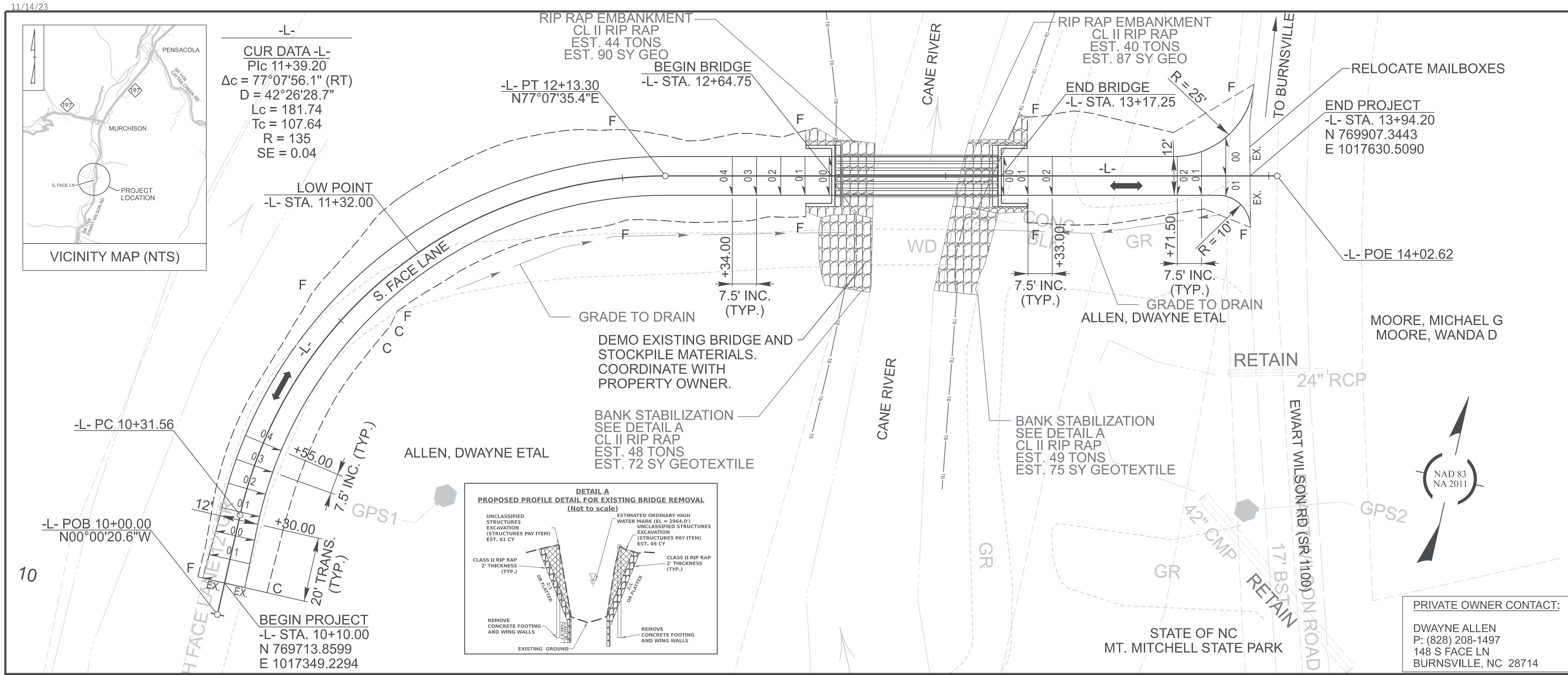
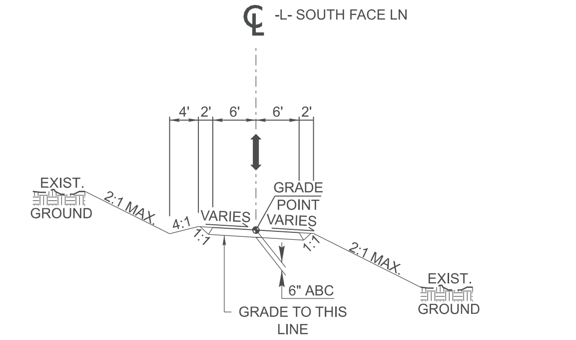
Bridge Contract

Site # 100-01-00202 - South Face Lane over the Cane River
in Yancey County

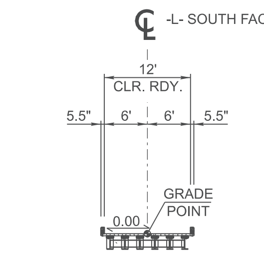
11/14/23


VICINITY MAP (NTS)
PENSACOLA
MURCHISON
PROJECT LOCATION
-L-
CUR DATA -L-
PIc 11+39.20
Δc = 77°07'56.1" (RT)
D = 42°26'28.7"
Lc = 181.74
Tc = 107.64
R = 135
SE = 0.04
LOW POINT
-L- STA. 11+32.00
-L- PT 12+13.30
N77°07'35.4"E
RIP RAP EMBANKMENT
CL II RIP RAP
EST. 44 TONS
EST. 90 SY GEO
BEGIN BRIDGE
-L- STA. 12+64.75
RIP RAP EMBANKMENT
CL II RIP RAP
EST. 40 TONS
EST. 87 SY GEO
END BRIDGE
-L- STA. 13+17.25
R = 25'
TO BURNSVILLE
RELOCATE MAILBOXES
END PROJECT
-L- STA. 13+94.20
N 769907.3443
E 1017630.5090
-L- POE 14+02.62
CANE RIVER
S. FACE LANE
GRADE TO DRAIN
DEMO EXISTING BRIDGE AND STOCKPILE MATERIALS. COORDINATE WITH PROPERTY OWNER.
BANK STABILIZATION
SEE DETAIL A
CL II RIP RAP
EST. 48 TONS
EST. 72 SY GEOTEXTILE
BANK STABILIZATION
SEE DETAIL A
CL II RIP RAP
EST. 49 TONS
EST. 75 SY GEOTEXTILE
7.5' INC. (TYP.)
+34.00
+33.00
+71.50
R = 10'
ALLEN, DWAYNE ETAL
MOORE, MICHAEL G
MOORE, WANDA D
RETAIN
24" RCP
42" CMP
17' BST
EWART WILSON RD (SR 1100)
STATE OF NC
MT. MITCHELL STATE PARK
GPS1
GPS2
NAD 83
NA 2011
-L- PC 10+31.56
-L- POB 10+00.00
N00°00'20.6"W
BEGIN PROJECT
-L- STA. 10+10.00
N 769713.8599
E 1017349.2294
+55.00
+30.00
20' TRANS. (TYP.)
DETAIL A
PROPOSED PROFILE DETAIL FOR EXISTING BRIDGE REMOVAL
(Not to scale)
UNCLASSIFIED STRUCTURES EXCAVATION (STRUCTURES PAY ITEM) EST. 61 CY
ESTIMATED ORDINARY HIGH WATER MARK (EL = 2964.0')
UNCLASSIFIED STRUCTURES EXCAVATION (STRUCTURES PAY ITEM) EST. 40 CY
CLASS II RIP RAP 2' THICKNESS (TYP.)
REMOVE CONCRETE FOOTING AND WING WALLS
EXISTING GROUND
PRIVATE OWNER CONTACT:
DWAYNE ALLEN
P: (828) 208-1497
148 S FACE LN
BURNSVILLE, NC 28714



TYPICAL SECTION NO. 1

-L- STA. 10+10.00 TO STA. 12+64.75 (BEGIN BRIDGE)
-L- STA. 13+17.25 (END BRIDGE) TO STA. 13+94.20

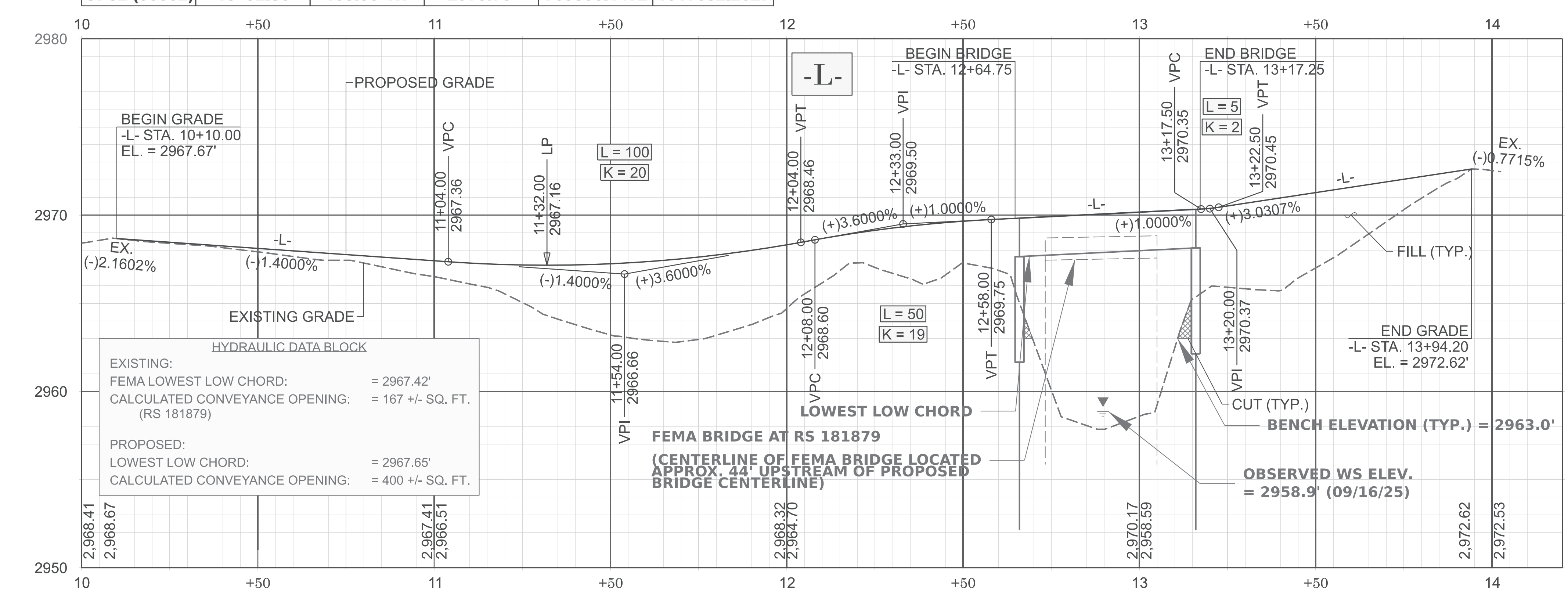


TYPICAL SECTION NO. 2

-L- STA. 12+64.75 (BEGIN BRIDGE) TO STA. 13+17.25 (END BRIDGE)

20' 0' 20' 40' 10' (ENGLISH)

POINT	-L- STA.	-L- OFFSET	ELEVATION	NORTH	EAST
GPS1 (50001)	10+66.99	57.93' RT	2970.64'	769755.4208	1017409.7961
GPS2 (50002)	13+92.86	103.50' RT	2973.75'	769806.1472	1017652.2627


-L-
BEGIN GRADE
-L- STA. 10+10.00
EL. = 2967.67'
PROPOSED GRADE
EXISTING GRADE
EX.
(-)2.1602%
(-)1.4000%
(+)3.6000%
(+)1.0000%
(+)3.0307%
EX.
(-)0.7715%
VPC 11+04.00 2967.36
LP 11+32.00 2967.16
VPI 11+54.00 2966.66
L = 100
K = 20
VPT 12+04.00 2968.46
VPC 12+08.00 2968.60
VPI 12+33.00 2969.50
L = 50
K = 19
VPT 12+58.00 2969.75
VPC 13+17.50 2970.35
VPI 13+20.00 2970.37
VPT 13+22.50 2970.45
L = 5
K = 2
BEGIN BRIDGE
-L- STA. 12+64.75
END BRIDGE
-L- STA. 13+17.25
END GRADE
-L- STA. 13+94.20
EL. = 2972.62'
FILL (TYP.)
CUT (TYP.)
LOWEST LOW CHORD
BENCH ELEVATION (TYP.) = 2963.0'
OBSERVED WS ELEV. = 2958.9' (09/16/25)
FEMA BRIDGE AT RS 181879
(CENTERLINE OF FEMA BRIDGE LOCATED APPROX. 44' UPSTREAM OF PROPOSED BRIDGE CENTERLINE)
HYDRAULIC DATA BLOCK
EXISTING:
FEMA LOWEST LOW CHORD: = 2967.42'
CALCULATED CONVEYANCE OPENING: (RS 181879) = 167 +/- SQ. FT.
PROPOSED:
LOWEST LOW CHORD: = 2967.65'
CALCULATED CONVEYANCE OPENING: = 400 +/- SQ. FT.
2,968.41 2,968.67
2,967.41 2,966.51
2,968.32 2,964.70
2,970.17 2,958.59
2,972.62 2,972.53
10 +50 11 +50 12 +50 13 +50 14
2980 2970 2960 2950

GENERAL NOTES AND STANDARD DRAWINGS

NCDOT'S 2024 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES
EFFECTIVE: 01-16-2024

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS. F&R WILL PROVIDE INVENTORIES FROM SITE BORINGS.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

NOTES

PROPERTY LINES AND OWNERS ARE TAKEN FROM YANCEY COUNTY GIS PAGE.

DESIGNED IN GUIDANCE WITH PRB DESIGN CRITERIA.

BASED ON UTILITY COORDINATION, THERE ARE NO KNOWN UTILITY CONFLICTS. THE CONTRACTOR SHALL INVESTIGATE THE PRESENCE OF UTILITIES BEFORE COMMENCING WORK.

ROADWAY QUANTITIES

DESCRIPTION	QUANTITY	UNIT
UNCLASSIFIED EXCAVATION	20	CY
BORROW EXCAVATION	690	CY
AGGREGATE BASE COURSE	80	TONS
RIP RAP, CLASS II	97	TONS
GEOTEXTILE FOR DRAINAGE	447	SY

20' 0' 20' 40' 10' HORIZONTAL (ENGLISH)

4' 0' 4' 8' 2' VERTICAL (ENGLISH)

REVISIONS

100.01.00202

FINAL | 4

NORTH CAROLINA DEPARTMENT OF EMERGENCY MANAGEMENT - PRIVATE ROADS AND BRIDGES
YANCEY COUNTY

ROADWAY DESIGN ENGINEER
10/22/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039234 NIKKI T. HONEYCUTT
Signed by: Nikki Honeycutt

HYDRAULICS ENGINEER
10/22/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049338 ERIK P. AADLAND
Signed by: Erik P. Aadland

UNLESS ALL SIGNATURES COMPLETED

PREPARED BY
KCA
KISINGER CAMPO & ASSOCIATES
NC FIRM LICENSE No: C-1506
301 Fayetteville St., Suite 1500
Raleigh, NC 27601
(919)882-7839

10

HO_NT1/amcswain - 10/22/2025

PROJECT REFERENCE NO.	SHEET NO.
100.01.00202	EC-01

Prepared in the Office of:
NC FIRM LICENSE NO: C-1506
301 FAYETTEVILLE ST.,
SUITE 1100
RALEIGH, NC 27601
(919) 882-7839
Designed by:
John McNulty 4263
NAME LEVEL III CERTIFICATION NO.

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

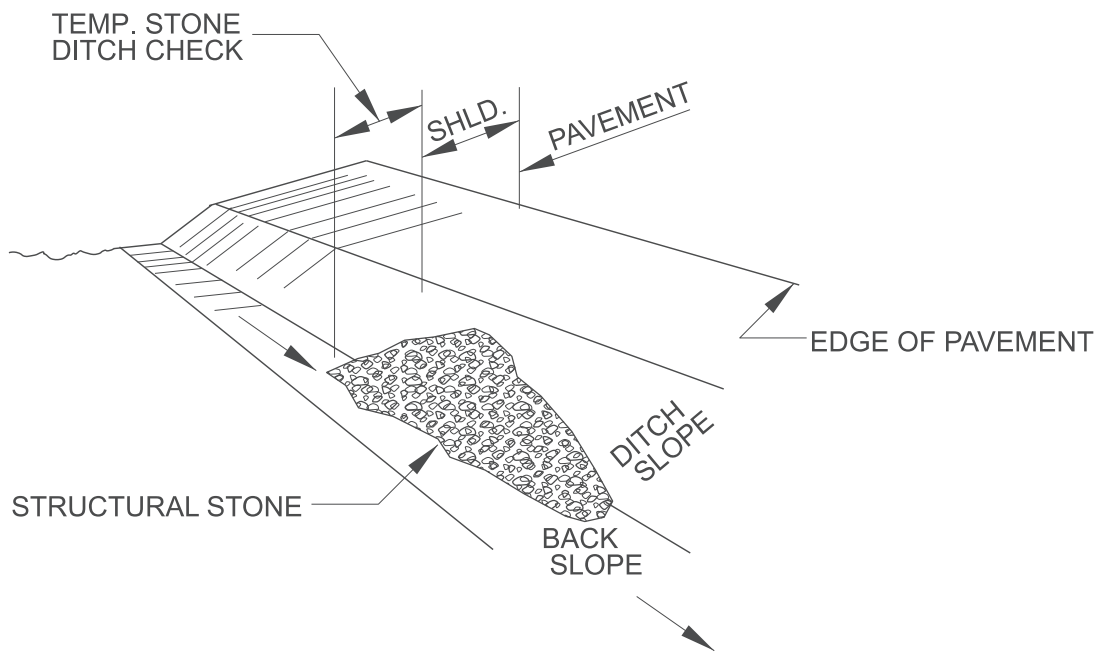
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet 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—

PROJECT REFERENCE NO.	SHEET NO.
100.01.00202	EC-2
R/W SHEET NO.	

Prepared in the Office of:
NC FIRM LICENSE NO: C-1506
301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

Designed by:
John McNulty — NAME
4263 — LEVEL III CERTIFICATION NO.

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

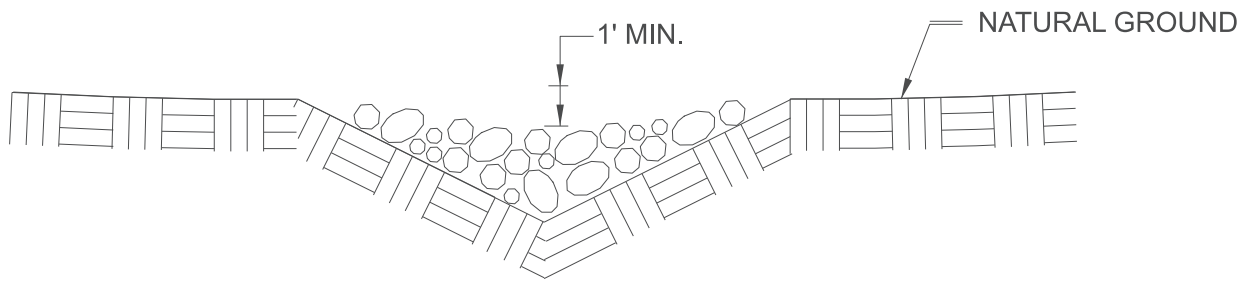


ISOMETRIC VIEW

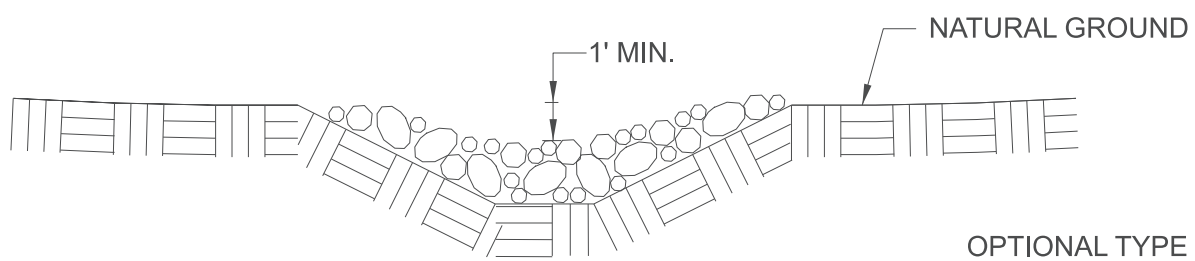
NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

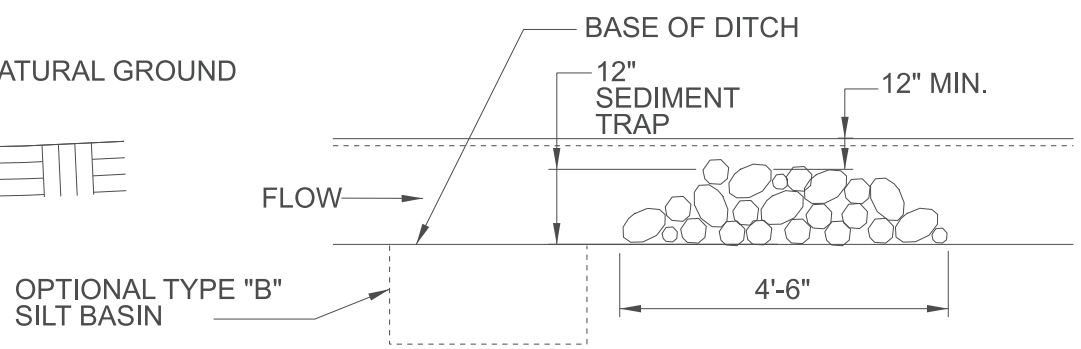
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH



ELEVATION VIEW

PROJECT REFERENCE NO.	SHEET NO.
PRB-01_100.01.00202 FACE LN	EC-2A

Prepared in the Office of:

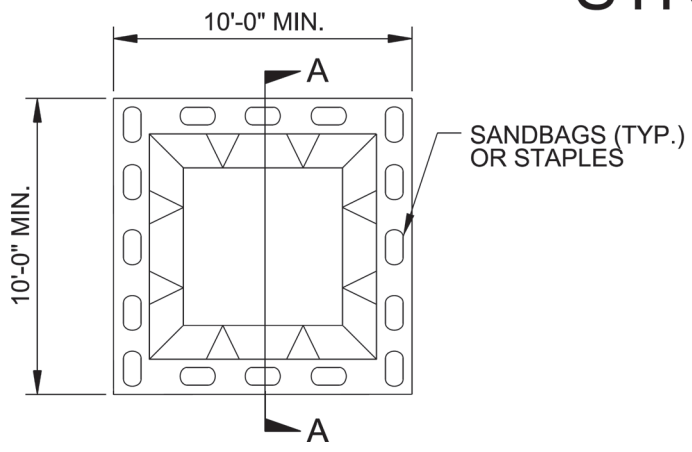
NC FIRM LICENSE NO: C-1506

301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

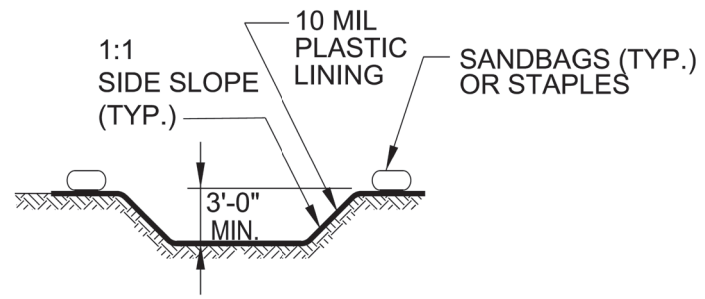
Designed by:

John McNulty — NAME
4263 — LEVEL III CERTIFICATION NO.

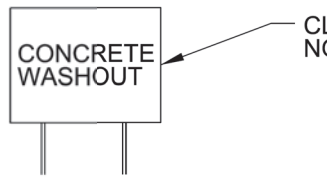
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



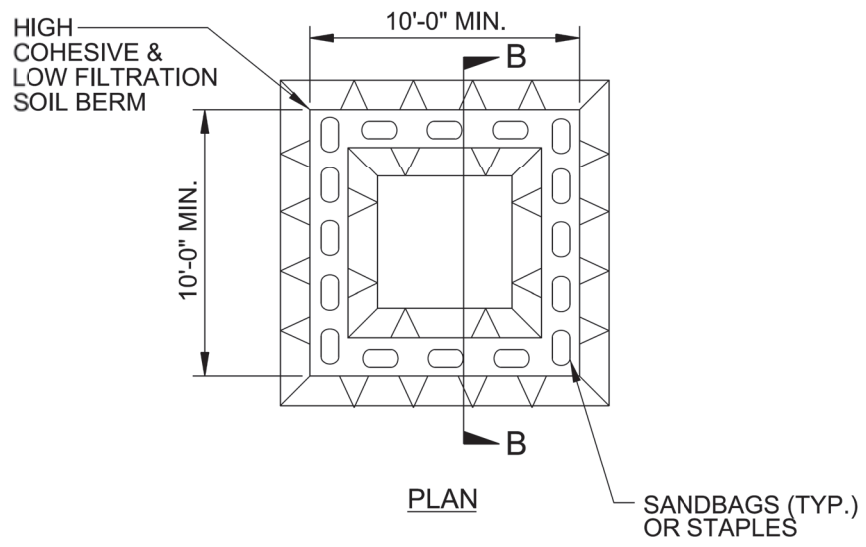
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

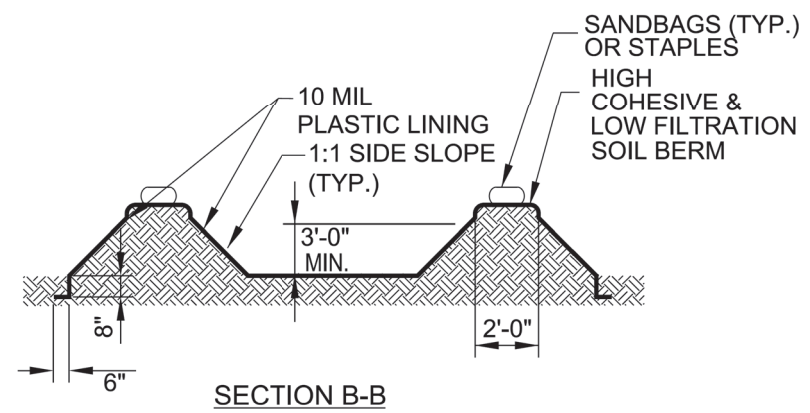
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

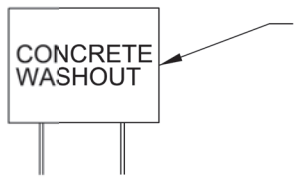
NOT TO SCALE



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 CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

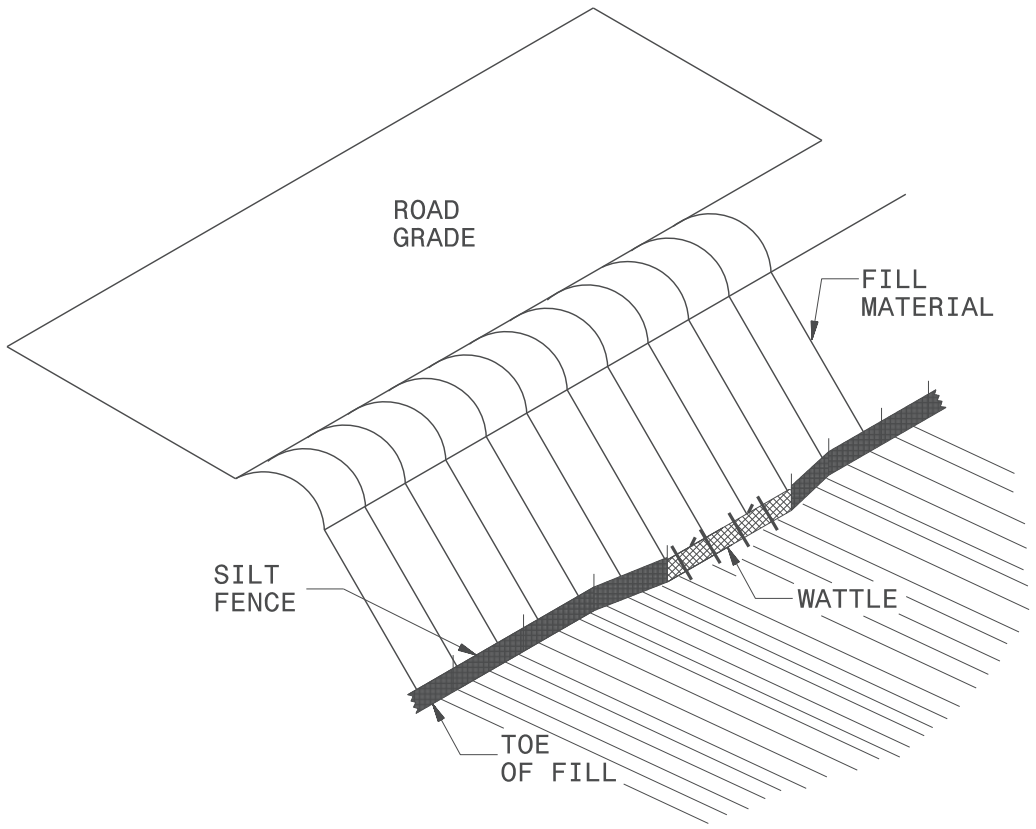
5/26/20

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

Prepared in the Office of:
NC FIRM LICENSE NO: C-1506
301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
Designed by:
John McNulty 4263
NAME LEVEL III CERTIFICATION NO.

100.01.00202

EC-2B



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

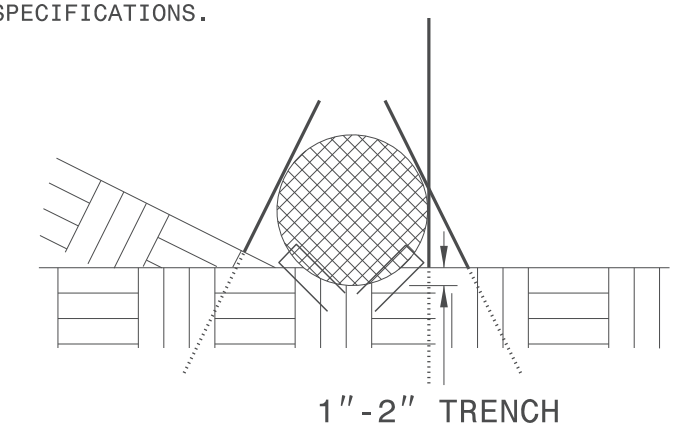
PROVIDE STAPLES MADE OF 11 GUAGE STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 6″ IN LENGTH.

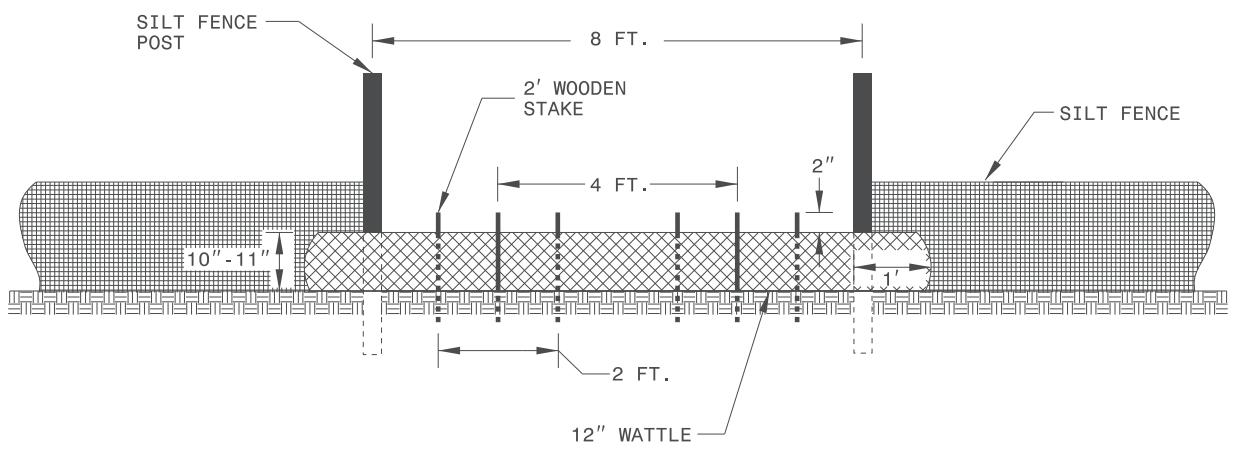
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

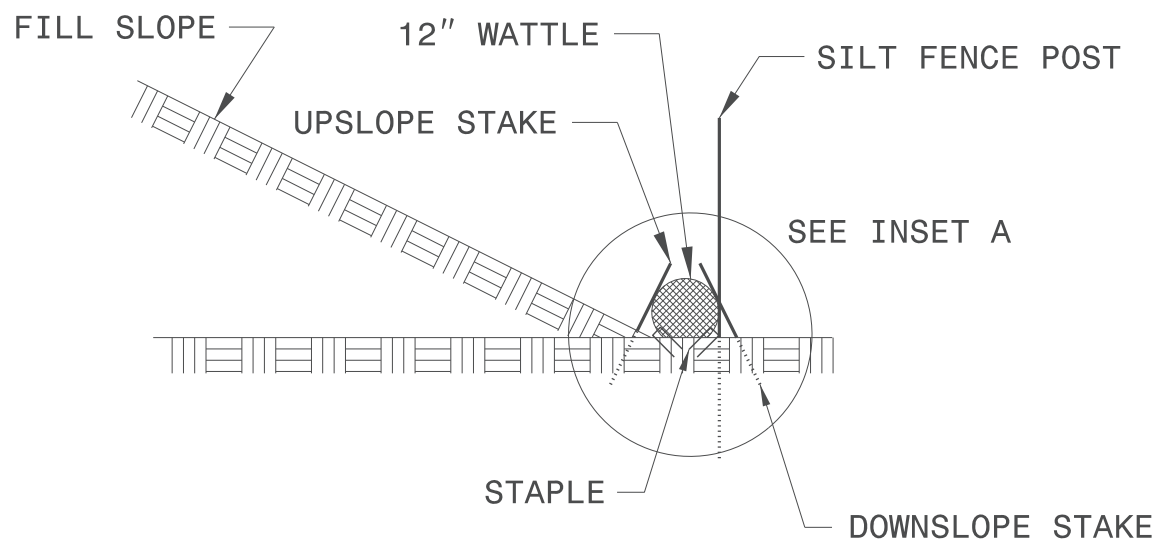
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
100.01.00202	EC-3

Prepared In the Office of:

NC FIRM LICENSE NO: C-1506

301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

Designed by:

John McNulty — NAME

4263 — LEVEL III CERTIFICATION NO.

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

PROJECT REFERENCE NO.	SHEET NO.
100.01.00202	EC-4 / CONST. 4
R/W SHEET NO.	

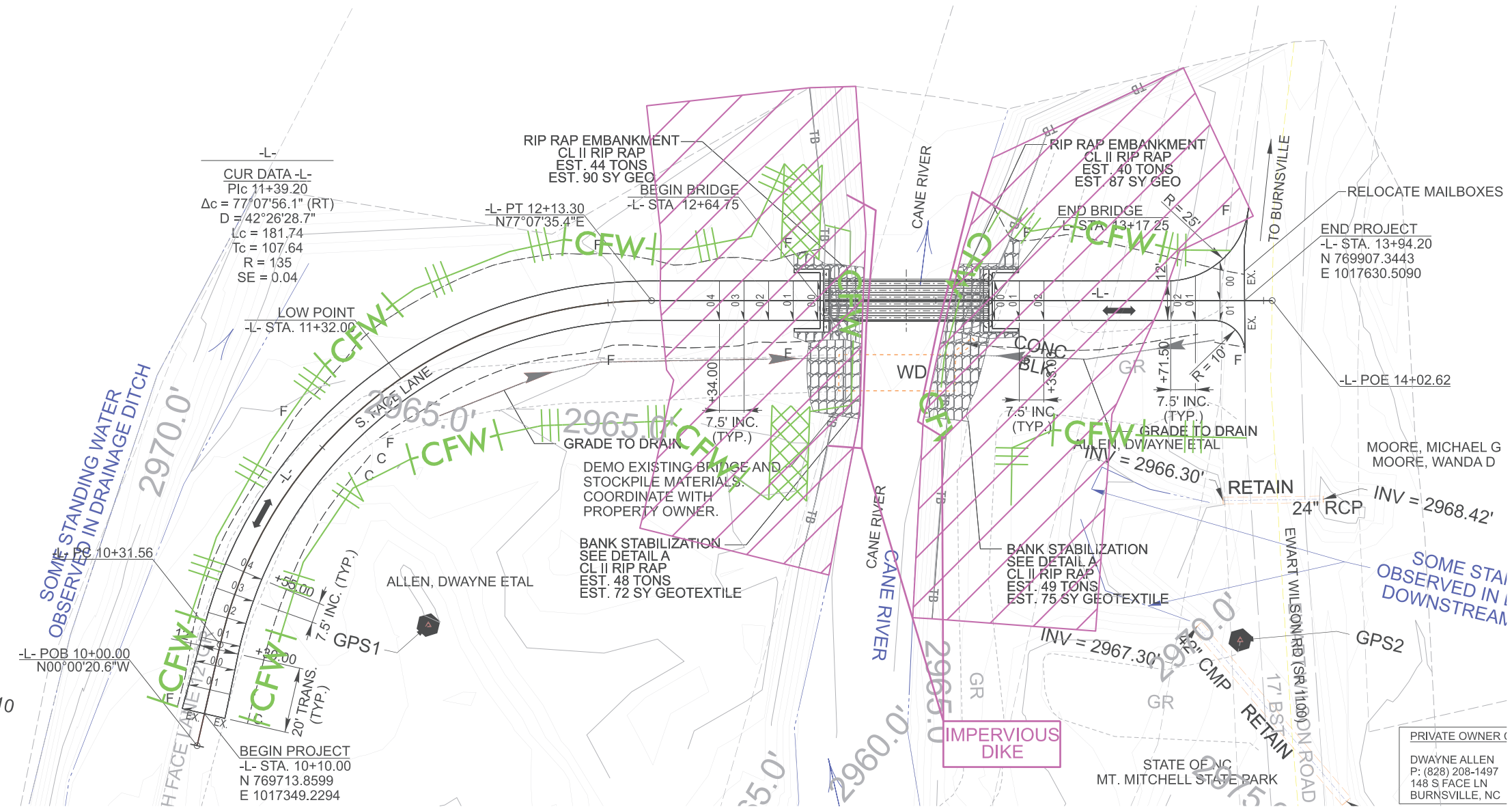
Prepared In the Office of:

NC FIRM LICENSE NO: C-1506

301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

Designed by:

John McNulty — NAME — *4263* — LEVEL III CERTIFICATION NO.



ENVIRONMENTALLY SENSITIVE AREA (ESA)

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN IN THE EVENT DRILLED SHAFTS ARE CONSTRUCTED.

PROJECT REFERENCE NO.	SHEET NO.
100.01.00202	EC-5 / CONST. 4
R/W SHEET NO.	

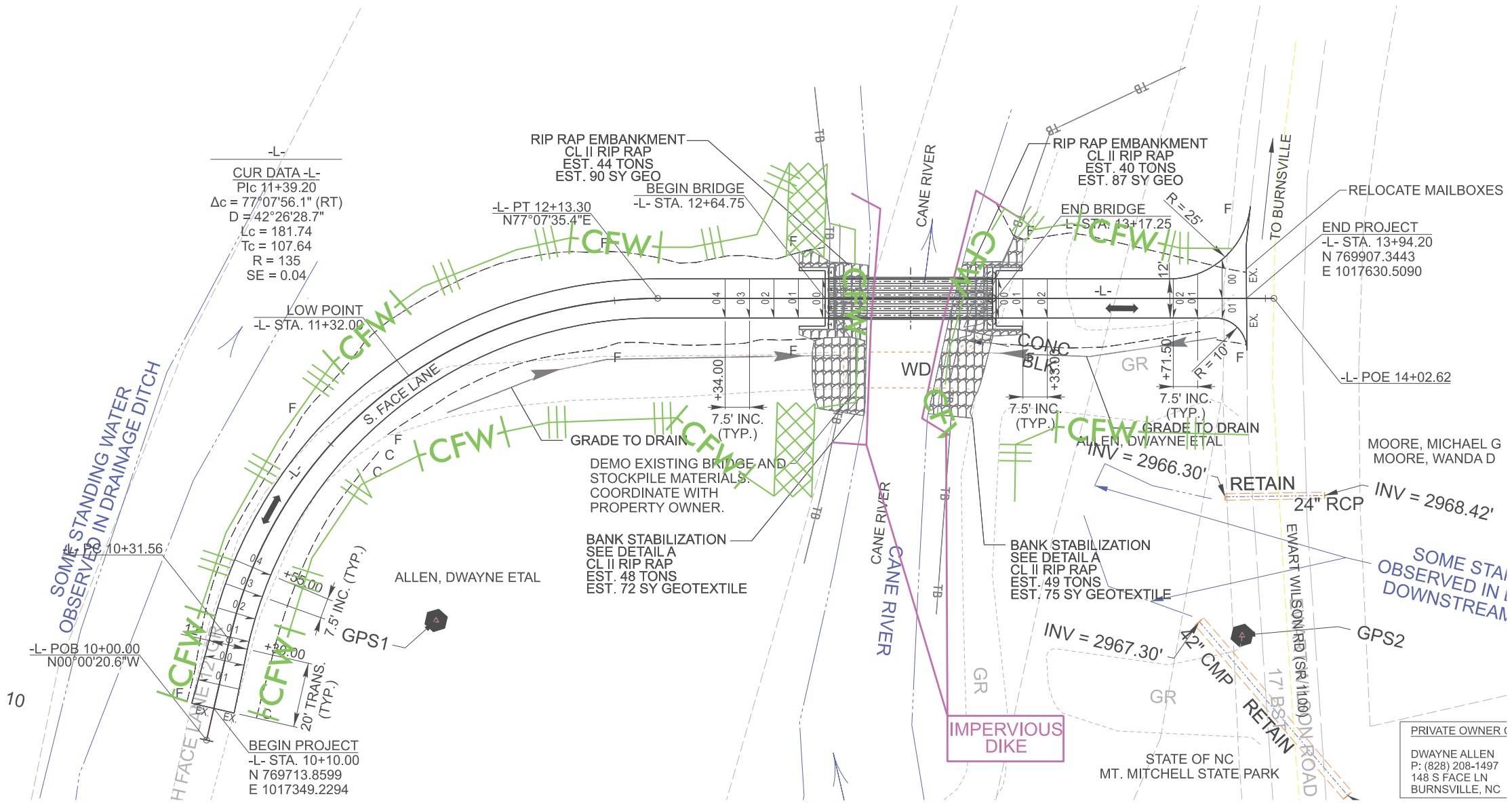
Prepared In the Office of:

NC FIRM LICENSE NO: C-1506

301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839

Designed by:

John McNulty — NAME — *4263* — LEVEL III CERTIFICATION NO.

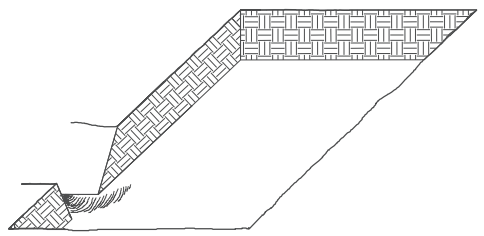


PLANTING DETAILS

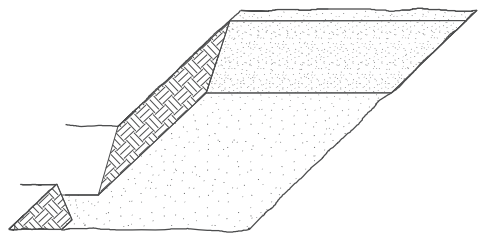
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

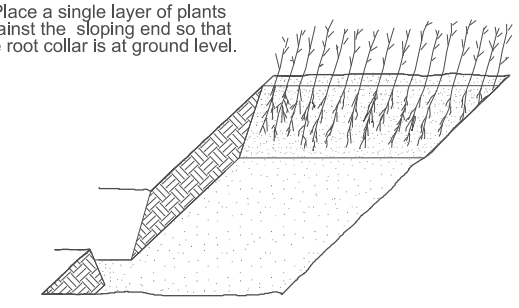
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



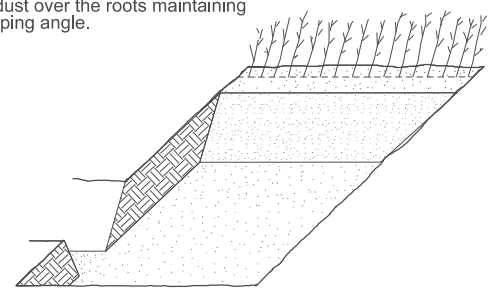
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

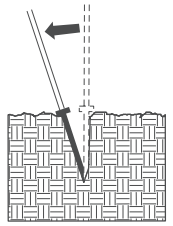


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

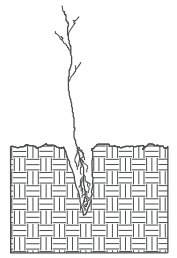


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

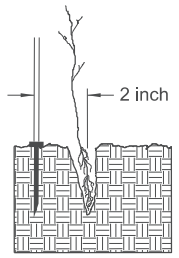
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



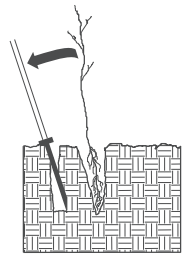
1. Insert planting bar as shown and pull handle toward planter.



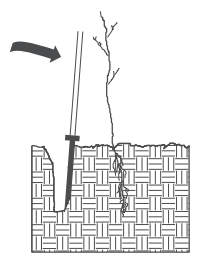
2. Remove planting bar and place seedling at correct depth.



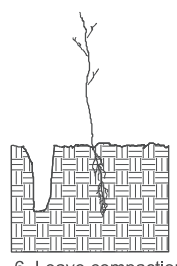
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	100.01.00202	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

Prepared In the Office of:
NC FIRM LICENSE NO: C-1506
301 FAYETTEVILLE ST.,
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
Designed by:
John McNulty 4263
NAME LEVEL III CERTIFICATION NO.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

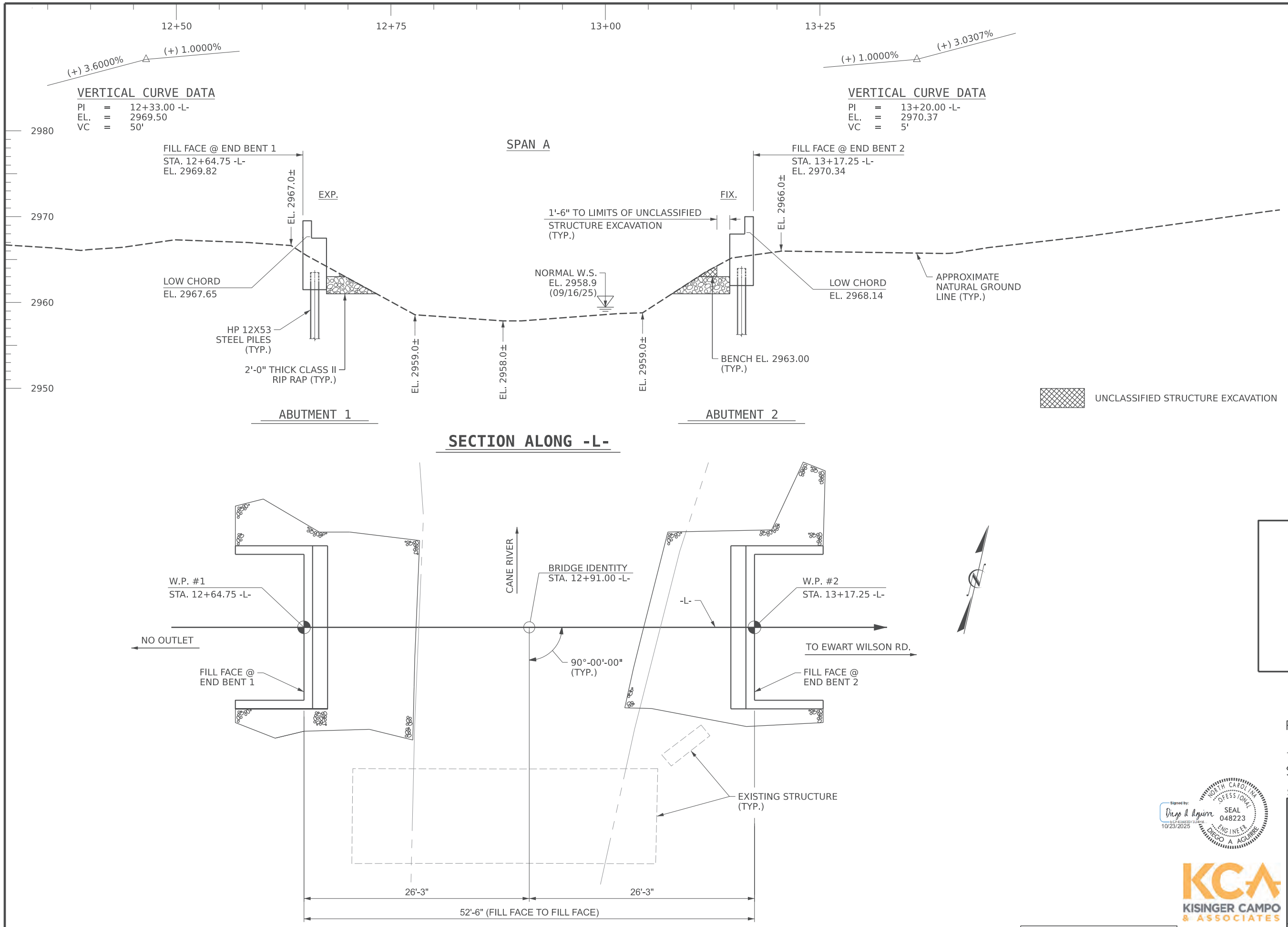
REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

34% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
33% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
33% BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



SECTION ALONG -L-

PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

SHEET 1 OF 4

Signed by: Diego A Aguirre
10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

GENERAL DRAWING

FOR BRIDGE OVER CANE RIVER
ON SOUTH FACE LN. BETWEEN
EWART WILSON RD.
& NO OUTLET

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

10/23/2025
401_005_100.01.00202_STR_GD01_S-1.dgn
daguirre

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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

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	120	2963.48	55			200					2952.00	3	8
End Bent 2, Piles 1-4	4	120	2963.97	55			200					2945.00	6	11
TOTAL QUANTITY:													36	76

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

** 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	120			0.60		
End Bent 2, Piles 1-4	120			0.60		

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

PROJECT NO. 100.01.00202

Yancey COUNTY

STATION: 12+91.00 -L-

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (W. Patrick Alton, #033758) on 10-10-2025.
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 048223 ENGINEER DIEGO A. AGUIRRE

Signed by: Diego A Aguirre 10/23/2025

SIGNATURE DATE

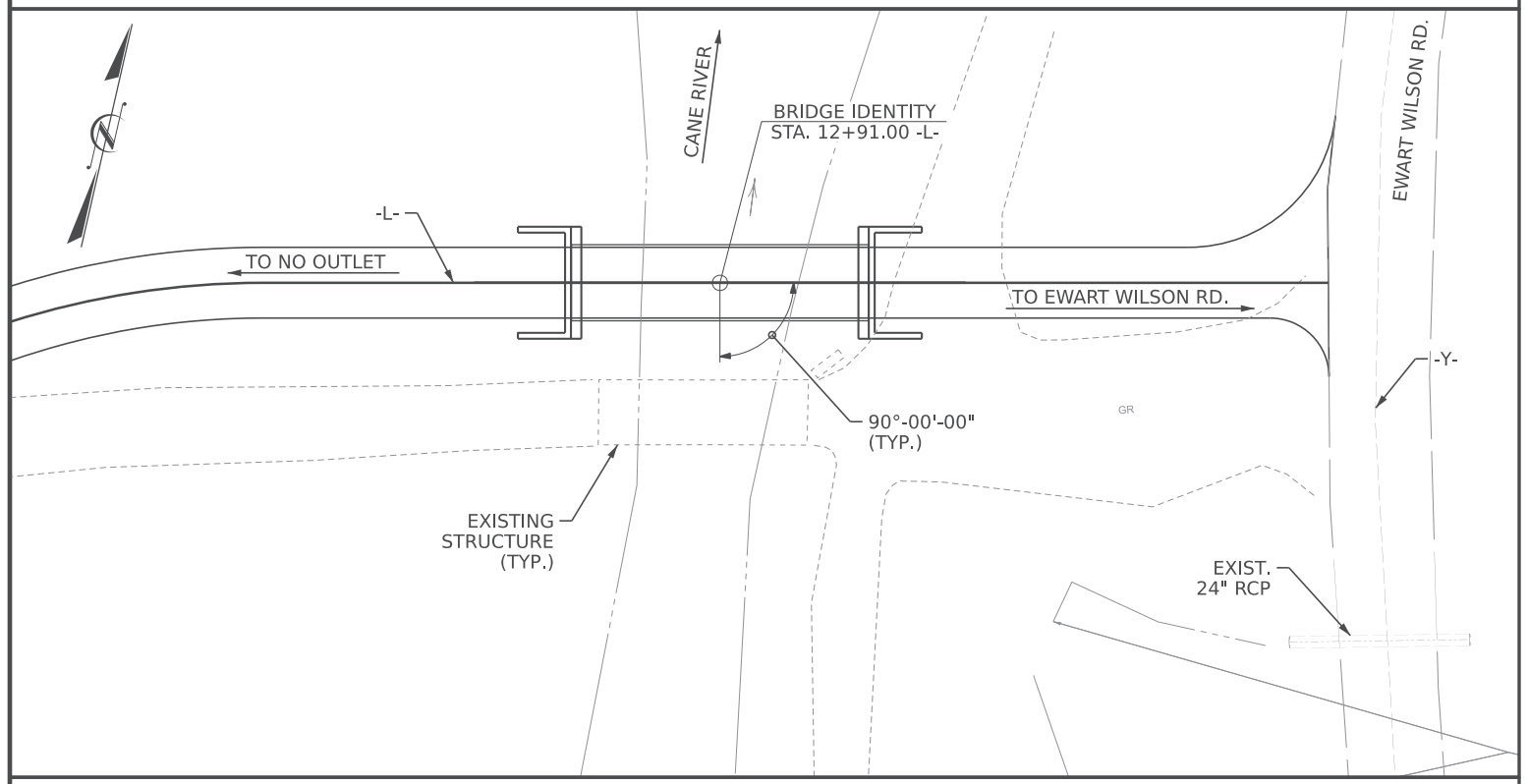
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

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

BM INFO: GPS#1 (50001), -L- STA. 10+66.99, 57.93 RT., EL. 2970.64, NORTHING: 769755.421 EASTING: 1017409.796
GPS#2 (50002), -L- STA. 13+92.86, 103.50 RT., EL. 2973.50, NORTHING: 769806.147 EASTING: 1017652.263



LOCATION SKETCH

FOR ADDITIONAL INFORMATION, SEE FULL CONTRACT DOCUMENTS

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY
STEEL BEAM (W18X130, BRG.-TO-BRG. = 48'-11")

LOAD TYPE	VEHICLE	DEAD LOAD FACTOR (γ_{DC})	LIVE LOAD FACTOR (γ_{LL})	WEIGHT (W) (TONS)	MINIMUM RATING FACTOR (RF)	RATING TONS = W x RF
DESIGN LOAD	HS-20 (INVENTORY)	1.25	1.75	36.00	1.94	69.84
	HS-20 (OPERATING)	1.25	1.35	36.00	2.52	90.72
EMERGENCY VEHICLE (EV)	EV2	1.25	1.30	28.75	2.32	66.70
	EV3	1.25	1.30	43.00	1.61	69.23

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 12+91.00 - L-	ASBESTOS ASSESSMENTS	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 12+91.00 -L-	CLASS A CONCRETE (BRIDGE)	REINFORCING STEEL (BRIDGE)	APPROX. 40,000 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 X 53 STEEL PILES		RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	TIMBER BRIDGE DECK SYSTEM	TIMBER BRIDGE WHEEL GUARD SYSTEM
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LBS.	LUMP SUM	EA.	No.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE								LUMP SUM						LUMP SUM	LUMP SUM	101.0
ABUTMENT 1			32	12		19.0	2,089		4	4	220	44	90			
ABUTMENT 2			44	24		19.0	2,089		4	4	220	40	87			
TOTAL	LUMP SUM	LUMP SUM	76	36	LUMP SUM	38.0	4,178	LUMP SUM	8	8	440	84	177	LUMP SUM	LUMP SUM	101.0

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 3 OF 4

Signed by: Diego A Aguirre 10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

GENERAL DRAWING

FOR BRIDGE OVER CANE RIVER
ON SOUTH FACE LN. BETWEEN
EWART WILSON RD.
& NO OUTLET

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

10/23/2025
401_015_100.01.00202_STR_GD02_S-3.dgn
daguirre

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KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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

NOTES

DESIGN DATA:

ASSUMED LIVE LOAD = HS-20.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) IN-KIND TIMBER BRIDGE PROGRAM DESIGN GUIDELINES DATED 03/28/2025, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, EXCEPT AS NOTED.

IMPACT ALLOWANCE = 15%.

MULTIPLE PRESENCE FACTOR = 1.0.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

A HYDRAULIC MODEL WAS NOT DEVELOPED FOR THIS BRIDGE SITE. HYDRAULIC DATA NOT PROVIDED OTHER THAN WHAT IS SHOWN IN THE ELEVATION VIEW, SHEET 1 OF 4. A FUTURE HYDRAULIC MODEL WILL BE DEVELOPED BY FEMA TO INCORPORATE THE PROPOSED STRUCTURE AND ANY CHANGES TO THE FLOODPLAIN AND FLOODWAY.

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

MAINTENANCE NOTES:

FOR MAINTENANCE AND INSPECTION RECOMMENDATIONS, SEE MAINTENANCE RECOMMENDATION NOTES SHEET.

AFTER SEVERE STORMS AND UPON INSPECTION, USE STONE TO BACK FILL SCOUR HOLES AROUND SUBSTRUCTURE AND GRADE AS SHOWN IN THESE PLANS. FOR ADDITIONAL DETAILS AND BRIDGE MAINTENANCE AND INSPECTION RECOMMENDATIONS, SEE MAINTENANCE RECOMMENDATION NOTES SHEET.

UTILITIES:

BASED ON UTILITY COORDINATION, THERE ARE NO KNOWN UTILITY CONFLICTS. THE CONTRACTOR SHALL INVESTIGATE THE PRESENCE OF UTILITIES BEFORE COMMENCING WORK.

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.

CONCRETE:

UNLESS OTHERWISE INDICATED ON THE PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF SUBSTRUCTURE.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON THE STRUCTURE SHALL BE CHAMFERED 3/4".

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO THE 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:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OR GALVANIZED OF THE STRUCTURAL STEEL SHOP COATING PROGRAM AND ARTICLE 442-8 OF THE NCDOT 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.

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 $^{1}/_{16}$" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING OR METALLIZING.

NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

ALL STRUCTURAL STEEL FIELD CONNECTIONS SHALL BE $^{5}/_{8}$" ∅ GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. BOLTS/NUTS/WASHERS SHALL BE IN ACCORDANCE WITH SECTION 1072-5 OF THE NCDOT STANDARD SPECIFICATIONS.

STRUCTURAL TIMBER:

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

ALL TIMBER DIMENSIONS SHOWN ON THE PLANS ARE NOMINAL DIMENSIONS.

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

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

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

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 FLASHING MEMBRANE, SEE TIMBER BRIDGE FLASHING MEMBRANE SPECIAL PROVISIONS.

FOR TIMBER BRIDGE WHEEL GUARD SYSTEM INCLUDING LUMBER, DELINEATORS, HARDWARE FOR BOLT CONNECTIONS, AND HARDWARE FOR SCREW CONNECTIONS, SEE TIMBER BRIDGE DECK ON STEEL BEAMS SPECIAL PROVISIONS.

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

HARDWARE AND CONNECTIONS:

ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS, 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.

BEAMS SHALL BE PLACED PARALLEL TO THE CHORD.

REPAIR ANY DAMAGED GALVANIZED SURFACES IN ACCORDANCE WITH SECTION 1076-7 OF THE NCDOT STANDARD SPECIFICATIONS.

FOUNDATION NOTES:

INSTALL ALL PILES IN ACCORDANCE WITH SECTION 450 OF THE NCDOT STANDARD SPECIFICATIONS. PILE EXCAVATION IS REQUIRED TO INSTALL ALL PILES AT THE ABUTMENTS.

PILES AT ABUTMENT 1 AND ABUTMENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 KIPS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 1. EXCAVATE HOLES TO AN ESTIMATED ELEVATION 2,952 FT.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 2. EXCAVATE HOLES TO AN ESTIMATED ELEVATION 2,945 FT.

AFTER PILE EXCAVATION HAS BEEN COMPLETED, DRIVE PILES THROUGH THE EXCAVATED HOLES AT ABUTMENT 1 AND ABUTMENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 KIPS PER PILE. THE REQUIRED DRIVING RESISTANCE IS EQUAL TO THE FACTORED RESISTANCE DIVIDED BY A DRIVING RESISTANCE FACTOR OF 0.6.

THE ESTIMATED PILE LENGTH IS 55 FEET AT ABUTMENT 1 AND ABUTMENT 2 WHICH INCLUDES 2-FEET OF EMBEDMENT INTO THE CAP.

FILL HOLES FOR PILE EXCAVATION AT ABUTMENT 1 AND ABUTMENT 2 WITH CONCRETE, GROUT OR FLOWABLE FILL.

A DELMAG D 19-32 PILE HAMMER WAS UTILIZED AS A COMMON HAMMER TYPE TO DETERMINE POTENTIAL PILE DRIVING STRESSES AT THE END BENTS. THIS HAMMER SHOULD PROVIDE SUFFICIENT ENERGY TO DRIVE THE PILES TO THE REQUIRED DRIVING RESISTANCES ALTHOUGH A REDUCED FUEL SETTING MAY BE REQUIRED IN ORDER TO LIMIT THE POSSIBILITY OF OVERSTRESSING THE PILES. HOWEVER, THE ACTUAL HAMMER(S) TO BE UTILIZED WILL NEED TO BE SUBMITTED BY THE CONTRACTOR AND ANALYZED AFTER LETTING.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGEOF 30,000 TO 40,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END ABUTMENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE NCDOT STANDARD SPECIFICATIONS.

IT IS ASSUMED THAT SCOUR WILL NOT IMPACT THE BRIDGE ABUTMENTS.

EXISTING STRUCTURE:

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 NORTH CAROLINA DEPARTMENT OF PUBLIC SAFETY FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE, WHICH WAS ERECTED AFTER HURRICANE HELENE, SHALL BE REMOVED. COORDINATE WITH THE PRIVATE OWNER TO STOCKPILE THE EXISTING BRIDGE MATERIALS. PRIVATE OWNER'S CONTACT INFORMATION: DWAYNE ALLEN, PHONE: 828-208-1497, ADDRESS: 148 S FACE LN BURNSVILLE, NC.

REMOVAL OF THE EXISTING BRIDGE AND WORK ON THE PROPOSED BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER, EXCEPT WHERE THE CONTRACTOR'S PLAN USES PLATFORMS, NETS, SCREENS OR OTHER PROTECTIVE DEVICES TO CATCH THE MATERIAL.

SPECIAL NOTES:

IT IS THE CONTRACTOR'S RESPONSABILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

WHEREIN THE PLANS AND THE SPECIAL PROVISIONS REFERENCE “STANDARD SPECIFICATIONS”, IT REFERS TO THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, DATED JANUARY 2024.

WHEREIN THE PLANS REFERENCE FUNCTIONS TO BE PERFORMED BY "THE ENGINEER", "THE DEPARTMENT", OR "NCDOT", THE INTENT OF THIS CONTRACT IS FOR THE NORTH CAROLINA DEPARTMENT OF PUBLIC SAFETY TO PERFORM THESE FUNCTIONS EITHER INDEPENDENTLY OR THROUGH ITS AGENTS.

WORK ON THE BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW, EXCEPT WHERE THE CONTRACTOR'S PLAN USES PLATFORMS, NETS, SCREENS OR OTHER PROTECTIVE DEVICES TO CATCH THE MATERIAL.

THE BRIDGE SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON THE PLANS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT,SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ALL PAY ITEMS SHOWN IN THESE PLANS, REFER TO THE STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS, AS APPLICABLE.

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

SHEET 4 OF 4

Signed by: Diego A Aguirre
10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

GENERAL DRAWING

NOTES

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

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

10/23/2025
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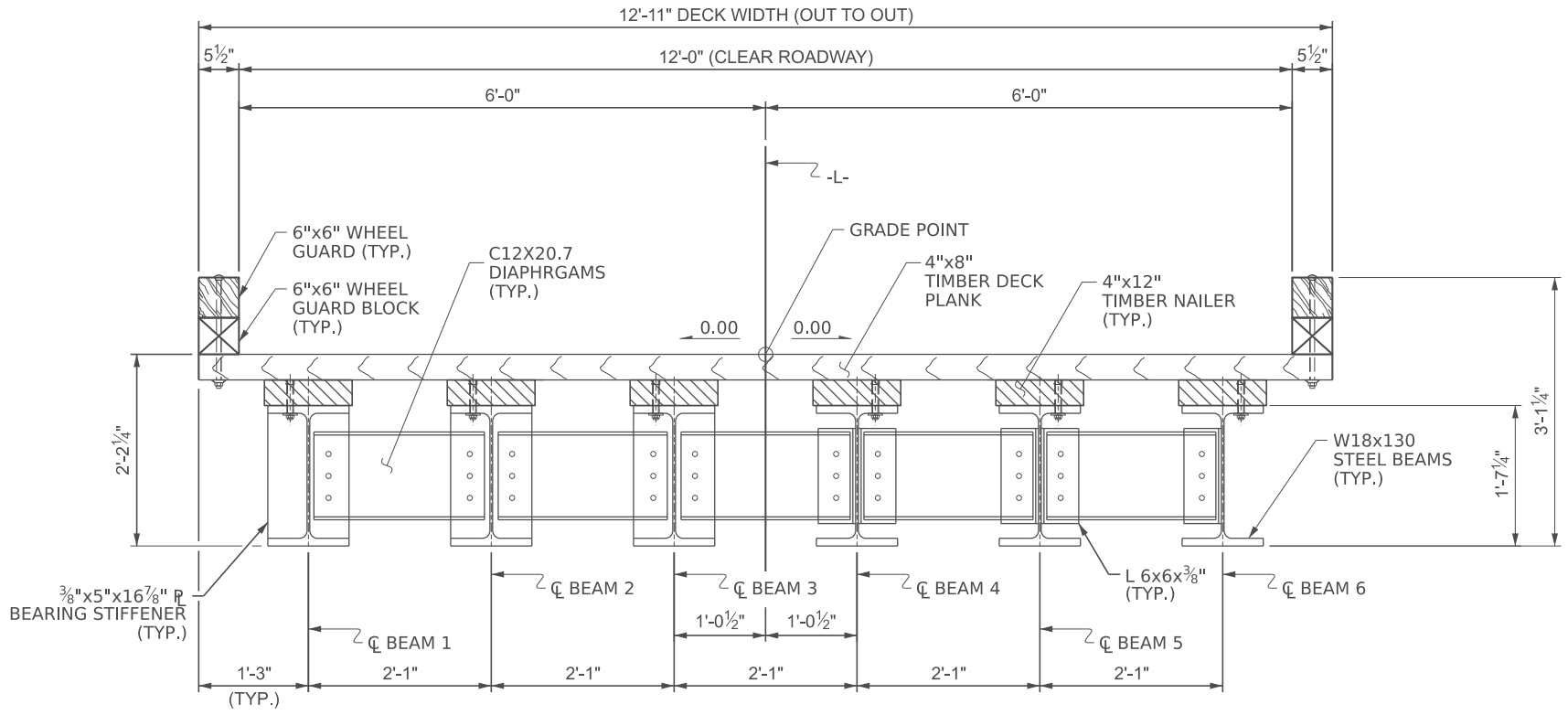
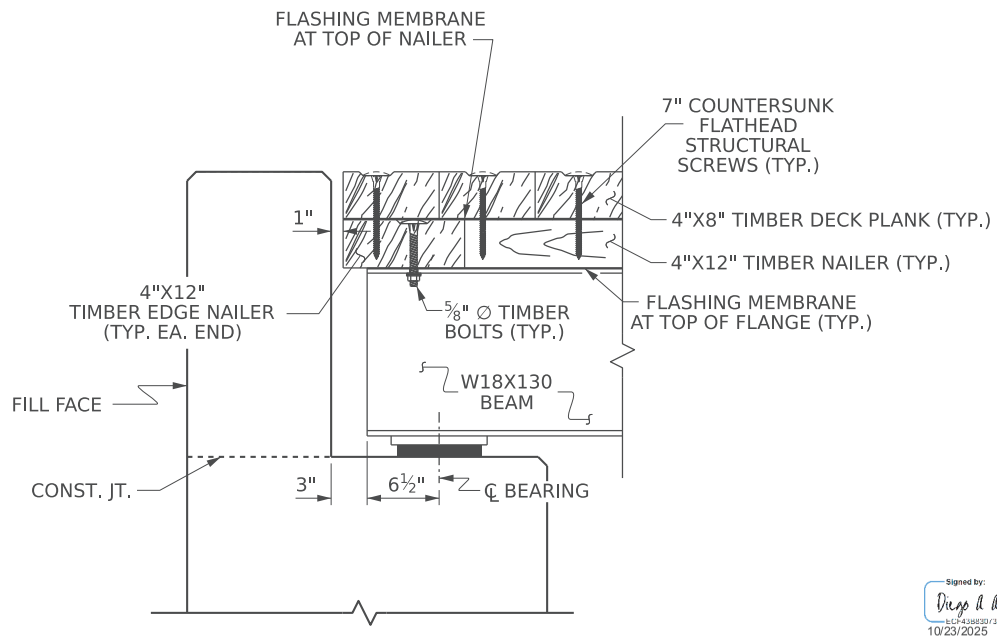


PARTIAL TYPICAL SECTION

(SHOWING BEARING STIFFENERS & END DIAPHRAGMS)
(SEE FRAMING PLAN SHEET FOR DETAILS)

PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)
(SEE FRAMING PLAN SHEET FOR DETAILS)



SECTION AT ABUTMENT

NOTES

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

FOR TIMBER BRIDGE WHEEL GUARD SYSTEM DETAILS, SEE TIMBER BRIDGE WHEEL GUARD 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 SHEET.

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

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

Signed by: Diego A Aguirre
10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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NC FIRM LICENSE: C-1506

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SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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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 BOLT WHEN DRIVING TIMBER DECK SCREWS.

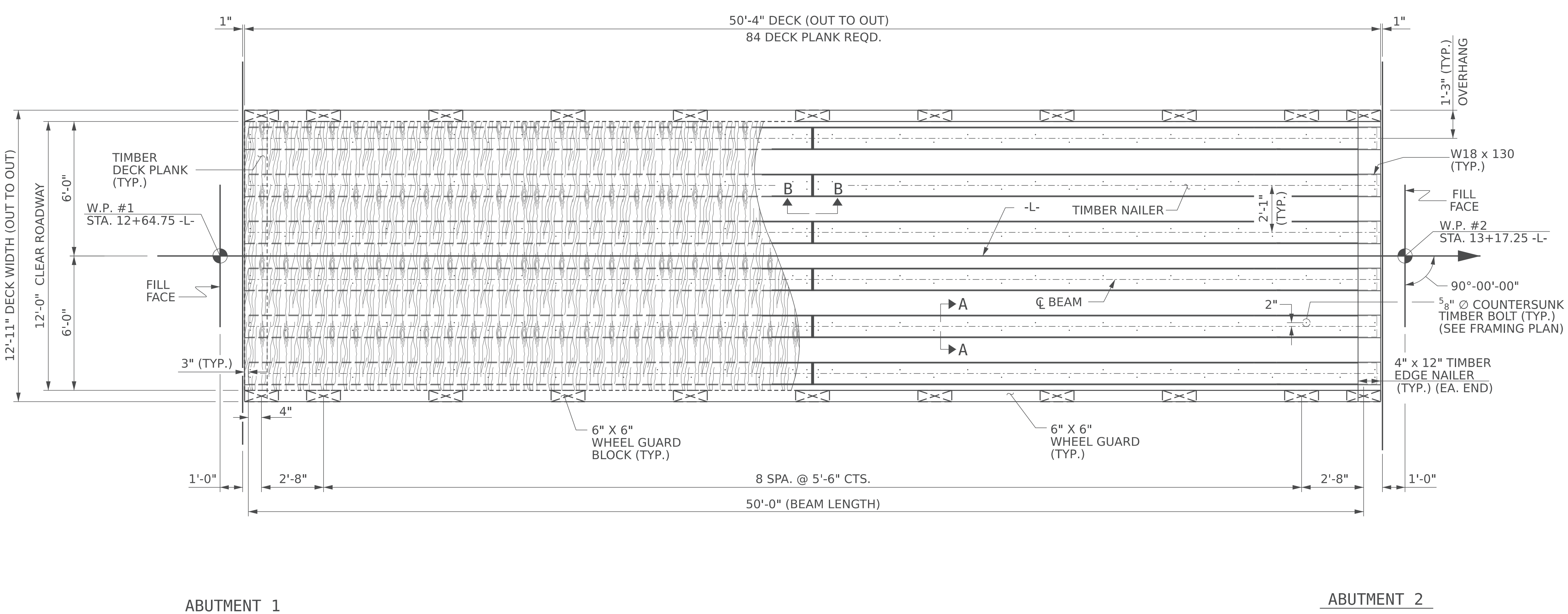
SEE BEAM DETAILS FOR SPACING OF TIMBER BOLTS IN TOP FLANGE OF ROLLED BEAM.

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

TRIM THE EDGE NAILER FLUSH WITH THE EDGE OF DECK.

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

FOR SECTIONS A-A AND B-B SEE SHEET 2 OF 2.



DECK LAYOUT

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 1 OF 2

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SUPERSTRUCTURE
PLAN OF SPAN
50' STEEL BEAM WITH
12'-0" CLEAR ROADWAY
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
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DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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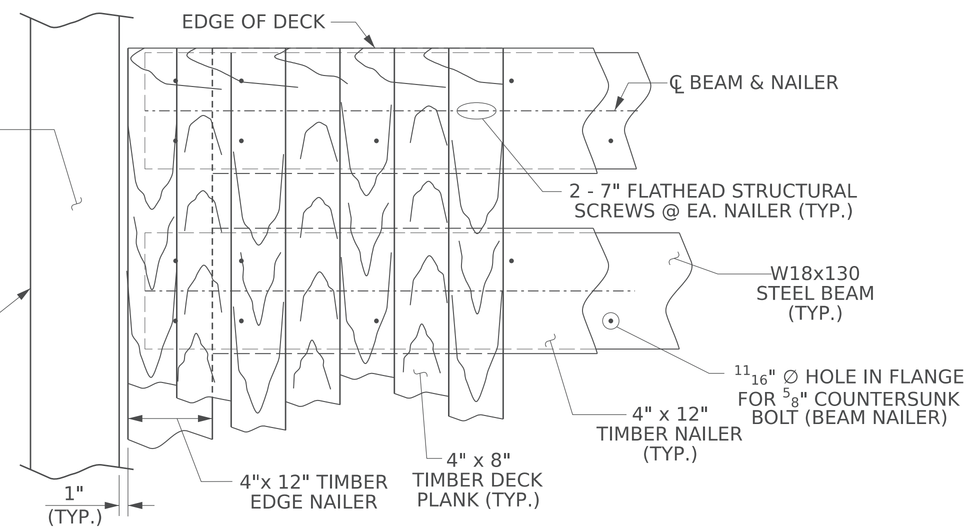
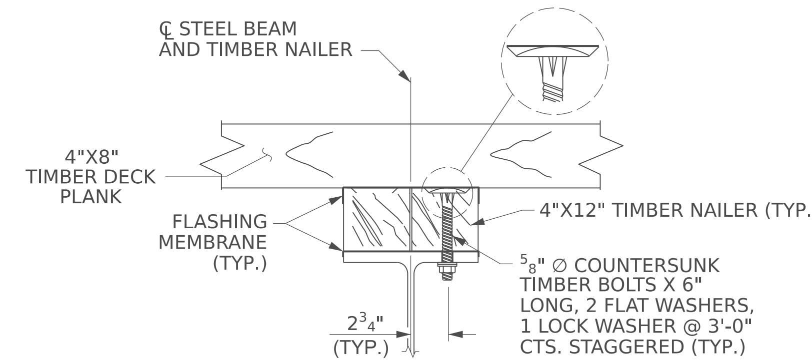


TYPICAL DECK DETAIL AT ABUTMENT



SECTION A-A

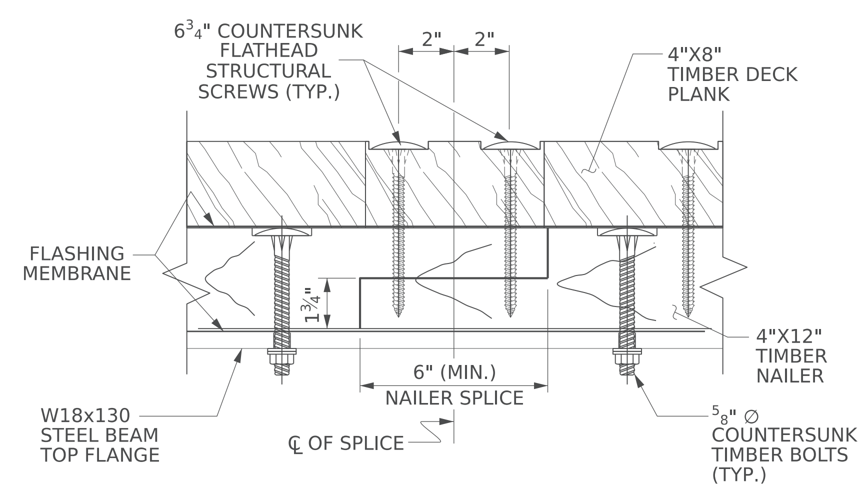
TIMBER NAILER ATTACHMENT DETAILS

BILL OF MATERIAL FOR 50 FT. SPAN

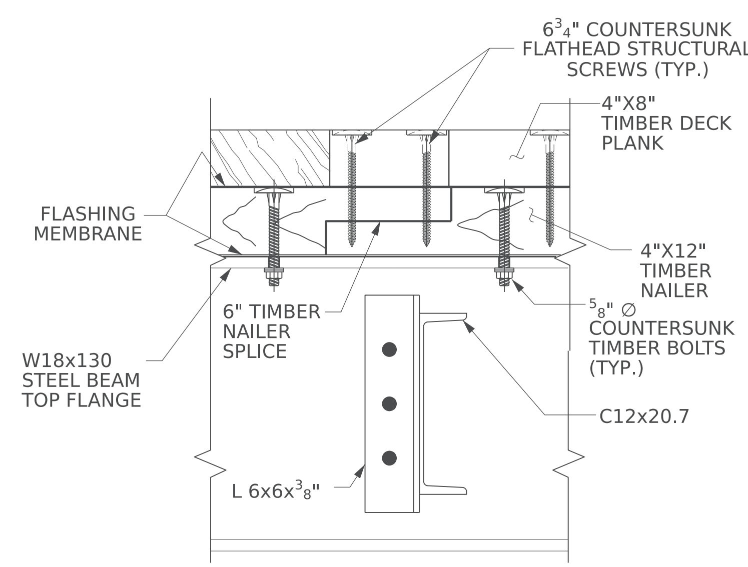
TREATED LUMBER		
ITEM	SIZE	LIN. FT.
TIMBER DECK PLANKS	4"x8"	1085
TIMBER NAILERS	4"x12"	300
TIMBER EDGE NAILERS	4"x12"	26
TOTAL TREATED LUMBER		1595.4 LIN. FT.

FLASHING MEMBRANE		
ITEM	SIZE	LIN. FT.
TOP OF BEAM	25 MILS	300
TOP OF TIMBER NAILERS	25 MILS	326
TOP OF TIMBER EDGE NAILERS	25 MILS	26
FLASHING MEMBRANE		884.8 LIN. FT.

HARDWARE			
ITEM	No.	SIZE	LBS.
5/8" ∅ TIMBER BOLTS	240	5/8"	60
HEAVY HEX NUTS	240	5/8"	12
STANDARD WASHER	240	5/8"	3
LOCK WASHER	240	5/8"	3
FLAT HEAD STR. SCREWS	1,008	6 3/4"	81
HARDWARE FOR CONNECTIONS			159 LBS.



NAILER SPLICE DETAILS



SECTION B-B

NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 2 OF 2

Signed by: Diego A. Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A. AGUIRRE

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SUPERSTRUCTURE
PLAN OF SPAN
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

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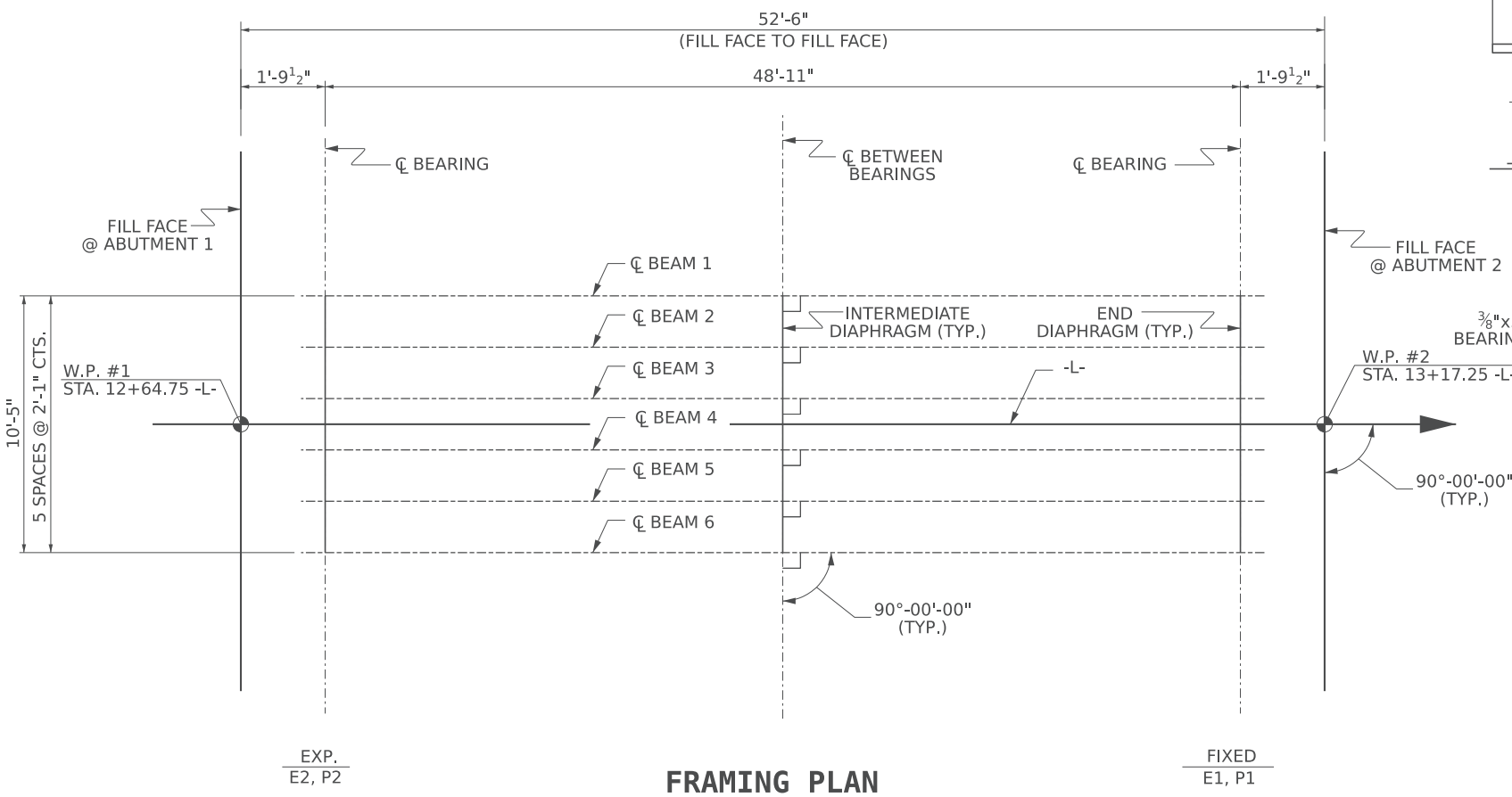
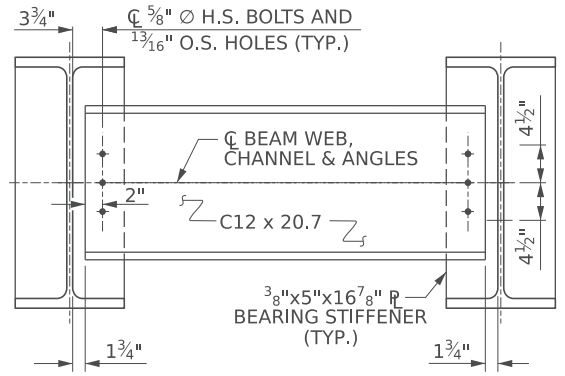
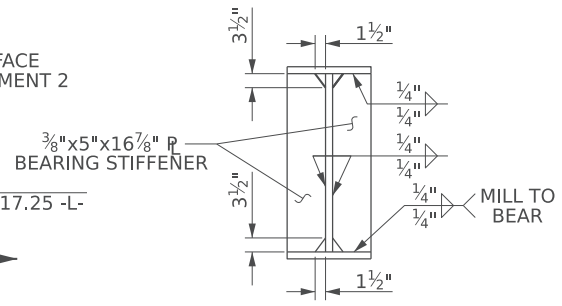


FRAMING PLAN



END DIAPHRAGM DETAIL



BEARING STIFFENER
(AT ABUTMENTS)

NOTES

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

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

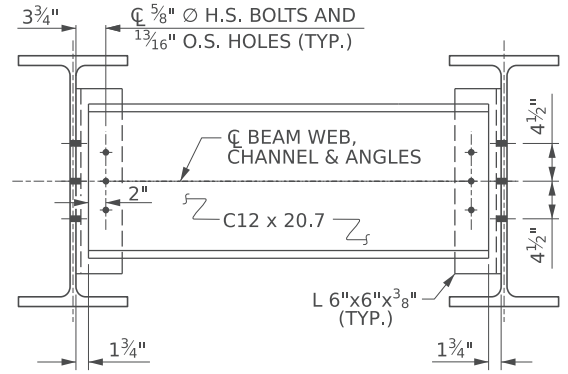
NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.

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

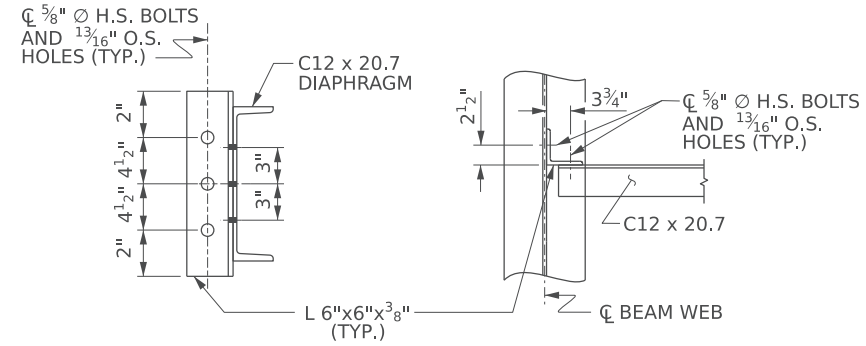
BEAMS SHALL BE PLACED PARALLEL TO THE CHORD.

SEE GENERAL DRAWING NOTES FOR COATING.

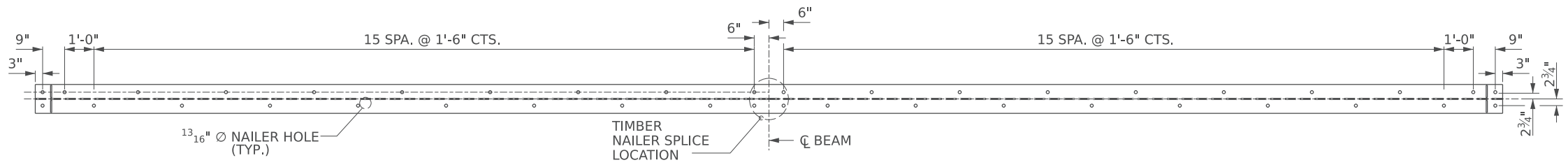
DURING BEAM ERECTION, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY AND PLUMBNESS OF THE BEAMS IN THE FINAL CONDITION.



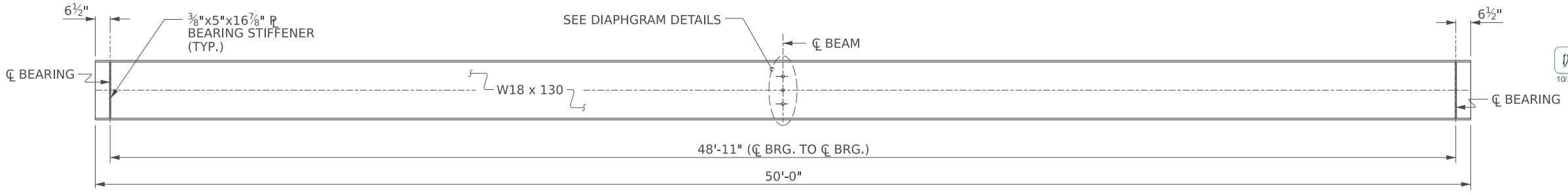
INTERMEDIATE DIAPHRAGM DETAIL



ANGLE DETAIL



TOP FLANGE



ELEVATION

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

Signed by: Diego A Aguirre
10/23/2025

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048223 DIEGO A AGUIRRE

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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SUPERSTRUCTURE

FRAMING PLAN
50' STEEL BEAM
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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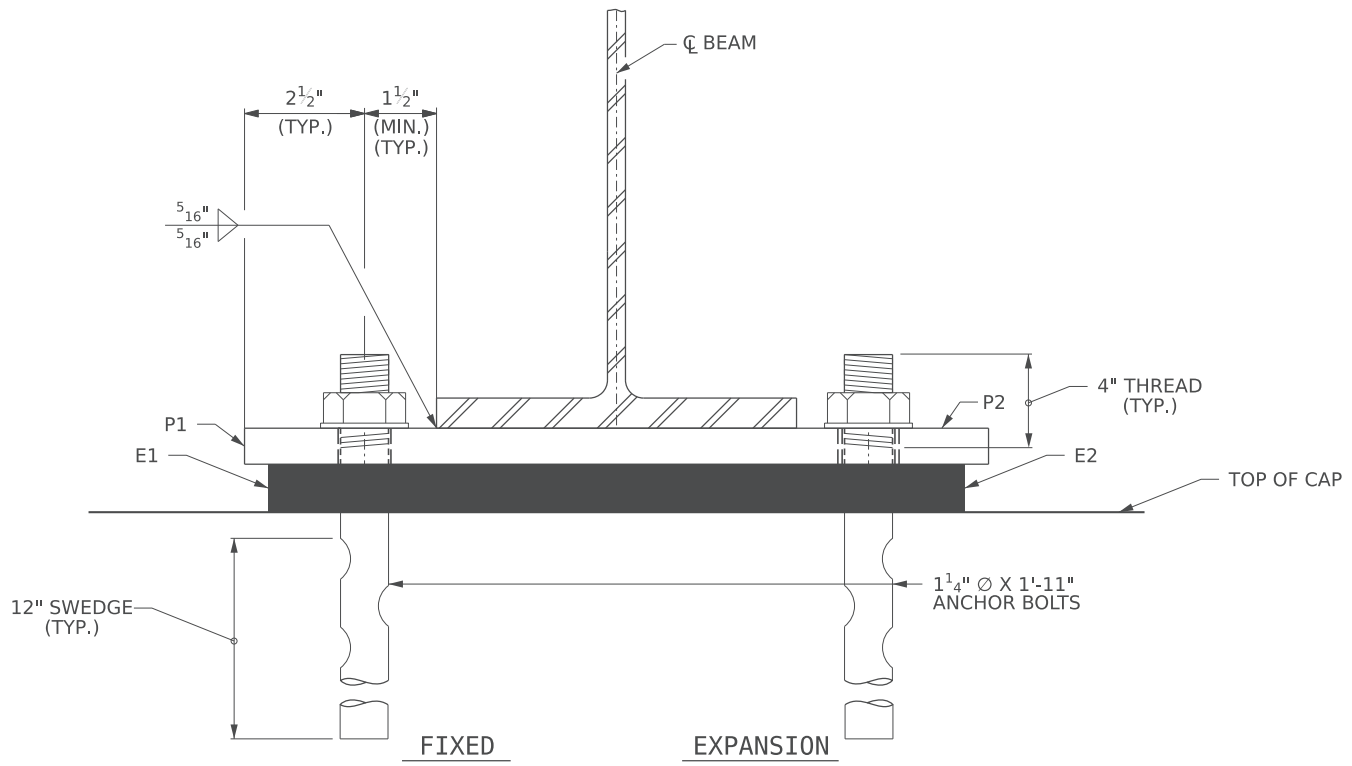


NOTES

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS IN ACCORDANCE WITH THE NCDOT 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 SECTION 1076 OF THE NCDOT 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.

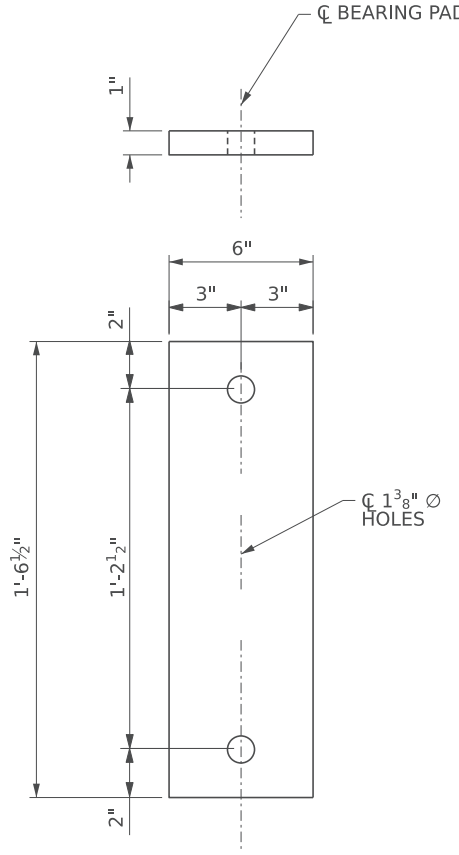
AT THE APPROVAL OF THE ENGINEER, SOLE PLATES AT THE EXPANSION END MAY BE FIELD WELDED.

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.

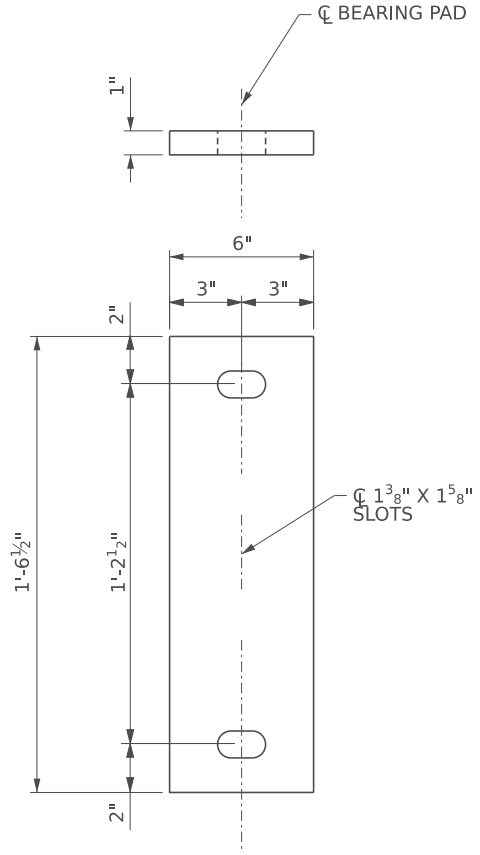
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT NO ADDITIONAL COST TO THE NORTH CAROLINA DEPARTMENT OF PUBLIC SAFETY, 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.

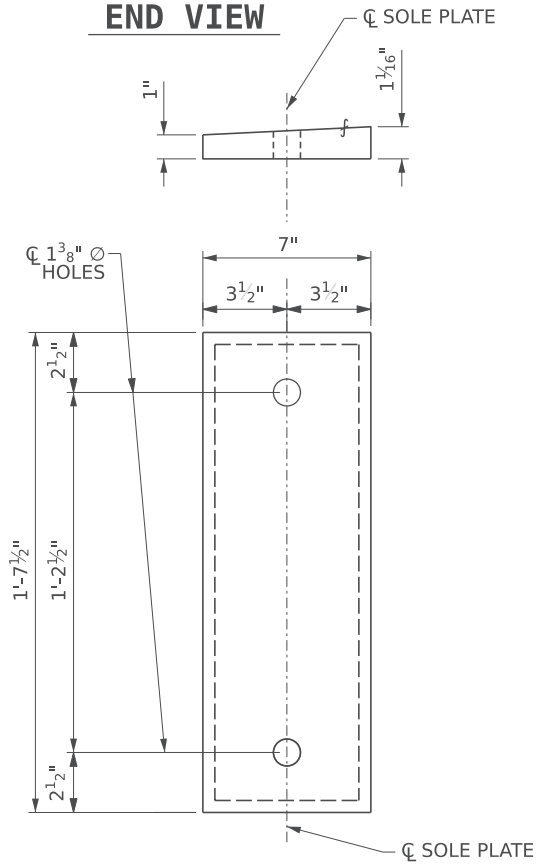


E1 ELASTOMERIC BEARING DETAILS
(6 REQ'D)
FIXED

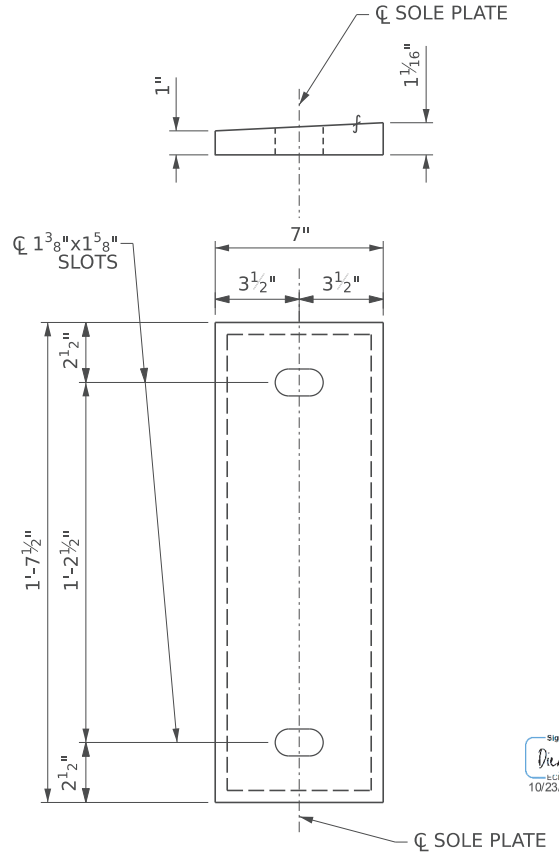


E2 ELASTOMERIC BEARING DETAILS
(6 REQ'D)
EXPANSION

END VIEW



P1 SOLE PLATE DETAILS
(6 REQ'D)
FIXED



P2 SOLE PLATE DETAILS
(6 REQ'D)
EXPANSION

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

SUPERSTRUCTURE

BEARING DETAILS

TYPE II

Signed by: Diego A Aguirre 10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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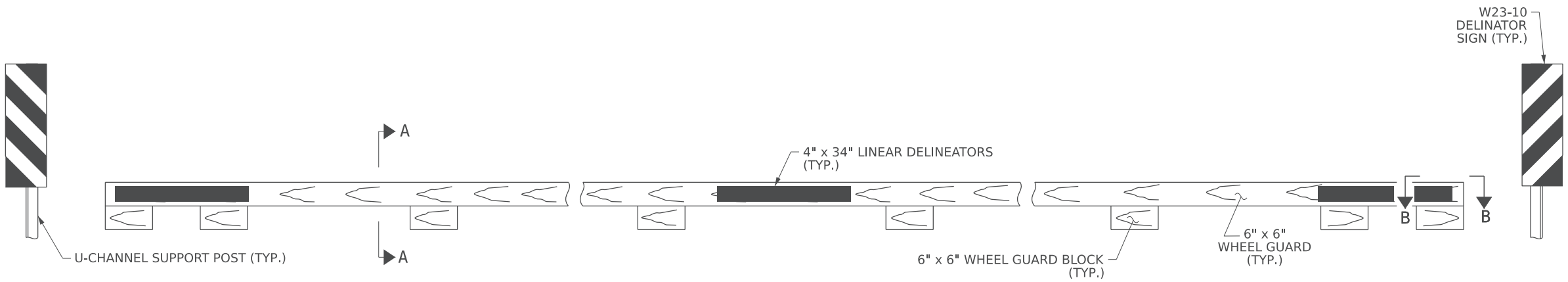
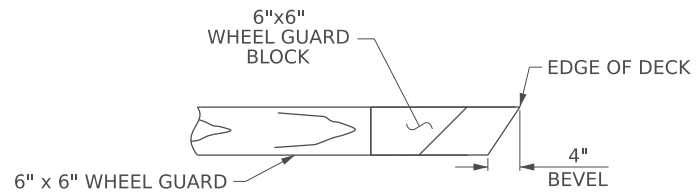
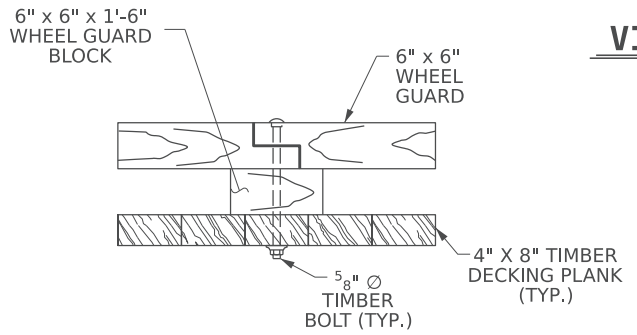


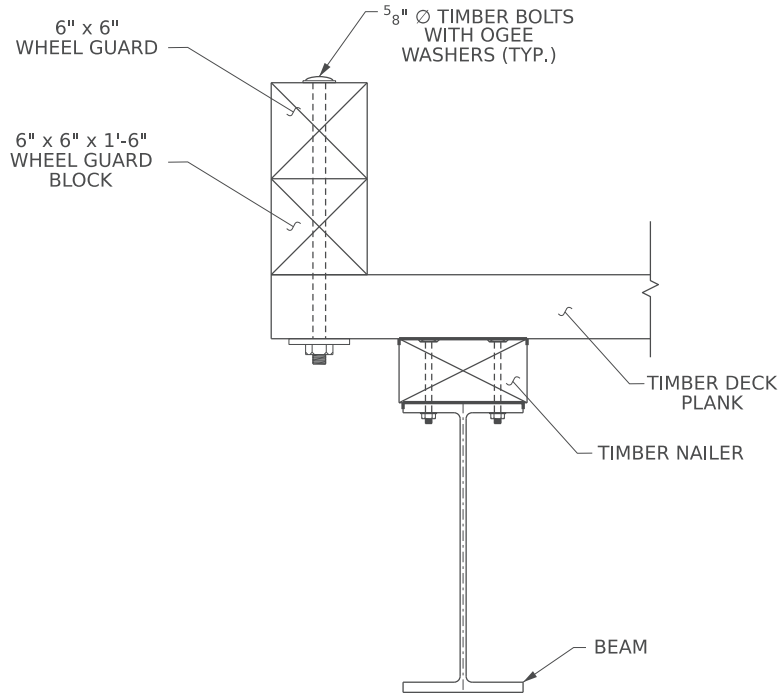
ELEVATION



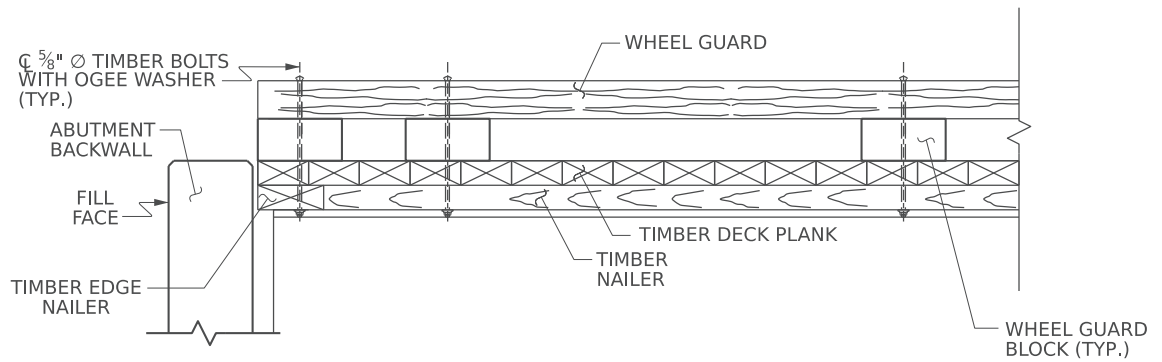
VIEW B-B



WHEEL GUARD SPLICE DETAIL



SECTION A-A



WHEEL GUARD DETAIL AT ABUTMENTS

BILL OF MATERIAL FOR ONE WHEEL GUARD 50 FT (2 REQ.D)

TREATED LUMBER

ITEM	SIZE	LIN. FT.
WHEEL GUARD	6"x6"	50.50
WHEEL GUARD BLOCK	6"x6"	16.50

HARDWARE

ITEM	Nos.	SIZE	LBS.
TIMBER BOLTS (WHEEL GUARD)	11	⅝" ∅	16
HEAVY HEX NUTS	11	⅝" ∅	1
OGEE WASHERS	11	⅝" ∅	7
STANDARD WASHER	11	⅝" ∅	1

HARDWARE FOR CONNECTIONS_____ APPROX. 25 LBS.

ACCESSORIES

ITEM	No.
W23-10 12x36 DELINEATOR	2
U-CHANNEL SUPPORT POST	2
4X34 LINEAR DELINEATOR	6

PAY LENGTH = 50.5 LIN. FT.

NOTES

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.

BRIDGE WHEEL GUARDS SHALL BE CONTINUOUS FROM EDGE OF DECK TO EDGE OF DECK WITH NO GAPS. WHEEL GUARD LUMBER LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE WHEEL GUARD BLOCKS.

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

FOR TIMBER WHEEL GUARD SYSTEM, SEE SPECIAL PROVISIONS.

Signed by: Diego A Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048223 DIEGO A AGUIRRE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-

SUBSTRUCTURE

TIMBER BRIDGE
WHEEL GUARD SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
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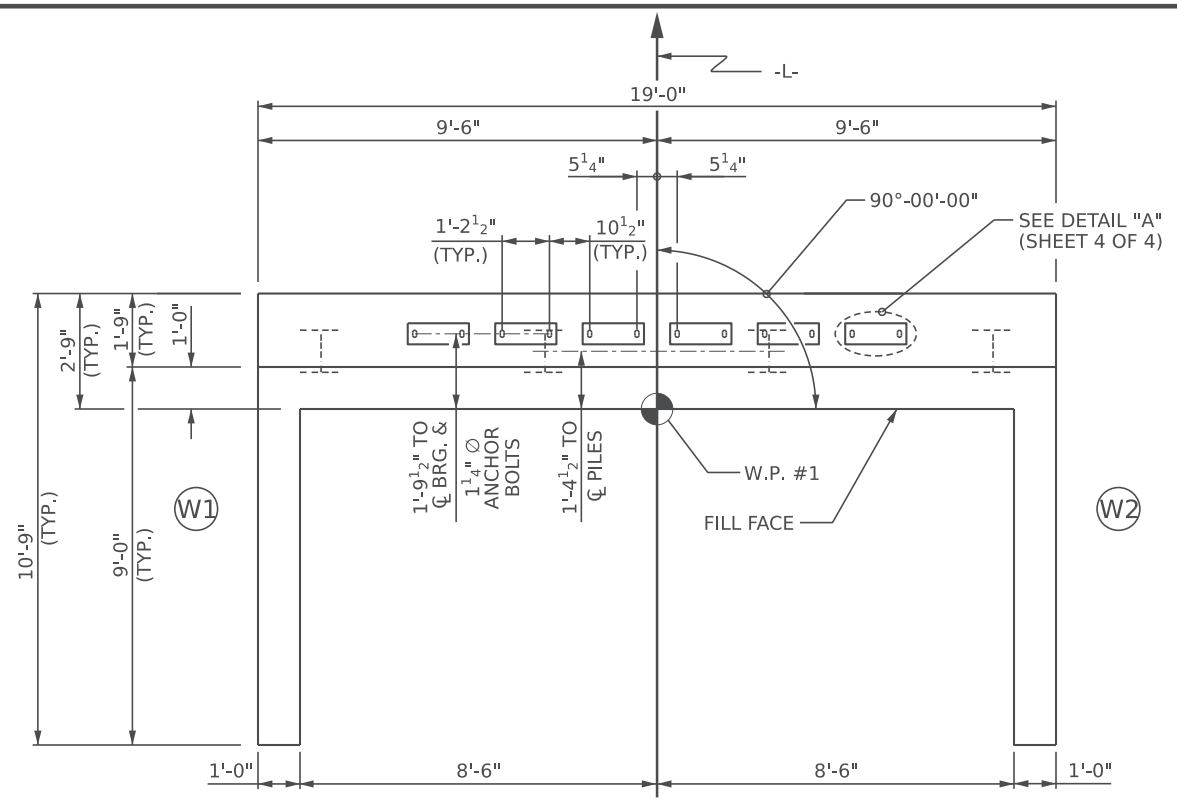
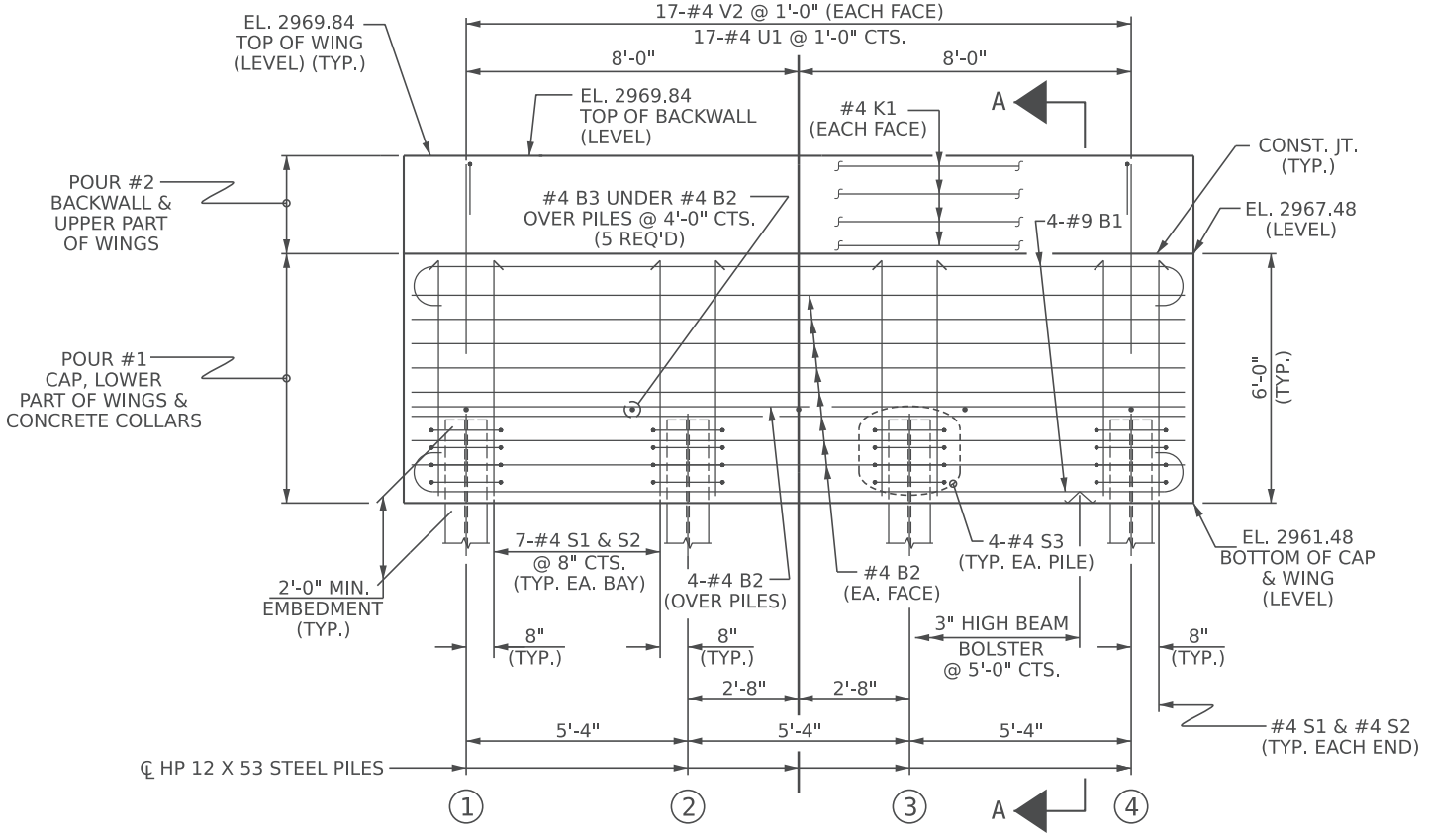


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

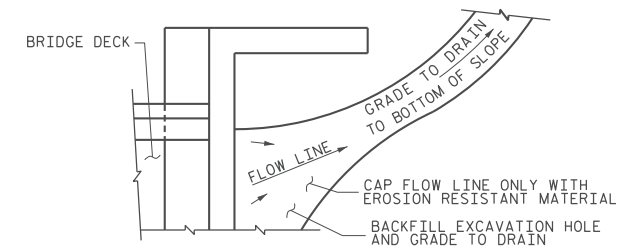
NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

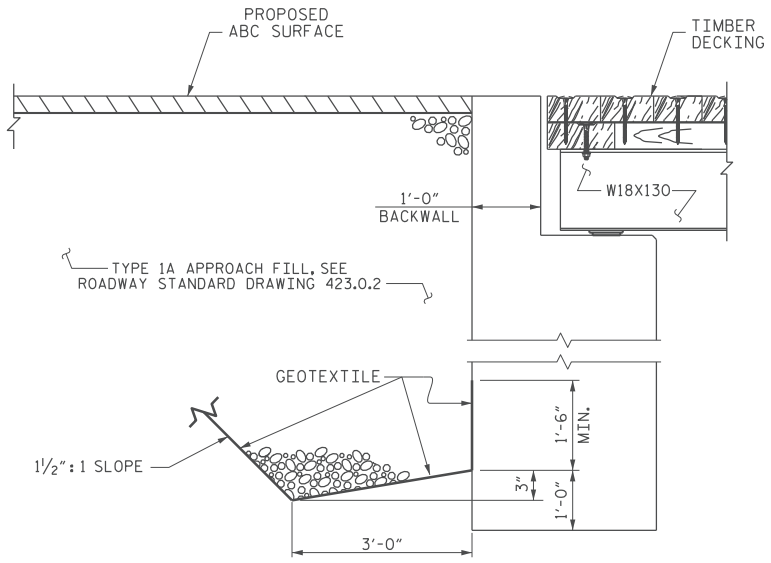
FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.



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

TEMPORARY DRAINAGE DETAIL



SECTION THRU APPROACH FILL

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 1 OF 4

SUBSTRUCTURE

ABUTMENT 1

Signed by: Diego A Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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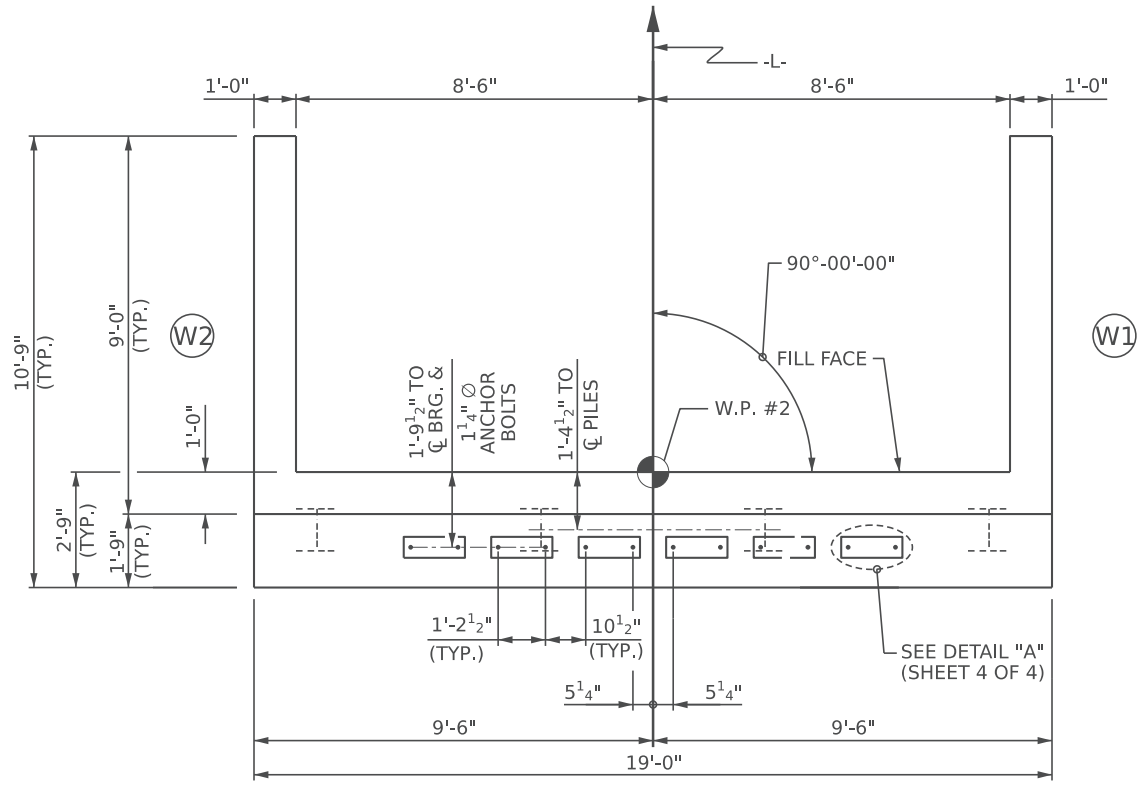
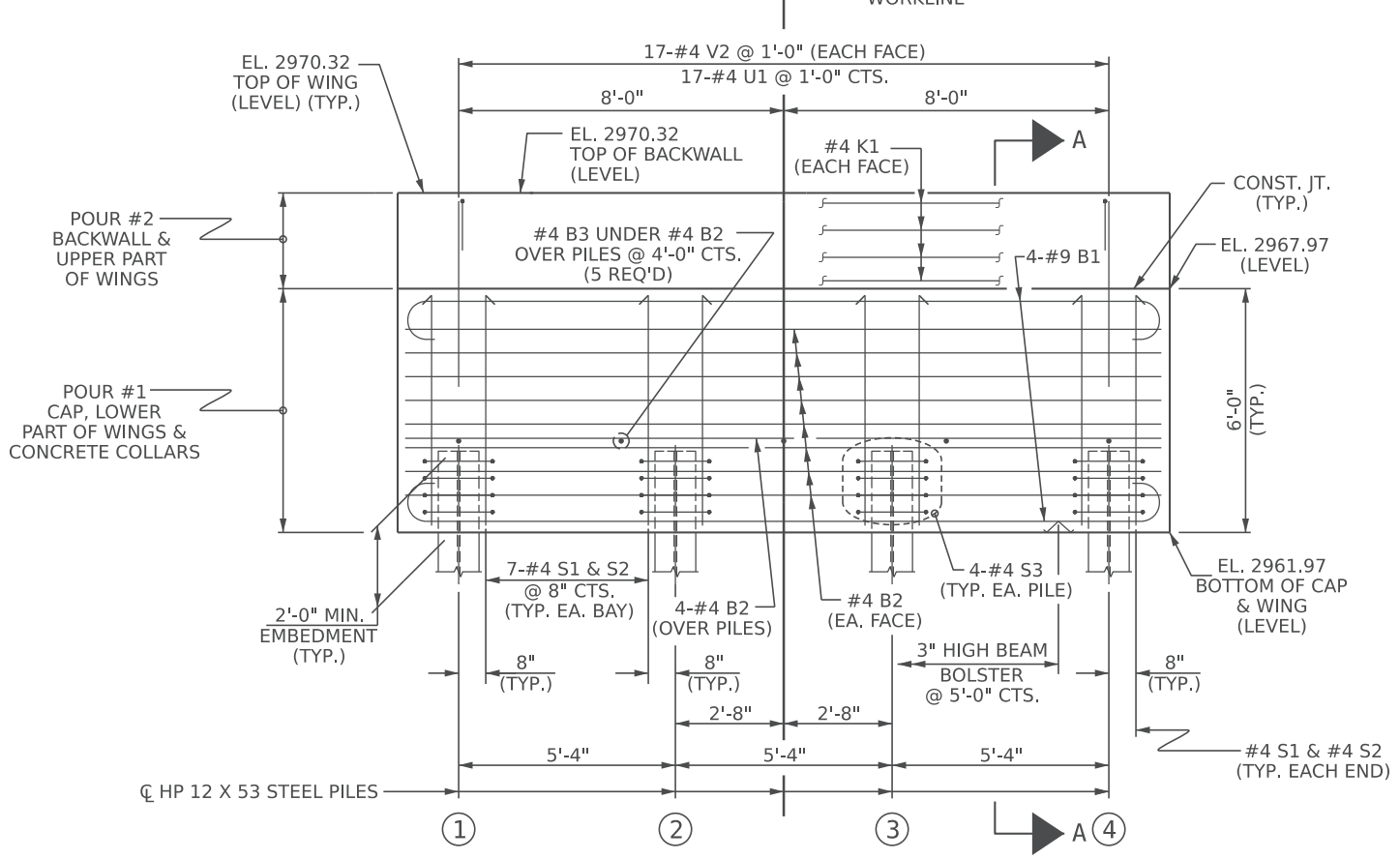


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

FOR TEMPORARY DRAINAGE DETAIL, SEE SHEET 1 OF 4.

FOR SECTION THRU APPROACH FILL, SEE SHEET 1 OF 4.

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 2 OF 4

SUBSTRUCTURE

ABUTMENT 2

Signed by: Diego A Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048223 DIEGO A AGUIRRE

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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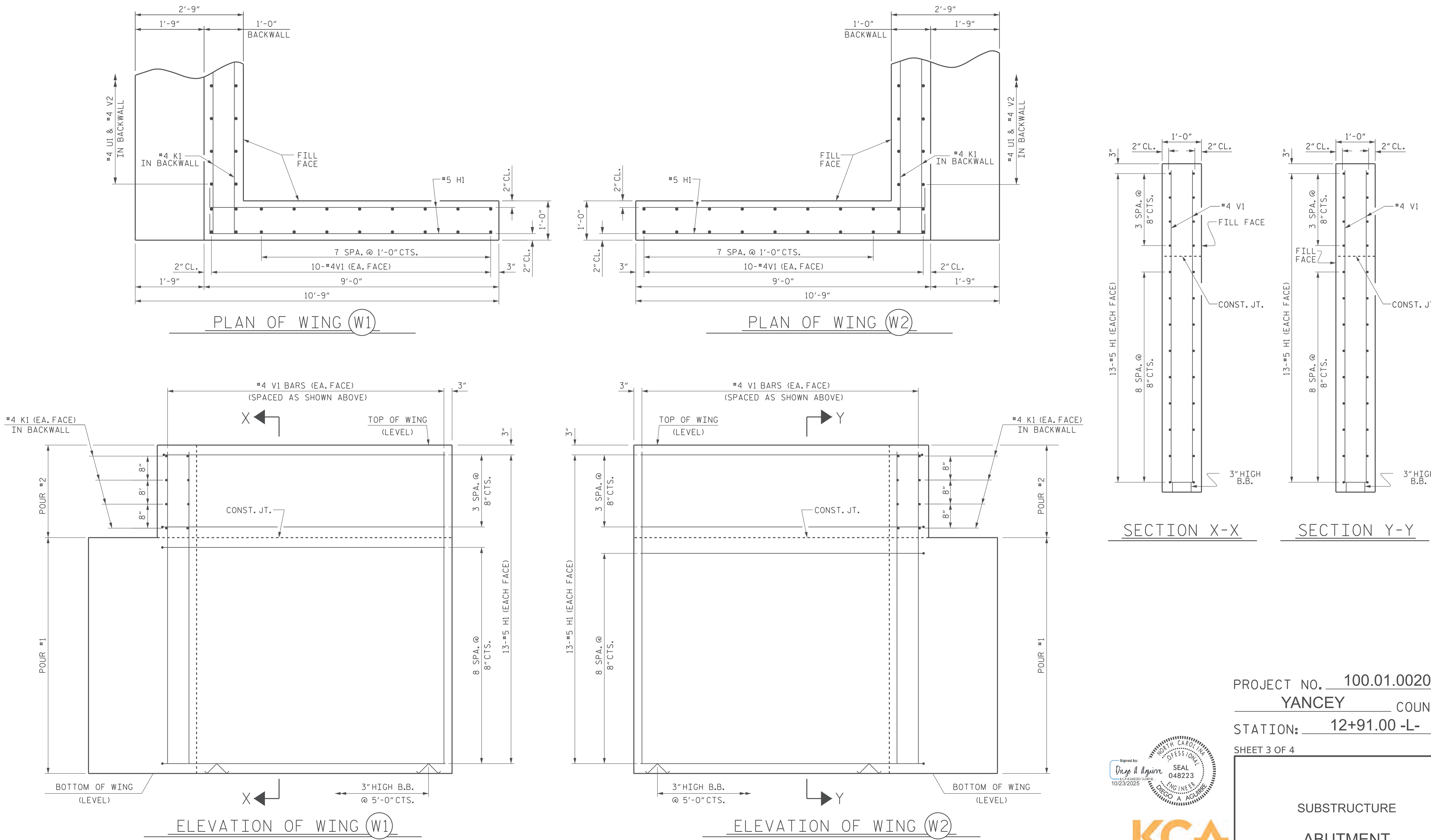

WING DETAILS

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-
SHEET 3 OF 4

SUBSTRUCTURE
ABUTMENT WING DETAILS

SEAL 048223 — NORTH CAROLINA PROFESSIONAL ENGINEER — DIEGO A. AGUIRRE
Signed by: Diego A. Aguirre 10/23/2025

KISINGER CAMPO & ASSOCIATES
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-13
TOTAL SHEETS 16

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DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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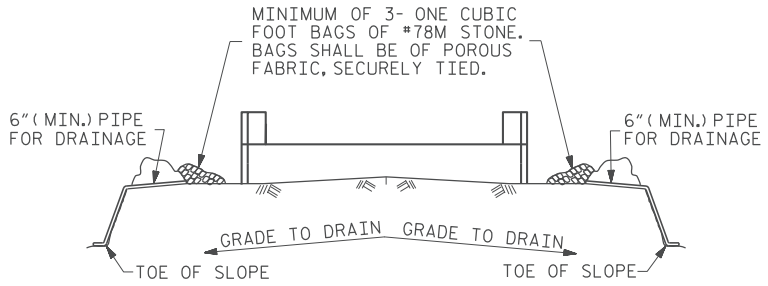
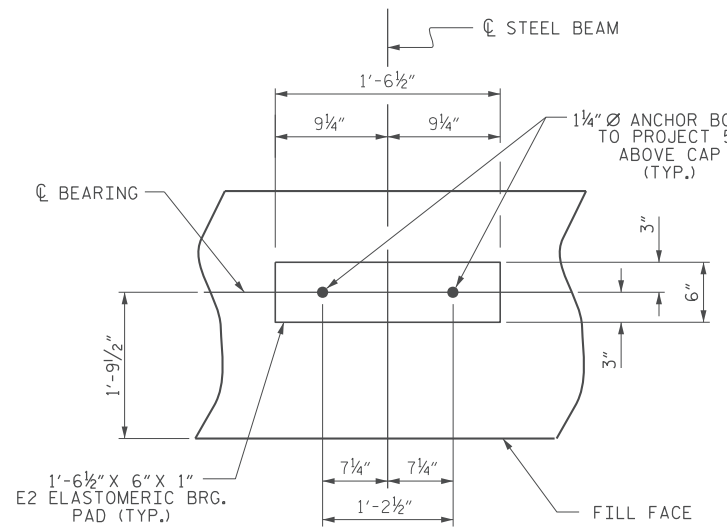


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

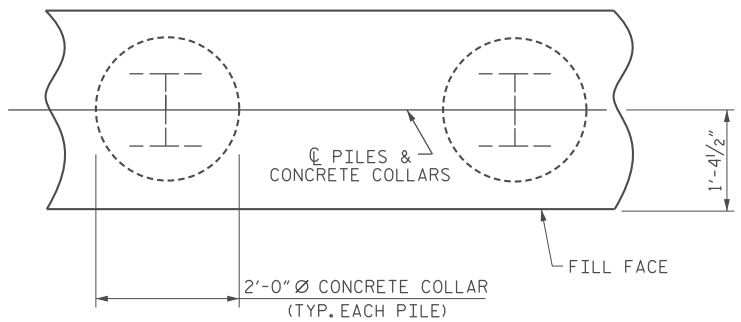
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT ABUTMENT

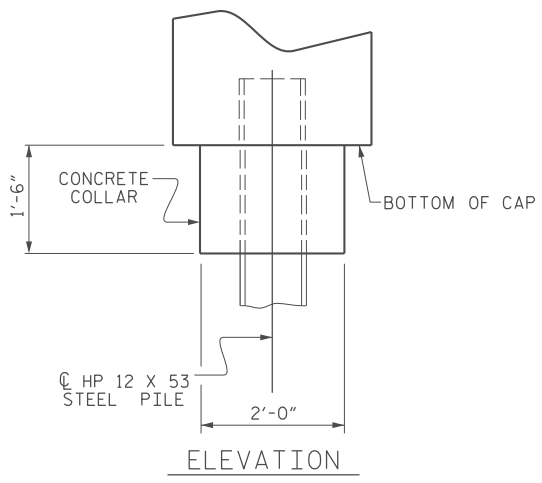


DETAIL "A"

(ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR BY ROTATION AND USE E1 ELASTOMERIC BEARING PAD)



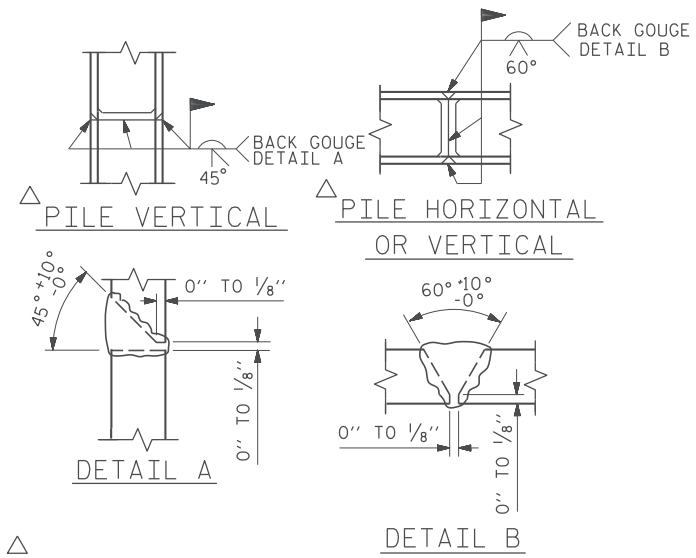
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

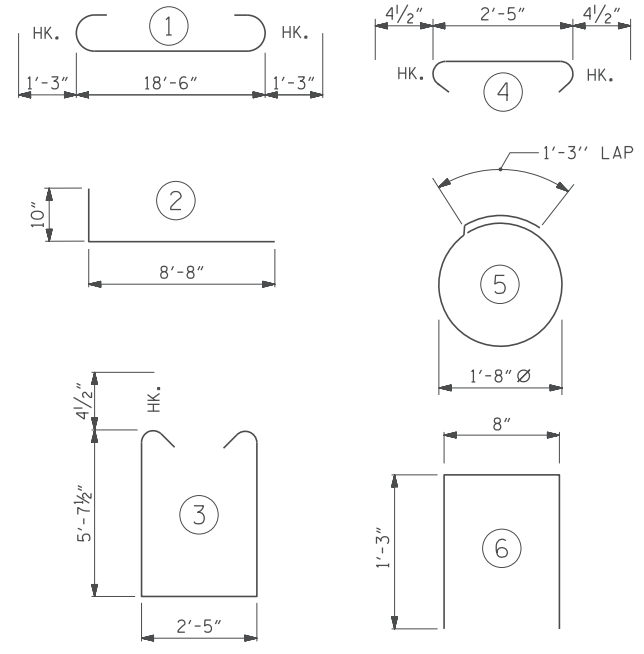
(ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR BY ROTATION)



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE ABUTMENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	21'-0"	572
B2	20	#4	STR	18'-8"	250
B3	5	#4	STR	2'-5"	8
H1	52	#5	2	9'-6"	515
K1	4	#4	STR	18'-8"	50
S1	23	#4	3	14'-5"	222
S2	23	#4	4	3'-2"	49
S3	16	#4	5	6'-6"	69
U1	17	#4	6	3'-2"	36
V1	40	#4	STR	7'-11"	212
V2	34	#4	STR	4'-8"	106

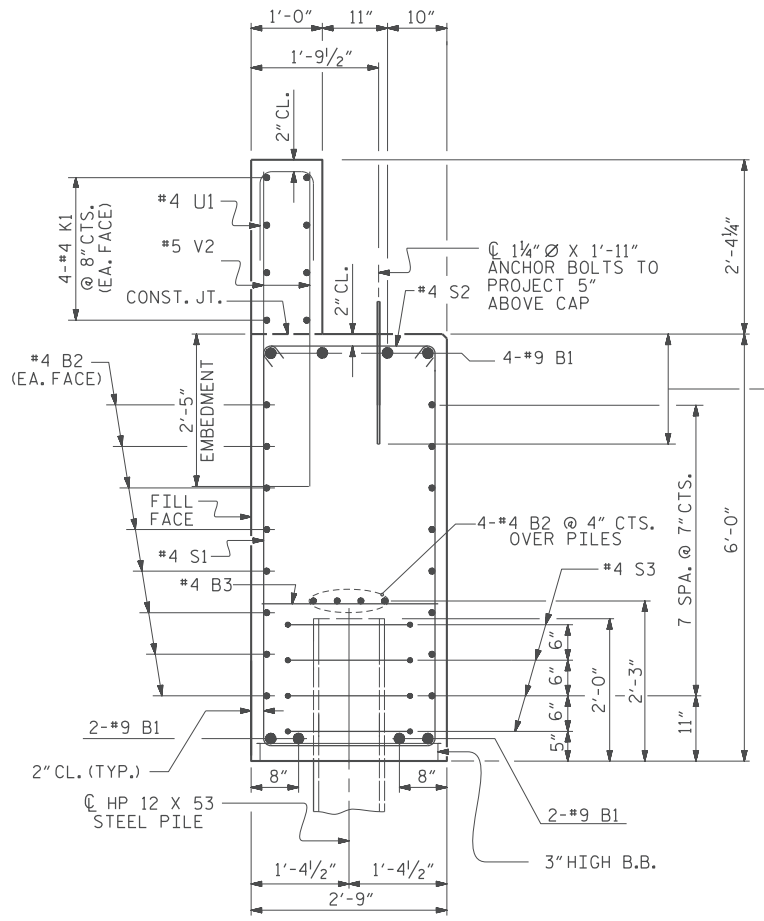
REINFORCING STEEL (FOR ONE END BENT) 2,089 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 15.9 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 3.1 C.Y.

TOTAL CLASS A CONCRETE 19.0 C.Y.



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

Signed by: Diego A Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048223 DIEGO A AGUIRRE

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

SHEET 4 OF 4

SUBSTRUCTURE

ABUTMENT 1 & 2 DETAILS

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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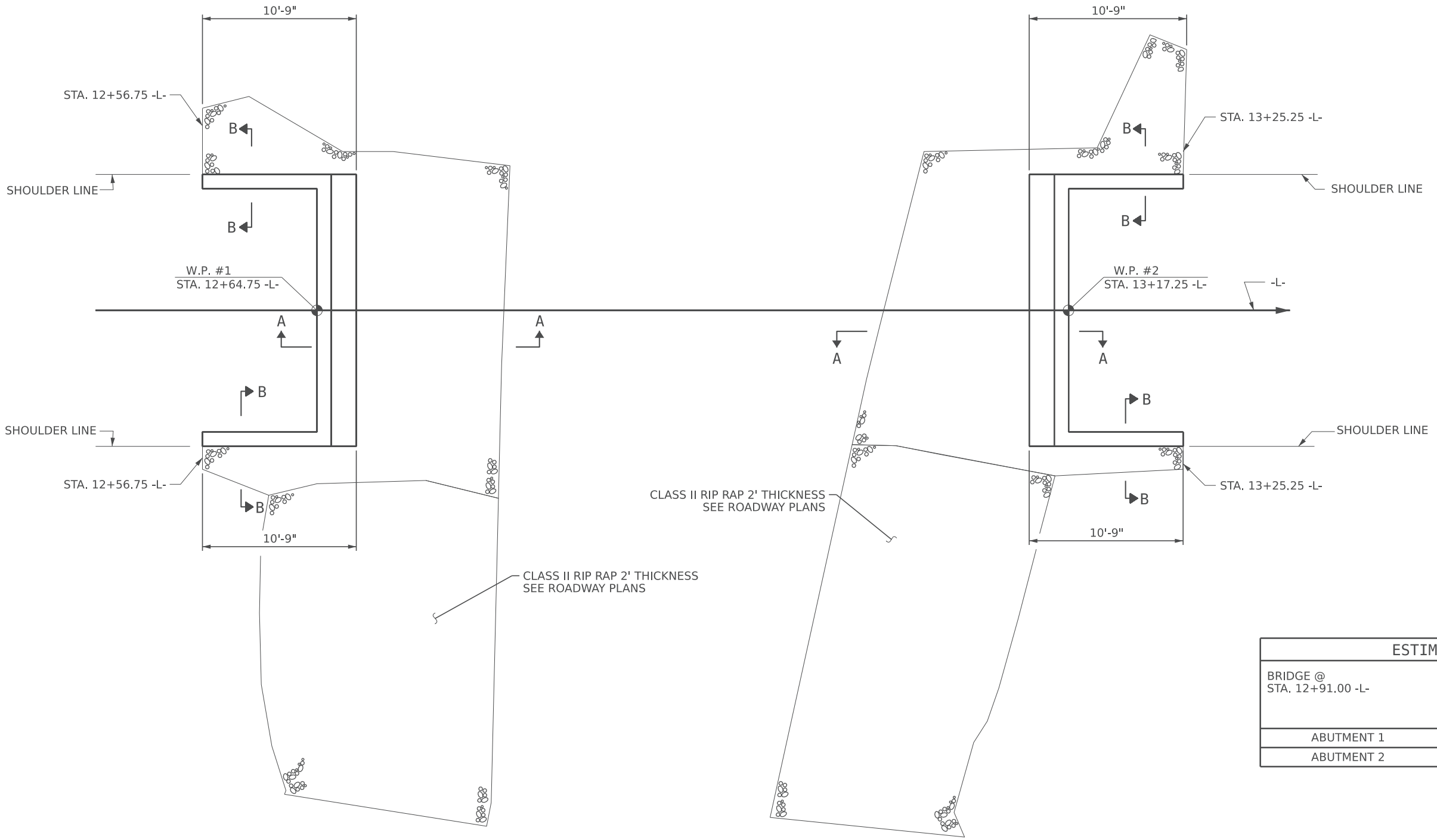
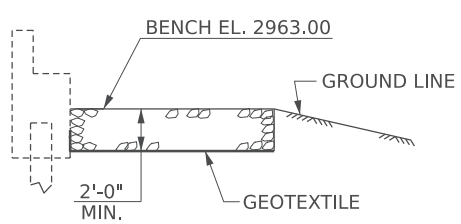


ABUTMENT 1

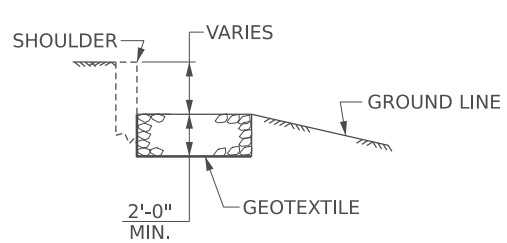
ABUTMENT 2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+91.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
ABUTMENT 1	44	90
ABUTMENT 2	40	87



SECTION A-A



SECTION B-B

PROJECT NO. 100.01.00202

YANCEY COUNTY

STATION: 12+91.00 -L-

Signed by: Diego A Aguirre
10/23/2025

NORTH CAROLINA PROFESSIONAL SEAL 048223 ENGINEER DIEGO A AGUIRRE

KISINGER CAMPO & ASSOCIATES

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RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

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DISCLAIMER

THESE RECOMMENDATIONS ARE NOT TO BE CONSTRUED AS A WARRANTY. ONCE FINAL INSPECTION IS COMPLETED BY THE PRIVATE ROADS AND BRIDGES PROGRAM THE BRIDGE BECOMES THE SOLE RESPONSIBILITY OF THE PROPERTY OWNER(S). THE PROPERTY OWNER IS RESPONSIBLE FOR ALL MAINTENANCE AND SAFETY RESPONSIBILITIES RELATED TO THEIR PRIVATE ROAD AND BRIDGE.

THESE RECOMMENDATIONS ARE INTENDED AS A GENERAL GUIDE FOR PRIVATE BRIDGE OWNERS. IT IS NOT A COMPREHENSIVE CHECKLIST AND DOES NOT REPLACE EVALUATION BY A QUALIFIED ENGINEER. IF YOU OBSERVE UNUSUAL MOVEMENT, DEFLECTION, CRACKING, OR DETERIORATION, CLOSE YOUR BRIDGE TO TRAFFIC IMMEDIATELY AND CONTACT A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

THE MAINTENANCE PRACTICES OUTLINED HEREIN ARE INTENDED AS GENERAL RECOMMENDATIONS FOR PRIVATE BRIDGE OWNERS. THEY DO NOT REPLACE INSPECTION OR REPAIR GUIDANCE FROM A QUALIFIED ENGINEER. FOR ANY STRUCTURAL CONCERNS OR SAFETY-RELATED ISSUES, CONSULT A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

INTRODUCTION

THESE RECOMMENDATIONS PROVIDE GUIDANCE FOR PRIVATE BRIDGE OWNERS WITH A BRIDGE CONSTRUCTED USING STEEL BEAMS, TIMBER DECK, TIMBER WHEEL GUARD SYSTEM, BEARINGS, AND REINFORCED CONCRETE CAPS ON STEEL PILES SUBSTRUCTURE. REGULAR INSPECTION AND MAINTENANCE ARE ESSENTIAL TO ENSURE THE BRIDGE REMAINS SAFE AND SERVICEABLE FOR YEARS TO COME.

SAFETY

DO NOT EXCEED THE BRIDGE'S INTENDED LOAD CAPACITY.

KEEP THE BRIDGE FREE OF DEBRIS, SNOW, AND ICE. WARNING: DO NOT APPLY SALT OR DE-ICING CHEMICALS TO REMOVE SNOW AND ICE. THESE CHEMICALS ARE EXTREMELY CORROSIVE TO METALS.

INSPECT THE BRIDGE REGULARLY TO IDENTIFY EARLY SIGNS OF DETERIORATION, DAMAGE, EXCESSIVE DEFLECTION OR MOVEMENT. SEE RECOMMENDED IN THE "ROUTINE INSPECTIONS" SECTION.

DO NOT MODIFY, WELD, OR CUT ANY STRUCTURAL ELEMENTS WITHOUT CONSULTING A QUALIFIED ENGINEER.

MAKE SURE THE WHEEL GUARD SYSTEM IS WELL-MAINTAINED, SECURE AND REINSTALLED OR REPLACED.

THE TIMBER WHEEL GUARD IS INTENDED ONLY TO MARK THE EDGE OF THE BRIDGE AND IS NOT DESIGNED TO STOP VEHICLES OR PREVENT THEM FROM DRIVING OFF THE BRIDGE. DRIVERS SHOULD USE EXTRA CAUTION WHEN CROSSING THE BRIDGE. TAKE MEASURES TO PROVIDE SAFE EDGE PROTECTION FOR PEDESTRIANS AND TO PREVENT FALLS.

BRIDGE COMPONENTS

DECK

TIMBER DECK

THE TIMBER DECKING IS COMPOSED OF PRESSURE-TREATED OR STRUCTURAL-GRADE WOOD PLANKS, INCLUDING RUNNING BOARDS, DECKING BOARDS, AND NAILERS.

THE TIMBER DECKING SERVES AS THE PRIMARY DRIVING SURFACE OF THE BRIDGE AND SUPPORTS THE VEHICLE LOADS BY DISTRIBUTING THE WEIGHT ACROSS THE BRIDGE STRUCTURE.

TIMBER DECKING IS SUBJECT TO WEATHERING, DECAY, AND DETERIORATION FROM TRAFFIC AND ENVIRONMENTAL EXPOSURE. OVER TIME BOARDS MAY LOOSEN, CRACK, WARP OR SPLINTER, FASTENERS MAY CORRODE, LOOSEN, OR BREAK, AND BIOLOGICAL GROWTH SUCH AS MOLD, MOSS, OR ALGAE MAY DEVELOP.

ROUTINE MAINTENANCE INCLUDES CLEANING TO REMOVE DEBRIS AND ORGANIC GROWTH, INSPECTING SIGNS OF DECAY, DETERIORATION, OR LOOSE BOARDS, AND PERFORMING NECESSARY REPAIRS TO PRESERVE SAFETY AND STRUCTURAL INTEGRITY.

BRIDGE COMPONENTS CONTINUED

TIMBER WHEEL GUARD SYSTEM

THE TIMBER WHEEL GUARD RUNS ALONG THE EDGES OF THE DECK TO PROVIDE A VISUAL AND PHYSICAL BOUNDARY. IT HELPS PREVENT VEHICLES FROM DRIFTING OFF THE DECK AND ASSISTS IN CHANNELING WATER RUNOFF AWAY FROM THE BRIDGE. THIS MUST BE KEPT FREE OF DEBRIS TO ENSURE PROPER DRAINAGE AND SAFETY.

THE WHEEL GUARD SYSTEM CONSISTS OF TIMBER WHEEL GUARDS AND TIMBER WHEEL GUARD BLOCKS. IT IS CONSTRUCTED FROM PRESSURE- TREATED OR STRUCTURAL-GRADE WOOD.

TIMBER WHEEL GUARD SYSTEMS ARE SUBJECT TO WEATHERING, DECAY, AND DETERIORATION FROM ENVIRONMENTAL EXPOSURE AND GENERAL WEAR. OVER TIME, COMPONENTS MAY LOOSEN, WARP, OR SPLIT, AND BIOLOGICAL GROWTH SUCH AS MOLD OR MILDEW MAY DEVELOP.

ROUTINE MAINTENANCE REQUIRES REGULAR CLEANING, INSPECTION, AND TIMELY REPAIR OR REPLACEMENT OF DETERIORATED OR LOOSE COMPONENTS TO ENSURE CONTINUED SAFETY AND APPEARANCE.

SUPERSTRUCTURE

STEEL BEAMS

THE SUPERSTRUCTURE IS MADE OF STEEL I-BEAMS AND CROSSMEMBERS, FORMING A RIGID SUPPORT SYSTEM. IT SERVES AS THE PRIMARY LOAD-CARRYING ELEMENT AND TRANSFERS LOADS FROM THE DECK TO THE BEARINGS AND SUBSTRUCTURE.
THE SUPERSTRUCTURE IS PROTECTED BY A COATING SYSTEM, BUT IT REMAINS SUSCEPTIBLE TO CORROSION AND MECHANICAL WEAR DUE TO ENVIRONMENTAL EXPOSURE, MOISTURE, AND TRAFFIC LOADS OVER TIME. ADDITIONALLY, WELDS MAY DEGRADE OVER TIME FROM FATIGUE AND VIBRATION.

REGULAR INSPECTION MUST BE CONDUCTED OF THE PROTECTIVE COATING FOR SIGNS OF CORROSION AND PITTING, INSPECTING FOR ANY CRACKING AT WELDS, AND CLEARING DEBRIS TO PREVENT MOISTURE RETENTION AND ENSURE CONTINUED STRUCTURAL PERFORMANCE. INSPECTIONS MUST BE PERFORMED BY A QUALIFIED PERSON AND USING A CERTIFIED BRIDGE INSPECTOR IS RECOMMENDED.

IF THE INSPECTION DETECTS ANY CRACKING IN THE STEEL BEAMS, THE OWNER SHOULD CLOSE THE BRIDGE IMMEDIATELY TO VEHICULAR TRAFFIC AND CONTACT A LICENSED STRUCTURAL ENGINEER FOR A REPAIR SOLUTION.

BEARINGS

BEARINGS MAY INCLUDE COMPONENTS SUCH AS STEEL PLATES, ELASTOMERIC PADS, AND SHIMS THAT ARE POSITIONED BETWEEN THE STEEL BEAMS AND THE TOP OF THE SUBSTRUCTURE CAPS OR ABUTMENTS, THE BEARINGS ACCOMMODATE CONTROLLED MOVEMENT CAUSED BY THERMAL EXPANSION, LOADING, AND SETTLING.

BEARINGS ARE SUSCEPTIBLE TO CORROSION, WEAR, MATERIAL DEGRADATION, AND LOSS OF FUNCTIONALITY DUE TO ACCUMULATED DEBRIS, AND MISALIGNMENT.

ROUTINE MAINTENANCE INCLUDES REGULAR INSPECTION FOR CORROSION, WEAR, MATERIAL DEGRADATION, AND DEBRIS BUILDUP, AS WELL AS ENSURING THAT BEARINGS REMAIN PROPERLY ALIGNED AND ARE NOT OBSTRUCTED BY DIRT OR SHIFTING MATERIALS.

SUBSTRUCTURE

REINFORCED CONCRETE CAPS ON STEEL PILES

THE SUBSTRUCTURE FEATURES A REINFORCED CONCRETE CAP SUPPORTED BY STRUCTURAL STEEL H-PILES, FORMING AN INTEGRATED CAP SYSTEM. THE SUBSTRUCTURE IS INTENDED TO TRANSFER ALL IMPOSED LOADS FROM THE SUPERSTRUCTURE TO THE FOUNDATION SYSTEM, ENSURING STRUCTURAL STABILITY.

THE SUBSTRUCTURE COMPONENTS ARE SUSCEPTIBLE TO CORROSION, CRACKING, BENDING, LOOSE CONNECTIONS, AND UNEVEN SETTLING.

ROUTINE MAINTENANCE INCLUDES REMOVING RUST, SEALING/REPAIRING CRACKS, STRAIGHTENING ANY BENT OR TIGHTENING ANY LOOSE COMPONENTS, AND LEVELING UNEVEN SETTLING DETECTED.

ROUTINE INSPECTIONS

DISCLAIMER: THESE RECOMMENDATIONS ARE INTENDED AS A GENERAL GUIDE FOR PRIVATE BRIDGE OWNERS. IT IS NOT A COMPREHENSIVE CHECKLIST AND DOES NOT REPLACE EVALUATION BY A QUALIFIED ENGINEER. IF YOU OBSERVE UNUSUAL MOVEMENT, DEFLECTION, CRACKING, OR DETERIORATION, CLOSE YOUR BRIDGE TO TRAFFIC IMMEDIATELY AND CONTACT A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

INSPECTION FREQUENCY

INSPECTIONS ARE TO BE PERFORMED EVERY 6 MONTHS FOR THE FIRST 2 YEARS, THEN ANNUALLY AFTER THAT.

PERFORM ADDITIONAL INSPECTIONS AFTER SEVERE STORMS, FLOODING, SEISMIC EVENTS, OR AFTER VEHICULAR IMPACTS.

INSPECTION CHECKLIST

TIMBER DECK AND TIMBER WHEEL GUARD SYSTEM

CHECK DECK AND WHEEL GUARD SYSTEM FOR DECAY, CRACKING, SPLITTING, OR IMPACT DAMAGE.

INSPECT CONNECTIONS BETWEEN WHEEL GUARDS AND WHEEL GUARD BLOCKS FOR LOOSENESS, RUSTED FASTENERS, OR DETERIORATION.

ENSURE ALL BOARDS AND WHEEL GUARD SYSTEM COMPONENTS ARE SECURELY FASTENED WITH NO MISSING FASTENERS.

LOOK FOR PROTRUDING OR CORRODED FASTENERS THAT COULD POSE A SAFETY HAZARD.

VERIFY THAT WHEEL GUARDS ARE UPRIGHT, STABLE, AND NOT SHIFTING OR LEANING.

ENSURE THE ENTIRE DECK AND WHEEL GUARD SYSTEM, ESPECIALLY THE CURB LINE, IS CLEAN AND FREE OF ORGANIC DEBRIS SUCH AS LEAVES, SOIL, OR MOSS BUILDUP.

SUPERSTRUCTURE

INSPECT FOR RUST, PEELING PAINT, DEFORMATION, LOOSE BOLTS OR CRACKED WELDS.

ENSURE COATING IS INTACT AND MOISTURE IS NOT ACCUMULATING ON STEEL SURFACES.

LOOK FOR SIGNS OF SHIFTING OR UNEVEN BEARING CONTACT.

BEARINGS

CONFIRM THAT ALL BEARING SURFACES ARE CLEAN AND FREE OF DEBRIS.

ENSURE THE BEARINGS ARE FREE TO MOVE AS INTENDED.

LOOK FOR CORROSION, WORN PADS, OR DETERIORATED SHIMS.

CHECK FOR ANY SIGNS OF SETTLEMENT OR ROTATION.

CAPS AND FOUNDATIONS

INSPECT FOR CRACKS, LOOSE CONNECTIONS, BENDING, SETTLEMENT, LEANING, OR EROSION.

CONFIRM THAT WATER IS BEING DIRECTED AWAY FROM THE BRIDGE SUPPORTS.

MONITOR CHANGES OVER TIME AND TAKE PHOTOS TO DOCUMENT CONDITION.

INSPECT EXPOSED STEEL FOR SIGNS OF RUST OR PAINT DETERIORATION.

EXAMINE STEEL PILE CAPS FOR DEFLECTION, CORROSION, OR PHYSICAL DAMAGE.

LOOK FOR SIGNS OF SCOUR. SCOUR REFERS TO THE EROSION OR REMOVAL OF SOIL AROUND THE FOUNDATION OR PILES, TYPICALLY CAUSED BY FLOWING WATER. IT CAN UNDERMINE SUPPORT AND LEAD TO STRUCTURAL INSTABILITY.

ROUTINE MAINTENANCE

DISCLAIMER: THE MAINTENANCE PRACTICES OUTLINED IN THIS SECTION ARE INTENDED AS GENERAL RECOMMENDATIONS FOR PRIVATE BRIDGE OWNERS. THEY DO NOT REPLACE INSPECTION OR REPAIR GUIDANCE FROM A QUALIFIED ENGINEER. FOR ANY STRUCTURAL CONCERNS OR SAFETY-RELATED ISSUES, CONSULT A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

KEEP A MAINTENANCE LOG TO TRACK INSPECTION DATES, OBSERVATIONS, AND ANY WORK PERFORMED.

ADDRESS MINOR ISSUES EARLY TO PREVENT COSTLY REPAIRS LATER.

PROMPTLY ADDRESS ANY FINDINGS FROM INSPECTIONS TO MAINTAIN SAFETY AND FUNCTIONALITY.

TIMBER DECK AND TIMBER WHEEL GUARD

REMOVE DEBRIS AND ORGANIC MATERIAL BUILDUP REGULARLY.

APPLY WOOD SEALER OR PRESERVATIVE EVERY 23 YEARS. CONSIDER USING REFLECTIVE PAINT ON BRIDGE WHEEL GUARDS FOR AN EXTRA SAFETY MEASURE.REPLACE DAMAGED, CRACKED, OR ROTTED BOARDS AND WHEEL GUARD COMPONENTS PROMPTLY.

TIGHTEN OR REPLACE LOOSE FASTENERS AND CONNECTIONS.

REPAIR OR REPLACE LEANING OR UNSTABLE WHEEL GUARDS TO MAINTAIN SAFETY.

SUPERSTRUCTURE

REMOVE SURFACE RUST USING WIRE BRUSHING AND APPLY RUST-INHIBITING PRIMER AND TOUCH-UP PAINT.

RECOAT ENTIRE STEEL SURFACES EVERY 5 YEARS, OR AS NEEDED BASED ON INSPECTION FINDINGS.

KEEP DRAINAGE PATHWAYS CLEAR TO PREVENT WATER ACCUMULATION ON STEEL MEMBERS.

BEARINGS

REMOVE ANY DEBRIS, VEGETATION, OR SEDIMENT BUILDUP NEAR OR AROUND THE BEARING POINTS.

INSPECT AND MAINTAIN BEARING PADS, PLATES, OR SHIMS TO ENSURE THEY FUNCTION PROPERLY.

ENSURE NO BINDING, JAMMING, OR CORROSION THAT COULD RESTRICT MOVEMENT.

REPLACE DETERIORATED COMPONENTS AS NEEDED, UNDER THE GUIDANCE OF A PROFESSIONAL ENGINEER.

CAPS AND FOUNDATIONS

MAINTAIN PROPER SITE GRADING AND DRAINAGE TO PREVENT EROSION OR WATER DAMAGE.

BACKFILL OR REINFORCE AREAS SHOWING SIGNS OF SCOUR OR SETTLEMENT.

REPAINT ANY EXPOSED STEEL SURFACES EVERY 5 YEARS TO PREVENT CORROSION.

AFTER SEVERE STORMS AND UPON INSPECTION, USE STONE TO FILL BACK SCOUR HOLES AROUND THE SUBSTRUCTURE AND GRADE AS SHOWN ON THE PLANS.

PROJECT NO. 100.01.00202
YANCEY COUNTY
STATION: 12+91.00 -L-

Signed by: Diego A. Aguirre 10/23/2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048223 DIEGO A. AGUIRRE

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MAINTENANCE

RECOMMENDATION NOTES

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

SHEET NO. S-16
TOTAL SHEETS 16

DRAWN BY : MIGUEL A. LEMOS DATE : 10/2025
CHECKED BY : LAURA E. SUTTON DATE : 10/2025
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 10/2025

10/23/2025
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