

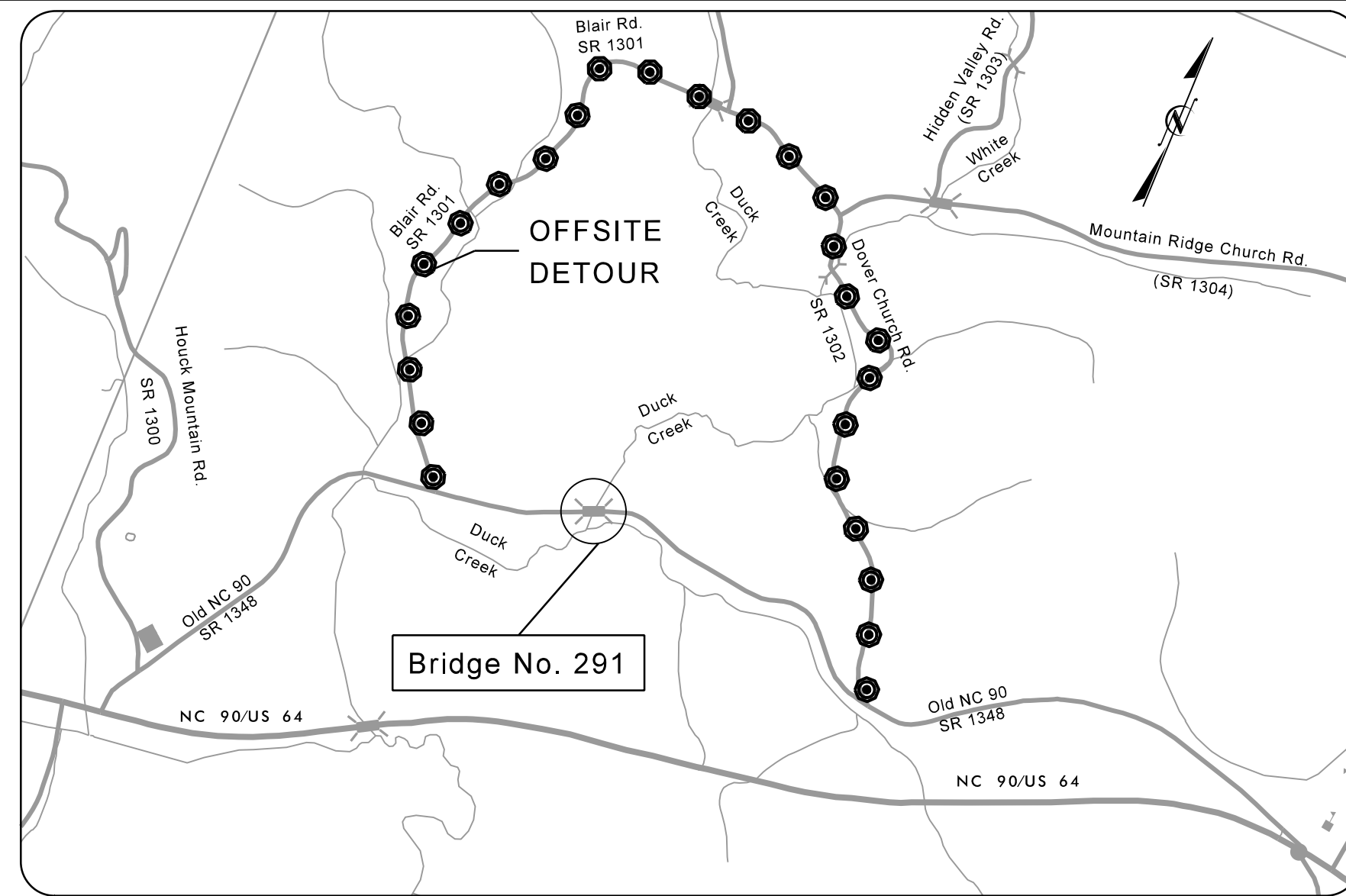
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**PROJECT: 17BP.12.R.88**

**CONTRACT: DL00220**



**VICINITY MAP**  
(NOT TO SCALE)

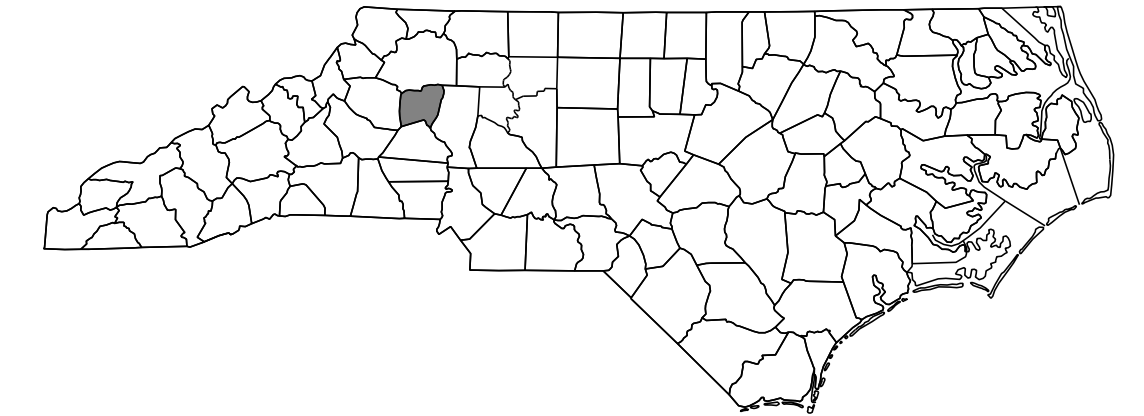
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALEXANDER COUNTY**

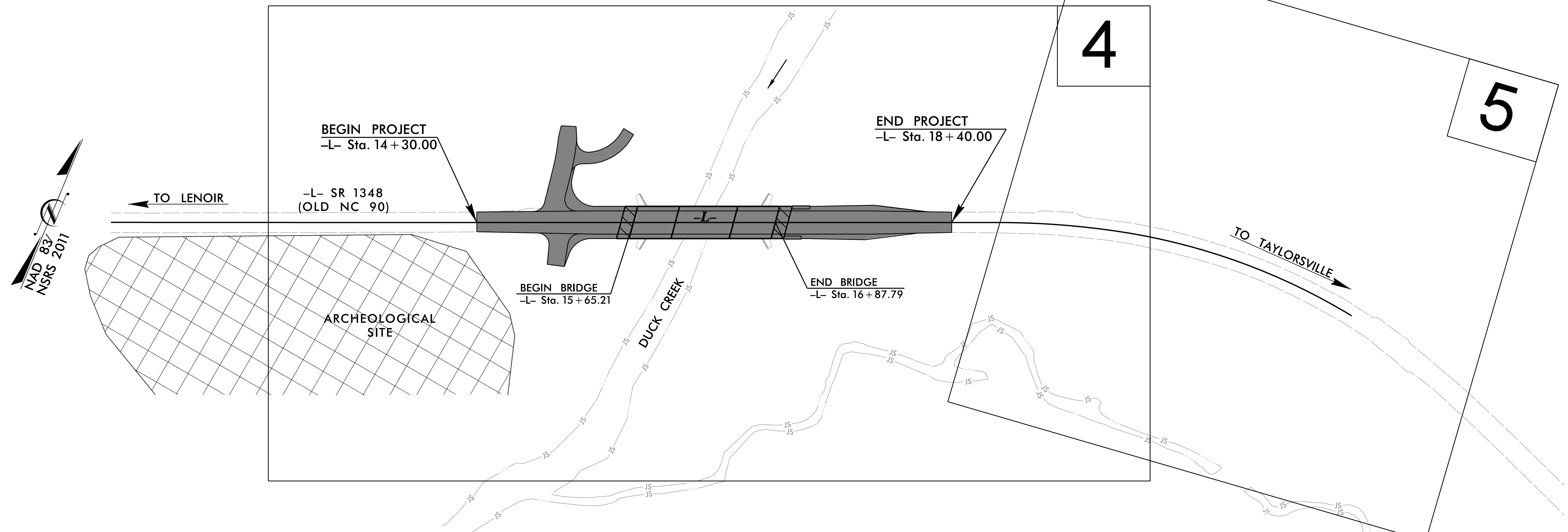
**LOCATION: BRIDGE NO. 291 OVER DUCK CREEK  
ON SR 1348 (OLD NC 90)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING,  
STRUCTURES, AND RESURFACING**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.88	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17 BP.12.R.88		P.E.	
17 BP.12.R.88		ROW & UTIL.	
17 BP.12.R.88		CONST.	

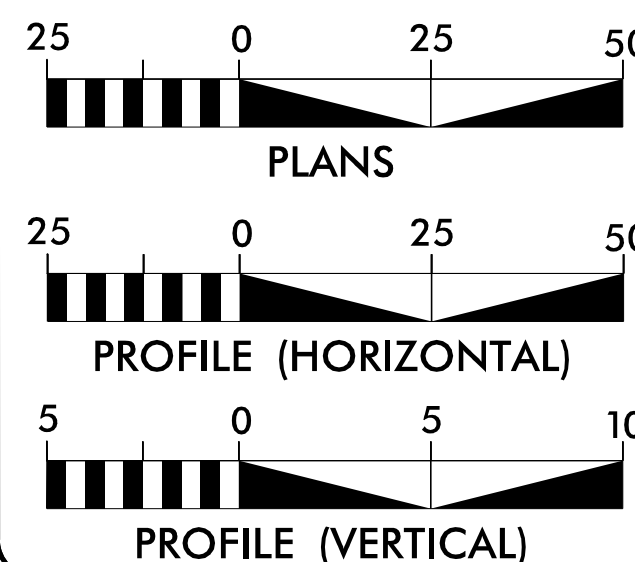


**RFC**  
RELEASED FOR CONSTRUCTION



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

**GRAPHIC SCALES**



**DESIGN DATA**

ADT = 800  
T = 6%\*  
V = 50 MPH  
\* TTST = 3% DUAL 3%

FUNC CLASS = RURAL LOCAL

SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT 17BP.12.R.88 = 0.055 mi  
LENGTH STRUCTURE TIP PROJECT 17BP.12.R.88 = 0.023 mi  
TOTAL LENGTH TIP PROJECT 17BP.12.R.88 = 0.078 mi

DOCUMENT NOT CONSIDERED FINAL  
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2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

OCTOBER 8, 2019

LETTING DATE:

MARCH 9, 2021

FOR  
DIVISION  
OF  
HIGHWAYS

Scott D. Blevins, P.E.  
PROJECT ENGINEER

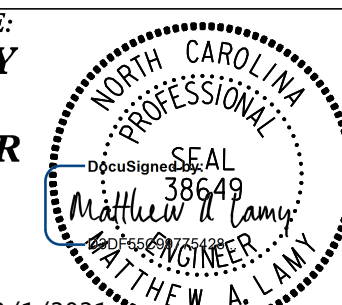
Matthew A. Lamy, P.E.  
PROJECT DESIGN ENGINEER

Steven Rackley, P.E.  
Division Bridge Manager

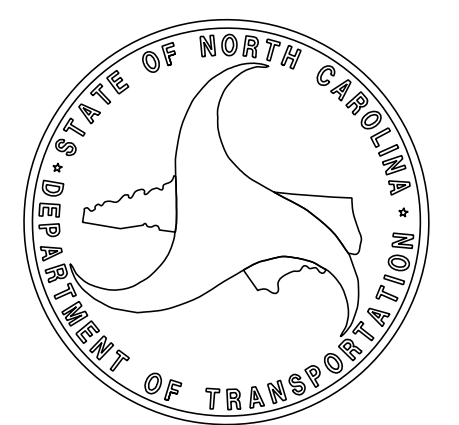
HYDRAULICS  
ENGINEER




SIGNATURE:  
ROADWAY  
DESIGN  
ENGINEER



SIGNATURE:



# INDEX of SHEETS, GENERAL NOTES, and LIST of STANDARDS

PROJECT REFERENCE NO.	SHEET NO.
17BP12R88	1-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	
	
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## INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2D-1	DRAINAGE DETAILS
3B-1	GUARDRAIL, EARTHWORK, & PAVEMENT REMOVAL SUMMARIES
3D-1	DRAINAGE SUMMARY SHEET
3P-1	RIGHT OF WAY AREA DATA SHEET
4	PLAN/PROFILE SHEET
5	PLAN SHEET
RW-01 THRU RW-05	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS, & PROPERTY TIES
TMP-1 THRU SD-1	TRANSPORTATION MANAGEMENT & SIGNING PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES BY OTHER PLANS
X-1 THRU X-7	CROSS-SECTIONS
S-1 THRU S-21	STRUCTURE 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
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard 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	
806.01	Concrete Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

## GENERAL NOTES

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

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

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

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

**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) & AT&T (TELECOMMUNICATIONS).  
  
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

## BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Existing Historic Property Boundary	----- HPB
Known Contamination Area: Soil	☠-S-☠
Potential Contamination Area: Soil	☠-S-☠
Known Contamination Area: Water	☠-W-☠
Potential Contamination Area: Water	☠-W-☠
Contaminated Site: Known or Potential	☠☠

## BUILDINGS AND OTHER CULTURE:

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

## HYDROLOGY:

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

## RAILROADS:

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

## RIGHT OF WAY & PROJECT CONTROL:

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

## ROADS AND RELATED FEATURES:

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

## VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale

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

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

## EXISTING STRUCTURES:

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

## UTILITIES:

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

## 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.*)	----- T
U/G Telephone Cable LOS C (S.U.E.*)	----- T
U/G Telephone Cable LOS D (S.U.E.*)	----- T
U/G Telephone Conduit LOS B (S.U.E.*)	----- TC
U/G Telephone Conduit LOS C (S.U.E.*)	----- TC
U/G Telephone Conduit LOS D (S.U.E.*)	----- TC
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- T FO

## 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	----- A/G Water

## TV:

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

## GAS:

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

## SANITARY SEWER:

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

## MISCELLANEOUS:

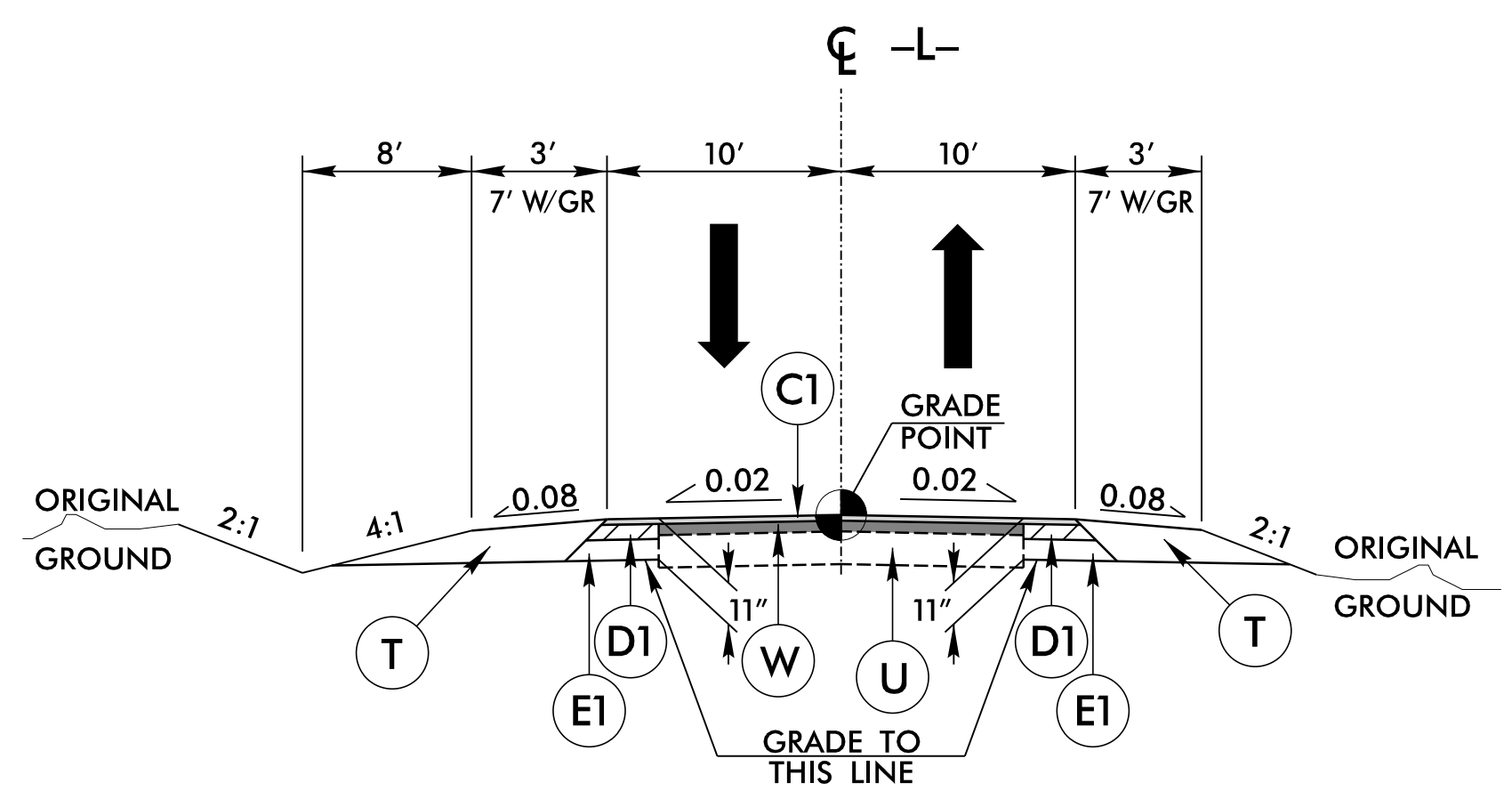
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	----- 7U/L
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

6/2/99

# PAVEMENT SCHEDULE

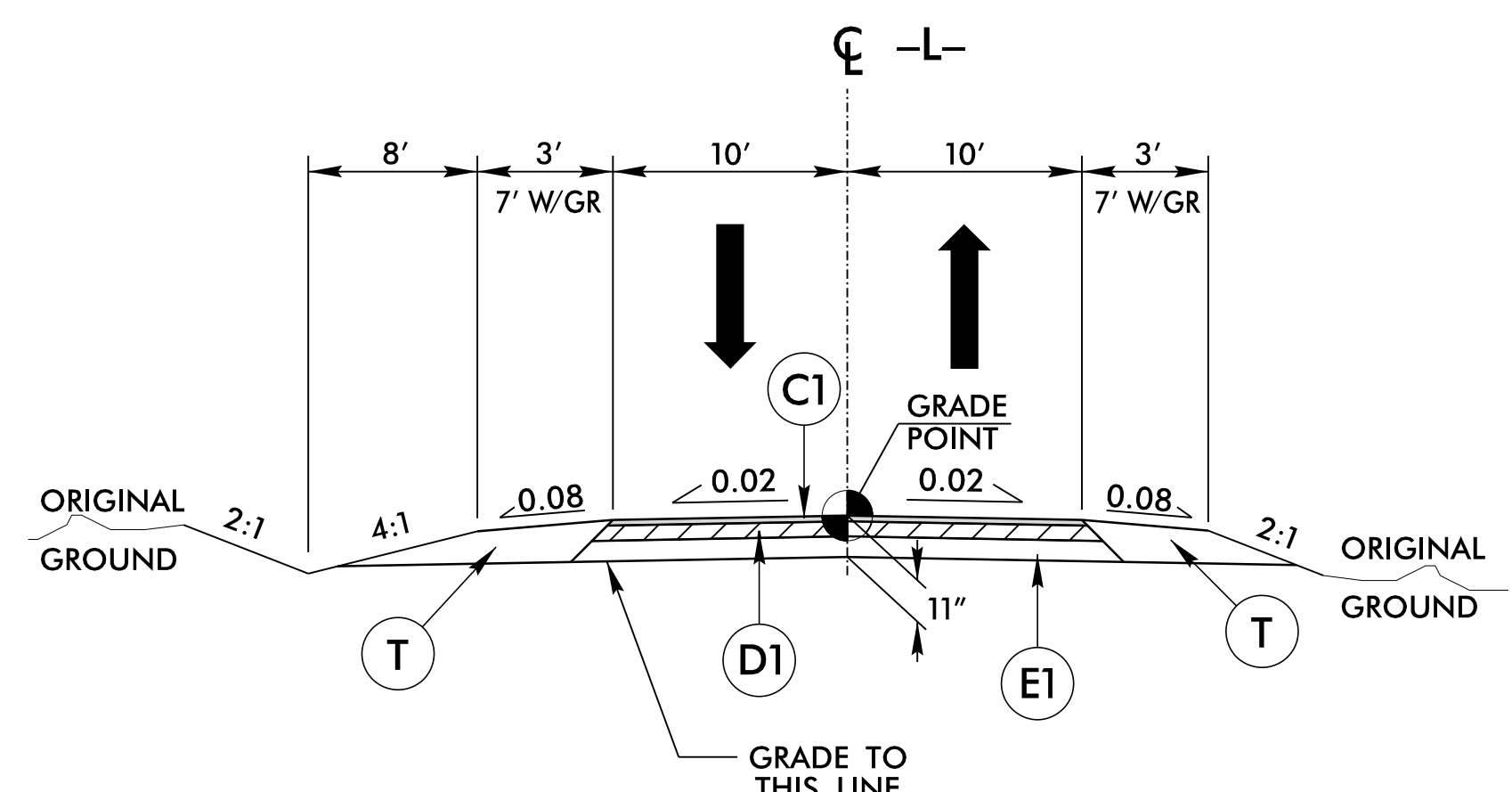
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH.	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" OR GREATER THAN 5.5" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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 2.5" OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. ALL DRIVEWAYS WILL BE CONSTRUCTED WITH 8" OF ABC.		W	VARIABLE DEPTH ASPHALT PAVEMENT

PROJECT REFERENCE NO. 17BPJ2.R.88	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



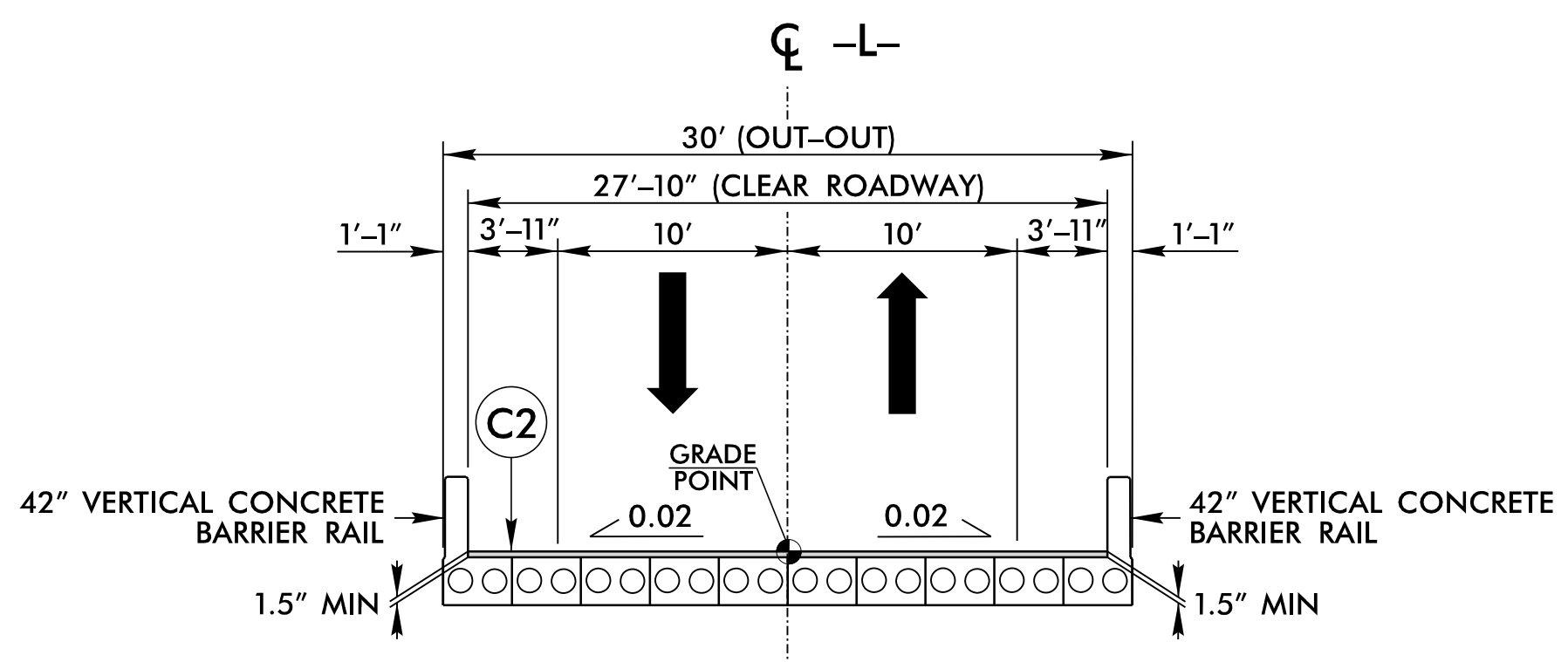
**TYPICAL SECTION NO. 1**

-L- STA. 14+30.00 TO 15+00.00  
-L- STA. 18+00.00 TO 18+40.00



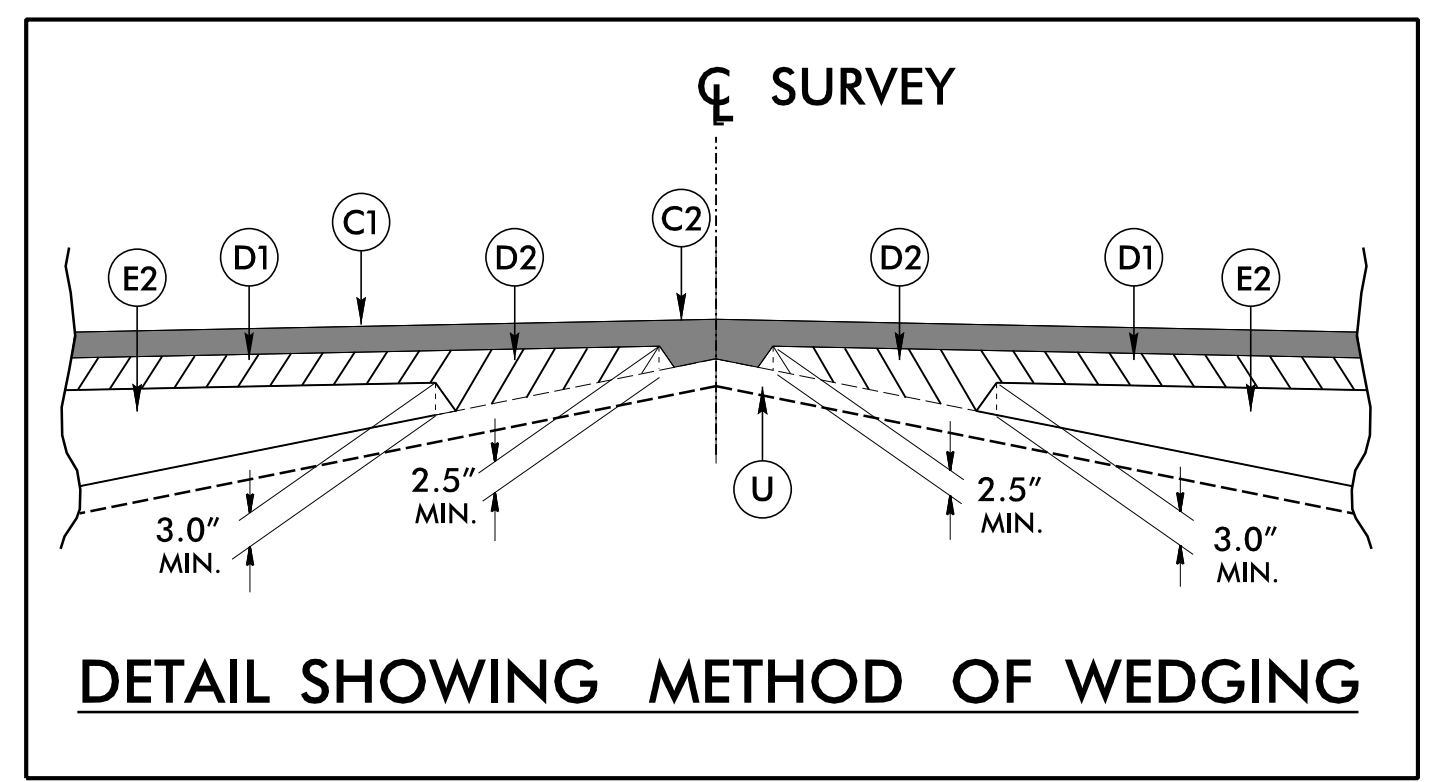
**TYPICAL SECTION NO. 2**

-L- STA. 15+00.00 TO 15+65.21 (BEGIN BRIDGE)  
-L- STA. 16+87.79 (END BRIDGE) TO 18+00.00

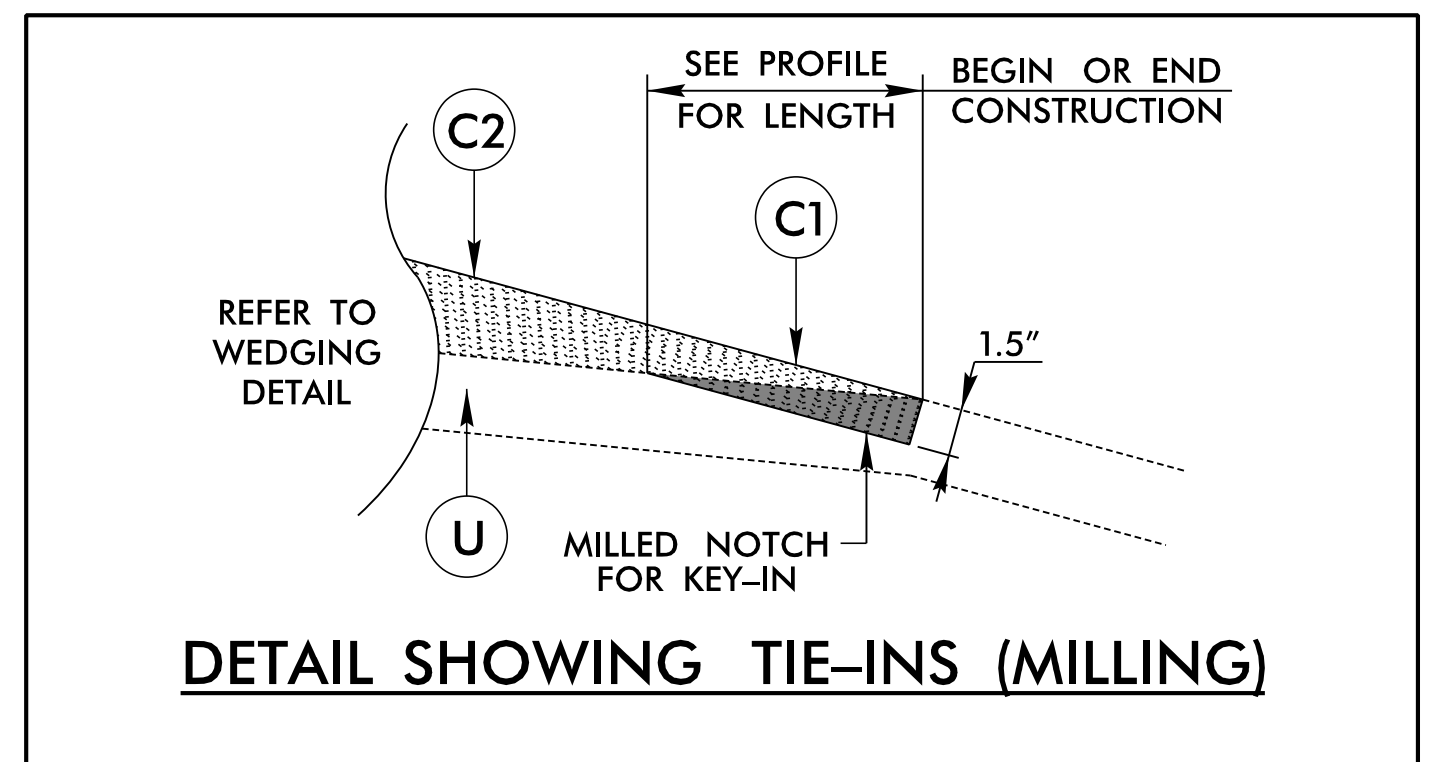


**TYPICAL SECTION NO. 3**

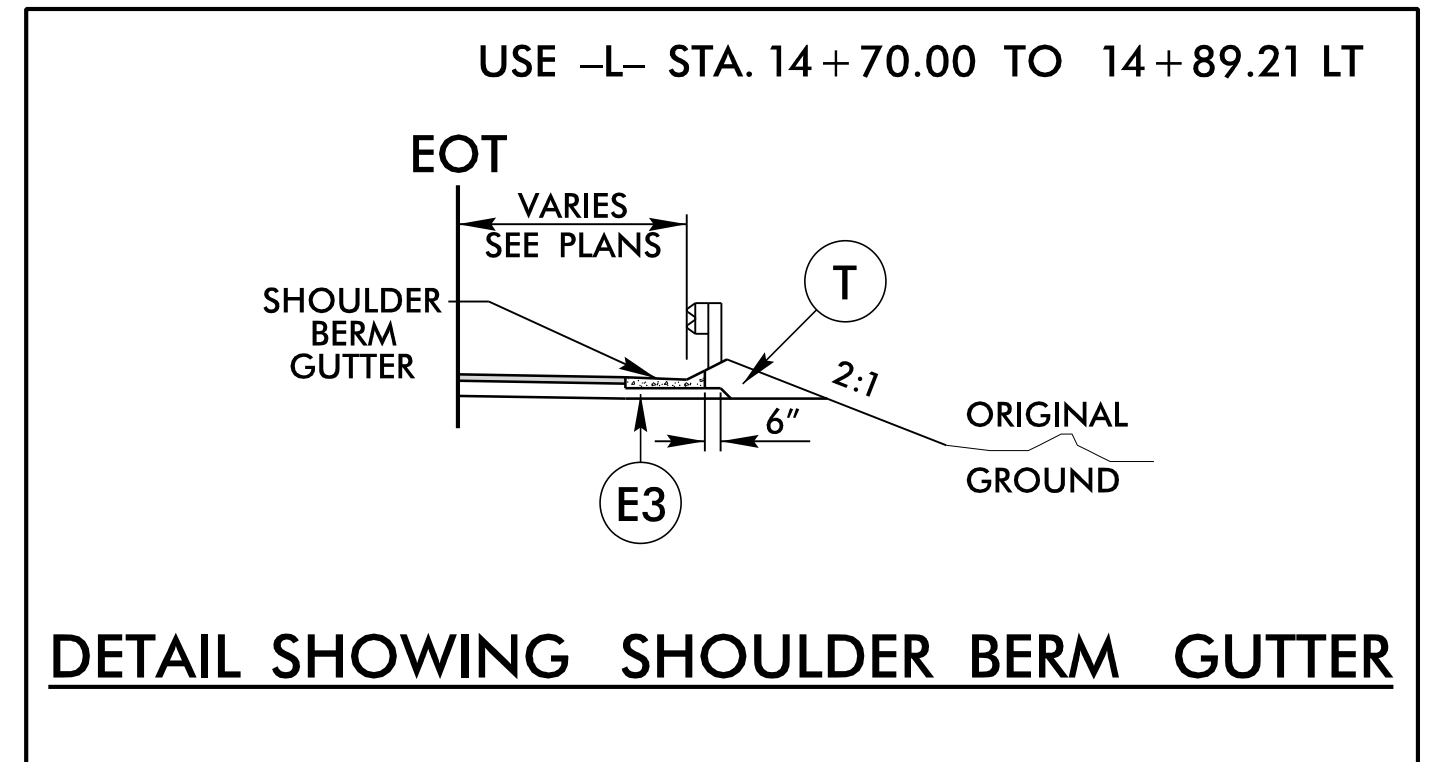
-L- STA. 15+65.21 (BEGIN BRIDGE) TO 16+87.79 (END BRIDGE)



**DETAIL SHOWING METHOD OF WEDGING**



**DETAIL SHOWING TIE-INS (MILLING)**



**DETAIL SHOWING SHOULDER BERM GUTTER**

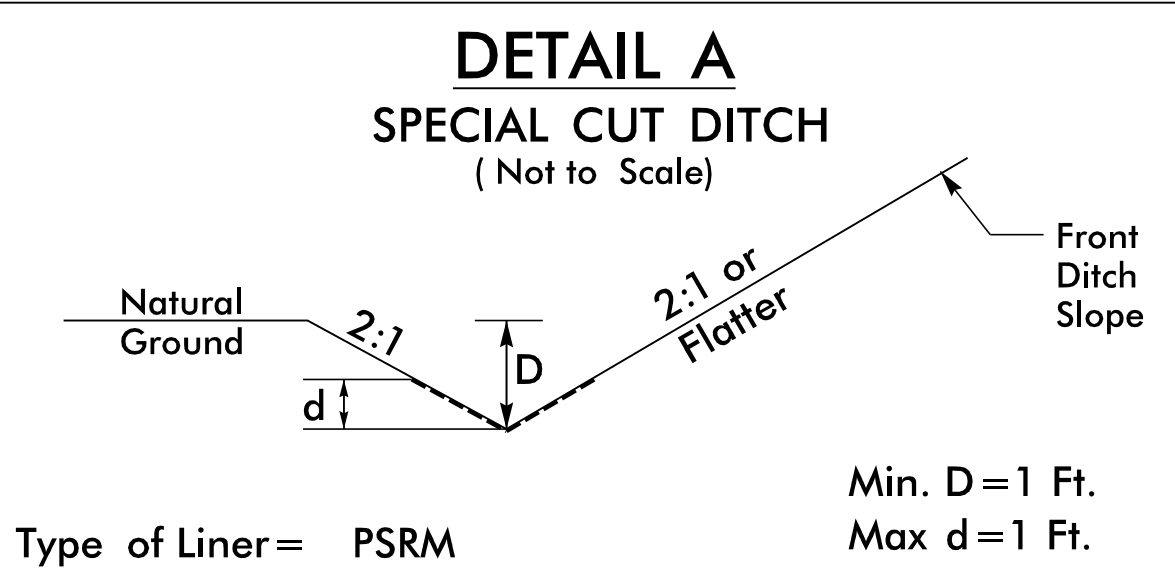
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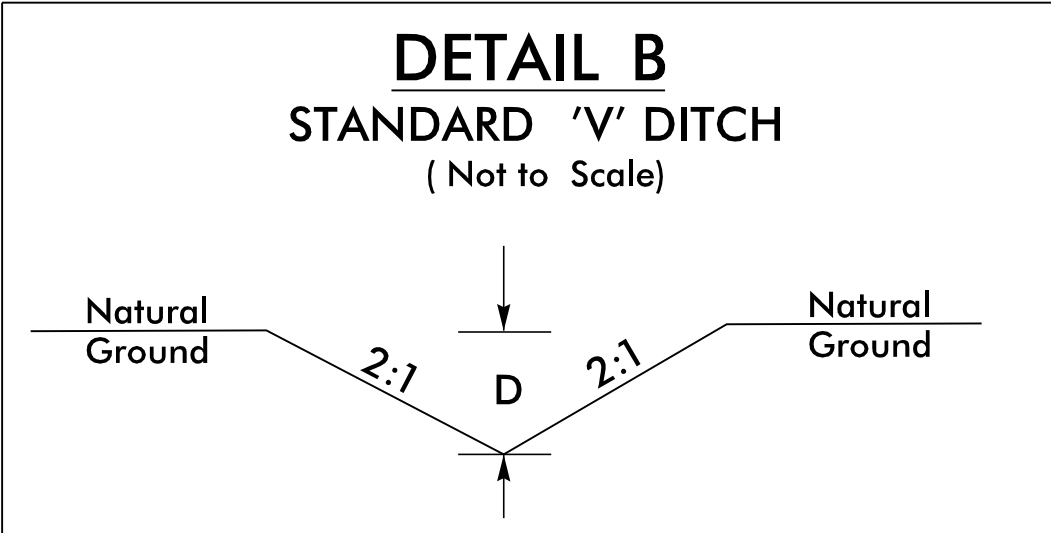
H:\27\2001\17BPJ2.R\17BPJ2.R.dwg - typ.dgn  
 6/2/99

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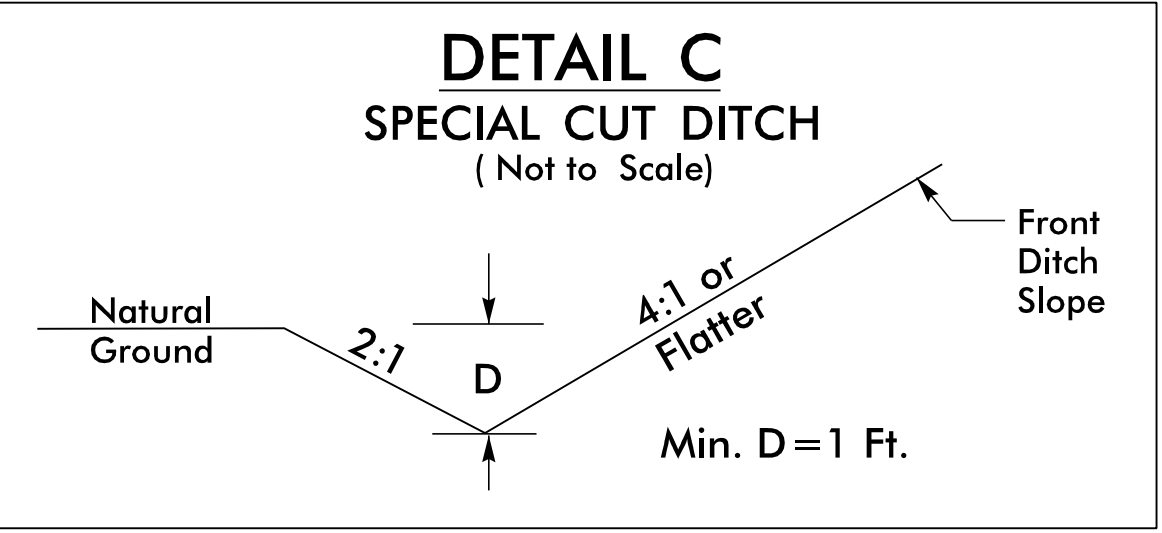
# DRAINAGE DETAILS



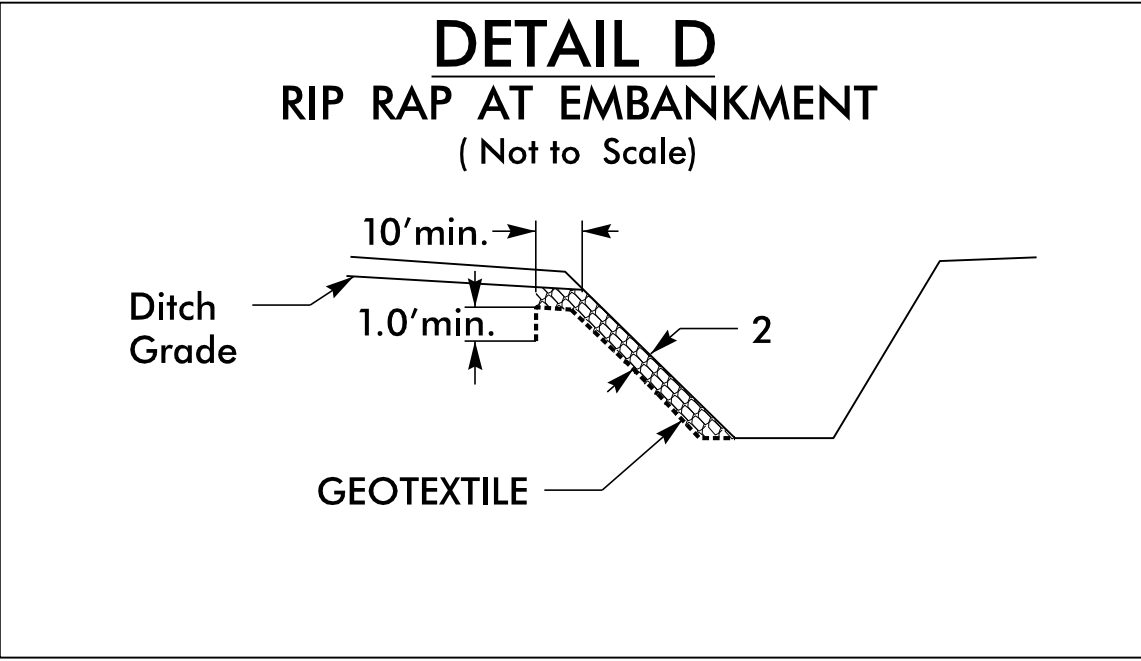
FROM -L STA. 14+30 TO STA. 14+75 LT  
33 SY PSRM



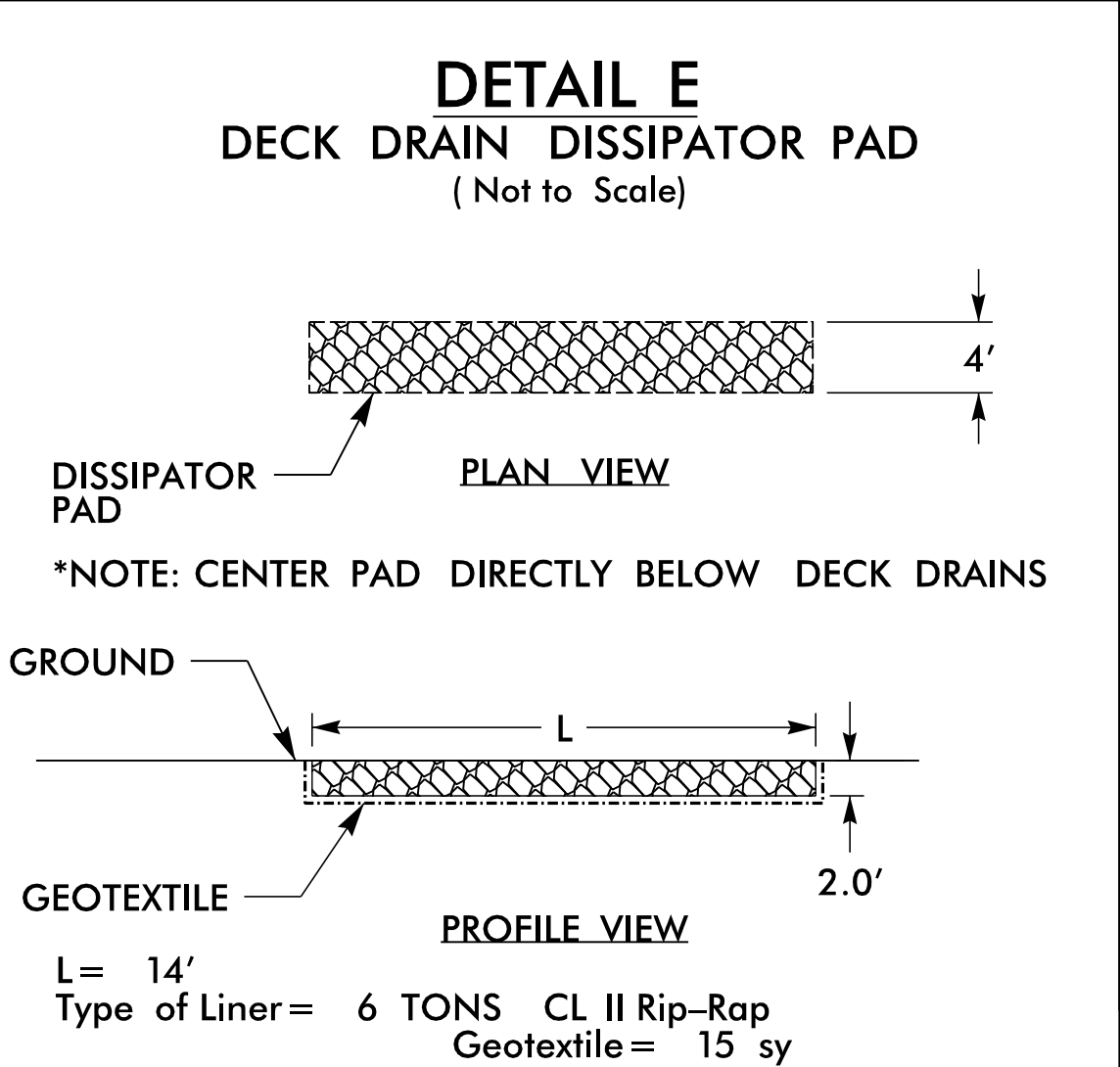
FROM -L STA. 15+69 TO STA. 16+22 LT  
Min. D=1.5 ft; DDE = 35CY  
FROM -L STA. 16+27 TO STA. 16+84 RT  
Min. D=1.0 ft; DDE = 13CY  
FROM -L STA. 16+55 TO STA. 16+91 LT  
Min. D=1.0 ft; DDE = 5CY



FROM -L STA. 16+84 TO STA. 18+25 RT  
FROM -L STA. 16+91 TO STA. 18+25 LT



AT -L- STA. 16+25, 35' LT  
13 TONS CL II RIP RAP, 17 SY GEOTEXTILE  
AT -L- STA. 16+25, 35' RT  
12 TONS CL II RIP RAP, 15 SY GEOTEXTILE  
AT -L- STA. 16+55, 40' LT  
11 TONS CL II RIP RAP, 13 SY GEOTEXTILE



FROM -L STA. 16+63 TO STA. 16+77 LT  
FROM -L STA. 16+55 TO STA. 16+69 RT

DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

STATION	STATION	EXCAVATION		EMBANK.	BORROW	WASTE
		TOTAL UNCLASS.	UNDERCUT			
-L- 14+30.00	-L- 15+65.21 (Begin Bridge)	133		184	51	
<b>SUBTOTAL #1</b>		133		184	51	
-L- 16+87.79 (End Bridge)	-L- 18+40.00	170		486	316	
<b>SUBTOTAL #2</b>		170		486	316	
<b>TOTAL</b>		303		670	367	
LOSS DUE TO CLEARING & GRUBBING ESTIMATED SHOULDER MATERIAL		-15		74	15	74
<b>PROJECT TOTAL</b>		287		743	455	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					23	
<b>GRAND TOTAL</b>		287		743	477	
<b>SAY</b>		<b>290</b>			<b>480</b>	

**SAFETY FENCE SUMMARY**  
 IN LINEAR FEET

LINE	STATION	STATION	SIDE	LENGTH (LF)
-L-	13+85.000	14+55.000	RT	76.35
<b>TOTAL</b>				<b>76.35</b>
<b>SAY</b>				<b>80</b>

**ASPHALT PAVEMENT  
 REMOVAL SUMMARY**  
 IN SQUARE YARDS

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	15+00	15+78	CL	1,272.29		141.37
-L-	16+74	18+00	CL	2,143.23		238.14
<b>TOTAL</b>						<b>379.50</b>
<b>SAY</b>						<b>380</b>

**GUARDRAIL SUMMARY**

ALN.	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS			IMPACT ATTENUATOR TYPE 350		REMOVE EXISTING GR	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPRO. END	TRAIL. END	APPR. END	TRAIL. END	TYPE-III	GREU 350 TL-3	AT-1	G	NG			
-L-	15+12.76	15+68.99	LT	43.97	31.03		15+68.99		3.92	6.92					1		1				Rigid Object	
-L-	15+07.90	15+61.53	RT	39.53	22.97			15+61.53	3.92	6.92					1		1				Rigid Object	
-L-	16+91.49	17+72.74	LT	81.25				16+91.49	3.92	6.92	50		1		1	1					Rigid Object	
-L-	16+84.03	17+65.28	RT	81.25			16+84.03		3.92	6.92		50		1	1	1					Rigid Object	
<b>SUBTOTAL:</b>				246.00	54.00										4	2	2					
<b>ANCHOR UNIT DEDUCTIONS:</b>																						
					-75.00																	
					-100.00																	
					-12.50																	
<b>LESS GUARDRAIL DEDUCTIONS:</b>				71.00	41.50																	
<b>PROJECT TOTAL:</b>				71.00	41.50										4	2	2					
<b>SAY:</b>				<b>75.0</b>	<b>50.0</b>																	

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL  
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.  
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL





5/9/06  
COMPUTED BY: \_\_\_\_\_ ESP \_\_\_\_\_ DATE: 5/15/18  
CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.R.88	3P-1

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

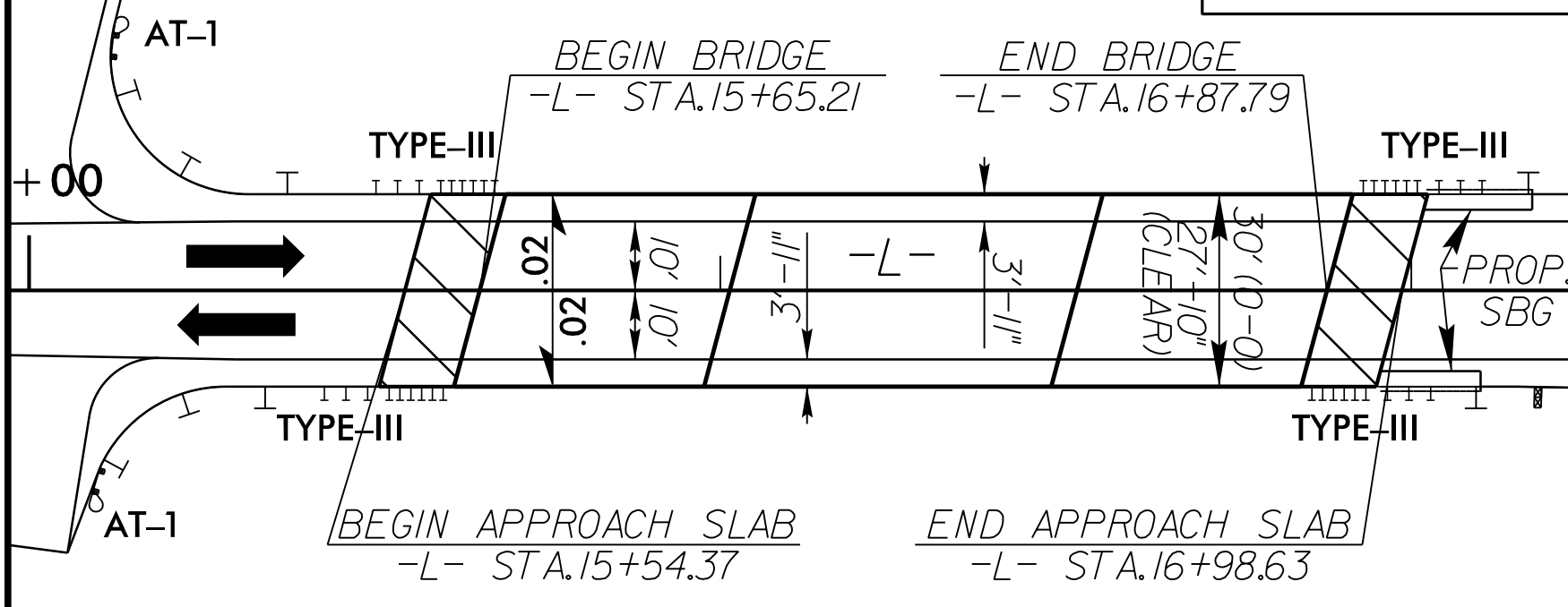
## ***RIGHT OF WAY AREA DATA SHEET***

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT
1	DONOCAN & SANDRA FULTON	1.860 AC	0.037 AC			0.067 AC
2	PATRICIA L. BELK	---	0.046 AC			0.002 AC
3	LINDA C. & GARRELL S. PENNELL	---	0.147 AC			0.012 AC

1/27/2021  
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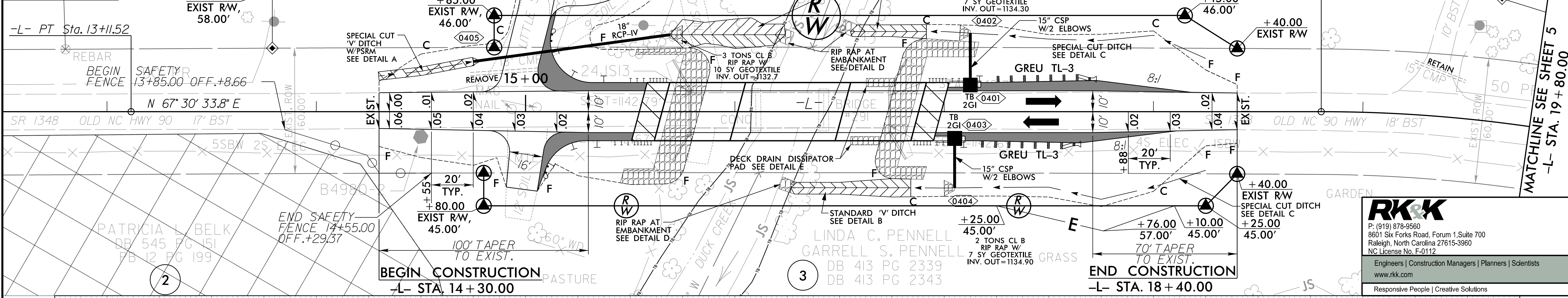
8/17/99

BRIDGE SKETCH



NOTE: ALL DRIVEWAY RADII 10' UNLESS OTHERWISE NOTED. NOTE: DO NOT DISTURB ARCHAEOLOGICAL SITE. NO CONSTRUCTION ACTIVITIES ALLOWED WITHIN ARCHAEOLOGICAL SITE BOUNDARY.

FOR DITCH DETAILS SEE SHT. 2D-1



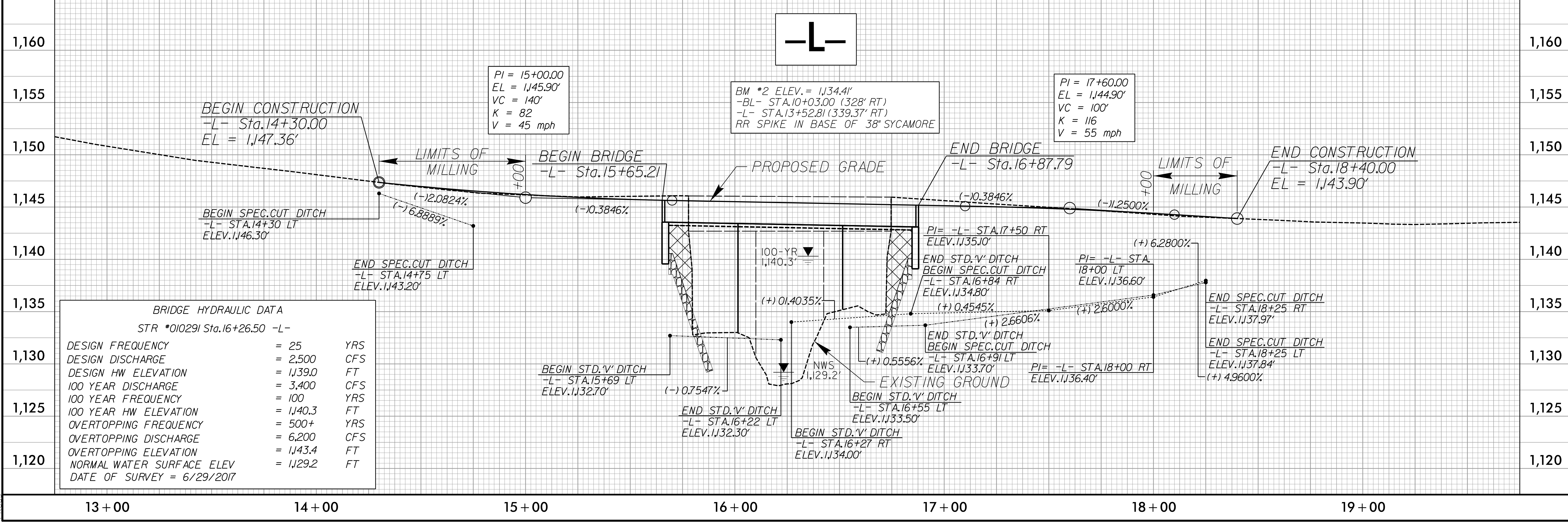
-L-	
PI Sta 11+55.76	PI Sta 19+33.98
$\Delta = 0^{\circ}05'55.6''$ (RT)	$\Delta = 8^{\circ}47'47.8''$ (LT)
D = 0'01'54.1"	D = 8'11'06.4"
L = 311.52'	L = 107.47'
T = 155.76'	T = 53.84'
R = 180,700.00'	R = 700.00'

PROJECT REFERENCE NO. 17BP12R.88 SHEET NO. 4

ROADWAY DESIGN ENGINEER: [Signature]

HYDRAULICS ENGINEER: [Signature]

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**RK&K**

P: (919) 878-9560  
8601 Six Forks Road, Forum 1, Suite 700  
Raleigh, North Carolina 27615-3960  
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists  
www.rk.com

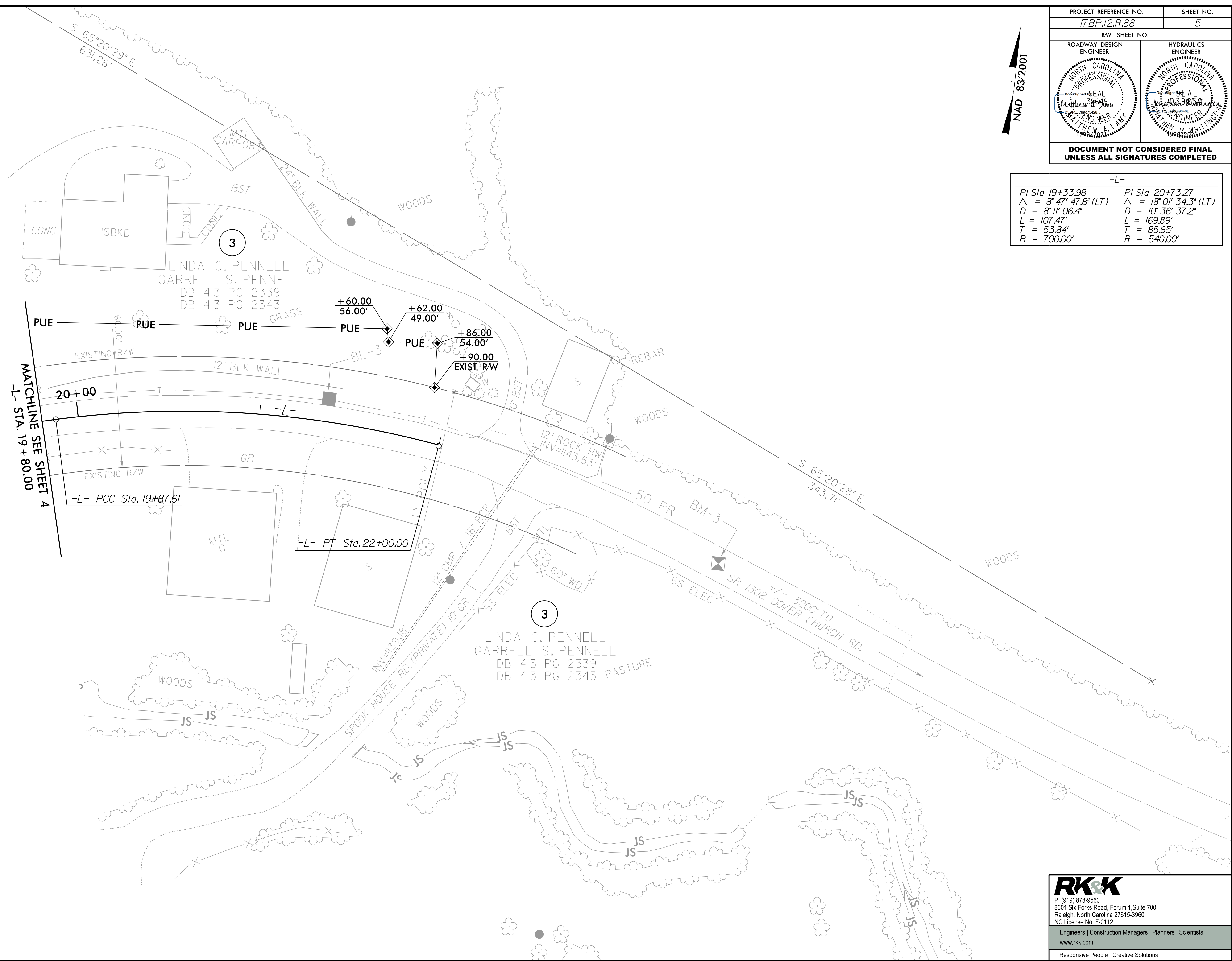
Responsive People | Creative Solutions

1/27/2021 R:\Roadway\Proj\10291\_rdy\_pah04.dgn

NAD 83/2001

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

-L-	
PI Sta 19+33.98	PI Sta 20+73.27
$\Delta = 8' 47' 47.8" (LT)$	$\Delta = 18' 01' 34.3" (LT)$
$D = 8' 11' 06.4"$	$D = 10' 36' 37.2"$
$L = 107.47'$	$L = 169.89'$
$T = 53.84'$	$T = 85.65'$
$R = 700.00'$	$R = 540.00'$



8/17/99  
K:\2021\Roadway\Pro\1010291\_rdy\_psh05.dgn

01/29/20

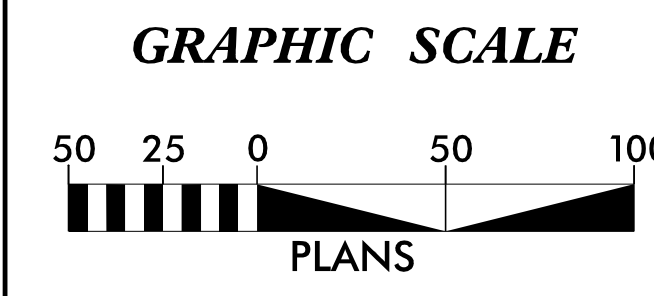
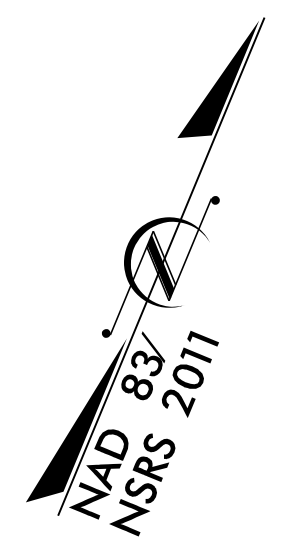
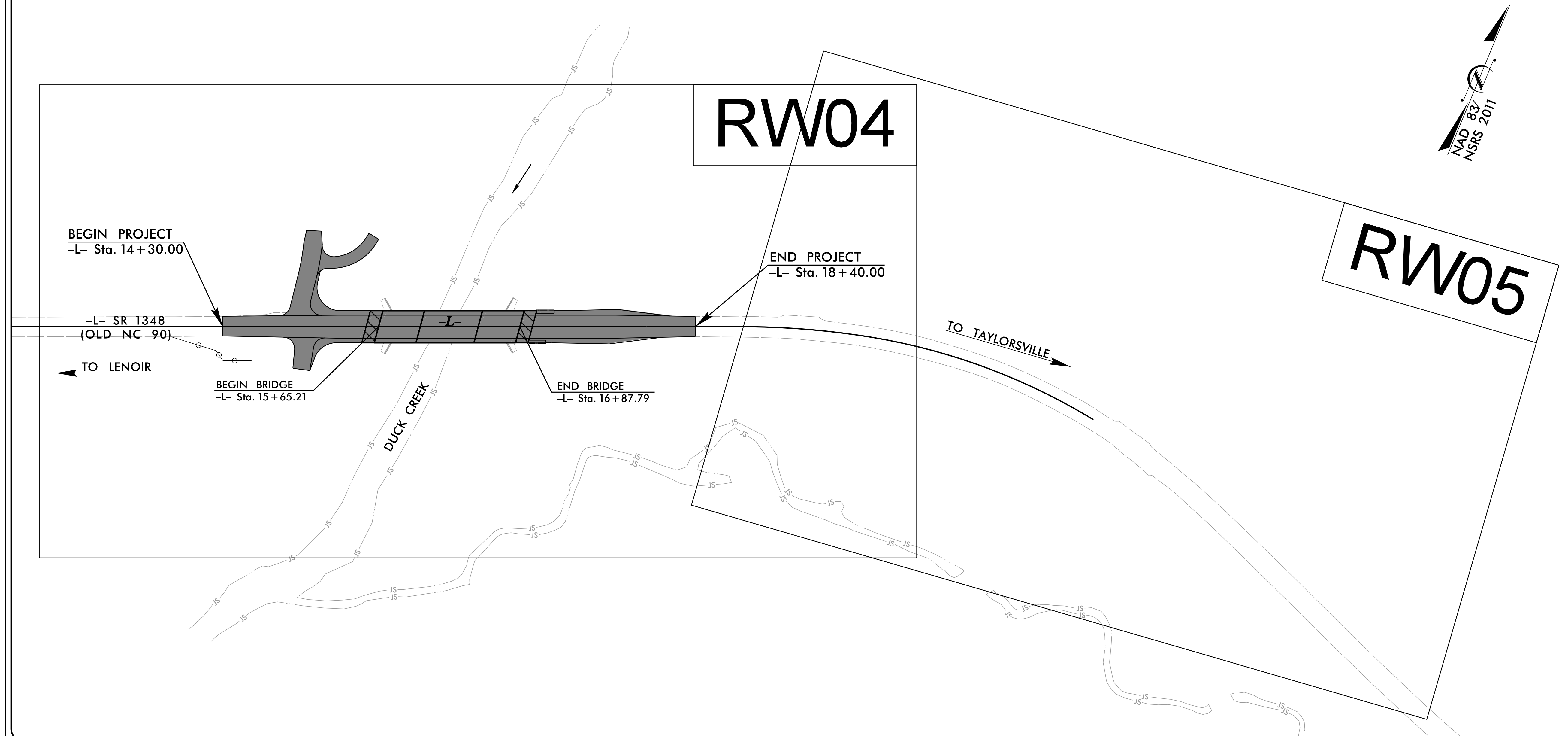
**TIP PROJECT: 17BP.12.R.88**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

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

**ALEXANDER COUNTY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.88	RW01	6



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4980-2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 800,036.873 (usft) EASTING: 1,316,453.309 (usft)  
 ELEVATION: 1145.83 (usft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989100  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4980-2" TO -L- STATION 10+00 IS  
 S 69°04'19.7" W 450.06(ft)  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88 (GEOID G12NC)

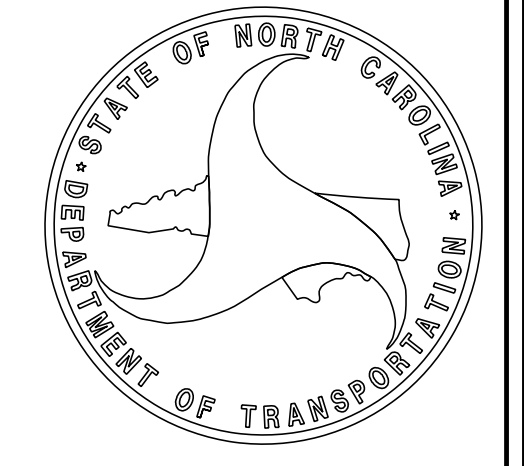
Prepared in the Office of:  
 NCDOT  
 LOCATION AND SURVEY  
 DIVISION 12  
 2312 Kings Rd. Ext.  
 Shelby, NC. 28152

2018 STANDARD SPECIFICATIONS  
**RIGHT OF WAY DATE:** October 8, 2019  
**LETTING DATE:** March 5, 2021

**PROFESSIONAL LAND SURVEYOR**



2/1/2021  
 SIGNATURE: \_\_\_\_\_ Date: \_\_\_\_\_



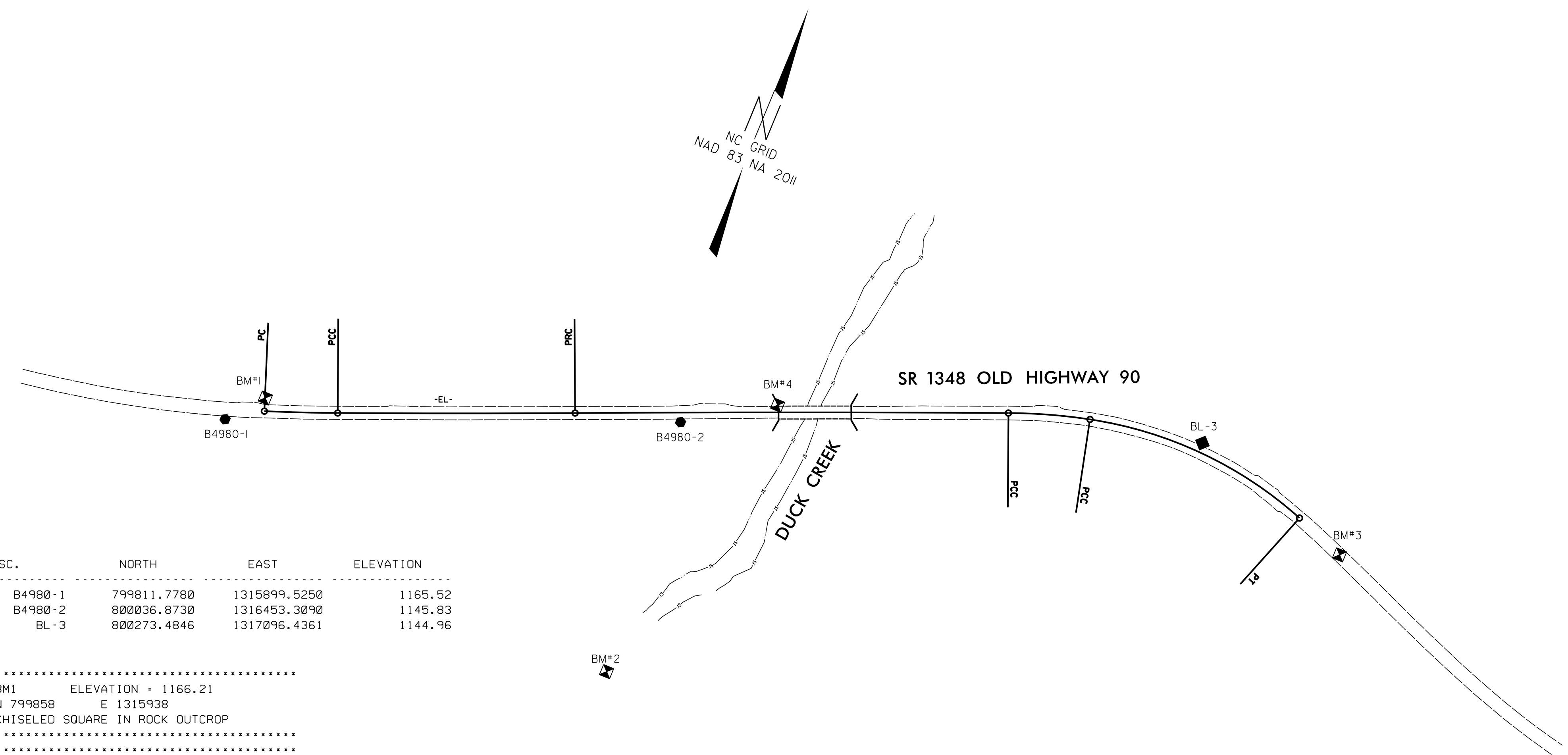
1/27/2021  
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01/29/20

PROJECT REFERENCE NO.	SHEET NO.
17BP12.R.88	RW-02
Location and Surveys	

# SURVEY CONTROL SHEET

## W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BL POINT	DESC.	NORTH	EAST	ELEVATION
LS1	B4980-1	799811.7780	1315899.5250	1165.52
LS2	B4980-2	800036.8730	1316453.3090	1145.83
LS3	BL-3	800273.4846	1317096.4361	1144.96

.....  
 BM1 ELEVATION = 1166.21  
 N 799858 E 1315938  
 CHISELED SQUARE IN ROCK OUTCROP  
 .....  
 BM2 ELEVATION = 1134.31  
 N 799697 E 1316489  
 RR SPIKE IN BASE 38/' SYCAMORE  
 .....  
 BM3 ELEVATION = 1150.70  
 N 800207 E 1317319  
 RR SPIKE FLUSH IN PAVEMENT SR 1348  
 .....  
 BM4 ELEVATION = 1149.24  
 N 800106 E 1316563  
 NCSHC 24JS13  
 .....

BL POINT	N	E	BEARING	DIST
POT	799811.778	1315899.525		
LINE			N 67°52'47.5" E	597.78
POT	800036.873	1316453.309		
LINE			N 69°48'03.7" E	685.27
POT	800273.485	1317096.436		

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	799841.266	1315943.186	N 68°55'26.0" E	96.28	02°07'18.7"(LT)	02°12'13.3"	96.29	48.15	2600.00
CURVE	799875.890	1316033.027	N 67°30'51.6" E	311.52	00°41'50.0"(LT)	00°13'25.7"	311.52	155.76	25600.00
PCC	799995.031	1316320.862	N 67°30'33.8" E	568.62	00°41'14.4"(RT)	00°07'15.2"	568.63	284.32	47400.00
CURVE	800212.547	1316846.238	N 71°57'25.7" E	107.35	08°12'29.2"(RT)	07°38'22.0"	107.44	53.81	750.00
PCC	800245.797	1316948.311	S 87°16'41.2" E	303.91	33°19'17.1"(RT)	10°48'37.9"	308.23	158.61	530.00
PT	800231.366	1317251.874							

- NOTES:
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
  - 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.

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# PROPOSED ALIGNMENT CONTROL SHEET


PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.88	RW-03
Location and Surveys	

L			
TYPE	STATION	NORTH	EAST
PC	10+00.00	799876.1137	1316032.9355
PT	13+11.52	799995.0309	1316320.8623
PC	18+80.14	800212.5475	1316846.2376
PCC	19+87.61	800245.8897	1316948.2947
PT	22+00.00	800254.8237	1317159.1271

**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 INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

# RIGHT OF WAY AND PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.R.88	RW03E-1
<b>Location and Surveys</b>	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

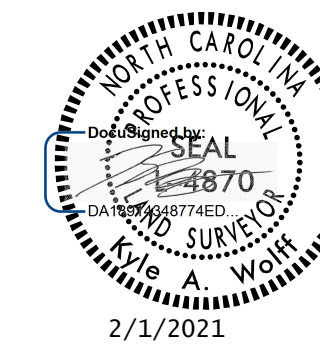
I, KYLE A. WOLFF, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and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

I further certify that the 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 29th day of January, 2020.

-----  
Professional Land Surveyor

L-4870  
PLS #



### ROW MARKER CONCRETE OR GRANITE -E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+80.00	45.00	800017.9034	1316493.7443
L	14+80.00	29.29	800032.4195	1316487.7343
L	14+85.00	-30.72	800089.7799	1316469.3975
L	14+85.00	-46.00	800103.8948	1316463.5536
L	18+15.00	-46.00	800230.1303	1316768.4546
L	18+25.00	45.00	800149.8769	1316812.5044
L	18+40.00	-30.22	800225.1177	1316797.5879
L	18+40.00	29.78	800169.6804	1316820.5401

### ROW MARKER PERMANENT EASEMENT -E

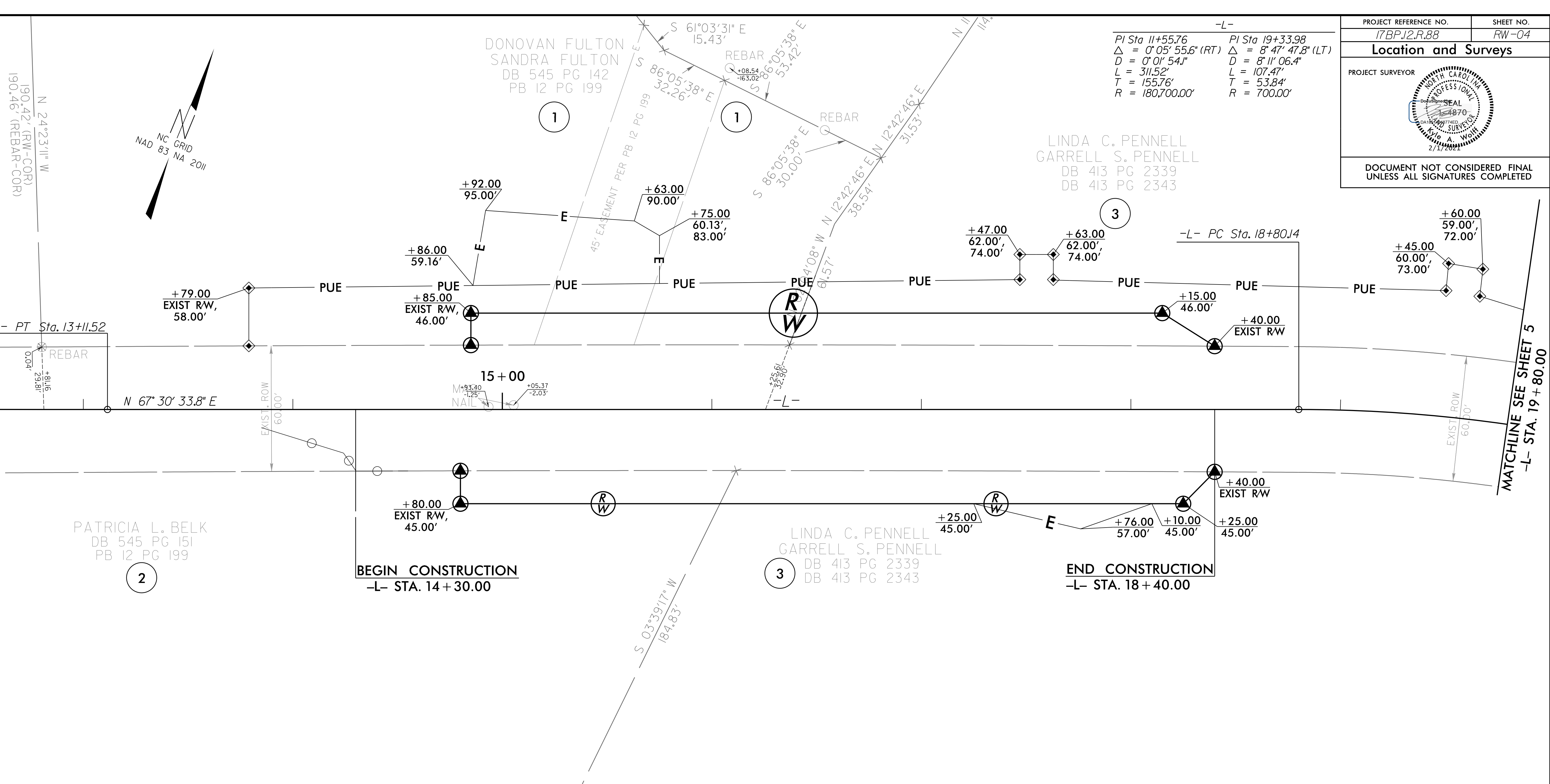
ALIGN	STATION	OFFSET	NORTH	EAST
L	13+79.00	-58.00	800074.4337	1316361.0253
L	13+79.00	-30.36	800048.8933	1316371.5997
L	17+47.00	-62.00	800218.9012	1316699.5060
L	17+47.00	-74.00	800229.9885	1316694.9156
L	17+63.00	-74.00	800236.1090	1316709.6987
L	17+63.00	-62.00	800225.0217	1316714.2891
L	19+45.00	-60.00	800291.8707	1316889.5021
L	19+45.00	-73.00	800304.2905	1316885.6619
L	19+60.00	-72.00	800308.0523	1316901.8130
L	19+60.00	-59.00	800295.5530	1316905.3863
L	21+60.00	-56.00	800315.3225	1317123.8991
L	21+62.00	-49.00	800308.1661	1317125.5122
L	21+86.00	-54.00	800310.3514	1317152.1806
L	21+90.00	-30.05	800286.0406	1317153.2999

**NOTES:**

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

01/29/20



PROJECT REFERENCE NO.	SHEET NO.
17BP12.R.88	RW-04
<b>Location and Surveys</b>	
PROJECT SURVEYOR	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L-	
PI Sta 11+55.76	PI Sta 19+33.98
$\Delta = 0^{\circ}05'55.6''$ (RT)	$\Delta = 8^{\circ}47'47.8''$ (LT)
$D = 0^{\circ}01'54.1''$	$D = 8^{\circ}11'06.4''$
$L = 311.52'$	$L = 107.47'$
$T = 155.76'$	$T = 53.84'$
$R = 180,700.00'$	$R = 700.00'$

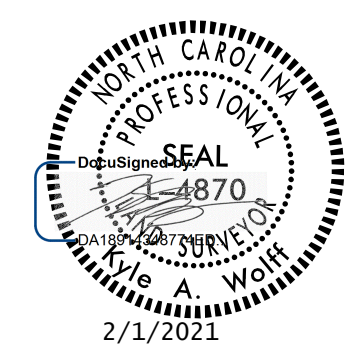
I, KYLE A. WOLFF, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and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

I further certify that the 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 29th day of January, 2020.

Professional Land Surveyor

L-4870  
PLS #



**NOTES:**

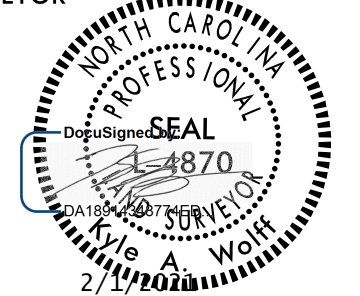
- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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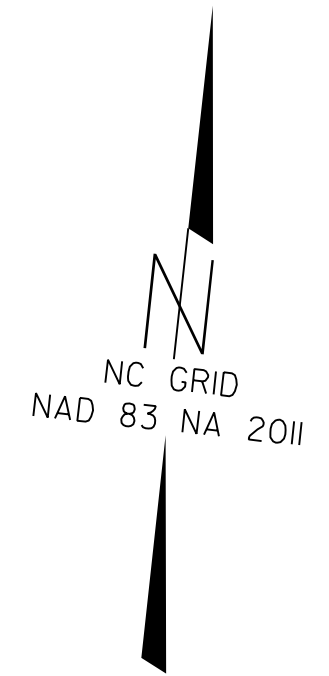


**Location and Surveys**

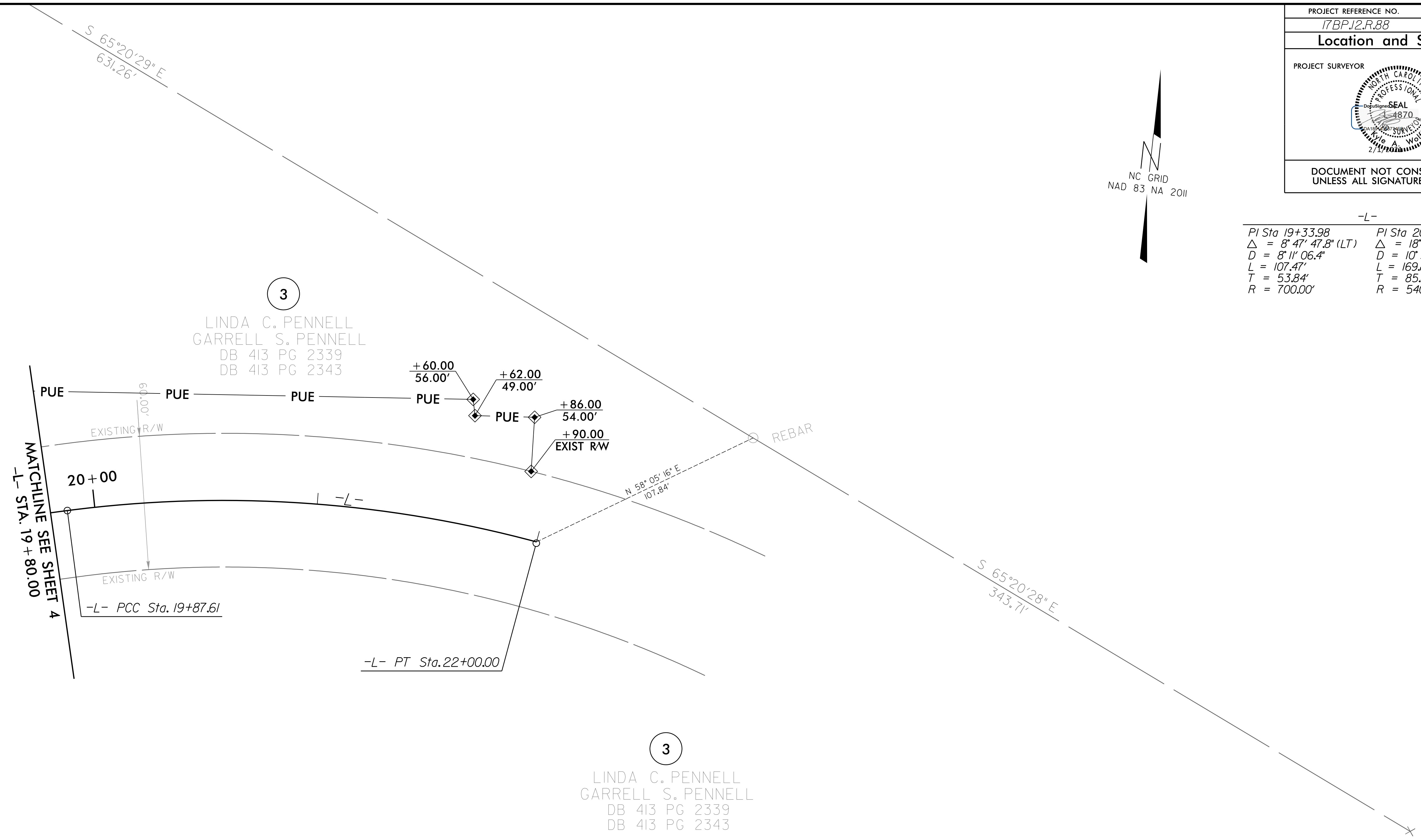
PROJECT SURVEYOR



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



-L-	
PI Sta 19+33.98	PI Sta 20+73.27
$\Delta = 8^{\circ}47'47.8''$ (LT)	$\Delta = 18^{\circ}01'34.3''$ (LT)
D = 8'11"06.4"	D = 10'36'37.2"
L = 107.47'	L = 169.89'
T = 53.84'	T = 85.65'
R = 700.00'	R = 540.00'



3  
LINDA C. PENNELL  
GARRELL S. PENNELL  
DB 413 PG 2339  
DB 413 PG 2343

3  
LINDA C. PENNELL  
GARRELL S. PENNELL  
DB 413 PG 2339  
DB 413 PG 2343

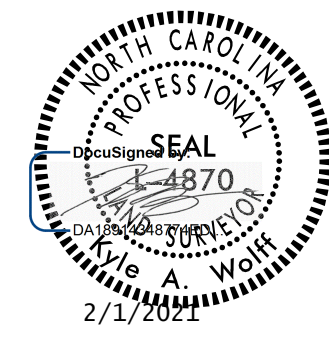
I, Kyle A. Wolff, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and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

I further certify that the 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 29th day of January, 2020.

Professional Land Surveyor

L-4870  
PLS #



**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.

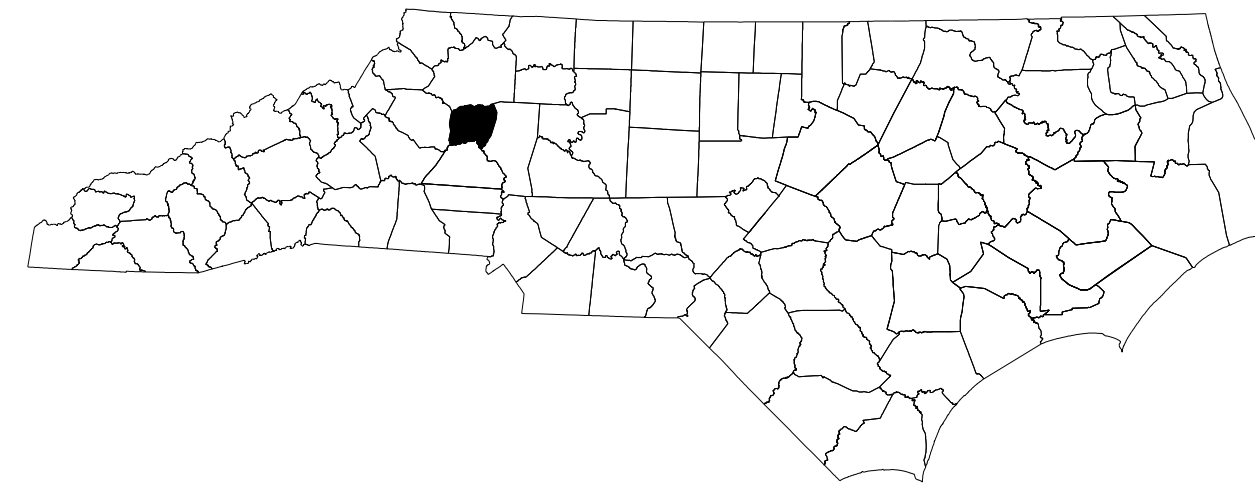
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1/27/2021 10:50 AM F:\010291\_1s\_rw05.dgn

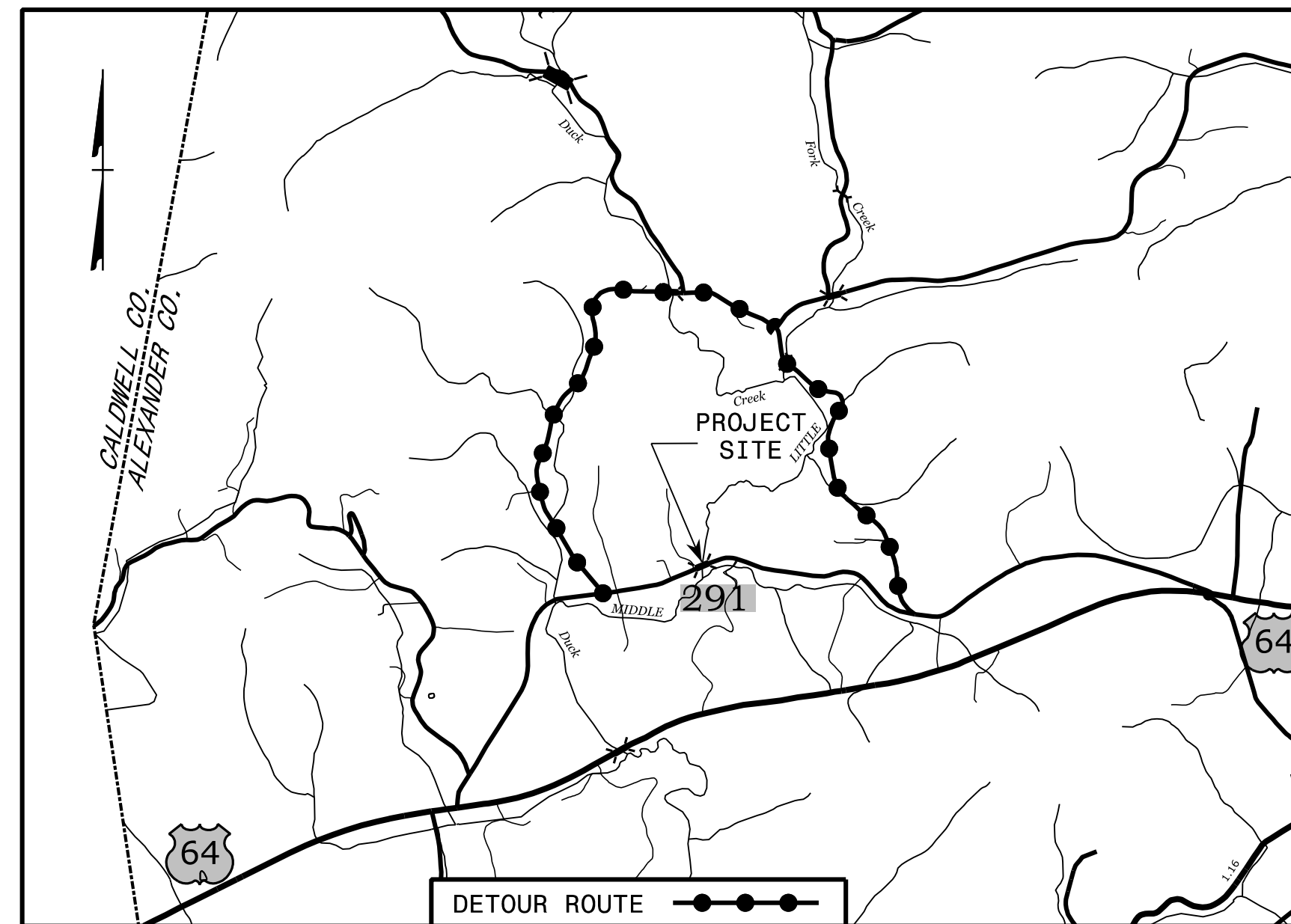
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**ALEXANDER COUNTY**



LOCATION: BRIDGE NO. 291 OVER DUCK CREEK ON  
SR 1348 (OLD NC 90)



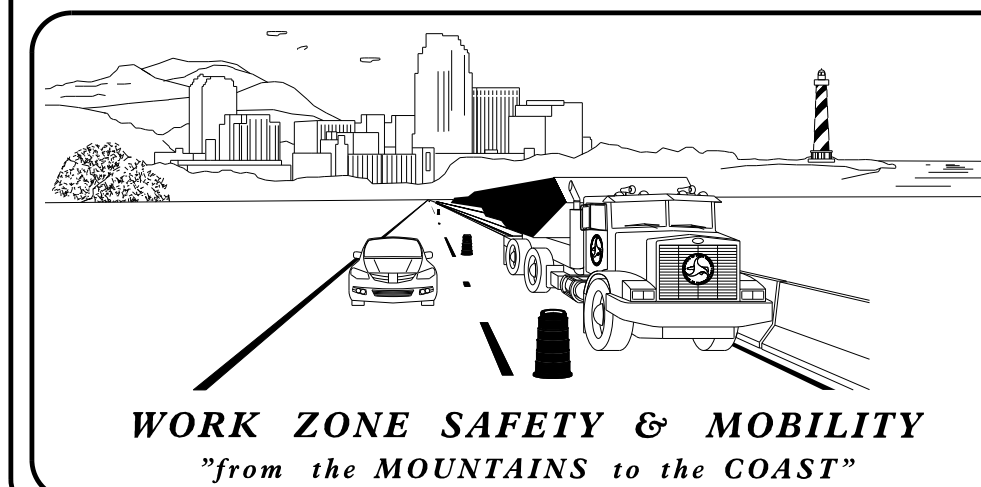
**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES AND GENERAL NOTES)
TMP-2	TRAFFIC CONTROL PHASING
TMP-3	OFFSITE DETOUR
SD-1	SIGN DESIGN

SHEET NO.  
TMP-1

**PROJECT: 17BP.12.R.88**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



N.C.D.O.T. HIGHWAY DIVISION 12  
1710 E. MARION STREET SHELBY, NC 28151  
PHONE: (704) 480-9020

S. RACKLEY, PE **DIVISION BRIDGE MANAGER**



PLANS PREPARED BY :

**RKK**  
P: (919) 878-8660  
8801 Six Forks Road, Forum 1, Suite 700  
Raleigh, North Carolina 27615-3960  
NC License No. F-0112  
Engineers | Construction Managers | Planners | Scientists  
www.rkk.com  
Responsive People | Creative Solutions

**FOR  
DIVISION OF HIGHWAYS**

APPROVED: *C. Byron Holden*  
DATE: 1/30/2021

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 033753  
BYRON HOLDEN

1/30/2021  
291\_TMP\_TSH.dgn  
deFault

**CONTRACT: DL00220**

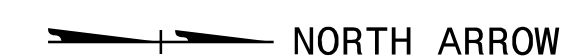
# ROADWAY STANDARD DRAWINGS

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:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

# LEGEND

## GENERAL

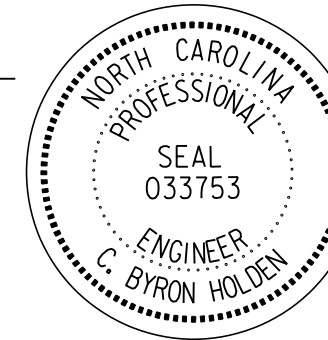
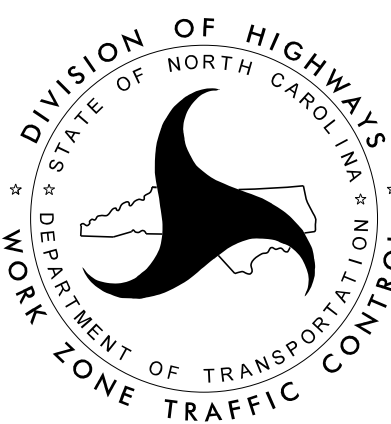


## TRAFFIC CONTROL DEVICES



## TEMPORARY SIGNING



<p>DocuSigned by:  APPROVED: <i>C. Byron Holden</i>  DATE: 1/30/2021</p> <p>SEAL</p> 		
<p><b>DOCUMENT NOT CONSIDERED FINAL  UNLESS ALL SIGNATURES COMPLETED</b></p>		

## MANAGEMENT STRATEGIES

## GENERAL NOTES / LOCAL NOTES

**TRAFFIC MANAGEMENT STRATEGIES:**

**OFF-SITE DETOURS / USE OF ALTERNATIVE ROUTES**

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 UNDESIRE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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

**TRAFFIC PATTERN ALTERATIONS**

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

**SIGNING**

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

AND

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

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

AND

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

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

- E) THE CONTRACTOR SHALL REPLACE ANY EXISTING SIGNS DAMAGED BY CONSTRUCTION OPERATIONS. THE SIGNS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR ACCORDING TO NCDOT'S SPECIFICATIONS. THE CONTRACTOR SHALL REMOVE ANY BRIDGE SIGNS NO LONGER APPLICABLE AFTER THE BRIDGE REPLACEMENT BOTH WITHIN AND OUTSIDE THE CONSTRUCTION LIMITS.

**TRAFFIC CONTROL DEVICES**

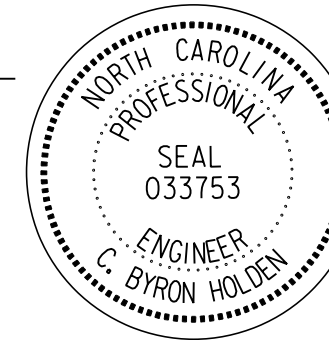

- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

**PAVEMENT MARKINGS AND MARKERS**

- G) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS SHOWN IN THE PAVEMENT MARKING PLAN.

**LANE AND SHOULDER CLOSURE REQUIREMENTS**

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

<p>DocuSigned by:  APPROVED: <i>C. Byron Holden</i>  <small>SC2AD85EAF0545F</small>  DATE: 1/30/2021</p>			
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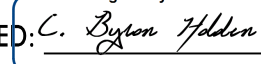
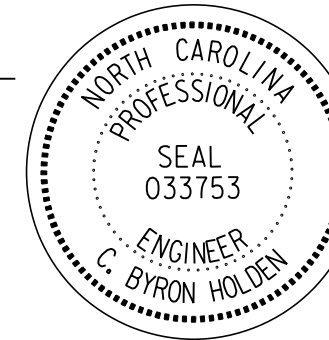

## TRAFFIC CONTROL PHASING

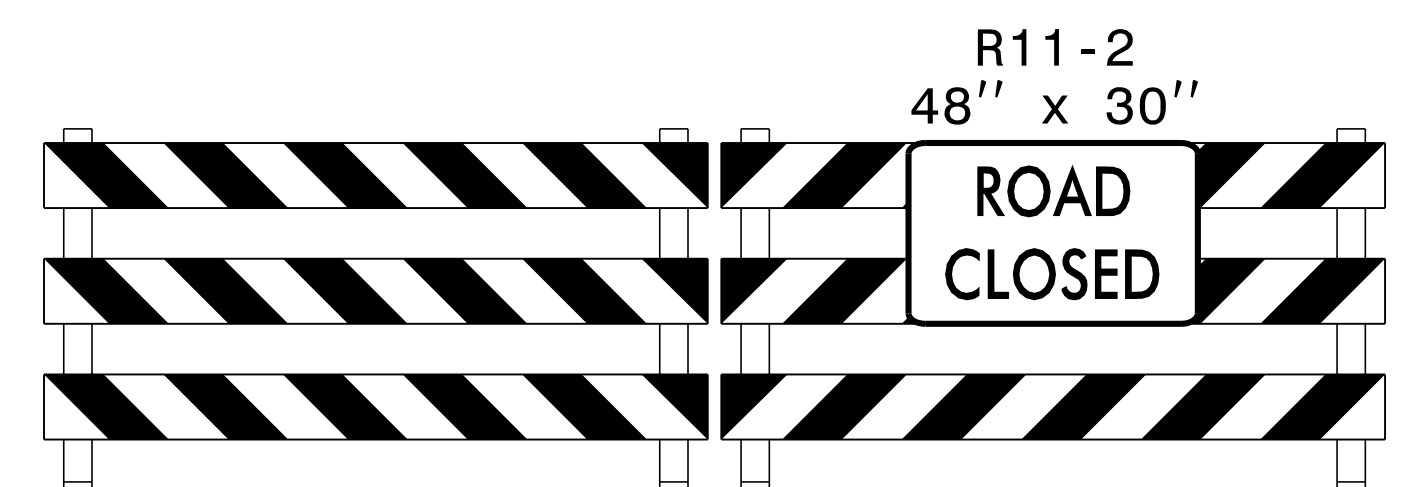
### PHASE I

- STEP 1) USING AN APPROVED METHOD PER THE DISCRETION OF THE ENGINEER, INSTALL SIGNING FOR THE SR 1348 (OLD NC 90) OFFSITE DETOUR, KEEPING SIGNS COVERED. REFER TO ROADWAY STANDARD DRAWING NUMBER 1101.03 SHEET 1, TMP-3 AND SD-1 FOR SIGN LOCATIONS AND DESIGN.
- STEP 2) UNCOVER OFF-SITE DETOUR SIGNS AND CLOSE SR 1348 (OLD NC 90) TO THRU TRAFFIC USING ROADWAY STANDARD DRAWING NUMBER 1101.03 SHEET 2.

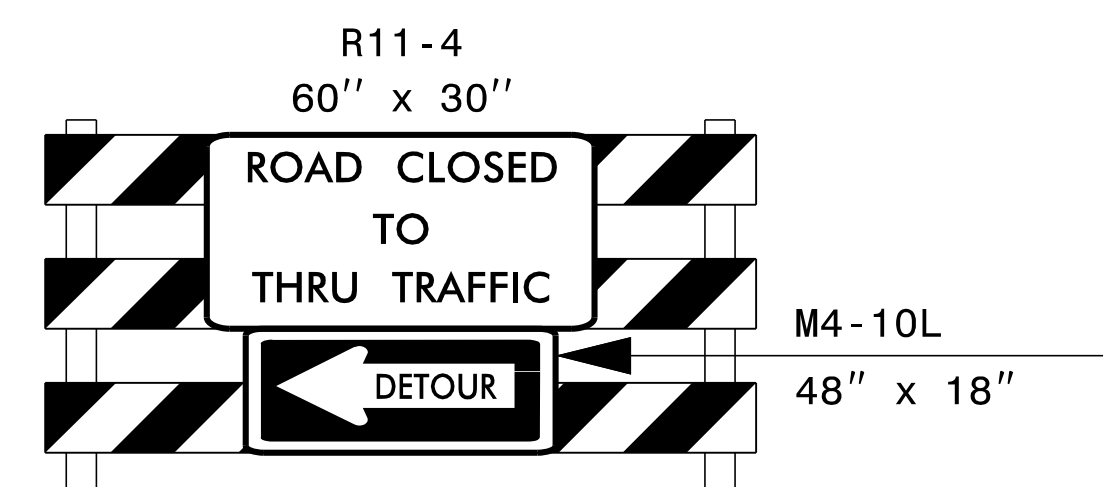
### PHASE II

- STEP 1) DEMOLISH AND REMOVE EXISTING BRIDGE NO. 291 OVER DUCK CREEK.
- STEP 2) CONSTRUCT PROPOSED STRUCTURE AND APPROACH ROADWAY WIDENING AND PAVING (SEE ROADWAY PLANS AND STRUCTURE PLANS). REPLACE ANY EXISTING SIGNS REMOVED DUE TO CONSTRUCTION OPERATIONS.
- STEP 3) PLACE THE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH THE FINAL PAVEMENT MARKING PLANS AND OPEN SR 1348 (OLD NC 90) TO TRAFFIC. REMOVE ANY REMAINING TRAFFIC CONTROL DEVICES AND DETOUR SIGNS FROM THE PROJECT.

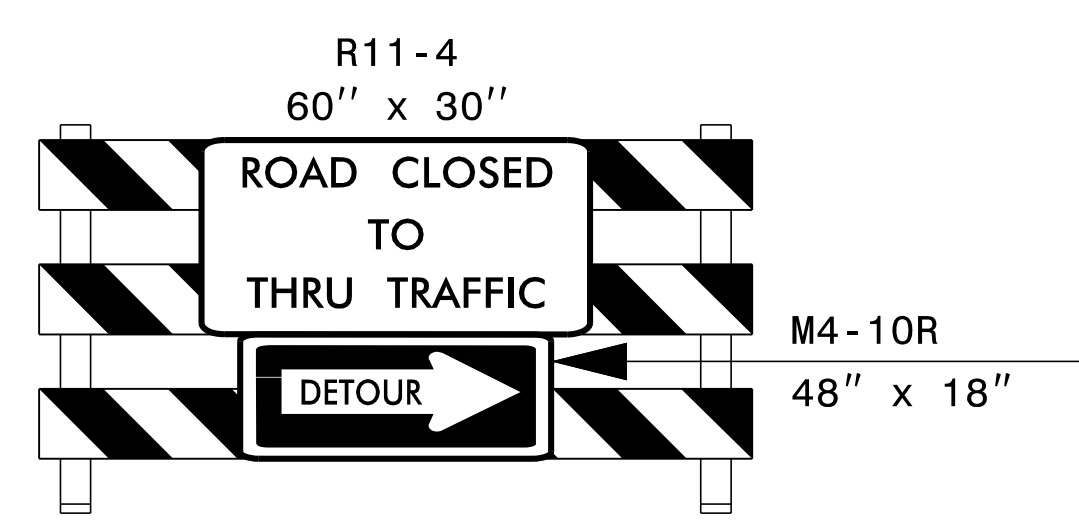
DocuSigned by: APPROVED:  <small>SC0A05EAF0545F</small> DATE: 1/30/2021	SEAL 	
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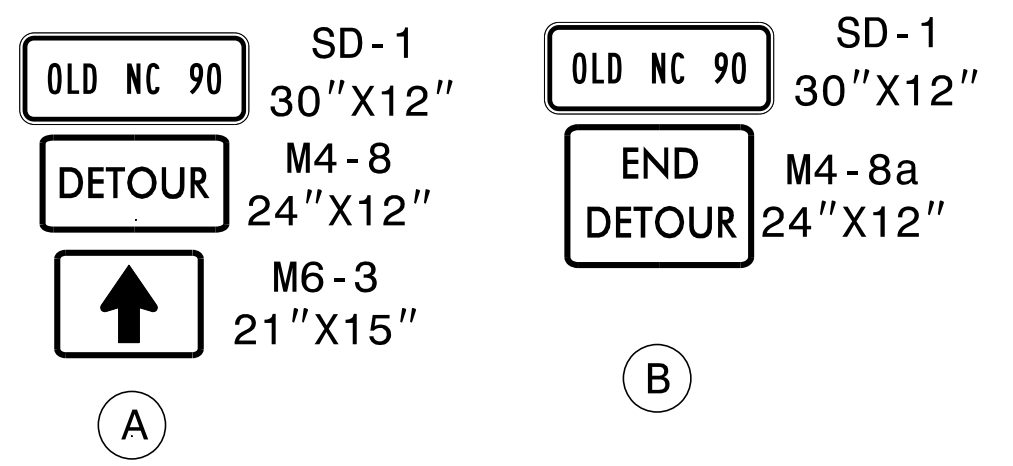
TYPE III BARRICADE(S)  
①



TYPE III BARRICADE  
②



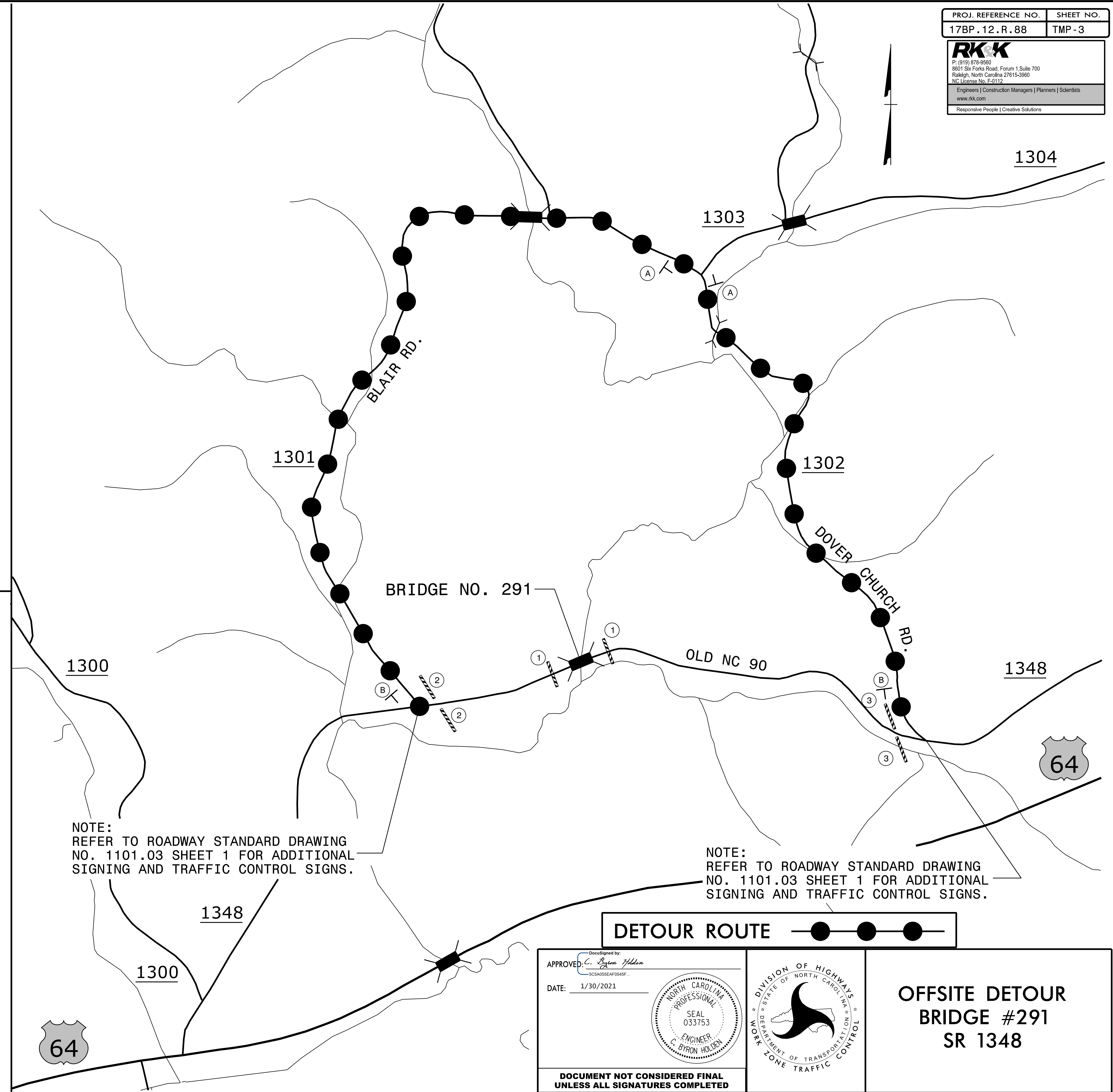
TYPE III BARRICADE  
③



NOTE:  
REFER TO ROADWAY STANDARD DRAWING  
NO. 1101.03 SHEET 1 FOR ADDITIONAL  
SIGNING AND TRAFFIC CONTROL SIGNS.

NOTE:  
REFER TO ROADWAY STANDARD DRAWING  
NO. 1101.03 SHEET 1 FOR ADDITIONAL  
SIGNING AND TRAFFIC CONTROL SIGNS.

**DETOUR ROUTE** —●—●—●—



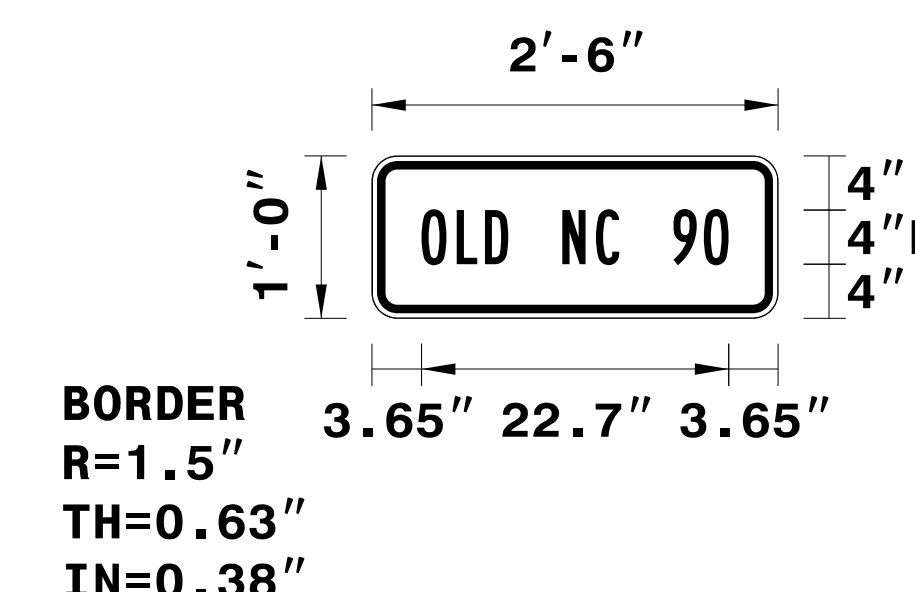
NOTE: SEE SD-1 FOR SIGN DESIGN.

DocuSigned by:  
APPROVED: *C. Byron Holden*  
DATE: 1/30/2021

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

**OFFSITE DETOUR  
BRIDGE #291  
SR 1348**

1/30/2021  
 I:\2021\17BP.12.R.88\17BP.12.R.88.TMP\03.dgn  
 2021.01.30 10:03:03 AM  
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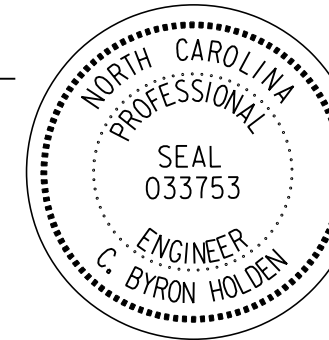
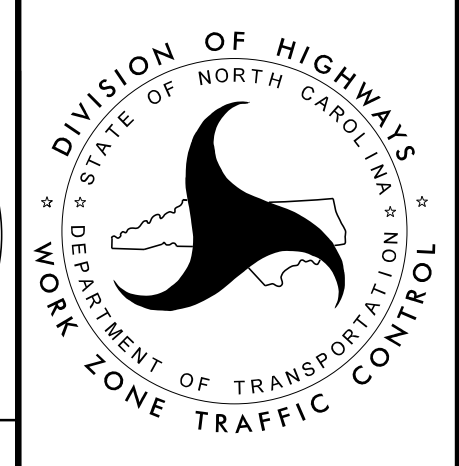
<p>SIGN NUMBER: SD-1      BACKG COLOR: Fluorescent Orange          TYPE: STATIONARY      COPY COLOR: Black          QUANTITY: SEE PLANS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>SIGN WIDTH: 2'-6"          HEIGHT: 1'-0"          TOTAL AREA: 2.5 Sq.Ft.</p> <p>BORDER TYPE: INSET          RECESS: 0.38"          WIDTH: 0.63"          RADII: 1.5"</p> <p>NO. Z BARS:      MAT'L: 0.080" (2.0 mm) ALUMINUM          LENGTH:</p>	SYMBOL	X	Y	WID	HT																															<p>DESIGN BY: LAT      CHECKED BY: CBH      DATE: Mar 24, 2020          PROJECT ID: 291      DIV: 12</p> <div style="text-align: center;">  </div> <p style="text-align: right;">Spacing Factor is 1 unless specified otherwise</p>
SYMBOL	X	Y	WID	HT																																
<p style="text-align: center;">USE NOTES: 1,2</p> <p>1. Legend and border shall be direct applied black non-reflective sheeting.          2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.</p>																																				

**LETTER POSITIONS**


Letter spacings are to start of next letter

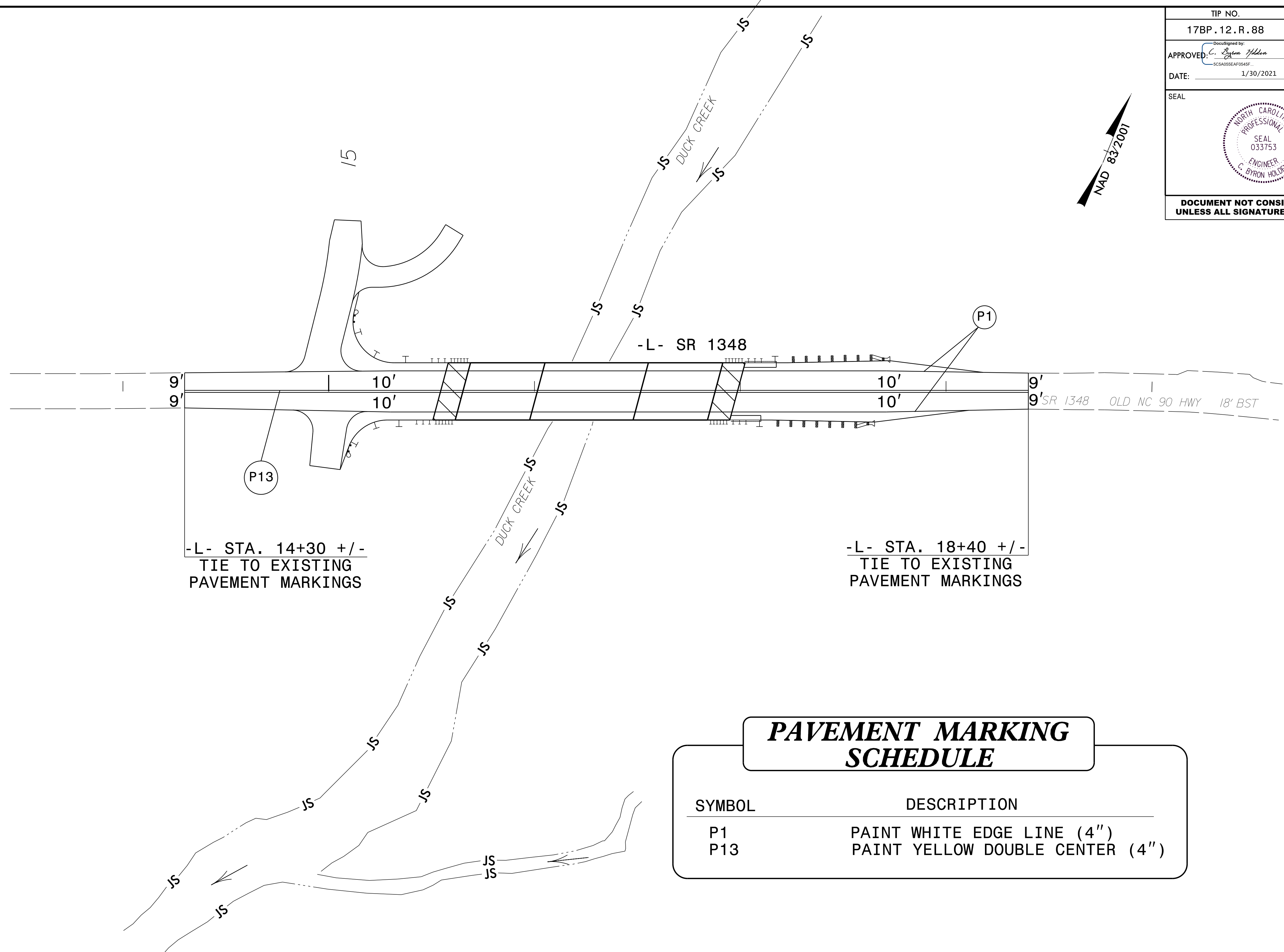
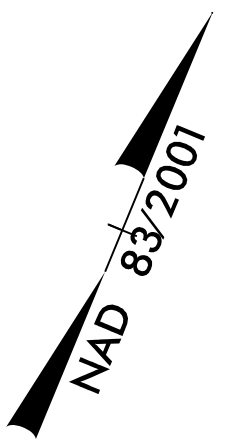
Letter spacings are to start of next letter												Series/Size
O	L	D	N C			9	0					Text Length
3.7	2.6	2.1	1.7	4	2.5	1.7	4	2.2	1.8	3.7		<b>B 2000</b>
												22.7

FILENAME: 291\_SD1 NORTH CAROLINA D.O.T. SIGN DETAIL

<p>APPROVED: <i>C. Byron Holden</i>  <small>SCS0305EAF0504SF</small>          DATE: 1/30/2021</p>			<h2 style="margin: 0;">SIGN DESIGN</h2>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

1/30/2021 291\_SD1.dgn default

TIP NO. 17BP.12.R.88	SHEET NO. PMP-2
APPROVED: <i>C. Byron Holden</i> <small>SCS&amp;AS&amp;E&amp;F&amp;S&amp;E&amp;F</small>	
DATE: 1/30/2021	
SEAL	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**PAVEMENT MARKING SCHEDULE**

SYMBOL	DESCRIPTION
P1	PAINT WHITE EDGE LINE (4")
P13	PAINT YELLOW DOUBLE CENTER (4")

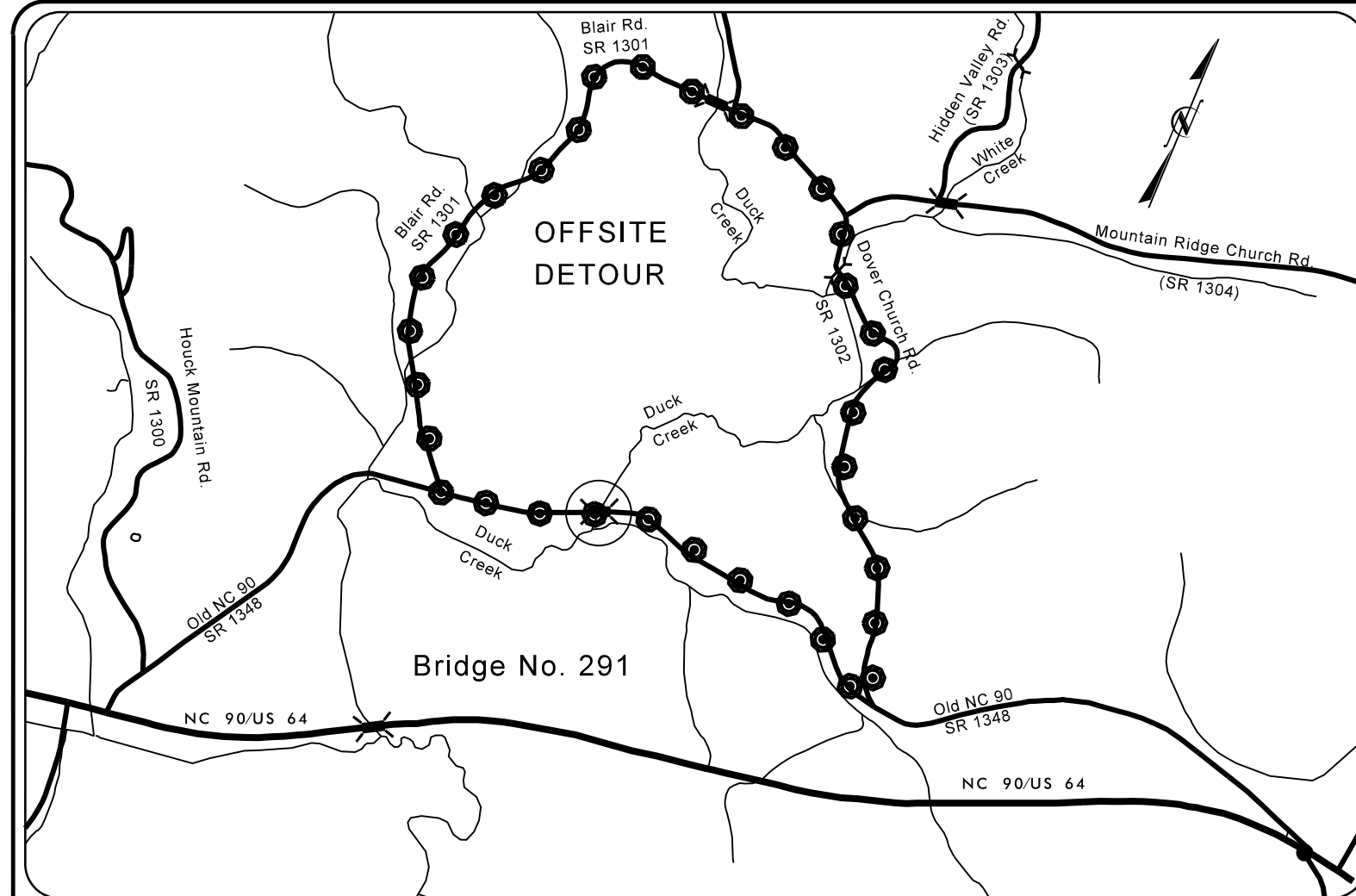
1/30/2021 0102-91\_PMP\_PSH02.dgn

**RK-K**  
 P: (919) 878-9560  
 8601 Six Forks Road, Forum 1, Suite 700  
 Raleigh, North Carolina 27615-3860  
 NC License No. F-2112  
 Engineers | Construction Managers | Planners | Scientists  
 www.rkk.com  
 Responsive People | Creative Solutions

PAVEMENT MARKING DETAIL



**PROJECT: 17BP.12.R.88**



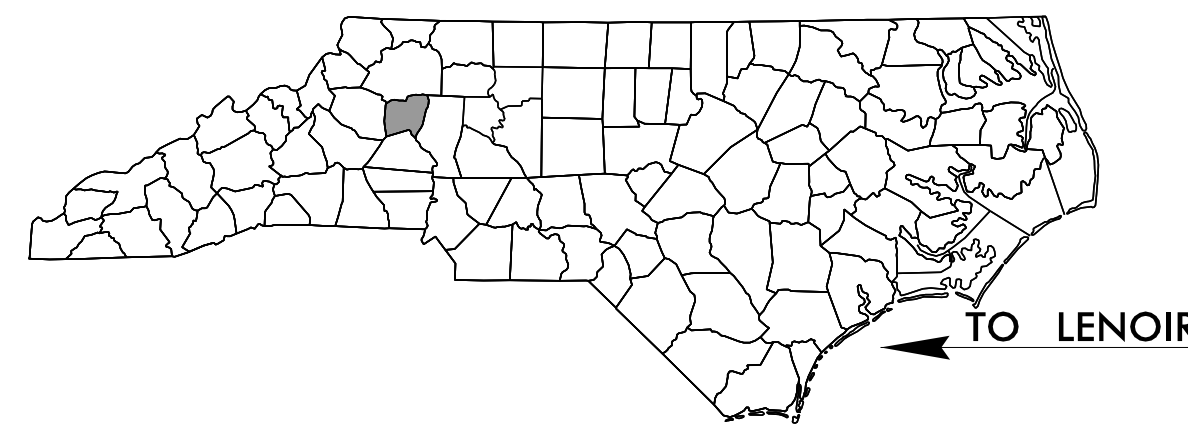
VICINITY MAP  
(NOT TO SCALE)

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

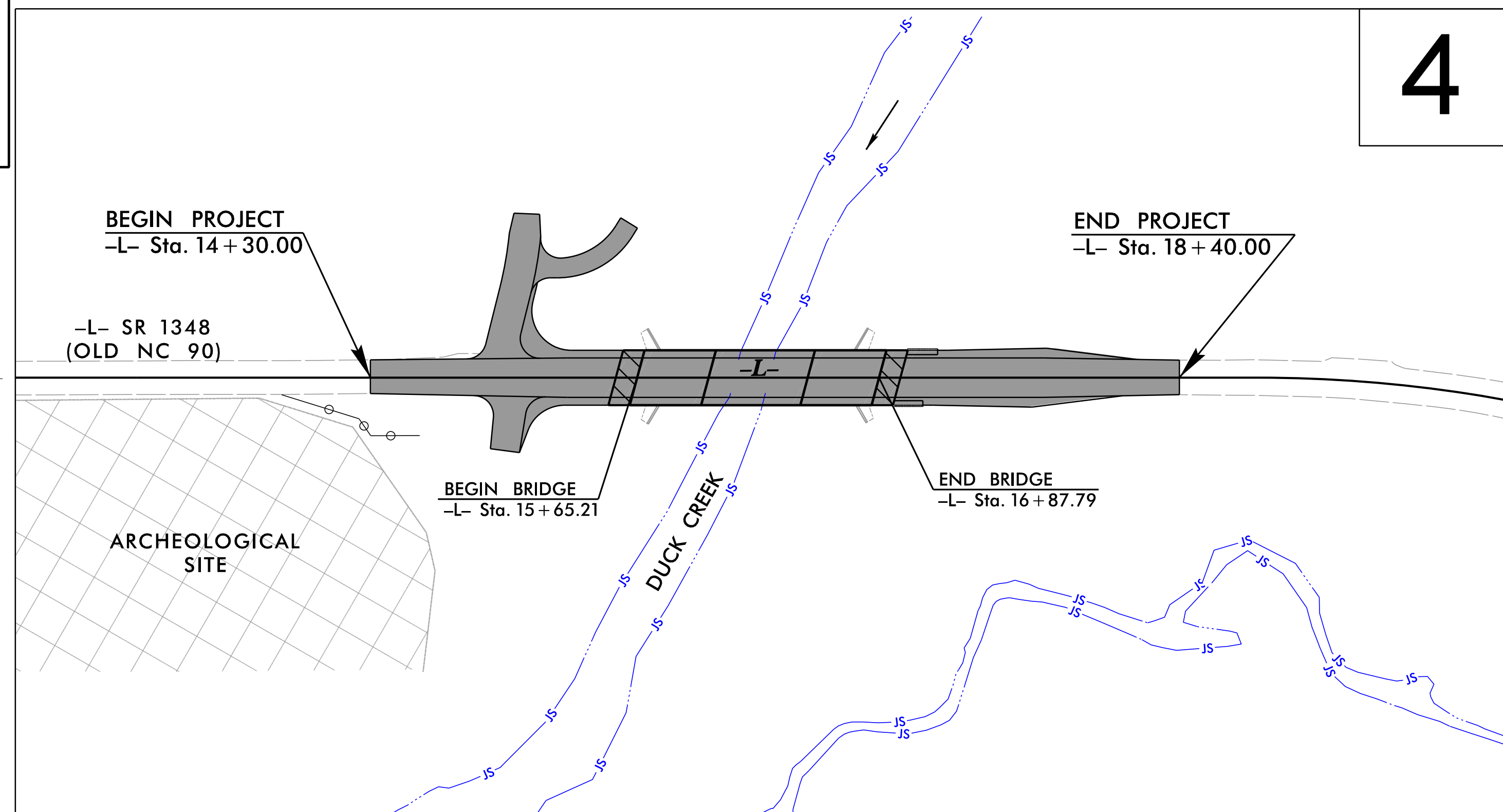
**LOCATION: BRIDGE NO. 291 OVER DUCK CREEK  
ON SR 1348 (OLD NC 90)**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING,  
STRUCTURES, AND RESURFACING**

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

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



- Clearing and Grubbing Phase
- Final Phase
- Both Phases



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.88	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

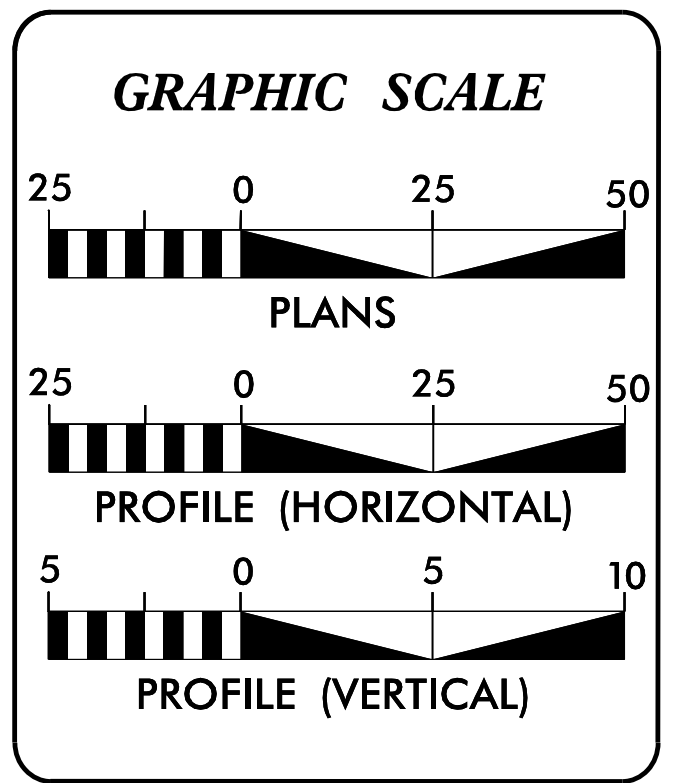
**EROSION AND SEDIMENT CONTROL MEASURES**

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

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:  
**RK&K**  
RUMMEL, KLEPPER & KAHL, LLP  
8601 Six Forks Road, Forum 1, Suite 700  
Raleigh, North Carolina 27615-3960  
NC License No. F-0112  
919-878-9560

Designed by:  
**Jonathan M. Whittington, P.E.**      3245  
NAME      LEVEL III CERTIFICATION NO.

Reviewed in the Office of:  
**ROADSIDE ENVIRONMENTAL UNIT**  
1 South Wilmington St.  
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by: \_\_\_\_\_

Roadway Standard Drawings

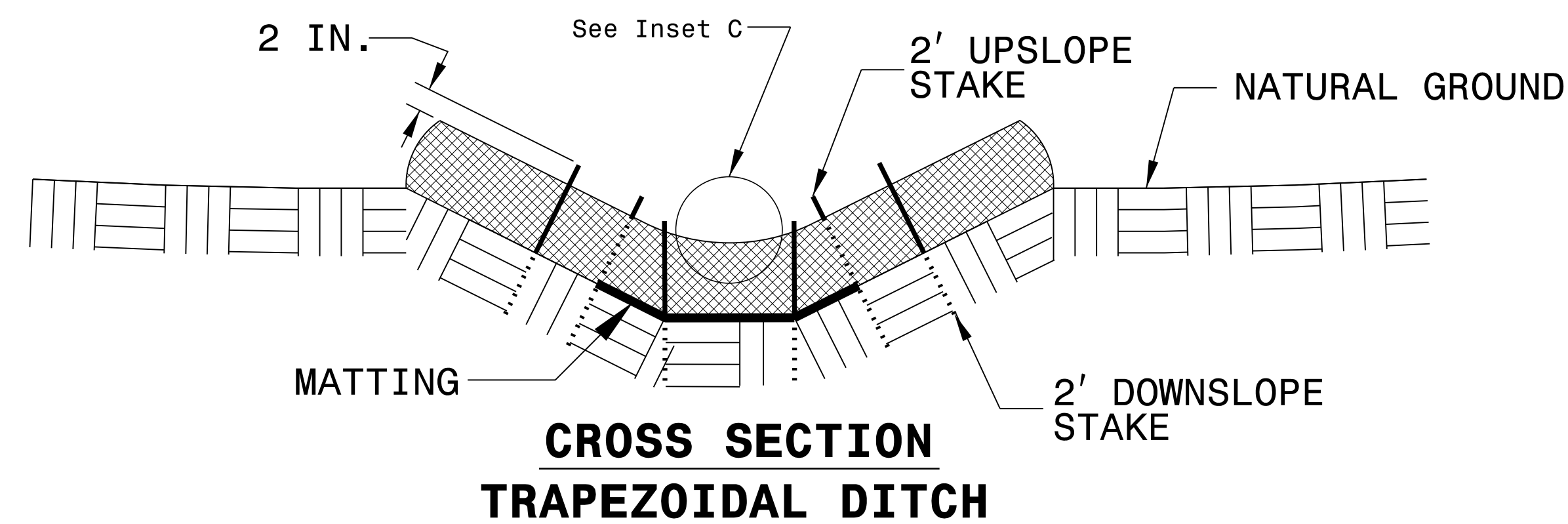
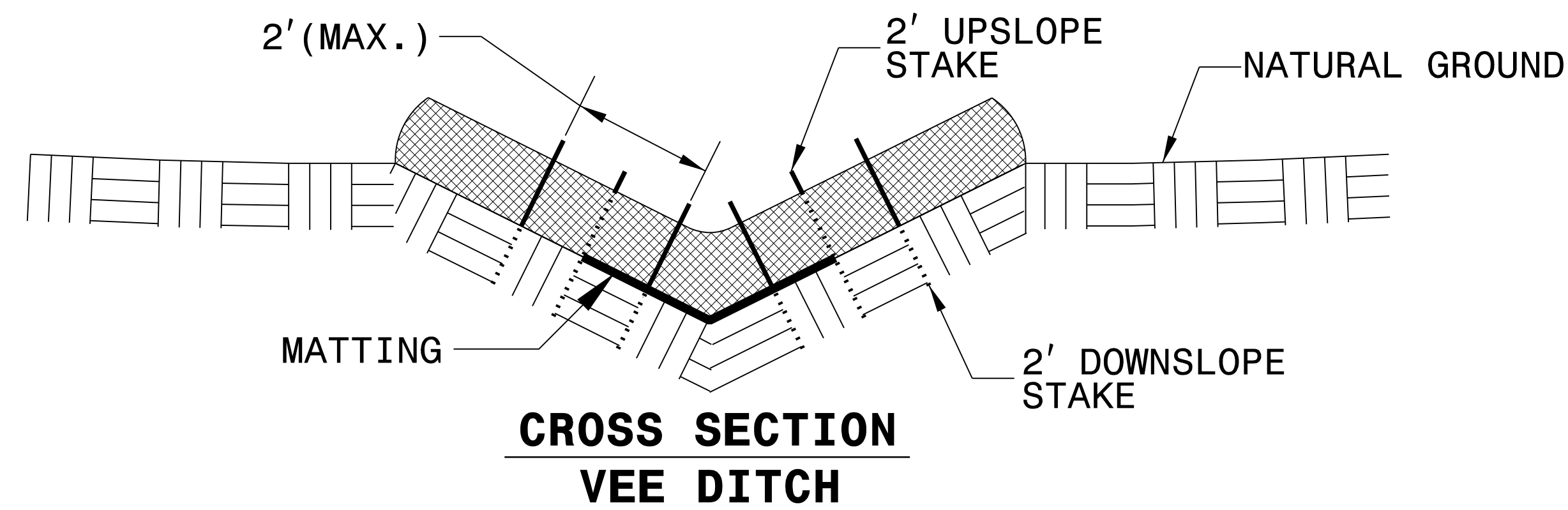
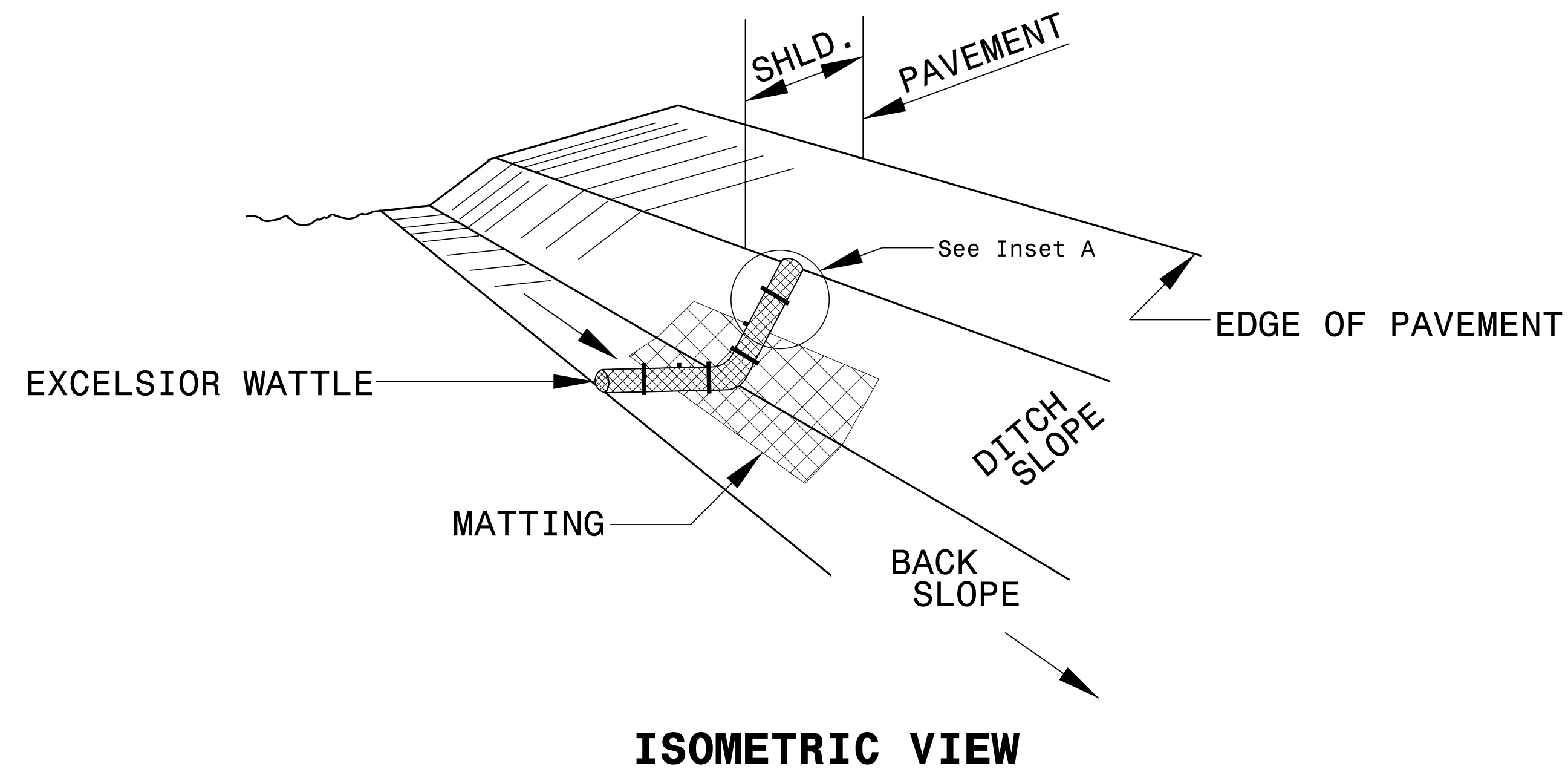
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

4/13/2020 EC\SF-010291L\_Hyd\_EC\_sahvdgn

PROJECT REFERENCE NO. 17BPJ2.R.88	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



**NOTES:**

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

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

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

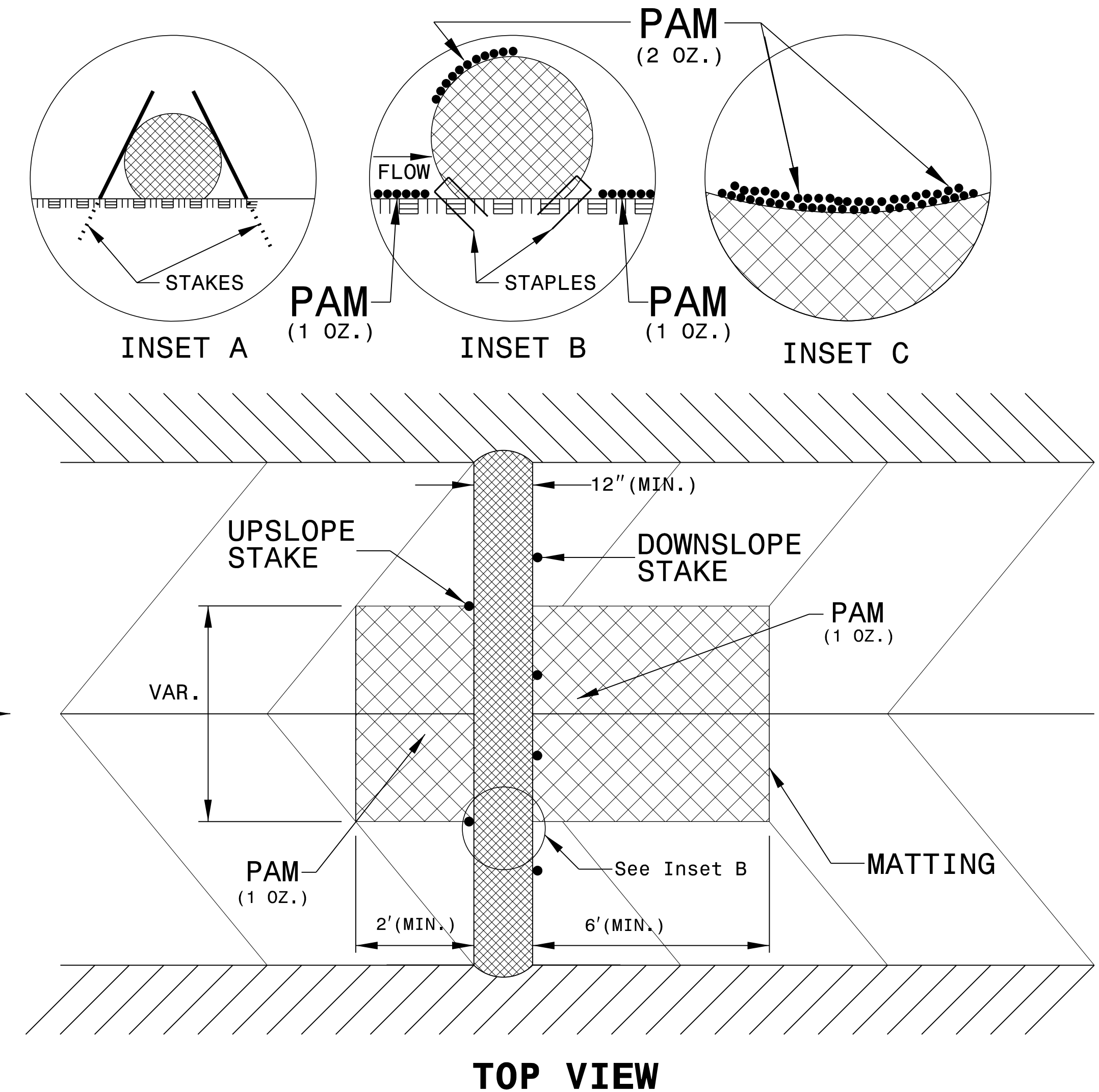
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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

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

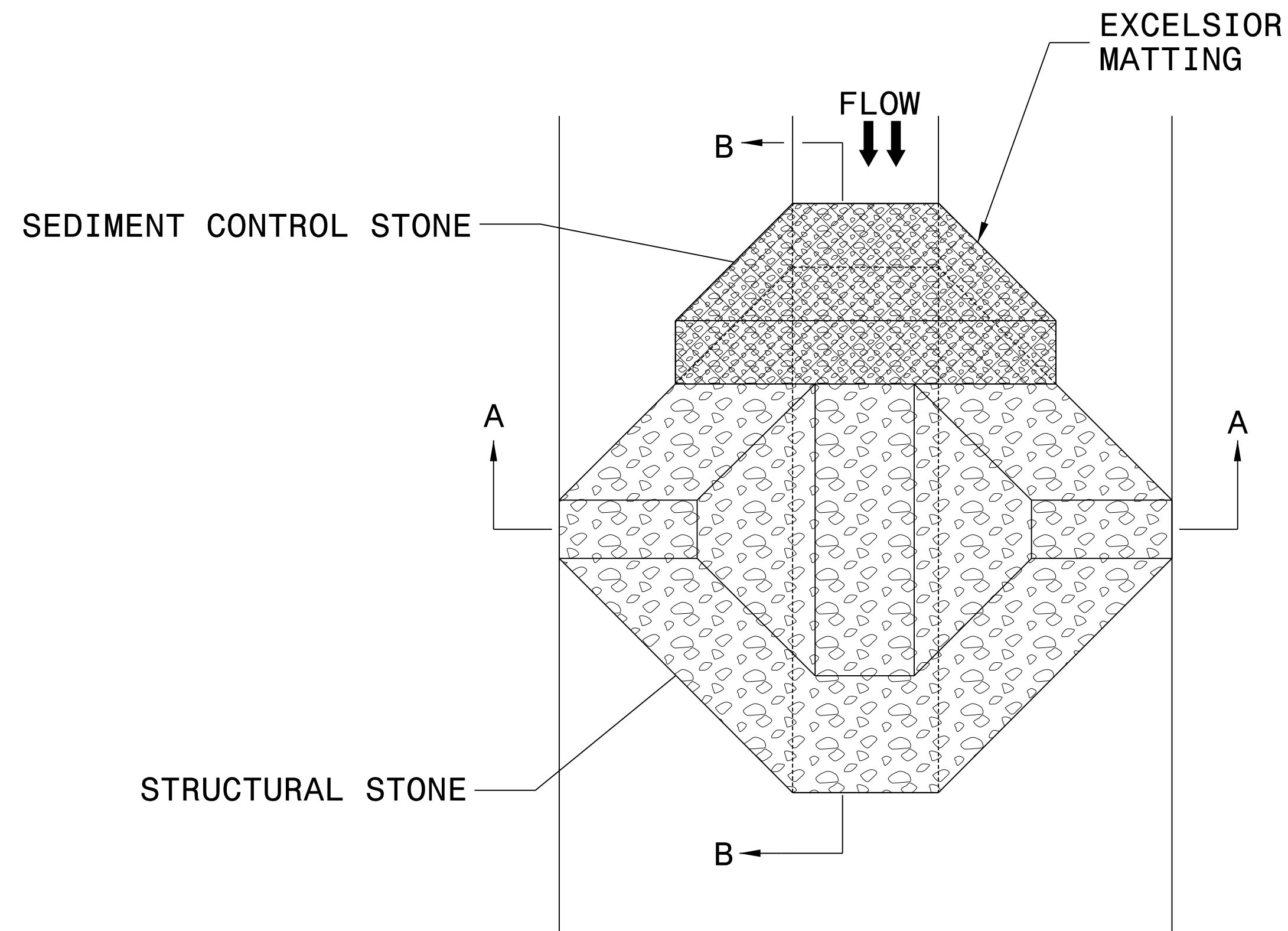
PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

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



PROJECT REFERENCE NO. 17BP.12.R.88	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

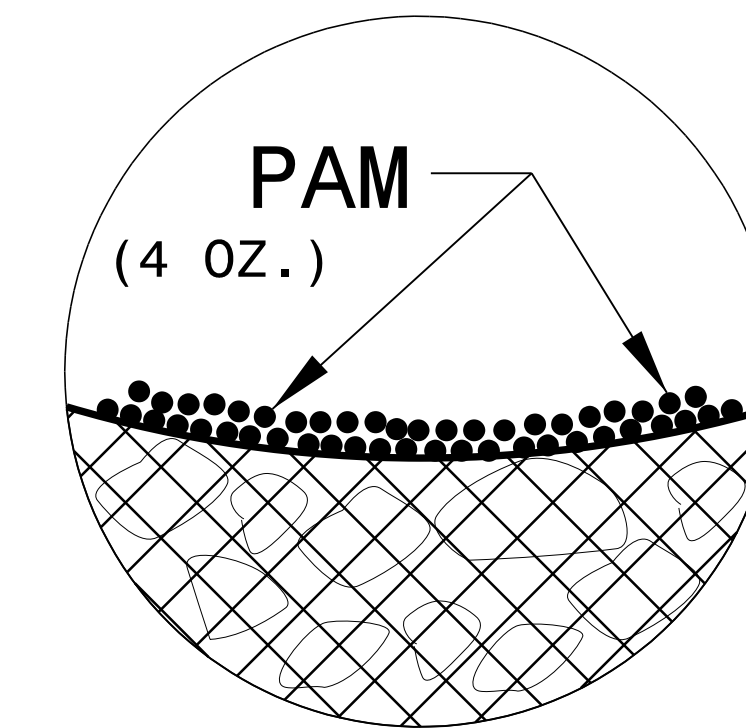
**NOTES:**

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

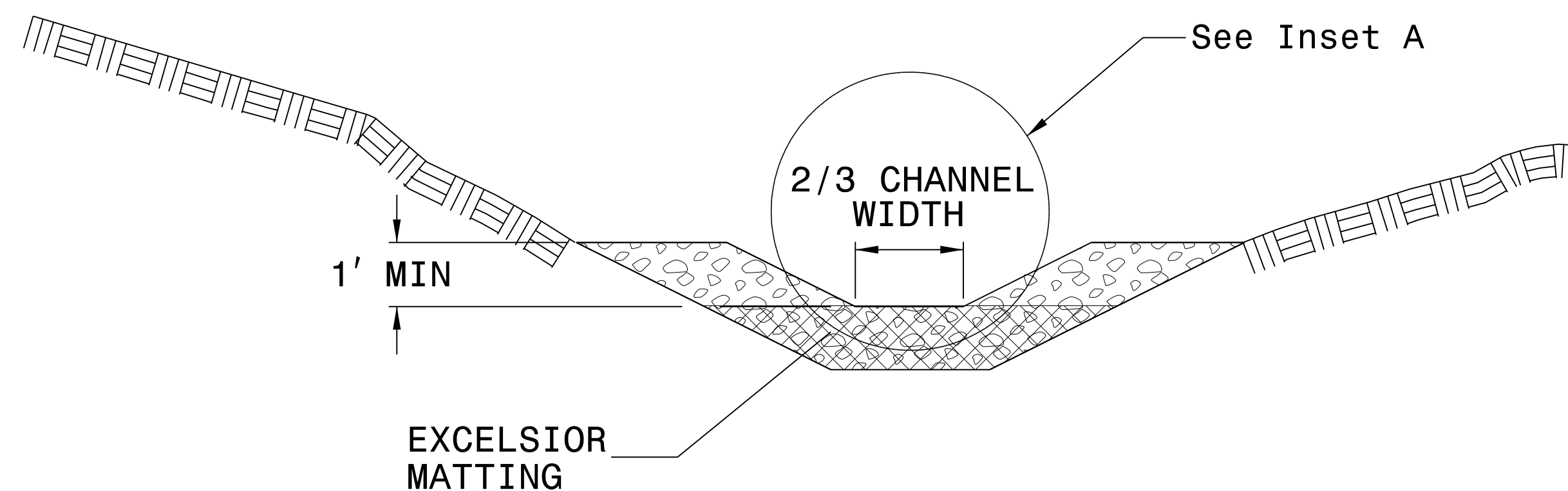
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.

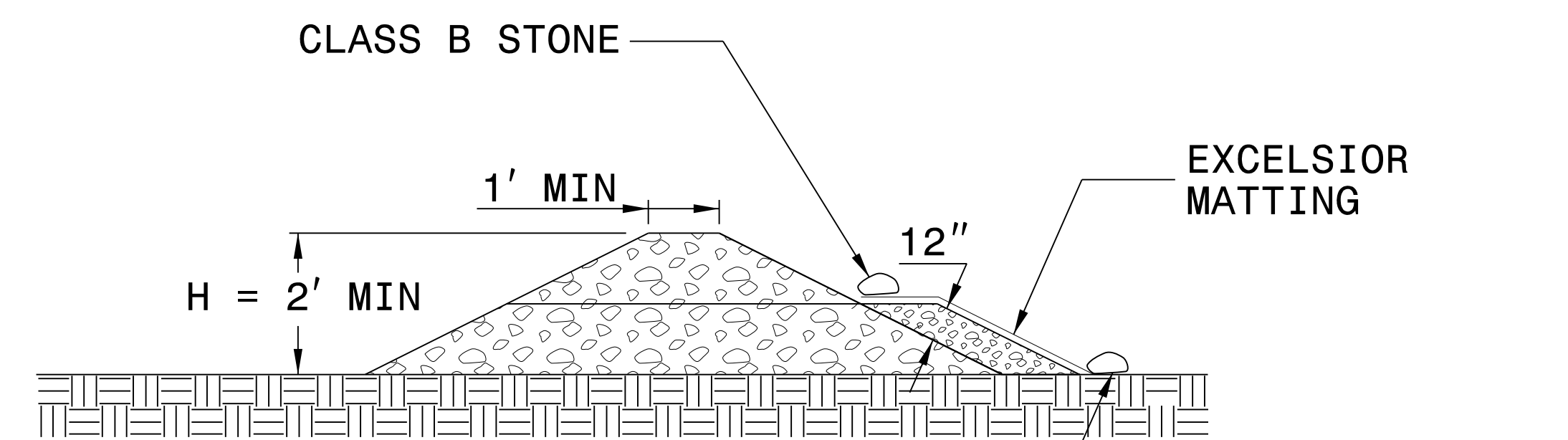
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO.	SHEET NO.
17BPJ2R88	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

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

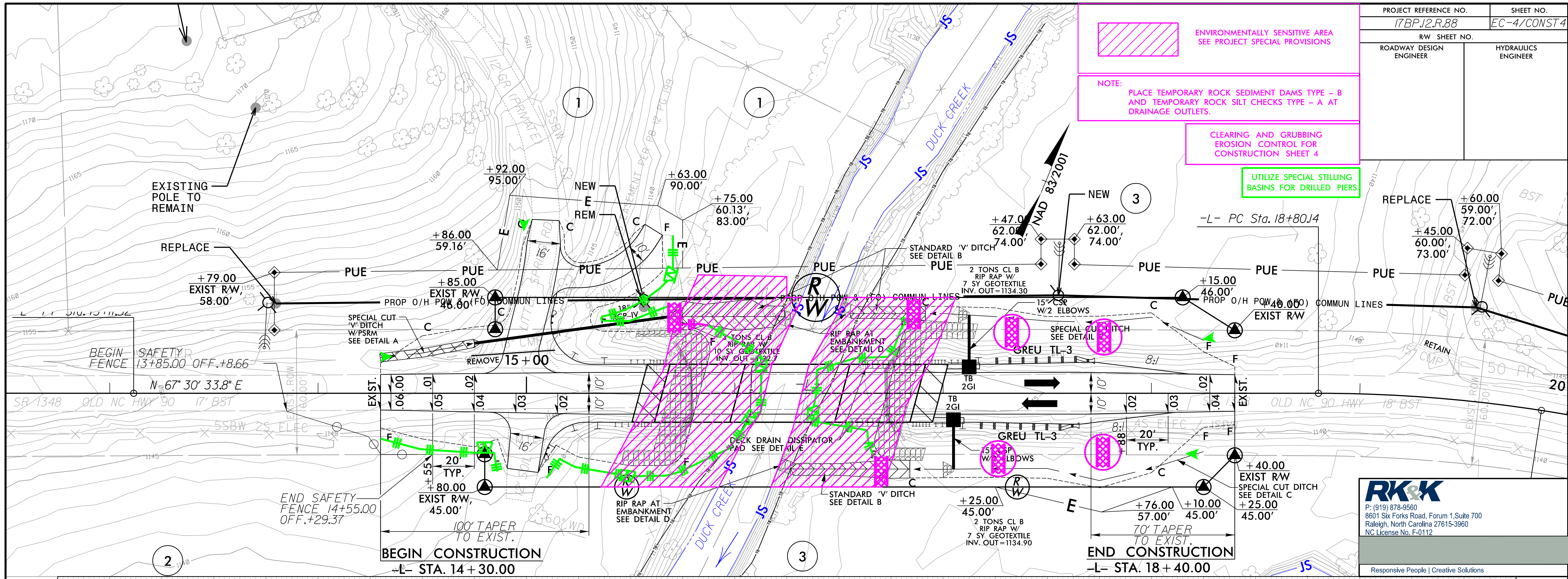
PROJECT REFERENCE NO.	SHEET NO.
17BPJ2.R.88	EC-4/CONST4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENVIRONMENTALLY SENSITIVE AREA  
SEE PROJECT SPECIAL PROVISIONS

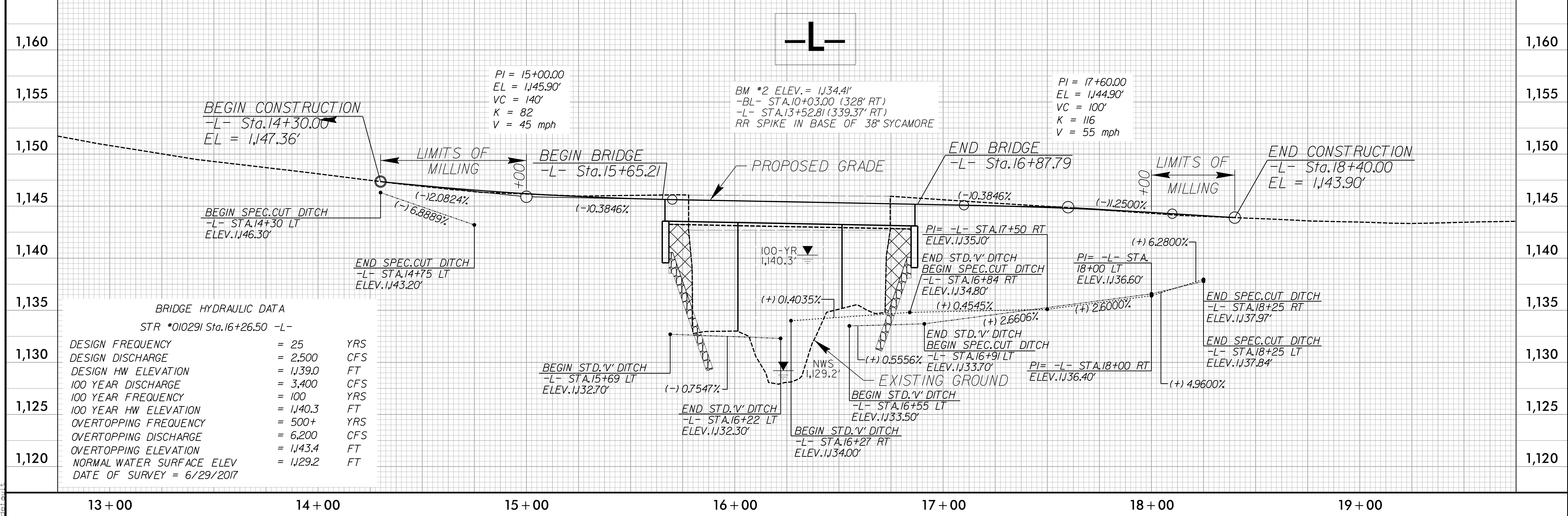
NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4

UTILIZE SPECIAL STILLING  
BASINS FOR DRILLED PIERS



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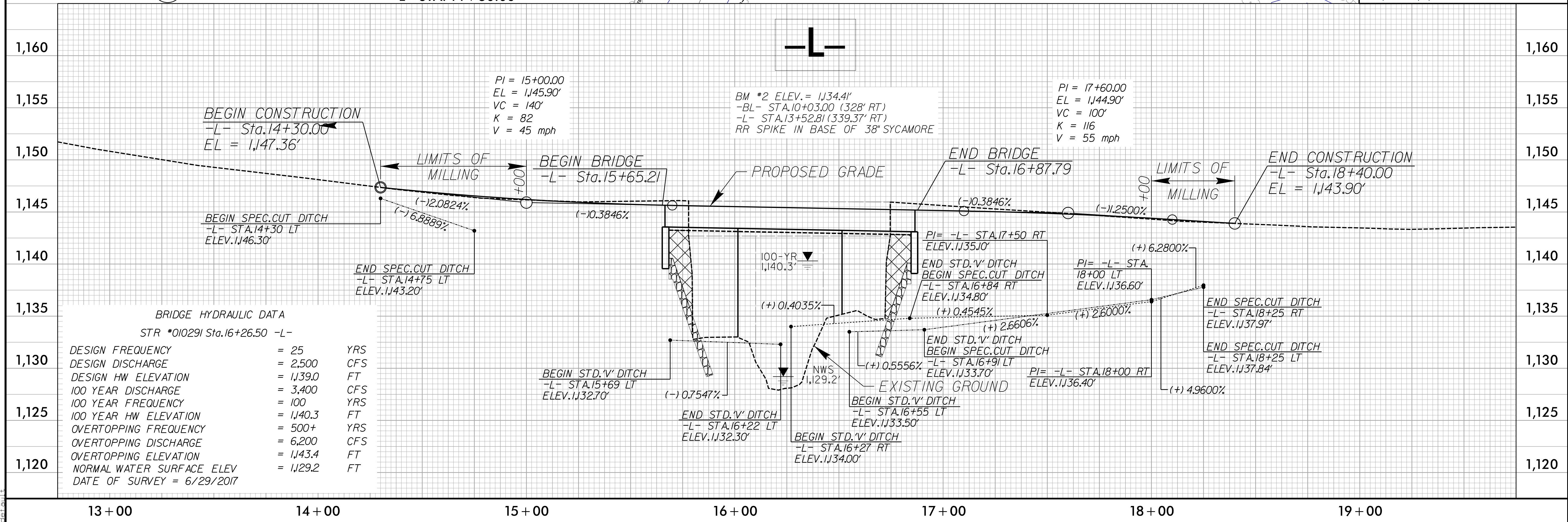
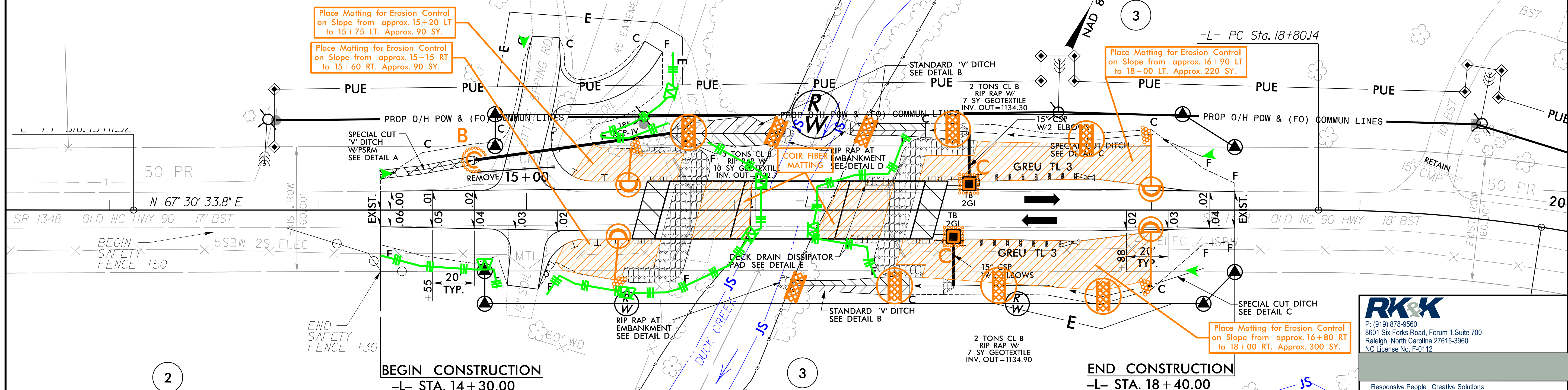
**MATting FOR EROSION CONTROL IN DITCHES**

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	15+69	16+22	LT	40
4	-L-	16+55	18+00	LT	75
4	-L-	16+27	18+00	RT	90
TOTAL					205

**PSRM FOR EROSION CONTROL IN DITCHES**

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	14+30	14+75	LT	35
4	-L-	18+00	18+25	RT	15

PROJECT REFERENCE NO. 17BP12.R.88	SHEET NO. EC-5/CONST4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

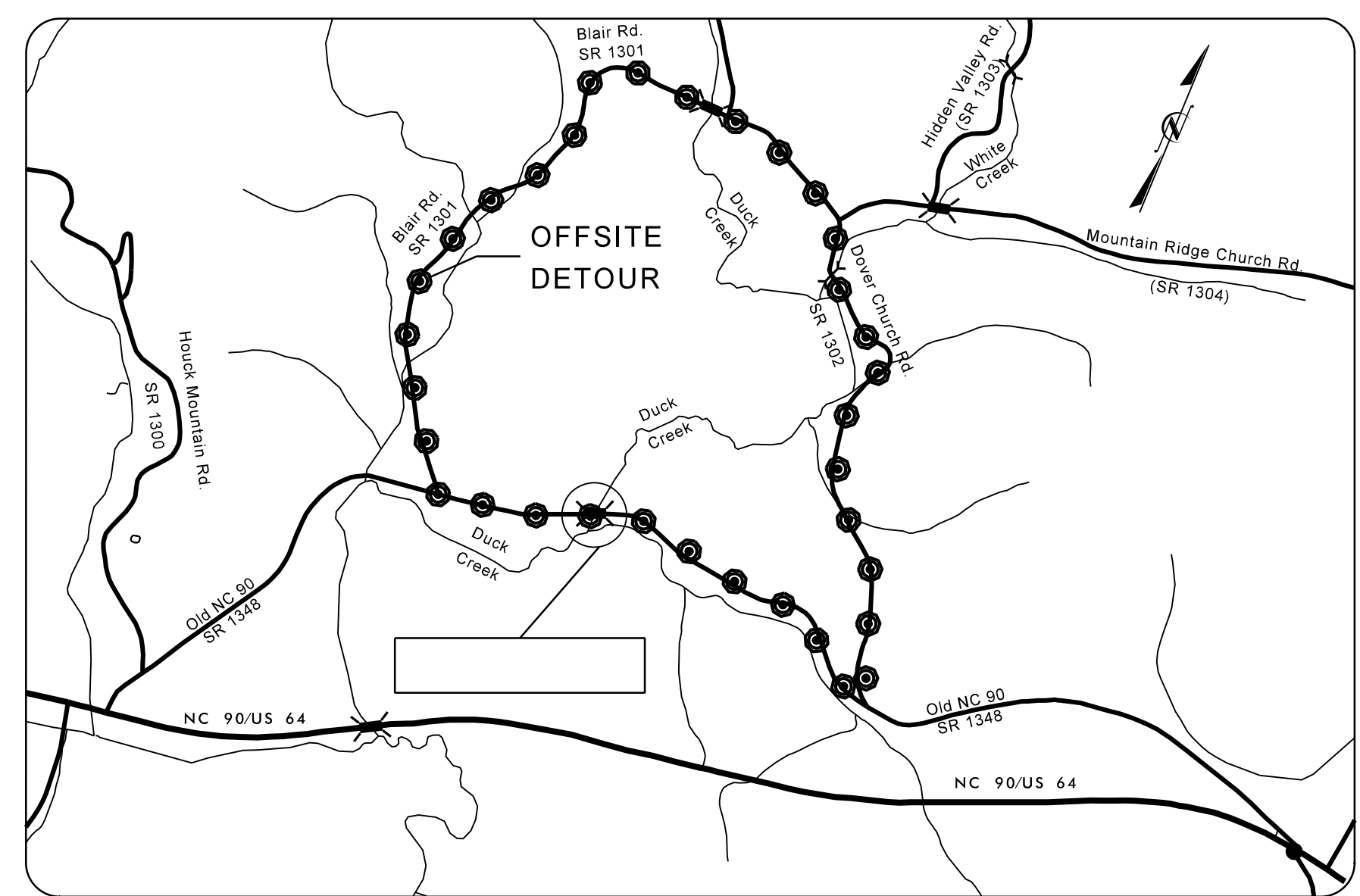


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2/4/2021 \\gd.rkk.com\fs\Cloud\Projects\2015\5077\_NCWest\LSA\H01\_Div12\_LIB\H03\_Alexander\_291\Design\Utilities\Engineering\UBO\Proj\010291\_ut\_tsh\_U001\_psh.dgn  
 09/08/19

**TIP PROJECT: 17BP.12.R.88**



**VICINITY MAP**  
(NOT TO SCALE)

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

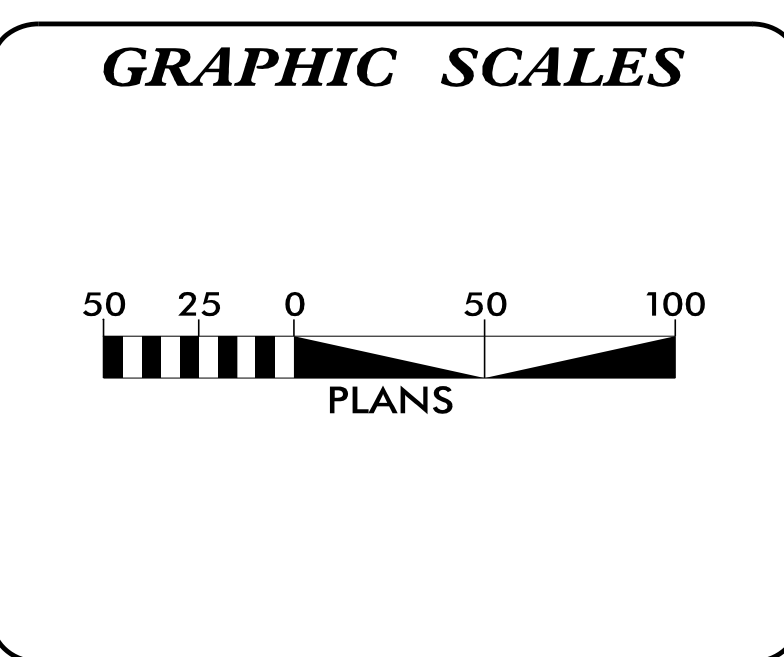
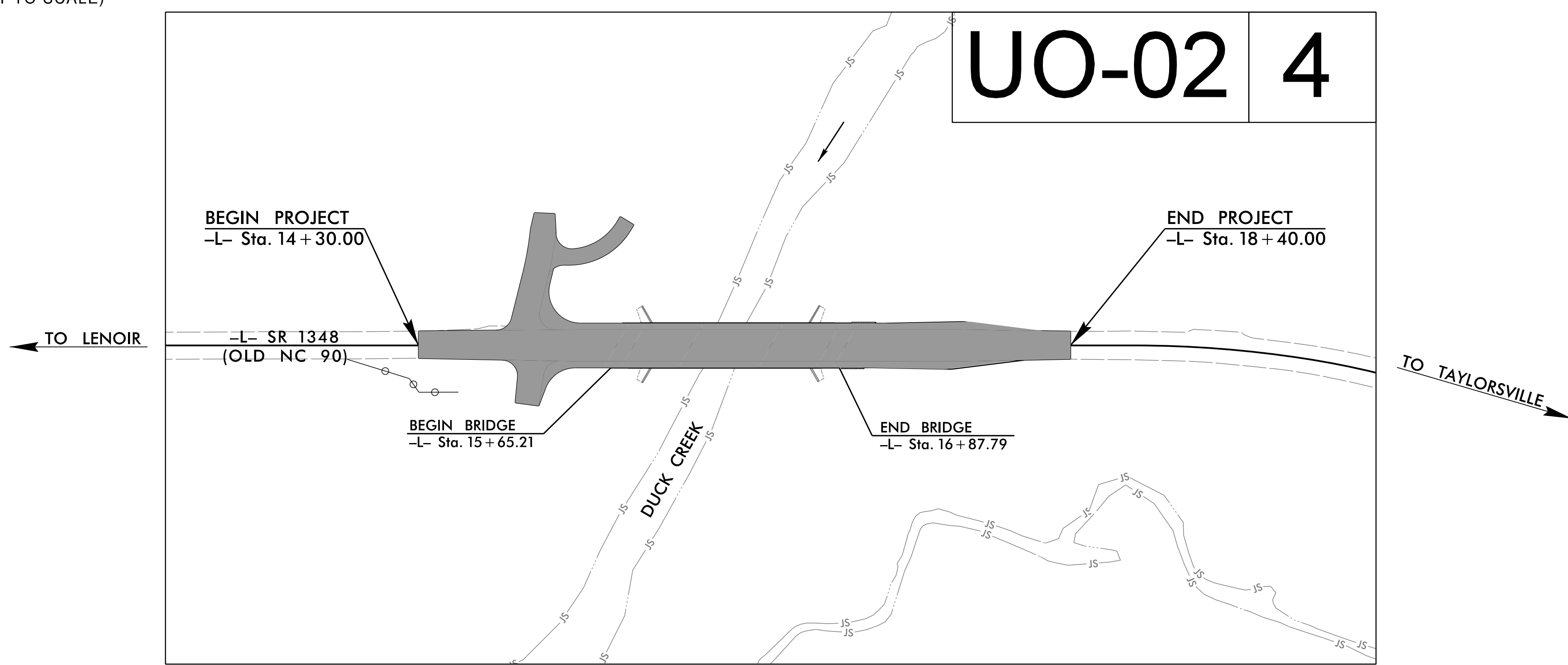
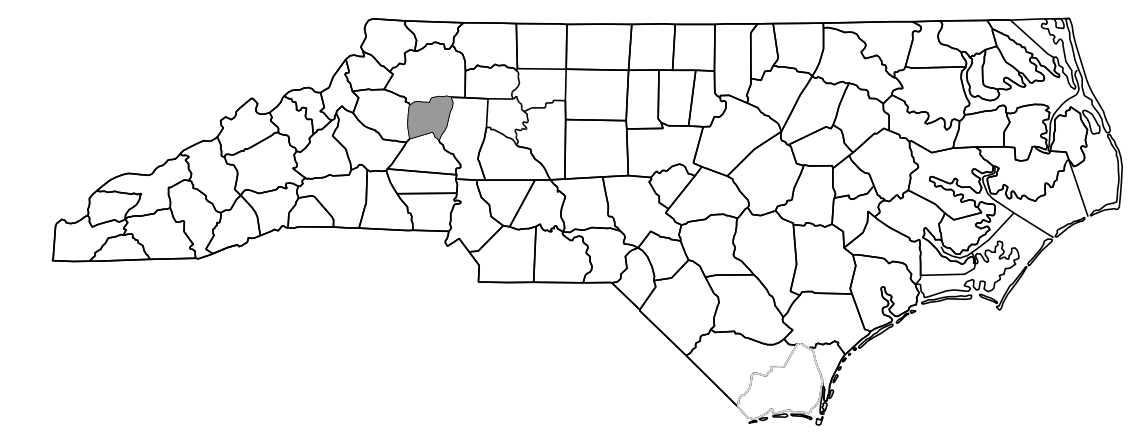
**UTILITIES BY OTHERS PLANS**  
**ALEXANDER COUNTY**

**LOCATION: BRIDGE NO. 291 OVER DUCK CREEK**  
**ON SR 1348 (OLD NC 90)**

**TYPE OF WORK: DRY UTILITIES**

T.I.P. NO.	SHEET NO.
<b>B-010291</b>	<b>UO-1</b>

**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.



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-02	UBO PLAN SHEETS

**UTILITY OWNERS WITH CONFLICTS**

(A) DUKE ENERGY - POWER (D)  
 (B) AT&T COMMUNICATIONS - TELECOMMUNICATIONS/FO

PREPARED IN THE OFFICE OF:

P: (919) 878-9560  
 900 Ridgeland Drive Suite 350 | Raleigh, North Carolina 27609-3960  
 NC License No. F-0112  
 Engineers | Construction Managers | Planners | Scientists  
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**Howard Woodall, PE** UTILITY PROJECT MANAGER  
**Mark Lawson** PROJECT UTILITY COORDINATOR  
**Mark Lawson** PROJECT UTILITY CADD

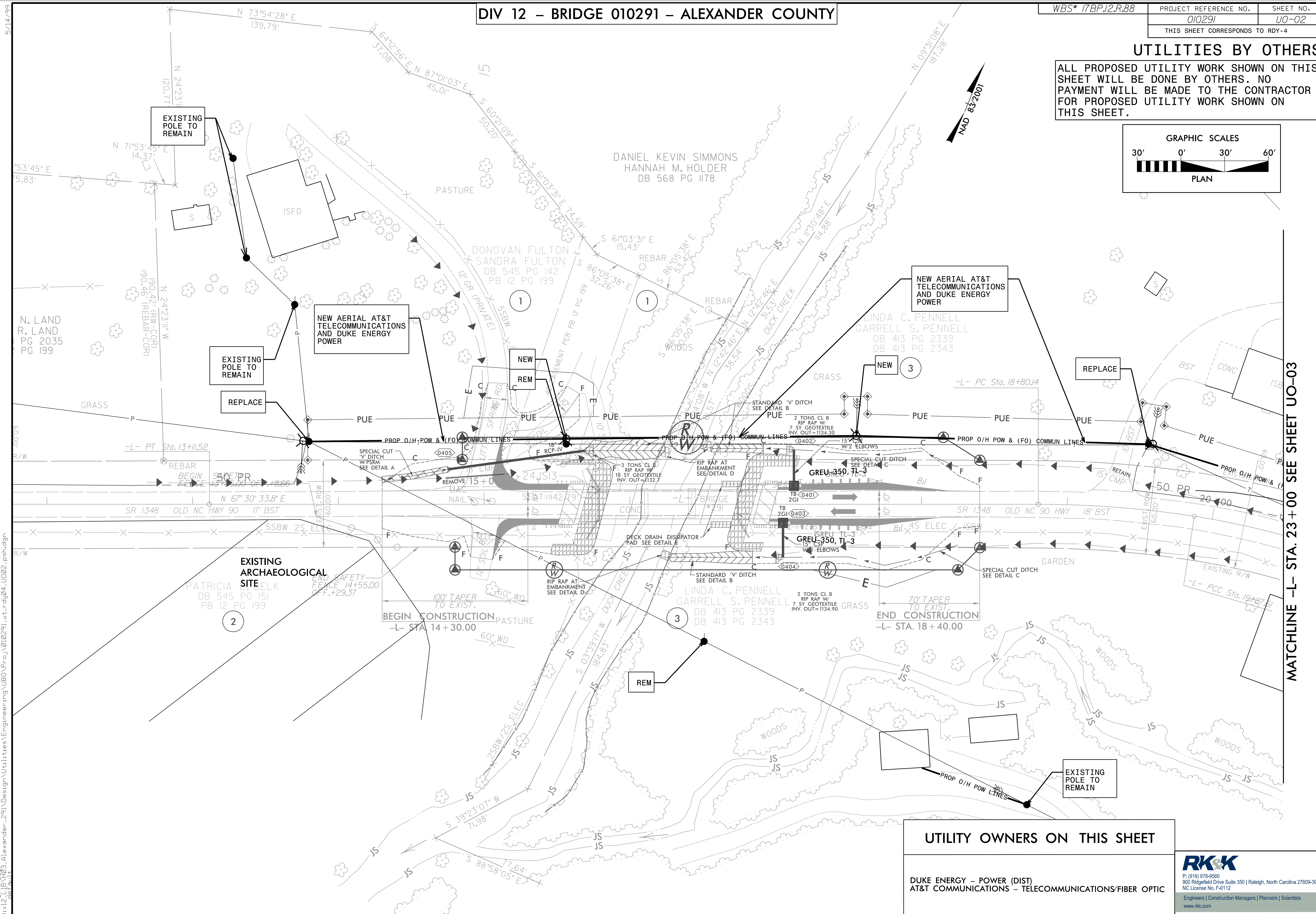
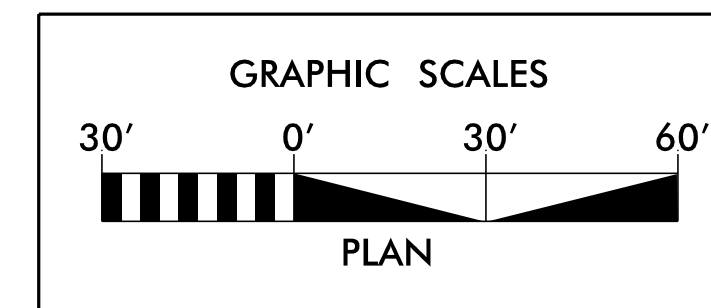
**DIVISION OF HIGHWAYS**  
**DIVISION 12**

1710 E MARION STREET  
(US 74 BUSINESS)  
SHELBY, NC 28151

**Chad Drewery** DIVISION CONTACT #1  
**Warren Anderson** DIVISION CONTACT #2  
**Larry Carpenter, PE** DIVISION CONTACT #3  
**Rodney Gant** 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.



MATCHLINE -L- STA. 23+00 SEE SHEET UO-03

UTILITY OWNERS ON THIS SHEET	
DUKE ENERGY - POWER (DIST)	AT&T COMMUNICATIONS - TELECOMMUNICATIONS/FIBER OPTIC

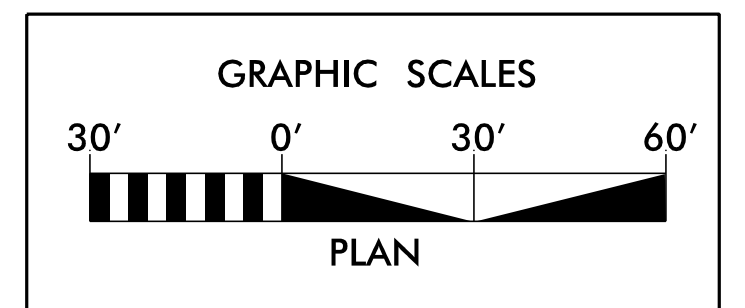
**RK&K**  
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2/14/2023 2:15:10 PM 21-Alexander-291-Utilities-Engineering\JB0\Pro\010291-ut-rdy04-U002-psk.dgn

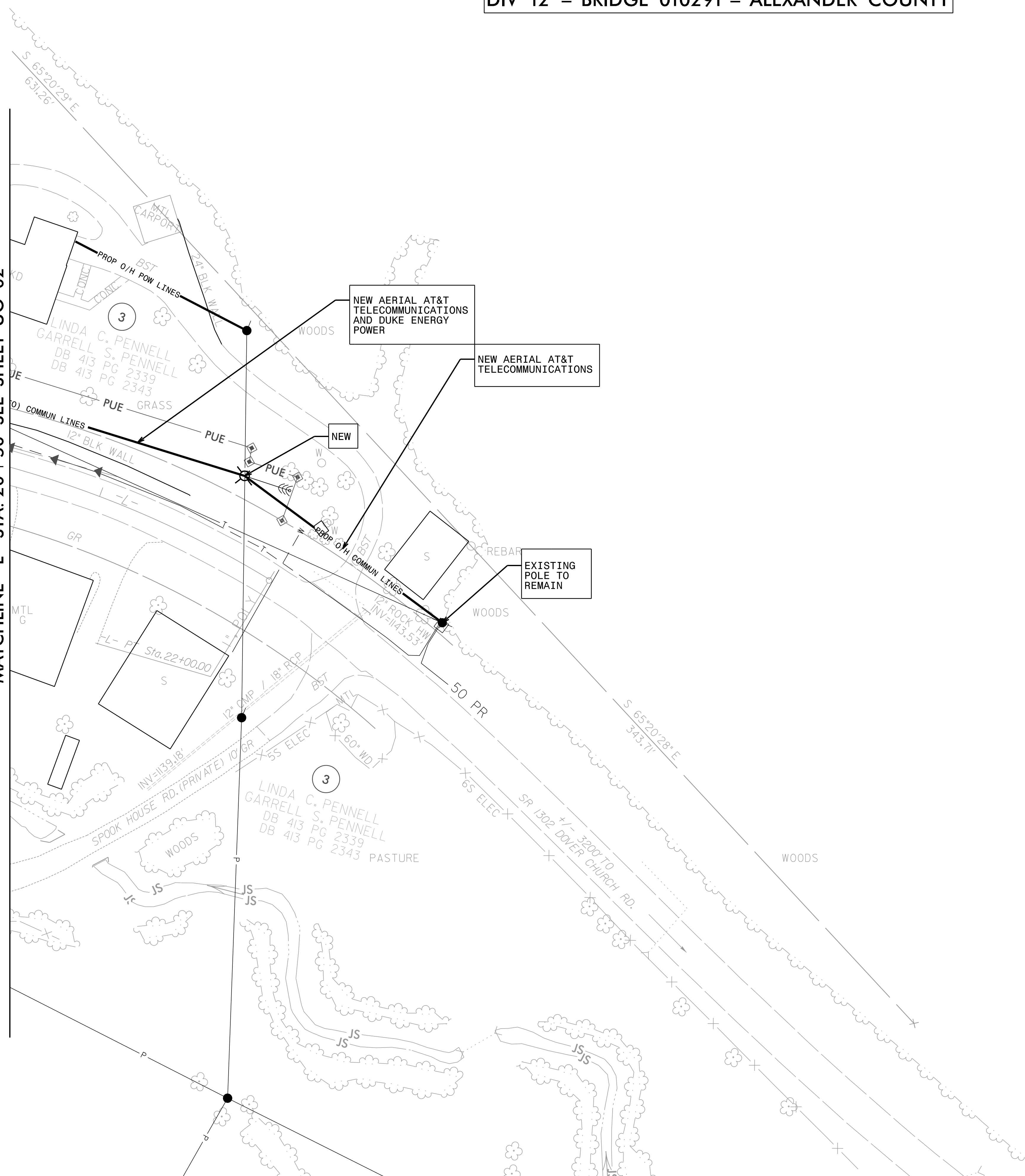


UTILITIES BY OTHERS

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.



MATCHLINE -L- STA. 20+50 SEE SHEET UO-02



UTILITY OWNERS ON THIS SHEET

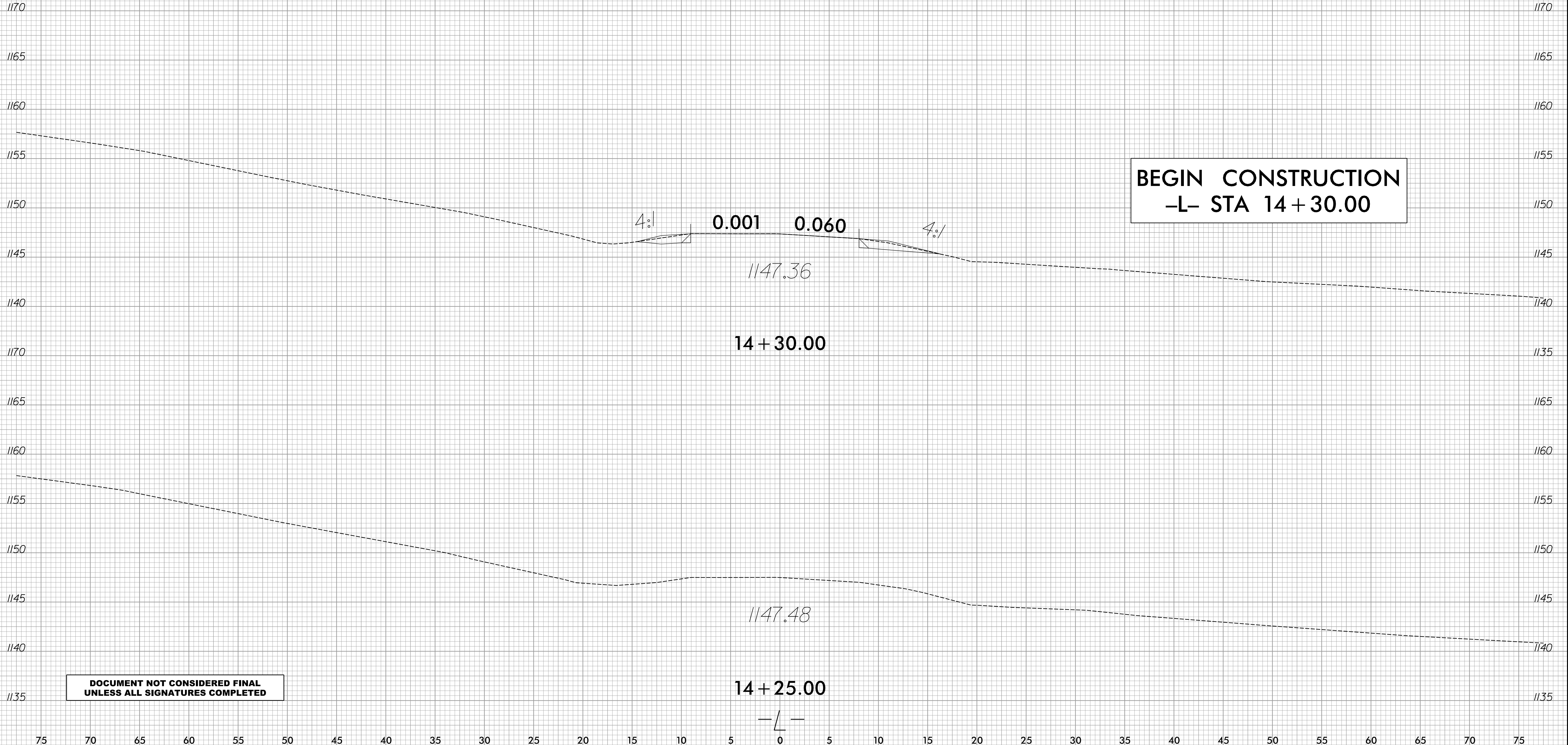
DUKE ENERGY – POWER (DIST)  
AT&T COMMUNICATIONS – TELECOMMUNICATIONS/FIBER OPTIC

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6/23/16

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



**BEGIN CONSTRUCTION**  
**-L- STA 14 + 30.00**

**14 + 30.00**

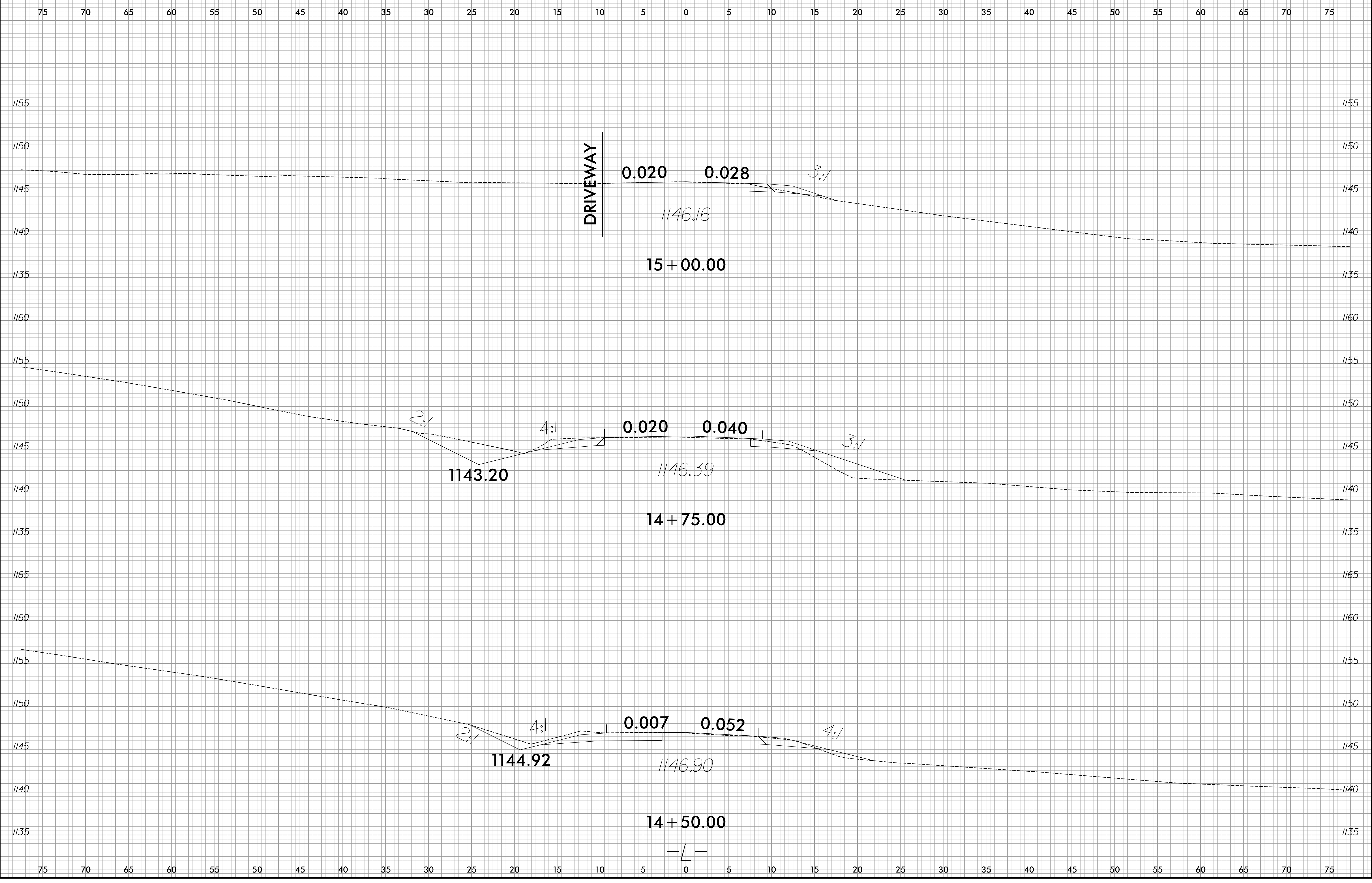
**14 + 25.00**

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

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6/23/16

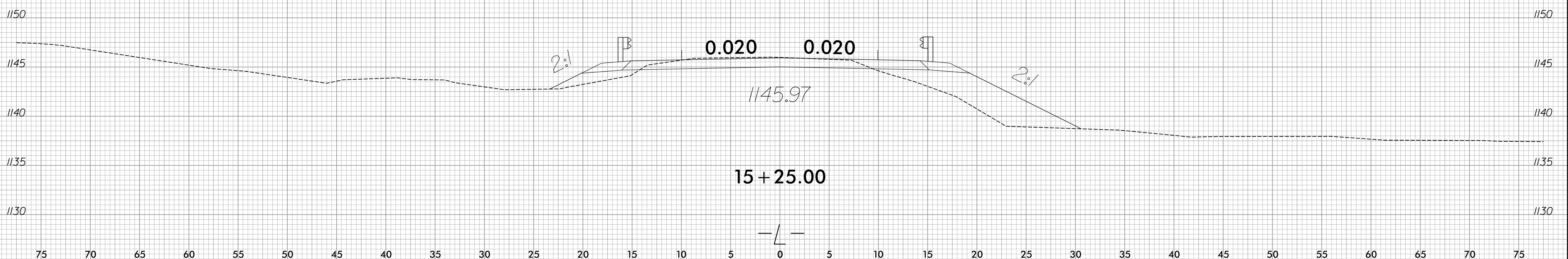
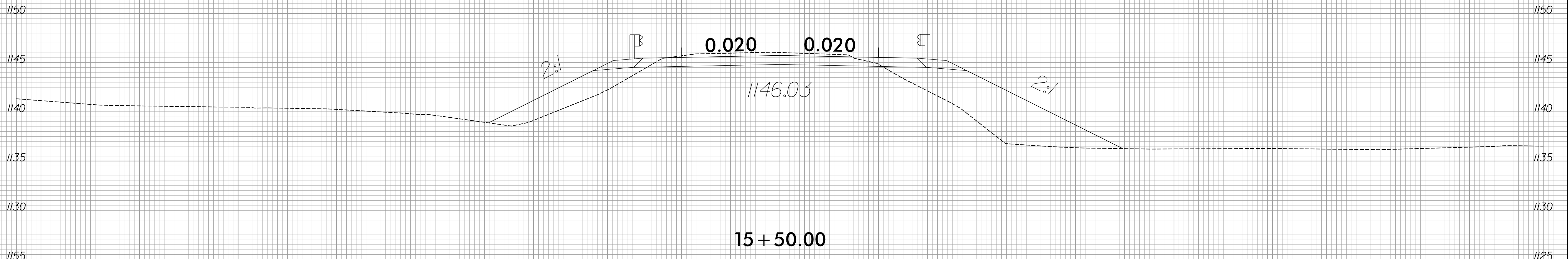
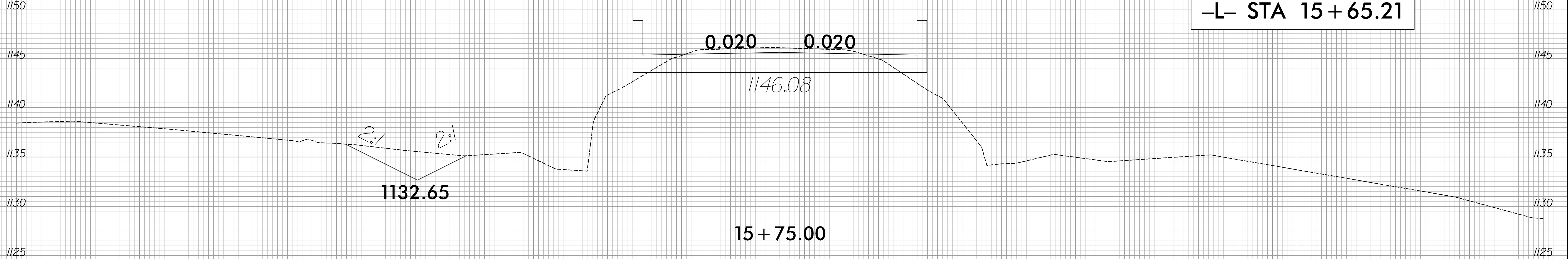


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6/23/16

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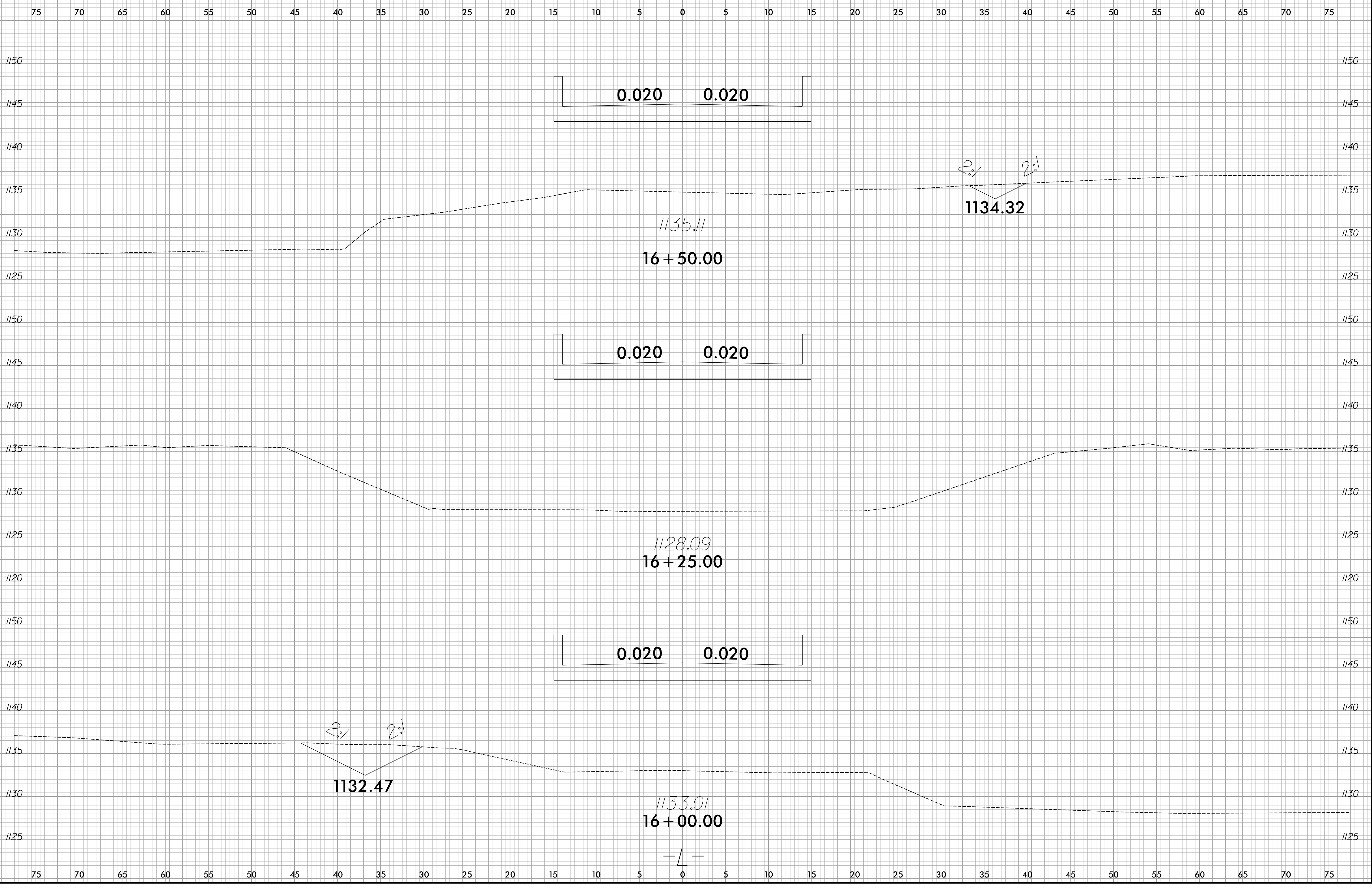
**BEGIN BRIDGE**  
**-L- STA 15+65.21**



1/27/2021  
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KEL

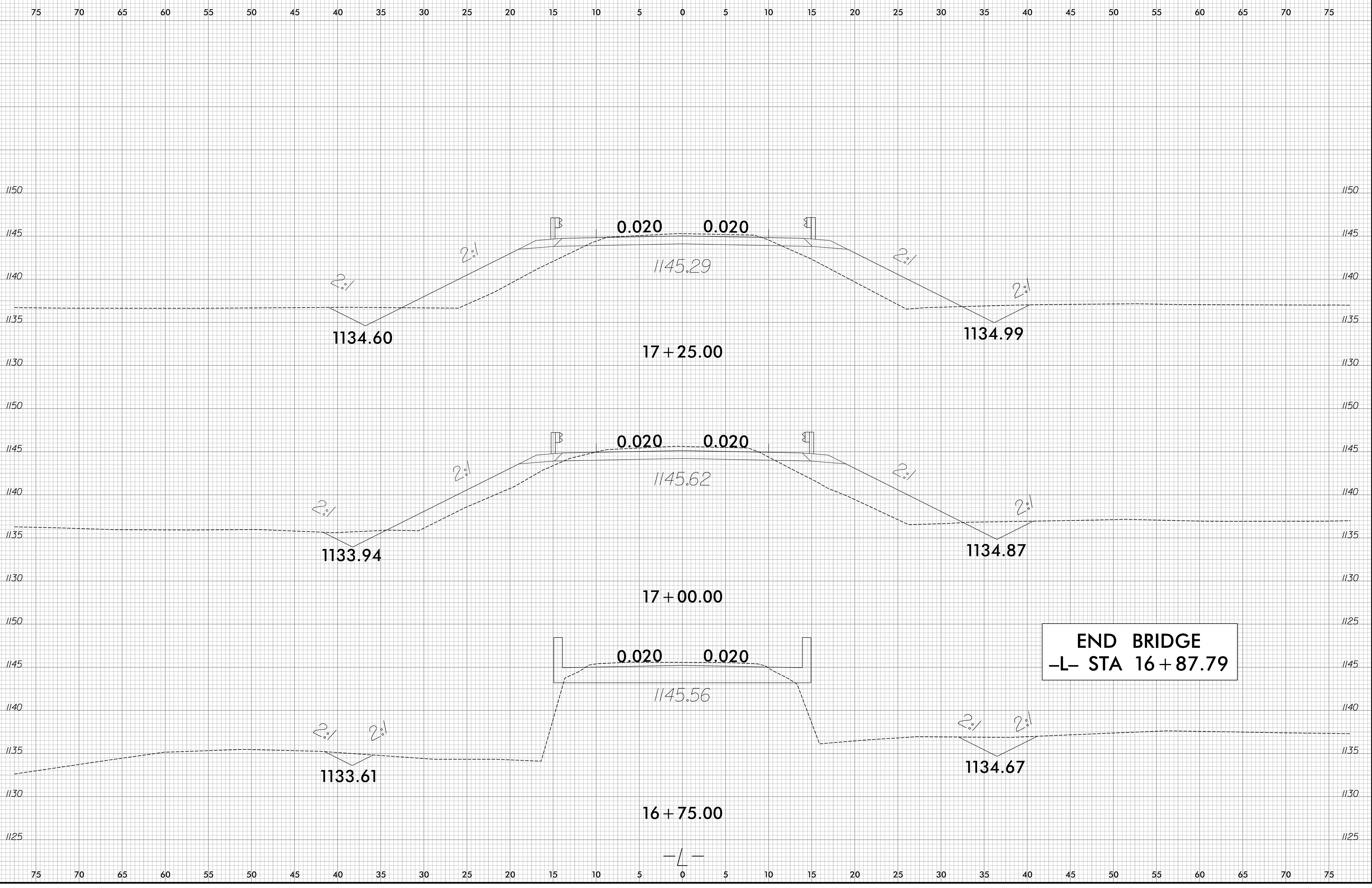
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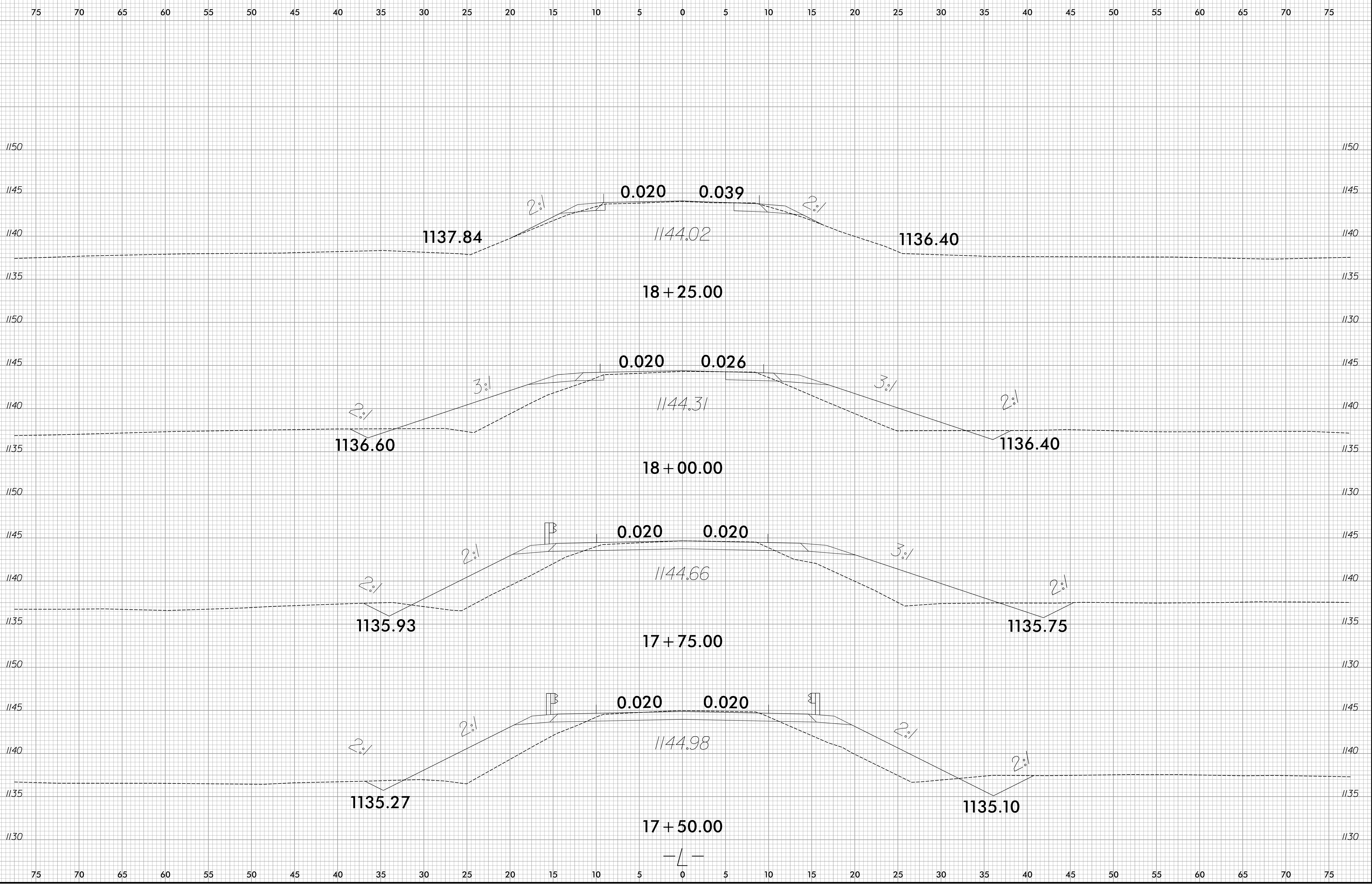
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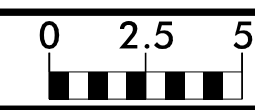
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6/23/16



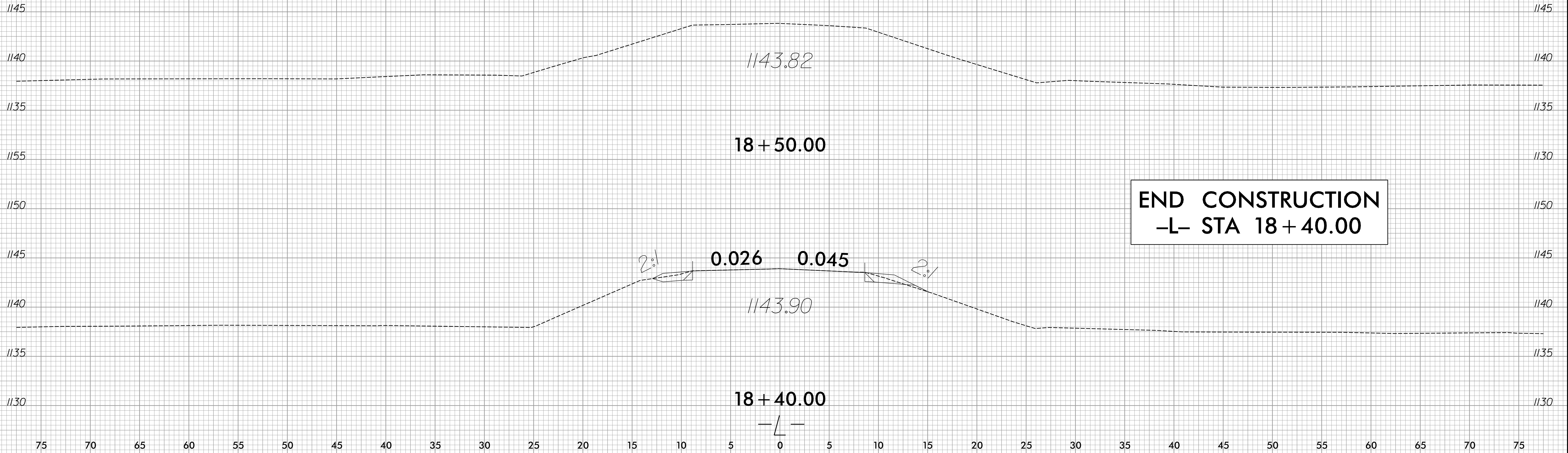
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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17BPJ2.R.88	X-7

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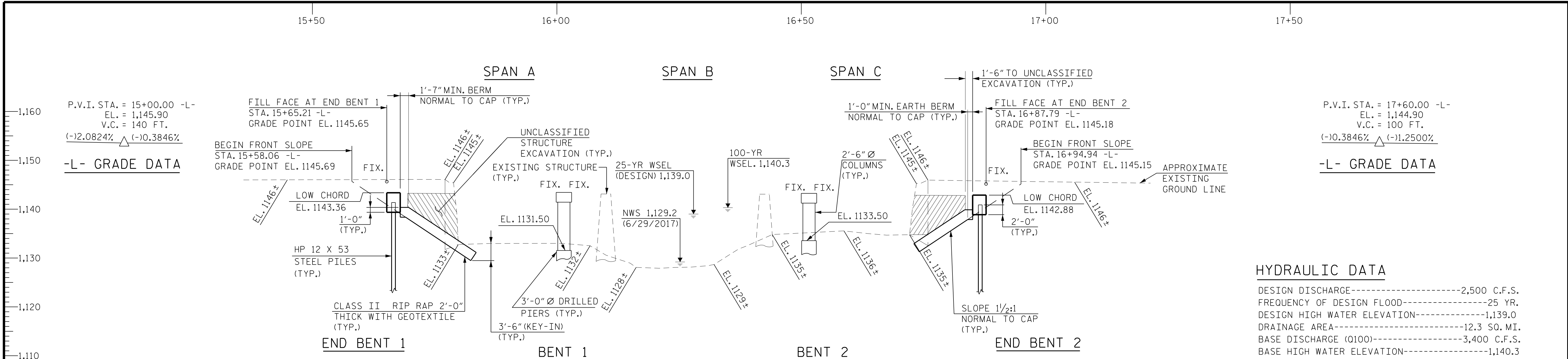


**END CONSTRUCTION**  
 -L- STA 18+40.00

1/27/2021  
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 KCH

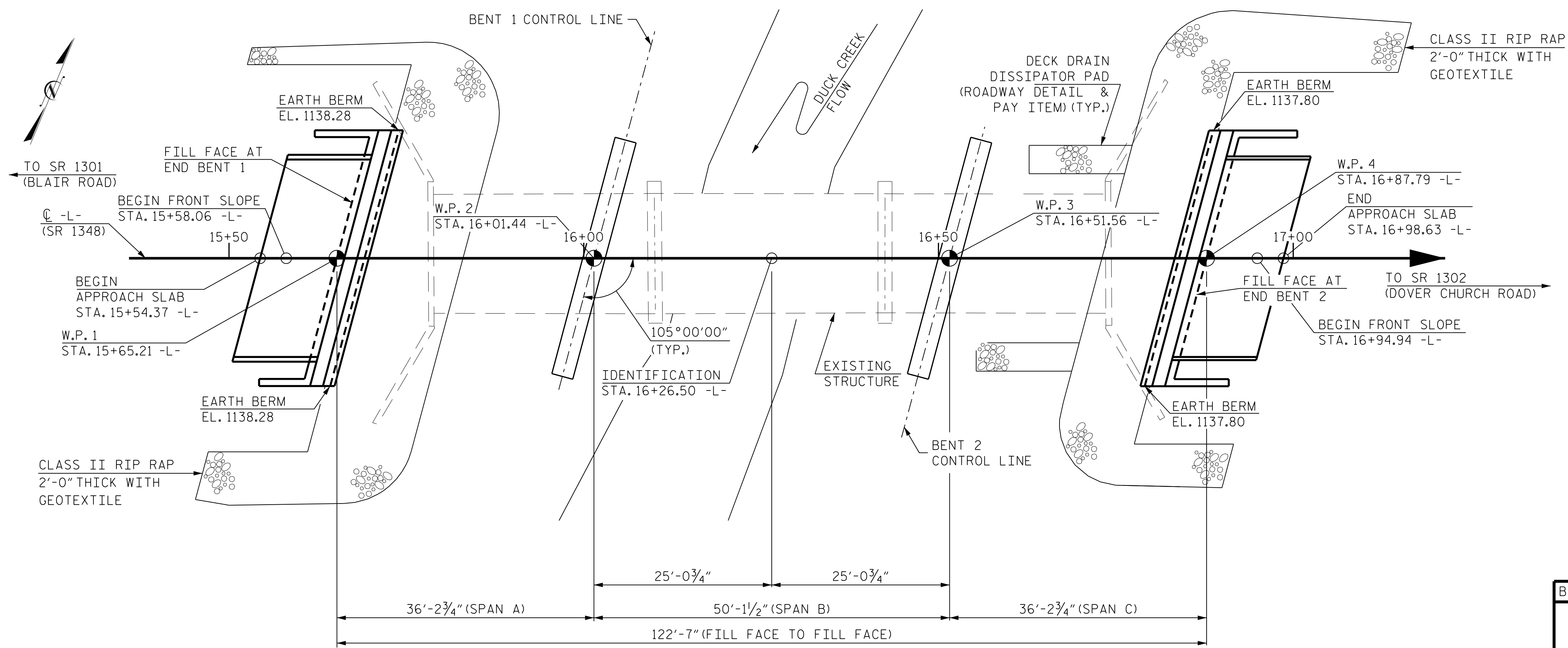
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**ELEVATION**

(END BENTS AND BENTS ON SECTION AT RIGHT ANGLES TO END BENTS AND BENTS)



**PLAN**

(PILES NOT SHOWN FOR CLARITY)

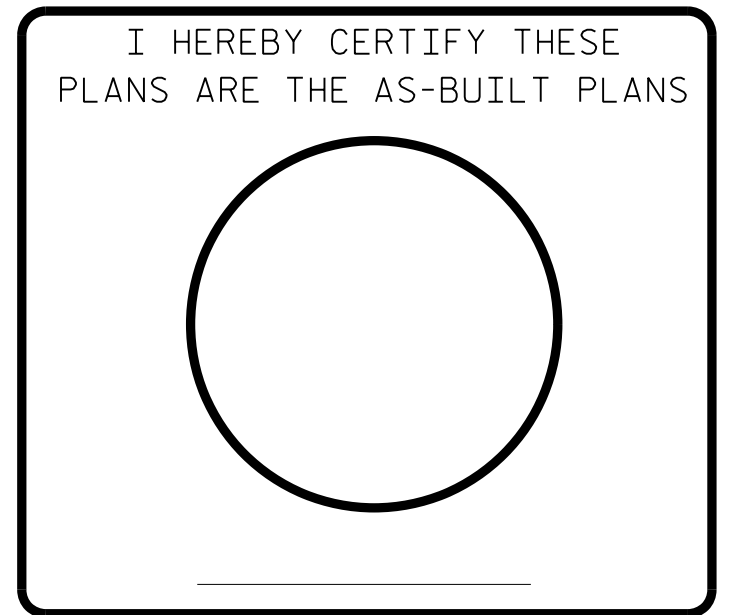
P.V.I. STA. = 17+60.00 -L-  
 EL. = 1,144.90  
 V.C. = 100 FT.  
 (-)0.3846% (-)1.2500%  
 -L- GRADE DATA

**HYDRAULIC DATA**

DESIGN DISCHARGE-----2,500 C.F.S.  
 FREQUENCY OF DESIGN FLOOD-----25 YR.  
 DESIGN HIGH WATER ELEVATION-----1,139.0  
 DRAINAGE AREA-----12.3 SQ. MI.  
 BASE DISCHARGE (Q100)-----3,400 C.F.S.  
 BASE HIGH WATER ELEVATION-----1,140.3

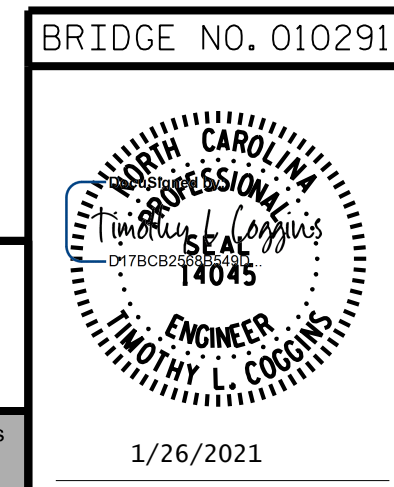
**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE-----6,200 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD-----500 YR. +  
 OVERTOPPING FLOOD ELEVATION-----1,143.4  
 OVERTOPPING STATION-----18+94.50-L-



PROJECT NO. 17BP.12.R.88  
 ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 291



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER DUCK CREEK  
 ON OLD NC HWY 90 (SR 1348)  
 BETWEEN SR 1301 (BLAIR RD)  
 AND SR 1302 (DOVER CHURCH RD)

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

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3/12/2020 R:\Structures\DGN\FINAL\001-010291.LD\_GEN.dgn  
 DRAWN BY : T. ROBERSON DATE : SEP 2018  
 CHECKED BY : T. L. COGGINS DATE : SEP 2018  
 DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : SEP 2018

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

**GENERAL NOTES:**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-21.

FOR SUBMITTAL OR 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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 20' EACH SIDE OF CENTERLINE AT END BENT NO.1 AND 15' EACH SIDE OF CENTERLINE AT END BENT NO.2 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.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN AT 32.125', 1 SPAN AT 32.5' AND 1 SPAN AT 32.125' WITH A 8" REINFORCED CONCRETE DECK AND A 7" AWS ON 3 LINES OF RC DECK GIRDERS; CLEAR ROADWAY OF 17'; SUBSTRUCTURE CONSISTING OF RC ABUTMENTS FULL HEIGHT AND RC ROUND NOSE POST AND WEB AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISIONS FOR REMOVAL OF EXISTING STRUCTURE AT STA. 16+26.50 -L-.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON THE DIFFERENCES BETWEEN THE EXISTING 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. CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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.

EXISTING FOUNDATIONS ARE FROM THE BEST INFORMATION AVAILABLE.

EXISTING INTERIOR BENTS SHALL BE CUT OFF AT GROUND LEVEL AND EXISTING RIP RAP TO REMAIN IN PLACE. ADDITIONAL CLASS II RIP RAP MAY BE ADDED TO EXISTING RIP RAP AS DIRECTED BY THE ENGINEER.

EXISTING CONCRETE END BENTS SHALL BE REMOVED BELOW THE PROPOSED 2' CLASS II RIP RAP AS DIRECTED BY THE ENGINEER.

FOR FIBER OPTIC CONDUIT SYSTEM AT STATION 16+26.50 -L-, SEE SPECIAL PROVISIONS.

**FOUNDATION NOTES:**

FOR PILES SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 66 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 66 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF 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.

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

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 352 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 1103 FT WITH A PENETRATION OF AT LEAST 12 FT INTO WEATHERED ROCK OR ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 1112.8 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 354 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 1094 FT (LT) AND 1097 FT (RT) WITH A PENETRATION OF AT LEAST 12 FT INTO WEATHERED ROCK OR ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 1112.8 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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.

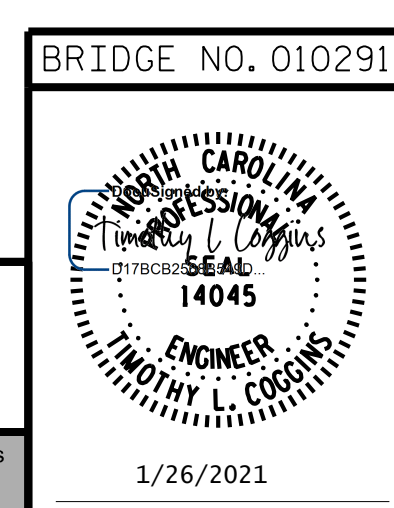
CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 1115 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.2. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 1115 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

SHEET 2 OF 3



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

DRAWN BY : T. ROBERSON DATE : SEP 2018  
 CHECKED BY : T. L. COGGINS DATE : SEP 2018  
 DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : SEP 2018

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 bgonfa

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

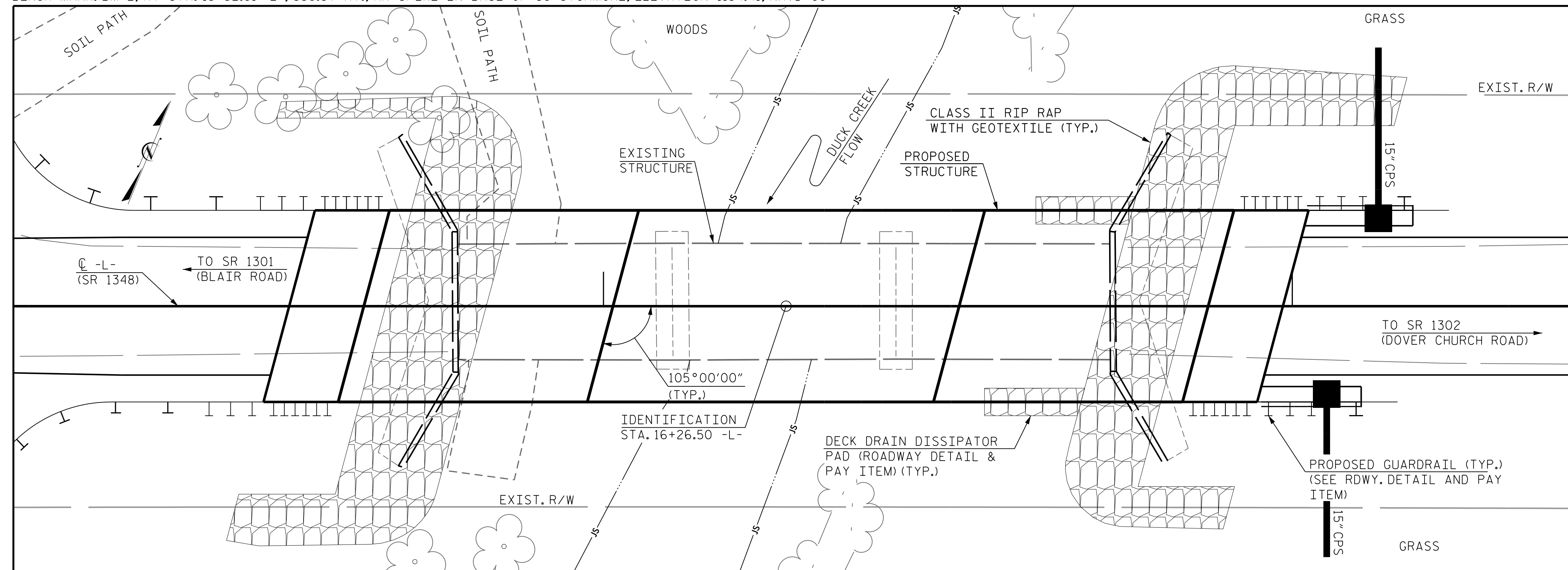
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 16+26.50 -L-	ASBESTOS ASSESSMENT	3'-0" DIA DRILLED PIERS IN SOIL	3'-0" DIA DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA DRILLED PIER	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS AT STA. 16+26.50 -L-
	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EA.	EA.	EA.	EA.	LUMP SUM	CU.YDS.	LUMP SUM
SUPERSTRUCTURE												LUMP SUM
END BENT NO.1											27.7	
BENT NO.1			49.5	36	54						16.8	
BENT NO.2			78.5	36	60						15.6	
END BENT NO.2											27.7	
TOTAL	LUMP SUM	LUMP SUM	128.0	72	114	1	2	2	2	LUMP SUM	87.8	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL (BRIDGE)	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	PILE DRIVING EQUIPMENT SET-UP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FIBER OPTIC CONDUIT SYSTEM AT STA. 16+26.50 -L-	3'-0" X 1'-9" PRESTRESSED CONCRETE CORE SLABS	
	LBS.	LBS.	EACH	NO.	LIN.FT.	EACH	LIN.FT.	SO.YDS.	LUMP SUM	LIN.FT.	NO.	LIN. FT.
SUPERSTRUCTURE							240.50			236.50	30	1200.00
END BENT NO.1	3,096		5	5	75	5		170	189			
BENT NO.1	10,944	1,926										
BENT NO.2	10,970	2,293										
END BENT NO.2	3,096		5	5	140			160	178			
TOTAL	28,106	4,219	10	10	215	5	240.50	330	367	LUMP SUM	30	1200.00

BENCH MARK: BM#2, AT STA. 13+52.81 -L-, 339.37' RT.; RR SPIKE IN BASE OF 38" SYCAMORE; ELEVATION 1134.41, NAVD 88



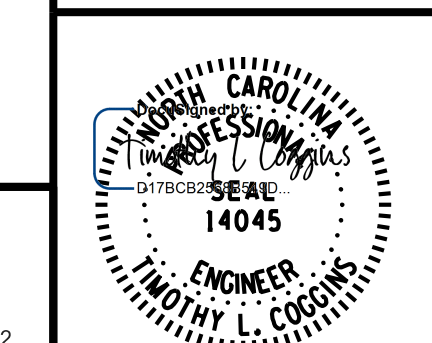
LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISION

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 3 OF 3

BRIDGE NO. 010291



1/26/2021

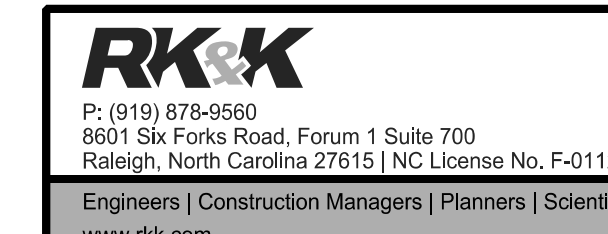
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE OVER DUCK CREEK  
ON OLD NC HWY 90 (SR 1348)  
BETWEEN SR 1301 (BLAIR RD)  
AND SR 1302 (DOVER CHURCH RD)

REVISIONS

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

SHEET NO.

S-3  
TOTAL SHEETS 21



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R:\Structures\003-010291-SD\_LOC.dgn

DRAWN BY : T. ROBERSON DATE : SEP 2018  
CHECKED BY : T. L. COGGINS DATE : SEP 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : SEP 2018

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

LOAD FACTORS:

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

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	<b>1</b>	1.06	--	1.75	0.275	1.38	35'	EL	16.982	0.623	1.2	35'	EL	1.698	0.80	0.275	<b>1.06</b>	35'	EL	<b>16.982</b>		
	HL-93(OPr)	N/A	--	1.549	--	1.35	0.275	1.79	35'	EL	16.982	0.623	1.55	35'	EL	1.698	N/A	--	--	--	--	--		
	HS-20(Inv)	36,000	<b>2</b>	1.377	49.573	1.75	0.275	1.82	35'	EL	13,586	0.623	<b>1.38</b>	35'	EL	<b>1.698</b>	0.80	0.275	1.41	35'	EL	16,982		
	HS-20(OPr)	36,000	--	1.785	64.262	1.35	0.275	2.36	35'	EL	13,586	0.623	1.79	35'	EL	1.698	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	2.424	32.72	1.4	0.275	3.95	35'	EL	16,982	0.623	3.55	35'	EL	1.698	0.80	0.275	2.42	35'	EL	16,982	
		SNGARBS2	20,000	--	2.082	41.635	1.4	0.275	3.34	35'	EL	13,586	0.623	2.68	35'	EL	1.698	0.80	0.275	2.08	35'	EL	13,586	
		SNAGRIS2	22,000	--	2.076	45.668	1.4	0.275	3.31	35'	EL	13,586	0.623	2.56	35'	EL	1.698	0.80	0.275	2.08	35'	EL	13,586	
		SNCOTTS3	27,250	--	1.213	33.066	1.4	0.275	1.98	35'	EL	16,982	0.623	1.79	35'	EL	1.698	0.80	0.275	1.21	35'	EL	16,982	
		SNAGGRS4	34,925	--	1.123	39.207	1.4	0.275	1.83	35'	EL	16,982	0.623	1.6	35'	EL	1.698	0.80	0.275	1.12	35'	EL	16,982	
		SNS5A	35,550	--	1.09	38.739	1.4	0.275	1.77	35'	EL	16,982	0.623	1.69	35'	EL	1.698	0.80	0.275	1.09	35'	EL	16,982	
		SNS6A	39,950	--	1.052	42.014	1.4	0.275	1.71	35'	EL	16,982	0.623	1.58	35'	EL	1.698	0.80	0.275	1.05	35'	EL	16,982	
	SNS7B	42,000	<b>3</b>	1.004	42.153	1.4	0.275	1.63	35'	EL	16,982	0.623	1.62	35'	EL	1.698	0.80	0.275	<b>1.00</b>	35'	EL	<b>16.982</b>		
	TTST	TNAGRIT3	33,000	--	1.299	42.872	1.4	0.275	2.11	35'	EL	16,982	0.623	1.85	35'	EL	1.698	0.80	0.275	1.30	35'	EL	16,982	
		TNT4A	33,075	--	1.298	42.933	1.4	0.275	2.11	35'	EL	16,982	0.623	1.75	35'	EL	1.698	0.80	0.275	1.30	35'	EL	16,982	
		TNT6A	41,600	--	1.137	47.314	1.4	0.275	1.85	35'	EL	16,982	0.623	1.71	35'	EL	1.698	0.80	0.275	1.14	35'	EL	16,982	
		TNT7A	42,000	--	1.175	49.358	1.4	0.275	1.92	35'	EL	16,982	0.623	1.59	35'	EL	1.698	0.80	0.275	1.18	35'	EL	16,982	
		TNT7B	42,000	--	1.156	48.536	1.4	0.275	1.88	35'	EL	16,982	0.623	1.54	35'	EL	1.698	0.80	0.275	1.16	35'	EL	16,982	
		TNAGRIT4	43,000	--	1.17	50.308	1.4	0.275	1.89	35'	EL	13,586	0.623	1.48	35'	EL	1.698	0.80	0.275	1.17	35'	EL	16,982	
TNAGT5A		45,000	--	1.079	48.572	1.4	0.275	1.76	35'	EL	16,982	0.623	1.56	35'	EL	1.698	0.80	0.275	1.08	35'	EL	16,982		
TNAGT5B	45,000	--	1.041	46.853	1.4	0.275	1.69	35'	EL	16,982	0.623	1.4	35'	EL	1.698	0.80	0.275	1.04	35'	EL	16,982			

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:

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- 
- 
- 

**# CONTROLLING LOAD RATING**

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

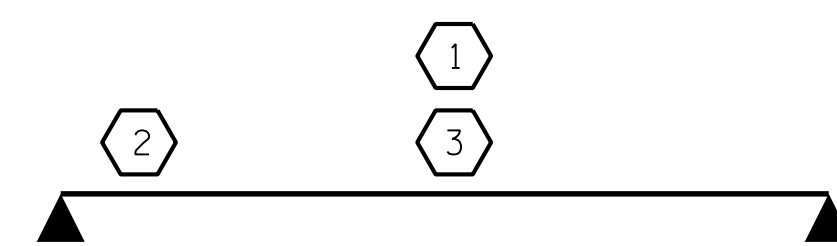
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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**GIRDER LOCATION**

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



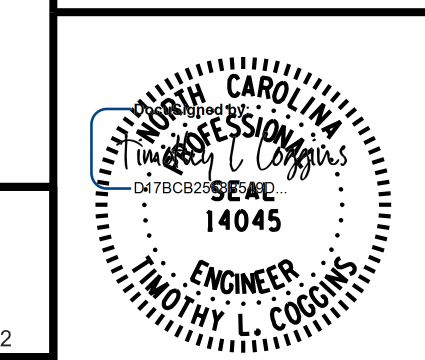
LRFR SUMMARY

FOR SPAN 'A' AND 'C'

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 1 OF 2

BRIDGE NO. 010291



1/26/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
35' CORED SLAB UNIT  
105° SKEW  
(SPANS A AND C)  
(NON-INTERSTATE TRAFFIC)

REVISIONS

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



**DOCUMENT NOT CONSIDERED FINAL  
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3/12/2020 R:\Structures\GON\FINAL\004-010291\_LSD\_LRFR\_35.dgn

DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
CHECKED BY : J. L. COGGINS DATE : JUN 2018  
DESIGN ENGINEER OF RECORD : J. L. COGGINS DATE : JUN 2018

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	<b>1</b>	1.205	--	1.75	0.271	1.59	50'	EL	24.482	0.616	<b>1.2</b>	50'	EL	<b>4.896</b>	0.80	0.271	1.46	50'	EL	24.482		
	HL-93(Opr)	N/A	--	1.562	--	1.35	0.271	2.06	50'	EL	24.482	0.616	1.56	50'	EL	4.896	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	<b>2</b>	1.434	51.614	1.75	0.271	1.97	50'	EL	24.482	0.616	<b>1.43</b>	50'	EL	<b>4.896</b>	0.80	0.271	1.81	50'	EL	24.482		
	HS-20(Opr)	36.000	--	1.859	66.906	1.35	0.271	2.56	50'	EL	24.482	0.616	1.86	50'	EL	4.896	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.678	49.655	1.4	0.271	5.02	50'	EL	24.482	0.616	4	50'	EL	4.896	0.80	0.271	3.68	50'	EL	24.482	
		SNGARBS2	20.000	--	2.905	58.101	1.4	0.271	3.97	50'	EL	24.482	0.616	2.93	50'	EL	4.896	0.80	0.271	2.91	50'	EL	24.482	
		SNAGRIS2	22.000	--	2.748	60.456	1.4	0.271	3.83	50'	EL	19.586	0.616	2.75	50'	EL	4.896	0.80	0.271	2.81	50'	EL	24.482	
		SNCOTTS3	27.250	--	1.835	49.998	1.4	0.271	2.5	50'	EL	24.482	0.616	2.01	50'	EL	4.896	0.80	0.271	1.83	50'	EL	24.482	
		SNAGGRS4	34.925	--	1.595	55.714	1.4	0.271	2.18	50'	EL	24.482	0.616	1.72	50'	EL	4.896	0.80	0.271	1.60	50'	EL	24.482	
		SNS5A	35.550	--	1.556	55.303	1.4	0.271	2.12	50'	EL	24.482	0.616	1.77	50'	EL	4.896	0.80	0.271	1.56	50'	EL	24.482	
		SNS6A	39.950	--	1.455	58.112	1.4	0.271	1.99	50'	EL	24.482	0.616	1.64	50'	EL	4.896	0.80	0.271	1.45	50'	EL	24.482	
	SNS7B	42.000	--	1.386	58.224	1.4	0.271	1.89	50'	EL	24.482	0.616	1.65	50'	EL	4.896	0.80	0.271	1.39	50'	EL	24.482		
	TTST	TNAGRIT3	33.000	--	1.782	58.809	1.4	0.271	2.43	50'	EL	24.482	0.616	1.94	50'	EL	4.896	0.80	0.271	1.78	50'	EL	24.482	
		TNT4A	33.075	--	1.798	59.458	1.4	0.271	2.45	50'	EL	24.482	0.616	1.86	50'	EL	4.896	0.80	0.271	1.80	50'	EL	24.482	
		TNT6A	41.600	--	1.497	62.293	1.4	0.271	2.04	50'	EL	24.482	0.616	1.8	50'	EL	4.896	0.80	0.271	1.50	50'	EL	24.482	
		TNT7A	42.000	--	1.52	63.842	1.4	0.271	2.08	50'	EL	24.482	0.616	1.67	50'	EL	4.896	0.80	0.271	1.52	50'	EL	24.482	
		TNT7B	42.000	--	1.585	66.559	1.4	0.271	2.16	50'	EL	24.482	0.616	1.59	50'	EL	4.896	0.80	0.271	1.58	50'	EL	24.482	
		TNAGRIT4	43.000	--	1.504	64.667	1.4	0.271	2.05	50'	EL	24.482	0.616	1.53	50'	EL	4.896	0.80	0.271	1.50	50'	EL	24.482	
TNAGT5A		45.000	--	1.405	63.217	1.4	0.271	1.92	50'	EL	24.482	0.616	1.56	50'	EL	4.896	0.80	0.271	1.40	50'	EL	24.482		
TNAGT5B	45.000	<b>3</b>	1.376	61.936	1.4	0.271	1.88	50'	EL	24.482	0.616	1.45	50'	EL	4.896	0.80	0.271	<b>1.38</b>	50'	EL	<b>24.482</b>			

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:

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- 

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

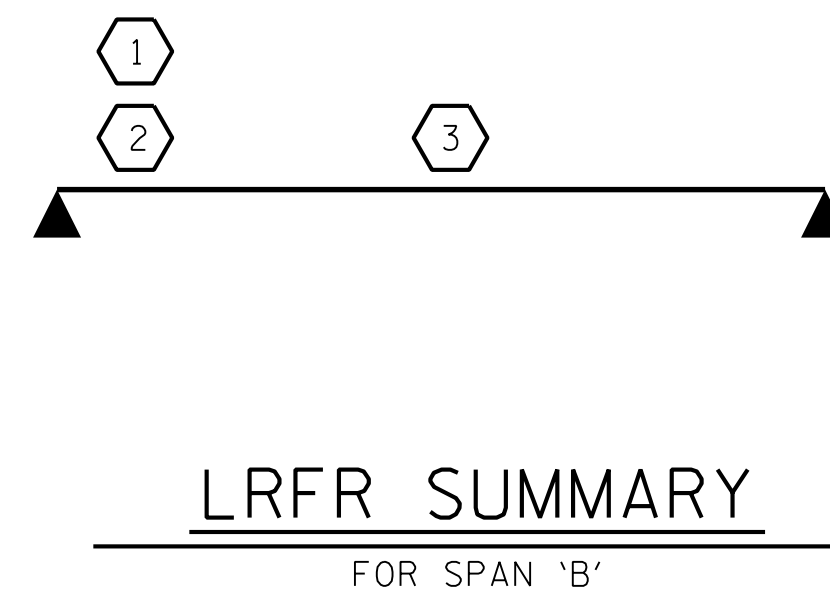
3 LEGAL LOAD RATING \*\*\*

\*\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

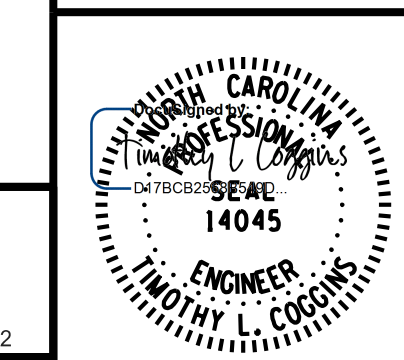
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 2 OF 2

BRIDGE NO. 010291



1/26/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
50' CORED SLAB UNIT  
105° SKEW  
(SPAN B)  
(NON-INTERSTATE TRAFFIC)

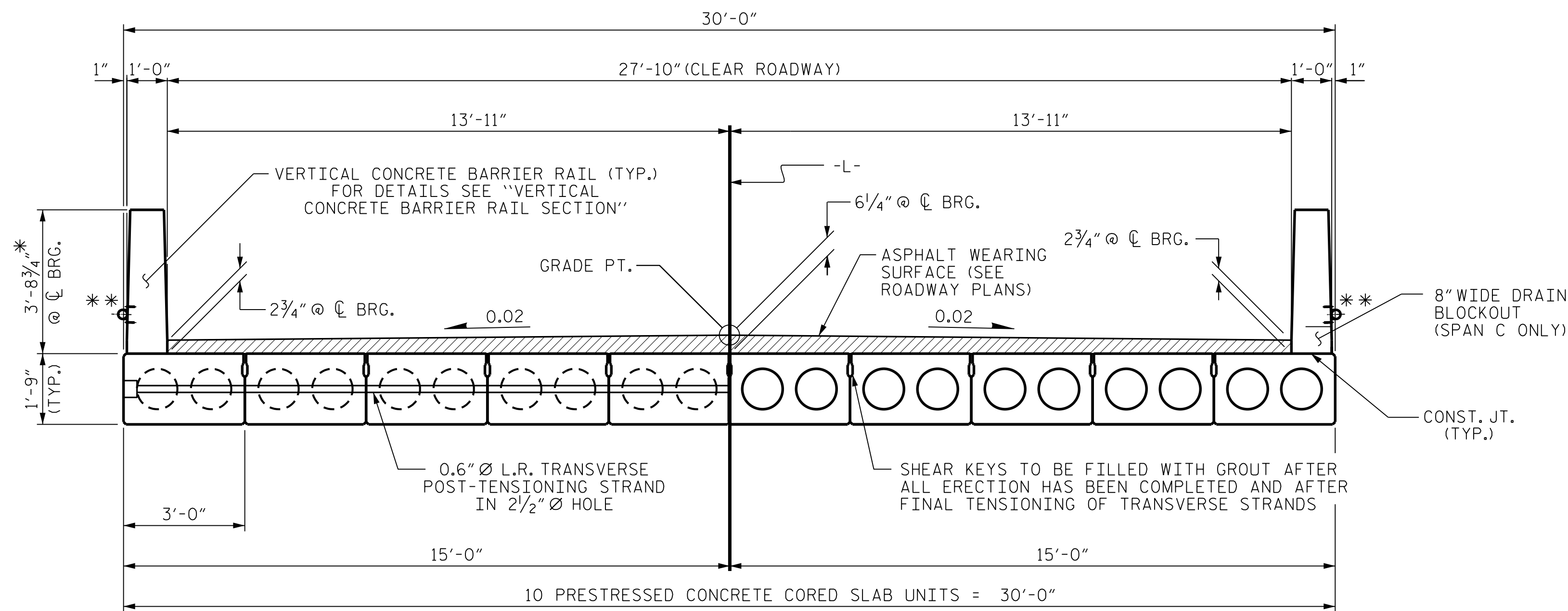
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-5
1			3			TOTAL SHEETS
2			4			21

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3/12/2020 R:\Structures\GON\FINAL\005-010291\_SD\_LRFR\_50.dgn

DRAWN BY : M. J. ZIEHL DATE : JUN 2018  
CHECKED BY : J. L. COGGINS DATE : JUN 2018  
DESIGN ENGINEER OF RECORD : J. L. COGGINS DATE : JUN 2018

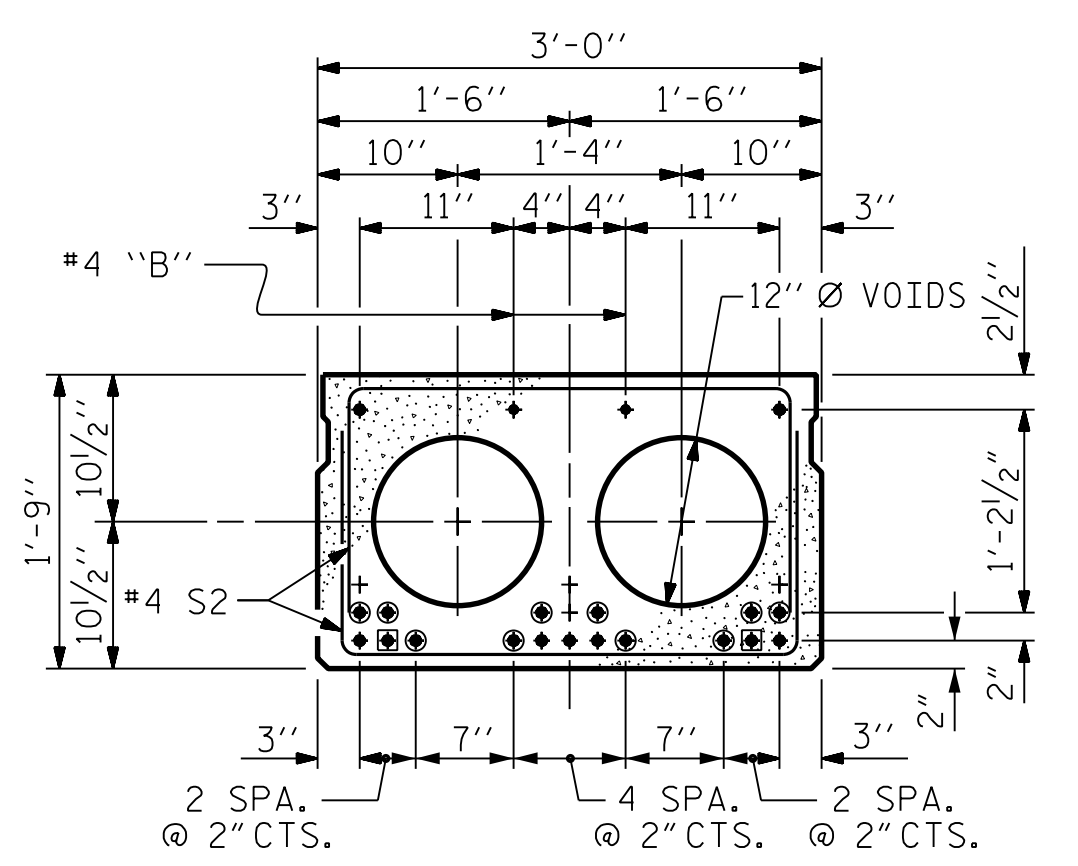


HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
 HALF SECTION THROUGH VOIDS

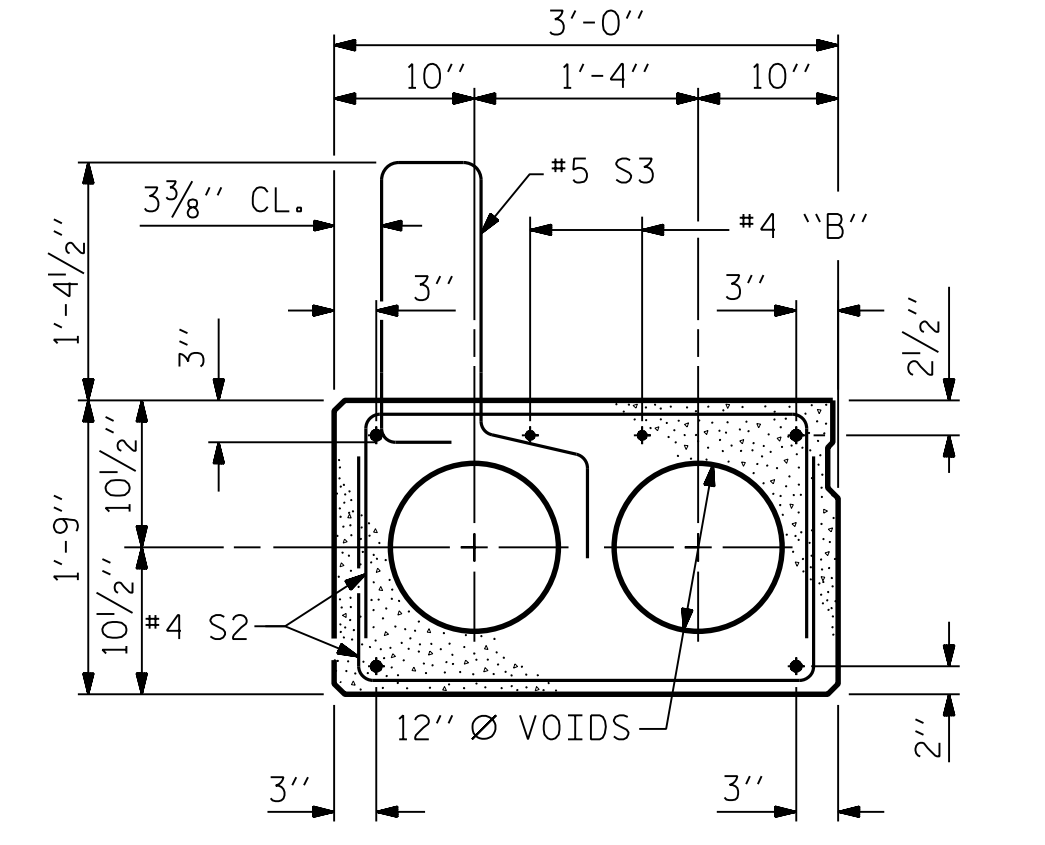
TYPICAL SECTION

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

\*\* FOR FIBER OPTIC CONDUIT SYSTEM DETAILS, SEE GUARDRAIL ANCHORAGE SHEET, S-10.



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

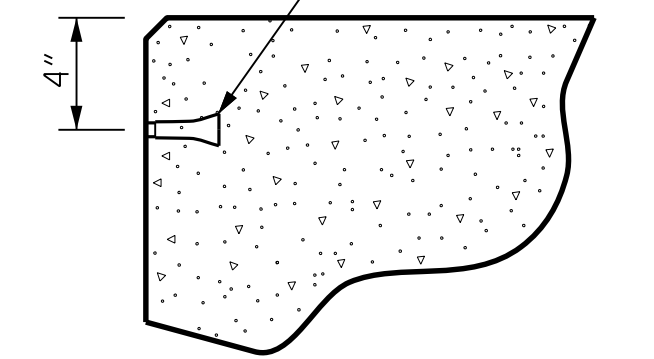


EXT. SLAB SECTION  
 (FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

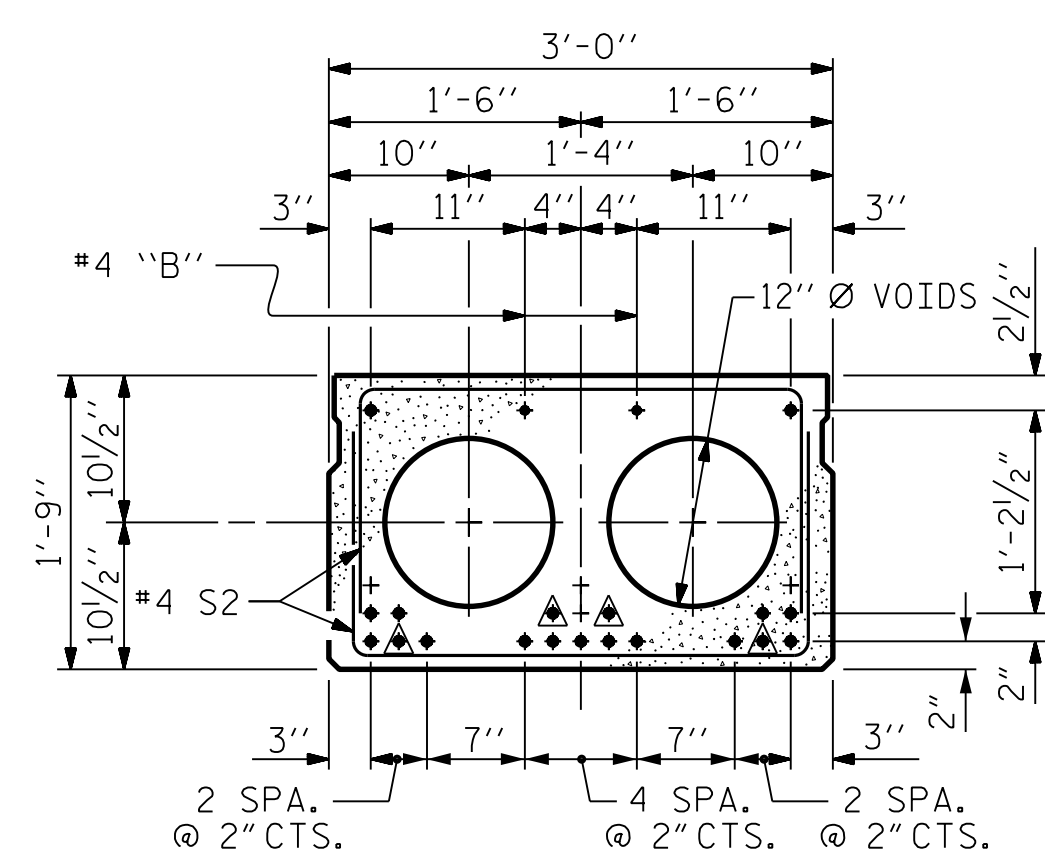
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

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

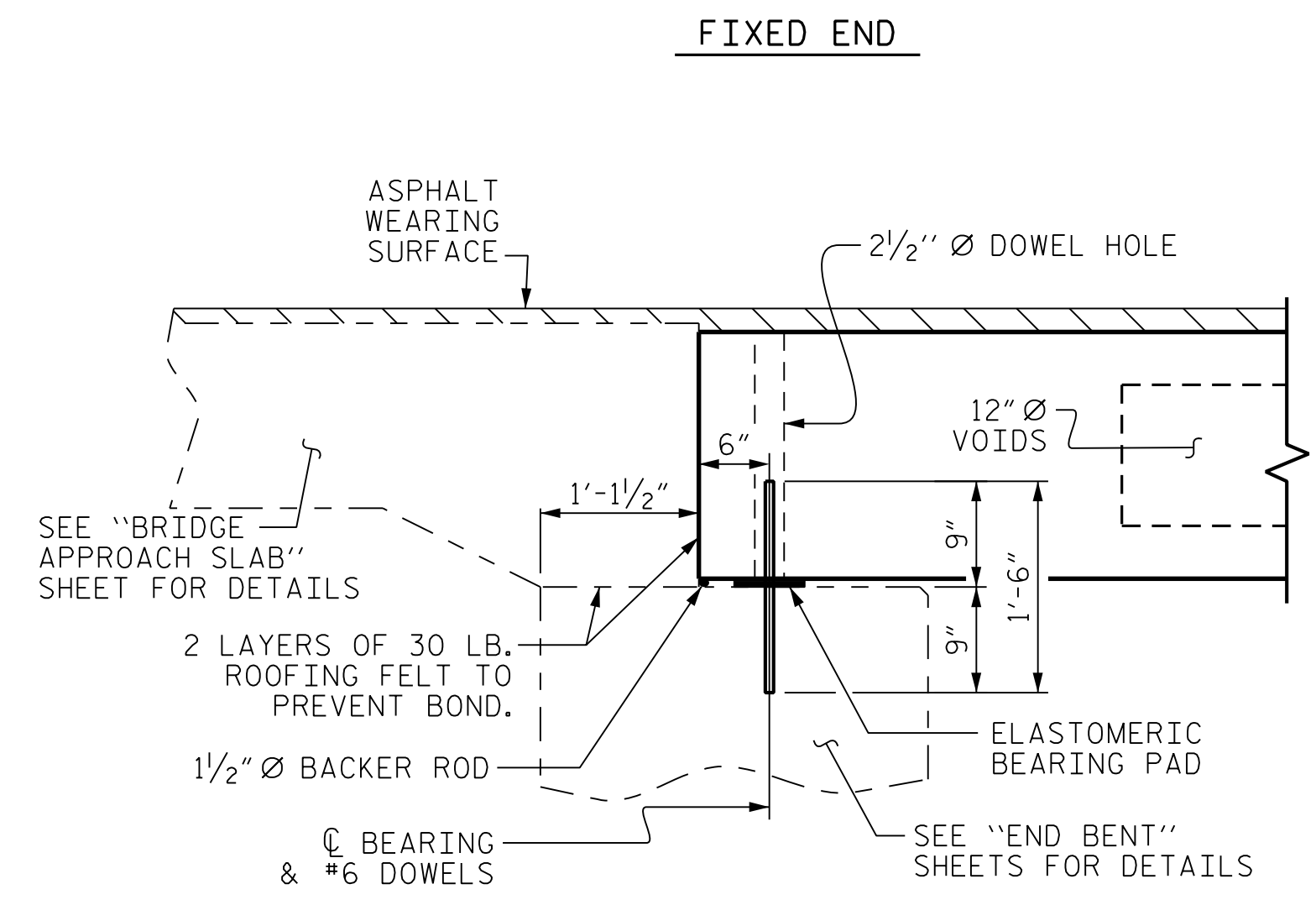


THREADED INSERT DETAIL

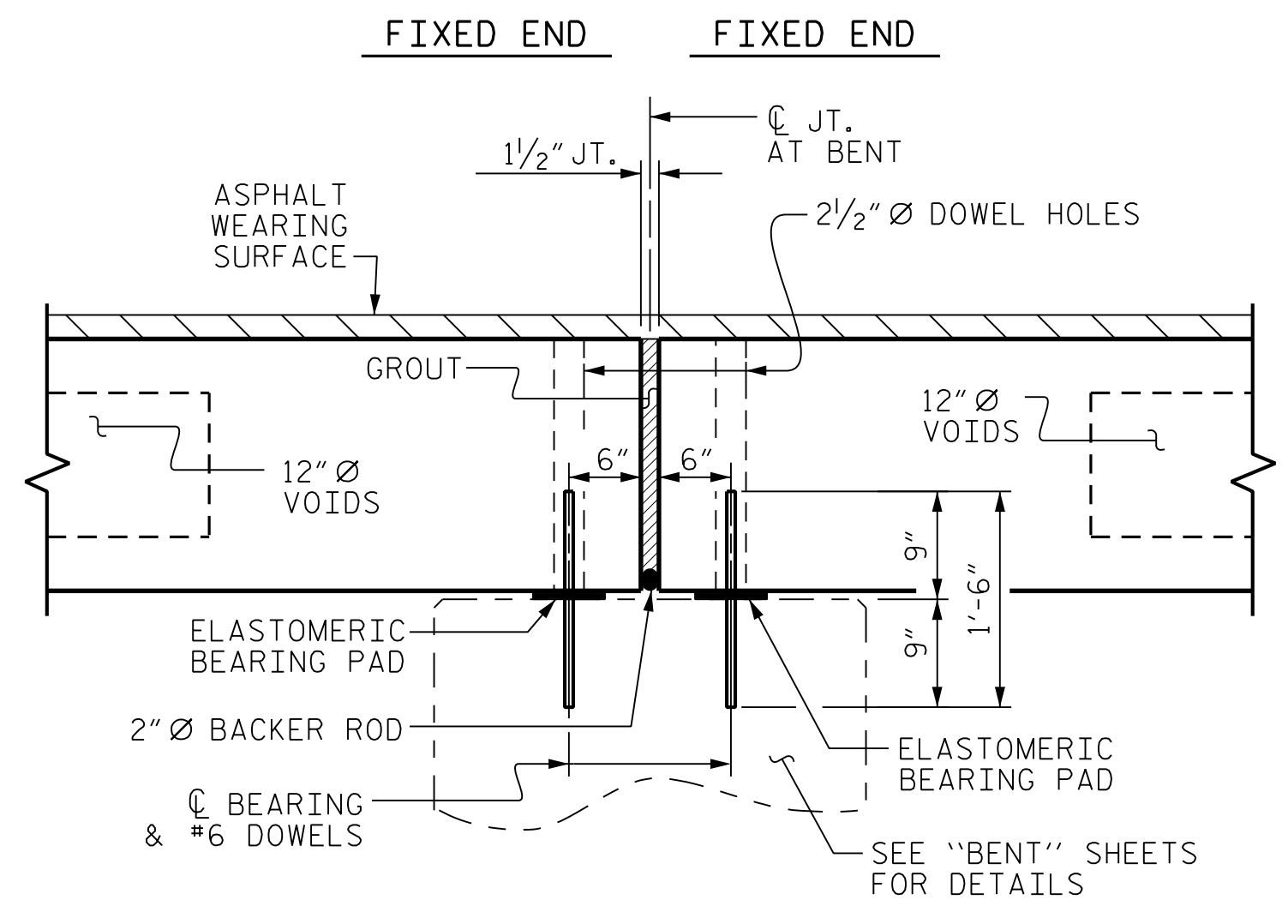


INTERIOR SLAB SECTION (50' UNIT)  
 (19 STRANDS REQUIRED)

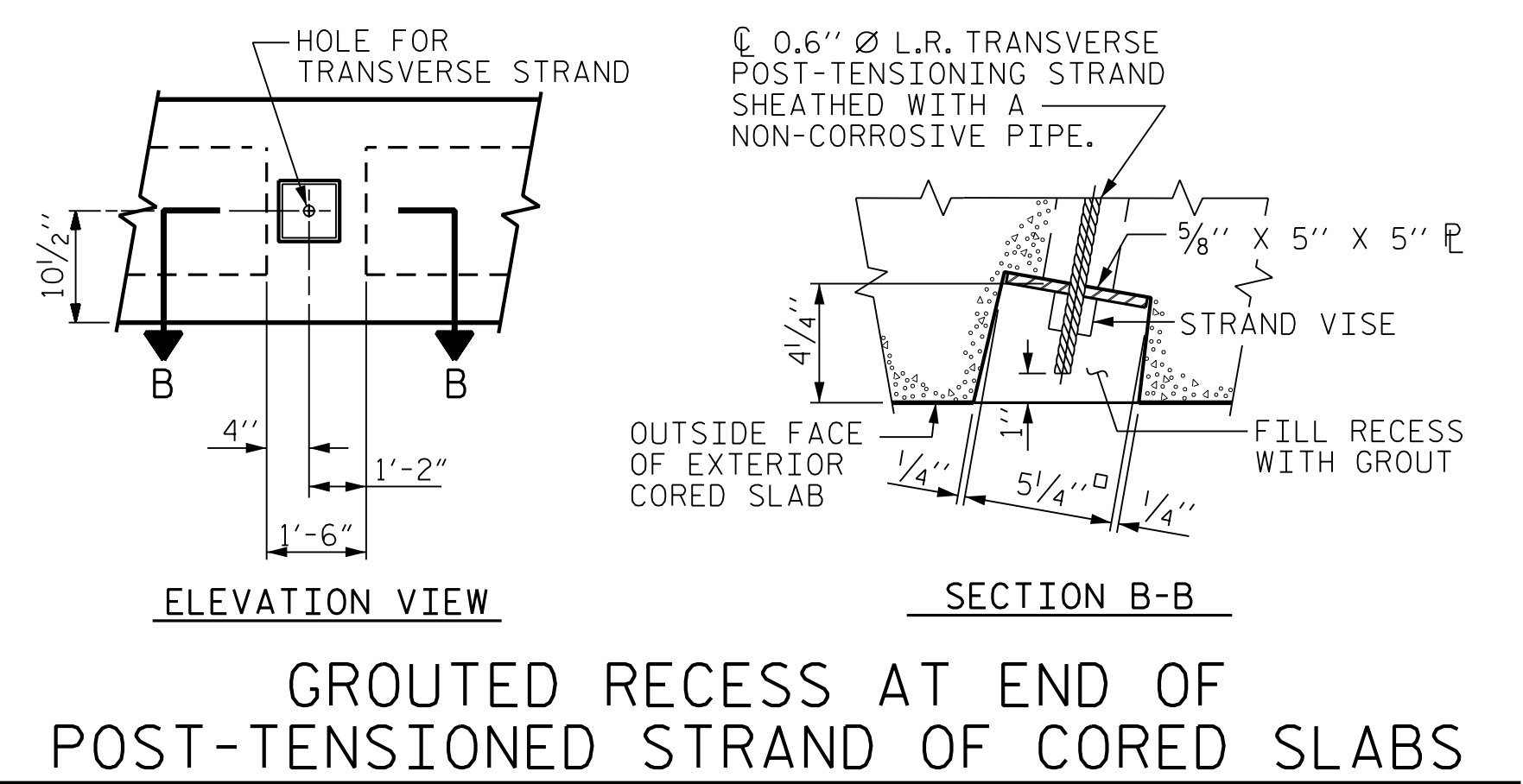
0.6" Ø LOW RELAXATION STRAND LAYOUT



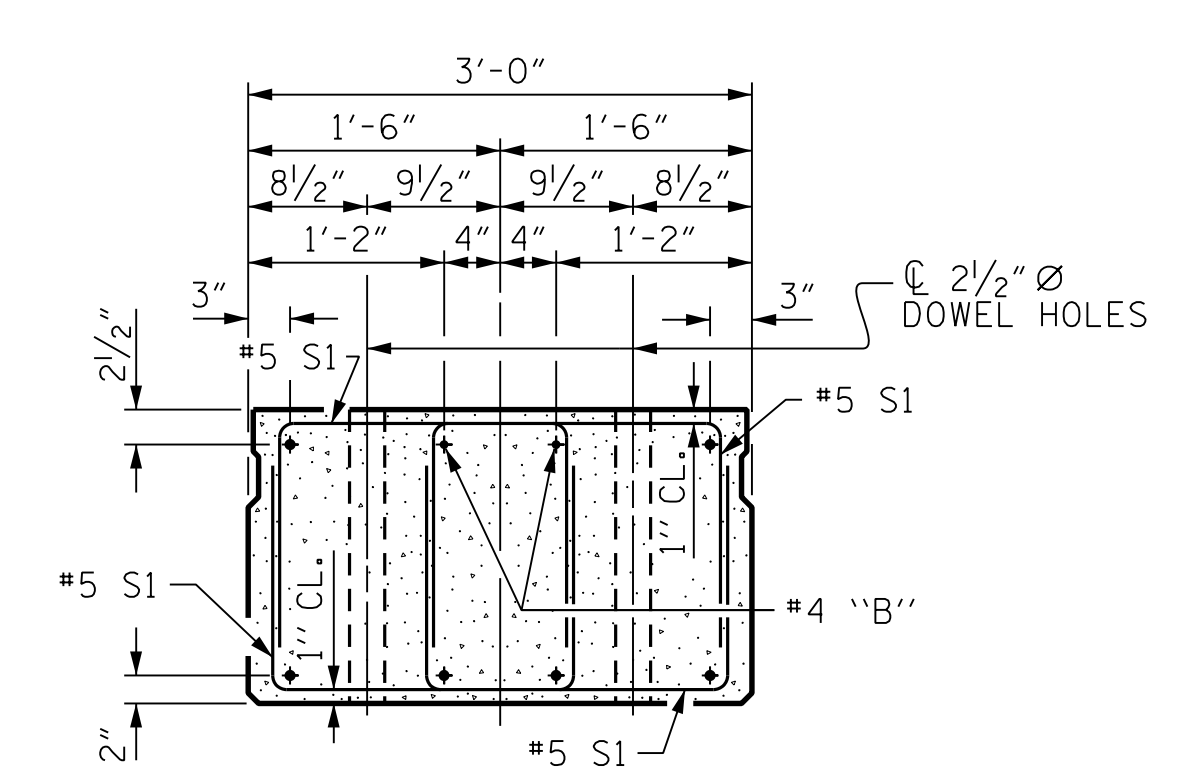
SECTION AT END BENT



SECTION AT BENT

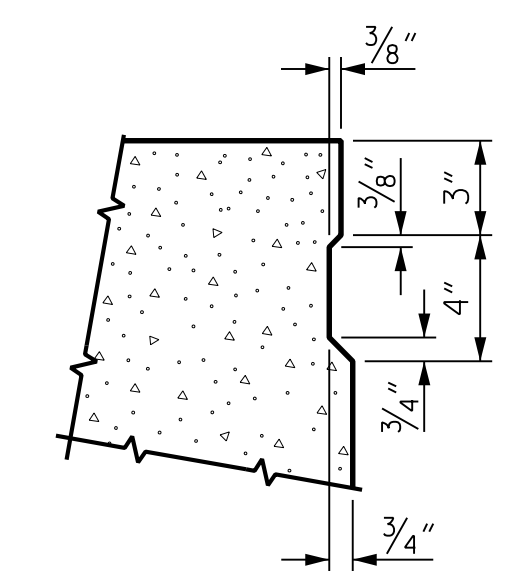


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



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.



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

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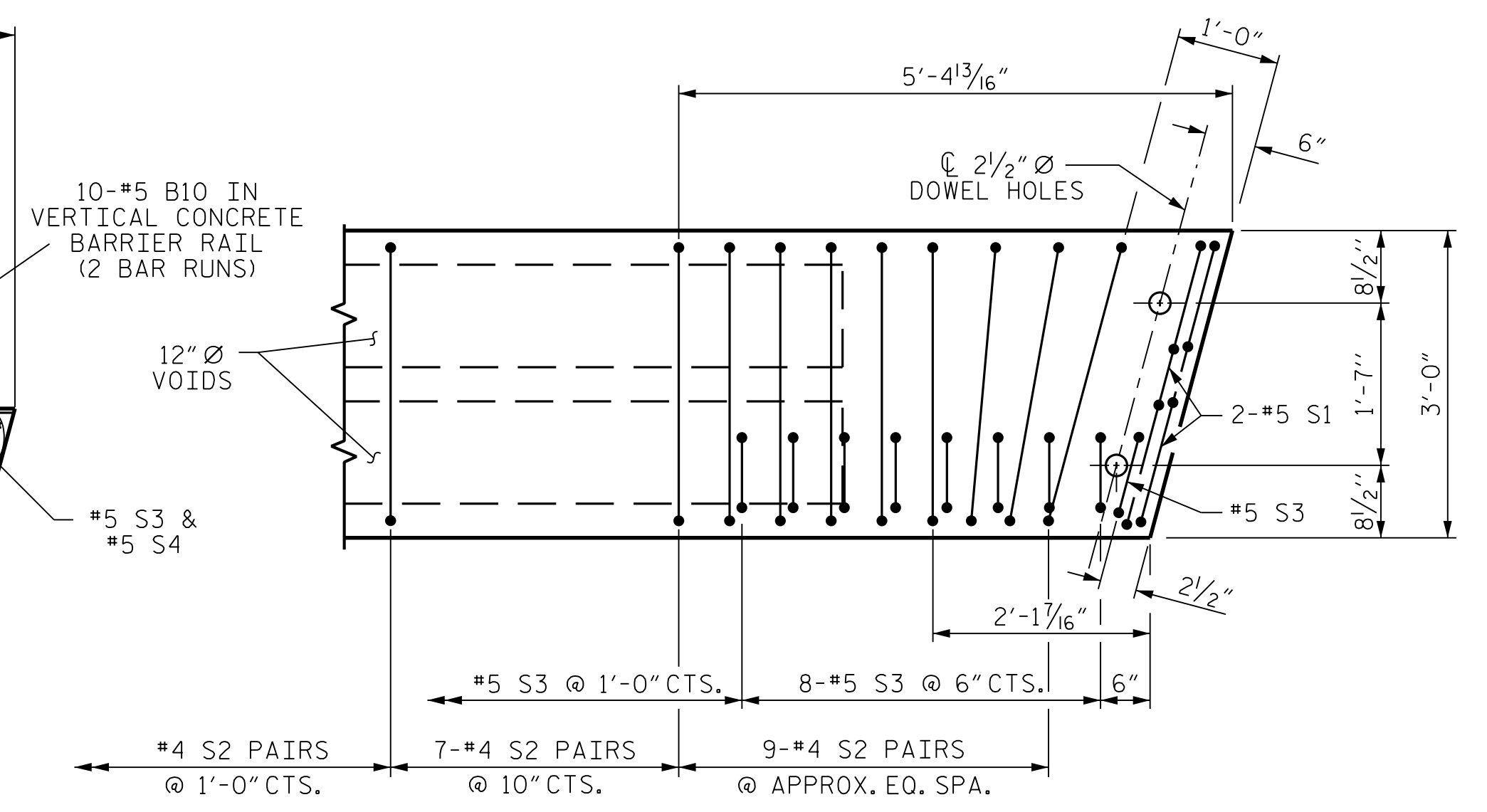
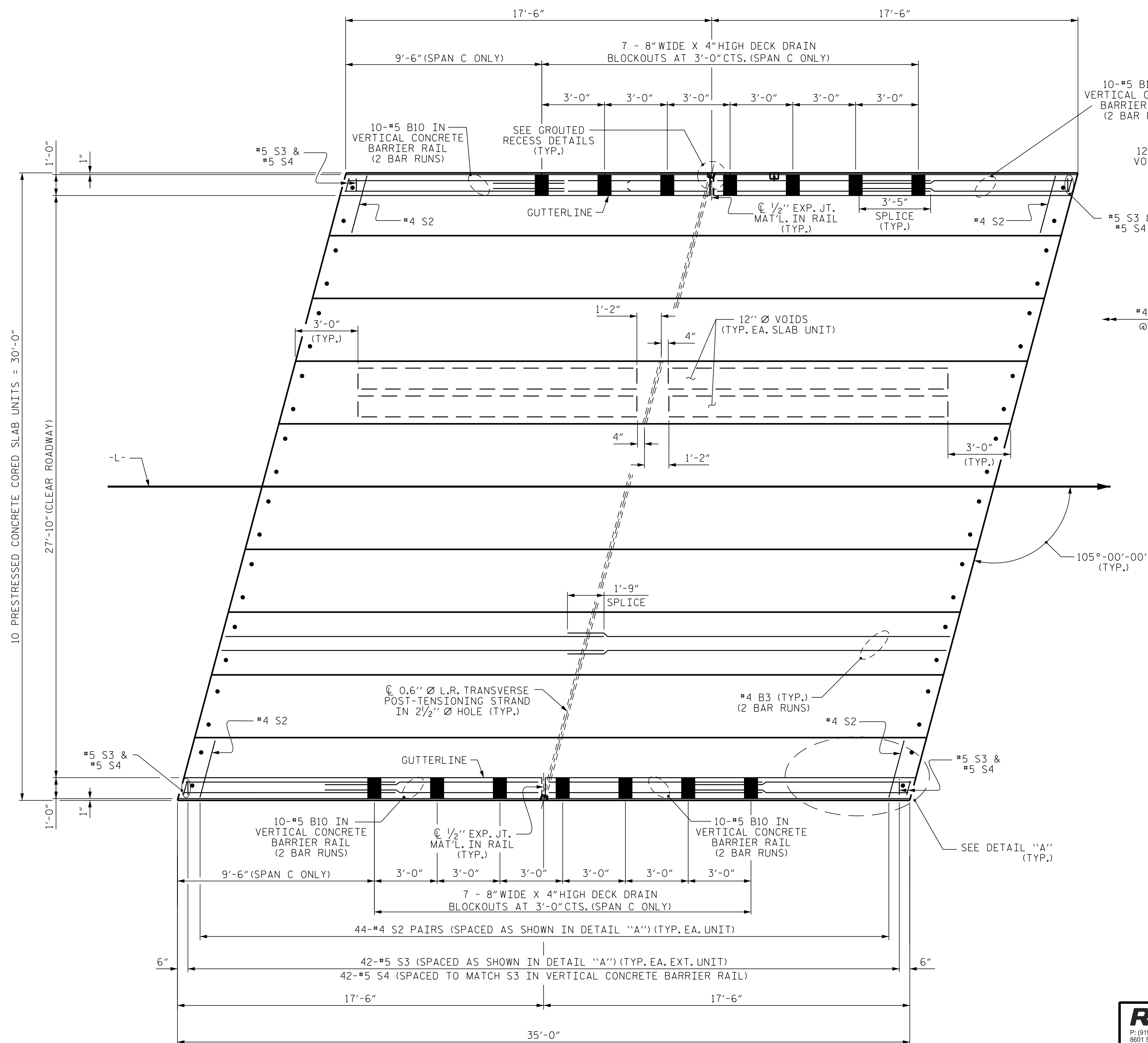
SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 105° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-6					TOTAL SHEETS 21

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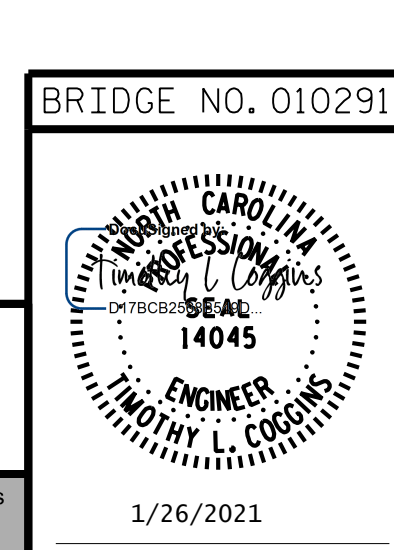


**DETAIL "A"**  
 (SIMILAR EACH END OF UNIT)  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

**PLAN OF UNIT**

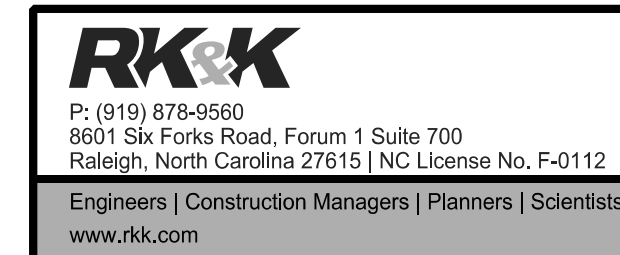
PROJECT NO. 17BP.12.R.88  
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 STATION: 16+26.50 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 BRIDGE NO. 010291  
 PLAN OF 35' UNIT  
 27'-10" CLEAR ROADWAY  
 105° SKEW  
 (SPAN A AND SPAN C)

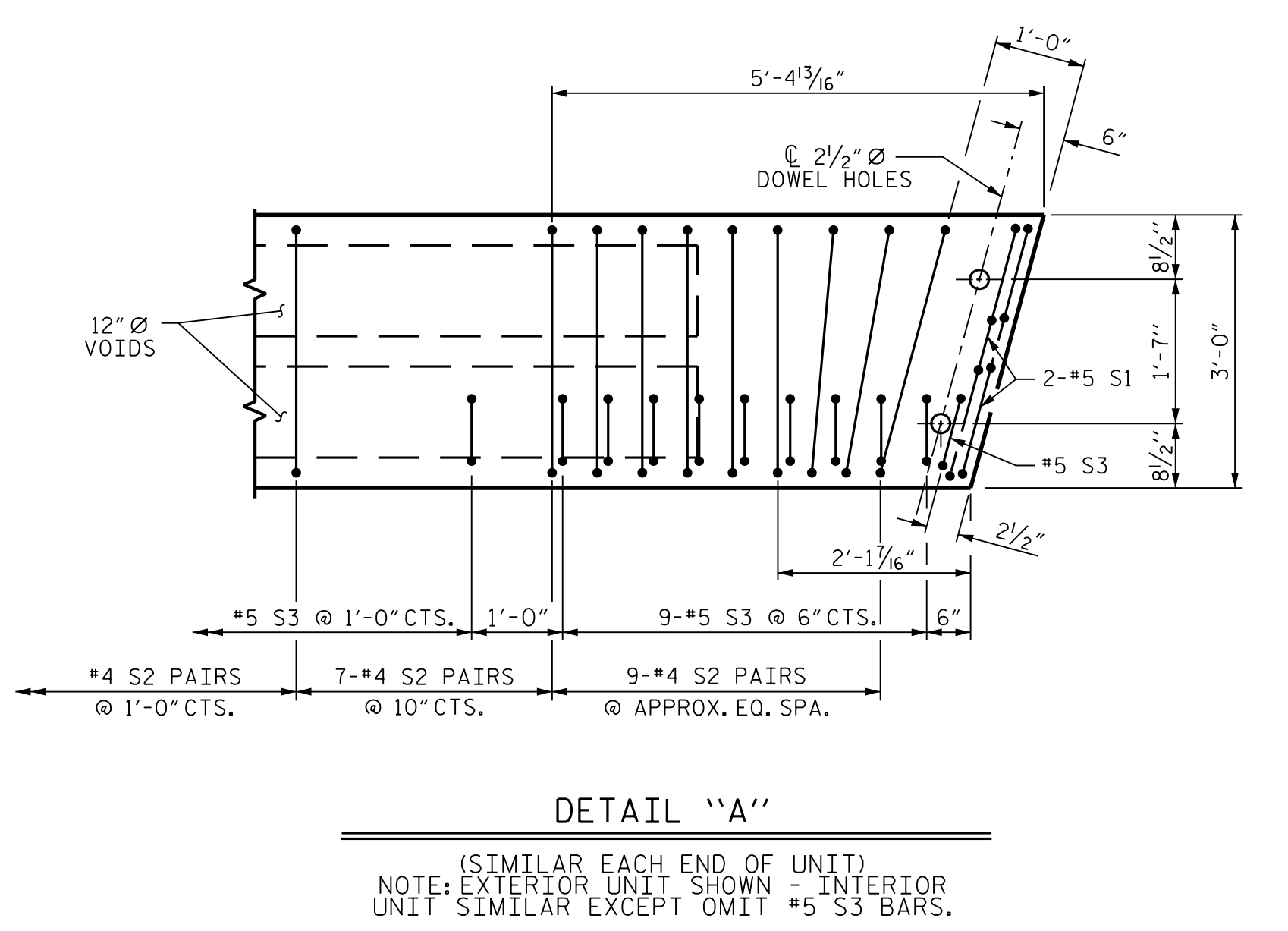
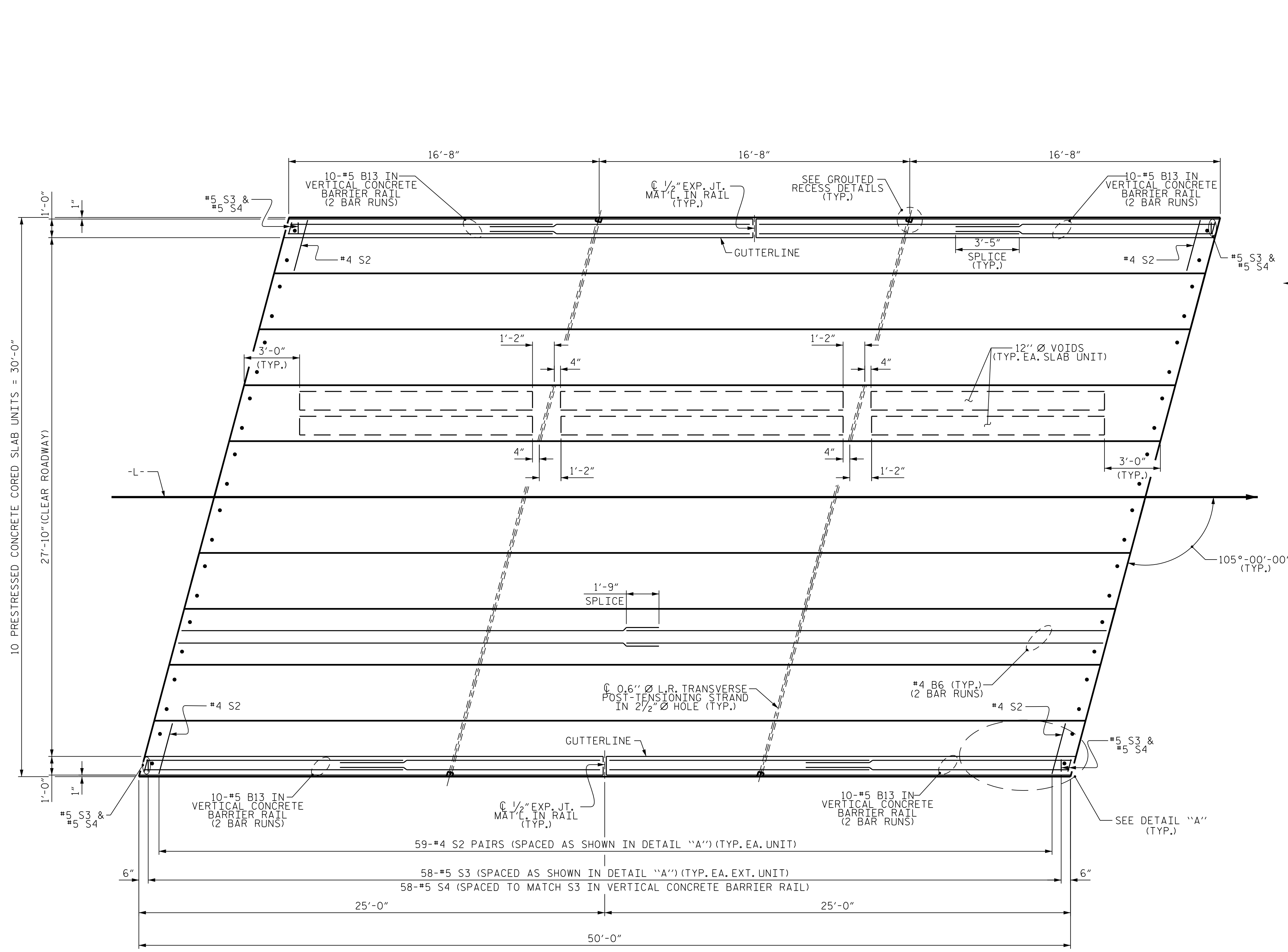
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			21	

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PLAN OF UNIT

PROJECT NO. 17BP.12.R.88  
 ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE NO. 010291

PLAN OF 50' UNIT  
 27'-10" CLEAR ROADWAY  
 105° SKEW  
 SPAN B

1/26/2021

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

SHEET NO. S-8  
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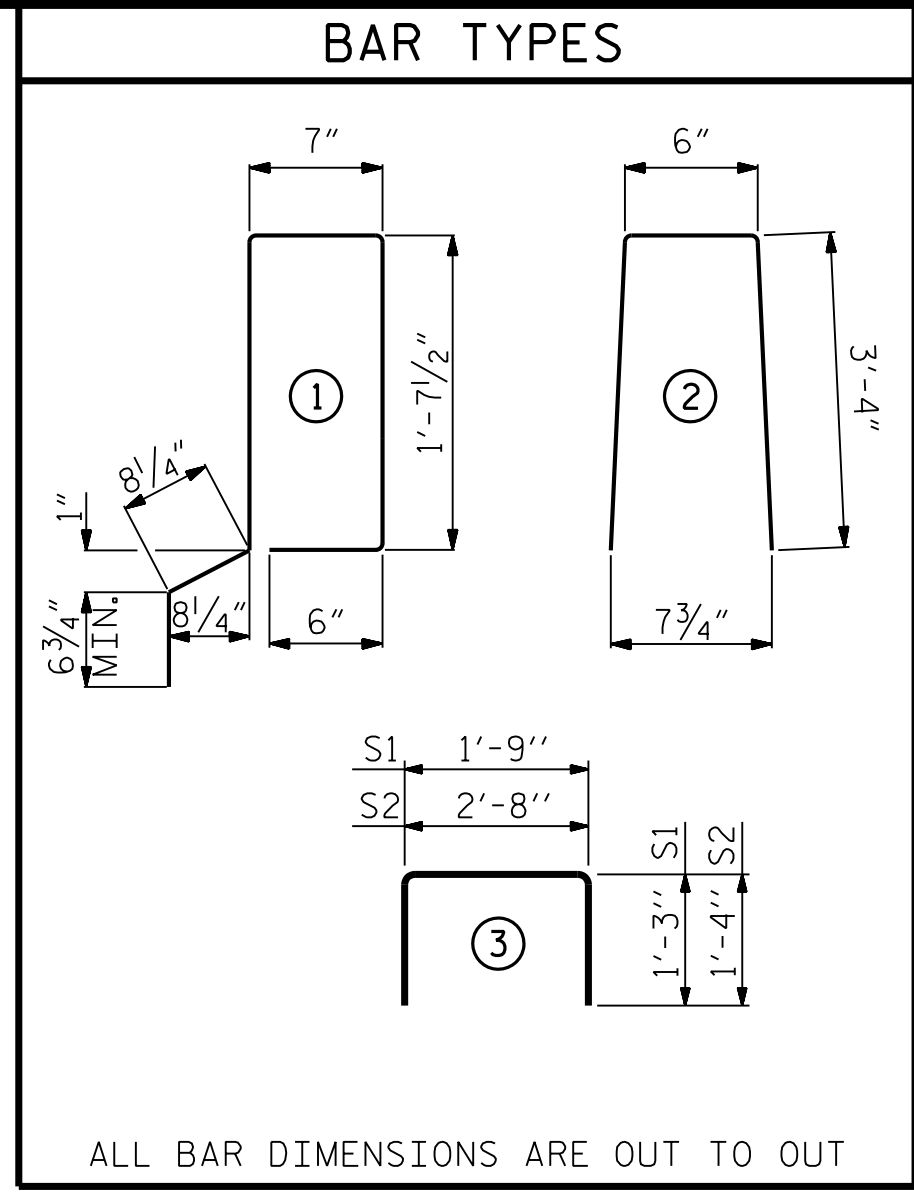
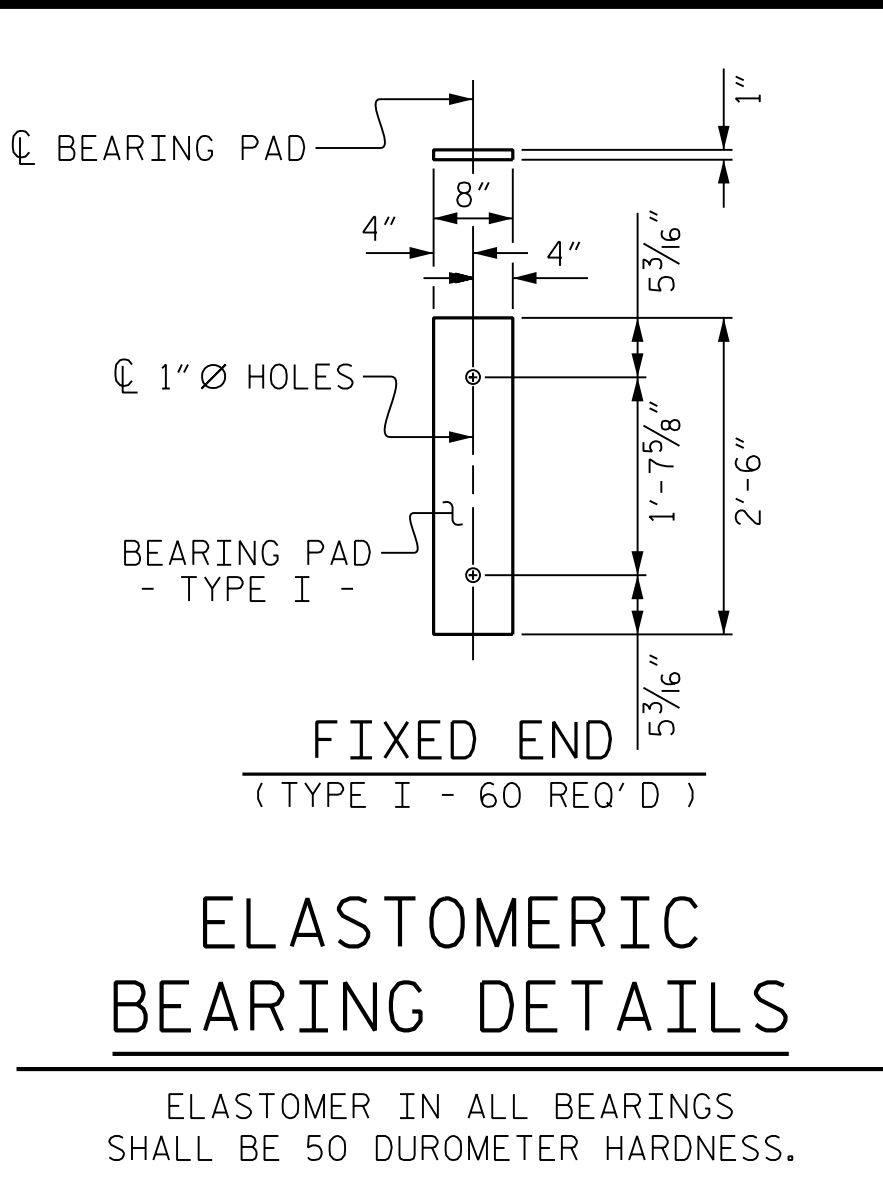
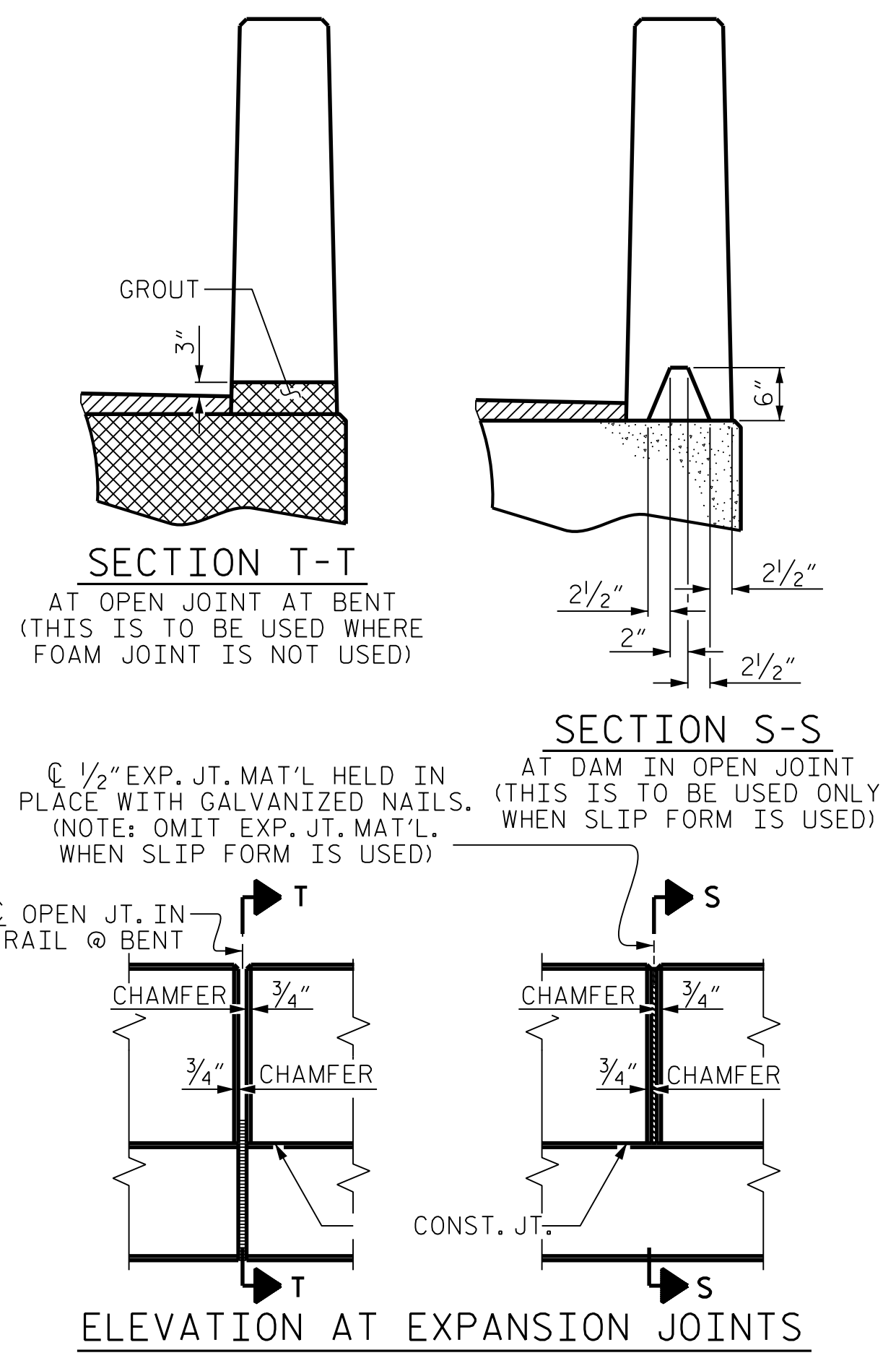
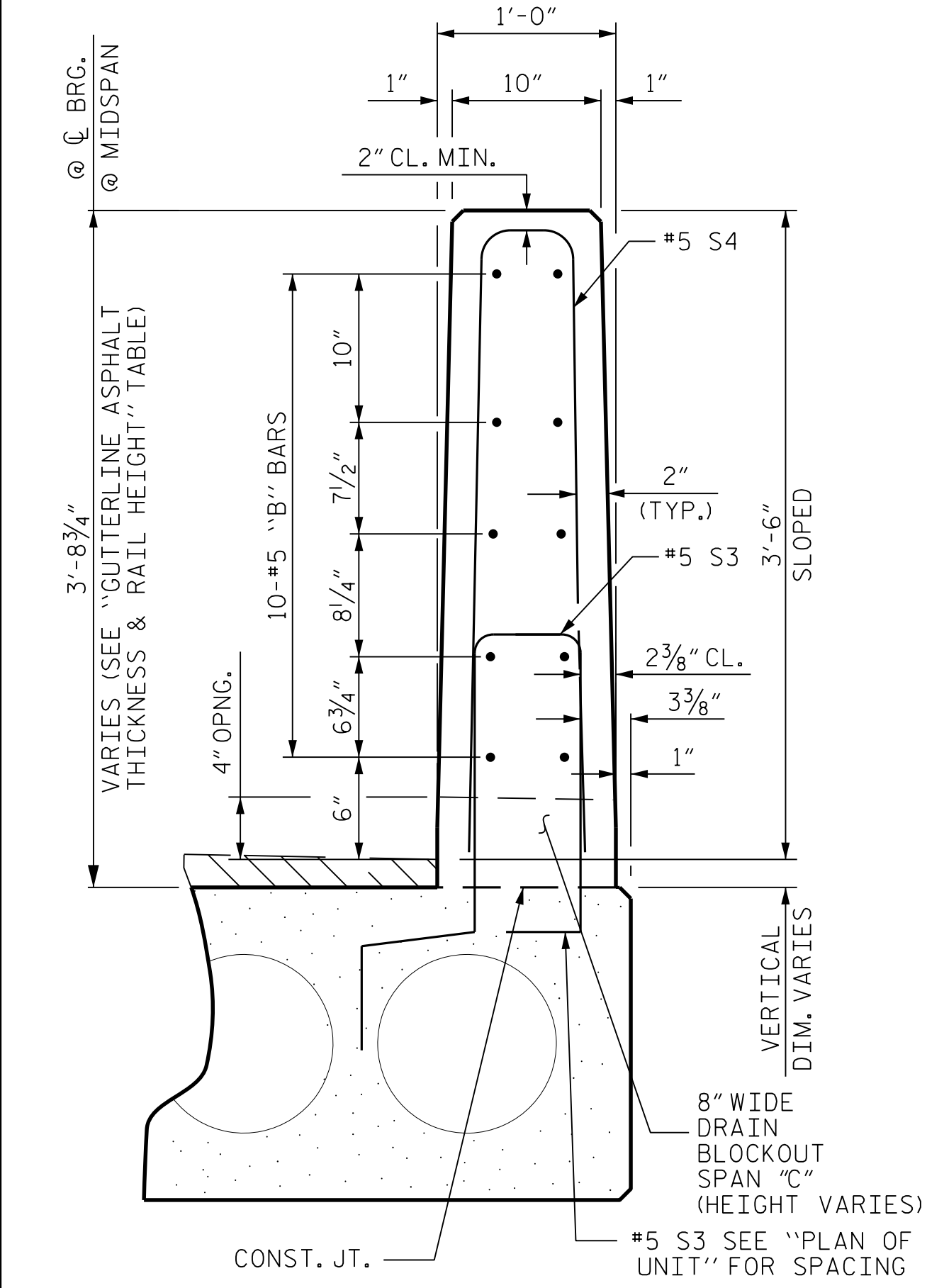
DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
 CHECKED BY : T. L. COGGINS DATE : JUN 2018  
 DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : JUN 2018

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GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
35' UNITS	2 5/8"	3'-8 5/8"
50' UNITS	1 5/8"	3'-7 5/8"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
35' UNITS	4,000
50' UNITS	4,900



### 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.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL 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.

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.

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.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

### VERTICAL CONCRETE BARRIER RAIL SECTION

### END OF RAIL DETAILS

CORED SLABS REQUIRED			
35' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	35'-0"	140'-0"
INTERIOR C.S.	16	35'-0"	560'-0"
<b>TOTAL</b>	<b>20</b>		<b>700'-0"</b>

CORED SLABS REQUIRED			
50' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	8	50'-0"	400'-0"
<b>TOTAL</b>	<b>10</b>		<b>500'-0"</b>

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	88	#4	3	5'-4"	314	5'-4"	314
* S3	44	#5	1	5'-7"	256		
REINFORCING STEEL				LBS.	398		398
* EPOXY COATED REINFORCING STEEL				LBS.	256		
5000 P.S.I. CONCRETE				CU. YDS.	5.2		5.2
0.6" Ø L.R. STRANDS				No.	9		9

DEAD LOAD DEFLECTION AND CAMBER	
35' CORED SLAB UNIT	3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↑

\*\* 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
50' UNIT						
* B13	80	80	#5	STR	14'-2"	1,182
* S4	120	120	#5	2	7'-2"	897
* EPOXY COATED REINFORCING STEEL				LBS.		2,079
CLASS AA CONCRETE				CU. YDS.		12.8
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		100.26

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	118	#4	3	5'-4"	420	5'-4"	420
* S3	60	#5	1	5'-7"	349		
REINFORCING STEEL				LBS.	524		524
* EPOXY COATED REINFORCING STEEL				LBS.	349		
6500 P.S.I. CONCRETE				CU. YDS.	7.3		7.3
0.6" Ø L.R. STRANDS				No.	19		19

DEAD LOAD DEFLECTION AND CAMBER	
50' CORED SLAB UNIT	3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/8" ↓
FINAL CAMBER	1/8" ↑

\*\* 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"	1,738
* S4	88	176	#5	2	7'-2"	1,316
* EPOXY COATED REINFORCING STEEL				LBS.		3,054
CLASS AA CONCRETE				CU. YDS.		18.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		140.26

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

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SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 1'-9"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 105° SKEW

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

SHEET NO. S-9  
 TOTAL SHEETS 21

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 DESIGN ENGINEER OF RECORD: T.L. COGGINS DATE: JUN 2018

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NOTES

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

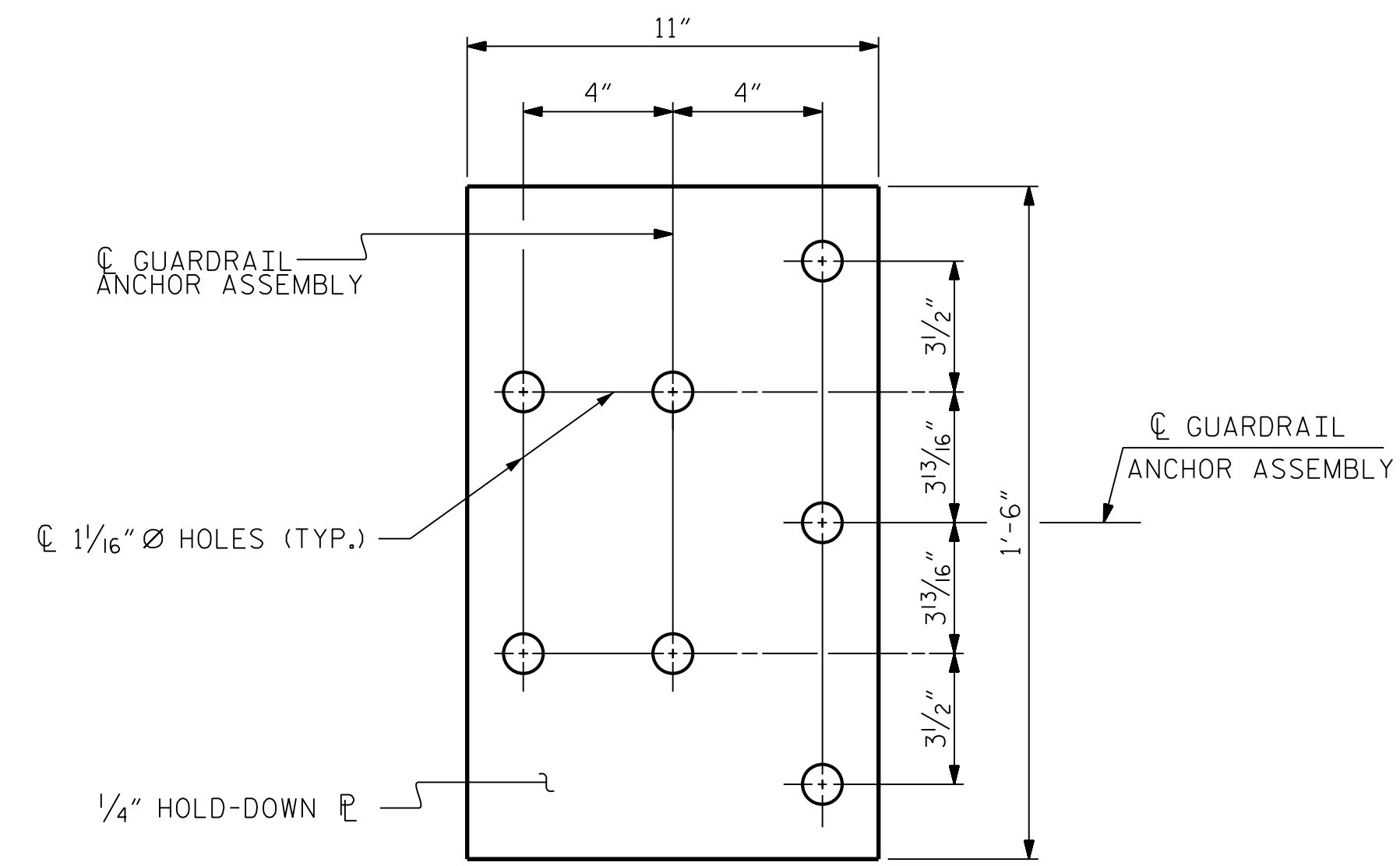
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

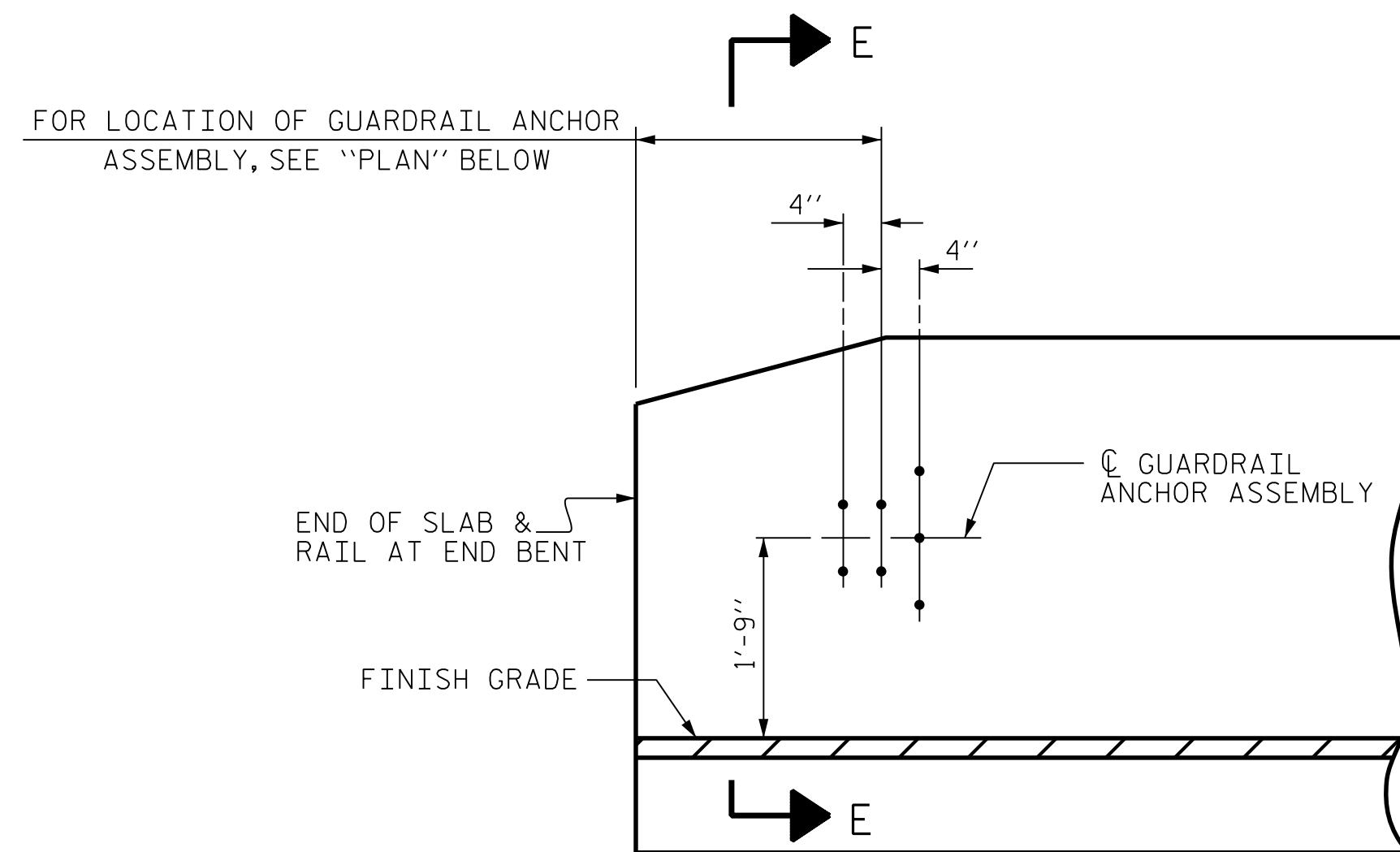
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

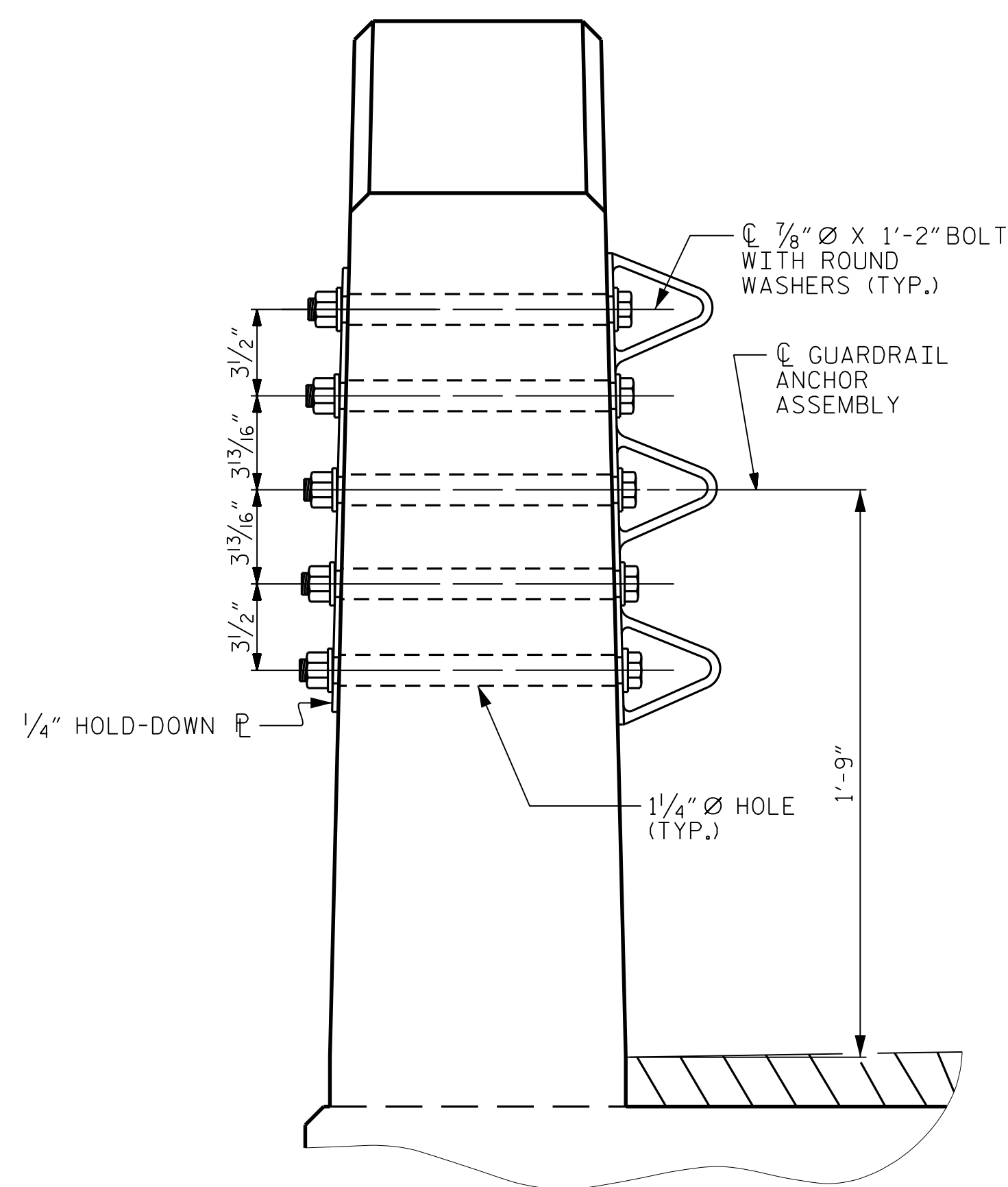
2 1/2" PVC PIPE SHALL BE RAISED ABOVE TOP OF DECK DRAIN OPENINGS AS REQUIRED.



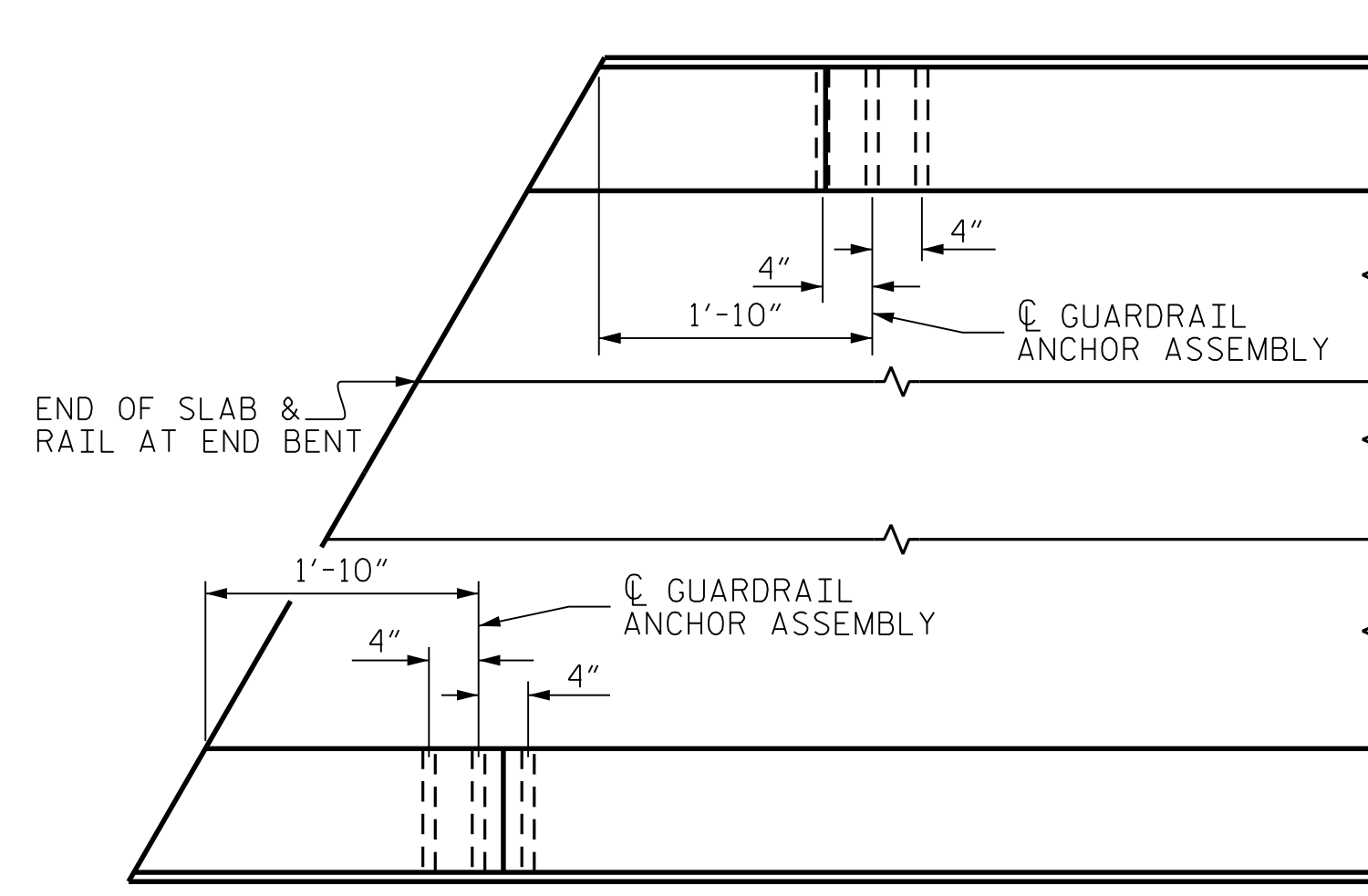
PLAN



ELEVATION



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

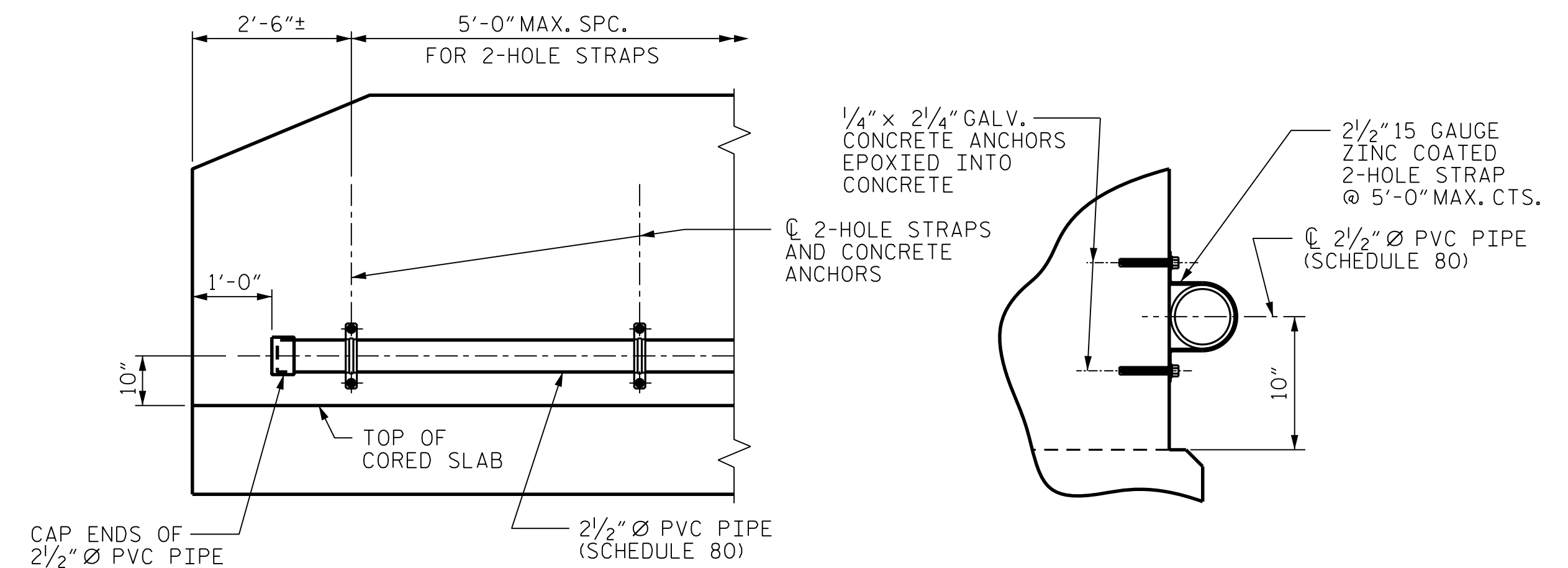
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY



ELEVATION

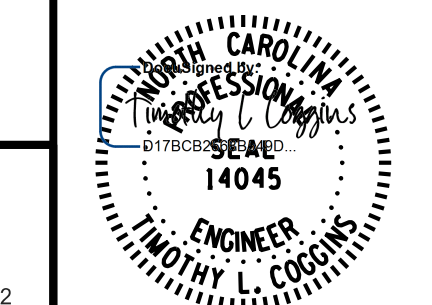
SECTION

FIBER OPTIC CONDUIT SYSTEM DETAILS

2 1/2" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.

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

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
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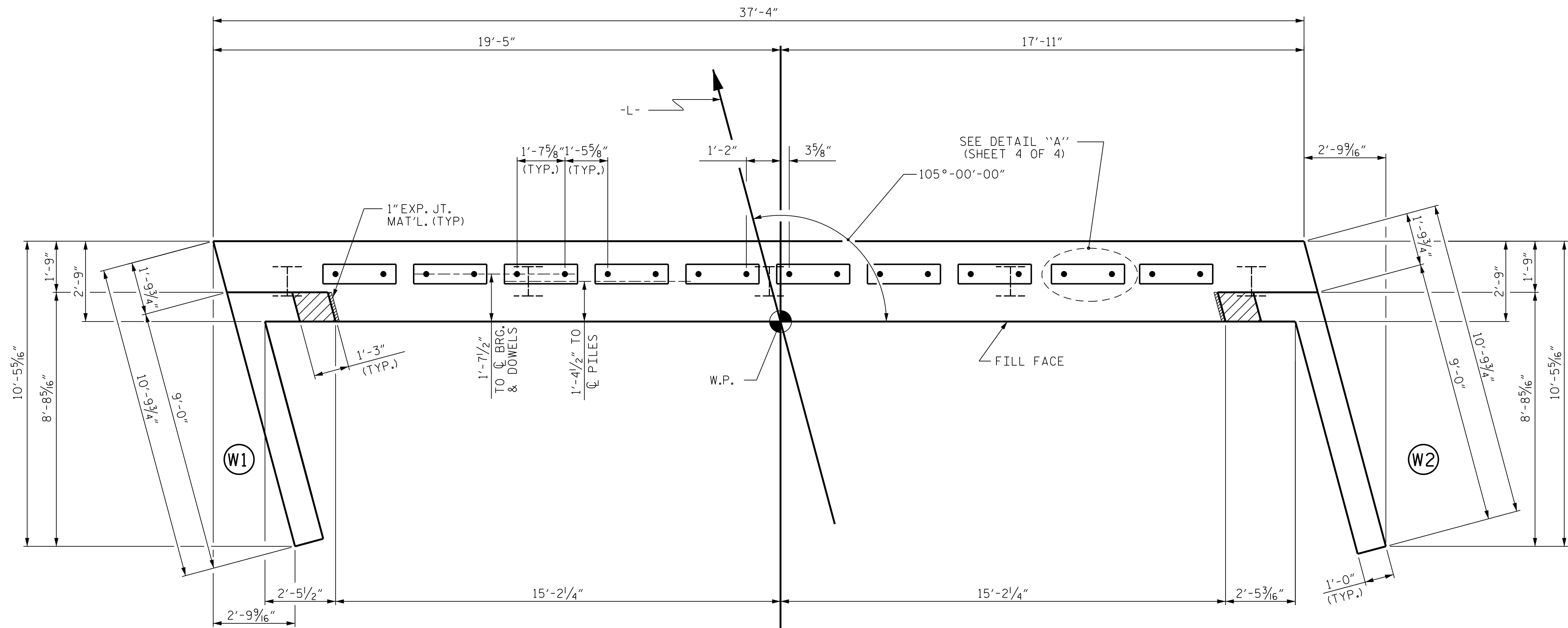
**NOTES**

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

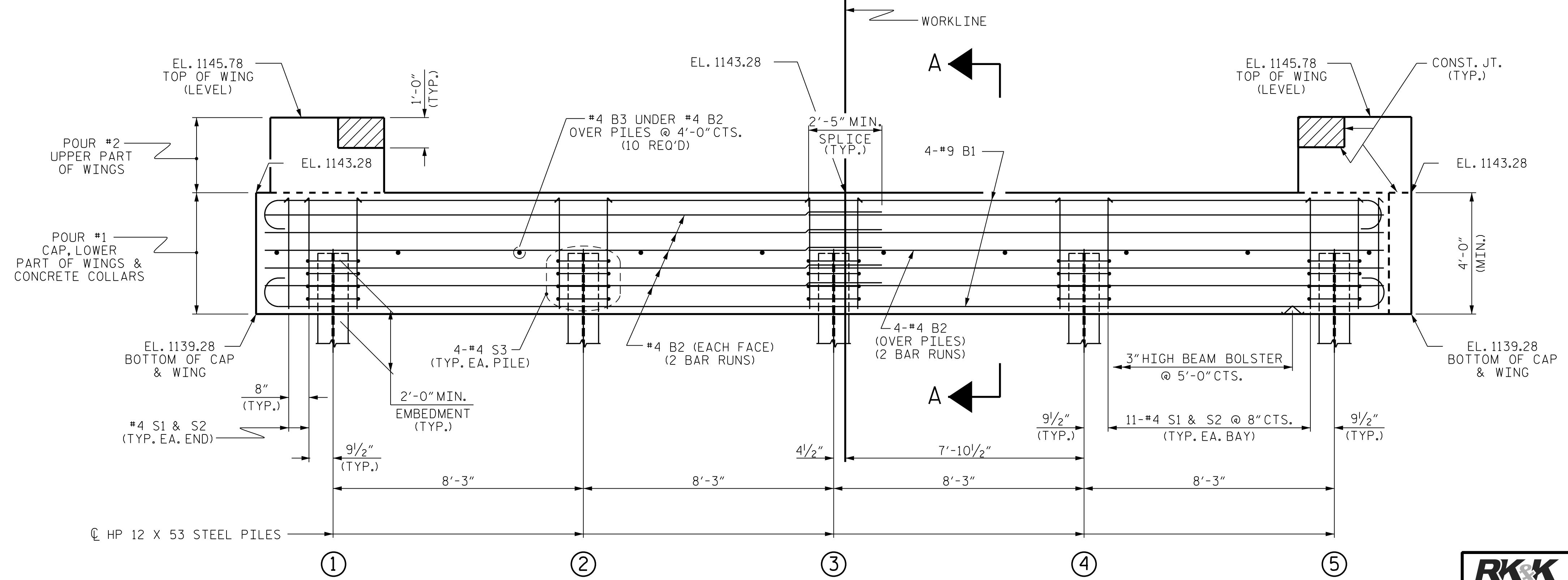
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



**PLAN**



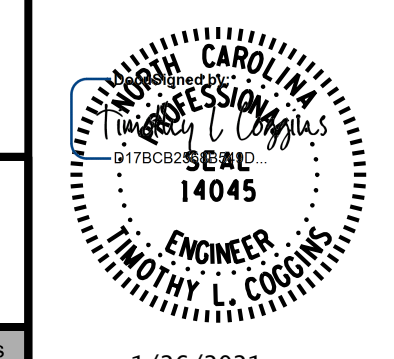
**ELEVATION**

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

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

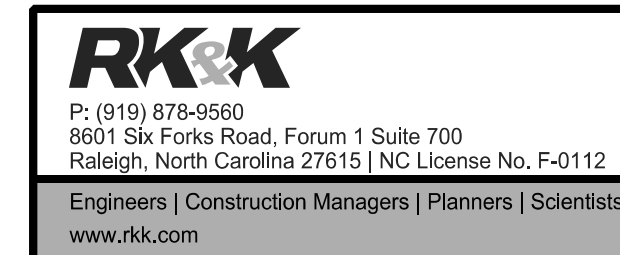
SHEET 1 OF 4

BRIDGE NO. 010291



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1



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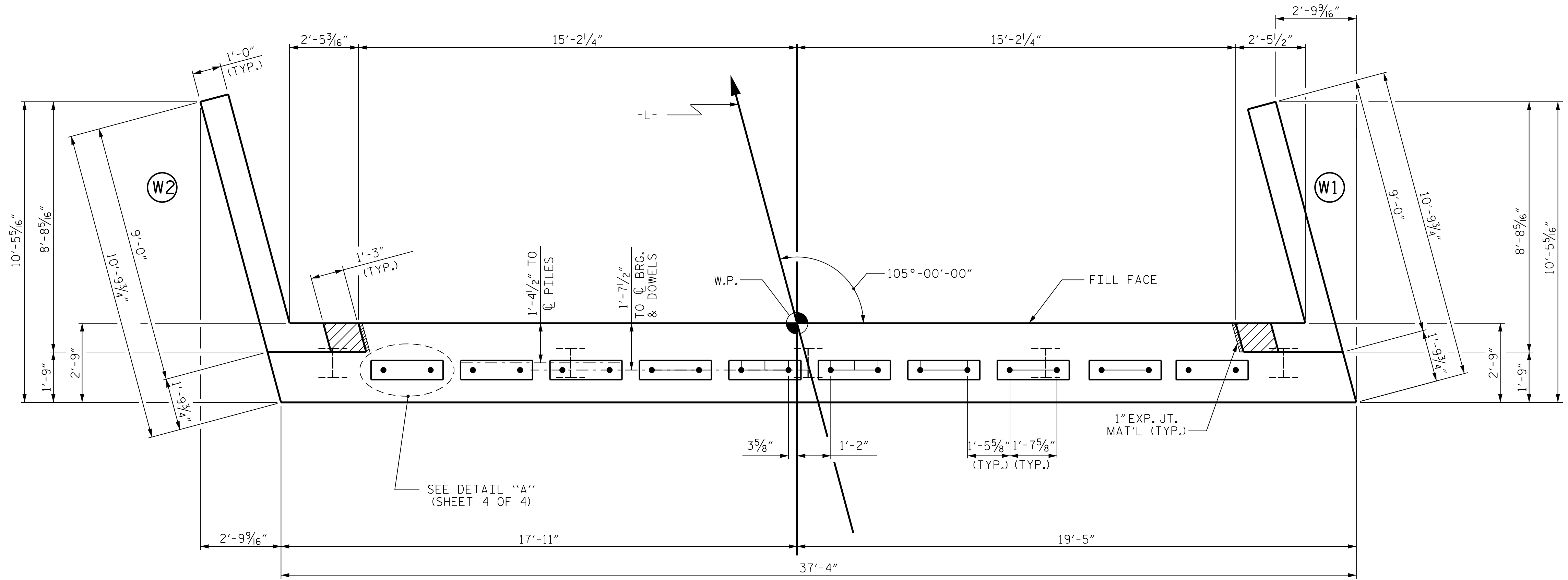
NOTES

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

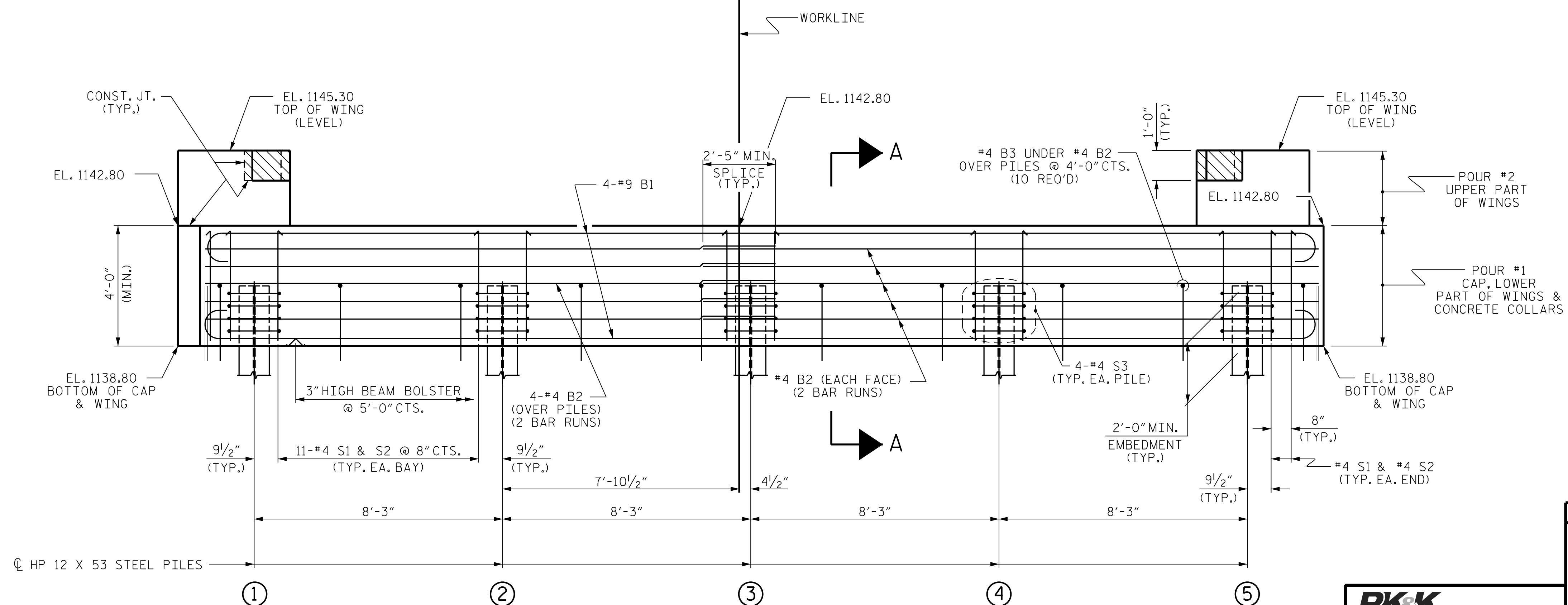
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



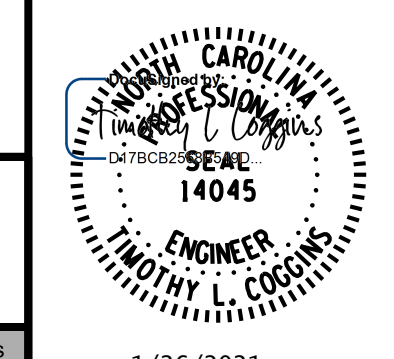
ELEVATION

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

PROJECT NO. 17BP.12.R.88  
 ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

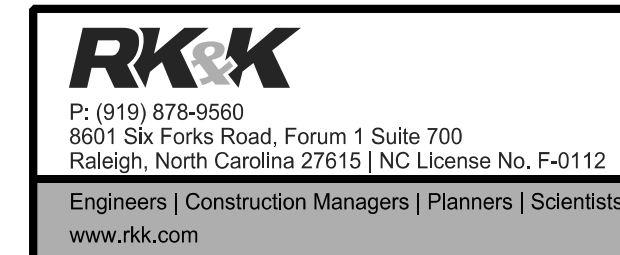
SHEET 2 OF 4

BRIDGE NO. 010291



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2



1/26/2021

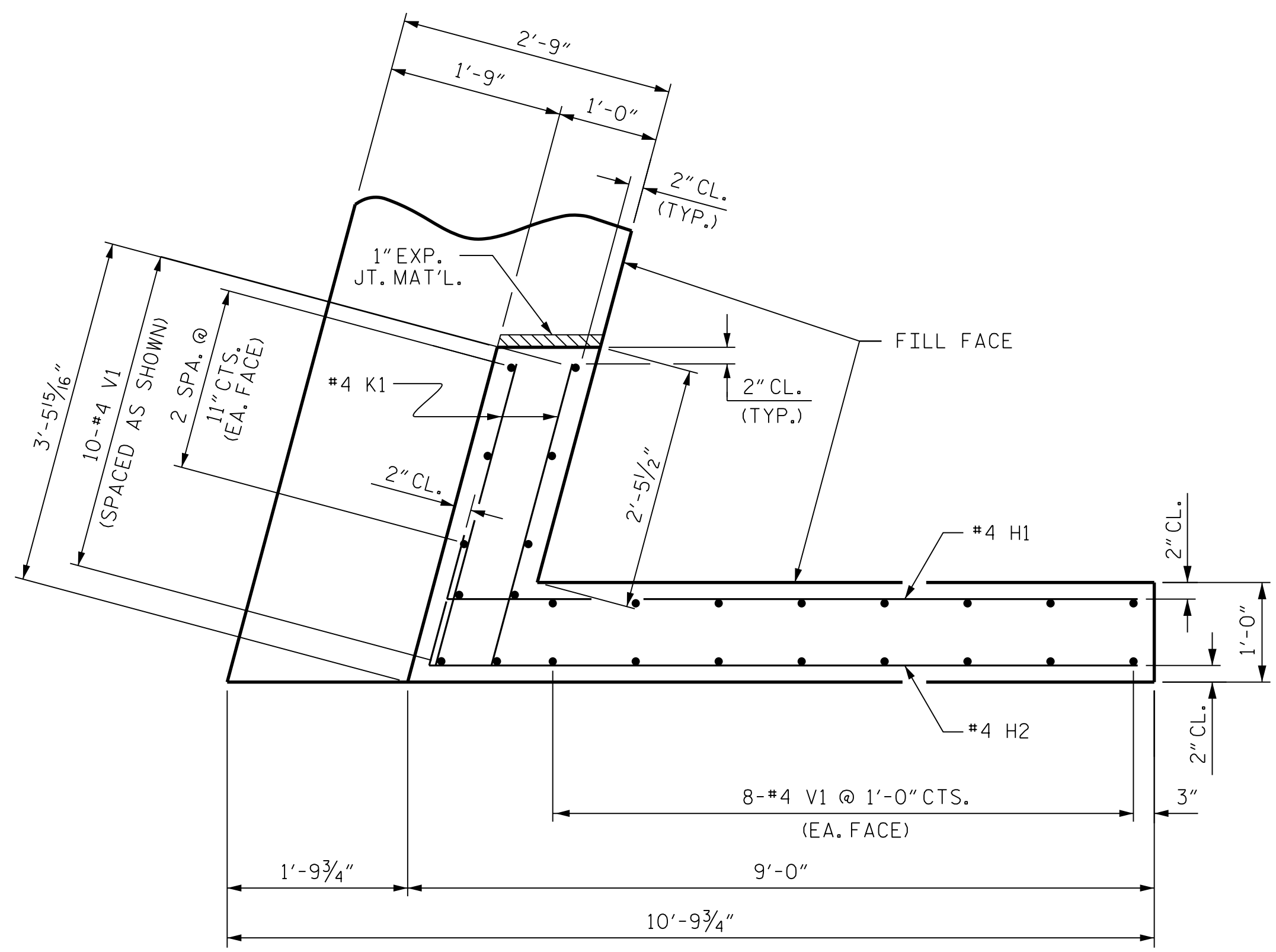
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	
2			4			21	

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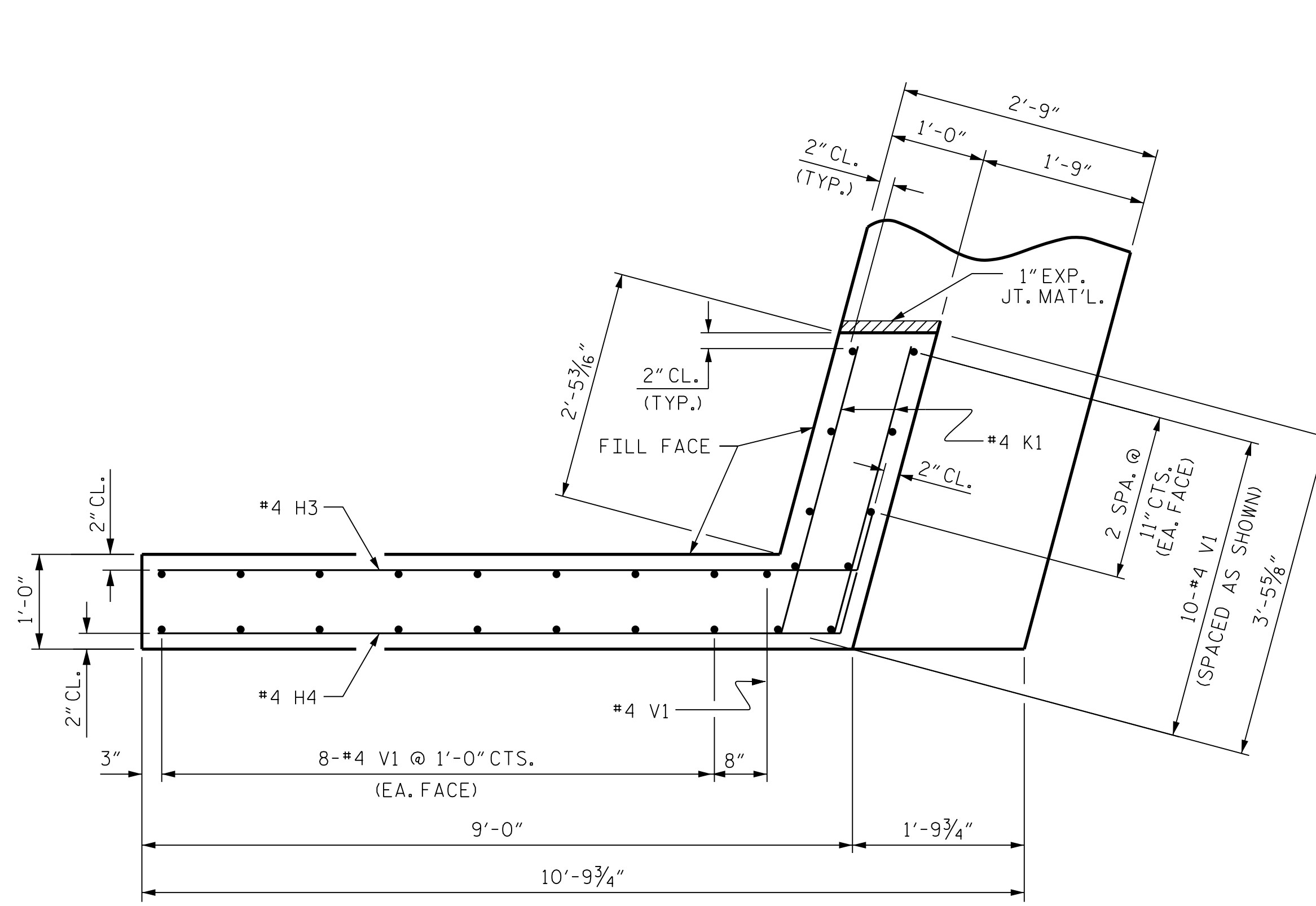
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DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
 CHECKED BY : T. L. COGGINS DATE : JUN 2018  
 DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : JUN 2018

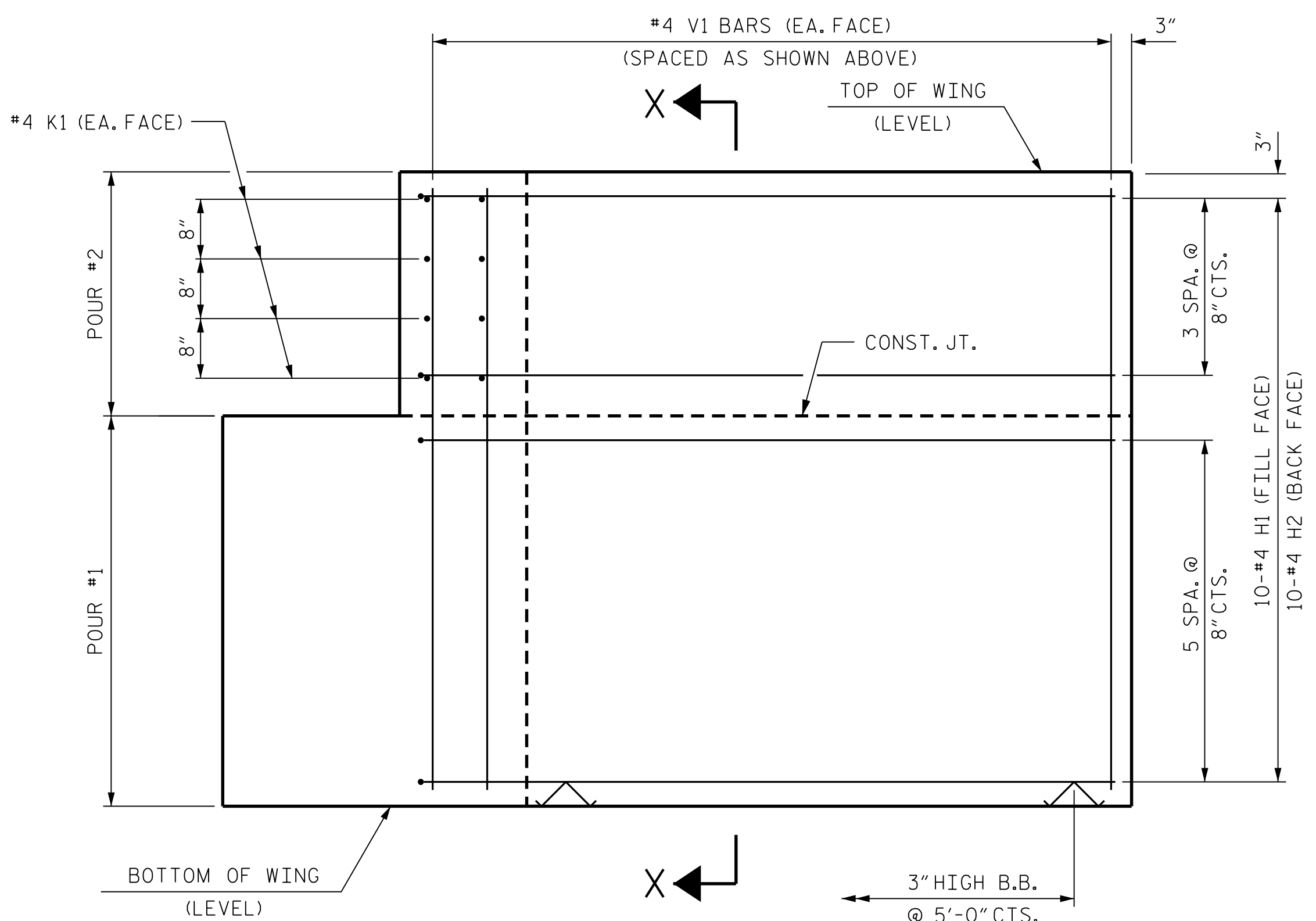
3/12/2020 R:\Structures\GON\FINAL\013-010291..SD\_WINGS\_EB3.dgn



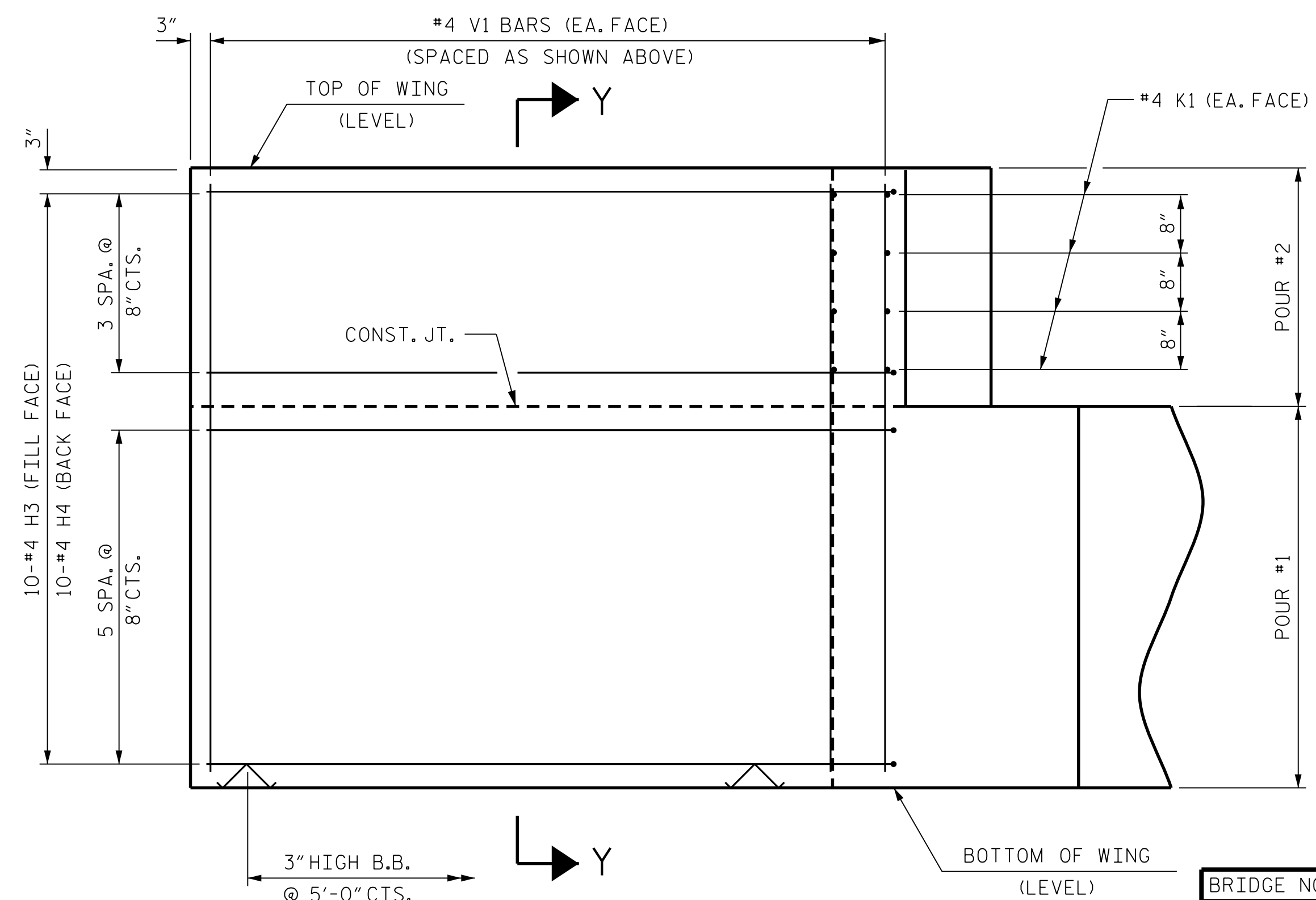
PLAN OF WING (W1)



PLAN OF WING (W2)

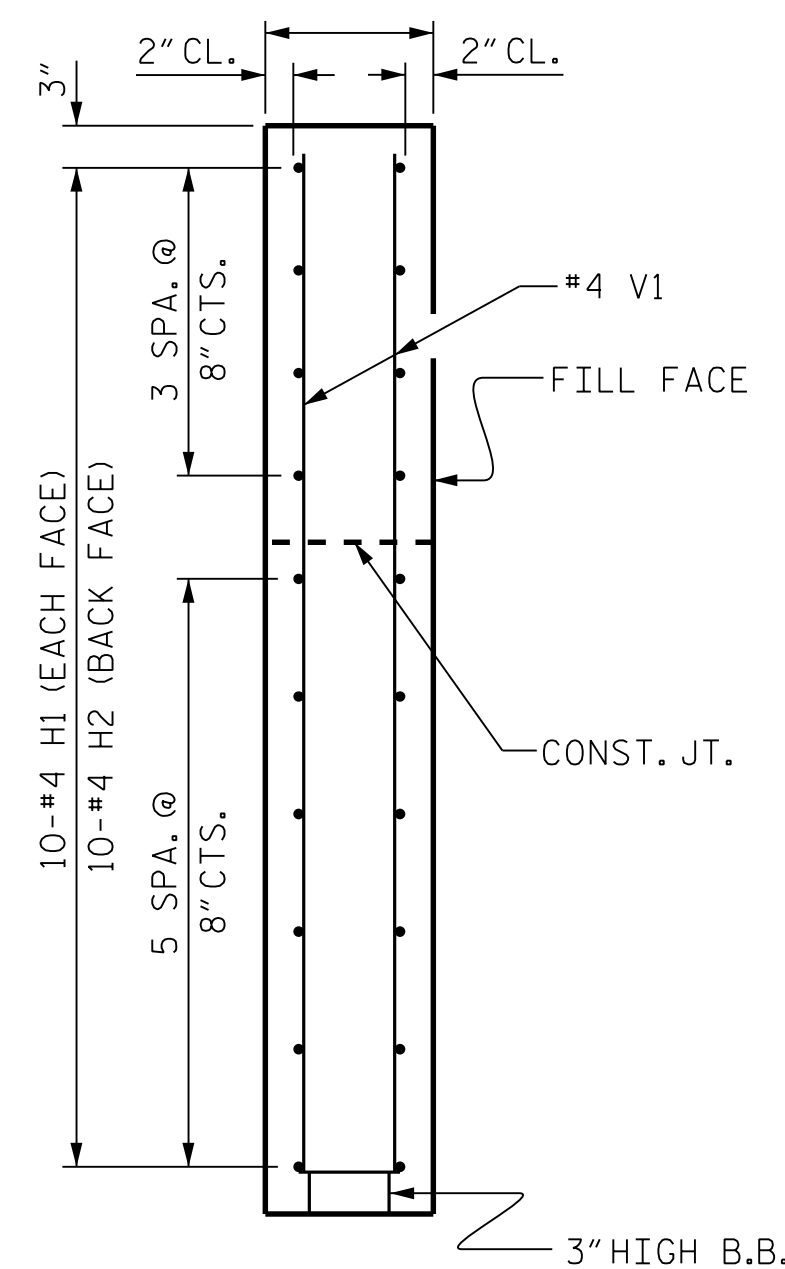


ELEVATION OF WING (W1)

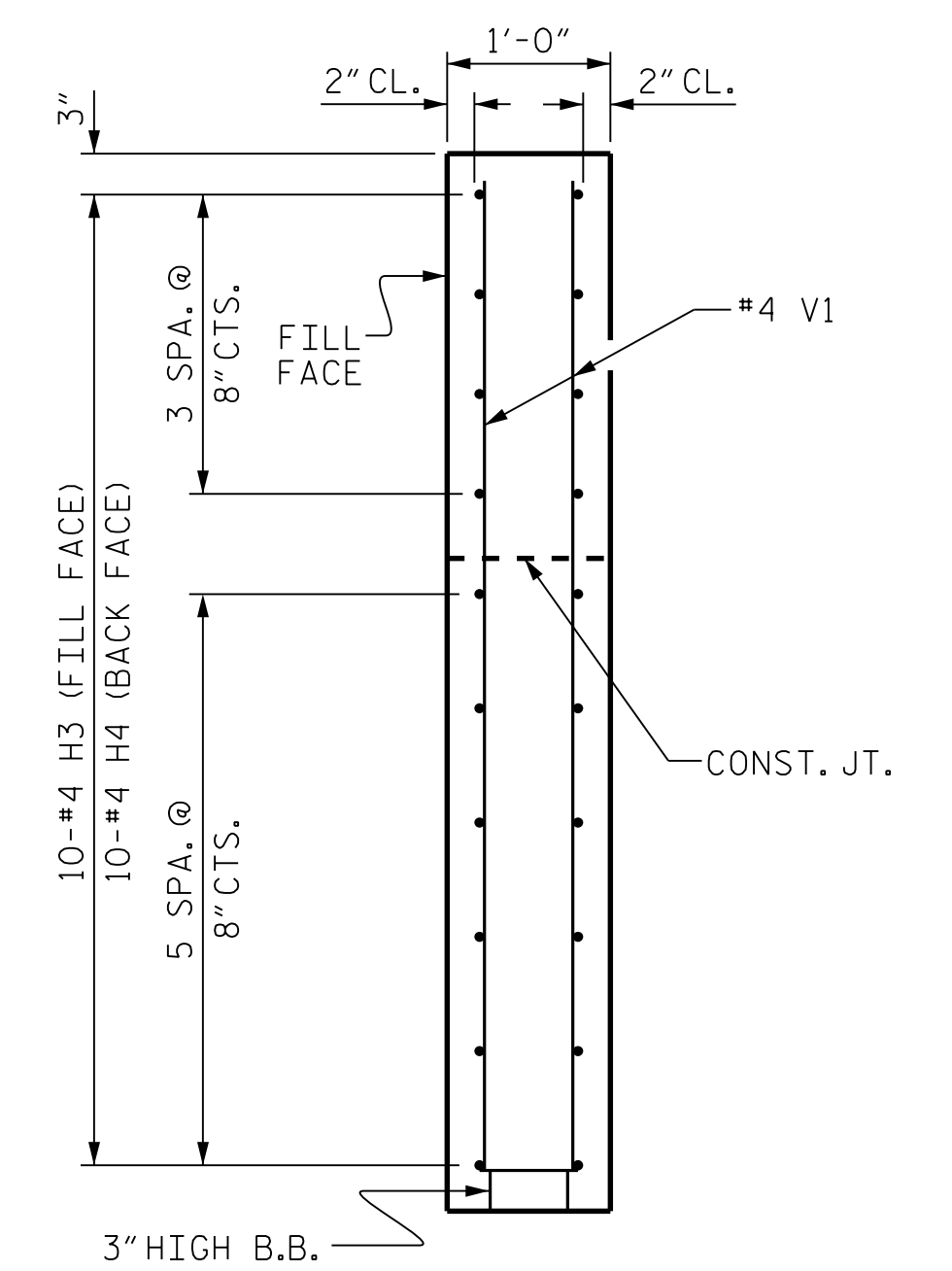


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

BRIDGE NO. 010291

14045  
ENGINEER  
TIMOTHY L. COGGINS

1/26/2021

REVISIONS

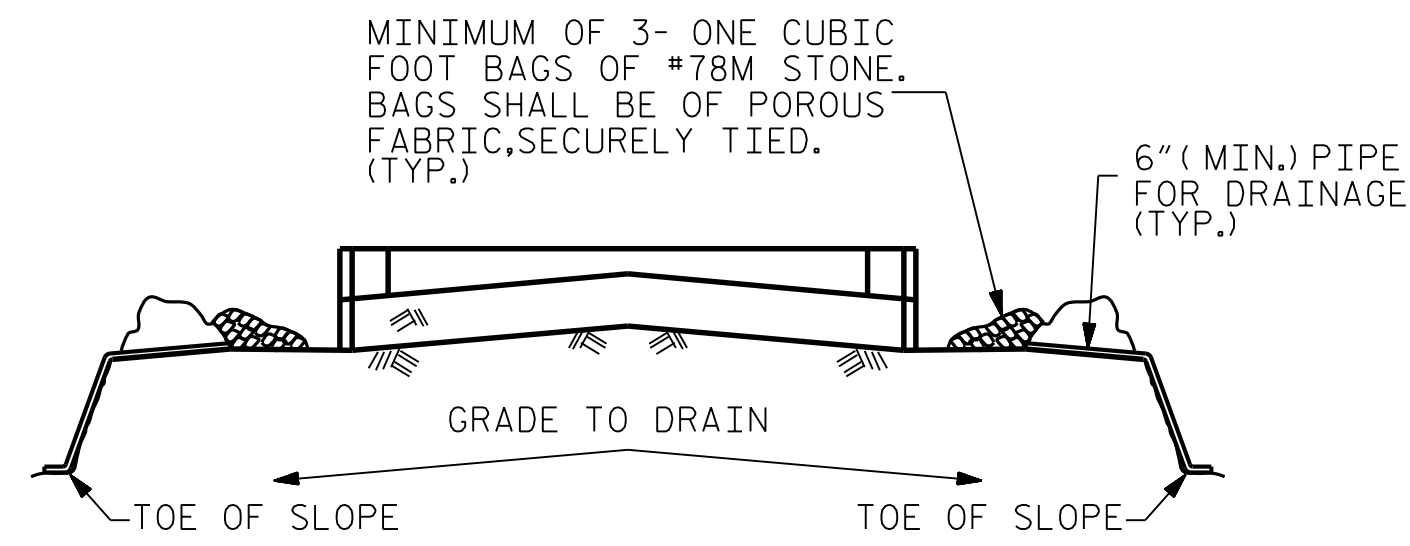
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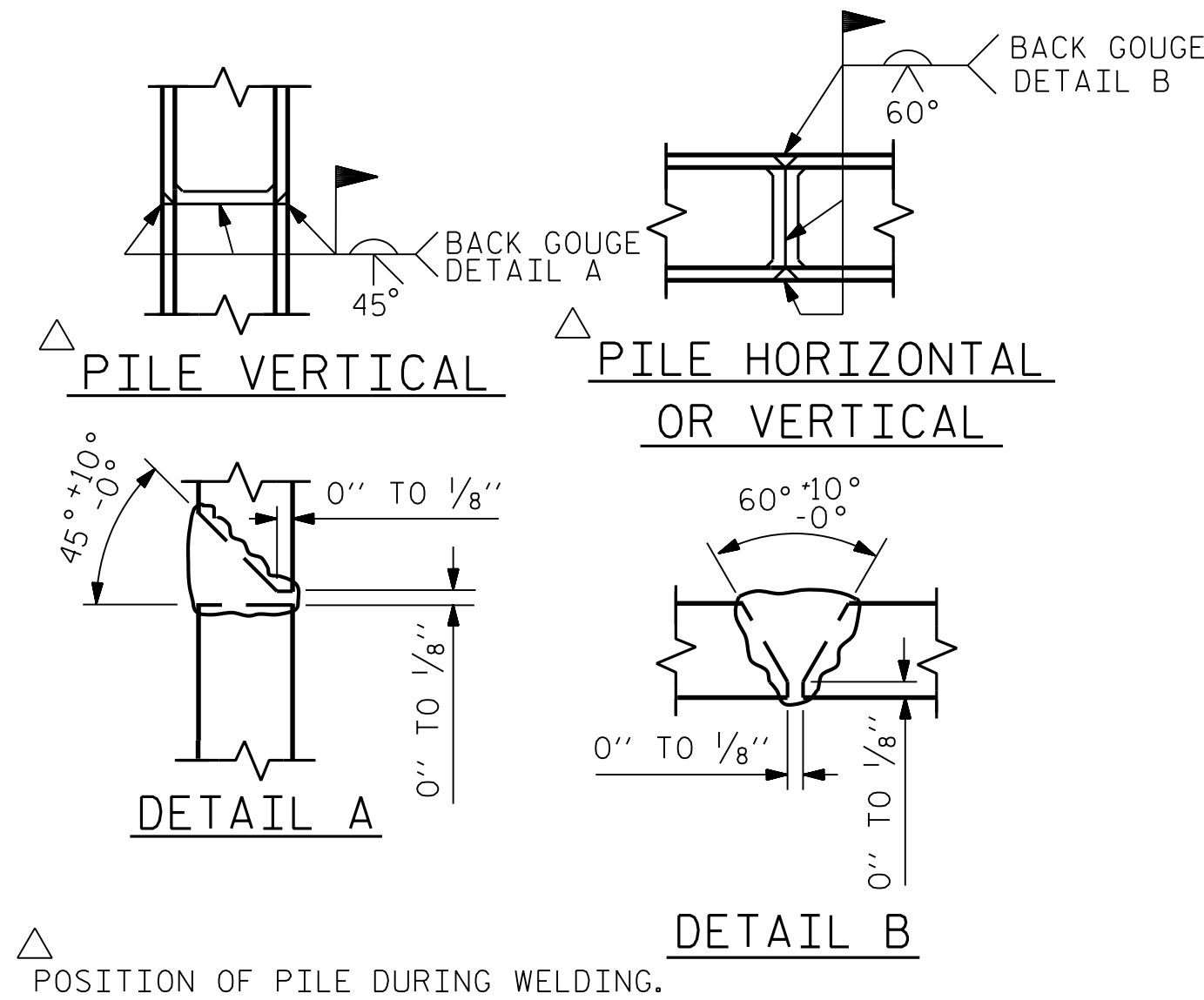


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

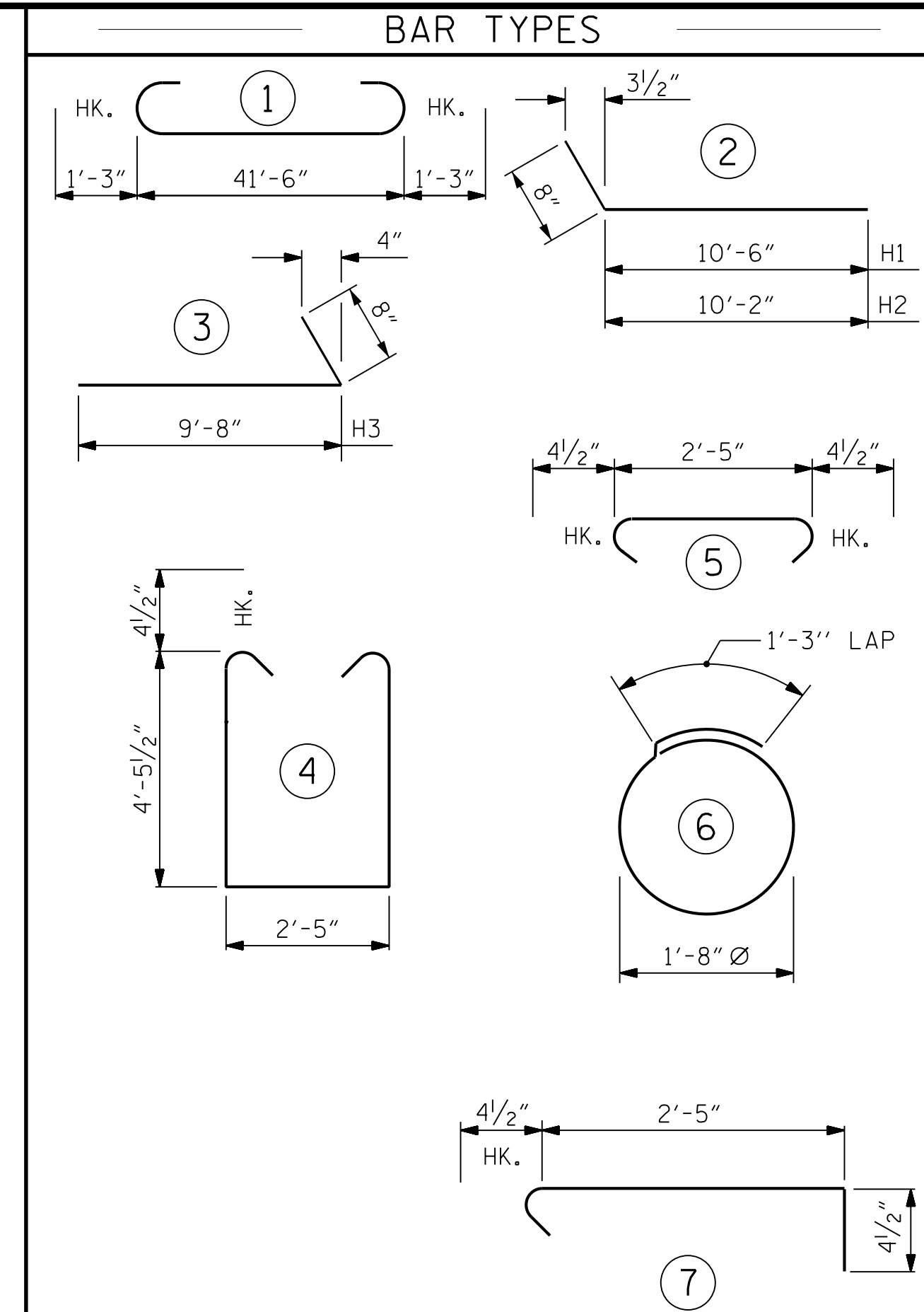
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

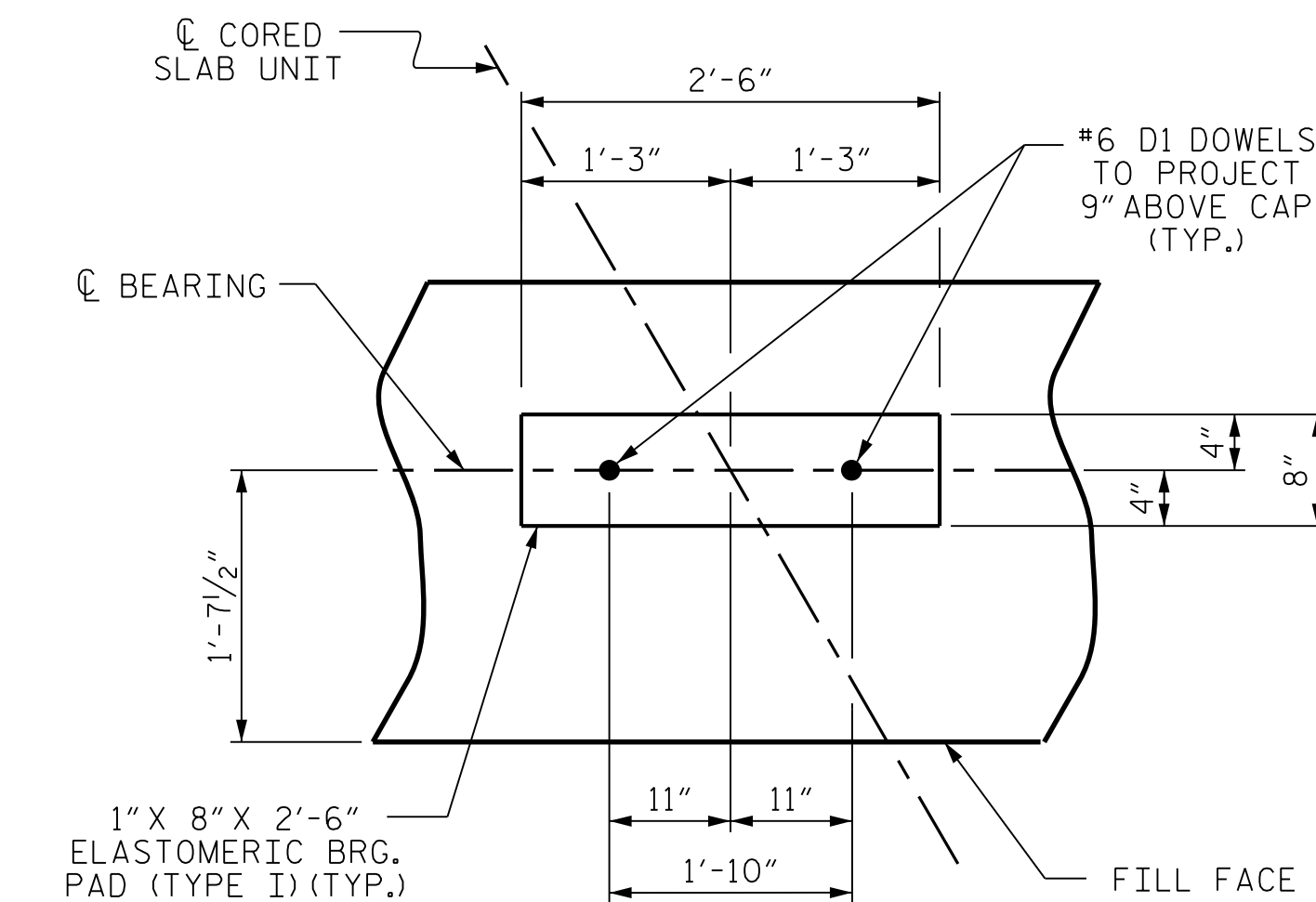


BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		44'-0"	1,197
B2	32	#4	STR	21'-11"	468
B3	11	#4	STR	2'-5"	18
D1	20	#6	STR	1'-6"	45
H1	11	#4	2	11'-2"	82
H2	11	#4	2	10'-10"	83
H3	22	#4	3	10'-4"	152
K1	8	#4	STR	4'-0"	21
K2	8	#4	STR	3'-5"	18
S1	54	#4	4	12'-1"	436
S2	54	#4	5	3'-2"	114
S3	20	#4	6	6'-6"	87
S4	22	#4	6	3'-2"	47
V1	67	#4	STR	7'-3"	328

REINFORCING STEEL (FOR END BENT 1)		3,096 LBS.
CLASS A CONCRETE BREAKDOWN		
POUR #1 CAP, LOWER PART OF WINGS & COLLARS		25.0 C.Y.
POUR #2 UPPER PART OF WINGS		2.7 C.Y.
TOTAL CLASS A CONCRETE		27.7 C.Y.

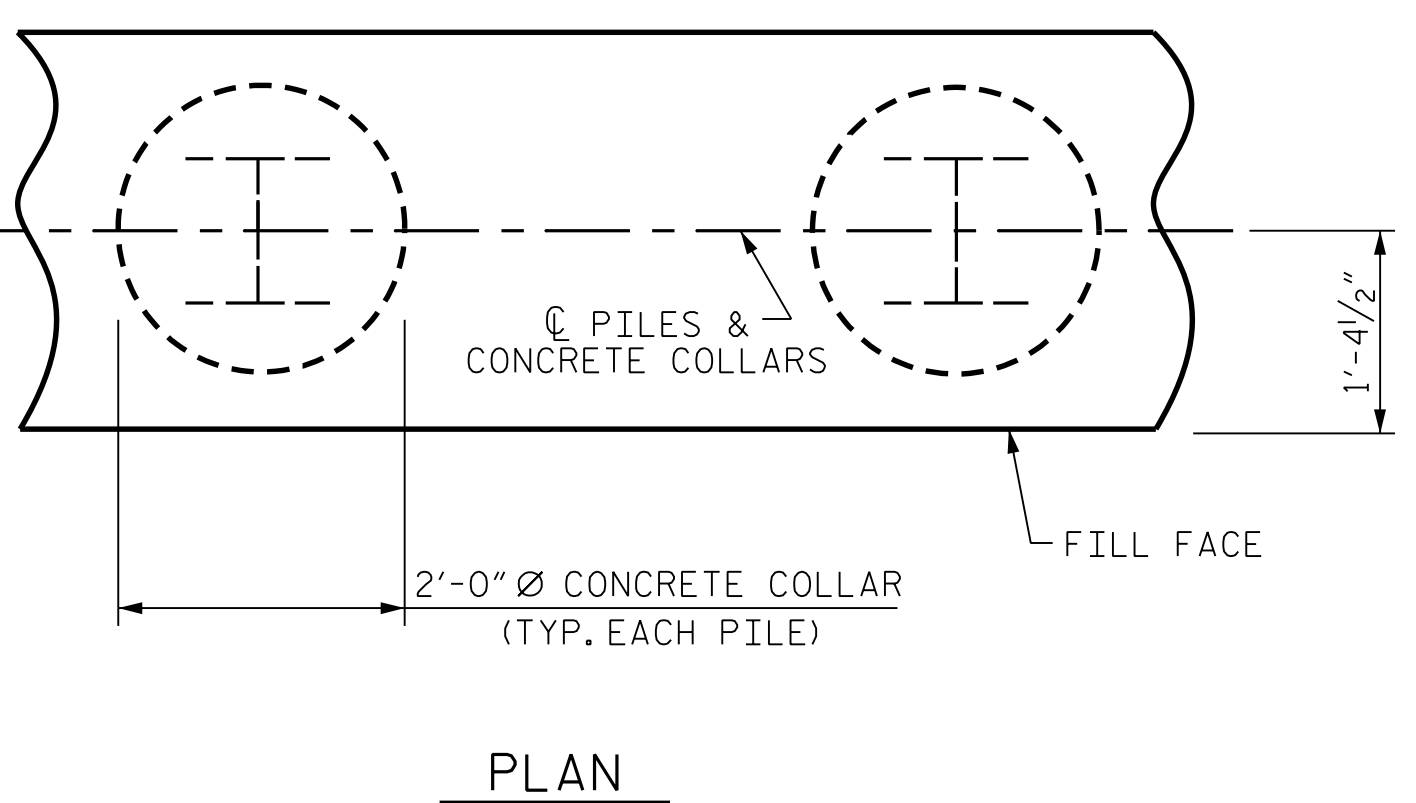
END BENT NO. 1		END BENT NO. 2	
HP 12 X 53 STEEL PILES	NO: 5	HP 12 X 53 STEEL PILES	NO: 5
NO: 5	LIN. FT.= 75	NO: 5	LIN. FT.= 140
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 5	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 5
STEEL PILE POINTS EA.	NO: 5		

ALL BAR DIMENSIONS ARE OUT TO OUT.

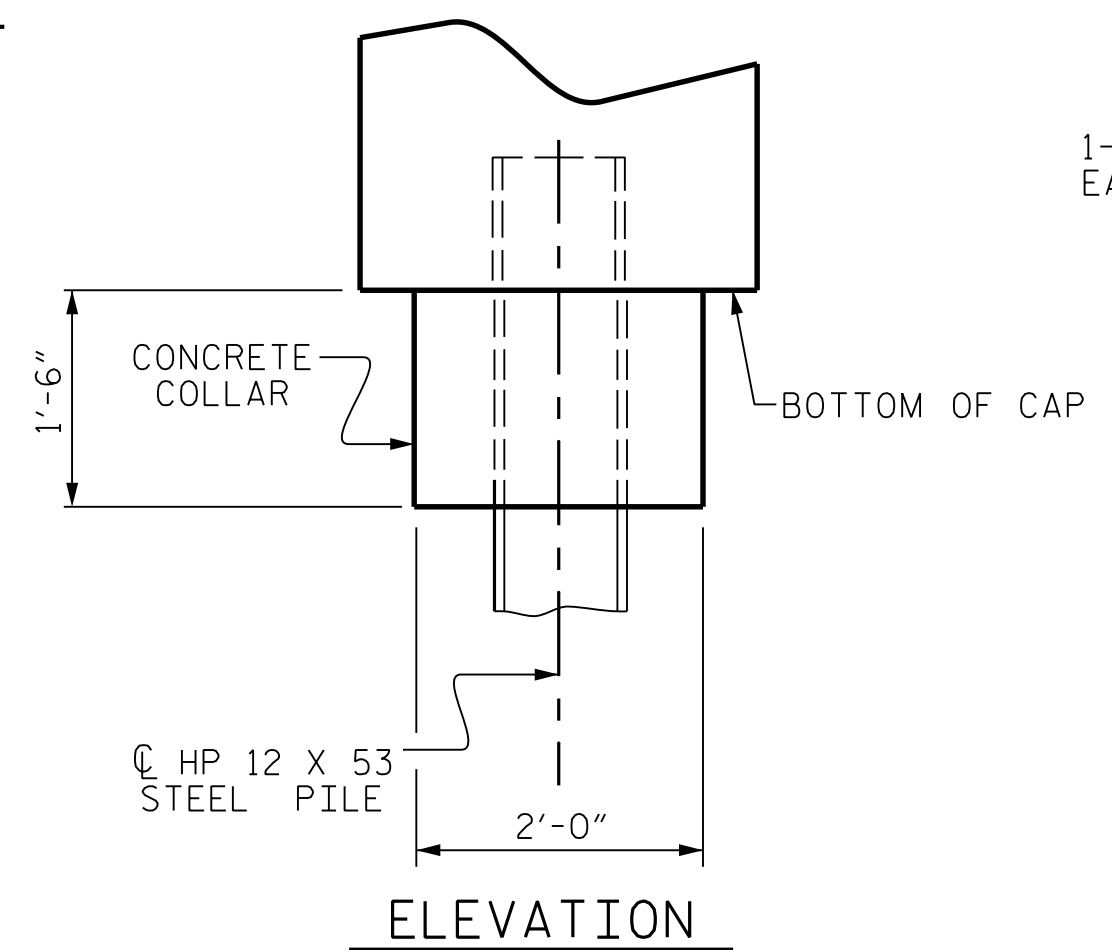


### DETAIL "A"

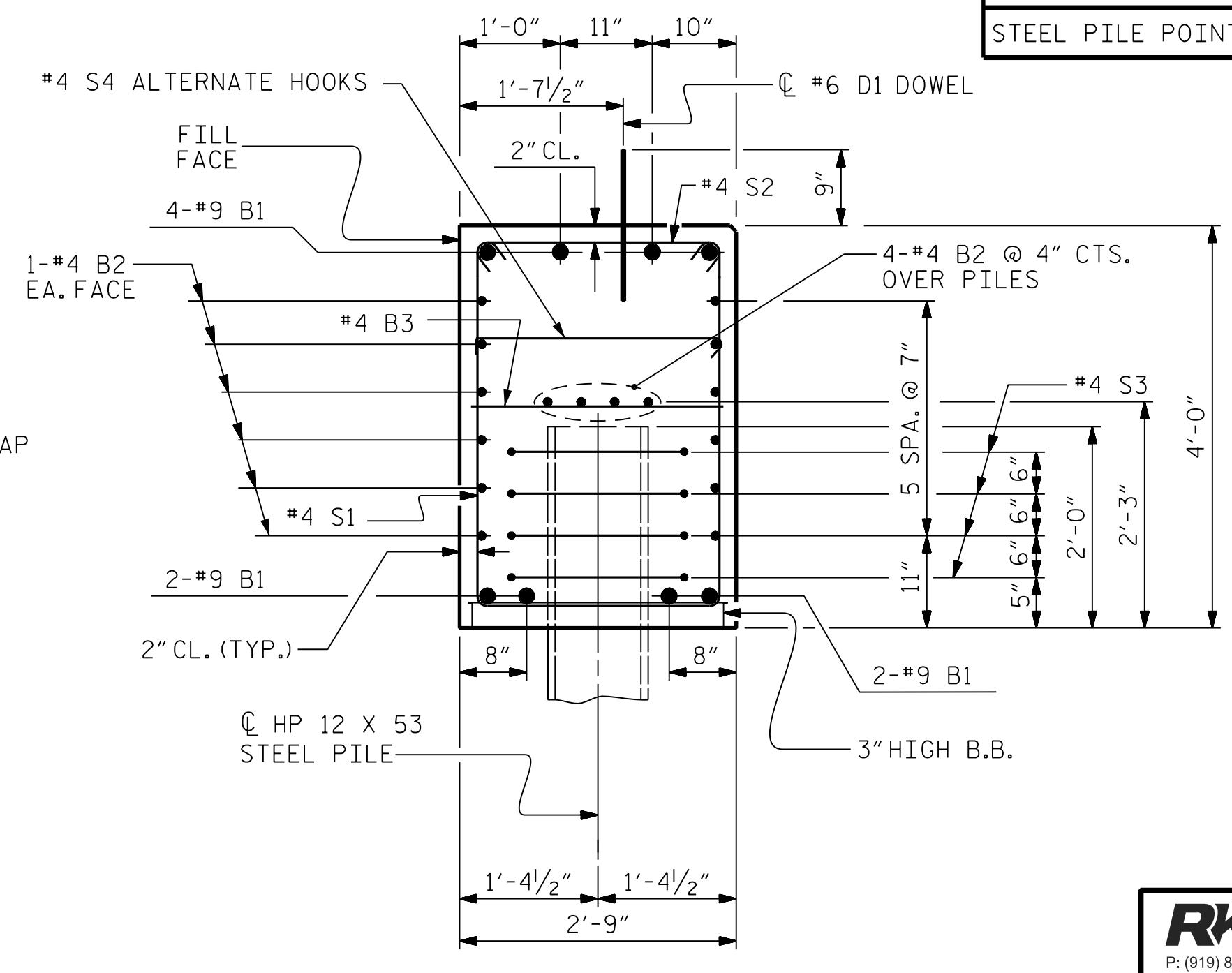
(END BENT No. 1)



### PLAN



### ELEVATION



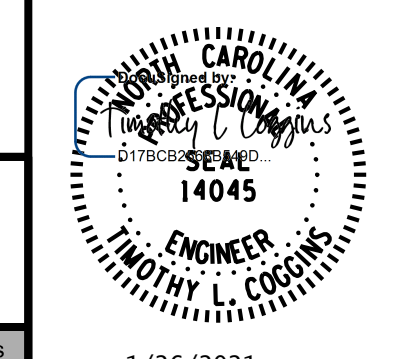
### SECTION A-A

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

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 4 OF 4

BRIDGE NO. 010291



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT  
DETAILS AND BOM

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S-14	TOTAL SHEETS 21

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DRAWN BY : T. ROBERSON DATE : SEP 2018  
CHECKED BY : T. L. COGGINS DATE : SEP 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : SEP 2018

**NOTES**

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

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

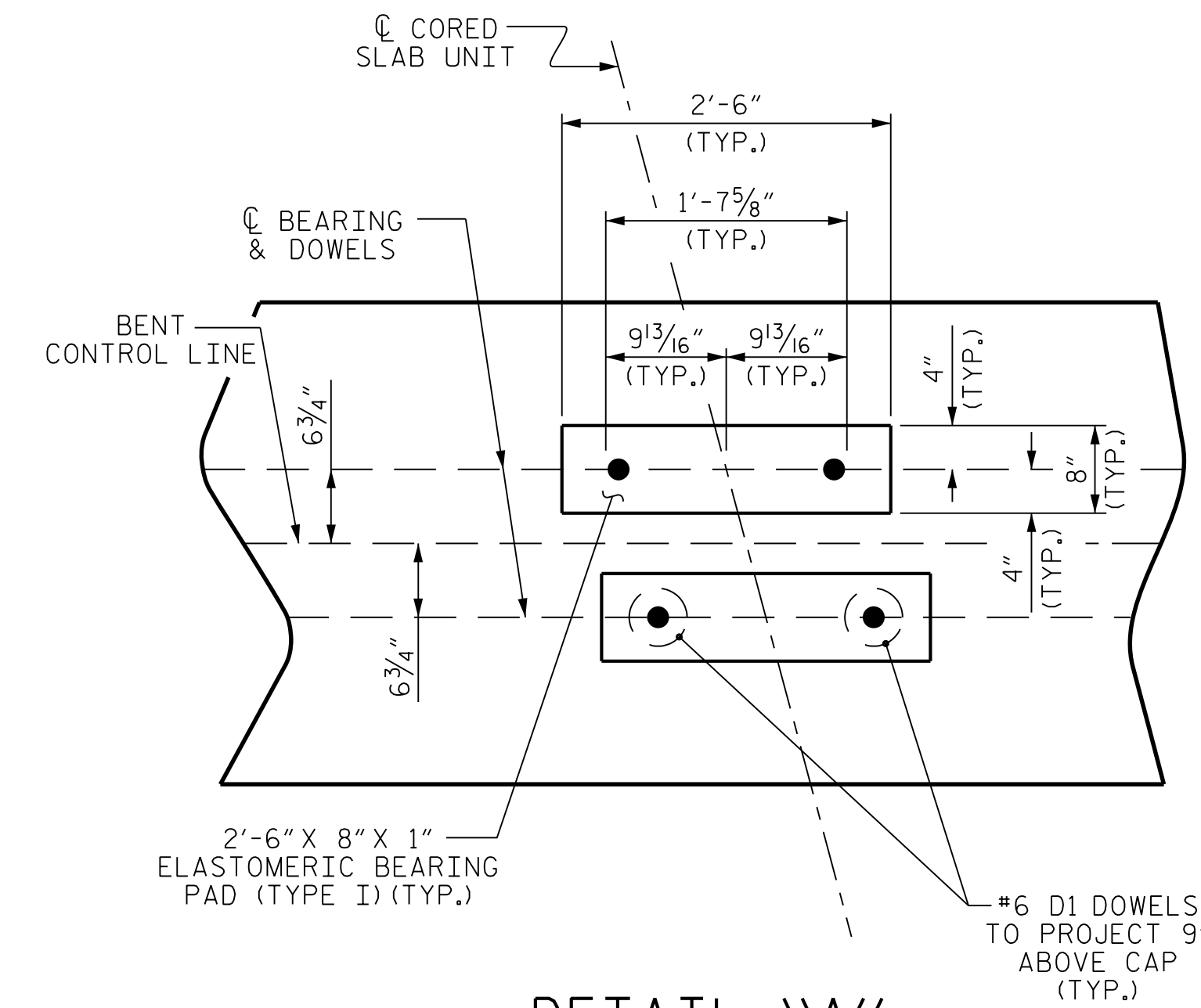
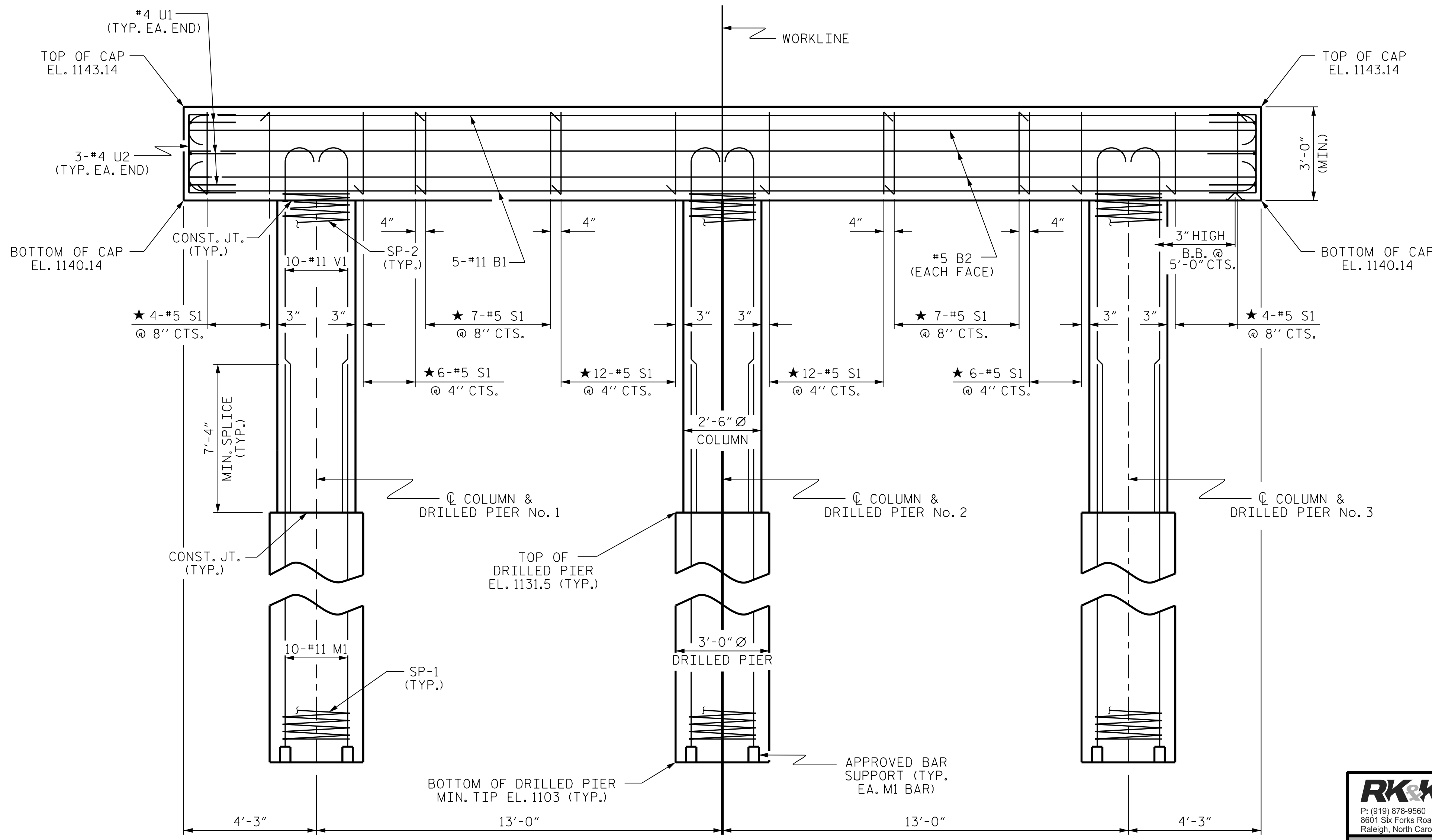
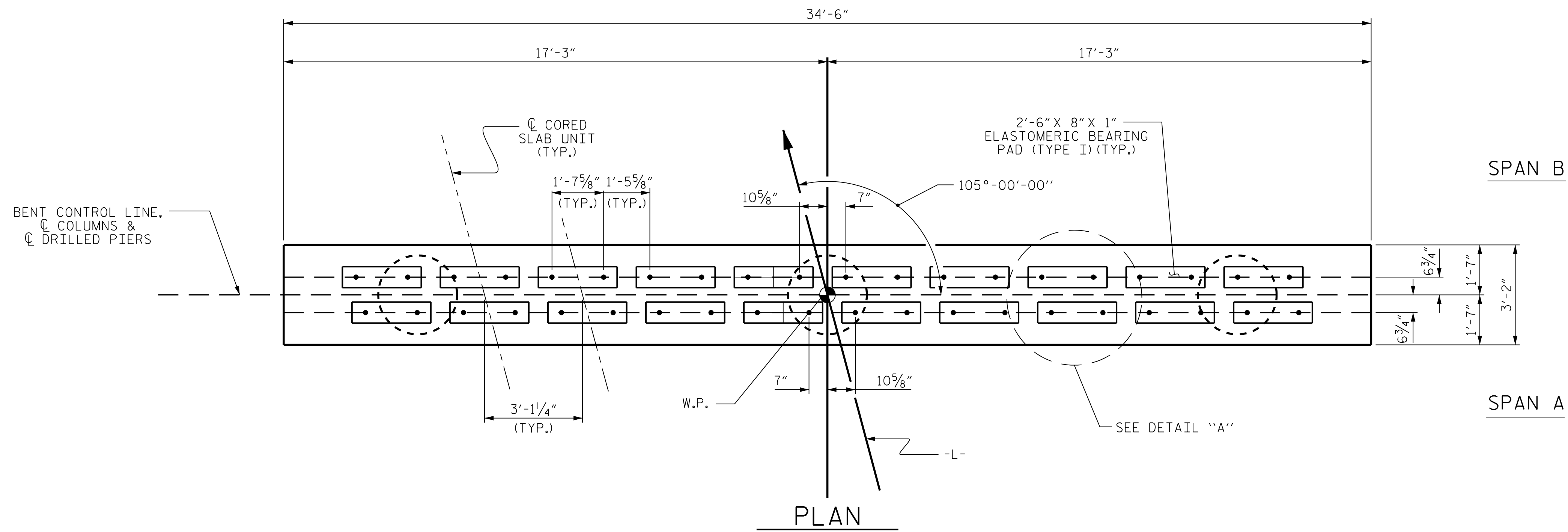
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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.



**DETAIL "A"**  
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

BRIDGE NO. 010291

**ENGINEER**  
MORTY L. COGGINS  
14045  
1/26/2021

SUBSTRUCTURE  
BENT No. 1

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1			3		
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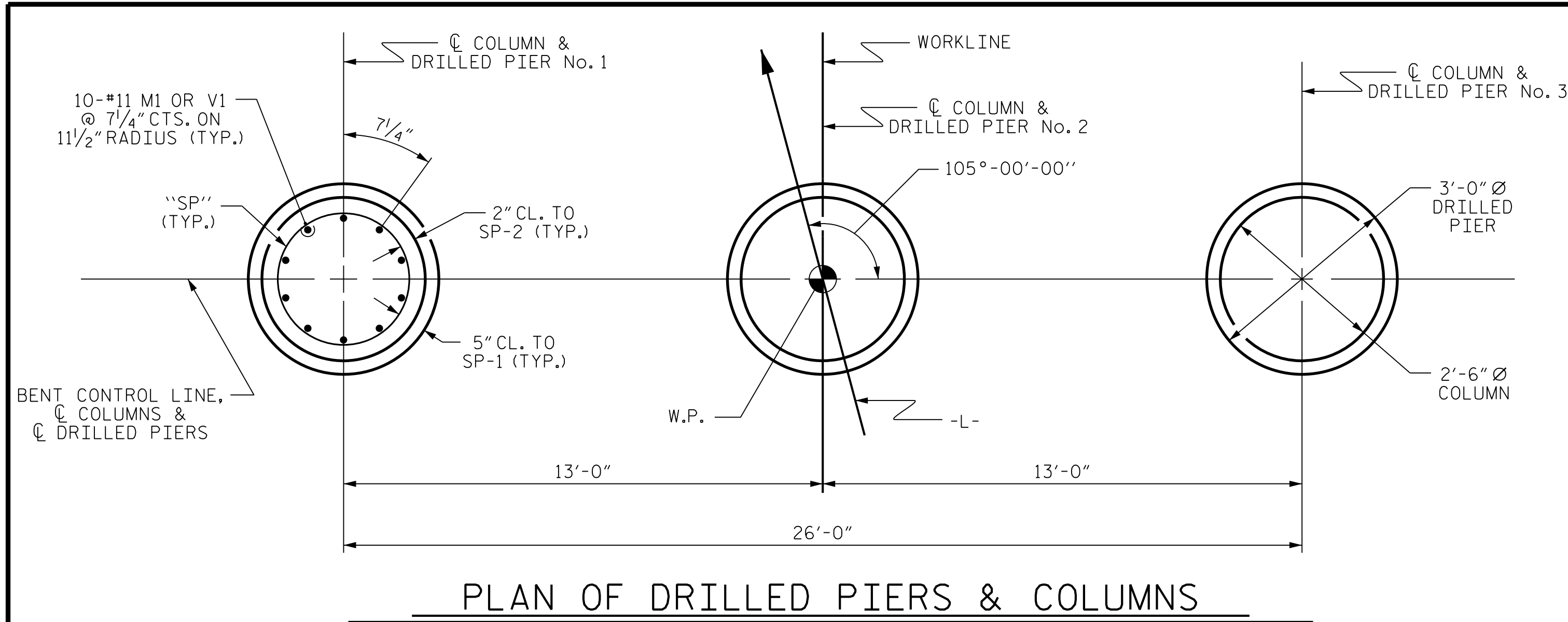
SHEET NO. **S-15**  
TOTAL SHEETS 21

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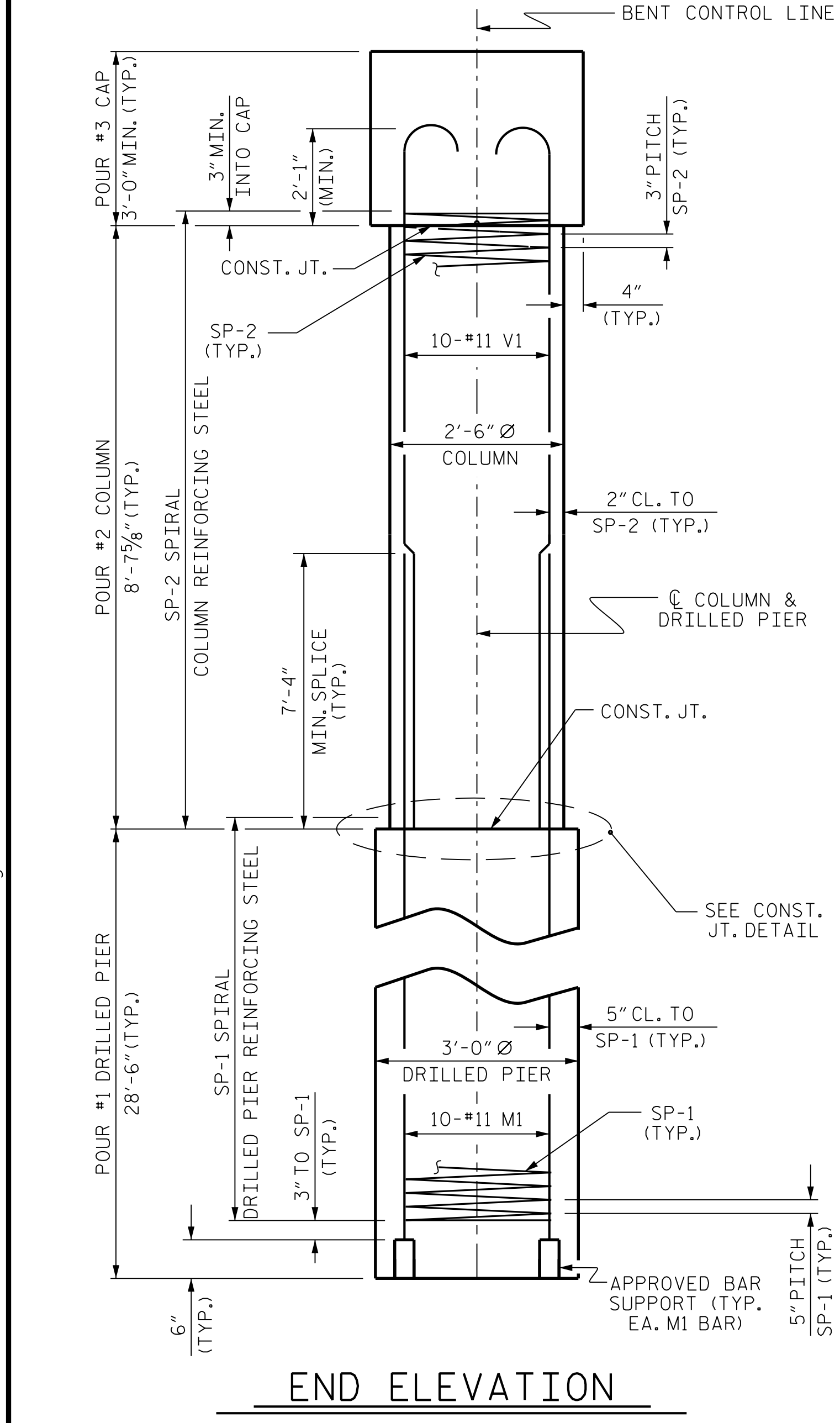
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

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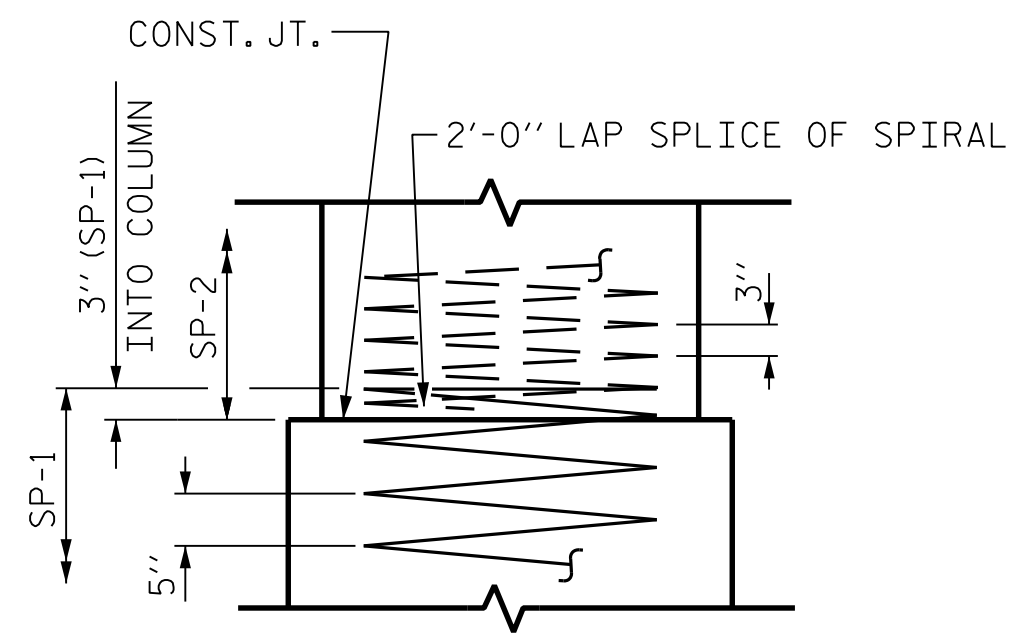
DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
CHECKED BY : T. L. COGGINS DATE : AUG 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : AUG 2018



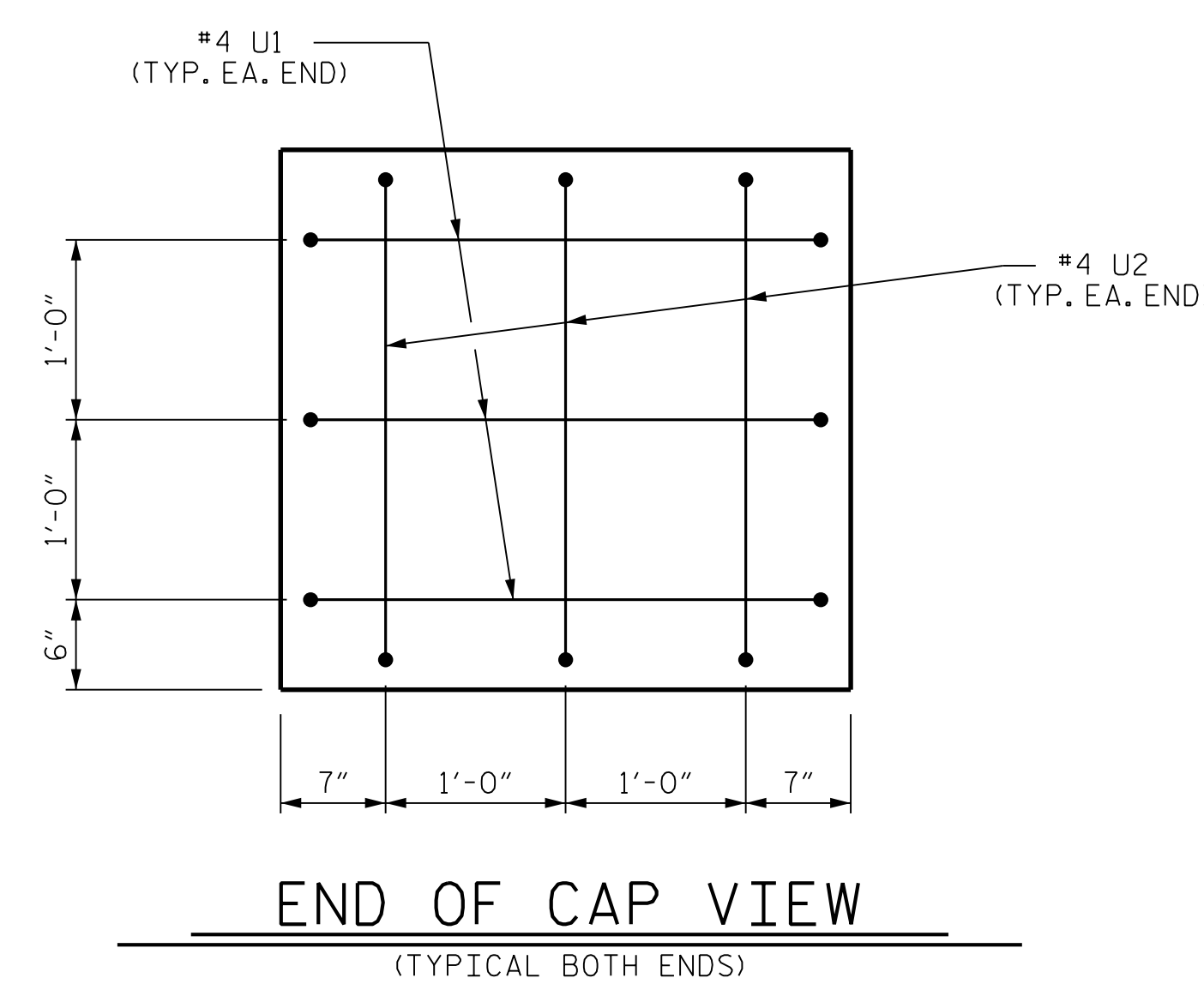
PLAN OF DRILLED PIERS & COLUMNS



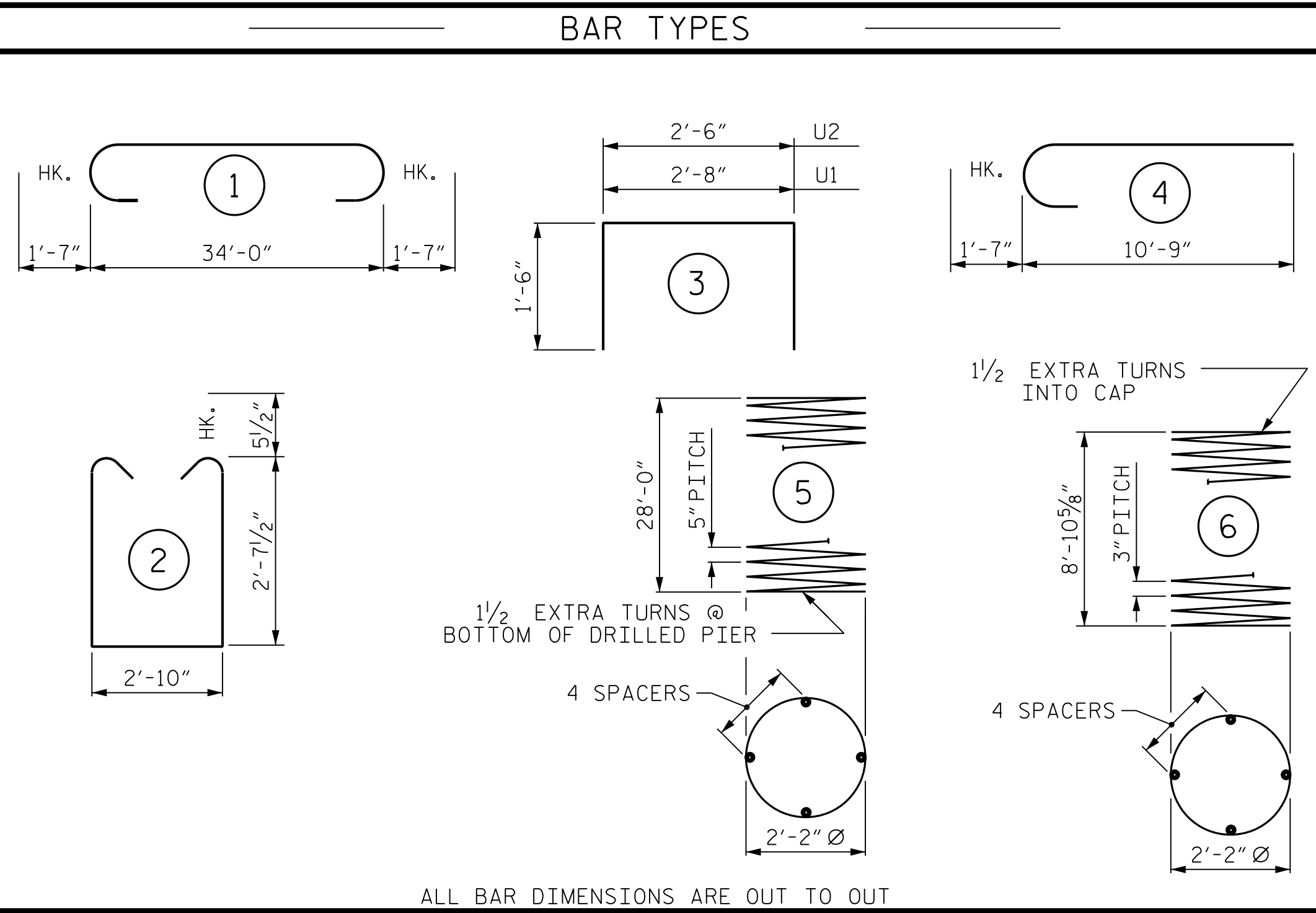
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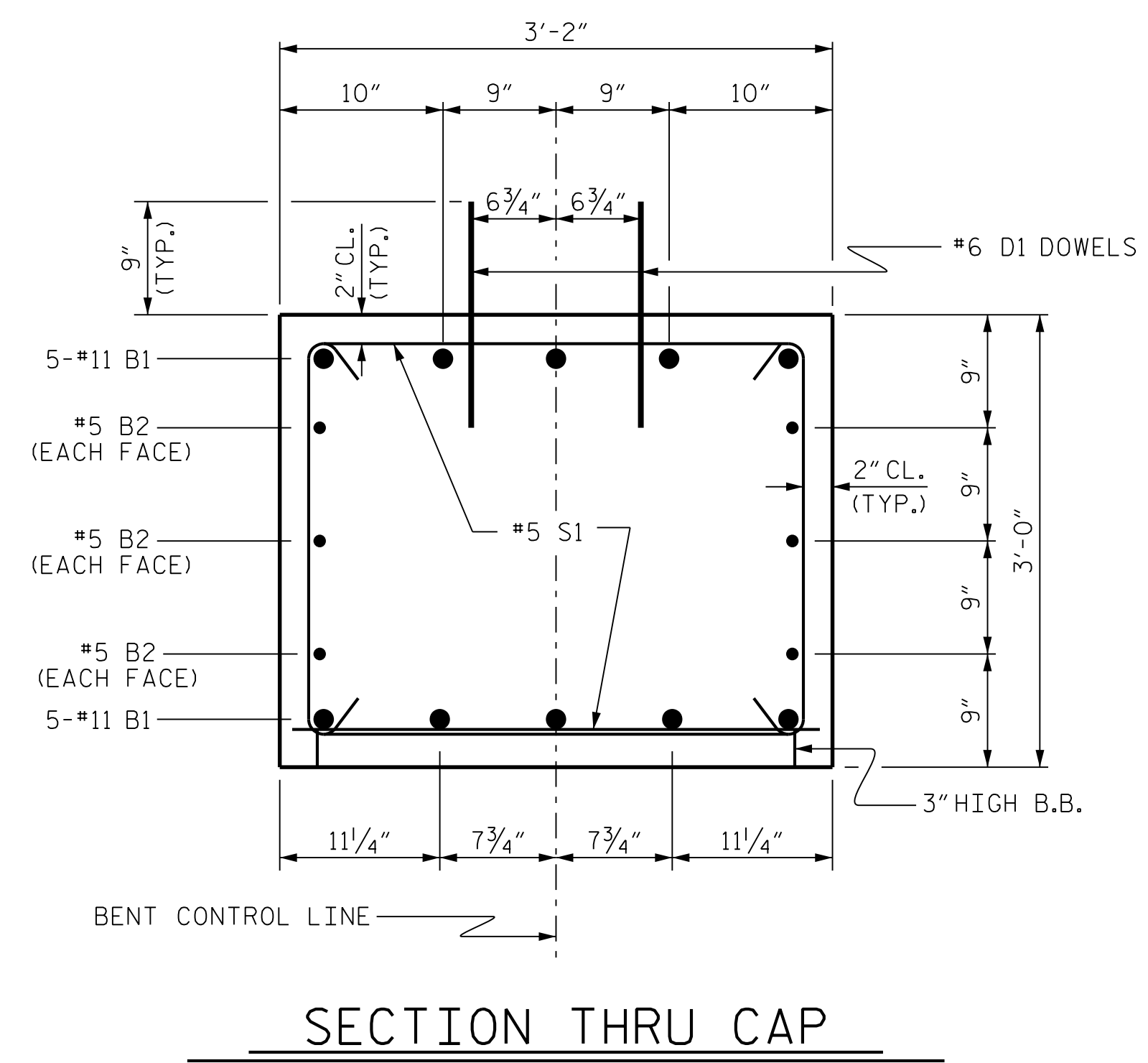
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW  
(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT



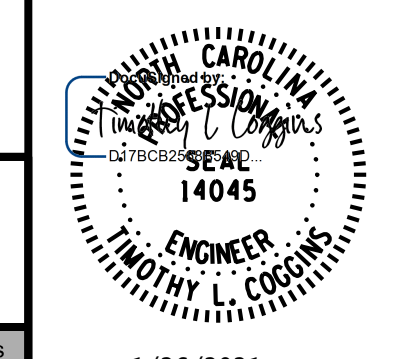
SECTION THRU CAP

BILL OF MATERIAL FOR ONE BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	37'-2"	1,975
B2	6	#5	STR	34'-2"	214
D1	40	#6	STR	1'-6"	90
M1	30	#11	STR	38'-4"	6,110
S1	58	#5	2	9'-0"	544
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
V1	30	#11	4	12'-4"	1,966
REINFORCING STEEL (FOR ONE BENT)					10,944 LBS.
SP-1	3	*	5	457'-4"	1,431
SP-2	3	**	6	247'-3"	495
SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT)					1,926 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 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)					4.7 C.Y.
POUR #3 (CAP)					12.1 C.Y.
TOTAL CLASS A CONCRETE					16.8 C.Y.
DRILLED PIERS: (FOR ONE BENT)					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					22.4 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL					36 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL					49.5 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER					54 LIN. FT.
CSL TUBES					360 LIN. FT.

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 2 OF 2

BRIDGE NO. 010291



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 1

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S-16  
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DRAWN BY: M. J. ZIEHL DATE: MAY 2018  
CHECKED BY: T. L. COGGINS DATE: AUG 2018  
DESIGN ENGINEER OF RECORD: T. L. COGGINS DATE: AUG 2018



**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.

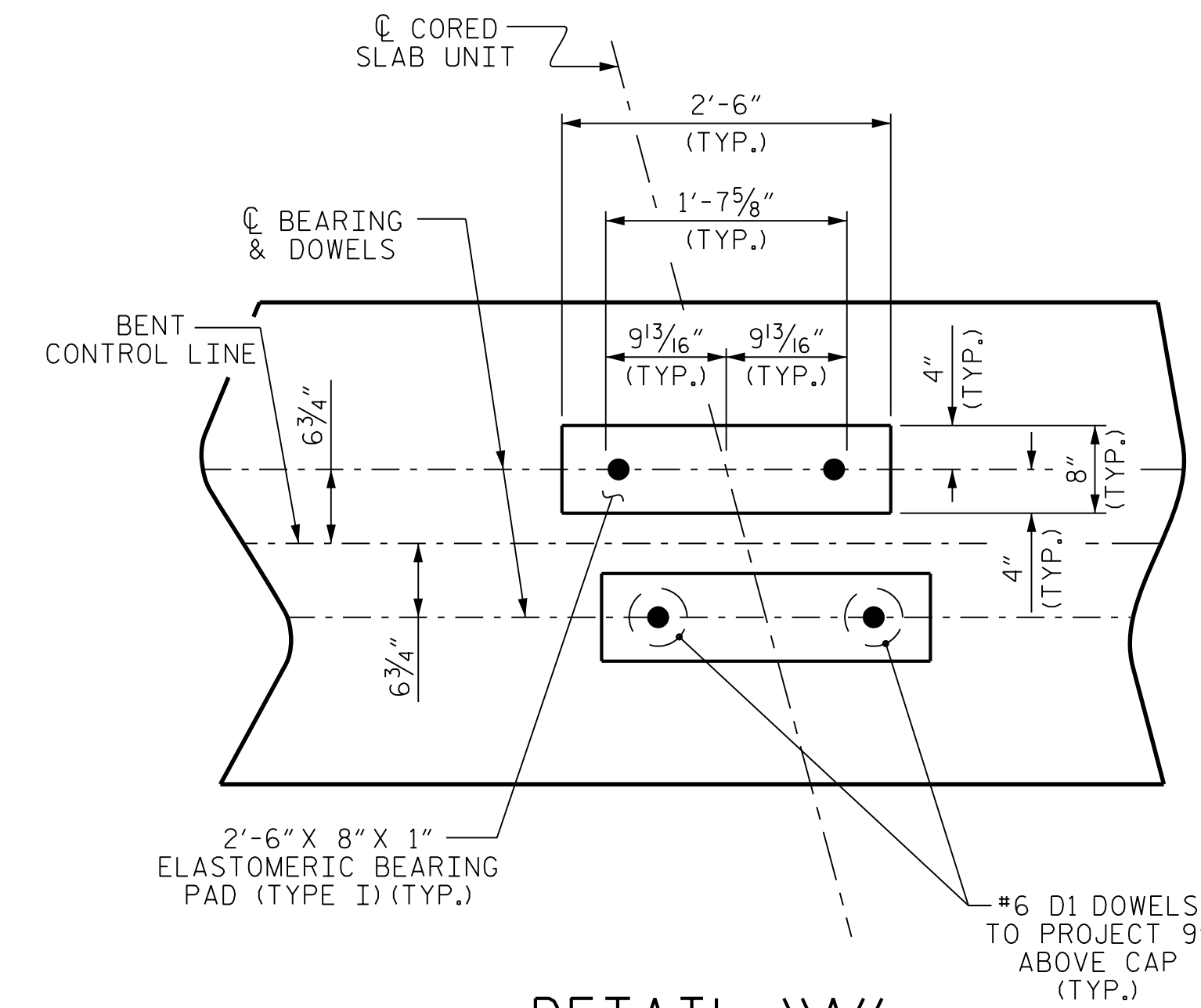
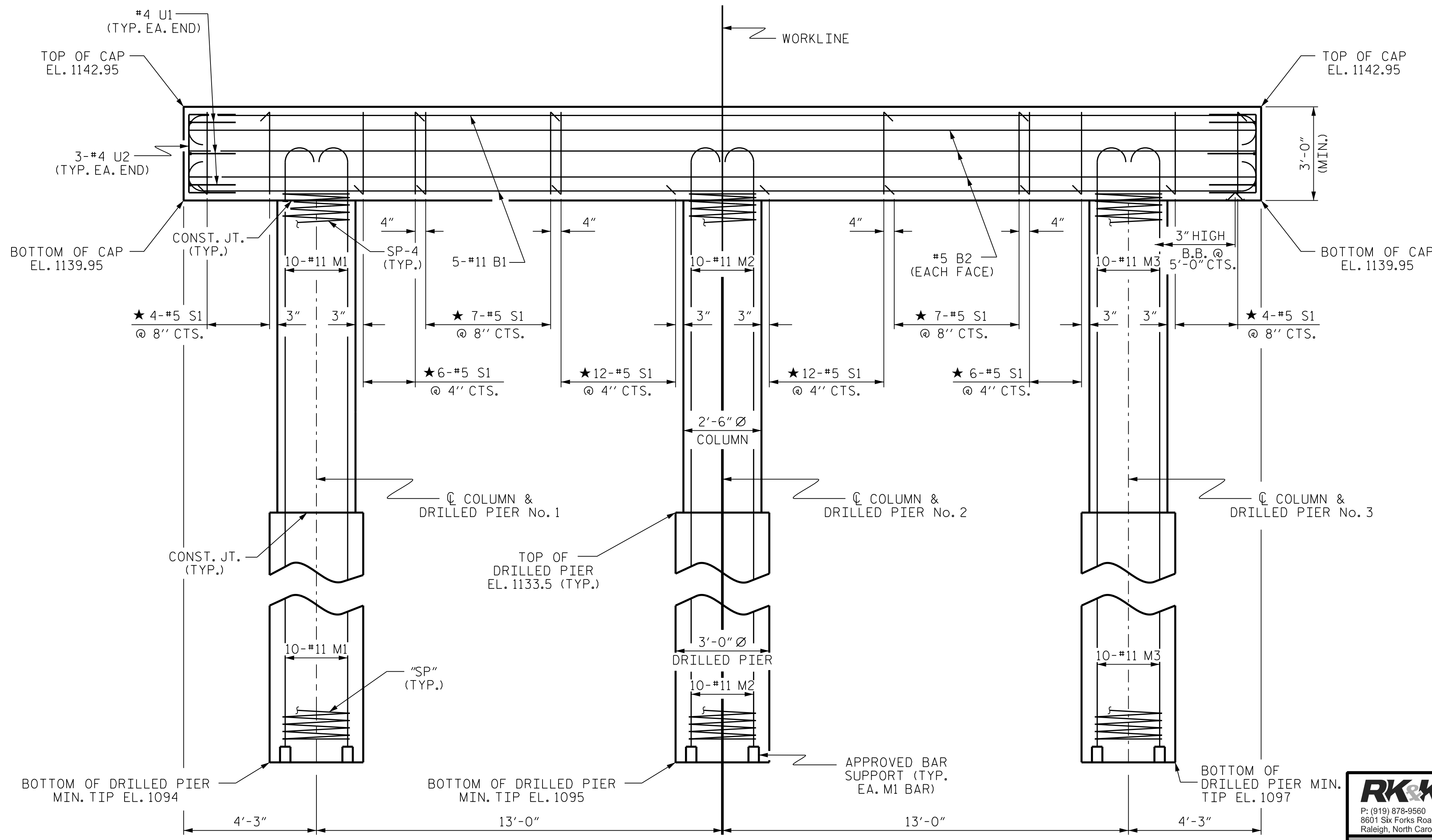
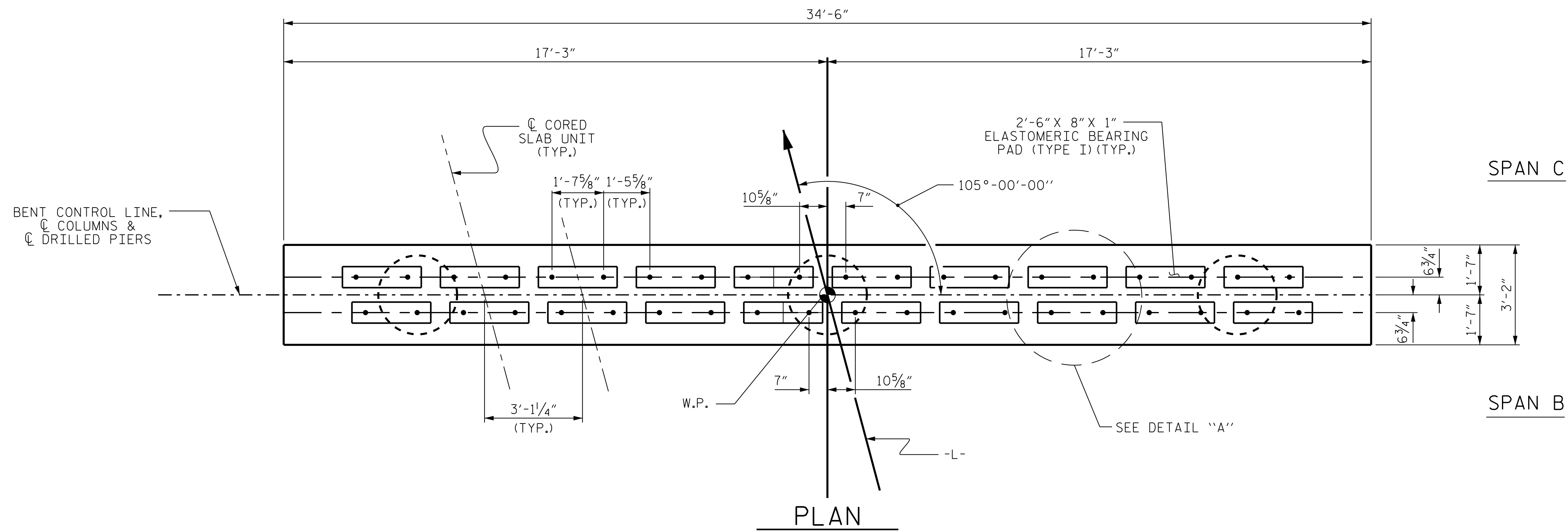
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

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PROJECT NO. 17BP.12.R.88  
 ALEXANDER COUNTY  
 STATION: 16+26.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE NO. 010291

14045  
 ENGINEER  
 MORTY L. COGGINS

1/26/2021

SUBSTRUCTURE  
 BENT No. 2

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SHEET NO. S-17  
 TOTAL SHEETS 21

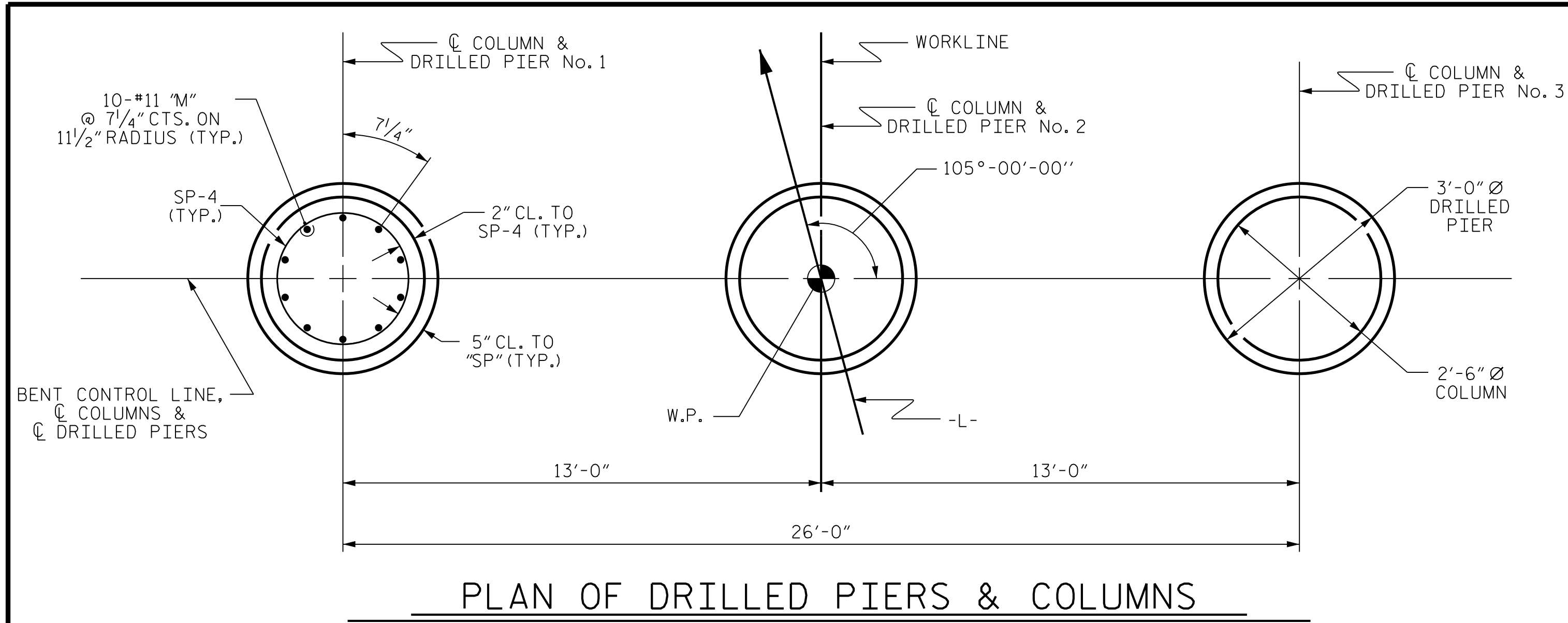
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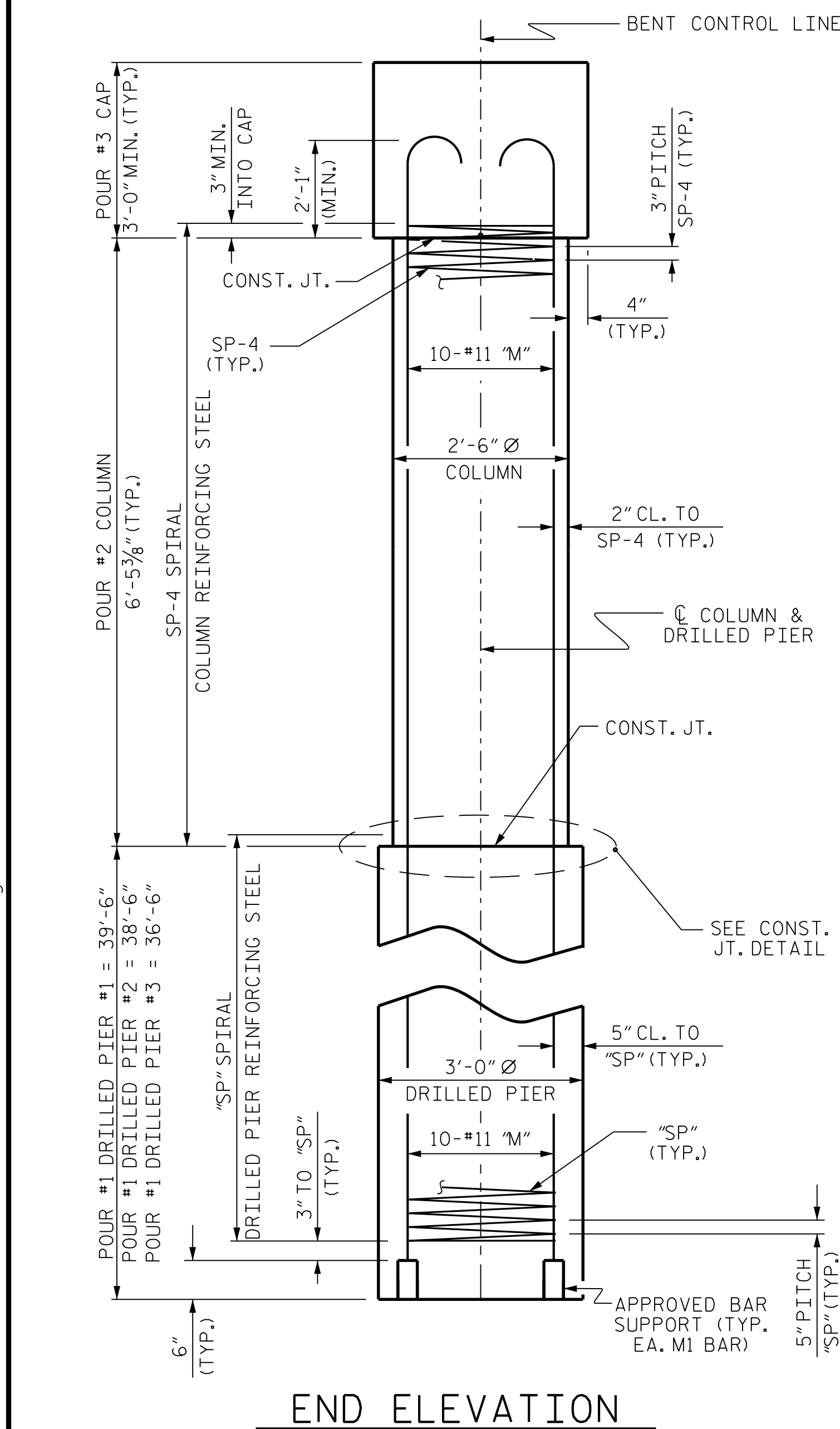
DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
 CHECKED BY : T. L. COGGINS DATE : AUG 2018  
 DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : AUG 2018

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

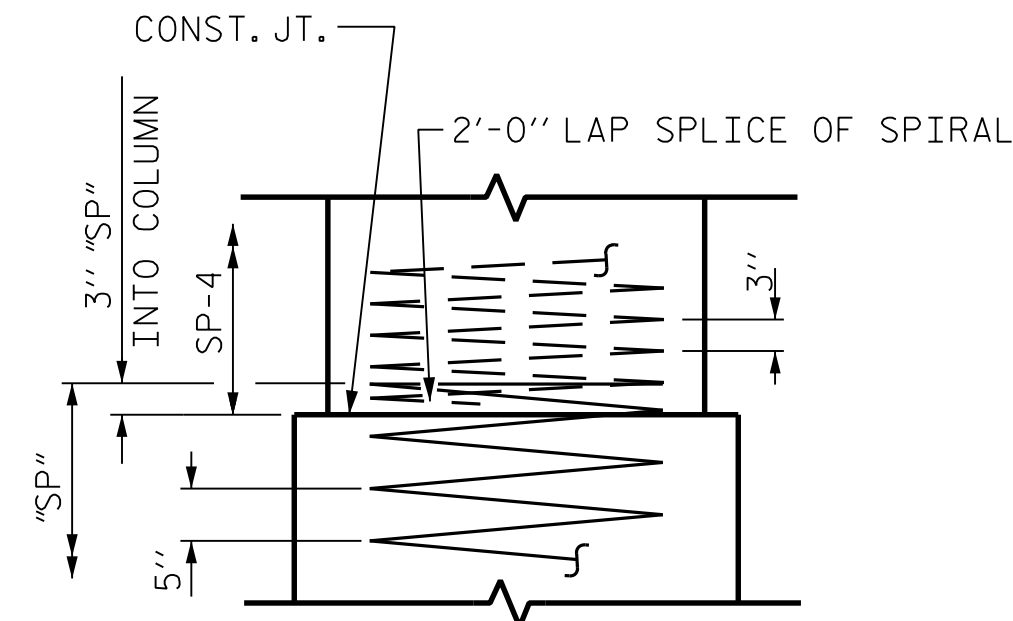
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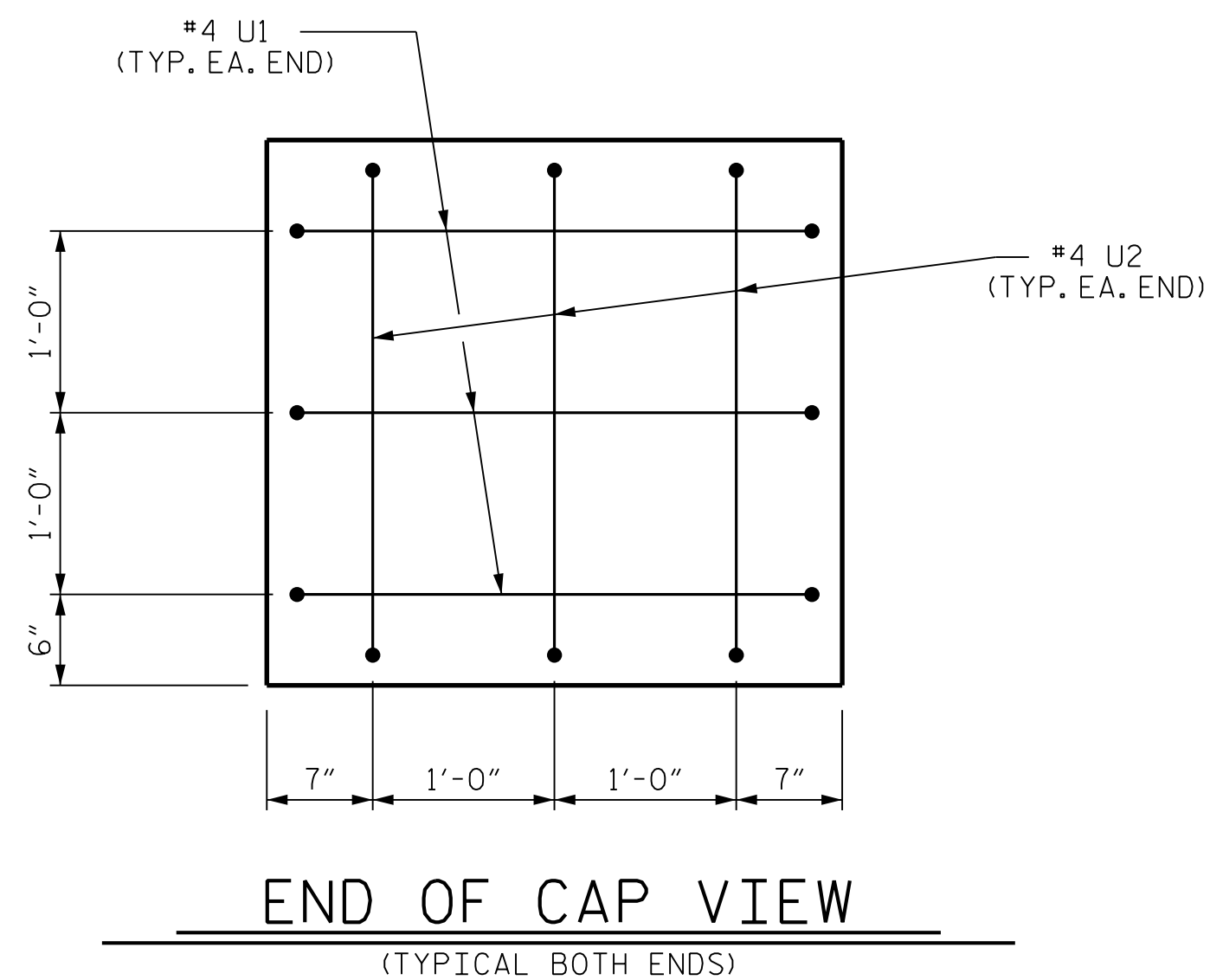
PLAN OF DRILLED PIERS & COLUMNS



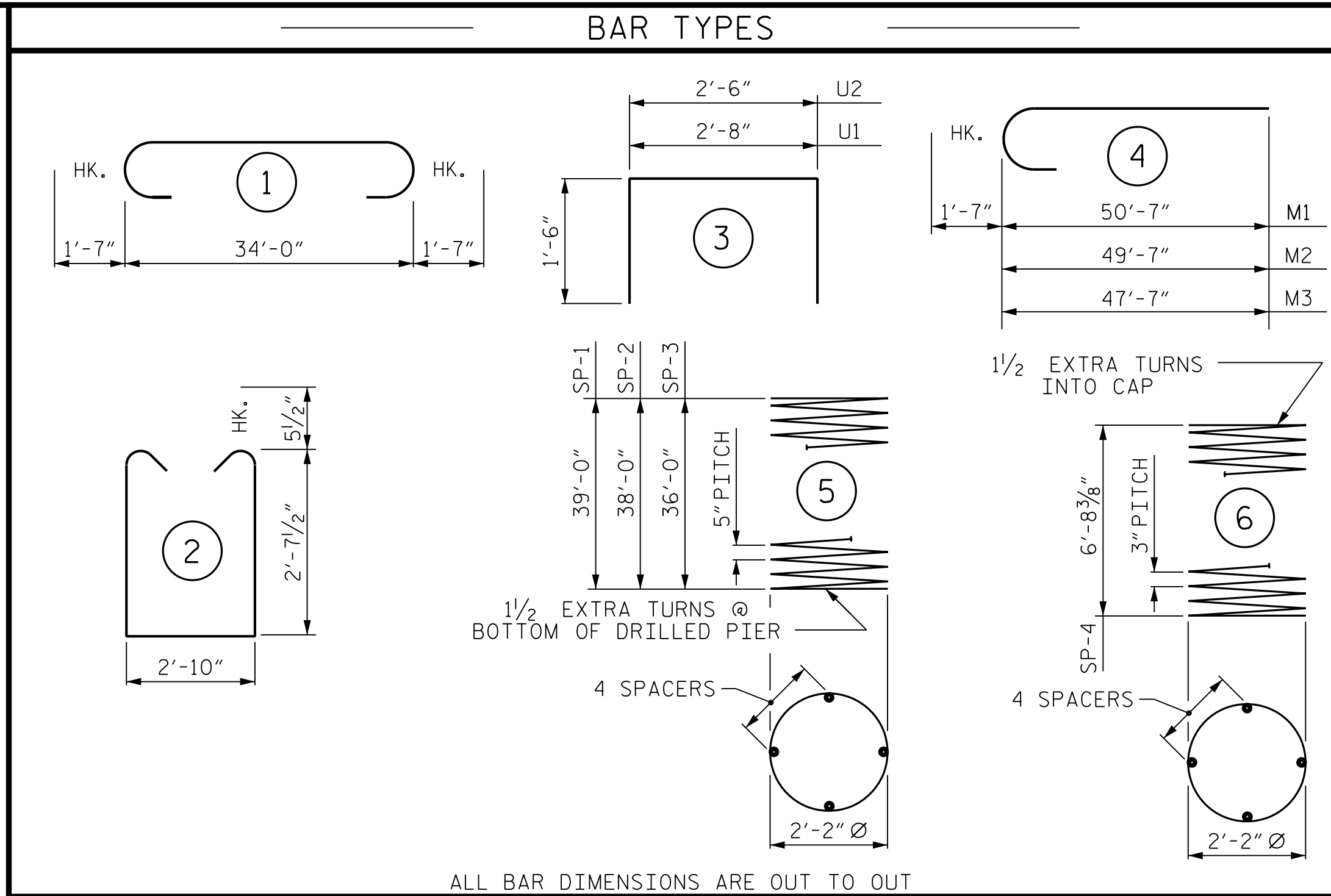
END ELEVATION



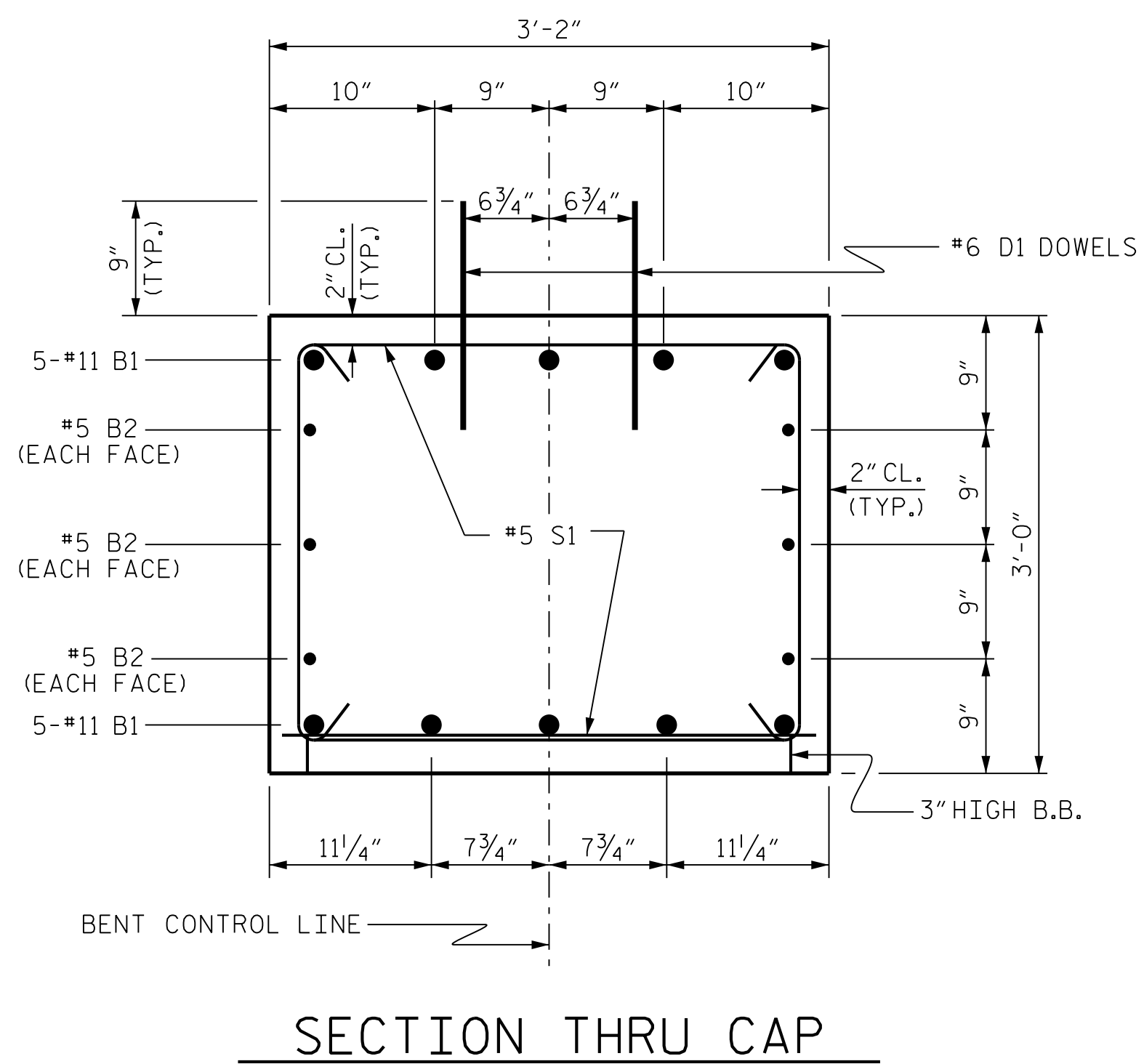
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW  
(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

FOR BENT

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	37'-2"	1,975
B2	6	#5	STR	34'-2"	214
D1	40	#6	STR	1'-6"	90
M1	10	#11	STR	52'-2"	2,772
M2	10	#11	STR	51'-2"	2,718
M3	10	#11	STR	49'-2"	2,612
S1	58	#5	2	9'-0"	544
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22

REINFORCING STEEL (FOR BENT) 10,970 LBS.

SP-1	1	*	5	633'-1"	660
SP-2	1	*	5	617'-1"	644
SP-3	1	*	5	585'-1"	610
SP-4	3	**	6	189'-1"	379

SPIRAL COLUMN REINFORCING STEEL (FOR BENT) 2,293 LBS.

\* THE SP-1, SP-2, AND SP-3 SPIRAL REINF. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

\*\* THE 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 BENT)

POUR #2 (COLUMNS)	3.5 C.Y.
POUR #3 (CAP)	12.1 C.Y.

TOTAL CLASS A CONCRETE 15.6 C.Y.

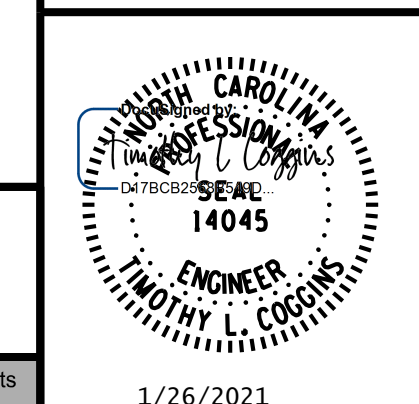
DRILLED PIERS: (FOR BENT)

DRILLED PIER CONCRETE	
POUR #1 TOTAL	29.8 C.Y.
DRILLED PIER #1	10.3 C.Y.
DRILLED PIER #2	9.9 C.Y.
DRILLED PIER #3	9.6 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	36.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	78.5 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	60 LIN. FT.
CSL TUBES	476 LIN. FT.

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

SHEET 2 OF 2

BRIDGE NO. 010291



1/26/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 2

REVISIONS

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

SHEET NO.

S-18  
TOTAL SHEETS 21

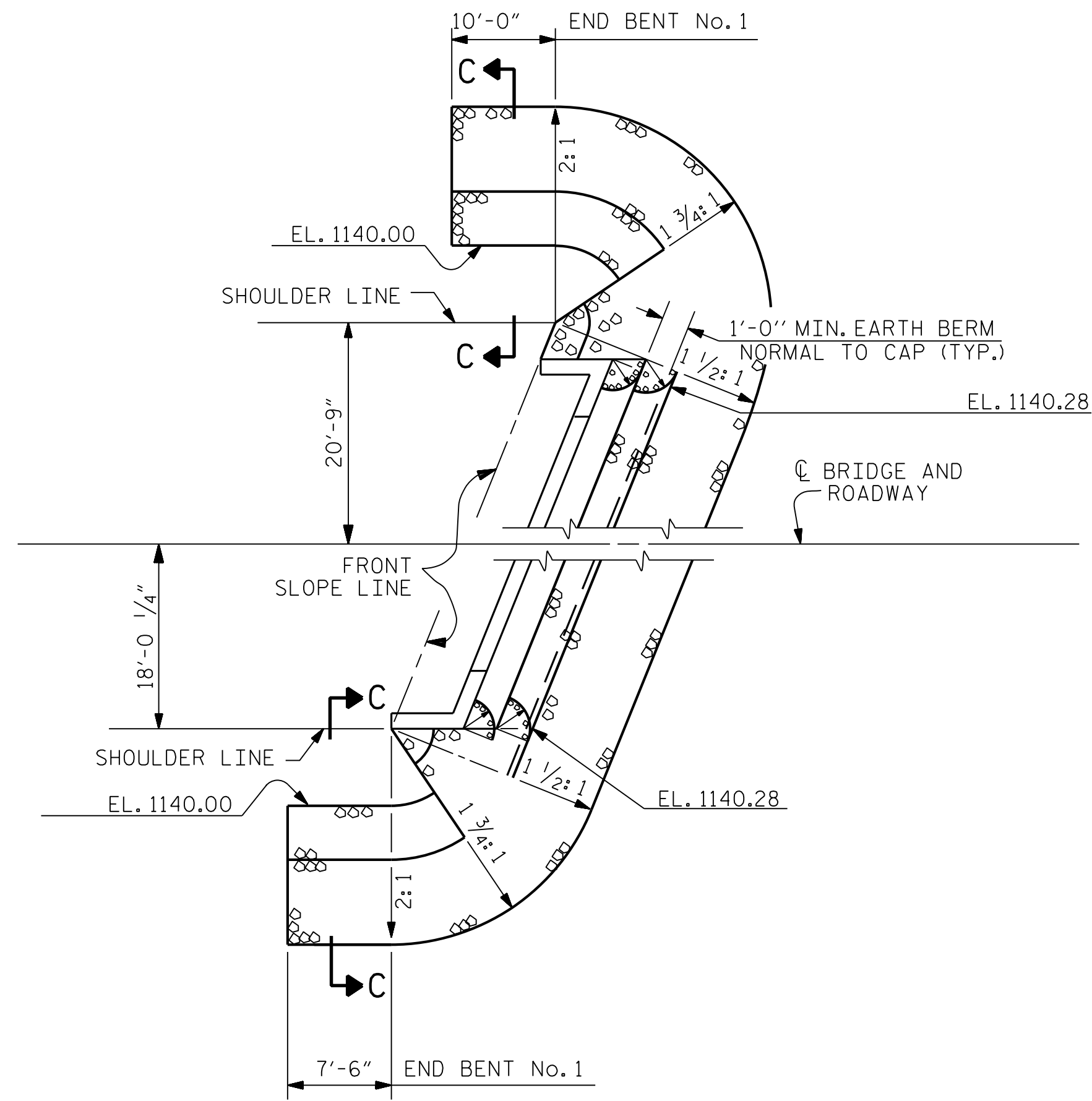
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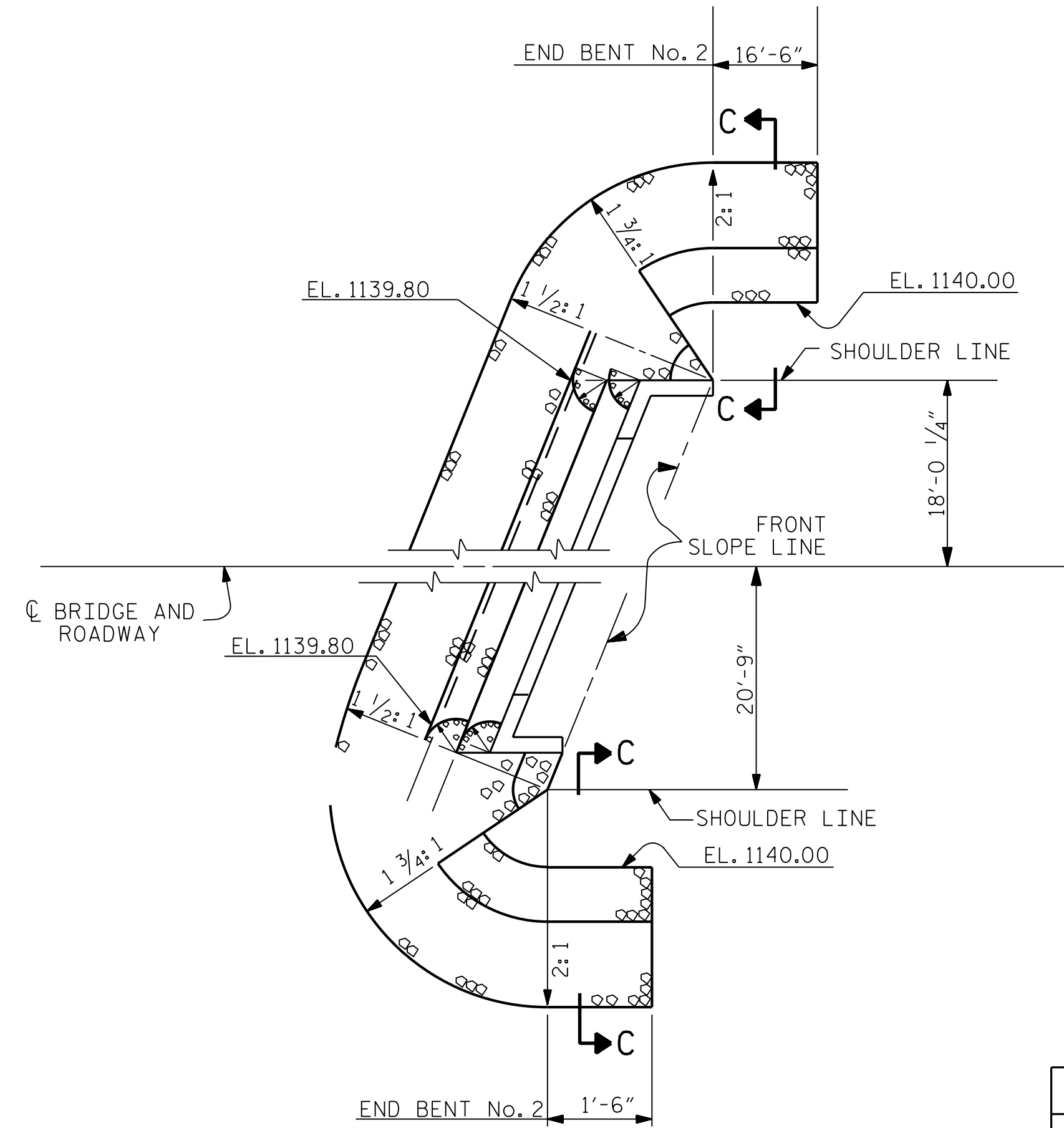
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DRAWN BY: M. J. ZIEHL DATE: MAY 2018  
CHECKED BY: T. L. COGGINS DATE: AUG 2018  
DESIGN ENGINEER OF RECORD: T. L. COGGINS DATE: AUG 2018

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

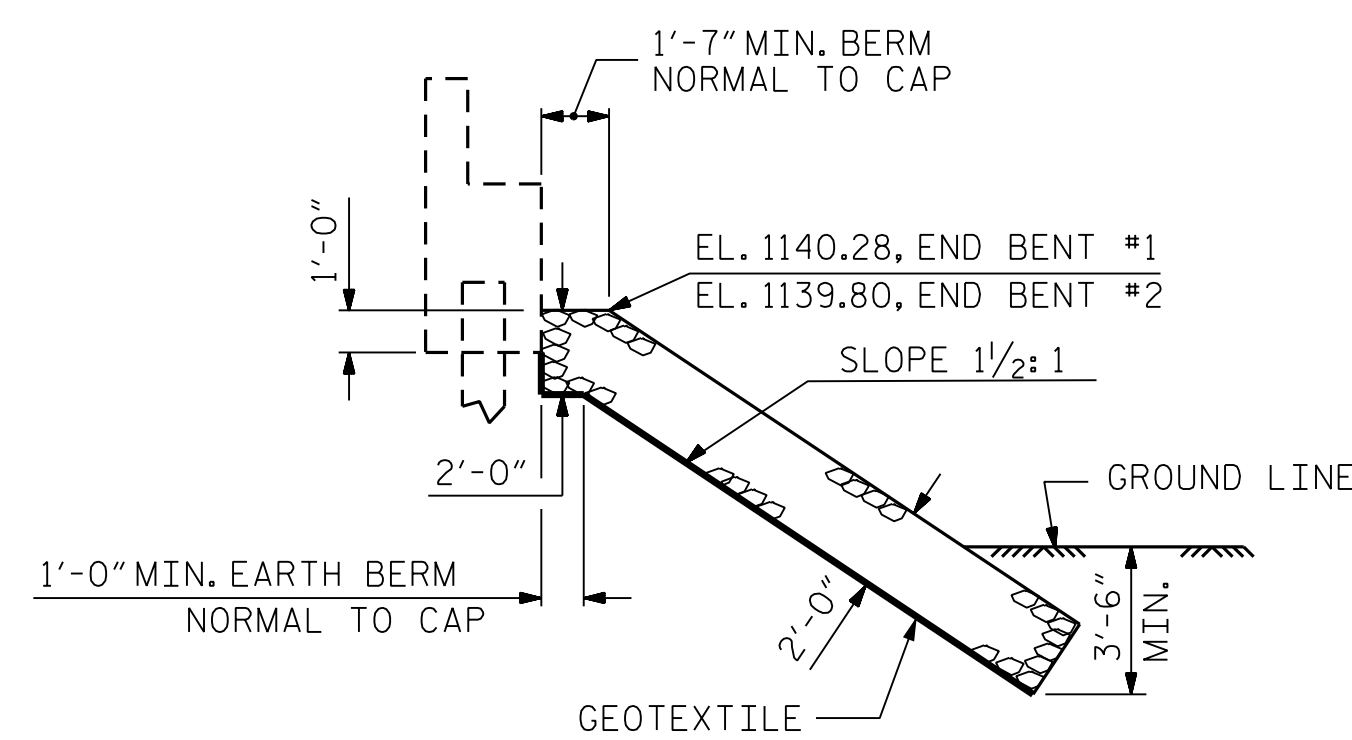


BERM RIP RAPPED END BENT NO. 1

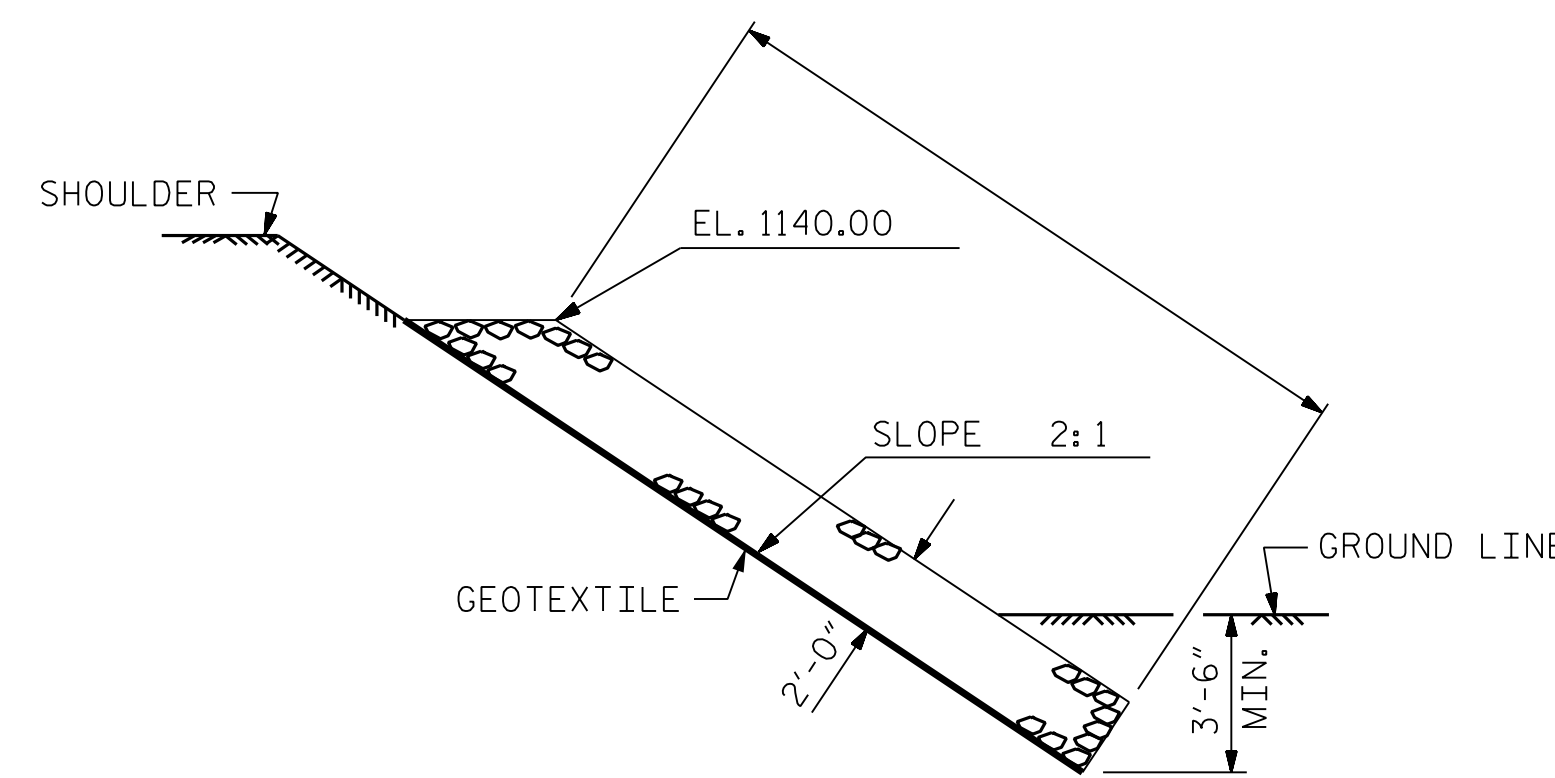


BERM RIP RAPPED END BENT NO. 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+26.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	170	189
END BENT 2	160	178



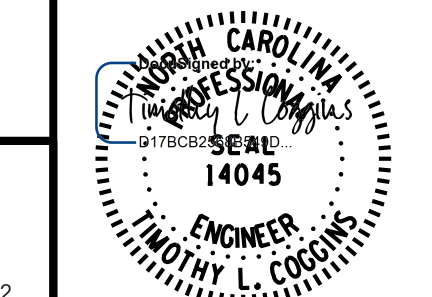
SECTION  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. 17BP.12.R.88  
ALEXANDER COUNTY  
STATION: 16+26.50 -L-

BRIDGE NO. 010291



1/26/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
RIP RAP DETAILS

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2			4		

SHEET NO.

**S-19**  
TOTAL SHEETS  
21

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DRAWN BY : M. J. ZIEHL DATE : MAY 2018  
CHECKED BY : T. L. COGGINS DATE : JUL 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : JUL 2018

**NOTES**

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

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

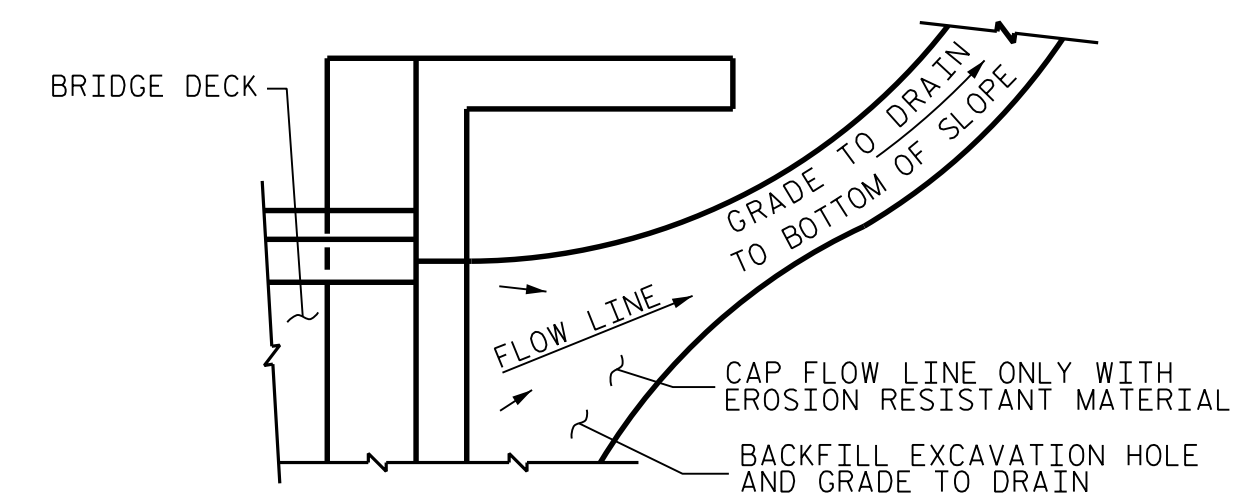
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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 OUTLETS, SEE ROADWAY STANDARD DRAWINGS.

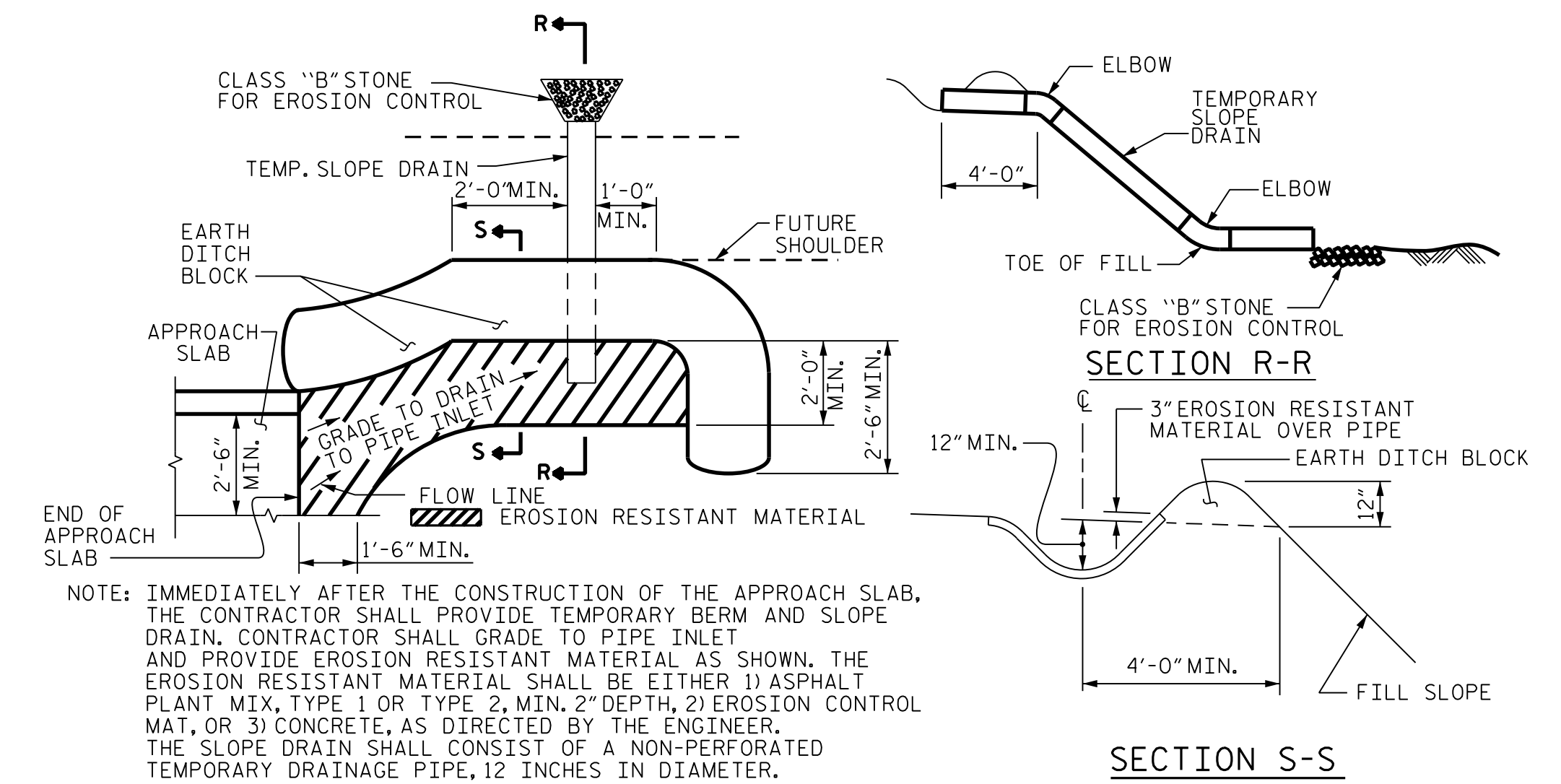
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED, SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



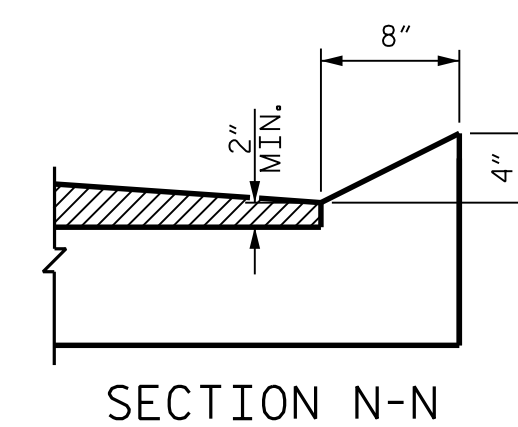
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

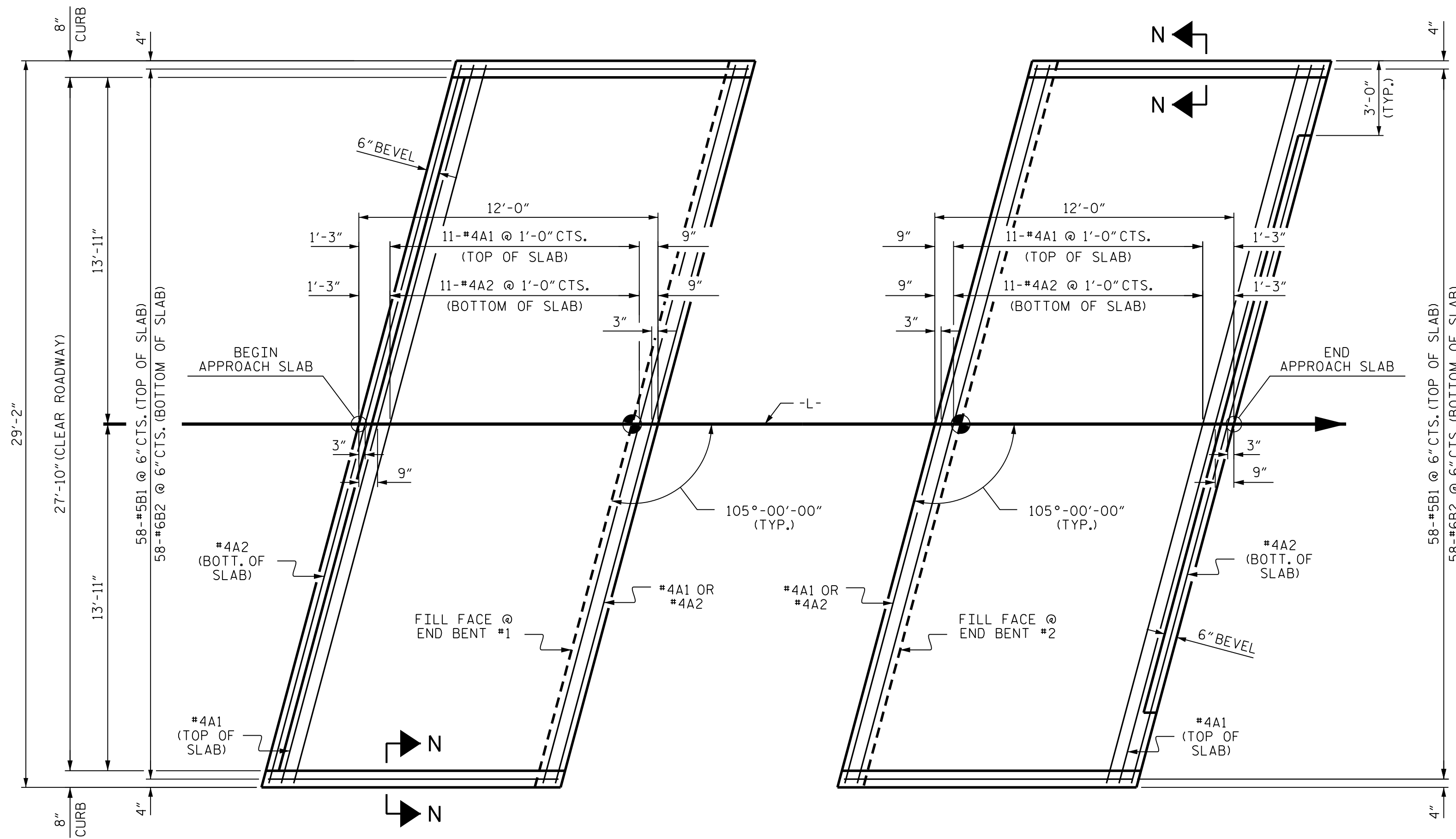


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

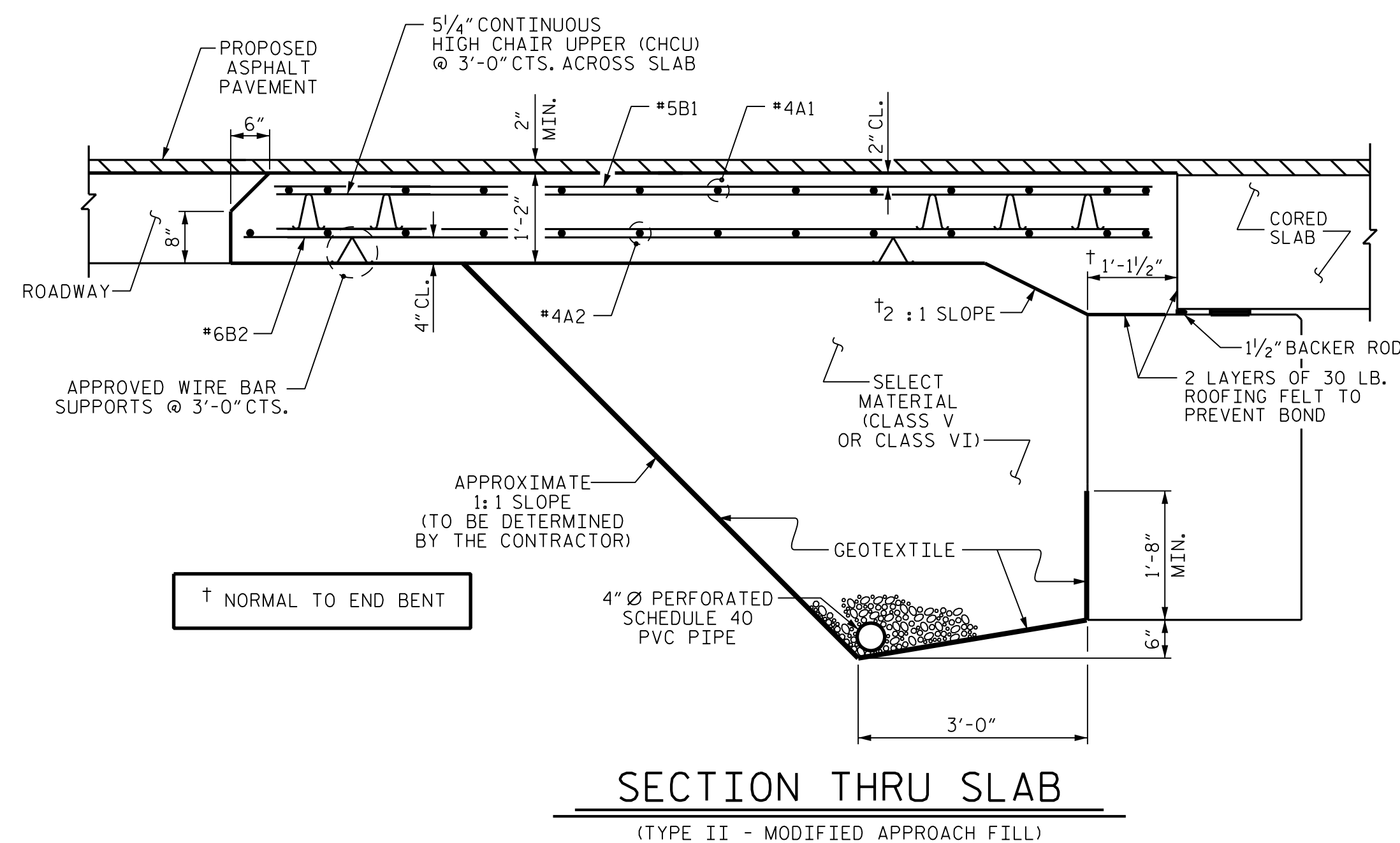
**TEMPORARY BERM AND SLOPE DRAIN DETAILS**  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
*EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C. Y.	16.7
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
*EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C. Y.	16.7



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



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

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

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BRIDGE NO. 010291  
STATE OF NORTH CAROLINA  
Professional Engineer  
14045  
1/26/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR PRESTRESSED CONCRETE  
CORED SLAB UNIT  
(SUB-REGIONAL TIER)  
105° SKEW

REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS	
2			4			21	

DRAWN BY : M. J. ZIEHL      DATE : MAY 2018  
CHECKED BY : T. L. COGGINS      DATE : JUN 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS      DATE : JUN 2018

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## 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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 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 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø 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 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 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.

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ALEXANDER COUNTY  
STATION: 16+26.50 -L-

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DRAWN BY : T. ROBBERTSON      DATE : SEP 2018  
CHECKED BY : T. L. COGGINS      DATE : SEP 2018  
DESIGN ENGINEER OF RECORD : T. L. COGGINS      DATE : SEP 2018

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<b>STANDARD</b>					
<b>NOTES</b>					
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