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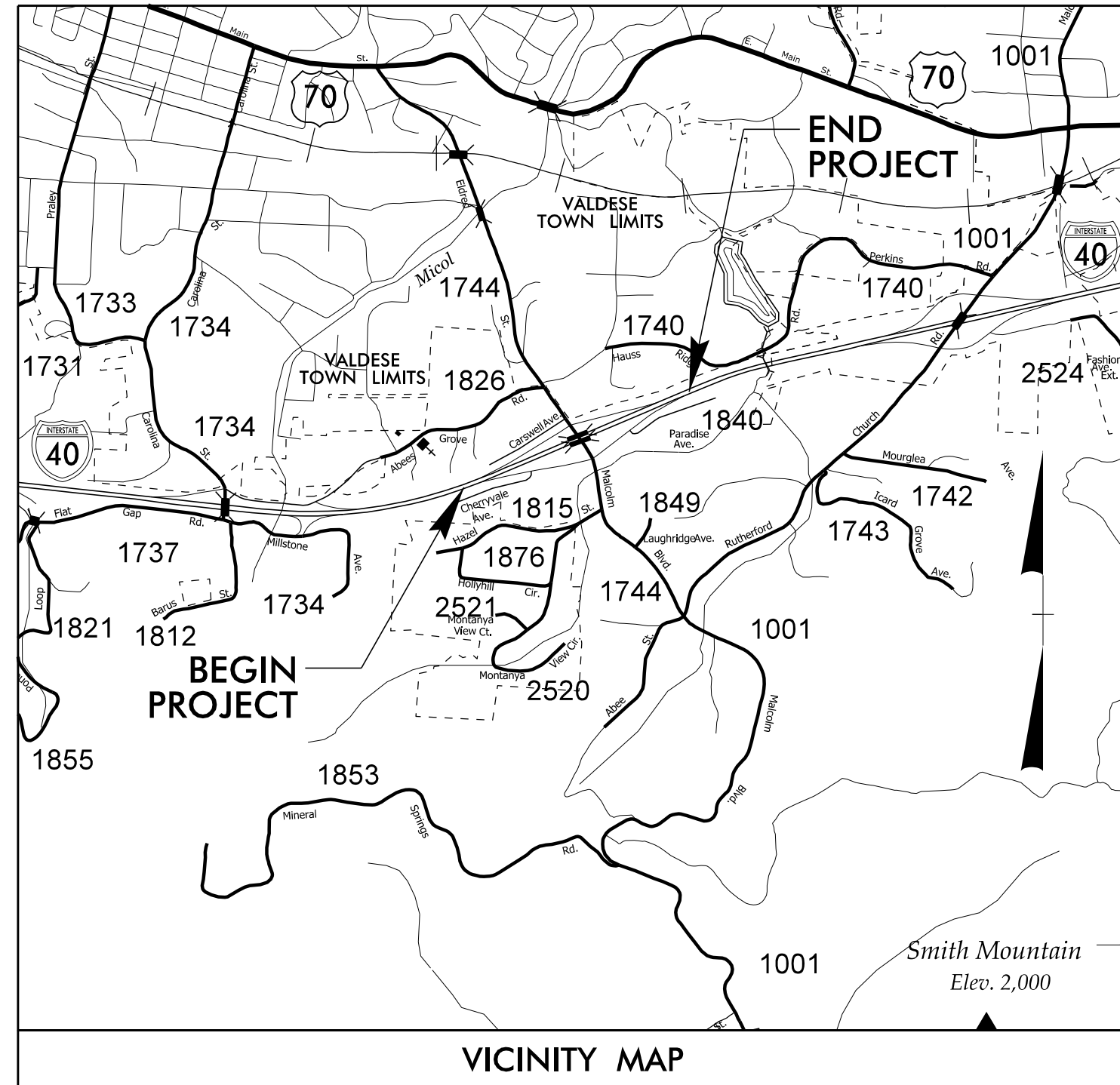
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09/08/19

TIP PROJECT: B-4448

CONTRACT: C204072

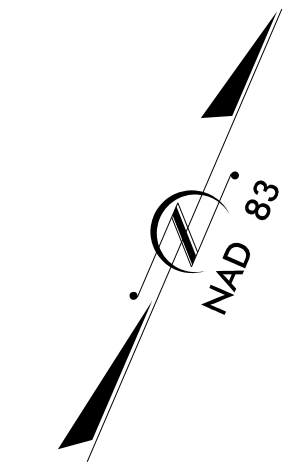


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BURKE COUNTY

LOCATION: BRIDGE NOS. 149 AND 150 ON I-40 (EXIT NO. 112)
OVER SR 1744 (MINERAL SPRINGS MOUNTAIN RD.)

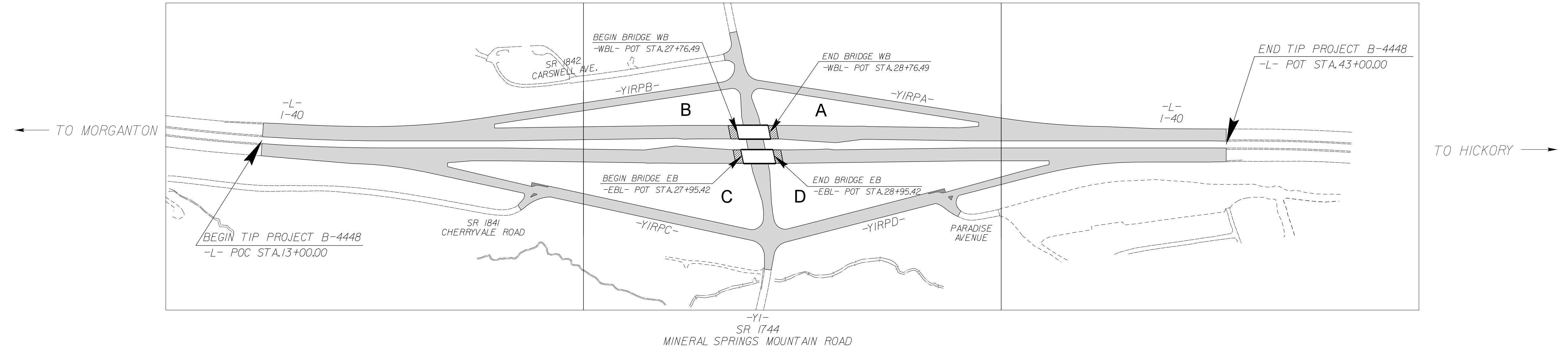
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4448		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38372.1.2		PE	
38372.2.1		UTILITIES	
38372.2.1		RIGHT OF WAY	
38372.3.1		CONSTRUCTION	



STRUCTURES

4 5 6



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

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DESIGN DATA

2018 ADT =	48,260
2038 ADT =	63,300
K =	8%
D =	55%
T =	10%*
V =	70 MPH
(TTST 7% + DUAL 3%)	
FUNC. CLASS. =	INTERSTATE
STATEWIDE TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4448	=	0.549 mi.
LENGTH STRUCTURES TIP PROJECT B-4448	=	0.019 mi.
TOTAL LENGTH TIP PROJECT B-4448	=	0.568 mi.
BRIDGE LENGTH BASED ON EASTBOUND BRIDGE		

Prepared in the Offices of:

421 FAYETTEVILLE ST., STE 400
RALEIGH, NC 27601
T 919.380.8750

2018 STANDARD SPECIFICATIONS

DAVID RUGGLES, PE
PROJECT ENGINEER

JEFFREY LOFTUS, PE
PROJECT DESIGN ENGINEER

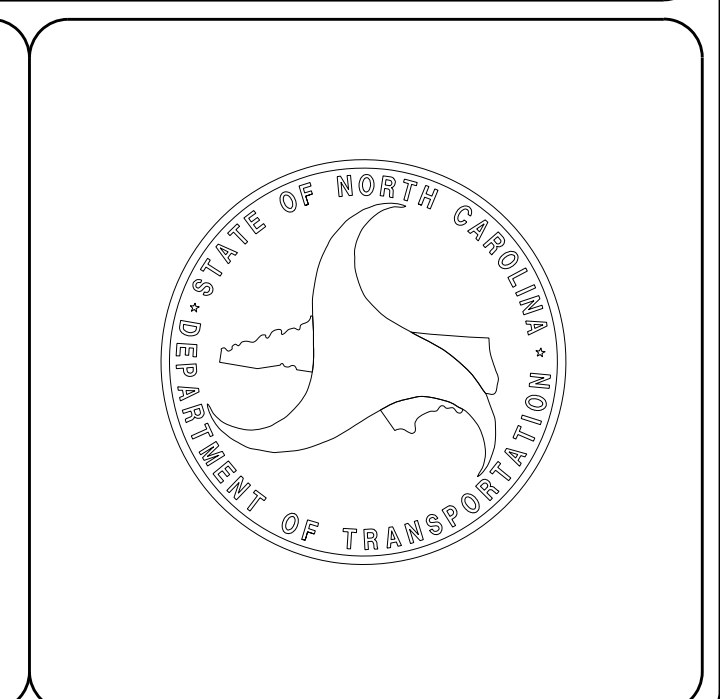
DAVID STUTTS, PE
NCDOT CONTACT

LETTING DATE:
JUNE 19, 2018

STRUCTURES ENGINEER

DocuSigned by:
Jeff Loftus
4/12/2018

SIGNATURE: _____ P.E.



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

-WBL- GRADE DATA

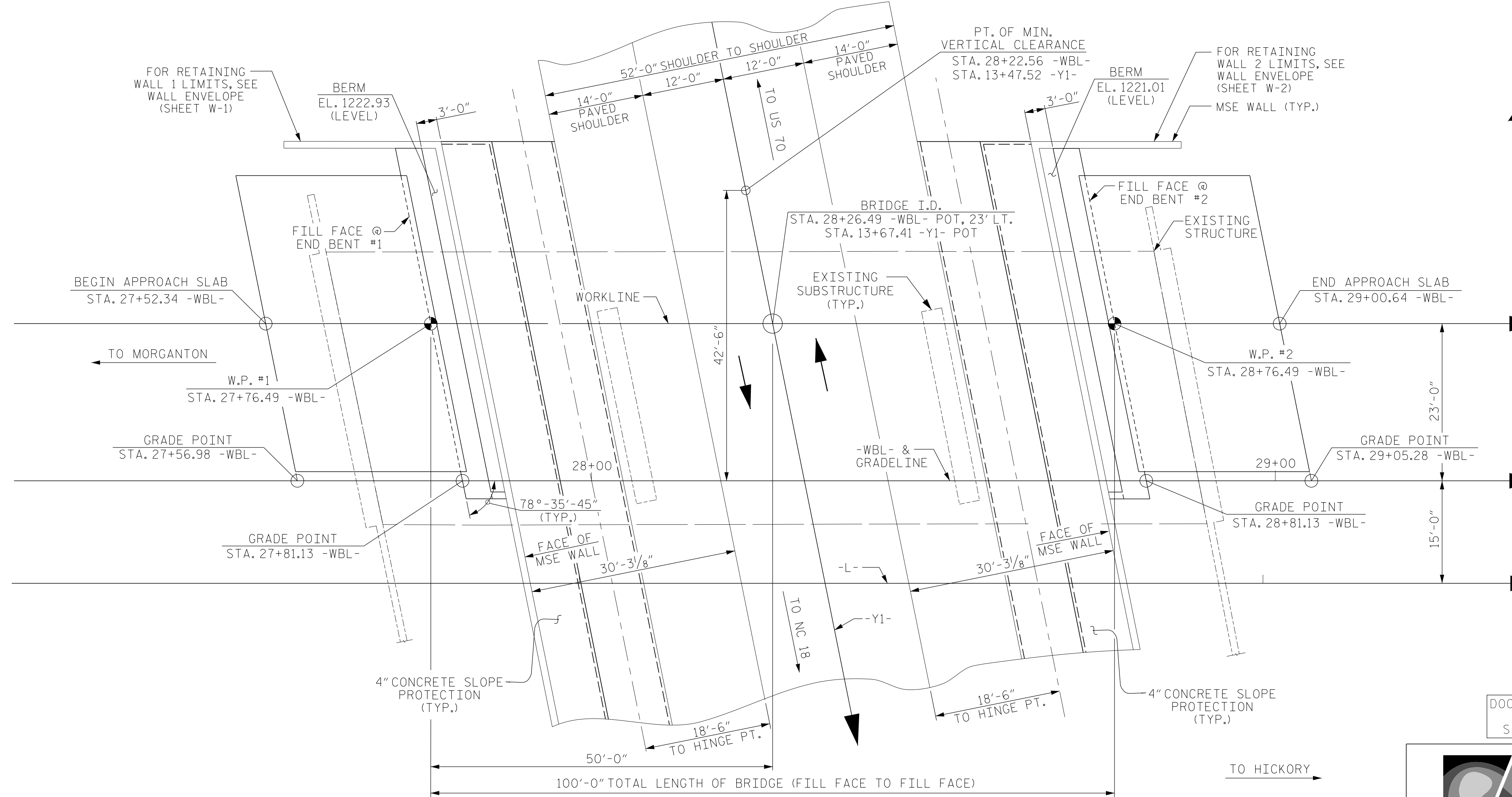
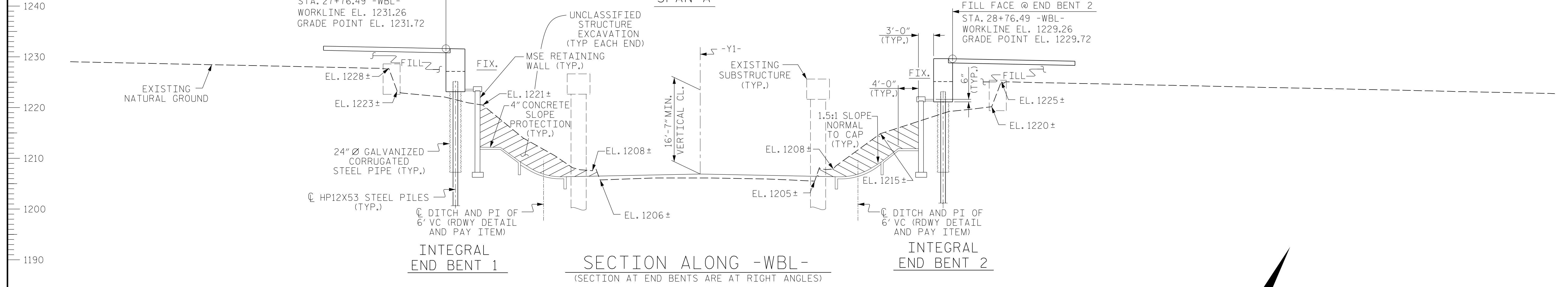
(-)-0.7867% Δ (-)-2.0000%

PI = 25+00.00 -WBL-
EL = 1237.25
VC = 300'

-WBL- GRADE DATA

(-)-2.0000% Δ (-)-3.0200%

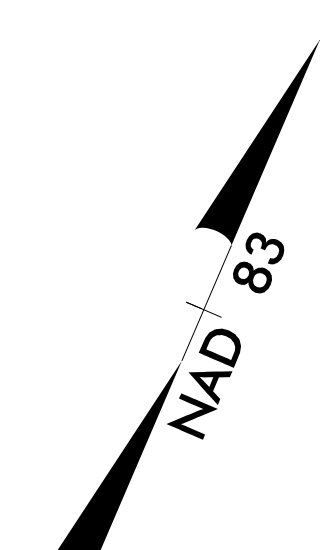
PI = 31+50.00 -WBL-
EL = 1224.25
VC = 300'



-Y1- GRADE DATA

(-)-5.9413% Δ (-)-2.3000%

PI = 16+80.00 -Y1-
EL = 1189.24
VC = 240'

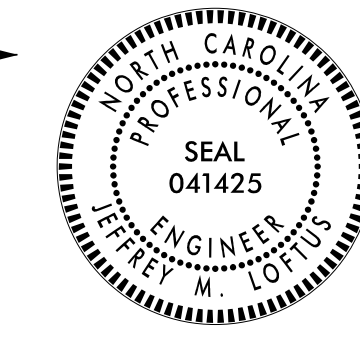


PLAN

GALVANIZED PIPES & PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY

PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT
13+67.41 -Y1- POT
SHEET 1 OF 4 REPLACES BRIDGE NO. 150

Designed by: Jeff Loftus 4/12/2018
PES1002879448



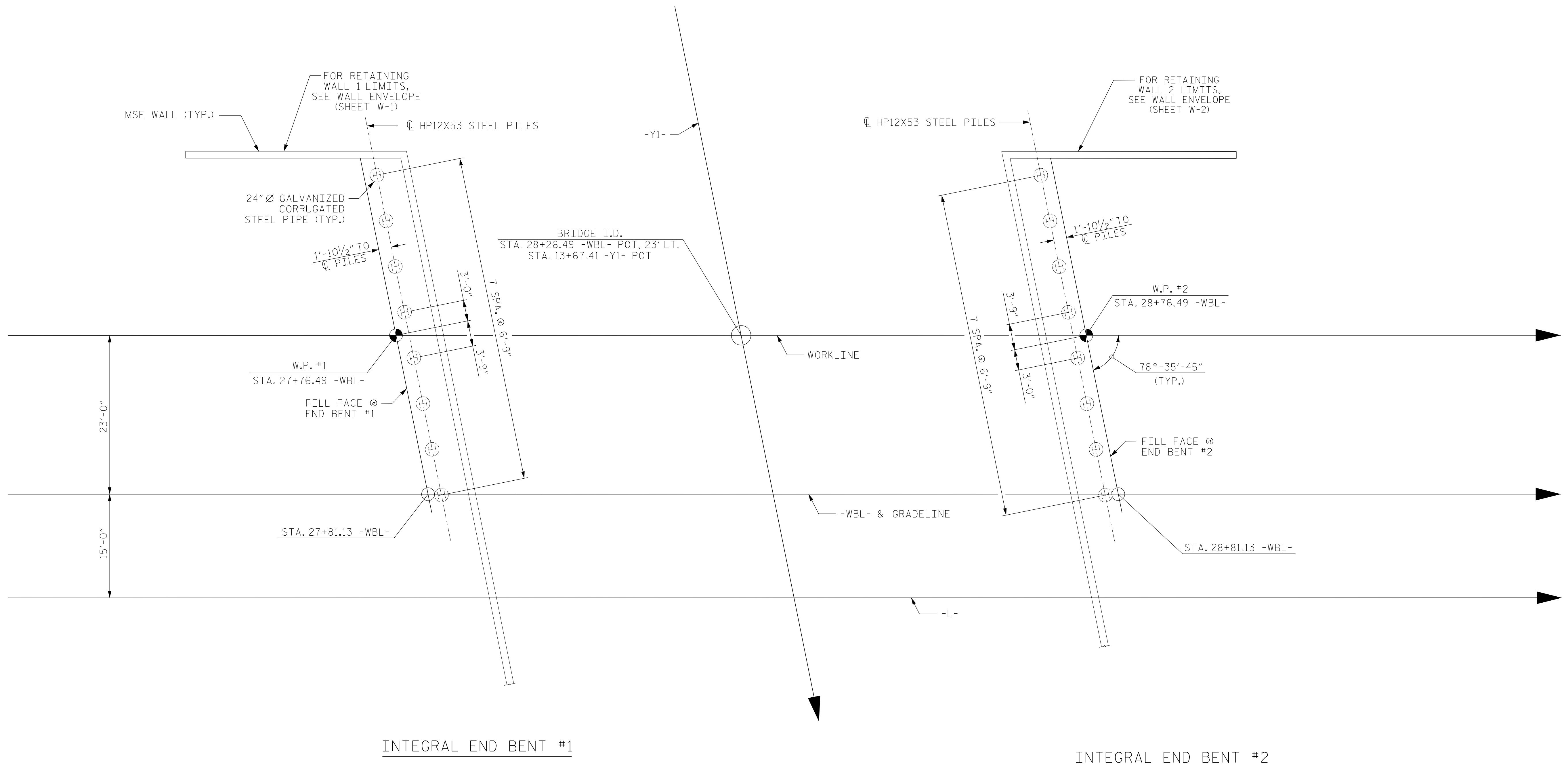
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS 24
2			4			

4/12/2018
DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 05-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448
4/12/2018
\\401_001_B4448_SMU_GD01_S1-1.dgn
USERdefault



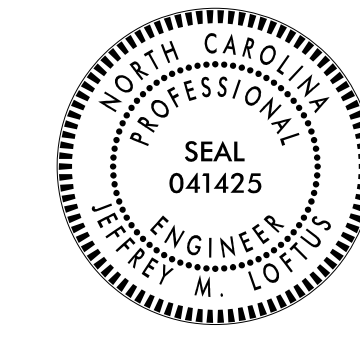
FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP.

FOUNDATION NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
3. DRIVE PILES AT END BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
4. PILES AT END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
5. DRIVE PILES AT END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
6. FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

Designed by: **Jeff Loftus** 4/12/2018
FES1DC02E6794A9



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PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER SR 1744
(MINERAL SPRINGS MOUNT. RD)
ON WBL I-40 BETWEEN
MORGANTON AND HICKORY

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
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USER: jloftus

B-4448

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.42	--	1.75	0.81	1.42	A	EL	48.1	0.97	2.79	A	I	96.2	1.30	0.81	1.47	A	EL	48.1		
	HL-93 (OPERATING)	N/A		1.84	--	1.35	0.81	1.84	A	EL	48.1	0.97	3.62	A	I	96.2	1.00	0.81	1.91	A	EL	48.1		
	HS-20 (INVENTORY)	36.000	②	2.38	85.7	1.75	0.81	2.38	A	EL	48.1	0.97	4.27	A	I	96.2	1.30	0.81	2.47	A	EL	48.1		
	HS-20 (OPERATING)	36.000		3.09	111.2	1.35	0.81	3.09	A	EL	48.1	0.97	5.53	A	I	96.2	1.00	0.81	3.21	A	EL	48.1		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		5.21	65.1	1.40	0.81	6.29	A	EL	48.1	0.97	12.70	A	I	96.2	1.30	0.81	5.21	A	EL	48.1	
		S3C	21.500		3.05	65.6	1.40	0.81	3.68	A	EL	48.1	0.97	7.44	A	I	96.2	1.30	0.81	3.05	A	EL	48.1	
		S3A	22.750		2.89	65.7	1.40	0.81	3.49	A	EL	48.1	0.97	7.05	A	I	96.2	1.30	0.81	2.89	A	EL	48.1	
		S4A	26.750		2.55	68.2	1.40	0.81	3.07	A	EL	48.1	0.97	6.51	A	I	96.2	1.30	0.81	2.55	A	EL	48.1	
		S5A	30.500		2.26	68.9	1.40	0.81	2.73	A	EL	48.1	0.97	6.03	A	I	96.2	1.30	0.81	2.26	A	EL	48.1	
		S6A	34.500		2.14	73.8	1.40	0.81	2.58	A	EL	48.1	0.97	5.56	A	I	96.2	1.30	0.81	2.14	A	EL	48.1	
		S7B	38.500		1.98	76.2	1.40	0.81	2.39	A	EL	48.1	0.97	5.29	A	I	96.2	1.30	0.81	1.98	A	EL	48.1	
		S7A	40.000	③	1.97	78.8	1.40	0.81	2.38	A	EL	48.1	0.97	5.28	A	I	96.2	1.30	0.81	1.97	A	EL	48.1	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.50	70.6	1.40	0.81	3.16	A	EL	48.1	0.97	6.29	A	I	96.2	1.30	0.81	2.50	A	EL	48.1	
		T5B	32.000		2.27	72.6	1.40	0.81	2.75	A	EL	48.1	0.97	5.96	A	I	96.2	1.30	0.81	2.27	A	EL	48.1	
		T6A	36.000		2.12	76.3	1.40	0.81	2.56	A	EL	48.1	0.97	5.57	A	I	96.2	1.30	0.81	2.12	A	EL	48.1	
		T7A	40.000		2.07	82.8	1.40	0.81	2.49	A	EL	48.1	0.97	5.28	A	I	96.2	1.30	0.81	2.07	A	EL	48.1	
		T7B	40.000		2.40	96.0	1.40	0.81	2.90	A	EL	48.1	0.97	5.27	A	I	96.2	1.30	0.81	2.40	A	EL	48.1	
		FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		1.47																		

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

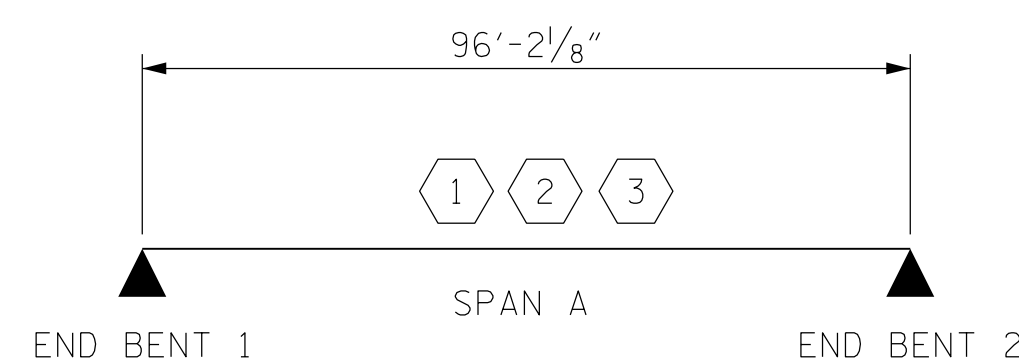
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 4 OF 4

DocuSigned by: Jeff Loftus 4/12/2018



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR STEEL GIRDERS (INTERSTATE TRAFFIC)

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

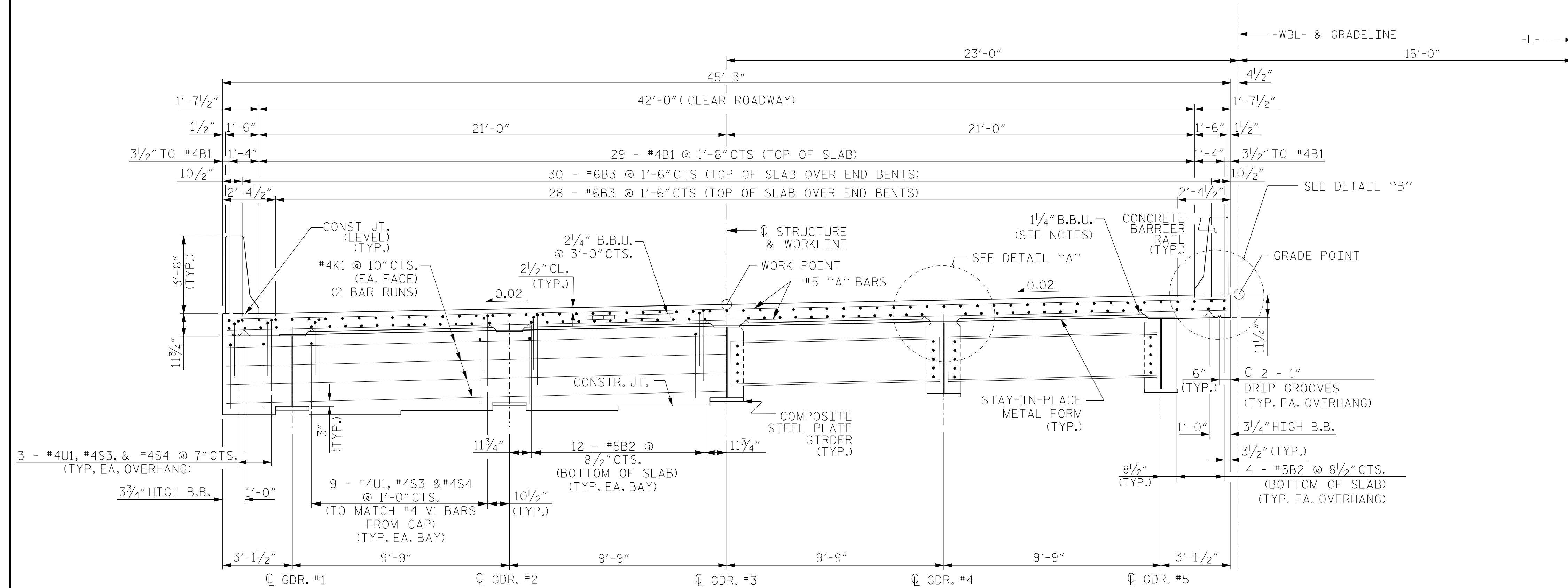
SHEET NO. S1-4
TOTAL SHEETS 24

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 05-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448
4/12/2018
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USER: jloftus

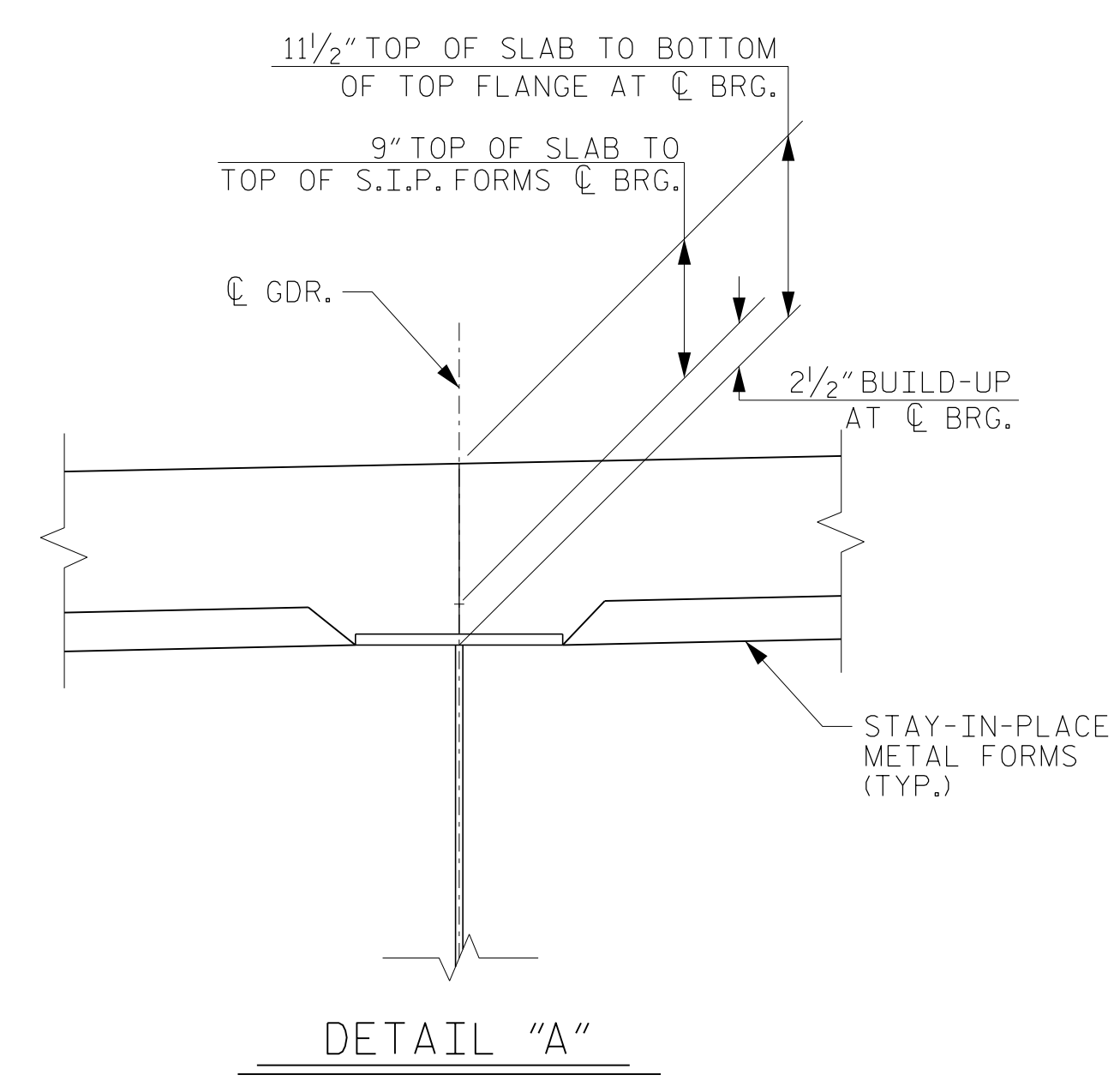
NOTES

1. PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
2. SPAN A IS TO BE CONSTRUCTED AS A SIMPLE SPAN COMPOSITE PLATE GIRDER WITH AASHTO M270 GRADE 50W STEEL AND INTEGRAL END BENTS.

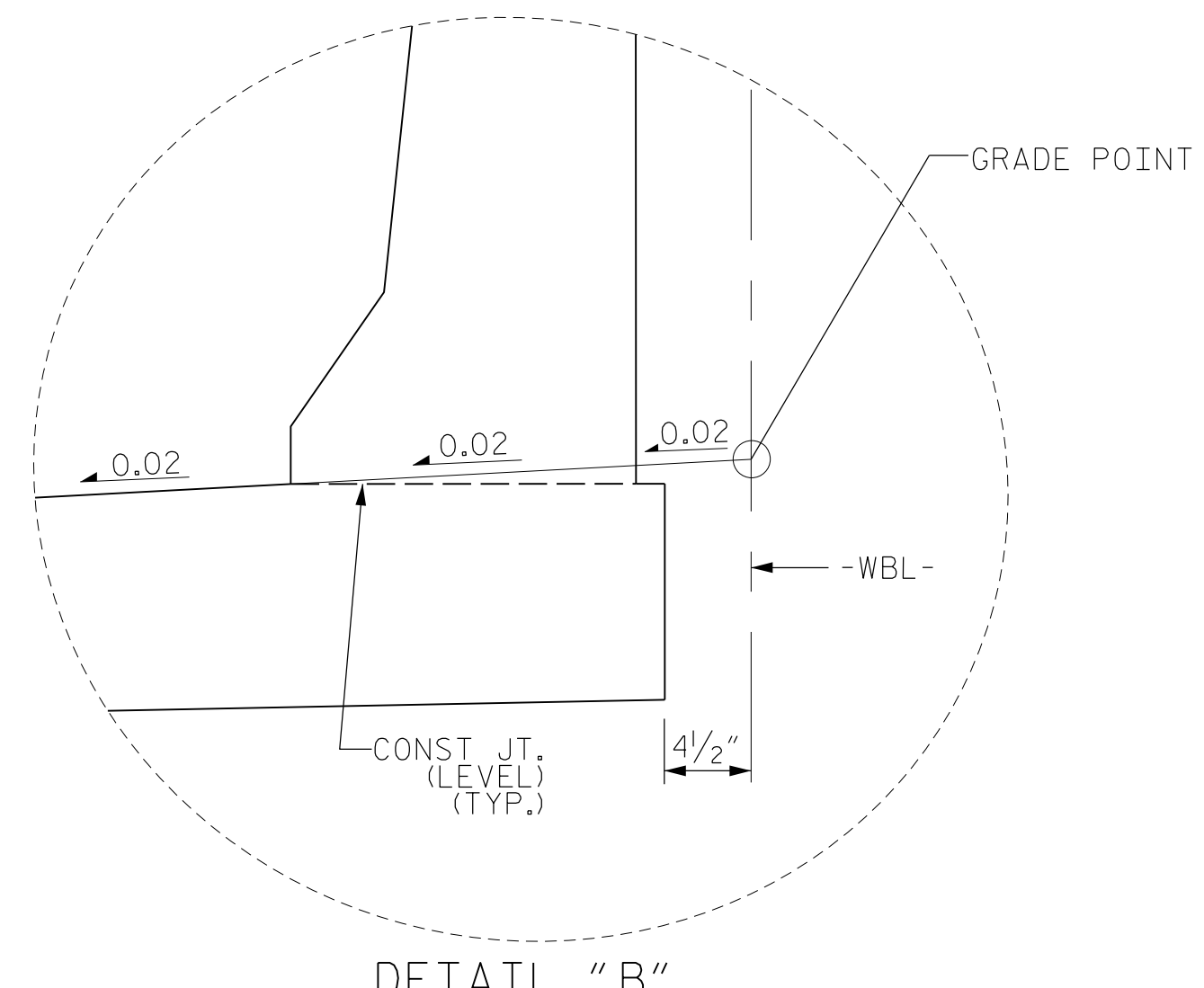


TYPICAL SECTION
SHOWING END-BENT DIAPHRAGMS

TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

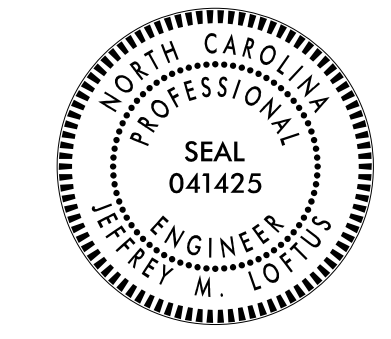


DETAIL "A"



DETAIL "B"

Designed by: **Jeff Loftus**
FES10002678448 4/12/2018



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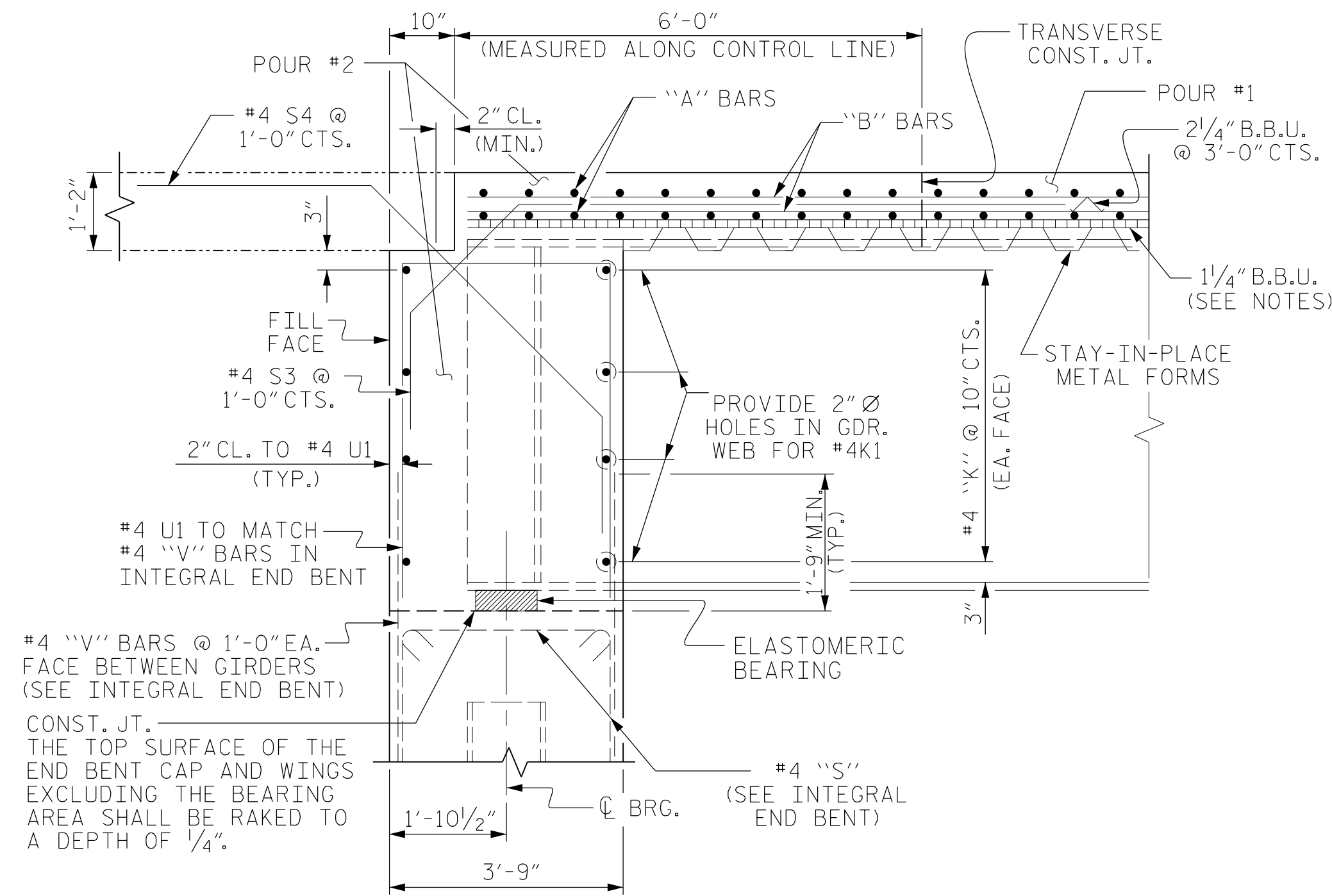
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUPERSTRUCTURE
TYPICAL SECTION**

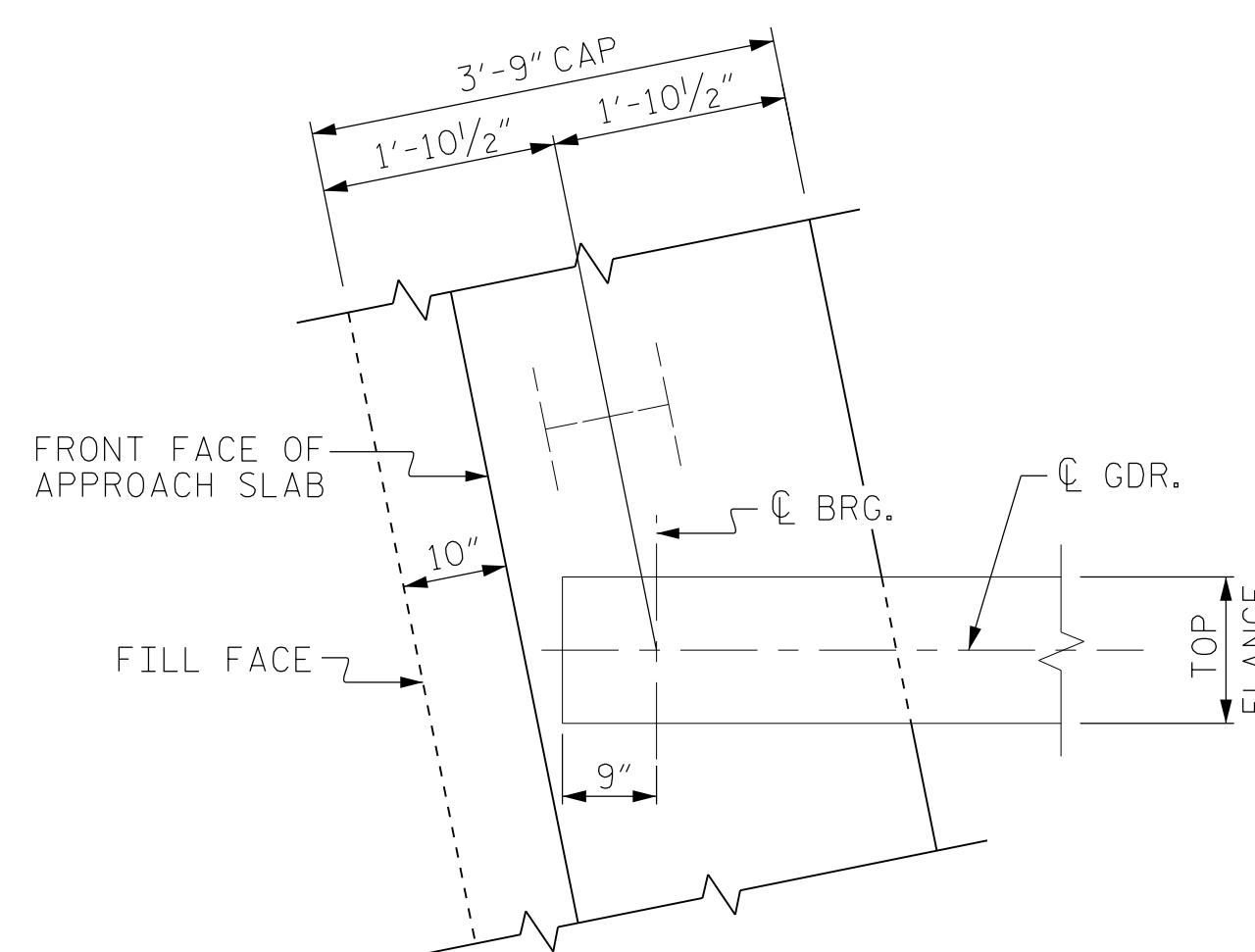
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			24

4/12/2018
DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448
4/12/2018
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USER: jloftus



END OF GIRDER DETAIL AT INTEGRAL END BENT



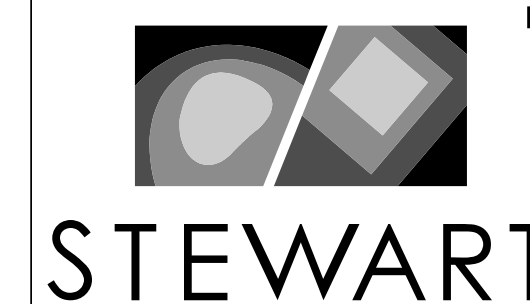
PLAN OF GIRDER AT INTEGRAL END BENT #1
PLAN OF GIRDER AT INTEGRAL END No.2 IS SIMILAR

DocuSigned by:
Jeff Loftus
FES1DC02E8794A9... 4/12/2018



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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT

SHEET 2 OF 2

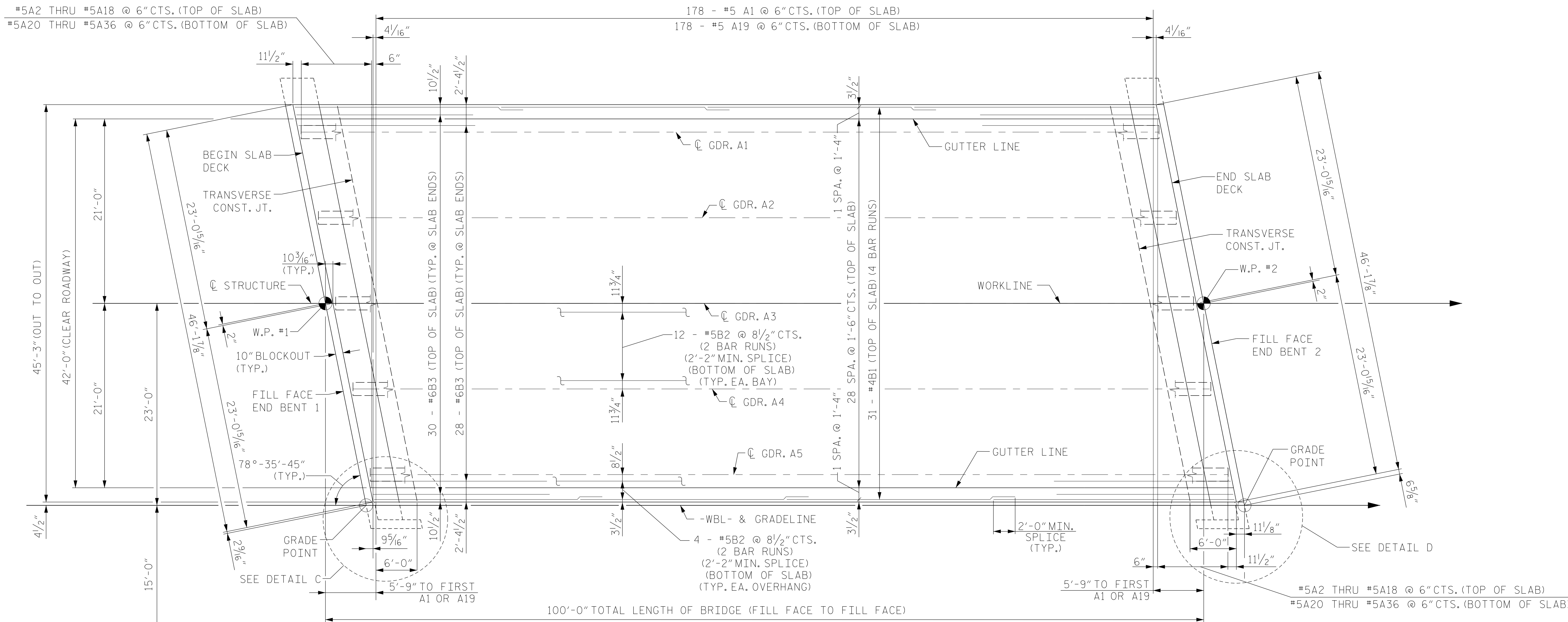
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			24

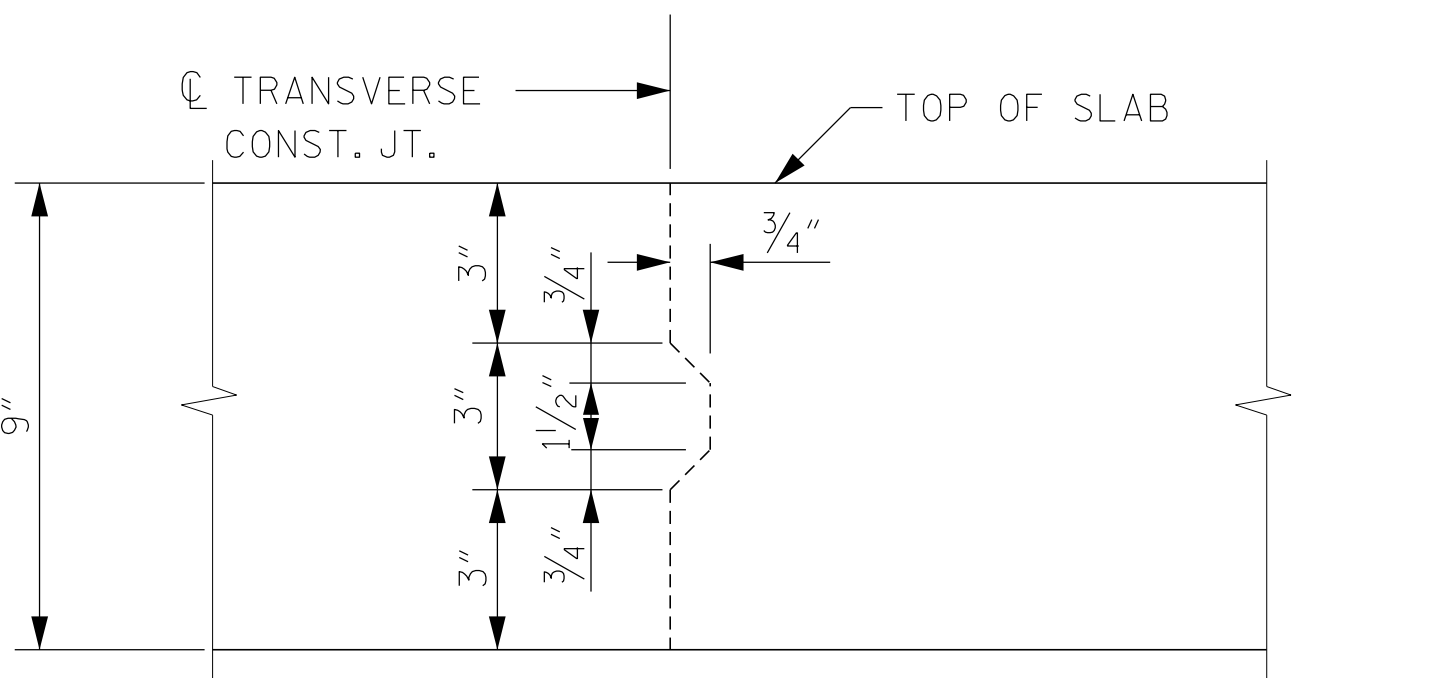
4/12/2018
DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

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USER: jloftus



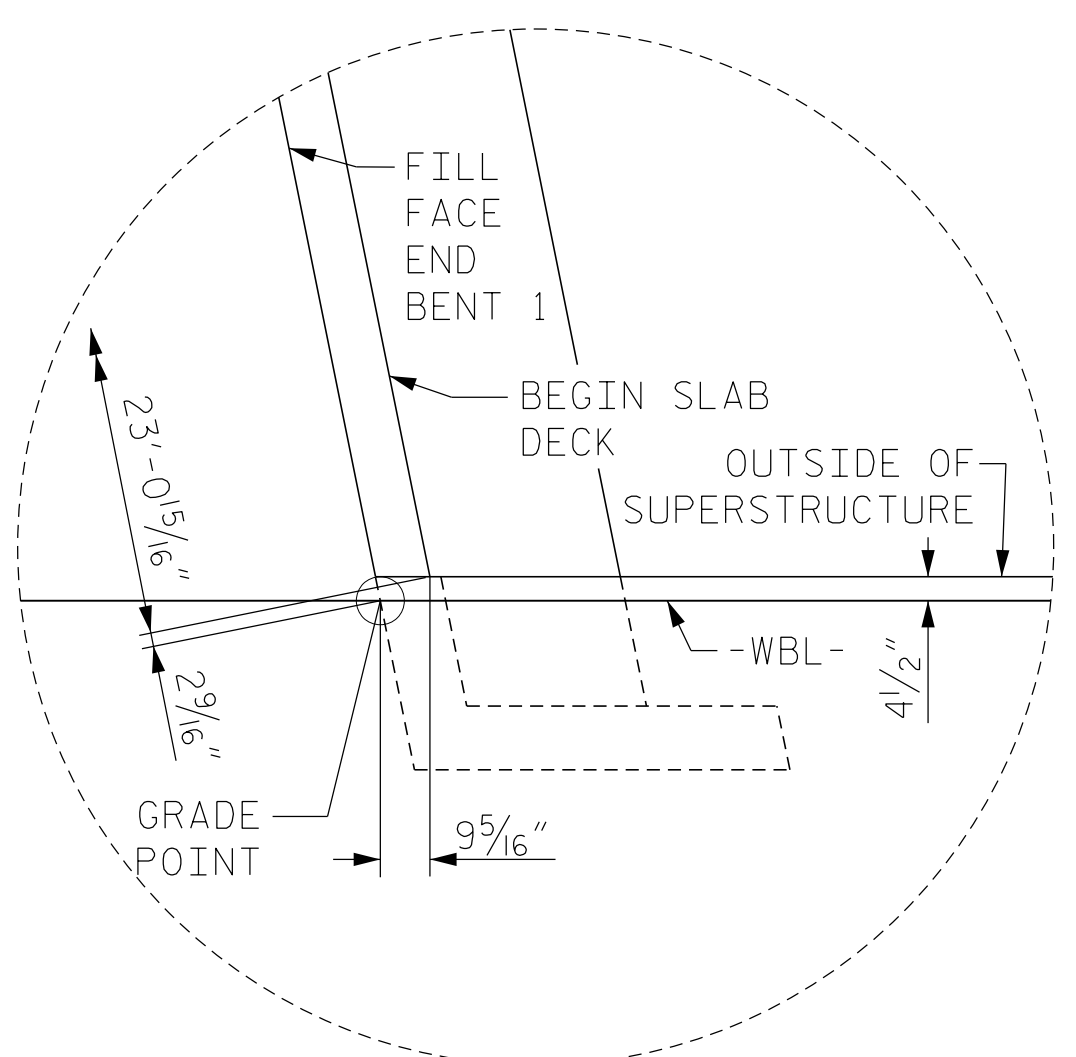
SPAN A
PLAN OF SPAN

FOR CONCRETE BARRIER REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

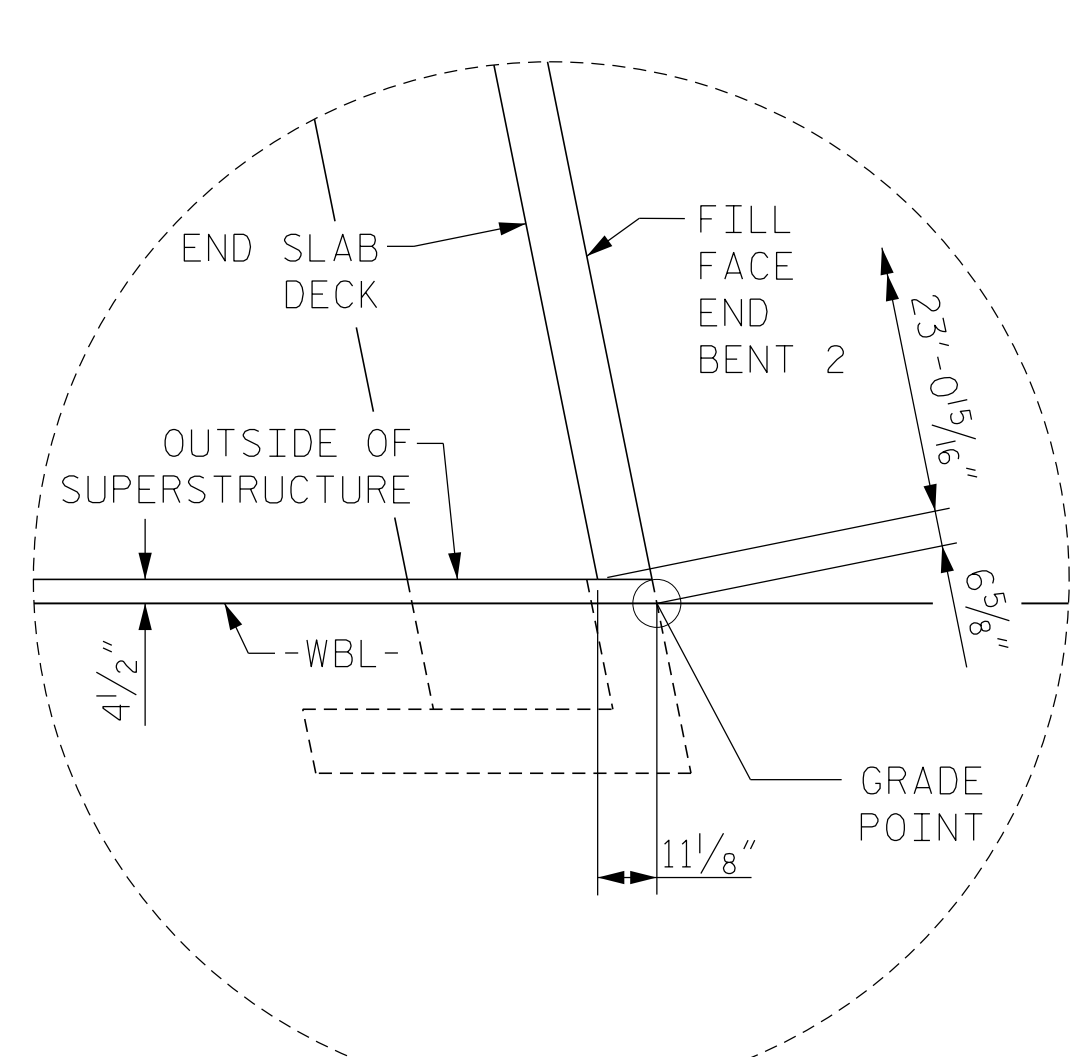


TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL STEEL SHALL BE CONTINUOUS THROUGH JOINT.

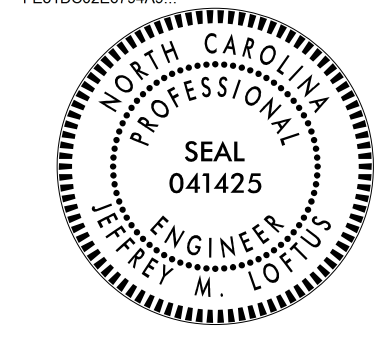


DETAIL C



DETAIL D

DocuSigned by:
Jeff Loftus
FES10C02E679A69
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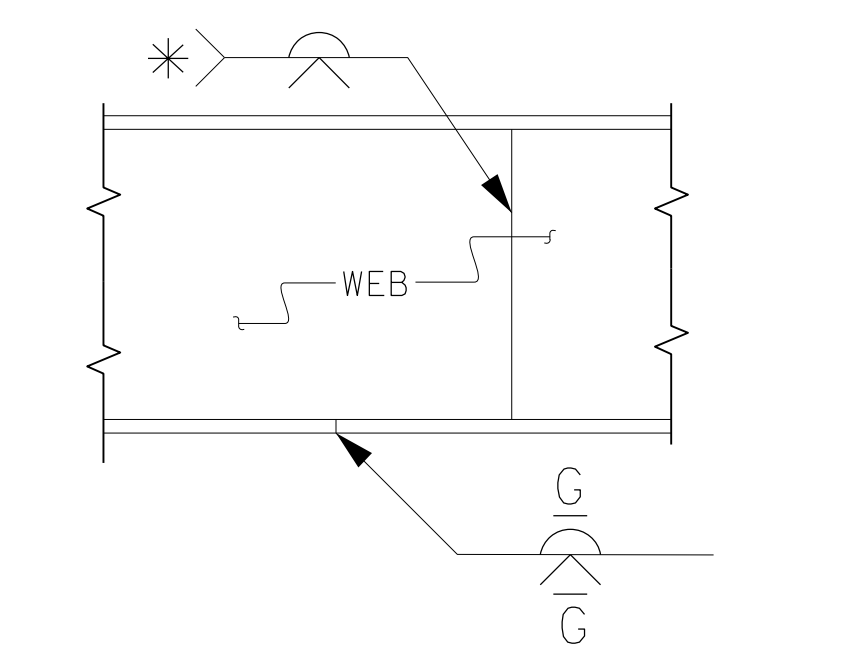
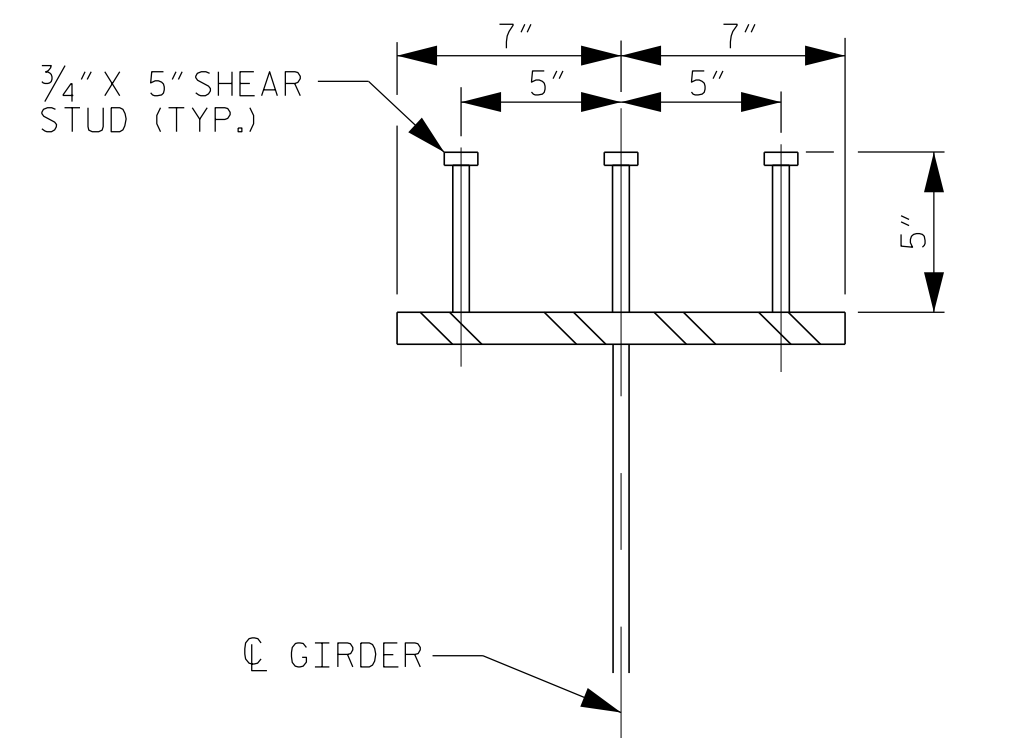
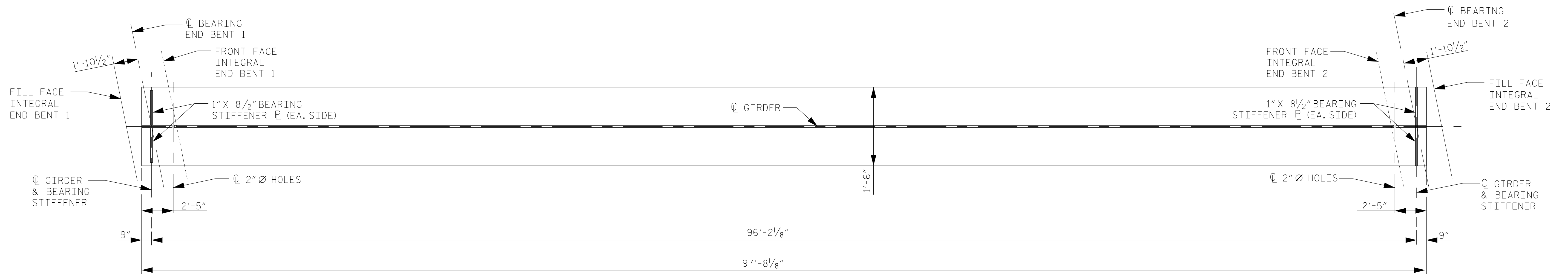
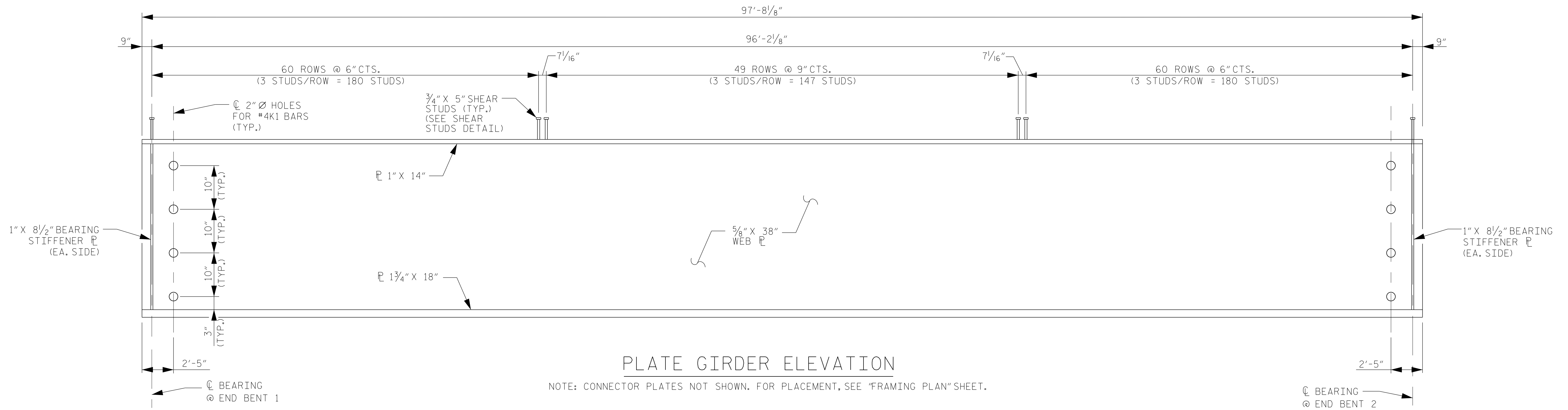
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT

SHEET 1 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN

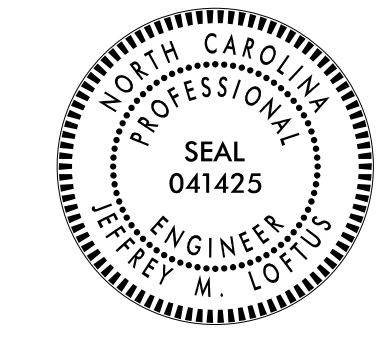
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-7
1			3			TOTAL SHEETS 24
2			4			

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4/12/2018
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DRAWN BY: E. PHELPS DATE: 05-17
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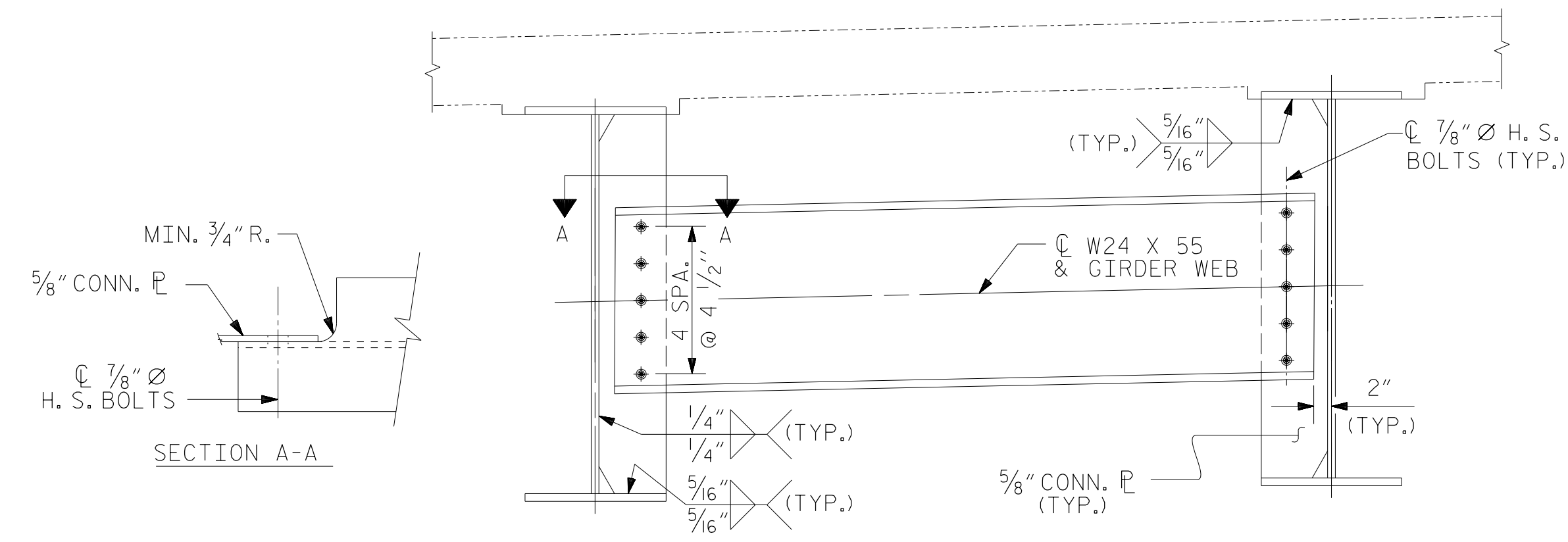
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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT
SHEET 1 OF 2

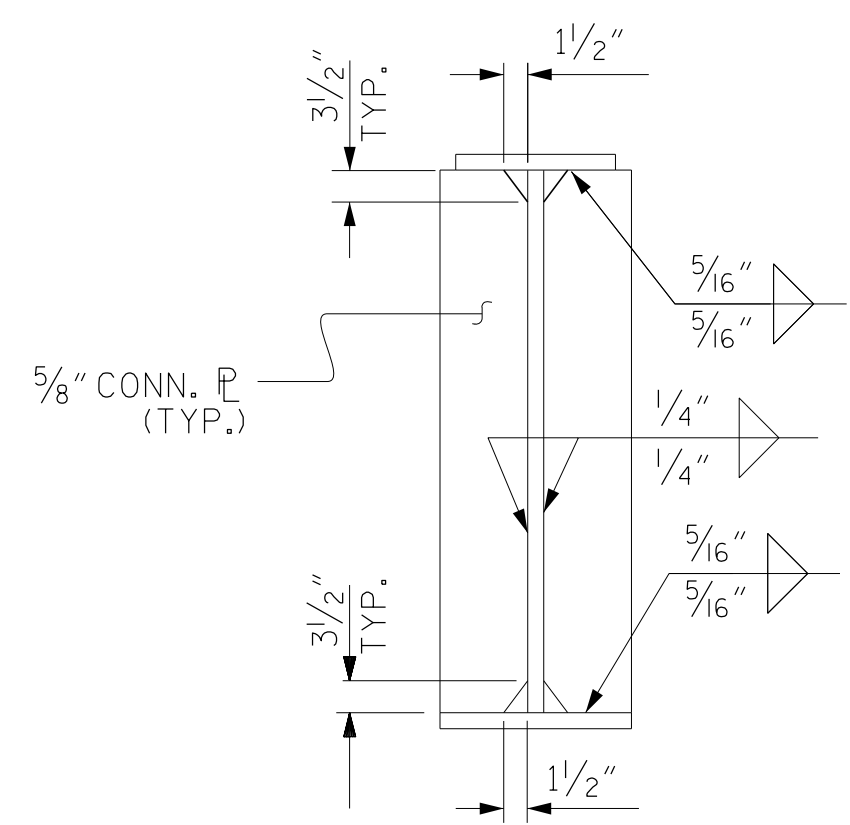
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STEEL PLATE GIRDER DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S1-10 TOTAL SHEETS 24

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

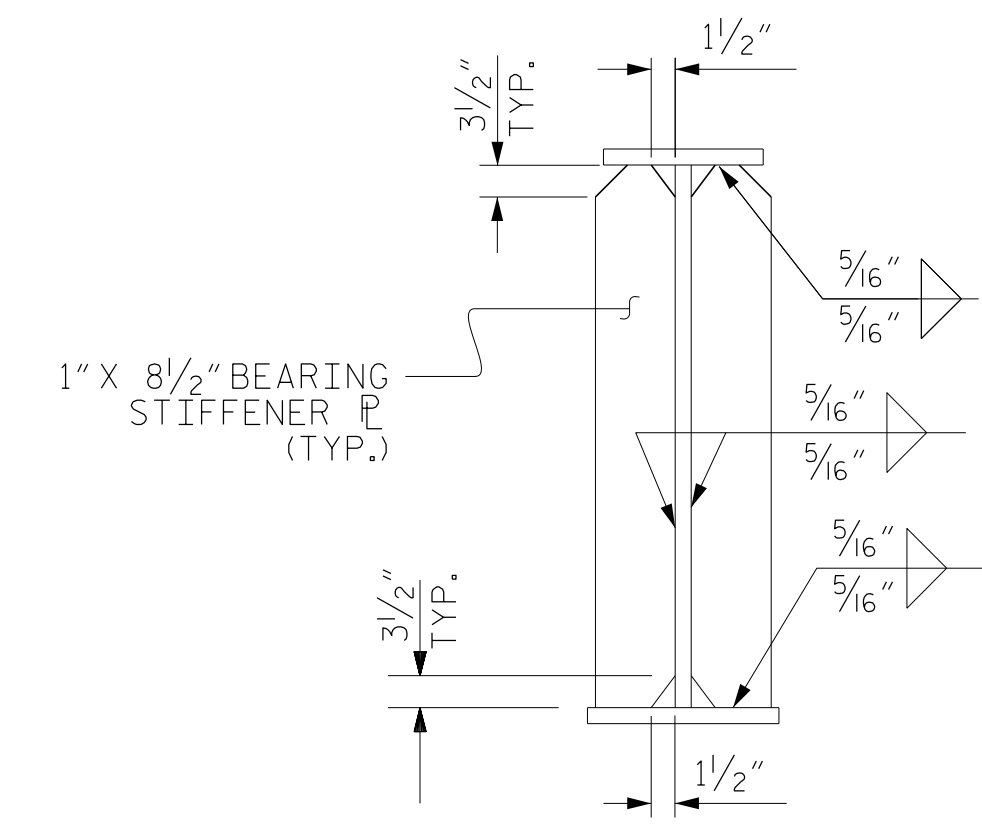
B-4448
 4/12/2018
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 USER: jloftus



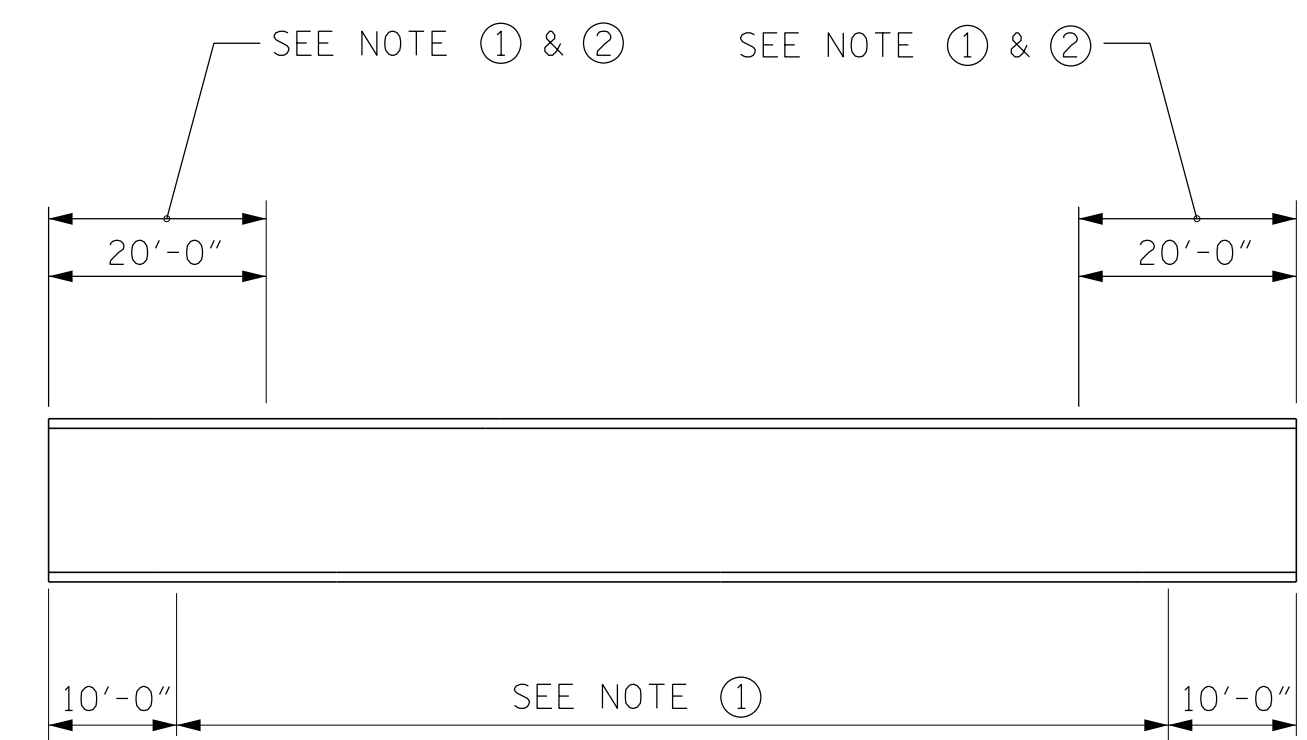
INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE



BEARING STIFFENER

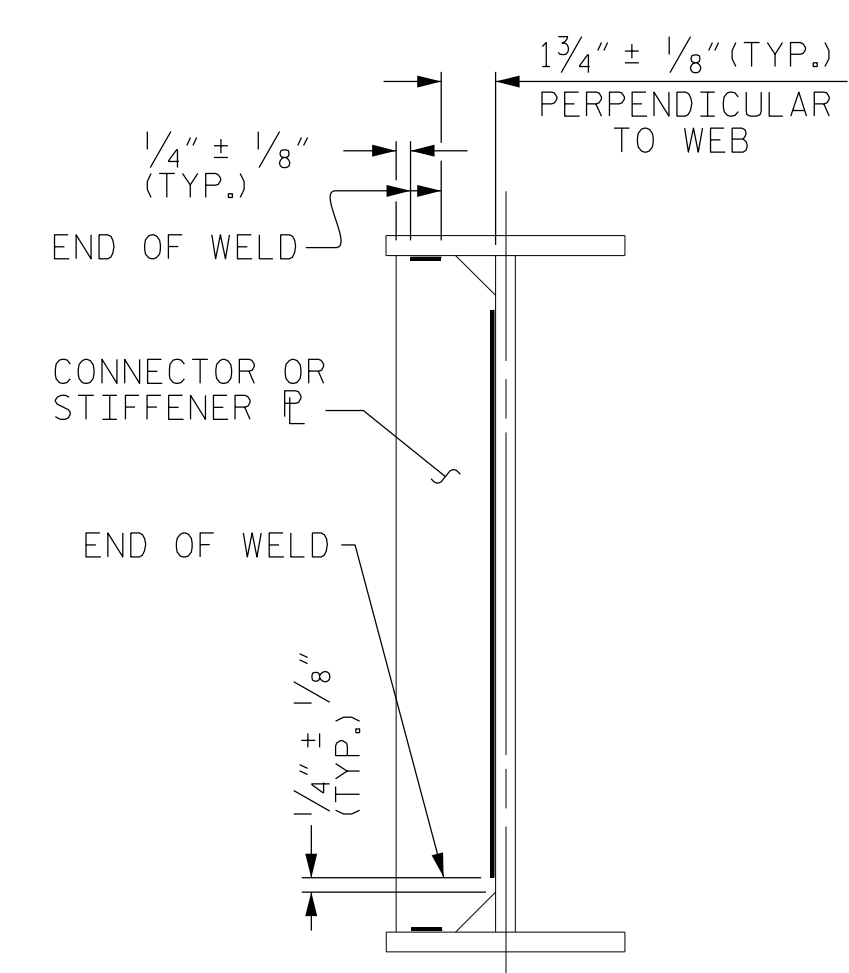


GIRDER MAKE UP

NOTE ① : CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR PLATE GIRDERS



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS
WELD TERMINATION DETAILS

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

INTERMEDIATE DIAPHRAGM CONNECTOR PLATES SHALL BE PLACED NORMAL TO THE GIRDER FLANGES AND WEB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELDS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

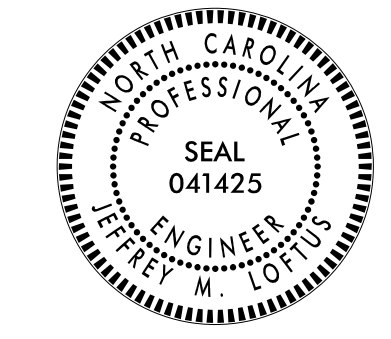
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

END OF GIRDERS SHALL BE PLUMB.

ALL FIELD CONNECTIONS TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS AND CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

Designed by: **Jeff Loftus** 4/12/2018
FES10C026794A8...



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PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
STEEL PLATE GIRDER
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			24

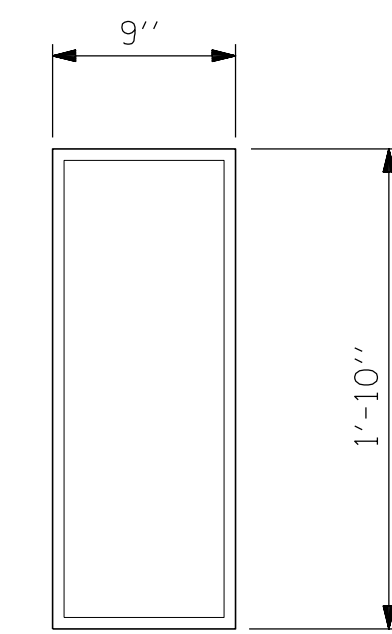
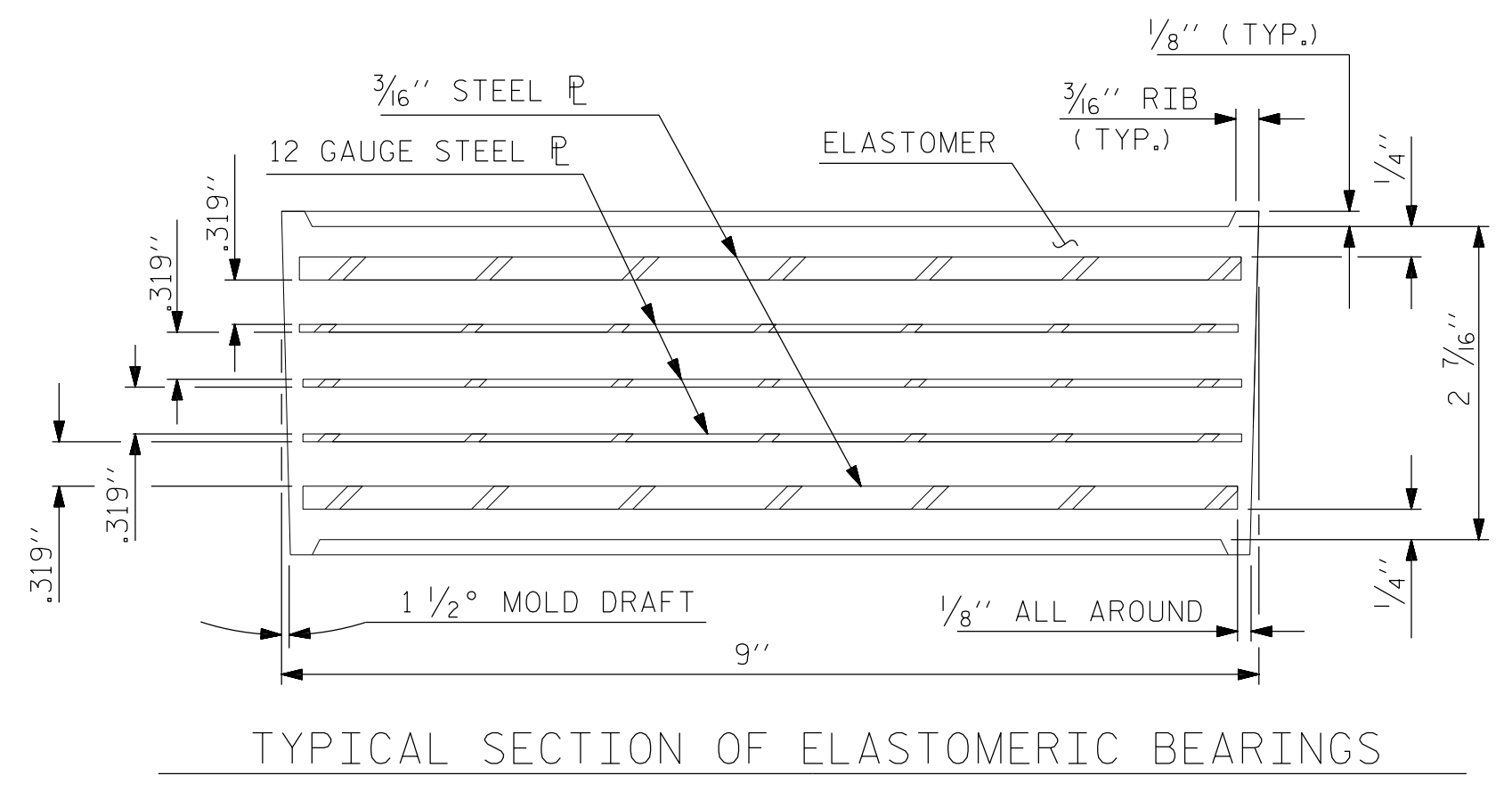
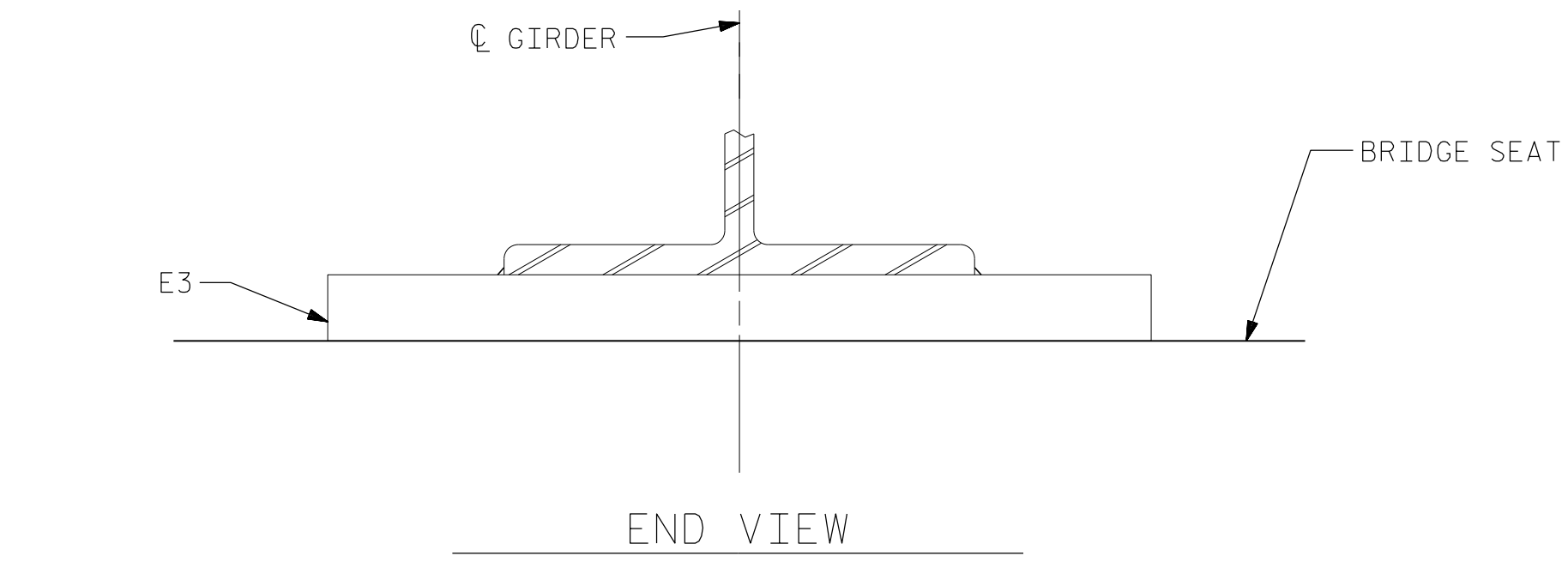
B-4448
 4/12/2018
 \\V01-021-B4448-SMU_GDR02-S1-11.dgn
 USER: jloftus

DRAWN BY: <u>E. PHELPS</u>	DATE: <u>05-17</u>
CHECKED BY: <u>J. LOFTUS</u>	DATE: <u>12-17</u>
DESIGN ENGINEER OF RECORD: <u>J. LOFTUS</u>	DATE: <u>05-17</u>

NOTES

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

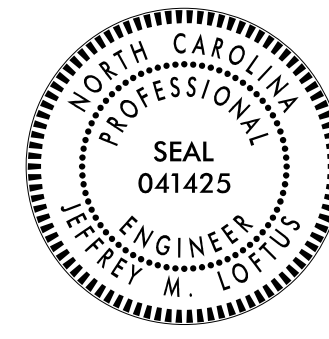
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	180 k

PROJECT NO. B-4448
BURKE COUNTY
 STATION: 28+26.49 -WBL- POT

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 FES1DC02E6794A0 4/12/2018



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**ELASTOMERIC BEARING
 DETAILS**
 (STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			24

4/12/2018
 \401_023_B4448_SMU_BRG01_S1-12.dgn
 USER: jloftus
 DRAWN BY: E. PHELPS DATE: 05-17
 CHECKED BY: J. LOFTUS DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A1 & A5										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.086	0.183	0.251	0.294	0.308	0.294	0.251	0.183	0.086	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.010	0.019	0.027	0.031	0.033	0.031	0.027	0.019	0.010	0
TOTAL DEAD LOAD DEFLECTION	0	0.121	0.249	0.342	0.400	0.420	0.400	0.342	0.249	0.121	0
REQUIRED CAMBER	0	1 ⁷ / ₁₆ "	3"	4 ¹ / ₈ "	4 ³ / ₁₆ "	5 ¹ / ₁₆ "	4 ³ / ₁₆ "	4 ¹ / ₈ "	3"	1 ⁷ / ₁₆ "	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A2 & A4										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.109	0.207	0.284	0.333	0.349	0.333	0.284	0.207	0.109	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.007	0.013	0.018	0.021	0.022	0.021	0.018	0.013	0.007	0
TOTAL DEAD LOAD DEFLECTION	0	0.141	0.267	0.366	0.429	0.450	0.429	0.366	0.267	0.141	0
REQUIRED CAMBER	0	1 ¹¹ / ₁₆ "	3 ³ / ₁₆ "	4 ³ / ₈ "	5 ¹ / ₈ "	5 ³ / ₈ "	5 ¹ / ₈ "	4 ³ / ₈ "	3 ³ / ₁₆ "	1 ¹¹ / ₁₆ "	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A3										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.109	0.207	0.284	0.333	0.349	0.333	0.284	0.207	0.109	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.010	0.014	0.022	0.027	0.030	0.027	0.022	0.014	0.010	0
TOTAL DEAD LOAD DEFLECTION	0	0.144	0.268	0.370	0.435	0.458	0.435	0.370	0.268	0.144	0
REQUIRED CAMBER	0	1 ³ / ₄ "	3 ³ / ₁₆ "	4 ⁷ / ₁₆ "	5 ¹ / ₄ "	5 ¹ / ₂ "	5 ¹ / ₄ "	4 ⁷ / ₁₆ "	3 ³ / ₁₆ "	1 ³ / ₄ "	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

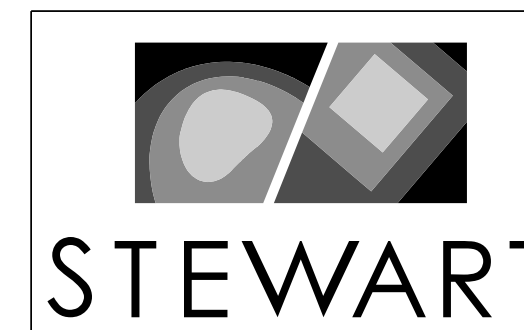
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT

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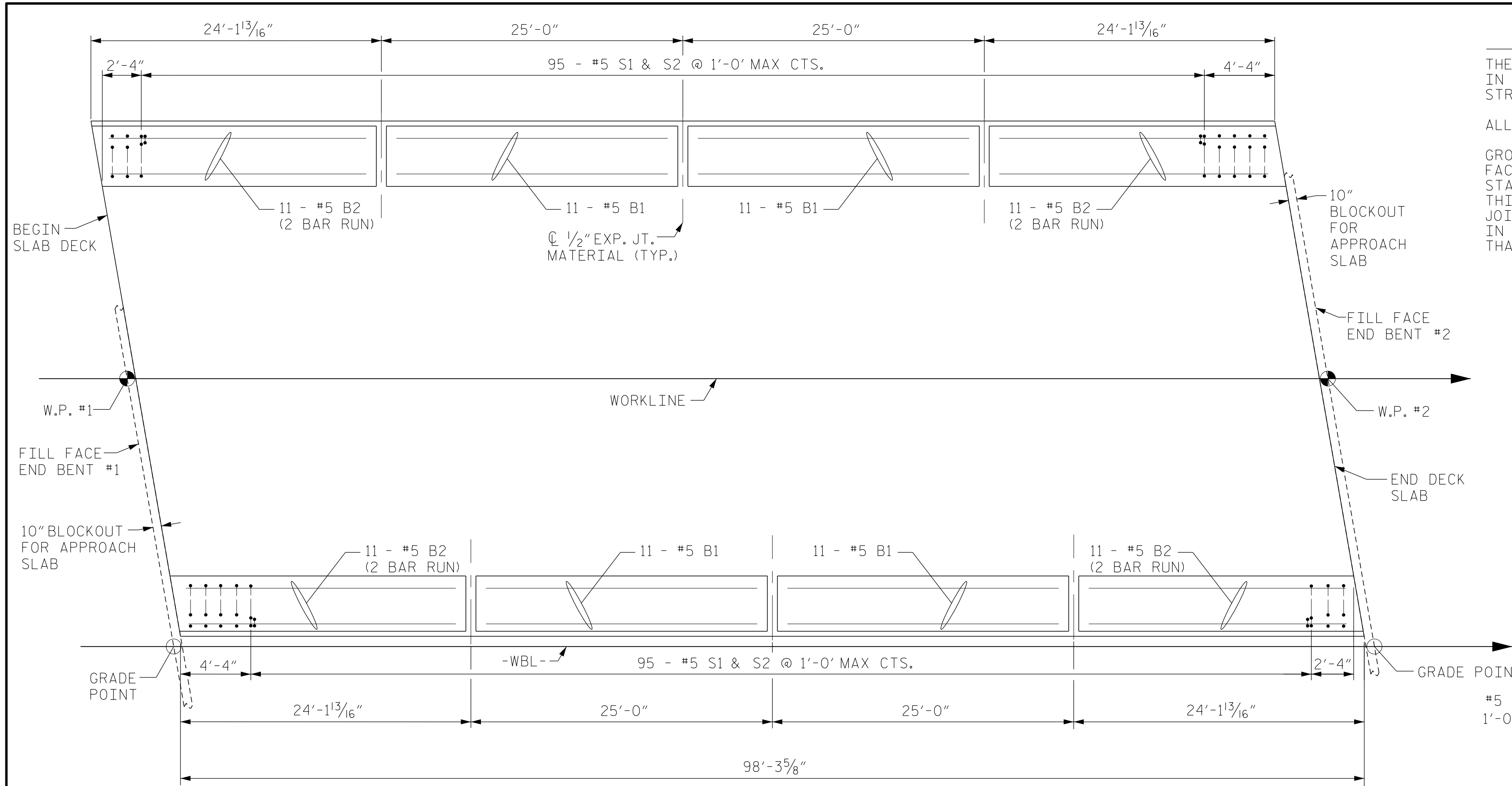


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE DEAD LOAD DEFLECTION TABLES					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 24

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CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

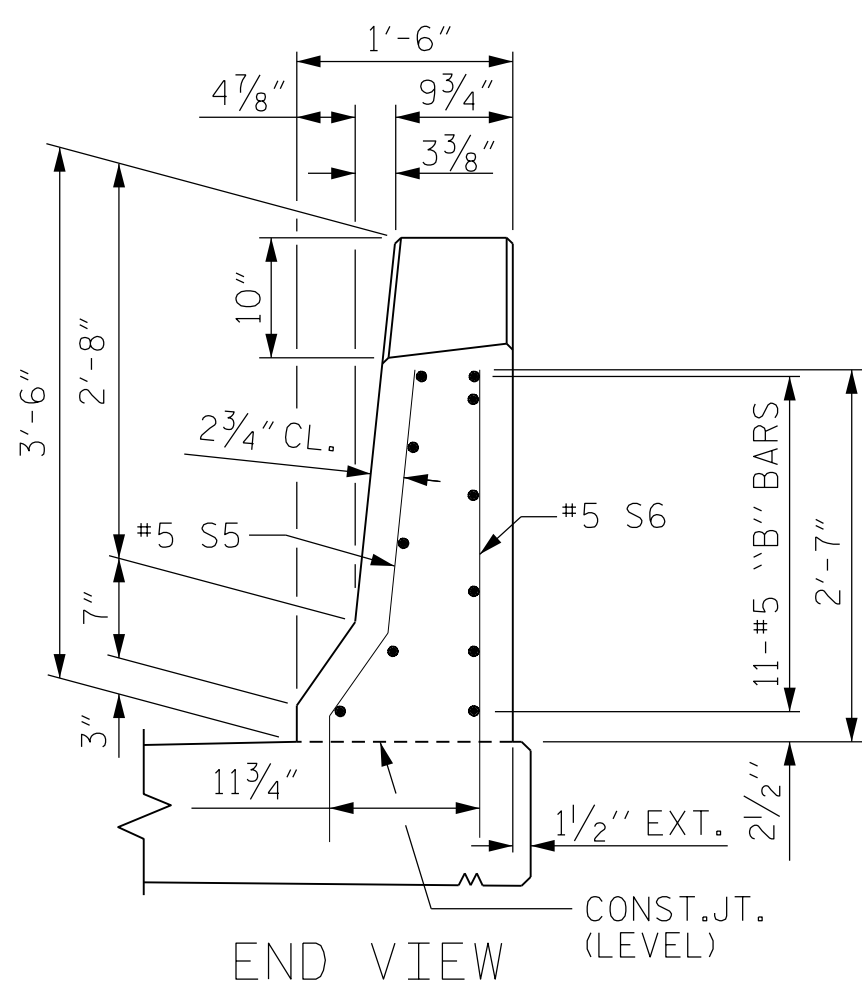
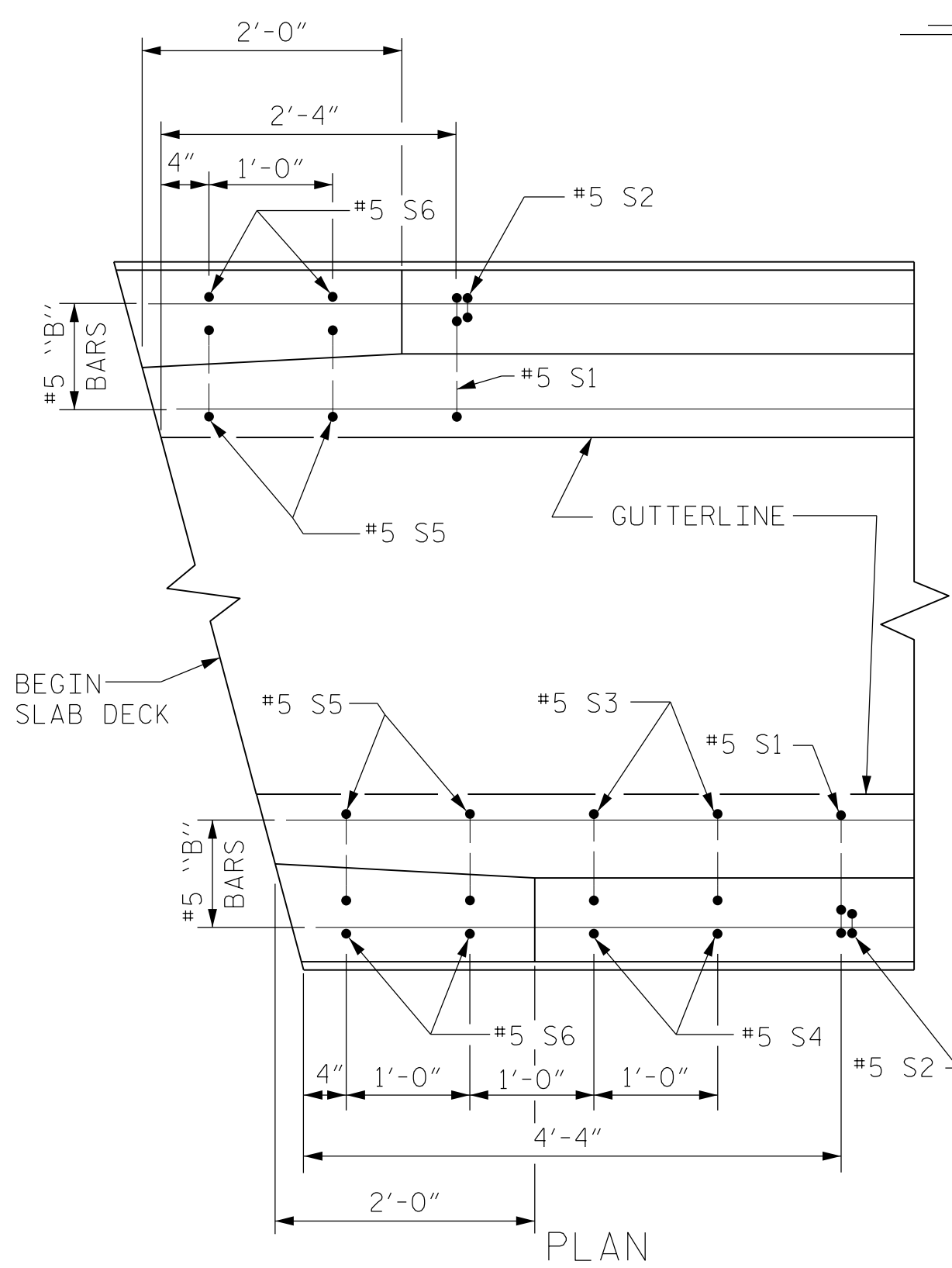
4/12/2018
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B-4448



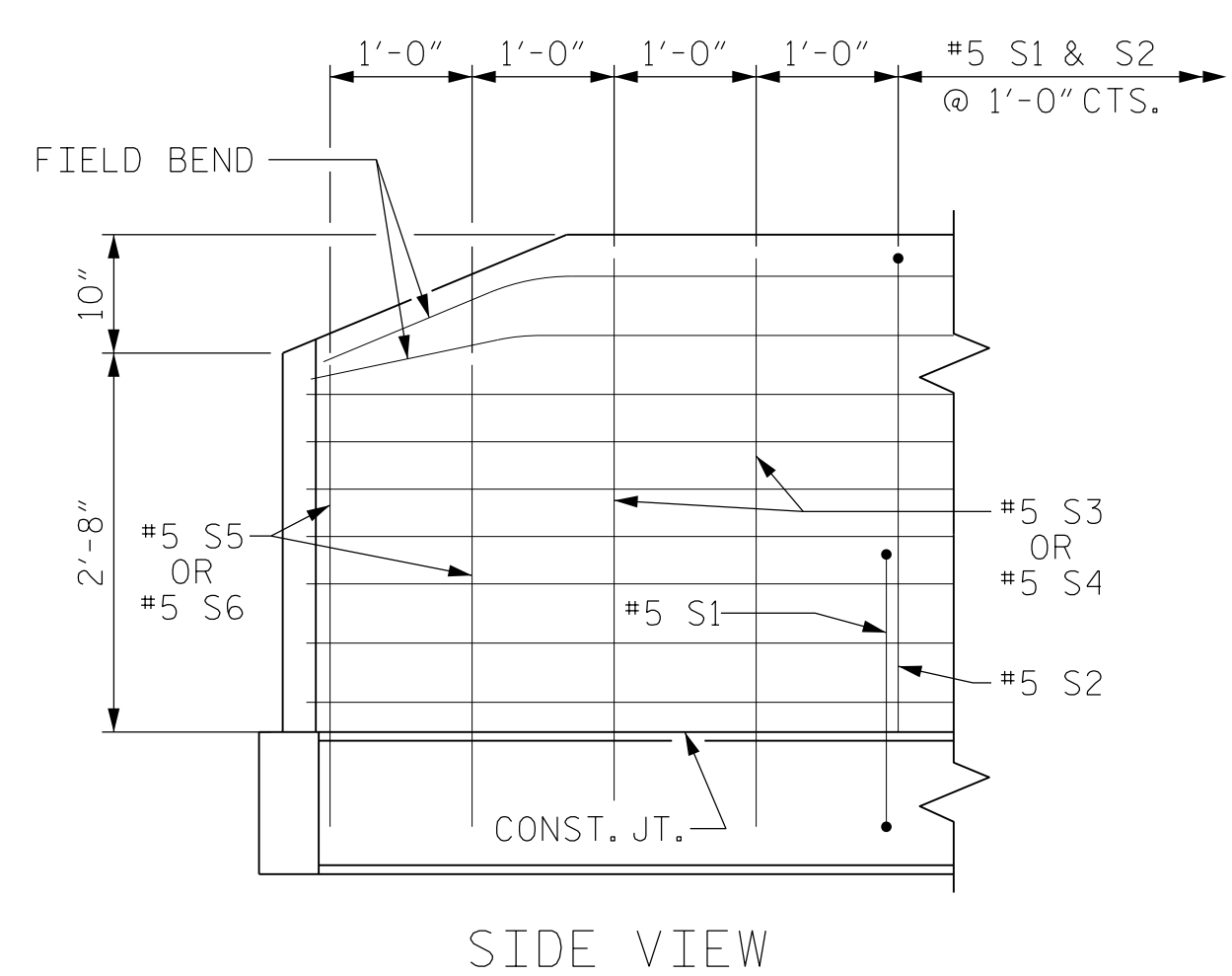
PLAN OF BARRIER RAIL

FOR "S" BARS @ END OF RAIL, SEE "END OF RAIL DETAILS"



END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



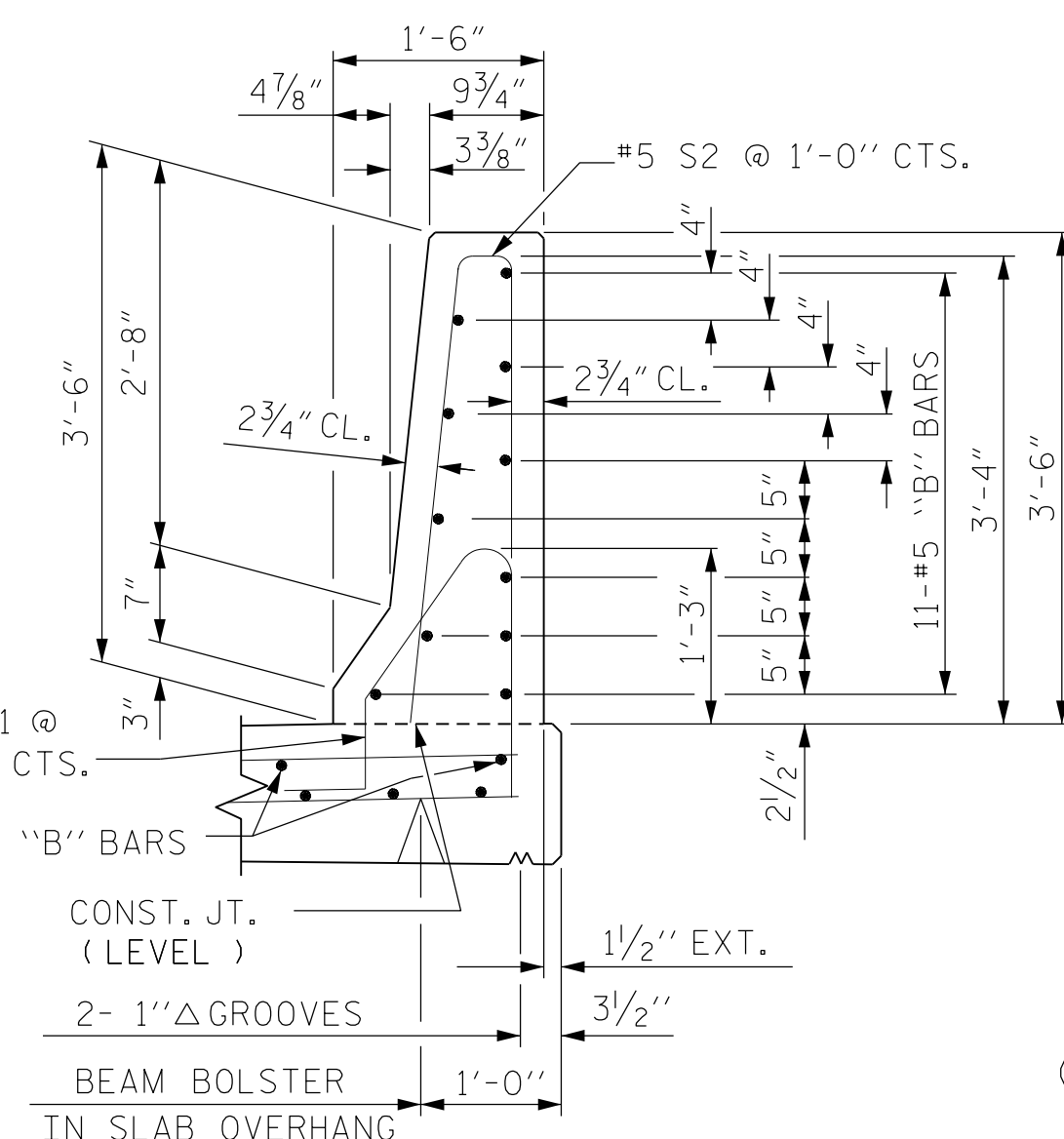
SIDE VIEW

NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

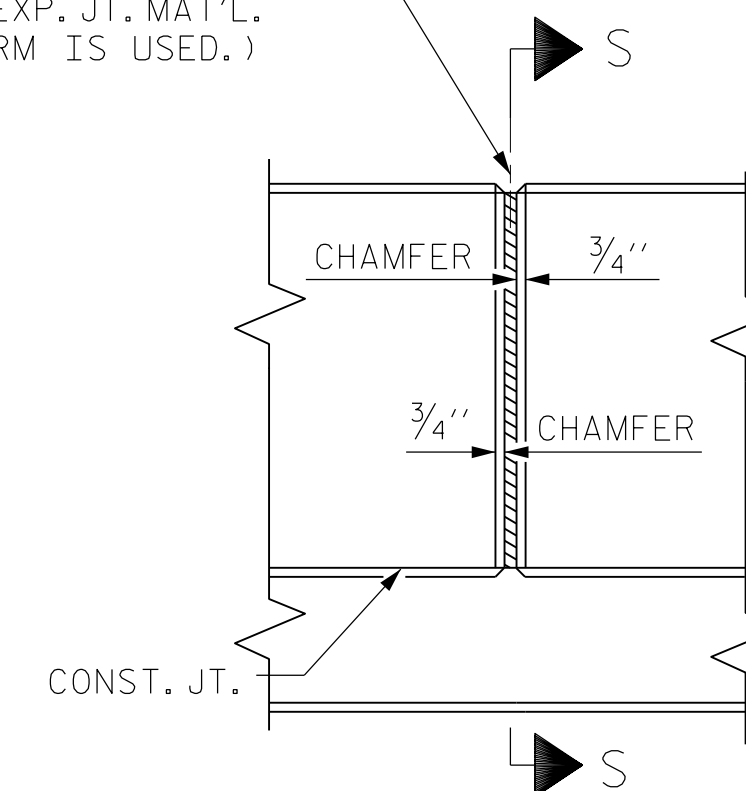
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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. THE 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.



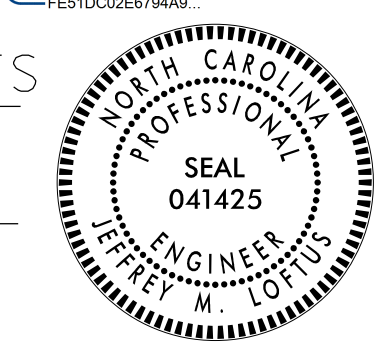
SECTION THRU RAIL

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



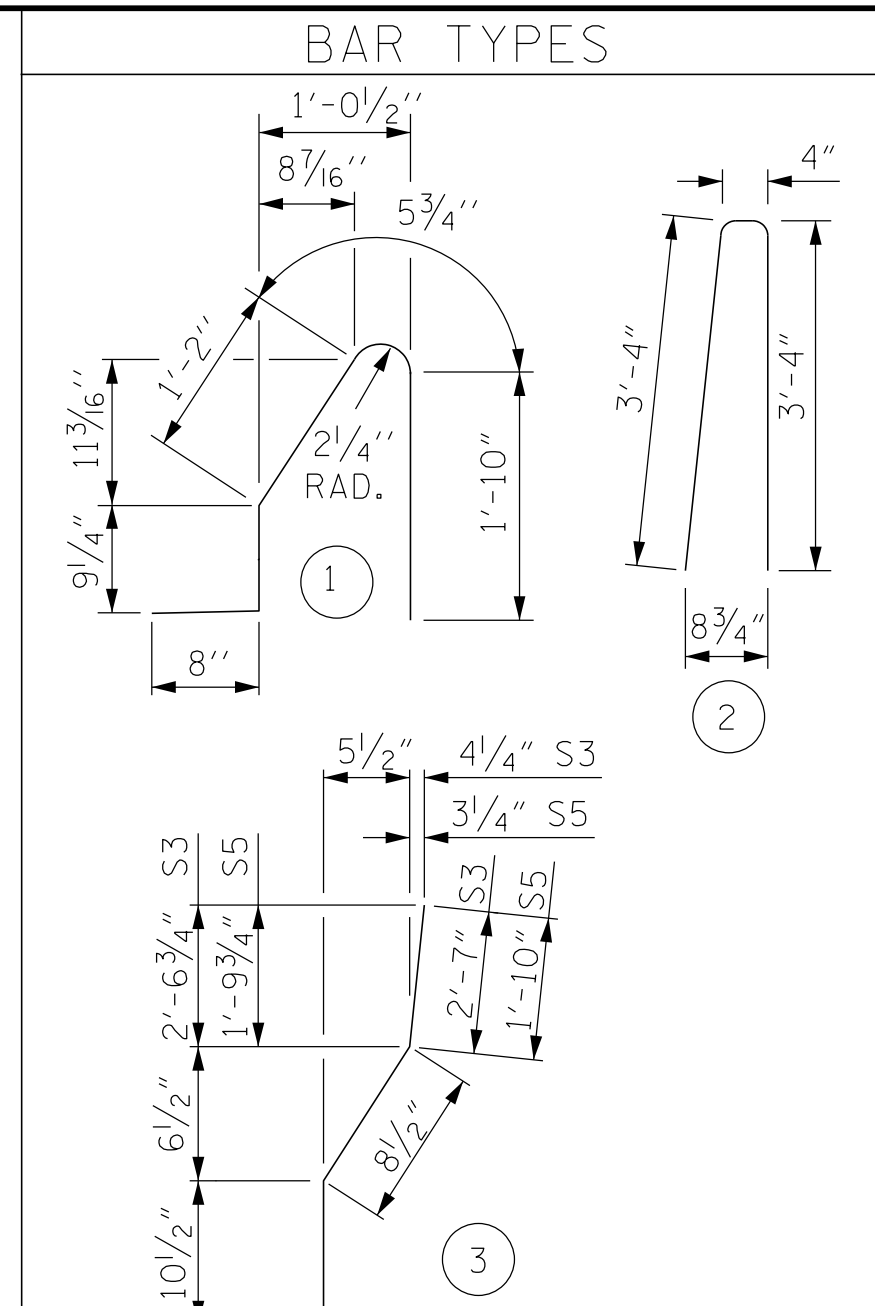
ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

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Jeff Loftus
FES100202E759A6
4/12/2018



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ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	186	#5	1	4'-11"	954
* S2	186	#5	2	7'-0"	1358
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27
* B1	44	#5	STR	24'-7"	1128
* B2	88	#5	STR	13'-10"	1270
* EPOXY COATED REINFORCING STEEL					4800 LBS.
CLASS AA CONCRETE					26.8 CU. YDS.
CONCRETE BARRIER RAIL					196.60 LIN. FT.

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS 24
2			4			

STD. NO. CBR1

4/12/2018
DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448
4/12/2018
V401_027_B4448_SMU_CBR01_S1-14.dgn
USER: jloftus

NOTES

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

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 M11.

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.)

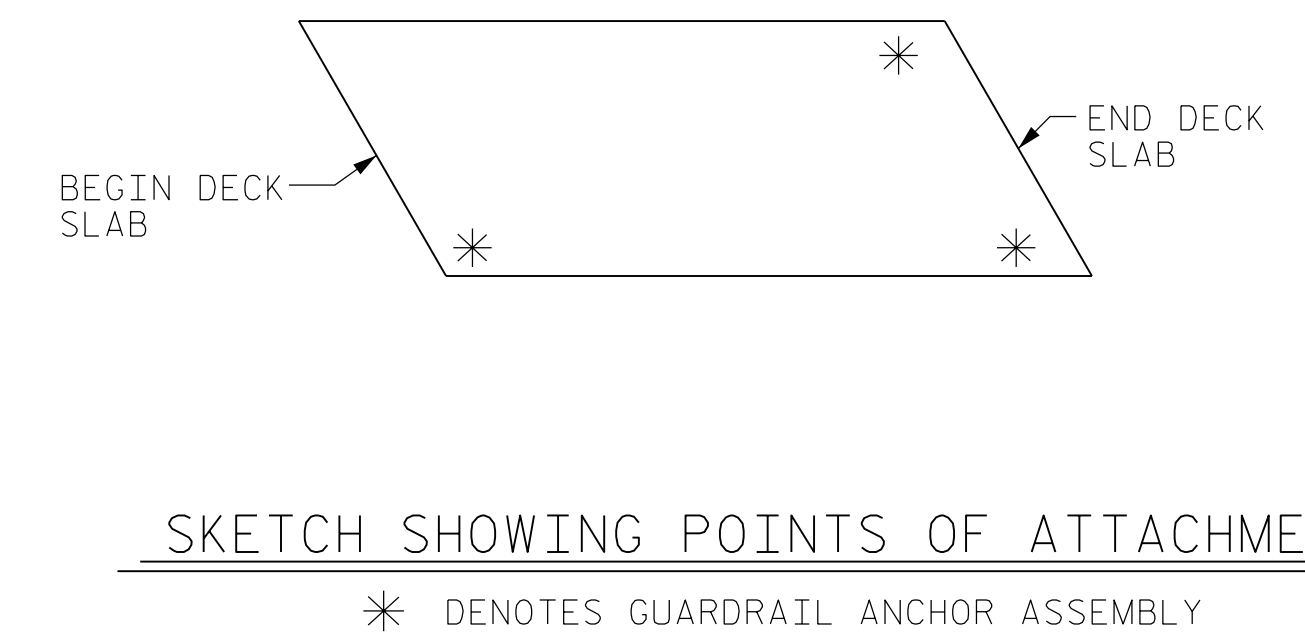
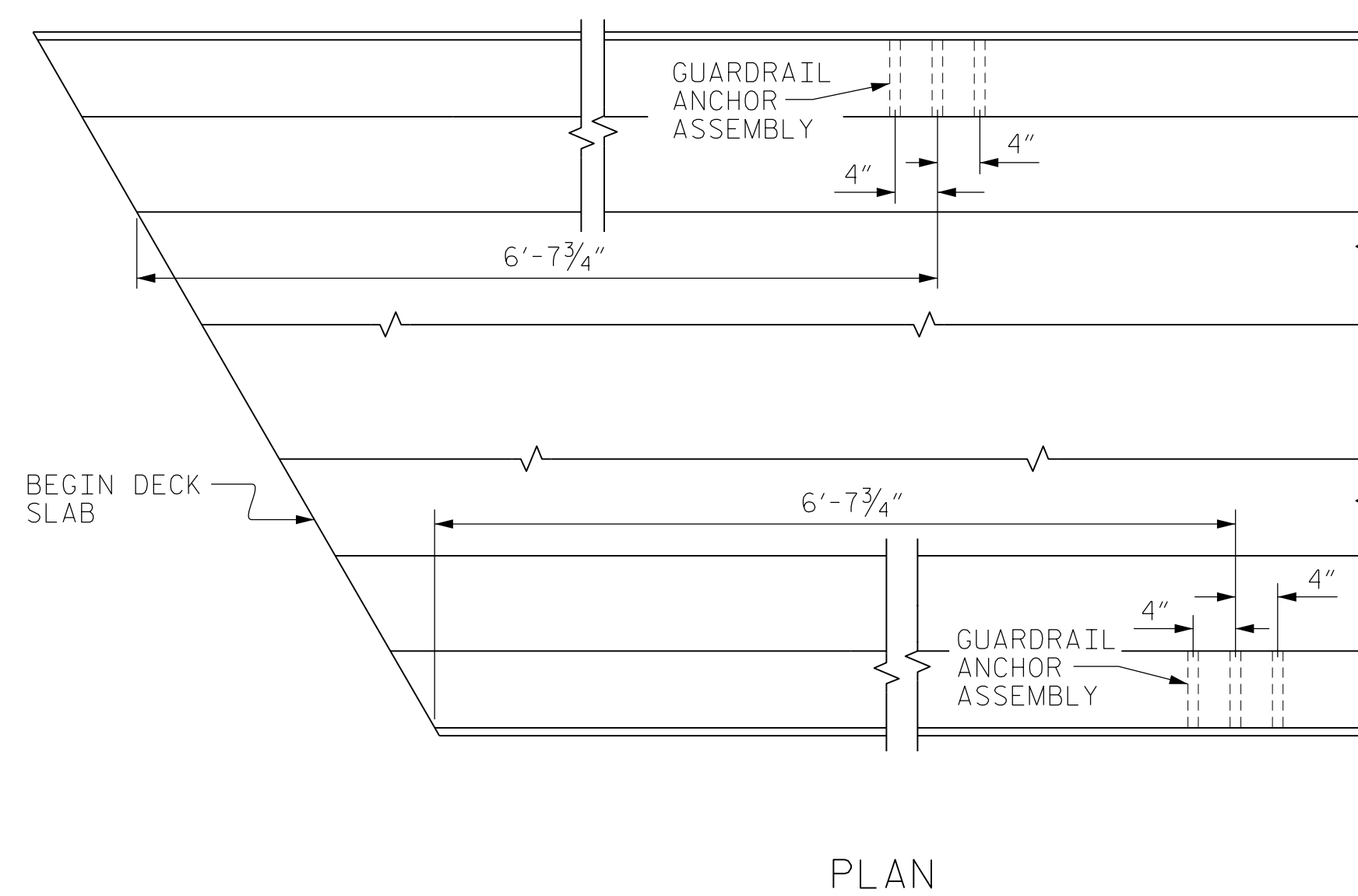
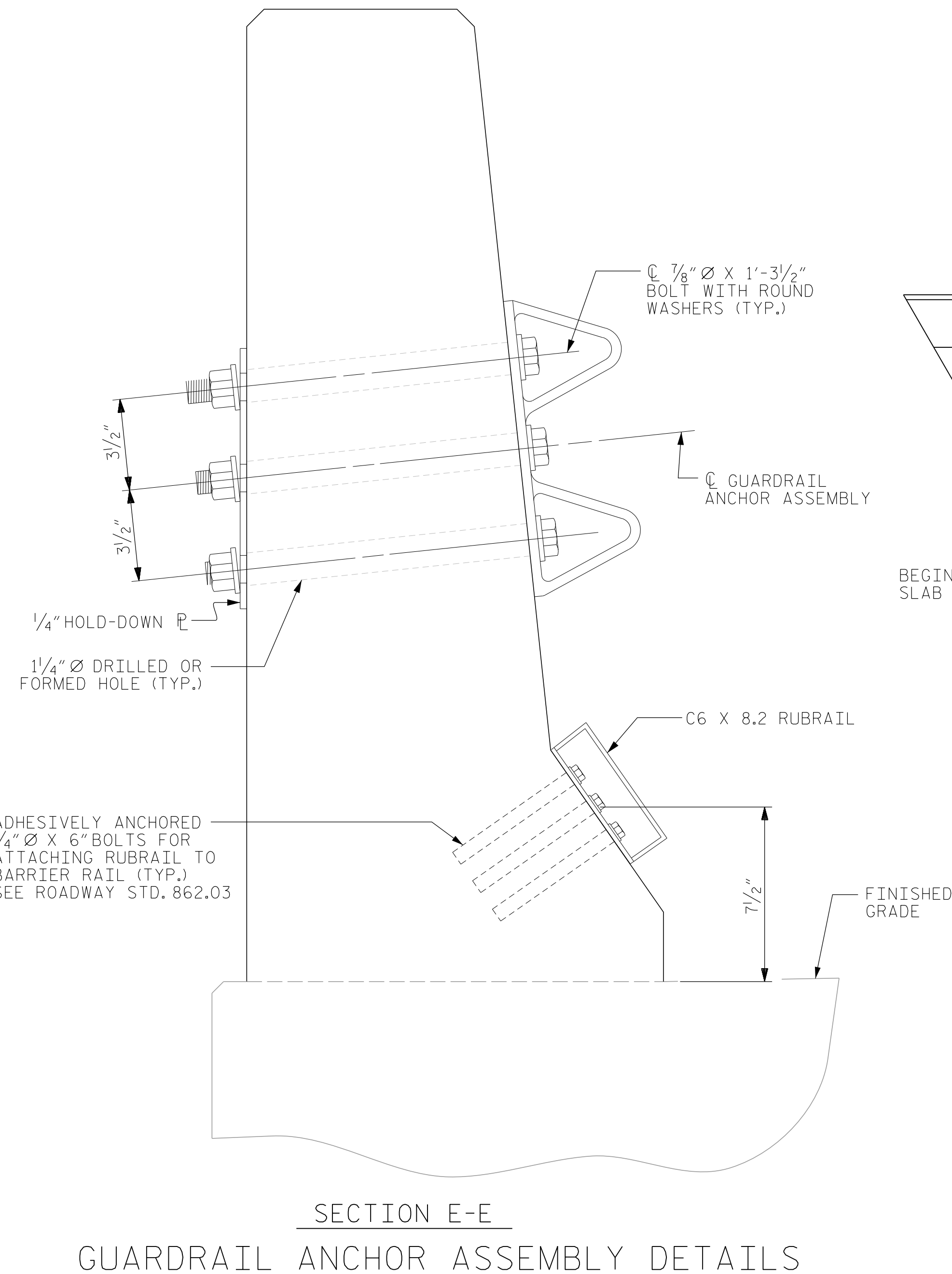
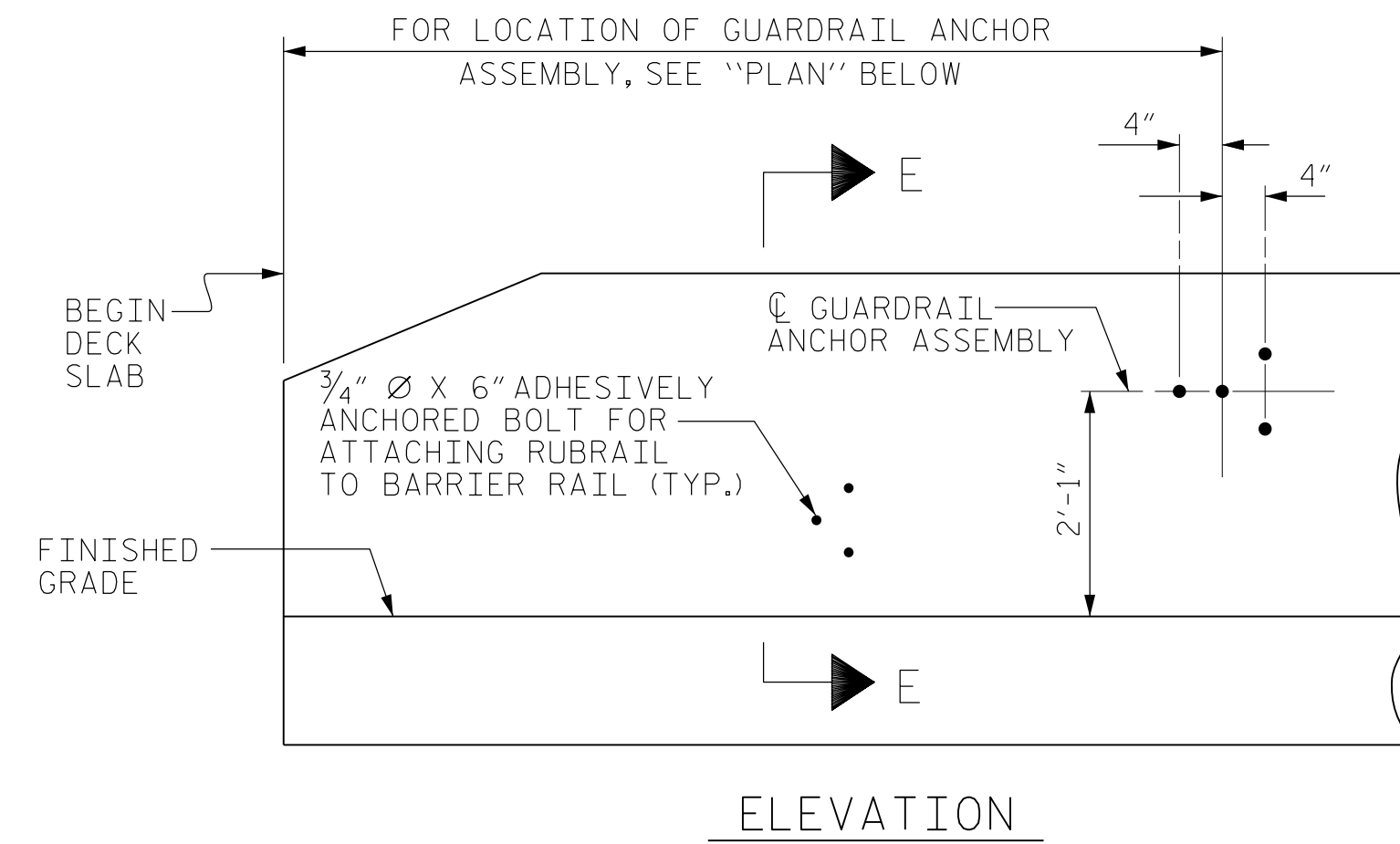
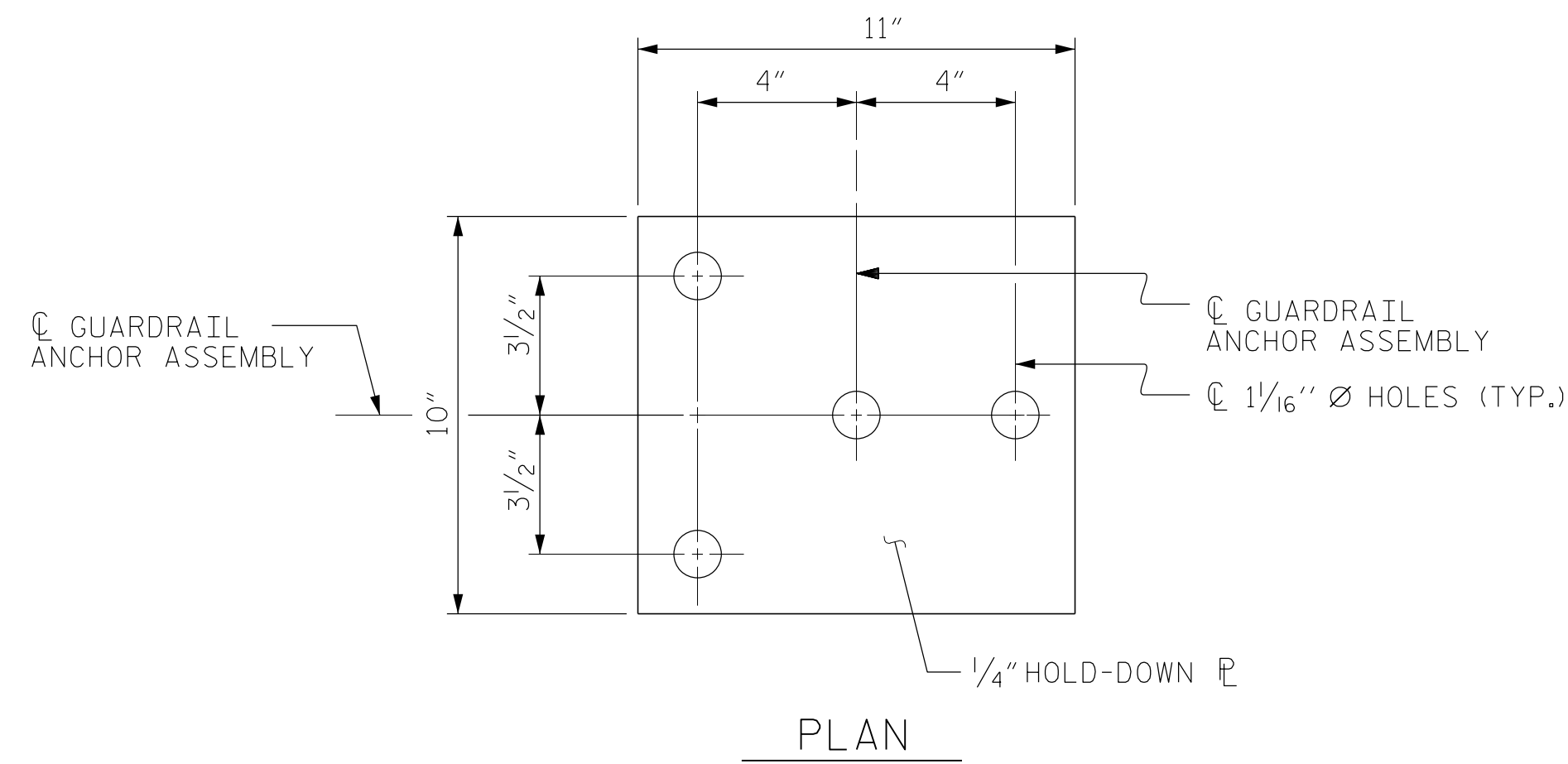
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 CONCRETE BARRIER RAIL.

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

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

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 2 OF 2

DocuSigned by:
Jeff Loftus
FES1DC02E794AG... 4/12/2018



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

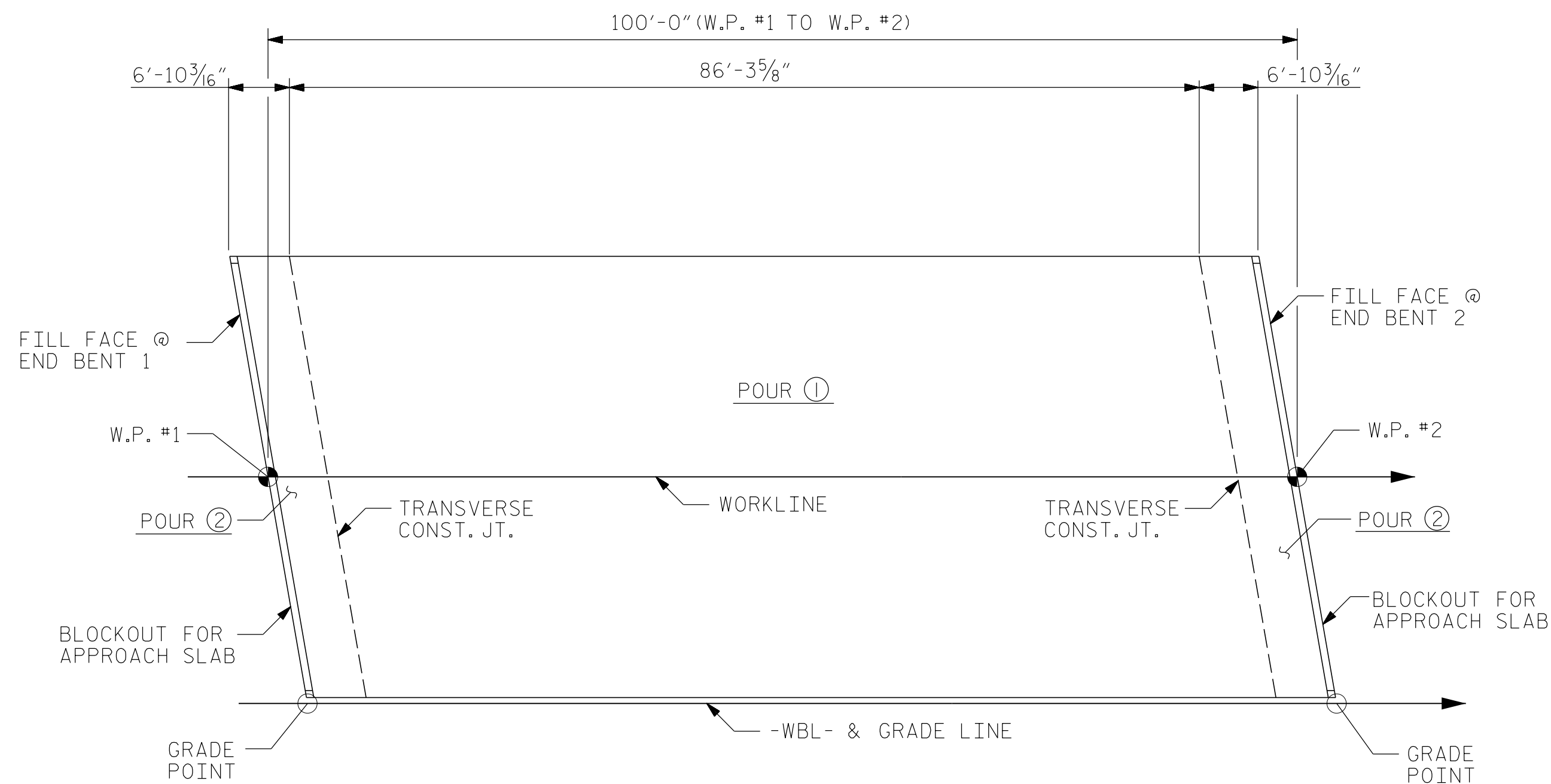
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			24

(SHT 1a) STD. NO. GRA2

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
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USER: jloftus

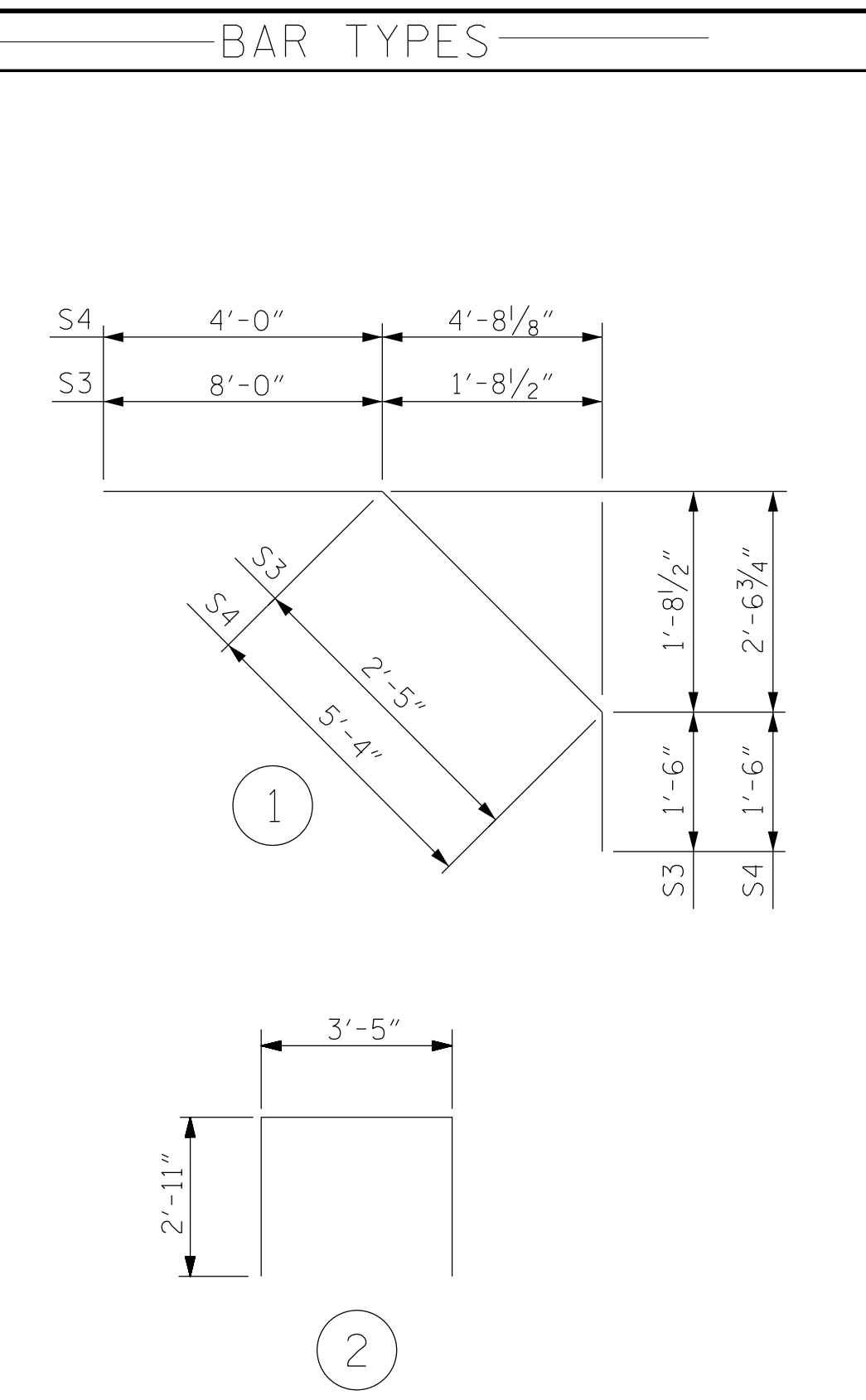
B-4448



POURING SEQUENCE

BILL OF MATERIAL											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	178	#5	STR	44'-11"	8,339	*B1	124	#4	STR	26'-0"	2,154
*A2	2	#5	STR	43'-5"	91	B2	112	#5	STR	50'-1"	5,851
*A3	2	#5	STR	40'-11"	85	*B3	116	#6	STR	20'-0"	3,485
*A4	2	#5	STR	38'-5"	80						
*A5	2	#5	STR	35'-11"	75	K1	32	#4	STR	23'-11"	511
*A6	2	#5	STR	33'-5"	70						
*A7	2	#5	STR	31'-0"	65	*S3	84	#4	1	11'-11"	669
*A8	2	#5	STR	28'-6"	59	*S4	84	#4	1	10'-10"	608
*A9	2	#5	STR	26'-0"	54						
*A10	2	#5	STR	23'-6"	49	U1	84	#4	2	9'-3"	519
*A11	2	#5	STR	21'-1"	44						
*A12	2	#5	STR	18'-7"	39						
*A13	2	#5	STR	16'-1"	34						
*A14	2	#5	STR	13'-7"	28						
*A15	2	#5	STR	11'-2"	23						
*A16	2	#5	STR	8'-8"	18						
*A17	2	#5	STR	6'-2"	13						
*A18	2	#5	STR	3'-8"	8						
A19	178	#5	STR	44'-11"	8,339						
A20	2	#5	STR	43'-5"	91						
A21	2	#5	STR	40'-11"	85						
A22	2	#5	STR	38'-5"	80						
A23	2	#5	STR	35'-11"	75						
A24	2	#5	STR	33'-5"	70						
A25	2	#5	STR	31'-0"	65						
A26	2	#5	STR	28'-6"	59						
A27	2	#5	STR	26'-0"	54						
A28	2	#5	STR	23'-6"	49						
A29	2	#5	STR	21'-1"	44						
A30	2	#5	STR	18'-7"	39						
A31	2	#5	STR	16'-1"	34						
A32	2	#5	STR	13'-7"	28						
A33	2	#5	STR	11'-2"	23						
A34	2	#5	STR	8'-8"	18						
A35	2	#5	STR	6'-2"	13						
A36	2	#5	STR	3'-8"	8						
										REINFORCING STEEL	16,055 LBS.
										* EPOXY COATED REINF. STEEL	16,090 LBS.

* DENOTES EPOXY COATED REINFORCING STEEL



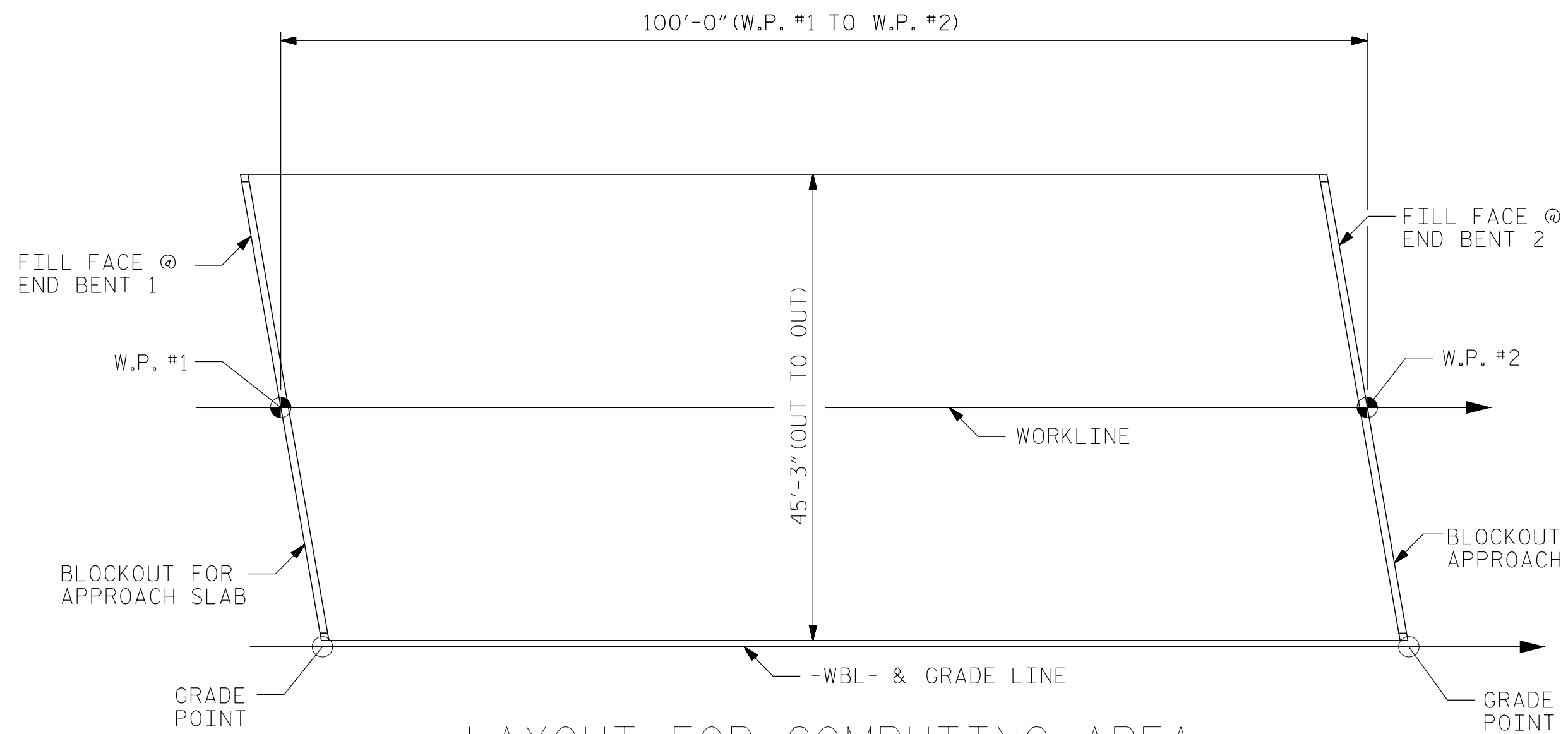
ALL BAR DIMENSIONS ARE OUT TO OUT

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1911 SQ.FT.
BRIDGE DECK	3834 SQ.FT.
TOTAL	5745 SQ.FT.

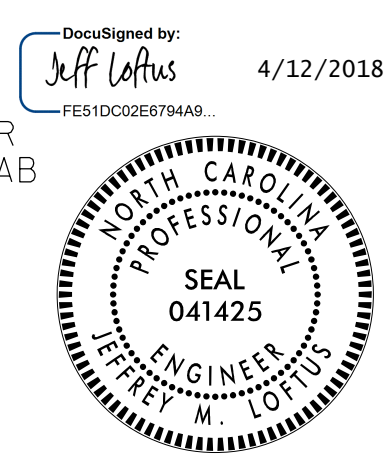
SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	122.6		
POUR #2	75.7		
TOTALS*	198.3	16,055	16,090

* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 4,449)



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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT

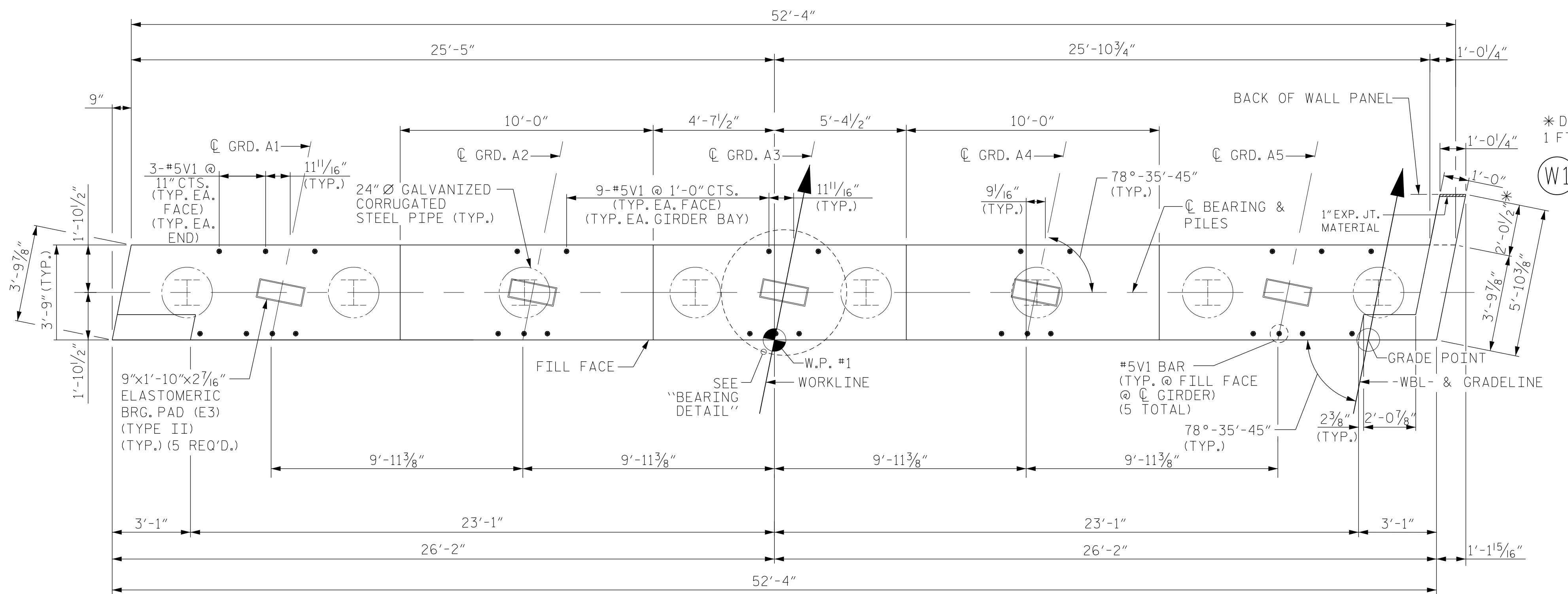
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

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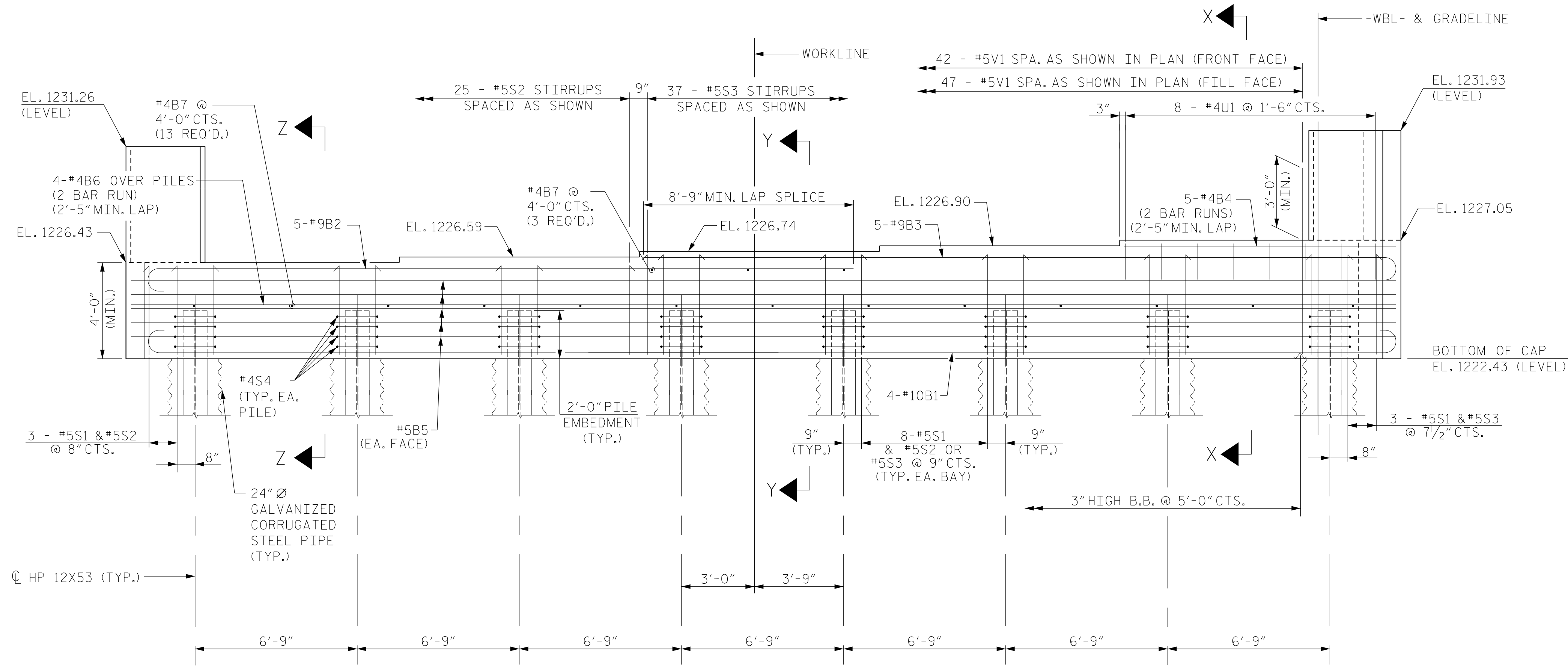
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
 \\401_031_B4448_SMU_B0M01_S1-16.dgn
 USER: jloftus



PLAN



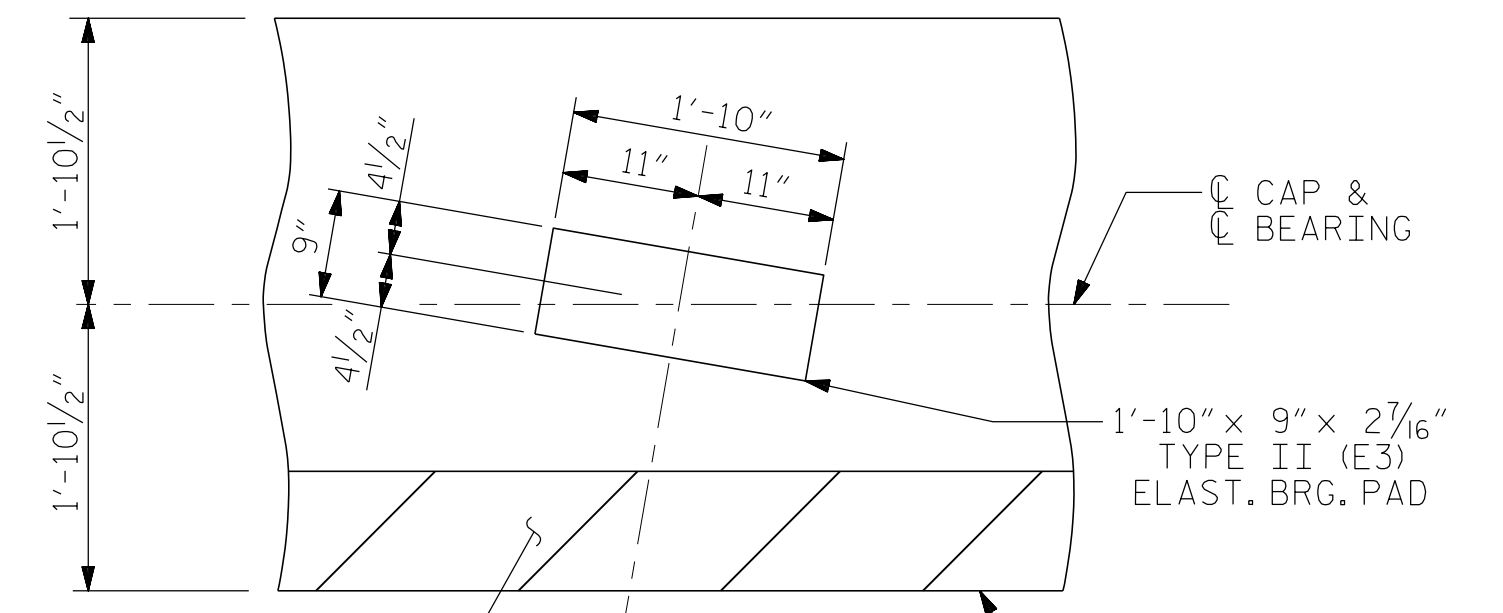
ELEVATION

FOR SECTIONS X-X, Y-Y & Z-Z, SEE SHEET 4 OF 4

NOTES

FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.
 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
 THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
 THE COST TO FURNISH AND INSTALL THE 24" Ø GALVANIZED CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE MSE RETAINING WALL. FOR MSE RETAINING WALL, SEE GEOTECHNICAL PROVISIONS.

* DIMENSION BASED ON ASSUMED 1 FT. MSE WALL THICKNESS



BEARING DETAIL

(DIMENSIONS ARE TYPICAL EACH GIRDER)
 (HP 12X53 PILES NOT SHOWN FOR CLARITY)

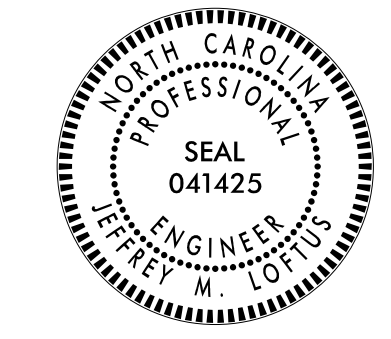
PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 1 OF 4

DocuSigned by:
 Jeff Loftus
 FES10C02E679A93
 4/12/2018



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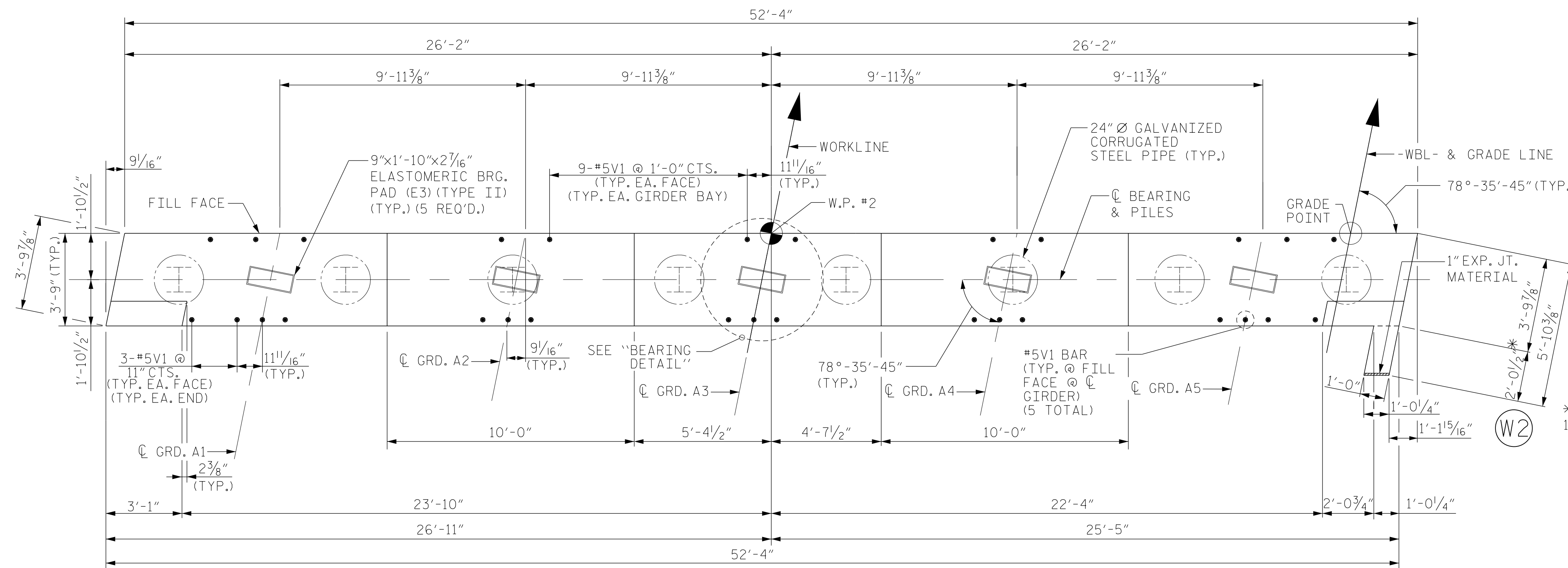
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL END BENT No.1

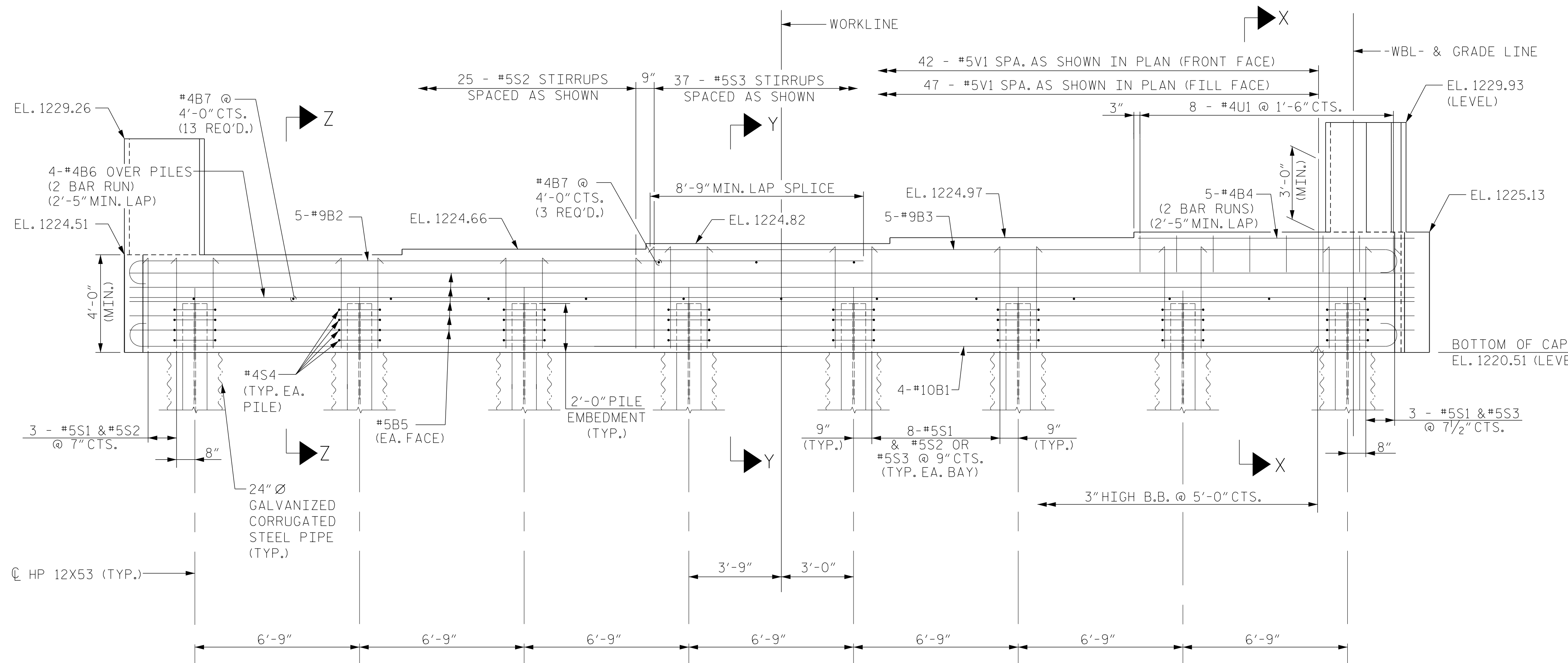
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: E. PHELPS DATE: 05-17
 CHECKED BY: J. LOFTUS DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

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 USER: jloftus



PLAN



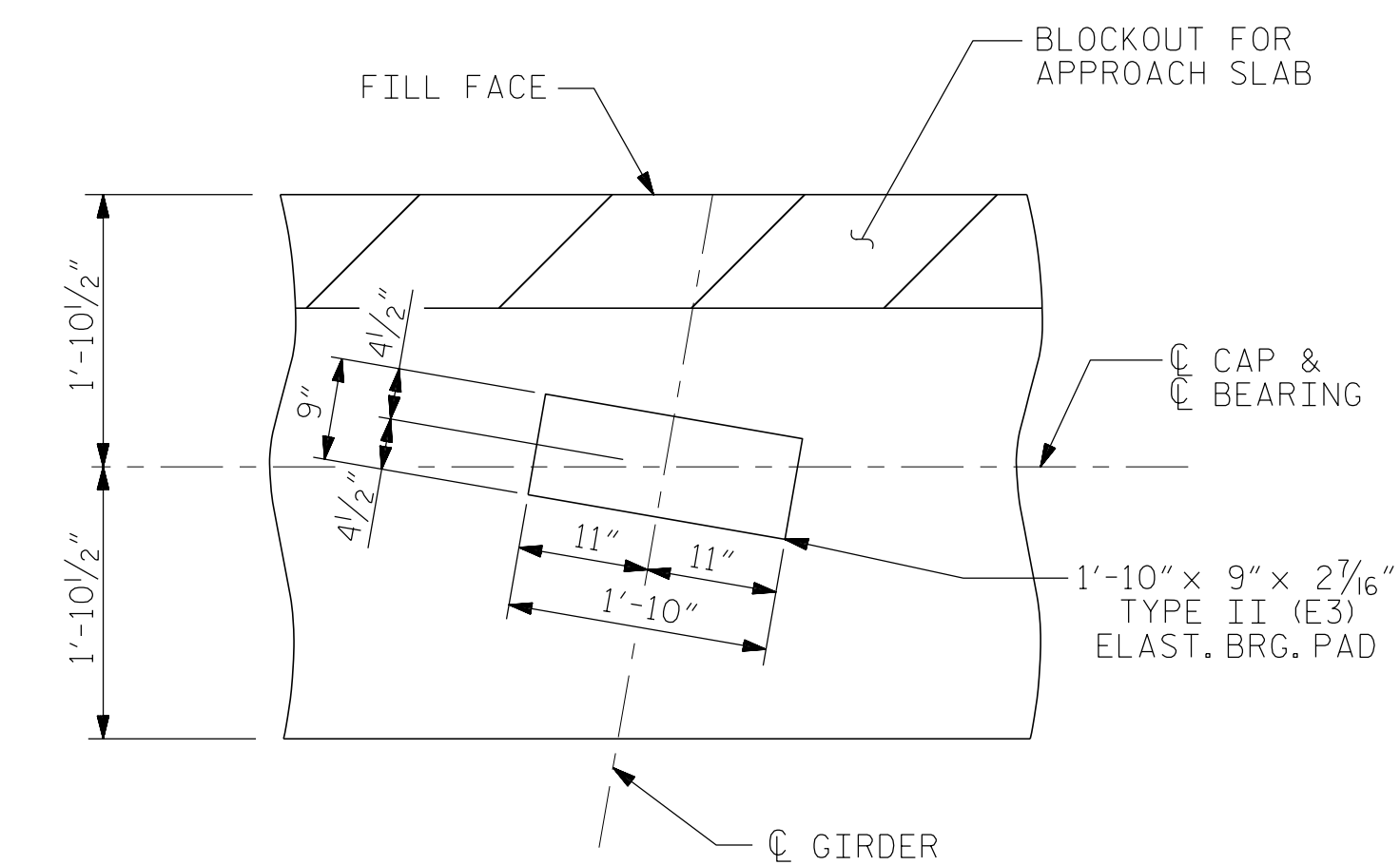
ELEVATION

FOR SECTIONS X-X, Y-Y & Z-Z, SEE SHEET 4 OF 4

NOTES

FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.
 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
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 THE COST TO FURNISH AND INSTALL THE 24" Ø GALVANIZED CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE MSE RETAINING WALL. FOR MSE RETAINING WALL, SEE GEOTECHNICAL PROVISIONS.

* DIMENSION BASED ON ASSUMED 1 FT. MSE WALL THICKNESS



BEARING DETAIL

(DIMENSIONS ARE TYPICAL EACH GIRDER) (HP 12X53 PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 2 OF 4

Designed by: Jeff Loftus
 FES100226794AG 4/12/2018



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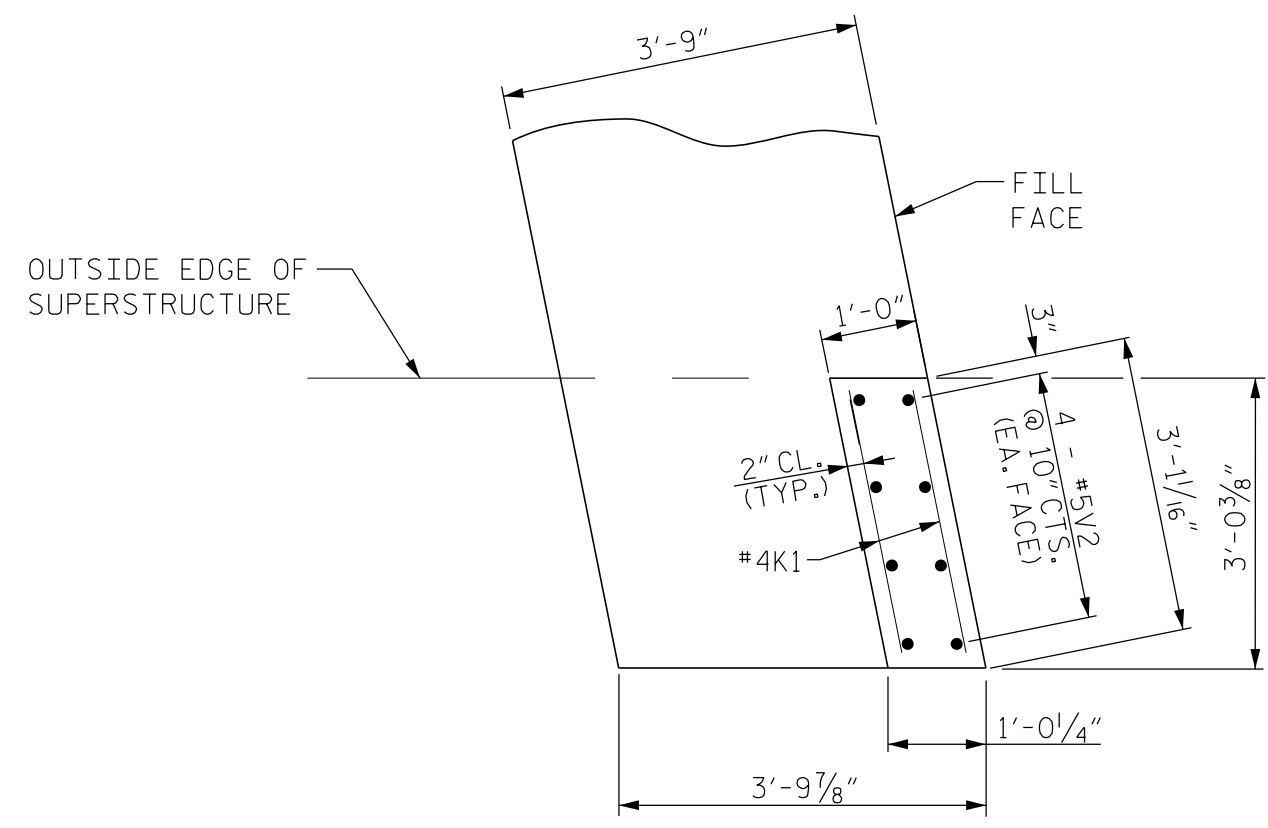
SUBSTRUCTURE
 INTEGRAL END BENT No.2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS 24
2			4			

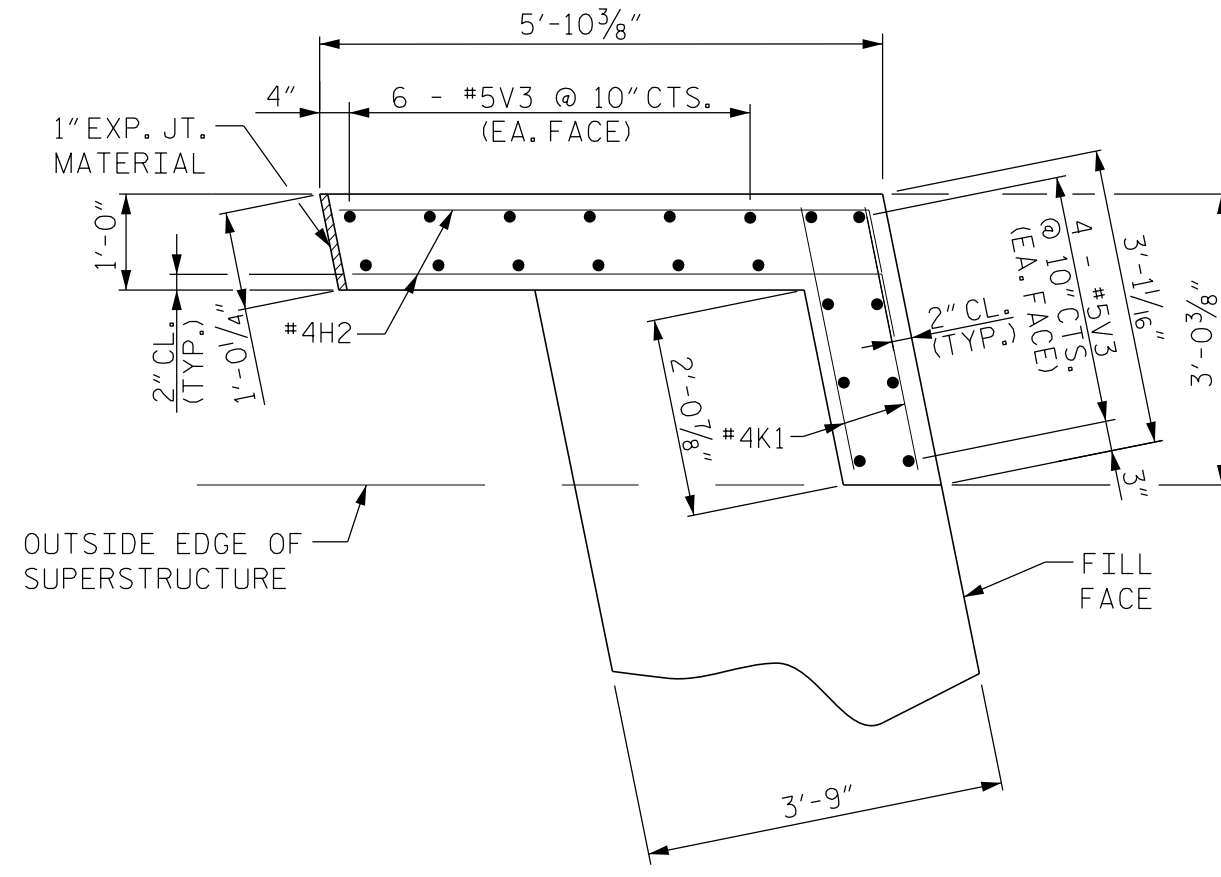
DRAWN BY: E. PHELPS DATE: 05-17
 CHECKED BY: J. LOFTUS DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
 \\401_035_B4448_SMU_SUB02_S1-18.dgn
 USER: jloftus

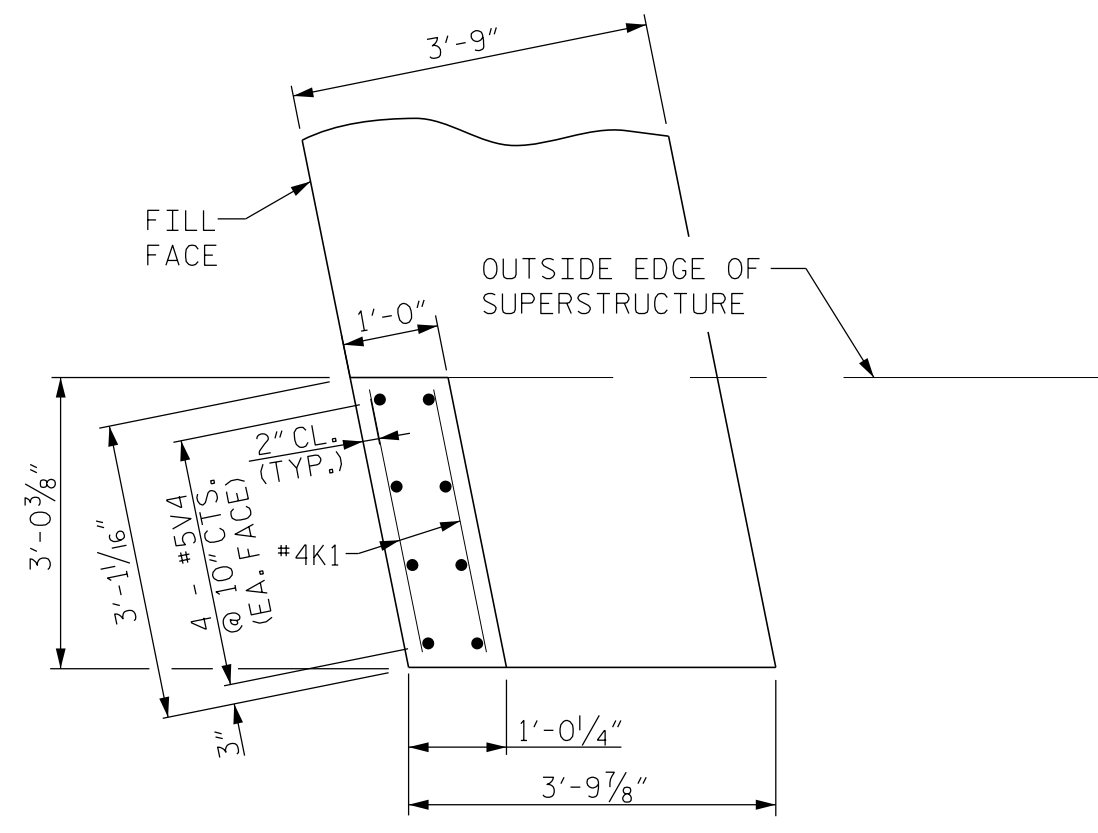
B-4448



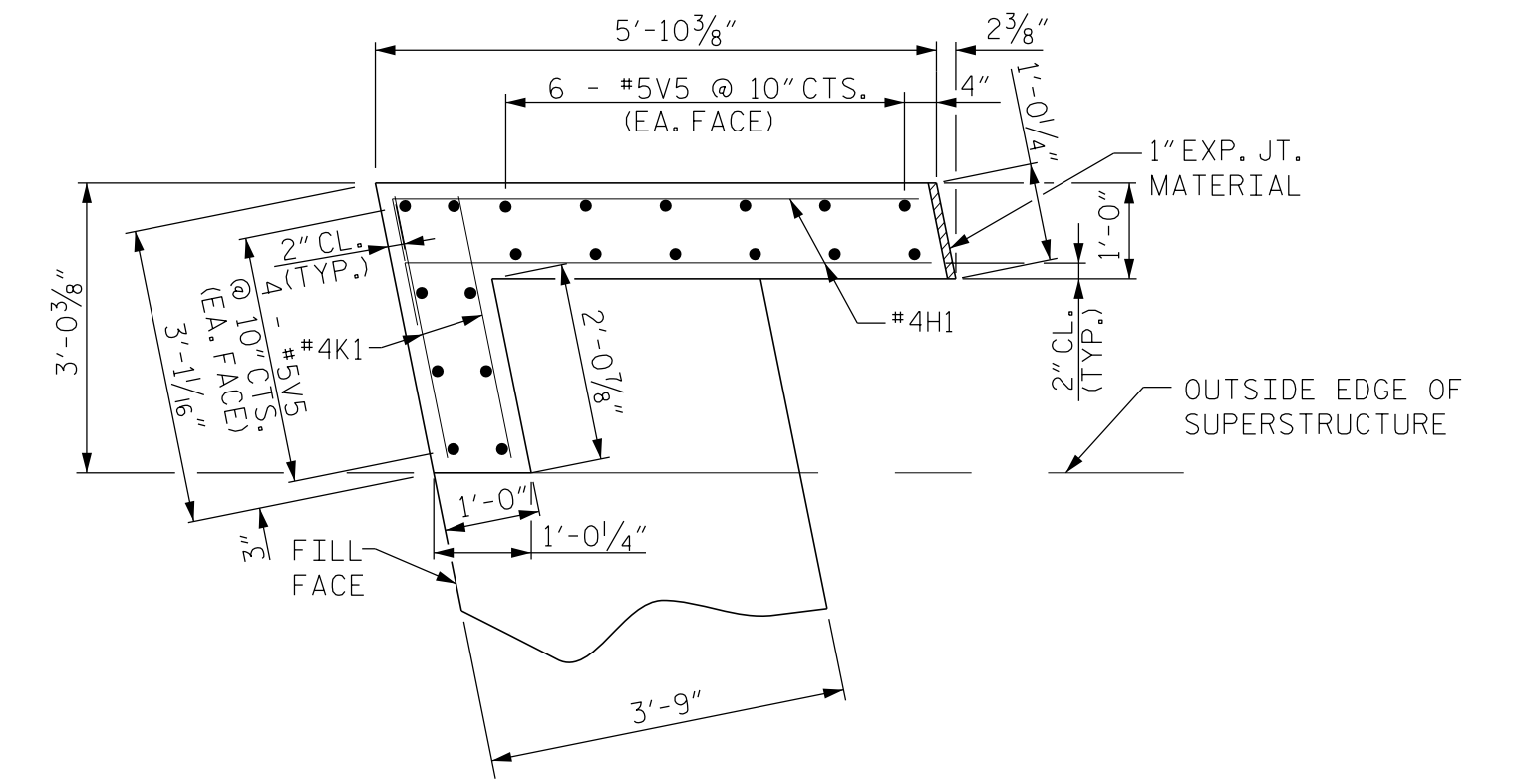
PLAN OF END BENT#1 CAP, LEFT SIDE



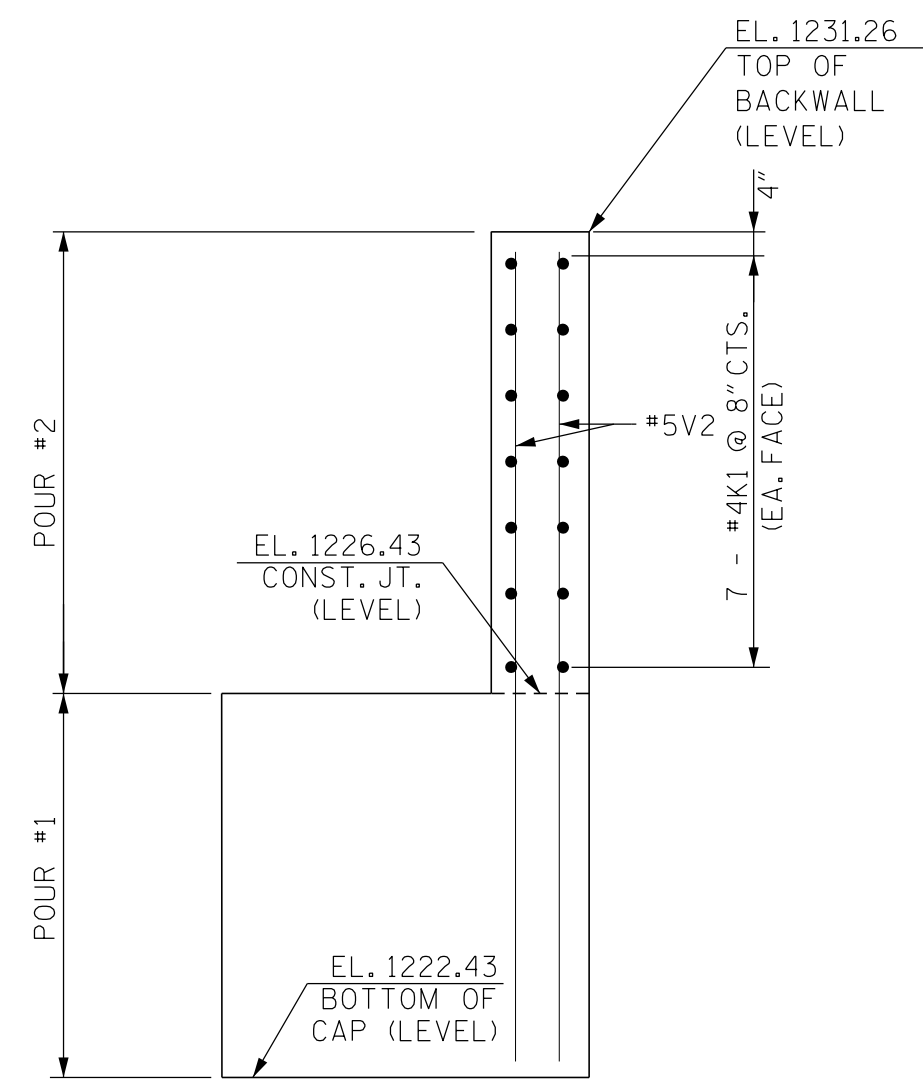
PLAN OF WING (W1)



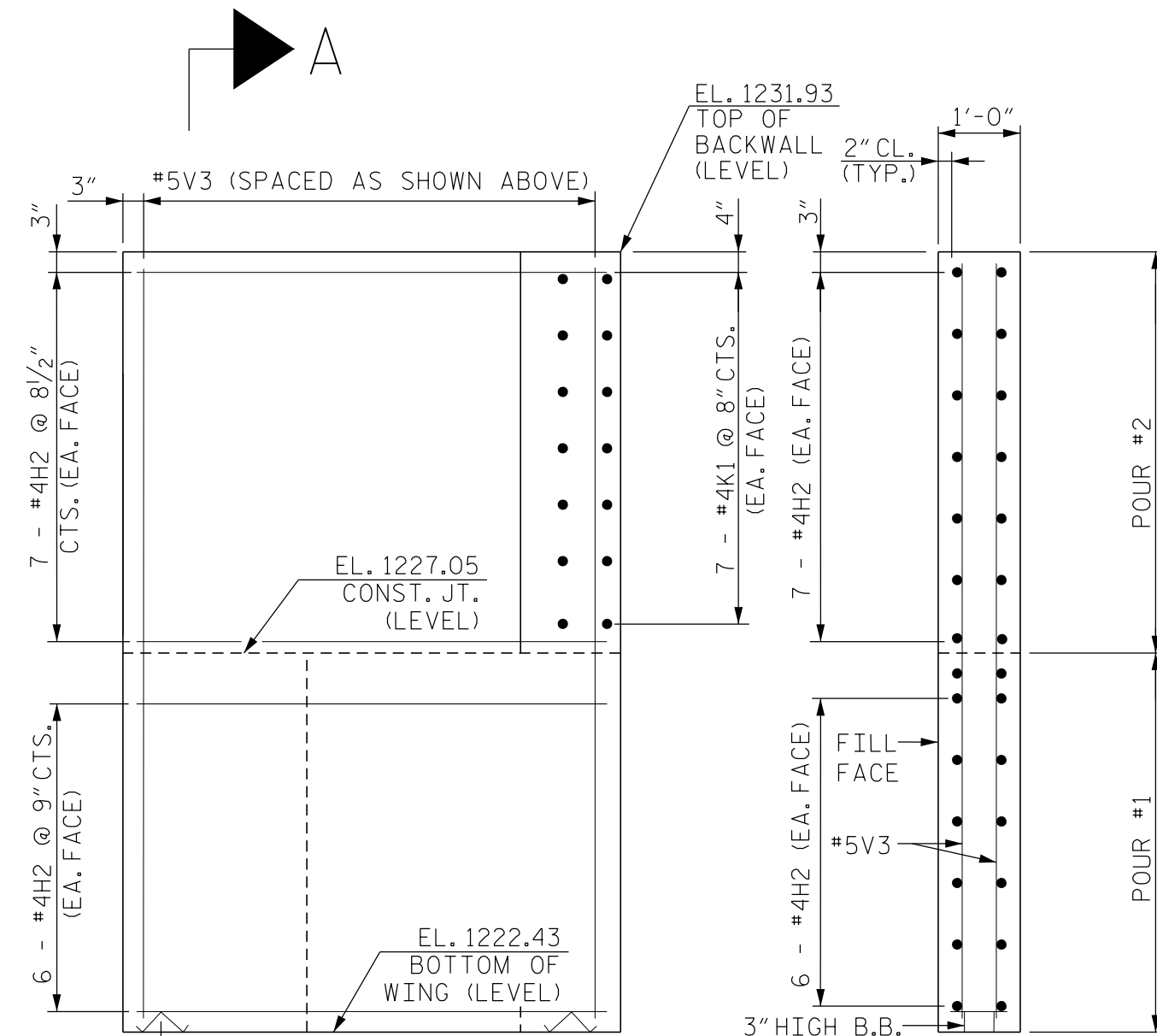
PLAN OF END BENT#2 CAP, LEFT SIDE



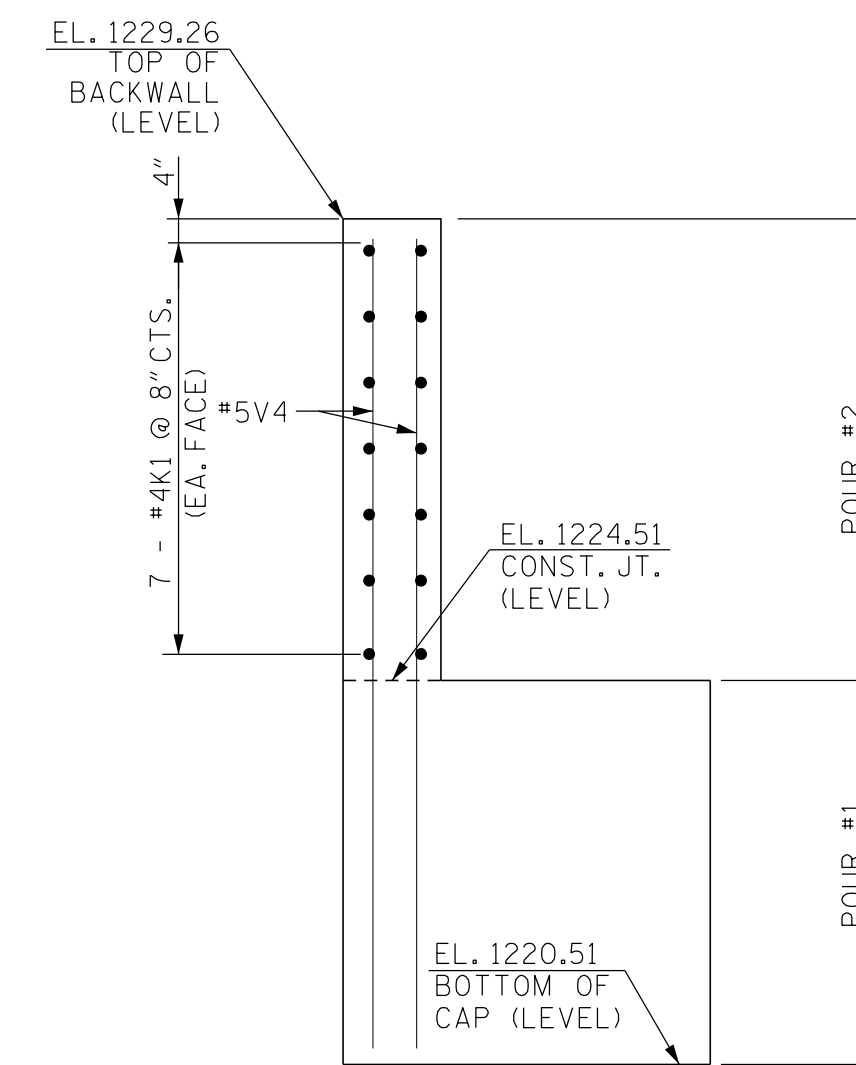
PLAN OF WING (W2)



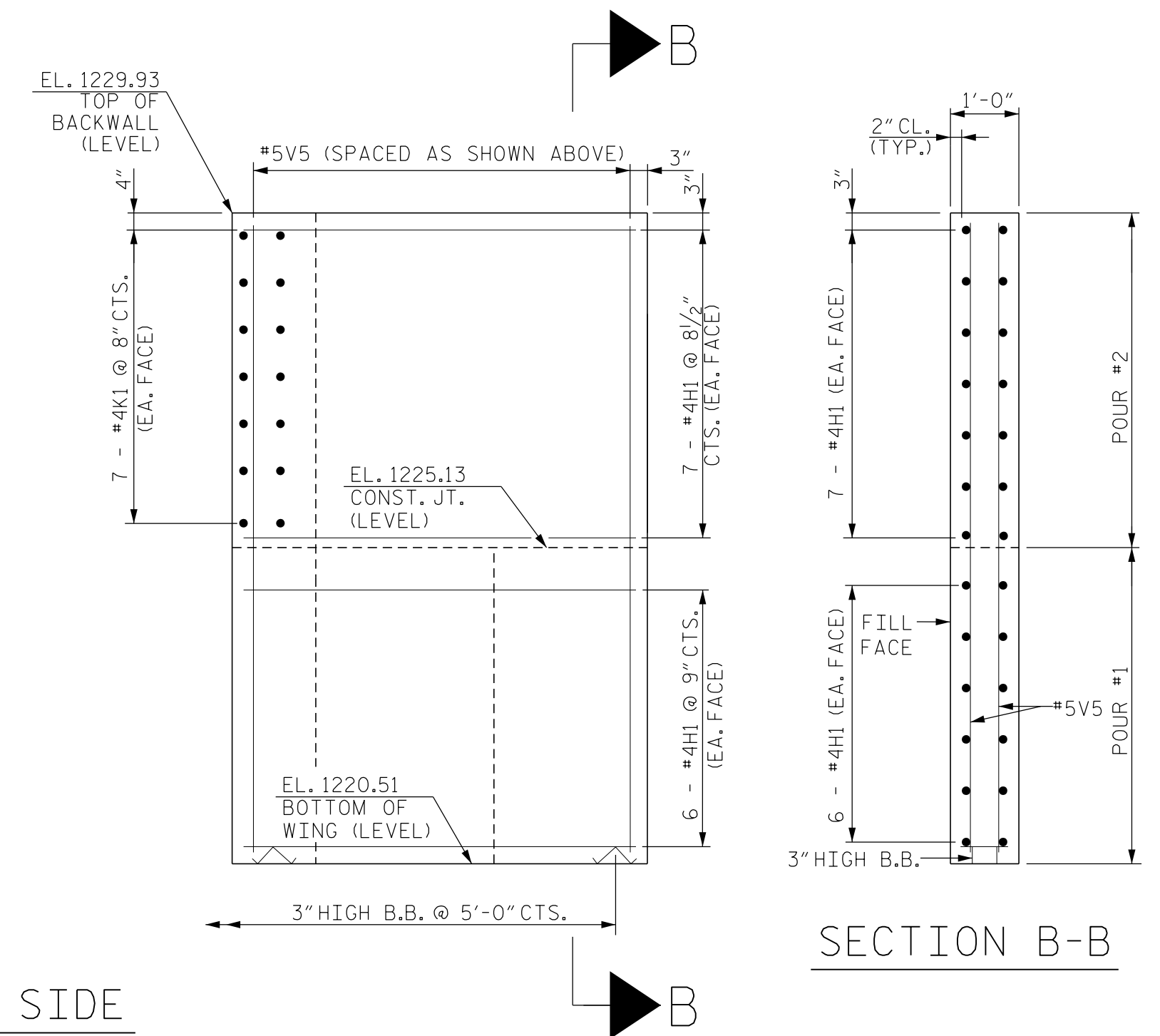
ELEVATION OF END BENT#1 CAP, LEFT SIDE



ELEVATION OF WING (W1)



ELEVATION OF END BENT#2 CAP, LEFT SIDE



ELEVATION OF WING (W2)

SECTION B-B

PROJECT NO. B-4448
 BURKE COUNTY
 STATION: 28+26.49 -WBL- POT

SHEET 3 OF 4

Designed by: Jeff Loftus
 FES1DC02E679468 4/12/2018



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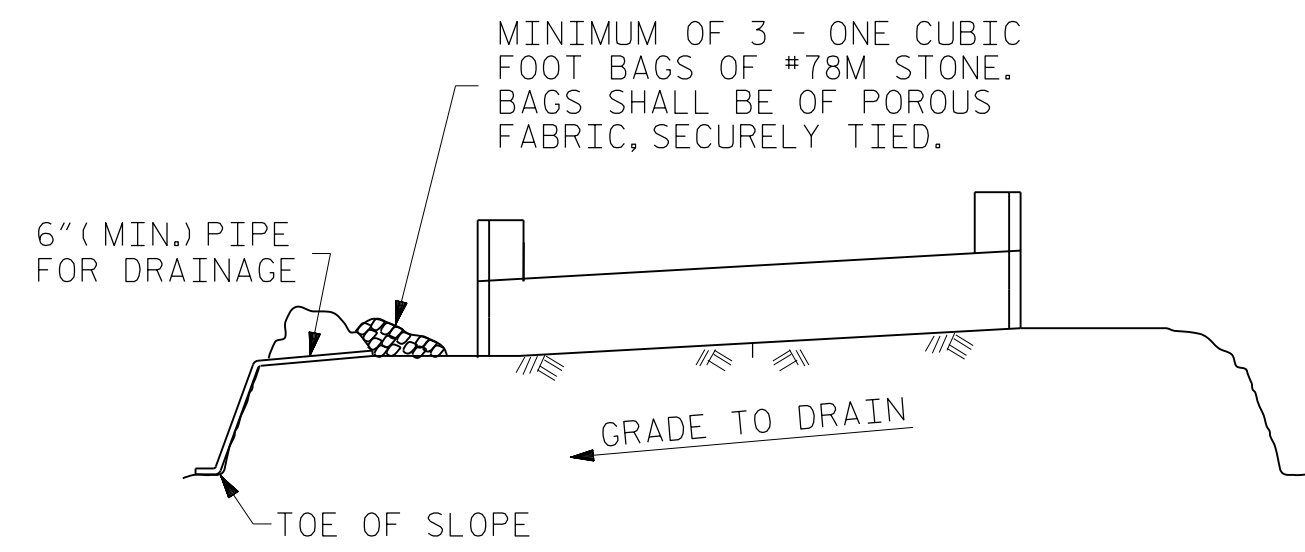
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: E. PHELPS DATE: 05-17
 CHECKED BY: J. LOFTUS DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
 \\401_037_B4448_SMU_SUB03_S1-19.dgn
 USER: jloftus

B-4448

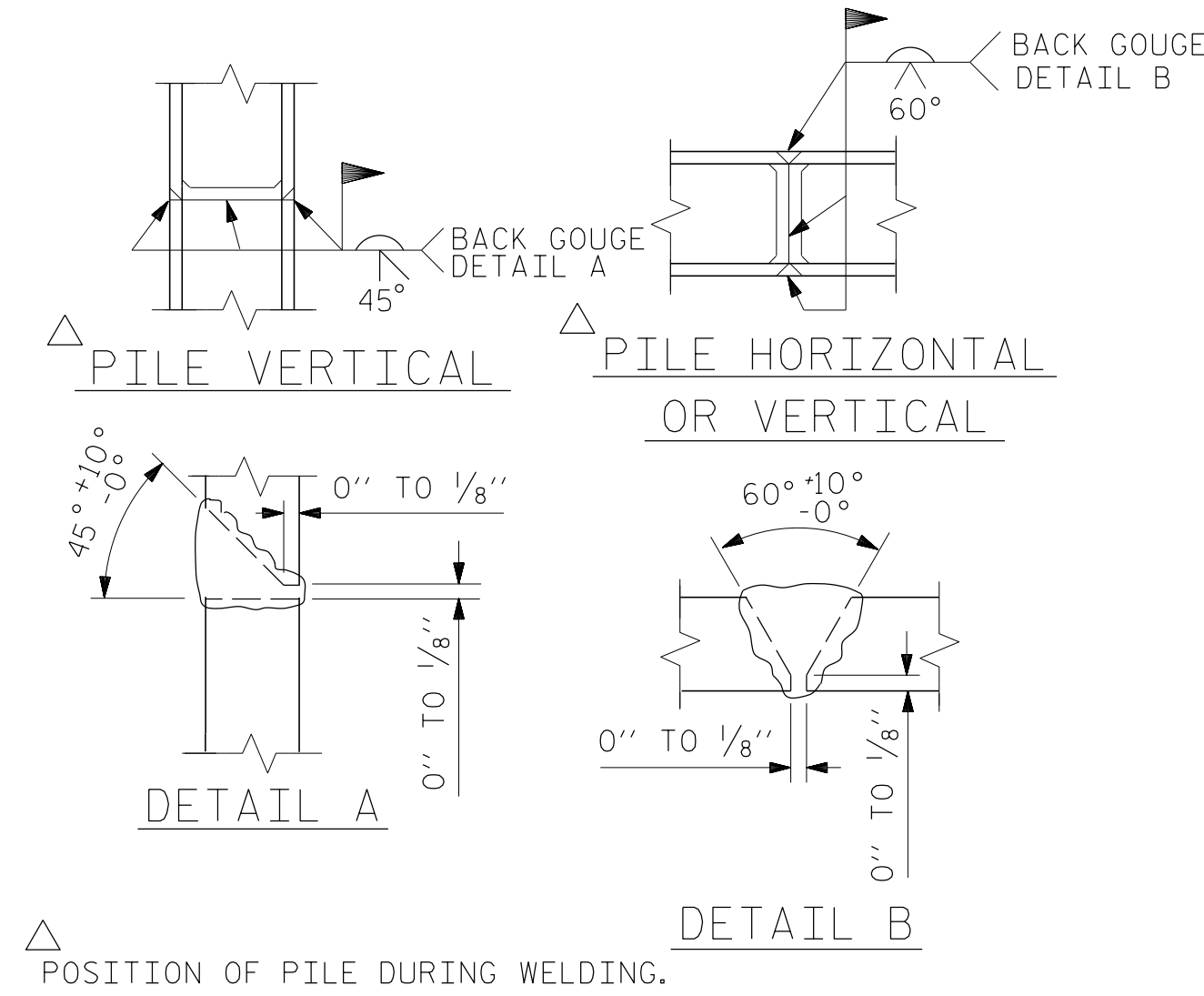


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

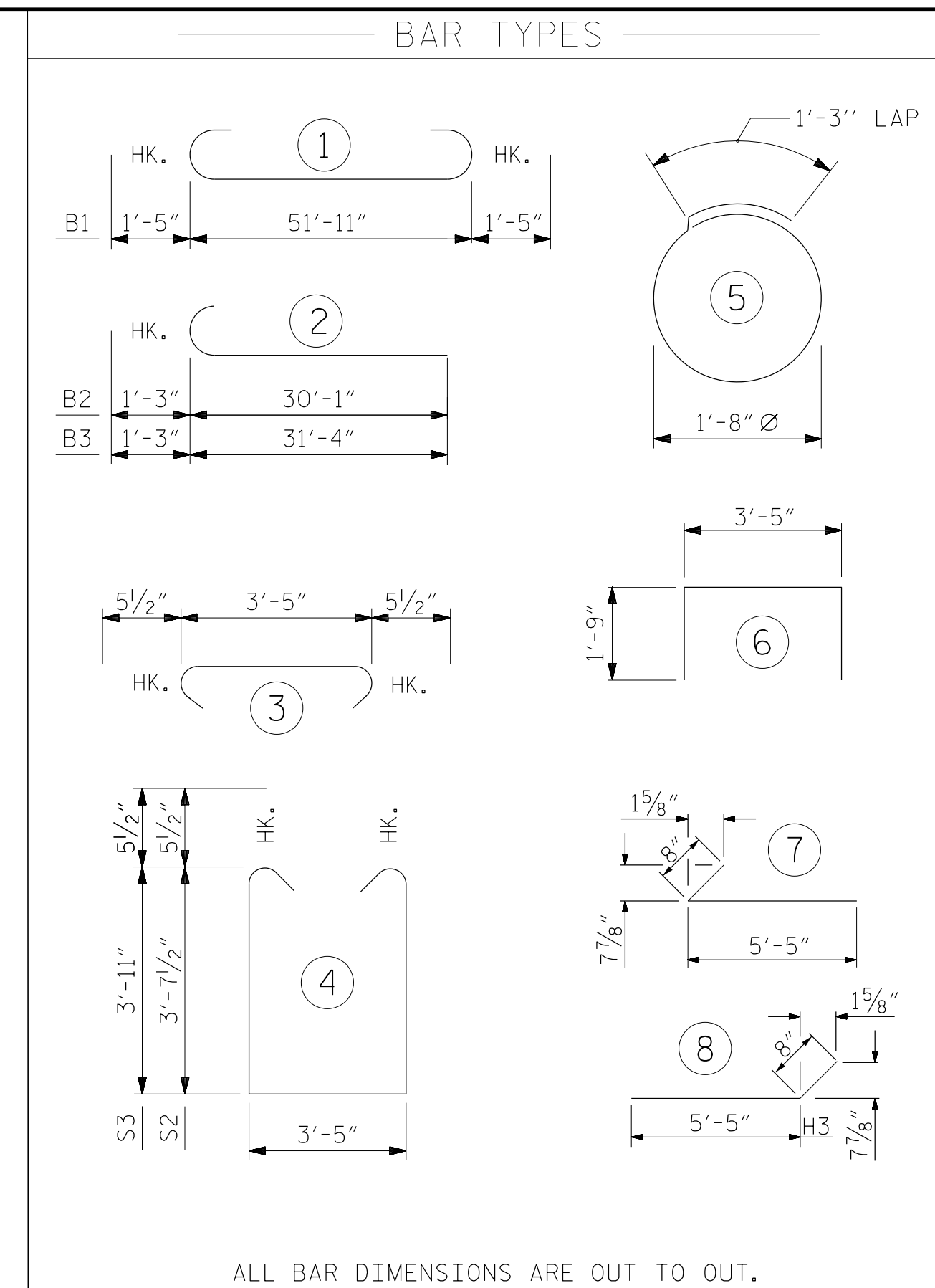
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

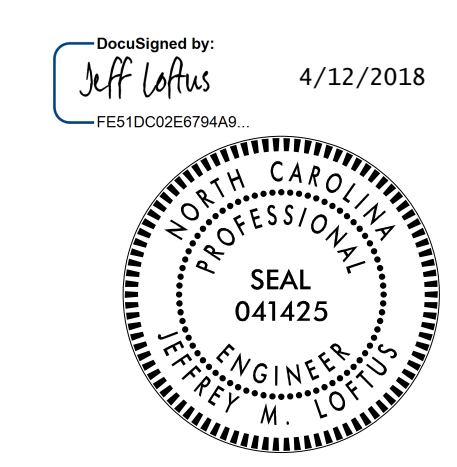
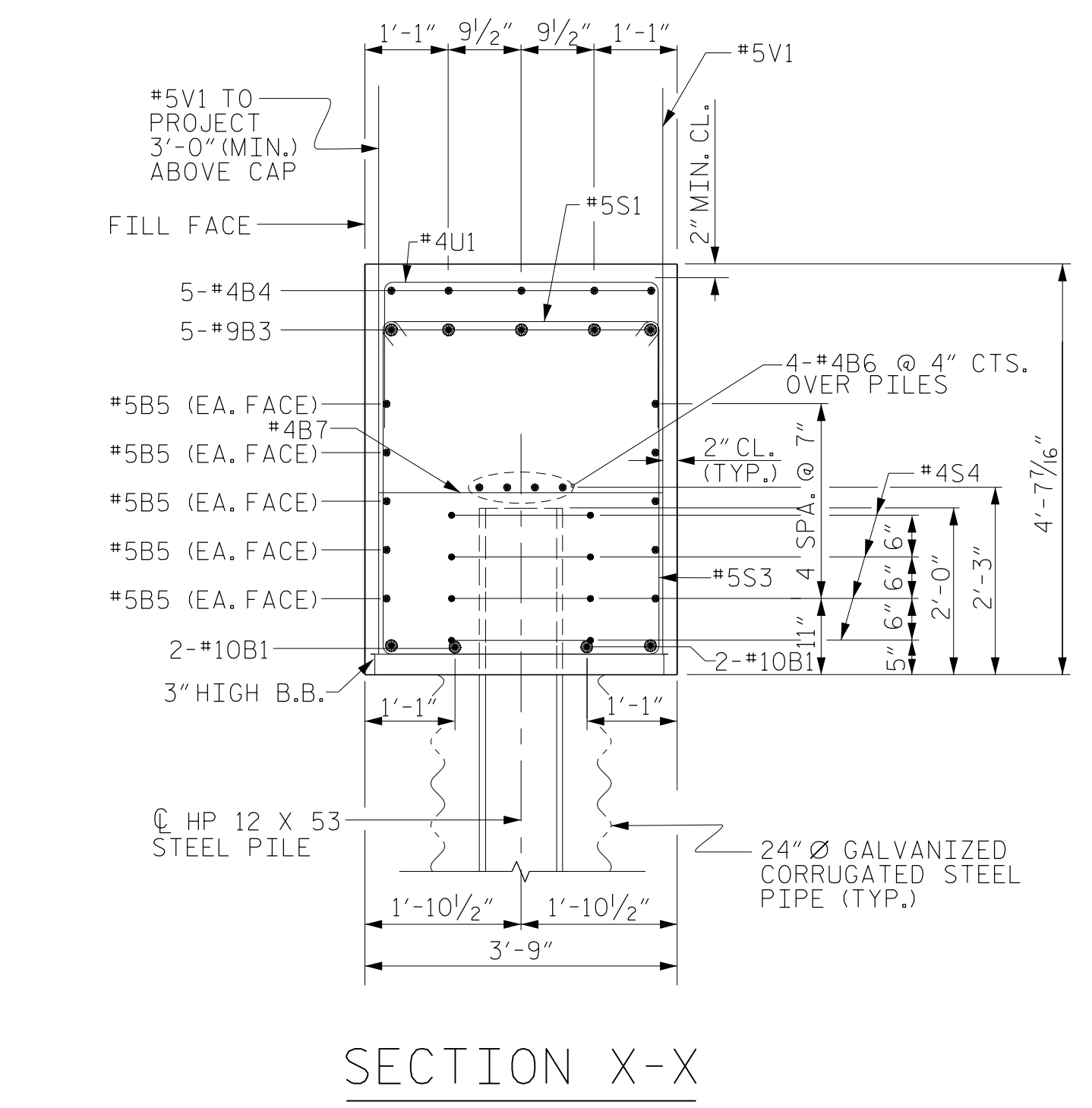
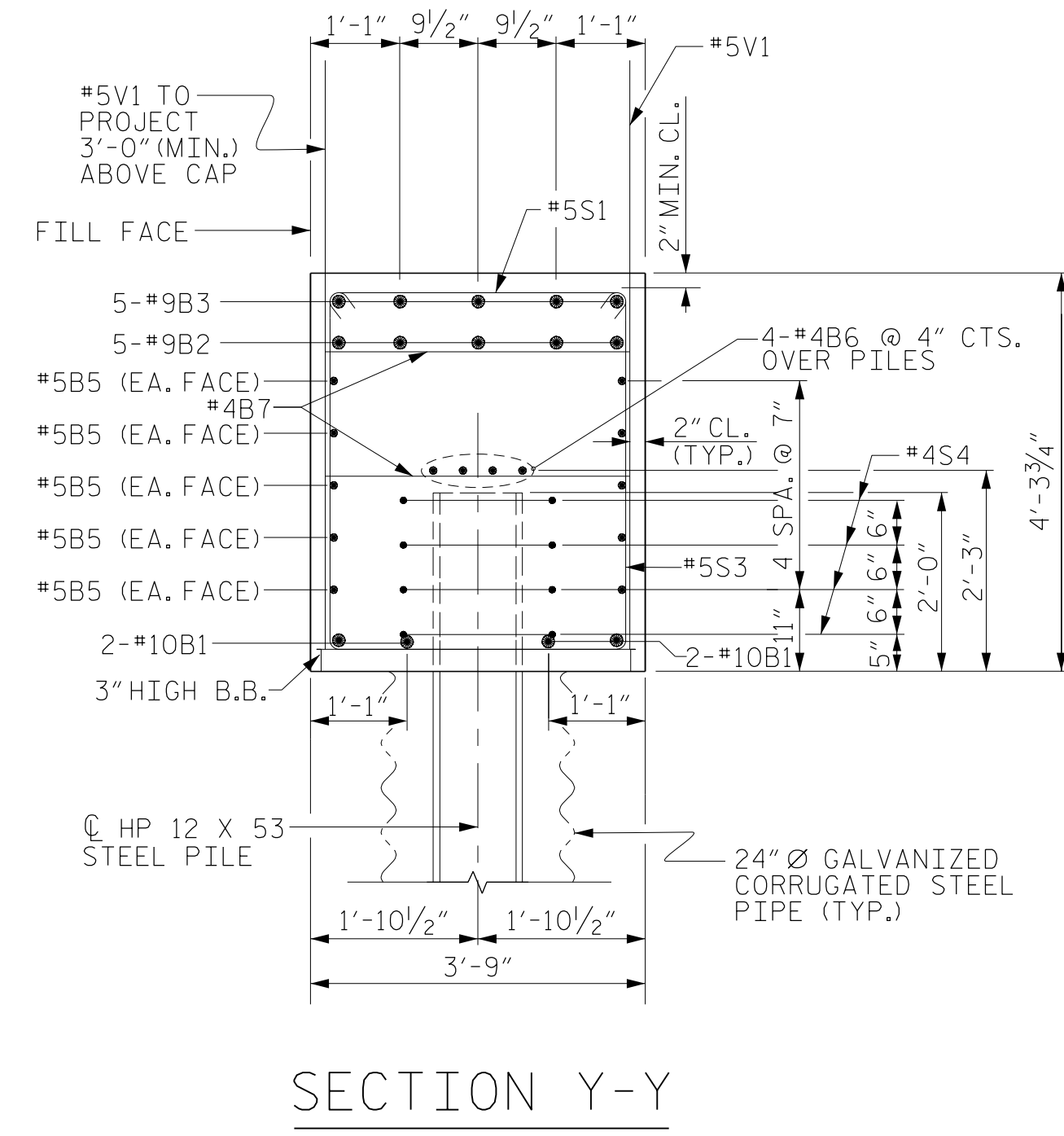
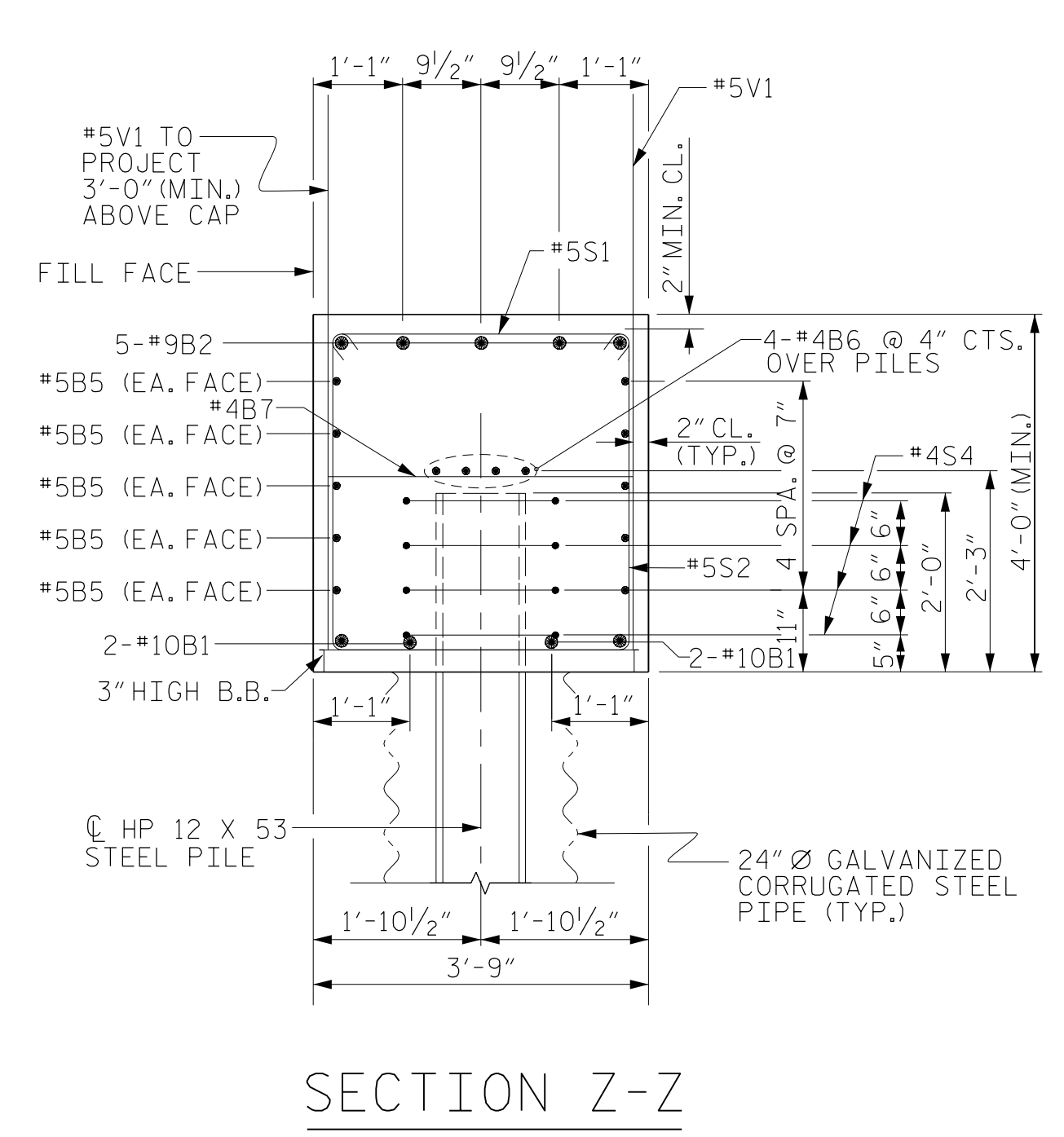
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



BILL OF MATERIAL											
FOR END BENT No. 1						FOR END BENT No. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-9"	942	B1	4	#10	1	54'-9"	942
B2	5	#9	2	31'-4"	533	B2	5	#9	2	31'-4"	533
B3	5	#9	2	32'-7"	554	B3	5	#9	2	32'-7"	554
B4	10	#4	STR	6'-11"	46	B4	10	#4	STR	6'-11"	46
B5	10	#5	STR	52'-0"	542	B5	10	#5	STR	52'-0"	542
B6	8	#4	STR	27'-3"	146	B6	8	#4	STR	27'-3"	146
B7	16	#4	STR	3'-5"	37	B7	16	#4	STR	3'-5"	37
K1	28	#4	STR	2'-9"	51	K1	28	#4	STR	2'-9"	51
H2	26	#4	8	6'-1"	106	H1	26	#4	7	6'-1"	106
S1	62	#5	3	4'-4"	280	S1	62	#5	3	4'-4"	280
S2	25	#5	4	11'-7"	302	S2	25	#5	4	11'-7"	302
S3	37	#5	4	12'-2"	470	S3	37	#5	4	12'-2"	470
S4	32	#4	5	6'-6"	139	S4	32	#4	5	6'-6"	139
U1	8	#4	6	6'-11"	37	U1	8	#4	6	6'-11"	37
V1	89	#5	STR	7'-5"	688	V1	89	#5	STR	7'-5"	688
V2	8	#5	STR	8'-4"	70	V4	20	#5	STR	8'-4"	70
V3	20	#5	STR	9'-0"	188	V5	8	#5	STR	9'-0"	188
REINFORCING STEEL FOR END BENT No.1					5131 LBS.	REINFORCING STEEL FOR END BENT No.2					5131 LBS.
CLASS A CONCRETE BREAKDOWN CAP & LOWER WINGS UPPER WINGS					34.4 C.Y. 1.7 C.Y.	CLASS A CONCRETE BREAKDOWN CAP & LOWER WINGS UPPER WINGS					34.4 C.Y. 1.7 C.Y.
TOTAL CLASS A CONCRETE					36.1 C.Y.	TOTAL CLASS A CONCRETE					36.1 C.Y.
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					8 EA.	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					8 EA.
HP 12 X 53 STEEL PILES NO: 8					LIN. FT.= 440	HP 12 X 53 STEEL PILES NO: 8					LIN. FT.= 360



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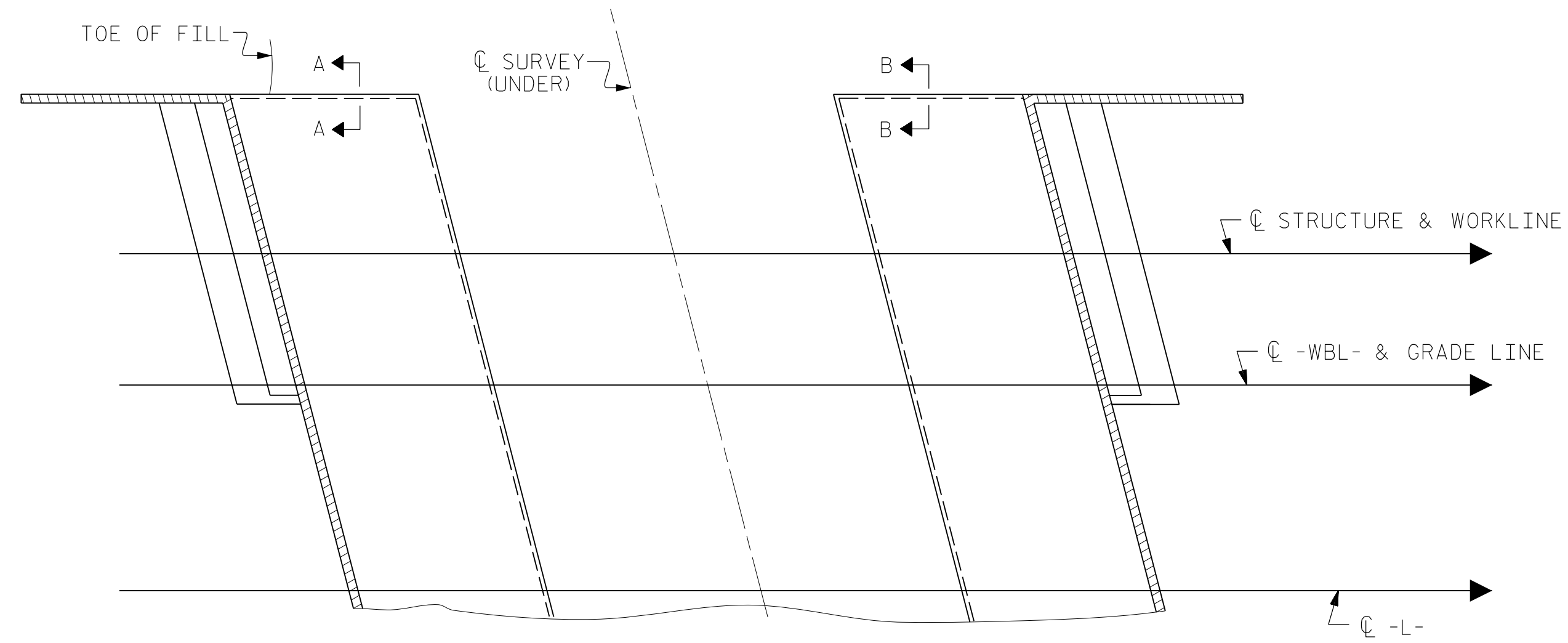
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BURKE COUNTY
STATION: 28+26.49 -WBL- POT
SHEET 4 OF 4

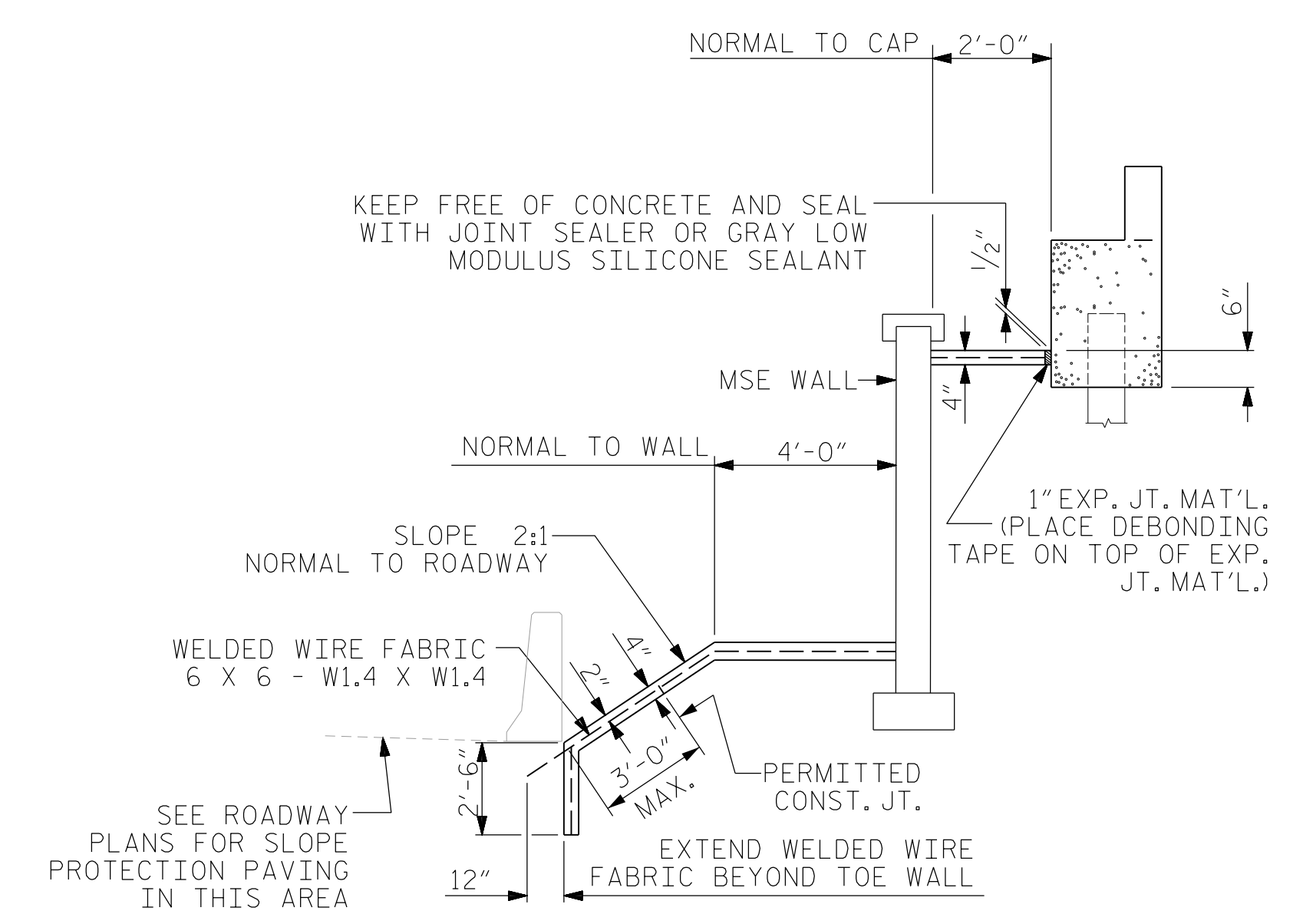
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH											
SUBSTRUCTURE INTEGRAL END BENT DETAILS											
REVISIONS											
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.					
1			3			S1-20					
2			4			TOTAL SHEETS 24					

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

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4/12/2018
\\V01_039_B4448_SMU_SUB04_S1-20.dgn
USER: jloftus



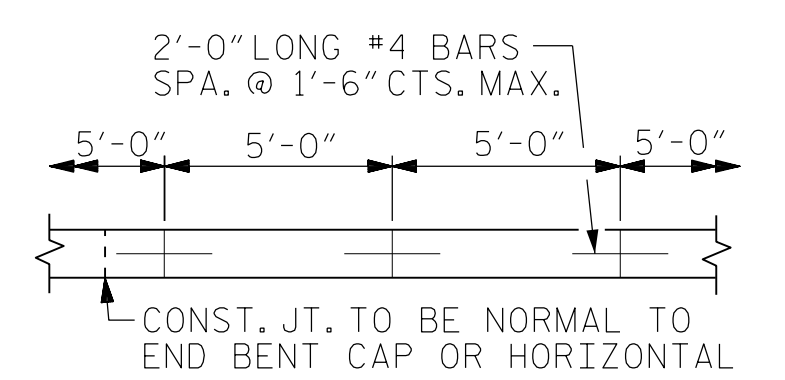
PLAN



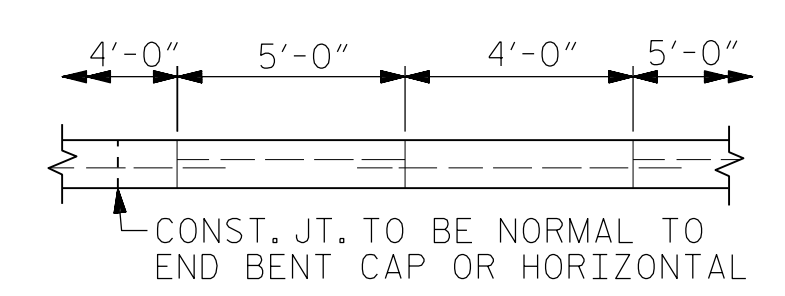
SECTION ALONG ROADWAY WHEN FILL CATCHES AGAINST BARRIER RAIL

DETAILS FOR ALTERNATE "A"

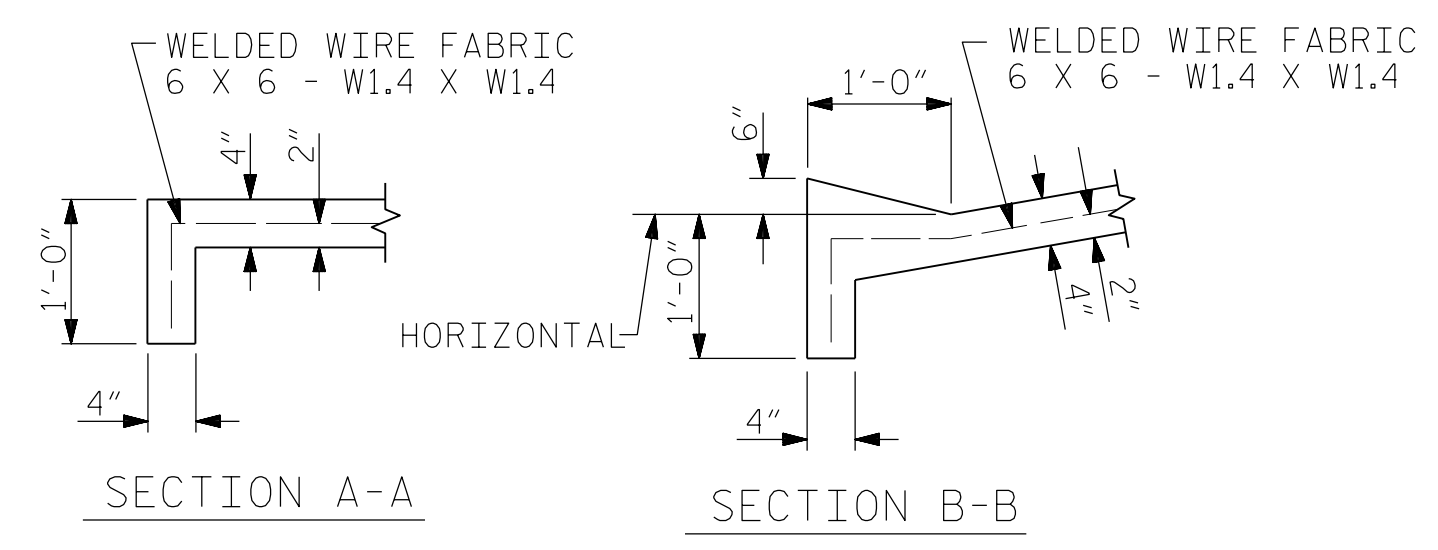
END BENT #2 SHOWN, END BENT #1 SIMILAR



POURING DETAIL



OPTIONAL POURING DETAIL



ALTERNATE "A"

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 28+26.49 -WBL-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	91	189
END BENT 2	91	189

QUANTITIES SHOWN HAS LIMITS TO -L- C
* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. B-4448

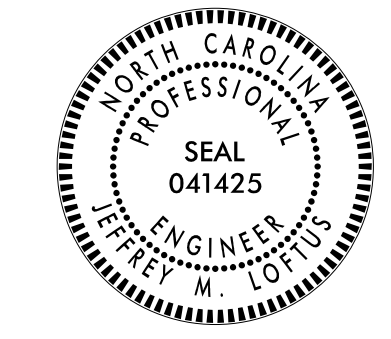
BURKE COUNTY

STATION: 28+26.49 -WBL- POT

SHEET 1 OF 2

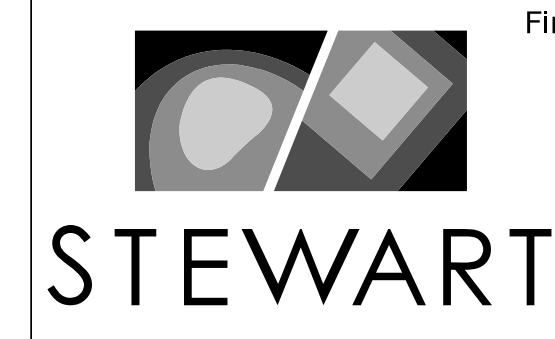
Designed by:
Jeff Loftus
FES1DC02E794A9

4/12/2018



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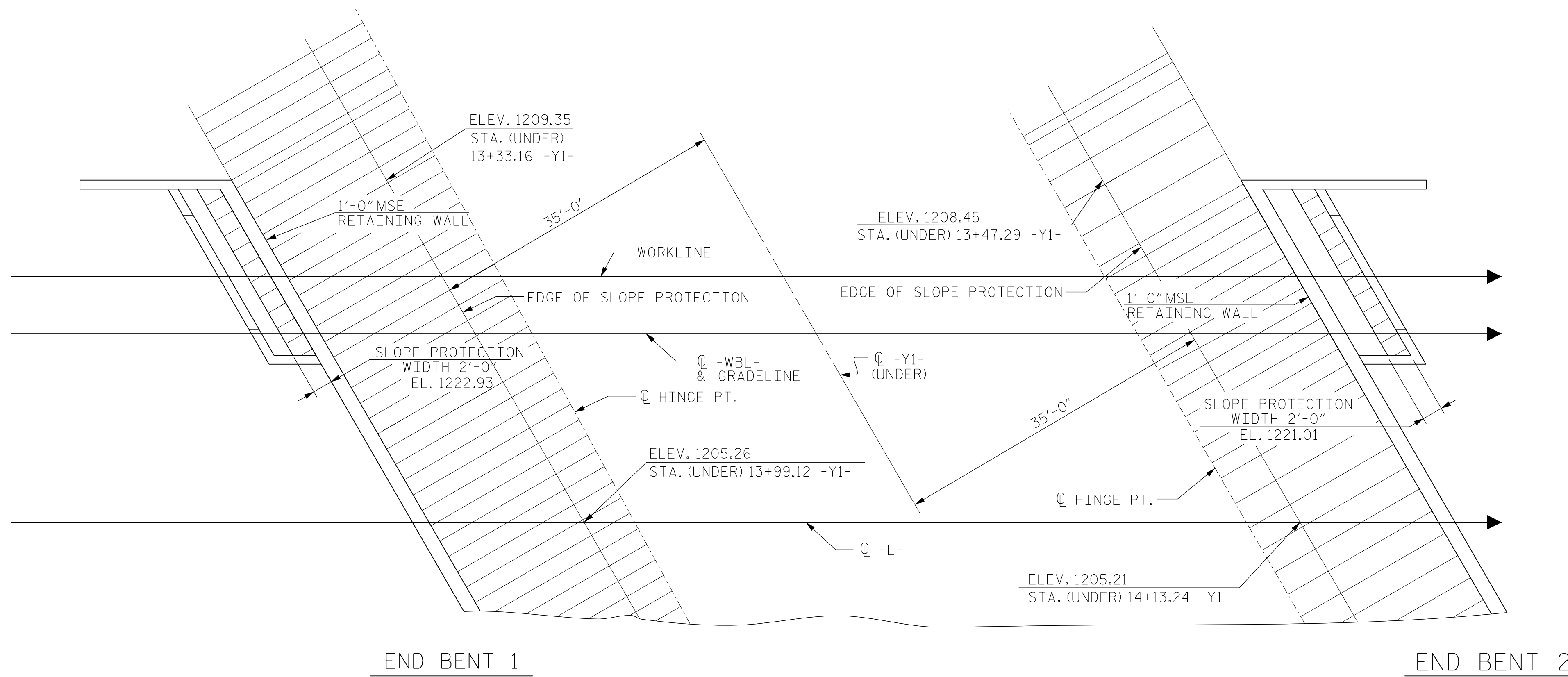
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION
DETAILS

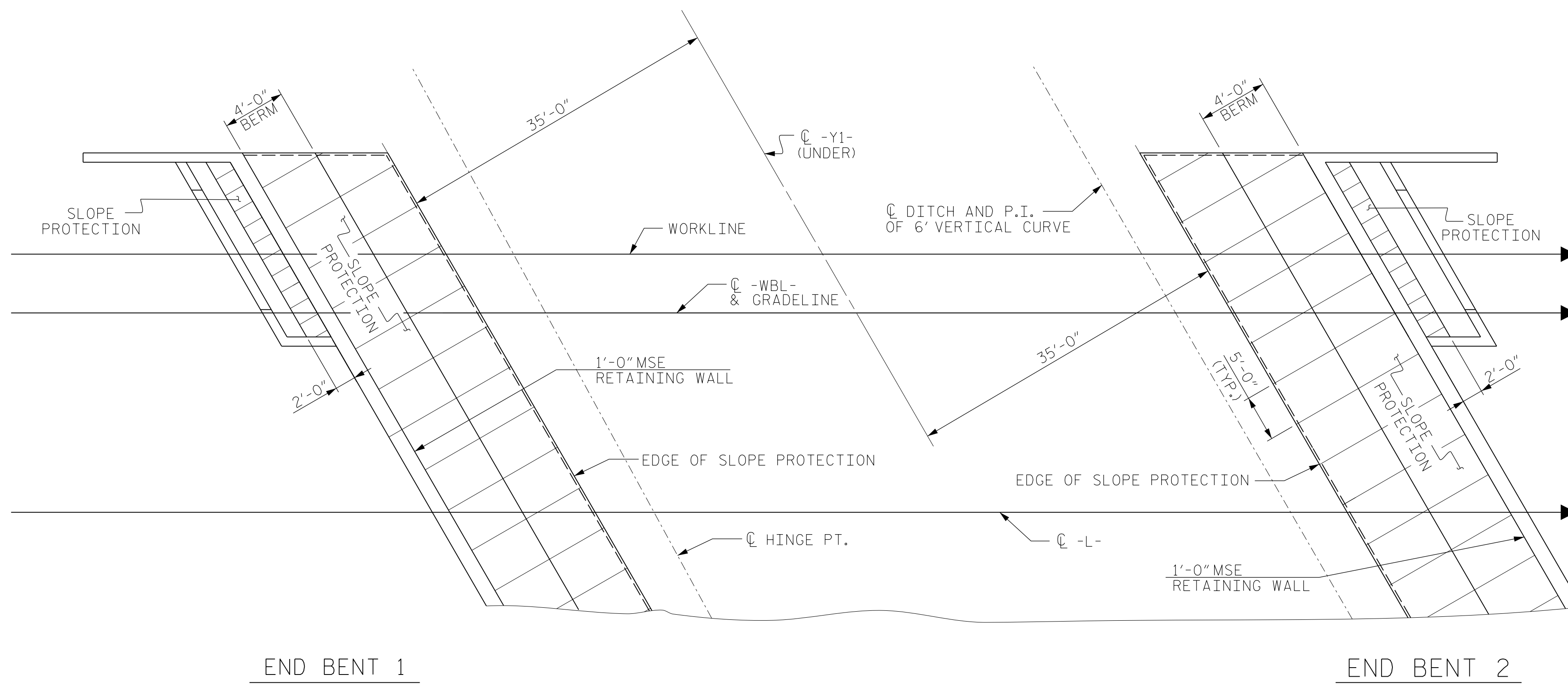
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

B-4448
4/12/2018
\\V01_041_B4448_SMU_SP01_S1-21.dgn
USER: jloftus

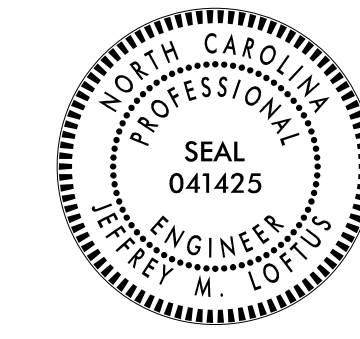


PLAN - GRADING



PLAN - CONCRETE PLACEMENT

Designed by:
Jeff Loftus
FES1000287848 4/12/2018



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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SLOPE PROTECTION
DETAILS

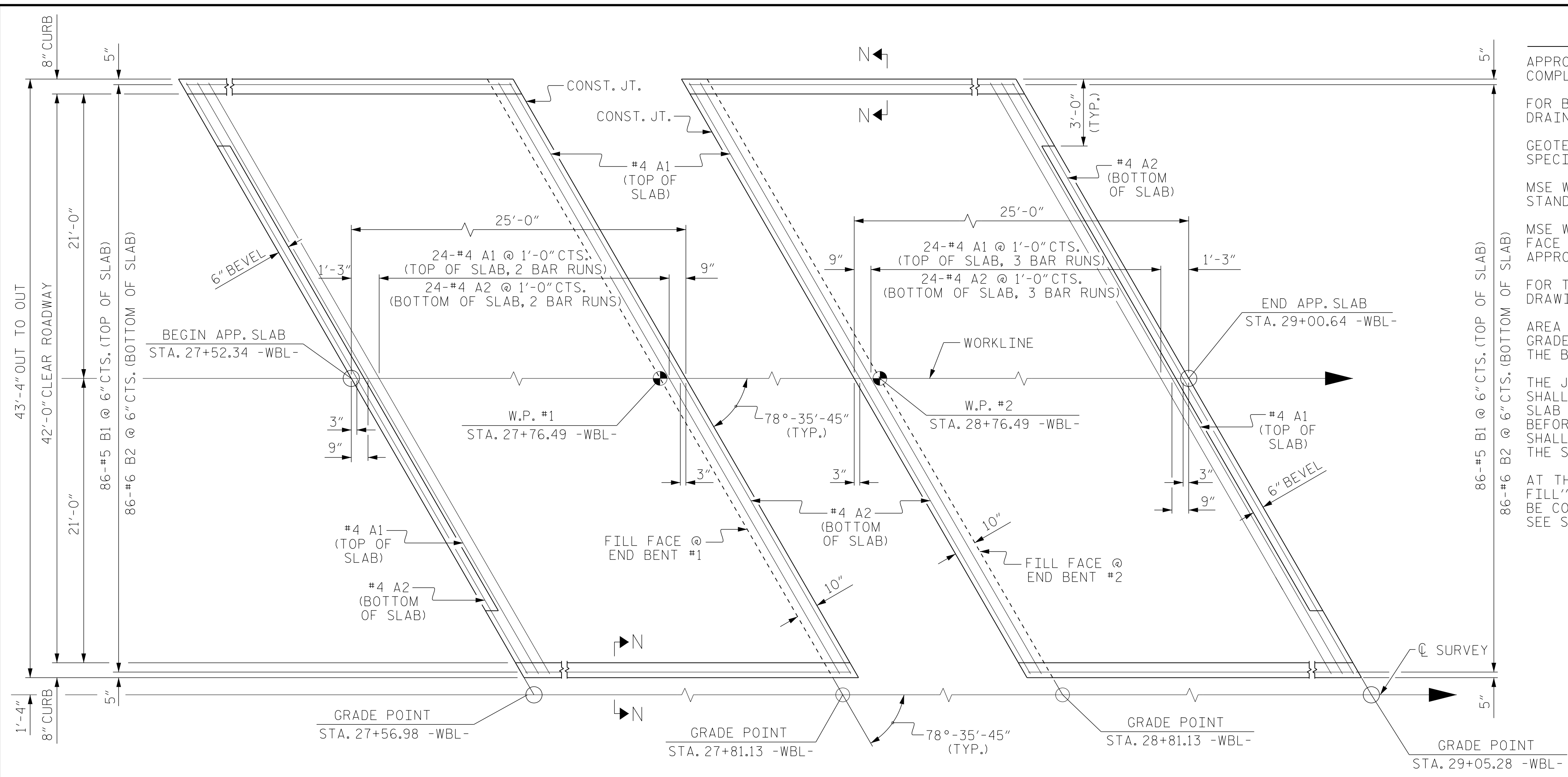
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Suite 400
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T 919.380.8750
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			24
2			4			

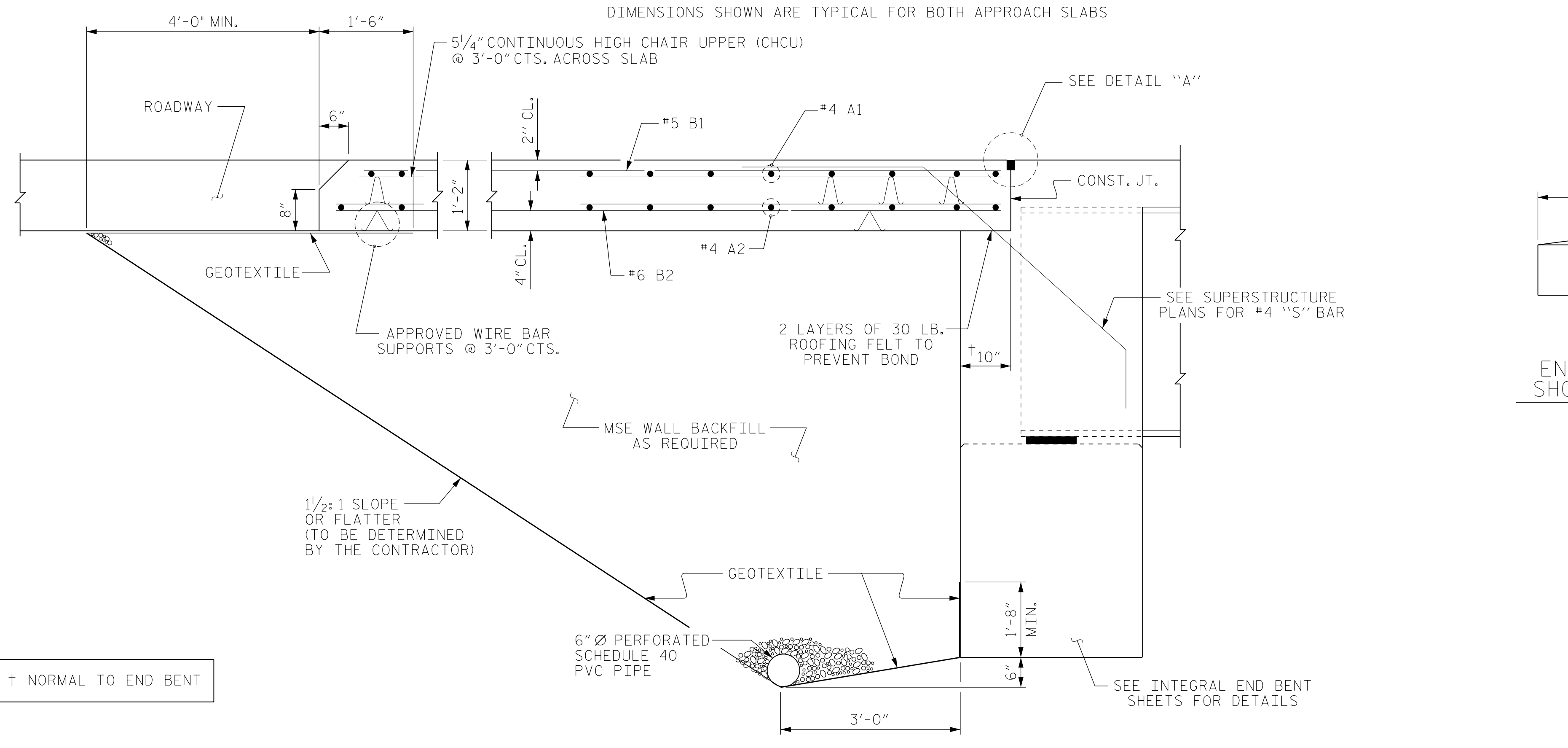
DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

4/12/2018
\\401_043_B4448_SMU_SP02_S1-22.dgn
USER: jloftus

B-4448



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



SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
 FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
 GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
 MSE WALL BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
 MSE WALL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
 FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
 THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.
 AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

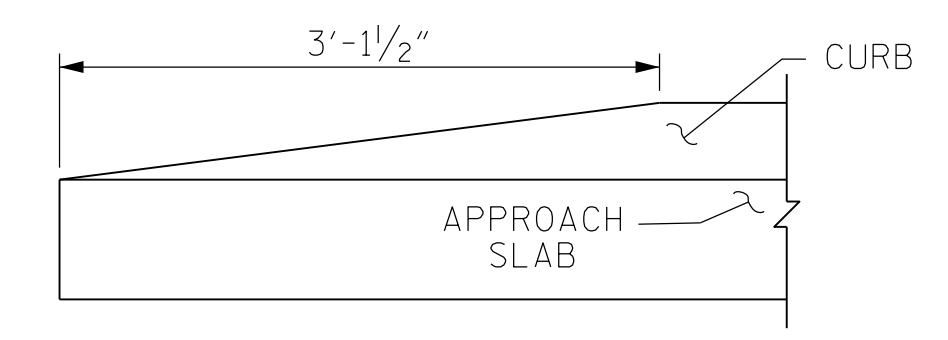
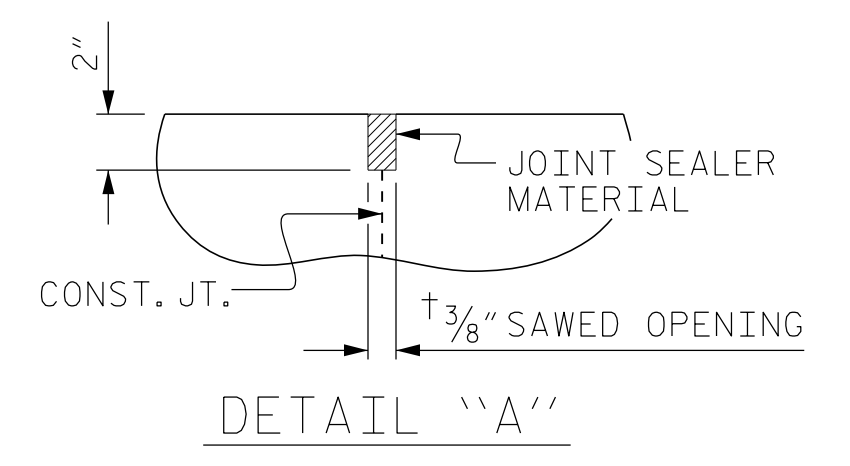
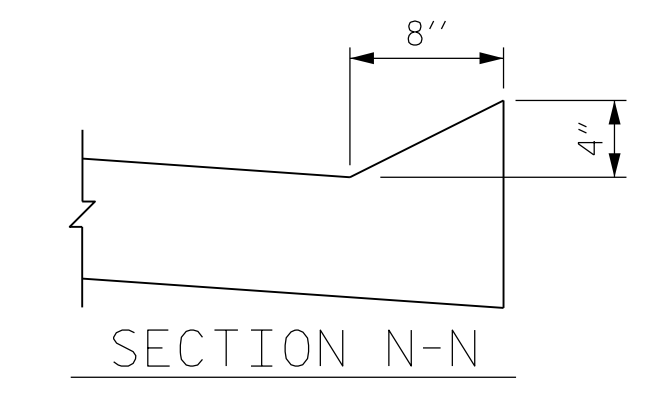
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	23'-0"	799
A2	52	#4	STR	22'-10"	793
* B1	86	#5	STR	24'-2"	2168
B2	86	#6	STR	24'-8"	3186
REINFORCING STEEL				3,979 LBS.	
* EPOXY COATED REINFORCING STEEL				2,967 LBS.	
CLASS AA CONCRETE				46.9 C.Y.	

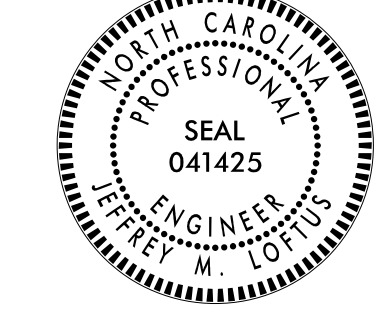
SPLICE LENGTHS

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



END OF CURB WITHOUT SHOULDER BERM GUTTER

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FES10002678448 4/12/2018



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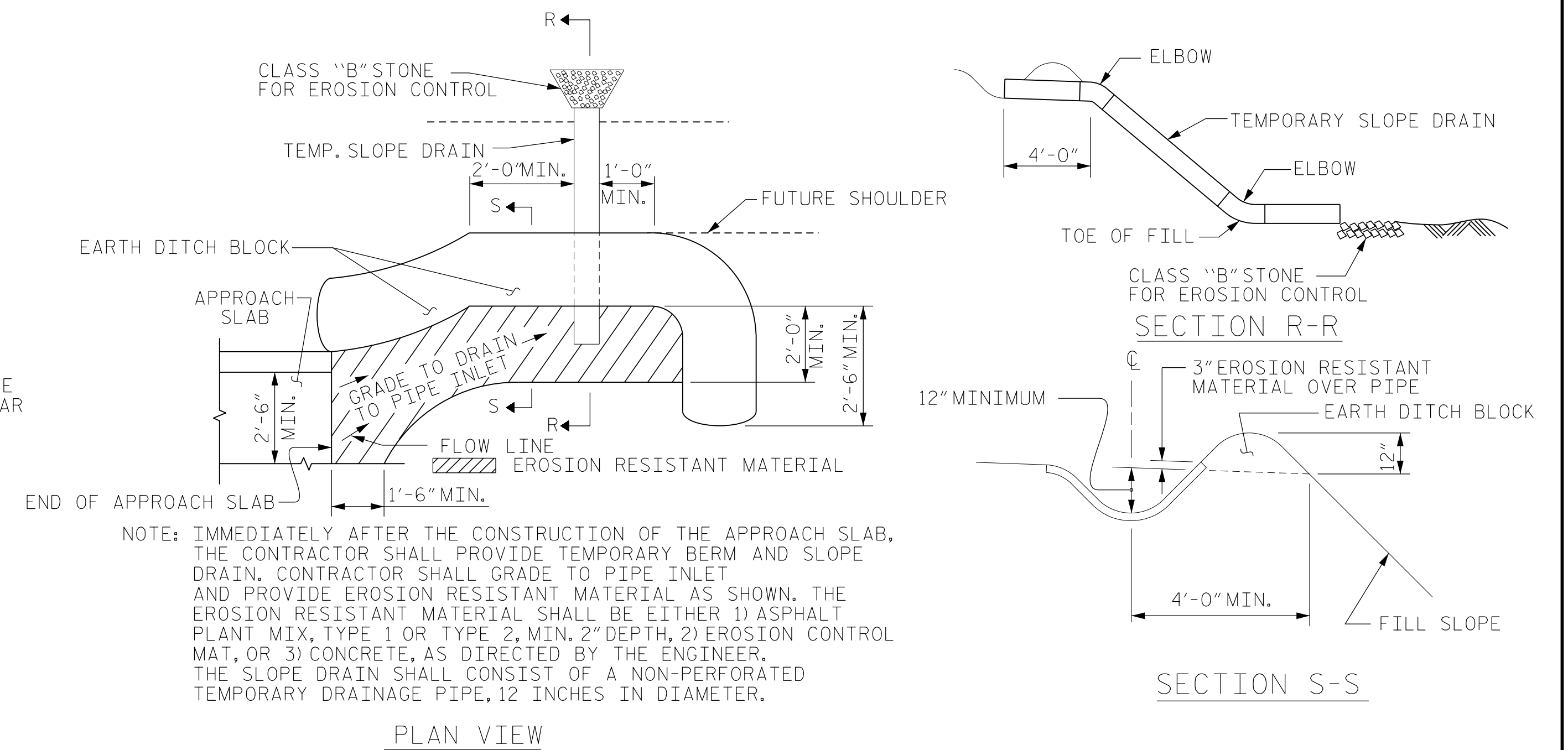
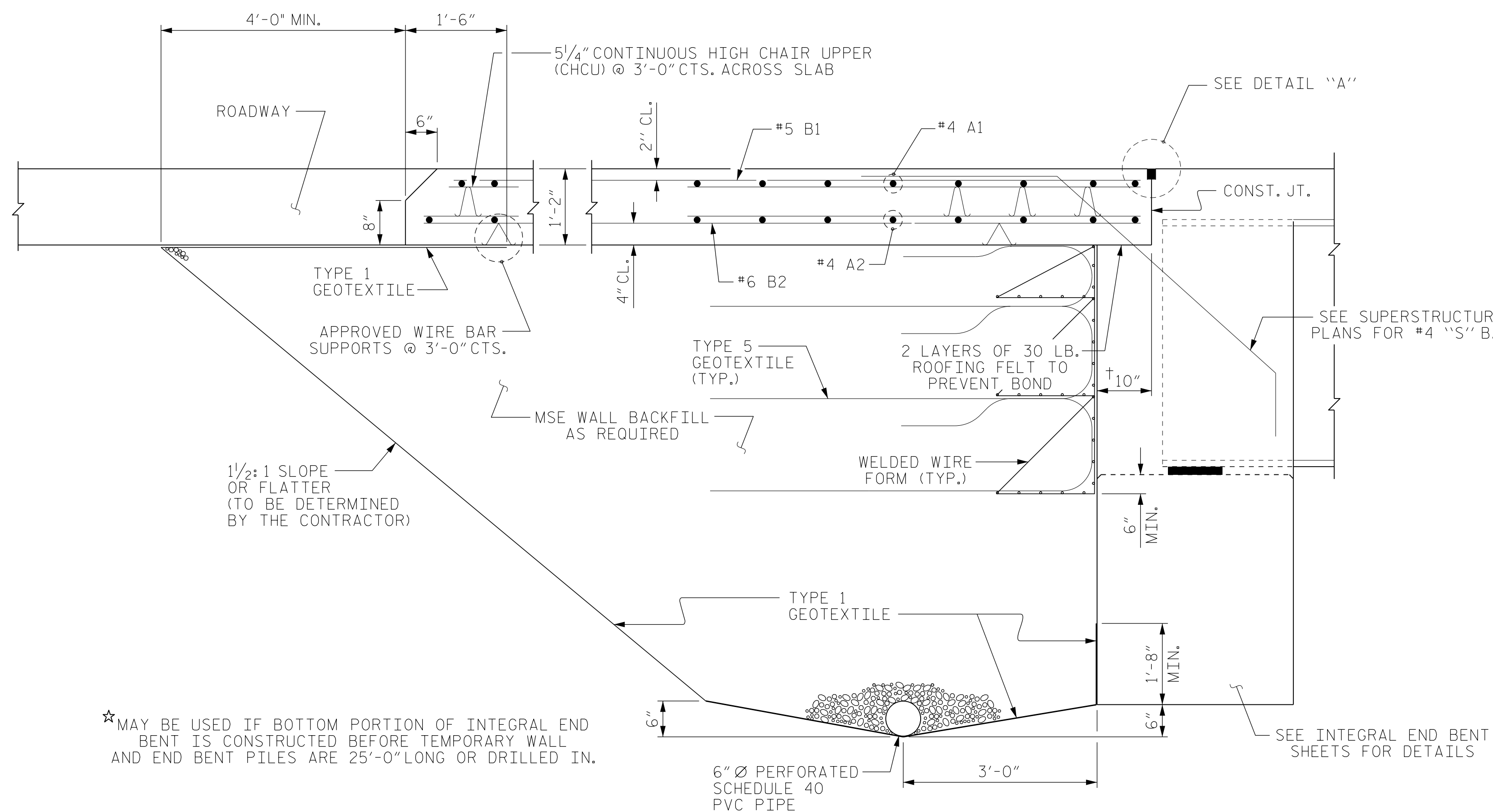
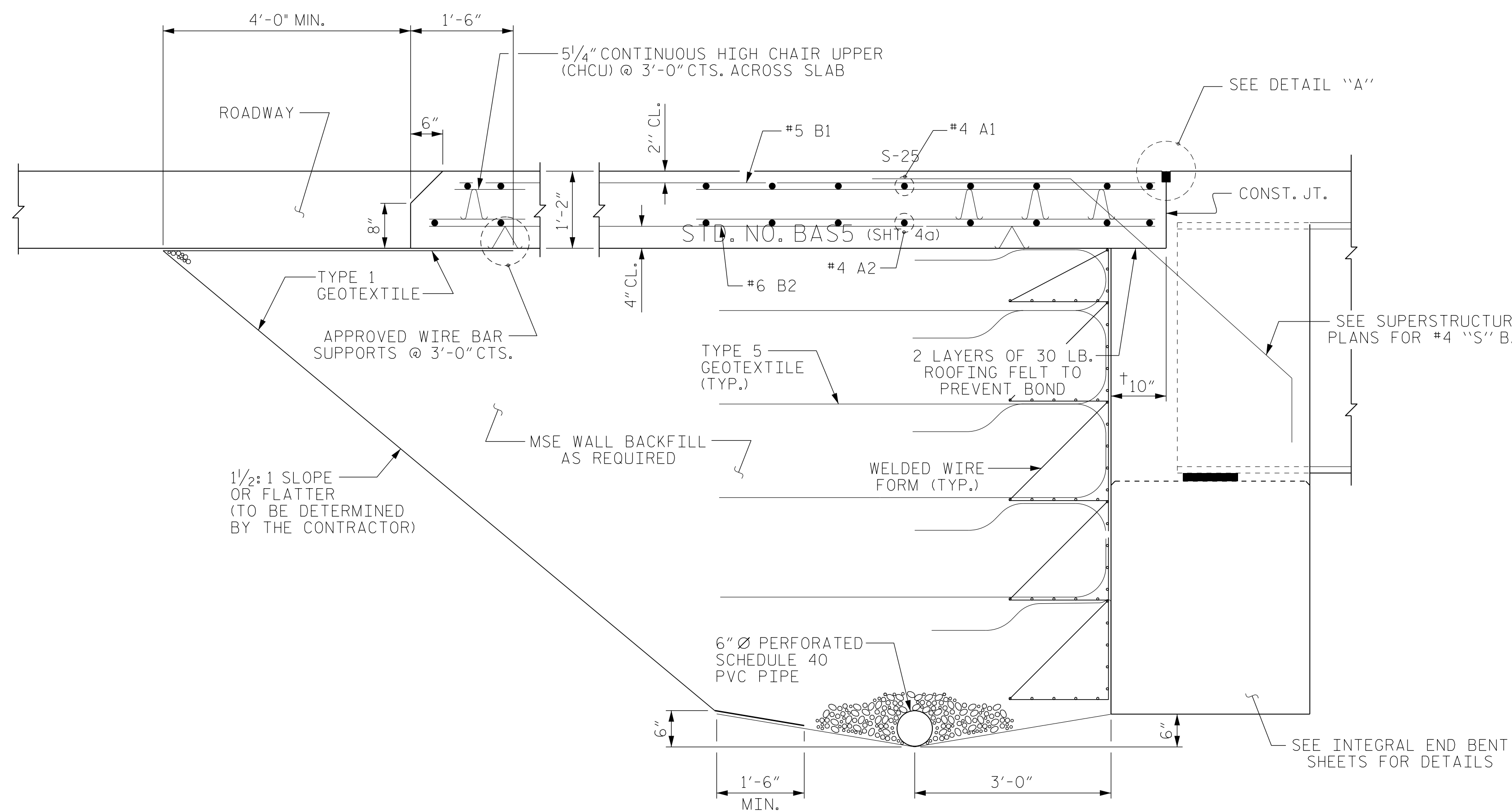
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-23
1			3			TOTAL SHEETS 24
2			4			

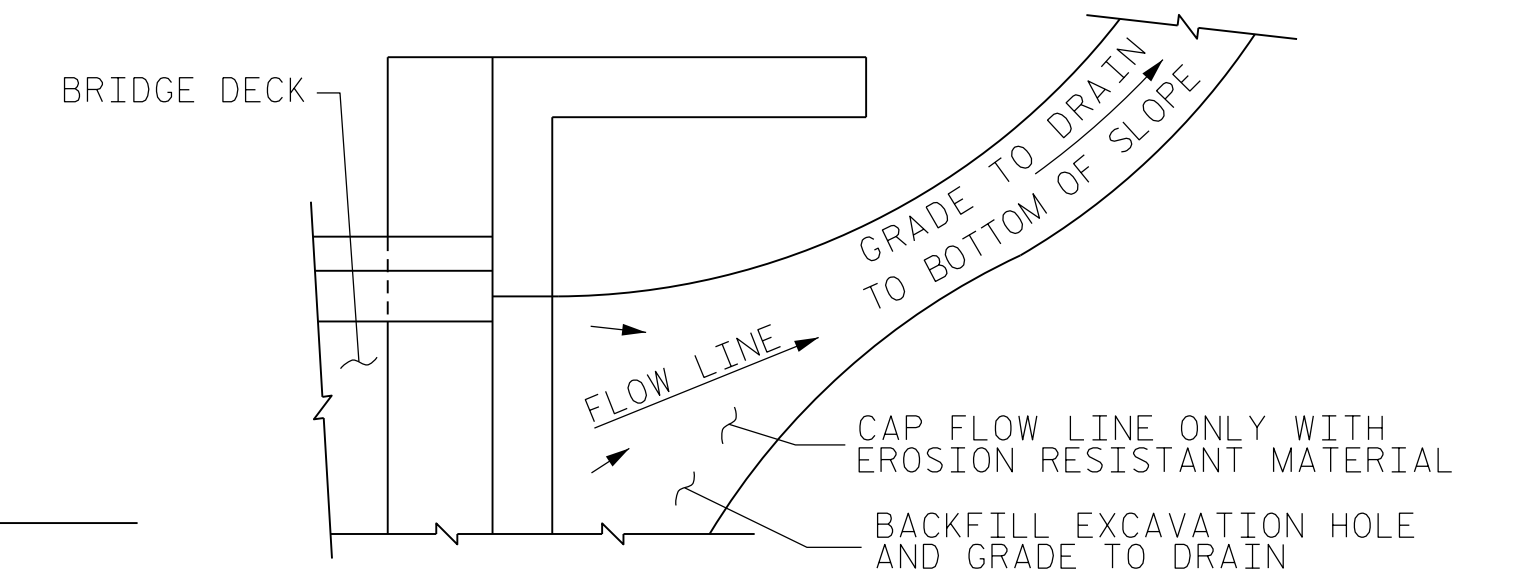
B-4448
4/12/2018
\\V01_045_B4448_SMU_AS01_S1-23.dgn
USER: jloftus

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

MSE WALL BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

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FES10C02609448 4/12/2018



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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+26.49 -WBL- POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-24					TOTAL SHEETS 24

STD. NO. BAS5

DRAWN BY: E. PHELPS DATE: 05-17
CHECKED BY: J. LOFTUS DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 05-17

SECTION THRU SLAB

(TYPE A - ALTERNATE APPROACH FILL)

4/12/2018
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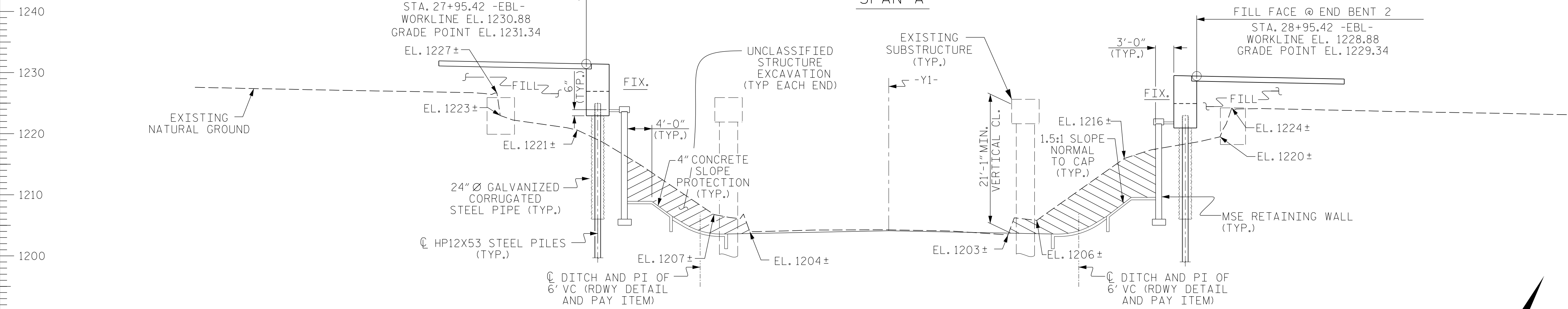
27+50 28+00 28+50 29+00 29+50

-EBL- GRADE DATA

(-)0.7833% (-)2.0000%
 PI = 25+00.00 -EBL-
 EL = 1237.25
 VC = 300'

-EBL- GRADE DATA

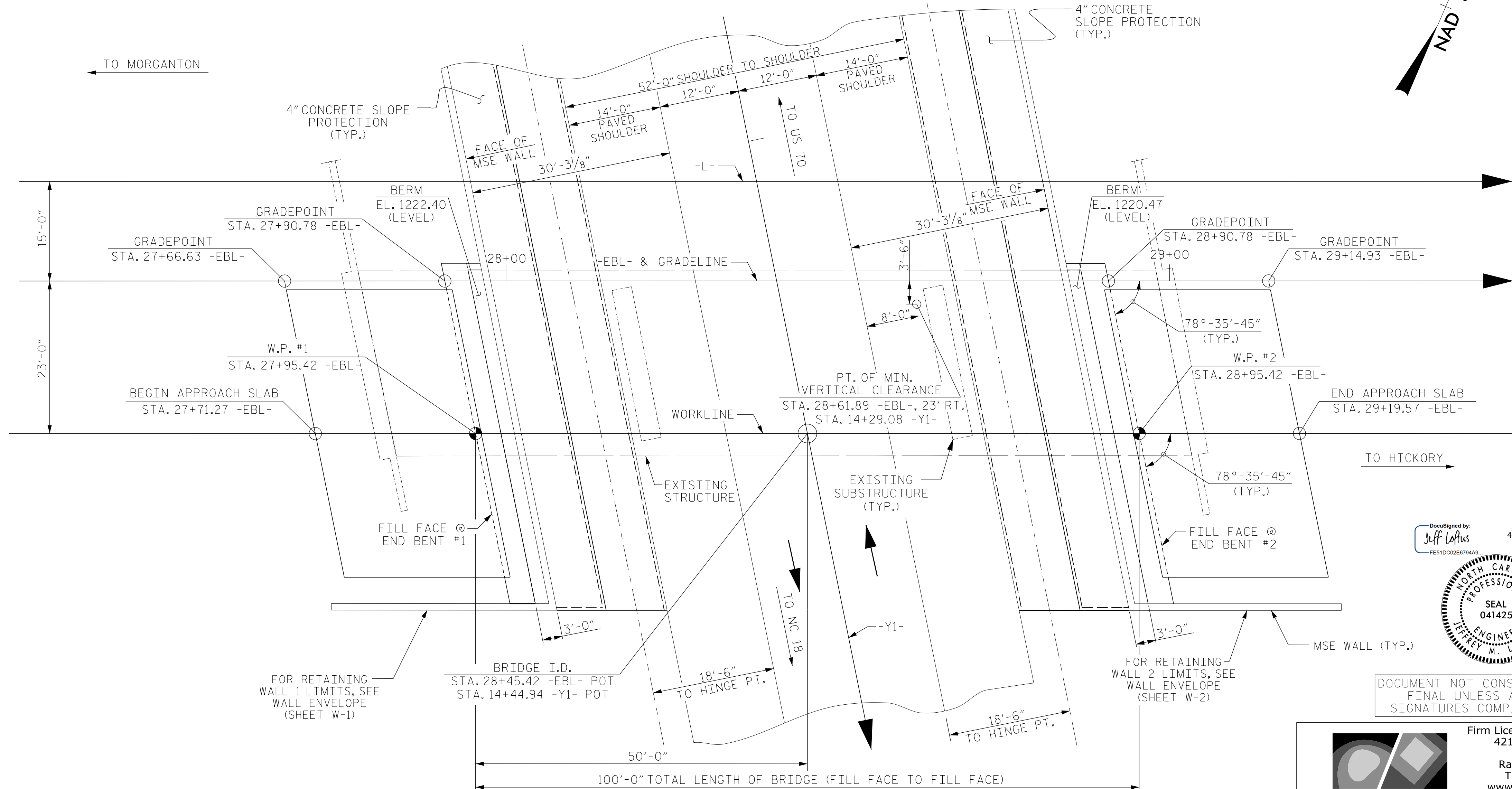
(-)2.0000% (-)2.9933%
 PI = 31+50.00 -EBL-
 EL = 1224.25
 VC = 300'



SECTION ALONG -EBL-
 (SECTION AT END BENTS ARE AT RIGHT ANGLES)

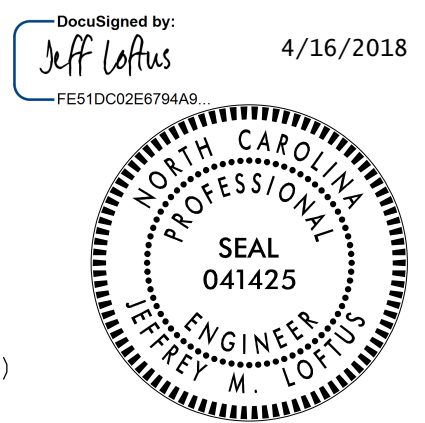
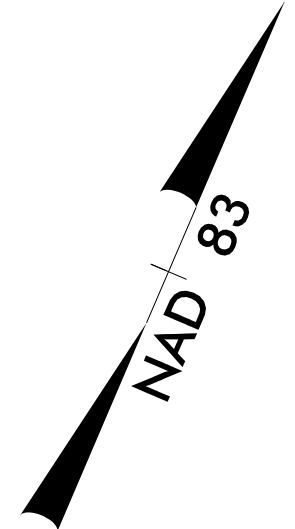
-Y1- GRADE DATA

(-)5.9413% (-)2.3000%
 PI = 16+80.00 -Y1-
 EL = 1189.24
 VC = 240'



PLAN

GALVANIZED PIPES & PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY



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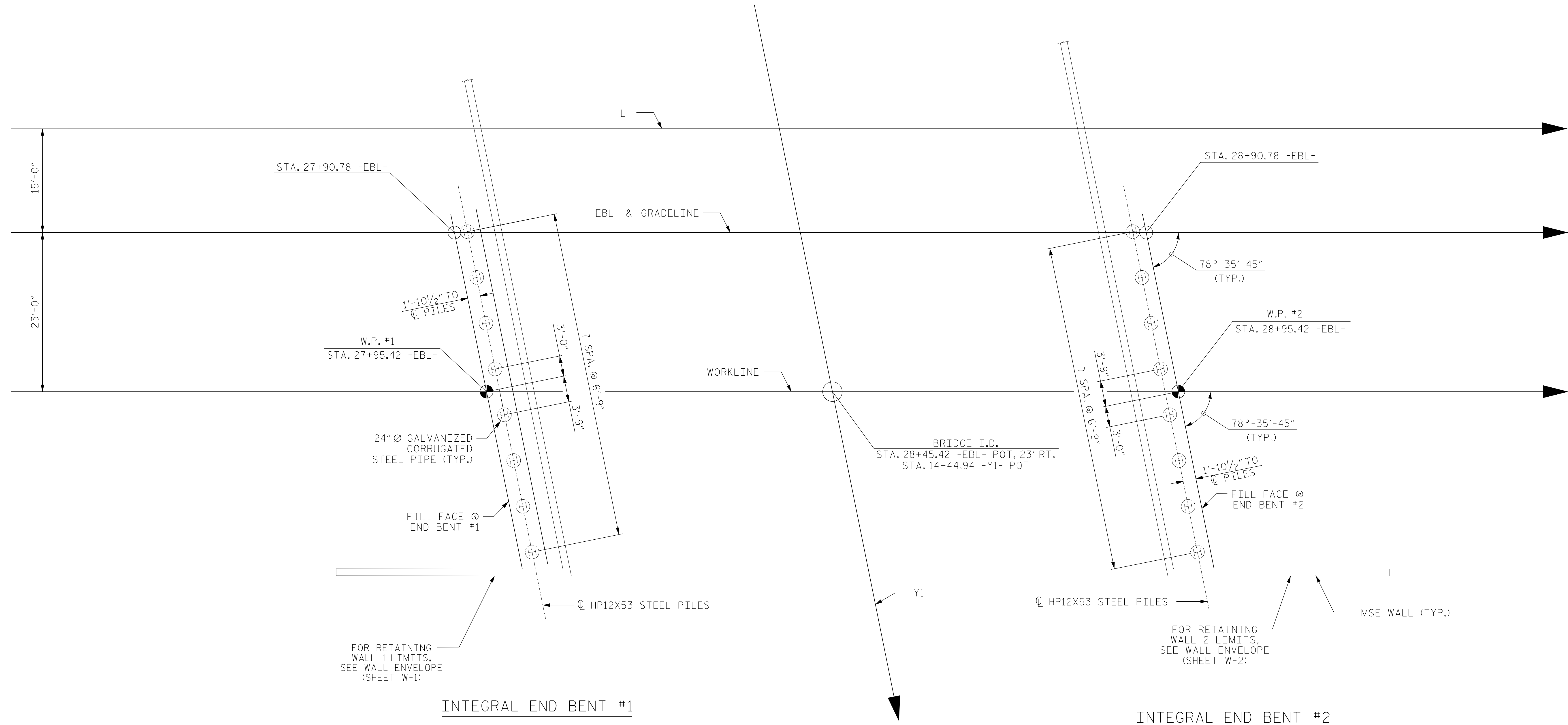
PROJECT NO. B-4448
 BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 14+44.94 -Y1- POT
 SHEET 1 OF 3 REPLACES BRIDGE NO. 149

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER SR 1744
 (MINERAL SPRINGS MOUNT. RD)
 ON EBL I-40 BETWEEN
 MORGANTON AND HICKORY

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS 24
2			4			

4/12/2018
 \\V02-001-B4448-SMU-GD01-S2-1.dgn
 USER:jeffloftus

DRAWN BY: J. LOFTUS DATE: 05-17
 CHECKED BY: D. RUGGLES DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP.

FOUNDATION NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
3. DRIVE PILES AT END BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
4. PILES AT END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
5. DRIVE PILES AT END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
6. FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+45.42 -EBL- POT

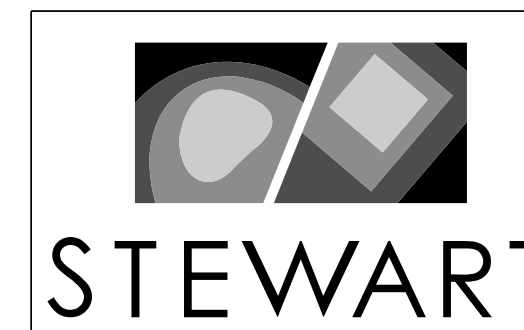
SHEET 2 OF 3

Designed by: *Jeff Loftus* 4/12/2018
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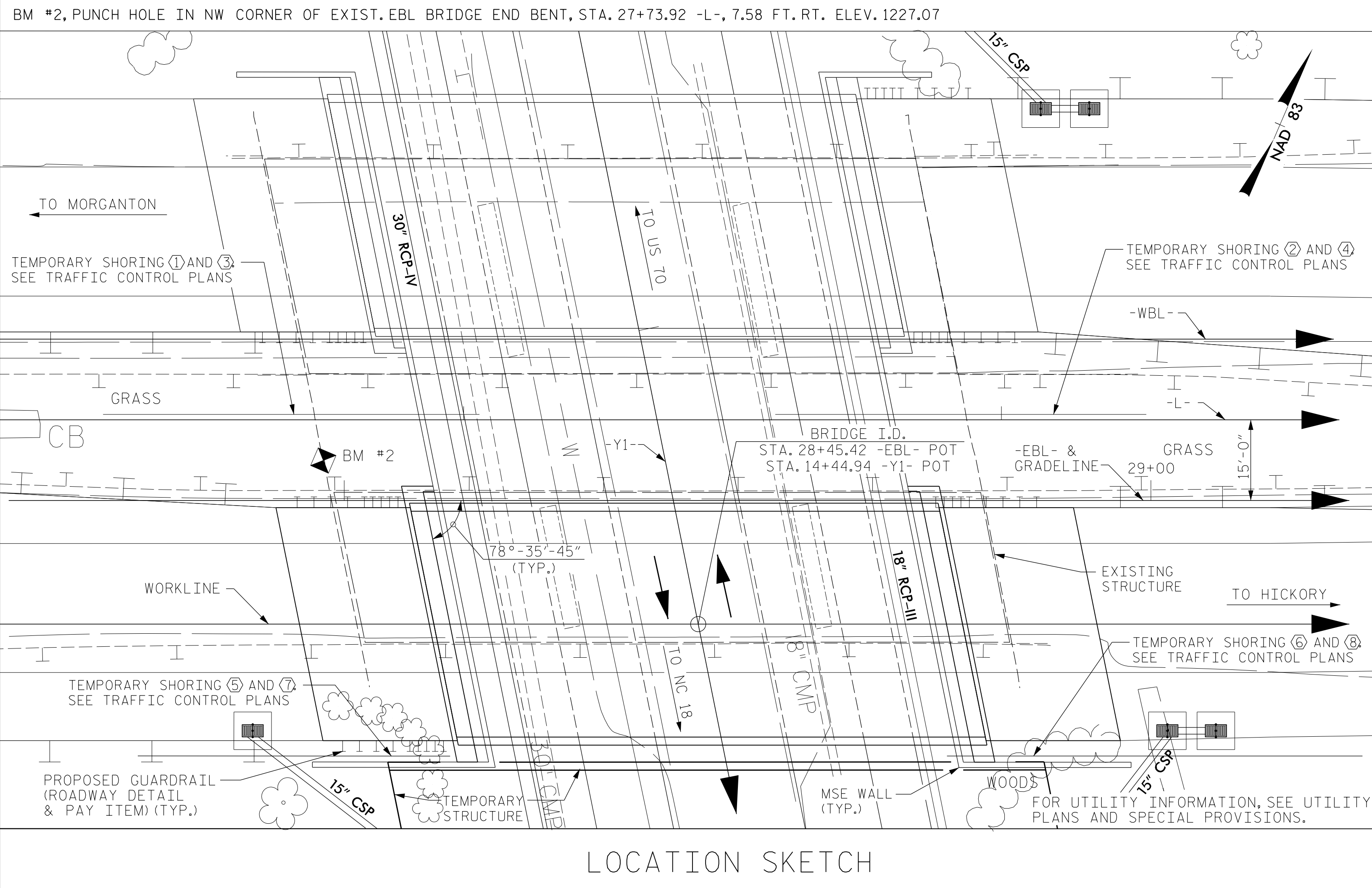


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER SR 1744
(MINERAL SPRINGS MOUNT. RD)
ON EBL I-40 BETWEEN
MORGANTON AND HICKORY

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			24

DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

4/12/2018
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USER: jloftus



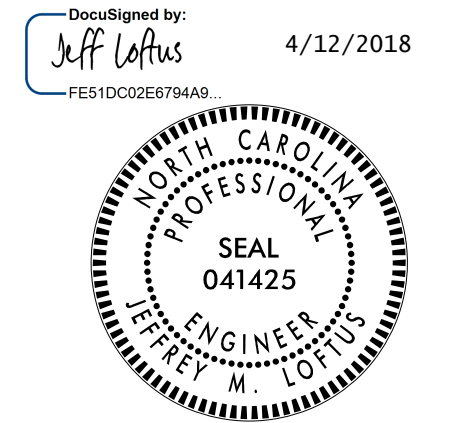
- ### NOTES
- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING
 - THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
 - THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 - FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 - FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 - FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 - FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 - FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 - FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
 - FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 - FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
 - THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
 - REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 - NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
 - ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
 - THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 - AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE, BRIDGE 149, CONSISTING OF THREE SPANS (40'-0", 47'-6" & 35'-0"); REINFORCED CONCRETE FLOOR ON STEEL I-BEAMS; 28'-4" CLEAR ROADWAY WIDTH SUPPORTED ON REINFORCED CONCRETE CAPS ON STEEL H-PILES WITH CONCRETE JACKETS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED IN ITS ENTIRETY. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOOR	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	APPROX. 132000 LBS STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CY. YDS.	LUMP SUM	LBS	LUMP SUM	EACH	No.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE					4449	5745		LUMP SUM		LUMP SUM			196.60			LUMP SUM
END BENT No. 1				LUMP SUM			36.1		5,189		8	8	400		91	
END BENT No. 2				LUMP SUM			36.1		5,189		8	8	360		91	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	4449	5745	72.2	LUMP SUM	10,378	LUMP SUM	16	16	760	182		LUMP SUM

NOTES (CONTINUED)

- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR 'REMOVAL OF EXISTING STRUCTURE AT STATION 28+45.42 -EBL-.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- FOR DETAIL OF SLOPE PROTECTION AND BERM AT END BENTS, SEE GEOTECHNICAL STANDARD SHEET ENTITLED "MSE ABUTMENT WALL WITH PANELS AND END BENT ON PILES- TYPICAL & COPING DETAILS."
- THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 20+48.78 -EBL- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
- THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.



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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER SR 1744
(MINERAL SPRINGS MOUNT, RD)
ON EBL I-40 BETWEEN
MORGANTON AND HICKORY

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS 24
2			4			

4/12/2018
...\\402-005-B4448-SM-L503-S2-3.dgn
USER: jloftus

DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.42	--	1.75	0.81	1.42	A	EL	48.1	0.97	2.79	A	I	96.2	1.30	0.81	1.47	A	EL	48.1		
	HL-93 (OPERATING)	N/A		1.84	--	1.35	0.81	1.84	A	EL	48.1	0.97	3.62	A	I	96.2	1.00	0.81	1.91	A	EL	48.1		
	HS-20 (INVENTORY)	36.000	②	2.38	85.7	1.75	0.81	2.38	A	EL	48.1	0.97	4.27	A	I	96.2	1.30	0.81	2.47	A	EL	48.1		
	HS-20 (OPERATING)	36.000		3.09	111.2	1.35	0.81	3.09	A	EL	48.1	0.97	5.53	A	I	96.2	1.00	0.81	3.21	A	EL	48.1		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		5.21	65.1	1.40	0.81	6.29	A	EL	48.1	0.97	12.70	A	I	96.2	1.30	0.81	5.21	A	EL	48.1	
		S3C	21.500		3.05	65.6	1.40	0.81	3.68	A	EL	48.1	0.97	7.44	A	I	96.2	1.30	0.81	3.05	A	EL	48.1	
		S3A	22.750		2.89	65.7	1.40	0.81	3.49	A	EL	48.1	0.97	7.05	A	I	96.2	1.30	0.81	2.89	A	EL	48.1	
		S4A	26.750		2.55	68.2	1.40	0.81	3.07	A	EL	48.1	0.97	6.51	A	I	96.2	1.30	0.81	2.55	A	EL	48.1	
		S5A	30.500		2.26	68.9	1.40	0.81	2.73	A	EL	48.1	0.97	6.03	A	I	96.2	1.30	0.81	2.26	A	EL	48.1	
		S6A	34.500		2.14	73.8	1.40	0.81	2.58	A	EL	48.1	0.97	5.56	A	I	96.2	1.30	0.81	2.14	A	EL	48.1	
		S7B	38.500		1.98	76.2	1.40	0.81	2.39	A	EL	48.1	0.97	5.29	A	I	96.2	1.30	0.81	1.98	A	EL	48.1	
		S7A	40.000	③	1.97	78.8	1.40	0.81	2.38	A	EL	48.1	0.97	5.28	A	I	96.2	1.30	0.81	1.97	A	EL	48.1	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.50	70.6	1.40	0.81	3.16	A	EL	48.1	0.97	6.29	A	I	96.2	1.30	0.81	2.50	A	EL	48.1	
		T5B	32.000		2.27	72.6	1.40	0.81	2.75	A	EL	48.1	0.97	5.96	A	I	96.2	1.30	0.81	2.27	A	EL	48.1	
		T6A	36.000		2.12	76.3	1.40	0.81	2.56	A	EL	48.1	0.97	5.57	A	I	96.2	1.30	0.81	2.12	A	EL	48.1	
		T7A	40.000		2.07	82.8	1.40	0.81	2.49	A	EL	48.1	0.97	5.28	A	I	96.2	1.30	0.81	2.07	A	EL	48.1	
		T7B	40.000		2.40	96.0	1.40	0.81	2.90	A	EL	48.1	0.97	5.27	A	I	96.2	1.30	0.81	2.40	A	EL	48.1	
		FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		1.47																		

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

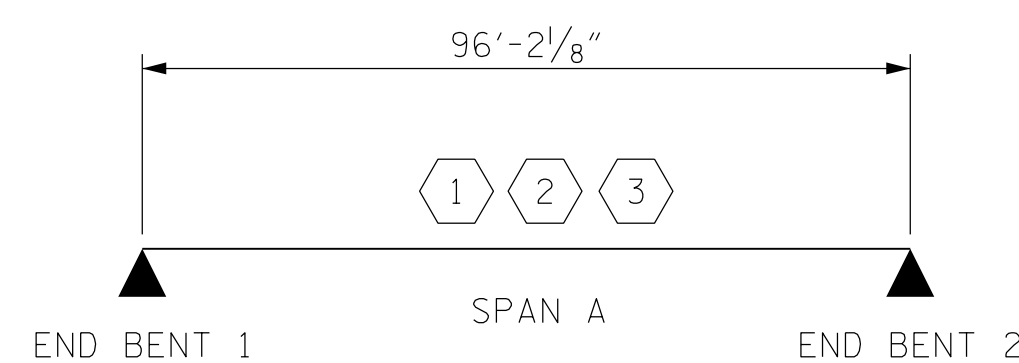
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4448
BURKE COUNTY
 STATION: 28+45.42 -EBL- POT

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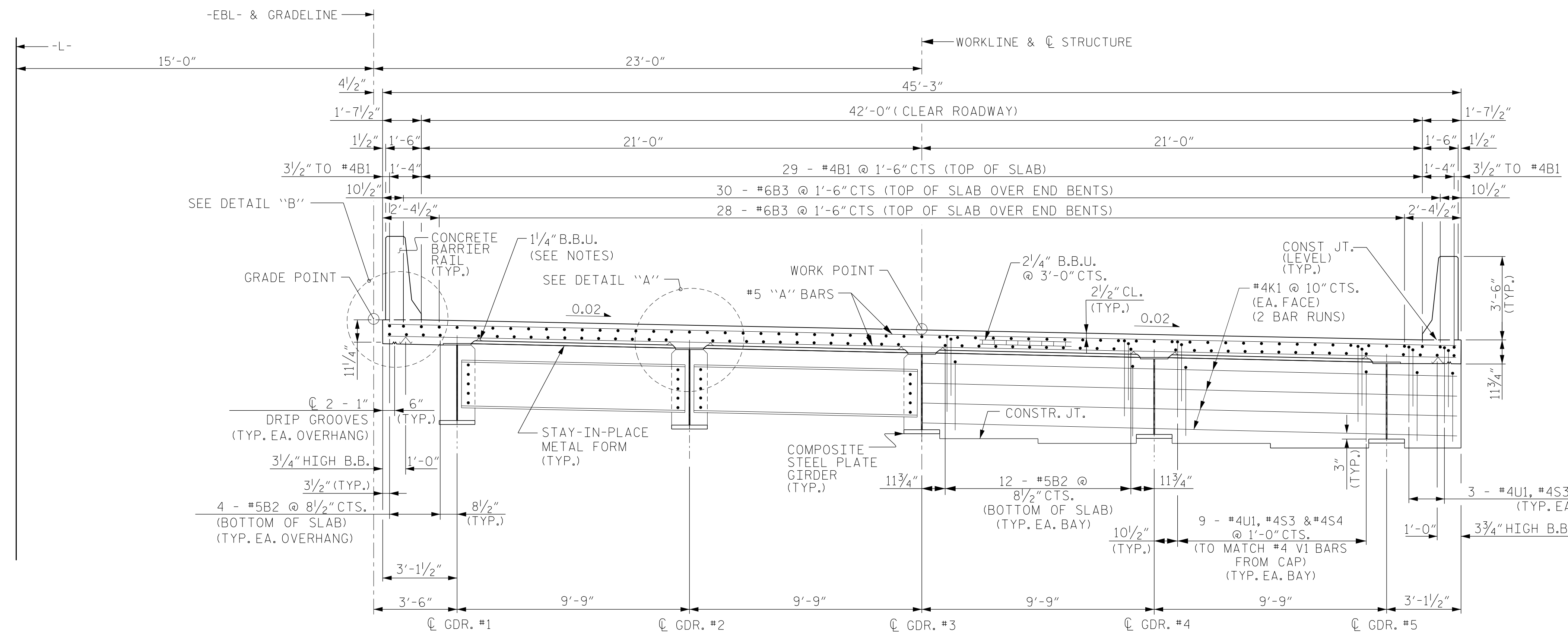
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

LRFR SUMMARY FOR
 STEEL GIRDERS
 (INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			24

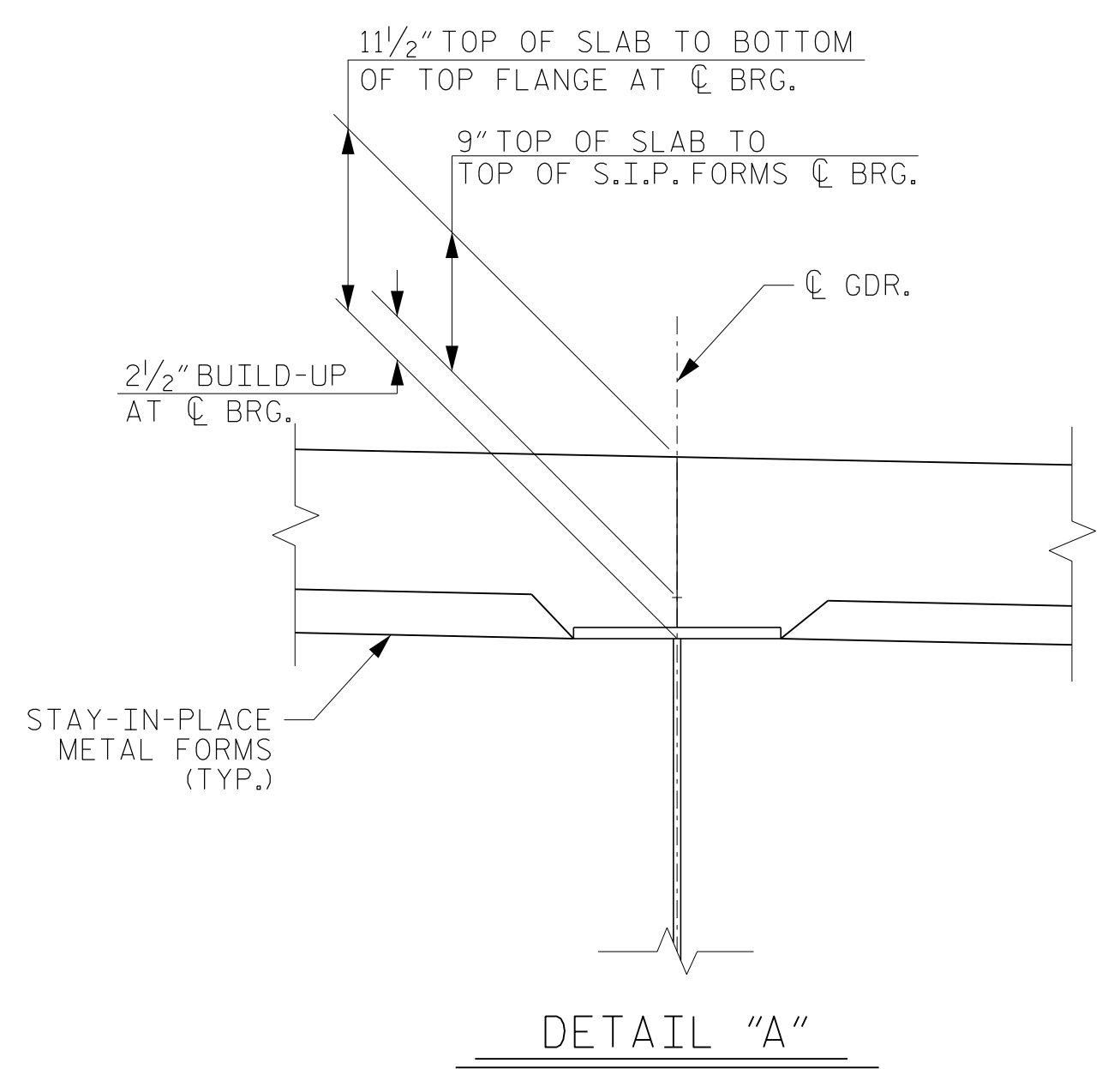
NOTES

1. PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
2. SPAN A IS TO BE CONSTRUCTED AS A SIMPLE SPAN COMPOSITE PLATE GIRDER WITH AASHTO M270 GRADE 50W STEEL AND INTEGRAL END BENTS.

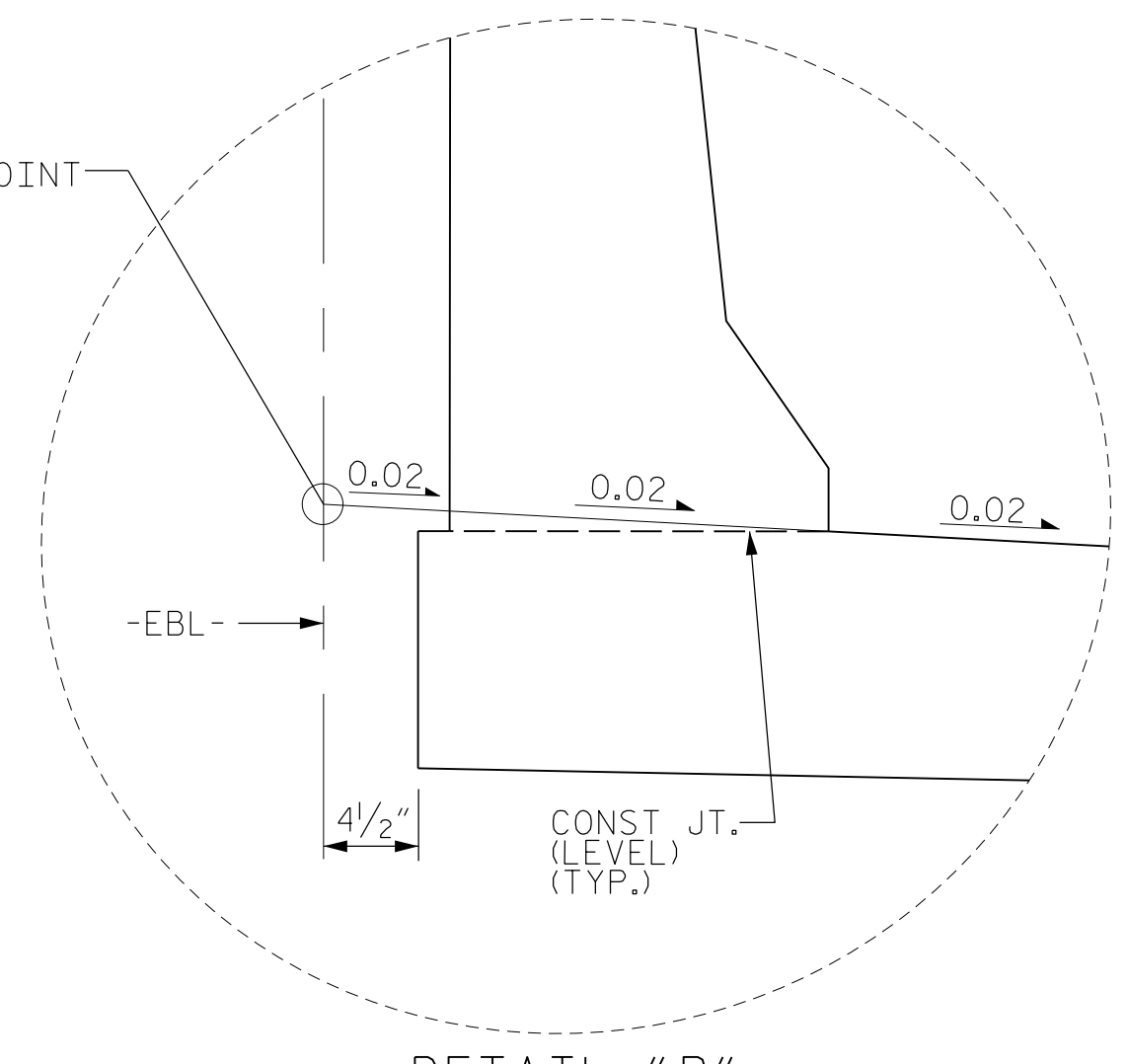


TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION
SHOWING END-BENT DIAPHRAGMS



DETAIL "A"



DETAIL "B"

PROJECT NO. B-4448
BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 SHEET 1 OF 2

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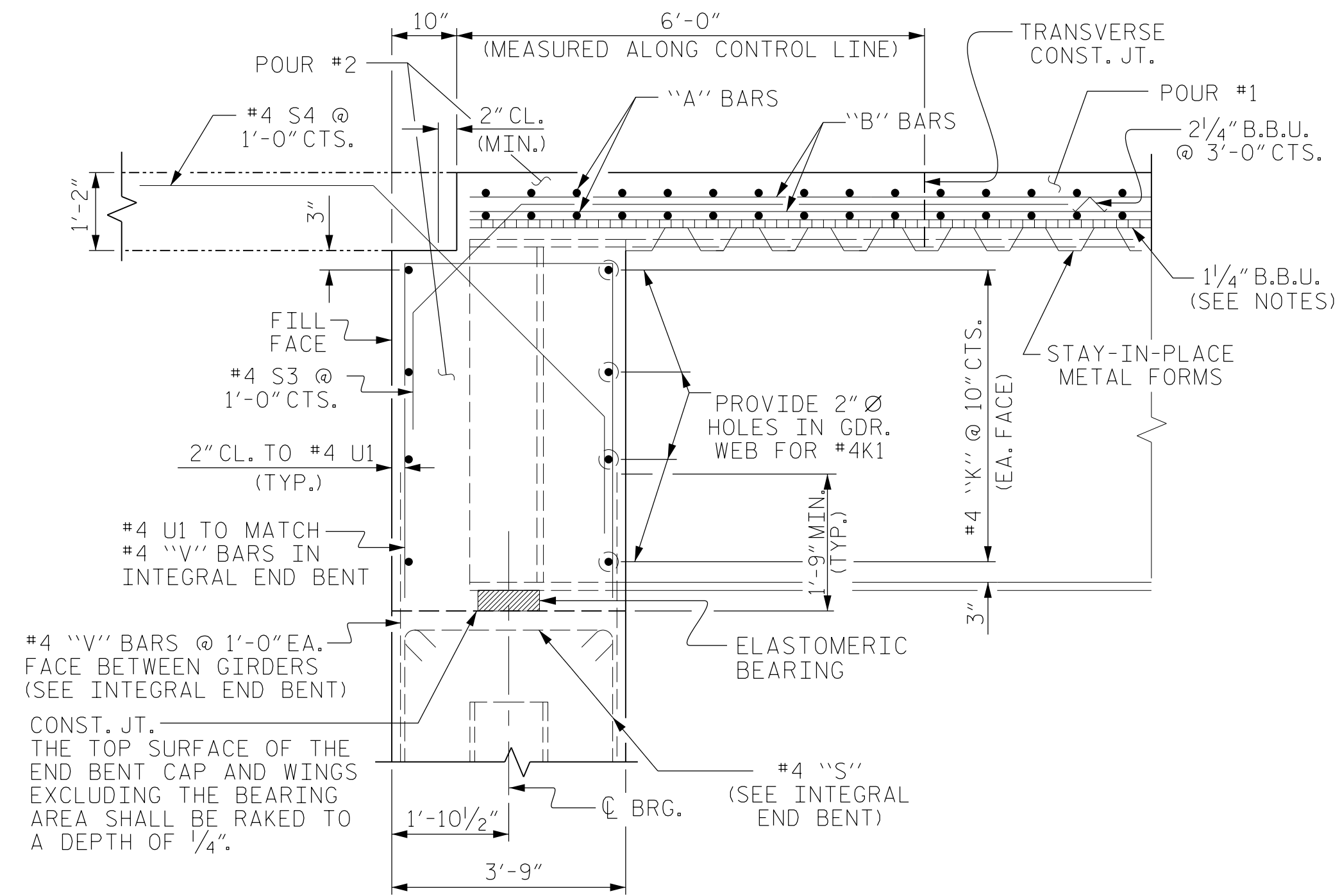
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

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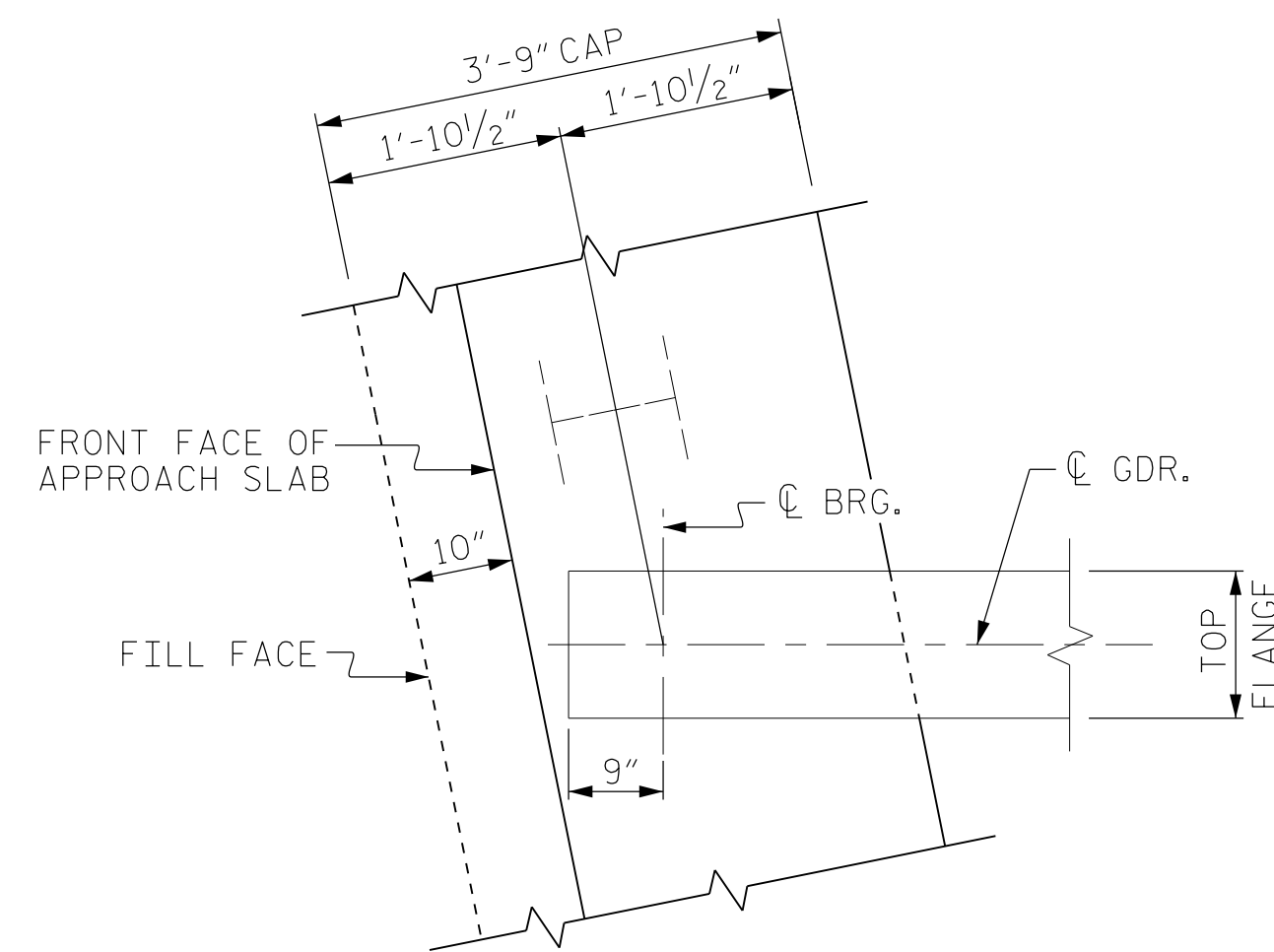
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			24

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 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18



END OF GIRDER DETAIL AT INTEGRAL END BENT



PLAN OF GIRDER AT INTEGRAL END BENT #1
PLAN OF GIRDER AT INTEGRAL END No. 2 IS SIMILAR

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STATION: 28+45.42 -EBL- POT

SHEET 2 OF 2

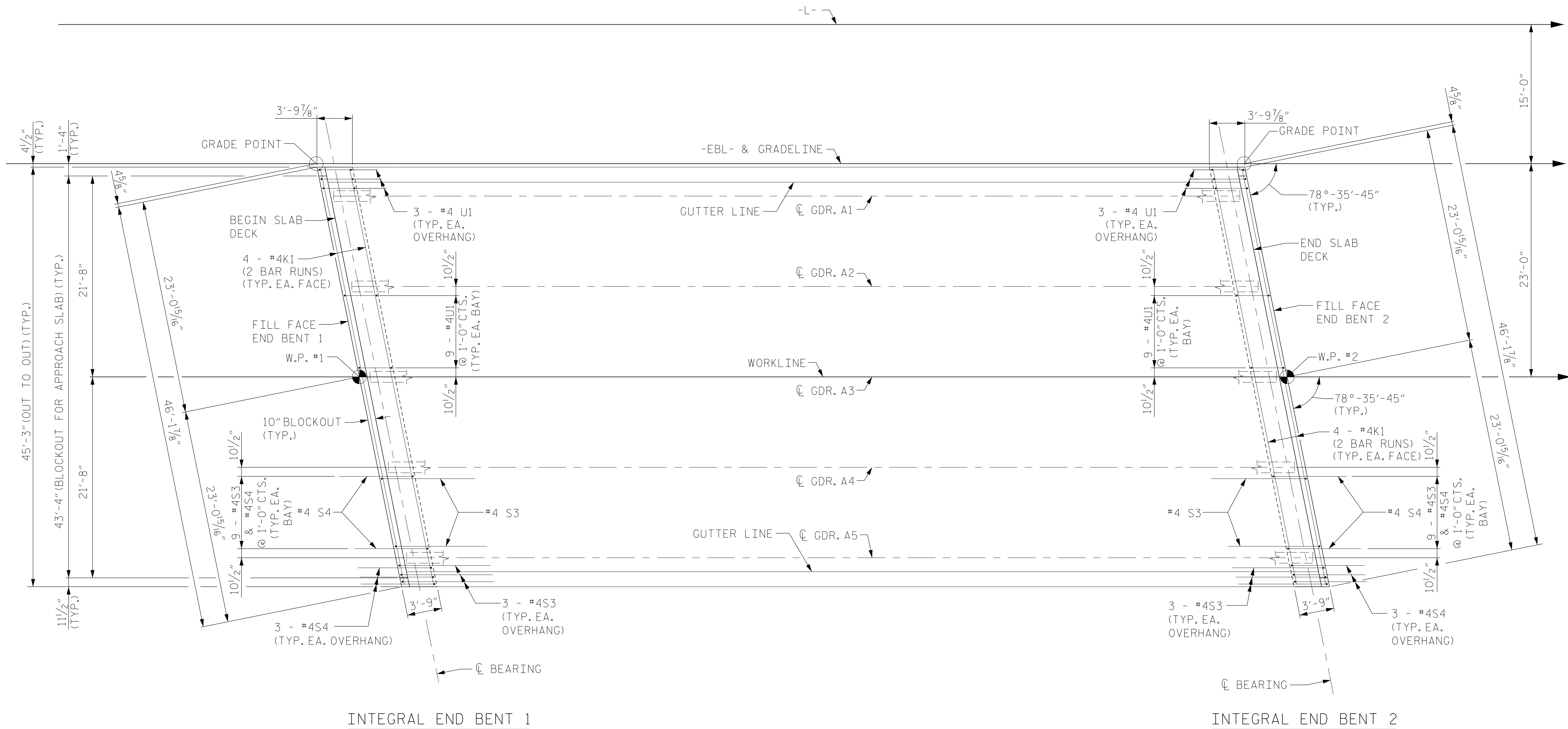
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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			24

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PLAN OF ABUTMENT WALLS

PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+45.42 -EBL- POT

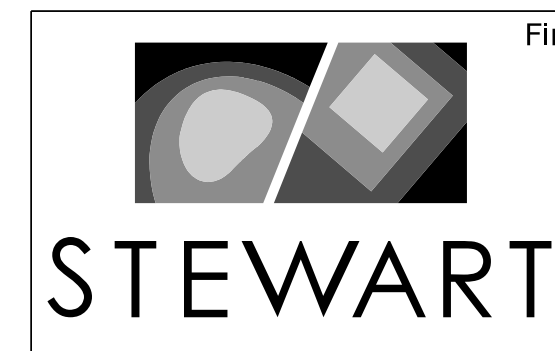
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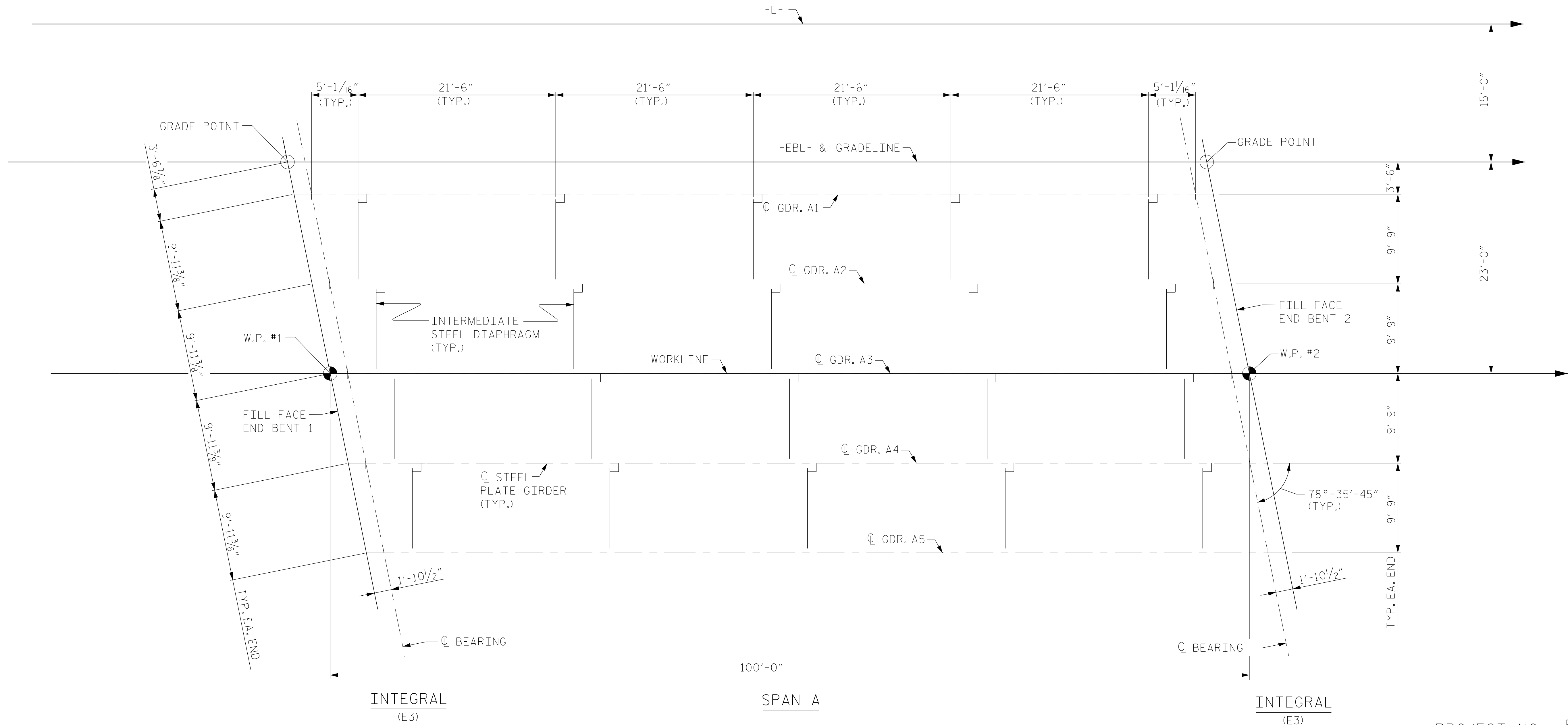
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			24

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FRAMING PLAN

PROJECT NO. B-4448
BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 SHEET 3 OF 3

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 FEESID002679448



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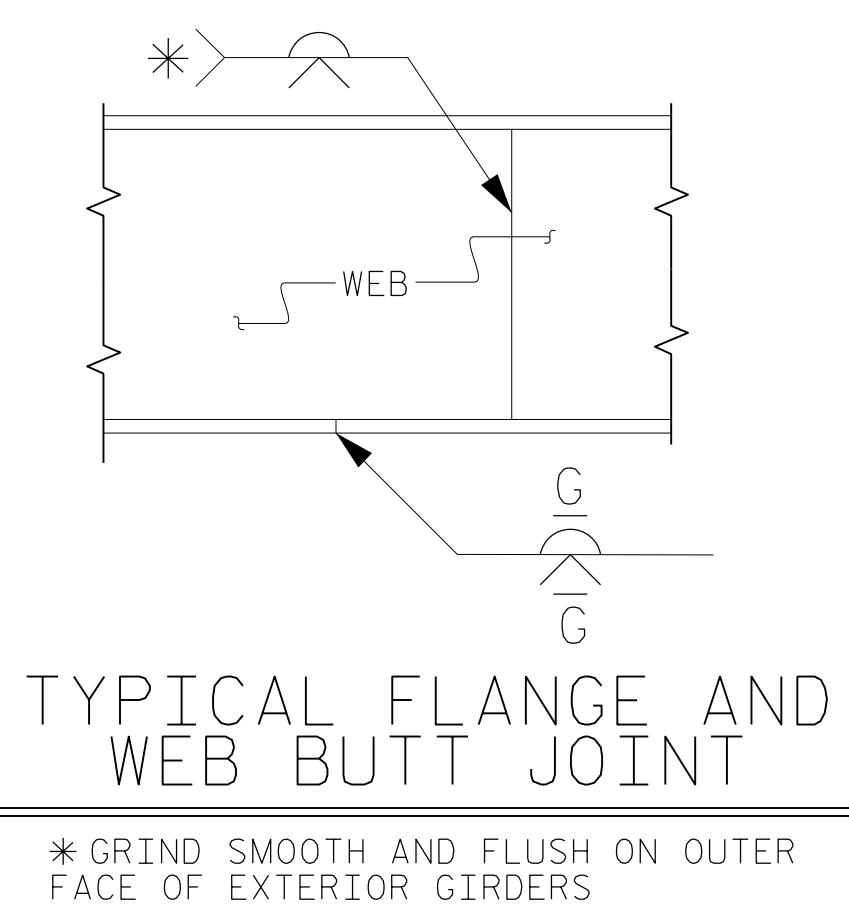
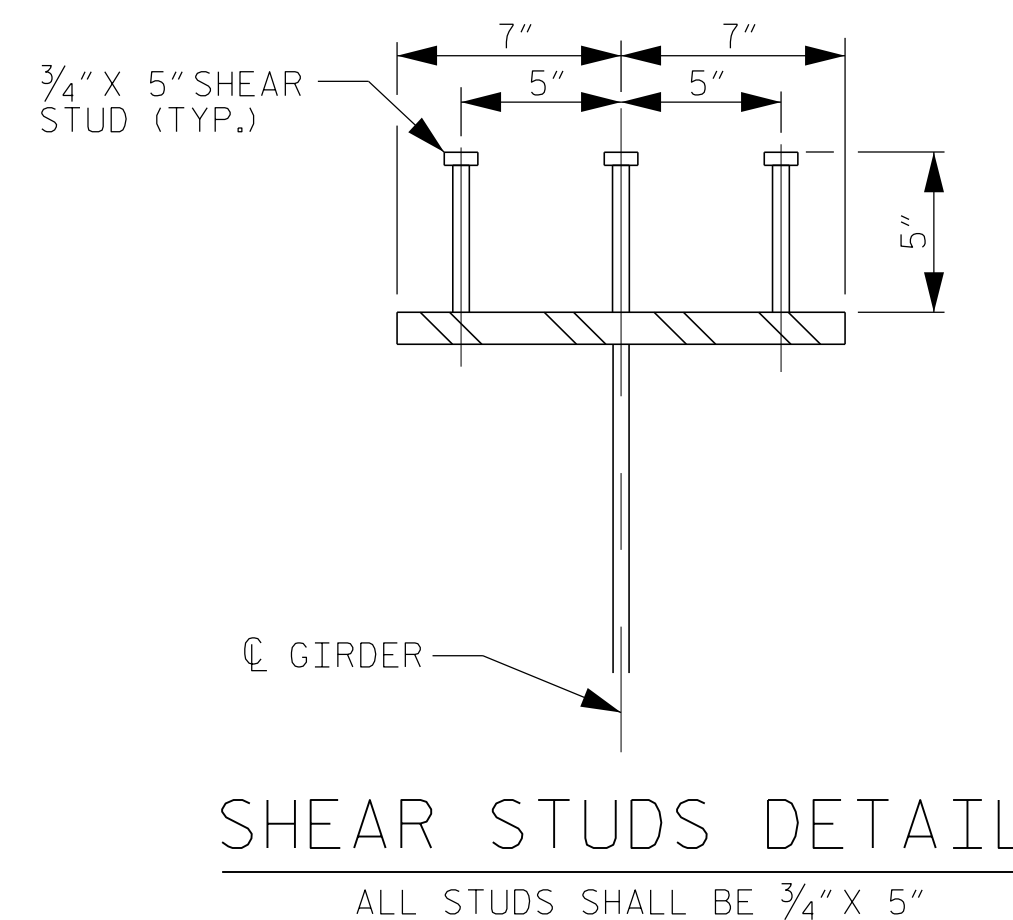
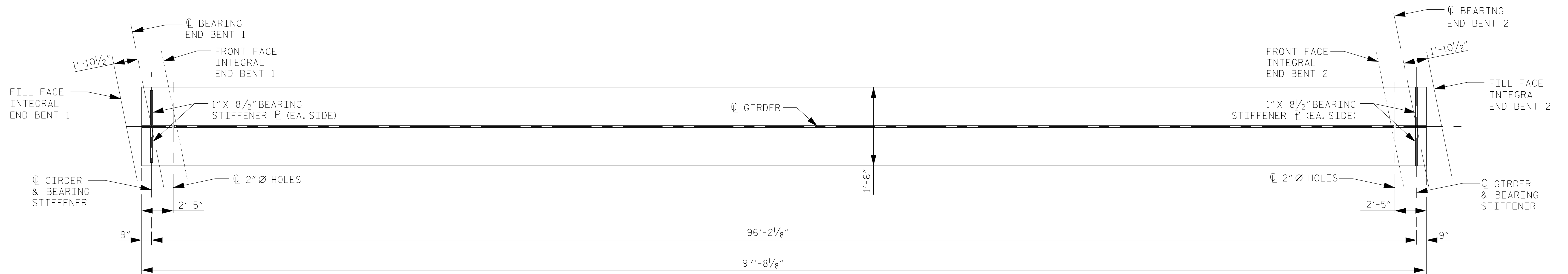
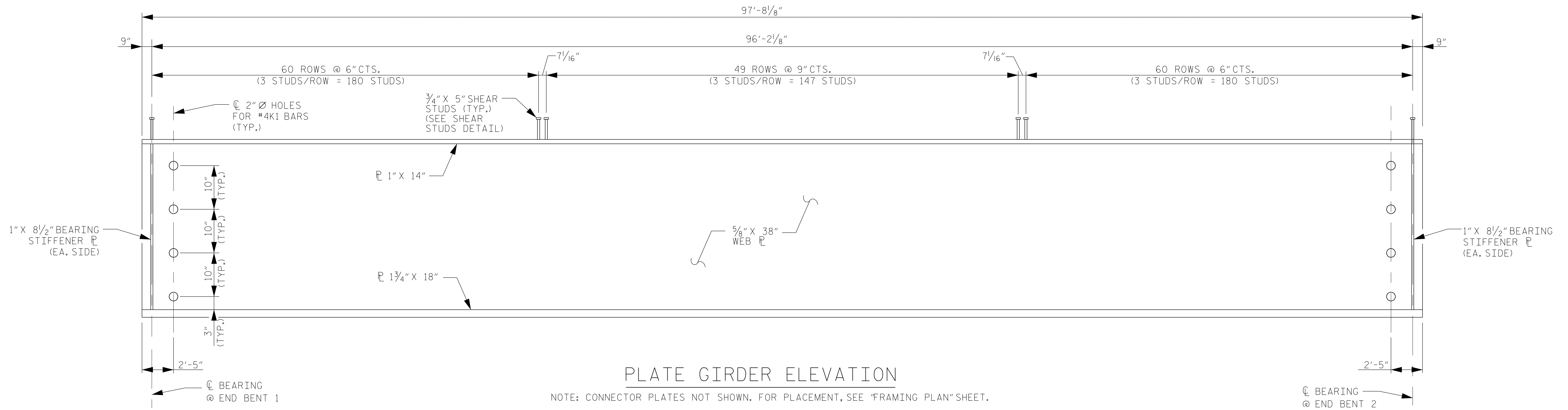
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STATE OF NORTH CAROLINA
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 SUPERSTRUCTURE
 FRAMING PLAN

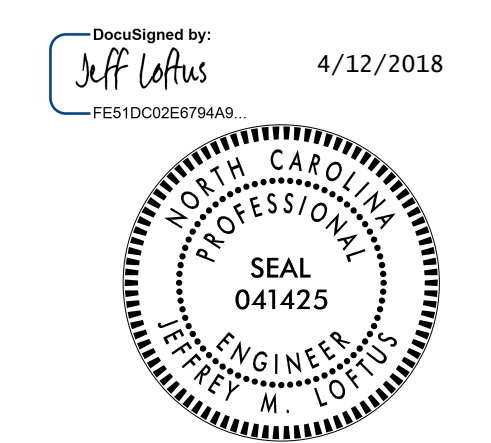
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-9
1			3			TOTAL SHEETS
2			4			24

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 ...\\402_017_B4448_SMU_SUP03_S2_9.dgn
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PROJECT NO. B-4448
BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 SHEET 1 OF 2



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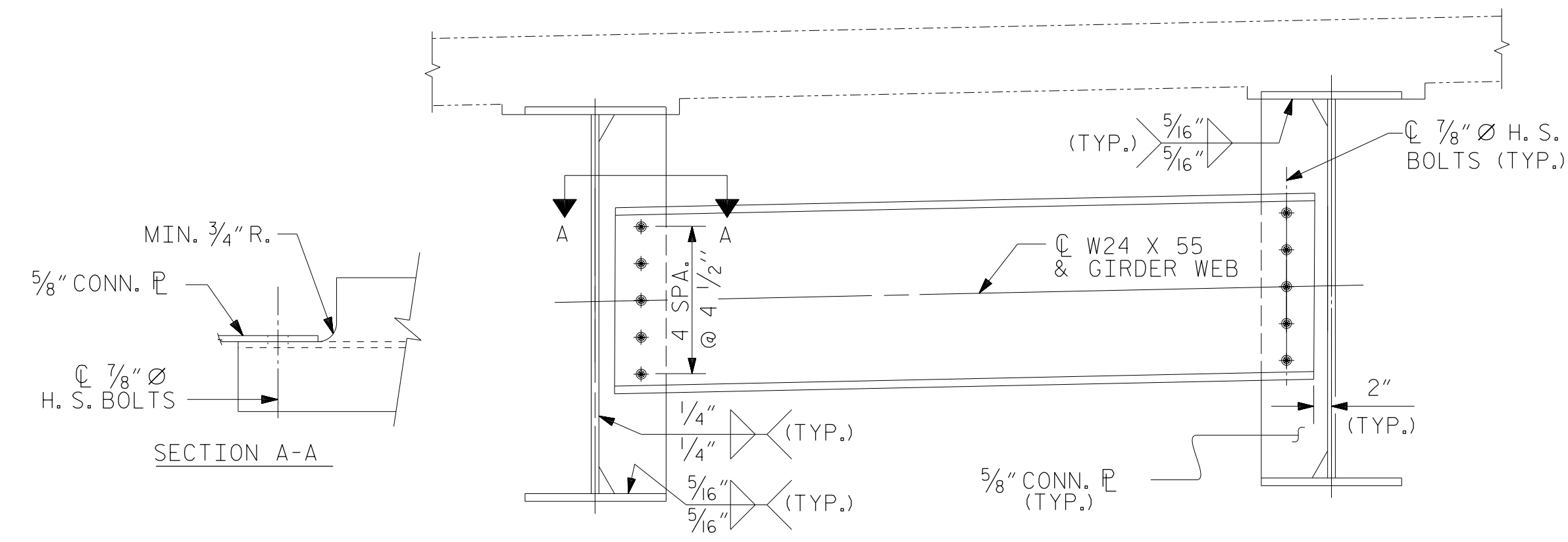
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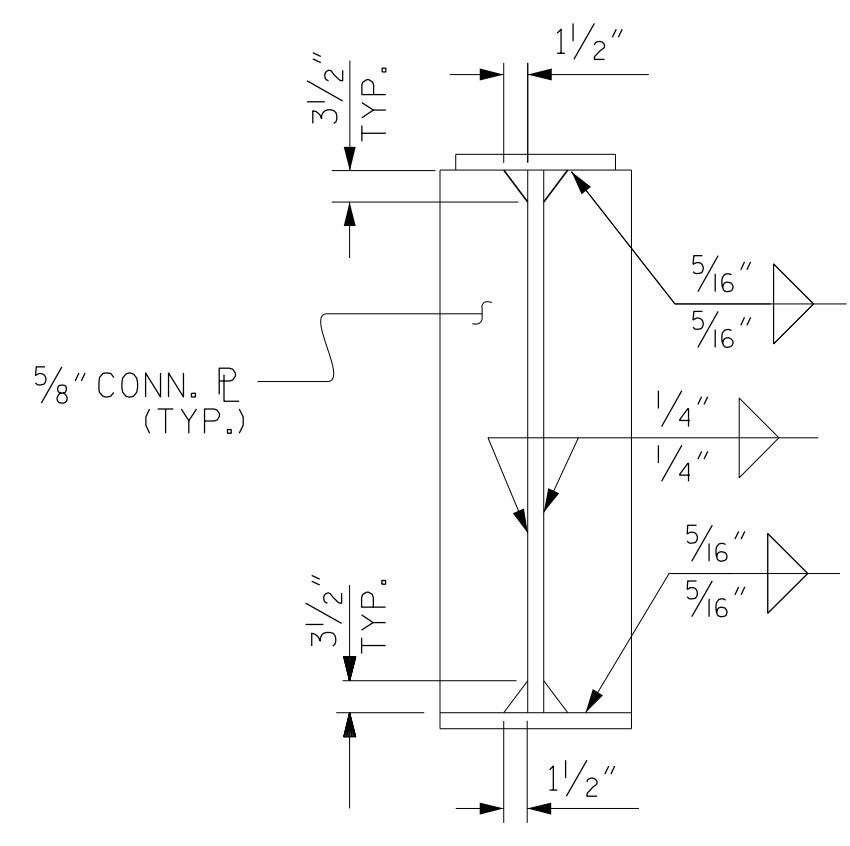
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STEEL PLATE GIRDER DETAILS					
SHEET NO. S2-10					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 24

4/12/2018
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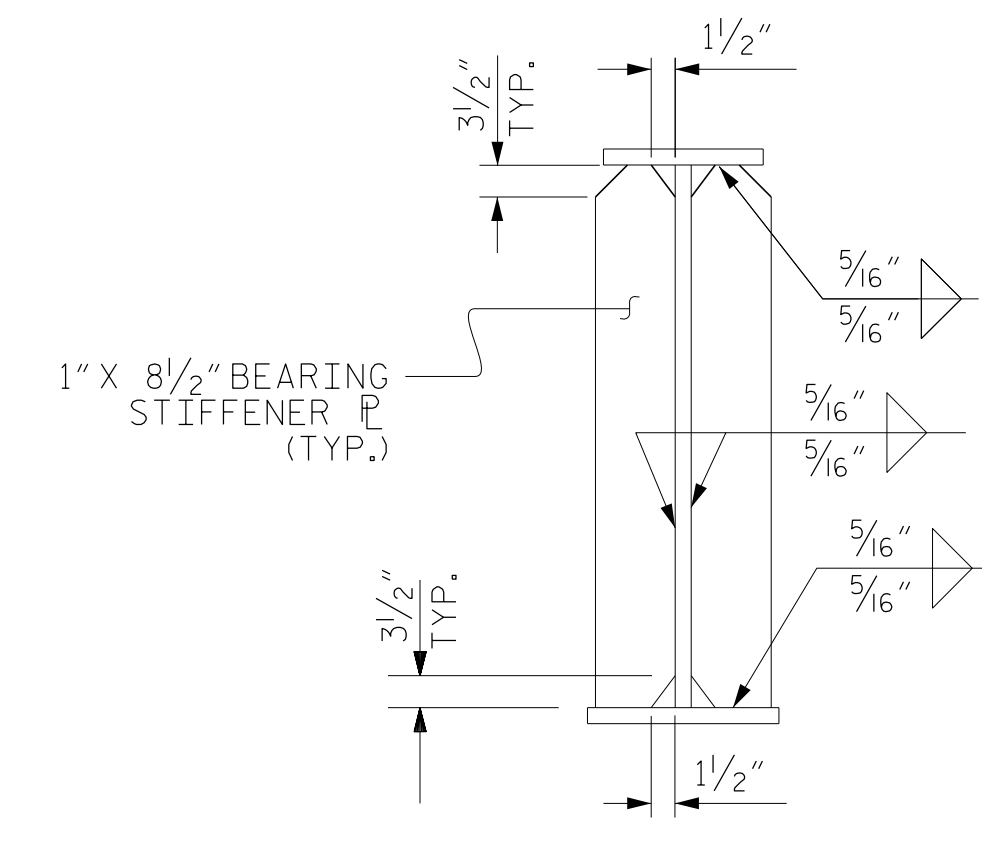
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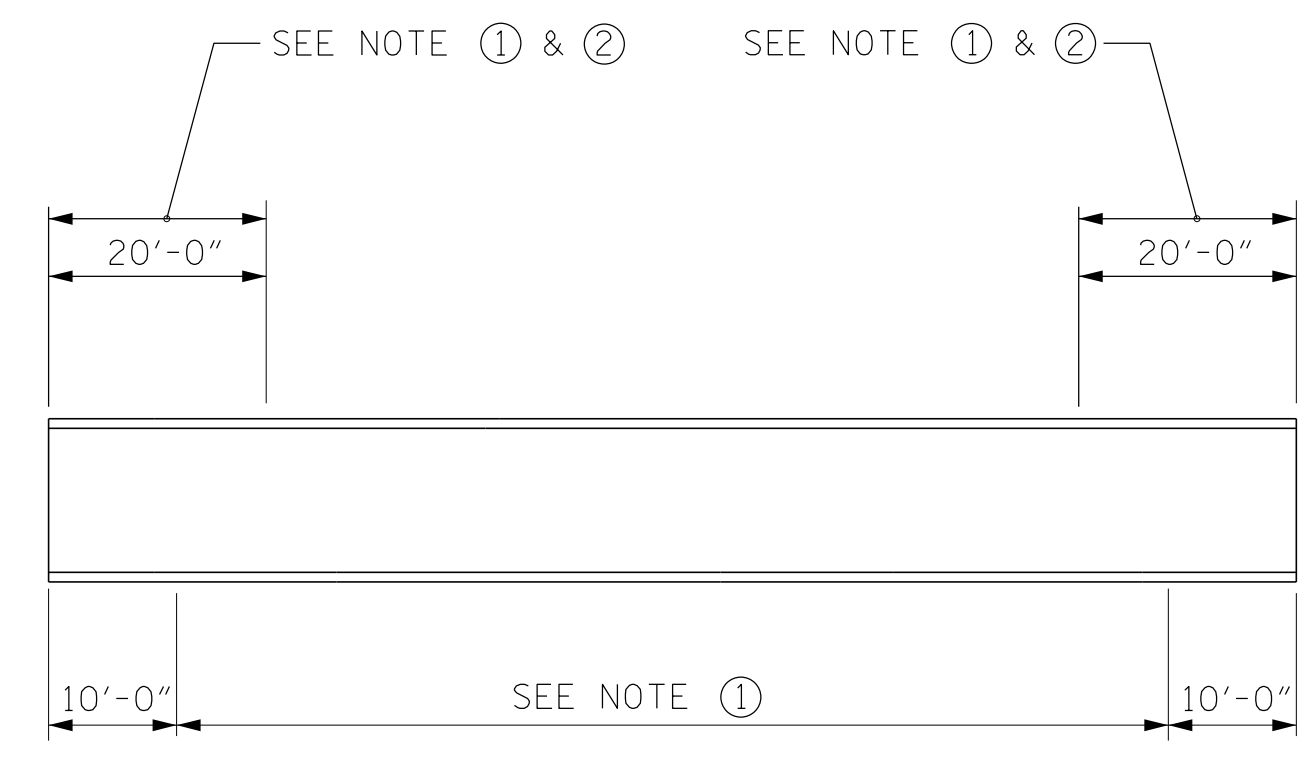
INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE



BEARING STIFFENER

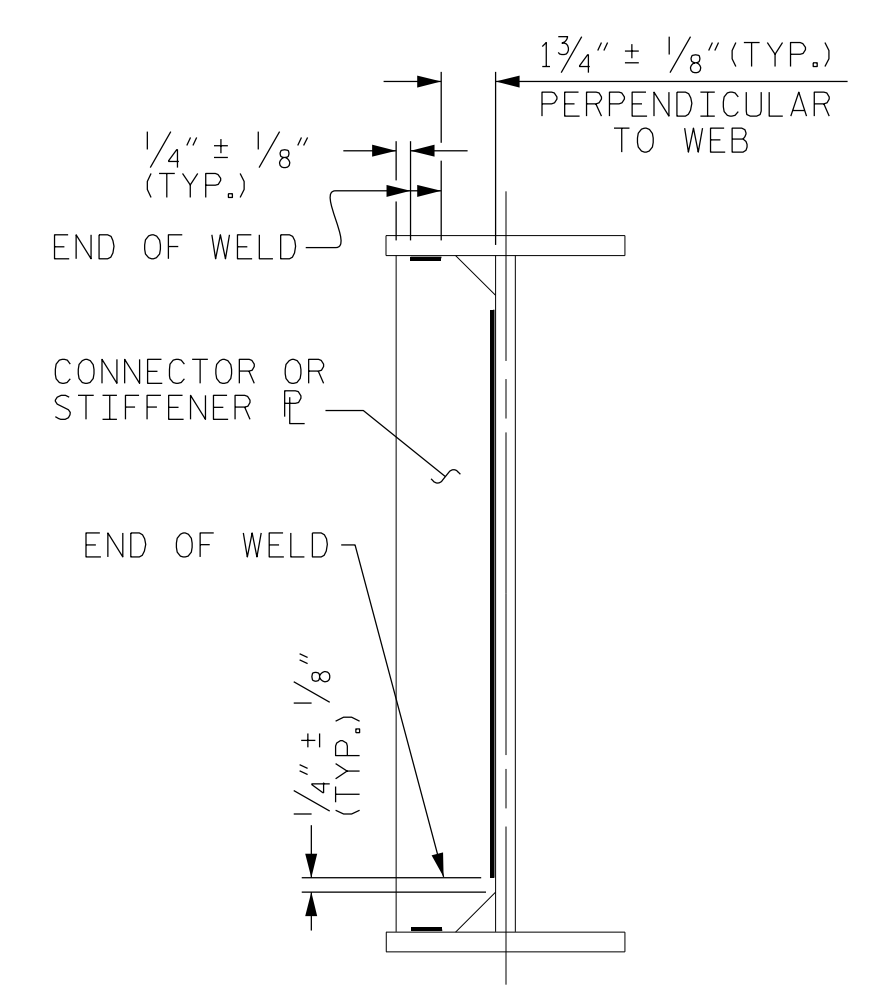


GIRDER MAKE UP

NOTE ① : CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR PLATE GIRDERS



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS
WELD TERMINATION DETAILS

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

INTERMEDIATE DIAPHRAGM CONNECTOR PLATES SHALL BE PLACED NORMAL TO THE GIRDER FLANGES AND WEB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELDS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

END OF GIRDERS SHALL BE PLUMB.

ALL FIELD CONNECTIONS TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS AND CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

PROJECT NO. B-4448

BURKE COUNTY

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SHEET 2 OF 2

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUPERSTRUCTURE
STEEL PLATE GIRDER
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS 24
2			4			

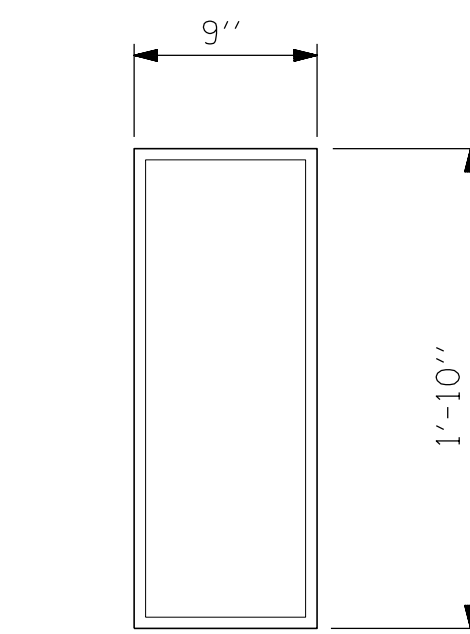
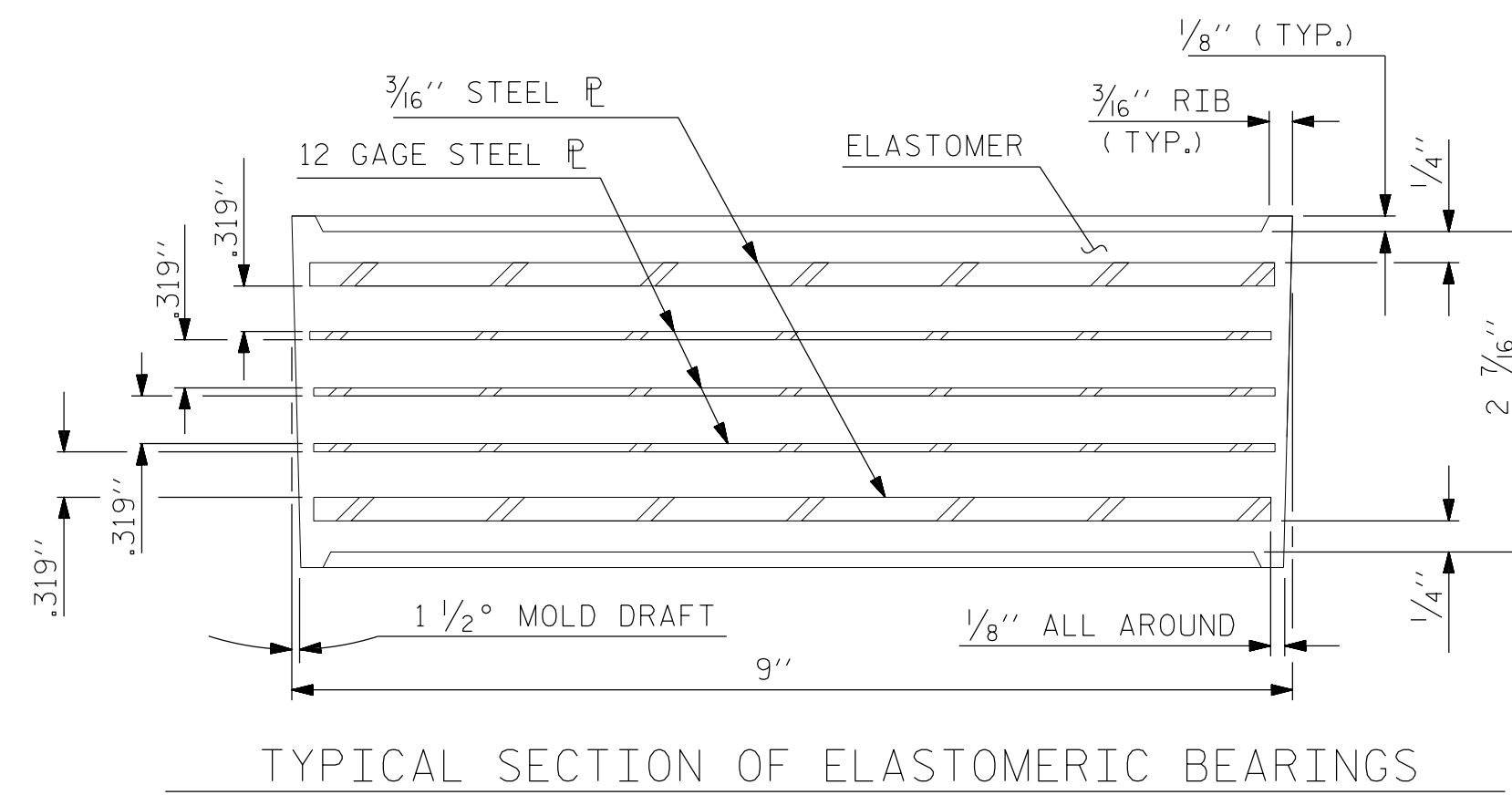
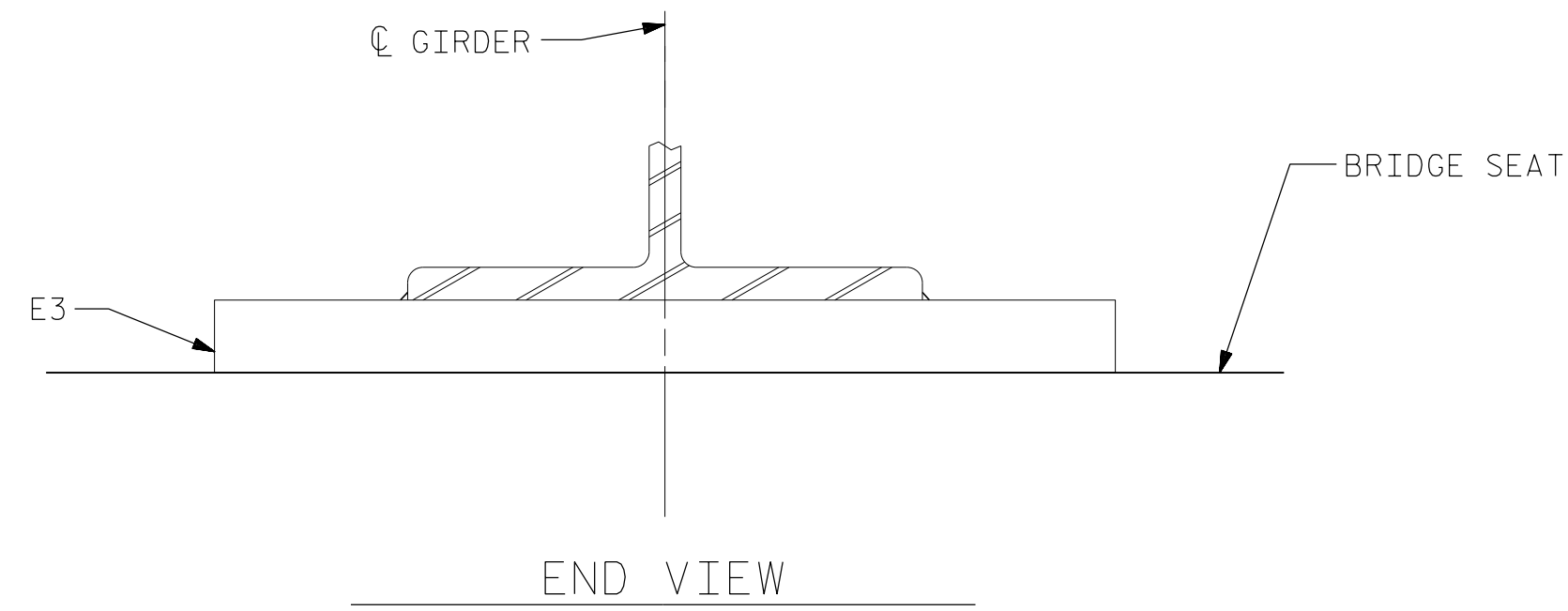
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DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

NOTES

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



E3 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING
TYPE II

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	180 k

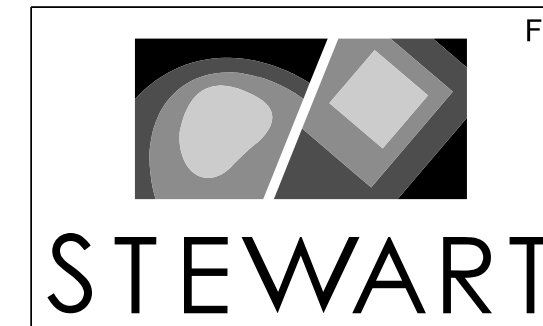
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
ELASTOMERIC BEARING
DETAILS
(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			24

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...\\402-023-B4448-SML-BRG01-S2-12.dgn
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A1 & A5										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.086	0.183	0.251	0.294	0.308	0.294	0.251	0.183	0.086	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.010	0.019	0.027	0.031	0.033	0.031	0.027	0.019	0.010	0
TOTAL DEAD LOAD DEFLECTION	0	0.121	0.249	0.342	0.400	0.420	0.400	0.342	0.249	0.121	0
REQUIRED CAMBER	0	1 7/16"	3"	4 1/8"	4 3/16"	5 1/16"	4 3/16"	4 1/8"	3"	1 7/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A2 & A4										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.109	0.207	0.284	0.333	0.349	0.333	0.284	0.207	0.109	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.007	0.013	0.018	0.021	0.022	0.021	0.018	0.013	0.007	0
TOTAL DEAD LOAD DEFLECTION	0	0.141	0.267	0.366	0.429	0.450	0.429	0.366	0.267	0.141	0
REQUIRED CAMBER	0	1 11/16"	3 3/16"	4 3/8"	5 1/8"	5 3/8"	5 1/8"	4 3/8"	3 3/16"	1 11/16"	0

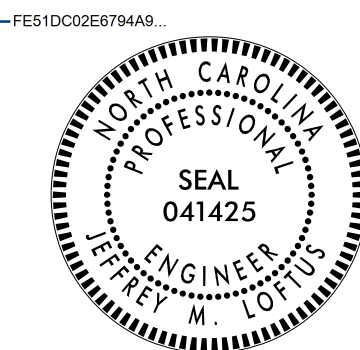
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
TENTH POINTS	SPAN A										
	GIRDER A3										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.025	0.047	0.064	0.075	0.079	0.075	0.064	0.047	0.025	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.109	0.207	0.284	0.333	0.349	0.333	0.284	0.207	0.109	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.010	0.014	0.022	0.027	0.030	0.027	0.022	0.014	0.010	0
TOTAL DEAD LOAD DEFLECTION	0	0.144	0.268	0.370	0.435	0.458	0.435	0.370	0.268	0.144	0
REQUIRED CAMBER	0	1 3/4"	3 3/16"	4 7/16"	5 1/4"	5 1/2"	5 1/4"	4 7/16"	3 3/16"	1 3/4"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

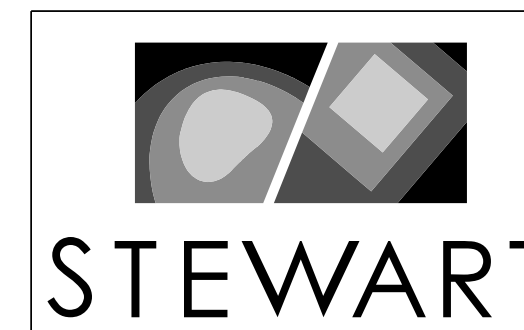
PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT

DocuSigned by:
Jeff Loftus
FES1DC02E6794A0 4/12/2018



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE DEAD LOAD DEFLECTION TABLES					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 24
					S2-13

4/12/2018
... \402_025_B4448_SML_DEF01_S2-13.dgn
USER: jloftus

DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

NOTES

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

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.)

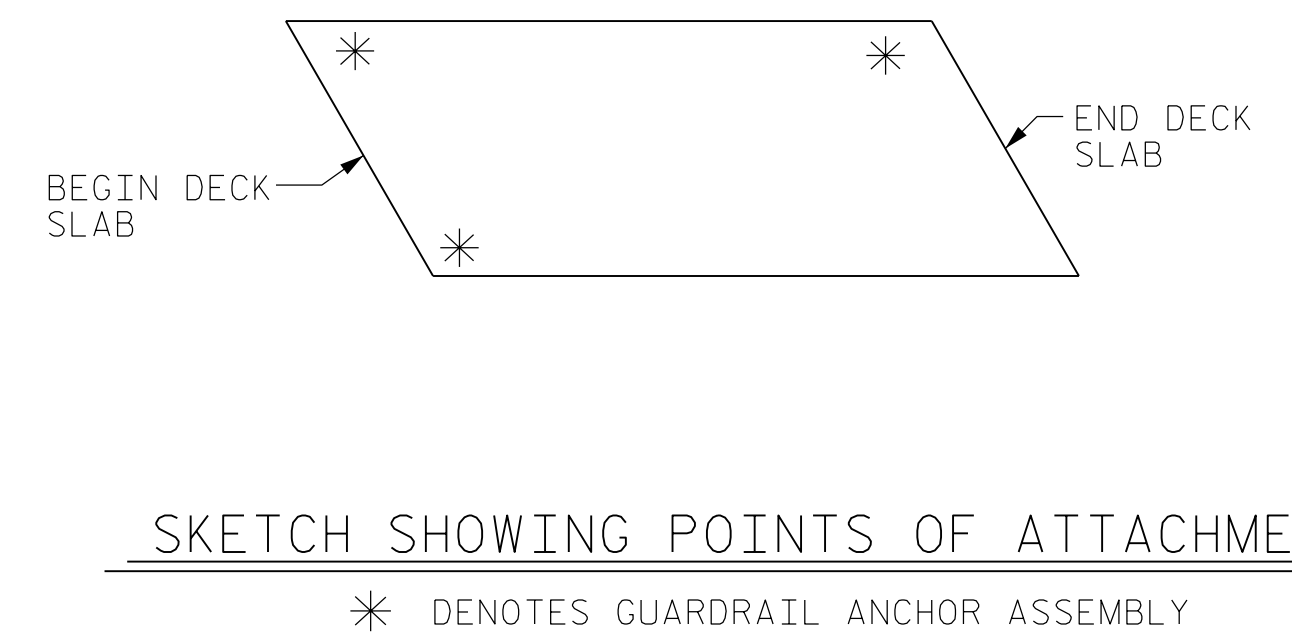
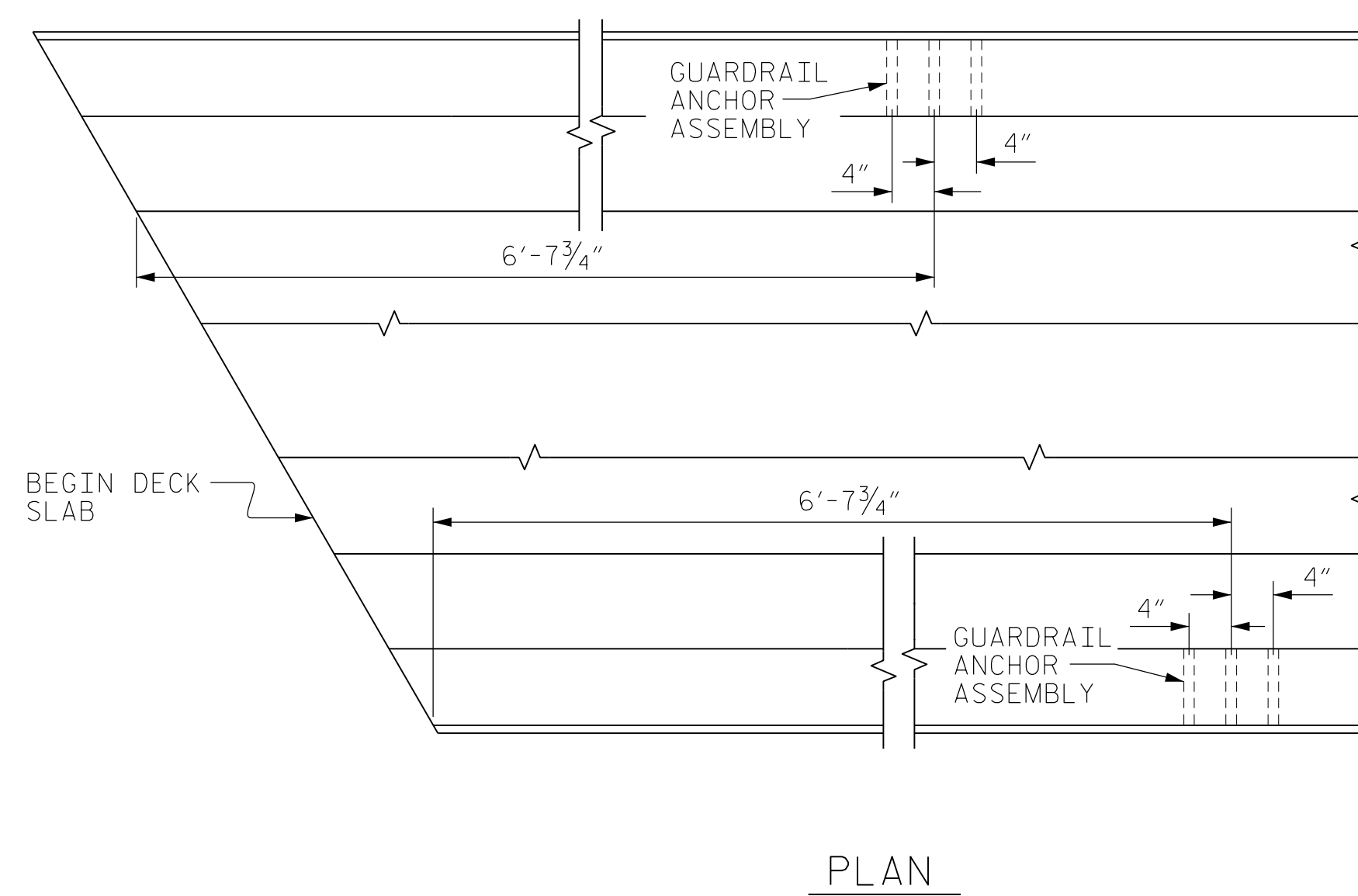
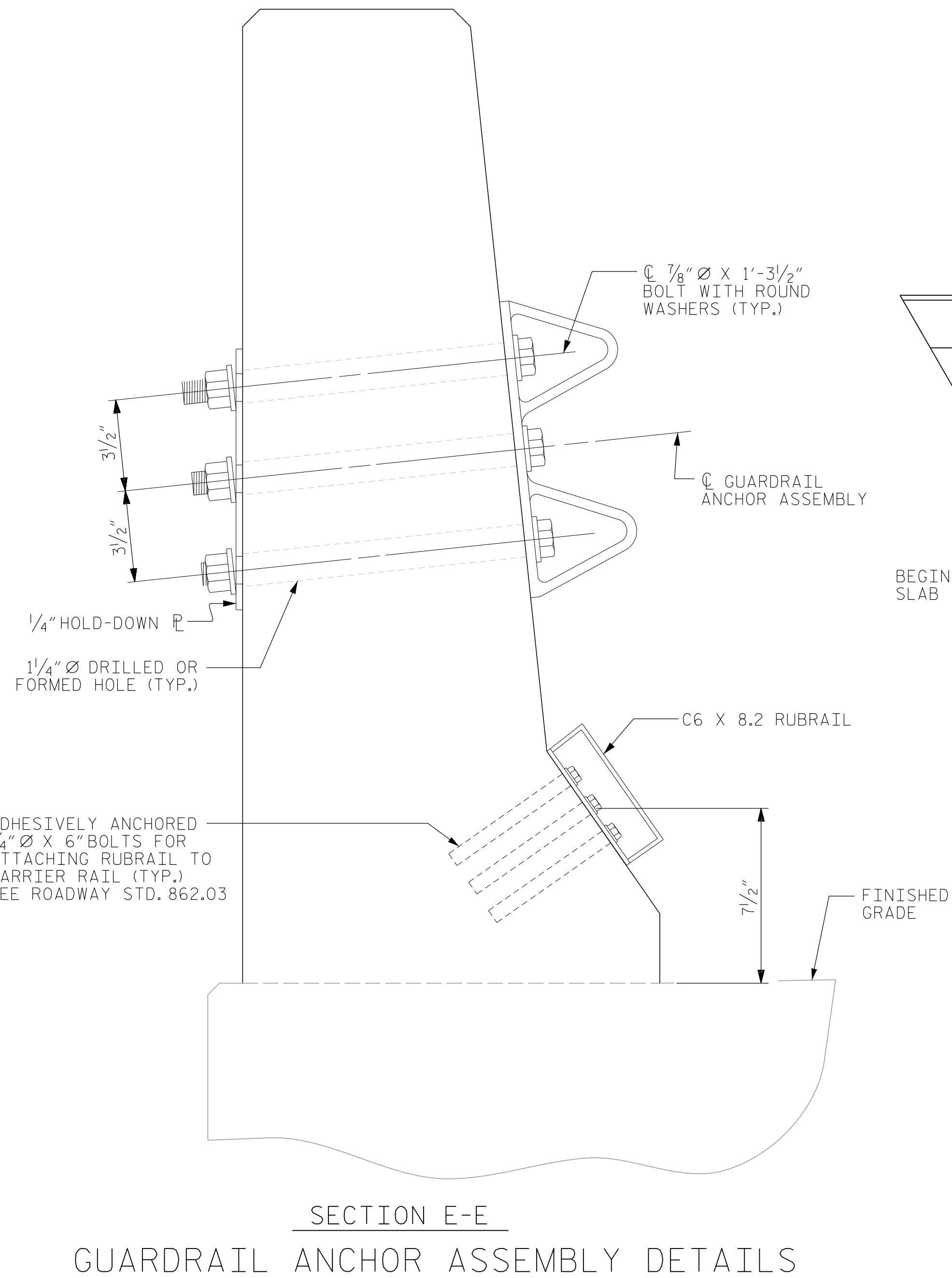
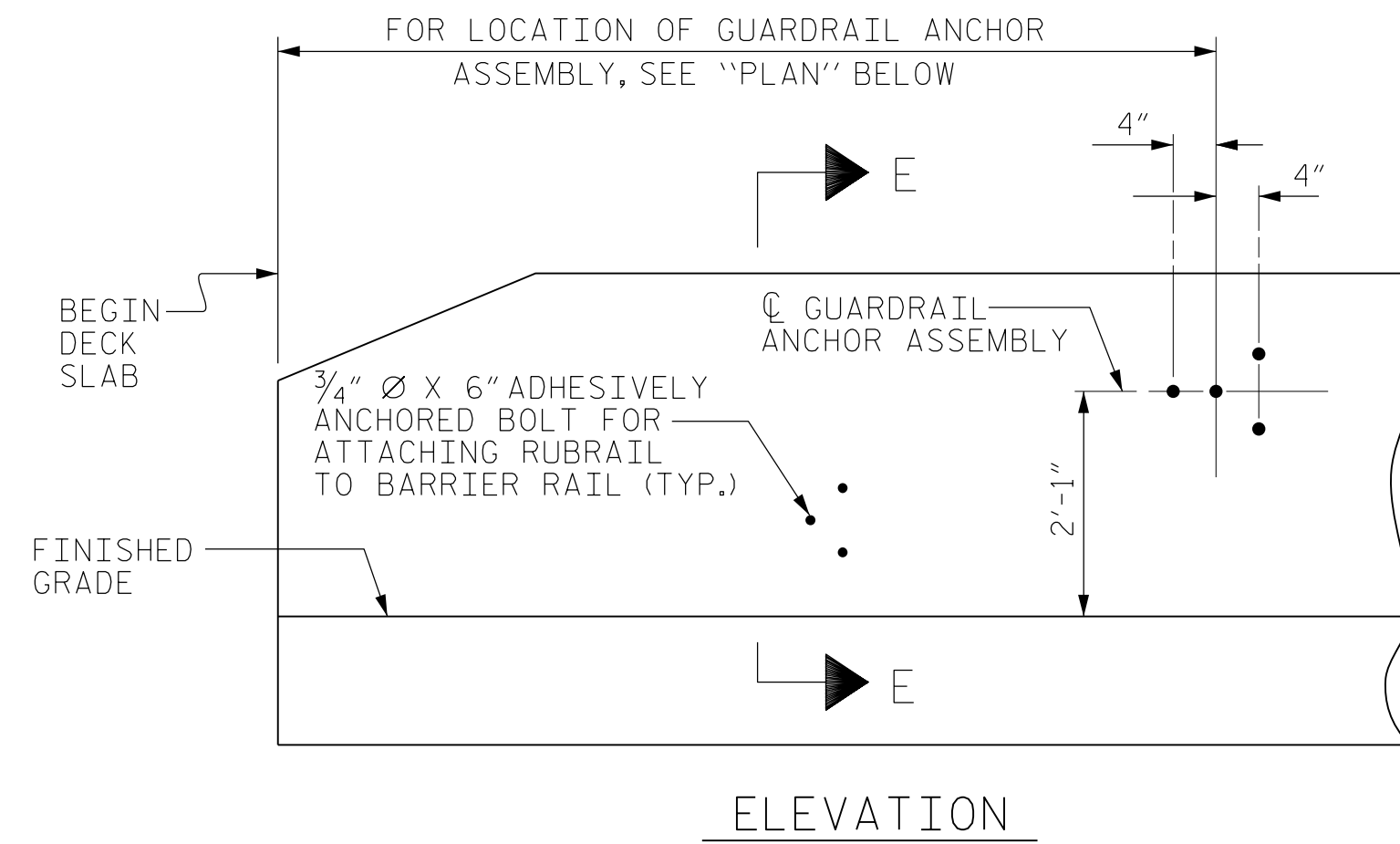
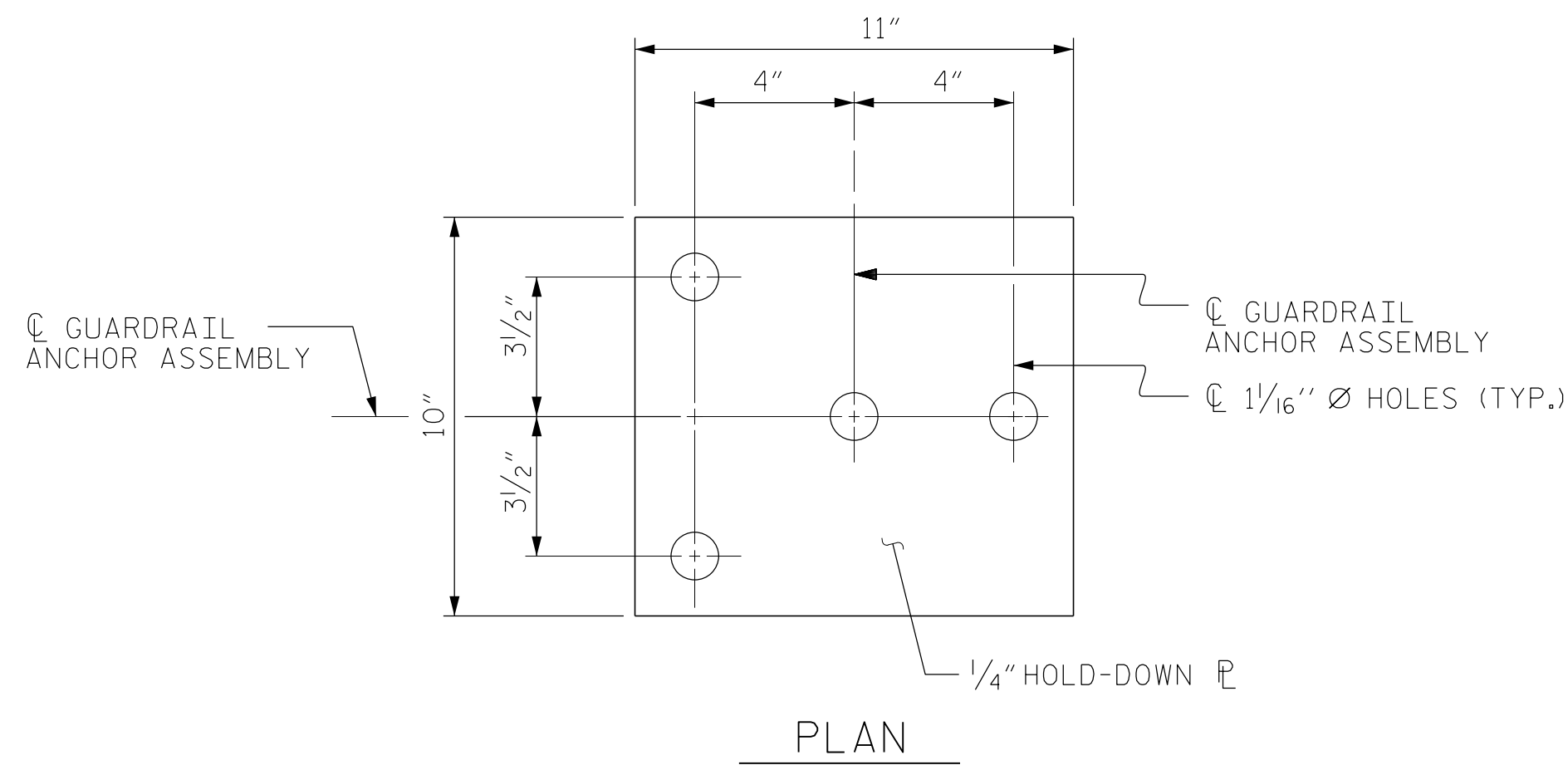
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 CONCRETE BARRIER RAIL.

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

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

PROJECT NO. B-4448
 BURKE COUNTY
 STATION: 28+45.42 -EBL- POT

SHEET 2 OF 2

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 4/12/2018

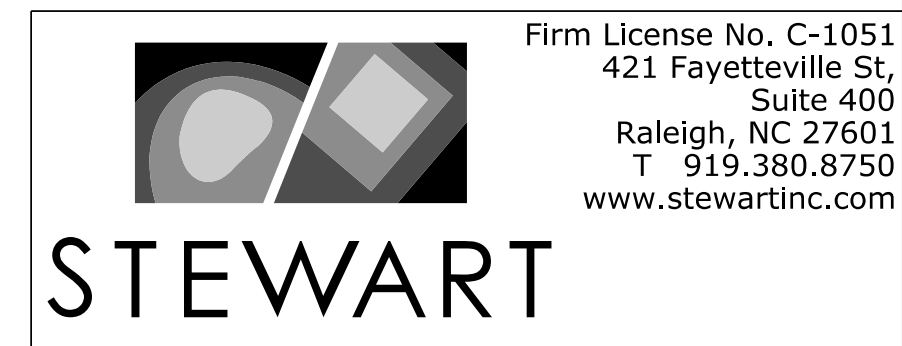


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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			24

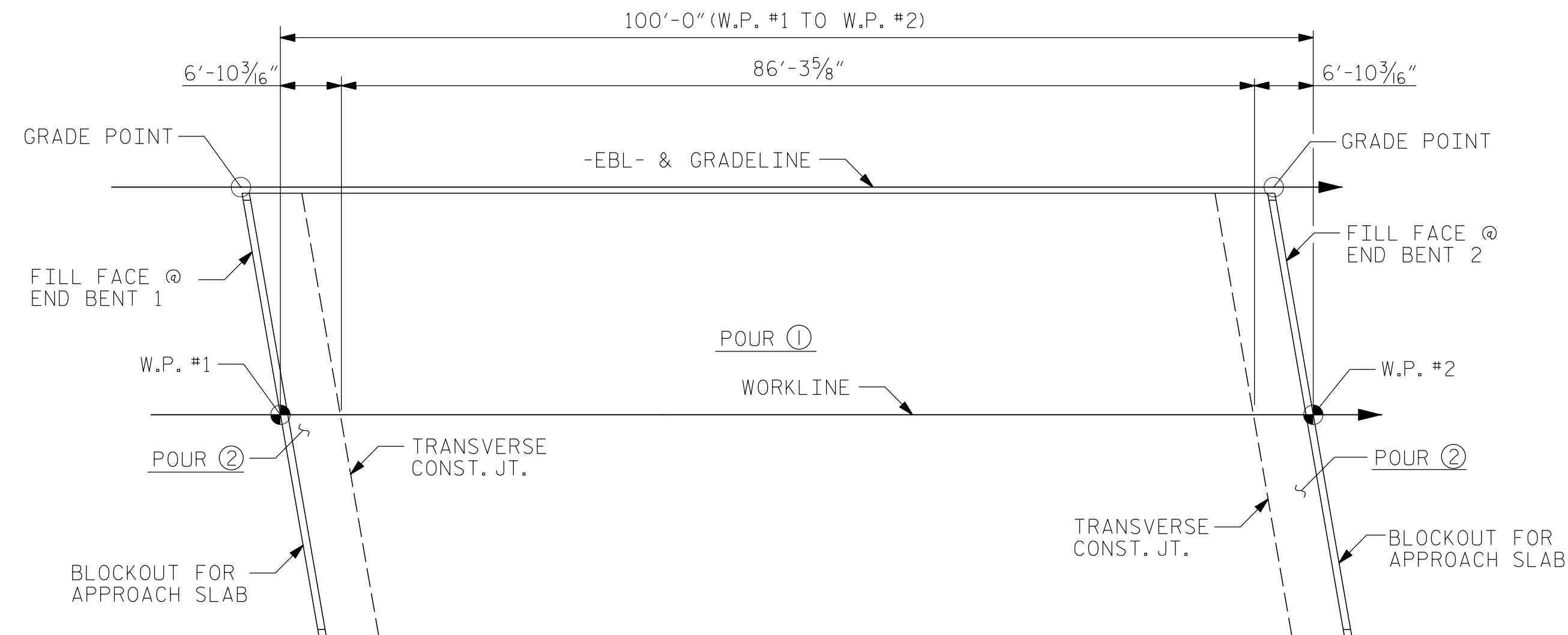


(SHT 1a) STD. NO. GRA2

4/12/2018
 ...V402_029_B4448_SML_CBR02_S2-15.dgn
 USER: jloftus

DRAWN BY: J. LOFTUS DATE: 05-17
 CHECKED BY: D. RUGGLES DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

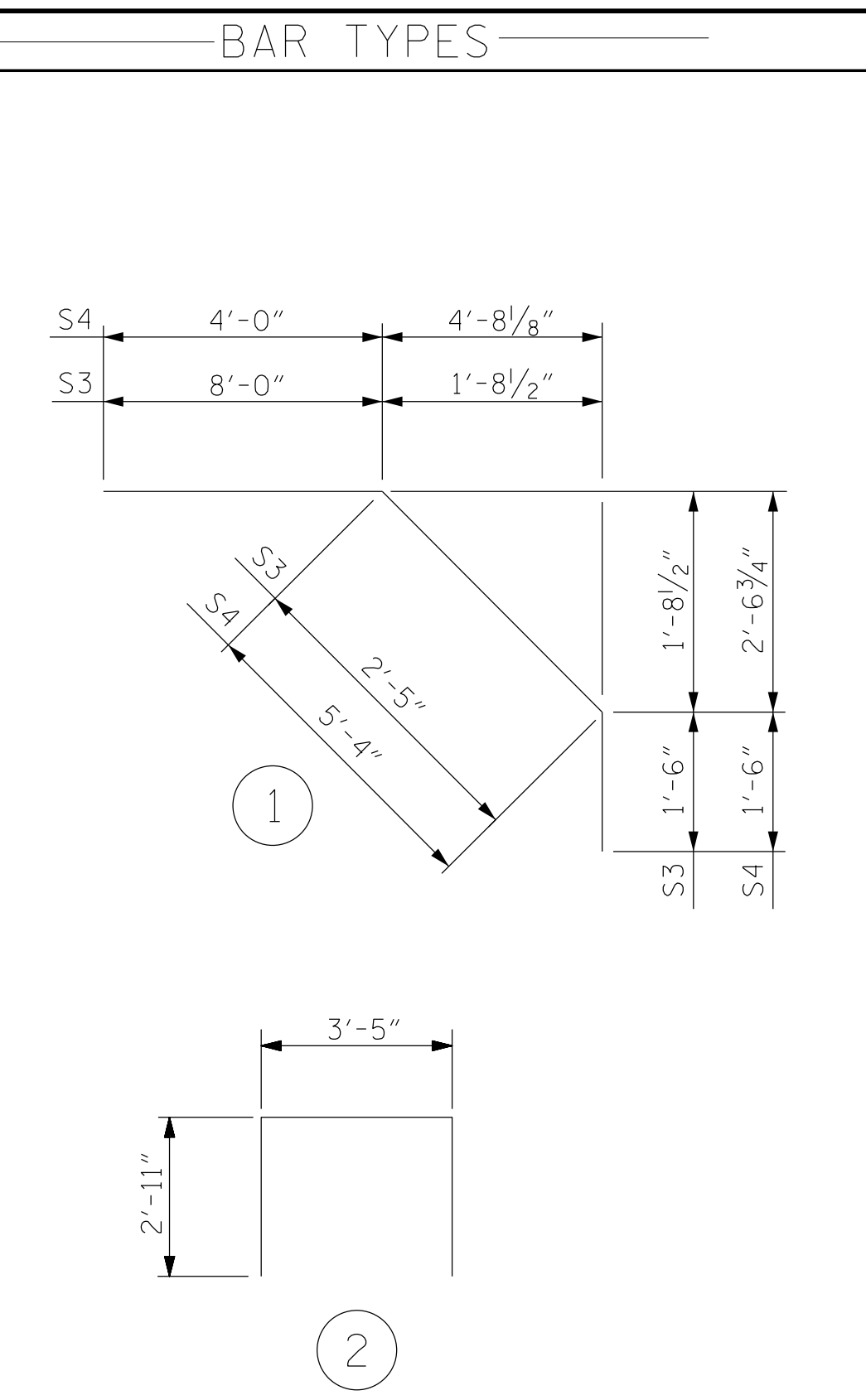
SECTION E-E
 GUARDRAIL ANCHOR ASSEMBLY DETAILS



POURING SEQUENCE

BILL OF MATERIAL											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	178	#5	STR	44'-11"	8,339	*B1	124	#4	STR	26'-0"	2,154
*A2	2	#5	STR	43'-5"	91	B2	112	#5	STR	50'-1"	5,851
*A3	2	#5	STR	40'-11"	85	*B3	116	#6	STR	20'-0"	3,485
*A4	2	#5	STR	38'-5"	80						
*A5	2	#5	STR	35'-11"	75	K1	32	#4	STR	23'-11"	511
*A6	2	#5	STR	33'-5"	70						
*A7	2	#5	STR	31'-0"	65	*S3	84	#4	1	11'-11"	669
*A8	2	#5	STR	28'-6"	59	*S4	84	#4	1	10'-10"	608
*A9	2	#5	STR	26'-0"	54						
*A10	2	#5	STR	23'-6"	49	U1	84	#4	2	9'-3"	519
*A11	2	#5	STR	21'-1"	44						
*A12	2	#5	STR	18'-7"	39						
*A13	2	#5	STR	16'-1"	34						
*A14	2	#5	STR	13'-7"	28						
*A15	2	#5	STR	11'-2"	23						
*A16	2	#5	STR	8'-8"	18						
*A17	2	#5	STR	6'-2"	13						
*A18	2	#5	STR	3'-8"	8						
A19	178	#5	STR	44'-11"	8,339						
A20	2	#5	STR	43'-5"	91						
A21	2	#5	STR	40'-11"	85						
A22	2	#5	STR	38'-5"	80						
A23	2	#5	STR	35'-11"	75						
A24	2	#5	STR	33'-5"	70						
A25	2	#5	STR	31'-0"	65						
A26	2	#5	STR	28'-6"	59						
A27	2	#5	STR	26'-0"	54						
A28	2	#5	STR	23'-6"	49						
A29	2	#5	STR	21'-1"	44						
A30	2	#5	STR	18'-7"	39						
A31	2	#5	STR	16'-1"	34						
A32	2	#5	STR	13'-7"	28						
A33	2	#5	STR	11'-2"	23						
A34	2	#5	STR	8'-8"	18						
A35	2	#5	STR	6'-2"	13						
A36	2	#5	STR	3'-8"	8						
										REINFORCING STEEL	16,055 LBS.
										* EPOXY COATED REINF. STEEL	16,090 LBS.

* DENOTES EPOXY COATED REINFORCING STEEL



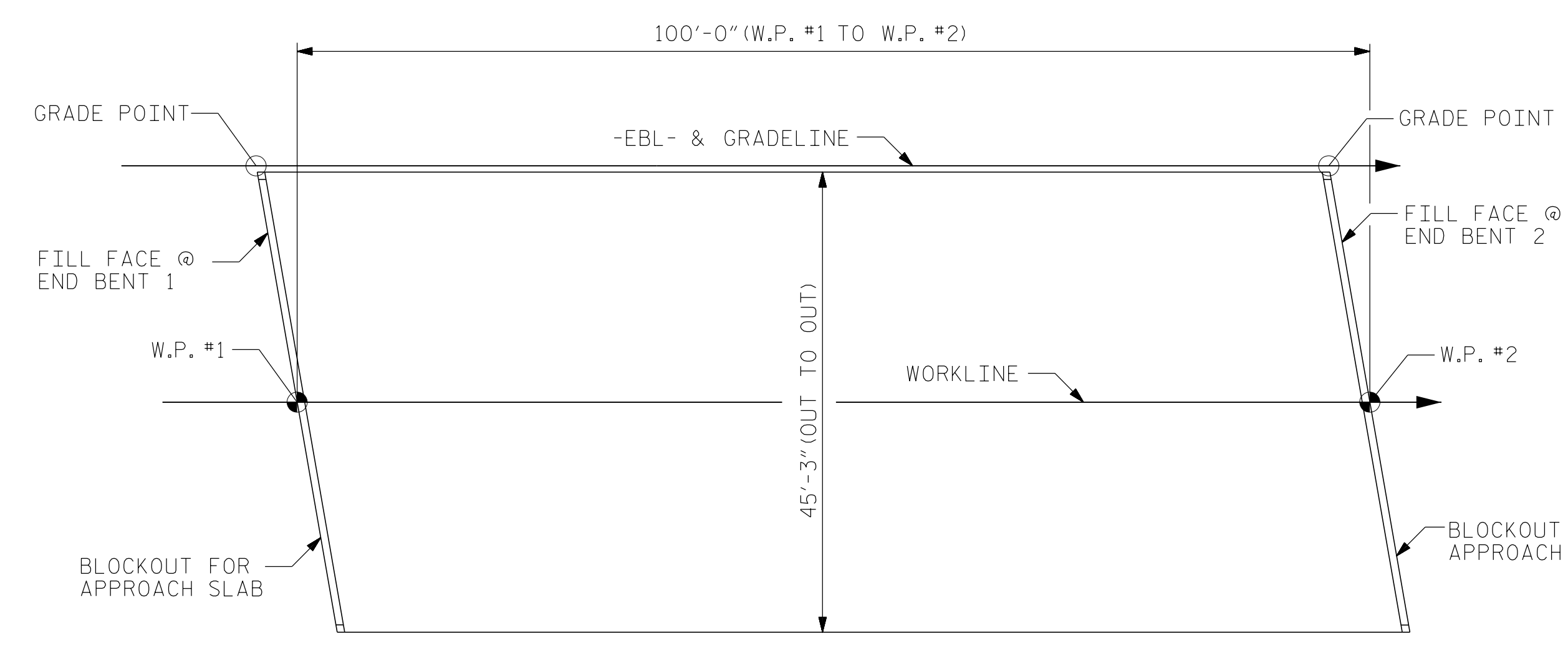
ALL BAR DIMENSIONS ARE OUT TO OUT

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1911 SQ.FT.
BRIDGE DECK	3834 SQ.FT.
TOTAL	5745 SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	122.6		
POUR #2	75.7		
TOTALS*	198.3	16,055	16,090

* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 4,449)

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BURKE COUNTY
STATION: 28+45.42 -EBL- POT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

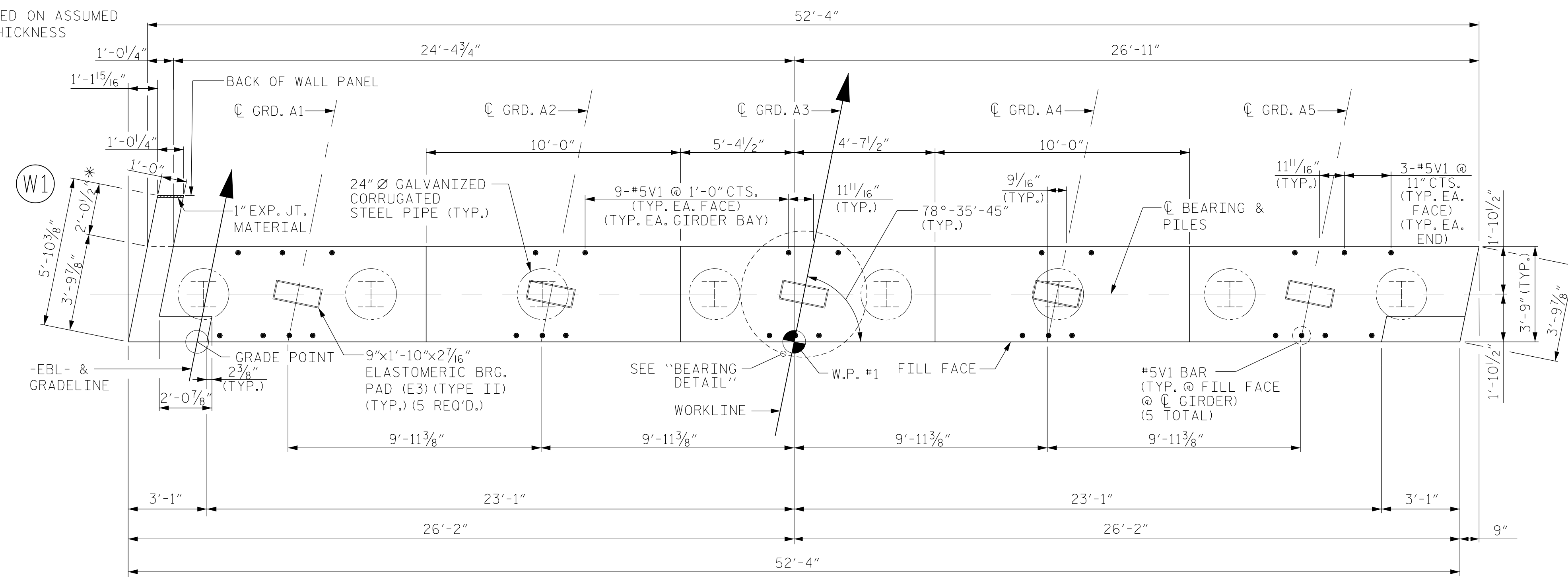
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS 24
2			4			

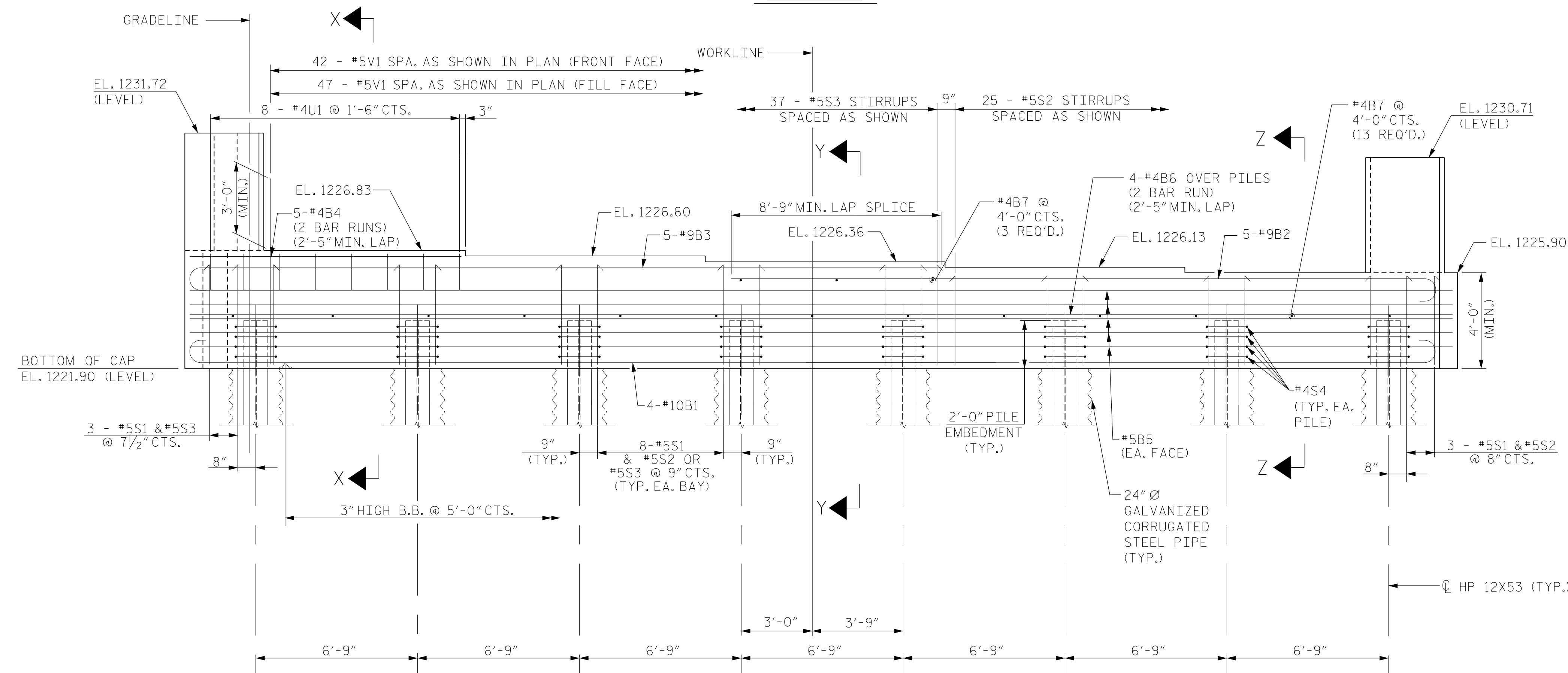
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DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

* DIMENSION BASED ON ASSUMED
1 FT. MSE WALL THICKNESS



PLAN



ELEVATION

FOR SECTIONS X-X, Y-Y & Z-Z, SEE SHEET 4 OF 4

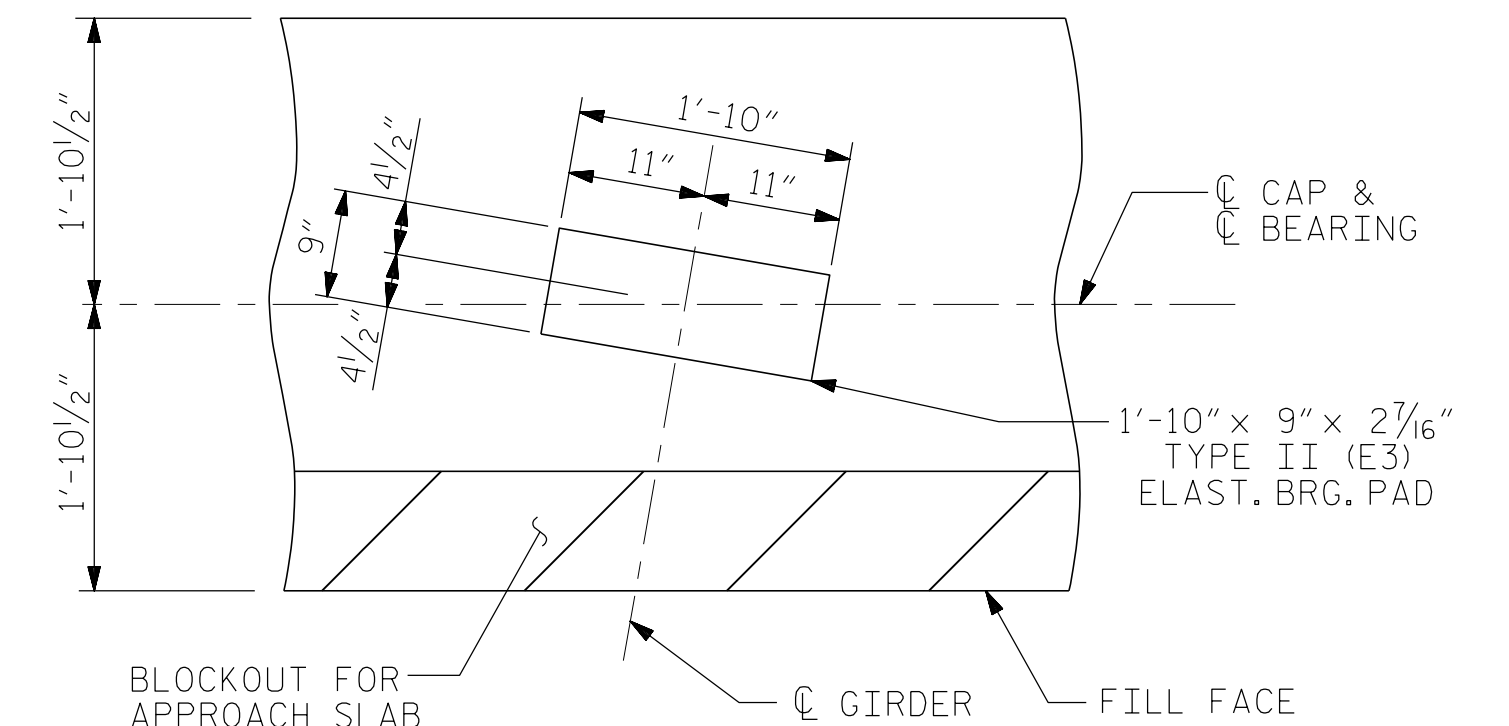
NOTES

FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

THE COST TO FURNISH AND INSTALL THE 24" Ø GALVANIZED CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE MSE RETAINING WALL. FOR MSE RETAINING WALL, SEE GEOTECHNICAL PROVISIONS.



BEARING DETAIL

(DIMENSIONS ARE TYPICAL EACH GIRDER)
(HP 12X53 PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT No.1

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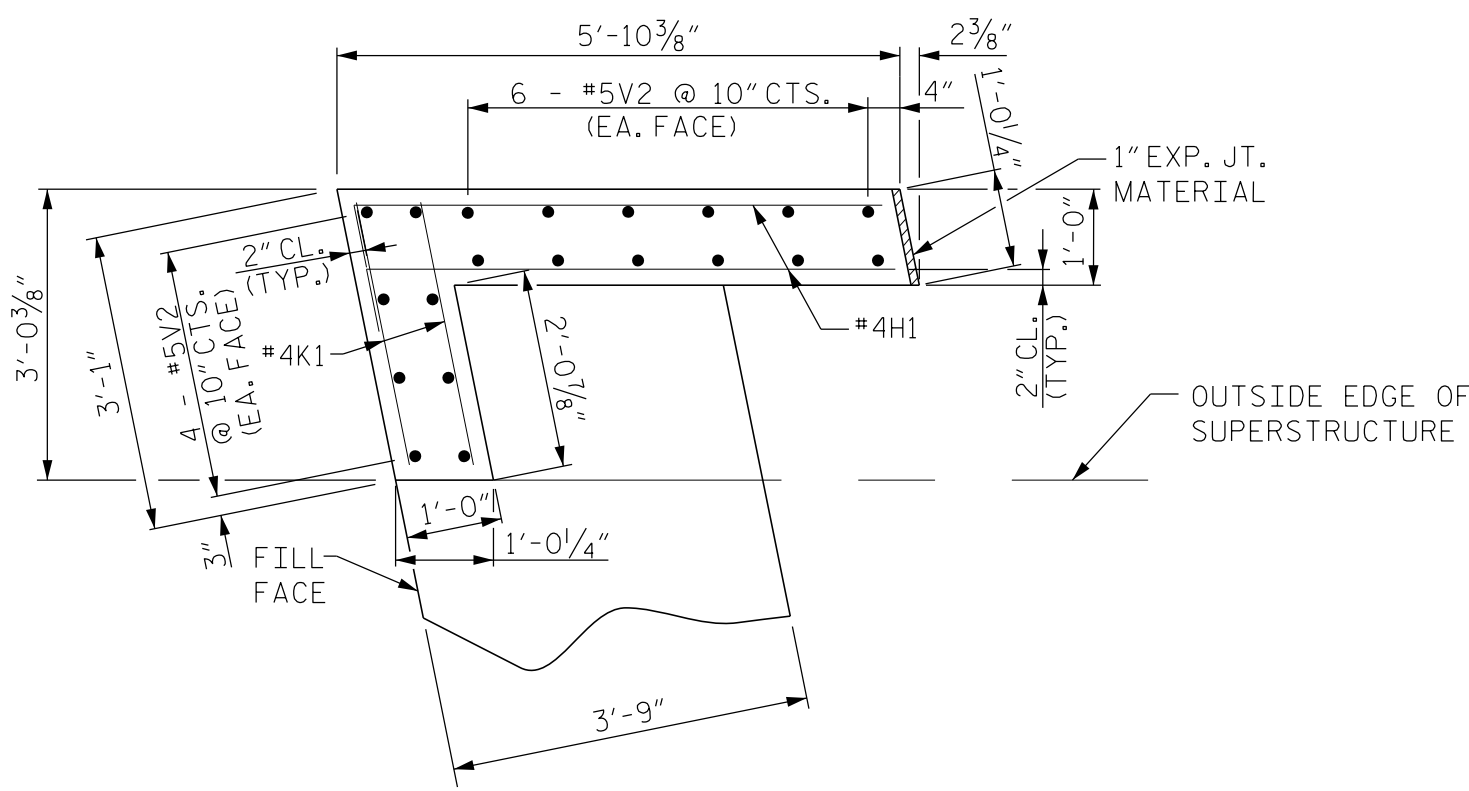
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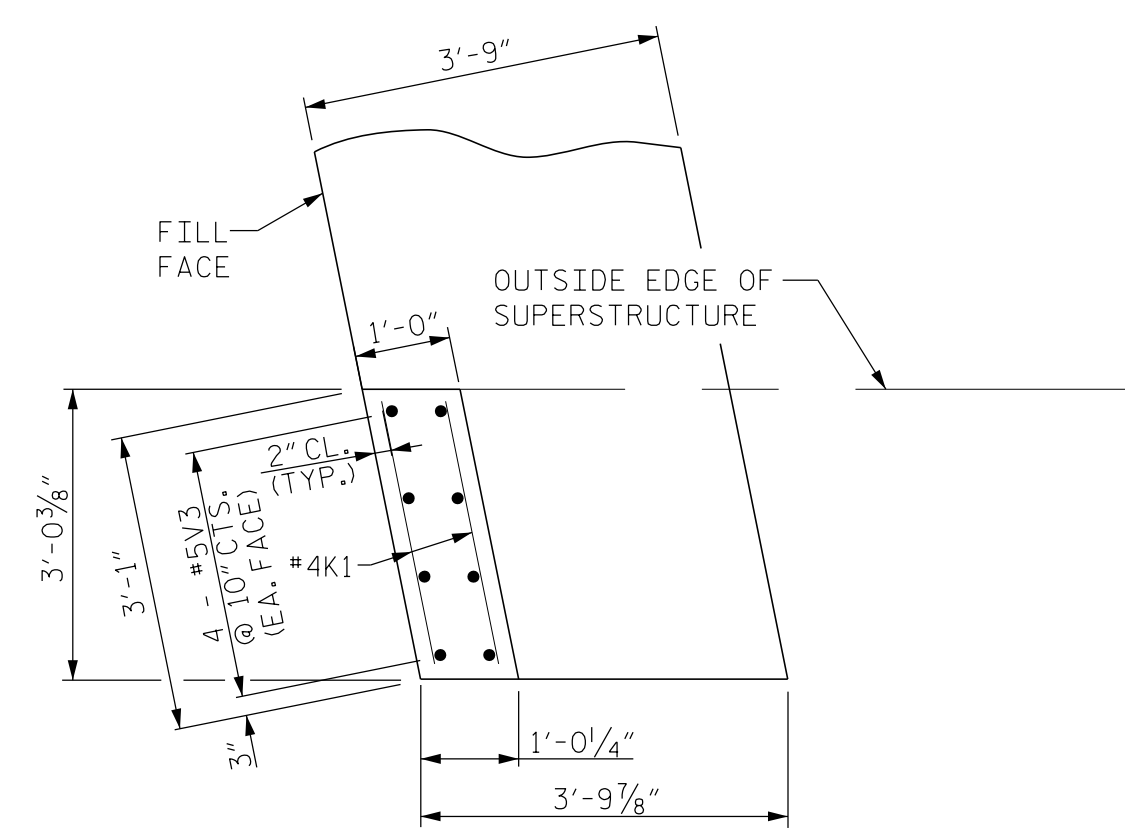
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17	
1			3			TOTAL SHEETS	
2			4			24	

4/12/2018
\\402-033-B4448-SML-SUB01-S2-17.dgn
USER: jloftus

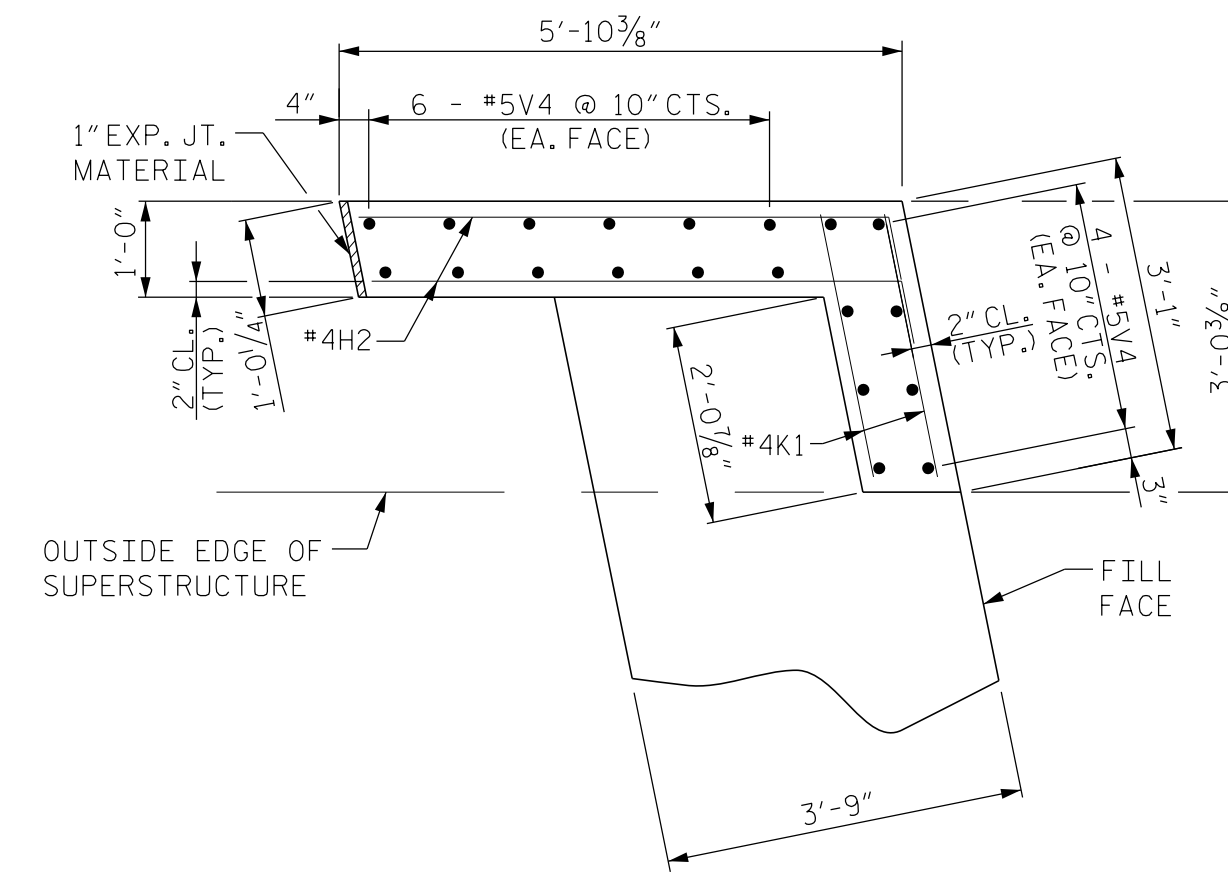
DRAWN BY: J. LOFTUS DATE: 05-17
CHECKED BY: D. RUGGLES DATE: 12-17
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18



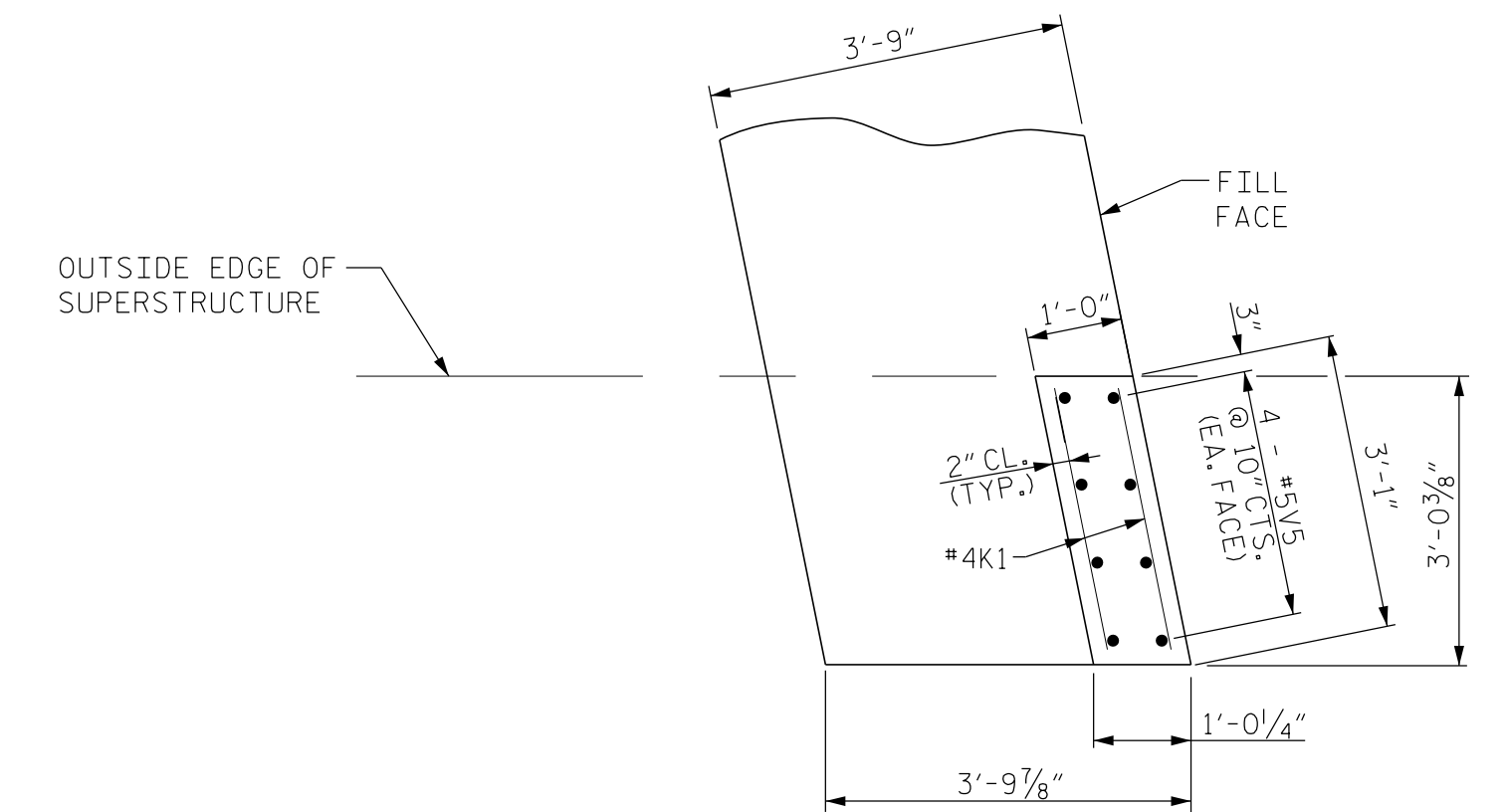
PLAN OF WING (W1)



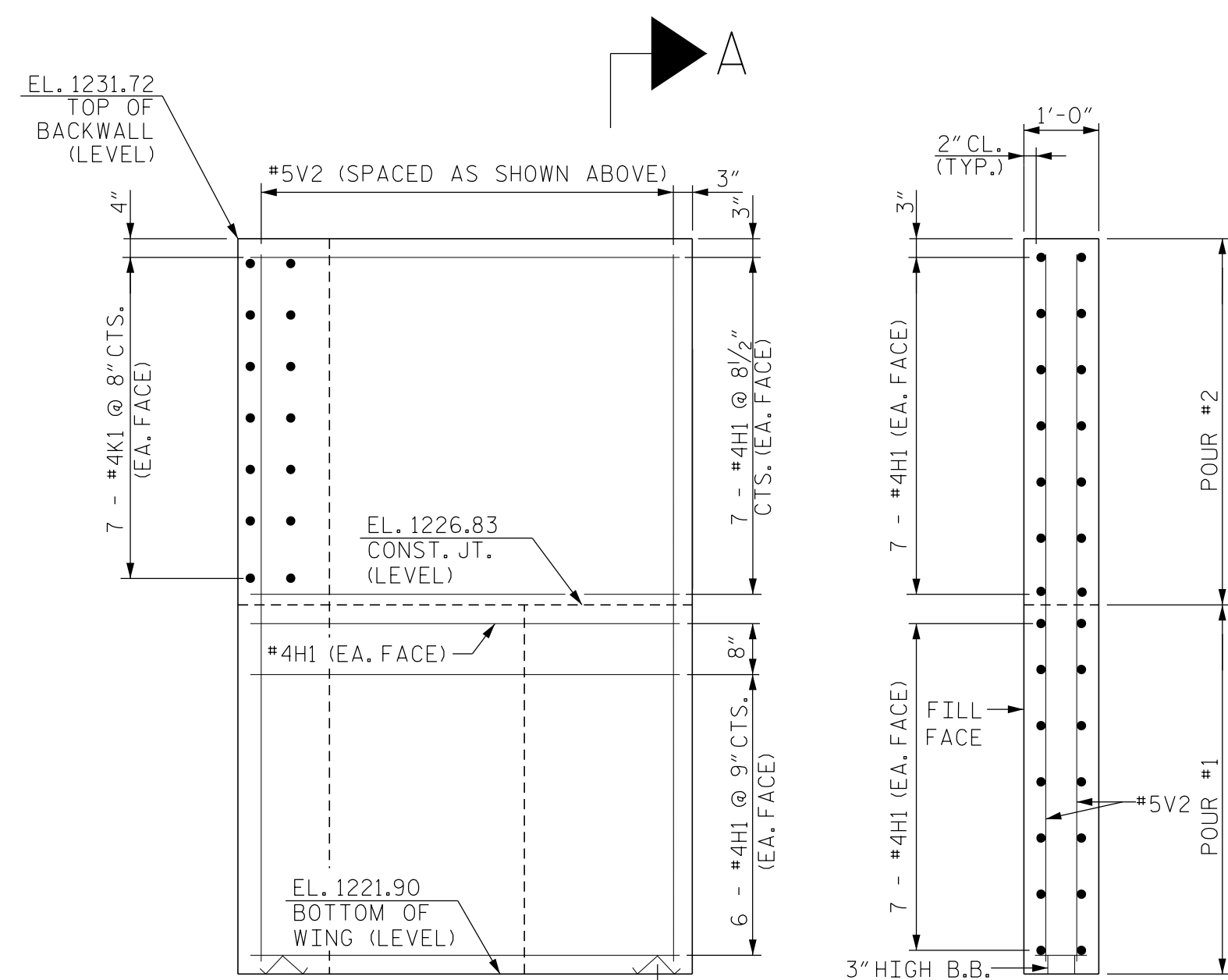
PLAN OF END BENT#1 CAP, RIGHT SIDE



PLAN OF WING (W2)

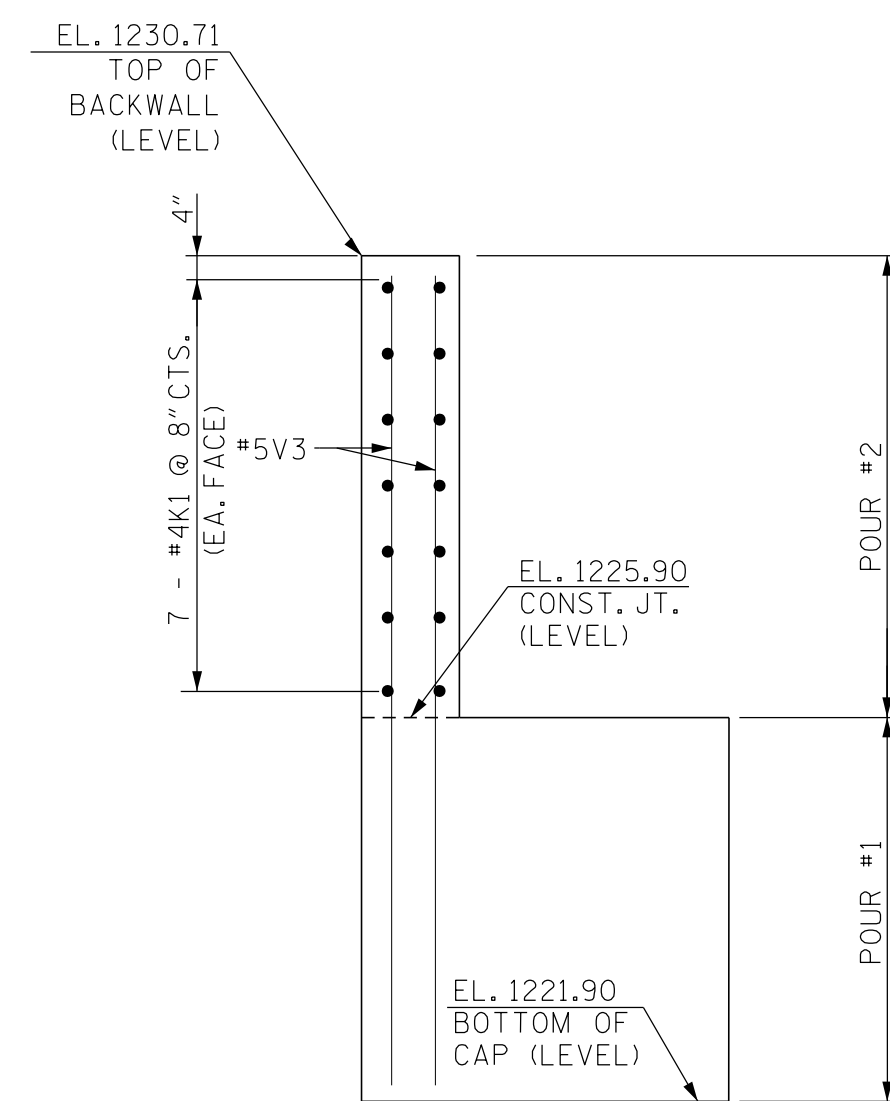


PLAN OF END BENT#1 CAP, RIGHT SIDE

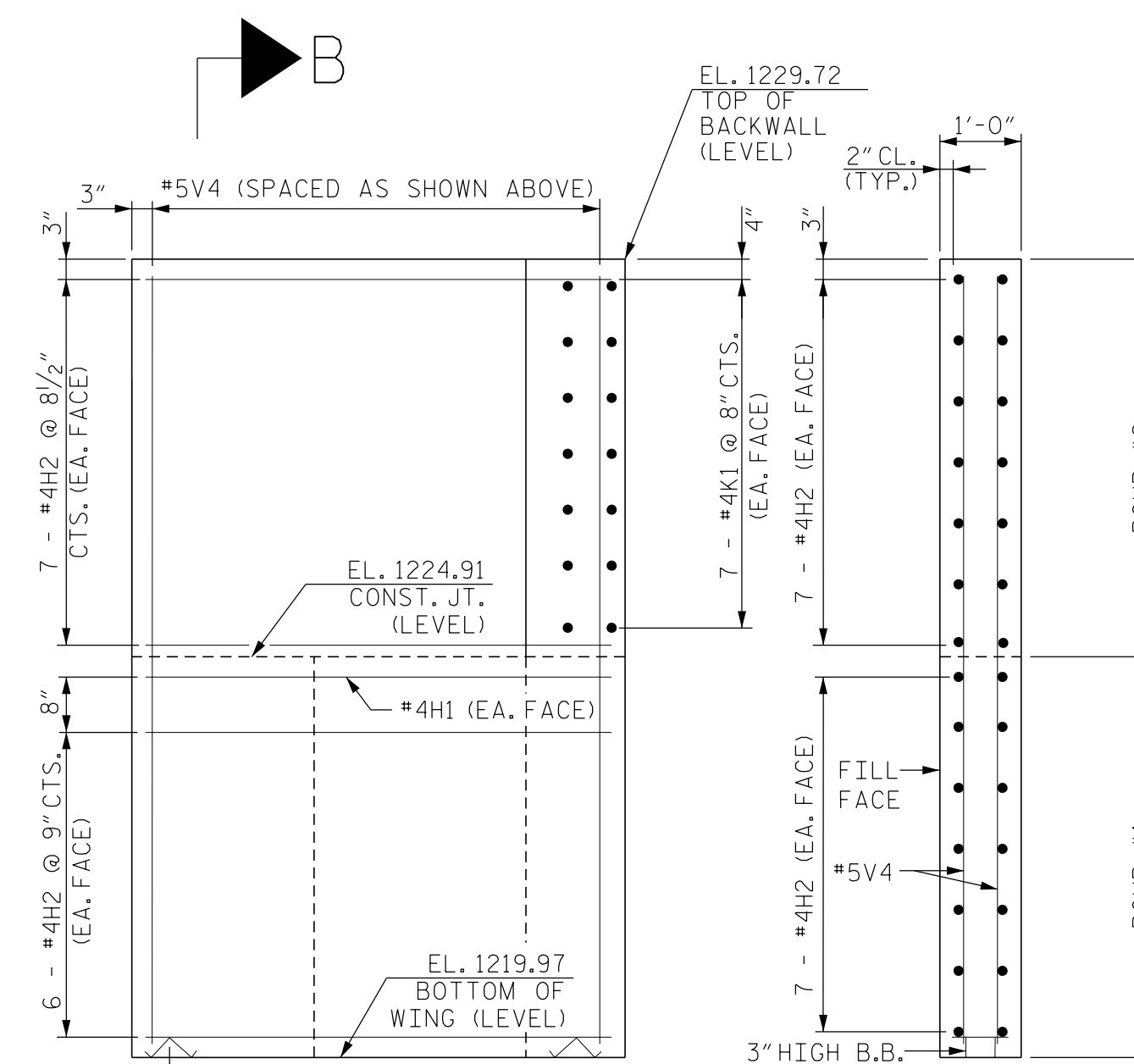


SECTION A-A

ELEVATION OF WING (W1)

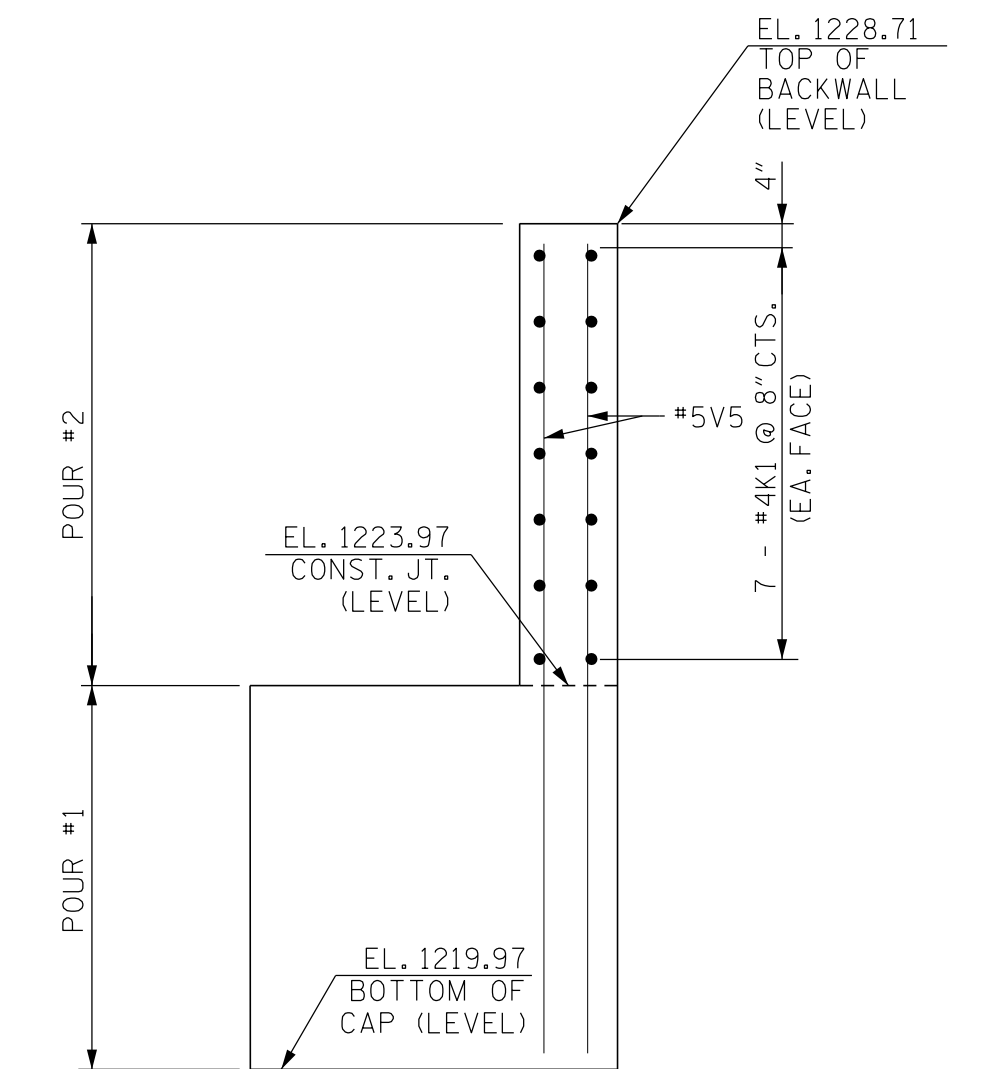


ELEVATION OF END BENT#1 CAP, RIGHT SIDE



SECTION B-B

ELEVATION OF WING (W2)



ELEVATION OF END BENT#2 CAP, RIGHT SIDE

4/12/2018
 \\402-037-B4448-SMUL-SUB03-S2-19.dgn
 USER: jloftus

DRAWN BY: J. LOFTUS DATE: 05-17
 CHECKED BY: D. RUGGLES DATE: 12-17
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 04-18

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 FES10C02679A48



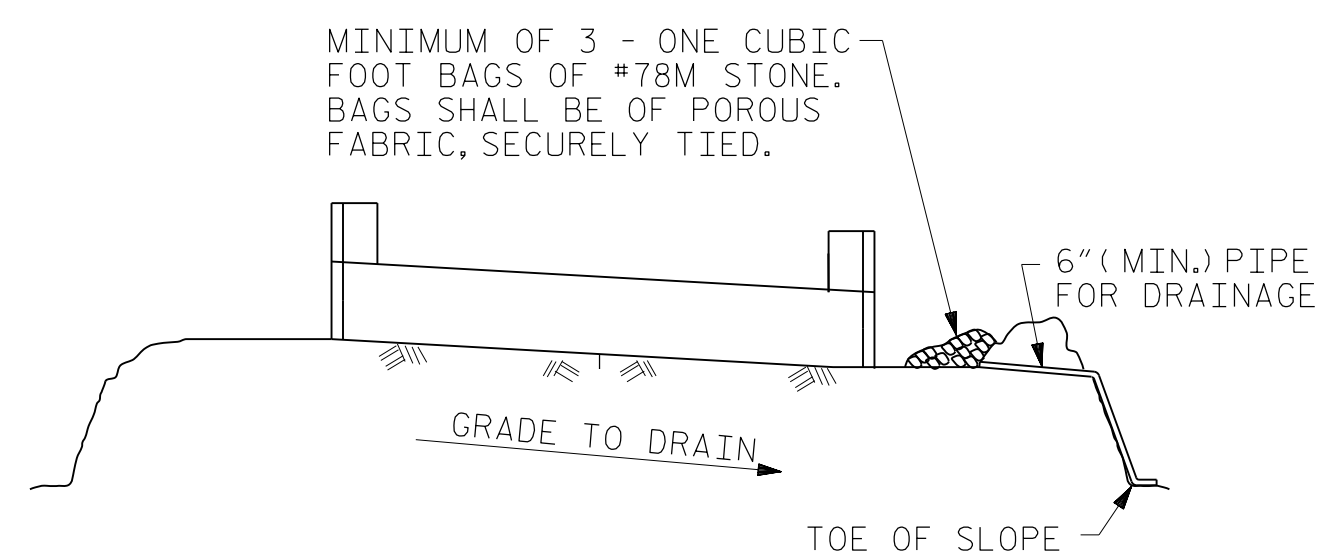
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PROJECT NO. B-4448
 BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 SHEET 3 OF 4

REVISIONS						SHEET NO. S2-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT
 DETAILS

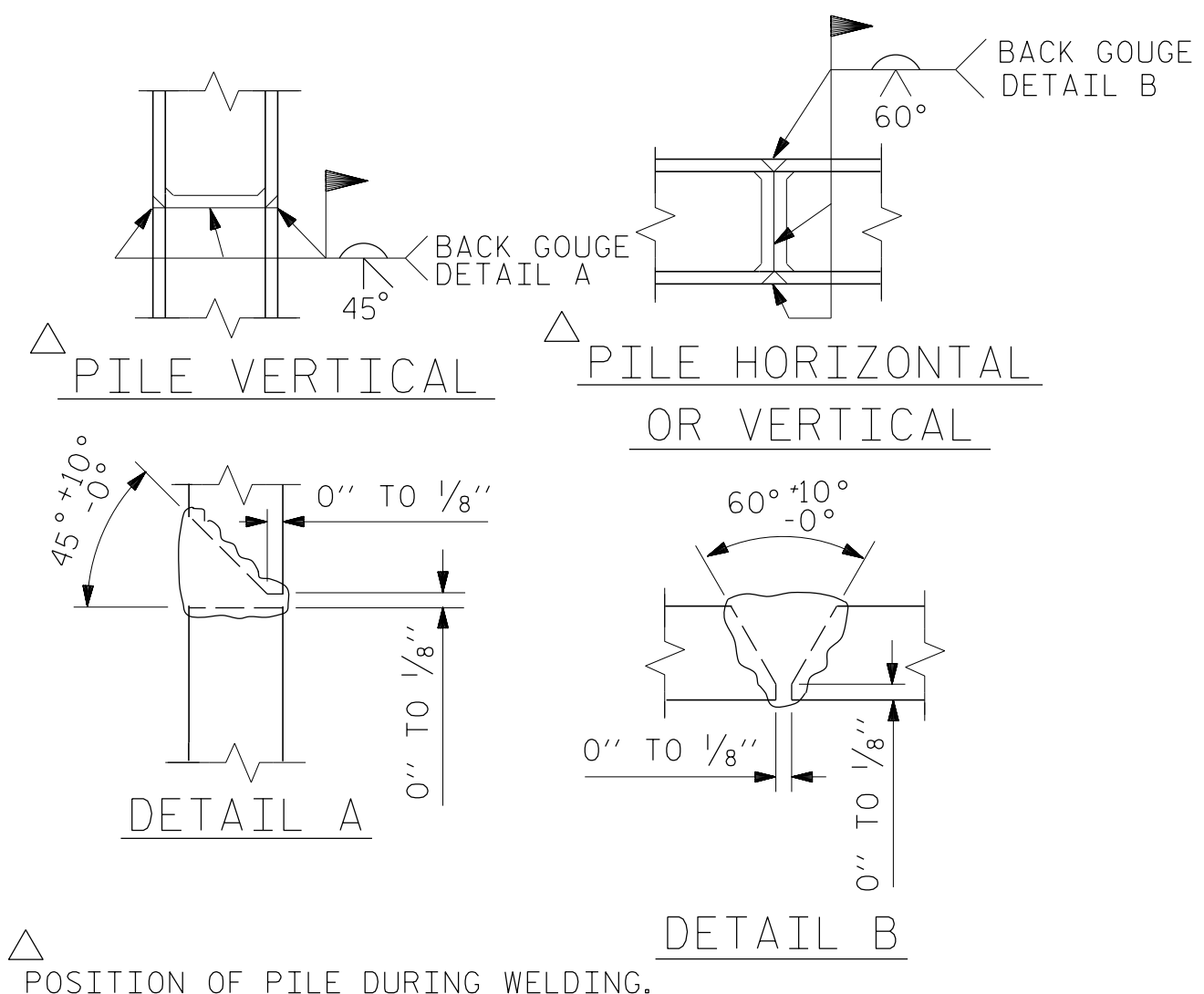


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

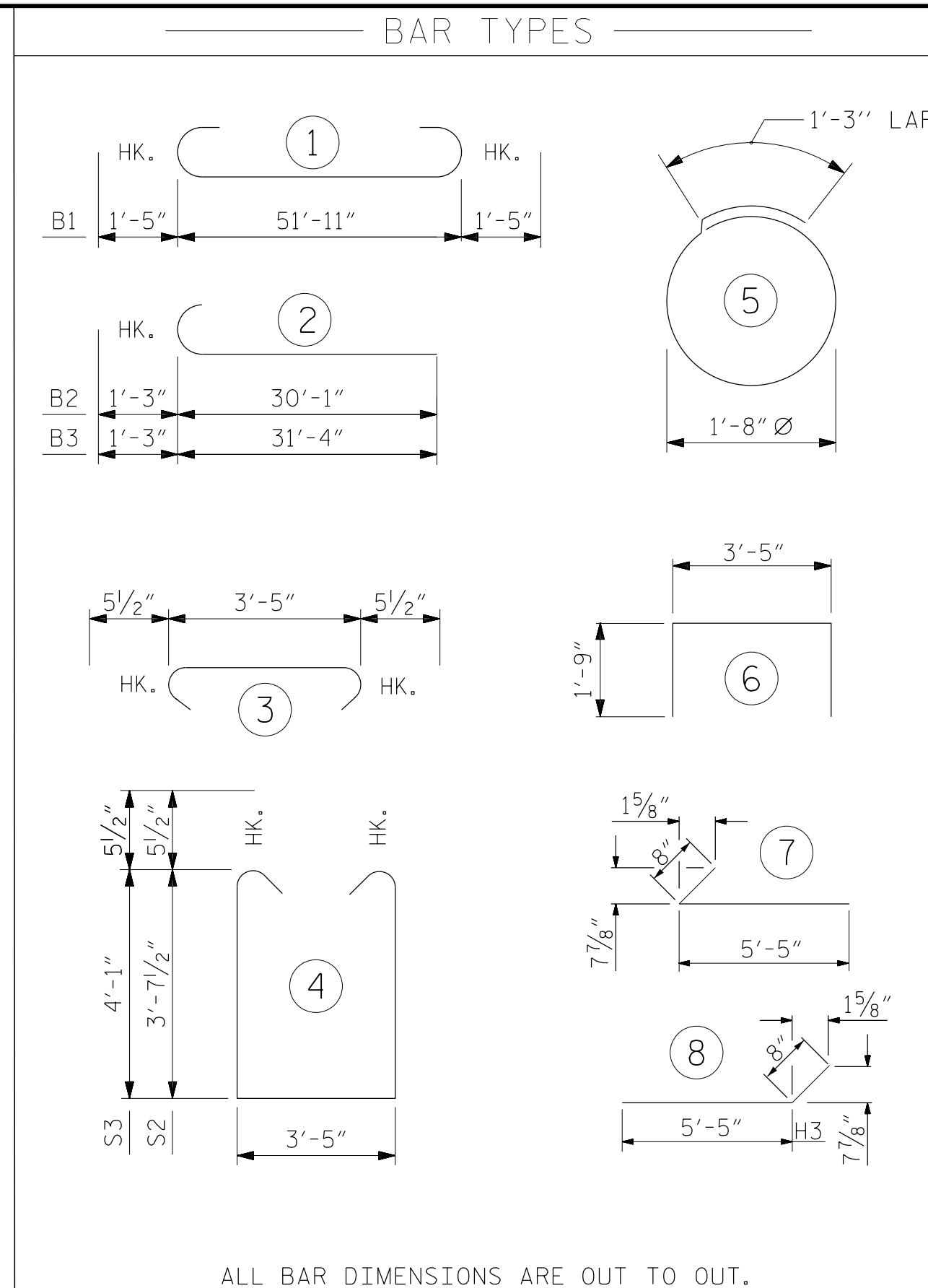
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

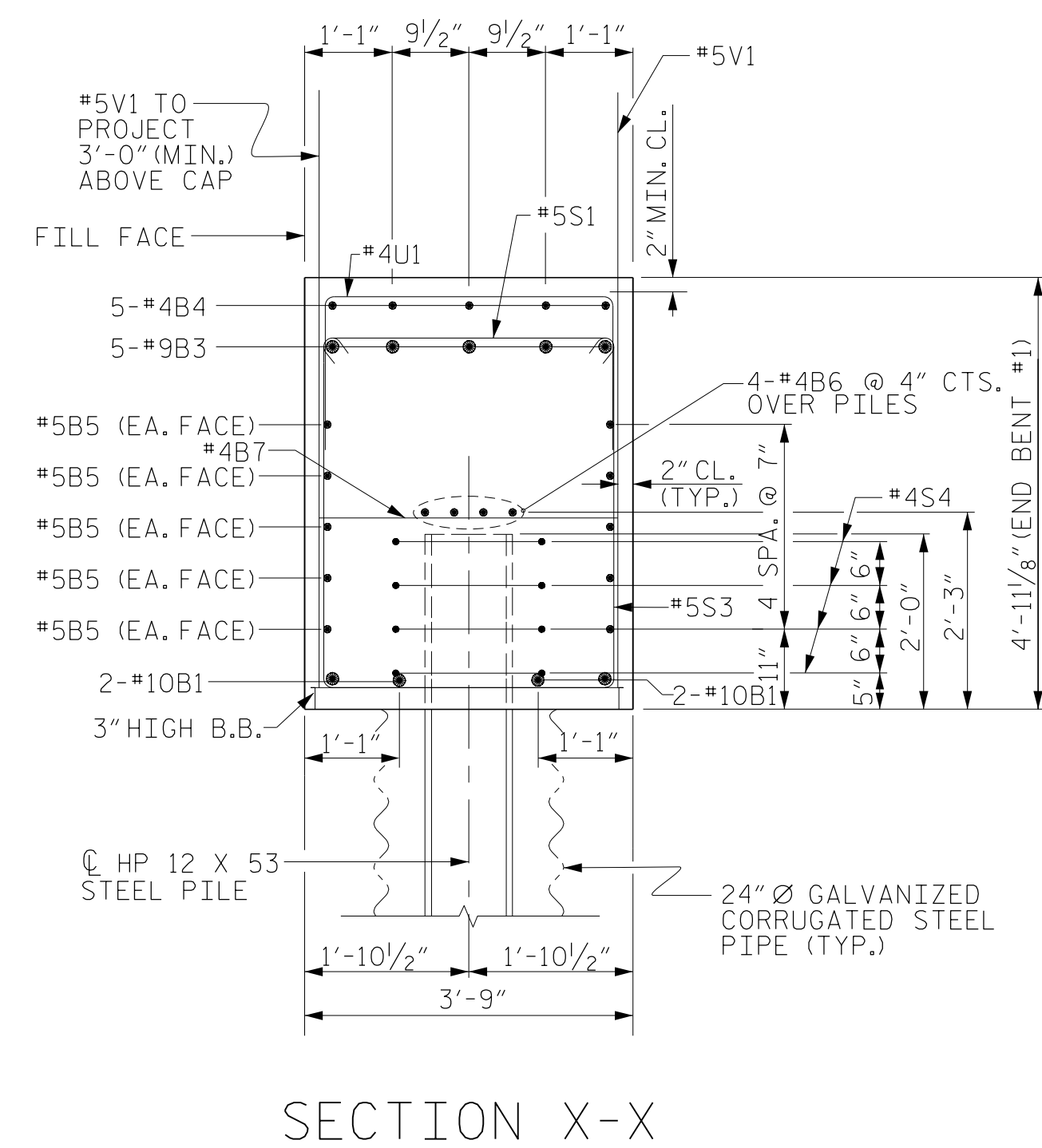
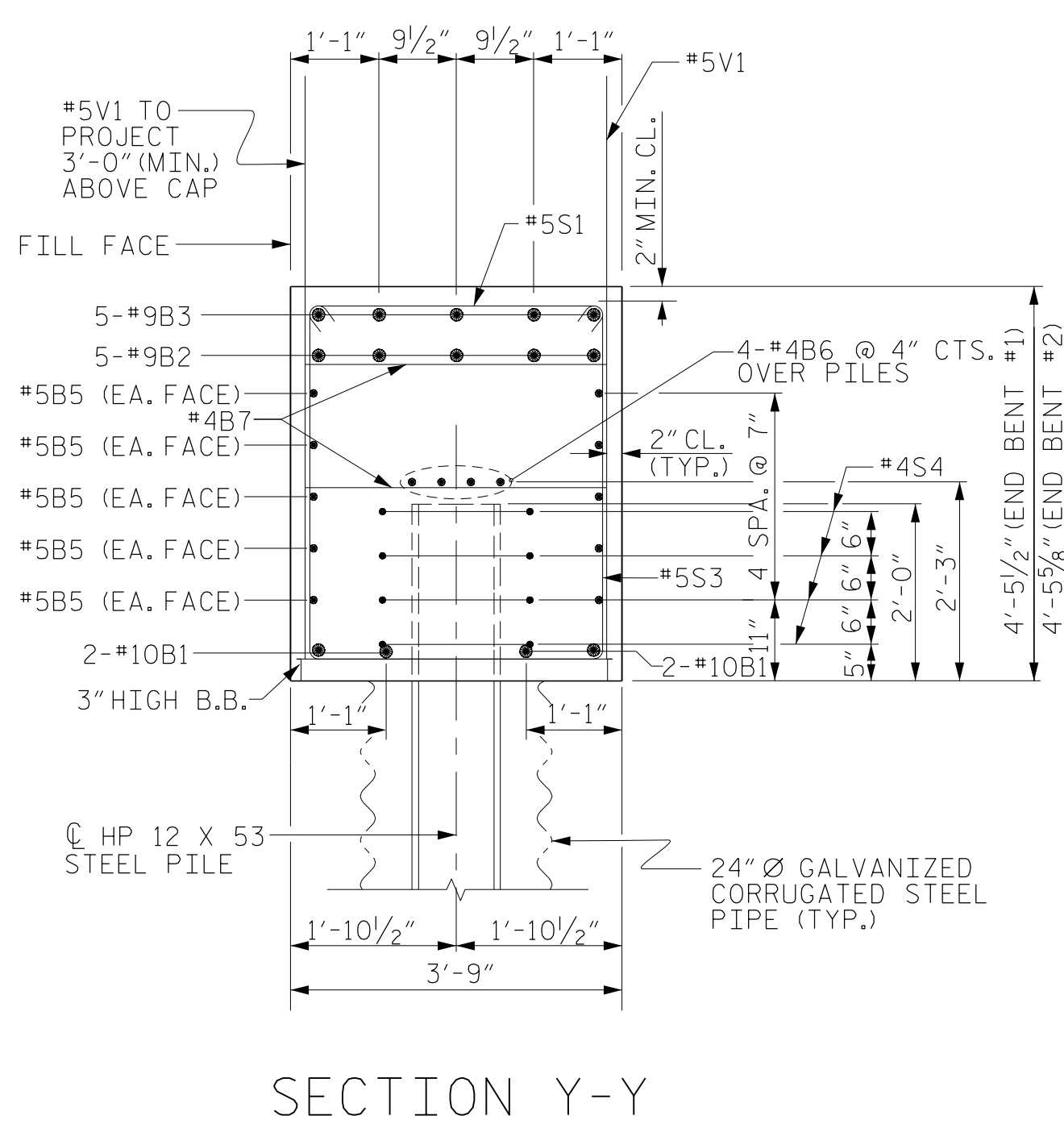
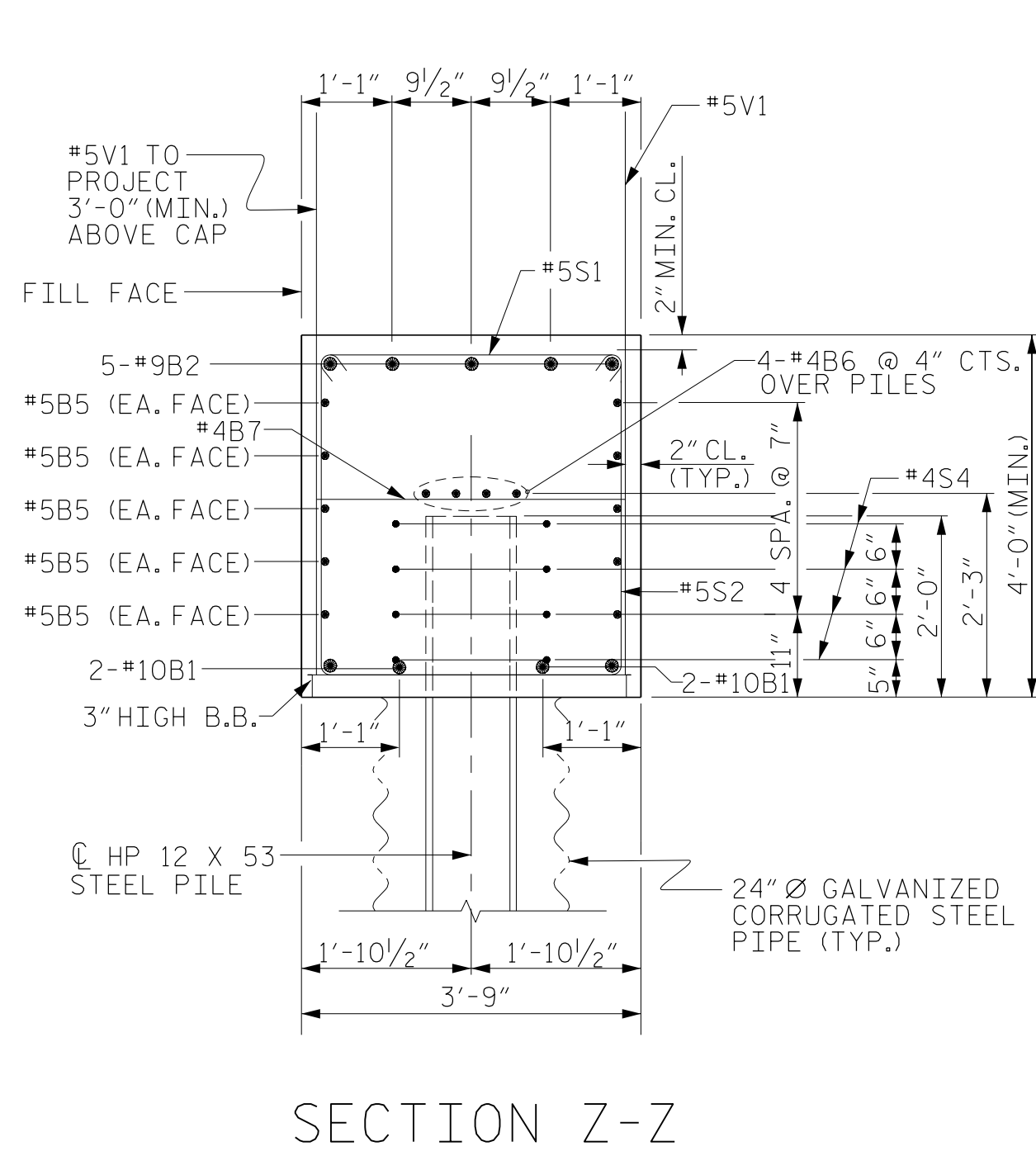
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



BILL OF MATERIAL											
FOR END BENT No. 1						FOR END BENT No. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-9"	942	B1	4	#10	1	54'-9"	942
B2	5	#9	2	31'-4"	533	B2	5	#9	2	31'-4"	533
B3	5	#9	2	32'-7"	554	B3	5	#9	2	32'-7"	554
B4	10	#4	STR	6'-11"	46	B4	10	#4	STR	6'-11"	46
B5	10	#5	STR	52'-0"	542	B5	10	#5	STR	52'-0"	542
B6	8	#4	STR	27'-3"	146	B6	8	#4	STR	27'-3"	146
B7	16	#4	STR	3'-5"	37	B7	16	#4	STR	3'-5"	37
K1	28	#4	STR	2'-9"	51	K1	28	#4	STR	2'-9"	51
H1	28	#4	7	6'-1"	114	H2	28	#4	8	6'-1"	114
S1	62	#5	3	4'-4"	280	S1	62	#5	3	4'-4"	280
S2	25	#5	4	11'-7"	302	S2	25	#5	4	11'-7"	302
S3	37	#5	4	12'-6"	482	S3	37	#5	4	12'-6"	482
S4	32	#4	5	6'-6"	139	S4	32	#4	5	6'-6"	139
U1	8	#4	6	6'-11"	37	U1	8	#4	6	6'-11"	37
V1	89	#5	STR	7'-9"	719	V1	89	#5	STR	7'-9"	719
V2	20	#5	STR	9'-4"	195	V4	20	#5	STR	9'-4"	195
V3	8	#5	STR	8'-4"	70	V5	8	#5	STR	8'-4"	70
REINFORCING STEEL FOR END BENT No. 1						REINFORCING STEEL FOR END BENT No. 1					
CLASS A CONCRETE BREAKDOWN CAP & LOWER WINGS UPPER WINGS						CLASS A CONCRETE BREAKDOWN COLLARS, CAP & LOWER WINGS BACKWALL & UPPER WINGS					
TOTAL CLASS A CONCRETE						TOTAL CLASS A CONCRETE					
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES						PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					
HP 12 X 53 STEEL PILES NO: 8 LIN. FT.= 400						HP 12 X 53 STEEL PILES NO: 8 LIN. FT.= 360					

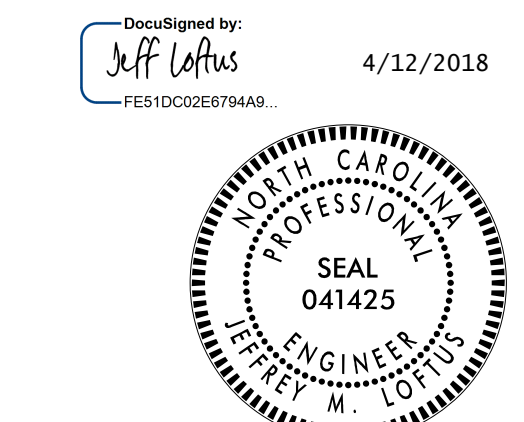


PROJECT NO. B-4448

BURKE COUNTY

STATION: 28+45.42 -EBL- POT

SHEET 4 OF 4



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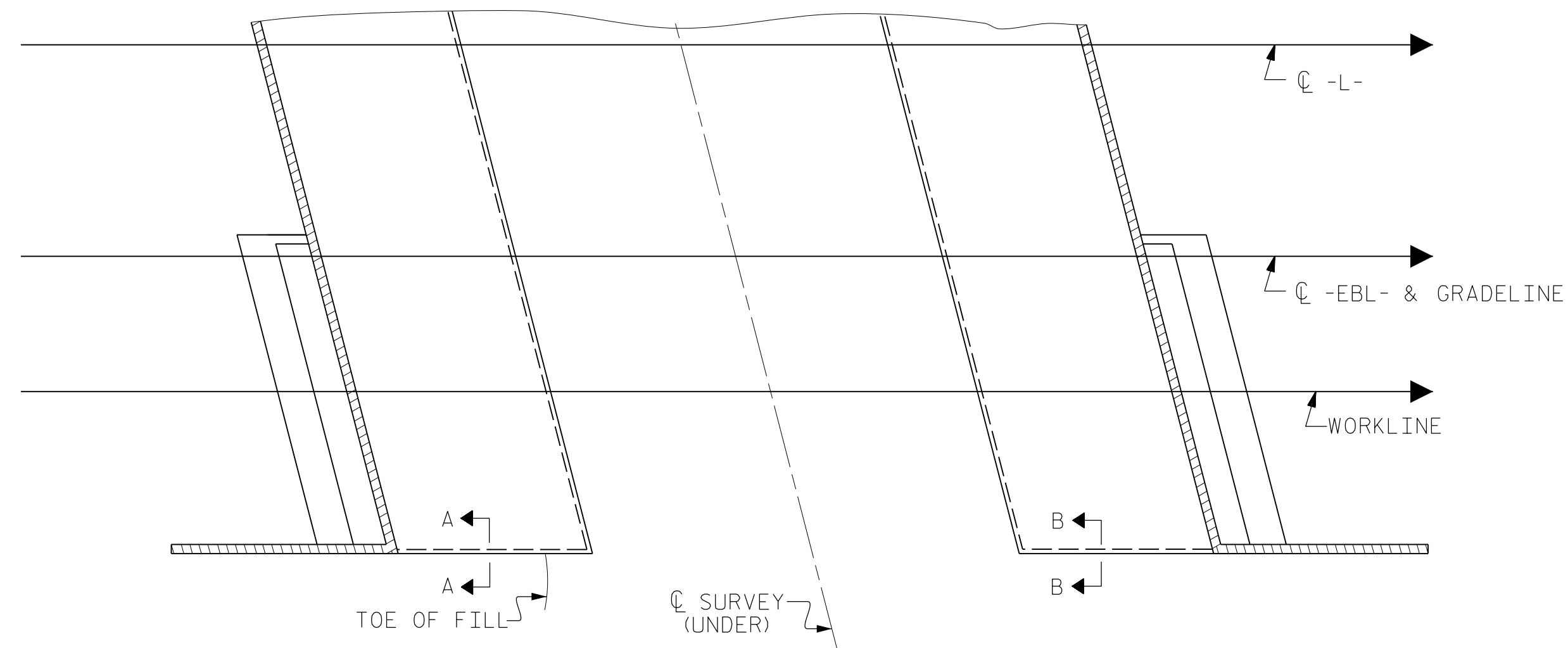
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SUBSTRUCTURE INTEGRAL END BENT DETAILS											
REVISIONS											
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1			3			TOTAL SHEETS 24					
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4/12/2018
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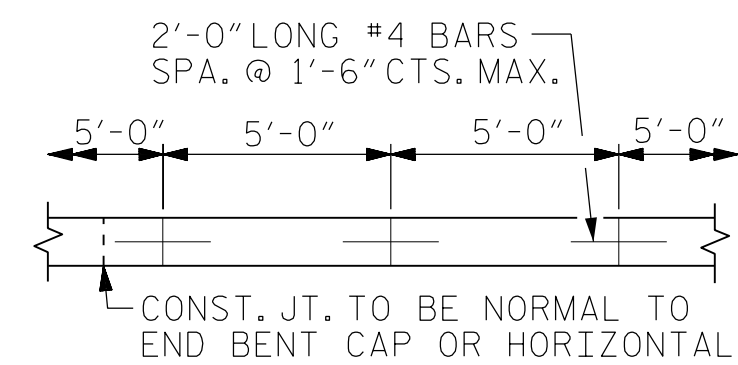
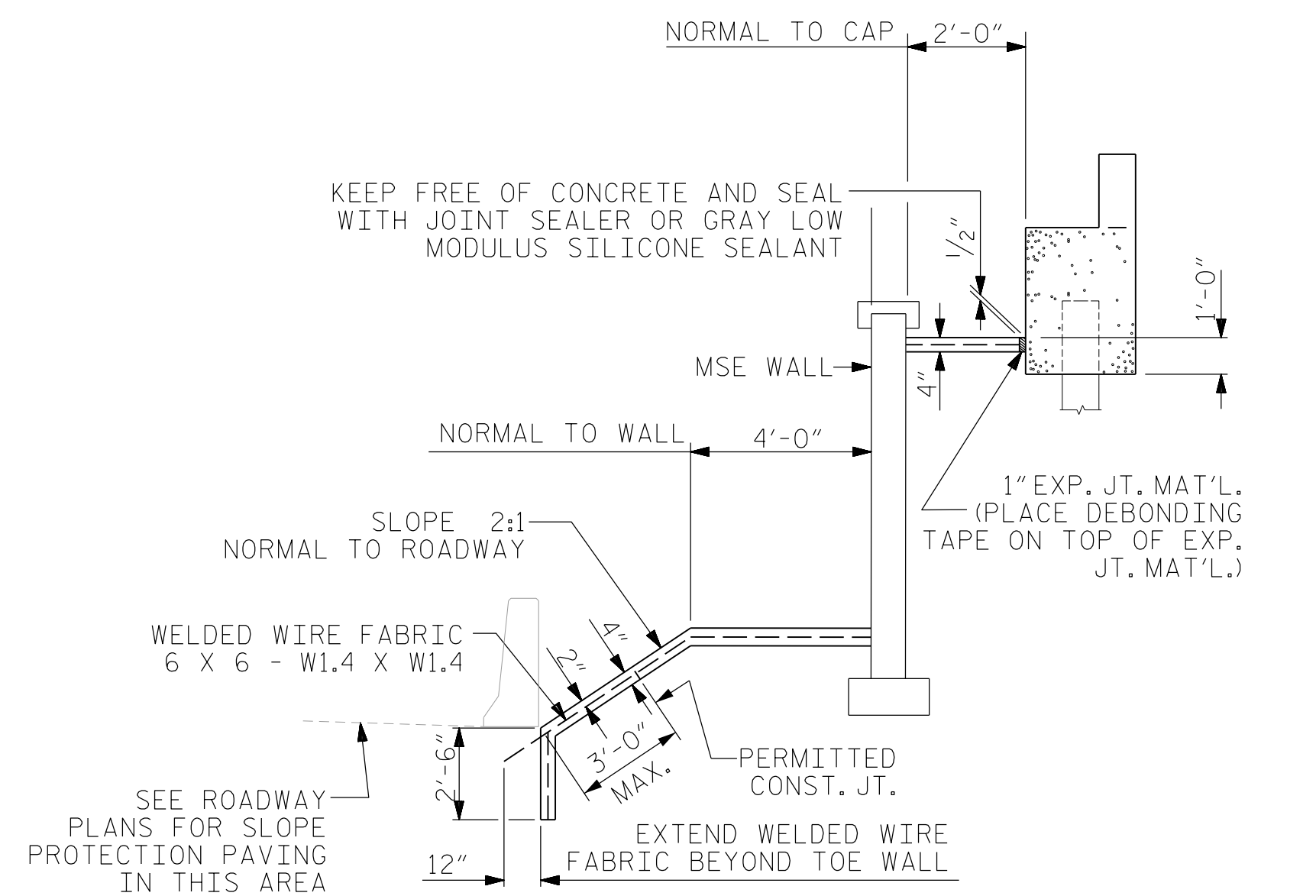


ALTERNATE "A"

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

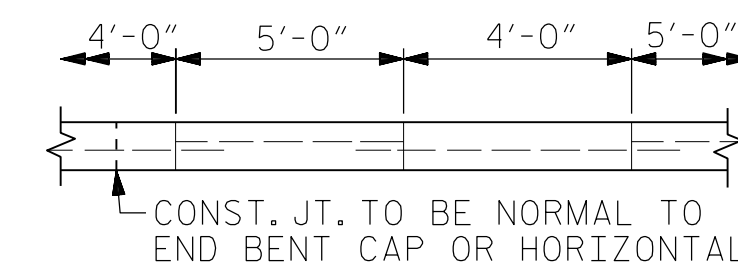
BRIDGE @ STA. 28+45.42 -EBL-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	91	189
END BENT 2	91	189

QUANTITIES SHOWN HAS LIMITS TO -L- ☉
* QUANTITY SHOWN IS BASED ON 5' POURS.



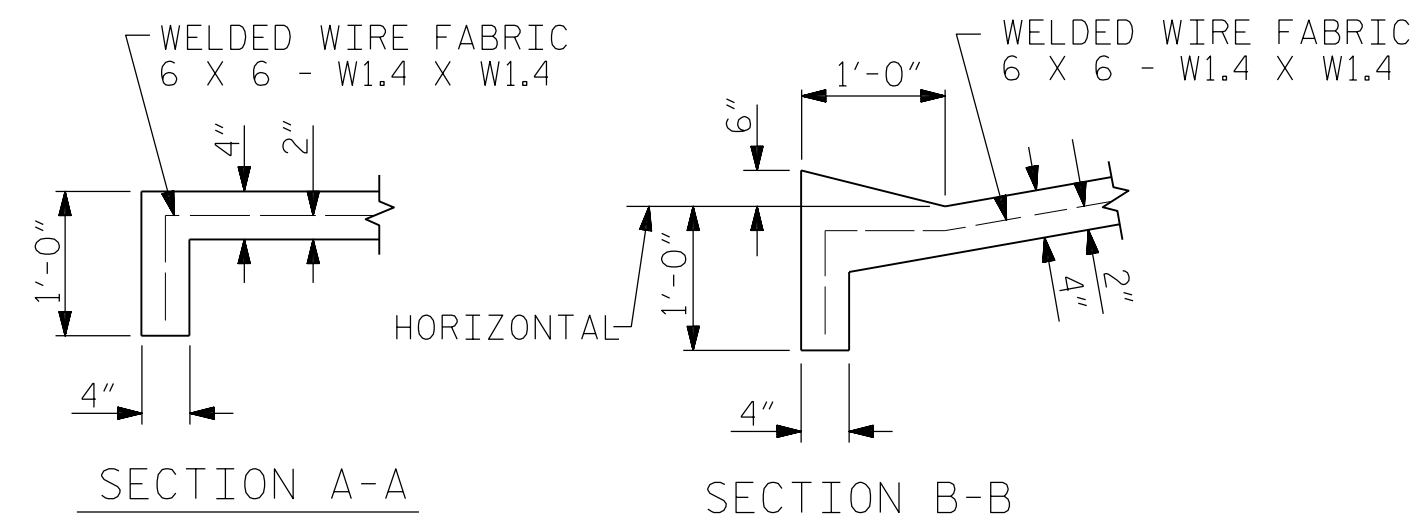
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT

SHEET 1 OF 2

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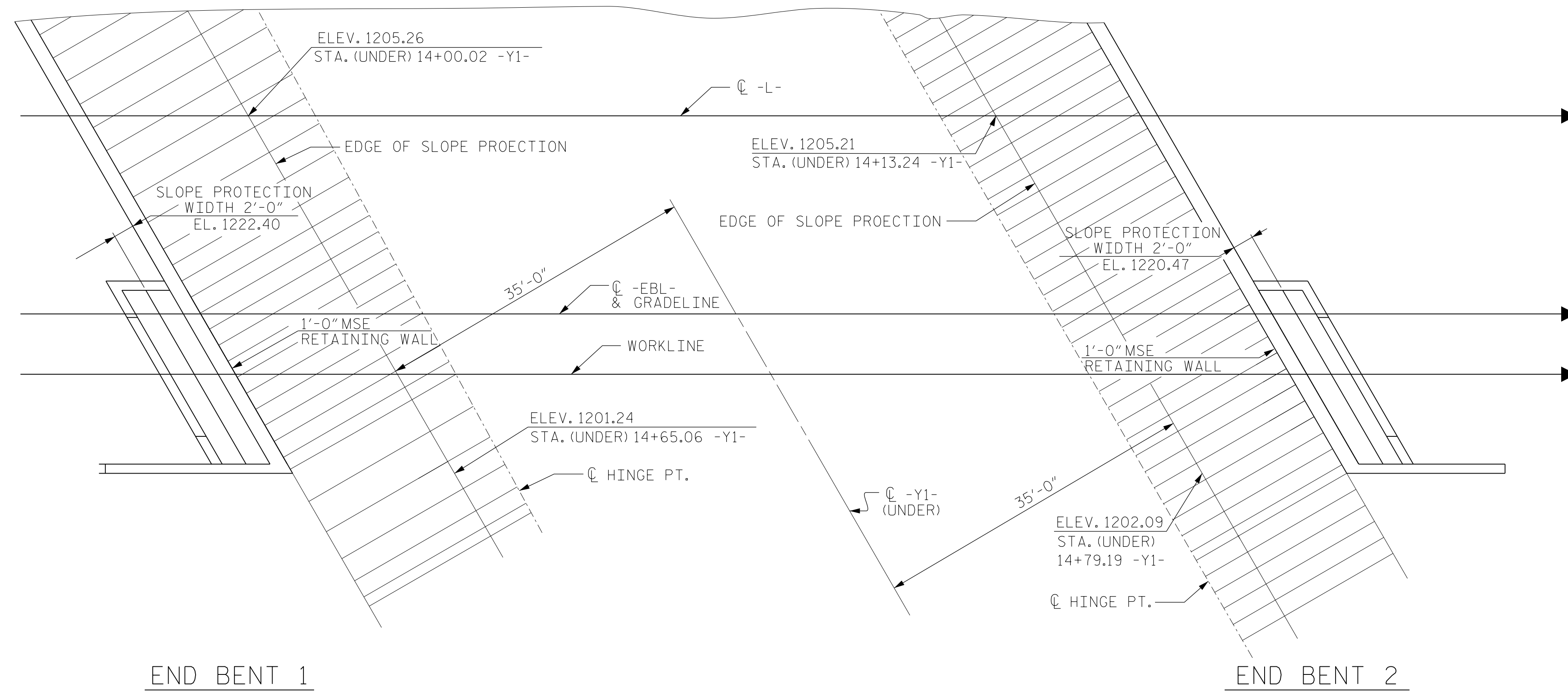
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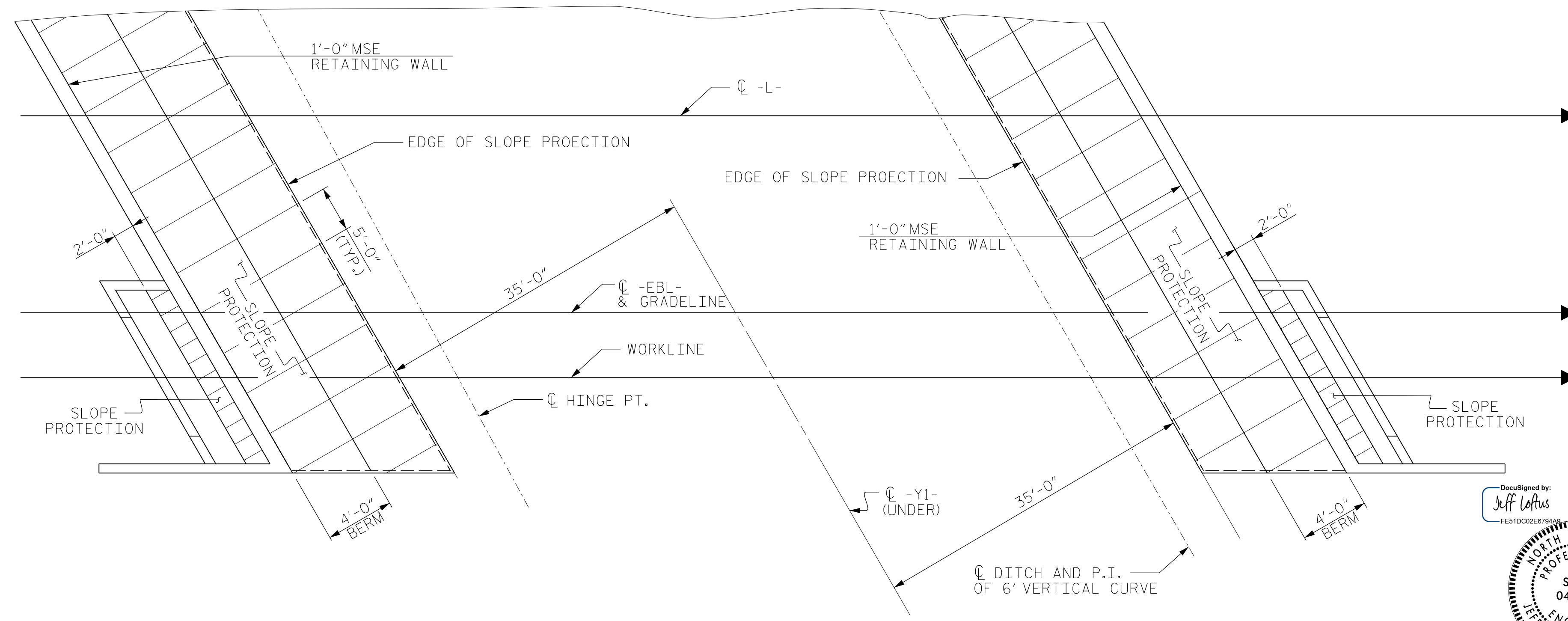
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TOTAL SHEETS 24

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PLAN - GRADING



PLAN - CONCRETE PLACEMENT

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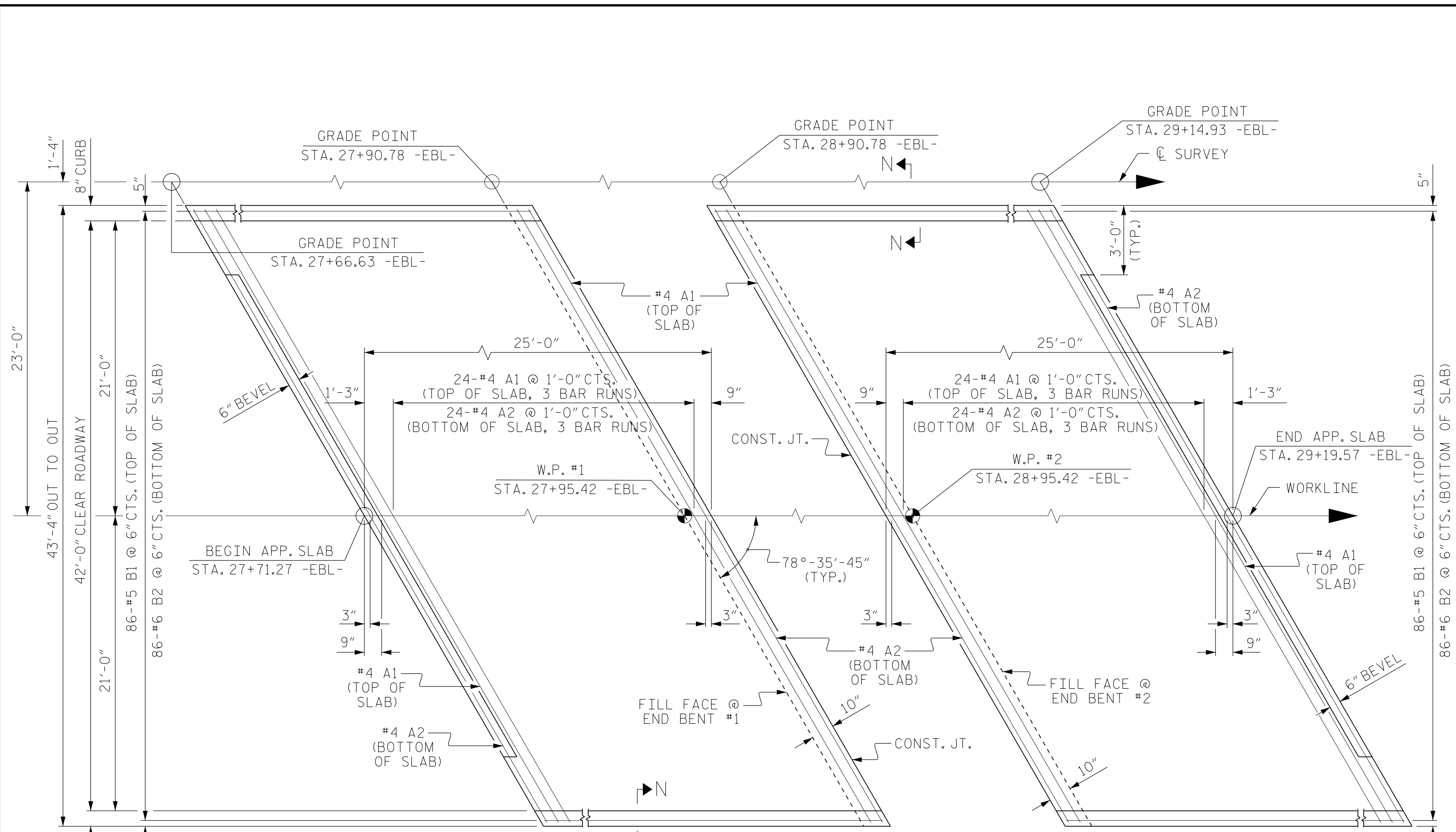
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PROJECT NO. B-4448
BURKE COUNTY
STATION: 28+45.42 -EBL- POT
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SLOPE PROTECTION DETAILS					
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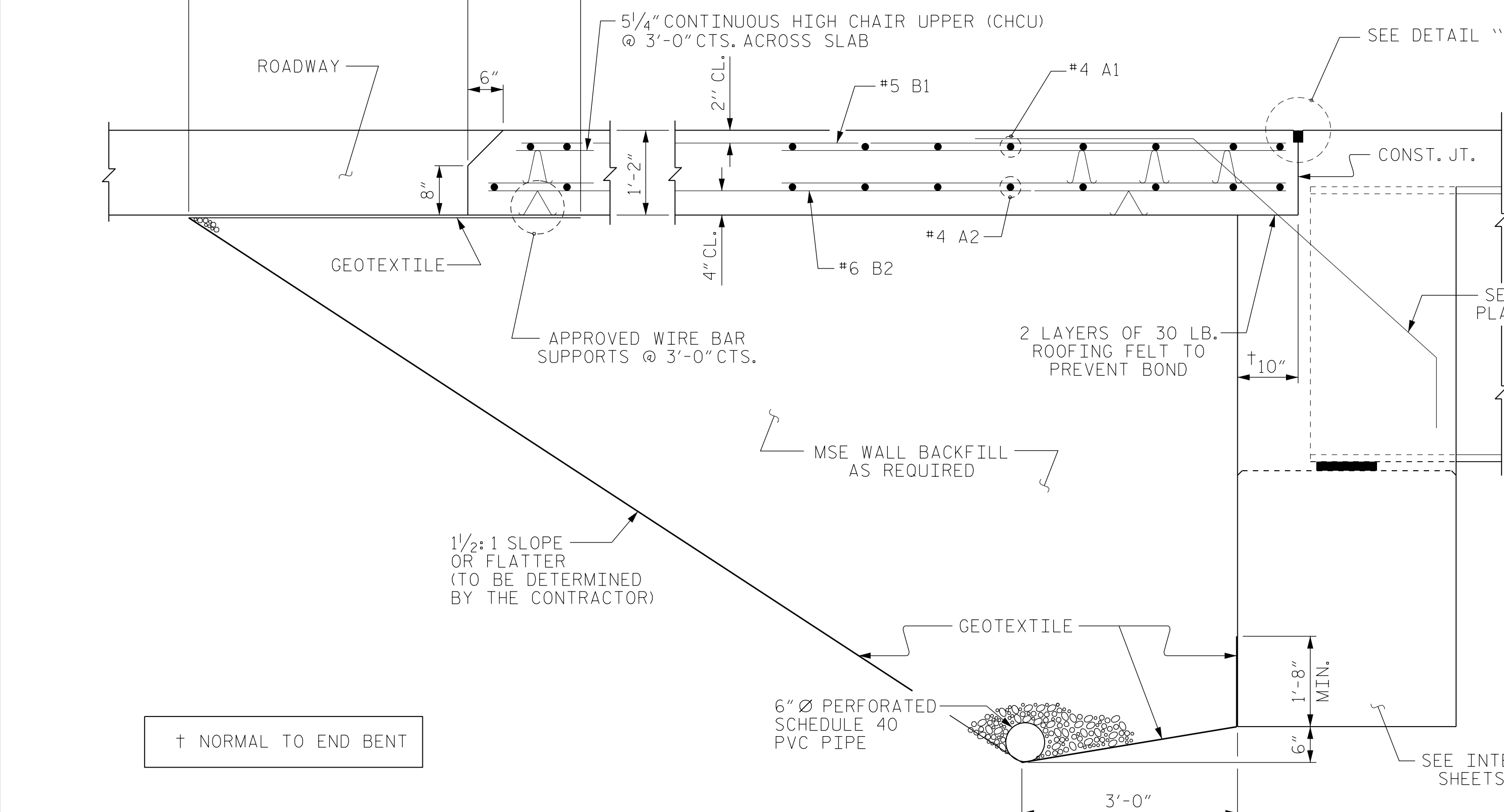
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PLAN @ END BENT #1 PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB (TYPE I - STANDARD APPROACH FILL)

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

MSE WALL BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

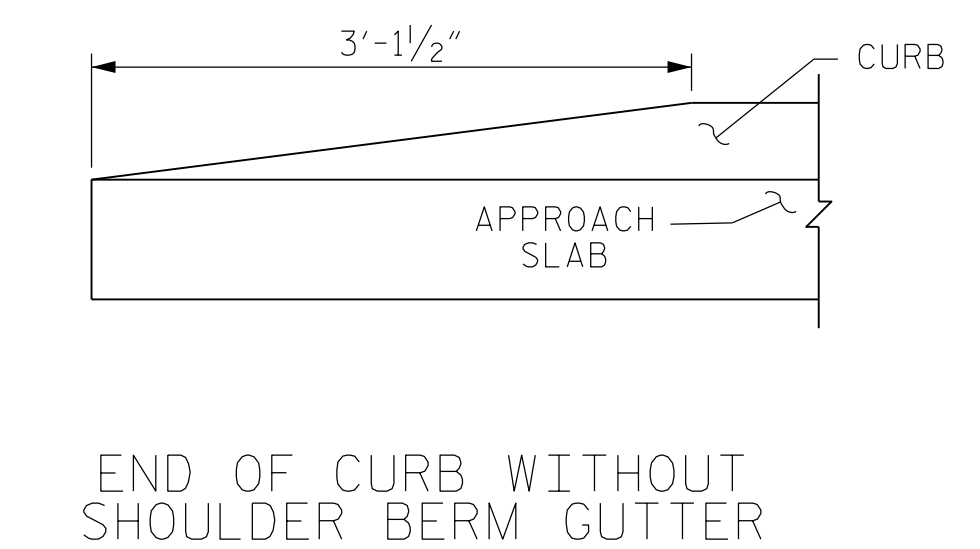
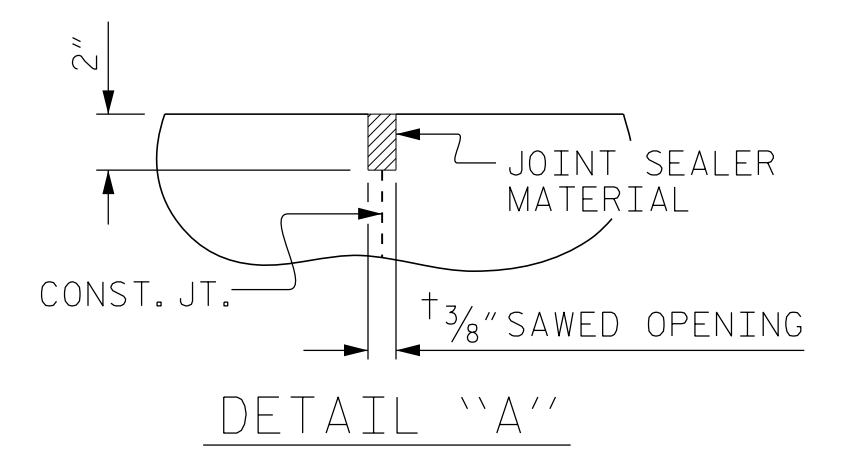
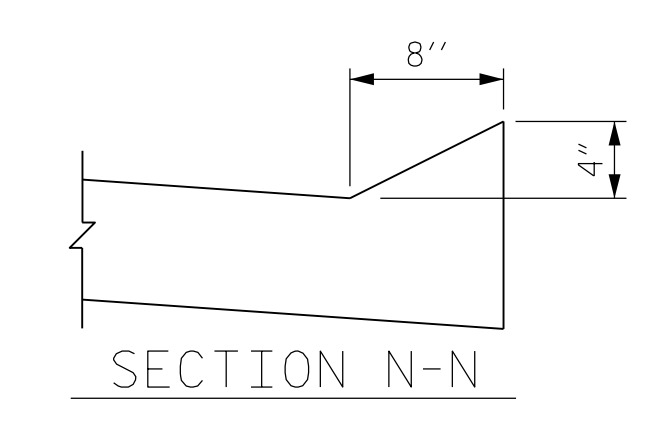
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

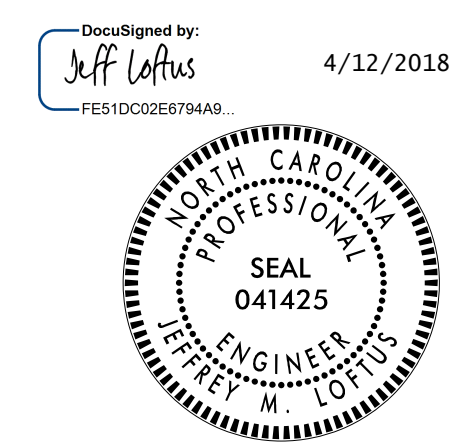
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	23'-0"	799
A2	52	#4	STR	22'-10"	793
* B1	86	#5	STR	24'-2"	2168
B2	86	#6	STR	24'-8"	3186
REINFORCING STEEL				3,979 LBS.	
* EPOXY COATED REINFORCING STEEL				2,967 LBS.	
CLASS AA CONCRETE				46.9 C.Y.	

SPLICE LENGTHS

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



PROJECT NO. B-4448
 BURKE COUNTY
 STATION: 28+45.42 -EBL- POT
 SHEET 1 OF 2



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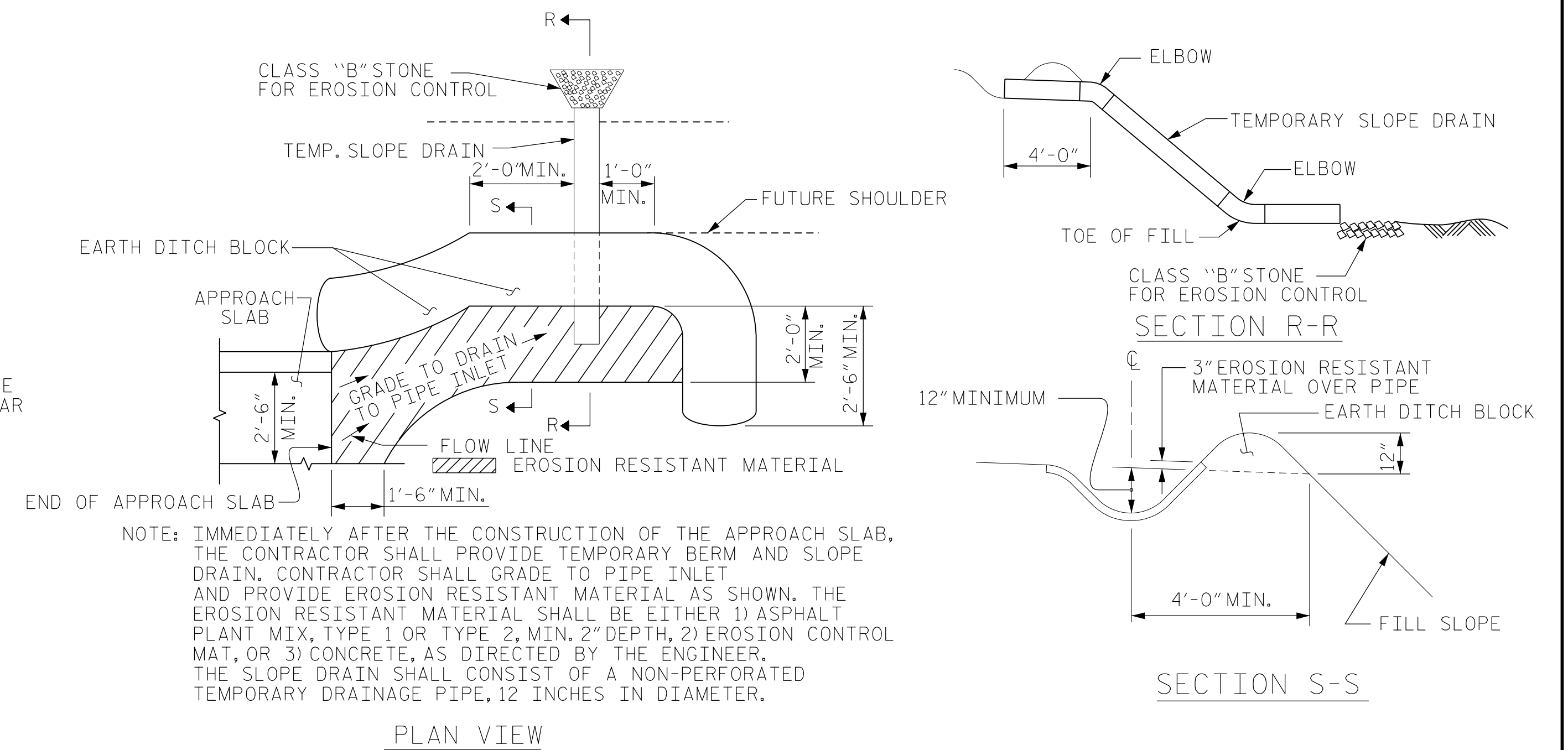
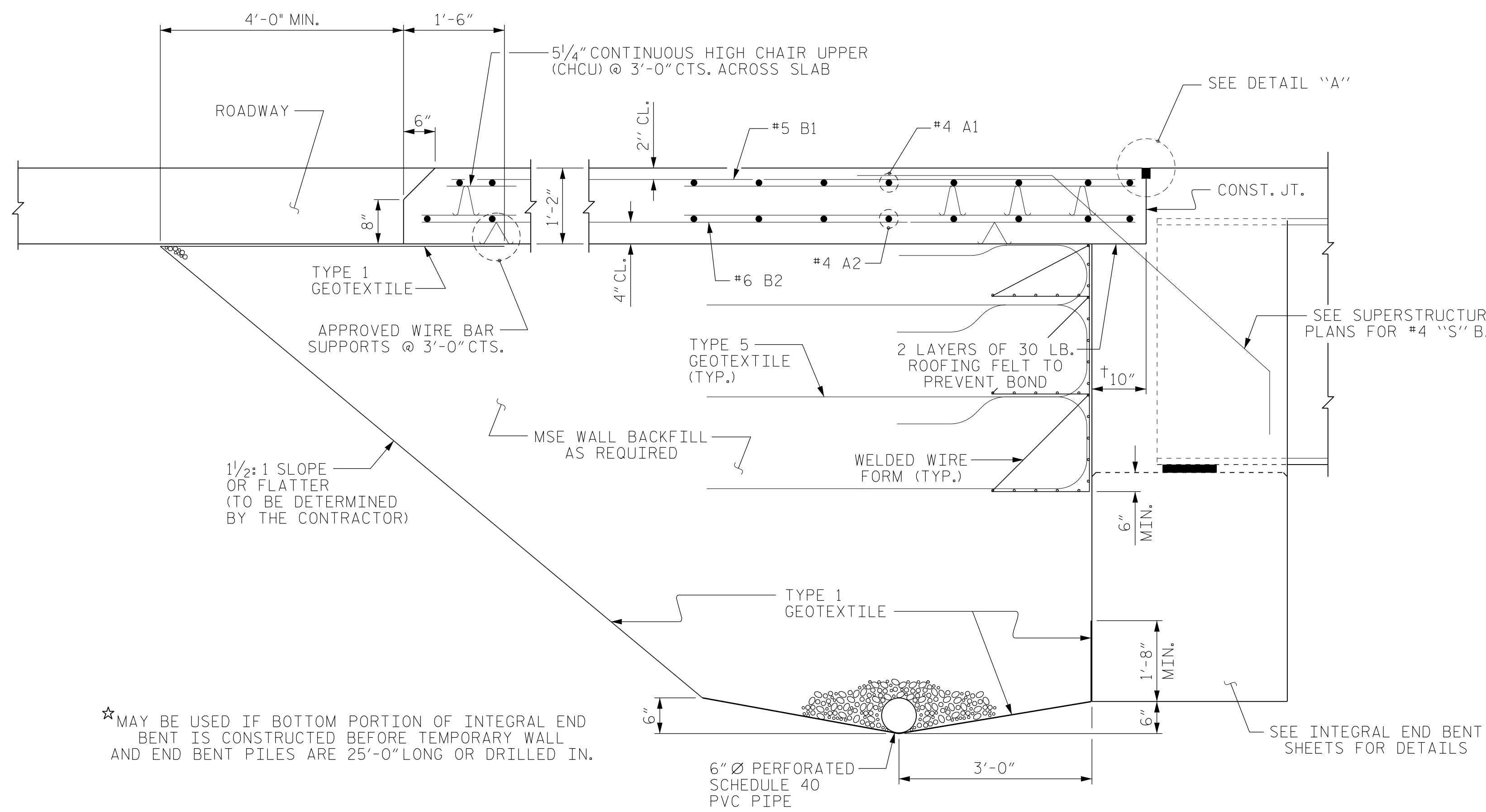
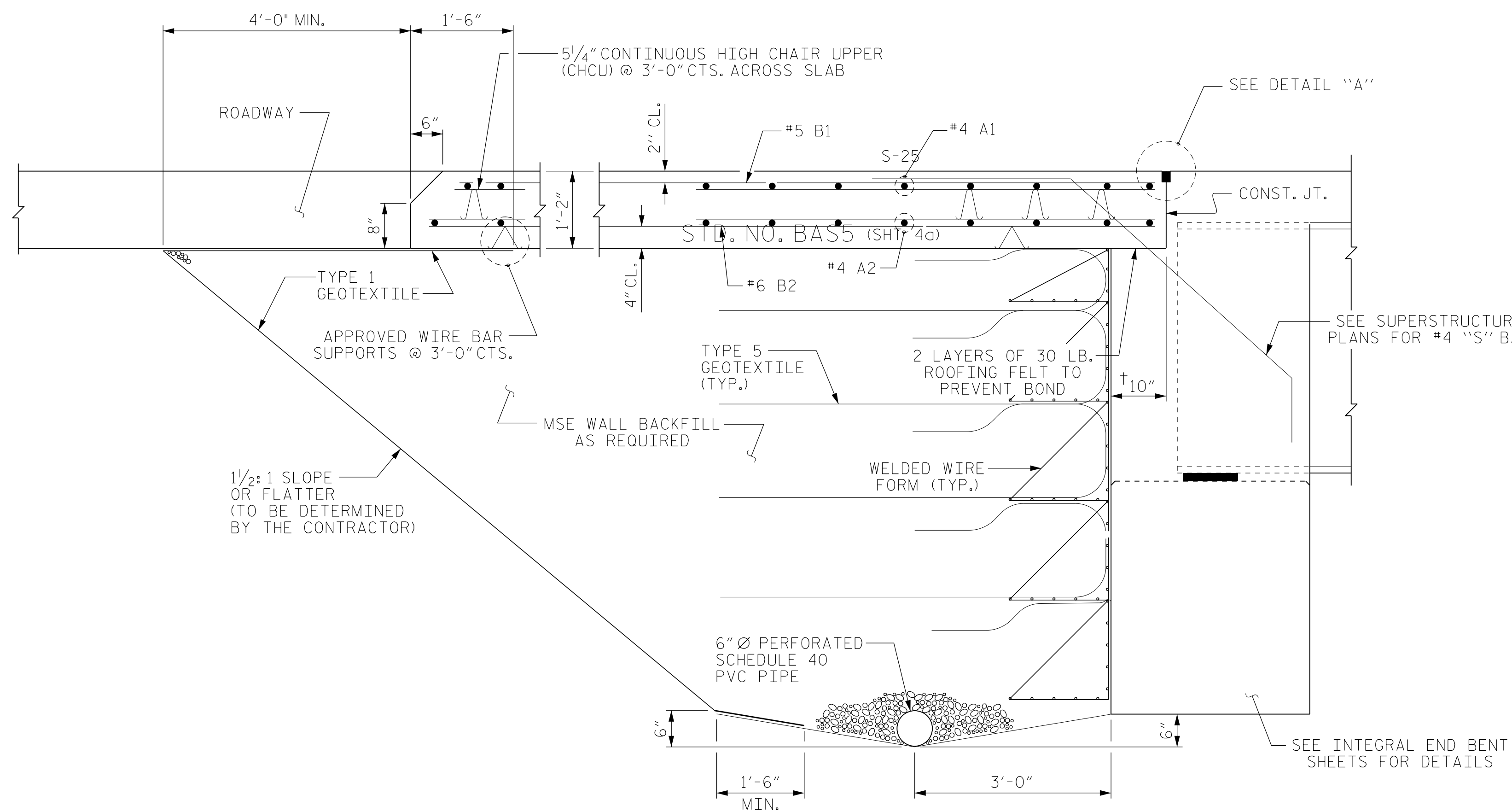
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STANDARD					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT					
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TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

MSE WALL BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWS NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

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SHEET 2 OF 2

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STANDARD BRIDGE APPROACH SLAB DETAILS					
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SHEET NO. S2-24					TOTAL SHEETS 24

STD. NO. BAS5

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SECTION THRU SLAB

(TYPE A - ALTERNATE APPROACH FILL)

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN