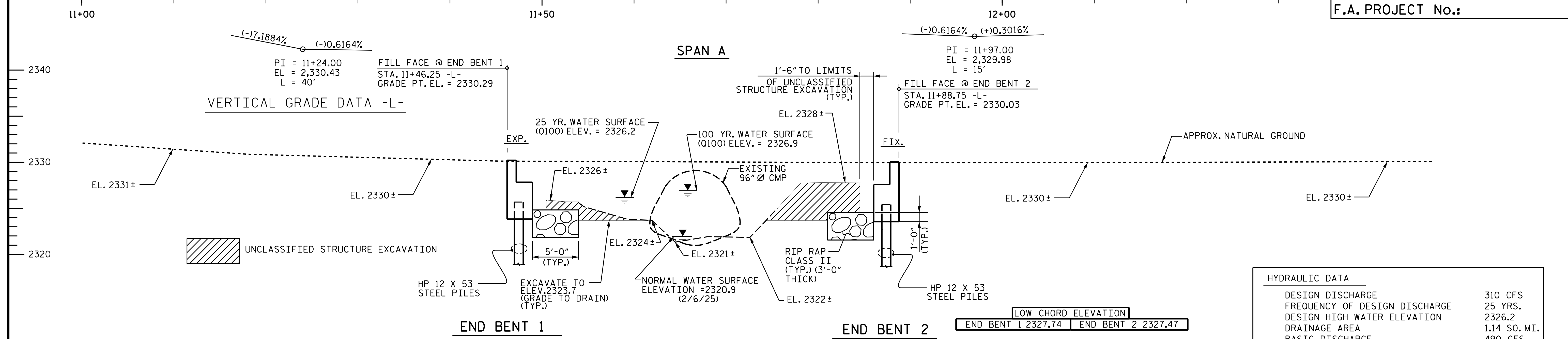


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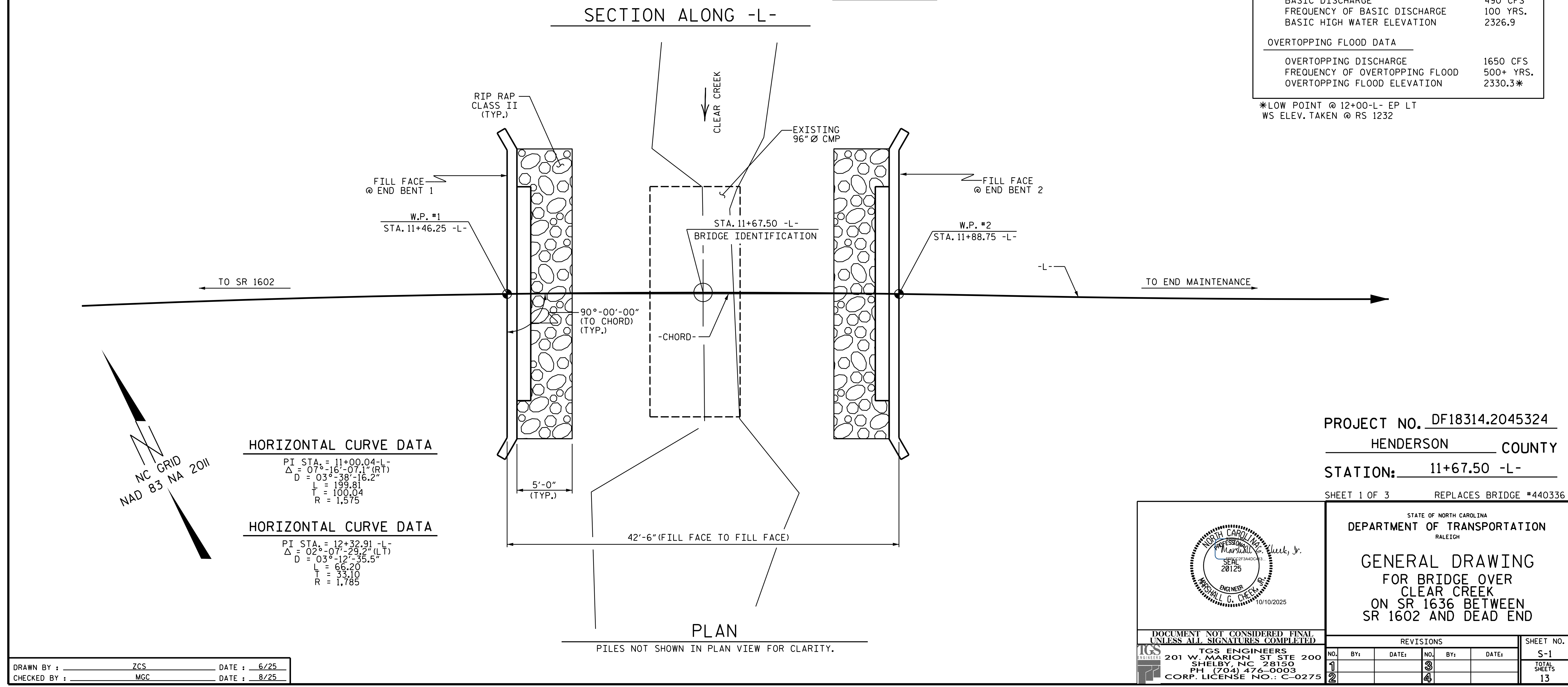
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numbers appear on each page, on the dates appearing
with their signature on that page.**

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HYDRAULIC DATA	
DESIGN DISCHARGE	310 CFS
FREQUENCY OF DESIGN DISCHARGE	25 YRS.
DESIGN HIGH WATER ELEVATION	2326.2
DRAINAGE AREA	1.14 SQ. MI.
BASIC DISCHARGE	490 CFS
FREQUENCY OF BASIC DISCHARGE	100 YRS.
BASIC HIGH WATER ELEVATION	2326.9
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	1650 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	2330.3*

*LOW POINT @ 12+00-L- EP LT
WS ELEV. TAKEN @ RS 1232

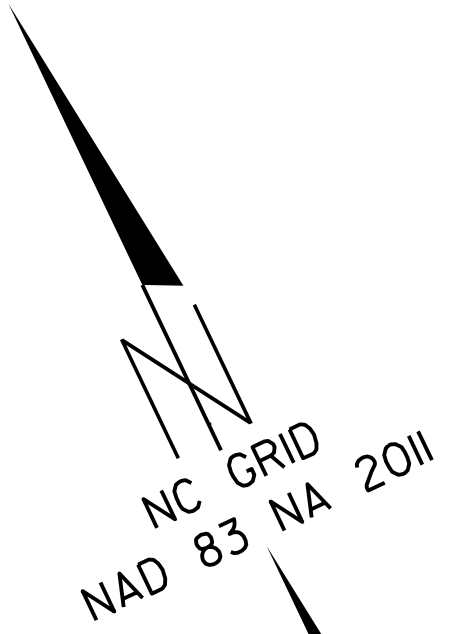


HORIZONTAL CURVE DATA

PI STA. = 11+00.04 -L-
Δ = 07°-16'-07.1" (RT)
D = 03°-38'-16.2"
L = 199.81
T = 100.04
R = 1,575

HORIZONTAL CURVE DATA

PI STA. = 12+32.91 -L-
Δ = 02°-07'-29.2" (LT)
D = 03°-12'-35.5"
L = 66.20
T = 33.10
R = 1,785

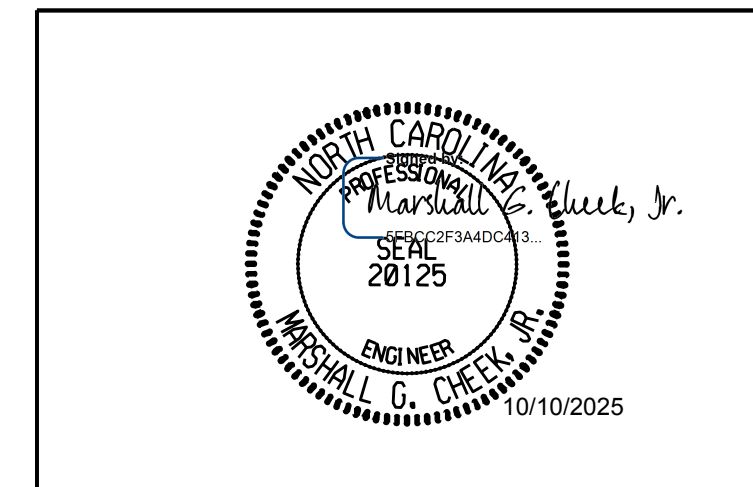


PROJECT NO. DF18314.2045324

HENDERSON COUNTY

STATION: 11+67.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE #440336



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

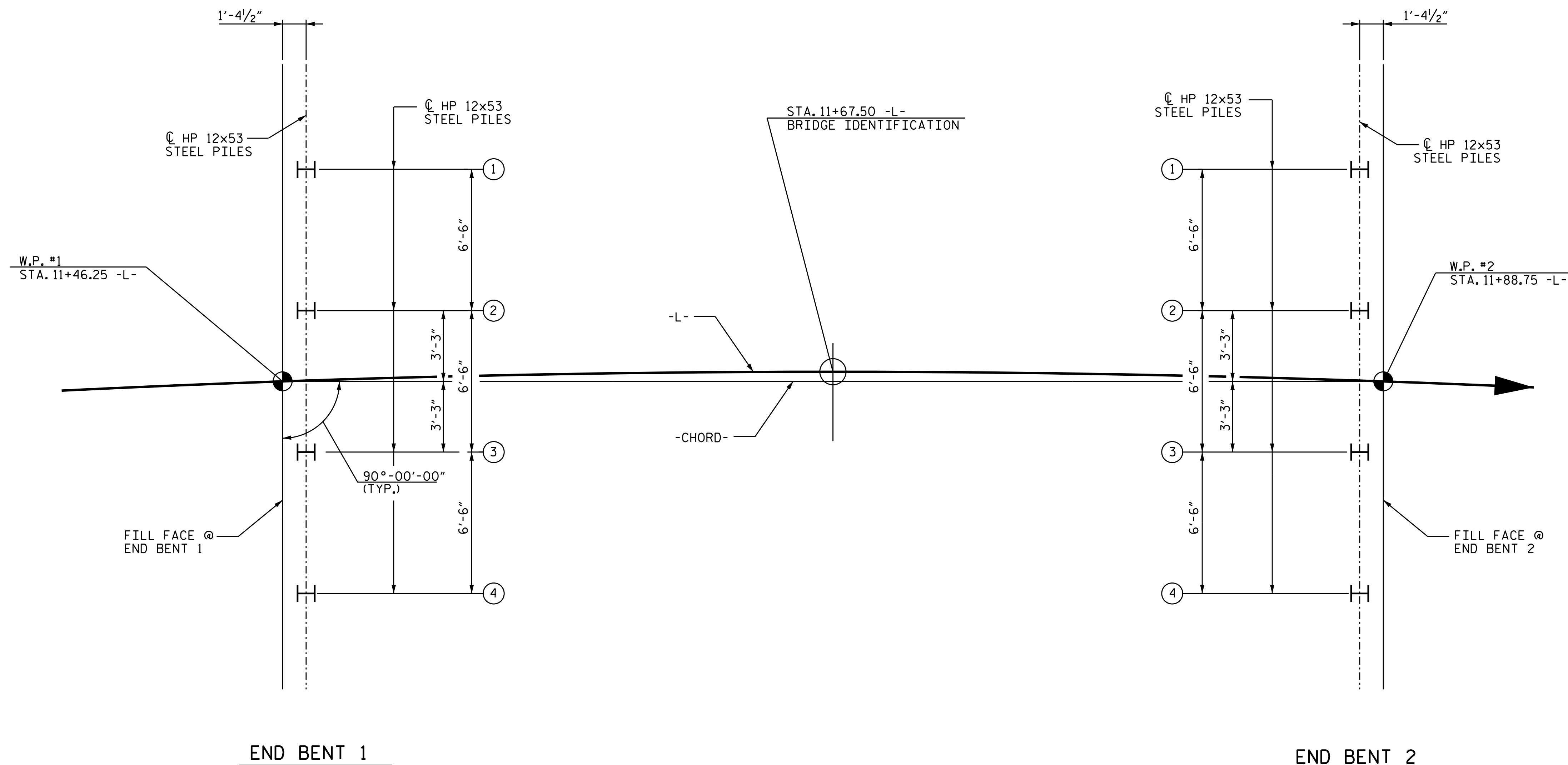
GENERAL DRAWING
FOR BRIDGE OVER
CLEAR CREEK
ON SR 1636 BETWEEN
SR 1602 AND DEAD END

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			13

DRAWN BY : ZCS DATE : 6/25
CHECKED BY : MGC DATE : 8/25



FOUNDATION LAYOUT PLAN

ALL END BENT PILES ARE HP12x53 STEEL PILES. DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ORIENT PILES AS SHOWN.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 177 KIPS PER PILE.
 BASED ON A REVIEW OF THE AVAILABLE BRIDGE INSPECTION REPORTS, SITE CONDITIONS AND THE SUBSURFACE INVESTIGATION, THE WEATHERED ROCK IS APPROXIMATELY 2276 FT (EB1) AND 2288 (EB2). WE RECOMMEND DRIVING STEEL PILES TO THESE ELEVATIONS.

PROJECT NO. DF18314.2045324

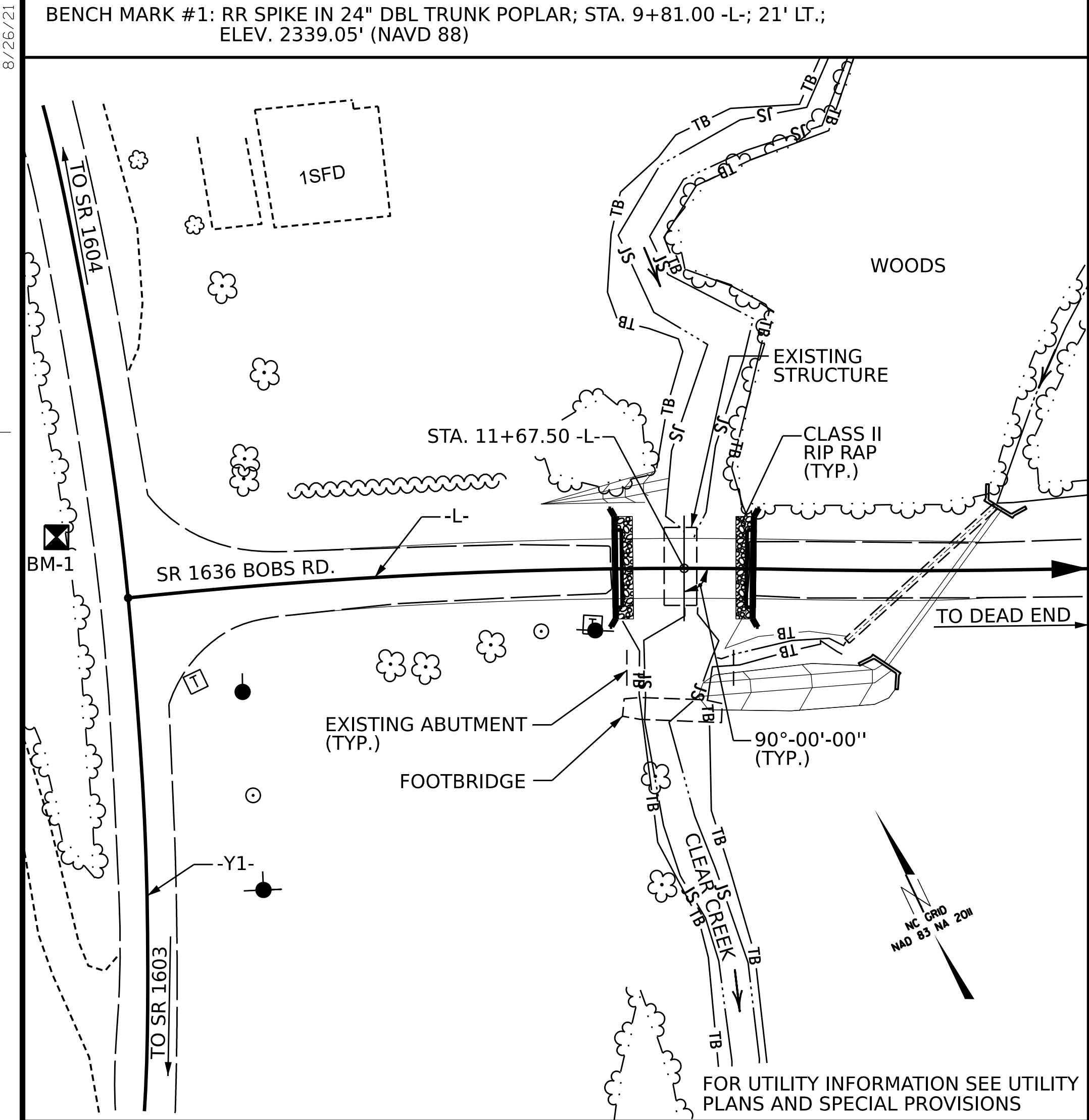
 HENDERSON COUNTY

STATION: 11+67.50 -L-

SHEET 2 OF 3

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING FOR BRIDGE OVER CLEAR CREEK ON SR 1636 BETWEEN SR 1602 AND DEAD END		SHEET NO.	
				S-2	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					13

DRAWN BY : ZCS DATE : 6/25
 CHECKED BY : MGC DATE : 7/25



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE EXISTING 96"Ø CMP AND THE EXISTING ABUTMENTS LOCATED DOWNSTREAM SHALL BE REMOVED. THE REMOVAL SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE 96"Ø PIPE AND ABUTMENTS IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED WITH SYSTEM 1 OR HOT DIPPED GALVANIZED IN ACCORDANCE WITH THE STRUCTURAL STEEL COATING PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

COATING APPLICATION FOR ALL STRUCTURAL STEEL SHALL NOT BE PERFORMED UNTIL SHOP FABRICATION INCLUDING CUTTING, DRILLING AND WELDING HAS BEEN COMPLETED.

ALL TIMBER AND LUMBER MEMBERS SHALL BE TREATED NO.1 SOUTHERN PINE AND CONFORM TO SECTION 1082 OF THE STANDARD SPECIFICATIONS.

ALL TIMBER DIMENSIONS SHOWN ON THE PLANS ARE NOMINAL DIMENSIONS.

WHEN FIELD CUTTING TIMBER MEMBERS, TREAT NEWLY EXPOSED SURFACES WITH EITHER A BITUMINOUS ASPHALT-BASED ROOFING CEMENT, COPPER NAPHTHENATE PASTE, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING.

TREAT ALL DRILLED OR NEWLY EXPOSED HOLES IN TIMBER MEMBERS BY PUMPING WITH BITUMINOUS ASPHALT-BASED ROOFING CEMENT, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING HARDWARE.

PRE-DRILL HOLES IN TIMBER AND LUMBER MEMBERS ACCEPTING BOLTS TO ELIMINATE SPLITTING.

FOR TIMBER FLASHING MEMBRANE, SEE SPECIAL PROVISIONS.

FOR TIMBER BRIDGE DECK WATERPROOFING, SEE SPECIAL PROVISIONS.

ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATION, UNLESS OTHERWISE NOTED ON THE PLANS.

DO NOT DRIVE LAG/STRUCTURAL SCREWS WITH A HAMMER, SCREW OR TORQUE LAG/STRUCTURAL SCREWS.

SCREWS SHALL PROVIDE SUFFICIENT LENGTH SO THAT SCREW THREADS AND SHANK WILL PENETRATE RECEIVING MEMBERS.

FOR TIMBER BRIDGE RAIL SYSTEM INCLUDING LUMBER, DELINEATORS, HARDWARE FOR BOLT CONNECTIONS, HARDWARE FOR SCREW CONNECTIONS AND ALUMINUM DRIP EDGE, SEE TIMBER BRIDGE SUPERSTRUCTURE ON STEEL BEAMS SPECIAL PROVISION.

FOR TIMBER BRIDGE DECK SYSTEM INCLUDING HARDWARE FOR BOLT CONNECTIONS AND HARDWARE FOR SCREW CONNECTIONS, SEE TIMBER BRIDGE SUPERSTRUCTURE ON STEEL BEAMS SPECIAL PROVISION.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f_y = 60ksi.

TOTAL BILL OF MATERIAL

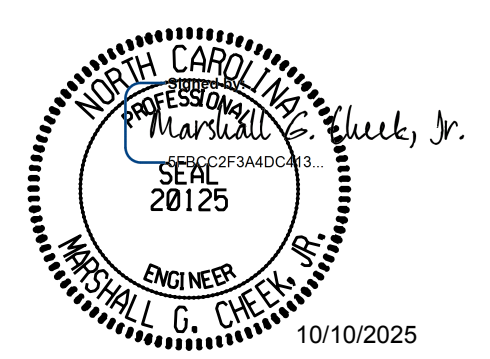
	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	REINFORCING STEEL	APPROX. 33,500 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 X 53 STEEL PILES	RIP RAP CLASS II (3'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	TIMBER DECK SYSTEM	TIMBER BRIDGE RAIL SYSTEM	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LUMP SUM	No.	No.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE						LUMP SUM						LUMP SUM	LUMP SUM	40.5
END BENT 1			LUMP SUM	14.7	1,448		4	4	220	25	28			
END BENT 2			LUMP SUM	14.7	1,448		4	4	180	25	28			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	29.4	2,896	LUMP SUM	8	8	400	50	56	LUMP SUM	LUMP SUM	40.5

PROJECT NO. DF18314.2045324

HENDERSON COUNTY

STATION: 11+67.50 -L-

SHEET 3 OF 3

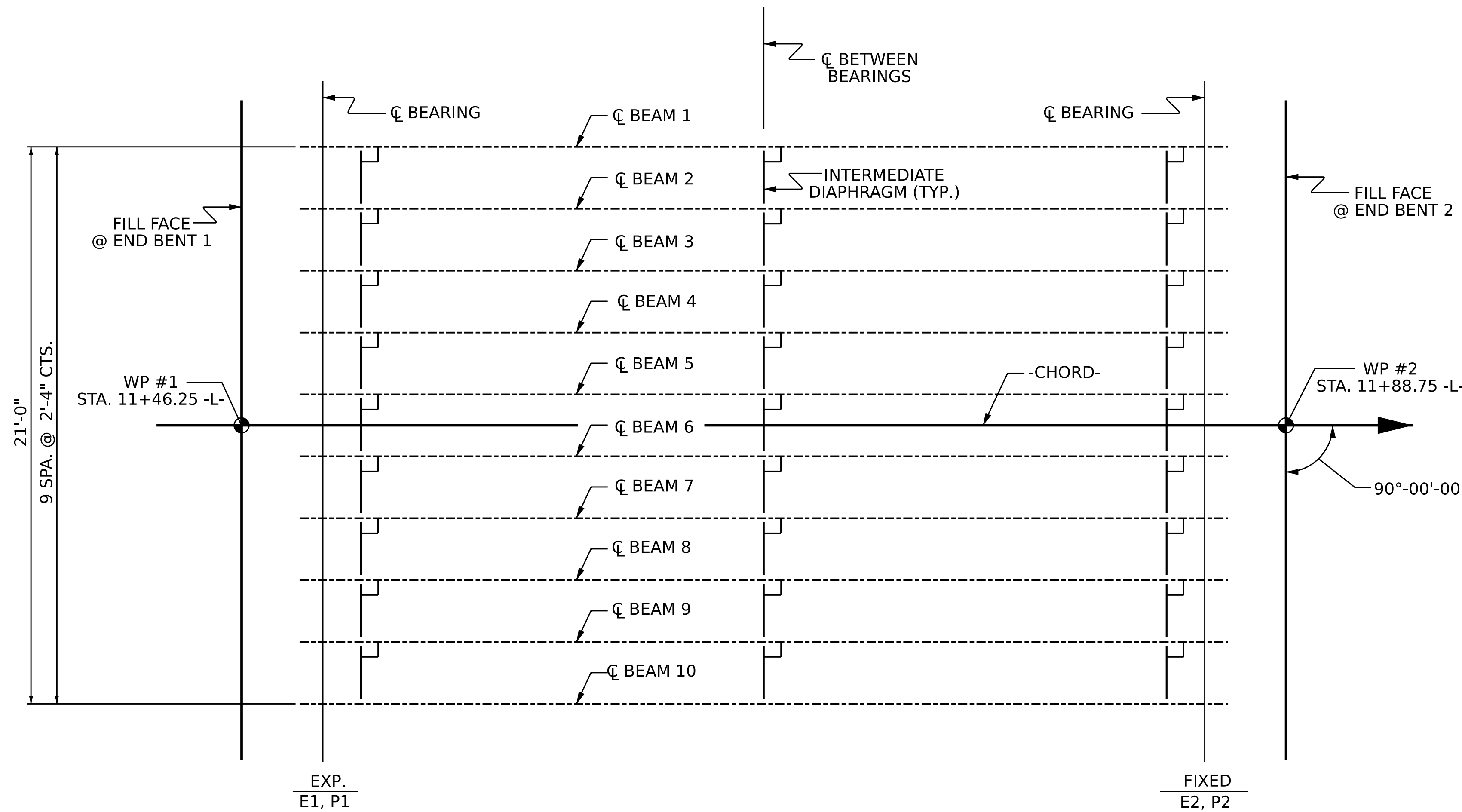


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

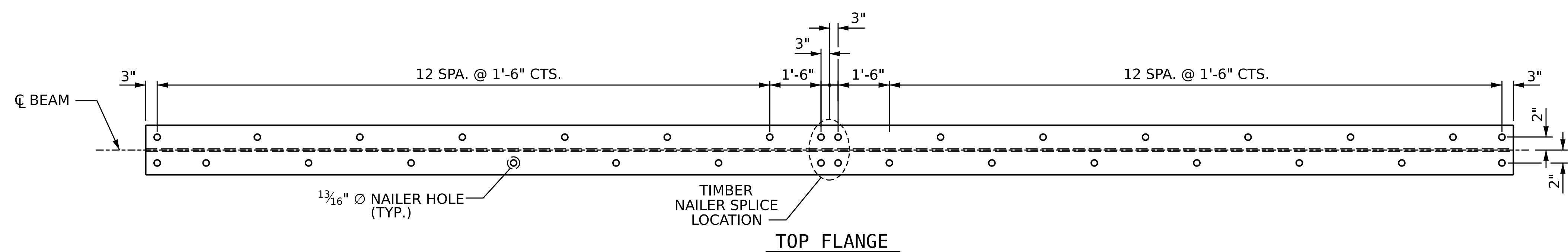
GENERAL DRAWING
FOR BRIDGE OVER
CLEAR CREEK
ON SR 1636 BETWEEN
SR 1602 AND DEAD END

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS 13
2			4			

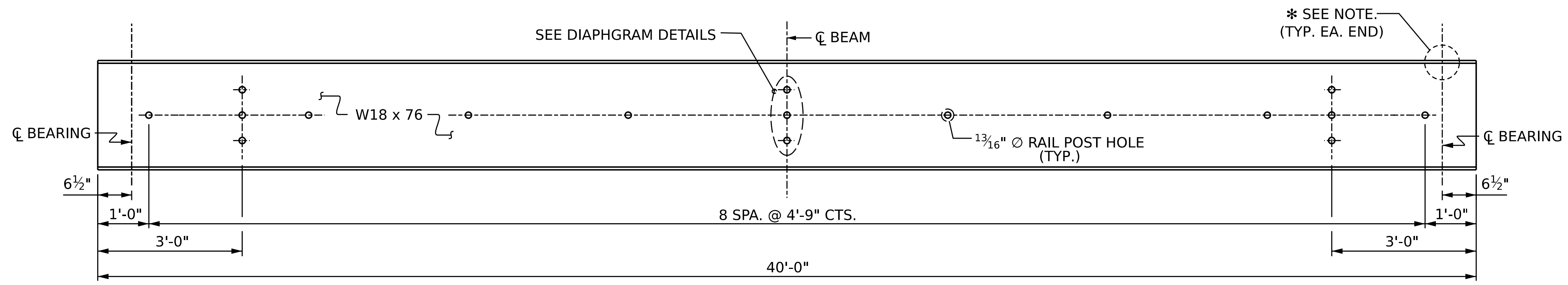
ASSEMBLED BY: ZCS DATE: 6/25
CHECKED BY: MGC DATE: 8/25



FRAMING PLAN



TOP FLANGE



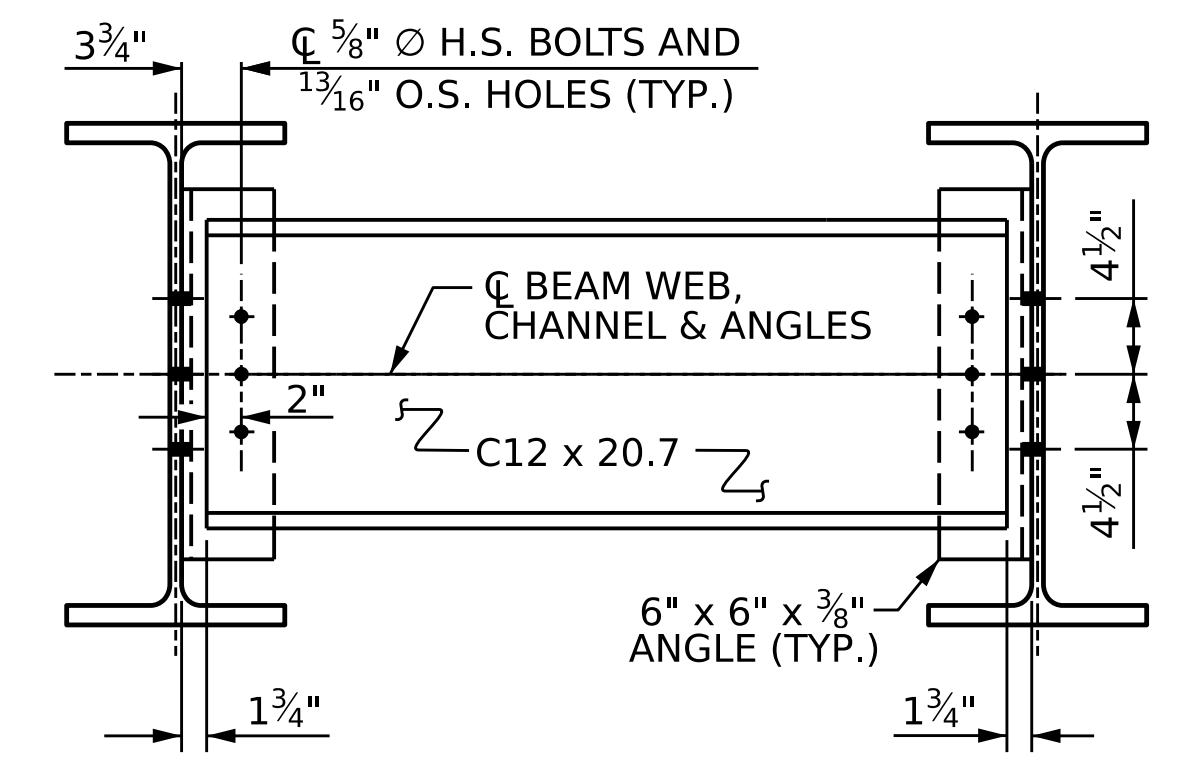
ELEVATION

(SHOWING RAIL POST HOLES FOR EXTERIOR BEAMS
INTERIOR BEAMS ARE SIMILAR BUT WITHOUT RAIL POST HOLES)

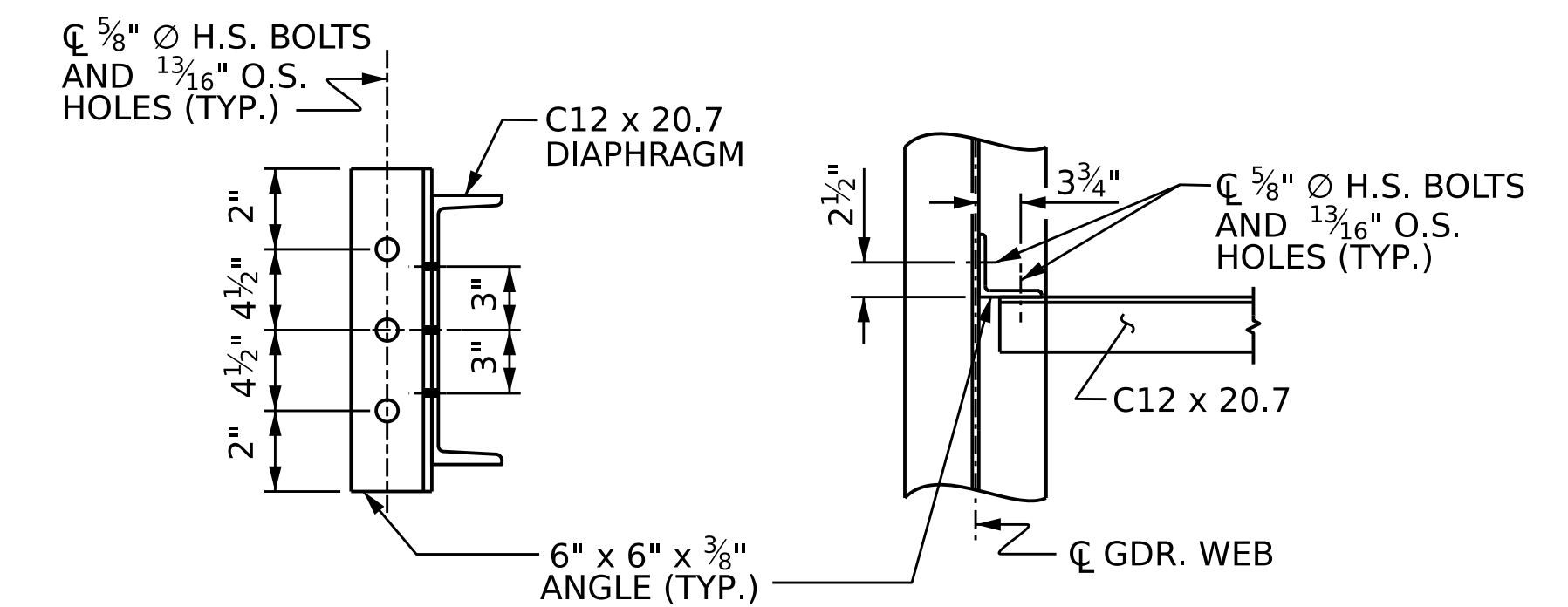
BEAM DETAILS

NOTES

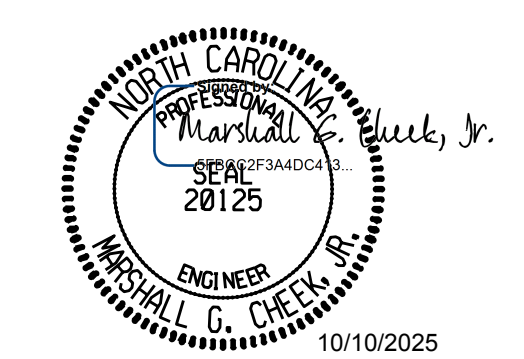
- NO SALVAGED BEAMS SHALL BE USED, UNLESS OTHERWISE NOTED ON THE PLANS.
- NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.
- ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL BE 5/8" DIA. GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
- CONTRACTOR'S OPTION TO WELD CONNECTOR TO BEAM PRIOR TO SHOP COATING.
- SEE GENERAL DRAWING NOTES FOR COATING.
- A CHARPY V-NOTCH TEST IS REQUIRED ON ALL BEAM SECTIONS IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.
- * FOR SIZE AND LOCATION OF OPTIONAL BOLTED SOLE PLATE, SEE BEARING DETAILS SHEET.



INTERIOR DIAPHRAGM DETAIL



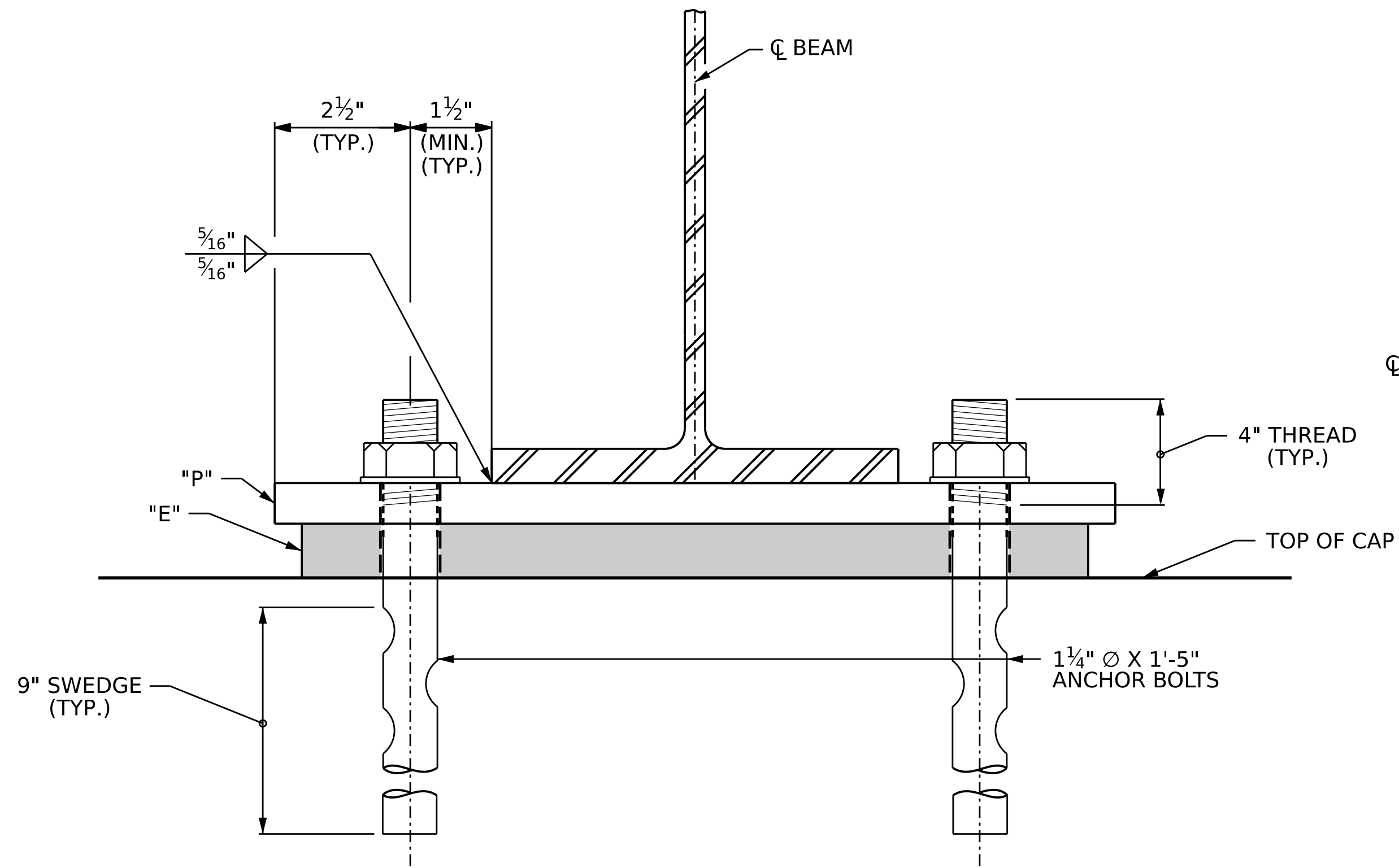
PROJECT NO. DF18314.2045324
HENDERSON COUNTY
 STATION: 11+67.50 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SUPERSTRUCTURE
**FRAMING PLAN FOR
 40' BEAM LENGTH
 90° SKEW**

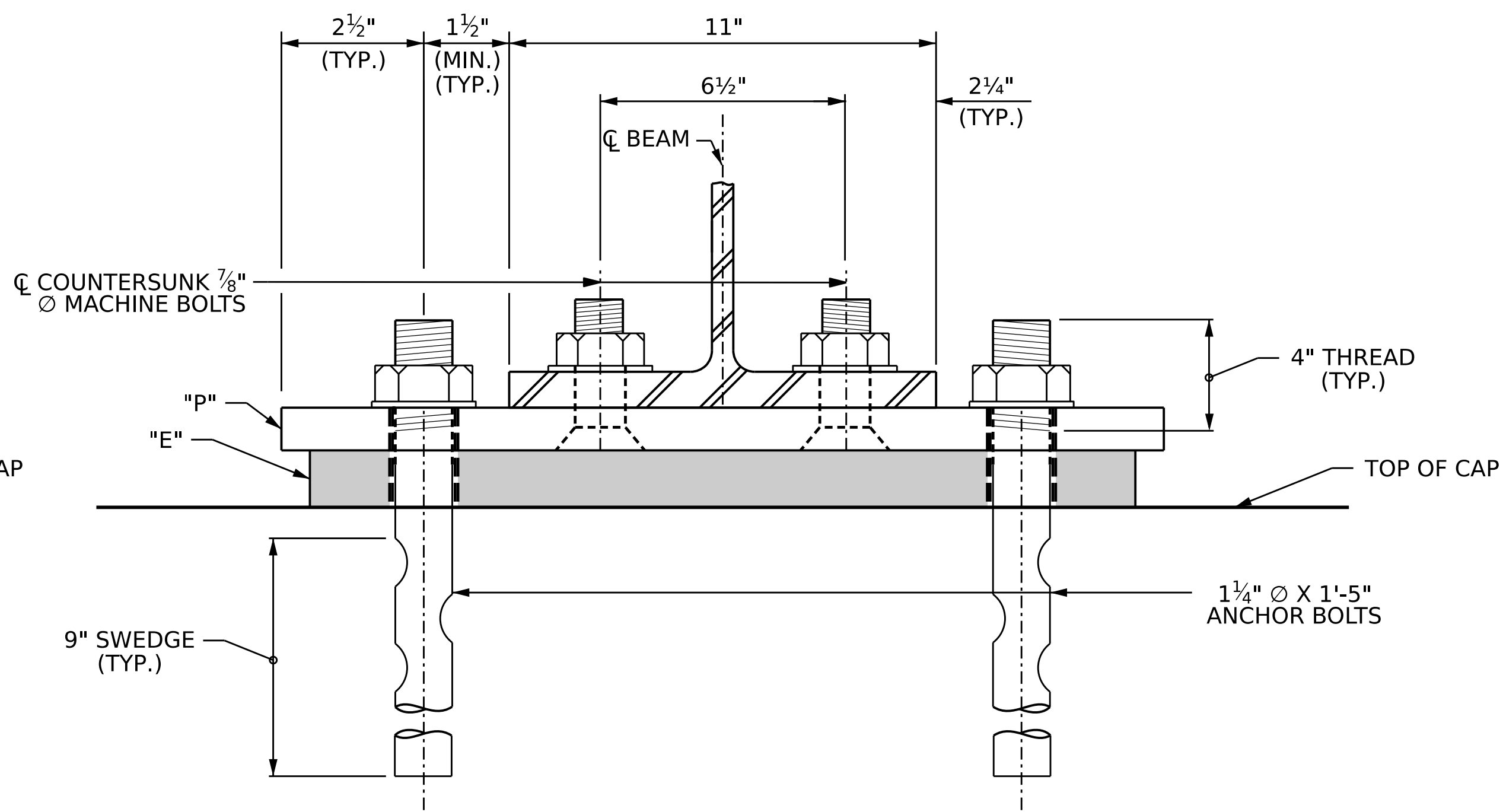
ASSEMBLED BY:	ZCS	DATE :	5/25
CHECKED BY :	MGC	DATE :	7/25
DRAWN BY :	BNB	4/24	
CHECKED BY :	JDH	10/24	

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TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275				NO.	BY:	DATE:	S-6
1			3				TOTAL SHEETS
2			4				13



END VIEW

WELDED



END VIEW

OPTIONAL BOLTED

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT ALL SUPPORTS, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

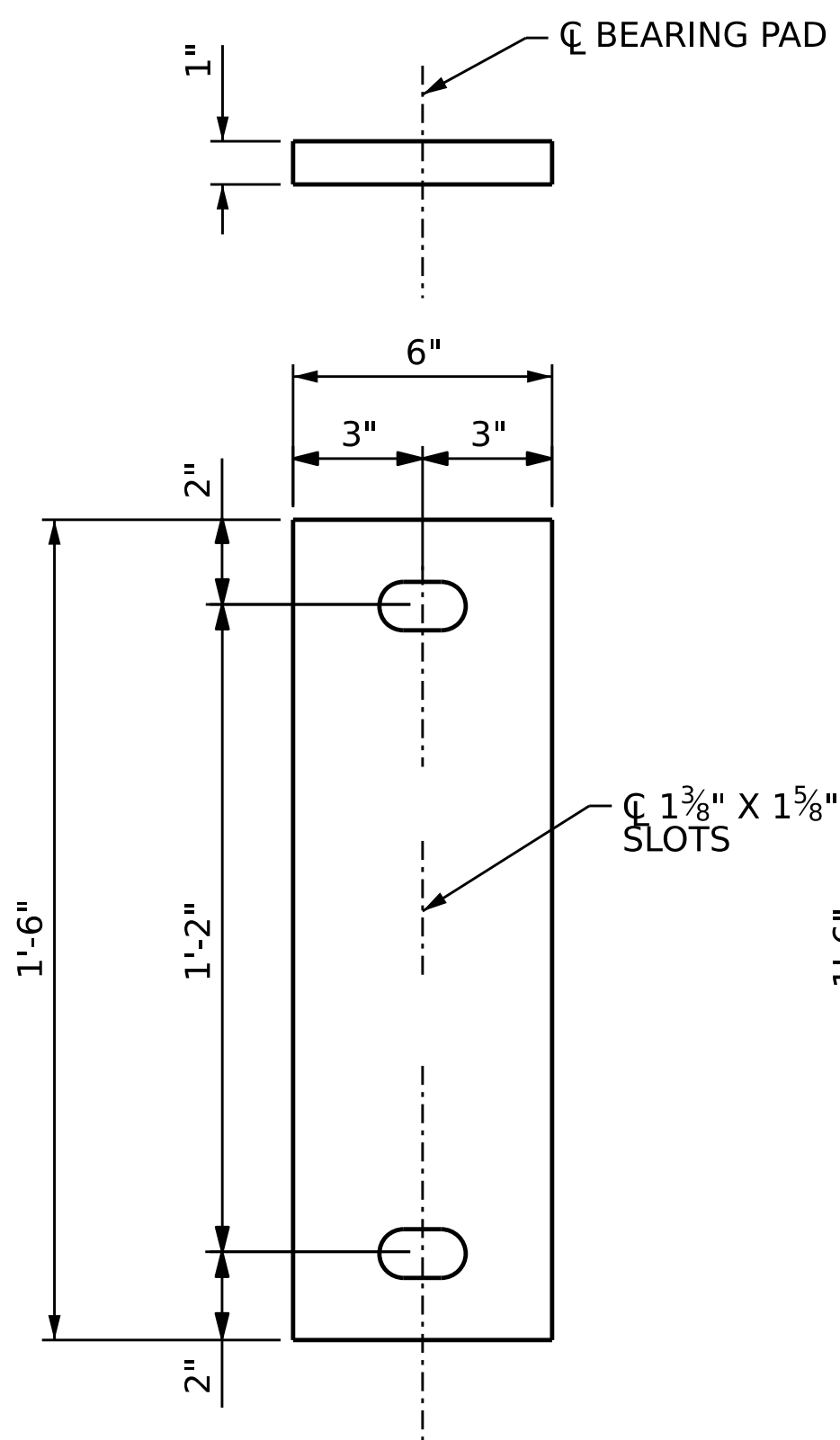
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS, AND WASHERS. SHOP INSPECTION IS REQUIRED.

AT THE APPROVAL OF THE ENGINEER, SOLE PLATES AT THE EXPANSION END MAY BE FIELD WELDED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300° F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

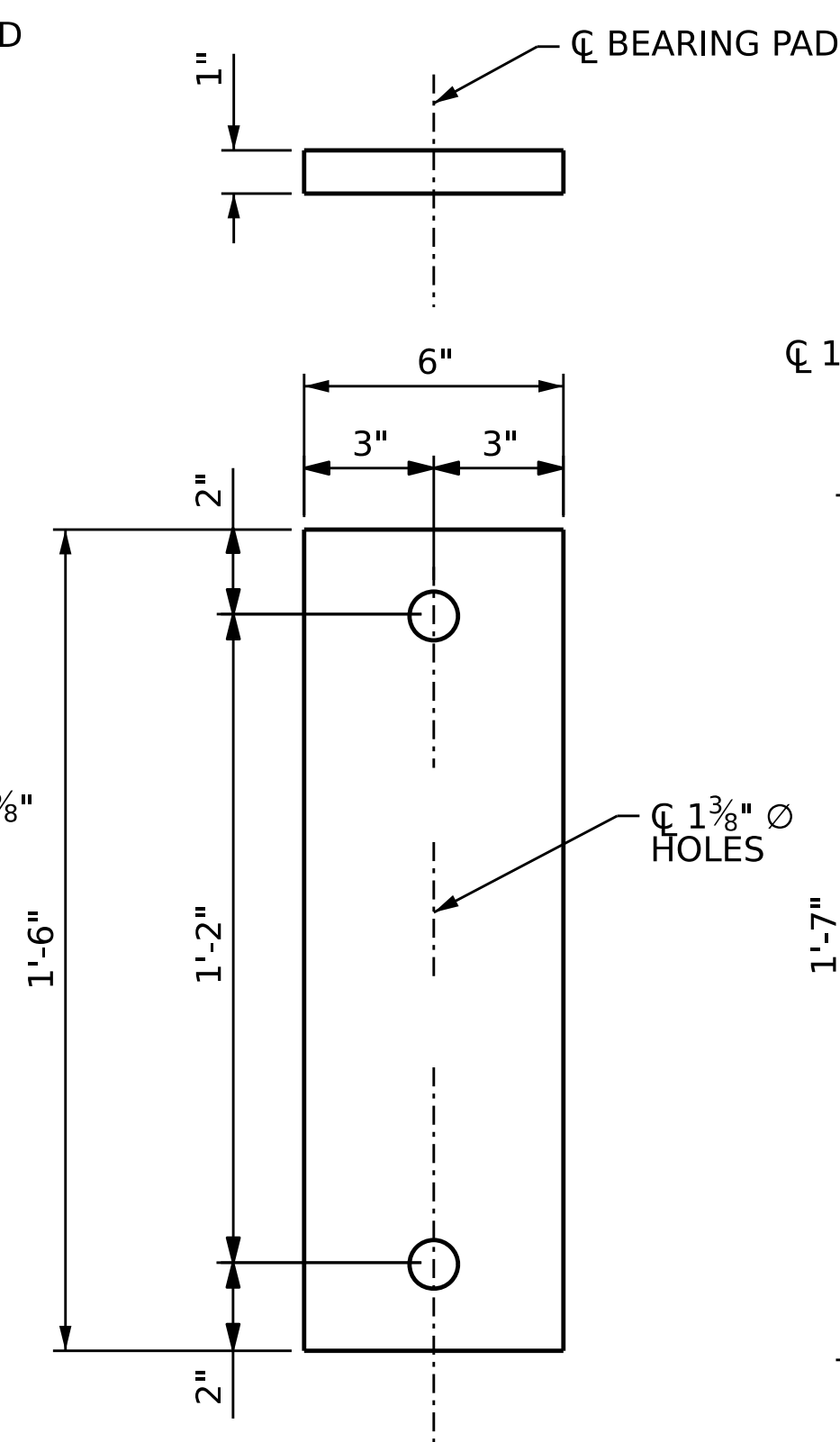
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT THE APPROVAL OF THE ENGINEER, THE OPTIONAL BOLTED SOLE PLATE MAY BE USED AT NO ADDITIONAL COST TO THE DEPARTMENT.



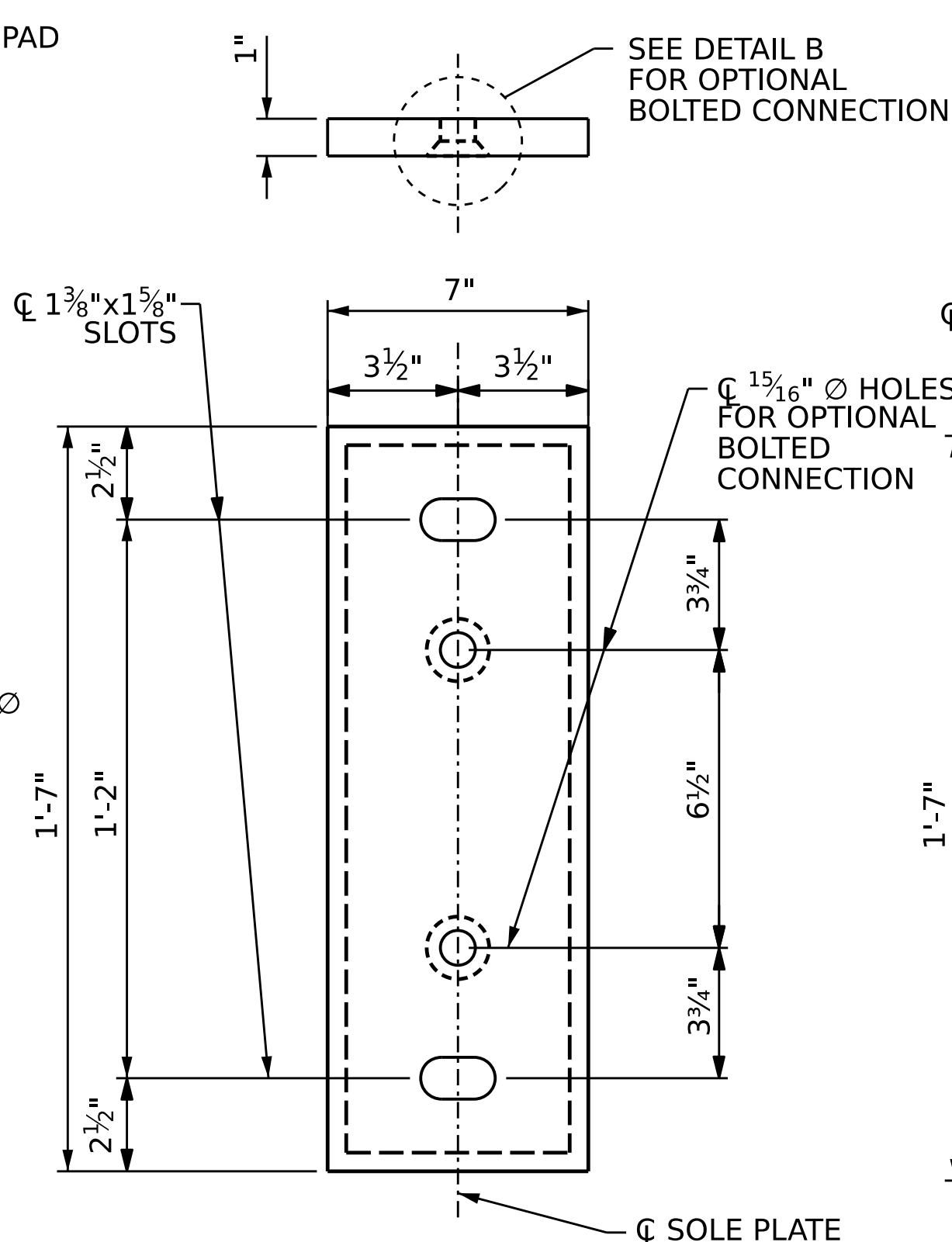
E1 ELASTOMERIC BEARING DETAILS

(10 REQ'D)
EXPANSION



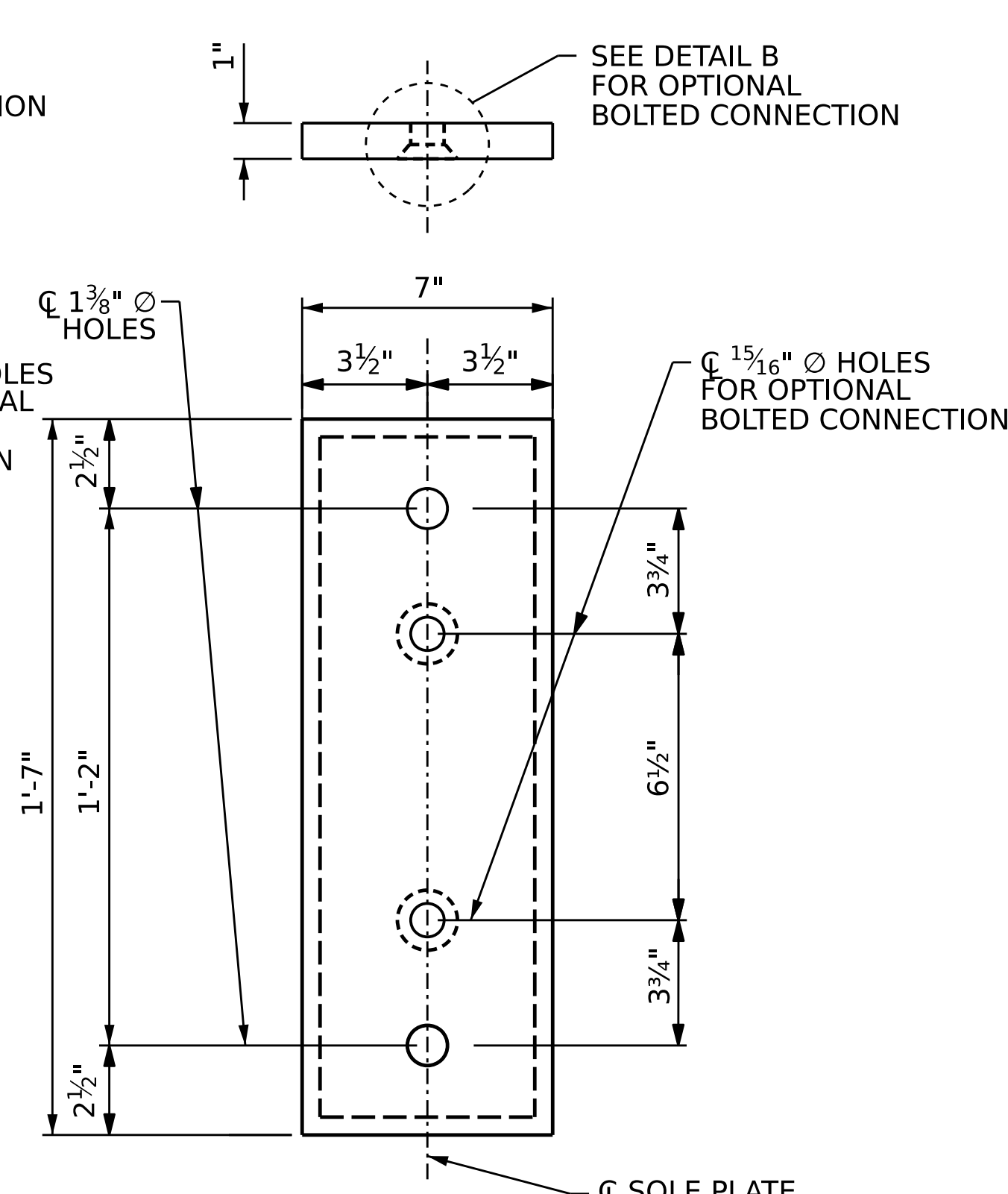
E2 ELASTOMERIC BEARING DETAILS

(10 REQ'D)
FIXED



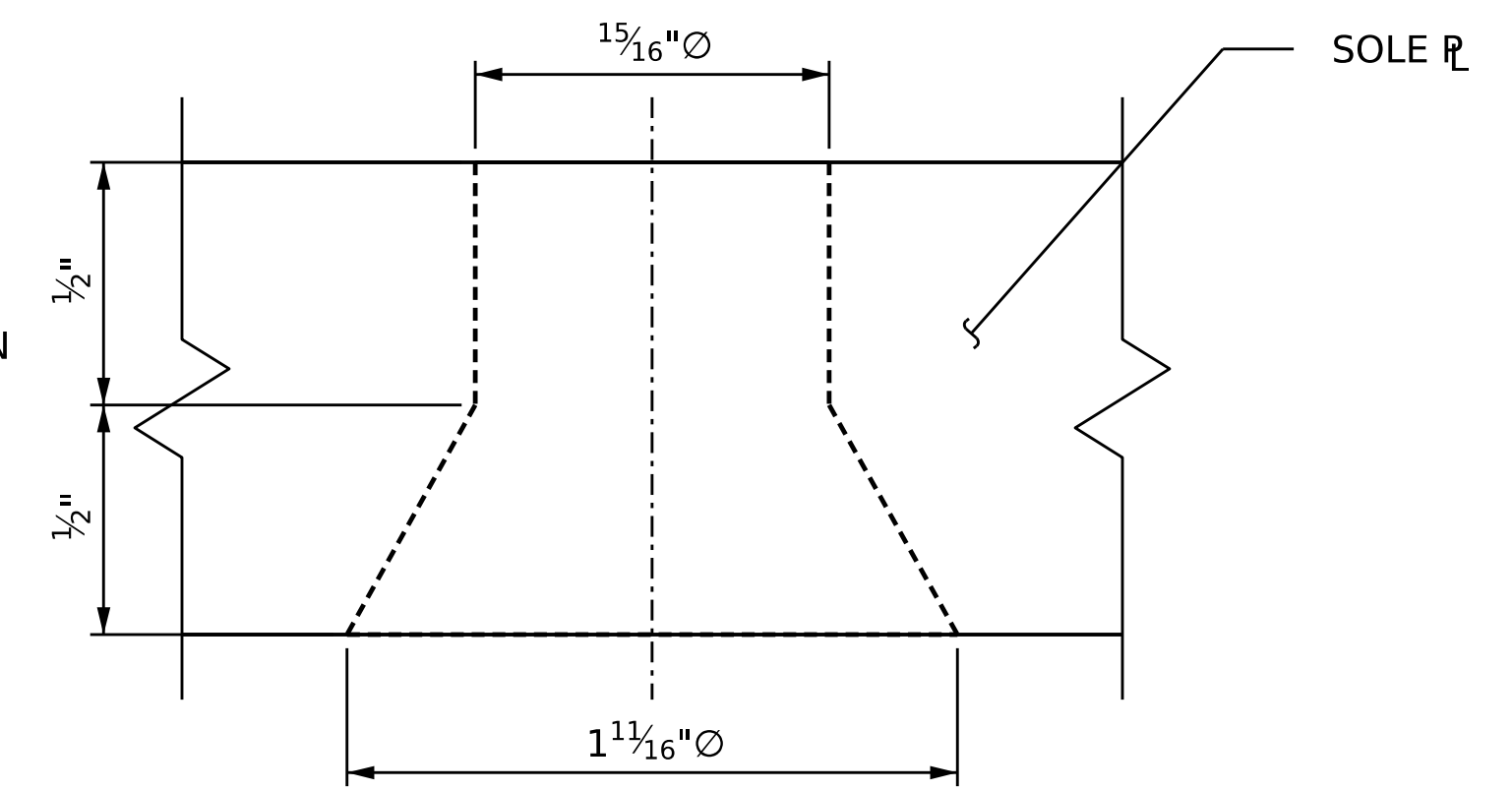
P1 SOLE PLATE DETAILS

(10 REQ'D)
EXPANSION



P2 SOLE PLATE DETAILS

(10 REQ'D)
FIXED



DETAIL B

PROJECT NO. DF18314.2045324

HENDERSON COUNTY

BRIDGE NO. 11+67.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
**BEARING DETAILS
TYPE II**

IGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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2			4		

SHEET NO. S-7
TOTAL SHEETS 13

ASSEMBLED BY:	ZCS	DATE:	5/25
CHECKED BY:	MGC	DATE:	7/25
DRAWN BY:	GA	DATE:	10/2024
CHECKED BY:	JDH	DATE:	11/2024

NOTES

FOR ADDITIONAL NOTES, SEE TYPICAL SECTION AND GENERAL DRAWING SHEETS.

STAGGER TIMBER DECK PLANK BUTT JOINTS AT 4FT MINIMUMS FROM ADJACENT RUNS.

ATTACH TIMBER DECK PLANKS TO NAILERS WITH TWO STRUCTURAL SCREWS PER TIMBER DECK PLANK.

AVOID HITTING NAILER BOLT WHEN DRIVING TIMBER DECK SCREWS.

SEE BEAM DETAILS FOR SPACING OF TIMBER BOLTS IN TOP FLANGE OF ROLLED BEAM.

COUNTERSINK TIMBER BOLT AND STRUCTURAL SCREW HEADS TO BE FLUSH WITH TIMBER SURFACE.

TRIM THE EDGE NAILER FLUSH WITH THE EDGE OF DECK.

DECK PLANK WIDTH MAY BE CUT TO 6" (MIN.) TO FIT WITHIN LIMITS OF TIMBER DECK. ALL DECK PLANKS ATTACHED TO THE EDGE NAILER SHALL BE FULL WIDTH. CUT BOARDS WILL NOT BE PERMITTED TO BE PLACED ADJACENT TO ONE ANOTHER.

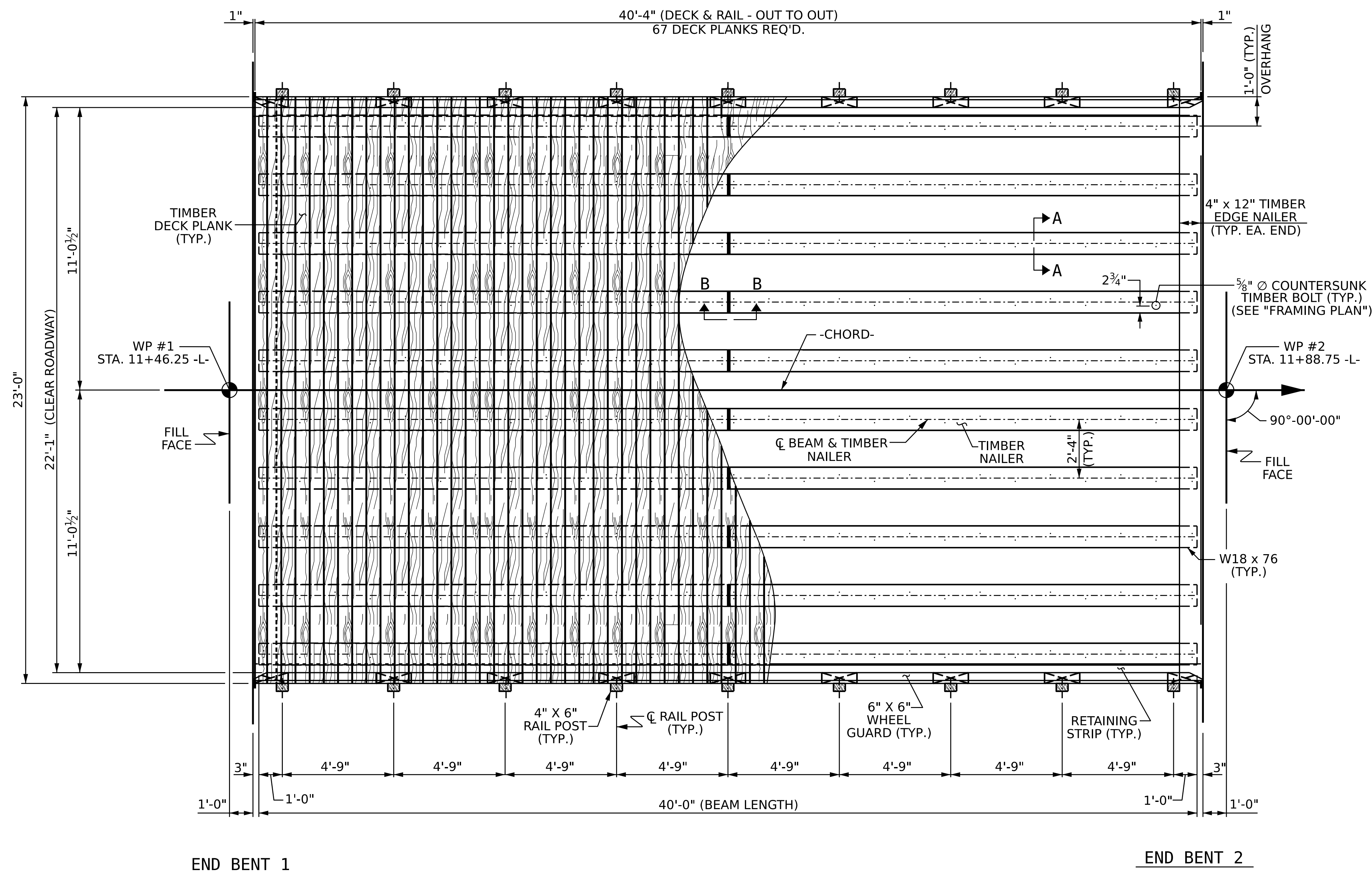
FINAL JOINT SEALS SHALL NOT BE INSTALLED UNTIL THE OVERLAY IS COMPLETE.

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE BACKER ROD FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

POURABLE SILICONE JOINT SEALANT SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINT.

FOR POURABLE SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.



DECK LAYOUT
FOR SECTIONS A-A & B-B, SEE SHEET 2 OF 2.

PROJECT NO. DF18314.2045324

HENDERSON COUNTY

STATION: 11+67.50 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
PLAN OF 40' BEAM
22'-0" CLEAR ROADWAY
90° SKEW

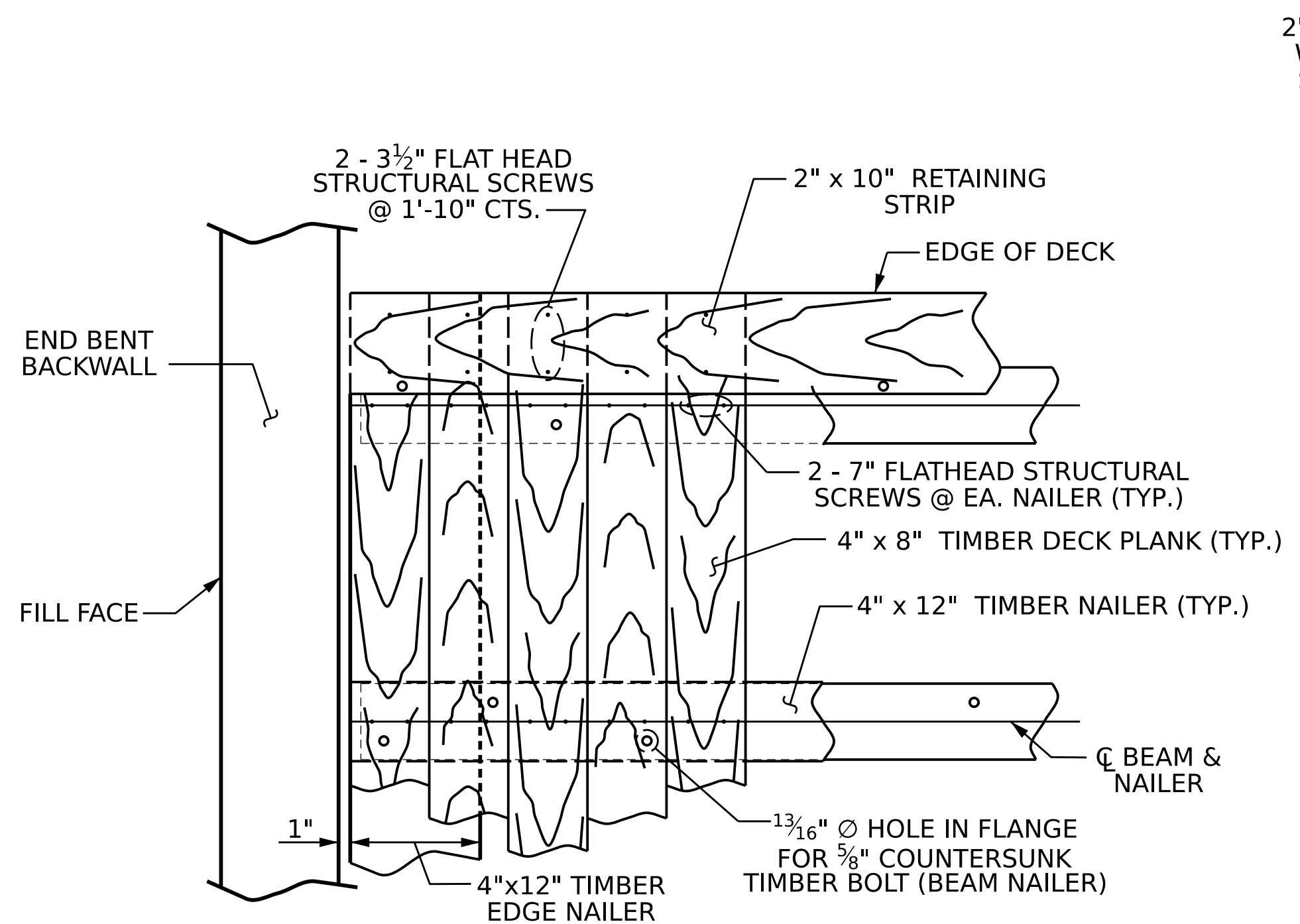
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SHELBY, NC 28150
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CORP. LICENSE NO.: C-0275

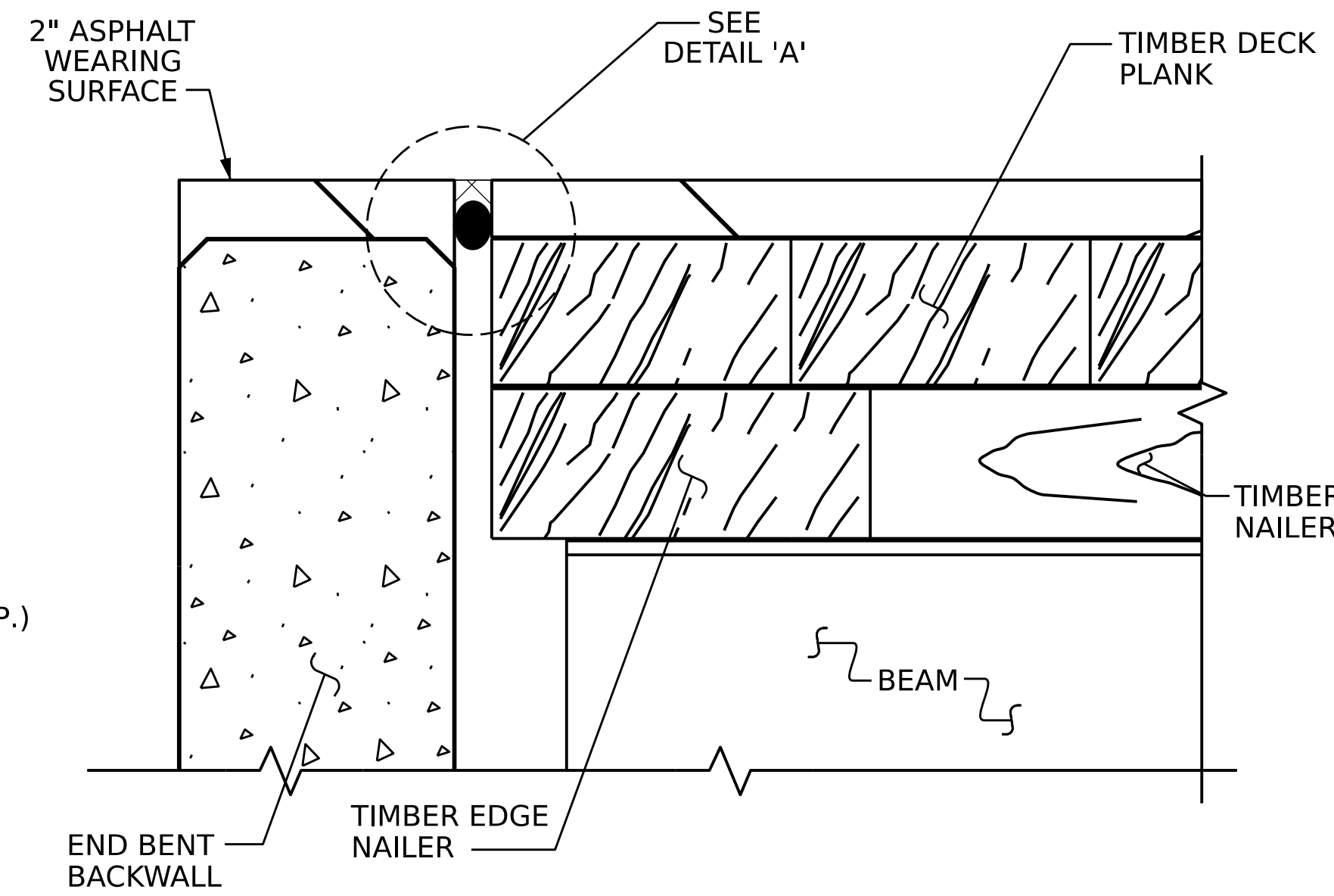
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
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S-8
TOTAL SHEETS
13

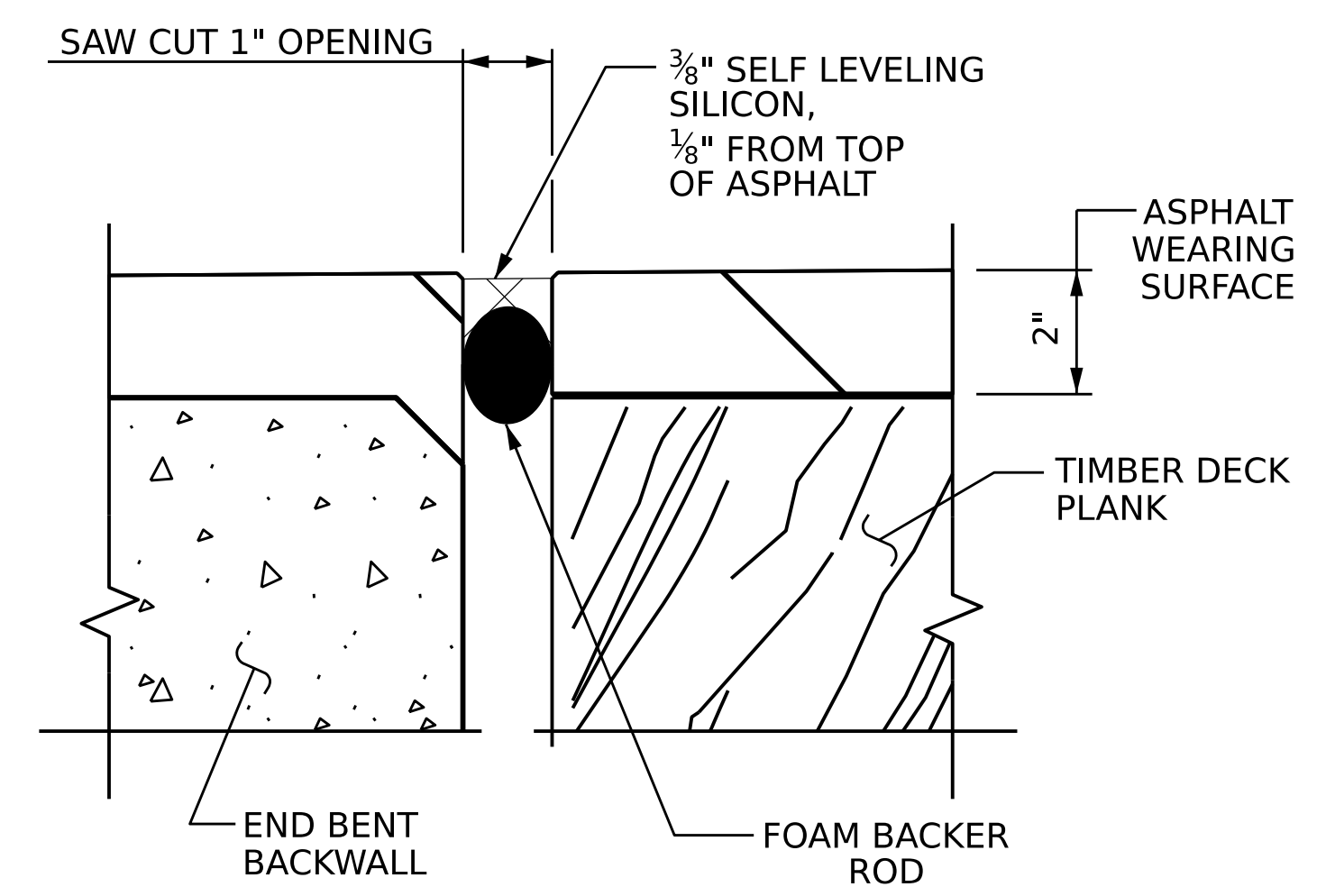
ASSEMBLED BY: ZCS	DATE: 5/25
CHECKED BY: MGC	DATE: 7/25
DRAWN BY: BNB 4/24	
CHECKED BY: JDH 10/24	



TYPICAL DECK DETAIL AT END BENT

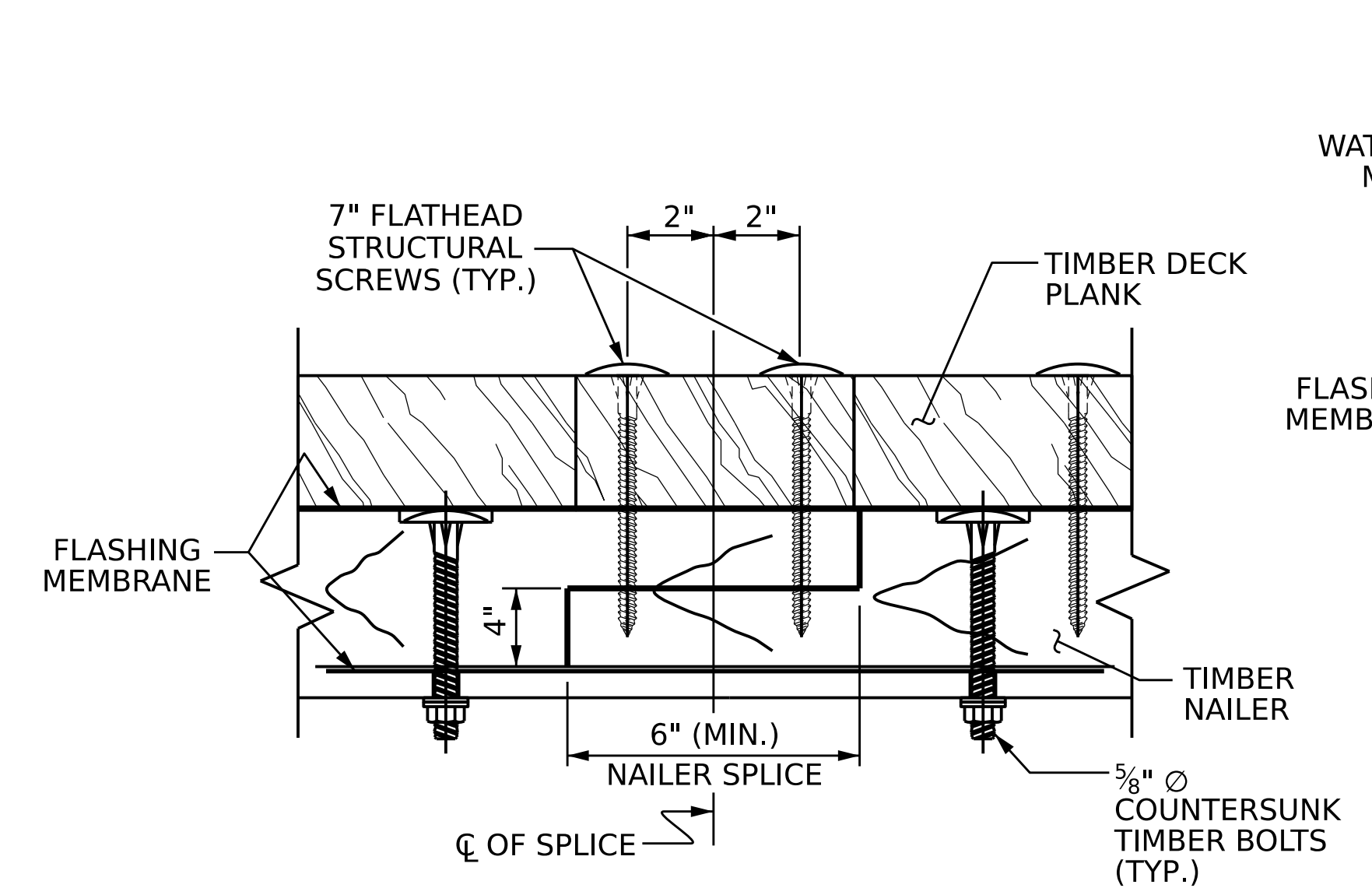


PROPOSED POURABLE SILICONE JOINT DETAIL

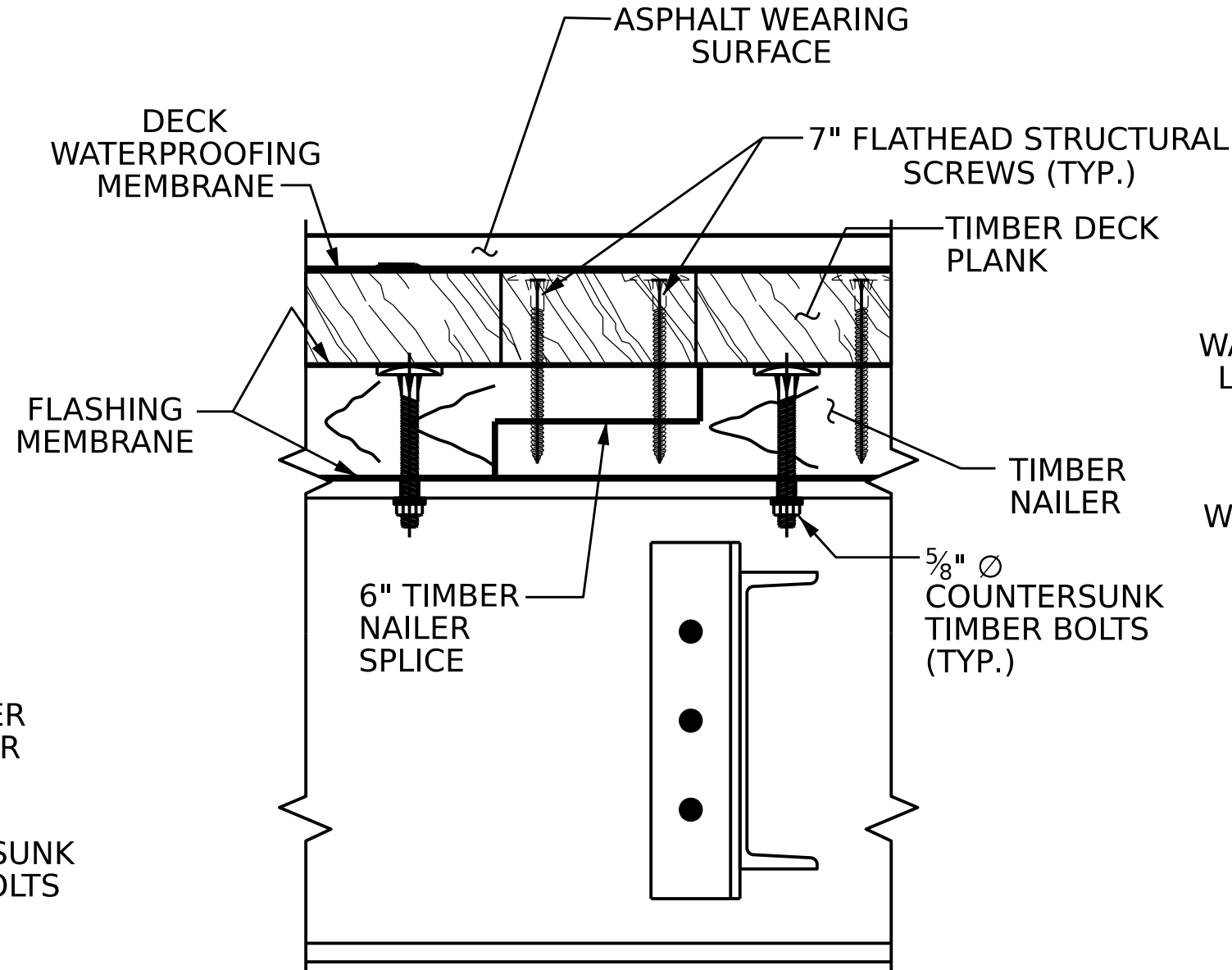


DETAIL 'A'

BILL OF MATERIAL FOR 40 FT. SPAN				
TREATED LUMBER				
ITEM	SIZE	LIN. FT.		
TIMBER DECK PLANKS	4"x8"	1541.00		
TIMBER NAILERS	4"x12"	384.58		
TIMBER EDGE NAILERS	4"x12"	46.00		
TOTAL TREATED LUMBER		1971.58 LIN. FT.		
FLASHING MEMBRANE				
ITEM	SIZE	SQ. FT.		
TOP OF BEAM	25 MILS	412		
TOP OF TIMBER NAILERS	25 MILS	393		
TOP OF TIMBER EDGE NAILERS	25 MILS	47		
FLASHING MEMBRANE		852 SQ. FT.		
HARDWARE FOR BOLT CONNECTIONS				
ITEM	No.	SIZE	LENGTH	LBS.
3/8" Ø TIMBER BOLTS	320	5/8" Ø	6"	195
HEAVY HEX NUTS	320	5/8" Ø		38
STANDARD WASHERS	640	5/8" Ø		50
LOCK WASHERS	320	5/8" Ø		8
HARDWARE FOR BOLT CONNECTIONS				291 LBS.
HARDWARE FOR SCREW CONNECTIONS				
ITEM	No.	SIZE	LENGTH	LBS.
FLAT HEAD STR. SCREWS	1340	.275" Ø	6"	100
HARDWARE FOR SCREW CONNECTIONS				100 LBS.
DECK WATERPROOFING MEMBRANE				
ITEM	SIZE	SQ. YDS		
DECK WATERPROOFING MEMBRANE	65 MILS	105		
DRIP EDGE				
ITEM	SIZE	LIN. FT.		
ALUMINUM DRIP EDGE	22 GA.	81		

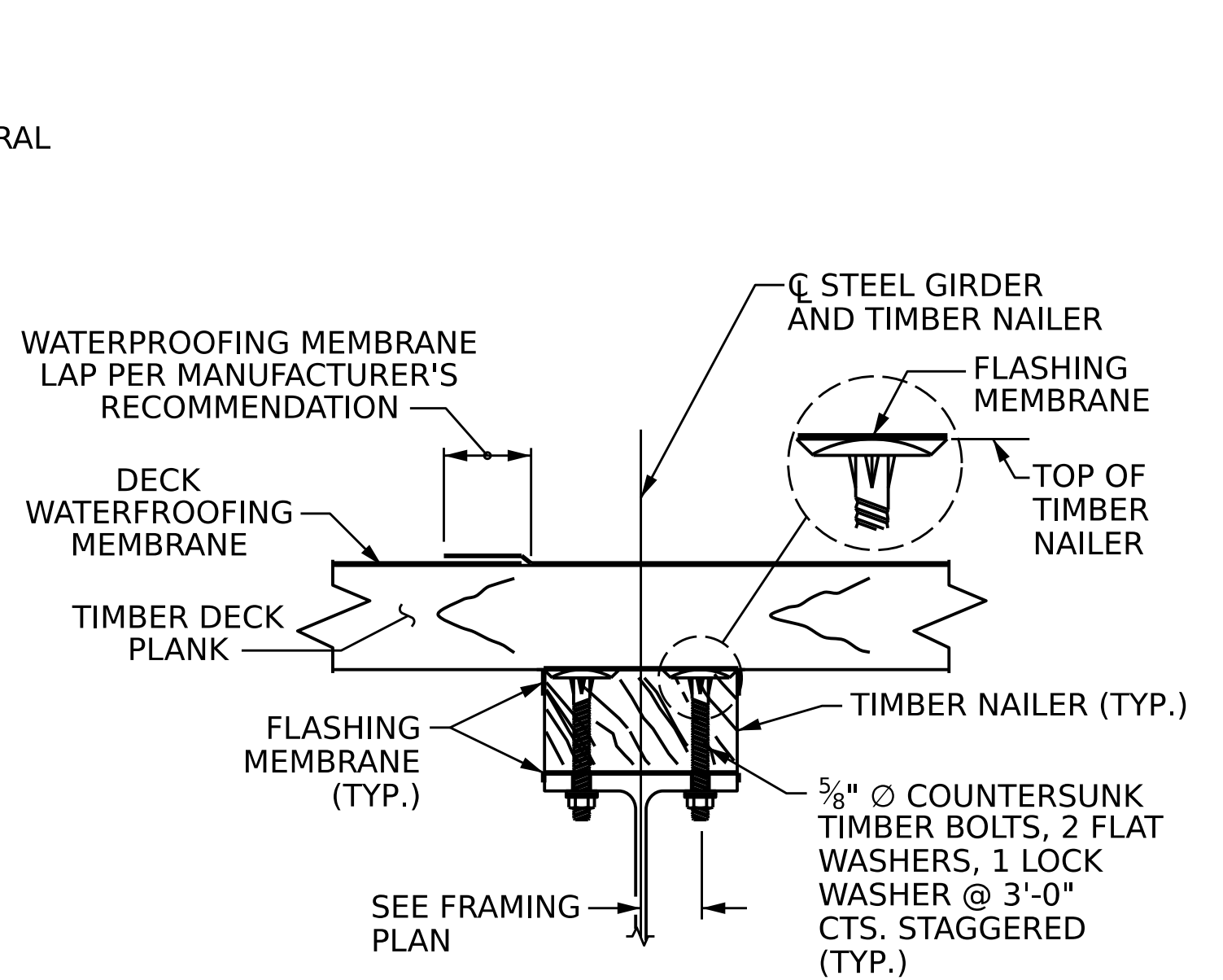


NAILER SPLICE DETAILS



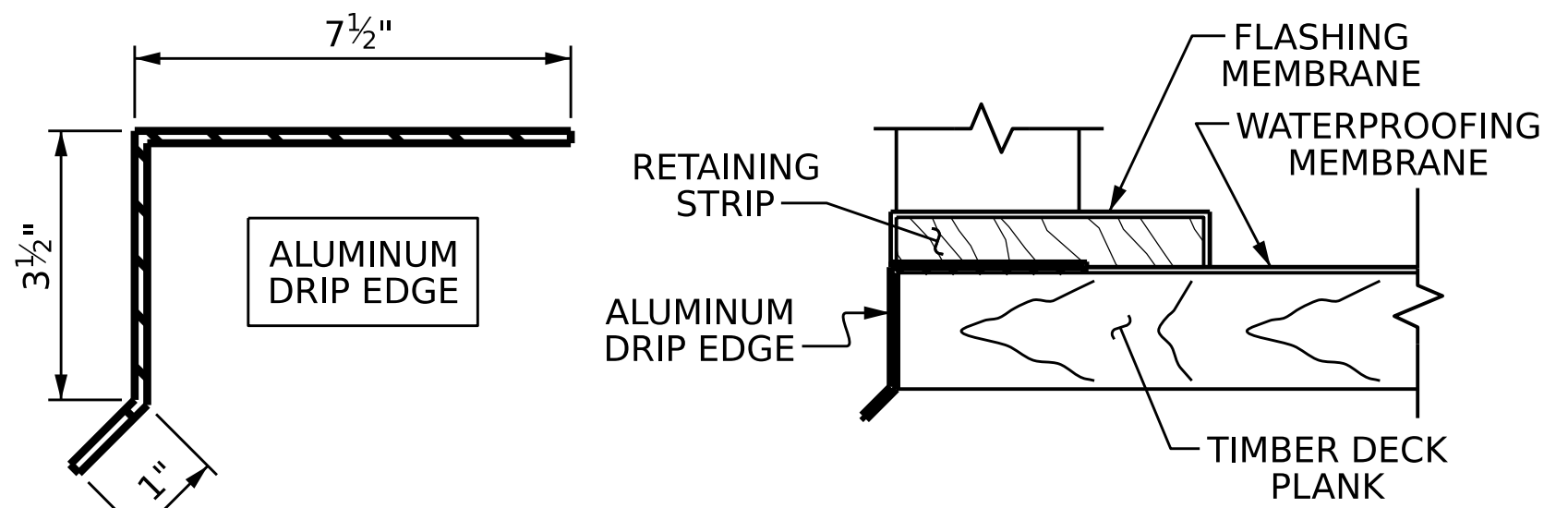
SECTION B-B

NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS



SECTION A-A

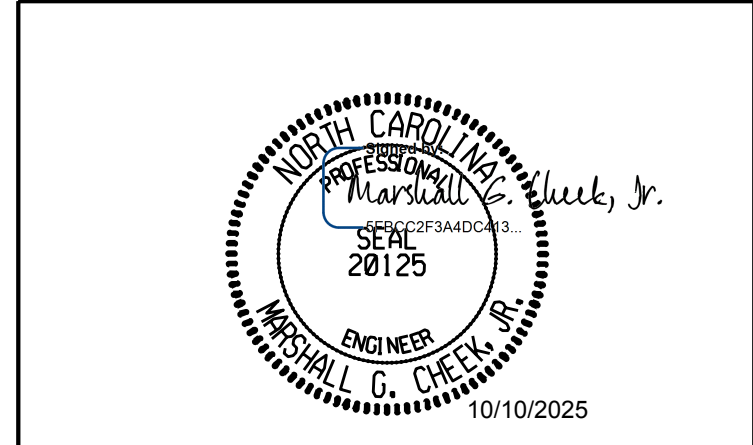
TIMBER NAILER ATTACHMENT DETAILS



DRIP EDGE DETAILS

POST AND BOLTS NOT SHOWN FOR CLARITY

PROJECT NO. DF18314.2045324
 HENDERSON COUNTY
 STATION: 11+67.50 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SUPERSTRUCTURE
 PLAN OF SPAN
 DETAILS

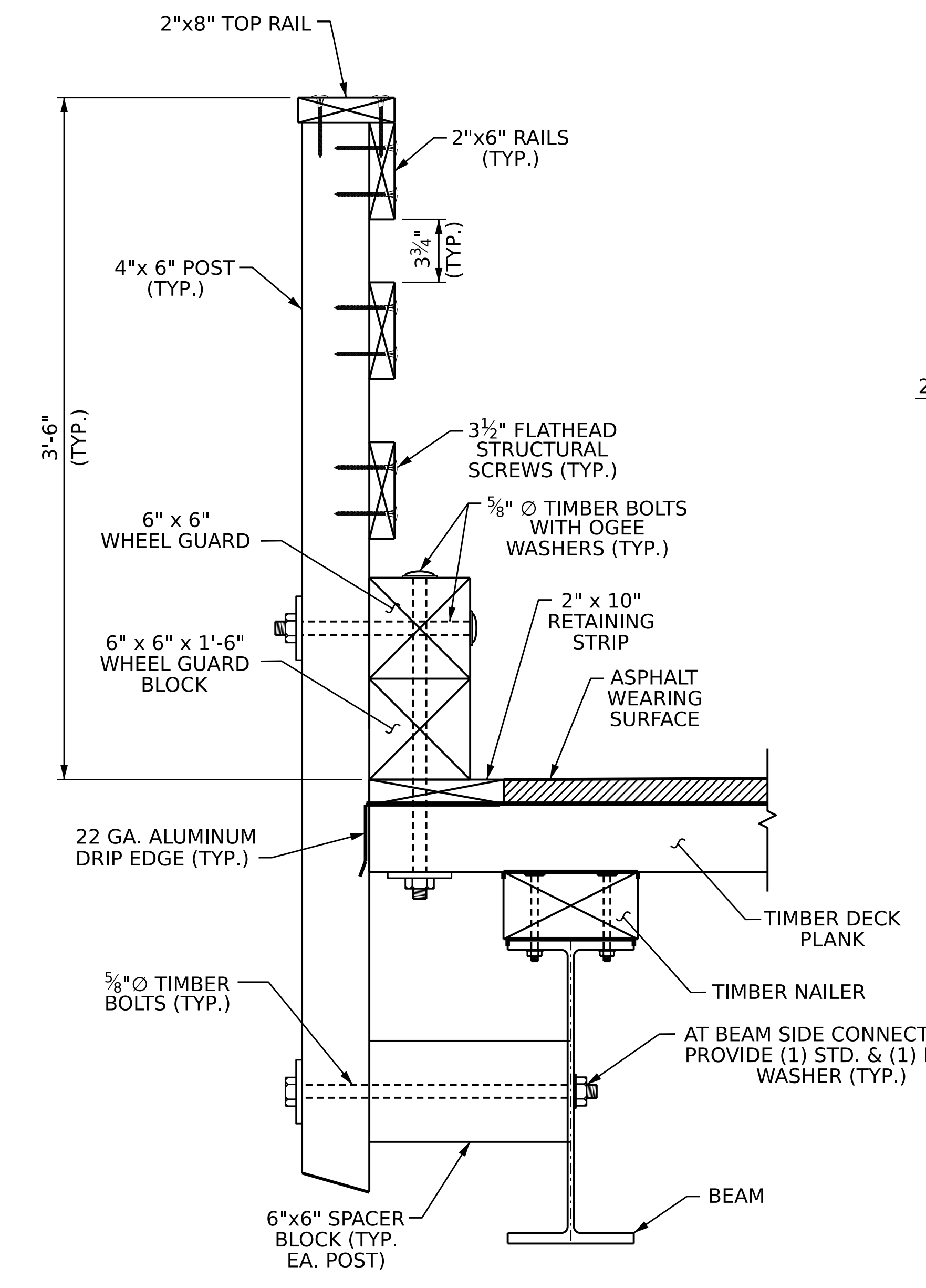
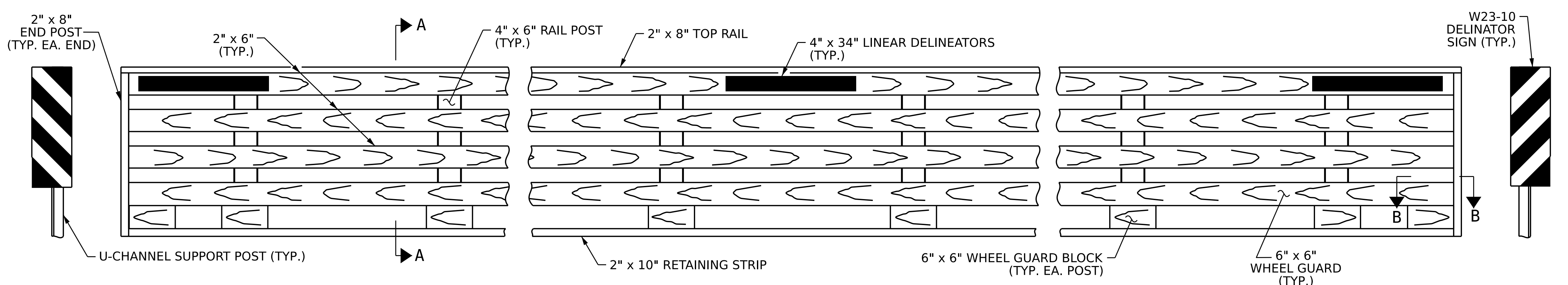
ASSEMBLED BY:	ZCS	DATE:	6/25
CHECKED BY:	MGC	DATE:	7/25
DRAWN BY:	BNB	DATE:	4/24
CHECKED BY:	JDH	DATE:	10/24

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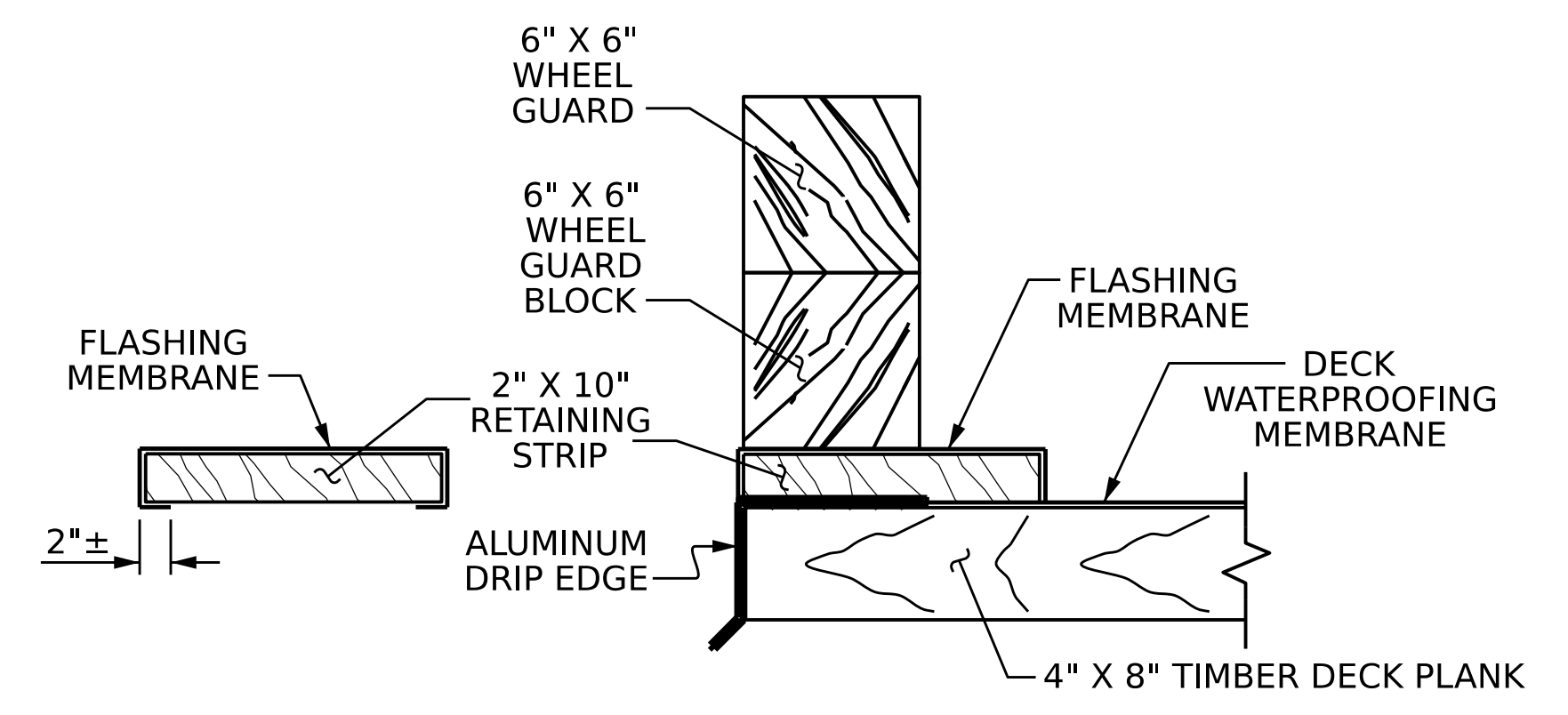
TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

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

TOTAL SHEETS 13

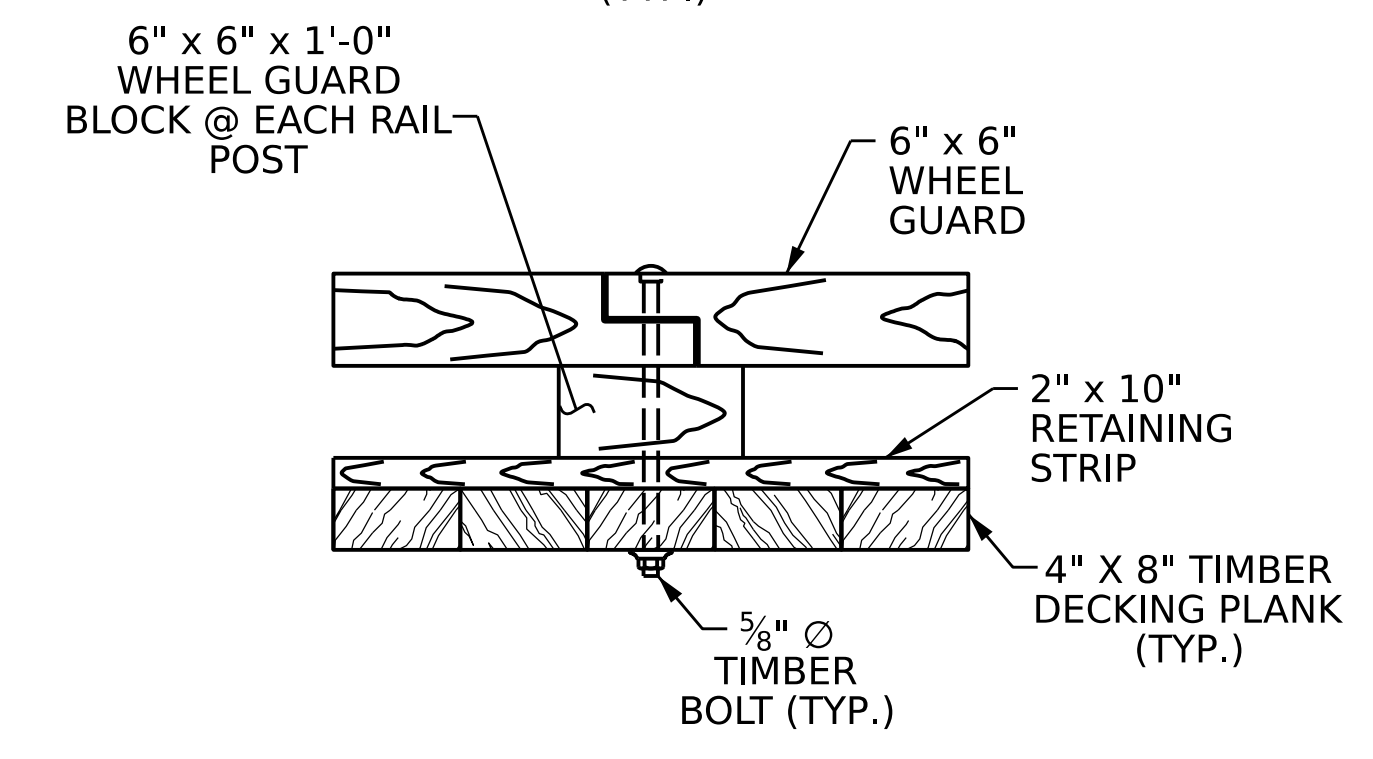


SECTION A-A

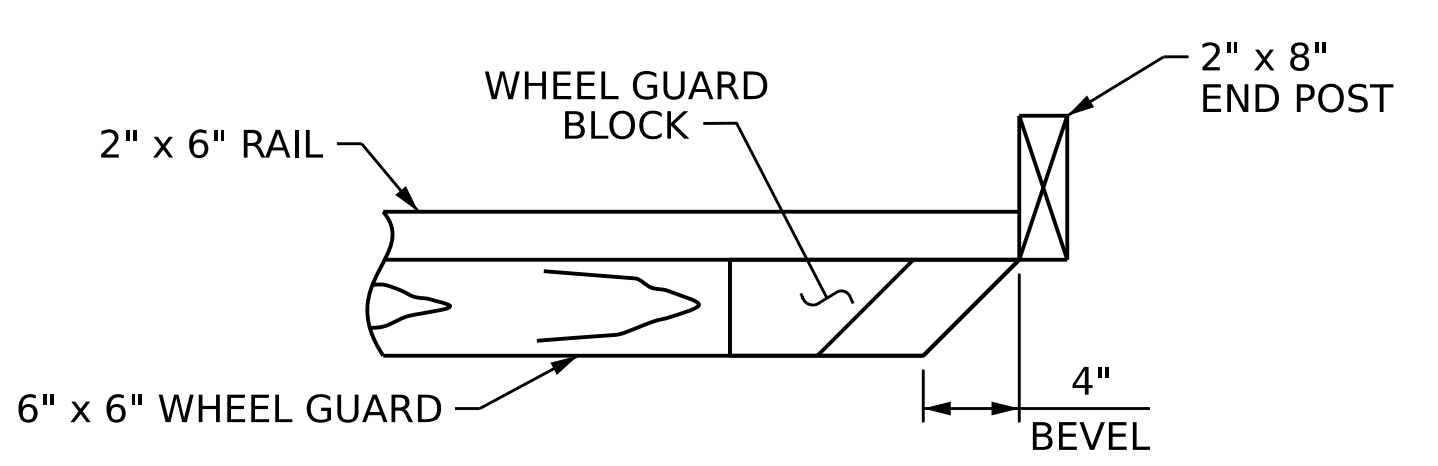


RETAINING STRIP DETAILS

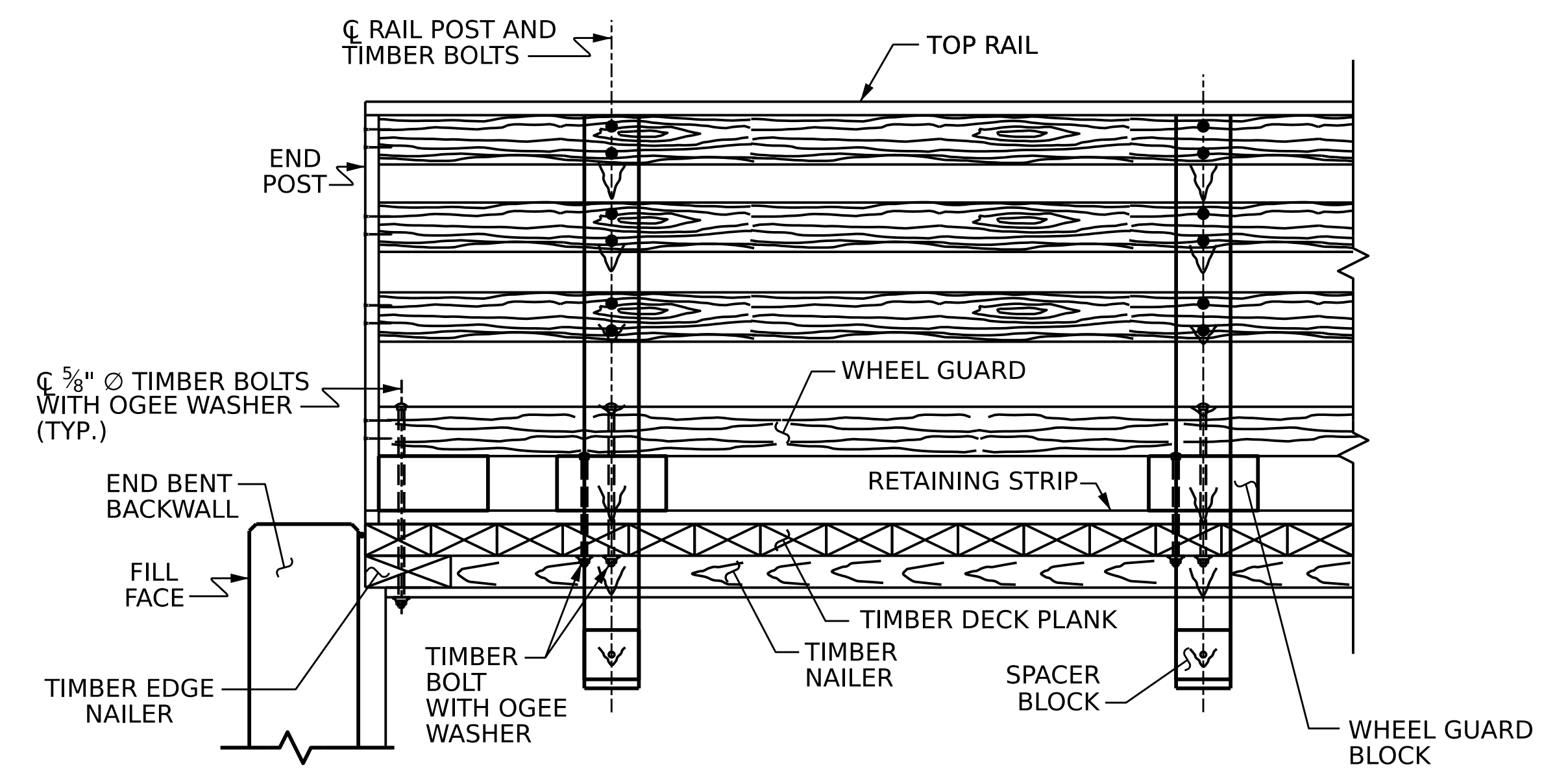
POST AND BOLTS NOT SHOWN FOR CLARITY



WHEEL GUARD SPLICE DETAIL



VIEW B-B



RAIL DETAIL AT END BENTS

BILL OF MATERIAL FOR ONE RAIL 40 FT (2 REQ.D)

TREATED LUMBER		
ITEM	SIZE	LIN. FT.
RAILS	2"x 6"	120.25
RAIL POSTS	4"x 6"	48.00
TOP RAIL	2"x 8"	40.33
WHEEL GUARD	6"x 6"	40.08
WHEEL GUARD BLOCK	6"x 6"	11.00
RETAINING STRIP	2"x 10"	40.08
END POSTS	2"x 8"	7.25
SPACER BLOCK	6"x 6"	9.00
TOTAL		315.99 LIN. FT.

FLASHING MEMBRANE		
ITEM	SIZE	SQ. FT.
MEMBRANE FOR RETAINER STRIP	25 MILS	41

HARDWARE FOR BOLT CONNECTIONS				
ITEM	NO.	SIZE	LENGTH	LBS.
TIMBER BOLTS (WHEEL GUARD)	9	5/8" Ø	18"	14
TIMBER BOLTS (SPACE BLOCK)	9	5/8" Ø	20"	14
TIMBER BOLTS (RAIL)	9	5/8" Ø	12"	10
HEAVY HEX NUTS	27	5/8" Ø		4
STANDARD WASHERS	9	5/8" Ø		1
LOCK WASHERS	9	5/8" Ø		1
OGEE WASHERS	18	5/8" Ø		12

HARDWARE FOR BOLT CONNECTIONS — APPROX. 56 LBS.

HARDWARE FOR SCREW CONNECTIONS				
ITEM	NO.	SIZE	LENGTH	LBS.
FLATHEAD STR. SCREWS	460	0.160" Ø	3 1/2"	115

HARDWARE FOR SCREW CONNECTIONS — APPROX. 115 LBS.

ACCESSORIES	
ITEM	NO.
4" X 34" LINEAR DELINEATOR	6
W23-10 12 X 36 DELINEATOR SIGN	2
U-CHANNEL SUPPORT POST	2

PAY LENGTH = 40.5 LIN. FT.

NOTES

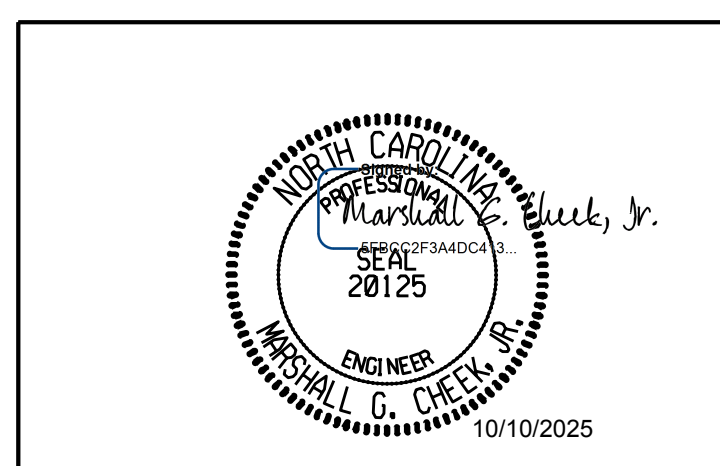
THE TIMBER BRIDGE RAIL SYSTEM SHALL NOT BE ATTACHED TO THE TIMBER BRIDGE DECK SYSTEM PRIOR TO THE TIMBER DECK WATERPROOFING MEMBRANE BEING INSTALLED.

BRIDGE RAILS SHALL BE CONTINUOUS FROM END POST TO END POST WITH NO GAPS. RAIL LUMBER LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

TREAT ALL DRILLED OR NEWLY EXPOSED HOLES IN TIMBER MEMBERS BY PUMPING WITH BITUMINOUS ASPHALT-BASED ROOFING CEMENT, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING HARDWARE.

SEE PLAN OF SPAN SHEET FOR NUMBER OF POSTS AND POST SPACING.

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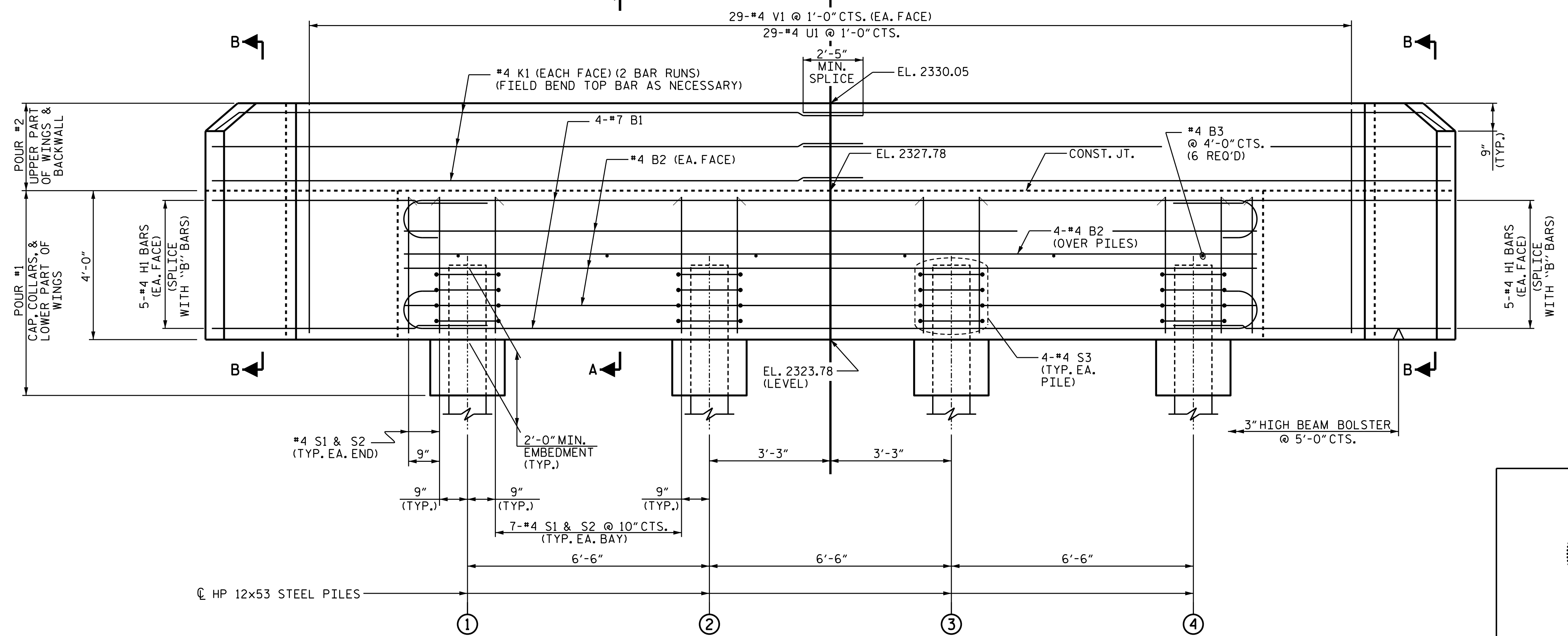
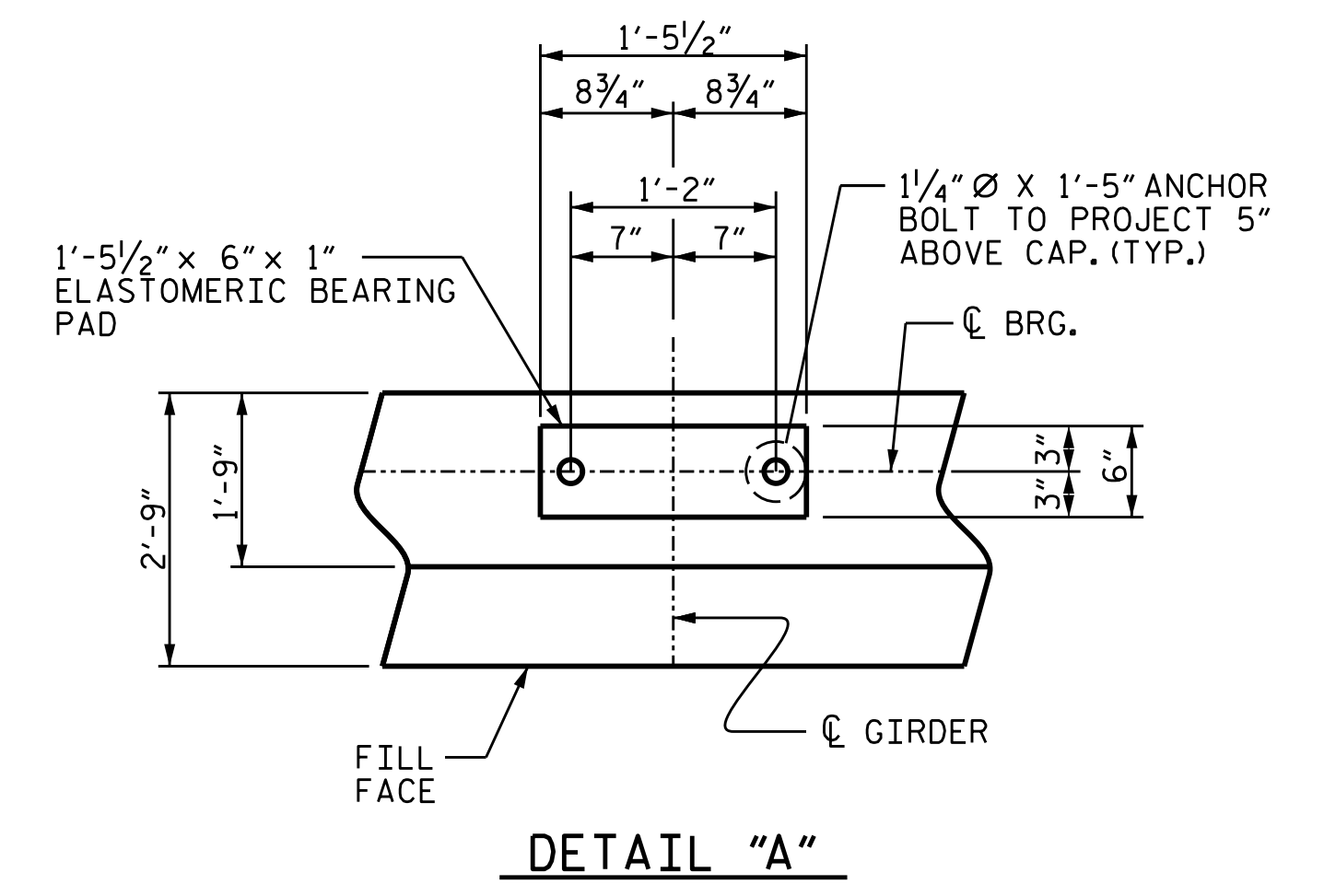
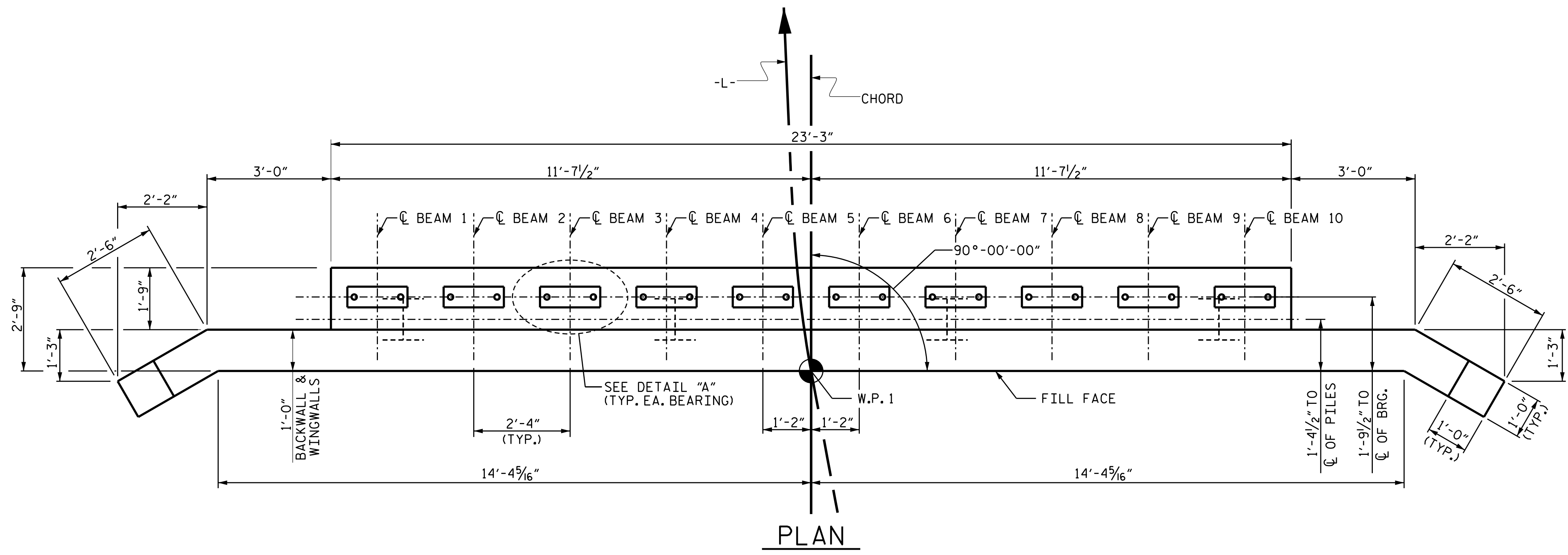


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**STANDARD
 TIMBER BRIDGE RAIL
 SYSTEM**

ASSEMBLED BY:	ZCS	DATE:	5/25
CHECKED BY:	MGC	DATE:	8/25
DRAWN BY:	BNB	4/24	
CHECKED BY:	JDH	10/24	

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NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3			5-10	
2			4			TOTAL SHEETS 13	

NOTES
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
 FOR WING DETAILS, SEE SHEET 3 OF 3.
 THE TOP SURFACE OF THE END BENT CAP SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 1%.



ELEVATION
 FOR SECTION A-A & B-B, SEE SHEET 3 OF 3.

PROJECT NO. DF18314.2045324
HENDERSON COUNTY
 STATION: 11+67.50 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

END BENT 1

10/10/2025

ENGINEER
 MARSHALL G. CHEEK, JR.

PROFESSIONAL SEAL
 MARSHALL G. CHEEK, JR.
 20125

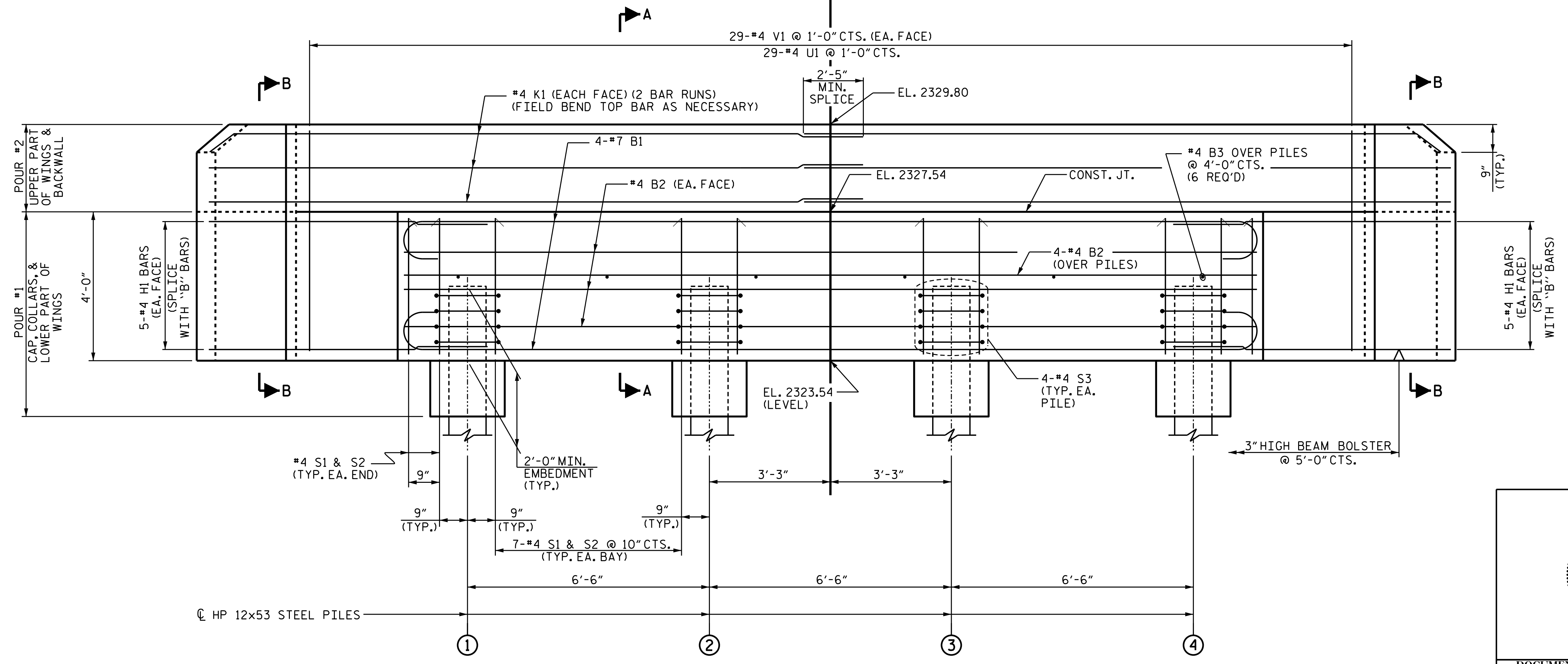
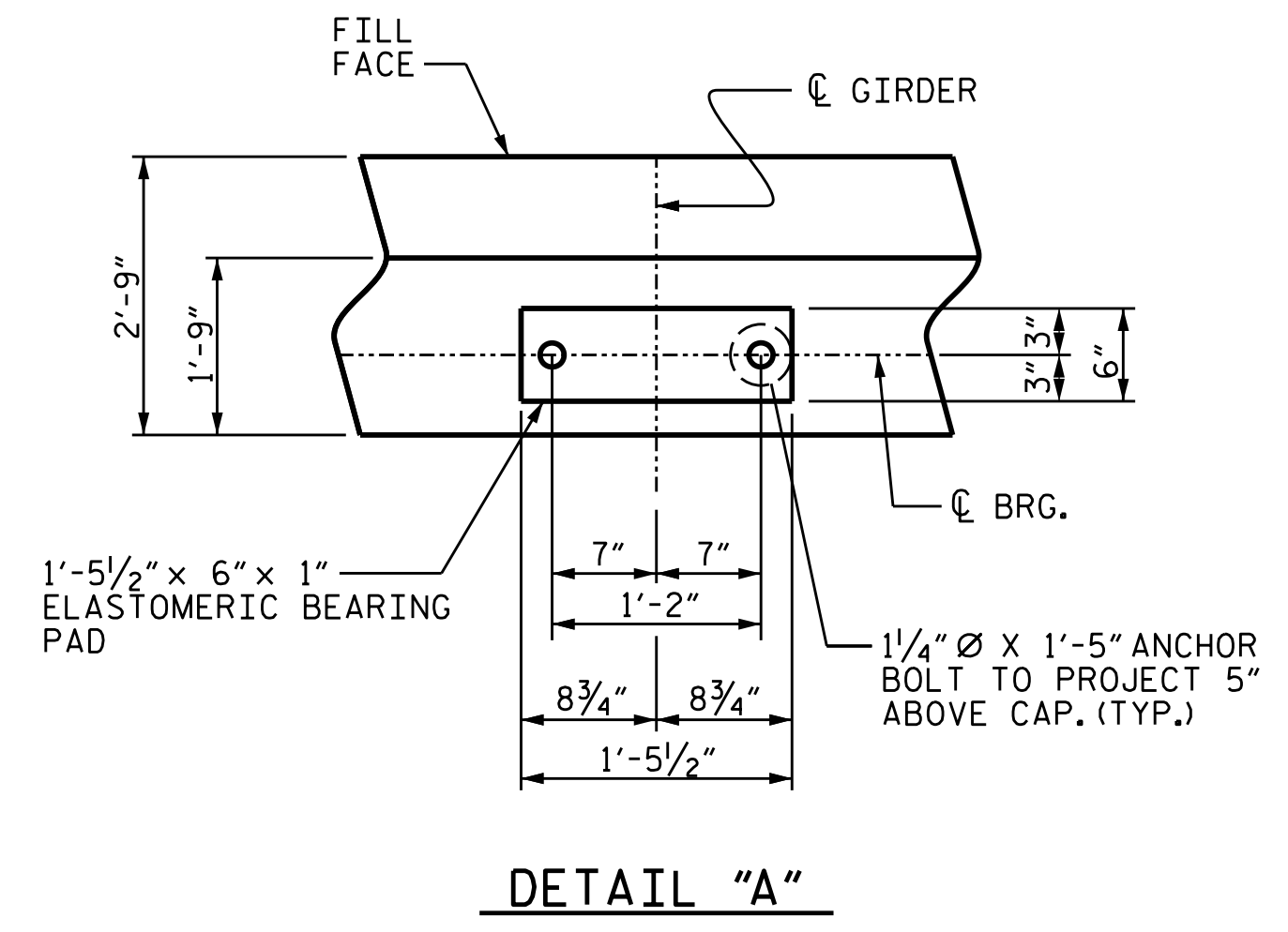
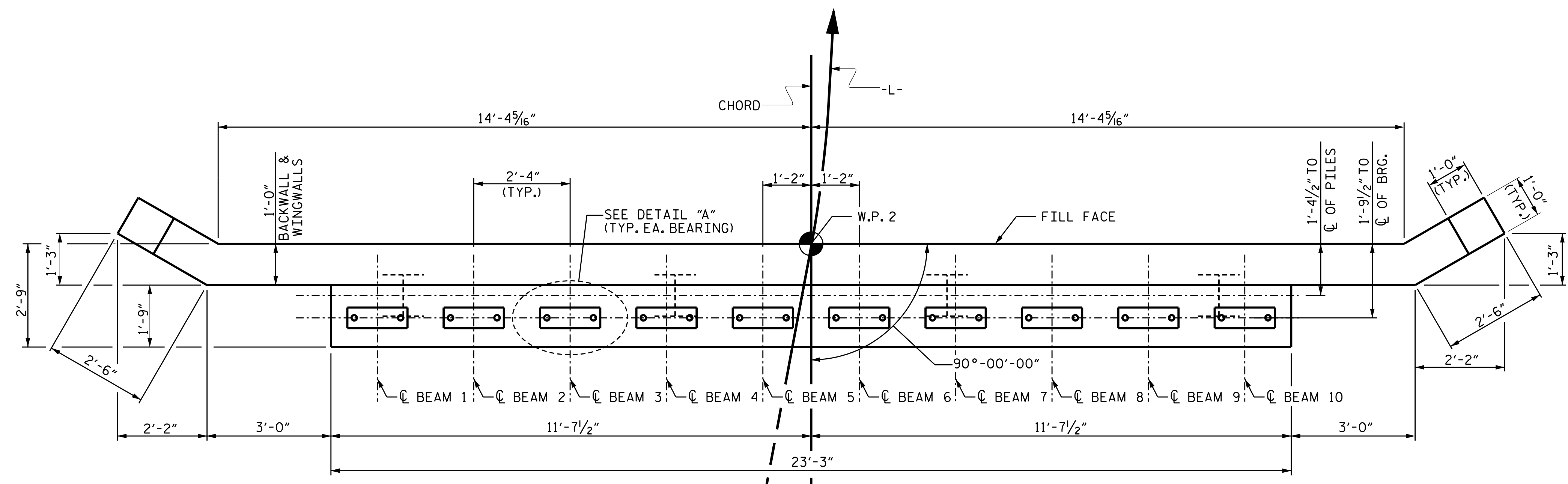
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 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			13
2			4			

DRAWN BY: ZCS DATE: 6/25
 CHECKED BY: MGC DATE: 8/25
 DESIGN ENGINEER OF RECORD: ZCS DATE: 8/25

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 FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
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 THE TOP SURFACE OF THE END BENT CAP SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 1%.



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 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

END BENT 2

10/10/2025

ENGINEER
 MARSHALL G. GREEN, JR.

PROFESSIONAL SEAL
 MARSHALL G. GREEN, JR.
 20125

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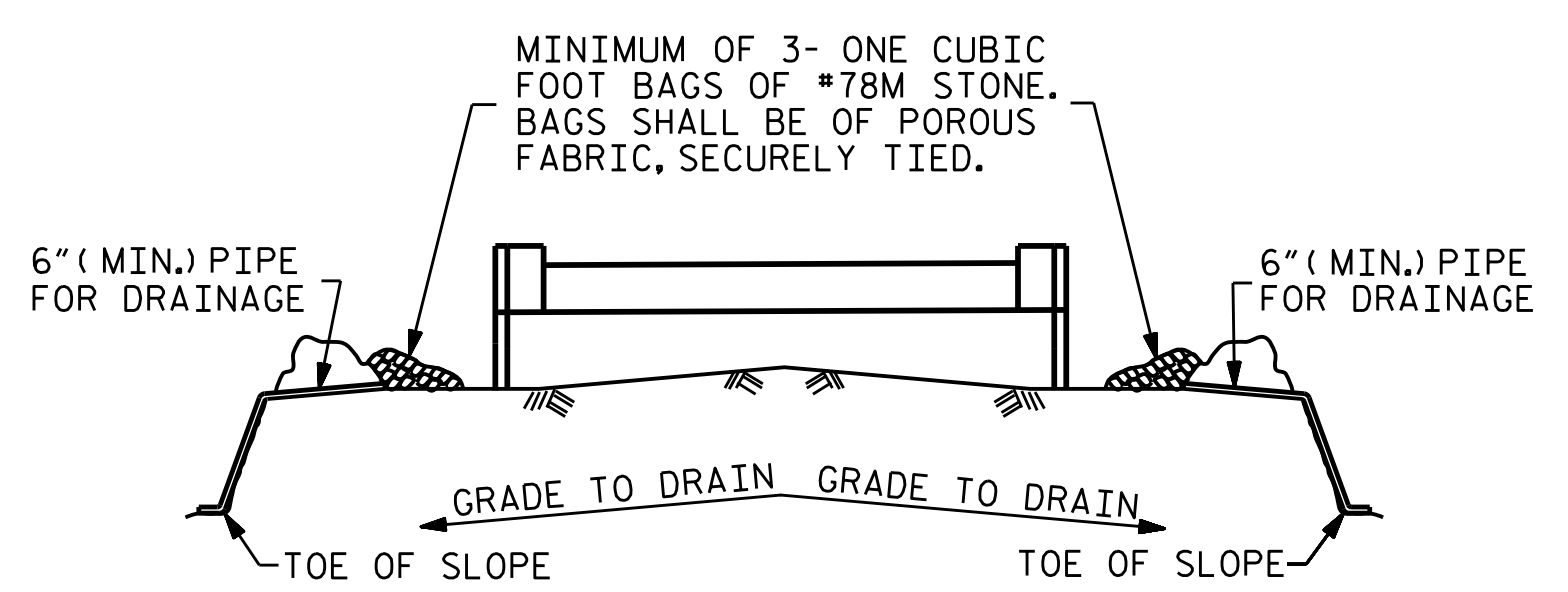
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FOR SECTION A-A & B-B, SEE SHEET 3 OF 3.

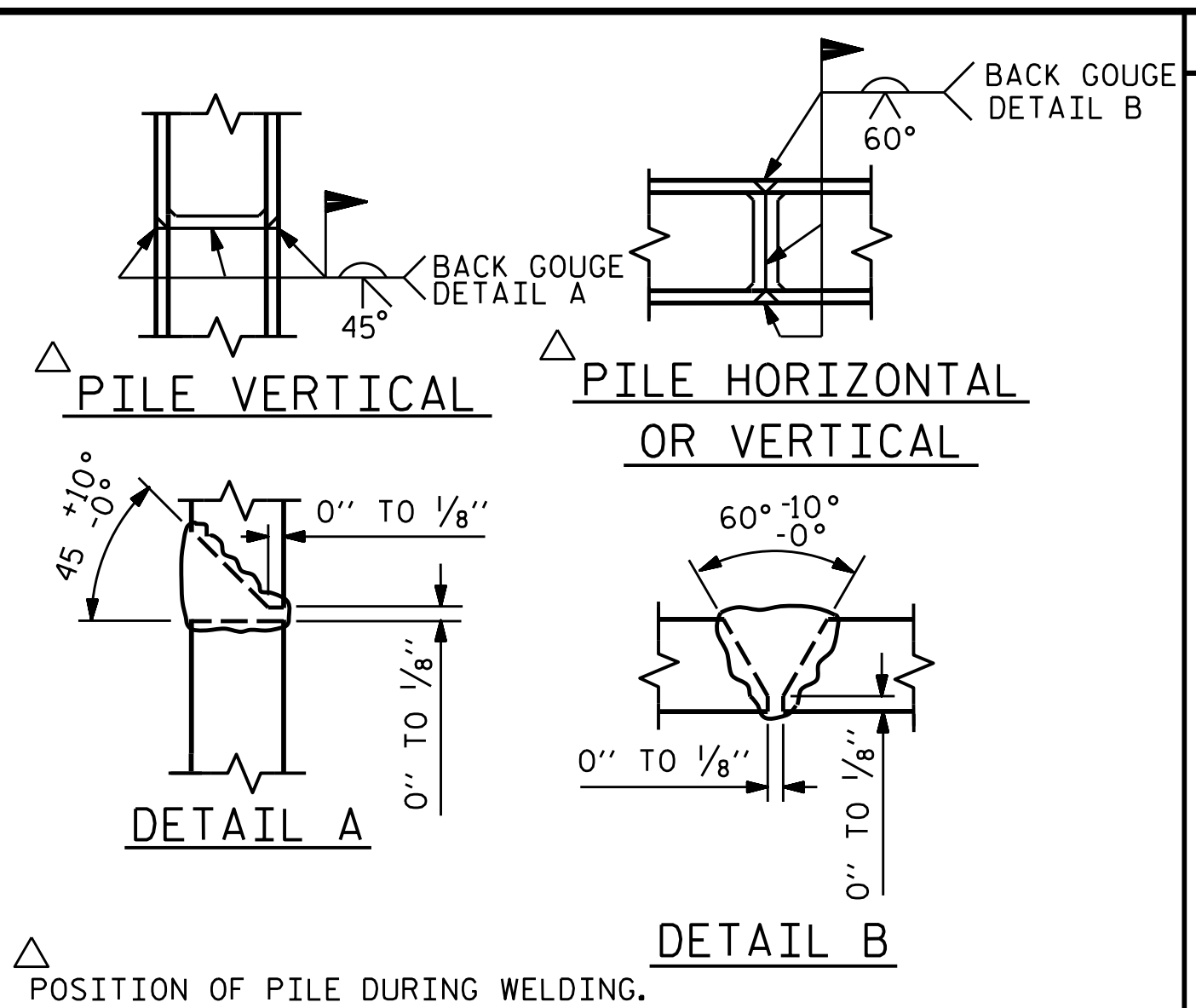


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

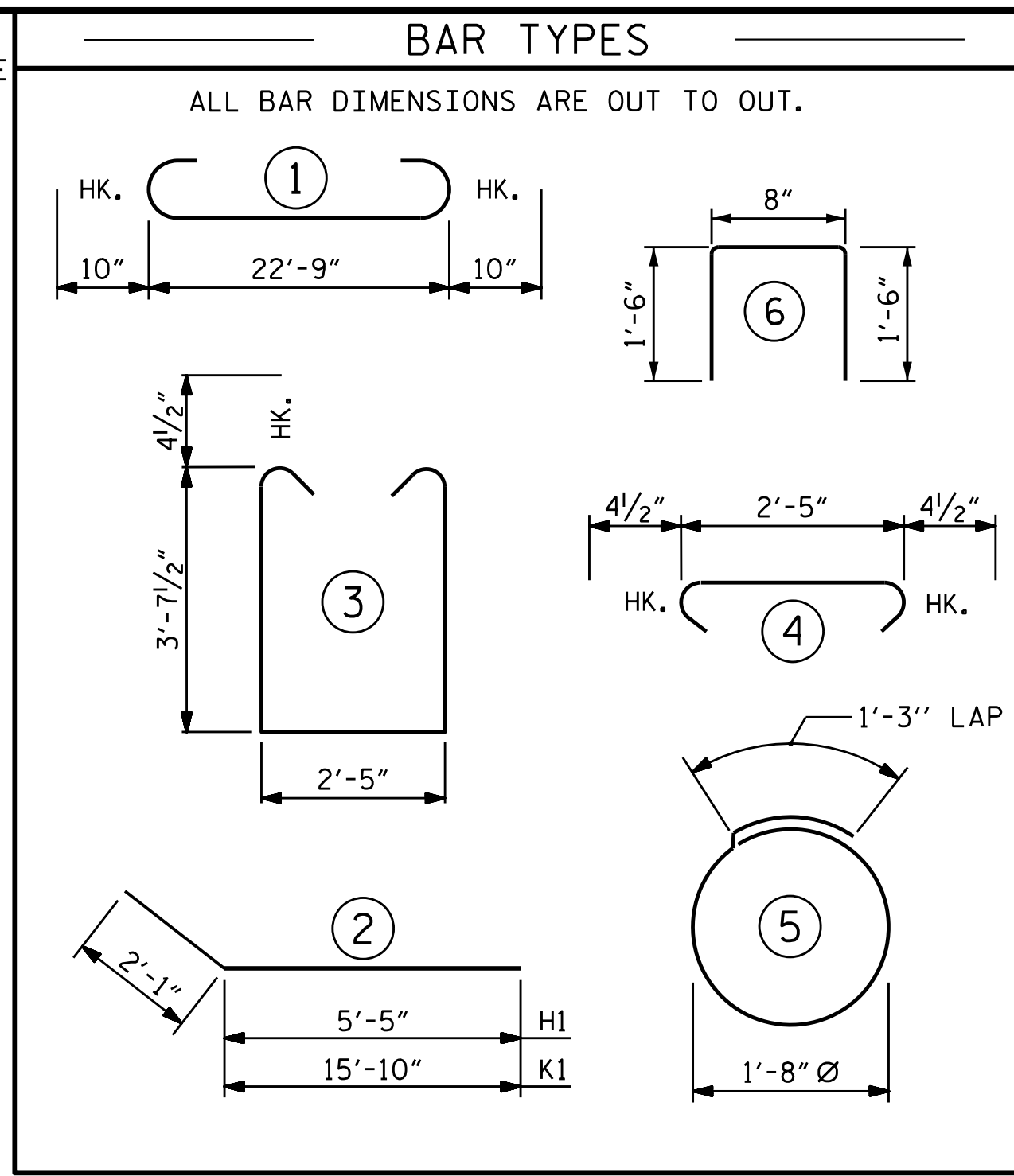
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

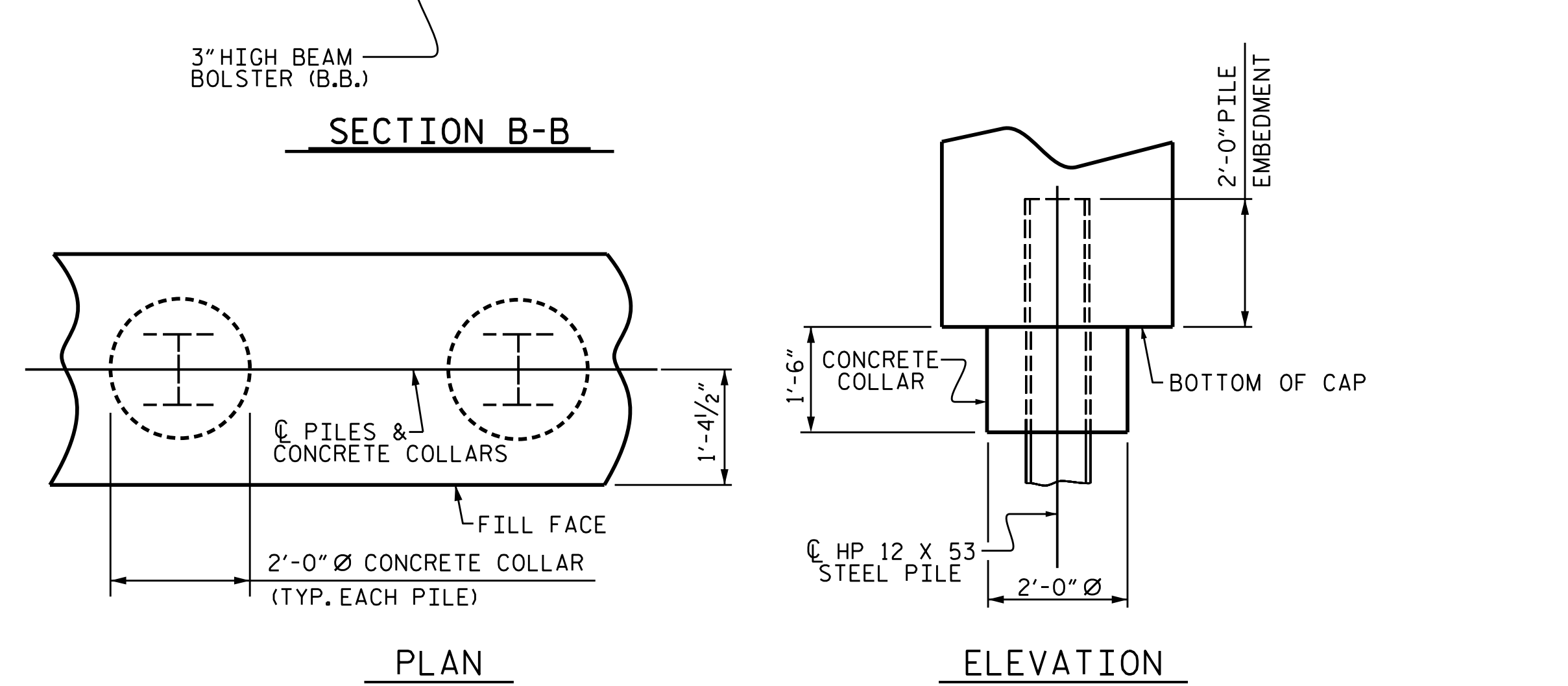
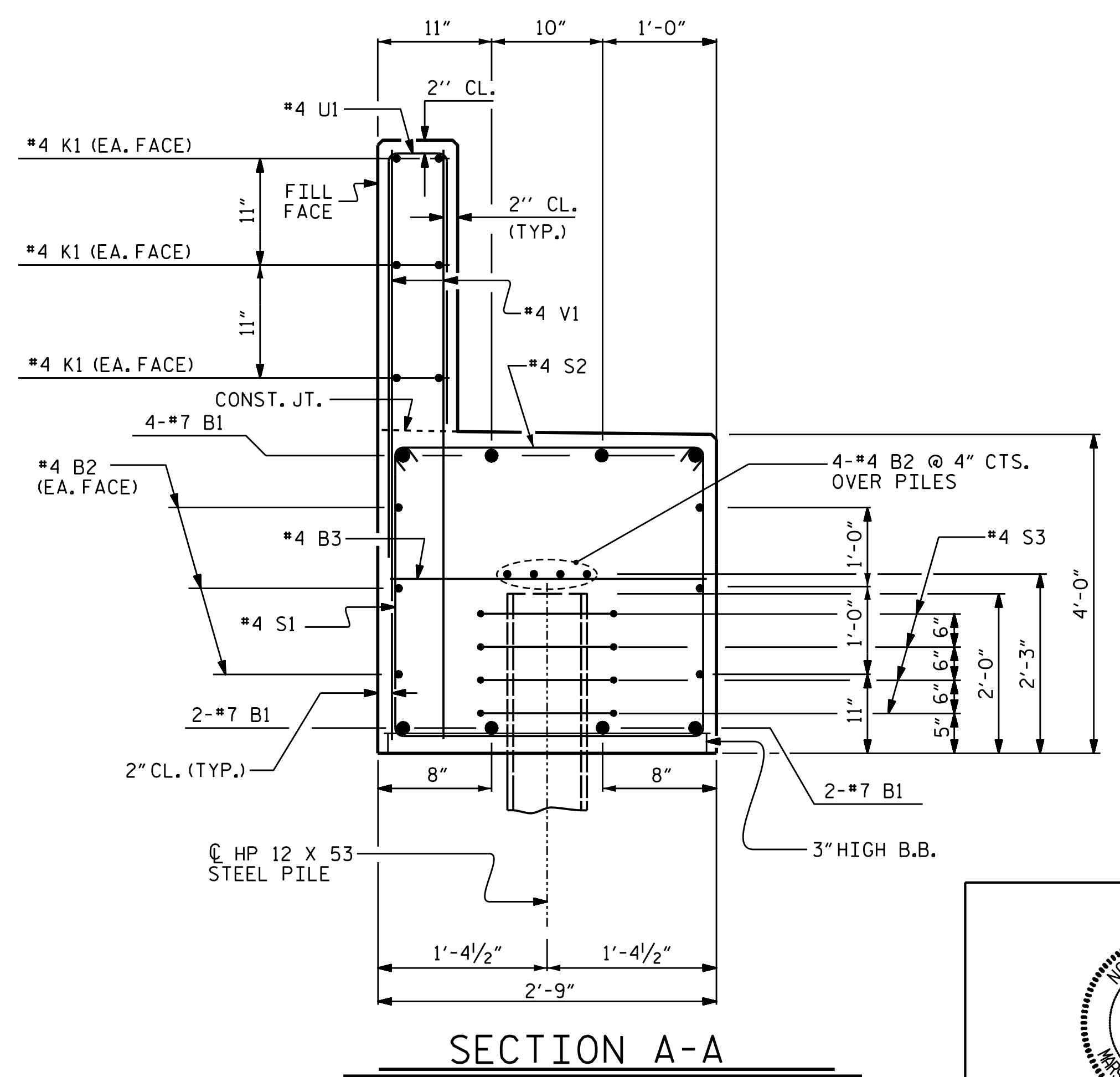
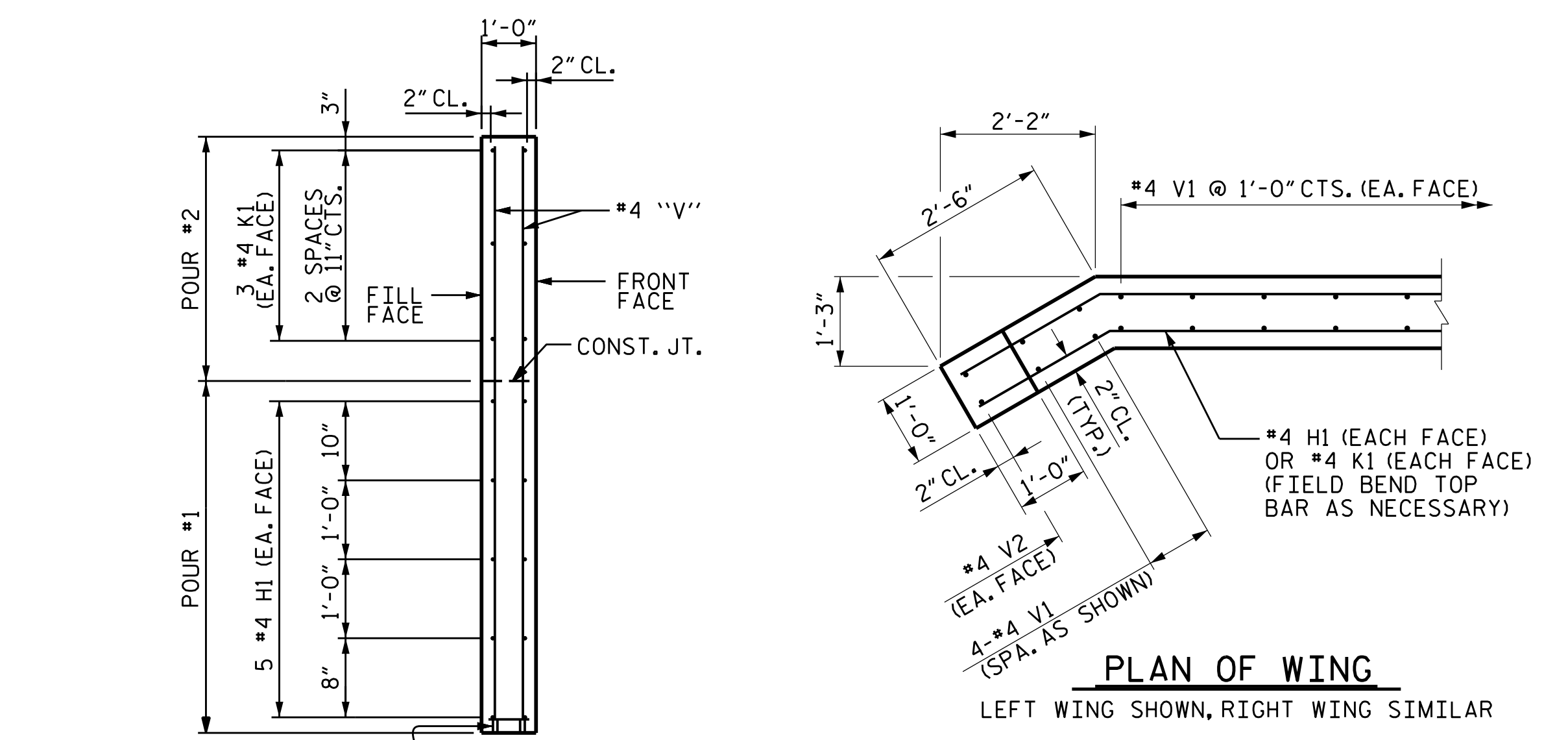
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

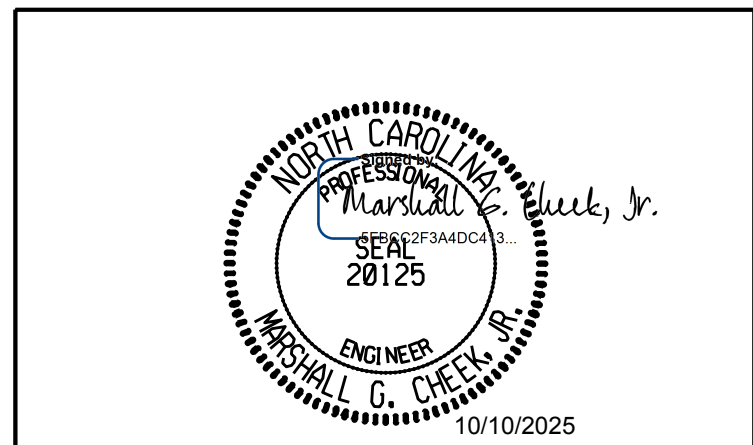


BILL OF MATERIAL						BILL OF MATERIAL					
END BENT 1						END BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8		24'-5"	399		B1	#8		24'-5"	399	
B2	#10	#4 STR	22'-11"	153		B2	#10	#4 STR	22'-11"	153	
B3	#6	#4 STR	2'-5"	10		B3	#6	#4 STR	2'-5"	10	
H1	#20	#4	2	7'-6"	100	H1	#20	#4	2	7'-6"	100
K1	#12	#4	2	17'-11"	144	K1	#12	#4	2	17'-11"	144
S1	#25	#4	3	10'-5"	174	S1	#25	#4	3	10'-5"	177
S2	#25	#4	4	3'-2"	53	S2	#25	#4	4	3'-2"	53
S3	#16	#4	5	6'-6"	69	S3	#16	#4	5	6'-6"	69
U1	#29	#4	6	3'-8"	71	U1	#29	#4	6	3'-8"	71
V1	#66	#4 STR.	5'-11"	261		V1	#66	#4 STR.	5'-11"	261	
V2	#4	#4 STR.	5'-3"	14		V2	#4	#4 STR.	5'-3"	14	
REINFORCING STEEL 1,448 LBS.						REINFORCING STEEL 1,448 LBS.					
CLASS A CONCRETE BREAKDOWN						CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS			11.8 C.Y.			POUR #1 CAP, LOWER PART OF WINGS & COLLARS			11.8 C.Y.		
POUR #2 BACKWALL AND UPPER PART OF WINGS			2.9 C.Y.			POUR #2 BACKWALL AND UPPER PART OF WINGS			2.9 C.Y.		
TOTAL CLASS A CONCRETE			14.7 C.Y.			TOTAL CLASS A CONCRETE			14.7 C.Y.		
HP 12 X 53 STEEL PILES						HP 12 X 53 STEEL PILES					
NO: 4			220 LIN. FT.			NO: 4			180 LIN. FT.		
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES						PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES					
4 EACH						4 EACH					



CORROSION PROTECTION FOR STEEL PILES DETAIL

PROJECT NO. DF18314.2045324
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 STATION: 11+67.50 -L-
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

END BENT DETAILS

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