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This file or an individual page shall not be considered a certified document.

TIP PROJECT: 30001.WIUM.002

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	30001.WIUM.002	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
84013.WIUM.002		PE
36249.5012		Const.

STATE OF NORTH CAROLINA

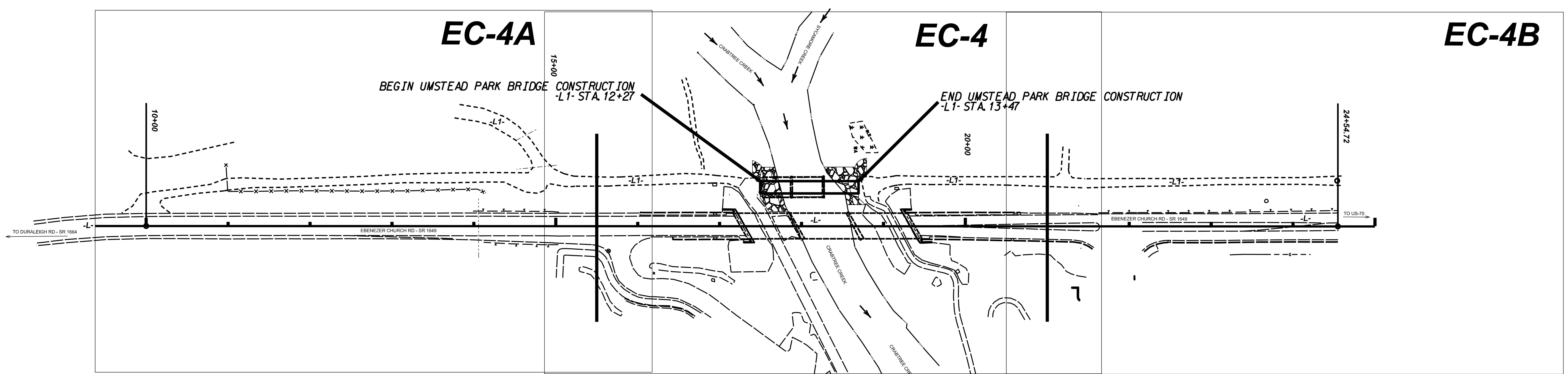
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY

LOCATION: Bridge 91-1473 over Crabtree Creek
Umstead State Park, South Turkey Creek Trail

TYPE OF WORK: STRUCTURES



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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

Prepared In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2024 STANDARD SPECIFICATIONS

Designed by:

Noelle Ring 3456

NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

INDEX OF SHEETS

SHEET NUMBER	SHEET
EC-1	TITLE SHEET
EC-1A	INDEX OF SHEETS
EC-2	EROSION CONTROL LEGEND
EC-2A	EROSION CONTROL DETAILS
EC-2C-1 THRU EC-2C-2	SPECIAL DETAILS
EC-3	SOIL STABILIZATION TIMEFRAMES
EC-4 THRU EC-4B	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
S-1 THRU S-17	STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
30001.WIUM.002	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

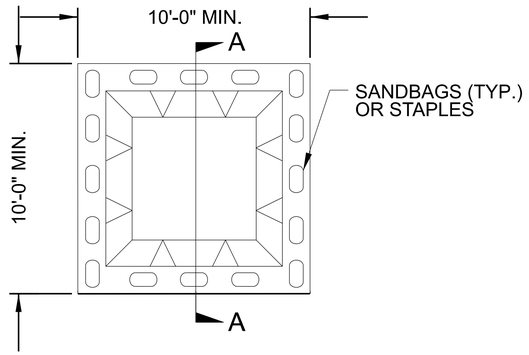
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

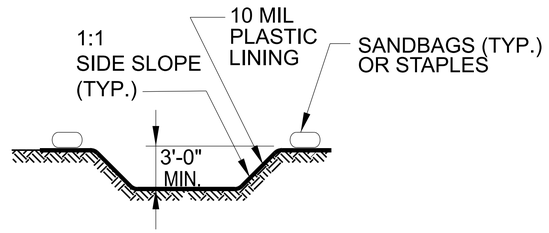
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

5/26/20

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

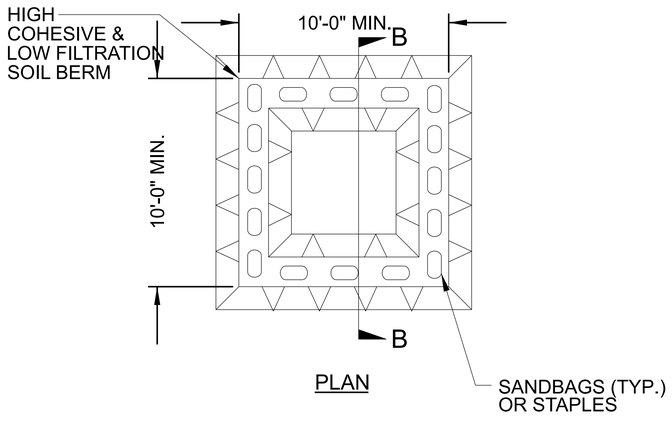
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

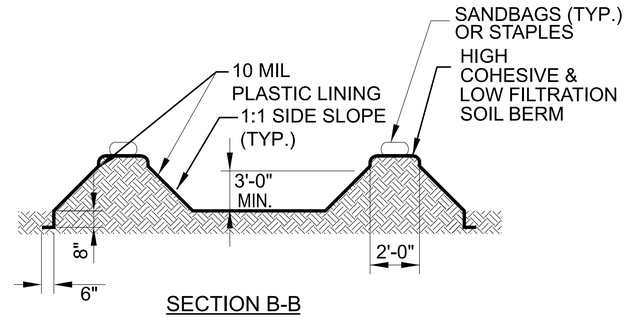
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

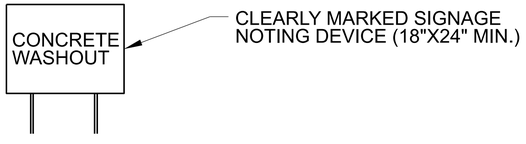
NOT TO SCALE



PLAN



SECTION B-B



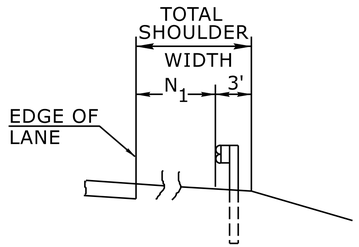
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

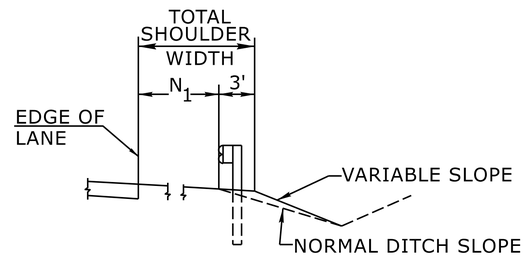
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

PROJECT REFERENCE NO.	SHEET NO.
30001.WUIM.002	EC-2C-1

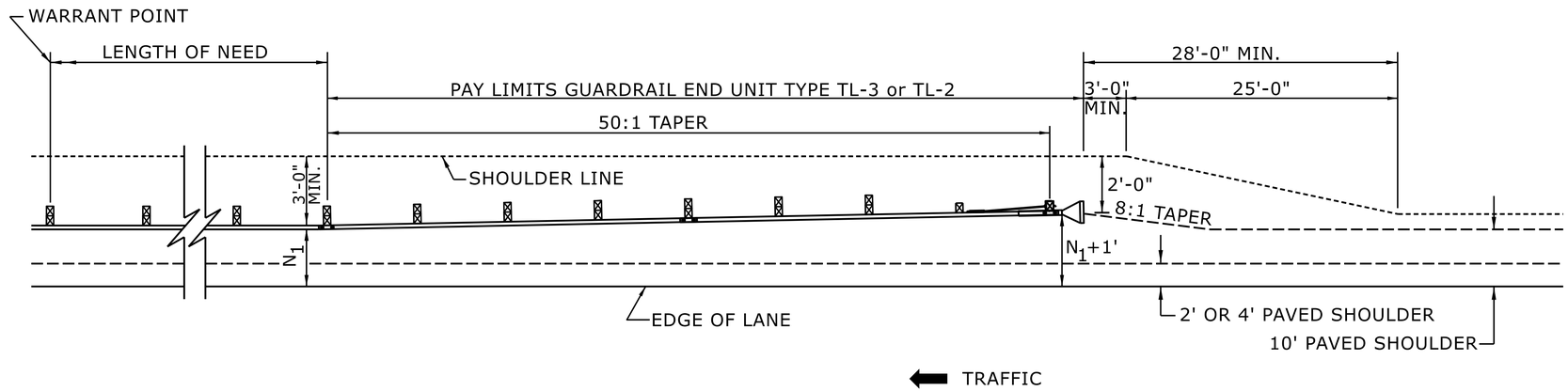


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
11/04/2025

SHEET 6 OF 15

862D01

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

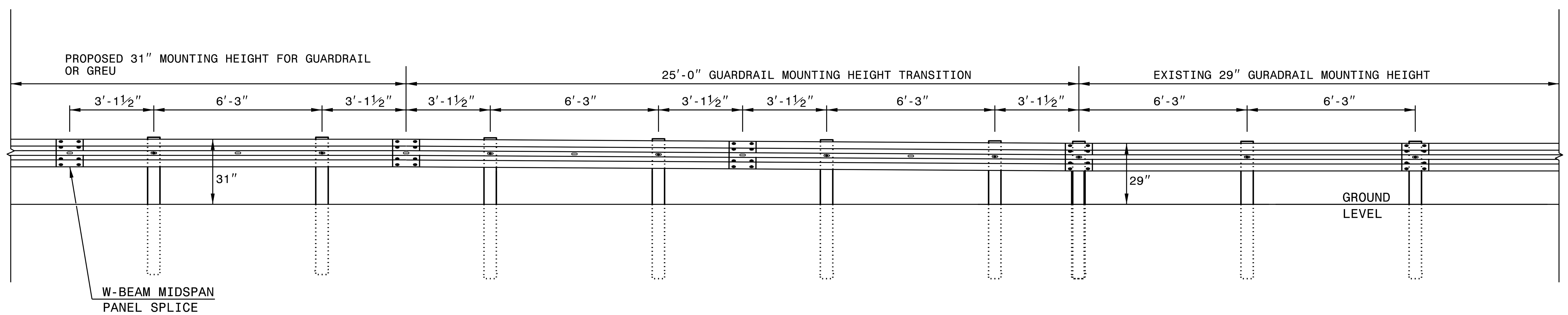
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
30001.WUIM.002	EC-2C-2

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29″, USE AN ADDITIONAL 12′-6″ LONG SECTION OF GUARDRAIL, FOR EVERY 1″ OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31″ GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM 29″ TO 31″ W-BEAM GUARDRAIL MOUNTING HEIGHT

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 9
862D02

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
11/04/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: K. Aldridge DATE: 02-25
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

05-FEB-2025 07:53
U:\Special Details Revisions\862D02 Detail\862D02.dgn
$$$$USERNAME$$$$

11/14/23

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	*STABILIZATION TIME*	*TIMEFRAME EXCEPTIONS*
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

7/22/2025

NOTE: ALL CONSTRUCTION WORK AND STAGING OF MATERIALS SHALL BE CONFINED TO THE AREA INDICATED BY THE SHADING ON THE PLANS.

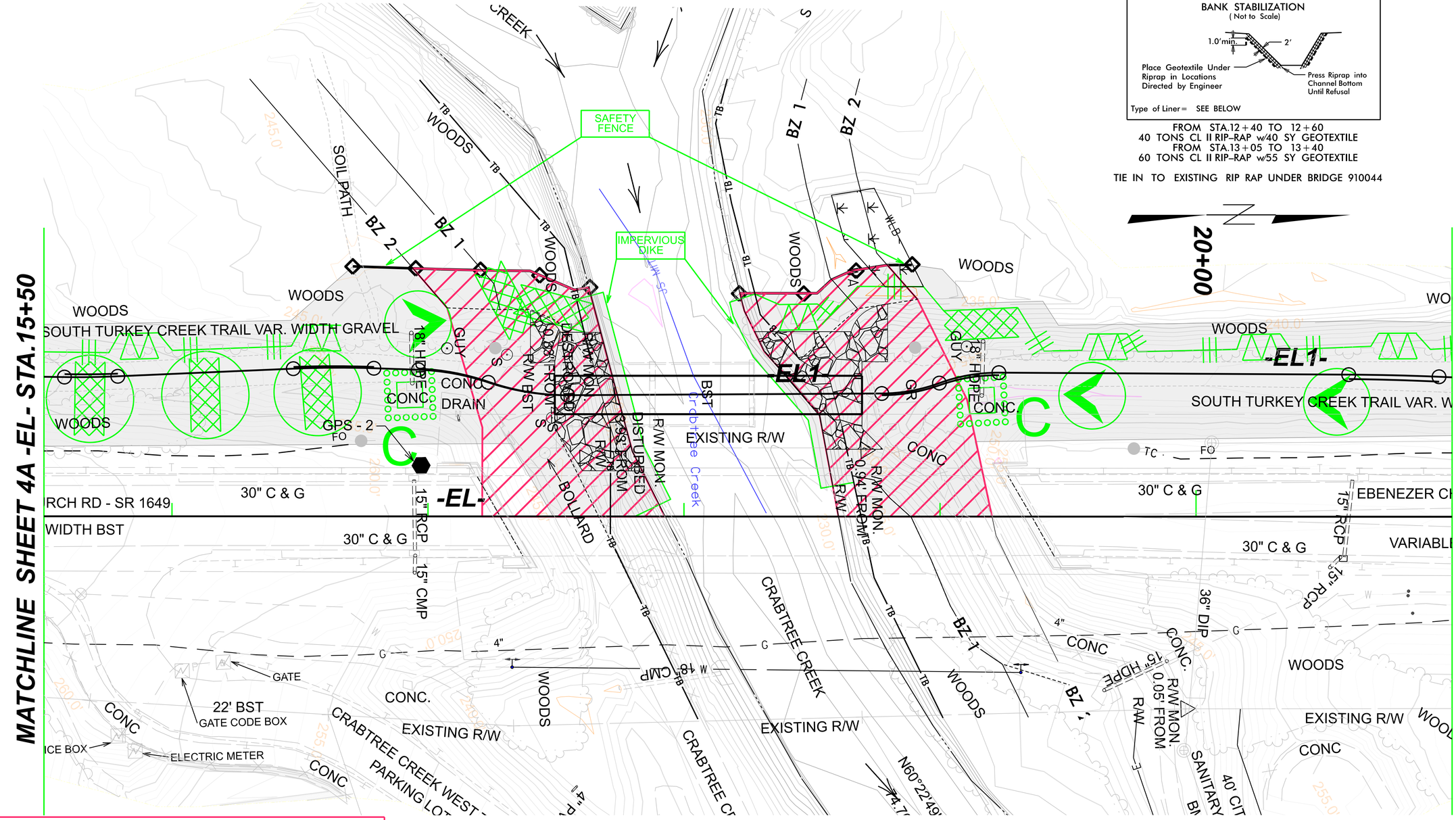
NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE

DETAIL 1
BANK STABILIZATION
(Not to Scale)

Type of Liner = SEE BELOW

FROM STA.12+40 TO 12+60
40 TONS CL II RIP-RAP w/40 SY GEOTEXTILE
FROM STA.13+05 TO 13+40
60 TONS CL II RIP-RAP w/55 SY GEOTEXTILE

TIE IN TO EXISTING RIP RAP UNDER BRIDGE 910044

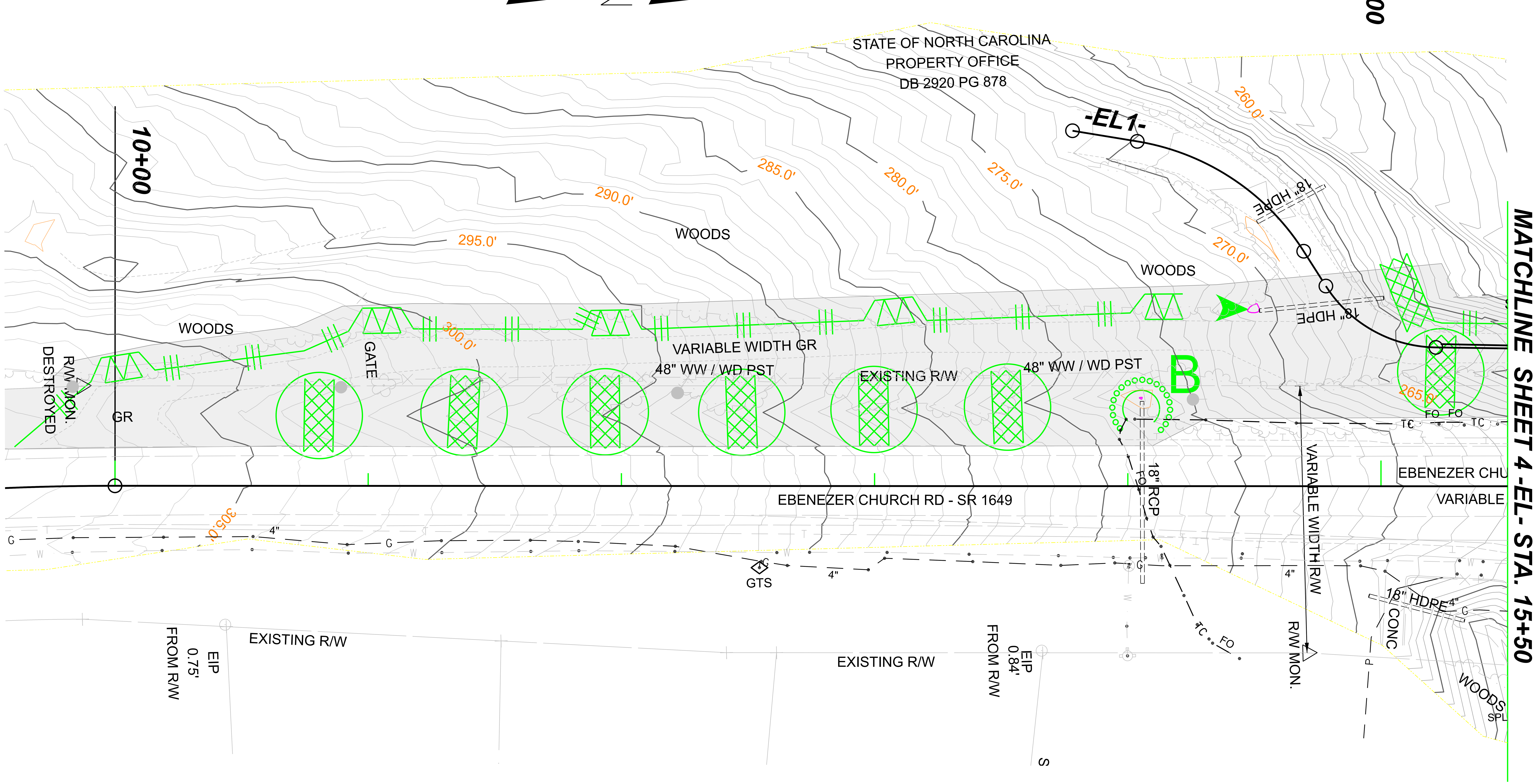


ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE

NOTE: ALL CONSTRUCTION WORK AND STAGING OF MATERIALS SHALL BE CONFINED TO THE AREA INDICATED BY THE SHADING ON THE PLANS.


15+00
10+00
STATE OF NORTH CAROLINA
PROPERTY OFFICE
DB 2920 PG 878
-EL1-
WOODS
WOODS
WOODS
18" HDPE
18" HDPE
VARIABLE WIDTH GR
48" WW / WD PST
48" WW / WD PST
EXISTING R/W
GATE
R/W MON. DESTROYED
GR
B
EBENEZER CHURCH RD - SR 1649
EBENEZER CHU
VARIABLE
18" RCP
VARIABLE WIDTH R/W
R/W MON.
GTS
4"
EXISTING R/W
EXISTING R/W
EIP 0.75' FROM R/W
EIP 0.84' FROM R/W
CONC
WOODS
290.0'
295.0'
285.0'
280.0'
275.0'
270.0'
260.0'
265.0'
300.0'
305.0'
MATCHLINE SHEET 4 -EL- STA. 15+50

11/14/23

30001.WUIM.002

EC-4B

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE

NOTE: ALL CONSTRUCTION WORK AND STAGING OF MATERIALS SHALL BE CONFINED TO THE AREA INDICATED BY THE SHADING ON THE PLANS.

STATE OF NORTH CAROLINA
PROPERTY OFFICE
DB 2920 PG 878

CEDAR RIDGE TRAIL VAR. WIDTH GRAVEL

MATCHLINE SHEET 4 -EL- STA. 21+00

24+54.72

WOODS

WOODS

WOODS

245.0'

-EL1-

IDTH GRAVEL

EXISTING R/W

250.0'

GUY

FO TC FO 36" DIP FO TC

CONC 36" DIP

255.0'

HURCH RD - SR 1649

EBENEZER CHURCH RD - SR 1649

VARIABLE WIDTH R/W

E WIDTH BST

255.0'

30" C & G

255.0'

FO TC

CONC 15" RCP

4" G

GTS

4" TC FO

2"

EIP

FO 0.12'

FROM R/W

TC

EXISTING R/W

EXISTING R/W

TIP PROJECT: 30001.WIUM.002

CONTRACT: _____

VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

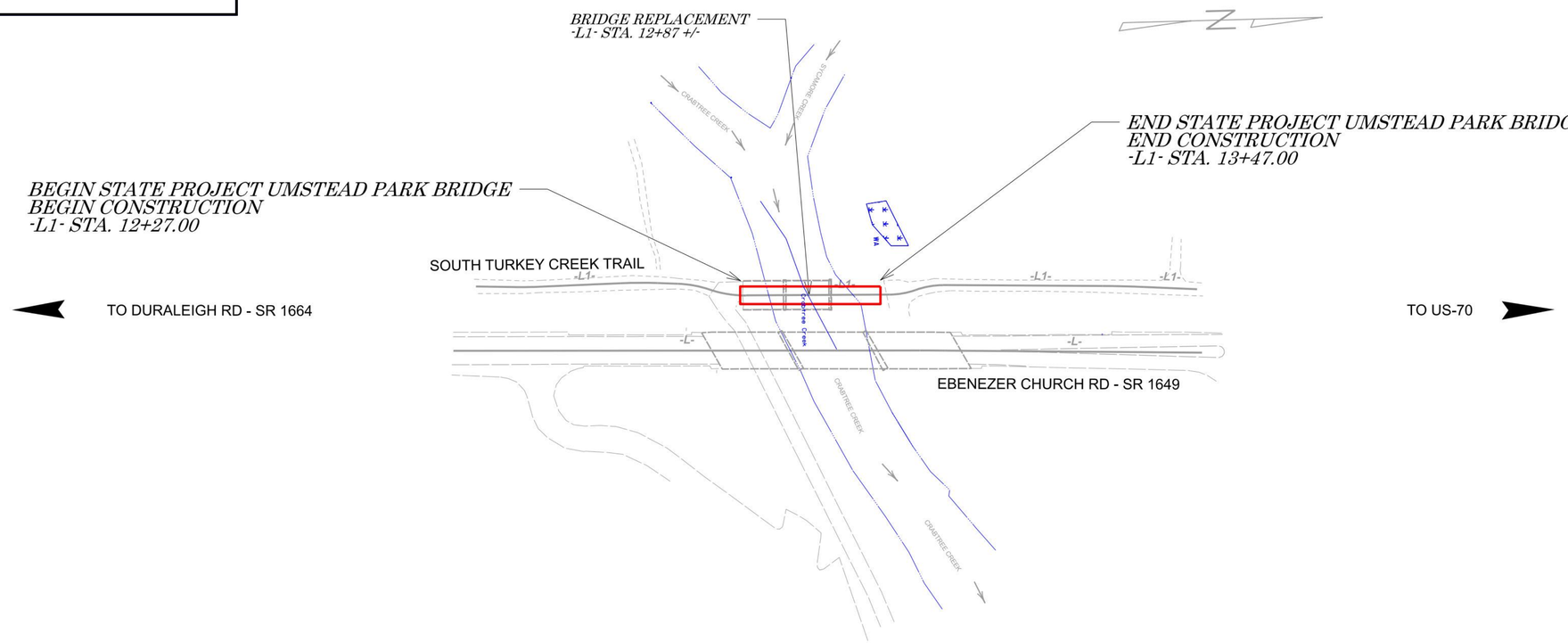
UTILITIES BY OTHERS PLANS
WAKE COUNTY

T.I.P. NO.	SHEET NO.
30001.WIUM.002	UO–1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: BRIDGE 91–1473 OVER CRABTREE CREEK
UMSTEAD STATE PARK
SOUTH TURKEY TRAIL

TYPE OF WORK: POWER AND COMMUNICATIONS RELOCATION



GRAPHIC SCALES

50 25 0 50 100
PLANS

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2 THRU UO–3	*UTILITIES BY OTHERS*

UTILITY OWNERS WITH CONFLICTS

(A) DUKE – POWER
(B) SPECTRUM – COMMUNICATIONS
(C) AT&T – COMMUNICATIONS

PREPARED IN THE OFFICE OF

DIVISISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6987
FAX (919)250–4151

TEVIN ASAMOAH *PROJECT UTILITY ENGINEER*

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699–1555
PHONE (919) 707–6690
FAX (919) 250–4151

NABIL HAMDAN	*UTILITIES REGIONAL ENGINEER*
TEVIN ASAMOAH	*UTILITIES ENGINEER*
TANGA SAMPSON	*UTILITIES AREA COORDINATOR*
TEVIN ASAMOAH	*UTILITIES COORDINATOR*

10/28/24

30001.WUM.002

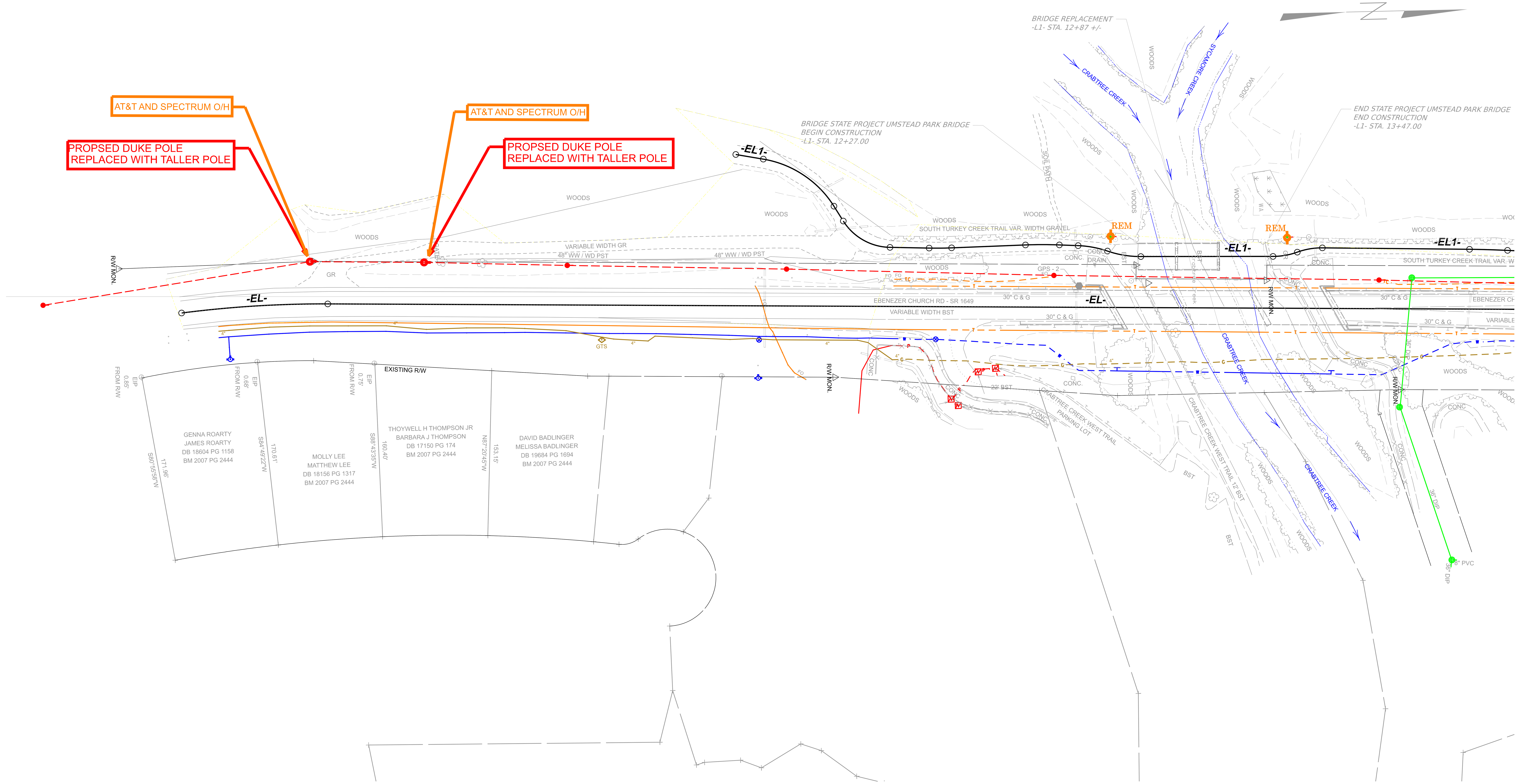
UD-03

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
-- COUNTY

UTILITY DESIGN UNIT

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

10/28/24


AT&T AND SPECTRUM O/H
PROPSED DUKE POLE REPLACED WITH TALLER POLE
AT&T AND SPECTRUM O/H
PROPSED DUKE POLE REPLACED WITH TALLER POLE
BRIDGE REPLACEMENT -L1- STA. 12+87 +/-
BRIDGE STATE PROJECT UMSTEAD PARK BRIDGE BEGIN CONSTRUCTION -L1- STA. 12+27.00
END STATE PROJECT UMSTEAD PARK BRIDGE END CONSTRUCTION -L1- STA. 13+47.00
-EL1-
-EL-
REM
CRABTREE CREEK
SYCAMORE CREEK
SOUTH TURKEY CREEK TRAIL VAR. WIDTH GRAVEL
EBENEZER CHURCH RD - SR 1649
VARIABLE WIDTH BST
VARIABLE WIDTH GR
48" WW / WD PST
EXISTING R/W
R/W MON.
WOODS
GENNA ROARTY
JAMES ROARTY
DB 18604 PG 1158
BM 2007 PG 2444
MOLLY LEE
MATTHEW LEE
DB 18156 PG 1317
BM 2007 PG 2444
THOYWELL H THOMPSON JR
BARBARA J THOMPSON
DB 17150 PG 174
BM 2007 PG 2444
DAVID BADLINGER
MELISSA BADLINGER
DB 19684 PG 1694
BM 2007 PG 2444
CRABTREE CREEK WEST TRAIL PARKING LOT
CRABTREE CREEK WEST TRAIL 12' BST

30001.WIUM.002

UO-02

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
-- COUNTY

UTILITY DESIGN UNIT

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

DESIGNED BY:

DRAWN BY:

CHECKED BY:

APPROVED BY:

REVISED:

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

TIP PROJECT: 30001.WIUM.002

CONTRACT: DE00405

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	30001.WIUM.002		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
30001.WIUM.002	–	P.E.
30001.WIUM.002	–	CONST.

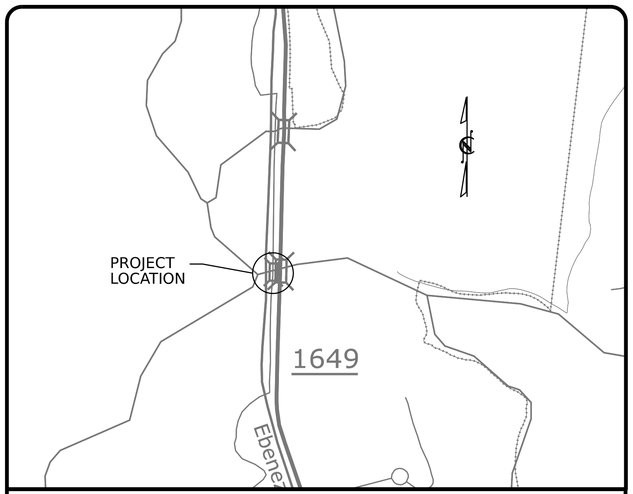
STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

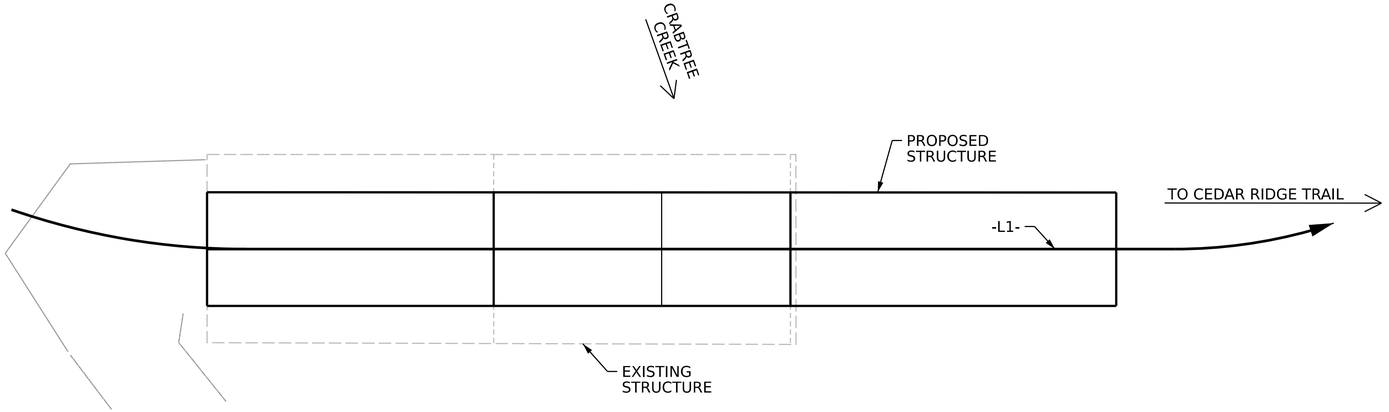
WAKE COUNTY

LOCATION: BRIDGE 911473 ON SOUTH TURKEY CREEK TRAIL OVER CRABTREE CREEK

TYPE OF WORK: TIMBER BRIDGE REPLACEMENT



VICINITY MAP



STRUCTURES

DESIGN DATA

PROJECT LENGTH

LENGTH STRUCTURE TIP PROJECT 30001.WIUM.002 = 0.023 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE :

APRIL 18, 2026

KRISTY W. ALFORD, P.E.

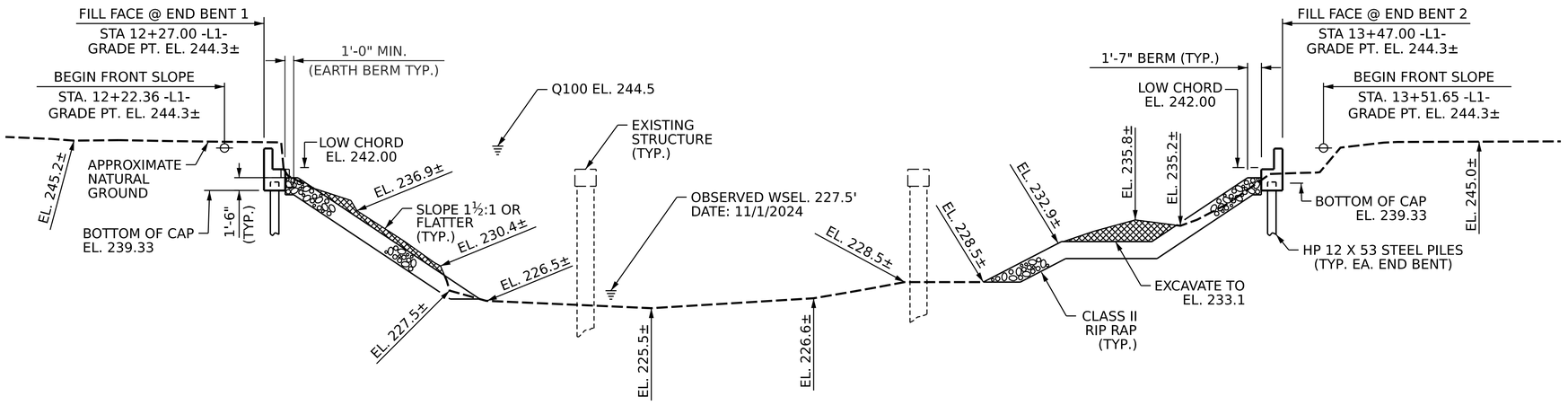
PROJECT ENGINEER

5/26/20

12+00 12+50 13+00 13+50 14+00

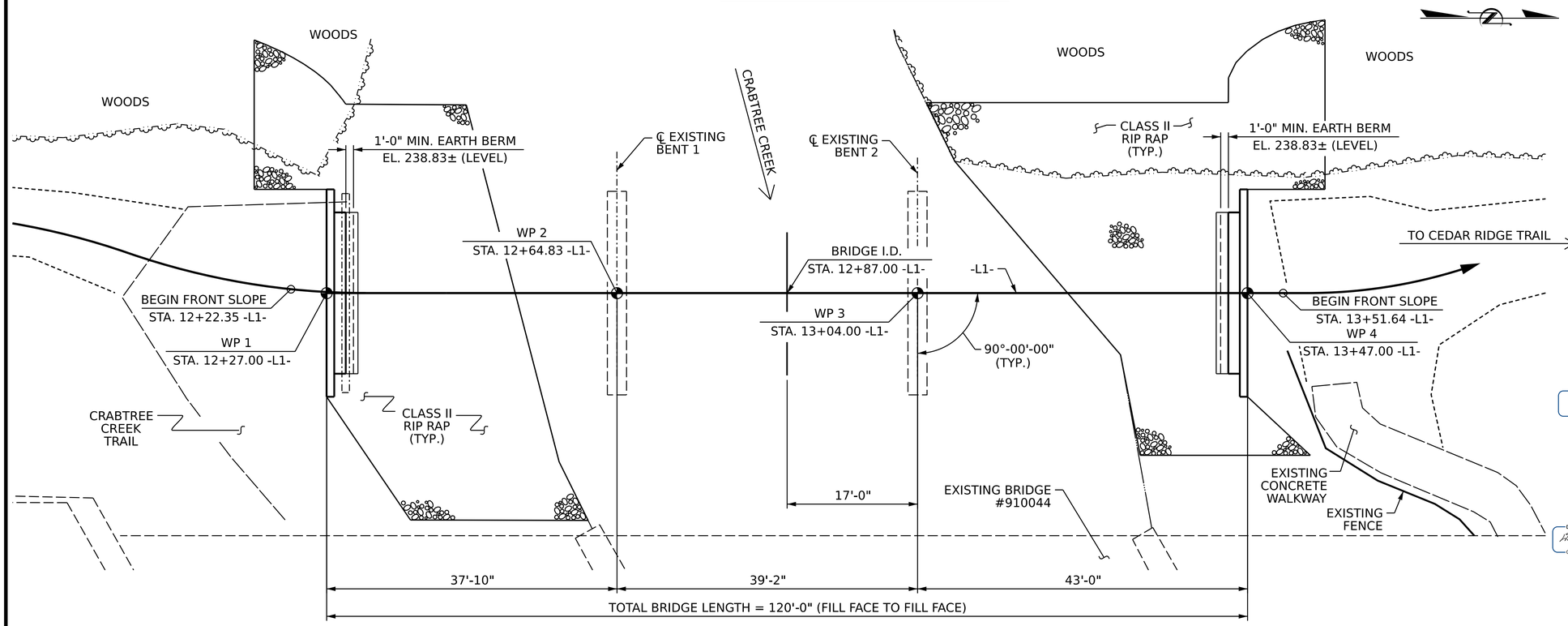
SPAN A SPAN B SPAN C

FIX. EXP. FIX. EXP. EXP. FIX.



END BENT 1 BENT 1 BENT 2 END BENT 2

SECTION ALONG -L1-



PLAN

(PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY)

NOTES

RETAIN EXISTING GRADE.

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ROUTINE INSPECTION REPORT, DATED 10/10/2023.

UNCLASSIFIED STRUCTURE EXCAVATION

DocuSigned by: F245838930BF40E...
NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER TIFFANY W. ALFORD
11/19/2025

DocuSigned by: CC466456CC8A4C1...
NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER DOUGLAS R. SHACKELFORD JR.
11/19/2025

DRAWN BY : P.D. BRYANT DATE : 05/2025
CHECKED BY : D. SHACKELFORD DATE : 05/2025
DESIGN ENGINEER OF RECORD: P.D. BRYANT DATE : 05/2025

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 30001.WIUM.002
WAKE COUNTY
STATION: 12+87.00 -L1-
SHEET 1 OF 4 REPLACES BRIDGE #911473

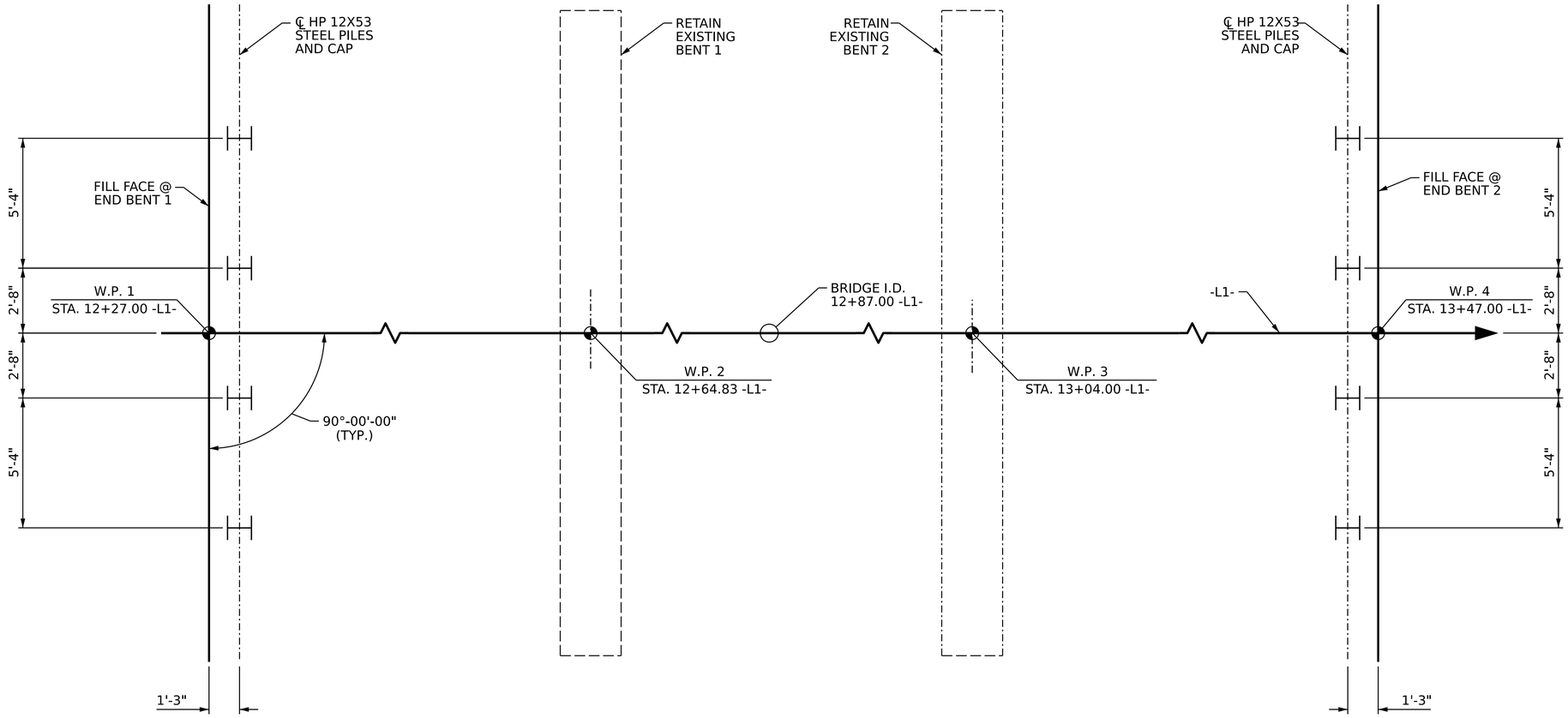
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SOUTH TURKEY CREEK TRAIL OVER CRABTREE CREEK BETWEEN CRABTREE CREEK TRAIL AND CEDAR RIDGE TRAIL

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

8/26/21



END BENT 1

END BENT 2

FOUNDATION LAYOUT PLAN

NOTES

ALL PILES IN ABUTMENTS ARE HP 12 X 53 STEEL PILES.

DIMENSIONS LOCATING THE PILES ARE SHOWN TO THE PILE CENTERLINES.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILE DRIVING LEADS ARE NOT REQUIRED TO INSTALL PILES AT THE END BENTS.

PILES SHALL BE INSTALLED USING A VIBRATORY HAMMER AND A DROP HAMMER WITH A MINIMUM RAM WEIGHT OF 1,000 POUNDS. A DROP HEIGHT OF AT LEAST THREE FEET SHALL BE ATTAINABLE WITH THE DROP HAMMER. THE CONTRACTOR SHALL SUBMIT A HAMMER DRIVING SYSTEM FOR APPROVAL BY THE ENGINEER PROVIDING DETAILED DRAWINGS AND/OR SPECIFICATION SHEETS FOR THE VIBRATORY AND DROP HAMMER.

USE OF CONSTRUCTION EQUIPMENT SUCH AS AN OFF-ROAD CRANE OR EXCAVATOR TO DRIVE PILES USING VIBRATORY AND DROP HAMMER METHODS IS ACCEPTABLE. THE CONTRACTOR SHALL PROVIDE DETAILS OF MEANS AND METHODS TO DRIVE THE PILES WITHIN THE HAMMER DRIVING SYSTEM SUBMITTAL.

ACCEPTABLE PENETRATION AND PILE BEARING WILL BE DETERMINED BY USING DYNAMIC PILE TEST EQUIPMENT AND A PROVIDED DRIVE CRITERIA AND/OR MINIMUM PILE TIP ELEVATION REQUIREMENT FOR THE REMAINING (NON-TESTED) PRODUCTION PILES.

THE FIRST PRODUCTION PILE SHALL BE TESTED USING DYNAMIC PILE TESTING EQUIPMENT. THE PILE SHALL BE INSTALLED IN SEGMENT LENGTHS OF 10 FEET. A VIBRATORY HAMMER SHALL BE USED TO INSTALL THE PILE TO REFUSAL. THE DROP HAMMER SHALL THEN BE PLACED ON THE PILE TO COMPLETE PILE INSTALLATION AND CONFIRM ACCEPTABLE PENETRATION AND BEARING IS ACHIEVED. DYNAMIC PILE TESTING SHALL BE PERFORMED ONLY WHEN USING THE DROP HAMMER TO INSTALL THE PILES.

PRODUCTION PILES SHALL BE INSTALLED IN ACCORDANCE TO THE RECOMMENDATIONS OUTLINED IN THE DRIVE CRITERIA PROVIDED IN THE DYNAMIC PILE TESTING REPORT.

AT LEAST ONE SPLICE PER PILE SHALL BE ANTICIPATED FOR THE PILES AT END BENT NO. 2. IF THE CONTRACTOR ELECTS TO USE SEGMENT LENGTHS LESS THAN 10 FEET, ADDITIONAL SPLICES MAY BE REQUIRED.

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

SHEET 2 OF 4

DocuSigned by: Timothy Shackelford
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NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER T. R. SHACKELFORD

03/05/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SOUTH TURKEY CREEK TRAIL OVER CRABTREE CREEK BETWEEN CRABTREE CREEK TRAIL AND CEDAR RIDGE TRAIL

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

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ASSEMBLED BY:	P.D. BRYANT	DATE :	04/2025
CHECKED BY :	D. SHACKELFORD	DATE :	04/2025
DRAWN BY :			
CHECKED BY :			

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$$$$USERNAME$$$$

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1, Piles 1-4	4	70	240.33	10			120							
End Bent 2, Piles 1-4	4	70	240.33	20			120							
TOTAL QUANTITY:														

$$* RDR = \frac{Factored\ Resistance + Factored\ Drag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + Nominal\ Resistance\ from\ Scourable\ Material$$

** Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-4	70			0.60		
End Bent 2, Piles 1-4	70			0.60		

* Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
End Bent 1, Piles 1-4				4
End Bent 2, Piles 1-4				4
TOTAL QUANTITY:				8

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
End Bent No.1	20	1
End Bent No.2		
TOTAL QUANTITY:		1

Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT

* EST = Pile order lengths from estimated pile lengths; DPT = Pile order lengths based on Dynamic Pile Testing. For groups of end bents/bents with pile order lengths based on DPT testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the DPT.

PROJECT NO. 30001.WIUM.002

Wake COUNTY

STATION: 12+87 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Jinyoung Park, #032171) on 02-17-2026.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.

NORTH CAROLINA PROFESSIONAL SEAL #029441 ENGINEER KRISTY ALFORD

SIGNATURE DATE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

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

8/26/21

NOTES

ASSUMED LIVE LOAD = 90 PSF

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, ON SHEET 1 OF 4, 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.

REMOVAL OF THE EXISTING BRIDGE 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 BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS. EXISTING BRIDGE SHALL BE REMOVED ENTIRELY EXCEPT THAT ALL INTERIOR BENTS SHALL BE RETAINED AND REUSED.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED WITH SYSTEM 1 OR GALVANIZED IN ACCORDANCE WITH THE STRUCTURAL STEEL COATINGS PROGRAM AND SECTION 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.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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.

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.

WORK BRIDGES OR TEMPORARY CAUSEWAYS THAT IMPACT THE STREAM WILL NOT BE ALLOWED. IF THE CONTRACTOR WISHES TO USE THE REMNANT BRIDGE OR NEW BRIDGE SPANS FOR TOP-DOWN CONSTRUCTION, CRANE LOADS MSUT BE SUBMITTED TO STRUCTURES MANAGEMENT FOR EVALUATION.

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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, 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 SHANK WILL PENETRATE RECEIVING MEMBERS.

FOR TIMBER BRIDGE RAIL AND TIMBER BRIDGE DECK SYSTEMS, SEE TIMBER BRIDGE SUPERSTRUCTURE ON STEEL BEAMS SPECIAL PROVISION.

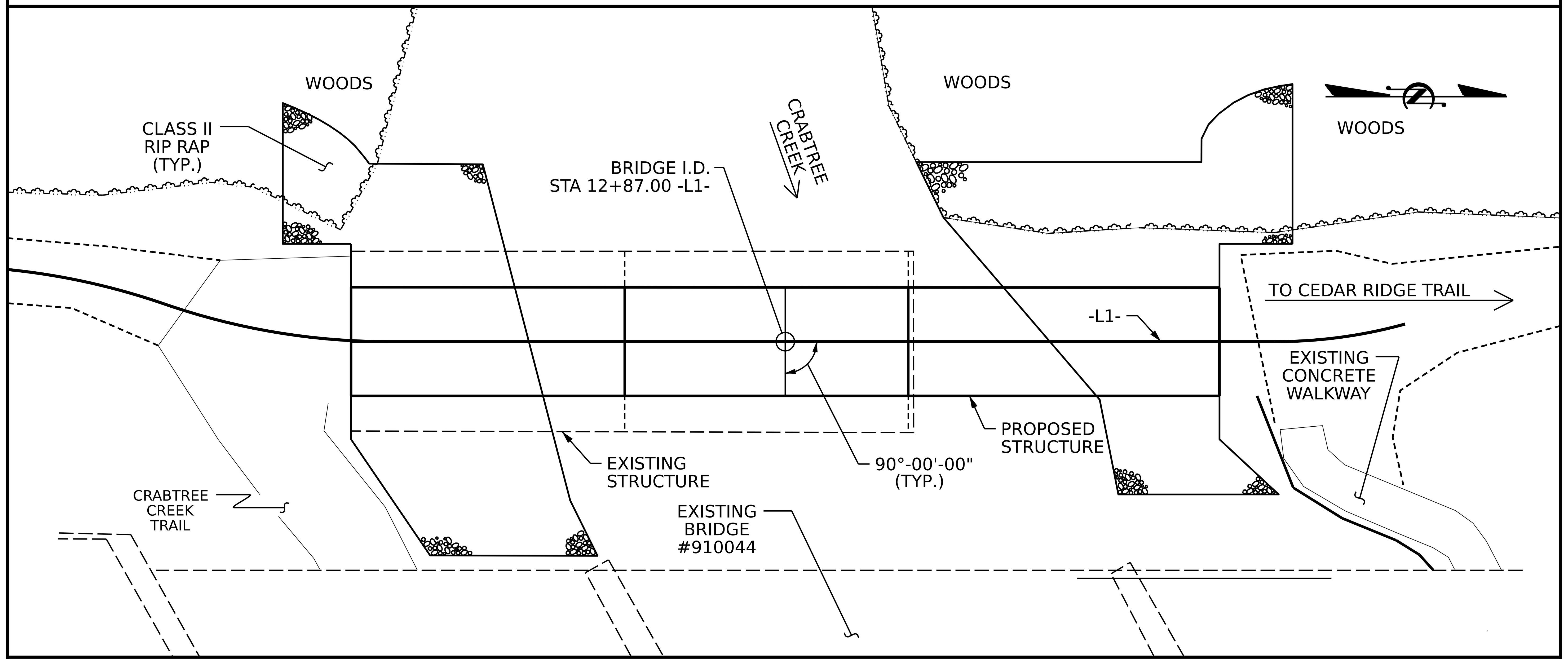
FOR ASBESTOS ASSESSMENT,SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+87.00 -L-".

HYDRAULIC DATA

DRAINAGE AREA = 76.6 SQ. MI.
BASE DISCHARGE (Q100) = 10,800 SQ. MI.

B.M. GPS-2 NORTHING 2081669.865 EASTING 762645.0495 ELEVATION 259.155 FT DATUM NAVD88



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	UNCLASSIFIED STRUCTURE EXCAVATION	REMOVAL OF EXISTING STRUCTURE @ STA. 12+87.00 -L1-	ASBESTOS ASSESSMENTS	CLASS A CONCRETE	REINFORCING STEEL	APPROX. 10,838 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTO-MERIC BEARINGS	TIMBER DECK SYSTEM	TIMBER BRIDGE RAIL SYSTEM
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LUMP SUM	No.	No.	LIN. FT.	EACH	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE															117.7
ABUTMENT 1				8.5	1397		4	4	40	4	319	355			
ABUTMENT 2				8.5	1397		4	4	80	4	329	365			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	17.0	2794	LUMP SUM	8	8	120	8	648	720	LUMP SUM	LUMP SUM	117.7

PROJECT NO. 30001.WIUM.002
WAKE COUNTY
STATION: 12+87.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SOUTH TURKEY CREEK TRAIL OVER CRABTREE CREEK BETWEEN CRABTREE CREEK TRAIL AND CEDAR RIDGE TRAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 45689 DOUGLAS R. SHACKELFORD, JR.
03/05/2026

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ASSEMBLED BY:	P. BRYANT	DATE:	08/2025
CHECKED BY:	D. SHACKELFORD	DATE:	09/2025
DRAWN BY: BNB	4/24		
CHECKED BY: JDH	10/24		

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

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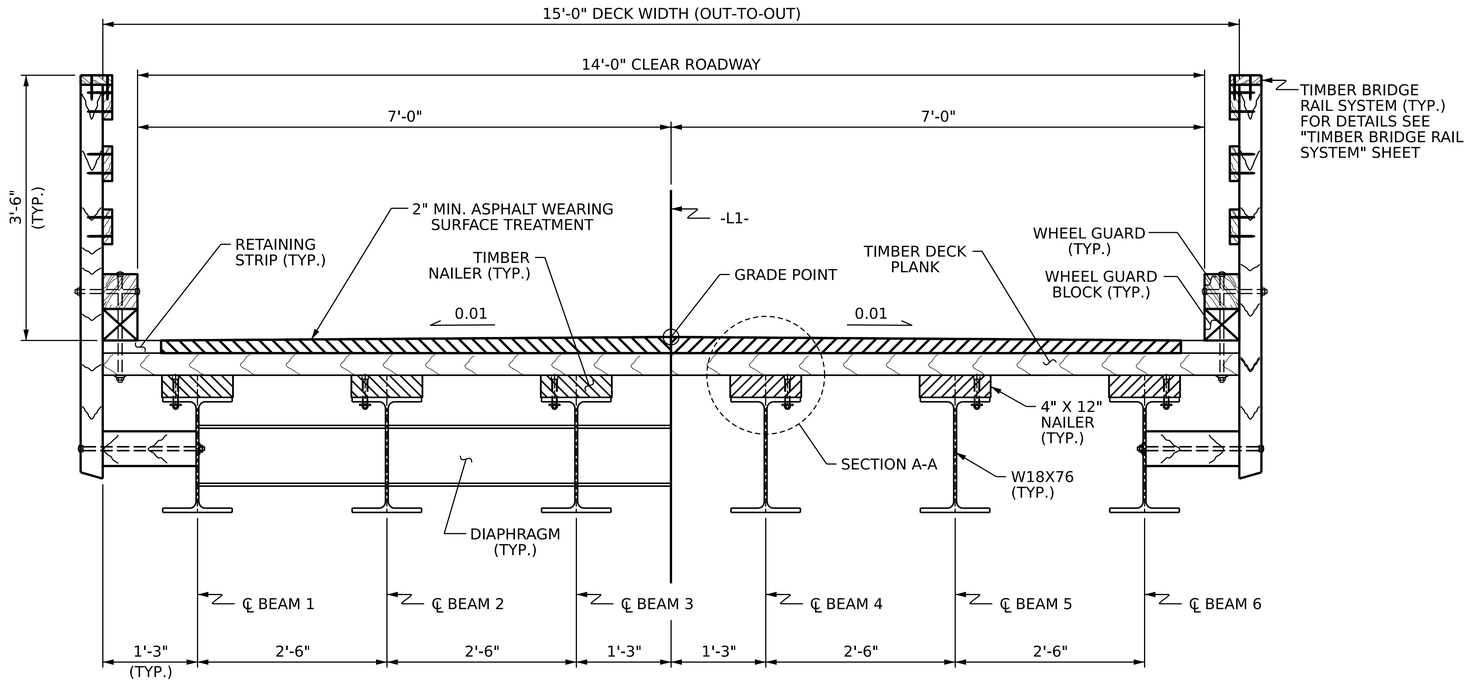
8/26/21



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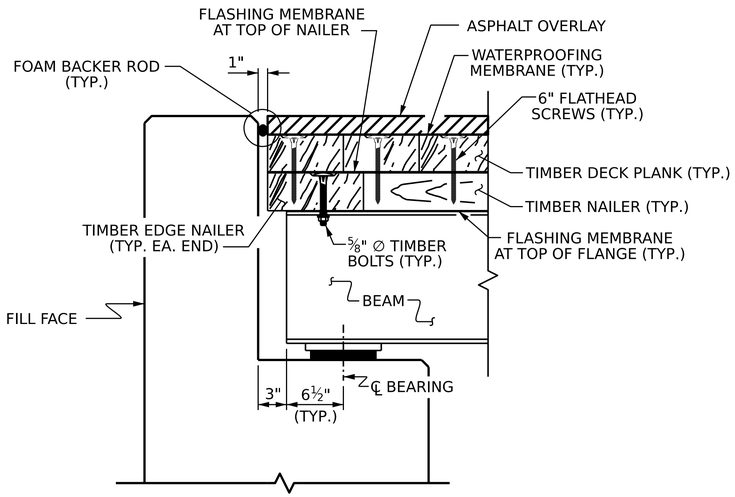

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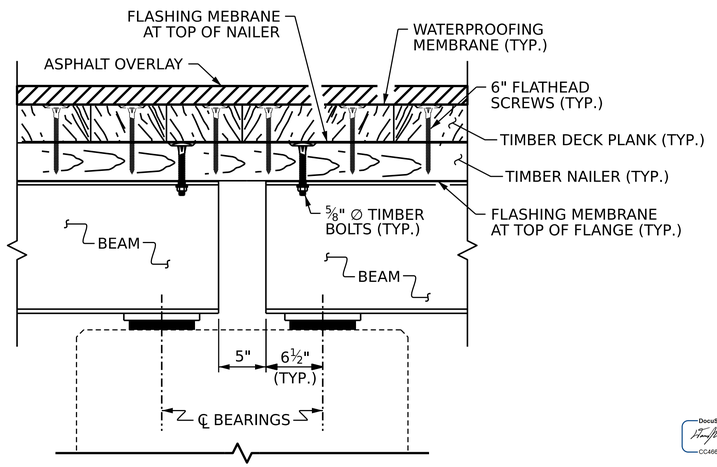

SECTION BENT

NOTES

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

FOR TIMBER BRIDGE RAIL SYSTEM DETAILS, SEE TIMBER BRIDGE RAIL SYSTEM PLAN SHEET.

PRIOR TO PLACING TIMBER BEAM NAILER AND EDGE NAILER MEMBERS, PLACE A FLASHING MEMBRANE ON THE TOP SIDE OF THE STEEL BEAMS.

PRIOR TO PLACING TIMBER PLANK MEMBERS, PLACE A SELF-ADHERING FLASHING MEMBRANE ON THE TOP SIDE OF THE TIMBER NAILERS.

FOR BEAM AND DIAPHRAGM DETAILS, SEE FRAMING PLAN SHEETS.

FOR SECTION A-A, SEE "PLAN OF SPAN DETAILS" SHEET

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

DocuSigned by: CC486456CC8A4C1...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER DOUGLAS R. SHACKELFORD

11/19/2025

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			17

DRAWN BY : P.D.BRYANT DATE : 03/2025
CHECKED BY : D. SHACKELFORD DATE : 03/2025
DESIGN ENGINEER OF RECORD: D. SHACKELFORD DATE : 03/2025

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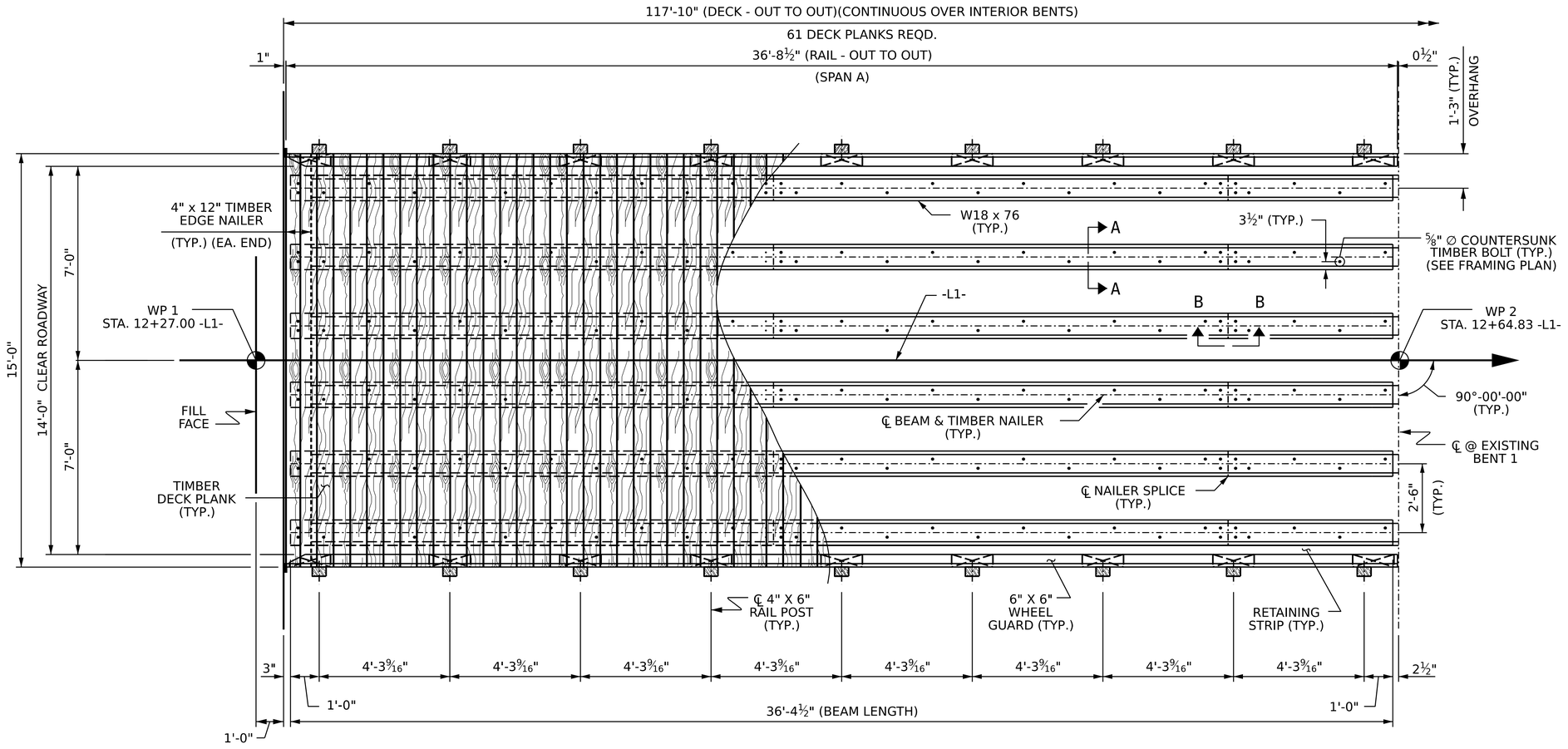
8/26/21



END BENT 1

EXISTING BENT 1

DECK LAYOUT

(DIAPHRAGMS NOT SHOWN FOR CLARITY)

NOTES

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

STAGGER TIMBER DECK PLANKS 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 BOLTS 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.

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE

PLAN OF SPAN A
14'-0" CLEAR ROADWAY
90° SKEW

DocuSigned by: CC466456CC8A4...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER P. SHACKELFORD

11/19/2025

ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
CHECKED BY :	P. BRYANT	DATE :	04/2025
DRAWN BY :	BNB		4/24
CHECKED BY :	JDH		10/24

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2			4		

SHEET NO. S-6

TOTAL SHEETS 17

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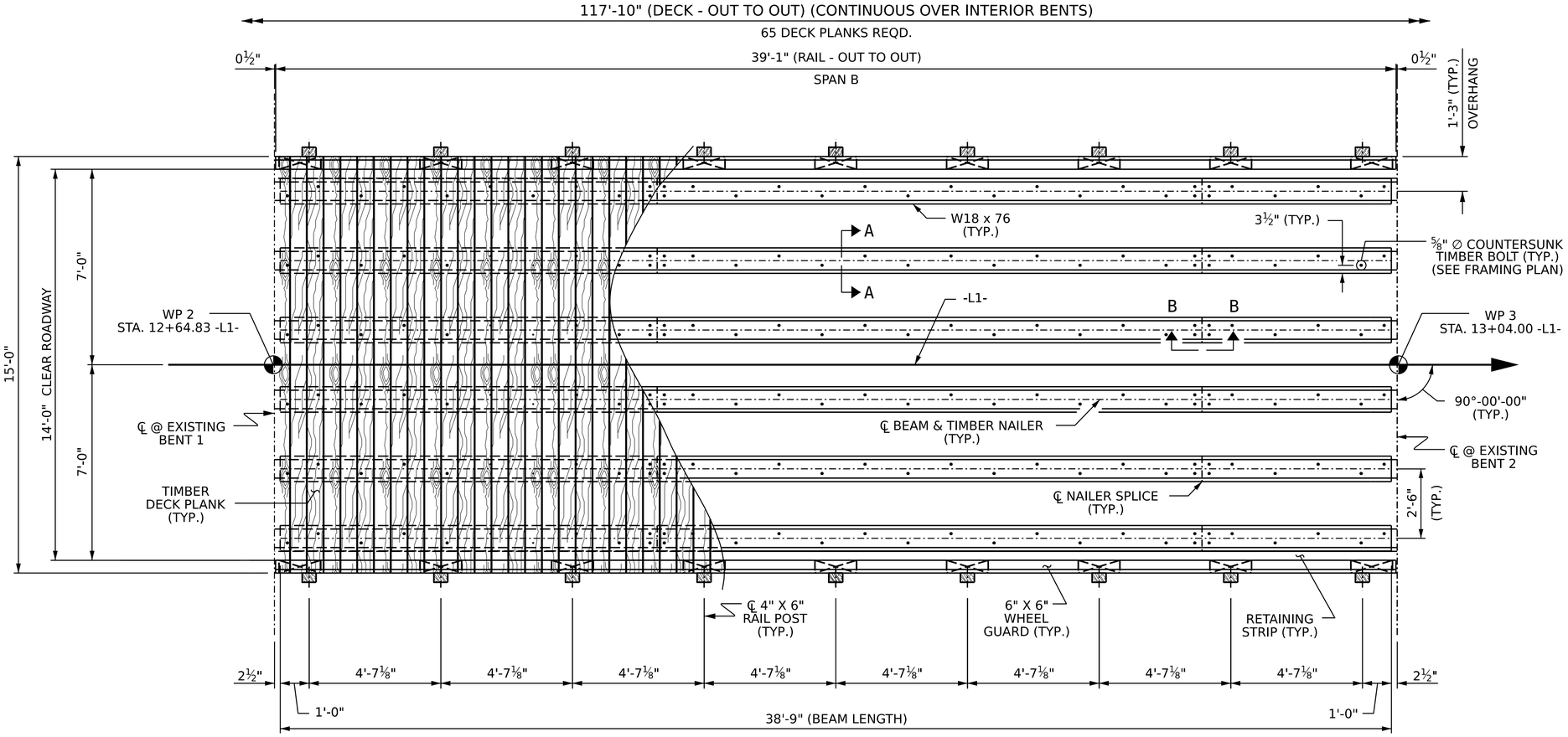
8/26/21



EXISTING BENT 1

EXISTING BENT 2

DECK LAYOUT

(DIAPHRAGMS NOT SHOWN FOR CLARITY)

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE

PLAN OF SPAN B
14'-0" CLEAR ROADWAY
90° SKEW

DocuSigned by: Douglas Shackelford
CC466456CC8A4...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER DOUGLAS R. SHACKELFORD

11/19/2025

ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
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CHECKED BY :	JDH		10/24

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			17

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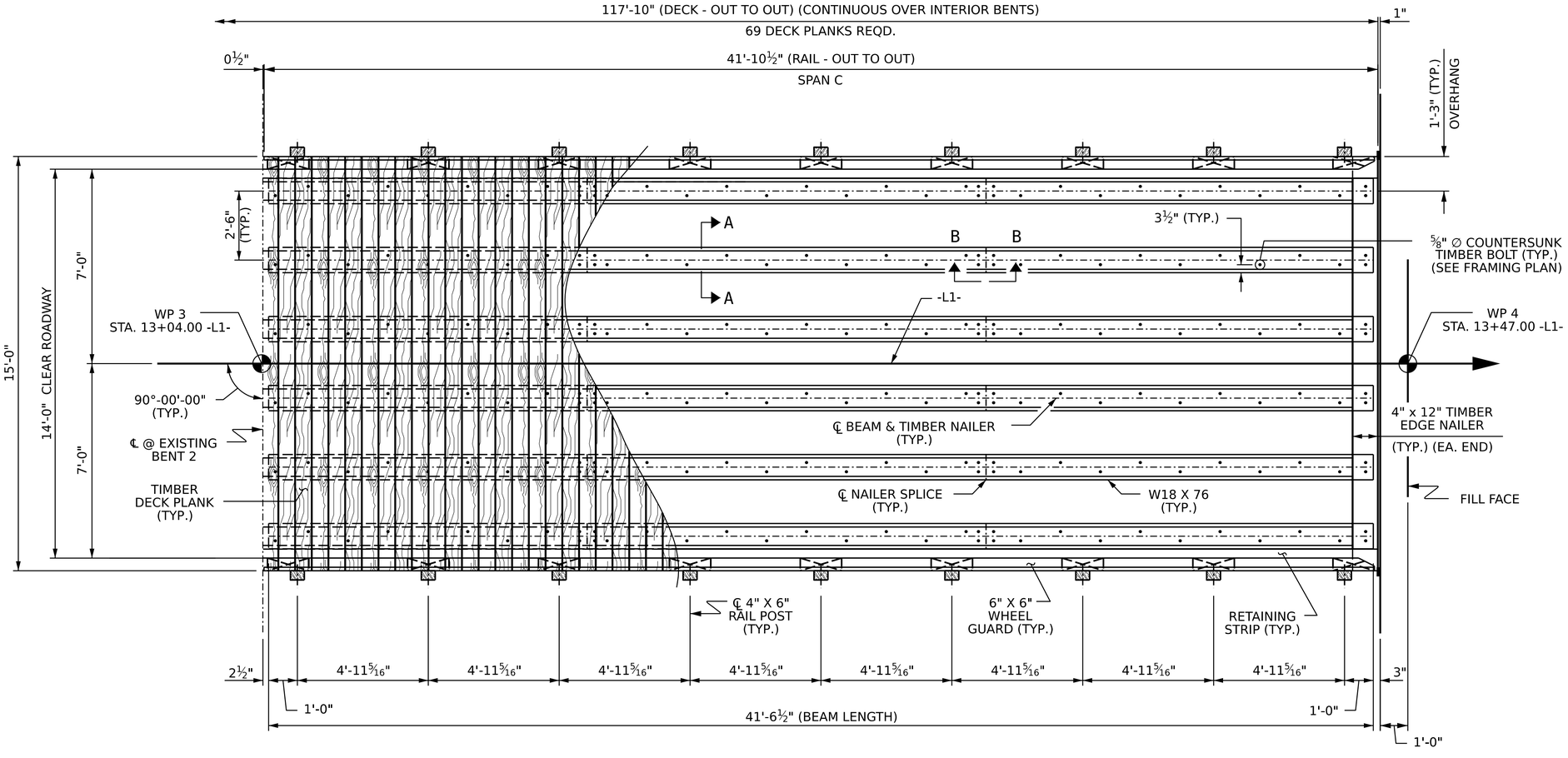
8/26/21



EXISTING BENT 2

END BENT 2

DECK LAYOUT

(DIAPHRAGMS NOT SHOWN FOR CLARITY)

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE

PLAN OF SPAN C
14'-0" CLEAR ROADWAY
90° SKEW

DocuSigned by: CC4664566CC8...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER D. SHACKELFORD

11/19/2025

ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			17

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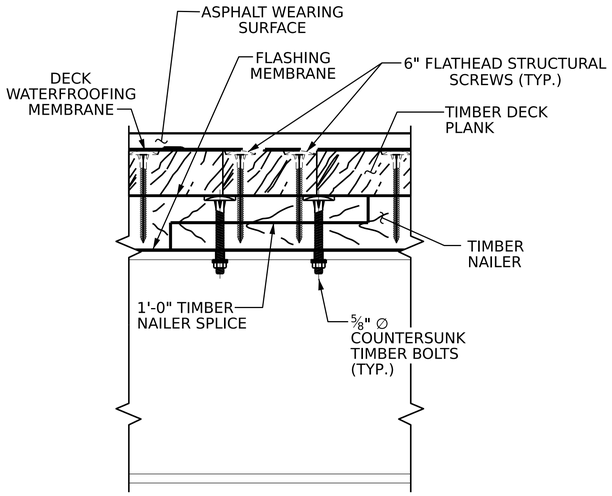
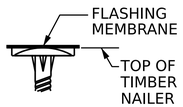
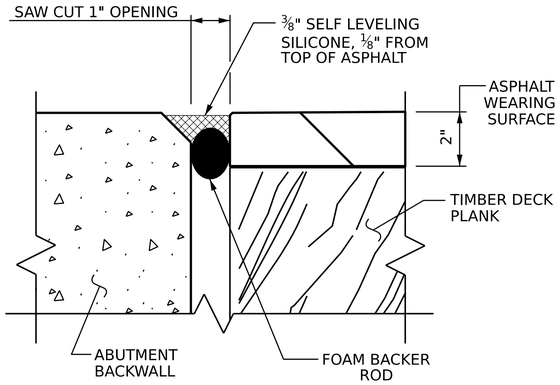


SECTION B-B

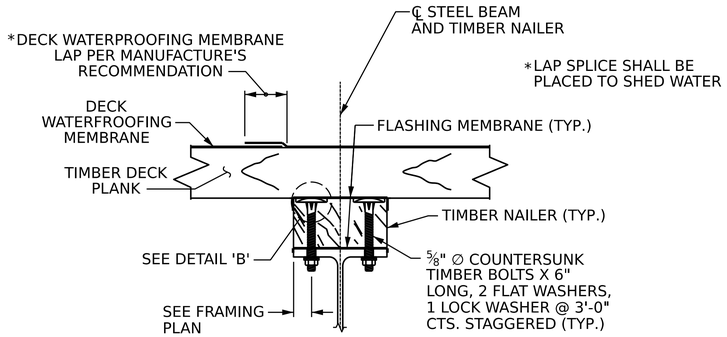
NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS



DETAIL 'B'

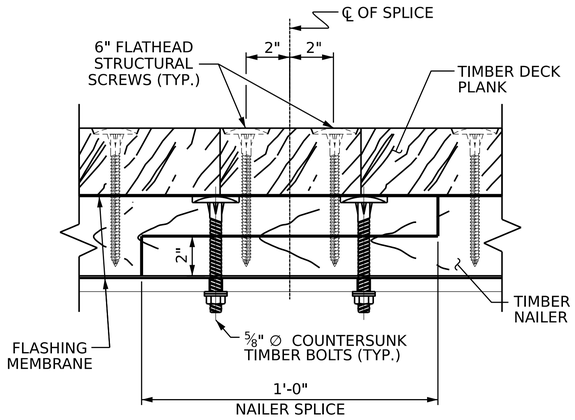


PROPOSED POURABLE SILICONE JOINT DETAIL



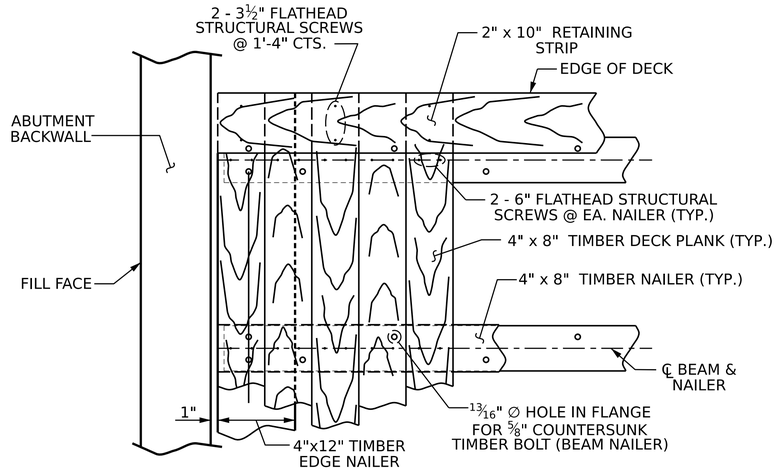
SECTION A-A

TIMBER NAILER ATTACHMENT DETAILS

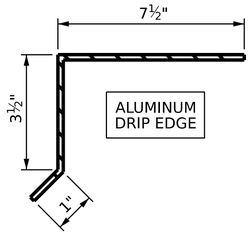


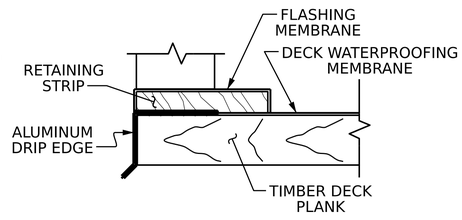
NAILER SPLICE DETAILS

NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS



TYPICAL DECK DETAIL AT ABUTMENT





DRIP EDGE DETAILS

POST AND BOLTS NOT SHOWN FOR CLARITY

BILL OF MATERIAL

TREATED LUMBER	SPAN 'A'		SPAN 'B'		SPAN 'C'	
ITEM	SIZE	LIN. FT.	SIZE	LIN. FT.	SIZE	LIN. FT.
RETAINING STRIP	2"x10"	72.9	2"x10"	77.7	2"x10"	83.3
TIMBER DECK PLANKS	4"x8"	915.0	4"x8"	975.0	4"x8"	1035.0
TIMBER NAILERS	4"x12"	218.3	4"x12"	235.0	4"x12"	245.9
TIMBER EDGE NAILERS	4"x12"	15.0	4"x12"	0.0	4"x12"	15.0
TOTAL TREATED LUMBER	1221.2 LIN. FT.		1287.7 LIN. FT.		1379.2 LIN. FT.	

FLASHING MEMBRANE						
ITEM	SIZE	LIN. FT.	SIZE	LIN. FT.	SIZE	LIN. FT.
TOP OF BEAM	25 MILS	218.3	25 MILS	232.5	25 MILS	249.3
TOP OF TIMBER NAILERS	25 MILS	214.8	25 MILS	235.0	25 MILS	245.8
TOP OF TIMBER EDGE NAILERS	25 MILS	15.0	25 MILS	0.0	25 MILS	15.0
SURFACE OF RETAINING STRIP	25 MILS	72.9	25 MILS	77.7	25 MILS	83.0
FLASHING MEMBRANE	521.0 LIN. FT.		545.2 LIN. FT.		510.9 LIN. FT.	

HARDWARE										
ITEM		No.	SIZE	LBS.	No.	SIZE	LBS.	No.	SIZE	LBS.
⅜" ∅ TIMBER BOLTS	1.4	204	⅝"	286.0	204	⅝"	286.0	222	⅝"	310.8
HEAVY HEX NUTS	0.12	204	⅝"	24.5	204	⅝"	24.5	222	⅝"	26.64
STANDARD WASHER	0.126	408	⅝"	49.0	408	⅝"	49.0	432	⅝"	54.4
LOCK WASHER	0.126	204	⅝"	25.7	204	⅝"	25.7	222	⅝"	28.0
FLAT HEAD STR. SCREWS	0.02	124	3½"	2.5	132	3½"	2.6	140	3½"	2.8
FLAT HEAD STR. SCREWS	0.042	732	6"	30.7	780	6"	32.8	828	6"	34.8
HARDWARE FOR CONNECTIONS		418.4 LBS.			420.6 LBS.			457.4 LBS.		

DECK WATERPROOFING MEMBRANE						
ITEM	SIZE	SQ. YDS	SIZE	SQ. YDS	SIZE	SQ. YDS
DECK WATERPROOFING MEMBRANE	65 MILS.	61.3	65 MILS.	65.3	65 MILS.	69.9

DRIP EDGE						
22 GA. ALUMINUM DRIP EDGE	SIZE	LIN. FT.	SIZE	LIN. FT.	SIZE	LIN. FT.
	1'-0"	73.5	1'-0"	78.3	1'-0"	83.8
POURABLE SILICONE JOINT	60.0 LIN. FT					

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

SHEET 4 OF 4

DocuSigned by: CC466456CC8A4... 11/19/2025

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER DOUGLAS R. SHACKELFORD

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE

PLAN OF SPAN DETAILS

ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
CHECKED BY :	K. ALFORD	DATE :	10/2025
DRAWN BY :	BNB		4/24
CHECKED BY :	JDH		10/24

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

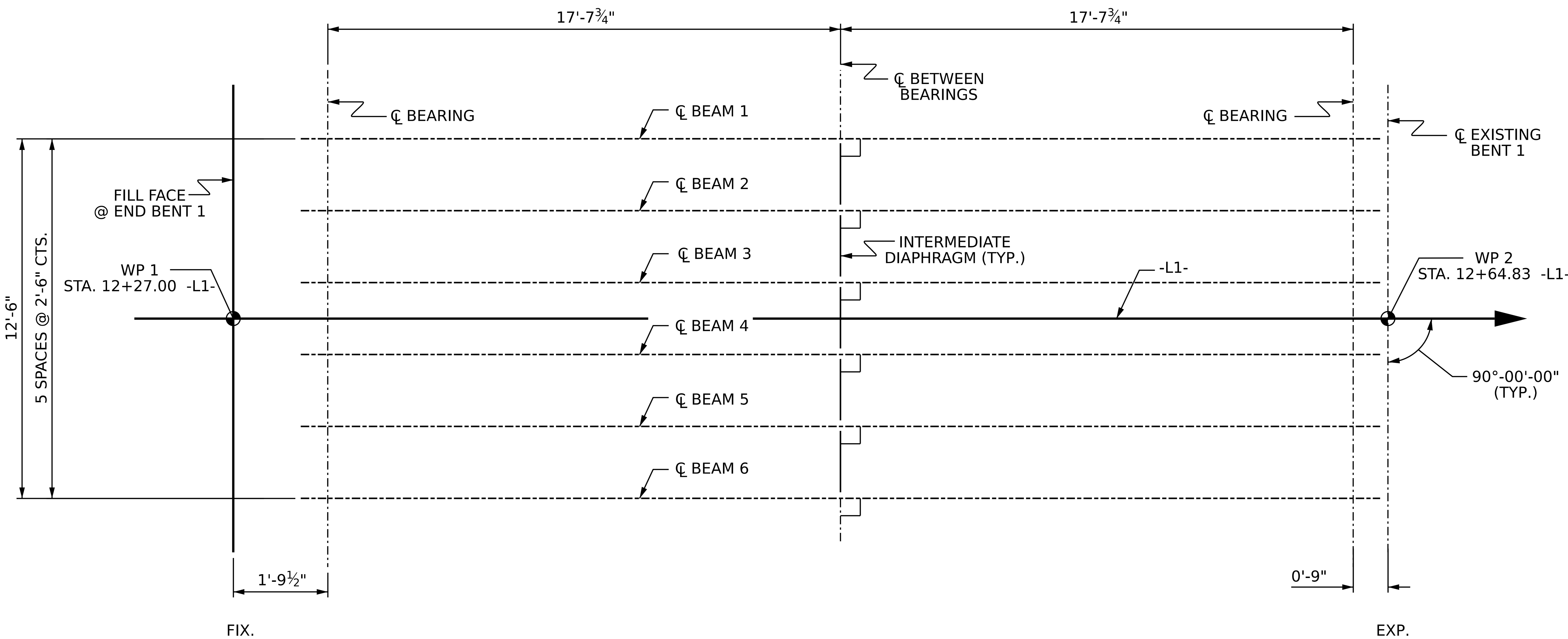
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-9

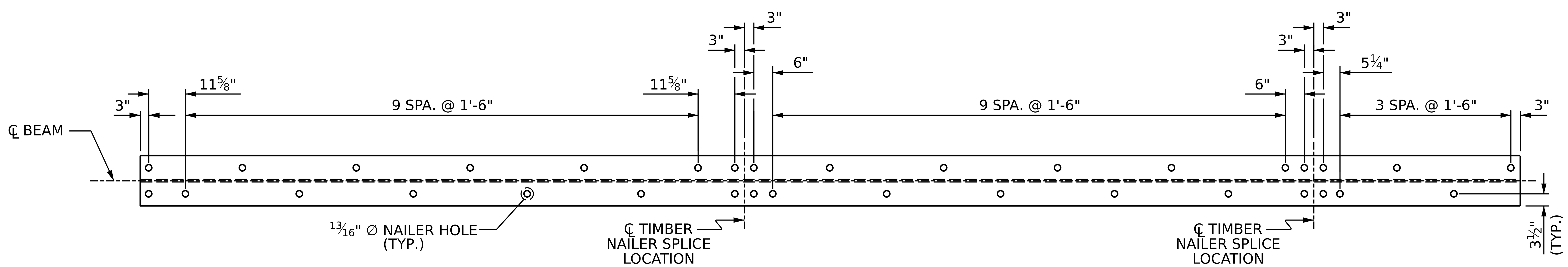
TOTAL SHEETS 17

STD. TB_PS_DETAILS

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



FRAMING PLAN



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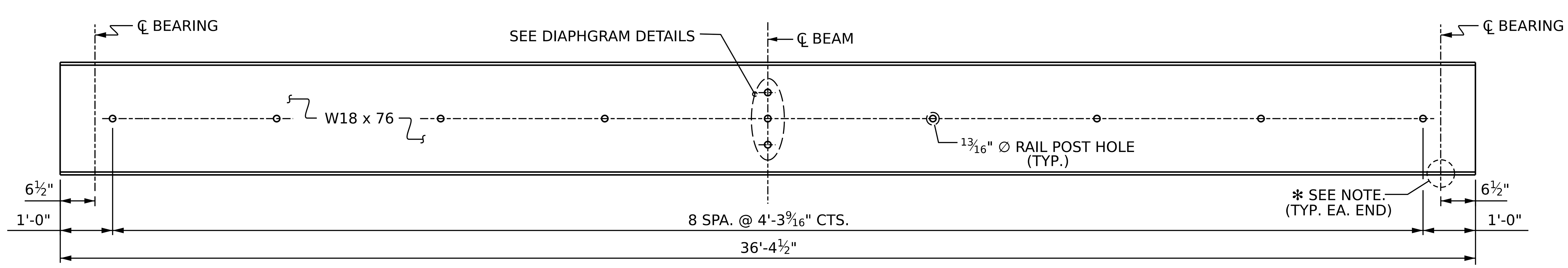


ELEVATION
(SHOWING RAIL POST HOLES FOR EXTERIOR BEAMS
INTERIOR BEAMS ARE SIMILAR BUT WITHOUT RAIL POST HOLES)

BEAM DETAILS

NOTES

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

NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

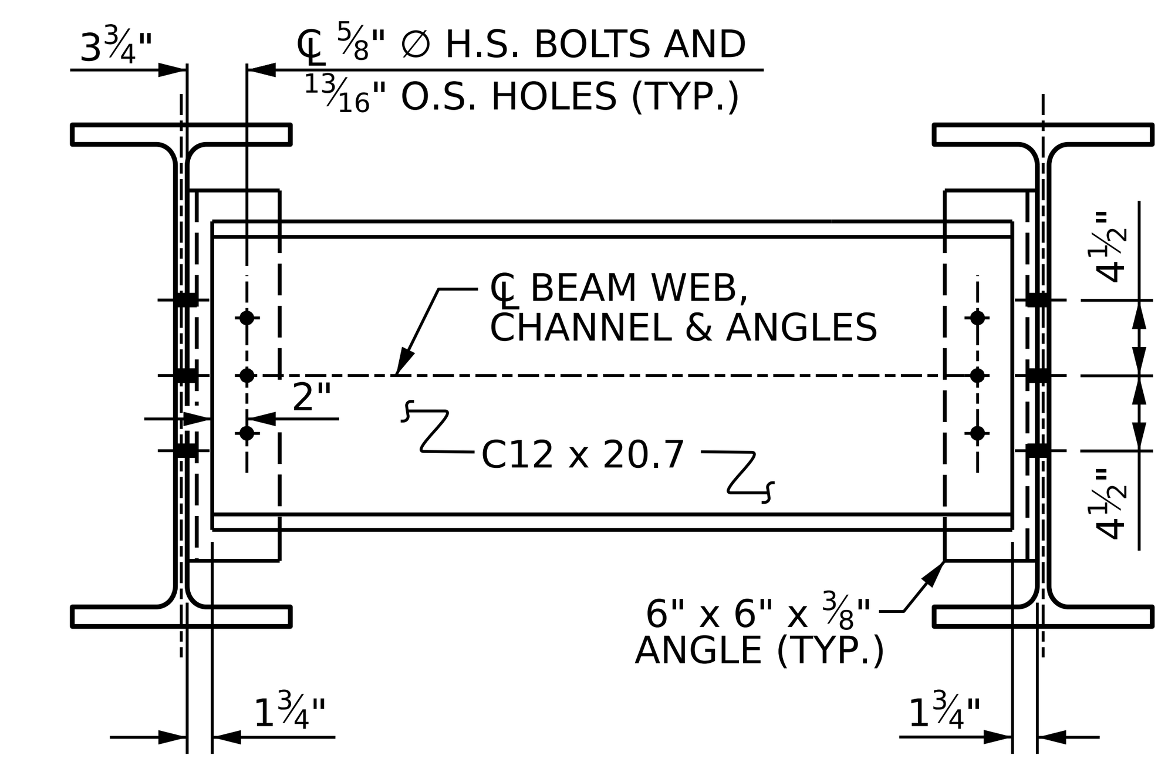
ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL BE ⅝" DIA. GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEAMS SHALL BE PLACED PARALLEL TO THE TANGENT, ALONG THE BRIDGE.

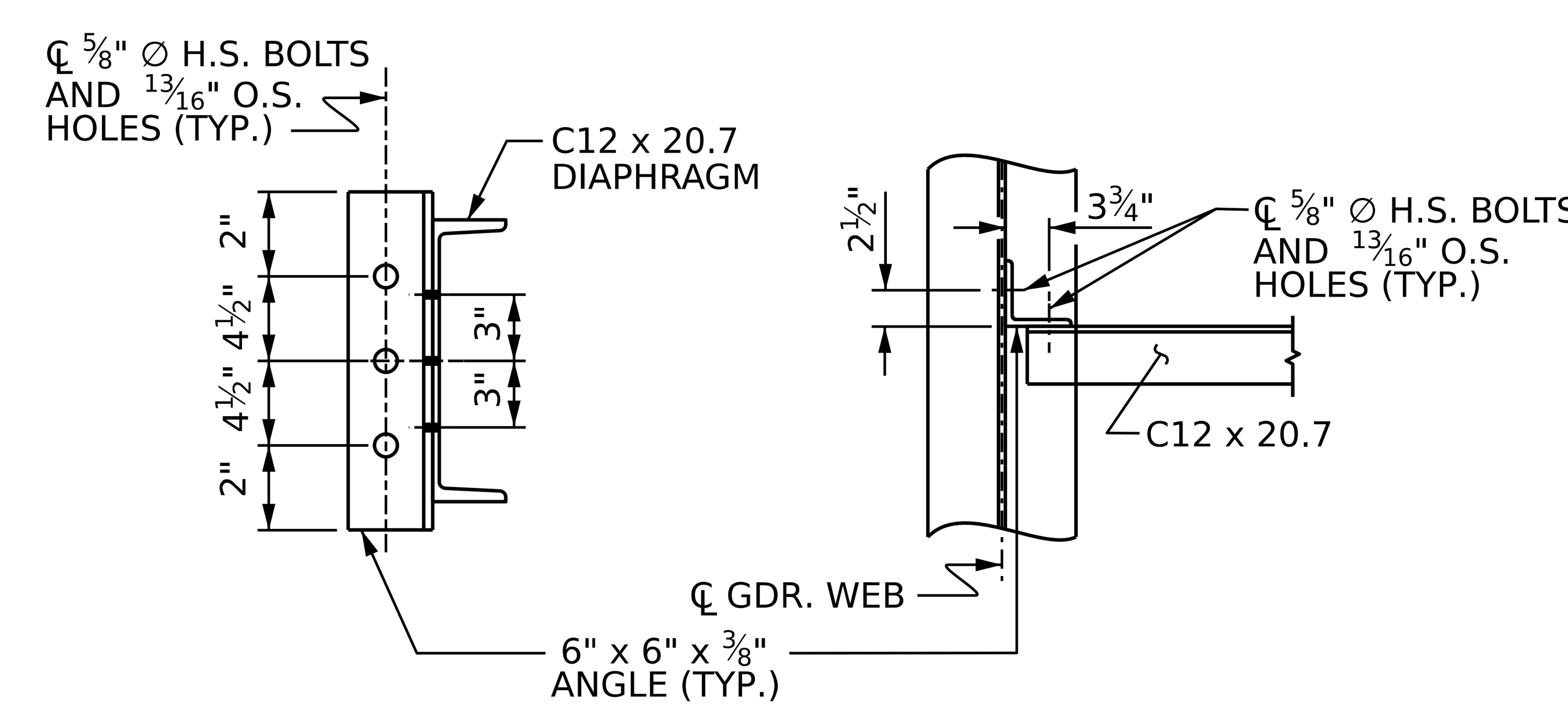
THE CONTRACTOR HAS THE OPTION TO WELD THE CONNECTOR ANGLE TO THE BEAM, PRIOR TO SHOP COATING.

SEE GENERAL DRAWING NOTES FOR COATING.

✻ FOR SIZE AND LOCATION OF OPTIONAL BOLTED SOLE PLATE, SEE BEARING DETAILS SHEET.



INTERIOR DIAPHRAGM DETAIL



ANGLE DETAIL

PROJECT NO. 30001.WIUM.002
WAKE COUNTY
STATION: 12+87.00 -L1-

DocuSigned by: CC466456CCB44C...
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER, SEAL 45689, DOUGLAS R. SHACKELFORD, JR.
11/19/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE
FRAMING PLAN FOR SPAN A
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY:	D. SHACKELFORD	DATE:	04/2025
CHECKED BY:	P. BRYANT	DATE:	04/2025
DRAWN BY:	BNB		4/24
CHECKED BY:	JDH		10/24

$$$$$$SYSTIME$$$$$
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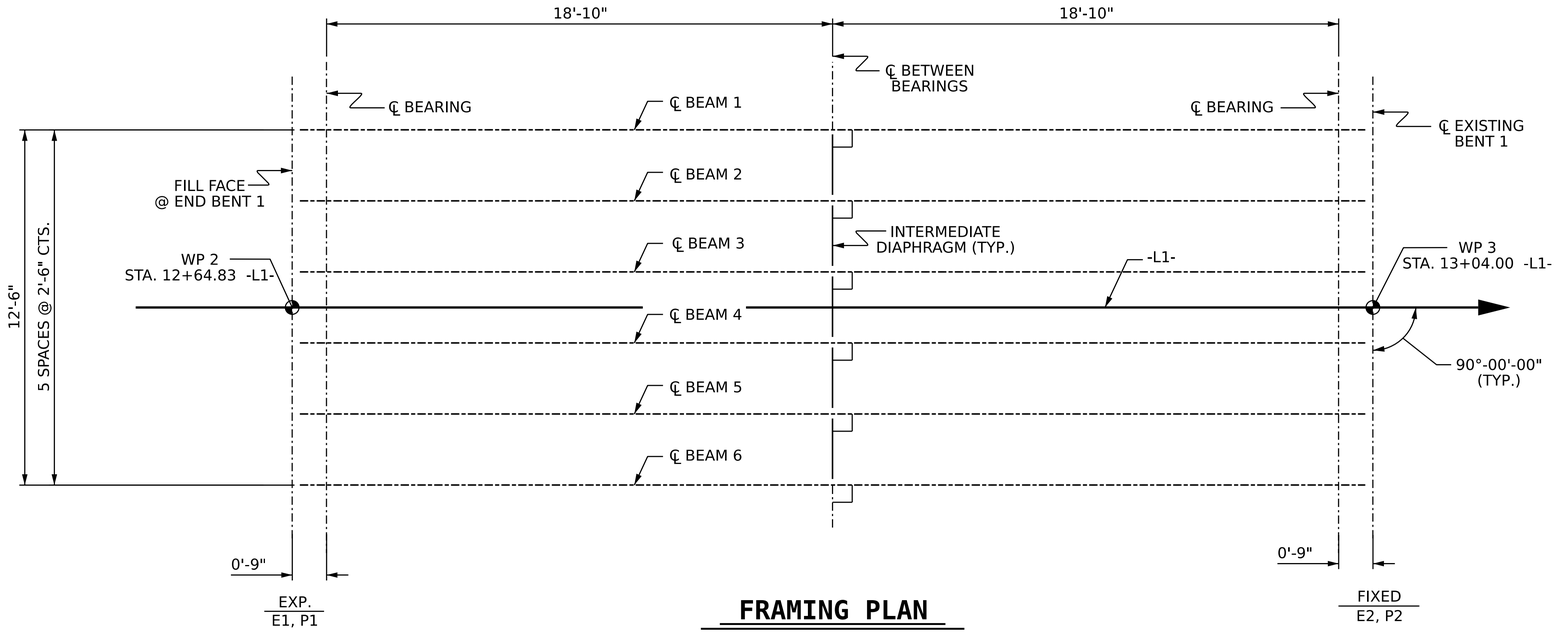
$$$$USERNAME$$$$

8/26/21



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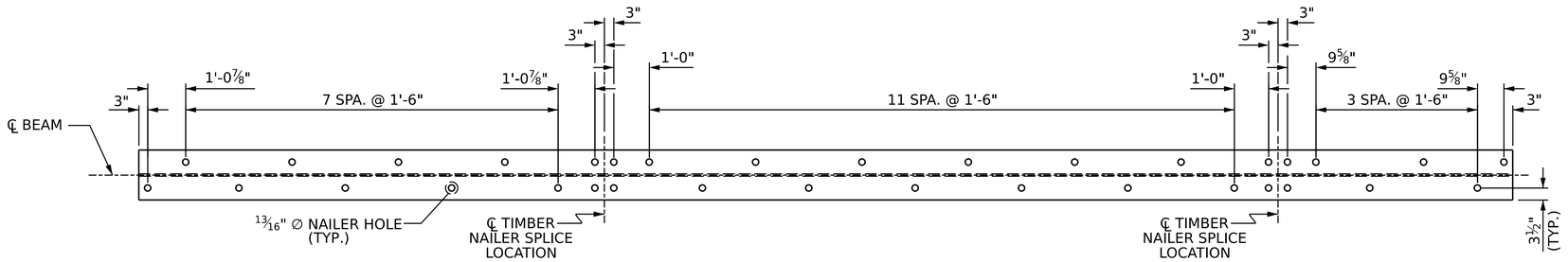

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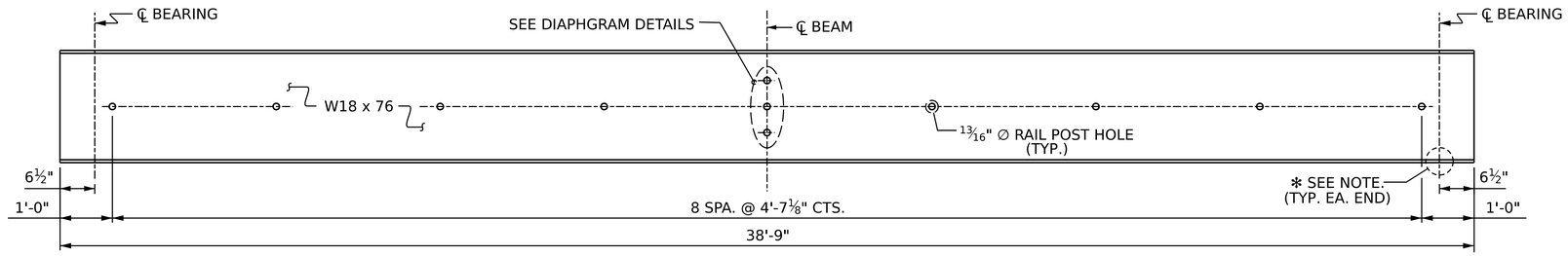

ELEVATION

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

BEAM DETAILS

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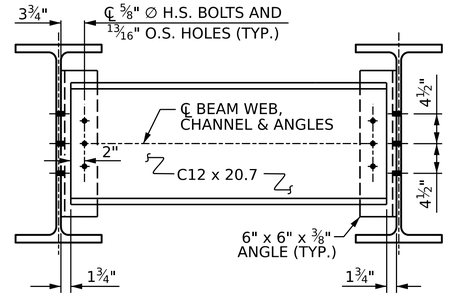
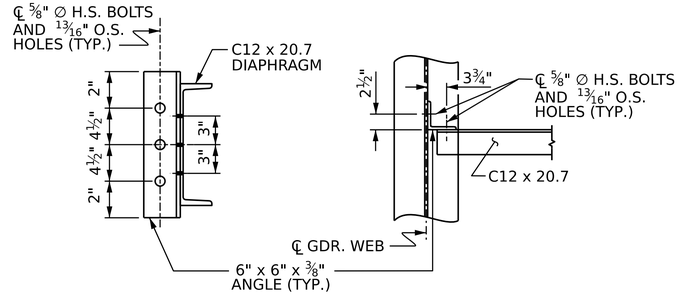
SEE GENERAL DRAWING NOTES FOR COATING.

✻ FOR SIZE AND LOCATION OF OPTIONAL BOLTED SOLE PLATE, SEE BEARING DETAILS SHEET.



INTERIOR DIAPHRAGM DETAIL



ANGLE DETAIL

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

DocuSigned by: CC466456CC8A4C1...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER DOUGLAS R. SHACKELFORD

11/19/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE

FRAMING PLAN FOR SPAN B
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			17

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ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
CHECKED BY :	P. BRYANT	DATE :	04/2025
DRAWN BY :	BNB	4/24	
CHECKED BY :	JDH	10/24	

$$$$$$SYSTIME$$$$$
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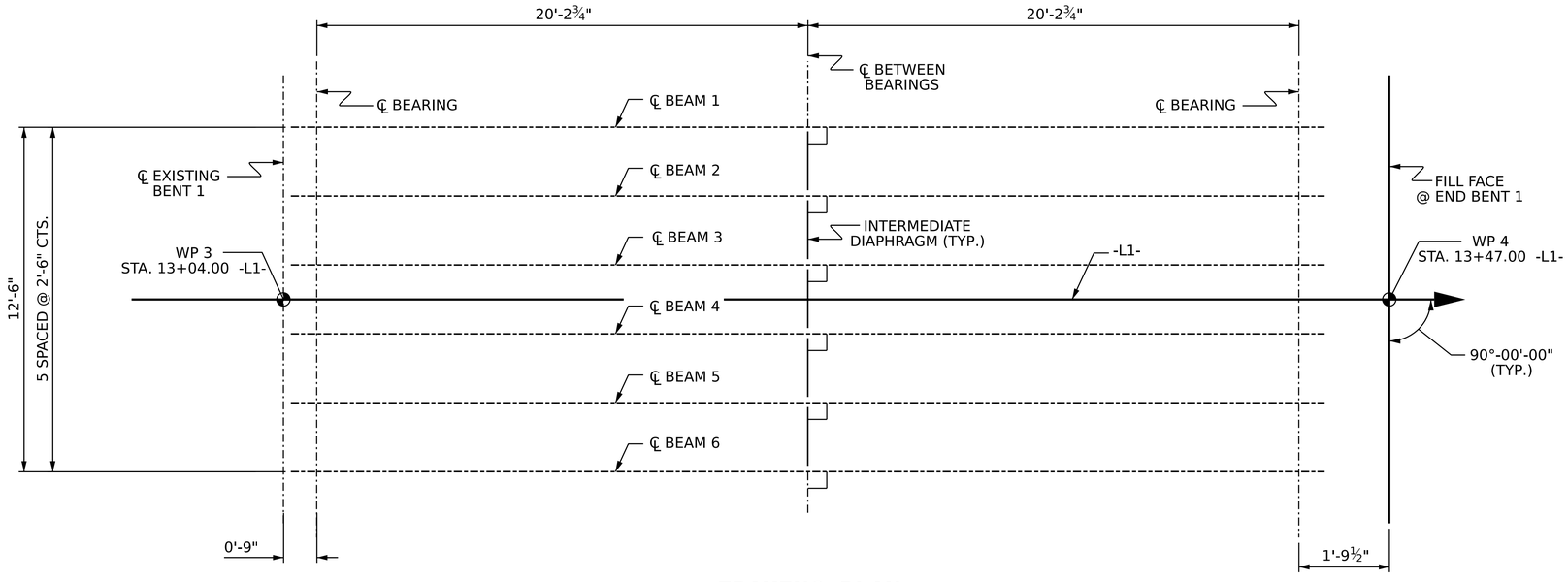
STD. TB_90S_FP

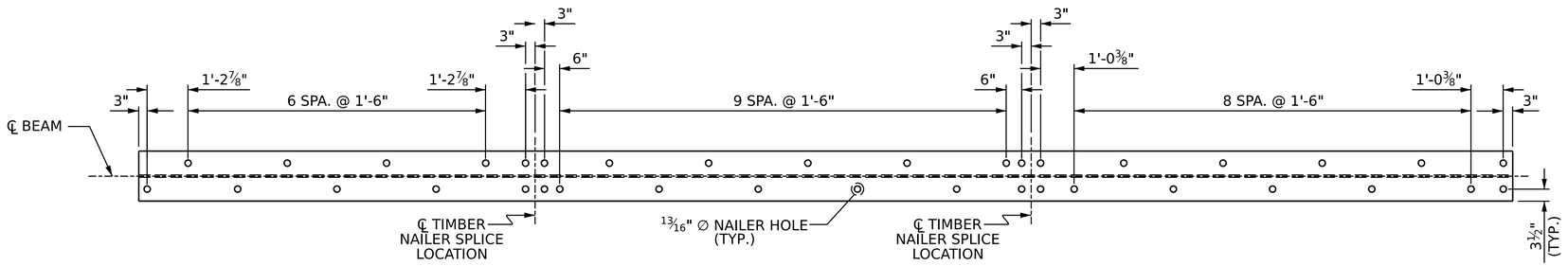
8/26/21



EXP.
E1, P1

FIXED
E2, P2

FRAMING PLAN



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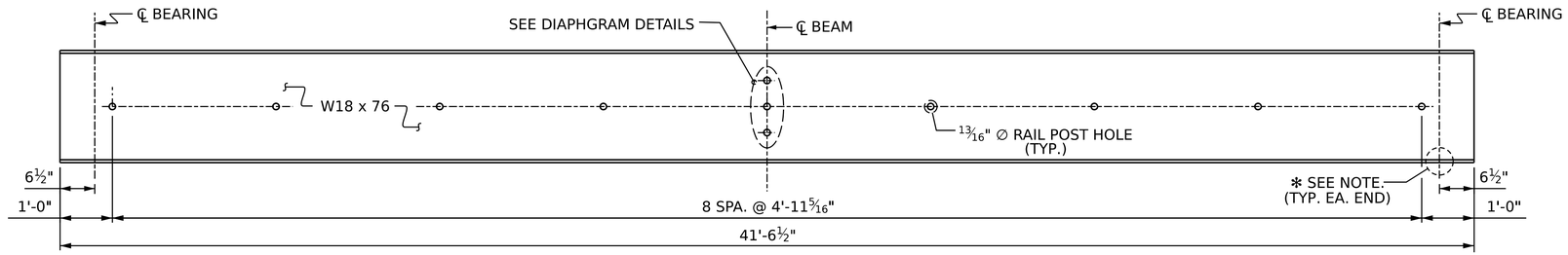

ELEVATION
(SHOWING RAIL POST HOLES FOR EXTERIOR BEAMS
INTERIOR BEAMS ARE SIMILAR BUT WITHOUT RAIL POST HOLES)

BEAM DETAILS

NOTES

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

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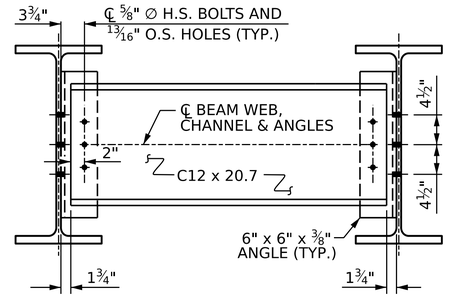
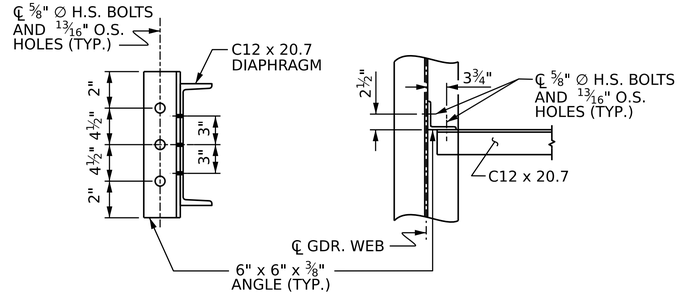
SEE GENERAL DRAWING NOTES FOR COATING.

✻ FOR SIZE AND LOCATION OF OPTIONAL BOLTED SOLE PLATE, SEE BEARING DETAILS SHEET.



INTERIOR DIAPHRAGM DETAIL



ANGLE DETAIL

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE

FRAMING PLAN FOR SPAN C
90° SKEW

DocuSigned by: CC466456CCBA4C1...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER D. SHACKELFORD

11/19/2025

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY:	D. SHACKELFORD	DATE :	04/2025
CHECKED BY :	P. BRYANT	DATE :	04/2025
DRAWN BY :	BNB 4/24	.	
CHECKED BY :	JDH 10/24	.	

$$$$$$SYSTIME$$$$$
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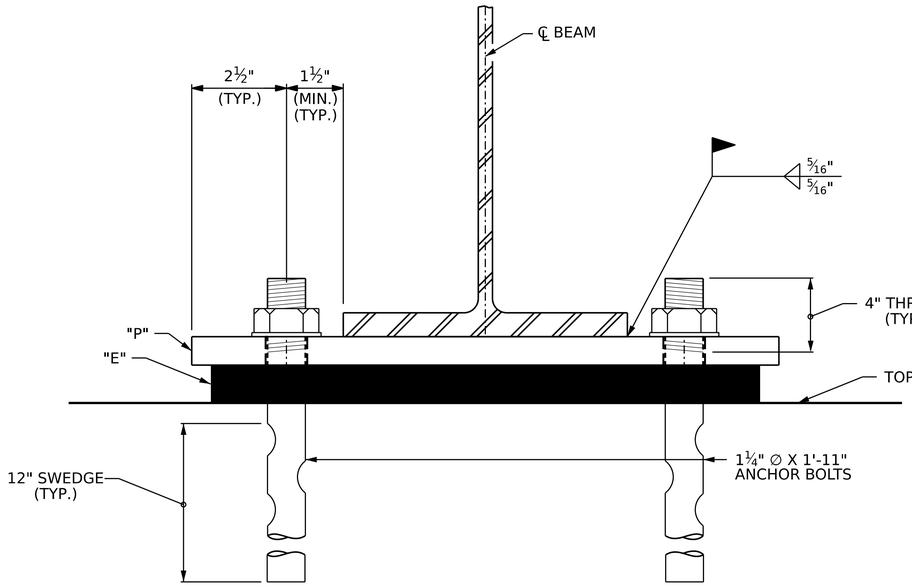
STD. TB_90S_FP

8/26/21



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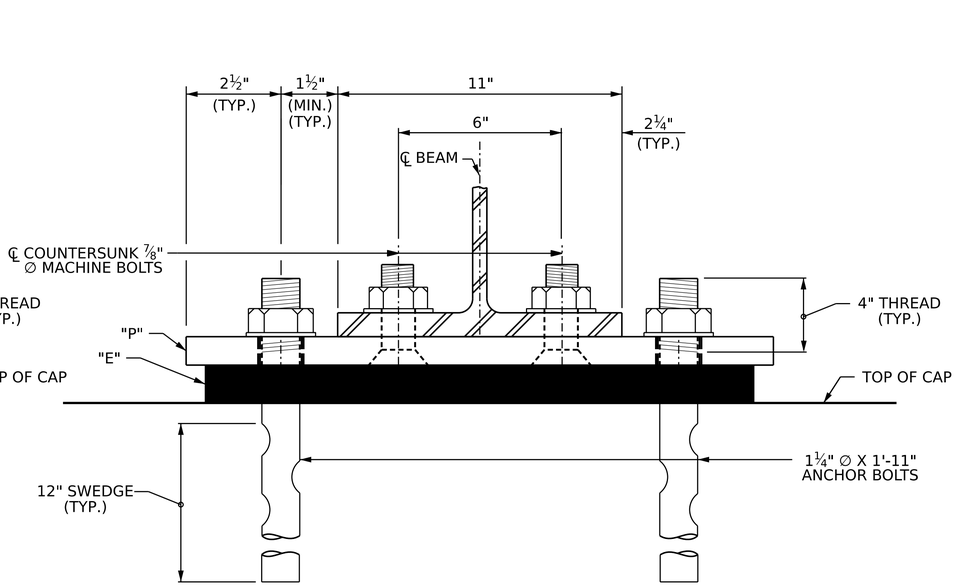
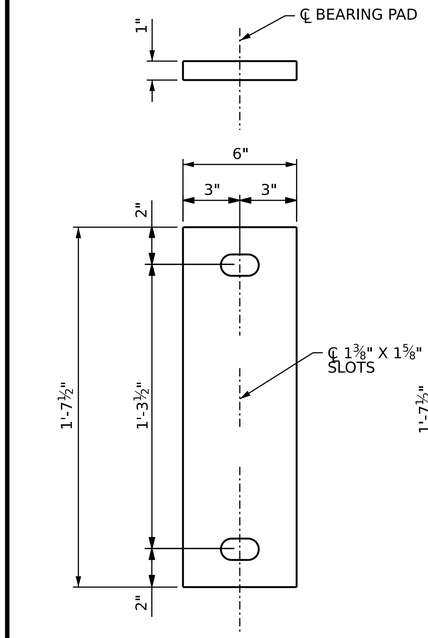
WELDED

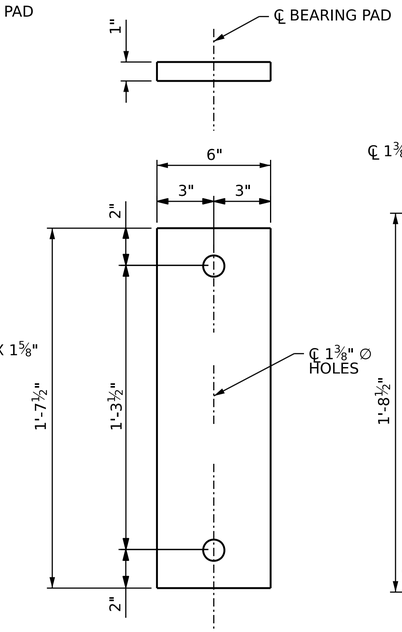


END VIEW

OPTIONAL BOLTED



E1 ELASTOMERIC BEARING DETAILS
(18 REQ'D)
EXPANSION



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(18 REQ'D)
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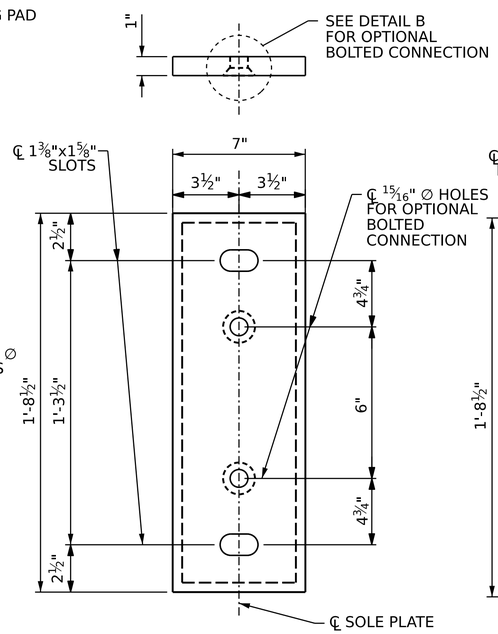
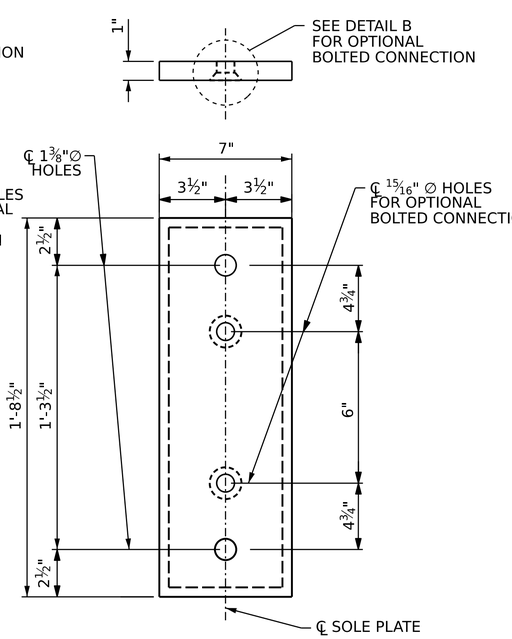


P1 SOLE PLATE DETAILS
(18 REQ'D)
EXPANSION



P2 SOLE PLATE DETAILS
(18 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 ½ 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.

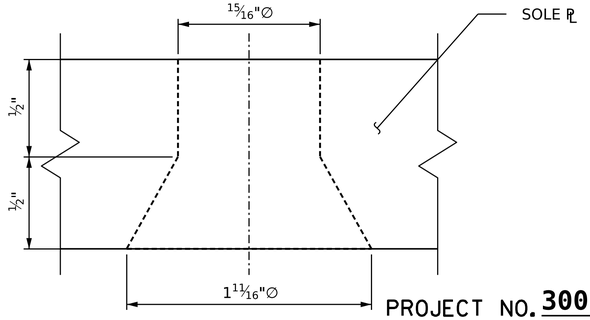
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT NO ADDITIONAL COST TO THE DEPARTMENT, 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.

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

EXISTING ANCHOR BOLTS, ON INTERIOR BENTS, SHALL BE CUT FLUSH WITH TOP OF CAP.



DETAIL B

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

DocuSigned by:
CC4664456CC8A4C1...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER D. SHACKELFORD

11/19/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BEARING DETAILS TYPE III

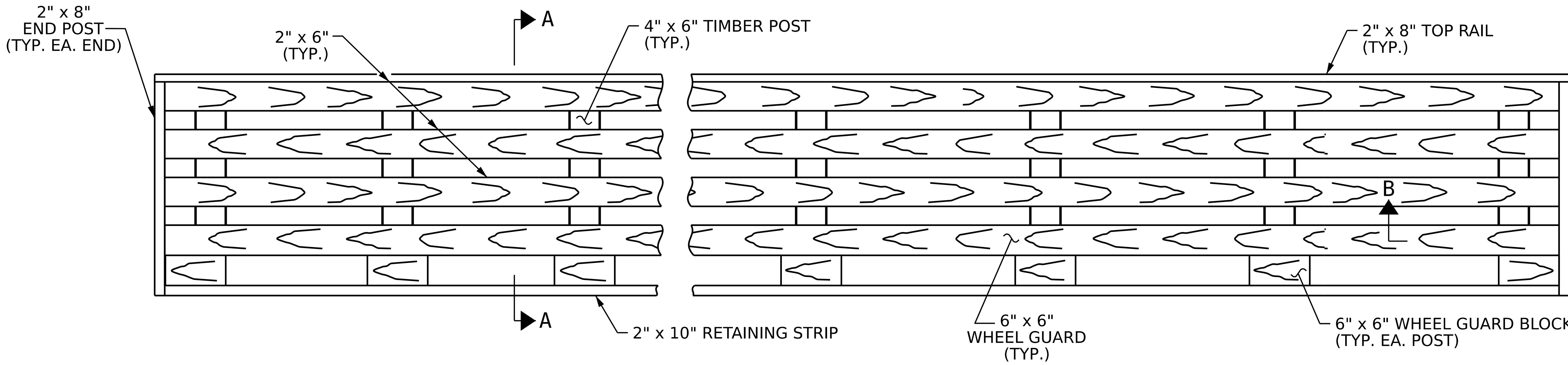
ASSEMBLED BY:	P. BRYANT	DATE :	08/2025
CHECKED BY :	D. SHACKELFORD	DATE :	08/2025
DRAWN BY :	GA		10/2024
CHECKED BY :	JDH		11/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

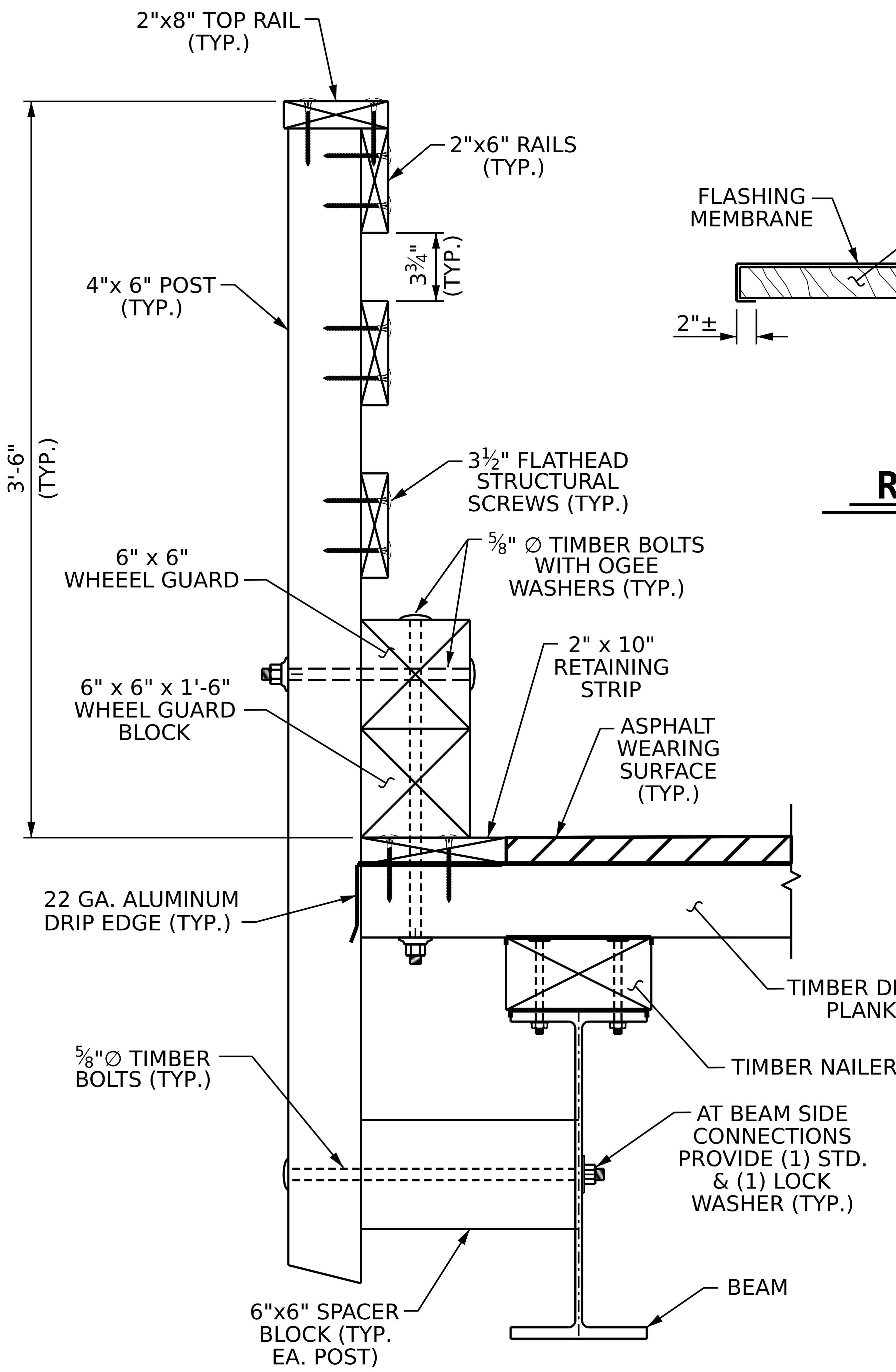
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			17

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

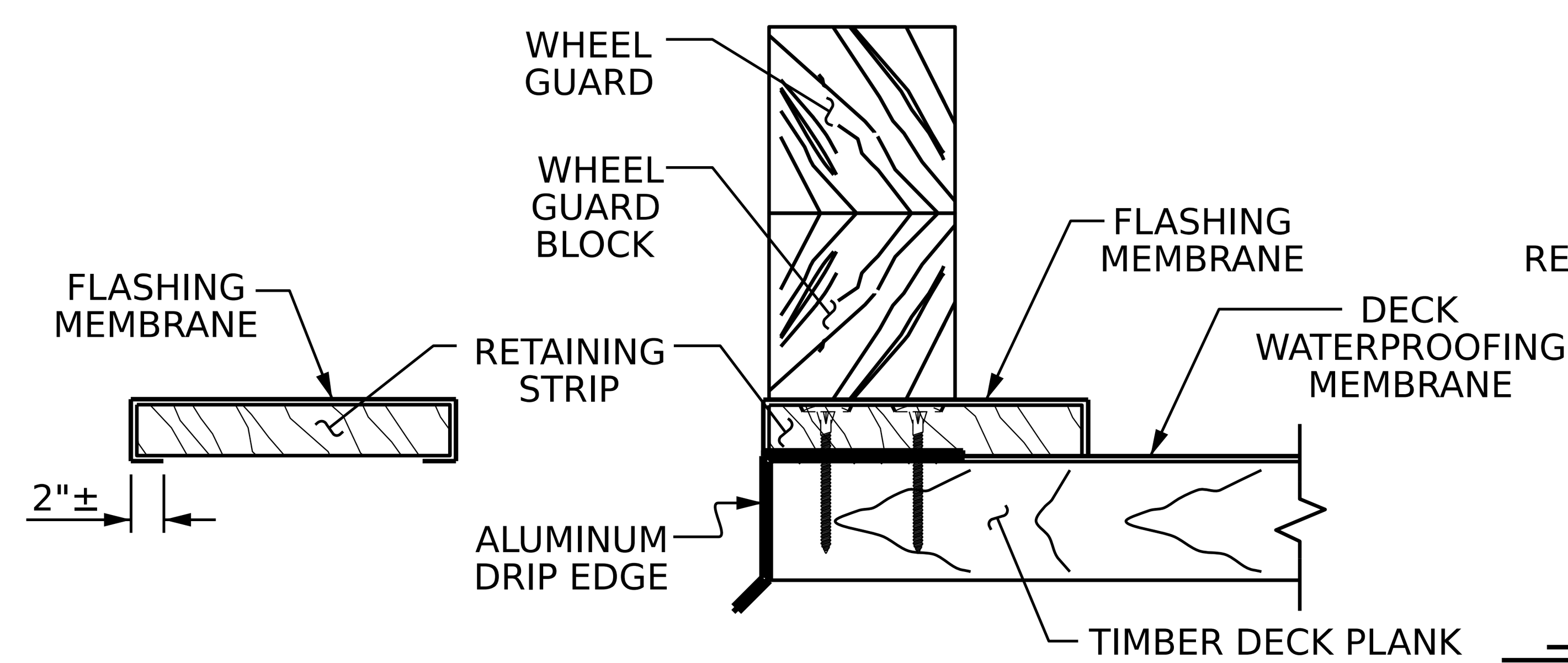
STD. TB_BRG_TYPEIII



ELEVATION

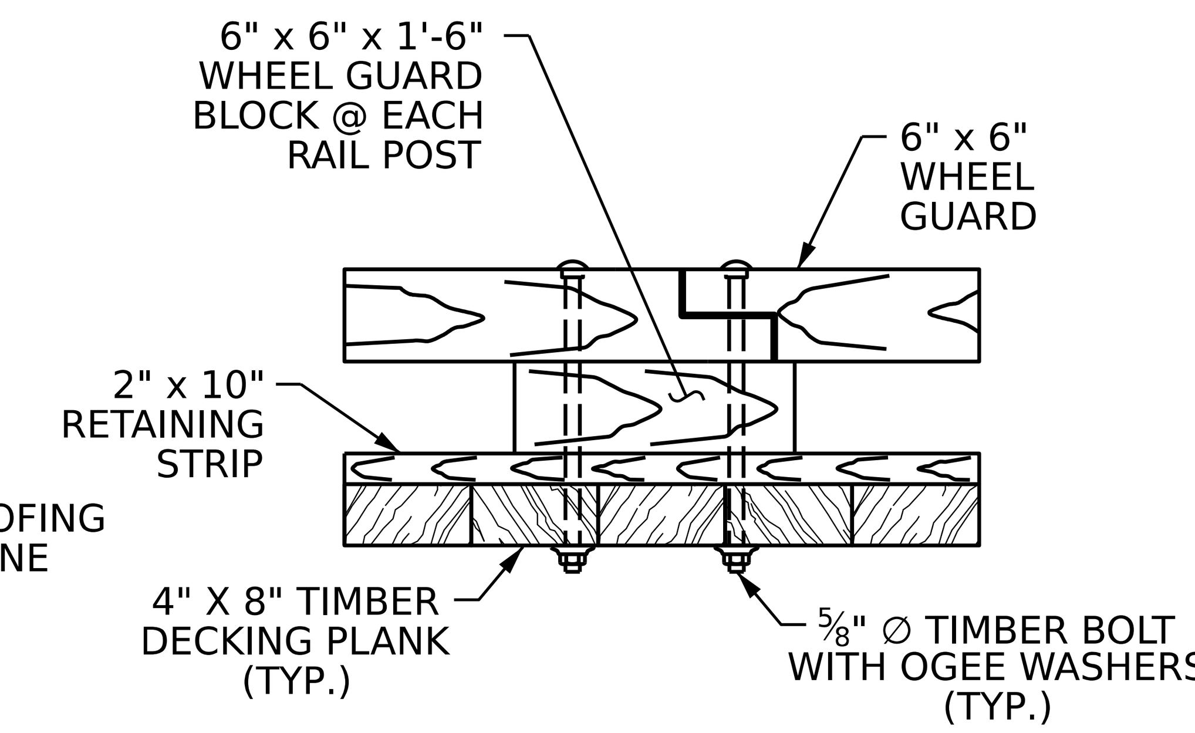


SECTION A-A

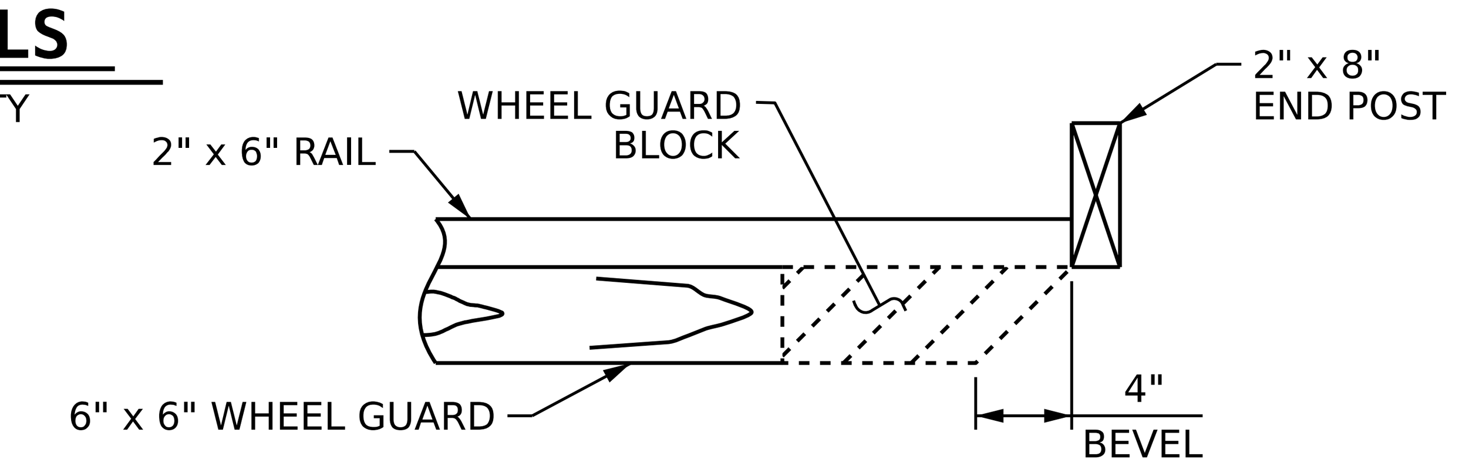


RETAINING STRIP DETAILS

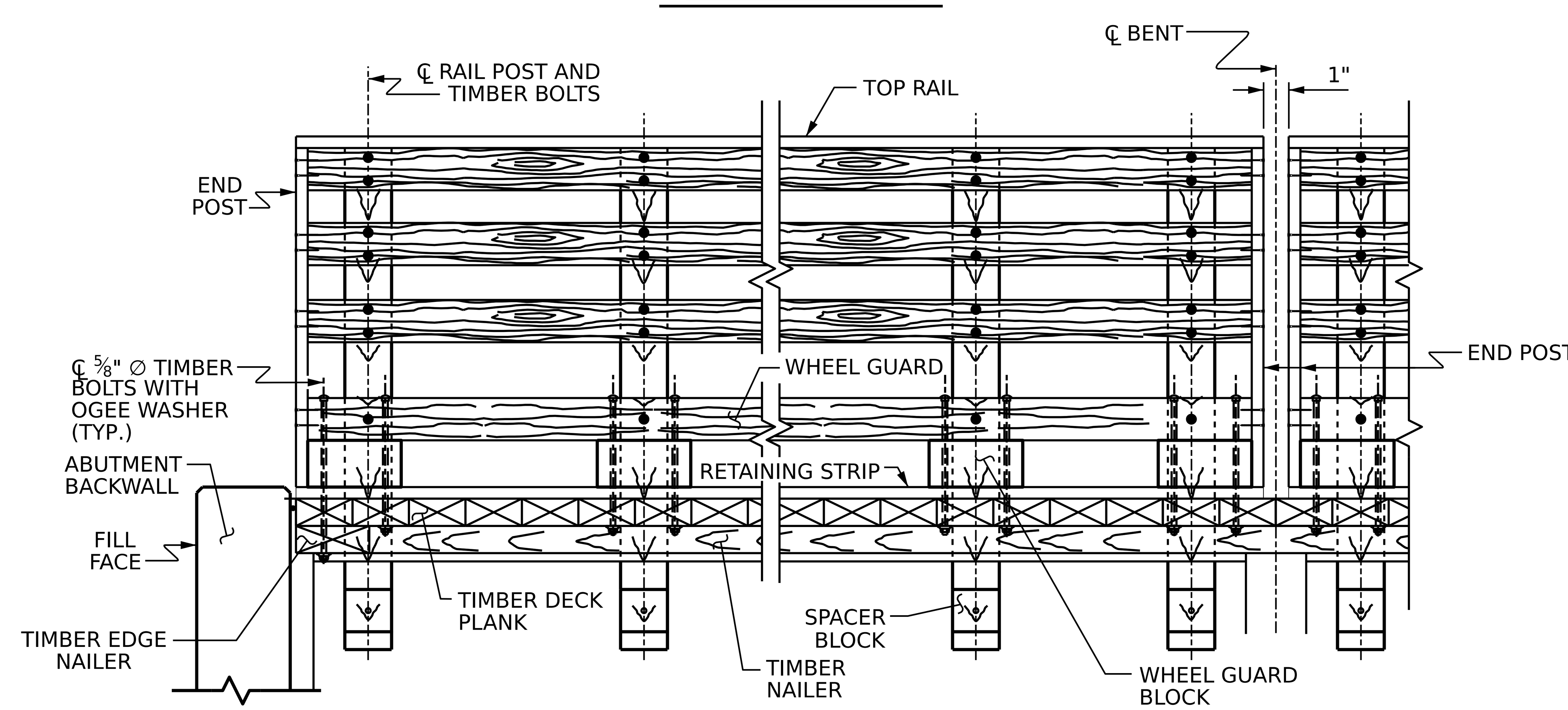
POST AND BOLTS NOT SHOWN FOR CLARITY



WHEEL GAURD SPLICE DETAIL



VIEW B-B



RAIL DETAIL AT ABUTMENTS

RAIL DETAIL AT EXISTING BENTS

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

TREATED LUMBER	SPAN 'A'		SPAN 'B'		SPAN 'C'	
ITEM	SIZE	LIN. FT.	SIZE	LIN. FT.	SIZE	LIN. FT.
RAILS	2"x 6"	109.38	2"x 6"	116.50	2"x 6"	124.88
RAIL POSTS	4"x6"	54.00	4"x6"	54.00	4"x6"	54.00
TOP RAIL	2"x8"	36.71	2"x8"	39.08	2"x8"	41.88
WHEEL GUARD	6"x6"	36.46	6"x6"	38.83	6"x6"	41.63
WHEEL GUARD BLOCK	6"x6"	13.50	6"x6"	13.50	6"x6"	13.50
END POSTS	2"x8"	7.0	2"x8"	7.0	2"x8"	7.0
SPACER BLOCK	6"x6"	11.25	6"x6"	11.25	6"x6"	11.25

HARDWARE	SPAN 'A'			SPAN 'B'			SPAN 'C'		
ITEM	No.	SIZE	LBS.	No.	SIZE	LBS.	No.	SIZE	LBS.
TIMBER BOLTS (WHEEL GUARD)	9	⅝" ∅	12.6	9	⅝" ∅	12.6	9	⅝" ∅	12.6
TIMBER BOLTS (SPACER BLOCK)	9	⅝" ∅	20.7	9	⅝" ∅	20.7	9	⅝" ∅	20.7
TIMBER BOLTS (RAIL)	18	⅝" ∅	41.4	18	⅝" ∅	41.4	18	⅝" ∅	41.4
HEAVY HEX NUTS	36	⅝" ∅	4.3	36	⅝" ∅	4.3	36	⅝" ∅	4.3
FLATHEAD STR. SCREWS	100	3½"	2.0	100	3½"	2.0	100	3½"	2.0
STANDARD WASHER	9	⅝" ∅	1.0	9	⅝" ∅	1.0	9	⅝" ∅	1.0
LOCK WASHER	9	⅝" ∅	1.0	9	⅝" ∅	1.0	9	⅝" ∅	1.0
OGEE WASHERS	27	⅝" ∅	16.7	27	⅝" ∅	16.7	27	⅝" ∅	16.7
HARDWARE FOR CONNECTIONS	APPROX. 99.7 LBS.			APPROX. 99.7 LBS.			APPROX. 99.7 LBS.		
PAY LENGTH =	36.7 LIN. FT.			39.1 LIN. FT.			41.9 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.

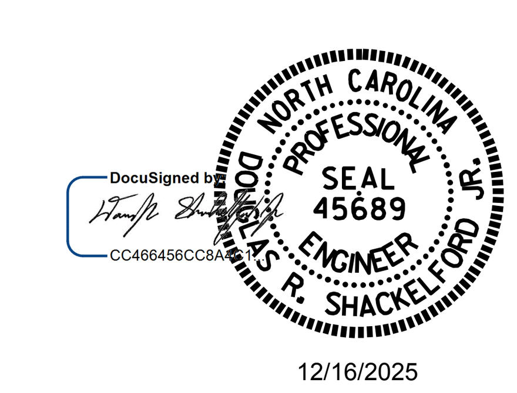
TREAT ALL DRILLED OR NEWLY EXPOSED HOLES IN TIMBER MEMBERS BY PUMPING WITH BITUMINOUS ASPHALT-BASED ROOFING CEMENT, OR APPROVED PRESERVATIVE SYSTEM BEFORE INSTALLING HARDWARE.

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

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

TIMBER BRIDGE RAIL SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			17

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ASSEMBLED BY:	P.D. BRYANT	DATE:	08/2025
CHECKED BY:	D. SHACKELFORD	DATE:	08/2025
DRAWN BY:	BNB		4/24
CHECKED BY:	JDH		10/24

8/26/21

$$$$$SYSTIME$$$$$
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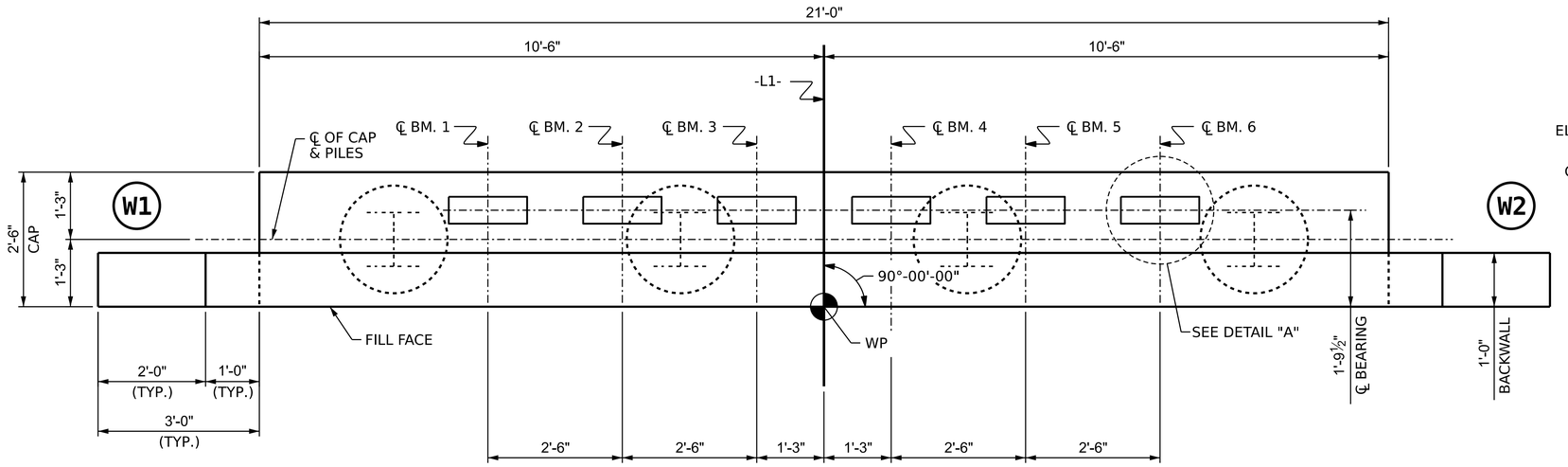
$$$$USERNAME$$$$

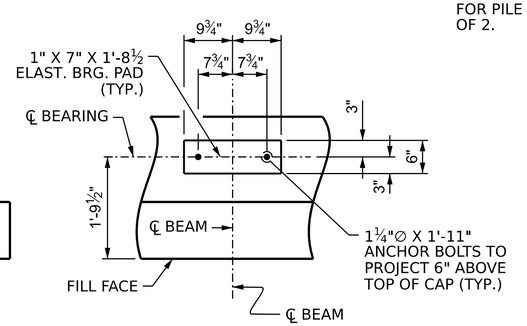
STD. TB_BRS

5/26/20



PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION

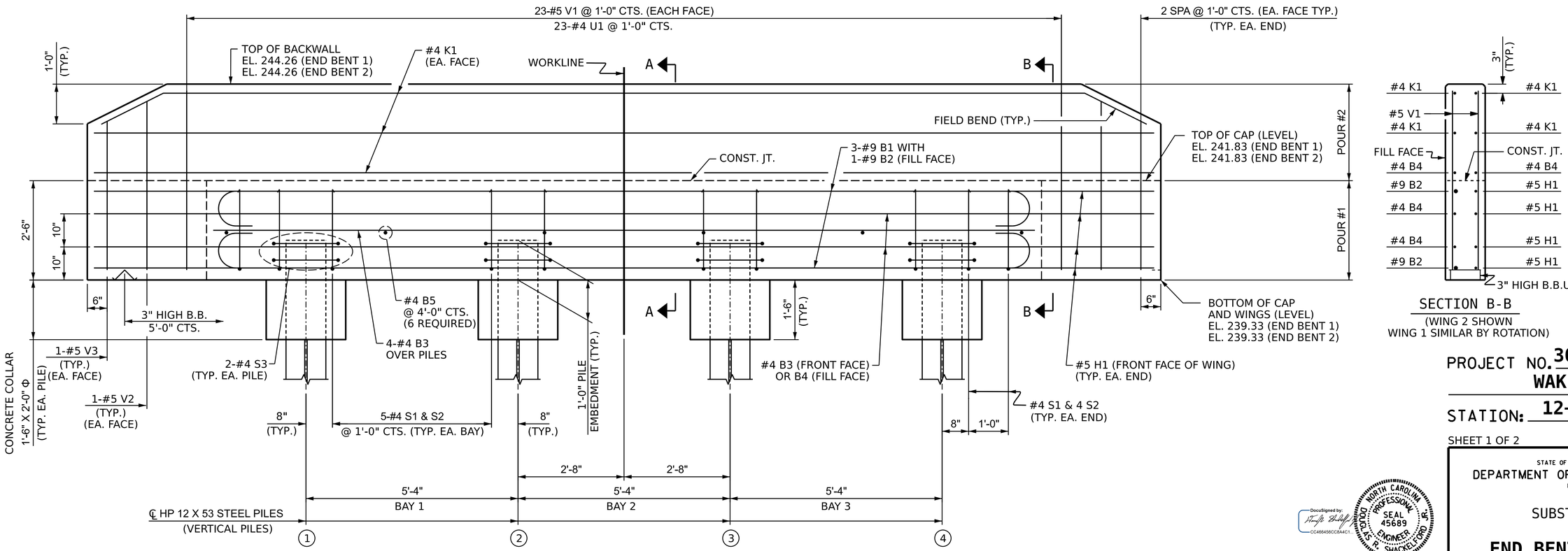


DETAIL "A"
(TYP. EA. BEAM)

NOTES

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

FOR PILE SPLICE DETAILS SEE SHEET 2 OF 2.



ELEVATION

END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION

SECTION B-B
(WING 2 SHOWN
WING 1 SIMILAR BY ROTATION)

PROJECT NO. 30001.WIUM.002
WAKE COUNTY
STATION: 12+87.00 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2

DocuSigned by: CC466456CC8A4C1...

NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER D. SHACKELFORD

11/19/2025

DRAWN BY :	P.D. BRYANT	DATE : 08/2025
CHECKED BY :	D. SHACKELFORD	DATE : 08/2025
DESIGN ENGINEER OF RECORD:	P.D. BRYANT	DATE : 08/2025

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			S-17

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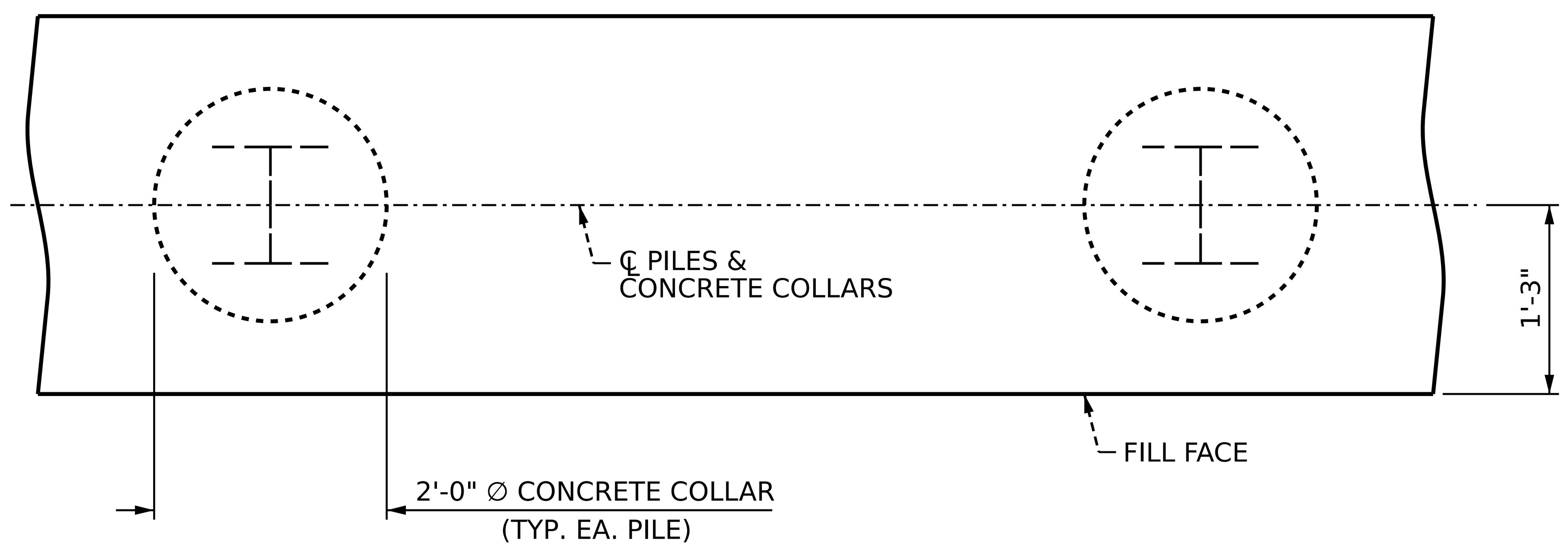
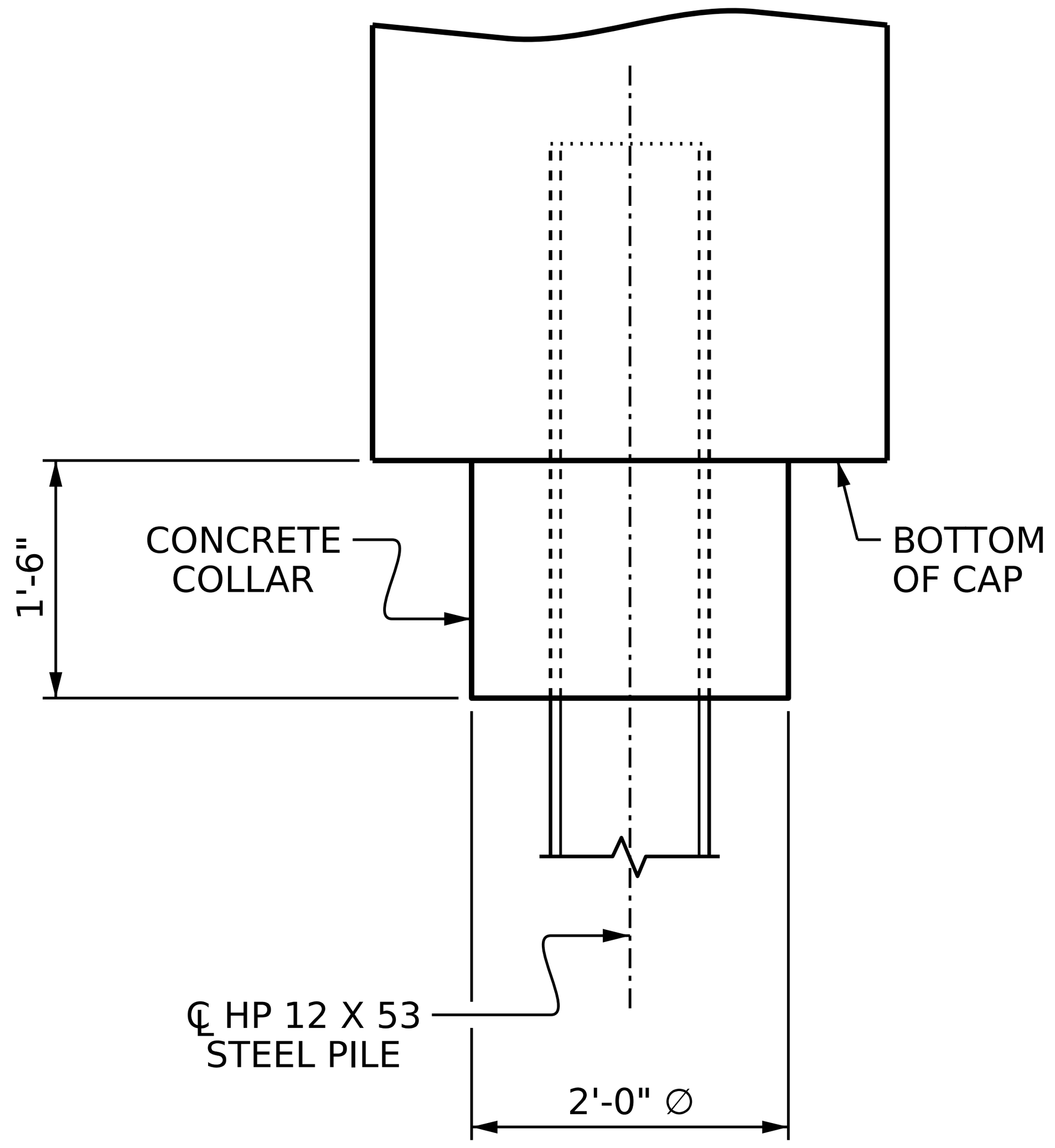
$$$$USERNAME$$$$

8/26/21

CORROSION PROTECTION FOR STEEL PILES DETAIL

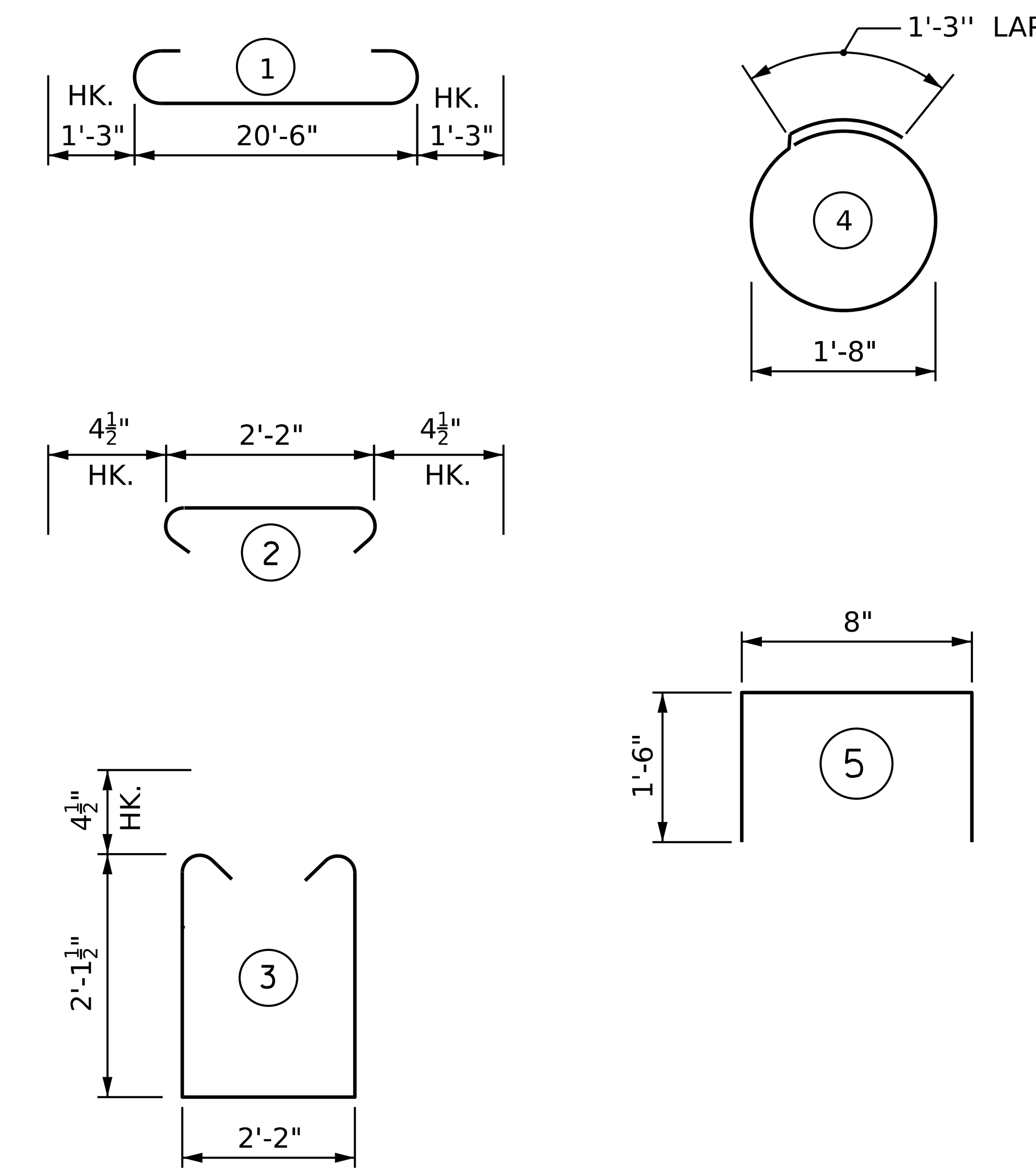


PLAN



ELEVATION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

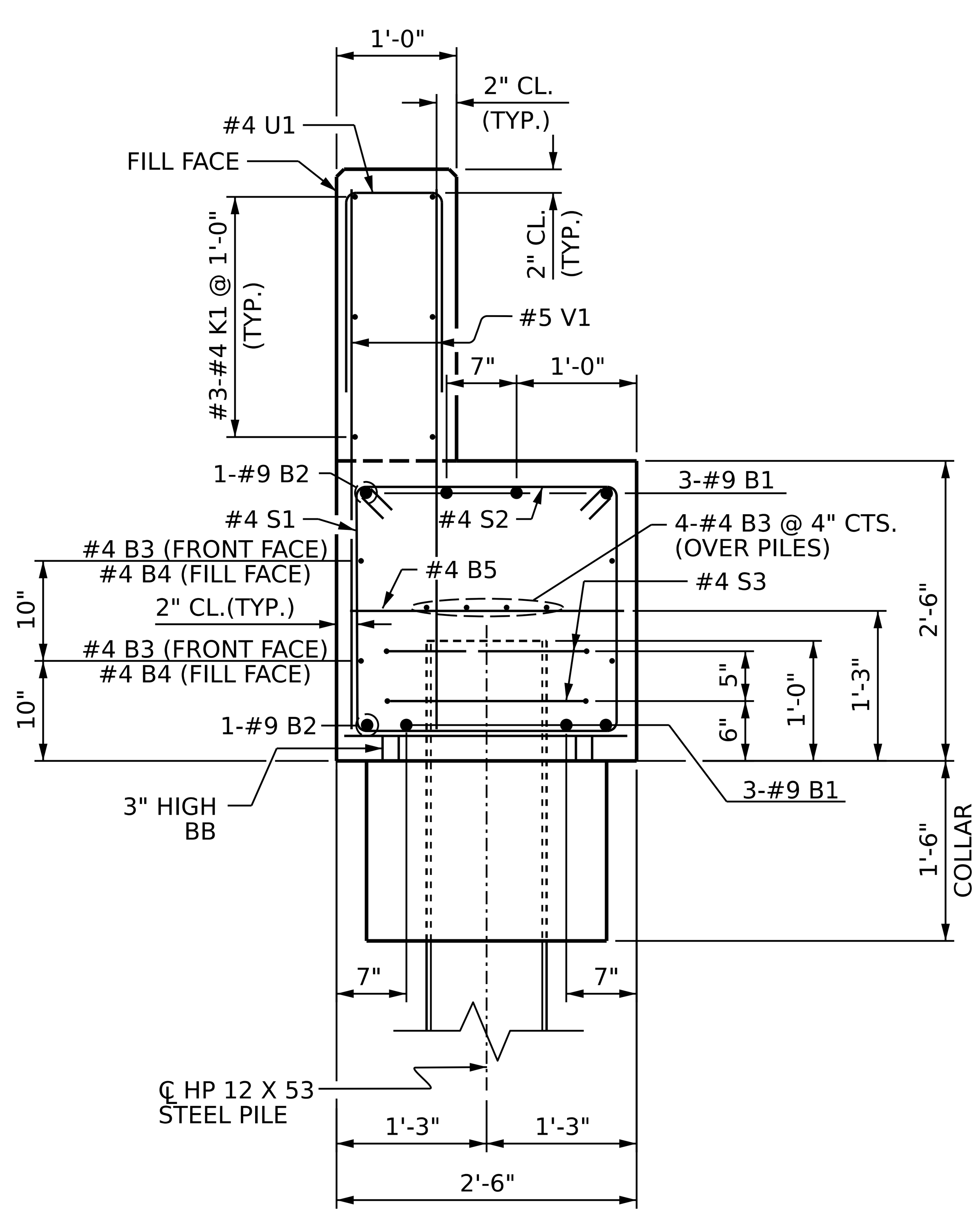
BILL OF MATERIAL FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	23'-0"	469
B2	2	#9	STR	26'-8"	181
B3	6	#4	STR	20'-8"	83
B4	2	#4	STR	26'-8"	36
B5	6	#4	STR	2'-2"	9
H1	8	#5	STR	5'-2"	43
K1	6	#4	STR	26'-8"	107
S1	19	#4	3	7'-2"	91
S2	19	#4	2	2'-11"	37
S3	8	#4	4	6'-6"	35
U1	23	#4	5	3'-8"	56
V1	46	#5	STR	4'-6"	216
V2	4	#5	STR	4'-3"	18
V3	4	#5	STR	3'-9"	16

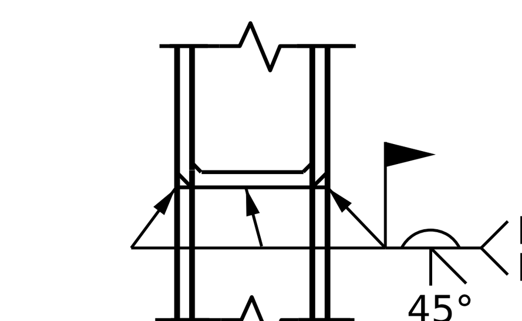
REINFORCING STEEL 1397 LBS.

CLASS A CONCRETE BREAKDOWN

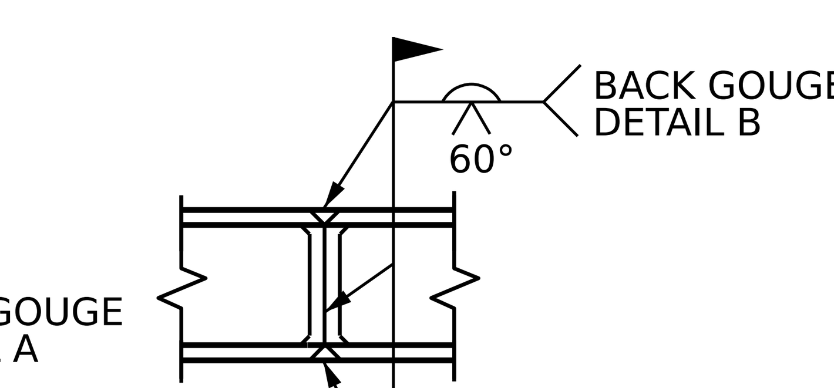
POUR #1	(COLLARS, CAP & LOWER WINGS)	6.1 C.Y.
POUR #2	(BACKWALL & UPPER WINGS)	2.4 C.Y.
CLASS A CONCRETE TOTAL		8.5 C.Y.



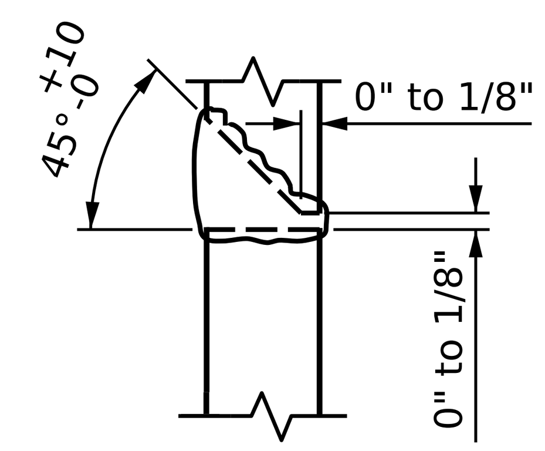
SECTION A-A



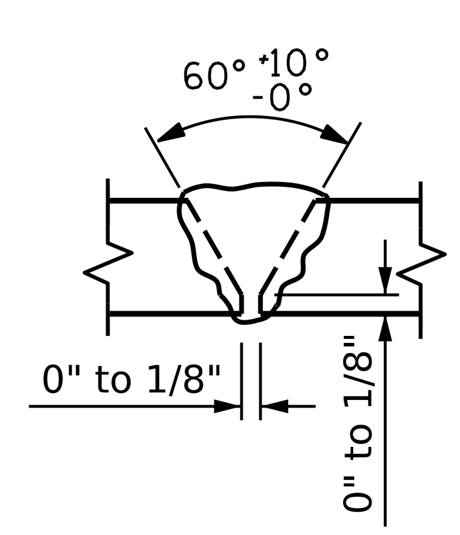
△ PILE VERTICAL



△ PILE HORIZONTAL OR VERTICAL



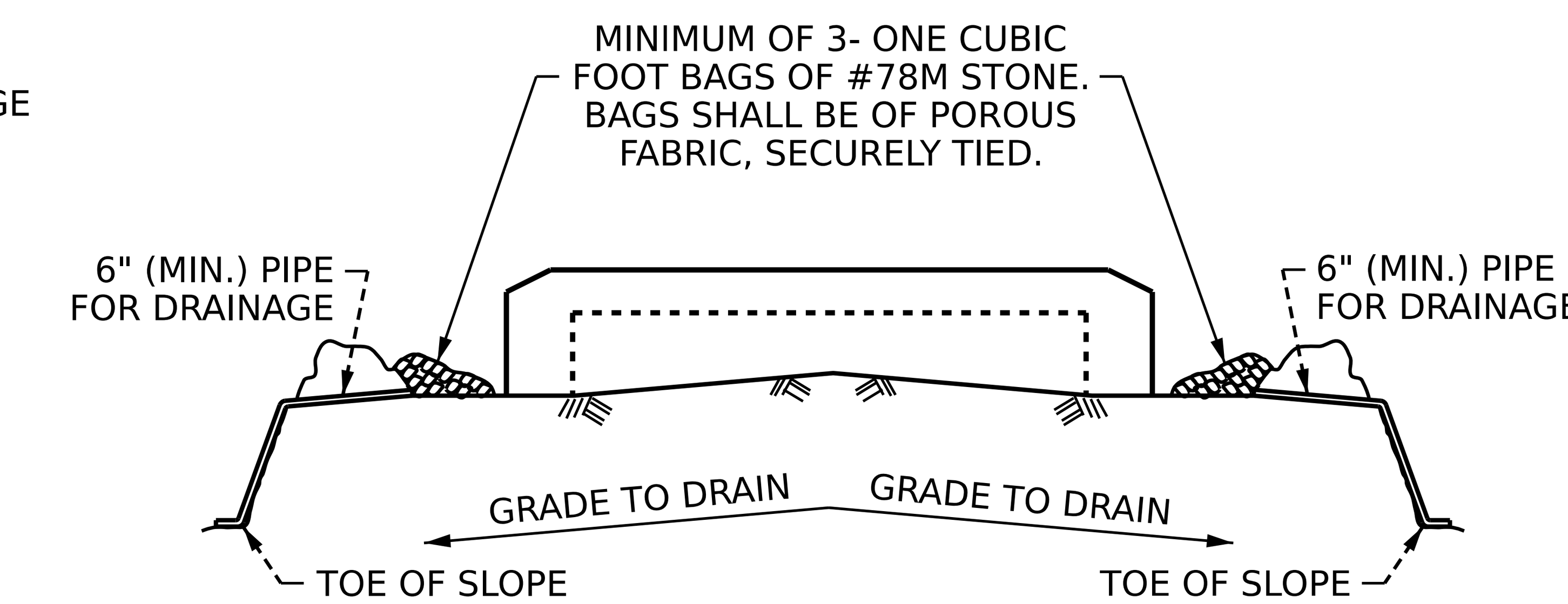
DETAIL A



DETAIL B

△ POSITION OF PILE DURING WELDING

PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. 30001.WIUM.002
WAKE COUNTY
STATION: 12+87.00 -L1-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 45689 DOUGLAS R. SHACKELFORD, JR.
11/19/2025

DocuSigned by:

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NO.	BY:	DATE:		NO.	BY:	DATE:		S-16
1				3				TOTAL SHEETS
2				4				17

DRAWN BY : P. D. BRYANT DATE : 08/2025
CHECKED BY : D. SHACKELFORD DATE : 08/2025
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 08/2025

11/19/2025
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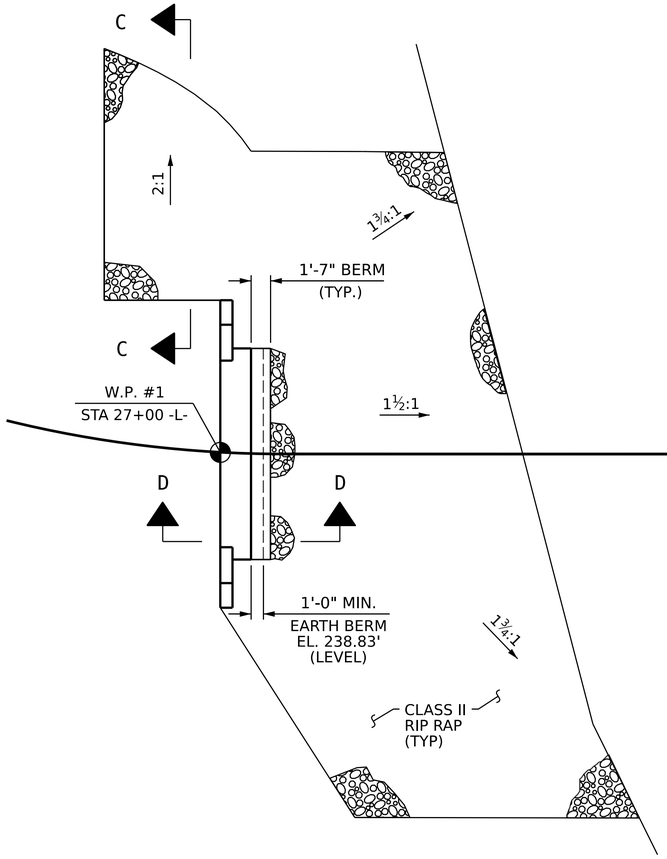
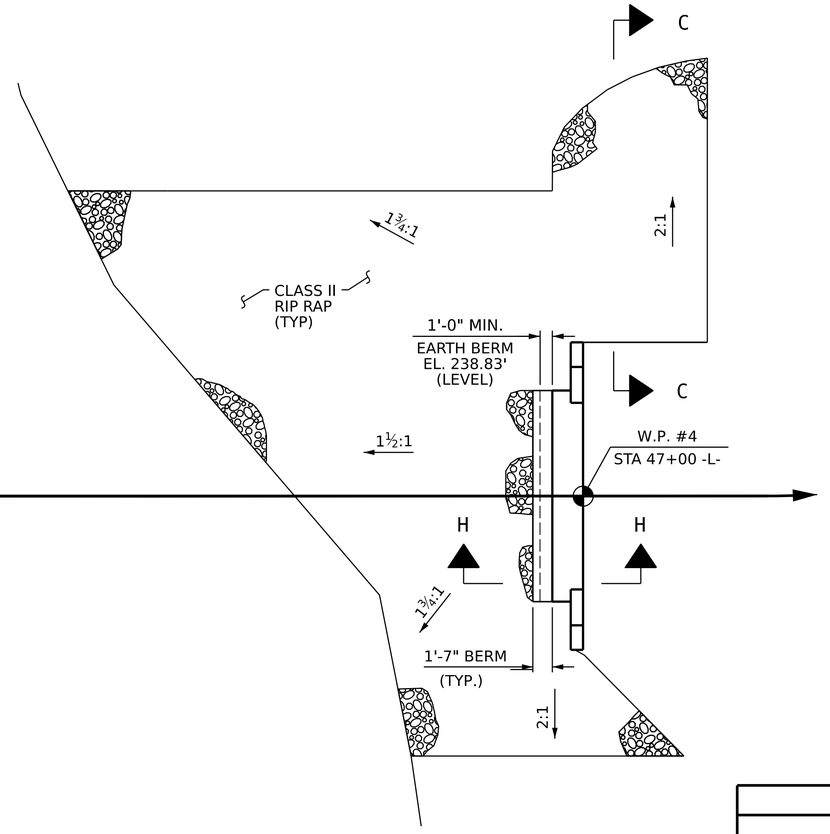
drshackelfordl

8/26/21

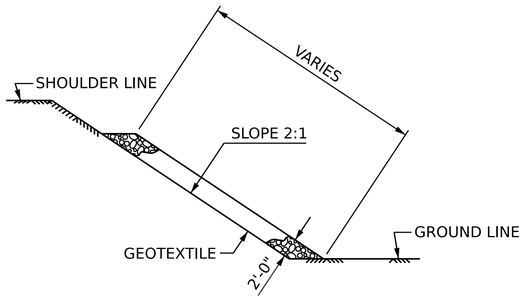


END BENT 1

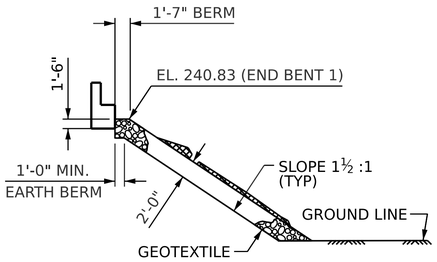


END BENT 2

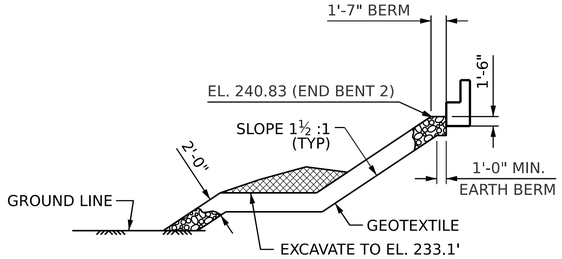
ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+87.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	319	355
END BENT 2	329	365



SECTION C-C



SECTION D-D



SECTION H-H

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NORTH CAROLINA PROFESSIONAL SEAL 45689 ENGINEER D. SHACKELFORD

11/19/2025

PROJECT NO. 30001.WIUM.002

WAKE COUNTY

STATION: 12+87.00 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

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

DRAWN BY : J.J. ANDERSON DATE : 06/2025
CHECKED BY : D. SHACKELFORD DATE : 07/2025
DESIGN ENGINEER OF RECORD: D. SHACKELFORD DATE : 07/2025

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8/26/21

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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