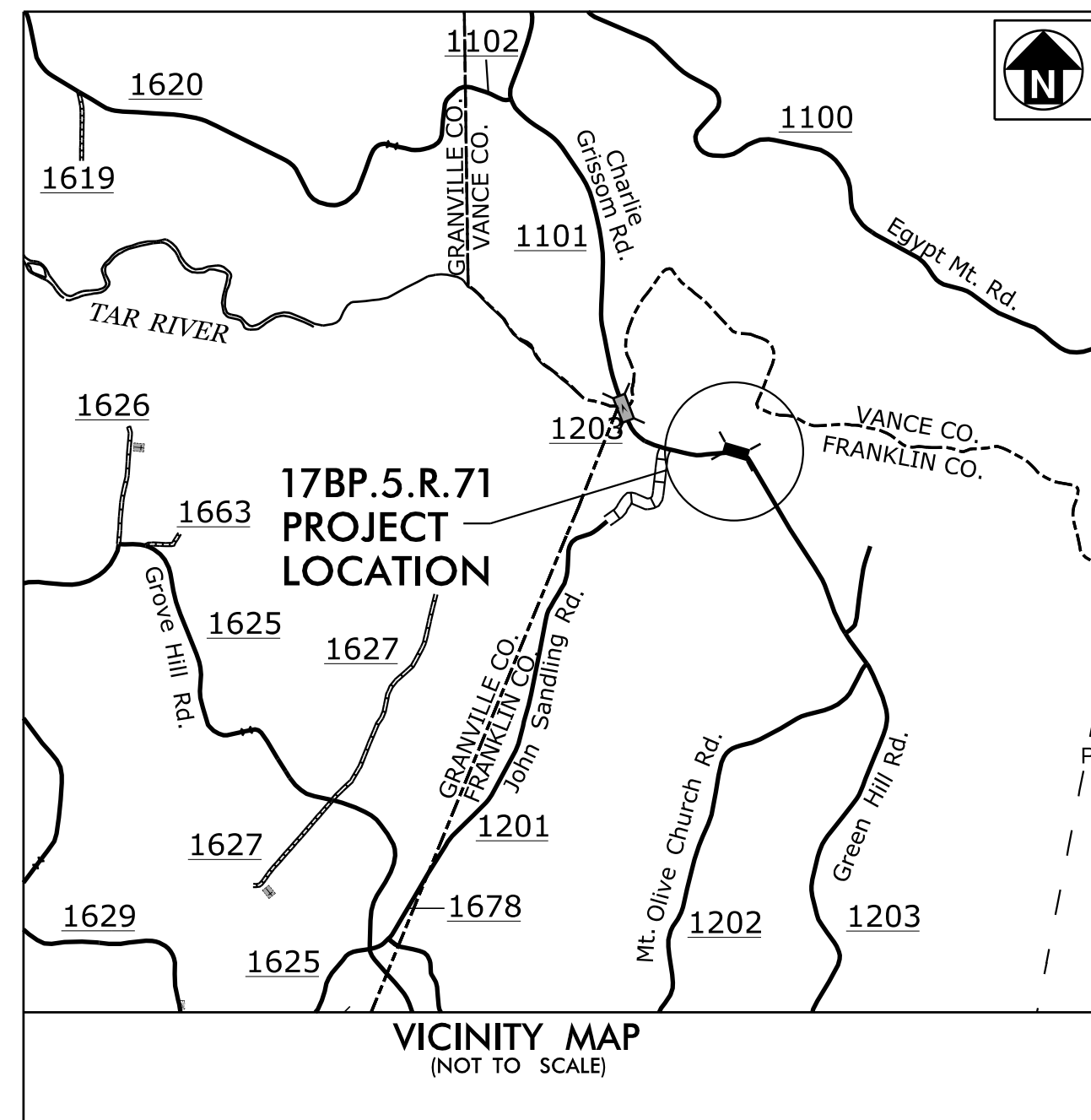


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with their signature on that page.**

**This file or an individual page  
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**CONTRACT: DE00251 TIP PROJECT: 17BP.5.R.71**

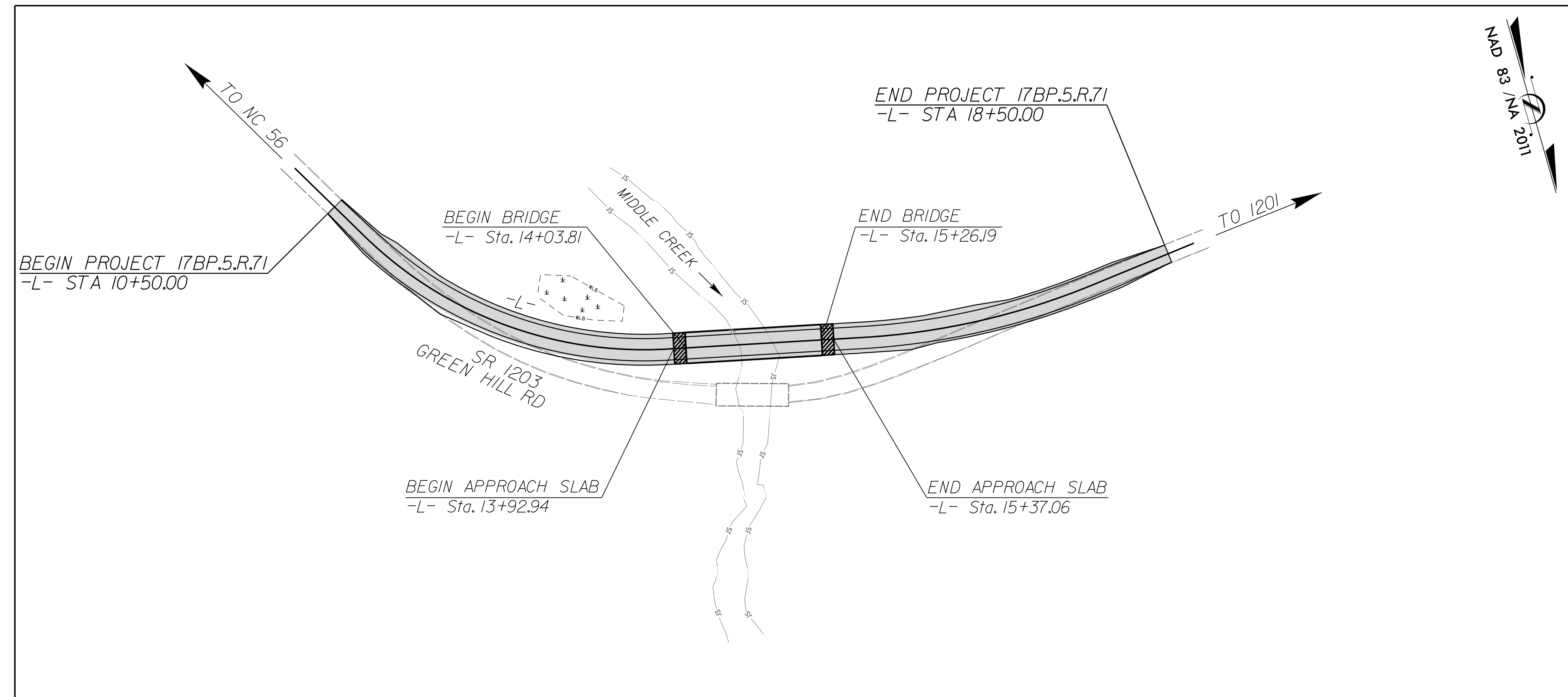


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**FRANKLIN COUNTY**

**LOCATION: BRIDGE NO. 25 OVER MIDDLE CREEK ON SR 1203 (GREEN HILL ROAD)**

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

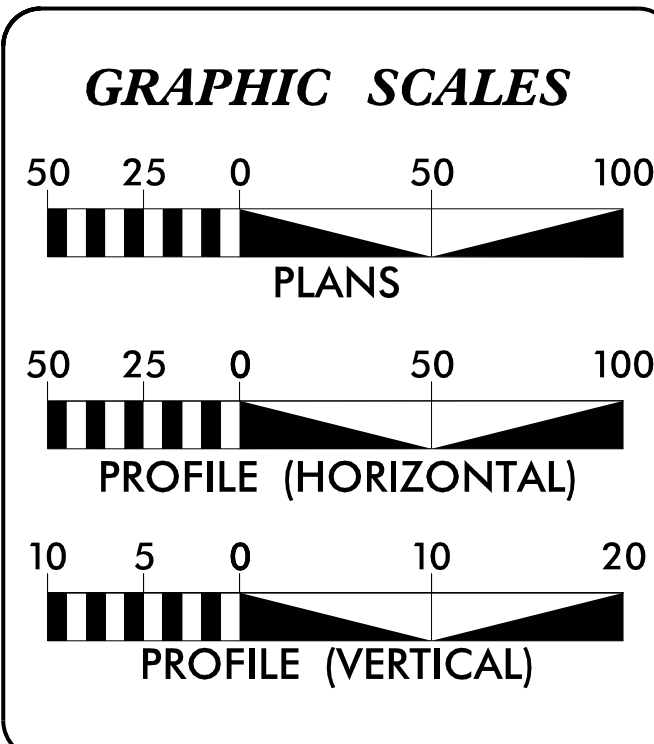
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.71	1	
STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.R.71		PE	
17BP.5.R.71		RW, UTL	
17BP.5.R.71		CONST	



**\*DESIGN EXCEPTION:**  
MIN. HORIZONTAL CURVE RADIUS  
SAG VERTICAL CURVE K  
HORIZONTAL SSD  
VERTICAL SSD

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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



**DESIGN DATA**

ADT (2012) = 510

ADT (2025) = 1000

V = 55 MPH

CLASS =  
MINOR COLLECTOR  
SUB REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT = 0.129 MILES

LENGTH STRUCTURE TIP PROJECT = 0.023 MILES

TOTAL LENGTH TIP PROJECT = 0.152 MILES

Prepared in the Office of Matt MacDonald for  
**DIVISION 5**  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS	<b>TIM JORDAN, PE</b> PROJECT ENGINEER
<b>RIGHT OF WAY DATE:</b> OCTOBER 5, 2017	<b>JAMES R. RICE, PE</b> HYDRAULICS ENGINEER
<b>LETTING DATE:</b> AUGUST 8, 2018	<b>LISA GILCHRIST, EI</b>
<b>NCDOT CONTACT:</b>	

**ROADWAY DESIGN ENGINEER**

NORTH CAROLINA PROFESSIONAL SEAL 21102  
7/10/2018  
P.E.

**HYDRAULICS ENGINEER**

NORTH CAROLINA PROFESSIONAL SEAL 031986  
7/10/2018  
P.E.

**PLANS PREPARED BY:**

**M M**  
MOTT MACDONALD  
PO Box 700  
Fuquay-Varina, NC 27526  
(919) 552-2253  
(919) 552-2254 (Fax)  
www.mottmac.com/americas  
LICENSE NO. F-0669

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE	SHEET NO.
17BP.5.R.71 – FRANKLIN 25	1A
ROADWAY DESIGN ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	
	MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas

## GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS EFFECTIVE: 01-16-18

### GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

### CLEARING:

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

### 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.

### 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.

### SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

### END BENTS:

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

### UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE POWER AND CENTURY LINK.

### RIGHT-OF-WAY MARKERS:

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

## LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01-16-2018

### 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>	
200.03	Method of Clearing – Method III
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
310.10	Driveway Pipe Construction
<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 8 – INCIDENTALS</b>	
806.01	Concrete Right-of-way Marker
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
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
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

## INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS
1D-1	CENTERLINE COORDINATE LIST
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	GUARDRAIL INSTALLATION
2C-2	STRUCTURE ANCHOR UNITS
3B-1	GUARDRAIL SUMMARY, SHOULDER BERM GUTTER SUMMARY AND EARTHWORK SUMMARY
3D-1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-5	CROSS-SECTIONS
S-1 THRU S-21	STRUCTURE PLANS
SN	STANDARD STRUCTURE NOTES



*Note: Not to Scale*

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

**BOUNDARIES AND PROPERTY:**

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-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-

**BUILDINGS AND OTHER CULTURE:**

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	□

**HYDROLOGY:**

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

**RAILROADS:**

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

**RIGHT OF WAY:**

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Utility Easement	-PUE-

**ROADS AND RELATED FEATURES:**

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Wheel Chair Ramp	WCR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊗

**VEGETATION:**

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

**EXISTING STRUCTURES:**

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

**UTILITIES:**

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

**TELEPHONE:**

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

**WATER:**

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

**TV:**

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	⊕
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

**GAS:**

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

**SANITARY SEWER:**

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

**MISCELLANEOUS:**

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



# SURVEY CONTROL SHEET 34-0025

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.71	1C-1
Location and Surveys	

PROJECT SURVEYOR

340025-1  
N=880631.899  
E=2152301.556  
ELEV.=311.285

340025-2  
N=881266.995  
E=2151927.631  
ELEV.=304.73

340025-4  
N=881967.4141  
E=2150163.7914  
ELEV.=241.23

340025-3  
N=881932.874  
E=2150579.813  
ELEV.=242.00

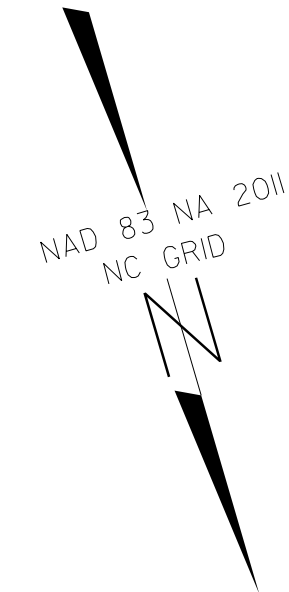
BM2  
N=881933  
E=2150924  
ELEV.=237.77

BL-102  
N=881976.676  
E=2150950.537  
ELEV.=239.38

BL-100  
N=881854.097  
E=2151617.471  
ELEV.=245.13

BL-101  
N=882039.796  
E=2151269.516  
ELEV.=235.88

BM1  
N=882081  
E=2151314  
ELEV.=232.34



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "340025-2"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
NORTHING: 881266.9950(ft) EASTING: 2151927.6310(ft)  
ELEVATION: 304.73(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99999313

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "340025-2" TO -L- STATION IS

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

**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.

**NOTE: DRAWING NOT TO SCALE**

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.71	1C-2
Location and Surveys	
PROJECT SURVEYOR	

**SURVEY CONTROL SHEET 34-0025**  
**W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION**

**BASELINE**

BL	POINT	DESC.	NORTH	EAST	ELEVATION
2		340025-2	881266.9950	2151927.6310	304.73
100		BL - 100	881854.0966	2151617.4711	245.13
101		BL - 101	882039.7958	2151269.5160	235.88
102		BL - 102	881976.6757	2150950.5366	239.38
3		340025-3	881932.8740	2150579.8130	242.00

\*\*\*\*\*  
 BM1            ELEVATION = 232.34  
 N 882081       E 2151314

SPIKE IN 16" GUM  
 \*\*\*\*\*

\*\*\*\*\*  
 BM2            ELEVATION = 237.77  
 N 881933       E 2150924

S 03°34'28.7" E    DIST 55.81  
 SPIKE IN 8" BEECH  
 \*\*\*\*\*

- 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.

**NOTE: DRAWING NOT TO SCALE**

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 10/25/99

11/13/17

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.71	1C-3
Location and Surveys	

PROJECT SURVEYOR

# SURVEY CONTROL SHEET 34-0025

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	881694.994	2151696.510							
LINE			N 30°07'50.8" W	121.55					
PC	881800.124	2151635.493							
CURVE			N 36°17'28.2" W	111.87	12°19'14.7"(LT)	10°59'31.9"	112.09	56.26	521.24
PCC	881890.294	2151569.278							
CURVE			N 52°05'07.1" W	119.59	19°16'03.1"(LT)	16°02'09.4"	120.15	60.65	357.30
PCC	881963.779	2151474.933							
CURVE			N 67°56'42.5" W	122.53	12°27'07.9"(LT)	10°08'31.9"	122.78	61.63	564.93
PT	882009.790	2151361.364							
LINE			N 74°10'16.5" W	21.63					
PC	882015.689	2151340.558							
CURVE			N 85°19'19.1" W	106.31	22°18'05.1"(LT)	20°50'46.2"	106.98	54.18	274.85
PT	882024.359	2151234.605							
LINE			S 83°31'38.4" W	316.06					
POT	881988.729	2150920.557							

NOTES:

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

**NOTE: DRAWING NOT TO SCALE**

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10/26/17



11/13/17

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.71	1D-1
Location and Surveys	

PROJECT  
SURVEYOR

# SURVEY CONTROL SHEET 34-0025

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

TYPE	STATION	NORTH	EAST
POT	10+00.00	881702.9429	2151691.8719
PC	10+87.40	881778.8221	2151648.5094
PT	13+87.05	881951.5852	2151414.2443
PC	15+63.06	881989.8655	2151242.4495
PT	17+76.67	882001.1589	2151030.1172
POT	18+75.00	881990.0745	2150932.4163

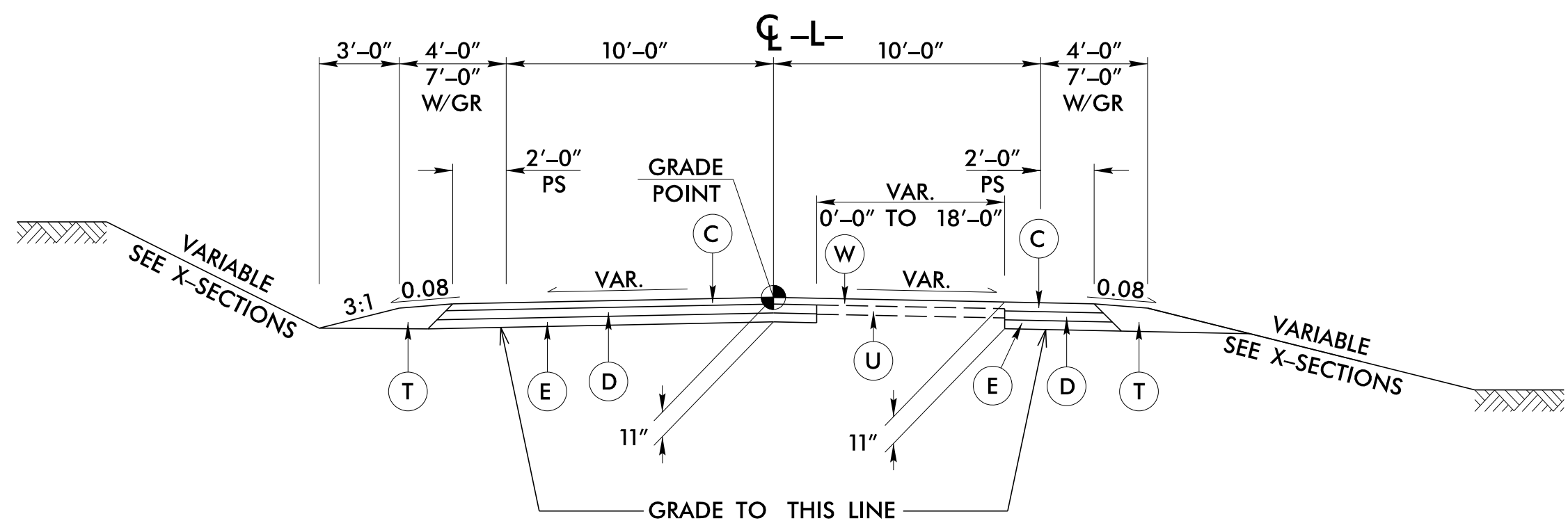
NOTES:

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

**NOTE: DRAWING NOT TO SCALE**

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11/13/17

PROJECT REFERENCE	SHEET NO.
17BP.5.R.71 - FRANKLIN 25	2A-1
ROADWAY DESIGN ENGINEER	
<p><b>DOCUMENT NOT CONSIDERED FINAL</b>  <b>UNLESS ALL SIGNATURES COMPLETED</b></p>	
Prepared in the Office of:	
	MOTT MACDONALD P.O. Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas

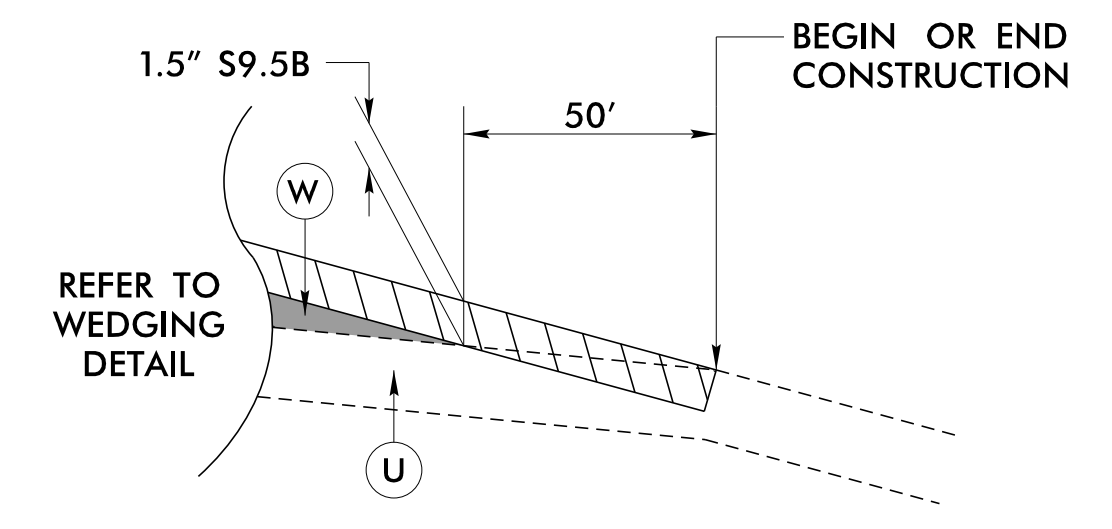


**TYPICAL SECTION NO. 1**

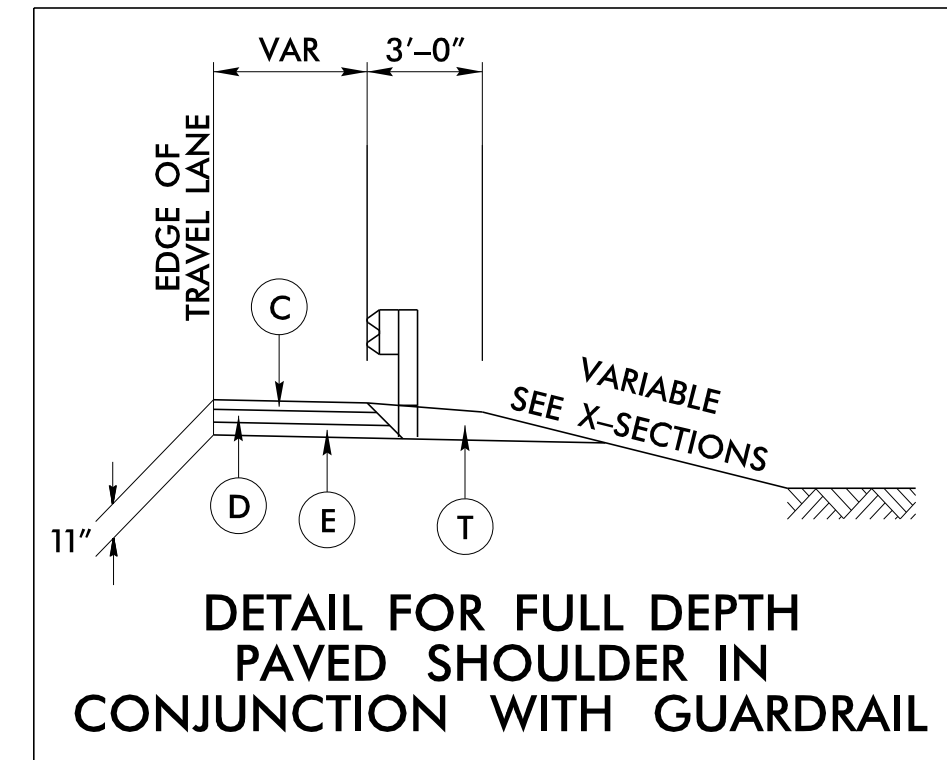
TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:  
 -L- STA 10+50.00 TO 11+00.00

USE TYPICAL SECTION NO. 1:  
 -L- STA 11+00.00 TO 12+65.00  
 -L- STA 16+23.00 TO 18+00.00

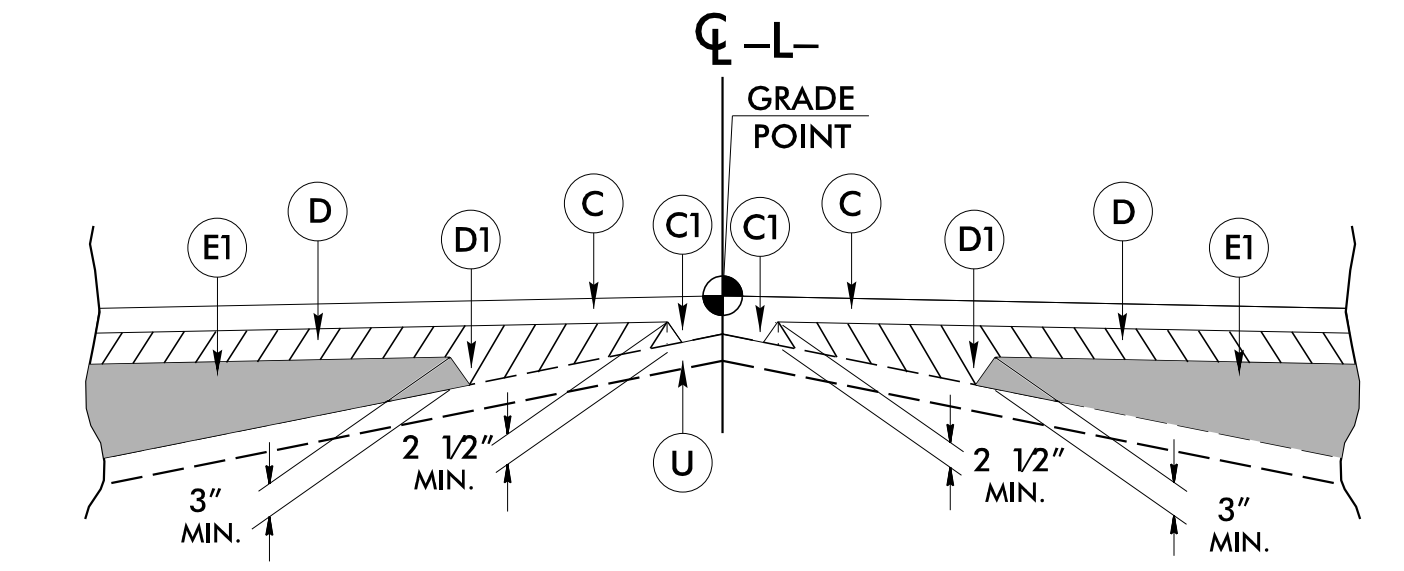
TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:  
 -L- STA 18+00.00 TO 18+50.00



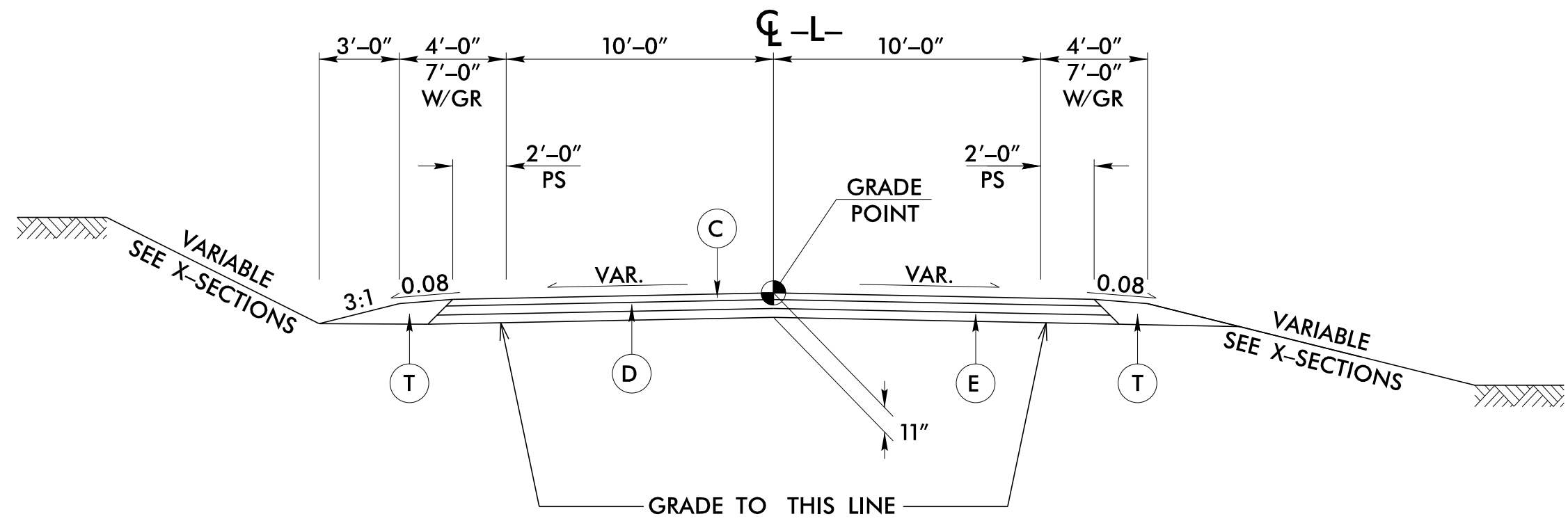
**MILLING DETAIL**  
 \*DETAIL SHOWING PROFILE VIEW\*



**DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH GUARDRAIL**

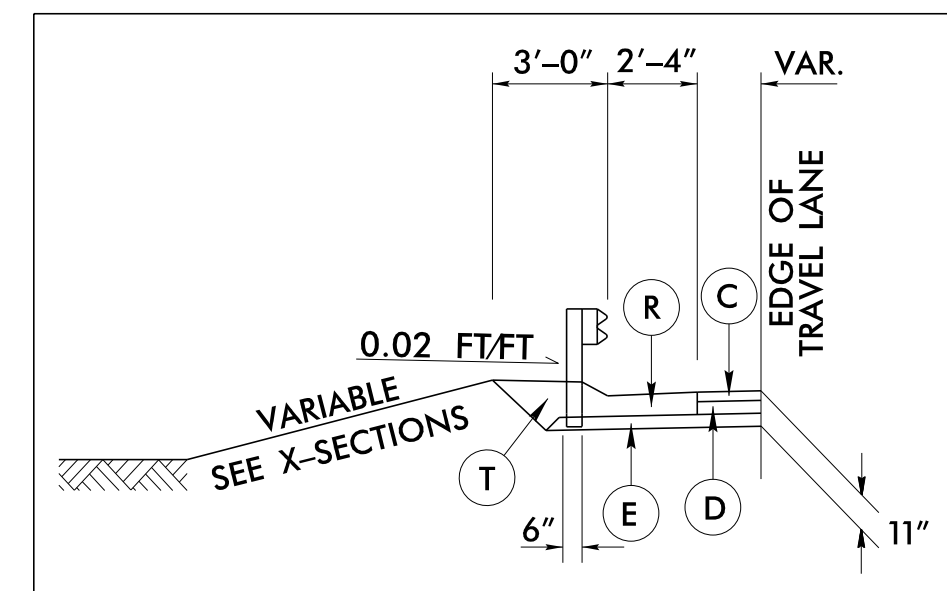


**Detail Showing Method of Wedging**

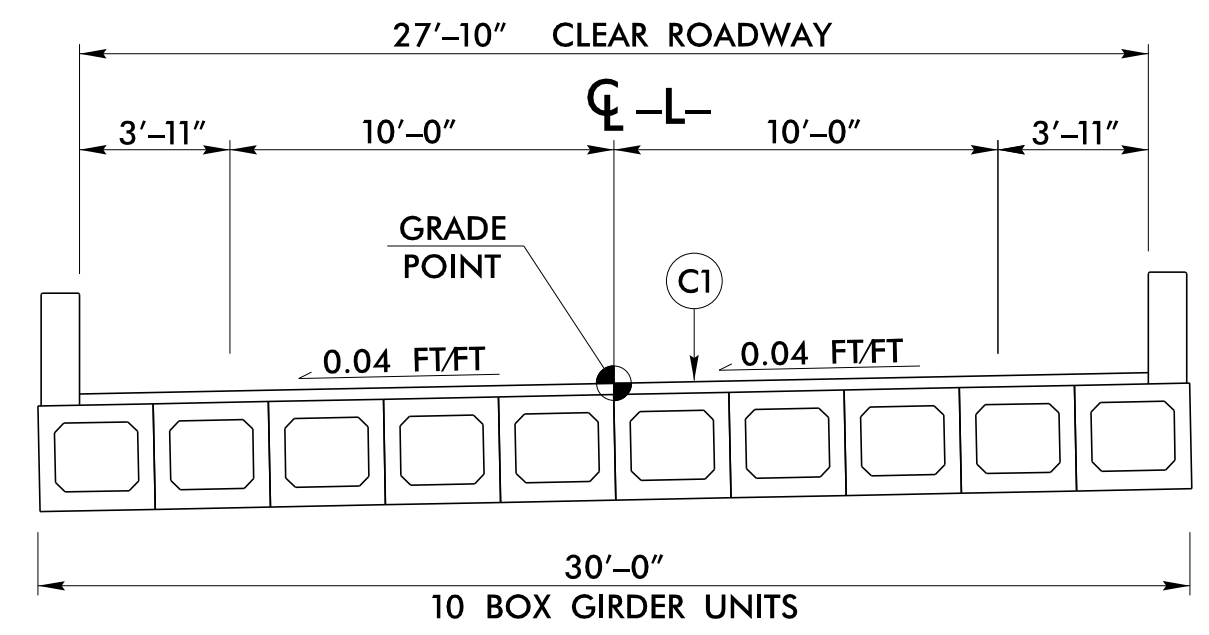


**TYPICAL SECTION NO. 2**

USE TYPICAL SECTION NO. 2:  
 -L- STA 12+65.00 TO 14+03.81 (BEGIN BRIDGE)  
 -L- STA 15+26.19 (END BRIDGE) TO 16+23.00



**DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL**  
 -L- STA 11+65.00 TO 13+92.94 LT



**TYPICAL SECTION NO. 3**

USE TYPICAL SECTION NO. 3:  
 -L- STA 14+03.81 (BEGIN BRIDGE) TO 15+26.19 (END BRIDGE)

NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTHS ON STRUCTURE

PAVEMENT SCHEDULE	
C	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C1	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 1 1/2" IN DEPTH.
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D1	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	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.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

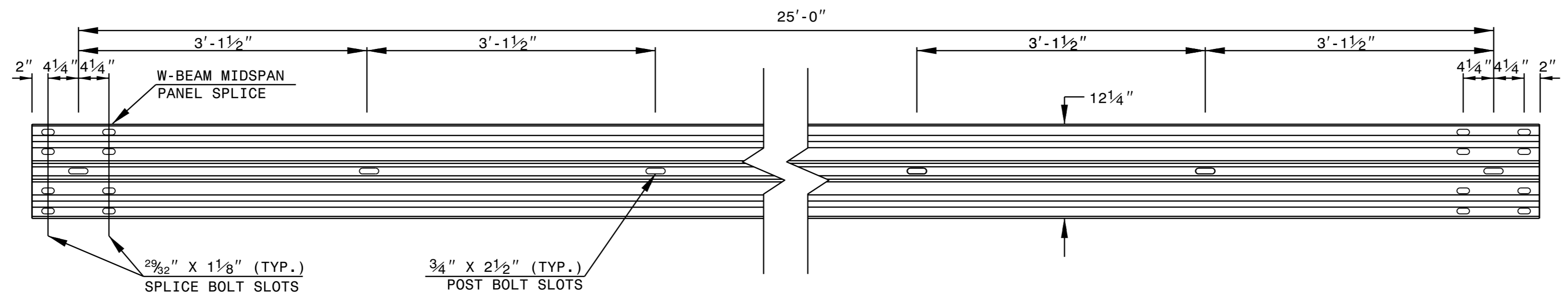
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

5/17/2018 4:26:57 PM  
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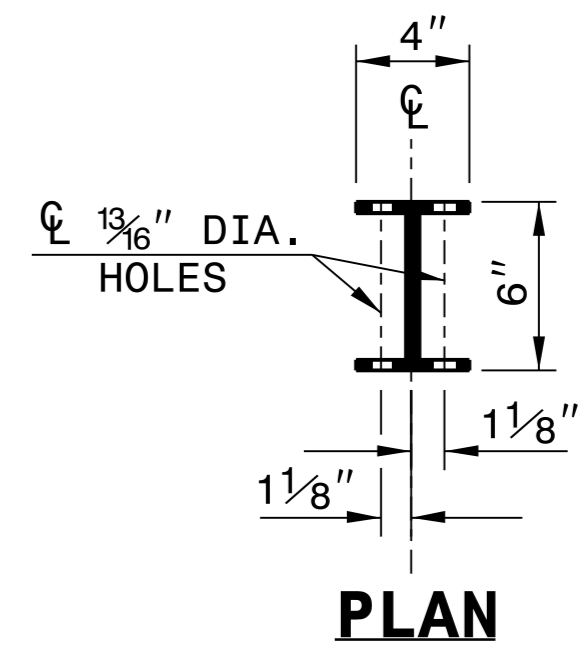
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

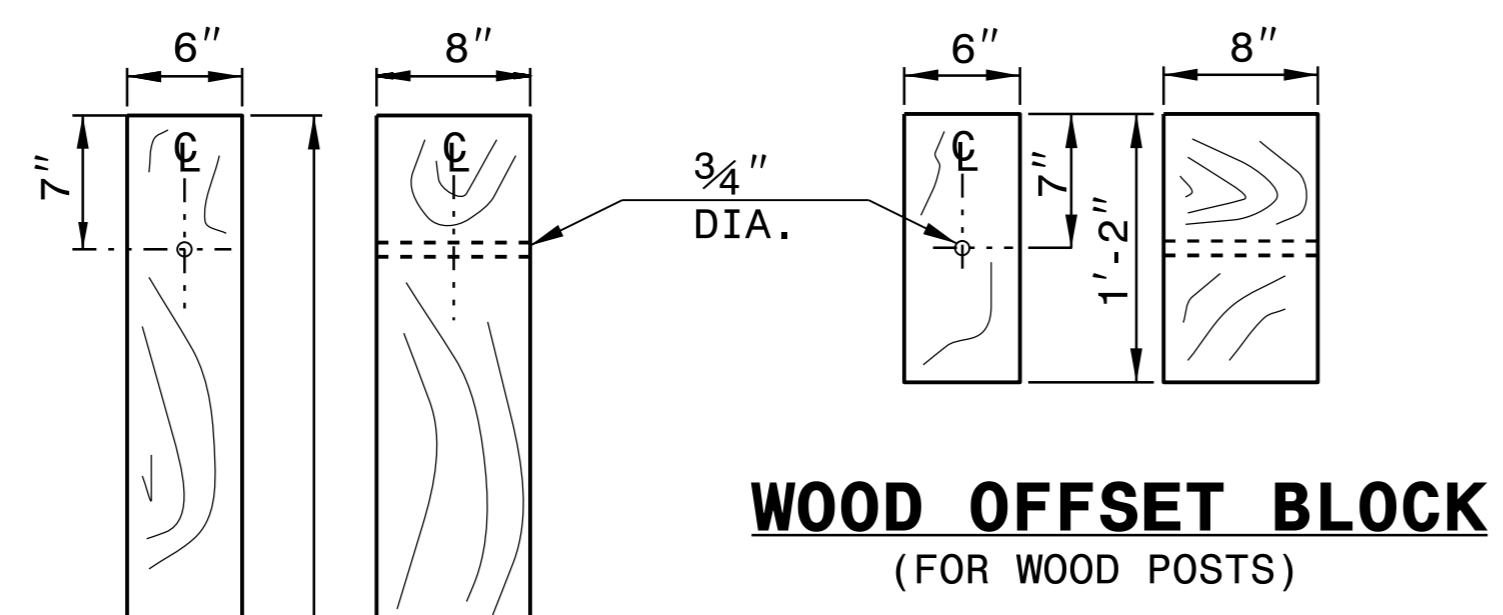
SHEET 6 OF 8  
**862D02**



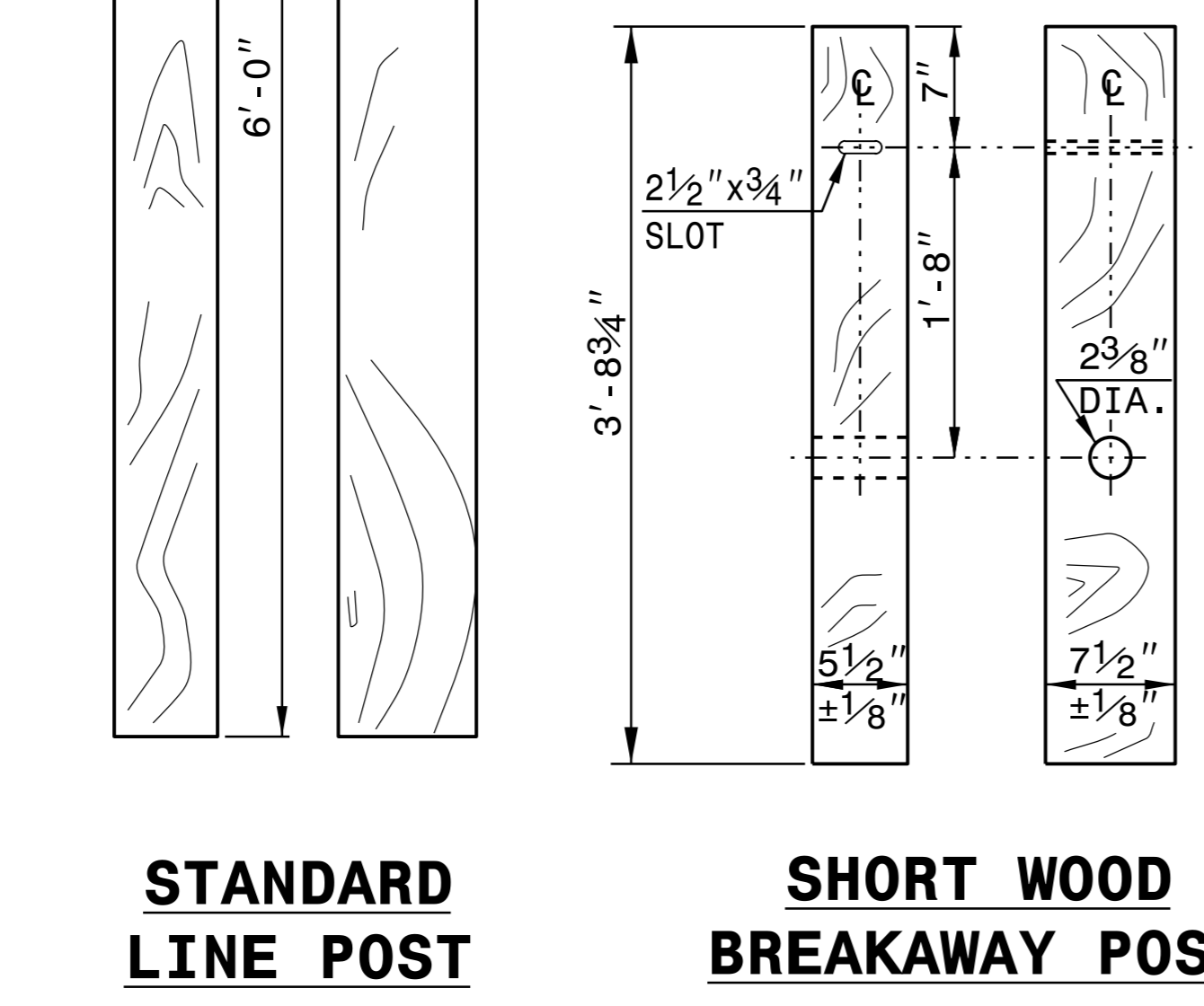
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

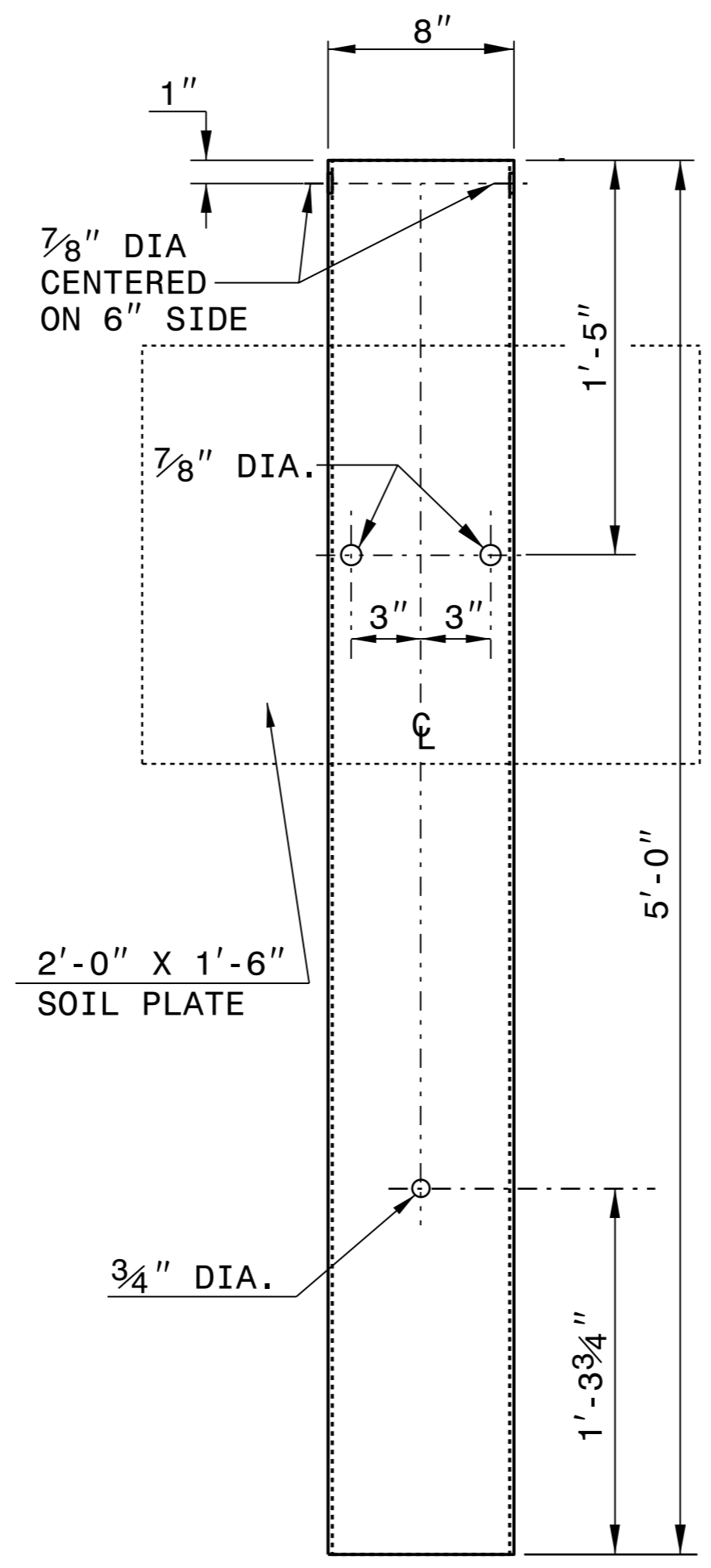


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

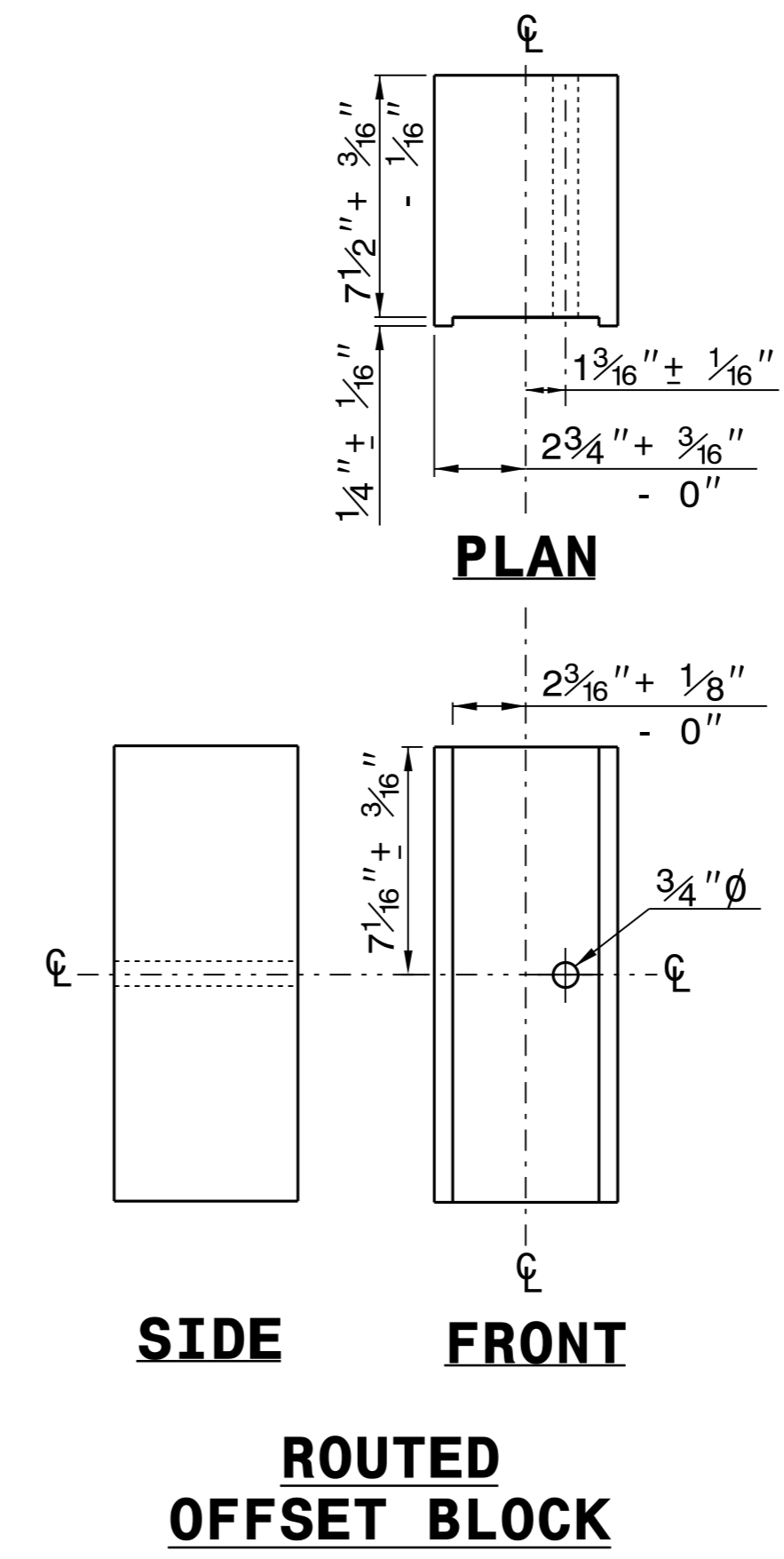


**STANDARD  
LINE POST**

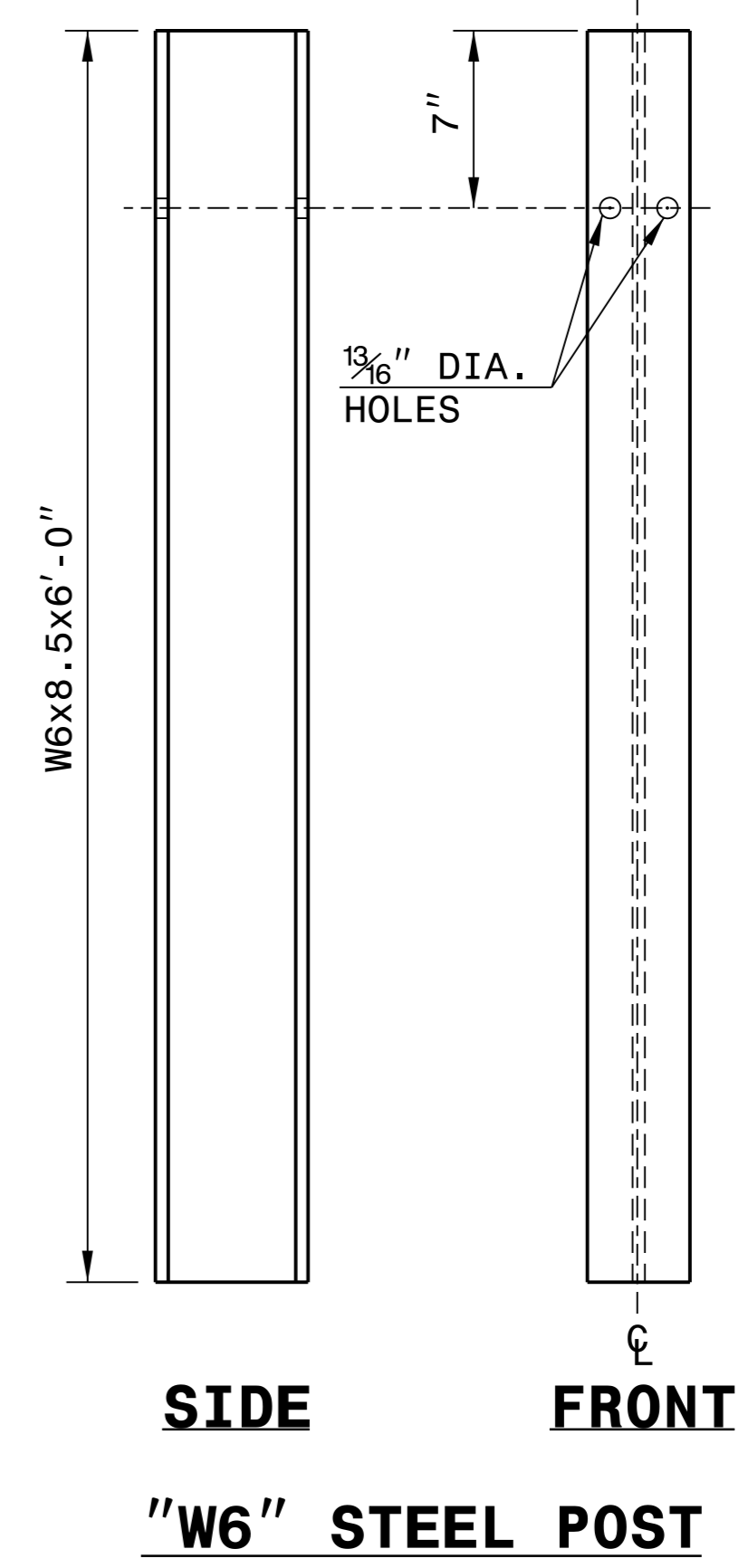
**SHORT WOOD  
BREAKAWAY POST**



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



**ROUTED  
OFFSET BLOCK**



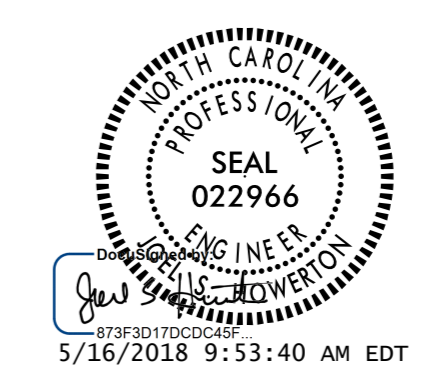
**"W6" STEEL POST**

**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

**SEE TITLE BLOCK**

ORIGINAL BY: J. HOWERTON DATE: 3-7-2018  
MODIFIED BY: DATE: \_\_\_\_\_  
CHECKED BY: DATE: \_\_\_\_\_  
FILE SPEC.: \_\_\_\_\_



I4-DEC-2017 10:36 S:\Contracts\Special Details\Standard Drawings\Division 8\0862d0301.dgn Jhowerton AT:CSU-292595

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

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

SHEET 1 OF 7  
**862D03**

SHEET 1 OF 7  
**862D03**

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

**NOTE:**  
 \*\*POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.  
 \*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.  
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.  
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).  
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.  
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

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

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

SHEET 1 OF 7  
**862D03**

SHEET 2 OF 7  
**862D03**

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

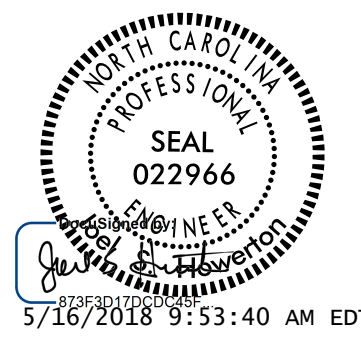
**NOTE:**  
 \*\*POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.  
 \*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.  
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.  
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).  
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.  
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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



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

## GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMARKS																								
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	AT-1	GREU TL-3	TYPE III									PERMITTED																										
																								NO.	G		NG																							
-L-	11+72.56	14+03.81	RT	231.25'				14+03.81	4'	7'	50'		1'																					GUARDRAIL REMOVAL = 280'																
-L-	11+22.56	14+03.81	LT	281.25'				14+03.81	4'	7'	50'		1'																				GUARDRAIL REMOVAL = 330'																	
-L-	15+26.19	16+07.44	RT	81.25'				15+26.19	4'	7'	50'		1'																				GUARDRAIL REMOVAL = 60'																	
-L-	15+26.19	16+69.94	LT	143.75'				15+26.19	4'	7'	50'		1'																				GUARDRAIL REMOVAL = 80'																	
SUBTOTAL				737.50'																																														
LESS ANCHOR DEDUCTIONS																																																		
				GREU TL3	4 x 50.00'	=	-200.00'																																											
				TYPE III	4 x 18.75'	=	-75.00'																																											
TOTAL				462.50'																																														
																													4	4																		5	EA	ADDITIONAL GUARDRAIL POSTS =

## SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LENGTH
-L- LT	11+65.00	13+92.94	227.94'
TOTAL			227.94'
SAY			240.00

## EXISTING ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	11+36	14+30	RT	439.23
-L-	14+93	17+10	RT	323.49
TOTAL:				762.72
SAY:				805

## SUMMARY OF EARTHWORK IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 10+50.00 TO 14+03.81 (BEGIN BRIDGE)	359		3959	3600	
-L- 15+26.19 (END BRIDGE) TO 18+50.00	41		695	654	
SUBTOTAL	400		4654	4254	
WASTE IN LIEU OF BORROW					
PROJECT TOTAL	400		4654	4254	
5% TO REPLACE BORROW				213	
GRAND TOTAL	400		4654	4467	
SAY	420			4700	

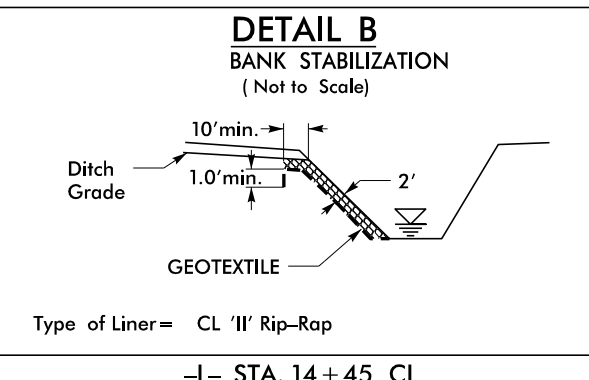
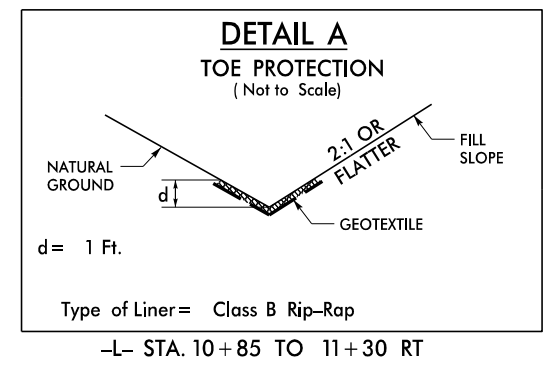
EST. 200 CY UNDERCUT (CONTINGENCY)  
 EST. 50 CY SHALLOW UNDERCUT (CONTINGENCY)  
 EST. 1590 CY DDE (SEE PLAN SHEET 4 DETAIL)

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Asphalt Pavement will be paid for at the contract Lump Sum price for "Grading".

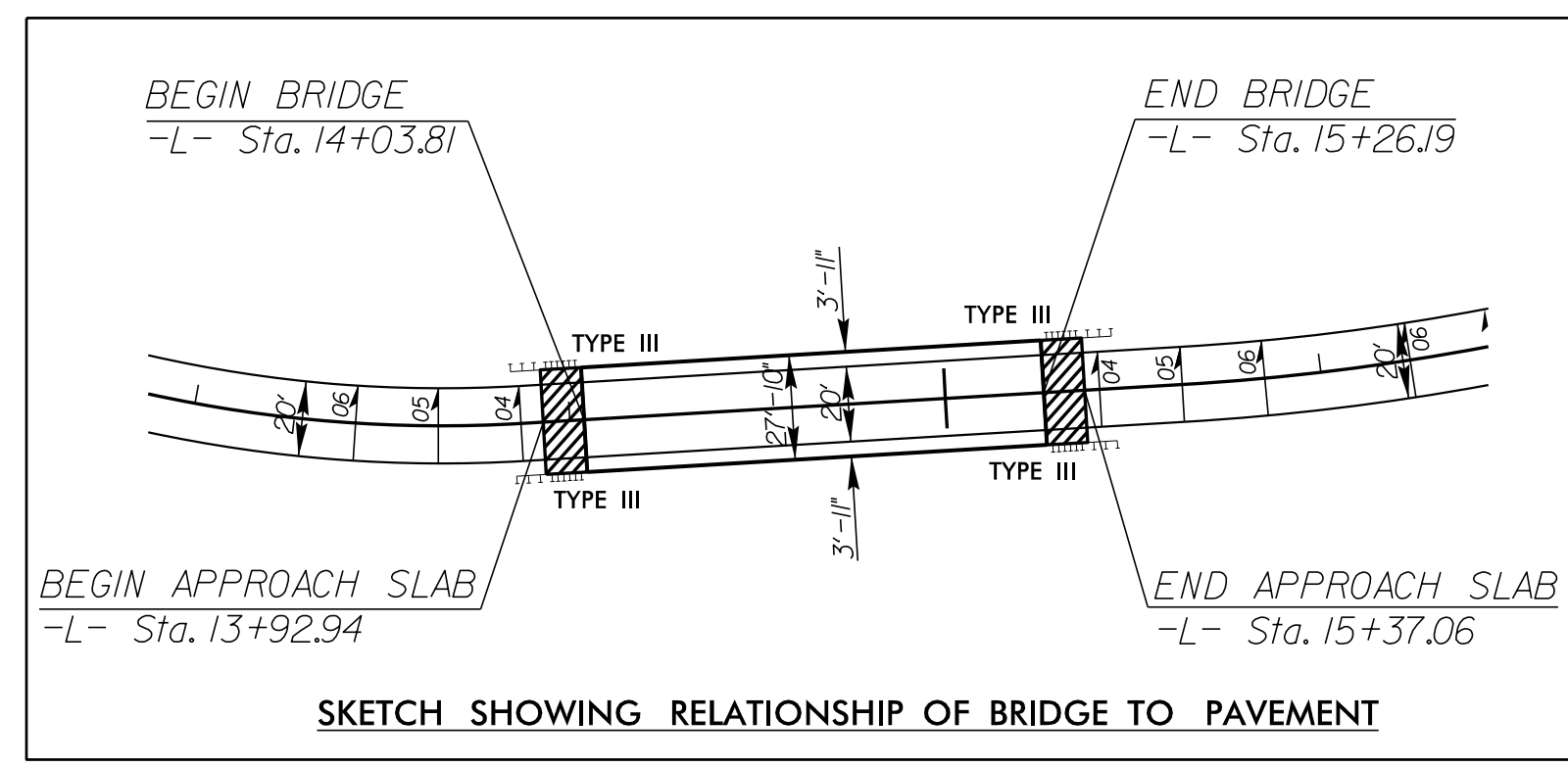




\*DESIGN EXCEPTION:  
MIN. HORIZONTAL CURVE RADIUS  
SAG VERTICAL CURVE K  
HORIZONTAL SSD  
VERTICAL SSD



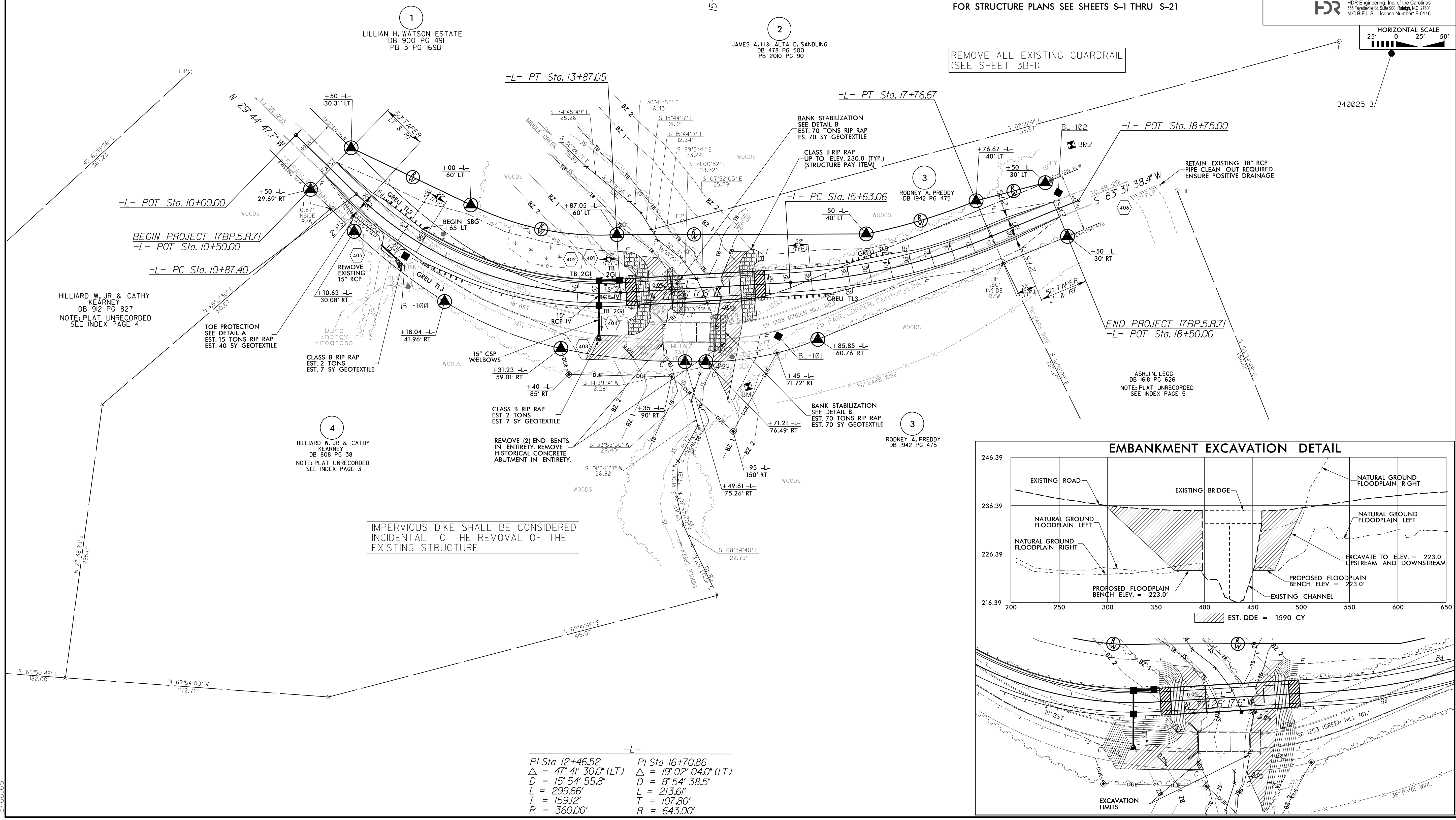
NAD 83 N/A 2011



QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-21

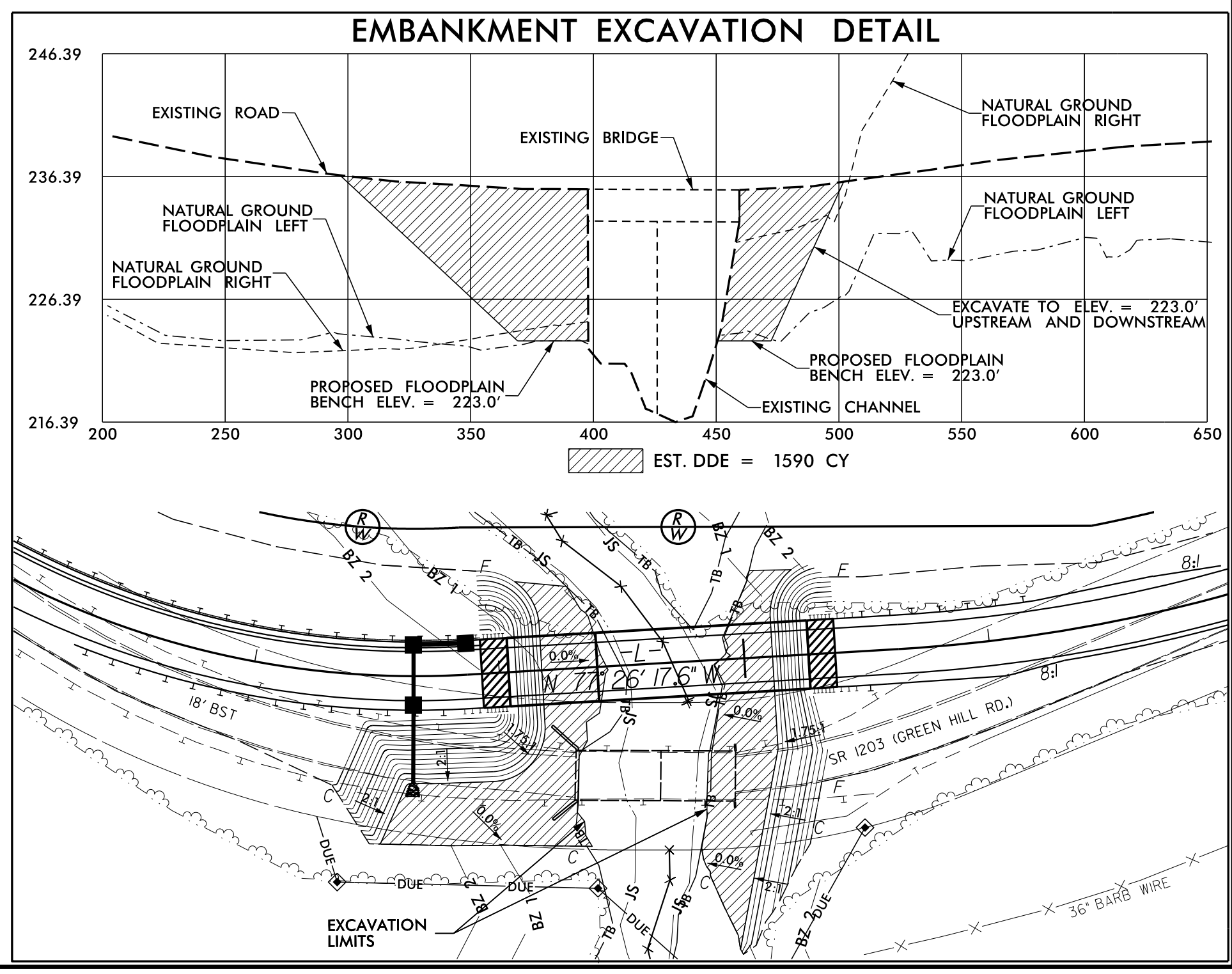
PROJECT REFERENCE 17BP.5.R.71 - FRANKLIN 25	SHEET NO. 4
ROADWAY DESIGN ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0116
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>Prepared in the Office of:</p> <p><b>M</b> MOTT MACDONALD PO Box 700 Fayetteville, NC 27526 www.mottmac.com/america</p> <p><b>HDR</b> HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116</p>	



REMOVE ALL EXISTING GUARDRAIL (SEE SHEET 3B-1)

RETAIN EXISTING 18" RCP PIPE CLEAN OUT REQUIRED ENSURE POSITIVE DRAINAGE

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE



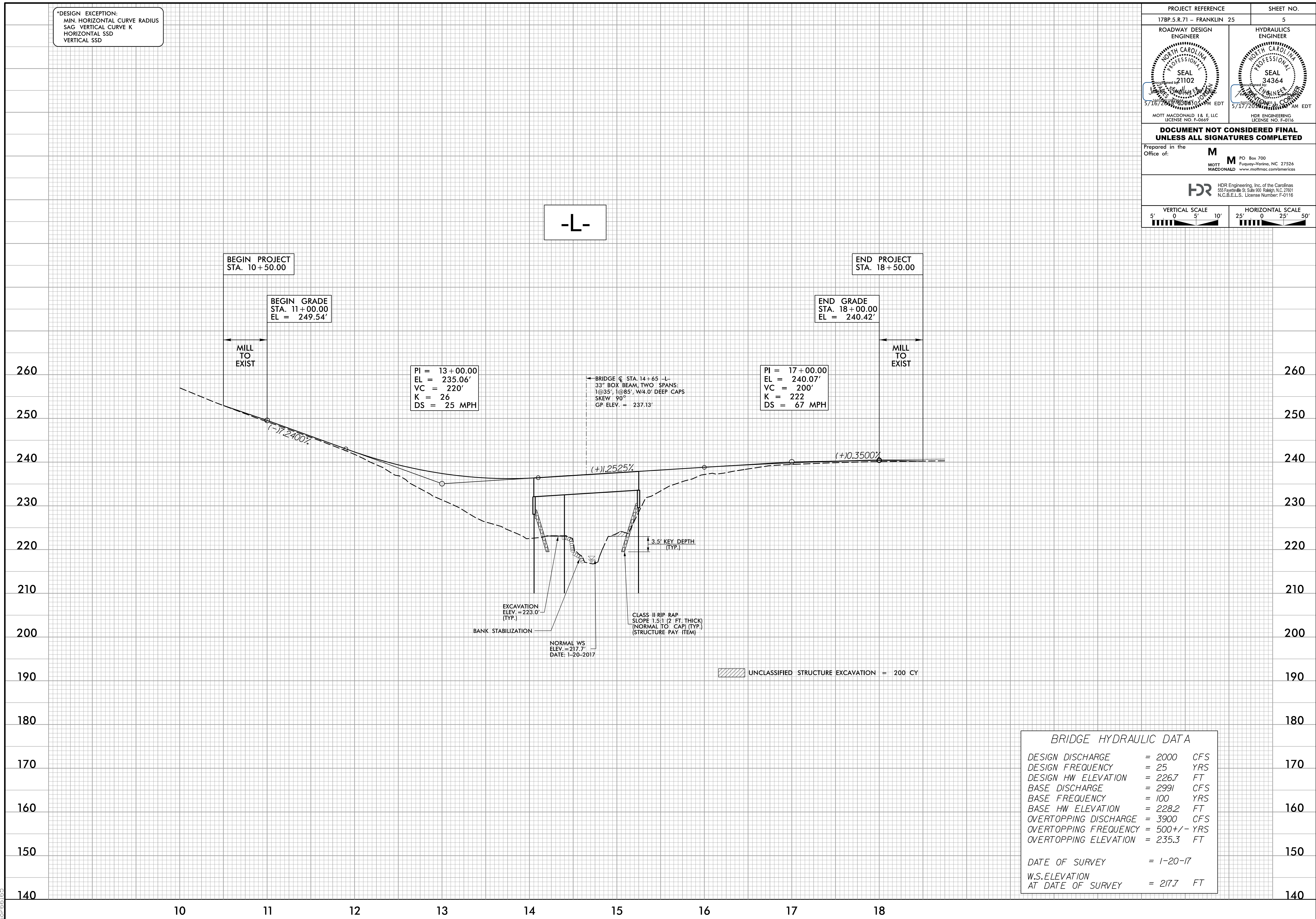
PI Sta 12+46.52	PI Sta 16+70.86
Δ = 47° 41' 30.0" (LT)	Δ = 19° 02' 04.0" (LT)
D = 15' 54' 55.8"	D = 8' 54' 38.5"
L = 299.66'	L = 213.61'
T = 159.12'	T = 107.80'
R = 360.00'	R = 643.00'

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10:06:16



\*DESIGN EXCEPTION:  
MIN. HORIZONTAL CURVE RADIUS  
SAG VERTICAL CURVE K  
HORIZONTAL SSD  
VERTICAL SSD

PROJECT REFERENCE 17BP.5.R.71 - FRANKLIN 25	SHEET NO. 5
ROADWAY DESIGN ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0116
<p><b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b></p>	
<p>Prepared in the Office of: <b>M</b> MOTT MACDONALD</p>	
<p>HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116</p>	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'



BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 2000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 226.7	FT
BASE DISCHARGE	= 2991	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 228.2	FT
OVERTOPPING DISCHARGE	= 3900	CFS
OVERTOPPING FREQUENCY	= 500+/-	YRS
OVERTOPPING ELEVATION	= 235.3	FT
DATE OF SURVEY	= 1-20-17	
W.S.ELEVATION AT DATE OF SURVEY	= 217.7	FT

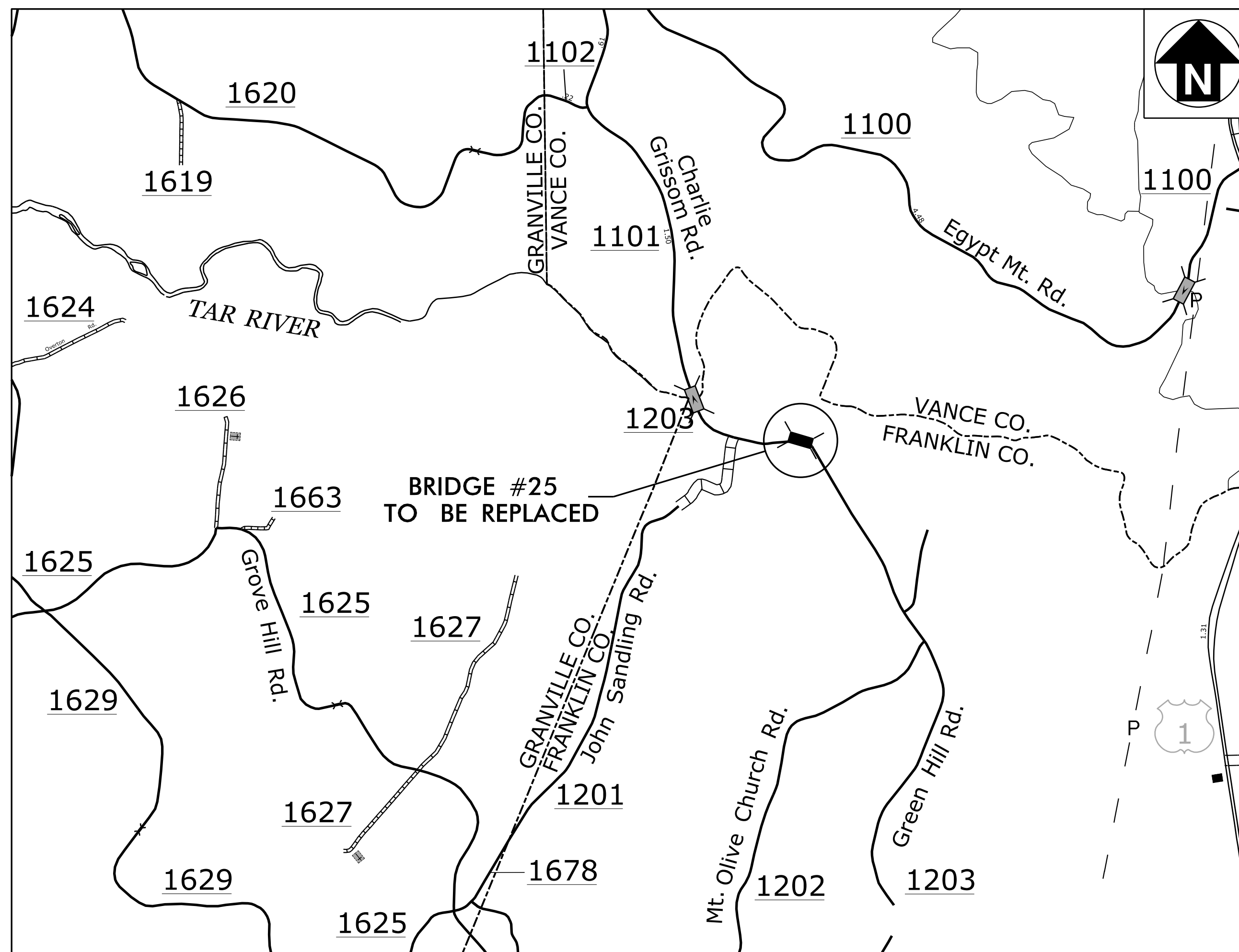
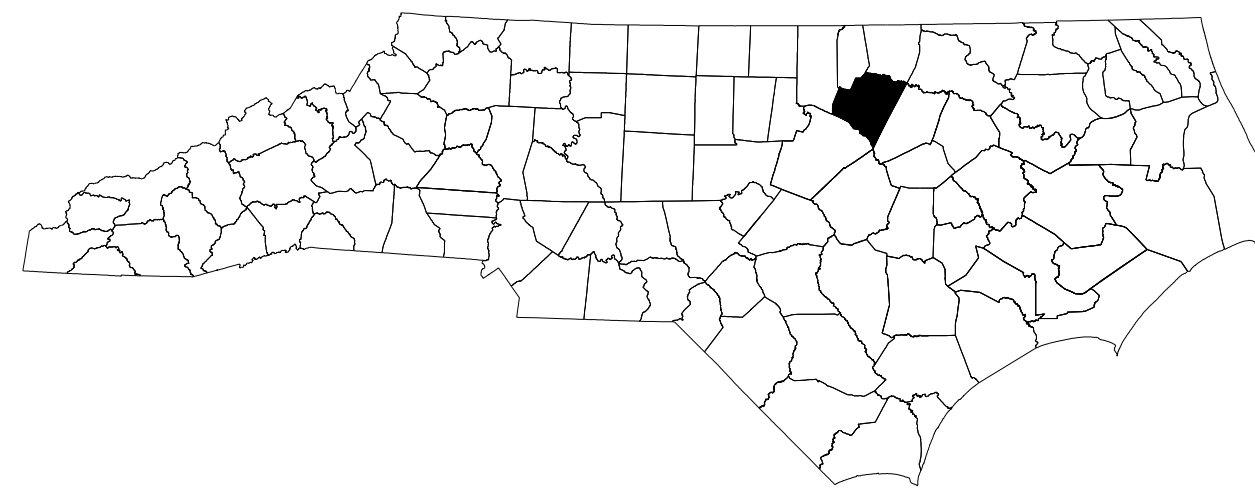
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**FRANKLIN COUNTY**

BRIDGE NO. 25 OVER MIDDLE CREEK ON SR 1203 (GREEN HILL ROAD)

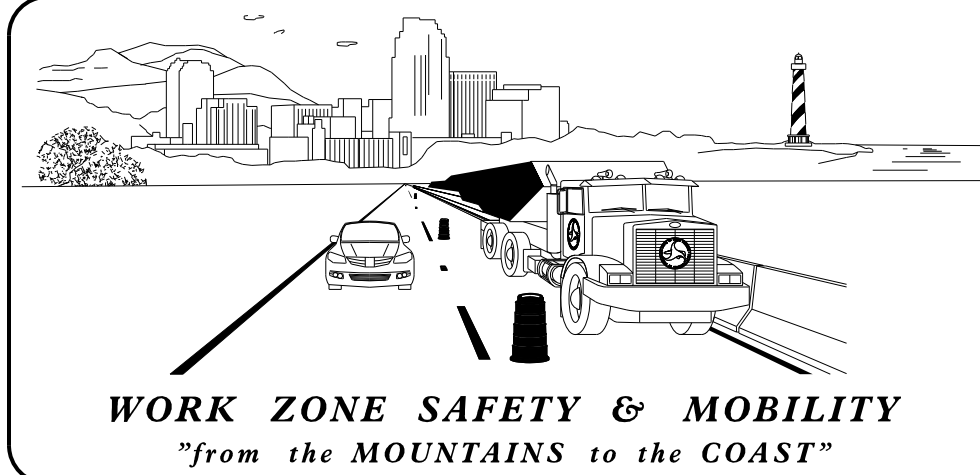


**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND AND PAVEMENT MARKING SCHEDULE
TMP-1B	GENERAL NOTES
TMP-2	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

**17BP.5.R.71**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



PREPARED IN THE OFFICE OF MOTT MACDONALD  
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIM JORDAN, PE                      TRAFFIC CONTROL PROJECT ENGINEER

BRIAN PHILLIPS                      TRAFFIC CONTROL DESIGN ENGINEER



**M M**  
MOTT  
MACDONALD

P.O. Box 700  
Fayetteville, NC 27526  
(919) 552-2253  
(919) 552-2254 (Fax)  
www.mottmac.com/americas

LICENSE NO. F-0669

SEAL

APPROVED: James Timothy Jordan

DATE: 5/16/2018 1:04:58 PM EDT

**TIP PROJECT:**



# 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
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY - DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)

- WORK AREA
- REMOVAL
- PAVEMENT OVERLAY
- USER DEFINED (IF NEEDED)

## SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TRAFFIC CONTROL DEVICES

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

## TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

## PAVEMENT MARKERS

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

## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

## TEMPORARY PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
PA PAINT WHITE EDGELINE (4")	3,200 LF
PI PAINT YELLOW DOUBLE CENTER (4")	3,200 LF
NOTE: QUANTITY INCLUDES 2 APPLICATION OF EACH	

## FINAL PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
TA THERMOPLASTIC WHITE EDGELINE (4")	1,600 LF
TI THERMOPLASTIC YELLOW DOUBLE CENTER (4")	1,600 LF
MA PERMANENT RAISED PAVEMENT MARKERS (YELLOW & YELLOW )	10 EA

5/16/2018 9:38:04 AM  
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 jor66165

 <b>MOTT MACDONALD</b> PO Box 100 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.mottmac.com/americas LICENSE NO. F-0669	APPROVED: DATE: 5/16/2018 1:04:58 PM EDT			LEGEND ROADWAY STANDARD DRAWINGS PAVEMENT MARKING SCHEDULE
	SEAL 			



## 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.

### TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
1. SR 1203 (-L-)	7:00 AM - 9:00 AM
2. SR 1203 (-L-)	4:00 PM - 6:00 PM

B) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
1. SR 1203 (-L-)	ANYTIME

C) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

### LANE AND SHOULDER CLOSURE REQUIREMENTS

- D) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- H) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.
- I) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

### PAVEMENT EDGE DROP OFF REQUIREMENTS

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

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

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

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

K) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 FEET IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

### TRAFFIC PATTERN ALTERATIONS

L) NOTIFY THE ENGINEER, SCHOOLS, AND EMS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION. ALL THREE COUNTIES (FRANKLIN, GRANVILLE AND VANCE) SHALL RECEIVE NOTIFICATION.

### SIGNING

- M) 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.
- N) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- O) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

### TRAFFIC CONTROL DEVICES

- P) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- Q) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

### PAVEMENT MARKINGS AND MARKERS

R) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
1. ALL ROADS	PAINT	NONE

S) INSTALL FINAL PAVEMENT MARKINGS AND MARKERS ON THE FINAL SURFACE ACCORDING TO THE ROADWAY STANDARD DRAWINGS.

T) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

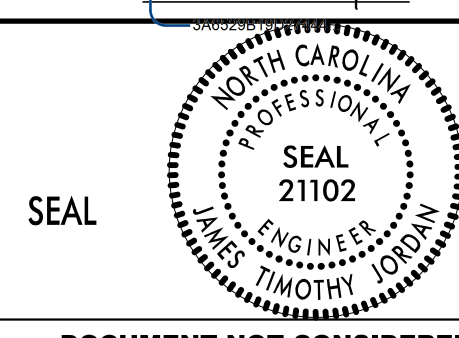
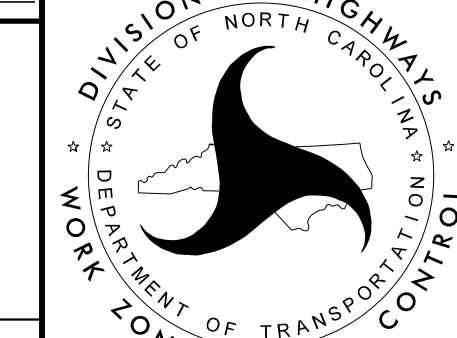
U) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

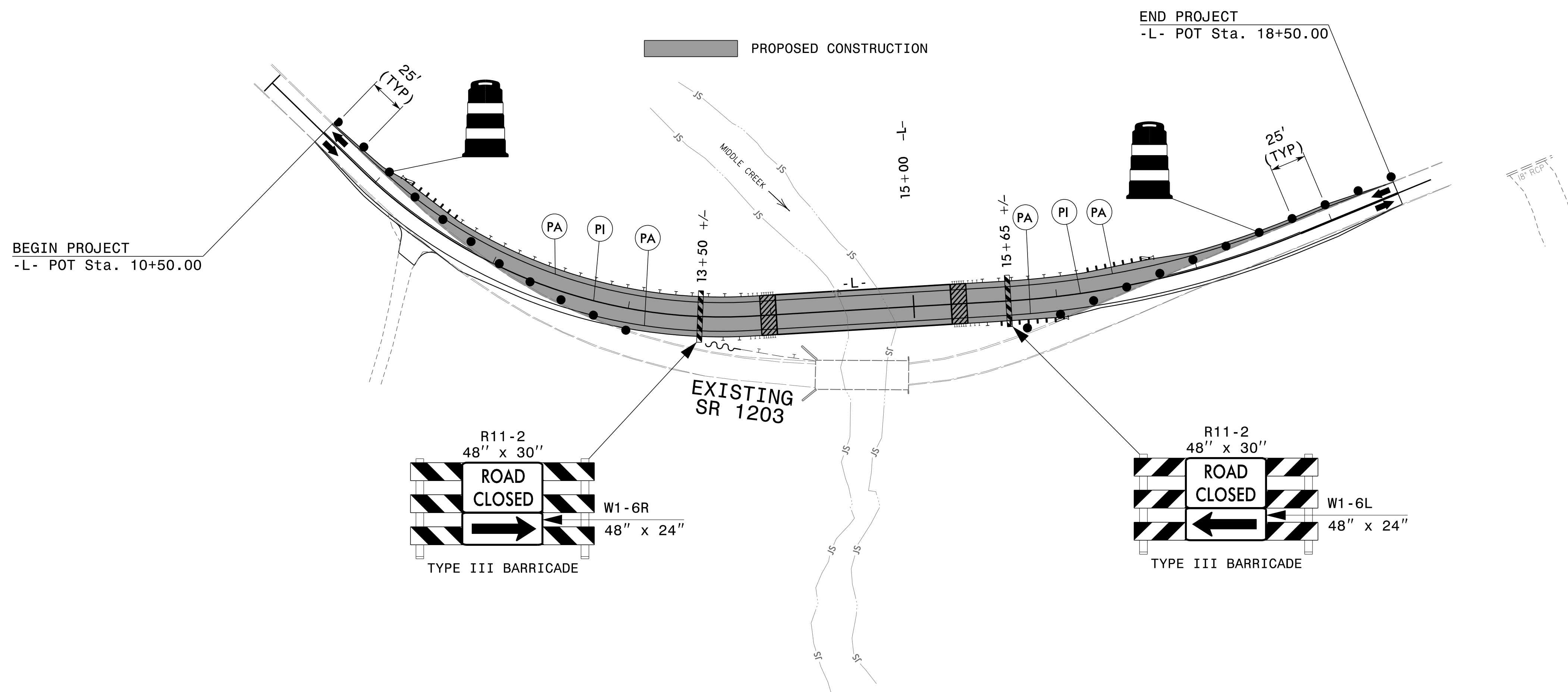
V) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

### MISCELLANEOUS

W) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTIONS.

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 jor66165

<p style="text-align: center;"><b>M M</b></p> <p style="text-align: center;"><b>MOTT MACDONALD</b></p> <p style="font-size: small;">                 PO Box 100                  Fuquay-Varina, NC 27526                  (919) 552-2253                  (919) 552-2254 (Fax)                  www.mottmac.com/americas                  LICENSE NO. F-0669             </p>	<p>APPROVED: <u>James Timothy Jordan</u> 5/16/2018 1:04:58 PM</p> <div style="text-align: center;">  <p>SEAL</p> </div>	<div style="text-align: center;">  <p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL</p> </div>	<h2 style="margin: 0;">GENERAL NOTES</h2>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



**PHASE I**

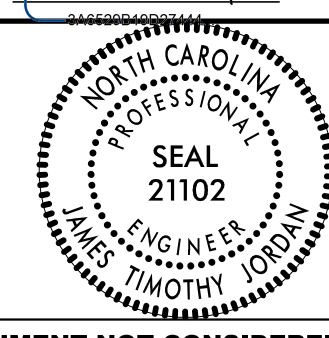
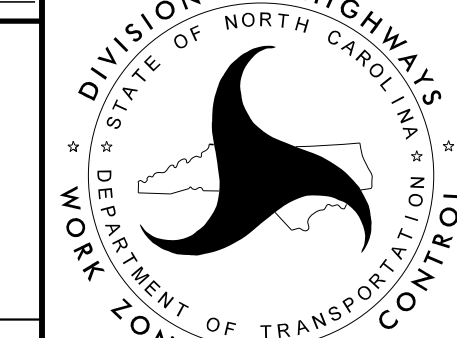
TRAFFIC SHALL BE MAINTAINED IN THE EXISTING TWO-LANE, TWO-WAY PATTERN DURING PHASE I.

STEP 1: USING ROADWAY STANDARD DRAWING 1101.01 SHEET 3 OF 3 AND FLAGGERS AS NEEDED:  
 -INSTALL ADVANCE WARNING SIGNS, DRUMS, AND BARRICADES AS SHOWN ON TMP-2.

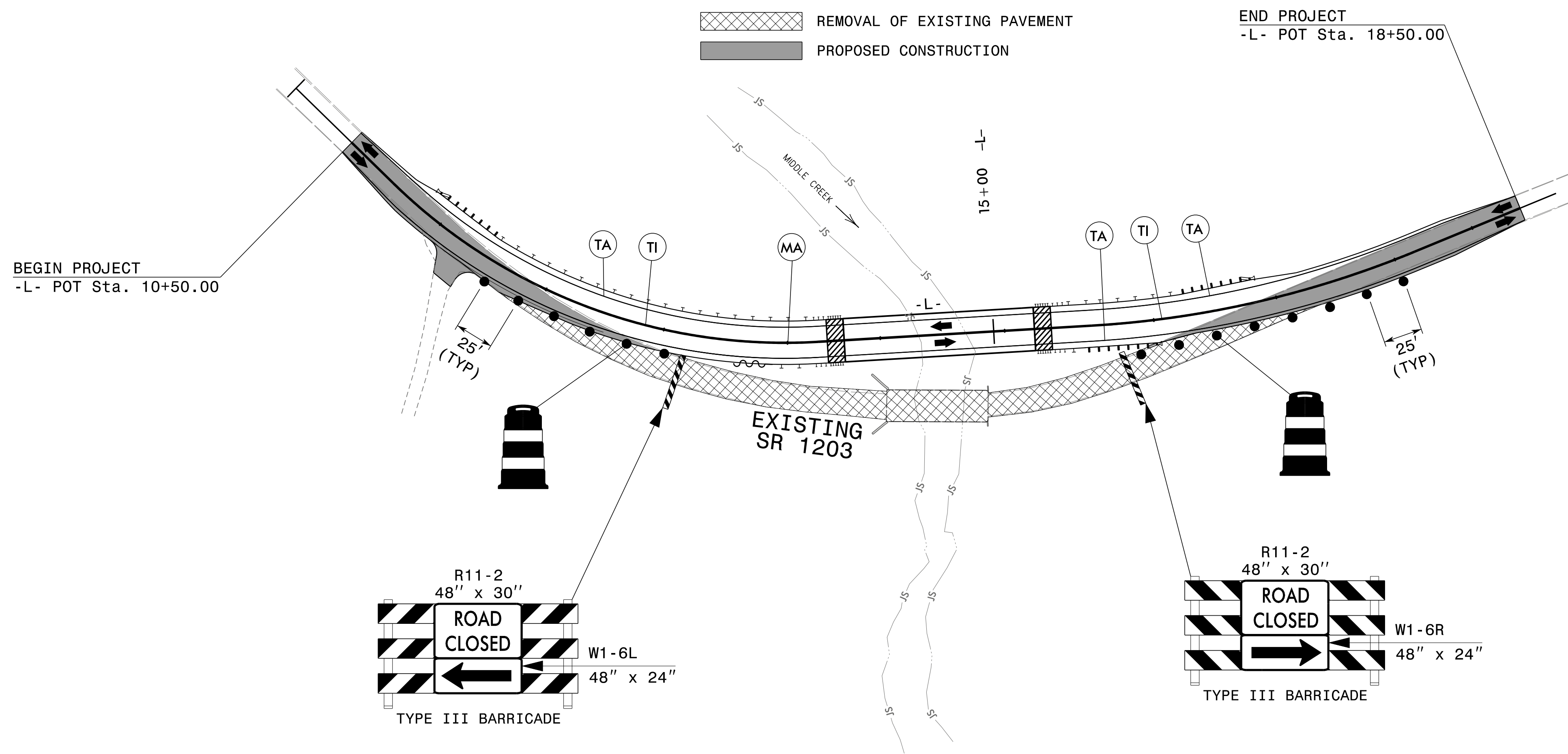
STEP 2: CONSTRUCT THE PROPOSED BRIDGE AND APPROACHES UP TO BUT NOT INCLUDING THE FINAL SURFACE COURSE FROM -L- STA. 13+50 +/- TO 15+65 +/- AS SHOWN ON TMP-2.

STEP 3: USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 15 AND FLAGGERS AS NEEDED, COMPLETE STEP 3 IN A CONTINUOUS MANNER  
 -TIE THE EXISTING ROADWAY TO THE PROPOSED ROADWAY -L- STA. 10+50 TO 13+50 +/- AND -L- STA. 15+65 +/- TO 18+50  
 -REMOVE THE BARRICADES AND DRUMS ON -L-  
 -PLACE TEMPORARY PAVEMENT MARKINGS ON -L- AS SHOWN ON TMP-3; REMOVE ANY CONFLICTING EXISTING PAVEMENT MARKINGS.  
 -SHIFT TRAFFIC TO A TWO-LANE, TWO-WAY PATTERN ON -L-  
 -PLACE DRUMS AND BARRICADES, CLOSING THE EXISTING ROADWAY, AS SHOWN ON TMP-3.

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 jpr66165

<p><b>M M</b>                  MOTT                  MACDONALD                  PO Box 100                  Fuquay-Varina, NC 27526                  (919) 552-2253                  (919) 552-2254 (Fax)                  www.mottmac.com/americas                  LICENSE NO. F-0669</p>	<p>APPROVED: <i>James Timothy Jordan</i> 5/16/2018 1:04:58 PM EDT</p> <p>SEAL  </p>	<p>SEAL  </p>	<p>PHASE I DETAIL</p>
	<p>DOCUMENT NOT CONSIDERED FINAL                  UNLESS ALL SIGNATURES COMPLETED</p>		





PHASE II

TRAFFIC SHALL BE MAINTAINED IN A TWO-LANE, TWO-WAY PATTERN DURING PHASE II.

STEP 1: USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 15 AND FLAGGERS AS NEEDED:

- REMOVE THE EXISTING BRIDGE AND ROADWAY AS SHOWN ON TMP-3.
- REMOVE TEMPORARY CRASH CUSHION AND COMPLETE GUARDRAIL INSTALLATION FROM -L- STA. 11+73 TO 13+60 +/- RT.
- PLACE THE FINAL SURFACE COURSE AND FINAL PAVEMENT MARKINGS AND MARKERS FROM -L- STA. 10+50 TO 18+50.

STEP 2: REMOVE ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES.

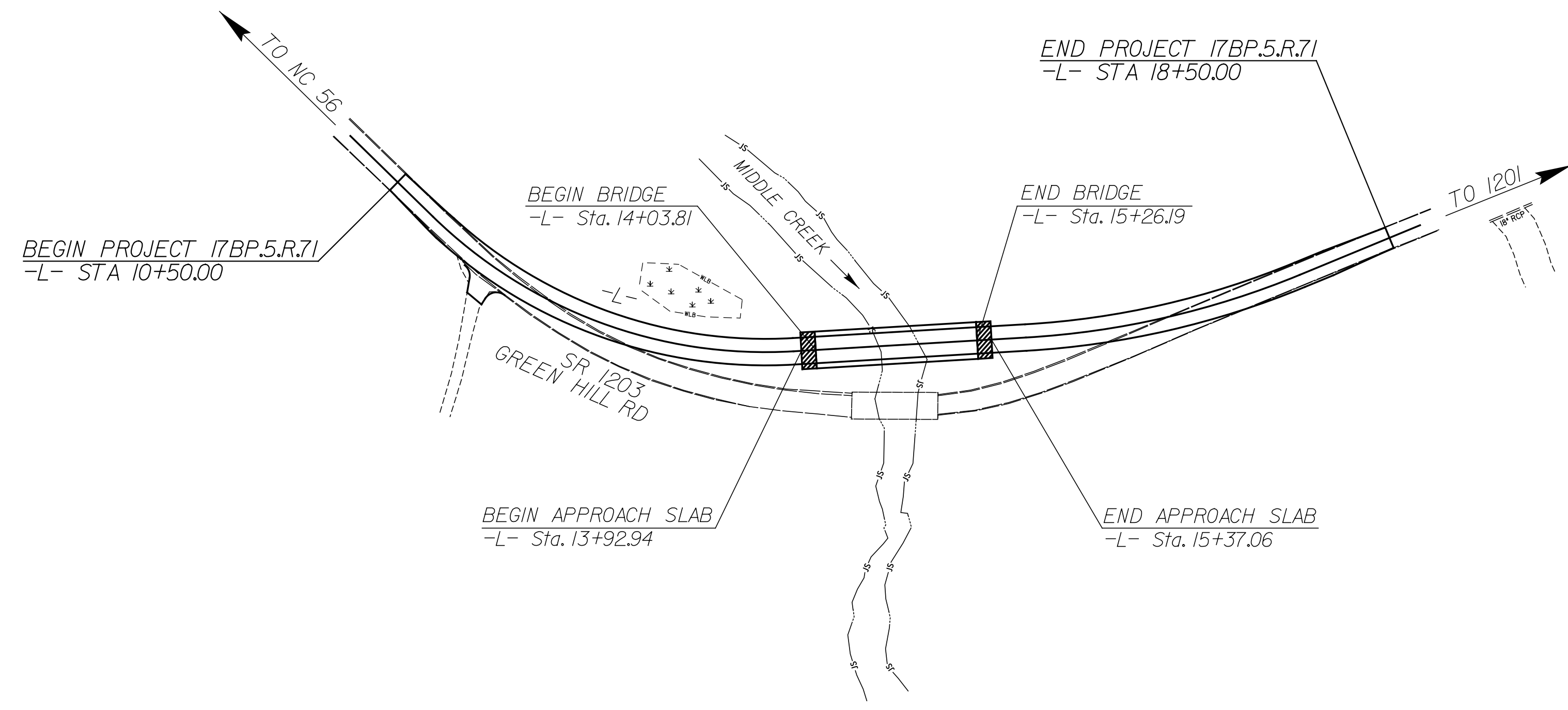
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<p><b>M M</b> MOTT MACDONALD</p> <p>PO Box 100 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.mottmac.com/americas LICENSE NO. F-0669</p>	<p>APPROVED: <i>James Timothy Jordan</i> DATE: 5/16/2018 1:04:58 PM EDT</p> <p>SEAL</p> <p><b>NORTH CAROLINA</b> PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JORDAN</p>	<p><b>DIVISION OF HIGHWAYS</b> STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL</p>	<p>PHASE II DETAIL</p>
	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.71	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

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

**BRIDGE NO. 25 ON SR 1203  
OVER MIDDLE CREEK**



**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	TSF
1606.01	Special Sediment Control Fence	SSCF
1622.01	Temporary Berms and Slope Drains	TBSD
1630.02	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	TRSCA
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	TRSCA-PAM
1633.02	Temporary Rock Silt Check Type-B	TRSCB
	Wattle / Coir Fiber Wattle	WCFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	WCFW-PAM
1634.01	Temporary Rock Sediment Dam Type-A	TRSDA
1634.02	Temporary Rock Sediment Dam Type-B	TRSDA-B
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPISTRA
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPISTRB
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SSB
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SKB
	Tiered Skimmer Basin	TSKB
	Infiltration Basin	IB

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

**ENVIRONMENTALLY  
SENSITIVE AREA(S) EXIST  
ON THIS PROJECT**  
*Refer To E. C. Special Provisions  
for Special Considerations.*

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

**TIP PROJECT: 17BP.5.R.71**

4/17/2018 10:45:00 AM C:\Users\jstoffer\OneDrive\Documents\17BP.5.R.71\17BP.5.R.71.dgn

**GRAPHIC SCALE**

0  
PLANS

0  
PROFILE (HORIZONTAL)

0  
PROFILE (VERTICAL)

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 ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

**HDR**

HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

Designed by:

**KYLE M. STOFFER, E.I.**      **3844**

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:

**DONALD PEARSON, EI**

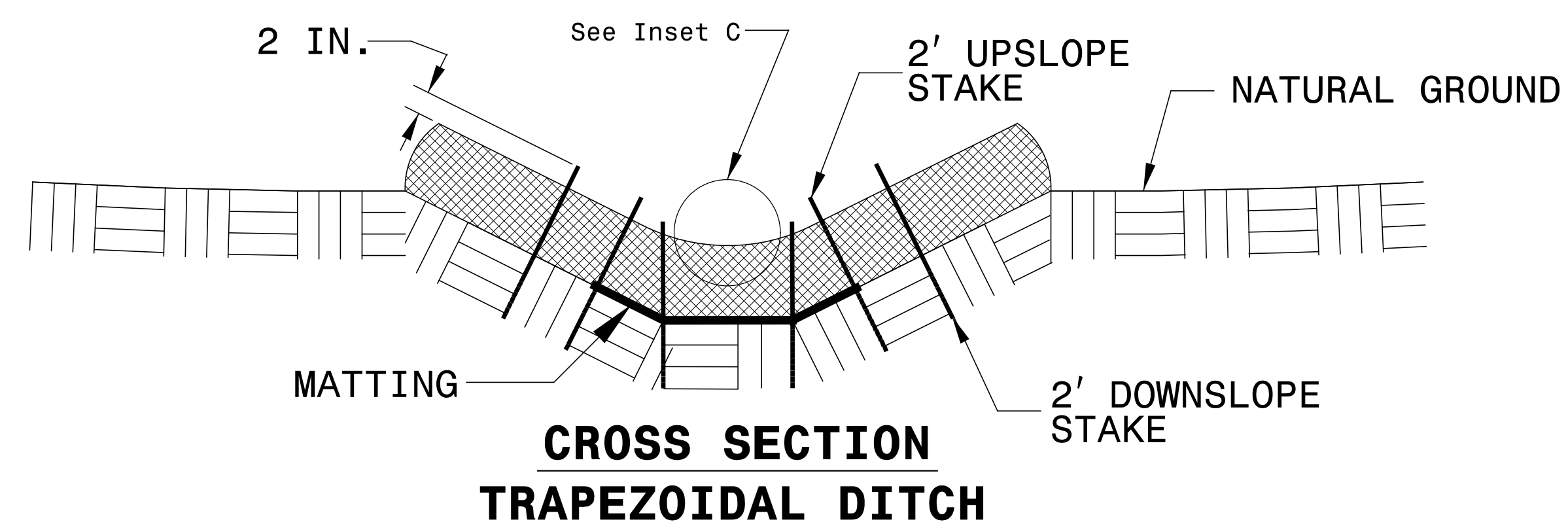
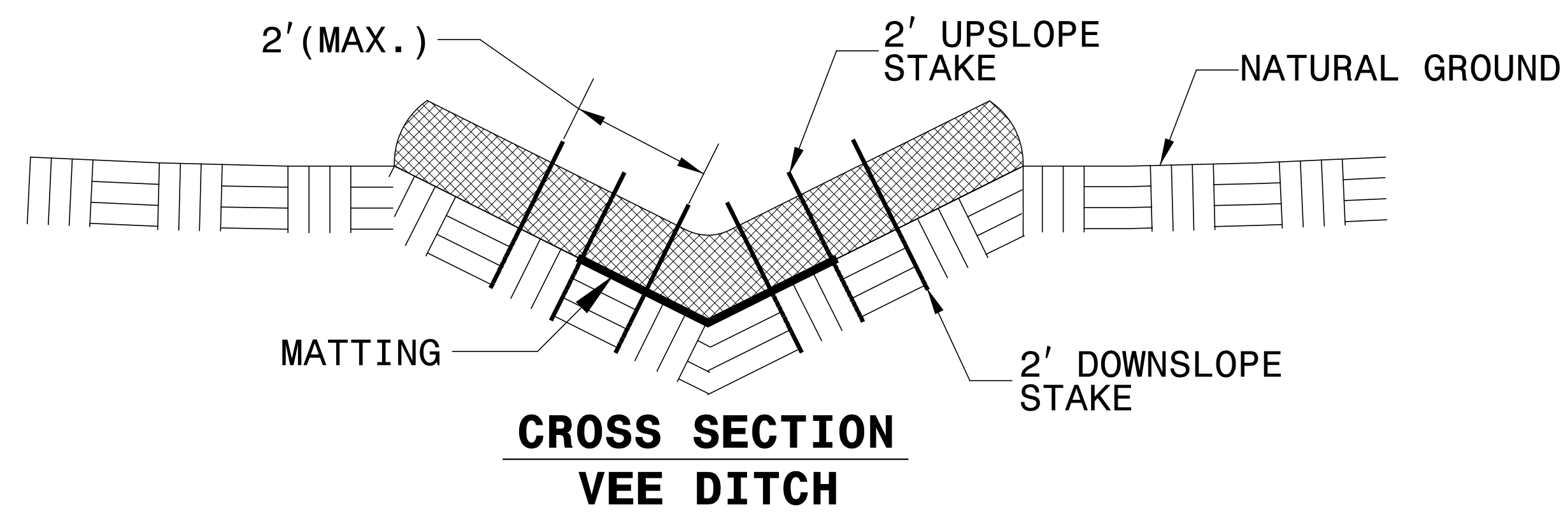
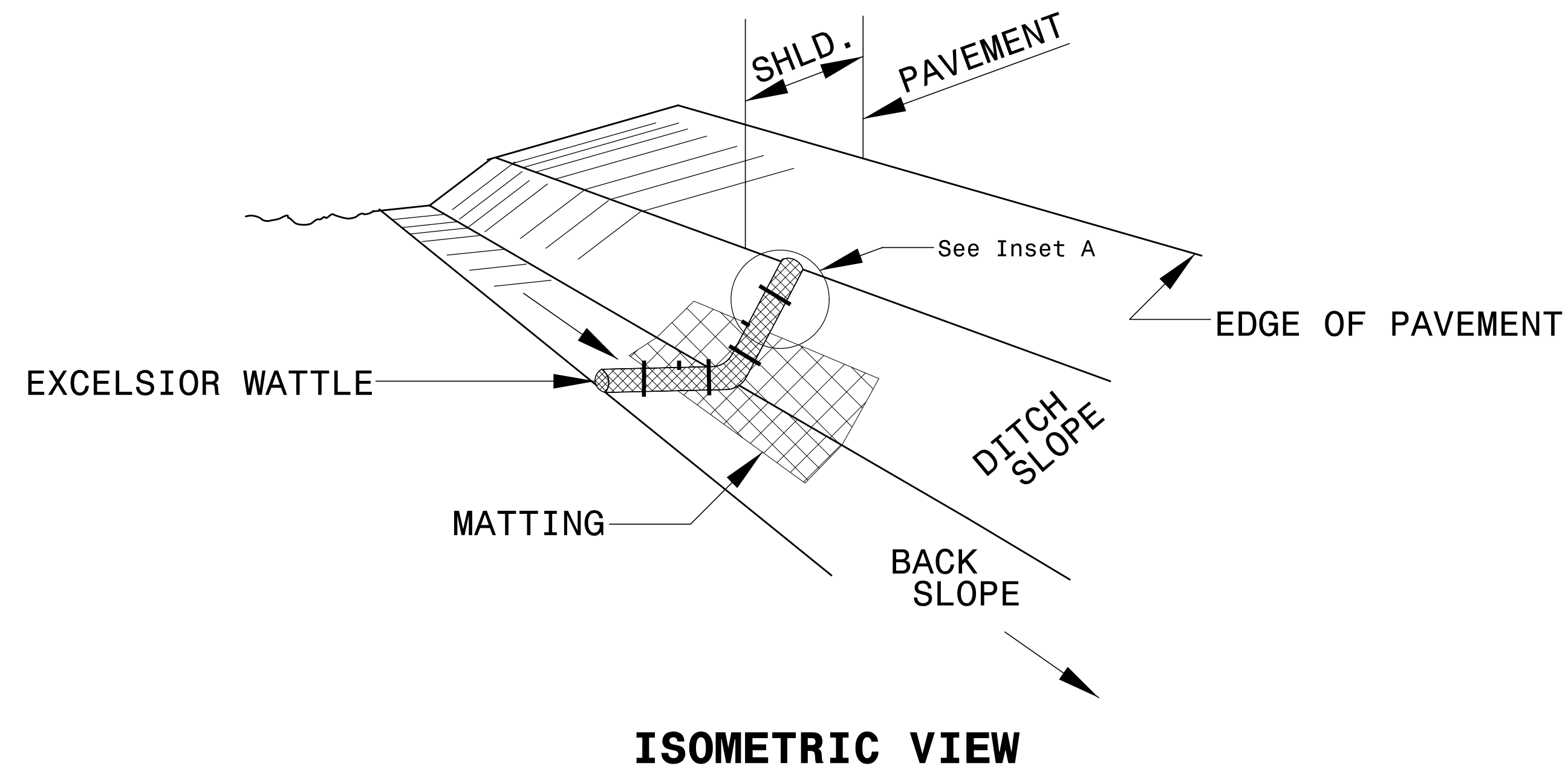
Roadway Standard Drawings

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



# WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



**NOTES:**

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

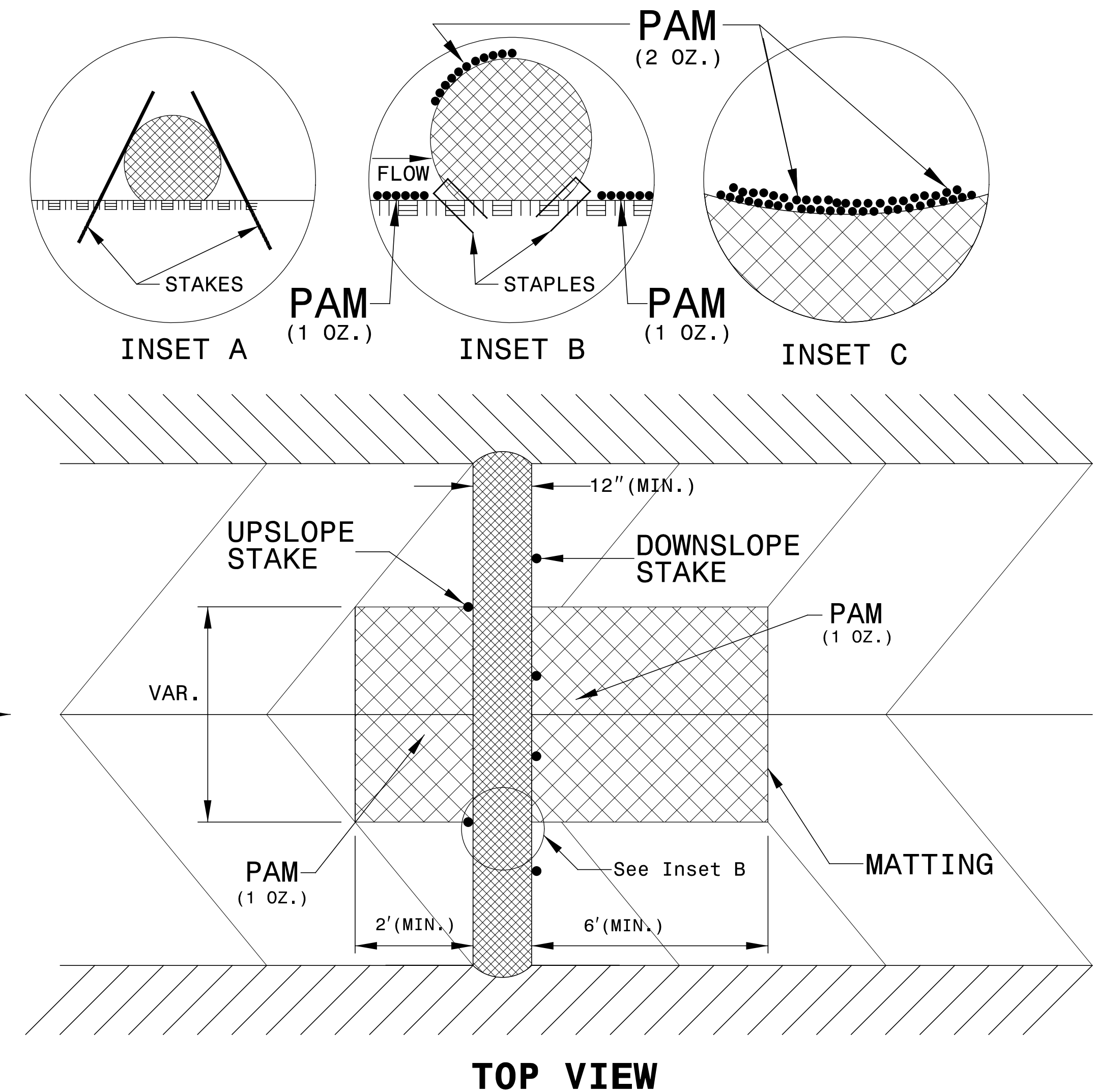
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

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 WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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## ***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.



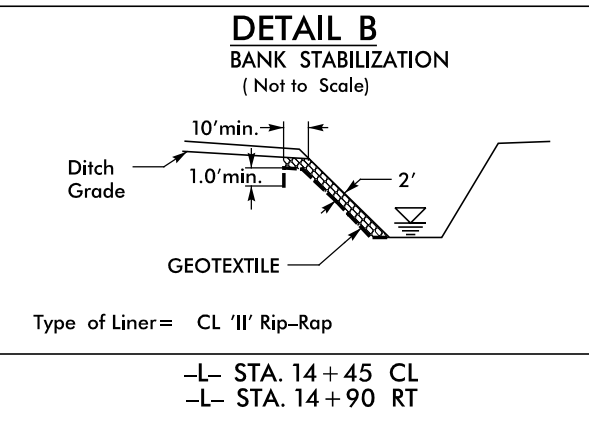
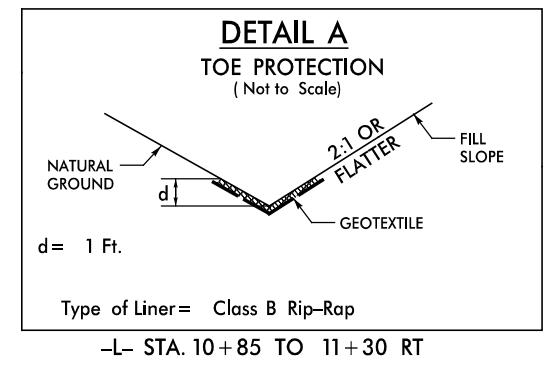
LEVEL III CERTIFIED BY:  
 KYLE M. STOFFER, E.I.  
 CERTIFICATION NUMBER: 3844  
 ISSUED: DECEMBER 7, 2017

Prepared in the Office of:  
**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 www.mottmac.com/americas

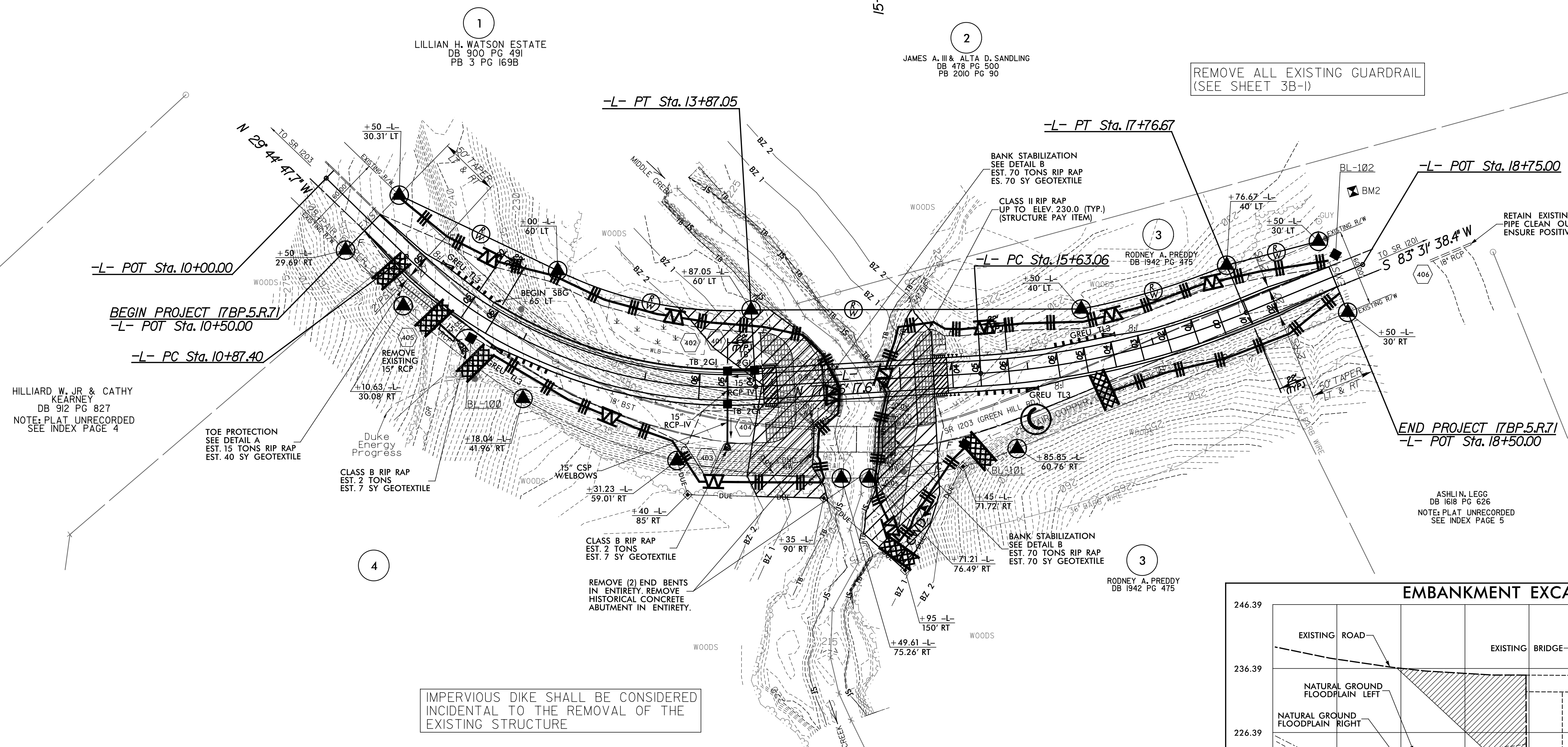
**HDR** HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116



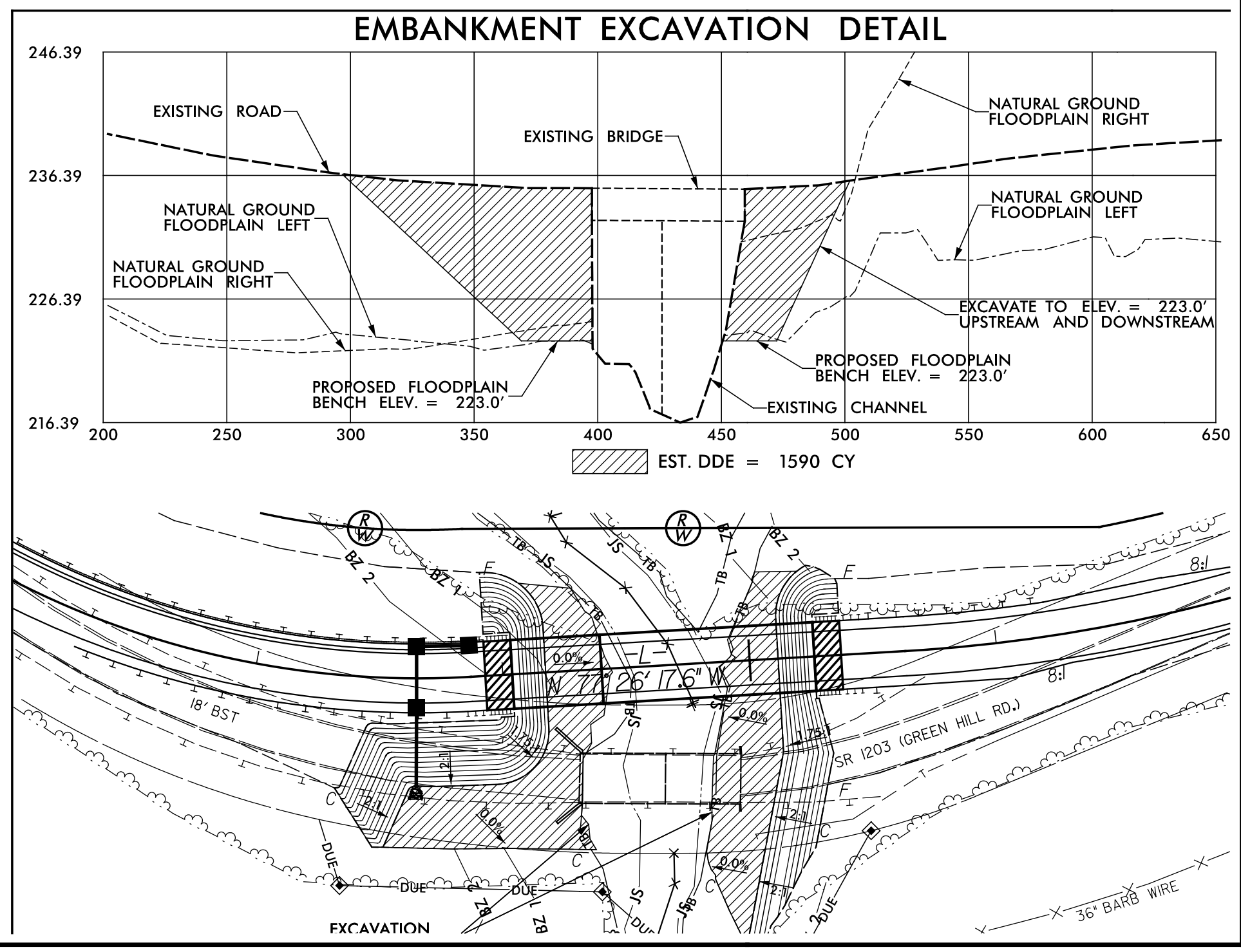
**CLEARING AND GRUBBING  
 EROSION CONTROL FOR  
 CONSTRUCTION SHEET 04**



QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION



REMOVE ALL EXISTING GUARDRAIL (SEE SHEET 3B-1)



ENVIRONMENTALLY SENSITIVE AREA  
 SEE PROJECT SPECIAL PROVISIONS

NOTE:  
 ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

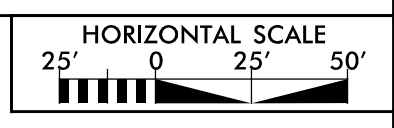
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 HDR Engineering, Inc. of the Carolinas



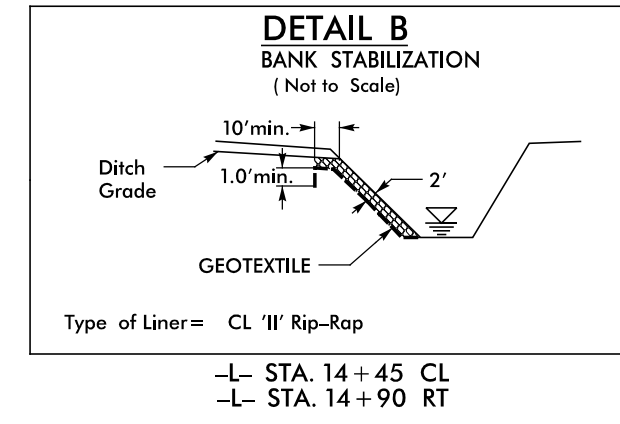
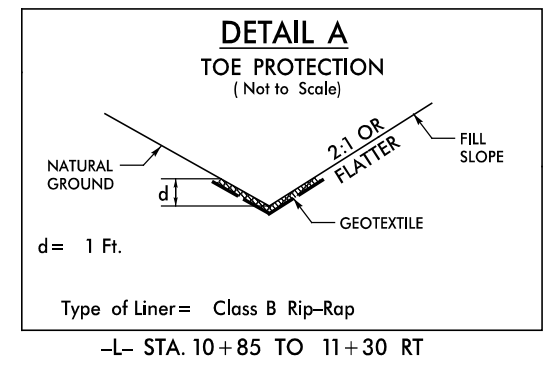
LEVEL III CERTIFIED BY:  
 KYLE M. STOFFER, E.I.  
 CERTIFICATION NUMBER: 3844  
 ISSUED: DECEMBER 7, 2017

Prepared in the Office of:  
**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 www.mottmac.com/americas

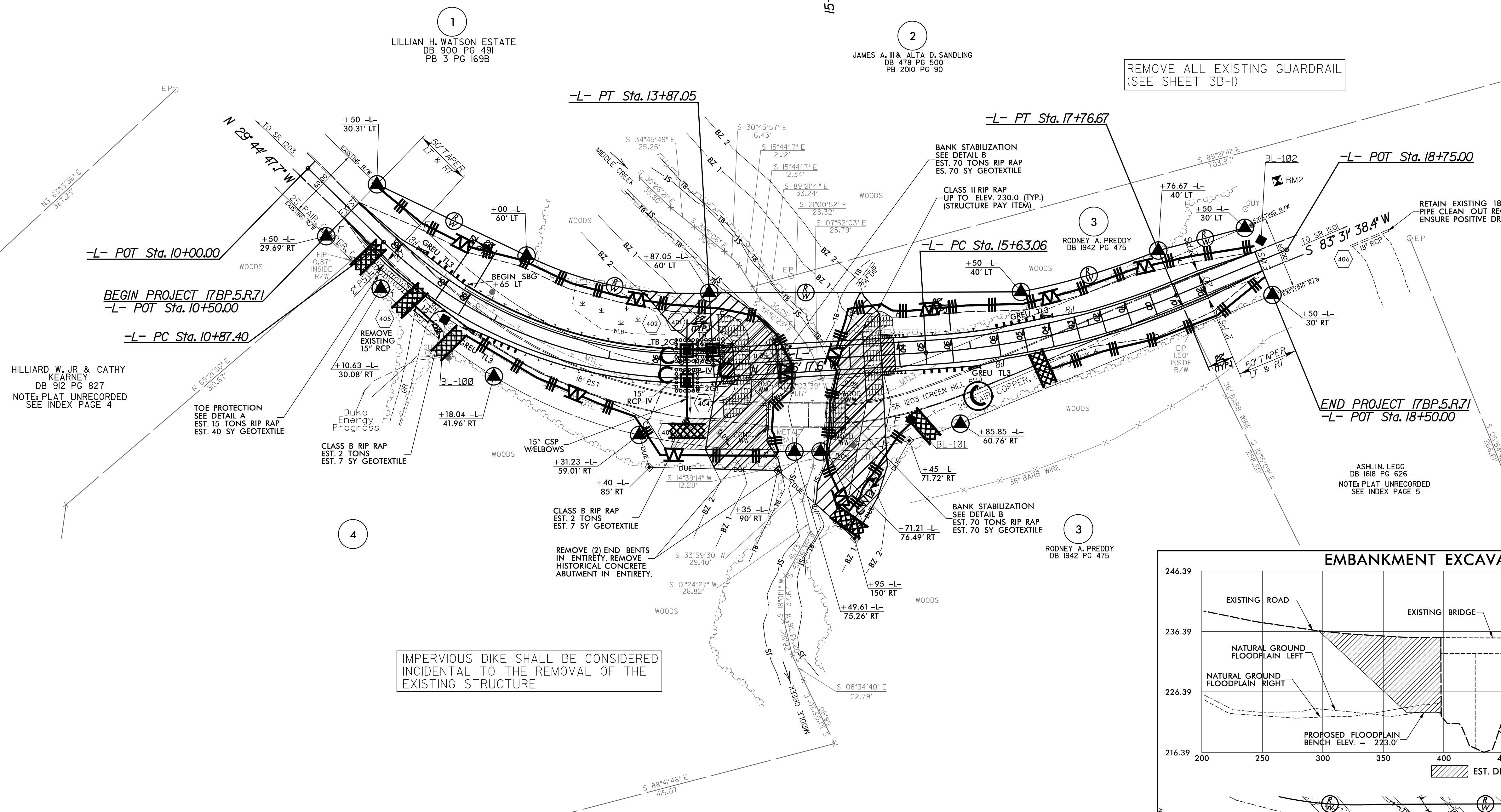
**HDR** HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116



**FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 04**



QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION



REMOVE ALL EXISTING GUARDRAIL (SEE SHEET 3B-1)

HILLIARD W. JR & CATHY KEARNEY  
 DB 912 PG 827  
 NOTE: PLAT UNRECORDED SEE INDEX PAGE 4

TOE PROTECTION SEE DETAIL A EST. 15 TONS RIP RAP EST. 40 SY GEOTEXTILE

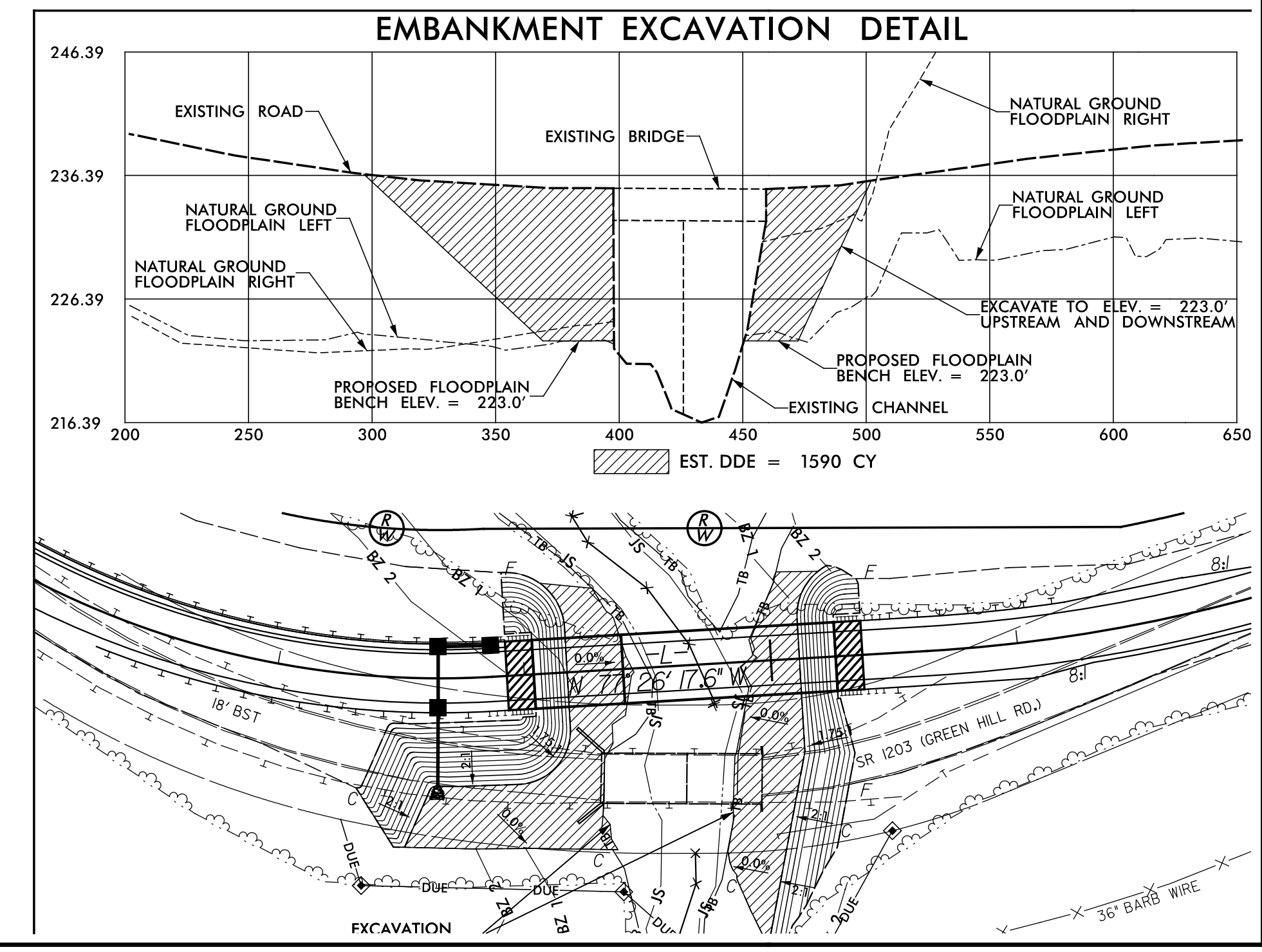
CLASS B RIP RAP EST. 2 TONS EST. 7 SY GEOTEXTILE

CLASS B RIP RAP EST. 2 TONS EST. 7 SY GEOTEXTILE

REMOVE (2) END BENTS IN ENTIRETY. REMOVE HISTORICAL CONCRETE ABUTMENT IN ENTIRETY.

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

NOTE:  
 ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN RW OR EASEMENT.



4/17/2018 8:55:55 AM J:\Hydro\DDC\Franklin\_025\Hydro\ulics\Erosion Control\cadd\340025\_hyd\_erosion\_f.mxd.dgn  
 J:\Hydro\DDC\Franklin\_025\Hydro\ulics\HDR Engineering, Inc. of the Carolinas



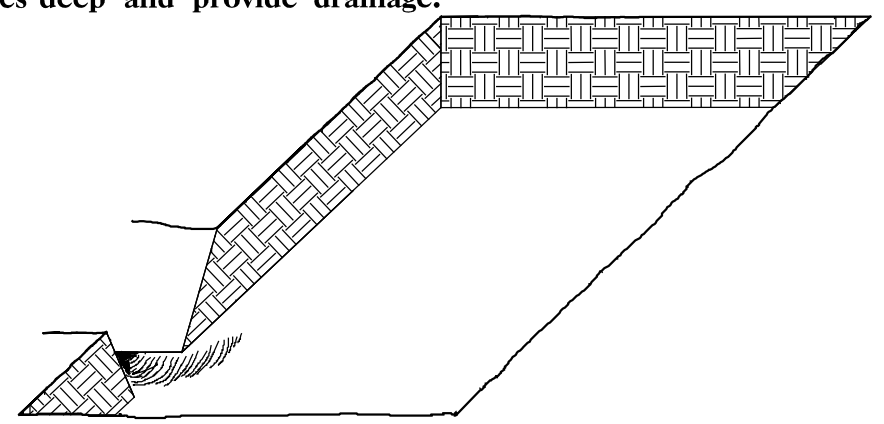
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.71	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

# PLANTING DETAILS

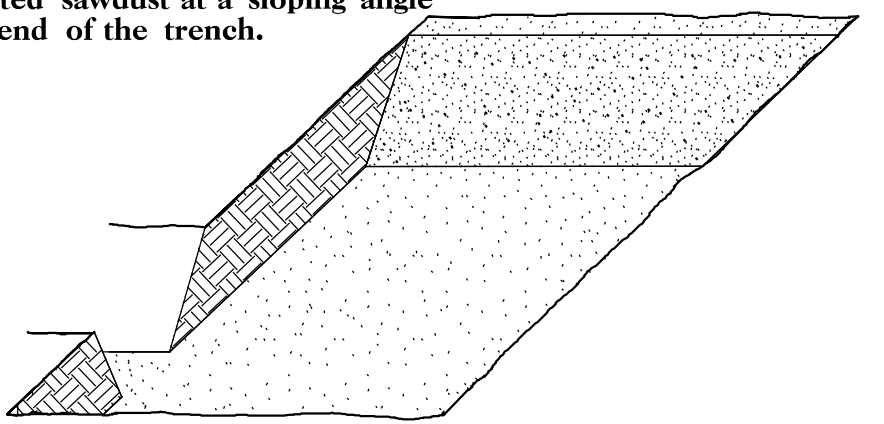
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

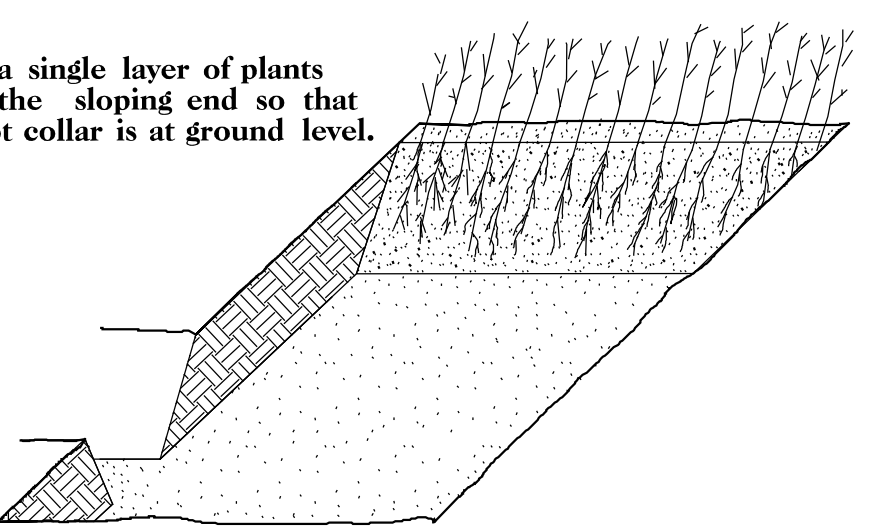
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



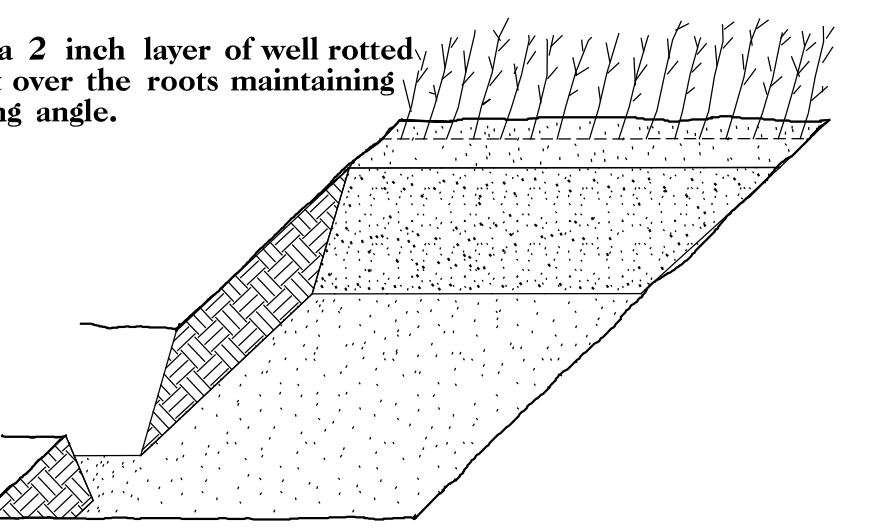
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

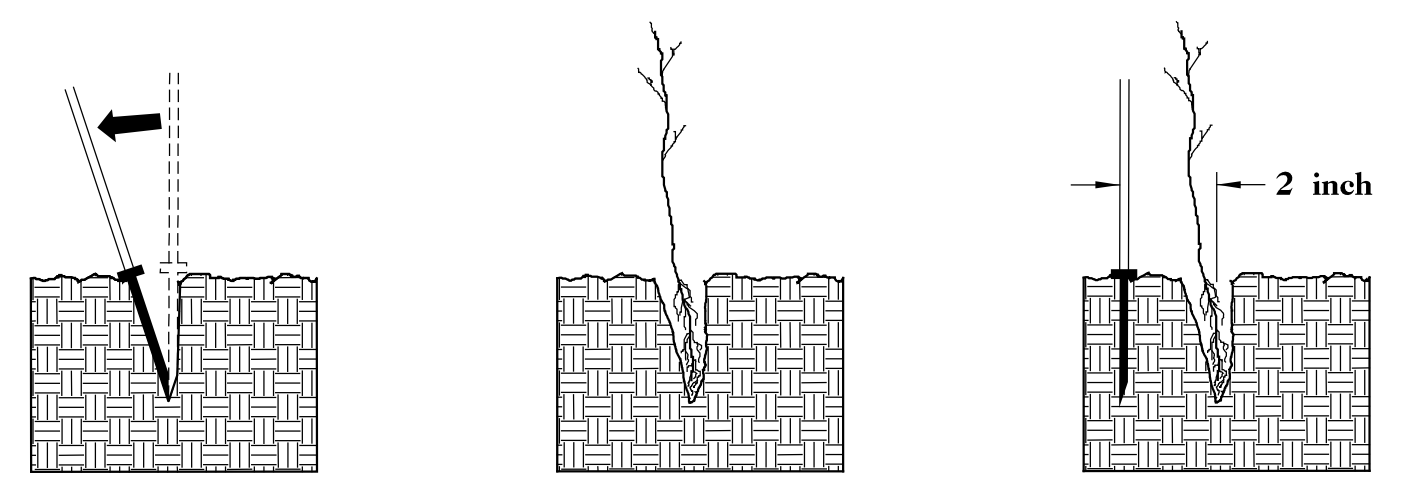


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

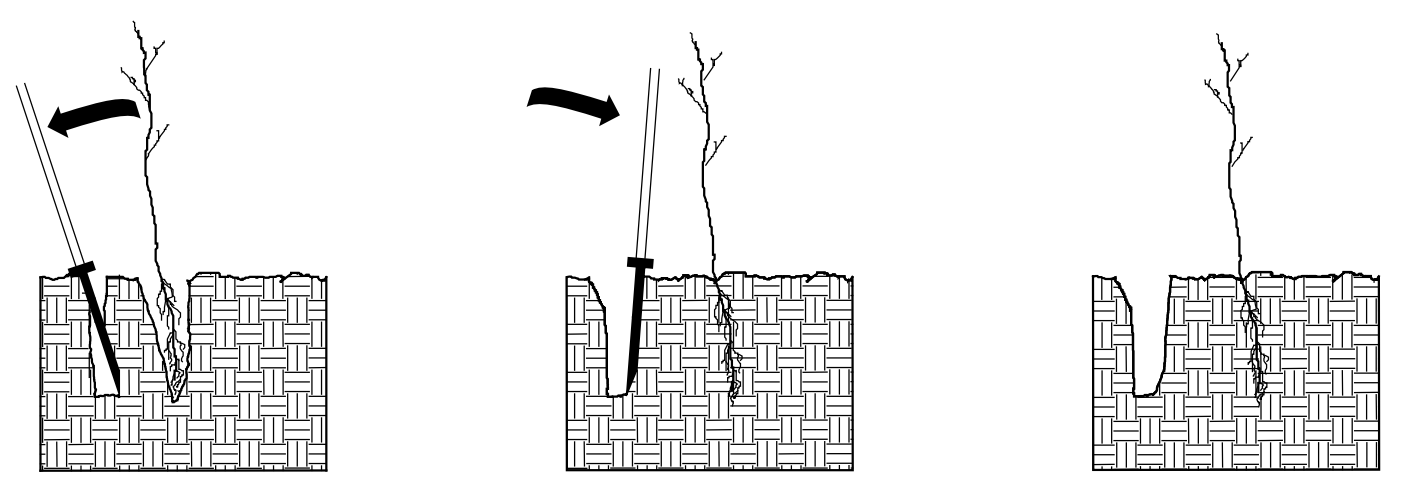


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



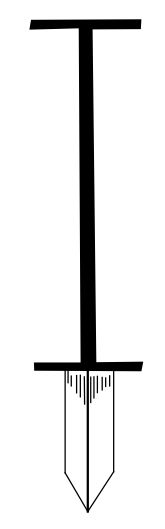
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

**PLANTING BAG**  
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



**KBC PLANTING BAR**  
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



**ROOT PRUNING**  
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

## REFORESTATION

TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION			
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:			
33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
34%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

## REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

2/8/2018 4:39:12 PM  
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 jharris

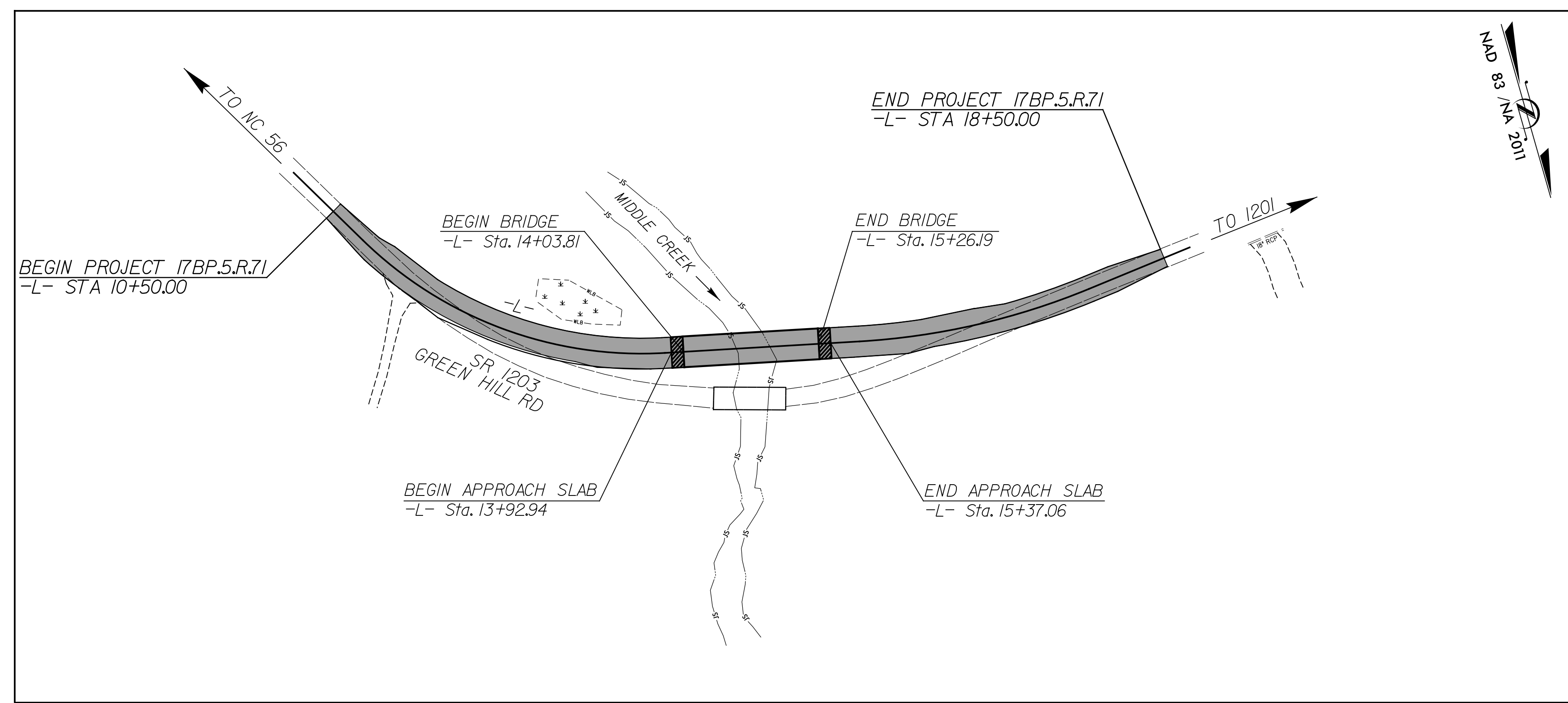
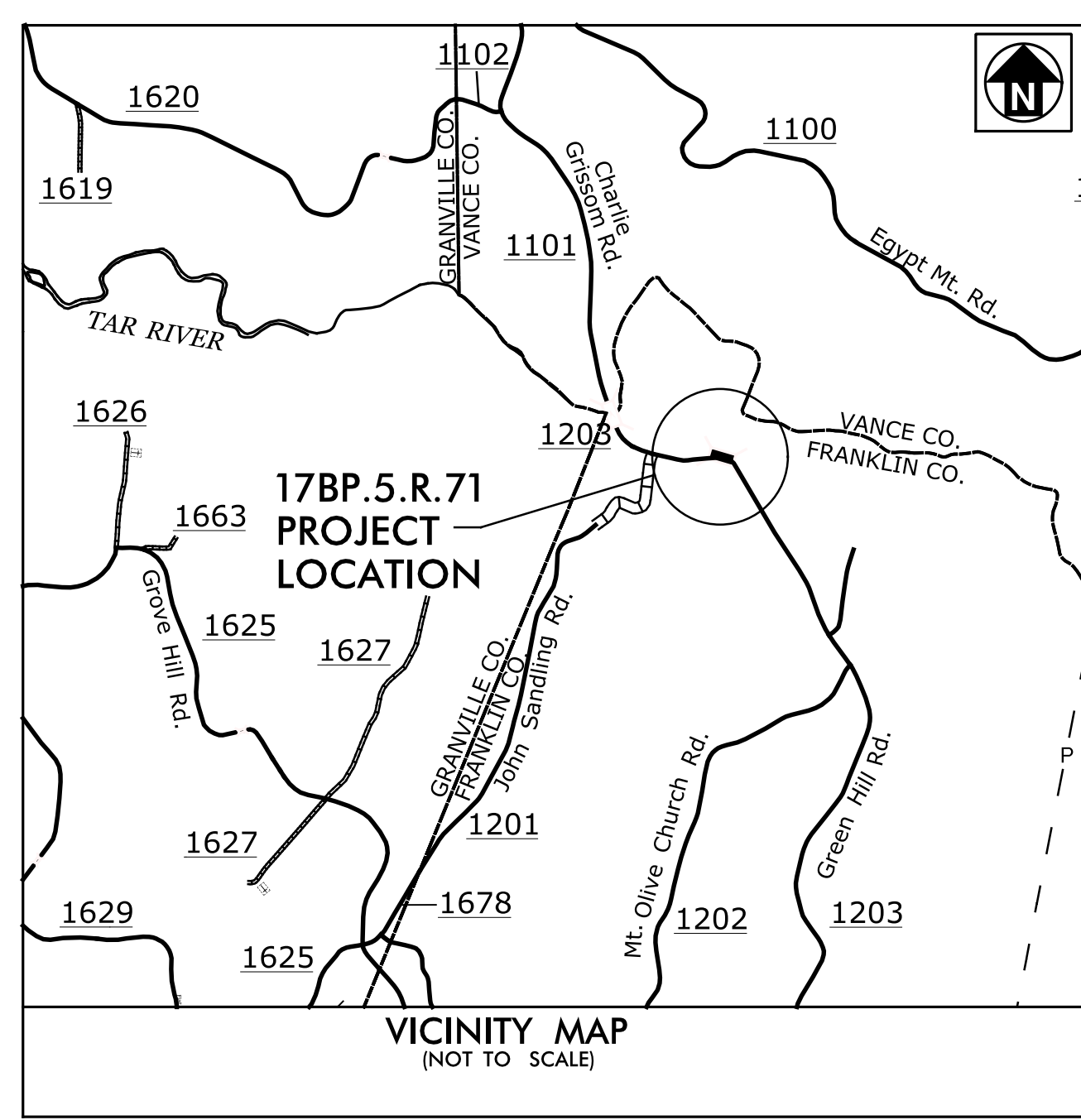
**CONTRACT: TIP PROJECT: 17BP.5.R.71**

T.I.P. NO.	SHEET NO.
17BP.5.R.71	UO-1

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS  
FRANKLIN COUNTY**

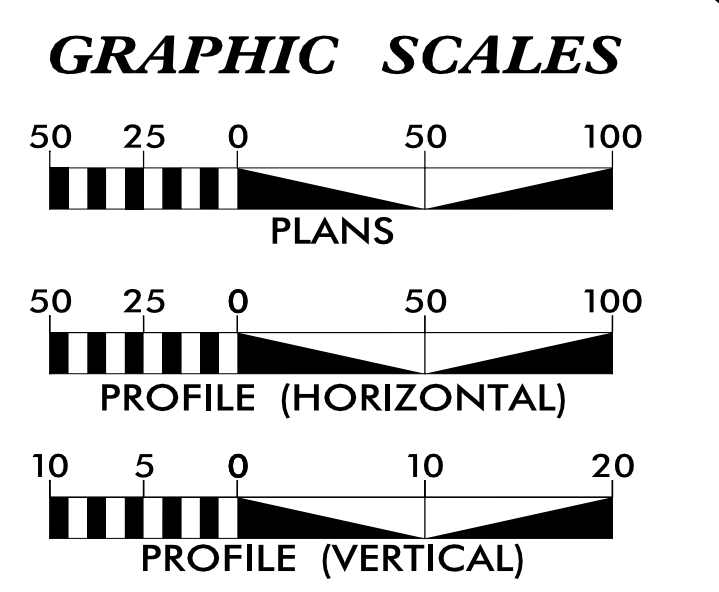
**LOCATION: BRIDGE NO. 25 OVER MIDDLE CREEK  
ON SR 1203 (GREEN HILL ROAD)**  
**TYPE OF WORK: UTILITY BY OTHERS RELOCATION**



**\*DESIGN EXCEPTION:**  
 MIN. HORIZONTAL CURVE RADIUS  
 SAG VERTICAL CURVE K  
 HORIZONTAL SSD  
 VERTICAL SSD

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
 CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET

**UTILITY OWNERS WITH CONFLICTS**

(A) POWER - DUKE ENERGY PROGRESS  
 (B) COMMUNICATIONS - CENTURYLINK

PREPARED BY:

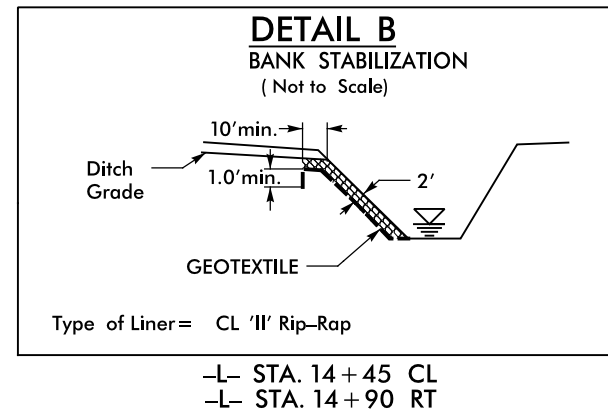
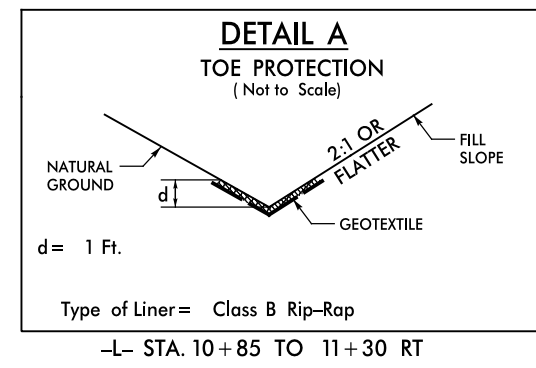
**THE WOOTEN COMPANY**  
 120 North Boylan Avenue Raleigh, NC 27603-1423  
 919.828.0531 Fax: 919.834.3589  
 License Number: F-0115

NCDOT PROJECT ENGINEER:  
**LISA GILCHRIST, E.I.**  
 NCDOT DIVISION BRIDGE PROGRAM MANAGER

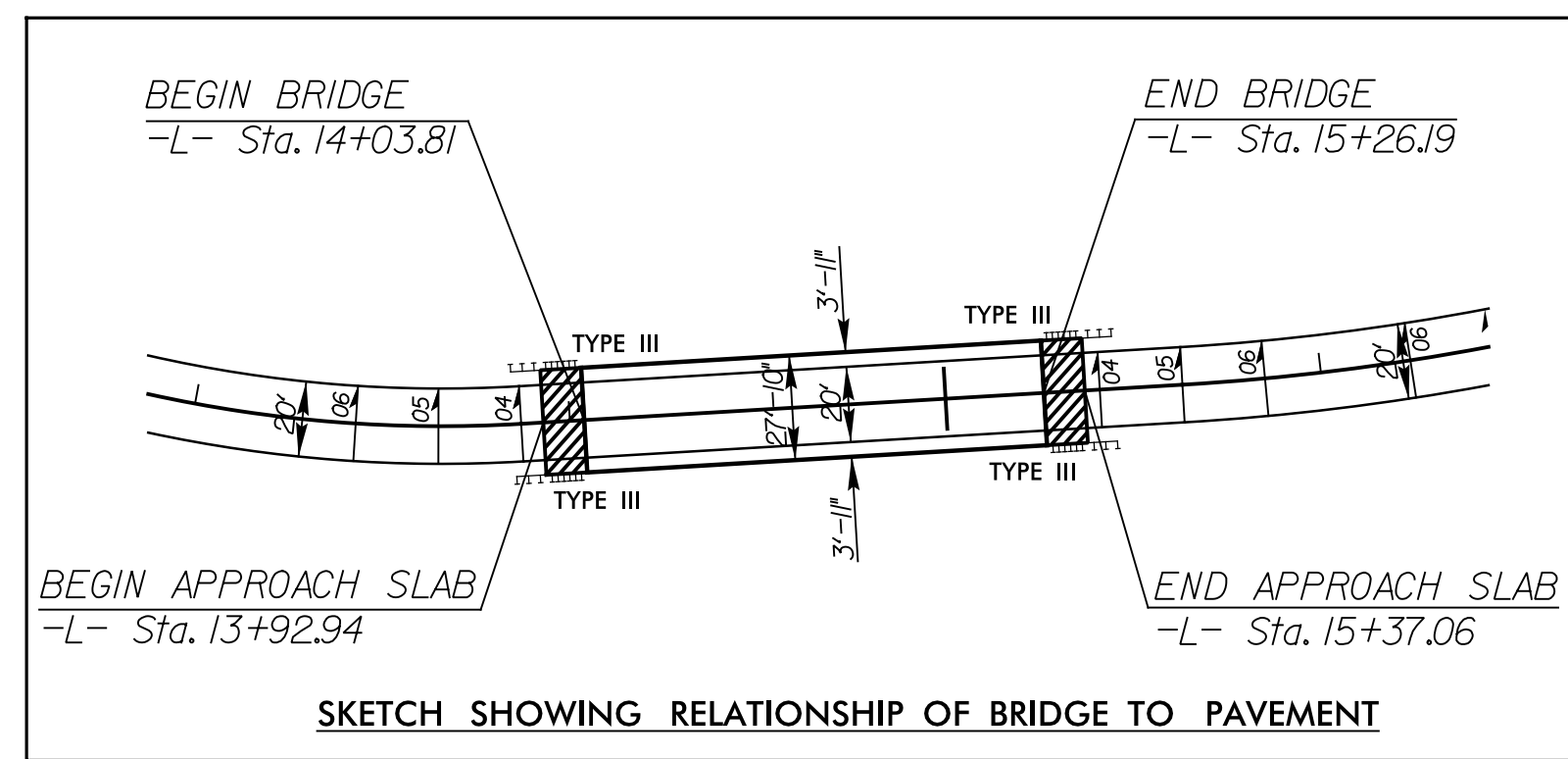
PREPARED FOR:  
 NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION BRIDGE PROGRAM



DESIGN EXCEPTION:  
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 SAG VERTICAL CURVE K  
 HORIZONTAL SSD  
 VERTICAL SSD



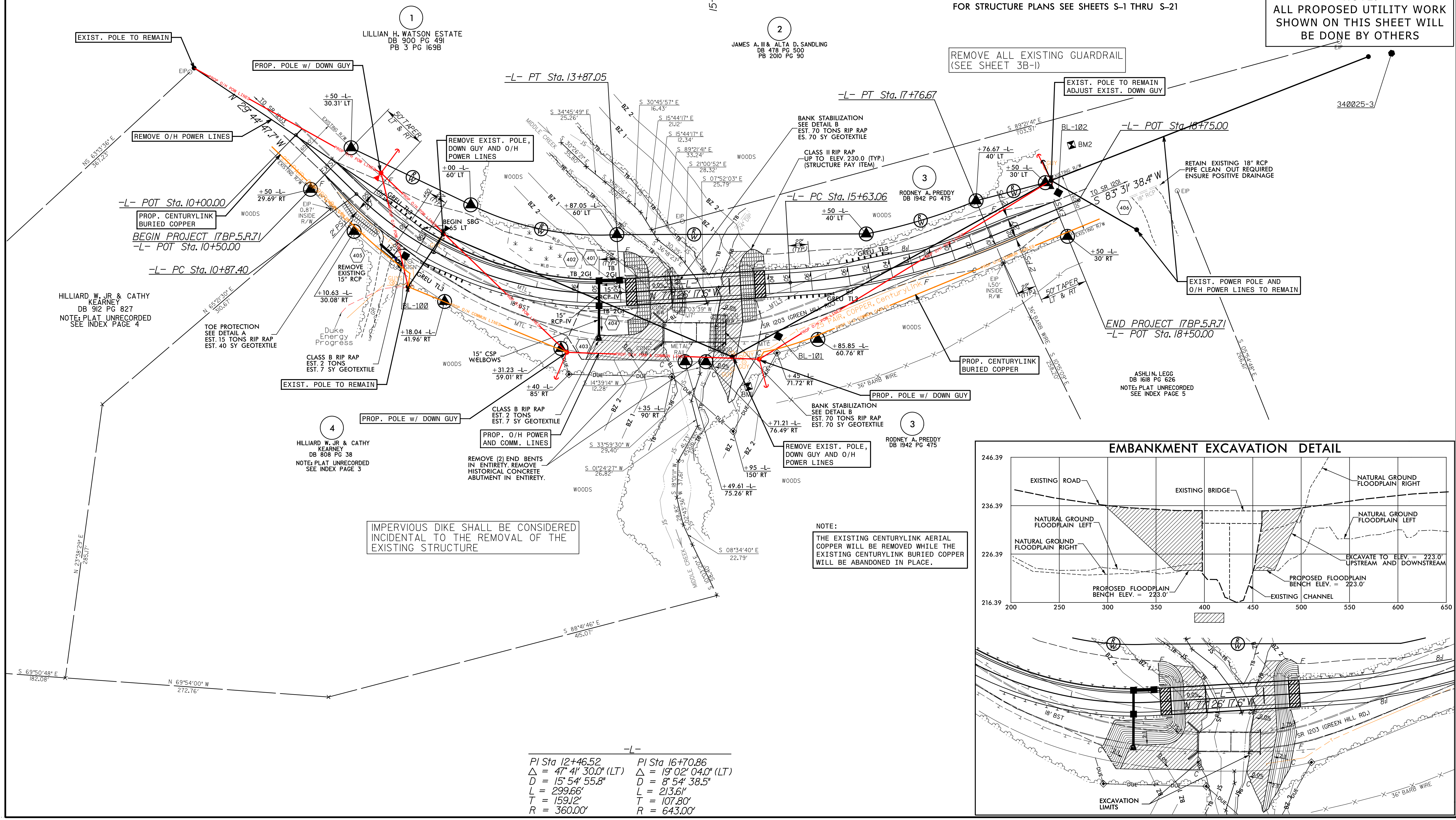
UTILITIES BY OTHERS



PROJECT REFERENCE: 17BP.5.R.71 - FRANKLIN 25  
 SHEET NO.: UO-2  
 Prepared in the Office of:  
**THE WOOTEN COMPANY**  
 120 North Boylan Avenue, Raleigh, NC 27603-1423  
 919.828.0531 fax 919.834.3589  
 License Number: F-0115  
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**  
 GRAPHIC SCALE: 25', 0, 25', 50'

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

QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION



REMOVE ALL EXISTING GUARDRAIL (SEE SHEET 3B-1)

EXIST. POLE TO REMAIN ADJUST EXIST. DOWN GUY

RETAIN EXISTING 18" RCP PIPE CLEAN OUT REQUIRED ENSURE POSITIVE DRAINAGE

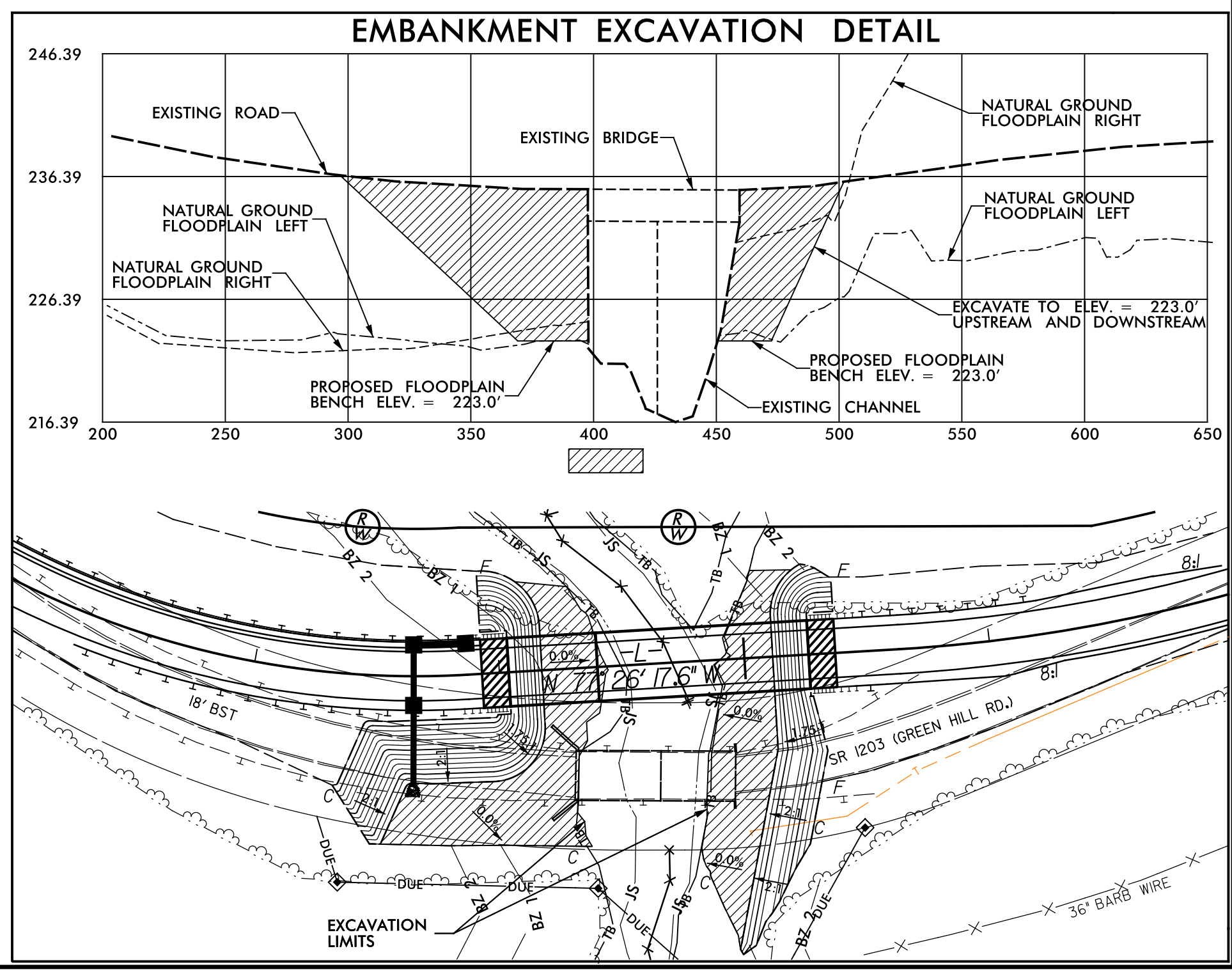
EXIST. POWER POLE AND O/H POWER LINES TO REMAIN

END PROJECT 17BP.5.R.71 -L- POT Sta. 18+50.00

ASHLIN, LEGG DB 1618 PG 626 NOTE: PLAT UNRECORDED SEE INDEX PAGE 5

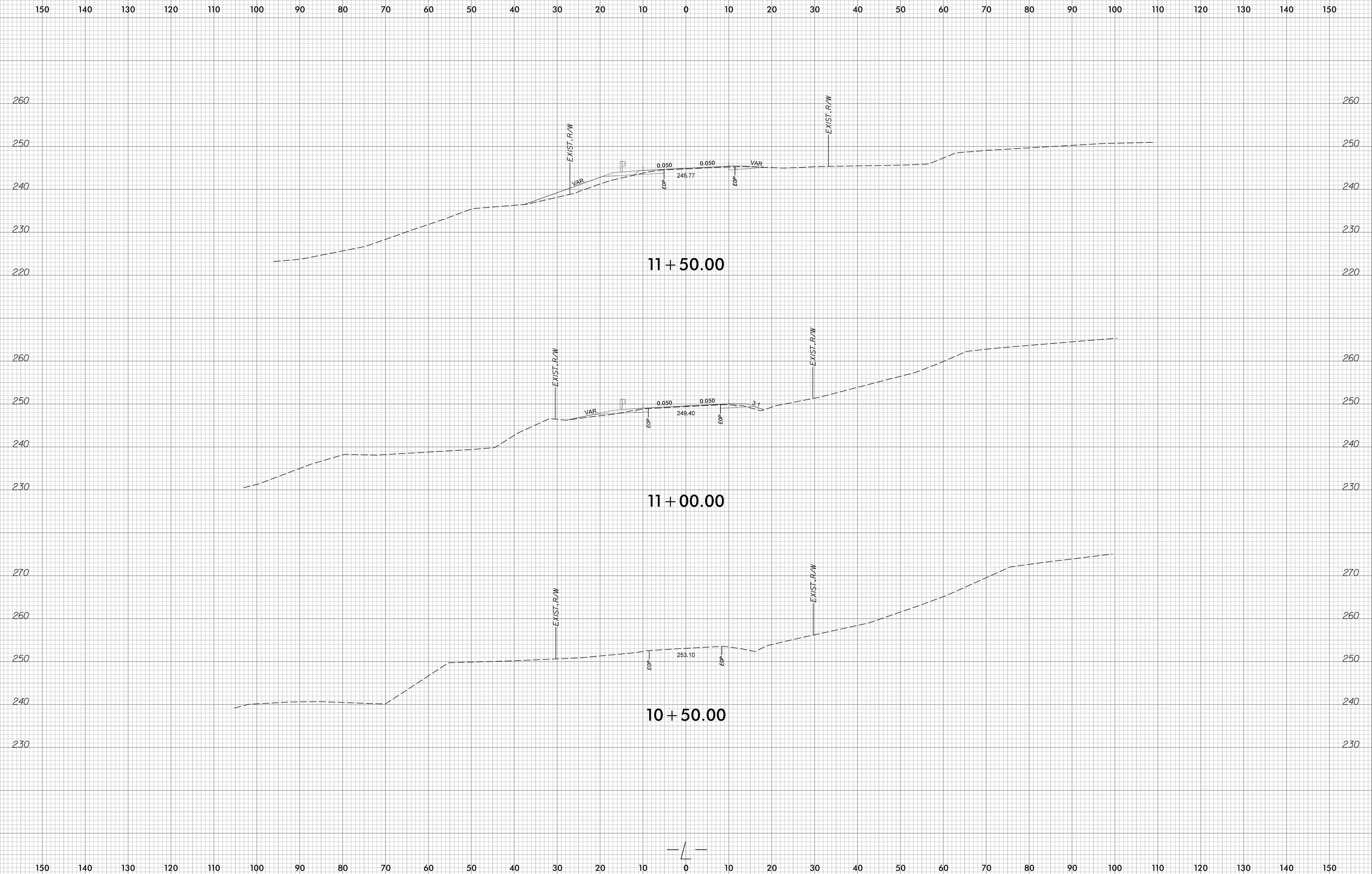
IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

NOTE:  
 THE EXISTING CENTURYLINK AERIAL COPPER WILL BE REMOVED WHILE THE EXISTING CENTURYLINK BURIED COPPER WILL BE ABANDONED IN PLACE.



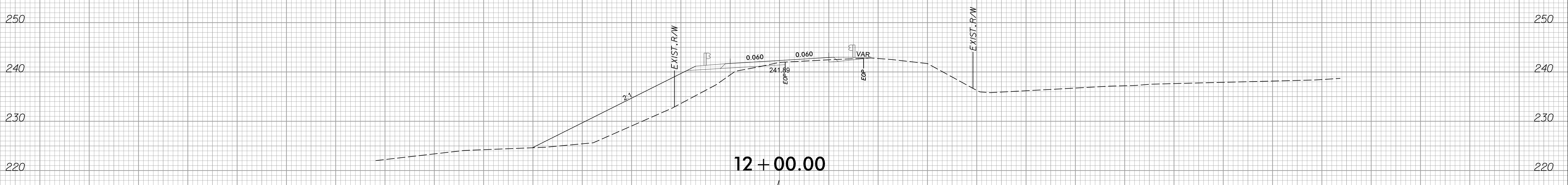
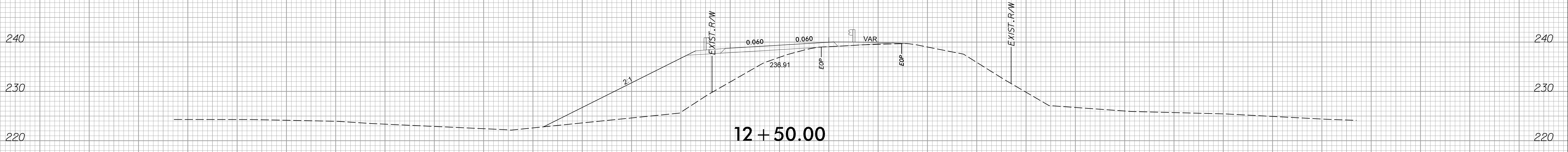
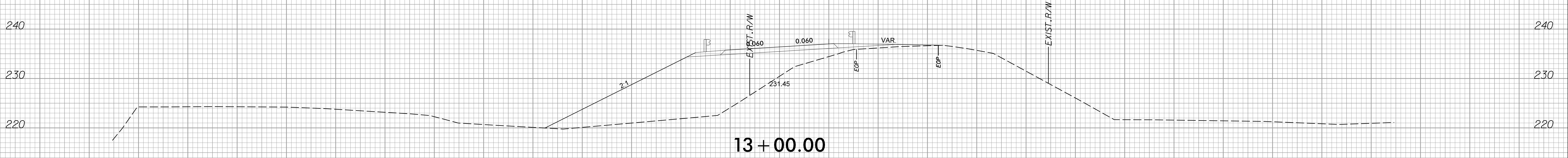
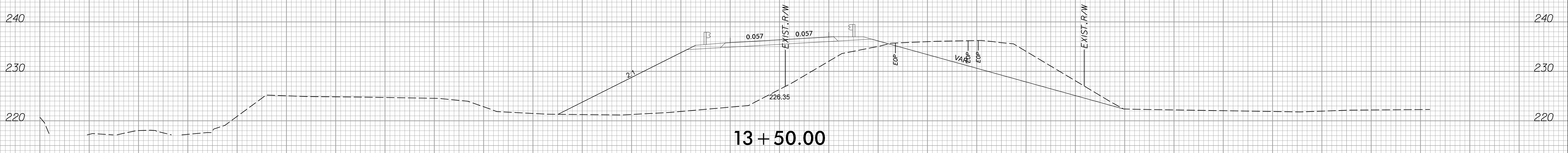
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Δ = 47° 41' 30.0" (LT)	Δ = 19° 02' 04.0" (LT)
D = 15' 54' 55.8"	D = 8' 54' 38.5"
L = 299.66'	L = 213.61'
T = 159.12'	T = 107.80'
R = 360.00'	R = 643.00'







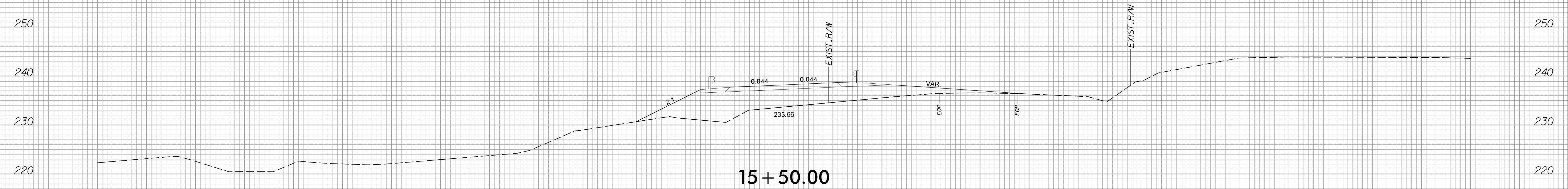
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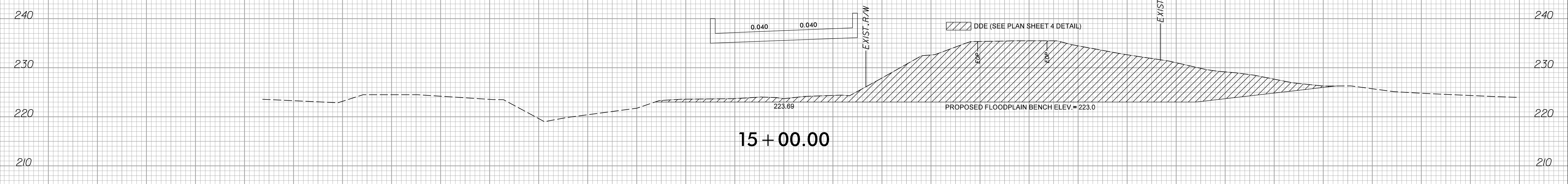
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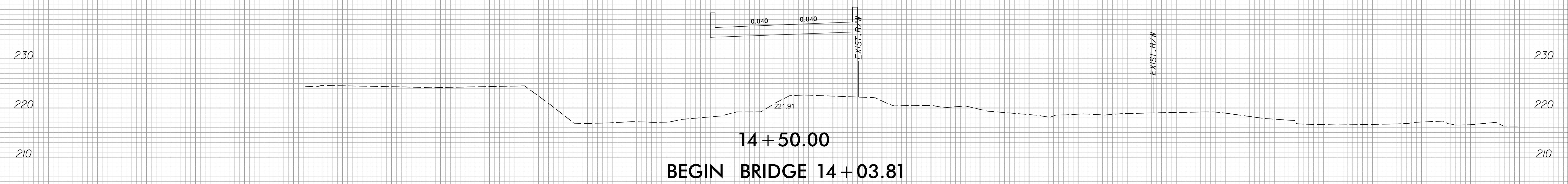
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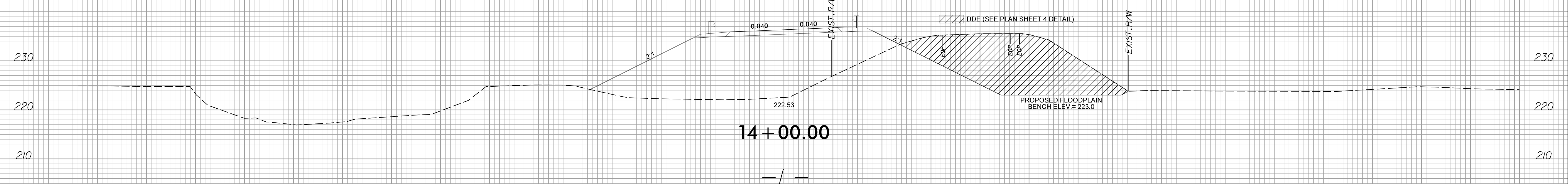
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**END BRIDGE 15 + 26.19**



**15 + 00.00**



**14 + 50.00**  
**BEGIN BRIDGE 14 + 03.81**

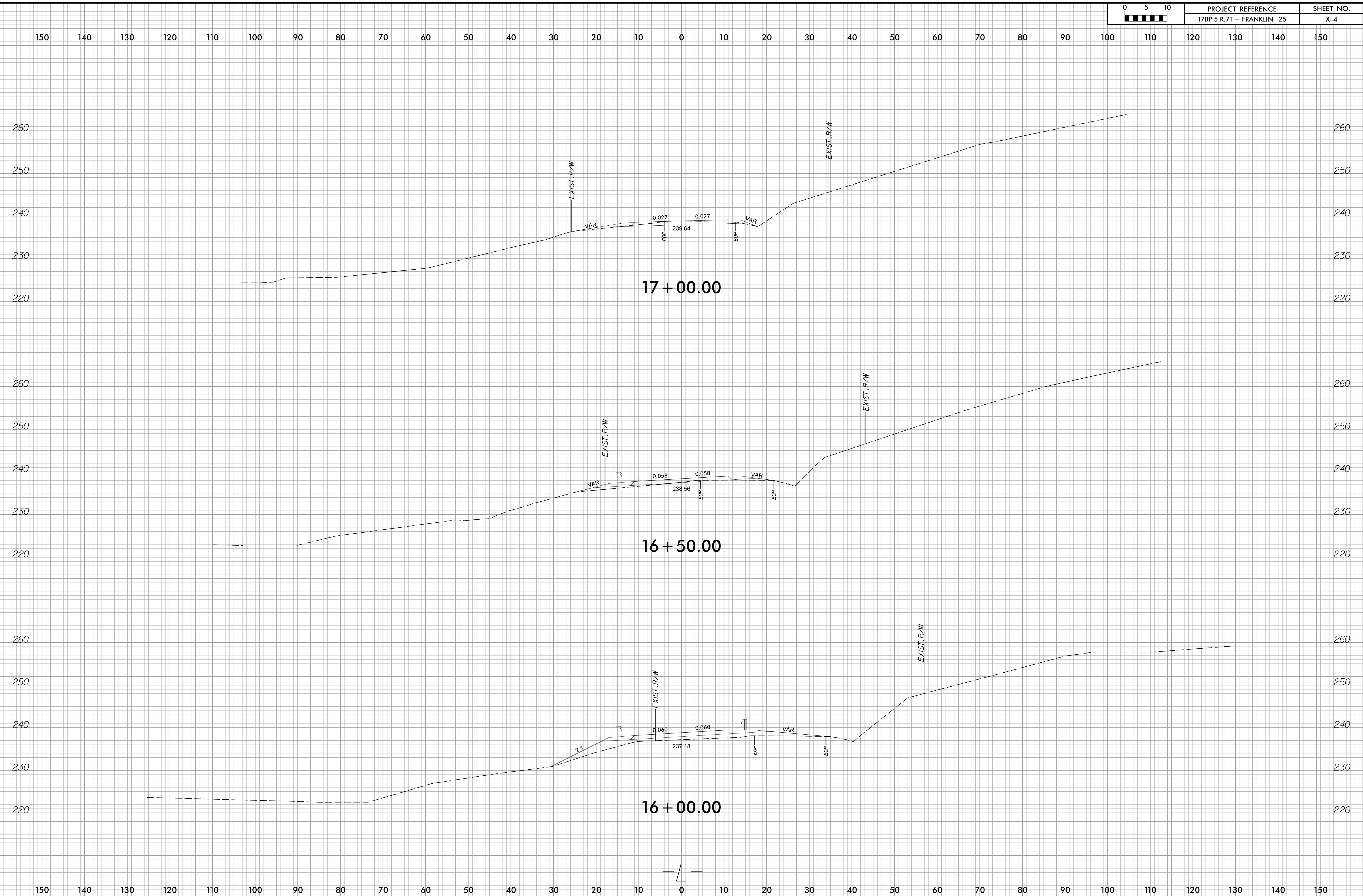


**14 + 00.00**

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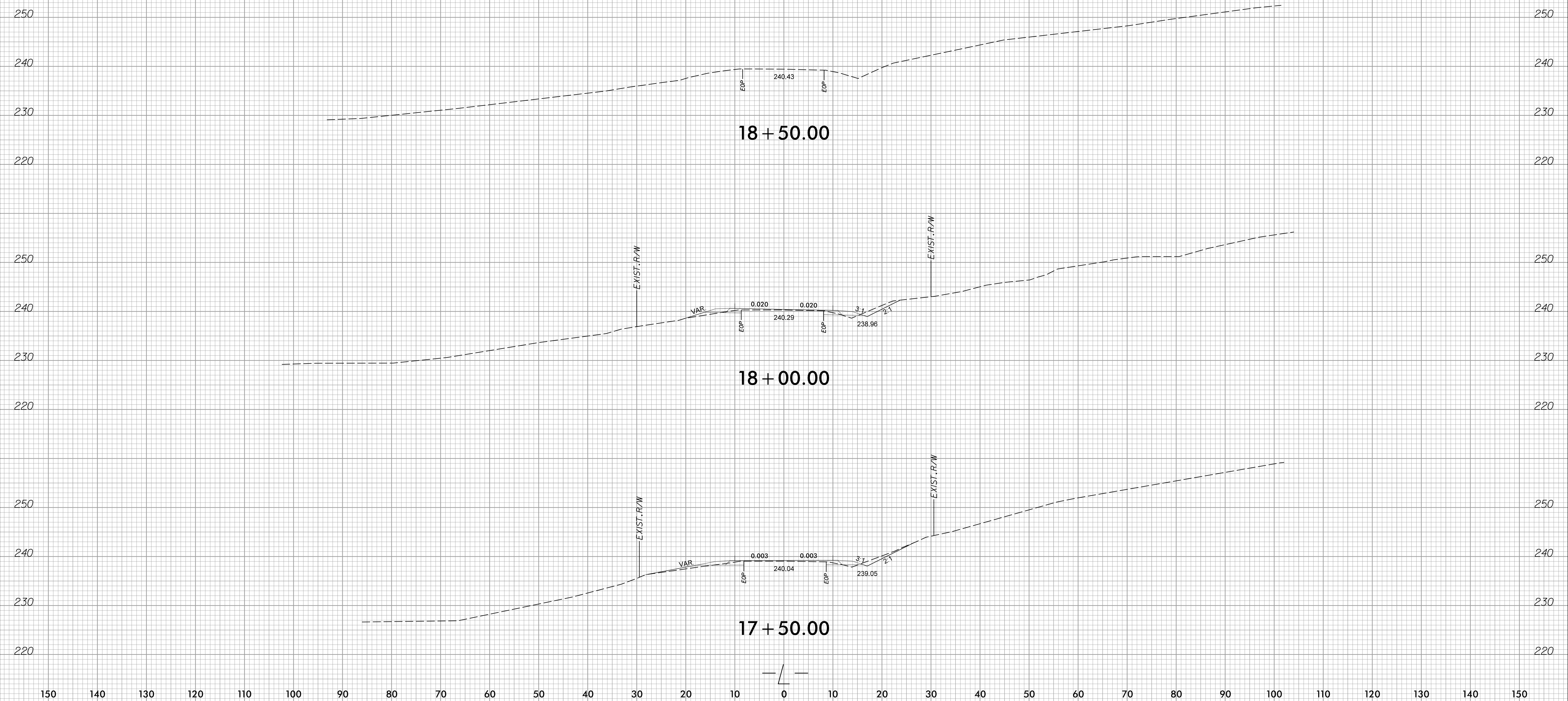
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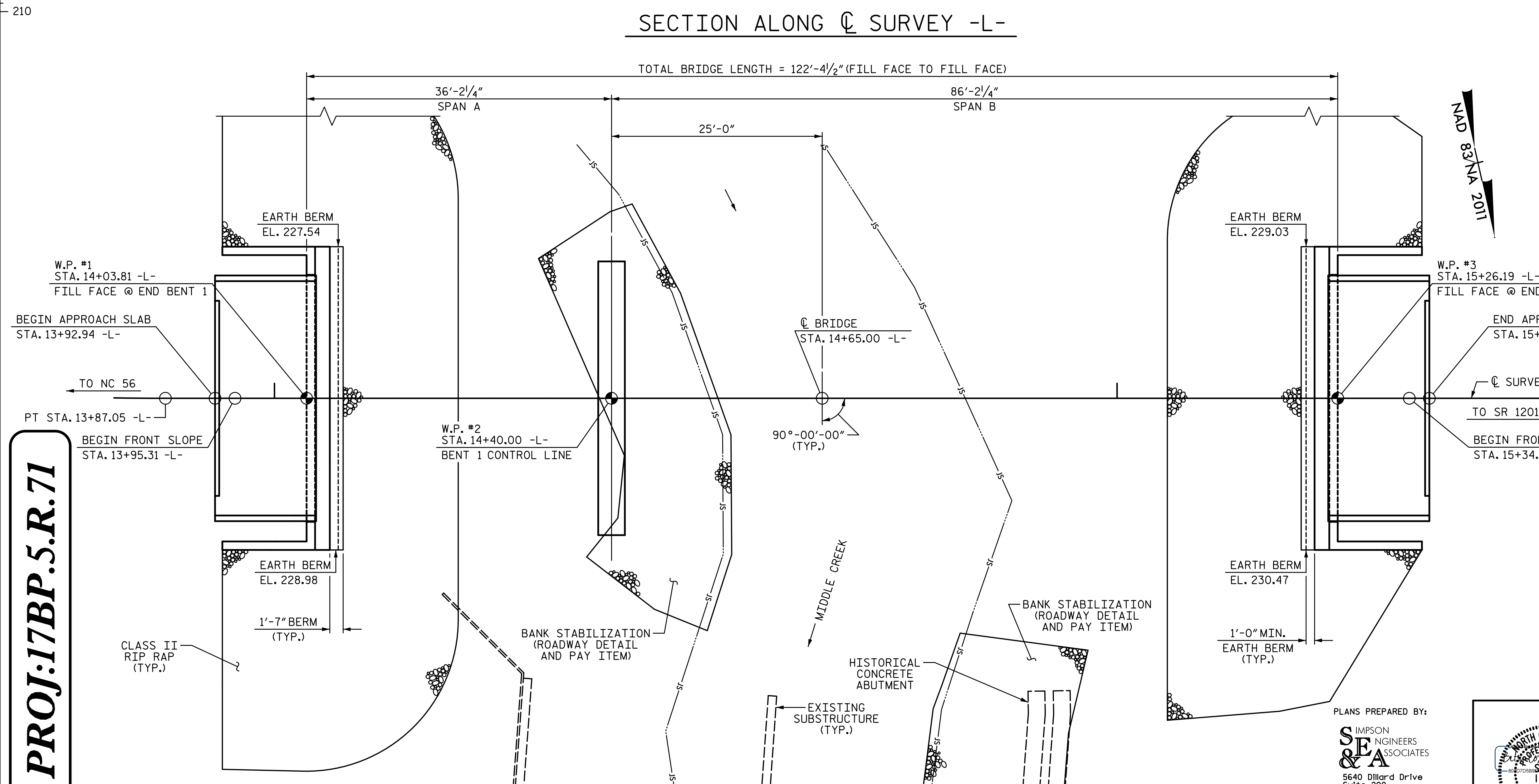
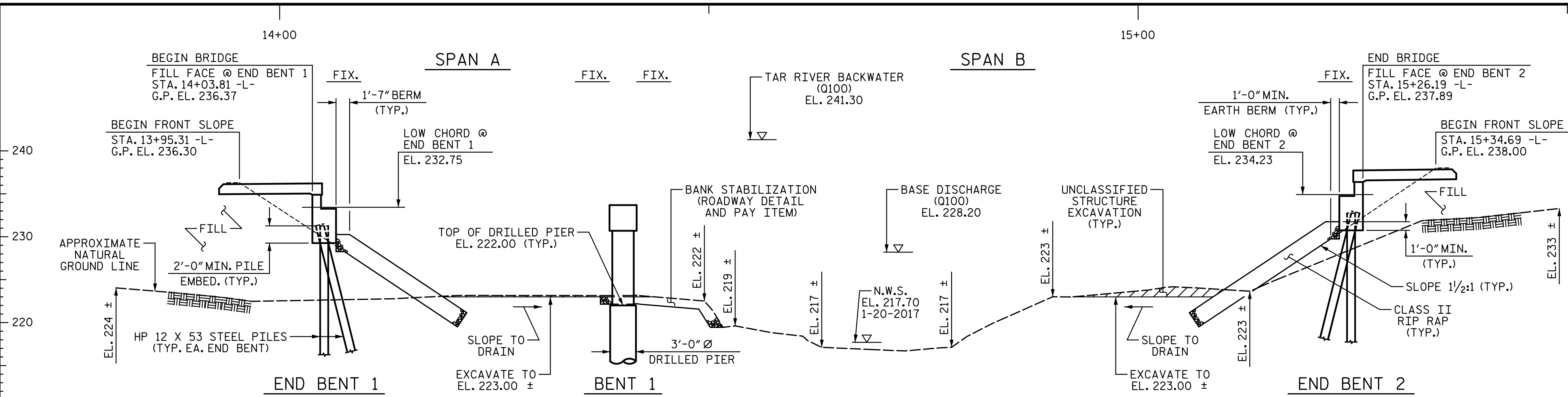
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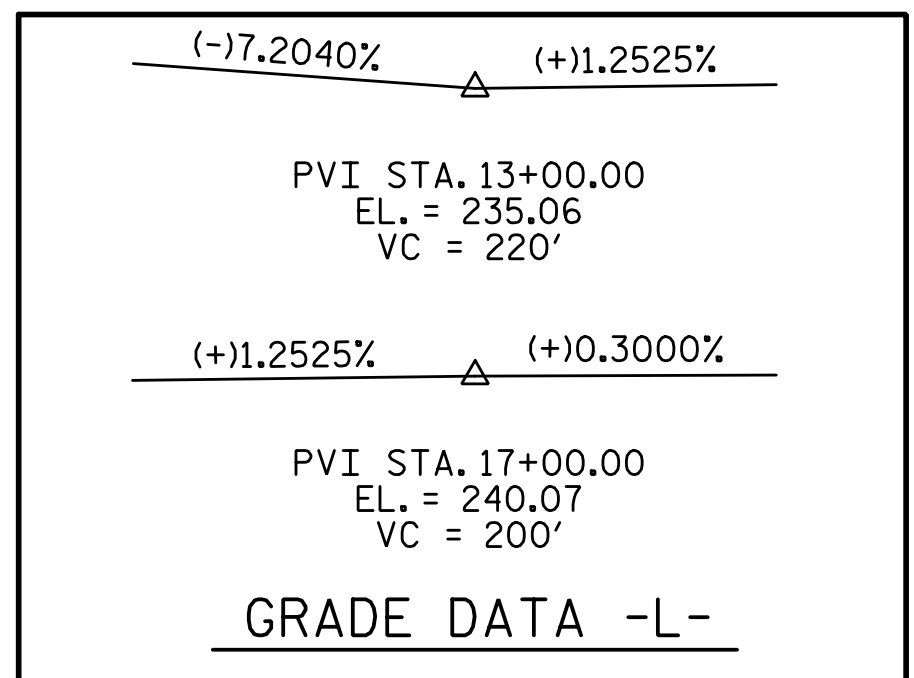
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**PROJ:17BP.5.R.71**

DRAWN BY: T. BANKOVICH DATE: 4-18  
 CHECKED BY: B.S. COX DATE: 4-18  
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18



SECTION ALONG Q SURVEY -L-  
 PLAN  
 (PILES AND DRILLED PIERS NOT SHOWN IN PLAN VIEW)



**HYDRAULIC DATA:**

DESIGN DISCHARGE	= 2000 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YEAR
DESIGN HIGH WATER ELEVATION	= 226.7
DRAINAGE AREA	= 9.0 SQ. MI.
BASE DISCHARGE (Q 100)	= 2991 CFS
BASE HIGH WATER ELEVATION	= 228.2

**OVERTOPPING FLOOD DATA:**

OVERTOPPING DISCHARGE	= 3900
FREQUENCY OF OVERTOPPING FLOOD	= 500 ± YEAR
OVERTOPPING FLOOD ELEVATION	= 235.3 **

\*\* OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 13+87.00 -L- AT ROADWAY SUPER HIGH (RIGHT) SIDE

**HORIZONTAL CURVE DATA**

PI STA. 12+46.52 -L-
Δ = 47°-41'-30.0" (L.T.)
D = 15°-54'-55.8"
L = 299.66'
T = 159.12'
R = 360.00'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

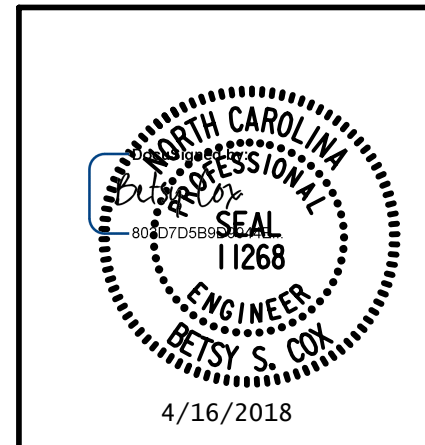
PROJECT NO. 17BP.5.R.71  
 FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE #25

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1203  
 (GREEN HILL RD)  
 OVER MIDDLE CREEK  
 BETWEEN NC 56 AND SR 1201  
 27'-10" CLEAR ROADWAY - 90° SKEW

PLANS PREPARED BY:  
**SEA & A**  
 SIMPSON ENGINEERS & ASSOCIATES  
 5640 Dillard Drive  
 Suite 200  
 Cary, NC 27518  
 (919) 852-0468  
 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521

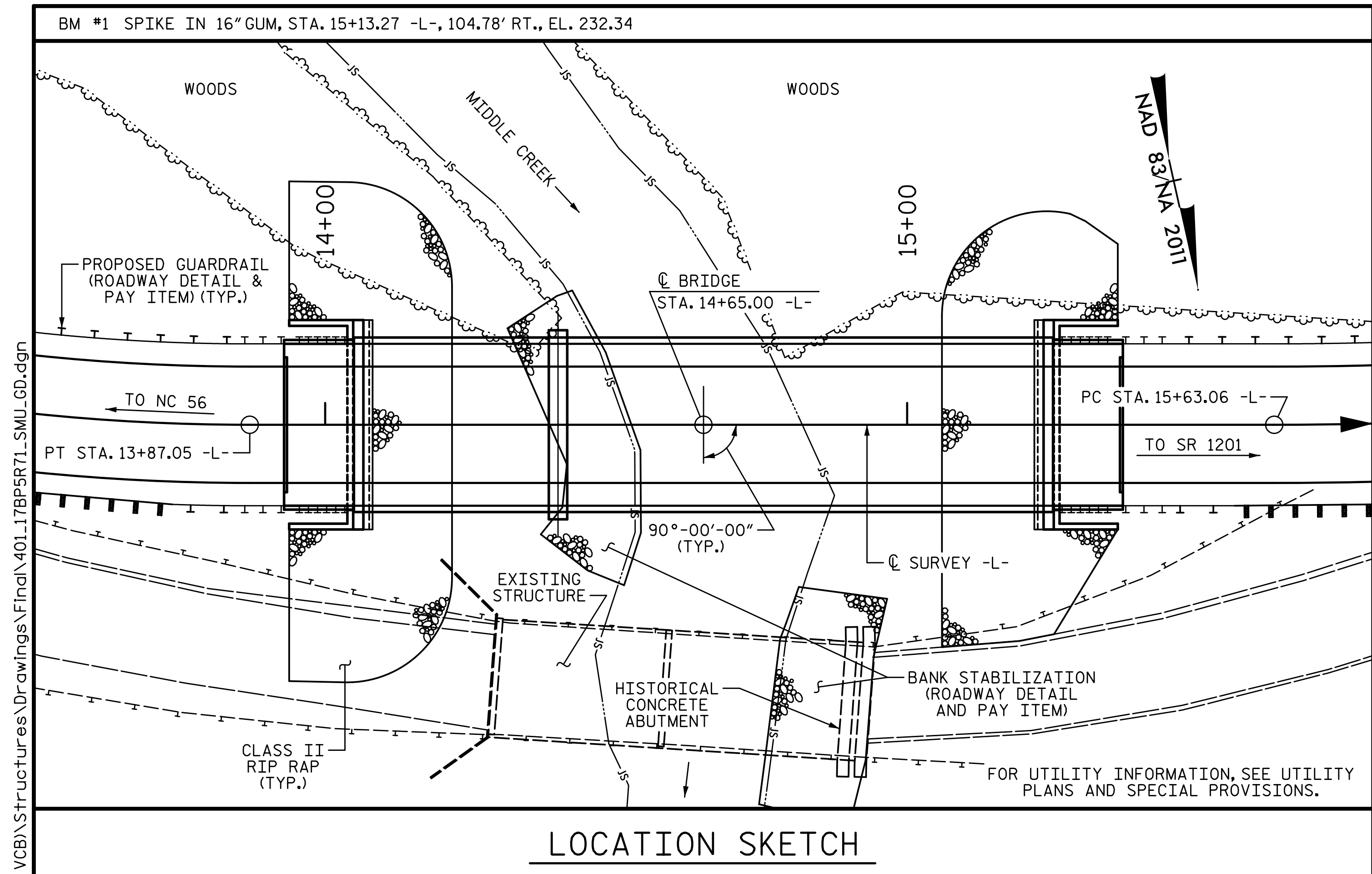


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 21

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





**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.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 35 FT. LEFT AND UP TO 120 FT. RIGHT 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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 2 SPANS, 1 @ 35'-6", 1 @ 30'-6" SHALL BE REMOVED. THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 19'-0" WITH TIMBER DECK ON STEEL I BEAMS. ABUTMENT 2 CONSISTS OF A CONCRETE ABUTMENT. END BENT 1 AND INTERIOR BENT 1 CONSIST OF STEEL PILE CAP ON STEEL H PILES. THE EXISTING STRUCTURE IS LOCATED DOWNSTREAM FROM THE PROPOSED STRUCTURE. THE EXISTING BRIDGE IS PRESENTLY NOT 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.

REMOVE THE TWO EXISTING END BENTS IN ENTIRETY. REMOVE HISTORICAL CONCRETE ABUTMENT IN ENTIRETY.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE 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.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 14+65.00 -L-".

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	3'-0" DIA. DRILLED PIER IN SOIL	3'-0" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINF. STEEL	SPIRAL COLUMN REINF. STEEL	PILE DRIVING EQUIP. 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 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
														NO.	LF						EA	LF
SUPERSTRUCTURE	LS	LS	LF	LF	LF	EA	EA	LS	CY	LS	LB	LB	EA	NO.	LF	EA	LF	TON	SY	LS	NO.	LF
END BENT 1								LS	23.8		3,342		5	5	115	5	240.00	200	225	LS	20	1200.00
BENT 1			42.0	27.0	42.0	1	1		17.1		10,046	1,661										
END BENT 2								LS	23.8		3,342		5	5	90	5		190	210			
TOTAL	LS	LS	42.0	27.0	42.0	1	1	LS	64.7	LS	16,730	1,661	10	10	205	10	240.00	390	435	LS	20	1200.00

**FOUNDATION NOTES:**

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 400 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 60 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 208 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 199.0 FT AND WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS 208.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE. DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE. DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

STEEL H-PILES POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENTS 1 AND 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

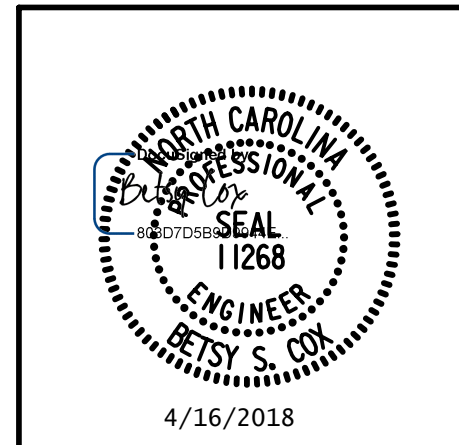
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON SR 1203  
 (GREEN HILL RD)  
 OVER MIDDLE CREEK  
 BETWEEN NC 56 AND SR 1201  
 27'-10" CLEAR ROADWAY - 90° SKEW

PLANS PREPARED BY:  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			21

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

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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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	<b>1</b>	2.58	--	1.75	0.28	4.17	A	EL	16.75	0.576	<b>2.58</b>	A	EL	<b>6.7</b>	0.80	0.28	5.43	A	EL	16.75		
	HL-93(Opr)	N/A		3.38	--	1.35	0.28	5.41	A	EL	16.75	0.576	3.38	A	EL	6.7	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	<b>2</b>	2.95	106.2	1.75	0.28	5.52	A	EL	13.4	0.576	<b>2.95</b>	A	EL	<b>6.7</b>	0.80	0.28	7.20	A	EL	13.4		
	HS-20(Opr)	36.000		3.86	139.0	1.35	0.28	7.16	A	EL	13.4	0.576	3.86	A	EL	6.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500		7.36	99.4	1.40	0.28	11.91	A	EL	16.75	0.576	7.36	A	EL	6.7	0.80	0.28	9.91	A	EL	16.75	
		SNGARBS2	20.000		5.68	113.6	1.40	0.28	10.13	A	EL	13.4	0.576	5.68	A	EL	6.7	0.80	0.28	8.45	A	EL	13.4	
		SNAGRIS2	22.000		5.48	120.6	1.40	0.28	10.04	A	EL	13.4	0.576	5.48	A	EL	6.7	0.80	0.28	8.38	A	EL	13.4	
		SNCOTTS3	27.250		3.64	99.2	1.40	0.28	5.96	A	EL	16.75	0.576	3.64	A	EL	6.7	0.80	0.28	4.96	A	EL	16.75	
		SNAGGRS4	34.925		3.32	116.0	1.40	0.28	5.53	A	EL	16.75	0.576	3.32	A	EL	6.7	0.80	0.28	4.61	A	EL	16.75	
		SNS5A	35.550		3.52	125.1	1.40	0.28	5.37	A	EL	16.75	0.576	3.52	A	EL	6.7	0.80	0.28	4.47	A	EL	16.75	
		SNS6A	39.950		3.35	133.8	1.40	0.28	5.18	A	EL	16.75	0.576	3.35	A	EL	6.7	0.80	0.28	4.31	A	EL	16.75	
	SNS7B	42.000		3.42	143.6	1.40	0.28	4.95	A	EL	16.75	0.576	3.42	A	EL	6.7	0.80	0.28	4.12	A	EL	16.75		
	TTST	TNAGRIT3	33.000		4.02	132.7	1.40	0.28	6.42	A	EL	16.75	0.576	4.02	A	EL	6.7	0.80	0.28	5.34	A	EL	16.75	
		TNT4A	33.075		3.72	123.0	1.40	0.28	6.39	A	EL	16.75	0.576	3.72	A	EL	6.7	0.80	0.28	5.32	A	EL	16.75	
		TNT6A	41.600		3.54	147.3	1.40	0.28	5.61	A	EL	16.75	0.576	3.54	A	EL	6.7	0.80	0.28	4.67	A	EL	16.75	
		TNT7A	42.000		3.37	141.5	1.40	0.28	5.80	A	EL	16.75	0.576	3.37	A	EL	6.7	0.80	0.28	4.83	A	EL	16.75	
		TNT7B	42.000		3.34	140.3	1.40	0.28	5.68	A	EL	16.75	0.576	3.34	A	EL	6.7	0.80	0.28	4.73	A	EL	16.75	
		TNAGRIT4	43.000		3.23	138.9	1.40	0.28	5.72	A	EL	13.4	0.576	3.23	A	EL	6.7	0.80	0.28	4.77	A	EL	13.4	
TNAGT5A		45.000		3.44	154.8	1.40	0.28	5.35	A	EL	16.75	0.576	3.44	A	EL	6.7	0.80	0.28	4.45	A	EL	16.75		
TNAGT5B	45.000	<b>3</b>	2.98	134.1	1.40	0.28	5.15	A	EL	16.75	0.576	<b>2.98</b>	A	EL	<b>6.7</b>	0.80	0.28	4.29	A	EL	16.75			

### LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

### NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
 ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.  
 DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\bar{C}$  BEARING.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

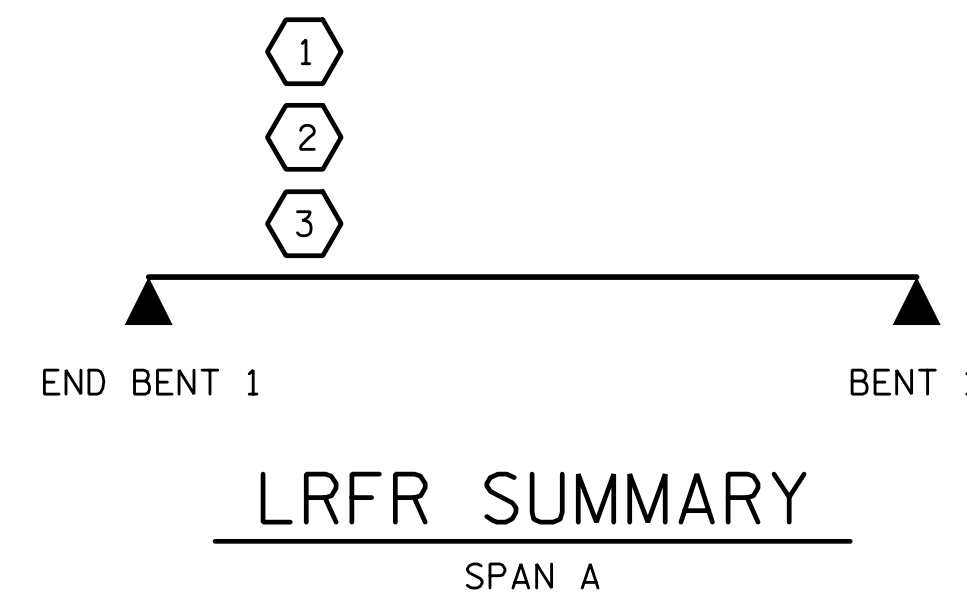
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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

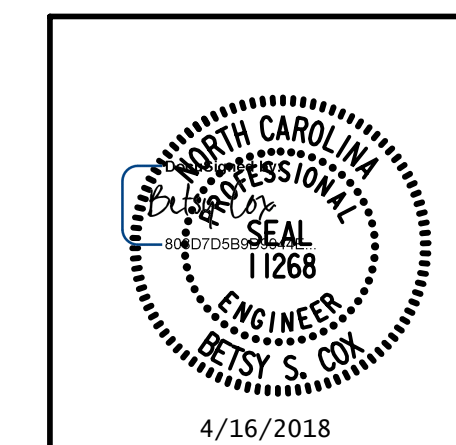


PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

DRAWN BY: T. BANKOVICH DATE: 4-18  
 CHECKED BY: B.S. COX DATE: 4-18  
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

PLANS PREPARED BY:

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 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**LRFR SUMMARY FOR  
 35' BOX BEAM UNITS  
 90° SKEW  
 (NON-INTERSTATE TRAFFIC)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			21

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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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.401	--	1.75	0.273	1.73	B	EL	41.75	0.497	1.54	B	EL	8.35	0.80	0.273	<b>1.40</b>	B	EL	<b>41.75</b>		
	HL-93(Opr)	N/A	--	1.994	--	1.35	0.273	2.25	B	EL	41.75	0.497	1.99	B	EL	8.35	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.882	67.762	1.75	0.273	2.33	B	EL	41.75	0.497	1.99	B	EL	8.35	0.80	0.273	<b>1.88</b>	B	EL	<b>41.75</b>		
	HS-20(Opr)	36.000	--	2.584	93.027	1.35	0.273	3.02	B	EL	41.75	0.497	2.58	B	EL	8.35	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	4.355	58.789	1.4	0.273	6.74	B	EL	41.75	0.497	6.03	B	EL	8.35	0.80	0.273	4.35	B	EL	41.75	
		SNGARBS2	20.000	--	3.199	63.989	1.4	0.273	4.95	B	EL	41.75	0.497	4.26	B	EL	8.35	0.80	0.273	3.20	B	EL	41.75	
		SNAGRIS2	22.000	--	3.011	66.245	1.4	0.273	4.66	B	EL	41.75	0.497	3.94	B	EL	8.35	0.80	0.273	3.01	B	EL	41.75	
		SNCOTTS3	27.250	--	2.166	59.016	1.4	0.273	3.35	B	EL	41.75	0.497	3.01	B	EL	8.35	0.80	0.273	2.17	B	EL	41.75	
		SNAGGRS4	34.925	--	1.792	62.595	1.4	0.273	2.77	B	EL	41.75	0.497	2.47	B	EL	8.35	0.80	0.273	1.79	B	EL	41.75	
		SNS5A	35.550	--	1.754	62.349	1.4	0.273	2.71	B	EL	41.75	0.497	2.49	B	EL	8.35	0.80	0.273	1.75	B	EL	41.75	
		SNS6A	39.950	--	1.602	63.995	1.4	0.273	2.48	B	EL	41.75	0.497	2.27	B	EL	8.35	0.80	0.273	1.60	B	EL	41.75	
	SNS7B	42.000	--	1.525	64.059	1.4	0.273	2.36	B	EL	41.75	0.497	2.22	B	EL	8.35	0.80	0.273	1.53	B	EL	41.75		
	TTST	TNAGRIT3	33.000	--	1.951	64.392	1.4	0.273	3.02	B	EL	41.75	0.497	2.7	B	EL	8.35	0.80	0.273	1.95	B	EL	41.75	
		TNT4A	33.075	--	1.958	64.758	1.4	0.273	3.03	B	EL	41.75	0.497	2.64	B	EL	8.35	0.80	0.273	1.96	B	EL	41.75	
		TNT6A	41.600	--	1.594	66.309	1.4	0.273	2.47	B	EL	41.75	0.497	2.34	B	EL	8.35	0.80	0.273	1.59	B	EL	41.75	
		TNT7A	42.000	--	1.598	67.128	1.4	0.273	2.47	B	EL	41.75	0.497	2.3	B	EL	8.35	0.80	0.273	1.60	B	EL	41.75	
		TNT7B	42.000	--	1.645	69.07	1.4	0.273	2.54	B	EL	41.75	0.497	2.17	B	EL	8.35	0.80	0.273	1.64	B	EL	41.75	
		TNAGRIT4	43.000	--	1.571	67.556	1.4	0.273	2.43	B	EL	41.75	0.497	2.11	B	EL	8.35	0.80	0.273	1.57	B	EL	41.75	
TNAGT5A		45.000	--	1.484	66.8	1.4	0.273	2.3	B	EL	41.75	0.497	2.08	B	EL	8.35	0.80	0.273	1.48	B	EL	41.75		
TNAGT5B	45.000	3	1.469	66.118	1.4	0.273	2.27	B	EL	41.75	0.497	2	B	EL	8.35	0.80	0.273	<b>1.47</b>	B	EL	<b>41.75</b>			

### LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

### NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
 ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.  
 DISTANCE FROM LEFT END IS MEASURED FROM  $\bar{C}$  BEARING.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

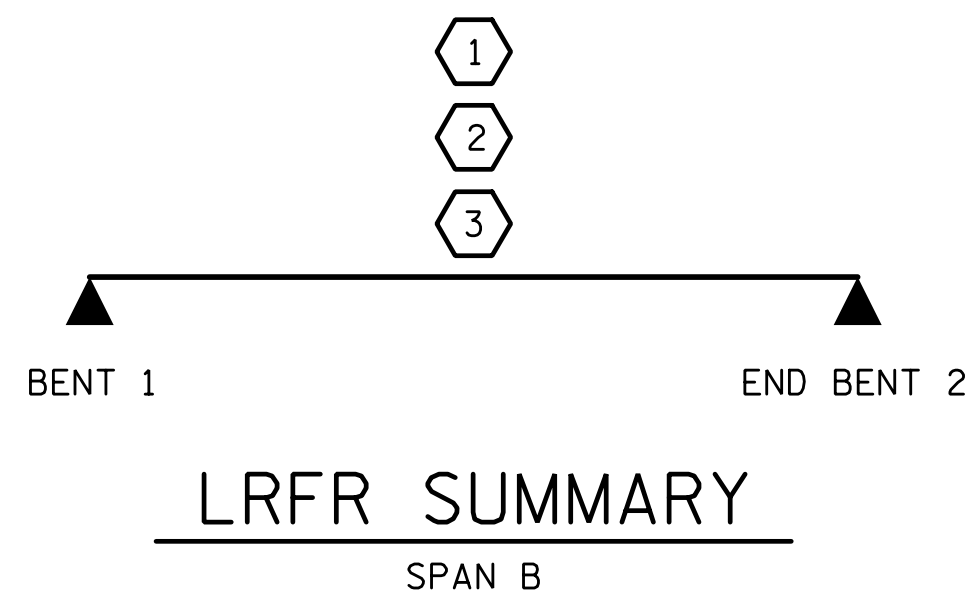
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

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

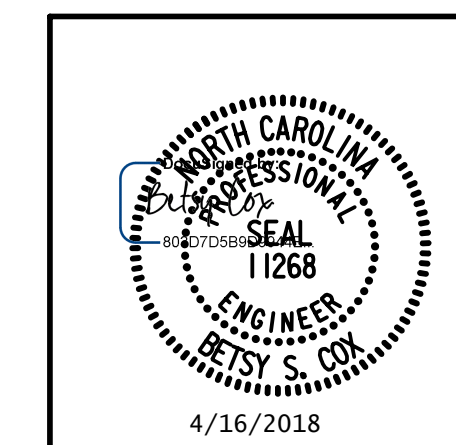


PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

DRAWN BY: T. BANKOVICH DATE: 4-18  
 CHECKED BY: B.S. COX DATE: 4-18  
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

PLANS PREPARED BY:

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

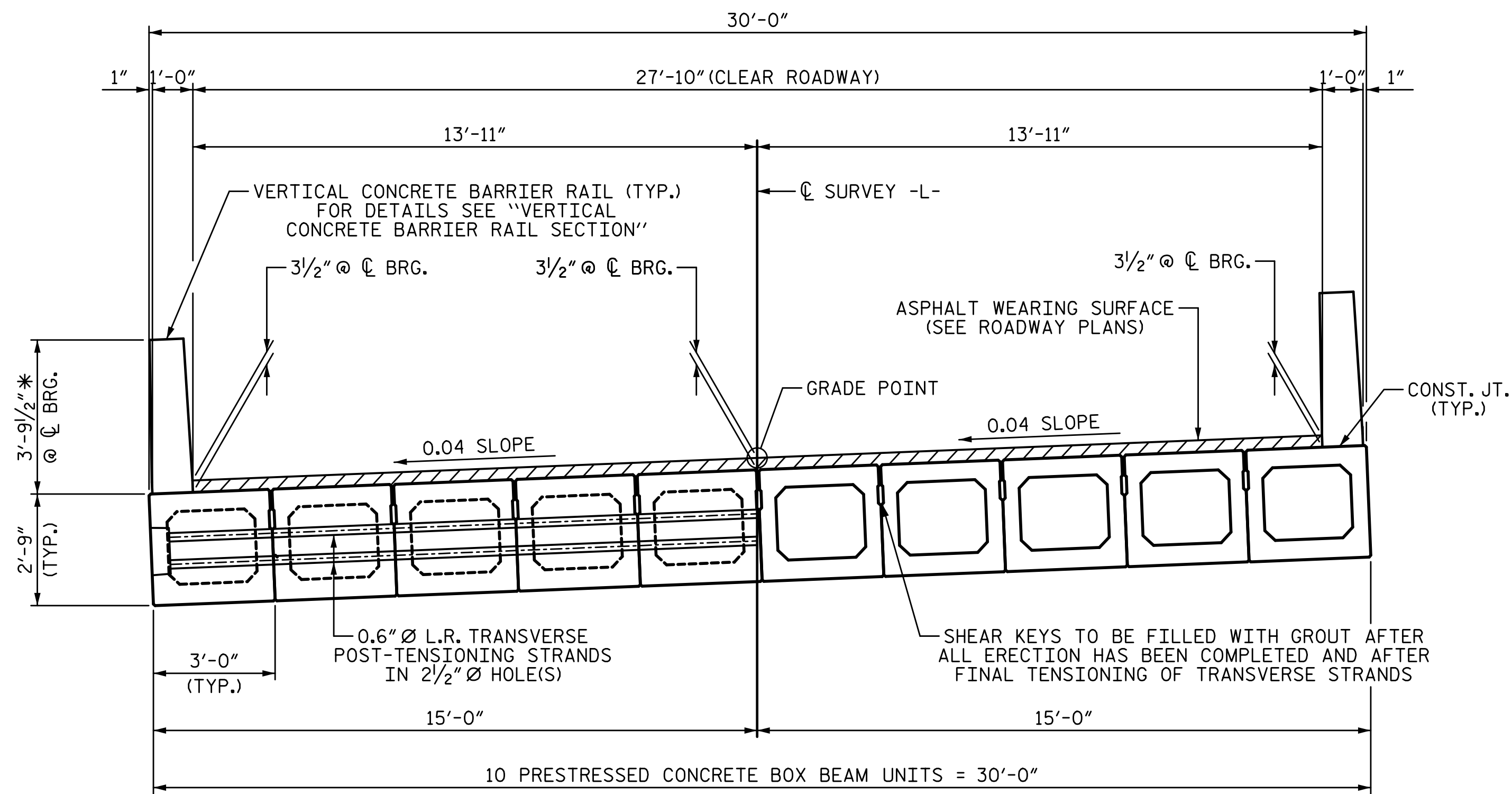
**LRFR SUMMARY FOR  
 85' BOX BEAM UNITS  
 90° SKEW  
 (NON-INTERSTATE TRAFFIC)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			21

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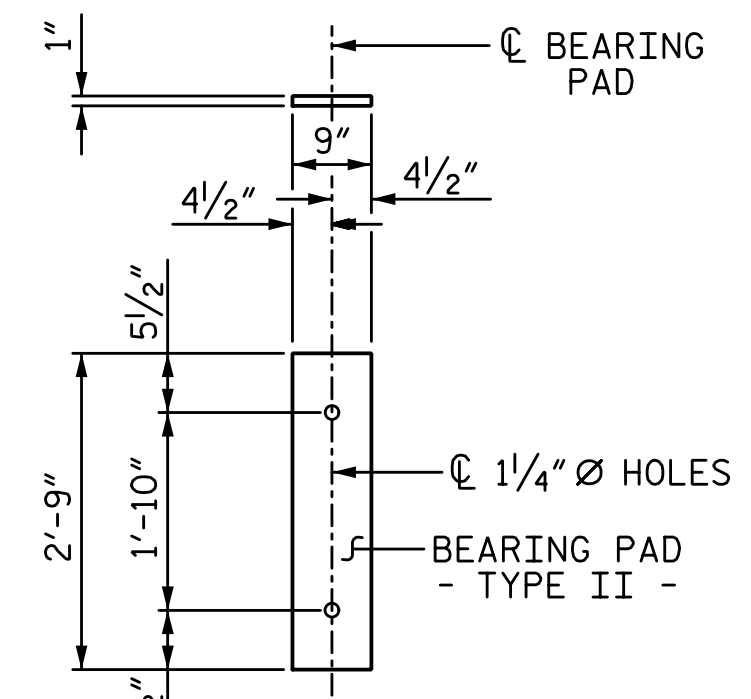


HALF SECTION  
(AT INTERMEDIATE DIAPHRAGMS)

HALF SECTION  
(THROUGH VOIDS)

**TYPICAL SECTION**

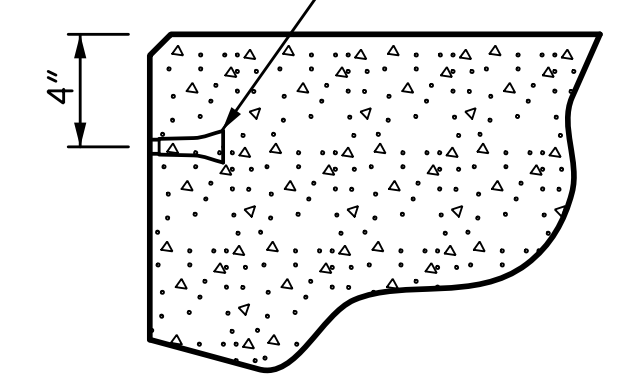
\* - THE MAXIMUM BARRIER RAIL HEIGHTS AND ASPHALT THICKNESS ARE SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



**FIXED END  
ELASTOMERIC BEARING DETAILS**

(TYPE II - 40 REQ'D)  
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

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



**THREADED INSERT DETAIL**

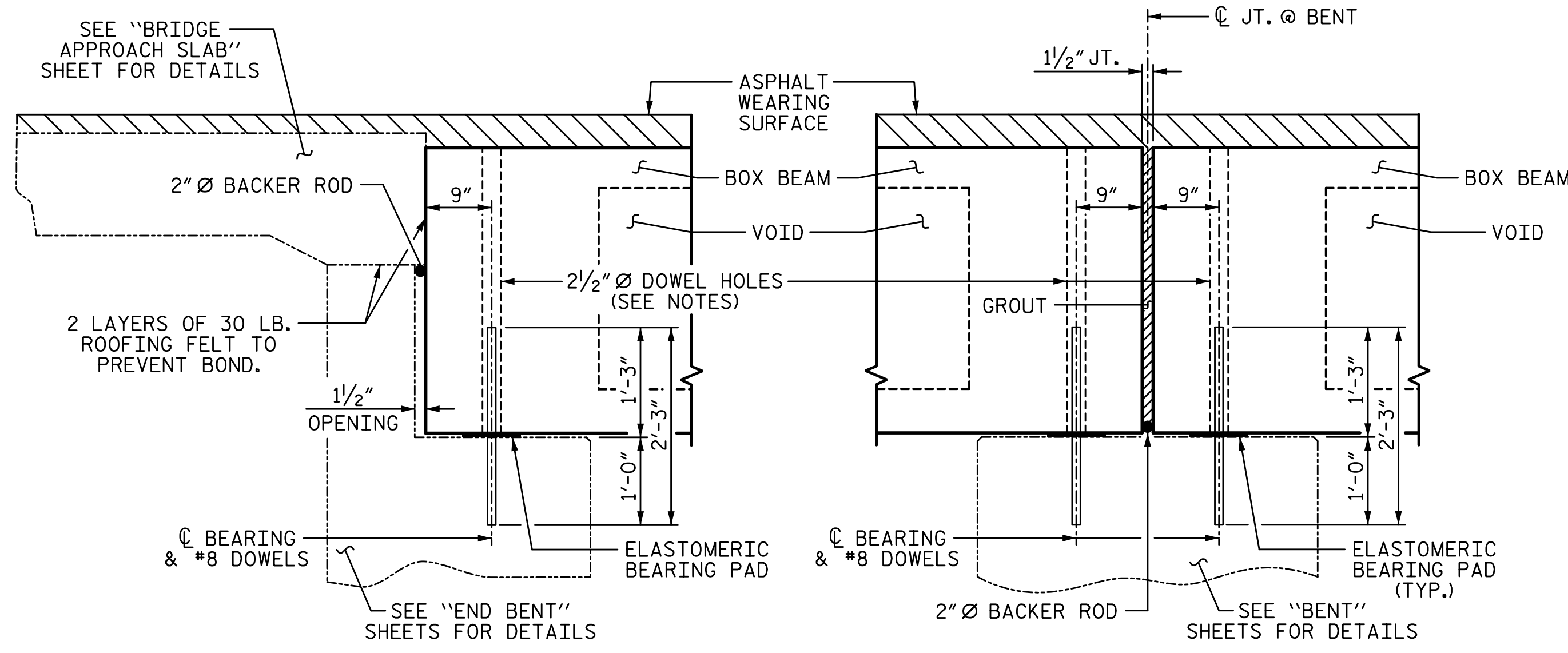
**NOTES:**

- 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 4000 PSI FOR SPAN A AND NOT LESS THAN 6000 PSI FOR SPAN B.
- 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.

FIXED END

FIXED END

FIXED END



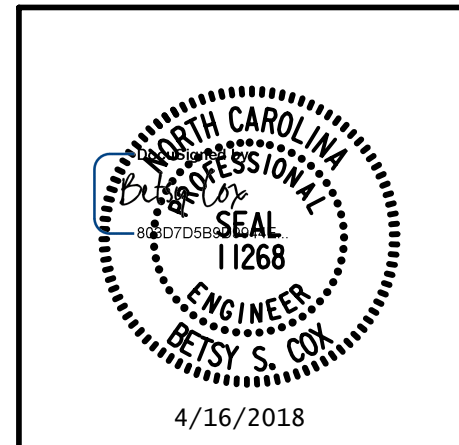
**SECTION AT END BENT**

**SECTION AT BENT 1**

PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
STATION: 14+65.00 -L-

SHEET 1 OF 7

PLANS PREPARED BY:  
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LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT  
90° SKEW

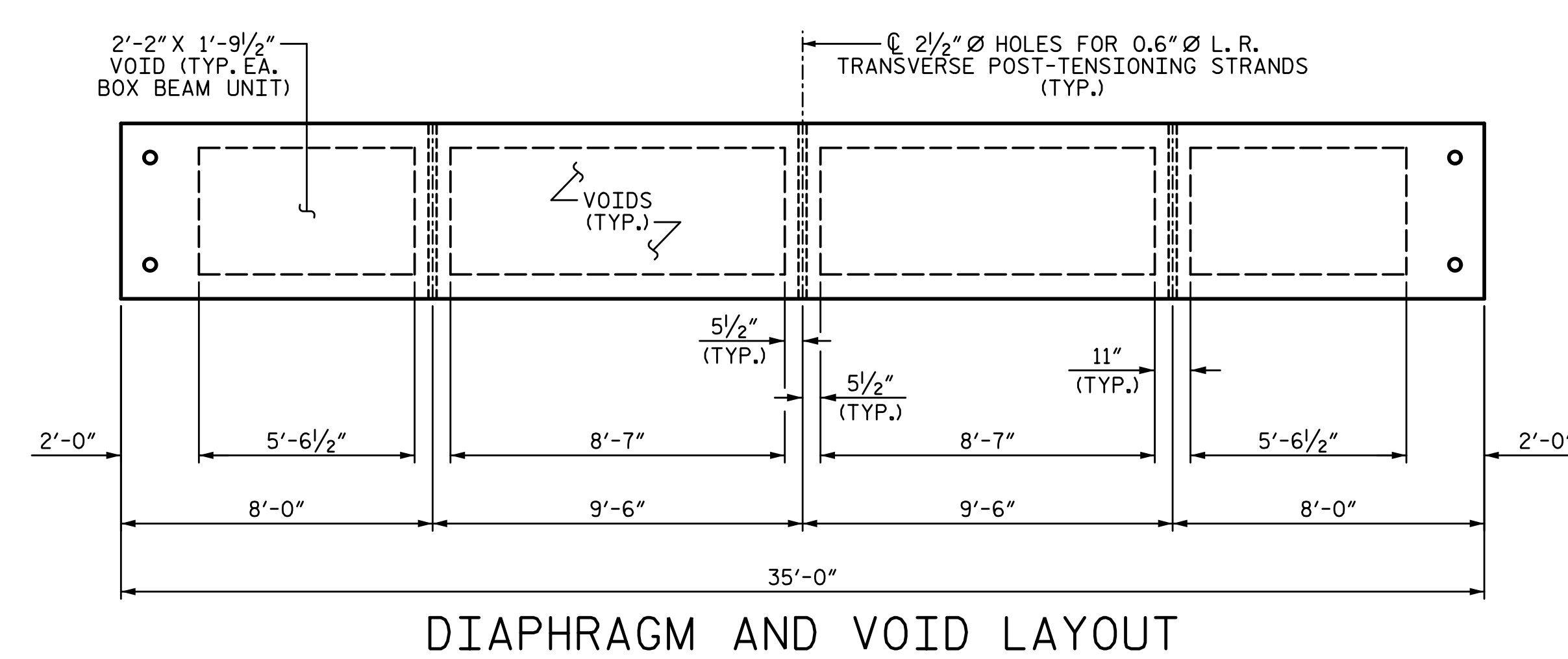
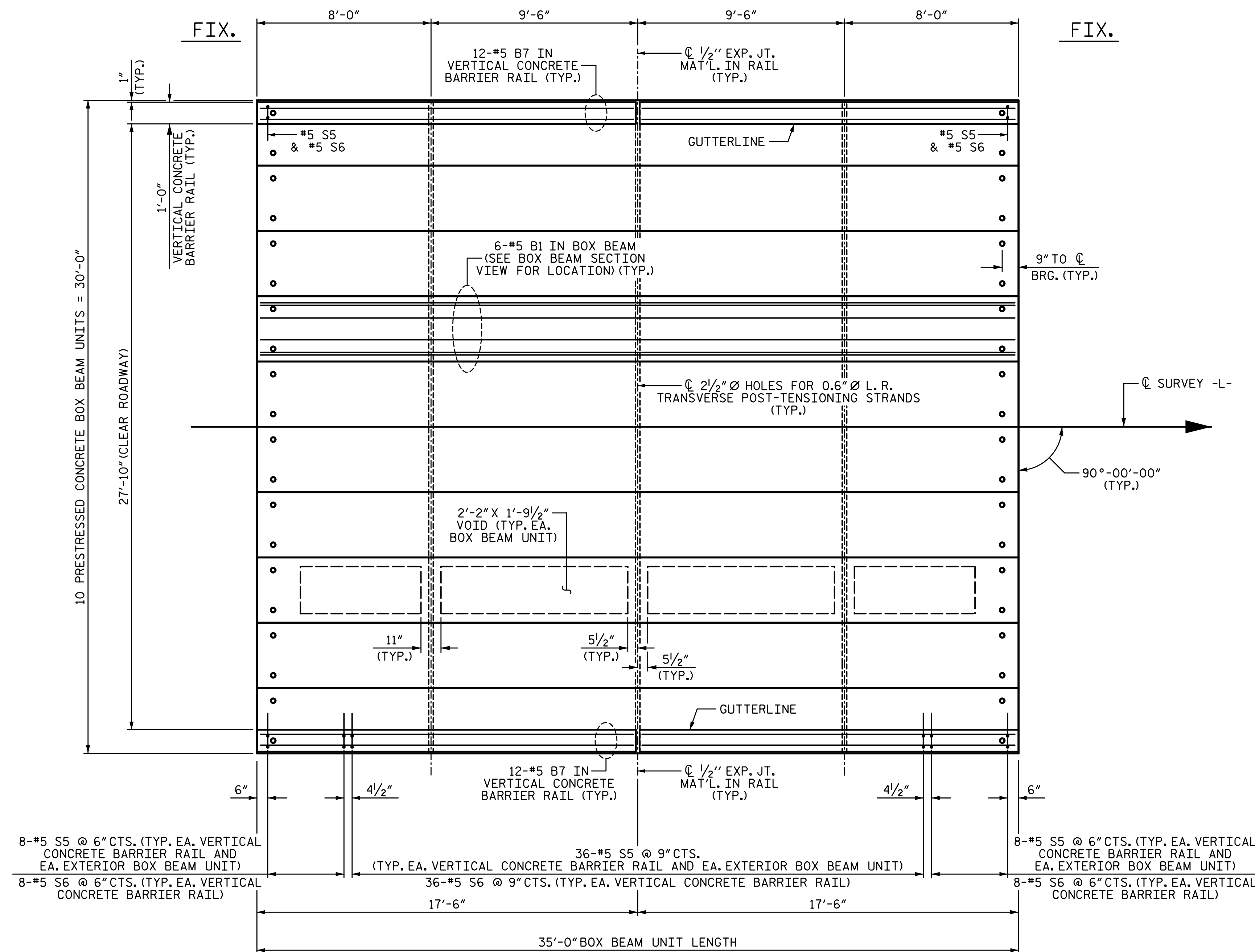
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			21

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CHECKED BY: B.S. COX DATE: 4-18  
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

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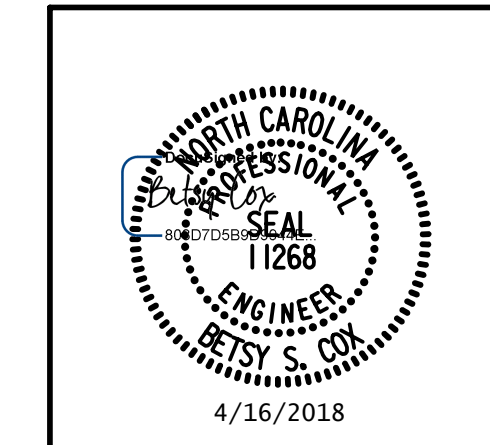
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PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-  
 SHEET 2 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPAN A**  
 (35'-0" UNIT)  
 27'-10" CLEAR ROADWAY  
 90° SKEW

PLANS PREPARED BY:  
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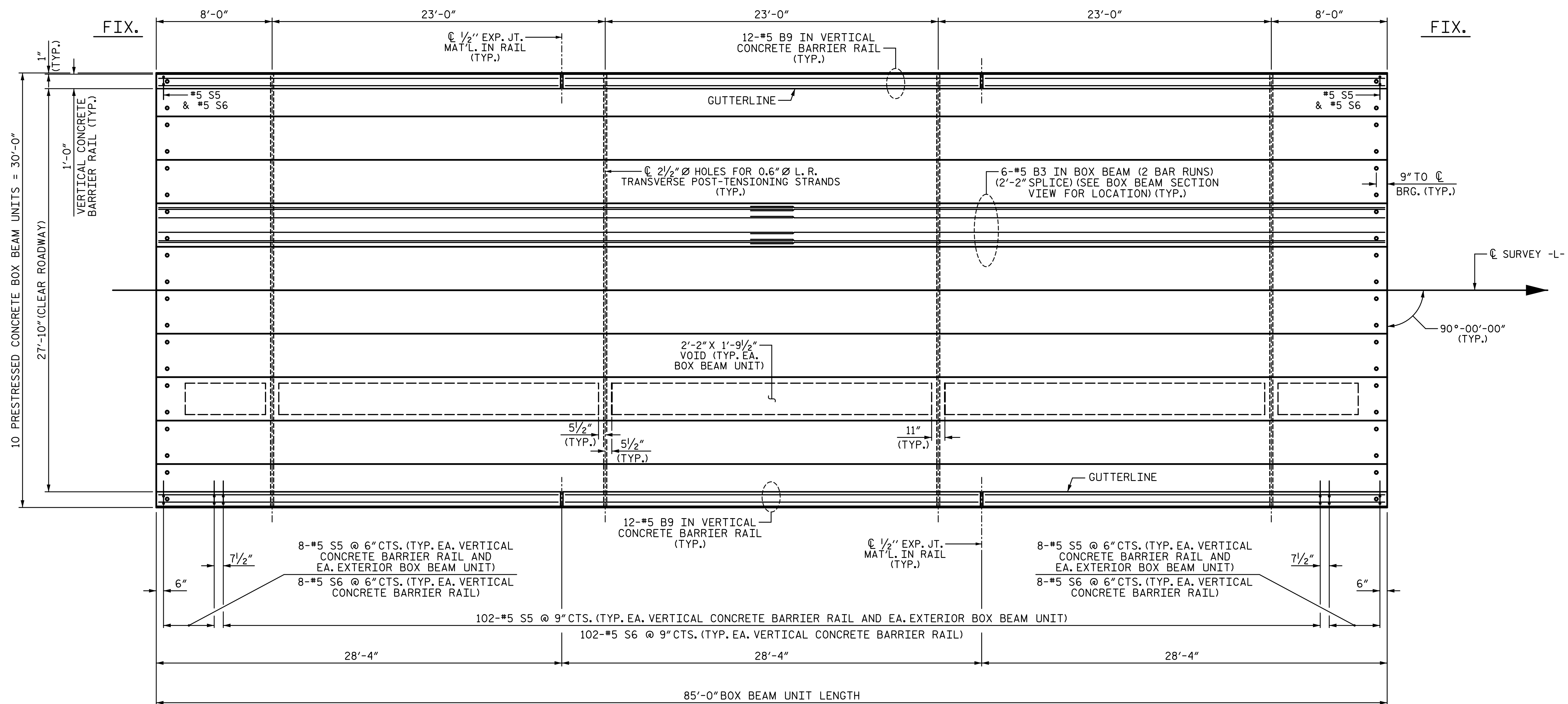


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 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

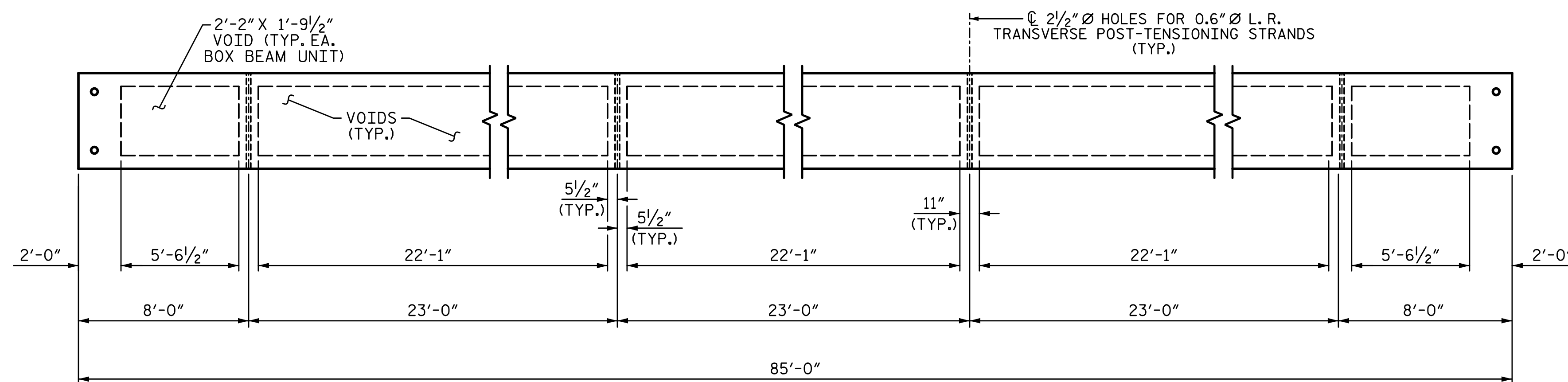
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
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PLAN OF SPAN B



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN B  
 (85'-0" UNIT)  
 27'-10" CLEAR ROADWAY  
 90° SKEW

PLANS PREPARED BY:

**S&A**  
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 & ASSOCIATES  
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REVISIONS

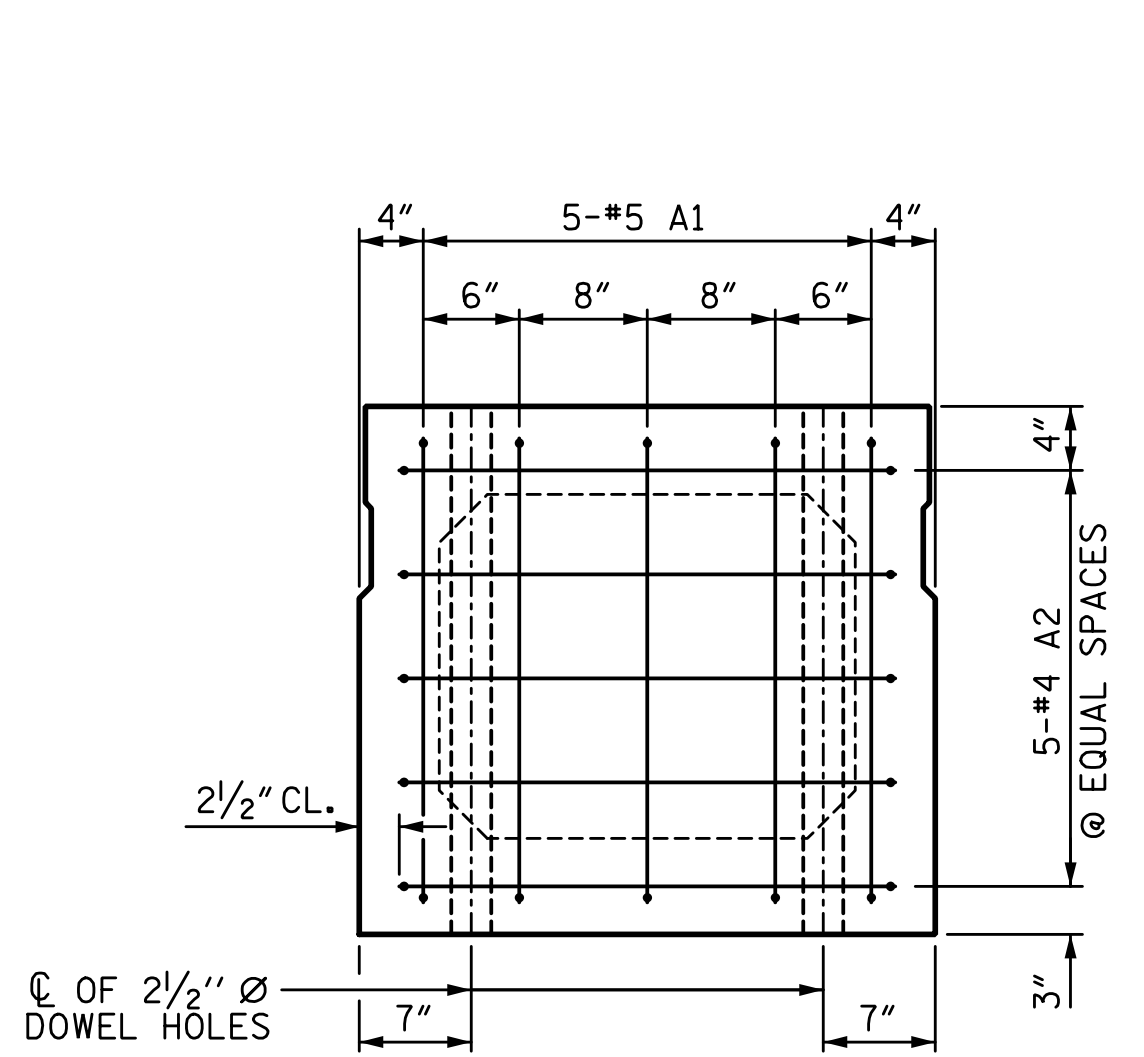
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-7
2			4			TOTAL SHEETS 21

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 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

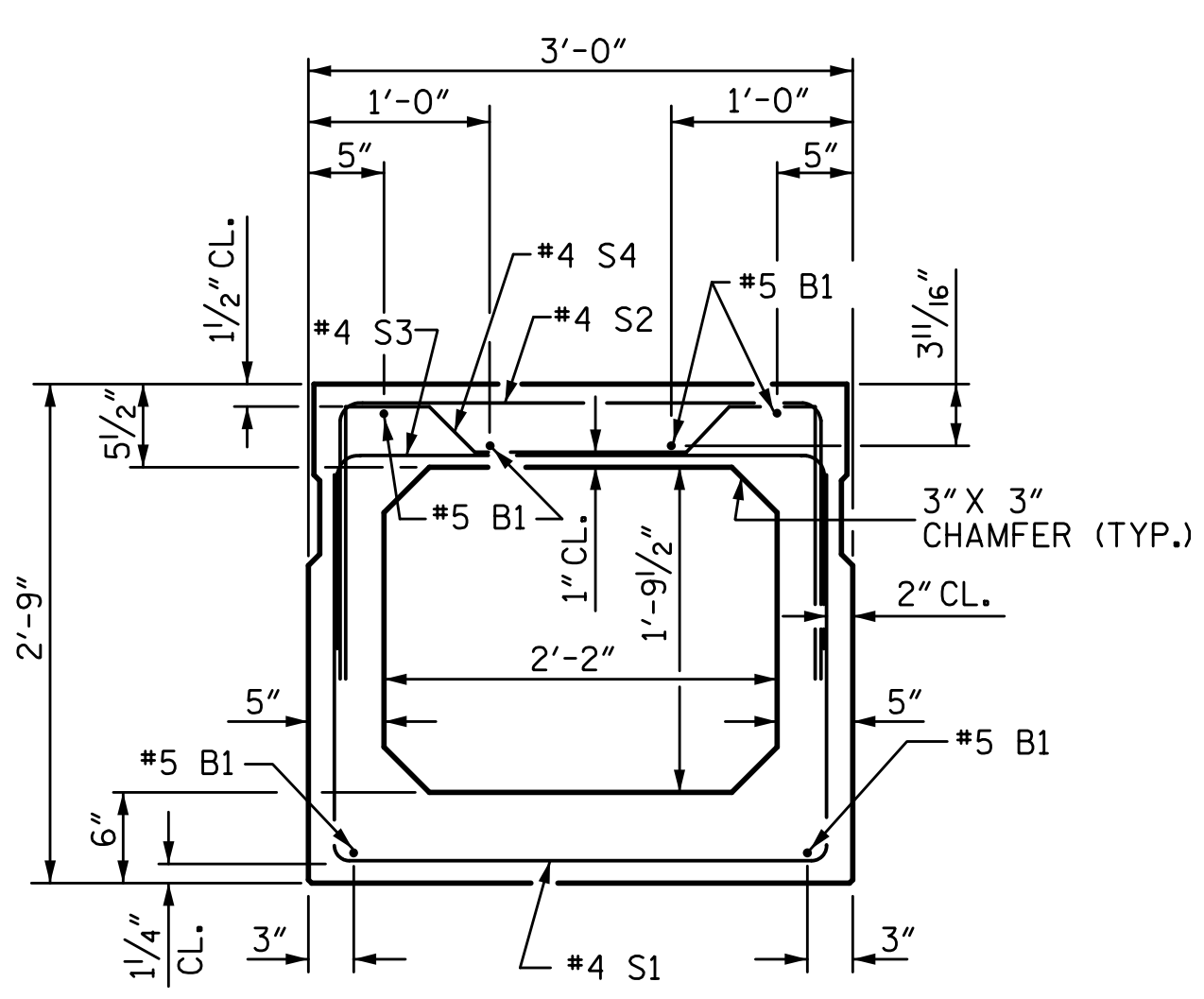
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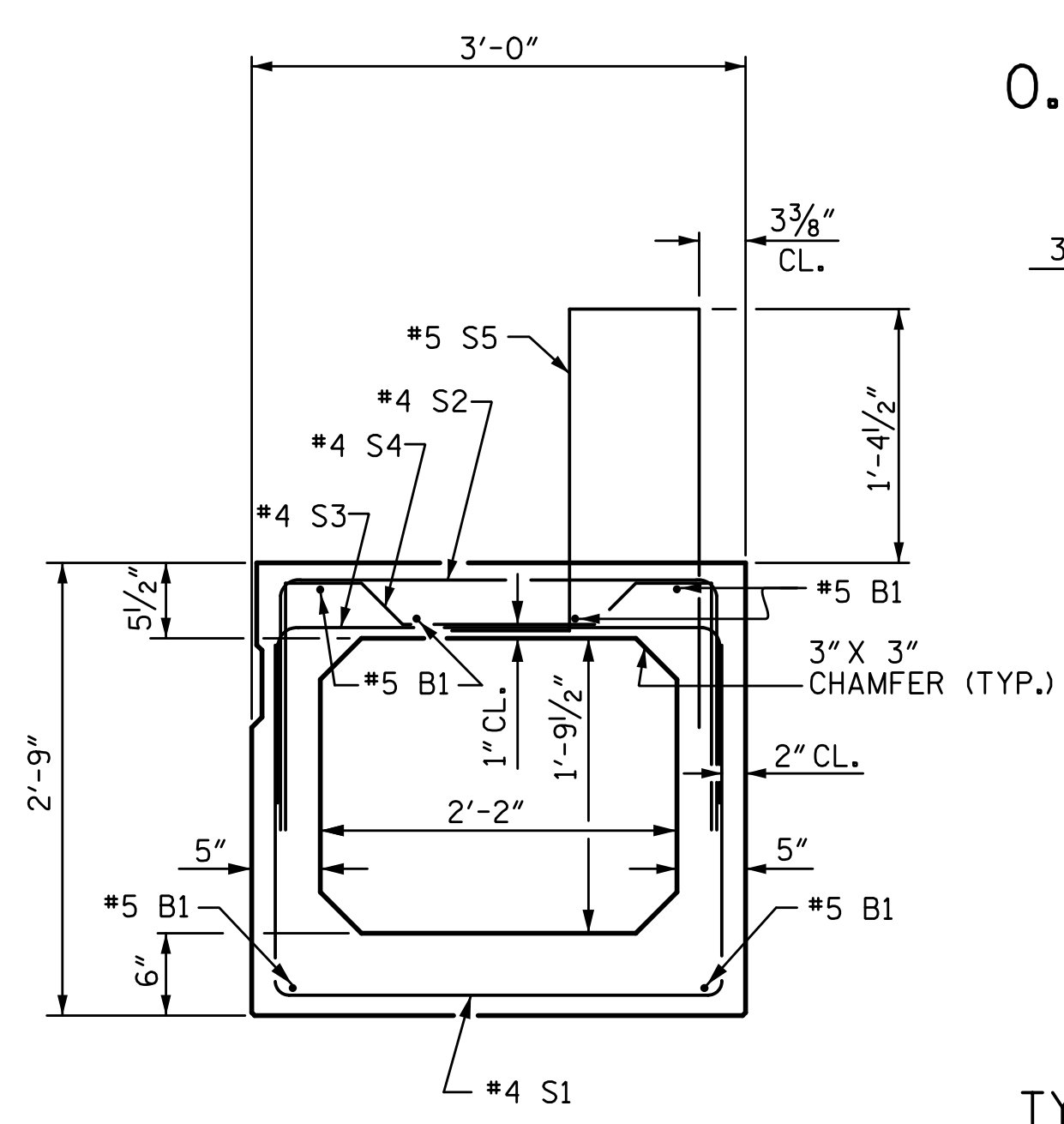
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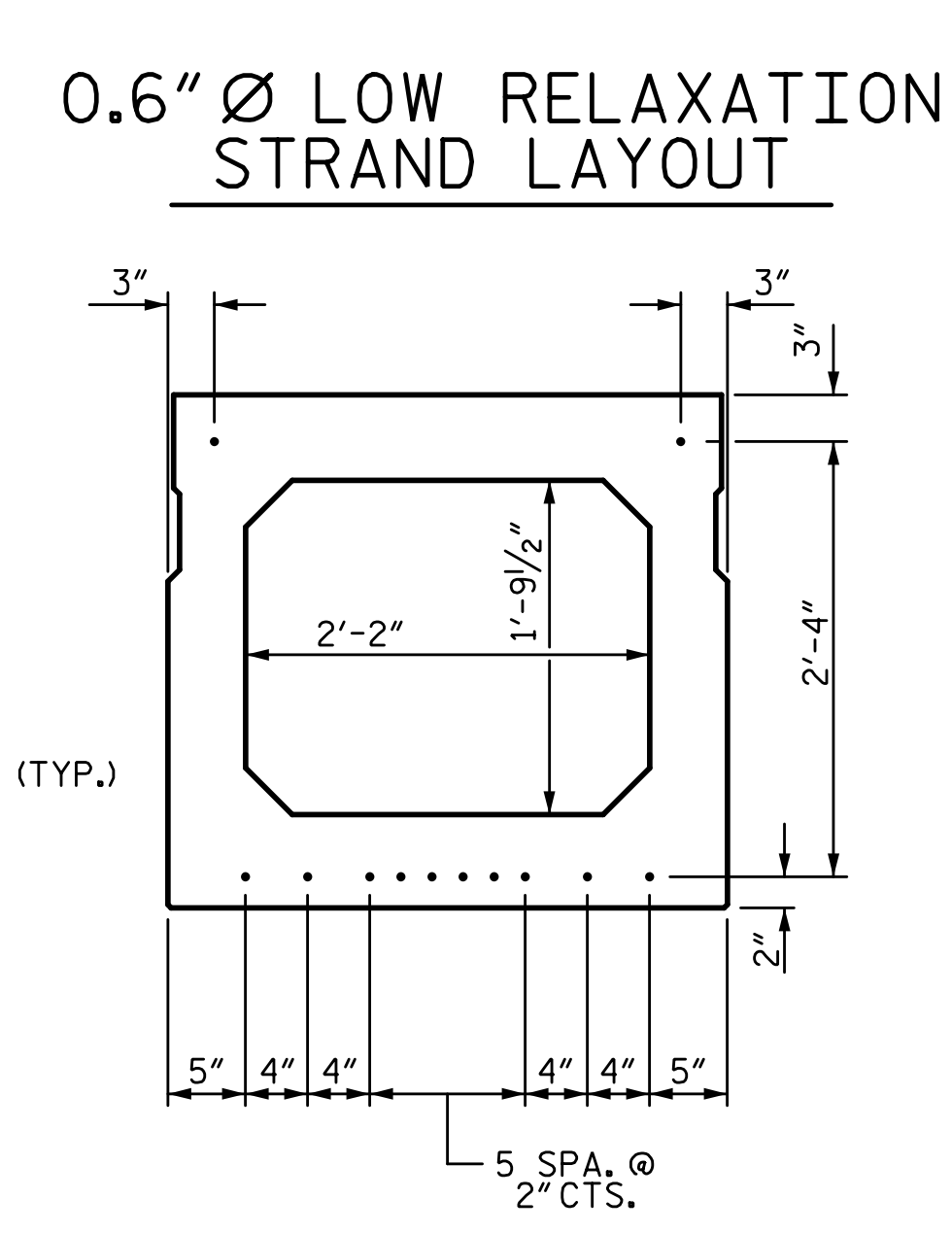
**END ELEVATION**  
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



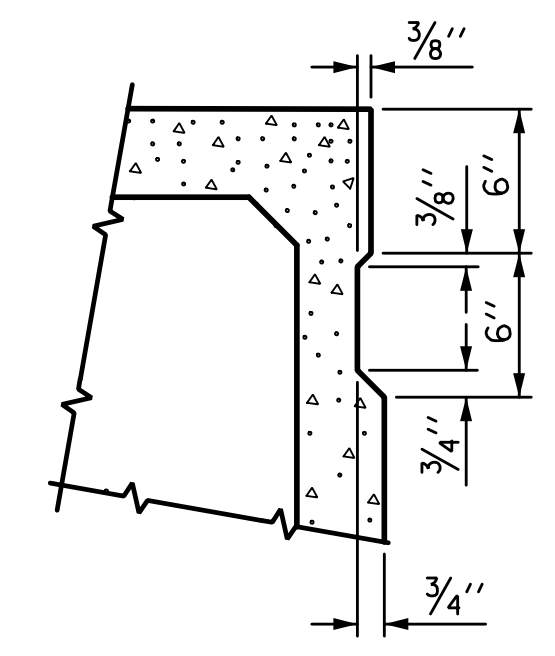
**INTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)



**EXTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)



**0.6" Ø LOW RELAXATION STRAND LAYOUT**  
**TYPICAL STAND LOCATION**  
(12 STRANDS REQUIRED)  
**DEBONDING LEGEND**  
● FULLY BONDED STRAND



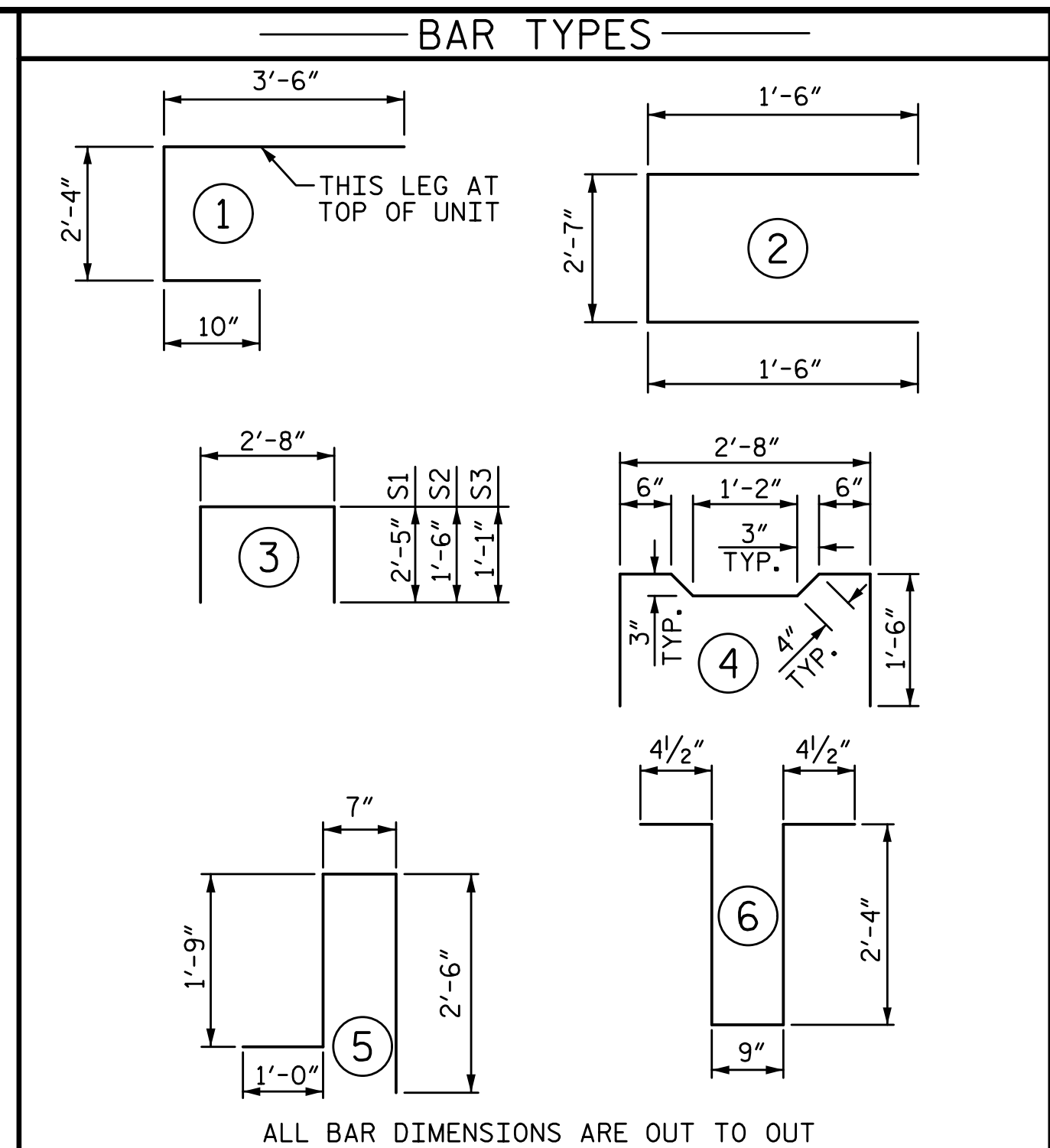
**SHEAR KEY DETAIL**  
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	35'-0"	70'-0"
INTERIOR B.B.	8	35'-0"	280'-0"
TOTAL	10		350'-0"

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

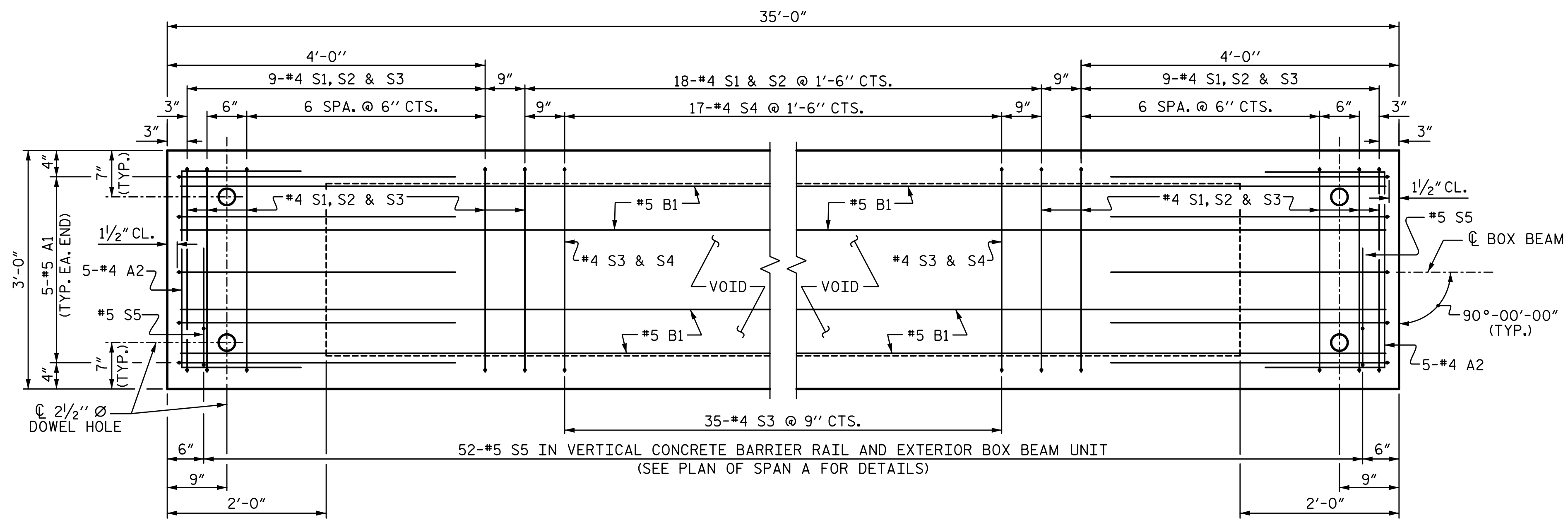
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
35' BOX BEAM UNIT	0.6" Ø L.R. STRAND
CAMBER ( SLAB ALONE IN PLACE )	1/16" ↓
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/16" ↓
FINAL CAMBER	3/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE



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

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	28	#4	2	5'-7"	104	5'-7"	104
B1	6	#5	STR	34'-8"	217	34'-8"	217
K1	9	#4	6	6'-2"	37	6'-2"	37
K2	6	#4	STR	2'-7"	10	2'-7"	10
S1	36	#4	3	7'-6"	180	7'-6"	180
S2	36	#4	3	5'-8"	136	5'-8"	136
S3	55	#4	3	4'-10"	178	4'-10"	178
S4	17	#4	4	5'-10"	66	5'-10"	66
* S5	52	#5	5	5'-10"	316	--	--
REINFORCING STEEL				998	LB	998	LB
* EPOXY COATED REINF. STEEL				316	LB		
5000 P.S.I. CONCRETE				6.6	CY	6.6	CY
0.6" Ø L.R. STRANDS				No. 12		No. 12	

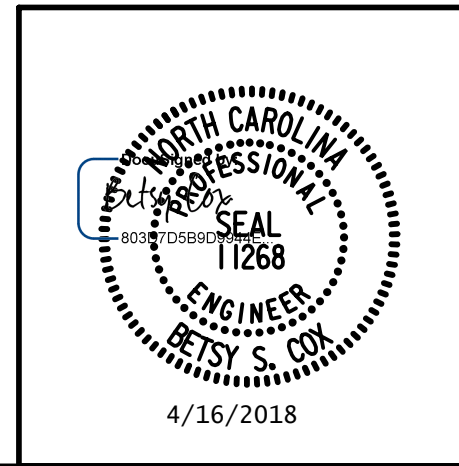


**PLAN OF BOX BEAM**

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

DRAWN BY: T. BANKOVICH	DATE: 4-18
CHECKED BY: B.S. COX	DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX	DATE: 4-18

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PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
STATION: 14+65.00 -L-  
SHEET 4 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT  
90° SKEW

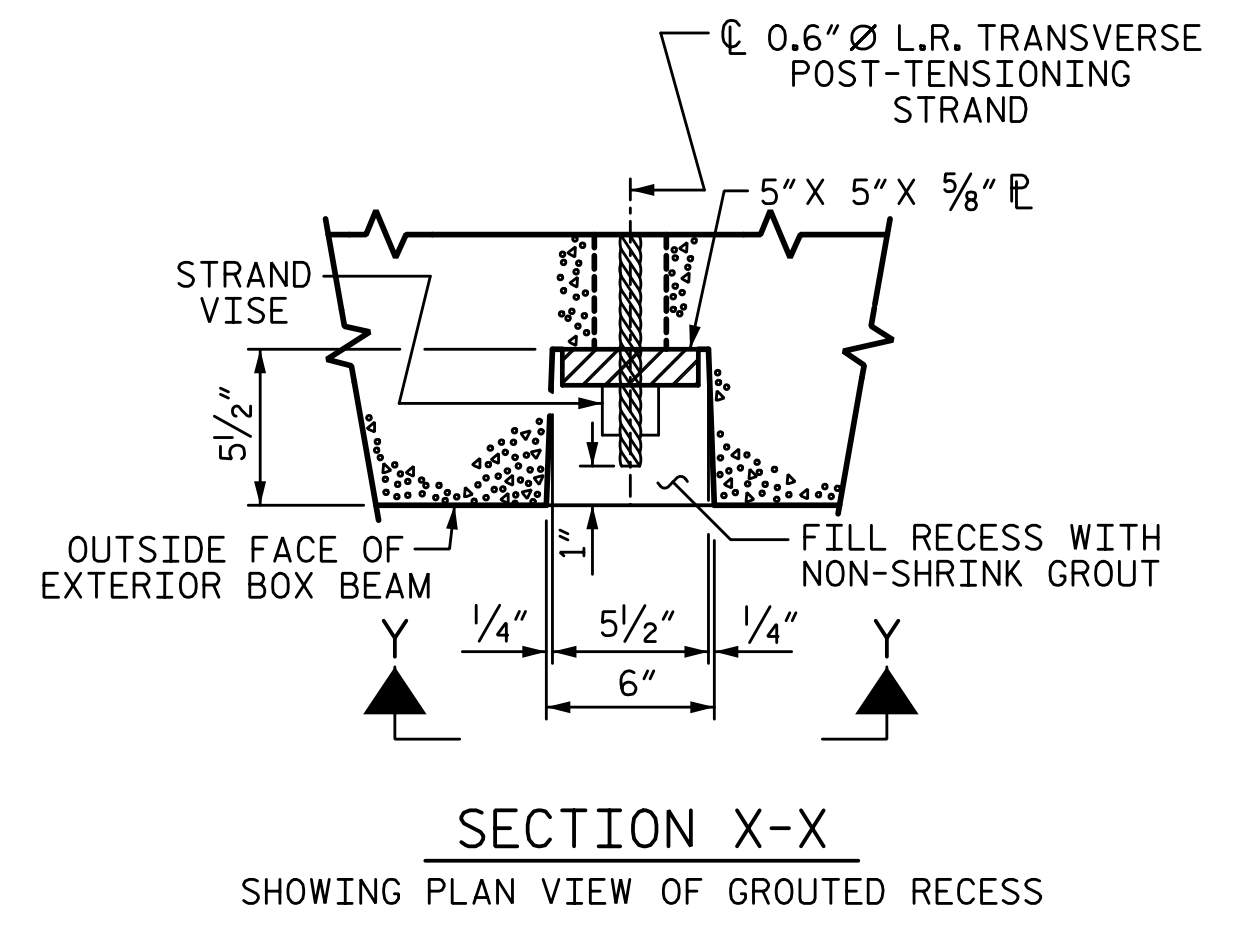
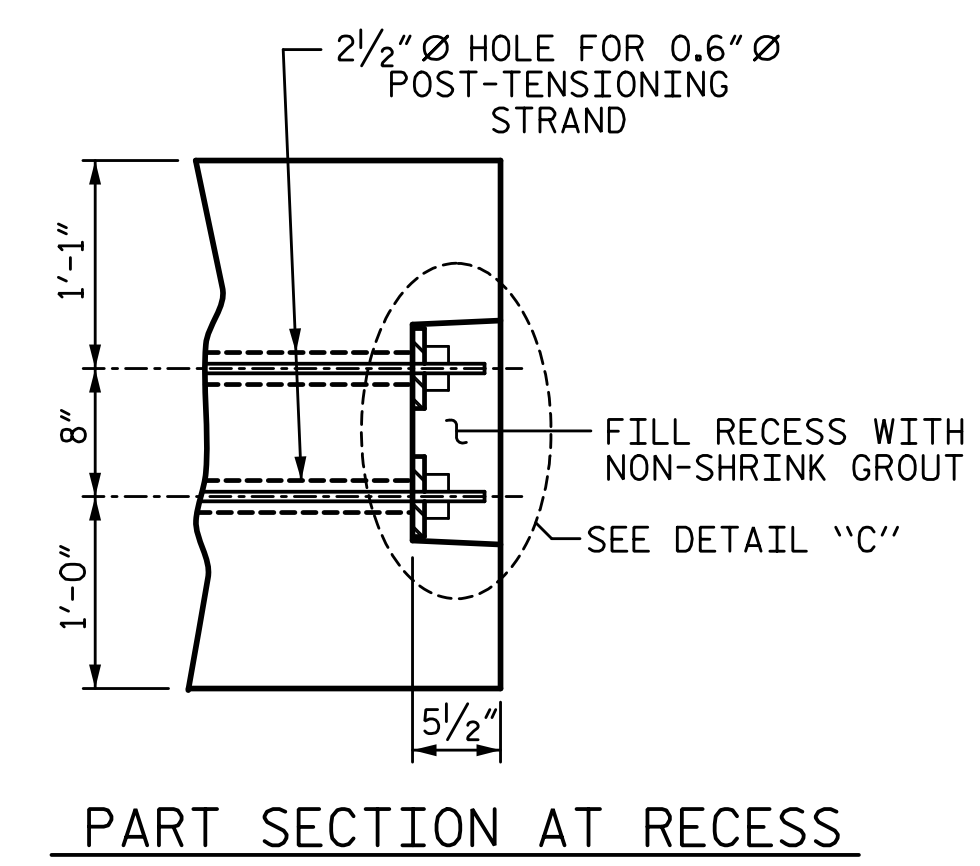
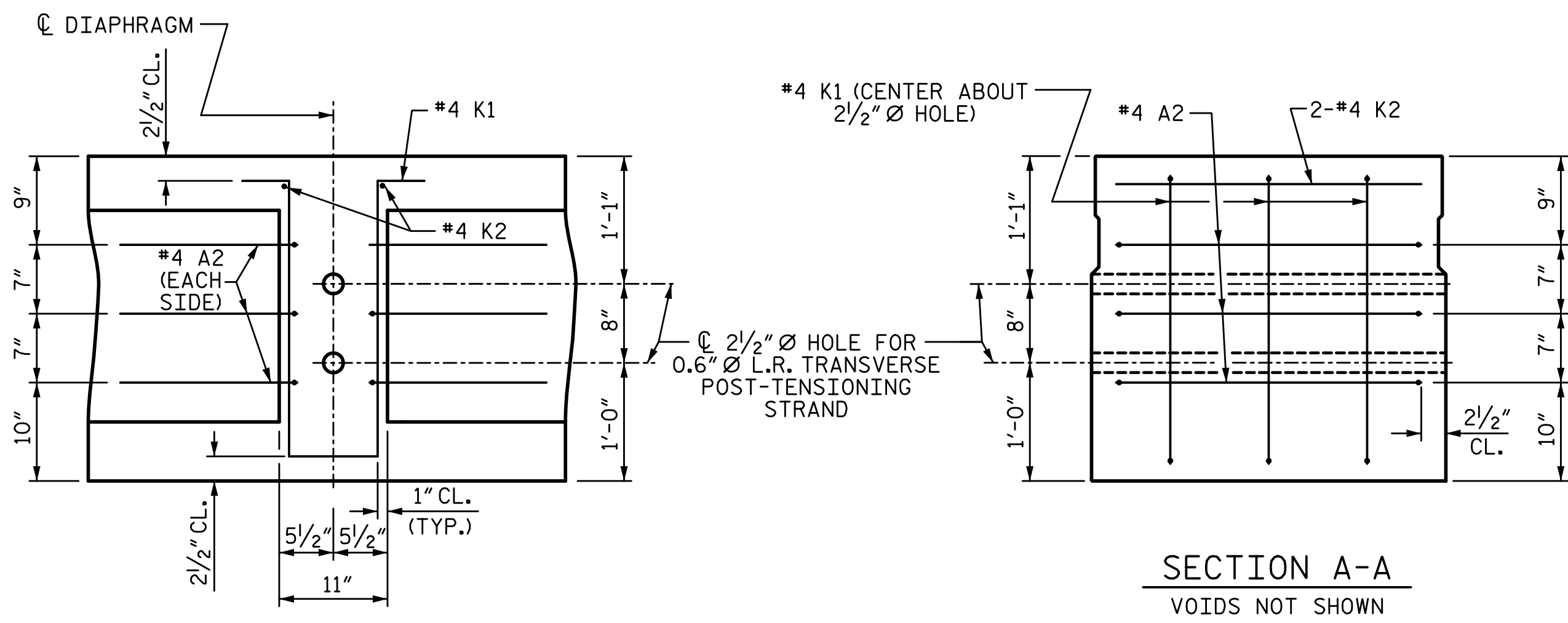
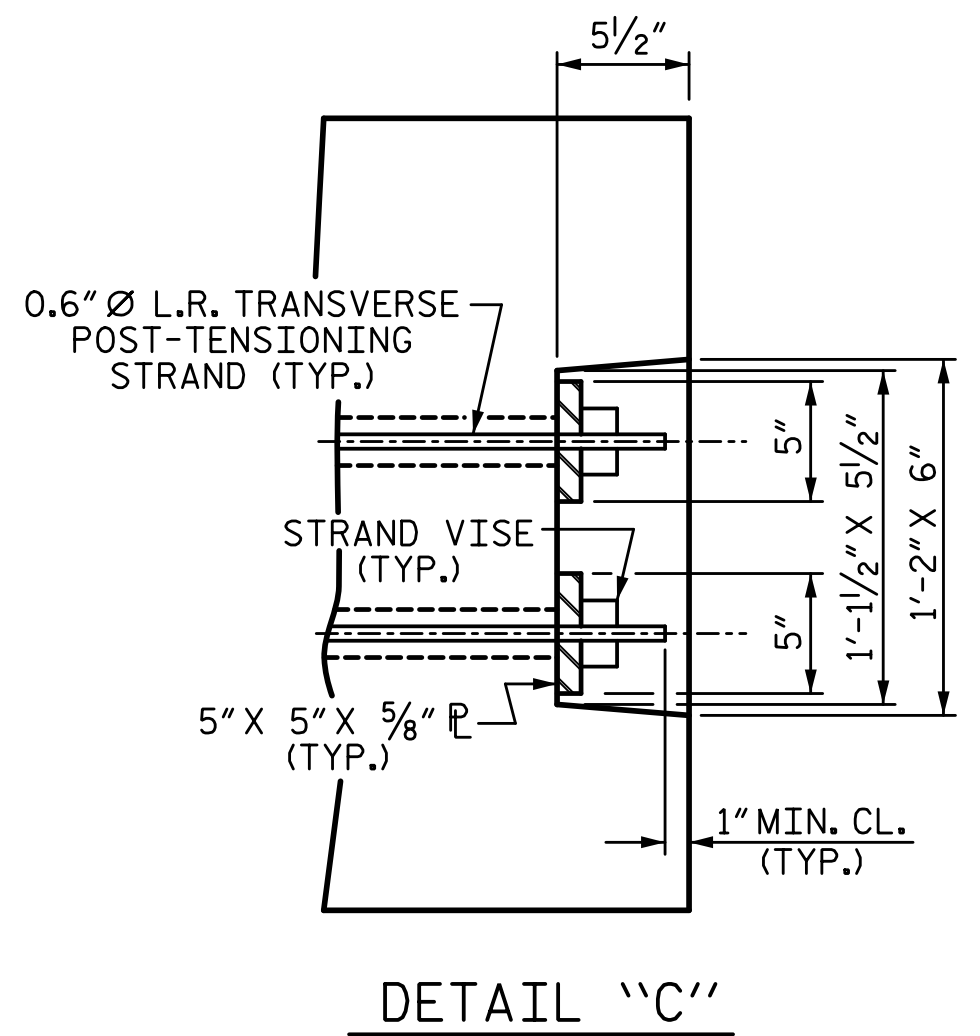
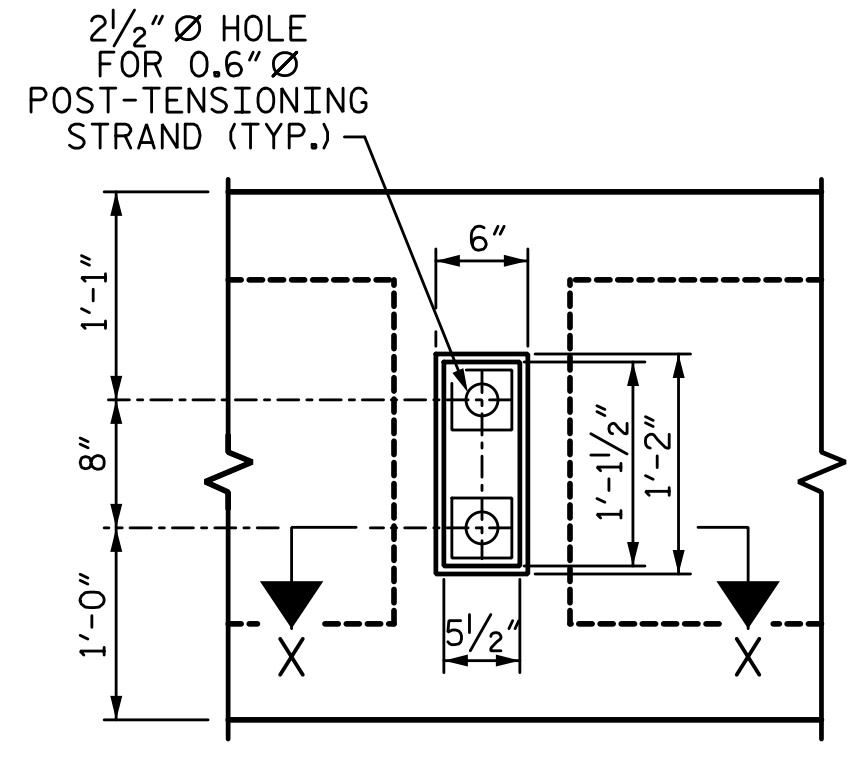
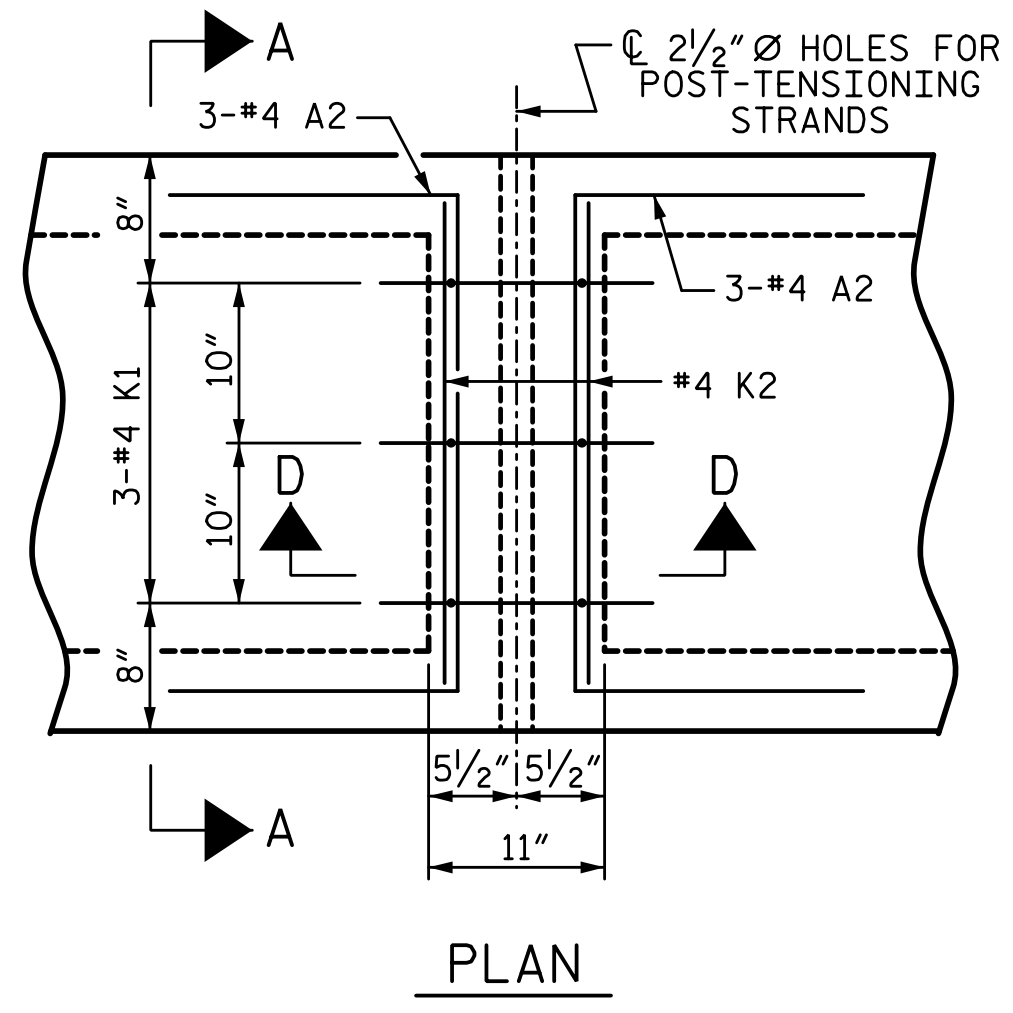
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1			3			TOTAL SHEETS 21
2			4			

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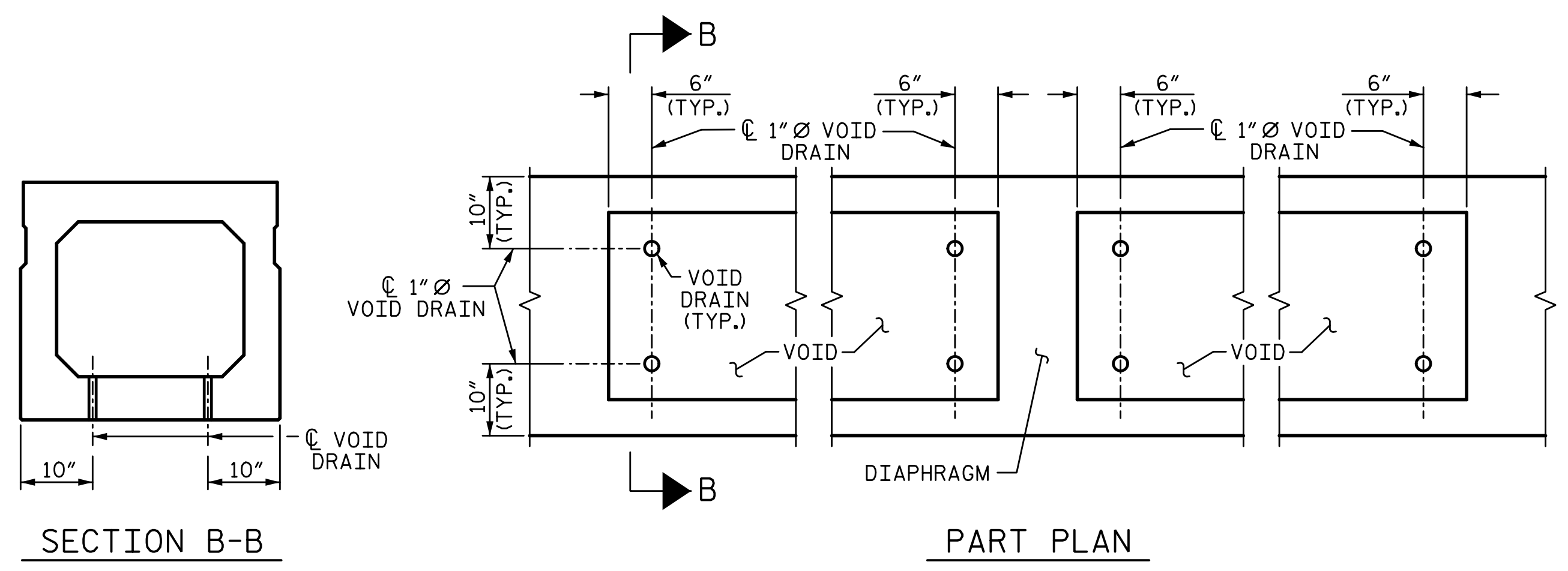
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**DOUBLE DIAPHRAGM DETAILS**

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

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

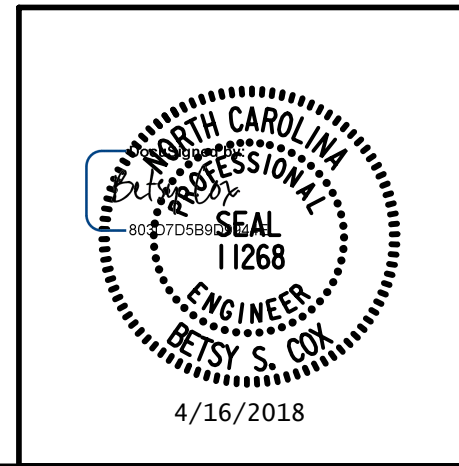


**VOID DRAIN DETAILS**  
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

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SHEET 6 OF 7

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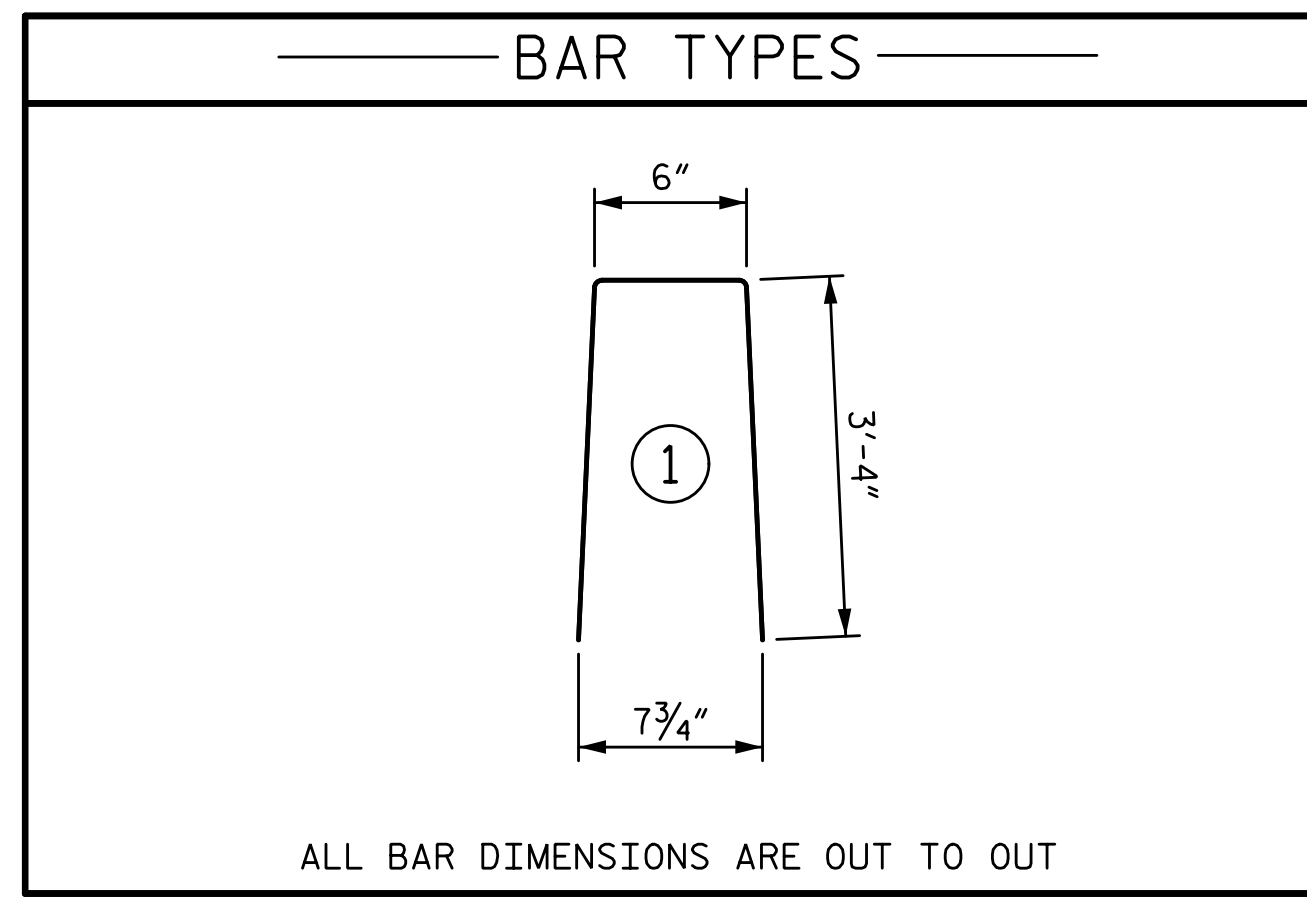
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
3'-0" X 2'-9"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT  
90° SKEW

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1			3			TOTAL SHEETS
2			4			21

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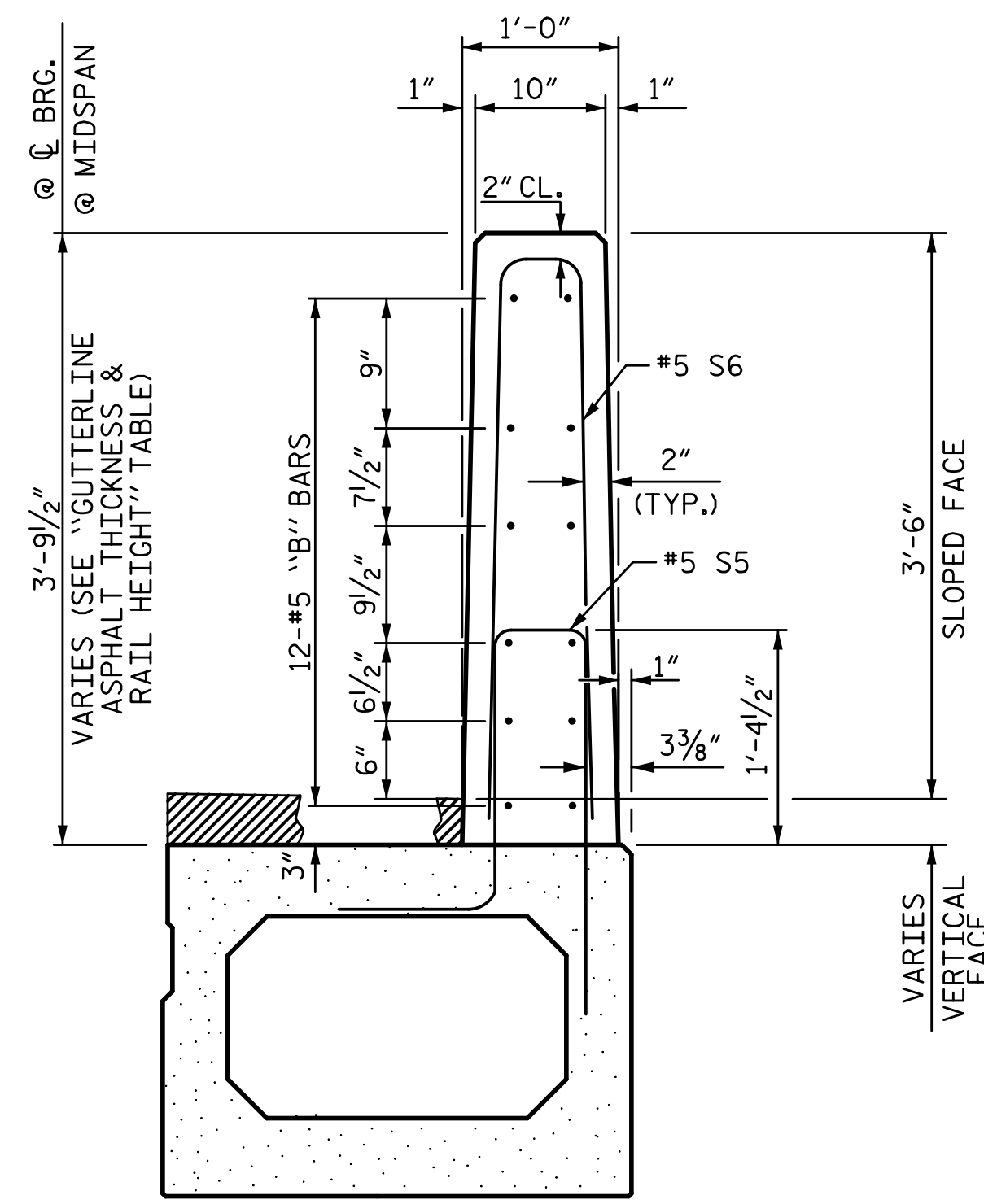
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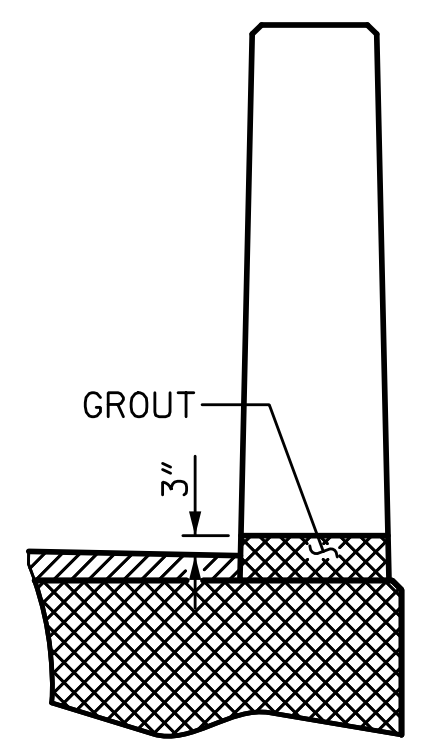
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
35' UNIT					
* B7	48	#5	STR	17'-1"	855
* S6	104	#5	1	7'-2"	777
* EPOXY COATED REINFORCING STEEL				LBS.	1632
CLASS AA CONCRETE				CU.YDS.	9.1
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	70.0

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
85' UNIT					
* B9	72	#5	STR	27'-11"	2096
* S6	236	#5	1	7'-2"	1764
* EPOXY COATED REINFORCING STEEL				LBS.	3860
CLASS AA CONCRETE				CU.YDS.	22.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	170.0

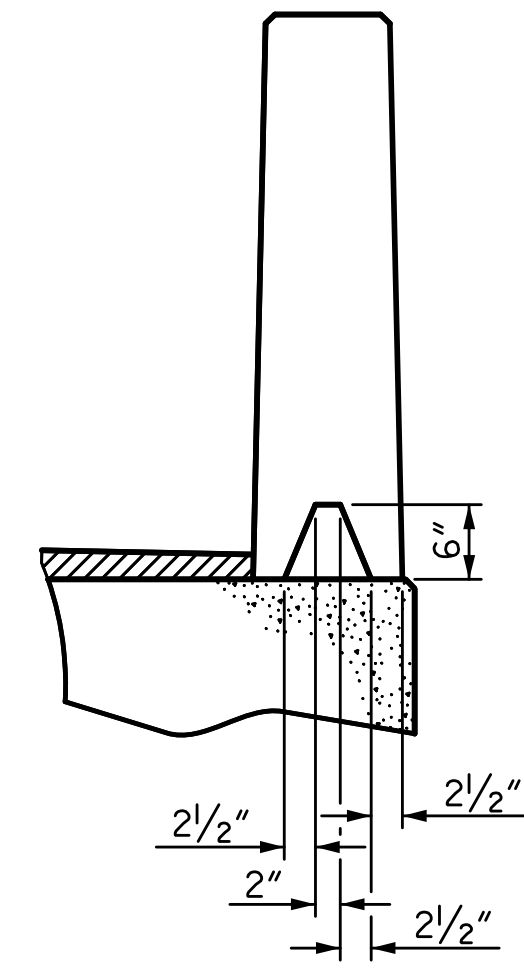
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
35' UNITS	3/8"	3'-9/8"
85' UNITS	1/2"	3'-7/2"



SECTION THRU RAIL

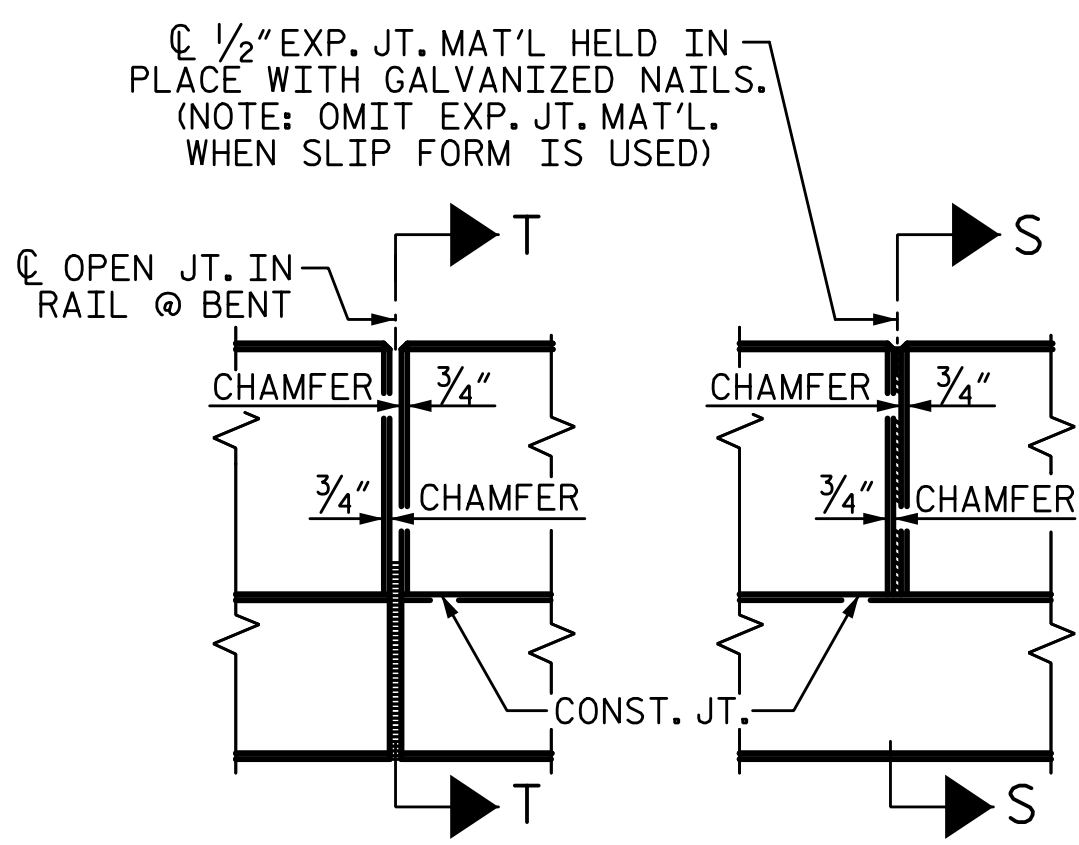


SECTION T-T

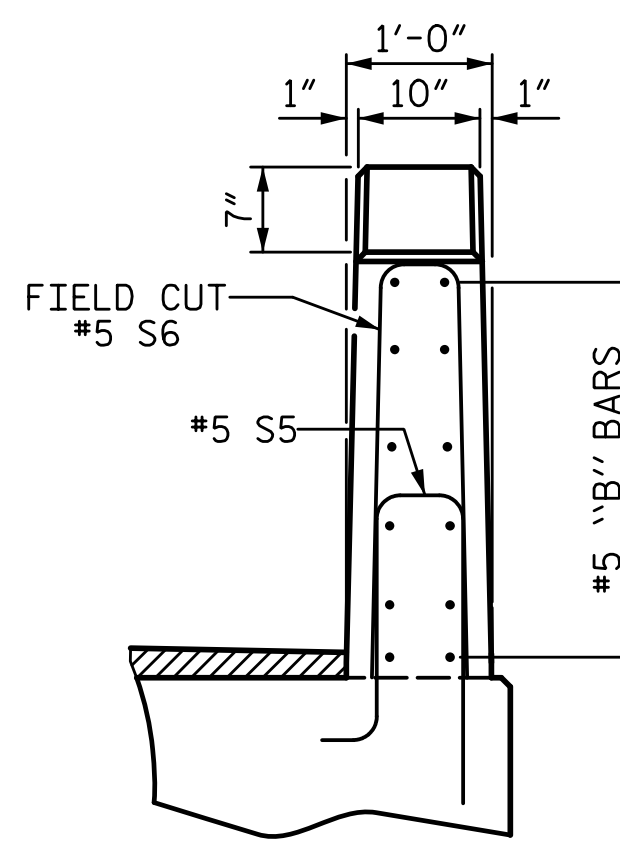


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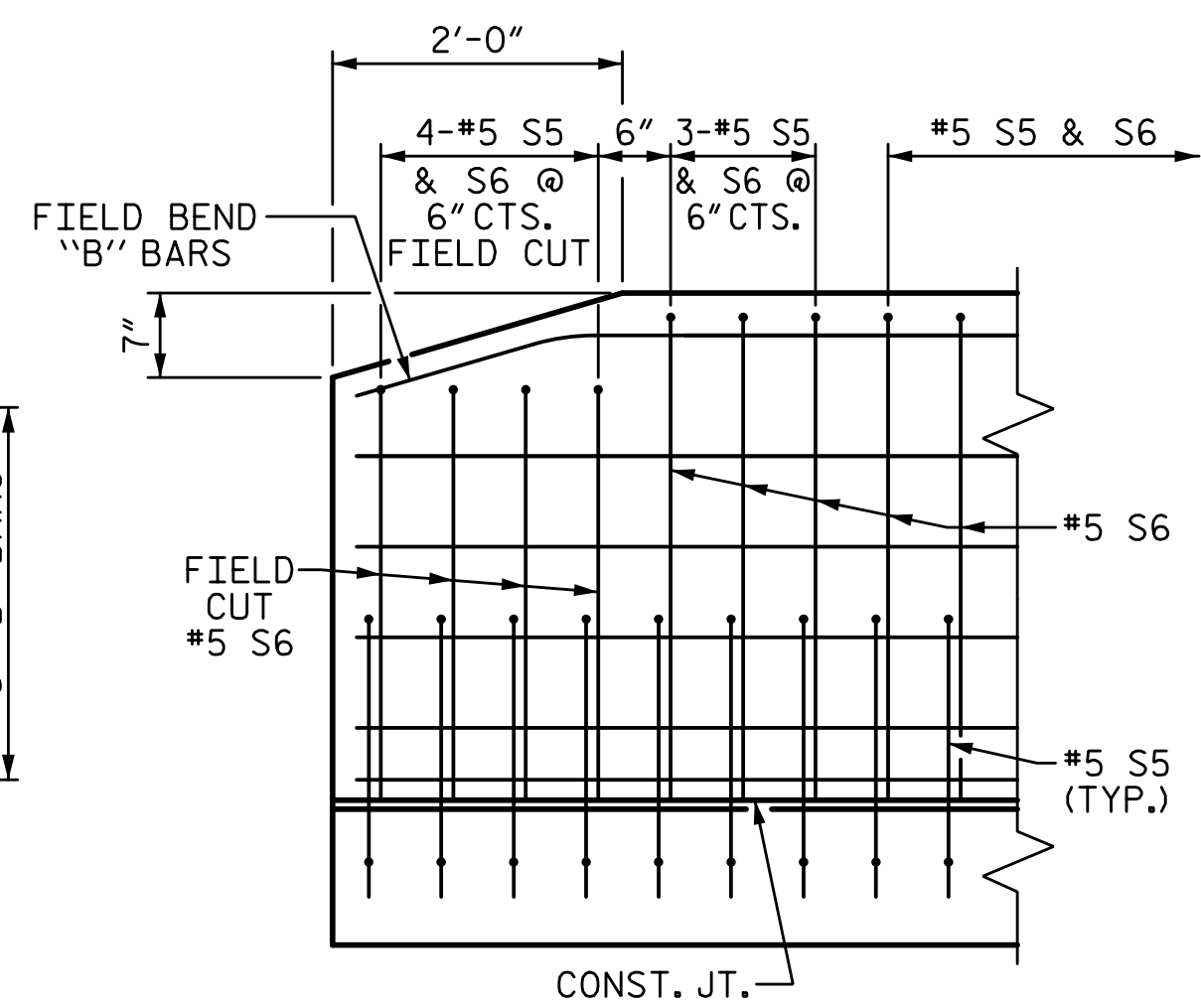
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



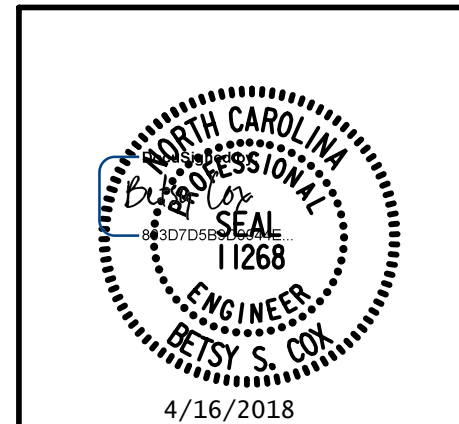
END OF RAIL DETAILS

VERTICAL CONCRETE BARRIER RAIL DETAILS

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FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 3'-0" X 2'-9"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT  
 90° SKEW



PLANS PREPARED BY:  
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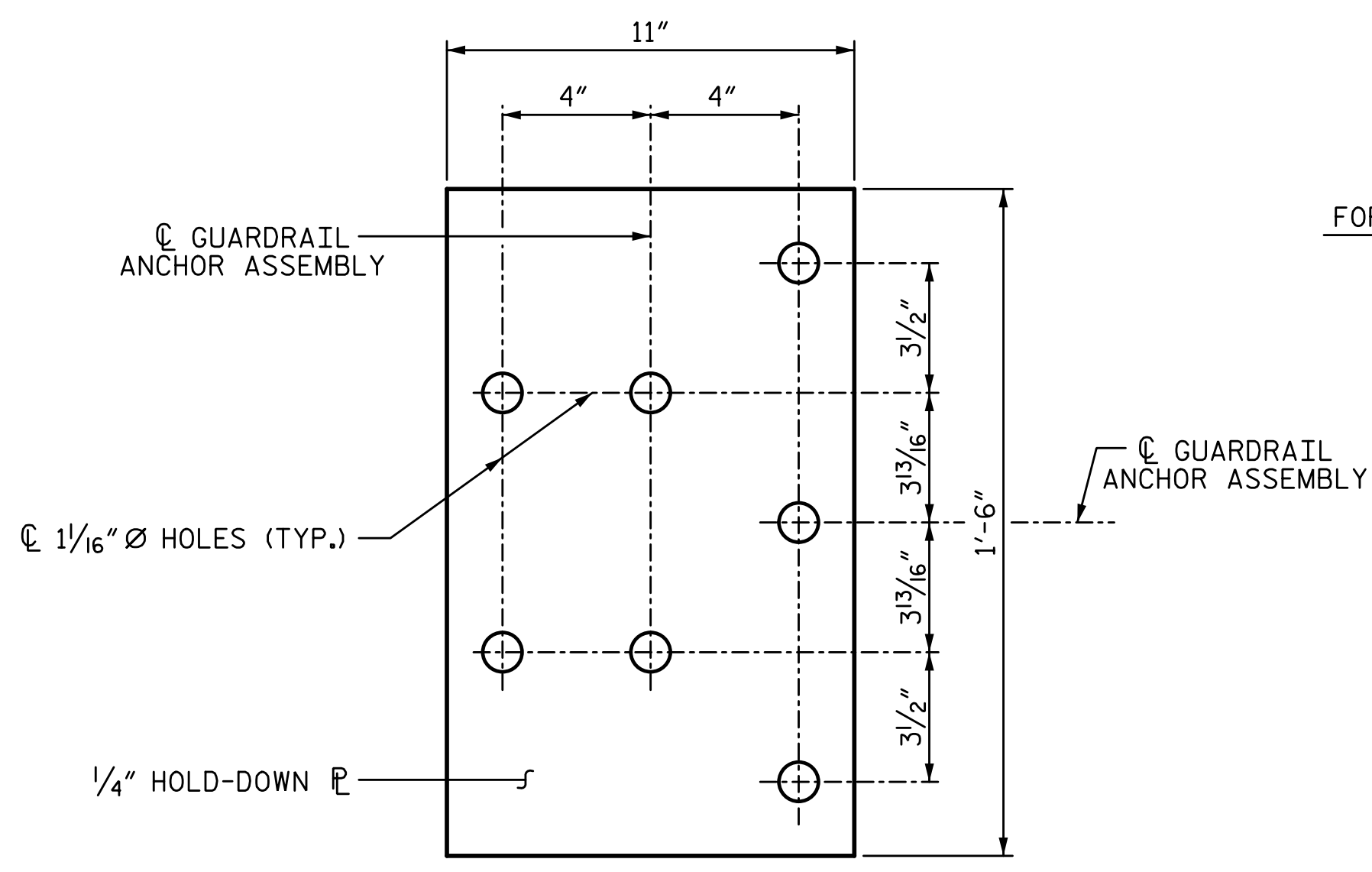
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2			4		

TOTAL SHEETS  
21

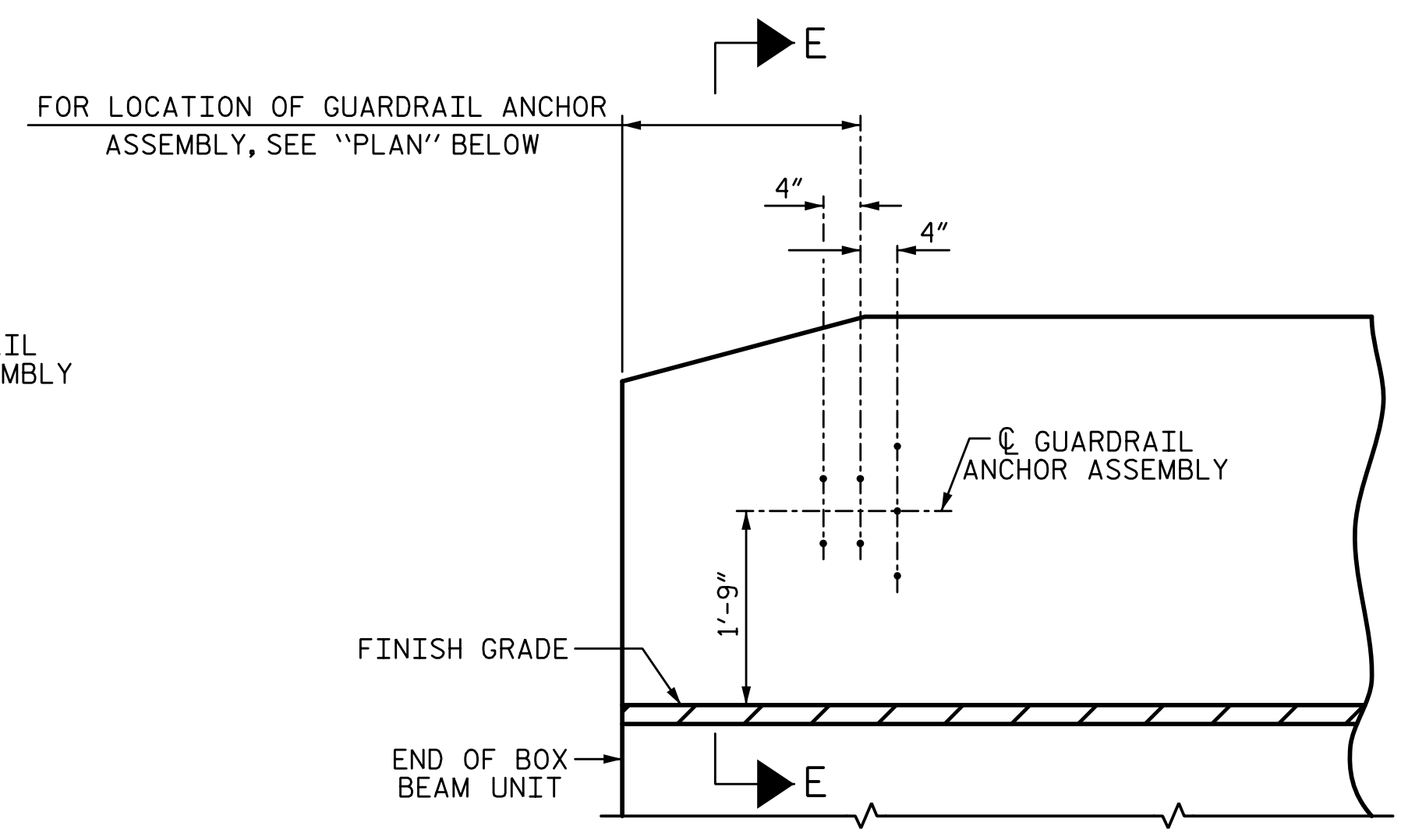
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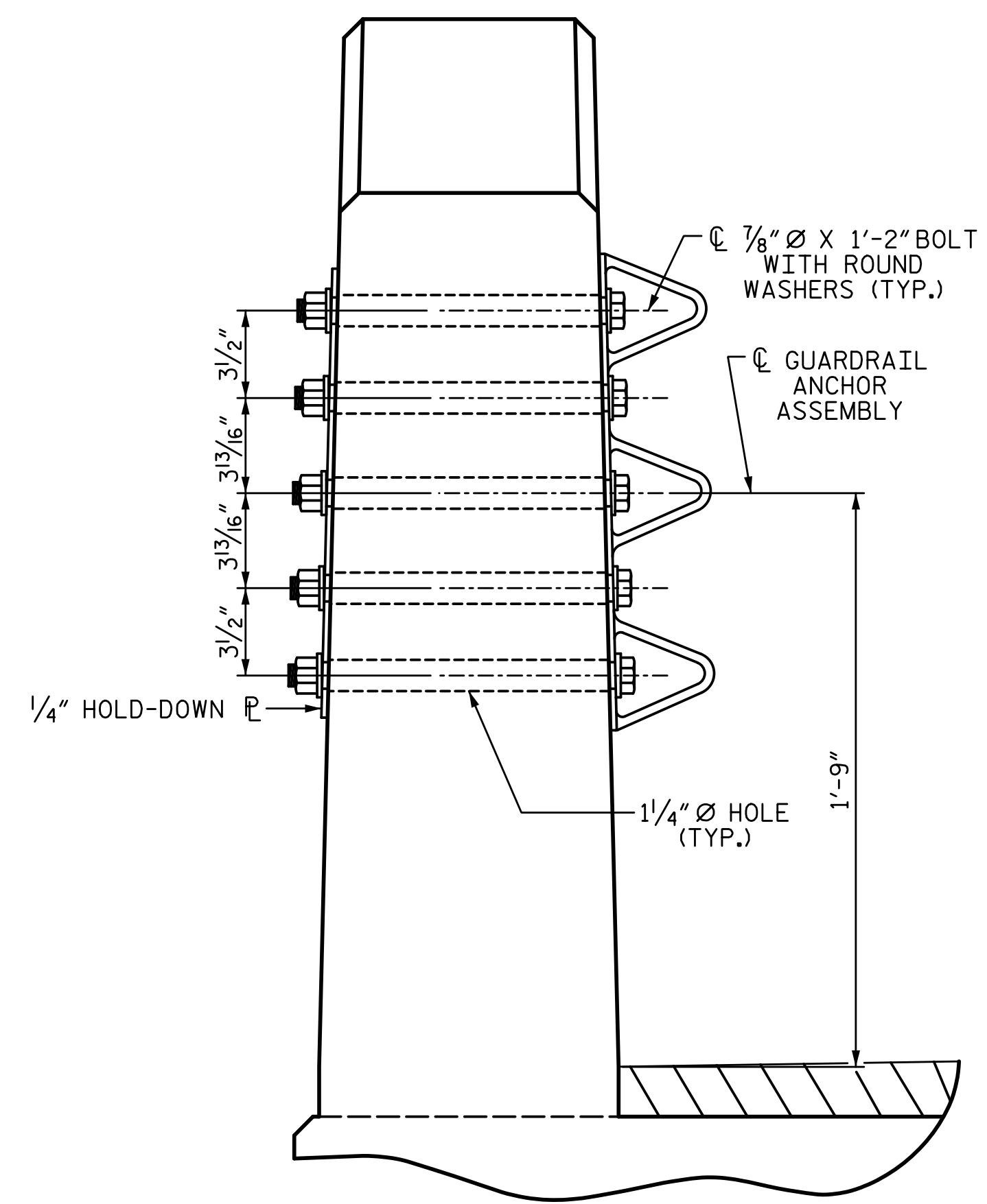
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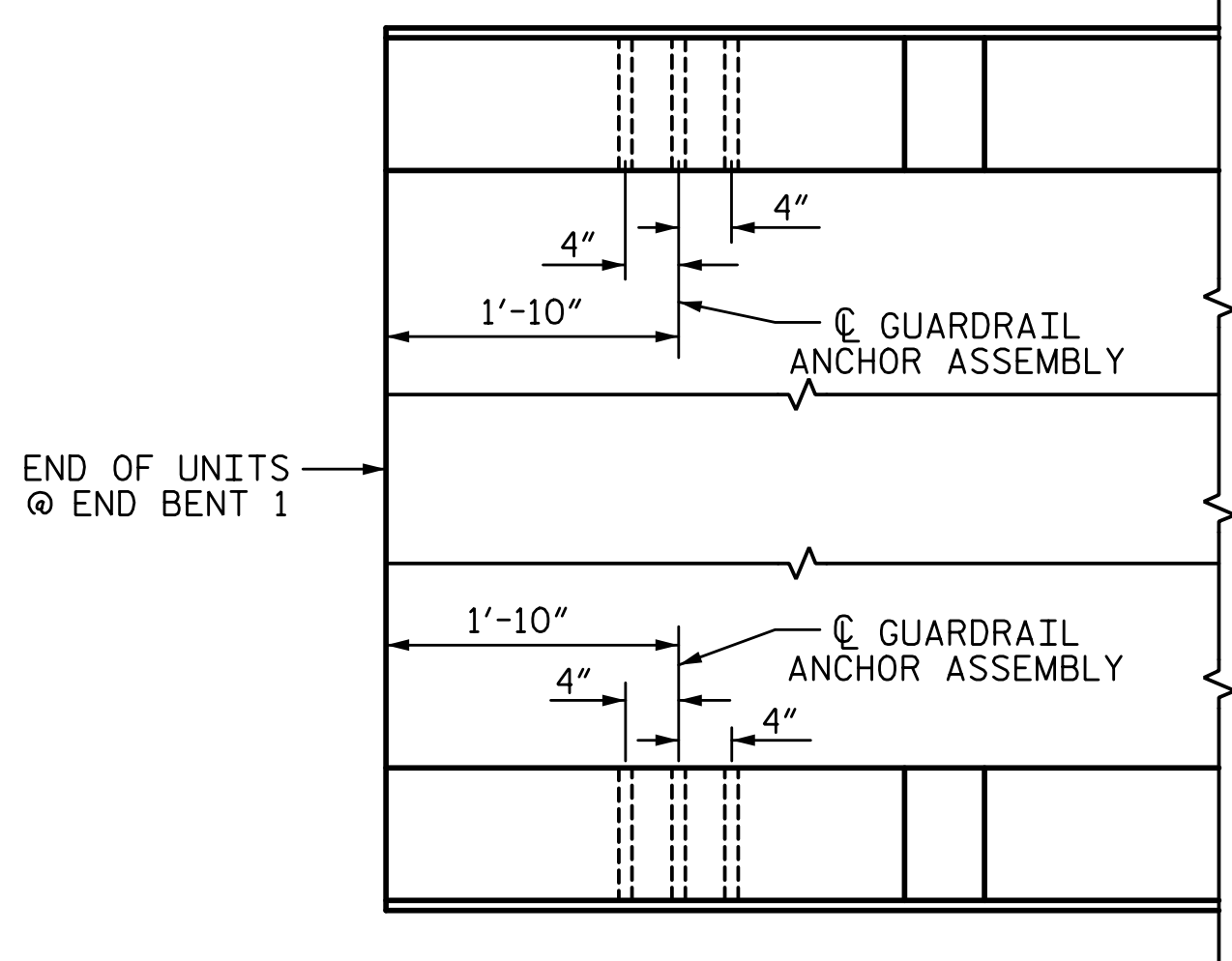
PLAN



ELEVATION



SECTION E-E



PLAN  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

LOCATION OF ANCHORS FOR GUARDRAIL

NOTES:

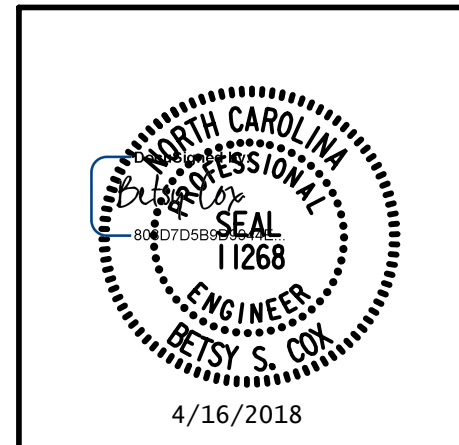
- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO 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 1/4" 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.



SKETCH SHOWING POINTS OF ATTACHMENT  
\* LOCATION OF GUARDRAIL ATTACHMENT

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 STATION: 14+65.00 -L-

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 VERTICAL CONCRETE  
 BARRIER RAIL



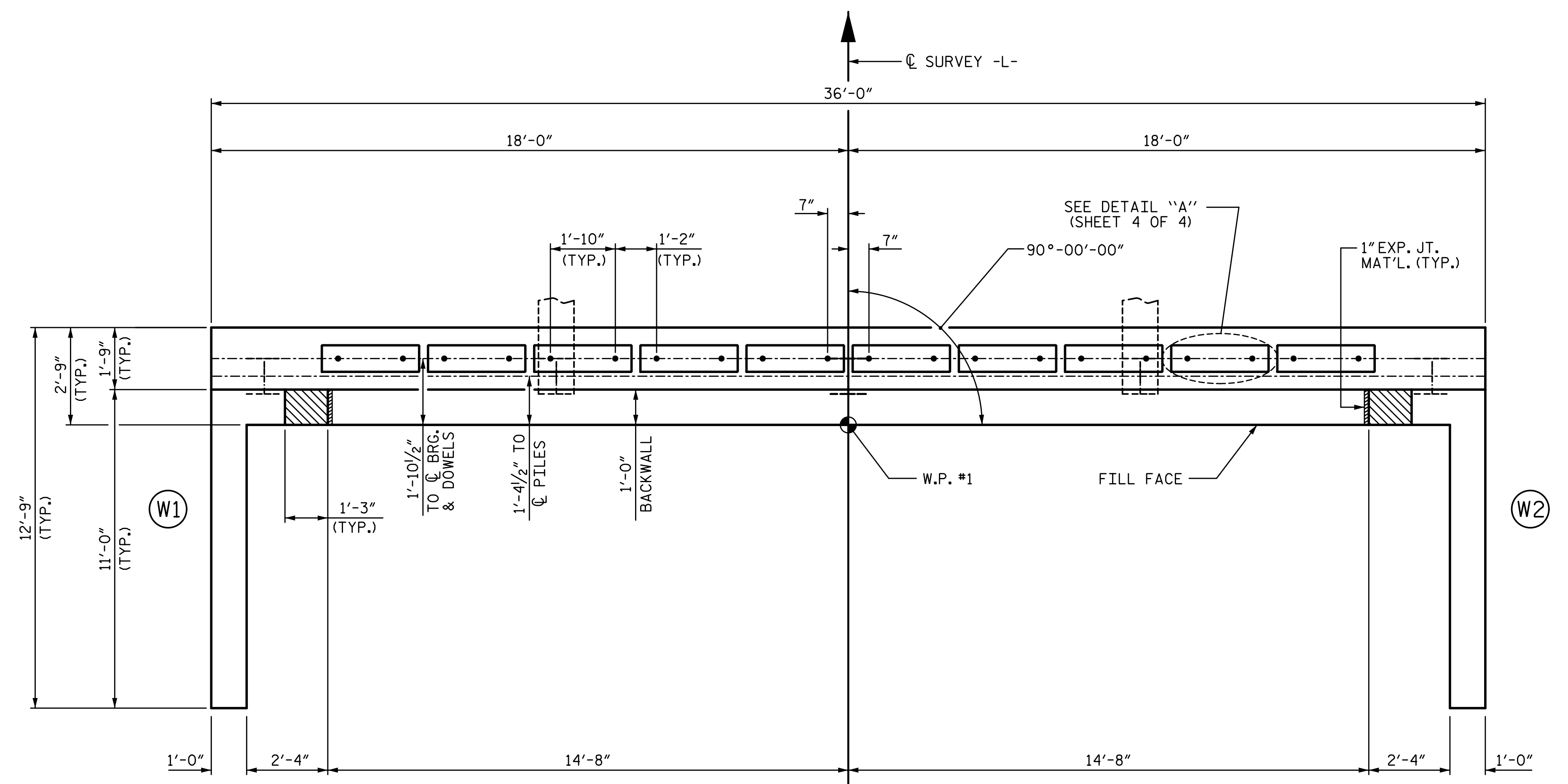
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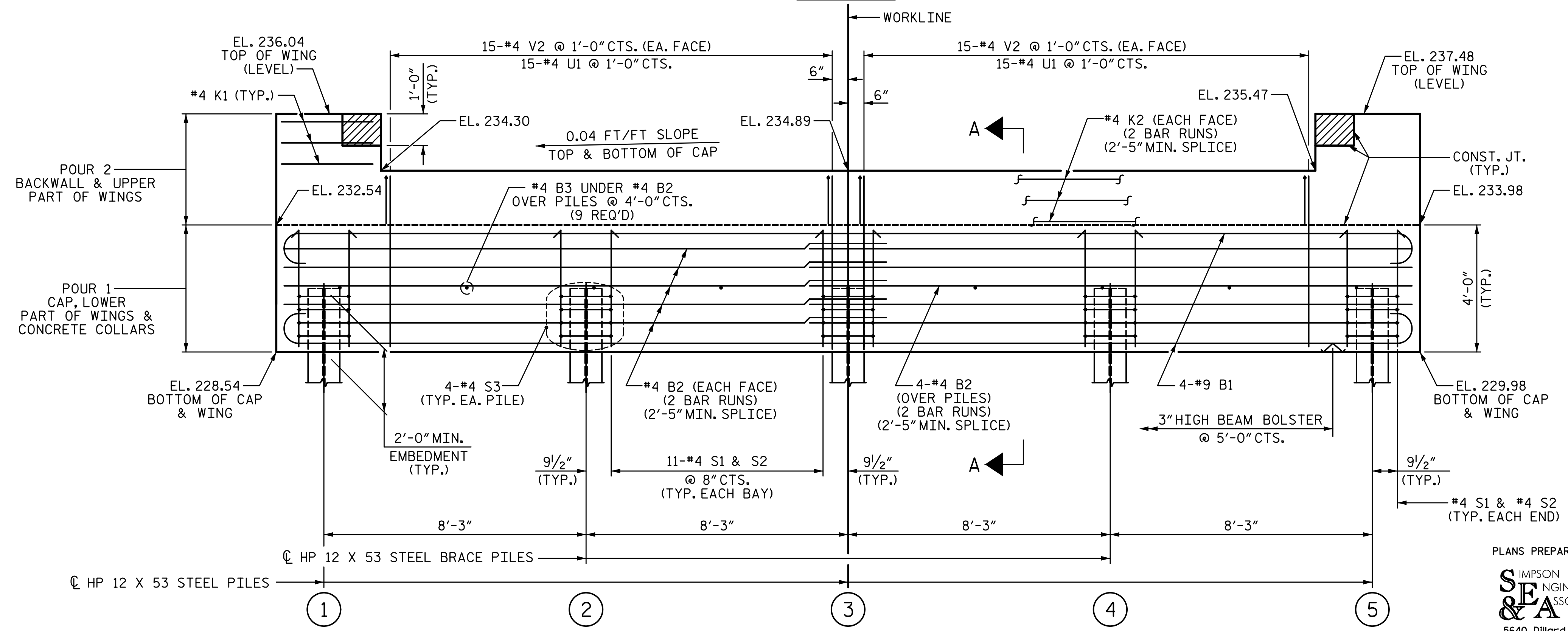
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PLAN



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.

**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.

TOP OF PILE ELEVATIONS	
①	230.62
②	230.95
③	231.28
④	231.61
⑤	231.94

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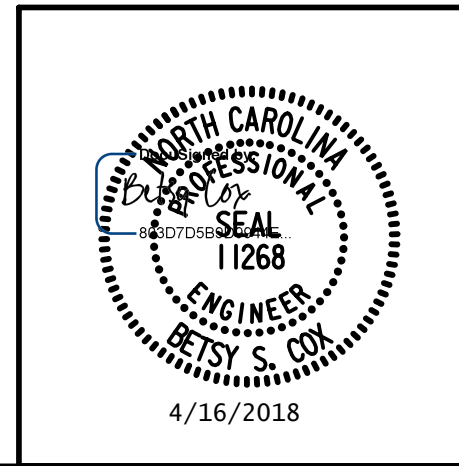
SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**END BENT 1**

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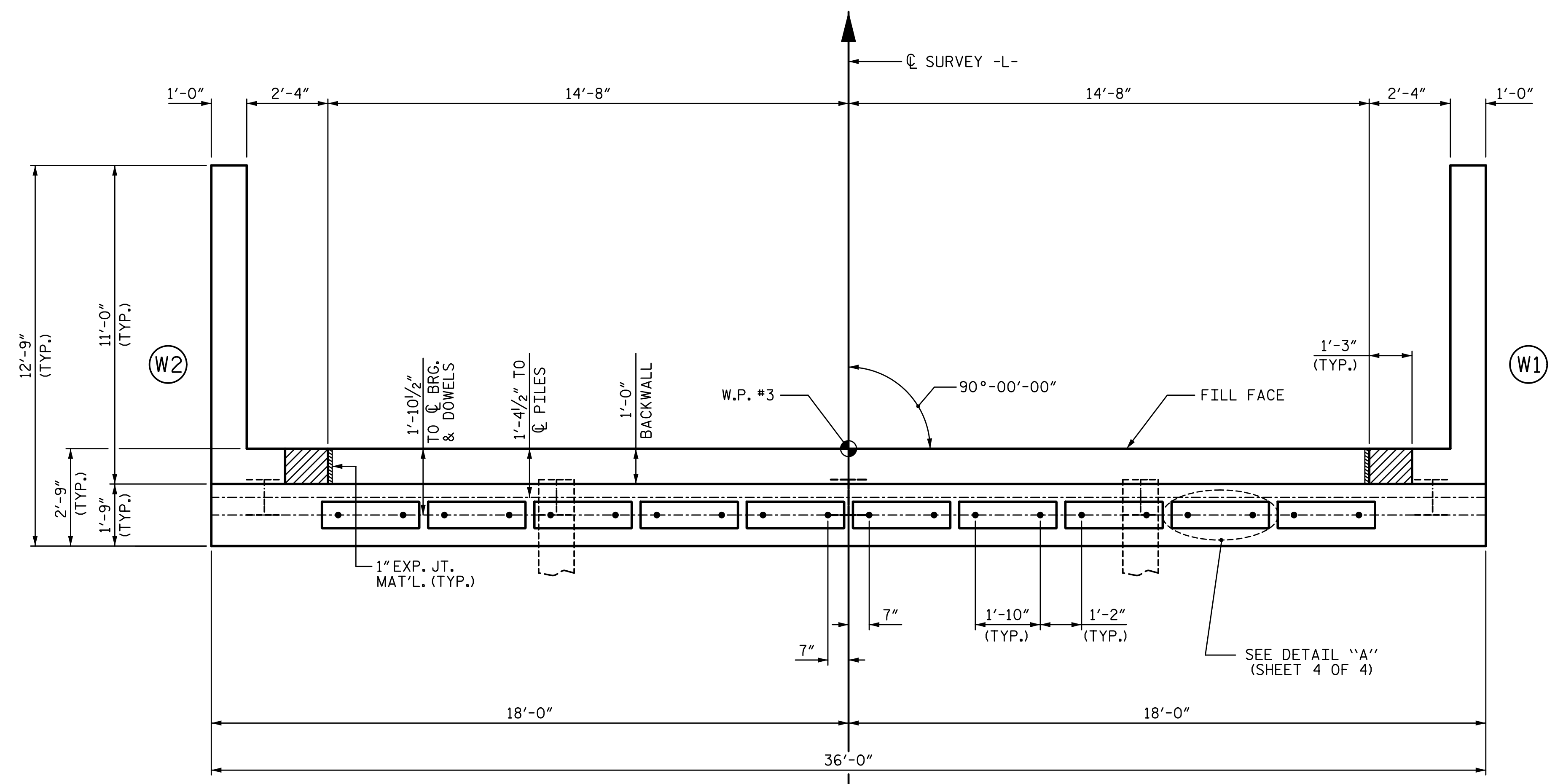


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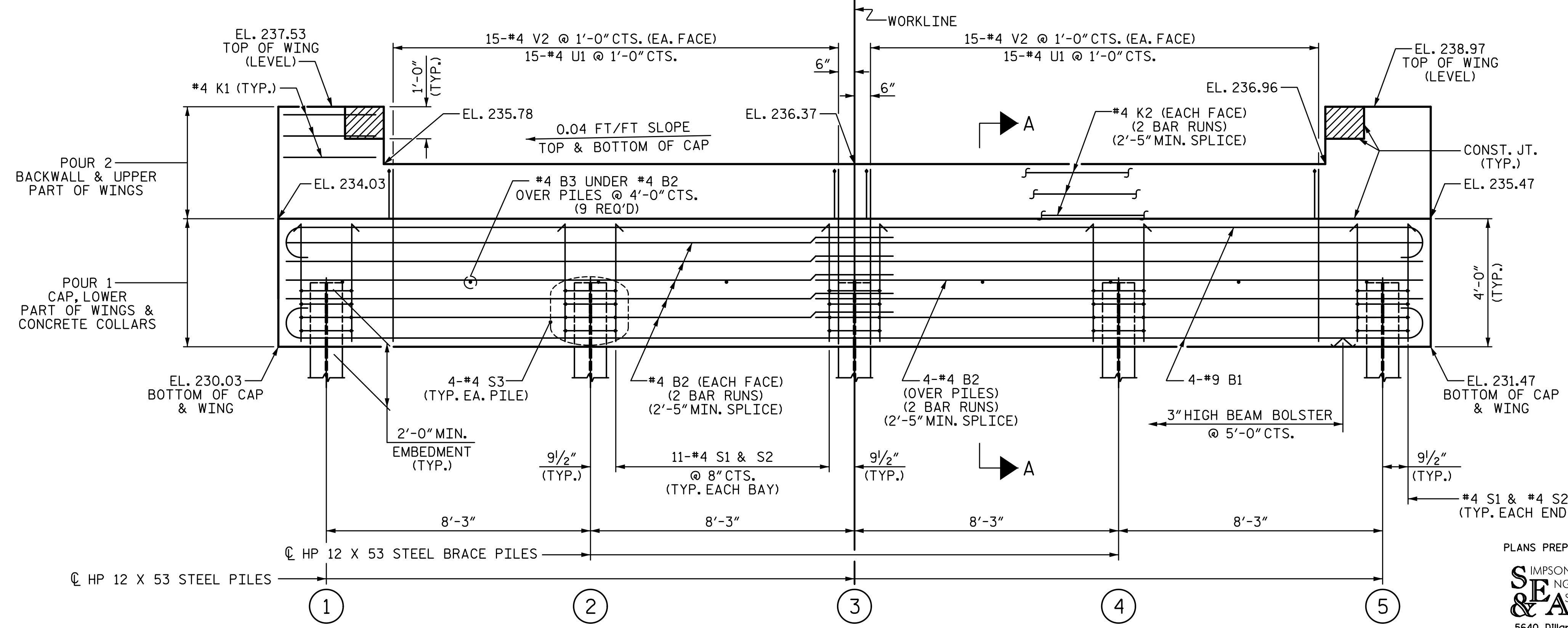
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PLAN

**NOTES:**  
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 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.

TOP OF PILE ELEVATIONS	
①	232.11
②	232.44
③	232.77
④	233.10
⑤	233.43



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.

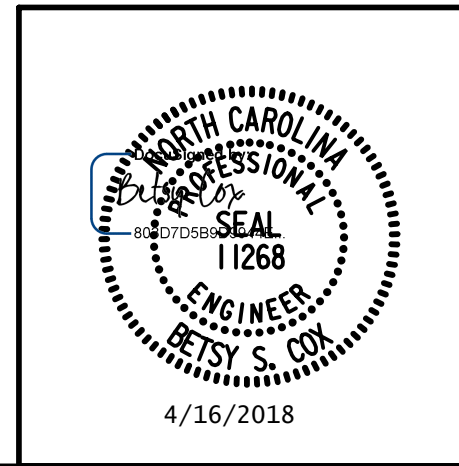
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SHEET 2 OF 4

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 SUBSTRUCTURE

END BENT 2

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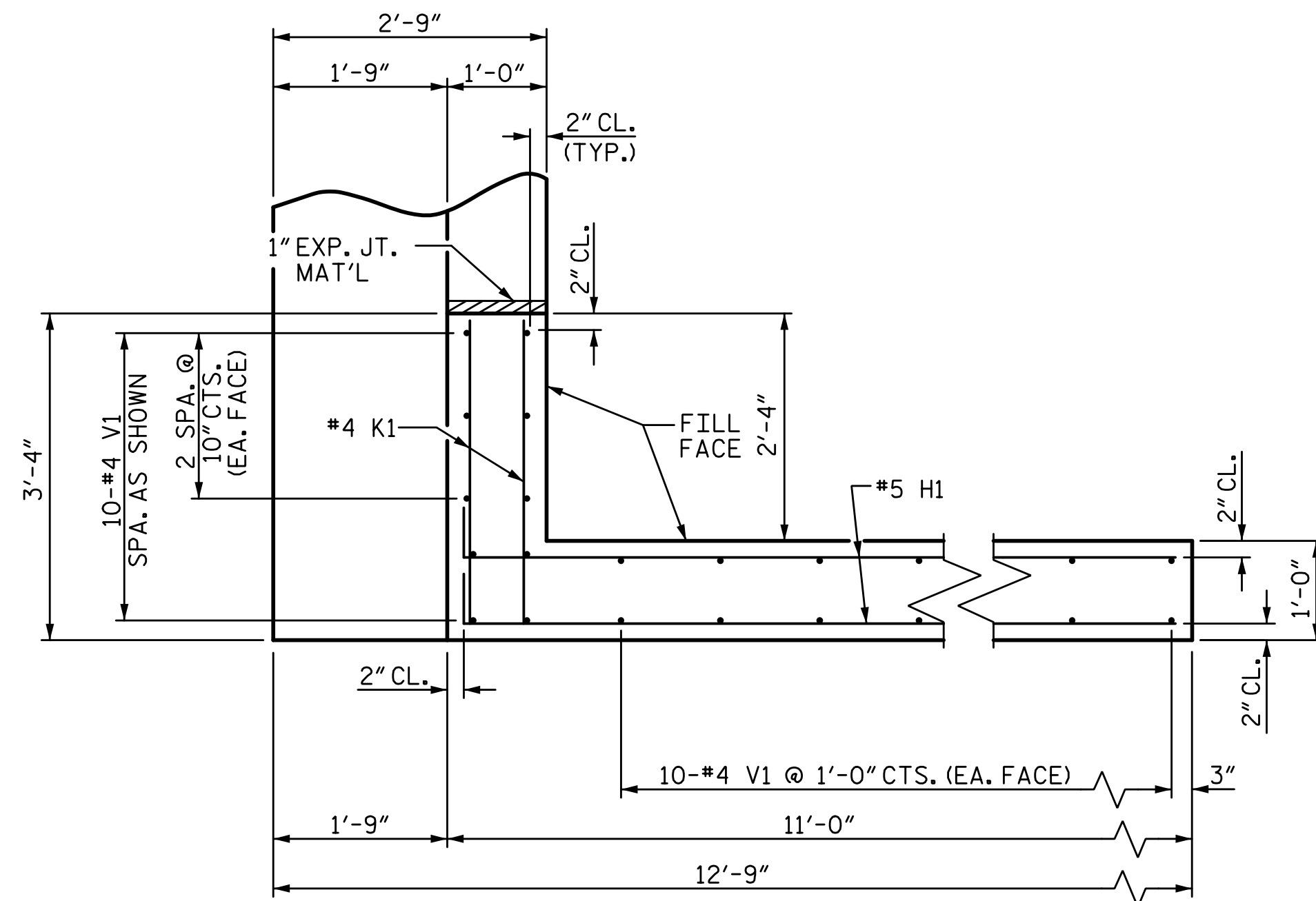


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 CHECKED BY: B.S. COX DATE: 4-18  
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-18

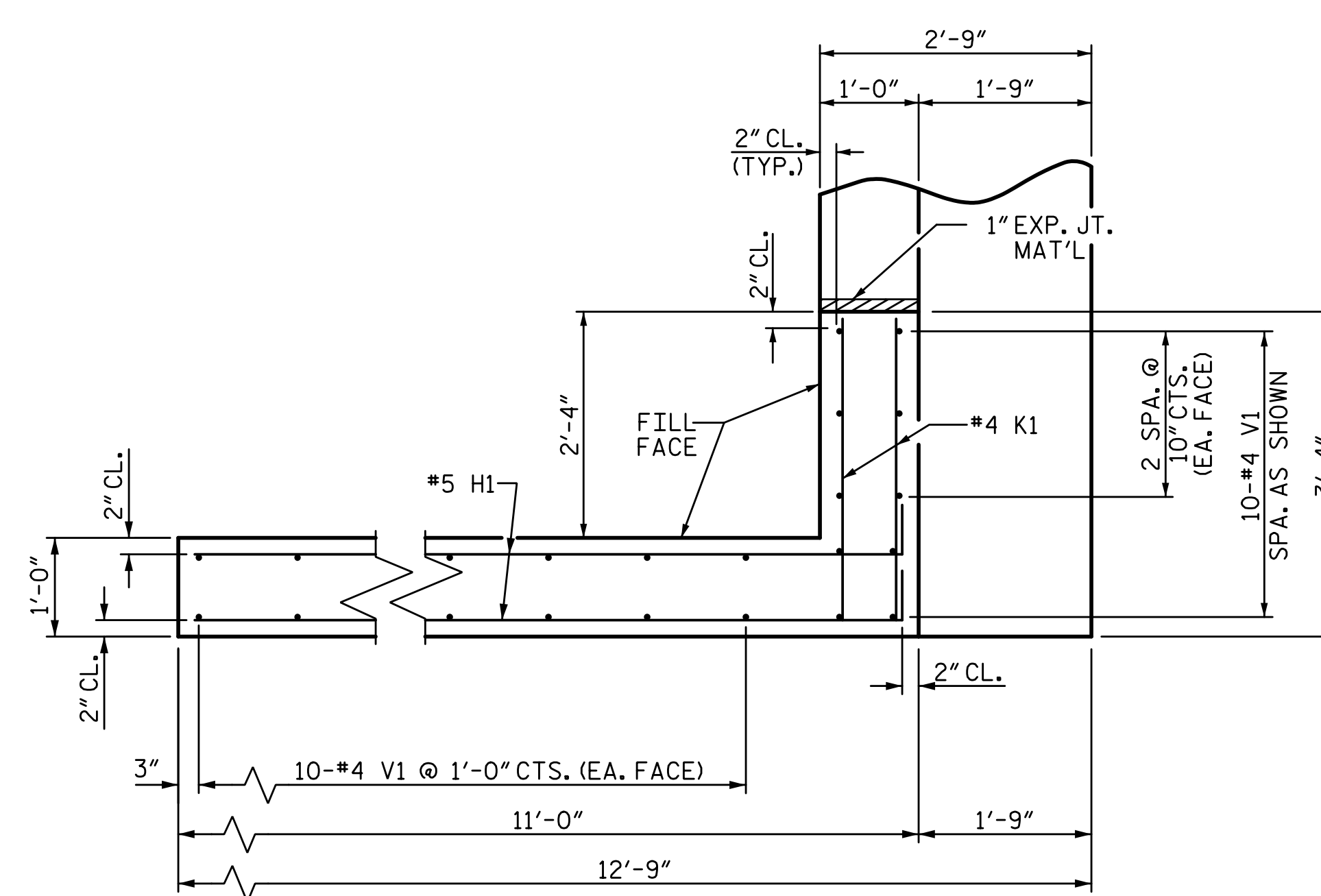
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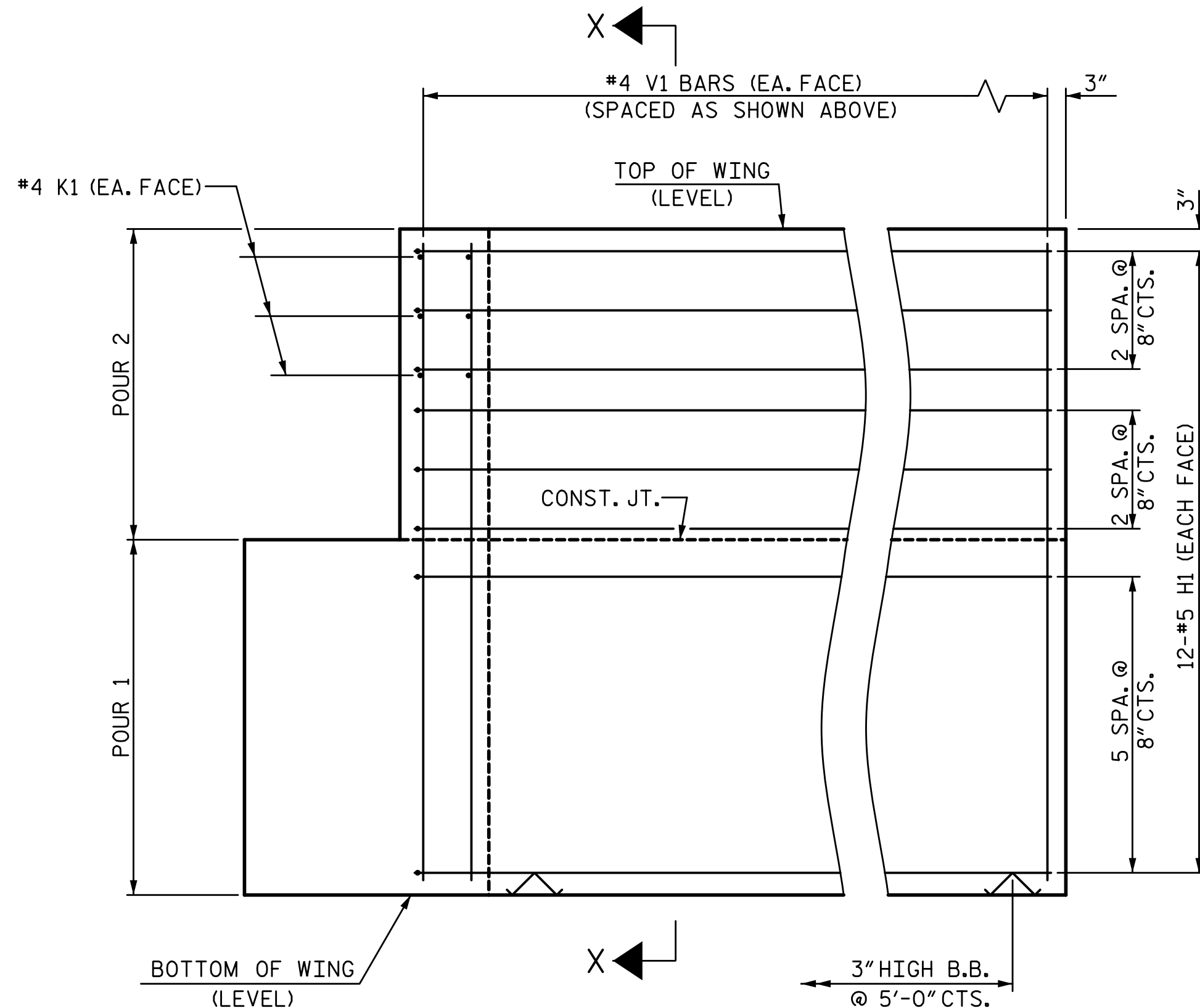
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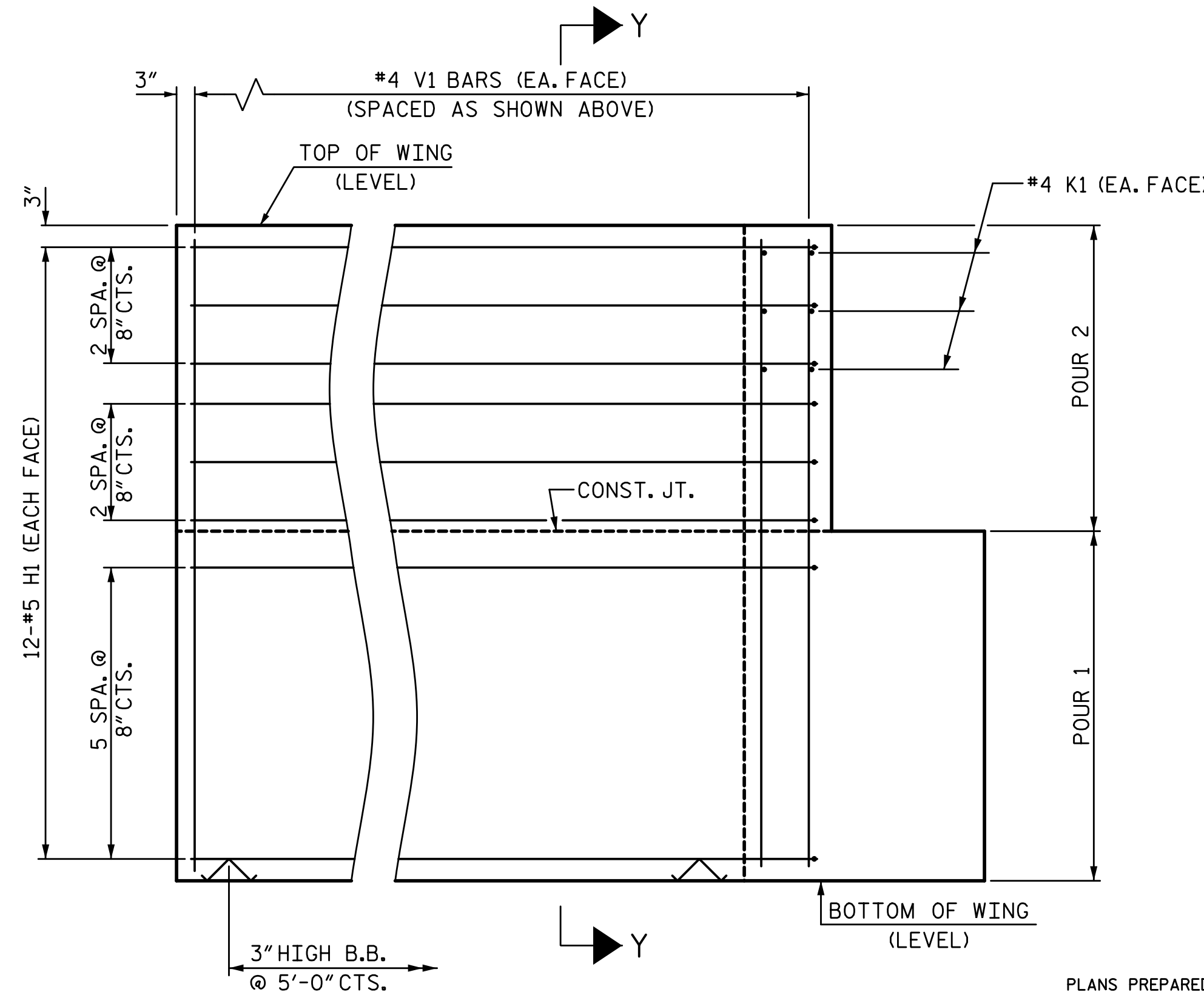
PLAN OF WING (W1)



PLAN OF WING (W2)

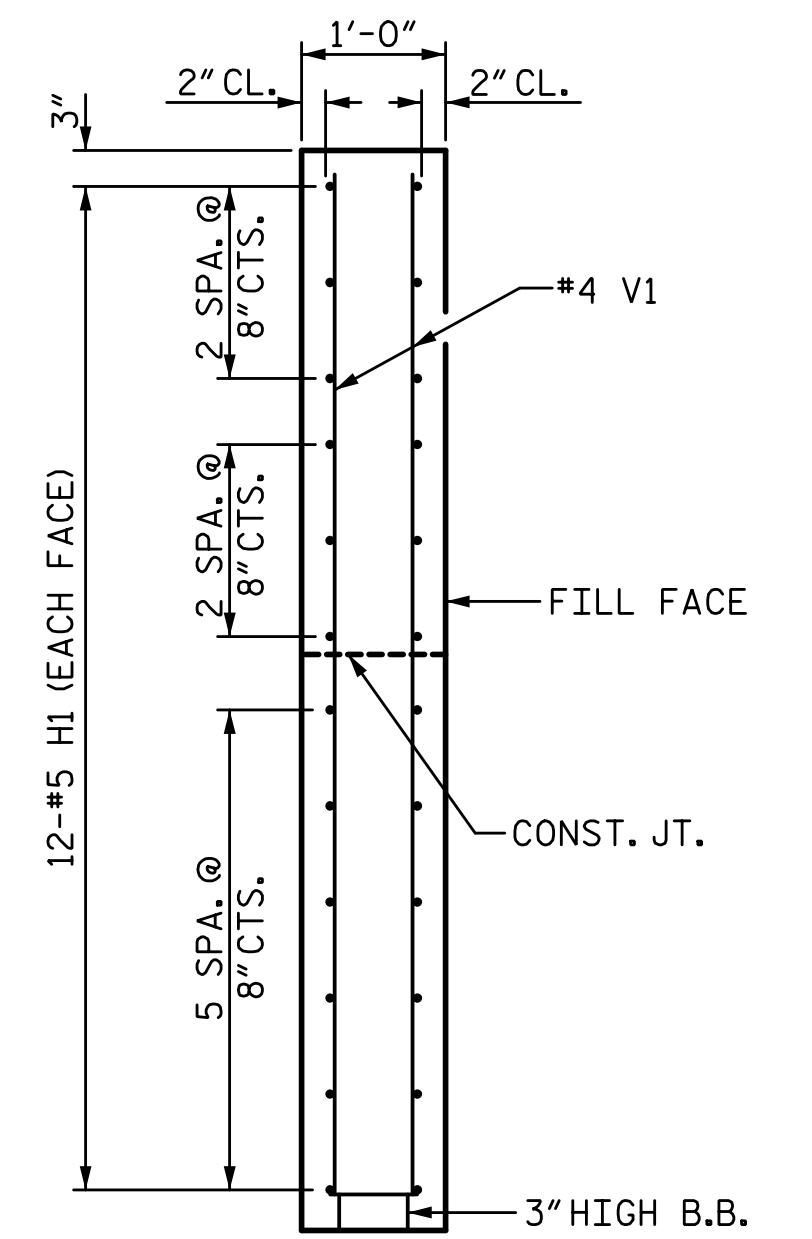


ELEVATION OF WING (W2)

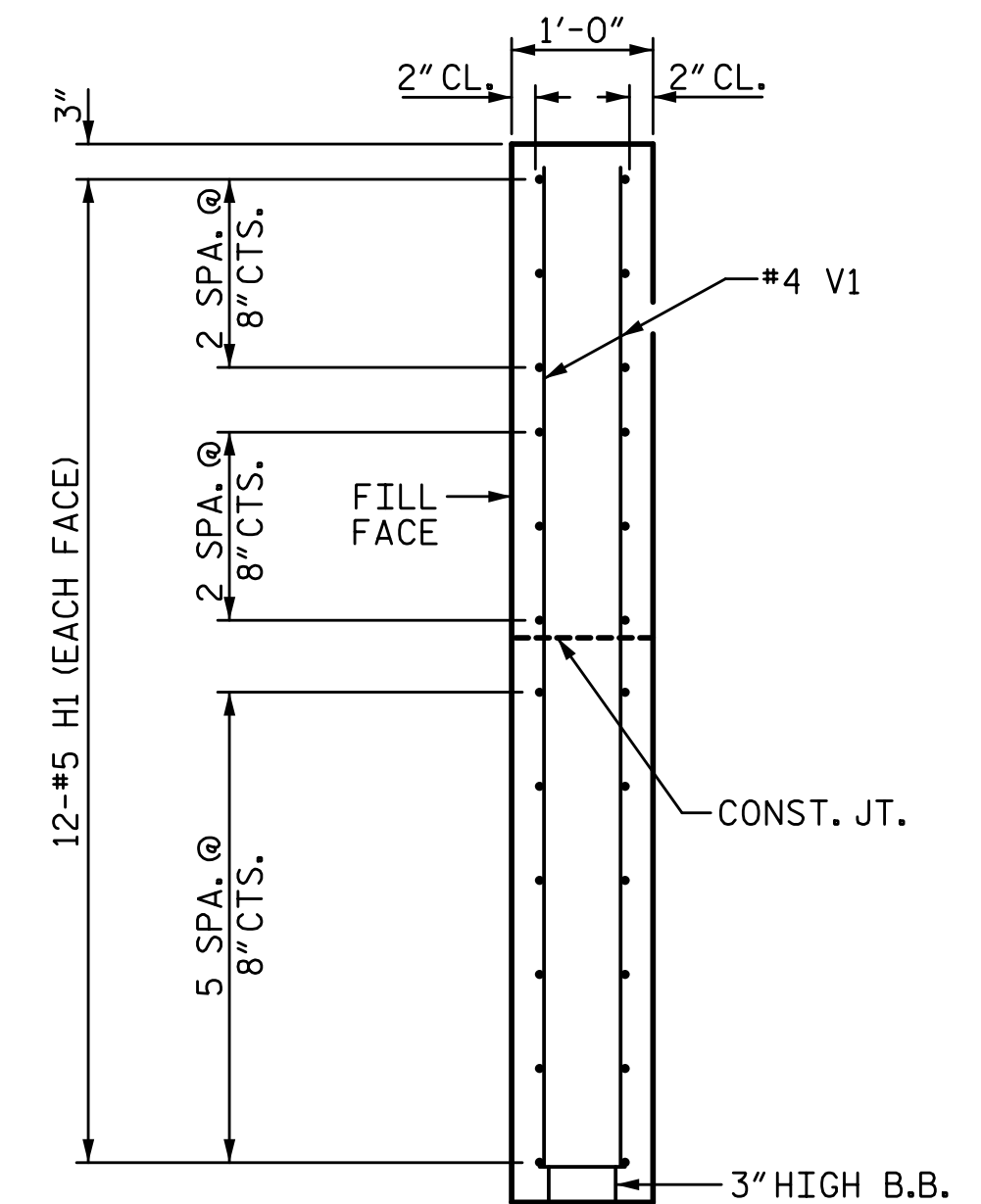


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



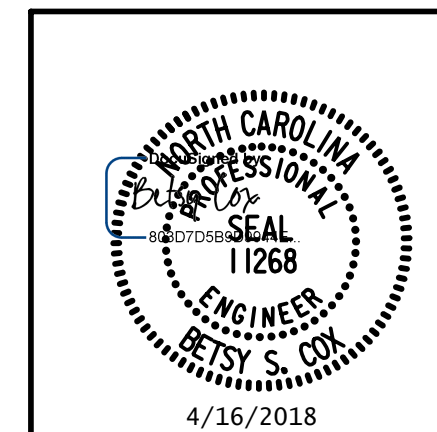
SECTION Y-Y

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SHEET 3 OF 4

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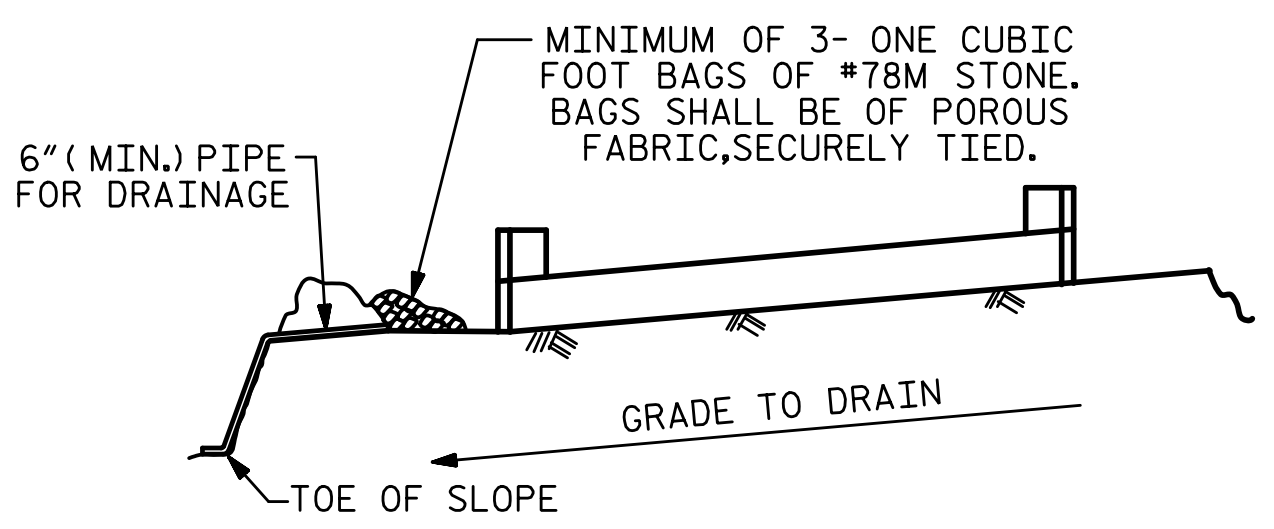
END BENT  
WING DETAILS

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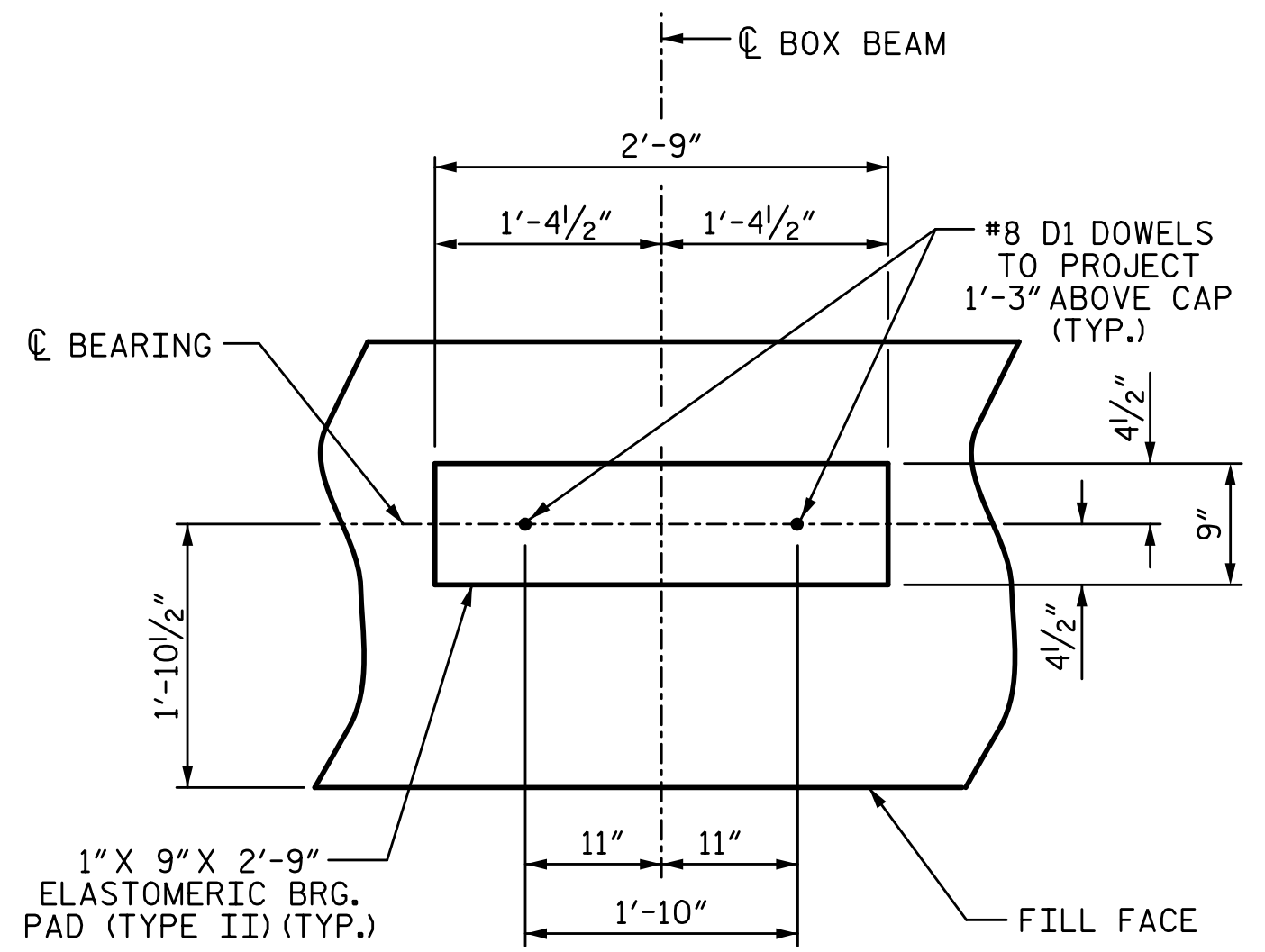


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

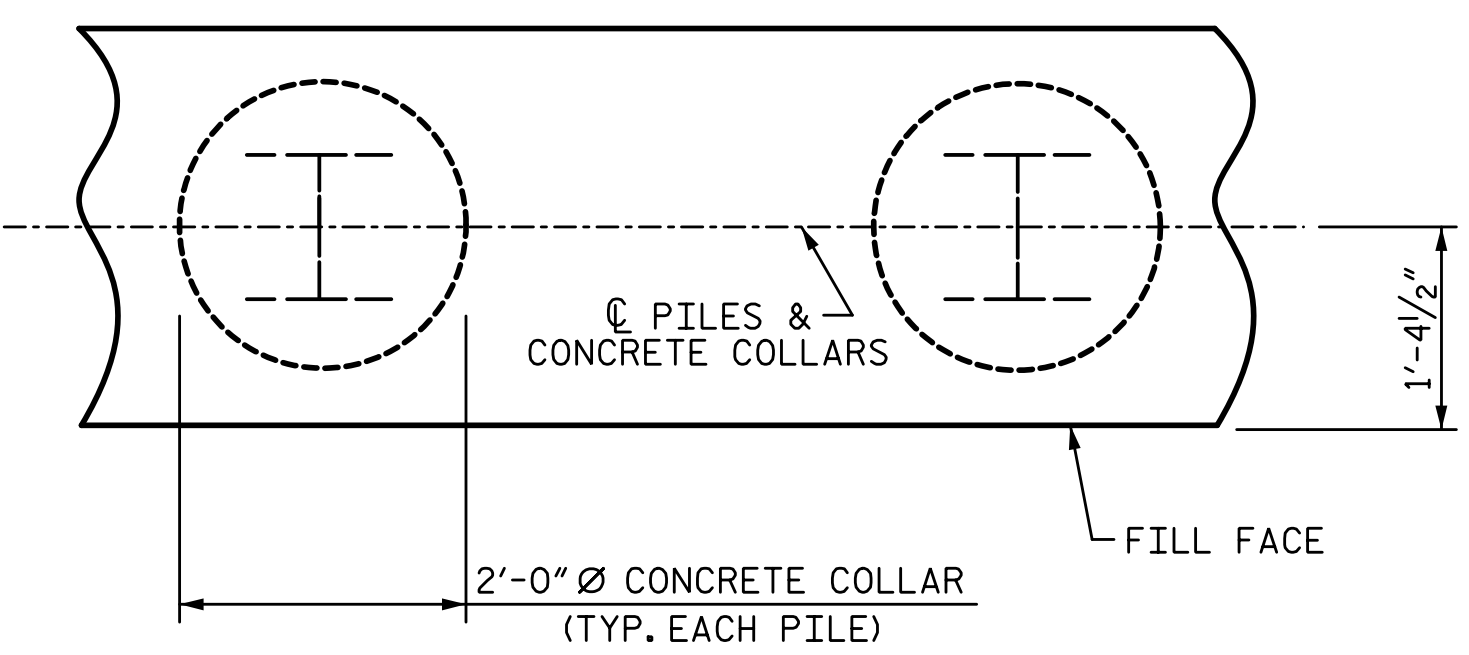
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**



**DETAIL "A"**

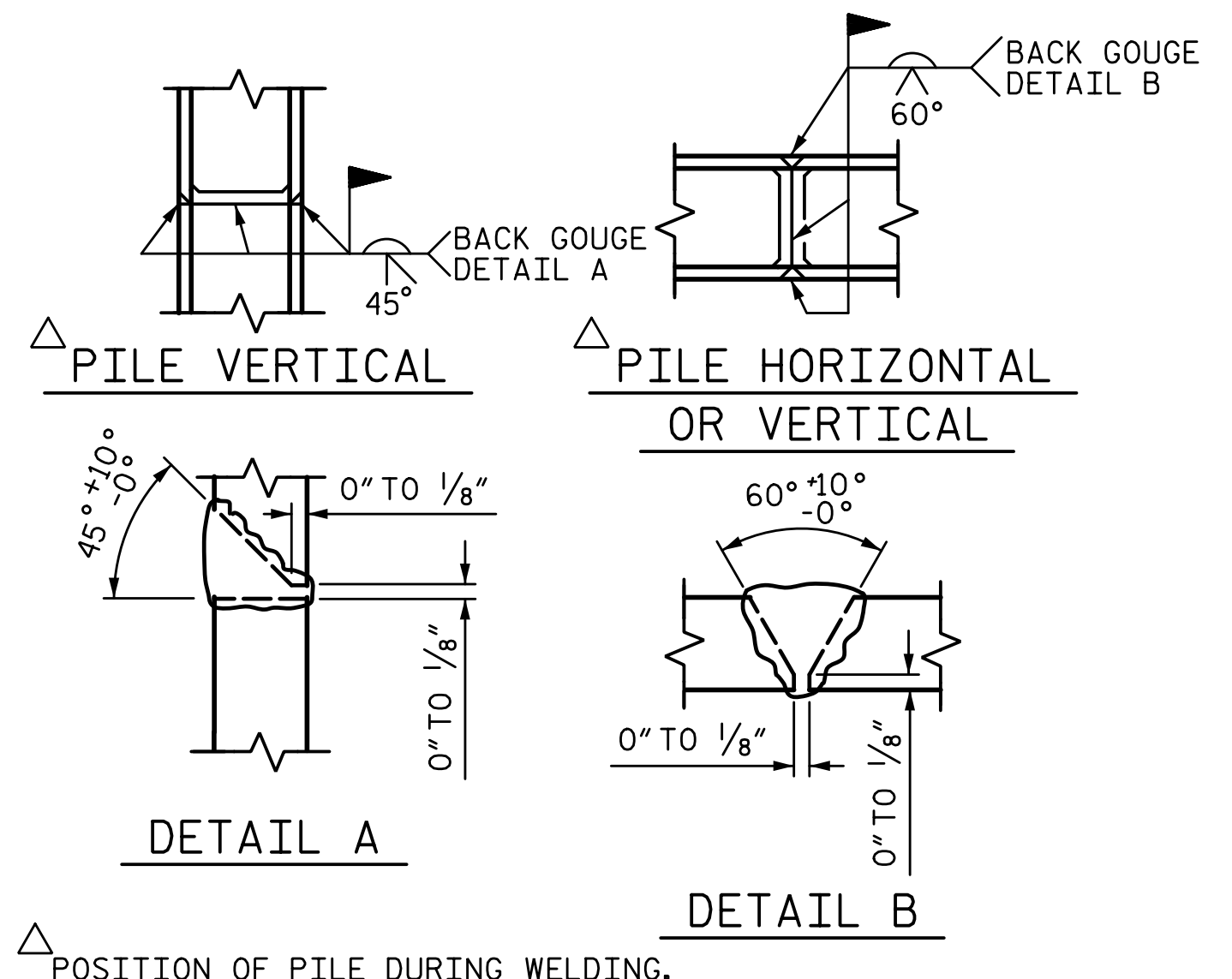
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



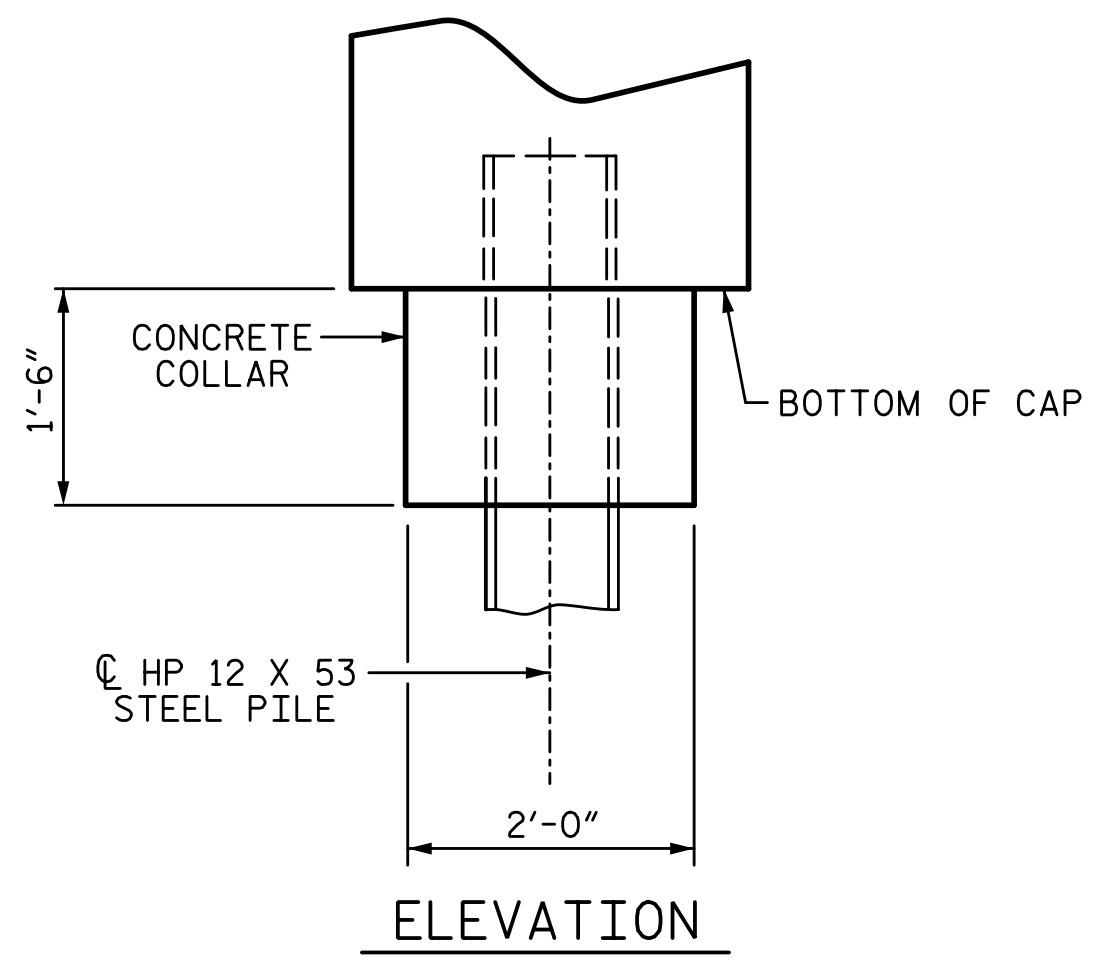
**PLAN**

**CORROSION PROTECTION FOR STEEL PILES DETAIL**

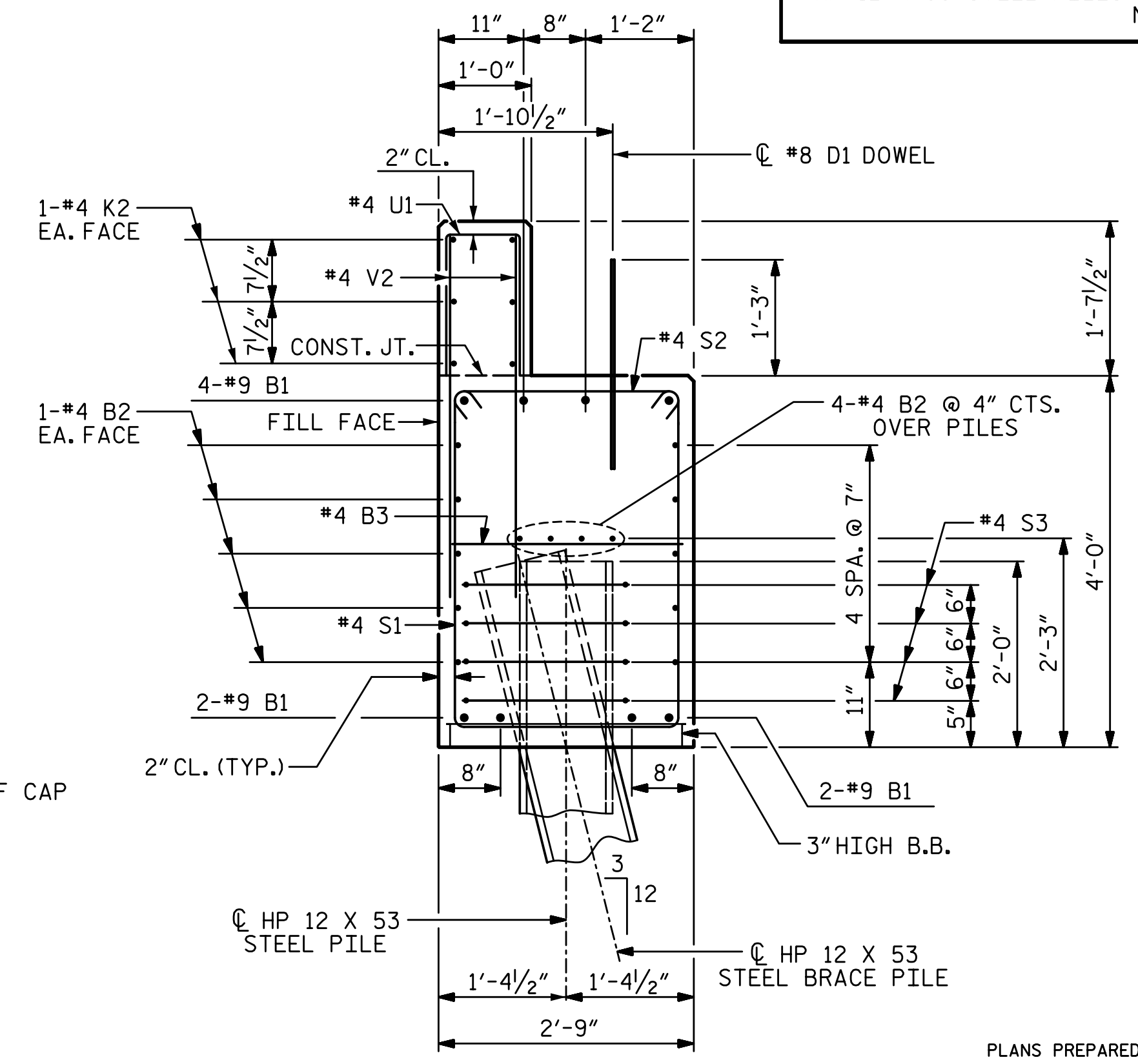
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



**PILE SPLICE DETAILS**



**ELEVATION**

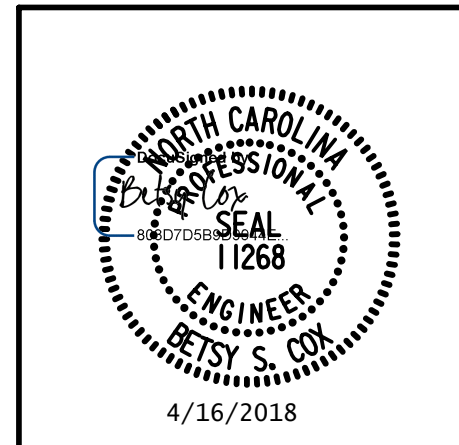


**SECTION A-A**

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

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BAR TYPES	
ALL BAR DIMENSIONS ARE OUT TO OUT.	
<b>END BENT No. 1</b> HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 115 STEEL PILE POINTS NO: 5	<b>END BENT No. 2</b> HP 12 X 53 STEEL PILES NO: 5 LIN. FT. = 90 STEEL PILE POINTS NO: 5
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5
PDA TESTING	EA: 1

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-0"	1034
B2	28	#4	STR	19'-1"	357
B3	9	#4	STR	2'-5"	15
D1	20	#8	STR	2'-3"	120
H1	48	#5	2	11'-4"	567
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	19'-1"	153
S1	46	#4	3	10'-5"	320
S2	46	#4	4	3'-2"	97
S3	20	#4	5	6'-6"	87
U1	30	#4	6	3'-7"	72
V1	60	#4	STR	7'-2"	287
V2	60	#4	STR	5'-3"	210
REINFORCING STEEL (FOR ONE END BENT)					3342 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR 1	CAP, LOWER PART OF WINGS & COLLARS				18.5 C.Y.
POUR 2	BACKWALL & UPPER PART OF WINGS				5.2 C.Y.
TOTAL CLASS A CONCRETE					23.8 C.Y.

PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
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 SHEET 4 OF 4

STATE OF NORTH CAROLINA  
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 SUBSTRUCTURE  
**END BENT 1 & 2**  
**DETAILS**

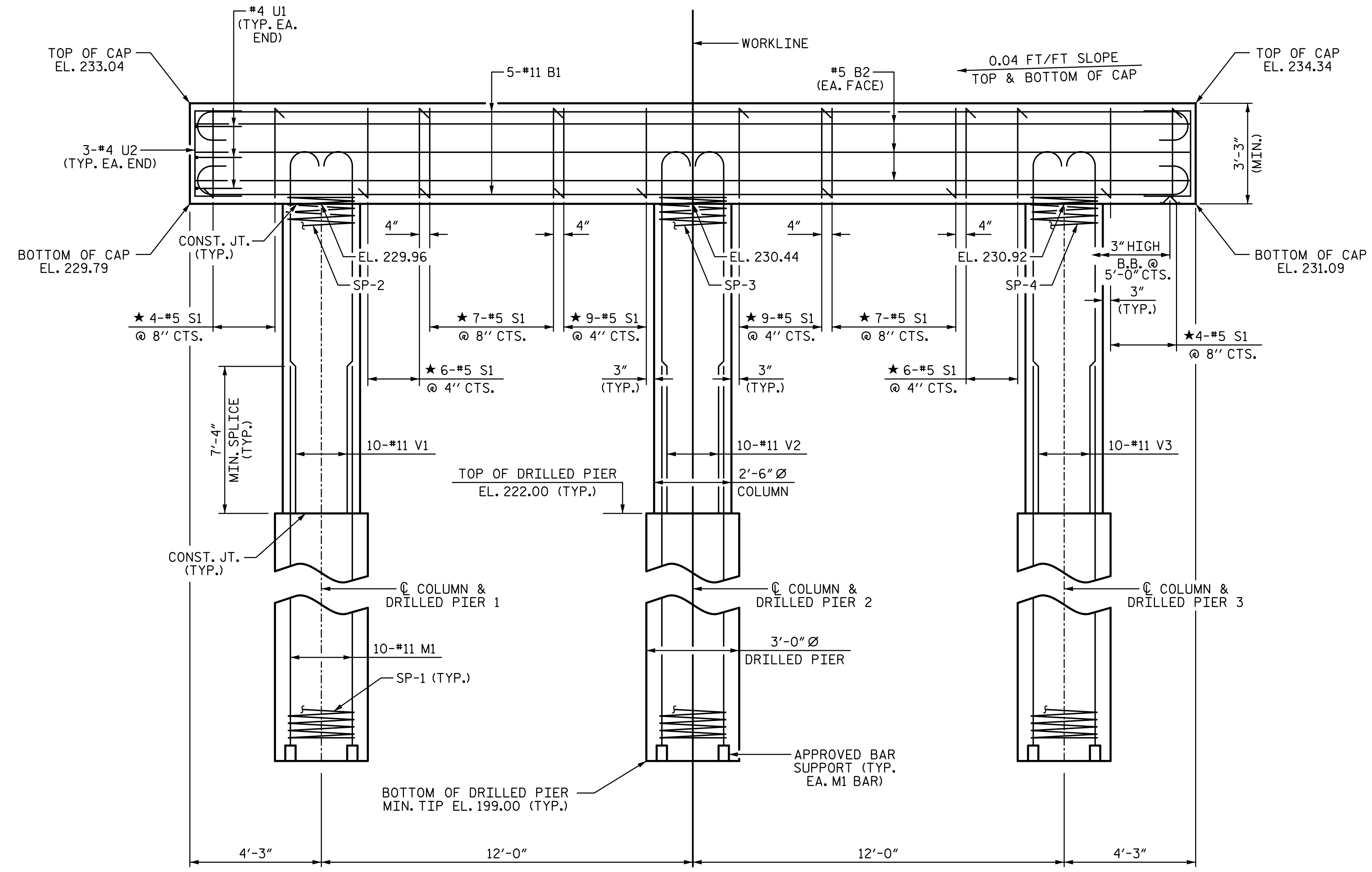
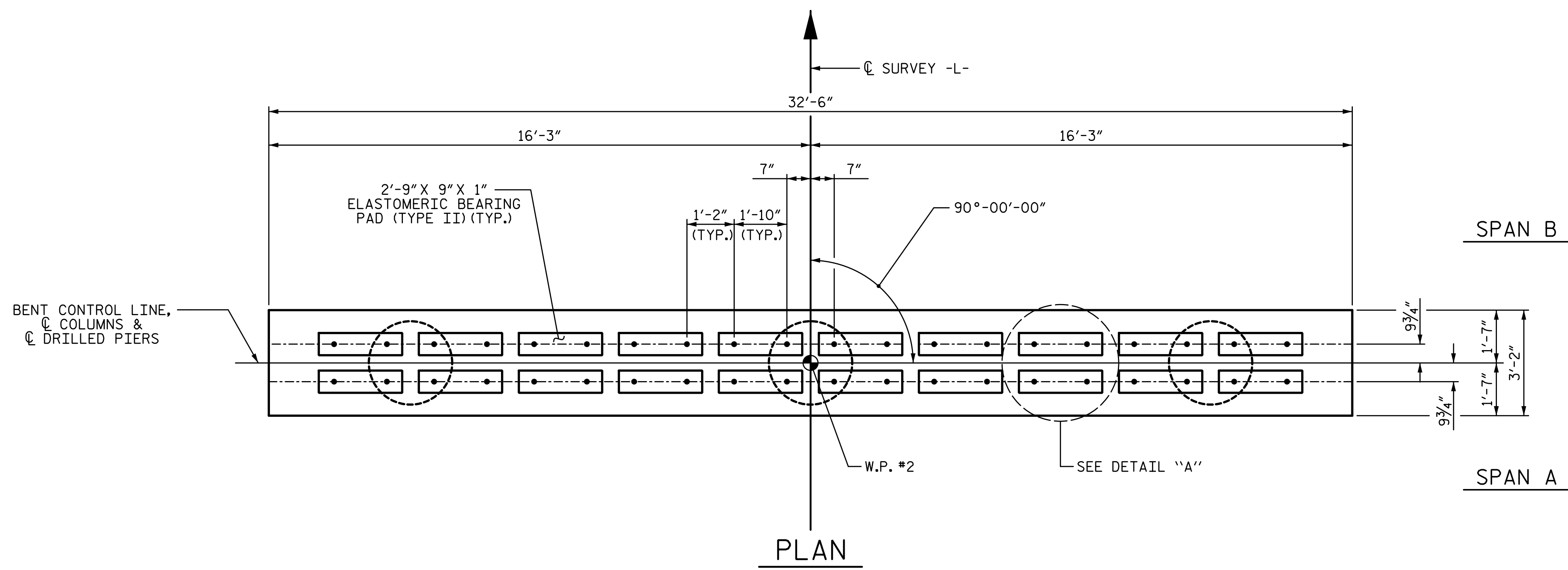
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

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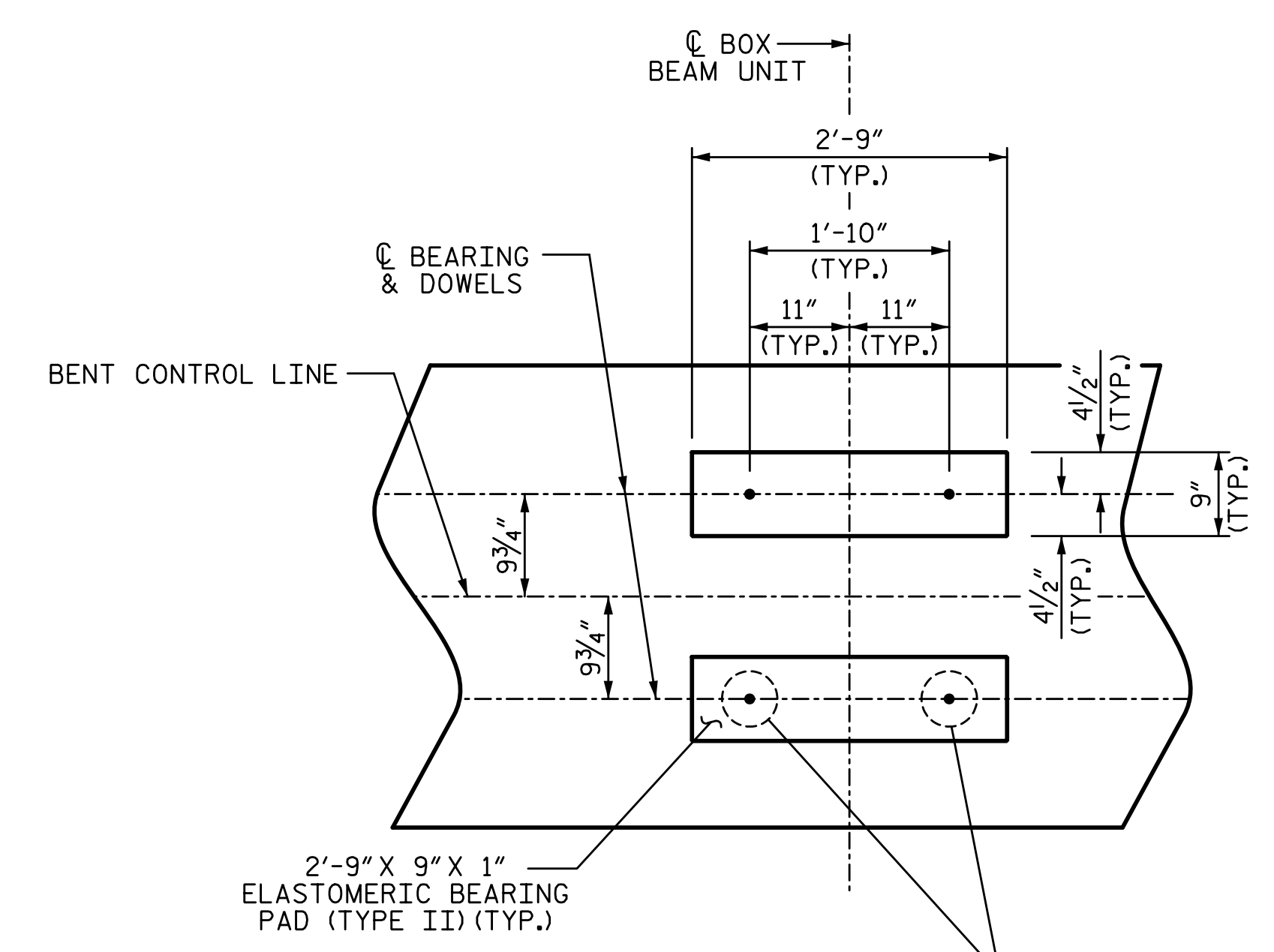


**ELEVATION**

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

**NOTES:**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- ★ INVERT ALTERNATE STIRRUPS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



**DETAIL "A"**

(DIMENSIONS ARE TYPICAL EACH BEARING)

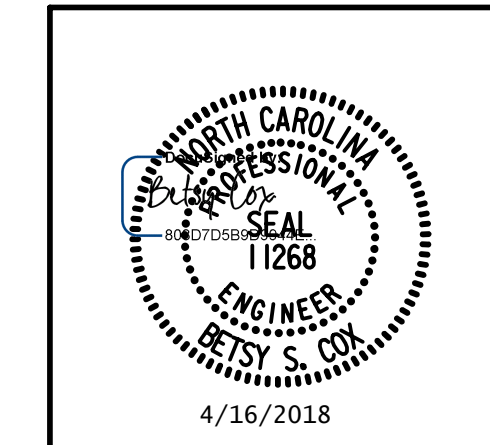
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FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

SHEET 1 OF 2

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 SUBSTRUCTURE

**BENT 1**

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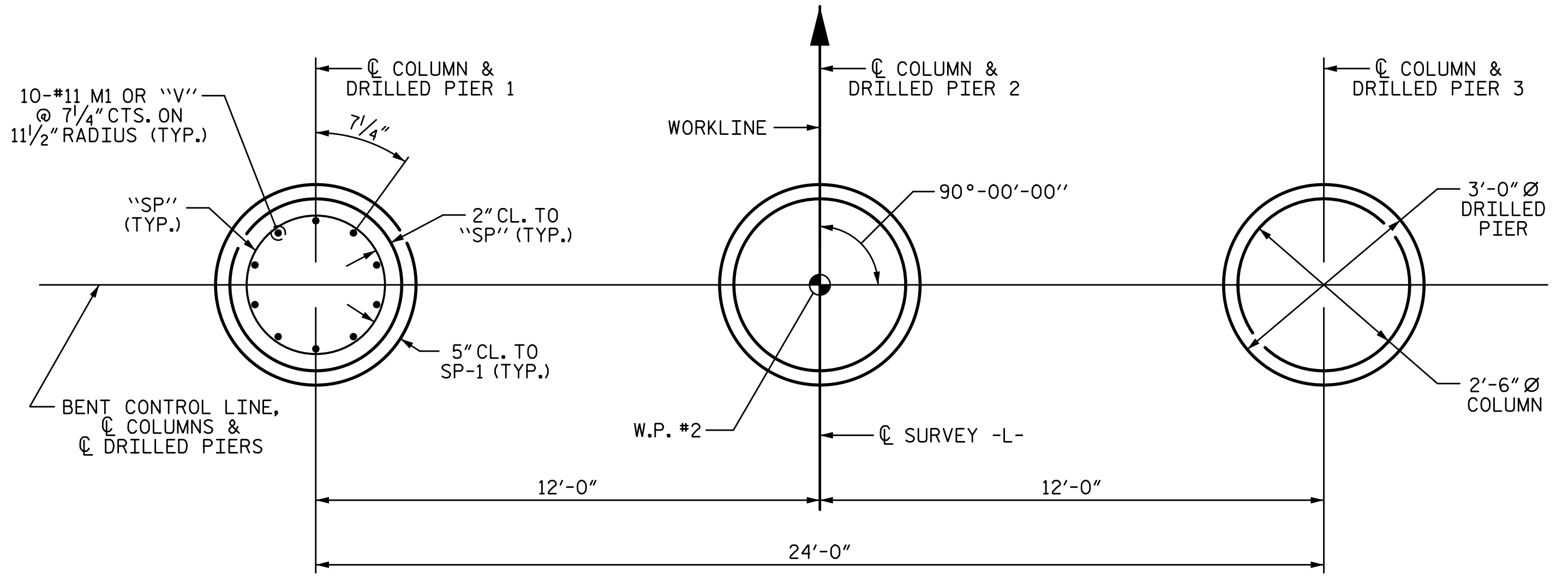
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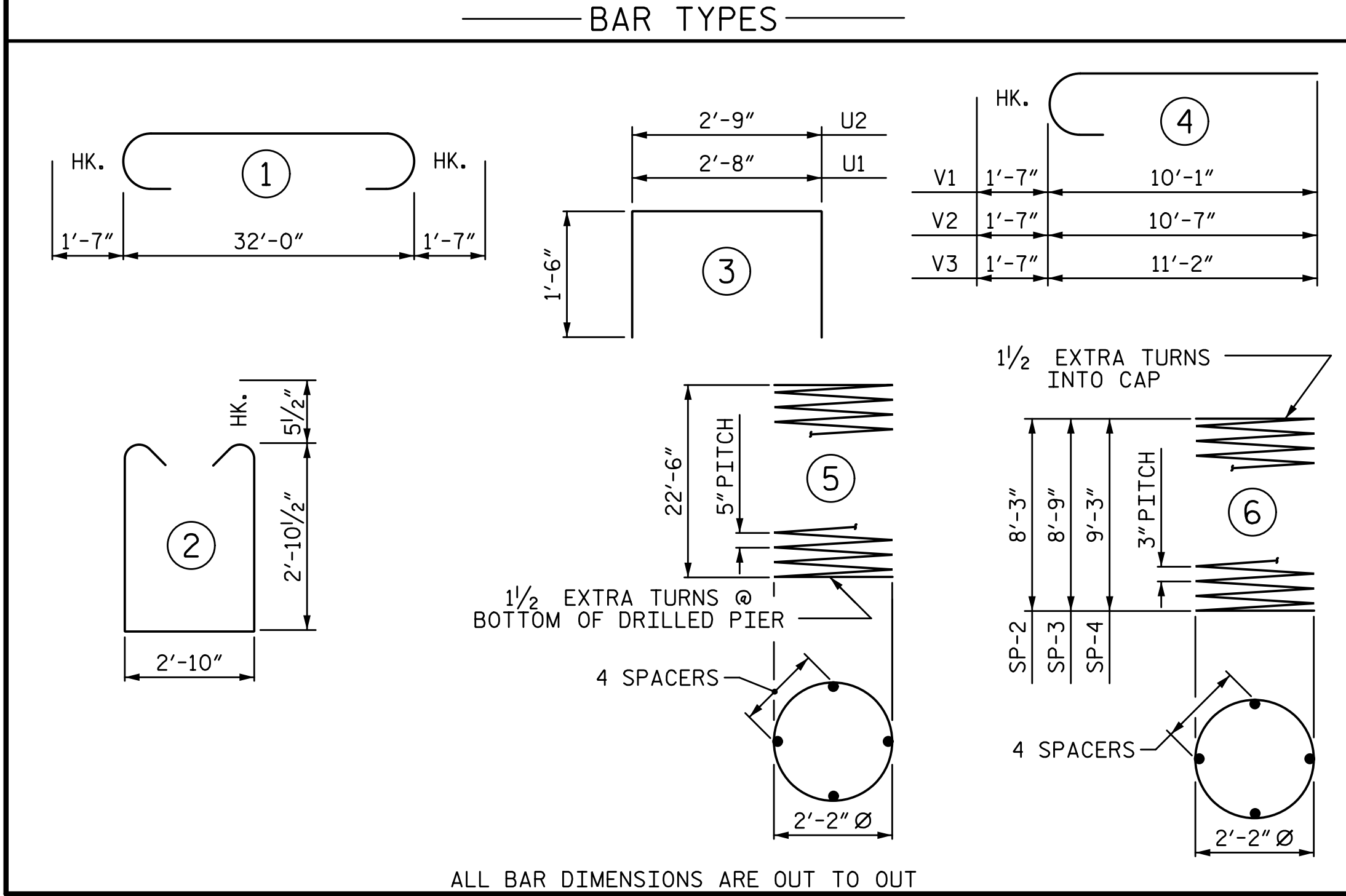
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**PLAN OF DRILLED PIERS & COLUMNS**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

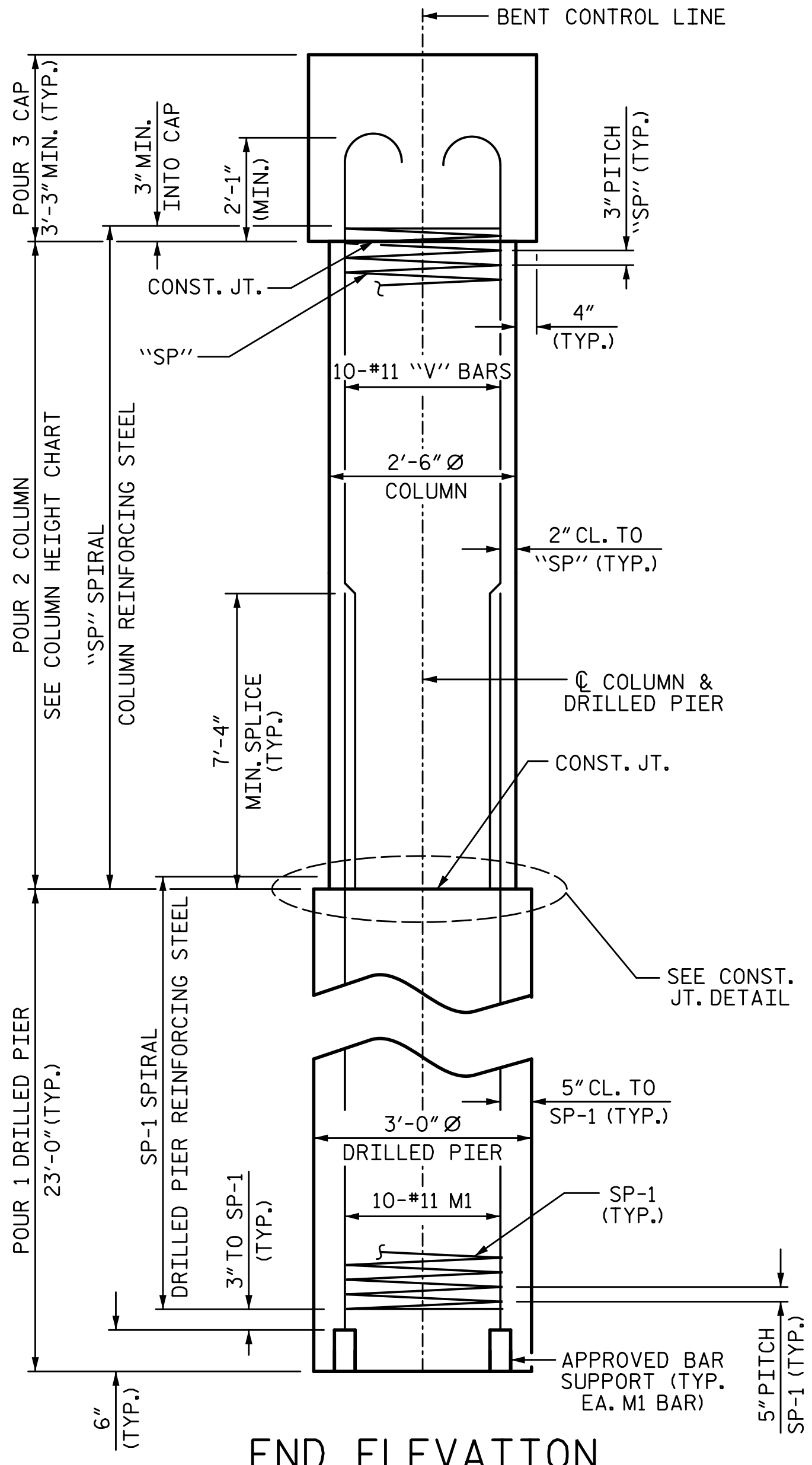
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	35'-2"	1868
B2	6	#5	STR	32'-2"	201
D1	40	#8	STR	2'-3"	240
M1	30	#11	STR	32'-10"	5233
S1	52	#5	2	9'-6"	515
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-9"	23
V1	10	#11	4	11'-8"	620
V2	10	#11	4	12'-2"	646
V3	10	#11	4	12'-9"	677

REINFORCING STEEL		10046 LBS.
SP-1	3 * 5	372'-9" 1166
SP-2	1 ** 6	233'-10" 156
SP-3	1 ** 6	247'-3" 165
SP-4	1 ** 6	260'-7" 174
SPIRAL COLUMN REINF. STEEL		1661 LBS.

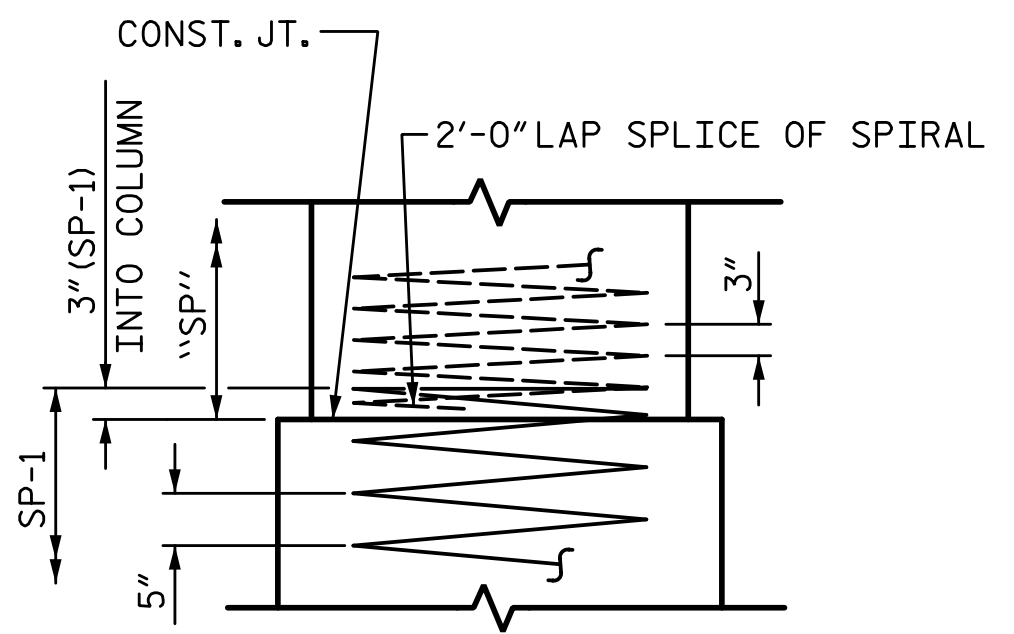
\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 \*\* THE SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR 2 (COLUMNS)	4.7 C.Y.
POUR 3 (CAP)	12.4 C.Y.
<b>TOTAL CLASS A CONCRETE</b>	<b>17.1 C.Y.</b>

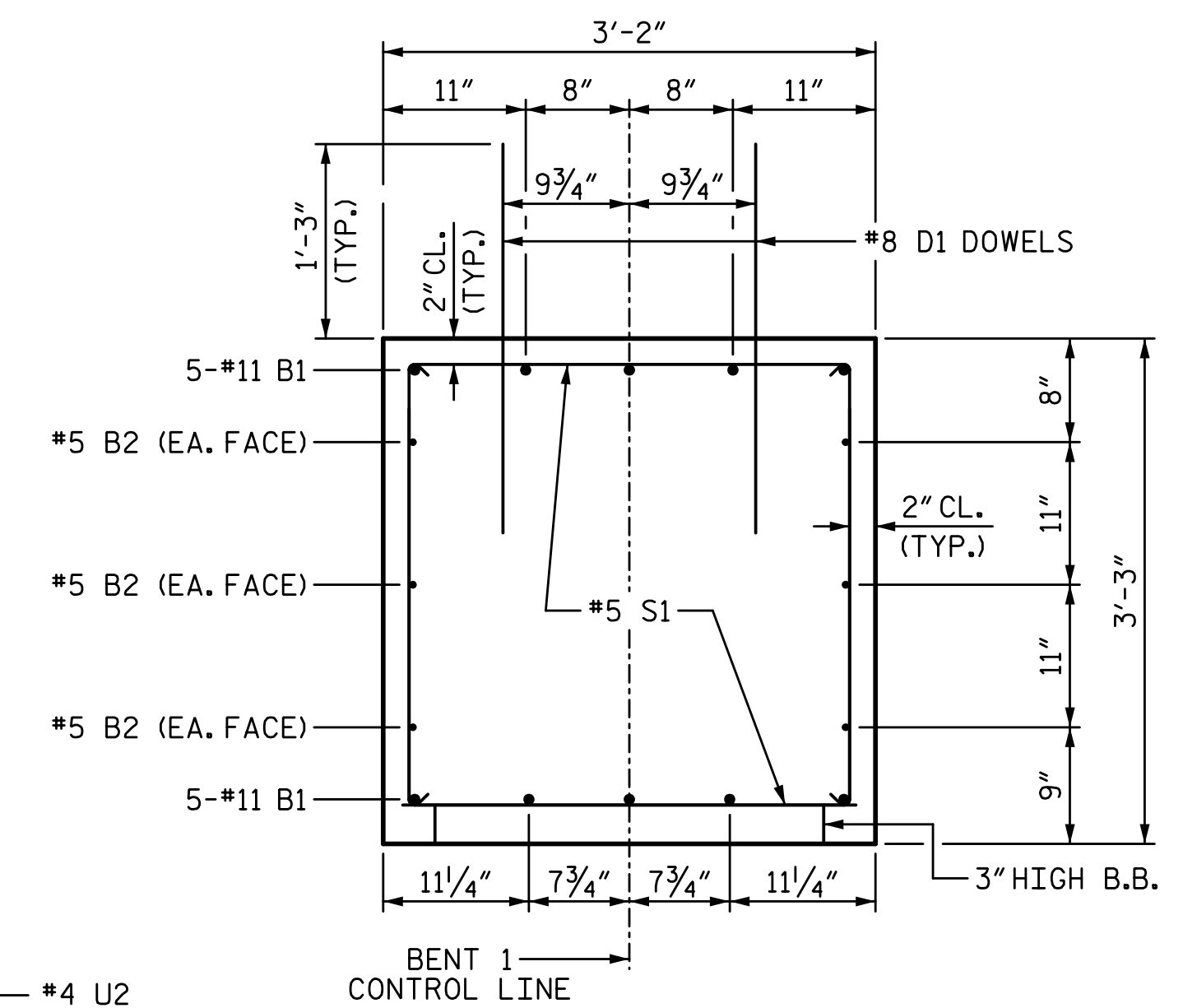
DRILLED PIERS:	
DRILLED PIER CONCRETE	
POUR 1 (DRILLED PIERS)	18.1 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	27.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	42.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	42.0 LIN. FT.
CSL TUBES	294.0 LIN. FT.



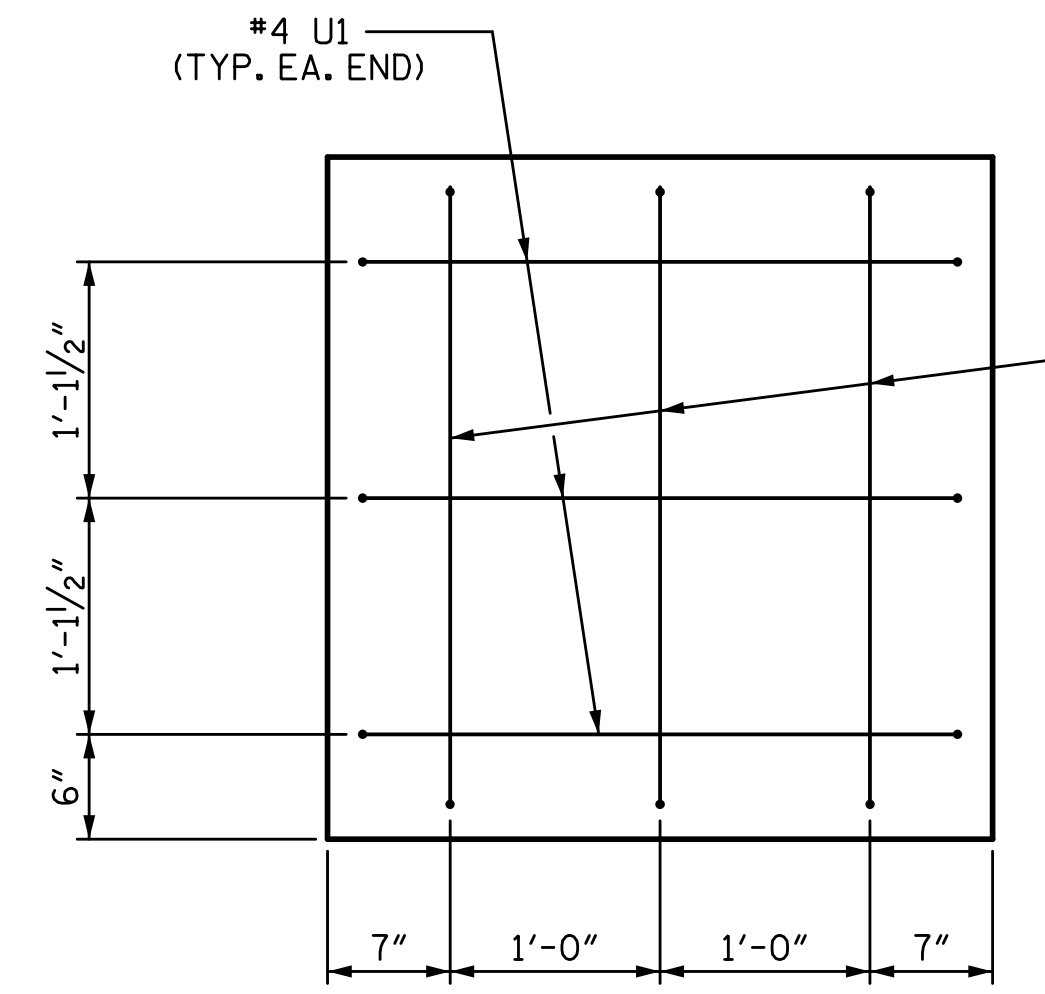
**END ELEVATION**



**CONSTRUCTION JOINT DETAIL**



**SECTION THRU CAP**

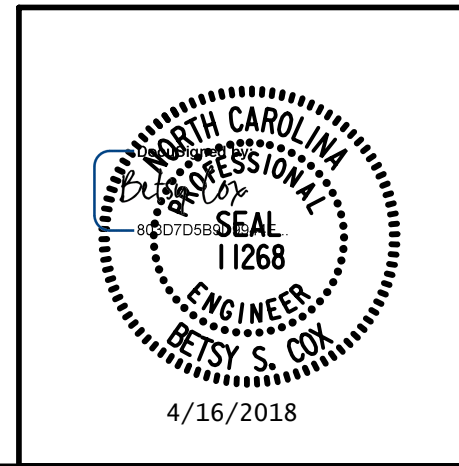


**END OF CAP VIEW (TYPICAL BOTH ENDS)**

COLUMN HEIGHT		
COLUMN 1	COLUMN 2	COLUMN 3
7'-11 1/2"	8'-5 1/4"	8'-11 1/16"

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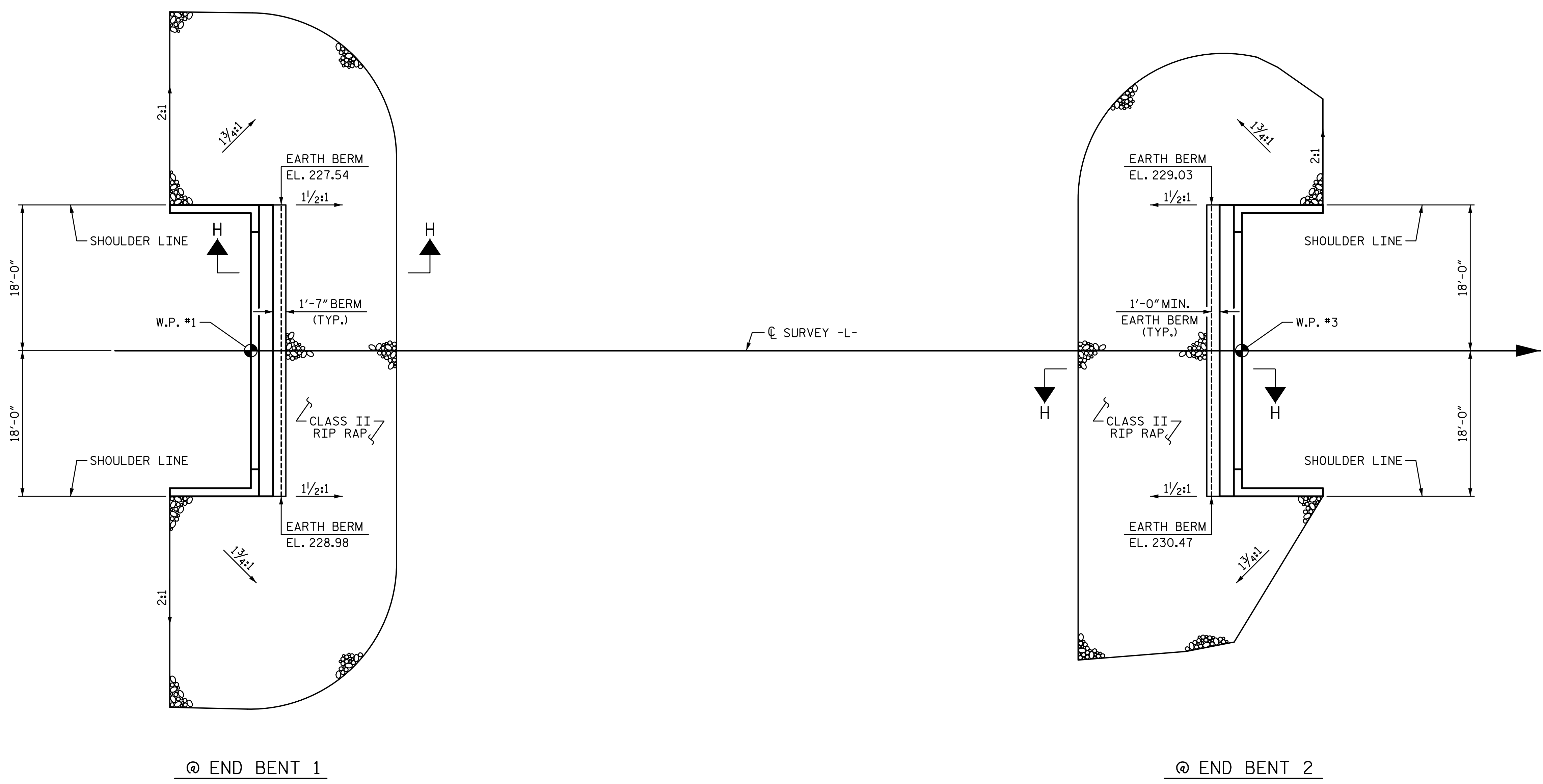
SHEET 2 OF 2

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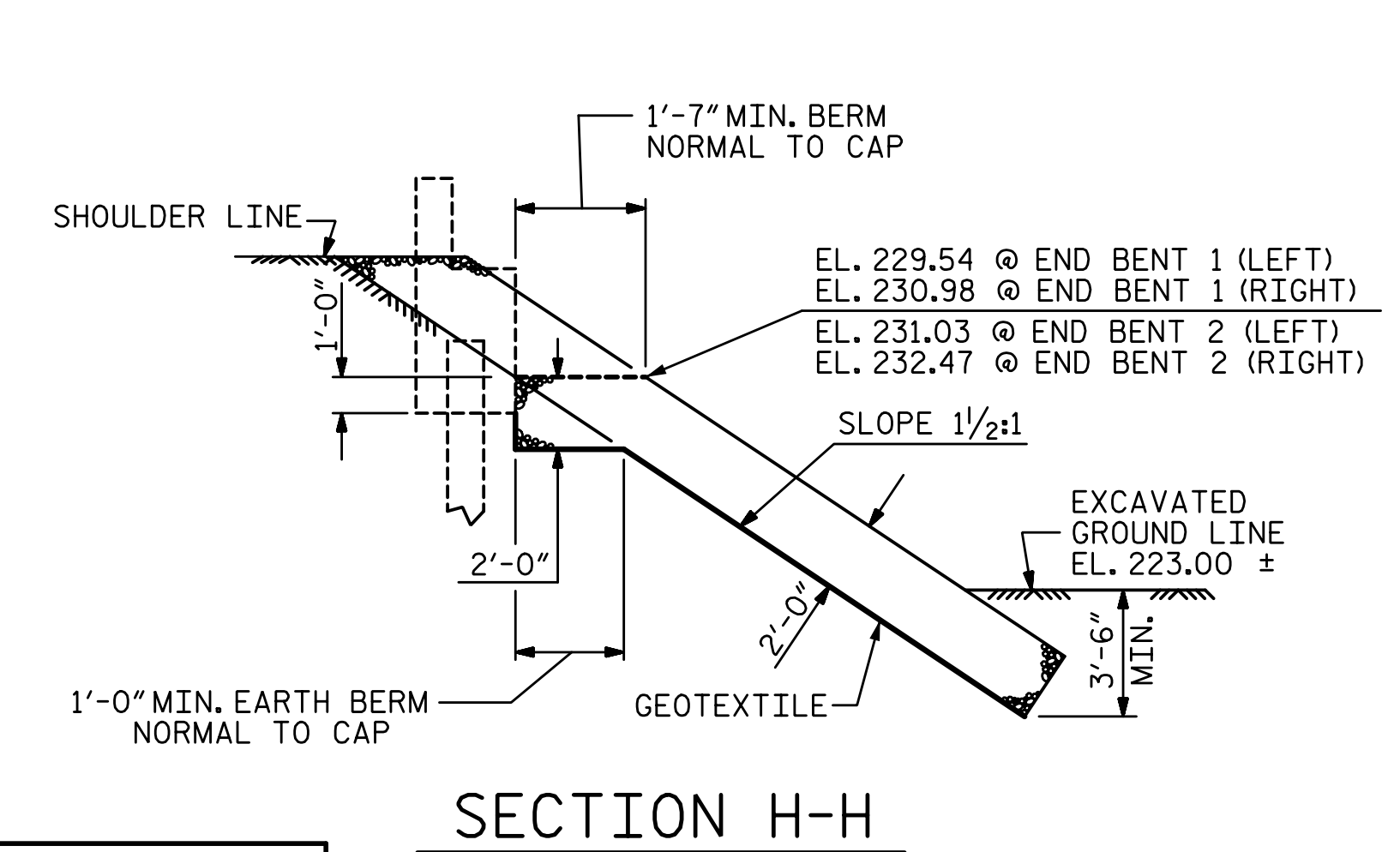
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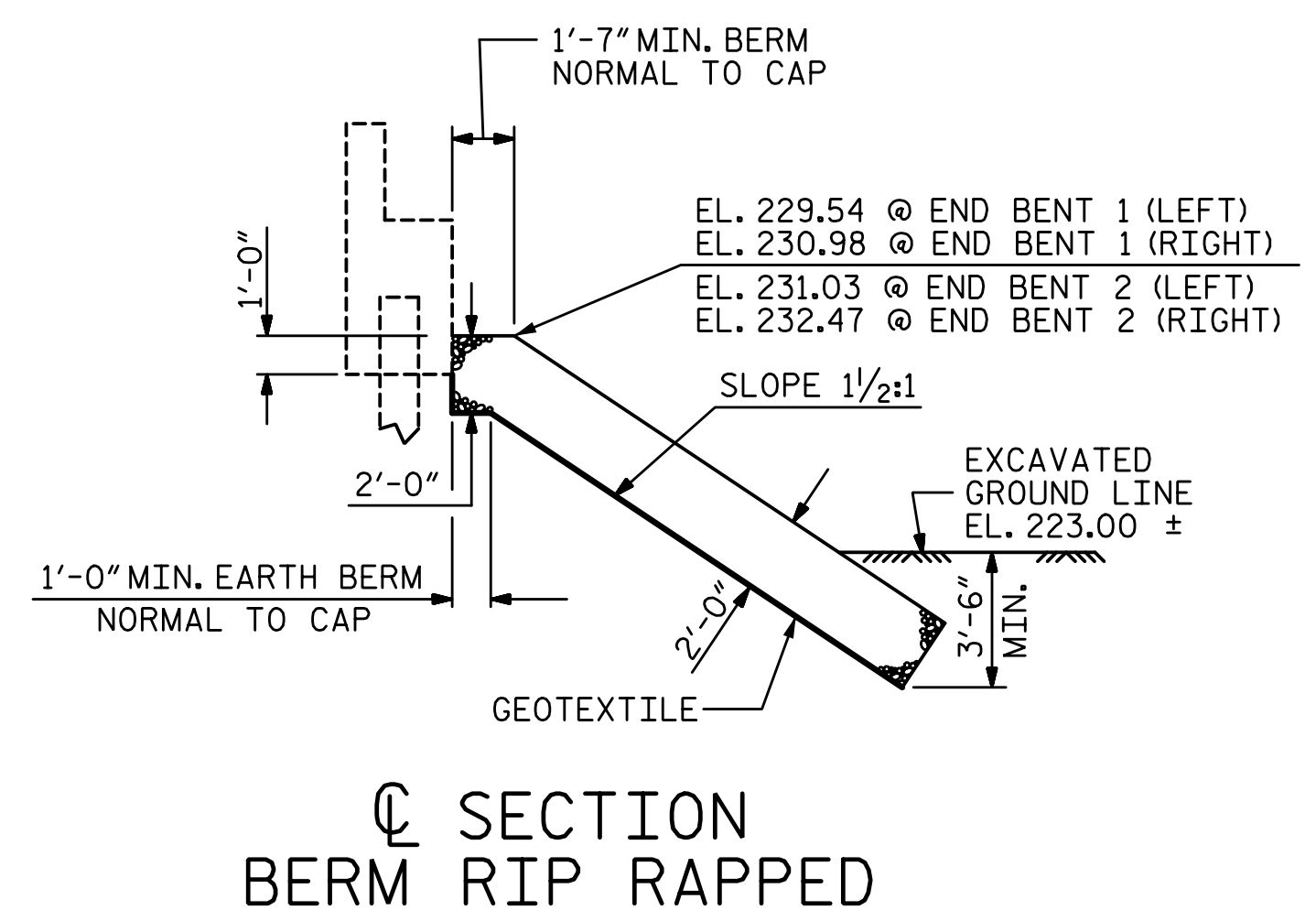


PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+65.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	200	225
END BENT 2	190	210



SECTION H-H

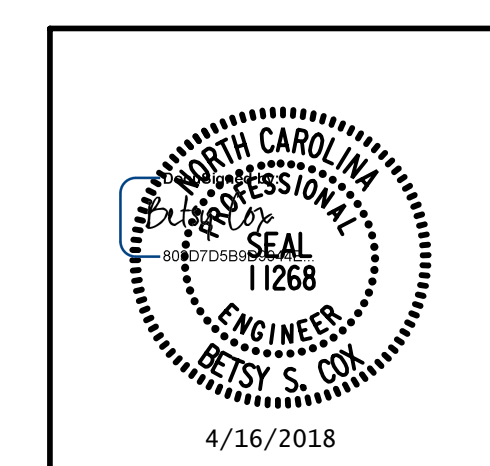


SECTION @ SECTION BERM RIP RAPPED

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FRANKLIN COUNTY  
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STATE OF NORTH CAROLINA  
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RIP RAP DETAILS



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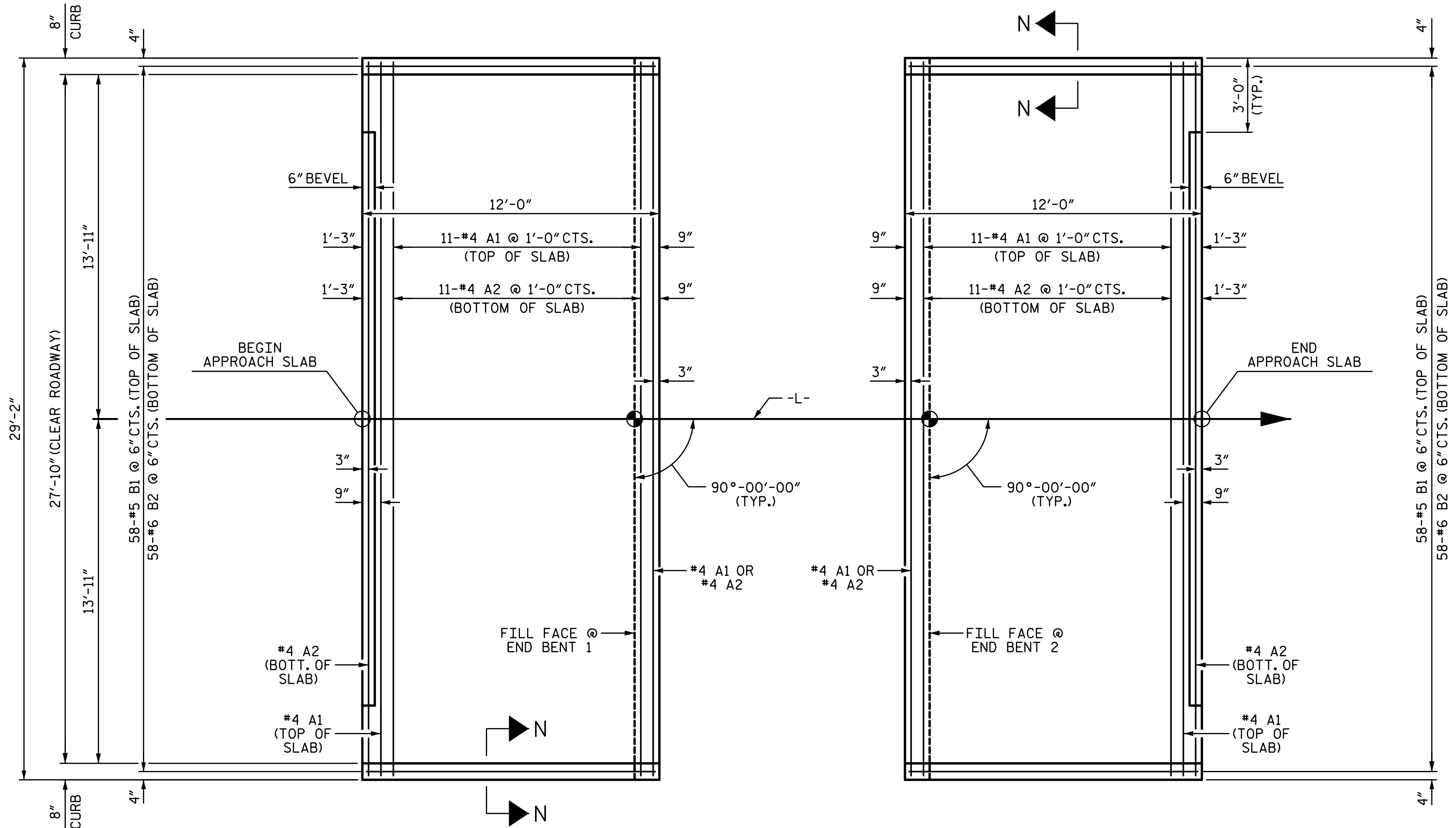
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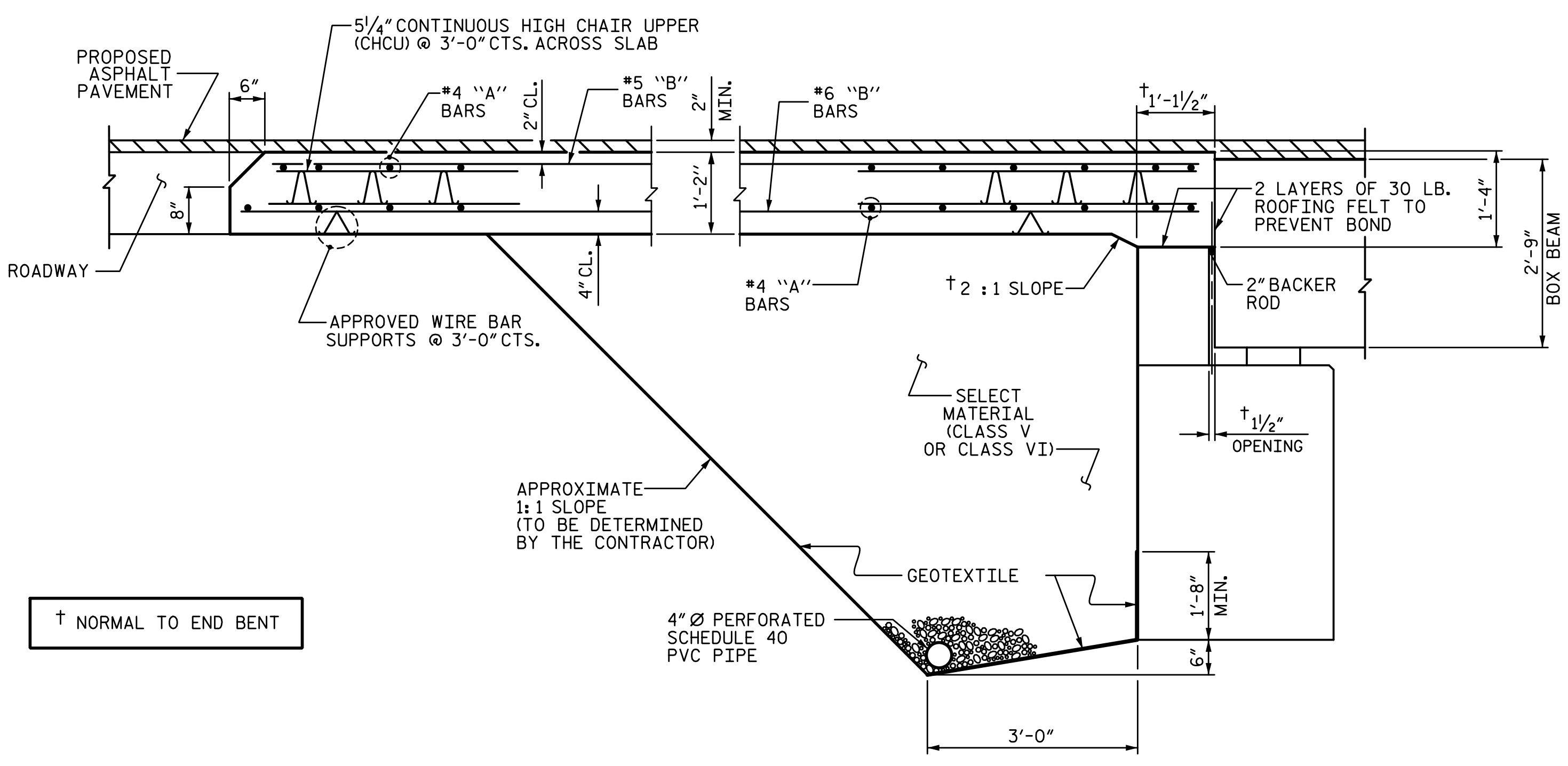
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**PLAN @ END BENT 1**      **PLAN @ END BENT 2**  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



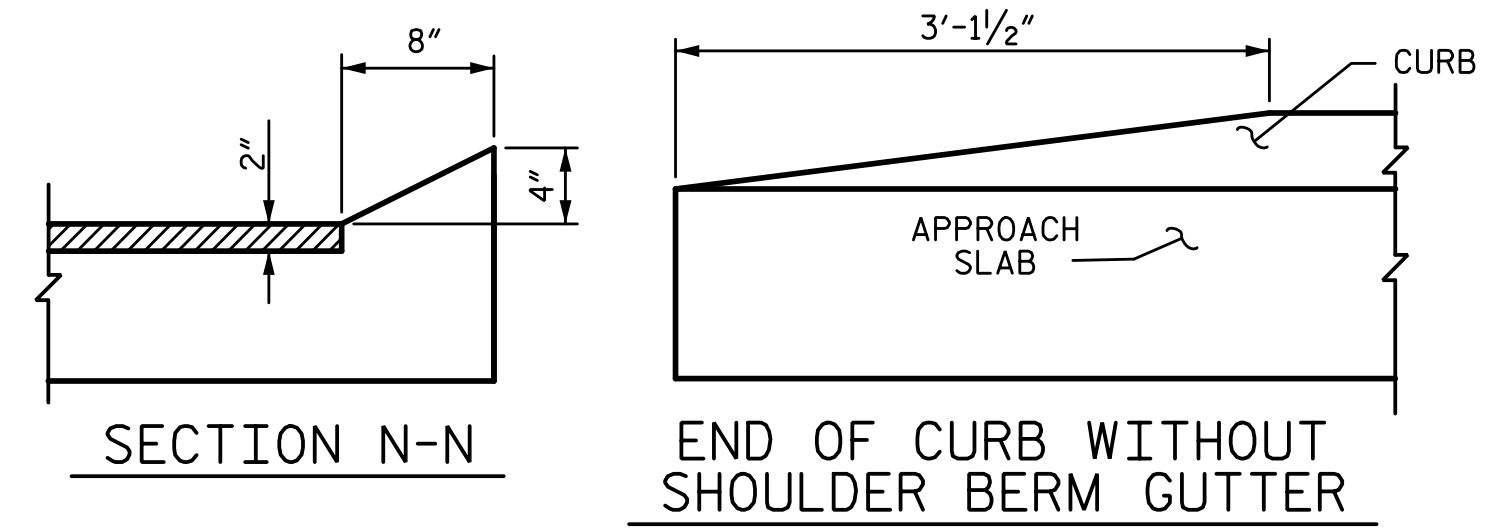
**SECTION THRU SLAB**  
 (TYPE II - MODIFIED APPROACH FILL)

**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.

**SPLICE CHART**

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



**CURB DETAILS**

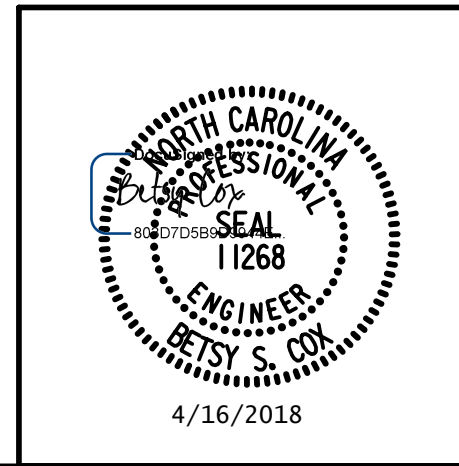
**BILL OF MATERIAL**

APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
<b>REINFORCING STEEL</b> LBS.      1266					
* EPOXY COATED REINFORCING STEEL      LBS.      926					
<b>CLASS AA CONCRETE</b> C. Y.      15.4					
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	28'-10"	250
A2	13	#4	STR	28'-10"	250
<b>REINFORCING STEEL</b> LBS.      1266					
* EPOXY COATED REINFORCING STEEL      LBS.      926					
<b>CLASS AA CONCRETE</b> C. Y.      15.4					

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SHEET 1 OF 2

PLANS PREPARED BY:  
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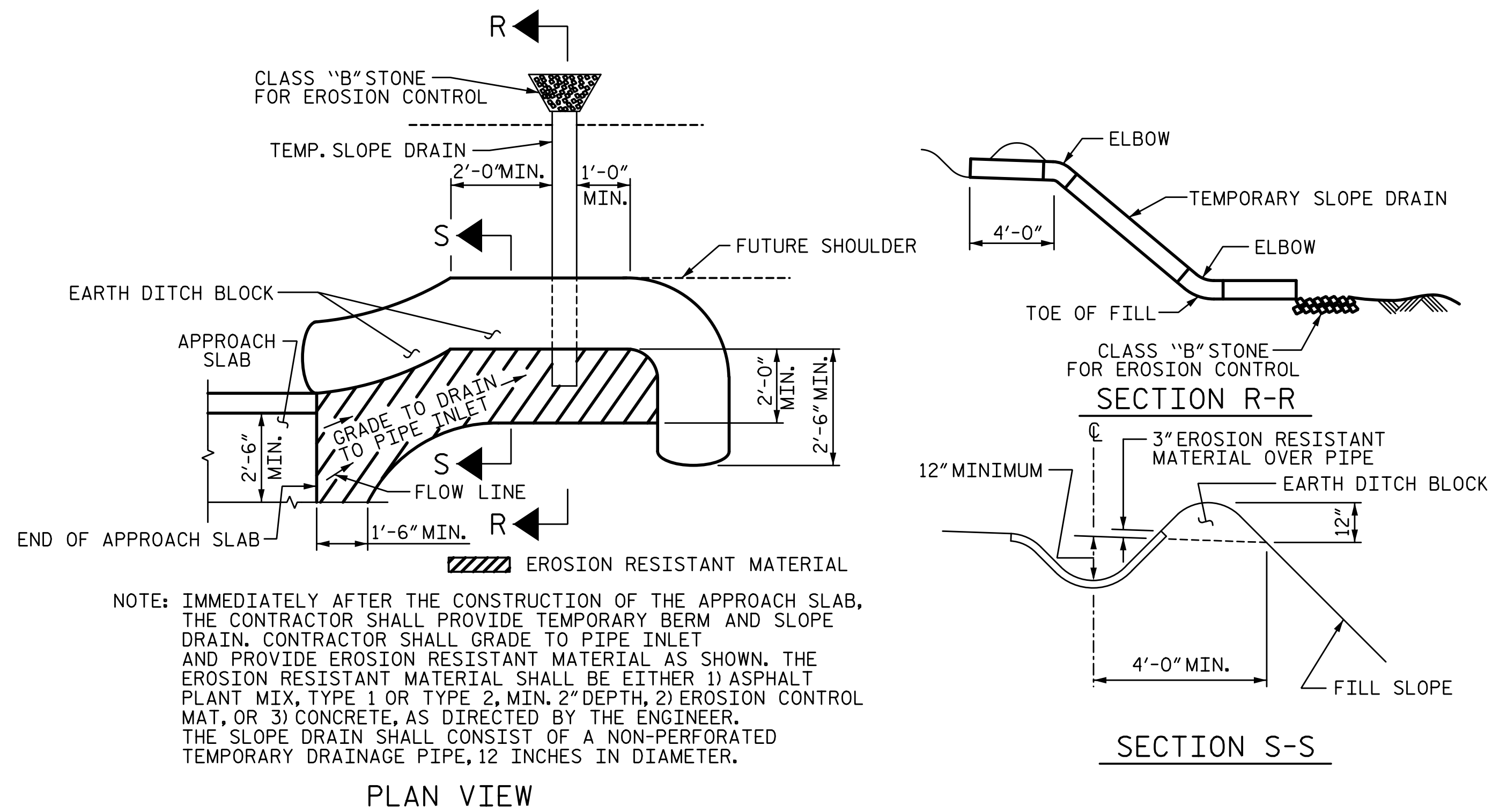
**BRIDGE APPROACH  
 SLAB FOR PRESTRESSED  
 CONCRETE BOX  
 BEAM UNIT**  
 (SUB-REGIONAL TIER)-90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			21

DRAWN BY: T. BANKOVICH      DATE: 4-18  
 CHECKED BY: B.S. COX      DATE: 4-18  
 DESIGN ENGINEER OF RECORD: B.S. COX      DATE: 4-18

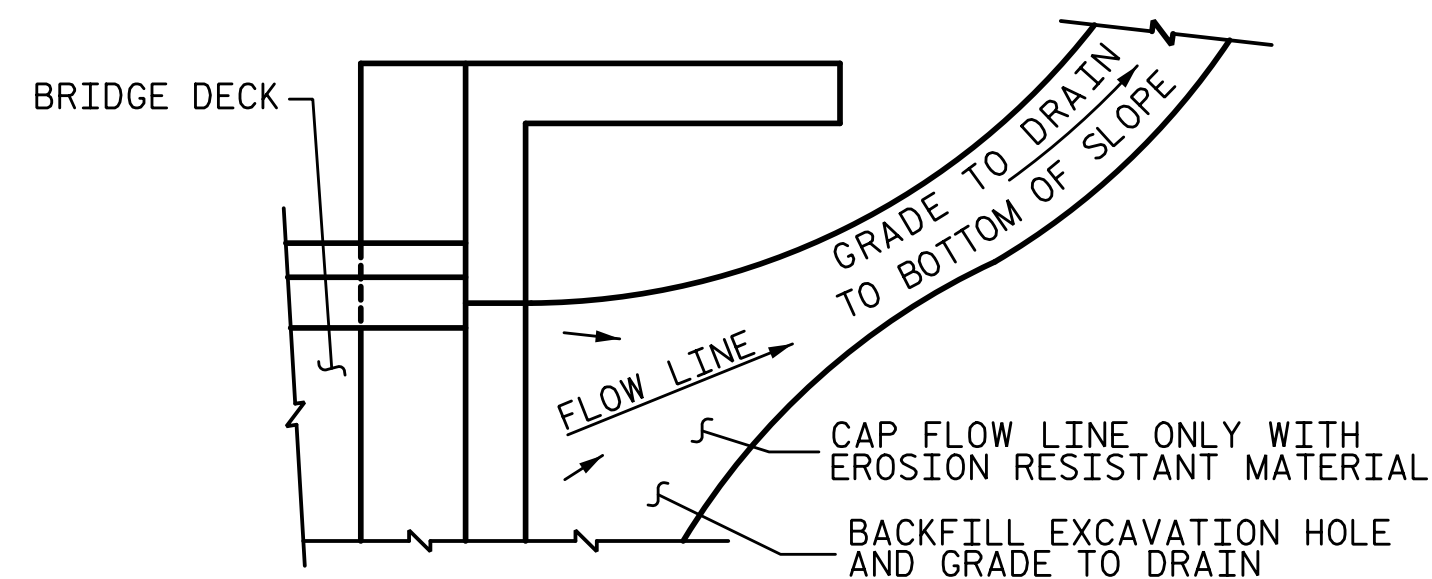
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

4/16/2018 11:26:40 AM G:\Projects\2016\Division 5 (Mott Macdonald)\17BP5R71 Franklin #25 (90 33BBU VCB)\Structures\Drawings\Final\401\_17BP5R71\_SMU\_AS.dgn



### TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS 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

PROJECT NO. 17BP.5.R.71  
FRANKLIN COUNTY  
 STATION: 14+65.00 -L-

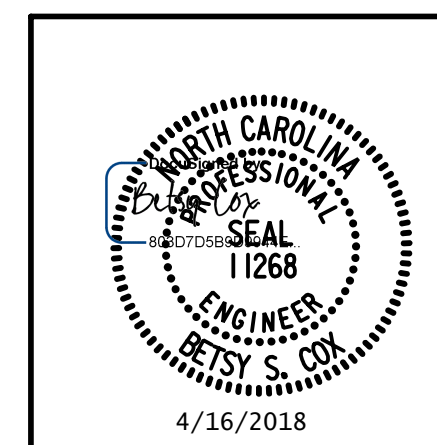
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### BRIDGE APPROACH SLAB DETAILS

PLANS PREPARED BY:

**SE & A**  
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 (919) 852-0468  
 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521



REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-21
2			4			TOTAL SHEETS 21

DRAWN BY: T. BANKOVICH	DATE: 4-18
CHECKED BY: B.S. COX	DATE: 4-18
DESIGN ENGINEER OF RECORD: B.S. COX	DATE: 4-18

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