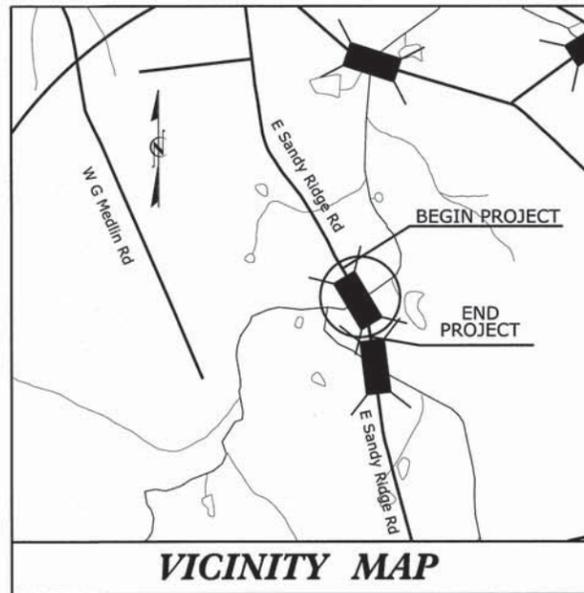


09/28/13

**PROJECT: WBS 17BP.10.R.17**

See Sheet 1-A For Index of Sheets



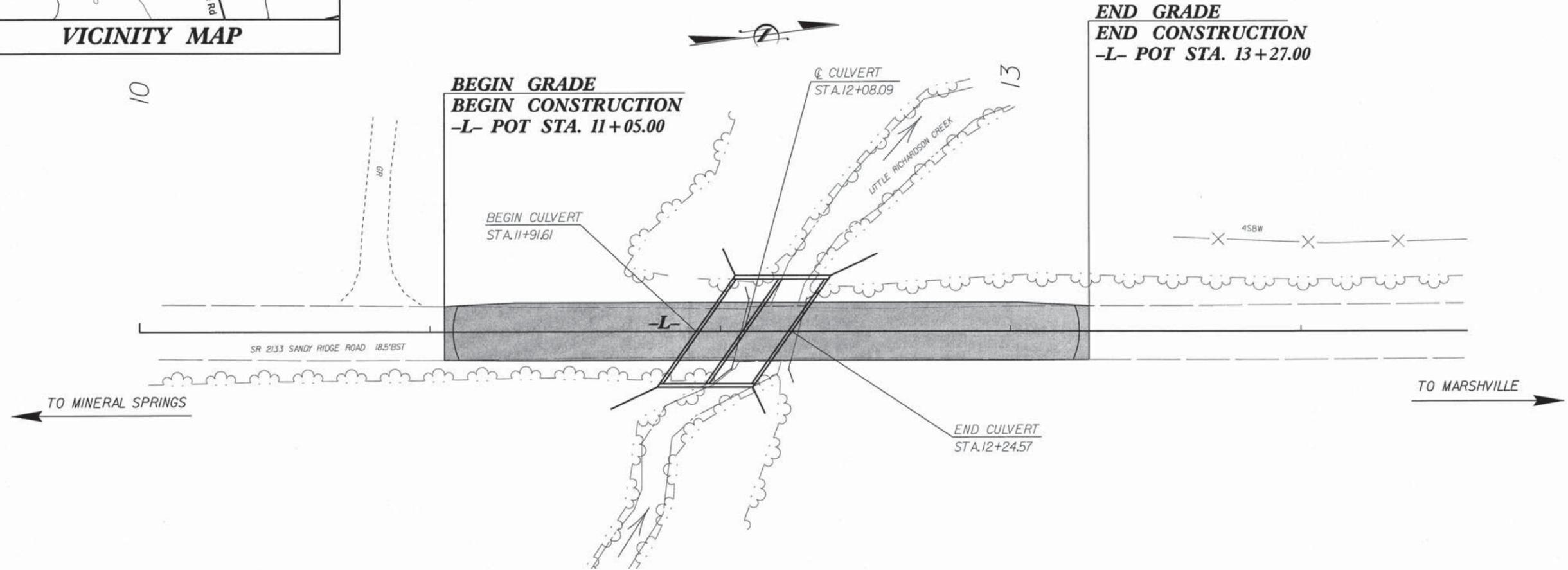
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**UNION COUNTY**

**LOCATION: BRIDGE NO. 356 ON SR 2133 (SANDY RIDGE ROAD)  
OVER LITTLE RICHARDSON CREEK**

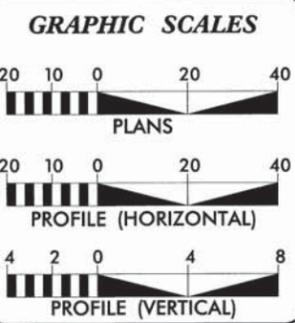
**TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES AND  
TRAFFIC CONTROL**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.10.R.17	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.10.R.17		PE ROW/UTIL. CONST.	

**VICINITY MAP**



**- CLEARING SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.**



**DESIGN DATA**

ADT 2010 =	570
ADT 2030 =	934
DHV =	NA %
D =	NA %
T =	6 % *
V =	55 MPH
FUNC CLASS =	LOCAL
SUB-REGIONAL TIER	

**PROJECT LENGTH**

LENGTH OF ROADWAY T.I.P. PROJECT 17BP.10.R.17	=	0.042 MI.
LENGTH OF STRUCTURE T.I.P. PROJECT 17BP.10.R.17	=	0.000 MI.
TOTAL LENGTH OF T.I.P. PROJECT 17BP.10.R.17	=	0.042 MI.

NCDOT CONTACT: **GARLAND HAYWOOD, PE**  
BRIDGE PROGRAM MANAGER

PREPARED IN THE OFFICE OF:  
**Stantec**  
801 Jones Franklin Road, Suite 300  
Raleigh, NC U.S.A. 27606  
Tel. (919) 851-6866  
Fax. (919) 851-7024  
www.stantec.com  
License No. F-0672

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **GARLAND HAYWOOD, PE**  
PROJECT ENGINEER  
JUNE 5, 2013

LETTING DATE: **ROBERT WILLIAMS, PE**  
PROJECT DESIGN ENGINEER  
JUNE 5, 2013

**HYDRAULIC ENGINEER**

02:38:32 PM 04/15/13  
SEAL 29185  
SIGNATURE: *Robert A. Williams* P.E.

**ROADWAY DESIGN ENGINEER**

SEAL 30932  
SIGNATURE: *Robert A. Williams* P.E. 4/15/13



4/12/2013  
U:\Union356\Roadway\Proj\890356\_rdy\_tsh.dgn  
Rwilliams



### INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2	PAVEMENT SCHEDULE & TYPICAL SECTIONS
3	SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND DRAINAGE
4	PLAN/PROFILE SHEET
5	DRAINAGE SHEET
TMP-1 THRU TMP-3	TRAFFIC MAINTENANCE PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
UD-1 THRU UD-2	UTILITY BY OTHER PLANS
X-1 THRU X-2	CROSS-SECTIONS
C-1 THRU C-4	CULVERT PLANS

### GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS  
EFFECTIVE: 01-17-12  
REVISED: 11/01/11

GRADE LINE:  
GRADING AND SURFACING:  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 11.

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.

DRIVEWAYS:  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

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.

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY AND FRONTIER COMMUNICATIONS. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:  
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

### ROADWAY 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 11
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
806.02	Granite Right-of-Way Marker
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units

Note: Not to Scale

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

# 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	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- MLB
Proposed Wetland Boundary	----- MLB
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	○
Well	○
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	-----
False Sump	-----

## RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
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	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	○
Proposed Right of Way Line with Concrete or Granite R/W Marker	△
Proposed Control of Access Line with Concrete C/A Marker	○
Existing Control of Access	○
Proposed Control of Access	○
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	-----
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	-----

## EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○
Storm Sewer	-----

## UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	□
H-Frame Pole	●
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

## TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

## WATER:

Water Manhole	⊕
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	□
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

## GAS:

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

## SANITARY SEWER:

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

## MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
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.

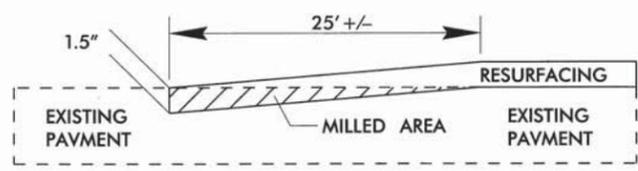
5/14/99

### PAVEMENT SCHEDULE

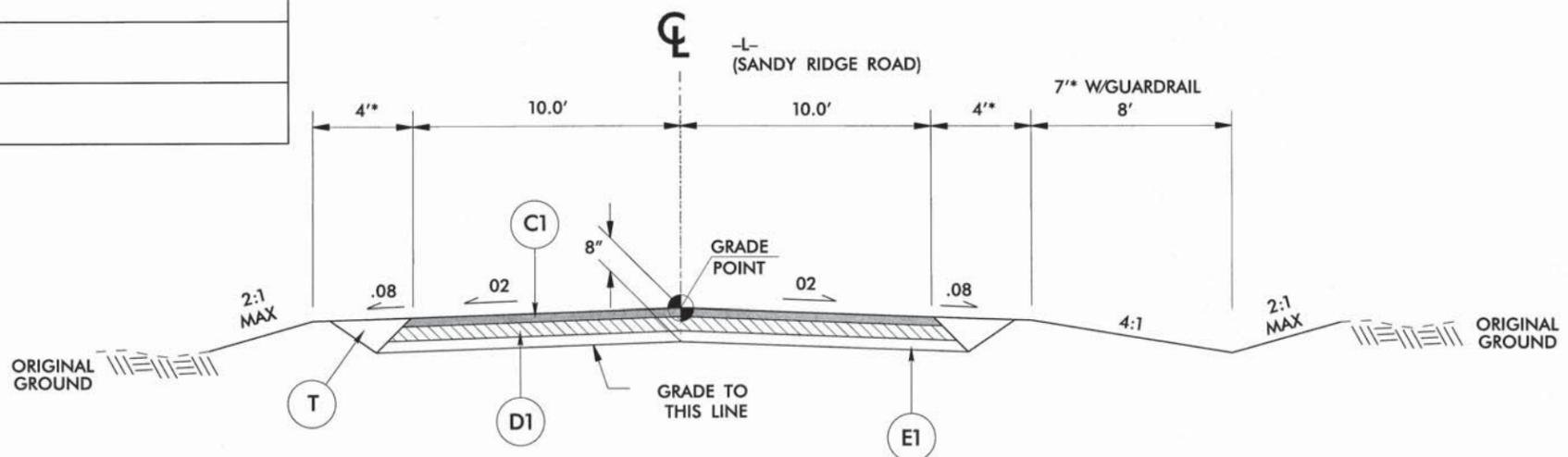
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE. TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER. SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2.0"
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER. SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4.0"
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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" OR GREATER THAN 5.5"
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING
Z	VARIABLE DEPTH MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO. 17BPJ0.RJ7	SHEET NO. 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER ROBERT A. WILLIAMS 30932 4/15/13	HYDRAULICS ENGINEER RICHARD L. HINES 29185

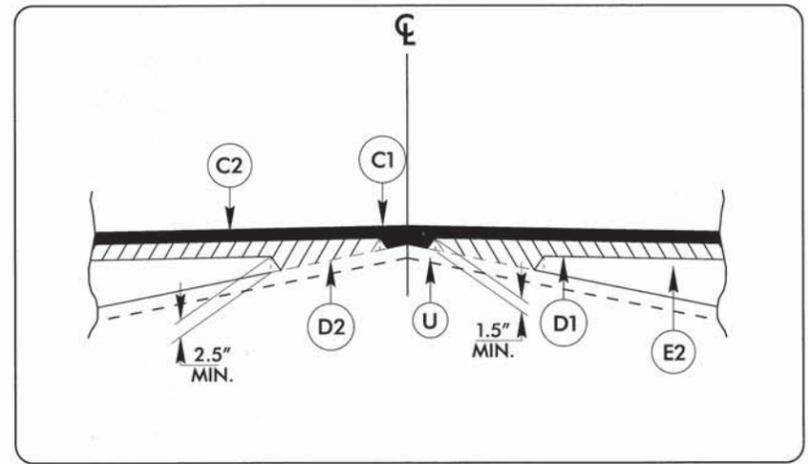


MILLING DETAIL

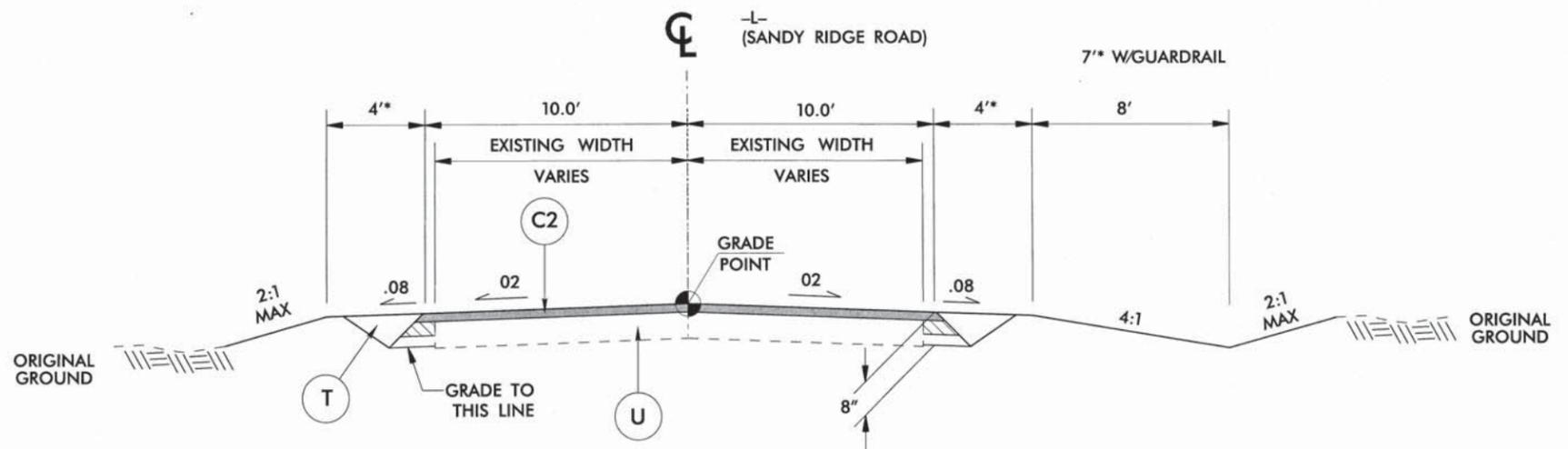


TYPICAL SECTION NO. 1

-L- STA. 11+05.00 TO STA. 13+27.00



WEDGING DETAIL



TYPICAL SECTION NO. 2

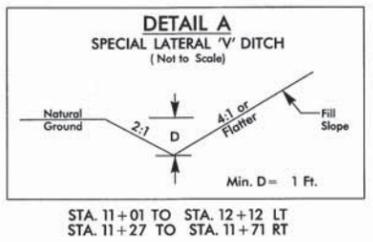
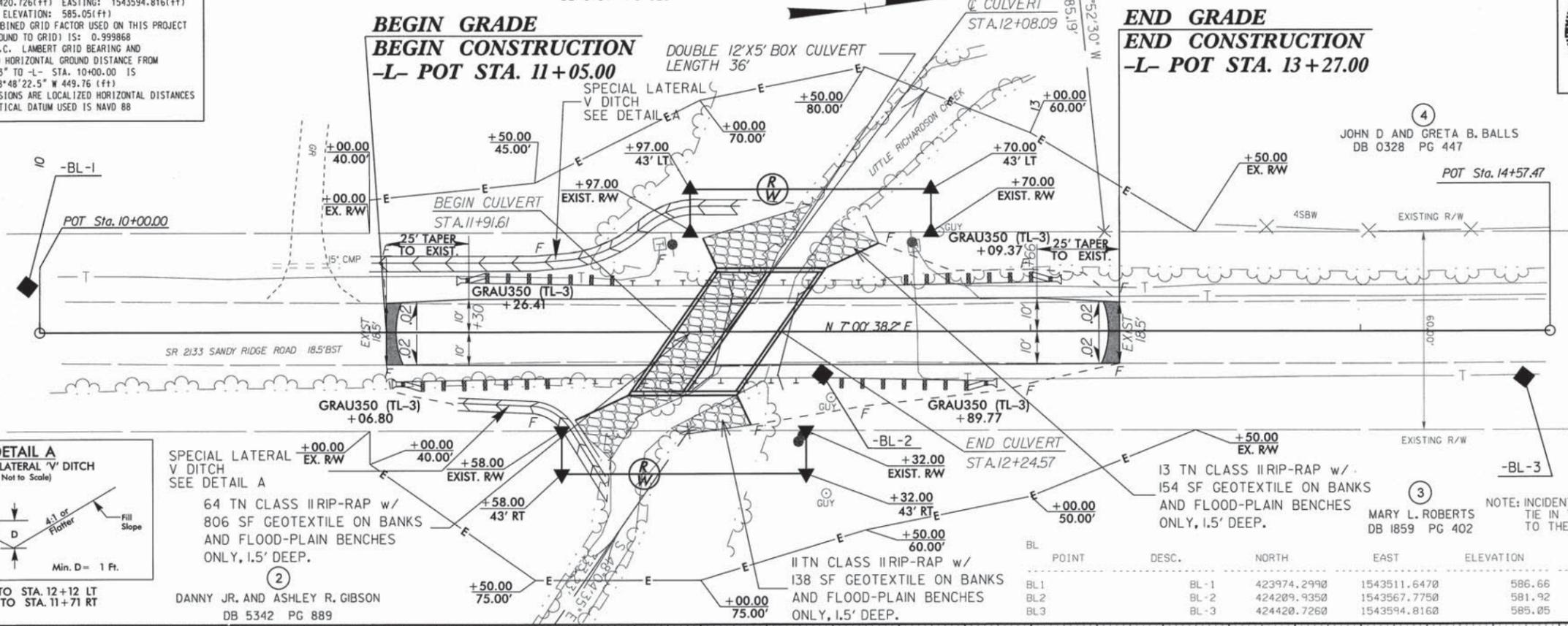
AS NEEDED

3/14/2013 10:35:56 AM \\roadway\proj\890356\_rdy\_ttp.dgn



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BL-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 424420.726(ft) EASTING: 1543594.816(ft) ELEVATION: 585.05(ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999868  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-3" TO -L- STA. 10+00.00 IS S 08°48'22.5" W 449.76 (ft)  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

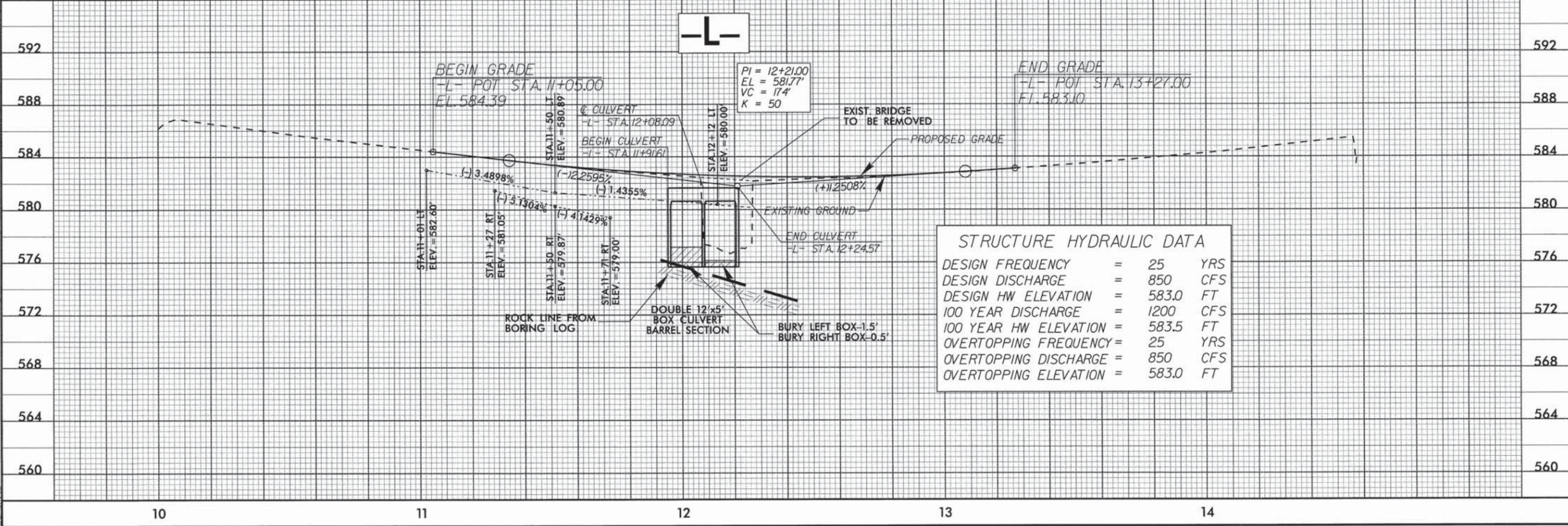
ELDON SETH SPURLOCK & BELINDA R. FINCHER  
 DB 3757 PG 628



SPECIAL LATERAL V DITCH  
 SEE DETAIL A  
 64 TN CLASS II RIP-RAP w/  
 806 SF GEOTEXTILE ON BANKS  
 AND FLOOD-PLAIN BENCHES  
 ONLY, 1.5' DEEP.  
 DANNY JR. AND ASHLEY R. GIBSON  
 DB 5342 PG 889

13 TN CLASS II RIP-RAP w/  
 154 SF GEOTEXTILE ON BANKS  
 AND FLOOD-PLAIN BENCHES  
 ONLY, 1.5' DEEP.  
 MARY L. ROBERTS  
 DB 1859 PG 402

POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
BL1	BL-1	423974.2990	1543511.6470	586.66	10+06.32	13.97 LT
BL2	BL-2	424209.9350	1543567.7750	581.92	12+47.04	12.98 RT
BL3	BL-3	424420.7260	1543594.8160	585.05	14+59.56	14.09 RT



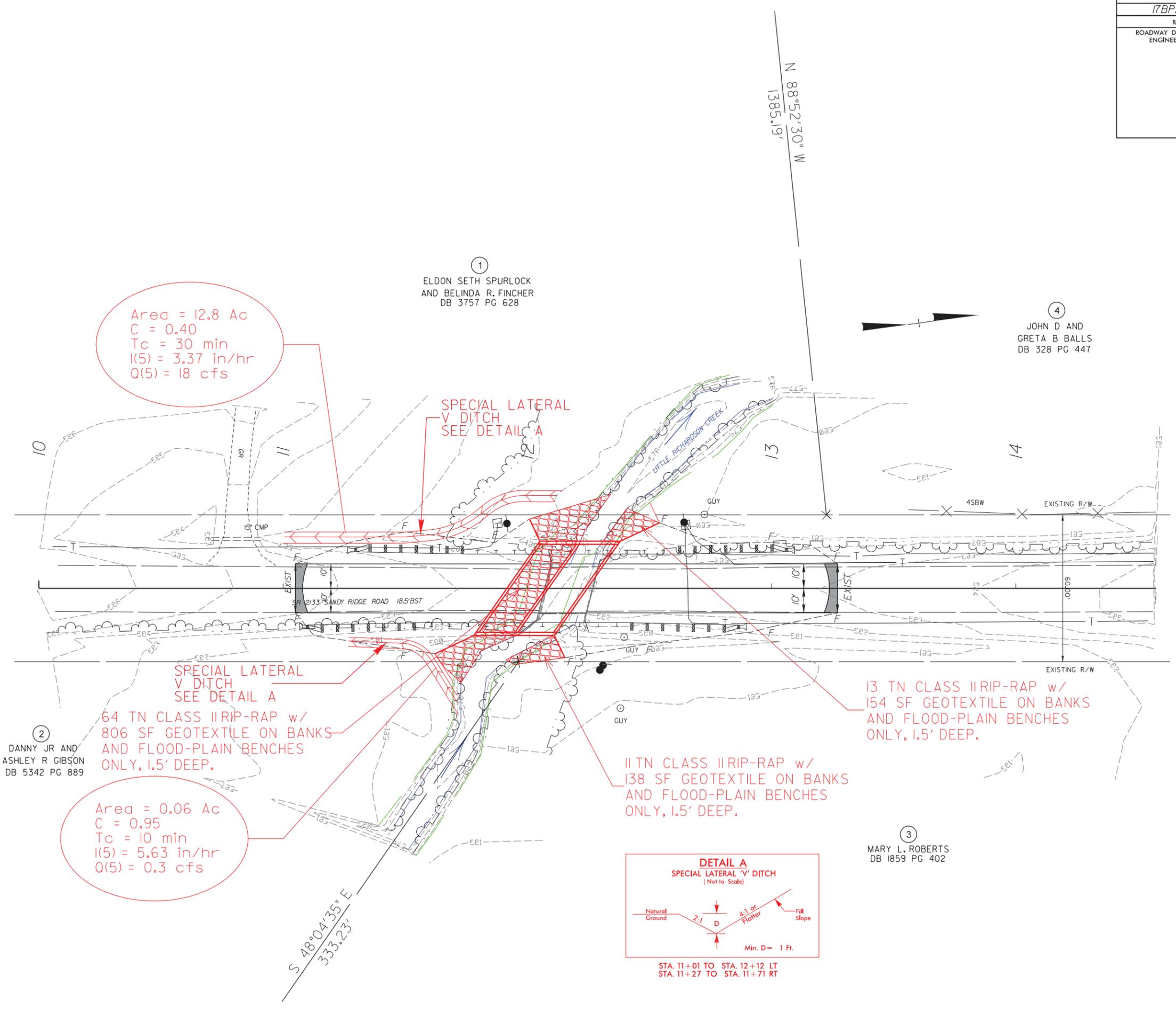
**STRUCTURE HYDRAULIC DATA**

DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	850	CFS
DESIGN HW ELEVATION	=	583.0	FT
100 YEAR DISCHARGE	=	1200	CFS
100 YEAR HW ELEVATION	=	583.5	FT
OVERTOPPING FREQUENCY	=	25	YRS
OVERTOPPING DISCHARGE	=	850	CFS
OVERTOPPING ELEVATION	=	583.0	FT

8/17/99  
 REVISIONS  
 3/14/2013  
 U:\Union356\Roadway\Proj\890356\_rdy\_psh.dgn  
 10 11 12 13 14

PROJECT REFERENCE NO. 17BP10.R17	SHEET NO. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	AMEC LICENSE No.F-1253

8/17/99  
STATIONING TO REMAIN



Area = 12.8 Ac  
C = 0.40  
Tc = 30 min  
I(5) = 3.37 in/hr  
Q(5) = 18 cfs

①  
ELDON SETH SPURLOCK  
AND BELINDA R. FINCHER  
DB 3757 PG 628

④  
JOHN D AND  
GRETA B BALLS  
DB 328 PG 447

SPECIAL LATERAL  
V DITCH  
SEE DETAIL A

SPECIAL LATERAL  
V DITCH  
SEE DETAIL A

64 TN CLASS II RIP-RAP w/  
806 SF GEOTEXTILE ON BANKS  
AND FLOOD-PLAIN BENCHES  
ONLY, 1.5' DEEP.

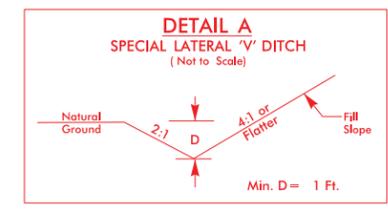
13 TN CLASS II RIP-RAP w/  
154 SF GEOTEXTILE ON BANKS  
AND FLOOD-PLAIN BENCHES  
ONLY, 1.5' DEEP.

11 TN CLASS II RIP-RAP w/  
138 SF GEOTEXTILE ON BANKS  
AND FLOOD-PLAIN BENCHES  
ONLY, 1.5' DEEP.

Area = 0.06 Ac  
C = 0.95  
Tc = 10 min  
I(5) = 5.63 in/hr  
Q(5) = 0.3 cfs

②  
DANNY JR AND  
ASHLEY R GIBSON  
DB 5342 PG 889

③  
MARY L. ROBERTS  
DB 1859 PG 402



STA. 11+01 TO STA. 12+12 LT  
STA. 11+27 TO STA. 11+71 RT

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

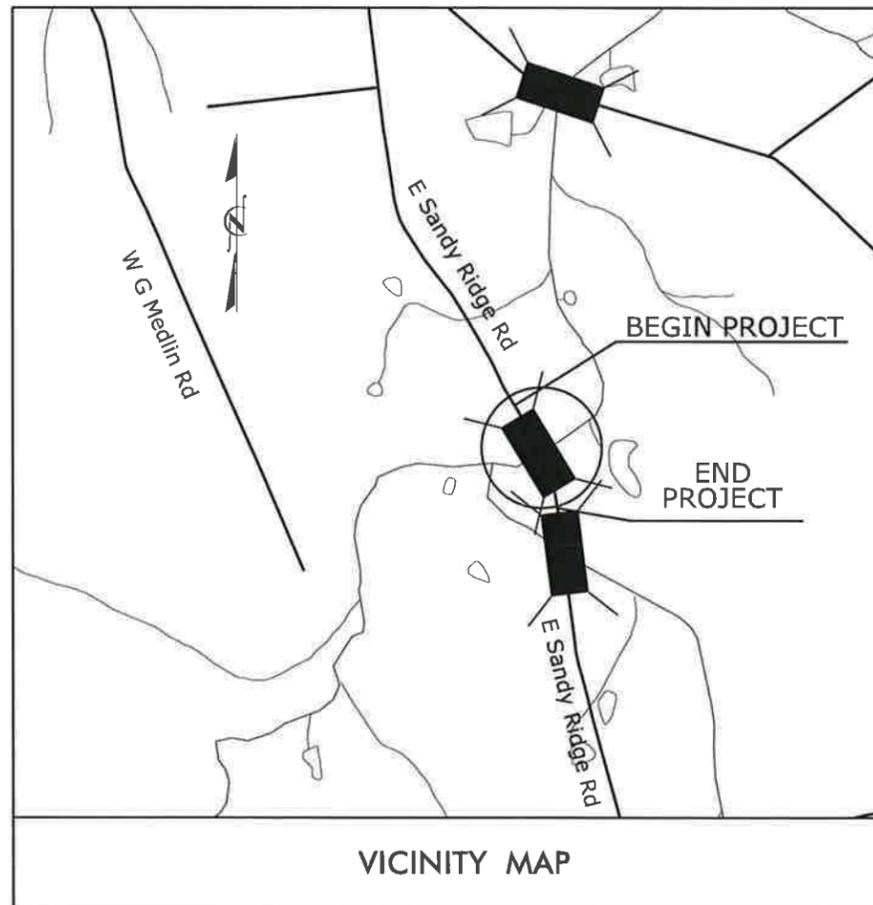
**TRANSPORTATION MANAGEMENT PLAN**

**UNION COUNTY**

**DIVISION 10**



**BRIDGE #356 – SR 2133 (SANDY RIDGE ROAD) OVER LITTLE RICHARDSON CREEK**



**INDEX OF SHEETS**

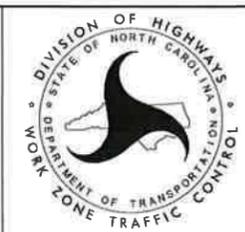
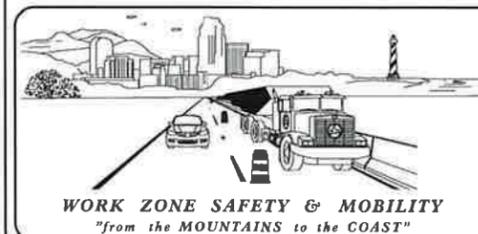
SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LEGEND AND LIST OF ROADWAY STANDARD DRAWINGS
TMP-2	GENERAL NOTES AND PHASING
TMP-3	BRIDGE #356 - ROAD CLOSURE & DETOUR ROUTE

SHEET NO.  
TMP-1

**WBS 17BP.10.R.17**

**TRAFFIC MANAGEMENT STRATEGY**

PROPOSED REPLACEMENT OF BRIDGE #356 WILL BE PERFORMED USING A ROAD CLOSURE WITH OFF-SITE DETOUR ROUTE. REFER TO SHEET TMP-2 FOR PHASING.



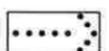
PLAN PREPARED BY:  
Stantec Consulting Services Inc.  
801 Jones Franklin Road-Suite 300  
Raleigh, NC 27606  
Tel. 919.851.6868  
Fax: 919.851.7024  
www.stantec.com

BETSY L. WATSON, P.E. TRAFFIC ENGINEER  
GEORGE KARAGEORGE WORK ZONE TRANSPORTATION DESIGN MANAGER

APPROVED: *Betsy L. Watson*  
DATE: *April 8, 2013*



# LEGEND

-  DIRECTION OF TRAFFIC FLOW
-  DIRECTION OF PEDESTRIAN TRAFFIC FLOW
-  WORK AREA     PAVEMENT REMOVAL
-  NORTH ARROW
-  TYPE III BARRICADE
-  CONE
-  DRUM     SKINNY DRUM     TUBULAR MARKER
-  CHANGEABLE MESSAGE SIGN (CMS)
-  FLAGGER
-  AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)
-  FLASHING ARROW BOARD (TYPE C)
-  LAW ENFORCEMENT
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  PORTABLE CONCRETE BARRIER (PCB)
-  TEMPORARY CRASH CUSHION
-  TEMPORARY SHORING
-  WORK ZONE SIGN-PORTABLE
-  WORK ZONE SIGN-STATIONARY
-  WORK ZONE SIGN-STATIONARY OR PORTABLE

### SIGNALS

-  EXISTING
-  PROPOSED
-  TEMPORARY

### PAVEMENT MARKINGS

-  EXISTING PAVEMENT MARKING (GRAY)
-  SKIP LINES
-  MINI-SKIP LINES
-  SOLID LINES

### PAVEMENT MARKING SYMBOLS

-  PAVEMENT MARKING SYMBOLS
-  EXISTING PAVEMENT MARKING SYMBOLS (HOLLOW)
-  ONLY PAVEMENT MARKING ALPHANUMERIC CHARACTERS

### PAVEMENT MARKERS

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

## ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR 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
1101.03	TEMPORARY ROAD CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS

4/1/2013 U:\Union356\TrafficControl\TCP\Plansheets\17BP.10.R.17.TC.TMP\_01A.RDWYSTDSLEGEND.dgn



Stantec Consulting Services Inc.  
801 Jones Franklin Road  
Suite 300  
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License No. F-0672

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_



*Patsy L. Watson*  
4/8/13



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

LEGEND  
&  
ROADWAY STANDARD DRAWINGS

## GENERAL NOTES

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

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.

### ROAD CLOSURES

- A) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY ROAD CLOSURE.
- B) FURNISH AND INSTALL SIGNING AND DEVICES FOR ROAD CLOSURES ACCORDING TO THE TRANSPORTATION MANAGEMENT PLAN. COVER OR REMOVE ALL SIGNS AND DEVICES FOR ROAD CLOSURES WHEN NOT IN EFFECT.
- C) FURNISH AND INSTALL OFFSITE-DETOUR ROUTE SIGNING AS SHOWN IN THE TRANSPORTATION MANAGEMENT PLAN. COVER OR REMOVE OFFSITE-DETOUR SIGNING WHEN THE DETOUR IS NOT IN OPERATION. ALL DETOUR ROUTES MUST BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTING.
- D) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- E) OTHER BRIDGE PROJECTS MAY BE ONGOING IN THE AREA. COORDINATE ALL DETOUR ROUTES WITH ENGINEER AND OTHER CONTRACTORS.

### PAVEMENT MARKINGS AND MARKERS

- F) RECORD ALL LOCATIONS AND TYPES OF EXISTING PAVEMENT MARKINGS AS THEY WILL BE REPLACED IN THE SAME LOCATION ON THE NEW SURFACE.
- G) UPON COMPLETION OF ALL OTHER CONSTRUCTION OPERATIONS INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

<u>ROAD NAME</u>	<u>MARKING</u>	<u>PAVEMENT MARKER</u>
SR 2133	PAINT	NONE

- H) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- I) REPLACE PAVEMENT MARKINGS BEFORE OPENING LANES TO TRAFFIC.

## PHASING

REFER TO SHEET TMP-3

STEP 1:

INSTALL DETOUR ROUTE SIGNS.

STEP 2:

CLOSE SR 2133 SANDY RIDGE RD. IN ACCORDANCE WITH ROADWAY STANDARD DRAWING 1101.03 SHEET 1 OF 9, TEMPORARY ROAD CLOSURES-CLOSURE BEYOND DETOUR POINT.

STEP 3:

WITH SR 2133 CLOSED TO TRAFFIC REPLACE BRIDGE #356 AND COMPLETE ALL CONSTRUCTION OPERATIONS.

STEP 4:

INSTALL FINAL PAVEMENT MARKINGS.

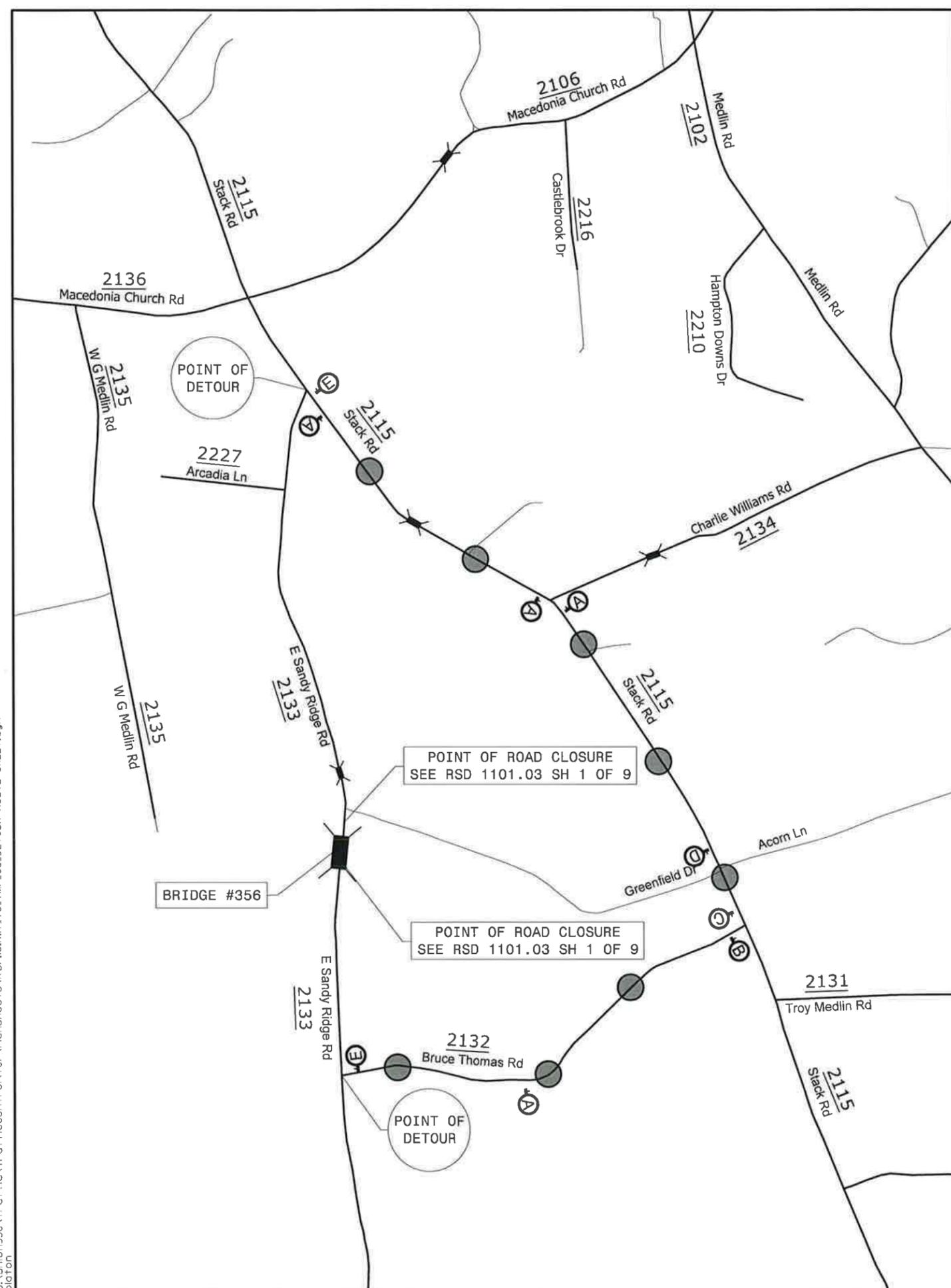
STEP 5:

OPEN SR 2133 TO TRAFFIC.

4/1/2013 U:\Union356\TrafficControl\CP\Plansheets\17BP.10.R.17\_TC\_TMP\_02\_GENERALNOTES.dgn Blaton

 <p>Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>APPROVED: _____ DATE: _____</p>  <p><i>Patsy L. Watson</i> 4/8/13</p>	 <p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL</p>	<p>GENERAL NOTES AND PHASING</p>
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4/1/2013 U:\Union356\Traffic\TrafficControl\TCPlan\Plansheet\17BP.10.R.17.TC.TMP.03.DETOUR ROUTE SHEET.dgn  
 Bidton



- (A) DETOUR** M4-8 24" X 12"  
 M6-3 21" X 15"
- (B) DETOUR** M4-8 24" X 12"  
 M6-1 L 21" X 15"
- (C) DETOUR** M4-8 24" X 12"  
 M6-1 21" X 15"
- (D) DETOUR** M4-8 24" X 12"  
 M5-1 R 21" X 15"
- (E) END DETOUR** M4-8 A 24" X 18"

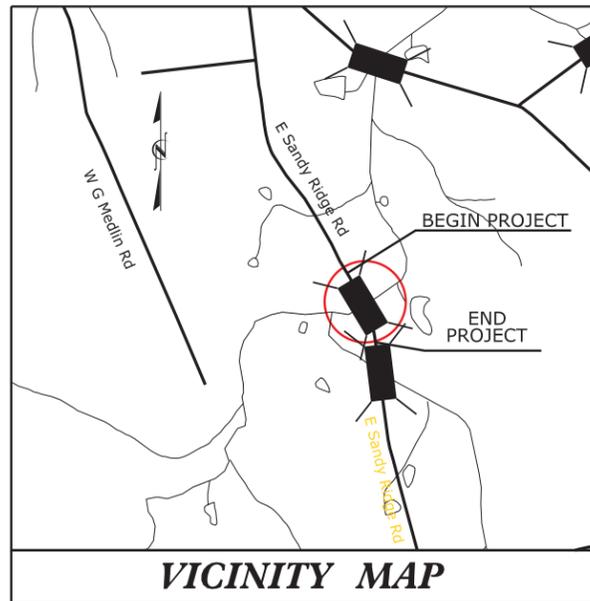
Stantec Consulting Services Inc.  
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APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_



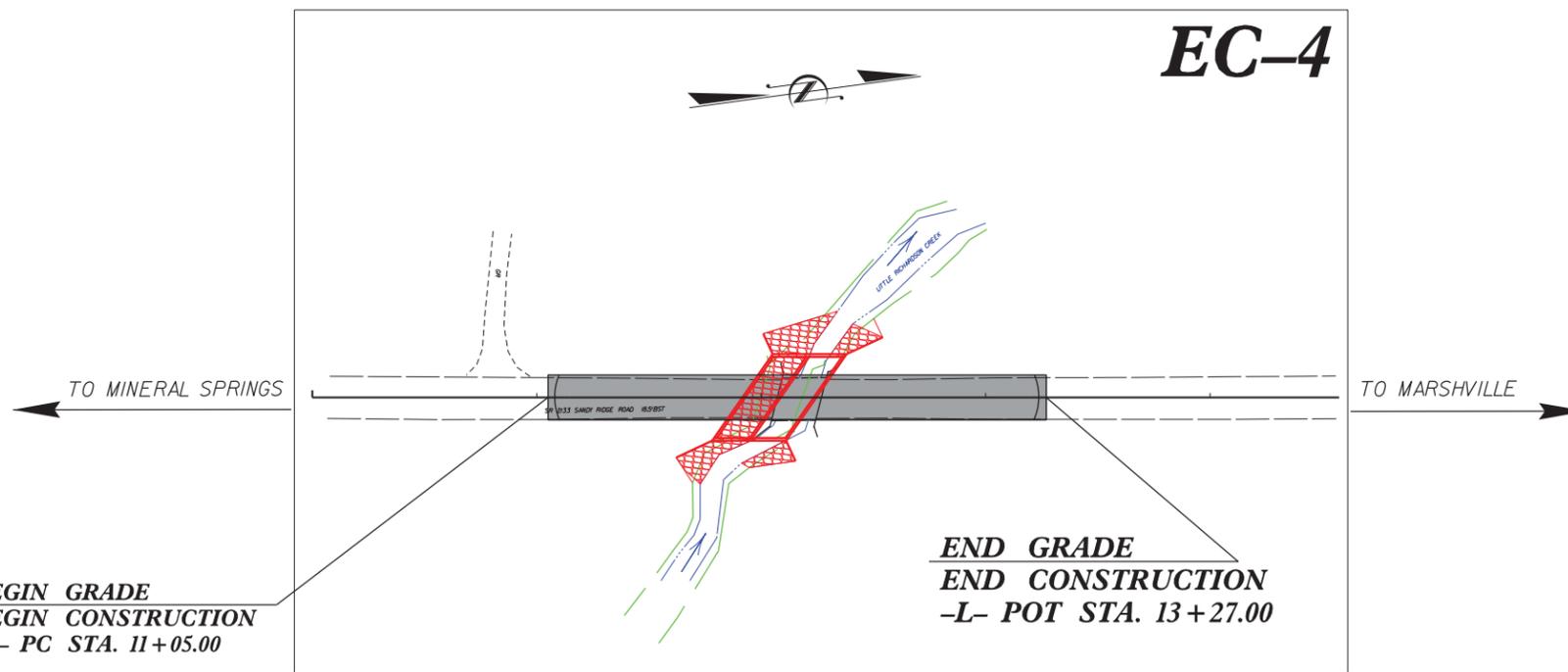
UNION CO. BRIDGE #356  
 ROAD CLOSURE &  
 DETOUR ROUTE

**TIP PROJECT: 17BP.10.R.17**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL  
**UNION COUNTY**

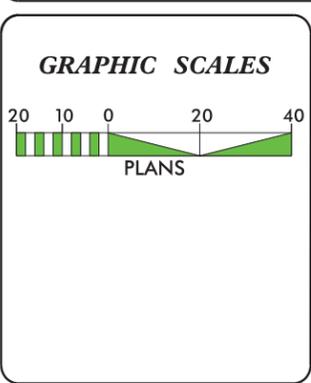
LOCATION: BRIDGE NO. 356 ON SR 2133 (SANDY RIDGE ROAD)  
OVER LITTLE RICHARDSON CREEK



**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	△△△△△
1622.01	Temporary Berms and Slope Drains	— T —
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	⤴
	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.



ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

03:24:39 PM 03-08-2013 (-05'00' GMT)

AMEC LICENSE No.F-1253

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

Prepared in the Office of:

AMEC Environment & Infrastructure, Inc.  
4021 Stirrup Creek Drive, Suite 100  
Durham, North Carolina, 27703  
NC Eng. License #: F-1253

**amec**

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**2012 STANDARD SPECIFICATIONS**

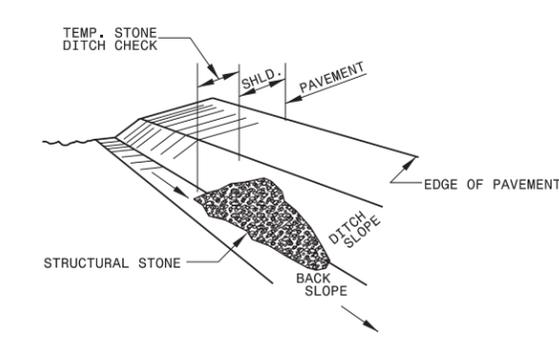
Tel. (919) 381-9900  
Fax. (919) 381-9901  
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Roadway Standard Drawings

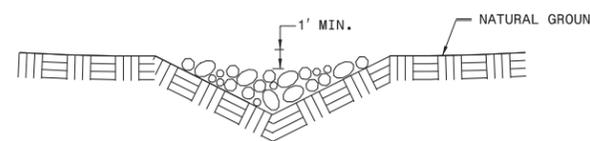
The following roadway english standards as appear in "Roadway Standard Drawings"— Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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 Dam 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	

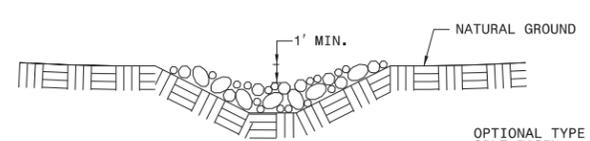
# TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH

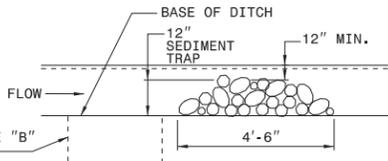


CROSS SECTION TRAPEZOIDAL DITCH

**NOTES:**

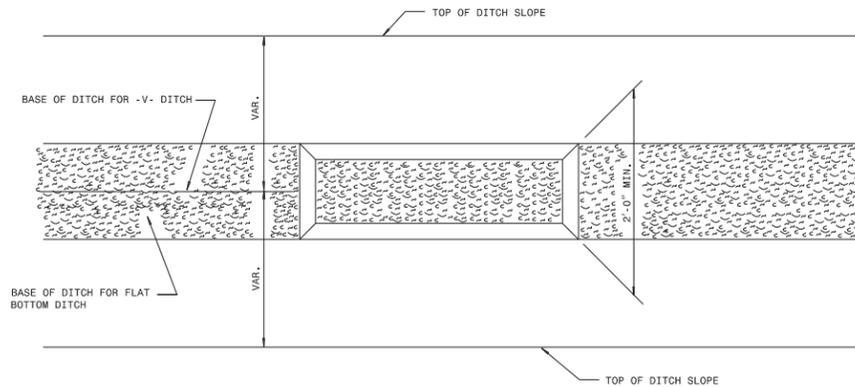
USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

THE ENGINEER MAY DIRECT THE OPTION OF CLASS 'A' STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.

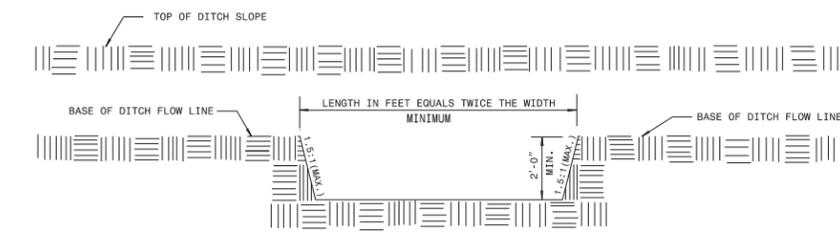


ELEVATION VIEW

# SILT BASIN 'B' DETAIL



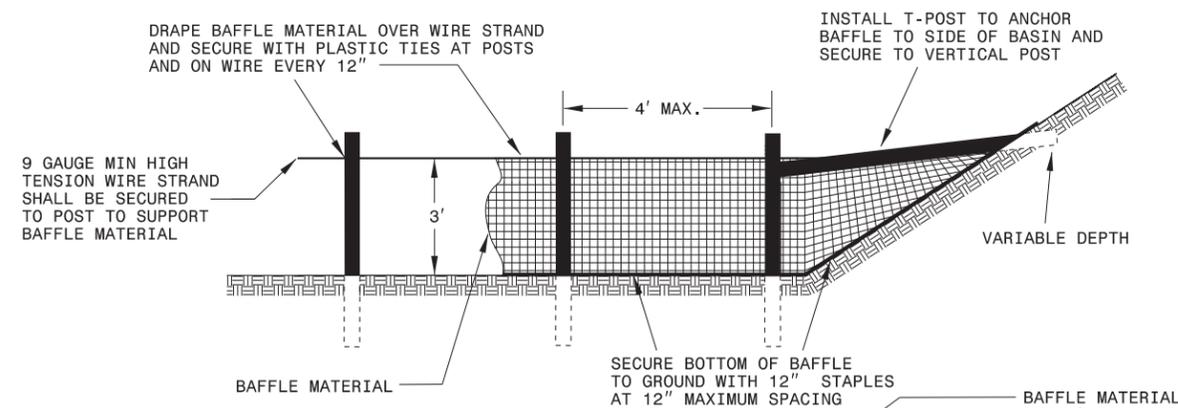
PLAN



ELEVATION

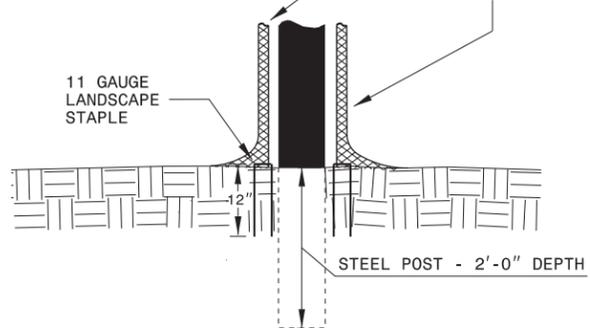
PROJECT REFERENCE NO. 17BP10.R17	SHEET NO. EC-2
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	ENGINEER SEAL 29185 RICHARD L. HINES AMEC LICENSE No.F-1253

# COIR FIBER BAFFLE DETAIL



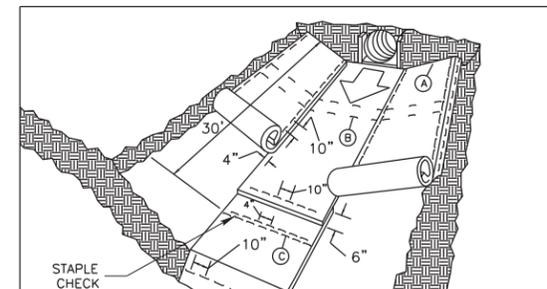
**NOTES:**

1. INSTALL THREE(3) COIR FIBER BAFFLES IN SILT BASINS AND SEDIMENT DAMS AT DRAINAGE OUTLETS WITH A SPACING OF 1/4 THE BASIN LENGTH.
2. TWO(2) COIR FIBER BAFFLES CAN BE INSTALLED IN SILT BASINS AND DAMS LESS THAN 20 FT. IN LENGTH WITH A SPACING OF 1/3 THE BASIN LENGTH.
3. TOP HEIGHT OF COIR FIBER BAFFLES SHALL NOT BE BELOW BASE OF EMERGENCY SPILLWAY ELEVATION.

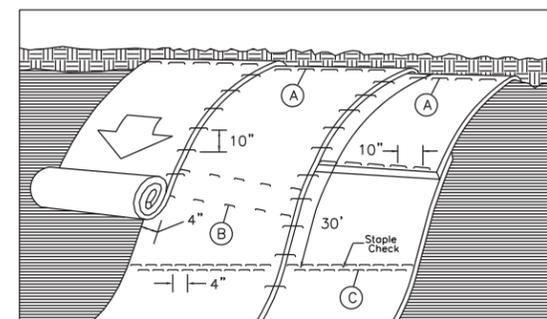


BAFFLE MATERIAL SHALL BE SECURED TO THE BOTTOM AND SIDES OF BASIN USING 12\"/>

# MATting INSTALLATION DETAIL



MATting IN DITCHES



MATting ON SLOPES

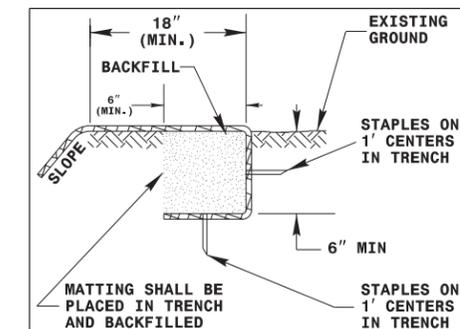


DIAGRAM (A)

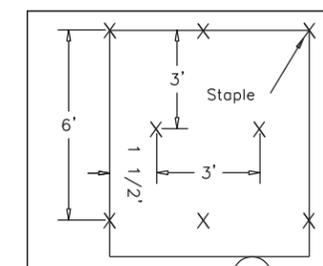


DIAGRAM B

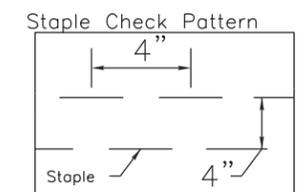


DIAGRAM (C)

**NOTES:**

THIS DETAIL APPLIES TO STRAW, EXCELSTOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION. STAPLES SHALL BE NO. 11 GAUGE STEEL FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. 17BP10.R.17	SHEET NO. EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 03/25/37 P.M. (EST. 1950' GMT)  AMEC LICENSE No.F-1253

**SOIL STABILIZATION SUMMARY SHEET**

**MATTING FOR EROSION CONTROL  
(FOR SLOPE STABILIZATION)**

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+05	11+99	LT	110
4	-L-	12+32	13+27	LT	100
4	-L-	11+05	11+85	RT	105
4	-L-	12+18	13+27	RT	125
SUBTOTAL					440
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					0
TOTAL					440
SAY					450

**IMPERVIOUS LINER (FOR TEMP. DIVERSION DITCHES)**

4	-L-	10+95	12+47	LT	150
4	-L-	11+82	13+15	RT	130
SUBTOTAL					280
MISCELLANEOUS LINER TO BE INSTALLED AS DIRECTED BY THE ENGINEER					0
TOTAL					280
SAY					300

**TEMPORARY SILT FENCE (FOR STOCK PILES)**

SUBTOTAL					300
ADDITIONAL FENCE TO BE INSTALLED					85
TOTAL					385
SAY					400

**SILT BAG**

TOTAL					1
-------	--	--	--	--	---

**SPECIAL STILLING BASIN**

TOTAL					1
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**PERMANENT SOIL REINFORCEMENT MAT  
(FOR TEMP. SILT DITCH STABILIZATION)**

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+04	12+00	LT	90
4	-L-	12+19	12+30	LT	15
4	-L-	12+93	13+28	LT	40
4	-L-	11+03	11+43	RT	45
4	-L-	11+61	11+69	RT	10
4	-L-	11+83	11+93	RT	10
4	-L-	12+16	13+28	RT	110
SUBTOTAL					320
ADDITIONAL PRSM TO BE INSTALLED					0
TOTAL					320
SAY					350

**COIR FIBER MATTING (STREAM BANK AT TEMP. DIKE)**

SUBTOTAL					15
ADDITIONAL MATTING TO BE INSTALLED					0
TOTAL					15
SAY					20

**CLASS II RIP RAP (WING WALLS AND CULVERT)**

SUBTOTAL					88
ADDITIONAL STONE TO BE INSTALLED					0
TOTAL					88
SAY					90 TON

**GEOTEXTILE (BANKS AND FLOODPLAIN BENCHES)**

SUBTOTAL					1100
ADDITIONAL GEOTEXTILE TO BE INSTALLED					0
TOTAL					1100
SAY					1150



09/08/99

**PROJECT: WBS 17BP.10.R.17**

**CONTRACT:**

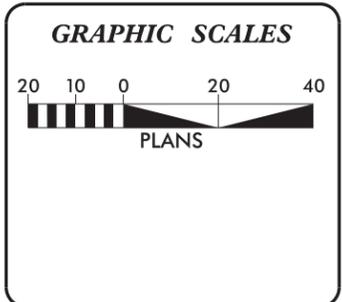
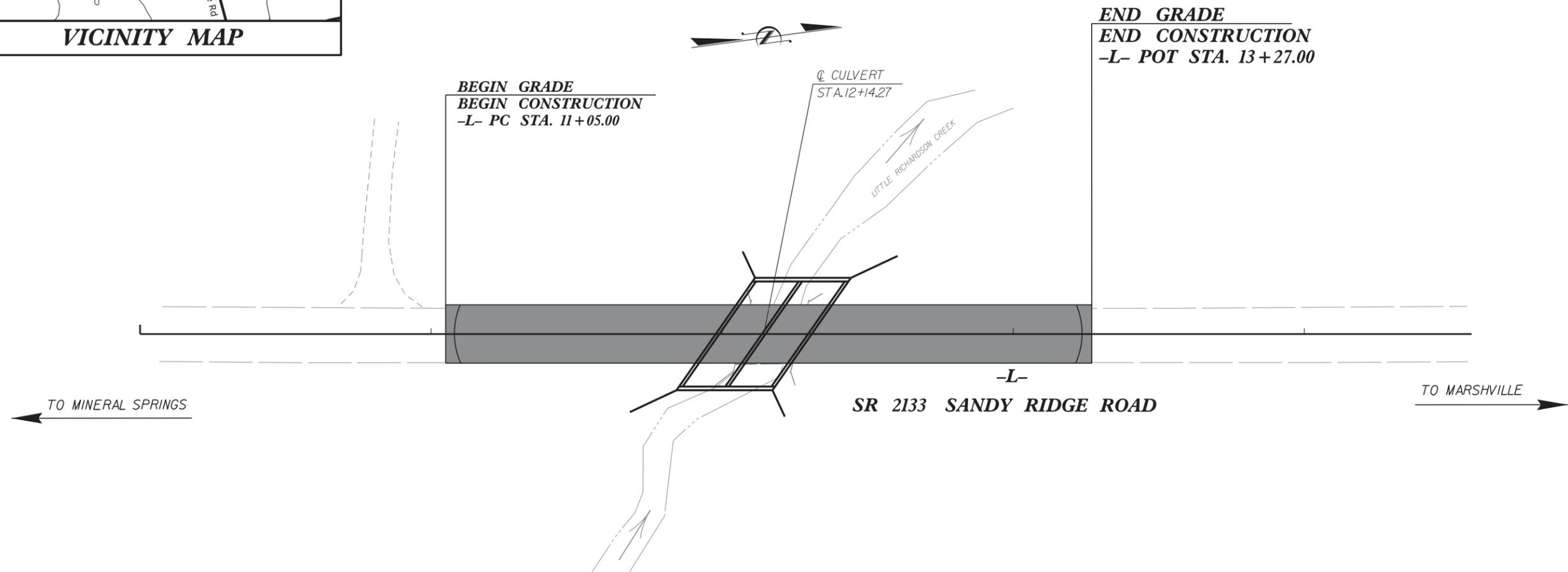
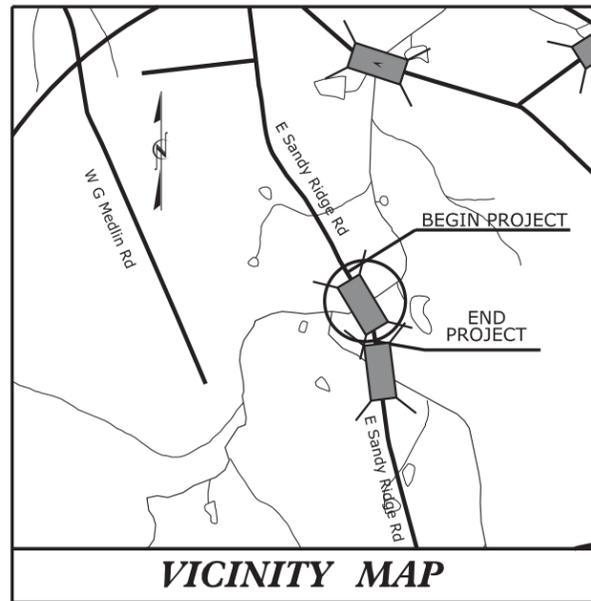
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

T.I.P.NO.	SHEET NO.
17BP.10.R.17	UO-1

# UTILITIES BY OTHERS PLANS UNION COUNTY

**LOCATION: BRIDGE NO. 356 ON SR 2133 (SANDY RIDGE ROAD)  
OVER LITTLE RICHARDSON CREEK**

**TYPE OF WORK: AERIAL POWER AND TELEPHONE**



**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEET

**UTILITY OWNERS ON PROJECT**

(1) POWER - DUKE ENERGY  
(1) TELEPHONE - FRONTIER



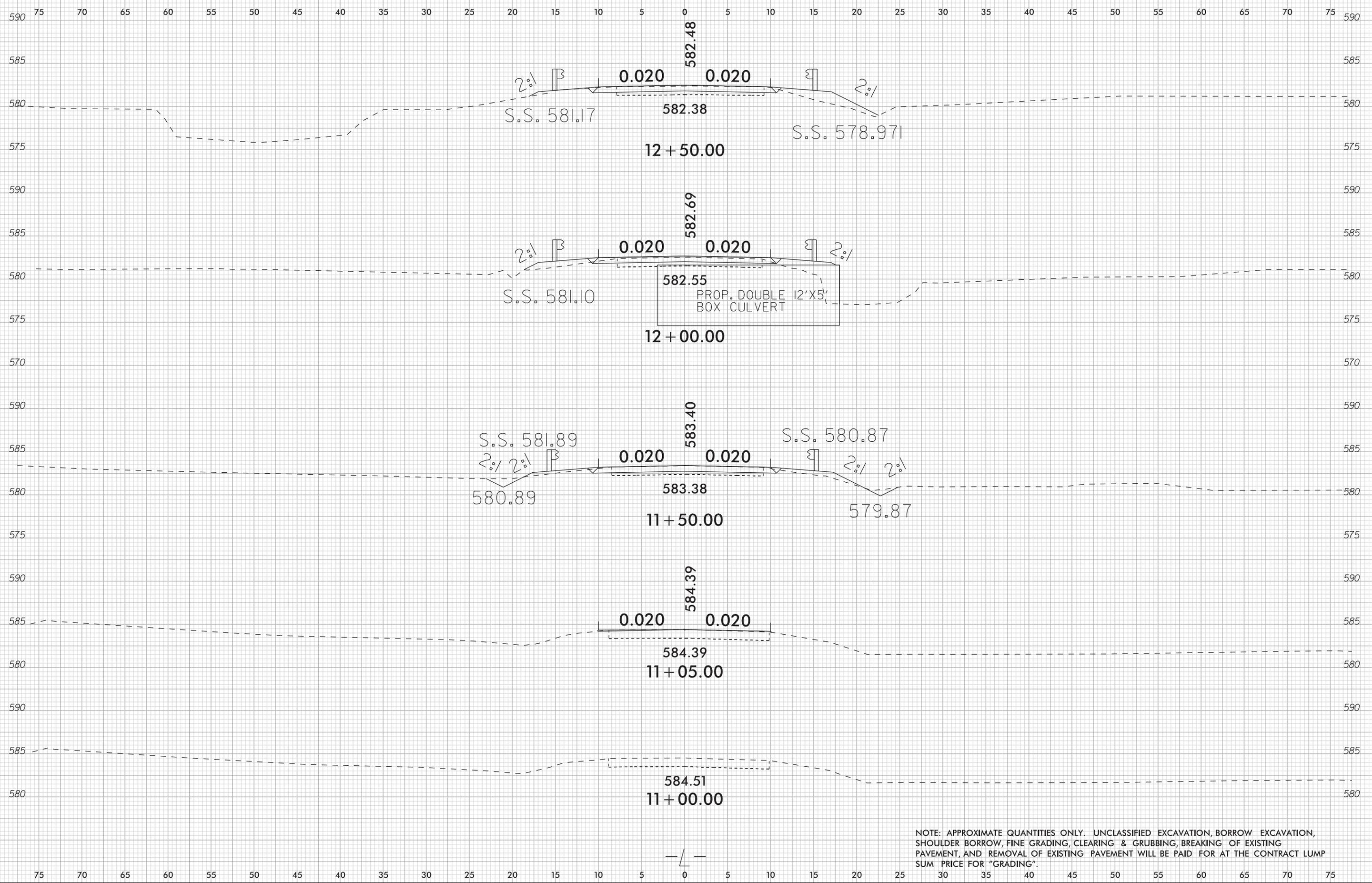
PREPARED FOR THE OFFICE OF:  
**DIVISION OF HIGHWAYS  
UTILITIES ENGINEERING  
SECTION**

1591 MAIL SERVICES CENTER  
RALEIGH NC 27699-1591  
PHONE (919) 250-4128  
FAX (919) 250-4119

**Roger Worthington, P.E.** UTILITIES SECTION ENGINEER  
**Xxxx Xxxx, P.E.** UTILITIES SQUAD LEADER PROJECT ENGINEER  
**Reece Schuler, PE** UTILITIES PROJECT DESIGNER

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$  
\$\$\$\$\$ DGN \$\$\$\$\$\$  
\$\$\$\$\$ USERNAME \$\$\$\$\$\$





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



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

585 585

580 580  
583.42  
13 + 50.00

575 575

590 590

585 585  
0.020 583.10 0.020  
583.10  
13 + 27.00

575 575

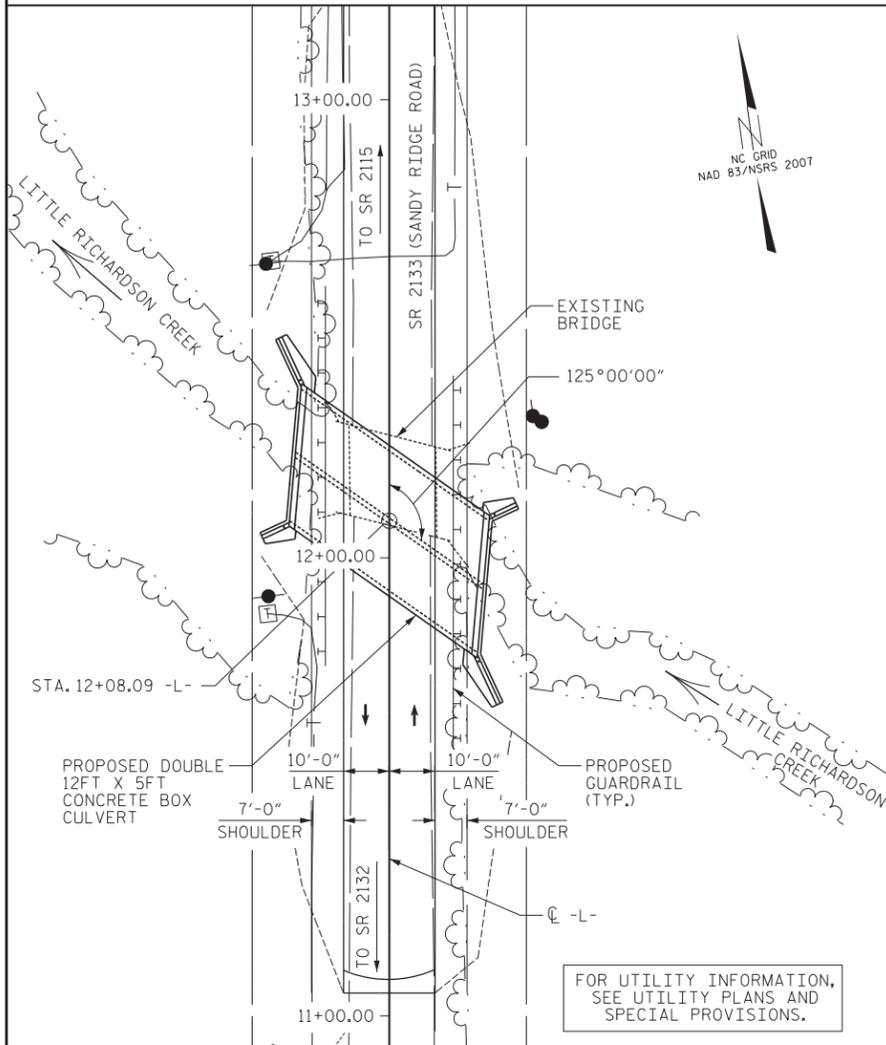
590 590

585 585  
2:1 3:1  
S.S. 581.45 582.75 581.68  
13 + 00.00

575 575

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

BM: BL-2 MONUMENT AT STA. 12+47.04, 12.98' RT. EL. 581.92



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE = 650 CFS  
 FREQUENCY OF DESIGN FLOOD = 10 YRS.  
 DESIGN HIGH WATER ELEVATION = 582.5  
 DRAINAGE AREA = 2.1 SQ. MI.  
 BASIC DISCHARGE (Q100) = 1,166 CFS  
 BASIC HIGH WATER ELEVATION = 583.46

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 650 CFS  
 FREQUENCY OF OVERTOPPING FLOOD = 10 YRS.  
 OVERTOPPING FLOOD ELEVATION = 582.5

GRADE DATA

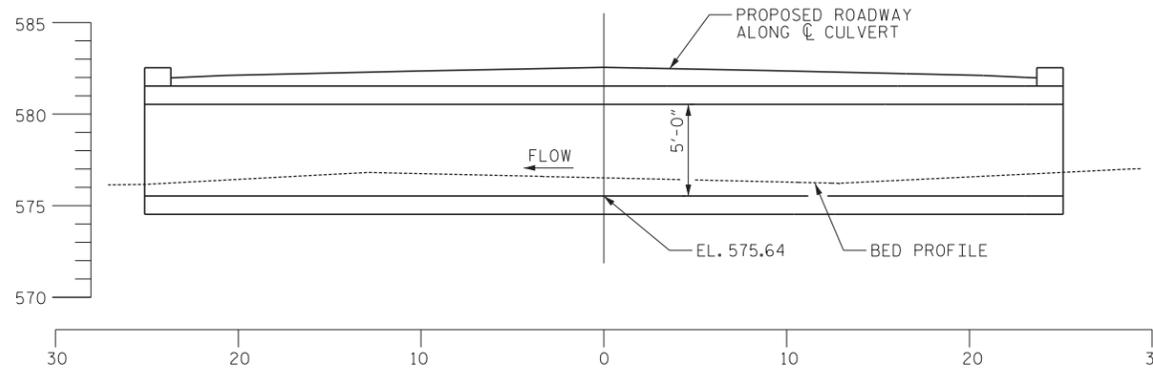
GRADE POINT ELEVATION @ STA. 12+08.09 -L- = 582.56  
 BED ELEVATION @ STA. 12+08.09 -L- = 575.64  
 ROADWAY SLOPES = 2:1 MAX

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CLASS A CONCRETE	
BARREL @ 2.57 CY/FT	128.9 C.Y.
WING ETC.	19.5 C.Y.
TOTAL	148.4 C.Y.
REINFORCING STEEL	
BARREL	28,400 LBS.
WINGS ETC.	807 LBS.
TOTAL	29,207 LBS.
FOUNDATION CONDITIONING MATERIAL	96 TONS
CULVERT EXCAVATION	LUMP SUM

NOTES:

ASSUMED LIVE LOAD -----HS20-44 OR ALTERNATE LOADING.  
 MAX. DESIGN FILL----- 5'  
 MIN. DESIGN FILL----- 6"  
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.  
 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.  
 CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:  
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.  
 THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.  
 THIS BARREL STANDARD TO BE USED ONLY ON CULVERT ON 120° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.  
 DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.



PROFILE ALONG CULVERT

STEEL IN THE BOTTOM SLAB MAY BE SPICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPlice THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPlice LENGTH SHALL BE AS PROVIDED IN THE SPlice LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF A 20'-6" LONG SINGLE SPAN; A 19'-2" CLEAR ROADWAY WIDTH WITH A STEEL I-BEAM SUPPORTED TIMBER DECK ON ABUTMENTS WITH TIMBER CAPS, POSTS, SILLS AND BULKHEADS AT THE PROPOSED STRUCTURE SITE, SHALL BE REMOVED.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATION.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR 'REMOVAL OF EXISTING STRUCTURE AT STATION 12+08.09 -L-'.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

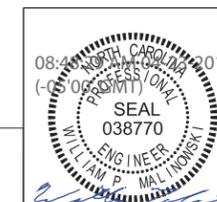
EXCAVATE 1 FOOT BELOW CULVERT AND FOOTINGS AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 RIP RAP CLASS II IS INCLUDED IN THE QUANTITY SHOWN ON THE DRAINAGE PLANS.

PROJECT NO. 17BP.10.R.17  
 UNION COUNTY  
 STATION: 12+08.09 -L-

SHEET 1 OF 4 REPLACES BR. NO. 356

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

DOUBLE 12 FT. X 5 FT.  
 CONCRETE BOX CULVERT  
 120° SKEW



PREPARED IN THE OFFICE OF:  
 AMEC Environment & Infrastructure, Inc.  
 4021 Stirrup Creek Drive, Suite 100  
 Durham, North Carolina, 27703  
 NC Eng. License #: F-1253  
 Tel. (919) 381-9900  
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 FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

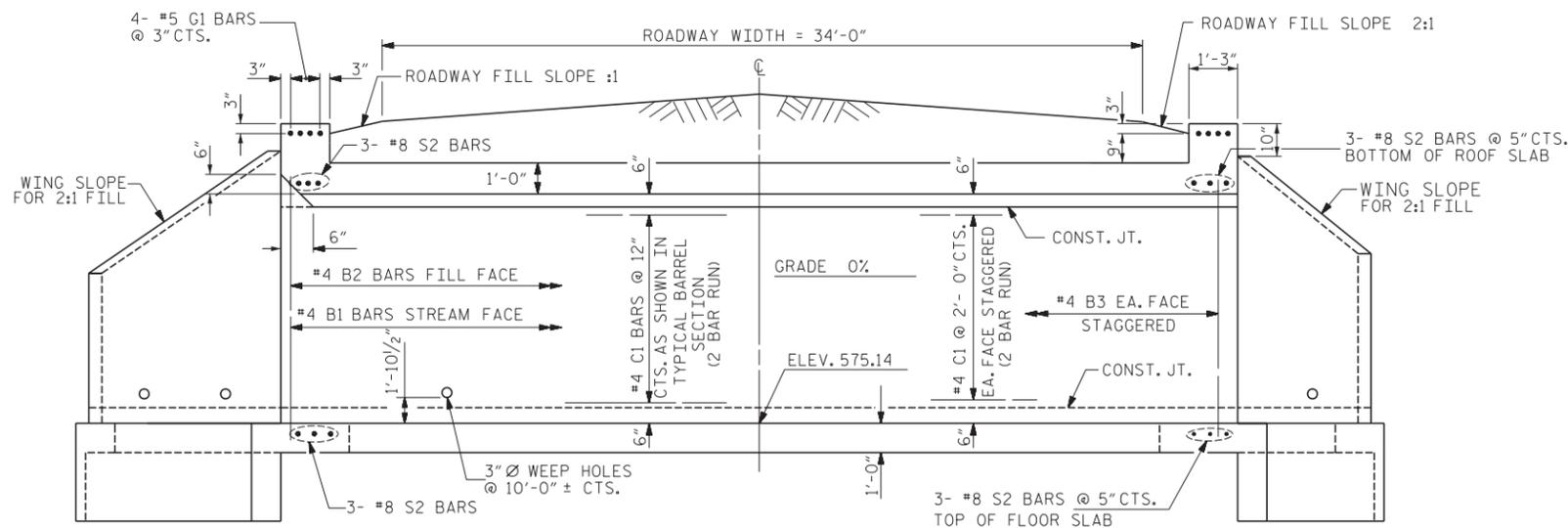
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS 4
2			4			

DRAWN BY : JY DATE : 10/12/12  
 CHECKED BY : WPM DATE : 11/07/12

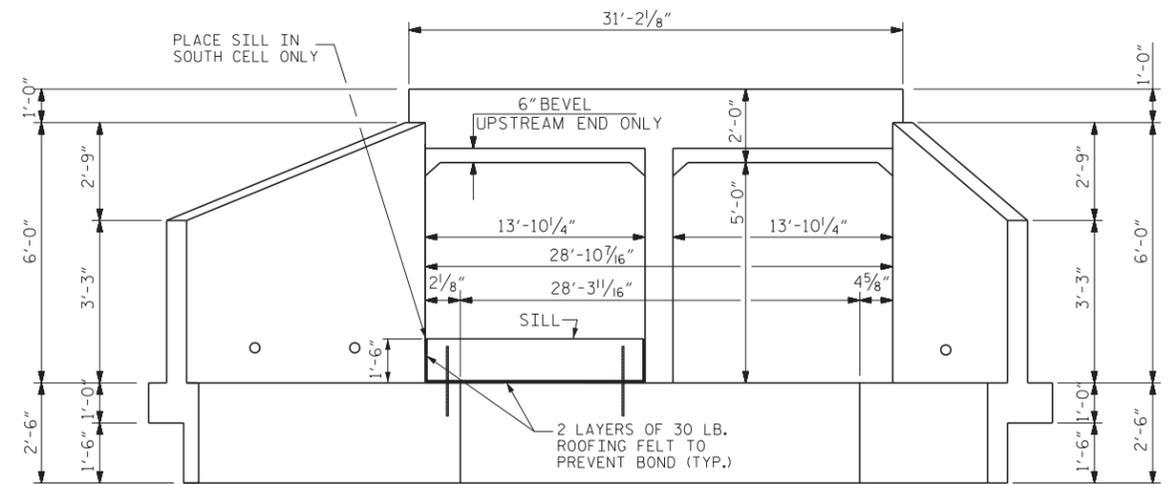
RIGHT ANGLE SECTION OF BARREL

THERE ARE 83 "C" BARS IN SECTION OF BARREL.  
 (LOOKING DOWNSTREAM)

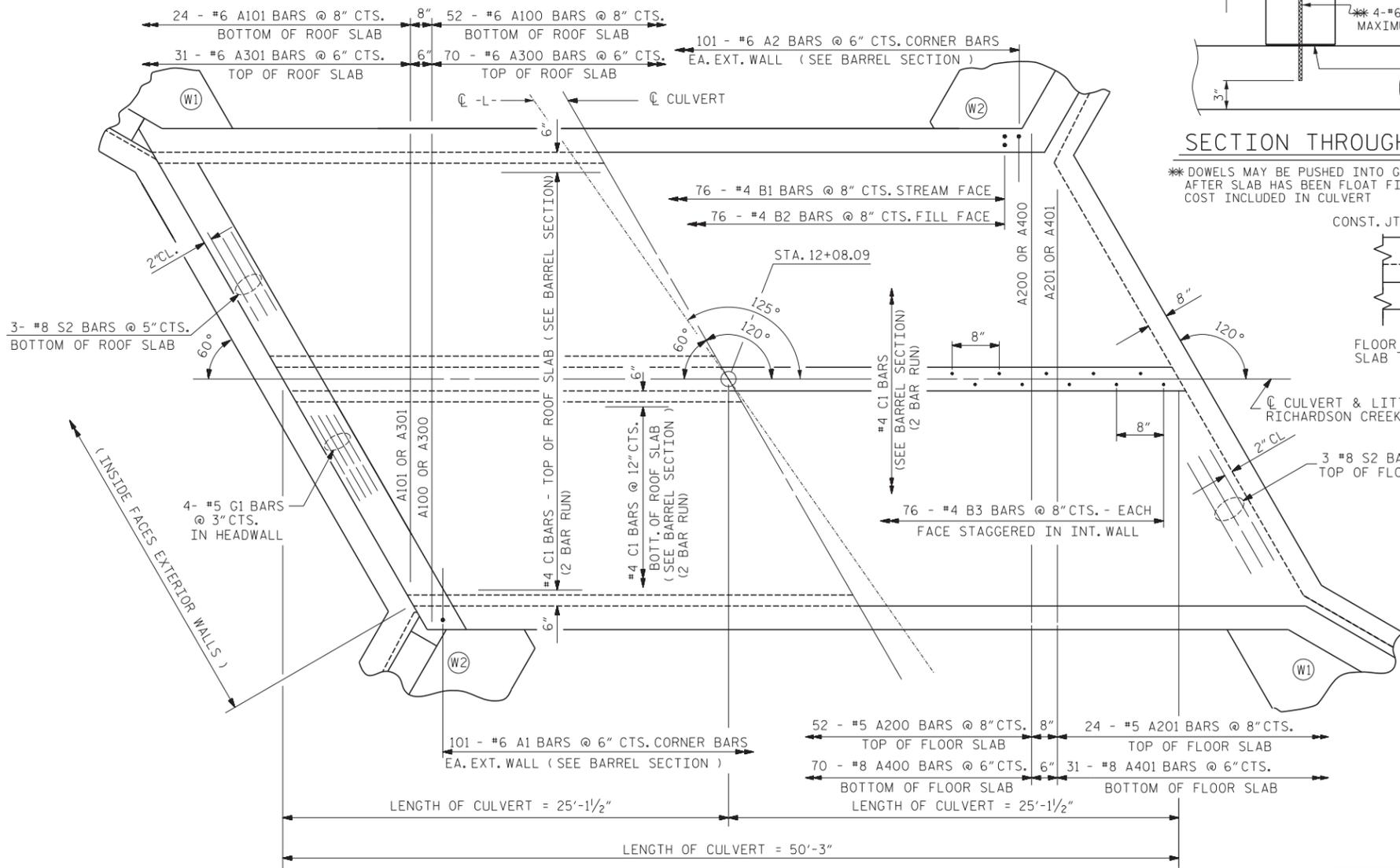
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EXTERIOR WALL INTERIOR WALL  
CULVERT SECTION NORMAL TO ROADWAY

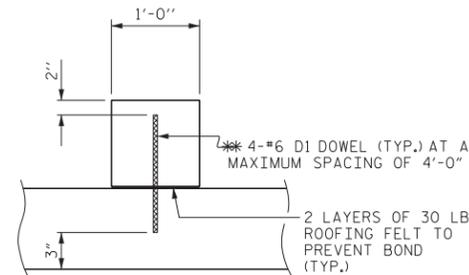


END ELEVATION NORMAL TO SKEW  
(LOOKING DOWNSTREAM)

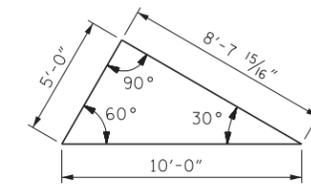


PART PLAN - ROOF SLAB

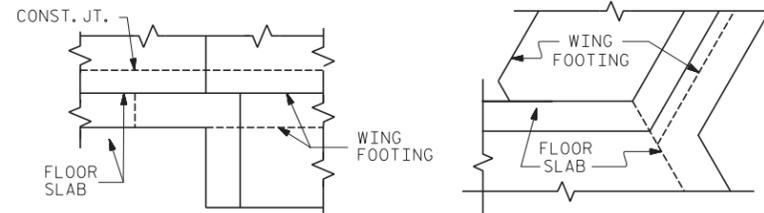
PART PLAN - FLOOR SLAB



SECTION THROUGH SILL  
\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED. COST INCLUDED IN CULVERT

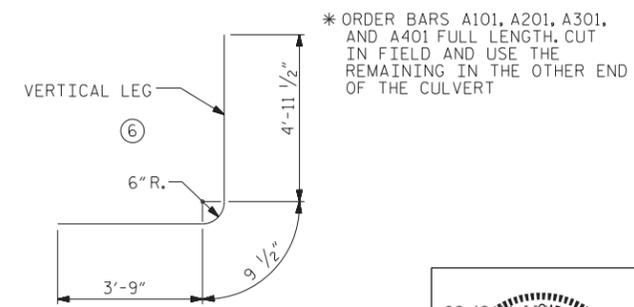


SKEW TRIANGLE



DETAIL

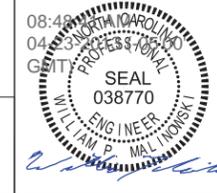
CONNECTION OF WING FOOTING AND FLOOR SLAB



BAR TYPE

BAR DIMENSIONS ARE TO OUT  
PREPARED IN THE OFFICE OF:

AMEC Environment & Infrastructure, Inc.  
4021 Stirrup Creek Drive, Suite 100  
Durham, North Carolina, 27703  
NC Eng. License #: F-1253  
**amec**  
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	202	#6	6	9'-6"	2882
A2	202	#6	6	9'-6"	2882
B1	152	#4	STR	6'-7"	668
B2	152	#4	STR	6'-7"	668
B3	152	#4	STR	6'-7"	668
C1	166	#4	STR	26'-2"	2902
A100	52	#6	STR	26'-8"	2083
A101	24	#6	STR	26'-8"	961
A200	52	#5	STR	26'-8"	1446
A201	24	#5	STR	26'-8"	668
A300	70	#6	STR	26'-8"	2804
A301	31	#6	STR	26'-8"	1242
A400	70	#8	STR	26'-8"	4984
A401	31	#8	STR	26'-8"	2207
G1	8	#5	STR	30'-9"	257
S2	12	#8	STR	30'-9"	985
D1	4	#6	STR	2'-1"	13
REINFORCING STEEL					28,400 LBS
CLASS A CONCRETE					
BARREL					128.9 CY
SILL					0.8 CY

PROJECT NO. 17BP.10.R.17

UNION COUNTY

STATION: 12+08.09 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

DOUBLE 12 FT. X 5 FT.  
CONCRETE BOX CULVERT

120° SKEW

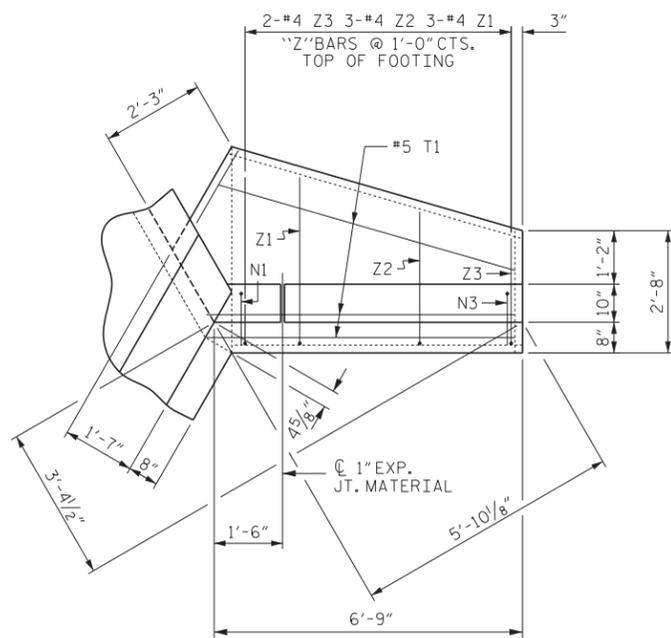
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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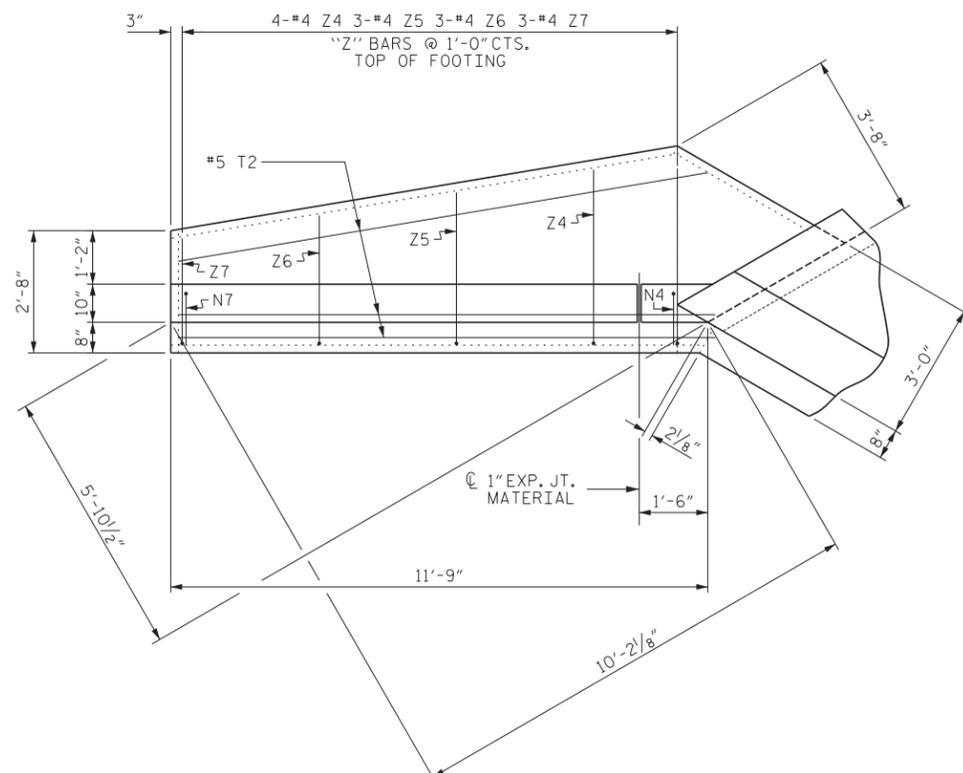
SHEET NO.  
C-2  
TOTAL SHEETS  
4

DRAWN BY : JY DATE : 10/12/12  
CHECKED BY : WPM DATE : 11/07/12

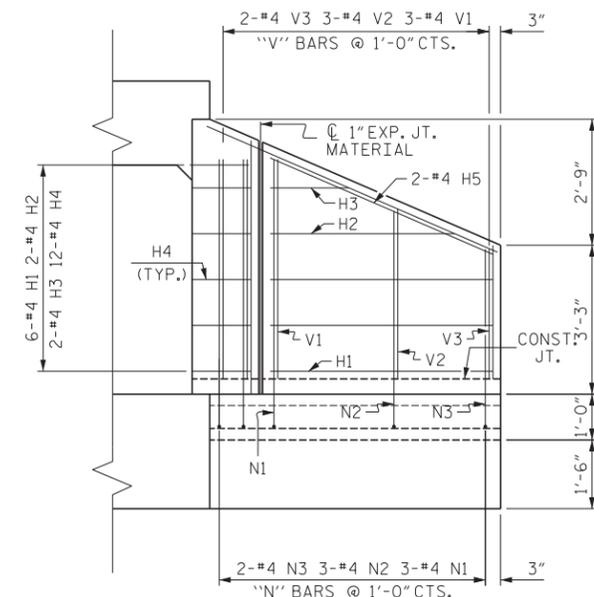
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\*\*\*\*\*USER\*\*\*\*\*



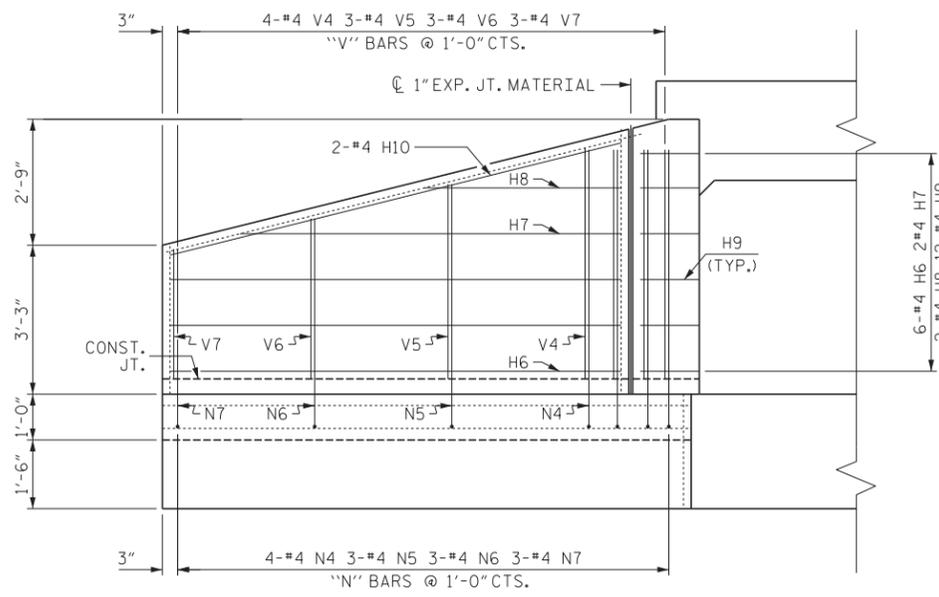
PLAN W2



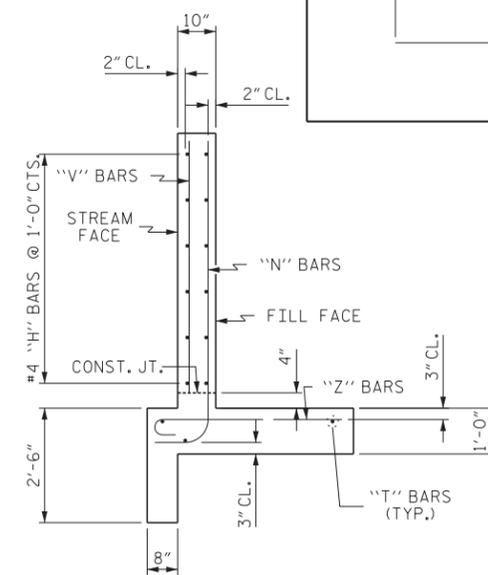
PLAN W1



ELEVATION W2



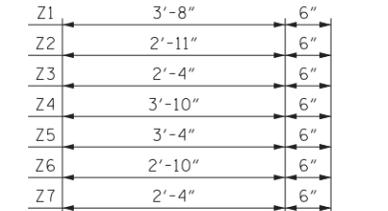
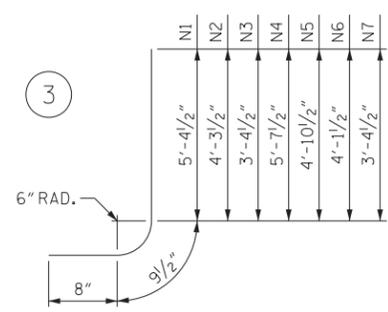
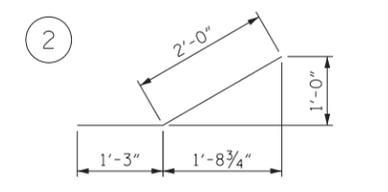
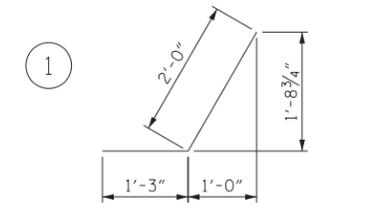
ELEVATION W1



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



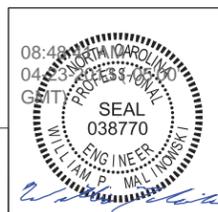
BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	4'-10"	39
H2	4	#4	STR	4'-0"	11
H3	4	#4	STR	1'-9"	5
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	5'-3"	14
H6	12	#4	STR	9'-10"	79
H7	4	#4	STR	8'-4"	22
H8	4	#4	STR	4'-3"	11
H9	24	#4	2	3'-3"	52
H10	4	#4	STR	10'-2"	27
N1	6	#4	3	6'-10"	27
N2	6	#4	3	5'-9"	23
N3	4	#4	3	4'-10"	13
N4	8	#4	3	7'-1"	38
N5	6	#4	3	6'-4"	25
N6	6	#4	3	5'-7"	22
N7	6	#4	3	4'-10"	19
T1	6	#5	STR	6'-9"	42
T2	6	#5	STR	11'-9"	74
V1	6	#4	STR	4'-9"	19
V2	6	#4	STR	3'-8"	15
V3	4	#4	STR	2'-10"	8
V4	8	#4	STR	5'-0"	27
V5	6	#4	STR	4'-3"	17
V6	6	#4	STR	3'-6"	14
V7	6	#4	STR	2'-10"	11
Z1	6	#4	4	4'-2"	17
Z2	6	#4	4	3'-4"	13
Z3	4	#4	4	2'-10"	8
Z4	8	#4	4	4'-4"	23
Z5	6	#4	4	4'-0"	16
Z6	6	#4	4	3'-4"	13
Z7	6	#4	4	2'-10"	11

REINFORCING STEEL FOR 4 WINGS 807 LBS  
 CLASS A CONCRETE  
 4 WINGS 12.2 CY  
 2 HEADWALLS 2.9 CY  
 2 END CURTAIN WALLS 3.6 CY  
 TOTAL 18.7 CY

DRAWN BY : JY DATE : 10/12/12  
 CHECKED BY : WPM DATE : 11/07/12

PREPARED IN THE OFFICE OF:  
 AMEC Environment & Infrastructure, Inc.  
 4021 Stirrup Creek Drive, Suite 100  
 Durham, North Carolina 27703  
 NC Eng. License #: F-1253  
**amec**  
 FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



PROJECT NO. 17BP.10.R.17  
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 STATION: 12+08.09 -L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

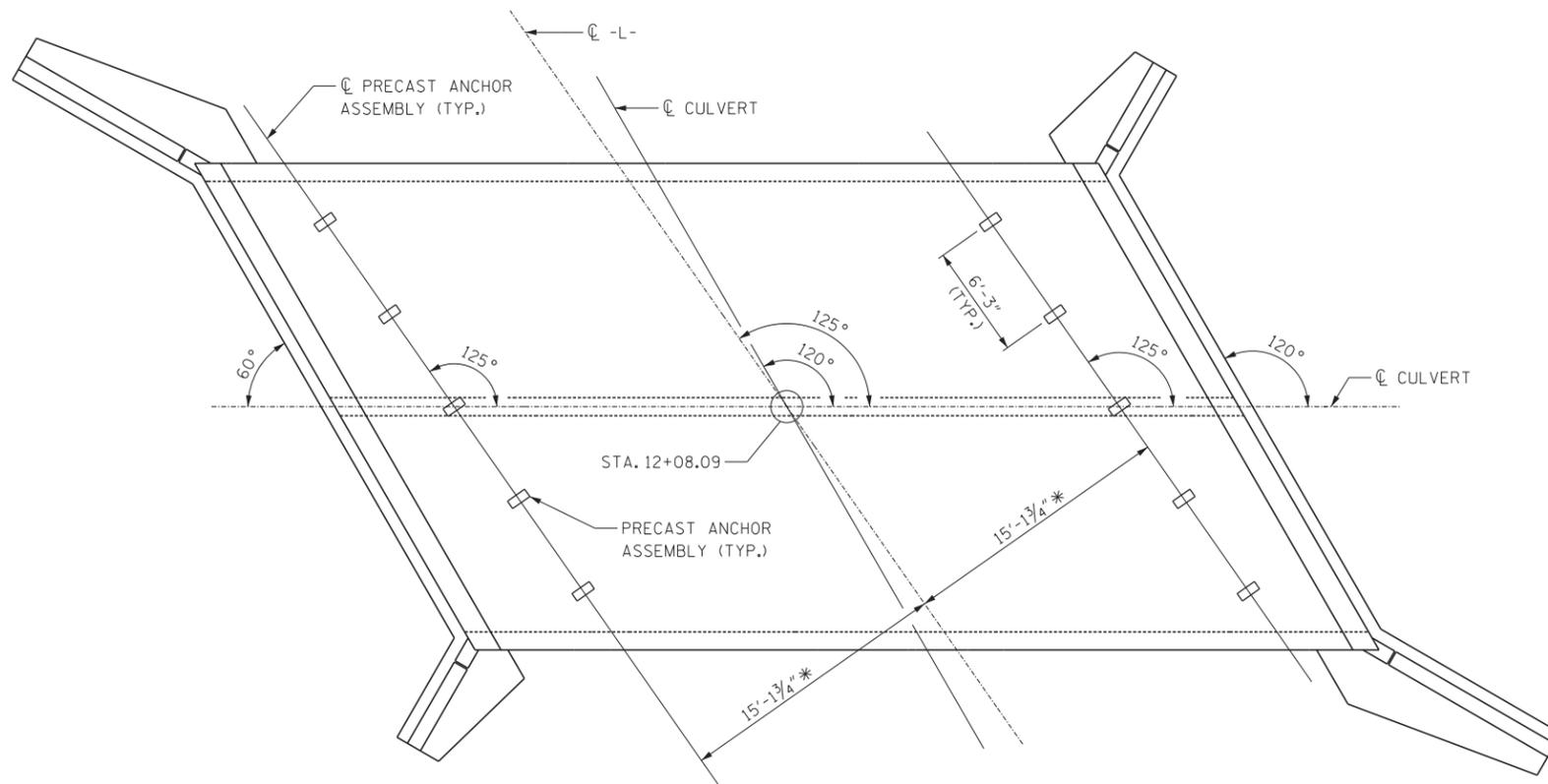
STANDARD WINGS FOR CONCRETE BOX CULVERT  
 H = 5 FT.  
 120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			4

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 \*\*\*\*\*DCN\*\*\*\*\*  
 \*\*\*\*\*USERNAME\*\*\*\*\*

NOTES

\* THIS DIMENSION TO BE VERIFIED BY THE ENGINEER IN THE FIELD



PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

- THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
  - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

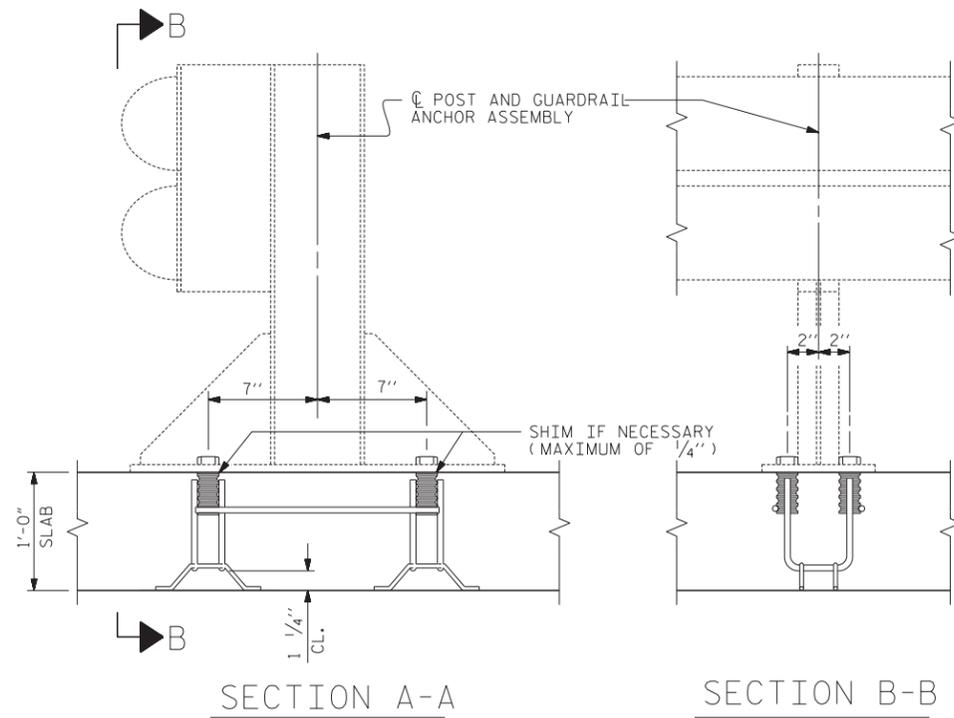
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

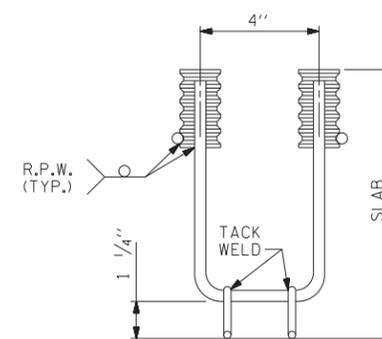
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



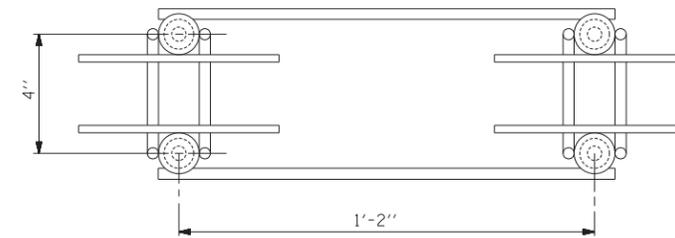
SECTION A-A

SECTION B-B

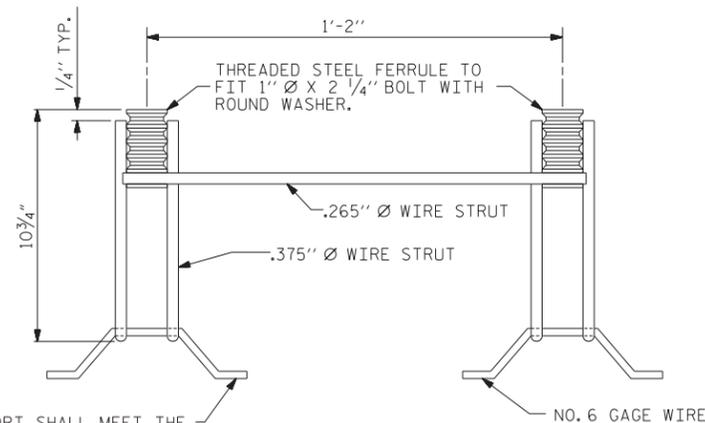


ELEVATION

THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.



PLAN



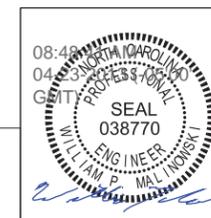
PROJECT NO. 17BP.10.R.17  
 UNION COUNTY  
 STATION: 12+08.09 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

ANCHORAGE DETAILS FOR  
 GUARDRAIL ANCHOR ASSEMBLY  
 FOR CULVERTS

120° SKEW



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1			3			TOTAL SHEETS
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