STA. 11+13.50 LT. | -L- STA. 12+70.62 (BR) LT. | 4 | 88 | 84 | |
| | -L- STA. 13+35.71 (BR) LT. | -L- STA. 15+75.00 LT. | 7 | 179 | 172 | |
| | | SUBTOTALS: | 11 | 267 | 256 | |
| | 5% TO REPLACE TOPSOIL | | | | 13 | |
| | | PHASE 1 SUBTOTALS: | 11 | 267 | 269 | |
| PHASE 2 | -L- STA. 11+13.50 RT. | -L- STA. 12+74.12 (BR) RT. | 246 | 9 | | 237 |
| | -L- STA. 13+31.88 (BR) RT. | -L- STA. 15+75.00 RT. | 102 | 41 | | 61 |
| | | PHASE 2 SUBTOTALS: | 348 | 50 | 0 | 298 |
| | PROJECT TOTALS: | | 359 | 317 | 269 | 298 |
| | GRAND TOTALS: | | 359 | | 269 | |
| | SAY: | | 375 | | 280 | |

EST UNDERCUT = 50 CY CONTINGENCY
EST SELECT GRANULAR MATERIAL = 50 CY CONTINGENCY
EST FABRIC FOR SOIL STABILIZATION = 50 SY CONTINGENCY

## PAVEMENT REMOVAL SUMMARY

| PHASE | SURVEY LINE | STATION | STATION | LOCATION LT/RT/CL | YD² |
|---|---|---|---|---|---|
| PHASE 2 (SEE TMP-3) | -L- | 11+14 | 12+87 | RT | 142.76 |
| | -L- | 13+26 | 15+75 | RT | 264.68 |
| | | | | TOTAL: | 407.44 |
| | | | | SAY: | 410 |

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

## SHOULDER BERM GUTTER SUMMARY

| SURVEY LINE | STATION | STATION | LENGTH |
|---|---|---|---|
| -L-, LT | 12+51.44 | 12+58.81 | 6.64 |
| -L-, RT | 12+61.00 | 12+67.46 | 6.66 |
| -L-, RT | 13+37.31 | 13+41.63 | 6.21 |
| -L-, LT | 13+47.19 | 13+52.32 | 4.61 |
| | | TOTAL: | 24.12 |
| | | SAY: | 25.00 |

NOTE:
INVERT ELEVATIONS INDICATED ARE FOR BID PURPOSES ONLY AND SHALL NOT BE USED FOR PROJECT CONSTRUCTION STAKEOUT.
SEE "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 300-5".

## LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

| STATION / SIZE / THICKNESS OR GAUGE | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" 15" 18" 24" 30" 36" 42" 48" | C.S. PIPE (UNLESS NOTED OTHERWISE) 12" 15" 18" 24" 30" 36" 42" 48" (.064 .064 .064 .064 .079 .079 .109 .109) | CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12" 15" 18" 24" 30" 36" 42" 48" | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0') | LIN. *FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E F G | MODIFIED CONCRETE FLUME | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -L- STA 13+58 | LT. | 0401 | | 2664.70 | | | | | | | | | | | | | | | | | 1 | | | | | |

ABBREVIATIONS
C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
G.D.I. GRATED DROP INLET
G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
J.B. JUNCTION BOX
M.H. MANHOLE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

## GUARDRAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH STRAIGHT | LENGTH SHOP CURVED | LENGTH DOUBLE FACED | WARRANT POINT APPROACH END | WARRANT POINT TRAILING END | "N" DIST. FROM E.O.L. | TOTAL SHOUL. WIDTH | FLARE LENGTH APPROACH END | FLARE LENGTH TRAILING END | W APPROACH END | W TRAILING END | ANCHORS TYPE III | ANCHORS TYPE III - SHOP CURVED | ANCHORS GREU TL-2 | ANCHORS AT-1 | IMPACT ATTENUATOR TYPE 350 EA | G | NG | SINGLE FACED GUARDRAIL | REMOVE EXISTING GUARDRAIL | REMOVE AND STOCKPILE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -L- | 12+23.59 | 12+72.21 (BR) | LT. | 43.75 | | | | 12+72.21 (BR) | 2.2019 | 6 | | 25 | | 0.5 | 1 | | 1 | | | | | | | | GUARDRAIL REDUCED TO AVOID EXISTING FIRE HYDRANT |
| -L- | 12+33.36 | 12+78.28 (BR) | RT. | 50.00 | | | 12+78.28 (BR) | | 4.9562 | 6 | 25 | | 0.5 | | 1 | | 1 | | | | | | | | GUARDRAIL CALCULATED USING SUBREGIONAL TIER GUIDELINES |
| -L- | 13+27.72 (BR) | 13+46.75 | RT. | 12.50 | 18.75 | | | 13+27.72 (BR) | 4.9562 | 6 | | | | | | 1 | | 1 | | | | | | | GUARDRAIL REDUCED FOR DRIVEWAY ACCESS |
| -L- | 13+33.79 (BR) | 13+96.31 | LT. | 56.25 | | | 13+33.79 (BR) | | 2.2019 | 6 | 25 | | 0.5 | | 1 | | 1 | | | | | | | | GUARDRAIL EXTENDED DUE TO MODIFIED CONCRETE FLUME |
| | | | SUBTOTALS | 162.50 | 18.75 | | | | | | | | | | | | | | | | | | | | |
| | | | ANCHOR DEDUCTION | 137.50 | 18.75 | | | | | | | | | | | | | | | | | | | | |
| | | | TOTAL | 25.00 | 0.00 | | | | | | | | | | | | | | | | | | | | |
| | | | SAY | 37.50 | 0.00 | | | | | | | | | | | | | | | | | | | | |

ANCHOR DEDUCTION
TYPE III: 3 @ 18.75' = 56.25'
TYPE III - SHOP CURVED: 1 @ 18.75' = 18.75'
TYPE GREU TL-2: 3 @ 25' = 75'
TYPE AT-1: 1 @ 6.25' = 6.25'
GRAND TOTAL = 156.25'
ADDITIONAL GUARDRAIL POSTS = 5

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| PROJECT REFERENCE NO. | SHEET NO. |
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| 17BP.14.R.118 | 4 |

R/W SHEET NO.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER — DOCUSIGNED BY: JEFFREY D. MORTON — 9/1/2017

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036188 ENGINEER — DOCUSIGNED BY: JOSHUA WILLIAMS — 9/1/2017

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

NAD 83/NA 2011

RS&H

8/17/99

REVISIONS

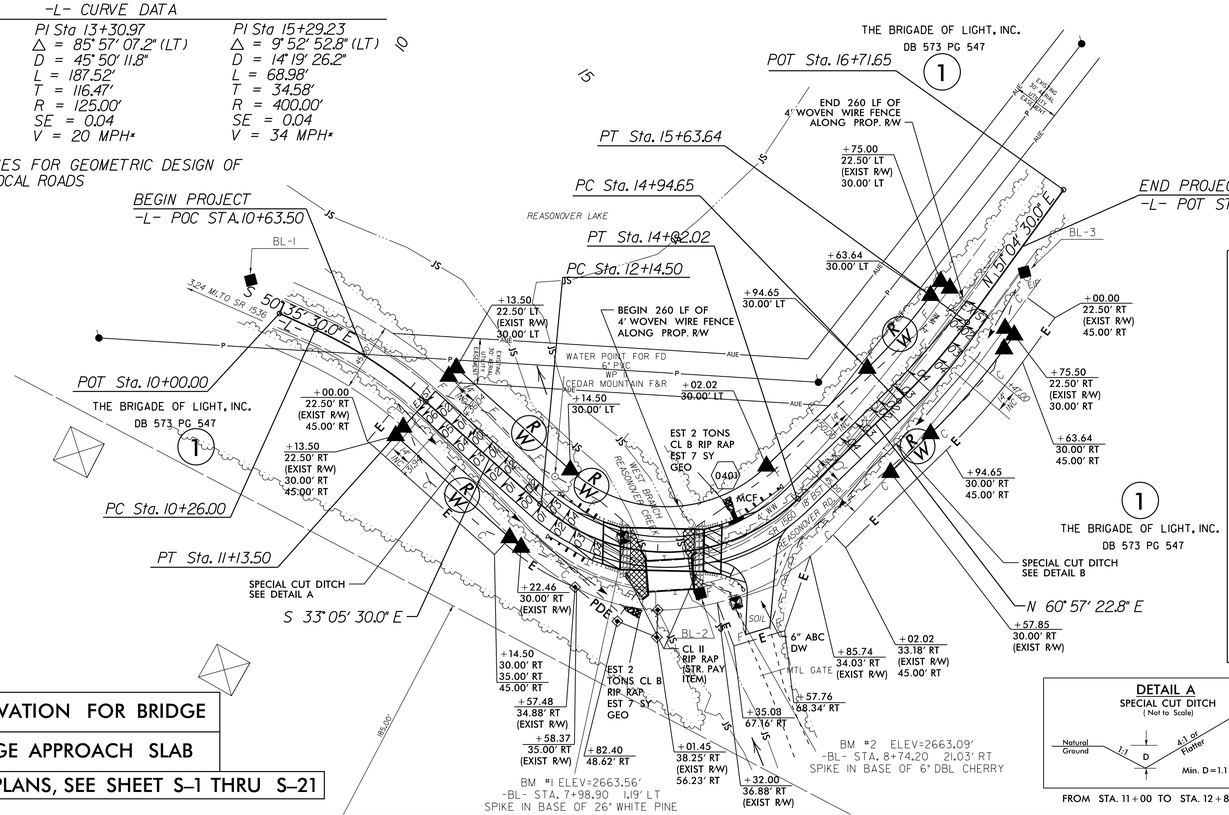
PLAN REVISION 08-31-17: ADDED EXISTING PAVEMENT TYPE AND WIDTH; TL-2 ANCHOR UNIT CHANGED TO GREU TL-2; BACKSLOPE REVISED ON SPECIAL CUT DITCH DETAIL B.

PLAN REVISION 08-31-17: GEOTEXTILE LABEL REVISED; SPECIAL CUT DITCH CALLOUTS ADDED; CLASS II RIP RAP CALLOUT ADDED.

## -L- CURVE DATA

| PI Sta 10+70.09 | PI Sta 13+30.97 | PI Sta 15+29.23 |
|---|---|---|
| Δ = 17° 30' 00.0" (RT) | Δ = 85° 57' 07.2" (LT) | Δ = 9° 52' 52.8" (LT) |
| D = 20° 00' 00.0" | D = 45° 50' 11.8" | D = 14° 19' 26.2" |
| L = 87.50' | L = 187.52' | L = 68.98' |
| T = 44.09' | T = 116.47' | T = 34.58' |
| R = 286.48' | R = 125.00' | R = 400.00' |
| SE = EXIST. | SE = 0.04 | SE = 0.04 |
| V = EXIST. | V = 20 MPH* | V = 34 MPH* |

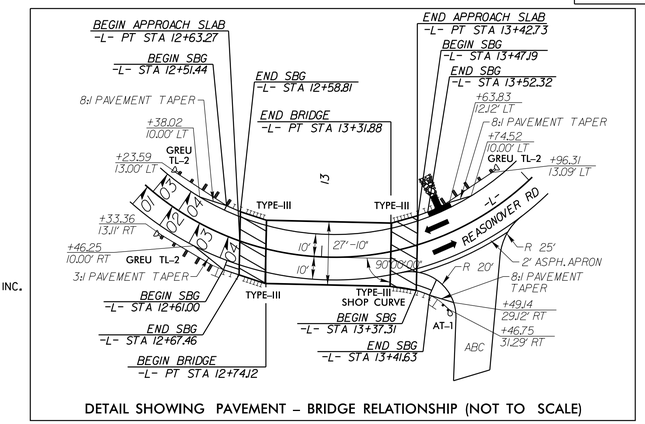
* AASHTO - GUIDELINES FOR GEOMETRIC DESIGN OF VERY LOW-VOLUME LOCAL ROADS



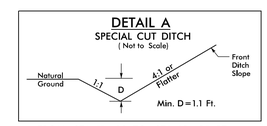

EXCAVATION FOR BRIDGE

BRIDGE APPROACH SLAB

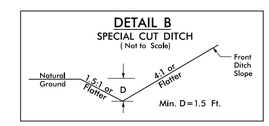
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-21




DETAIL SHOWING PAVEMENT – BRIDGE RELATIONSHIP (NOT TO SCALE)




FROM STA. 11+00 TO STA. 12+85 RT




FROM STA. 14+00 TO STA. 16+00 RT

BM #1
SPIKE IN BASE OF 26 INCH WHITE PINE TREE
-BL- STA 7+98.90 1.19' LEFT
-L- STA 12+75.63 6.08' LEFT
ELEV.= 2663.56'

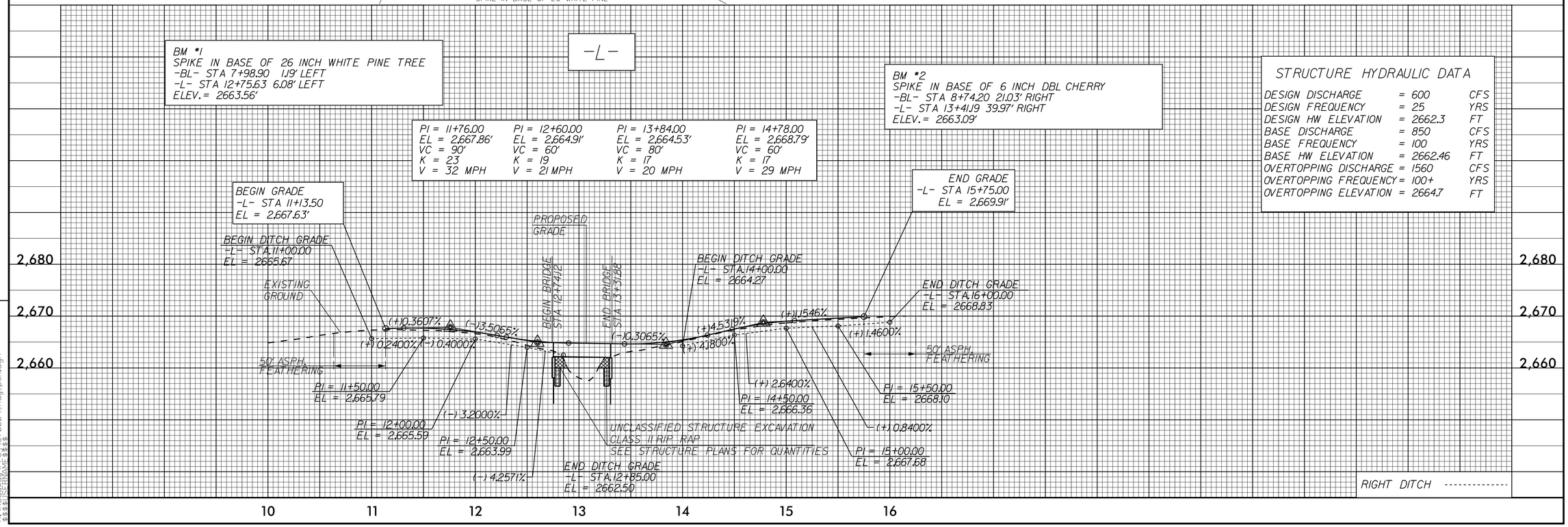
-L-

BM #2
SPIKE IN BASE OF 6 INCH DBL CHERRY
-BL- STA 8+74.20 21.03' RIGHT
-L- STA 13+41.19 39.97' RIGHT
ELEV.= 2663.09'

| PI = 11+76.00 | PI = 12+60.00 | PI = 13+84.00 | PI = 14+78.00 |
|---|---|---|---|
| EL = 2,667.86' | EL = 2,664.91' | EL = 2,664.53' | EL = 2,668.79' |
| VC = 90' | VC = 60' | VC = 80' | VC = 60' |
| K = 23 | K = 19 | K = 17 | K = 17 |
| V = 32 MPH | V = 21 MPH | V = 20 MPH | V = 29 MPH |

STRUCTURE HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = 600 | CFS |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN HW ELEVATION | = 2662.3 | FT |
| BASE DISCHARGE | = 850 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 2662.46 | FT |
| OVERTOPPING DISCHARGE | = 1560 | CFS |
| OVERTOPPING FREQUENCY | = 100+ | YRS |
| OVERTOPPING ELEVATION | = 2664.7 | FT |

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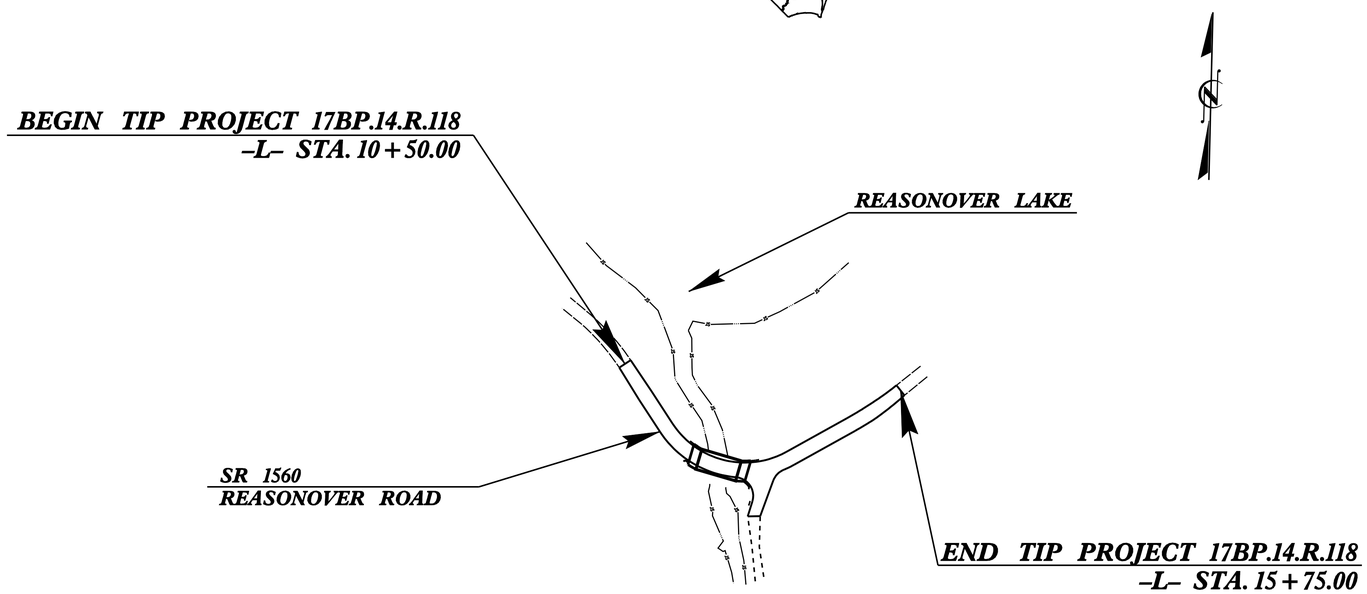
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# TRANSPORTATION MANAGEMENT PLAN

# TRANSYLVANIA COUNTY




## INDEX OF SHEETS


| SHEET NO. | TITLE |
|---|---|
| TMP-1 | TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS |
| TMP-1A | LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND |
| TMP-1B | TRANSPORTATION OPERATIONS PLAN: (PROJECT NOTES AND PHASING) |
| TMP-2 | PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS |
| TMP-3 | TEMPORARY TRAFFIC CONTROL PHASE DETAILS |
| TMP-4 | SPECIAL PROVISION |


SHEET NO.
TMP-1

TIP PROJECT: 17BP.14.R.118

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

_____ STATE TRAFFIC MANAGEMENT ENGINEER
_____ TRAFFIC CONTROL PROJECT ENGINEER
_____ TRAFFIC CONTROL PROJECT DESIGN ENGINEER
_____ TRAFFIC CONTROL DESIGN ENGINEER

DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

Prepared In the Office of:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED: DocuSigned by: Tim Arey 1C096E1DD6634BB...
DATE: 5/5/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

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| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | TMP-1A |

# ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

| STD. NO. | TITLE |
|---|---|
| 1101.01 | WORK ZONE WARNING SIGNS |
| 1101.02 | TEMPORARY LANE CLOSURES |
| 1101.04 | TEMPORARY SHOULDER CLOSURES |
| 1101.05 | WORK ZONE VEHICLE ACCESSES |
| 1101.11 | TRAFFIC CONTROL DESIGN TABLES |
| 1110.01 | STATIONARY WORK ZONE SIGNS |
| 1110.02 | PORTABLE WORK ZONE SIGNS |
| 1115.01 | FLASHING ARROW BOARDS |
| 1130.01 | DRUMS |
| 1135.01 | CONES |
| 1145.01 | BARRICADES |
| 1150.01 | FLAGGING DEVICES |
| 1160.01 | TEMPORARY CRASH CUSHION |
| 1165.01 | WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION |
| 1170.01 | PORTABLE CONCRETE BARRIER |
| 1180.01 | SKINNY - DRUM |
| 1205.01 | PAVEMENT MARKINGS - LINE TYPES AND OFFSETS |
| 1205.04 | PAVEMENT MARKINGS - INTERSECTIONS |
| 1205.08 | PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES |
| 1205.12 | PAVEMENT MARKINGS - BRIDGES |
| 1250.01 | RAISED PAVEMENT MARKERS - INSTALLATION SPACING |
| 1251.01 | RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY) |
| 1261.01 | GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING |
| 1261.02 | GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING |
| 1262.01 | GUARDRAIL END DELINEATION |

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- TEMPORARY PAVEMENT WEDGING

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

## TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

## PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

PLAN PREPARED IN THE OFFICE OF:

PROGRESSIVE DESIGN GROUP, INC.

ENGINEERS • CONSULTANTS

APPROVED: Tim Arey DATE: 5/5/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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# GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 100 ft IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

H) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

# PROJECT NOTES & PHASING

SIGNING

I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

L) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

M) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

| POSTED SPEED LIMIT | MINIMUM OFFSET |
|---|---|
| 40 OR LESS | 15 FT |
| 45 - 50 | 20 FT |
| 55 | 25 FT |
| 60 MPH or HIGHER | 30 FT |

TRAFFIC CONTROL DEVICES

N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

# PHASING

## PHASE I

STEP 1: INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01.

STEP 2: INSTALL A PORTABLE TRAFFIC SIGNAL SYSTEM TO OPERATE THE ONE-LANE, TWO-WAY TEMPORARY PATTERN ALONG -L- AS SHOWN ON DETAIL-1, SHEET TMP-3.

STEP 3: ACTIVATE THE PORTABLE TRAFFIC SIGNAL SYSTEM AND INSTALL PORTABLE CONCRETE BARRIER AND SHORING AS SHOWN ON DETAIL-1, SHEET TMP-3.

STEP 4: REMOVE PART OF THE EXISTING STRUCTURE, AS SHOWN IN THE STRUCTURE PLANS, AND CONSTRUCT -L- WIDENING AND AND STAGE I OF THE PROPOSED -L- BRIDGE FOR THE LIMITS SHOWN ON SHEET TMP-3, UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

## PHASE II

STEP 1: SHIFT -L- TRAFFIC ONTO THE NEWLY CONSTRUCTED SECTION OF THE PROPOSED -L- BRIDGE IN A ONE-LANE, TWO-WAY PATTERN USING THE PORTABLE TRAFFIC SIGNAL SYSTEM AS SHOWN ON THE PHASE II DETAIL, SHEET TMP-3.

STEP 2: INSTALL ANCHORED PORTABLE CONCRETE BARRIER AS SHOWN ON THE PHASE II DETAIL, SHEET TMP-3.

STEP 3: REMOVE EXISTING BRIDGE AND CONSTRUCT REMAINDER OF THE PROPOSED -L- BRIDGE AND APPROACHES BEHIND PORTABLE CONCRETE BARRIER AS SHOWN ON THE PHASE II DETAIL, SHEET TMP-3.

STEP 4: REMOVE ALL TRAFFIC CONTROL DEVICES, PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS AND OPEN -L- TO THE FINAL TRAFFIC PATTERN.

PLAN PREPARED IN THE OFFICE OF:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED: DocuSigned by: Tim Alley DATE: 5/5/2015
DOCUSIGNED CERTIFICATE

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DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

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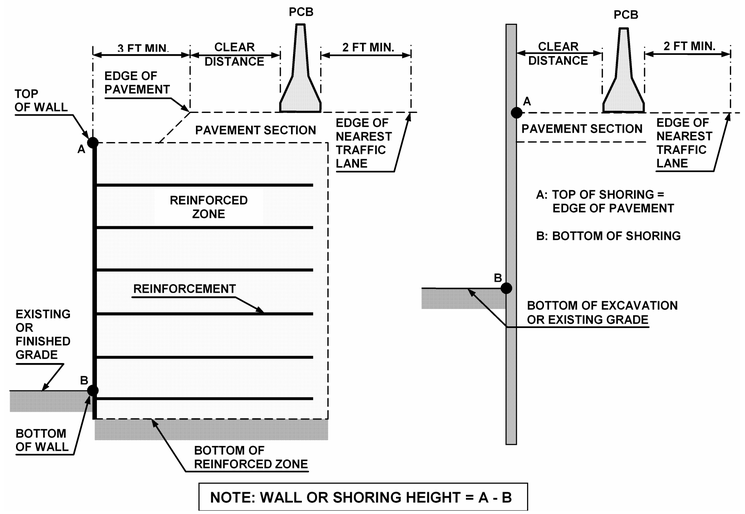



# FIGURE A

## NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).

3- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

4- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

5- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

6- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.

7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.

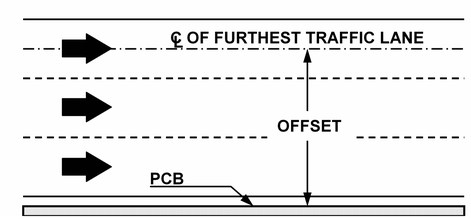
8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.

9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

**MINIMUM REQUIRED CLEAR DISTANCE, inches**

| Barrier Type | Pavement Type | Offset * ft | Design Speed, mph <30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 |
|---|---|---|---|---|---|---|---|---|
| Unanchored PCB | Asphalt | <8 | 24 | 26 | 29 | 32 | 36 | 40 |
| | | 8-14 | 26 | 28 | 31 | 35 | 38 | 42 |
| | | 14-20 | 27 | 29 | 34 | 36 | 39 | 43 |
| | | 20-26 | 28 | 31 | 35 | 38 | 40 | 44 |
| | | 26-32 | 29 | 32 | 36 | 39 | 42 | 45 |
| | | 32-38 | 30 | 34 | 38 | 41 | 43 | 46 |
| | | 38-44 | 31 | 34 | 41 | 43 | 45 | 48 |
| | | 44-50 | 31 | 35 | 41 | 43 | 46 | 49 |
| | | 50-56 | 32 | 36 | 42 | 44 | 47 | 50 |
| | | >56 | 32 | 36 | 42 | 45 | 47 | 51 |
| | Concrete | <8 | 17 | 18 | 21 | 22 | 25 | 26 |
| | | 8-14 | 19 | 20 | 23 | 25 | 26 | 29 |
| | | 14-20 | 22 | 22 | 24 | 26 | 28 | 31 |
| | | 20-26 | 23 | 24 | 26 | 27 | 30 | 34 |
| | | 26-32 | 24 | 25 | 27 | 28 | 32 | 35 |
| | | 32-38 | 24 | 26 | 27 | 30 | 33 | 36 |
| | | 38-44 | 25 | 26 | 28 | 30 | 34 | 37 |
| | | 44-50 | 26 | 26 | 28 | 32 | 35 | 37 |
| | | 50-56 | 26 | 26 | 28 | 32 | 35 | 38 |
| | | >56 | 26 | 27 | 29 | 32 | 36 | 38 |
| Anchored PCB | Asphalt | All Offsets | 24 for All Design Speeds | | | | | |
| Anchored PCB | Concrete (including bridge approach slabs) | All Offsets | 12 for All Design Speeds | | | | | |

* See Figure Below




# FIGURE B

PLAN PREPARED IN THE OFFICE OF:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED: DocuSigned by: Tim Ary 4C0BE1C0C0B4B... DATE: 5/5/2015

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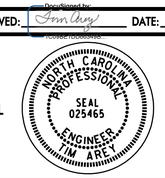


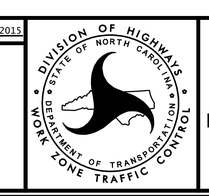


TRANSPORTATION MANAGEMENT PLAN
PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

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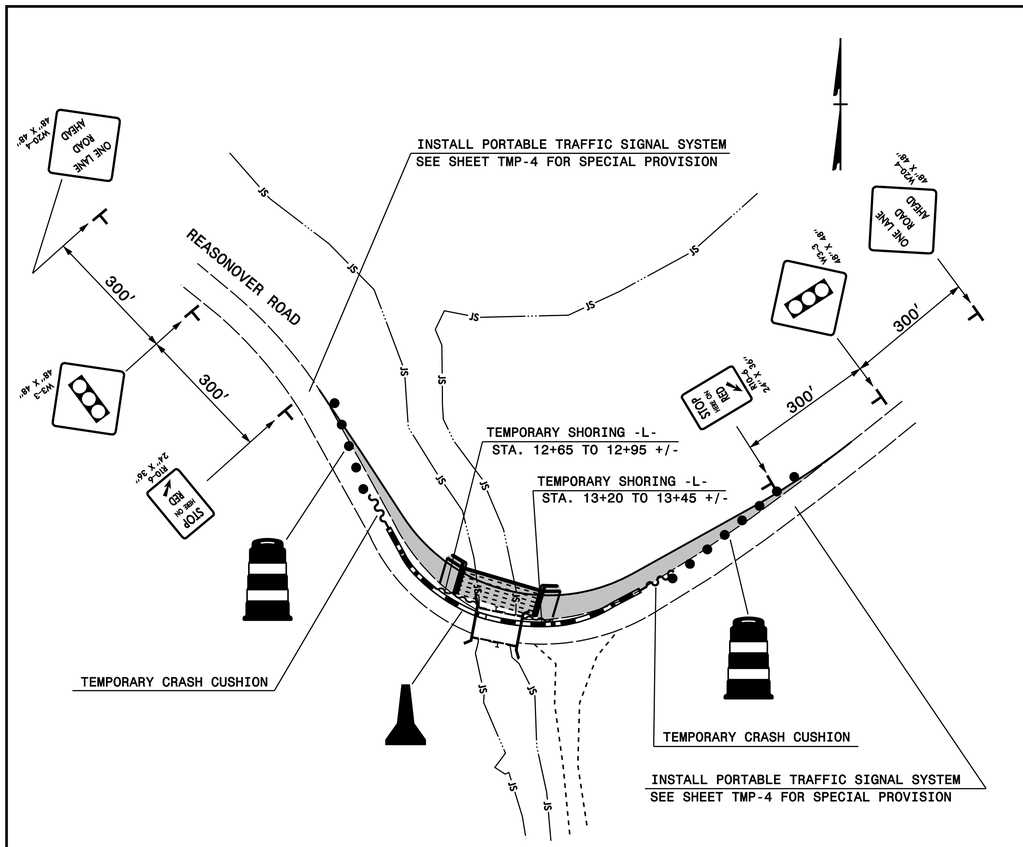
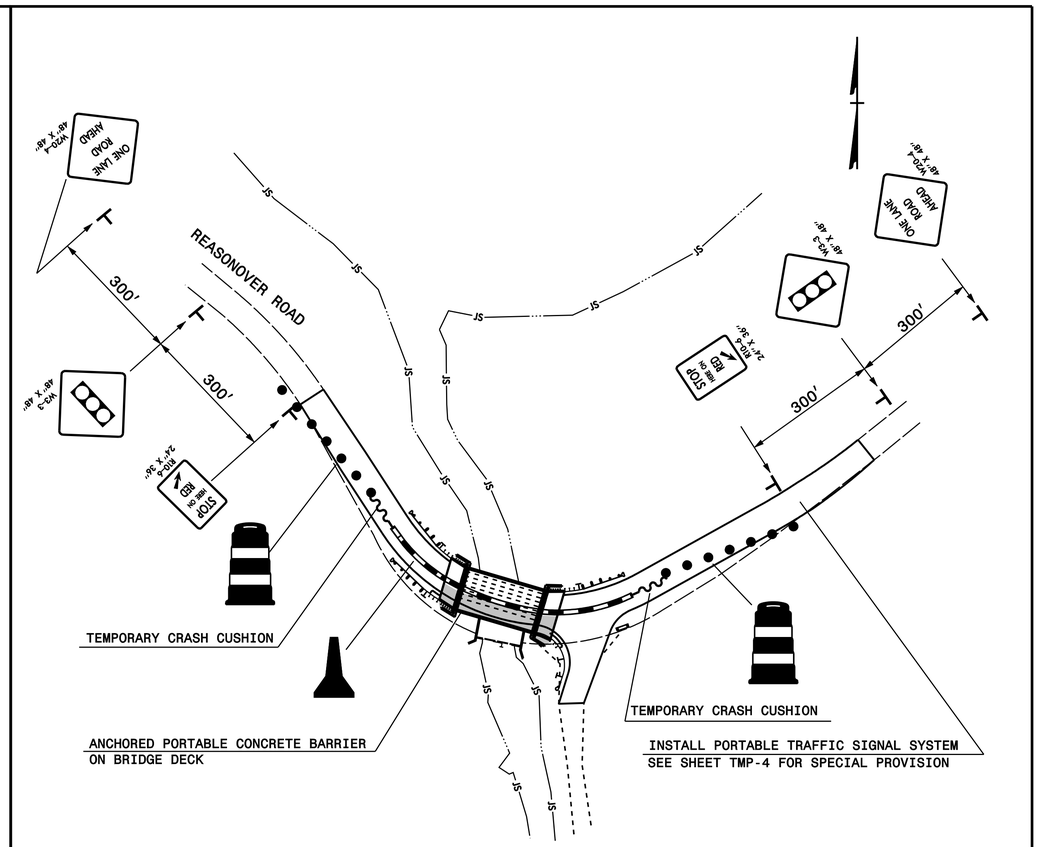
## PHASE I DETAIL




**INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01 AND GENERAL NOTE I THE LOCATION OF TEMPORARY SHORING IS APPROXIMATE, AND WILL BE FIELD ADJUSTED.**

## PHASE II DETAIL




**INSTALL WORK ZONE ADVANCE WARNING SIGNS AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01 AND GENERAL NOTE I**

*PLAN PREPARED IN THE OFFICE OF:*

PROGRESSIVE DESIGN GROUP, INC.

ENGINEERS • CONSULTANTS

APPROVED: DATE: 5/5/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM ARCE

DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

TRANSPORTATION MANAGEMENT PLAN DETAIL SHEET

# PORTABLE TRAFFIC SIGNAL SYSTEM SPECIAL PROVISION

## 13. PORTABLE TRAFFIC SIGNAL SYSTEM

### 13.1. DESCRIPTION

Furnish, install, place in operation, repair, maintain, relocate, and remove portable traffic signal systems. Comply with the provisions of Section 1700 of the 2012 *Standard Specifications for Roads and Structures.*

### 13.2. MATERIALS

Provide a complete portable traffic signal system that is totally mobile and capable of being relocated as traffic conditions demand. Design the system for operation both with and without an external power source. Furnish two signal control trailers with two vehicle signal heads per trailer and one operator unit for each portable traffic signal system. Furnish transmitters, generators, batteries, controls, back-up systems and all other components necessary to operate the system.

Ensure each system meets the physical display and operational requirements of conventional traffic signals as specified in PART IV of the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *North Carolina Supplement to the MUTCD* in effect on the date of advertisement.

Used equipment will be acceptable if the equipment is in good working condition. Contractor retains ownership of the portable traffic signal systems.

Provide yellow 12-inch aluminum or polycarbonate vehicle signal heads with 10-inch tunnel visors, backplates and Light Emitting Diode (LED) modules. Provide aluminum signal heads and backplates listed on the Department's Qualified Products List (QPL) for traffic signal equipment. Provide polycarbonate signal heads and visors that comply with the provisions pertaining to Signal Heads within these *Project Special Provisions* with the following exceptions:

Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide U.V. stabilized polycarbonate plastic with a minimum thickness of $0.1 \pm 0.01$ inches that is highway yellow (Federal Standard 595C, Color Chip 13538). Ensure the color is incorporated into the plastic material before molding the signal head housings and end caps. Ensure the plastic formulation provides the following physical properties in the assembly (tests may be performed on separately molded specimens):

| Test | Required | Method |
|---|---|---|
| Specific Gravity | 1.17 minimum | ASTM D 792 |
| Vicat Softening Temperature, °F | 305-325 | ASTM D 1525 |
| Brittleness Temperature, °F | Below –200 | ASTM D 746 |
| Flammability | Self-extinguishing | ASTM D 635 |
| Tensile Strength, yield, PSI | 8500 minimum | ASTM D 638 |
| Elongation at yield, % | 5.5-8.5 | ASTM D 638 |
| Shear, strength, yield, PSI | 5500 minimum | ASTM D 732 |
| Izod impact strength, ft-lb/in [notched, 1/8 inch] | 15 minimum | ASTM D 256 |
| Fatigue strength, PSI at 2.5 mm cycles | 950 minimum | ASTM D 671 |

To minimize signal head movement due to wind, mount top and bottom of signal heads to the signal head supports.

Provide 120V AC powered LED modules listed on the QPL, or provide 12V DC powered LED modules that meet the *ITE VTCSH Part 2: Light Emitting Diode (LED) Vehicle Signal Modules (Interim Purchase Specification)* with the exception of paragraphs 5.2, 5.3, 5.7, and testing associated with 120V AC. Ensure DC powered LED modules operate with input power between 9V DC and 15V DC.

Provide trailers that have durable paint in highway orange, Federal Standard 595C Color Chip ID # 12473 with a minimum paint thickness of 2.5 mils.

Provide trailers with a 12-volt trailer lighting system complying with *Federal Motor Carrier Safety Regulations 393*, safety chains, and a 2-inch ball hitch. When provided, locate generators, fuel tanks, batteries and electronic controls in protective housings that are provided with locks to restrict access.

Design the trailer assembly and signal supports to withstand an 80 MPH wind load with the signal supports raised in the operating position. Provide independent certification from a registered Professional Engineer that the assembly meets this 80 MPH wind load requirement. Provide a reliable hydraulic, electric or manual means for raising and lowering the signal support members. Provide screw-type stabilizing and leveling devices with a self-leveling foot to support the unit in the operating position on slopes 1V:3H or flatter when detached from the transporting vehicle.

During manual operation, ensure the system provides a means of informing the operator of signal indications, such as a light on the back of each signal head that illuminates when the signal displays a red indication.

Design the portable traffic signal system to perform without interruption during the time it is in operation.

Where a traffic actuated system is required, provide a system control unit that is capable of pre-timed operation, traffic actuated operation, a variable green time interval dependent upon vehicle actuations, and programmable yellow clearance and red clearance intervals. Furnish all sensors to monitor vehicle demands for vehicle actuation per the Project Special Provisions and Section 1098 of the Standard Specifications.

Design the systems to be fail-safe. Ensure the system monitors the following conditions: lack of green, yellow, and red signal indication voltage, total loss of indication on any approach, presence of multiple signal indications on any approach, conflicting green/yellow signal indications, and low power condition. In the event any of these conditions are detected, immediately begin flashing operation of red indications in all directions.

Provide either hard-wired, microwave, or radio controlled type communications for pre-timed and traffic actuated portable traffic signal systems. In the event a loss of communication is detected, immediately begin flashing operation of red indications in all directions.

Ensure systems that use wireless communication links continuously monitor and verify proper transmission and reception of data used to monitor and control each signal head. Ensure ambient mobile or other radio transmissions or adverse weather conditions do not affect the system. Encode signal transmissions digitally to protect radio transmissions from interference. Do not violate FCC regulations and ensure radio frequencies are appropriate for portable signal equipment applications.

Upon detecting a malfunction, ensure all signals go to a flashing red condition and the operator is notified by a reliable means approved by the Engineer. Provide a battery back-up system for generator and direct current powered signal systems to power the warning means and "flashing red" condition. Provide a back-up system with a 72-hour minimum reserve.

Ensure the system meets the Environmental Standards for traffic signals in accordance with NEMA TS-1, Section 2.

### 13.3. CONSTRUCTION METHODS

Do not use portable traffic signal systems in a work area with intersecting streets or driveways, unless directed by the Engineer.

Do not install portable traffic signal within 300 feet of at-grade railroad crossing.

During automatic operation, ensure the motorist has an unobstructed view of opposing traffic.

Ensure the distance between signal units does not exceed 500 feet unless otherwise shown on the plans or directed by the Engineer. If modification to the distance between signal units is required after the units are positioned, relocate the signals or the system and make the necessary timing revisions only as directed by the Engineer.

Submit a traffic signal timing plan to the Engineer for approval a minimum of two weeks prior to installation. Include the following items in the plan: distance between stop bars, speed limit to be posted during operation, each approach grade, recommended yellow change interval, recommended red clearance interval, recommended minimum and maximum green intervals. Make timing changes to approved signal timing plan only as authorized by the Engineer. Keep a written record of all timing changes.

Allow only trained operators to set up and operate the system. Provide an experienced operator at all times for each portable traffic signal system during periods of manual operation. Do not violate yellow change and red clearance intervals during periods of manual operation. During manual operation, ensure the operator has an unobstructed view of the motorists and all signal head units. Locate the operator as close to the center of the operation as possible.

Perform all maintenance operations required by the system manufacturer including periodic cleaning of the systems. Ensure properly skilled and trained maintenance personnel are available to maintain the system in good working order and to perform all emergency and preventive maintenance as recommended by the system manufacturer.

Furnish the Engineer with the name, office telephone number, cellular (mobile) telephone number, and pager number of the supervisory employee who will be responsible for maintenance and repair of equipment during all hours.

For all failures, malfunctions, or damage to this equipment, begin necessary repairs within four hours of notification. Complete repairs within eight hours of notification. Comply with Section 150 for maintenance of traffic flow. The inability to contact the supervisory employee or prearranged alternate will not extend repair time requirements.

In the event that the system becomes inoperative, be prepared at all times to revert to flagging operations or suspend all construction activities requiring the use of the portable traffic signal system until the system is restored to proper operation. Implement flagging operations as shown on 2012 Roadway Standard Drawing No. 1101.02 Sheet 1 (Closure of one lane of a Two-lane, Two-way Highway).

When not in operation, remove signal heads from the view of traffic or cover signal heads with burlap bags or bags made of non-ripping material specifically designed for covering signal heads. Do not use trash bags of any type. Remove, cover, fold, or turn all inappropriate signs so that they are not readable by oncoming traffic.

### 13.4. MEASUREMENT AND PAYMENT

Actual number of portable traffic signal systems furnished, installed, operated, removed, and accepted.

No measurement will be made for operation, relocation, maintenance, removal of each system, or use of flaggers during repair periods as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

No measurement will be made for signal controller, communication cable, messenger cable, wireless communication, inductive loop sawcut, loop emulator detection system, machine vision detection system, microwave detection system, detector channel/unit, detector lead-in cable, trenching, vehicle signal heads, signal head support assemblies, signal cable, and traffic signal software as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

Payment will be made under:

Portable Traffic Signal System (actuated)....................Each
Portable Traffic Signal System (pre-timed)....................Each



PLAN PREPARED IN THE OFFICE OF:
PROGRESSIVE DESIGN GROUP, INC.
ENGINEERS • CONSULTANTS

APPROVED: DATE: 5/5/2015

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NORTH CAROLINA PROFESSIONAL SEAL 025465 ENGINEER TIM AREY

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION MANAGEMENT PLAN SPECIAL PROVISION

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09/08/99

WBS: 17BP.14.R.118

CONTRACT: DN00286

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APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER DREW D. MORROW

12/3/2015

RS&H

# STATE OF NORTH CAROLINA
# DEPARTMENT OF TRANSPORTATION

# PAVEMENT MARKING PLAN
# TRANSYLVANIA COUNTY

### LOCATION: BRIDGE NO. 9 OVER WEST BRANCH REASONOVER CREEK ON SR 1560 (REASONOVER ROAD)

## ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

| STD. NO. | TITLE |
|---|---|
| 1205.01 | PAVEMENT MARKINGS - LINE TYPES AND OFFSETS |
| 1205.02 | PAVEMENT MARKINGS - 2 LANE AND MULTILANE ROADWAYS |
| 1205.12 | PAVEMENT MARKINGS - BRIDGES |
| 1250.01 | PAVEMENT MARKER SPACING |
| 1251.01 | RAISED PAVEMENT MARKERS |
| 1261.01 | GUARDRAIL AND BARRIER DELINEATOR SPACING |
| 1261.02 | GUARDRAIL AND BARRIER DELINEATOR TYPES |
| 1262.01 | GUARDRAIL END DELINEATION |

PAVEMENT MARKING SCHEDULE
BRIDGE NO. 870009

FINAL
PAVEMENT MARKINGS

| | | |
|---|---|---|
| PA | WHITE EDGELINE | PAINT (4") |
| PI | YELLOW DOUBLE CENTER | PAINT (4") |

## GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR AS DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

| ROAD NAME | MARKING | MARKER |
|---|---|---|
| SR 1560 | PAINT | N/A |

PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) ALL EXISTING SIGNS ON WOOD & U POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

PLAN PREPARED BY: RS&H ARCHITECT-ENGINEERS-PLANNERS, INC.

JENNIFER FARINO, PE — PROJECT ENGINEER

DREW MORROW, PE — PROJECT DESIGN ENGINEER

## INDEX

| SHEET NO. | DESCRIPTION |
|---|---|
| PMP-1 | PAVEMENT MARKING & SIGNING PLAN TITLE SHEET<br>SIGNING & PAVEMENT MARKING SCHEDULE |
| PMP-2 | PAVEMENT MARKING DETAIL |

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$$$$USERNAME$$$$

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8/17/99

REVISIONS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.J18 | PMP-2 |

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 039222 ENGINEER ANDREW D. MORRONE

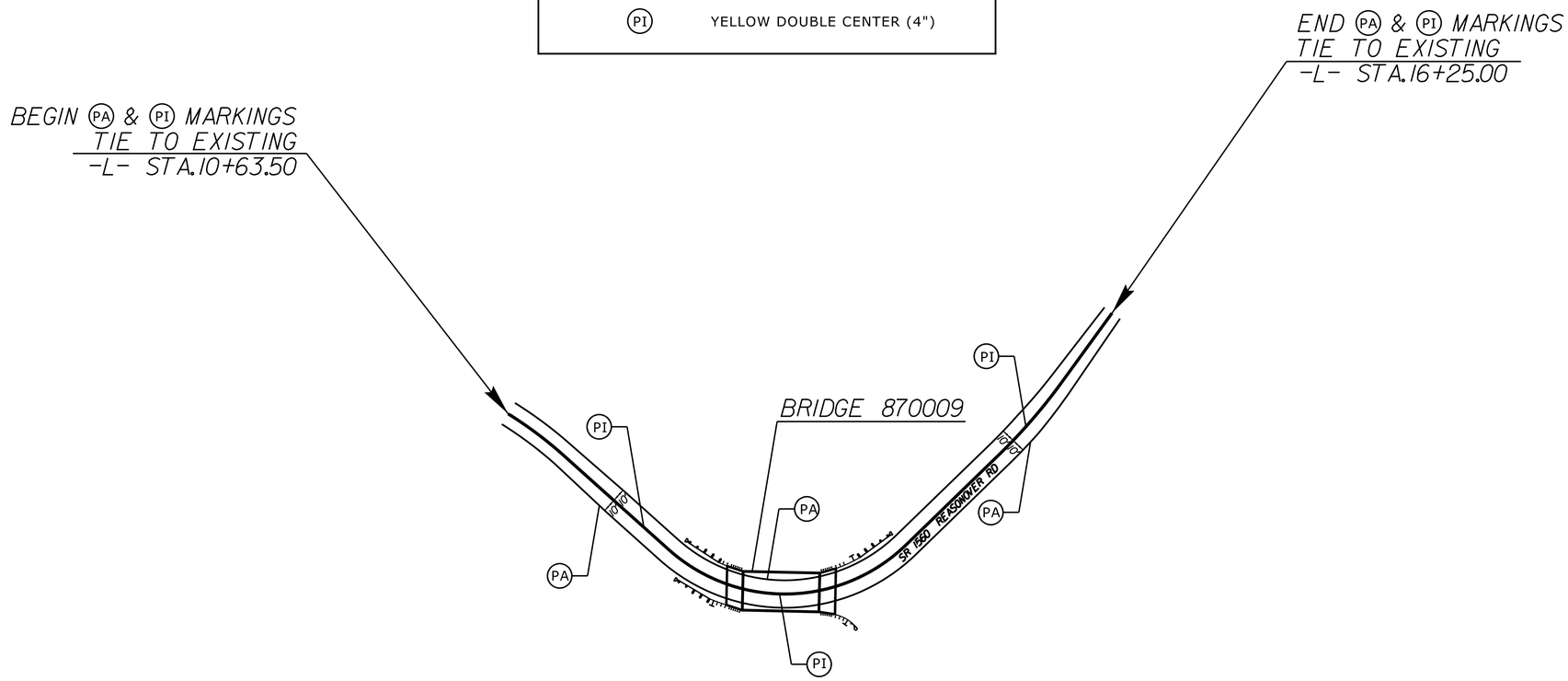
DocuSigned by:

12/3/2015

RS&H

## SYMBOL AND PAVEMENT MARKING LEGEND

| | |
|---|---|
| PA | WHITE EDGE LINE (4") |
| PI | YELLOW DOUBLE CENTER (4") |




PAVEMENT MARKING DETAIL

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WBS: 17BP.14.R.118

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | 17BP.14.R.118 | EC-1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 17BP.14.R.118 | N/A | PE |
| 17BP.14.R.118 | N/A | ROW, UTL |
| 17BP.14.R.118 | N/A | CONST. |
| | | |
| | | |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

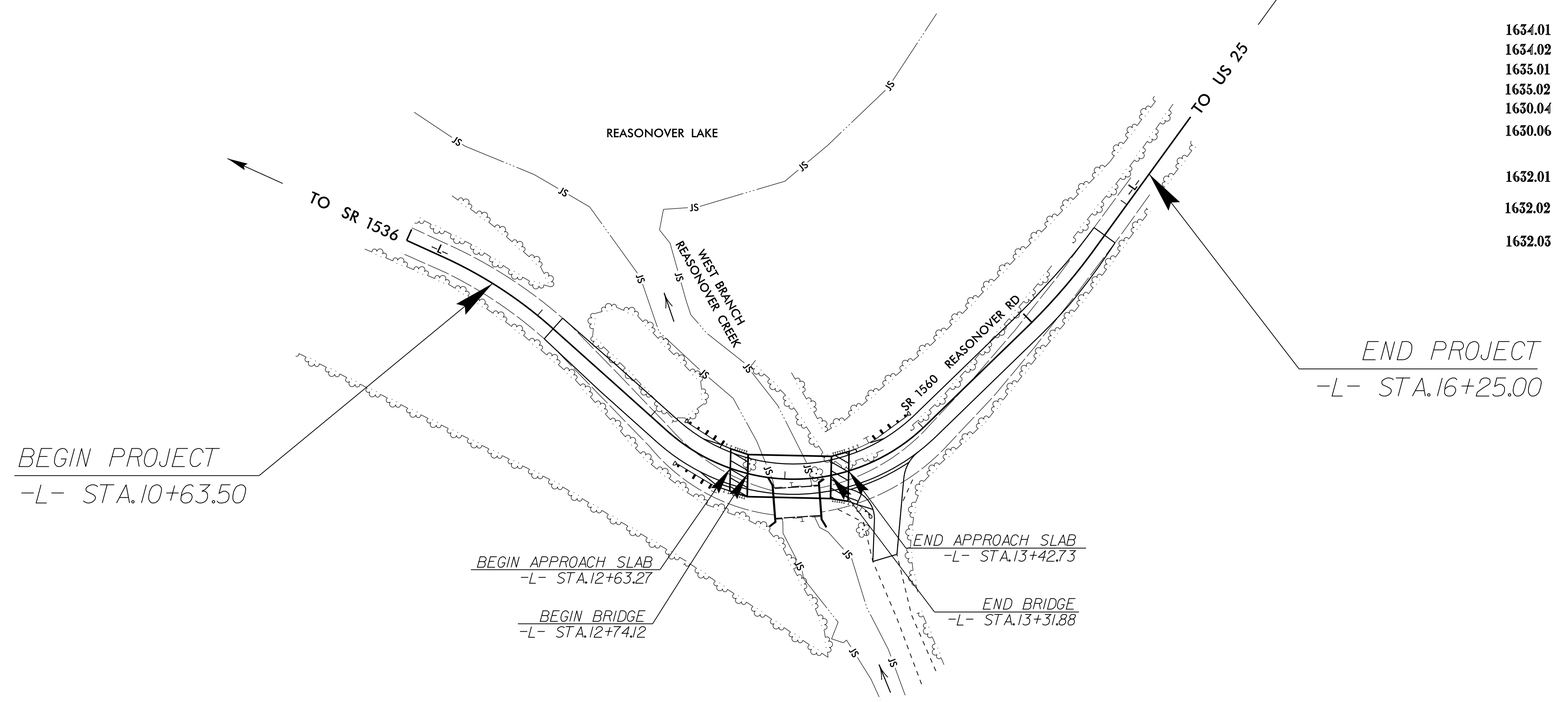
## PLAN FOR PROPOSED
## HIGHWAY EROSION CONTROL

# *TRANSYLVANIA COUNTY*

***LOCATION: BRIDGE NO. 9 OVER WEST BRANCH REASONOVER CREEK ON SR 1560 (REASONOVER ROAD)***

***TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE***

NAD 83/NA 2011




## EROSION AND SEDIMENT CONTROL MEASURES

| Std. # | Description | Symbol |
|---|---|---|
| 1630.03 | Temporary Silt Ditch | TSD |
| 1630.05 | Temporary Diversion | TD |
| 1605.01 | Temporary Silt Fence | |
| 1606.01 | Special Sediment Control Fence | |
| 1622.01 | Temporary Berms and Slope Drains | |
| 1630.02 | Silt Basin Type B | |
| 1633.01 | Temporary Rock Silt Check Type-A | |
| | Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM) | |
| 1633.02 | Temporary Rock Silt Check Type-B | |
| | Wattle/ Coir Fiber Wattle | EW CFW |
| | Wattle/ Coir Fiber Wattle with Polyacrylamide (PAM) | |
| 1634.01 | Temporary Rock Sediment Dam Type-A | |
| 1634.02 | Temporary Rock Sediment Dam Type-B | |
| 1635.01 | Rock Pipe Inlet Sediment Trap Type-A | |
| 1635.02 | Rock Pipe Inlet Sediment Trap Type-B | |
| 1630.04 | Stilling Basin | |
| 1630.06 | Special Stilling Basin | |
| | Rock Inlet Sediment Trap: | |
| 1632.01 | Type A | A |
| 1632.02 | Type B | B |
| 1632.03 | Type C | C |
| | Skimmer Basin | |
| | Tiered Skimmer Basin | |
| | Infiltration Basin | |

**THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.**

**THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.**

**ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT**

***Refer To E. C. Special Provisions for Special Considerations.***

***GRAPHIC SCALE***

25 0 50

PLANS

***THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.***

*Prepared in the Office of:*

**RS&H**

*1520 SOUTH BOULEVARD, SUITE 200*
*CHARLOTTE, NC 28203*
*704-752-0610*

***2012 STANDARD SPECIFICATIONS***

*Designed by:*

***Will Weathersbee, P.E.*** ***3161***

*NAME* *LEVEL III CERTIFICATION NO.*

*Reviewed in the Office of:*

***ROADSIDE ENVIRONMENTAL UNIT***

*1 South Wilmington St.*
*Raleigh, NC 27611*

***2012 STANDARD SPECIFICATIONS***

*Reviewed by:*

**Roadway Standard Drawings**

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

| | | | |
|---|---|---|---|
| 1604.01 | Railroad Erosion Control Detail | 1632.01 | Rock Inlet Sediment Trap Type A |
| 1605.01 | Temporary Silt Fence | 1632.02 | Rock Inlet Sediment Trap Type B |
| 1606.01 | Special Sediment Control Fence | 1632.03 | Rock Inlet Sediment Trap Type C |
| 1607.01 | Gravel Construction Entrance | 1633.01 | Temporary Rock Silt Check Type A |
| 1622.01 | Temporary Berms and Slope Drains | 1633.02 | Temporary Rock Silt Check Type B |
| 1630.01 | Riser Basin | 1634.01 | Temporary Rock Sediment Dam Type A |
| 1630.02 | Silt Basin Type B | 1634.02 | Temporary Rock Sediment Dam Type B |
| 1630.03 | Temporary Silt Ditch | 1635.01 | Rock Pipe Inlet Sediment Trap Type A |
| 1630.04 | Stilling Basin | 1635.02 | Rock Pipe Inlet Sediment Trap Type B |
| 1630.05 | Temporary Diversion | 1640.01 | Coir Fiber Baffle |
| 1630.06 | Special Stilling Basin | 1645.01 | Temporary Stream Crossing |
| 1631.01 | Matting Installation | | |

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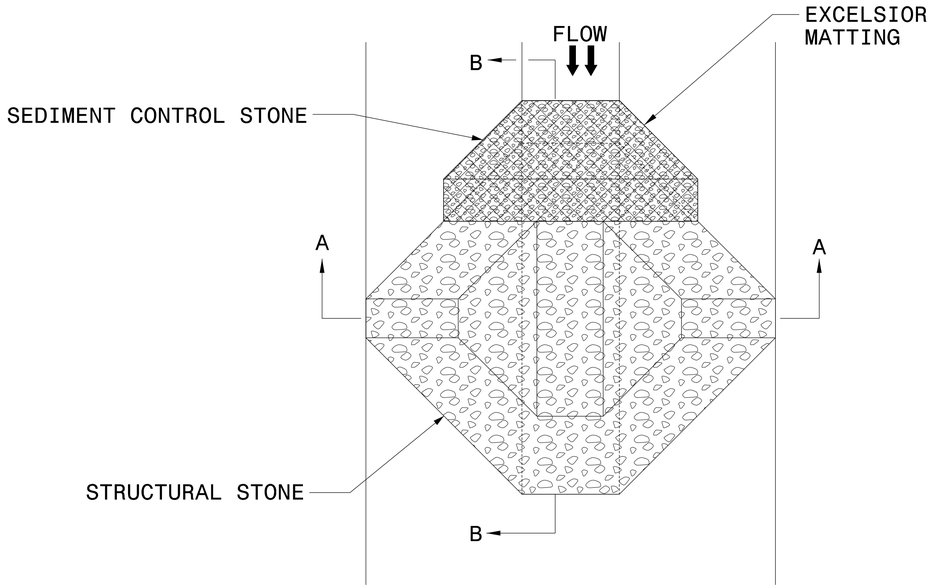
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | EC-2 |

RS&H

# TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)




PLAN

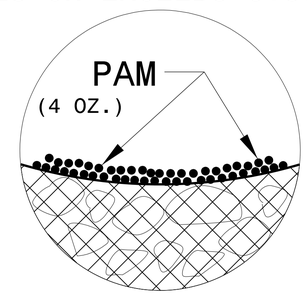
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

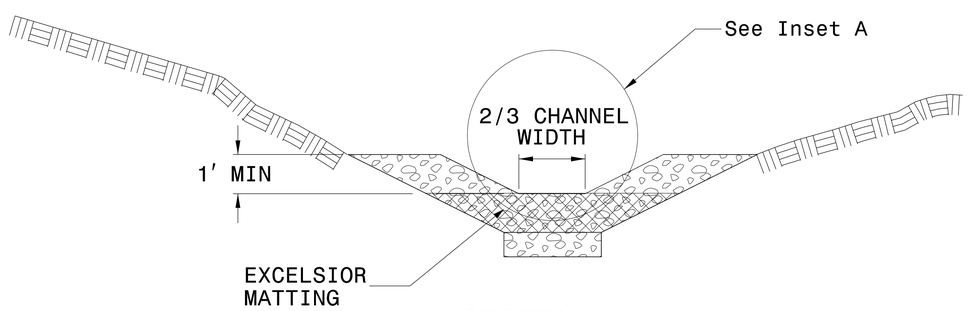
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

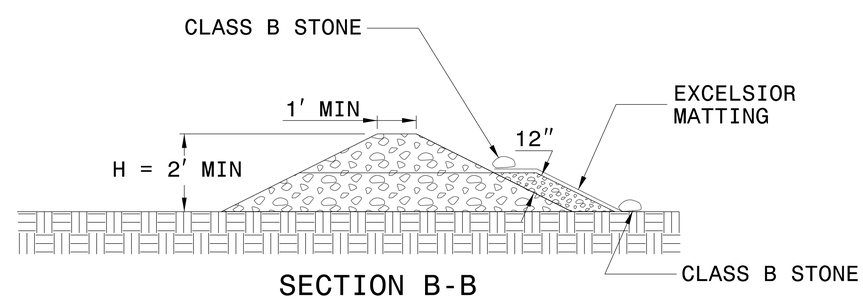
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.




INSET A




SECTION A-A




SECTION B-B

NOT TO SCALE

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | EC-3 |

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

RS&H

# SOIL STABILIZATION TIMEFRAMES

| SITE DESCRIPTION | STABILIZATION TIME | TIMEFRAME EXCEPTIONS |
|---|---|---|
| PERIMETER DIKES, SWALES, DITCHES AND SLOPES | 7 DAYS | NONE |
| HIGH QUALITY WATER (HQW) ZONES | 7 DAYS | NONE |
| SLOPES STEEPER THAN 3:1 | 7 DAYS | IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED. |
| SLOPES 3:1 OR FLATTER | 14 DAYS | 7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH. |
| ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1 | 14 DAYS | NONE, EXCEPT FOR PERIMETERS AND HQW ZONES. |

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | EC-4/CONST.4 |

RS&H

NAD 83/NA 2011

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

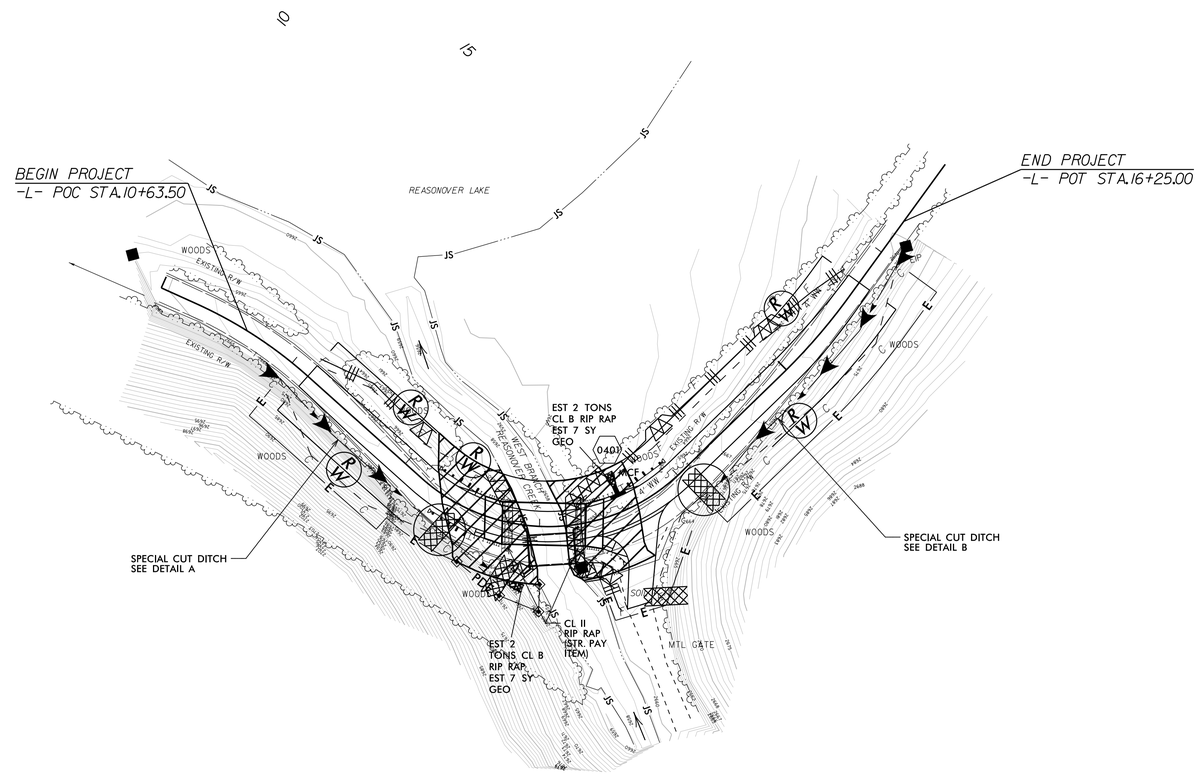
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
UTILIZE SPECIAL STILLING BASIN AS STILLING BASIN WHERE APPLICABLE.

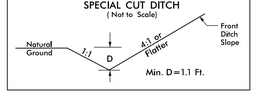
NOTE:
EXCELSIOR OR OTHER MESH TYPE NETTING IS NOT ALLOWED IN OR ON STREAM BANKS

REVISIONS

PLAN REVISION 08-31-17: BACKSLOPE REVISED ON SPECIAL CUT DITCH DETAIL B; GEOTEXTILE LABEL REVISED; SPECIAL CUT DITCH CALLOUTS ADDED.
PLAN REVISION 08-31-17: CLASS II RIP RAP CALLOUT ADDED; SILT FENCE MOVED BEHIND FLUME; EXCELSIOR OR OTHER MESH TYPE NETTING NOTE ADDED.

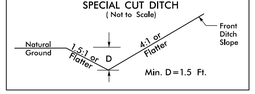



## DETAIL A
SPECIAL CUT DITCH
( Not to Scale)




FROM STA. 11+00 TO STA. 12+85 RT

## DETAIL B
SPECIAL CUT DITCH
( Not to Scale)




FROM STA. 14+00 TO STA. 16+00 RT

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | EC-5/CONST.4 |

RS&H

NAD 83/NA 2011

REVISIONS

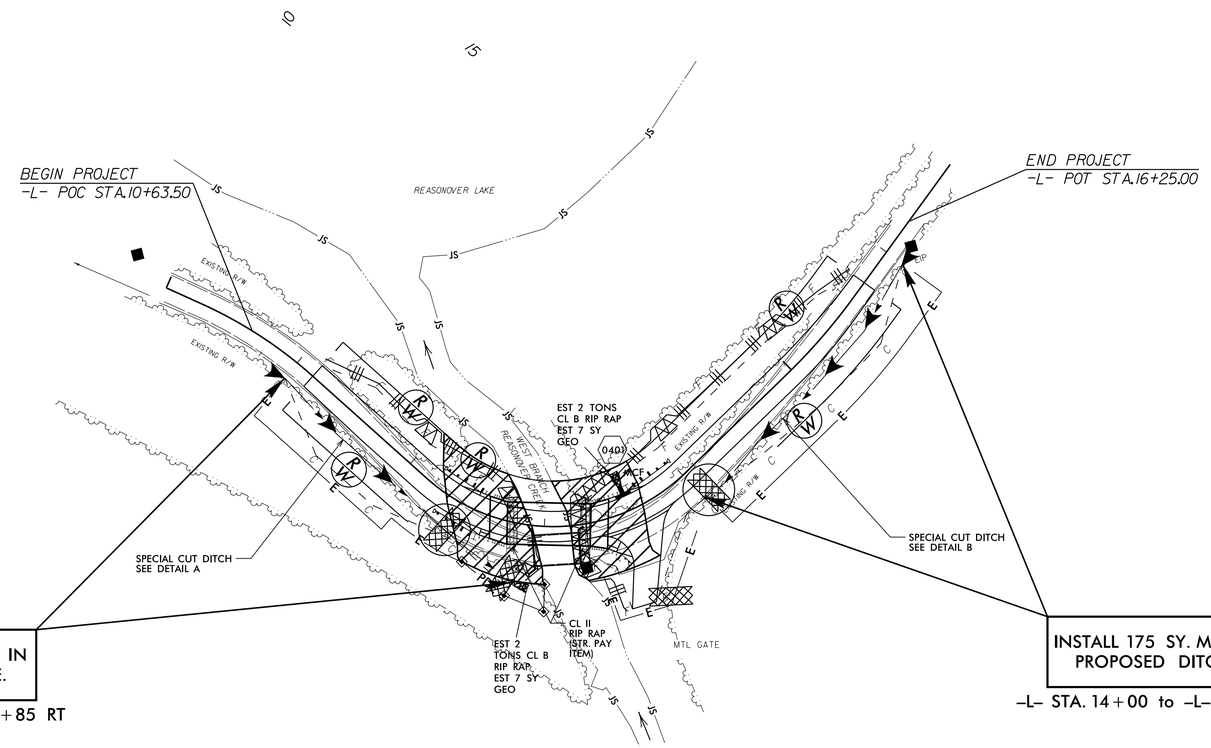
PLAN REVISION 08-31-17: BACKSLOPE REVISED ON SPECIAL CUT DITCH DETAIL B; GEOTEXTILE LABEL REVISED; SPECIAL CUT DITCH CALLOUTS ADDED.
PLAN REVISION 08-31-17: CLASS II RIP RAP CALLOUT ADDED; SILT FENCE MOVED BEHIND FLUME; EXCELSIOR OR OTHER MESH TYPE NETTING NOTE ADDED.

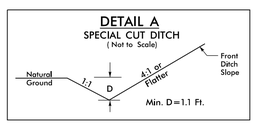
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

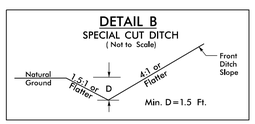
NOTE:
UTILIZE SPECIAL STILLING BASIN AS STILLING BASIN WHERE APPLICABLE.

NOTE:
EXCELSIOR OR OTHER MESH TYPE NETTING IS NOT ALLOWED IN OR ON STREAM BANKS




FROM STA. 11+00 TO STA. 12+85 RT




FROM STA. 14+00 TO STA. 16+00 RT

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

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3/18/14

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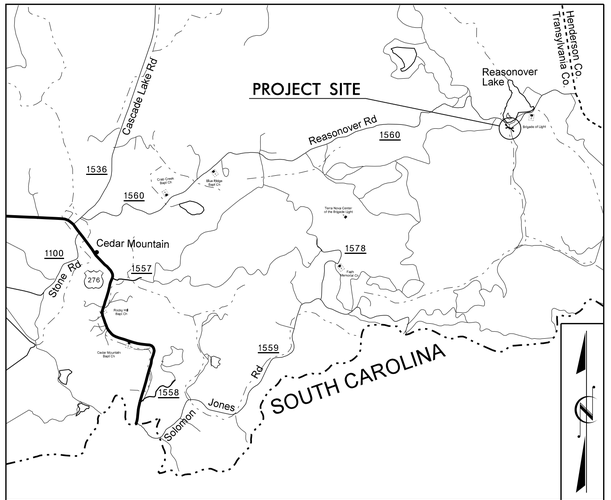
CONTRACT: DN00286




VICINITY MAP

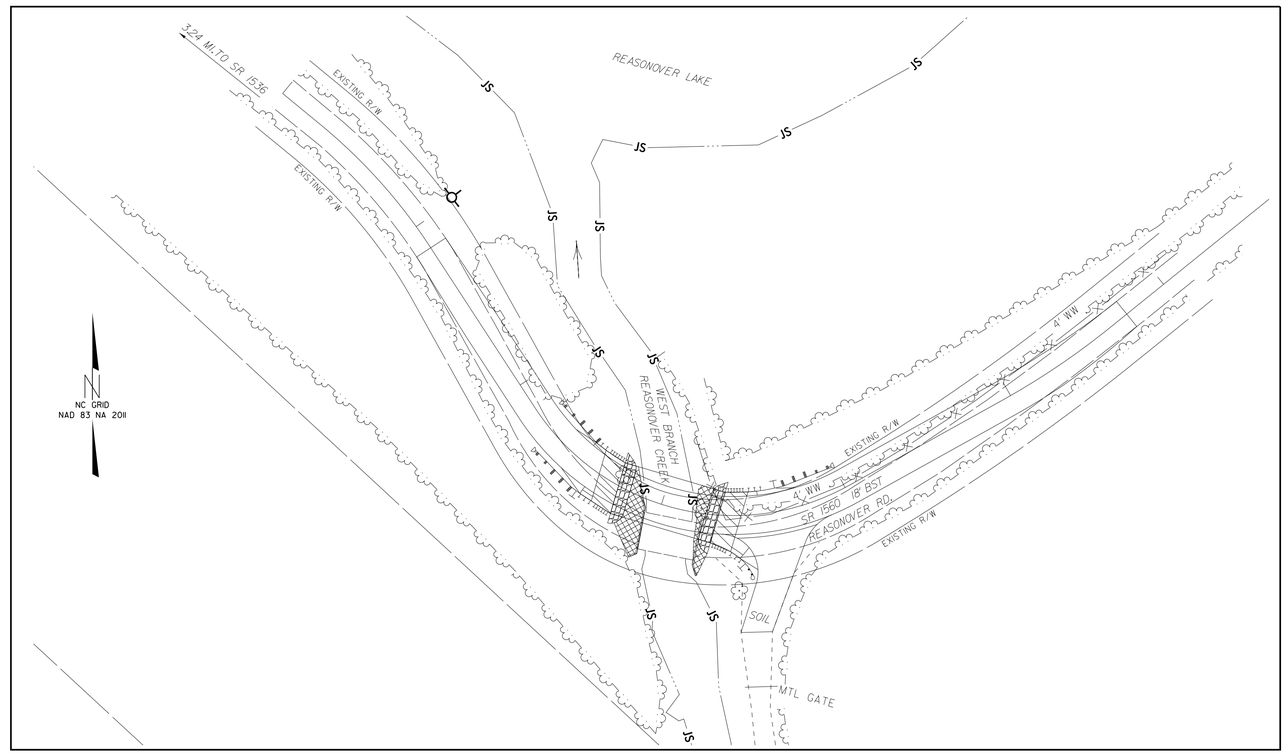
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | UO–1 |

# UTILITIES BY OTHERS PLANS
# TRANSYLVANIA COUNTY

***LOCATION: BRIDGE NO. 9 OVER THE WEST BRANCH OF REASONOVER CREEK ON SR 1560 (REASONOVER ROAD)***

***TYPE OF WORK: AERIAL TELEPHONE***




Vaughn & Melton
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Charlotte, North Carolina 704-357-8488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865-546-5800
Middlesboro, Kentucky 606-248-6600
Spartanburg, South Carolina 864-574-4775
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***GRAPHIC SCALES***

30 15 0 30 60
PLANS

## *INDEX OF SHEETS*

| *SHEET NO.* | *DESCRIPTION* |
|---|---|
| *UO–1* | *TITLE SHEET* |
| *UO–2* | *UTILITIES BY OTHERS PLAN SHEET* |

## *UTILITY OWNERS ON PROJECT*

*(1) POWER – DUKE ENERGY*

*(2) TELEPHONE – COMPORIUM– (CITIZENS TELEPHONE COMPANY)*

***PLANS PREPARED BY:***

Vaughn & Melton
Consulting Engineers
1318-F PATTON AVE.
Asheville, NC 28806
828-253-2796

*PREPARED FOR THE OFFICE OF:*
*DIVISION OF HIGHWAYS*
*UTILITIES ENGINEERING SECTION*
*1591 MAIL SERVICES CENTER*
*RALEIGH NC 27699-1591*
*PHONE (919) 250-4128*
*FAX (919) 250-4119*

*Lynn A. Mann, P.G.* *UTILITIES PROJECT DESIGNER*

V&M PROJECT #31430-02
TRANSPORTATION\31430-02\TRANS 9\UTILITIES\UO-1.DGN

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3/13/14

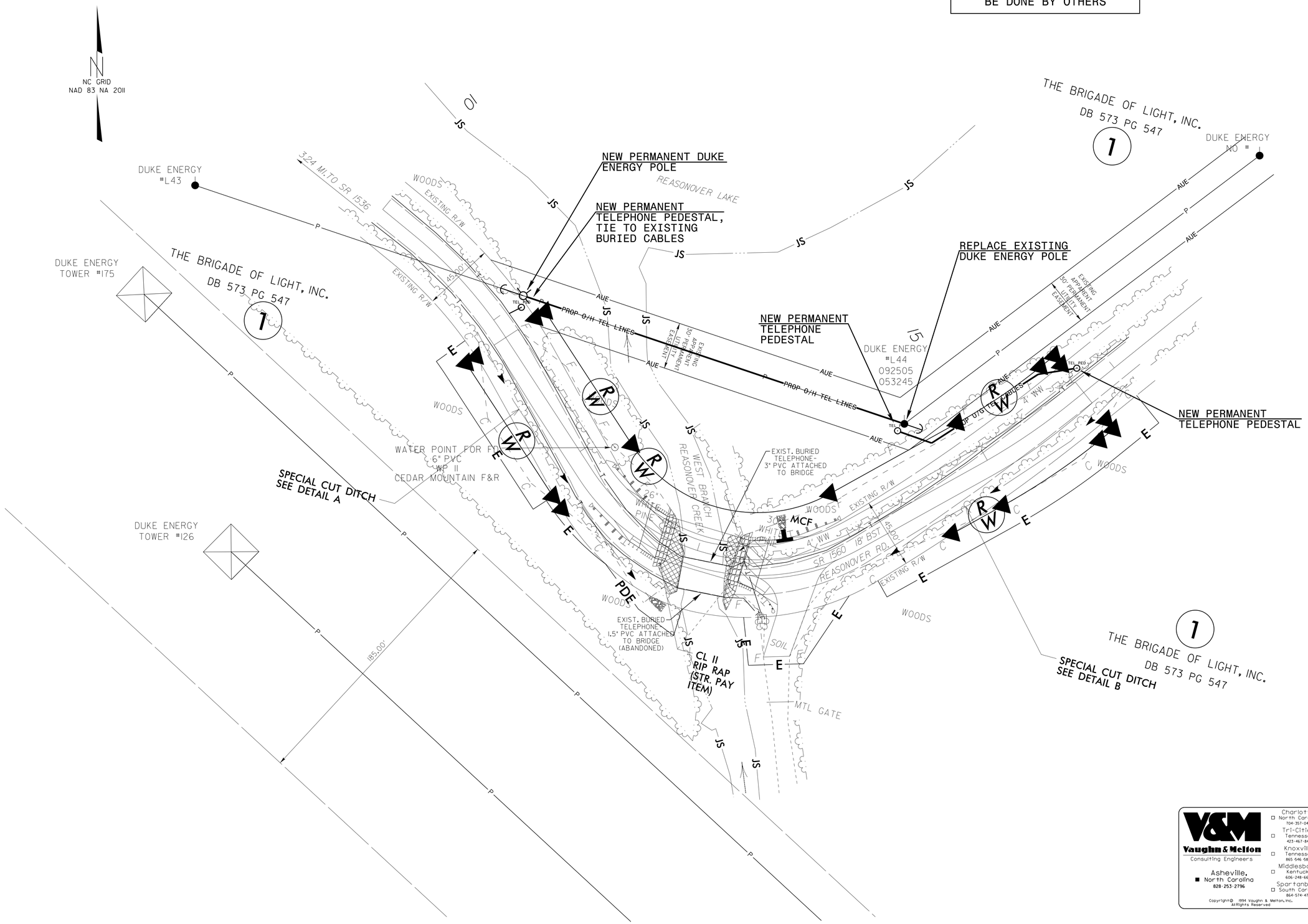
**WBS ELEMENT: 17BP.14.R.118**

**CONTRACT: DN00286**

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 17BP.14.R.118 | U0-2 |

# UTILITIES BY OTHERS

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V&M PROJECT #31430-02
TRANSPORTATION\31430-02\TRANS 9\UTILITIES\U0-2.DGN