

09/08/19

See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**MONTGOMERY COUNTY**

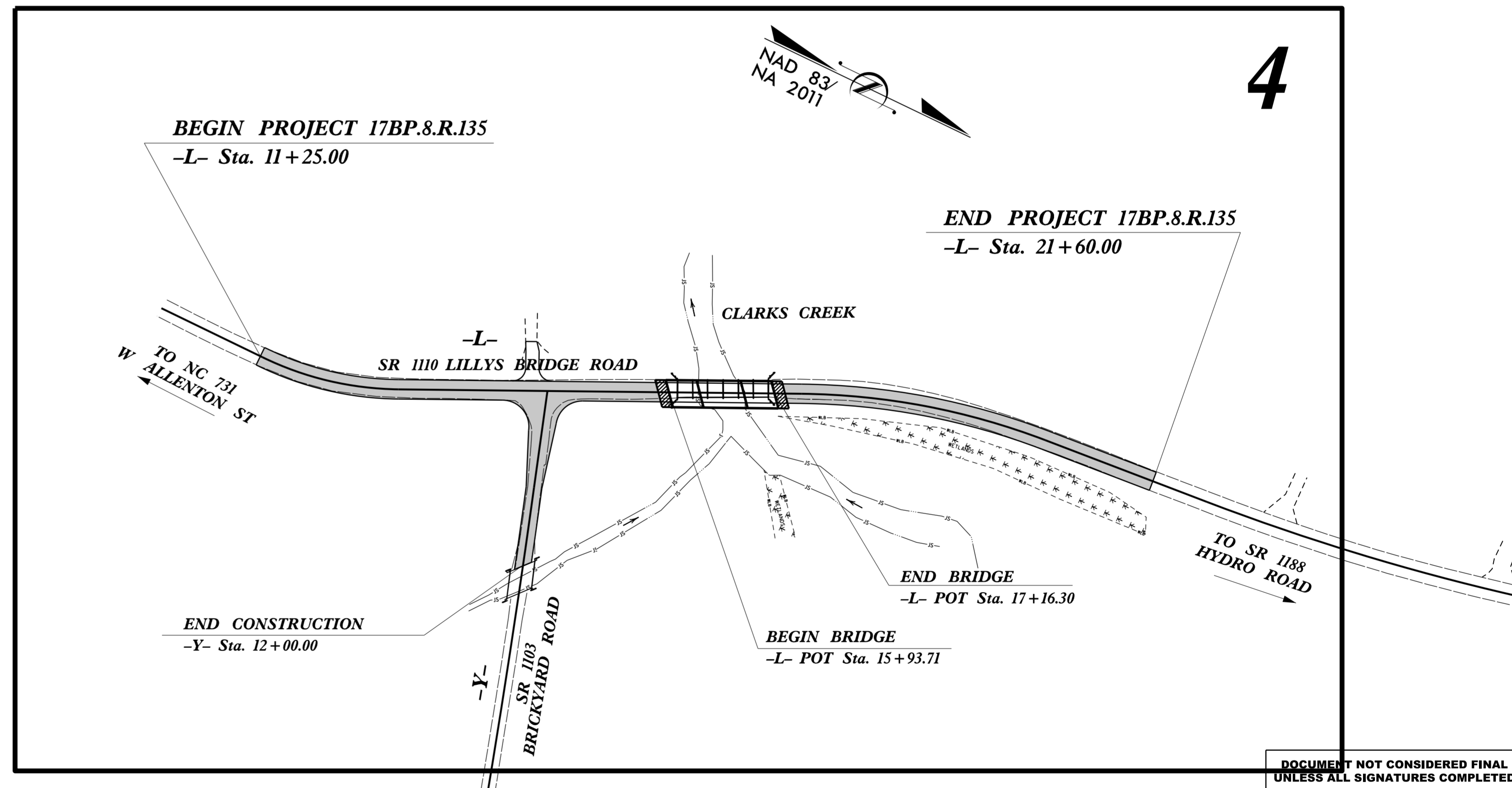
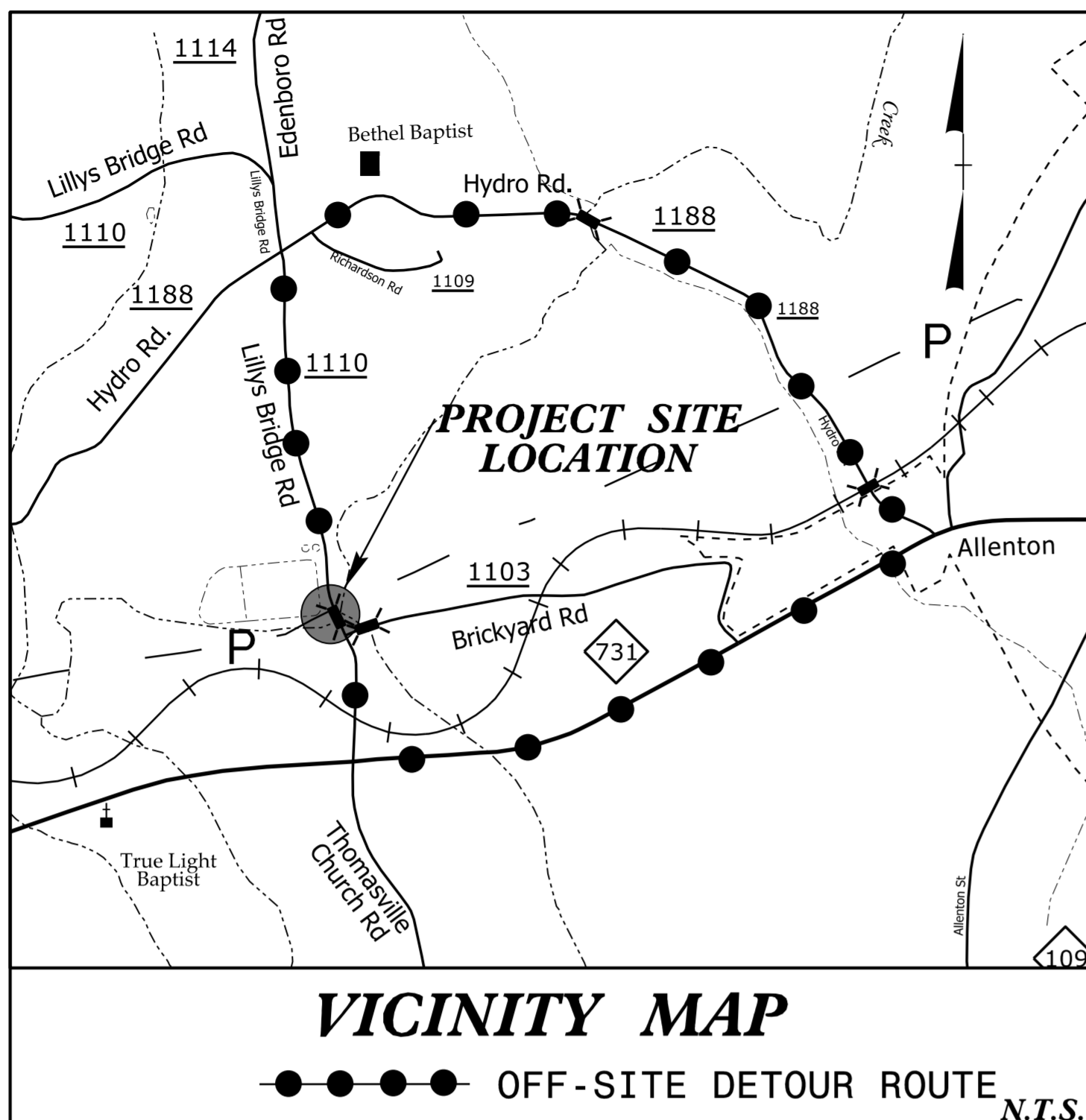
**LOCATION: BRIDGE 610190 OVER CLARKS CREEK  
ON SR 1110 (LILLYS BRIDGE ROAD)**

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

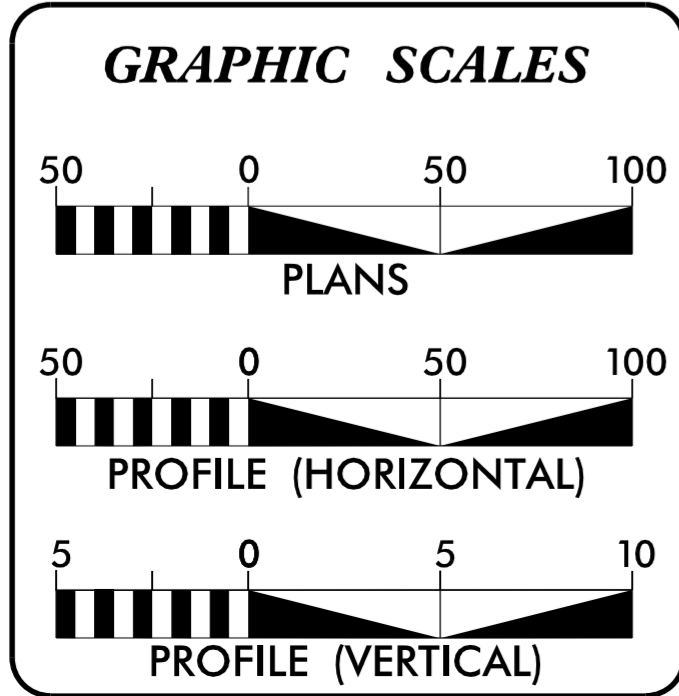
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.8.R.135	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.8.PE.135		P.E.	
17BP.8.ROW.135		R/W	
17BP.8.R.135		CONST.	

**PROJECT: 17BP.8.R.135**

**CONTRACT:**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2015 =	480
ADT 2025 =	960
K =	%
D =	%
T =	6 % *
V =	40 MPH
* TTST =	DUAL
FUNC CLASS =	LOCAL
SUBREGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT 17BP.8.R.135	=	0.173 mi
LENGTH STRUCTURE PROJECT 17BP.8.R.135	=	0.023 mi
TOTAL LENGTH OF PROJECT 17BP.8.R.135	=	0.196 mi

**PLANS PREPARED BY:**  
**CH ENGINEERING**  
3220 GLEN ROYAL RD, RALEIGH, NC 27617  
TELE 919.788.0224 FAX 919.788.0232  
NC LICENSE #P-0189

**2018 STANDARD SPECIFICATIONS**

**RIGHT OF WAY DATE:**  
MARCH 16, 2021

**LETTING DATE:**  
SEPTEMBER 28, 2021

**PLANS PREPARED FOR:**  
**DIVISION OF HIGHWAYS  
DIVISION 8**  
121 DOT Drive  
Carthage, NC 28327

**BRIAN A. WILES, PE**  
PROJECT ENGINEER

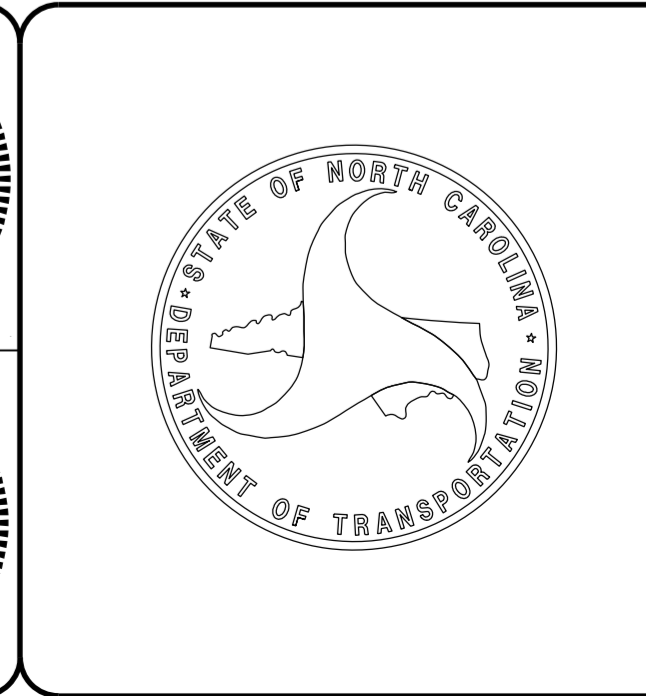
**TIM WELCH, PE**  
NCDOT CONTACT  
DIV 8 BRIDGE PROGRAM MANAGER

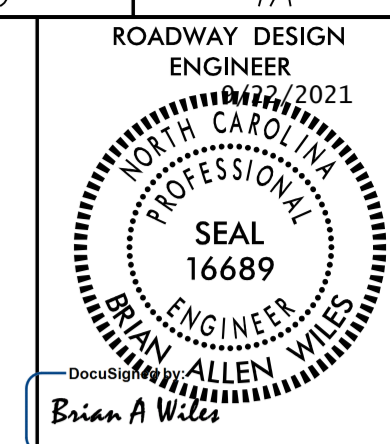
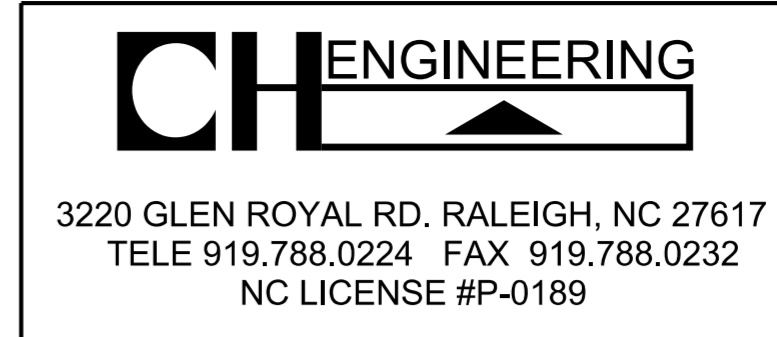
**HYDRAULICS ENGINEER**  
NCDOT  
Hydraulics Unit  
Raleigh, NC  
6/17/2021

DocuSigned by:  
**Erik Selen**  
SIGNATURE:

**ROADWAY DESIGN ENGINEER**  
6/17/2021

DocuSigned by:  
**Brian A Wiles**  
SIGNATURE:





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

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS No. 1 THRU 3, PAVED SHOULDER FOR -L-, INCIDENTAL MILLING AND WEDGING DETAILS
2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS No. 4 AND 5, AND PAVED SHOULDER FOR -Y- DETAILS
2C-1	GUARDRAIL INSTALLATION - SHEET 6 OF 8
2C-2	GUARDRAIL INSTALLATION - DETAIL A.T.-1 SYSTEM
2C-3	DETAIL OF STRUCTURE ANCHOR UNIT, TYPE III
3B-1	SUMMARIES OF EARTHWORK, GUARDRAIL, ASPHALT PAVEMENT REMOVAL AND SHOULDER BERM GUTTER
3D-1	LIST OF PIPES, ENDWALLS, ETC. (for PIPES 48" & UNDER)
4	PLAN SHEET
5	PROFILE SHEET
RW-01 THRU RW-04	RIGHT OF WAY SHEETS
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UC-1 THRU UC-7	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-20	CROSS-SECTIONS
S-1 THRU S-20	STRUCTURE PLANS

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

**GRADE LINE:  
GRADING AND SURFACING:**

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

**CLEARING:**

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

**SIDE ROADS:**

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

**SUBSURFACE DRAINS:**

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

**GUARDRAIL:**

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

**TEMPORARY SHORING:**

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

**END BENTS:**

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

**UTILITIES:**

UTILITY OWNERS ON THIS PROJECT ARE Duke Energy - Power (Transmission and Distribution), Spectrum - Communications, Town of Mt. Gilead - Sewer and Montgomery County - Water.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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
DIVISION 2 - EARTHWORK	
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
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
300.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
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
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 01-16-2018  
REV.

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

### BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

### 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	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

### RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

### RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easement Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite RW Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage / Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

### VEGETATION:

Single Tree	
Single Shrub	

Note: Not to Scale

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

Hedge	
Woods Line	
Orchard	
Vineyard	

### EXISTING STRUCTURES:

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

### UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

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

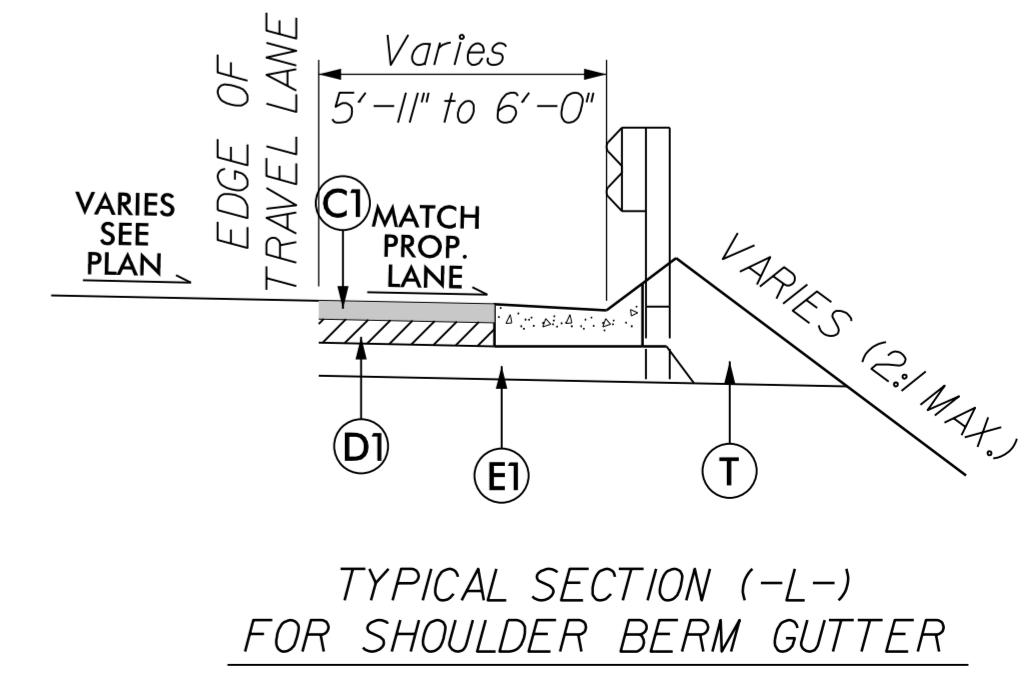
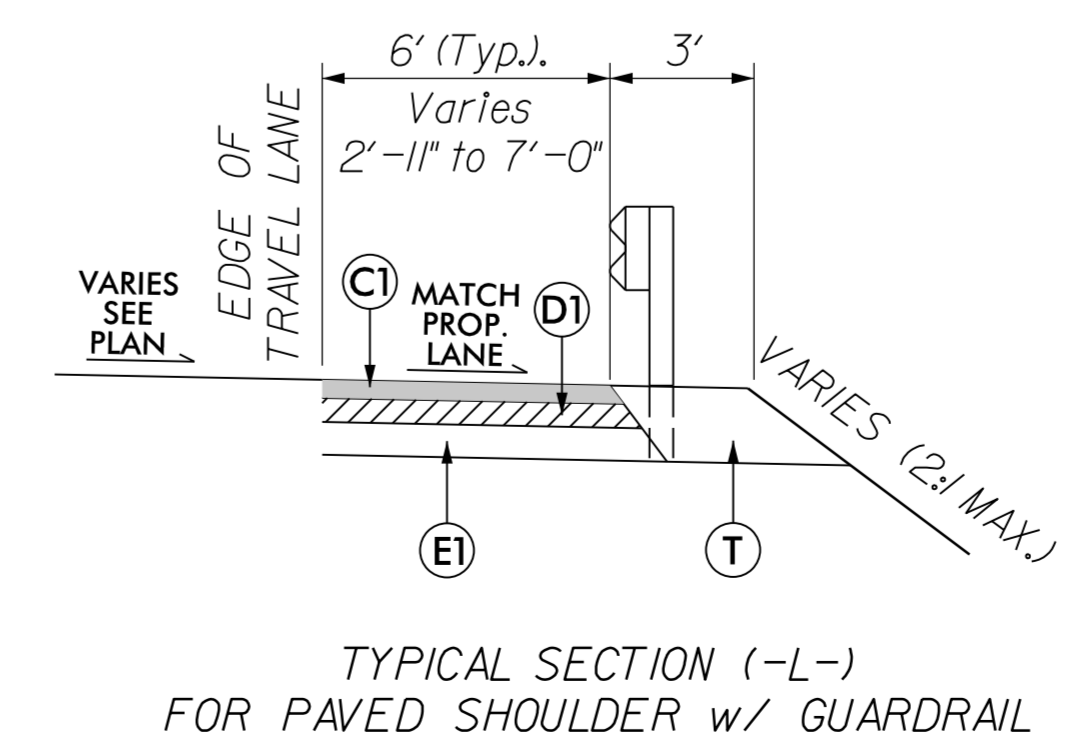
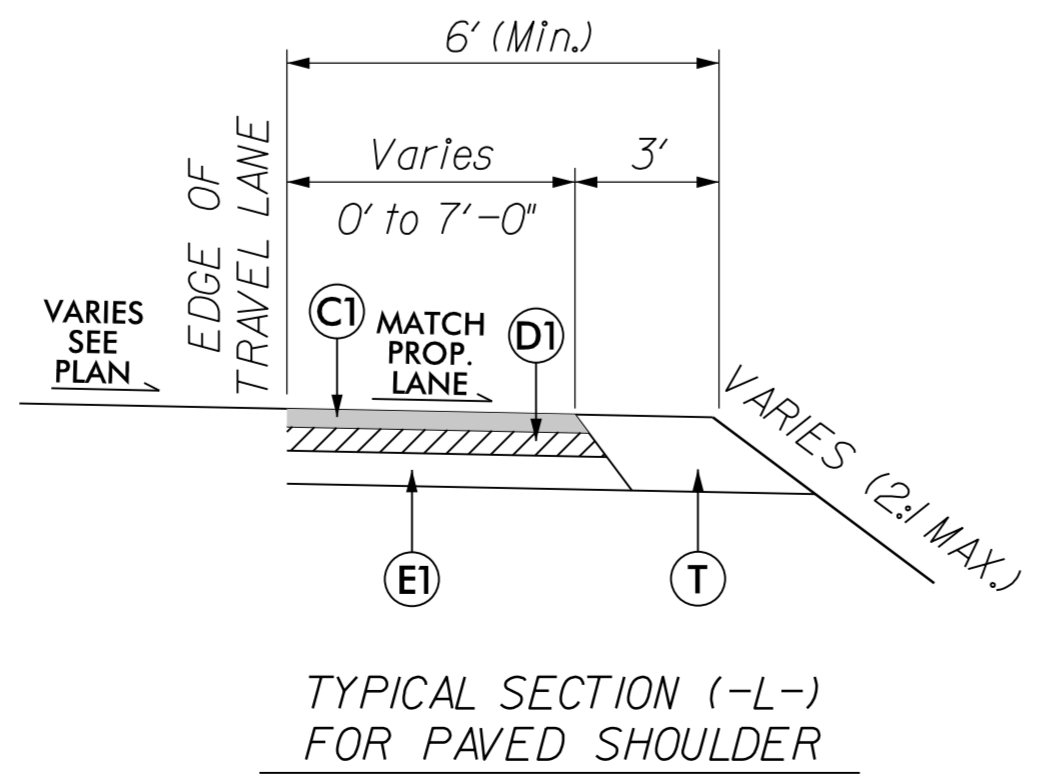
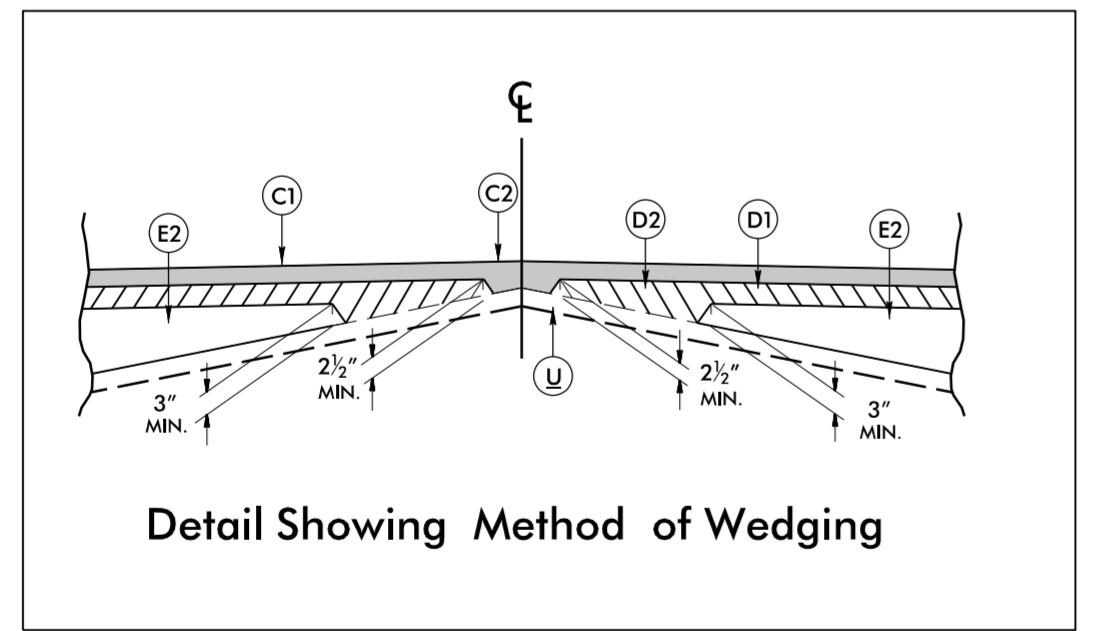
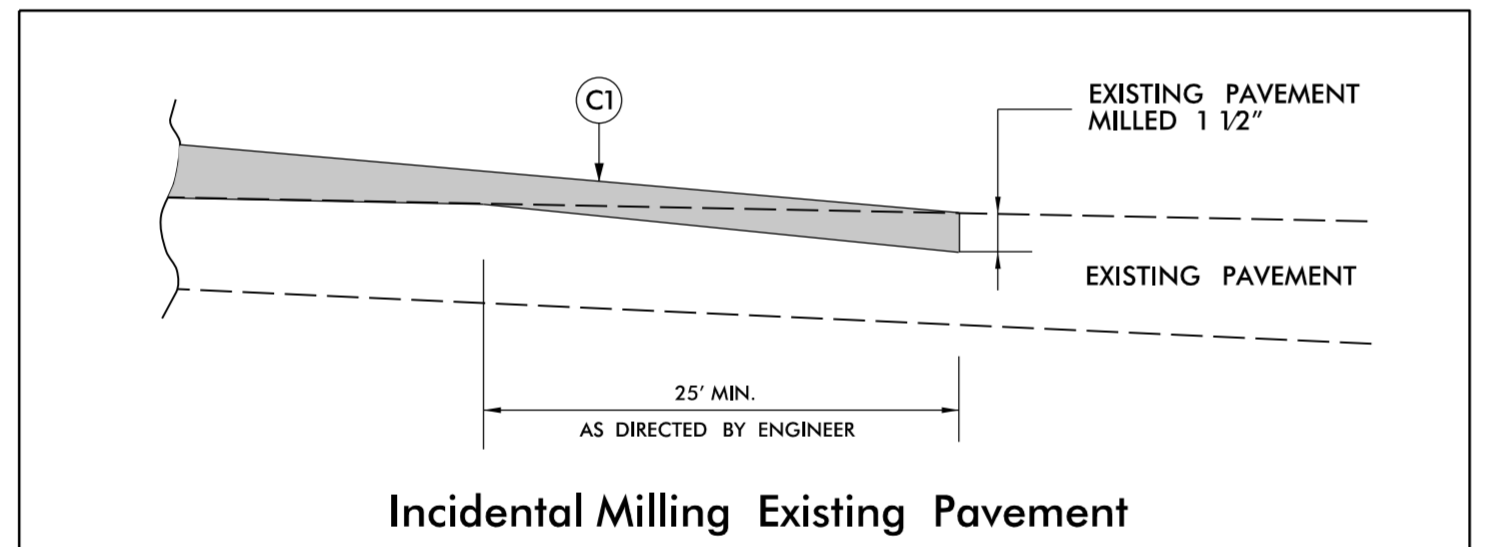
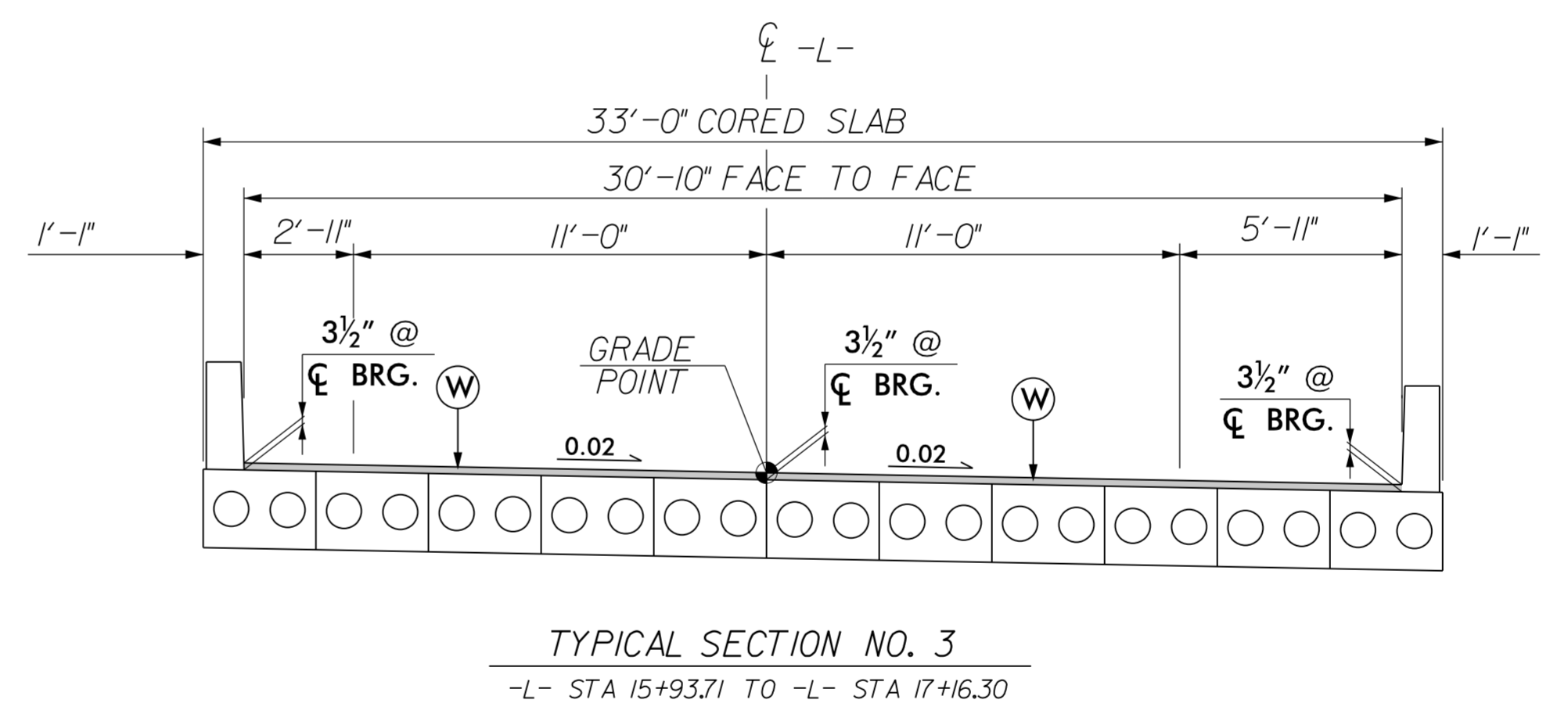
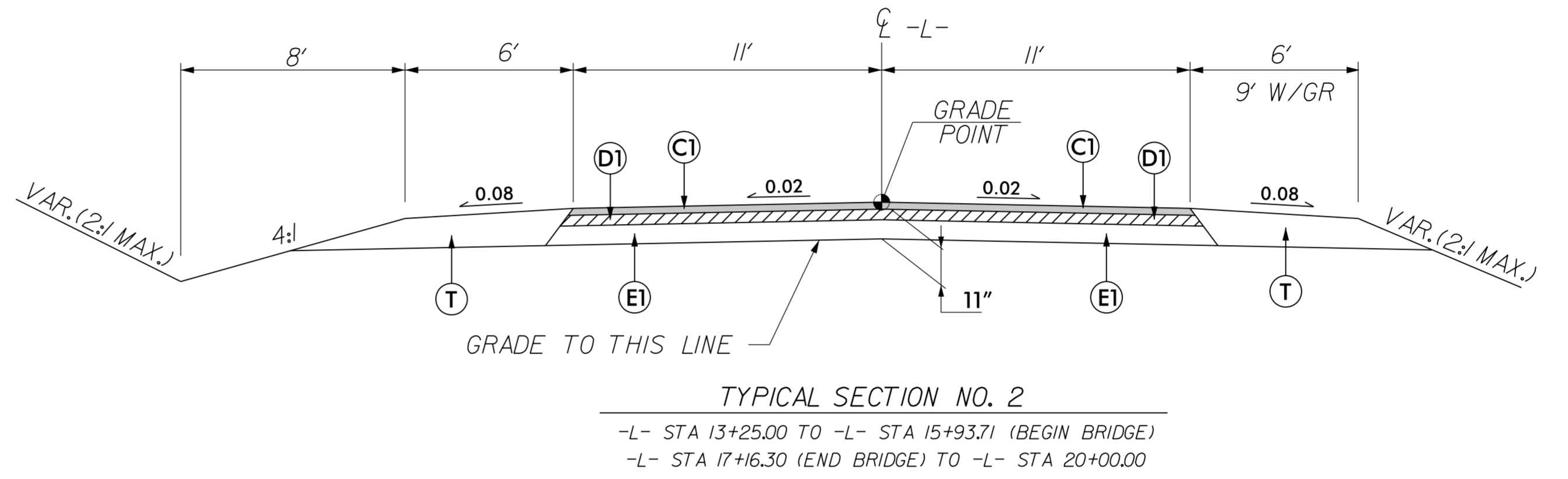
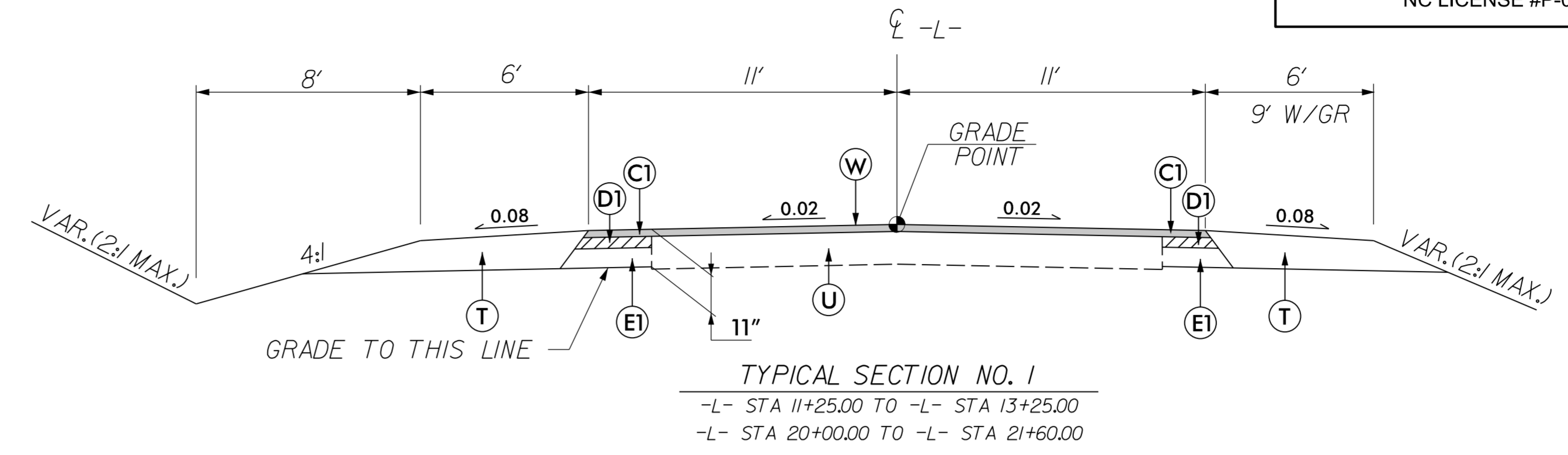
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	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.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

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

**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

PROJECT REFERENCE NO. 17BP.8.R.J35	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 6/17/2021 BRIAN ALLEN WILES	PAVEMENT DESIGN ENGINEER

SEAL 16689  
 ENGINEER  
 BRIAN ALLEN WILES  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



6/2/2021

PAVEMENT SCHEDULE

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T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

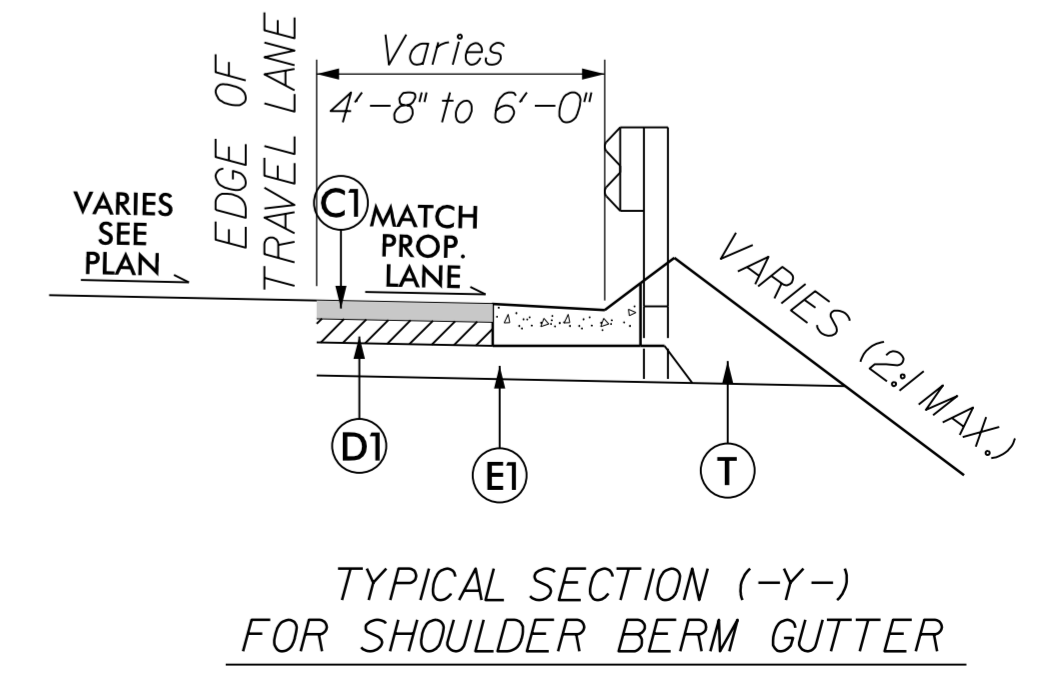
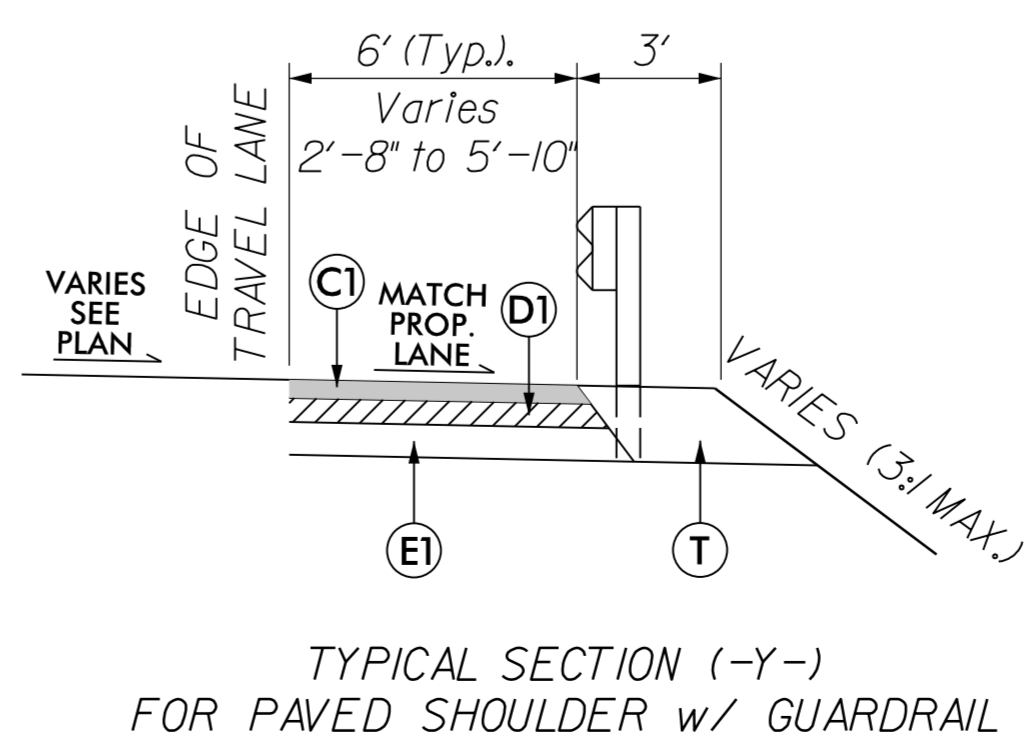
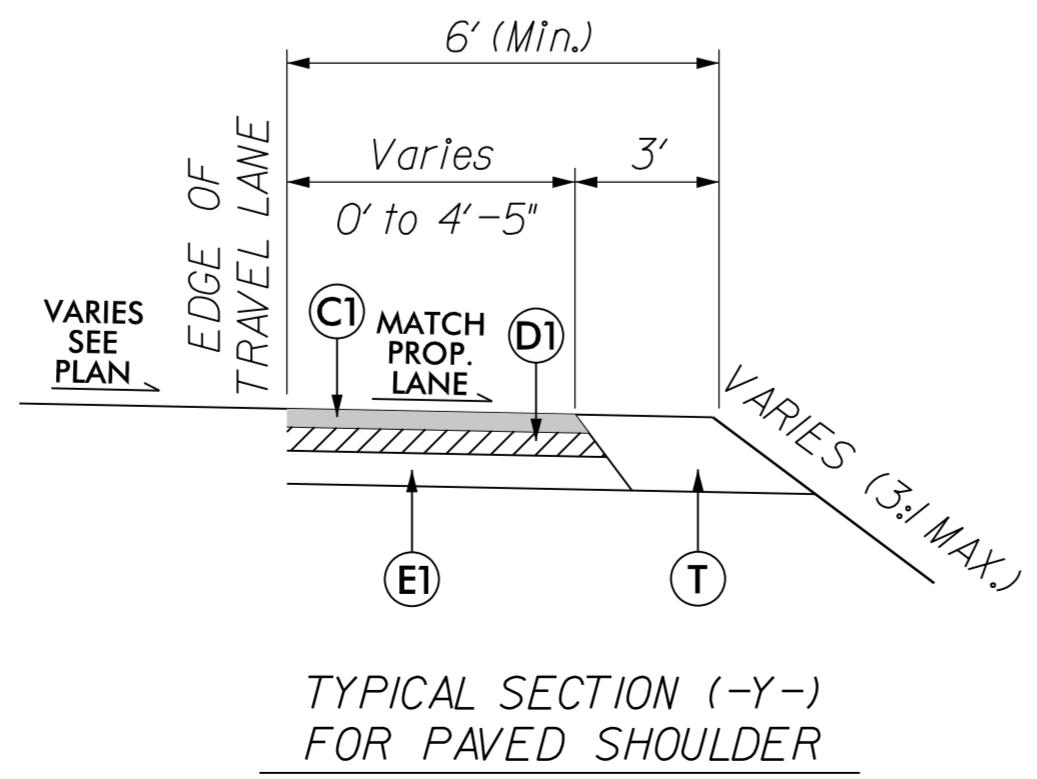
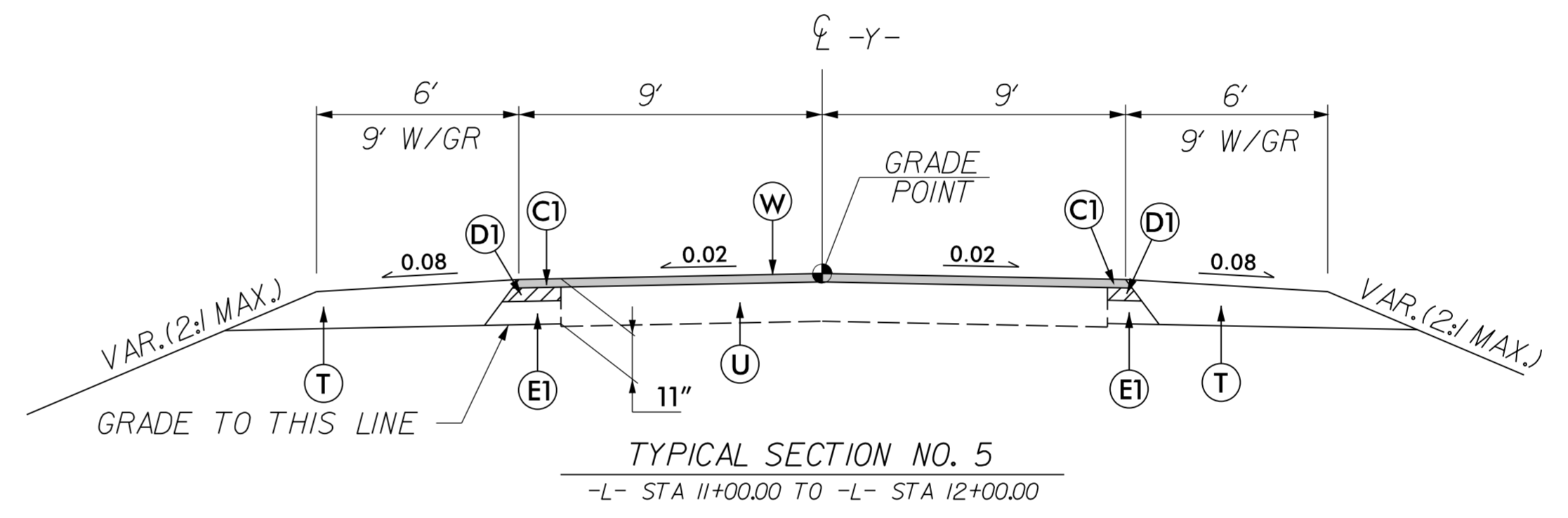
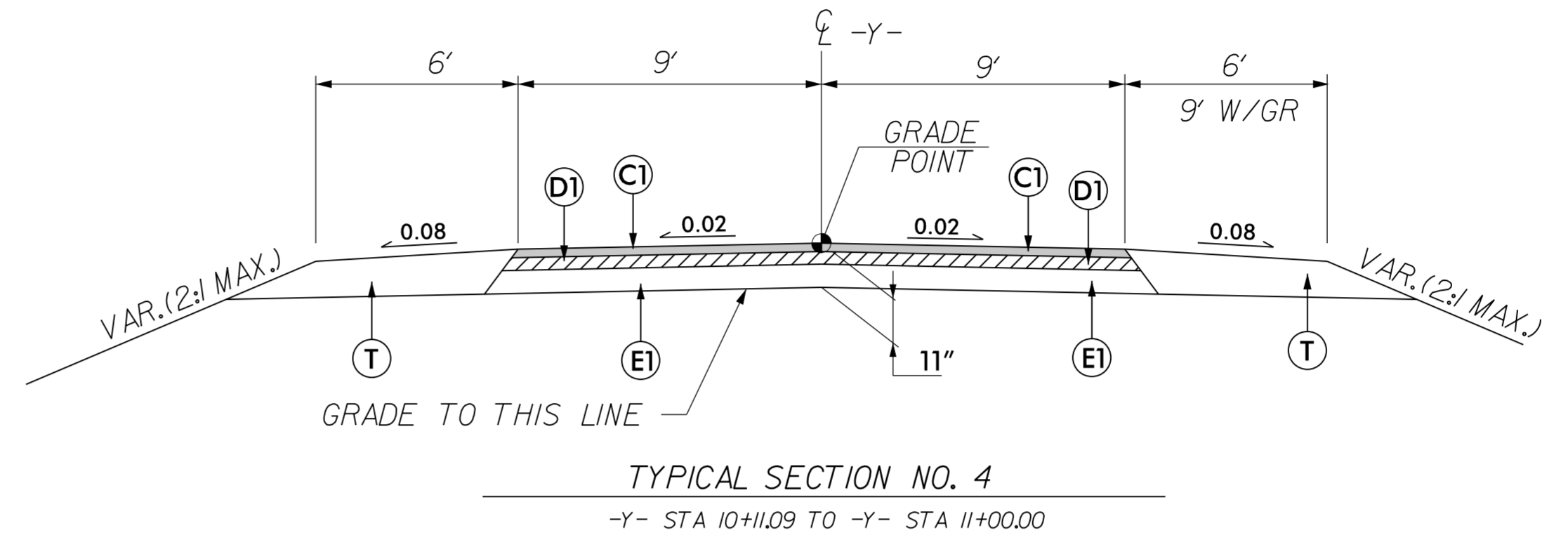
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

PROJECT REFERENCE NO. 17BP.8.R.J35	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER 6/17/2021	PAVEMENT DESIGN ENGINEER

SEAL 16689  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 BRIAN A. WILLS

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



6/15/2021  
 PROJECT: 17BP.8.R.J35  
 DRAWING: 2A-2  
 FILE: 17BP.8.R.J35\_2A-2.dgn

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

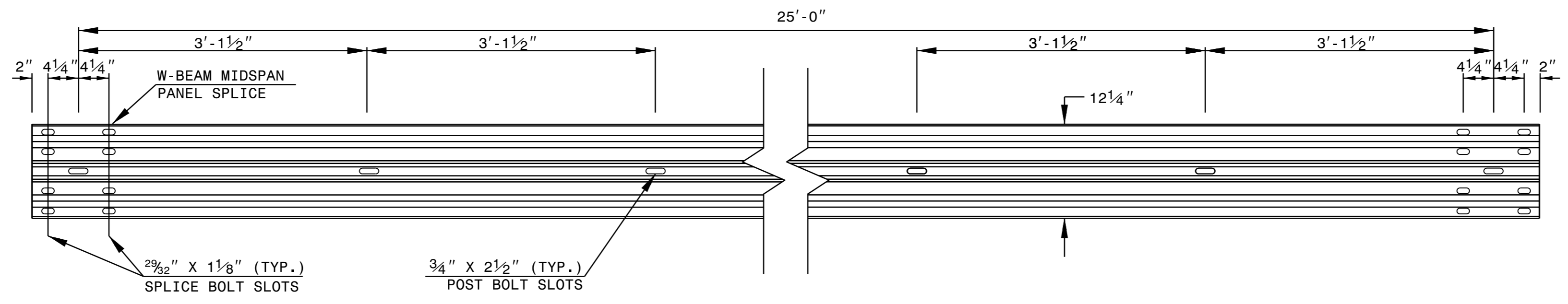
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

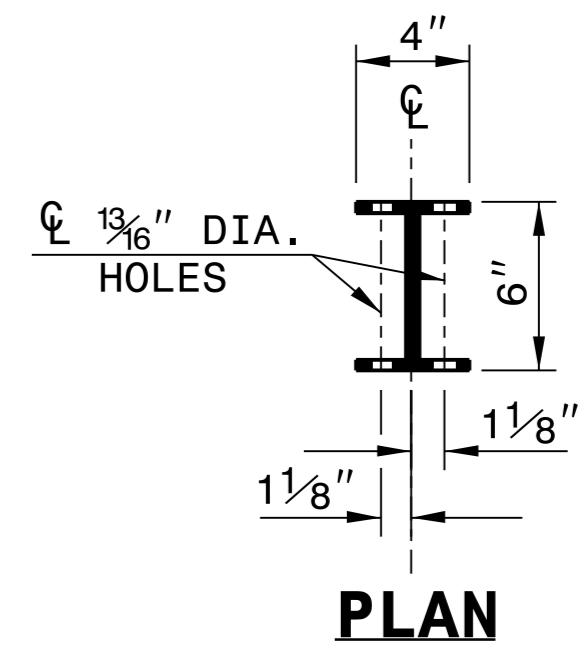
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

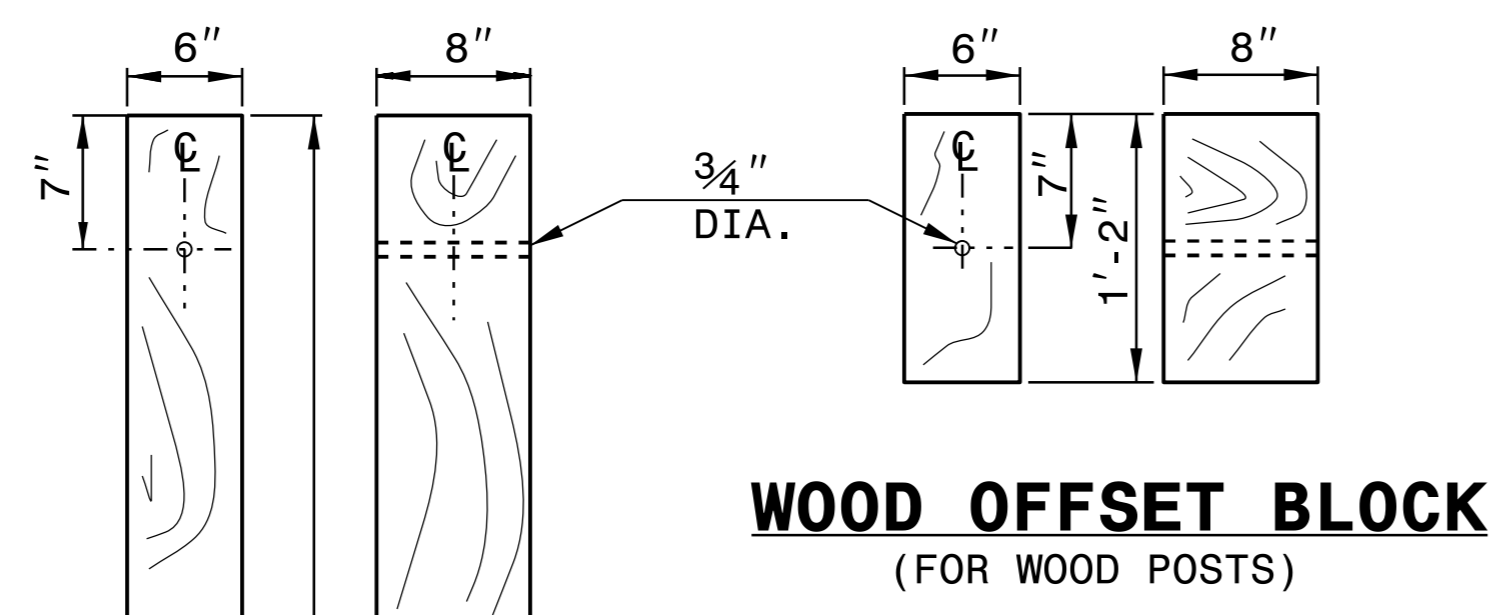
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



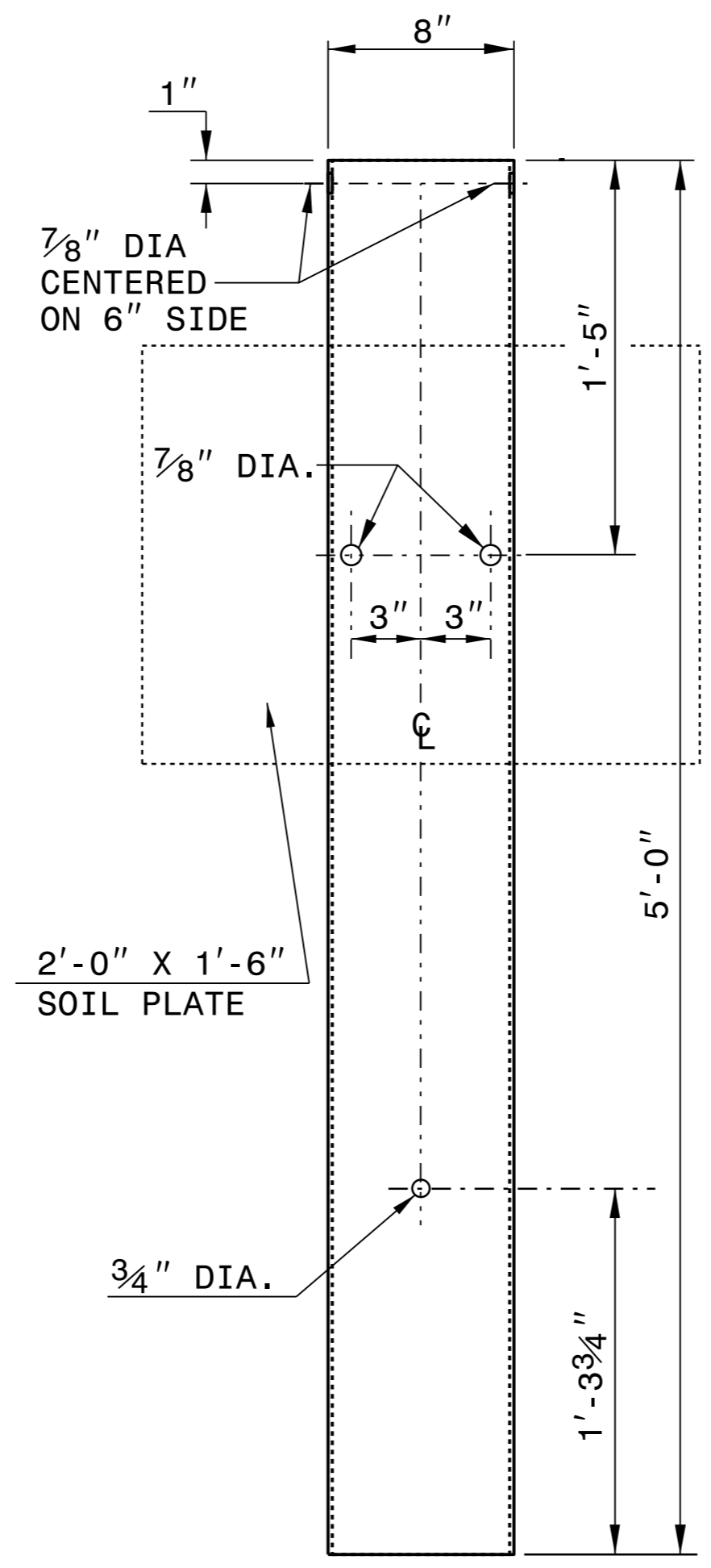
**PLAN**



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

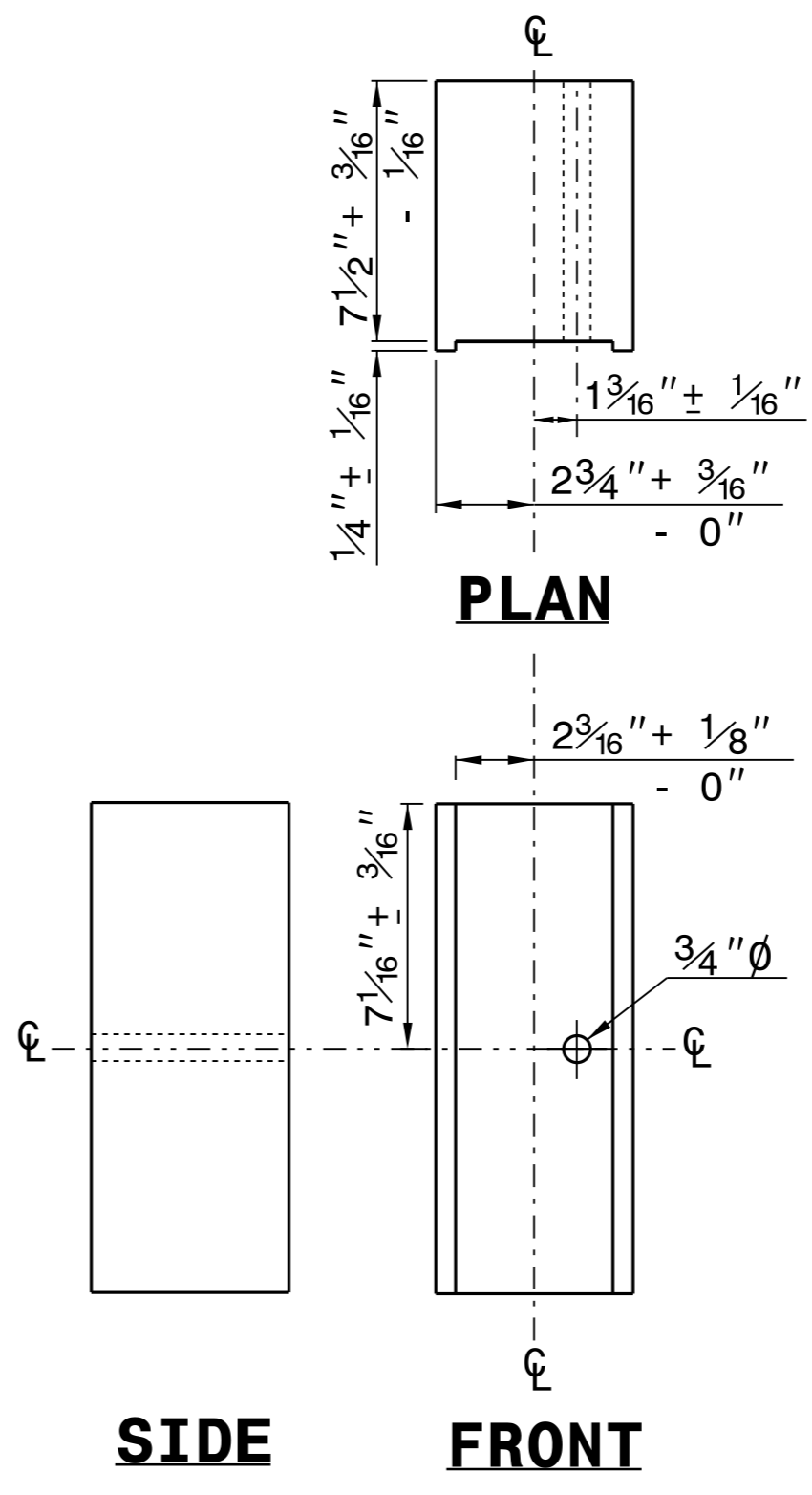
**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



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

**SYSTEM PARTS**

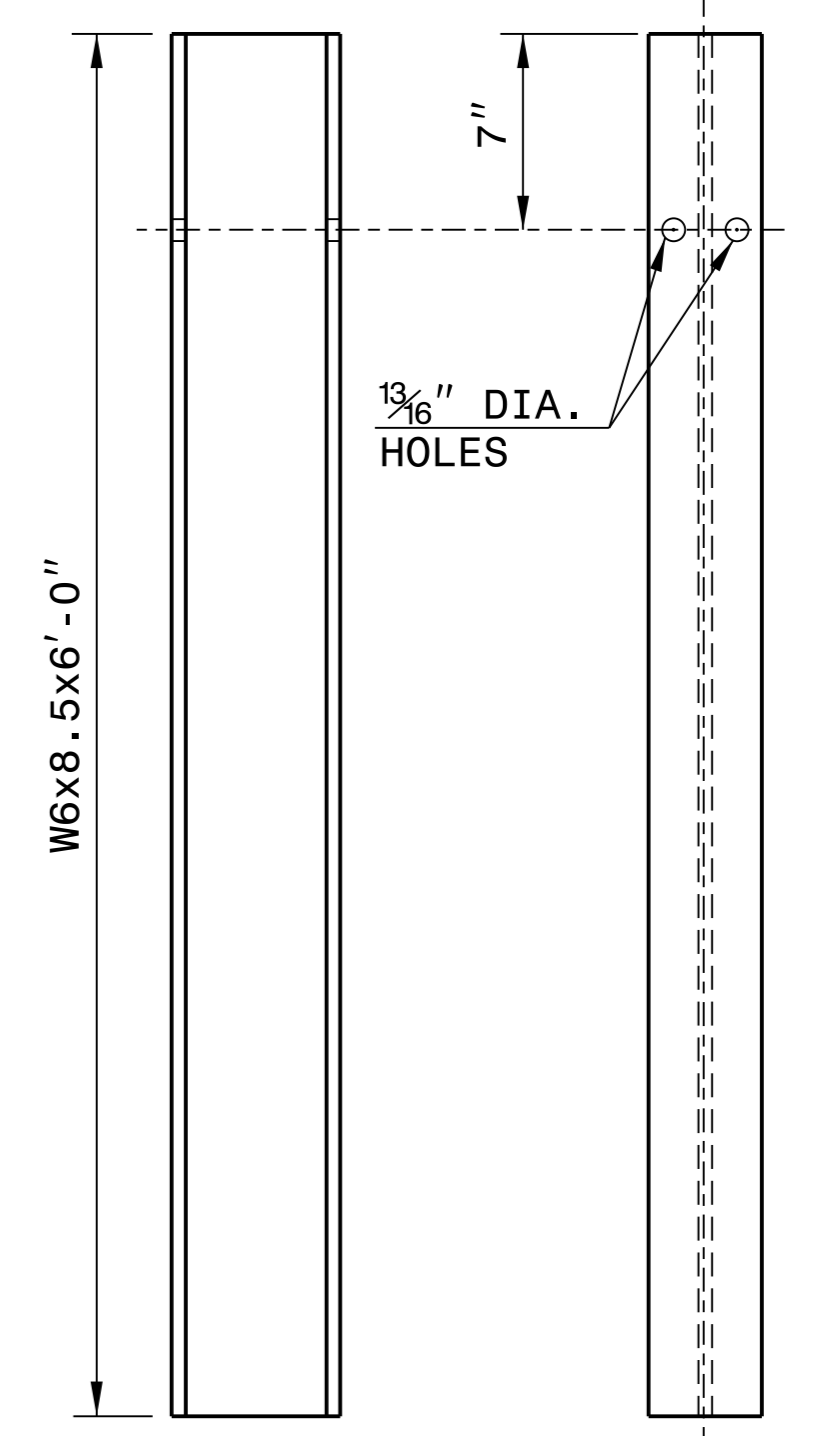


**PLAN**

**SIDE**

**FRONT**

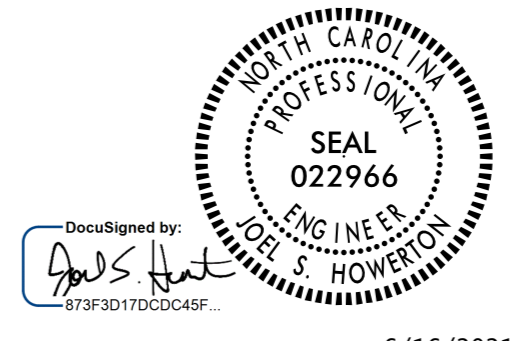
**ROUTED  
OFFSET BLOCK**



**SIDE**

**FRONT**

**"W6" STEEL POST**



6/16/2021

**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.: \_\_\_\_\_

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

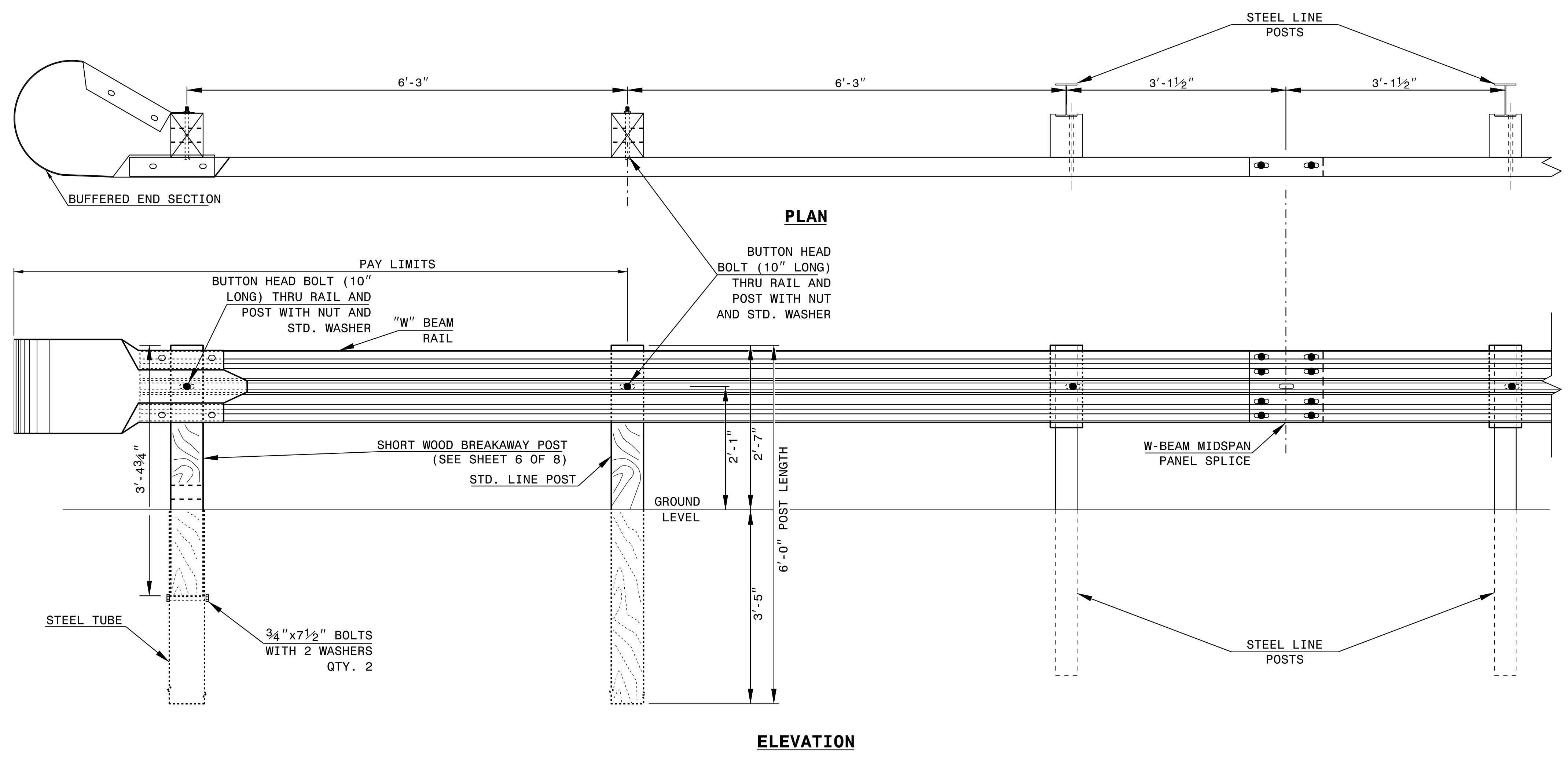
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF

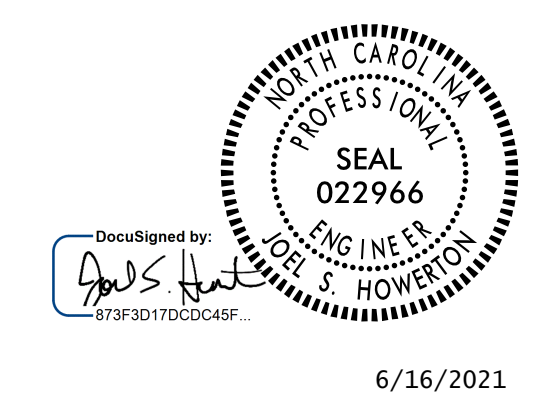
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET OF



**TRAILING END UNIT ASSEMBLY**  
**A.T. - 1 SYSTEM**



6/16/2021

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

<b>CONTRACTS STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>A.T. - 1 SYSTEM</b>	
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	







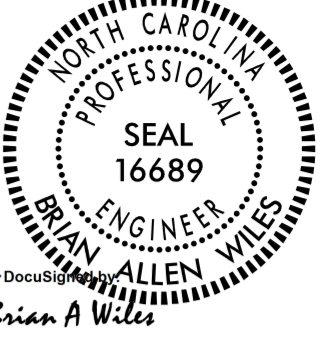
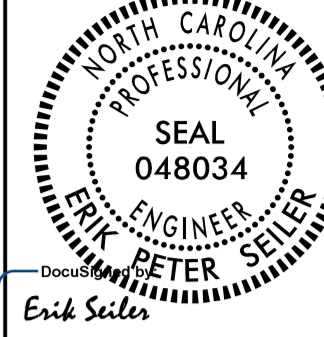




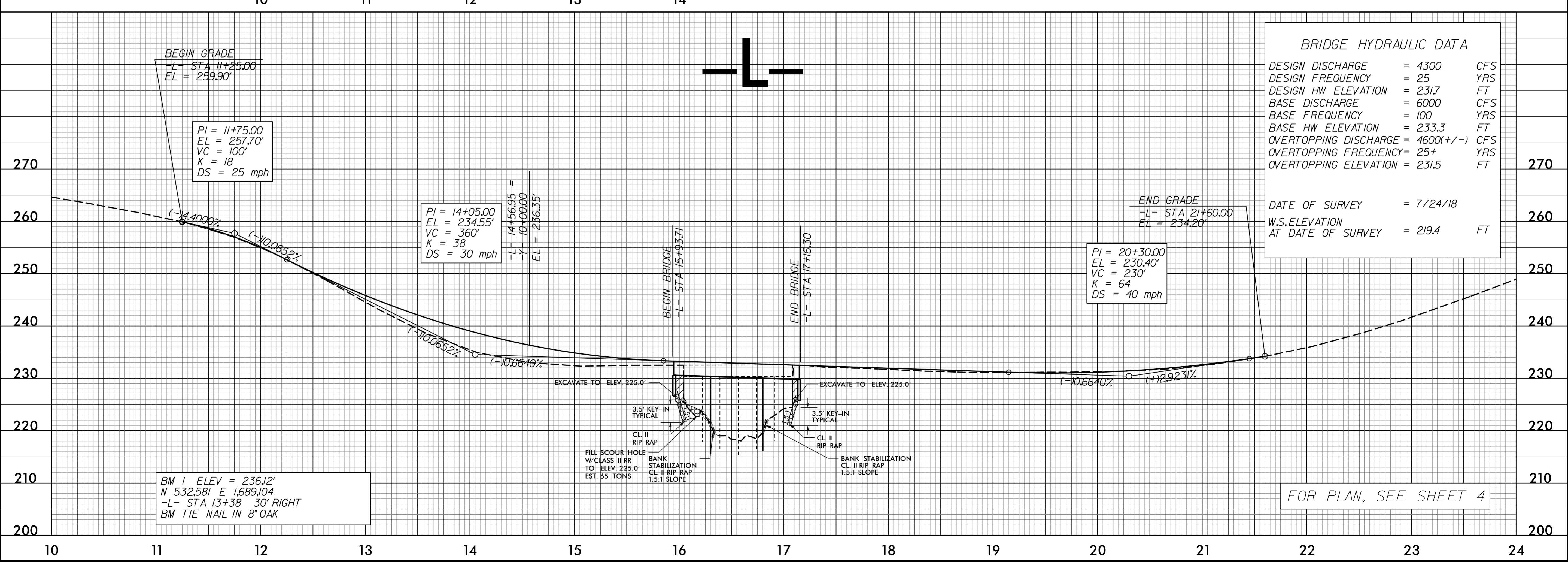
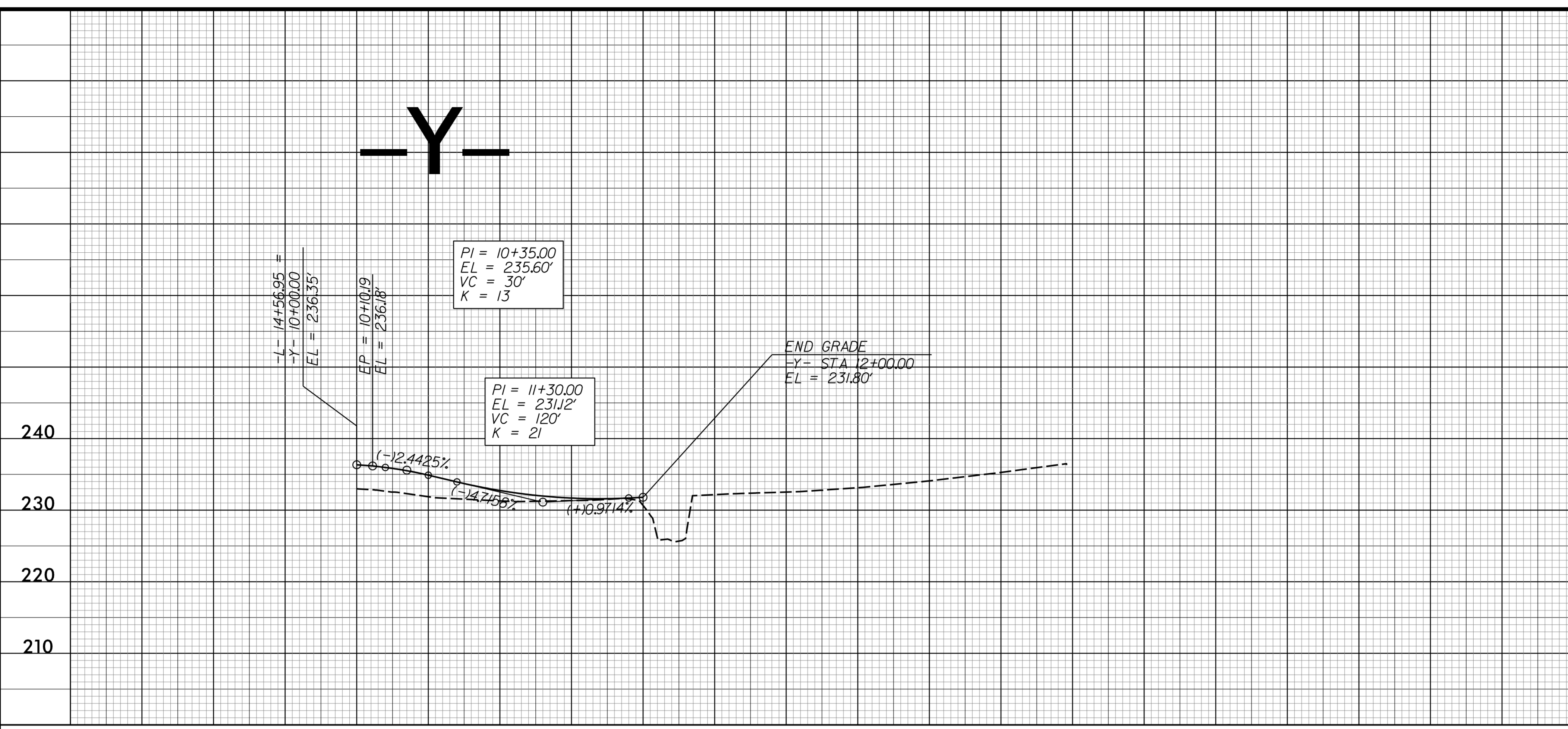
5/28/19

**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

**NCDOT**  
 Hydraulics Unit  
 Raleigh, NC

PROJECT REFERENCE NO. <b>17BP.8.RJ35</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER 8/17/2021	HYDRAULICS ENGINEER 8/17/2021
 Brian A. Wiles	 Erik Seiler

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



8/15/2021  
 N:\SERVING\Projects\190\_Mont190\_Rdy.p1\_05.dgn

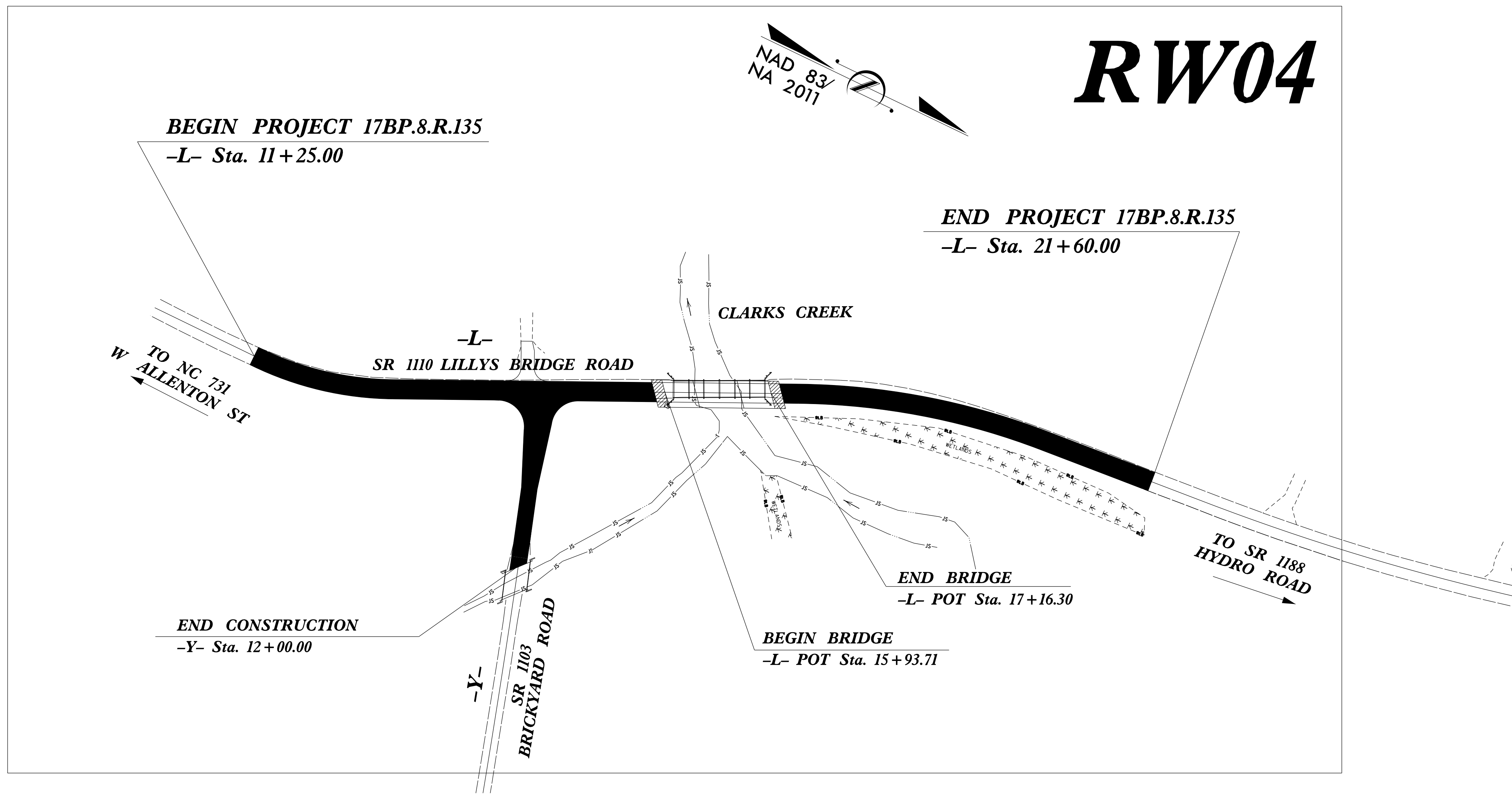
**TIP PROJECT: 17BP.8.R.135**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.8.R.135	RW01	XX

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

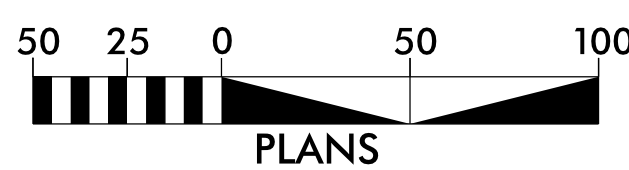
SURVEY CONTROL, EXISTING CENTERLINES,  
RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

**MONTGOMERY COUNTY**



**RW04**

**GRAPHIC SCALE**



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY WSP USA FOR GPS MONUMENT "610190-1" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 533,297.3240(ft) EASTING: 1,688,807.7645(ft) ELEVATION: 231.663(ft)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999808516  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "610190-1" TO -L- STATION 10+00 IS S 17-03'08" E 1,106.57(ft)  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

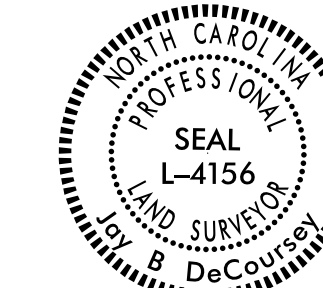
WSP USA  
434 Fayetteville Street  
Suite 1500  
Raleigh NC 27601  
NC License Number F-0165

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
MARCH 16, 2021

**LETTING DATE:**  
SEPTEMBER 28, 2021

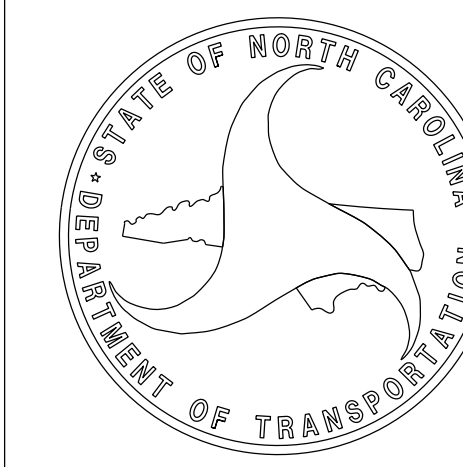
**PROFESSIONAL LAND SURVEYOR**



Jay B. DeCoursey  
Digitally signed by Jay B. DeCoursey  
DN: cn=Jay B. DeCoursey, o=US, email=jay.decoursey@ncdot.com, Date: 2021.04.30 07:07:08 -0400

SIGNATURE:

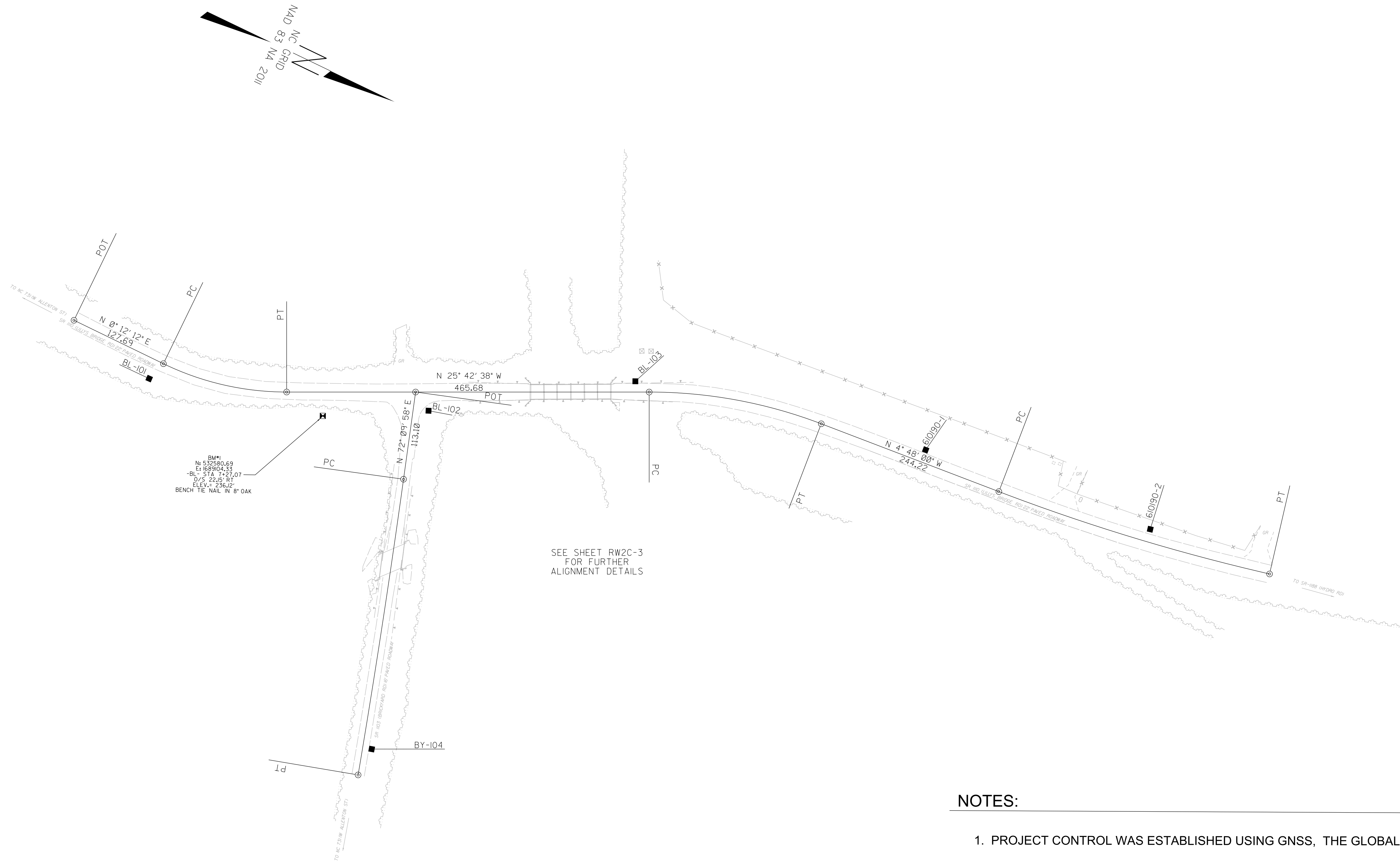
Date:



# SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.B.R.135	RW02C-1
<b>Location and Surveys</b>	
WSP USA 434 Fayetteville Street Suite 1500 Raleigh, NC 27601 NC License Number F-0165	



### NOTES:

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

30-APR-2021 10:40  
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 USJ0672823 AT W-AMRAG-L-00044

# SURVEY CONTROL SHEET

*W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

PROJECT REFERENCE NO. 17BP.B.R.135	SHEET NO. RW02C-2
<b>Location and Surveys</b>	
WSP USA Fayetteville Street Suite 1500 Raleigh, NC 27601 NC License Number F-0165	

REVISIONS

EL									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	532239.399	1689132.261							
LINE			N 00°12'12.4" E	127.69					
PC	532367.085	1689132.714							
CURVE			N 12°45'13.0" W	162.47	25°54'50.9"(LT)	15°48'53.0"	163.86	83.36	362.29
PT	532525.545	1689096.848							
LINE			N 25°42'38.5" W	465.68					
PC	532945.122	1688894.823							
CURVE			N 15°15'19.3" W	224.77	20°54'38.3"(RT)	09°15'05.7"	226.02	114.28	619.31
PT	533161.971	1688835.681							
LINE			N 04°48'00.1" W	244.22					
PC	533405.339	1688815.245							
CURVE			N 08°46'44.9" W	363.46	07°57'29.5"(LT)	02°11'16.1"	363.75	182.17	2618.87
PT	533764.541	1688759.771							

EY									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	532674.791	1689024.986							
LINE			N 72°09'58.1" E	113.10					
PC	532709.430	1689132.655							
CURVE			N 73°01'08.9" E	384.49	01°42'21.7"(RT)	00°26'37.3"	384.50	192.27	12913.35
PT	532821.721	1689500.383							

BL				
POINT	DESC.	NORTH	EAST	ELEVATION
101	BL-101	532358.9210	1689157.8860	260.69
102	BL-102	532700.1451	1689039.4100	231.97
103	BL-103	532923.0780	1688890.0710	232.16
1	610190-1	533297.3240	1688807.7640	231.66
2	610190-2	533601.5100	1688774.4820	249.36

BY				
POINT	DESC.	NORTH	EAST	ELEVATION
A102		532700.1450	1689039.4100	UNKNOWN
104	BY-104	532823.0290	1689462.8920	235.48

.....  
 BM#1 ELEVATION = 236.12  
 N 532581 E 1689104  
 BM TIE NAIL IN 8" OAK  
 .....

**NOTES:**

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

# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BR.8.R.135	RWD2-1
<b>Location and Surveys</b>	
WSP USA 434 Fayetteville Street Suite 1500 Raleigh, NC 27601 NC License Number F-0165	

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	532239.3988	1689132.2610
PC	11+27.69	532367.0852	1689132.7144
PT	12+87.55	532521.9307	1689098.5637
PC	17+45.81	532936.9889	1688904.3303
PT	20+28.94	533209.1277	1688831.7212
PC	22+25.84	533405.3393	1688815.2447
PT	25+89.59	533764.5410	1688759.7712

Y			
TYPE	STATION	NORTH	EAST
POT	10+00.00	532675.3625	1689026.7628
PC	11+10.97	532709.3478	1689132.4000
PT	14+96.28	532821.8622	1689500.8992

REVISIONS


C:\Users\j5010572823\Documents\SURVEY\_PROJECTS\610190\Bridge NCDOT\CADD\61-0190.LS.rw02c-1.dgn  
 20-Apr-2019 10:17  
 USJ0672823

### NOTES:

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



# RIGHT OF WAY AND PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO. 17BP.8.R.135	SHEET NO. RW03E-1
<b>Location and Surveys</b>	
WSP USA 434 Fayetteville Street Suite 1500 Raleigh NC 27601 NC License Number F-0165	
PROJECT SURVEYOR 	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PERMANENT EASEMENT IRON PIN AND CAP-E

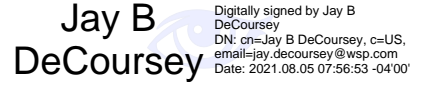
ALIGN	STATION	OFFSET	NORTH	EAST
L	15+04.23	50.00	532739.3786	1689052.0094
L	18+75.72	40.00	533069.4797	1688897.5330
L	20+28.94	40.00	533212.4748	1688871.5809
L	20+28.94	30.00	533211.6381	1688861.6160
Y	10+99.00	-30.00	532734.2402	1689111.8168

I, Jay DeCoursey, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

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

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 5th day of August, 2021.  
Originally signed April 30th, 2021. Resubmitted due to changes in the ROW and PUE.

  
 Jay B. DeCoursey  
 Professional Land Surveyor

PLS # L-4156

### 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.
- RIGHT OF WAY MONUMENTATION ESTABLISHED 4/20/2021 TO 8/2/2021.

REVISIONS

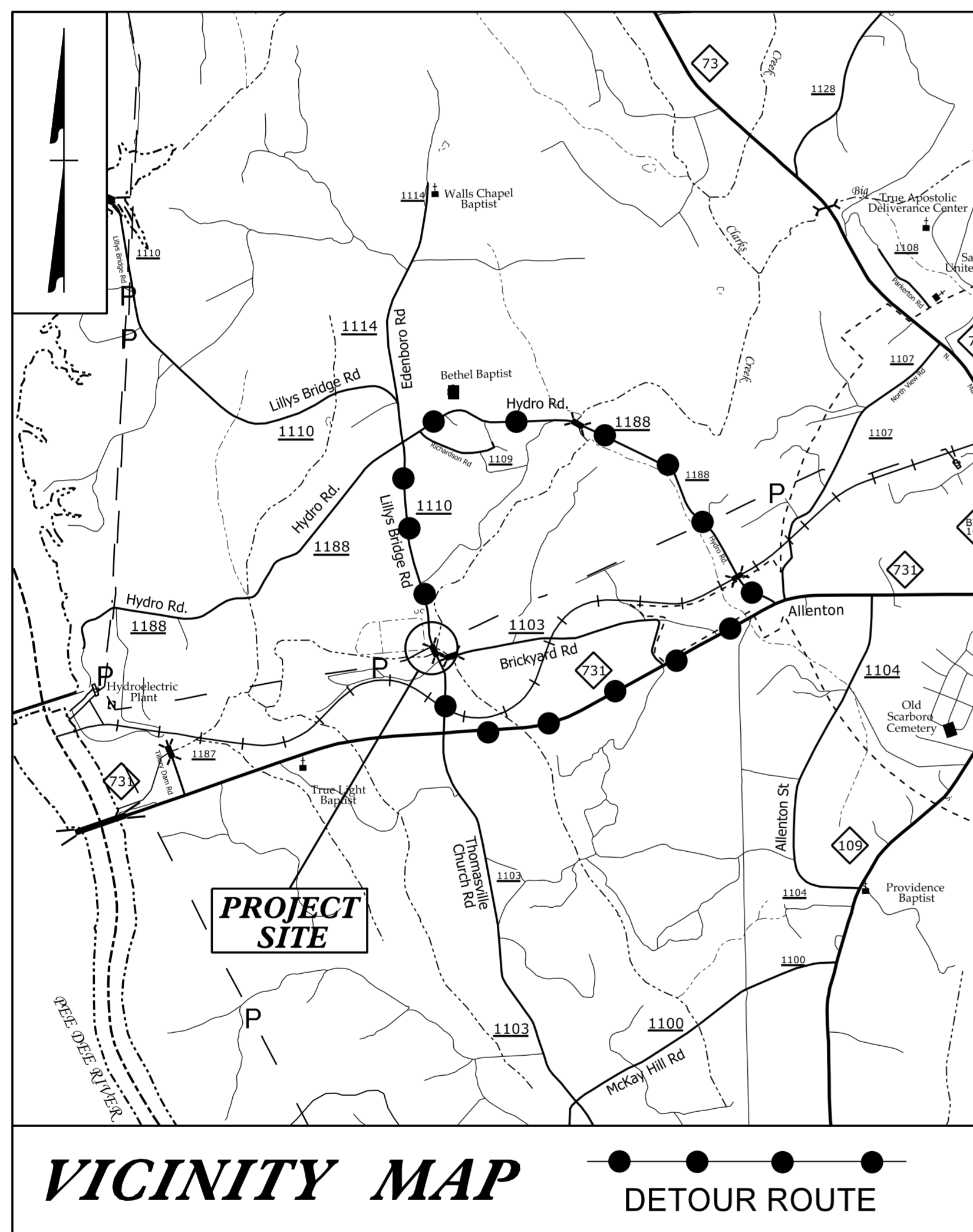
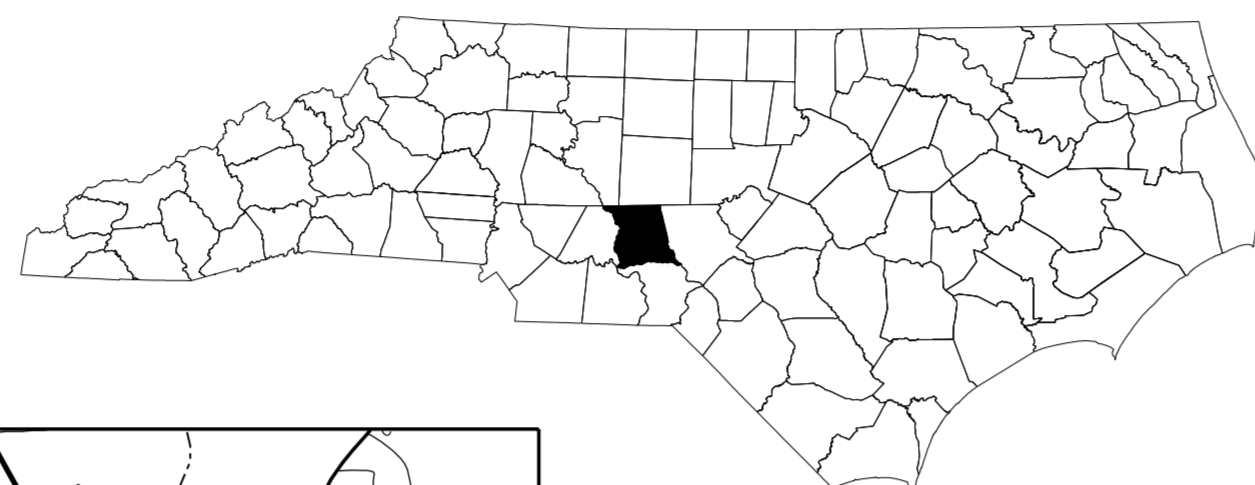
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 05-AUG-2021 07:48  
 USJ0672823



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**MONTGOMERY COUNTY**



**LOCATION: BRIDGE NO. 190 OVER CLARKS CREEK  
ON SR 1110 (LILLYS BRIDGE ROAD)**

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

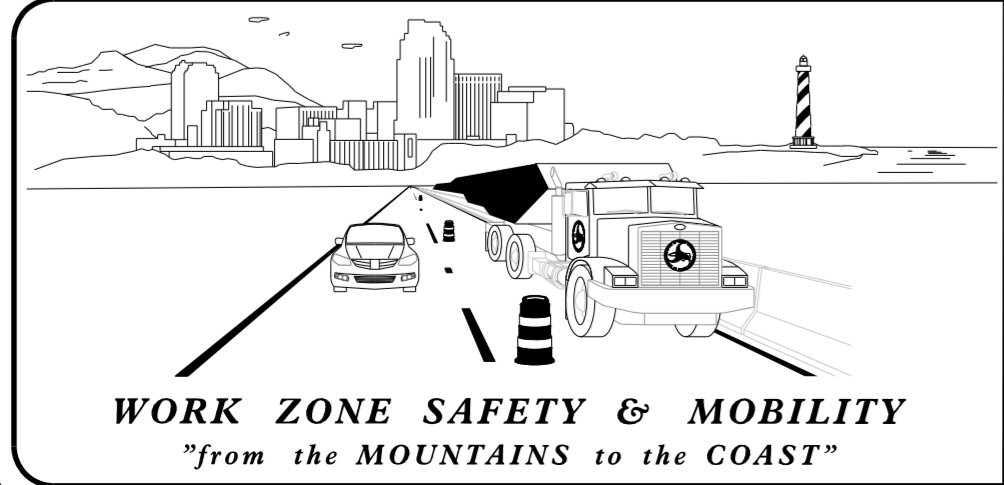
SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND LOCAL NOTES)
TMP-2	SPECIAL SIGN DESIGN
TMP-3	OFF-SITE DETOUR
TMP-4	ROAD CLOSURE DETAIL AND DETOUR SIGNS

SHEET NO.  
TMP-1

**17BP.8.R.135**

**PROJECT:**

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



**PLANS PREPARED BY:**  
  
BRIAN A. WILES, PE  
PROJECT MANAGER

**NC DOT CONTACTS:**  
  
TIM WELCH, PE  
DIV. 8 BRIDGE PROGRAM MANAGER



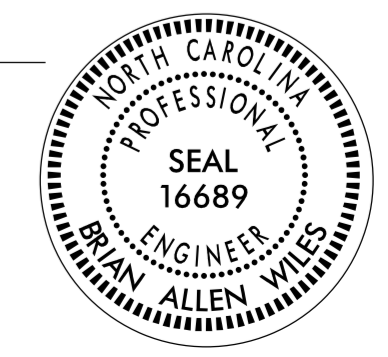
**PLANS PREPARED FOR:**  
DIVISION OF HIGHWAYS  
DIVISION 8  
121 DOT Drive  
Carthage, NC 28327

**PLANS PREPARED BY:**  
**CH ENGINEERING**  
3220 GLEN ROYAL RD. RALEIGH, NC 27617  
TELE 919.788.0224 FAX 919.788.0232  
NC LICENSE #P-0189

**APPROVED:** Brian A Wiles  
88800FEA2E34DE

**DATE:** 6/16/2021

SEAL



6/15/2021 8:41:24 AM C:\TrafficControl\TCP\Montgomery\190\_TC\_TMP\_1.dgn USERNAME

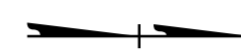
# ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

<u>STD. NO.</u>	<u>TITLE</u>
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

# LEGEND

## GENERAL

- EXIST. PVMT.
-  NORTH ARROW
- PROPOSED PVMT.

## TRAFFIC CONTROL DEVICES

-  BARRICADE (TYPE III)

## TEMPORARY SIGNING

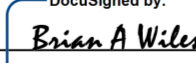
-  STATIONARY SIGN

## FINAL PAVEMENT MARKING

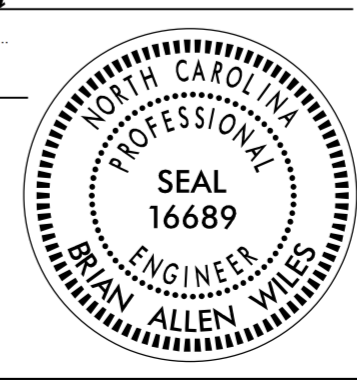

PAINT PAVEMENT MARKING LINES (4")	9,900 LF
PERMANENT RAISED PAVEMENT MARKERS	25 EACH

6/16/2021  
 B:\T\2021\TrafficControl\TCP\Montgomery\90\_TC\_TMP\_1A.dgn  
 USERNAME

**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

APPROVED:   
DocuSigned by: Brian A Wilder  
8890D0FEA2E34DE  
 DATE: 6/16/2021

SEAL

ROADWAY STANDARD  
DRAWINGS & LEGEND

## MANAGEMENT STRATEGIES

- CLOSE SR 1110 (LILLYS BRIDGE ROAD) AND DETOUR TRAFFIC OFF-SITE
- CLOSE SR 1103 (BRICKYARD ROAD) AT LILLYS BRIDGE ROAD
- MAINTAIN LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION

## GENERAL NOTES

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

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

**SIGNING**

- A) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRANSPORTATION MANAGEMENT PLANS.  
  
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRANSPORTATION MANAGEMENT PLANS.
- B) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.  
  
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- C) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

## LOCAL NOTES

- 1) NOTIFY THE ENGINEER AT LEAST 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
- 2) NOTIFY THE MONTGOMERY COUNTY SCHOOLS TRANSPORTATION OFFICE AT (910) 576-6511 OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.
- 3) NOTIFY THE MONTGOMERY COUNTY EMERGENCY MANAGEMENT AT (910) 572-1347 OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

## PHASING

- STEP 1) USING RSD 1101.03, SHEET 1 OF 9 AND TMP-4, CLOSE SR 1110 (LILLYS BRIDGE RD) AND SR 1103 (BRICKYARD RD) AND DETOUR TRAFFIC OFF-SITE AS SHOWN ON TMP-3. MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN CLOSURE POINTS.
- STEP 2) REMOVE THE EXISTING STRUCTURE.
- STEP 3) CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAYS.
- STEP 4) PLACE FINAL PAVEMENT MARKINGS.
- STEP 5) OPEN SR 1110 (LILLY BRIDGE RD) AND SR 1103 (BRICKYARD RD) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

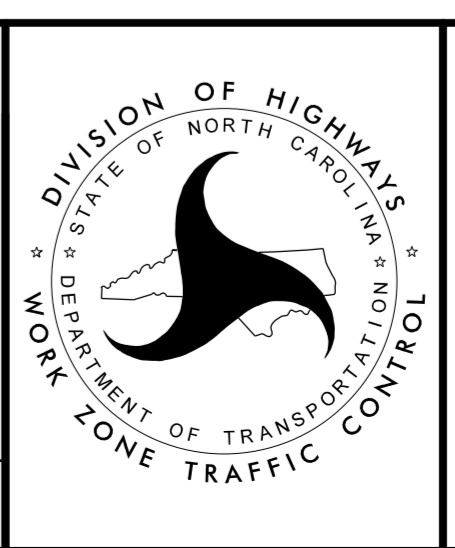
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**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

APPROVED: Brian A Wiles  
 DATE: 6/16/2021

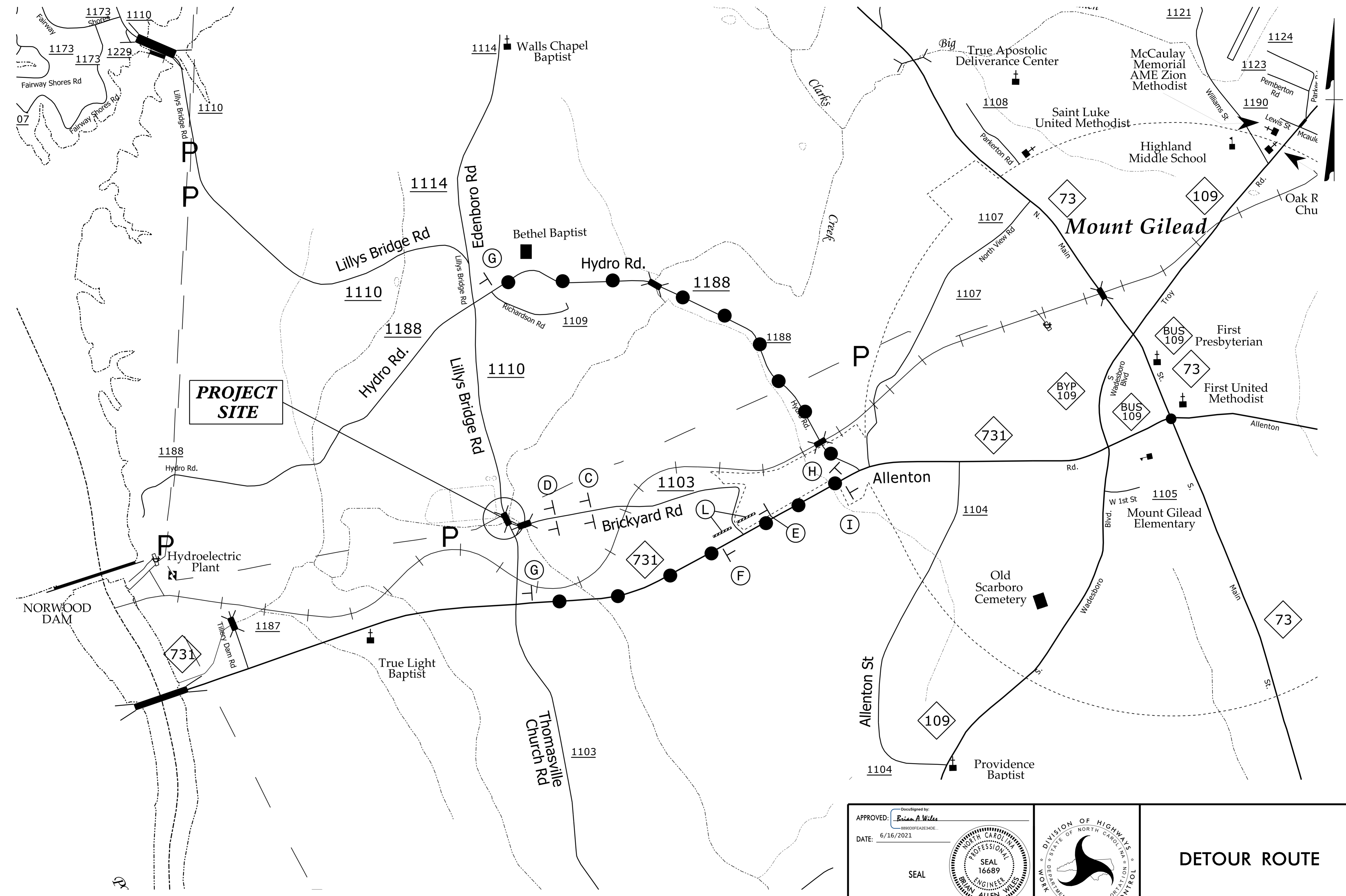
SEAL

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



**TRANSPORTATION  
OPERATIONS  
PLAN**



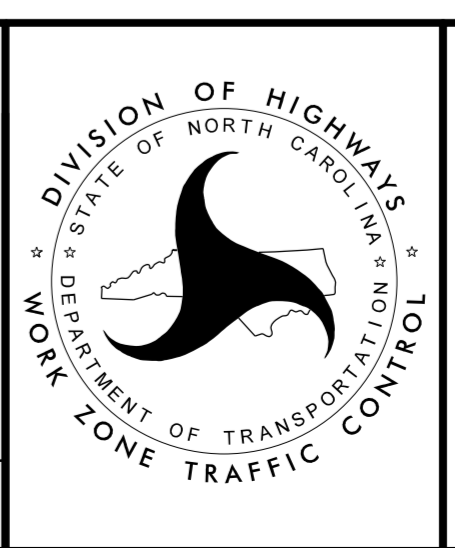


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APPROVED: *Brian A. Wiles*  
 DATE: 6/16/2021

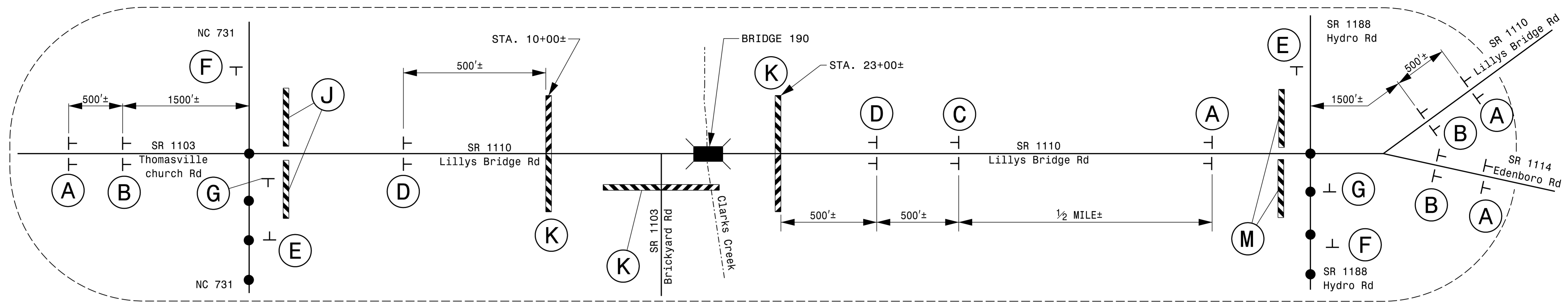
SEAL

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

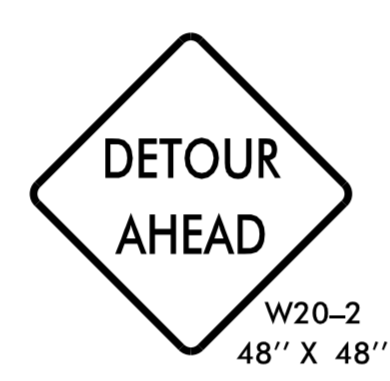


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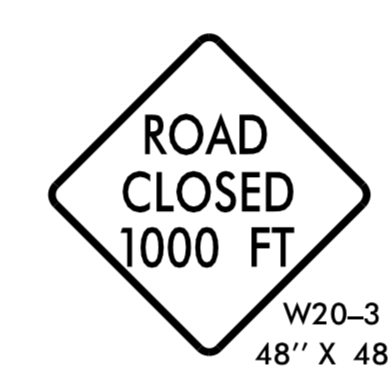
DIVISION OF HIGHWAYS  
 NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 WORK ZONE TRAFFIC CONTROL



(A)



(B)



(C)



(D)



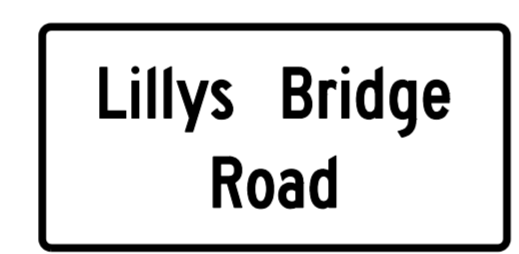
(E)



(F)



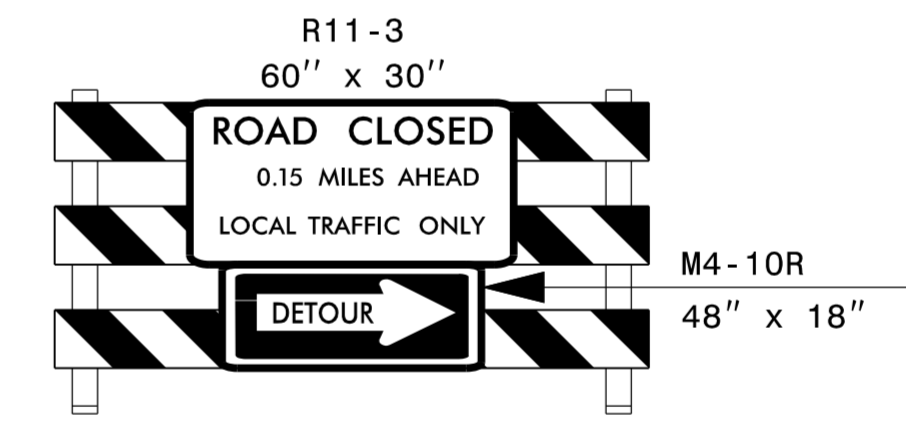
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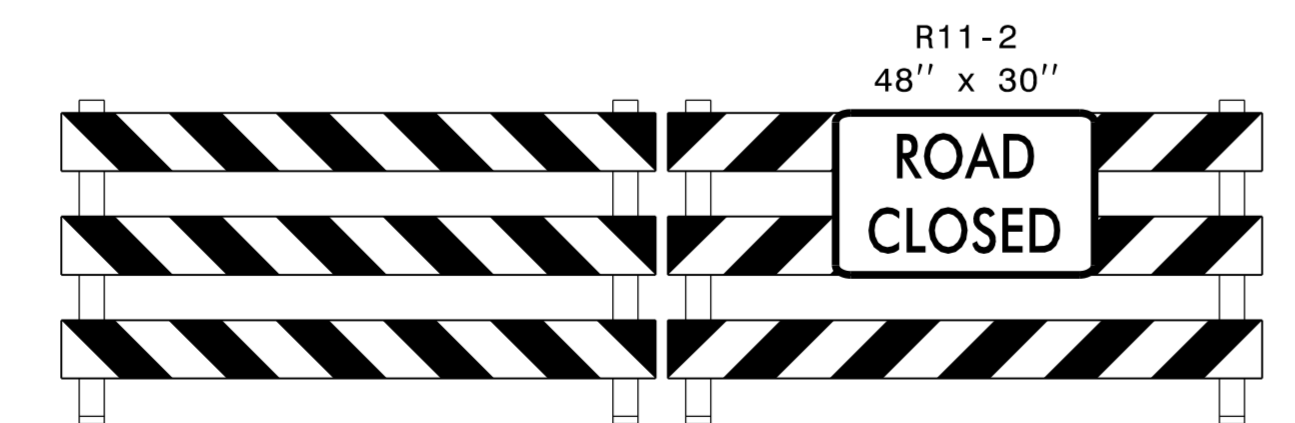
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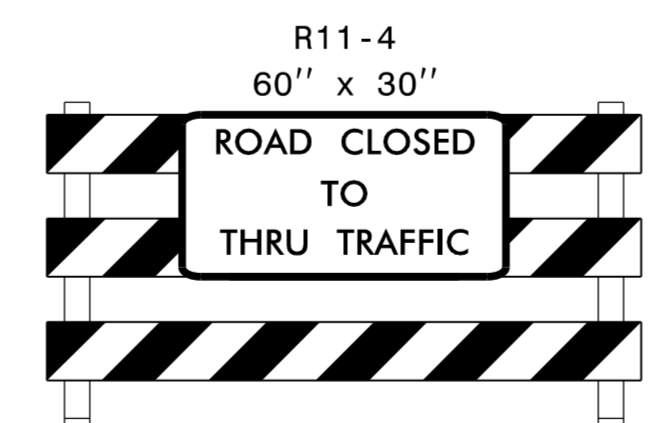
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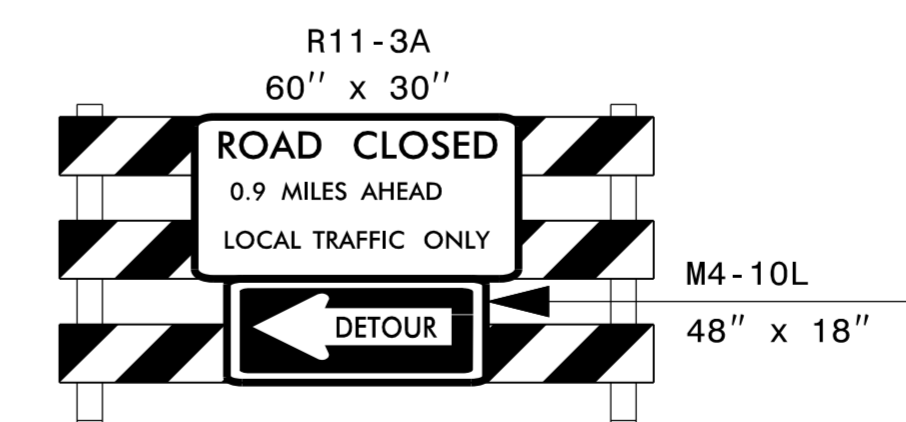
(J)



(K)



(L)



(M)

6/16/2021 8:41:20 AM C:\Users\jgoff\OneDrive\Documents\TrafficControl\TCP\Montgomery\90\_Tc\_TMP-4.dgn USERNAME

**CH ENGINEERING**  
 3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

APPROVED: *Brian A. Wiles*  
 DATE: 6/16/2021  
 SEAL  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

ROAD CLOSURE DETAIL  
and  
DETOUR SIGNS





DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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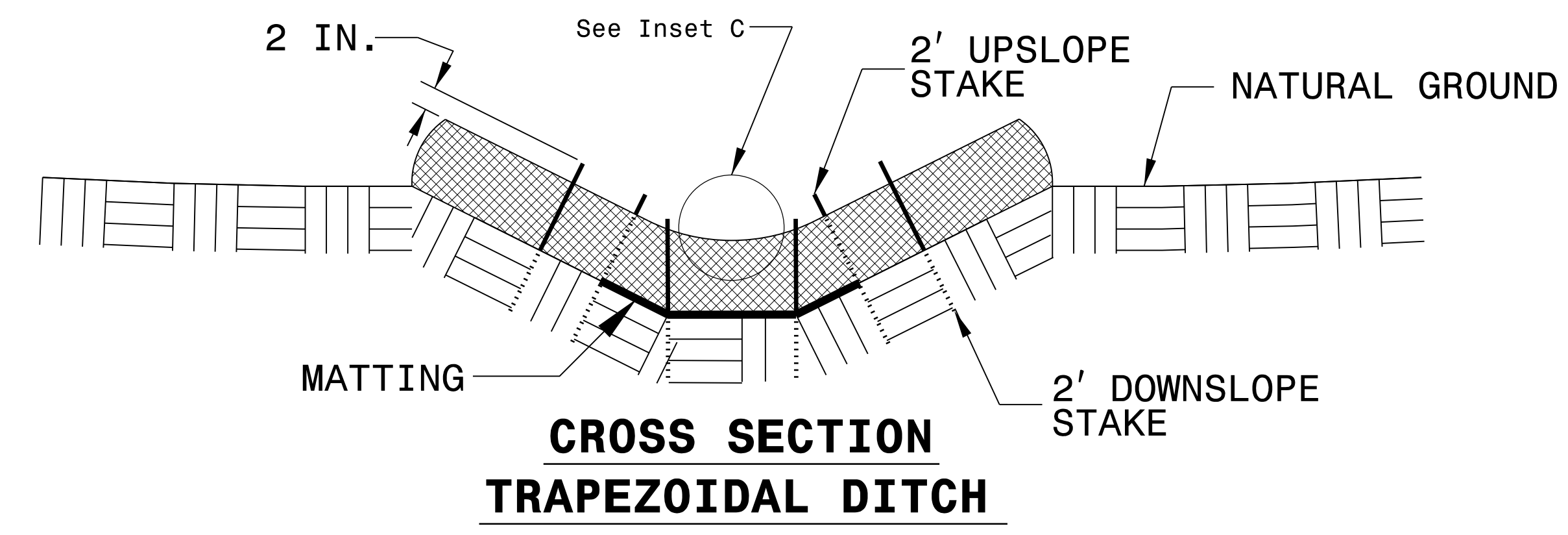
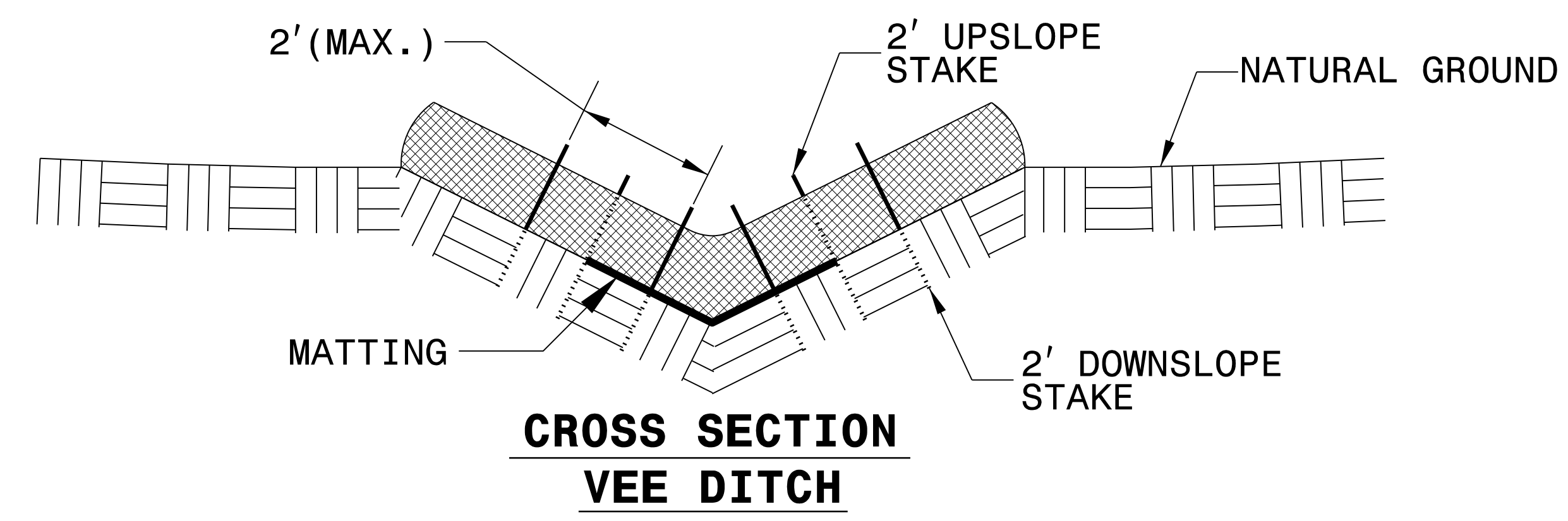
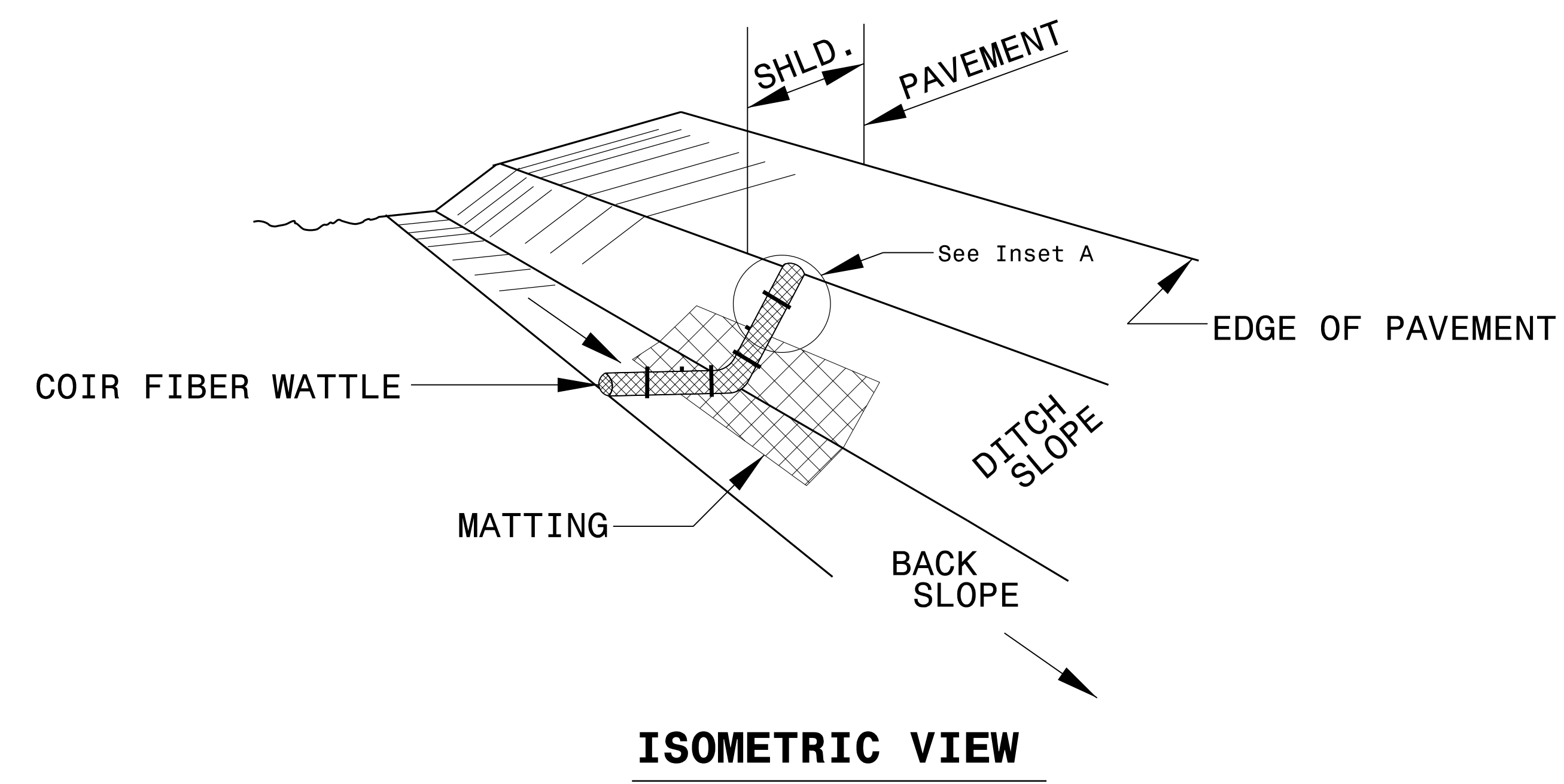
PROJECT REFERENCE NO. <i>17BP.8.R.135</i>	SHEET NO. <i>EC-02</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

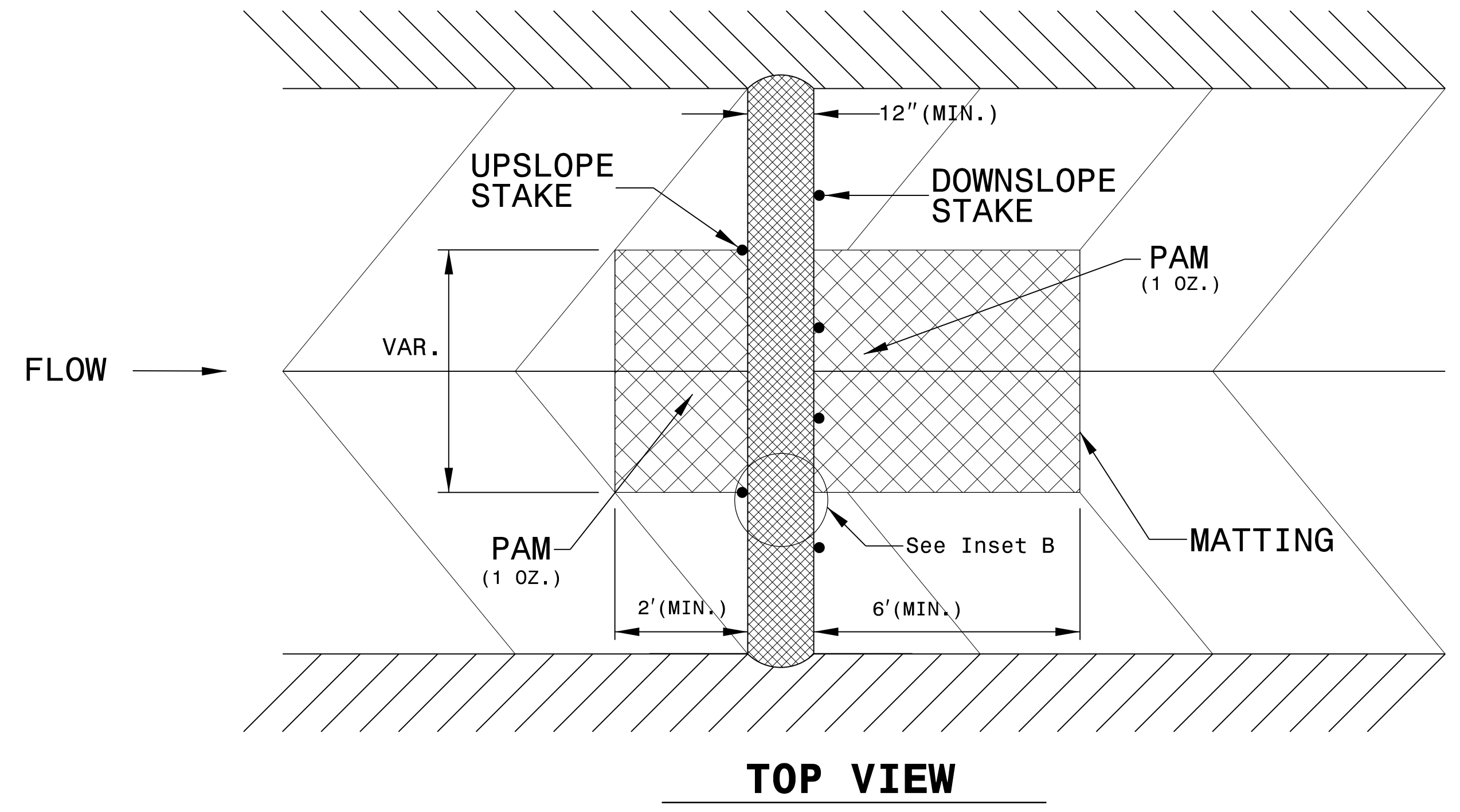
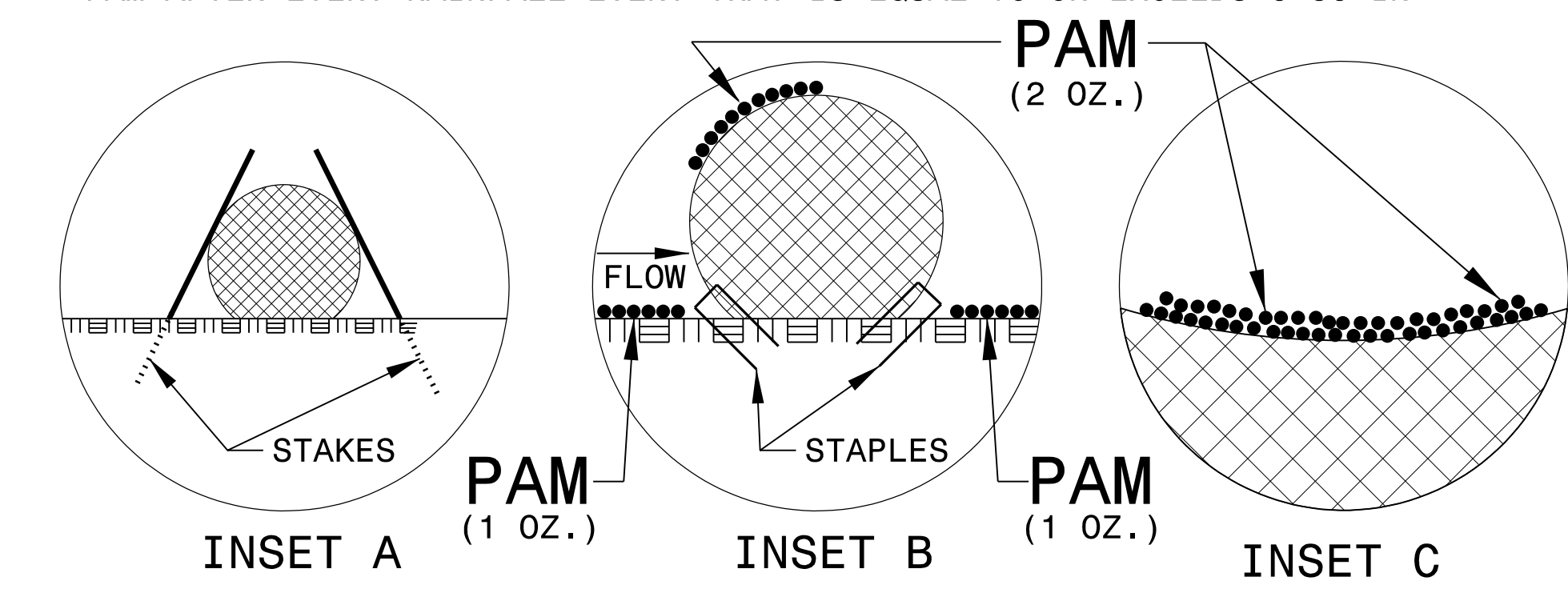
<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES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

PROJECT REFERENCE NO. 17BP,8,R,135	SHEET NO. EC-26
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

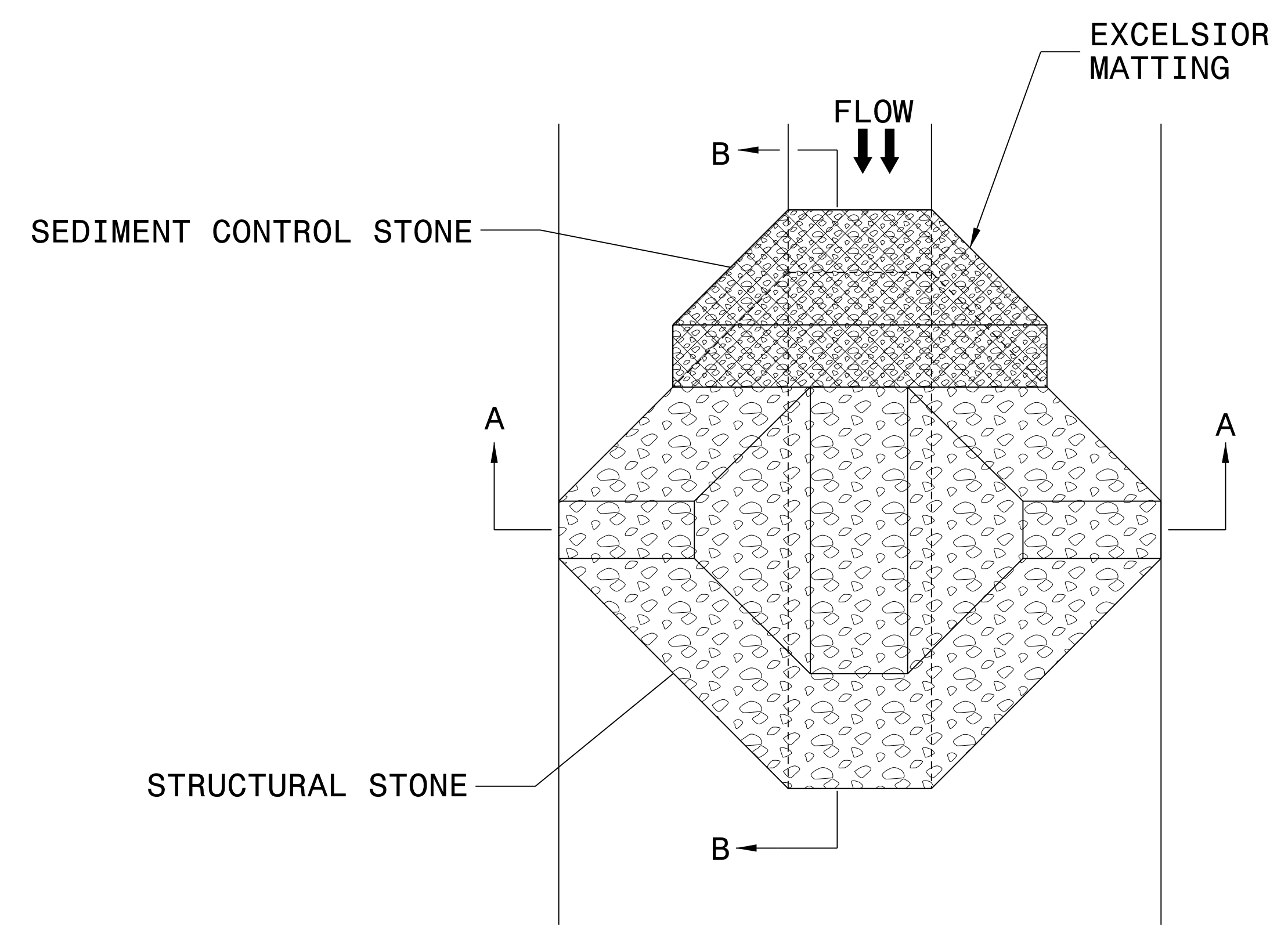


- NOTES:
- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.
  - USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
  - ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
  - INSTALL A MINIMUM OF 2 UPSLOPE 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.



PROJECT REFERENCE NO. 17BP.8.R.135	SHEET NO. EC-03
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

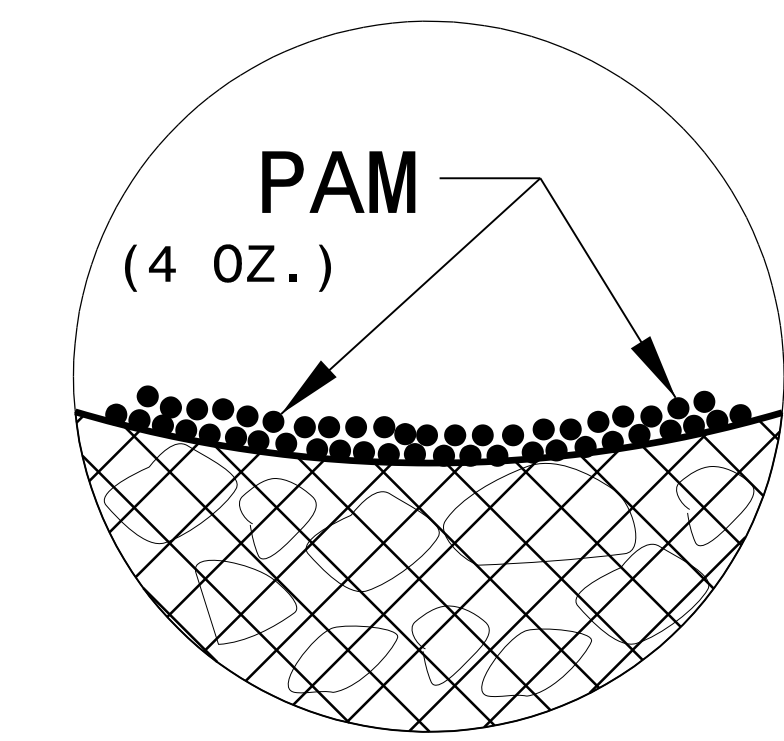
**NOTES:**

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

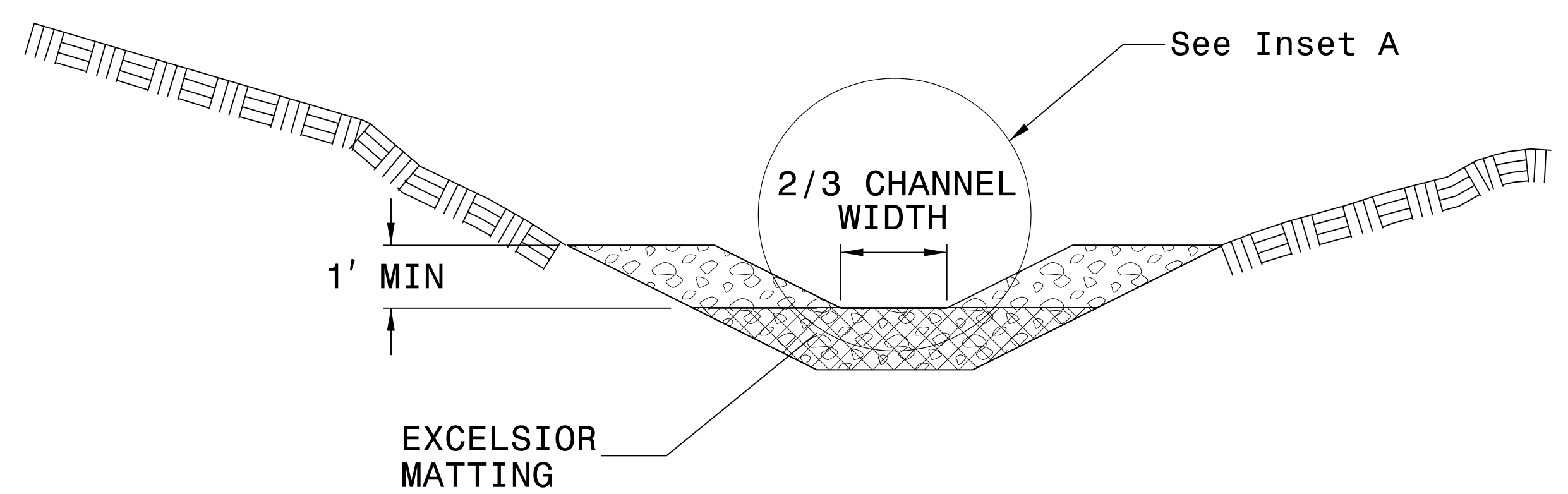
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

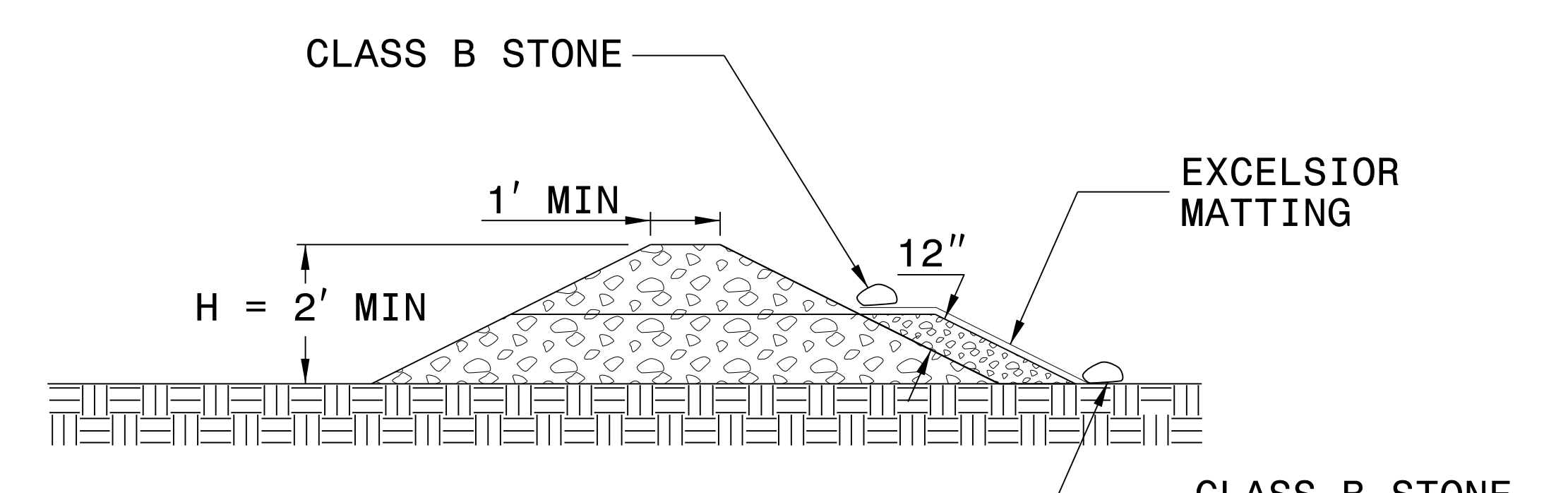
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A

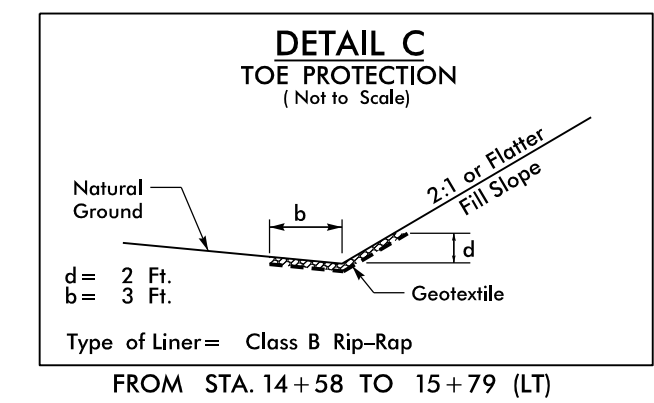
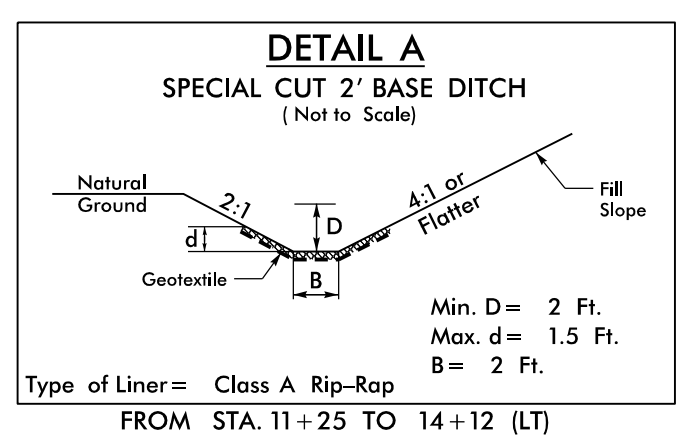


SECTION B-B

NOT TO SCALE



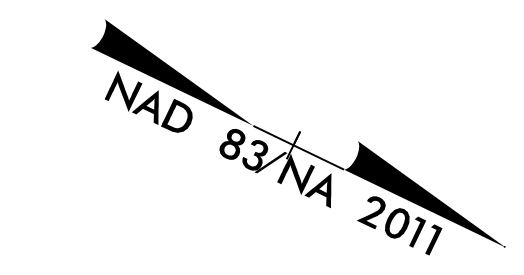
8/17/99



PI Sta 12+08.94  
 $\Delta = 25'16'' 53.3''$  (LT)  
 $D = 15'48'' 53.0''$   
 $L = 159.86'$   
 $T = 81.25'$   
 $R = 362.29'$

PI Sta 18+88.87  
 $\Delta = 20'16'' 40.7''$  (RT)  
 $D = 7'09'' 43.1''$   
 $L = 283.13'$   
 $T = 143.06'$   
 $R = 800.00'$

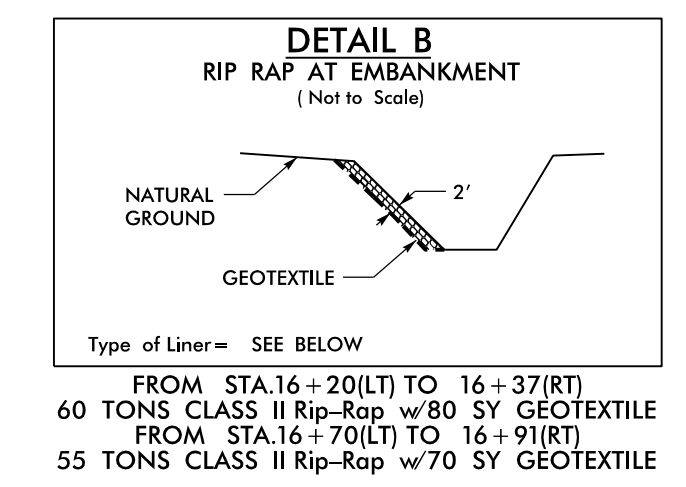
PI Sta 24+08.01  
 $\Delta = 7'57'' 29.5''$  (LT)  
 $D = 2'11'' 16.1''$   
 $L = 363.75'$   
 $T = 182.17'$   
 $R = 2,618.87'$



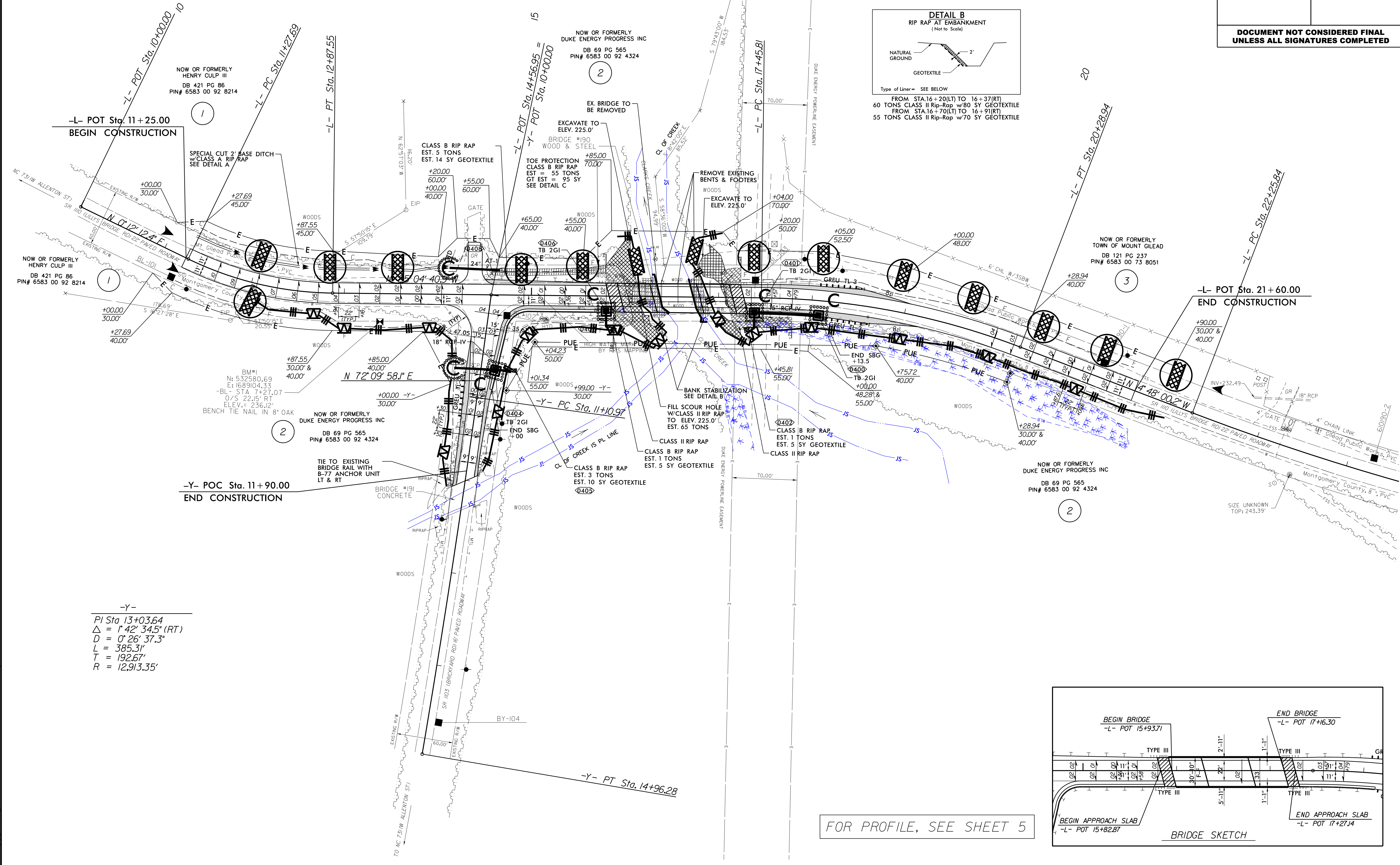
**CH ENGINEERING**

3220 GLEN ROYAL RD. RALEIGH, NC 27617  
TELE 919.788.0224 FAX 919.788.0232  
NC LICENSE #P0189

PROJECT REFERENCE NO. 17BP.8.R.135	SHEET NO. EC-05/CONST.04
MONTGOMERY COUNTY BRIDGE #190	ROADWAY DESIGN ENGINEER
	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

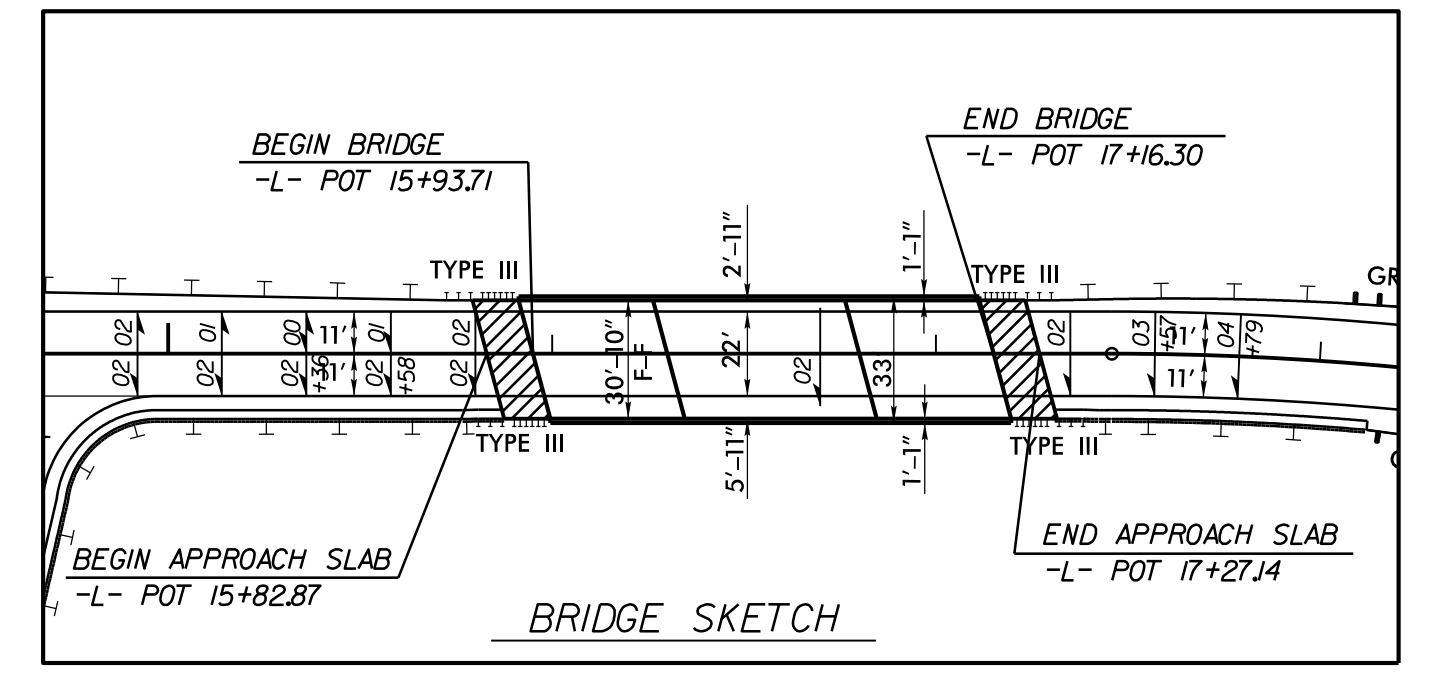


REVISIONS



-Y-  
PI Sta 13+03.64  
 $\Delta = 1'42'' 34.5''$  (RT)  
 $D = 0'26'' 37.3''$   
 $L = 385.31'$   
 $T = 192.67'$   
 $R = 12,913.35'$

FOR PROFILE, SEE SHEET 5




20-JUL-2021 09:39  
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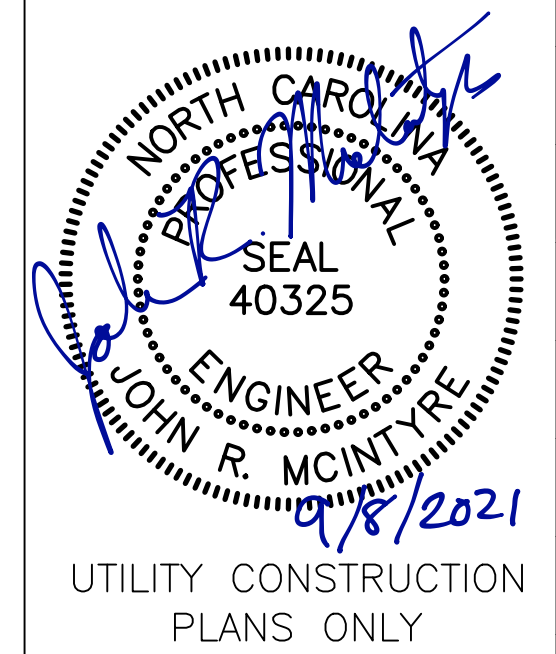


5/14/99

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

REFERENCE NO. 17BP.8.PE.135	SHEET NO. UC-2
	
<small>LKC Engineering, LLC 143 Aqua Street Court Asheboro, NC 28315 P: 910.420.1837 F: 910.637.0096 lkcengineering.com License No. P-1095</small>	

## UTILITIES PLAN SHEET SYMBOLS



### PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	_____
11¼ Degree Bend	_____++
22½ Degree Bend	_____+X
45 Degree Bend	_____+X
90 Degree Bend	_____+†
Plug	_____■
Tee	_____+†
Cross	_____+†
Reducer	_____▶
Gate Valve	_____GV
Butterfly Valve	_____BV
Tapping Valve	_____TGV
Line Stop	_____LS
Line Stop with Bypass	_____LS/BP
Blow Off	_____BO
Fire Hydrant	_____PFH
Relocate Fire Hydrant	_____RFH
Remove Fire Hydrant	_____REM FH
Water Meter	_____PMM
Relocate Water Meter	_____RWM
Remove Water Meter	_____REM WM
Water Pump Station	_____PST(W)
RPZ Backflow Preventer	_____PRPZ
DCV Backflow Preventer	_____PBFP
Relocate RPZ Backflow Preventer	_____RRPZ
Relocate DCV Backflow Preventer	_____RBFP

### PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	_____
Force Main Sewer Line (Sized as Shown)	_____
Manhole (Sized per Note)	_____●
Sewer Pump Station	_____PST(SS)

### PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	_____o
Telephone Pole	_____o
Joint Use Pole	_____o
Telephone Pedestal	_____TEL PED
Utility Line by Others (Type as Shown)	_____
Trenchless Installation	_____
Encasement by Open Cut	_____
Encasement	_____

Thrust Block	_____I
Air Release Valve	_____AR
Utility Vault	_____UV
Concrete Pier	_____CP
Steel Pier	_____SP
Plan Note	_____NOTE
Pay Item Note	_____PAY ITEM

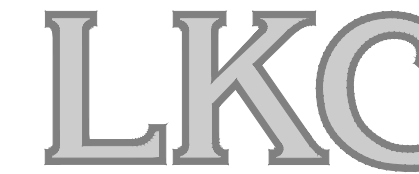
### EXISTING UTILITIES SYMBOLS

Power Pole	_____●	*Underground Power Line	_____
Telephone Pole	_____●	*Underground Telephone Cable	_____
Joint Use Pole	_____●	*Underground Telephone Conduit	_____
Utility Pole	_____●	*Underground Fiber Optics Telephone Cable	_____
Utility Pole with Base	_____□	*Underground TV Cable	_____
H-Frame Pole	_____●	*Underground Fiber Optics TV Cable	_____
Power Transmission Line Tower	_____⊠	*Underground Gas Pipeline	_____
Water Manhole	_____⊙	Aboveground Gas Pipeline	_____A/G Gas
Power Manhole	_____⊙	*Underground Water Line	_____
Telephone Manhole	_____⊙	Aboveground Water Line	_____A/G Water
Sanitary Sewer Manhole	_____⊙	*Underground Gravity Sanitary Sewer Line	_____
Hand Hole for Cable	_____⊠	Aboveground Gravity Sanitary Sewer Line	_____A/G Sanitary Sewer
Power Transformer	_____⊠	*Underground SS Forced Main Line	_____
Telephone Pedestal	_____⊠	Underground Unknown Utility Line	_____
CATV Pedestal	_____⊠	SUE Test Hole	_____●
Gas Valve	_____◇	Water Meter	_____⊙
Gas Meter	_____◇	Water Valve	_____⊙
Located Miscellaneous Utility Object	_____○	Fire Hydrant	_____◇
Abandoned According to Utility Records	_____AATUR	Sanitary Sewer Cleanout	_____⊙
End of Information	_____E.O.I.		

\*For Existing Utilities  
 Utility Line Drawn from Record \_\_\_\_\_  
 (Type as Shown)  
 Designated Utility Line \_\_\_\_\_  
 (Type as Shown)

L:\MonCo-21.01\_Bridge\_#190\_Utility\_Relocation\From CH Engineering\Details & Misc\MonCo-21.01\_SHEET SYMBOLS.dwg; Last Saved By: BRYAN, 9/2/2021 11:22:30 PM; SHEET SYMBOLS; Plotted By: Bryan Stone, 09/08/21 08:36:21 AM





Engineering  
Landscape Architecture  
Surveying

LKC Engineering, PLLC  
140 Aqua Shed Court  
Aberdeen, NC 28315  
O: 910.420.1437  
F: 910.637.0096  
lkceengineering.com  
License No. P-1095

PROJECT REFERENCE NO.	SHEET NO.
17BP.8.PE.135	UC-3
DESIGNED BY: JRM	
DRAWN BY: BCS	
CHECKED BY: JRM	
APPROVED BY: -	
REVISED: -	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	
<b>UTILITY CONSTRUCTION</b> <b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL CONTACT THE POWER CO., GAS CO., AND TELEPHONE CO. FOR THE EXACT LOCATION OF ALL UNDERGROUND MAINS, CABLES, OR LINES BEFORE CONSTRUCTION BEGINS.
2. PIPE SEPARATION: THE FOLLOWING MINIMUM PIPE SEPARATION WILL BE MAINTAINED: 18 INCHES VERTICAL SEPARATION BETWEEN CROSSING OF SANITARY SEWER AND STORM SEWERS, 18 INCHES VERTICAL SEPARATION BETWEEN CROSSING OF SEWER (INCLUDING FORCE MAINS) AND WATER MAINS, OR 10 FEET HORIZONTAL SEPARATION BETWEEN SANITARY SEWER (INCLUDING FORCE MAINS) AND WATER MAINS. IF THESE SEPARATIONS CANNOT BE MAINTAINED, DUCTILE IRON PIPE WILL BE USED 10 FEET EITHER SIDE OF CROSSING AND ALONG ENTIRE LENGTH OF LINE LESS THAN 10 HORIZONTAL FEET FROM WATER MAINS. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE ENGINEER IN THE FIELD BEFORE PAYMENT WILL BE MADE AT DUCTILE IRON PRICES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING WATER SERVICE CONNECTIONS DURING CONSTRUCTION. ANY DAMAGE WHICH OCCURS AS A RESULT OF THE CONSTRUCTION SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. IN THE EVENT OF A TEMPORARY SERVICE INTERRUPTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND BEGIN REPAIRS.
4. ALL PIPING FOR PRESSURE MAINS SHALL BE PRESSURE TESTED, GRAVITY LINES SHALL BE AIR TESTED, AND MANHOLES SHALL BE VACUUM TESTED, ALL IN ACCORDANCE WITH THE DETAILED SPECIFICATIONS AND SPECIAL PROVISIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 24 HOURS IN ADVANCE OF ALL SCHEDULED TESTING.
5. ALL WORK PERFORMED WITHIN NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RIGHTS-OF-WAY SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE NCDOT CONSTRUCTION AND MAINTENANCE OPERATIONS SUPPLEMENT TO THE MANUAL OR UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE WORK AND ADHERING TO THE RIGHT-OF-WAY ENCROACHMENT CONTRACT SPECIAL PROVISIONS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE OWNER TO ACCURATELY DETERMINE THE LOCATION OF EXISTING WATER MAINS AND SEWER LINES WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL TAKE ADDITIONAL CAUTION IN EXCAVATING AROUND THE SERVICE LINES AND MAINS WHILE WORKING WITHIN THIS PROJECT. ANY DAMAGE TO THE MAINS OR SERVICE LINES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. THE CONTRACTOR SHALL REMOVE AND REPLACE EXISTING CULVERTS AND DRAINAGE STRUCTURES AS NECESSARY DURING THE CONSTRUCTION OF THE WATER MAIN. ANY DAMAGE TO THE CULVERTS SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. SPECIAL CIRCUMSTANCES (I.E. UNREINFORCED CONCRETE PIPE) SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY IN ORDER TO RECEIVE ANY NECESSARY
8. THE CONTRACTOR IS INSTRUCTED TO CONTROL SEDIMENTATION RUNOFF BY METHODS APPROVED BY THE ENGINEERS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS REMINDED THAT ALL WORK SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE RULES AND REGULATIONS OF EROSION AND SEDIMENT CONTROL AS PUBLISHED BY THE DEPARTMENT OF NC ENVIRONMENTAL QUALITY.
9. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING THE ACTUAL AS-BUILT CONDITION OF THE PROJECT AT COMPLETION. AS-BUILTS WILL BE FURNISHED AT OR PRIOR TO FINAL INSPECTION BY THE ENGINEER. AS-BUILTS WILL BE REVIEWED BY THE ENGINEERS REPRESENTATIVE PRIOR TO APPROVAL OF MONTHLY PROGRESS PAYMENTS. MARK-UP COPIES OF THE DRAWINGS INDICATING ALL DIMENSIONS AND ELEVATIONS ARE ACCEPTABLE AS AS-BUILT DRAWINGS.

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JANUARY 2018.
2. THE EXISTING UTILITIES BELONG TO MONTGOMERY COUNTY
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION, NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNER'S REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.
6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIAL SUBMITTALS AND RECORDS IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED FORCE MAIN AND WATER LINE TO BE PVC C-900 DR18 UNLESS NOTED OTHERWISE ON PLANS. ALL DUCTILE IRON PIPE SHALL BE PC350. AND DUCTILE IRON WATER MAIN SHALL HAVE AN EPOXY INTERIOR LINING.
2. WELL IN ADVANCE OF BEGINNING UTILITY WORK, SOFT DIGS SHALL BE PERFORMED BY CONTRACTOR TO VERIFY ACTUAL WATER LINE DEPTH AND MATERIAL AT PROPOSED TIE-IN LOCATIONS.
3. LAY PIPE STRAIGHT IN ALIGNMENT AND GRADIENT OR FOLLOW TRUE CURVES AS NEARLY AS POSSIBLE. DO NOT DEFLECT ANY JOINT MORE THAN THE MAXIMUM DEFLECTION RECOMMENDED BY THE MANUFACTURER.
4. LKC/ MONTGOMERY COUNTY AND NCDOT TO REVIEW/ APPROVE RELEVANT SUBMITTALS.
5. ANY SERVICE INTERRUPTIONS SHALL BE SCHEDULED FOR MINIMAL IMPACT TO CUSTOMERS AND APPROVED BY MONTGOMERY COUNTY.
6. THE CONTRACTOR SHALL NOTIFY LKC/ MONTGOMERY COUNTY IN ADVANCE OF THE FOLLOWING ACTIVITIES:
  - A. START OF UTILITY CONSTRUCTION- 48 HOURS
  - B. MAIN LINE SERVICE INTERRUPTIONS- 96 HOURS
  - C. PRESSURE TESTING- 24 HOURS
  - D. DISINFECTION- 24 HOURS
7. LKC/ MONTGOMERY COUNTY AND NCDOT HAVE RIGHT-OF-ENTRY TO THE PROJECT SITE.
8. THE PROPOSED PIPELINE SHALL BE INSTALLED AT THE DEPTHS SHOWN IN THE PROFILE TO AVOID HIGH POINTS THAT CAN TRAP AIR. ALL COST FOR INSTALLATION IN DEEPER CUTS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND SHOULD BE INCLUDED IN THE PRICE FOR WATER MAIN INSTALLATION.

# PROJECT TYPICAL DETAILS

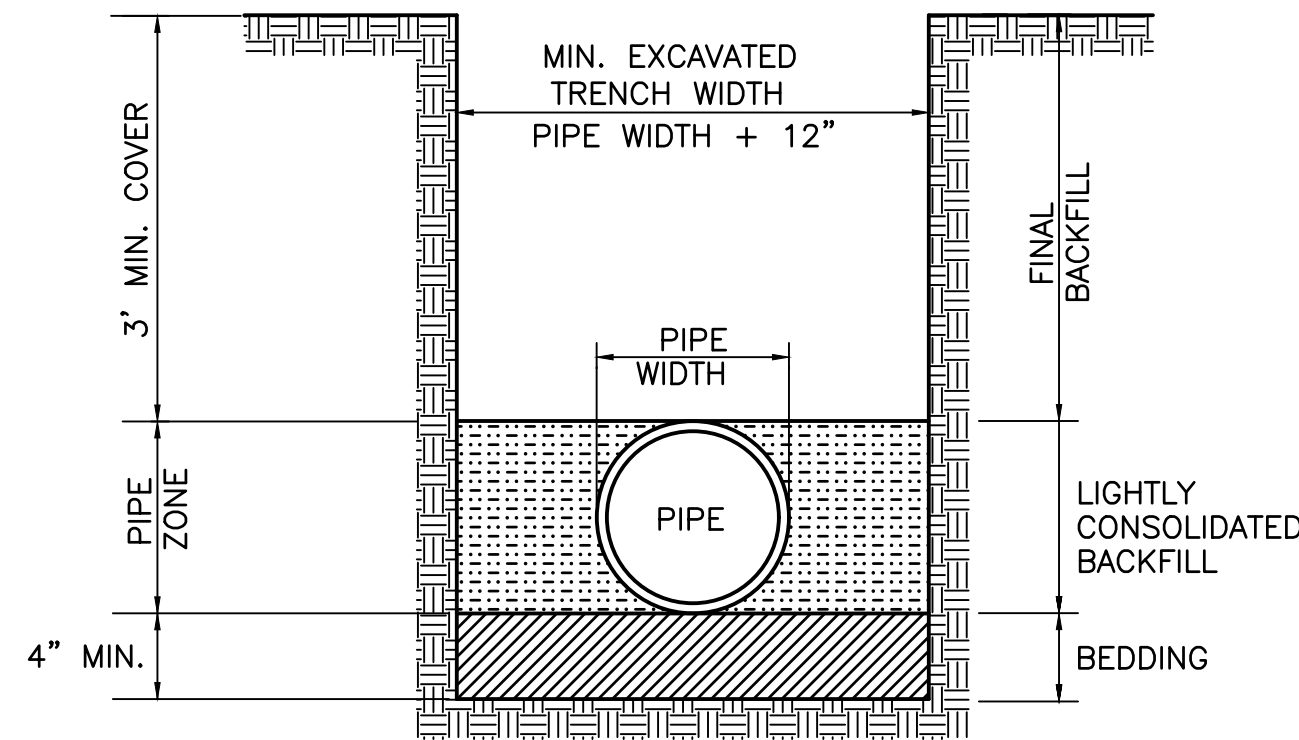
# LKC

Engineering  
Landscape Architecture  
Surveying

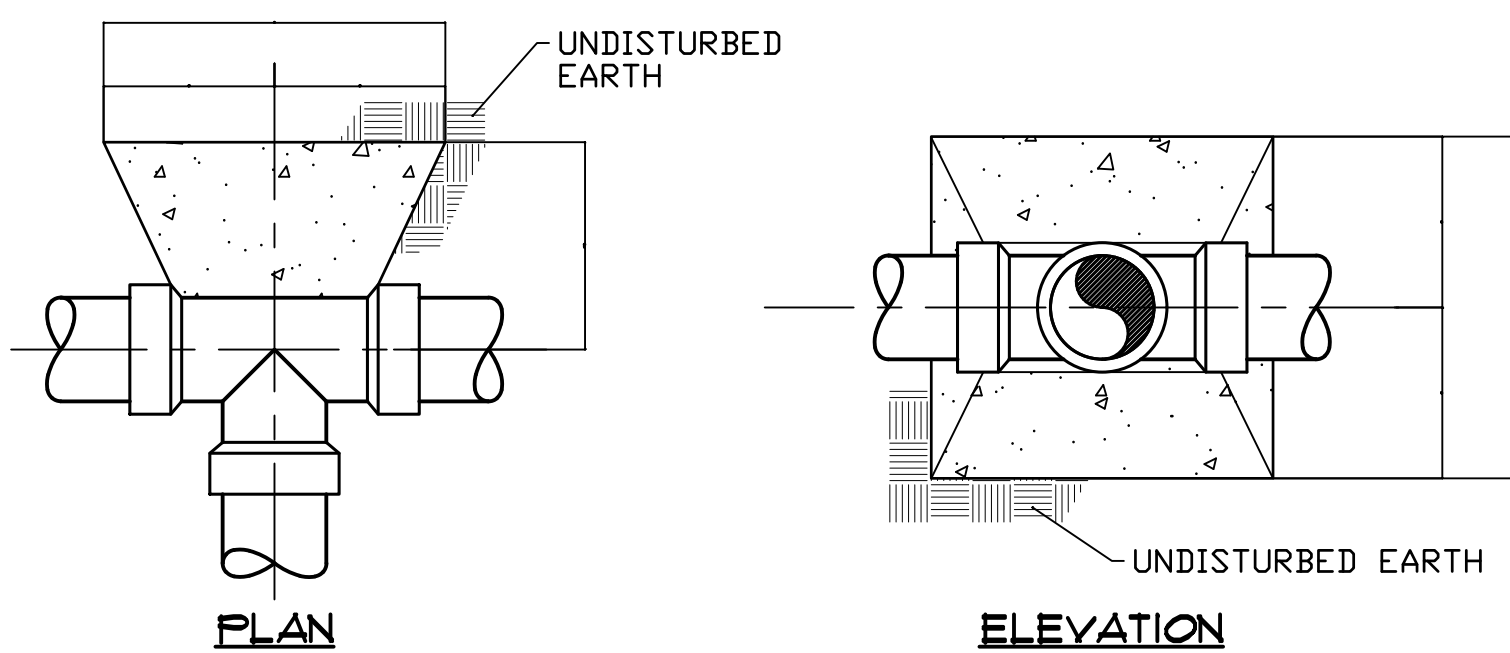
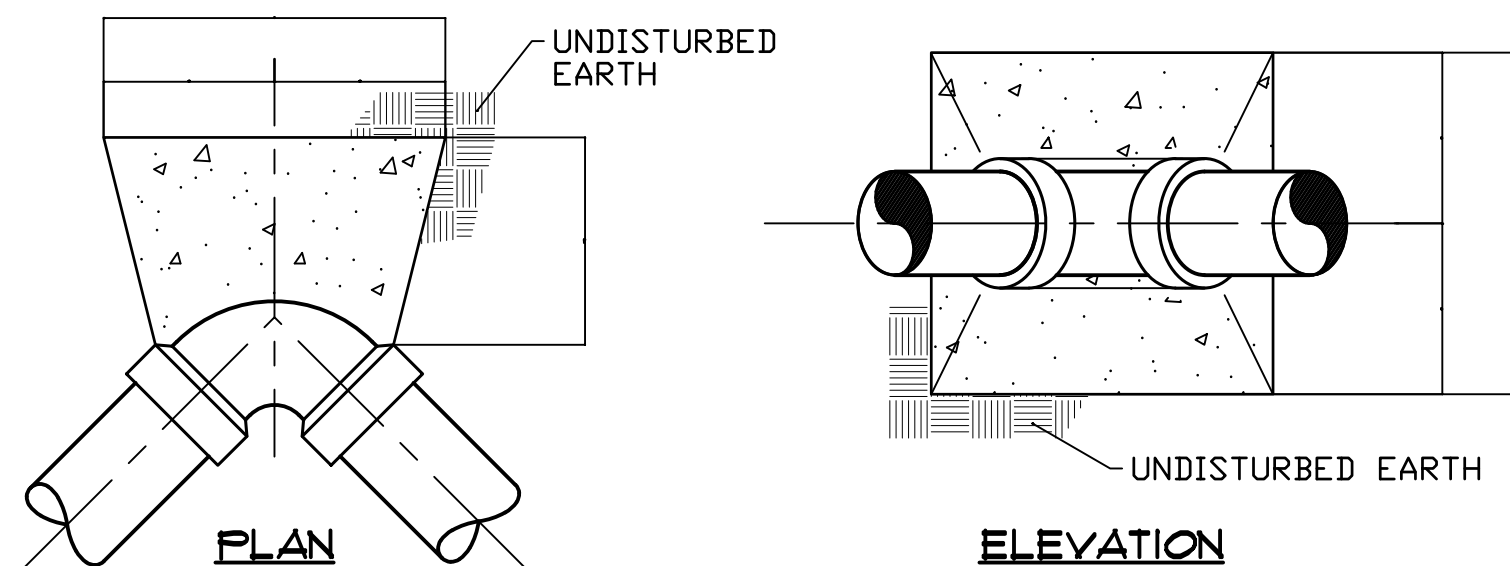
LKC Engineering, PLLC  
140 Aqua Shed Court  
Aberdeen, NC 28315  
O: 910.420.1437  
F: 910.637.0096  
lkceengineering.com  
License No. P-1095

<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
17.BP.8.PE.135	UC-4
DESIGNED BY: <b>JRM</b>	
DRAWN BY: <b>BCS</b>	
CHECKED BY: <b>JRM</b>	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITY CONSTRUCTION PLANS ONLY	
<b>UTILITY CONSTRUCTION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

**NOTE:**  
BEDDING SHALL BE 4" MINIMUM LOOSE SOIL, FREE FROM ROCKS, AND SHALL PROVIDE UNIFORM SUPPORT FOR THE FULL LENGTH OF PIPE.



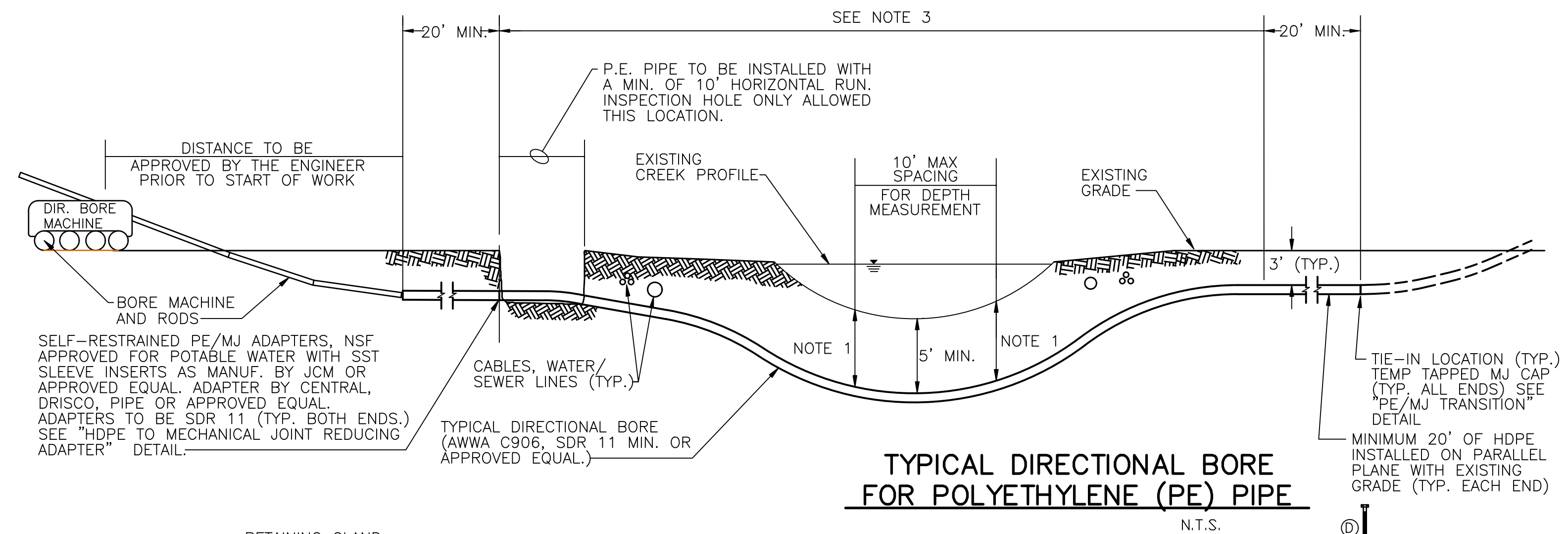
**TRENCH DETAIL  
TYPE 3 LAYING CONDITIONS**  
N.T.S.



**NOTES:**  
1. THRUST BLOCKS SHALL BE CONSTRUCTED OF 2500 P.S.I. CONCRETE.  
2. INSTALL TAR PAPER AROUND BEND OR FITTING TO PREVENT BONDING OF CONCRETE.

BEND / FITTING	DIMENSION A (FEET)									
	PIPE SIZE (NOM. DIA. IN INCHES)									
	4	6	8	10	12	16	18	20	24	
90° BEND	1.4	2.0	2.7	3.4	4.0	5.4	6.0	6.7	8.0	
45° BEND	1.0	1.5	2.0	2.5	3.0	4.0	4.5	5.0	5.9	
22 1/2° BEND	0.8	1.1	1.5	1.8	2.2	2.9	3.2	3.6	4.3	
11 1/4° BEND	0.5	0.8	1.0	1.3	1.5	2.0	2.3	2.5	3.0	
TEE BRANCH/DEAD END	1.2	1.7	2.3	2.9	3.4	4.5	5.1	5.7	6.8	

**CONCRETE THRUST BLOCK DETAIL  
FOR PRESSURE MAIN HORIZONTAL BENDS AND TEES**  
N.T.S.

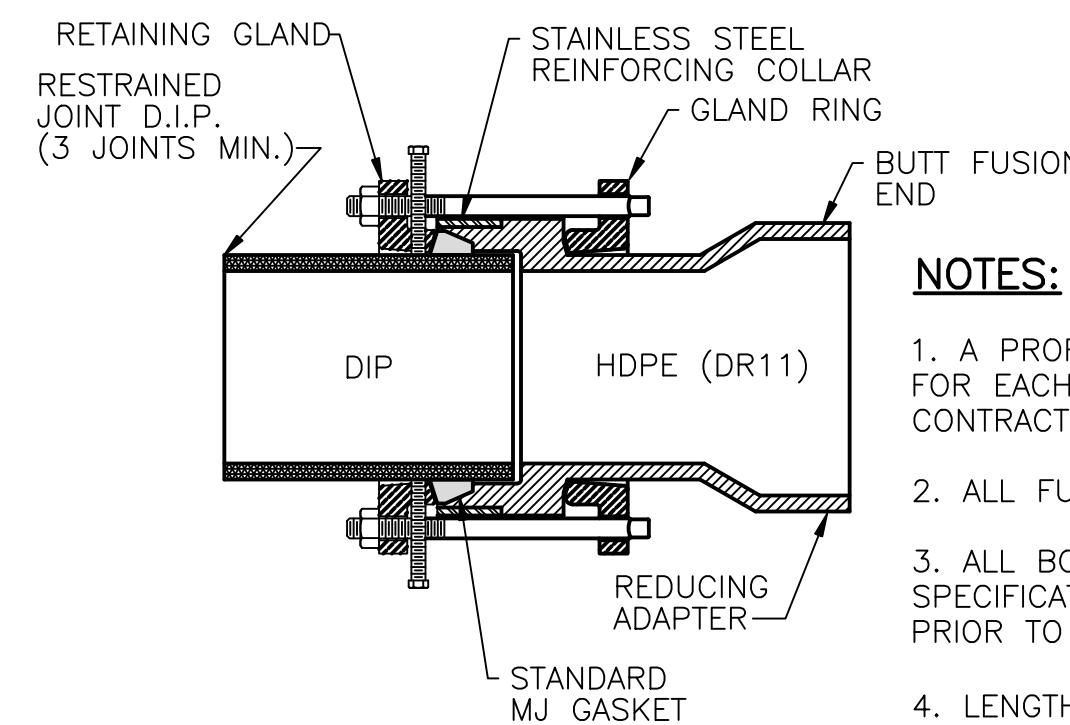


**TYPICAL DIRECTIONAL BORE  
FOR POLYETHYLENE (PE) PIPE**  
N.T.S.

SELF-RESTRAINED PE/MJ ADAPTERS, NSF APPROVED FOR POTABLE WATER WITH SST SLEEVE INSERTS AS MANUF. BY JCM OR APPROVED EQUAL. ADAPTER BY CENTRAL, DRISCO, PIPE OR APPROVED EQUAL. ADAPTERS TO BE SDR 11 (TYP. BOTH ENDS.) SEE "HDPE TO MECHANICAL JOINT REDUCING ADAPTER" DETAIL.

TYPICAL DIRECTIONAL BORE (AWWA C906, SDR 11 MIN. OR APPROVED EQUAL.)

TIE-IN LOCATION (TYP.) TEMP TAPPED MJ CAP (TYP. ALL ENDS) SEE "PE/MJ TRANSITION" DETAIL  
MINIMUM 20' OF HDPE INSTALLED ON PARALLEL PLANE WITH EXISTING GRADE (TYP. EACH END)

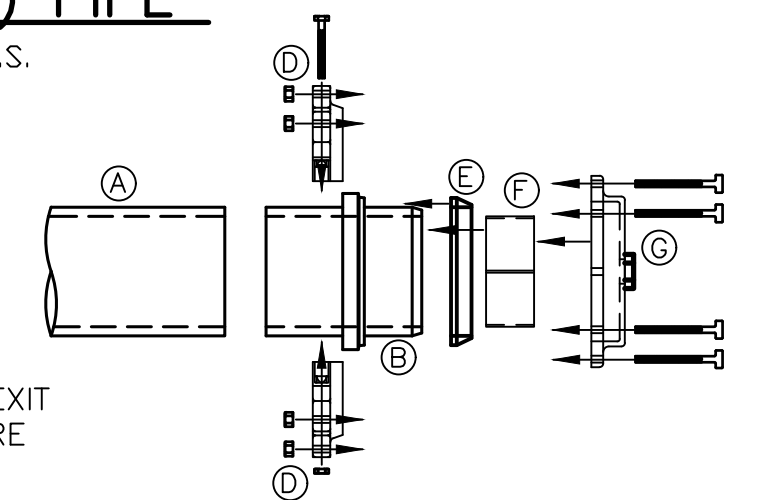


**HDPE TO MECHANICAL  
JOINT REDUCING ADAPTER**  
N.T.S.

HDPE PRESSURE RATING	
HDPE DR11	160 PSI
HDPE DR9	200 PSI
HDPE DR7	250 PSI

**NOTES:**

- A PROFILE AND PLAN SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR.
- ALL FUSED HDPE PIPE SHALL BE AIR TESTED PRIOR TO BORING.
- ALL BORE SECTIONS SHALL BE HYDROSTATICALLY TESTED PER SPECIFICATION STANDARDS UPON COMPLETION OF INSTALLATION AND PRIOR TO PLACING THE WATER MAIN ON-LINE.
- LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF P.E. PIPE JOINTS, LOCATION OF BORE MACHINE, AUGER ENTRANCE LOCATION, AND TIE-IN POINTS ARE TO BE APPROVED BY THE ENGINEER PRIOR TO ANY START OF WORK.
- THIS DETAIL IS ALSO APPLICABLE TO STREAMS, WETLANDS, LARGE STORM DRAINS, AND SIMILAR APPLICATIONS FOR DIRECTIONAL BORE WITH POLY-ETHYLENE PIPE.
- THE BORE DEVELOPED FOR THE LEAD IN END OF THE PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION. THE LEAD IN END SHALL BE PULLED THROUGH WITHOUT THE M.J. FLANGE ATTACHED FOR LARGER THAN 6" PIPE INSTALLATIONS. THE M.J. FLANGE FOR SAID LEAD IN END SHALL BE INSTALLED AFTER THE PIPE INSTALLATION WITH THE USE OF A SPLIT M.J. FLANGE PER THE DETAIL ON THIS DRAWING.
- CONTRACTOR SHALL FURNISH TO THE ENGINEER THE AS-BUILT LOCATION OF THE BORE IN ACCORDANCE WITH THE SPECIFICATIONS FOR DIRECTIONAL BORING.



**PRE-ASSEMBLY**

- A) HDPE PIPE
- B) HDPE/MJ TRANS. FITTING
- C) HDPE FUSED JOINT
- D) SPLIT MJ GLAND
- E) MJ RUBBER GASKET
- F) SST SLEEVE INSERT
- G) MJ TAPPED CAP

**ASSEMBLED**

**HDPE/MJ TRANSITION  
ASSEMBLY**  
N.T.S.

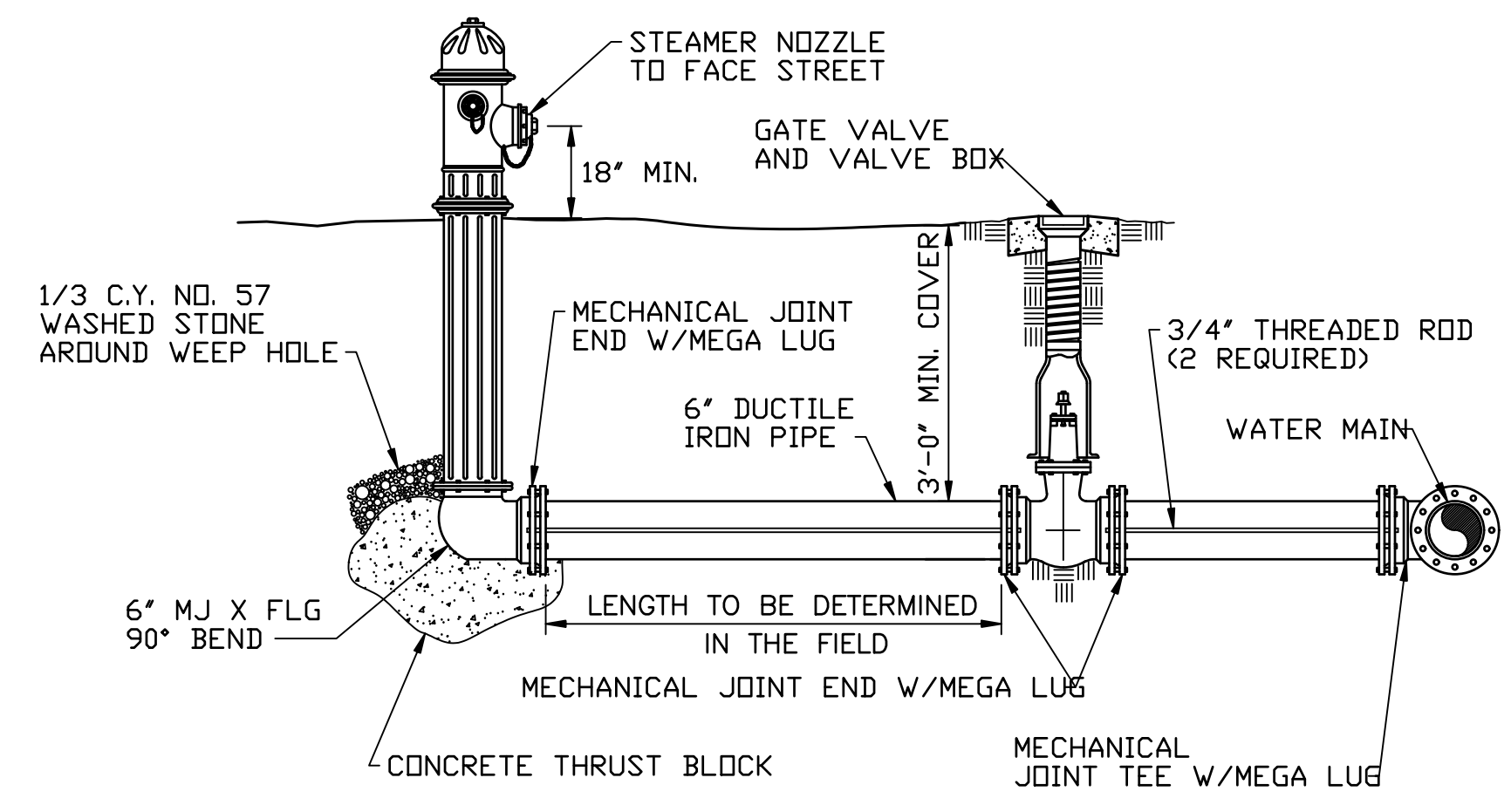
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# PROJECT TYPICAL DETAILS

**LKC** Engineering  
 Landscape Architecture  
 Surveying

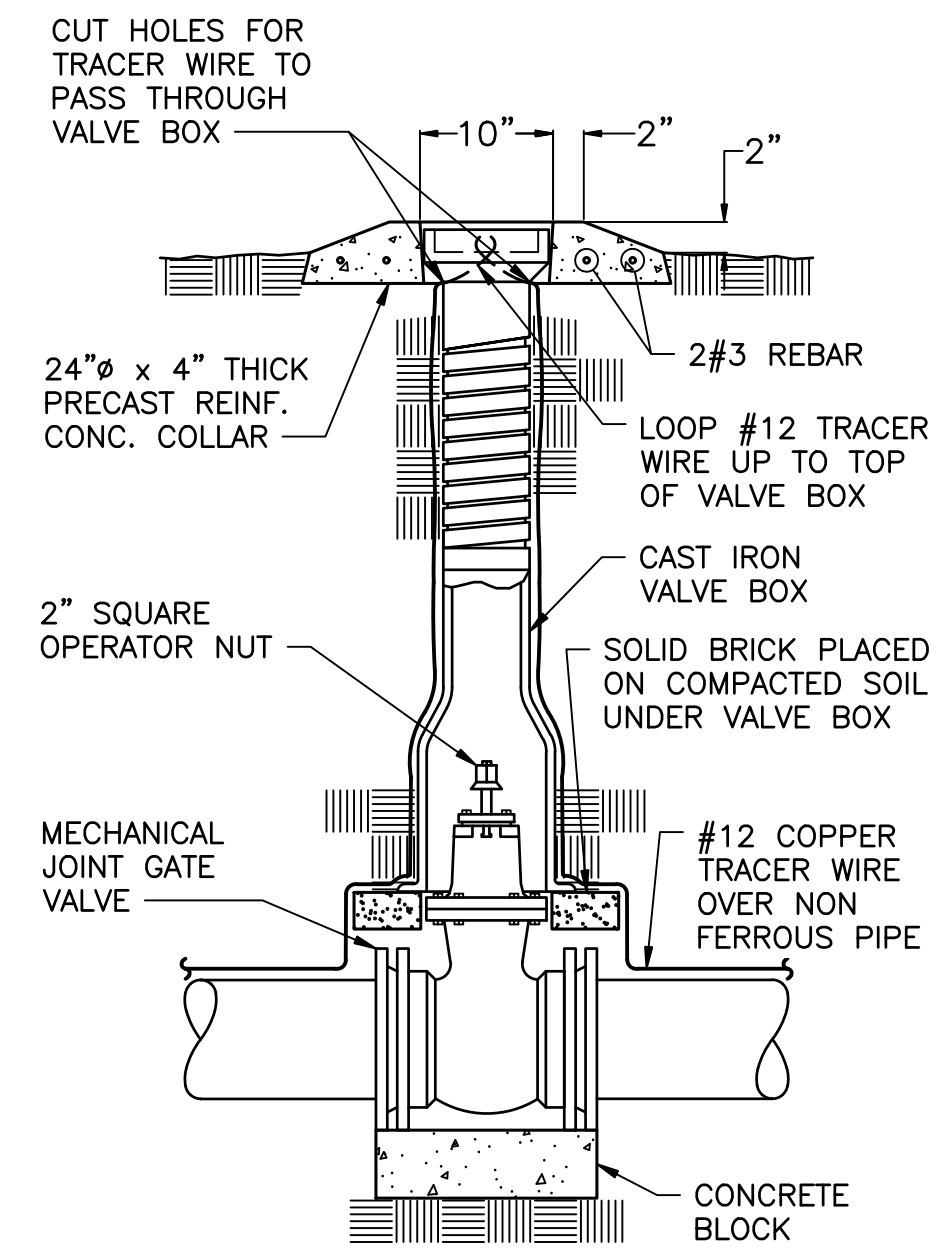
LKC Engineering, PLLC  
 140 Aqua Shed Court  
 Aberdeen, NC 28315  
 O: 910.420.1437  
 F: 910.637.0096  
 lkceengineering.com  
 License No. P-1095

PROJECT REFERENCE NO.	SHEET NO.
17BP.8.PE.135	UC-5
DESIGNED BY: <b>JRM</b>	
DRAWN BY: <b>BCS</b>	
CHECKED BY: <b>JRM</b>	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITY CONSTRUCTION PLANS ONLY	
<b>UTILITY CONSTRUCTION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



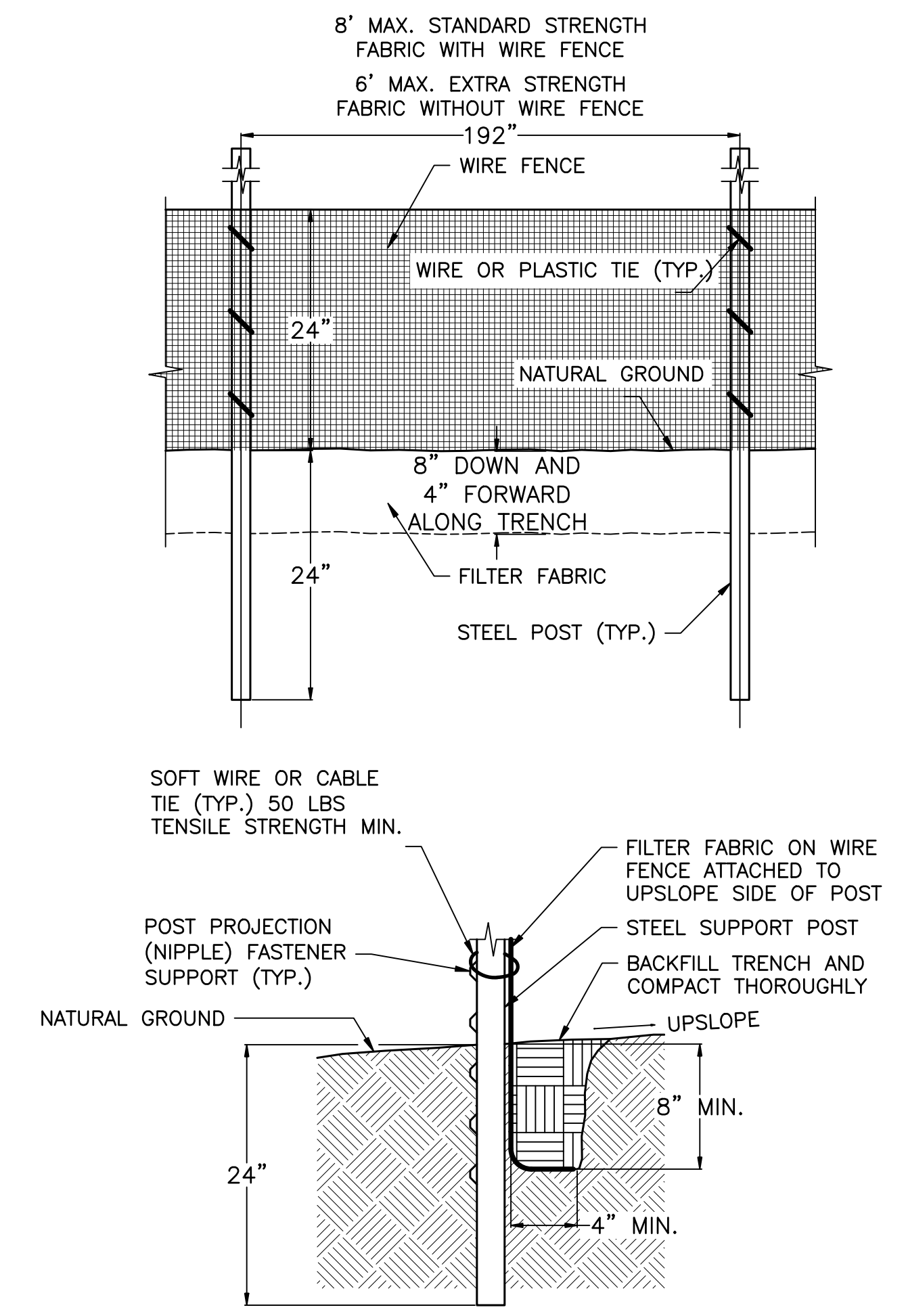
**FIRE HYDRANT AND VALVE DETAIL**  
 N.T.S.

- FIRE HYDRANT NOTES:**
1. FIRE HYDRANTS SHALL BE INSTALLED AT THE EDGE OF THE N.C. D.O.T. RIGHT-OF-WAY. THE DISTANCE FROM THE WATER MAIN TO THE FIRE HYDRANT VARIES. THE CONTRACTORS BID PRICE FOR FIRE HYDRANT ASSEMBLIES SHALL INCLUDE THE COST FOR THE VARYING FIRE HYDRANT LEG LENGTH.
  2. COSTS TO INSTALL THE FIRE HYDRANT TO GRADE SHALL BE PAID BY THE CONTRACTOR.



**GATE VALVE ASSEMBLY**  
 N.T.S.

NOTE:  
 SEPARATION FROM ADJACENT FITTINGS SHOWN ON PLANS AND PROFILES IS FOR CLARITY. ACTUAL SEPARATION MAY BE ADJUSTED TO FIT LAYING CONDITIONS.



NOTE:  
 THIS DETAIL IS SUBSTANTIALLY THE SAME AS FIGURE 6.62a, FOR ADDITIONAL INFORMATION SEE FIGURE 6.62a OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (Rev. 5/13)

**SILT FENCE INSTALLATION - STANDARD METHOD**  
 N.T.S.

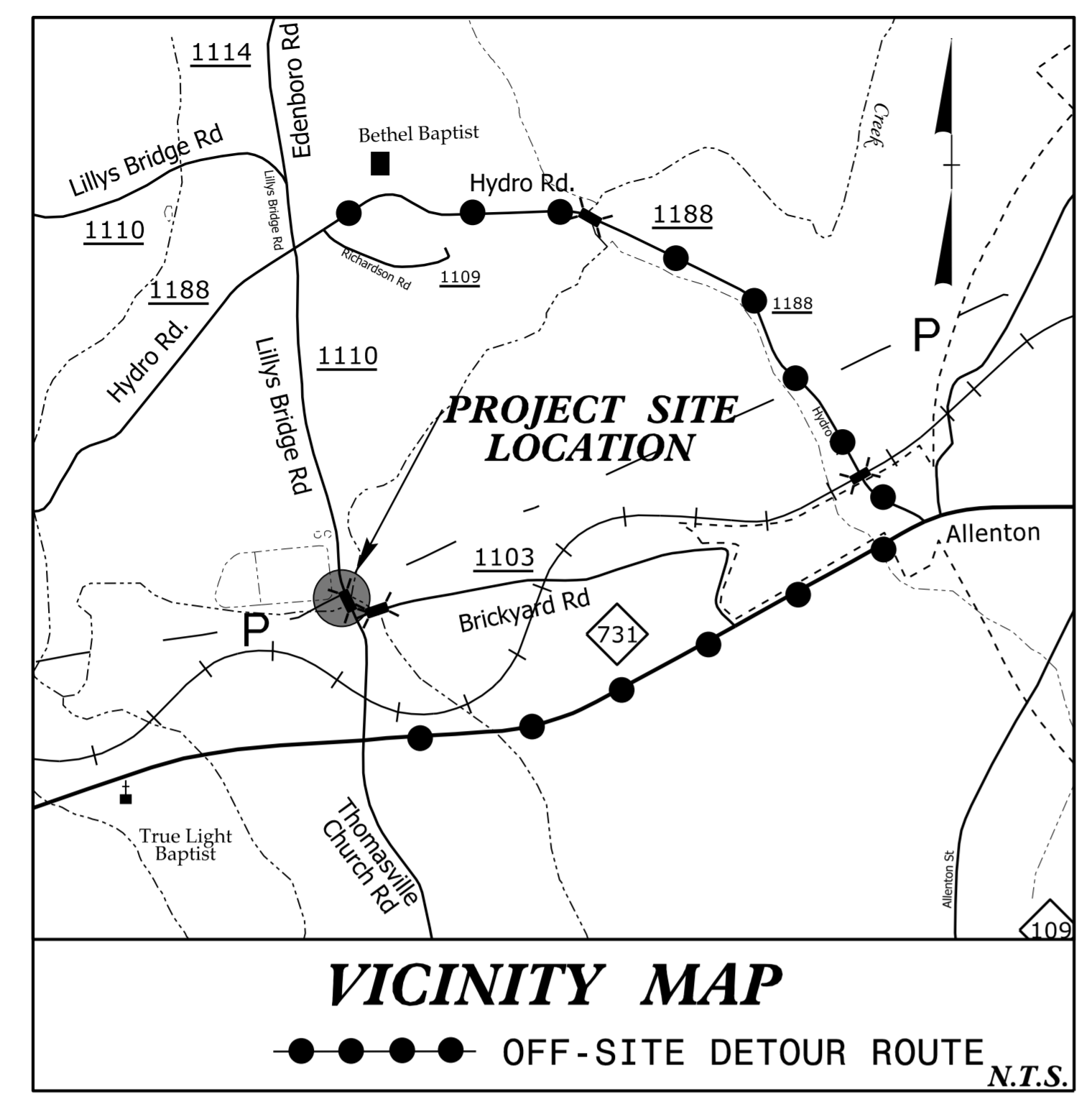




T.I.P. NO.	SHEET NO.
17BP.8.R.135	UO-1

NOTE:  
 ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

**PROJECT: 17BP.8.R.135**

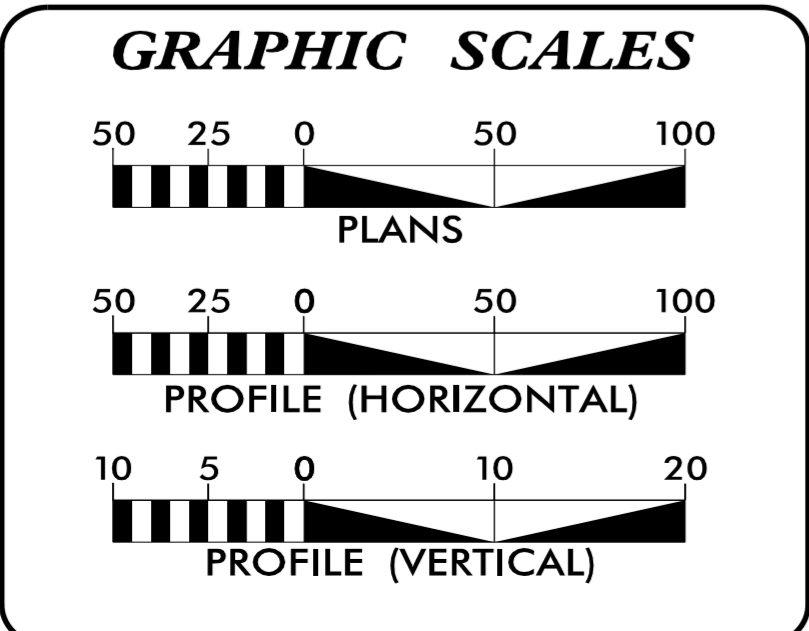
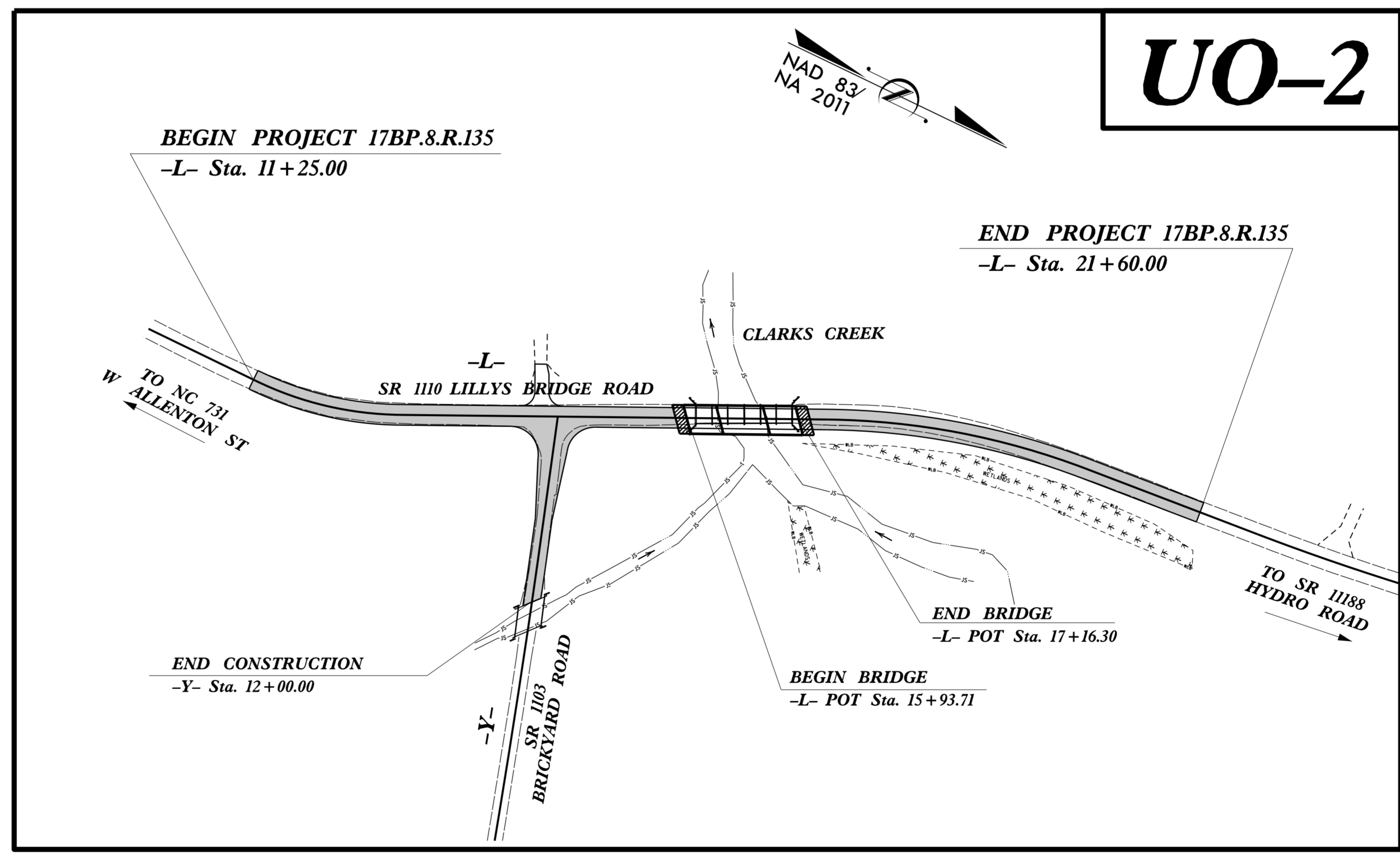


STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

## UTILITIES BY OTHERS PLANS MONTGOMERY COUNTY

**LOCATION: BRIDGE 610190 OVER CLARKS CREEK  
 ON SR 1110 (LILLYS BRIDGE ROAD)**

**TYPE OF WORK: UTILITY RELOCATION**



**INDEX OF SHEETS**

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

**UTILITY OWNERS WITHIN PROJECT**


(A) POWER - DUKE ENERGY TRANSMISSION
(B) POWER - DUKE ENERGY DISTRIBUTION
(C) COMMUNICATIONS - SPECTRUM
(D) WATER - MONTGOMERY COUNTY
(C) SEWER - TOWN OF MT. GILEAD

PREPARED IN THE OFFICE OF:

**CH ENGINEERING**

3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189

**UTILITIES PROJECT ENGINEER**  
 Mary Jo Lee, P.E.

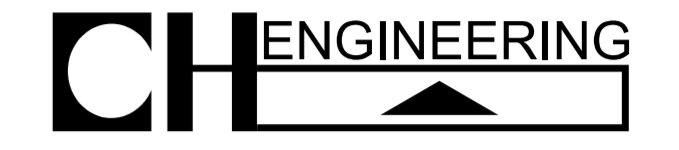
 **DIVISION OF HIGHWAYS  
 DIVISION 8**

121 DOT DRIVE  
 CARTHAGE, NC 28327

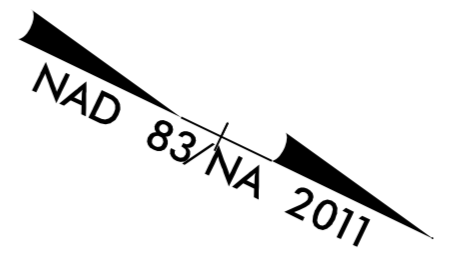
JAMIE YOW	DIVISION CONTACT #1
TRAVIS MORGAN	DIVISION CONTACT #2
TIM WELCH	DIVISION CONTACT #3
	DIVISION CONTACT #4

**UTILITIES BY OTHERS**

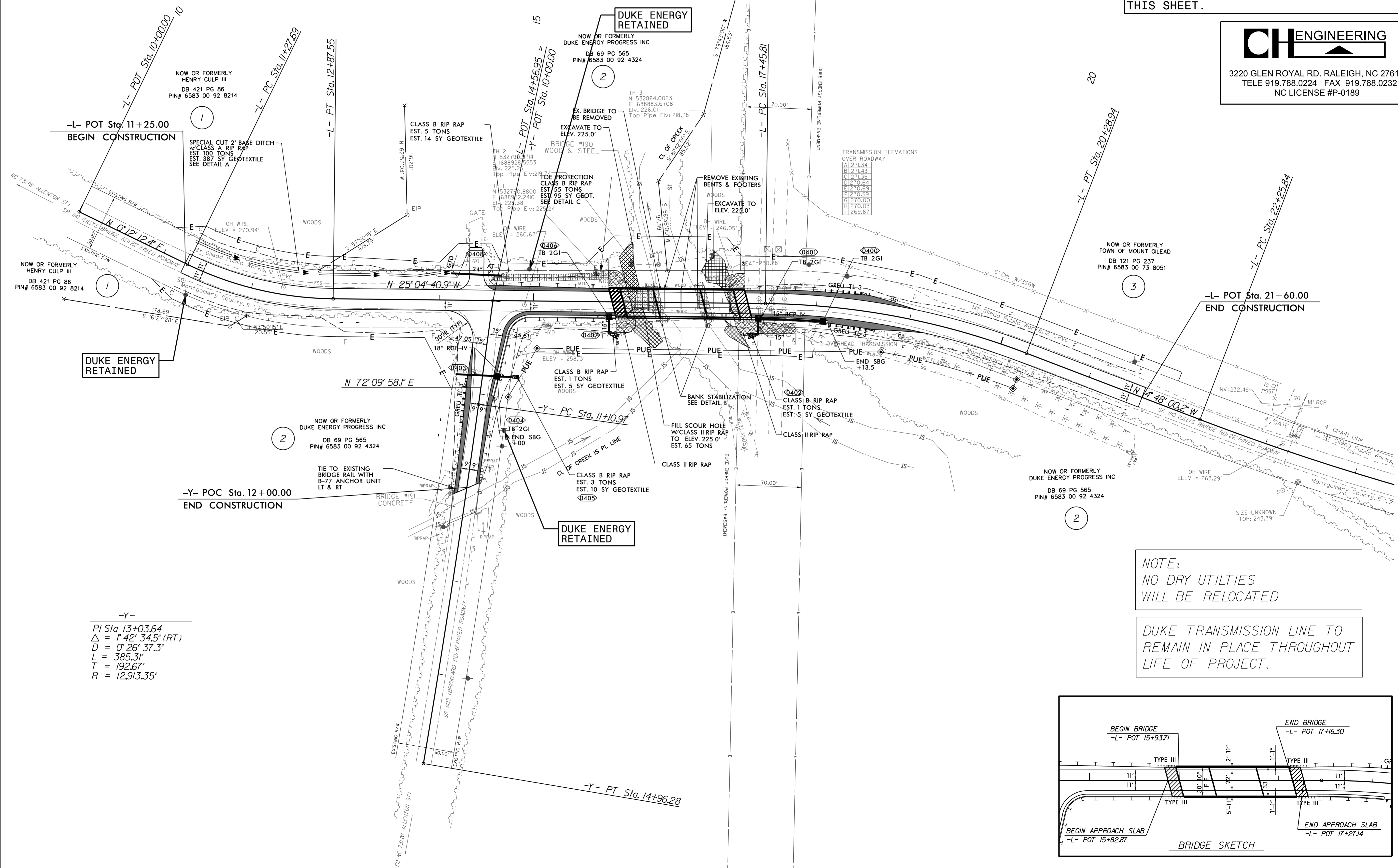
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.



3220 GLEN ROYAL RD. RALEIGH, NC 27617  
 TELE 919.788.0224 FAX 919.788.0232  
 NC LICENSE #P-0189



-L-	-L-	-L-
PI Sta. 12+08.94	PI Sta. 18+88.87	PI Sta. 24+08.01
$\Delta = 25^{\circ}16'53.3"$ (LT)	$\Delta = 20^{\circ}16'40.7"$ (RT)	$\Delta = 7^{\circ}57'29.5"$ (LT)
D = 15'48'53.0"	D = 7'09'43.1"	D = 2'11'16.1"
L = 159.86'	L = 283.13'	L = 363.75'
T = 81.25'	T = 143.06'	T = 182.17'
R = 362.29'	R = 800.00'	R = 2,618.87'



TRANSMISSION ELEVATIONS OVER ROADWAY

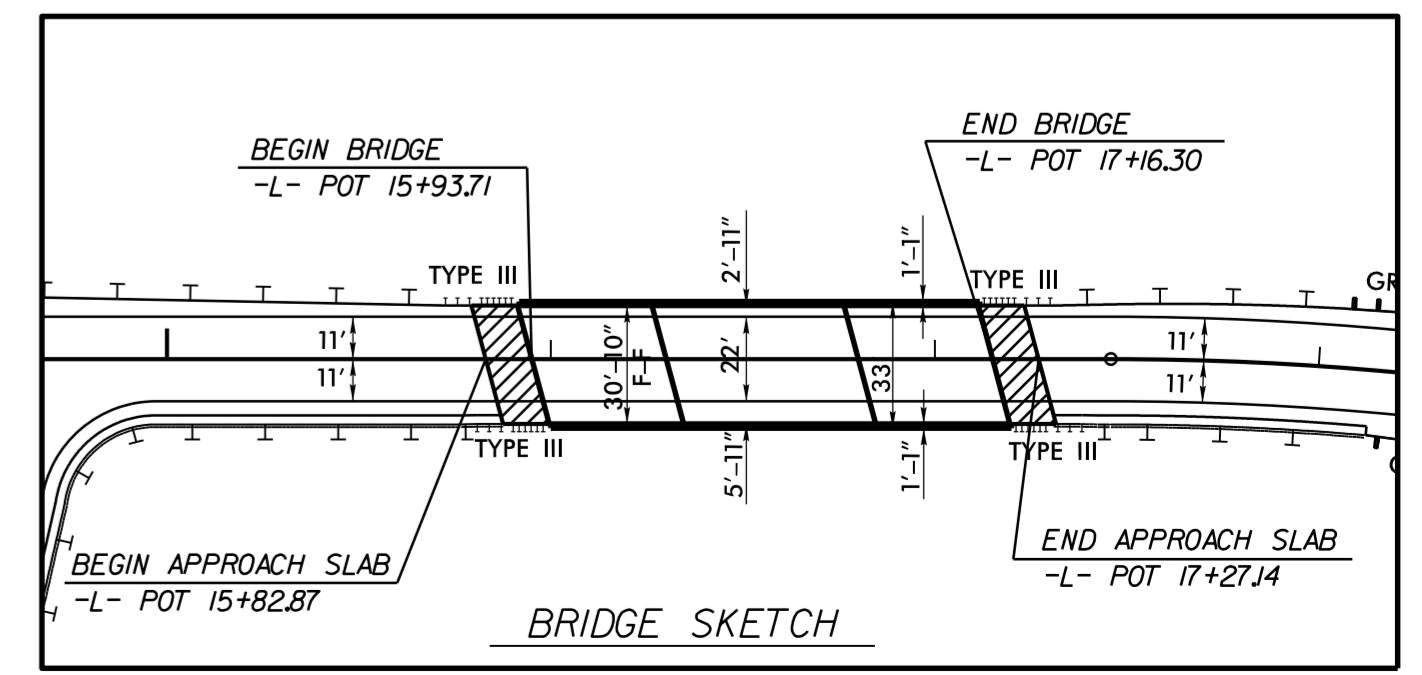
A	271.34
B	271.43
C	271.35
D	270.64
E	270.69
F	270.59
G	270.00
H	270.03
I	269.87

-Y-

PI Sta. 13+03.64
$\Delta = 1^{\circ}42'34.5"$ (RT)
D = 0'26'37.3"
L = 385.31'
T = 192.67'
R = 12,913.35'

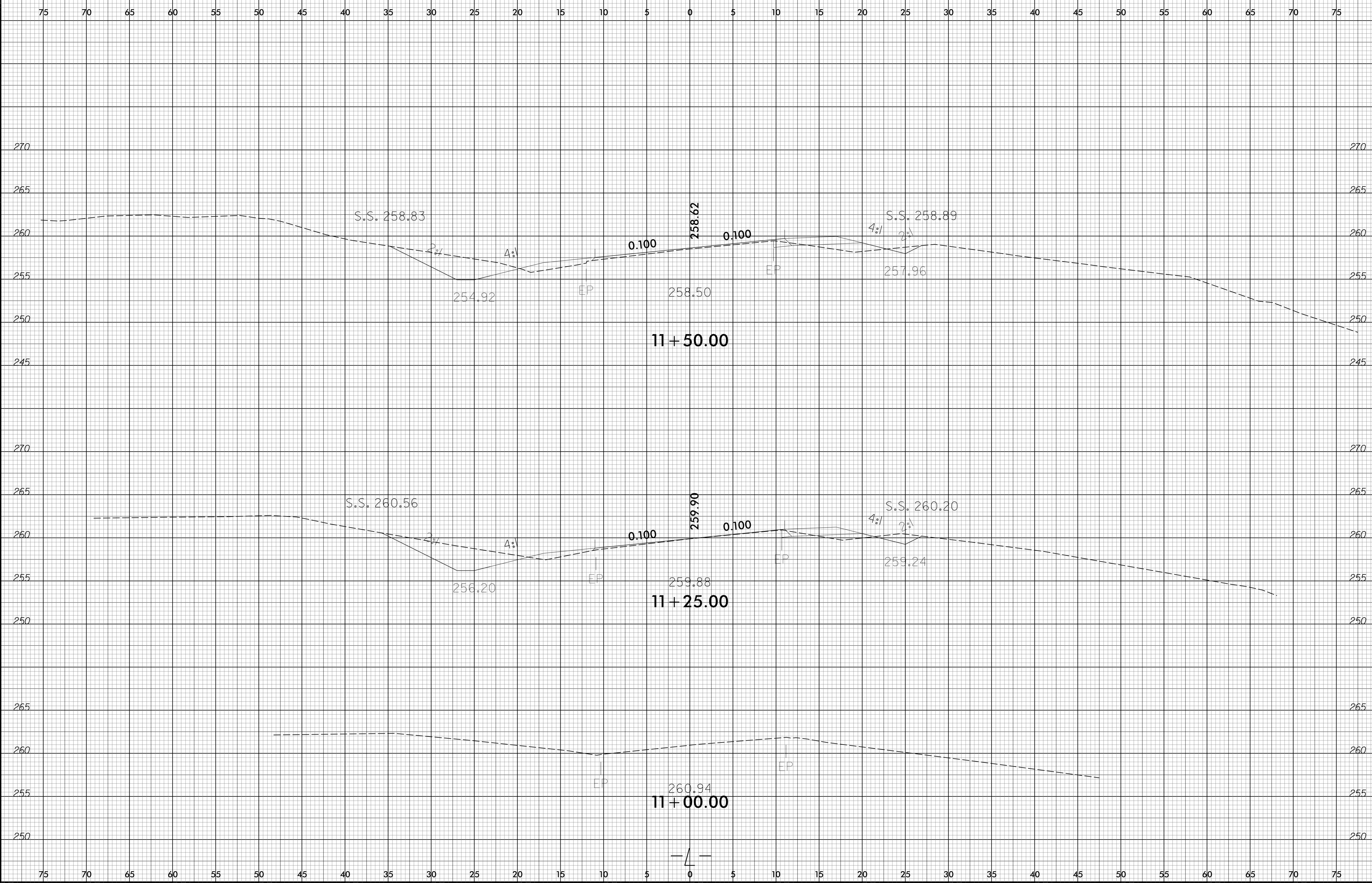
NOTE:  
 NO DRY UTILITIES WILL BE RELOCATED

DUKE TRANSMISSION LINE TO REMAIN IN PLACE THROUGHOUT LIFE OF PROJECT.



5/14/09  
 7/21/2021  
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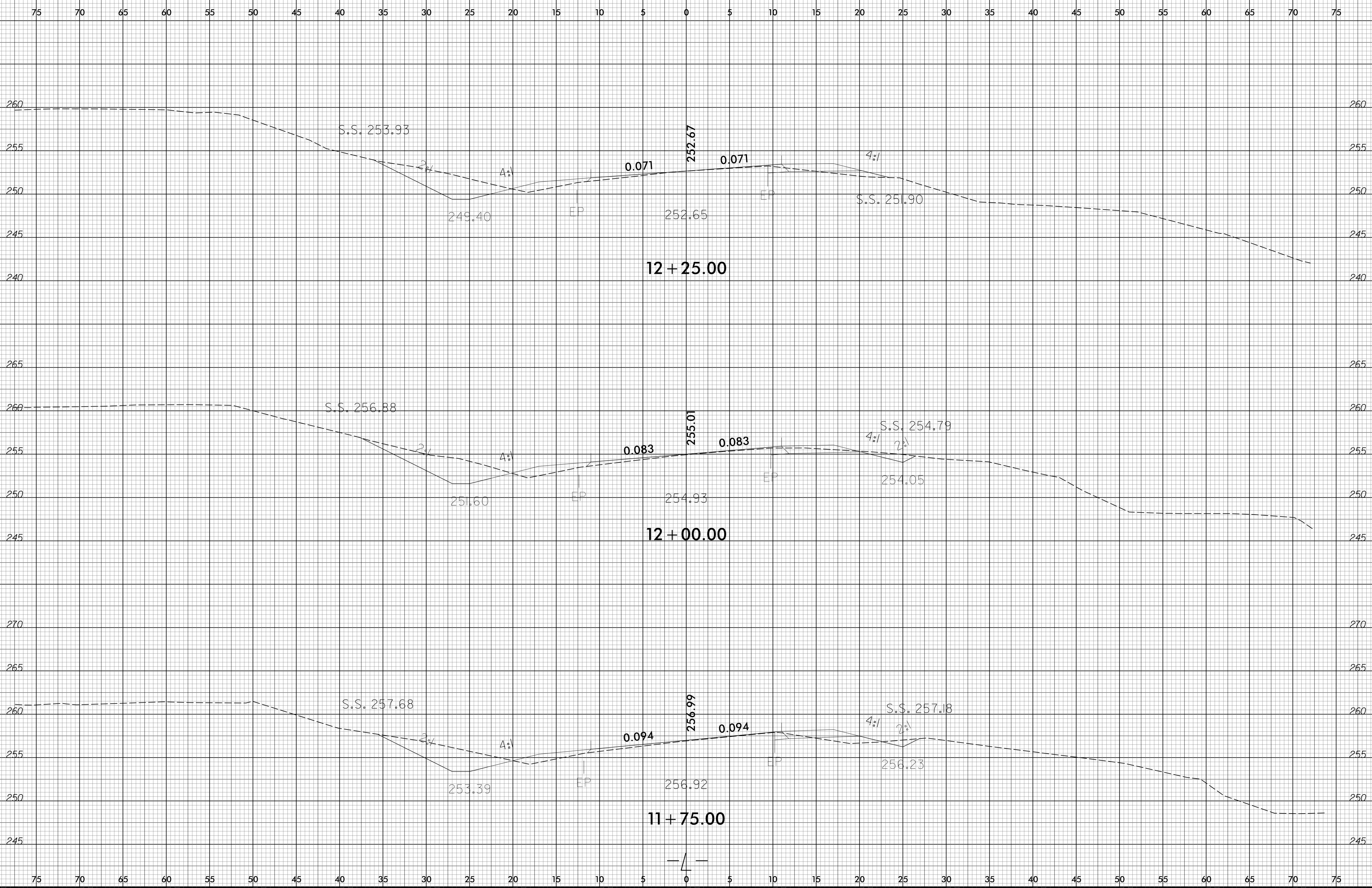
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6/15/2021  
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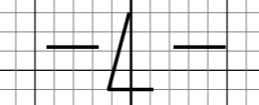
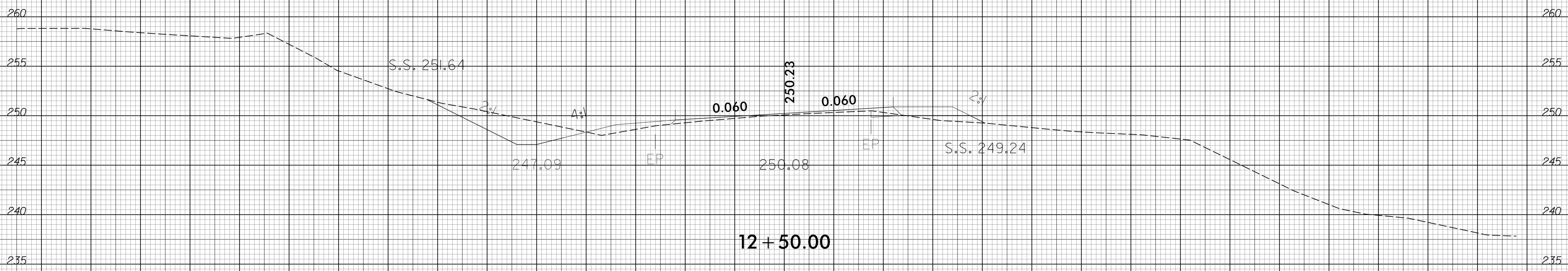
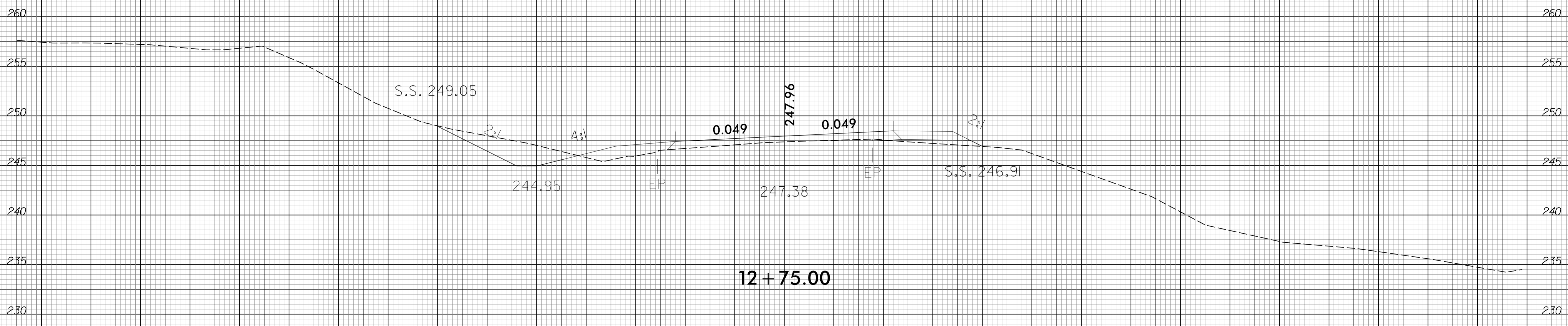
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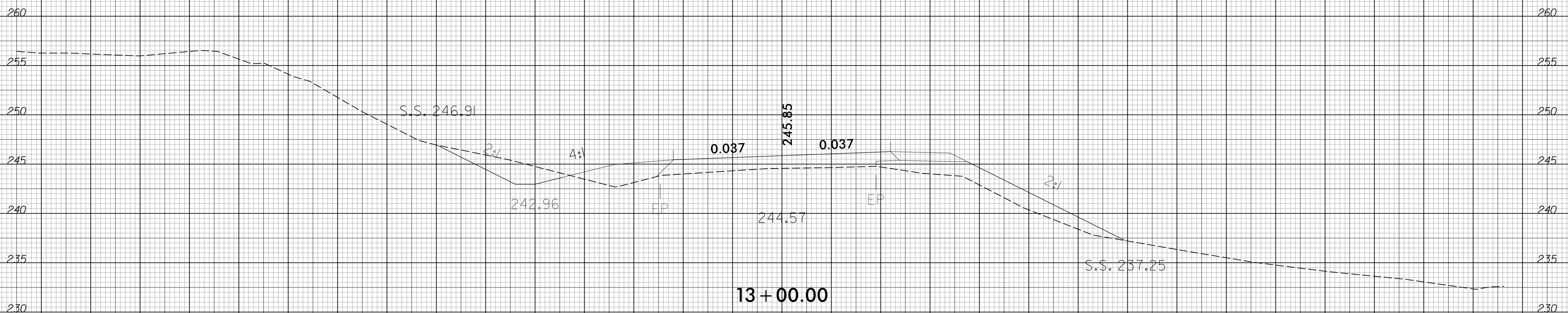
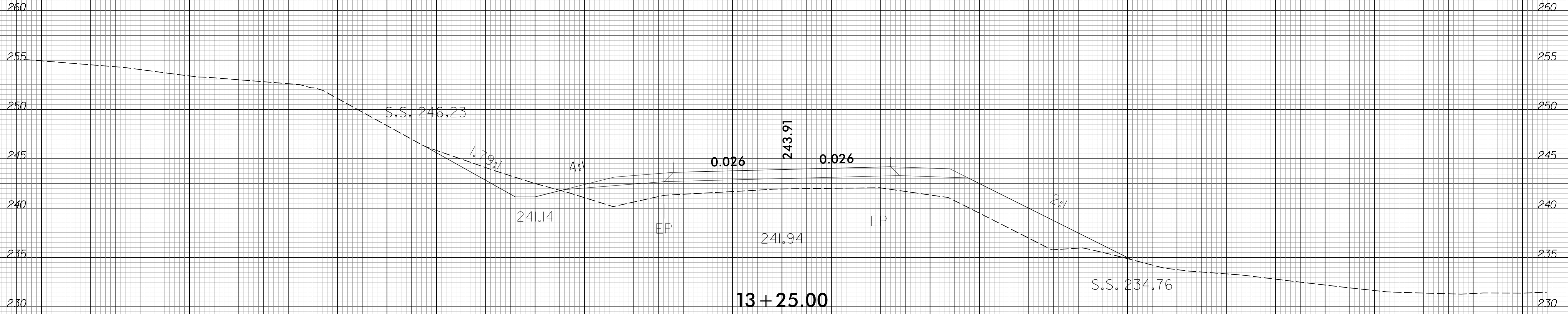
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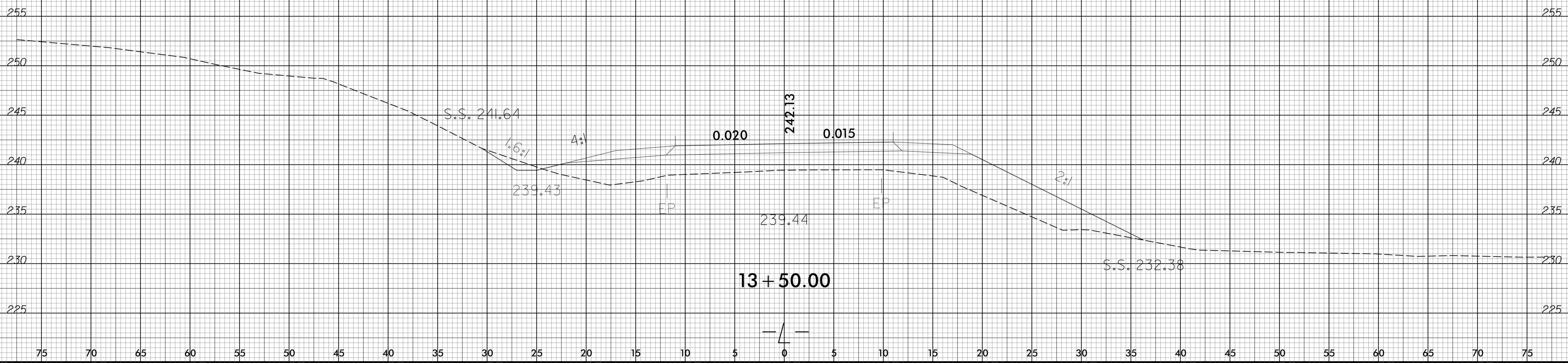
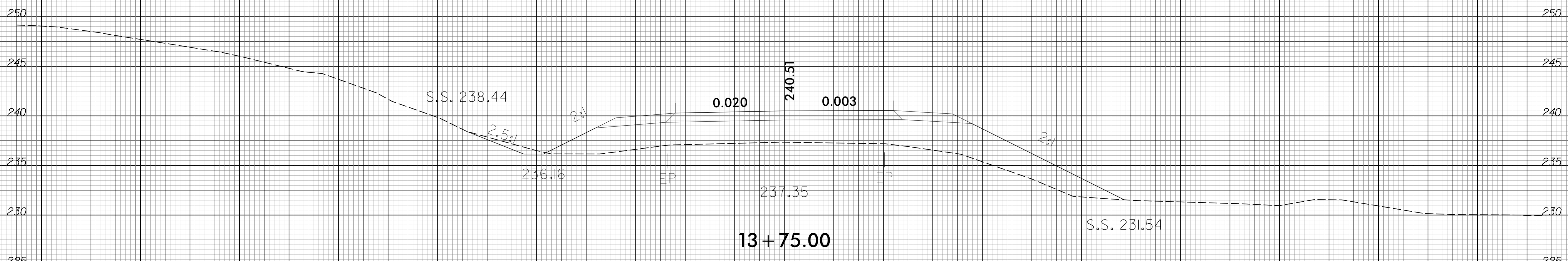
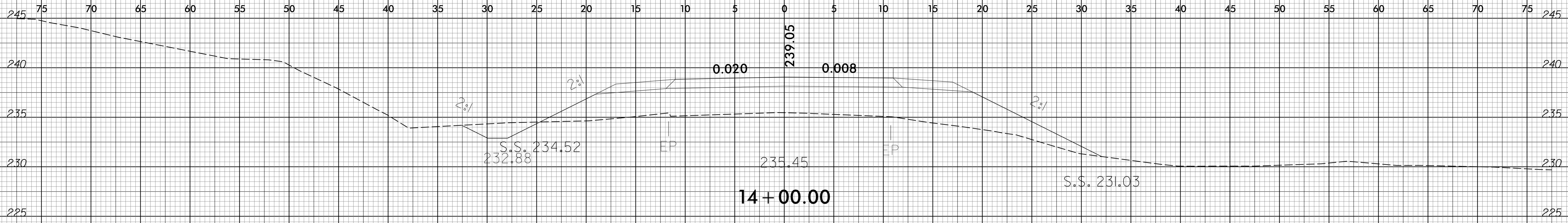


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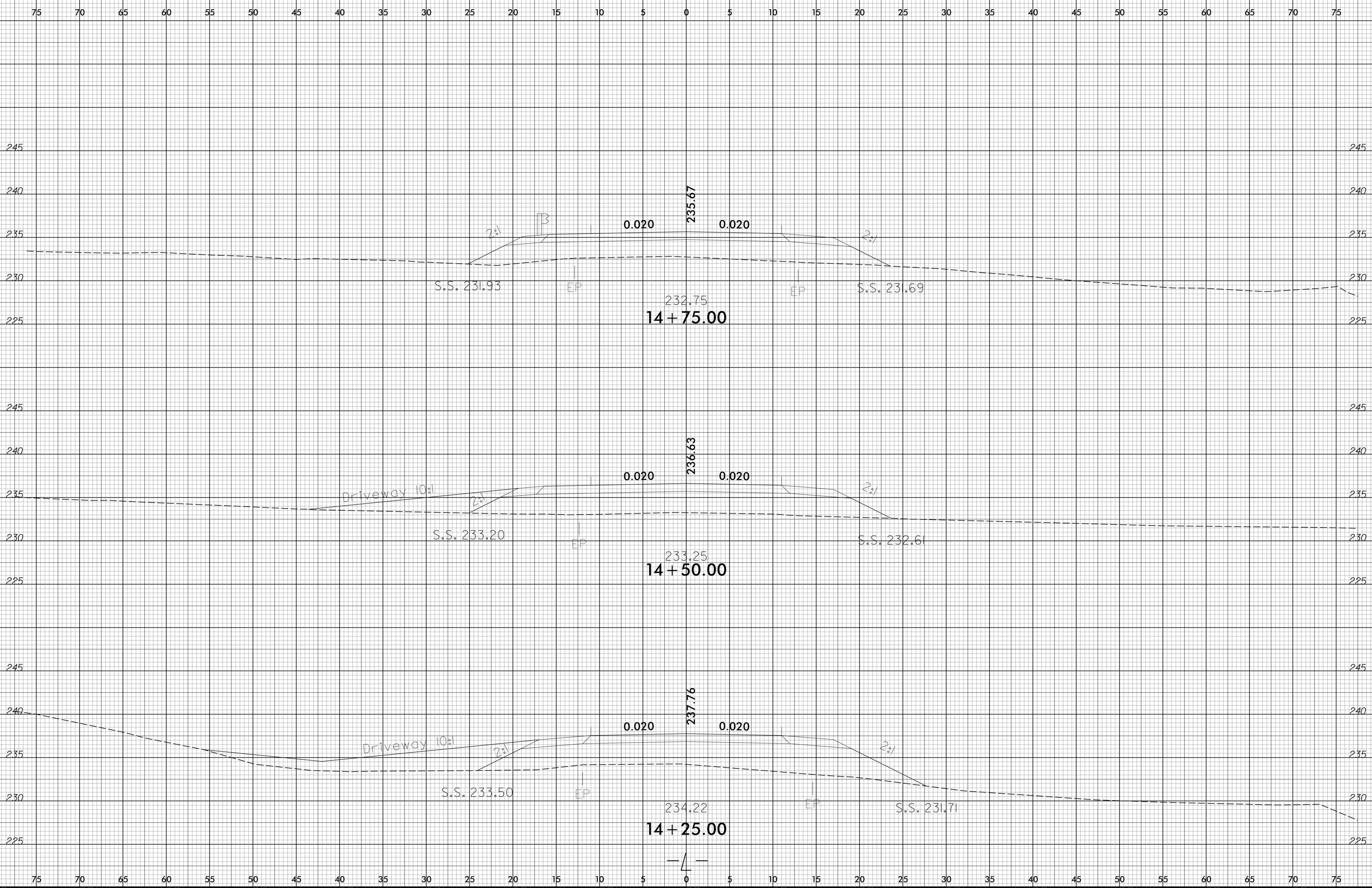
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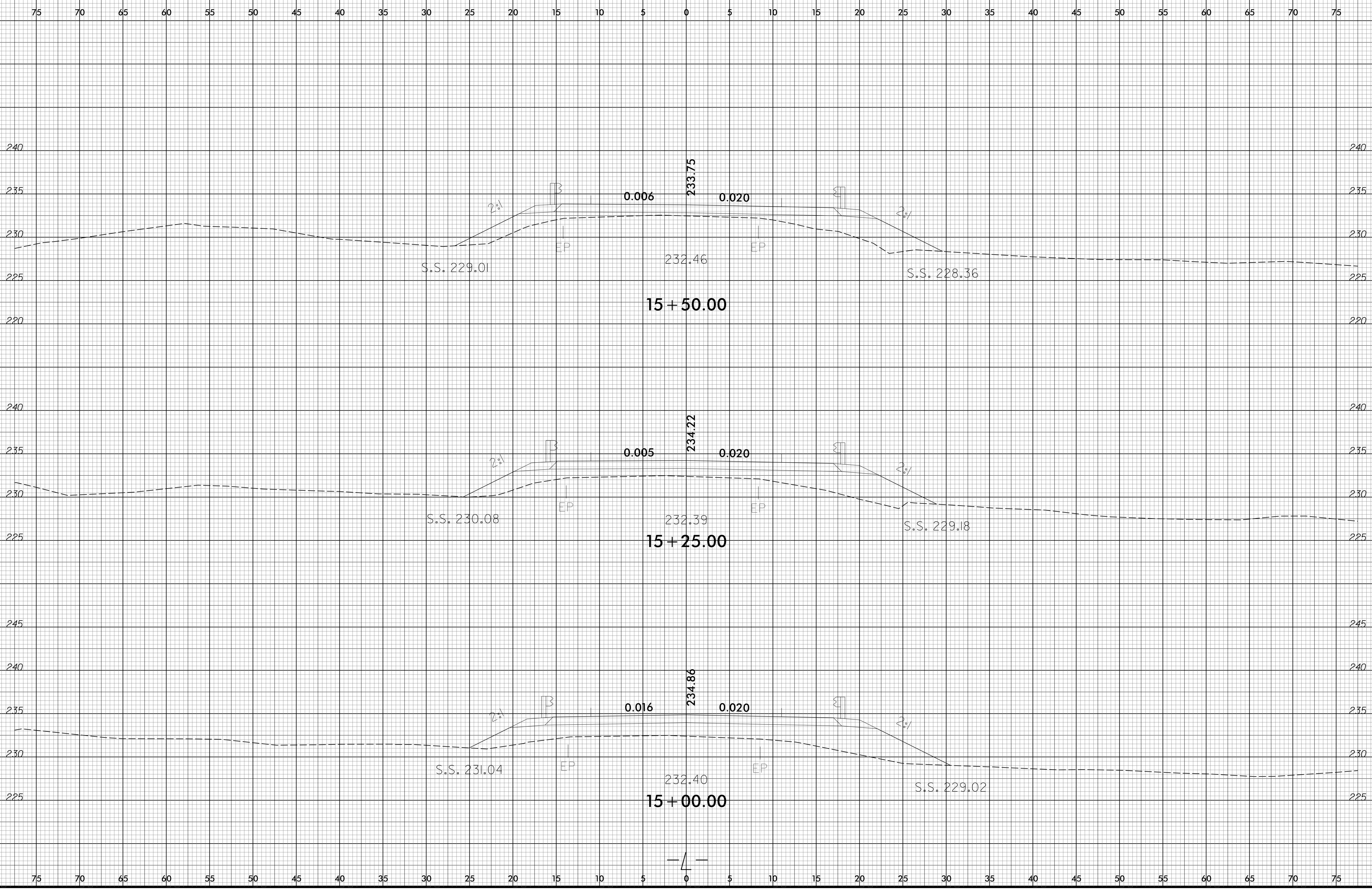
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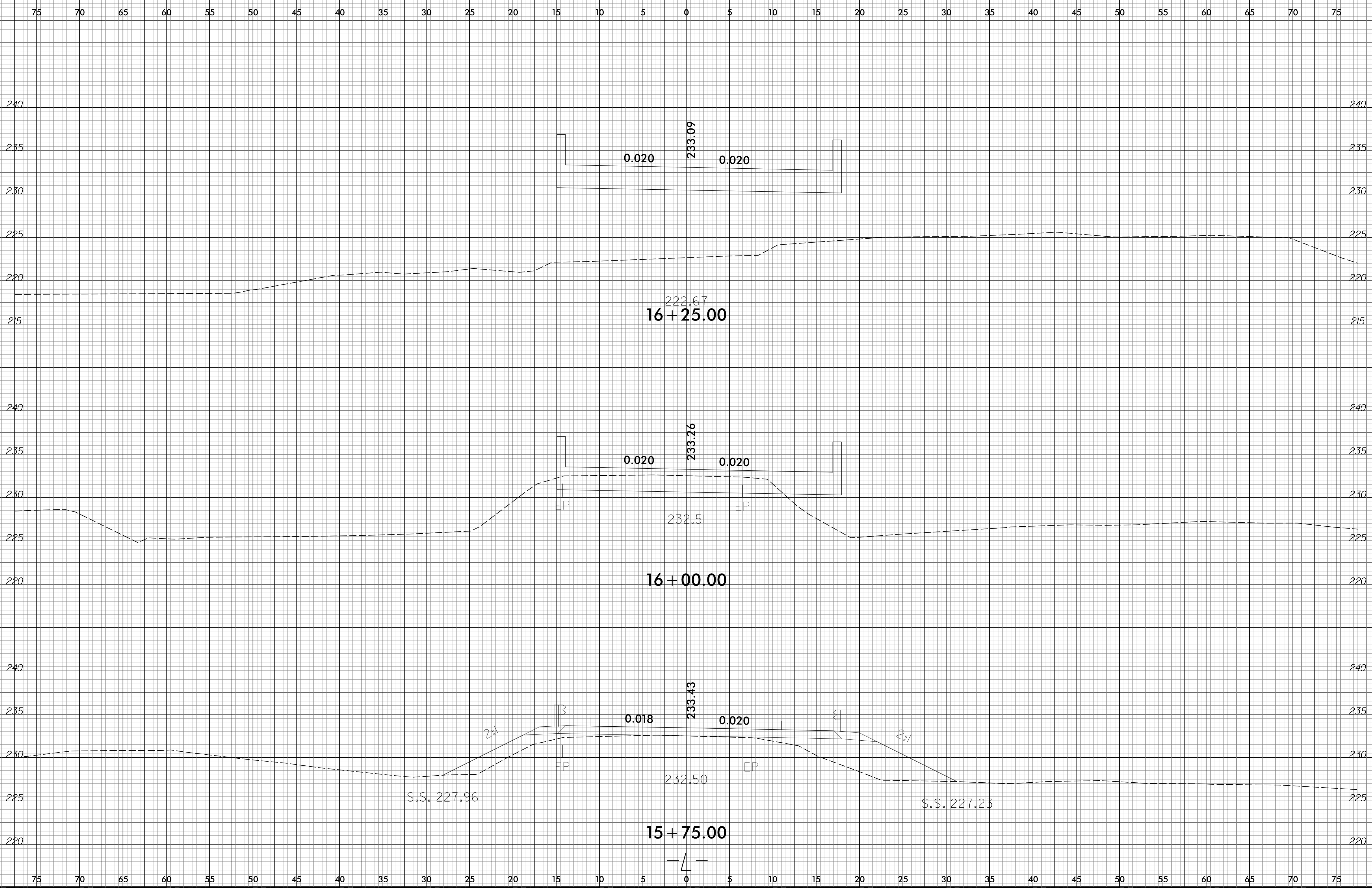
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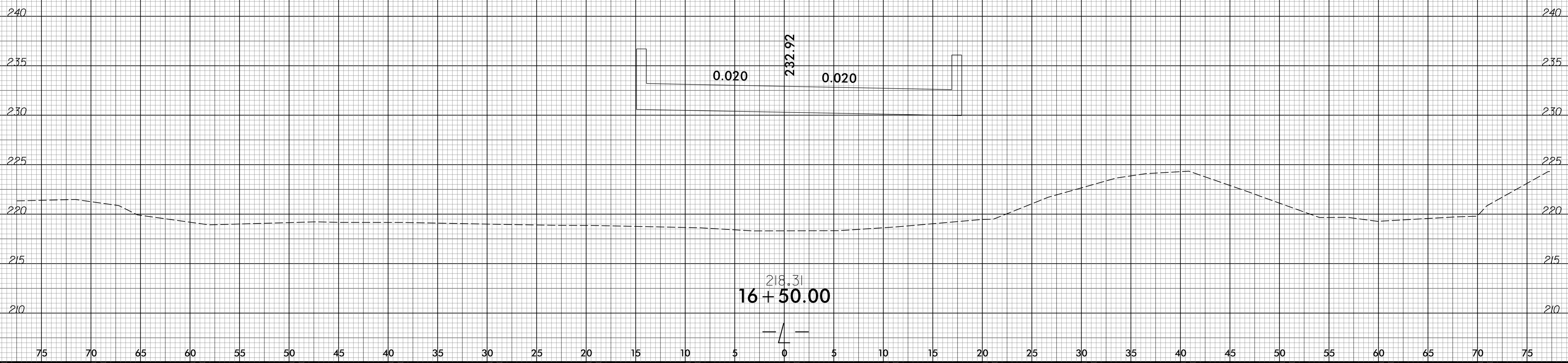


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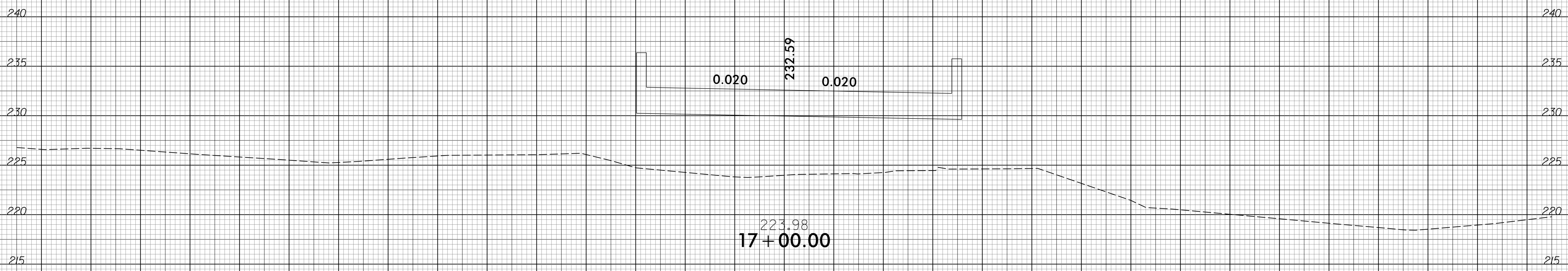
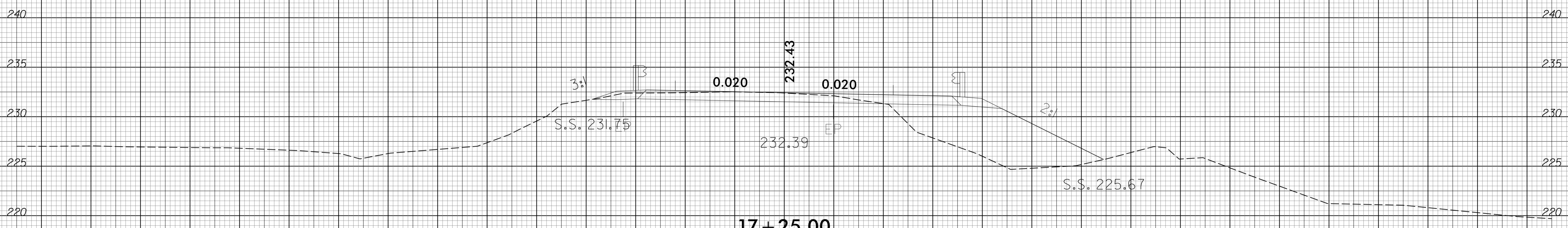
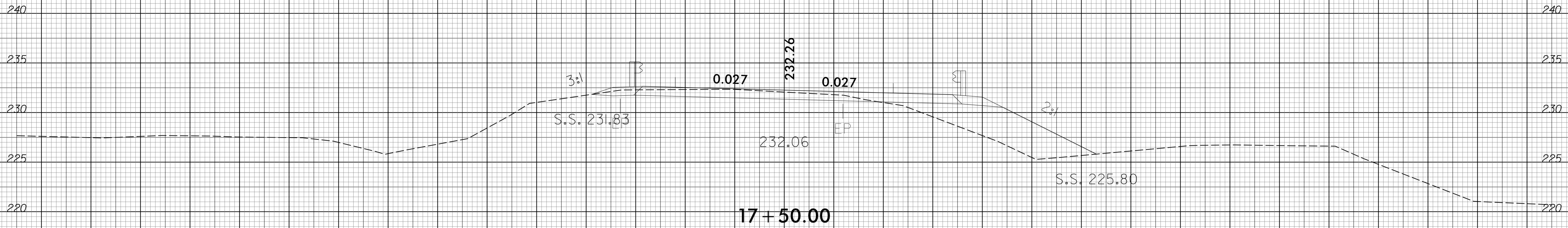
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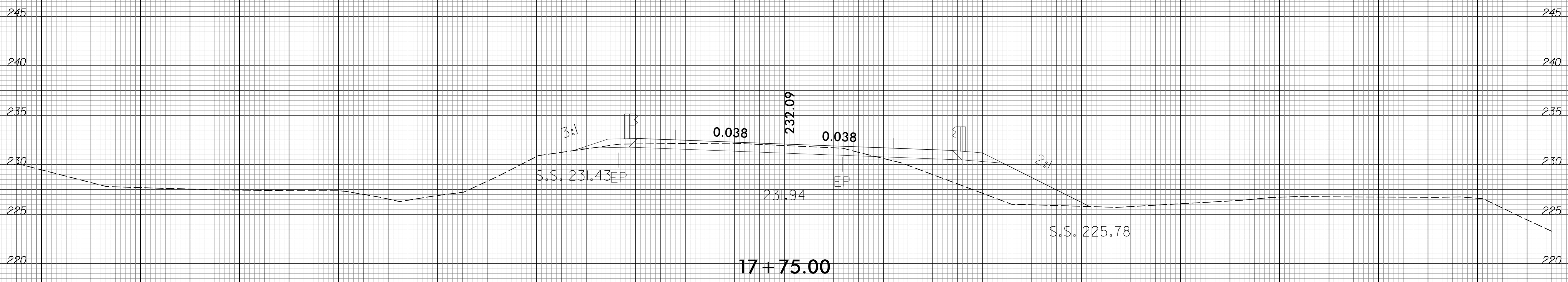
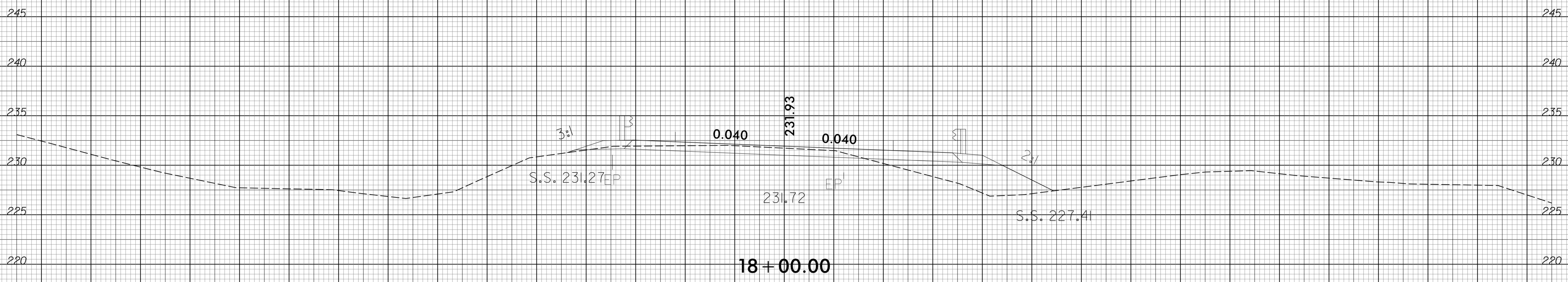


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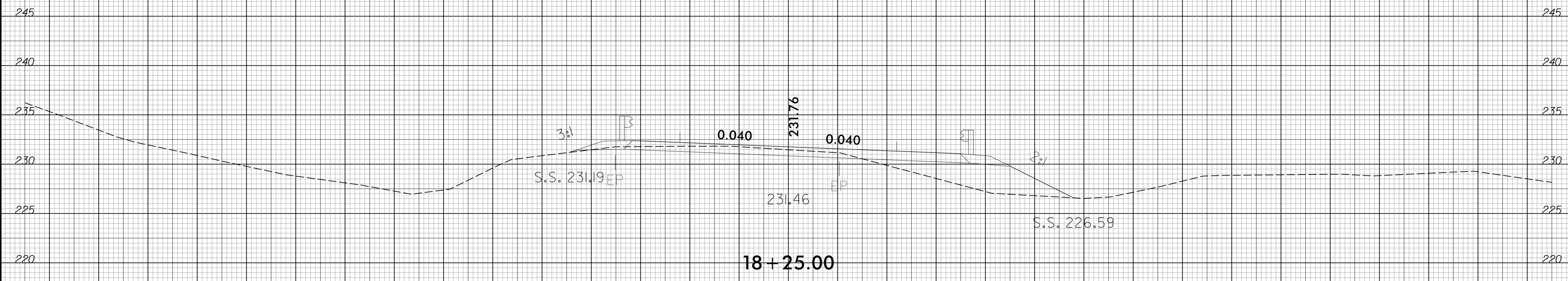
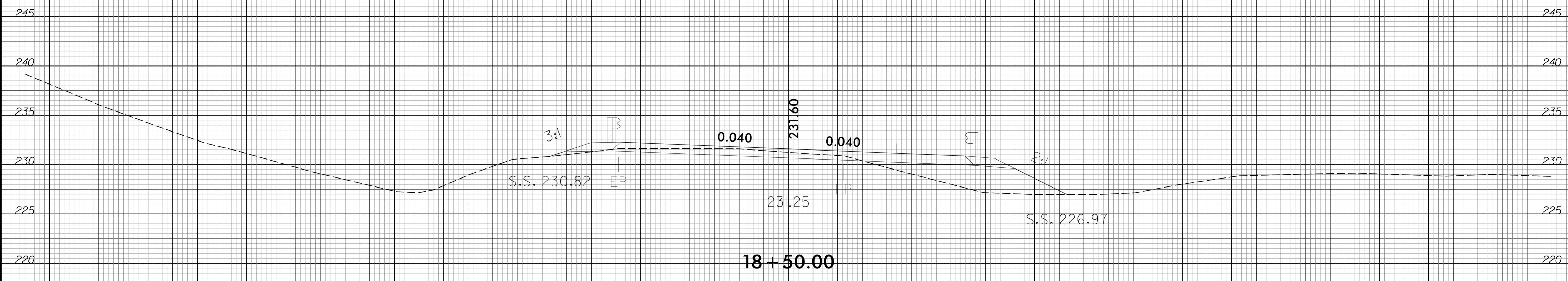
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6/23/16

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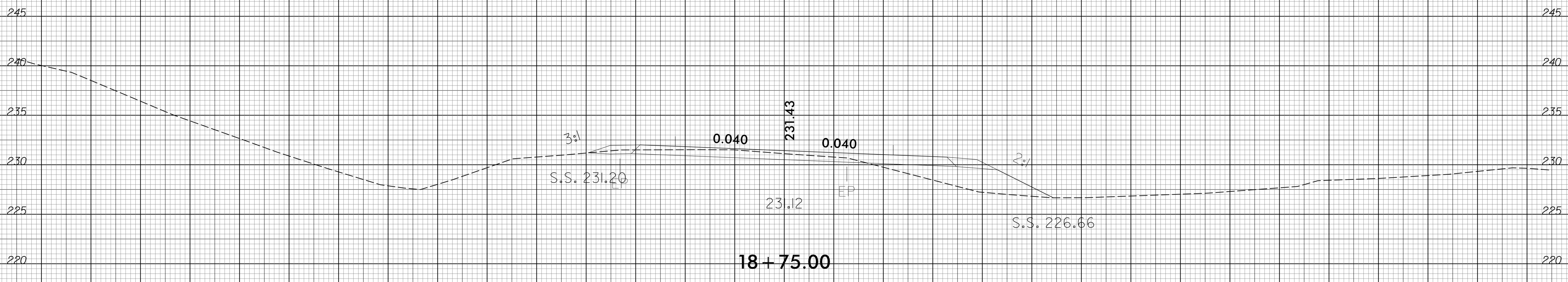
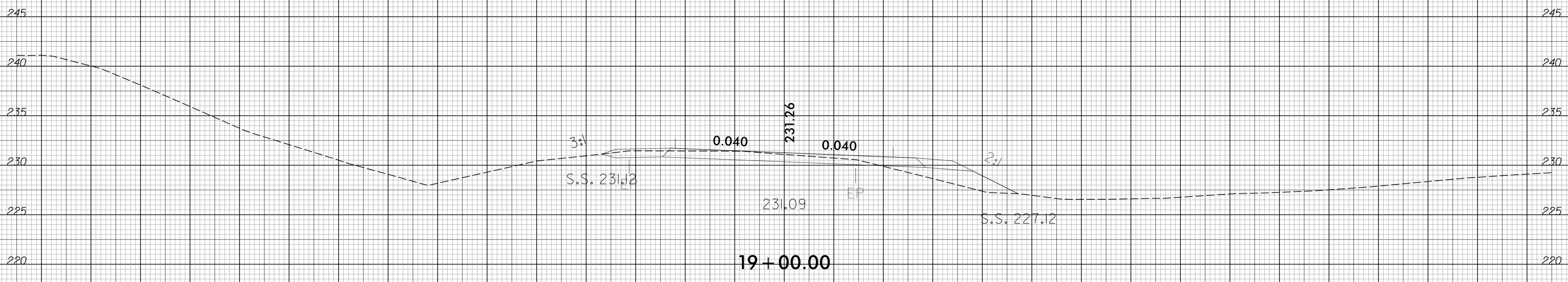
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6/23/16

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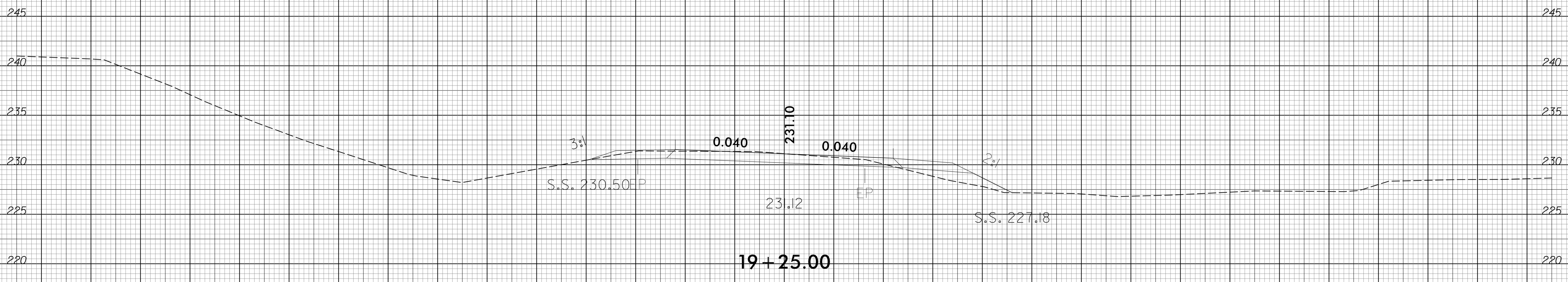
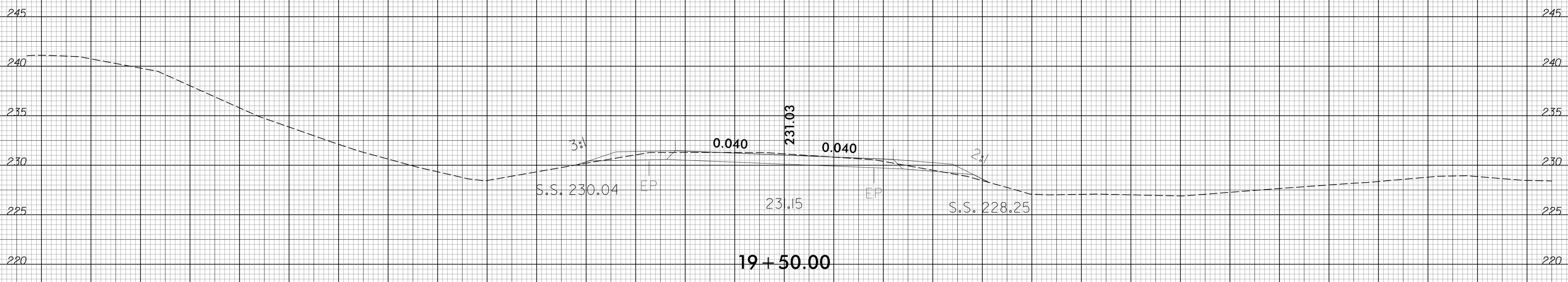
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6/15/2021 R:\Roadwork\XSC\Mont190\_Rdu\_xpl.dgn USER:VAMEL

6/23/16

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	17BP.8.R.135	X-14

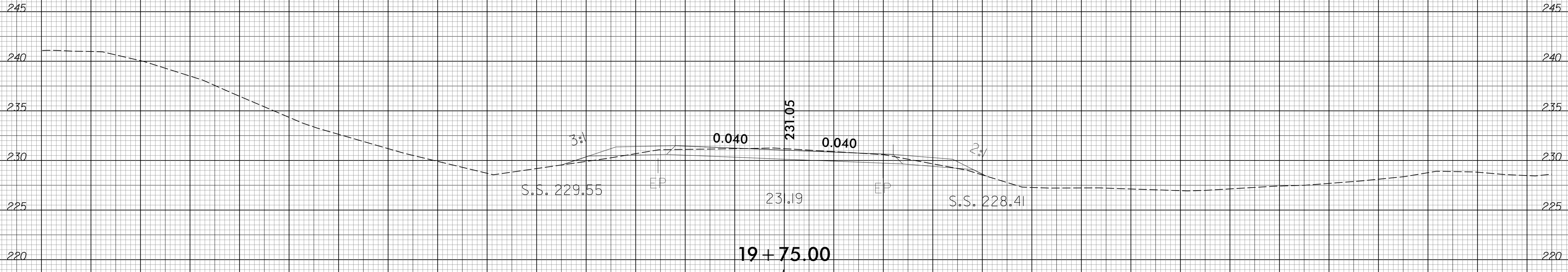
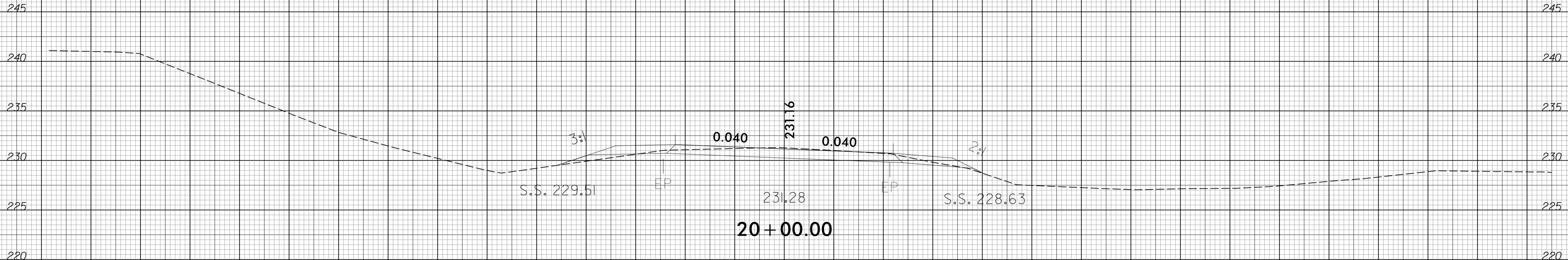
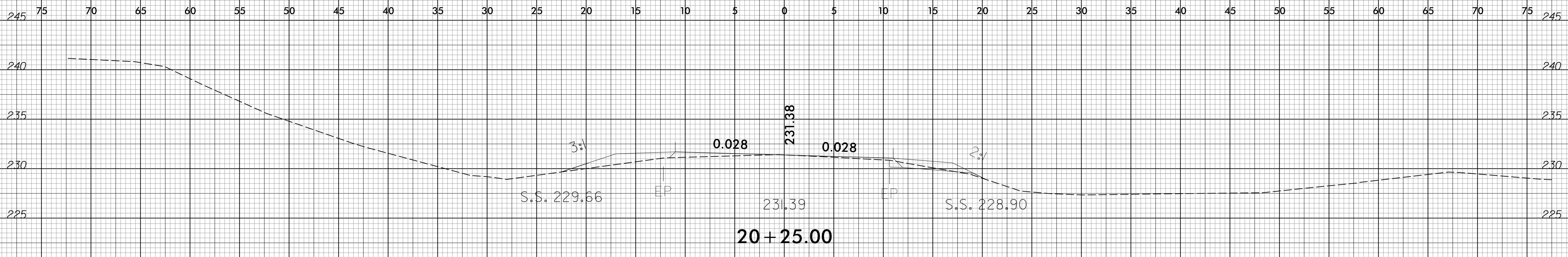
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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6/23/16

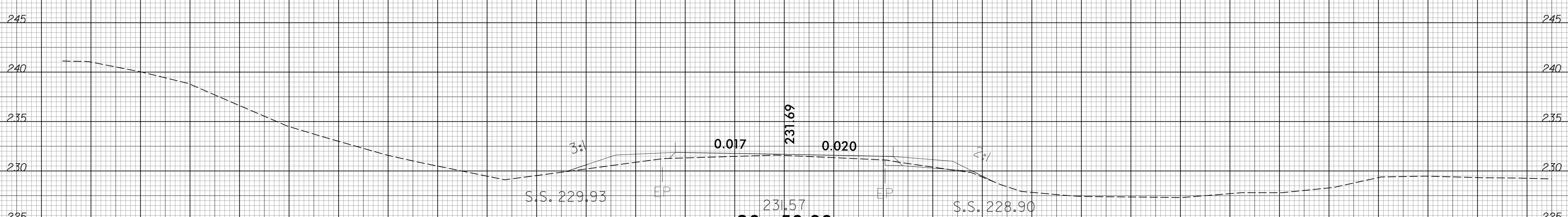
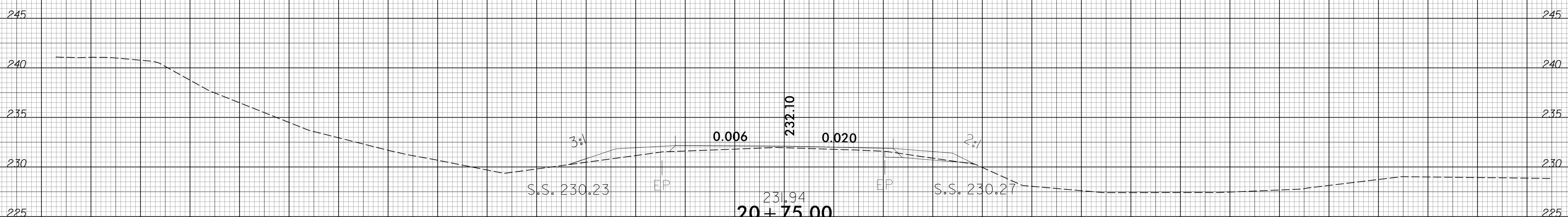
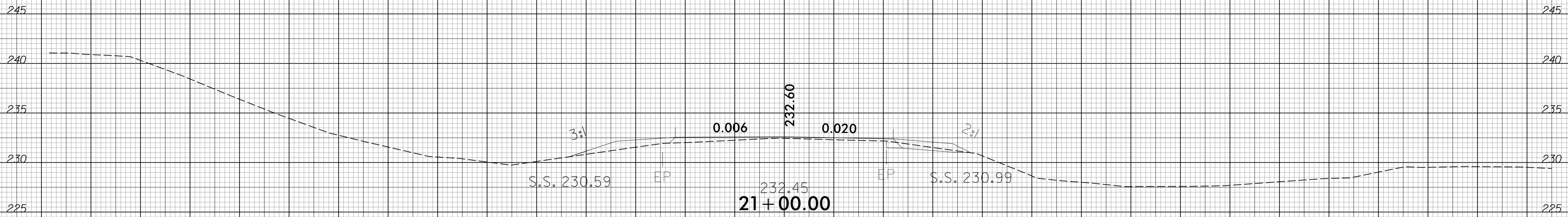


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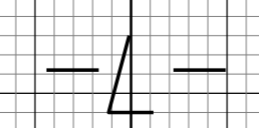
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	17BP.8.R.135	X-16

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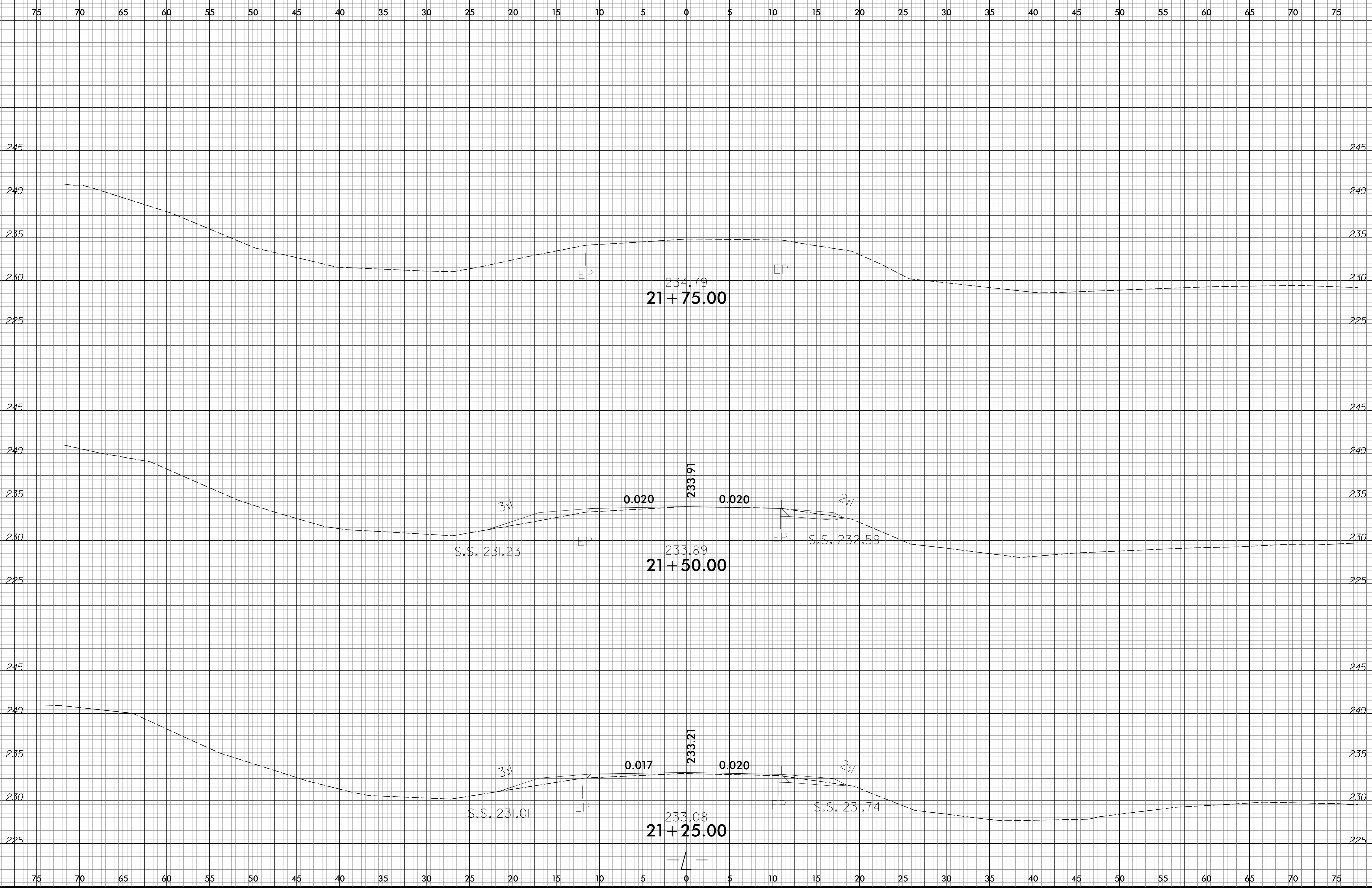
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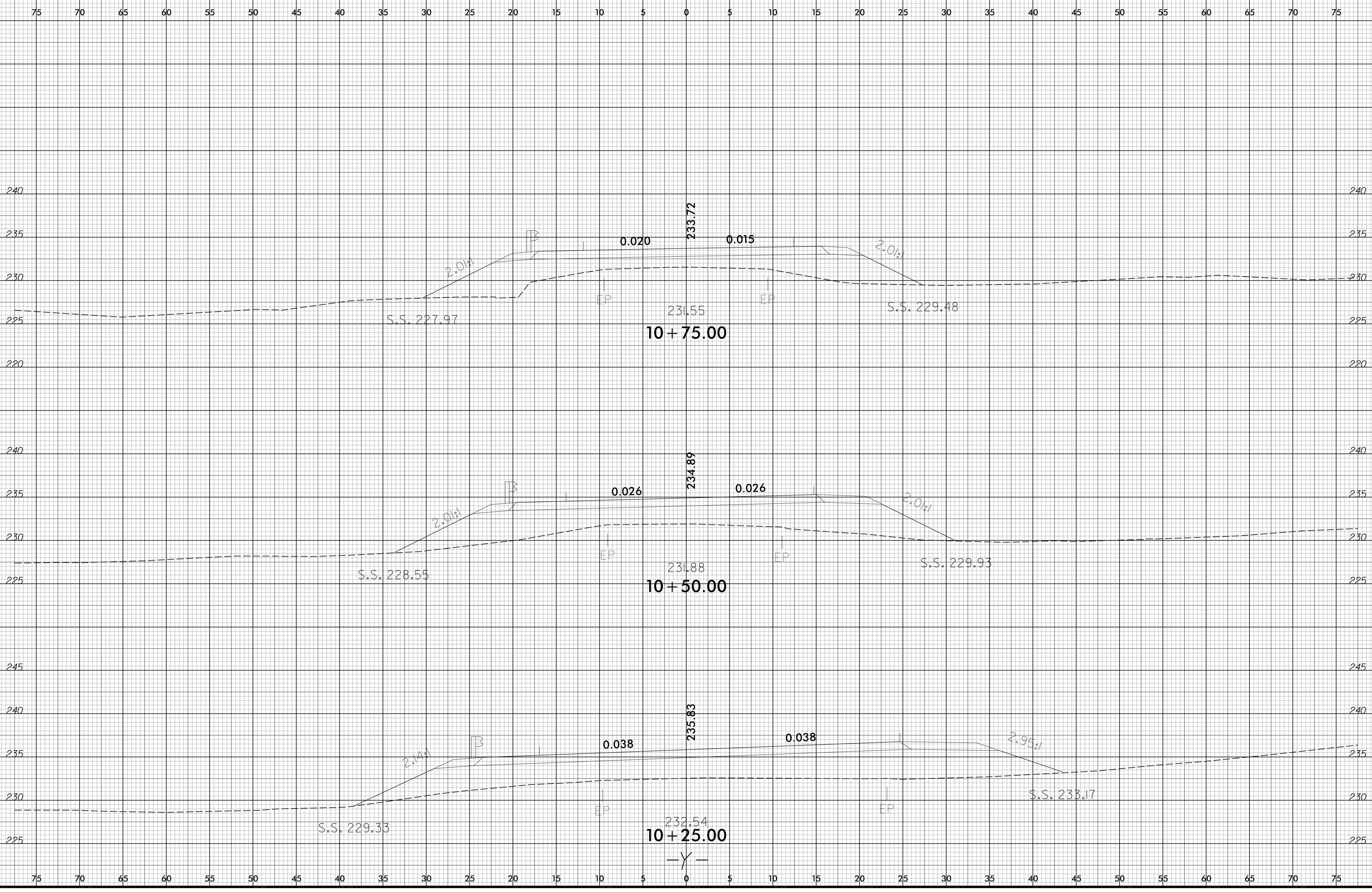
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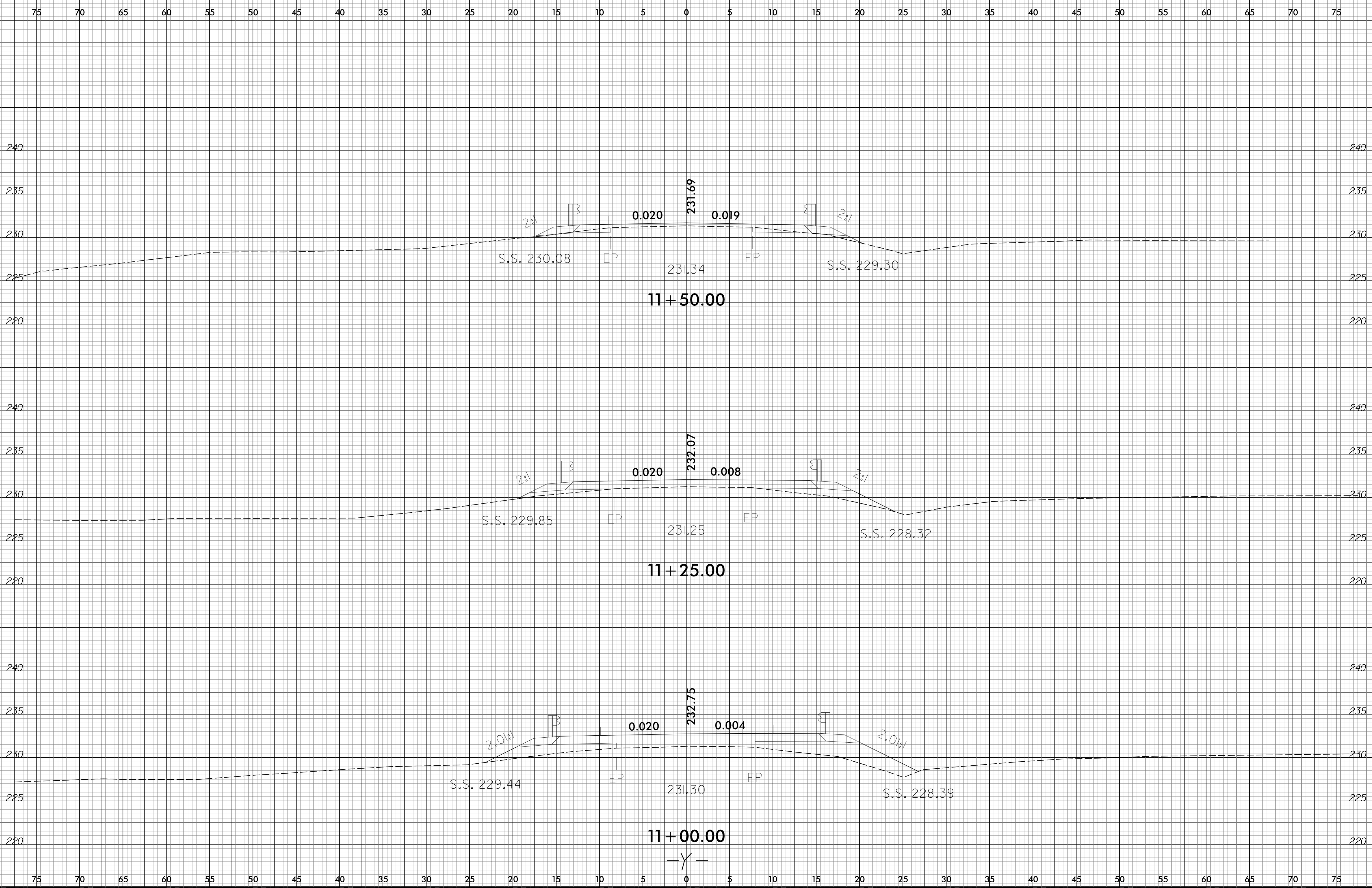
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USER:VHME





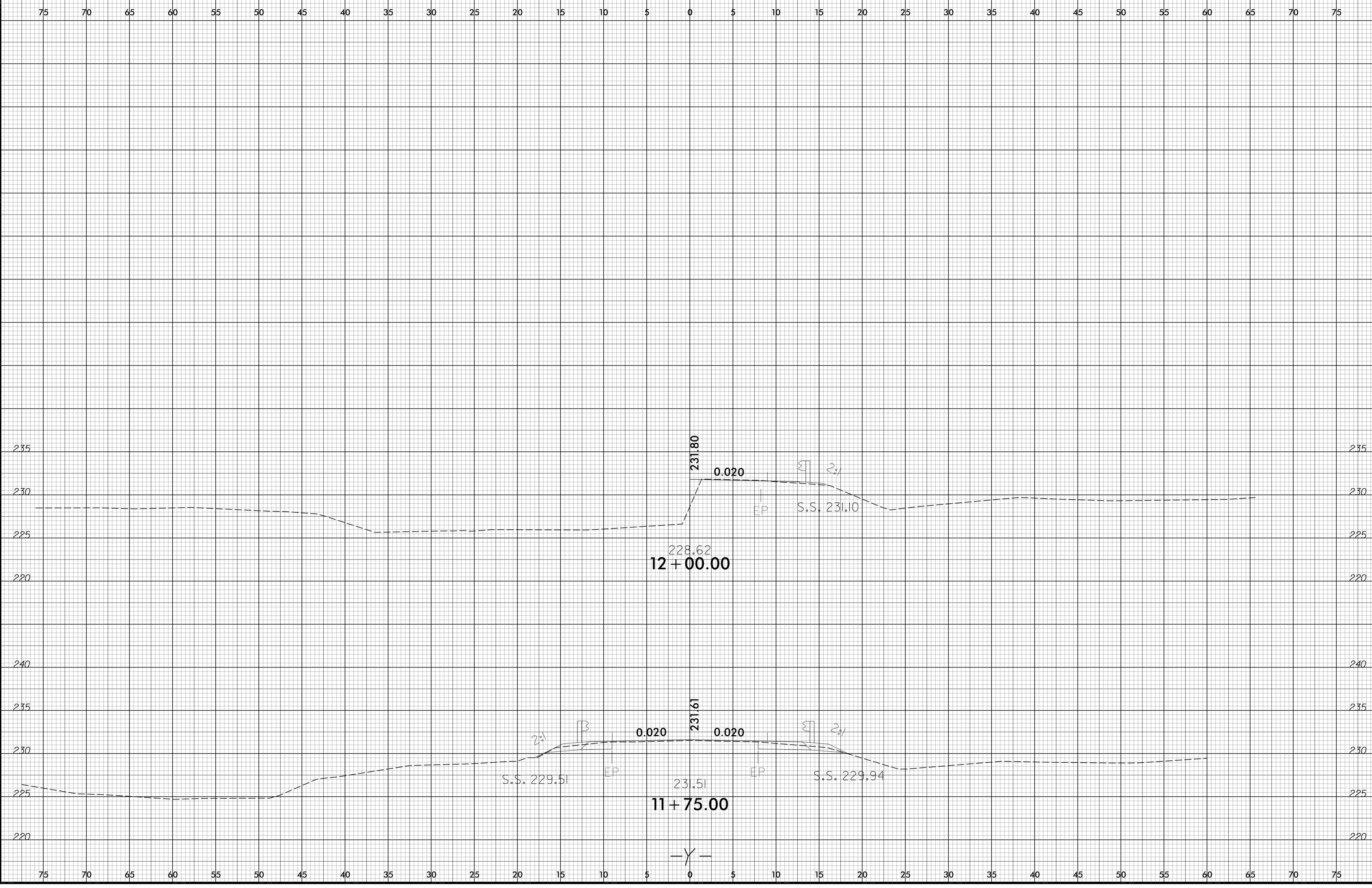
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6/23/16

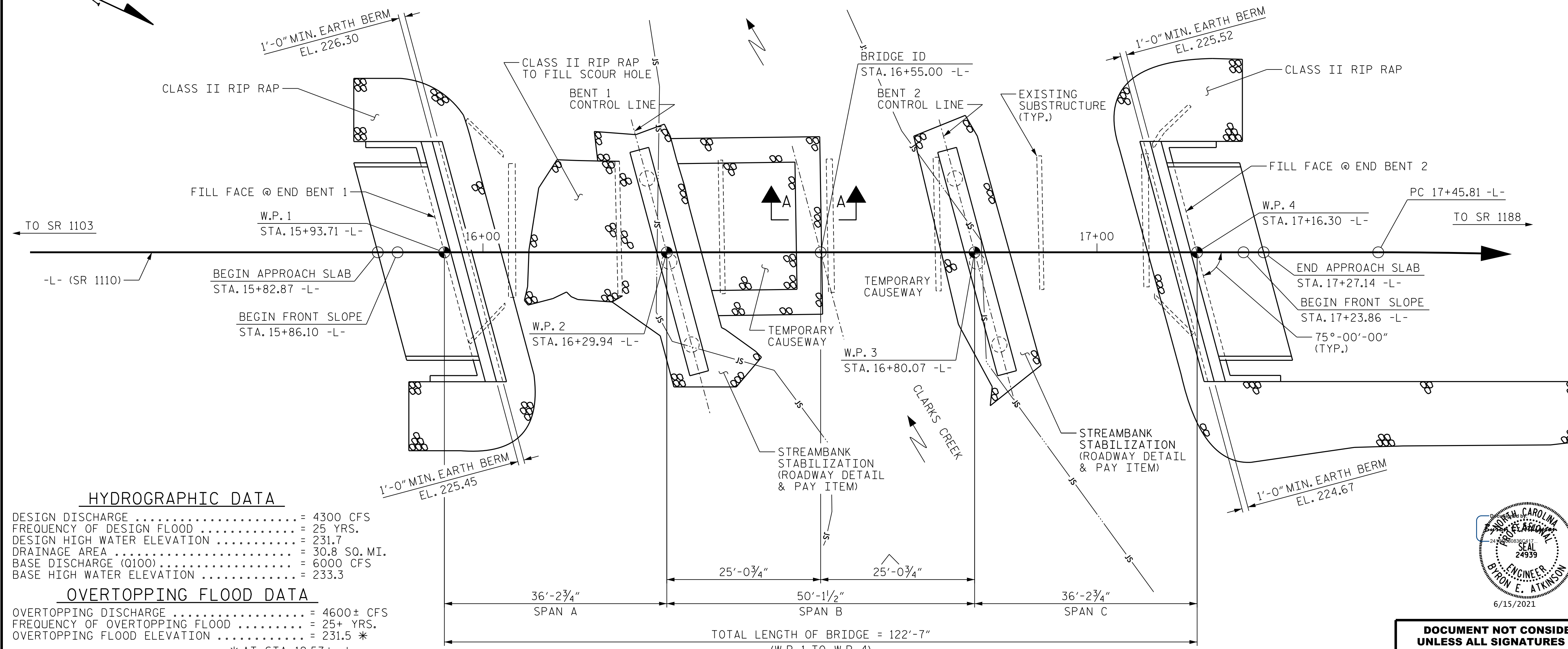
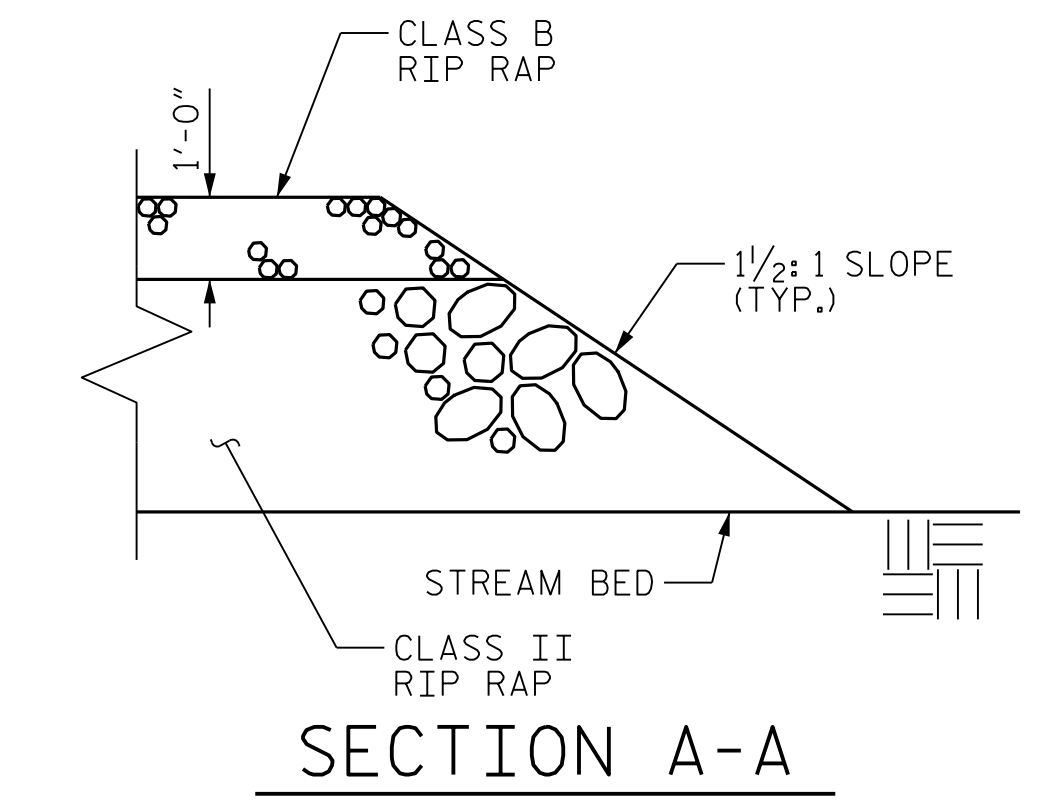
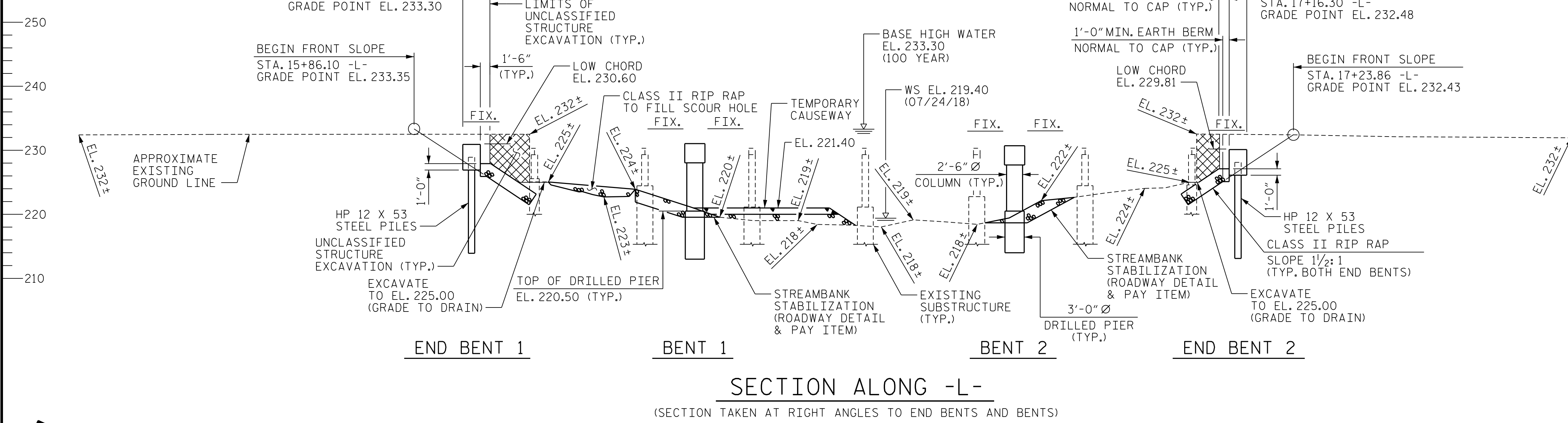


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-10.0652%  
-0.6640%

PVI = 14+05.00 -L-  
EL. = 234.55  
V.C. = 360.00'

GRADE DATA -L-



I HEREBY CERTIFY THESE PLANS  
ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
STATION: 16+55.00 -L-  
SHEET 1 OF 3 REPLACES BRIDGE NO. 190

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON SR 1110  
OVER CLARKS CREEK  
BETWEEN SR 1103 & SR 1188

**HYDROGRAPHIC DATA**

DESIGN DISCHARGE ..... = 4300 CFS  
FREQUENCY OF DESIGN FLOOD ..... = 25 YRS.  
DESIGN HIGH WATER ELEVATION ..... = 231.7  
DRAINAGE AREA ..... = 30.8 SQ. MI.  
BASE DISCHARGE (Q100) ..... = 6000 CFS  
BASE HIGH WATER ELEVATION ..... = 233.3

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE ..... = 4600± CFS  
FREQUENCY OF OVERTOPPING FLOOD ..... = 25+ YRS.  
OVERTOPPING FLOOD ELEVATION ..... = 231.5 \*  
\* AT STA. 19.57± -L-

DRAWN BY: B.E. LANNING DATE: 05/21  
CHECKED BY: B.E. ATKINSON DATE: 06/21  
DESIGN ENGINEER OF RECORD: B.E. ATKINSON DATE: 06/21

**PLAN**  
(PILES NOT SHOWN FOR CLARITY)

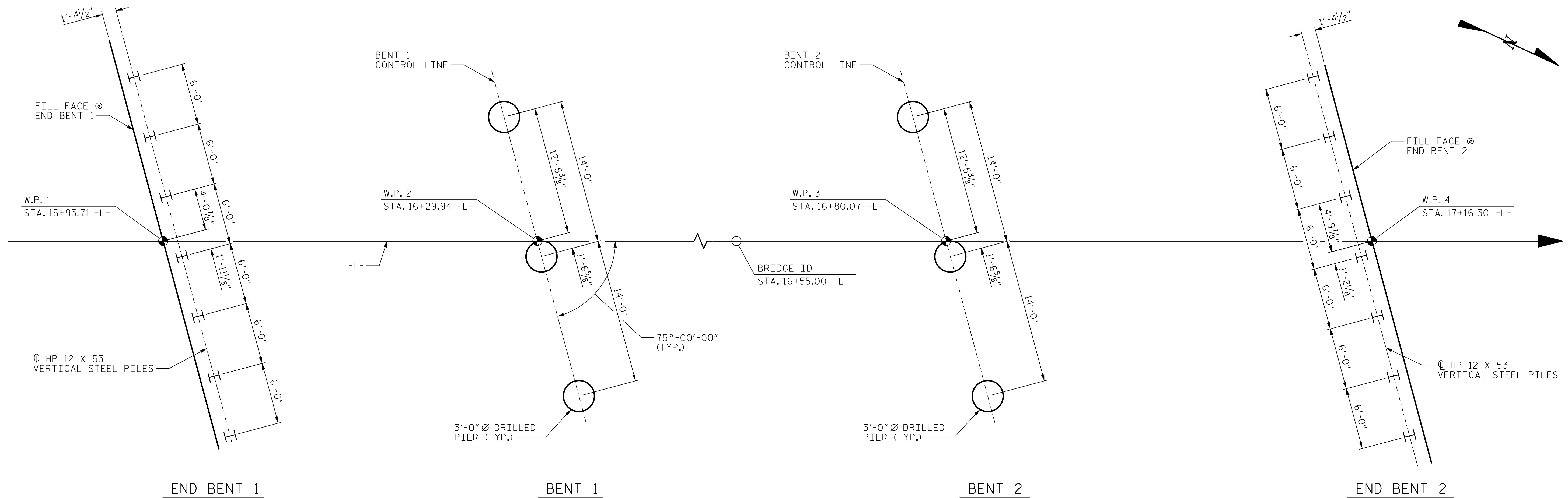
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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

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

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### FOUNDATION LAYOUT

DIMENSIONS LOCATING END BENT PILES AND BENT DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES AND DRILLED PIERS.

### FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE IF THE BOTTOM OF PILE EXCAVATION HOLES CANNOT BE VISUALLY INSPECTED.

DRILLED-IN PILES ARE REQUIRED FOR END BENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 217.6. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED-IN PILES ARE REQUIRED FOR END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 217.3. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT 1 AND END BENT 2.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 AND BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 360 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 213.3 AND A PENETRATION OF AT LEAST 5.0 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 214.1 AND A PENETRATION OF AT LEAST 5.0 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 218.3 AT BENT 1 AND ELEVATION 219.1 AT BENT 2 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

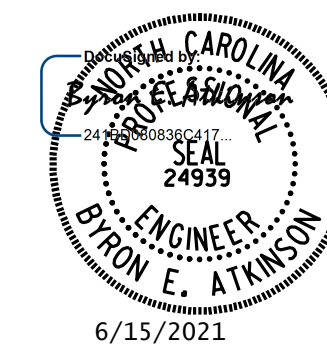
THE SCOUR CRITICAL ELEVATIONS FOR BENT 1 IS ELEVATION 217.3 AND FOR BENT 2 IS ELEVATION 218.1. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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.

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1110  
 OVER CLARKS CREEK  
 BETWEEN SR 1103 & SR 1188

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

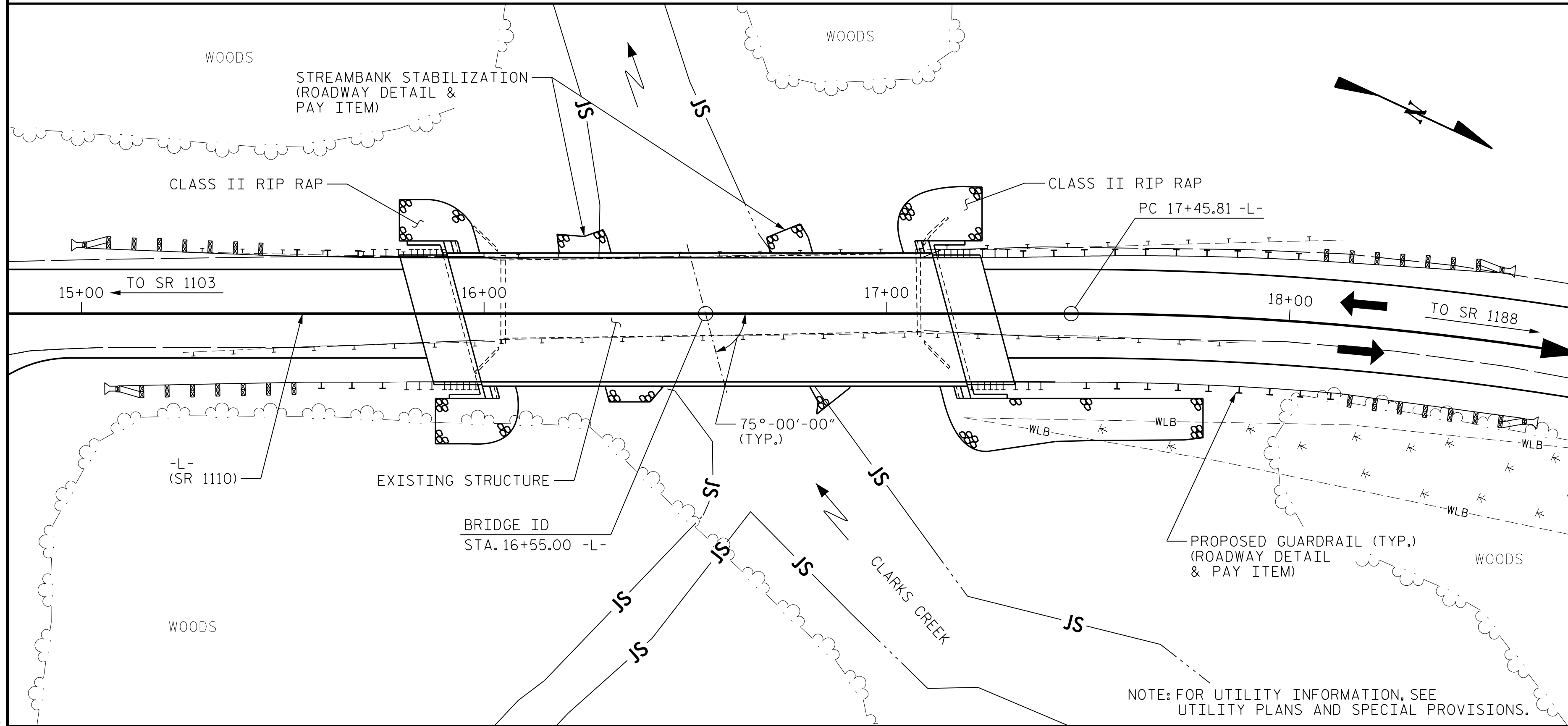
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

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

DRAWN BY : B.E. LANNING	DATE : 05/21
CHECKED BY : B.E. ATKINSON	DATE : 06/21
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

BM #1: BENCH TIE NAIL IN 8" OAK, 30' RIGHT OF STA. 13+38.00 -L-, EL. 236.12

NOTES



LOCATION SKETCH

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.

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 STA. 16+55.00 -L-".

THE EXISTING STRUCTURE CONSISTING OF SIX SPANS (2 @ 17'-8" CONTINUOUS, 2 @ 17'-7" CONTINUOUS AND 2 @ 17'-8" CONTINUOUS), WITH TIMBER DECK ON I-BEAMS AND A CLEAR ROADWAY WIDTH OF 18'-10" ON SUBSTRUCTURE CONSISTING OF STEEL OR TIMBER CAPS WITH STEEL OR TIMBER PILES AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED IN ITS ENTIRETY, EXCEPT APPROACH GUARDRAIL. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 70 FT. LEFT SIDE AND 55 FT. RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY. SEE ROADWAY QUANTITIES.

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

FOR 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.

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

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 16+55.00 -L-.

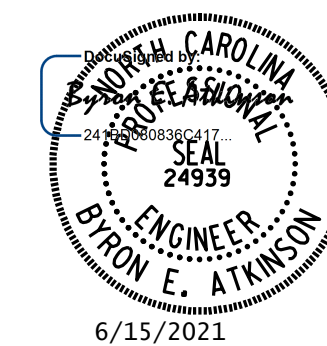
FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

TOTAL BILL OF MATERIAL											
	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS AT STA. 16+55.00 -L-	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" Ø DRILLED PIER IN SOIL	3'-0" Ø DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	PDA TESTING	SID INSPECTIONS	CSL TESTING
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH
SUPERSTRUCTURE											
END BENT 1				44.0	26.0						
BENT 1						7.5	15.0	6.6			1
BENT 2						4.5	15.0	4.2			1
END BENT 2				49.0	21.0						
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	93.0	47.0	12.0	30.0	10.8	1	2	2

TOTAL BILL OF MATERIAL													
	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	EACH	NO. LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	NO. LIN. FT.	
SUPERSTRUCTURE			LUMP SUM					240.50			LUMP SUM	33 1320.00	
END BENT 1	LUMP SUM	22.4		2714		7	7 105		178	197			
BENT 1		17.2		6452	798								
BENT 2		17.1		6239	730								
END BENT 2	LUMP SUM	22.4		2714		7	7 105		257	285			
TOTAL	LUMP SUM	79.1	LUMP SUM	18,119	1528	14	14 210	240.50	435	482	LUMP SUM	33 1320.00	

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 110  
 OVER CLARKS CREEK  
 BETWEEN SR 1103 & SR 1188

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

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

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

DRAWN BY : B.E. LANNING DATE : 05/21  
 CHECKED BY : B.E. ATKINSON DATE : 06/21  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 06/21

6/15/2021 11:37:14 AM User: blanning  
 Filename: N:\NC Bridges\MI8023.Ch.Eng.Montgomery 190 Br. Rep\17BP8R135\Structures\401.005-17BP8R135.SML.GD3-610190.dgn

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	①	1.31	--	1.75	0.304	1.72	A	E	17.0	0.374	5.40	A	E	1.8	0.80	0.304	<b>1.31</b>	A	E	17.0		
	HL-93(Opr)	N/A		2.23	--	1.35	0.304	2.23	A	E	17.0	0.374	7.04	A	E	1.8	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	②	1.76	63.36	1.75	0.304	2.29	A	E	13.6	0.374	6.24	A	E	1.8	0.80	0.304	<b>1.76</b>	A	E	17.0		
	HS-20(Opr)	36.000		2.97	106.92	1.35	0.304	2.97	A	E	13.6	0.374	8.12	A	E	1.8	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500		3.00	40.50	1.4	0.304	4.92	A	E	17.0	0.374	16.26	A	E	1.8	0.80	0.304	3.00	A	E	17.0	
		SNGARBS2	20.000		2.59	51.80	1.4	0.304	4.21	A	E	13.6	0.374	12.26	A	E	1.8	0.80	0.304	2.59	A	E	13.6	
		SNAGRIS2	22.000		2.57	56.54	1.4	0.304	4.17	A	E	13.6	0.374	11.69	A	E	1.8	0.80	0.304	2.57	A	E	13.6	
		SNCOTTS3	27.250		1.50	40.88	1.4	0.304	2.46	A	E	17.0	0.374	8.19	A	E	1.8	0.80	0.304	1.50	A	E	17.0	
		SNAGGRS4	34.925		1.39	48.55	1.4	0.304	2.28	A	E	17.0	0.374	7.32	A	E	1.8	0.80	0.304	1.39	A	E	17.0	
		SNS5A	35.550		1.35	47.99	1.4	0.304	2.21	A	E	17.0	0.374	7.74	A	E	1.8	0.80	0.304	1.35	A	E	17.0	
		SNS6A	39.950		1.30	51.94	1.4	0.304	2.14	A	E	17.0	0.374	7.27	A	E	1.8	0.80	0.304	1.30	A	E	17.0	
	SNS7B	42.000	③	1.24	52.08	1.4	0.304	2.04	A	E	17.0	0.374	7.45	A	E	1.8	0.80	0.304	<b>1.24</b>	A	E	17.0		
	TTST	TNAGRIT3	33.000		1.61	53.13	1.4	0.304	2.64	A	E	17.0	0.374	8.52	A	E	1.8	0.80	0.304	1.61	A	E	17.0	
		TNT4A	33.075		1.60	52.92	1.4	0.304	2.64	A	E	17.0	0.374	8.02	A	E	1.8	0.80	0.304	1.60	A	E	17.0	
		TNT6A	41.600		1.41	58.66	1.4	0.304	2.31	A	E	17.0	0.374	7.87	A	E	1.8	0.80	0.304	1.41	A	E	17.0	
		TNT7A	42.000		1.45	60.90	1.4	0.304	2.39	A	E	17.0	0.374	7.29	A	E	1.8	0.80	0.304	1.45	A	E	17.0	
		TNT7B	42.000		1.43	60.06	1.4	0.304	2.35	A	E	17.0	0.374	7.08	A	E	1.8	0.80	0.304	1.43	A	E	17.0	
		TNAGRIT4	43.000		1.45	62.35	1.4	0.304	2.37	A	E	17.0	0.374	6.79	A	E	1.8	0.80	0.304	1.45	A	E	17.0	
TNAGT5A		45.000		1.33	59.85	1.4	0.304	2.19	A	E	17.0	0.374	7.19	A	E	1.8	0.80	0.304	1.33	A	E	17.0		
TNAGT5B	45.000		1.29	58.05	1.4	0.304	2.11	A	E	17.0	0.374	6.40	A	E	1.8	0.80	0.304	1.29	A	E	17.0			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

- 
- 
- 
- 

⊕ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

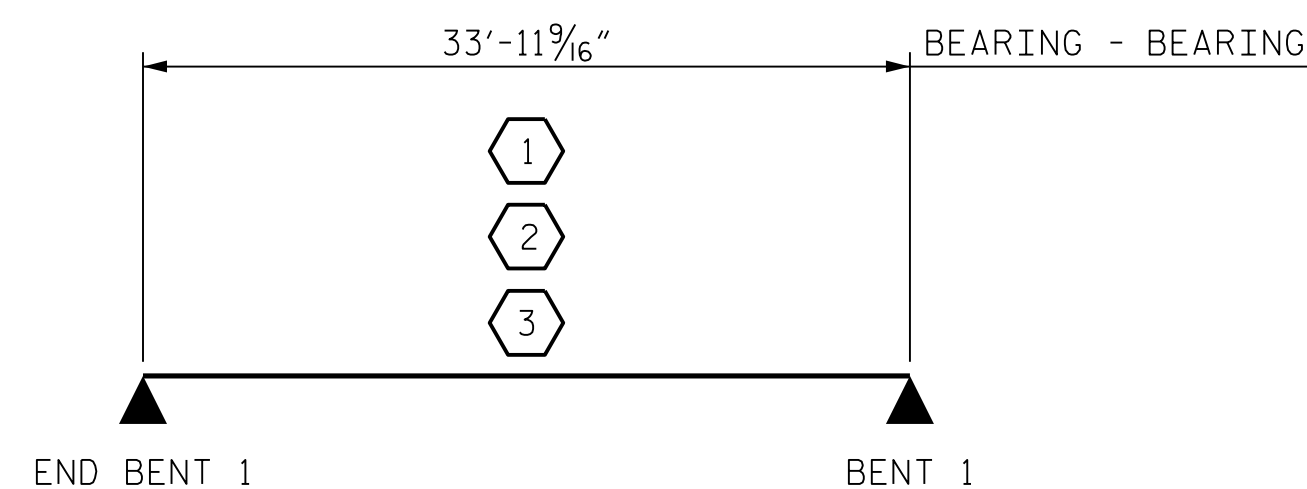
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

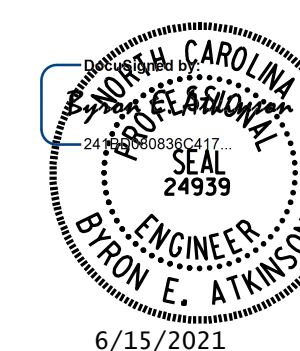
GIRDER LOCATION

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



LRFR SUMMARY  
SPAN A SHOWN, SPAN C SIMILAR

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
STATION: 16+55.00 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY FOR  
35' CORED SLAB UNIT  
75° SKEW  
SPAN A AND SPAN C  
(NON-INTERSTATE TRAFFIC)

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

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

DRAWN BY : B.E. LANNING	DATE : 01/20
CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	①	1.19	--	1.75	0.253	1.65	B	E	24.5	0.323	5.11	B	E	1.8	0.80	0.253	<b>1.19</b>	B	E	24.5		
	HL-93(Opr)	N/A		2.14	--	1.35	0.253	2.14	B	E	24.5	0.323	6.67	B	E	1.8	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	②	1.48	53.28	1.75	0.253	2.04	B	E	24.5	0.323	6.10	B	E	9.8	0.80	0.253	<b>1.48</b>	B	E	24.5		
	HS-20(Opr)	36.000		2.65	95.40	1.35	0.253	2.65	B	E	24.5	0.323	7.99	B	E	9.8	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500		3.01	40.64	1.40	0.253	5.20	B	E	24.5	0.323	17.13	B	E	9.8	0.80	0.253	3.01	B	E	24.5	
		SNGARBS2	20.000		2.38	47.60	1.40	0.253	4.10	B	E	24.5	0.323	12.58	B	E	9.8	0.80	0.253	2.38	B	E	24.5	
		SNAGRIS2	22.000		2.31	50.82	1.40	0.253	3.99	B	E	24.5	0.323	11.85	B	E	9.8	0.80	0.253	2.31	B	E	24.5	
		SNCOTTS3	27.250		1.50	40.88	1.40	0.253	2.59	B	E	24.5	0.323	8.36	B	E	9.8	0.80	0.253	1.50	B	E	24.5	
		SNAGGRS4	34.925		1.31	45.75	1.40	0.253	2.25	B	E	24.5	0.323	7.30	B	E	9.8	0.80	0.253	1.31	B	E	24.5	
		SNS5A	35.550		1.27	45.15	1.40	0.253	2.20	B	E	24.5	0.323	7.59	B	E	9.8	0.80	0.253	1.27	B	E	24.5	
		SNS6A	39.950		1.19	47.54	1.40	0.253	2.05	B	E	24.5	0.323	7.06	B	E	1.8	0.80	0.253	1.19	B	E	24.5	
	SNS7B	42.000		1.13	47.46	1.40	0.253	1.96	B	E	24.5	0.323	7.02	B	E	1.8	0.80	0.253	1.13	B	E	24.5		
	TTST	TNAGRIT3	33.000		1.46	48.18	1.40	0.253	2.52	B	E	24.5	0.323	8.33	B	E	9.8	0.80	0.253	1.46	B	E	24.5	
		TNT4A	33.075		1.47	48.62	1.40	0.253	2.54	B	E	24.5	0.323	7.94	B	E	9.8	0.80	0.253	1.47	B	E	24.5	
		TNT6A	41.600		1.23	51.17	1.40	0.253	2.12	B	E	24.5	0.323	7.71	B	E	1.8	0.80	0.253	1.23	B	E	24.5	
		TNT7A	42.000		1.24	52.08	1.40	0.253	2.15	B	E	24.5	0.323	7.13	B	E	9.8	0.80	0.253	1.24	B	E	24.5	
		TNT7B	42.000		1.30	54.60	1.40	0.253	2.24	B	E	24.5	0.323	6.79	B	E	1.8	0.80	0.253	1.30	B	E	24.5	
		TNAGRIT4	43.000		1.23	52.89	1.40	0.253	2.12	B	E	24.5	0.323	6.53	B	E	9.8	0.80	0.253	1.23	B	E	24.5	
TNAGT5A		45.000		1.15	51.75	1.40	0.253	1.98	B	E	24.5	0.323	6.64	B	E	1.8	0.80	0.253	1.15	B	E	24.5		
TNAGT5B	45.000		③	1.13	50.85	1.40	0.253	1.94	B	E	24.5	0.323	6.17	B	E	9.8	0.80	0.253	<b>1.13</b>	B	E	24.5		

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

- 
- 
- 
- 

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

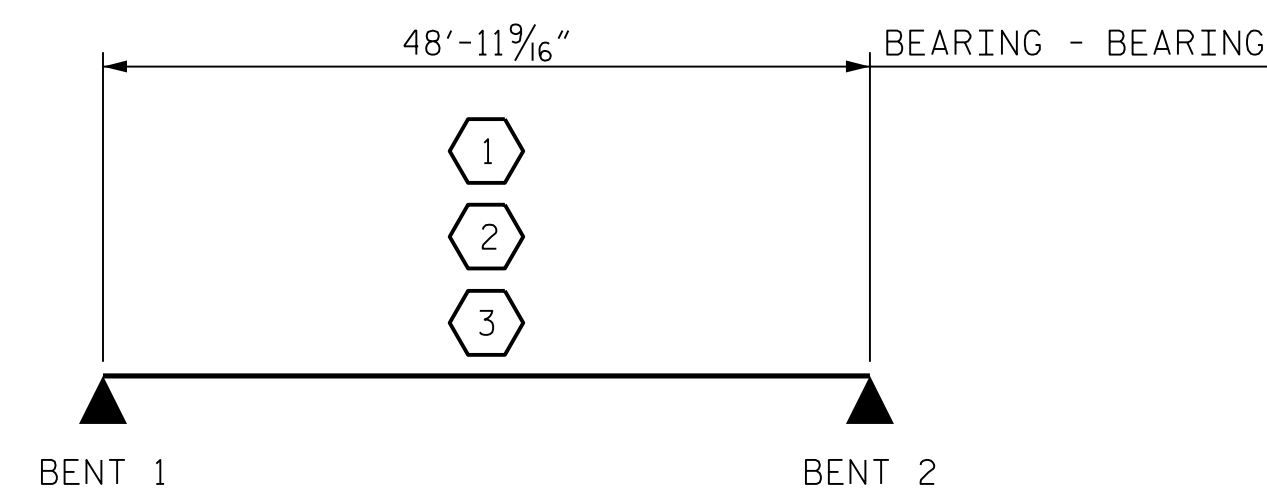
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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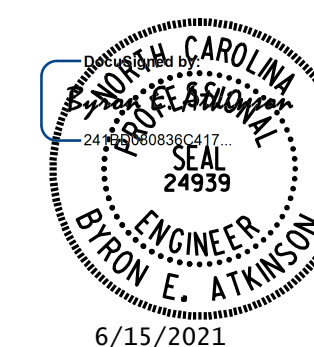
GIRDER LOCATION

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



LRFR SUMMARY  
SPAN B

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 LRFR SUMMARY FOR  
 50' CORED SLAB UNIT  
 75° SKEW  
 SPAN B  
 (NON-INTERSTATE TRAFFIC)

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

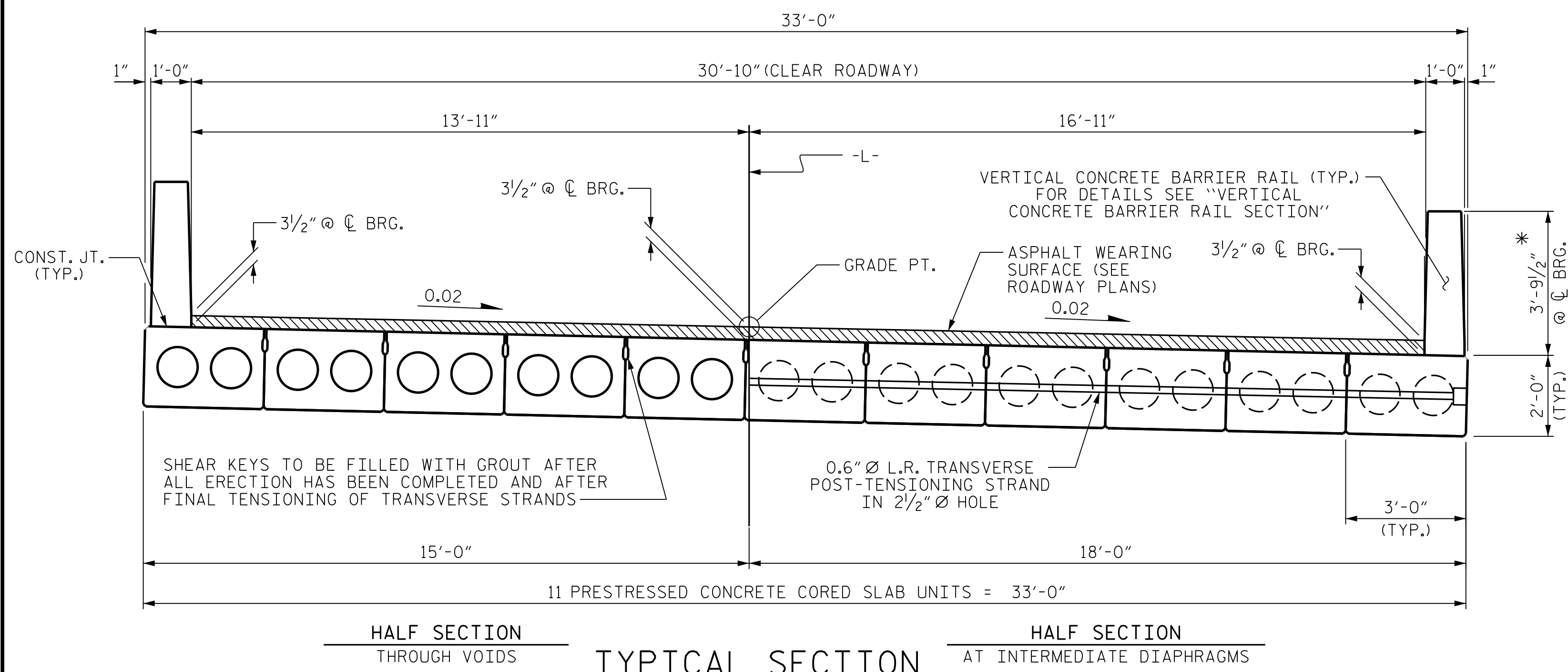
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5 TOTAL SHEETS 20
1			3			
2			4			

DRAWN BY : B.E. LANNING	DATE : 01/20
CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21



6/15/2021 11:37:19 AM User: blanning  
 File: N:\NC Bridges\17BP8.R.135\Structures\401.011.17BP8.R.135.SMU.CSUI.610190.dgn

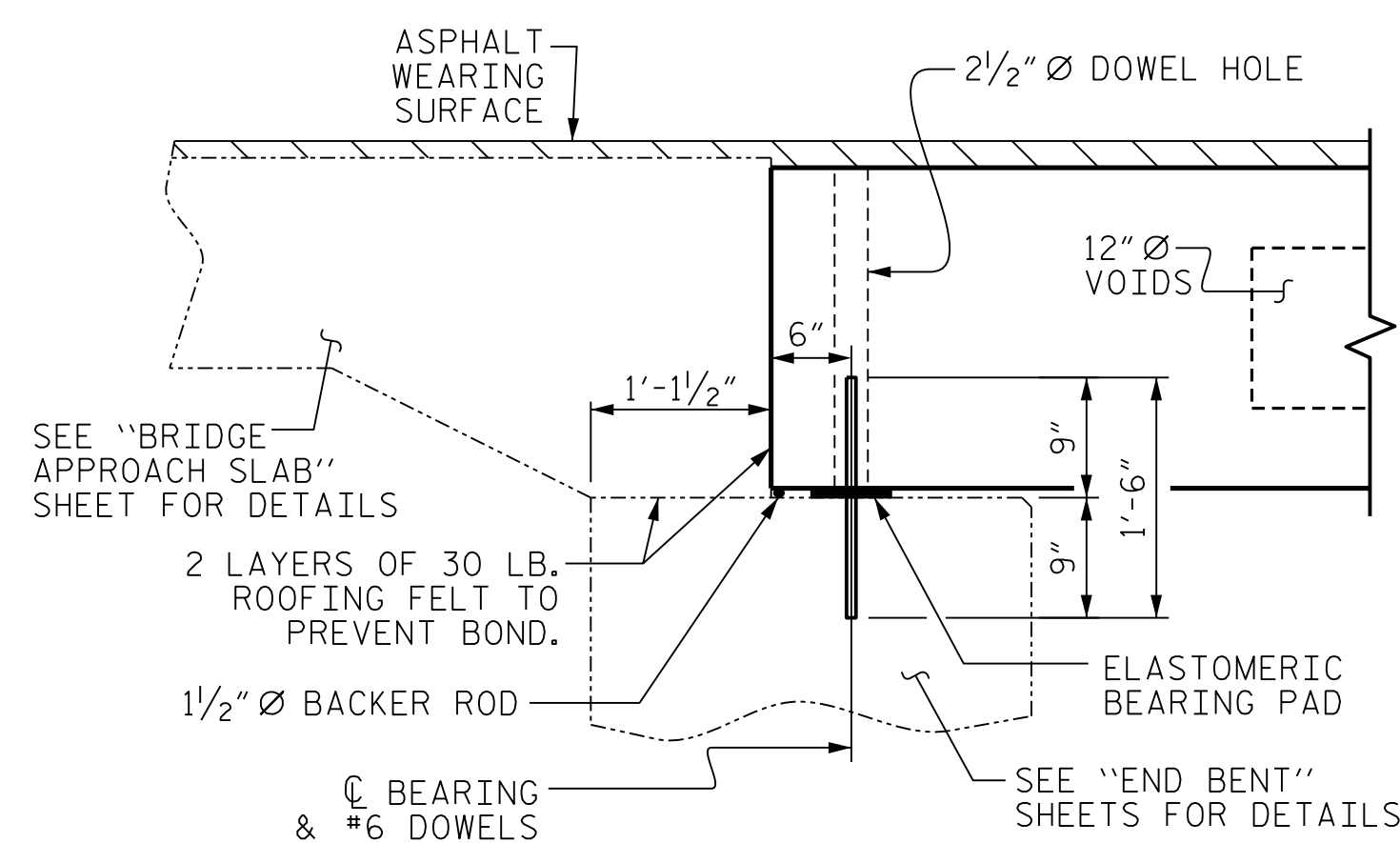


\* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

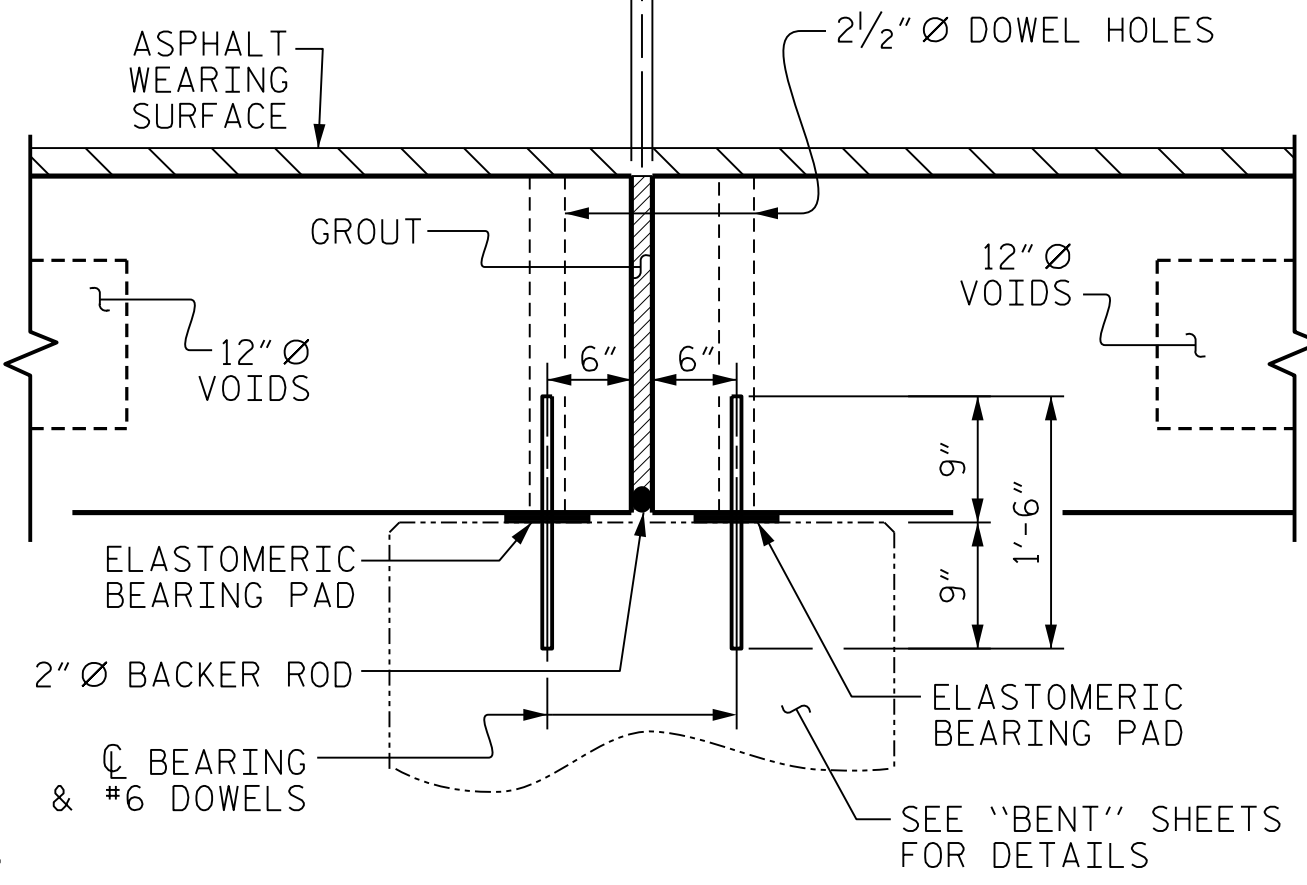
FIXED END

FIXED END

FIXED END

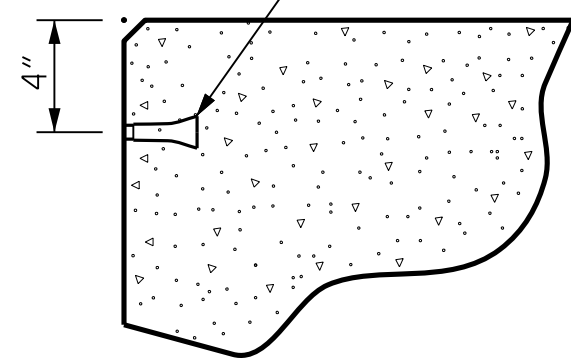


SECTION AT END BENT

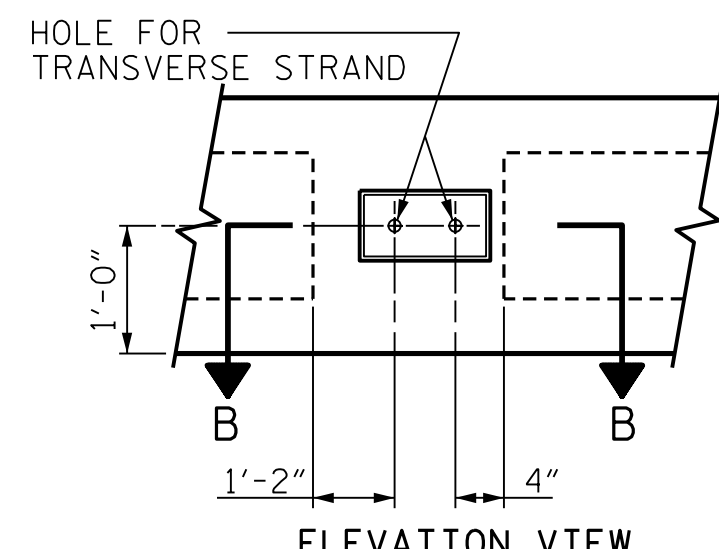


SECTION AT BENT

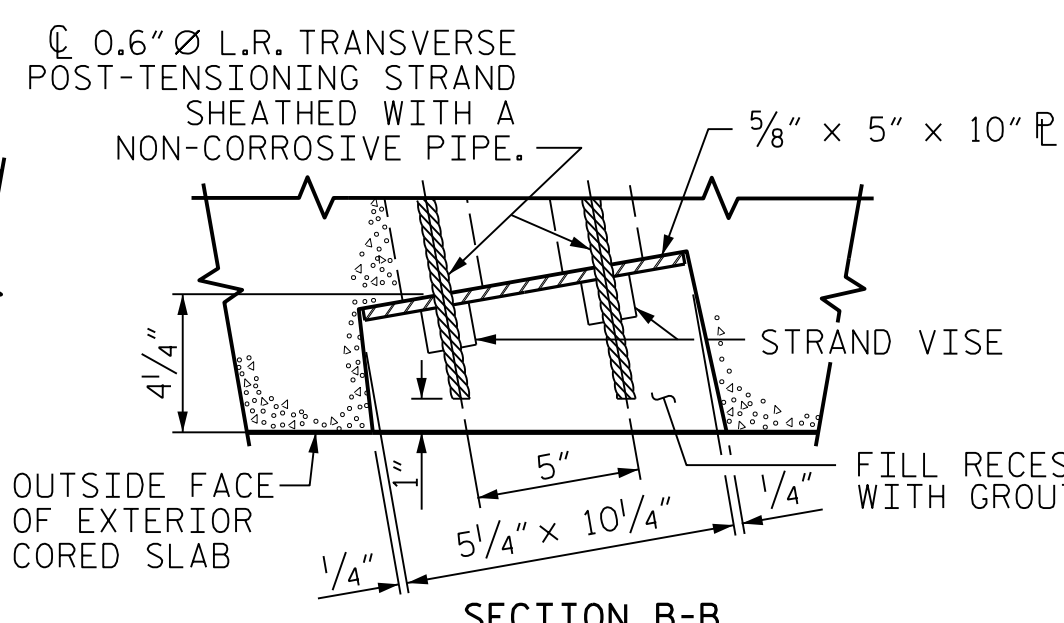
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

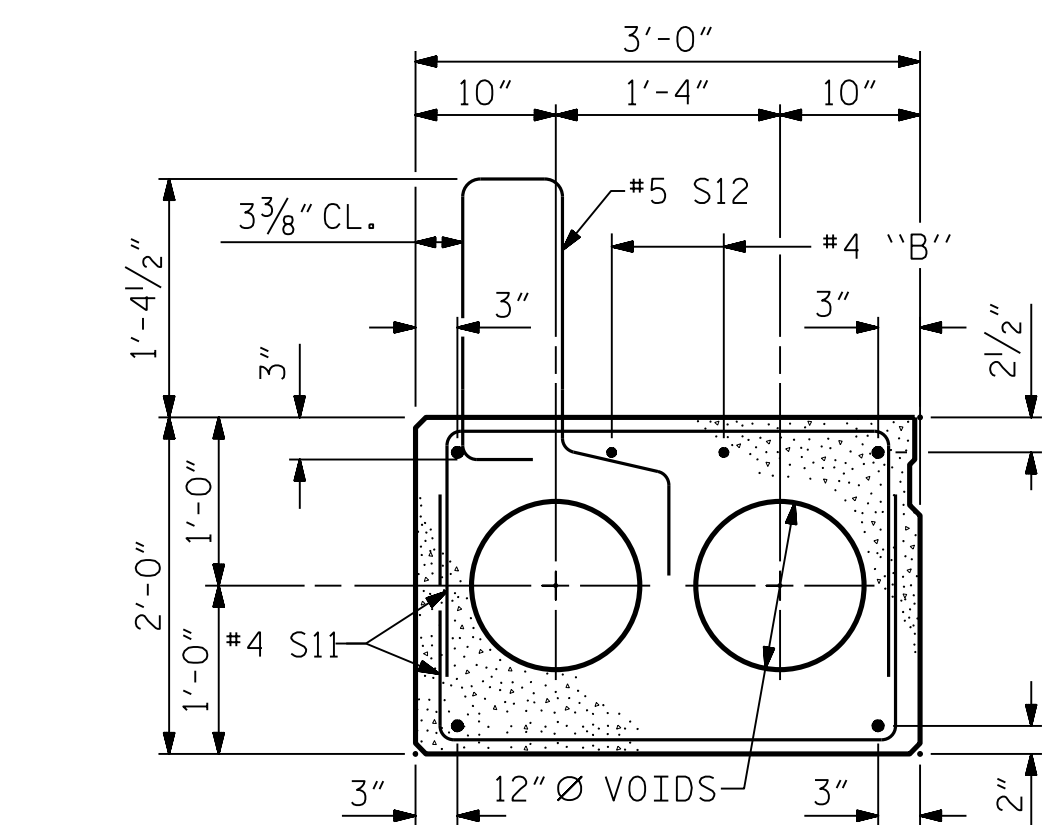


ELEVATION VIEW



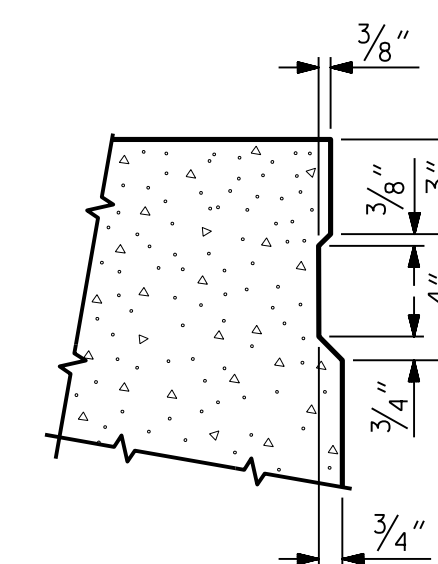
SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS



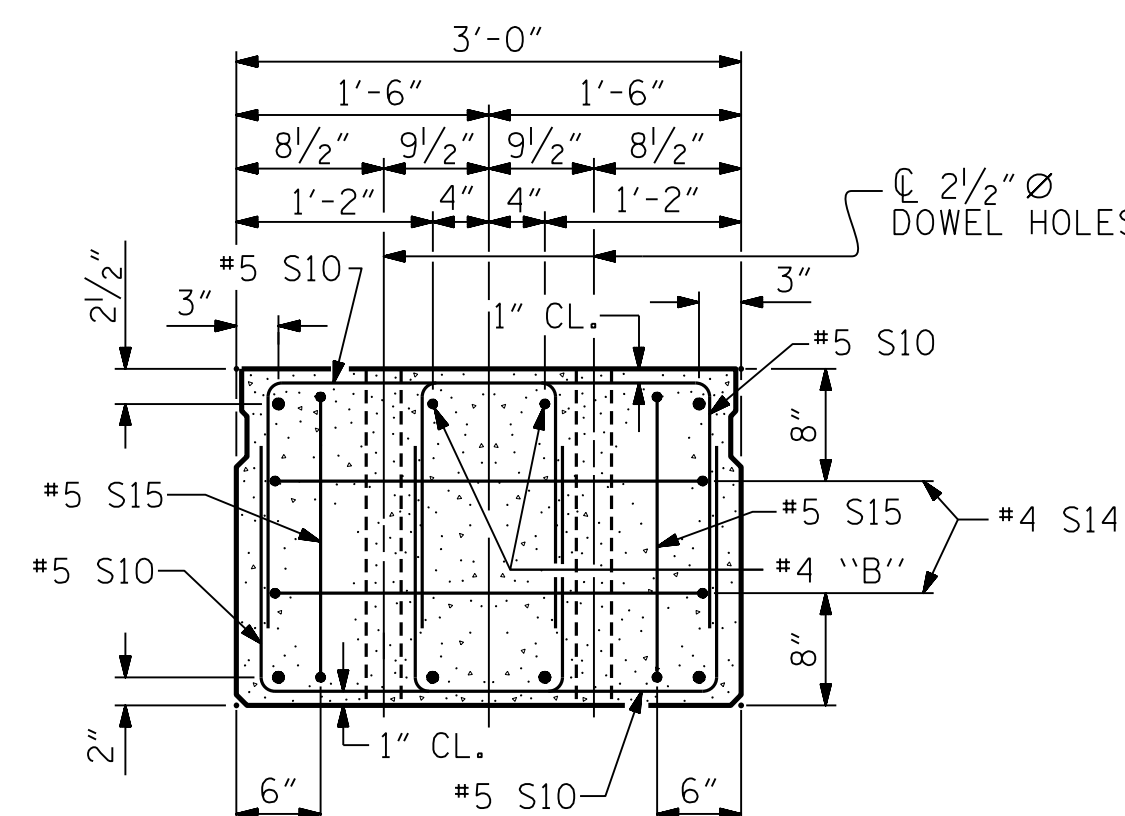
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



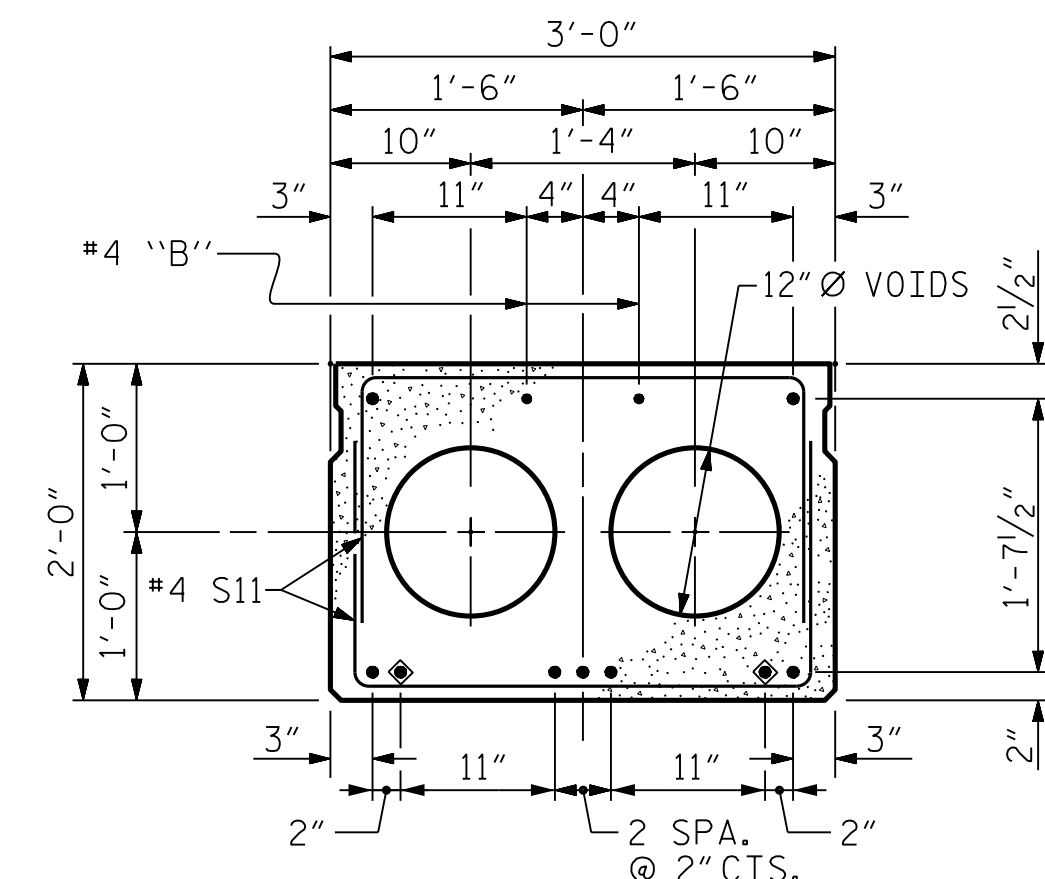
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

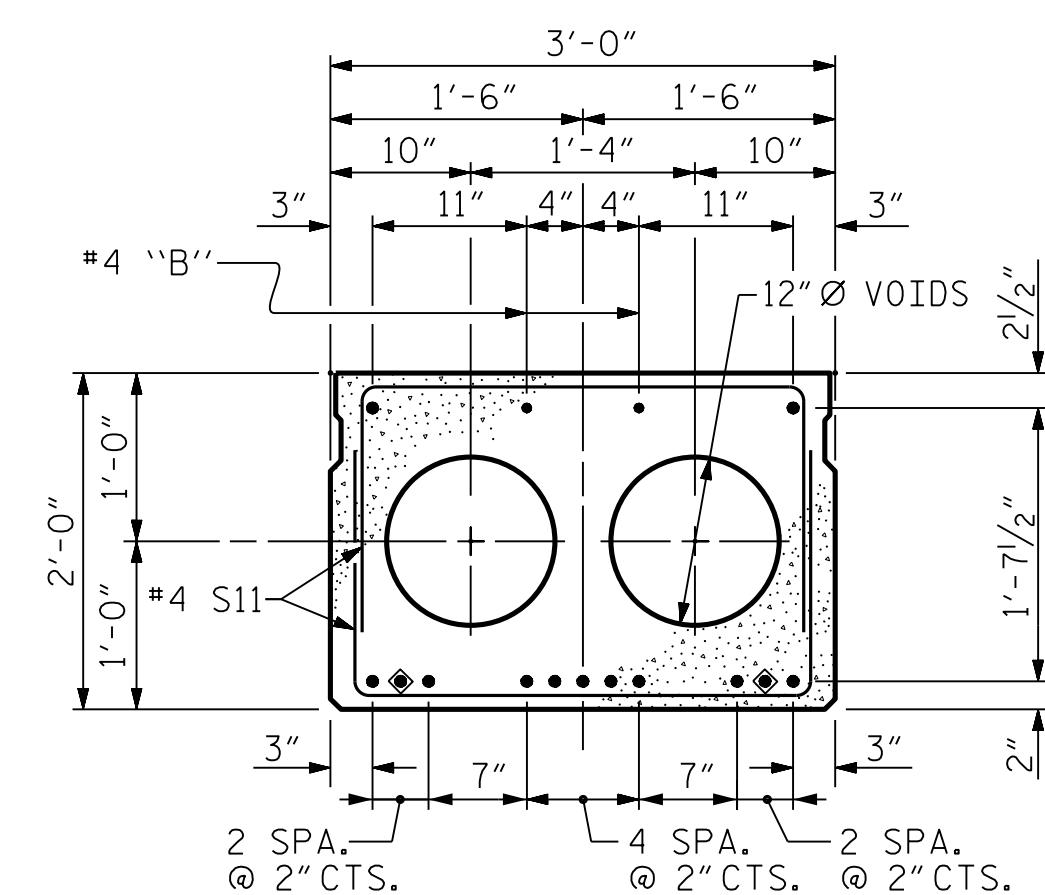


END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN).  
 INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



INTERIOR SLAB SECTION (35' UNIT)  
(9 STRANDS REQUIRED)



INTERIOR SLAB SECTION (50' UNIT)  
(13 STRANDS REQUIRED)

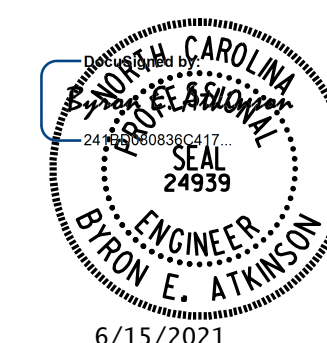
0.6" Ø LOW RELAXATION STRAND LAYOUT

BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

3'-0" X 2'-0"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

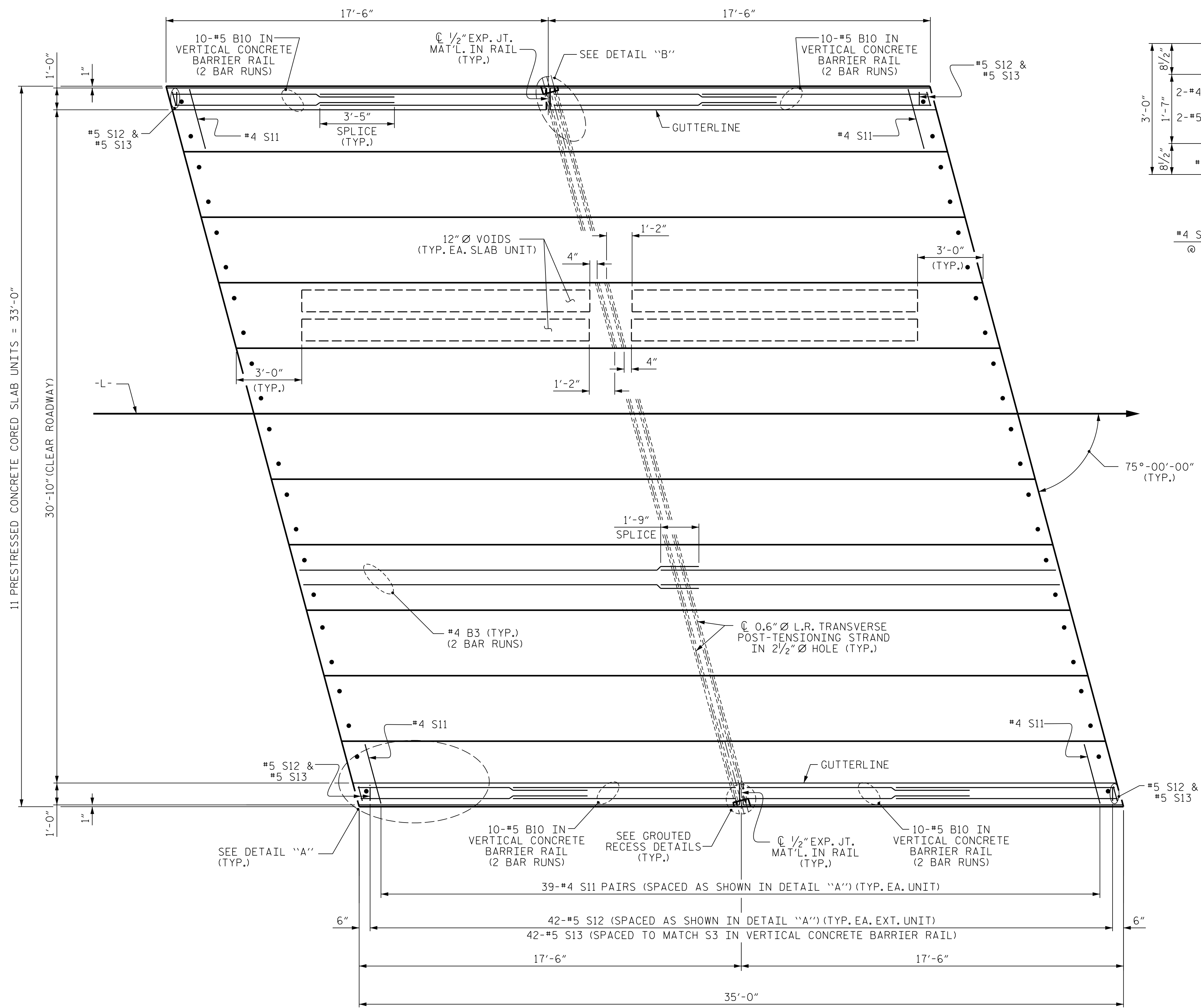
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

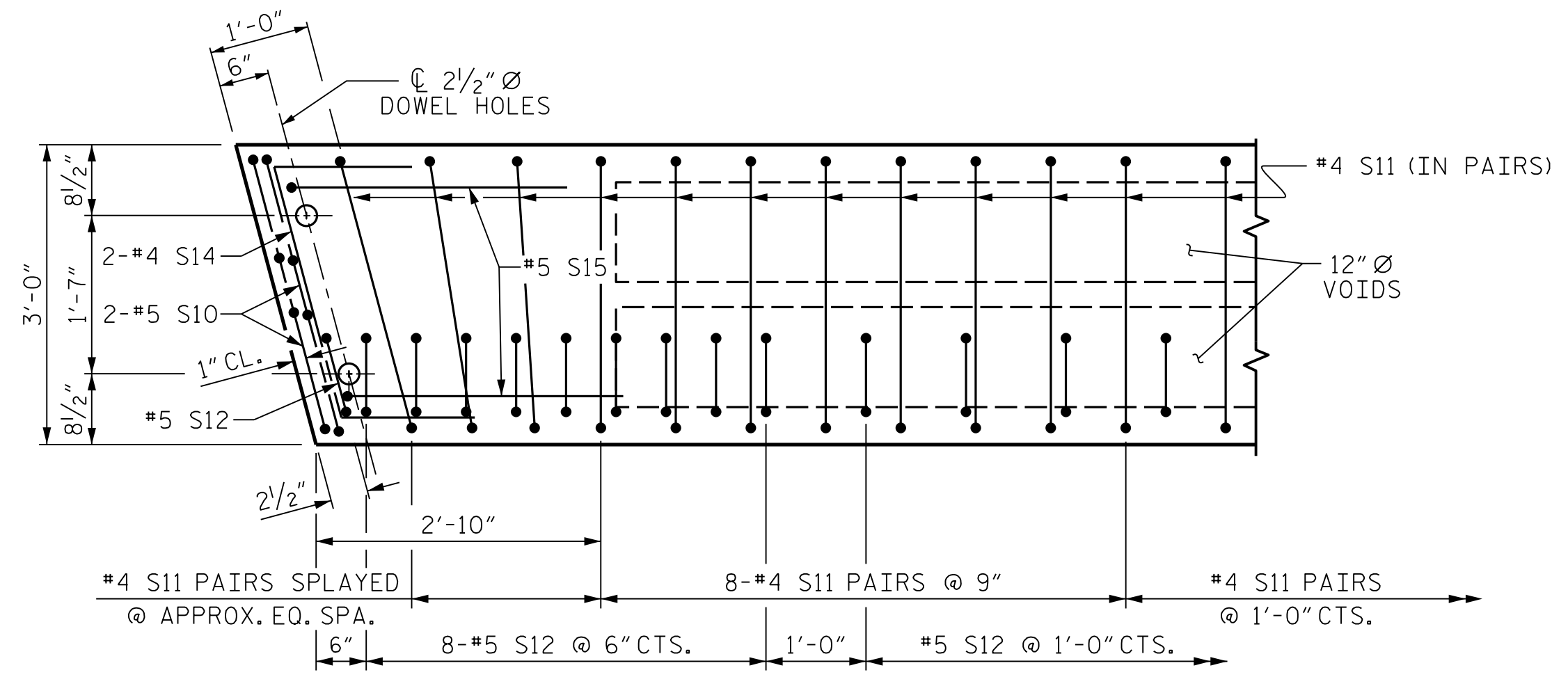
REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

DRAWN BY: B.E. LANNING DATE: 01/20  
 CHECKED BY: B.E. ATKINSON DATE: 02/20  
 DESIGN ENGINEER OF RECORD: B.E. ATKINSON DATE: 06/21

6/15/2021 11:37:20 AM User: blanning  
 Filename: N:\NC Bridges\MI8023.CH Eng.Montgomery 190 Br. Rep\17BP8R135\Structures\401.013.17BP8R135.SMU.CSU2.610190.dgn

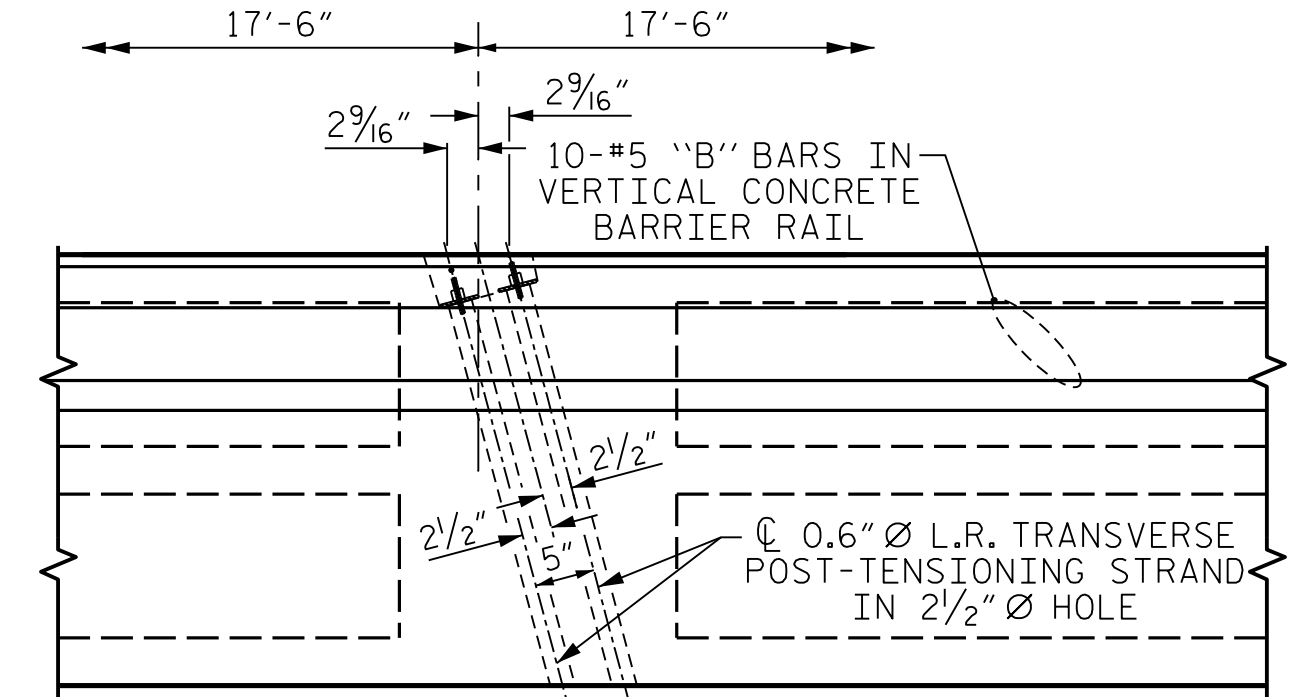


PLAN OF UNIT



DETAIL "A"

(SIMILAR EACH END OF UNIT)  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.

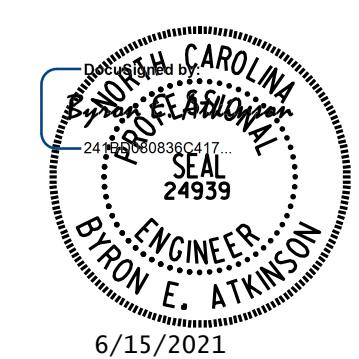


DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 2 OF 4



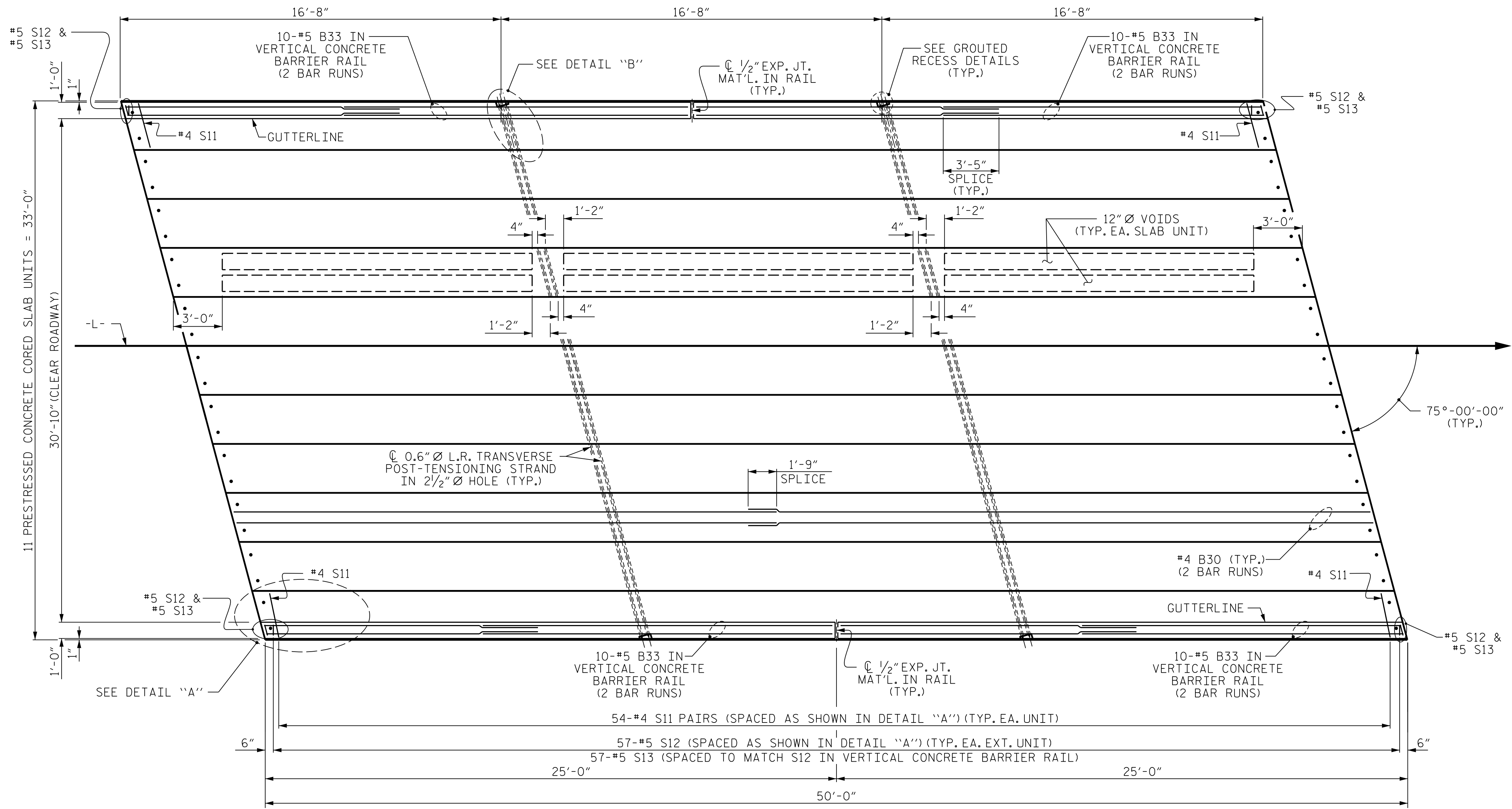
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

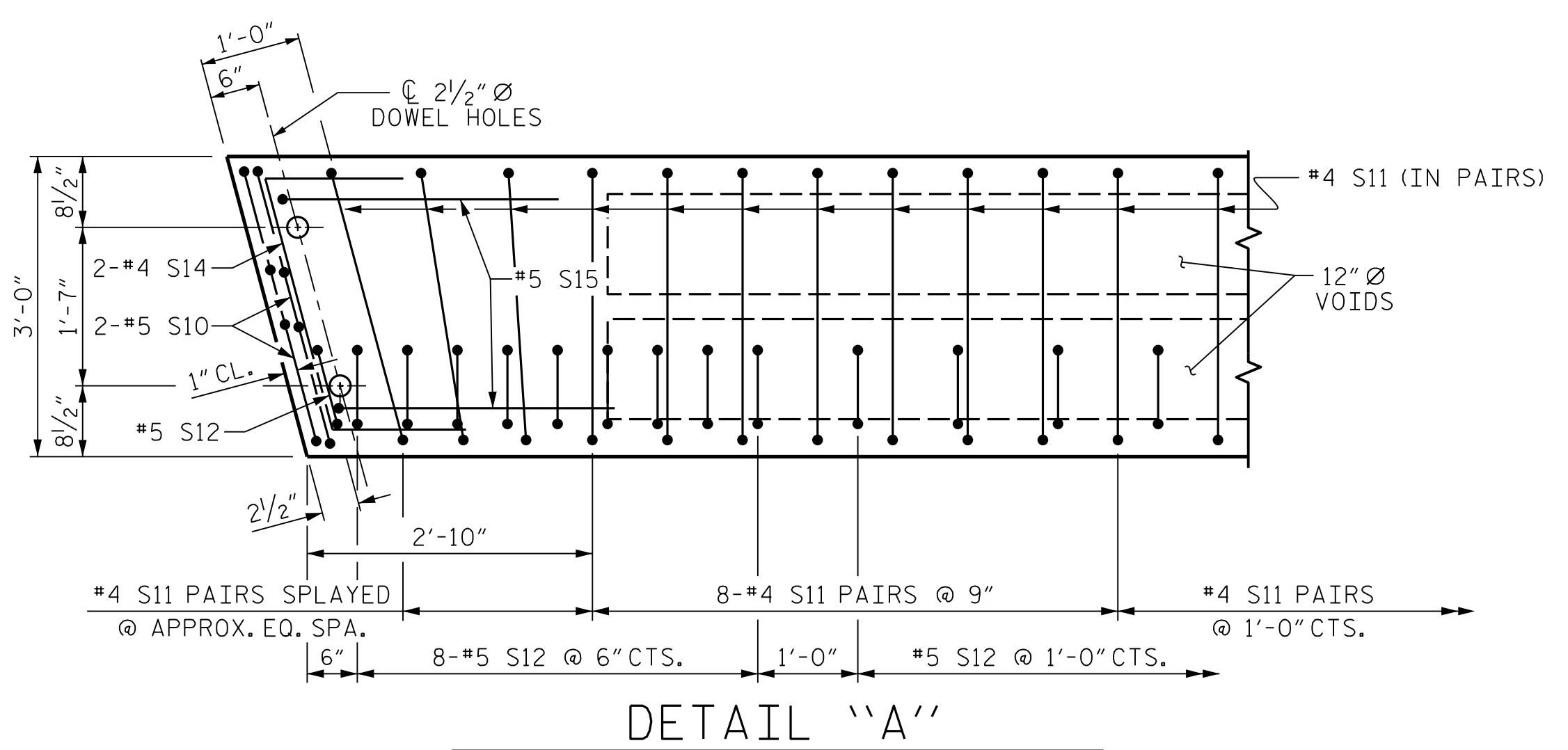
STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION		RALEIGH	
PLAN OF 35' UNIT 30'-10" CLEAR ROADWAY 75° SKEW SPAN A OR SPAN C					
SHEET NO. S-7					
TOTAL SHEETS 20					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY :	B.E. LANNING	DATE :	01/20
CHECKED BY :	B.E. ATKINSON	DATE :	02/20
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE :	06/21

6/15/2021 11:37:21 AM User: blanning  
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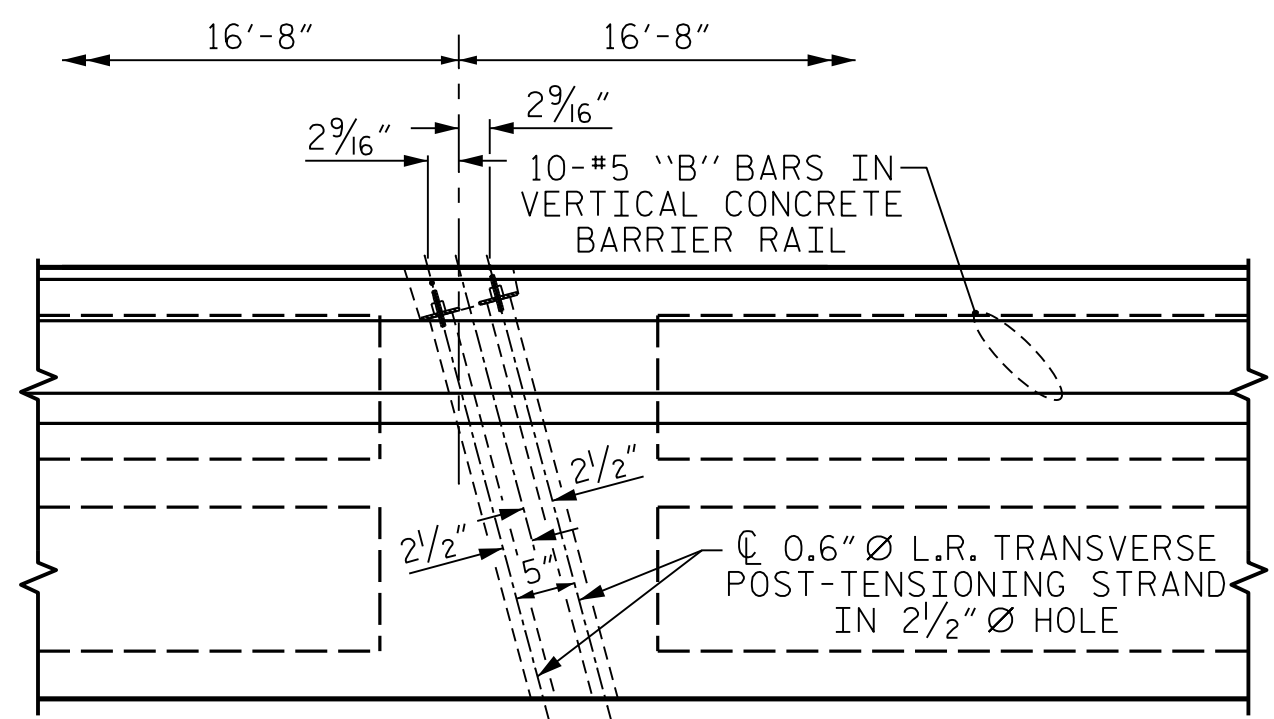


**PLAN OF UNIT**



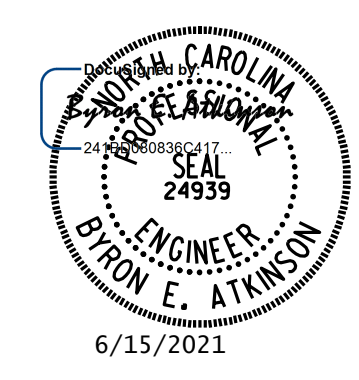
**DETAIL "A"**

(SIMILAR EACH END OF UNIT)  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



**DETAIL "B"**

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES



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

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

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-  
 SHEET 3 OF 4

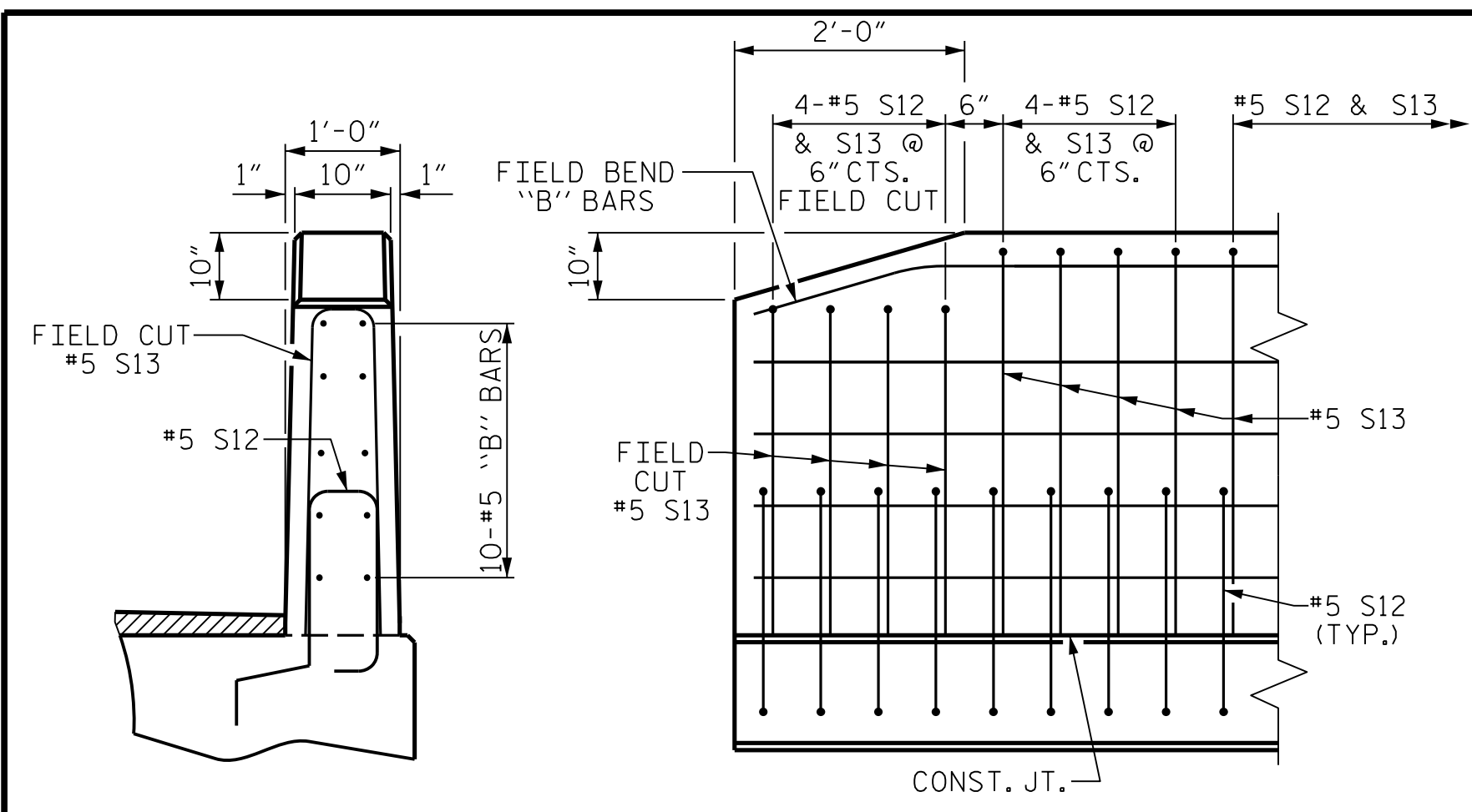
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PLAN OF 50' UNIT  
 30'-10" CLEAR ROADWAY  
 75° SKEW  
 SPAN B**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

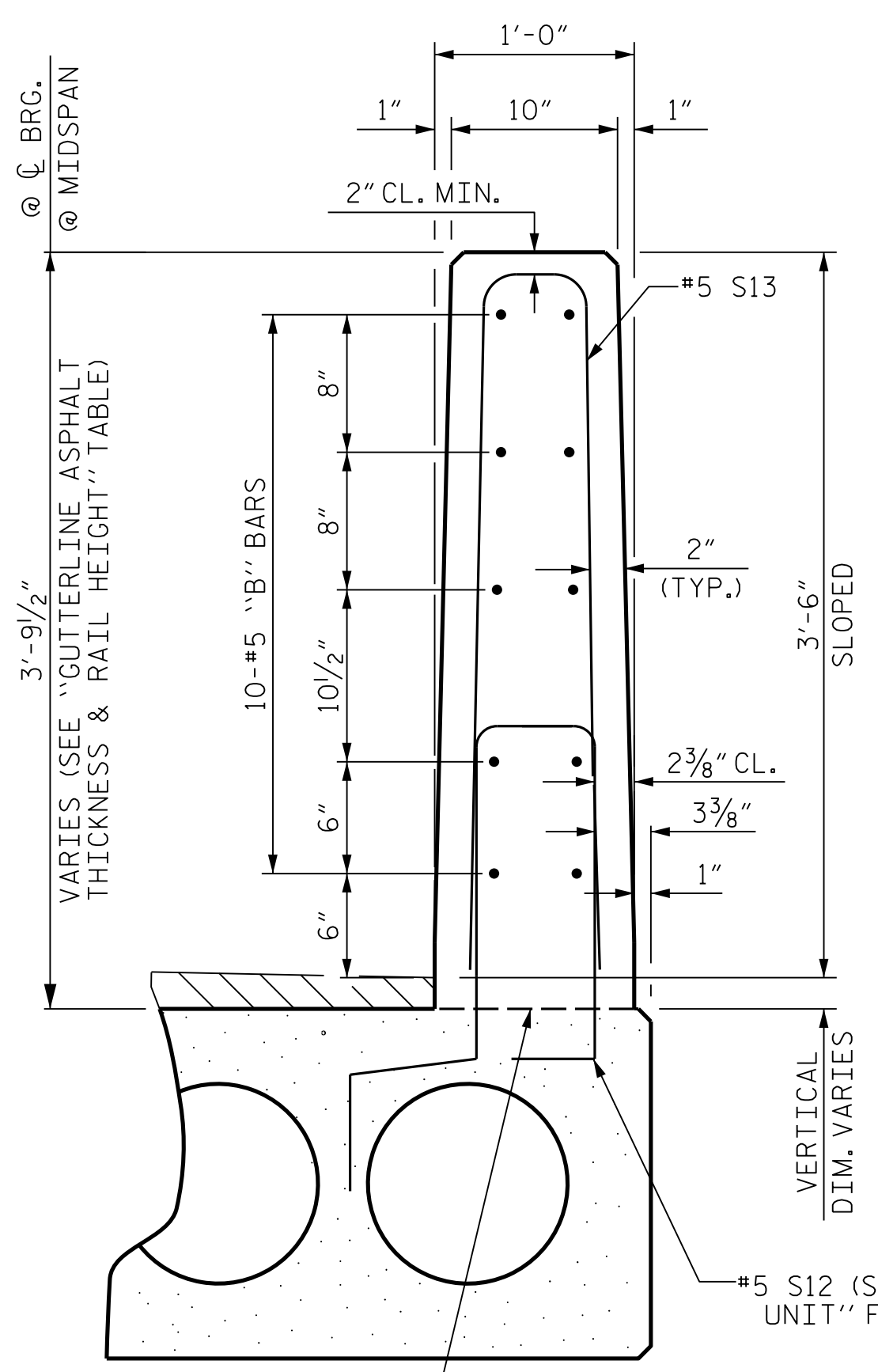
DRAWN BY : B.E. LANNING	DATE : 01/20
CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

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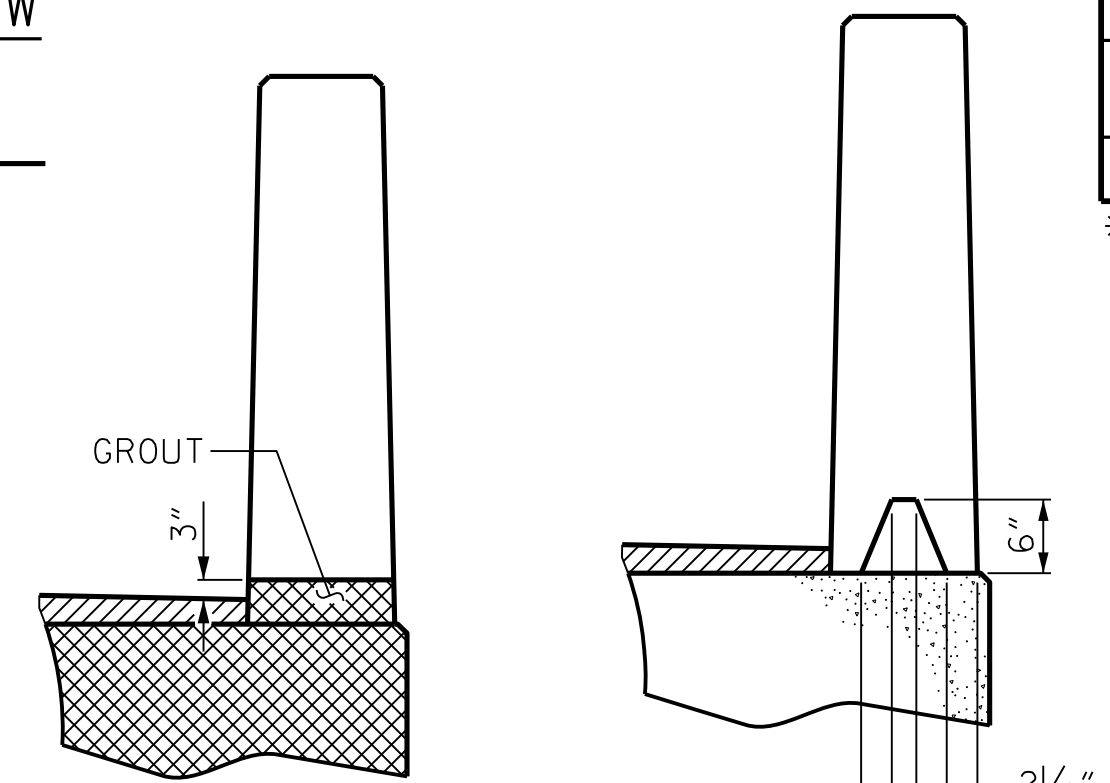
END VIEW SIDE VIEW

**END OF RAIL DETAILS**

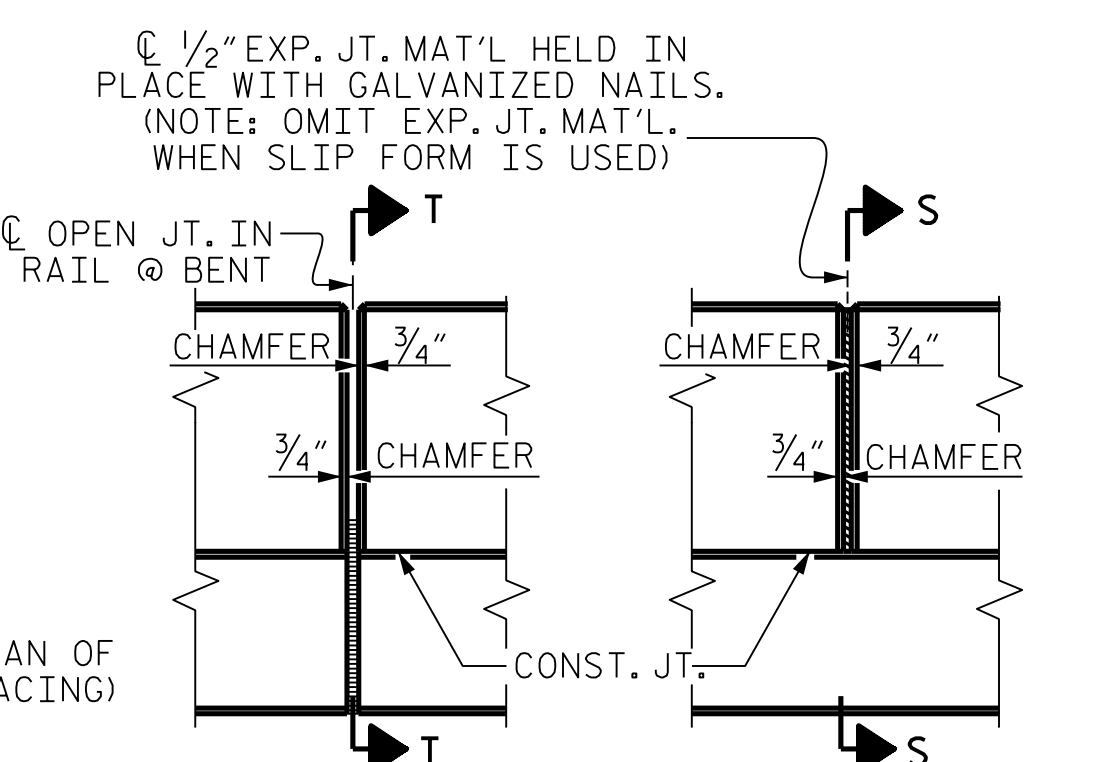


**VERTICAL CONCRETE BARRIER RAIL SECTION**

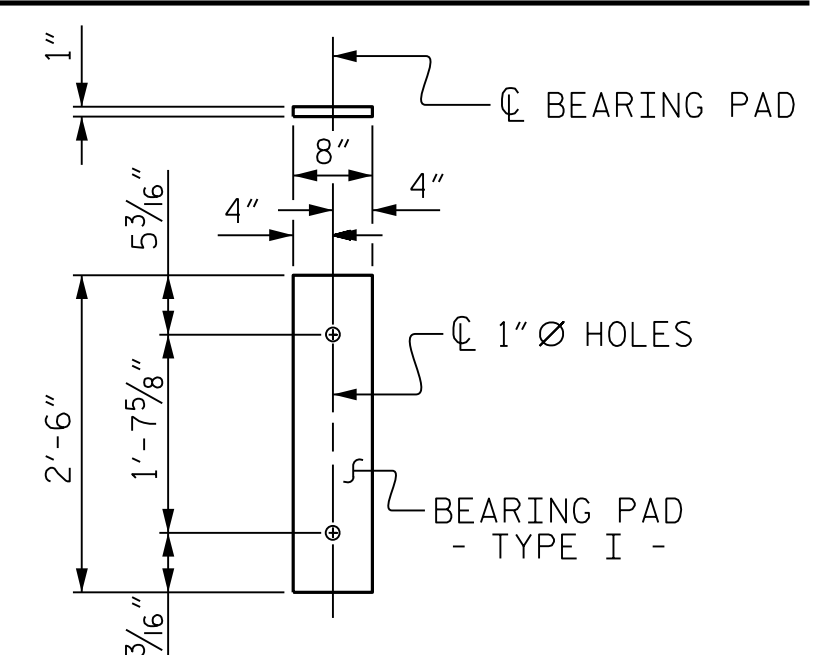
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
35' UNITS	3 3/8"	3'-9 3/8"
50' UNITS	3 1/8"	3'-9 1/8"



SECTION T-T AT OPEN JOINT AT BENT (THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)  
 SECTION S-S AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

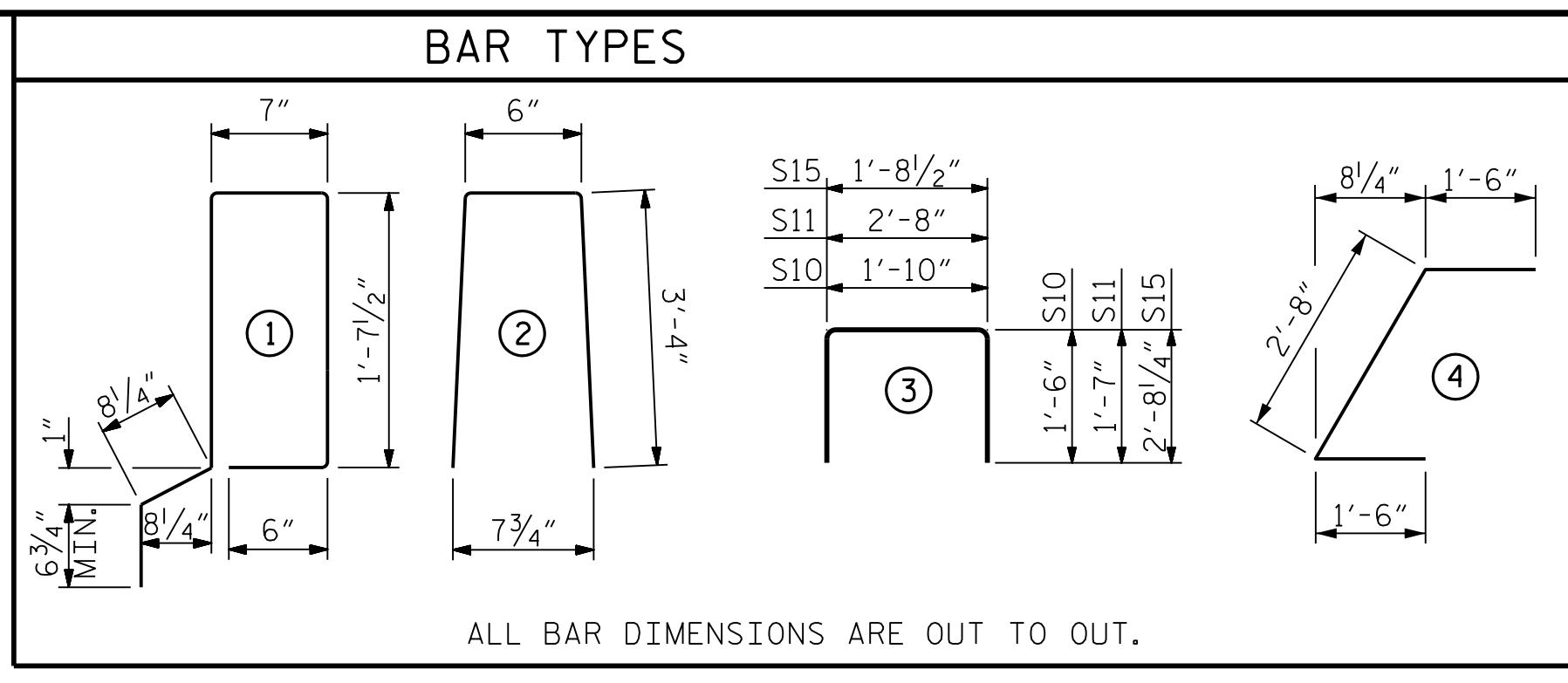


**ELASTOMERIC BEARING DETAILS**  
 ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

CORED SLABS REQUIRED			
35' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	35'-0"	140'-0"
INTERIOR C.S.	18	35'-0"	635'-0"
TOTAL	22		770'-0"

CORED SLABS REQUIRED			
50' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	9	50'-0"	450'-0"
TOTAL	11		550'-0"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
35' UNIT	4800
50' UNIT	4800



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

DEAD LOAD DEFLECTION AND CAMBER	
50' CORED SLAB UNIT	3'-0" x 2'-0" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	5/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1/4" ↓
FINAL CAMBER	3/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

\*\* INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
35' UNIT						
*B10	80	160	#5	STR	10'-5"	1738
*S13	88	176	#5	2	7'-2"	1316
* EPOXY COATED REINFORCING STEEL					LBS.	3054
CLASS AA CONCRETE					CU.YDS.	18.2
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	140.25

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
50' UNIT						
*B33	80	80	#5	STR	14'-2"	1182
*S13	118	118	#5	2	7'-2"	882
* EPOXY COATED REINFORCING STEEL					LBS.	2064
CLASS AA CONCRETE					CU.YDS.	13.0
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	100.25

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S10	8	#5	3	4'-10"	40	4'-10"	40
S11	78	#4	3	5'-10"	304	5'-10"	304
*S12	44	#5	1	5'-7"	256		
S14	4	#4	4	5'-8"	15	5'-8"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL				LBS.	438		438
* EPOXY COATED REINFORCING STEEL				LBS.	256		
6000 P.S.I. CONCRETE				CU. YDS.	6.3		6.3
0.6" Ø L.R. STRANDS				No.	9		9

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B30	4	#4	STR	25'-9"	69	25'-9"	69
S10	8	#5	3	4'-10"	40	4'-10"	40
S11	108	#4	3	5'-10"	421	5'-10"	421
*S12	59	#5	1	5'-7"	344		
S14	4	#4	4	5'-8"	15	5'-8"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL				LBS.	575		575
* EPOXY COATED REINFORCING STEEL				LBS.	344		
6000 P.S.I. CONCRETE				CU. YDS.	8.7		8.7
0.6" Ø L.R. STRANDS				No.	13		13

**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 CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB 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.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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 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.

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

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

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.

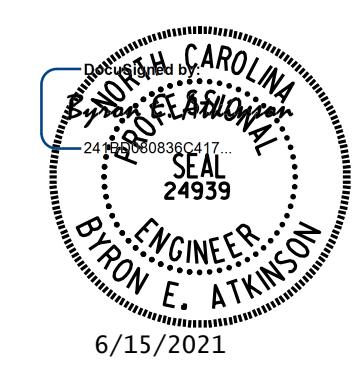
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

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.

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

PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-



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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW					
SHEET 4 OF 4					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : B.E. LANNING DATE : 01/20  
 CHECKED BY : B.E. ATKINSON DATE : 02/20  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 06/21

SHEET NO. **S-9**  
 TOTAL SHEETS **20**

NOTES

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

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

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

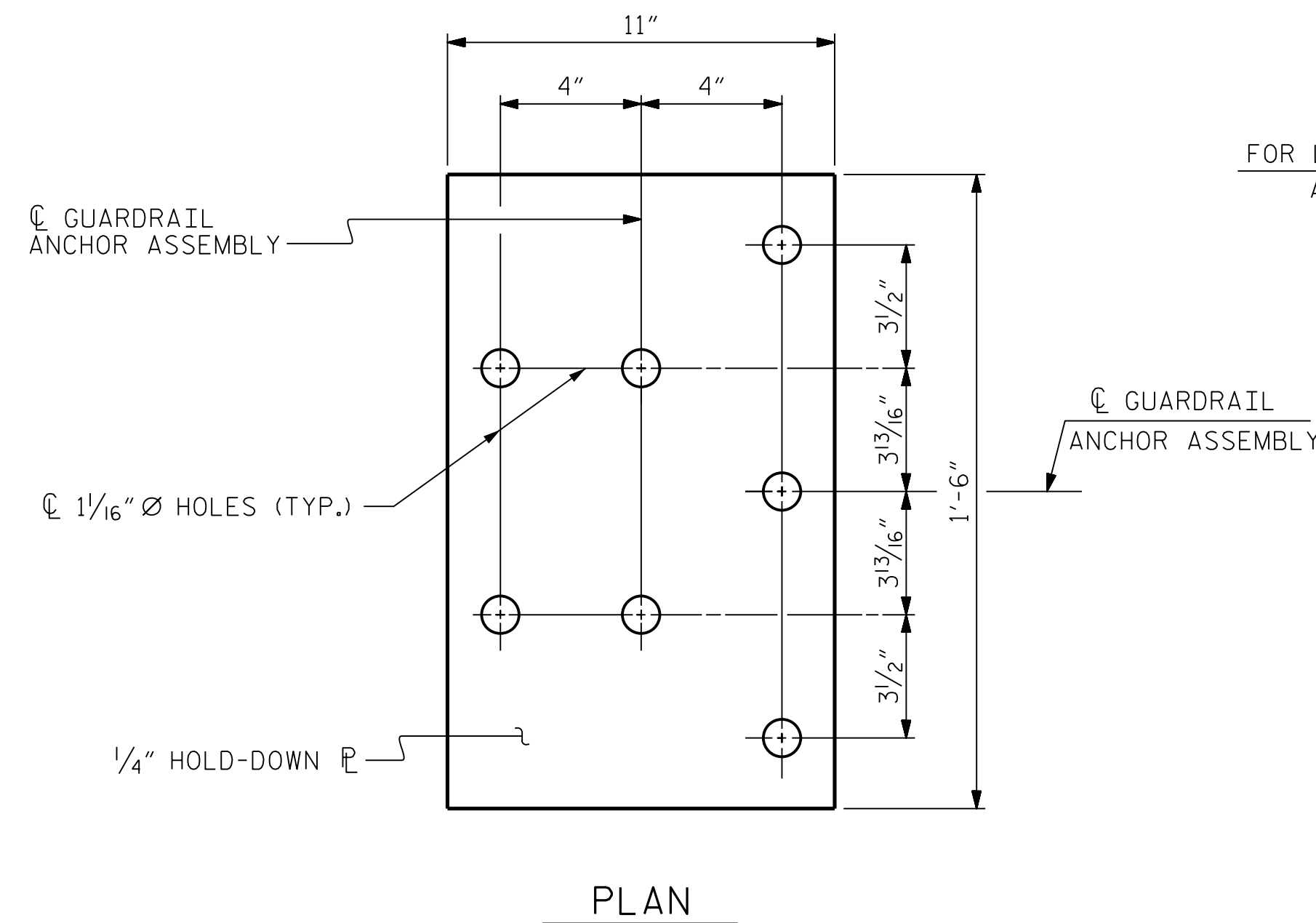
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

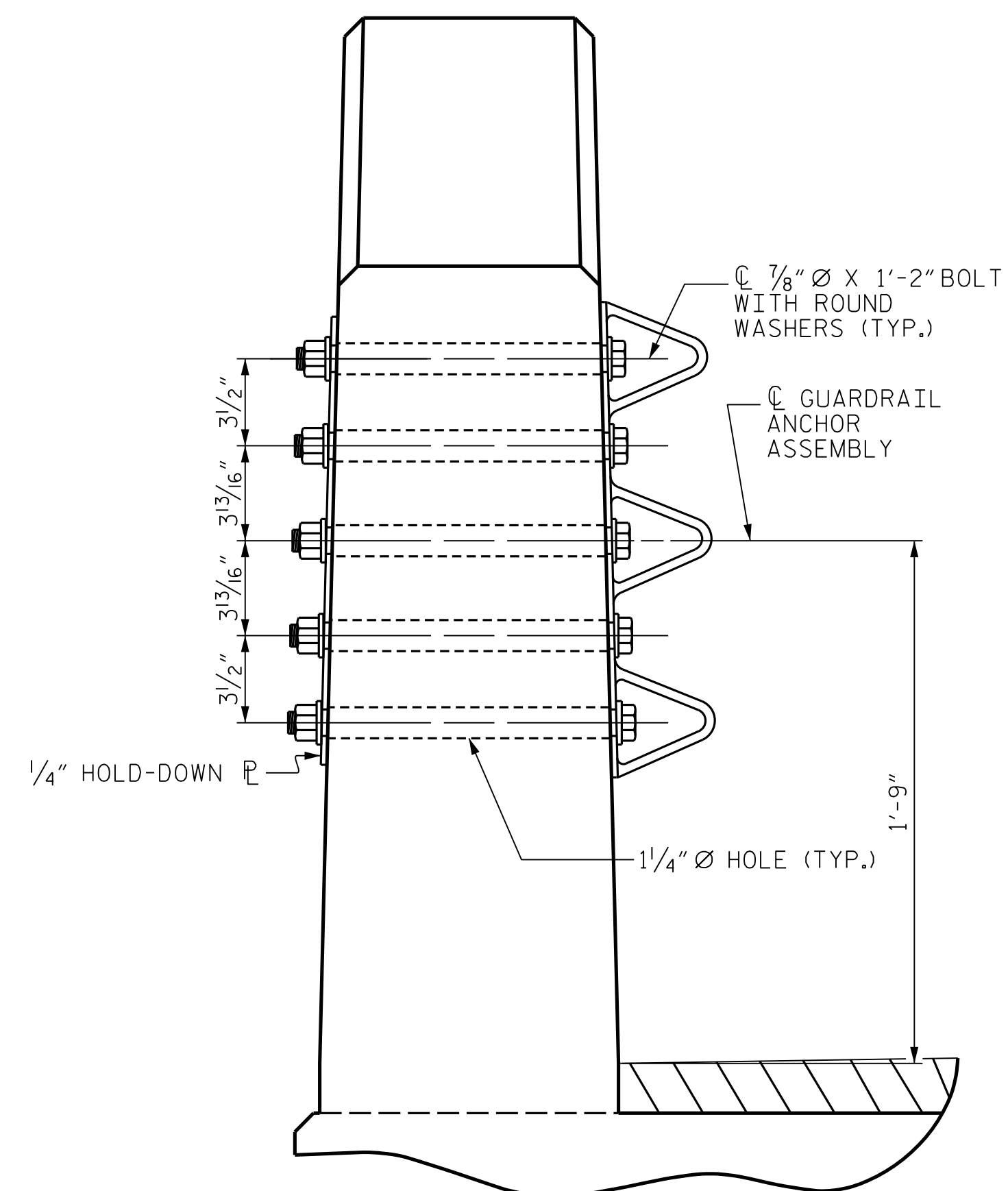
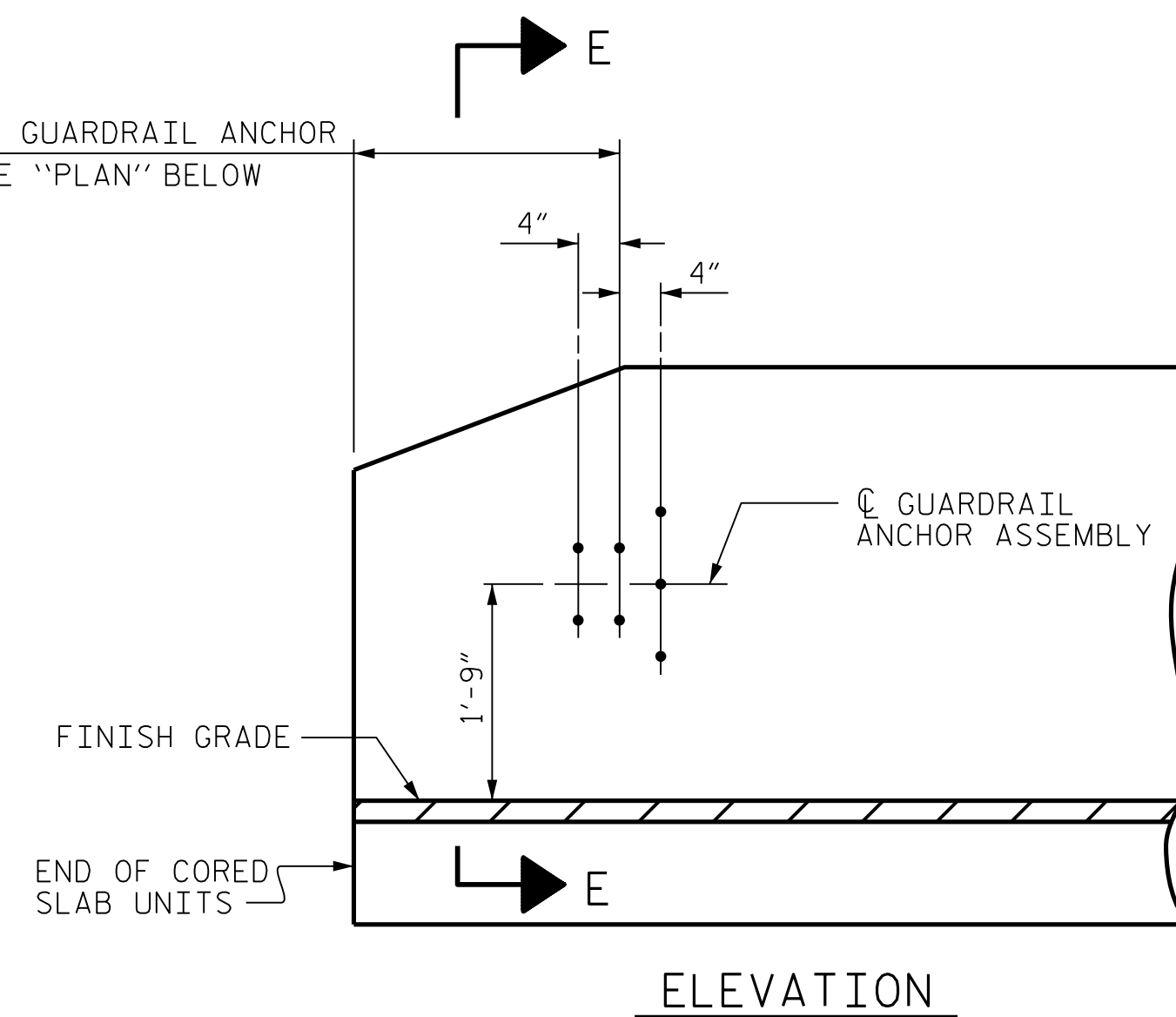
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

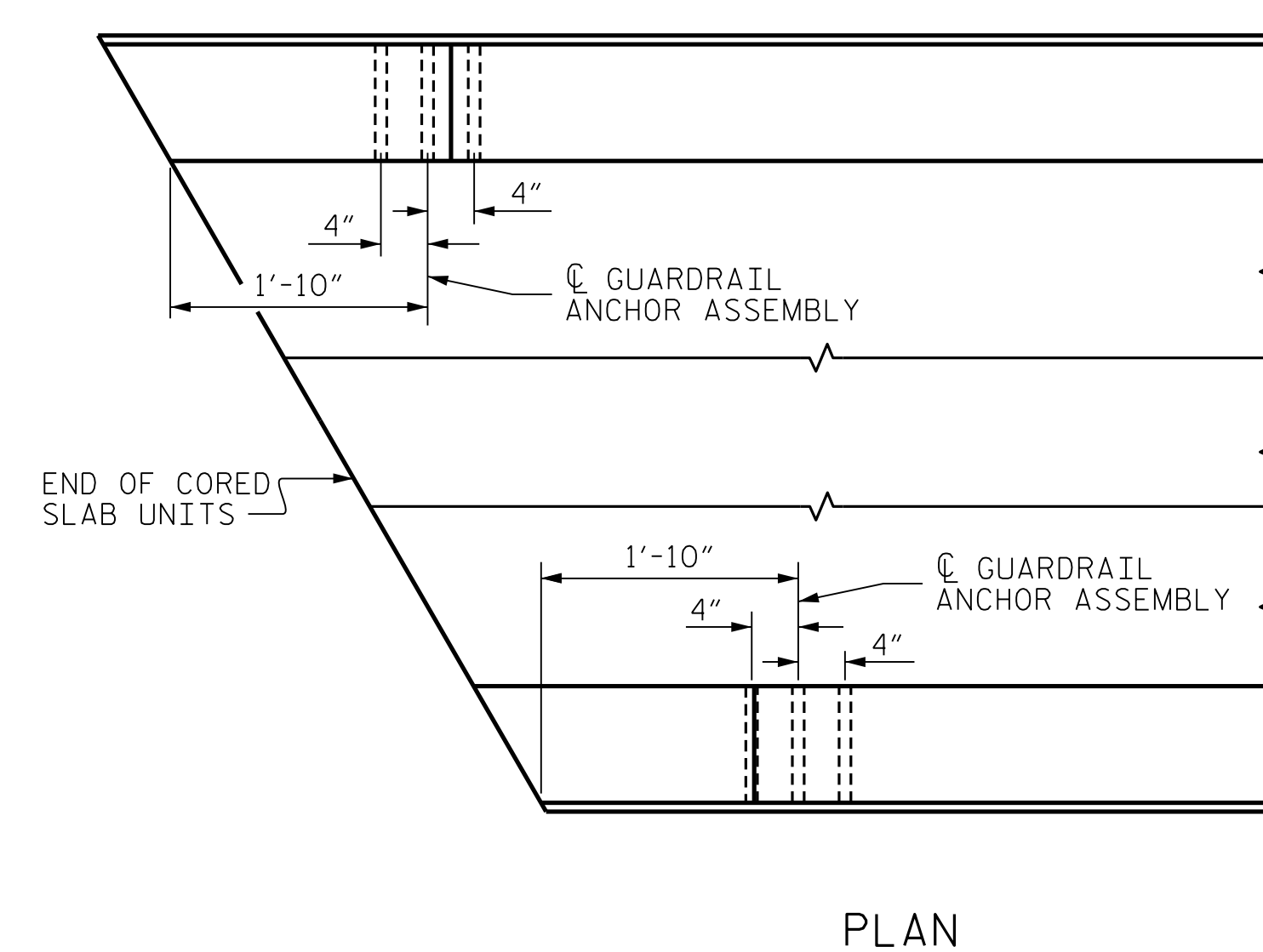
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



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



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

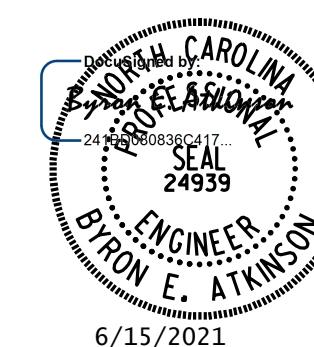
END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
STATION: 16+55.00 -L-



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

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

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

(SHT 1a) STD. NO. GRA3

6/15/2021 11:37:24 AM User: blanning File: N:\17BP8R135\Structures\401.019.17BP8R135.SMU.GRA1.610190.dgn

ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: B.E. ATKINSON	DATE: 02/20
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 06/21
DRAWN BY: MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY: GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

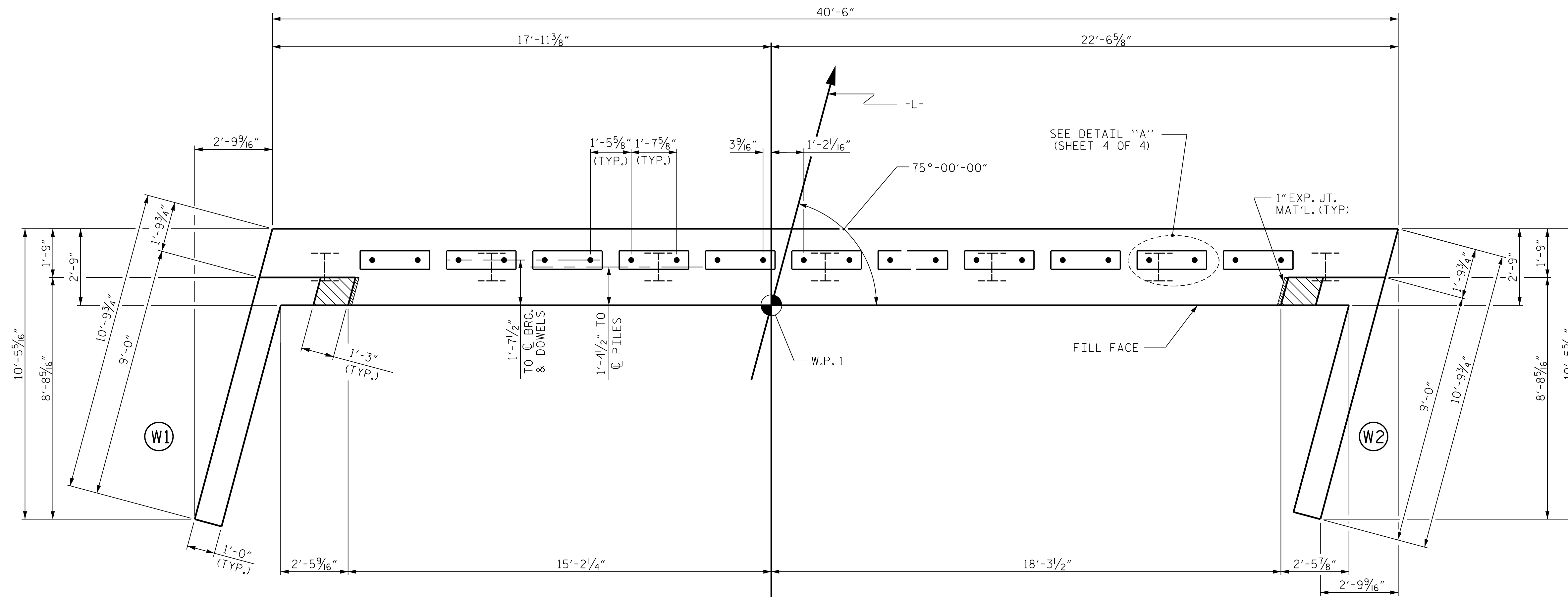
**NOTES**

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

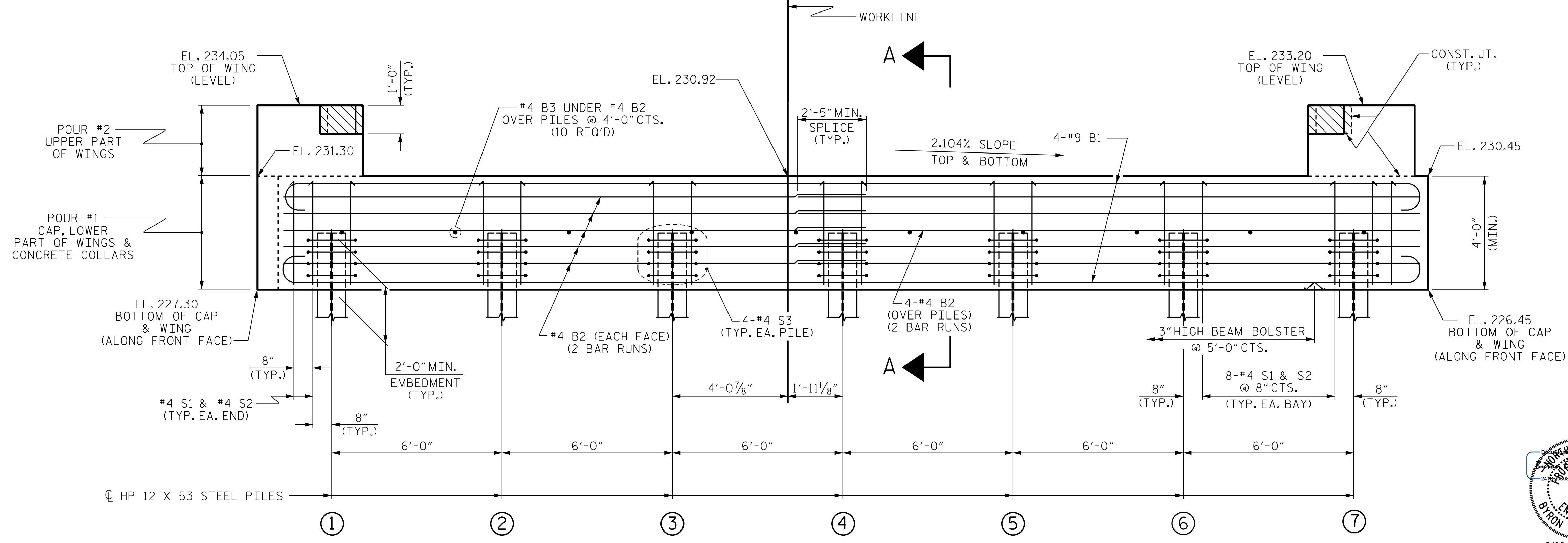
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



**PLAN**



**ELEVATION**

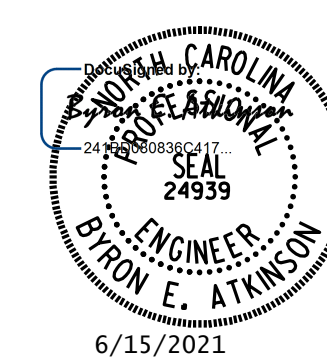
TOP OF PILE ELEVATIONS	
①	229.27
②	229.15
③	229.02
④	228.89
⑤	228.77
⑥	228.64
⑦	228.52

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1



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

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

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.

ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: B.E. ATKINSON	DATE: 02/20
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 06/21
DRAWN BY: WJH 12/II	REV. 4/15
CHECKED BY: AAC 12/II	MAA/TMG

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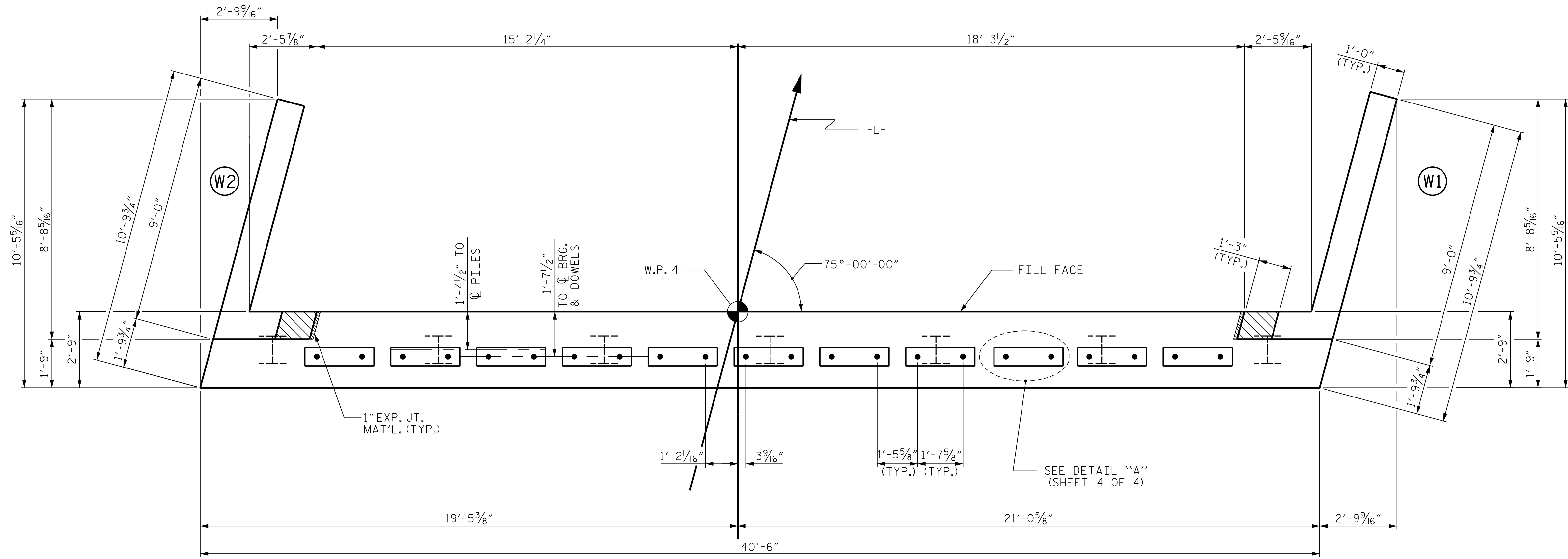
NOTES

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

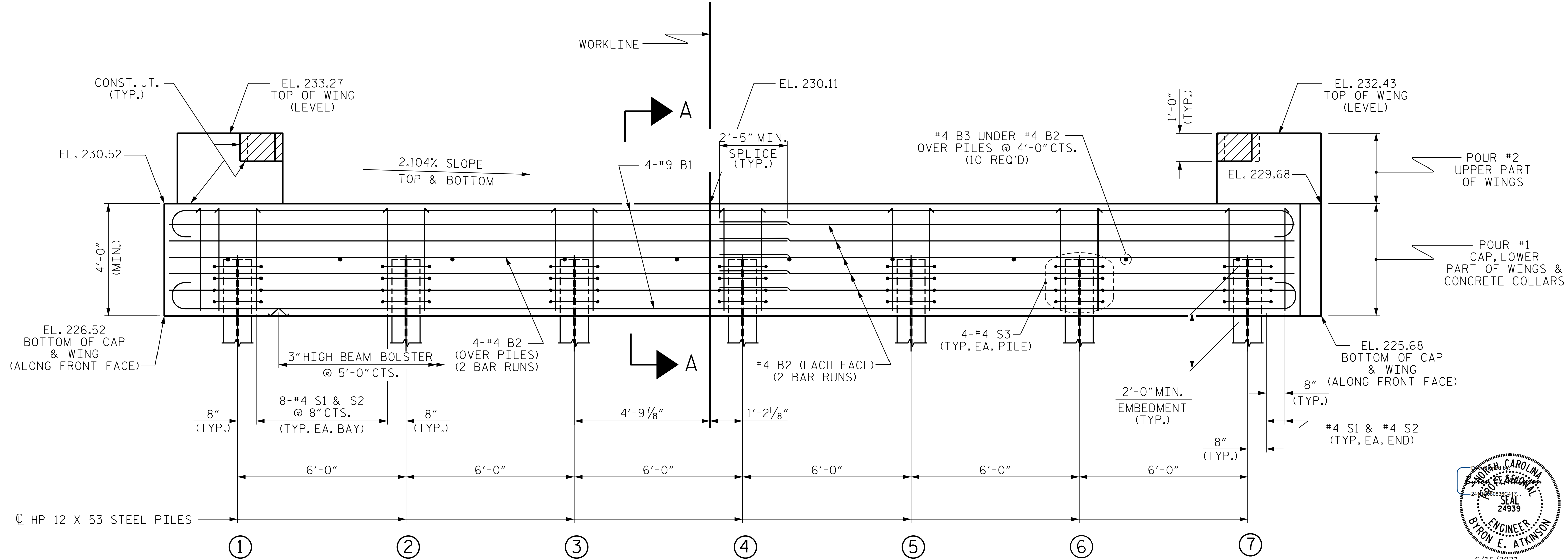
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

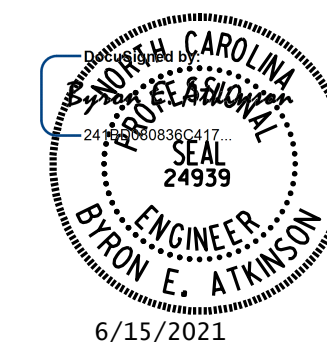
TOP OF PILE ELEVATIONS	
①	228.48
②	228.35
③	228.23
④	228.10
⑤	227.98
⑥	227.85
⑦	227.73

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2



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

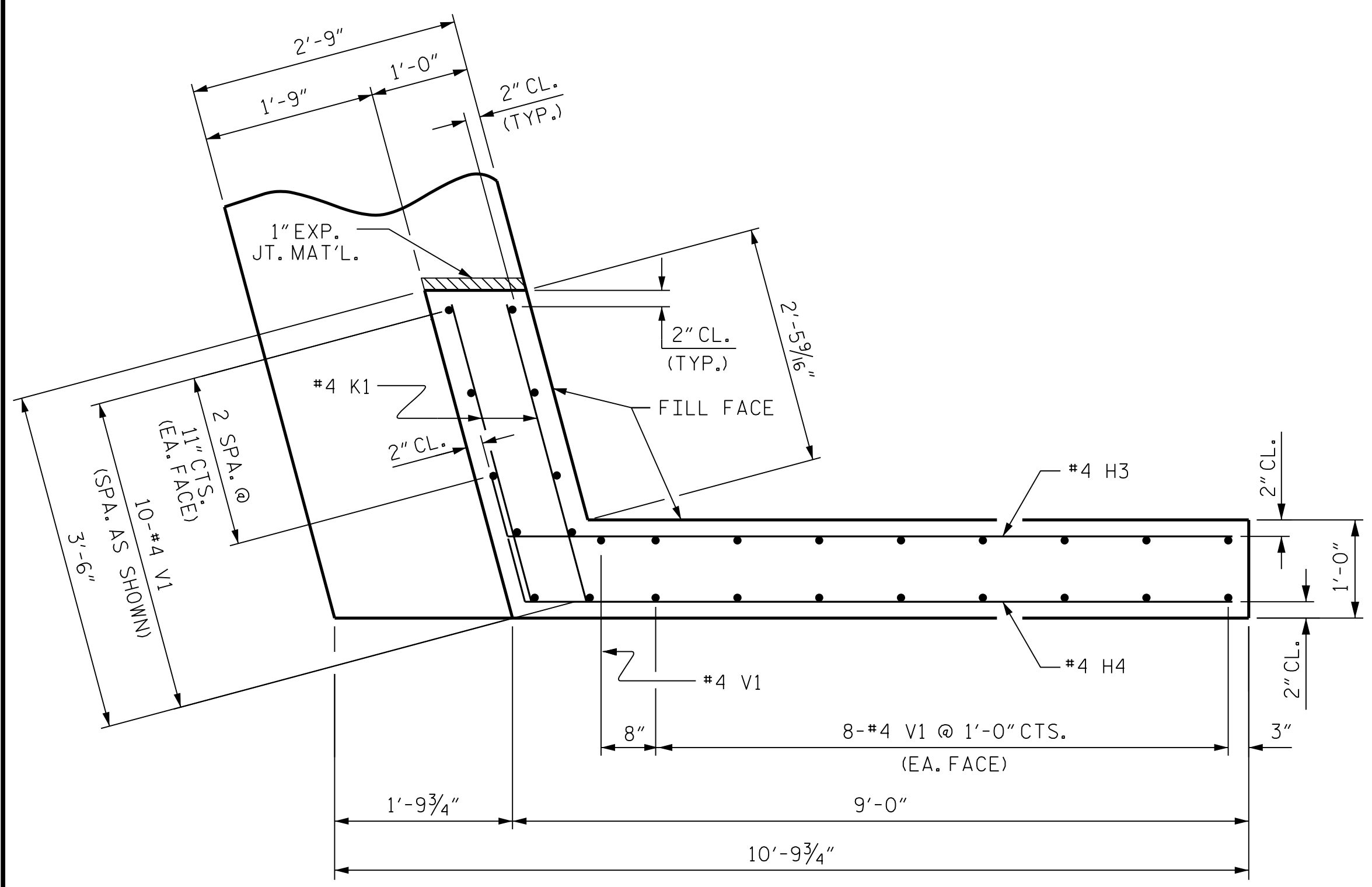
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			20
2			4			

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.

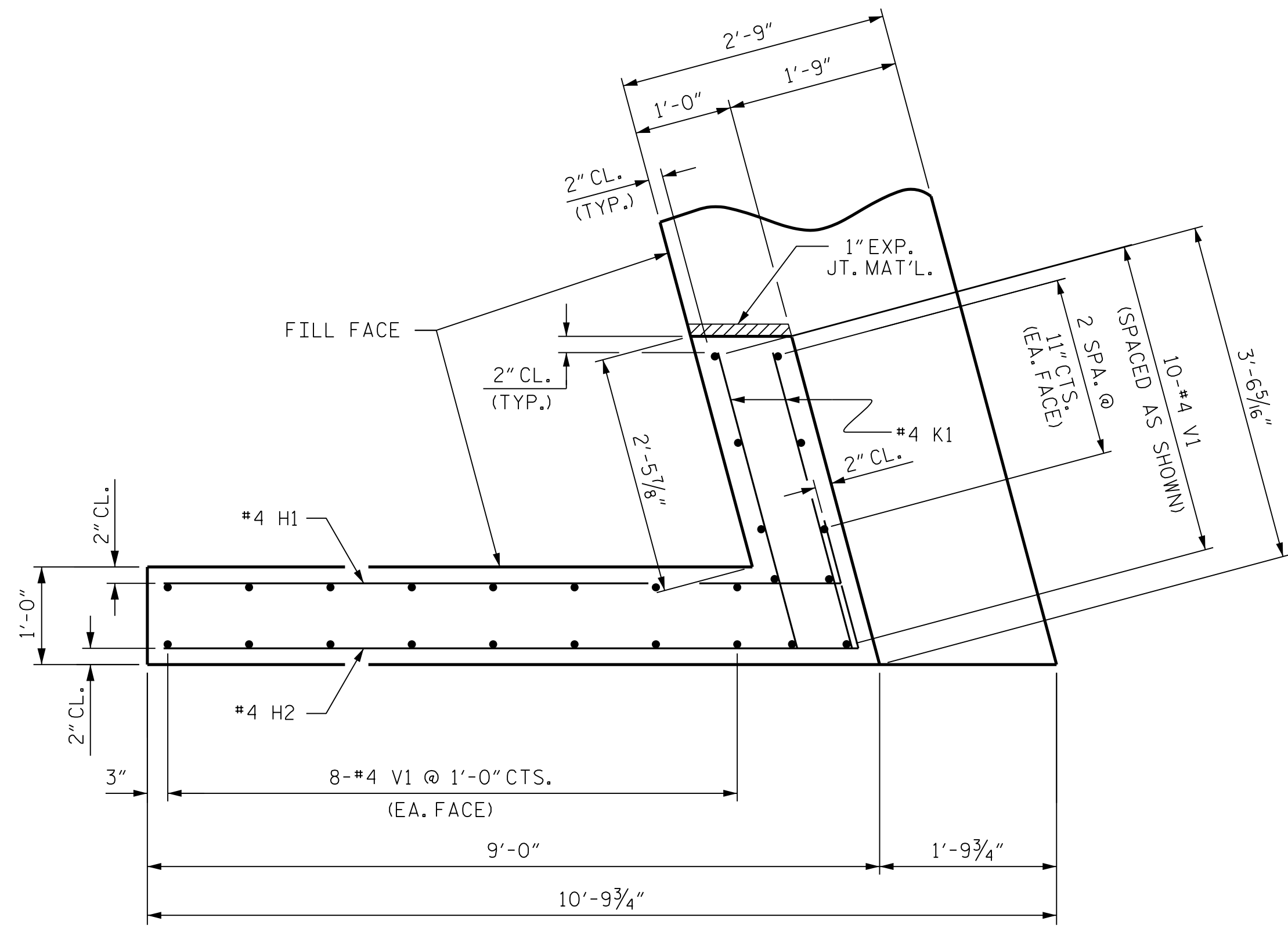
ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: B.E. ATKINSON	DATE: 02/20
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 06/21
DRAWN BY: WJH 12/11	REV. 4/15
CHECKED BY: AAC 12/11	MAA/TMG

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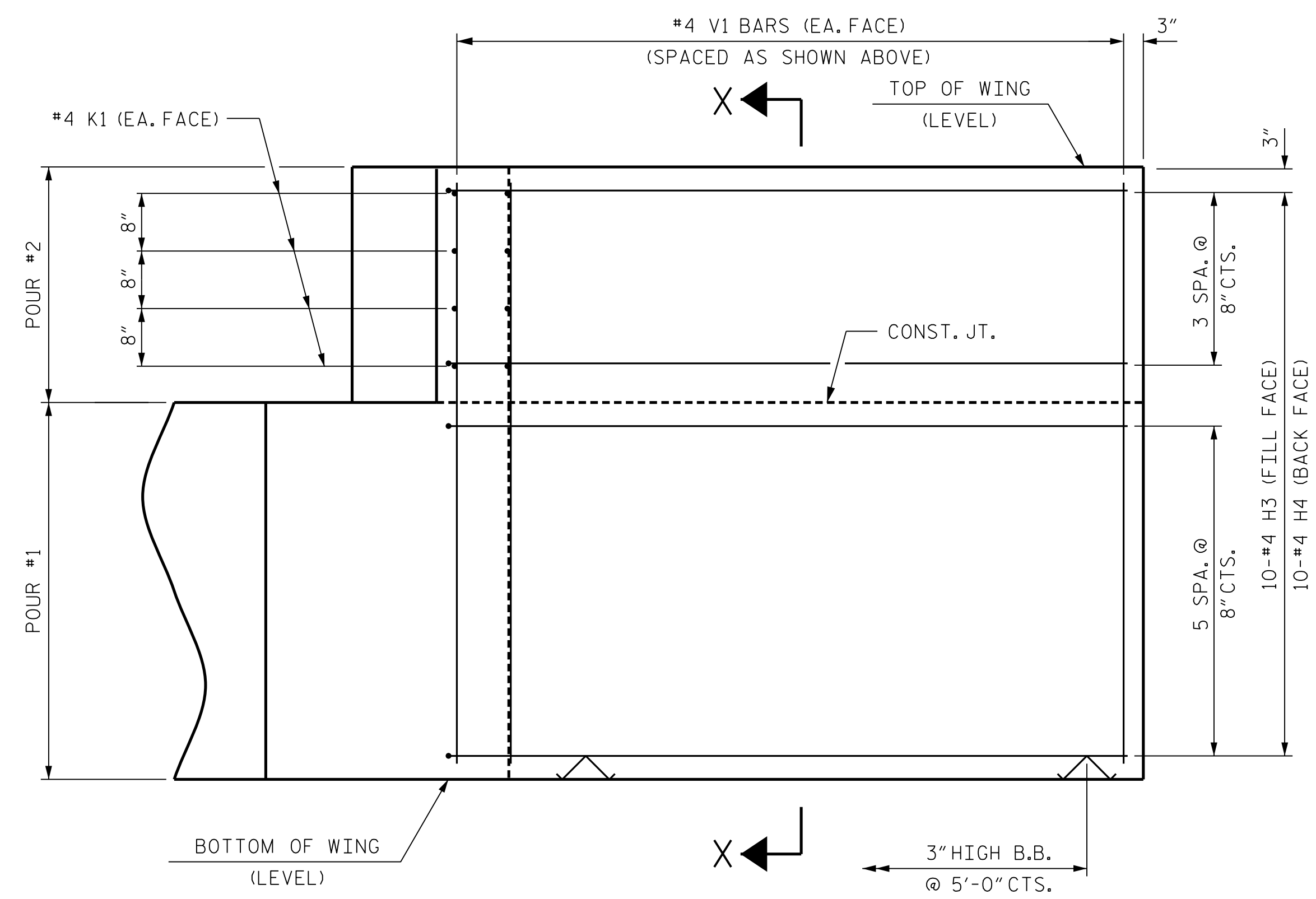
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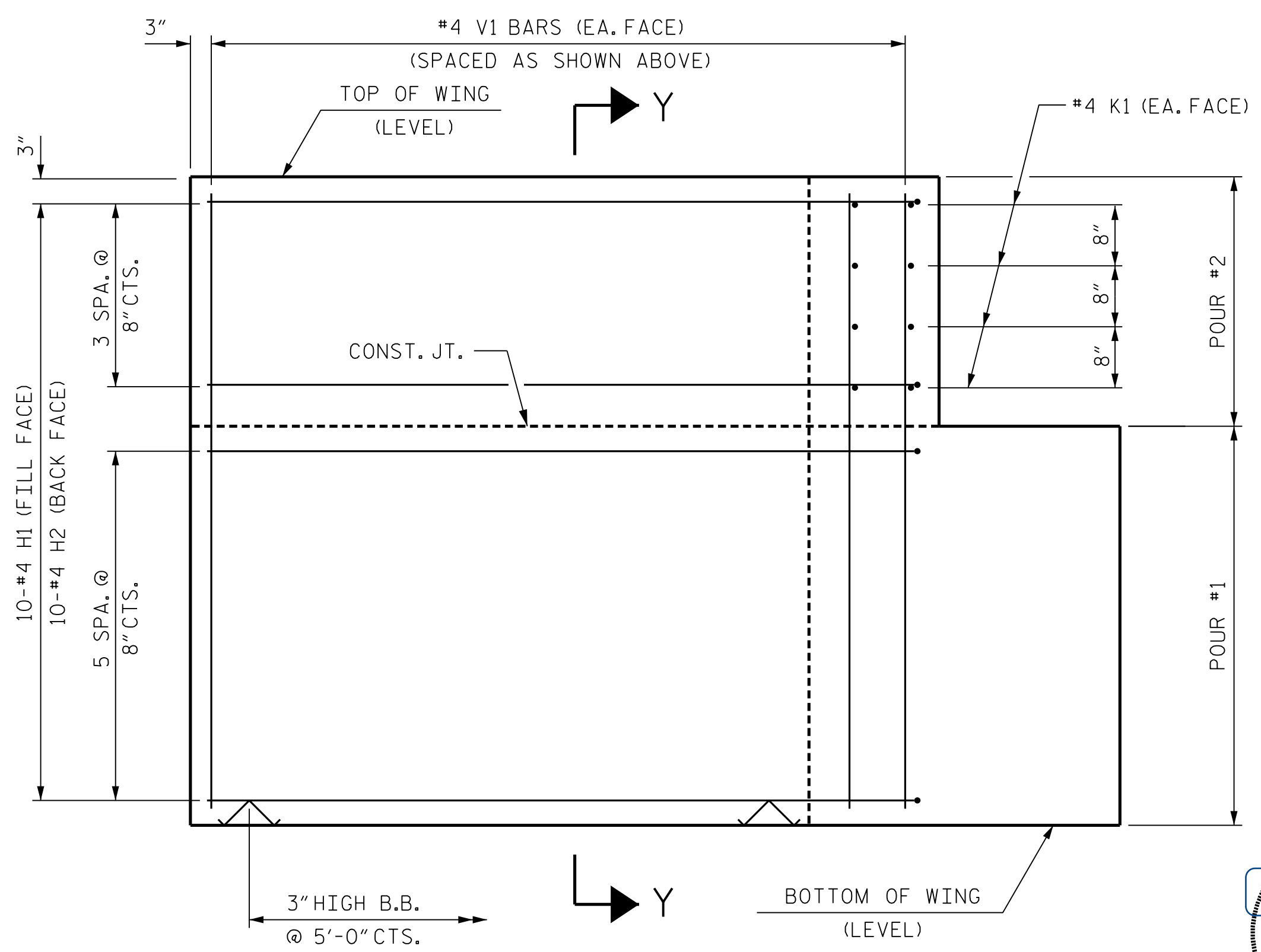
PLAN OF WING (W1)



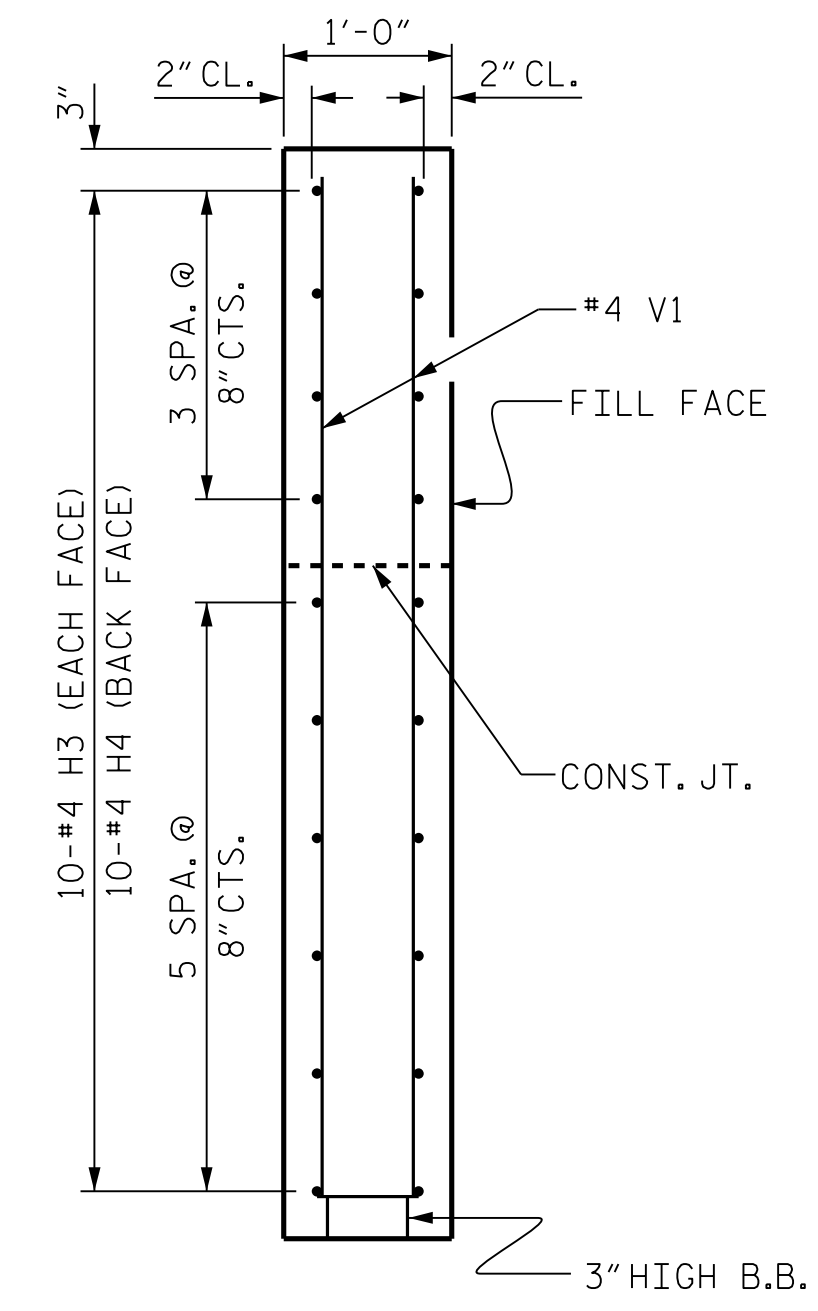
PLAN OF WING (W2)



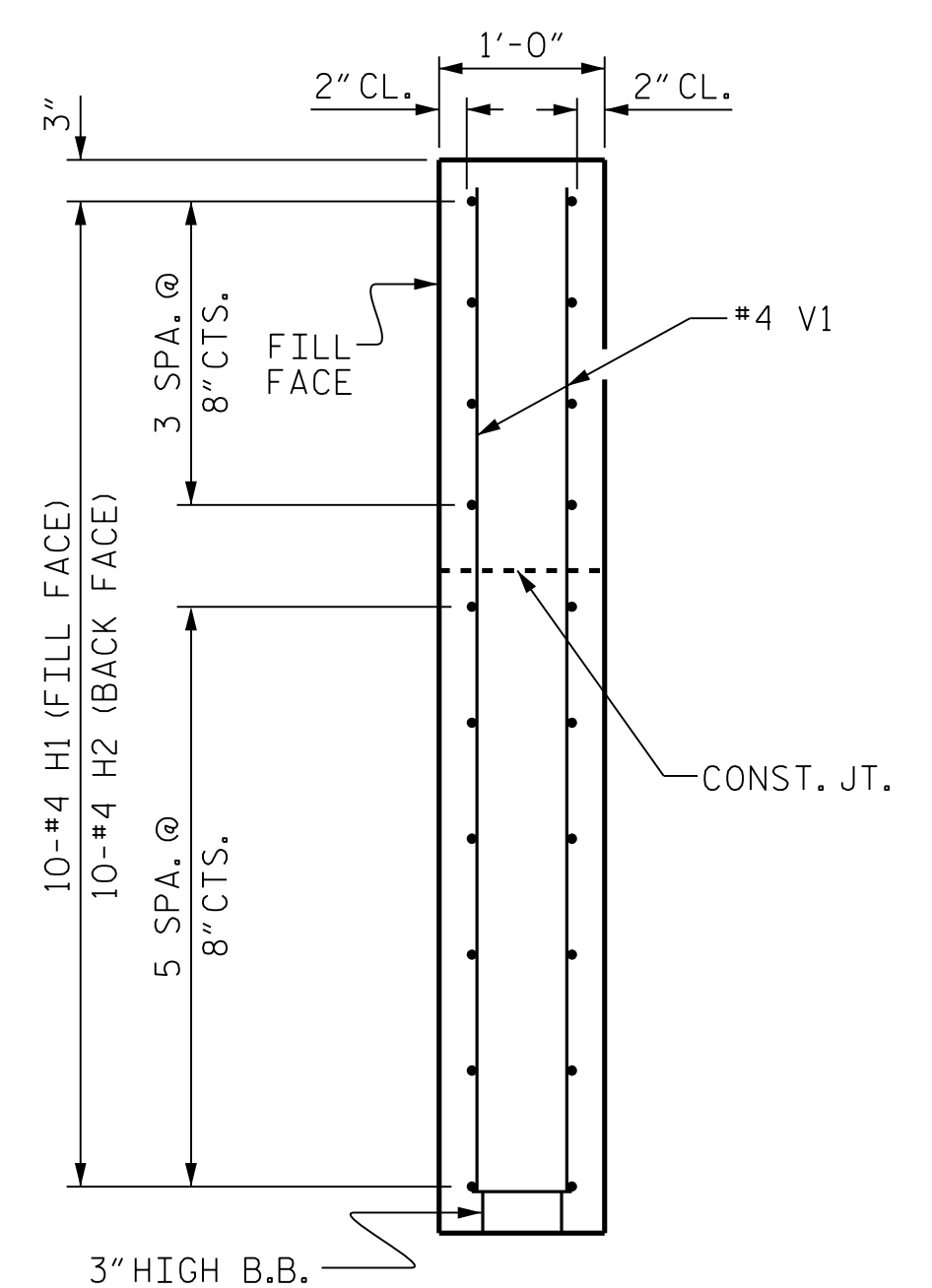
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



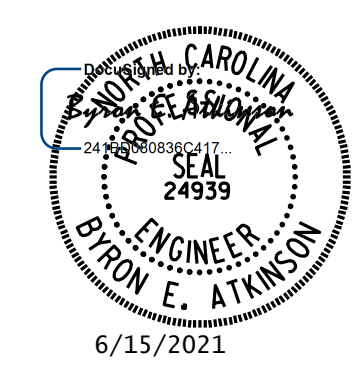
SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 3 OF 4



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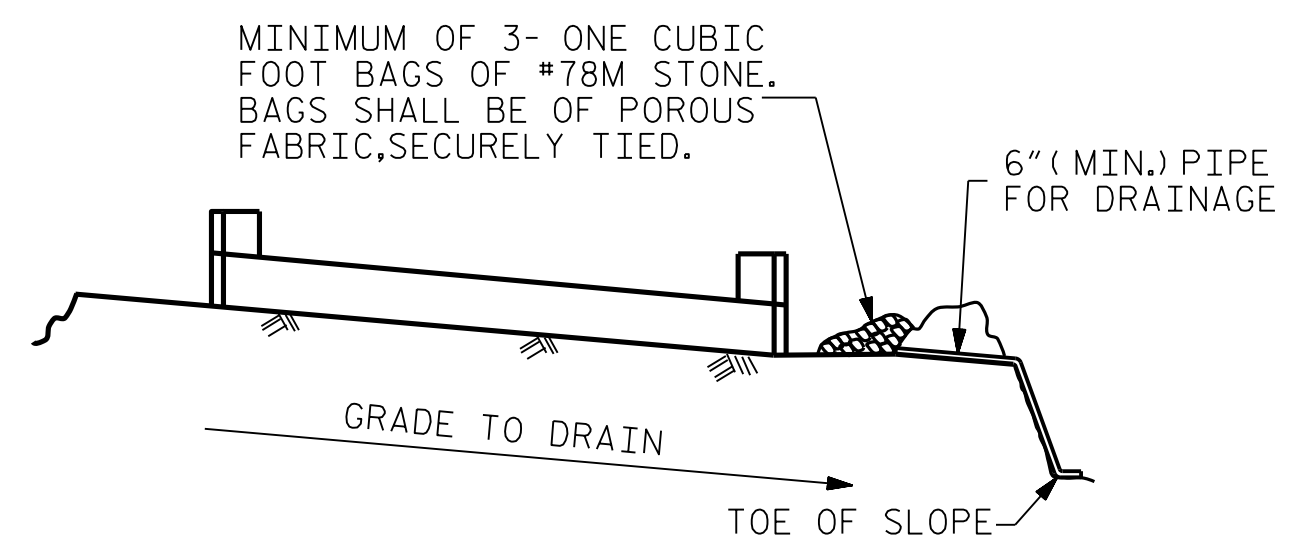
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-13
TOTAL SHEETS					20

WING DETAILS

ASSEMBLED BY : B.E. LANNING	DATE: 01/20
CHECKED BY : B.E. ATKINSON	DATE: 02/20
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 06/21
DRAWN BY : WJH 12/II	REV. 4/15
CHECKED BY : AAC 12/II	MAA/TMG



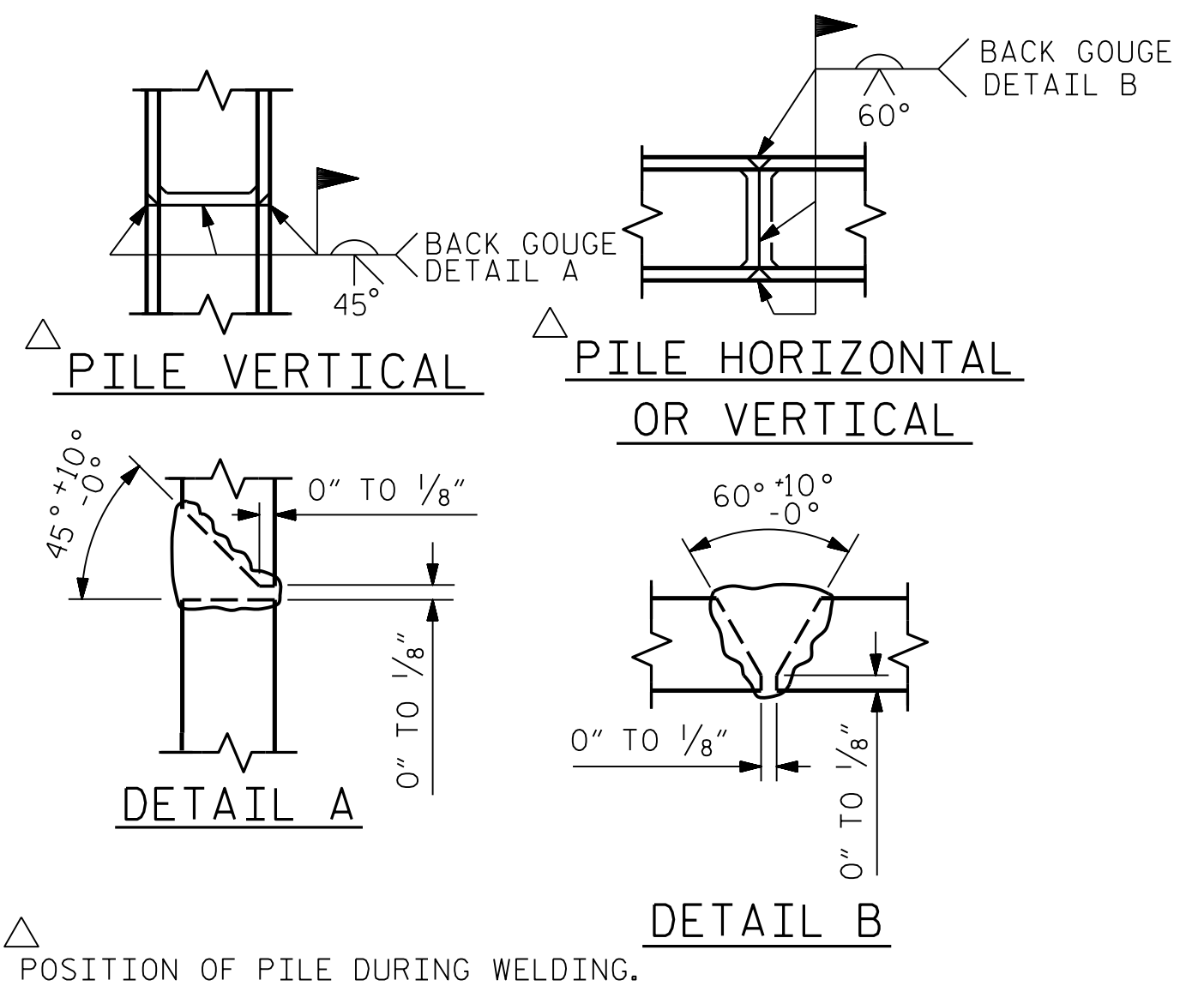


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

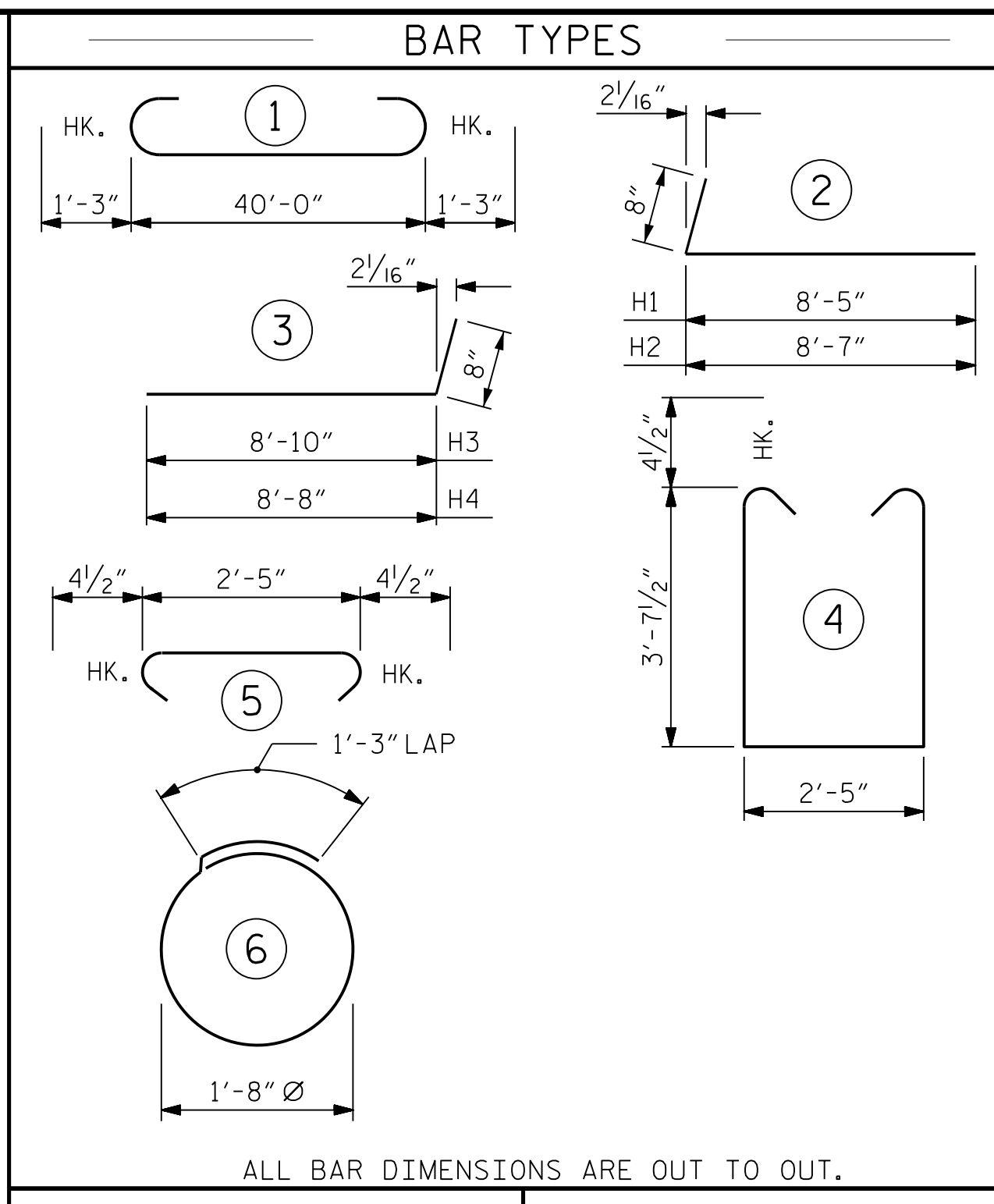
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT

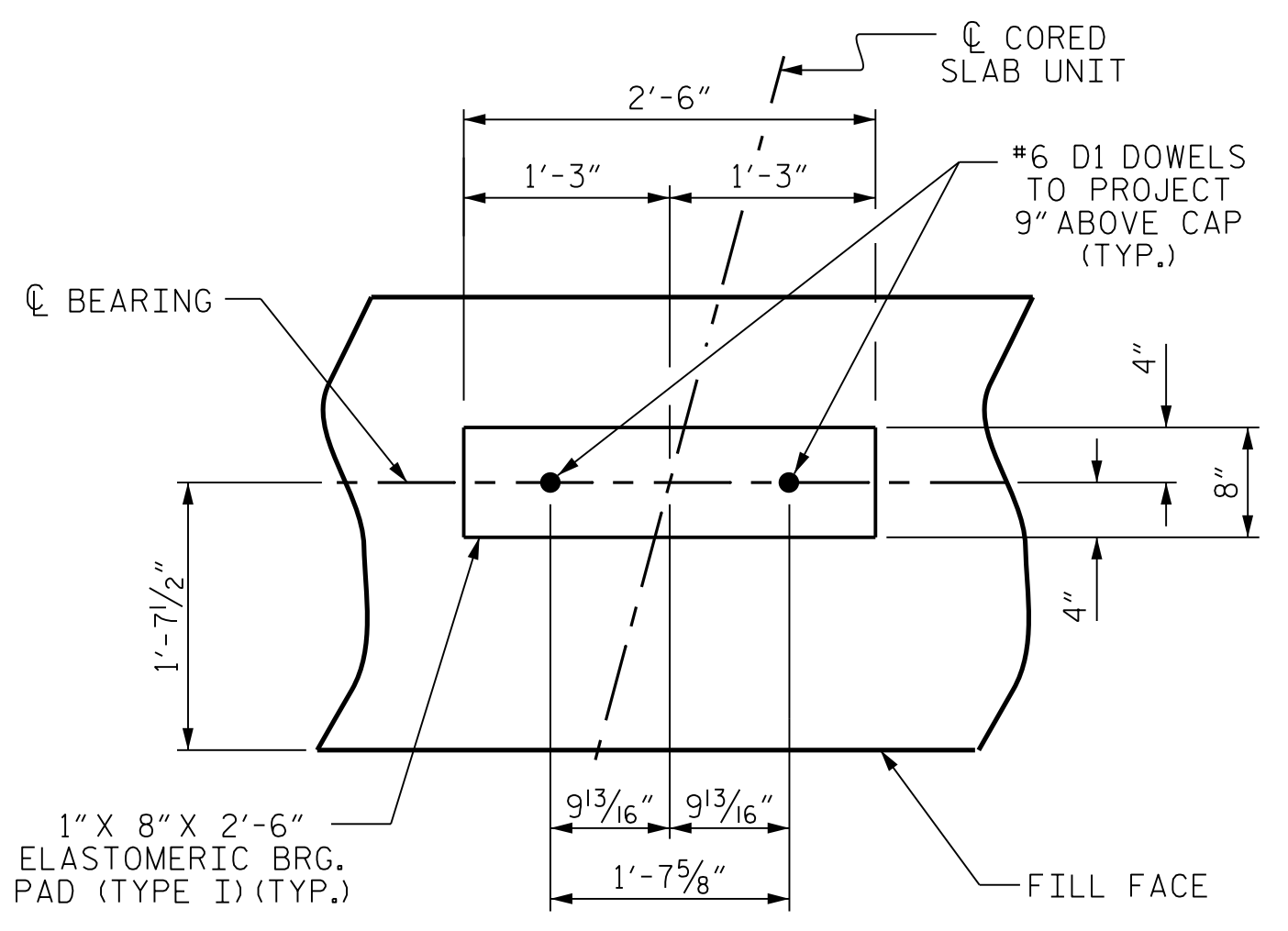


### PILE SPLICE DETAILS



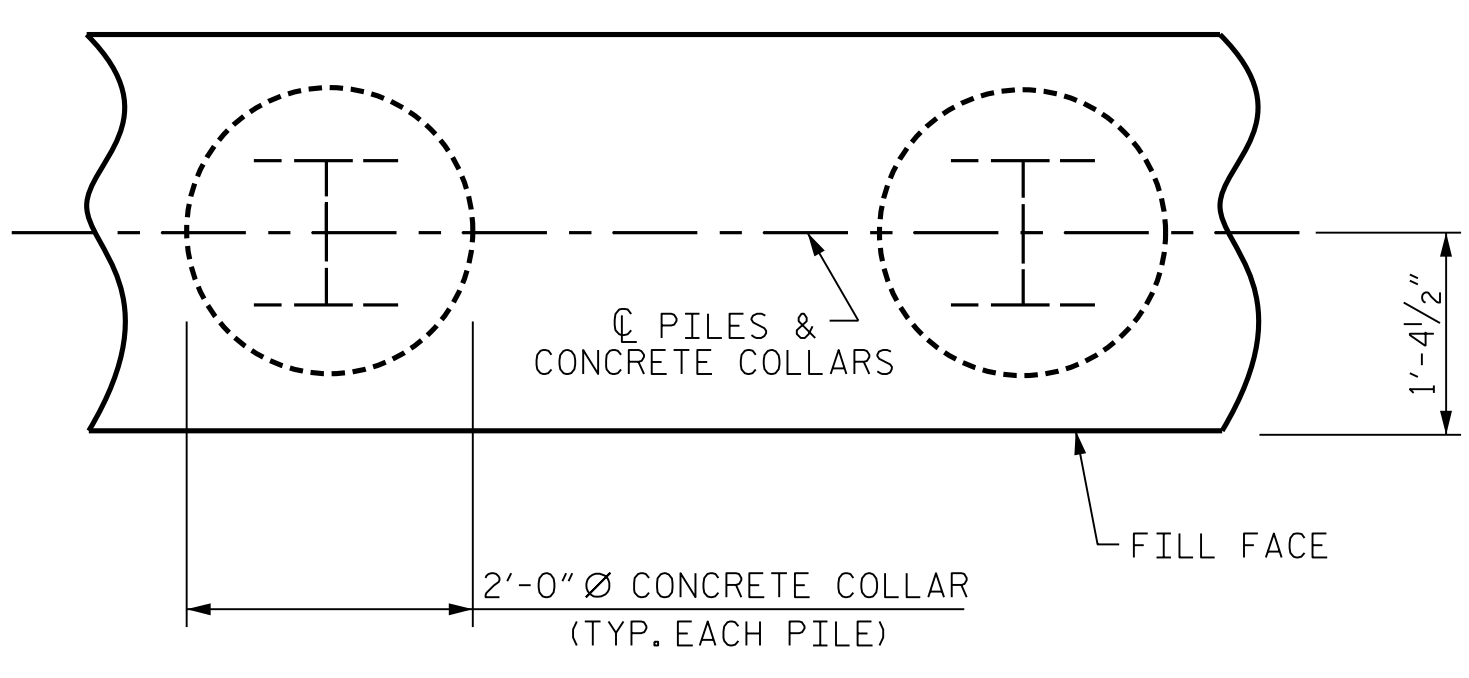
END BENT 1		END BENT 2	
HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 105	HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 105	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7
PILE EXCAVATION IN SOIL LIN. FT.= 44	PILE EXCAVATION IN SOIL LIN. FT.= 49	PILE EXCAVATION NOT IN SOIL LIN. FT.= 26	PILE EXCAVATION NOT IN SOIL LIN. FT.= 21

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	42'-6"	1156
B2	28	#4	STR	21'-4"	399
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	10	#4	2	9'-1"	61
H2	10	#4	2	9'-3"	62
H3	10	#4	3	9'-6"	63
H4	10	#4	3	9'-4"	62
K1	16	#4	STR	3'-1"	33
S1	52	#4	4	10'-5"	362
S2	52	#4	5	3'-2"	110
S3	28	#4	6	6'-6"	122
V1	53	#4	STR	6'-2"	218
REINFORCING STEEL (FOR ONE END BENT)					2714 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				20.1 C.Y.	
POUR #2 UPPER PART OF WINGS				2.3 C.Y.	
TOTAL CLASS A CONCRETE				22.4 C.Y.	

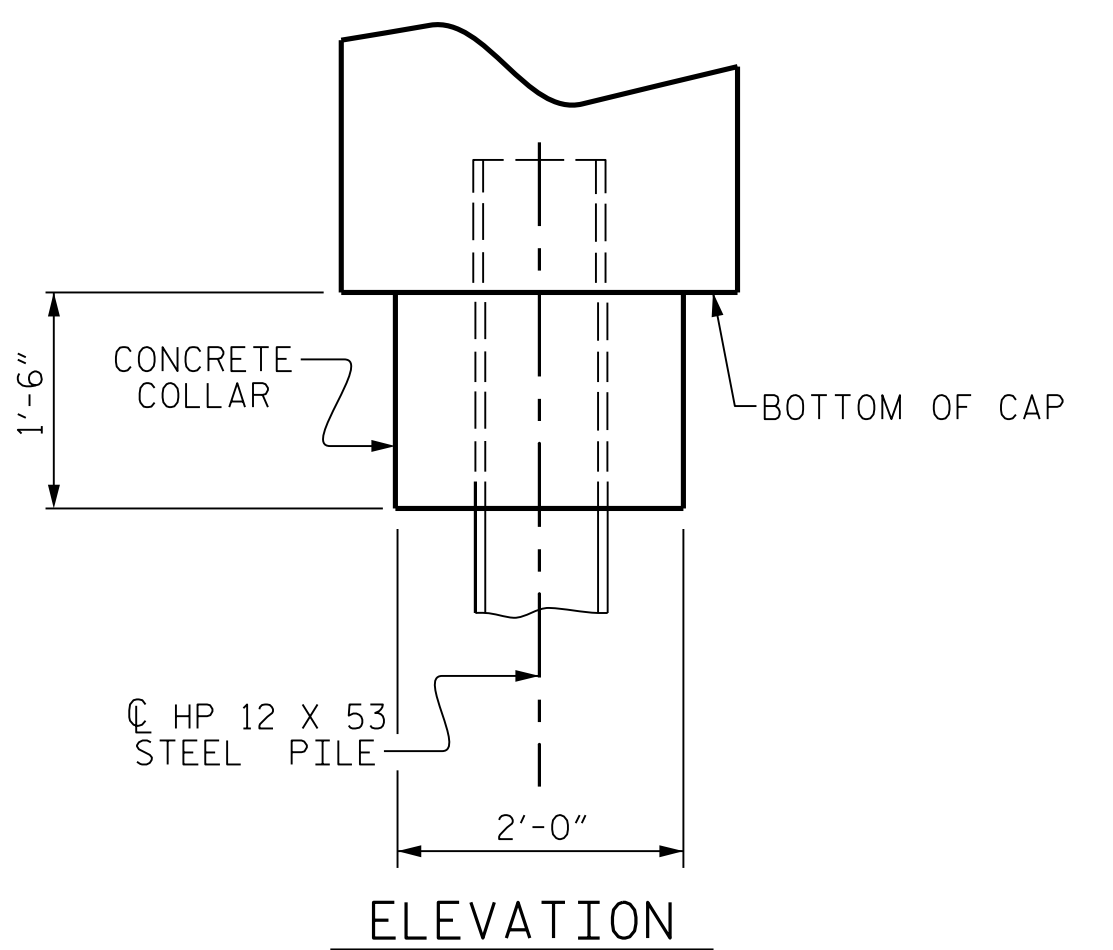


### DETAIL "A"

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



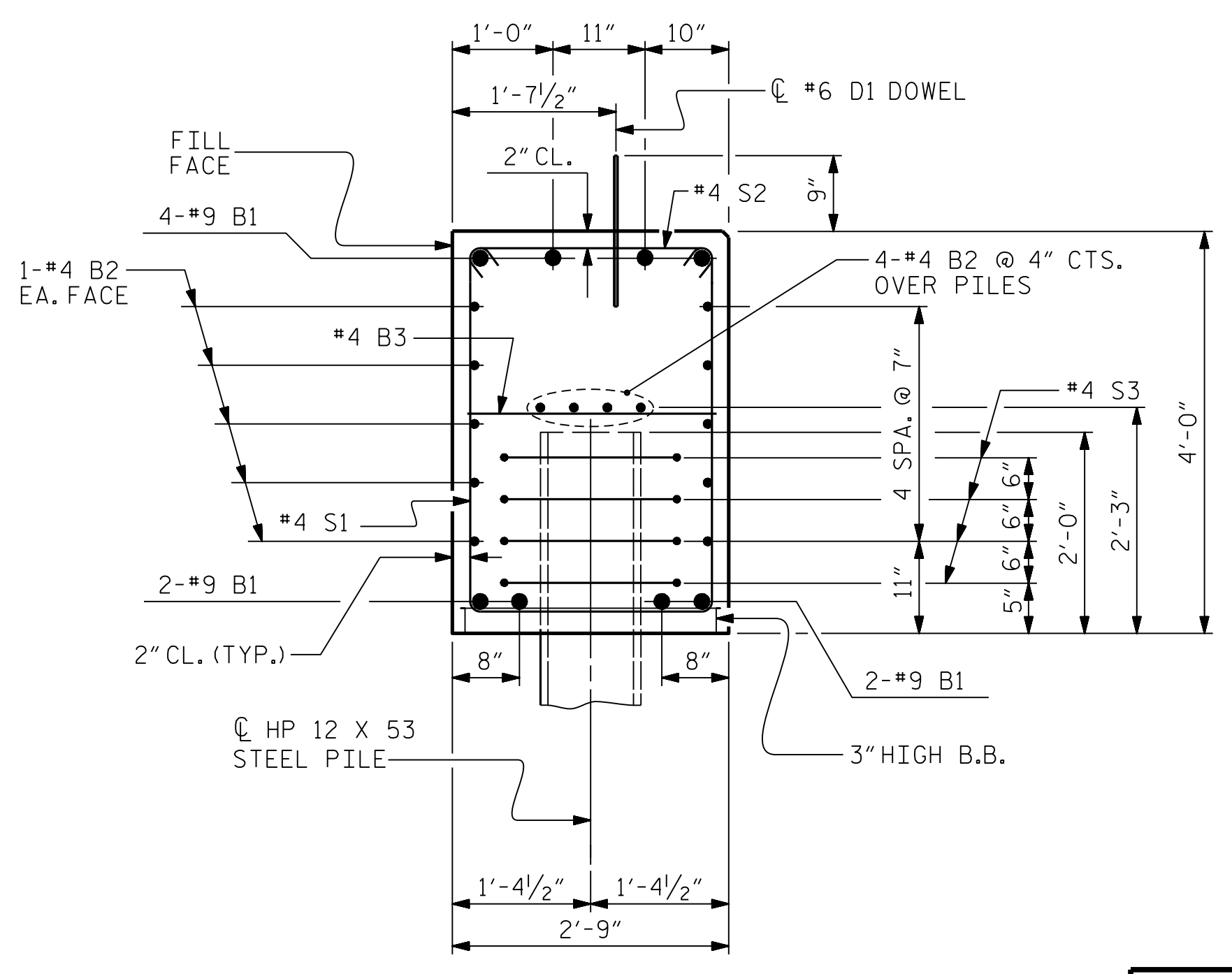
### PLAN



### ELEVATION

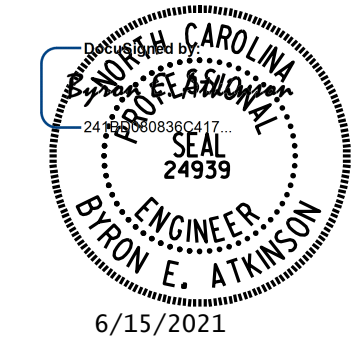
### CORROSION PROTECTION FOR STEEL PILES DETAIL

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



### SECTION A-A

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
STATION: 16+55.00 -L-  
SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 & 2 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					20

6/15/2021 11:37:30 AM User: blanning File: N:\NC Bridges\MI8023.CH Eng.Montgomery 190 Br. Rep\17BP8R135\Structures\401.027.17BP8R135.SMU.EB4-610190.dgn

ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: B.E. ATKINSON	DATE: 02/20
DESIGN ENGINEER OF RECORD: B.E. ATKINSON	DATE: 06/21
DRAWN BY: WJH 12/11	REV. 4/17
CHECKED BY: AAC 12/11	MAA/THC

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.

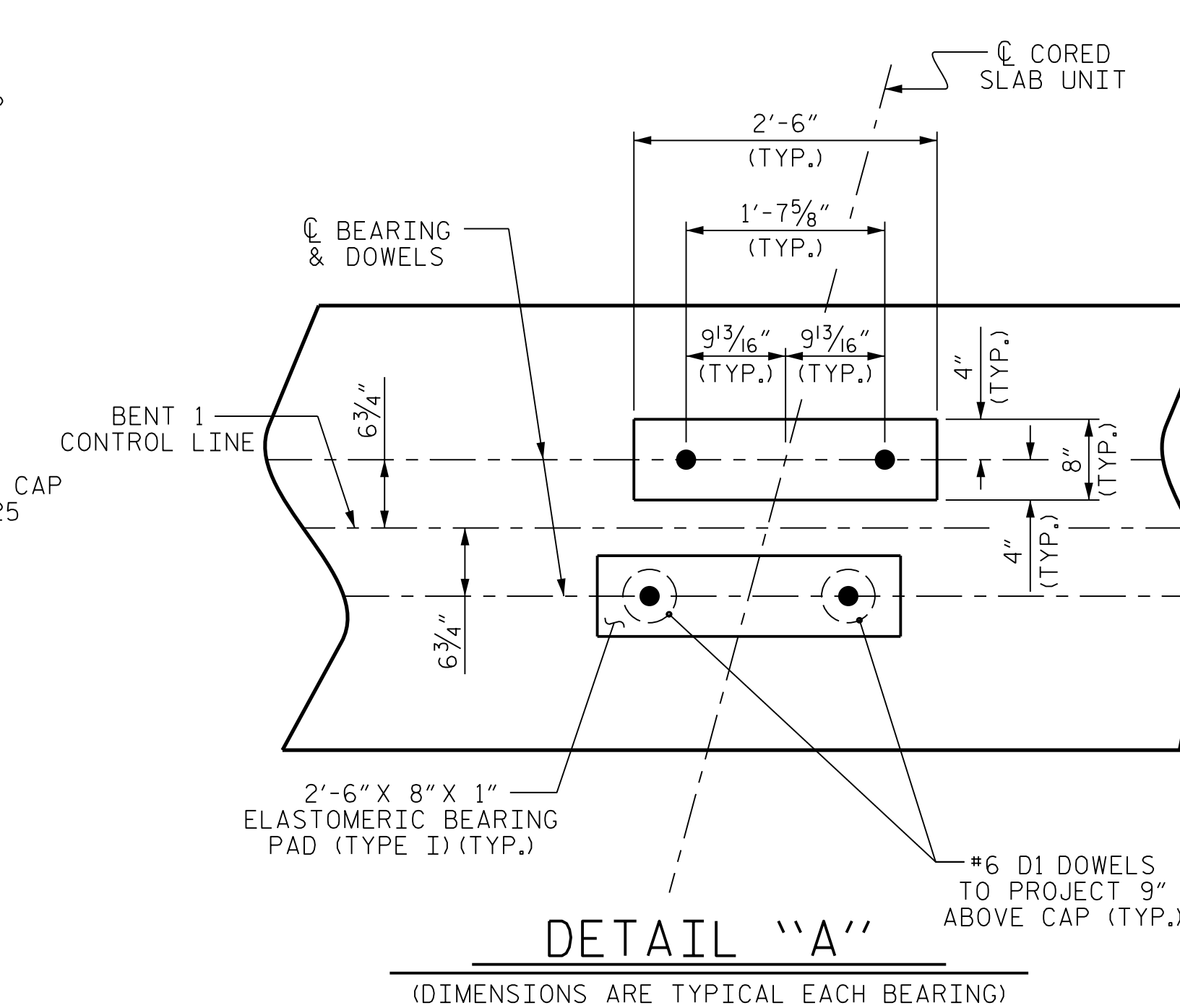
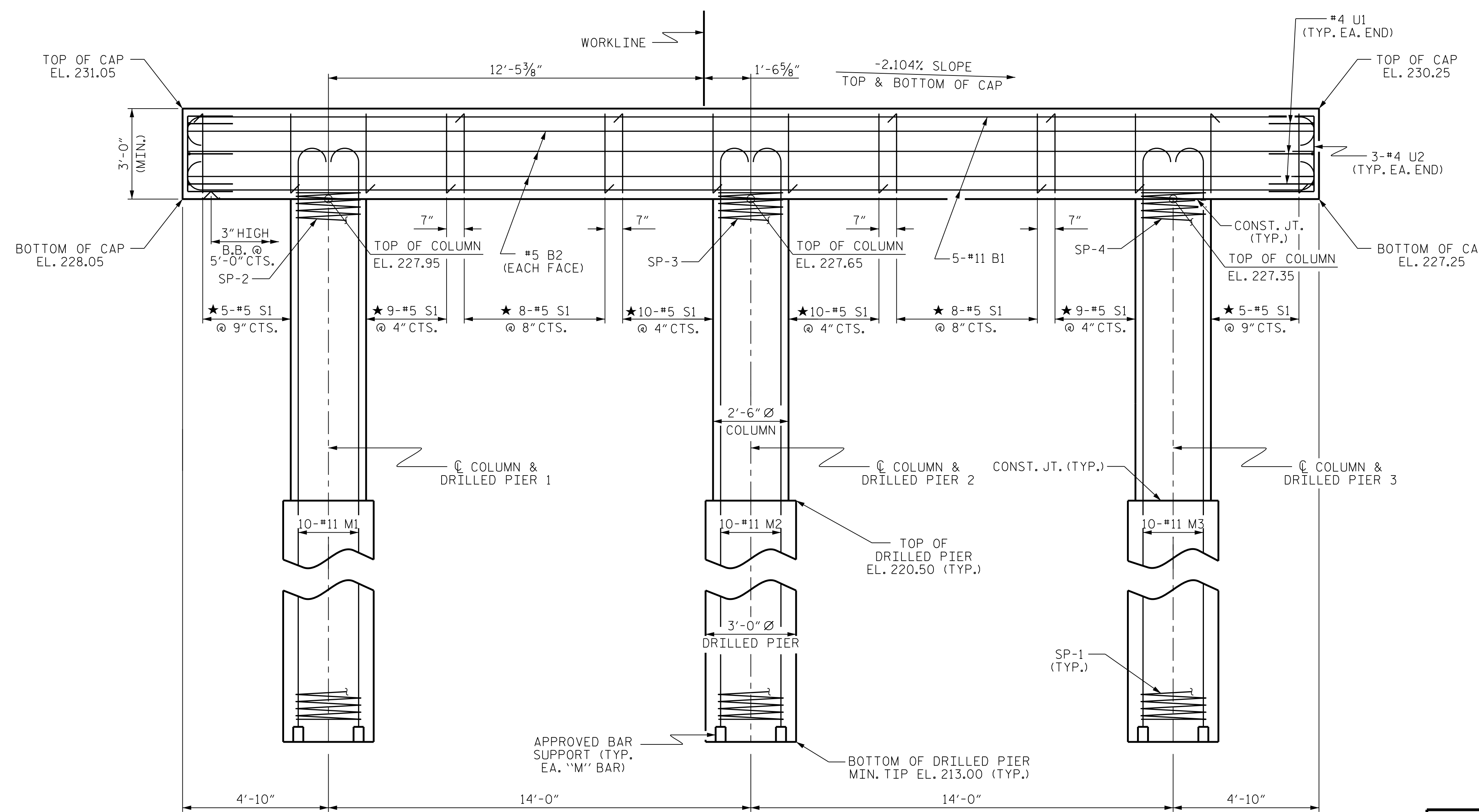
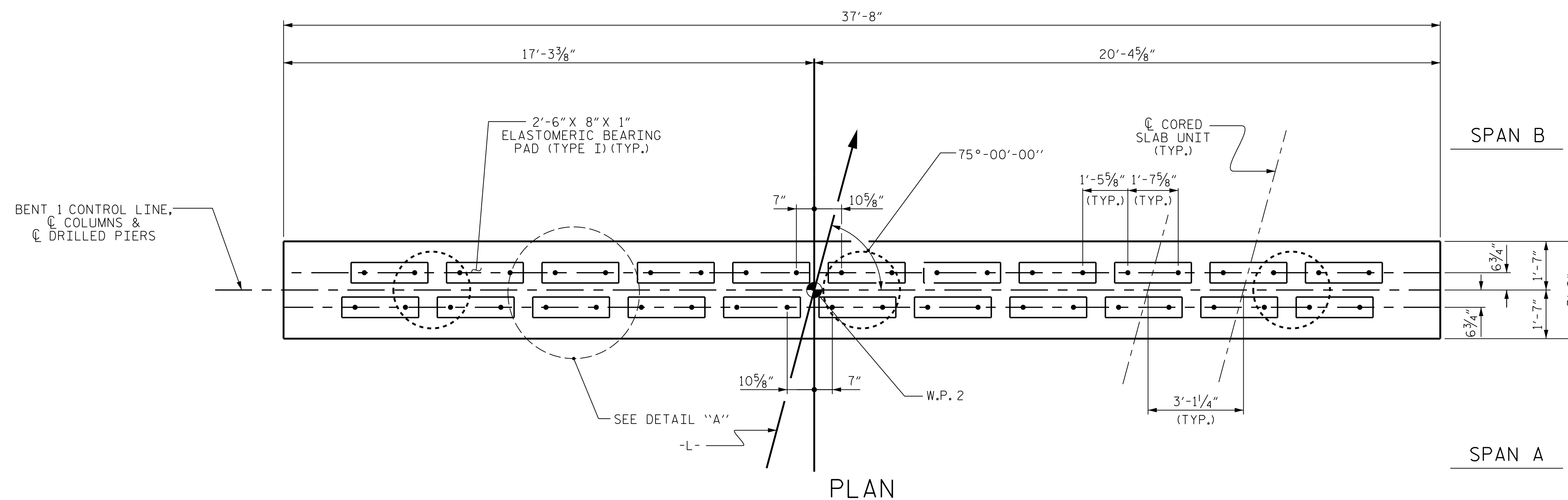
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

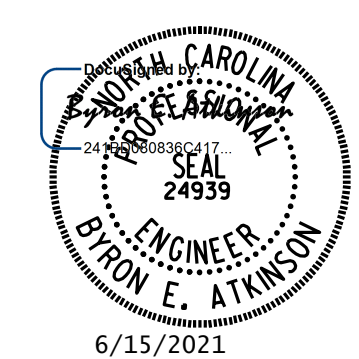
DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

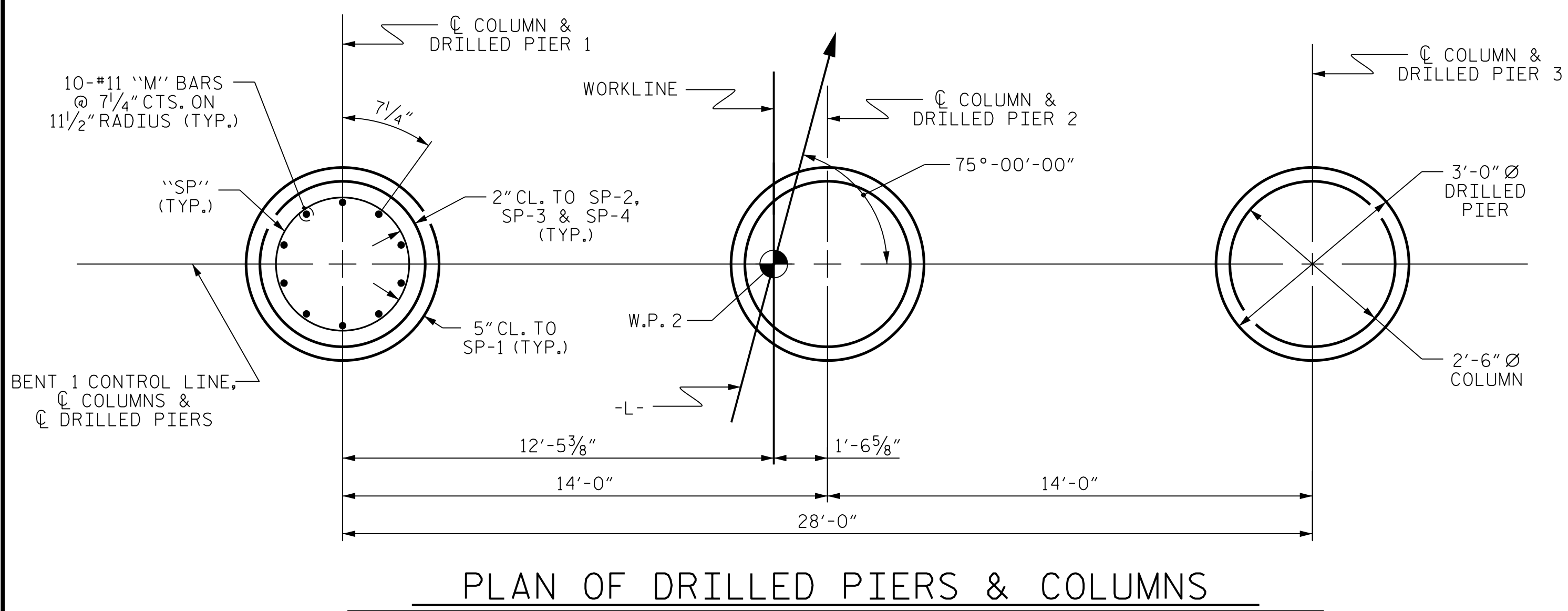
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			20

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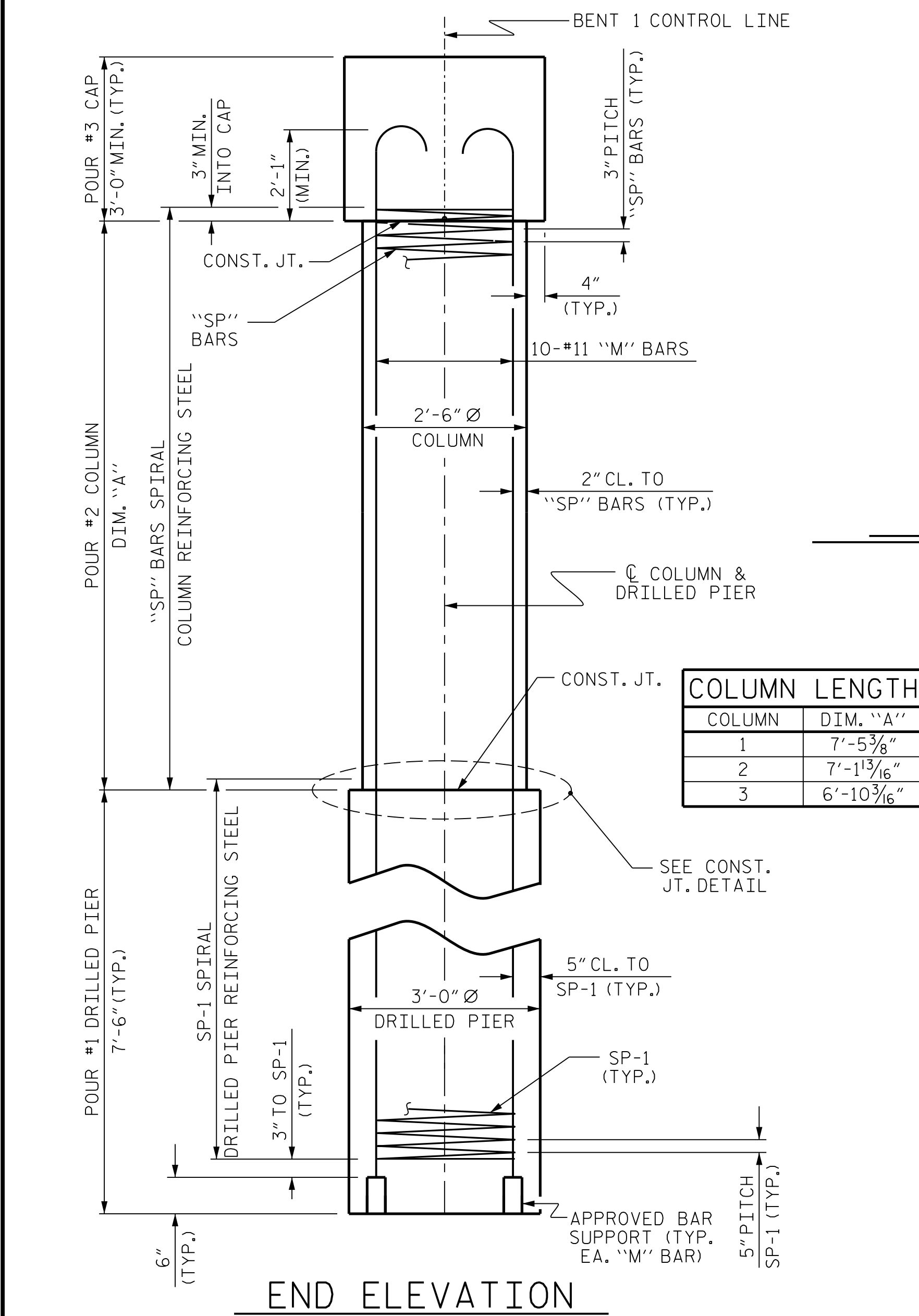
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 CHECKED BY : B.E. ATKINSON DATE : 02/20  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 06/21

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

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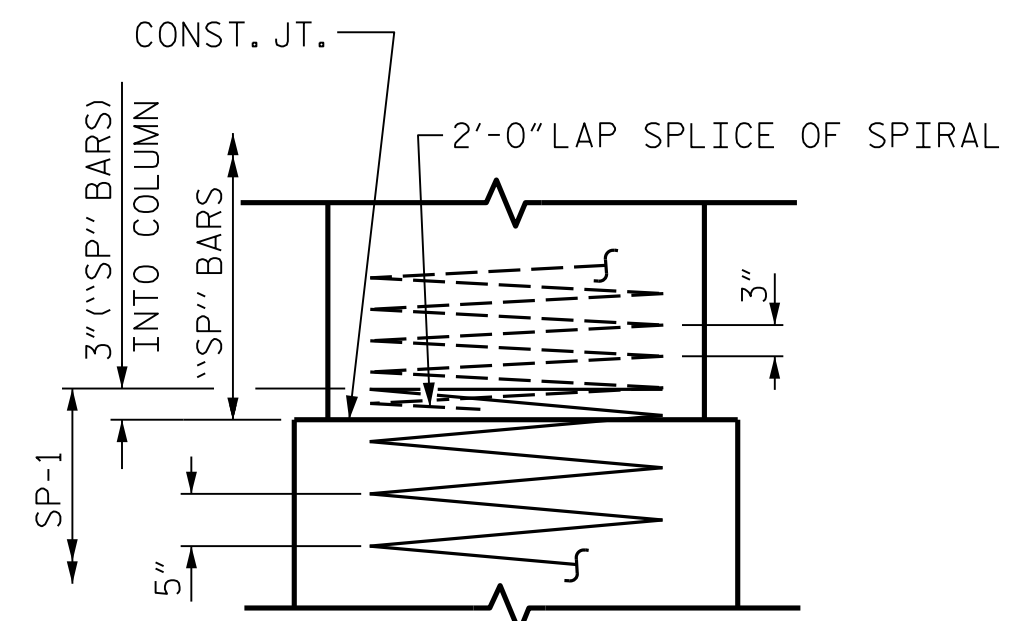


PLAN OF DRILLED PIERS & COLUMNS

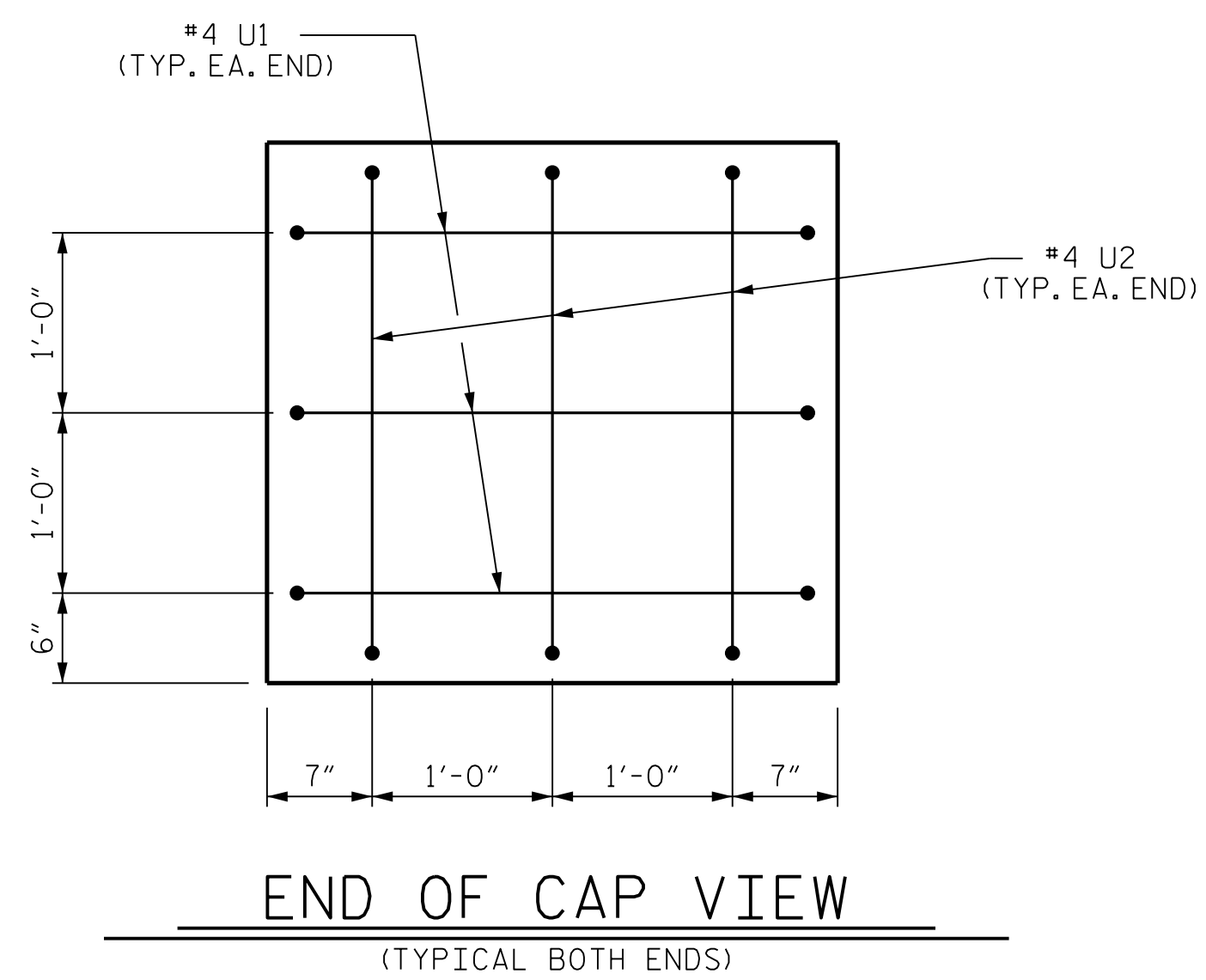


END ELEVATION

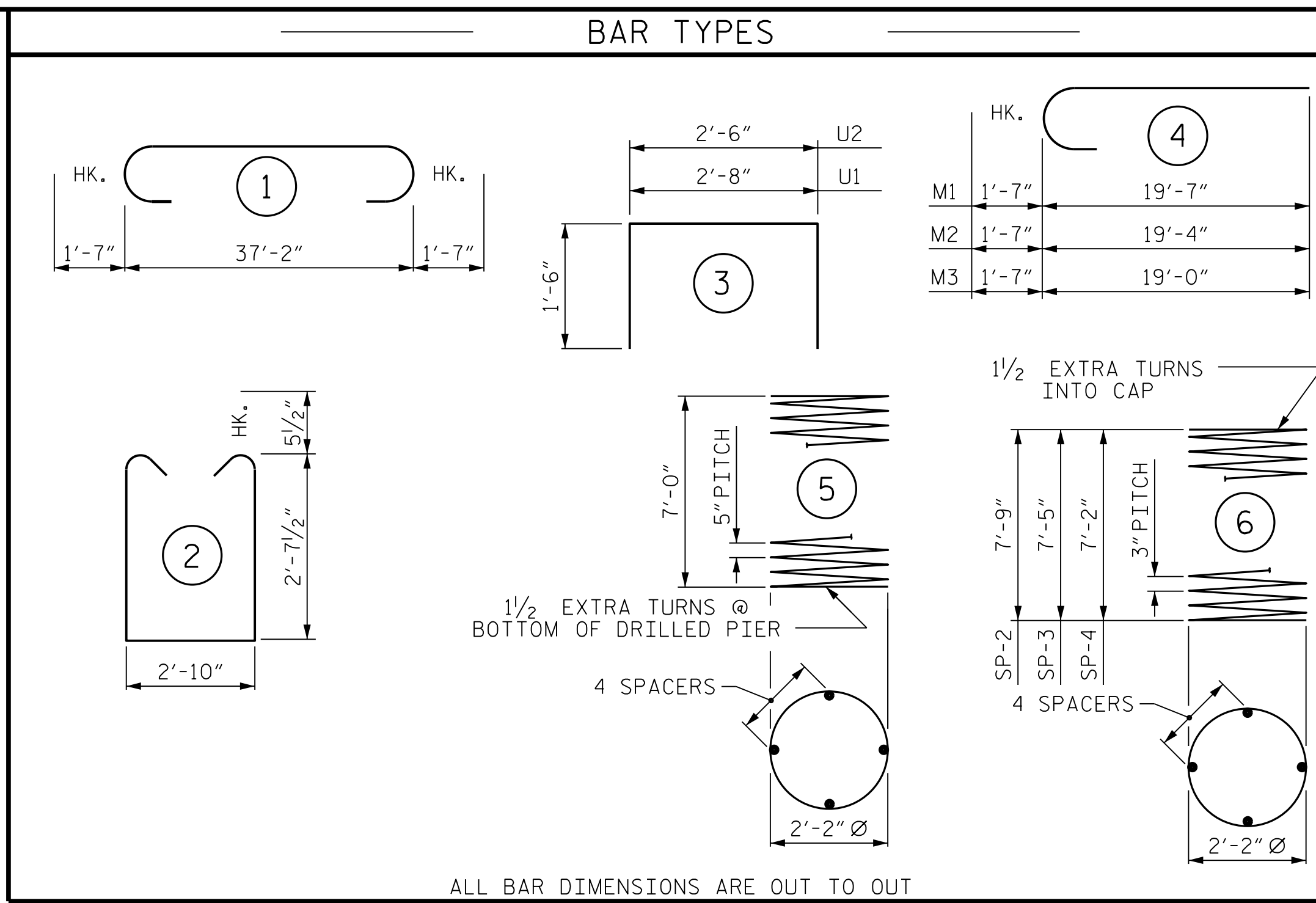
COLUMN	DIM. "A"
1	7'-5 3/8"
2	7'-1 13/16"
3	6'-10 3/16"



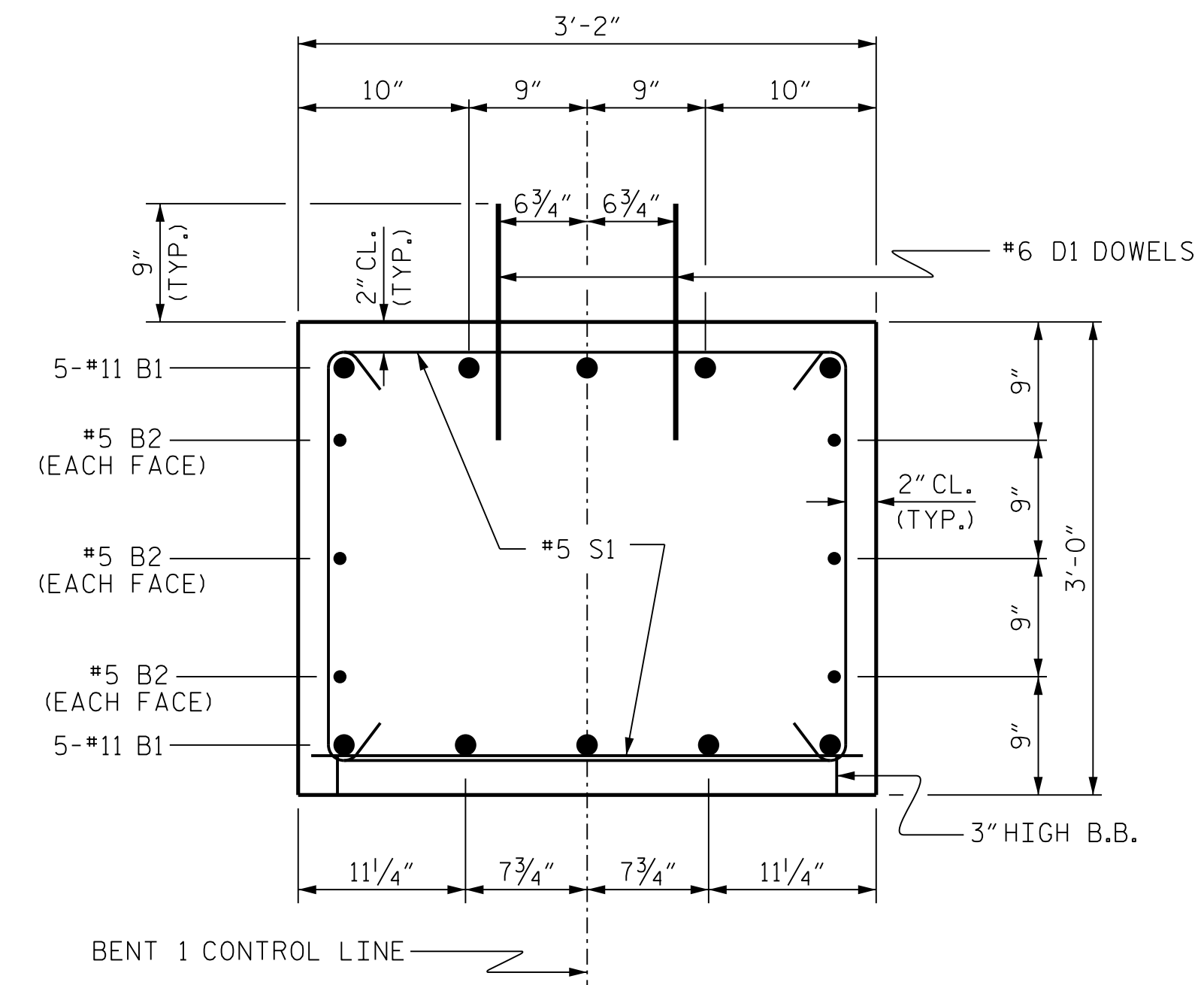
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW  
(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	40'-4"	2143
B2	6	#5	STR	37'-4"	234
D1	44	#6	STR	1'-6"	99
M1	10	#11	4	21'-2"	1125
M2	10	#11	4	20'-11"	1111
M3	10	#11	4	20'-7"	1094
S1	64	#5	2	9'-0"	601
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22

REINFORCING STEEL (FOR ONE BENT) 6452 LBS.

SP-1	3	*	5	121'-6"	380
SP-2	1	**	6	216'-7"	145
SP-3	1	**	6	207'-11"	139
SP-4	1	**	6	201'-3"	134

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 798 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 (FOR ONE BENT)

POUR #2 (COLUMNS)	3.9 C.Y.
POUR #3 (CAP)	13.3 C.Y.
<b>TOTAL CLASS A CONCRETE</b>	<b>17.2 C.Y.</b>

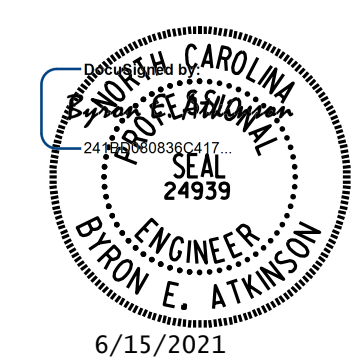
DRILLED PIERS: (FOR ONE BENT)	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	5.9 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	15.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	7.5 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	6.6 LIN. FT.
CSL TUBES	108.0 LIN. FT.

PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1



DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

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

DRAWN BY : B.E. LANNING	DATE : 01/20
CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

**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.

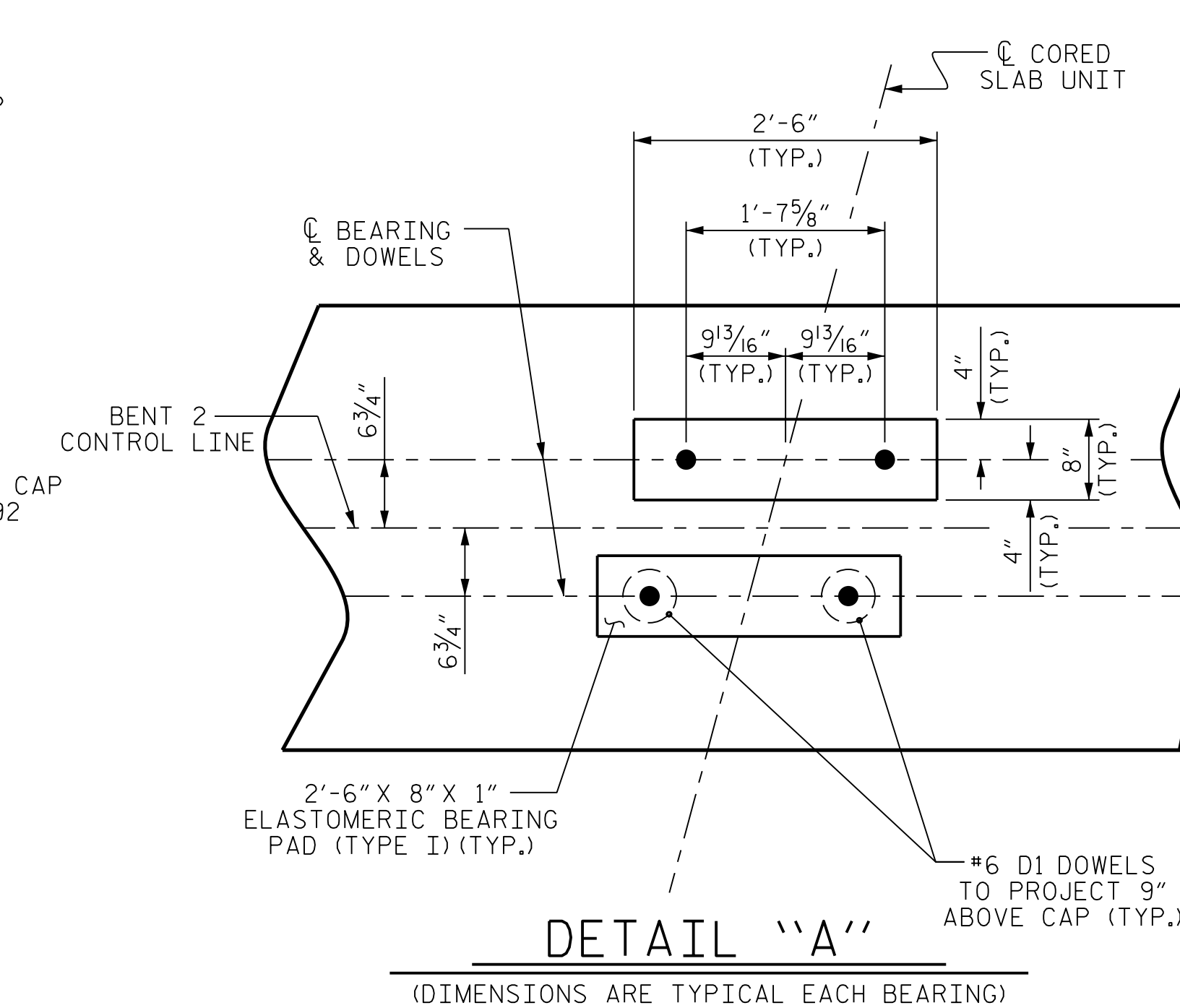
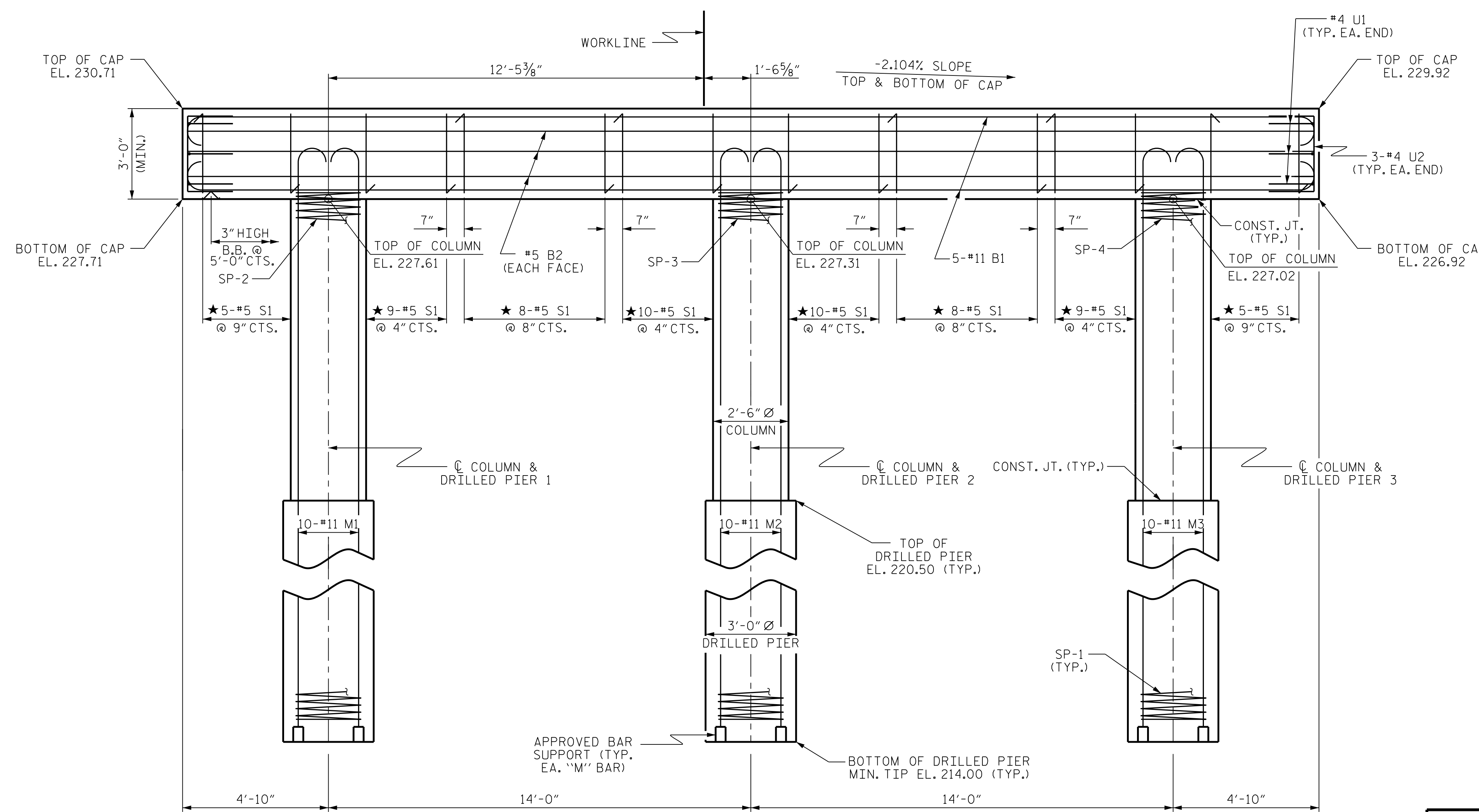
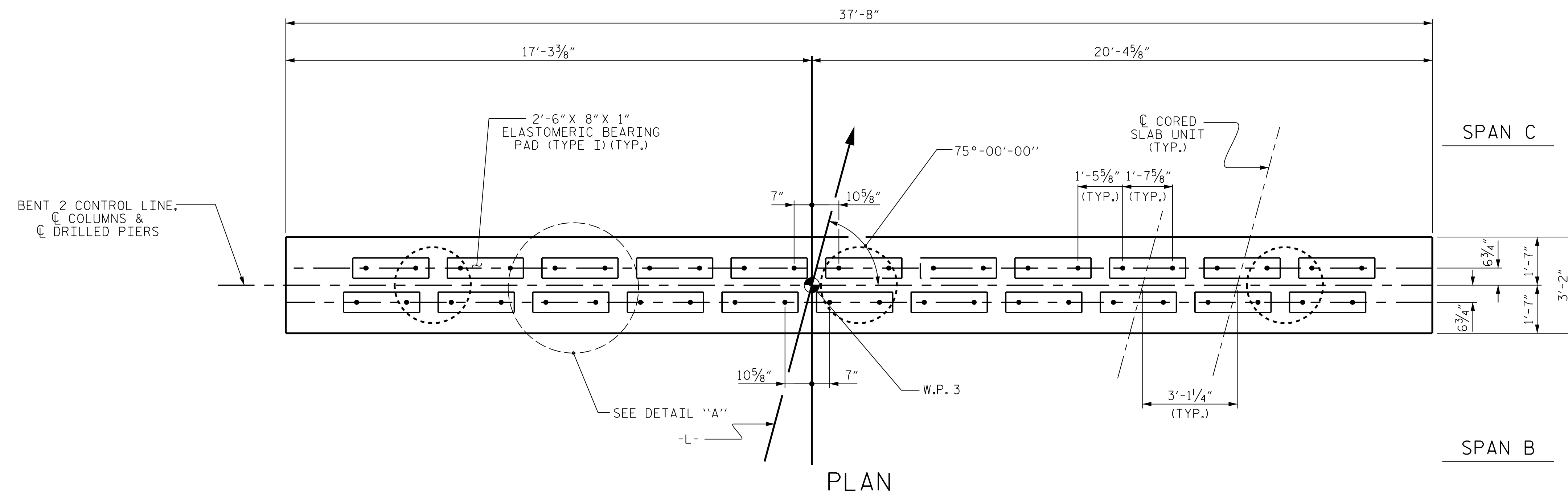
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

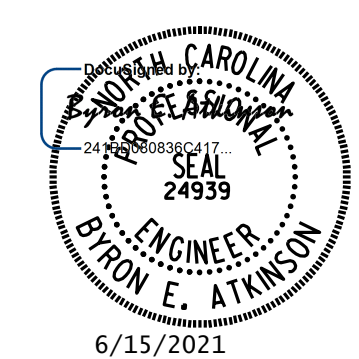
DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

SHEET 1 OF 2



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

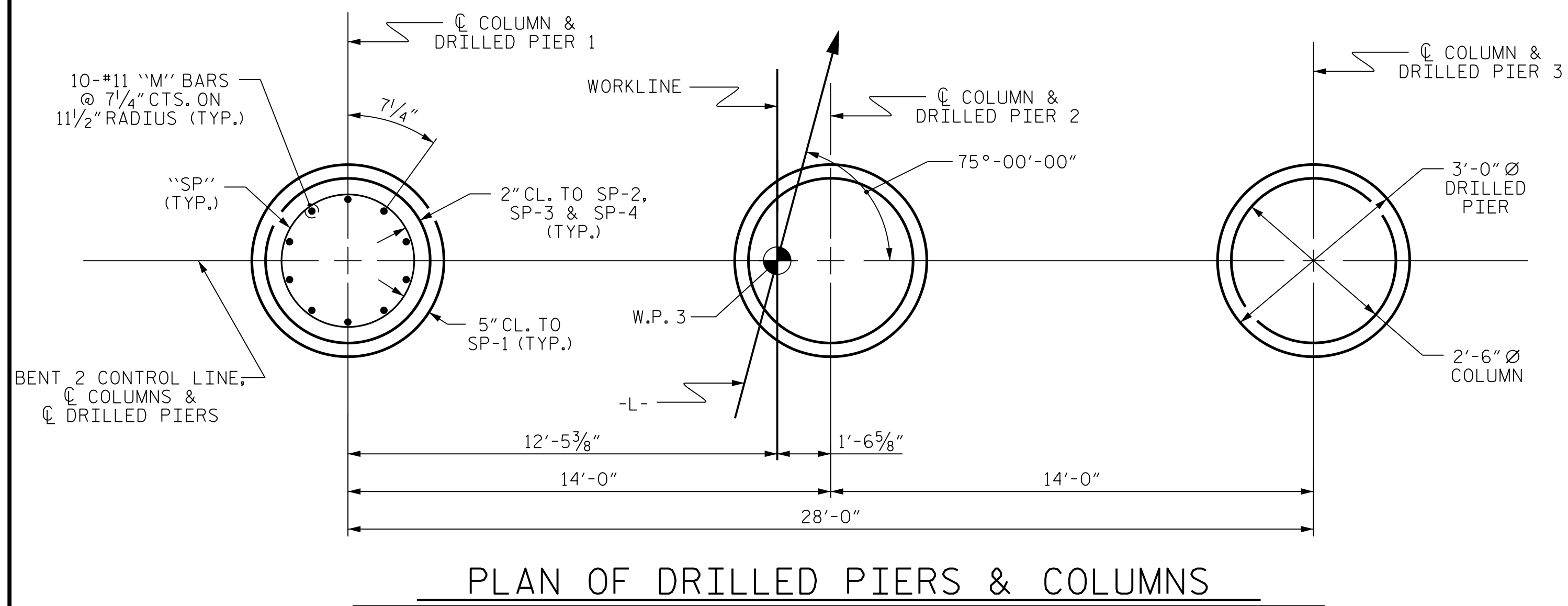
STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION		RALEIGH	
SUBSTRUCTURE BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-17					TOTAL SHEETS 20

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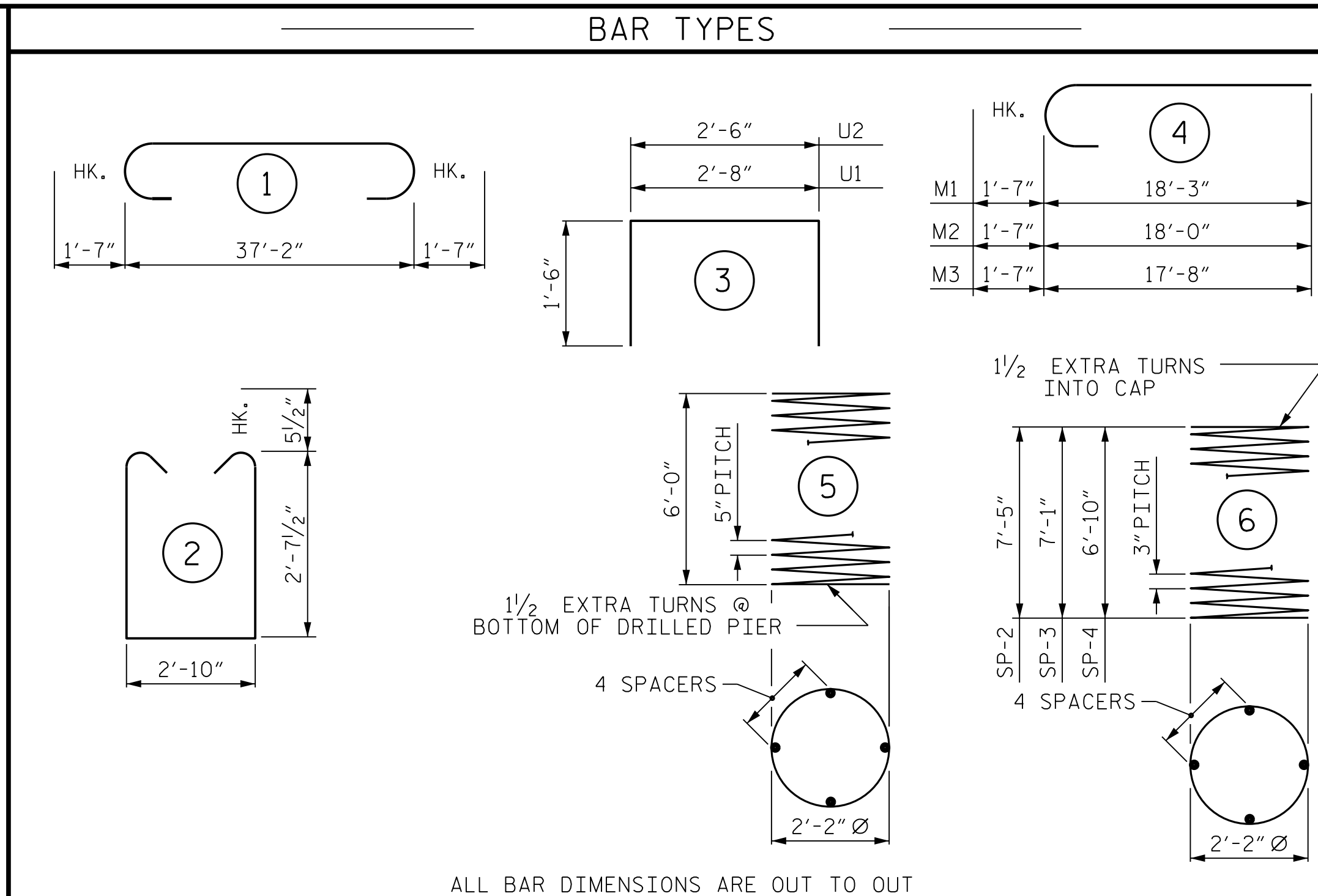
DRAWN BY : B.E. LANNING DATE : 01/20  
 CHECKED BY : B.E. ATKINSON DATE : 02/20  
 DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 06/21

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

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PLAN OF DRILLED PIERS & COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	40'-4"	2143
B2	6	#5	STR	37'-4"	234
D1	44	#6	STR	1'-6"	99
M1	10	#11	4	19'-10"	1054
M2	10	#11	4	19'-7"	1040
M3	10	#11	4	19'-3"	1023
S1	64	#5	2	9'-0"	601
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22

REINFORCING STEEL (FOR ONE BENT) 6239 LBS.

SP-1	3	*	5	105'-7"	330
SP-2	1	**	6	207'-11"	139
SP-3	1	**	6	198'-7"	133
SP-4	1	**	6	191'-11"	128

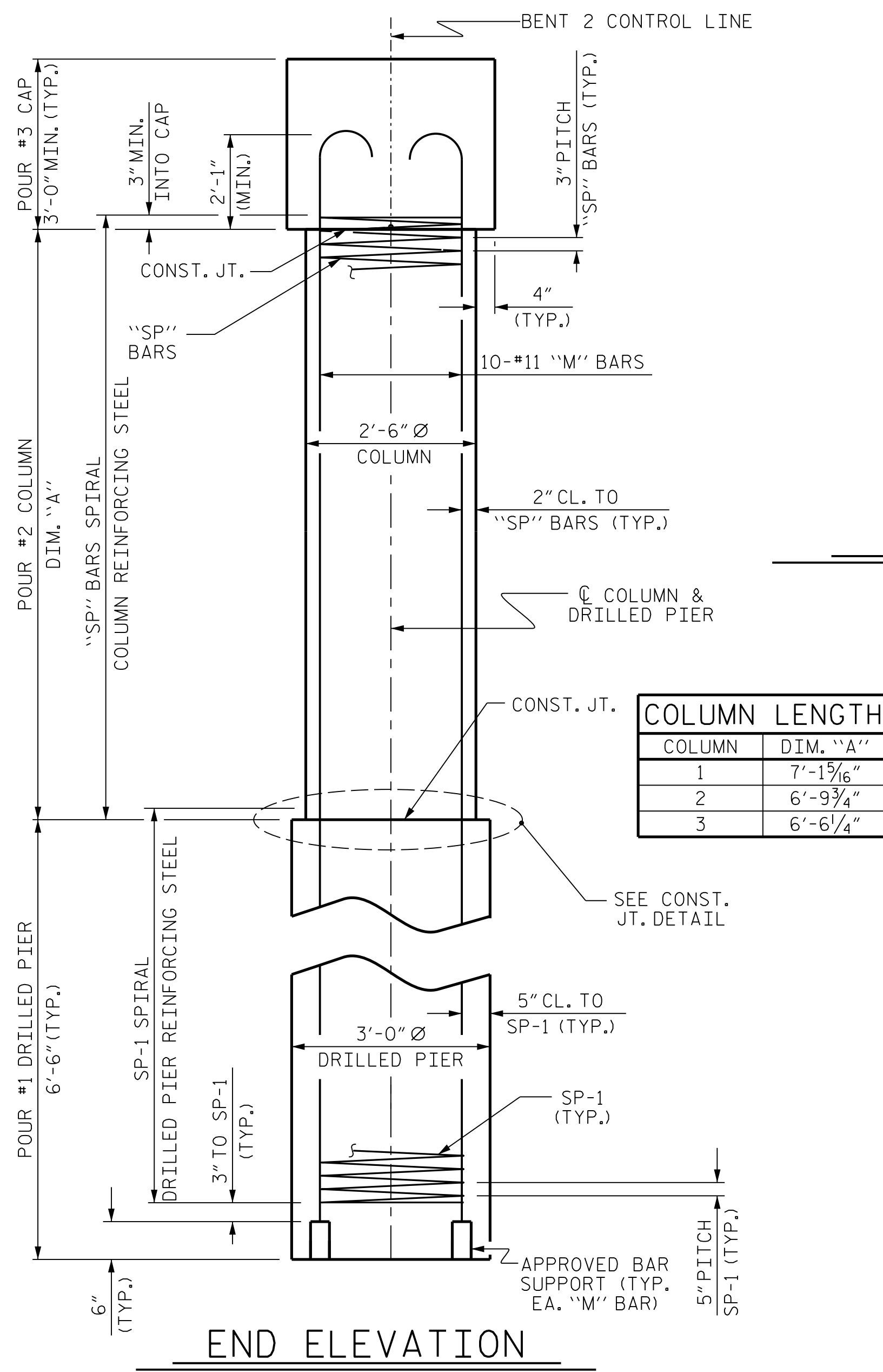
SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 730 LBS.

\* 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.

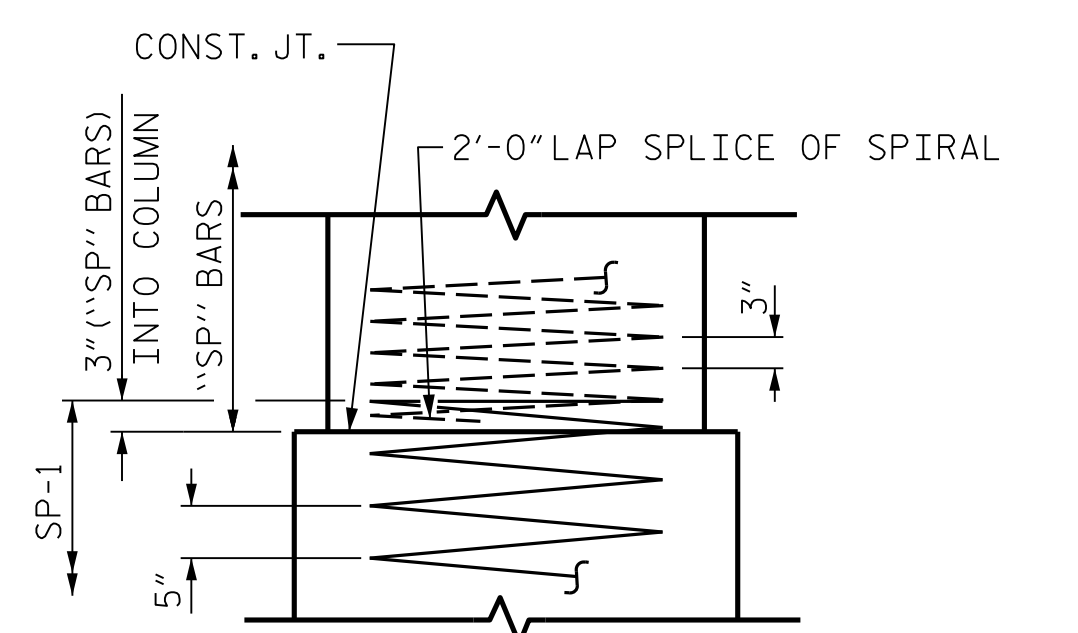
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	3.8 C.Y.
POUR #3 (CAP)	13.3 C.Y.
<b>TOTAL CLASS A CONCRETE</b>	<b>17.1 C.Y.</b>

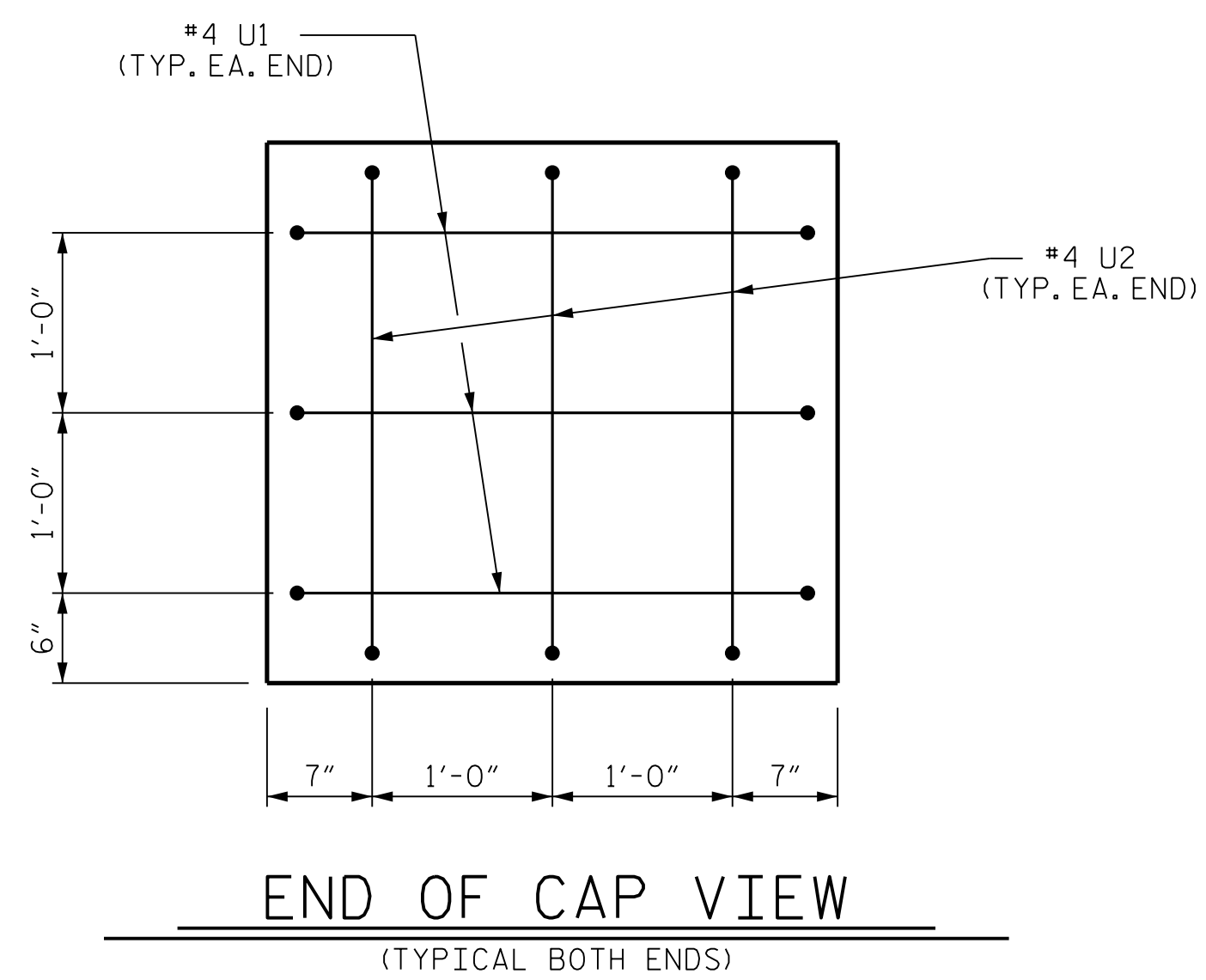
DRILLED PIERS: (FOR ONE BENT)	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	5.2 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	15.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	4.5 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	4.2 LIN. FT.
CSL TUBES	96.0 LIN. FT.



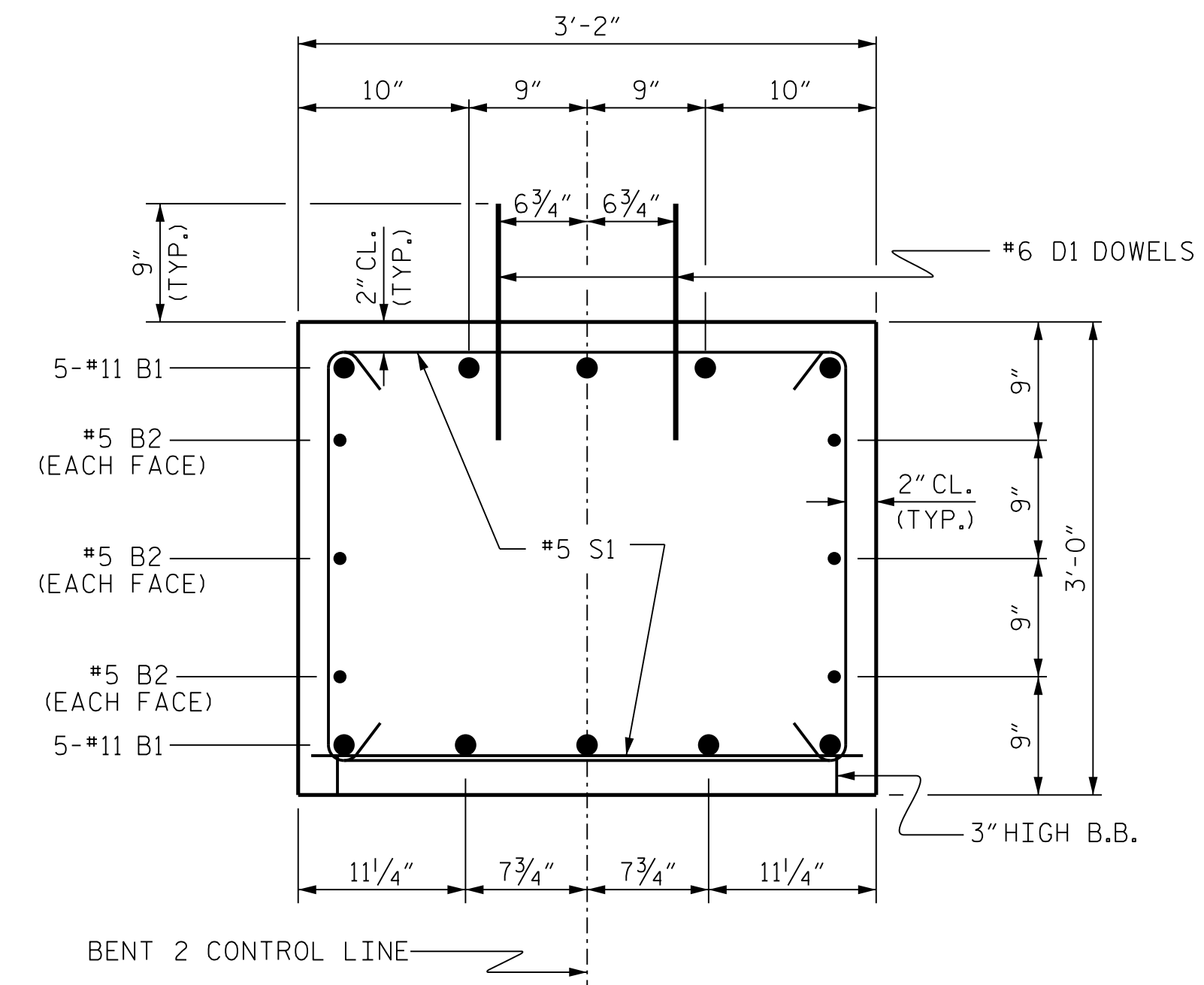
END ELEVATION



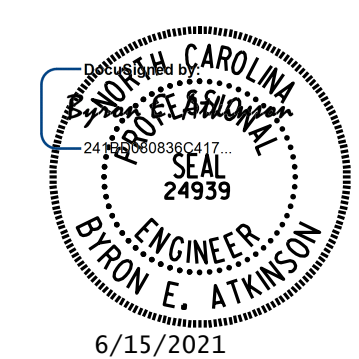
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW (TYPICAL BOTH ENDS)



SECTION THRU CAP



**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**  
 MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-

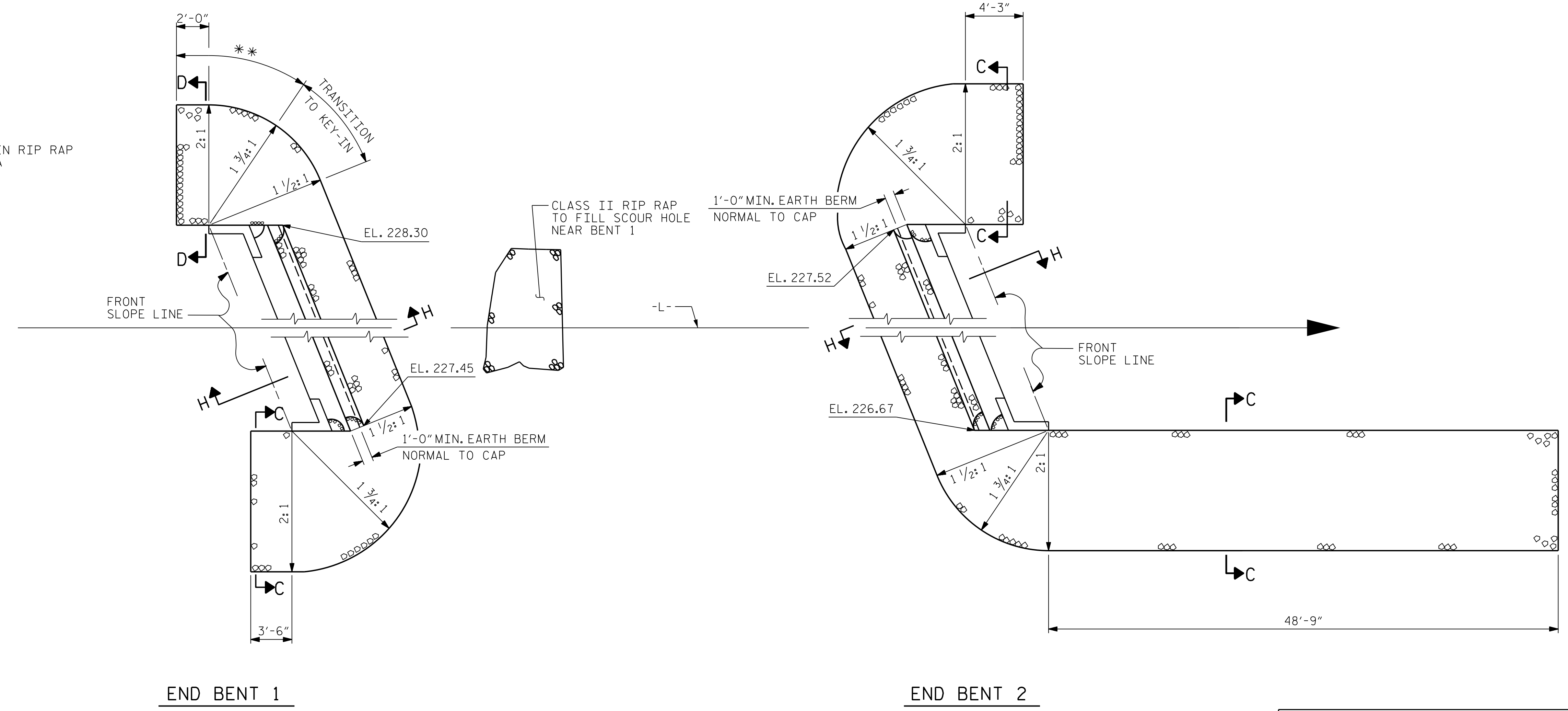
SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			
2			4			20

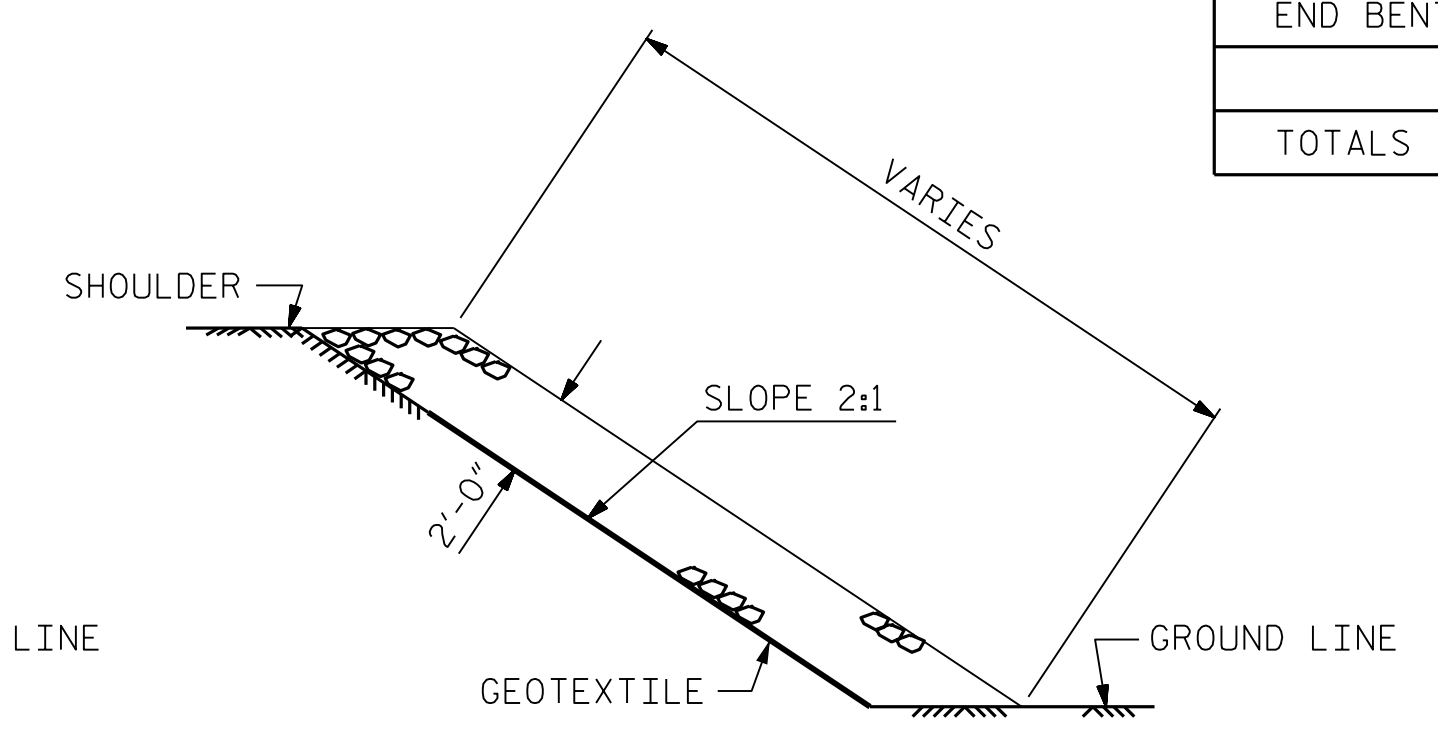
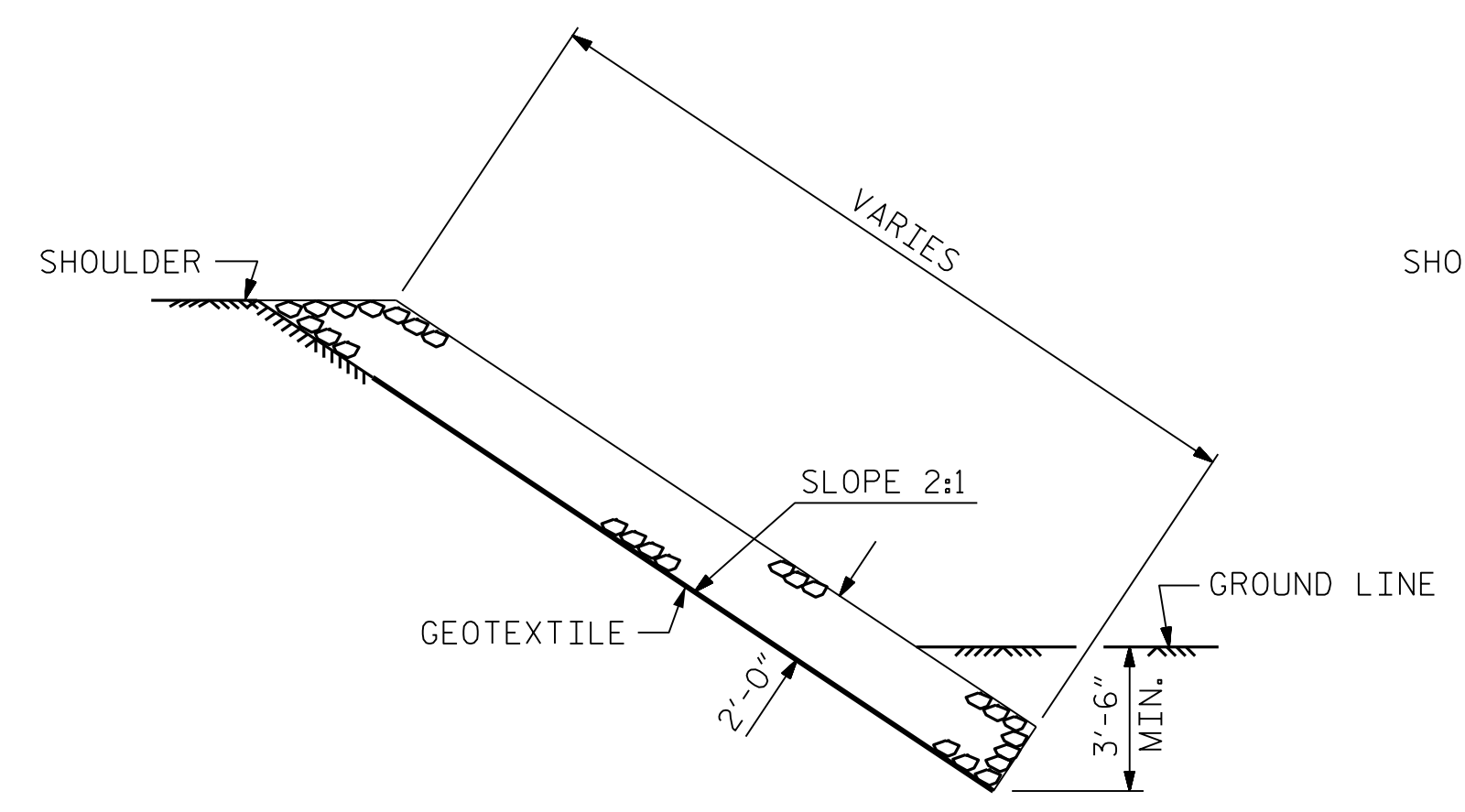
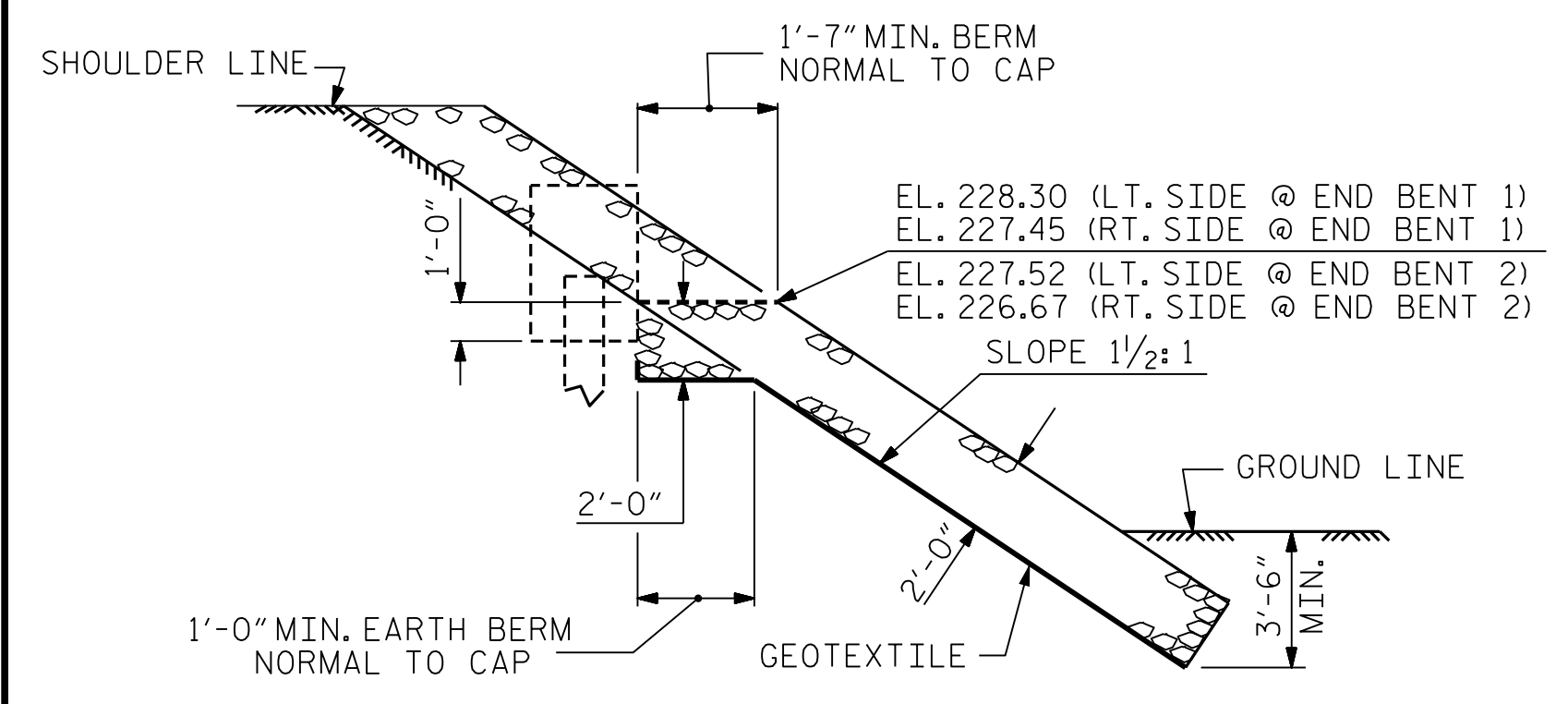
DRAWN BY : B.E. LANNING	DATE : 01/20
CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

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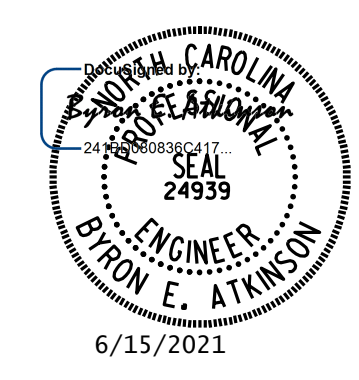
\*\* DO NOT KEY-IN RIP RAP IN THIS AREA



ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+55.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	150	166
SCOUR HOLE NEAR BENT 1	28	31
END BENT 2	257	285
TOTALS	435	482



PROJECT NO. 17BP.8.R.135  
MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

—RIP RAP DETAILS—

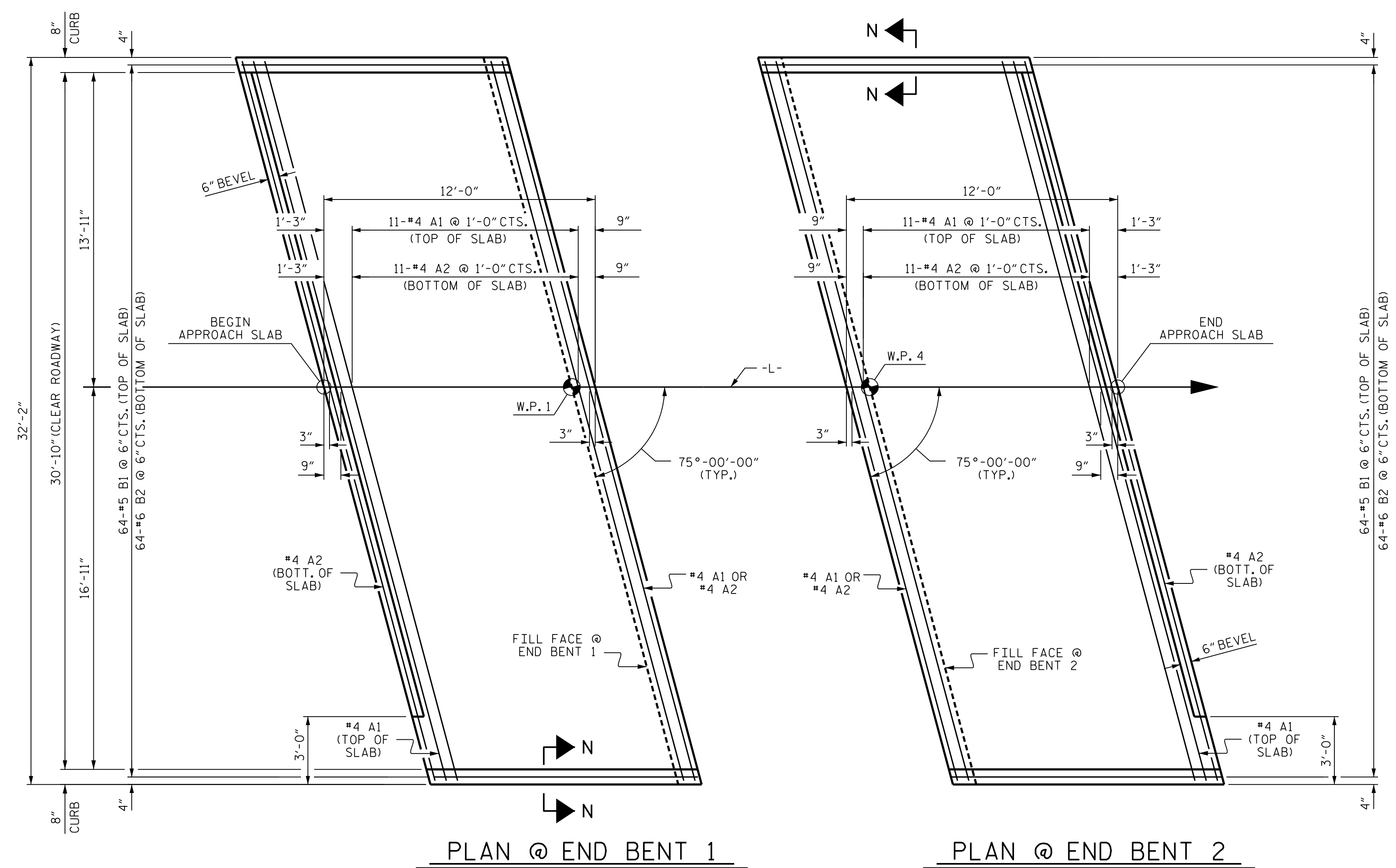
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

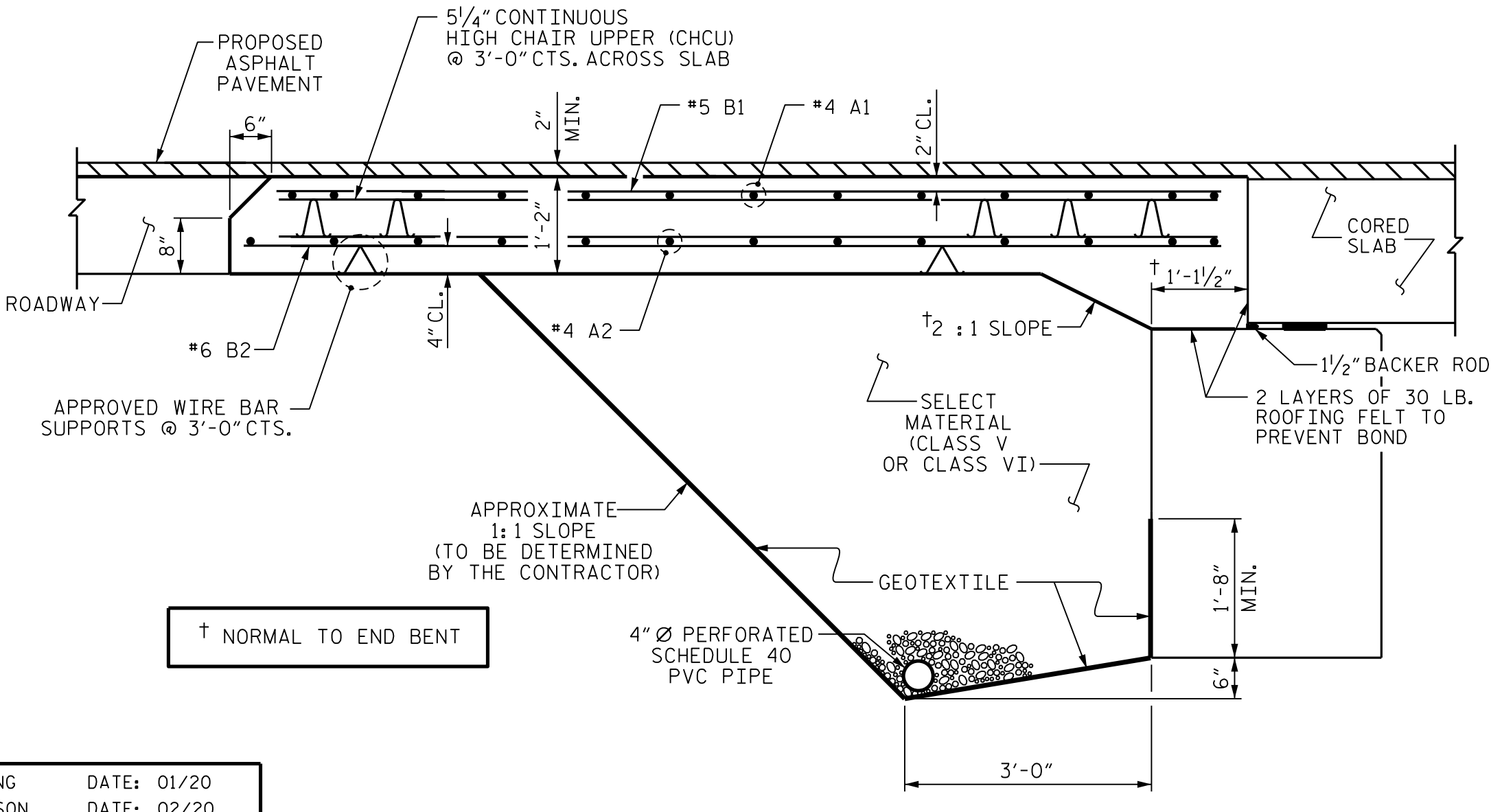
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CHECKED BY : B.E. ATKINSON	DATE : 02/20
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 06/21

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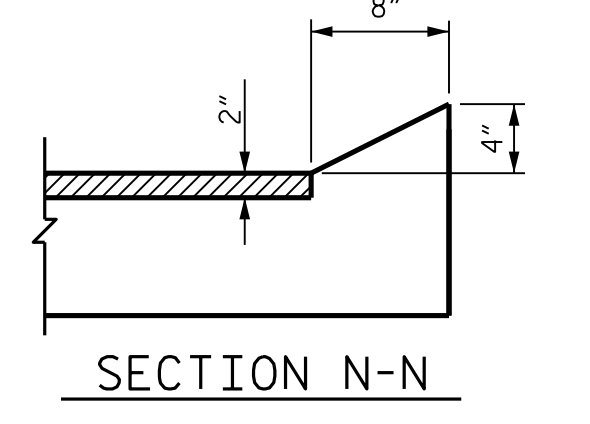
PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

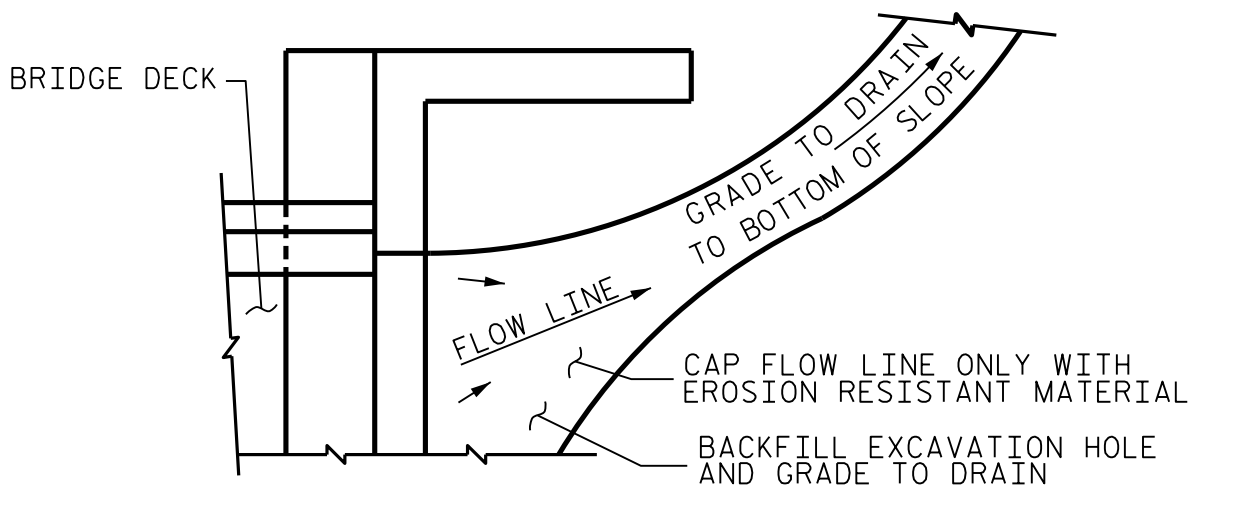
(TYPE II - MODIFIED APPROACH FILL)



CURB DETAILS

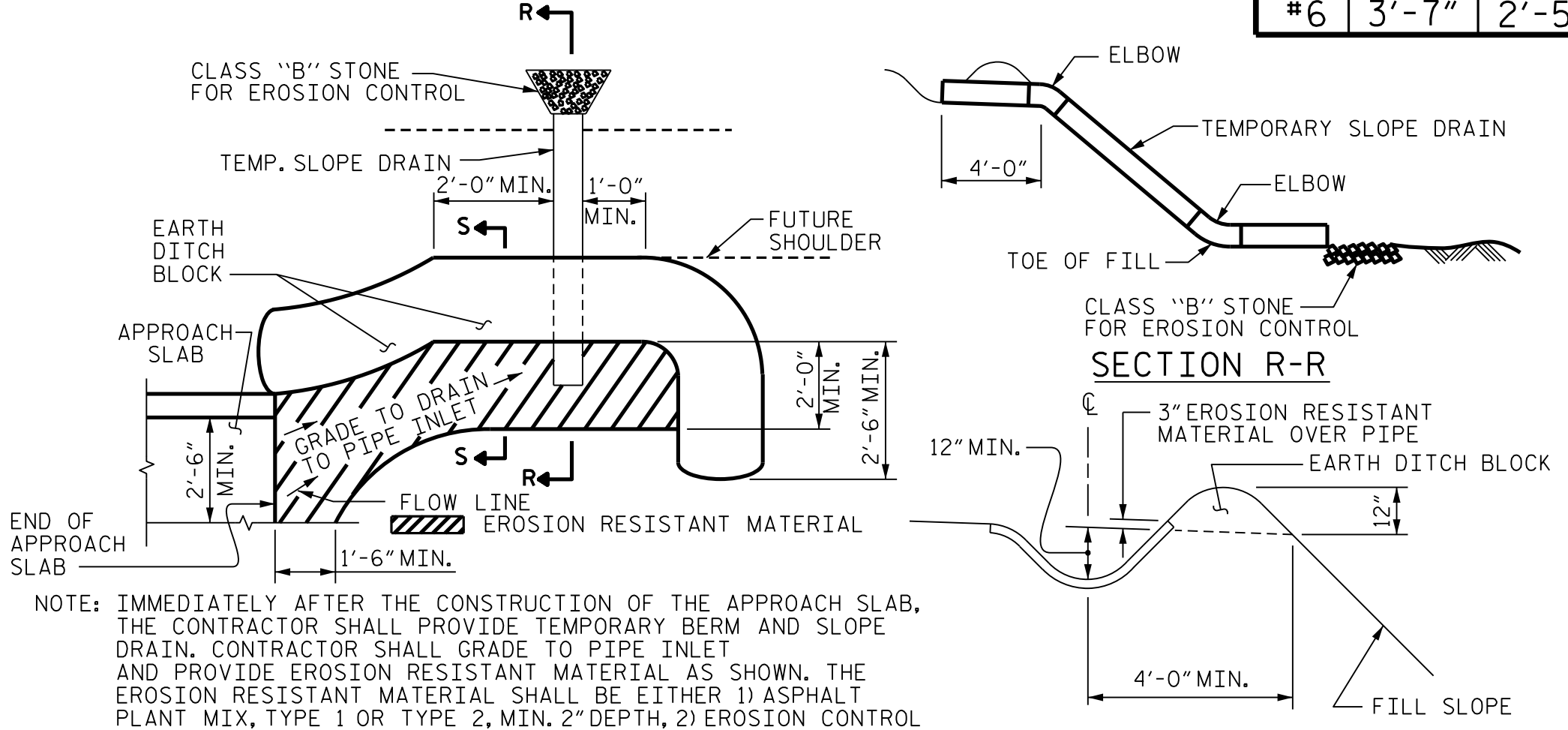
NOTES

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.  
 FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
 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.  
 APPROACH SLAB GROOVING IS NOT REQUIRED.



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

TEMPORARY DRAINAGE DETAIL



TEMPORARY BERM AND SLOPE DRAIN DETAILS

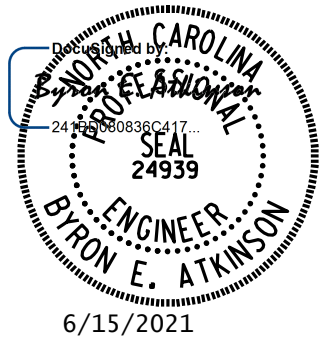
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	32'-11"	286	
A2	13	#4	STR	32'-11"	286	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1399
*EPOXY COATED REINFORCING STEEL					LBS.	1026
CLASS AA CONCRETE					C. Y.	19.2
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	32'-11"	286	
A2	13	#4	STR	32'-11"	286	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1399
*EPOXY COATED REINFORCING STEEL					LBS.	1026
CLASS AA CONCRETE					C. Y.	19.2

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

PROJECT NO. 17BP.8.R.135  
 MONTGOMERY COUNTY  
 STATION: 16+55.00 -L-



DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 (SUB-REGIONAL TIER)  
 75° SKEW

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

STD. NO. BAS\_33\_75S

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST  $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990