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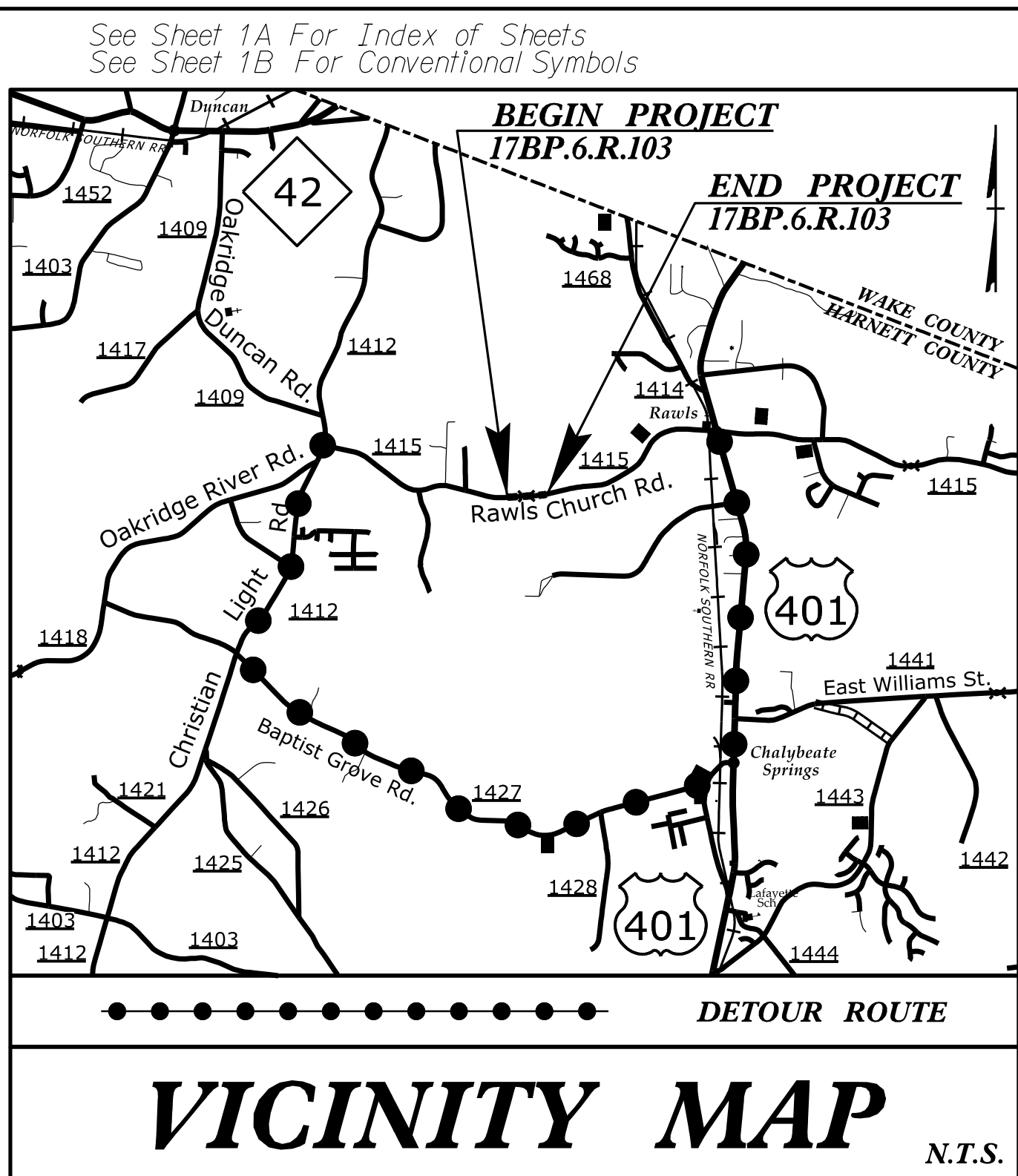
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09/08/19

**PROJECT: 17BP.6.R.103**

**CONTRACT: DF00246**



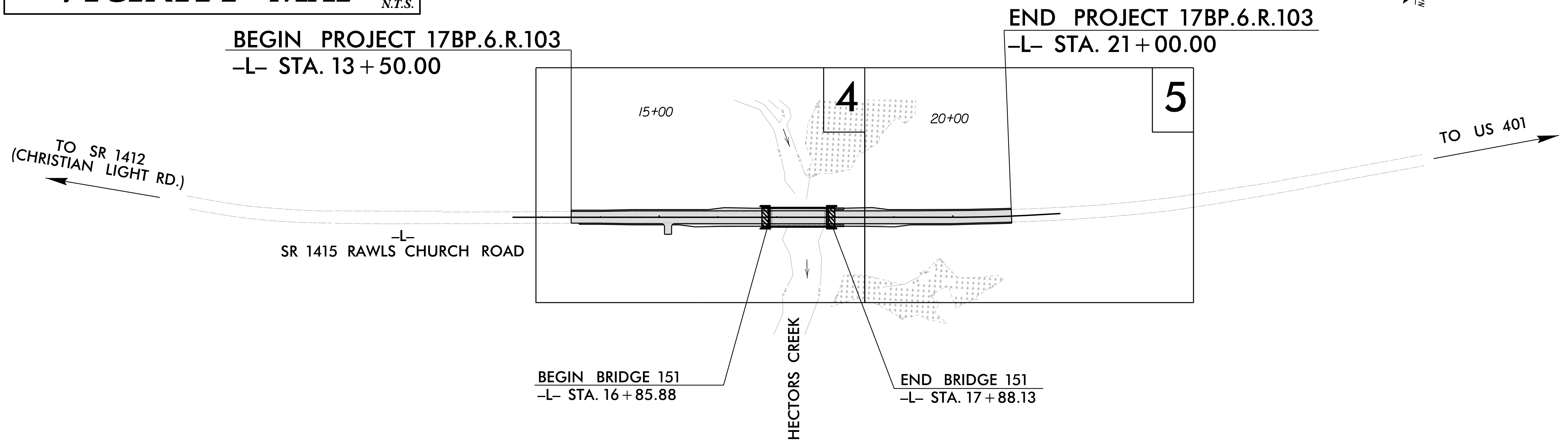
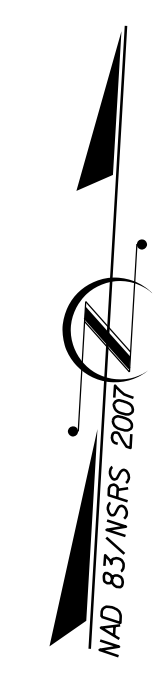
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**HARNETT COUNTY**

**LOCATION: BRIDGE NO. 151 ON SR 1415 (RAWLS CHURCH RD) OVER HECTORS CREEK**

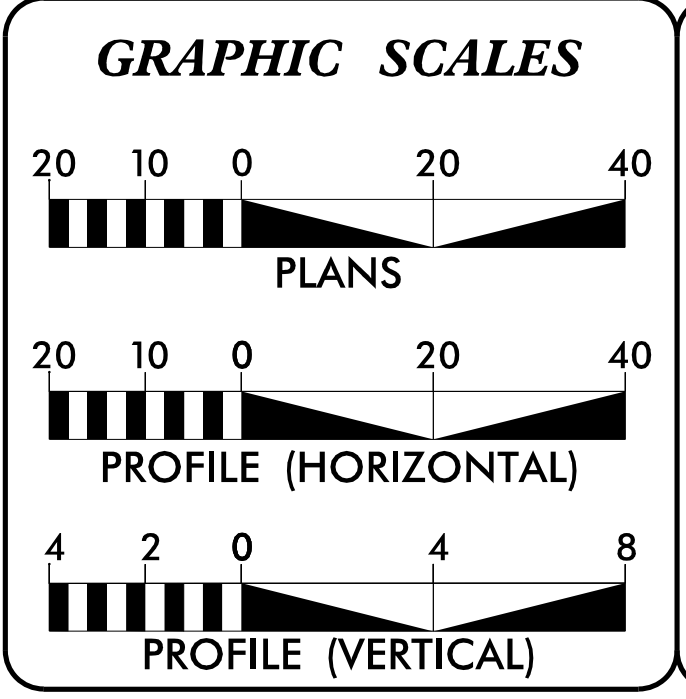
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.103	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.6.R.103		P.E., UTIL., RW	
17BP.6.R.103		CONST.	

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



DESIGN EXCEPTION REQUIRED FOR MAXIMUM GRADE AND SAG VERTICAL CURVE K VALUE.



**DESIGN DATA**

ADT 2020	1,100
ADT 2040	1,500
DHV =	12%
D =	65%
T =	13%
V =	55 MPH
TTST = 2%	DUALS = 11%
FUNC CLASS =	RURAL LOCAL
SUBREGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT 17BP.6.R.103	= 0.123 MILES
LENGTH STRUCTURE PROJECT 17BP.6.R.103	= 0.019 MILES
LENGTH TOTAL PROJECT 17BP.6.R.103	= 0.142 MILES

**NCDOT CONTACT:** CHRISTY W. HUFF, PE  
DIVISION 6 - DIVISION BRIDGE PROGRAM MANAGER  
PH: 910-364-0600

Prepared In the Office of:  
**RAMEY KEMP ASSOCIATES, INC.**  
Transportation Engineers  
5808 Faringdon Place, Suite 100 - Raleigh, North Carolina 27609  
Phone: 919-872-5115 - www.rameykemp.com  
NC License No. C-0910

2018 STANDARD SPECIFICATIONS

SEPTEMBER 27, 2018  
**RIGHT OF WAY DATE:**  
FEBRUARY 3, 2021  
**LETTING DATE:**

**CLAUDETTE M.K. ROQUE, PE**  
PROJECT ENGINEER

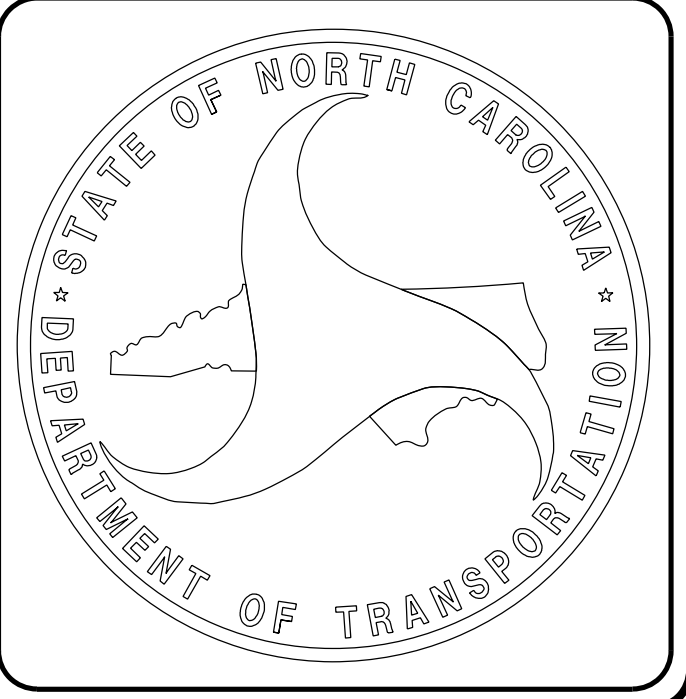
**HERB RIDGEWAY IV**  
PROJECT DESIGNER

**HYDRAULICS ENGINEER**

DocuSigned by:  
**Brandon T. Balthan** 1/7/2021

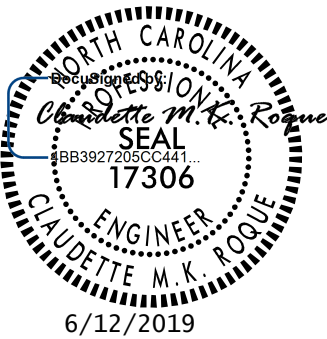

**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
**Claudette M.K. Roque** 1/7/2021



# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## **INDEX OF SHEETS, GENERAL NOTES AND 2018 ROADWAY ENGLISH STANDARD DRAWINGS**

PROJECT REFERENCE NO. <b>17BP.6.R.103</b>	SHEET NO. <b>1A</b>
RW SHEET NO.	
	
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 <b>RAMEY KEMP &amp; ASSOCIATES, INC.</b> Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 Phone: 919-872-5115 www.rameykemp.com NC License No. C-0910	

GENERAL NOTES: 2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

**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 MODIFIED.

**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.

**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 CENTURYLINK, TIME WARNER CABLE/CHARTER, AND HARNETT COUNTY PUBLIC UTILITIES DEPARTMENT

**RIGHT-OF-WAY MARKERS:**

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

**INDEX OF SHEETS**

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	TYPE III ANCHOR UNIT DETAIL
2C-2	W-BEAM RAIL SECTION DETAIL
2C-3	METHOD OF CLEARING - METHOD II MODIFIED DETAIL
3B-1	EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARY, AND PARCEL INDEX
3D-1	DRAINAGE SUMMARY
4 THRU 5	PLAN SHEETS
6	PROFILE SHEET
RW02C-1	SURVEY CONTROL SHEET - EXISTING
RW02D-1	SURVEY CONTROL SHEET - PROPOSED
RW02E-1	R/W CONTROL SHEET
TMP-1 THRU TMP-3	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING AND SIGNING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-6	CROSS-SECTIONS
S-1 THRU S-15	STRUCTURE PLANS
SN	STRUCTURE STANDARD NOTES

EFF. 01-16-2018  
REV.

**2018 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, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 – EARTHWORK</b>	
200.02	Method of Clearing – Method II Modified (Use Detail in Lieu of Standard)
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
<b>DIVISION 3 – PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
<b>DIVISION 4 – MAJOR STRUCTURES</b>	
422.02	Bridge Approach Fills – Type II Modified Approach Fill
<b>DIVISION 5 – SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
<b>DIVISION 6 – ASPHALT BASES AND PAVEMENTS</b>	
654.01	Pavement Repairs
<b>DIVISION 8 – INCIDENTALS</b>	
840.00	Concrete Base Pad for Drainage Structures
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed 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	--- WLB ---
Proposed Wetland Boundary	--- WLB ---
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---
Existing Historic Property Boundary	--- HPB ---
Known Contamination Area: Soil	☠-s-☠
Potential Contamination Area: Soil	☠-s-☠
Known Contamination Area: Water	☠-w-☠
Potential Contamination Area: Water	☠-w-☠
Contaminated Site: Known or Potential	☠?

### 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	-----
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite R/W Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

### 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	☼

*Note: Not to Scale*      \*S.U.E. = *Subsurface Utility Engineering*

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	-----
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	-----
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

### TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

### GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

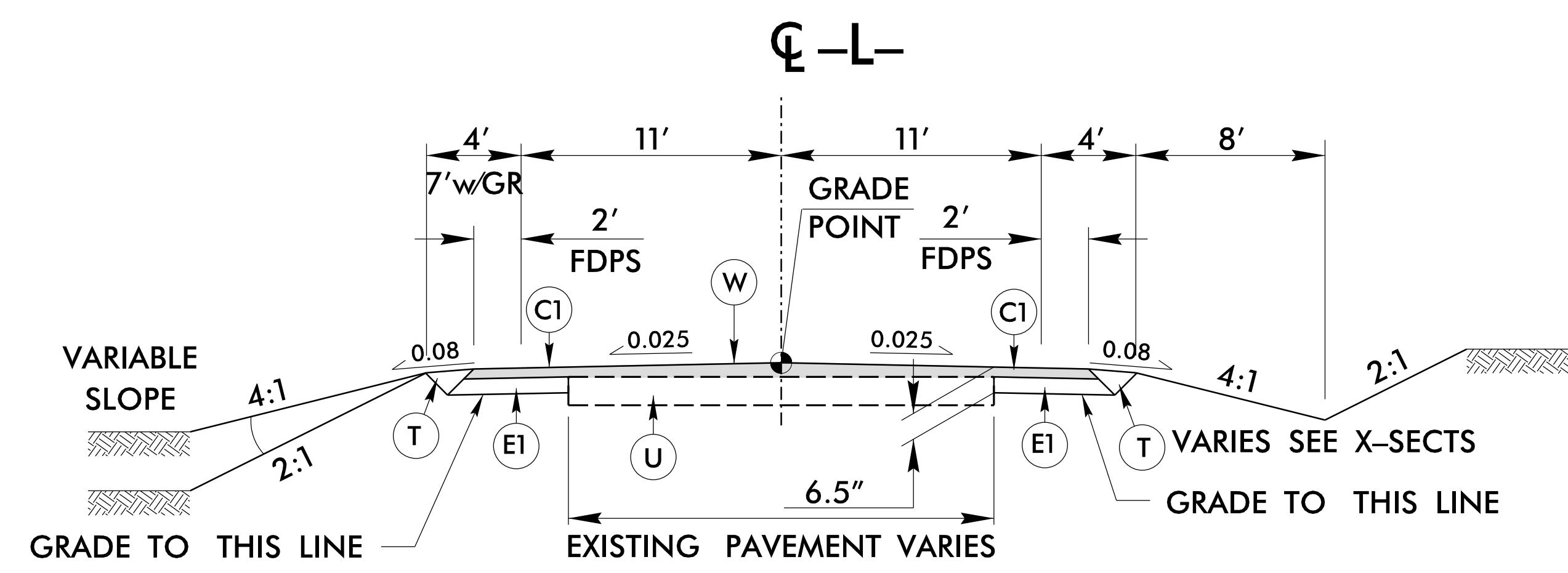
### MISCELLANEOUS:

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

8.17.19

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5 1/2" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	COMPACTED EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING (VARIABLE DEPTH)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

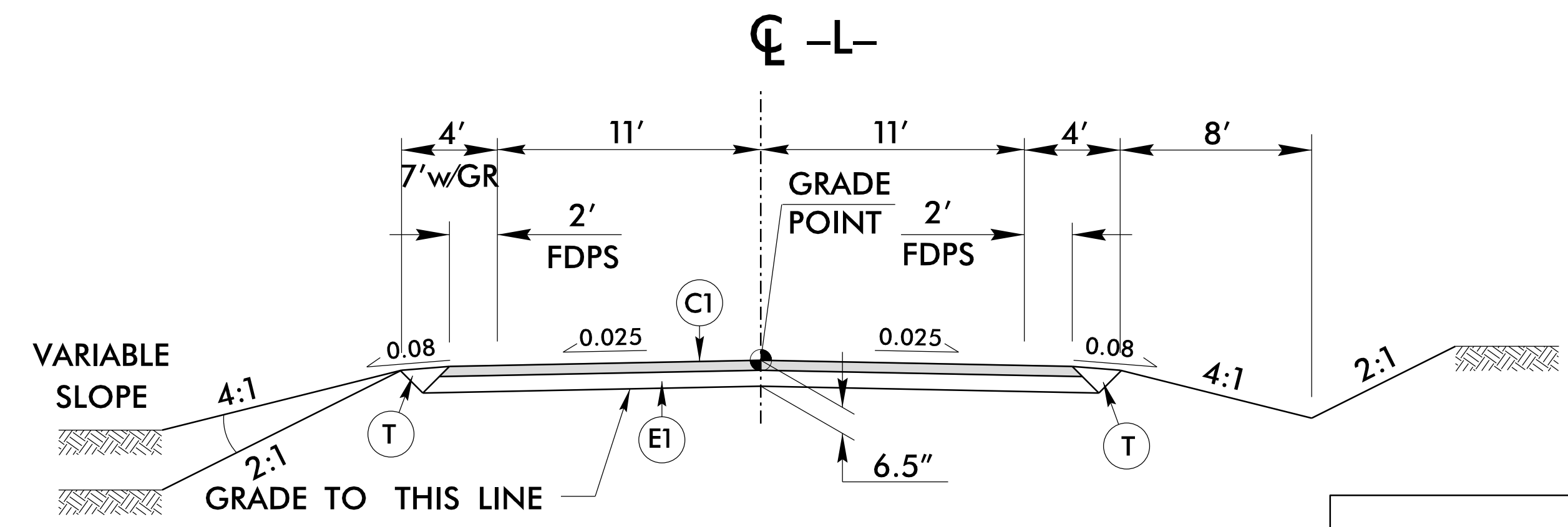
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SPECIFIED.



**TYPICAL SECTION NO. 1**

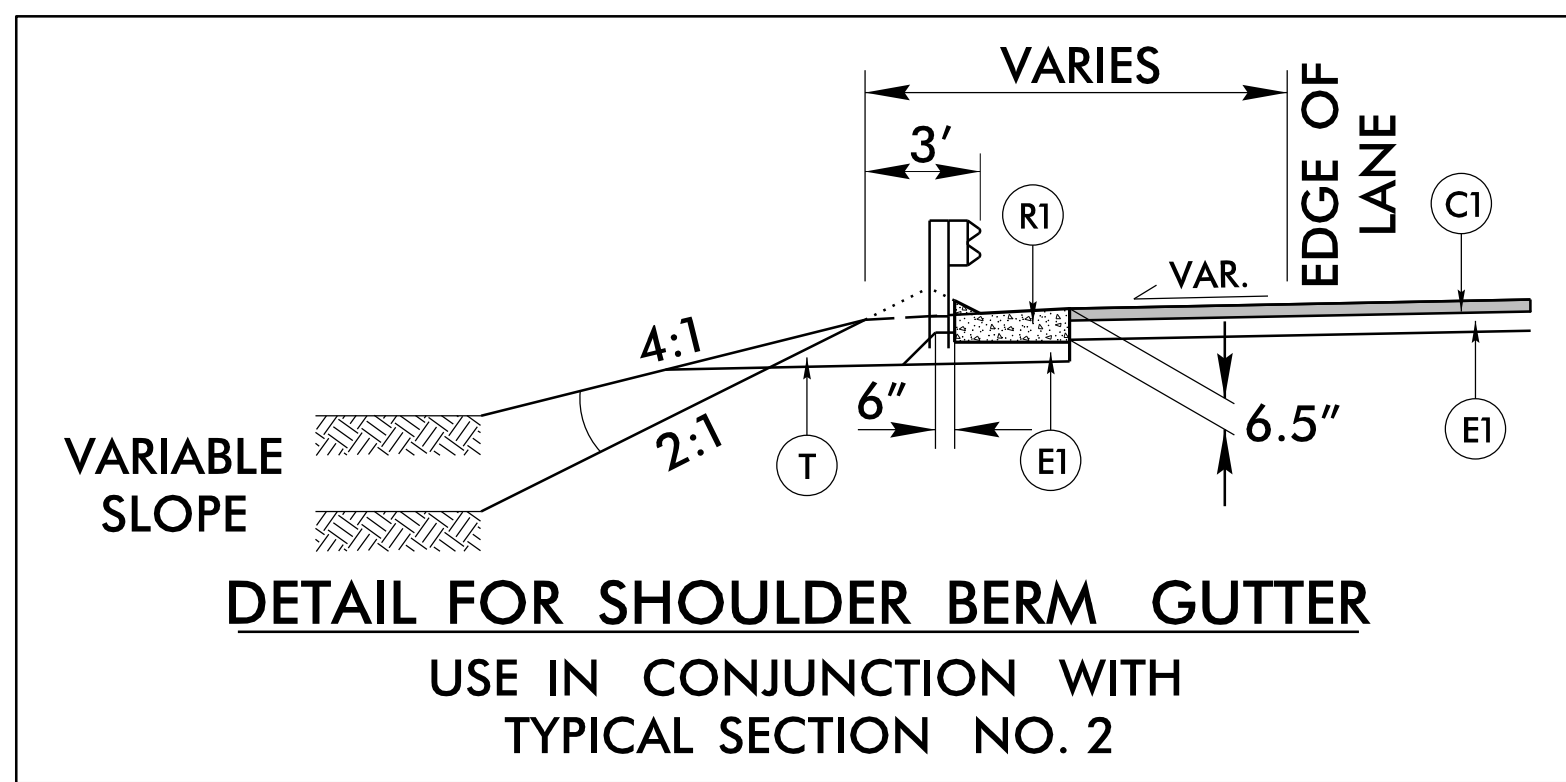
-L- STA. 13+50.00 TO 16+35.88  
 -L- STA. 18+38.13 TO 21+00.00

NOTE: MILL & REPLACE WITH 1.25" OVERLAY ONLY FROM -L- STA. 13+50 TO 14+00 AND -L- STA. 20+50 TO 21+00



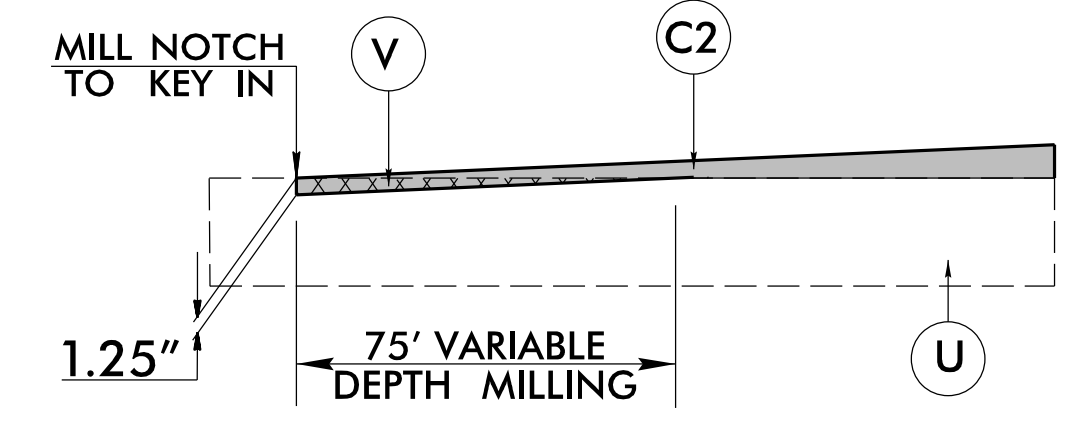
**TYPICAL SECTION NO. 2**

-L- STA. 16+35.88 TO 16+85.88 (BEGIN BRIDGE)  
 -L- STA. 17+88.13 (END BRIDGE) TO 18+38.13



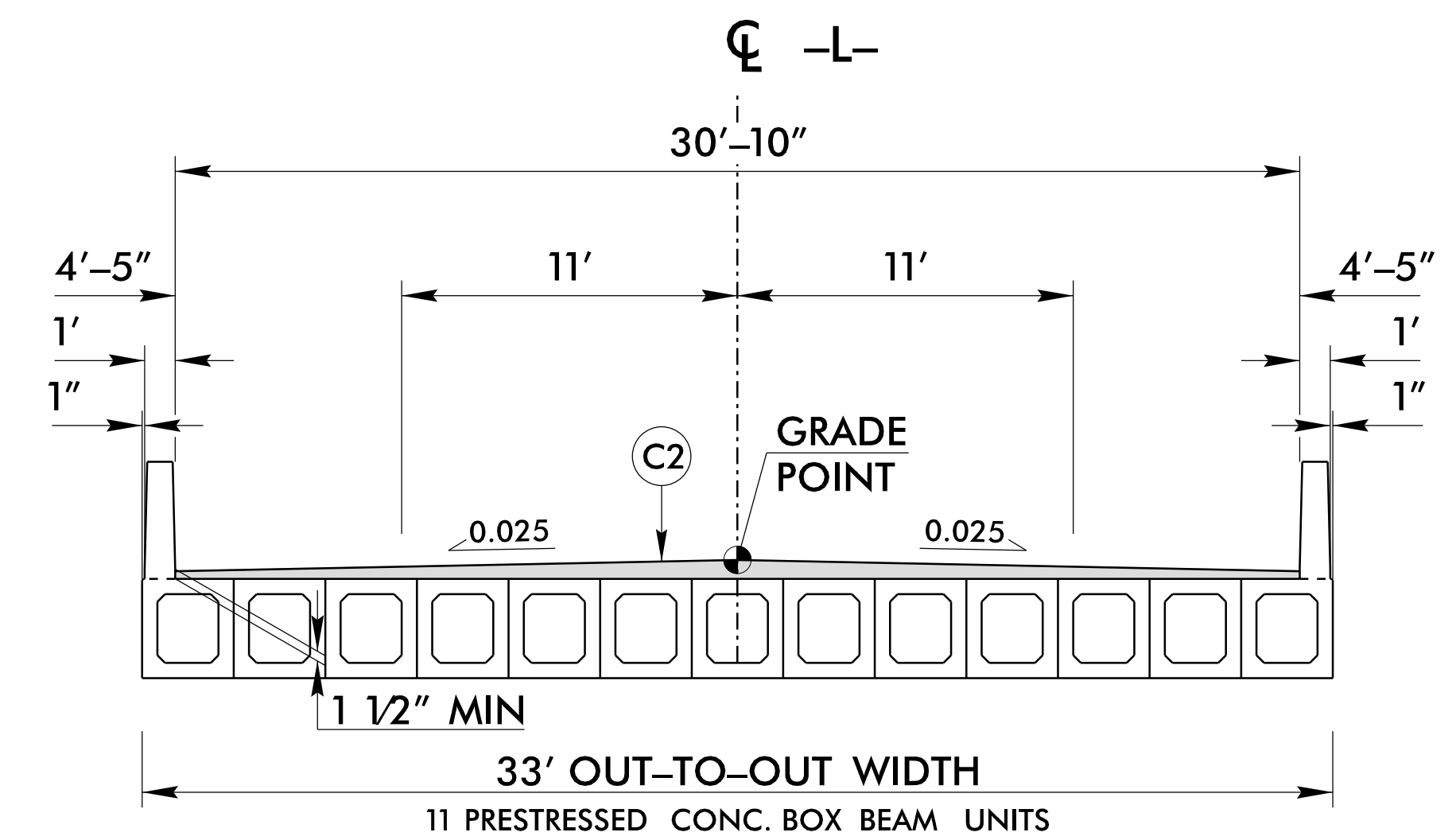
**DETAIL FOR SHOULDER BERM GUTTER**  
 USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

- NOTES:
- FOR SURFACE MIX OVER 1" IN THICKNESS, MILL THE EXISTING PAVEMENT IN ACCORDANCE WITH THE FOLLOWING SKETCH AS DIRECTED BY THE ENGINEER
  - LOCATIONS SHALL INCLUDE TIES INTO EXISTING PAVEMENT.
  - PERFORM THE WORK IN ACCORDANCE WITH SECTION 607 OF THE JANUARY 2018 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. RESURFACING WILL BE ACCOMPLISHED AT THE SAME TIME AS THE MILLING OPERATION.



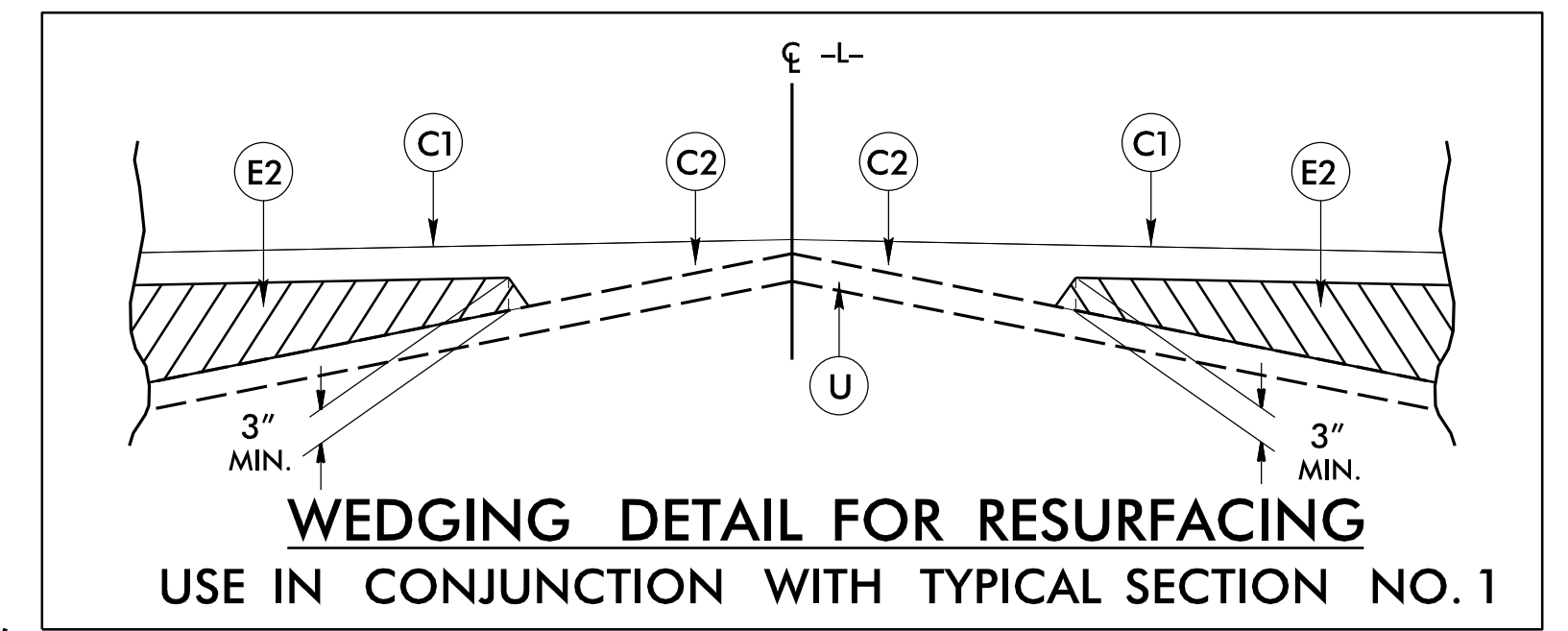
**INCIDENTAL MILLING DETAIL**  
 AS DIRECTED BY THE ENGINEER AT THE FOLLOWING LOCATIONS

-L- STA 14+00.00 TO -L- STA 14+75.00  
 -L- STA 19+75.00 TO -L- STA 20+50.00

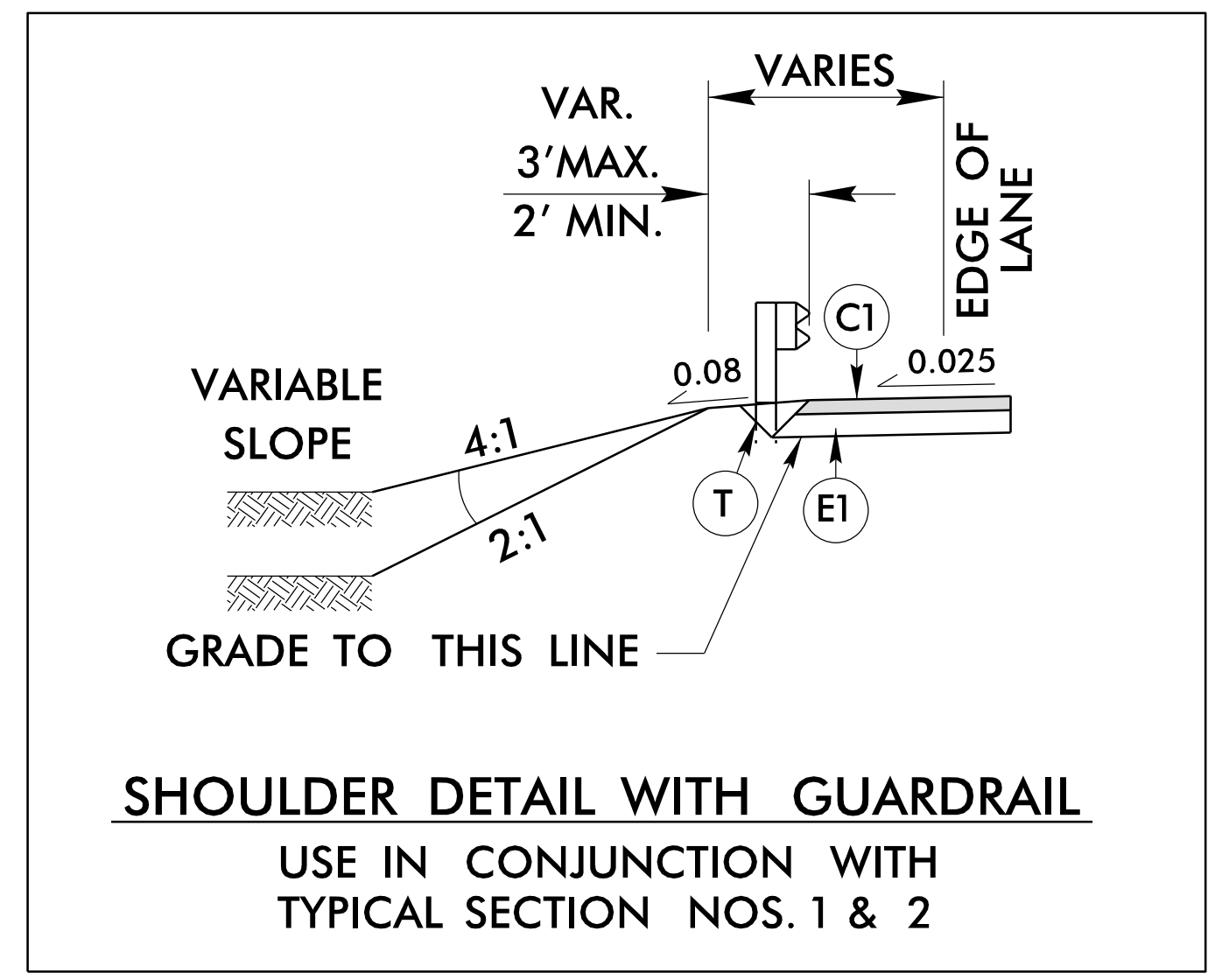


**TYPICAL SECTION NO. 3**

-L- STA. 16+85.88 (BEGIN BRIDGE) TO 17+88.13 (END BRIDGE)  
 NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTH ON STRUCTURE.



**WEDGING DETAIL FOR RESURFACING**  
 USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1



**SHOULDER DETAIL WITH GUARDRAIL**  
 USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 2

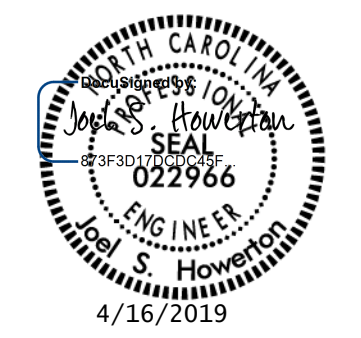
PROJECT REFERENCE NO. <b>17BP.6.R.103</b>	SHEET NO. <b>2A-1</b>
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	PAVEMENT DESIGN ENGINEER <i>[Signature]</i>
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<p><b>RAMEY KEMP ASSOCIATES, INC.</b>                  Transportation Engineers                  5808 Faringdon Place, Suite 100                  Raleigh, North Carolina 27609                  Phone: 919-872-5115                  www.rameykemp.com                  NC License No. C-0910</p>	

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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR <b>STRUCTURE ANCHOR UNITS</b> GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE	SHEET 1 OF 7 <b>862D03</b>
<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.</li> <li>*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.</li> <li>-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.</li> <li>-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).</li> <li>-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.</li> <li>-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.</li> </ul>		
<b>GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE</b>		

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR <b>STRUCTURE ANCHOR UNITS</b> GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 <b>862D03</b>
<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.</li> <li>*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.</li> <li>-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.</li> <li>-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).</li> <li>-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.</li> <li>-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.</li> </ul>		
<b>GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER</b>		



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

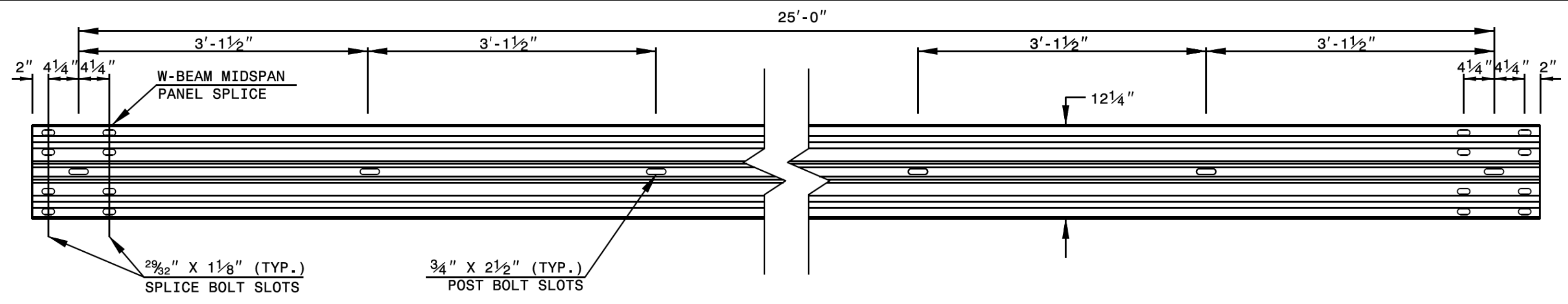
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ORIGINAL BY: J. HOWERTON	DATE: 06-22-12
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

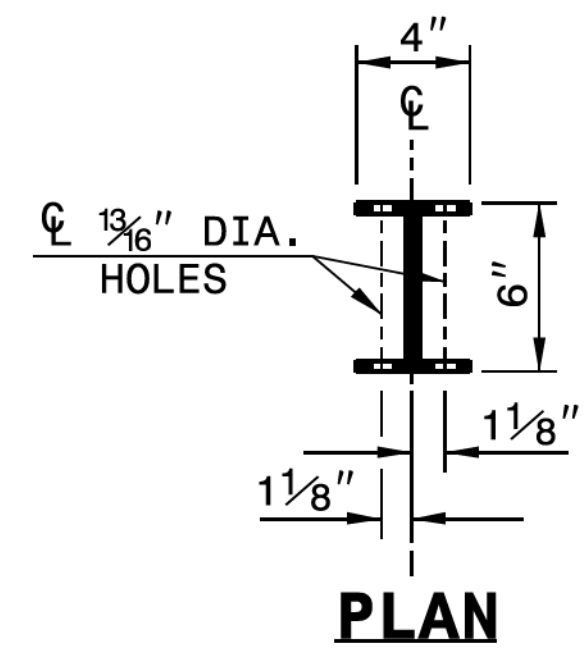
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

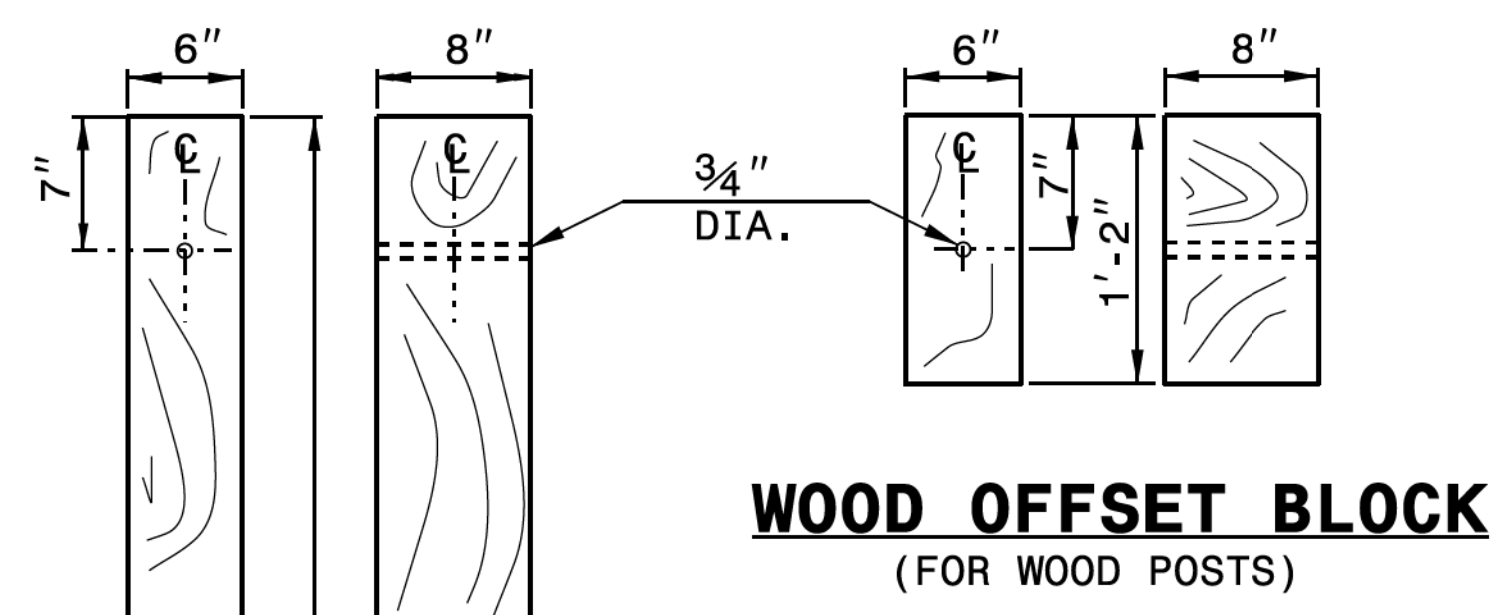
SHEET 6 OF 8  
**862D02**



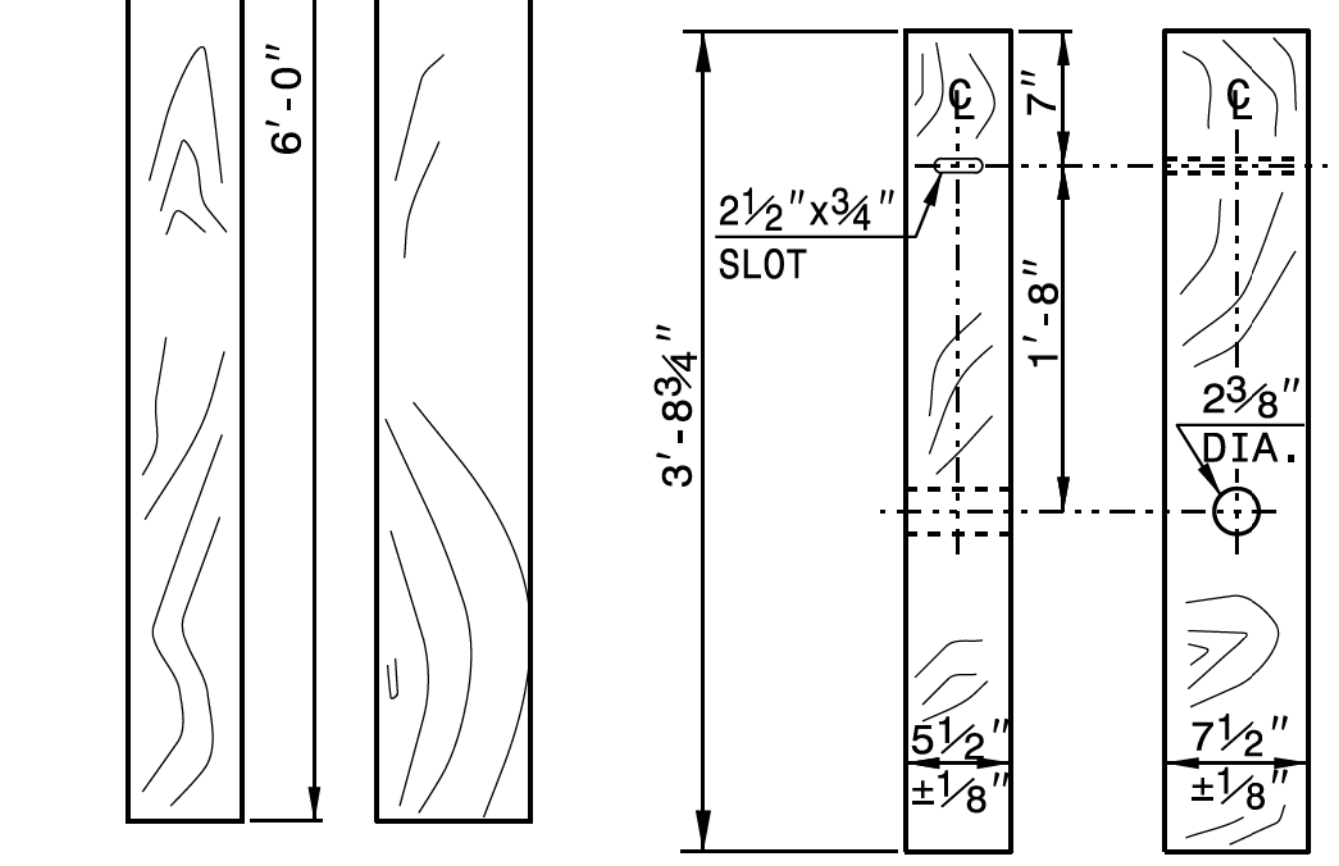
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

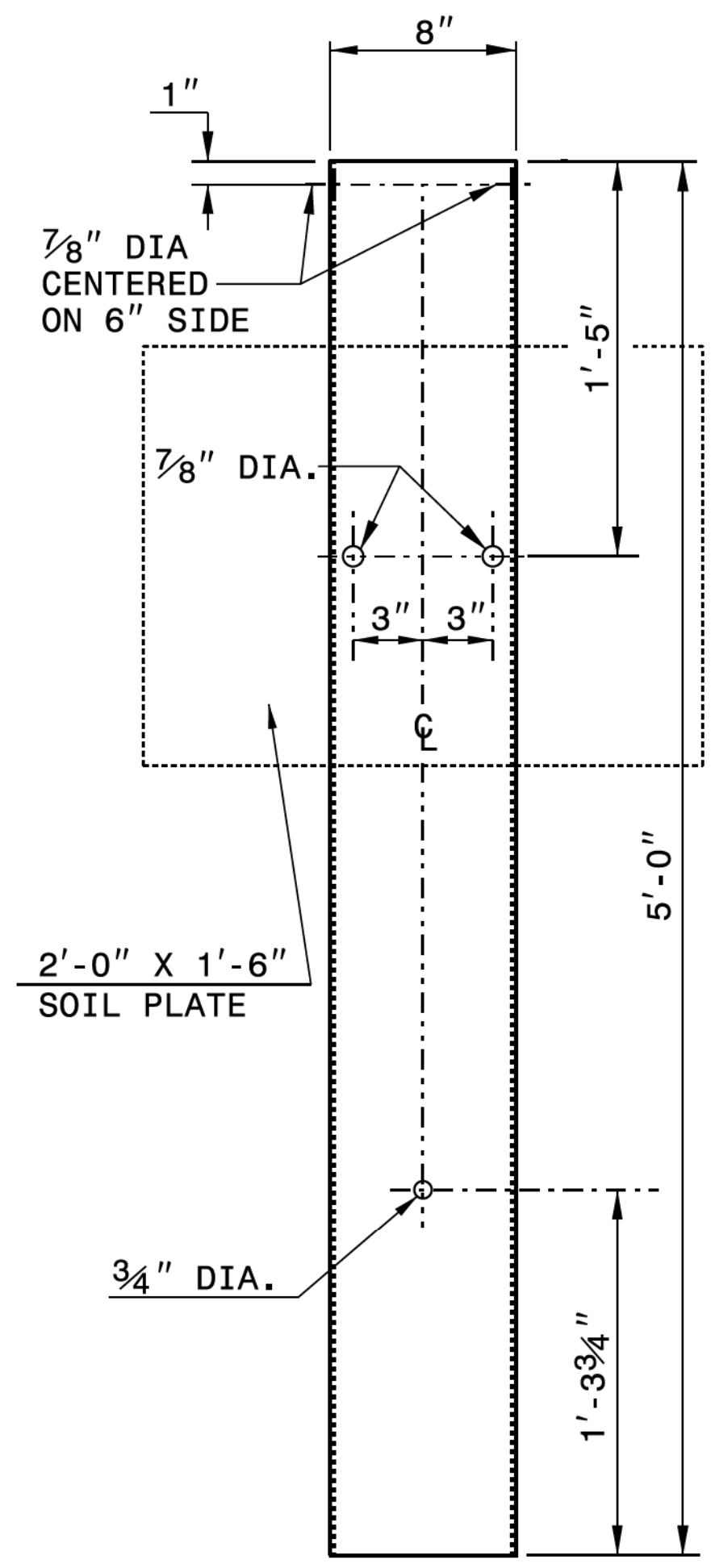


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

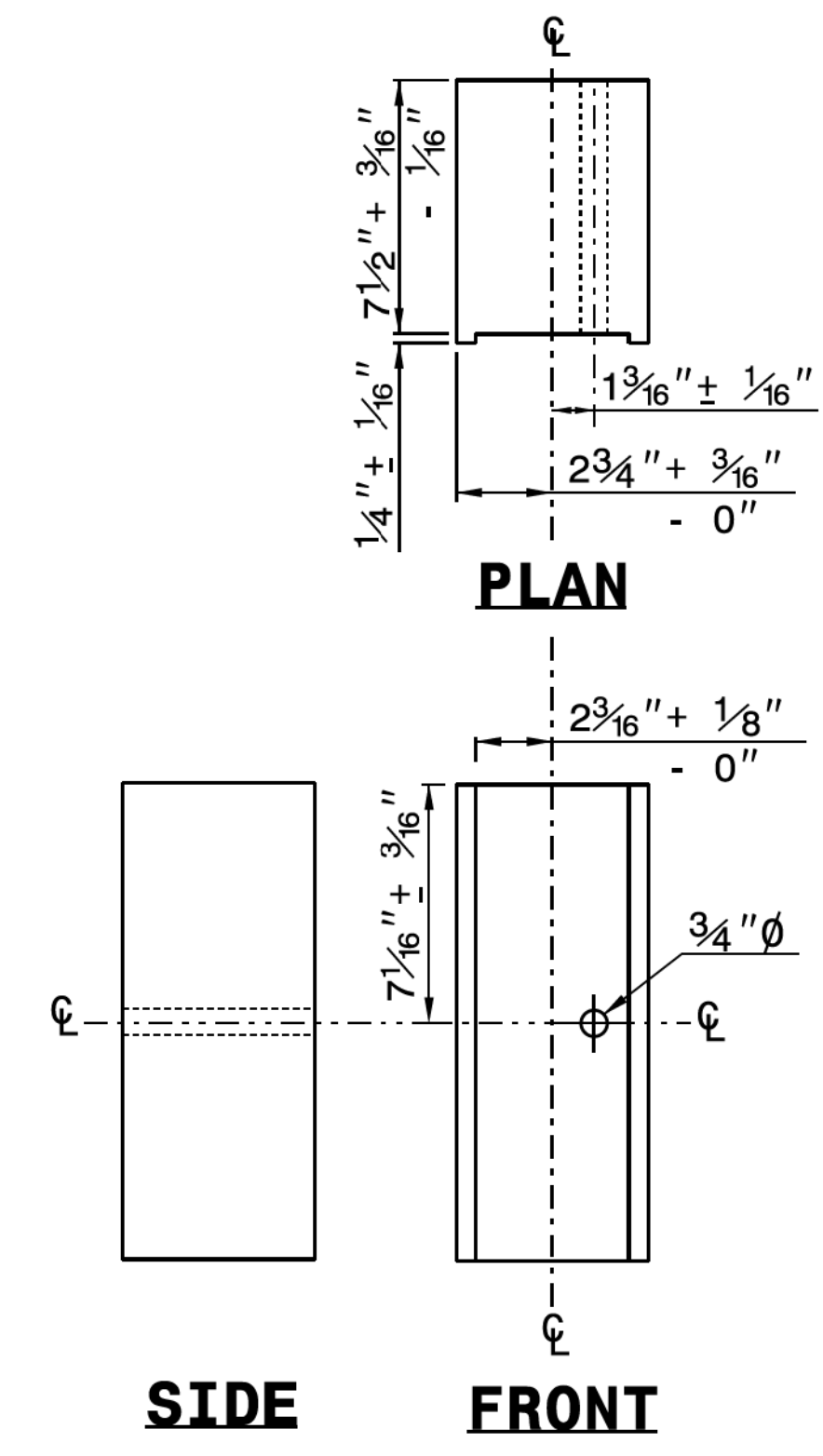


**STANDARD  
LINE POST**

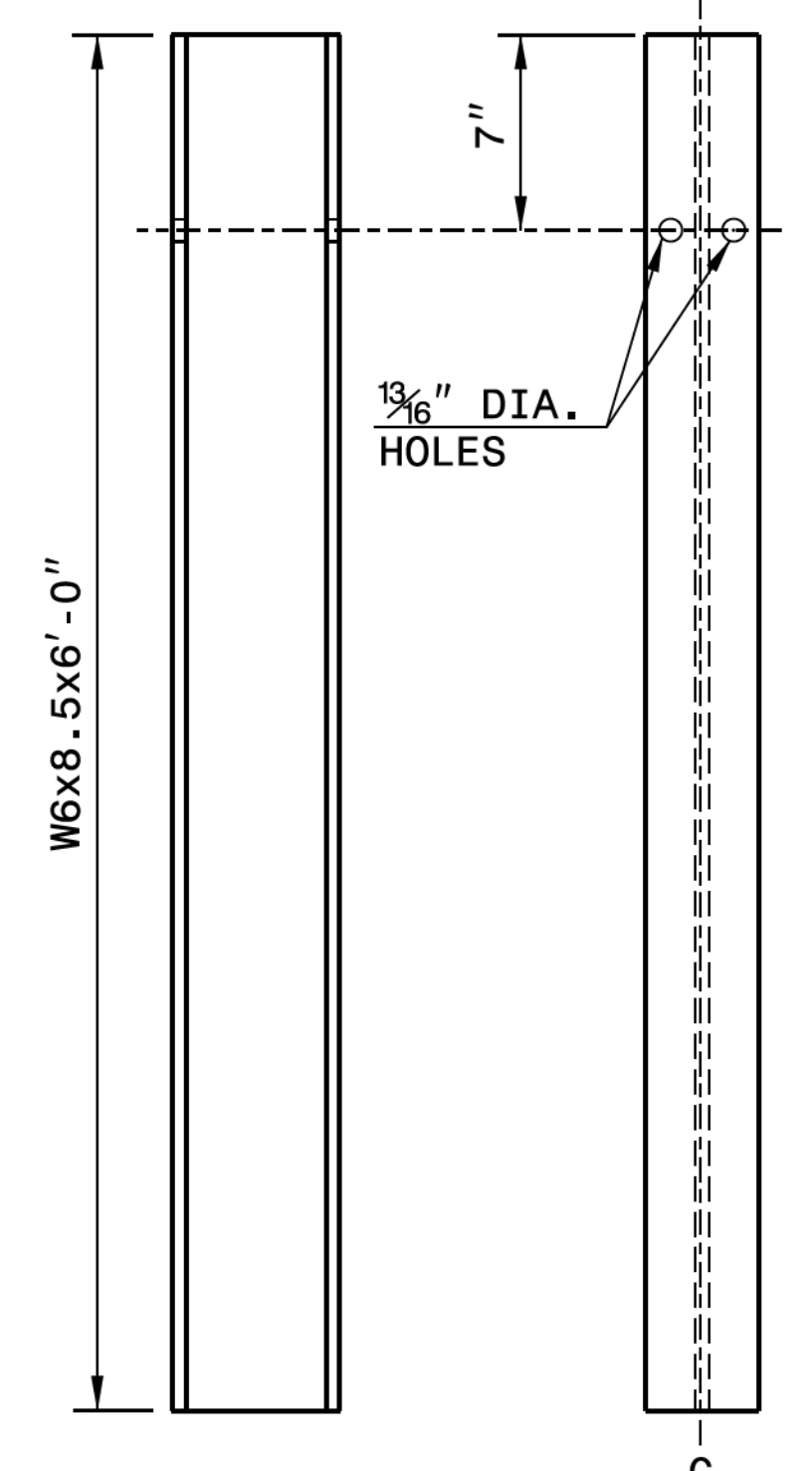
**SHORT WOOD  
BREAKAWAY POST**



**STEEL TUBE  
TS 6"x8"x0.1875"**



**ROUTED  
OFFSET BLOCK**



**"W6" STEEL POST**

**SYSTEM PARTS**

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

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**



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

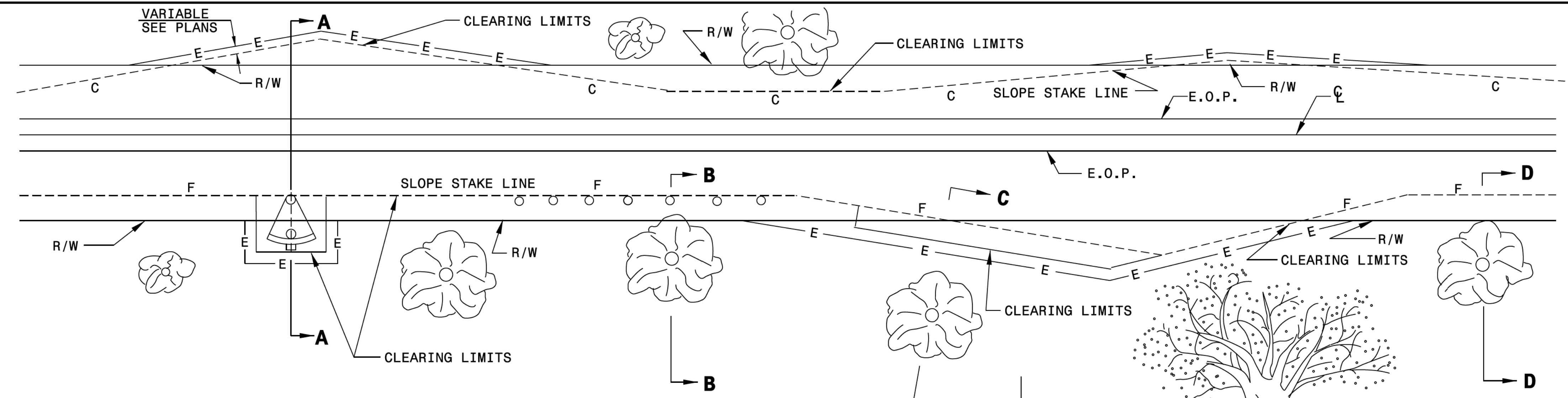
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MODIFIED BY: DATE: \_\_\_\_\_  
CHECKED BY: DATE: \_\_\_\_\_  
FILE SPEC.: \_\_\_\_\_

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

ENGLISH DETAIL DRAWING FOR  
**METHOD OF CLEARING**  
 MODIFIED METHOD - II

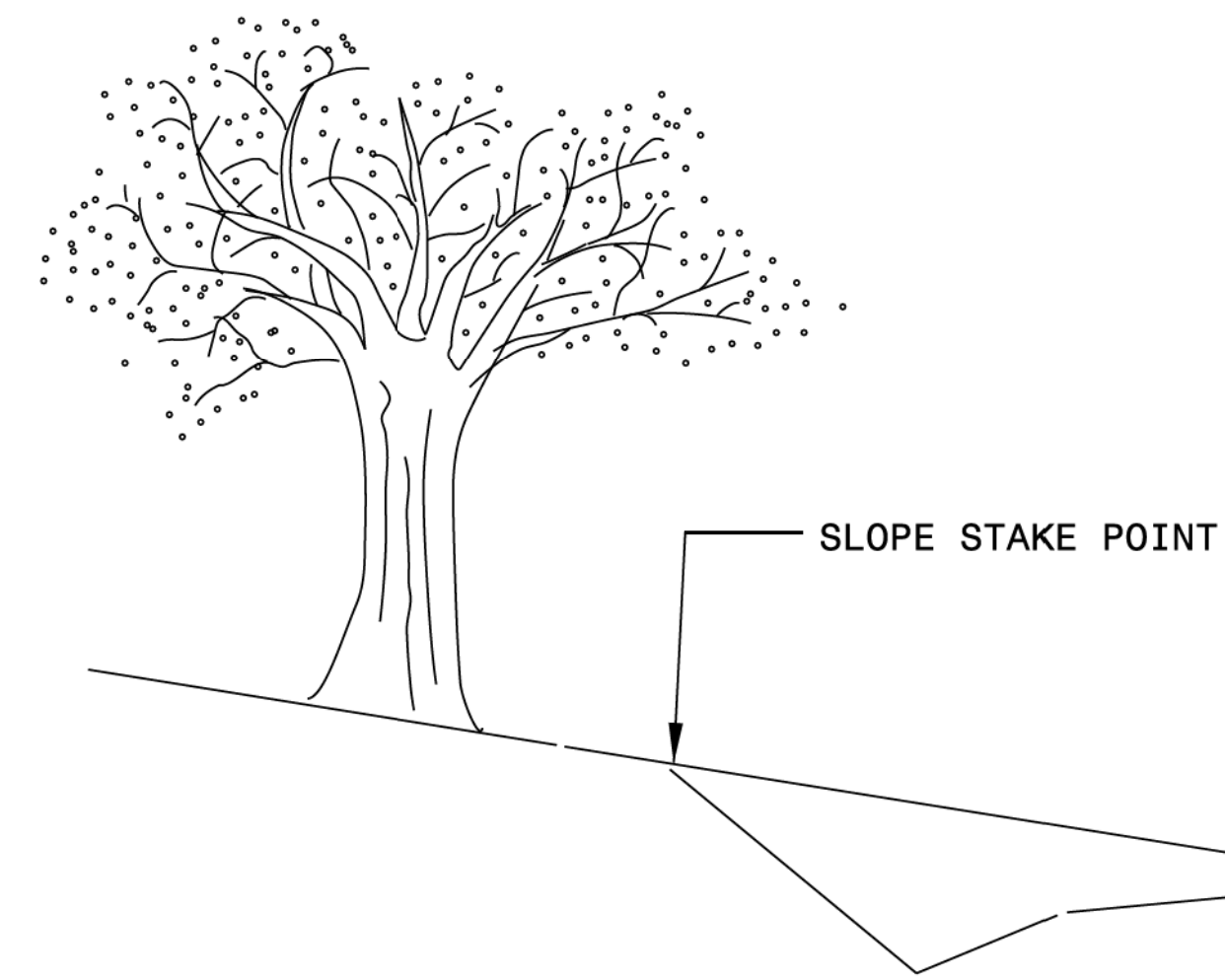
SHEET 1 OF 1  
**200d02**



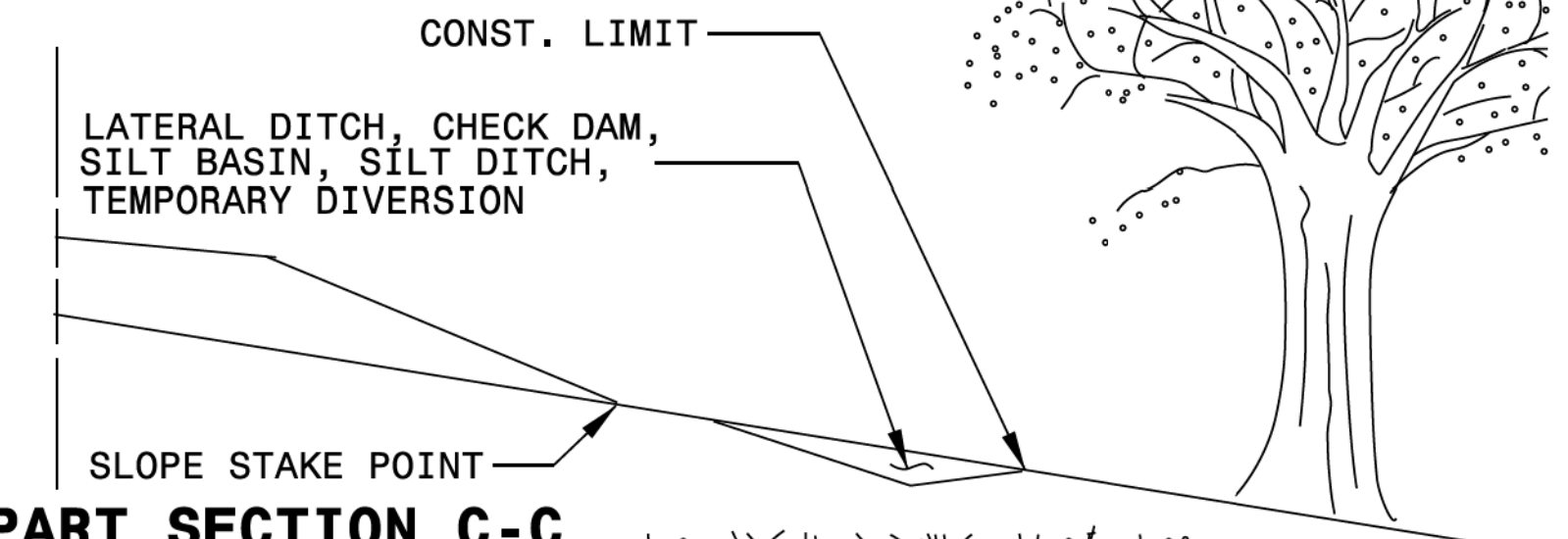
**GENERAL NOTES:**

1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.
3. FOR SECTIONS WITH WIDE MEDIANS WHERE TREES ARE TO REMAIN, CLEAR THE MEDIAN SIDE IN THE SAME MANNER AS ON THE OUTSIDE.
4. HAND CLEAR AS NEEDED TO 5' OUTSIDE THE SLOPE STAKE LINES FOR INSTALLATION OF EROSION CONTROL DEVICES.

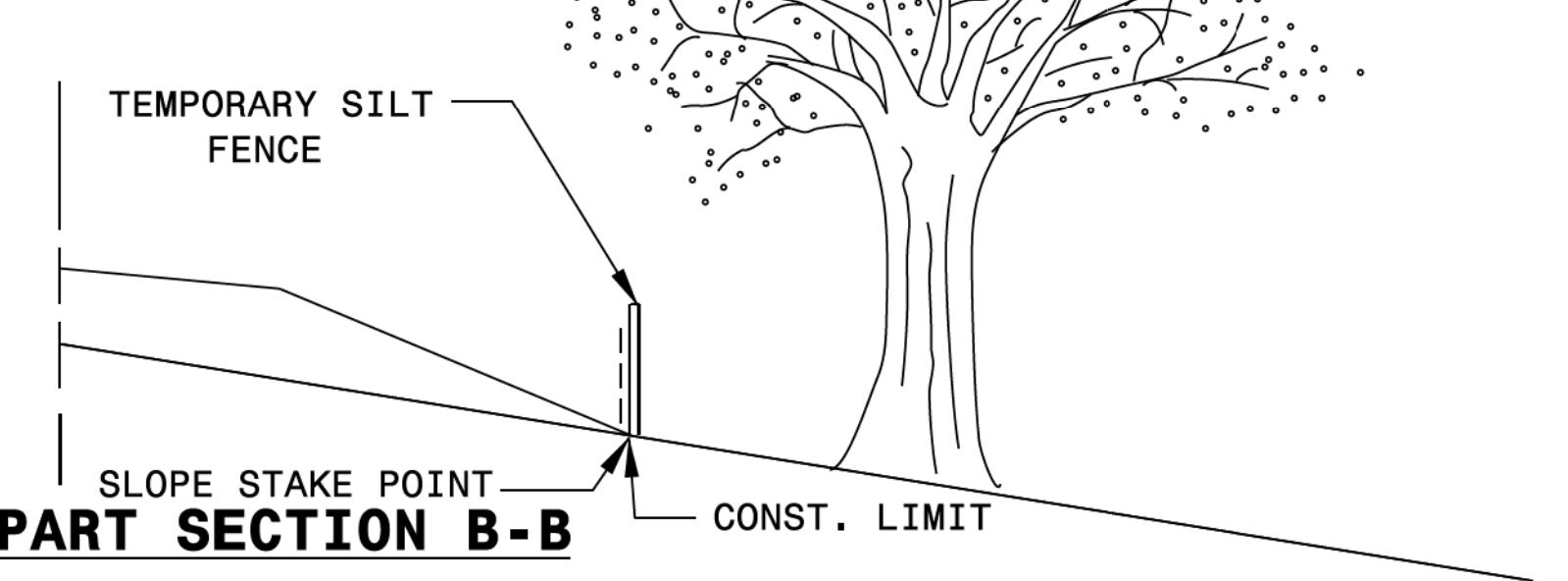
**CLEAR TO SLOPE STAKE LINE OR CONSTRUCTION LIMITS**



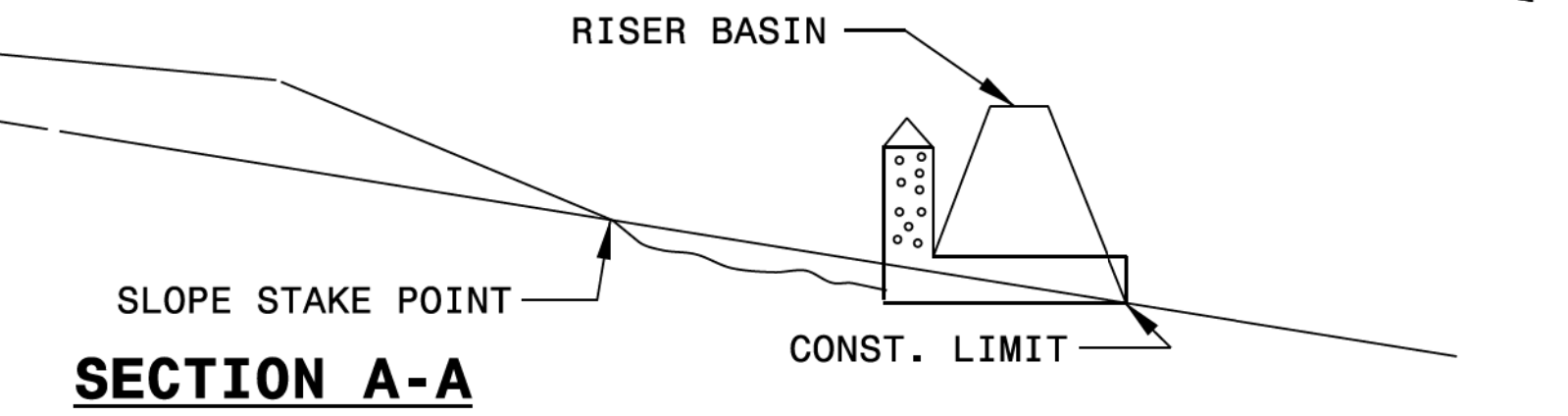
**PART SECTION D-D**



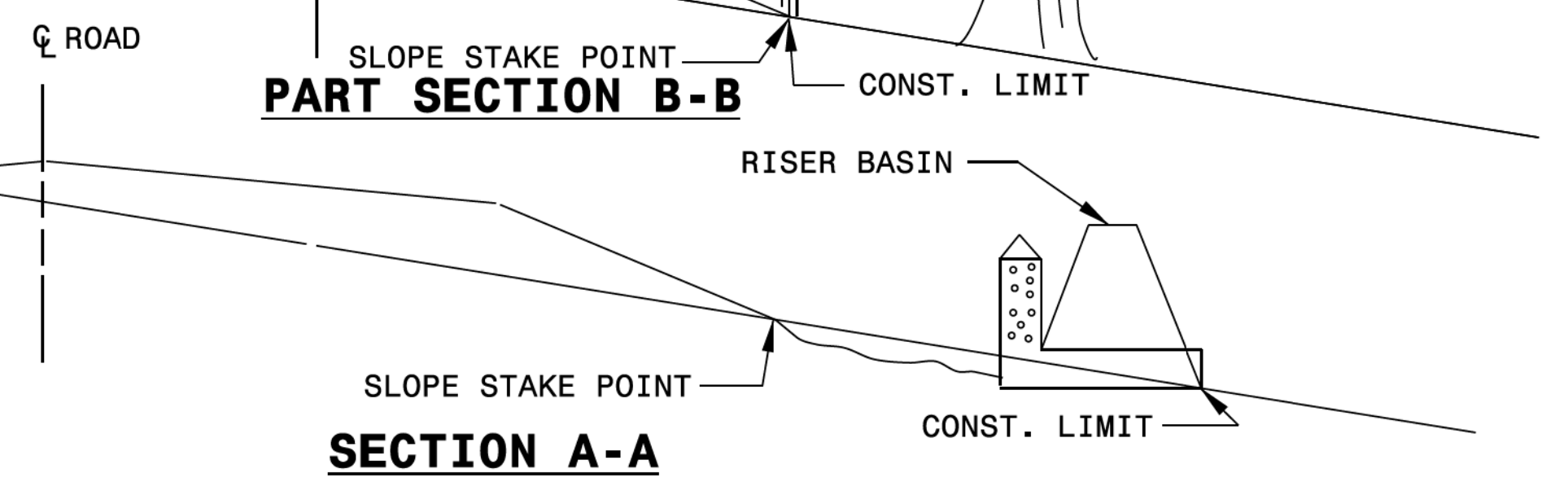
**PART SECTION C-C**



**PART SECTION B-B**



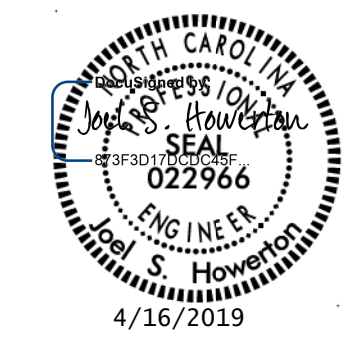
**SECTION A-A**



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

ENGLISH DETAIL DRAWING FOR  
**METHOD OF CLEARING**  
 MODIFIED METHOD - II

SHEET 1 OF 1  
**200d02**



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

**SEE TITLE BLOCK**

ORIGINAL BY: rnbritt DATE: 05-02-11  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
 FILE SPEC.: details/rnbritt/english/urban/u3615aconcretefume.dgn

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 UNLESS ALL SIGNATURES COMPLETED





COMPUTED BY: Ecological Engineering LLP DATE: 11/30/2018  
CHECKED BY: Ecological Engineering LLP DATE: 11/30/2018

PROJECT NO. 17BP.6.R.103 SHEET NO. 3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

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 INCHES & UNDER)

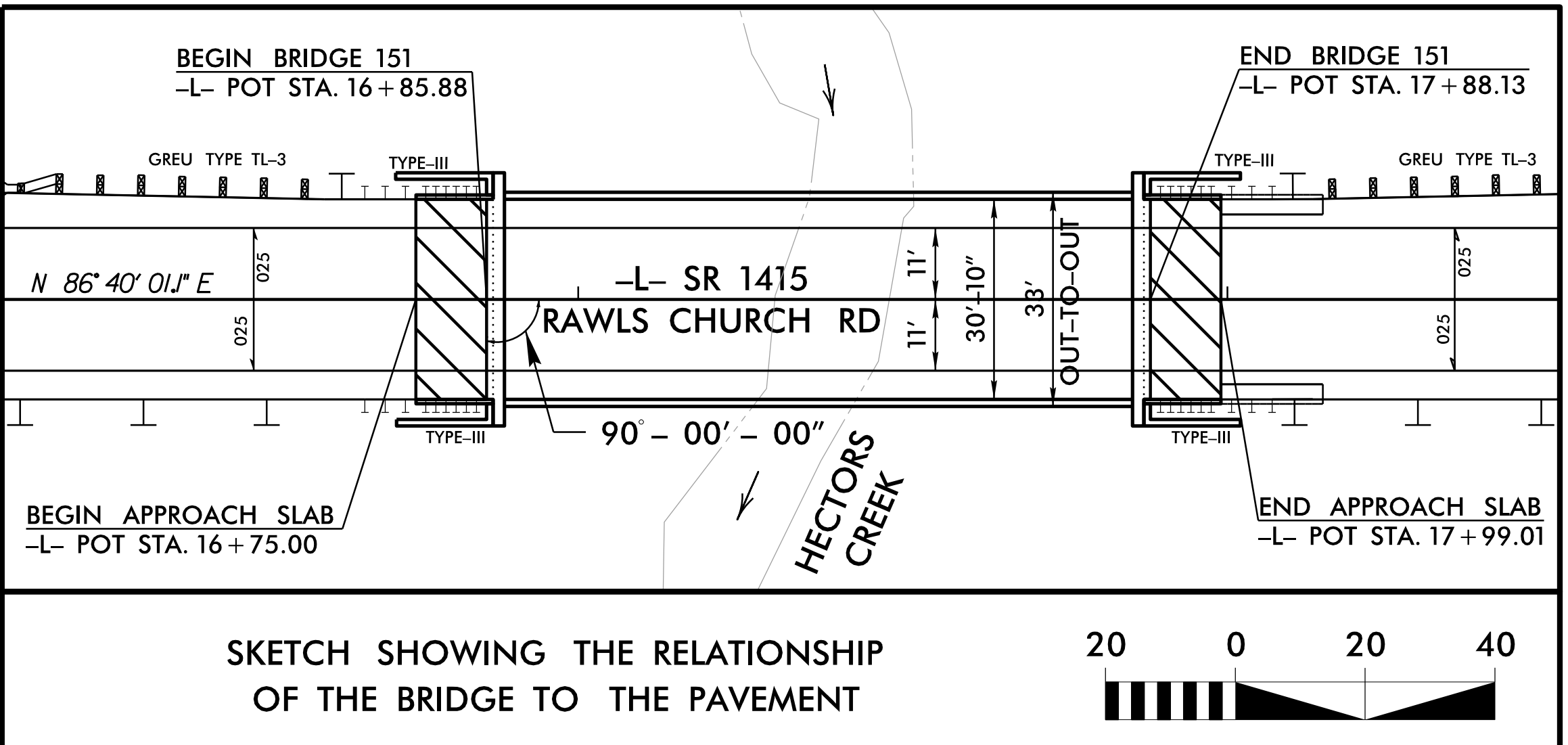
Table with columns for LINE & STATION, SIZE, THICKNESS OR GAUGE, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, MASONRY, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, and REMARKS. Includes summary rows for SHEET TOTALS and PROJECT TOTALS.

8/17/99

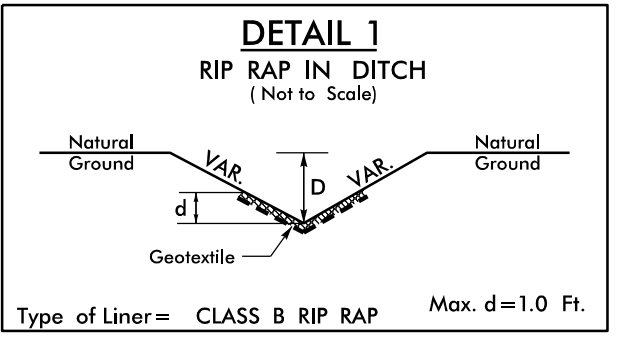
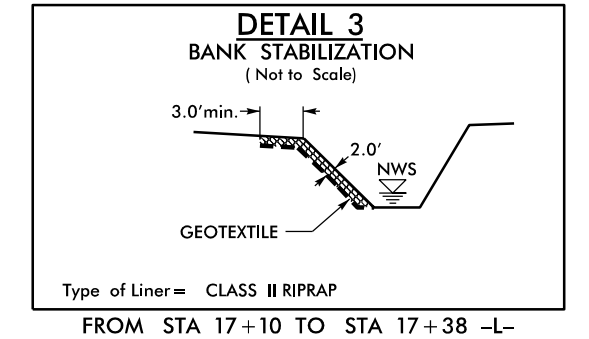
PROJECT REFERENCE NO. <b>17BP.6.R.103</b>	SHEET NO. <b>4</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**RAMEY KEMP ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910



SKETCH SHOWING THE RELATIONSHIP OF THE BRIDGE TO THE PAVEMENT



-L-  
 PI Sta 13+00.00  
 $\Delta = 0' 01' 49.3'' (LT)$   
 $D = 0' 01' 49.3''$   
 $L = 100.00'$   
 $T = 50.00'$   
 $R = 188,720.00'$

1  
CATHRYNE SEXTON  
DB 95E PG 294

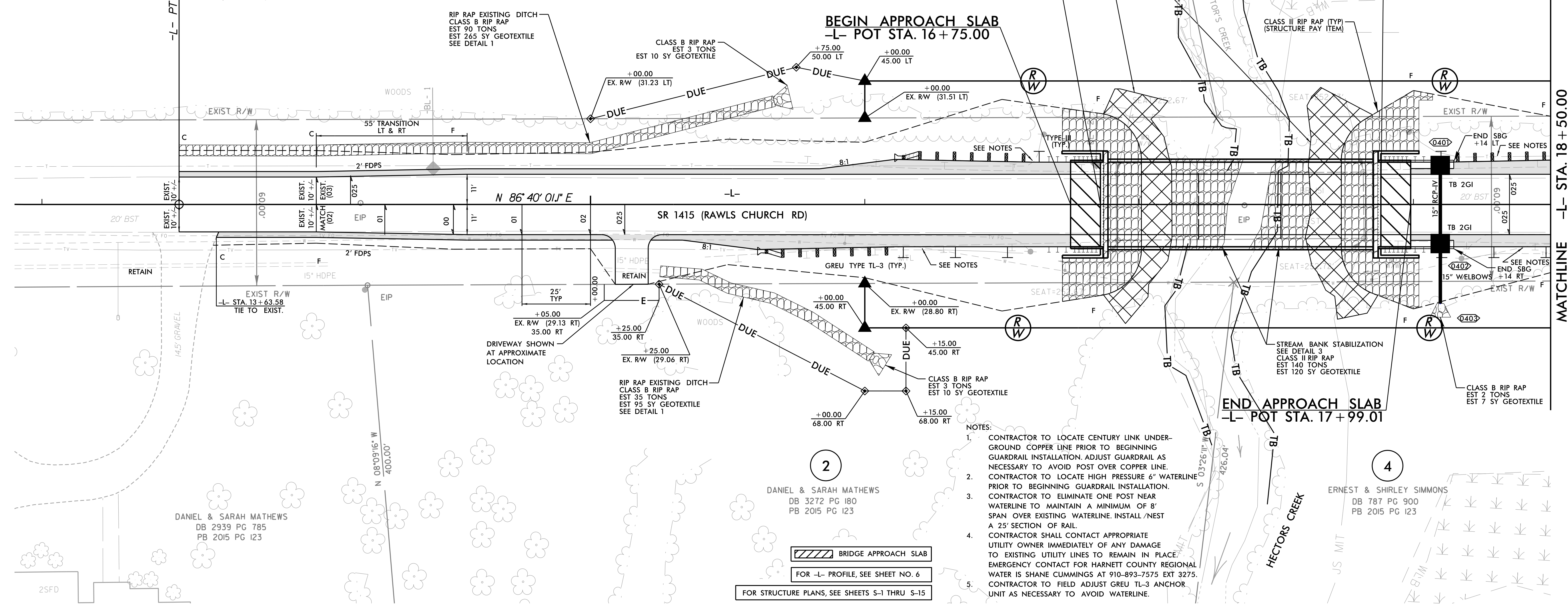
15+00

BEGIN PROJECT 17BP.6.R.103  
 -L- STA. 13+50.00  
 TIE TO EXIST.

BEGIN BRIDGE 151  
 -L- POT STA. 16+85.88

BEGIN APPROACH SLAB  
 -L- POT STA. 16+75.00

END BRIDGE 151  
 -L- POT STA. 17+88.13



REVISIONS

MATCHLINE -L- STA. 18 + 50.00  
SEE SHEET 5

- NOTES:
- CONTRACTOR TO LOCATE CENTURY LINK UNDERGROUND COPPER LINE PRIOR TO BEGINNING GUARDRAIL INSTALLATION. ADJUST GUARDRAIL AS NECESSARY TO AVOID POST OVER COPPER LINE.
  - CONTRACTOR TO LOCATE HIGH PRESSURE 6" WATERLINE PRIOR TO BEGINNING GUARDRAIL INSTALLATION.
  - CONTRACTOR TO ELIMINATE ONE POST NEAR WATERLINE TO MAINTAIN A MINIMUM OF 8' SPAN OVER EXISTING WATERLINE. INSTALL /NEST A 25' SECTION OF RAIL.
  - CONTRACTOR SHALL CONTACT APPROPRIATE UTILITY OWNER IMMEDIATELY OF ANY DAMAGE TO EXISTING UTILITY LINES TO REMAIN IN PLACE. EMERGENCY CONTACT FOR HARNETT COUNTY REGIONAL WATER IS SHANE CUMMINGS AT 910-893-7575 EXT 3275.
  - CONTRACTOR TO FIELD ADJUST GREU TL-3 ANCHOR UNIT AS NECESSARY TO AVOID WATERLINE.

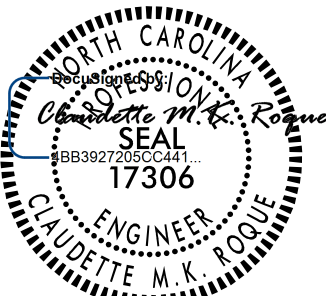

2  
DANIEL & SARAH MATHEWS  
DB 3272 PG 180  
PB 2015 PG 123

4  
ERNEST & SHIRLEY SIMMONS  
DB 787 PG 900  
PB 2015 PG 123

BRIDGE APPROACH SLAB  
 FOR -L- PROFILE, SEE SHEET NO. 6  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-15

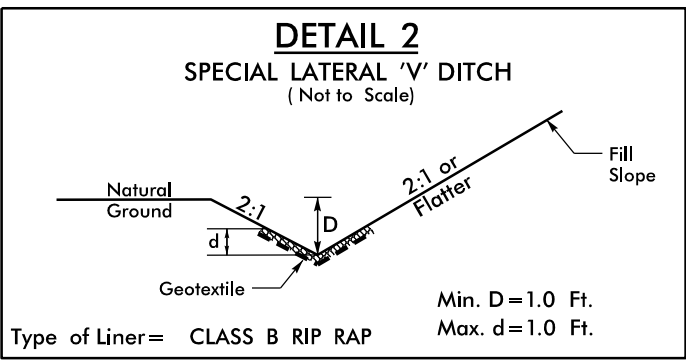
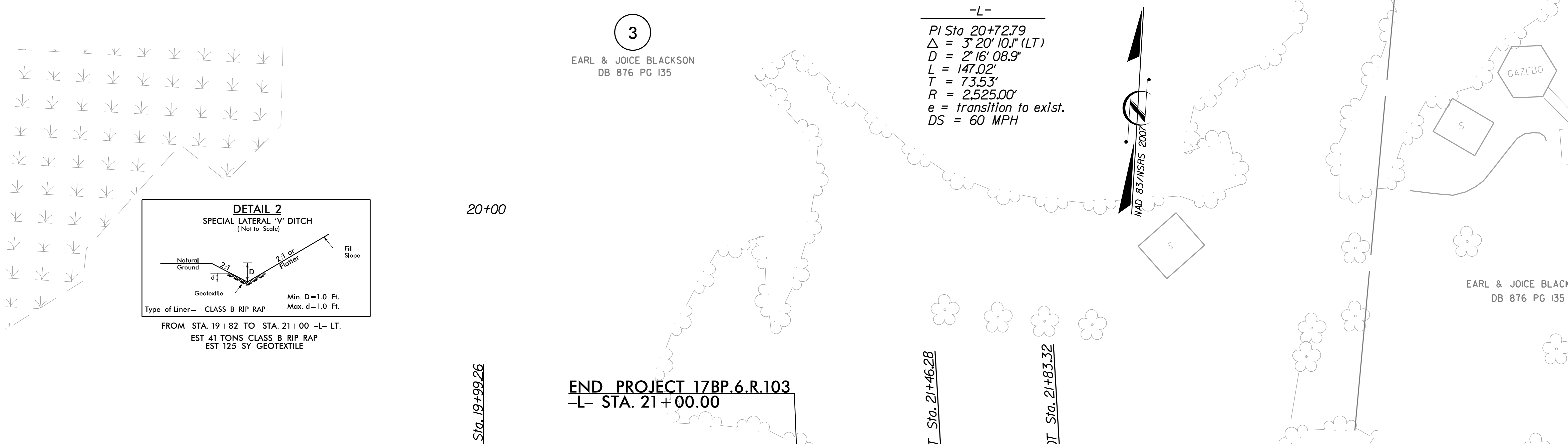
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User: KWI

8/17/99

PROJECT REFERENCE NO. <b>17BP.6.R.103</b>	SHEET NO. <b>5</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DATE: 4/16/2019	

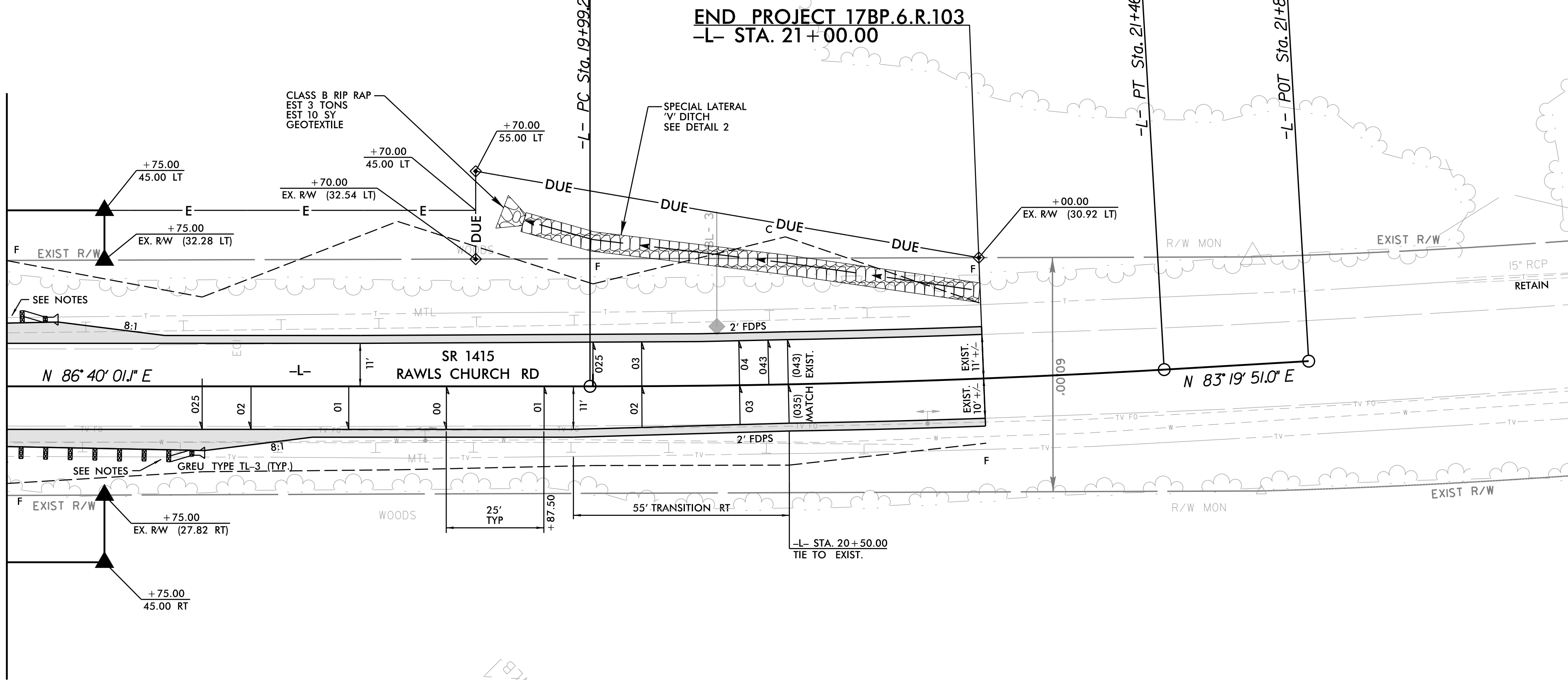
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

**RAMEY KEMP ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910



FROM STA. 19+82 TO STA. 21+00 -L- LT.  
 EST 41 TONS CLASS B RIP RAP  
 EST 123 SY GEOTEXTILE

MATCHLINE -L- STA. 18+50.00 SEE SHEET 4



**4**  
 ERNEST & SHIRLEY SIMMONS  
 DB 787 PG 900  
 PB 2015 PG 123

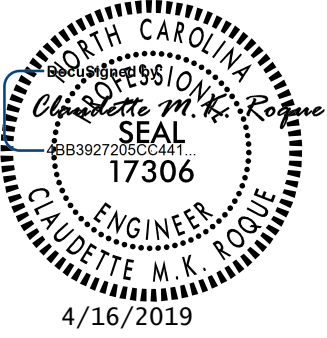
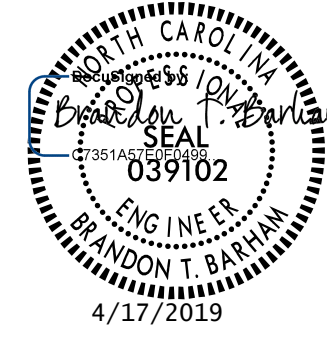

- NOTES:
- CONTRACTOR TO LOCATE CENTURY LINK UNDERGROUND COPPER LINE PRIOR TO BEGINNING GUARDRAIL INSTALLATION. ADJUST GUARDRAIL AS NECESSARY TO AVOID POST OVER COPPER LINE.
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  - CONTRACTOR TO FIELD ADJUST GREU TL-3 ANCHOR UNIT AS NECESSARY TO AVOID WATERLINE.

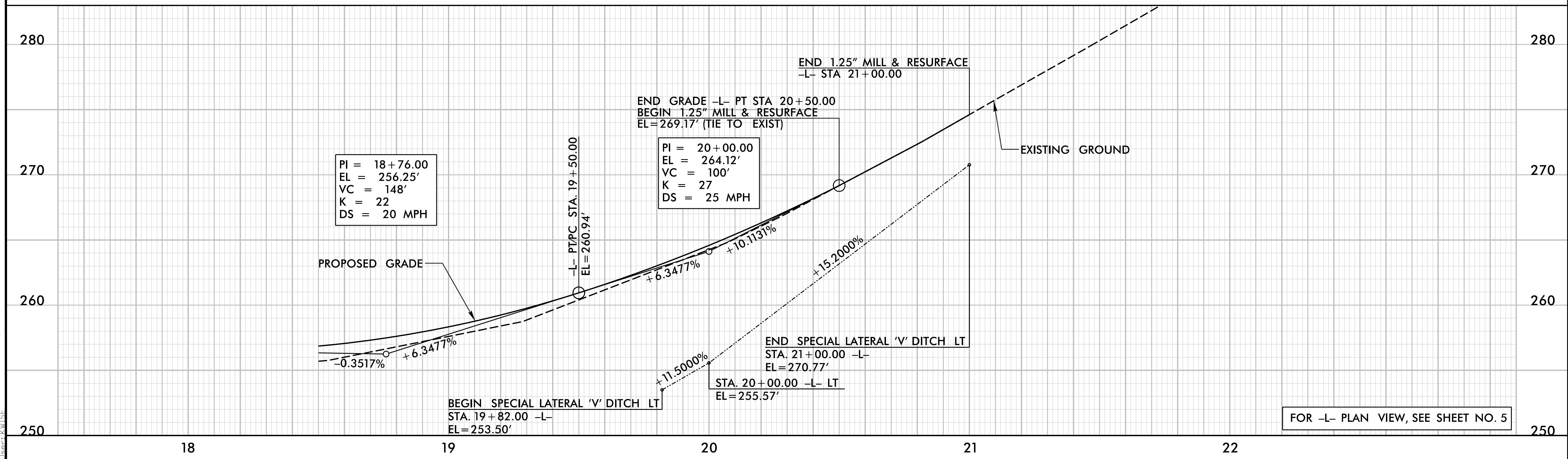
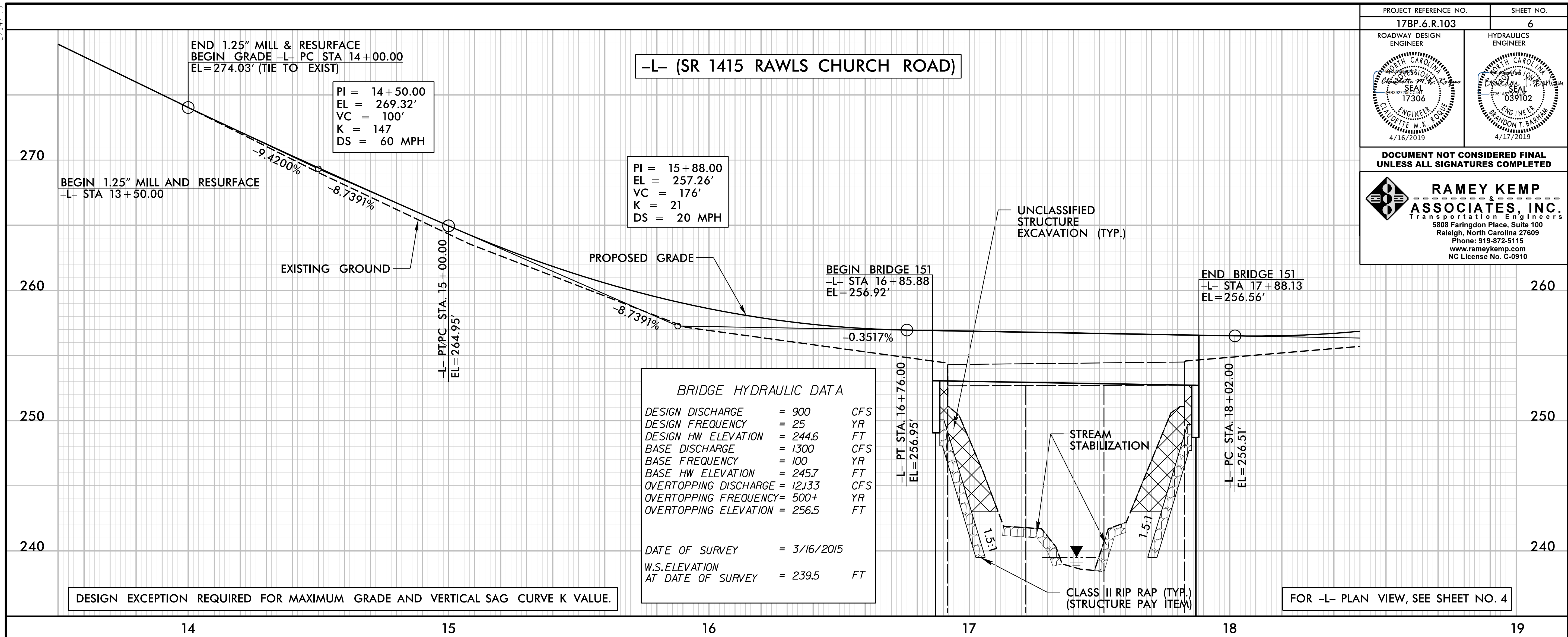
ERNEST & SHIRLEY SIMMONS  
NO DEED INFO FOUND

FOR -L- PROFILE, SEE SHEET NO. 6

REVISIONS

4/16/2019  
 P:\Projects\17BP.6.R.103\17BP.6.R.103.dgn  
 User: KJLISE

PROJECT REFERENCE NO. <b>17BP.6.R.103</b>	SHEET NO. <b>6</b>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 <b>RAMEY KEMP ASSOCIATES, INC.</b> Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 Phone: 919-872-5115 www.rameykemp.com NC License No. C-0910	

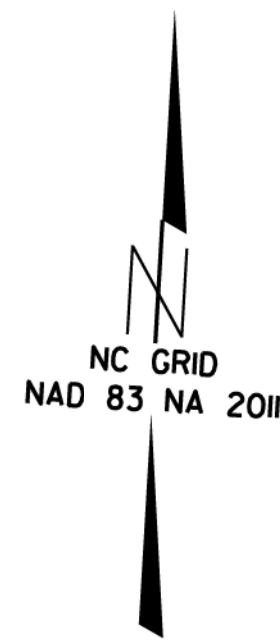


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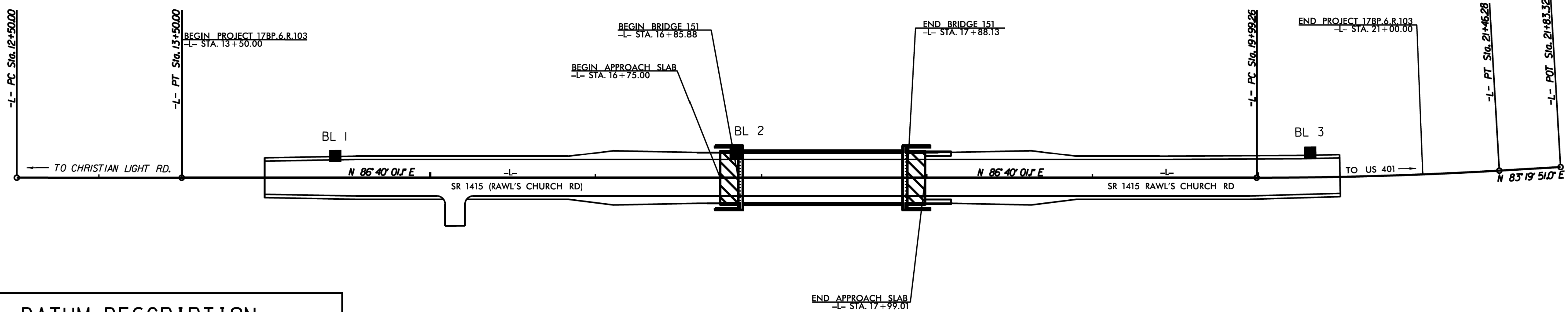
4/16/2019 8:55:05 PM rdj\_e1106.dgn

# SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	RW02C-1
Location and Surveys	



BL	POINT	DESC.	NORTH	EAST	ELEVATION
1	B-5505 BL1		648357.5265	2048746.5321	268.96
2	B-5505 BL2		648373.3570	2048987.7532	253.72
3	B-5505 BL3		648393.9196	2049334.4840	266.13



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "420151 BL-2"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 648373.3570(ft) EASTING: 2048987.7532(ft)  
 ELEVATION: 253.72(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999877105

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "420151 BL-2" TO -L- STATION 12+50 IS  
 S84°42'07.27"W 434.63

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

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

REVISIONS

6/2/09

6/2/09 10:00 AM

# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	RW02D-1
Location and Surveys	

L			
TYPE	STATION	NORTH	EAST
PC	12+50.00	648333.2256	2048554.9842
PT	13+50.00	648339.0131	2048654.8166
PC	19+99.26	648376.7606	2049302.9749
PT	21+46.28	648389.5753	2049449.4165
POT	21+83.32	648393.8772	2049486.2074

REVISIONS

## NOTES:

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

6/2/99

6/2/20

REVISIONS

# RIGHT OF WAY CONTROL SHEET WITH PERMANENT EASEMENT CONTROL

PROJECT REFERENCE NO. 17BP.6.R.103	SHEET NO. RW02E-1
NCDOT	

PROJECT SURVEYOR
------------------

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+00.00	-45.00	648398.4719	2048901.7775
L	16+00.00	-31.51	648385.0060	2048902.5617
L	16+00.00	28.80	648324.8004	2048906.0679
L	16+00.00	45.00	648308.6241	2048907.0100
L	18+75.00	-45.00	648414.4602	2049176.3123
L	18+75.00	-32.28	648401.7605	2049177.0519
L	18+75.00	27.82	648341.7653	2049180.5459
L	18+75.00	45.00	648324.6125	2049181.5449

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+70.00	-55.00	648429.9666	2049270.5702
L	19+70.00	-32.54	648407.5484	2049271.8758
L	21+00.00	-30.92	648415.3920	2049400.3771
L	16+15.00	45.00	648309.4962	2048921.9846
L	16+15.00	68.00	648286.5351	2048923.3218
L	16+00.00	68.00	648285.6630	2048908.3472
L	15+25.00	29.06	648320.1736	2048831.2103
L	15+00.00	-31.23	648378.9135	2048802.7471
L	15+75.00	-50.00	648402.0099	2048876.5291

NOTES:

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

6/2/20

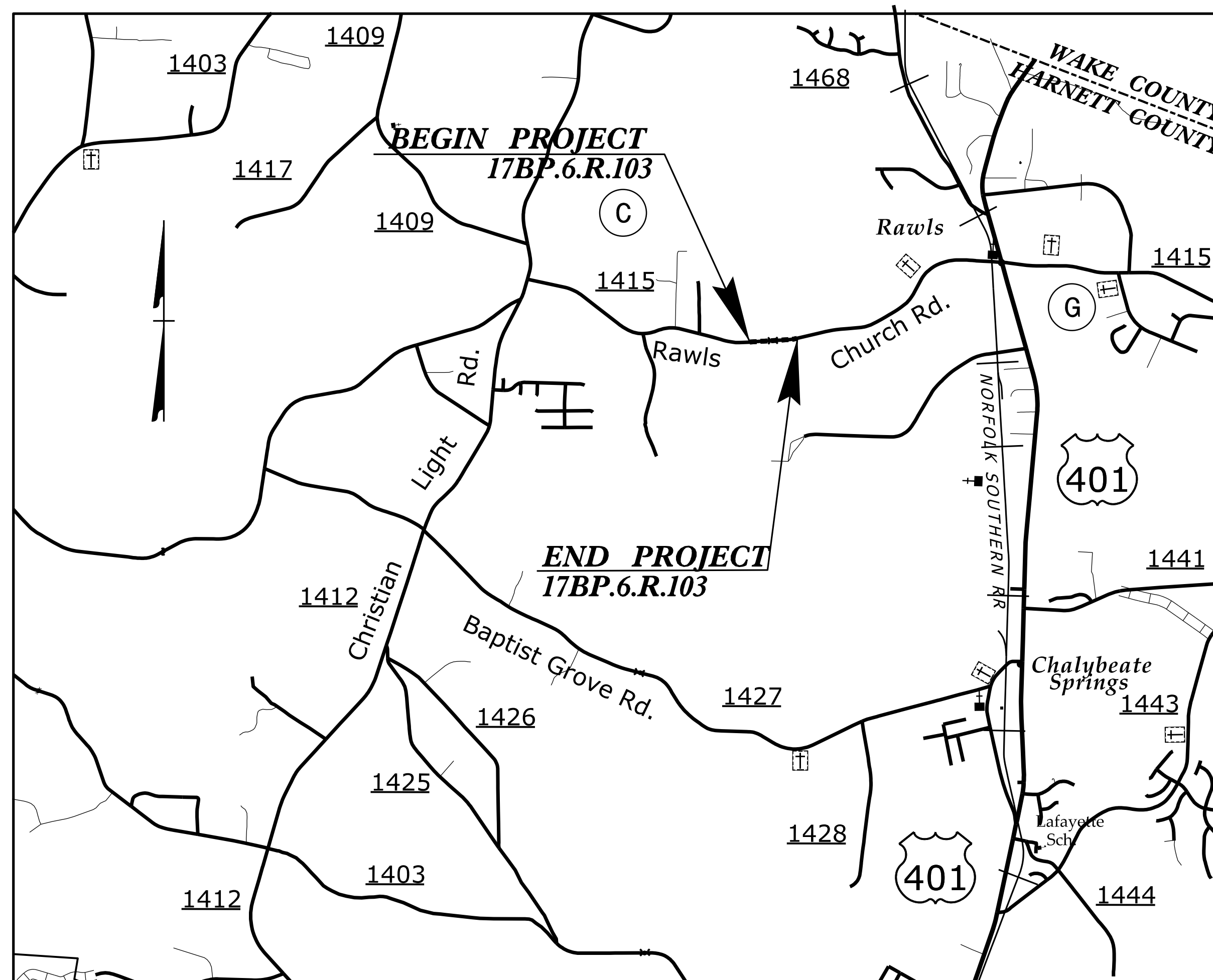
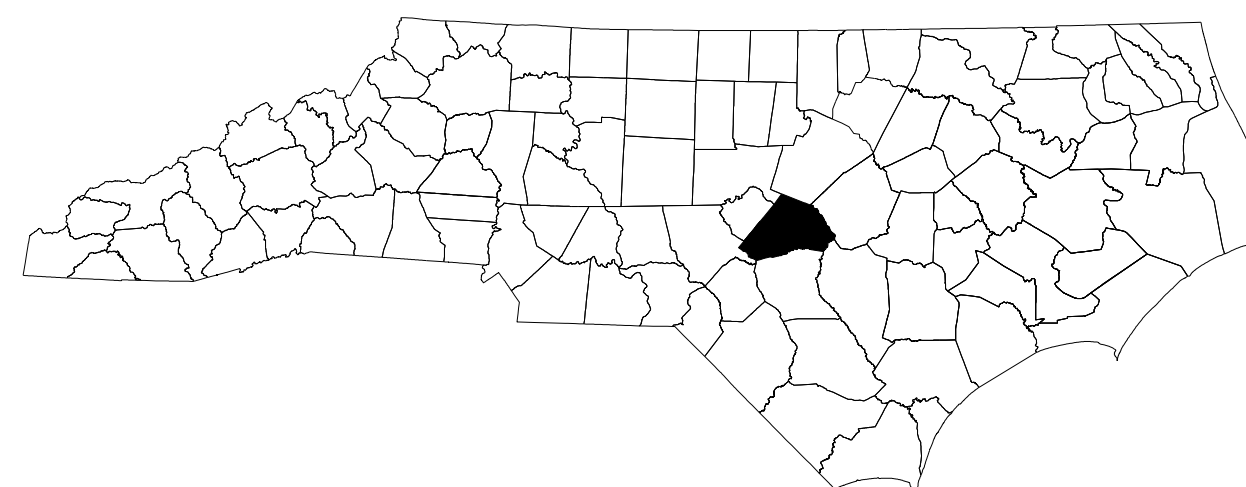


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**HARNETT COUNTY**

LOCATION: BRIDGE NO. 151 ON SR 1415 (RAWLS CHURCH RD) OVER HECTORS CREEK



**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, INDEX OF SHEETS, LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	SPECIAL SIGN DESIGN
TMP-3	MANAGEMENT STRATEGY, PHASING NOTES, GENERAL NOTES, AND DETOUR SIGNING

**LEGEND**

GENERAL	TRAFFIC CONTROL DEVICES
← DIRECTION OF TRAFFIC FLOW	▩ BARRICADE (TYPE III)
----- EXIST. PVMT.	▲ CONE
———— PROP. PVMT.	● DRUM
↑ NORTH ARROW	⊙ SKINNY DRUM
■ WORK AREA	
	TEMPORARY SIGNING
	⊠ PORTABLE SIGN
	⊥ STATIONARY SIGN
	⊙ STATIONARY OR PORTABLE SIGN
SIGNALS	
⊙ EXISTING	⊙ PROPOSED

**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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD.NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

CLAUDETTE M.K. ROQUE, P.E.  
PROJECT ENGINEER  
KAYLA M. POULOS, E.I.  
PROJECT DESIGN ENGINEER

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UNLESS ALL SIGNATURES COMPLETED

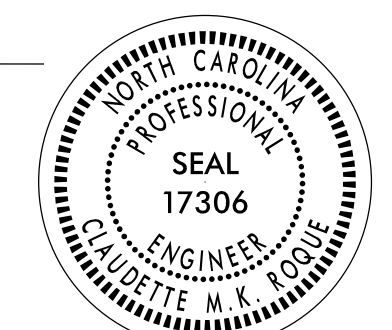
Prepared in the Office of:

**RAMEY KEMP ASSOCIATES, INC.**  
Transportation Engineers  
5808 Faringdon Place, Suite 100  
Raleigh, North Carolina 27609  
Phone: 919-872-5115  
www.rameykemp.com  
NC License No. C-0910

APPROVED: *Claudette M.K. Roque*

DATE: 4/16/2019

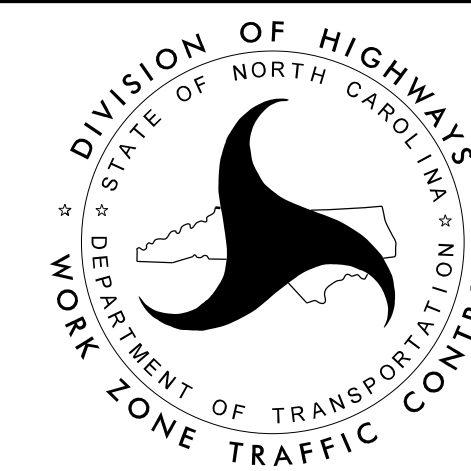
SEAL



**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



**PROJECT: 17BP.6.R.103**

SIGN NUMBER: SD-1 TYPE: D QUANTITY: 1 SIGN WIDTH: 5'-0" HEIGHT: 2'-0" TOTAL AREA: 10.0 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0.75" WIDTH: 0.75" RADII: 3" NO. Z BARS: LENGTH:	BACKG COLOR: Orange COPY COLOR: Black <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	SYMBOL	X	Y	WID	HT																																														DESIGN BY: NE BURNS PROJECT ID: B-5505 CHECKED BY: LOCATION: HARNETT COUNTY DIV: 6 Feb 06, 2018
SYMBOL	X	Y	WID	HT																																																



Spacing Factor is 1 unless specified otherwise

**LETTER POSITIONS**

Letter locations are panel edge to lower left corner

R	A	W	L	S											Series/Size	
Text Length	Text Length	Text Length	Text Length	Text Length												
19.8	23.7	27.9	33.3	36.9												C 2000
																20.5
C	H	U	R	C	H	R	O	A	D						Series/Size	
Text Length	Text Length	Text Length	Text Length	Text Length	Text Length	Text Length	Text Length	Text Length	Text Length							
5.7	10.2	14.9	19.6	23.9	28.4	31.8	37.8	42	46.3	51						C 2000
																48.7

FILENAME: SSD-1 NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: <u>Claudette M. K. Rogne</u> DATE: 4/16/2019 <div style="text-align: center;">   <b>SEAL</b> </div>		<h1 style="margin: 0;">SPECIAL SIGN DESIGN</h1>
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

# MANAGEMENT STRATEGY

CLOSE SR 1415 (RAWLS CHURCH ROAD) BETWEEN CHRISTIAN LIGHT ROAD & US 401 TO THRU TRAFFIC TO CONSTRUCT THE BRIDGE AND ROADWAY IMPROVEMENTS USING AN OFF-SITE DETOUR.

## PHASING NOTES

THE CONTRACTOR SHALL MAINTAIN ACCESS TO THE EXISTING DRIVEWAYS AS DIRECTED BY THE ENGINEER.

- STEP 1: PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE AND COVER OFF-SITE DETOUR SIGNING AS SHOWN ON TMP-3 AND IN ACCORDANCE WITH RSD 1101.03 (SHEET 1 OF 9).
- STEP 2: USING OFF-SITE DETOUR, UNCOVER DETOUR SIGNS, CLOSE -L- (SR 1415) TO THRU TRAFFIC (OPEN TO LOCAL TRAFFIC ONLY) AND CONSTRUCT THE BRIDGE AND ROADWAY APPROACHES UP TO AND INCLUDING FINAL SURFACE COURSE.
- STEP 3: PLACE FINAL PAVEMENT MARKINGS ON -L- (SR 1415) AS SHOWN ON PAVEMENT MARKING PLANS.
- STEP 4: REMOVE BARRICADES AND DETOUR SIGNS AND OPEN -L- (SR 1415) TO TRAFFIC.

## 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 UNDESIRABLE 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.

### TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

### SIGNING

- B) 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.

- C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

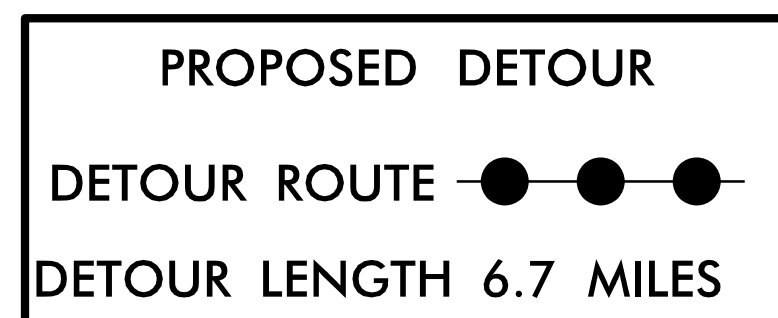
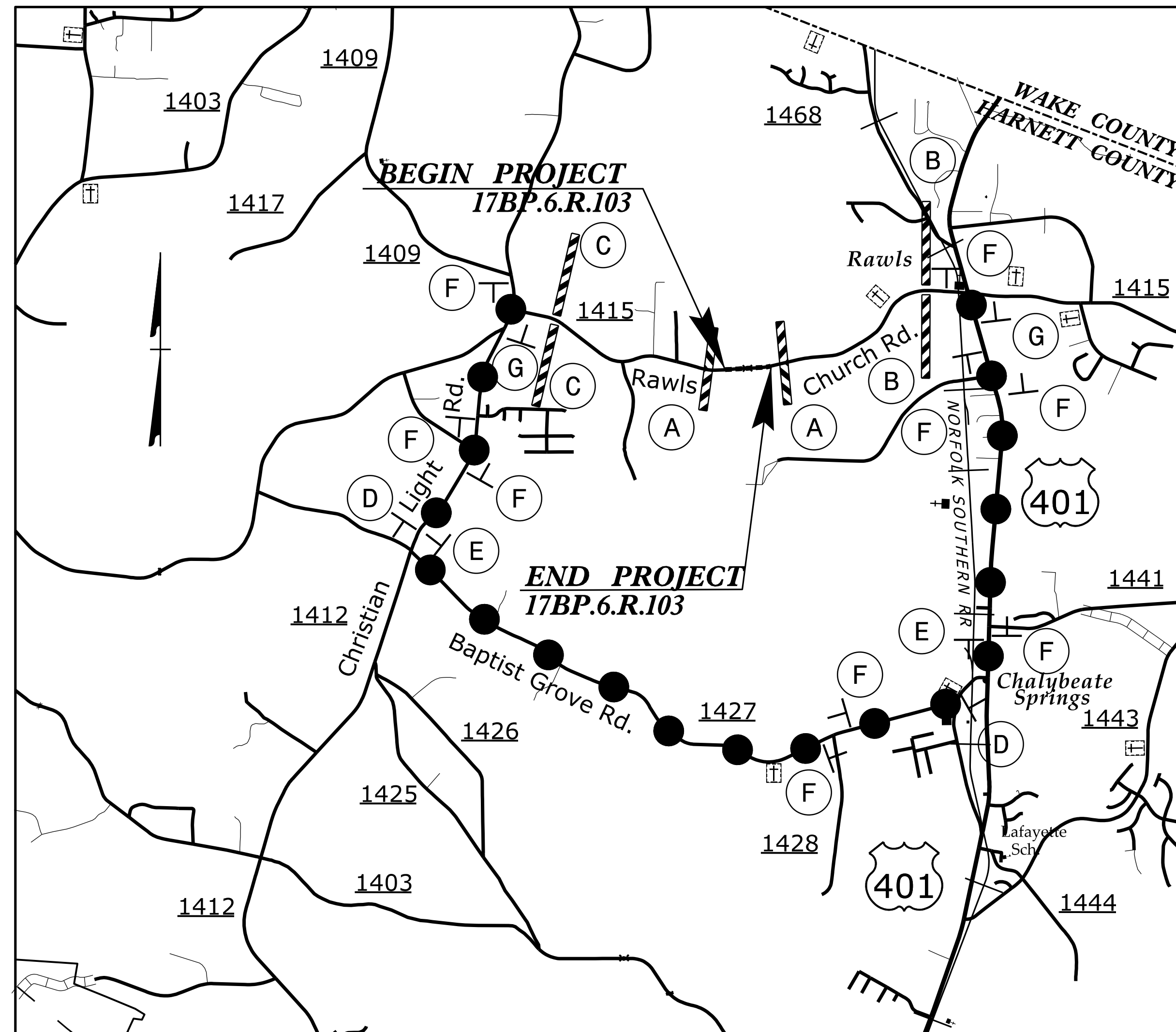
- D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

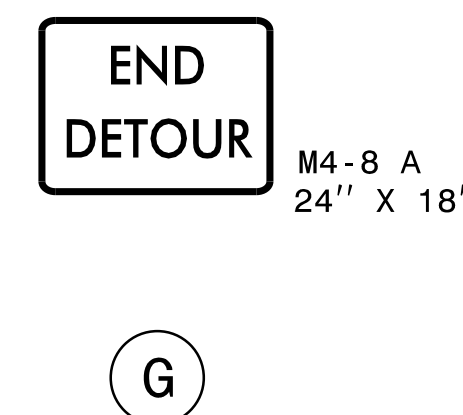
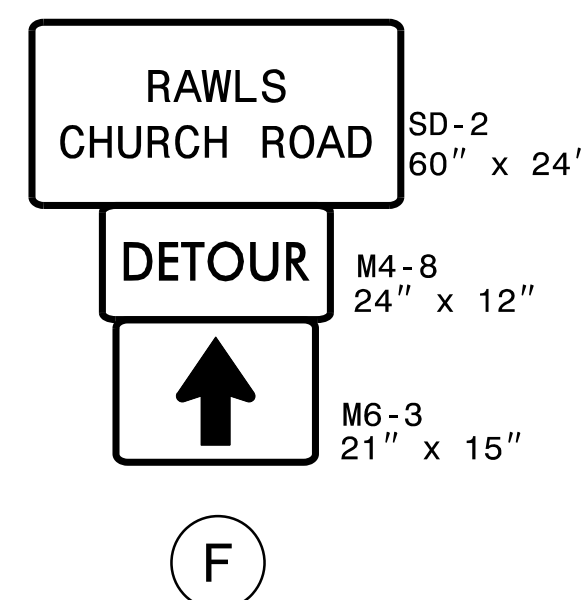
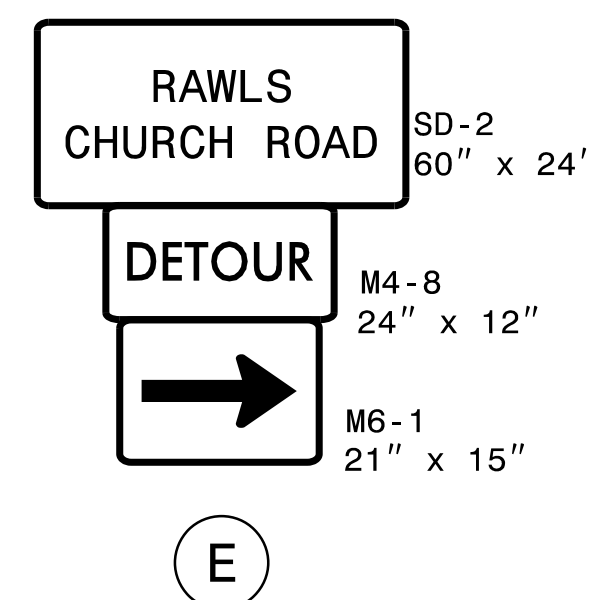
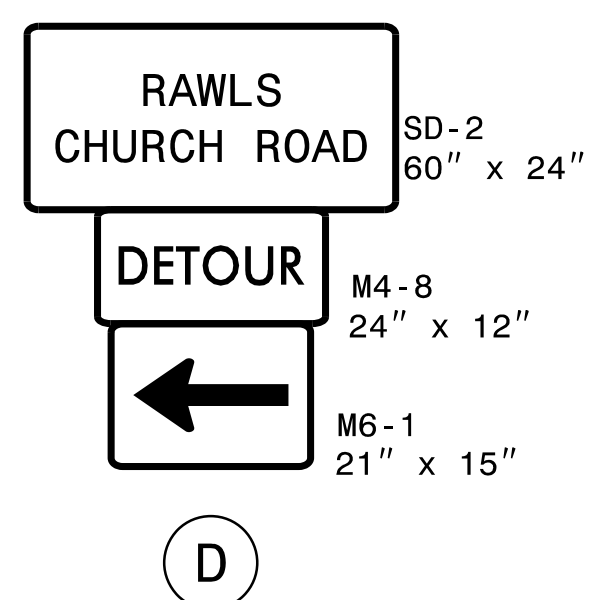
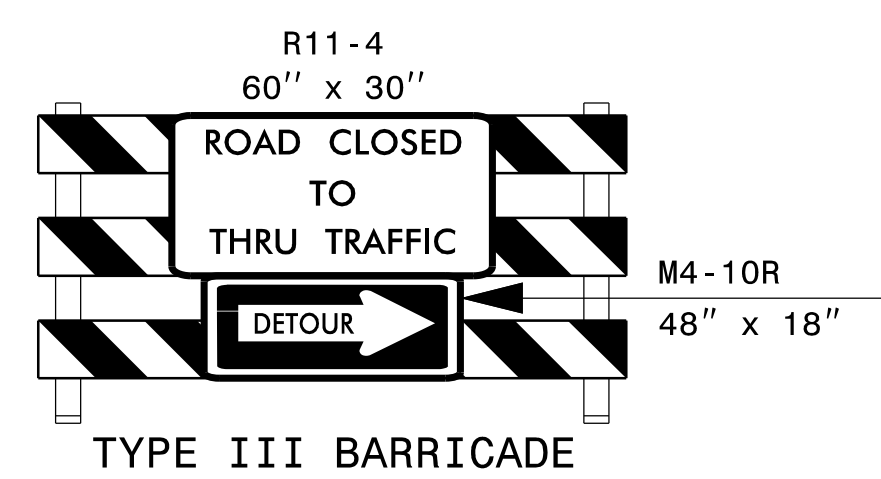
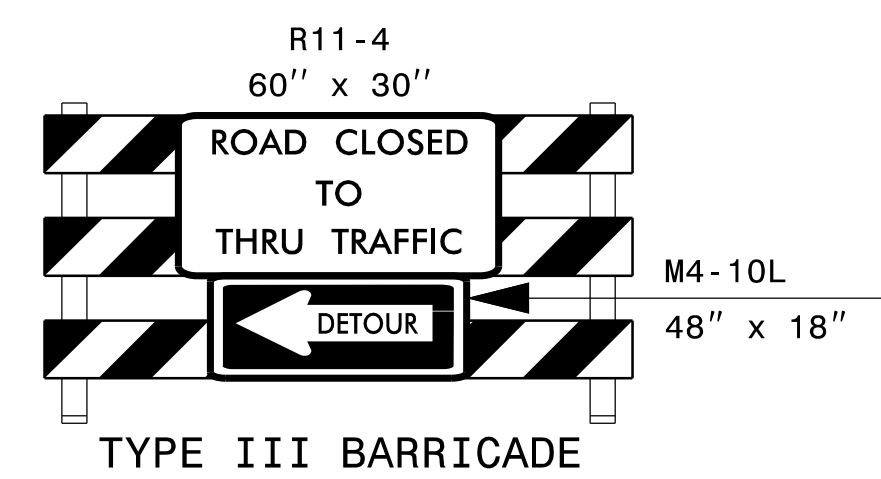
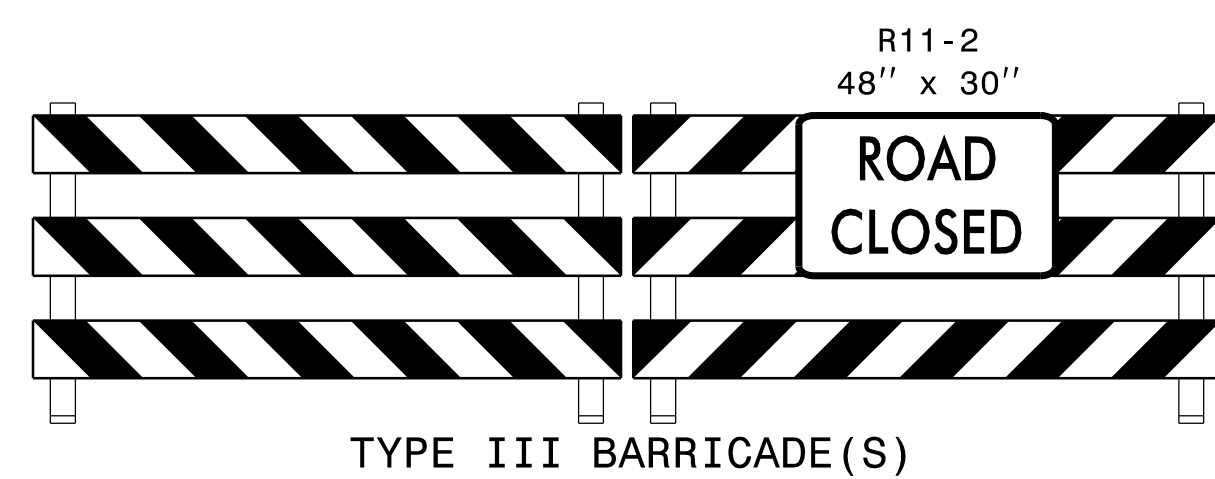
- E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

### TRAFFIC CONTROL DEVICES

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



SEE ROADWAY STD 1101.03 (SHEET 1 OF 9) FOR ADDITIONAL ADVANCE WARNING SIGNS.



APPROVED: *Charlette M.K. Rogne*  
 DATE: 4/16/2019  
 SEAL

MANAGEMENT STRATEGY,  
 PHASING NOTES,  
 GENERAL NOTES,  
 AND DETOUR SIGNING

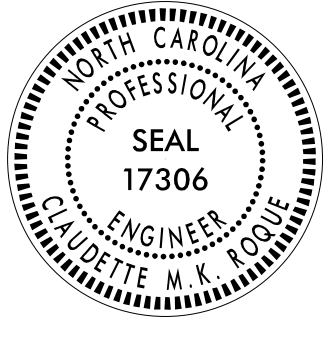
**PROJECT: 17BP.6.R.103**

**CONTRACT: DF00246**

**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN  
HARNETT COUNTY**

**LOCATION: BRIDGE NO.151 ON SR 1415 (RAWLS  
CHURCH RD) OVER HECTORS CREEK**

TIP NO. 17BP.6.R.103	SHEET NO. PMP - 1
Documented by: APPROVED: <i>Claudette M.K. Roque</i> DATE: 4/16/2019	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

**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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

<u>STD. NO.</u>	<u>TITLE</u>
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER 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

**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 DIRECTED BY THE ENGINEER.

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

<u>ROAD NAME</u>	<u>MARKING</u>	<u>MARKER</u>
RAWLS CHURCH ROAD	PERMANENT PAINT	RAISED

- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.  
 C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.  
 D) PASSING ZONE LOCATION WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

**PAVEMENT MARKING SCHEDULE**

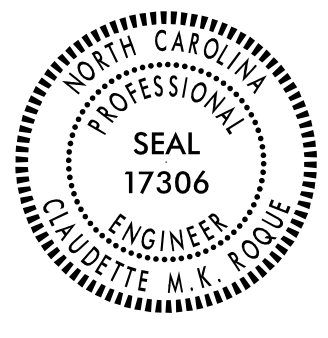

<u>SYMBOL</u>	<u>DESCRIPTION</u>
PAINT (4")	
PA	WHITE EDGELINE
PI	YELLOW DOUBLE CENTER

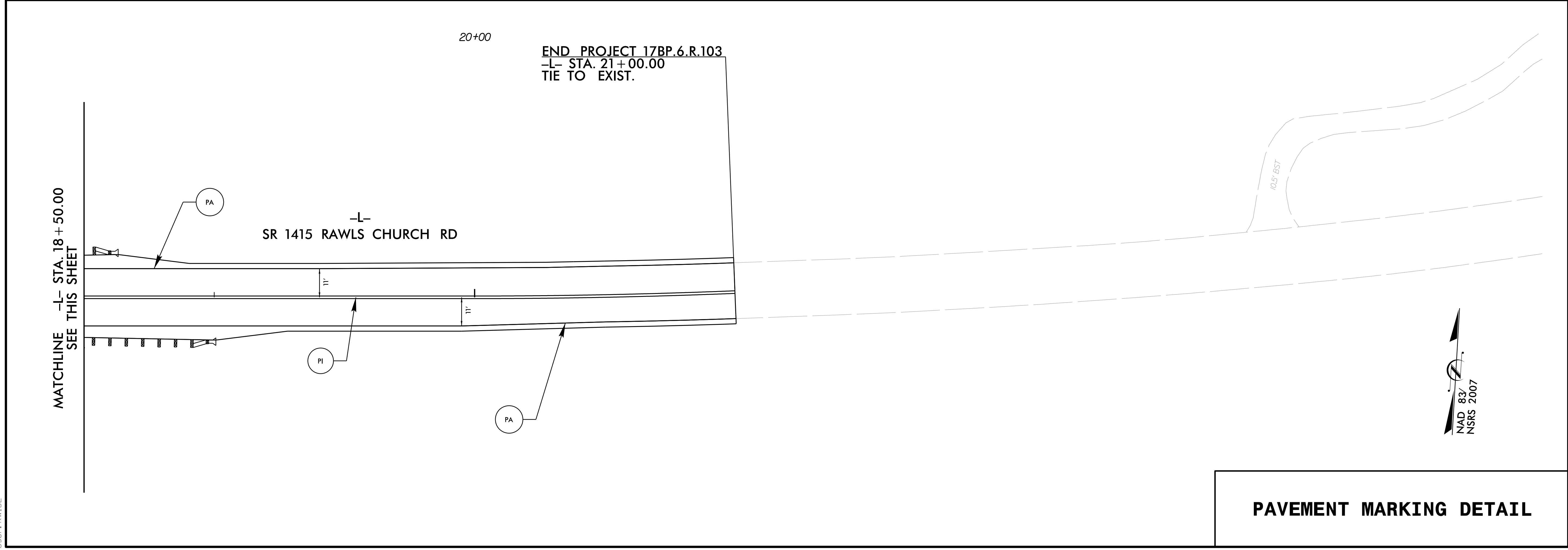
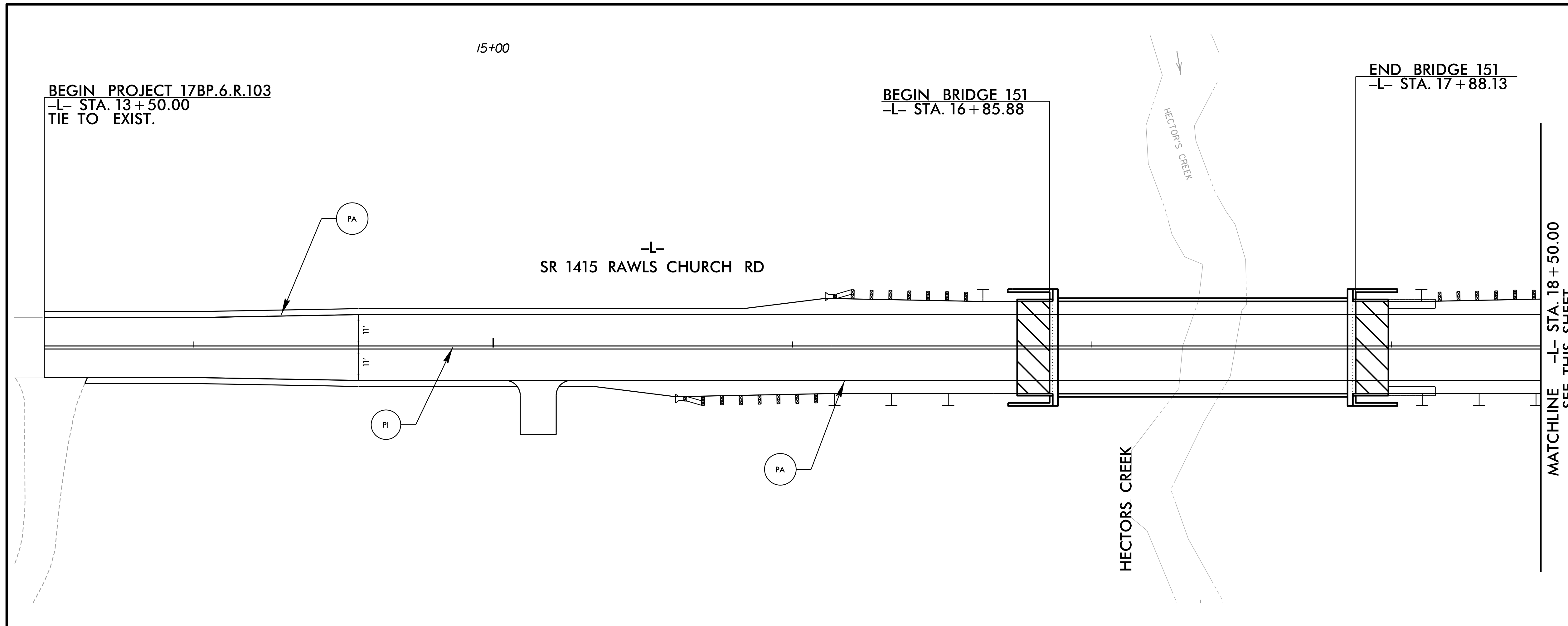
*PLANS PREPARED BY: Ramey Kemp & Associates*

**CLAUDETTE M.K. ROQUE, P.E.** PROJECT ENGINEER  
**KAYLA M. POULOS, E.I.** PROJECT DESIGN ENGINEER



**RAMEY KEMP & ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910

TIP NO. 17BP.6.R.103	SHEET NO. PMP-2
APPROVED: <i>Claudette M.K. Rogne</i> 483927205C441	
DATE: 4/16/2019	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 <b>RAMEY KEMP &amp; ASSOCIATES, INC.</b> Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 919-872-5115 Tel. 919-878-5416 Fax. www.rameykemp.com NC License No. C-0910	

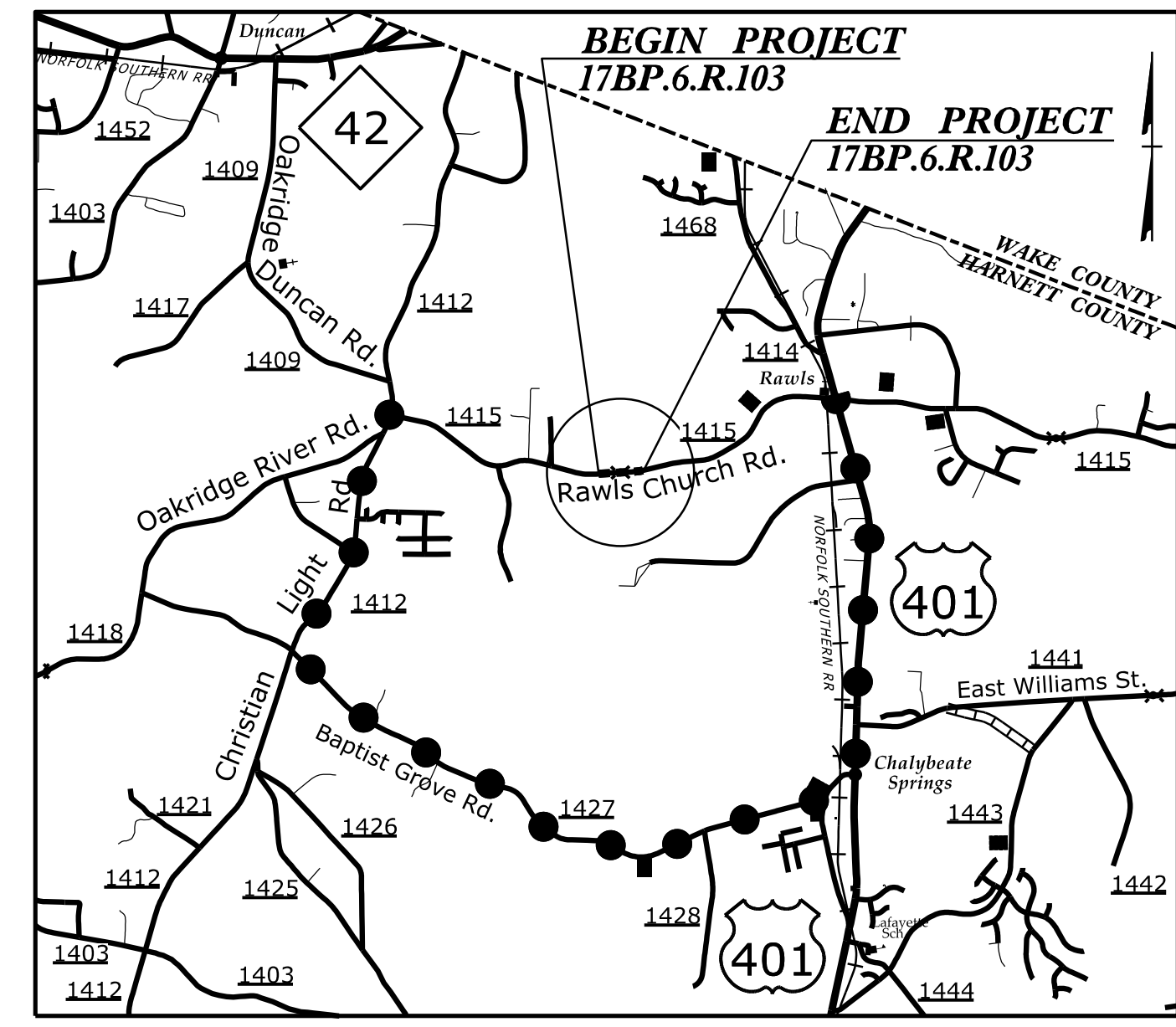


**PAVEMENT MARKING DETAIL**

4/16/2019  
User: KWISE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.103	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

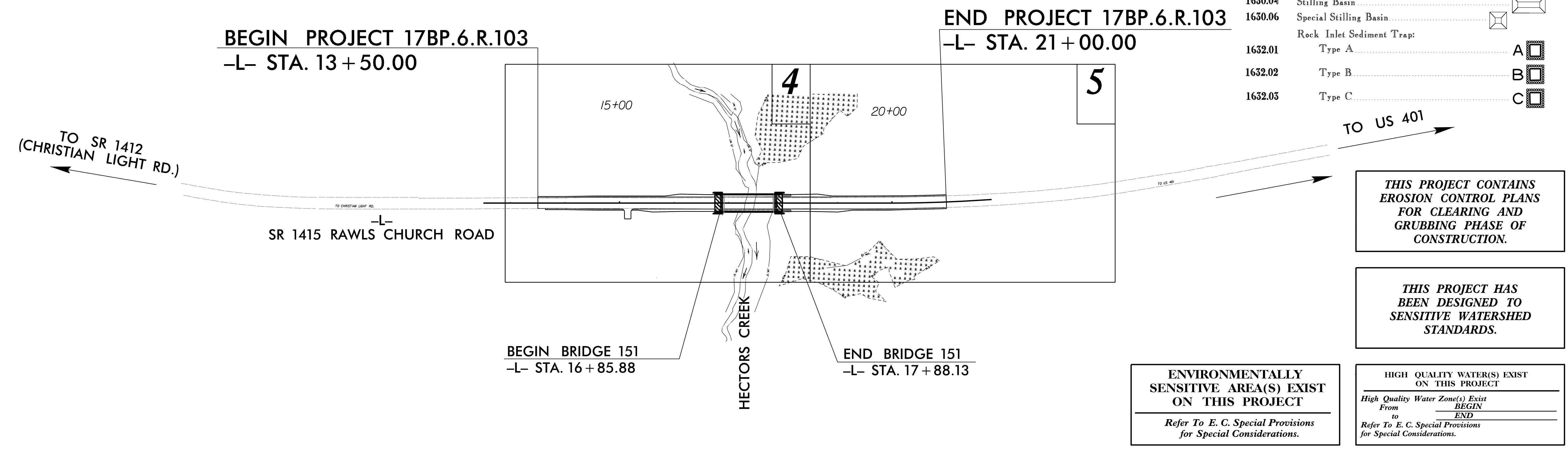
**TIP PROJECT: 17BP.6.R.103**



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

LOCATION: BRIDGE NO. 151 ON SR 1415 (RAWLS CHURCH RD) OVER HECTORS CREEK

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



**EROSION AND SEDIMENT CONTROL MEASURES**

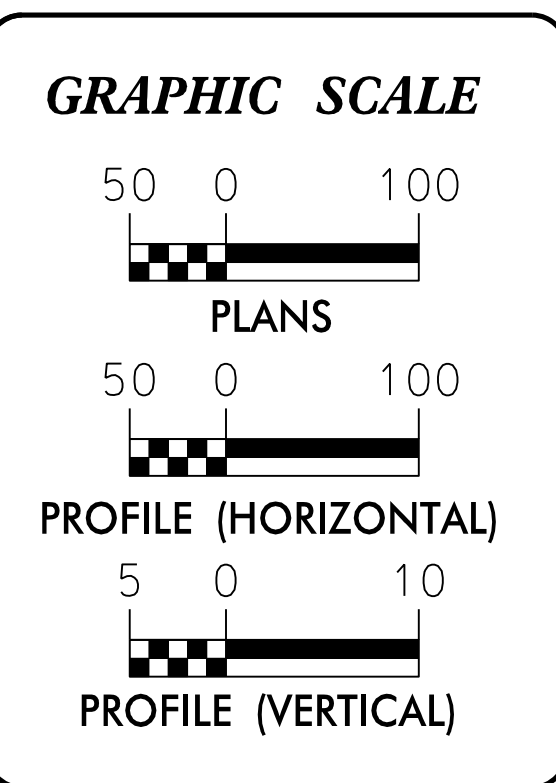
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	△△△△△
1622.01	Temporary Berms and Slope Drains	—
1630.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	⊗
	Temporary Rock 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

**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.

**HIGH QUALITY WATER(S) EXIST ON THIS PROJECT**  
High Quality Water Zone(s) Exist From BEGIN to END  
Refer To E. C. Special Provisions for Special Considerations.



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

**ECOLOGICAL ENGINEERING**

NC FIRM LICENSE No: F-1148  
1151 SE Cary Parkway  
Suite 101  
Cary, NC 27518  
(919) 557-0929

Designed by:

**BRANDON BARHAM, PE** 3368  
NAME LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

**ROADSIDE ENVIRONMENTAL UNIT**  
1 South Wilmington St.  
Raleigh, NC 27611

**2018 STANDARD SPECIFICATIONS**

Reviewed by:

**NOELLE RING, CPESC**

Roadway Standard Drawings

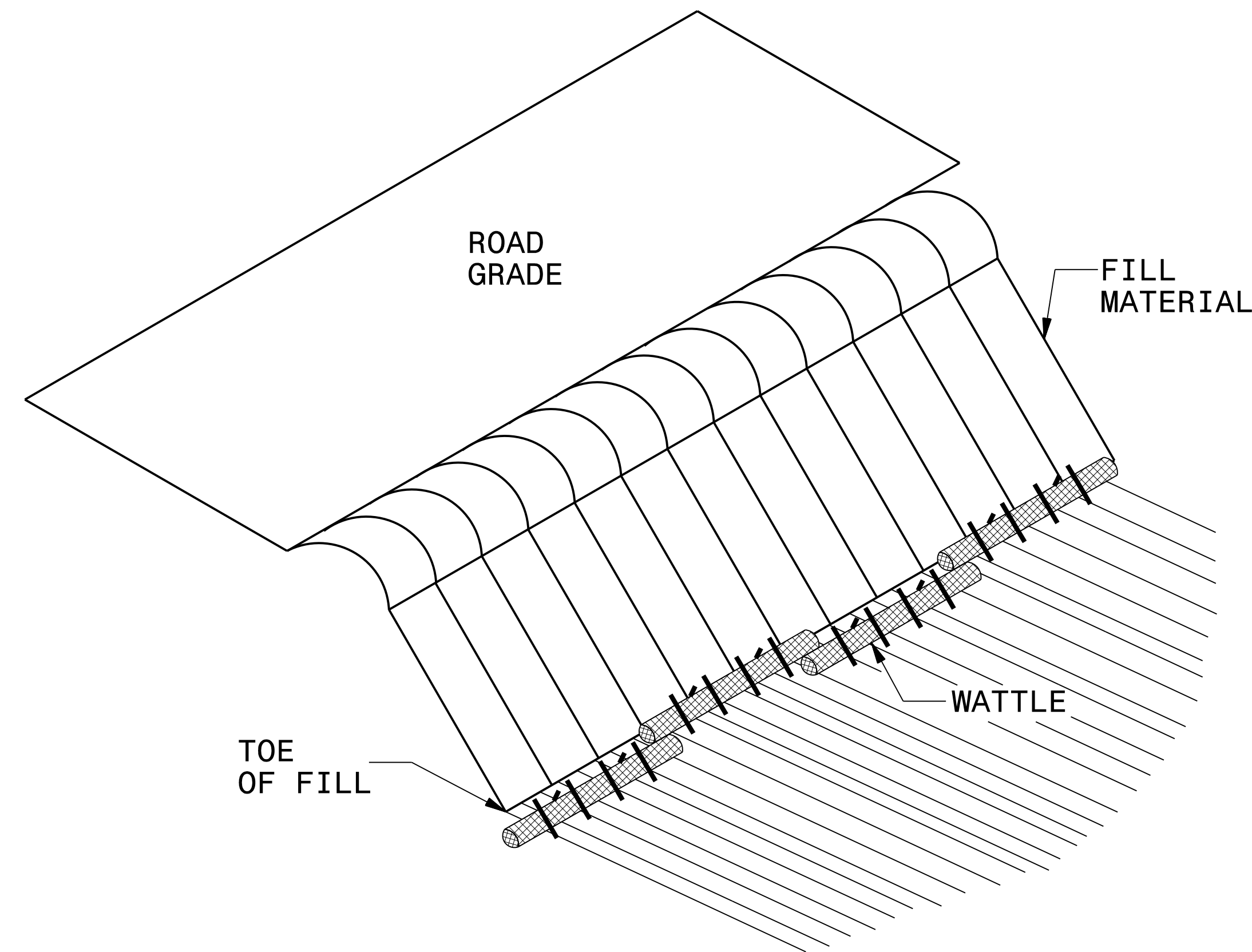
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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 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 Jaffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

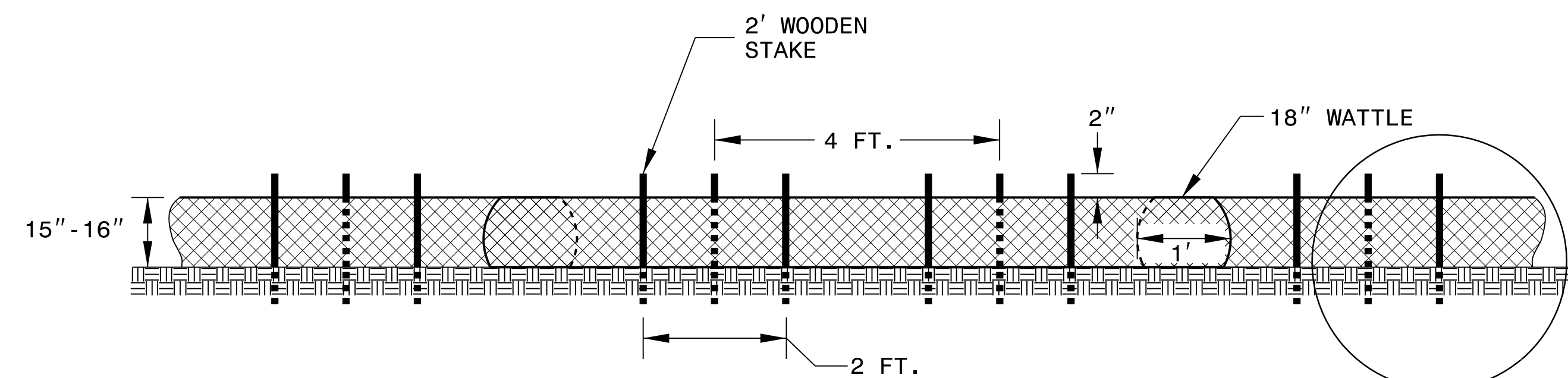
12:16:508 \BES005\_REU\_1.sch.dgn  
USE: Roadway

PROJECT REFERENCE NO. 17BP.6.R.J03	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# COIR FIBER WATTLE BARRIER DETAIL



**ISOMETRIC VIEW**



**FRONT VIEW**

**NOTES:**

USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

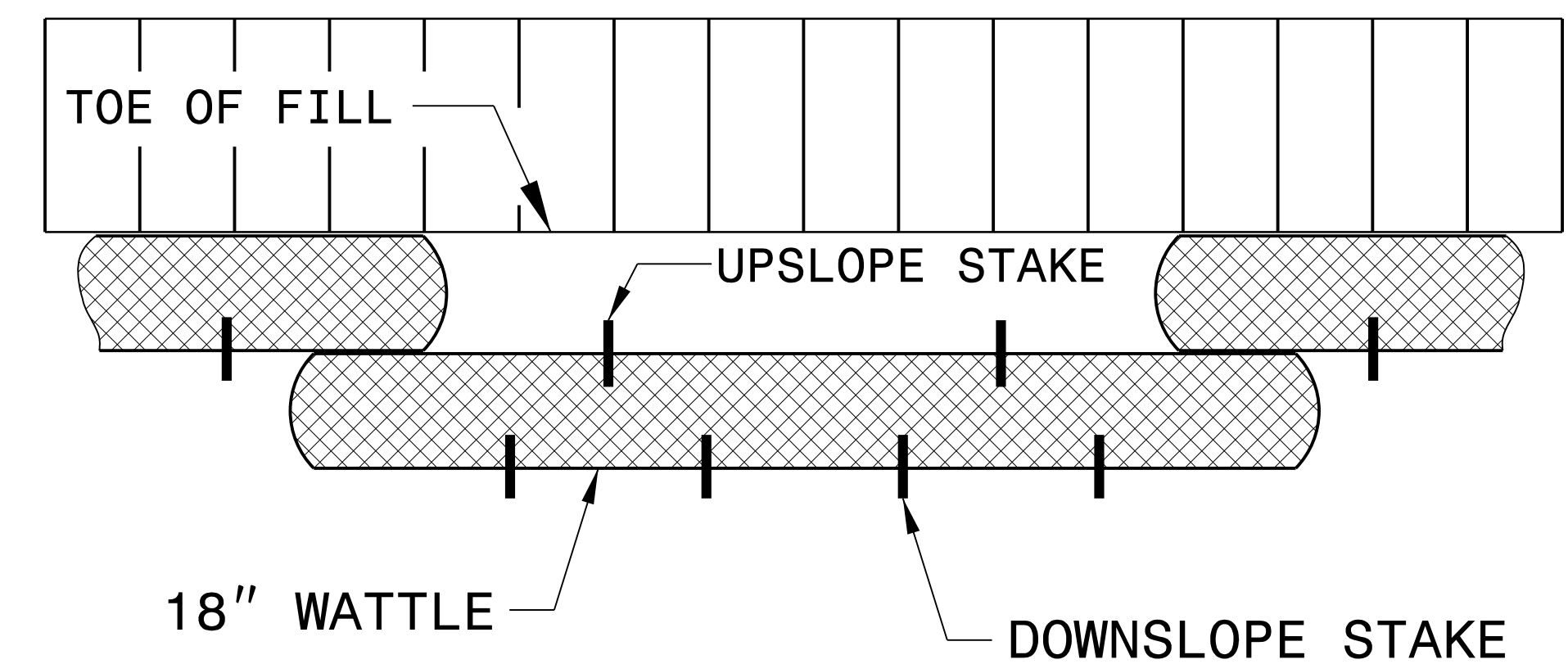
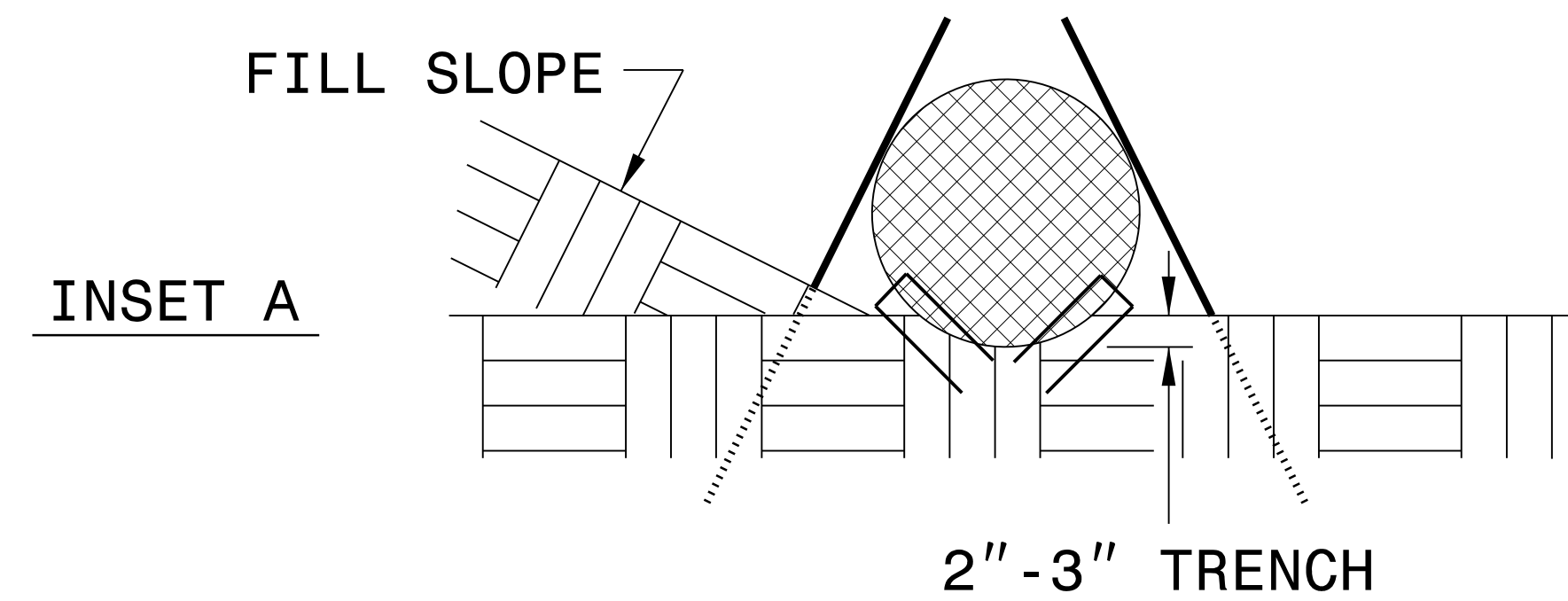
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

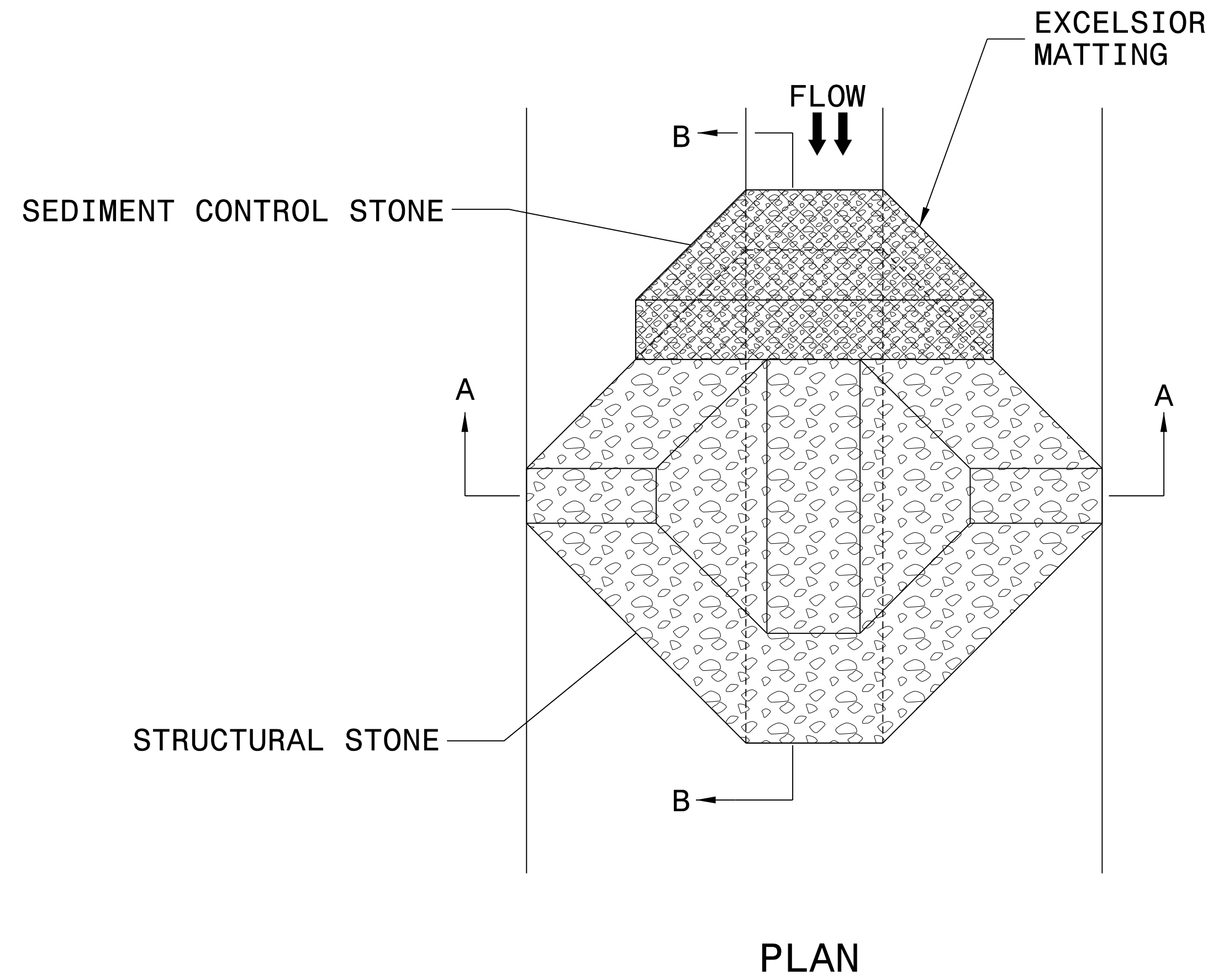
FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.



**TOP VIEW**

PROJECT REFERENCE NO. 17BP.6.R.103	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



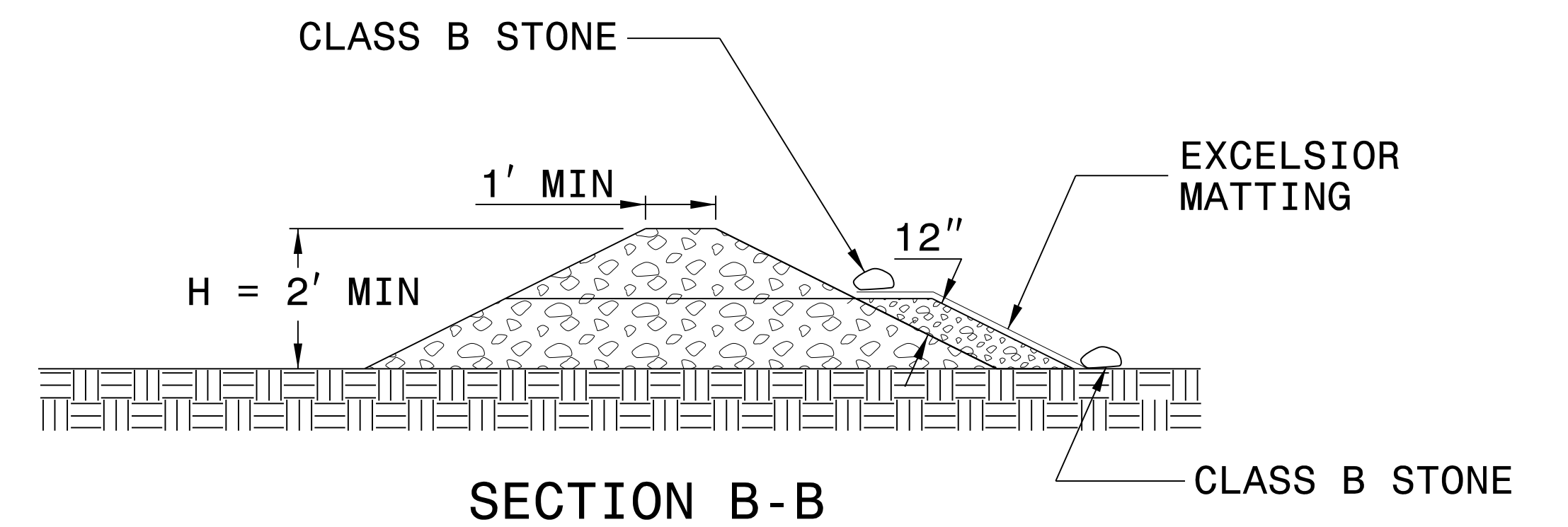
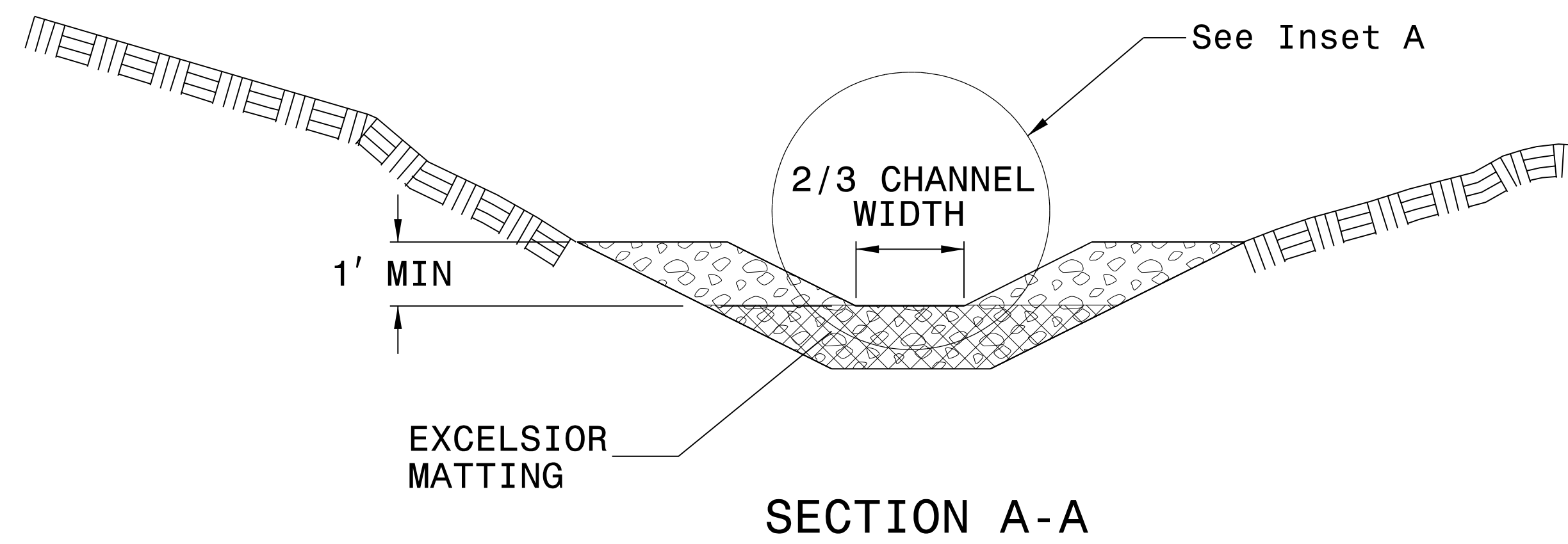
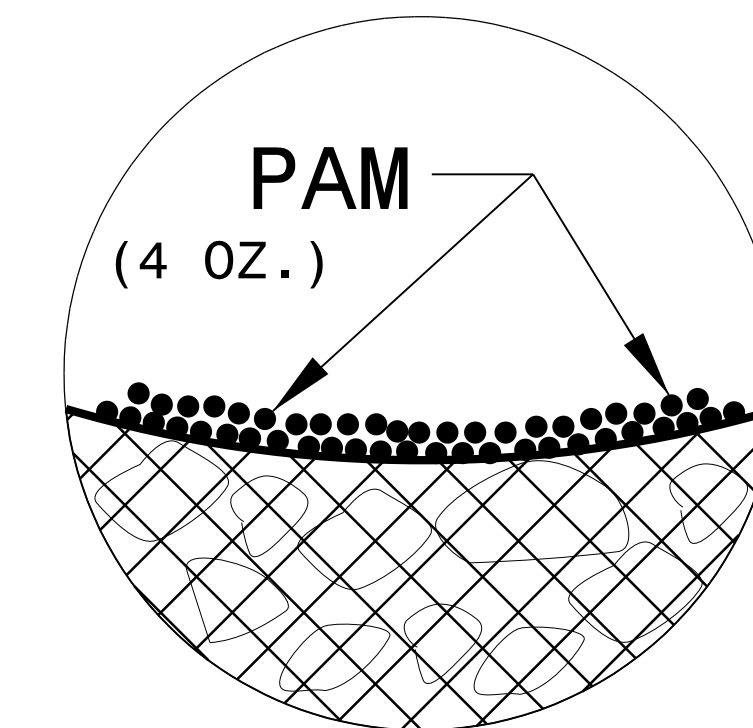
**NOTES:**

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.



NOT TO SCALE



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>17BP.6.RJ03</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	EC-04/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

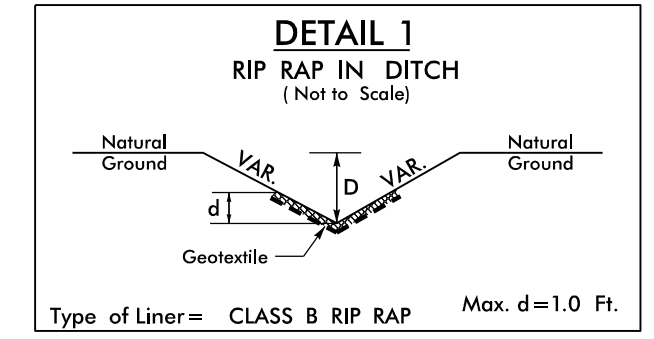
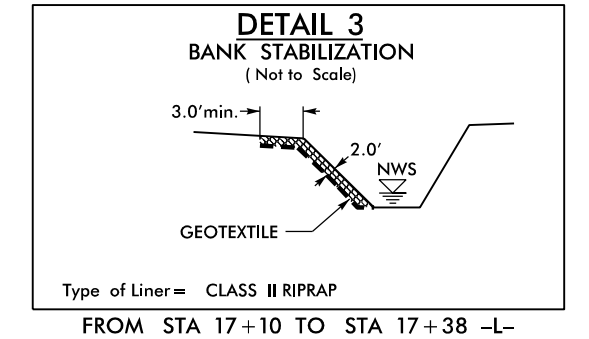
**RAMEY KEMP ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

NOTE: UTILIZE SPECIAL STILLING BASIN(S) WHERE APPLICABLE

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

ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS



NOTE: EXISTING CONCRETE FOOTERS ARE TO BE TOTALLY REMOVED. BANK WILL BE STABILIZED WITH CLASS II RIP RAP AS SHOWN IN DETAIL 3.

-L-  
 PI Sta 13+00.00  
 $\Delta = 0' 01' 49.3''$  (LT)  
 $D = 0' 01' 49.3''$   
 $L = 100.00'$   
 $T = 50.00'$   
 $R = 188,720.00'$

BEGIN PROJECT 17BP.6.R.103  
 -L- STA. 13+50.00  
 TIE TO EXIST.

1  
 CATHRYNE SEXTON  
 DB 95E PG 294

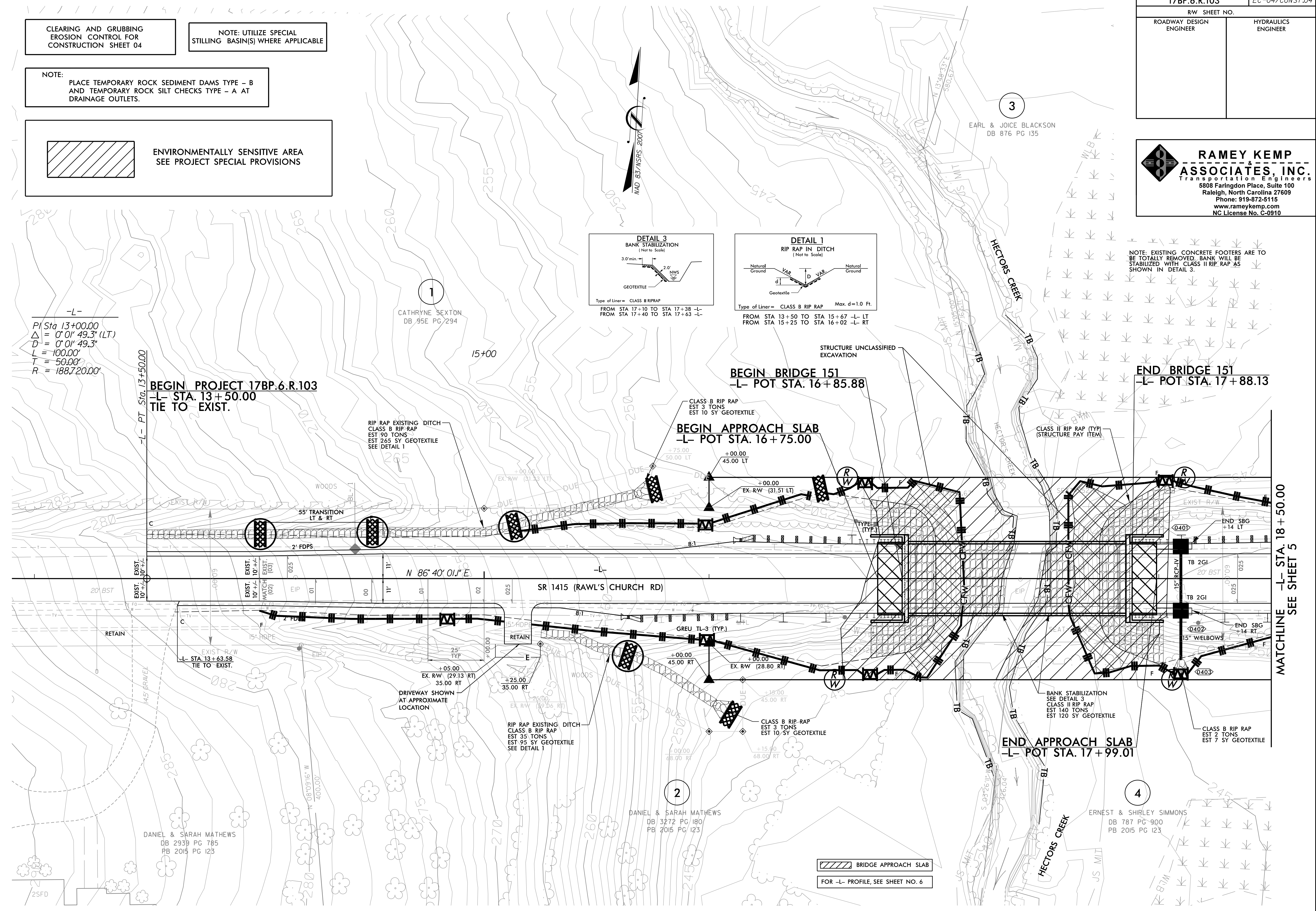
BEGIN BRIDGE 151  
 -L- POT STA. 16+85.88

BEGIN APPROACH SLAB  
 -L- POT STA. 16+75.00

END BRIDGE 151  
 -L- POT STA. 17+88.13

END APPROACH SLAB  
 -L- POT STA. 17+99.01

MATCHLINE -L- STA. 18+50.00  
 SEE SHEET 5



REVISIONS

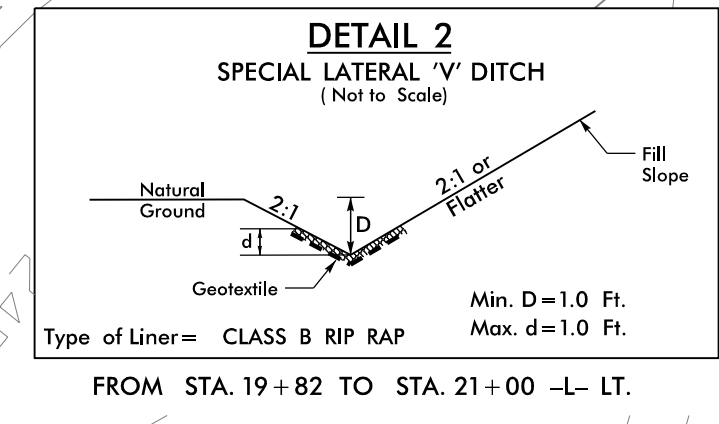
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PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	EC-05/CONST.05
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**RAMEY KEMP & ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910

CLEARING AND GRUBBING  
 EROSION CONTROL FOR  
 CONSTRUCTION SHEET 05

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



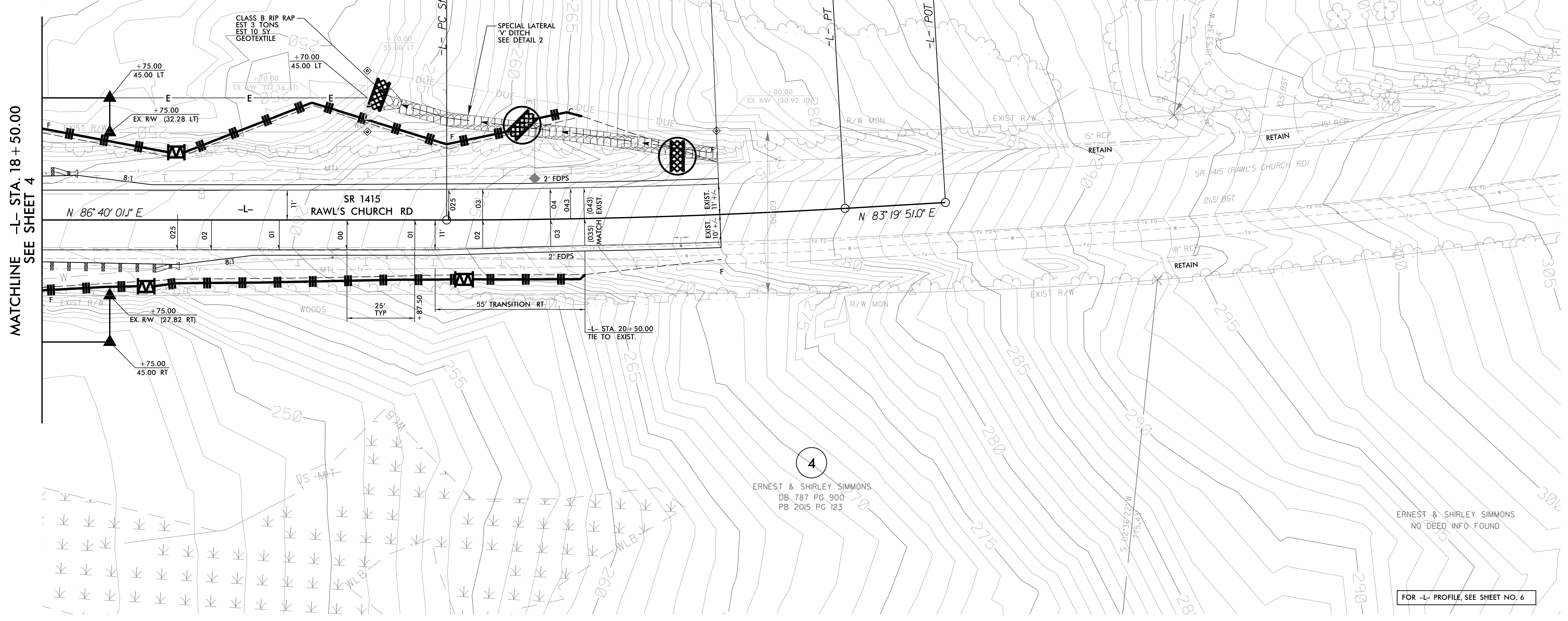
-L-  
 PI Sta 20+72.79  
 $\Delta = 3^{\circ}20'10.1''$  (LT)  
 $D = 2^{\circ}16'08.9''$   
 $L = 147.02'$   
 $T = 73.53'$   
 $R = 2,525.00'$   
 $e =$  transition to exist.  
 $DS = 60$  MPH



REVISIONS

MATCHLINE -L- STA. 18+50.00  
 SEE SHEET 4

END PROJECT 17BP.6.R.103  
 -L- STA. 21+00.00



4  
 ERNEST & SHIRLEY SIMMONS  
 DB. 787 PG. 900  
 PB 2015 PG 123

ERNEST & SHIRLEY SIMMONS  
 NO DEED INFO FOUND

FOR -L- PROFILE, SEE SHEET NO. 6

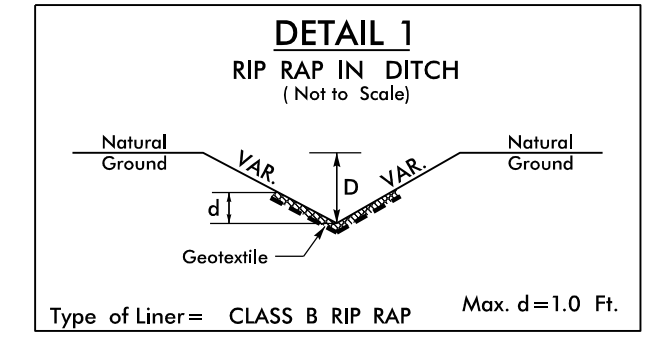
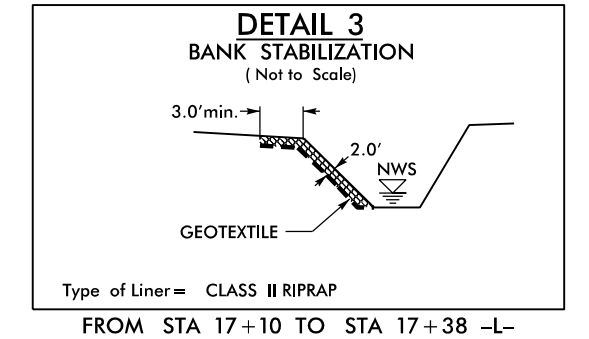
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PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	EC-06/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

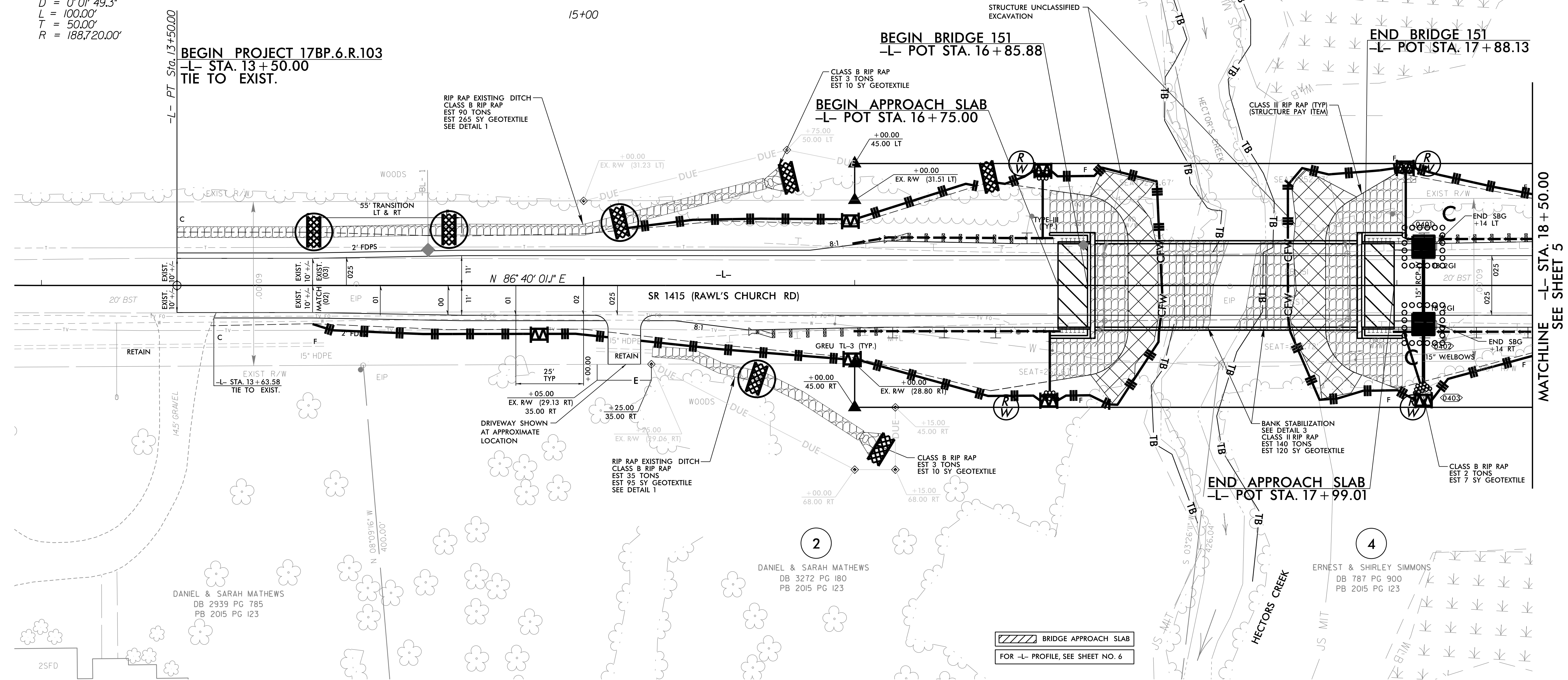
**RAMEY KEMP ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910

Place Matting for Erosion Control on Slope as Work Allows.  
 Sta. 16+00 to Sta. 16+70  
 Sta. 18+00 to Sta. 18+50

-L-  
 PI Sta 13+00.00  
 $\Delta = 0' 01' 49.3"$  (LT)  
 $D = 0' 01' 49.3"$   
 $L = 100.00'$   
 $T = 50.00'$   
 $R = 188,720.00'$



NOTE: EXISTING CONCRETE FOOTERS ARE TO BE TOTALLY REMOVED. BANK WILL BE STABILIZED WITH CLASS II RIP RAP AS SHOWN IN DETAIL 3.



1  
 CATHRYNE SEXTON  
 DB 95E PG 294

2  
 DANIEL & SARAH MATHEWS  
 DB 3272 PG 180  
 PB 2015 PG 123

4  
 ERNEST & SHIRLEY SIMMONS  
 DB 787 PG 900  
 PB 2015 PG 123

BRIDGE APPROACH SLAB  
 FOR -L- PROFILE, SEE SHEET NO. 6

MATCHLINE -L- STA. 18 + 50.00  
 SEE SHEET 5

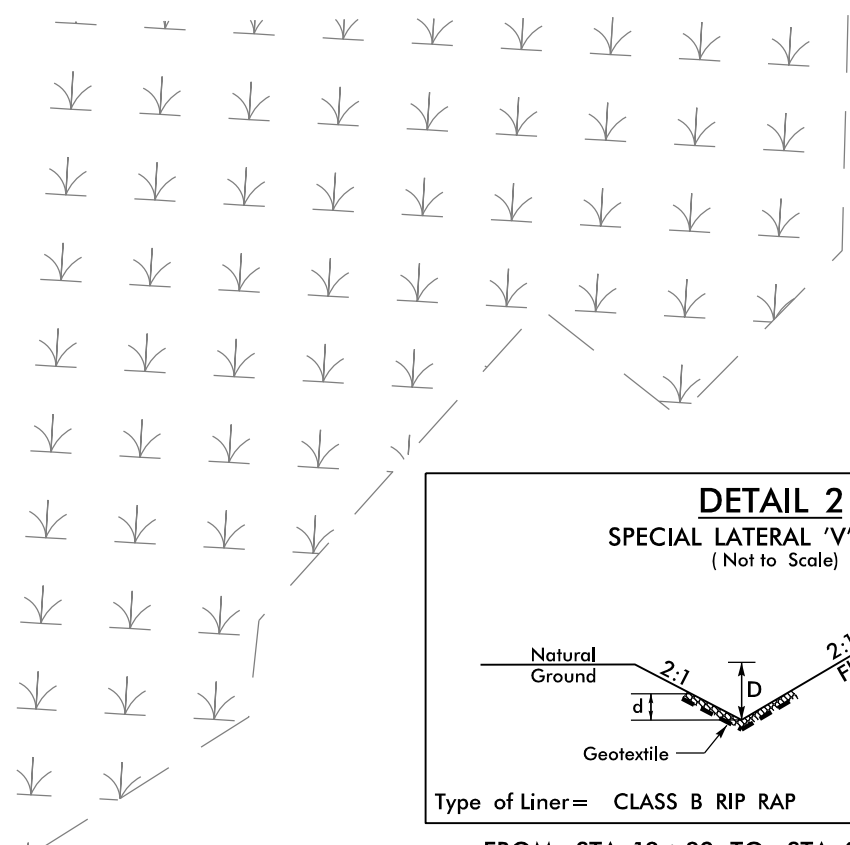
REVISIONS

12/15/2018  
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 8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.103	EC-07/CONST.05
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**RAMEY KEMP & ASSOCIATES, INC.**  
 Transportation Engineers  
 5808 Faringdon Place, Suite 100  
 Raleigh, North Carolina 27609  
 Phone: 919-872-5115  
 www.rameykemp.com  
 NC License No. C-0910

Place Matting for Erosion Control  
 on Slope as Work Allows.  
 Sta. 19+00 LT to Sta. 20+00 LT



FROM STA. 19+82 TO STA. 21+00 -L- LT.

3  
 EARL & JOICE BLACKSON  
 DB 876 PG 135

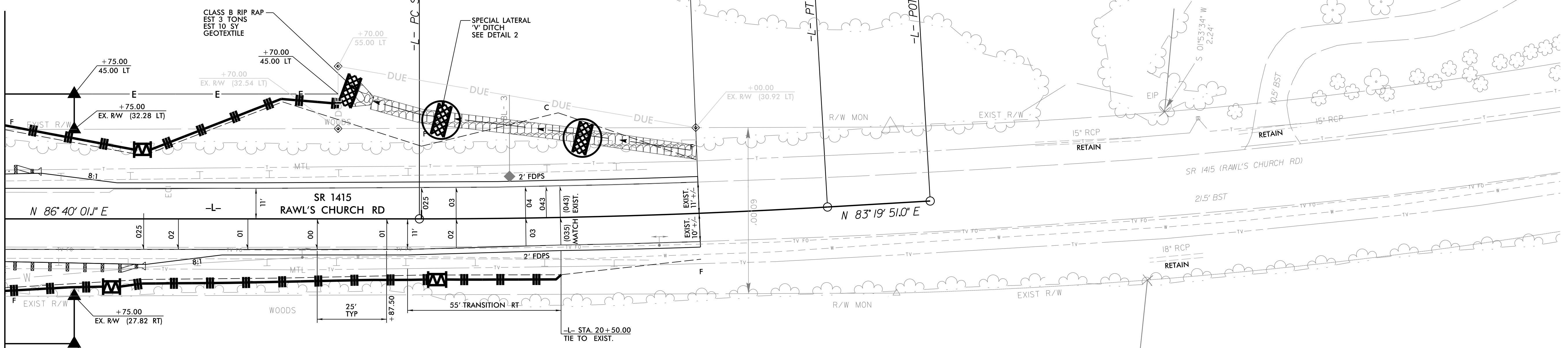
-L-  
 PI Sta 20+72.79  
 Δ = 3° 20' 10.1" (LT)  
 D = 2° 16' 08.9"  
 L = 147.02'  
 T = 73.53'  
 R = 2,525.00'  
 e = transition to exist.  
 DS = 60 MPH



20+00

END PROJECT 17BP.6.R.103  
 -L- STA. 21+00.00

MATCHLINE -L- STA. 18+50.00  
 SEE SHEET 4



4

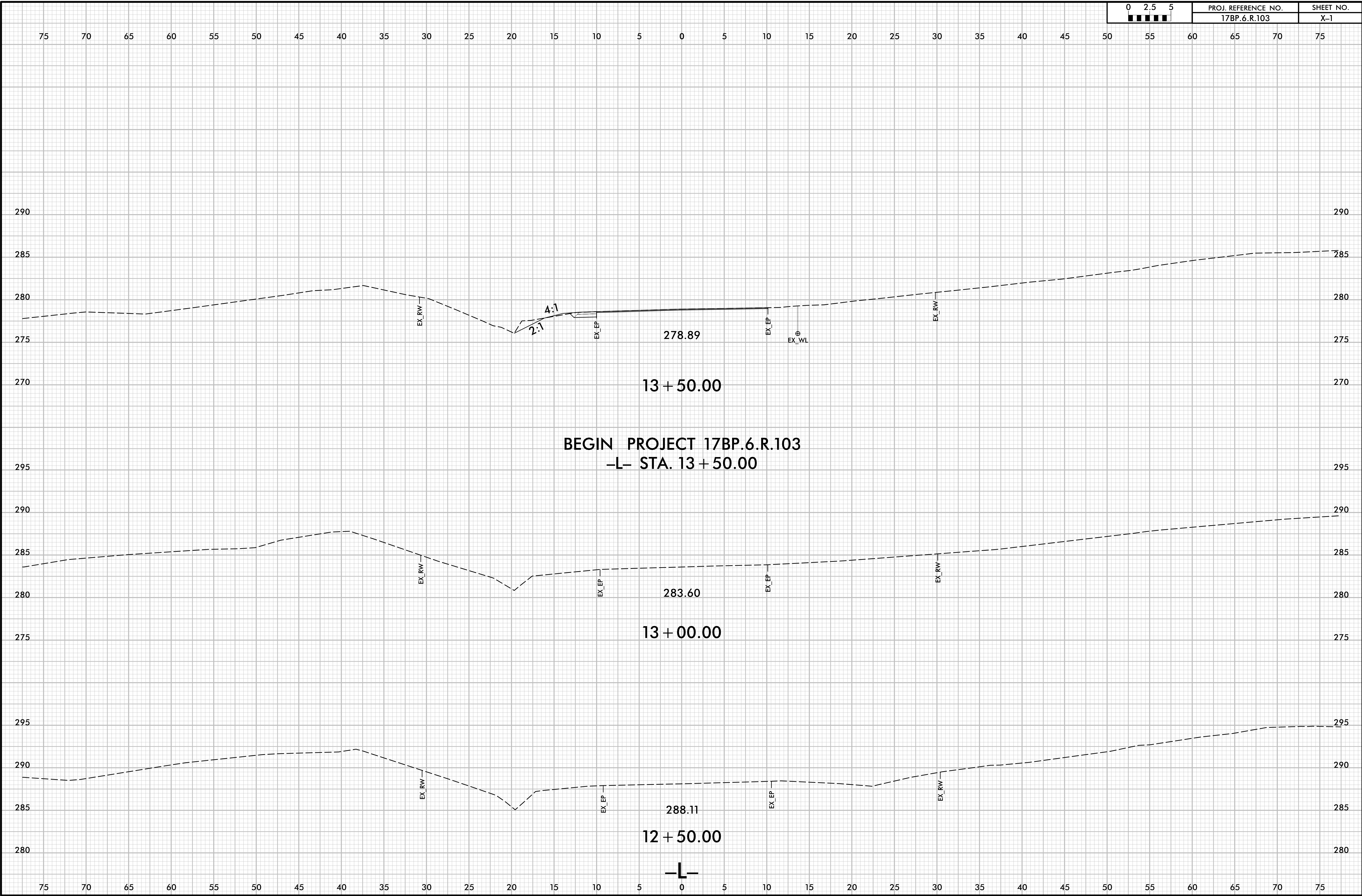
ERNEST & SHIRLEY SIMMONS  
 DB 787 PG 900  
 PB 2015 PG 123

ERNEST & SHIRLEY SIMMONS  
 NO DEED INFO FOUND

FOR -L- PROFILE, SEE SHEET NO. 6

REVISIONS

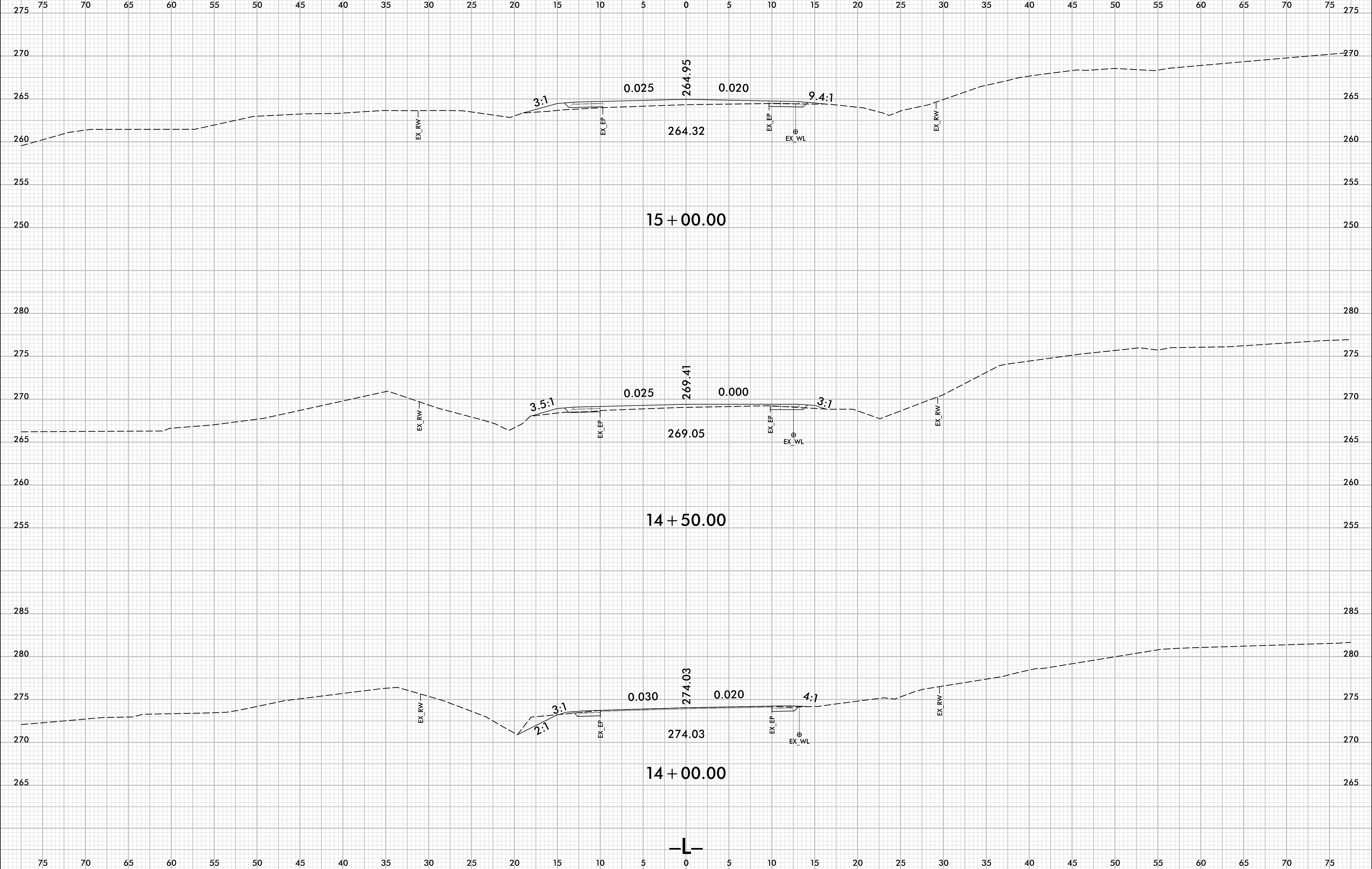




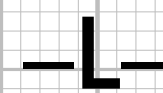
6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.103	X-2



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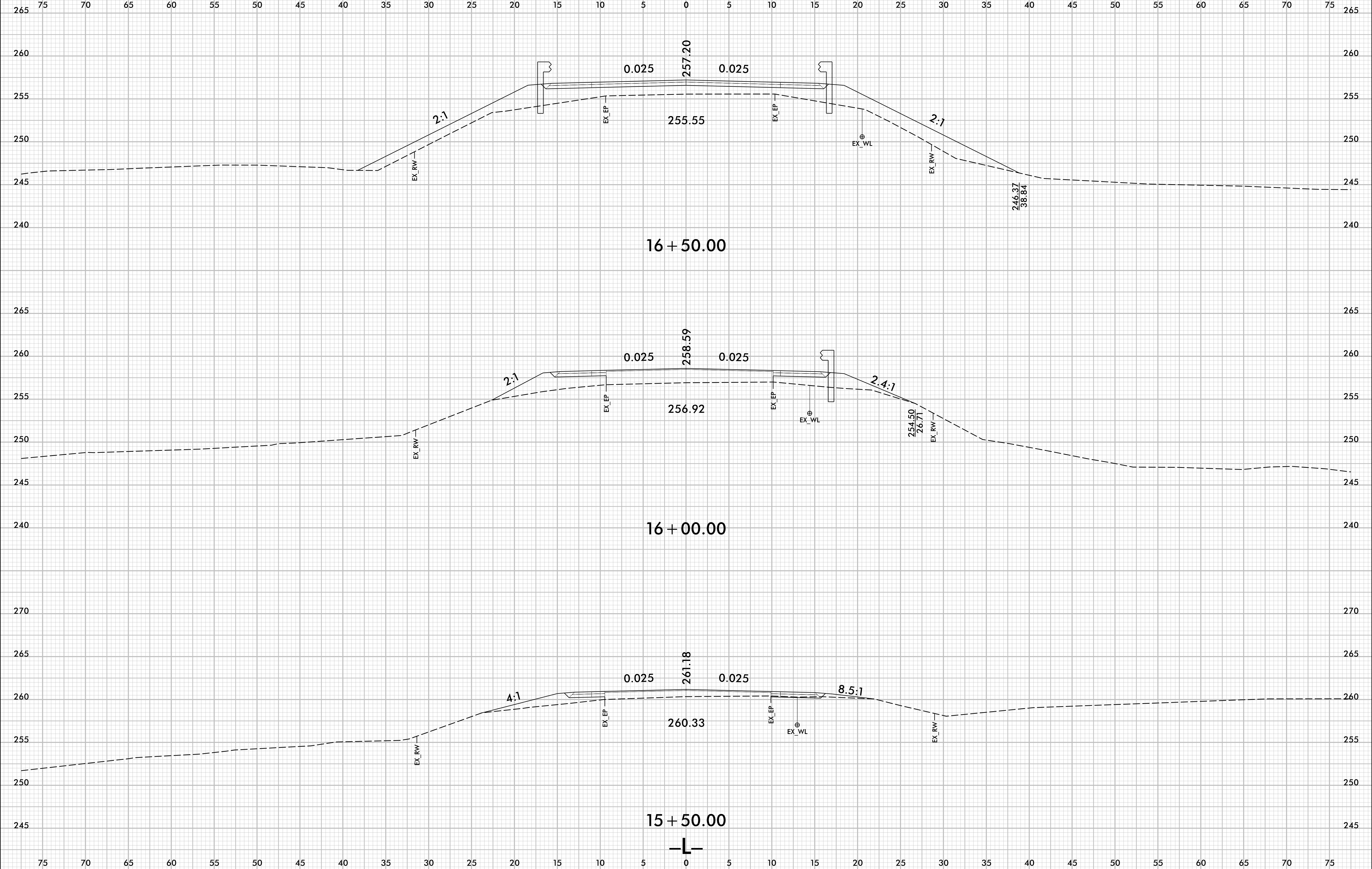




6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.103	X-3

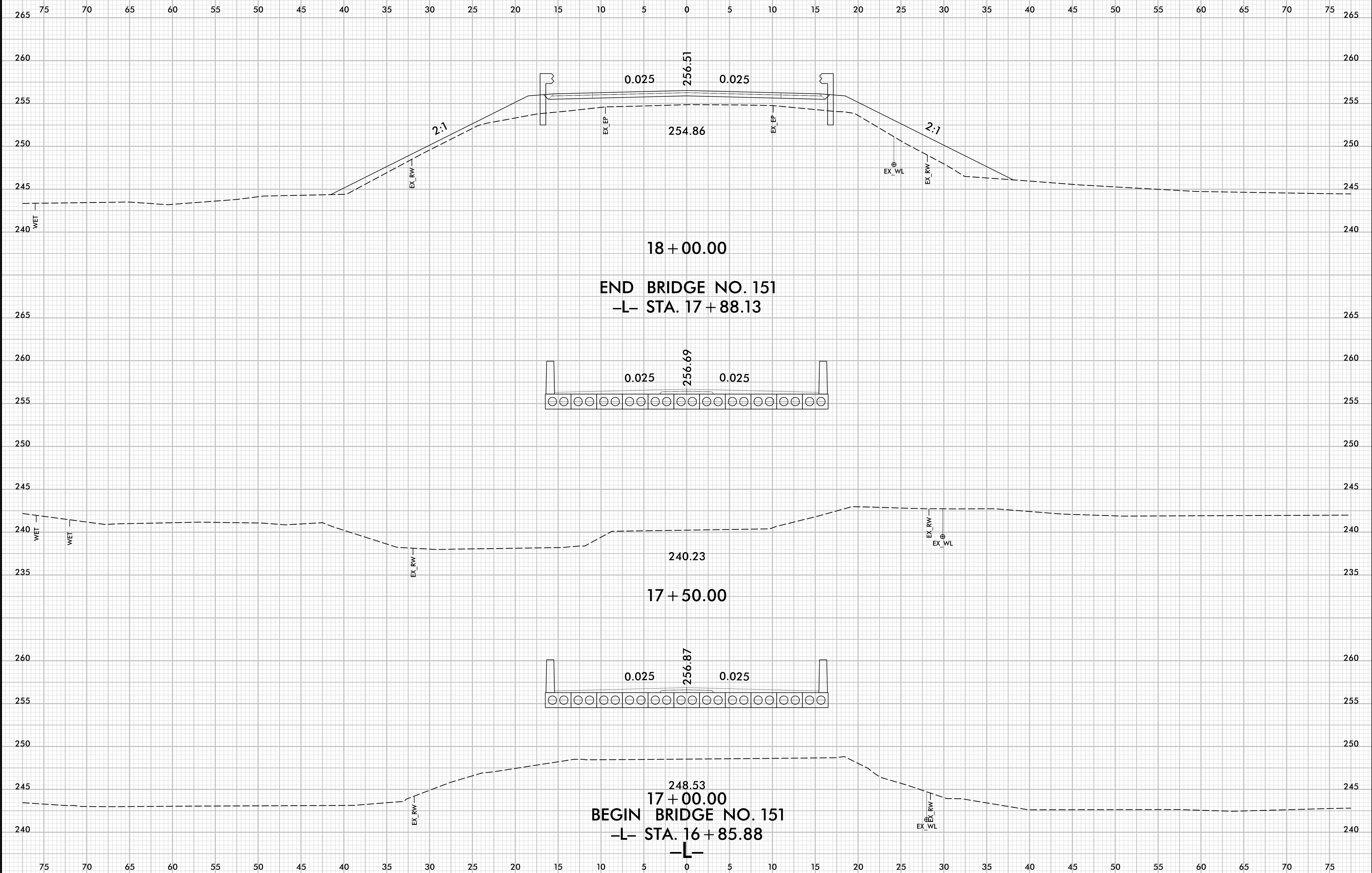


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User: kmise

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.103	X-4



18 + 00.00

END BRIDGE NO. 151  
-L- STA. 17 + 88.13

17 + 50.00

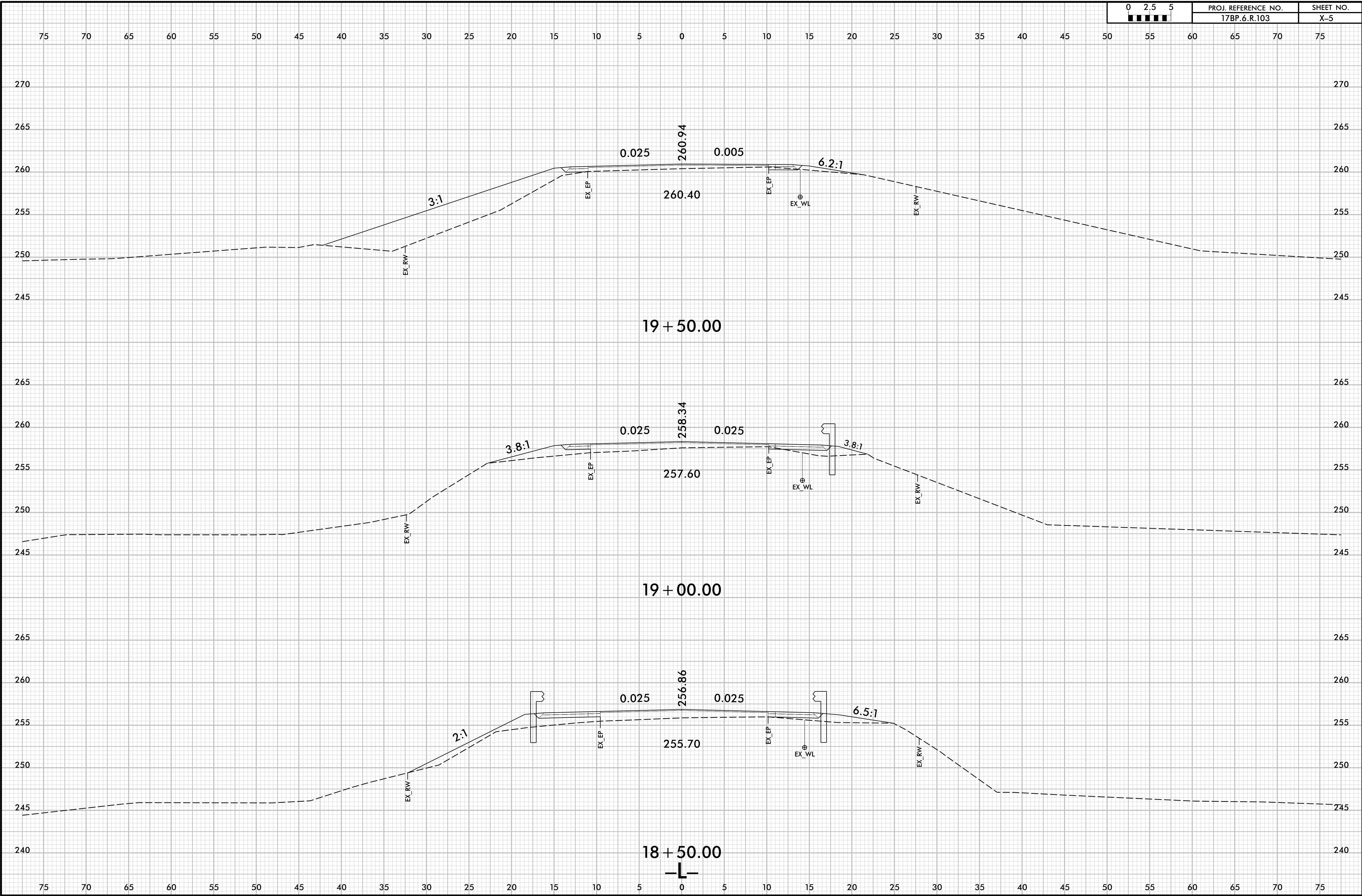
248.53  
17 + 00.00  
BEGIN BRIDGE NO. 151  
-L- STA. 16 + 85.88

12/17/2018  
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User: kmise

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.103	X-5



12/17/2018  
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User: kmise

6/23/16

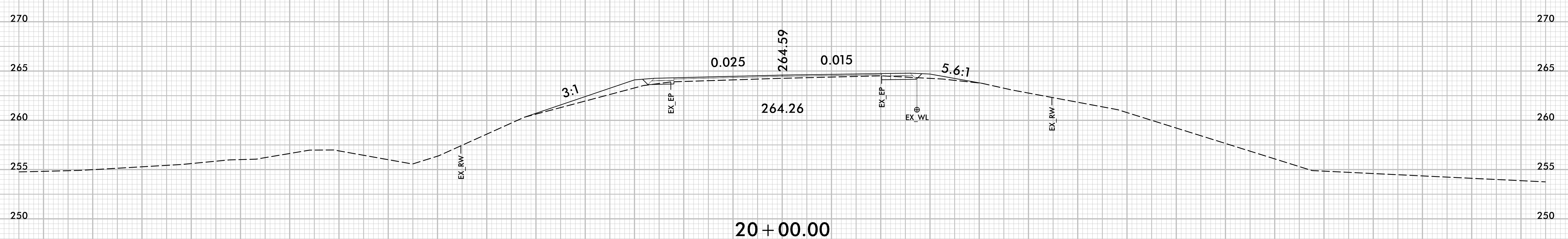
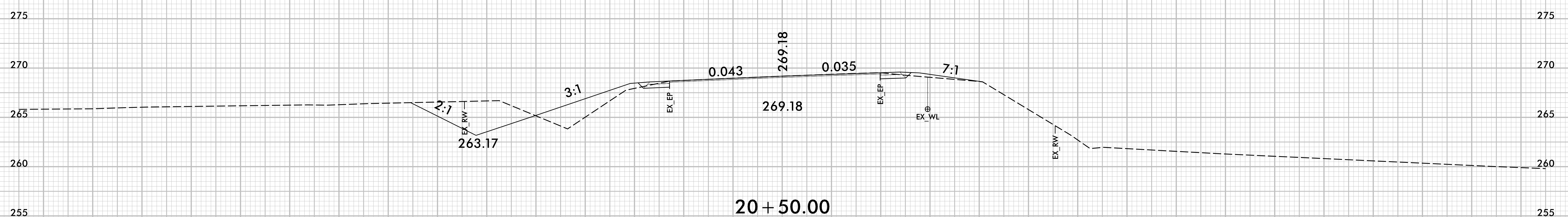
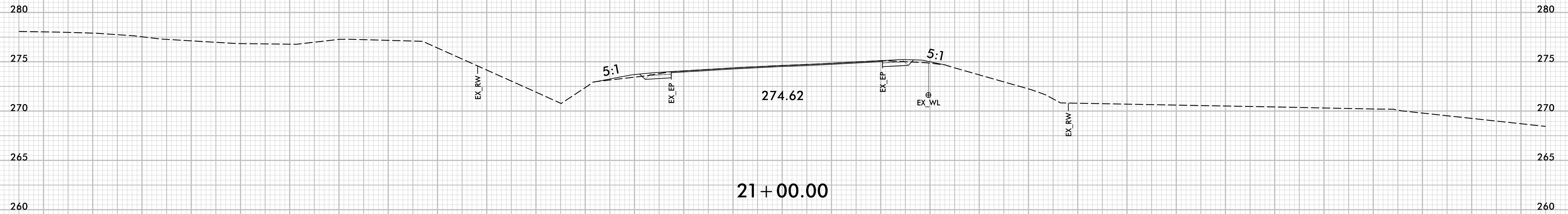


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17BP.6.R.103

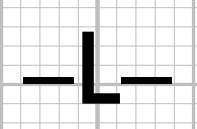
SHEET NO.  
X-6

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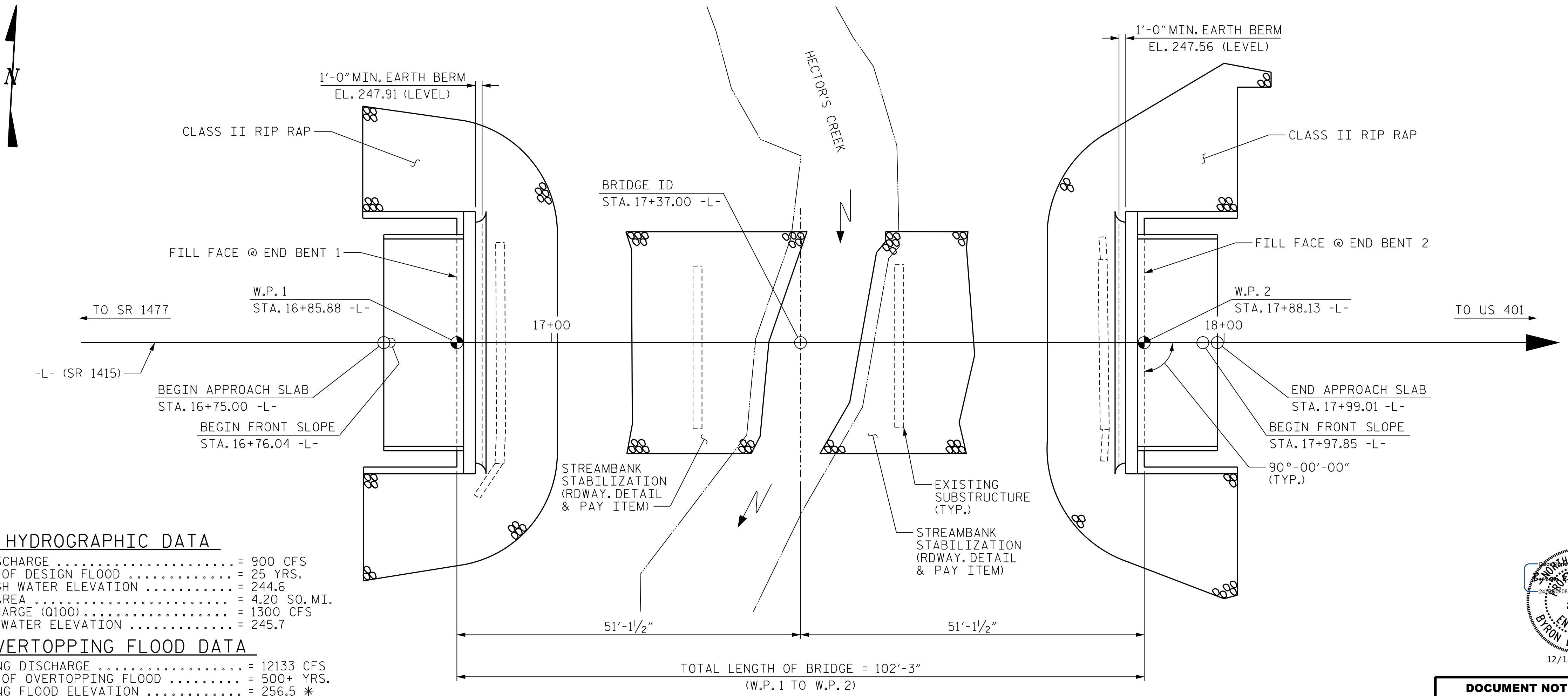
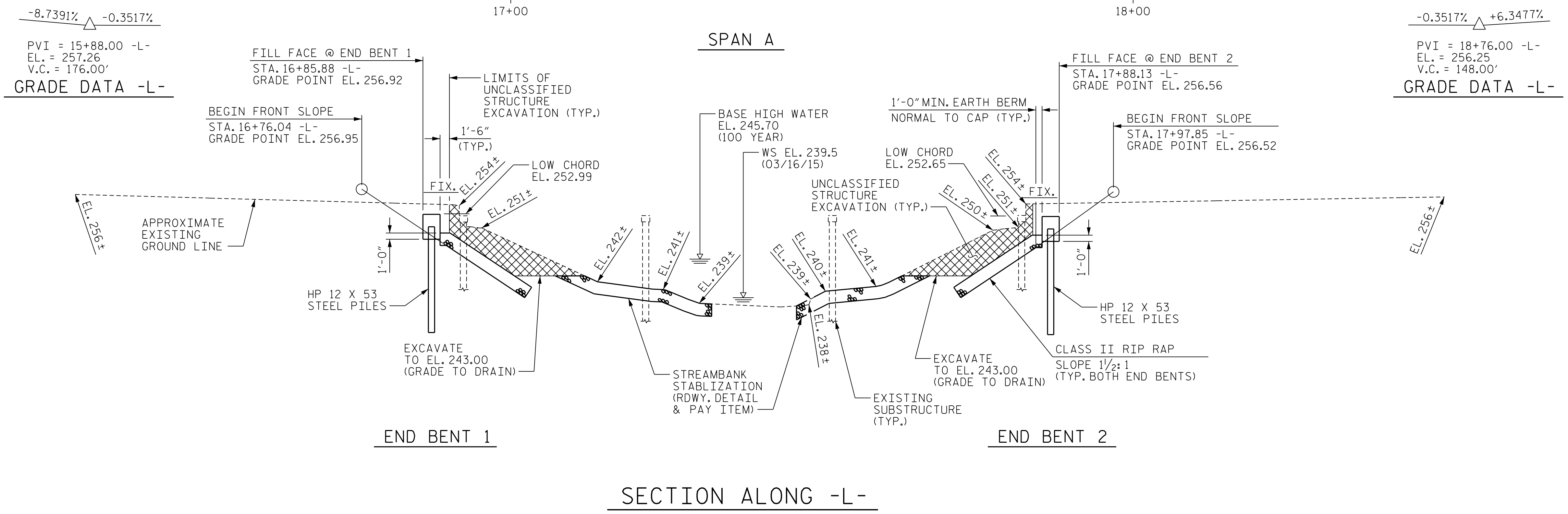
### END PROJECT 17BP.6.R.103 -L- STA. 21+00.00



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12/17/2018  
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User: kmise



**HYDROGRAPHIC DATA**

DESIGN DISCHARGE ..... = 900 CFS  
 FREQUENCY OF DESIGN FLOOD ..... = 25 YRS.  
 DESIGN HIGH WATER ELEVATION ..... = 244.6  
 DRAINAGE AREA ..... = 4.20 SQ. MI.  
 BASE DISCHARGE (Q100) ..... = 1300 CFS  
 BASE HIGH WATER ELEVATION ..... = 245.7

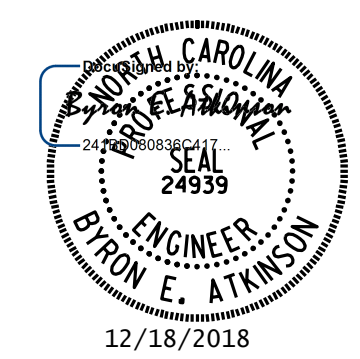
**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE ..... = 12133 CFS  
 FREQUENCY OF OVERTOPPING FLOOD ..... = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION ..... = 256.5 \*

\* AT STA. 18+10.00 -L-

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-  
 SHEET 1 OF 2 REPLACES BRIDGE NO. 151

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1415  
 OVER HECTOR'S CREEK  
 BETWEEN SR 1477 & US 401



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

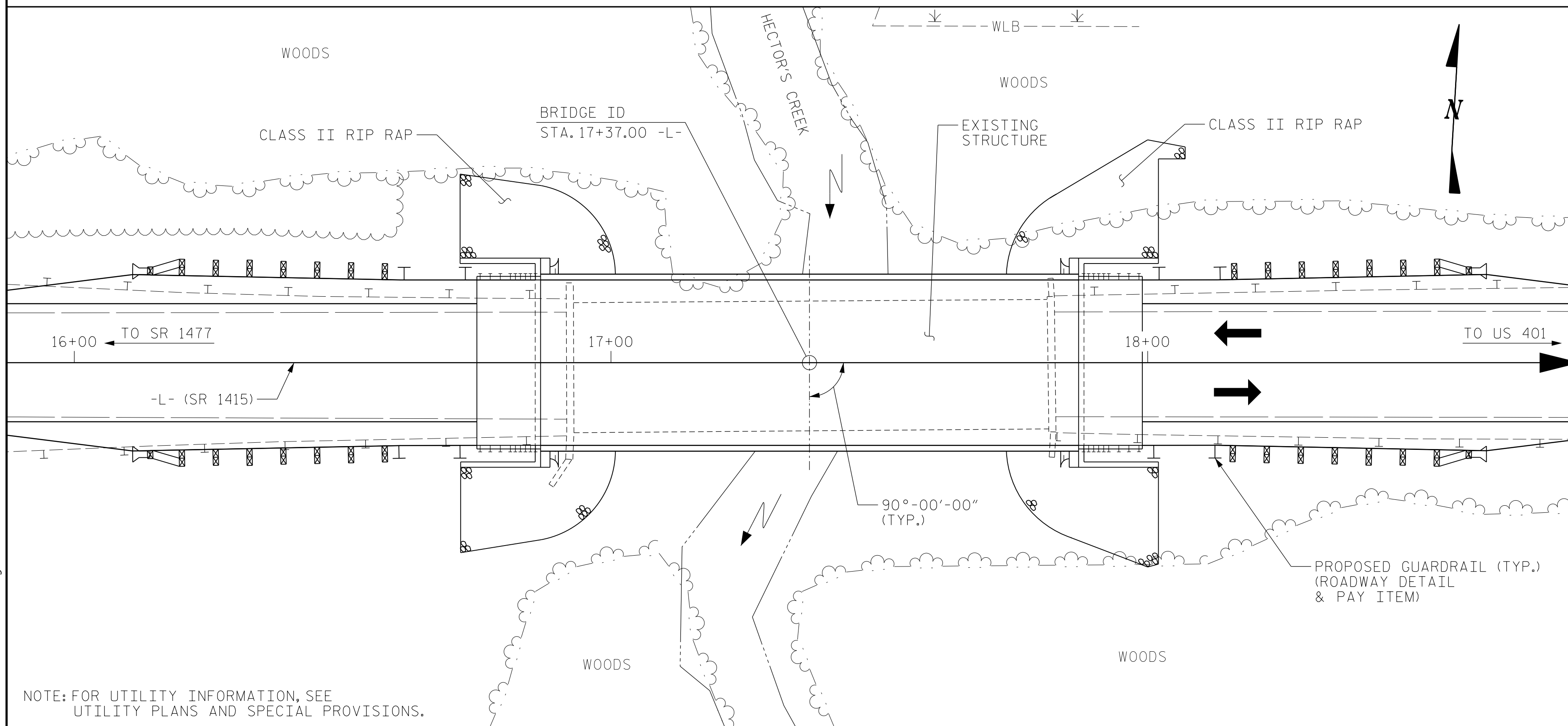
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			15

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DRAWN BY : B.E. LANNING DATE : 11/18  
 CHECKED BY : B.E. ATKINSON DATE : 11/18  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 11/18

BM: ELEVATIONS BASED OFF OF NCDOT "420151 BL-2", 14.92' LT. OF STA. 16+84.37 -L-, EL. 253.72



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS (3 @ 30'-0"), WITH ASPHALT WEARING SURFACE ON PRECAST PRESTRESSED CONCRETE CHANNELS AND A CLEAR ROADWAY WIDTH OF 24'-4" ON TIMBER CAP WITH TIMBER PILES AT END BENTS AND INTERIOR BENTS WITH REINFORCED CONCRETE SILLS AT BENT 1 AND BENT 2 AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED IN IT'S ENTIRETY. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE UP TO OF 45 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY. SEE ROADWAY QUANTITIES.  
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18- EVALUATING SCOUR AT BRIDGES".  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.  
 CONTRACTOR SHALL VERIFY LOCATION OF WATERLINE, MAINTAIN A SAFE CLEARANCE AND A MINIMUM OF 3 FEET OF COVER FOR CONSTRUCTION OF BRIDGE.

FOUNDATION NOTES

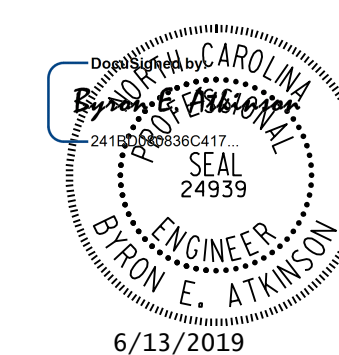
FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.  
 PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.  
 DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.  
 STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	NO.	LIN. FT.	EACH	LIN. FT.	TON	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE					LUMP SUM						200.00			LUMP SUM	11	1100.00
END BENT 1			LUMP SUM	29.0		4610	7	7	105	7		214	238			
END BENT 2			LUMP SUM	29.0		4610	7	7	105	7		213	237			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	58.0	LUMP SUM	9220	14	14	210	14	200.00	427	475	LUMP SUM	11	1100.00

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 2 OF 2



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

**MI ENGINEERING**  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1415  
 OVER HECTOR'S CREEK  
 BETWEEN SR 1477 & US 401

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

DRAWN BY : B.E. LANNING DATE : 11/18  
 CHECKED BY : B.E. ATKINSON DATE : 11/18  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 11/18

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LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.035	--	1.75	0.272	1.26	A	EL	49.25	0.489	1.34	A	EL	4.925	0.80	0.272	1.04	A	EL	49.25		
	HL-93(Opr)	N/A	--	1.633	--	1.35	0.272	1.63	A	EL	49.25	0.489	1.73	A	EL	4.925	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.44	51.84	1.75	0.272	1.75	A	EL	49.25	0.489	1.81	A	EL	4.925	0.80	0.272	1.44	A	EL	49.25		
	HS-20(Opr)	36.000	--	2.271	81.756	1.35	0.272	2.27	A	EL	49.25	0.489	2.35	A	EL	4.925	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.413	46.079	1.4	0.272	5.19	A	EL	49.25	0.489	5.59	A	EL	4.925	0.80	0.272	3.41	A	EL	49.25	
		SNGARBS2	20.000	--	2.473	49.452	1.4	0.272	3.76	A	EL	49.25	0.489	3.91	A	EL	4.925	0.80	0.272	2.47	A	EL	49.25	
		SNAGRIS2	22.000	--	2.313	50.885	1.4	0.272	3.52	A	EL	49.25	0.489	3.6	A	EL	4.925	0.80	0.272	2.31	A	EL	49.25	
		SNCOTTS3	27.250	--	1.696	46.228	1.4	0.272	2.58	A	EL	49.25	0.489	2.78	A	EL	4.925	0.80	0.272	1.70	A	EL	49.25	
		SNAGGRS4	34.925	--	1.39	48.556	1.4	0.272	2.11	A	EL	49.25	0.489	2.26	A	EL	4.925	0.80	0.272	1.39	A	EL	49.25	
		SNS5A	35.550	--	1.361	48.398	1.4	0.272	2.07	A	EL	49.25	0.489	2.27	A	EL	4.925	0.80	0.272	1.36	A	EL	49.25	
		SNS6A	39.950	--	1.238	49.456	1.4	0.272	1.88	A	EL	49.25	0.489	2.05	A	EL	4.925	0.80	0.272	1.24	A	EL	49.25	
	SNS7B	42.000	--	1.178	49.496	1.4	0.272	1.79	A	EL	49.25	0.489	2	A	EL	4.925	0.80	0.272	1.18	A	EL	49.25		
	TTST	TNAGRIT3	33.000	--	1.506	49.709	1.4	0.272	2.29	A	EL	49.25	0.489	2.46	A	EL	4.925	0.80	0.272	1.51	A	EL	49.25	
		TNT4A	33.075	--	1.51	49.942	1.4	0.272	2.3	A	EL	49.25	0.489	2.41	A	EL	4.925	0.80	0.272	1.51	A	EL	49.25	
		TNT6A	41.600	--	1.224	50.926	1.4	0.272	1.86	A	EL	49.25	0.489	2.09	A	EL	4.925	0.80	0.272	1.22	A	EL	49.25	
		TNT7A	42.000	--	1.225	51.442	1.4	0.272	1.86	A	EL	49.25	0.489	2.05	A	EL	4.925	0.80	0.272	1.22	A	EL	49.25	
		TNT7B	42.000	--	1.254	52.657	1.4	0.272	1.91	A	EL	49.25	0.489	1.96	A	EL	4.925	0.80	0.272	1.25	A	EL	49.25	
		TNAGRIT4	43.000	--	1.203	51.711	1.4	0.272	1.83	A	EL	49.25	0.489	1.91	A	EL	4.925	0.80	0.272	1.20	A	EL	49.25	
TNACT5A		45.000	--	1.139	51.236	1.4	0.272	1.73	A	EL	49.25	0.489	1.87	A	EL	4.925	0.80	0.272	1.14	A	EL	49.25		
TNACT5B	45.000	3	1.129	50.805	1.4	0.272	1.72	A	EL	49.25	0.489	1.82	A	EL	4.925	0.80	0.272	1.13	A	EL	49.25			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

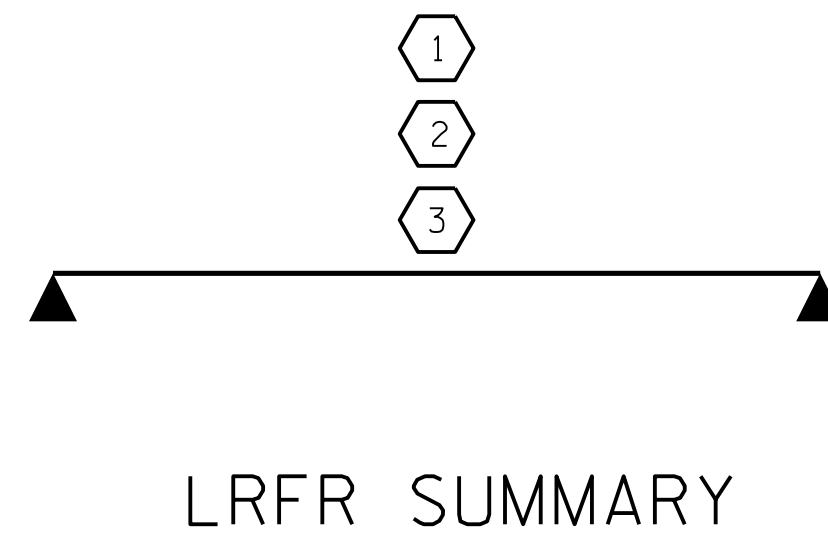
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

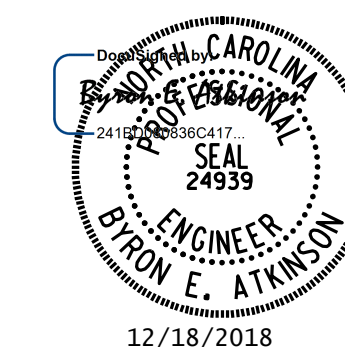
\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
 STATION: 17+37.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 100' BOX BEAM UNIT  
 90° SKEW  
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3 TOTAL SHEETS 15
1			3			
2			4			

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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

ASSEMBLED BY: B.E. LANNING DATE: 08/18  
 CHECKED BY: B.E. ATKINSON DATE: 11/18  
 DESIGN ENGINEER OF RECORD: B.E. ATKINSON DATE: 11/18  
 DRAWN BY: TMG II/II  
 CHECKED BY: AAC II/II

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOoled IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

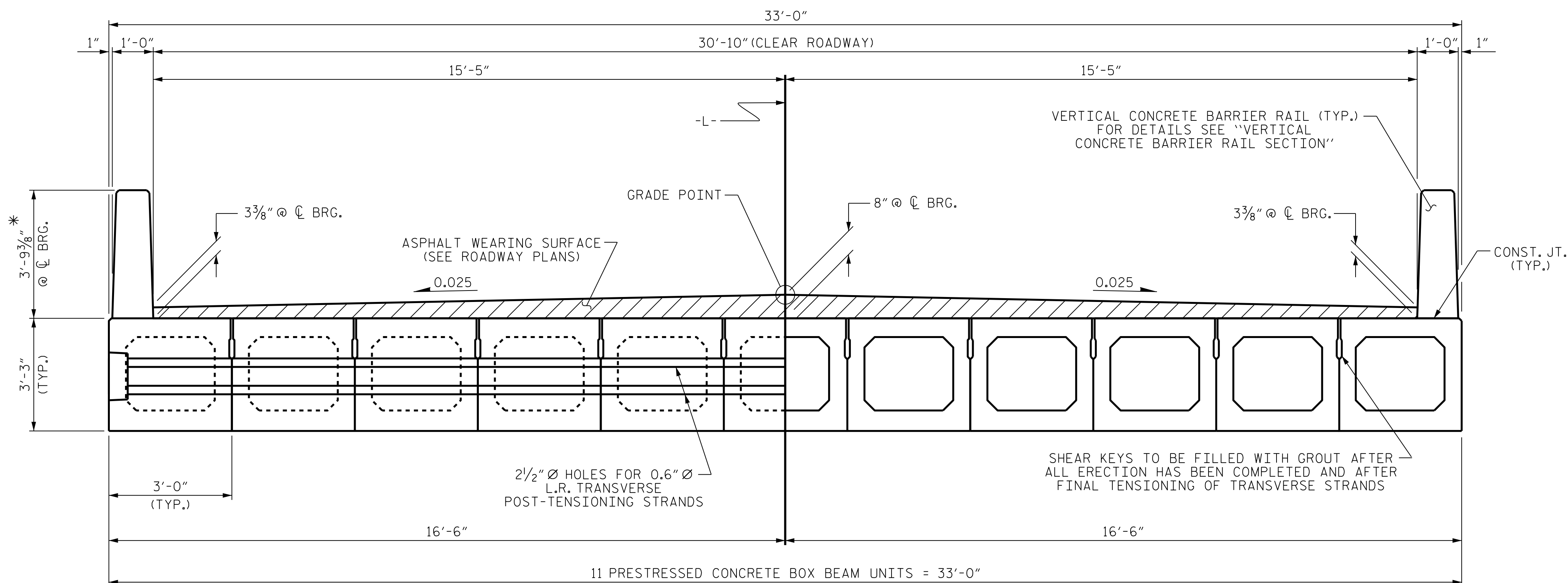
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

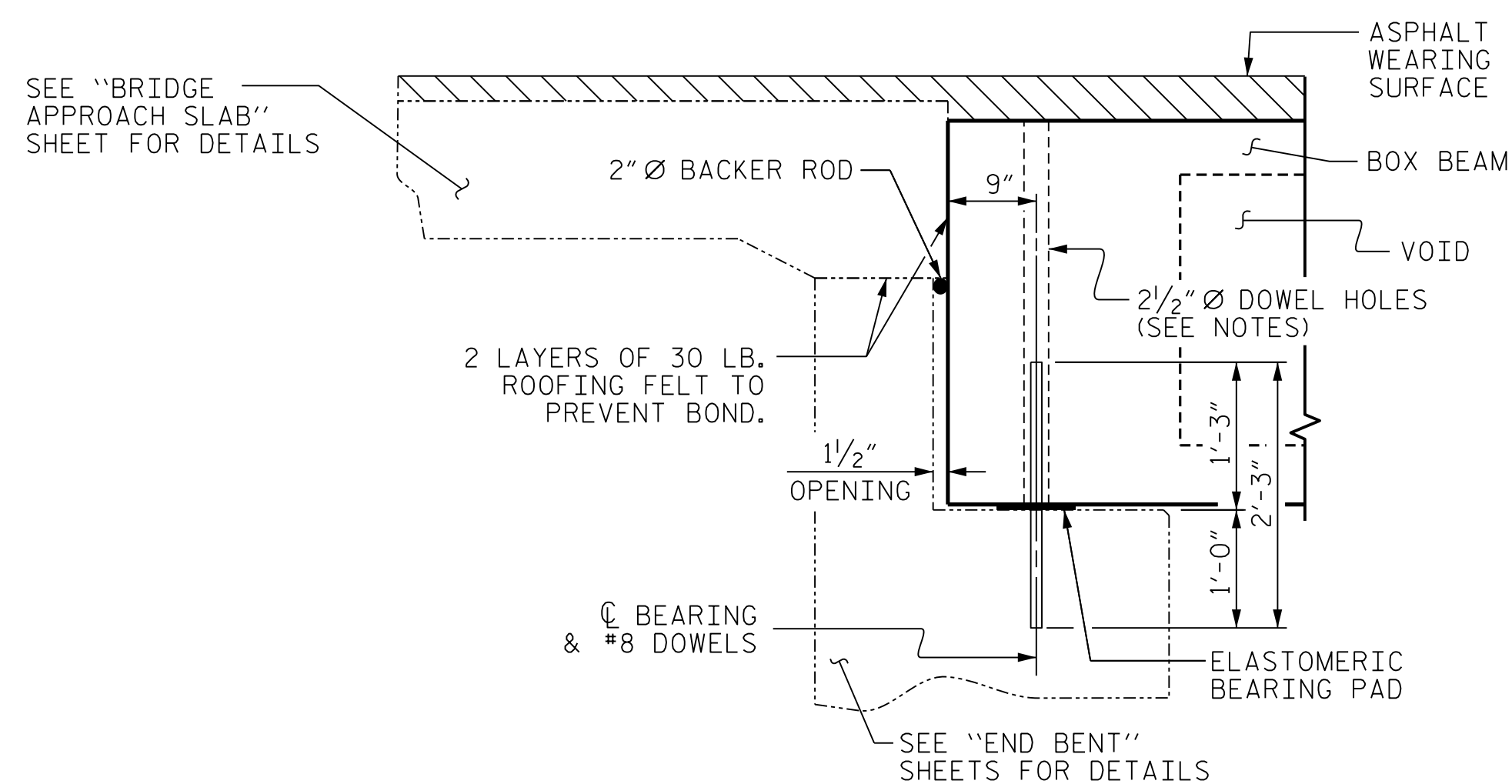


HALF SECTION  
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION  
THROUGH VOIDS

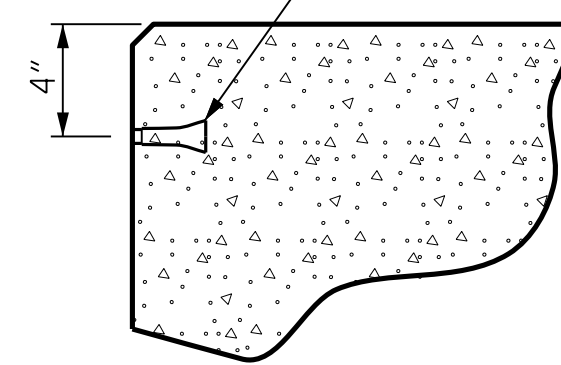
TYPICAL SECTION

\* THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



SECTION AT END BENT

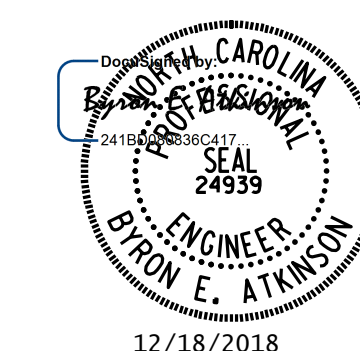
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
STATION: 17+37.00 -L-

SHEET 1 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			15

STD. NO. 39PCBB1-33

12/18/2018 10:03:19 AM

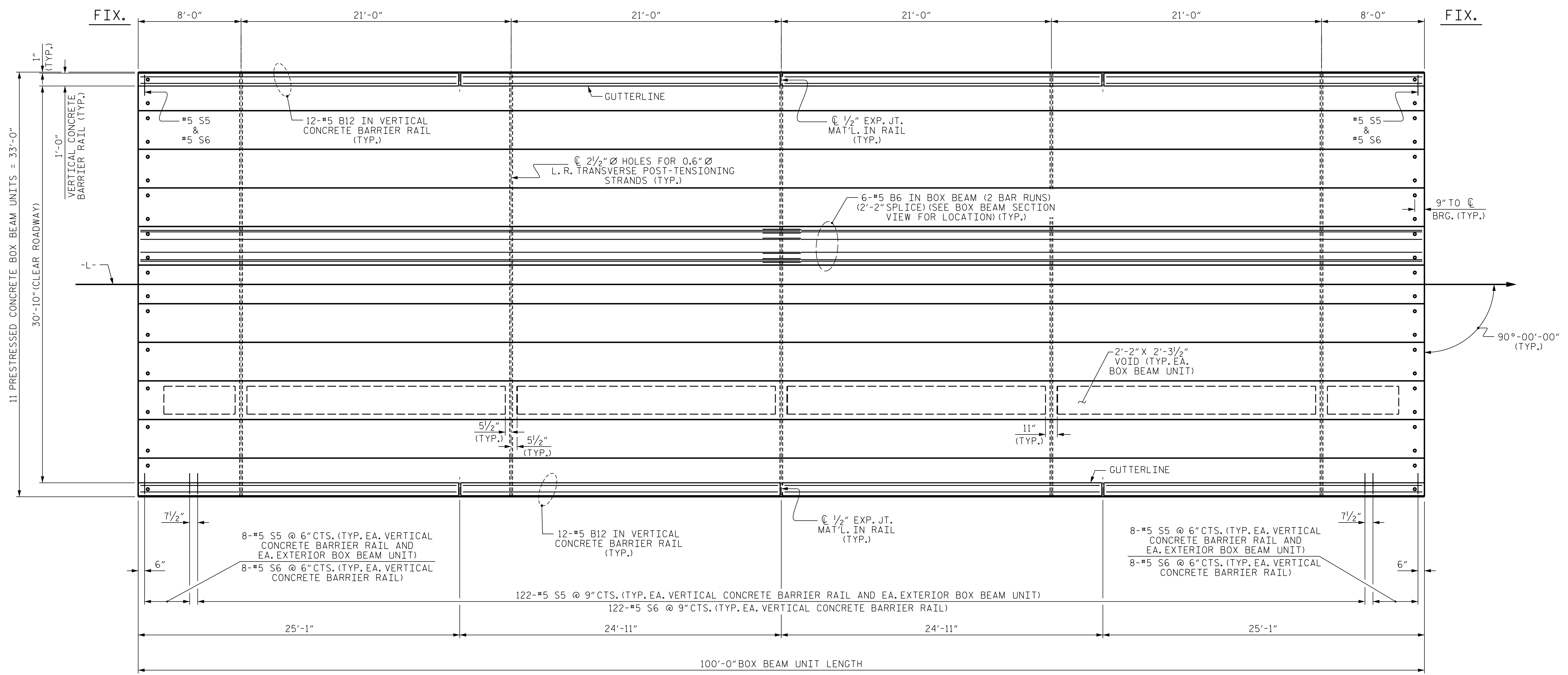
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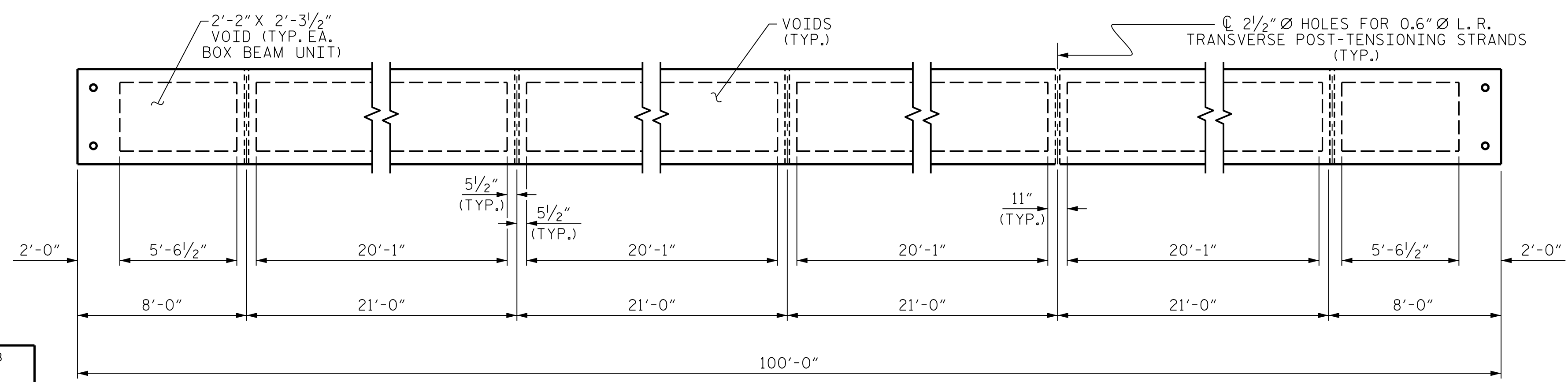
ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: DGE 8/11	REV. 10/15 MAA/TMG
CHECKED BY: TMG 11/11	



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PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PLAN OF 100' UNIT  
 30'-10" CLEAR ROADWAY  
 90° SKEW

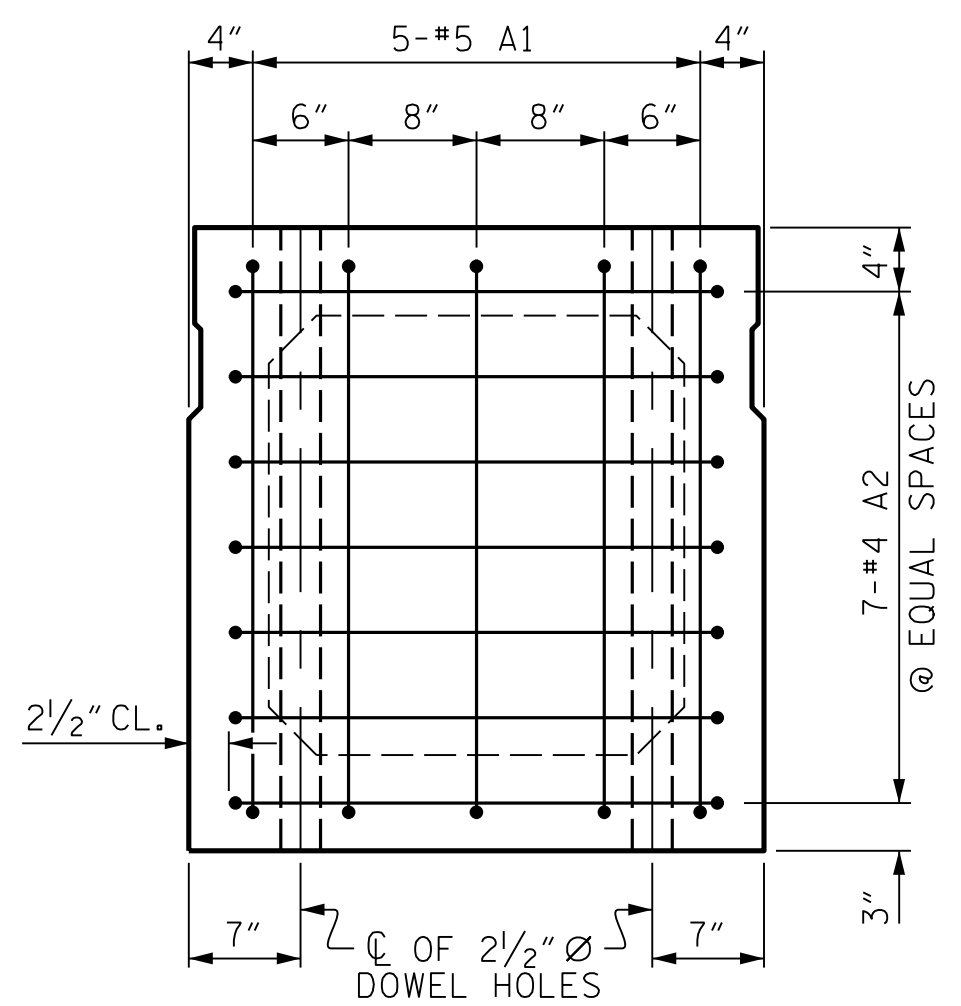


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**MI ENGINEERING**  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

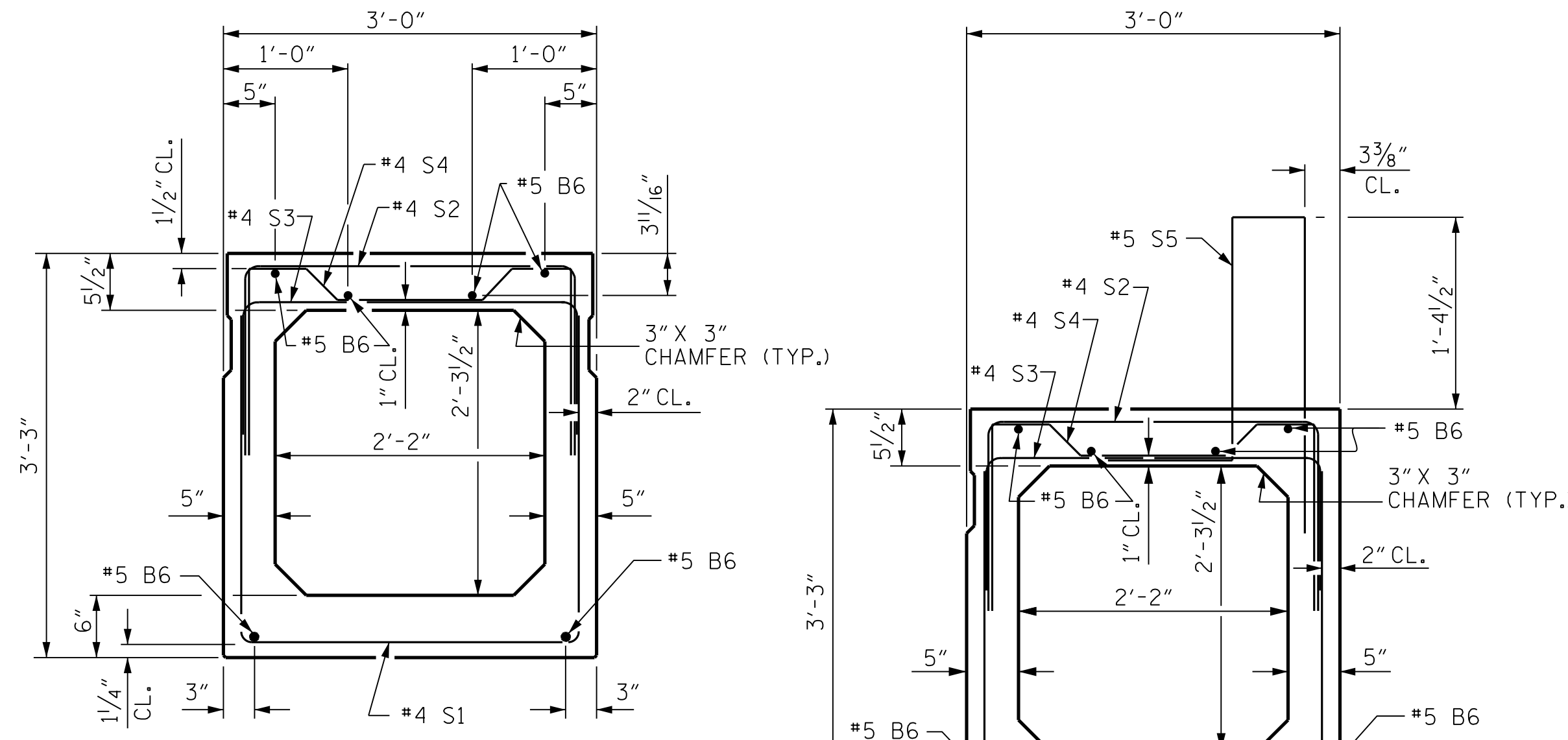
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			15

ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: DGE 8/10	REV. 8/14 MAA/TMG
CHECKED BY: TMG 11/11	



**END ELEVATION**

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION, STRAND LAYOUT NOT SHOWN.)



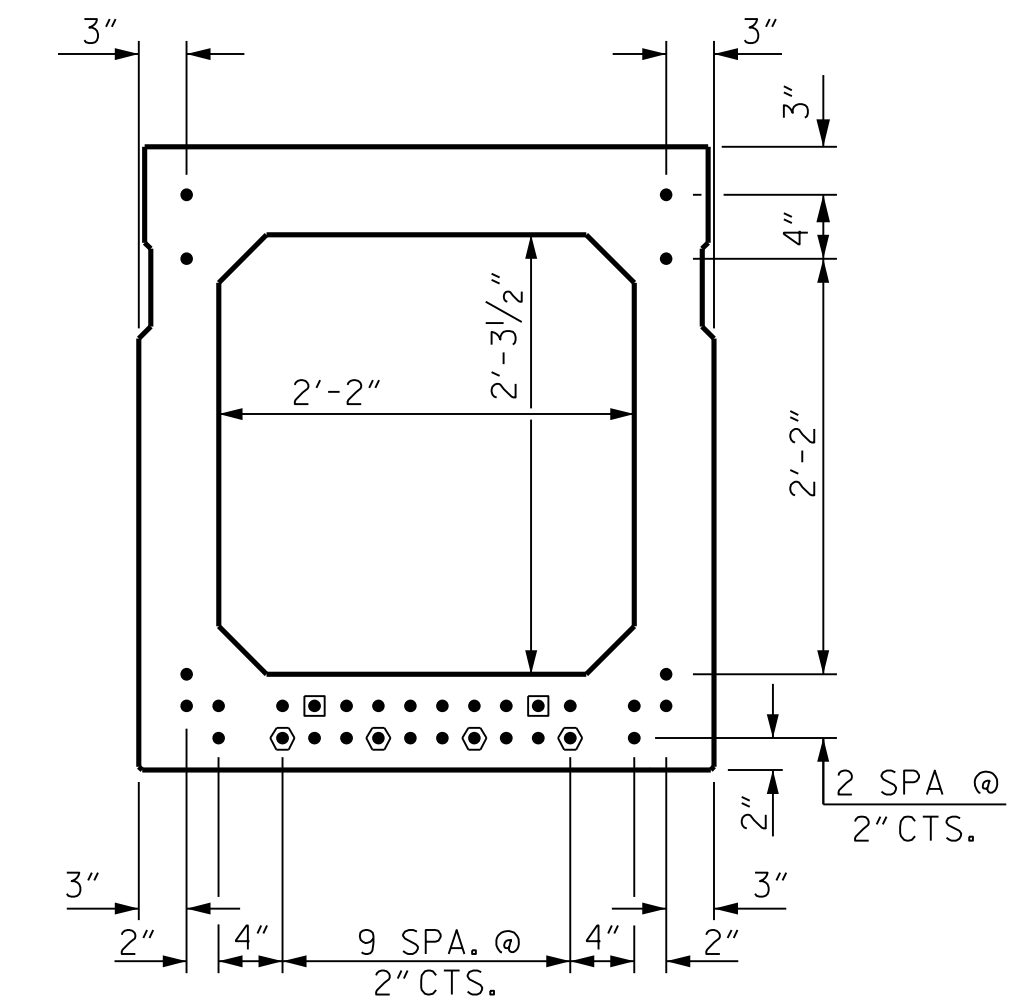
**INTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)

**EXTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)

**0.6" Ø LOW RELAXATION STRAND LAYOUT**



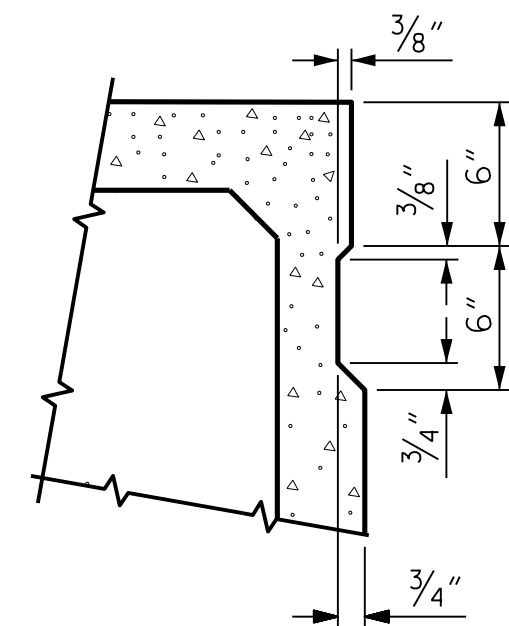
**TYPICAL STRAND LOCATION**

(32 STRANDS REQUIRED)

**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

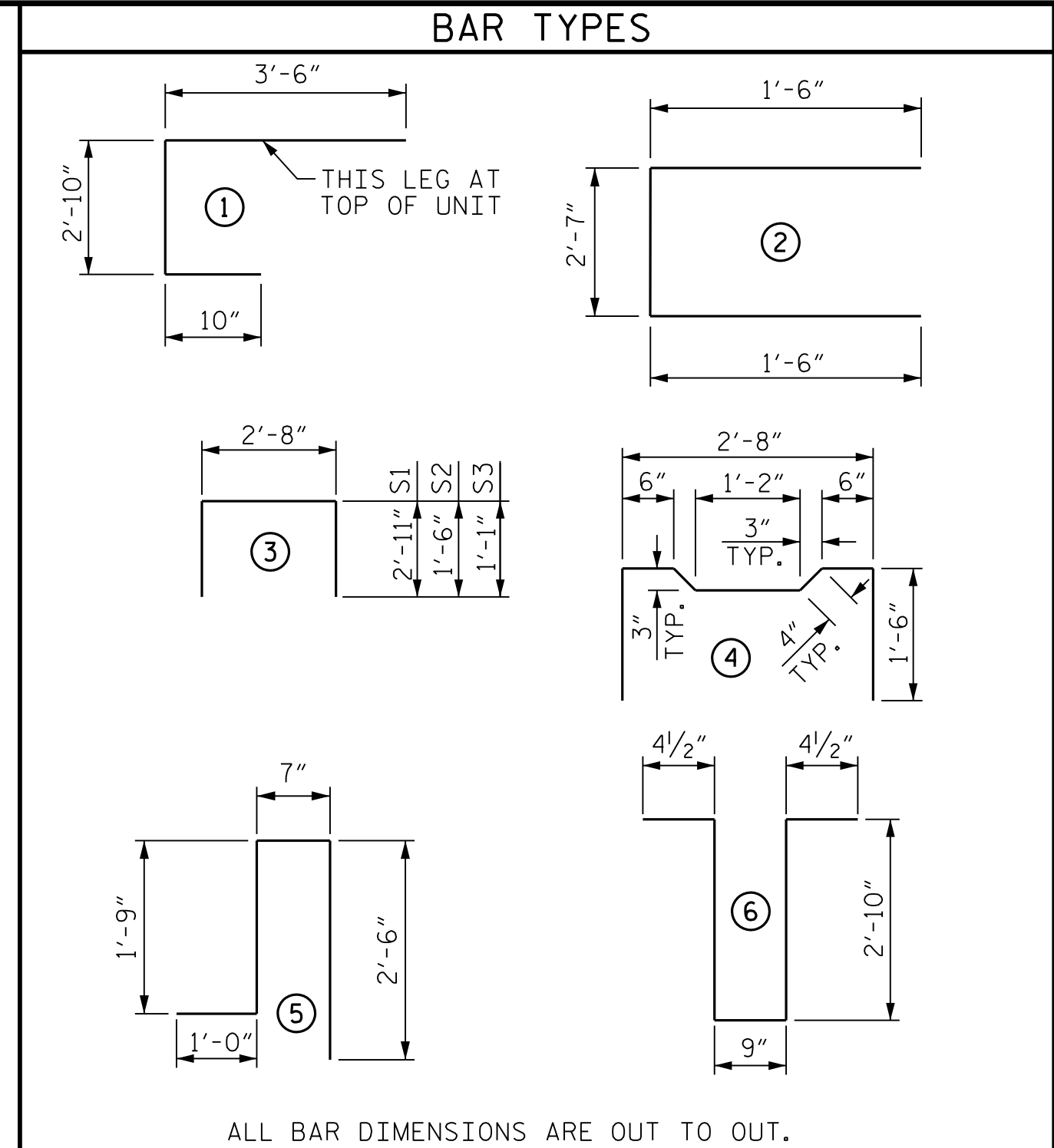
BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



**SHEAR KEY DETAIL**

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

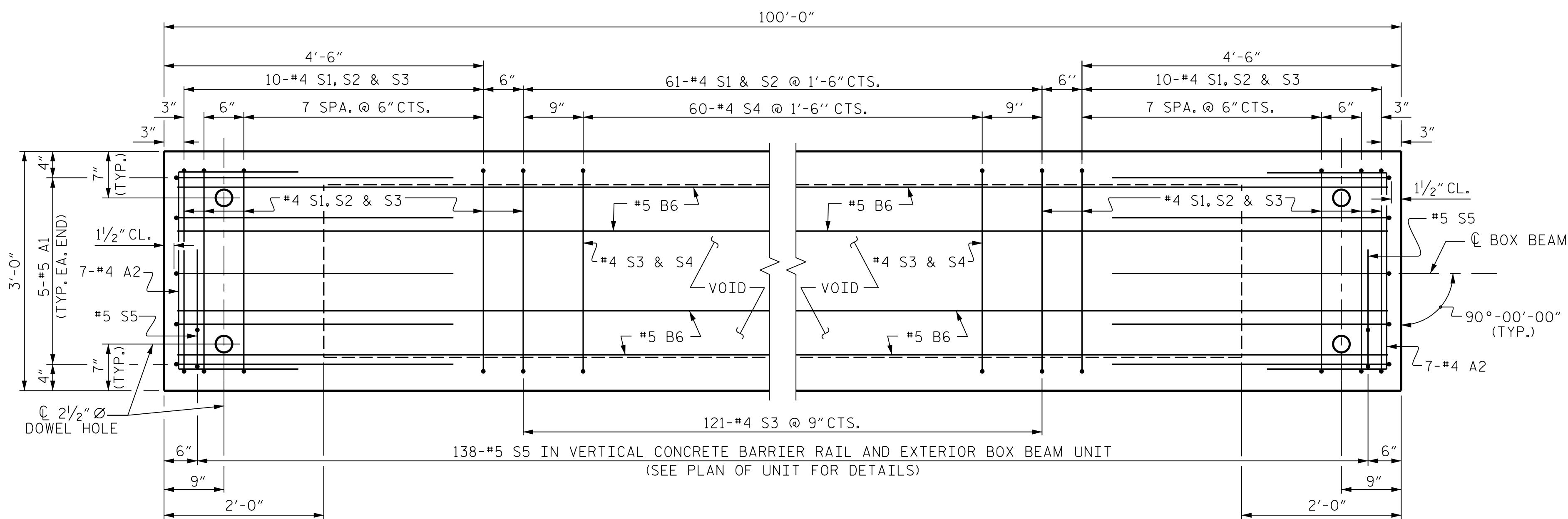
GRADE 270 STRANDS	
AREA ( SQUARE INCHES )	0.217
ULTIMATE STRENGTH ( LBS. PER STRAND )	58,600
APPLIED PRESTRESS ( LBS. PER STRAND )	43,950



ALL BAR DIMENSIONS ARE OUT TO OUT.

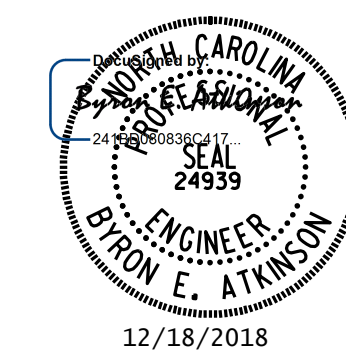
**BILL OF MATERIAL FOR ONE BOX BEAM SECTION**

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	81	#4	3	8'-6"	460	8'-6"	460
S2	81	#4	3	5'-8"	307	5'-8"	307
S3	141	#4	3	4'-10"	455	4'-10"	455
S4	60	#4	4	5'-10"	234	5'-10"	234
* S5	138	#5	5	5'-10"	840	--	--
REINFORCING STEEL				2421	LBS.	2421	LBS.
* EPOXY COATED REINF. STEEL				840	LBS.		
7500 P.S.I. CONCRETE				19.6	CU. YDS.	19.4	CU. YDS.
0.6" Ø L.R. STRANDS				No. 32		No. 32	



**PLAN OF BOX BEAM**

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".



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

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
STATION: 17+37.00 -L-

SHEET 3 OF 5

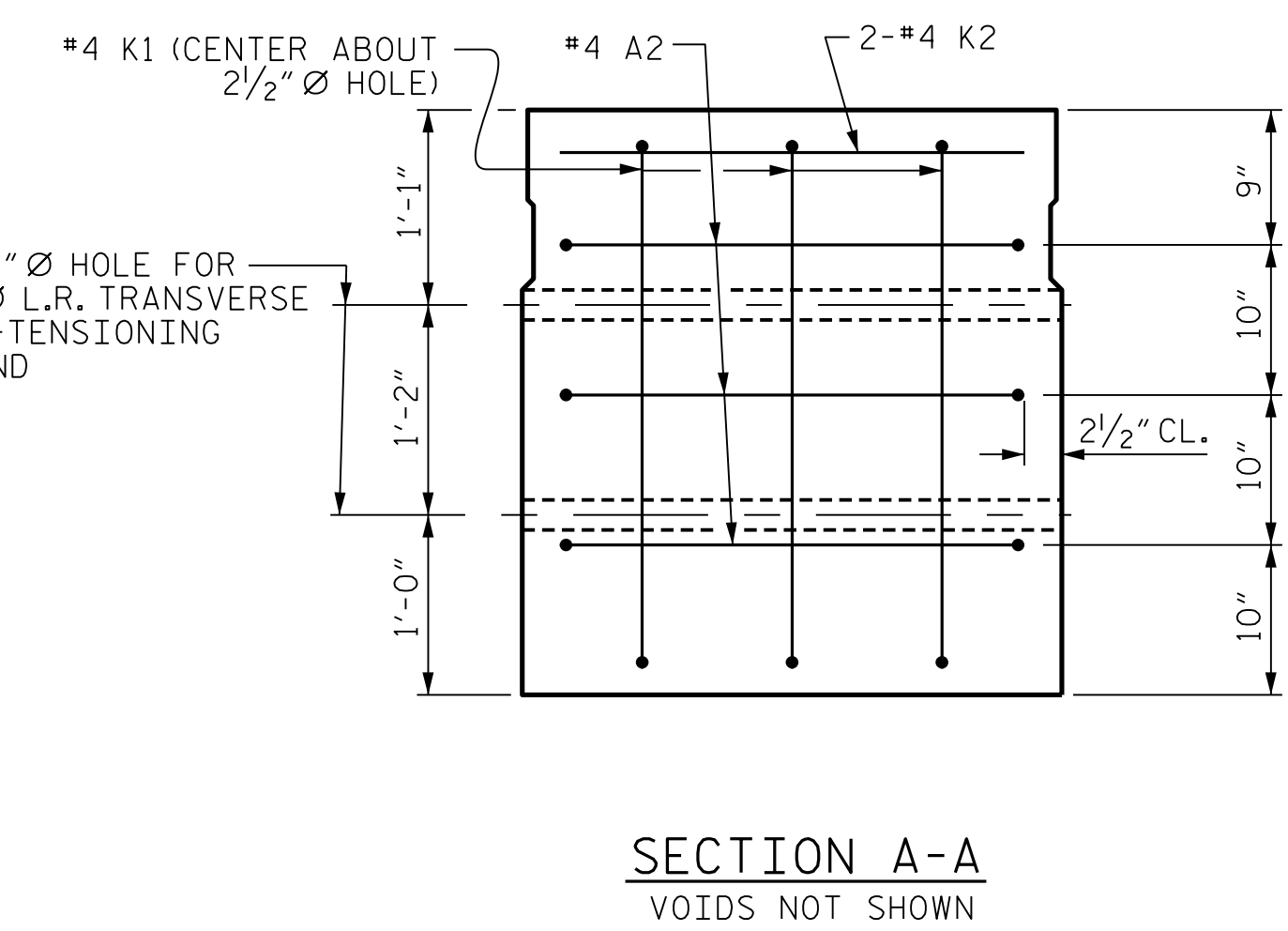
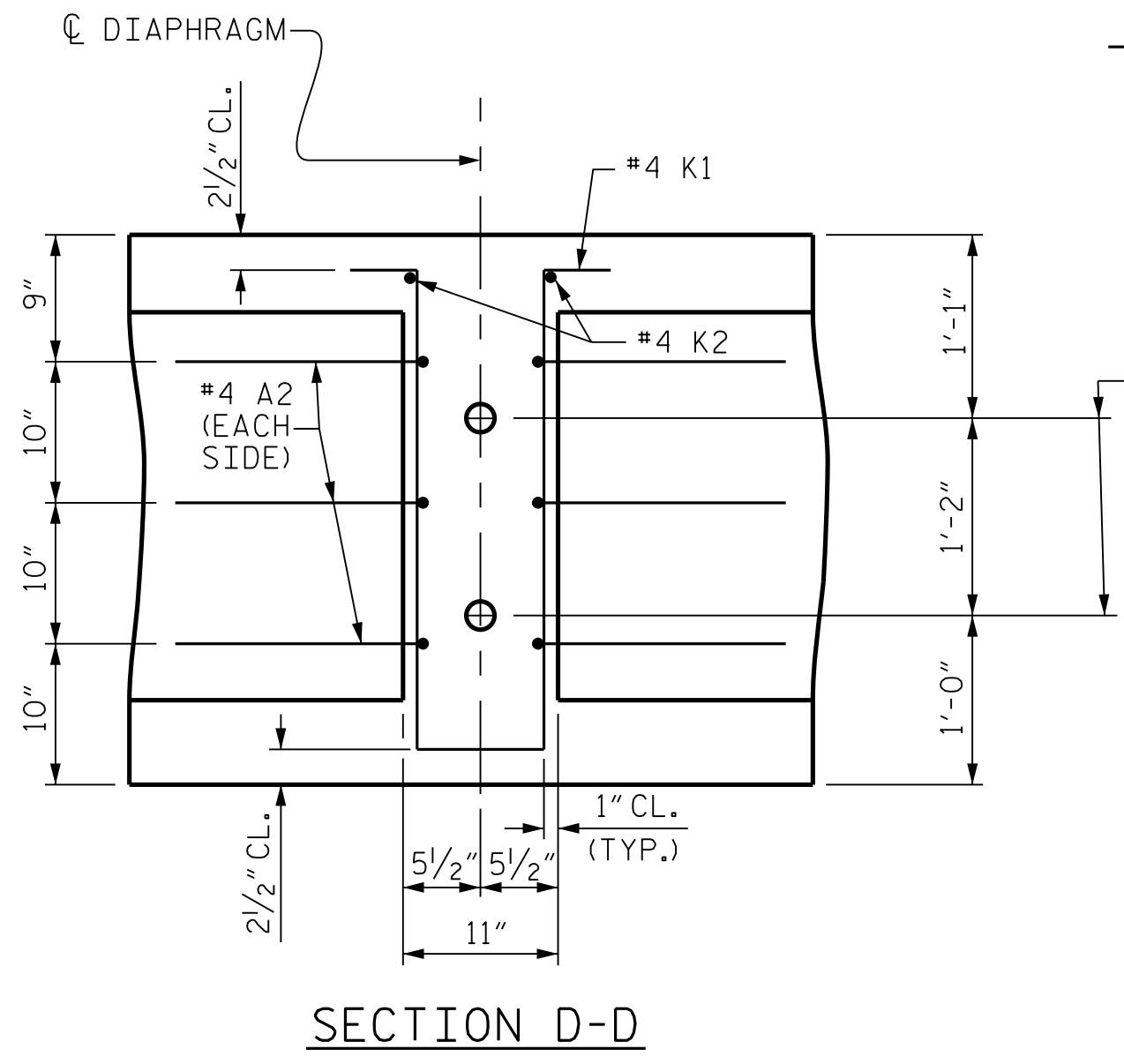
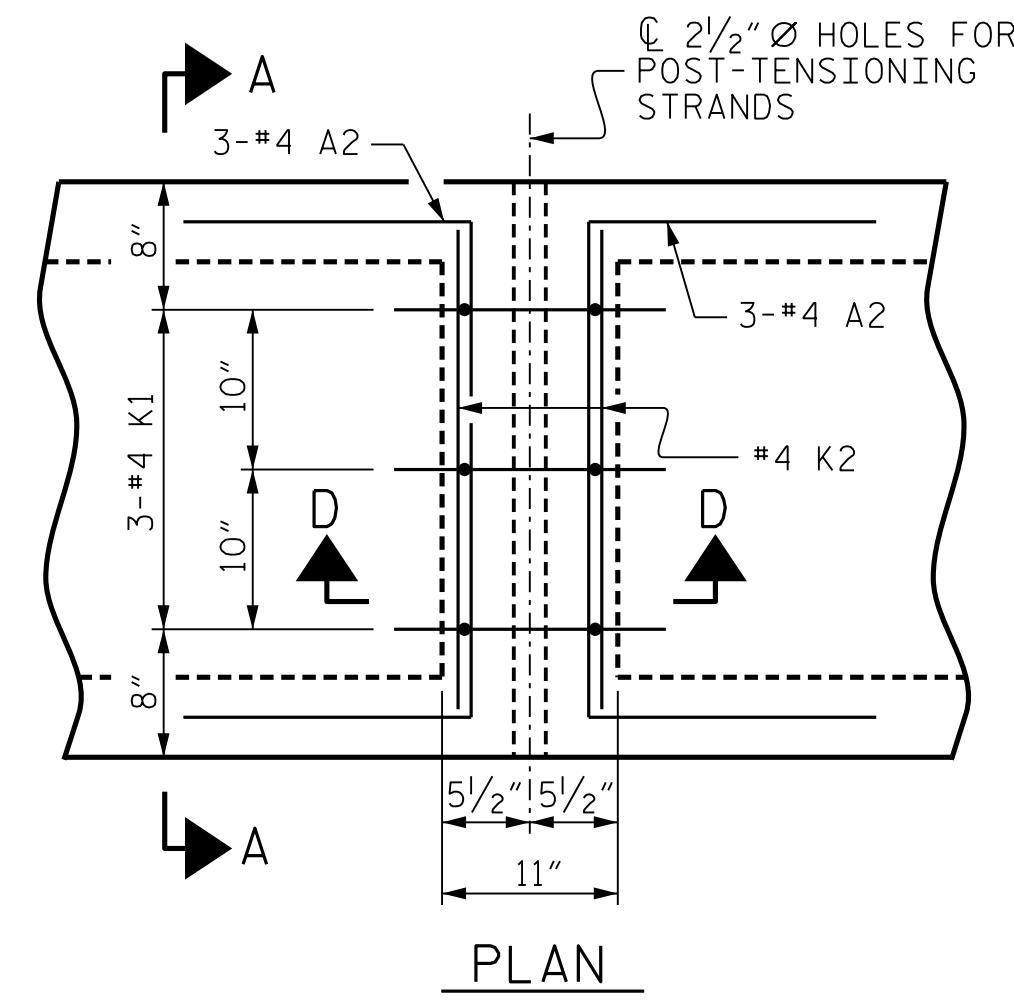
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS 15
2			4			

STD. NO. 39PCBB6-90S-100L

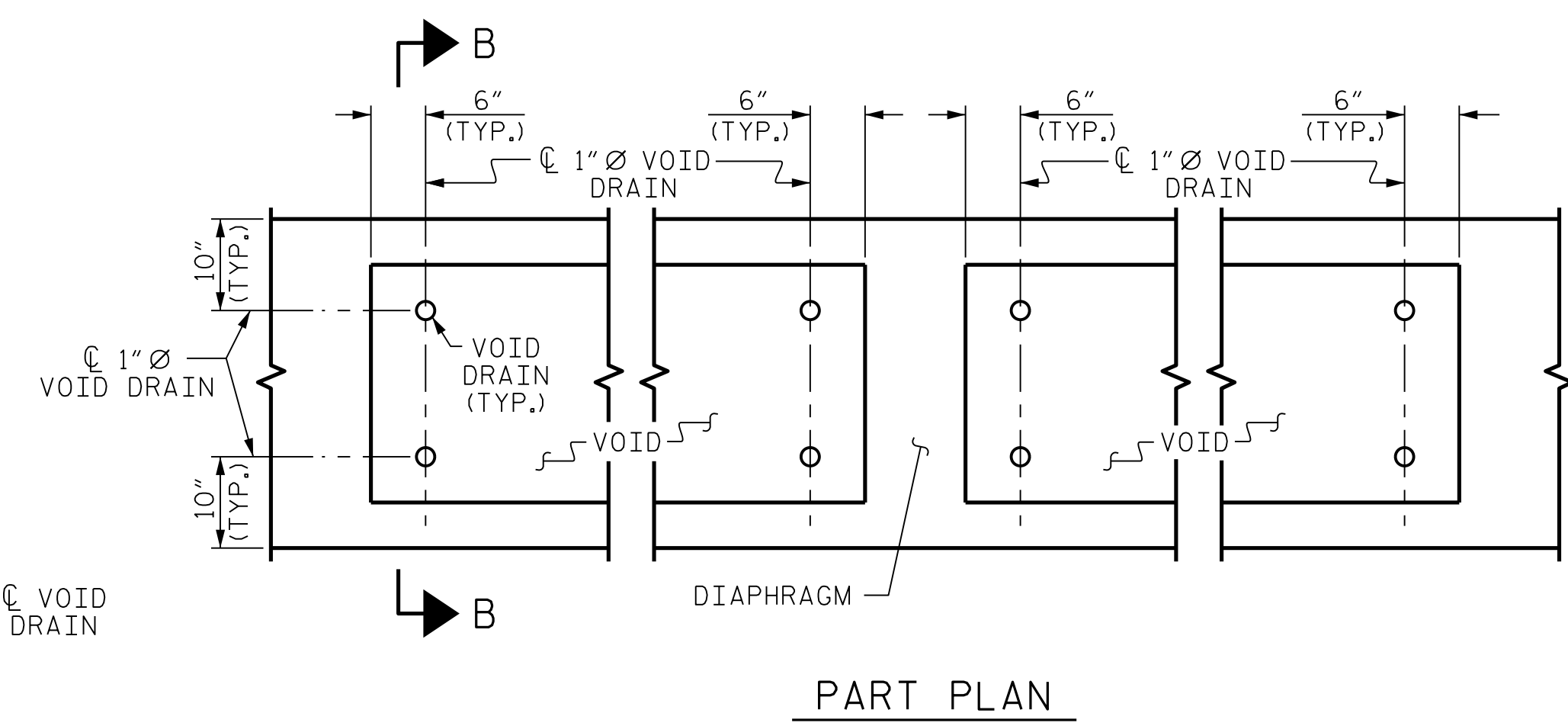
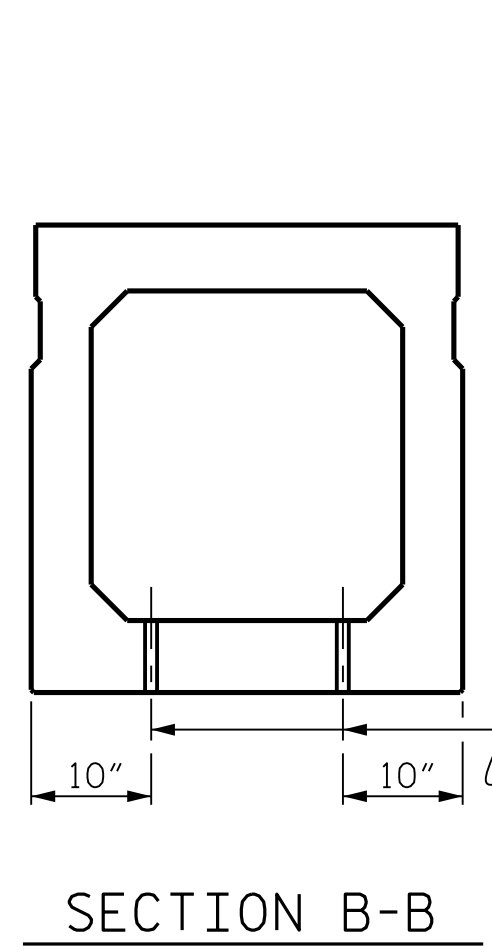
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ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: DGE 11/11	REV. 9/14
CHECKED BY: TMG 11/11	MAA/TMG



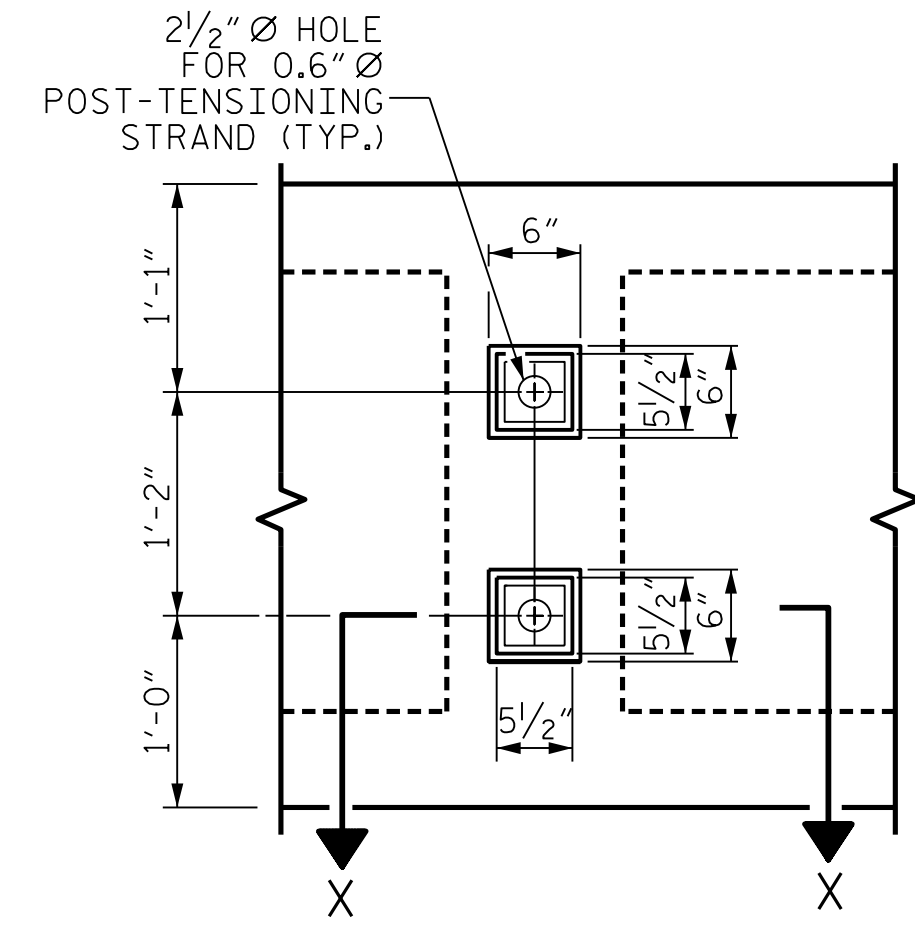
**DOUBLE DIAPHRAGM DETAILS**

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.

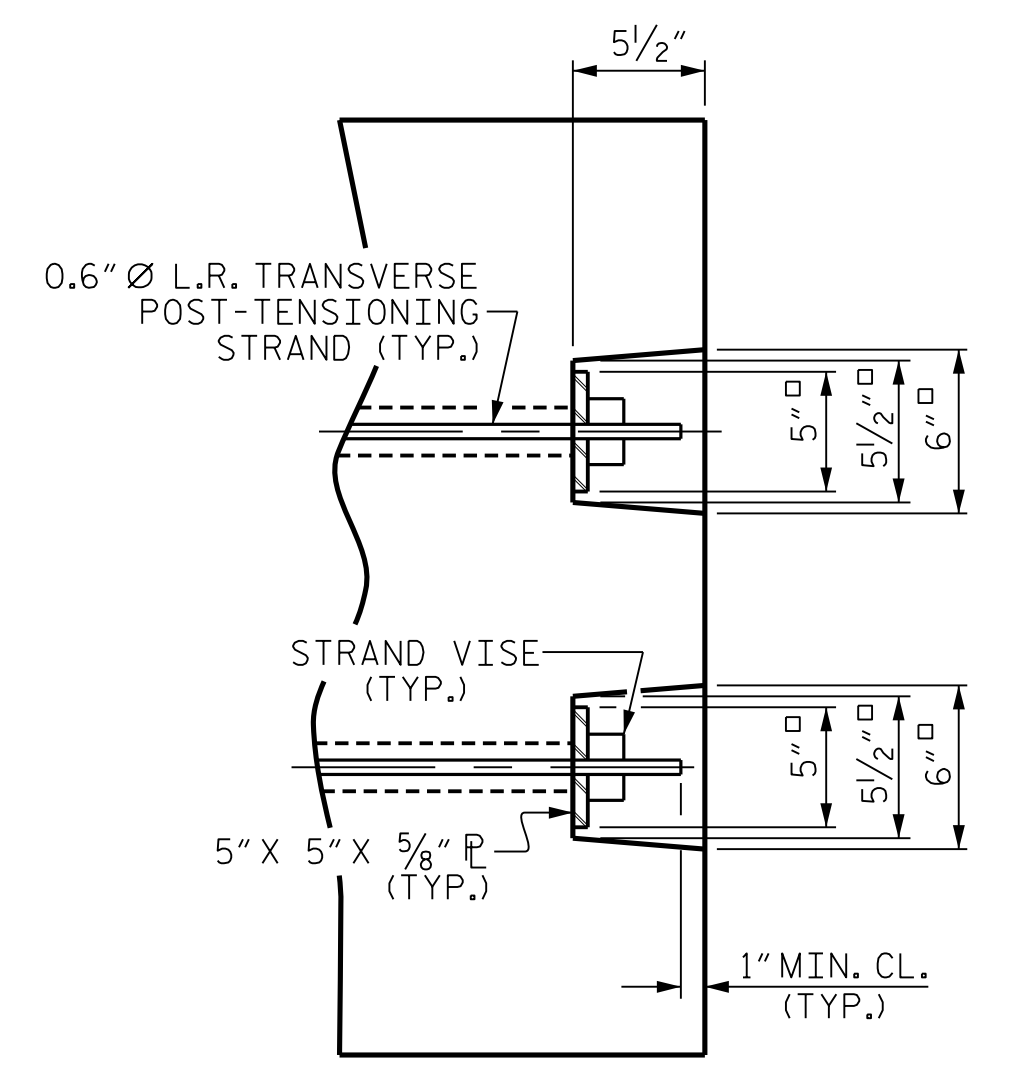


**VOID DRAIN DETAILS**

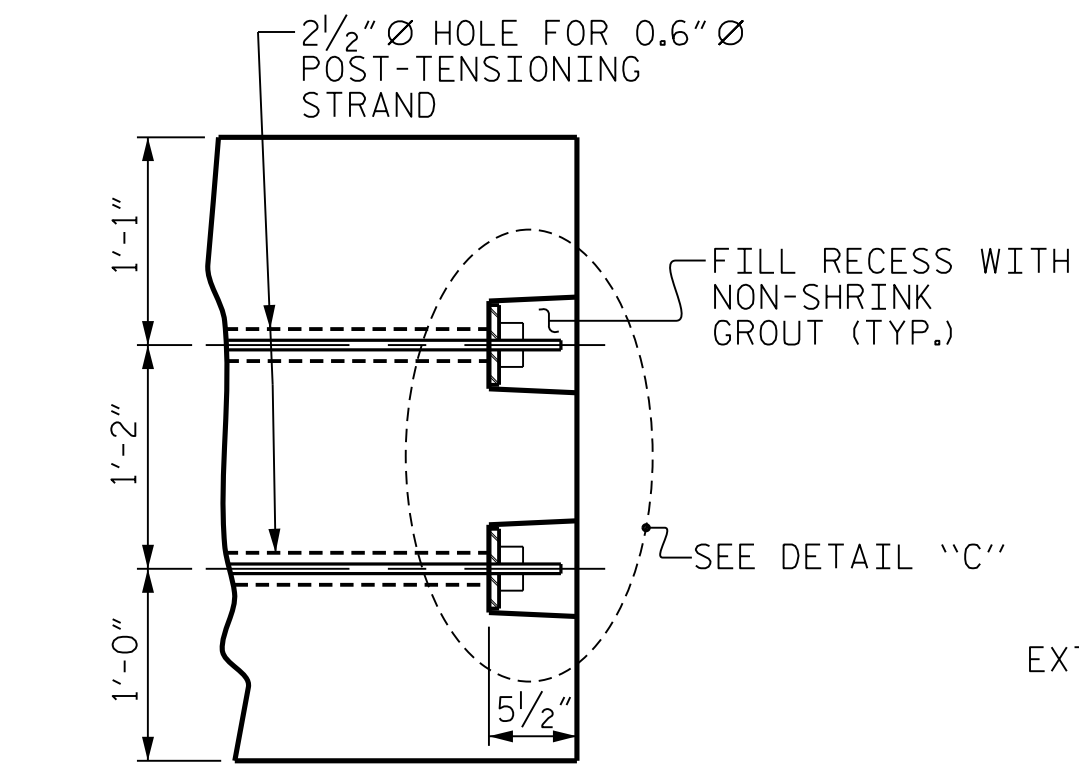
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



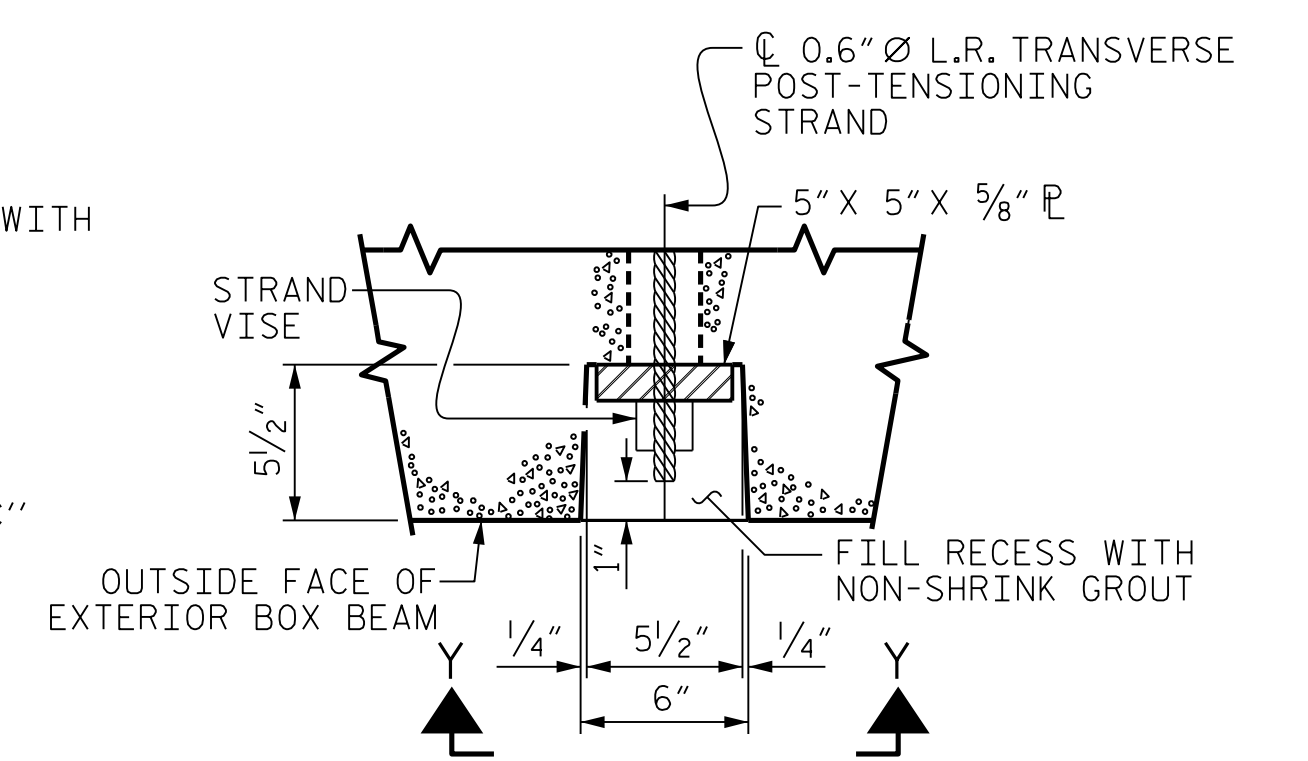
**VIEW Y-Y**  
SHOWING ELEVATION VIEW OF GROUDED RECESS



**DETAIL "C"**



**PART SECTION AT RECESS**



**SECTION X-X**  
SHOWING PLAN VIEW OF GROUDED RECESS

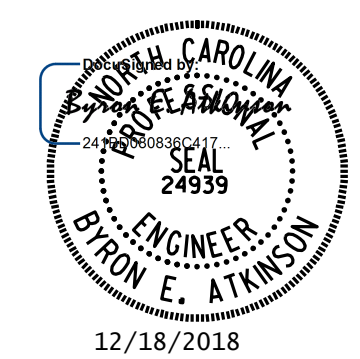
**GROUDED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM**

DEAD LOAD DEFLECTION AND CAMBER	
100' BOX BEAM UNIT	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	2" ↑
FINAL CAMBER	7/8" ↓
	1/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 4 OF 5



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

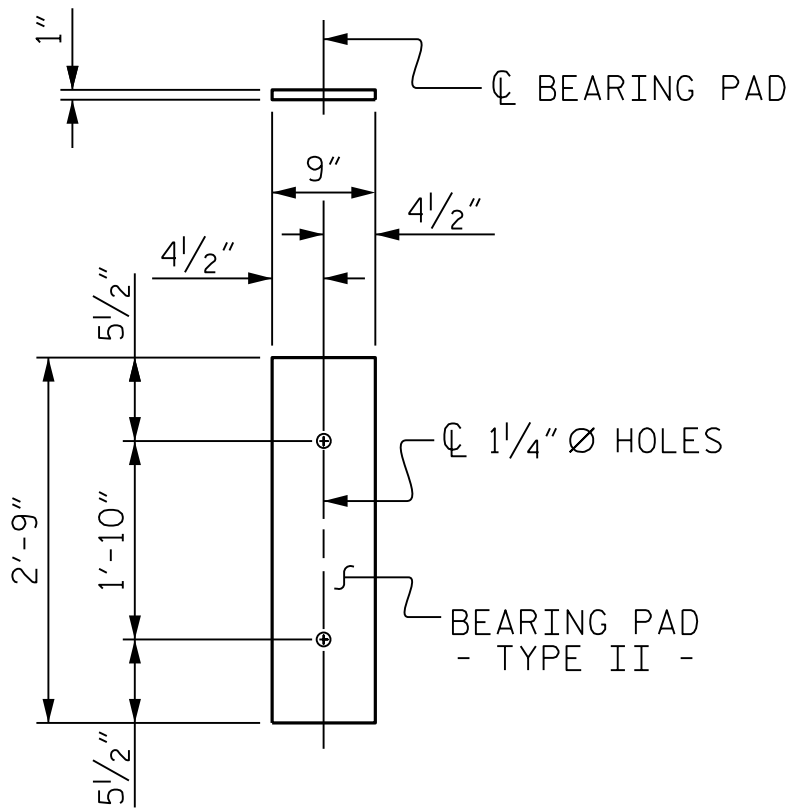
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 3'-3"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT

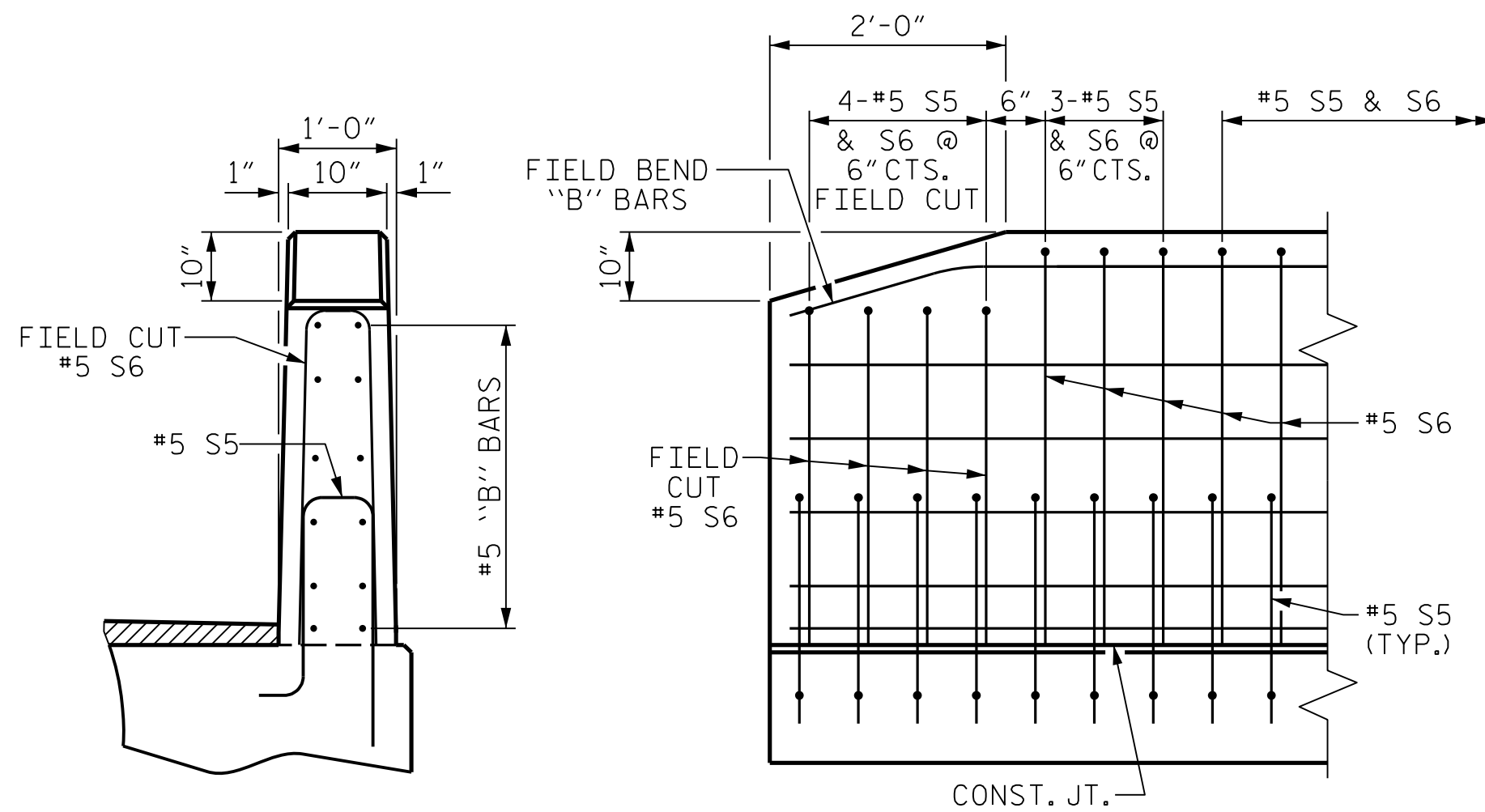
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			15

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ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: DGE 11/11	REV. 8/14
CHECKED BY: TMG 11/11	MAA/TMG

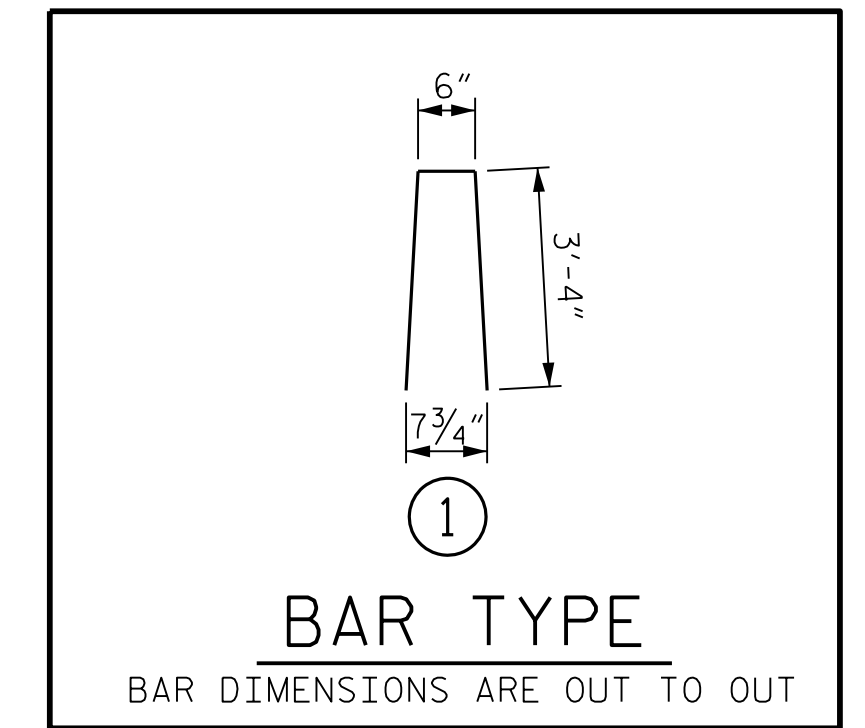


**FIXED END**  
(TYPE II - 22 REQ'D.)



**END VIEW**      **SIDE VIEW**  
**END OF RAIL DETAILS**

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11		1100'-0"

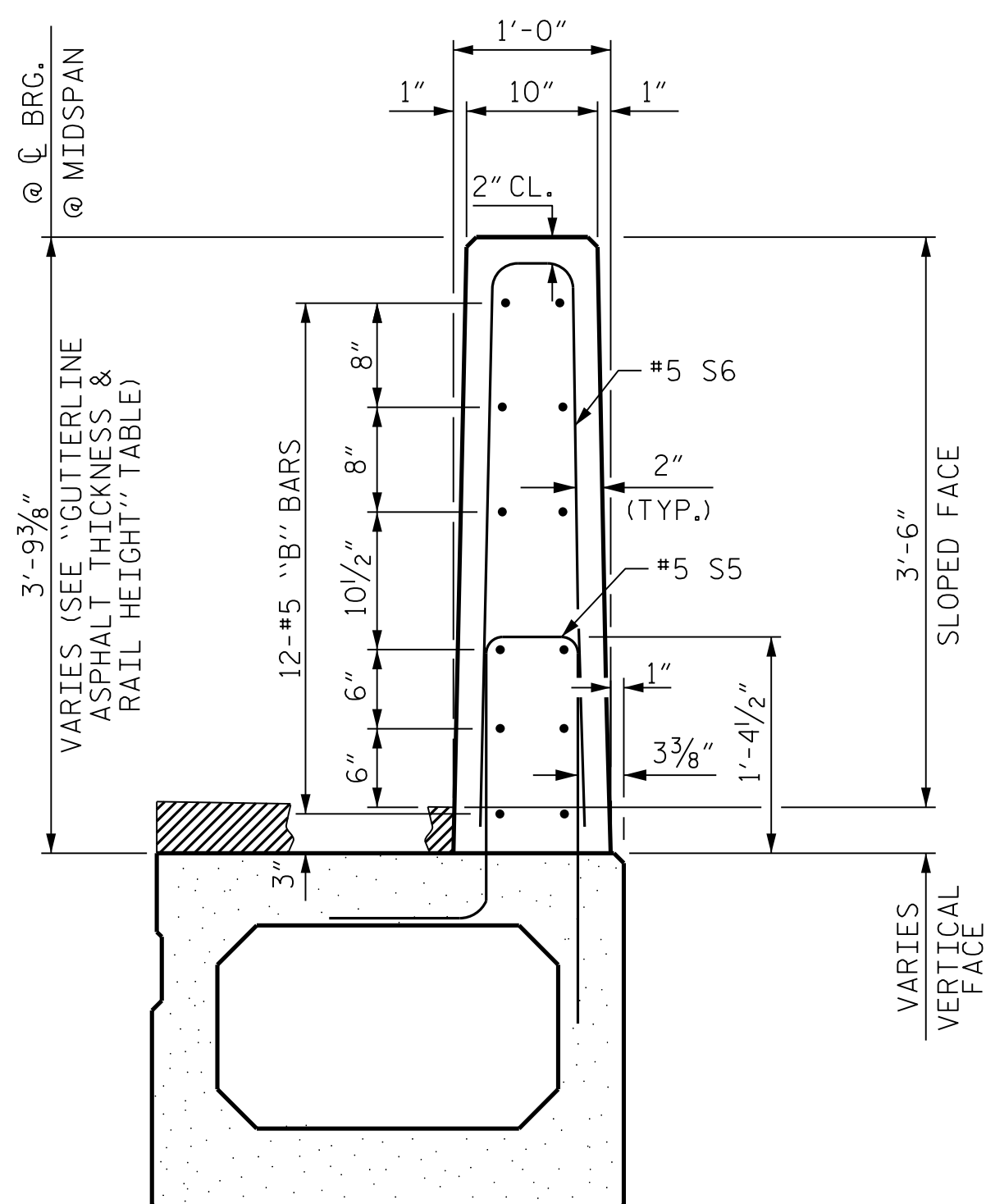


**BAR TYPE**  
BAR DIMENSIONS ARE OUT TO OUT

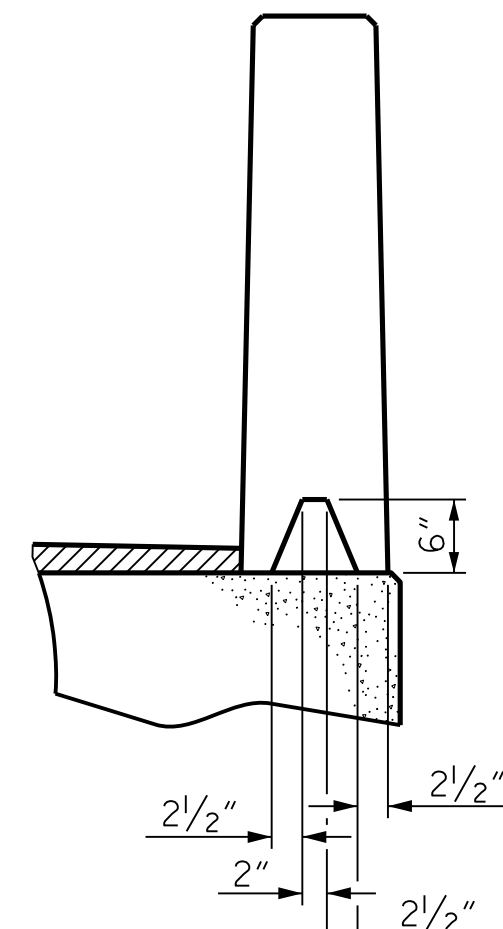
**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT	
	100' UNIT					
*B12	96	#5	STR	24'-7"	2461	
*S6	276	#5	1	7'-2"	2063	
* EPOXY COATED REINFORCING STEEL				LBS.	4524	
CLASS AA CONCRETE				CU.YDS.	25.9	
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	200.0	

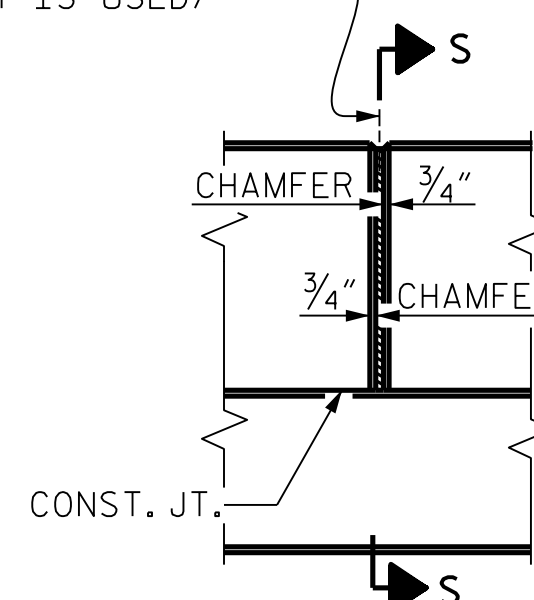


**SECTION THRU RAIL**



**SECTION S-S**  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)

1/2" EXP. JT. MAT'L. HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED)



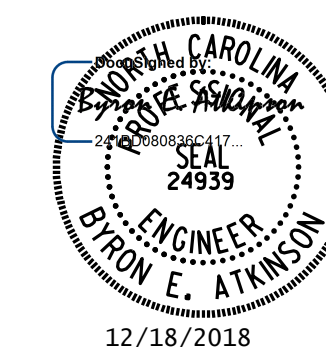
**ELEVATION AT EXPANSION JOINTS**

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2 1/4"	3'-8 1/4"

**VERTICAL CONCRETE BARRIER RAIL DETAILS**

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
STATION: 17+37.00 -L-

SHEET 5 OF 5



12/18/2018

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MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-8
2			4			TOTAL SHEETS 15

STD. NO. 39PCBB8\_90S

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ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: DGE 10/11	REV. 5/18
CHECKED BY: TMG 11/11	MAA/THC

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS 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.)

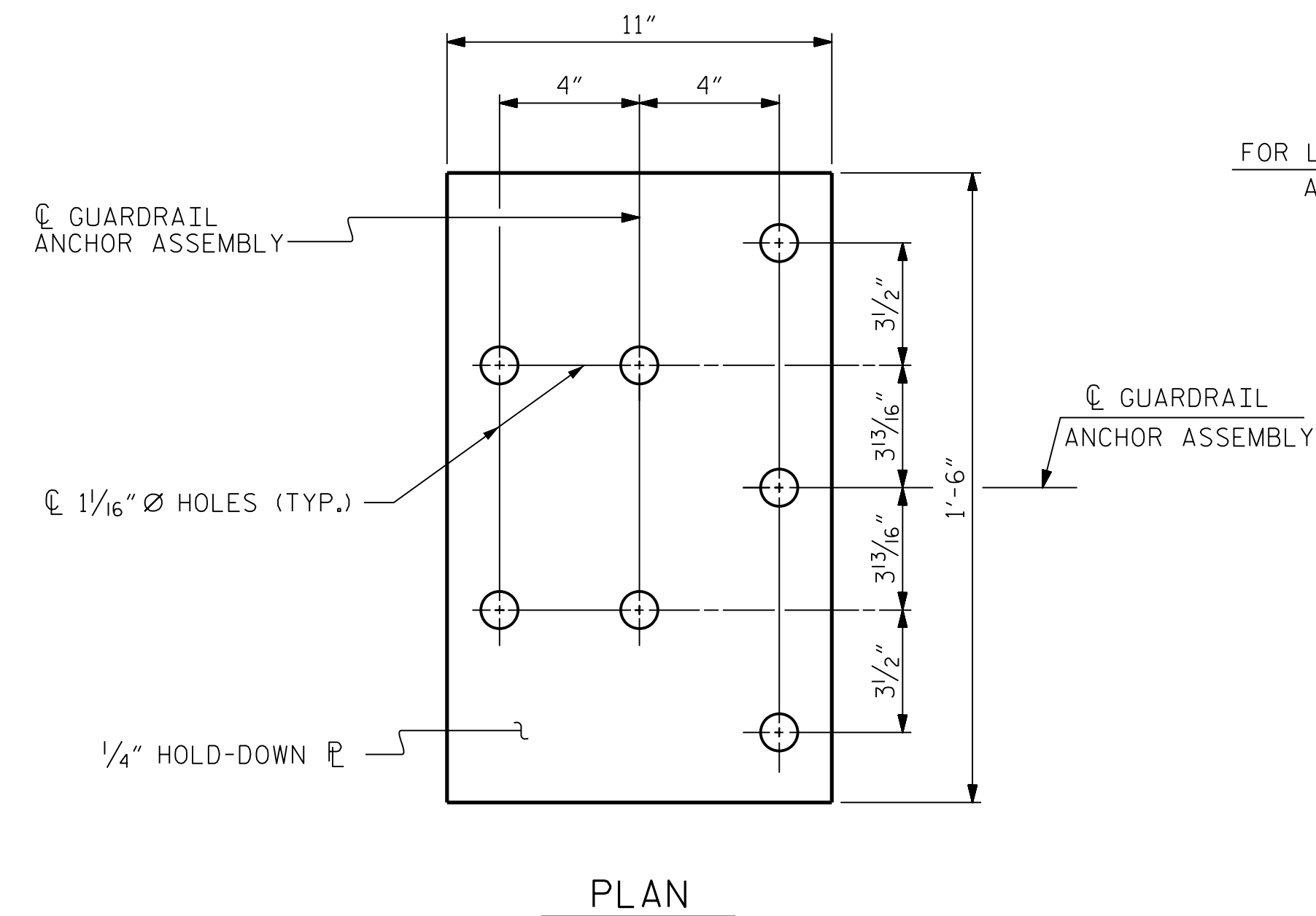
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

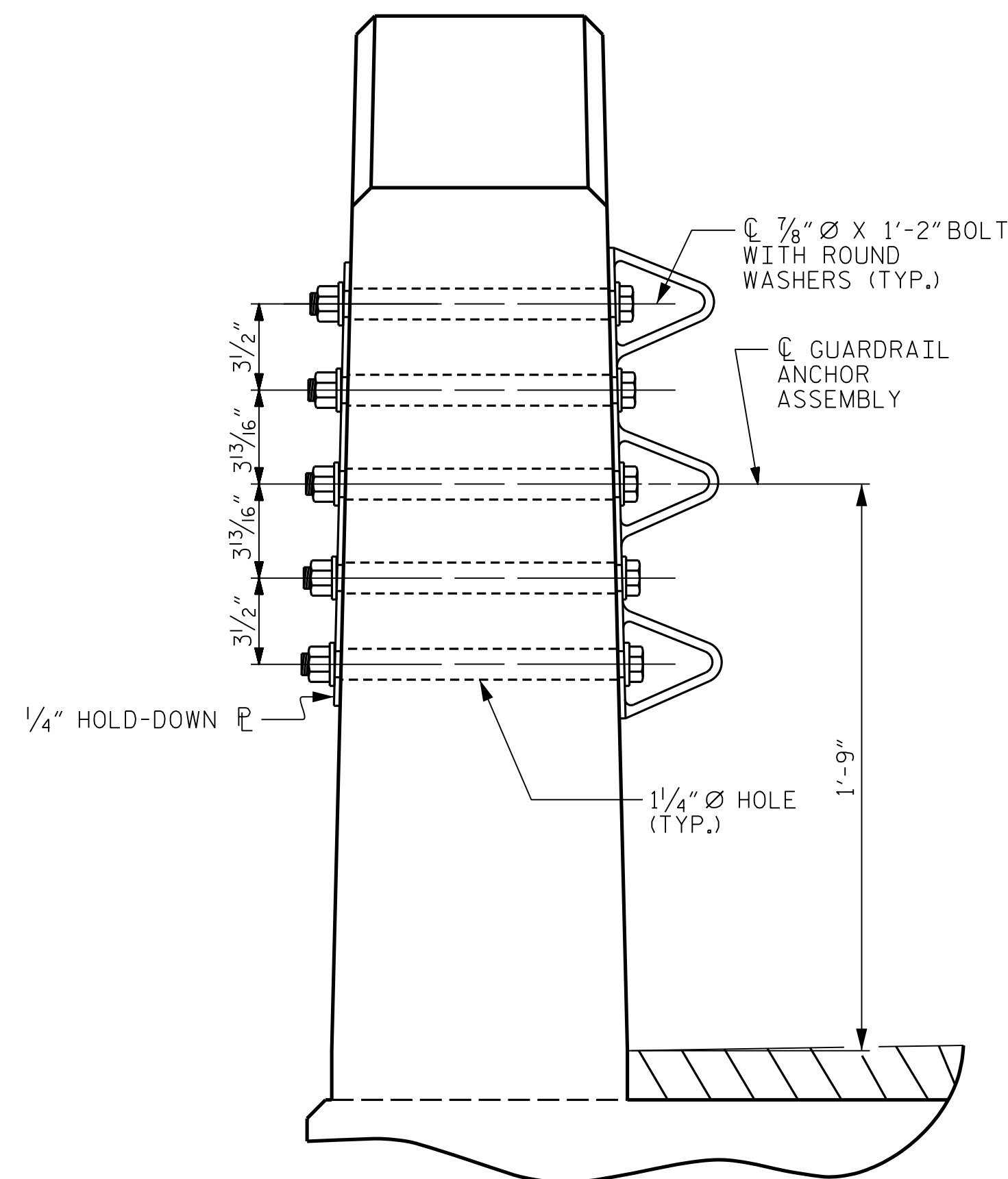
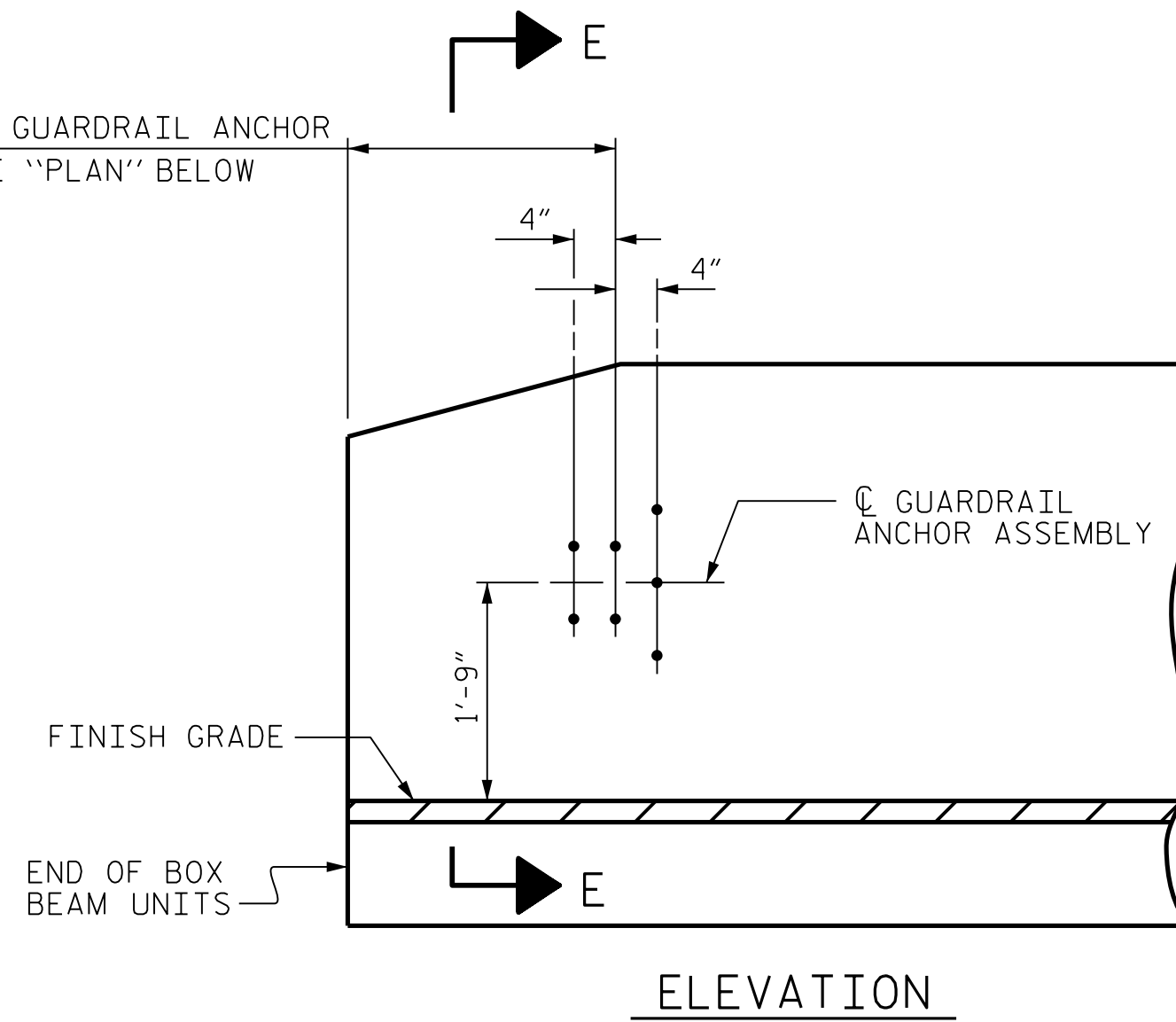
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

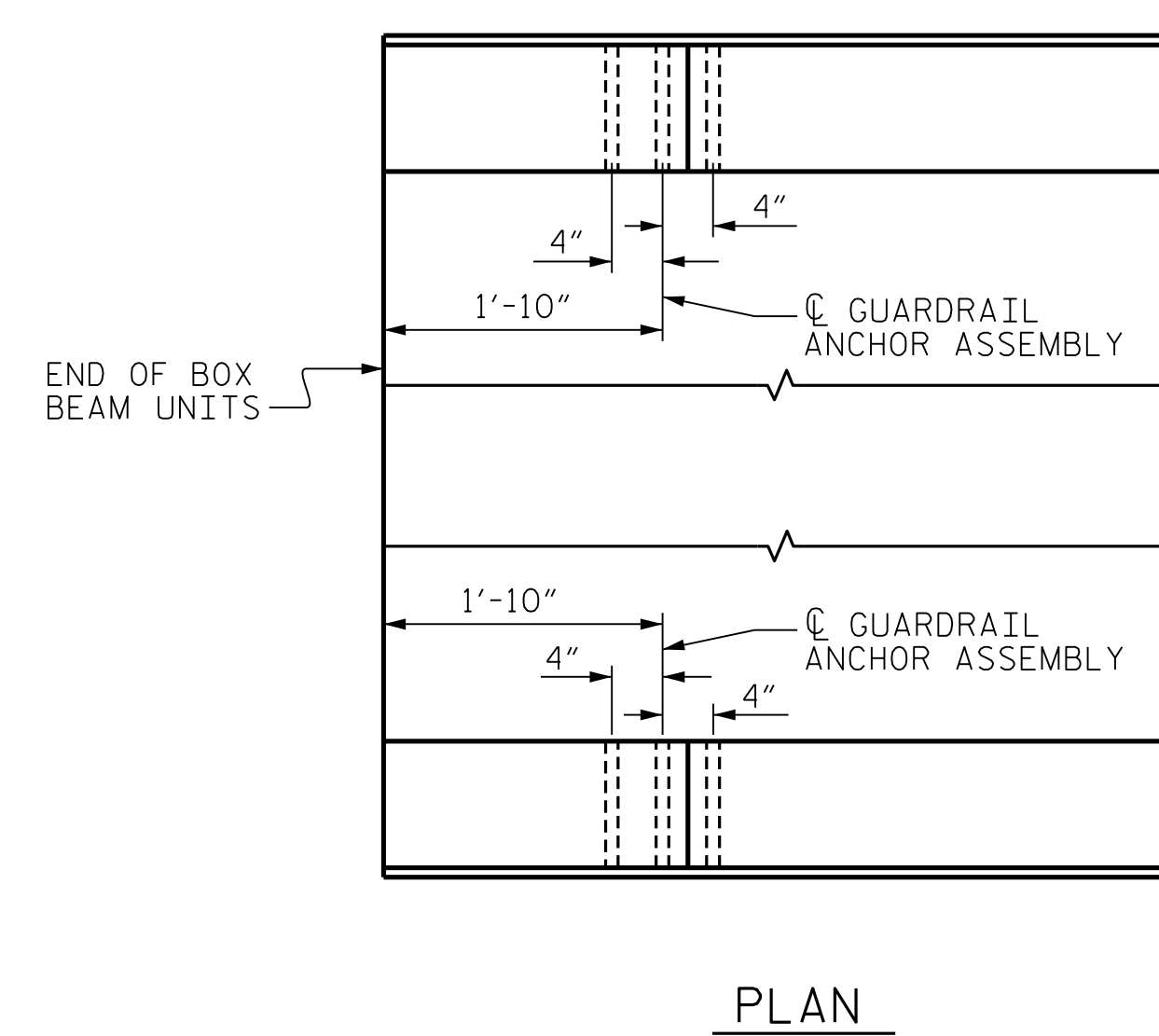
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

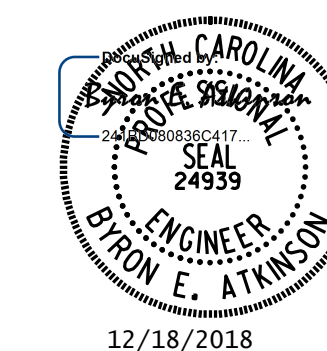
END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
STATION: 17+37.00 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
DETAILS  
FOR VERTICAL CONCRETE  
BARRIER RAIL

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

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-9
2			4			TOTAL SHEETS 15

(SHT 1) STD. NO. GRA3

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ASSEMBLED BY: B.E. LANNING	DATE: 08/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: MAA 5/10	REV. 6/13 MAA/GM
CHECKED BY: GM 5/10	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

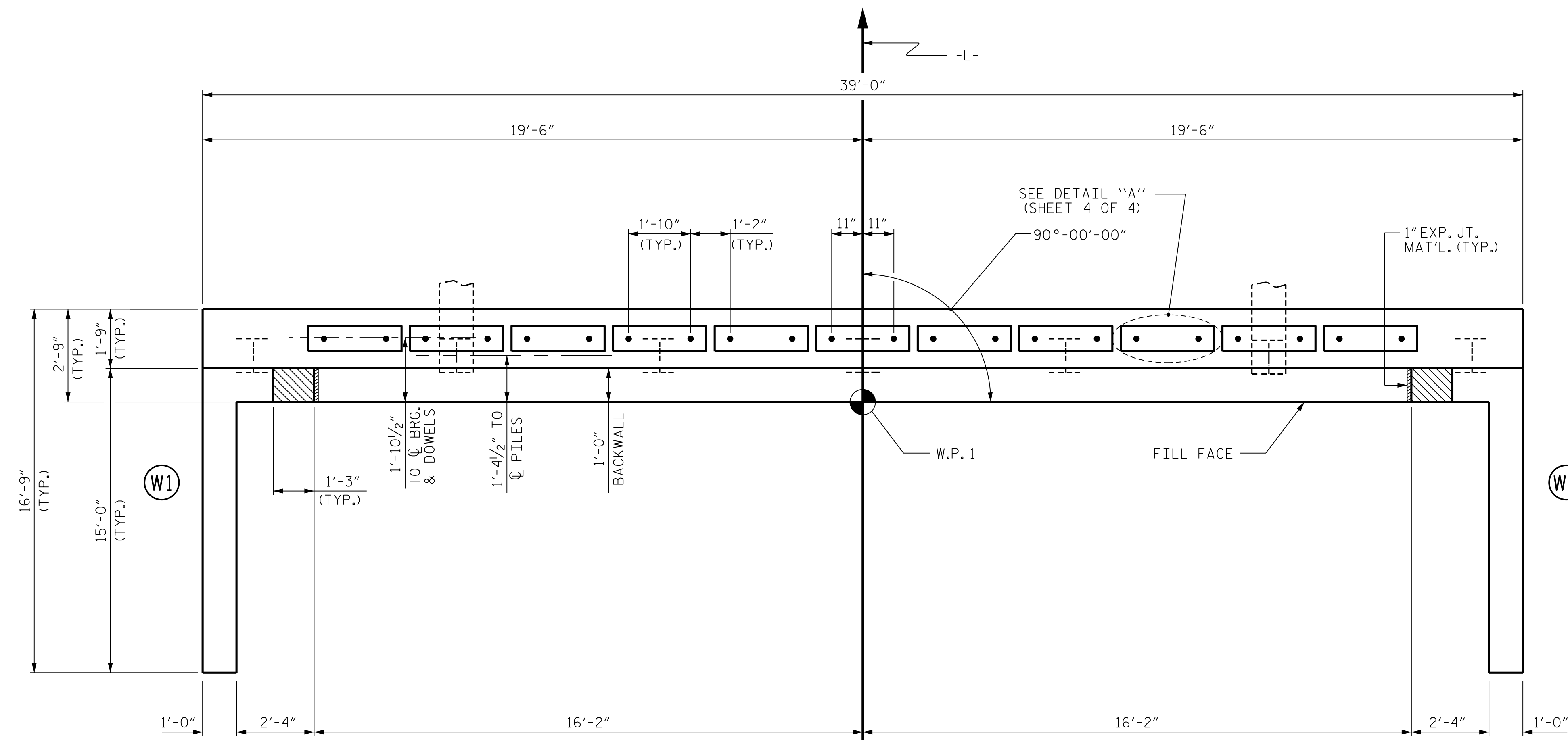
**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

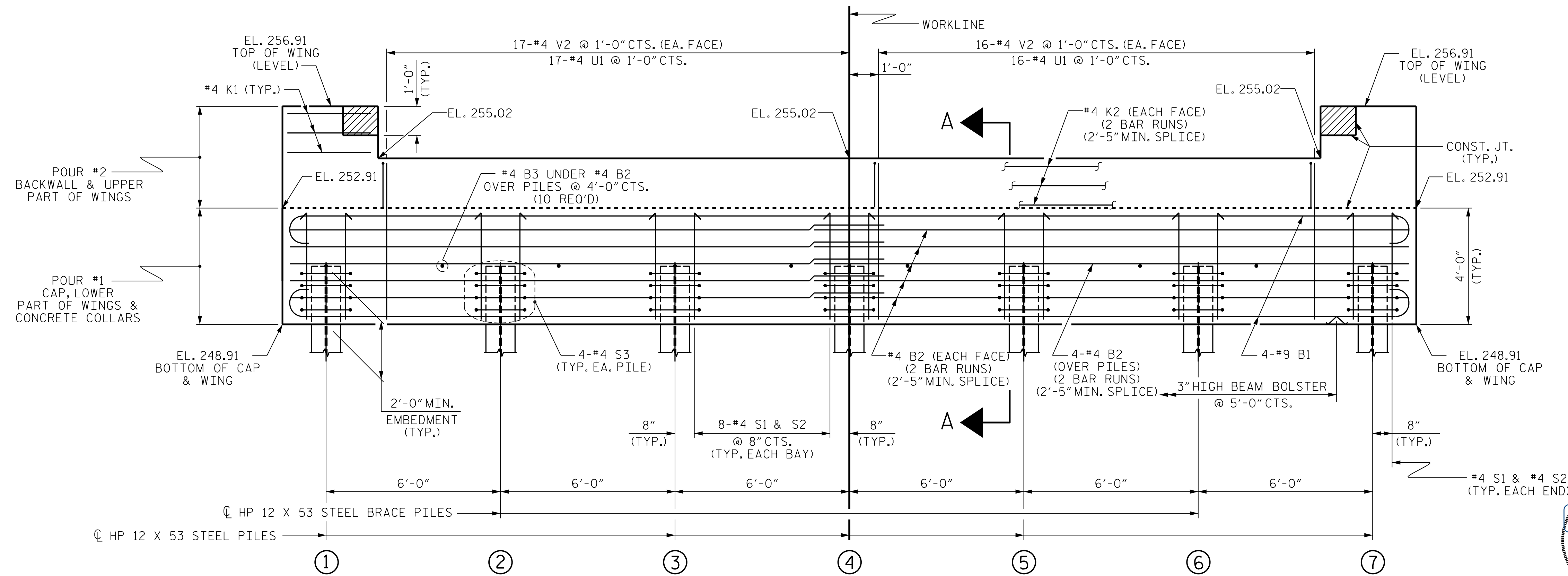
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



**PLAN**



**ELEVATION**

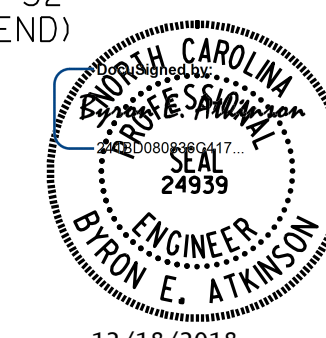
WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. 17BP.6.R.103  
HARNETT COUNTY  
STATION: 17+37.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1



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UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
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2			4			

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CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: WJH 12/11	REV. 4/15
CHECKED BY: AAC 12/11	MAA/TMG

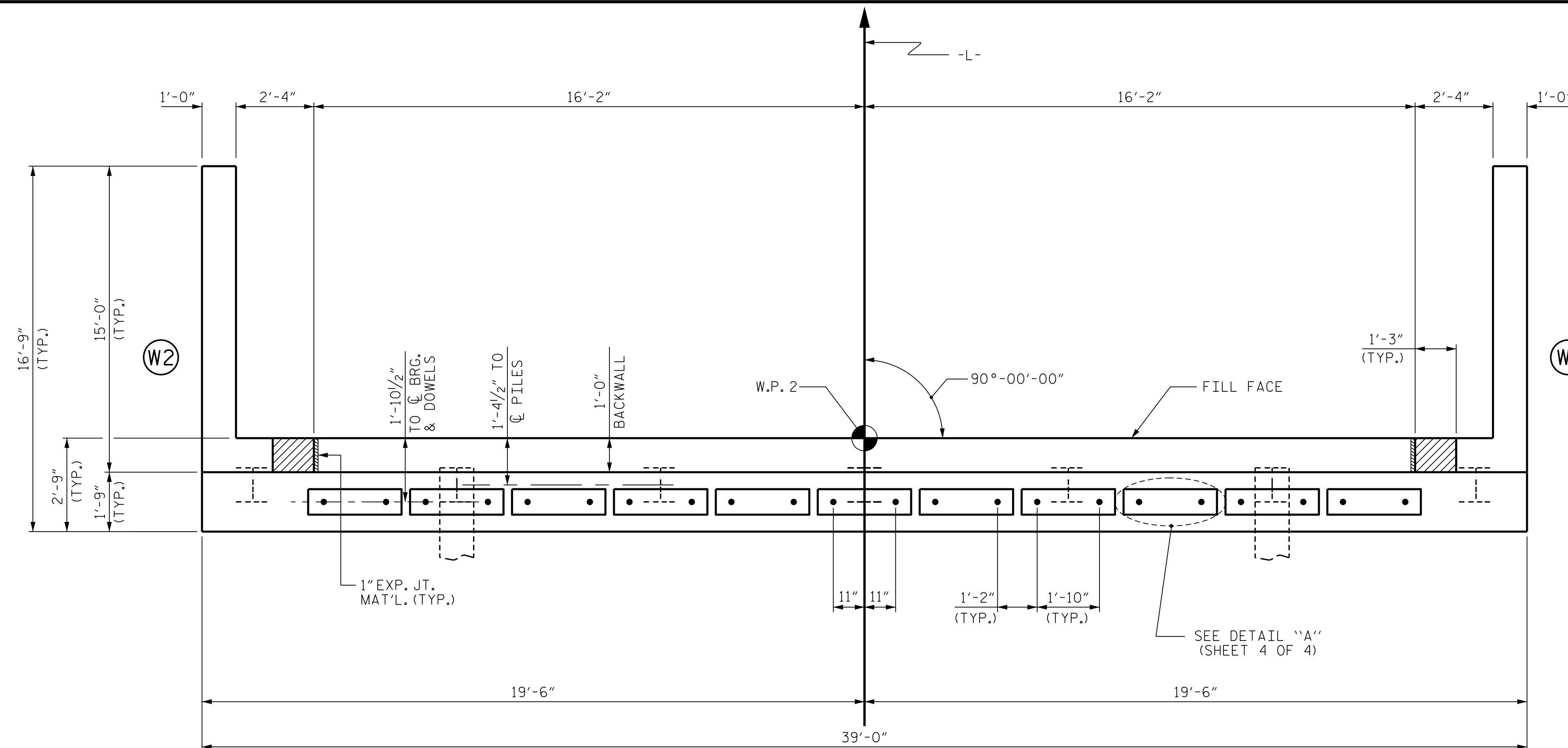
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STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

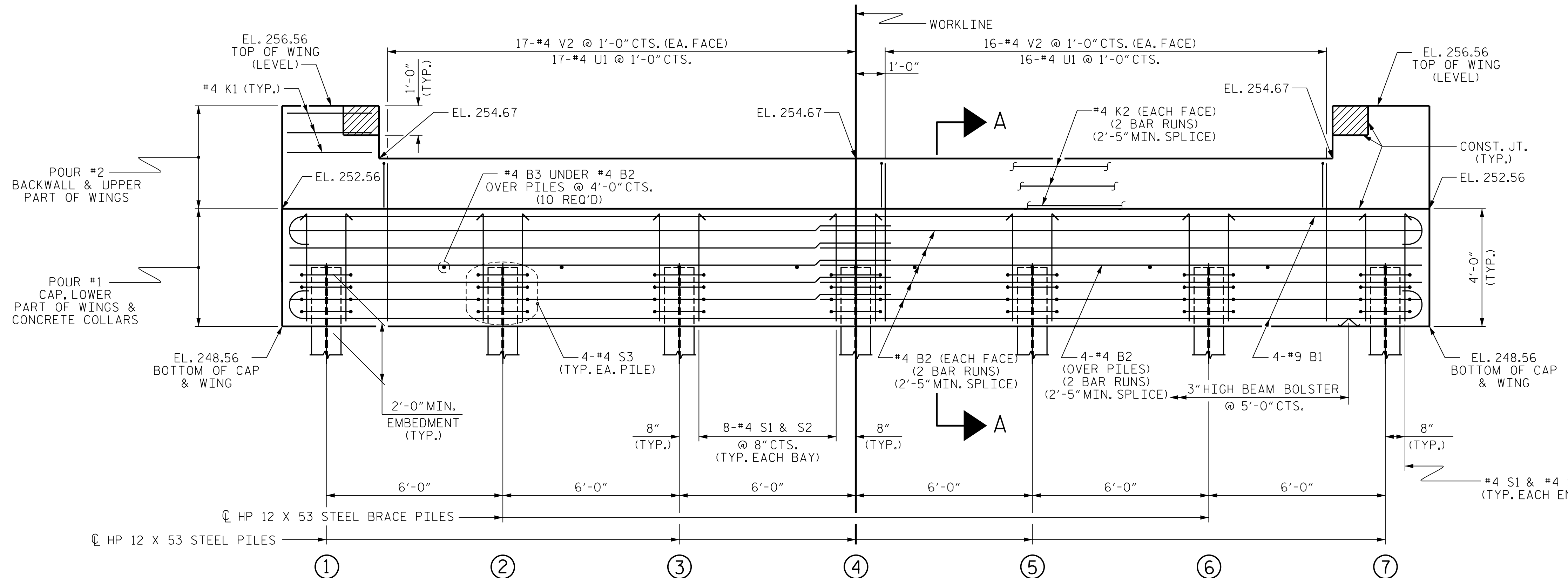
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

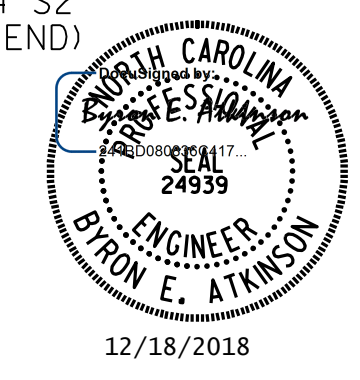
WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2



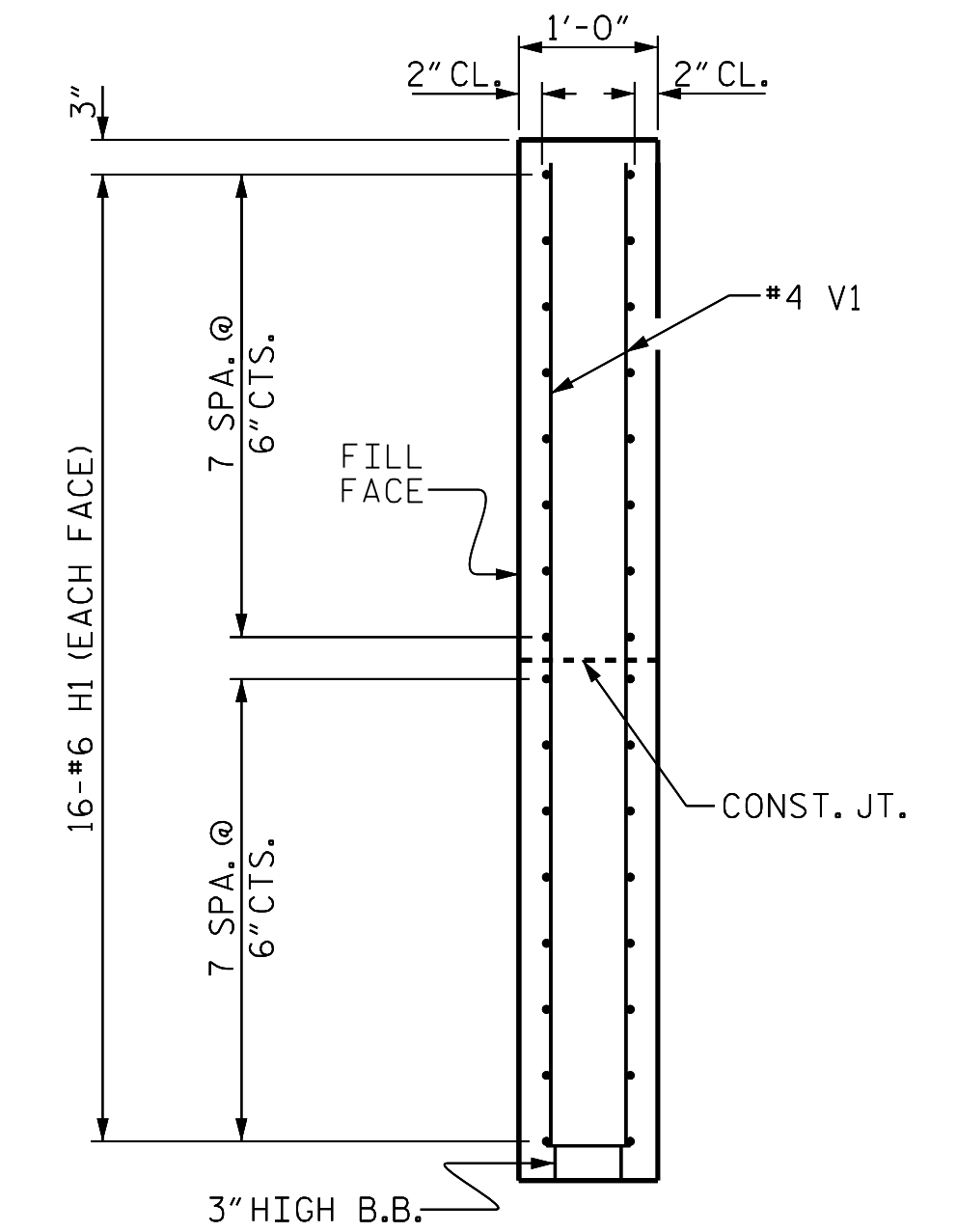
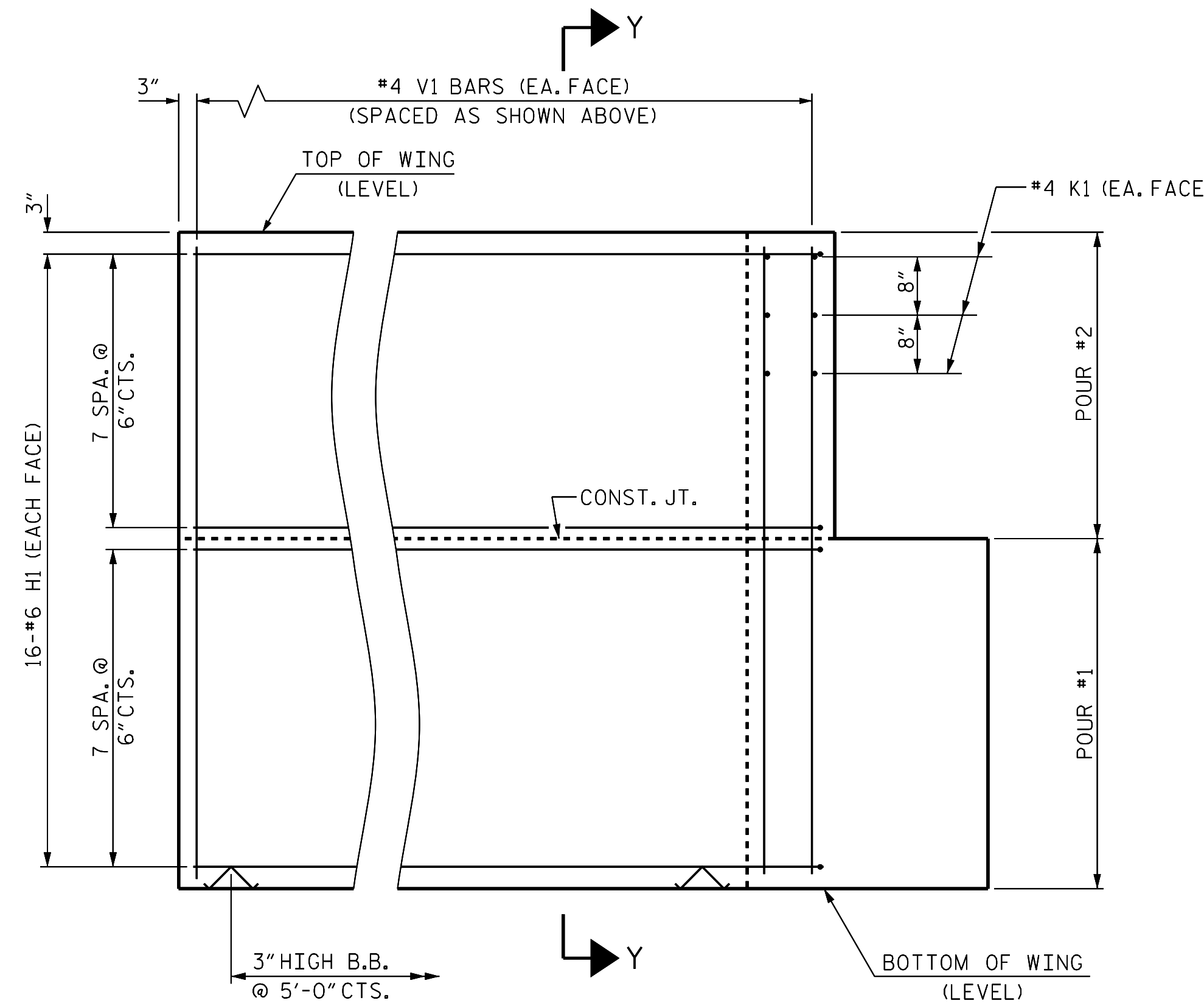
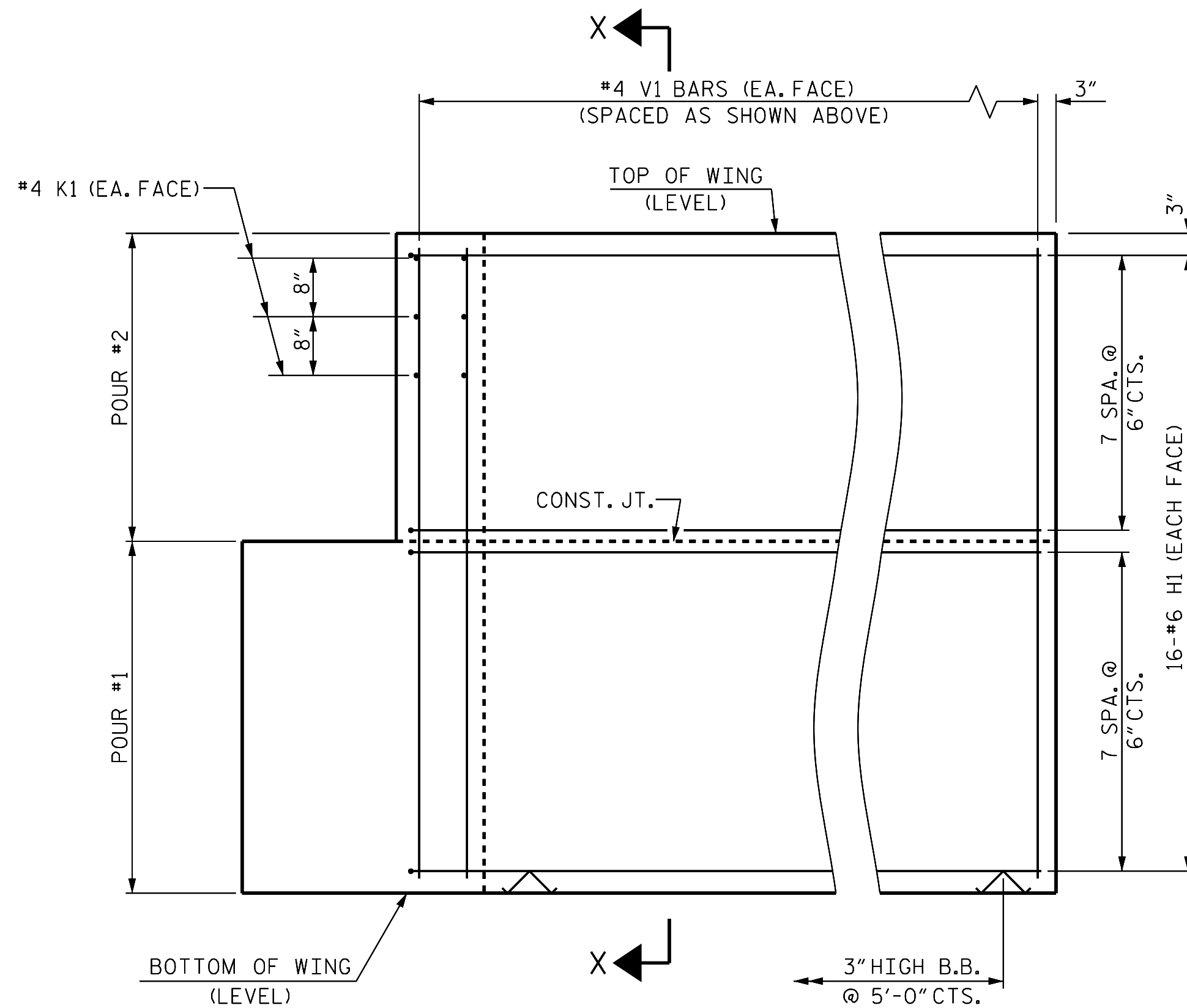
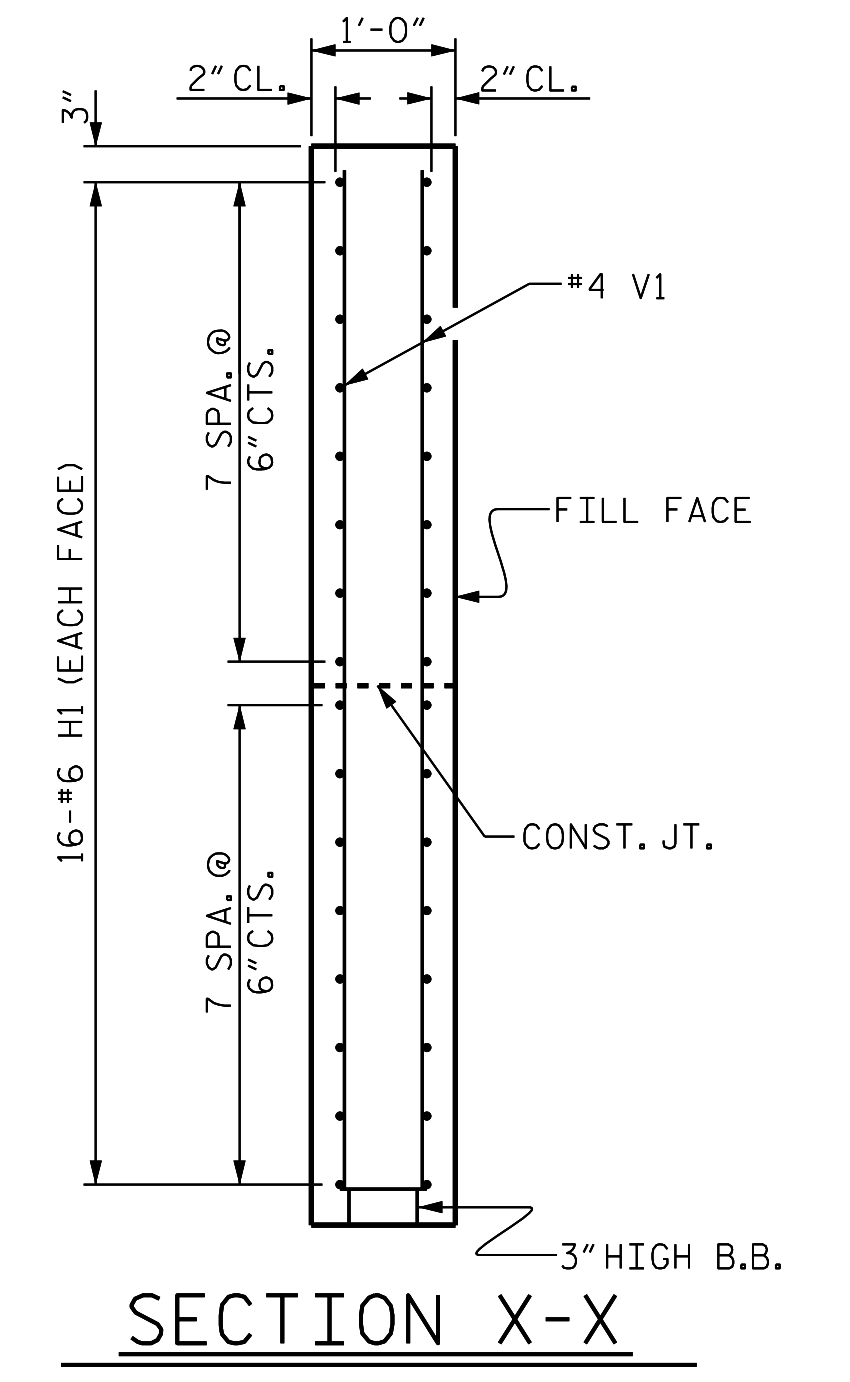
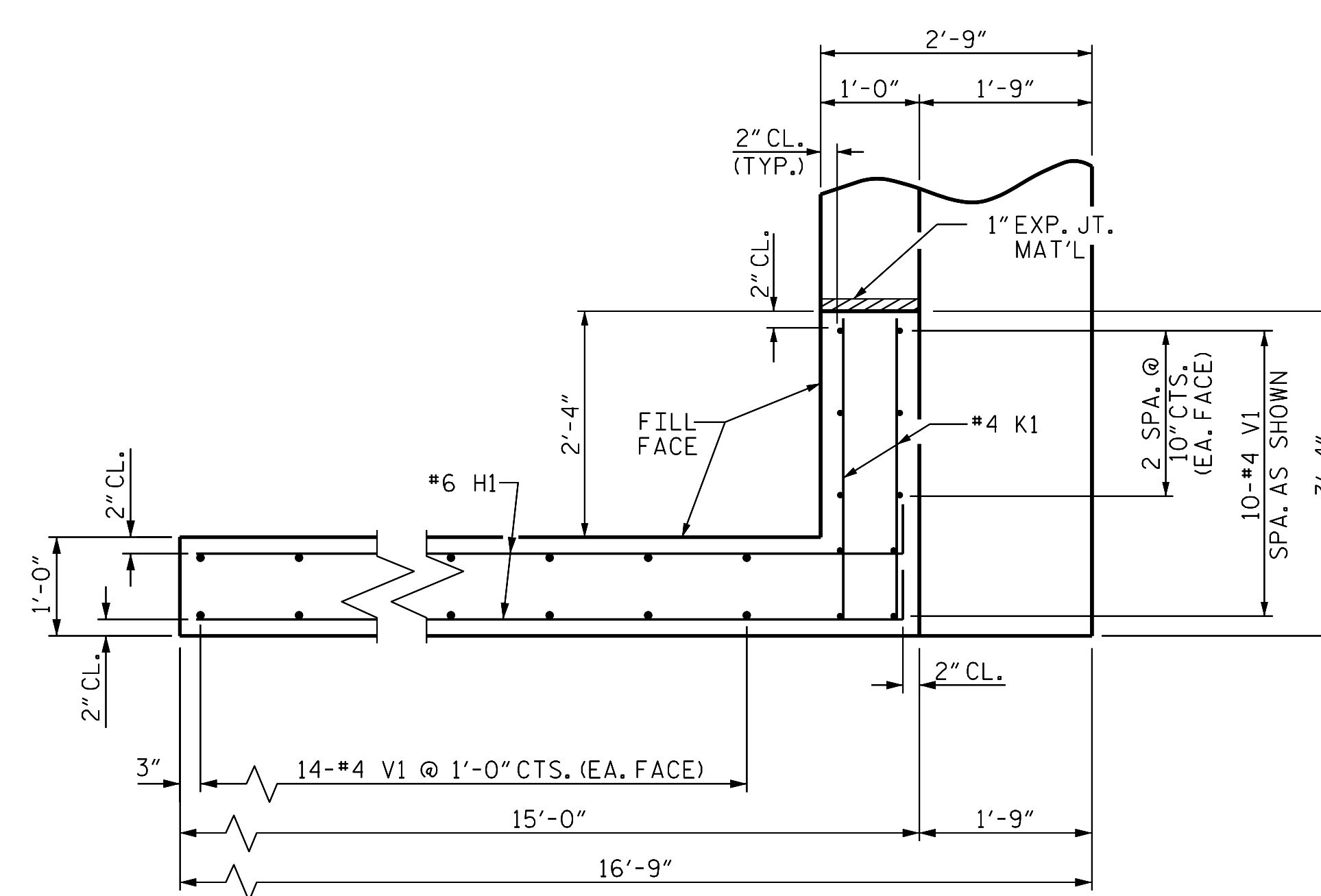
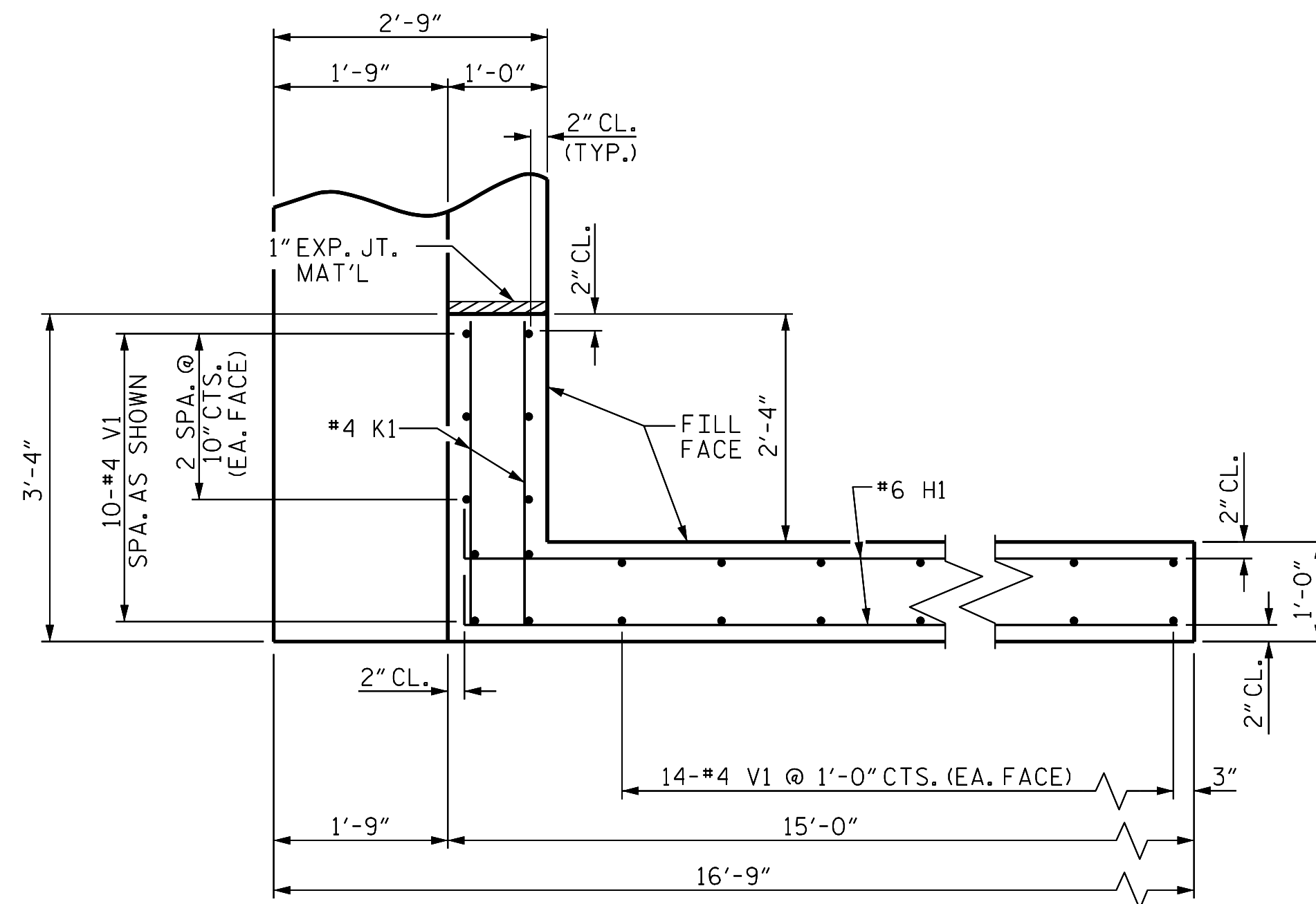
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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			15

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ASSEMBLED BY: B.E. LANNING	DATE: 09/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY: AAC 12/11	



ELEVATION OF WING (W1)

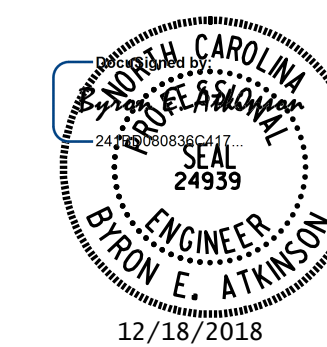
ELEVATION OF WING (W2)

SECTION Y-Y

WING DETAILS

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 3 OF 4



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 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

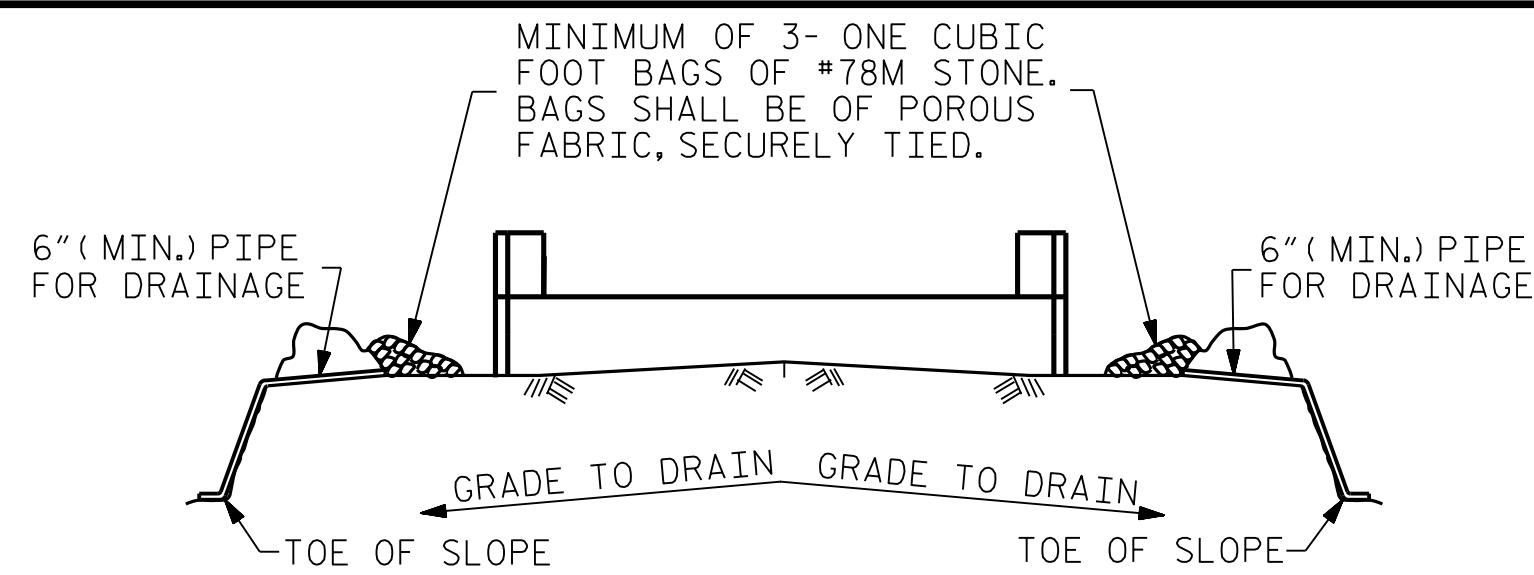
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-12					TOTAL SHEETS 15

STD. NO. EB-33-90S4-39BB

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ASSEMBLED BY: B.E. LANNING	DATE: 09/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: WJH 12/11	REV. 4/15
CHECKED BY: AAC 12/11	MAA/TMG



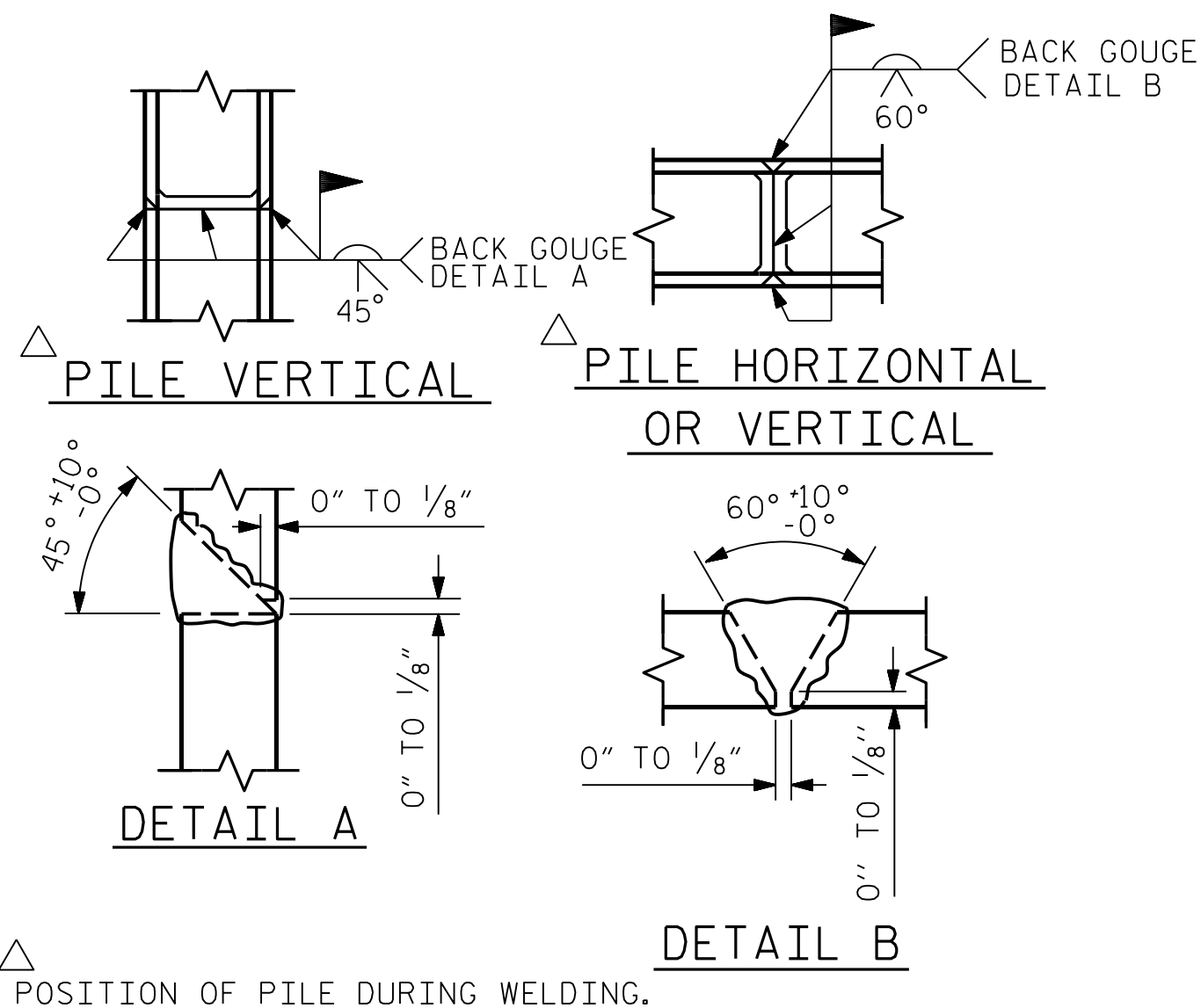


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

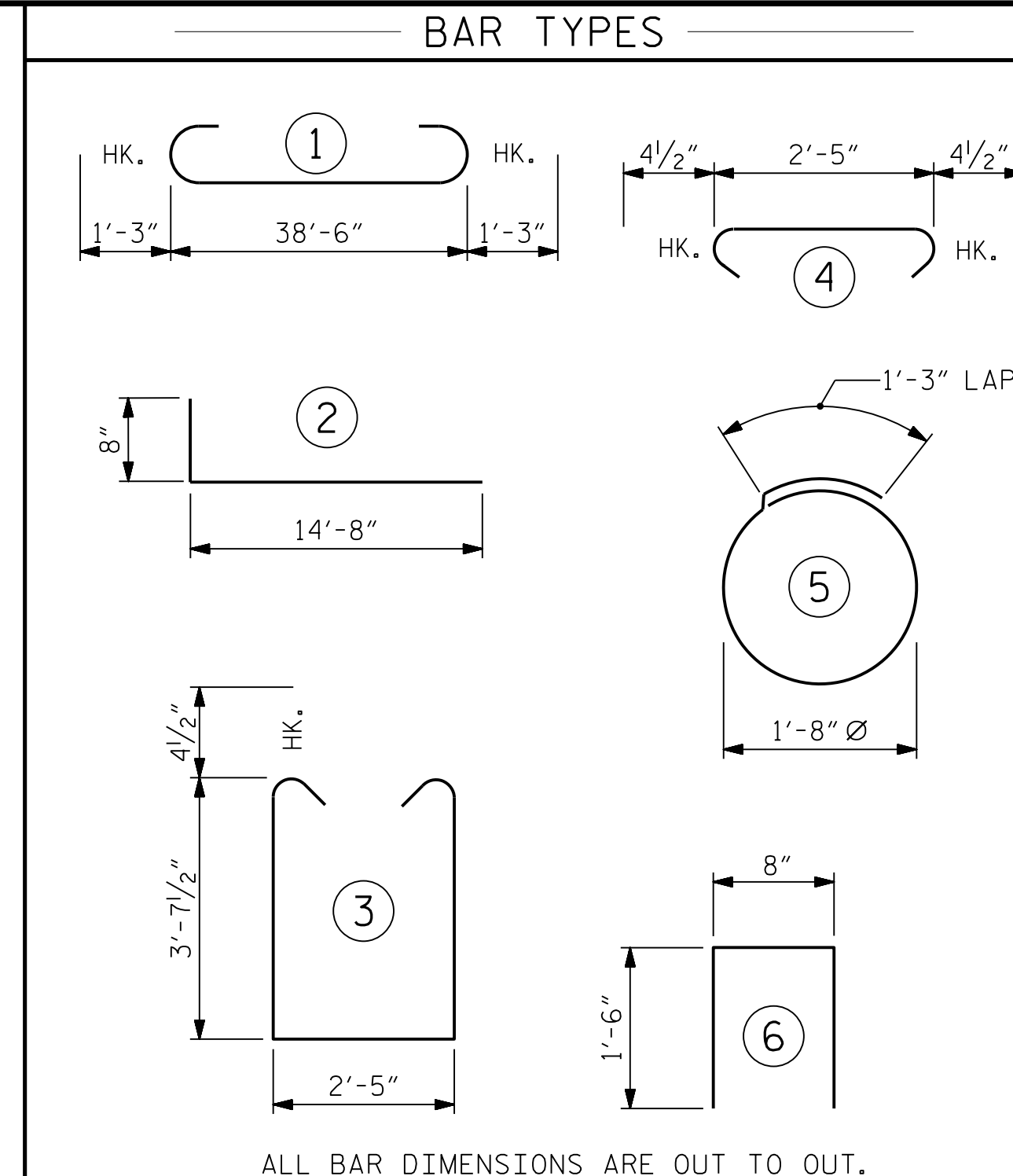
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT

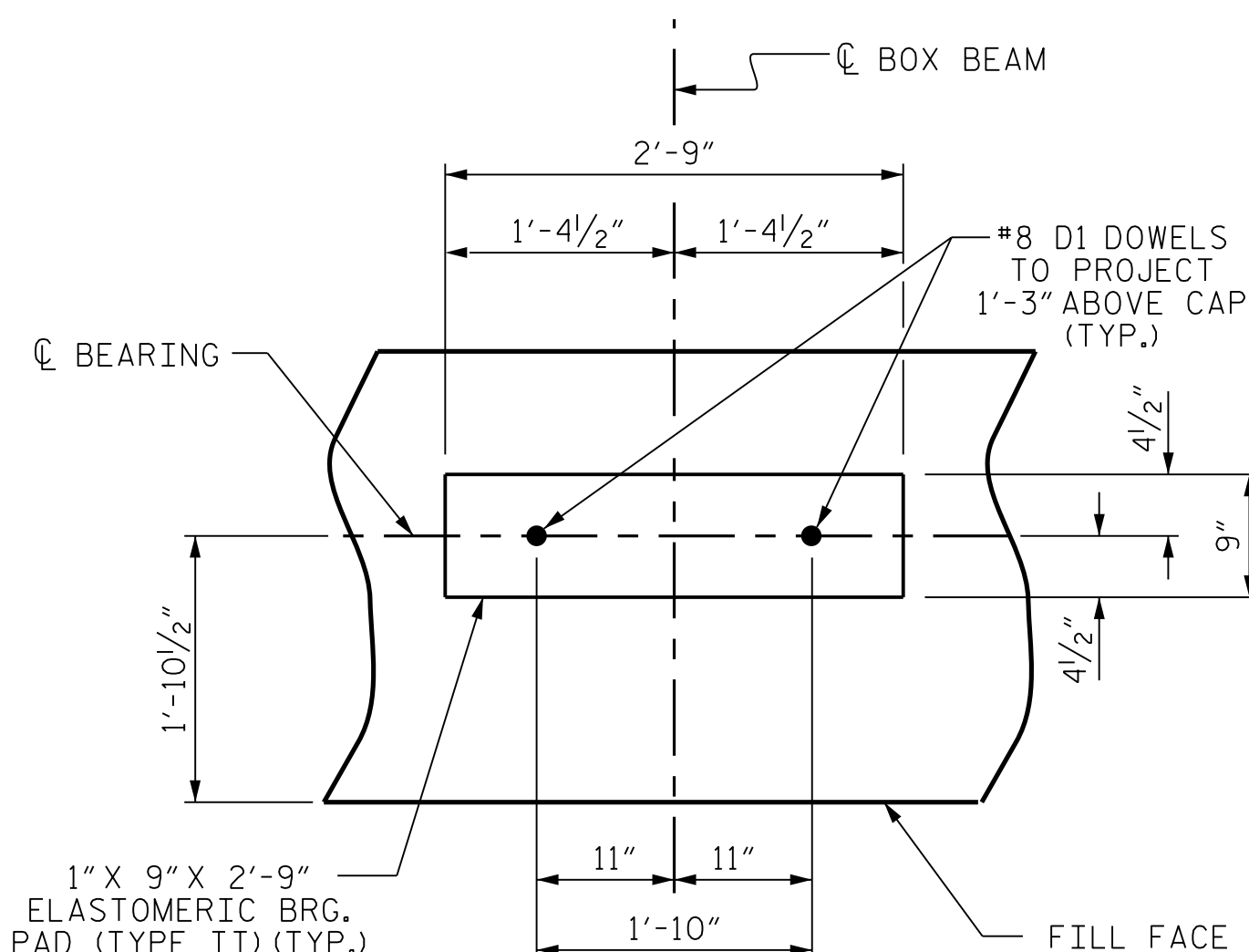


### PILE SPLICE DETAILS



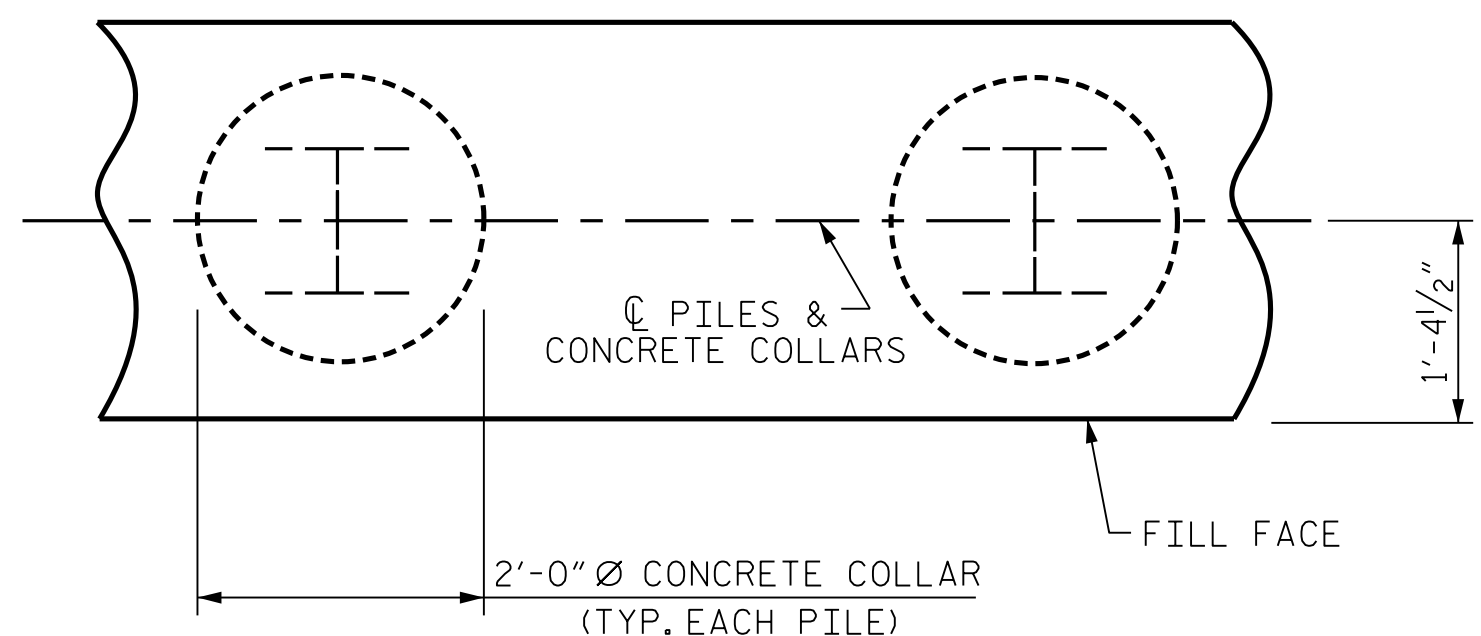
END BENT No. 1		END BENT No. 2	
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 7	LIN. FT.= 105	NO: 7	LIN. FT.= 105
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	
STEEL PILE POINTS NO: 7		STEEL PILE POINTS NO: 7	

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-8"	81
V1	76	#4	STR	7'-8"	389
V2	66	#4	STR	5'-9"	254
REINFORCING STEEL (FOR ONE END BENT)					4610 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					21.3 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS					7.7 C.Y.
TOTAL CLASS A CONCRETE					29.0 C.Y.



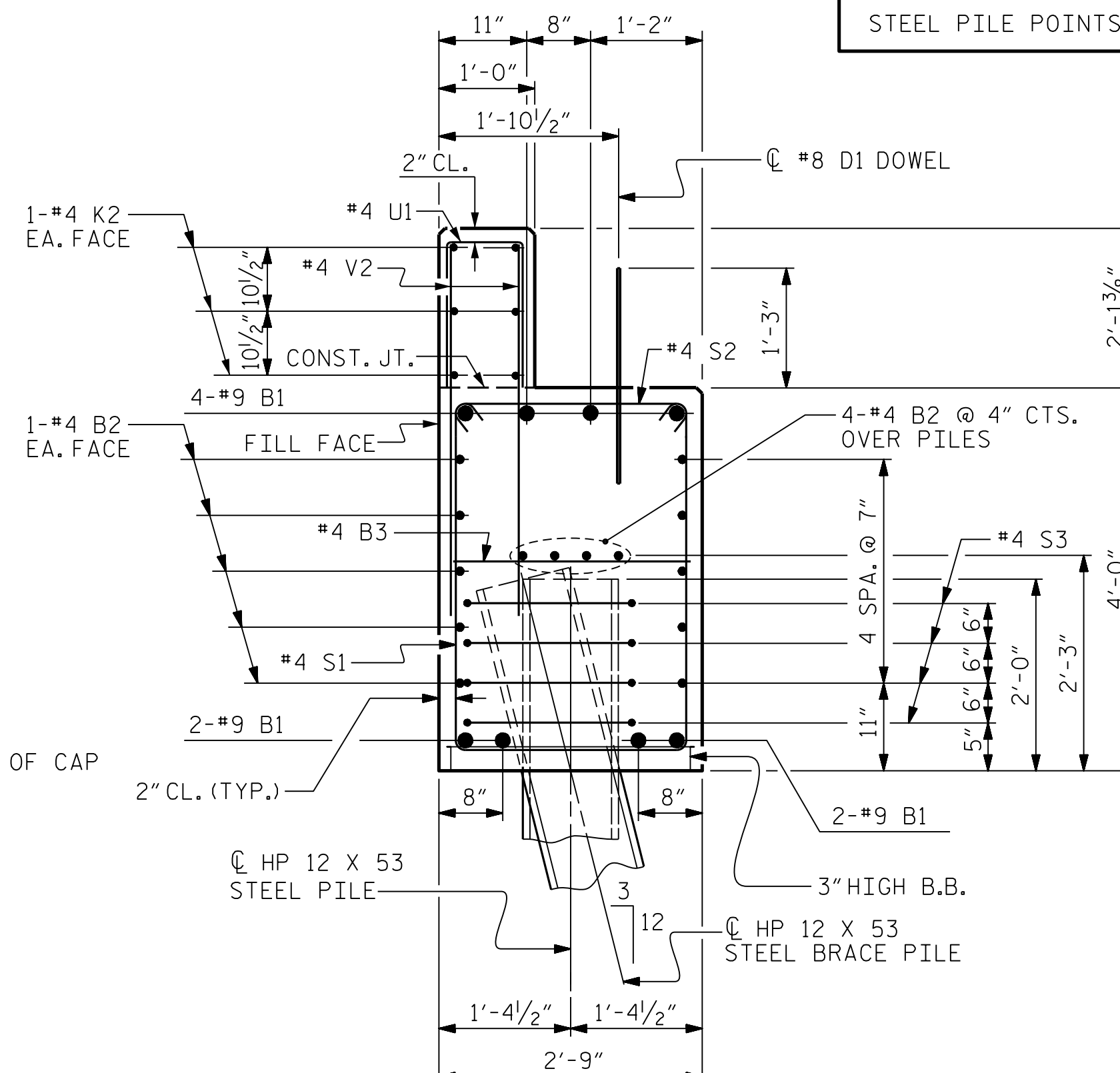
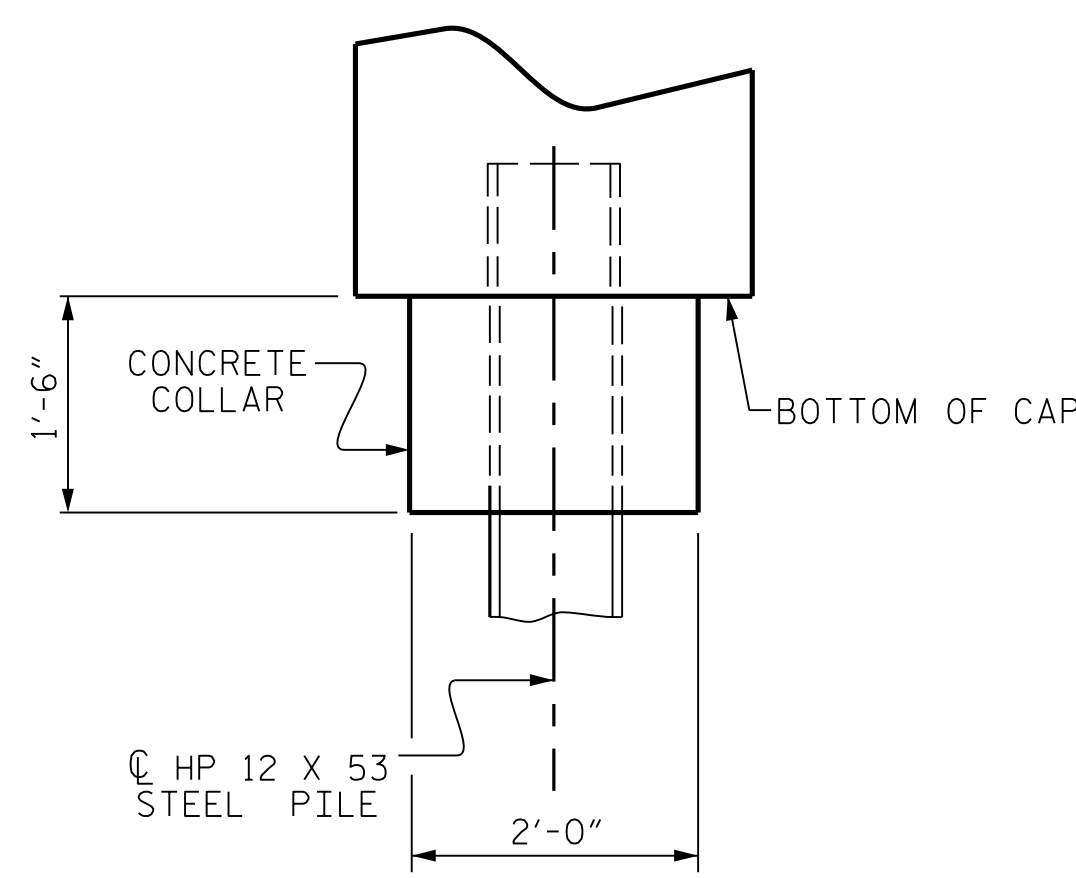
### DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



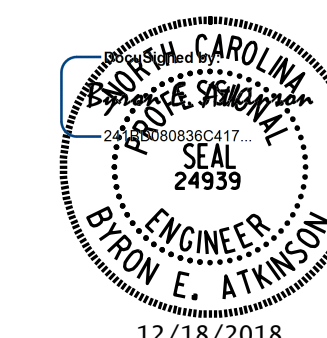
PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2  
 DETAILS



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

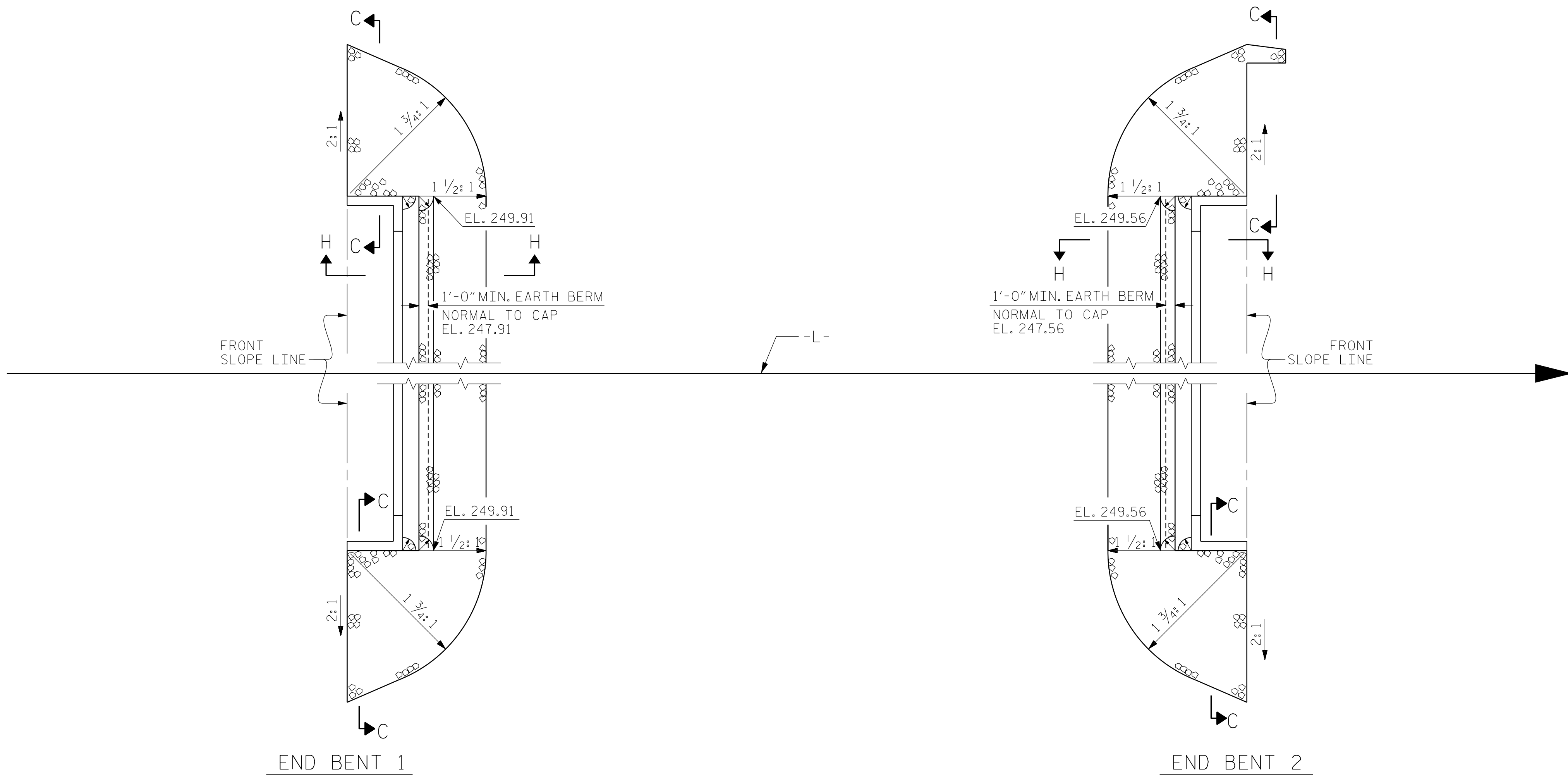
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
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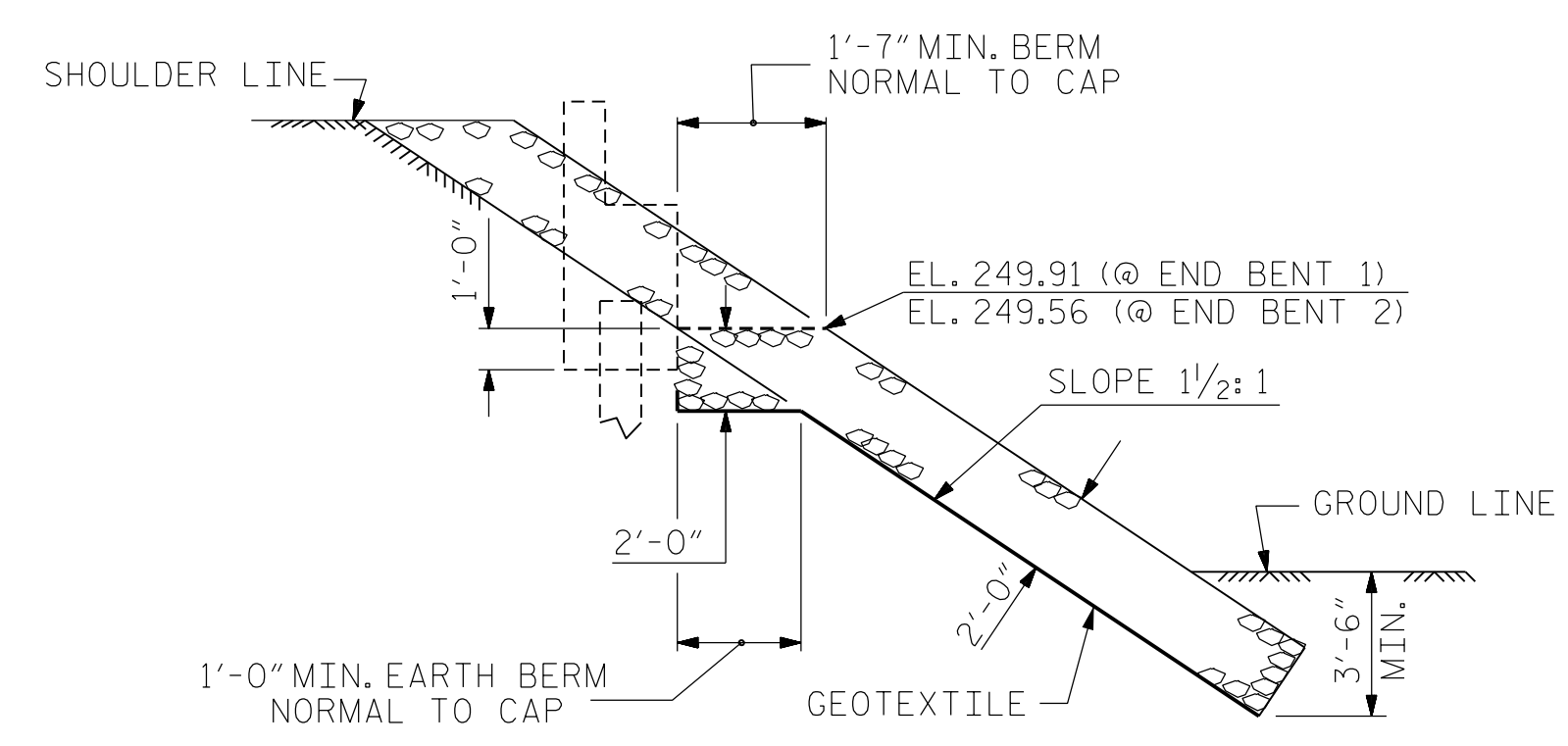
ASSEMBLED BY: B.E. LANNING	DATE: 09/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: WJH 12/II	REV. 4/17
CHECKED BY: AAC 12/II	MAA/THC

6/13/2019 6:37:37 PM User: blanning  
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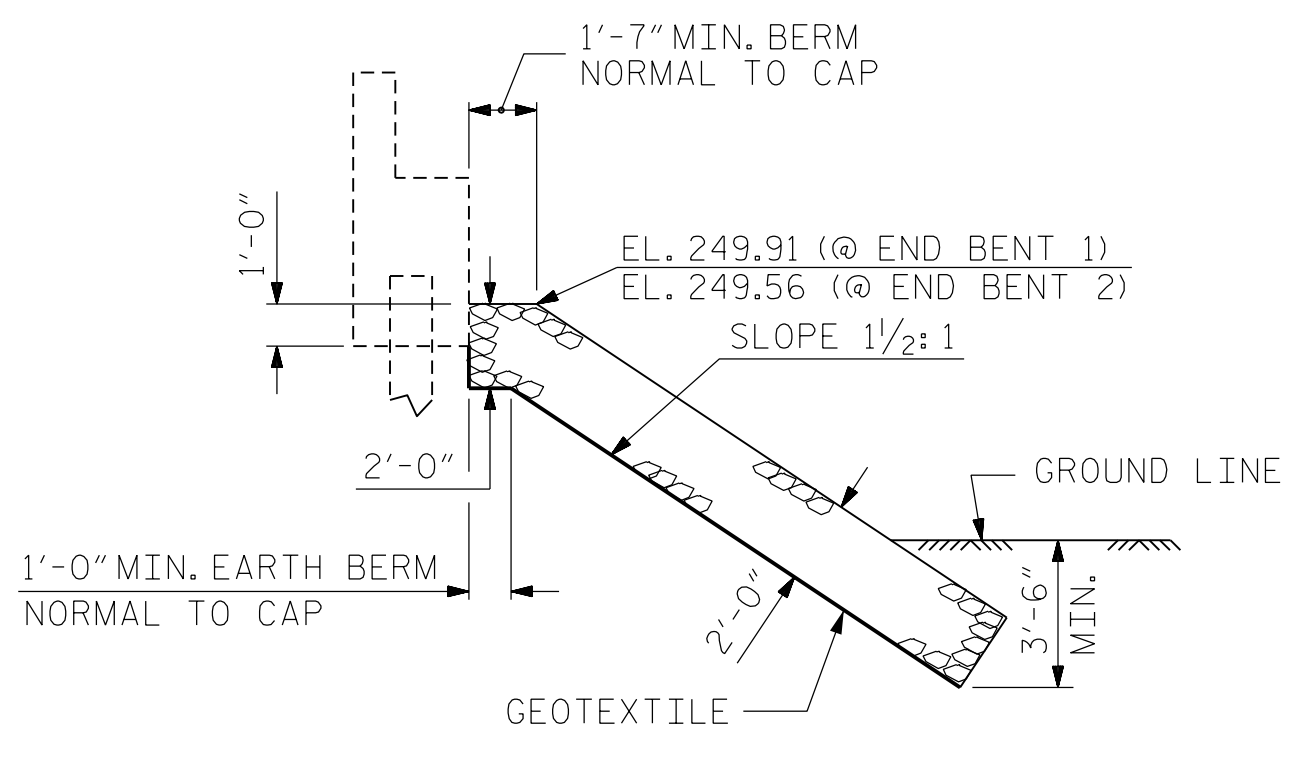


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+37.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	214	238
END BENT 2	213	237

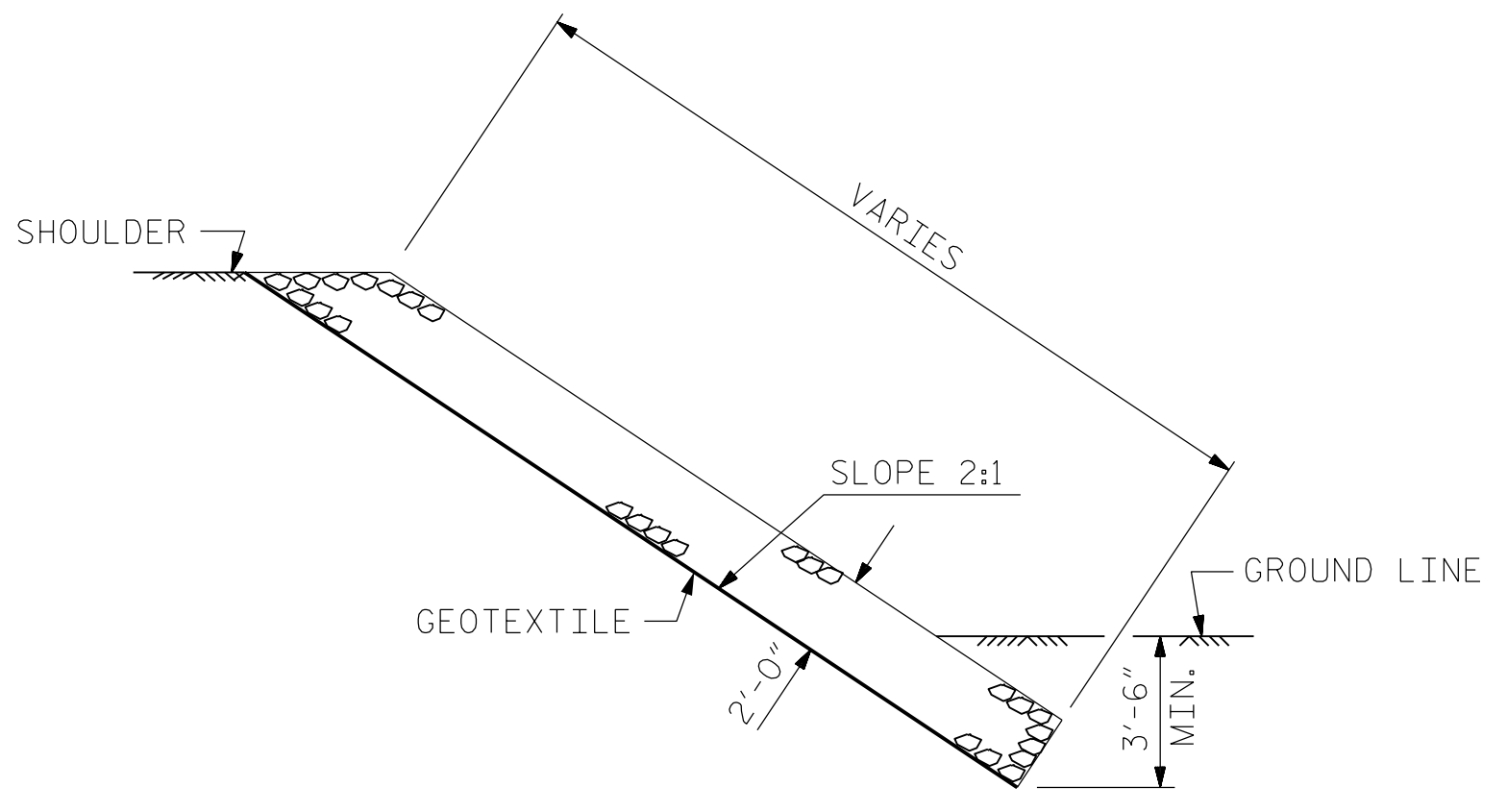


SECTION H-H



SECTION C-C

BERM RIP RAPPED



SECTION C-C

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-



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**MI ENGINEERING**  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS

ASSEMBLED BY: B.E. LANNING	DATE: 09/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY: RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			15

**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

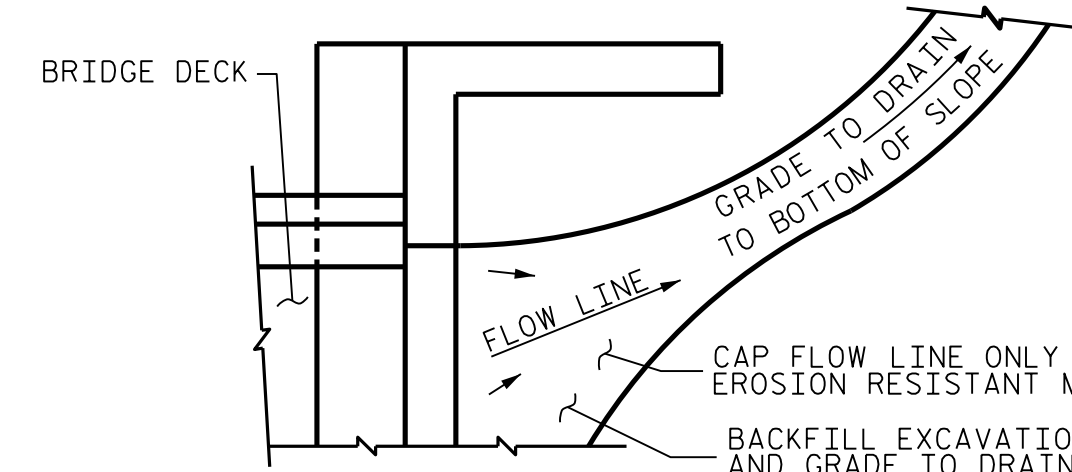
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED, SEE ROADWAY PLANS.

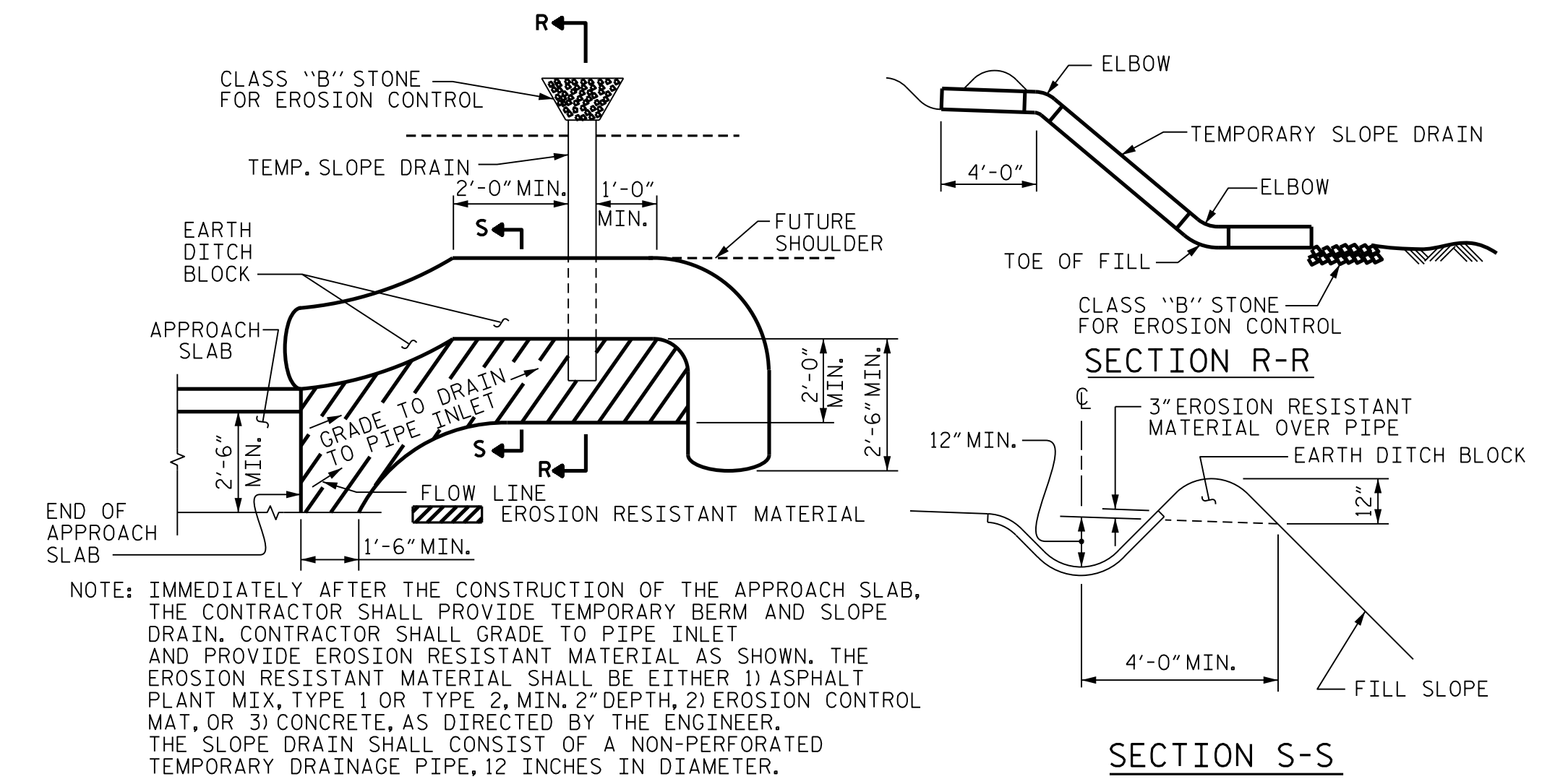
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

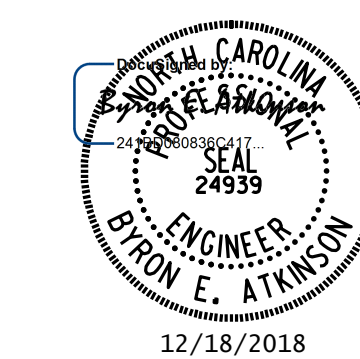
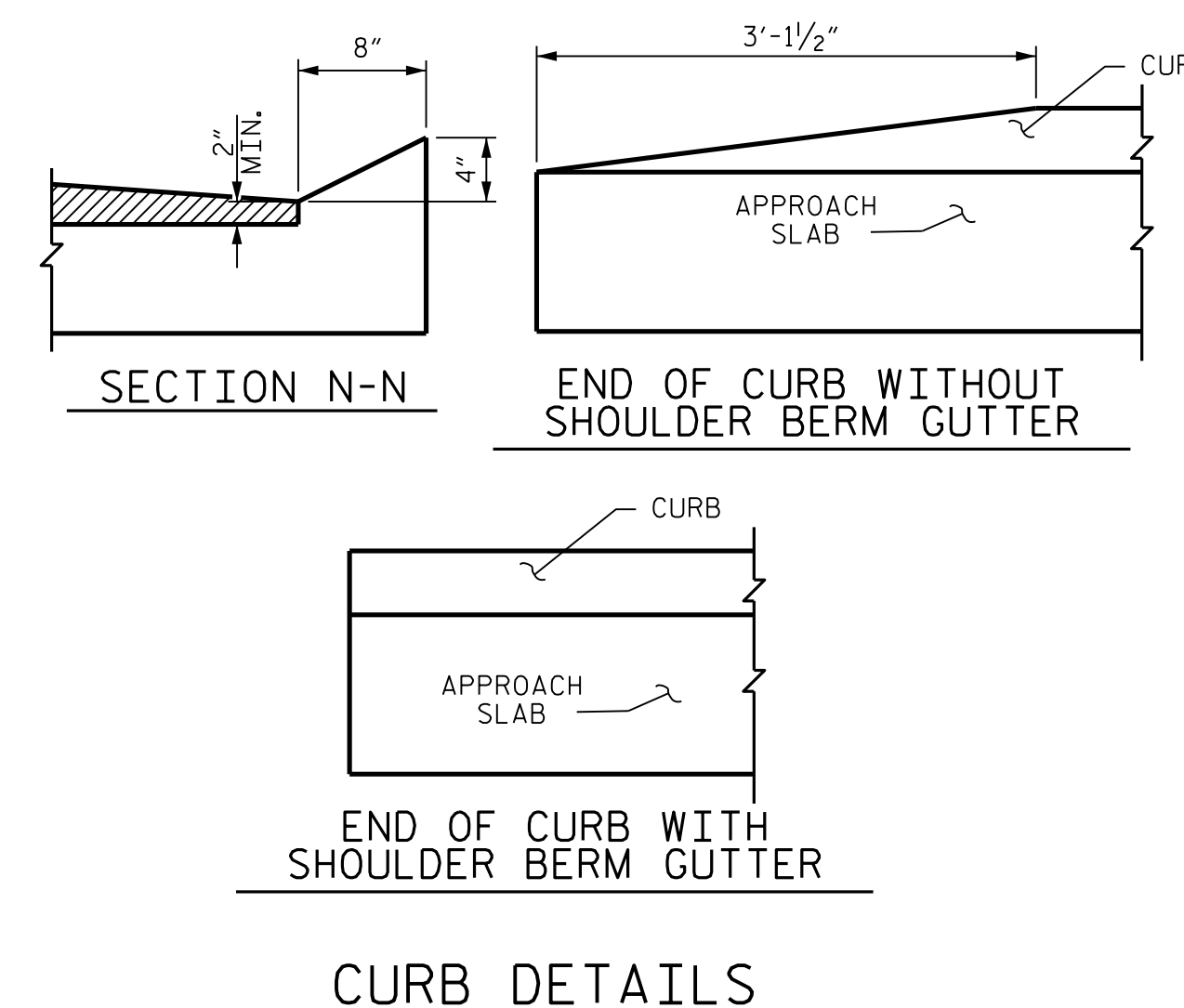


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

**TEMPORARY DRAINAGE DETAIL**



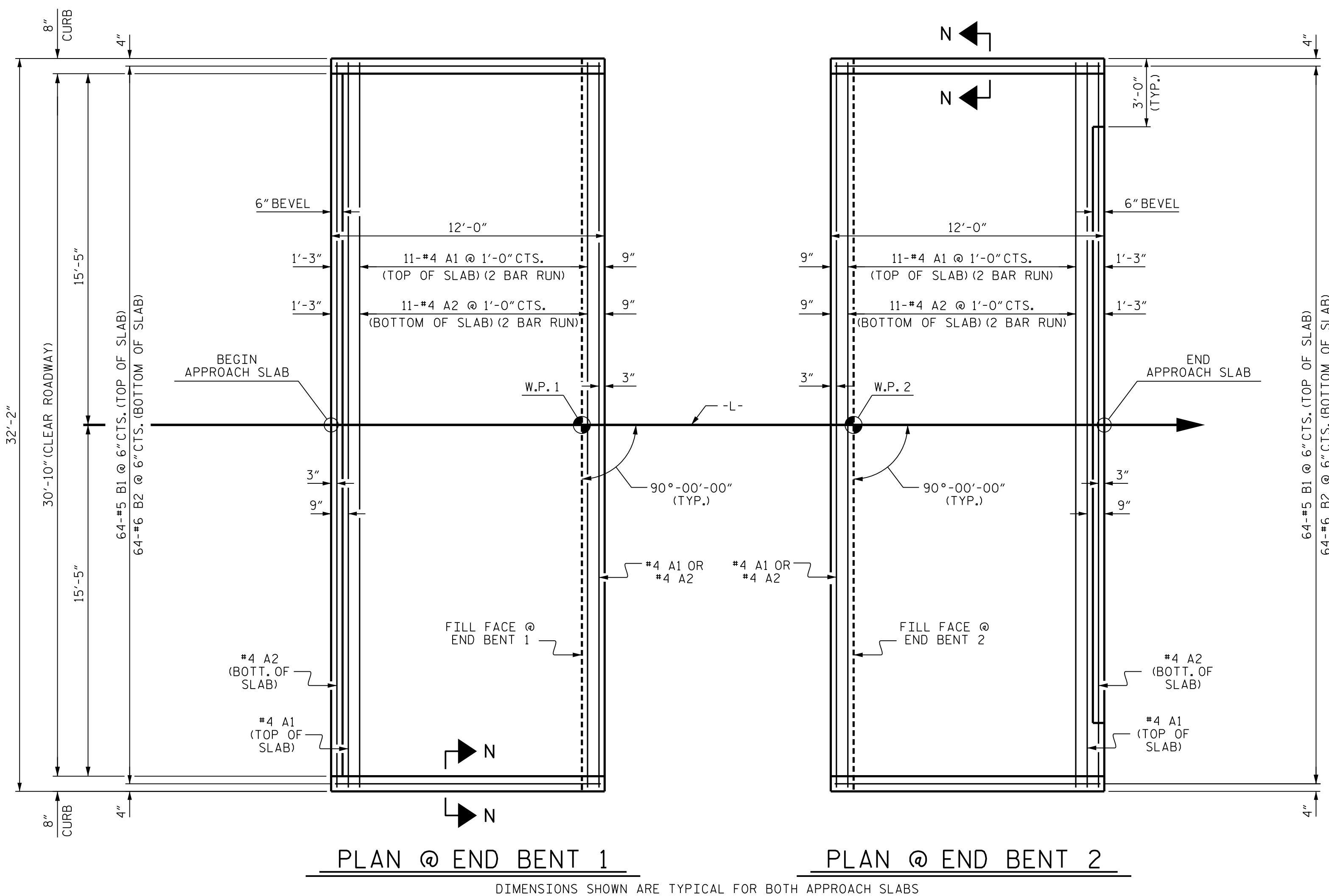
**TEMPORARY BERM AND SLOPE DRAIN DETAILS**  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



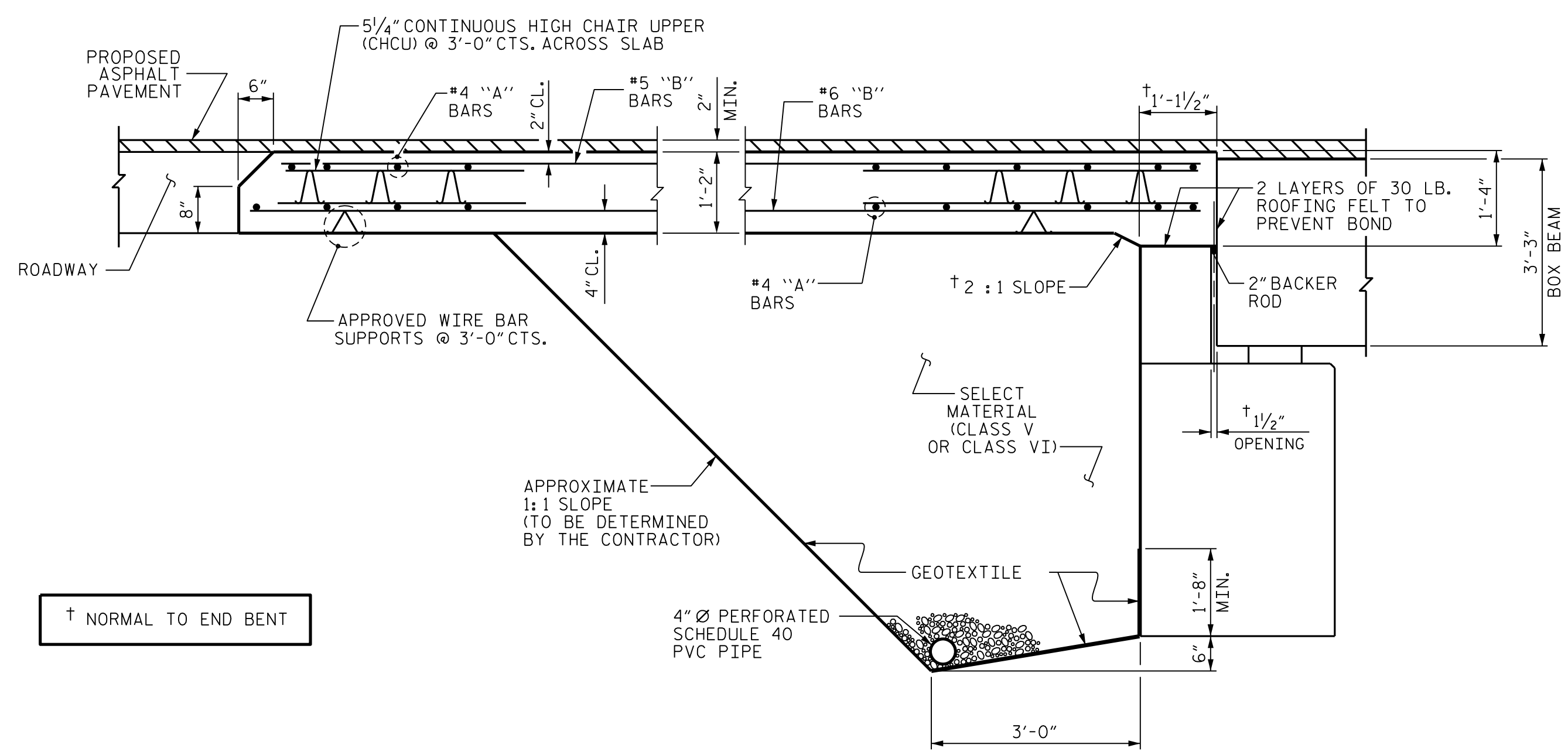
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
1011 SCHAUH DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER : P-0671

BILL OF MATERIAL						
APPROACH SLAB AT EB 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	26	#4	STR	16'-11"	294	
A2	26	#4	STR	16'-9"	291	
* B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1412
* EPOXY COATED REINFORCING STEEL					LBS.	1039
CLASS AA CONCRETE					C. Y.	17.0
APPROACH SLAB AT EB 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	26	#4	STR	16'-11"	294	
A2	26	#4	STR	16'-9"	291	
* B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1412
* EPOXY COATED REINFORCING STEEL					LBS.	1039
CLASS AA CONCRETE					C. Y.	17.0



**PLAN @ END BENT 1**  
**PLAN @ END BENT 2**  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



**SECTION THRU SLAB**  
(TYPE II - MODIFIED APPROACH FILL)

12/18/2018 10:03:43 AM User: blanning  
 Filenamer: N:\NC Bridges\MI7015.RK&A.17BP6R103.Structures\401.029.17BP6R103.SMU.BAS1\_4240151.dgn

ASSEMBLED BY: B.E. LANNING	DATE: 09/18
CHECKED BY: B.E. ATKINSON	DATE: 11/18
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 11/18
DRAWN BY: MAA	11/11
CHECKED BY: AAC	11/11
REV. 12-17	MAA/THC

PROJECT NO. 17BP.6.R.103  
 HARNETT COUNTY  
 STATION: 17+37.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)  
 90° SKEW

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. **S-15**  
TOTAL SHEETS 15

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS - - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD - - - - -	SEE PLANS
IMPACT ALLOWANCE - - - - -	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36 - -	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W - -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 - -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60 - - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER - - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT. (MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A  $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST  $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY  $\frac{1}{16}$ " INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990