

Bridge Summary

Bridge No.	PROJECT NO	SITE NUMBER	COUNTY	LOCATION	TYPE	EXISTING CONDITION
SBD-11-1a	51830.2.11.03	006-01-06088	Avery	2053 Big Horse Rd, Newland	20 ft span	Existing bridge in place
SBD-11-1b	51830.2.11.05	095-01-3e0cf	Watauga	301 Spice Creek Rd, Banner Elk	30 ft span	No existing bridge in place

North Carolina Emergency Management – Private Roads and Bridges
Site Information Form

Site Number: 006-01-06088

Site Address: 2053 Big Horse Creek Road, Newland, NC 28657

GPS Coordinates: 36.1188, -82.0104

County: Avery

Bridge Type: Steel I-beam with timber decking

Span Length: 20 feet

Bridge Width: 12'-0" Clear Width

Substructure Type: Concrete Cap on Driven Piles

Geotechnical Information: See Standard Bridge Plans for Notes

Additional Notes: _____

Timber bridge railing not required.

Wing walls not required.

The existing bridge is in place and must be removed prior to the start of construction.

The stream contains no debris or obstructions requiring removal.

North Carolina Emergency Management – Private Roads and Bridges
Site Information Form

Site Number: 095-01-3e0cf

Site Address: 301 Spice Creek Rd., Banner Elk, NC 28604

GPS Coordinates: 36.2296, -81.8512

County: Watauga

Bridge Type: Steel I-beam with timber decking

Span Length: 30 feet

Bridge Width: 12'-0" Clear Width

Substructure Type: Spread Footing with a 3' anticipated stem wall height

Geotechnical Information: Spread Footing will bear on rock. See Standard Bridge Plans for Notes

Additional Notes: _____

Timber bridge railing not required.

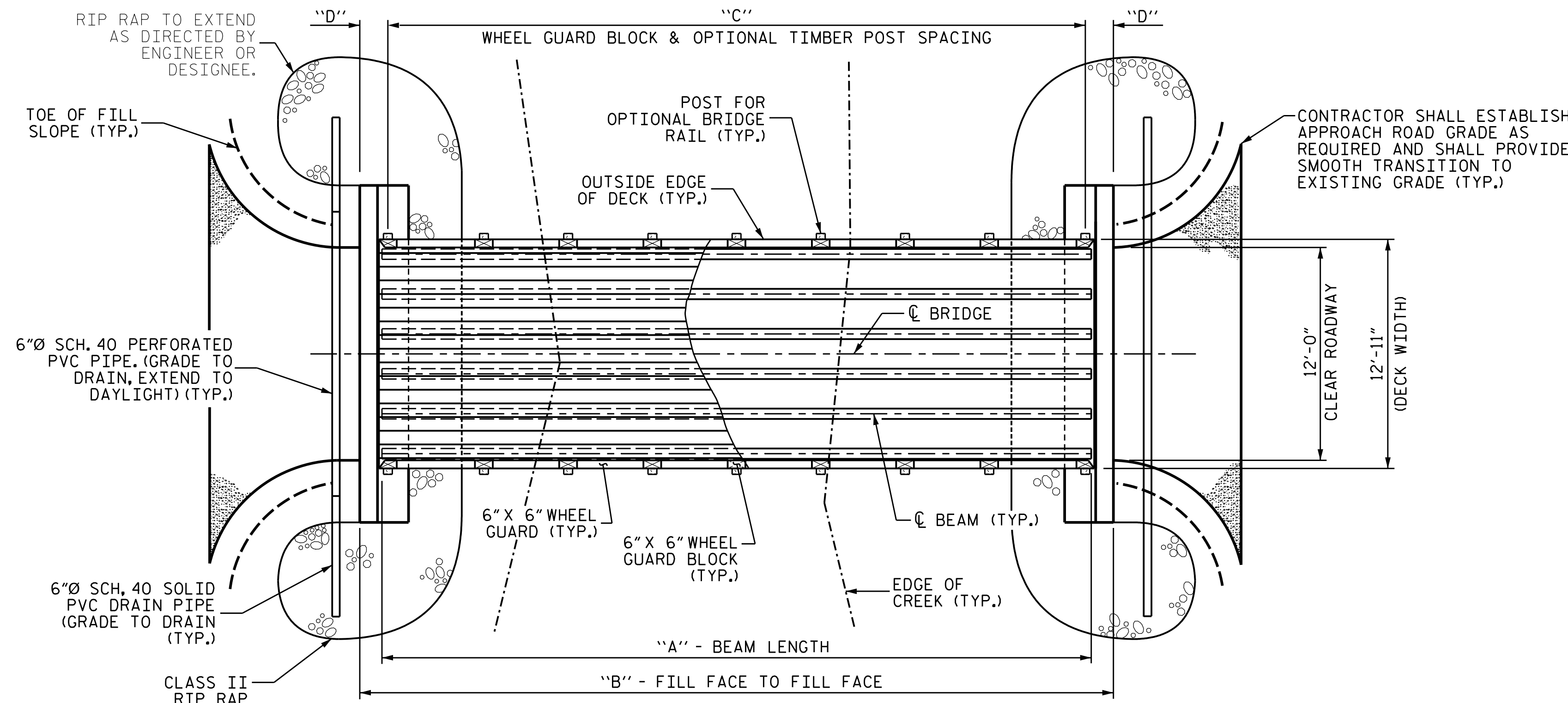
Wing walls not required.

No existing bridge in place.

The stream contains no debris or obstructions requiring removal.

NOTES

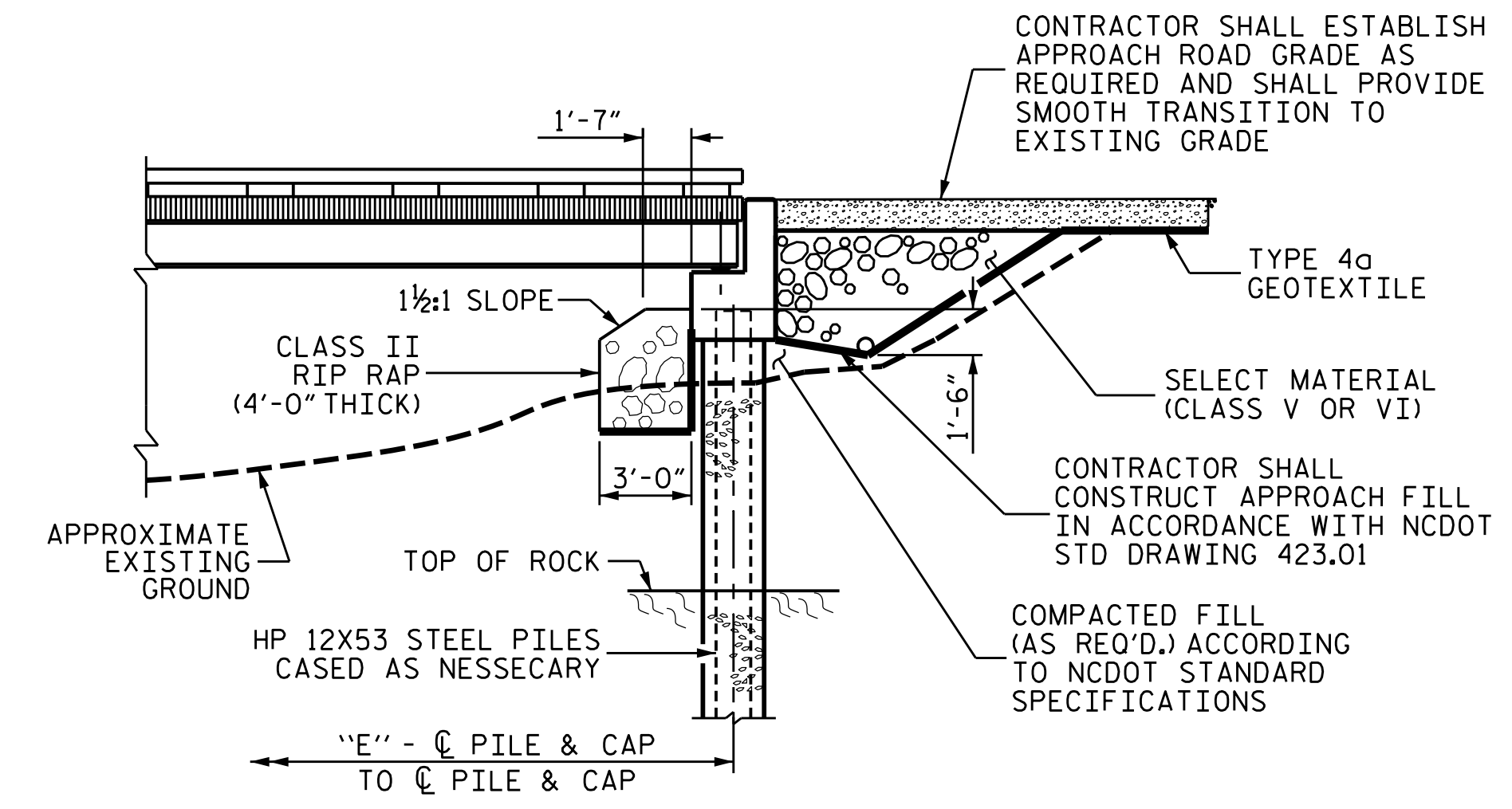
FOR OPTIONAL TIMBER BRIDGE RAIL DETAILS, SEE "OPTIONAL TIMBER BRIDGE RAIL" SHEET.
 CONTRACTOR SHALL LOCATE THE EXPANSION BEARING ON THE "UPHILL" END OF THE BRIDGE. THERE WILL BE ONLY ONE EXPANSION BEARING PER BRIDGE.
 CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES, AS REQUIRED ACCORDING TO NCDOT STANDARD SPECIFICATIONS AND THE CONTRACT DOCUMENTS.
 THE CONTRACTOR SHALL SET THE LOW-CHORD ELEVATION OF THE BRIDGE BASED ON EXISTING SITE CONDITIONS AND IN COORDINATION WITH THE ENGINEER, SUCH THAT THE NEW CROSSING PROVIDES CONVEYANCE GREATER THAN OR EQUAL TO THE ORIGINAL DESTROYED CROSSING. THE CONTRACTOR SHALL REFER TO THE BSR WHEN SETTING THE LOW-CHORD ELEVATION OF THE BRIDGE. NO CONSTRUCTION ACTIVITIES SHALL COMMENCE UNTIL ALL PARTIES HAVE AGREED UPON THE LOW-CHORD ELEVATION AND THE DATED PERMIT APPLICATION IS APPROVED.



BRIDGE PLAN

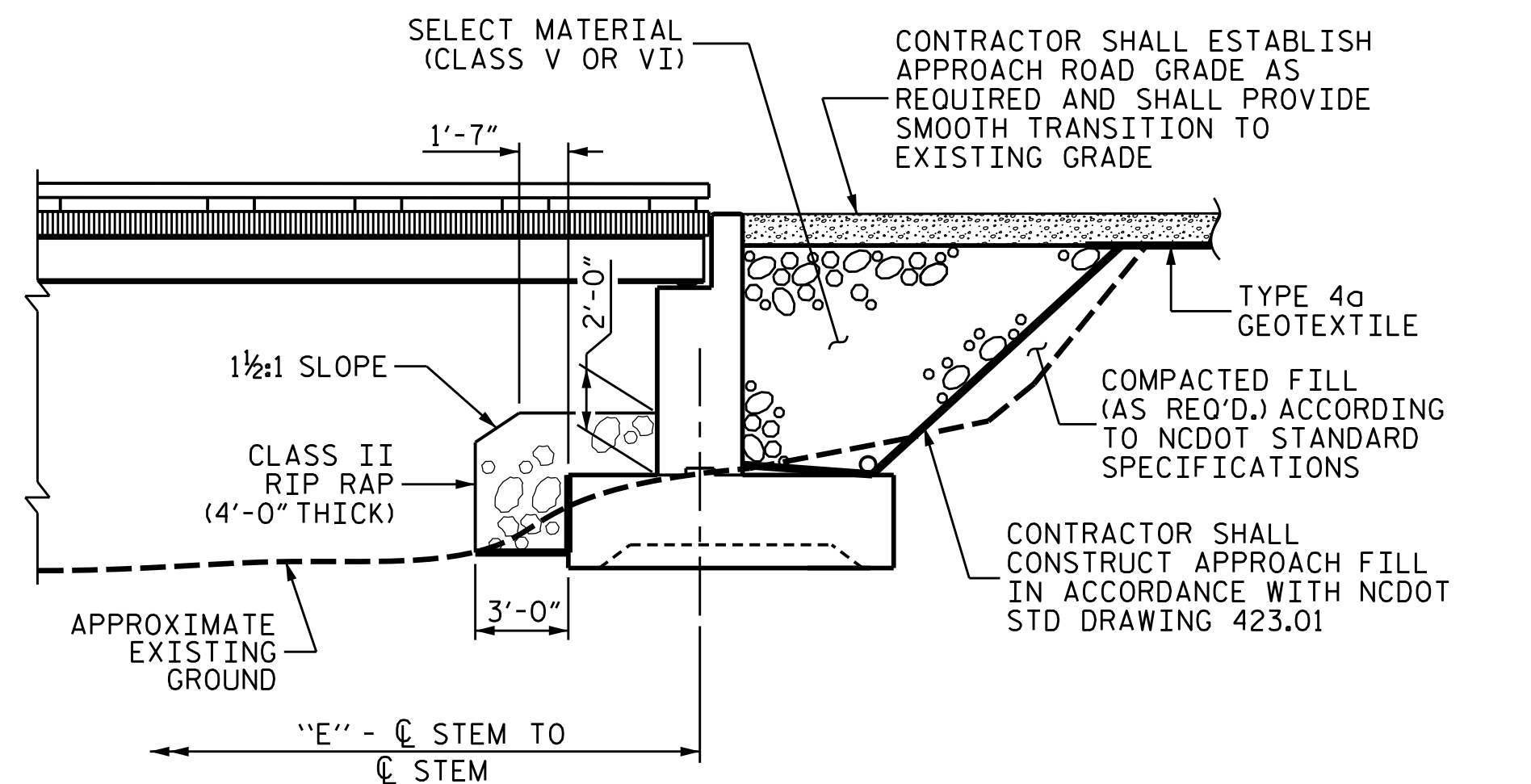
(FOUNDATION TYPE NOT SHOWN FOR CLARITY)

DIMENSIONS TABLE					
SPAN	A	B	C	D	E
20'-0"	20'-0"	22'-6"	4 SPA. @ 4'-6"	2'-3"	19'-9"
30'-0"	30'-0"	32'-6"	7 SPA. @ 4'-0"	2'-3"	29'-9"
40'-0"	40'-0"	42'-6"	9 SPA. @ 4'-3"	2'-1 1/2"	39'-9"
50'-0"	50'-0"	52'-6"	11 SPA. @ 4'-4"	2'-5"	49'-9"



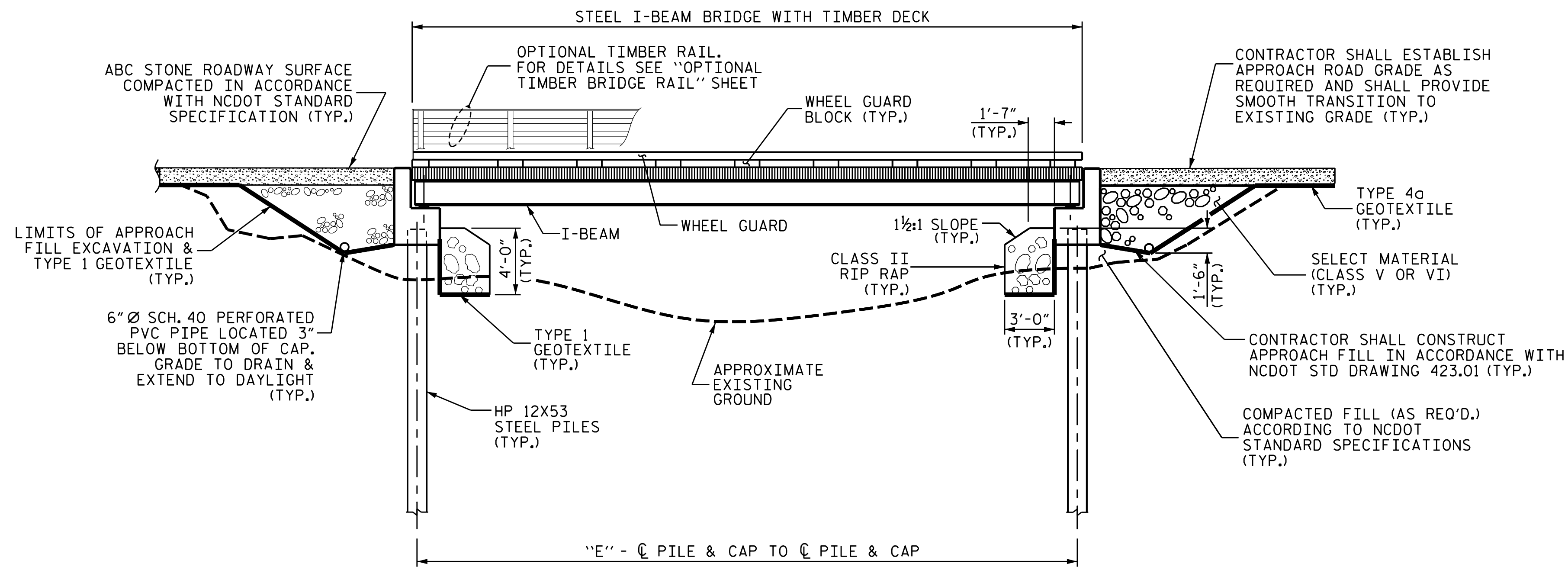
BRIDGE PARTIAL ELEVATION

(SHOWING DRILLED-IN 12X53 STEEL PILES FOUNDATION)



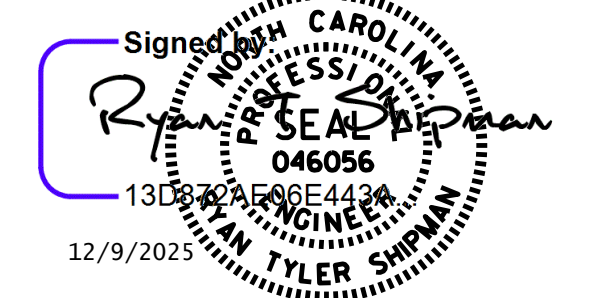
BRIDGE PARTIAL ELEVATION

(SHOWING SPREAD FOOTING FOUNDATION)



BRIDGE ELEVATION

(SHOWING DRIVEN 12X53 STEEL PILES FOUNDATION)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
GENERAL DRAWING

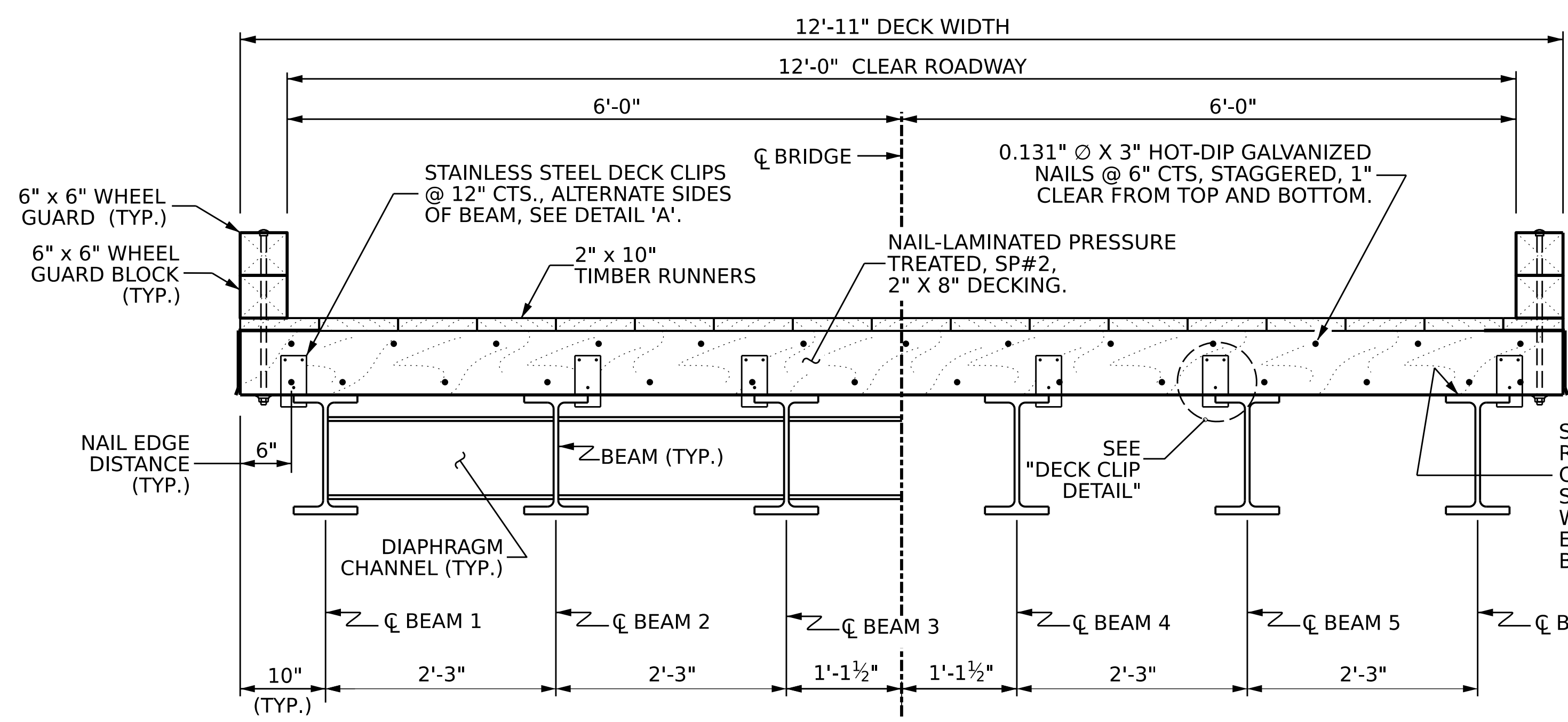
REVISIONS						SHEET NO. S-01
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 12
2			4			

JMT Johnson, Mirmiran, & Thompson Inc.
 108 Asheville Commerce Parkway
 Candler, NC, 28715
 License No: C-3097

DWN. BY: WDC DATE: 12/2025
 CHKD. BY: RTS DATE: 12/2025
 DES. EGR. OF RECORD: PCW DATE: 12/2025

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 TIME: 12/9/2025

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 DATE: 12/9/2025
 TIME: 12/9/2025



TYPICAL SECTION

MATERIALS TABLE				
SPAN	BEAM	DIAPHRAGM CHANNEL	DECK PLANK	DECKING SQ. FT.
20'-0"	W16X36	C12X20.7	2X8	263
30'-0"	W21X48	C12X20.7	2X8	392
40'-0"	W24X76	C12X20.7	2X8	521
50'-0"	W24X104	C12X20.7	2X8	650

NOTES

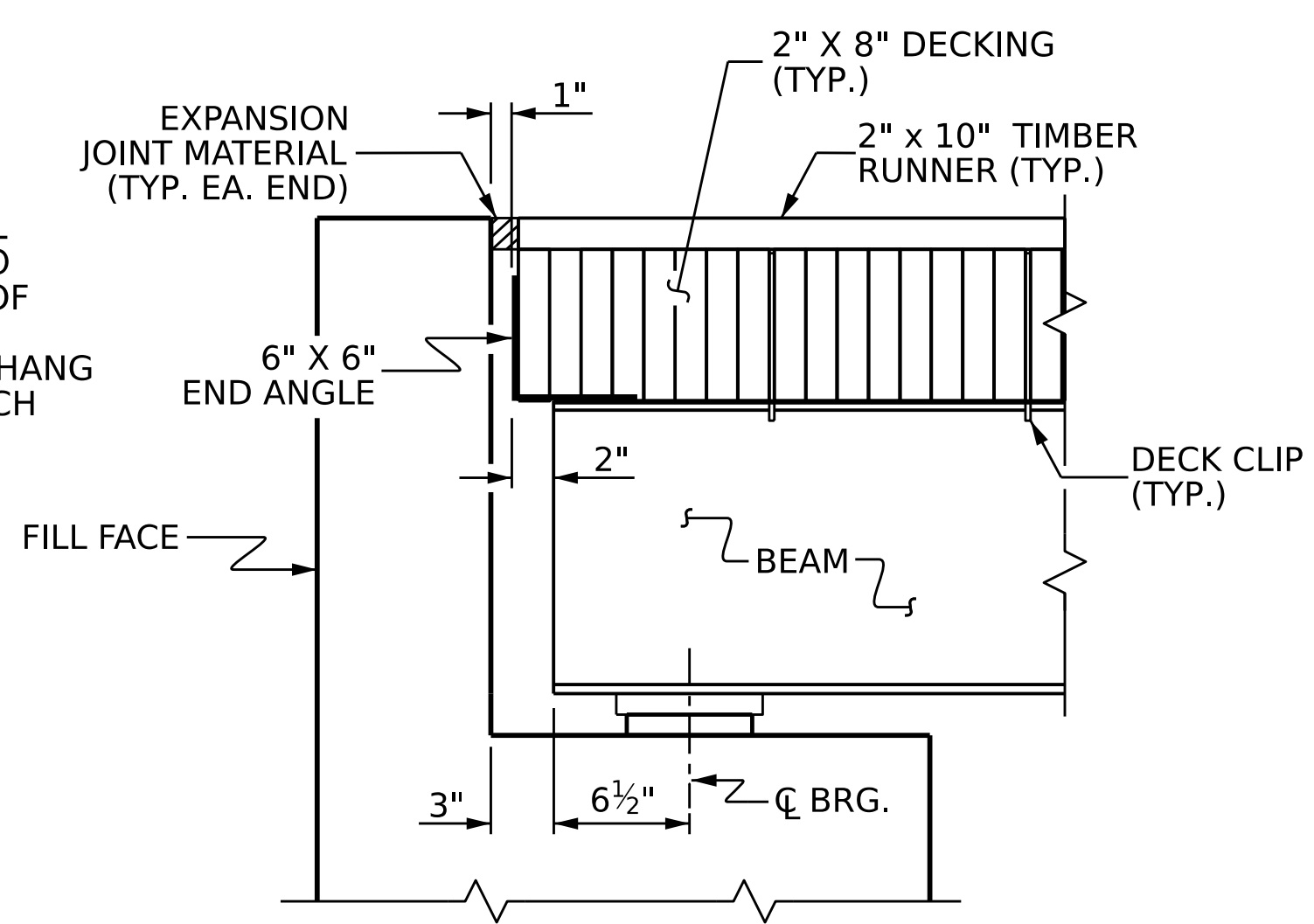
FOR TIMBER BRIDGE DECK SYSTEM DETAILS, SEE "PLAN OF SPAN" SHEET.

FOR OPTIONAL TIMBER RAILS, SEE "OPTIONAL TIMBER BRIDGE RAIL" SHEET.

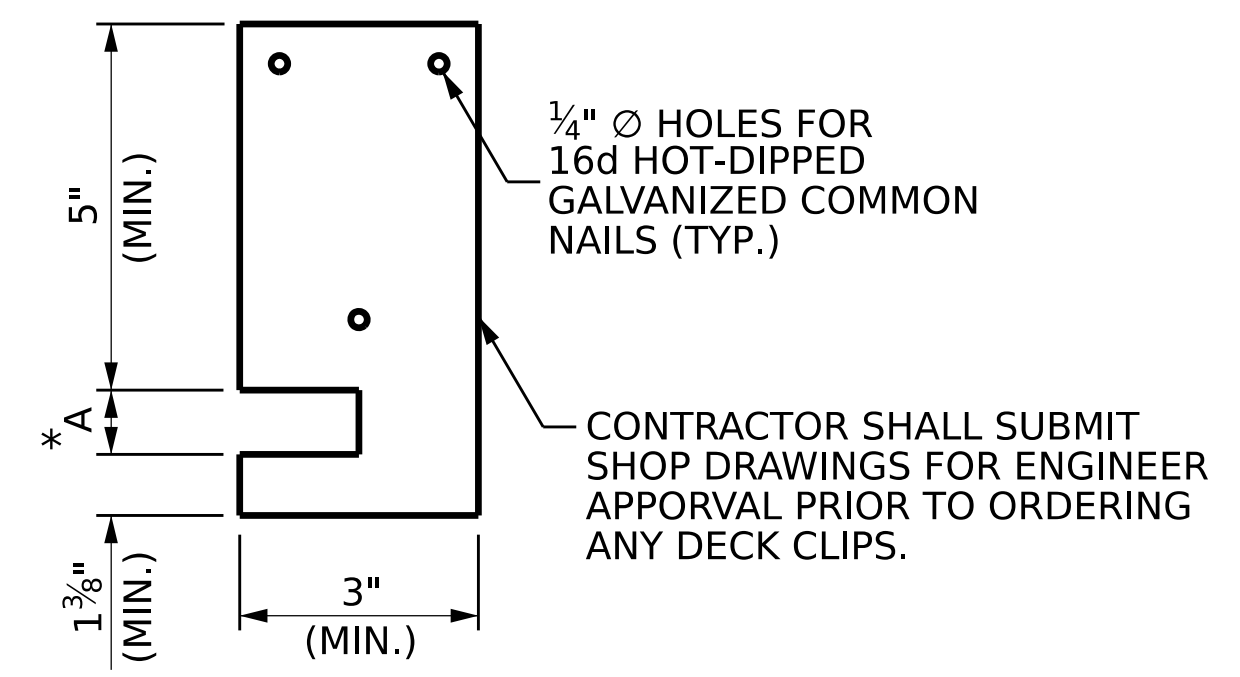
FOR BEAM AND DIAPHRAGM DETAILS, SEE "FRAMING PLAN & BEAM DETAILS" SHEET.

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.

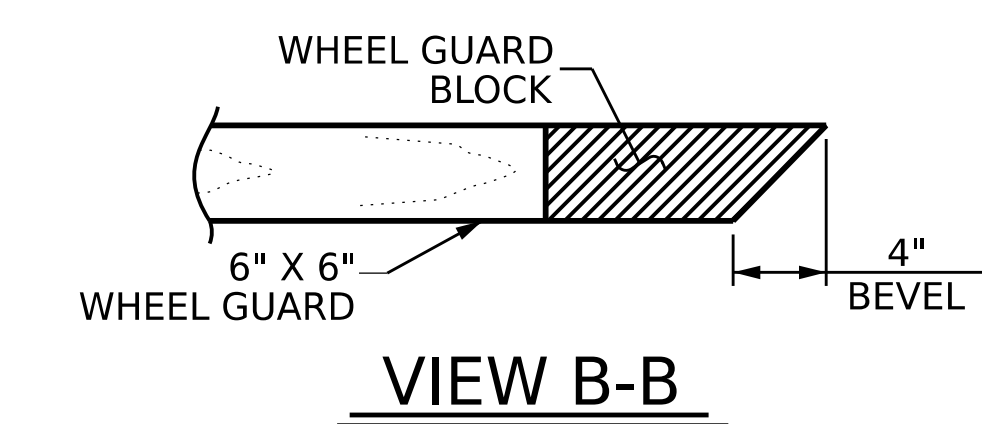
SEE "PLAN OF SPAN" SHEET FOR NUMBER OF WHEEL GUARDS AND WHEEL GUARD SPACING.



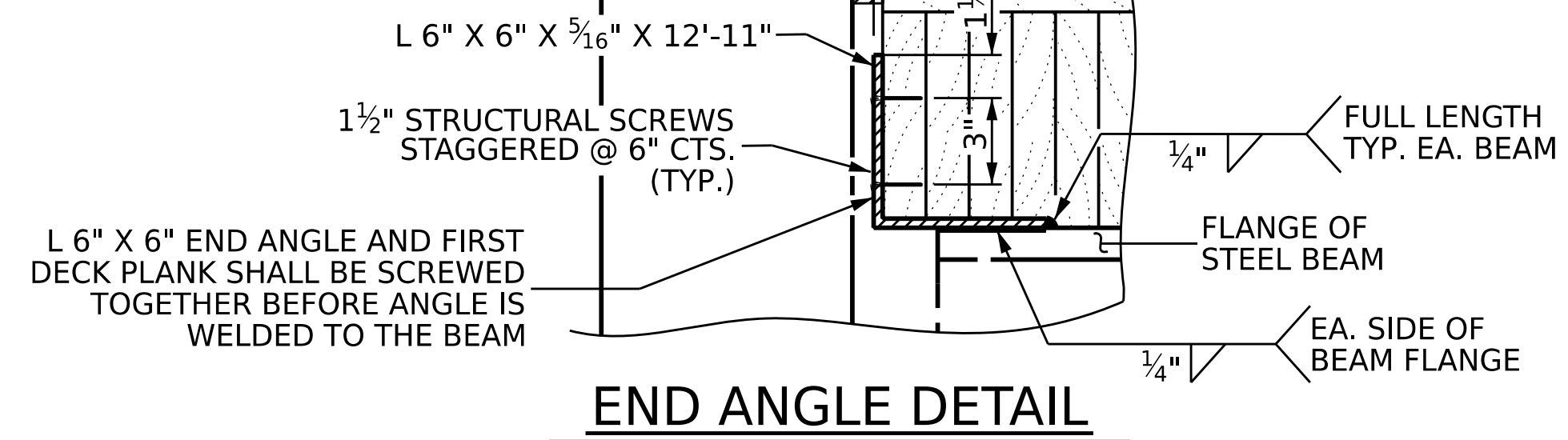
SECTION AT END BENT



DECK CLIP DETAIL



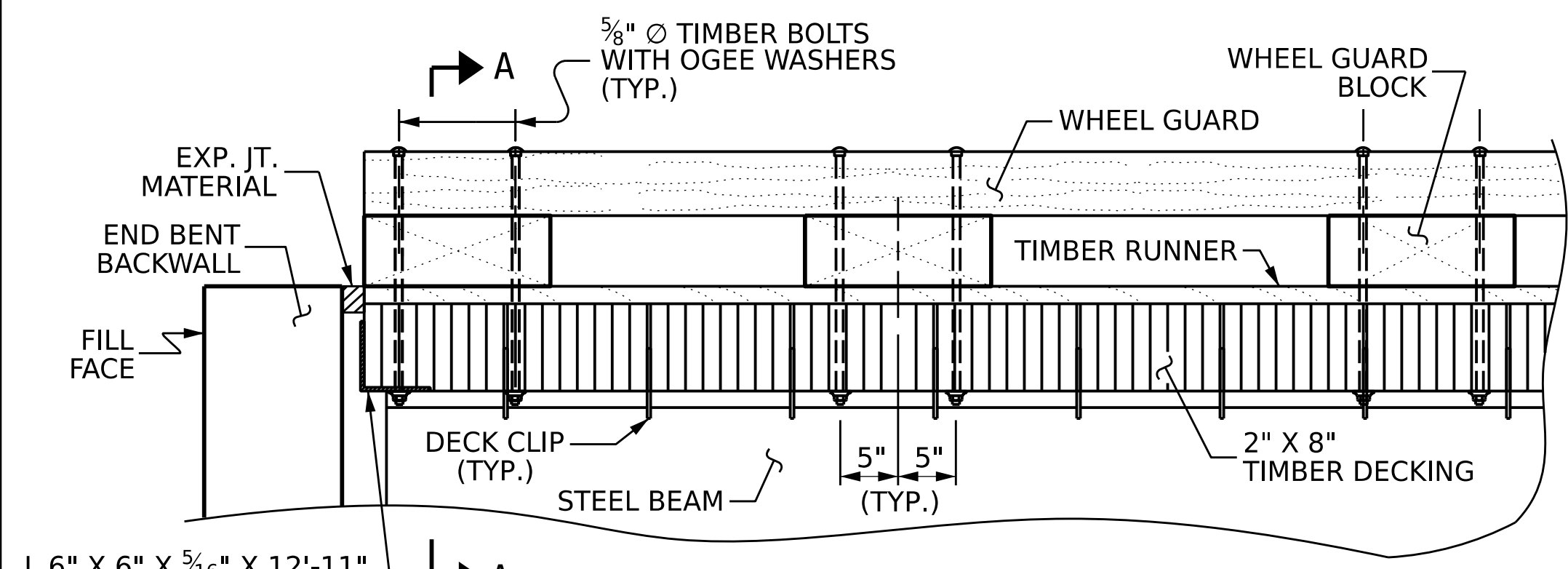
VIEW B-B



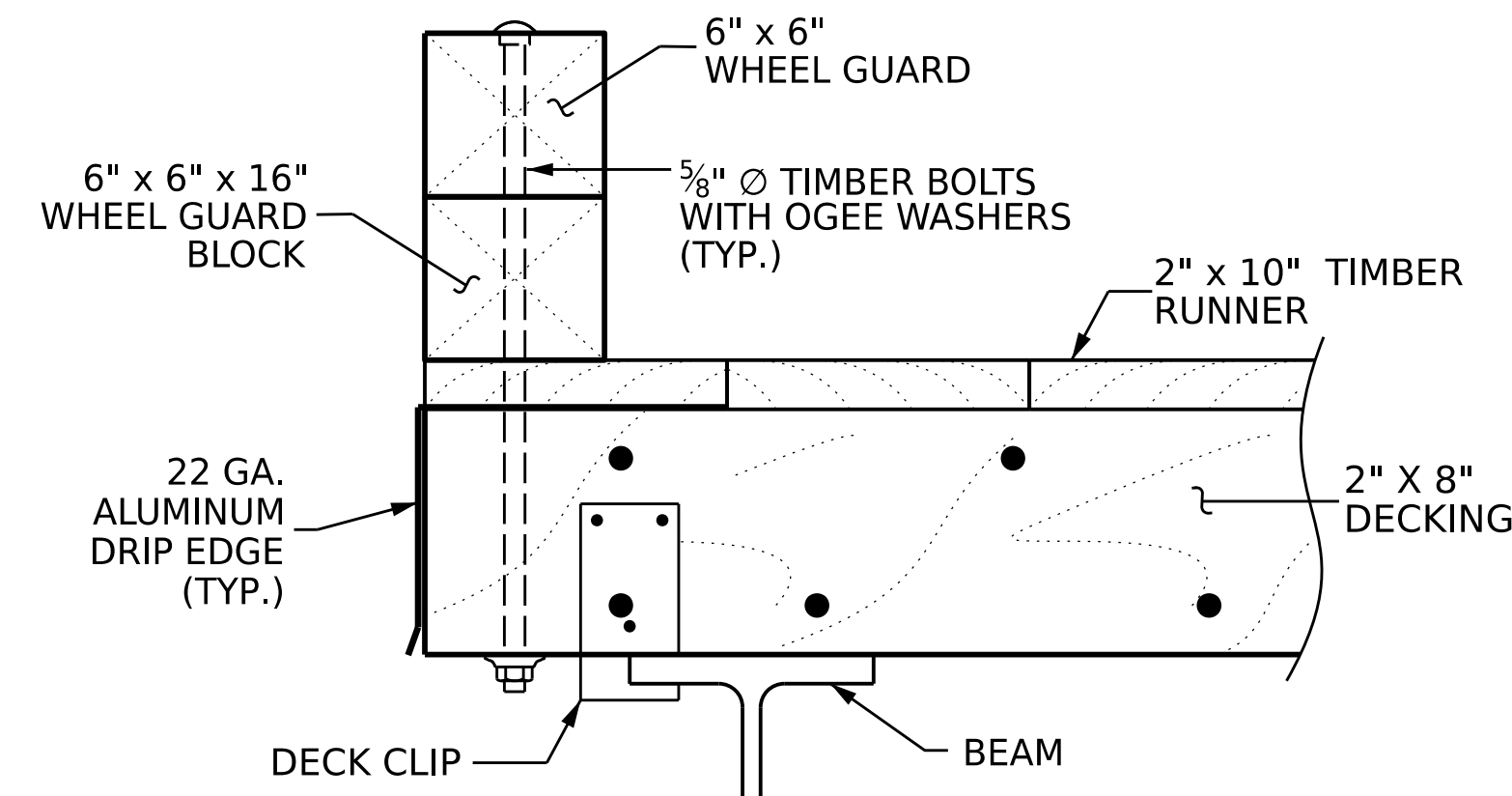
END ANGLE DETAIL

DECK CLIP DIMENSIONS		
SPAN	BEAM	*A
20'-0"	W16X36	1/2"
30'-0"	W21X48	1/2"
40'-0"	W24X76	3/4"
50'-0"	W24X104	13/16"

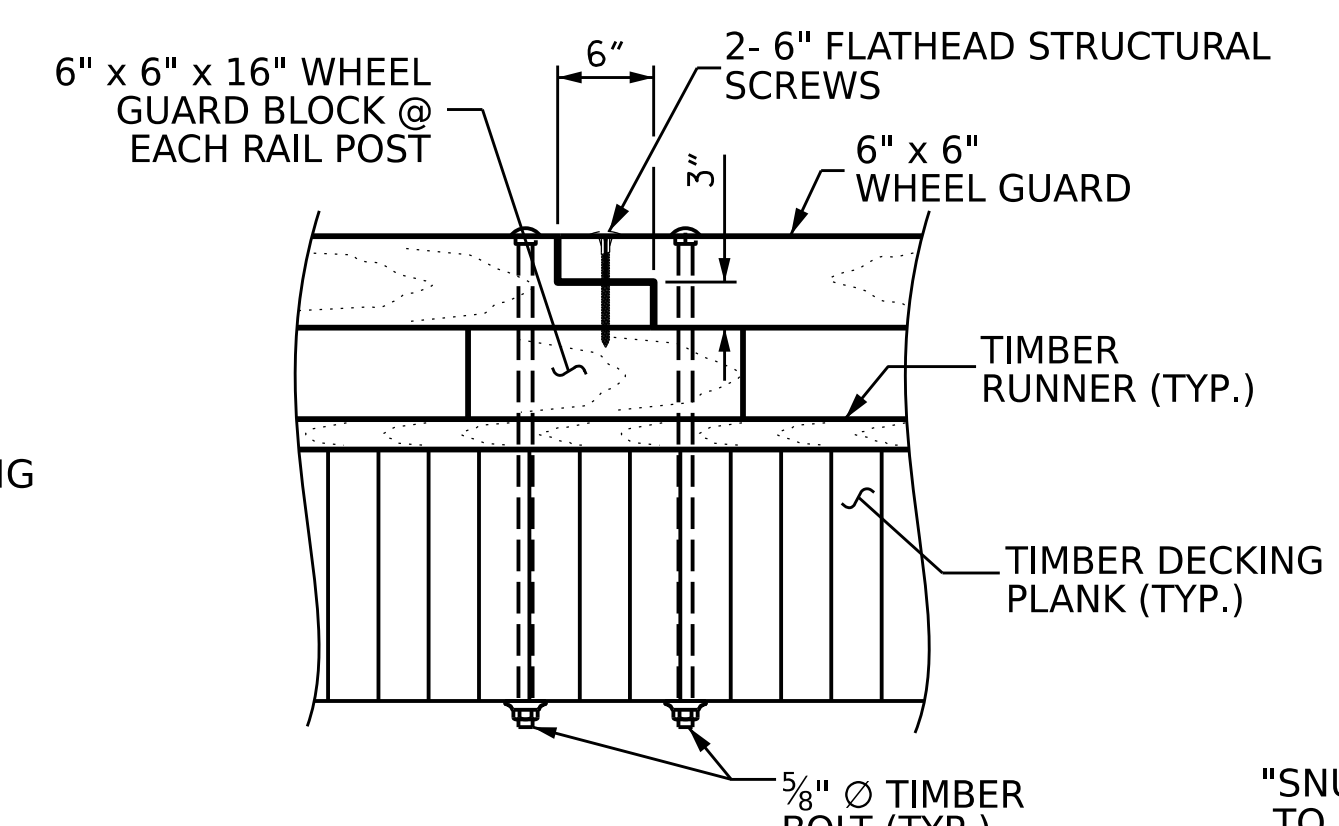
* DIMENSION A IS FOR INFORMATION ONLY. IT IS BASED ON THE FLANGE THICKNESS PLUS A 1/16" TOLERANCE. THE CONTRACTOR SHALL VERIFY THIS DIMENSION WITH DECK CLIP SUPPLIER. THE DECK CLIP SHALL HAVE A SNUG FIT TO THE BEAM FLANGE.



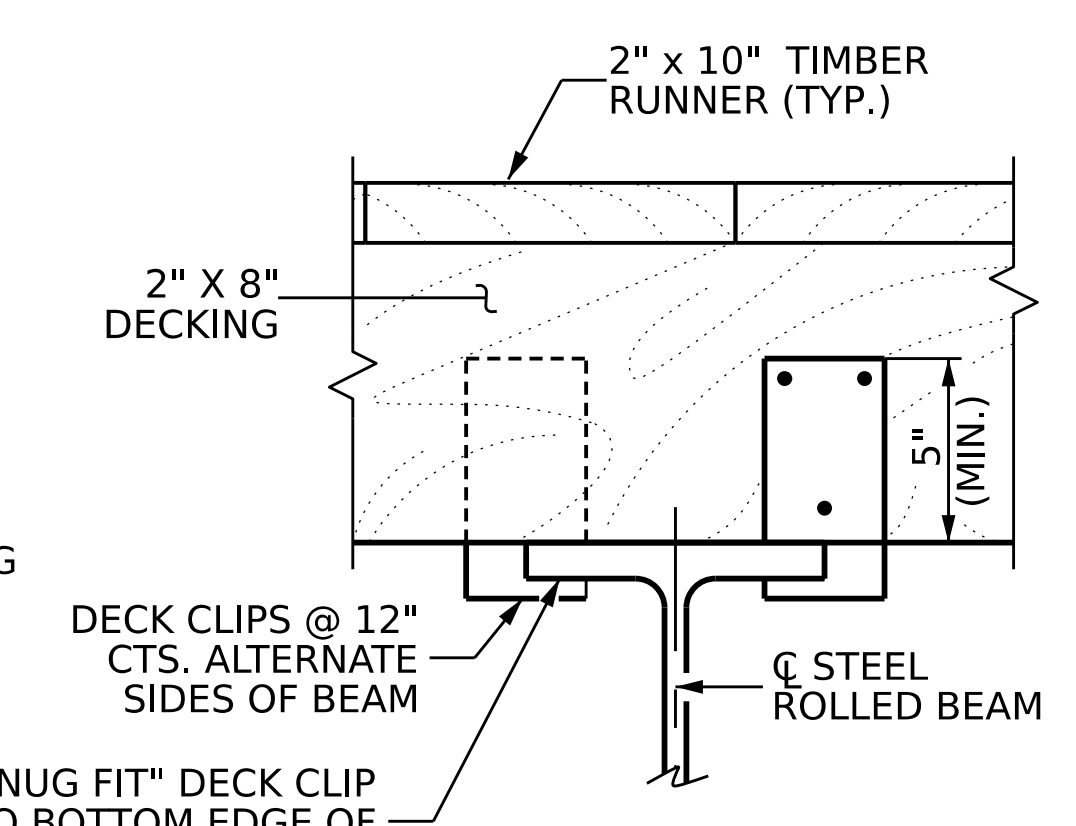
WHEEL GUARD DETAIL AT END BENTS



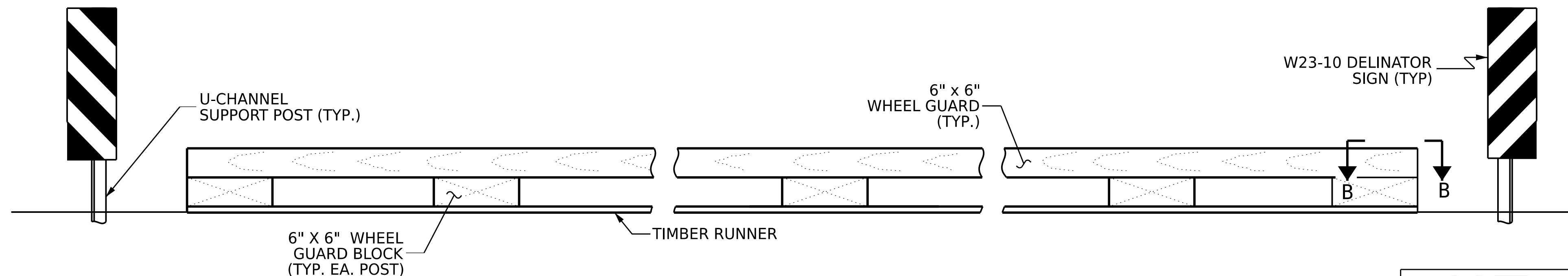
SECTION A-A



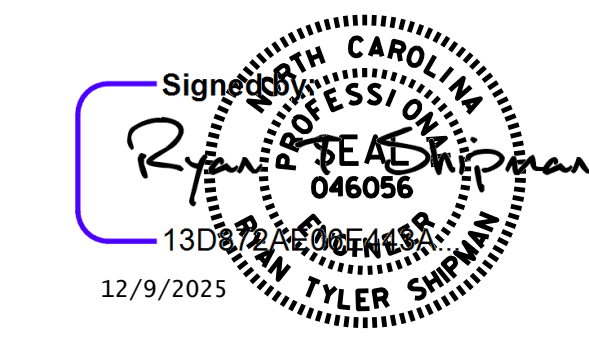
WHEEL GUARD SPLICE DETAIL



DETAIL 'A'



WHEEL GUARD ELEVATION

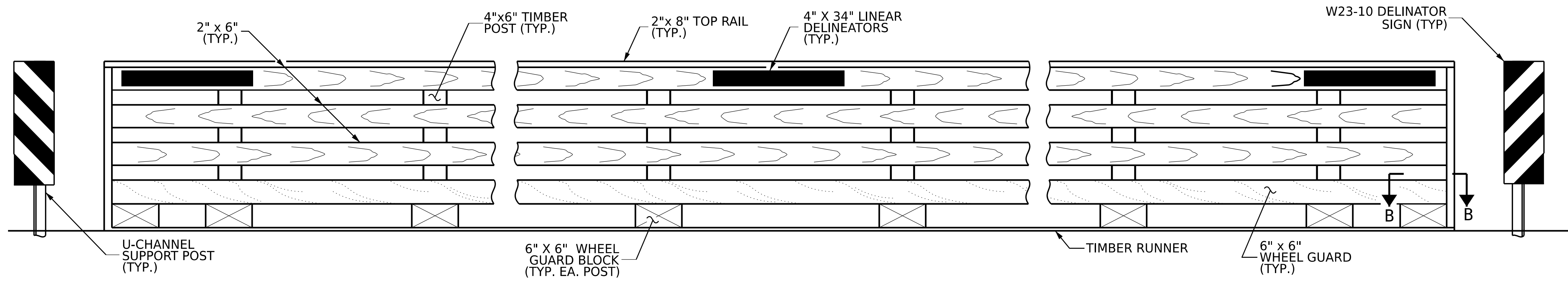


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
TYPICAL SECTION & RAIL DETAILS

Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097	DWN. BY: WDC CHKD. BY: RTS DES. EGR. OF RECORD: PCW	DATE: 12/2025 DATE: 12/2025 DATE: 12/2025	NO. 1 BY: [] DATE: []	NO. 2 BY: [] DATE: []	NO. 3 BY: [] DATE: []	NO. 4 BY: [] DATE: []	SHEET NO. S-02 TOTAL SHEETS 12
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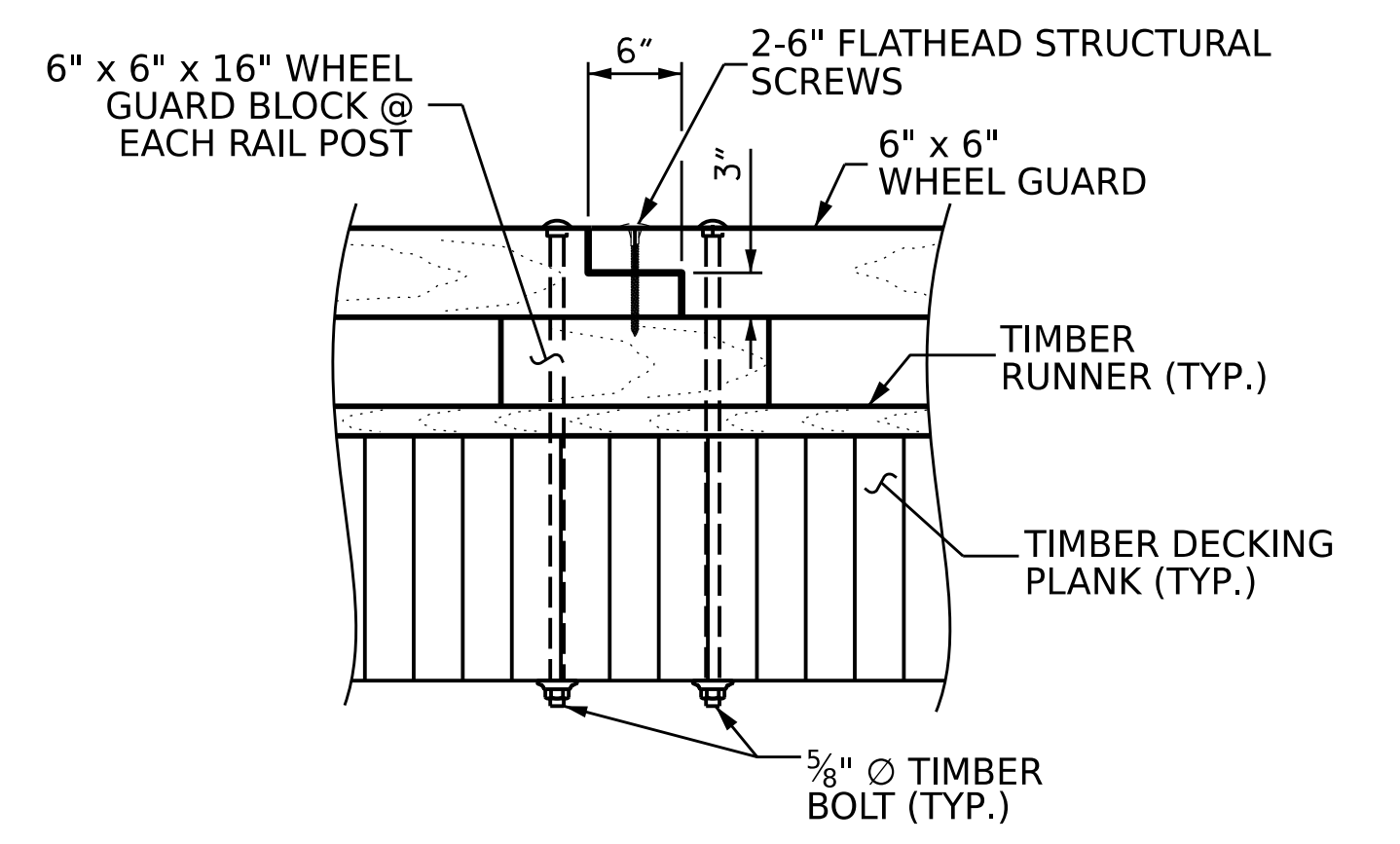
ELEVATION OF OPTIONAL BRIDGE RAIL

OPTIONAL BRIDGE RAIL NOTES

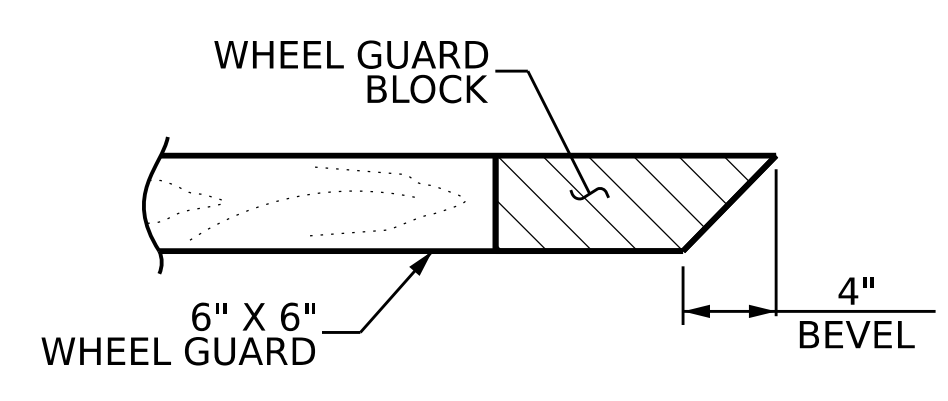
BRIDGE RAILS SHALL BE CONTINUOUS FROM END POST TO END POST WITH NO GAPS. RAIL LUMBER LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

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.

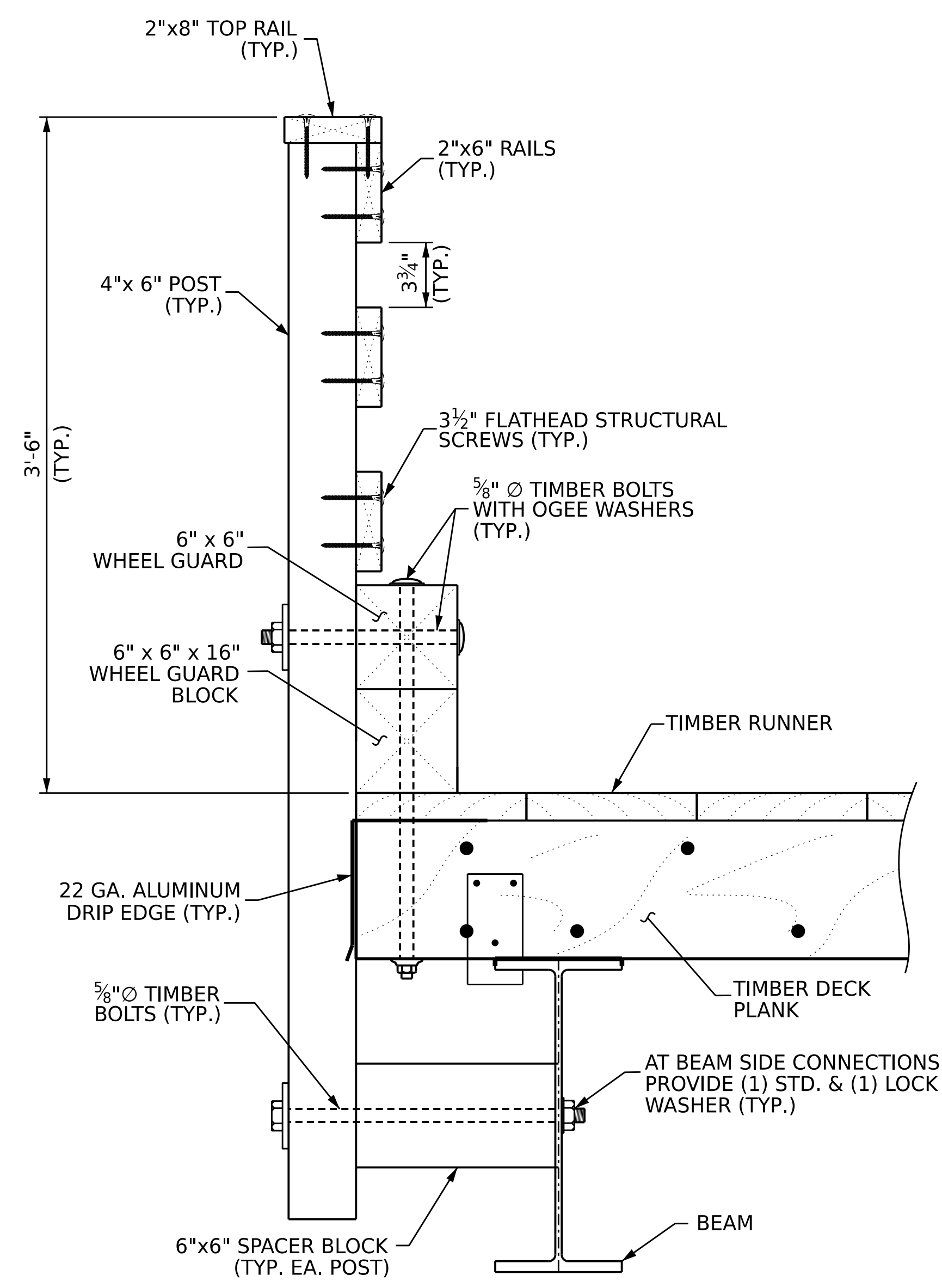
SEE "PLAN OF SPAN" SHEET FOR NUMBER OF POSTS AND POST SPACING.



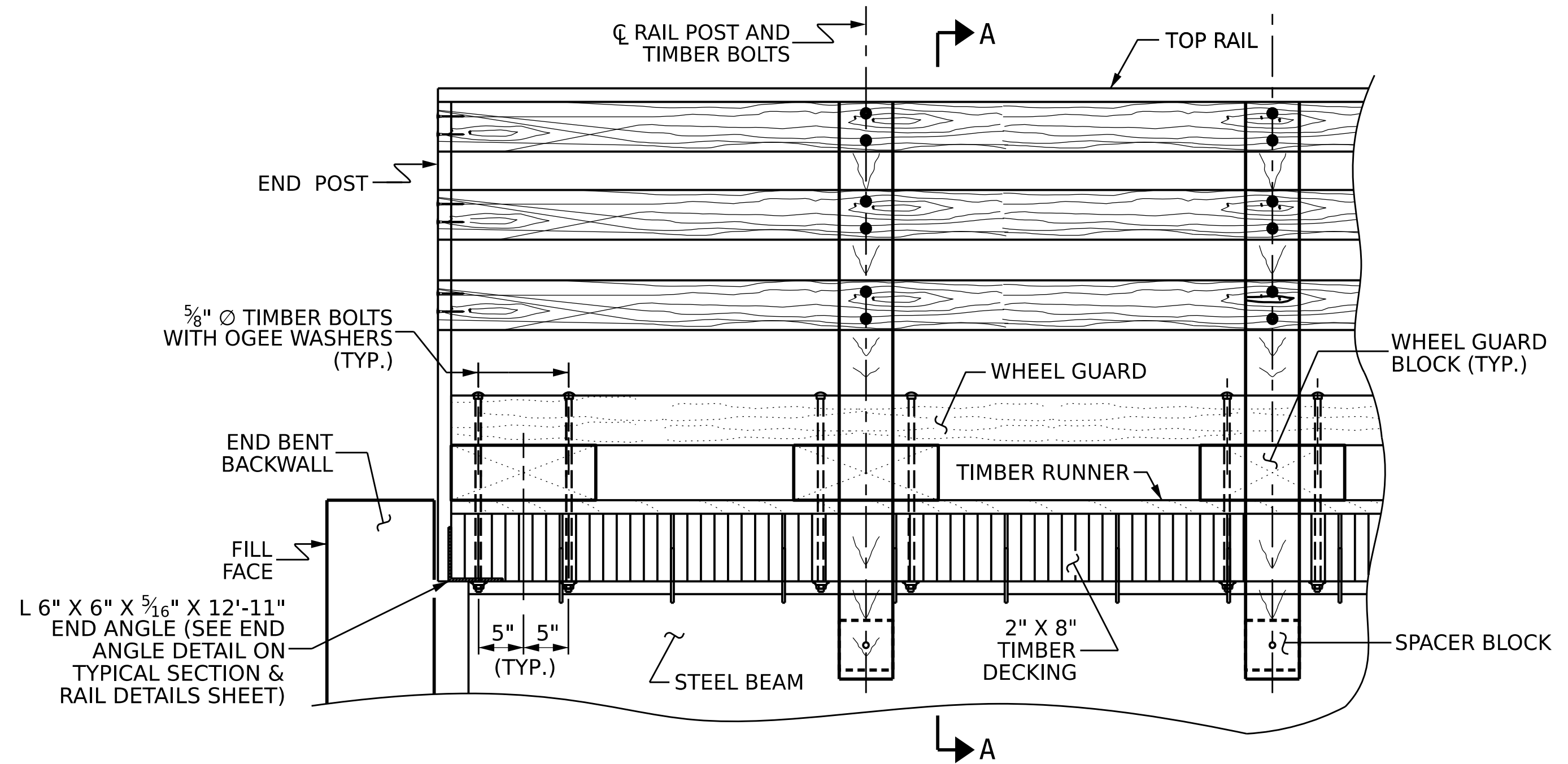
WHEEL GUARD SPLICE DETAIL



VIEW B-B



SECTION A-A



OPTIONAL RAIL DETAIL AT END BENTS

Signature: *Ryan A. Seal*
 PROFESSIONAL ENGINEER
 046056
 1305 S. TAYLOR STREET
 TYLER SHAWM
 12/9/2025

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NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
**PRIVATE DRIVEWAY
 BRIDGE STANDARDS**
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
**OPTIONAL TIMBER
 BRIDGE RAIL**

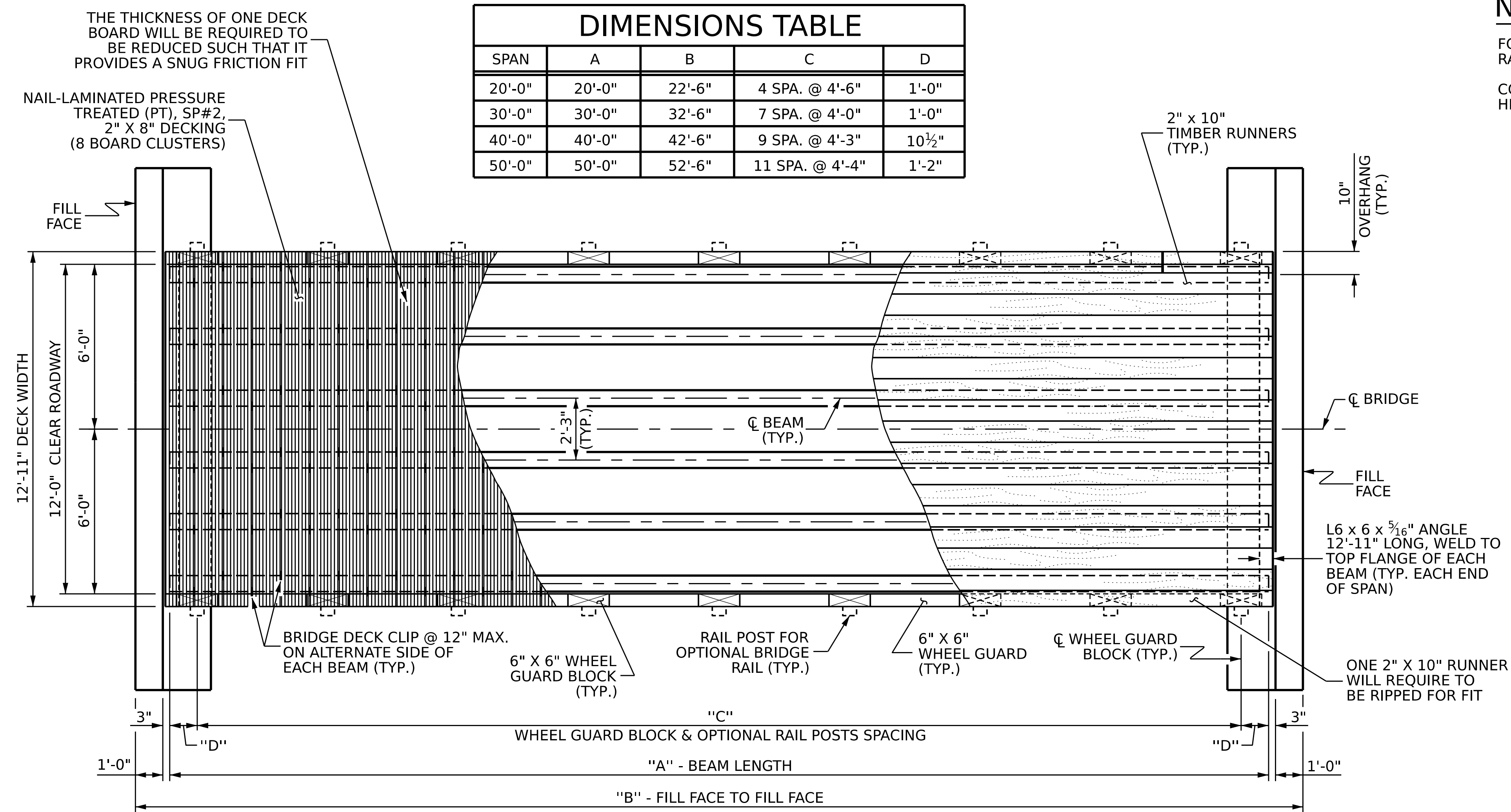
JMT Johnson, Mirmiran, & Thompson Inc.
 108 Asheville Commerce Parkway
 Candler, NC, 28715
 License No: C-3097

DWN. BY: WDC
 CHKD. BY: RTS
 DES. EGR. OF RECORD: PCW
 DATE: 12/2025
 DATE: 12/2025
 DATE: 12/2025

REVISIONS						SHEET NO. S-03
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 12
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 TIME: 12:19:2025

DIMENSIONS TABLE				
SPAN	A	B	C	D
20'-0"	20'-0"	22'-6"	4 SPA. @ 4'-6"	1'-0"
30'-0"	30'-0"	32'-6"	7 SPA. @ 4'-0"	1'-0"
40'-0"	40'-0"	42'-6"	9 SPA. @ 4'-3"	10½"
50'-0"	50'-0"	52'-6"	11 SPA. @ 4'-4"	1'-2"



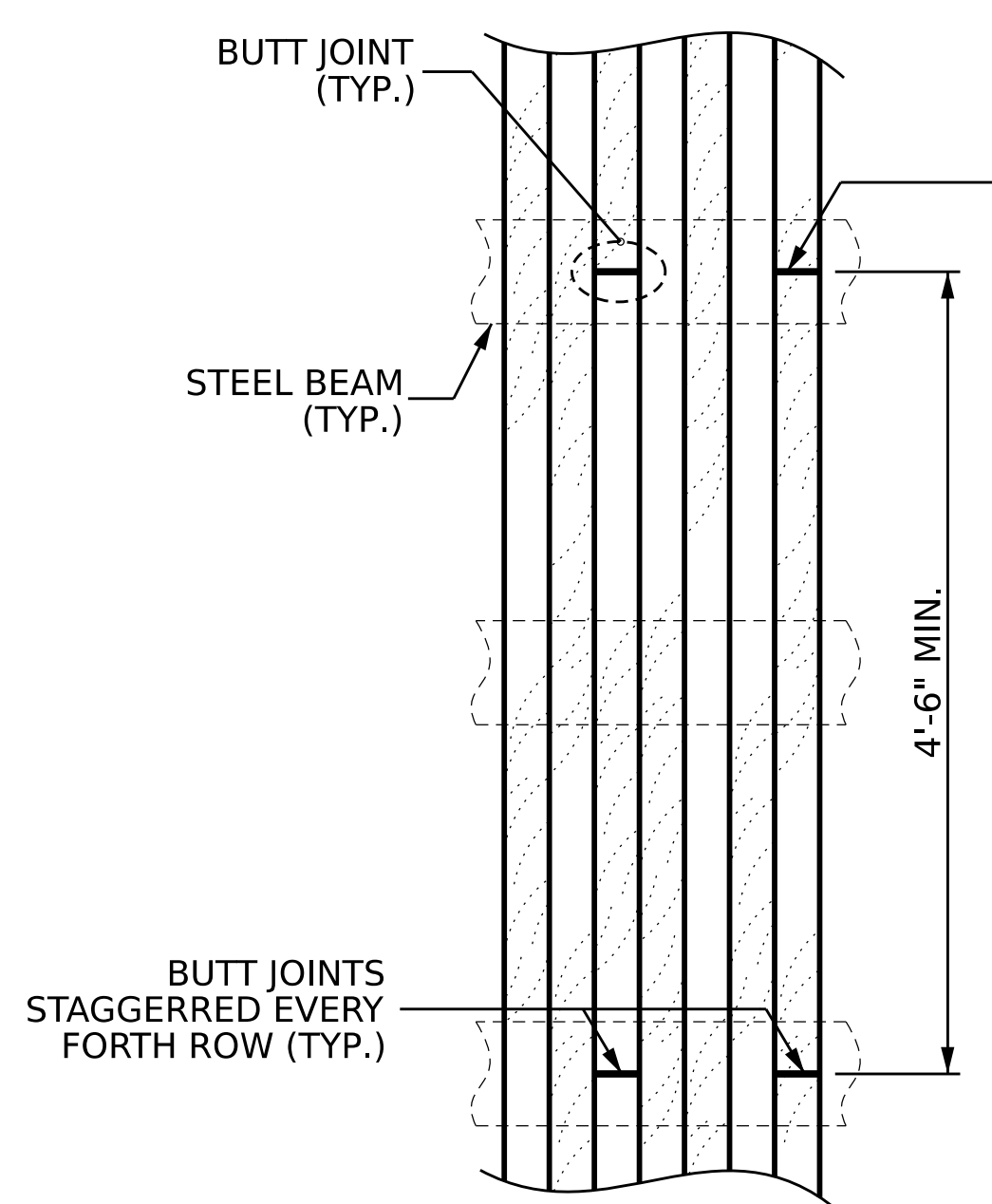
END BENT 1

DECK LAYOUT

END BENT 2

NOTES

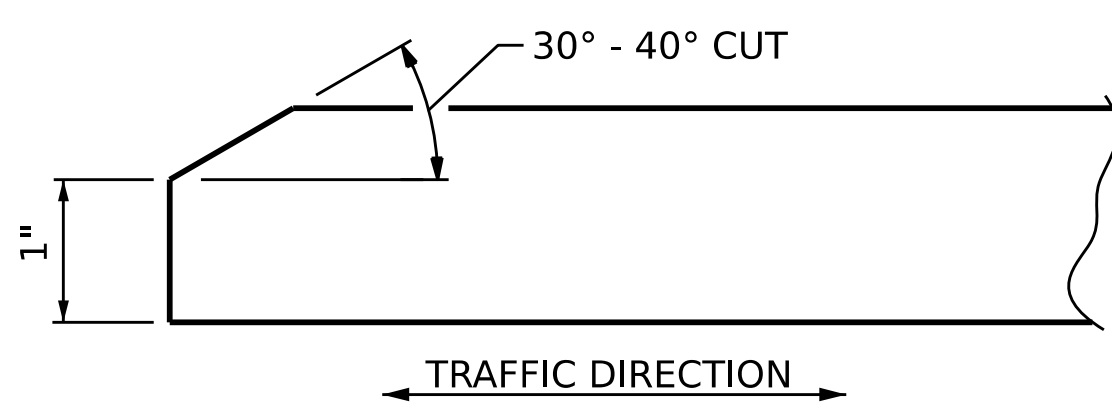
FOR ADDITIONAL NOTES, SEE "TYPICAL SECTION & RAIL DETAILS" SHEET, AND "GENERAL NOTES" SHEET.
 COUNTERSINK FLATHEAD STRUCTURAL TIMBER SCREW HEADS TO BE FLUSH WITH TIMBER SURFACE.



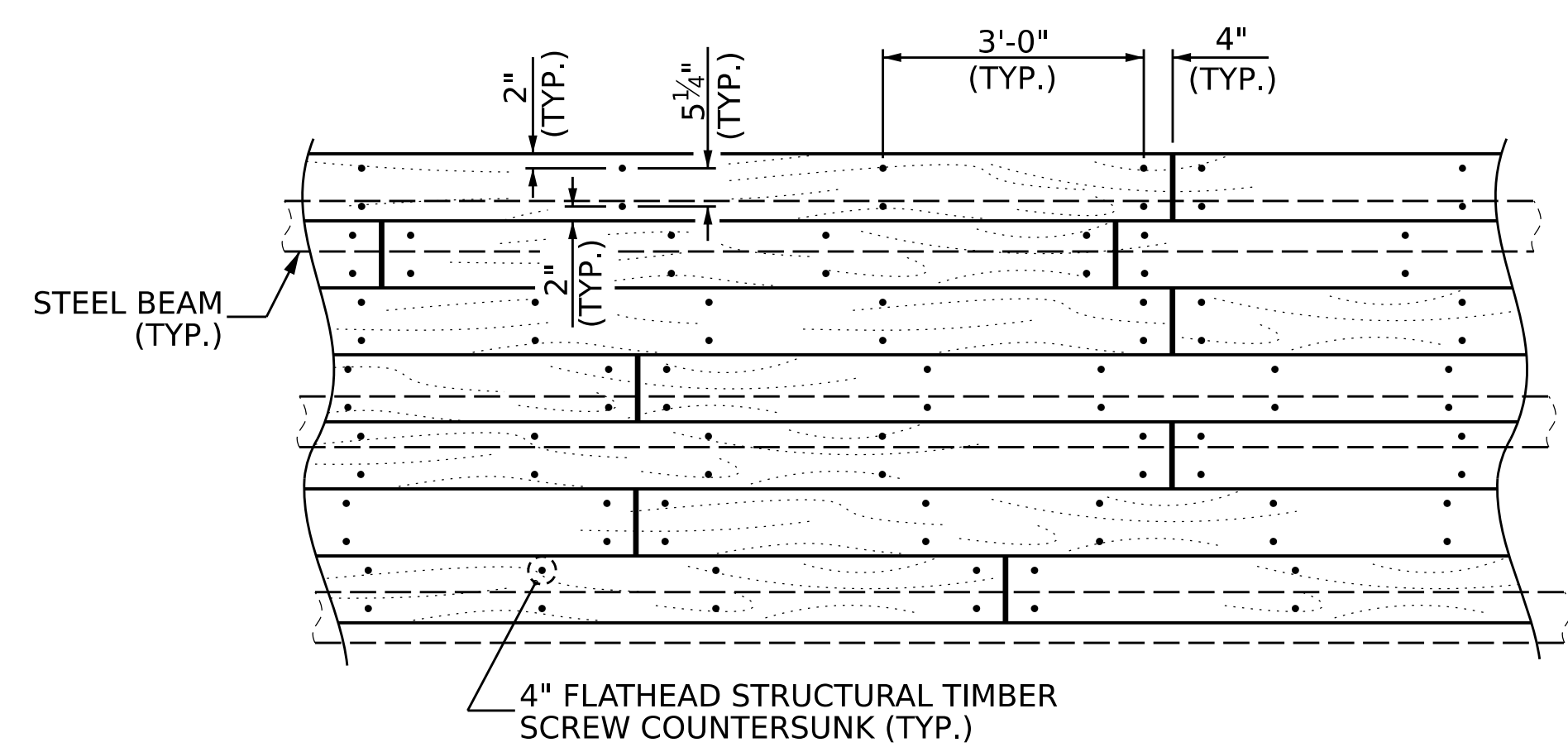
DECKING BOARD BUTT JOINT DETAIL

BUTT JOINTS SHALL BE OVER THE CENTERLINE OF A BEAM. JOINTS SHALL BE STAGGERED EVERY FOURTH DECK BOARD. NONE ALLOWED AT THE EXTERIOR BEAMS.

WHEN BUTT JOINTS ARE REQUIRED IN A PLANK RUN, DETAIL THE BUTT JOINTS OVER THE CENTERLINE OF THE BEAM



SIDE VIEW TIMBER RUNNER BEVEL DETAIL
 (TYP. AT EACH END OF BRIDGE)



TIMBER RUNNER BUTT JOINT DETAIL

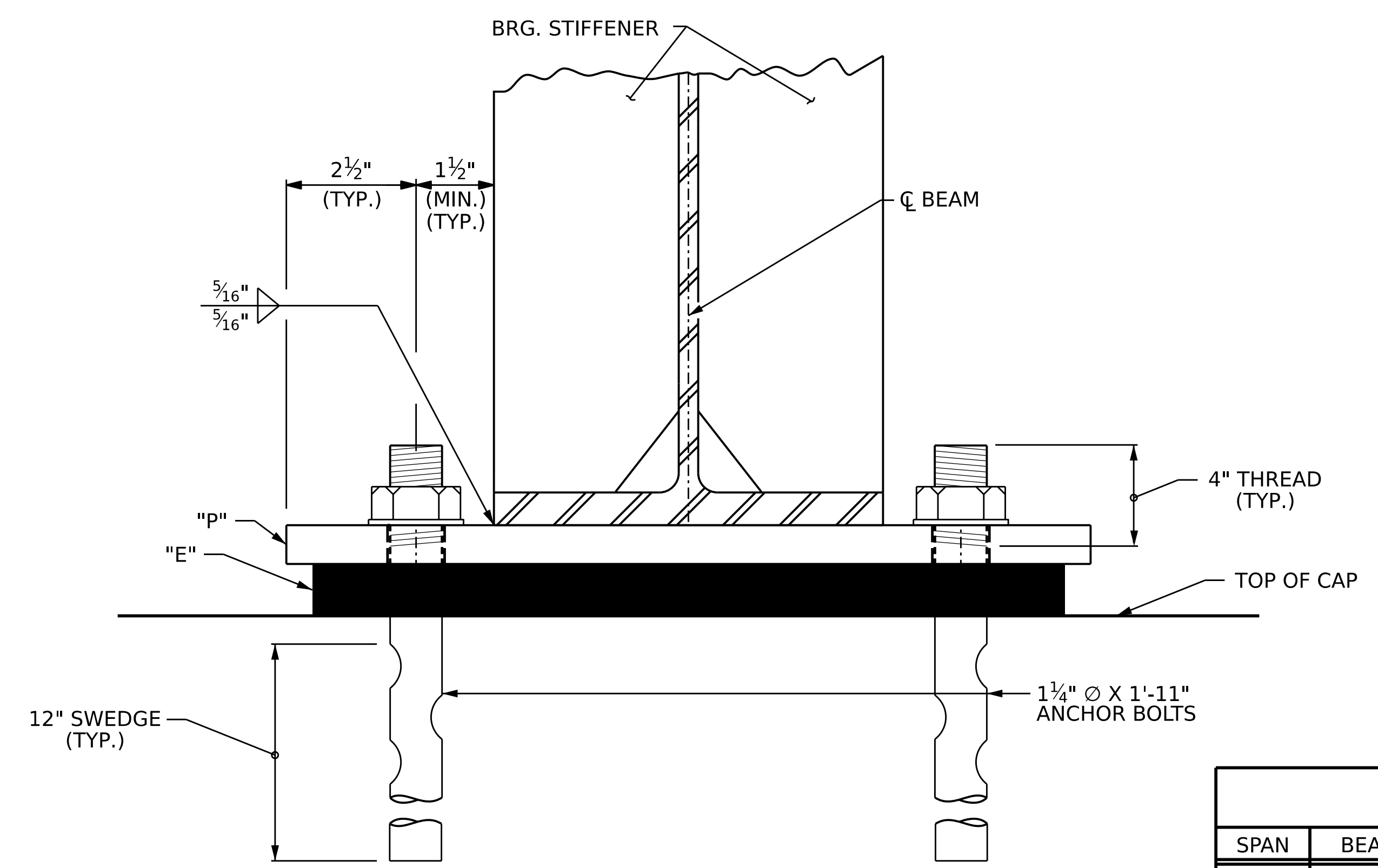
Signed: *Ryan D. Sherman*
 PROFESSIONAL SEAL
 046056
 13000 ENGINEER
 TYLER SHERMAN
 12/9/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
PLAN OF SPAN

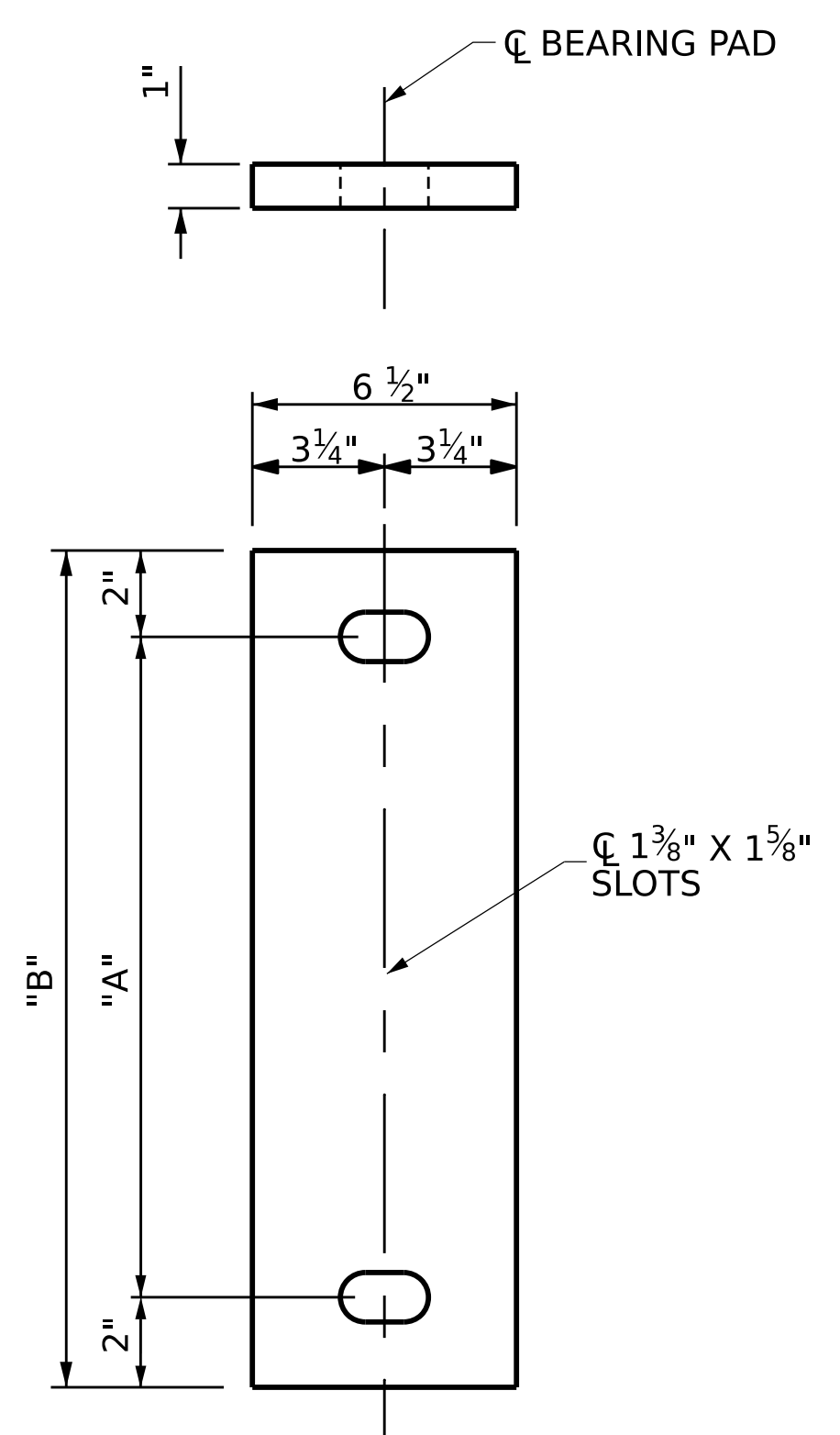
Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097	DWN. BY: WDC CHKD. BY: RTS DES. EGR. OF RECORD: PCW	DATE: 12/2025 DATE: 12/2025 DATE: 12/2025	REVISIONS NO. BY: DATE: NO. BY: DATE:			SHEET NO. S-04 TOTAL SHEETS 12
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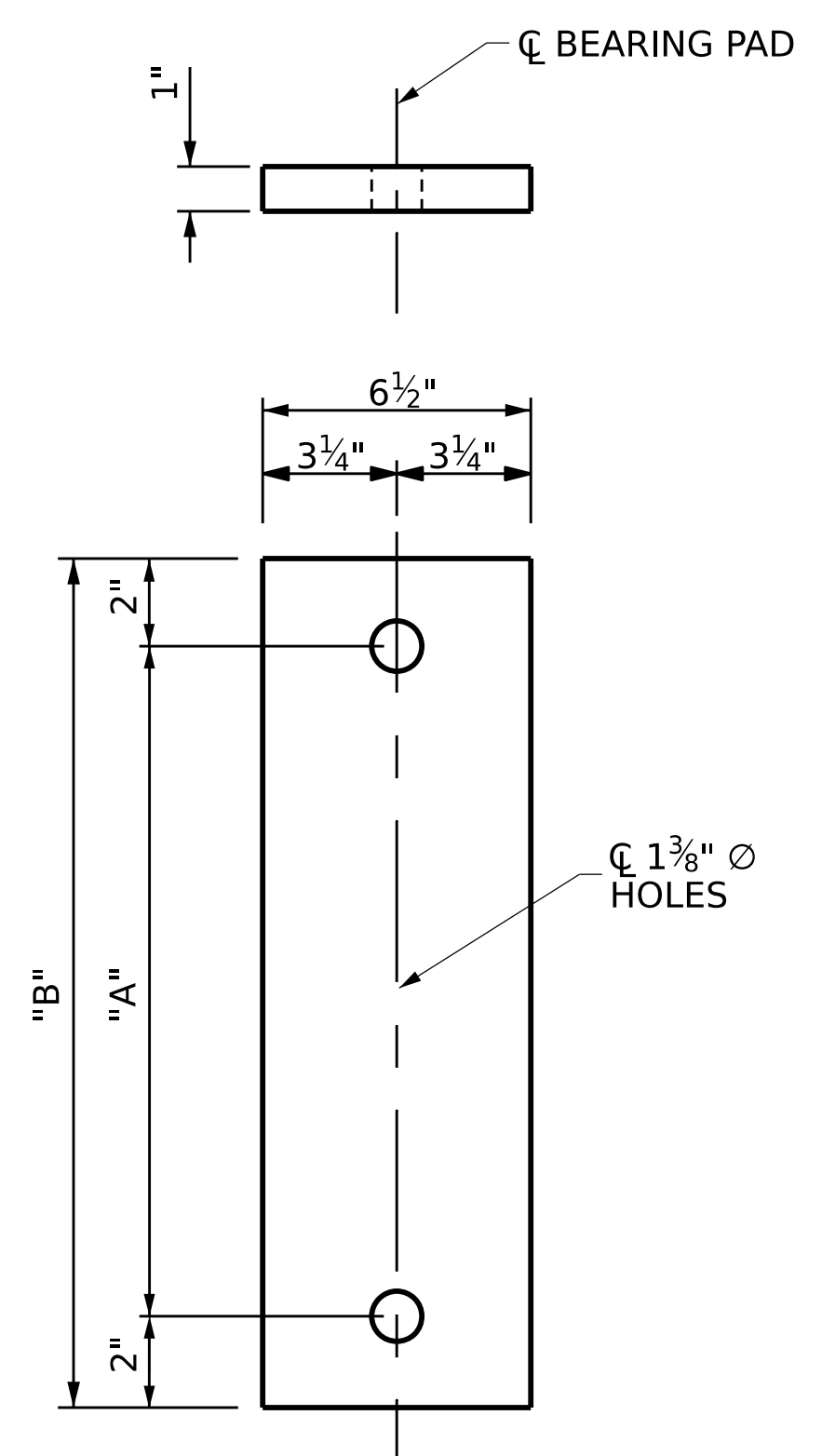


SECTION AT BEARING

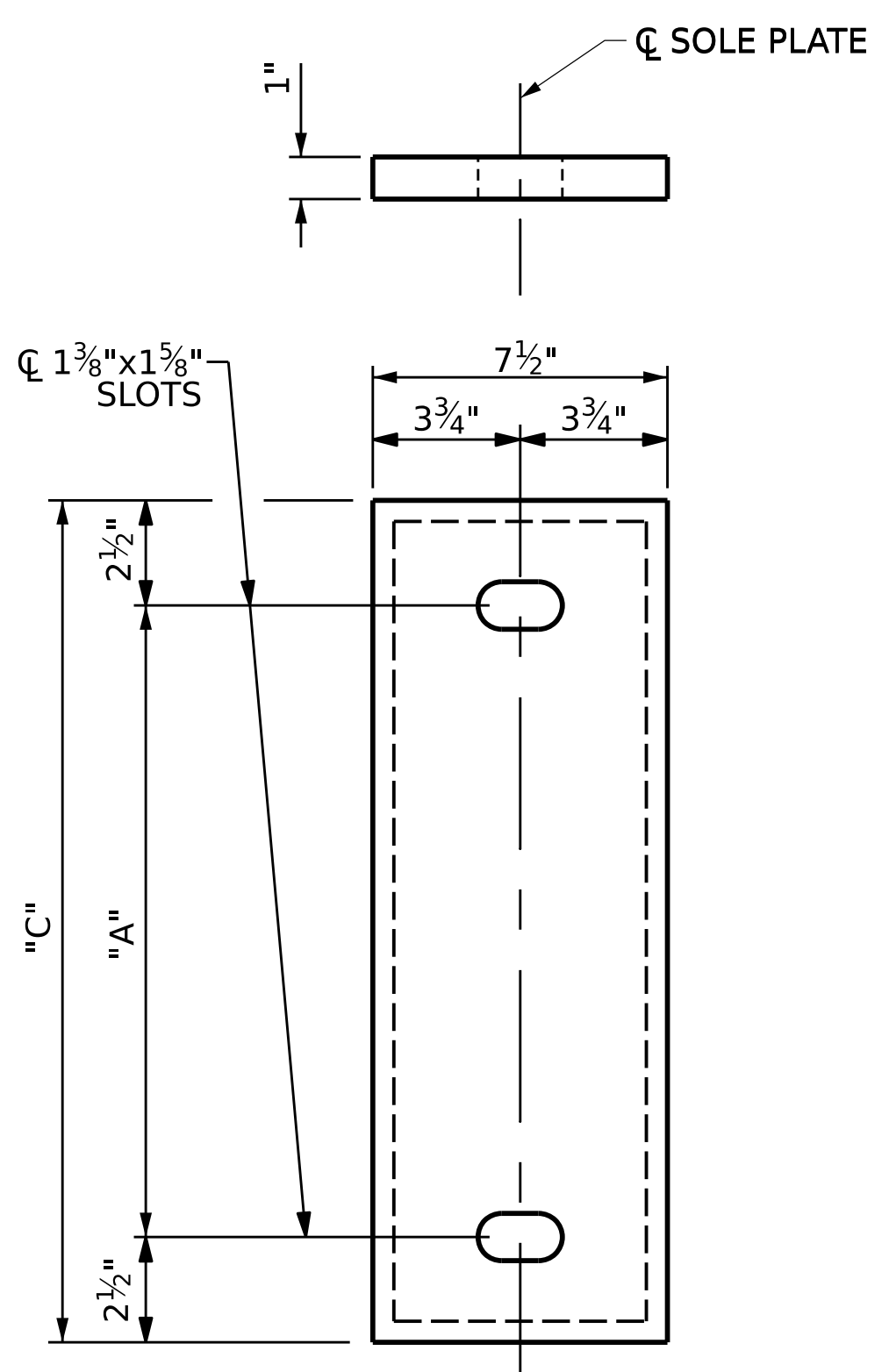
DIMENSIONS TABLE						
SPAN	BEAM	FLANGE WIDTH	TYPE	A	B	C
20'-0"	W16X36	6.99"	I	10"	1'-2"	1'-3"
30'-0"	W21X48	8.14"	II	1'-0"	1'-4"	1'-5"
40'-0"	W24X76	9.0"	II	1'-0"	1'-4"	1'-5"
50'-0"	W24X104	12.75"	III	1'-4"	1'-8"	1'-9"



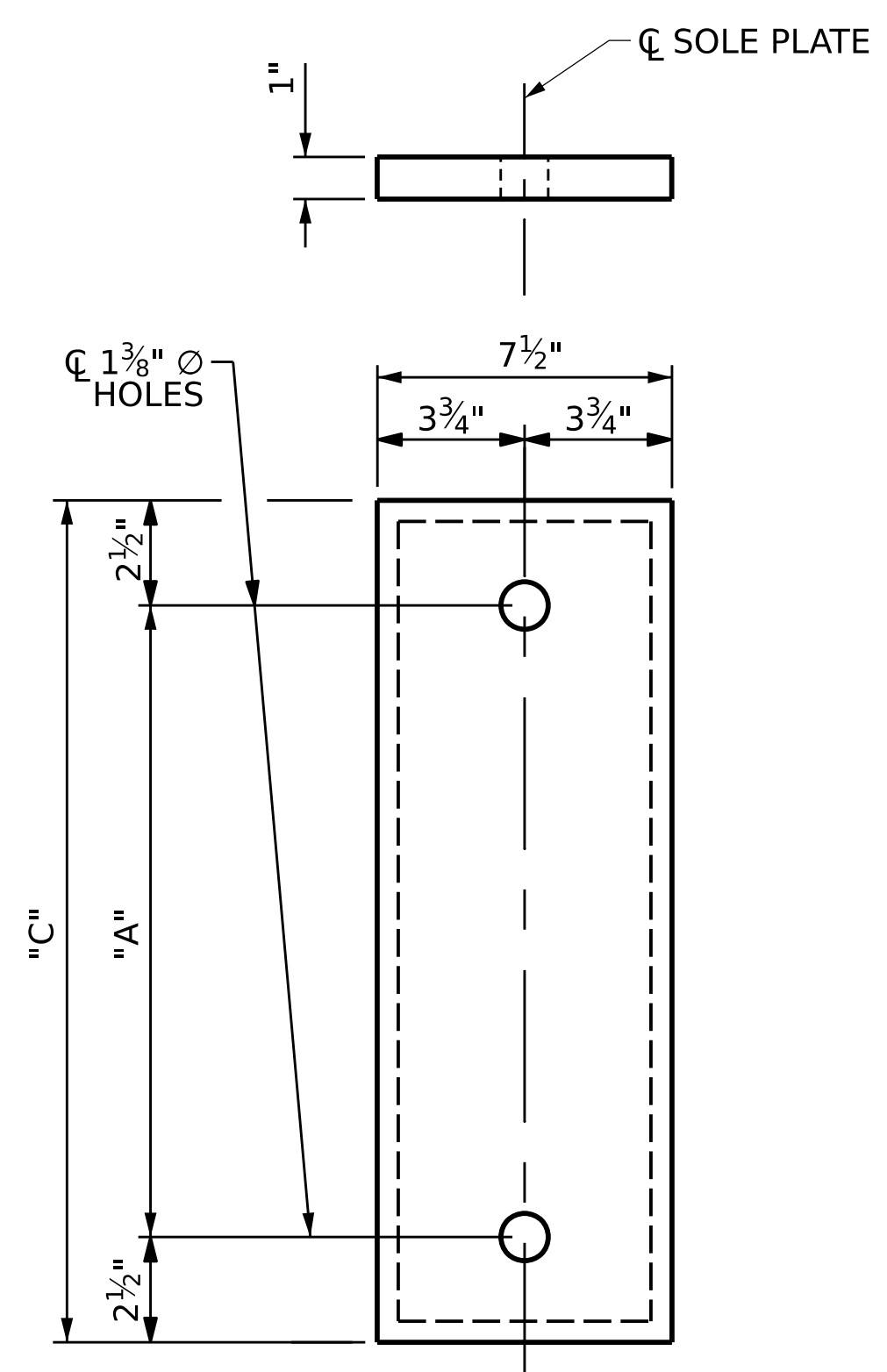
E1 ELASTOMERIC BEARING DETAILS
(6 REQ'D)
EXPANSION



E2 ELASTOMERIC BEARING DETAILS
(6 REQ'D)
FIXED



P1 SOLE PLATE DETAILS
(6 REQ'D)
EXPANSION



P2 SOLE PLATE DETAILS
(6 REQ'D)
FIXED

NOTES

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.

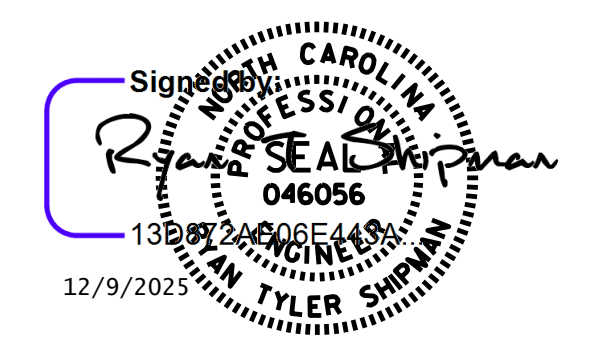
AT THE APPROVAL OF THE ENGINEER, SOLE PLATES AT THE EXPANSION END MAY BE FIELD WELDED.

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 NO ADDITIONAL COST, THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CAST-IN-PLACE ANCHORS. LEVEL 1 FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ANCHOR BOLT IS 30 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

ADHESIVELY ANCHORED ANCHOR BOLTS SHALL BE THREADED FULL LENGTH.



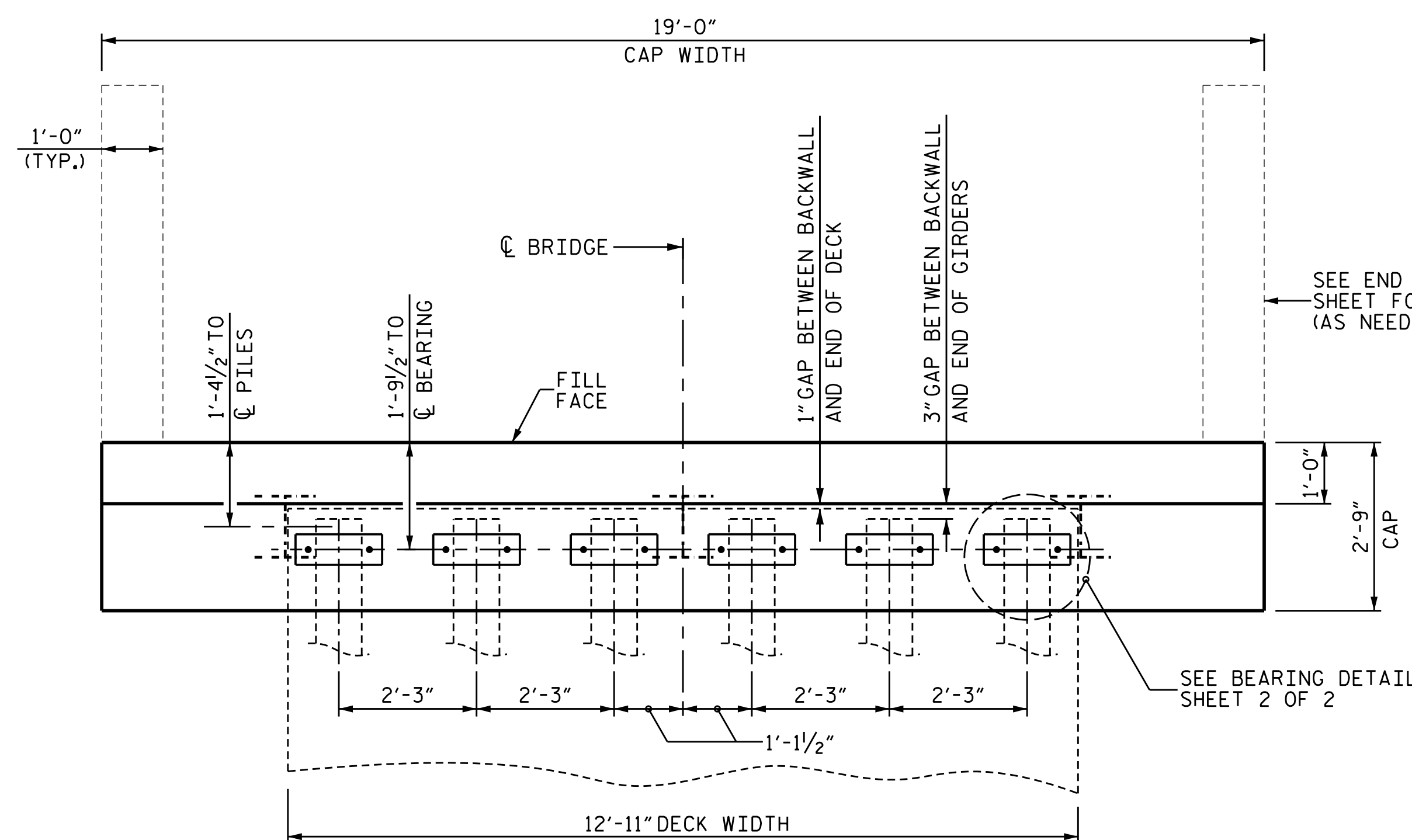
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY
BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
BEARING DETAILS

JMT	Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097		DWN. BY: WDC	DATE: 12/2025	SHEET NO. S-06
			CHKD. BY: RTS	DATE: 12/2025	
			DES. EGR. OF RECORD: PCW	DATE: 12/2025	

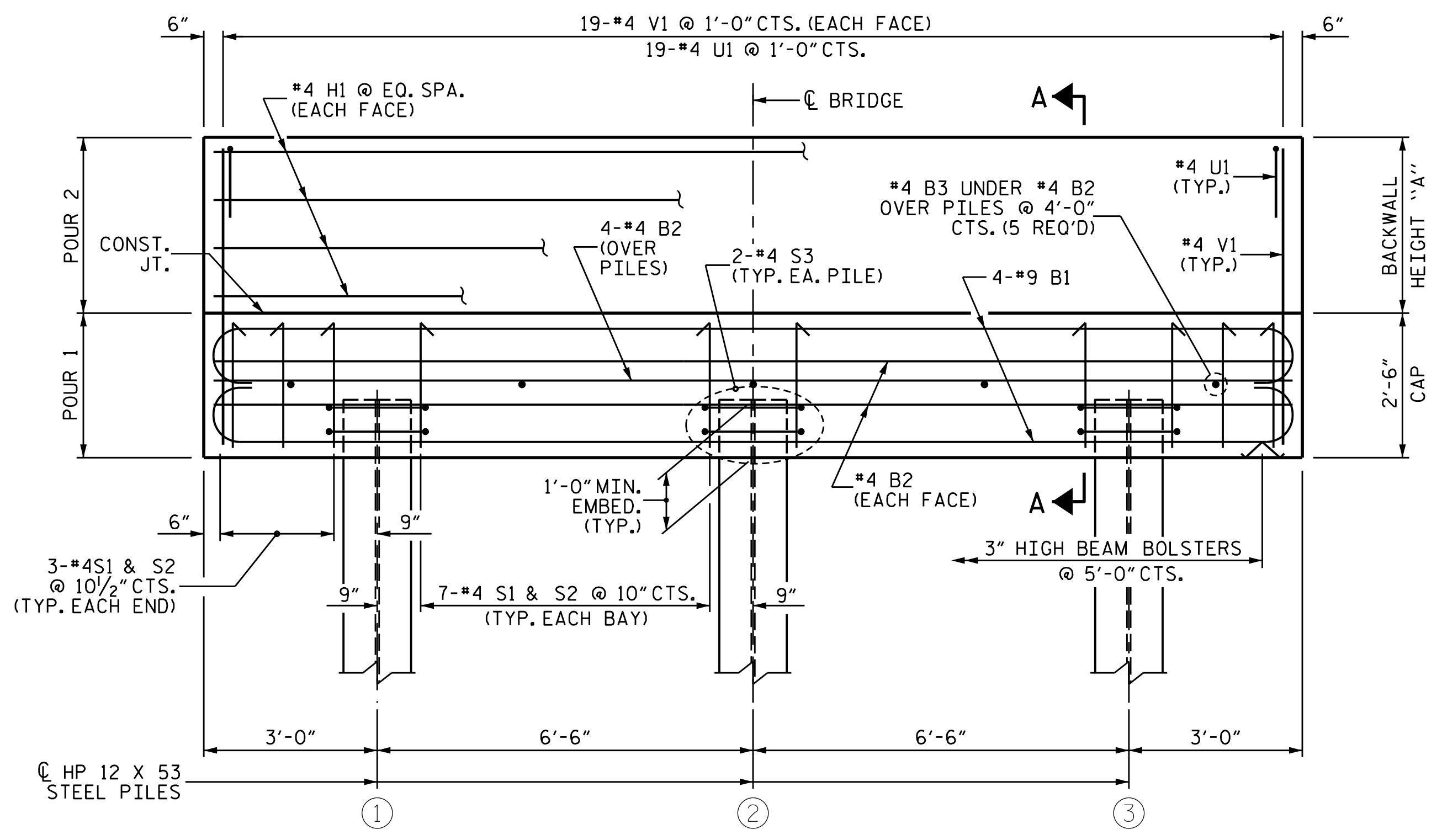
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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W:\Projects\2025\25-00629\25-00629-001\Design\Structures\NC FRB-Steel Beam with Timber Deck Standards\Single Lane Steel Beam with Timber Deck Plans\2 Standard Drawings\1-Beam Bridge Plans\20-50\007-ST_End Bent_Driven Piles.dgn
 DATE: 12/9/2025
 TIME: 12:12:15



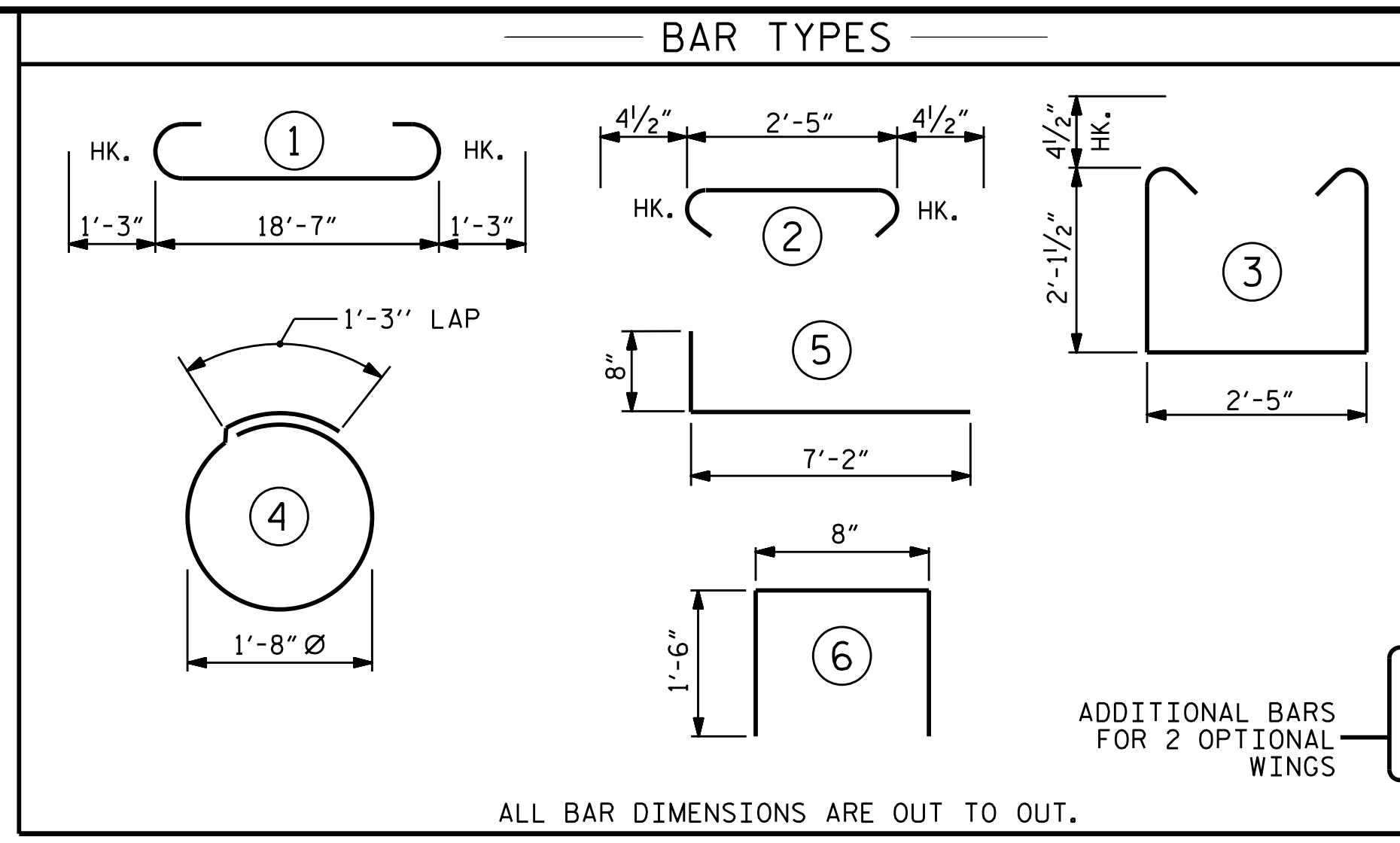
PLAN

BACKWALL DIM.		
SPAN	BEAM	A
20'-0"	W16X36	2'-2 ⁵ / ₈ "
30'-0"	W21X48	2'-7 ³ / ₈ "
40'-0"	W24X76	2'-10 ⁵ / ₈ "
50'-0"	W24X104	2'-10 ³ / ₄ "



ELEVATION

(OPTIONAL WINGS NOT SHOWN FOR CLARITY)



BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	QTY	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	①	21'-1"	573
B2	8	#4	STR	18'-8"	100
B3	5	#4	STR	2'-5"	8
H1	8	#4	STR	18'-8"	100
U1	19	#4	⑥	3'-8"	47
S1	20	#4	③	7'-5"	99
S2	20	#4	②	3'-2"	42
S3	6	#4	④	6'-6"	26
V1	38	#4	STR	4'-5"	112
H2	28	#4	⑤	7'-10"	147
V2	56	#4	STR	3'-6"	131
				W/O WINGS	WITH WINGS
REINFORCING STEEL (FOR ONE END BENT) (LBS.)				1,107	1,385
CLASS A CONCRETE (FOR ONE END BENT) (C.Y.)					
POUR 1				4.8	6.0
POUR 2 *				1.7	2.8
TOTAL				6.5	8.8

GENERAL NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

CONTRACTOR SHALL SLOPE TOP OF CAP TO MATCH LONGITUDINAL GRADE OF THE BRIDGE. SLOPES SHALL MATCH ON BOTH END BENT 1 AND END BENT 2 CAPS.

WINGS MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER OR DESIGNEE.

FOR OPTIONAL WINGS FOR END BENT, SEE SHEET 2 OF 2.

FOR BEARING DETAILS, SEE SHEET 2 OF 2.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.

THE LENGTH OF THE "V" BARS ARE BASED ON THE SHORTEST BACKWALL CONFIGURATION. THESE BARS WILL HAVE EXTRA CLEARANCE AT THE BOTTOM OF THE CAP WHEN USING TALLER BACKWALLS.

FOUNDATION NOTES

DRIVEN PILES

INSTALL PILES IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

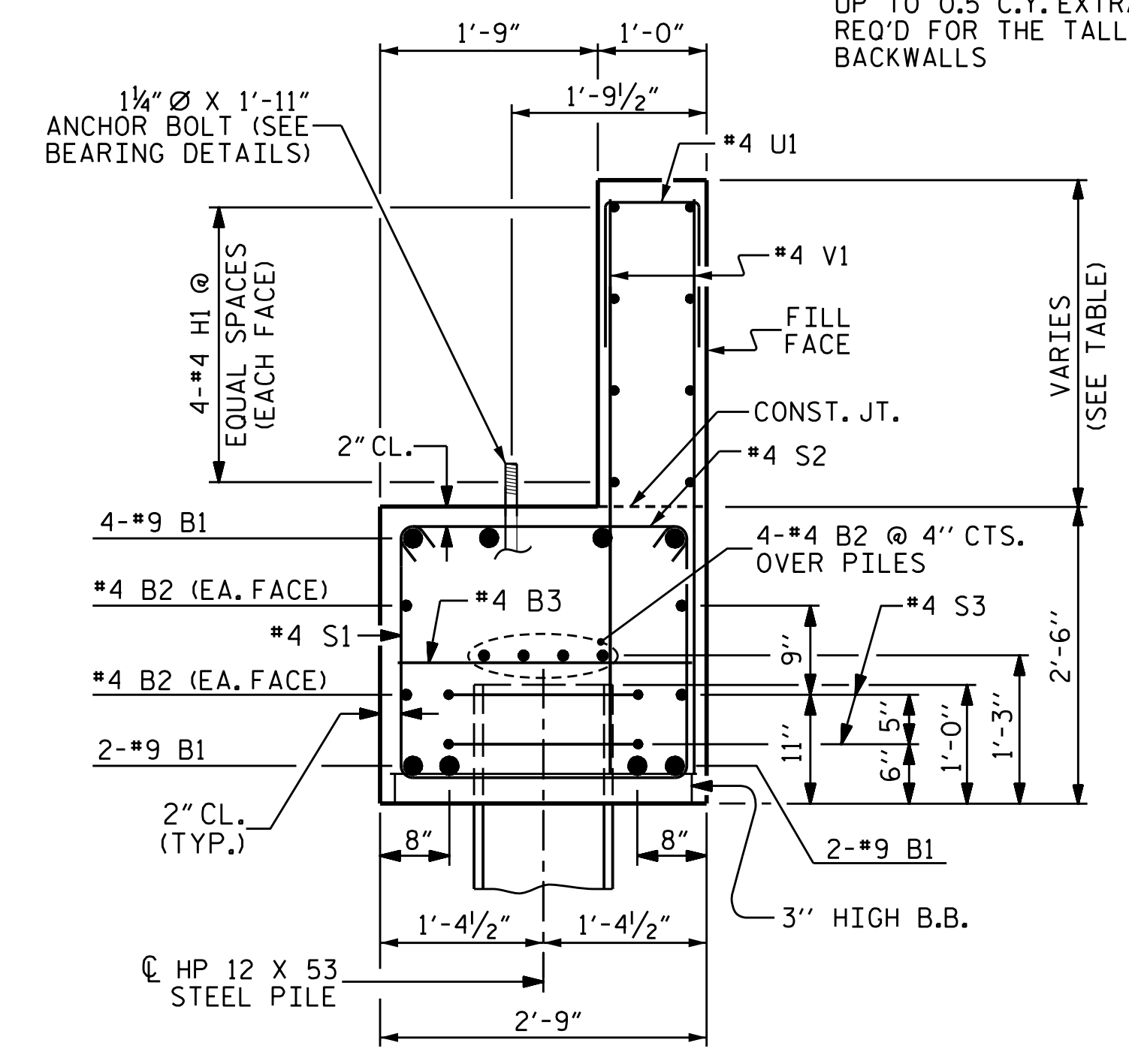
DO NOT INSTALL PILES UNTIL FILL HAS BEEN PLACED.

DRIVE PILES TO A MINIMUM PENETRATION OF AT LEAST 10 FEET INTO NATURAL GROUND OR CHANNEL BOTTOM.

DRIVE ALL PILES TO 'REFUSAL' BELOW MINIMUM PENETRATION.

PREDRILLING OR SPUDGING MAY BE REQUIRED TO ACHIEVE THE MINIMUM PILE PENETRATION.

SUBMIT THE PROPOSED PILE DRIVING METHODS AND EQUIPMENT FOR ACCEPTANCE BY THE ENGINEER.



SECTION A-A



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET 1 OF 2

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT

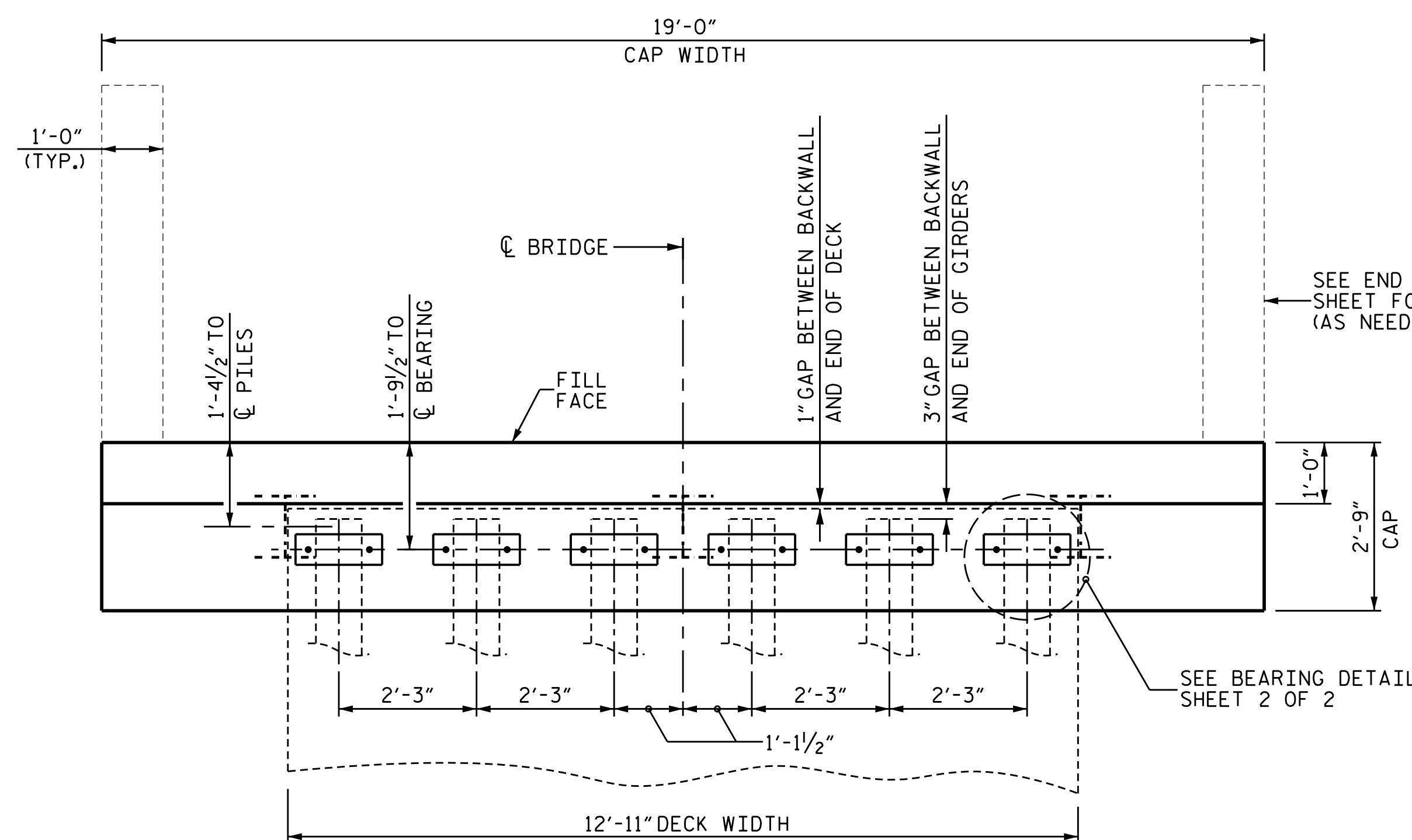
**PRIVATE DRIVEWAY
BRIDGE STANDARDS**

SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK

**END BENT
DRIVEN PILES**

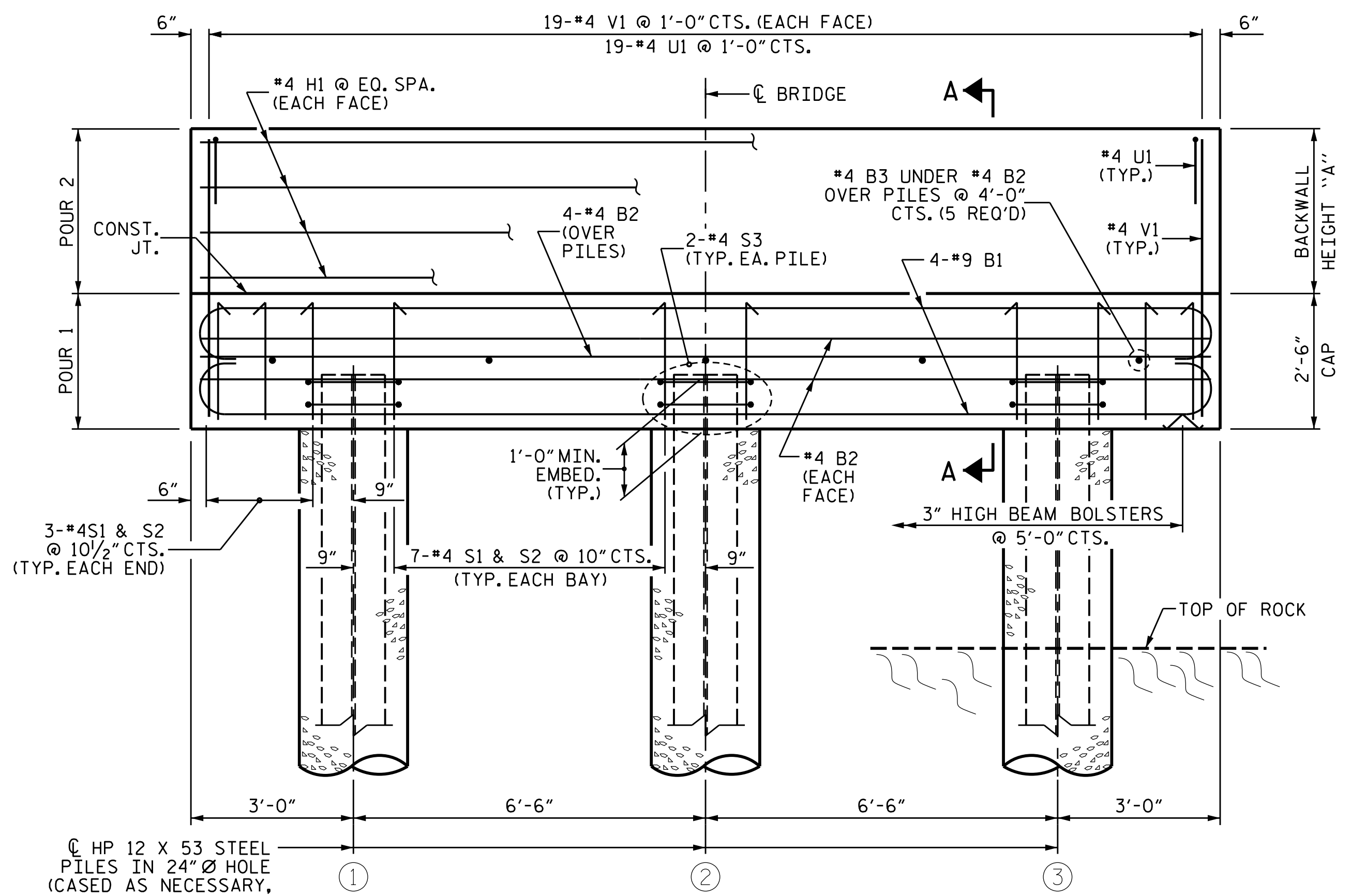
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 TIME: 12/9/2025



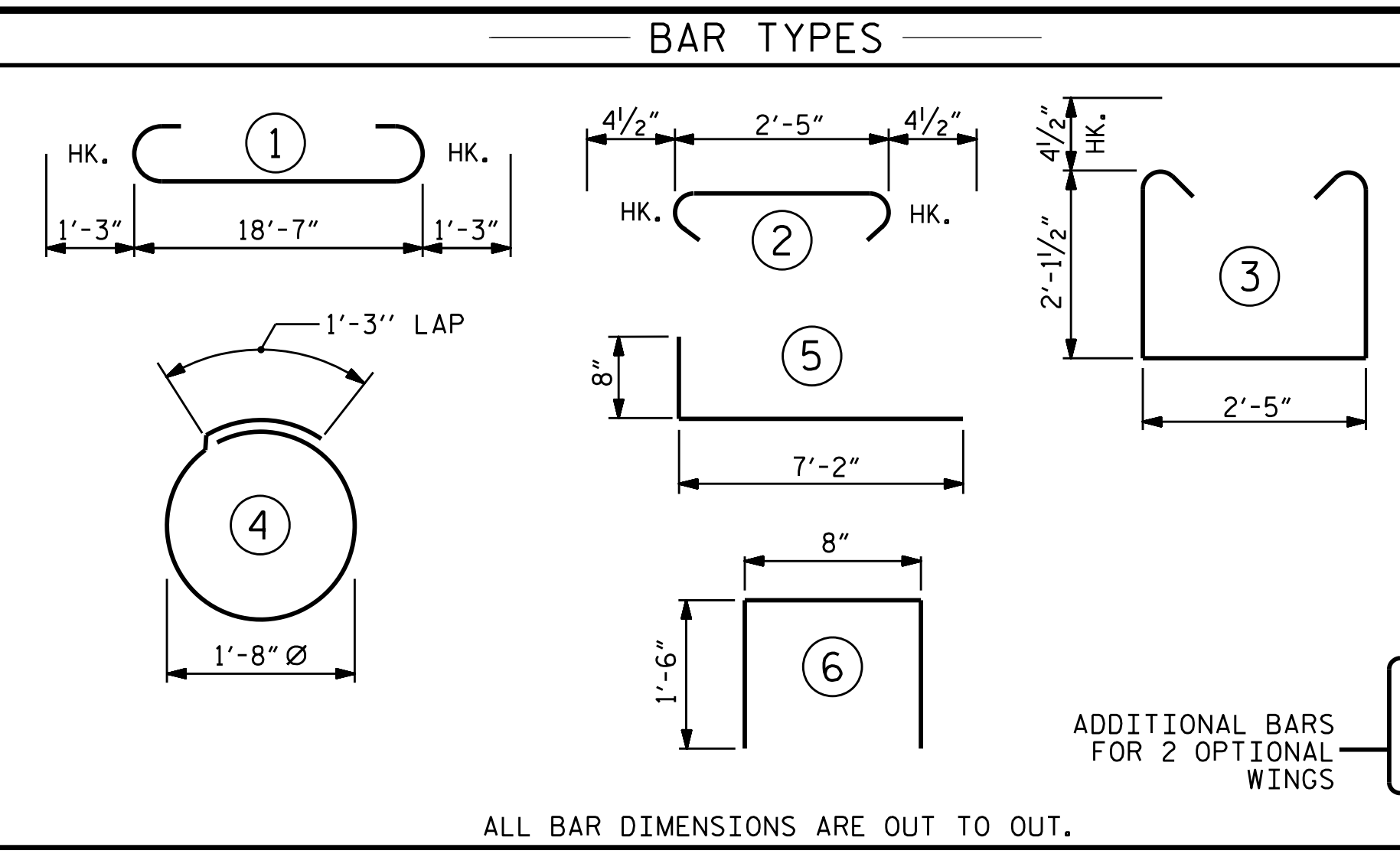
PLAN

BACKWALL DIM.		
SPAN	BEAM	A
20'-0"	W16X36	2'-2 5/8"
30'-0"	W21X48	2'-7 3/8"
40'-0"	W24X76	2'-10 5/8"
50'-0"	W24X104	2'-10 3/4"



ELEVATION

(OPTIONAL WINGS NOT SHOWN FOR CLARITY)



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8	#9	21'-1"	573	
B2	#8	#4 STR	18'-8"	100	
B3	5	#4 STR	2'-5"	8	
H1	8	#4 STR	18'-8"	100	
U1	19	#4	3'-8"	47	
S1	20	#4	7'-5"	99	
S2	20	#4	3'-2"	42	
S3	6	#4	6'-6"	26	
V1	38	#4 STR	4'-5"	112	
H2	28	#4	7'-10"	147	
V2	56	#4 STR	3'-6"	131	
			W/O WINGS	WITH WINGS	
REINFORCING STEEL (FOR ONE END BENT) (LBS.)			1,107	1,385	
CLASS A CONCRETE (FOR ONE END BENT) (C.Y.)					
POUR 1			4.8	6.0	
POUR 2 *			1.7	2.8	
TOTAL			6.5	8.8	

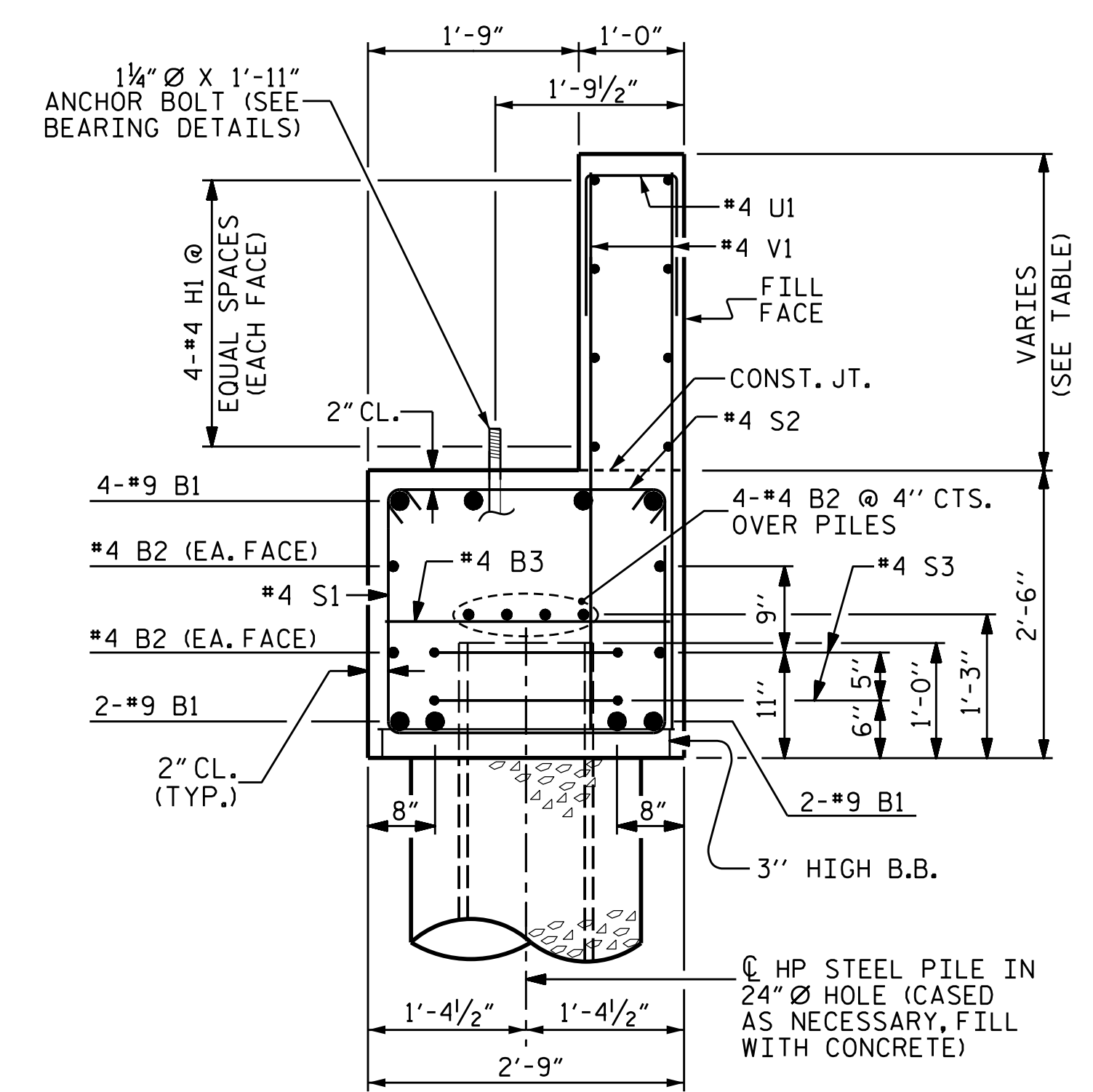
* BASED ON SHORTEST BACKWALL HEIGHT. UP TO 0.5 C.Y. EXTRA REQ'D FOR THE TALLER BACKWALLS

GENERAL NOTES

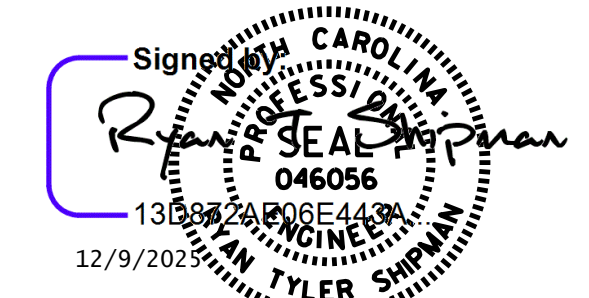
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- CONTRACTOR SHALL SLOPE TOP OF CAP TO MATCH LONGITUDINAL GRADE OF THE BRIDGE. SLOPES SHALL MATCH ON BOTH END BENT 1 AND END BENT 2 CAPS.
- WINGS MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER OR DESIGNEE.
- FOR OPTIONAL WINGS FOR END BENT, SEE SHEET 2 OF 2.
- FOR BEARING DETAILS, SEE SHEET 2 OF 2.
- FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.
- THE LENGTH OF THE "V" BARS ARE BASED ON THE SHORTEST BACKWALL CONFIGURATION. THESE BARS WILL HAVE EXTRA CLEARANCE AT THE BOTTOM OF THE CAP WHEN USING TALLER BACKWALLS.

**FOUNDATION NOTES
DRILLED-IN PILES**

- ROCK QUALITY DESIGNATION (ROD) GEOLOGICAL STRENGTH INDEX (GSI)
- INSTALL DRILLED-IN PILES IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.
- MINIMUM PILE PENETRATION OF 10-FT INTO NATURAL GROUND OR CHANNEL BOTTOM IS REQUIRED.
- MINIMUM ROCK SOCKET DEPTHS, UNLESS OTHERWISE INDICATED ON PROJECT SPECIFIC DATA SHEET:
 - 4' MINIMUM (ROD >70, GSI >50)
 - 6' MINIMUM (ROD 30-70, GSI 30-50)
 - 8' MINIMUM (ROD <30, GSI <30)
- REFER TO BORING LOGS FOR ROD AND GSI DATA.
- PILES SHALL BE SEATED IN THE BOTTOM OF THE EXCAVATION. PILE DRIVING IS NOT REQUIRED.
- BACKFILL WITH CONCRETE ONLY. DO NOT PROCEED WITH CONSTRUCTION ACTIVITIES UNTIL THE 28 DAY STRENGTH IS ACHIEVED.



SECTION A-A



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SHEET 1 OF 2

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EMERGENCY MANAGEMENT

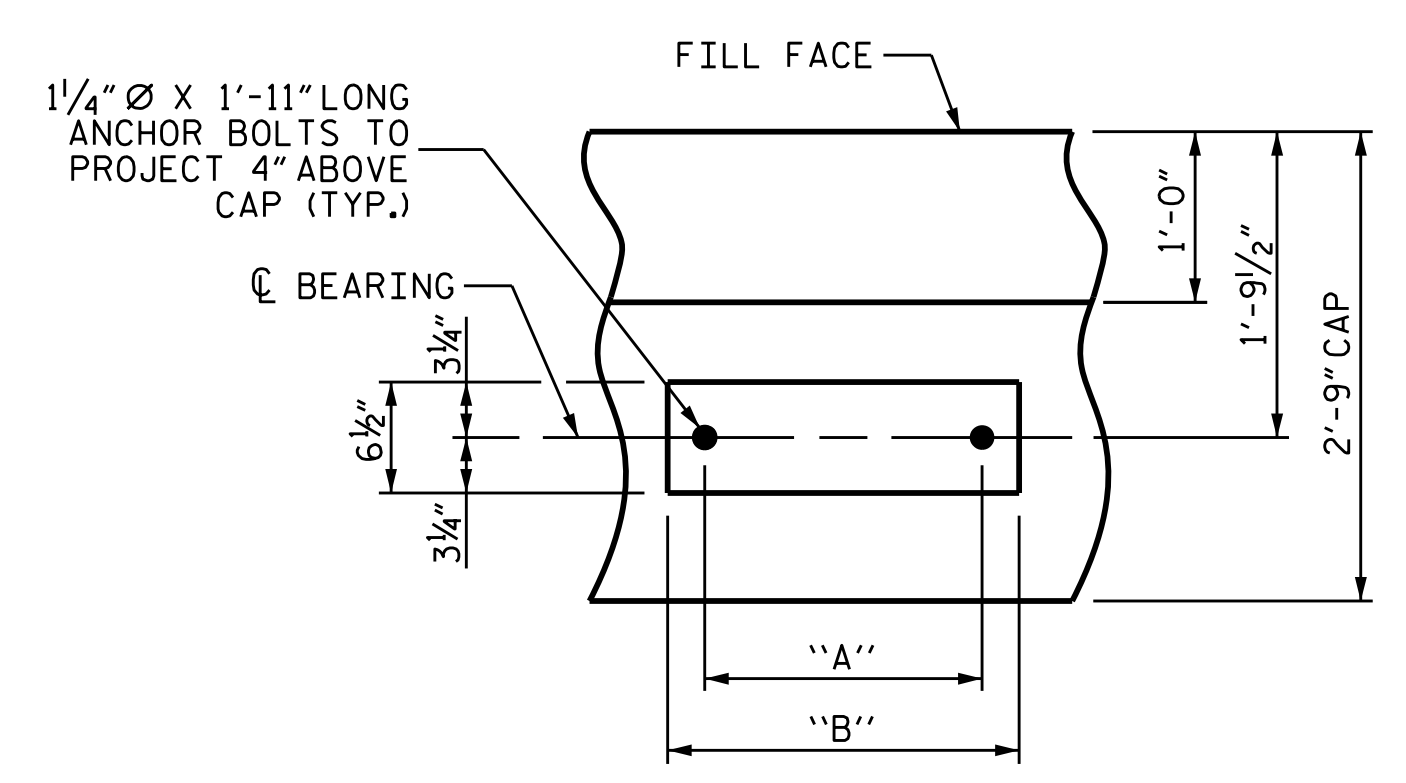
**PRIVATE DRIVEWAY
BRIDGE STANDARDS**

SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK

**END BENT
DRILLED-IN PILES**

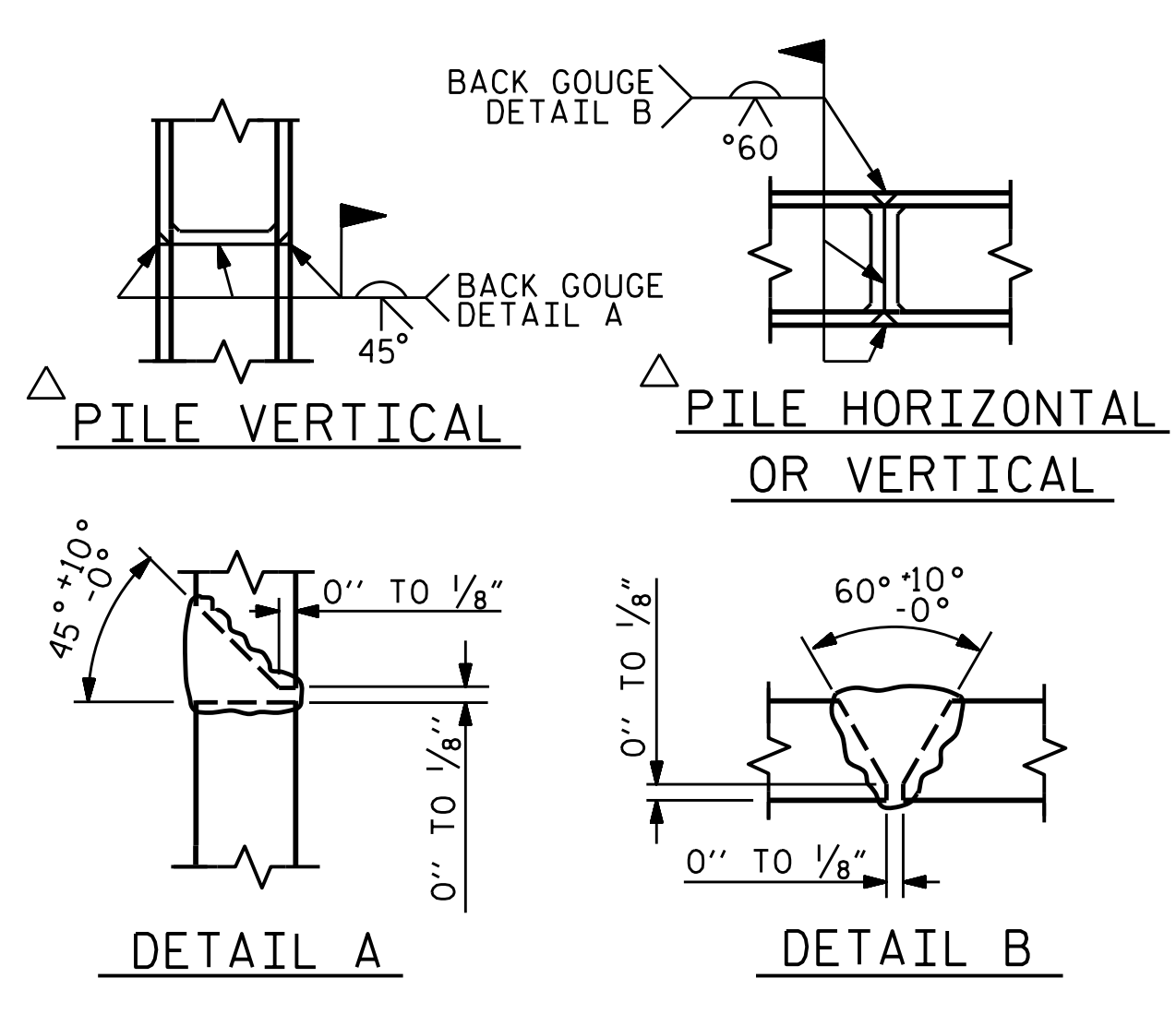
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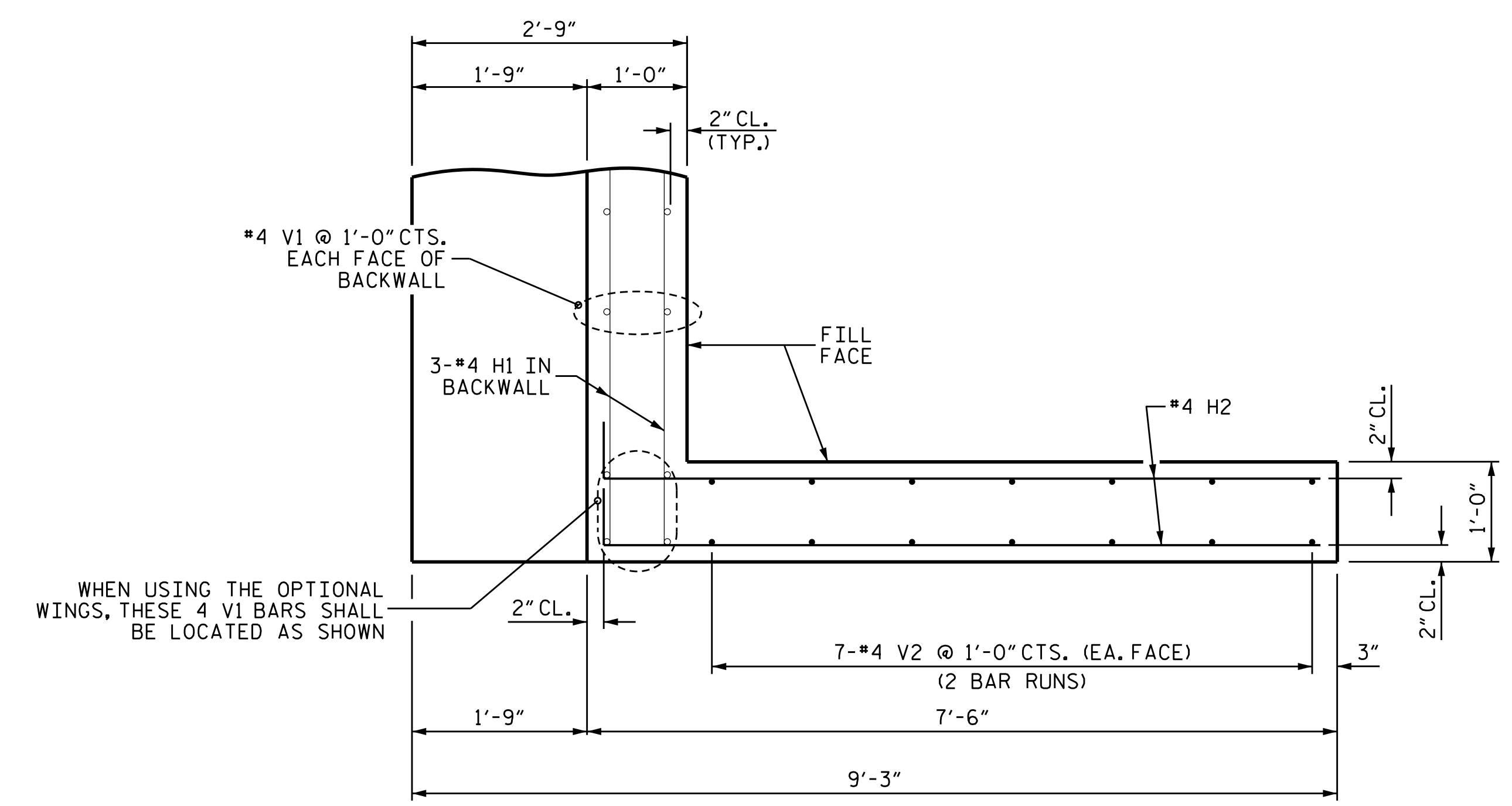


BEARING DETAIL
(TYP. EACH BEARING LOCATION)

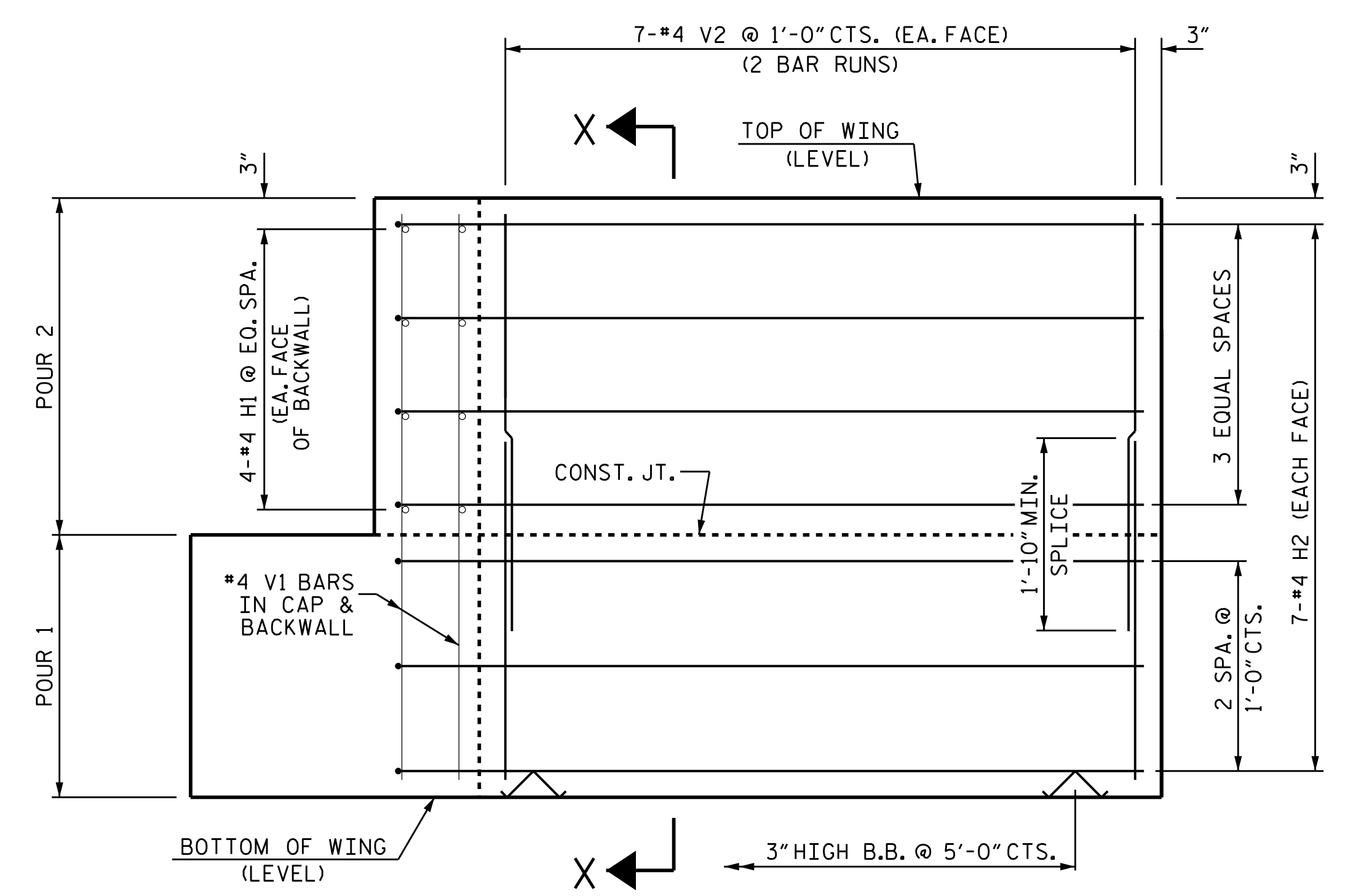
BEARING TABLE					
SPAN	BEAM	FLANGE WIDTH	TYPE	A	B
20'-0"	W16X36	6.99"	I	10"	1'-2"
30'-0"	W21X48	8.14"	II	1'-0"	1'-4"
40'-0"	W24X76	9.0"	II	1'-0"	1'-4"
50'-0"	W24X104	12.75"	III	1'-4"	1'-8"



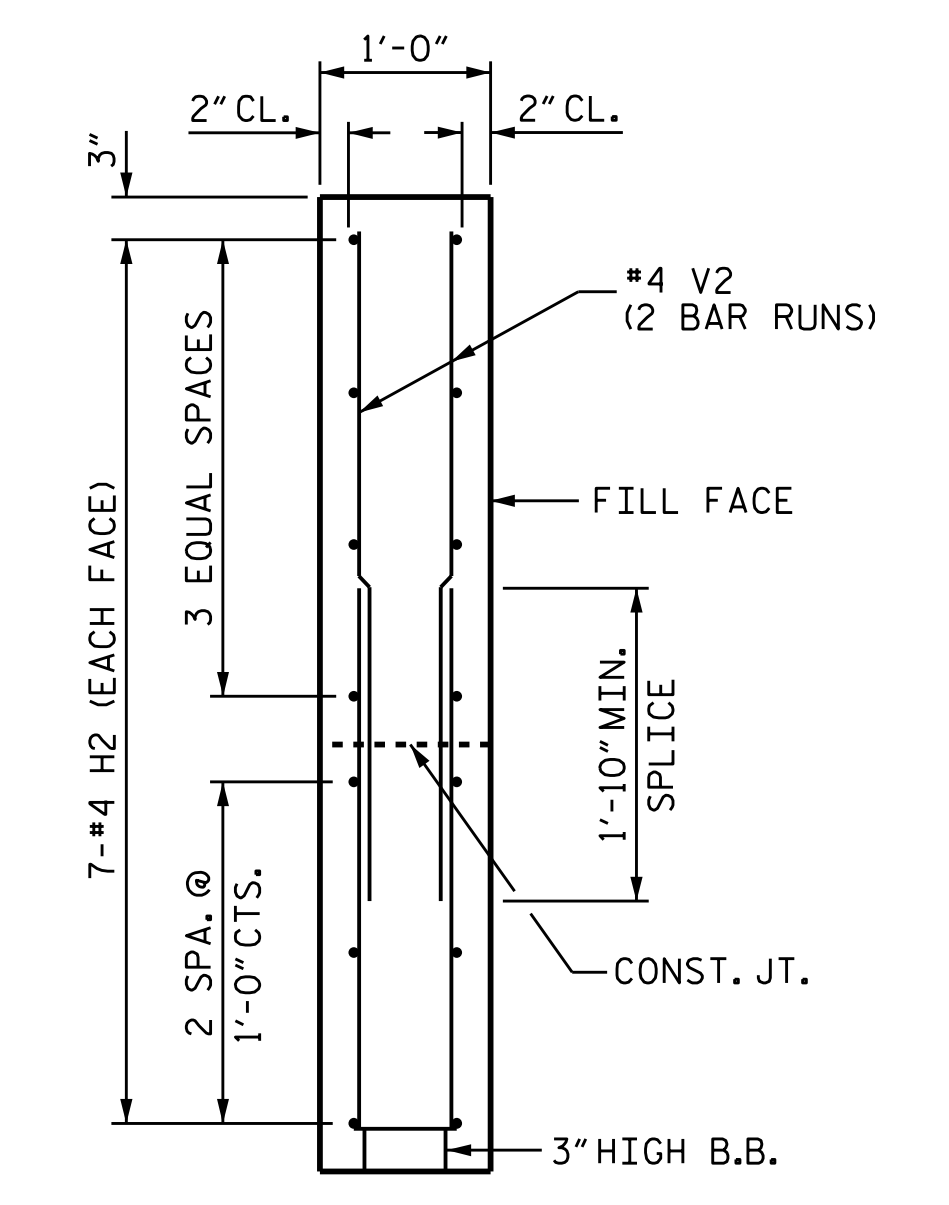
PILE SPLICE DETAILS
△ POSITION OF PILE DURING WELDING.



ELEVATION OF WING
(OPTIONAL)

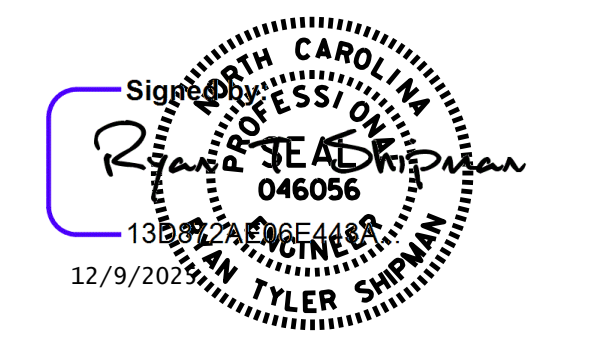


PLAN OF WING
(OPTIONAL)



SECTION X-X
(OPTIONAL)

RIGHT SIDE WING SHOWN, LEFT SIDE WING SIMILAR.
WING HEIGHT DEPENDENT ON BACKWALL HEIGHT.



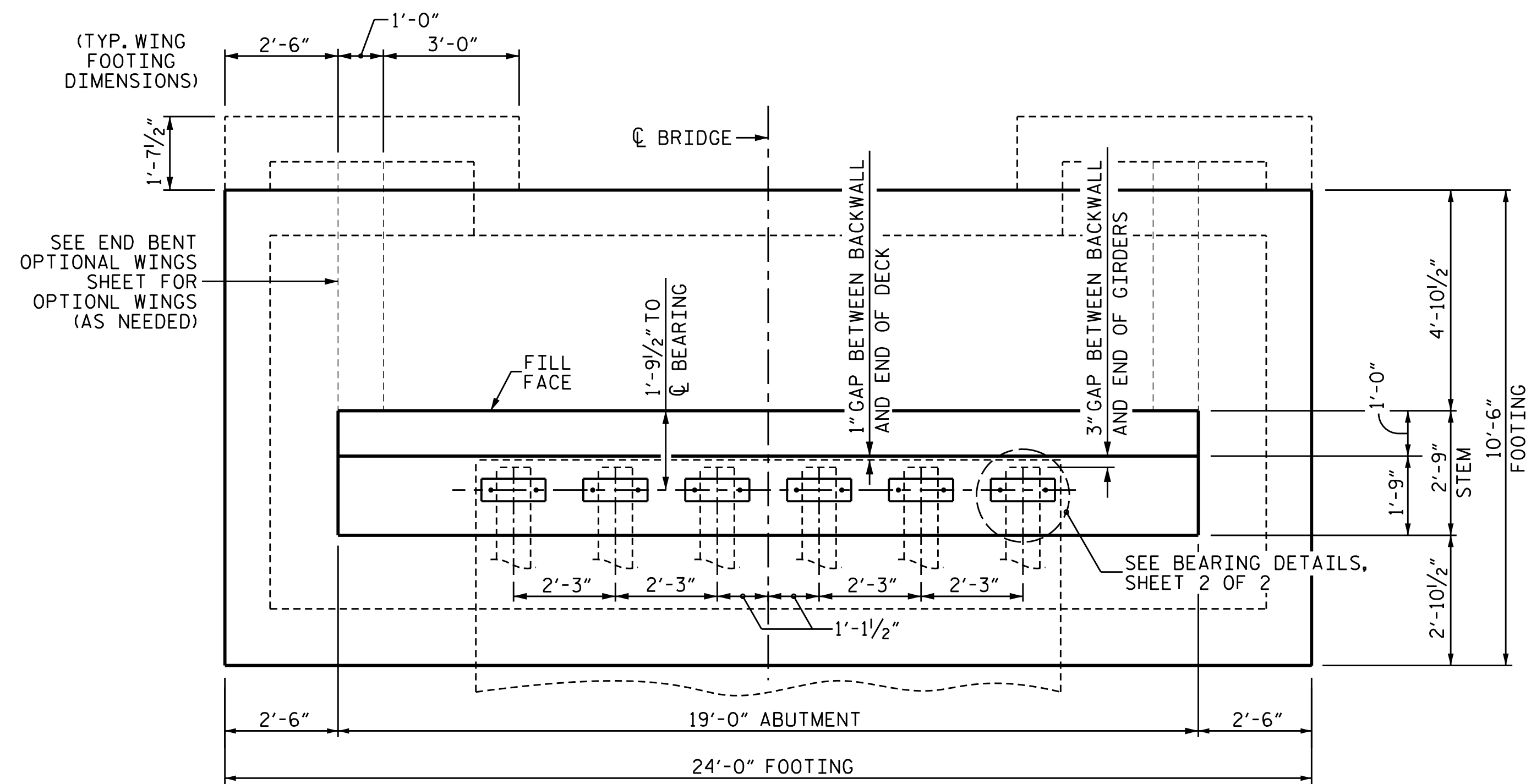
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SHEET 2 OF 2

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
OPTIONAL WINGS FOR DRIVEN OR DRILLED-IN PILES

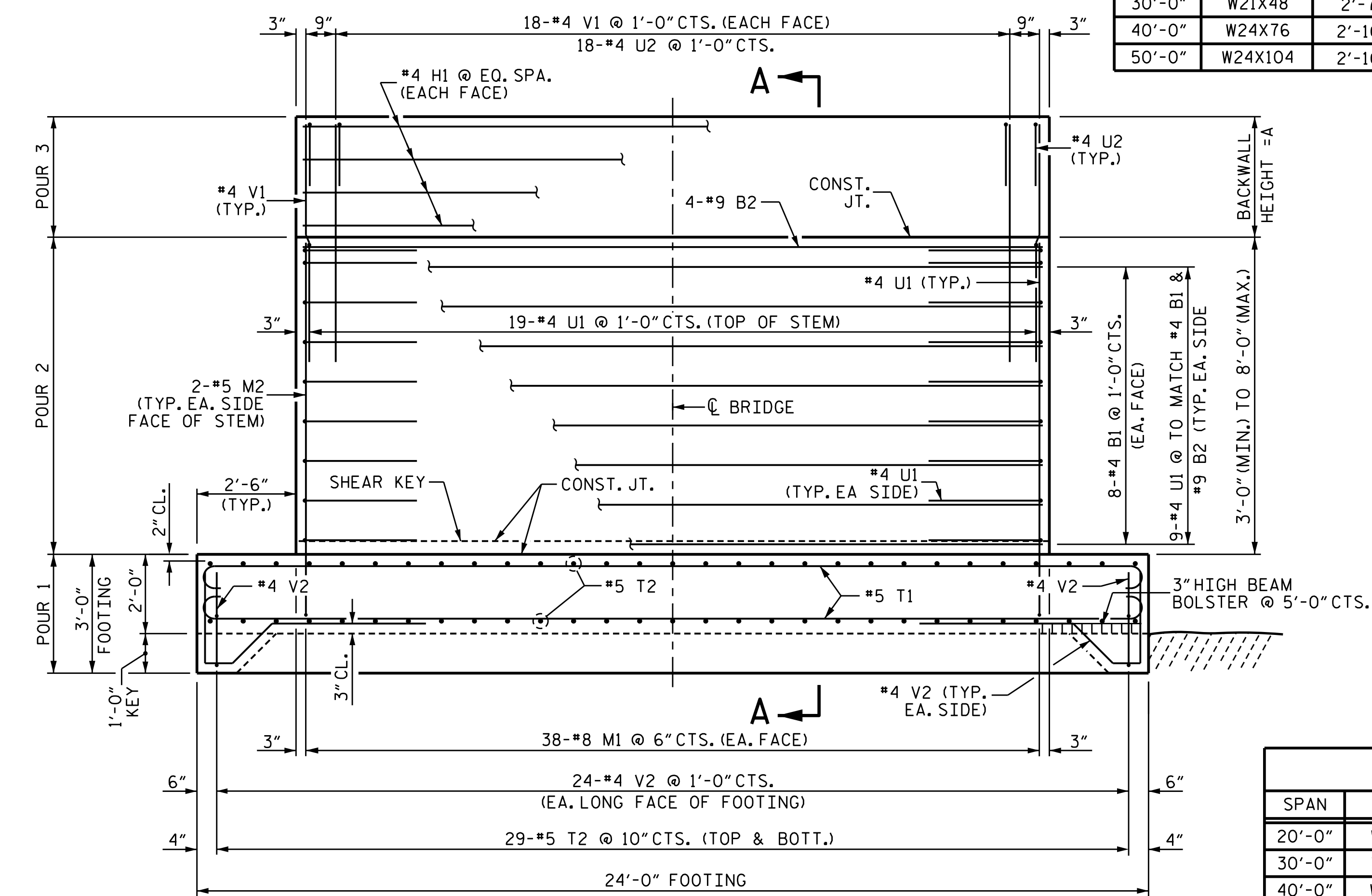
Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097	DWN. BY: WDC CHKD. BY: RTS DES. EGR. OF RECORD: PCW	DATE: 12/2025 DATE: 12/2025 DATE: 12/2025	NO. 1 BY: WDC DATE: 12/19/2025	NO. 3 BY: RTS DATE: 12/19/2025	NO. 4 BY: PCW DATE: 12/19/2025	SHEET NO. S-09 TOTAL SHEETS 12
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 TIME: 12:19:2025



PLAN

BACKWALL DIM.		
SPAN	BEAM	A
20'-0"	W16X36	2'-2 5/8"
30'-0"	W21X48	2'-7 3/8"
40'-0"	W24X76	2'-10 5/8"
50'-0"	W24X104	2'-10 3/8"

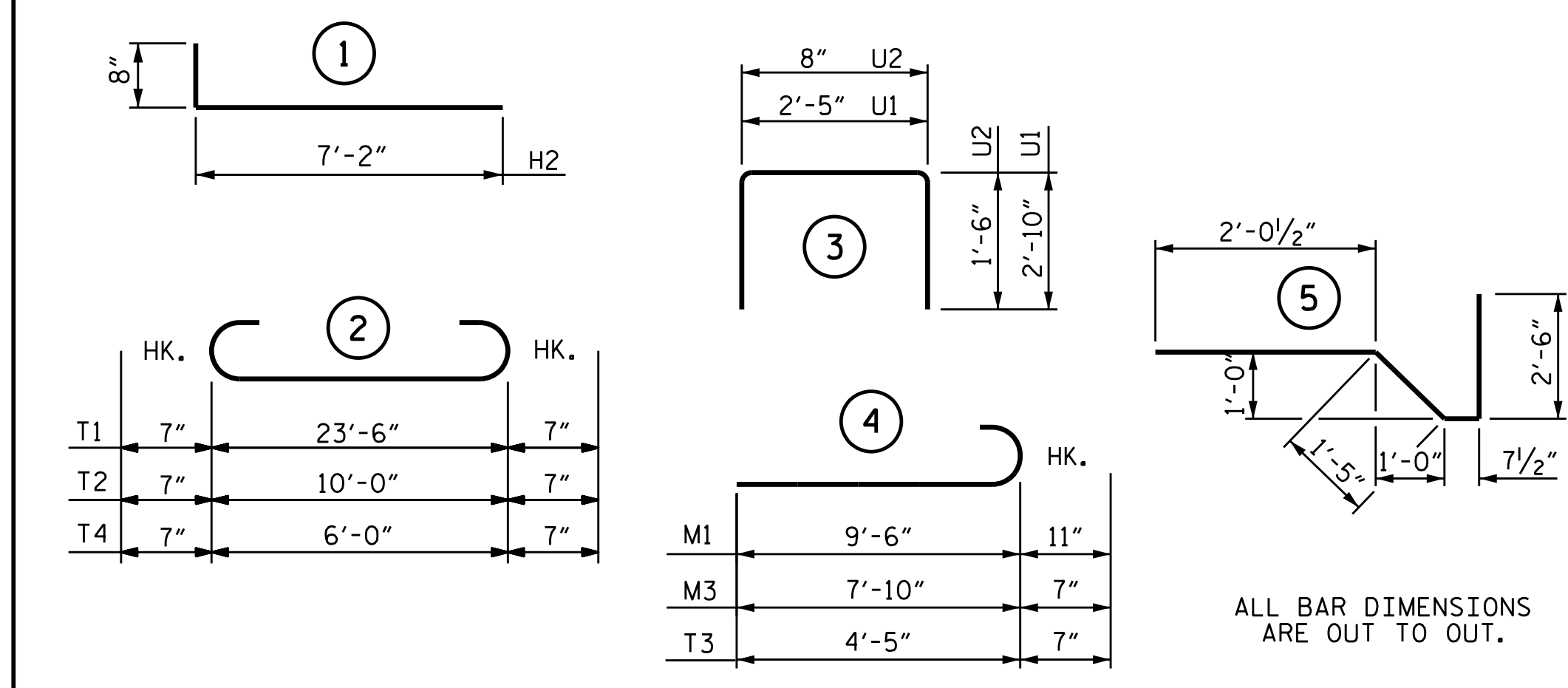


ELEVATION

(OPTIONAL WINGS NOT SHOWN FOR CLARITY)

BEARING TABLE						
SPAN	BEAM	FLANGE WIDTH	TYPE	A	B	
20'-0"	W16X36	6.99"	I	10"	1'-2"	
30'-0"	W21X48	8.14"	II	1'-0"	1'-4"	
40'-0"	W24X76	9.0"	II	1'-0"	1'-4"	
50'-0"	W24X104	12.75"	III	1'-4"	1'-8"	

BAR TYPES



**** BILL OF MATERIAL FOR ONE END BENT**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#4	STR	18'-8"	200
B2	4	#9	STR	18'-8"	254
M1	76	#8	④	10'-5"	2,114
M2	4	#5	STR	7'-6"	31
T1	26	#5	②	24'-8"	669
T2	58	#5	②	7'-6"	31
H1	8	#4	STR	18'-8"	100
U1	37	#4	③	8'-1"	200
U2	20	#4	③	3'-8"	49
V1	40	#4	STR	6'-0"	160
V2	70	#4	⑤	6'-7"	308
H2	52	#4	①	7'-10"	272
M3	40	#5	④	8'-5"	351
M4	40	#5	STR	7'-10"	327
T3	32	#5	④	5'-0"	167
T4	8	#5	②	7'-2"	60
V2	22	#4	⑤	6'-7"	97
REINFORCING STEEL (W/O WINGS)				4761 LBS.	
REINFORCING STEEL (WITH WINGS)				6035 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTING				22.5 C.Y.	
POUR #2 END BENT STEM				15.5 C.Y.	
POUR #3 BACKWALL				1.6 C.Y.	
WINGWALLS (OPTIONAL)				7.5 C.Y.	
TOTAL CLASS A CONCRETE (W/O WINGS)				39.6 C.Y.	
TOTAL CLASS A CONCRETE (WITH WINGS)				47.1 CY	

GENERAL NOTES

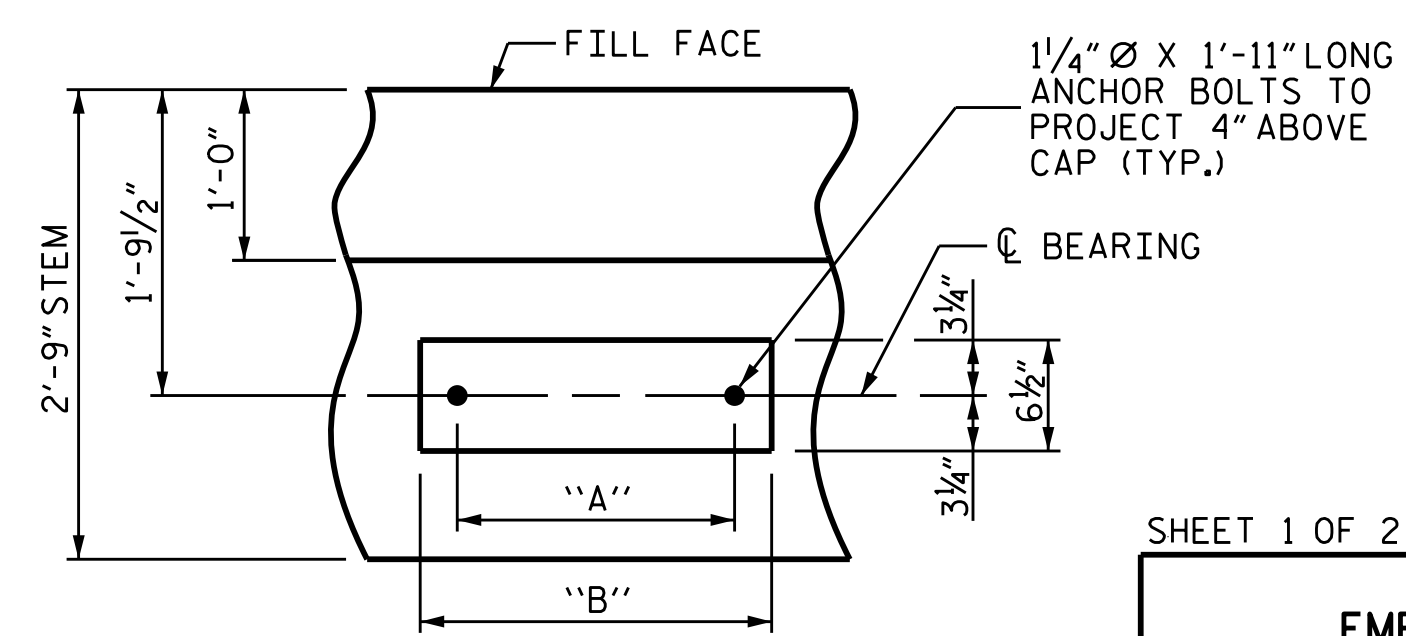
U1 BARS IN STEM MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 CONTRACTOR SHALL SLOPE TOP OF CAP TO MATCH LONGITUDINAL GRADE OF THE BRIDGE. SLOPES SHALL MATCH ON BOTH END BENT 1 AND END BENT 2 CAPS.
 WINGS MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER OR DESIGNEE.
 FOR OPTIONAL WINGS FOR END BENT, SEE SHEET 2 OF 2.
 FOR SECTION A-A, SEE SHEET 2 OF 2.

THE FINAL STEM WALL HEIGHT SHALL BE DETERMINED IN THE FIELD BASED ON EXISTING ROCK ELEVATIONS. THE STEM WALL HEIGHT SHALL NOT BE LESS THAN 3'-0" OR GREATER THAN 8'-0".
 STEM WALL REINFORCEMENT AND DETAILS ARE BASED ON A MAXIMUM STEM WALL HEIGHT OF 8'-0". THE CONTRACTOR SHALL ADJUST THE HORIZONTAL REINFORCEMENT LAYOUT TO ACCOMMODATE FIELD-VERIFIED STEM WALL HEIGHTS WHILE MAINTAINING REBAR SIZES, SPACING, LAP LENGTHS, AND THE OVERALL REINFORCING CONFIGURATION SHOWN IN THE STRUCTURAL PLANS AND DETAILS.

FOUNDATION NOTES

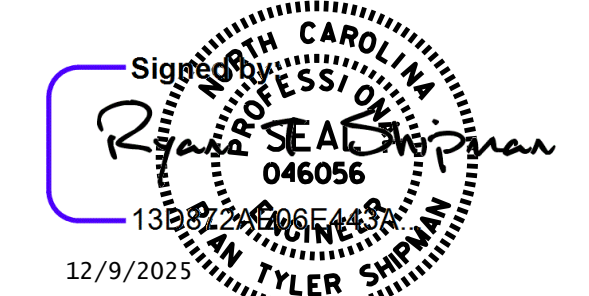
SPREAD FOOTING
 FOUNDATION EXCAVATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SECTION 410 OF THE SPECIFICATIONS.
 A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA SHALL OBSERVE THE BEARING SURFACE AND CONFIRM THE FOOTING IS CONSTRUCTED ON ROCK. THE ENGINEER SHALL PROVIDE A LETTER VERIFYING ACCEPTANCE OF THE BEARING SURFACE.
 CLEAN ALL ROCK OF LOOSE MATERIAL AND CUT TO A FIRM SURFACE, AS DIRECTED BY THE ENGINEER AND FILL WITH CONCRETE, MORTAR OR GROUT. LEAVE ROCK SURFACE IN A ROUGH CONDITION.
 BEARING SURFACE MUST RESIST A MAXIMUM APPLIED BEARING PRESSURE OF 3.0 TSF.
 KEY IN FOOTINGS AT LEAST 1 FT INTO ROCK.

** THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE QUANTITIES AND REINFORCING BARS SHOWN IN THE BILL OF MATERIAL ARE BASED ON AN 8'-0" MAXIMUM STEM WALL HEIGHT. THE CONTRACTOR IS RESPONSIBLE FOR THE FINAL QUANTITIES BASED ON THE ACTUAL STEM WALL HEIGHT.



BEARING DETAIL

(TYP. EACH BEARING LOCATION)

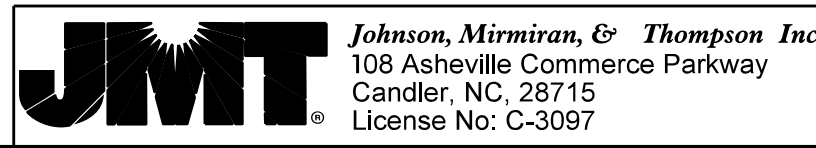


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SHEET 1 OF 2

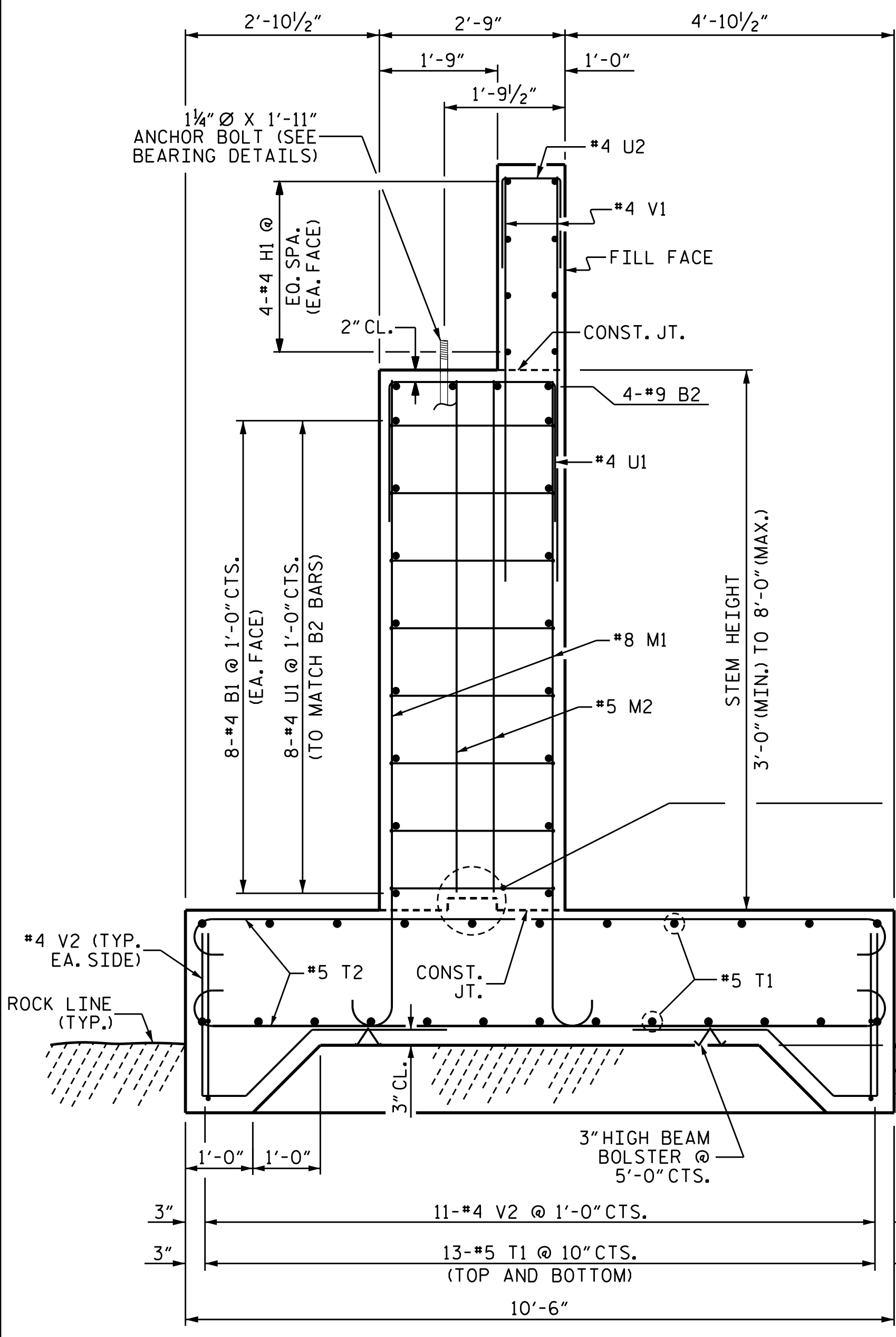
NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
END BENT
 SPREAD FOOTING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			12

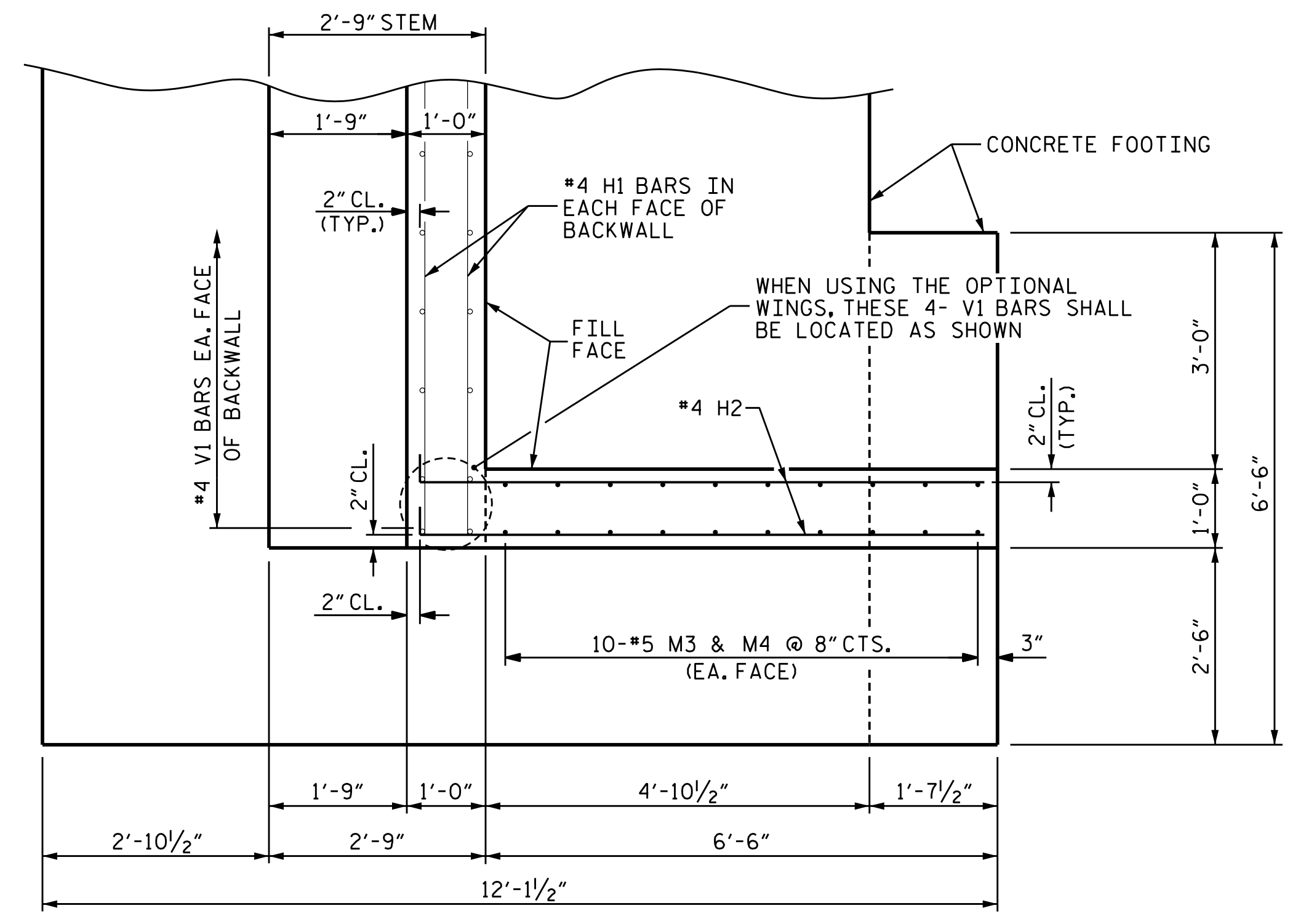


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 CHKD. BY: RTS
 DES. EGR. OF RECORD: PCW
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 DATE: 12/2025

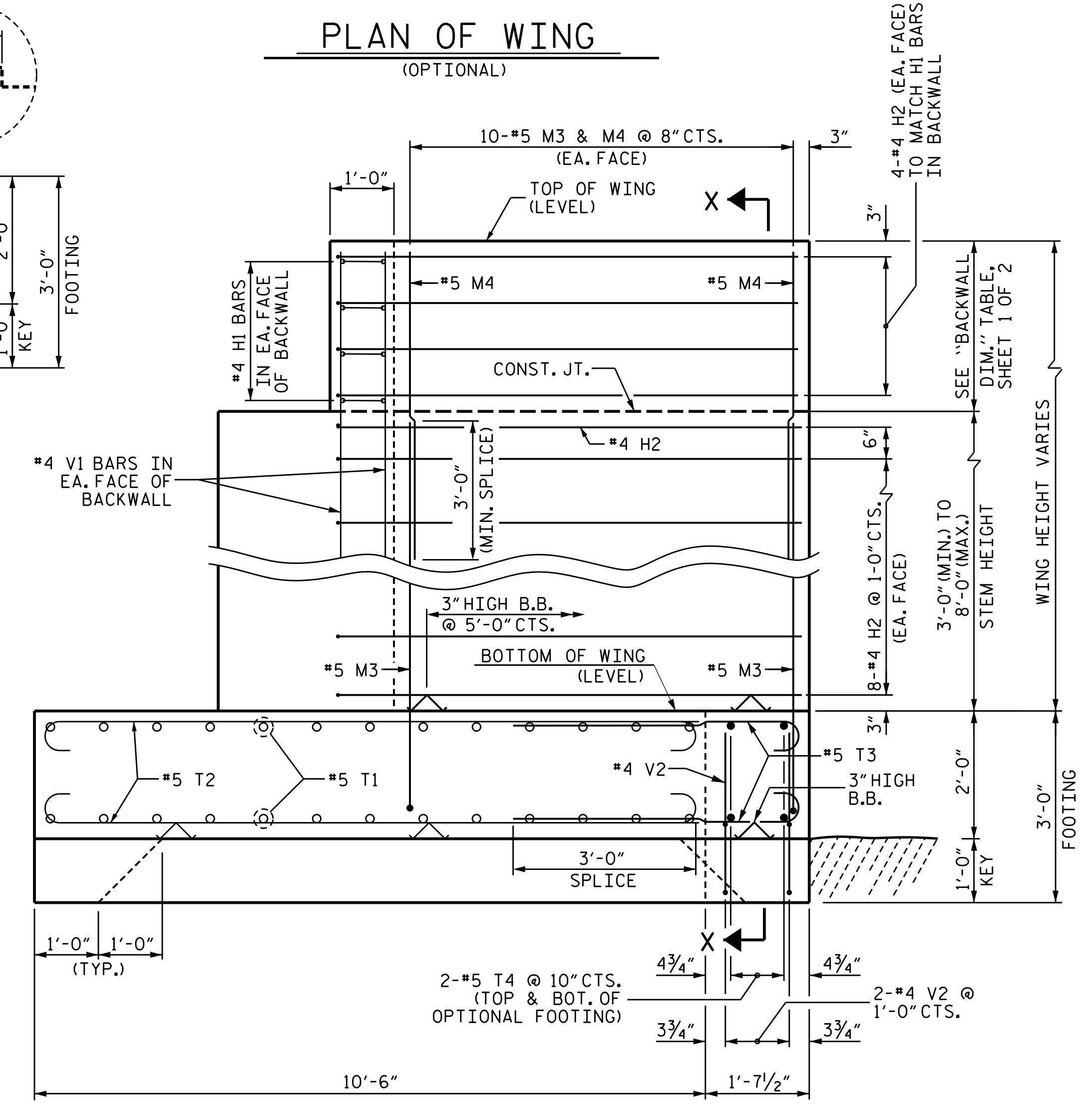
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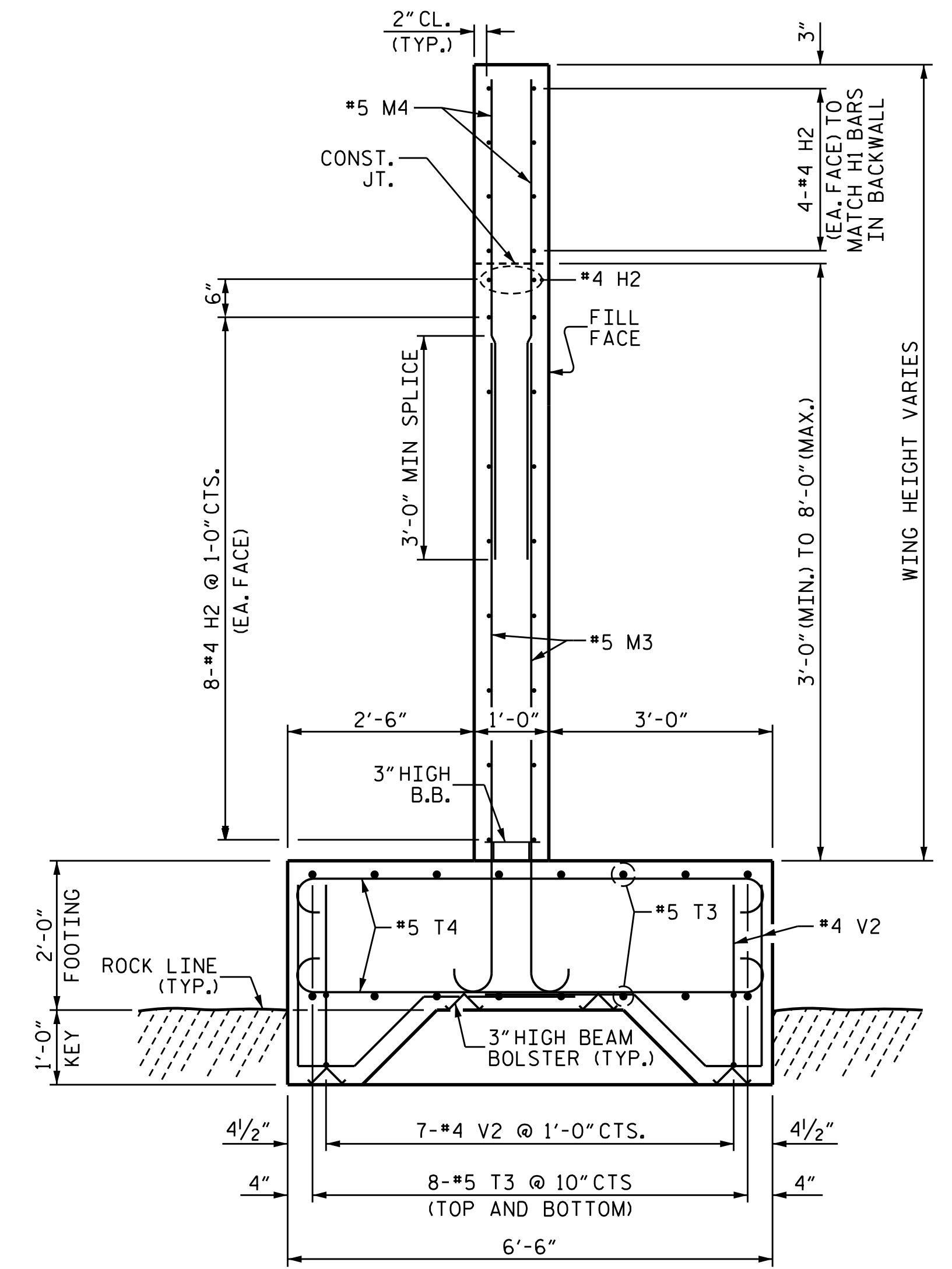
SECTION A-A



PLAN OF WING (OPTIONAL)



ELEVATION OF WING (OPTIONAL)



SECTION X-X (OPTIONAL)

Signed: *Ronald A. Seader*
 PROFESSIONAL ENGINEER
 046055
 1300 S. W. TAYLOR STREET
 RALEIGH, NC 27605
 12/9/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET 2 OF 2

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT

**PRIVATE DRIVEWAY
BRIDGE STANDARDS**

SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK

**END BENT
OPTIONAL WINGS & FOOTINGS**

JMT Johnson, Mirmiran, & Thompson Inc.
 108 Asheville Commerce Parkway
 Candler, NC, 28715
 License No: C-3097

DWN. BY: WDC
 CHKD. BY: RTS
 DES. EGR. OF RECORD: PCW

DATE: 12/2025
 DATE: 12/2025
 DATE: 12/2025

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			12

STRUCTURAL STEEL / HARDWARE NOTES:

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

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

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 SHANK WILL PENETRATE RECEIVING MEMBERS.

REPAIR ANY DAMAGED GALVANIZED SURFACES IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1076-7.

REPAIR ANY DAMAGED PAINTED SURFACES IN ACCORDANCE WITH SECTION 422 OF THE STANDARD SPECIFICATIONS

TIMBER / LUMBER NOTES:

ALL TIMBER AND LUMBER MEMBERS SHALL BE TREATED SOUTHERN PINE AND CONFORM TO SECTION 1082 OF THE STANDARD SPECIFICATIONS.

ALL TIMBER DIMENSIONS SHOWN ON THE PLANS ARE NOMINAL DIMENSIONS.

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

1

CORROSION PROTECTION:

~~IF END BENTS ARE IN NEAR PROXIMITY TO THE WATER, ALL STRUCTURAL STEEL SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.~~

~~IF END BENTS ARE NOT IN NEAR PROXIMITY TO THE WATER, ALL STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SYSTEM 1 OF THE STRUCTURAL STEEL COATINGS PROGRAM AND SECTION 442-8 OF THE NCDOT STANDARD SPECIFICATIONS.~~

DESIGN LOADS:

LIVE LOAD:

TRUCK LOAD:

THIS BRIDGE WAS DESIGNED FOR:

HS20
GVWR = 72,000 LBS
NUMBER OF AXLES: 3
AXLE WEIGHTS:
GAWR FRONT = 8,000 LBS
GAWR INTERMEDIATE = 32,000 LBS
GAWR REAR = 32,000 LBS

EV2

GVWR = 57,500 LBS

NUMBER OF AXLES: 2

AXLE WEIGHTS:

GAWR FRONT = 24,000 LBS
GAWR REAR = 33,500 LBS

EV3

GVWR = 86,000 LBS

NUMBER OF AXLES: 3

AXLE WEIGHTS:

GAWR FRONT = 24,000 LBS
GAWR INTERMEDIATE = 31,000 LBS
GAWR REAR = 31,000 LBS

LIVE LOAD FACTORS:

HS-20 = 1.75

EV2 = 1.3

EV3 = 1.3

LIVE LOAD FACTORS LOAD RATING:

HS-20 = 1.35

EV2 = 1.0

EV3 = 1.0

MULTIPLE PRESENCE FACTOR:

MPF = 1.0

LANE LOAD:

NO LANE LOAD WAS APPLIED.

IMPACT:

DYNAMIC IMPACT FOR WOOD/TIMBER COMPONENTS IS ZERO. DYNAMIC IMPACT FACTOR FOR ALL OTHER COMPONENTS IS 33%.

DEAD LOADS:

WEARING SURFACES SHALL NOT BE ALLOWED.

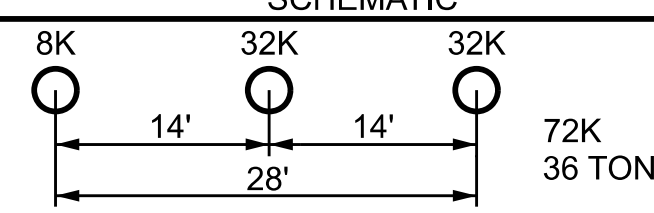
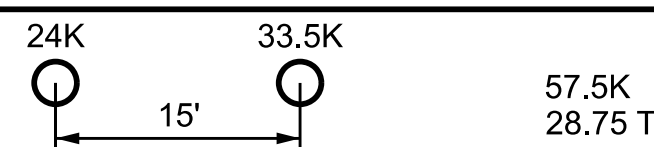
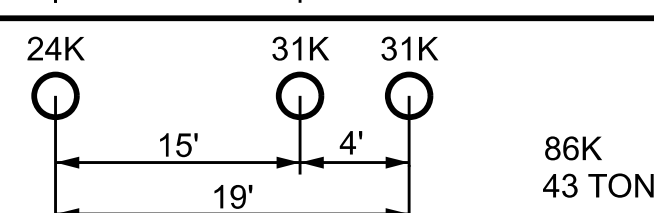
WEIGHT OF TIMBER = 40 PCF.

DESIGN ASSUMPTIONS/PARAMETERS:

SUPERSTRUCTURE WILL BE SIX LINES OF I-BEAMS.

BRIDGE IS SINGLE SPAN.

BRIDGE WIDTH = 12'-11" OUT TO OUT.

REF.#	DESIGN VEHICLES	
	SCHEMATIC	
HS-20		72K 36 TON
EV2		57.5K 28.75 TON
EV3		86K 43 TONS

GENERAL NOTES:

THIS BRIDGE IS DESIGNED IN ACCORDANCE WITH THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) "STRUCTURES MANAGEMENT UNIT MANUAL", DATED 6/15/23, AND THE AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 9th EDITION.

THESE DRAWINGS ARE INTENDED ONLY FOR USAGE IN THE INSTALLATION OF SINGLE SPAN I-BEAM BRIDGES FOR PRIVATE DRIVEWAYS IN COUNTIES AS LISTED IN THE CONTRACT DOCUMENTS BY NORTH CAROLINA OFFICE OF EMERGENCY MANAGEMENT IN RESPONSE TO THE DAMAGE CAUSED BY HURRICANE HELENE.

BRIDGE CONSTRUCTION, WORKMANSHIP, AND MATERIALS SHALL BE IN ACCORDANCE WITH THE NCDOT "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", 2024 EDITION.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

IT IS ASSUMED THAT THERE ARE NO UTILITY CONFLICTS. THE CONTRACTOR SHALL INVESTIGATE THE PRESENCE OF UTILITIES BEFORE COMMENCING WORK.

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, SEE SPECIAL PROVISIONS.

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

CONTRACTOR SHALL SET BRIDGE ELEVATIONS SUCH THAT WATER WILL DRAIN AND NOT POND ON THE BRIDGE DECK AND MINIMUM LONGITUDINAL GRADE SHALL BE 0.5% AND MAXIMUM GRADE SHALL BE 6%.

WORK ON END BENTS SHALL NOT BE STARTED UNTIL APPROACH ROCK EMBANKMENT AND CORE MATERIAL IN THE AREA OF END BENT PILES HAVE BEEN PLACED.

THIS BRIDGE HAS BEEN DESIGNED FOR ADTT < 100.

MATERIAL PROPERTIES:

CONCRETE: MINIMUM COMPRESSIVE STRENGTH, $f_c = 3,000$ psi (CLASS A)

STRUCTURAL STEEL: AASHTO M270, GRADE 50.

WELDS: SMAW, 70 KSI ELECTRODES PER NCDOT STANDARD SPECIFICATIONS.

ANCHOR BOLTS: ASTM F1554, GRADE 55.

BOLTS/NUTS/WASHER: ALL BOLTS/NUTS/WASHER SHALL BE ASTM F3125, GRADE A325 AND SHALL BE GALVANIZED.

TIMBER: ALL TIMBER & DIMENSIONAL LUMBER SHALL BE NO. 2 VISUALLY GRADED, MIXED SOUTHERN PINE WITH REFERENCE DESIGN VALUES OF: $F_{bo} = .925$ ksi AND $F_{vo} = 0.175$ ksi OR GREATER.

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS WITH A SHEAR MODULUS OF 0.110 KSI.

Signature: Ryan Seal
Professional Engineer
046056
13507 ZWINGERS
TYLER SHIRMAN
1/28/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA OFFICE OF EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK
GENERAL NOTES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1	RTS	1-28-26	3			TOTAL SHEETS 12
2			4			

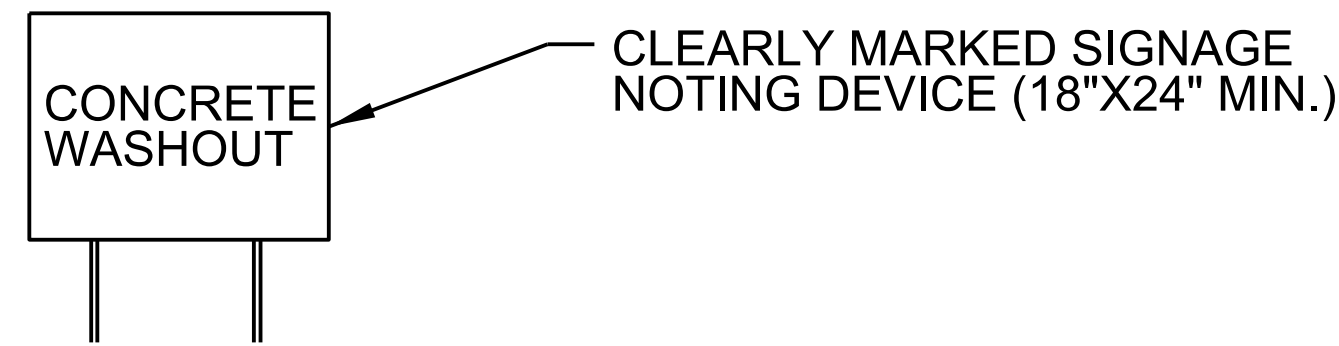
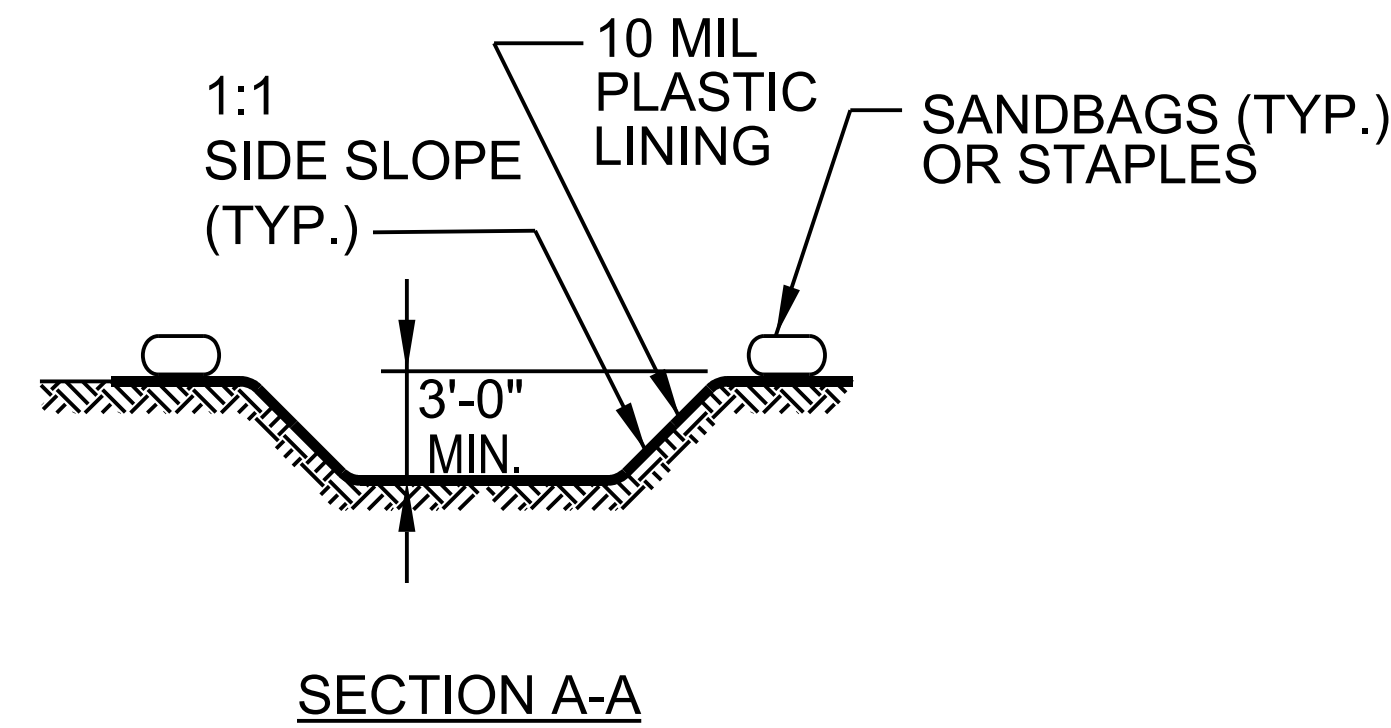
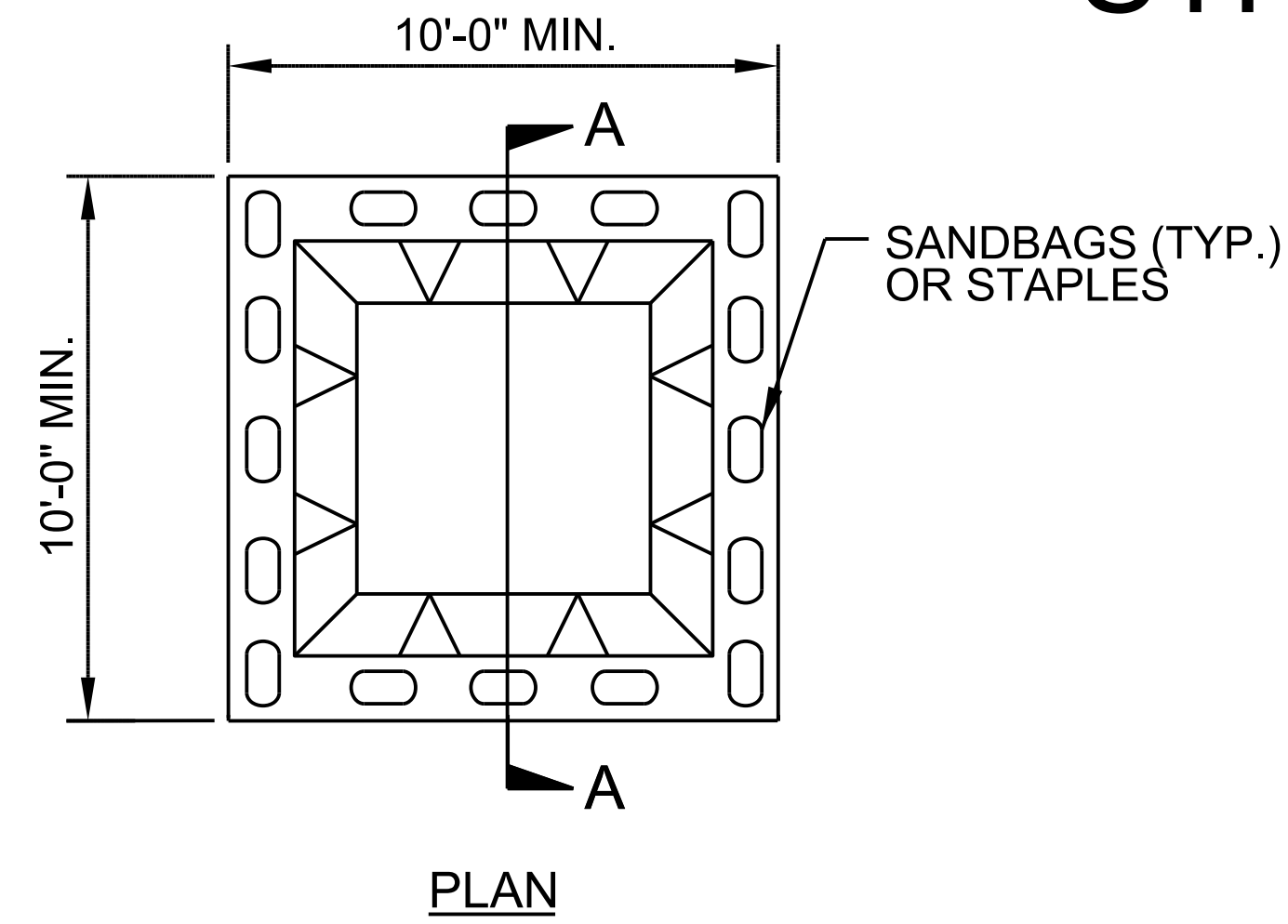
JMT Johnson, Mirmiran, & Thompson Inc.
108 Asheville Commerce Parkway
Candler, NC, 28715
License No: C-3097

DWN. BY: WDC DATE: 12/2025
CHKD. BY: RTS DATE: 12/2025
DES. EGR. OF RECORD: PCW DATE: 12/2025

\\pcw\pwworking\jmt-jw-01\Documents\Projects\2025\25-00629\25-00629-001\Design\Structures\AC FRB-Steel Beam with Timber Deck Standards\Single Lane Steel Beam with Timber Deck Plans\2 Standard Drawings\I-Beam Bridge Plans_20-50\012-512_General Notes.dgn
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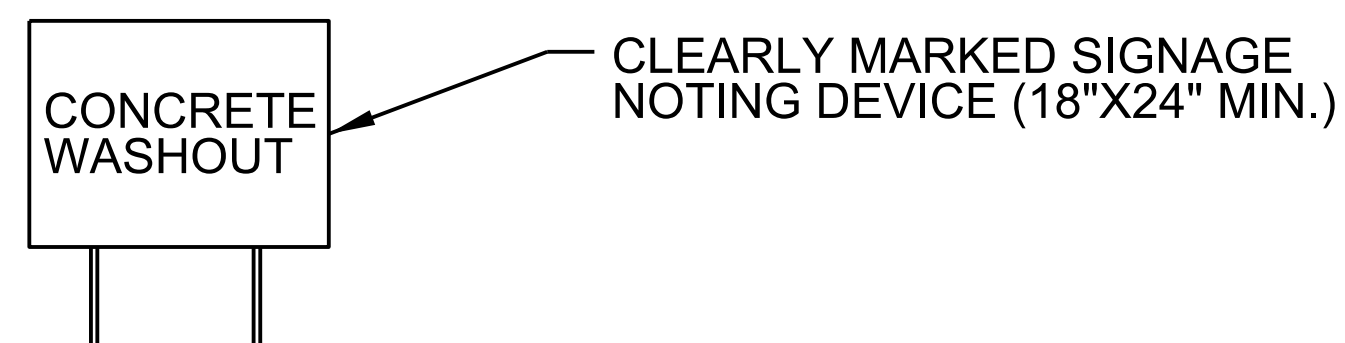
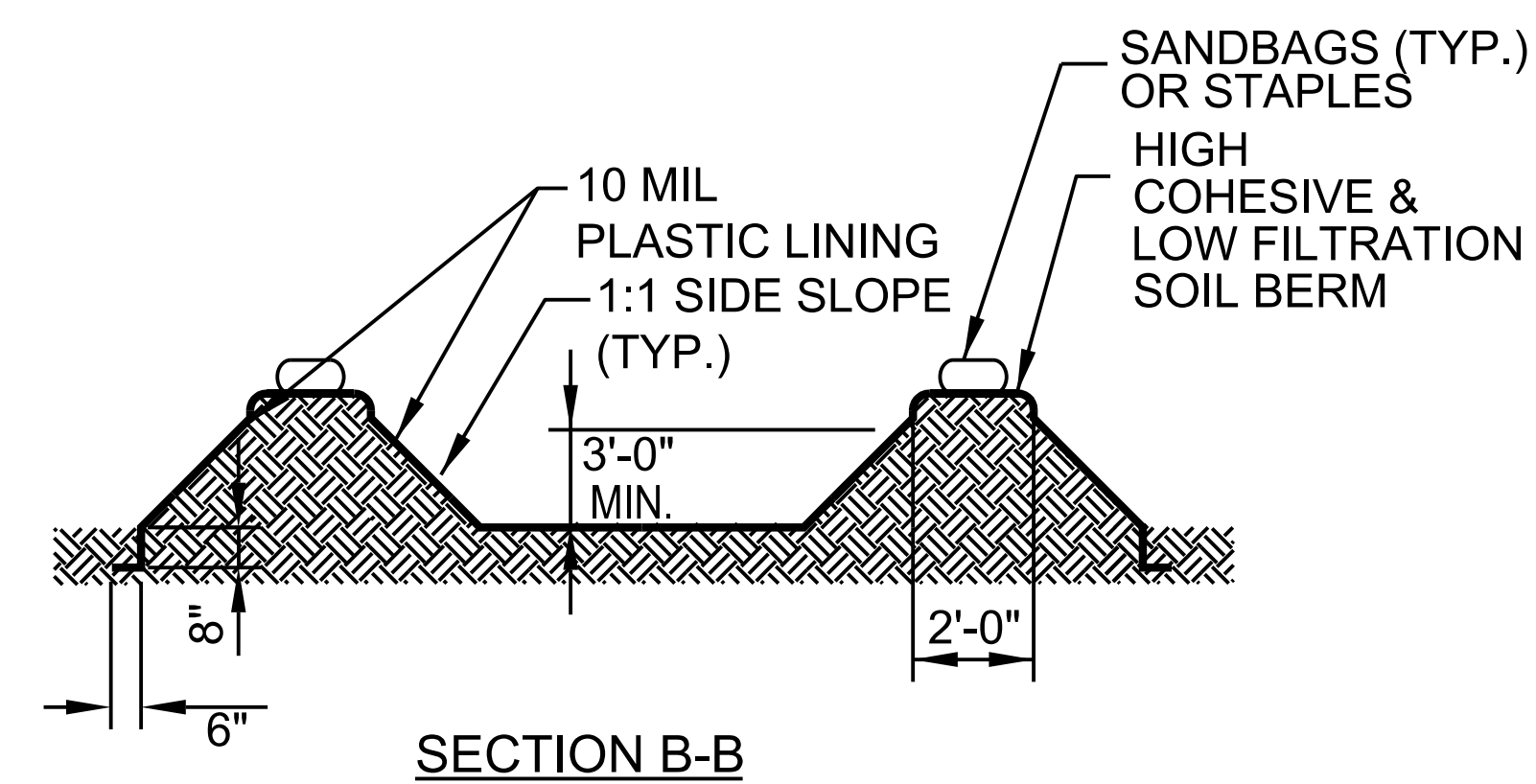
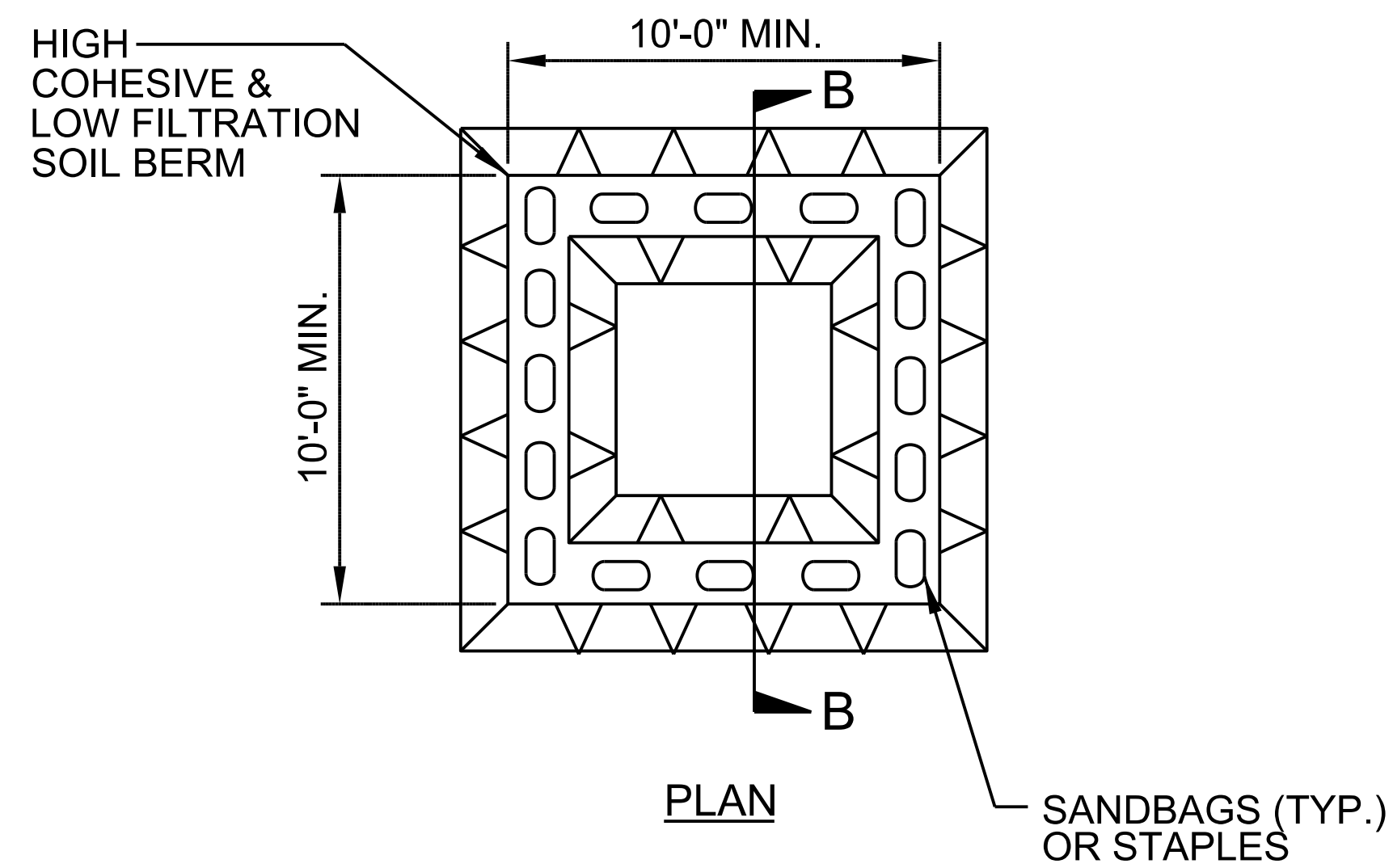
PROJECT REFERENCE NO. <i>PRB</i>	SHEET NO. <i>EC-2</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
<i>PRB</i>	<i>EC-2</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION TIMEFRAMES

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