

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

Site Number: 095-01-90803

Site Address: 138 Hill Road, Zionville, NC 28698

GPS Coordinates: 36.3303, -81.7546

County: Watauga

Bridge Type: Steel I-beam with timber decking

Span Length: 30 feet

Bridge Width: 12'-0" Clear Width

Substructure Type: Concrete Cap on Drilled-in 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.



SITE ID: 095-01-90803

SITE ADDRESS: 138 HILL ROAD
ZIONVILLE, NC 28698

**GEOTECHNICAL BORING REPORT
BORE LOG**

**GEOTECHNICAL BORING REPORT
CORE LOG**

WBS N/A		TIP 095-01-90803		COUNTY WATAUGA		GEOLOGIST A. Smith	
SITE DESCRIPTION GROW NC/NCEM - 138 HILL ROAD, ZIONVILLE, NC 28698							GROUND WTR (ft)
BORING NO. EB1		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. 0.0 ft		TOTAL DEPTH 18.5 ft		NORTHING 950,401		EASTING 1,188,626	
DRILL RIG/HAMMER EFF./DATE BR12974 CME-45C 76% 03/14/2024		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic			
DRILLER K. Campbell		START DATE 01/08/26		COMP. DATE 01/09/26		SURFACE WATER DEPTH N/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT			SAMP. NO.
			0.5ft 0.5ft 0.5ft	0	25	50	75
0	0.0	0.0	6 12 5	17			
-5	-4.5	4.5	8 10 17	27			
-10	-8.5	8.5	29 24 34	38			
-15	-13.5	13.5	60/0,0	60/0,0			
SOIL AND ROCK DESCRIPTION DEPTH (ft) 0.0 GROUND SURFACE ARTIFICIAL FILL Brown and gray, SAND and GRAVEL (A-1-b), with some silt -3.0 Brown and gray, sandy SILT (A-4), with trace gravel -7.0 RESIDUAL Brown, light brown, gray, and black, SAND and GRAVEL (A-1-b), with some silt -13.5 CRYSTALLINE ROCK Gray, black, and white, GRANITIC GNEISS, fresh to very slight weathering, hard to moderately hard, wide fracture spacing -16.2 REC=100% (2.7') RQD=100% (2.7') GSI=85-90 -17.5 Gray and black, BIOTITE SCHIST, fresh to very slight weathering, moderately hard, wide fracture spacing -18.5 REC=100% (1.3') RQD=100% (1.3') GSI=85-90 Gray, black, and white, GRANITIC GNEISS, fresh to very slight weathering, hard to moderately hard, wide fracture spacing REC=100% (1.0') RQD=100% (1.0') GSI=85-90 Boring Terminated at Elevation -18.5 ft in Crystalline Rock (GRANITIC GNEISS) TOPSOIL 1-INCH Rig Chatter 5.0'							

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DRILLER K. Campbell		START DATE 01/08/26		COMP. DATE 01/09/26		SURFACE WATER DEPTH N/A	
CORE SIZE NQ2		TOTAL RUN 5.0 ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.
-13.5	-13.5	13.5	5.0	2:35/1.0	(5.0)	(5.0)	
-15				2:23/1.0	100%	100%	
				2:31/1.0			
				1:58/1.0			
				1:53/1.0			
-18.5	-18.5	18.5					
DESCRIPTION AND REMARKS DEPTH (ft) Begin Coring @ 13.5 ft CRYSTALLINE ROCK -13.5 Gray, black, and white, GRANITIC GNEISS, fresh to very slight weathering, hard to moderately hard, wide fracture spacing -16.2 GSI=85-90 -17.5 Gray and black, BIOTITE SCHIST, fresh to very slight weathering, moderately hard, wide fracture spacing -18.5 GSI=85-90 Gray, black, and white, GRANITIC GNEISS, fresh to very slight weathering, hard to moderately hard, wide fracture spacing Boring Terminated at Elevation -18.5 ft in Crystalline Rock (GRANITIC GNEISS) TOPSOIL 1-INCH Rig Chatter 5.0'							

N:\DDOT\BORE DOUBLE 095-01-90803_GEO_BRDGS_LOSS- BORE GPJ NC_DOT.GDT 1/16/26

CORE PHOTOGRAPH
GROW NC/NCEM - 138 HILL ROAD, ZIONVILLE, NC 28698

EB1
BOX 1 OF 1: 13.5 - 18.5 FEET



APPROXIMATE SCALE IN FEET

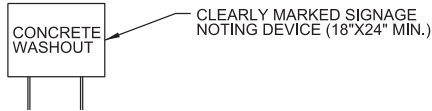
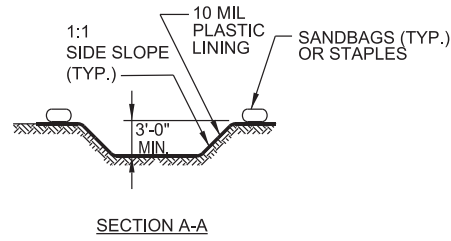
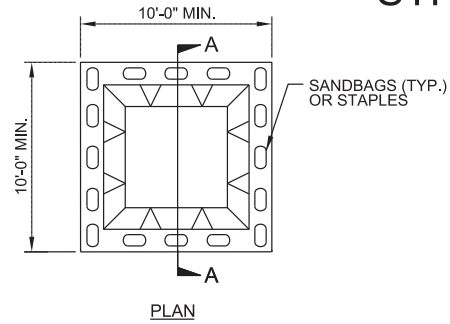
CORE PHOTOGRAPH
GROW NC/NCEM - 138 HILL ROAD, ZIONVILLE, NC 28698

EB2
BOX 1 OF 1: 28.5 - 33.5 FEET



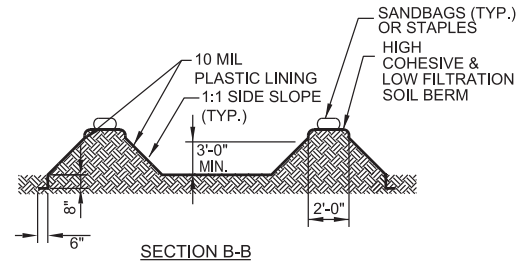
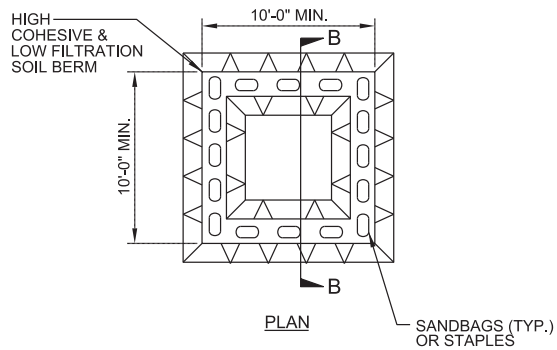
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

PROJECT REFERENCE NO. PRB	SHEET NO. 00B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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

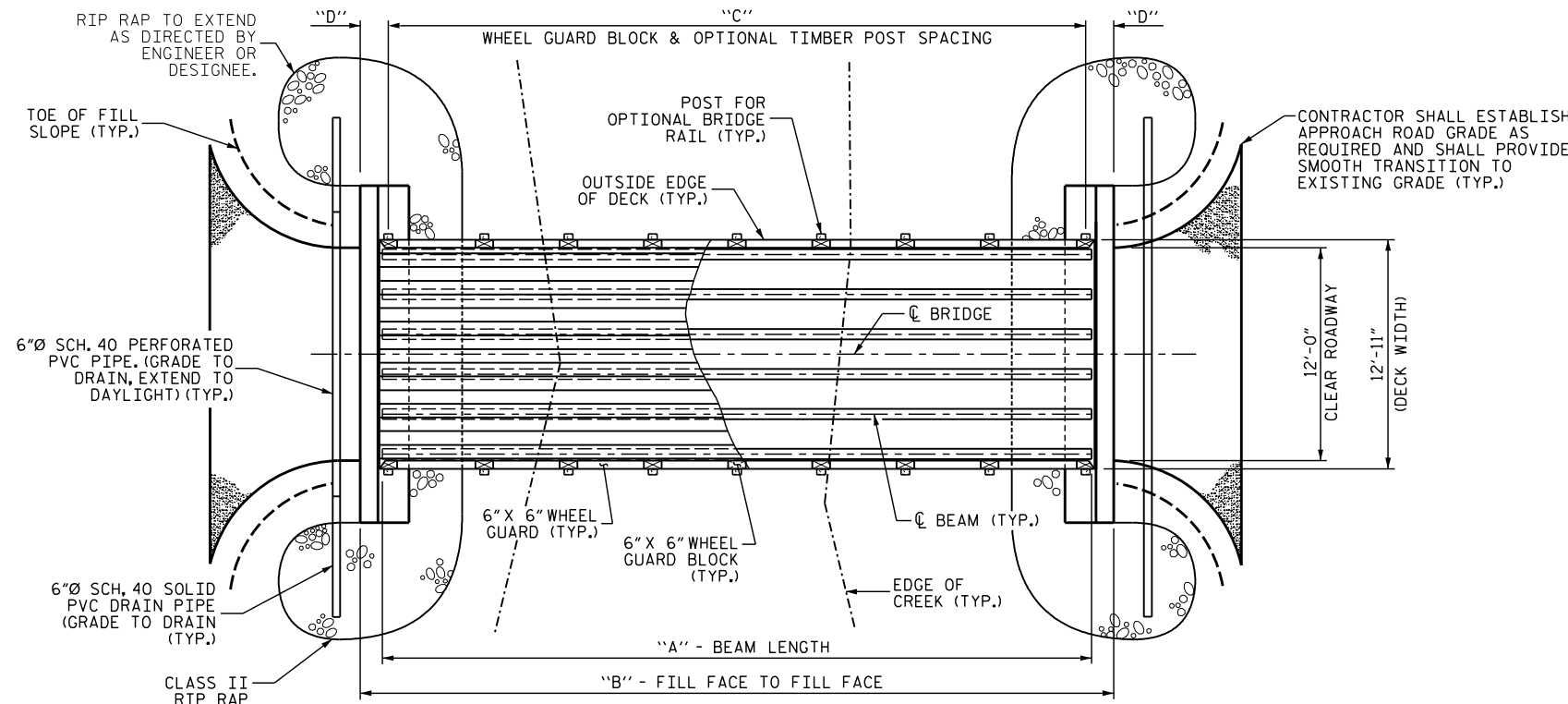
PROJECT REFERENCE NO. <i>PRB</i>	SHEET NO. <i>EC-2</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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 (HOW) 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 HOW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HOW ZONES

NOTES

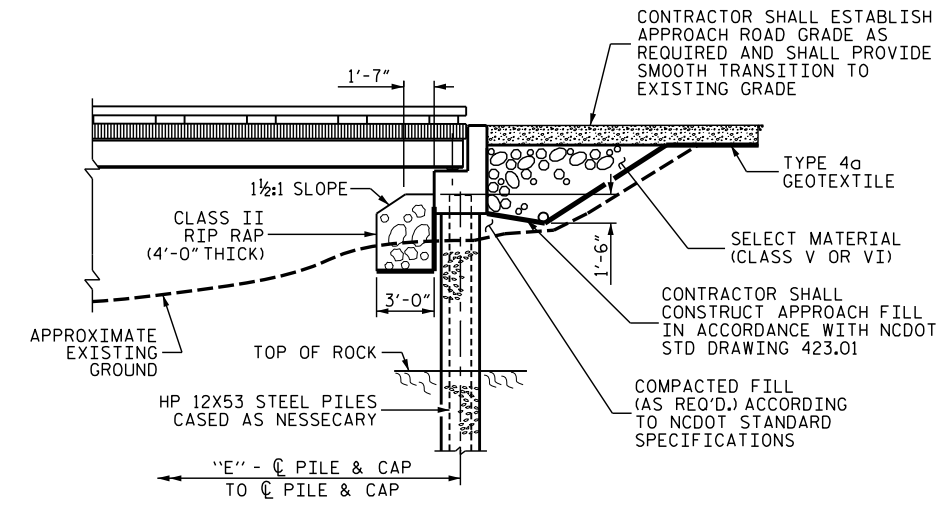
FOR OPTIONAL TIMBER BRIDGE RAIL DETAILS, SEE "OPTIONAL TIMBER BRIDGE RAIL" SHEET.
 CONTRACTOR SHALL LOCATE THE EXPANSION BEARING ON THE "UPHILL" END OF THE BRIDGE. THERE WILL BE ONLY ONE EXPANSION BEARING PER BRIDGE.
 CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES, AS REQUIRED ACCORDING TO NCDOT STANDARD 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

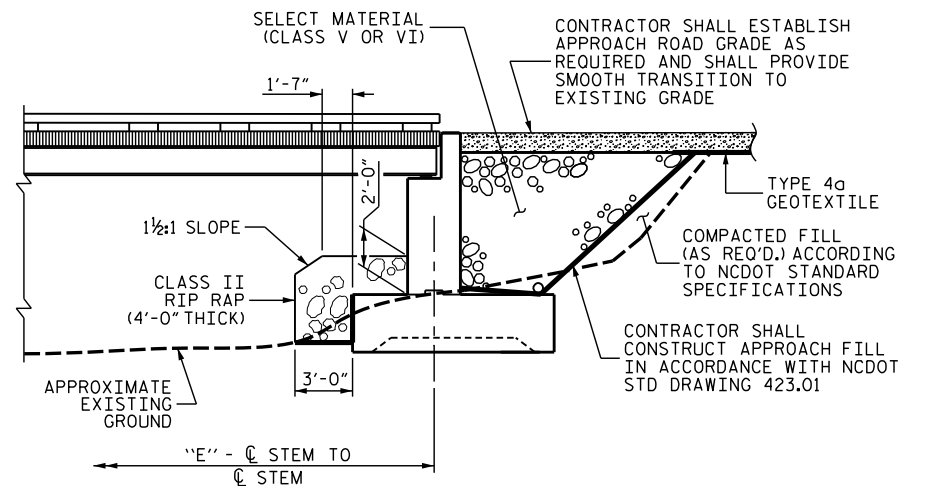
(FOUNDATION TYPE NOT SHOWN FOR CLARITY)

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"



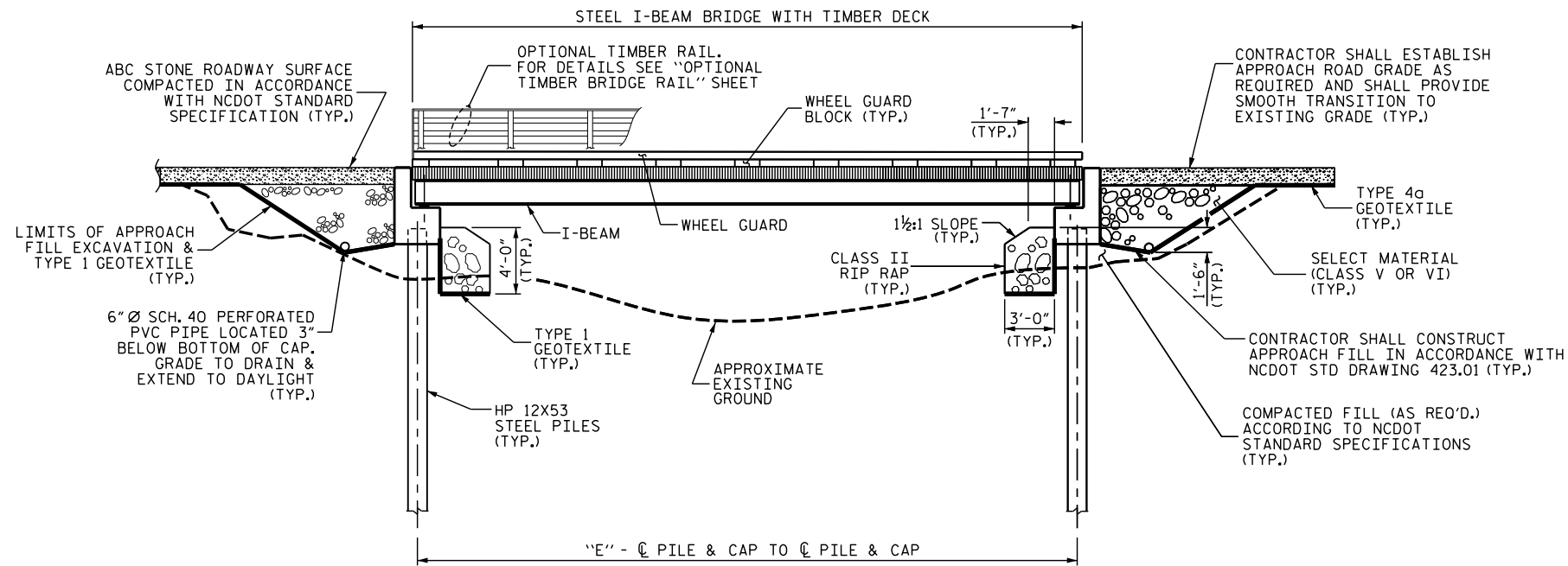
BRIDGE PARTIAL ELEVATION

(SHOWING DRILLED-IN 12X53 STEEL PILES FOUNDATION)



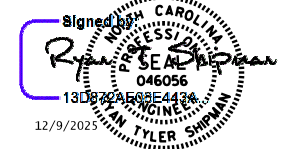
BRIDGE PARTIAL ELEVATION

(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

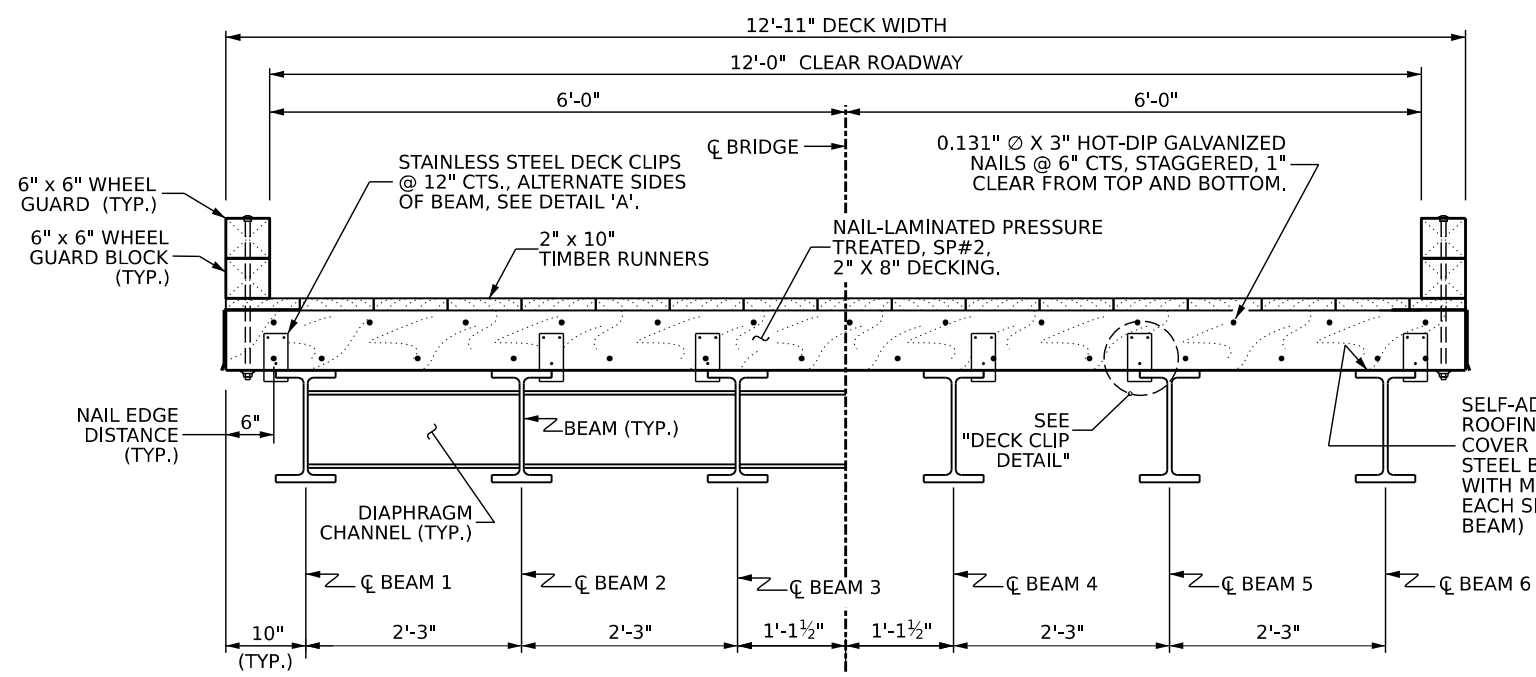
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 12
2			4			

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

W:\Projects\2025\25-00629\25-00629-001\Design\Structures\NC PRB-Steel Beam with Timber Deck Standards\Single Lane Steel Beam with Timber Deck Standards\20-50\00-SI_General Drawing.dwg
 DATE: 12/9/2025 TIME: 11:12:12 AM

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 DATE: 12/9/2025
 TIME: 11:51:00 AM



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

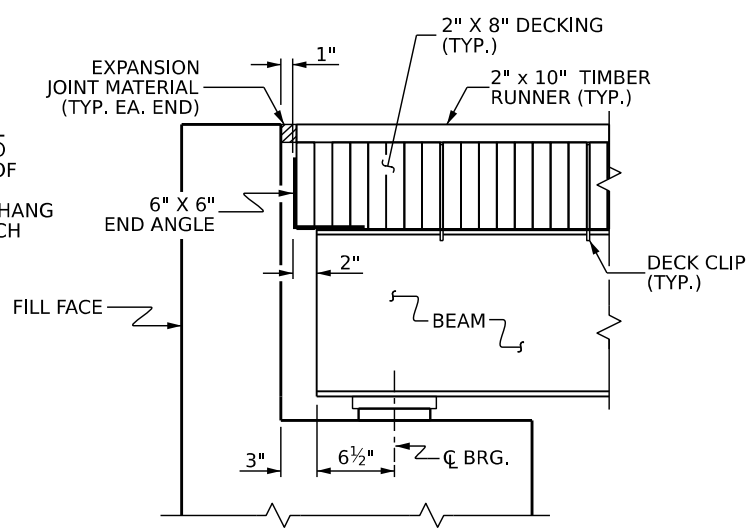
FOR TIMBER BRIDGE DECK SYSTEM DETAILS, SEE "PLAN OF SPAN" SHEET.

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

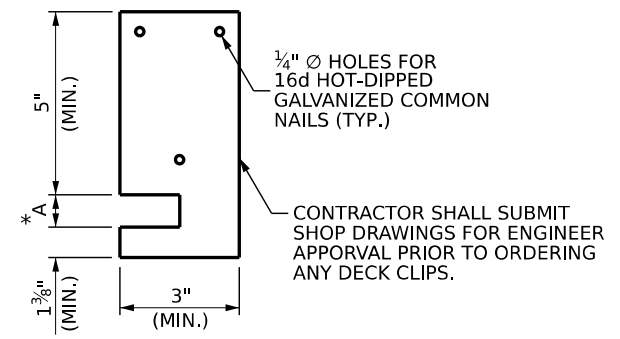
FOR BEAM AND DIAPHRAGM DETAILS, SEE "FRAMING PLAN & BEAM DETAILS" SHEET.

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.

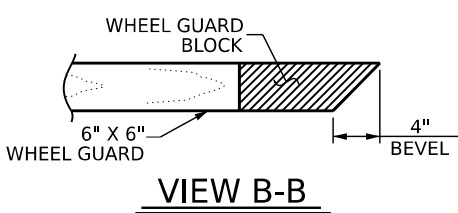
SEE "PLAN OF SPAN" SHEET FOR NUMBER OF WHEEL GUARDS AND WHEEL GUARD SPACING.



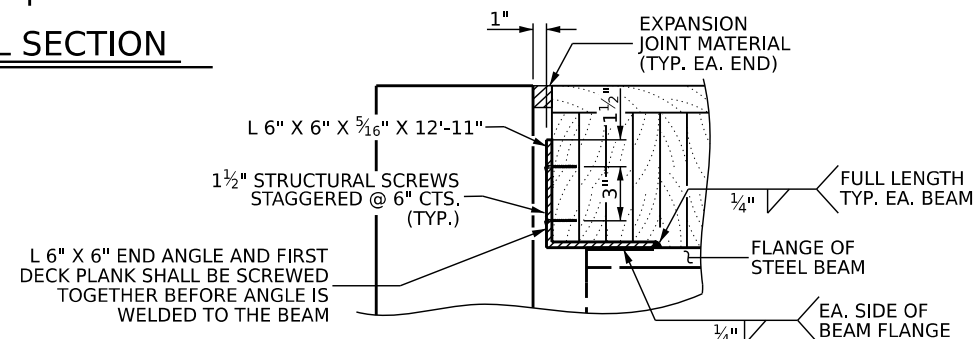
SECTION AT END BENT



DECK CLIP DETAIL



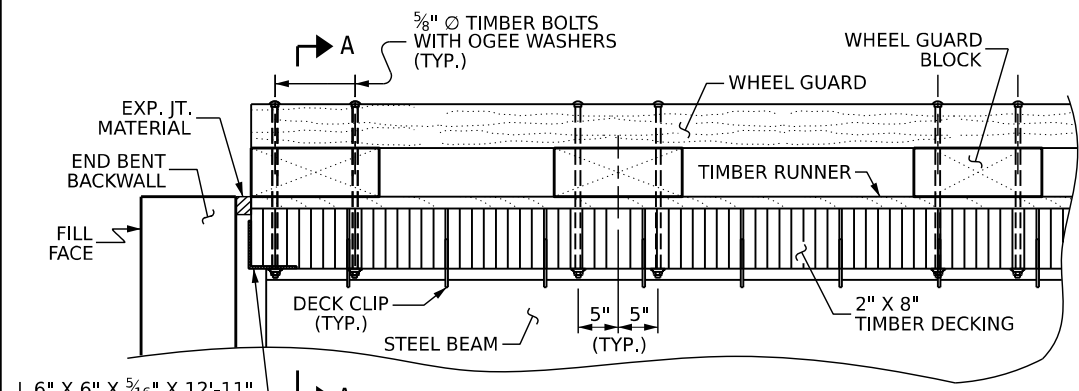
VIEW B-B



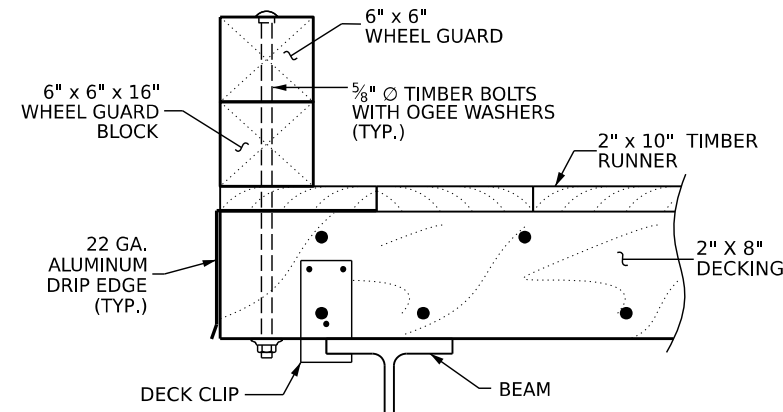
END ANGLE DETAIL

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"

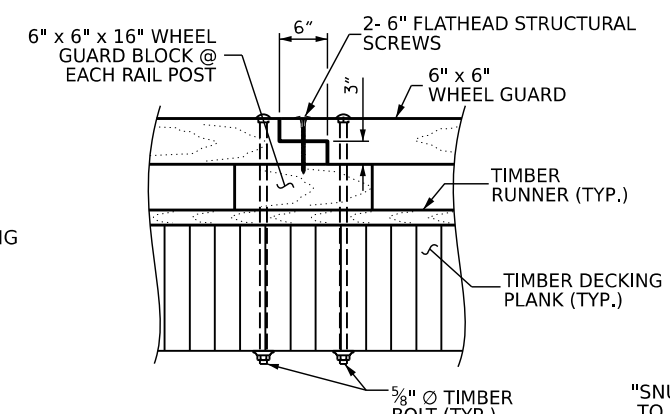
* DIMENSION A IS FOR INFORMATION ONLY. IT IS BASED ON THE FLANGE THICKNESS PLUS A 1/16\"/>



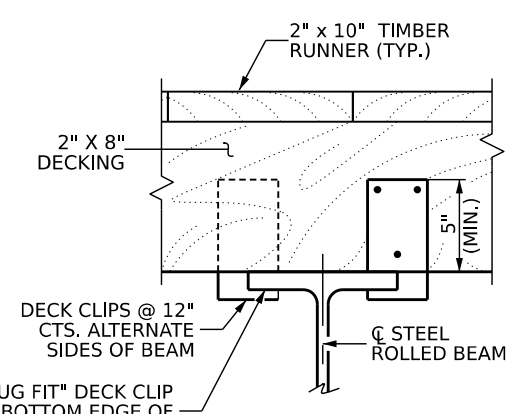
WHEEL GUARD DETAIL AT END BENTS



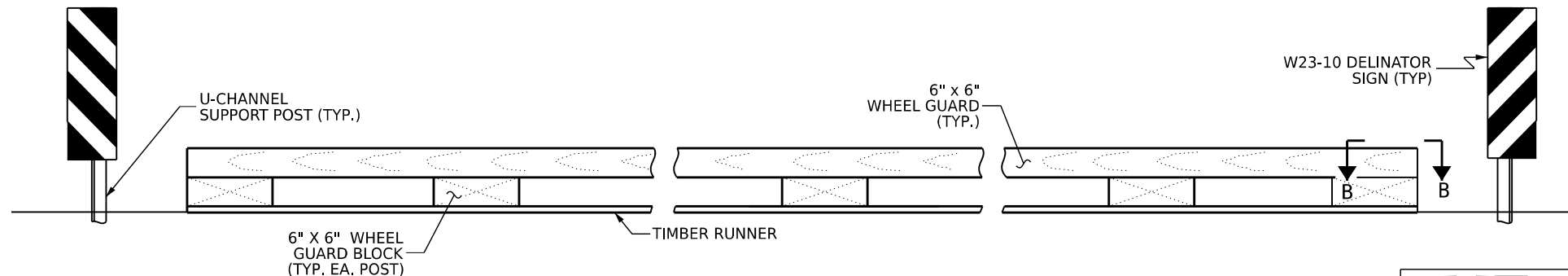
SECTION A-A



WHEEL GUARD SPLICE DETAIL



DETAIL 'A'



WHEEL GUARD ELEVATION

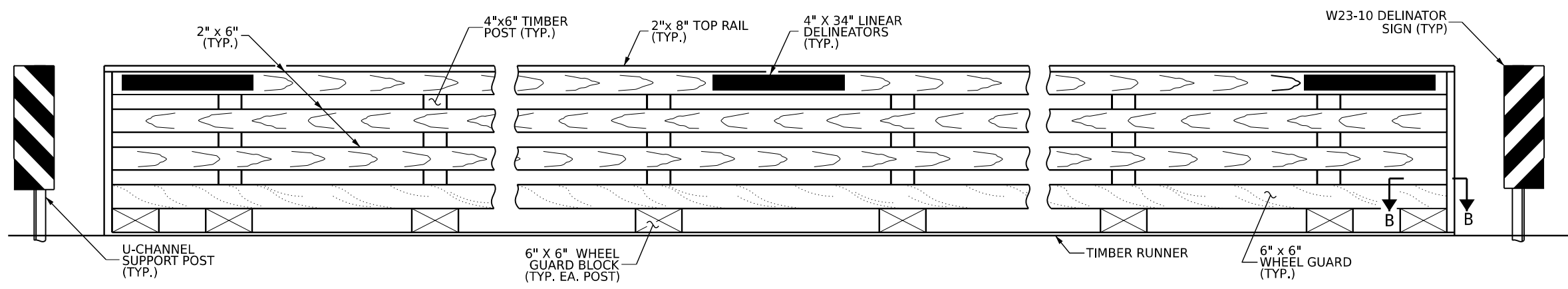
Signature: *Ryan A. Thompson*
 NORTH CAROLINA PROFESSIONAL ENGINEER
 046056
 1300 PINEWOOD DRIVE
 TYLER, NC 27570
 12/9/2025

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
**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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W:\GIS\user\2561\proj\paw\bridge\plans\2-Standard Bridge Plans\2-Standard Drawings\1-Beam Bridge Plans\20-50\003-S3 Optional Bridge Rail.dwg
 DATE: 12/9/2025 TIME: 11:21:11 AM



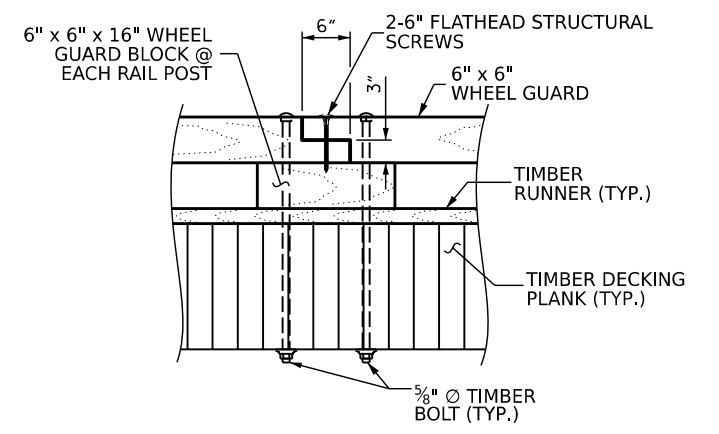
ELEVATION OF OPTIONAL BRIDGE RAIL

OPTIONAL BRIDGE RAIL NOTES

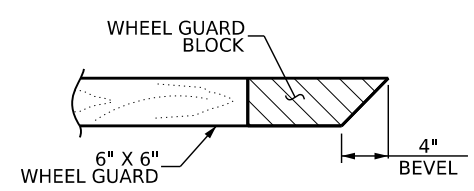
BRIDGE RAILS SHALL BE CONTINUOUS FROM END POST TO END POST WITH NO GAPS. RAIL LUMBER LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

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.

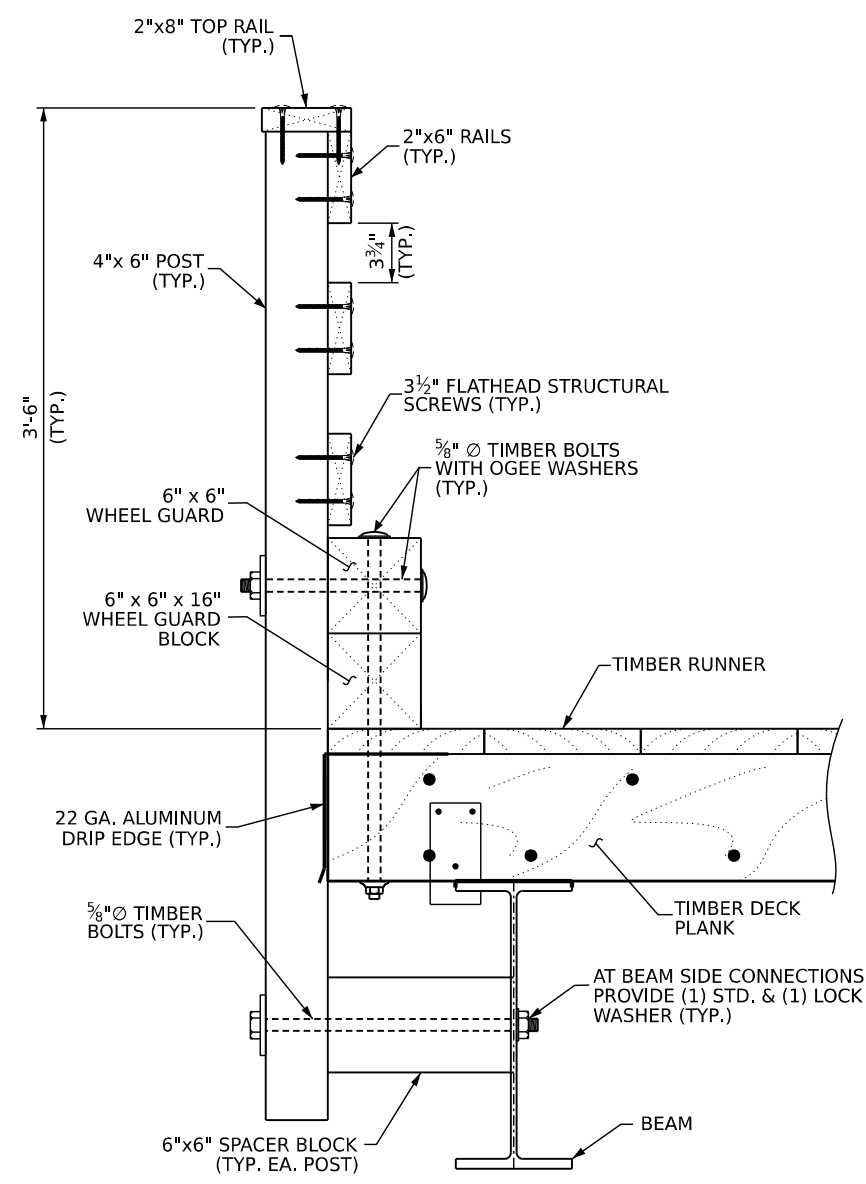
SEE "PLAN OF SPAN" SHEET FOR NUMBER OF POSTS AND POST SPACING.



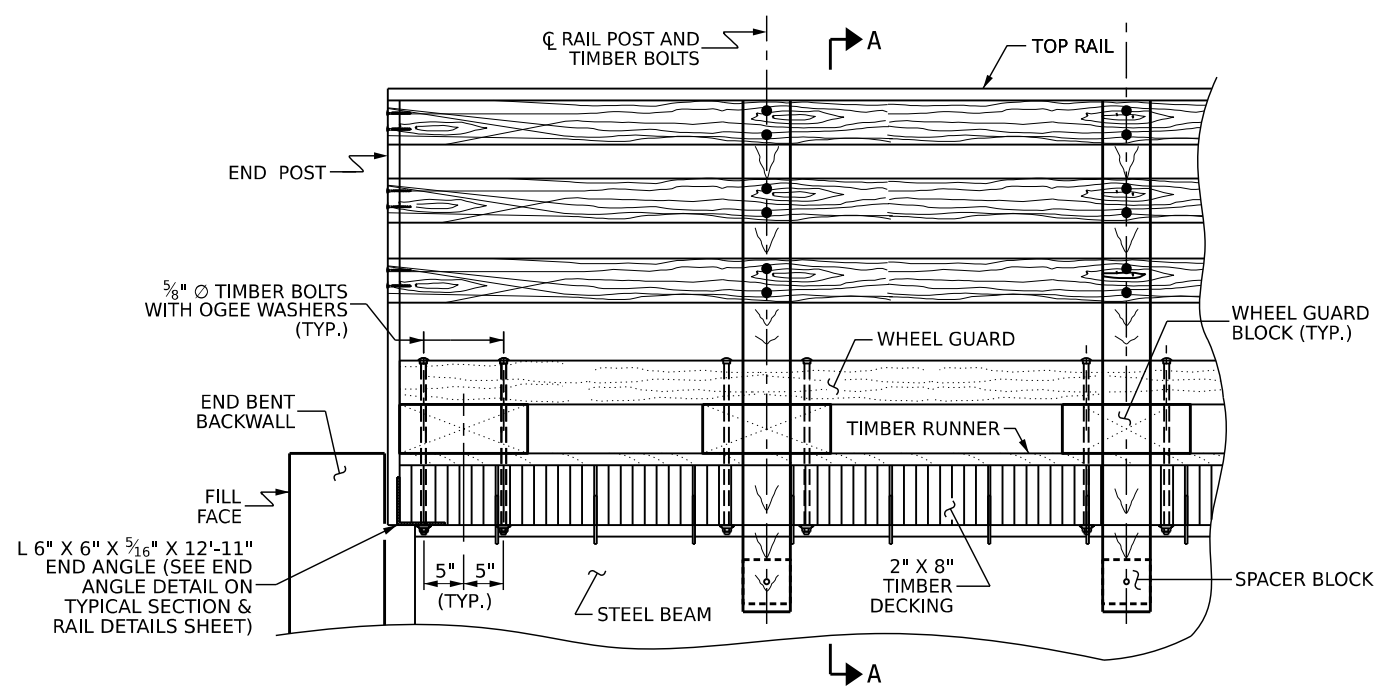
WHEEL GUARD SPLICE DETAIL



VIEW B-B



SECTION A-A



OPTIONAL RAIL DETAIL AT END BENTS



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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

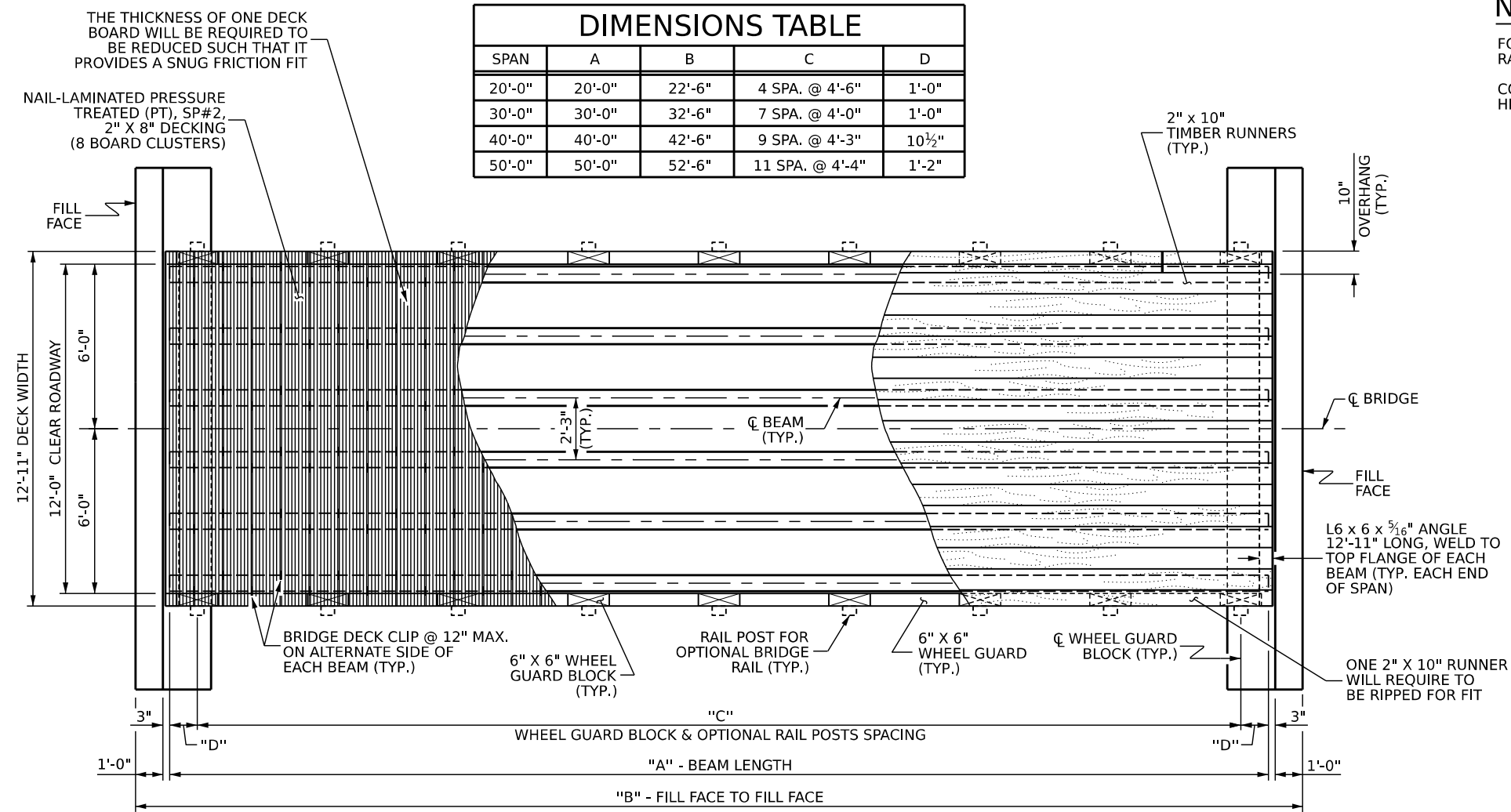
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			12

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W:\Projects\2025\25-00629\25-00629-01\Design\Structures\NC PRB-Steel Beam with Timber Deck Standards\Single Lane Steel Beam with Timber Deck Plans\2 Standard Drawings\1-Beam Bridge Plans\20-50\004-S4_Plan of Span.dwg
DATE: 12/9/2025
TIME: 11:51:00 AM

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"



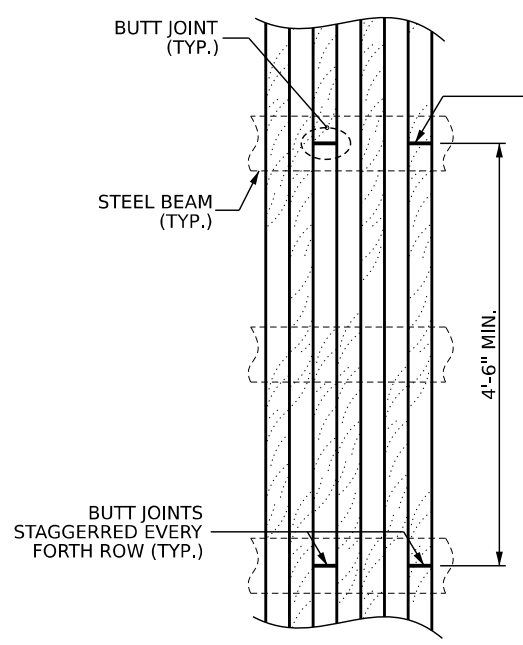
END BENT 1

DECK LAYOUT

END BENT 2

NOTES

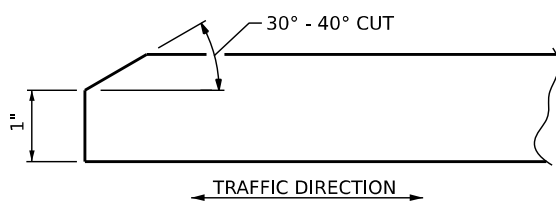
FOR ADDITIONAL NOTES, SEE "TYPICAL SECTION & RAIL DETAILS" SHEET, AND "GENERAL NOTES" SHEET.
COUNTERSINK FLATHEAD STRUCTURAL TIMBER SCREW HEADS TO BE FLUSH WITH TIMBER SURFACE.



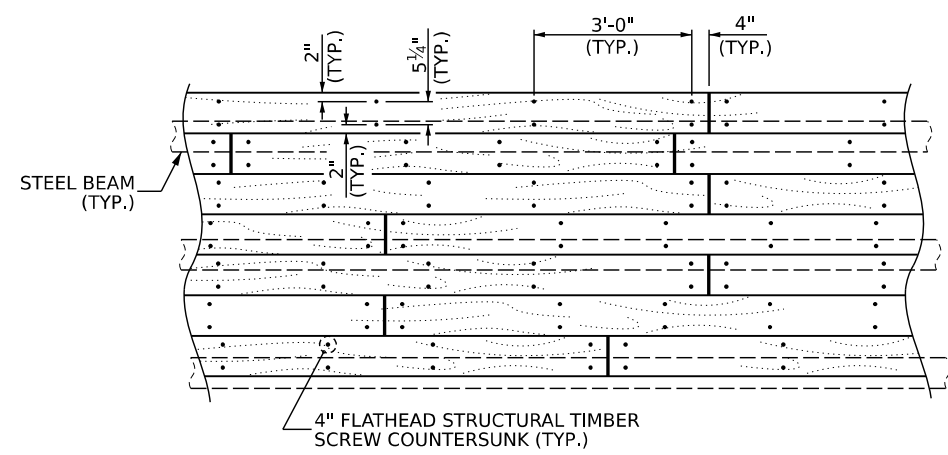
DECKING BOARD BUTT JOINT DETAIL

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

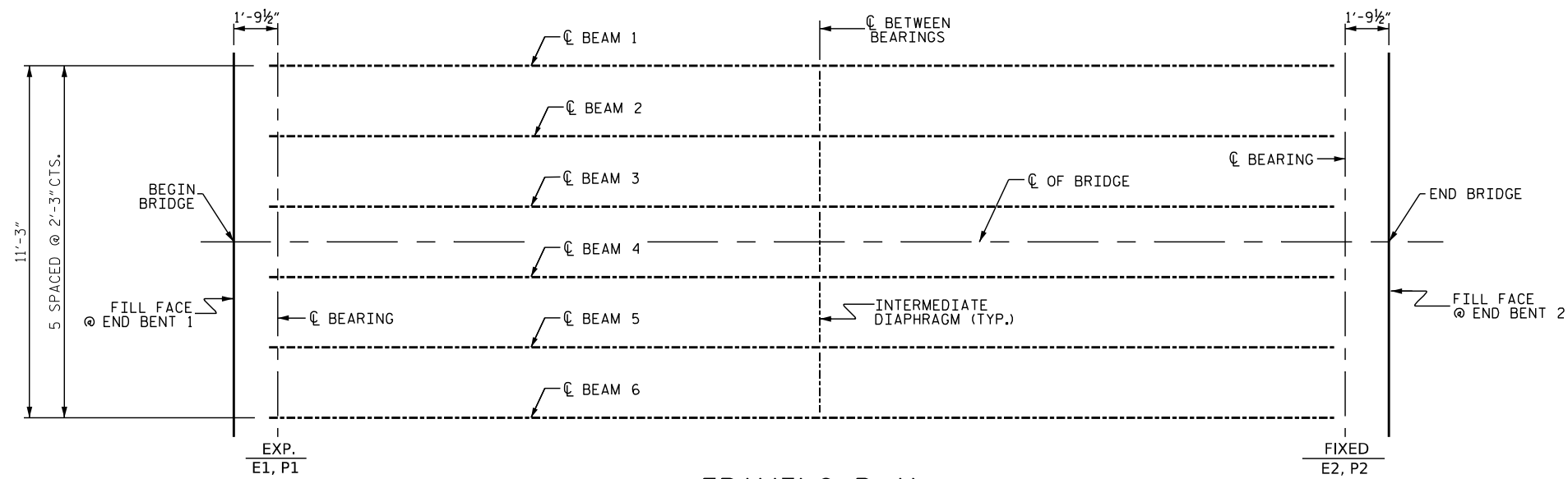


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

JMT Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097	DWN. BY: WDC	DATE: 12/2025	NO. 1	BY: [Signature]	DATE:	NO. 3	BY: [Signature]	DATE:	SHEET NO. S-04
	CHKD. BY: RTS	DATE: 12/2025							

W:\C\Users\jmt\OneDrive\Documents\Projects\2025\25-00529\25-00529-01\Design\Structures\NC PRB-Steel Beam with Timber Deck Standards\Single Lane Steel Beam with Timber Deck Plans\2 Standard Drawings\1-Beam Bridge Plans\20-50\005-SS-Framing Plans.dwg
 DATE: 12/9/2025
 TIME: 11:30 AM



FRAMING PLAN

EXPANSION BEARING SHALL BE PLACED ON THE "UPHILL" END OF THE BRIDGE.

NOTES

NO SALVAGED BEAMS SHALL BE USED, UNLESS OTHERWISE NOTED ON THE PLANS.

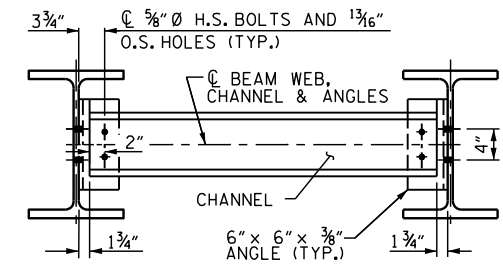
NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL BE 5/8" DIA. GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

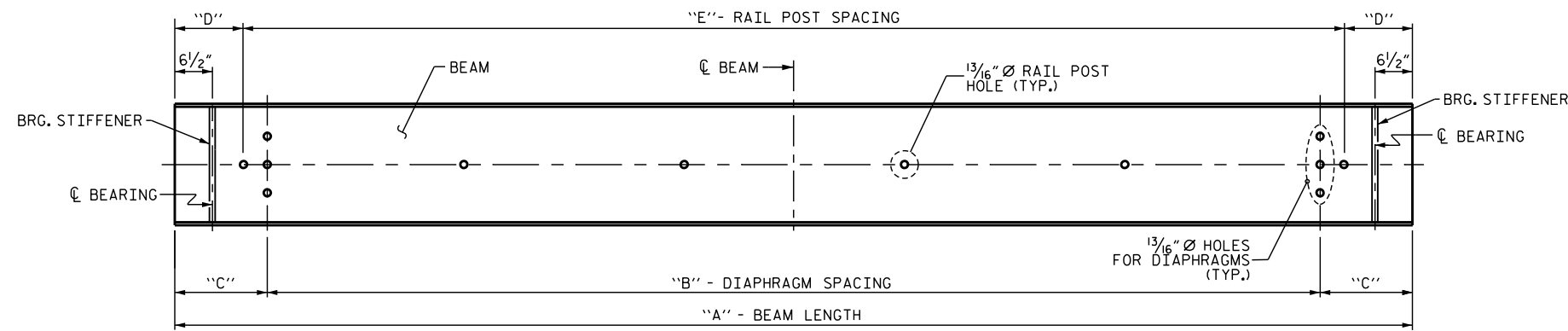
BEAMS SHALL BE PLACED PARALLEL TO THE CHORD.

CONTRACTORS OPTION TO WELD CONNECTOR TO BEAM PRIOR TO SHOP COATING.

SEE "GENERAL NOTES" SHEET FOR COATING.

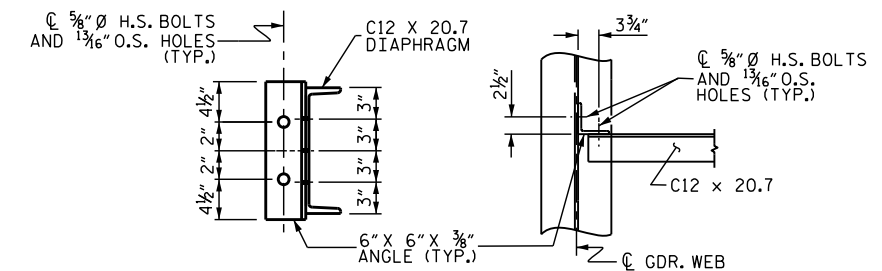


DIAPHRAGM DETAILS



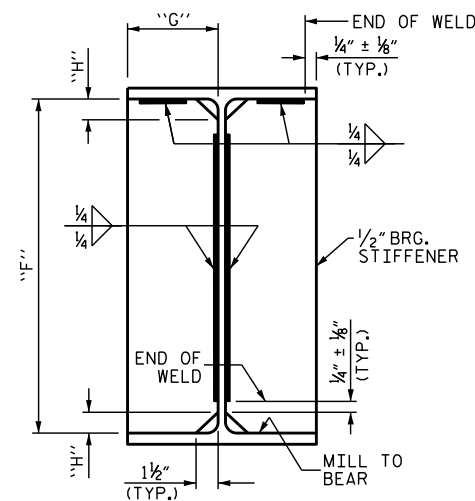
BEAM FLANGE ELEVATION

SHOWING DIAPHRAGM HOLES FOR ALL BEAMS, AND RAIL POST HOLES FOR EXTERIOR BEAMS.



ANGLE DETAILS

BEAM DIMENSION TABLE							
SPAN	BEAM	CHANNEL	A	B	C	D	E
20'-0"	W16X36	C12X20.7	20'-0"	2 SPA. @ 7'-0"	3'-0"	1'-0"	4 SPA. @ 4'-6"
30'-0"	W21X48	C12X20.7	30'-0"	2 SPA @ 12'-0"	3'-0"	1'-0"	7 SPA. @ 4'-0"
40'-0"	W24X76	C12X20.7	40'-0"	2 SPA. @ 17'-0"	3'-0"	10 1/2"	9 SPA. @ 4'-3"
50'-0"	W24X104	C12X20.7	50'-0"	2 SPA. @ 22'-0"	3'-0"	1'-2"	11 SPA. @ 4'-4"



SECTION VIEW - BRG. STIFFENER

STIFFENER DIMENSION

BEAM	F	G	H
W16X36	1'-3"	3 3/8"	2"
W21X48	1'-7 3/4"	3 7/8"	2 1/8"
W24X76	1'-10 9/16"	4 1/4"	2 7/16"
W24X104	1'-10 9/16"	6 3/8"	2 3/4"

Signature: *Ryan E. Thompson*
 NORTH CAROLINA PROFESSIONAL ENGINEER
 046056
 13088 ZION CHURCH RD
 WYOMING, NC 28157
 12/9/2025
 TYLER SHIPMAN

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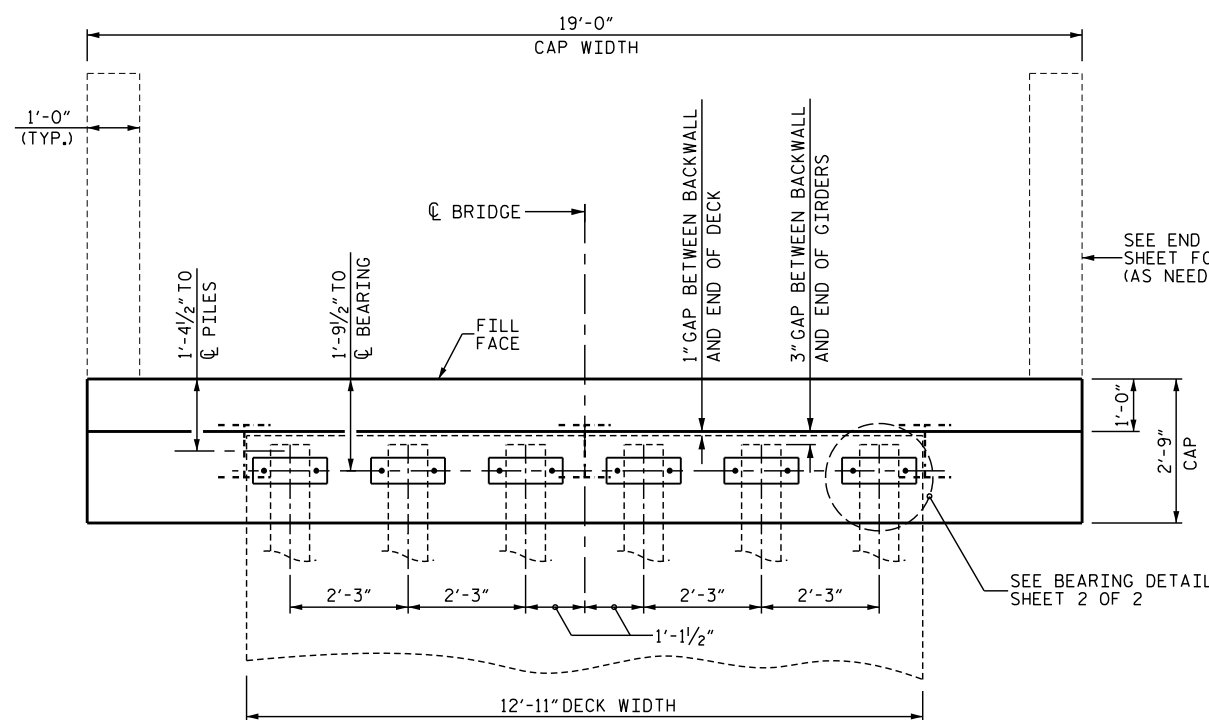
NORTH CAROLINA OFFICE OF
 EMERGENCY MANAGEMENT
**PRIVATE DRIVEWAY
 BRIDGE STANDARDS**
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
**FRAMING PLAN &
 BEAM DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS 12
2			4			

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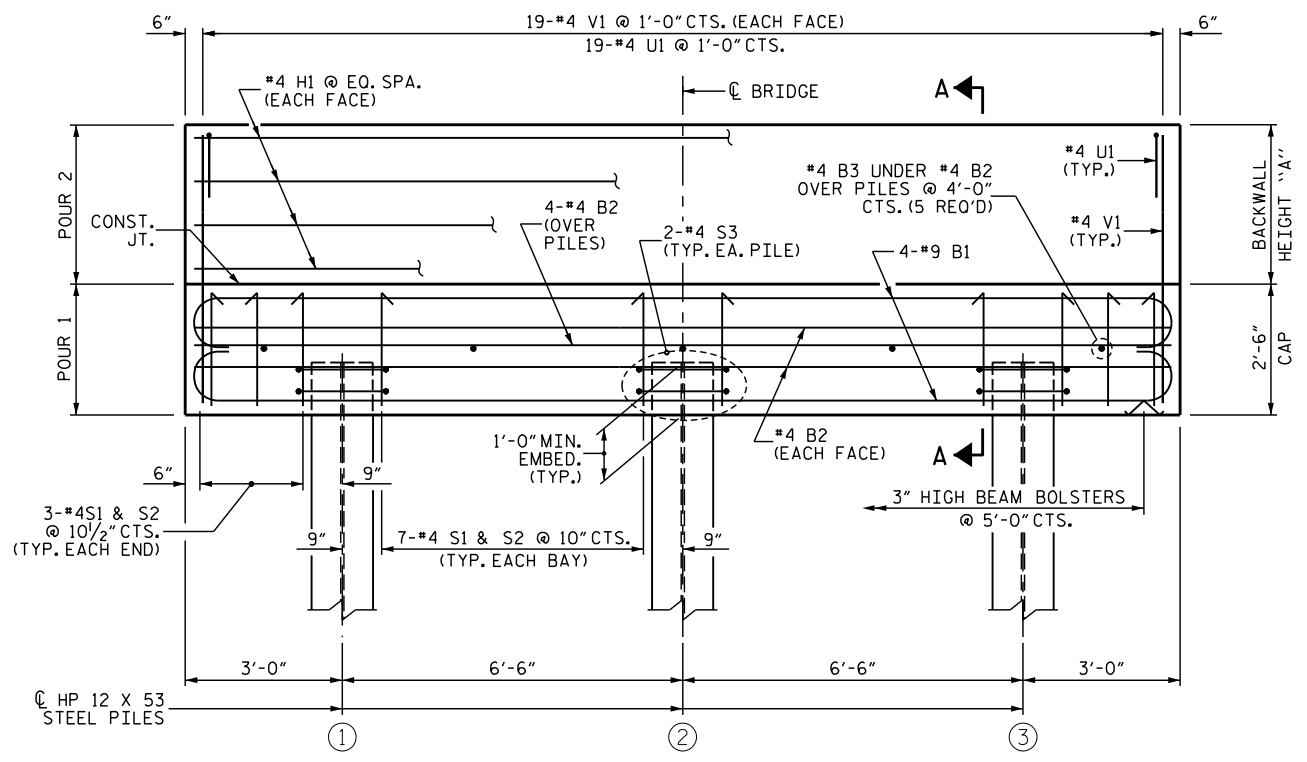
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 CHKD. BY: RTS
 DES. EGR. OF RECORD: PCW
 DATE: 12/2025
 DATE: 12/2025
 DATE: 12/2025

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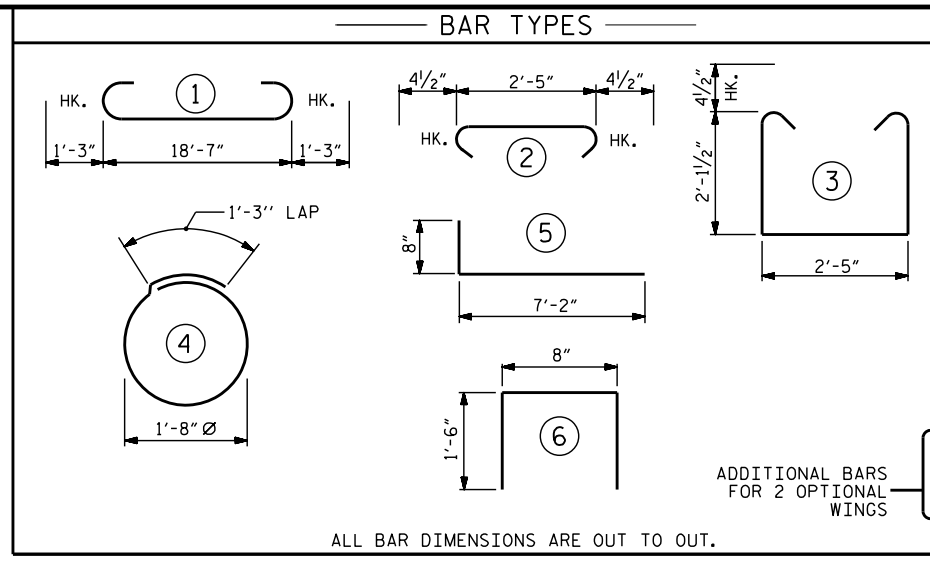
PLAN

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	18'-8"	100	
B3	#5	#4	2'-5"	8	
H1	#8	#4	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	4'-5"	112	
H2	#28	#4	7'-10"	147	
V2	#56	#4	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.

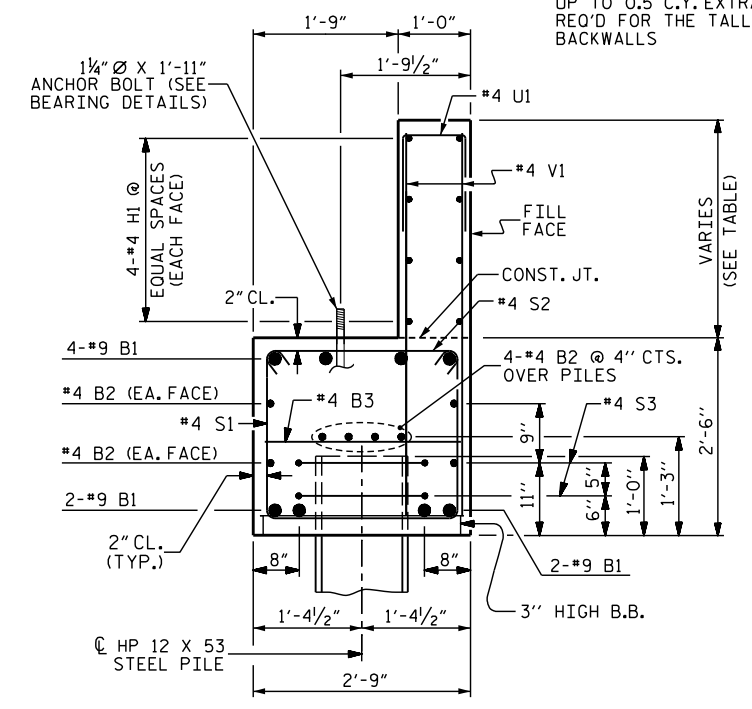
DO NOT INSTALL PILES UNTIL FILL HAS BEEN PLACED.

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.

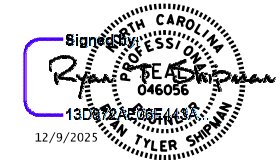
PREDRILLING OR SPUDGING MAY BE REQUIRED TO ACHIEVE THE MINIMUM PILE PENETRATION.

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



SECTION A-A

SHEET 1 OF 2



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NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT

**PRIVATE DRIVEWAY
BRIDGE STANDARDS**

SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK

**END BENT
DRIVEN PILES**

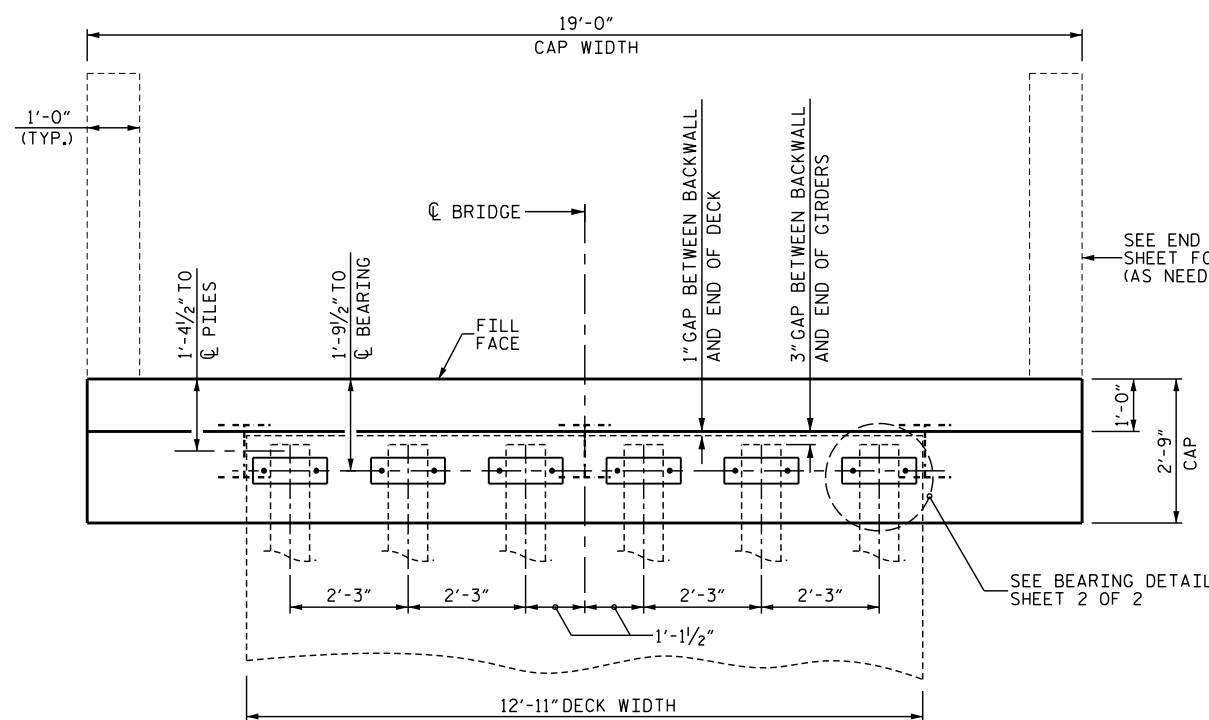
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DWN. BY: WDC
CHKD. BY: RTS
DES. EGR. OF RECORD: PCW

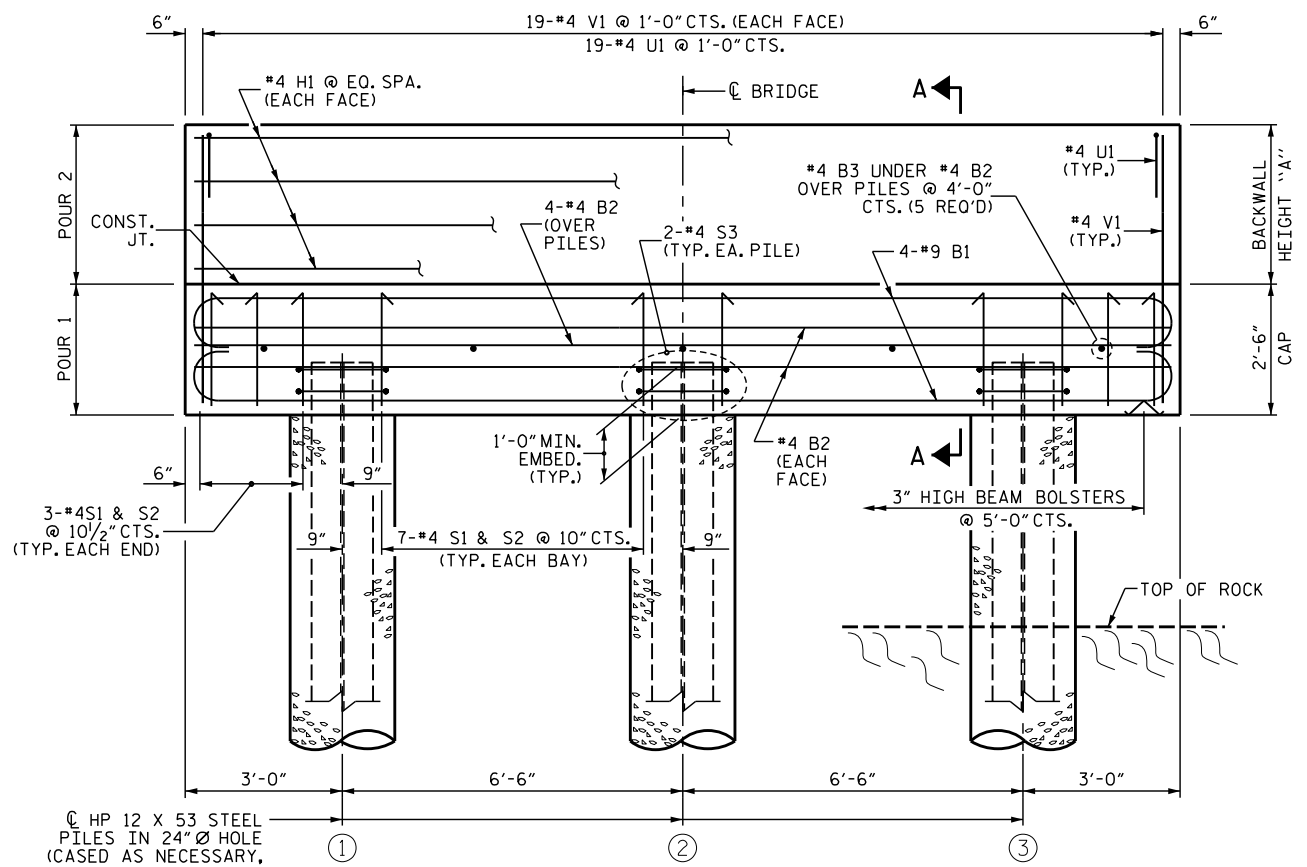
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DATE: 12/2025

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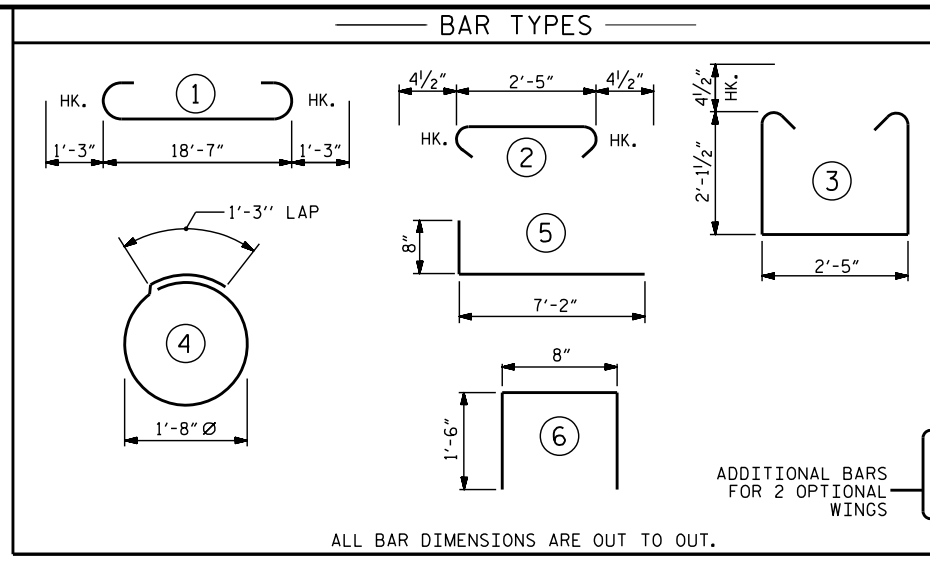
PLAN

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.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8	#9	21'-1"	573	
B2	#8	#4 STR	18'-8"	100	
B3	#5	#4 STR	2'-5"	8	
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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.

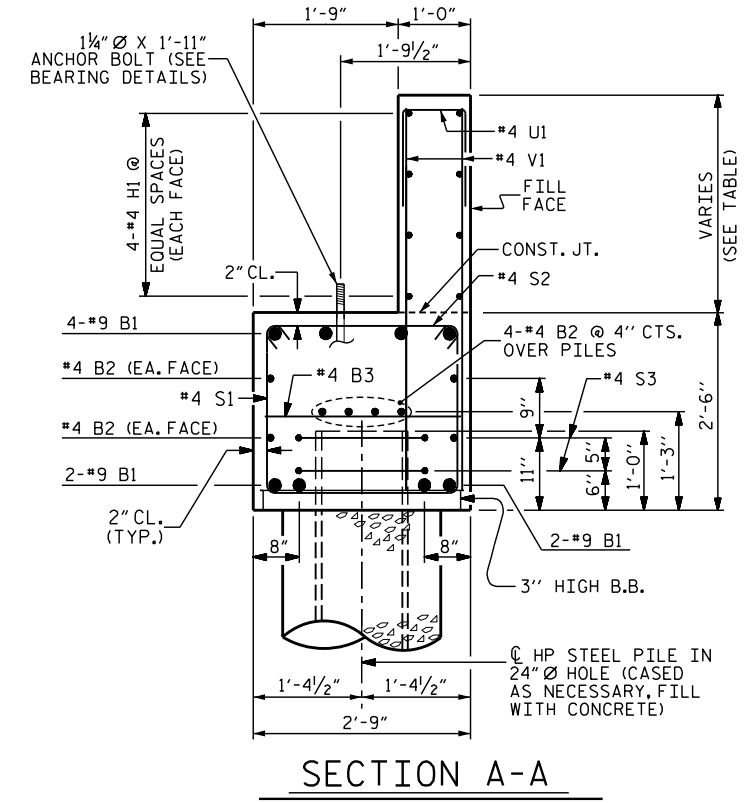
MINIMUM ROCK SOCKET DEPTHS, UNLESS OTHERWISE INDICATED ON PROJECT SPECIFIC DATA SHEET:

- 4' MINIMUM (ROD >70, GSI >50)
- 6' MINIMUM (ROD 30-70, GSI 30-50)
- 8' MINIMUM (ROD <30, GSI <30)

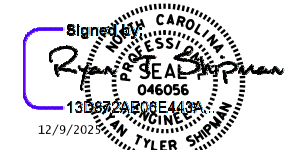
REFER TO BORING LOGS FOR ROD AND GSI DATA.

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

NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT

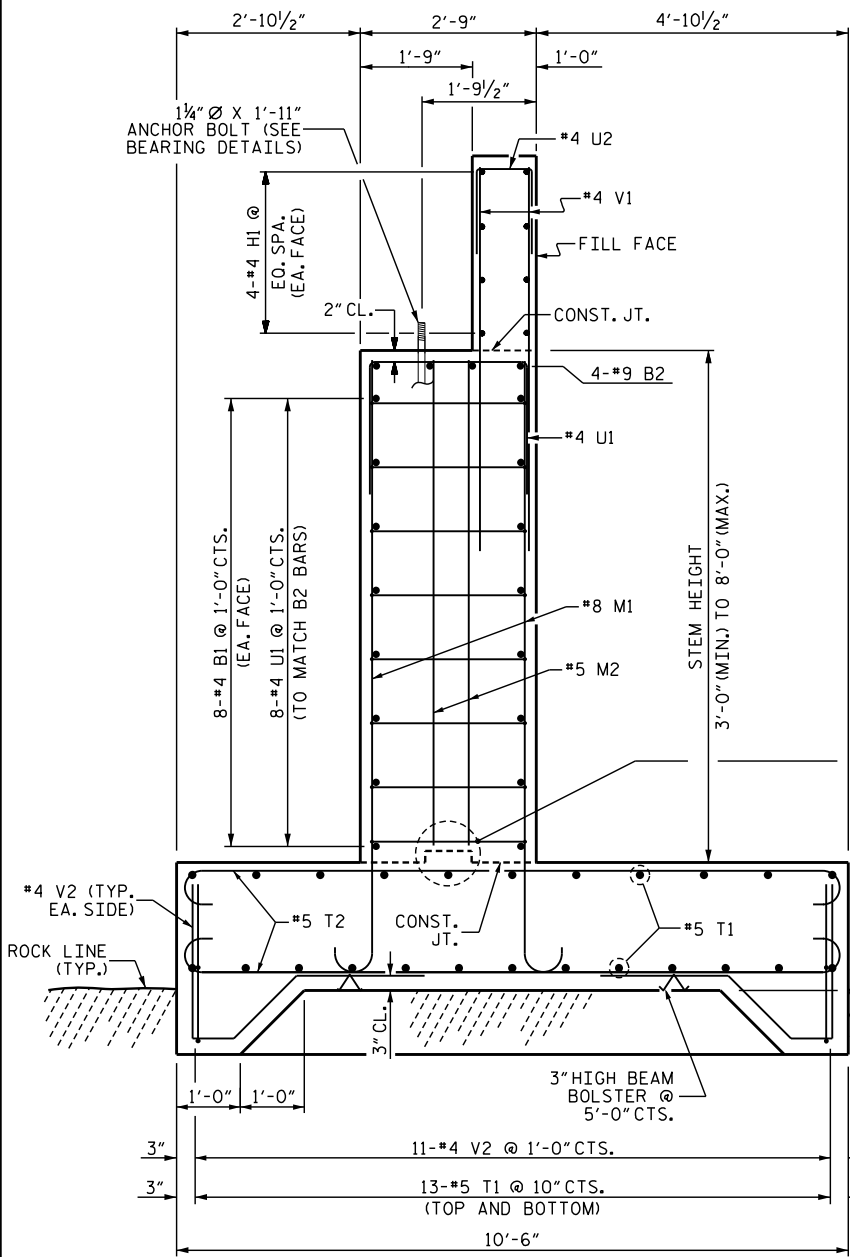
**PRIVATE DRIVEWAY
BRIDGE STANDARDS**

SINGLE LANE STEEL BEAM BRIDGE
TIMBER DECK

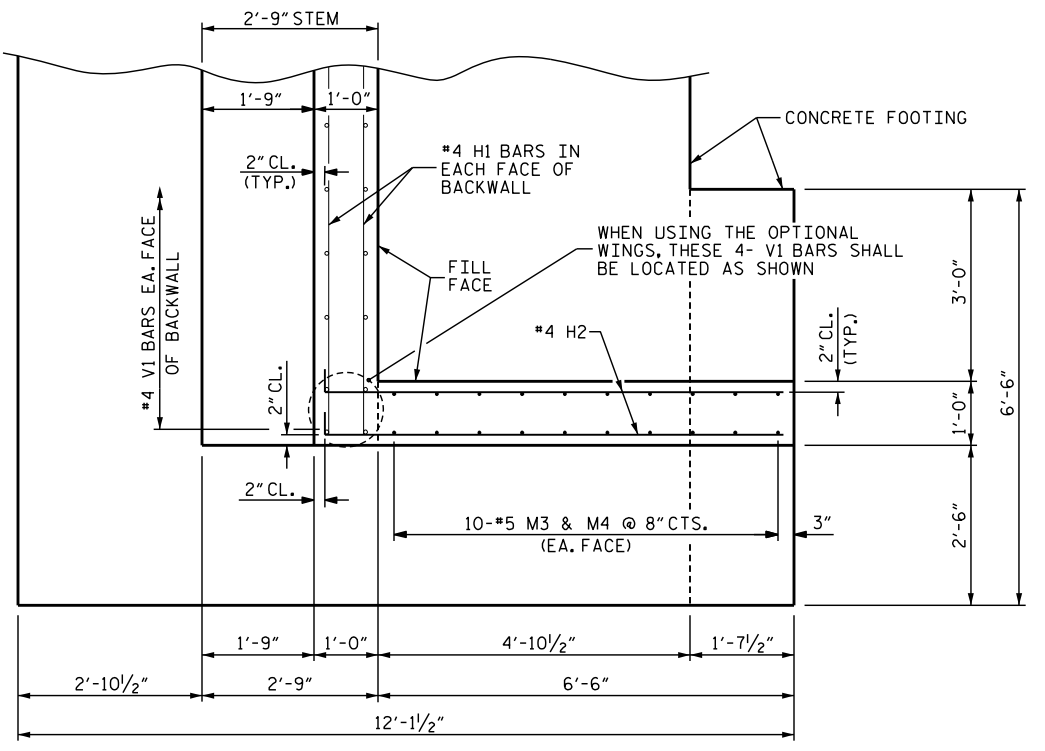
**END BENT
DRILLED-IN PILES**

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: [] DATE: []	NO. 2 BY: [] DATE: []	NO. 3 BY: [] DATE: []	NO. 4 BY: [] DATE: []	SHEET NO. S-08 TOTAL SHEETS 12
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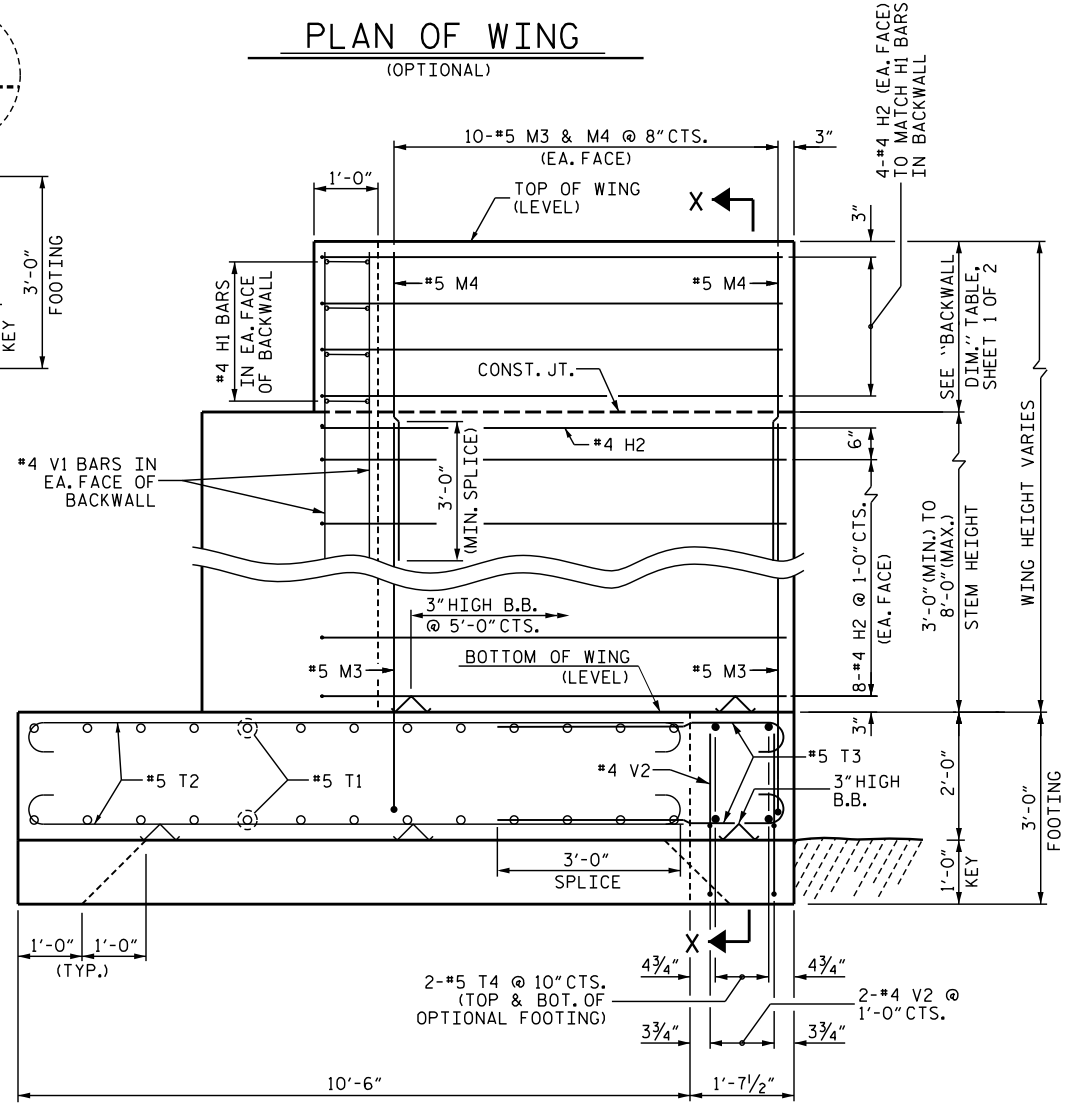
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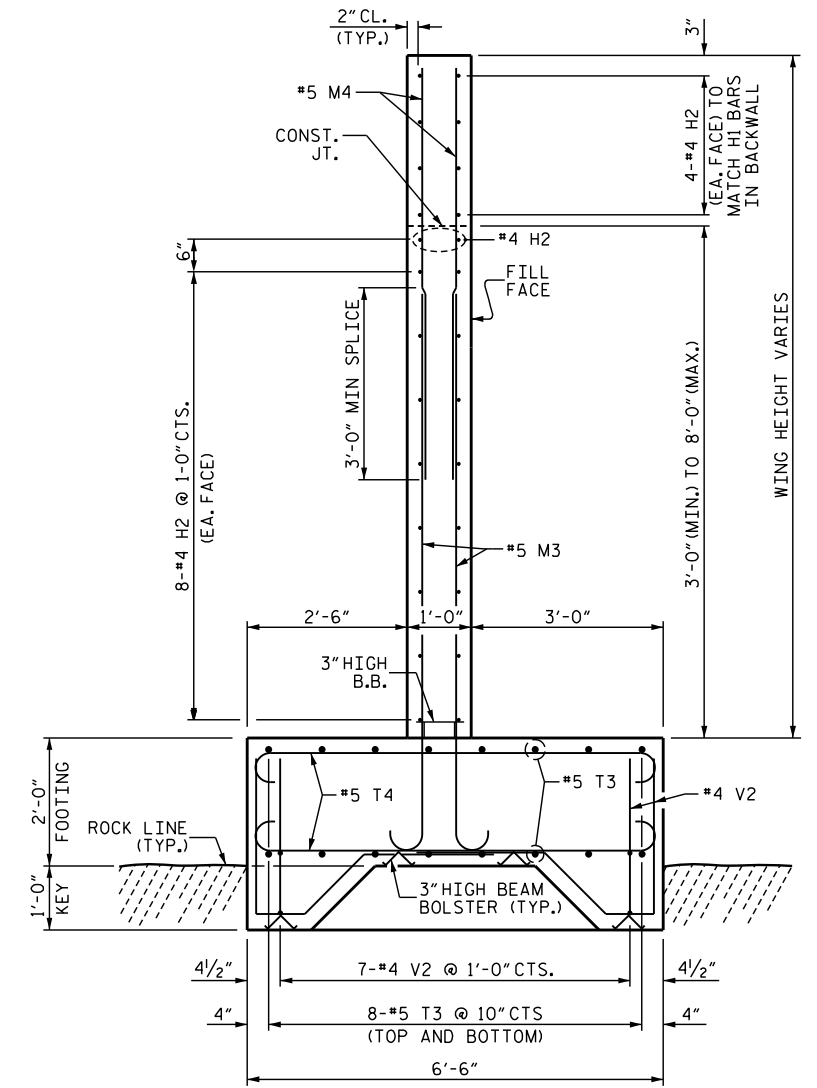
SECTION A-A



PLAN OF WING (OPTIONAL)

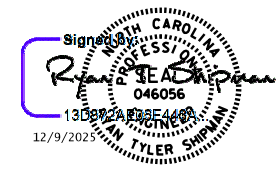


ELEVATION OF WING (OPTIONAL)



SECTION X-X (OPTIONAL)

SHEET 2 OF 2



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NORTH CAROLINA OFFICE OF
EMERGENCY MANAGEMENT
PRIVATE DRIVEWAY BRIDGE STANDARDS
 SINGLE LANE STEEL BEAM BRIDGE
 TIMBER DECK
END BENT
OPTIONAL WINGS & FOOTINGS

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 DES. EGR. OF RECORD: PCW
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 DATE: 12/2025
 DATE: 12/2025

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 TIME: 1/30/2026

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.

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.

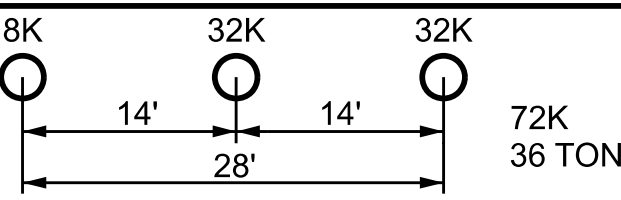
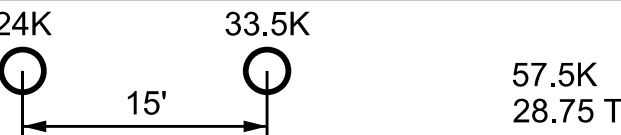
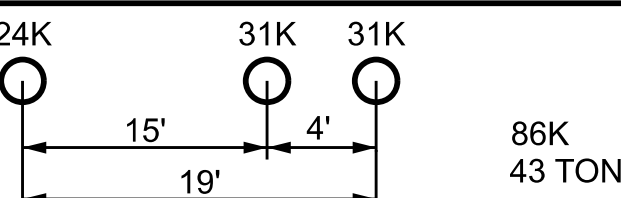
WEIGHT OF TIMBER = 40 PCF.

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.

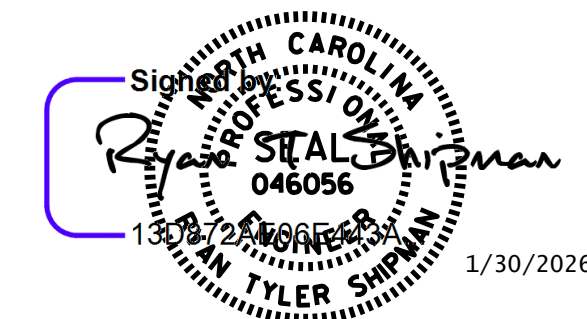
WELDS: SMAW, 70 KSI ELECTRODES PER NCDOT STANDARD SPECIFICATIONS.

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.



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

JMT Johnson, Mirmiran, & Thompson Inc. 108 Asheville Commerce Parkway Candler, NC, 28715 License No: C-3097	DWN. BY: WDC	DATE: 12/2025	<table border="1"> <thead> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	REVISIONS						NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
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CHKD. BY: RTS	DATE: 12/2025																										
DES. EGR. OF RECORD: PCW	DATE: 12/2025																										

SHEET NO.
 S-12
 TOTAL SHEETS
 12