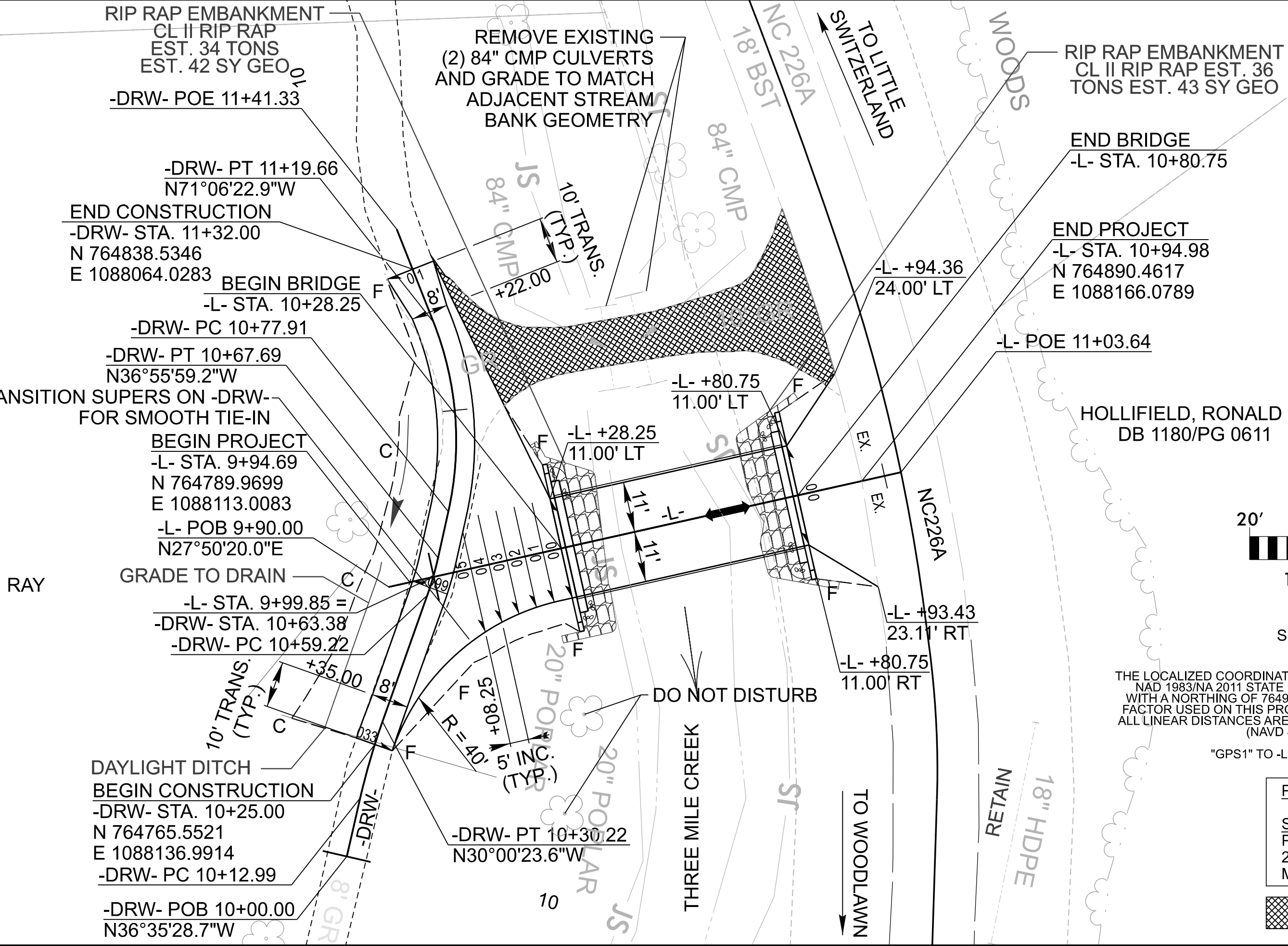
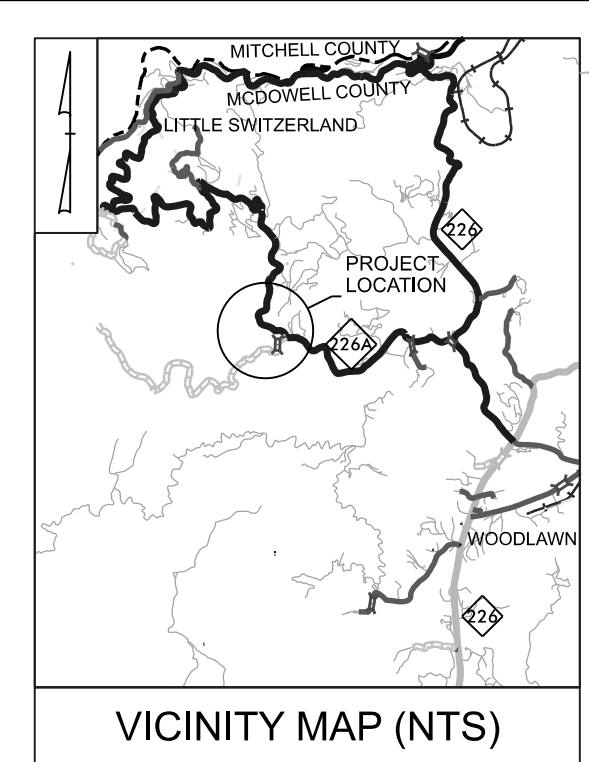
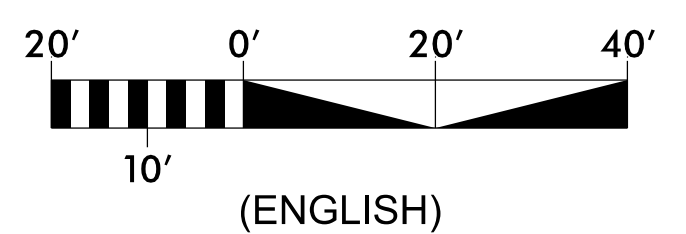


Site # 059-01-9d41f Gravel Road over Three Mile Creek in  
McDowell County



**CUR DATA -DRW-**

Pic 10+21.61 Δc = 06°35'05.0" (RT) D = 38°11'49.9" Lc = 17.24 Tc = 8.63 R = 150 SE = 0.000	Pic 10+99.43 Δc = 34°10'23.7" (LT) D = 81°51'04.0" Lc = 41.75 Tc = 21.52 R = 70 SE = 0.058	Pic 10+63.46 Δc = 06°55'35.6" (LT) D = 81°51'04.0" Lc = 8.46 Tc = 4.24 R = 70 SE = 0.100
--	--	--



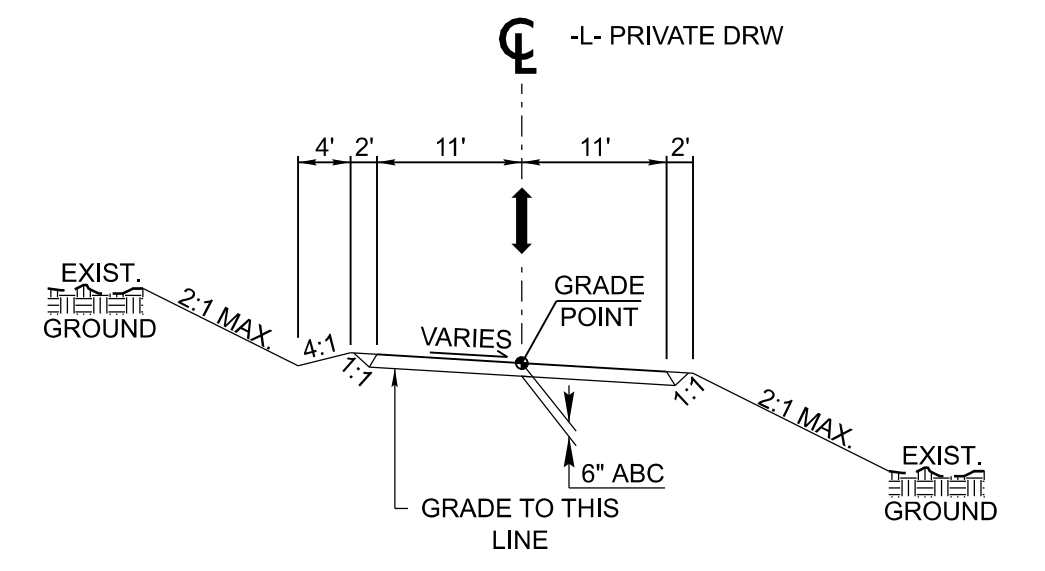
SURVEYS PROVIDED BY: ESP DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 1983/NA 2011 STATE PLANE COORDINATES FOR THE ESP CONTROL POINT "GPS1" WITH A NORTHING OF 764932.1480, EASTING OF 1088029.9402. THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS 0.9998500538 (1/X = 1.0001499687). ALL LINEAR DISTANCES ARE LOCALIZED HORIZONTAL DISTANCES. THE VERTICAL DATUM IS (NAVD 88) BASED ON ESP "GPS1" (ELEV. 1573.62').

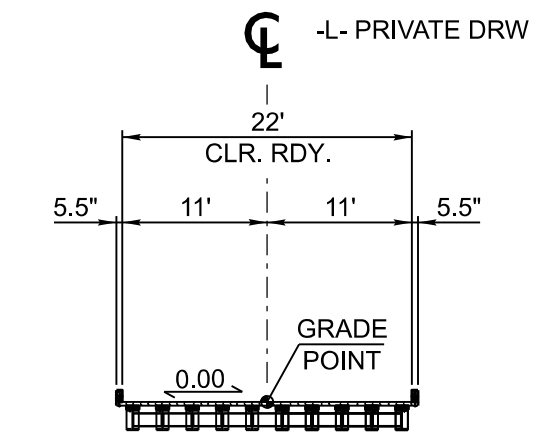
\*GPS1 TO -L- STATION 9+90.00 IS S 30°17'44.8" E 164.67 (ft)

PRIVATE OWNER CONTACT:

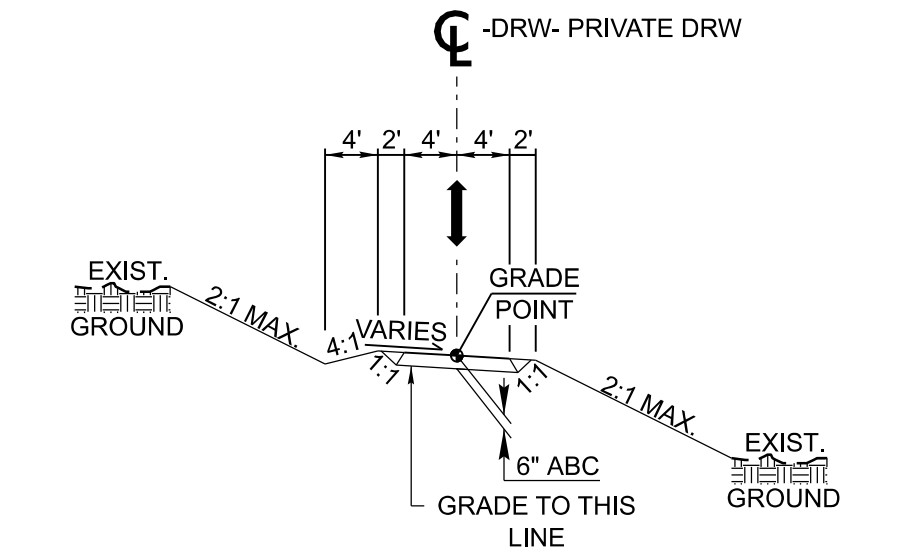
STEPHEN HOLLIFIELD  
P: (828) 460-5379  
2327 NC 226A  
MARION, NC 28752



TYPICAL SECTION NO. 1  
-L- STA. 9+94.69 TO STA. 10+28.25 (BEGIN BRIDGE)  
-L- STA. 10+80.75 (END BRIDGE) TO STA. 10+94.98

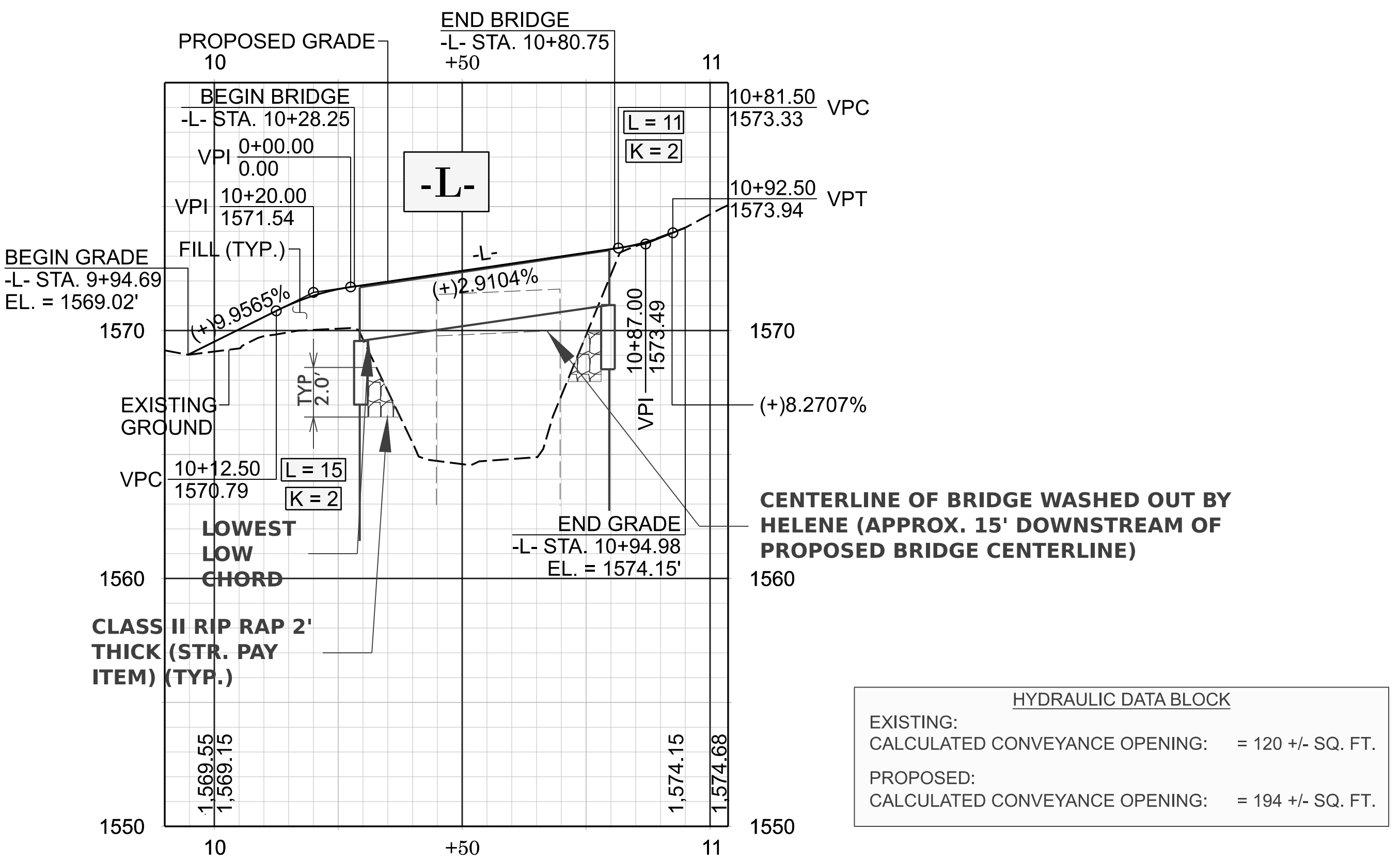


TYPICAL SECTION NO. 2  
-L- STA. 10+28.25 (BEGIN BRIDGE) TO STA. 10+80.75 (END BRIDGE)



TYPICAL SECTION NO. 3  
-DRW- STA. 10+25.00 TO STA. 11+32.00

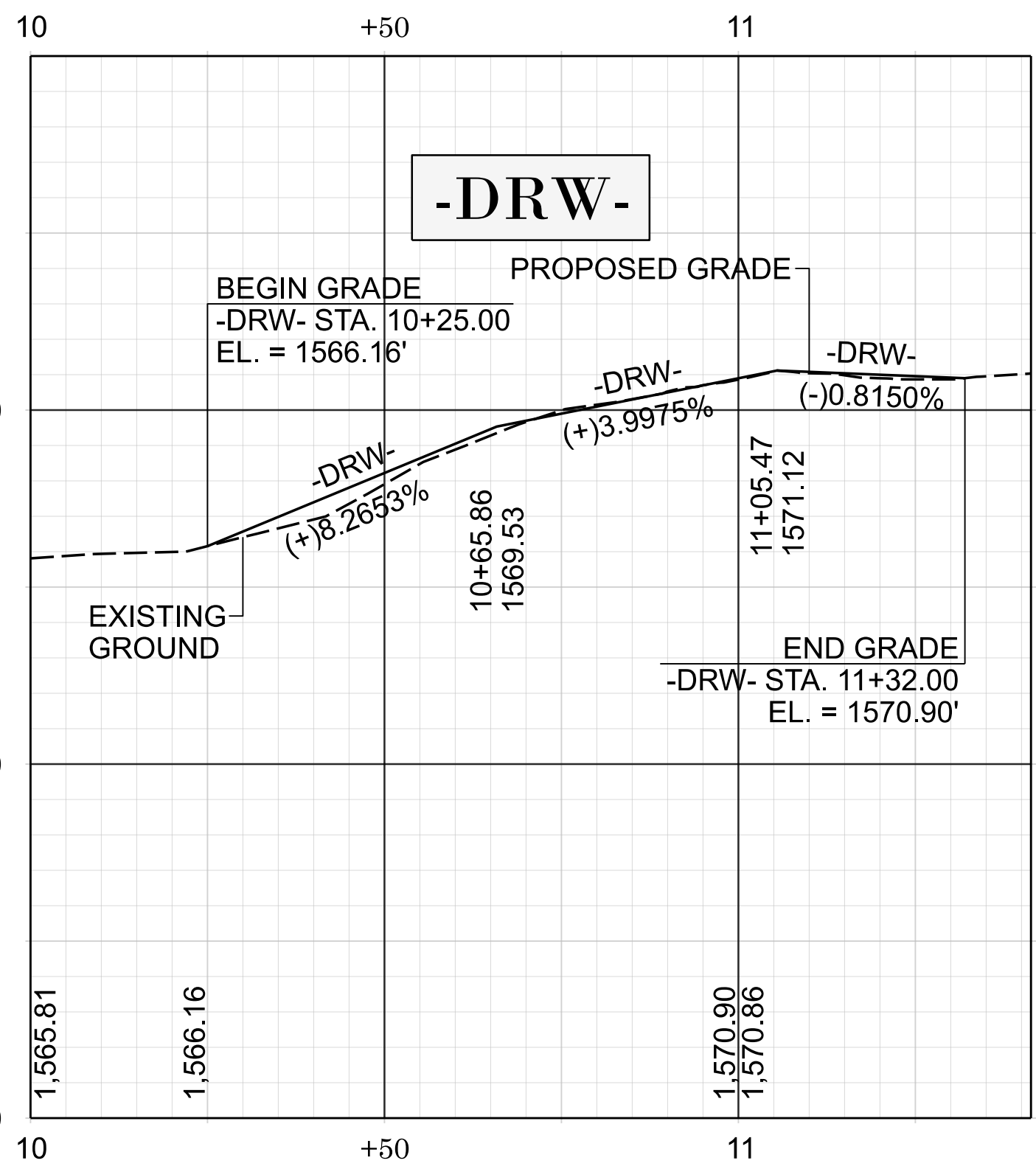
POINT	-L- STA.	-L- OFFSET	ELEVATION	NORTH	EAST
BM1 (10001)	9+92.91	322.42' LT	1576.38'	764943.1111	1087829.2690
GPS1 (1)	10+76.93	139.85' LT	1573.62'	764932.1480	1088029.9402
GPS2 (2)	10+41.71	181.28' RT	1576.90'	764751.0362	1088297.4557



CENTERLINE OF BRIDGE WASHED OUT BY HELENE (APPROX. 15' DOWNSTREAM OF PROPOSED BRIDGE CENTERLINE)

**HYDRAULIC DATA BLOCK**

EXISTING: CALCULATED CONVEYANCE OPENING:	= 120 +/- SQ. FT.
PROPOSED: CALCULATED CONVEYANCE OPENING:	= 194 +/- SQ. FT.



GENERAL NOTES AND STANDARD DRAWINGS

NC DOT'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

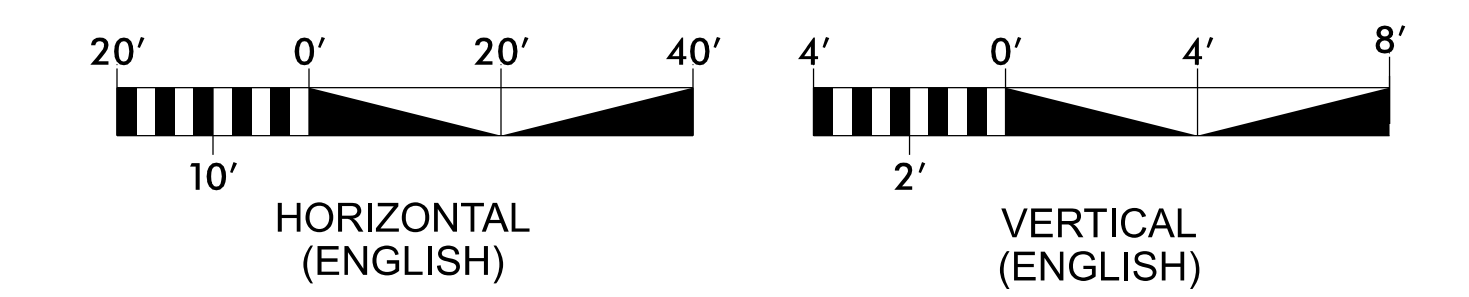
PROPERTY LINES AND OWNERS ARE TAKEN FROM MCDOWELL COUNTY GIS PAGE.

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	325	CY
AGGREGATE BASE COURSE	100	TONS



059.01.9d4if

FINAL 1

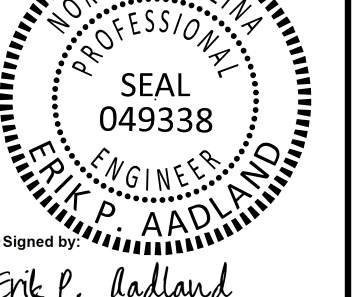


ROADWAY DESIGN ENGINEER



2/11/2025

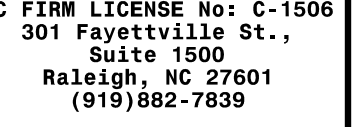
HYDRAULICS ENGINEER



2/11/2025

ENGINEER

PREPARED BY



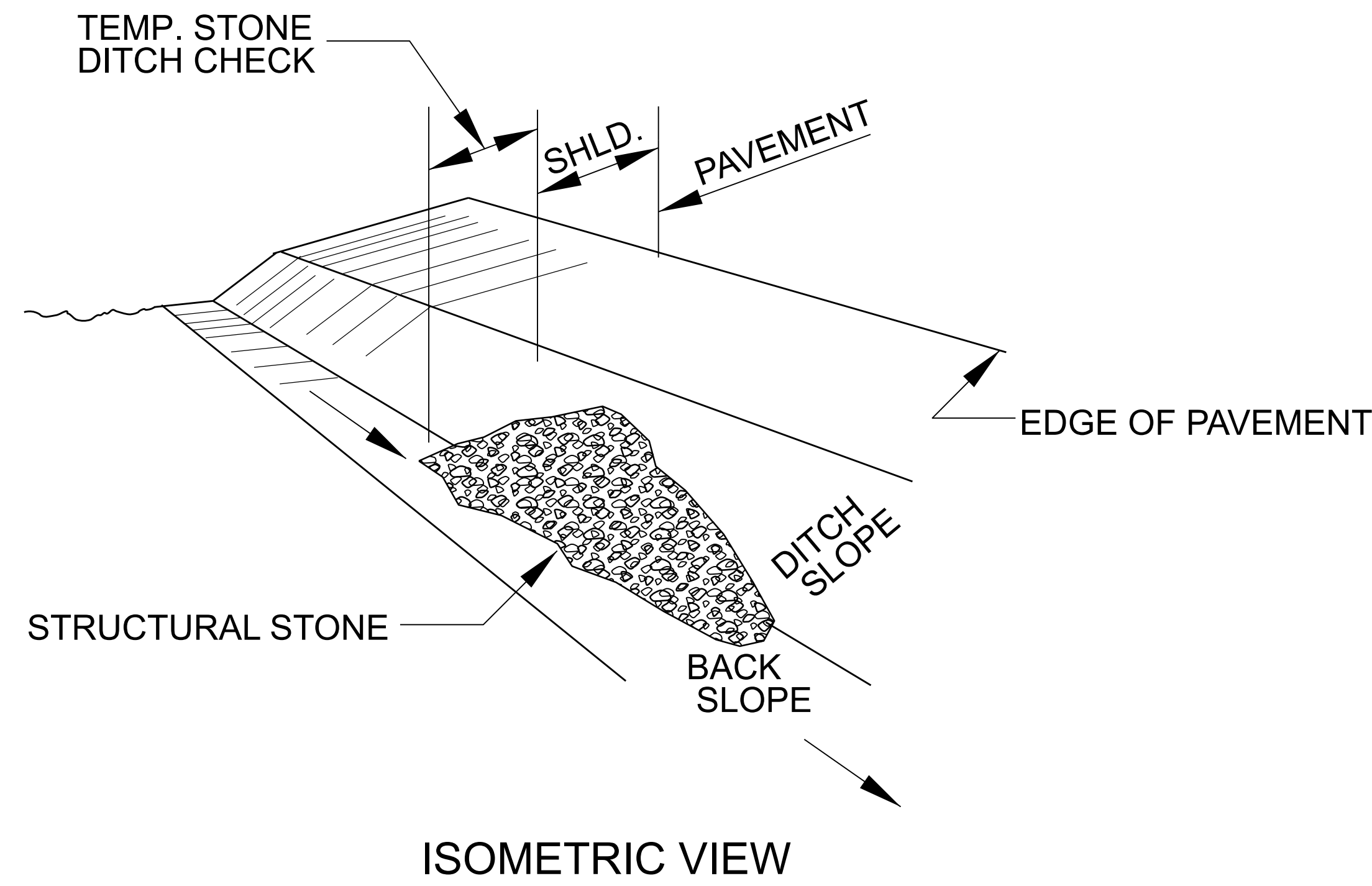
NC FIRM LICENSE No: C-1506  
301 Fayetteville St.,  
Suite 1500  
Raleigh, NC 27601  
(919) 862-7839

# EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1630.02	Silt Basin Type B		1634.01	Temporary Rock Sediment Dam Type A	
1630.03	Temporary Silt Ditch		1634.02	Temporary Rock Sediment Dam Type B	
1630.04	Stilling Basin		1635.01	Rock Pipe Inlet Sediment Trap Type A	
1630.05	Temporary Diversion		1635.02	Rock Pipe Inlet Sediment Trap Type B	
1630.06	Special Stilling Basin		1636.01	Excelsior Wattle Check	
1630.07	Skimmer Basin		1636.01	Excelsior Wattle Check with Flocculant	
1630.08	Tiered Skimmer Basin		1636.01	Coir Fiber Wattle Check	
1630.09	Earthen Dam with Skimmer		1636.01	Coir Fiber Wattle Check with Flocculant	
	Infiltration Basin		1636.02	Silt Fence Excelsior Wattle Break	
	Rock Inlet Sediment Trap:			Silt Fence Coir Fiber Wattle Break	
1632.01	Type A		1636.03	Excelsior Wattle Barrier	
1632.02	Type B		1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C				

PROJECT REFERENCE NO.	SHEET NO.
059-01-9d41f	EC-2
RW SHEET NO.	
Prepared in the Office of:	
NC FIRM LICENSE NO: C-1506	
301 FAYETTEVILLE ST., SUITE 1509 RALEIGH, NC 27601 (919) 882-7839	
Designed by:	
John McNulty	4263
NAME	LEVEL III CERTIFICATION NO.

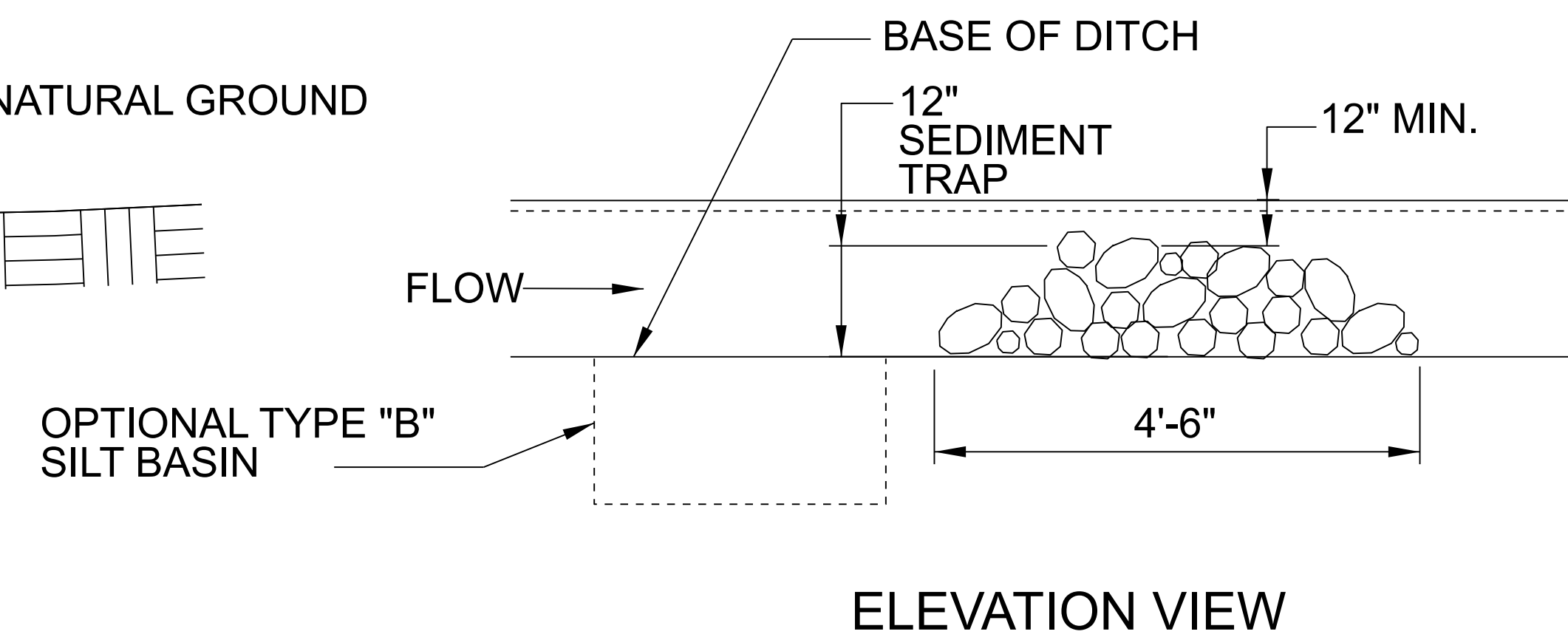
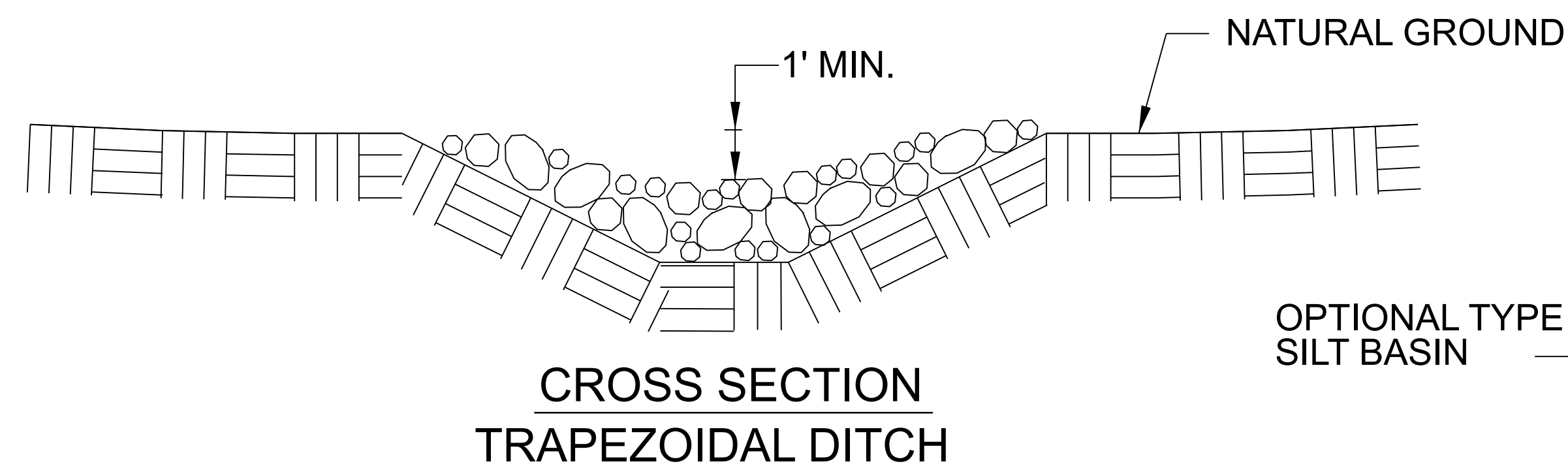
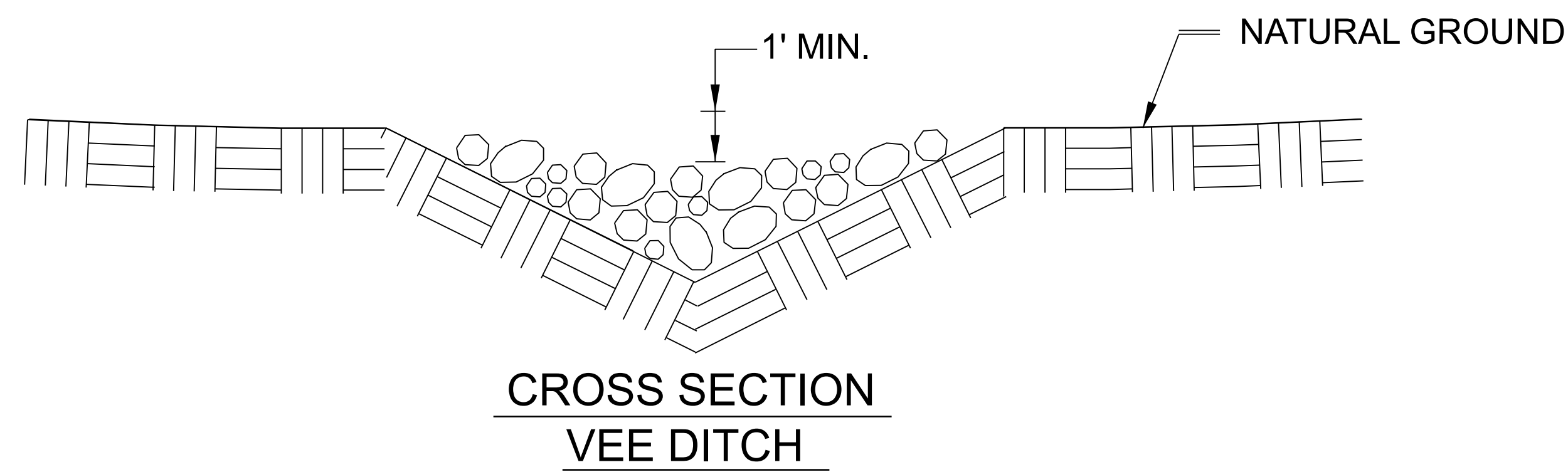
# TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL



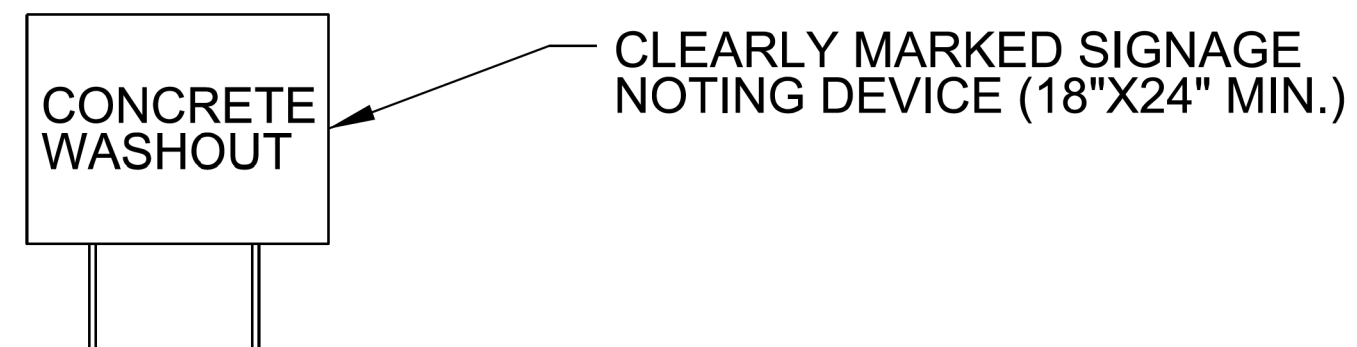
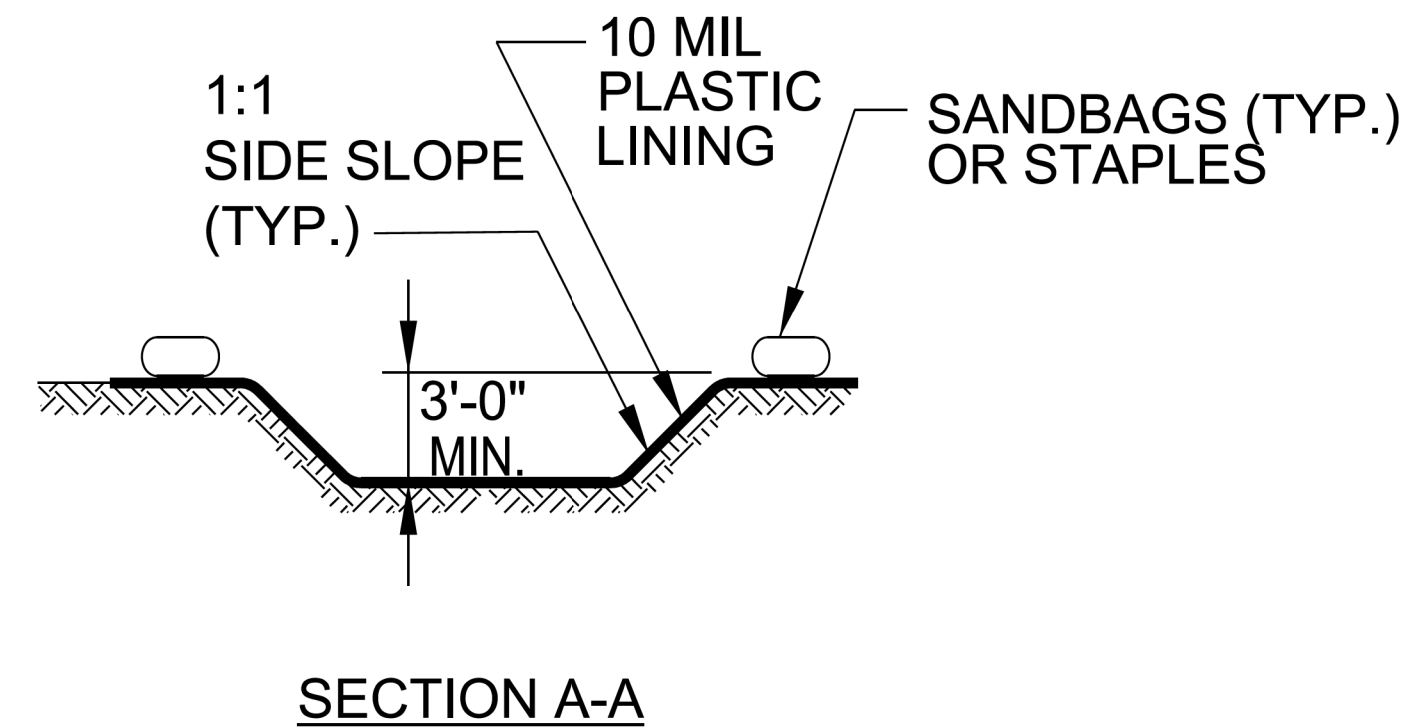
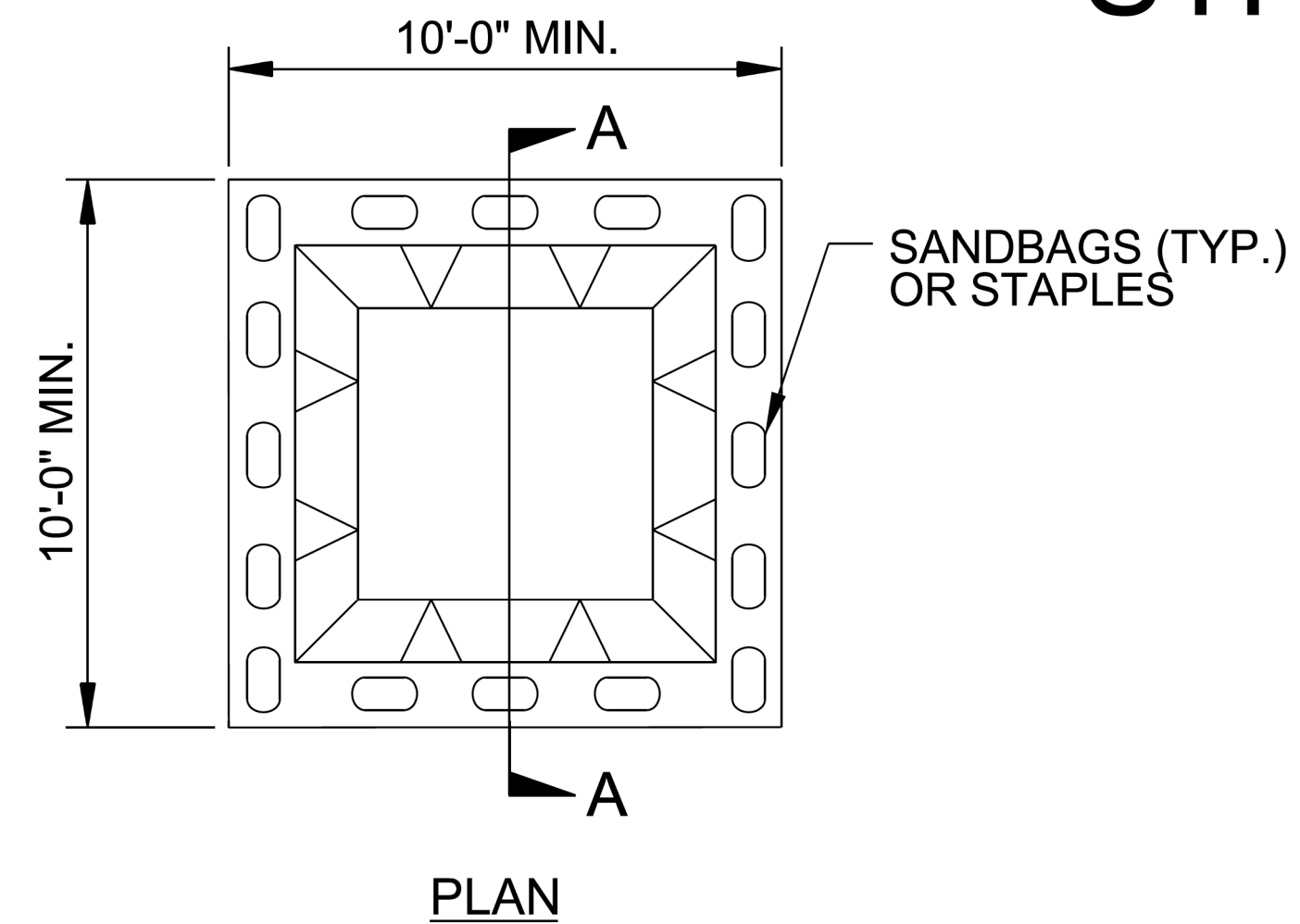
**NOTES:**

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%.

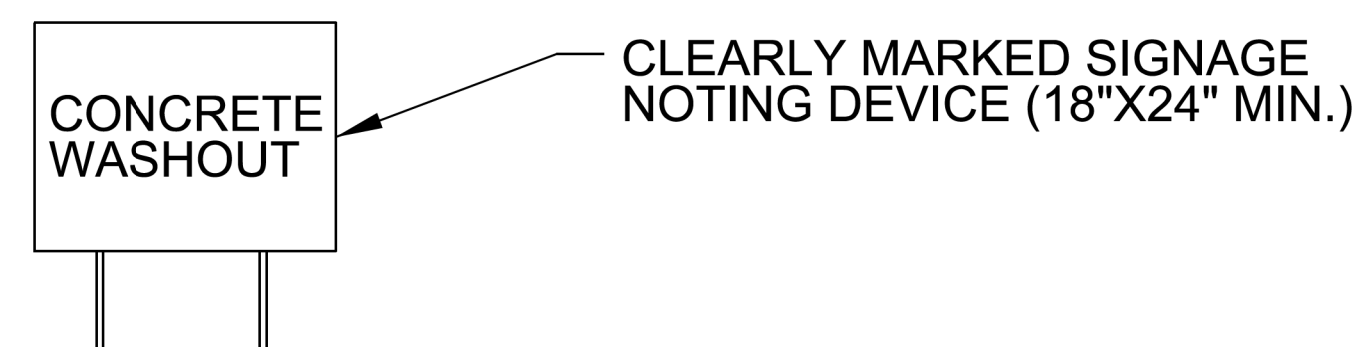
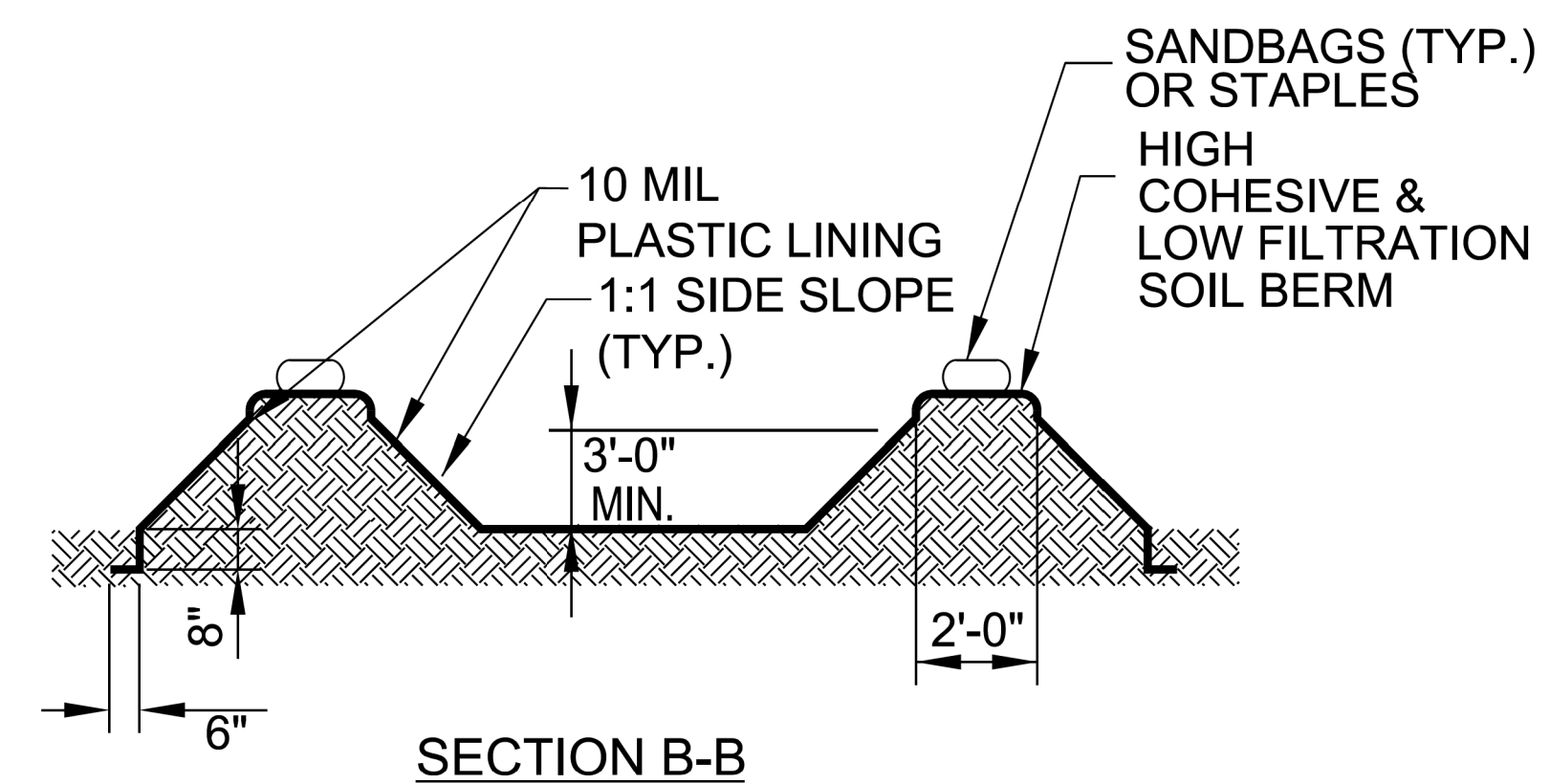
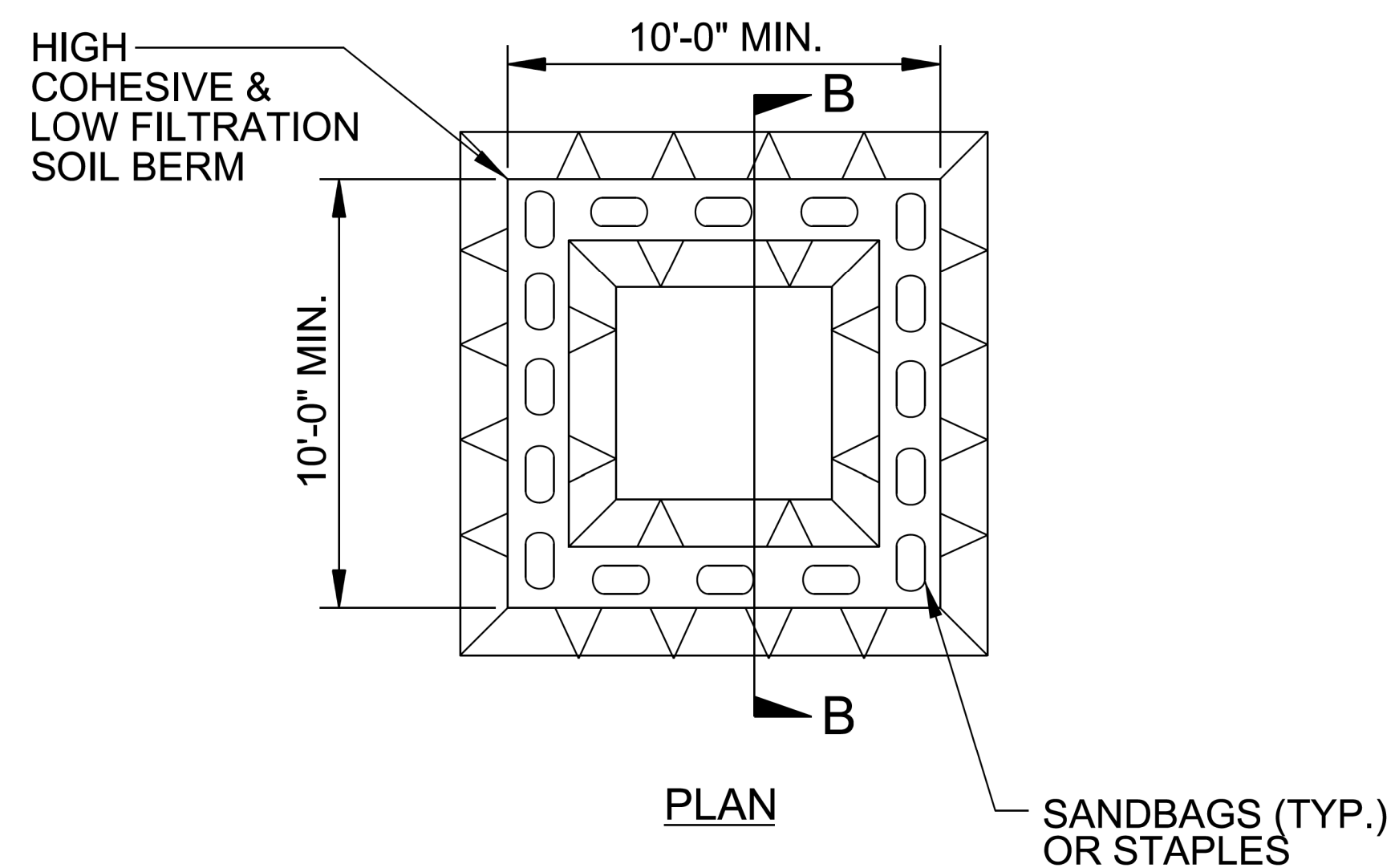


# ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



**BELOW GRADE WASHOUT STRUCTURE**  
 NOT TO SCALE

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

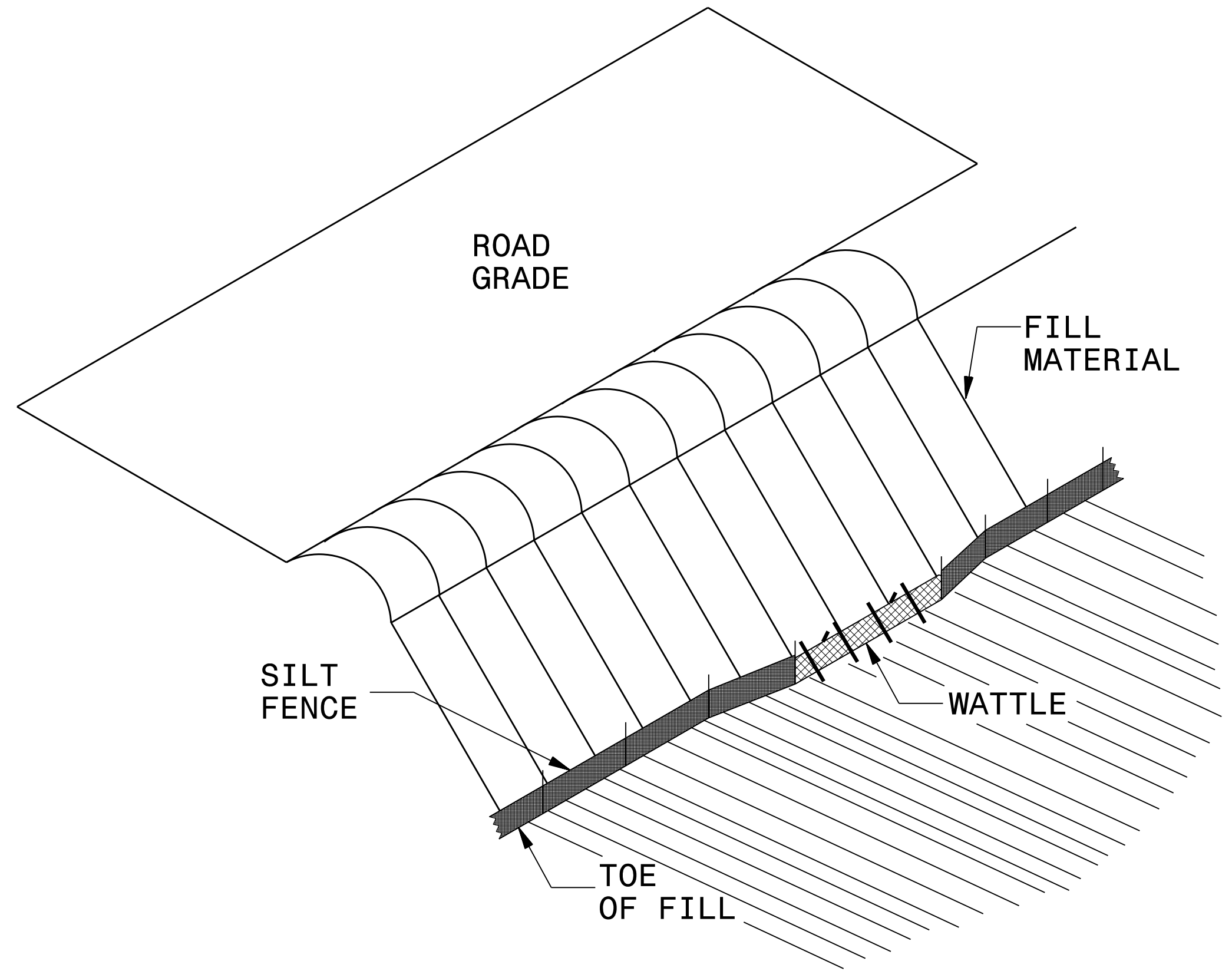


**ABOVE GRADE WASHOUT STRUCTURE**  
 NOT TO SCALE

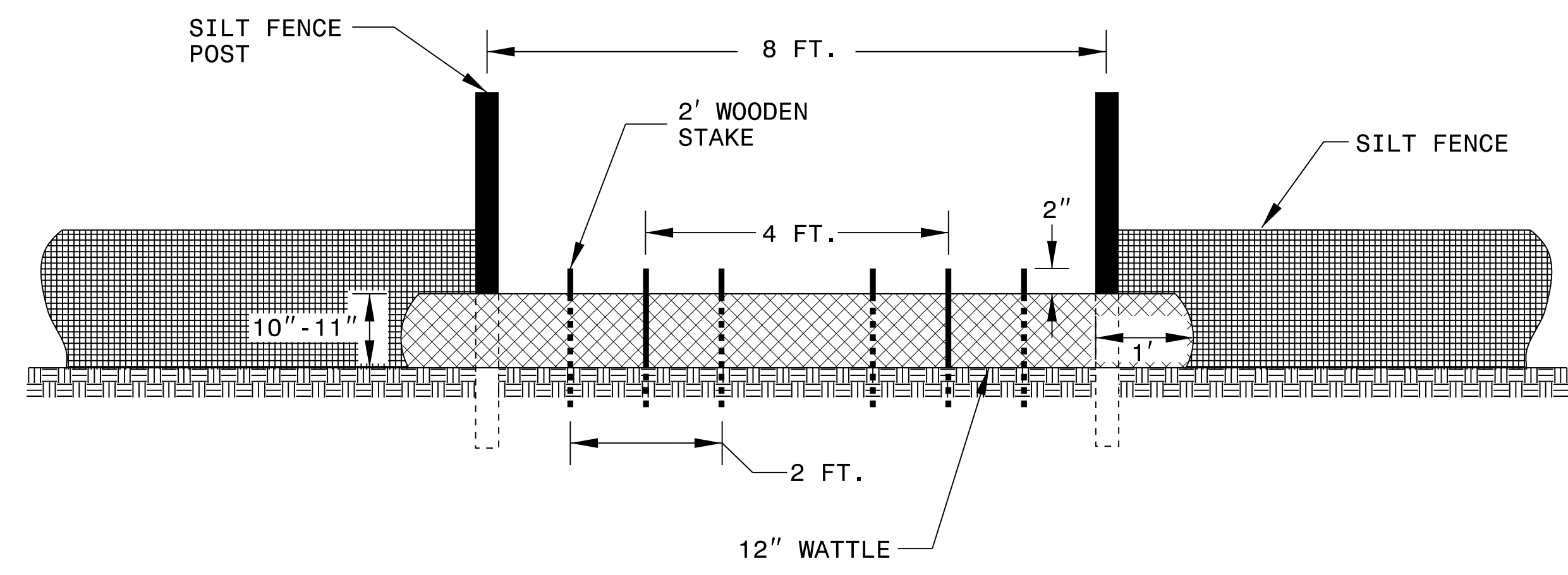
- NOTES:**
1. ACTUAL LOCATION DETERMINED IN FIELD
  2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
  3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY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

PROJECT REFERENCE NO.	SHEET NO.
059-01-9d41f	EC-2B
R/W SHEET NO.	
Prepared In the Office of: <b>NC FIRM LICENSE NO: C-1506</b> 301 FAYETTEVILLE ST., SUITE 1508 RALEIGH, NC 27601 (919) 882-7839	
Designed by: <b>John McNulty</b> 4263 NAME LEVEL III CERTIFICATION NO.	

# SILT FENCE COIR FIBER WATTLE BREAK DETAIL



**ISOMETRIC VIEW**

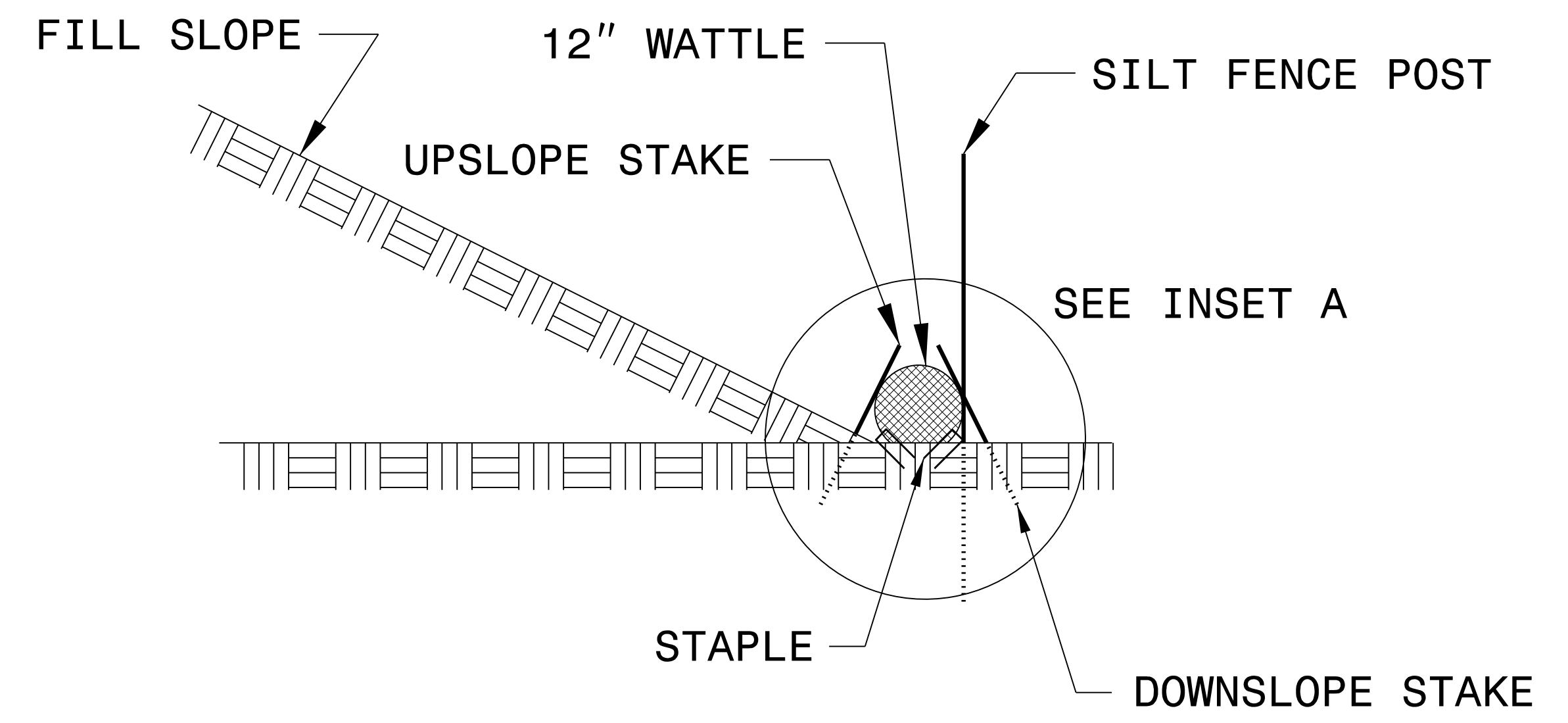
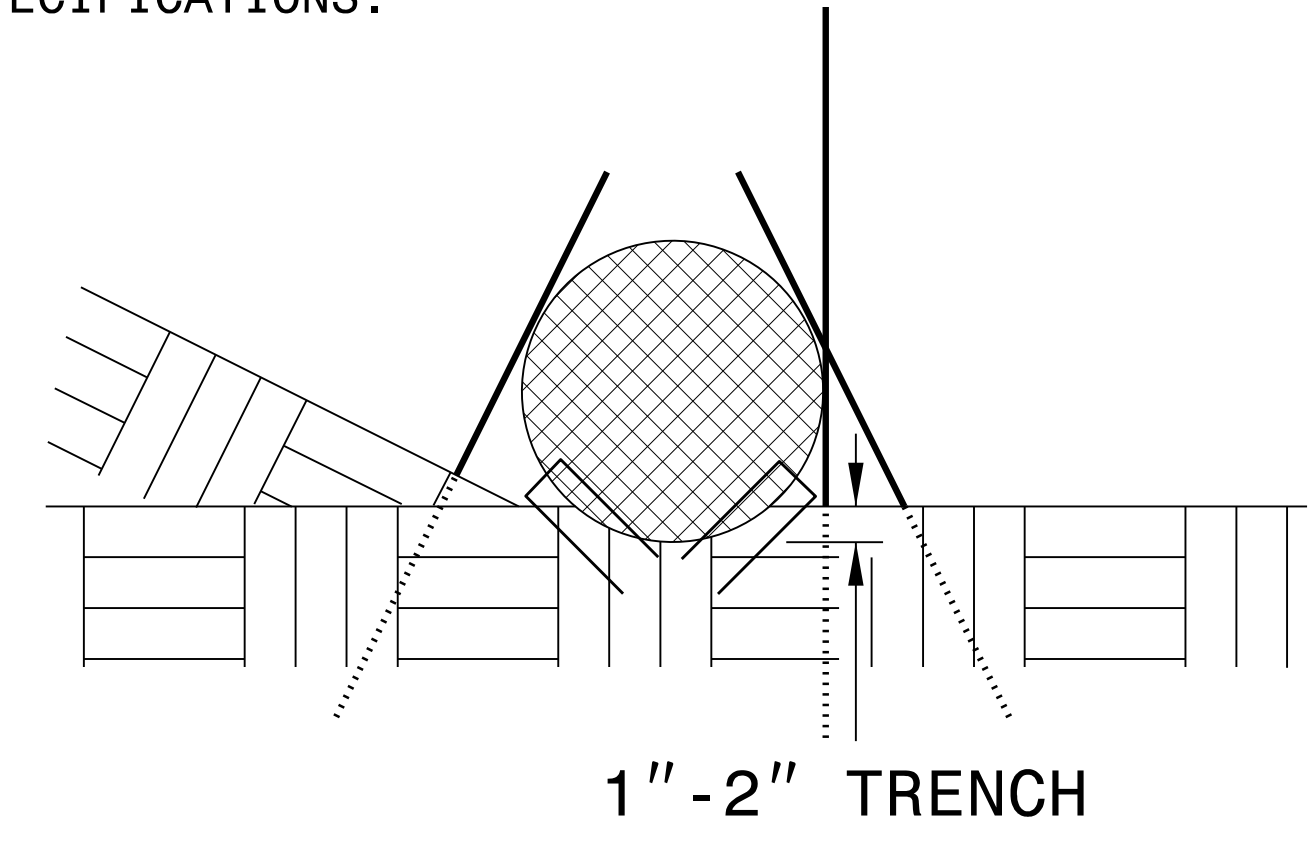


**VIEW FROM SLOPE**

**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 GAUGE 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**



**SIDE VIEW**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
059-01-9d41f	EC-3
Prepared in the Office of: <b>NC FIRM LICENSE NO: C-1506</b> 301 FAYETTEVILLE ST., SUITE 1500 RALEIGH, NC 27601 (919) 882-7839	
Designed by: <b>John McNulty</b> <b>4263</b> <small>NAME      LEVEL III CERTIFICATION NO.</small>	

# SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
059-01-9d41f	EC-4 / CONST. 4
RW SHEET NO.	
Prepared In the Office of: <b>NC FIRM LICENSE NO: C-1506</b> 301 FAYETTEVILLE ST., SUITE 1500 RALEIGH, NC 27601 (919) 882-7839 Designed by: <b>John McNulty</b> 4263 NAME LEVEL III CERTIFICATION NO.	

**THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.**

**THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.**

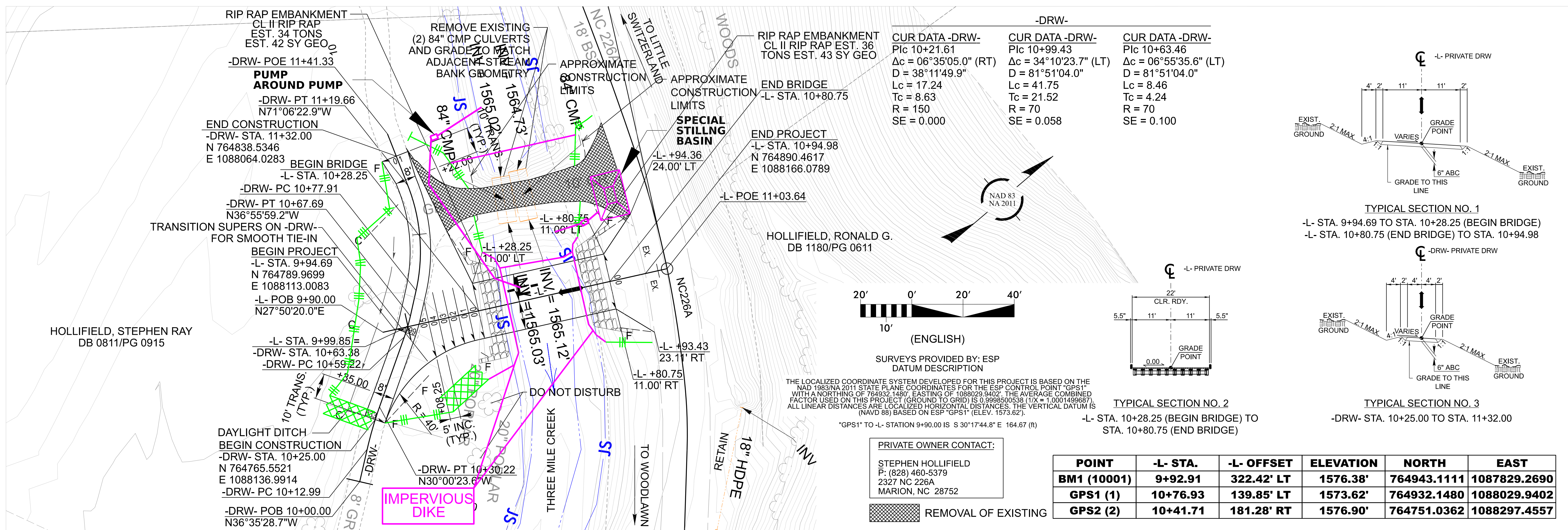
**HIGH QUALITY WATER(S) EXIST ON THIS PROJECT**  
High Quality Water Zone(s) Exist From Sta. BEGIN PROJECT to Sta. END PROJECT  
Refer To E. C. Special Provisions for Special Considerations.

**ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT**  
Refer To E. C. Special Provisions for Special Considerations.

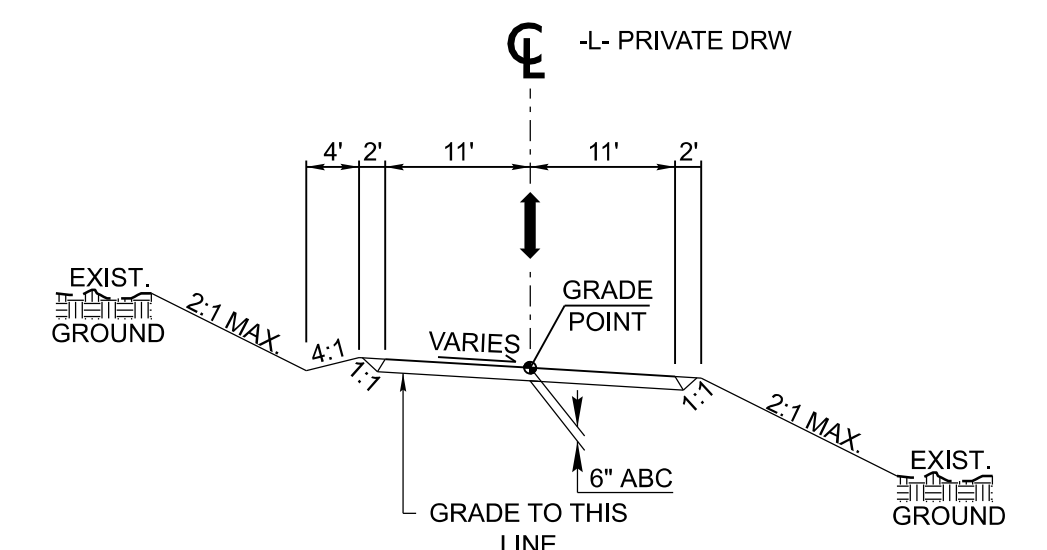
THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

**Roadway Standard Drawings**

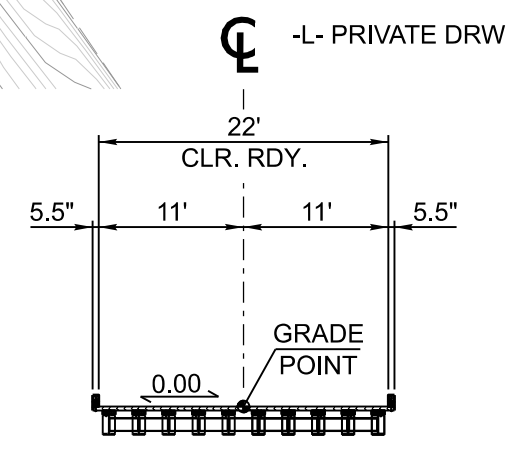
The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.



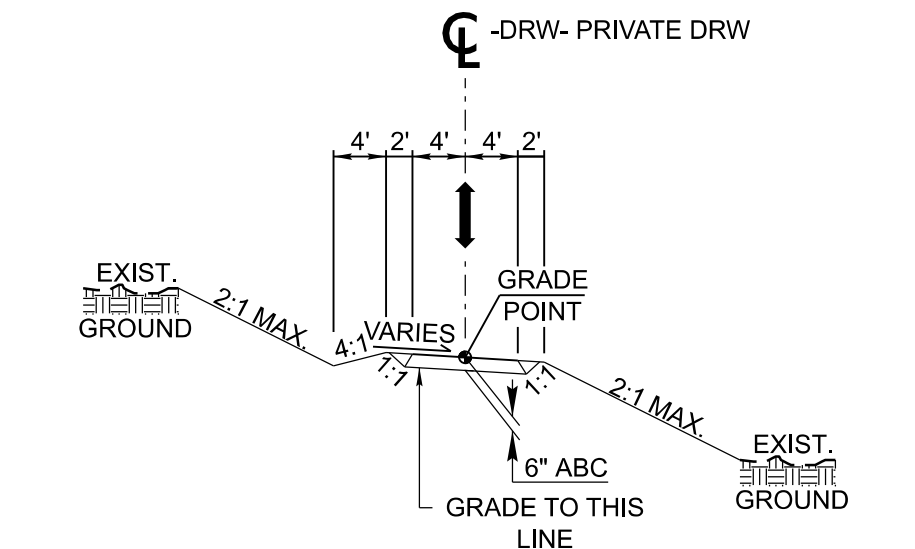
CUR DATA -DRW-	CUR DATA -DRW-	CUR DATA -DRW-
Plc 10+21.61	Plc 10+99.43	Plc 10+63.46
$\Delta c = 06^{\circ}35'05.0''$ (RT)	$\Delta c = 34^{\circ}10'23.7''$ (LT)	$\Delta c = 06^{\circ}55'35.6''$ (LT)
D = 38'11'49.9"	D = 81'51'04.0"	D = 81'51'04.0"
Lc = 17.24	Lc = 41.75	Lc = 8.46
Tc = 8.63	Tc = 21.52	Tc = 4.24
R = 150	R = 70	R = 70
SE = 0.000	SE = 0.058	SE = 0.100



**TYPICAL SECTION NO. 1**  
-L- STA. 9+94.69 TO STA. 10+28.25 (BEGIN BRIDGE)  
-L- STA. 10+80.75 (END BRIDGE) TO STA. 10+94.98



**TYPICAL SECTION NO. 2**  
-L- STA. 10+28.25 (BEGIN BRIDGE) TO STA. 10+80.75 (END BRIDGE)



**TYPICAL SECTION NO. 3**  
-DRW- STA. 10+25.00 TO STA. 11+32.00



(ENGLISH)  
SURVEYS PROVIDED BY: ESP  
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 1983/NA 2011 STATE PLANE COORDINATES FOR THE ESP CONTROL POINT "GPS1" WITH A NORTHING OF 764932.1480' EASTING OF 1088029.9402'. THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS 0.9998500538 (1/X = 1.0001499687). ALL LINEAR DISTANCES ARE LOCALIZED HORIZONTAL DISTANCES. THE VERTICAL DATUM IS (NAVD 88) BASED ON ESP "GPS1" (ELEV. 1573.62').

"GPS1" TO -L- STATION 9+90.00 IS S 30°17'44.8" E 164.67 (ft)

PRIVATE OWNER CONTACT:  
STEPHEN HOLLIFIELD  
P: (828) 460-5379  
2327 NC 226A  
MARION, NC 28752



POINT	-L- STA.	-L- OFFSET	ELEVATION	NORTH	EAST
<b>BM1 (10001)</b>	<b>9+92.91</b>	<b>322.42' LT</b>	<b>1576.38'</b>	<b>764943.1111</b>	<b>1087829.2690</b>
<b>GPS1 (1)</b>	<b>10+76.93</b>	<b>139.85' LT</b>	<b>1573.62'</b>	<b>764932.1480</b>	<b>1088029.9402</b>
<b>GPS2 (2)</b>	<b>10+41.71</b>	<b>181.28' RT</b>	<b>1576.90'</b>	<b>764751.0362</b>	<b>1088297.4557</b>

**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.

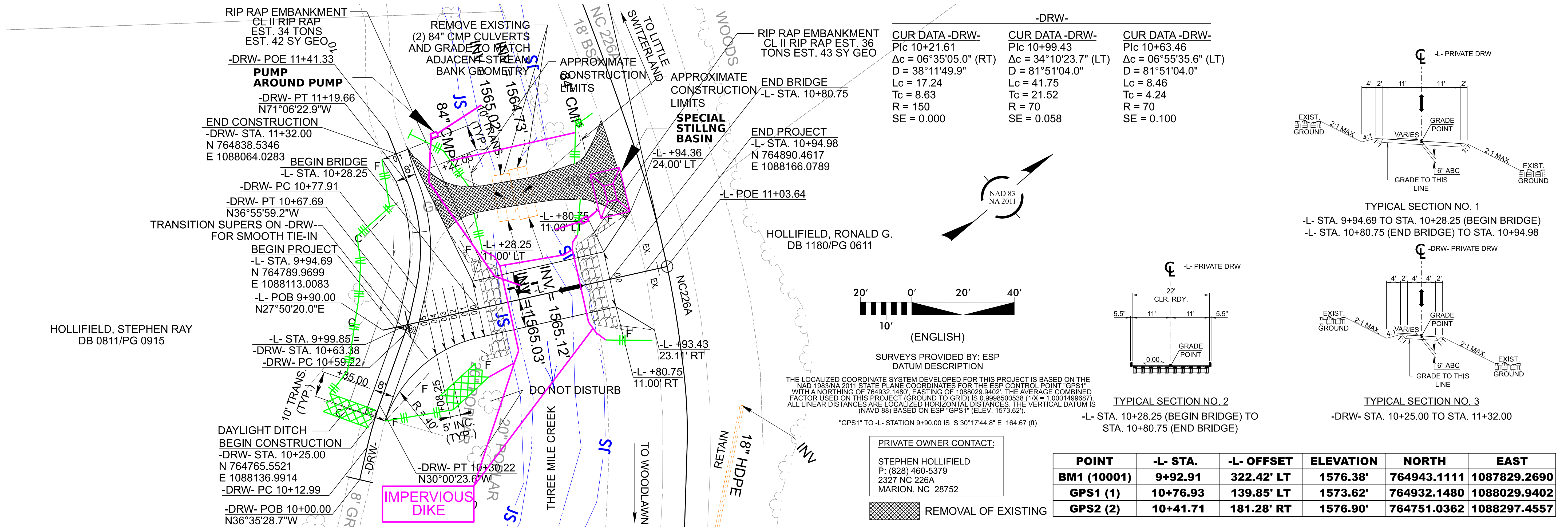
- SEQUENCE FOR CULVERT CONSTRUCTION:**
1. INSTALL TEMPORARY FLEXIBLE HOSE AND PUMP AROUND PUMP
  2. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS, DIVERT FLOW TO STABILIZED OUTFALL
  3. PLACE DOWNSTREAM DEWATERING PUMP, SPECIAL STILLING BASIN, AND IMPERVIOUS DIKE. DEWATER.
  4. REMOVE EXISTING CULVERT IN ACCORDANCE TO THE PLANS.
  5. REMOVE IMPERVIOUS DIKES, PUMPS, TEMPORARY HOSE AND PIPE. (DOWNSTREAM FIRST)
  6. REMOVE SPECIAL STILLING BASIN(S) AND STABILIZE AREA.
  7. RESET SILT FENCE AS NEEDED TO MAINTAIN PROPER EROSION CONTROL.

- CULVERT SEQUENCING NOTES:**
1. ALL EXCAVATION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED AREAS OF THE WORK ZONE.
  2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE THE WORK FROM STREAM FLOW WHEN NECESSARY.
  3. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES DIVERSION PIPES, PUMPS, AND HOSES.
  4. PUMPS AND HOSES SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA.

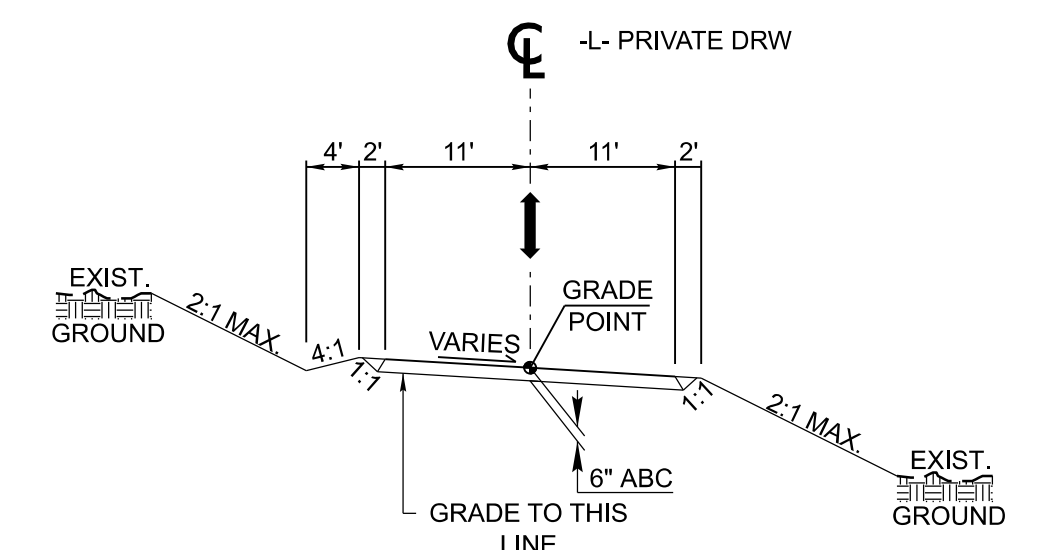
THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

Roadway Standard Drawings

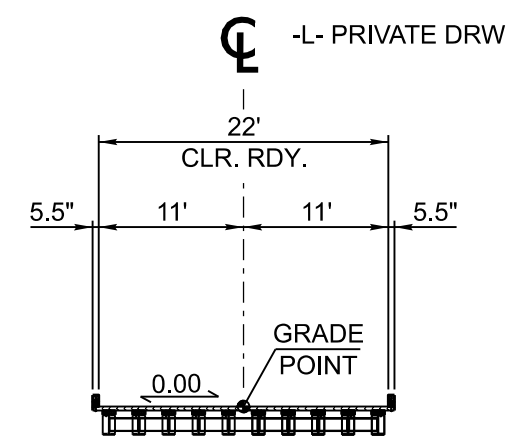
The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.



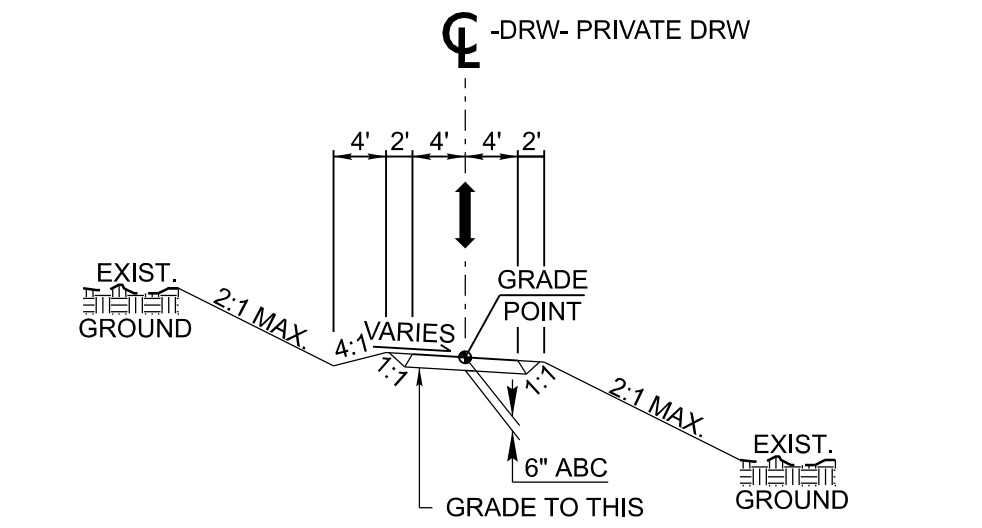
CUR DATA -DRW-	CUR DATA -DRW-	CUR DATA -DRW-
PIC 10+21.61	PIC 10+99.43	PIC 10+63.46
$\Delta c = 06^{\circ}35'05.0''$ (RT)	$\Delta c = 34^{\circ}10'23.7''$ (LT)	$\Delta c = 06^{\circ}55'35.6''$ (LT)
D = 38'11'49.9"	D = 81'51'04.0"	D = 81'51'04.0"
Lc = 17.24	Lc = 41.75	Lc = 8.46
Tc = 8.63	Tc = 21.52	Tc = 4.24
R = 150	R = 70	R = 70
SE = 0.000	SE = 0.058	SE = 0.100



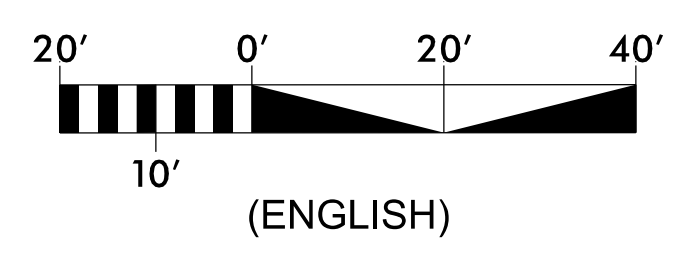
TYPICAL SECTION NO. 1  
-L- STA. 9+94.69 TO STA. 10+28.25 (BEGIN BRIDGE)  
-L- STA. 10+80.75 (END BRIDGE) TO STA. 10+94.98



TYPICAL SECTION NO. 2  
-L- STA. 10+28.25 (BEGIN BRIDGE) TO STA. 10+80.75 (END BRIDGE)



TYPICAL SECTION NO. 3  
-DRW- STA. 10+25.00 TO STA. 11+32.00



(ENGLISH)  
SURVEYS PROVIDED BY: ESP  
DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 1983/NA 2011 STATE PLANE COORDINATES FOR THE ESP CONTROL POINT "GPS1" WITH A NORTHING OF 764932.1480' EASTING OF 1088029.9402'. THE AVERAGE COMBINED FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS 0.9998500538 (1/X = 1.0001499687). ALL LINEAR DISTANCES ARE LOCALIZED HORIZONTAL DISTANCES. THE VERTICAL DATUM IS (NAVD 88) BASED ON ESP "GPS1" (ELEV. 1573.62').

"GPS1" TO -L- STATION 9+90.00 IS S 30°17'44.8" E 164.67 (ft)

PRIVATE OWNER CONTACT:  
STEPHEN HOLLIFIELD  
P: (828) 460-5379  
2327 NC 226A  
MARION, NC 28752



POINT	-L- STA.	-L- OFFSET	ELEVATION	NORTH	EAST
BM1 (10001)	9+92.91	322.42' LT	1576.38'	764943.1111	1087829.2690
GPS1 (1)	10+76.93	139.85' LT	1573.62'	764932.1480	1088029.9402
GPS2 (2)	10+41.71	181.28' RT	1576.90'	764751.0362	1088297.4557

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

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

10+25 10+50 10+75 11+00

(+) 9.9565% (+) 2.9104%

(+) 2.9104% (+) 8.2707%

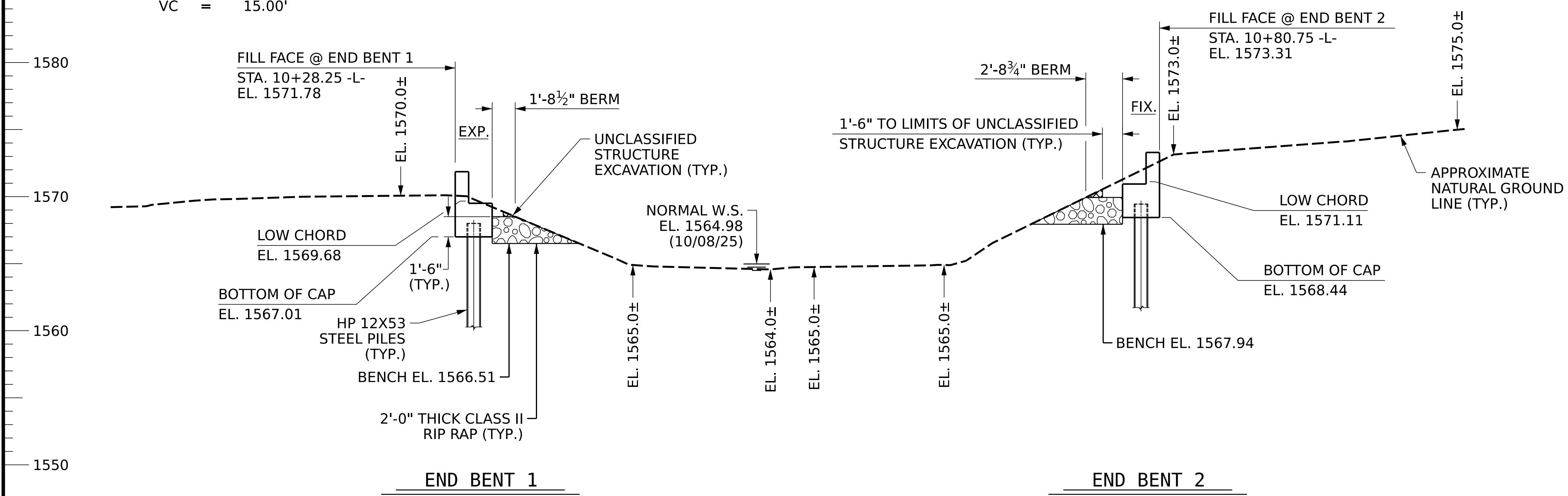
**VERTICAL CURVE DATA**

PI = 10+20.00 -L-  
EL. = 1571.54  
VC = 15.00'

**VERTICAL CURVE DATA**

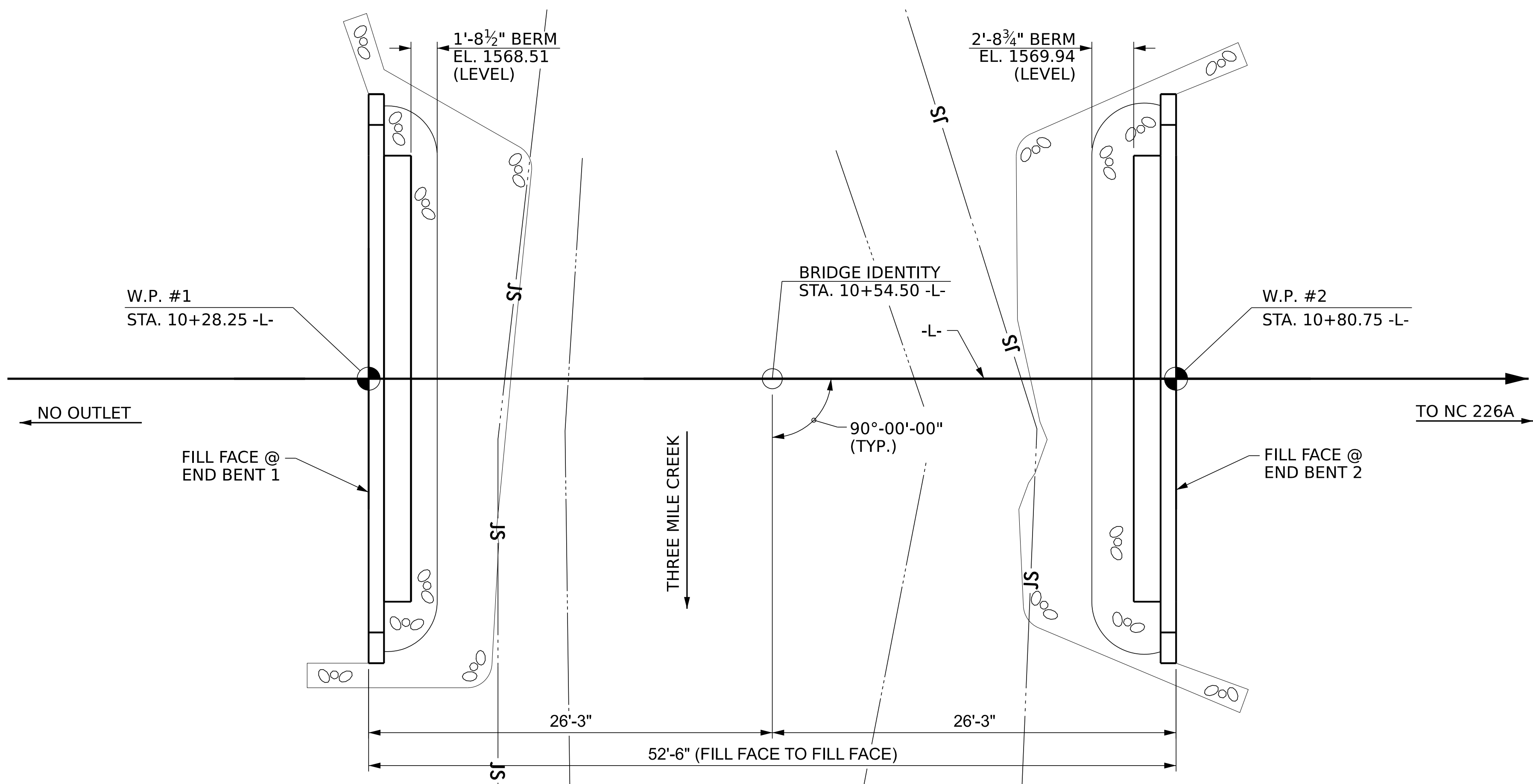
PI = 10+87.00 -L-  
EL. = 1573.49  
VC = 11.00'

**SPAN A**



UNCLASSIFIED STRUCTURE EXCAVATION

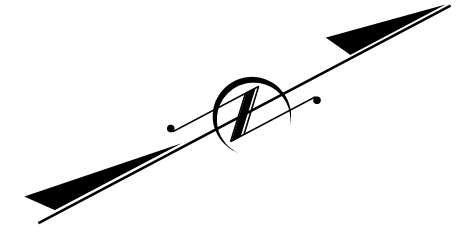
**SECTION ALONG -L-**



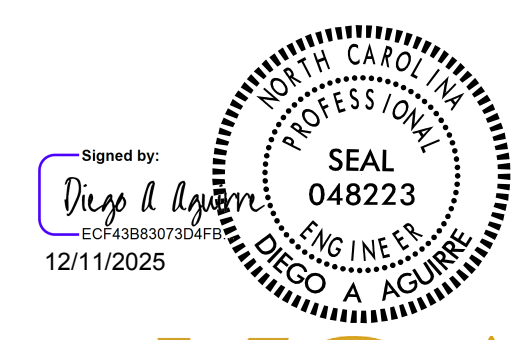
**PLAN**

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-  
 SHEET 1 OF 4



**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 THREE MILE CREEK BETWEEN  
 NO OUTLET & NC 226A

DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
 CHECKED BY : AIDAN J. HALPERN DATE : 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025

12/11/2025  
 401.005.059-01-9d41f\_STR.GD01.S-1.dgn  
 dquirre

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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			15

**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 1-5	5	150	1568.01	15			250							
End Bent 2, Piles 1-5	5	150	1569.44	15			250							
<b>TOTAL QUANTITY:</b>														

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

\*\* 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 1-5	150			0.60		
End Bent 2, Piles 1-5	150			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 1-5				5
End Bent 2, Piles 1-5				5
<b>TOTAL QUANTITY:</b>				10

PROJECT NO. 059-01-9d41f


McDowell COUNTY

STATION: 10+54.50 -L-

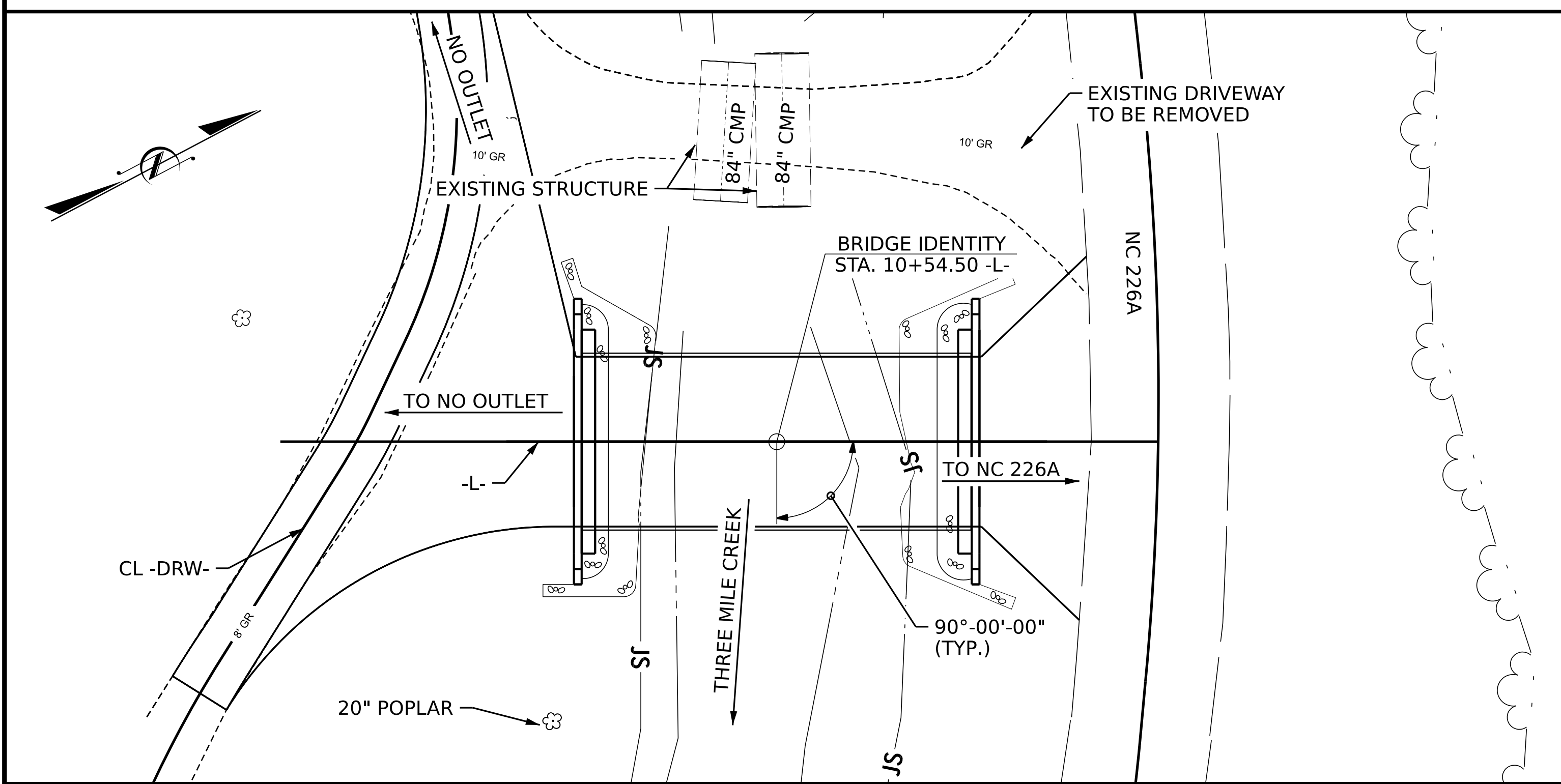
SHEET 2 OF 4

**NOTES:**

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Cheng Wang, #048123) on 11-18-2025.
- 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.
- The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.

 Signed by: <u>Diego A. Aguirre</u> 12/11/2025 SIGNATURE DATE	<h2>PILE FOUNDATION TABLES</h2>						SHEET NO. S-2 TOTAL SHEETS 15
	REVISIONS						
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. 1	BY:	DATE:	NO. 3	BY:	DATE:	
	2			4			

BM INFO: BM#1, -L- STA. 9+92.91, 322.42 LT., EL. 1576.38, NORTHING: 764943.111 EASTING: 1087829.269  
 GPS#1, -L- STA. 10+76.93, 139.85 LT., EL. 1573.62, NORTHING: 764932.148 EASTING: 1088029.940  
 GPS#2, -L- STA. 10+41.71, 181.28 RT., EL. 1572.90, NORTHING: 764751.036 EASTING: 1088297.456



**LOCATION SKETCH**

FOR ADDITIONAL INFORMATION, SEE FULL CONTRACT DOCUMENTS

**LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY  
 STEEL BEAM (W18X106, BRG.-TO-BRG. = 48'-11")**

LOAD TYPE	VEHICLE	DEAD LOAD FACTOR (γ <sub>DC</sub> )	LIVE LOAD FACTOR (γ <sub>LL</sub> )	WEIGHT (W) (TONS)	MINIMUM RATING FACTOR (RF)	RATING TONS = W x RF
DESIGN LOAD	HS-20 (INVENTORY)	1.25	1.75	36.00	1.31	47.16
	HS-20 (OPERATING)	1.25	1.35	36.00	1.69	60.84
EMERGENCY VEHICLE (EV)	EV2	1.25	1.30	28.75	1.81	52.04
	EV3	1.25	1.30	43.00	1.29	55.47

**TOTAL BILL OF MATERIAL**

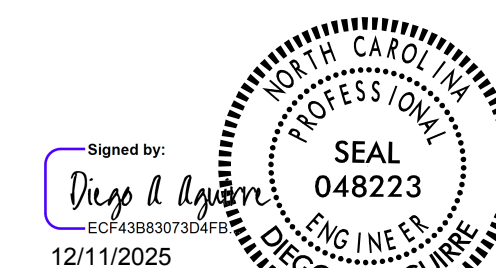
	REMOVAL OF EXISTING STRUCTURE @ STA. 10+54.50 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 10+54.50 -L-	CLASS A CONCRETE (BRIDGE)	REINFORCING STEEL (BRIDGE)	APPROX. 54,800 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	TIMBER BRIDGE DECK SYSTEM	TIMBER BRIDGE WHEEL GUARD SYSTEM
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LBS.	LUMP SUM	EA.	No.	LIN. FT.	EA.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE						LUMP SUM							LUMP SUM	LUMP SUM	101.0
END BENT 1				12.1	1,868		5	5	75	5	34	42			
END BENT 2				12.1	1,868		5	5	75	5	36	43			
<b>TOTAL</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>24.2</b>	<b>3,736</b>	<b>LUMP SUM</b>	<b>10</b>	<b>10</b>	<b>150</b>	<b>10</b>	<b>70</b>	<b>85</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>101.0</b>

PROJECT NO. 059-01-9d41f

MCDOWELL COUNTY

STATION: 10+54.50 -L-

SHEET 3 OF 4



**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 THREE MILE CREEK BETWEEN  
 NO OUTLET & NC 226A

DOCUMENT NOT CONSIDERED  
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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:	TOTAL SHEETS
1			3			5-3
2			4			15

DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
 CHECKED BY : AIDAN J. HALPERN DATE : 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025

## 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%.

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 UTILITY CONFLICTS BEFORE COMMENCING WORK.

UTILITY OWNER'S CONTACT INFORMATION:

RUTHERFORD ELECTRIC MEMBERSHIP CORP.  
JAKE WHEELER, PHONE: (828) 584-1410 x207  
ROBBIE HENDERSON, PHONE: (828) 245-1621 x444

FRONTIER COMMUNICATIONS  
PHONE: (800) 921-8102

### 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 PLACED SO 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 THAT 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" Ø 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 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:

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 KIPS PER PILE.

THE ESTIMATED PILE LENGTH IS 15 FEET AT END BENT 1 AND END BENT 2 WHICH INCLUDES 1-FOOT OF EMBEDMENT INTO THE CAP.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2.

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 IS ASSUMED THAT SCOUR WILL NOT IMPACT THE BRIDGE END BENTS.

### EXISTING STRUCTURE:

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE, CONSISTING OF TWO 84" CMP INSTALLED AFTER HURRICANE HELENE AND LOCATED UPSTREAM FROM THE PROPOSED STRUCTURE, SHALL BE REMOVED.

REMOVAL OF THE EXISTING STRUCTURE 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 PROPOSED 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 TIMBER BRIDGE DECK ON STEEL BEAMS, SEE SPECIAL PROVISIONS.

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

FOR FLASHING MEMBRANE, SEE TIMBER BRIDGE FLASHING MEMBRANE SPECIAL PROVISIONS.

COORDINATE WITH THE PRIVATE OWNER, AS NEEDED. PRIVATE OWNER'S CONTACT INFORMATION:

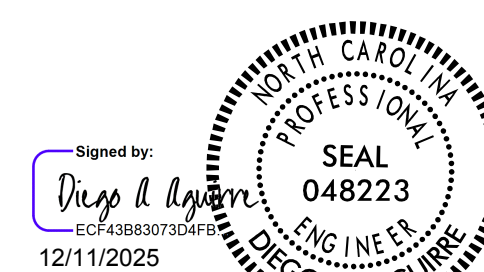
STEPHEN HOLLIFIELD, PHONE: 828-460-5379,  
E-MAIL: KRISTENG1921@YAHOO.COM,  
ADDRESS: 2327 NC 226A, MARION, NC.

PROJECT NO. 059-01-9d41f

MCDOWELL COUNTY

STATION: 10+54.50 -L-

SHEET 4 OF 4



GENERAL DRAWING

GENERAL DRAWING NOTES

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

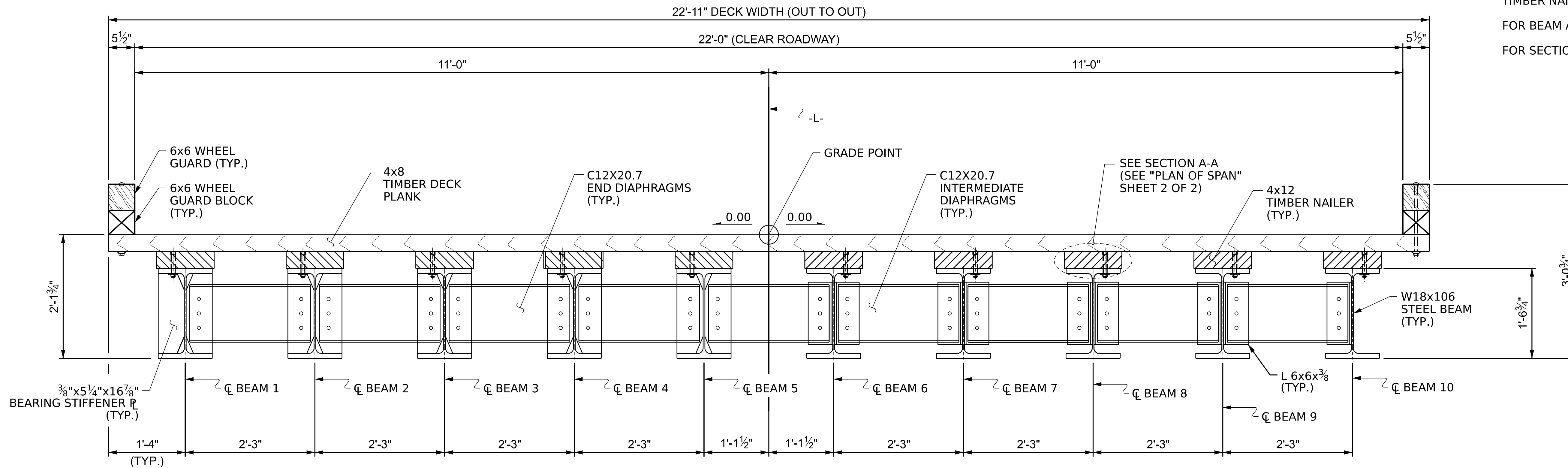
301 FAYETTEVILLE ST., SUITE 1500  
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NC FIRM LICENSE: C-1506

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-4
1			3			TOTAL SHEETS
2			4			15

DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
CHECKED BY : AIDAN J. HALPERN DATE : 11/2025  
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025

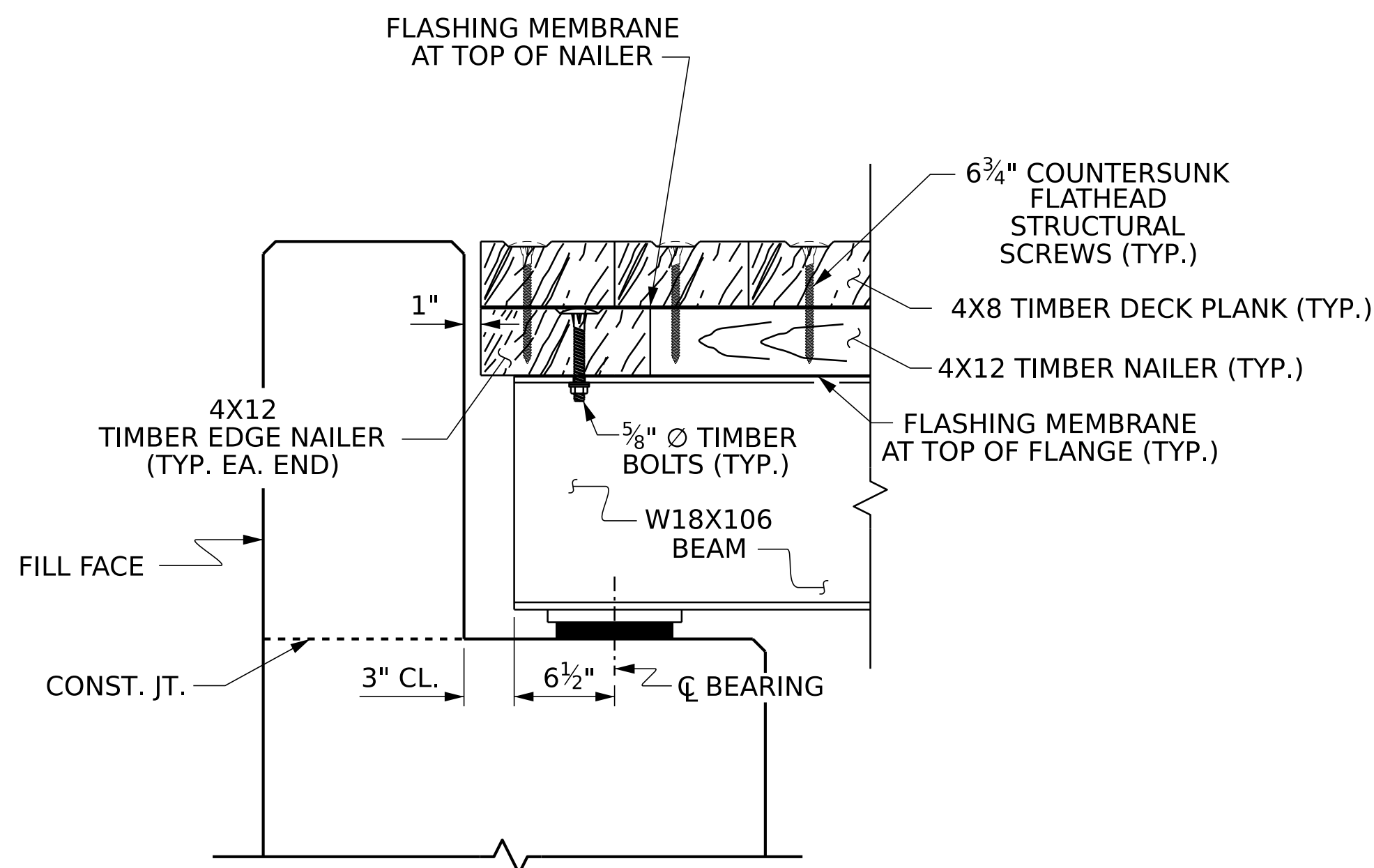
**NOTES**

- 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



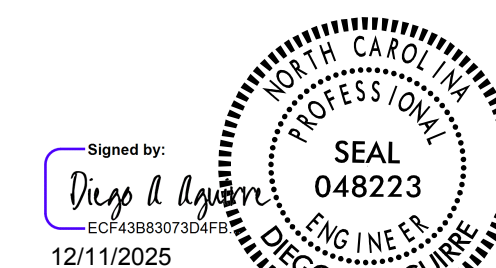
**PARTIAL TYPICAL SECTION**  
(SHOWING BEARING STIFFENERS & END DIAPHRAGMS)  
(SEE FRAMING PLAN SHEET FOR DETAILS)

**PARTIAL TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS)  
(SEE FRAMING PLAN SHEET FOR DETAILS)



**SECTION AT END BENT**

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
STATION: 10+54.50 -L-



**SUPERSTRUCTURE  
TYPICAL SECTION**

DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

12/11/2025  
401.025.059-01-9d41f\_STR\_TS01.S-5.dgn  
daguirre

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

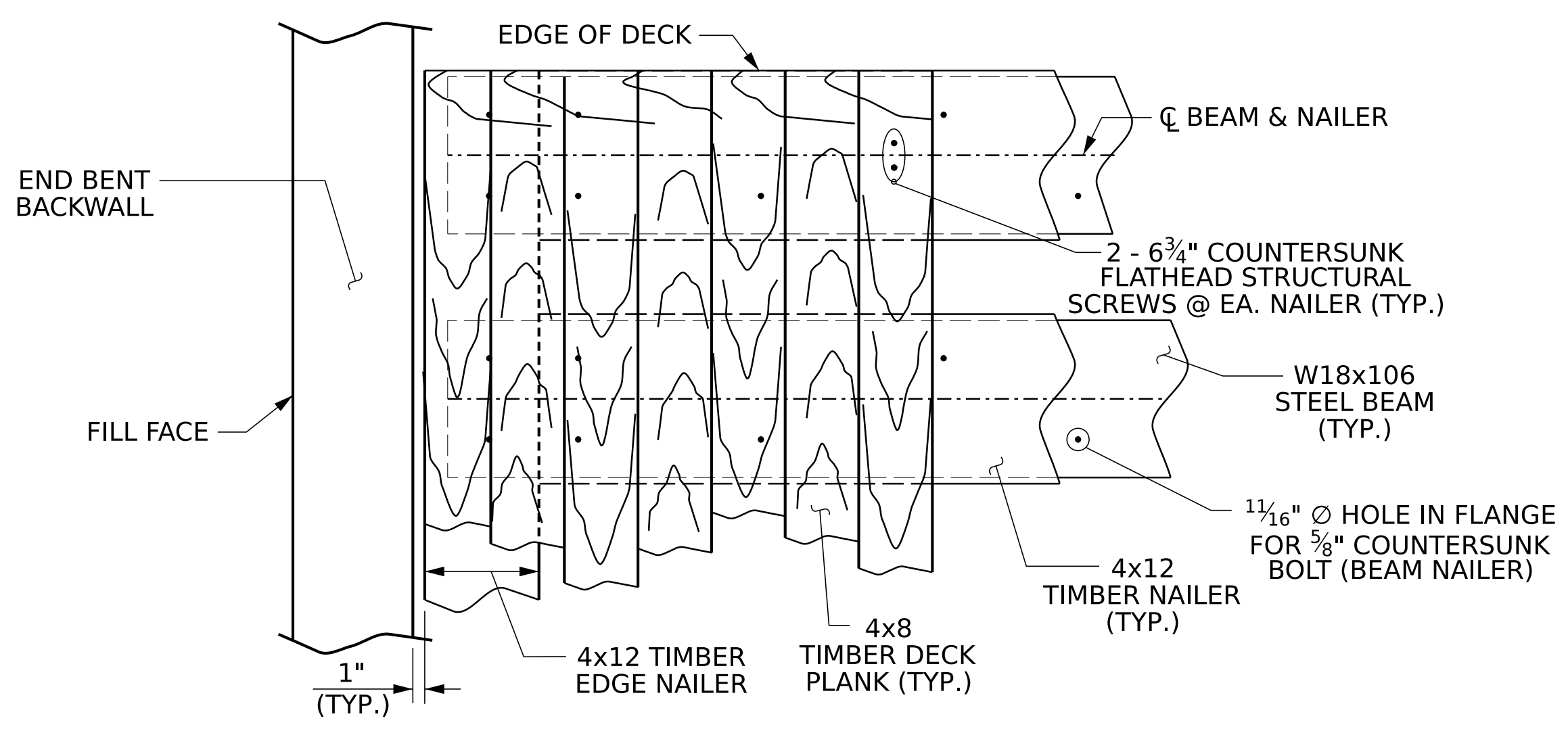
301 FAYETTEVILLE ST., SUITE 1500  
RALEIGH, NC 27601 (919) 882-7839  
NC FIRM LICENSE: C-1506

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5
2			4			15

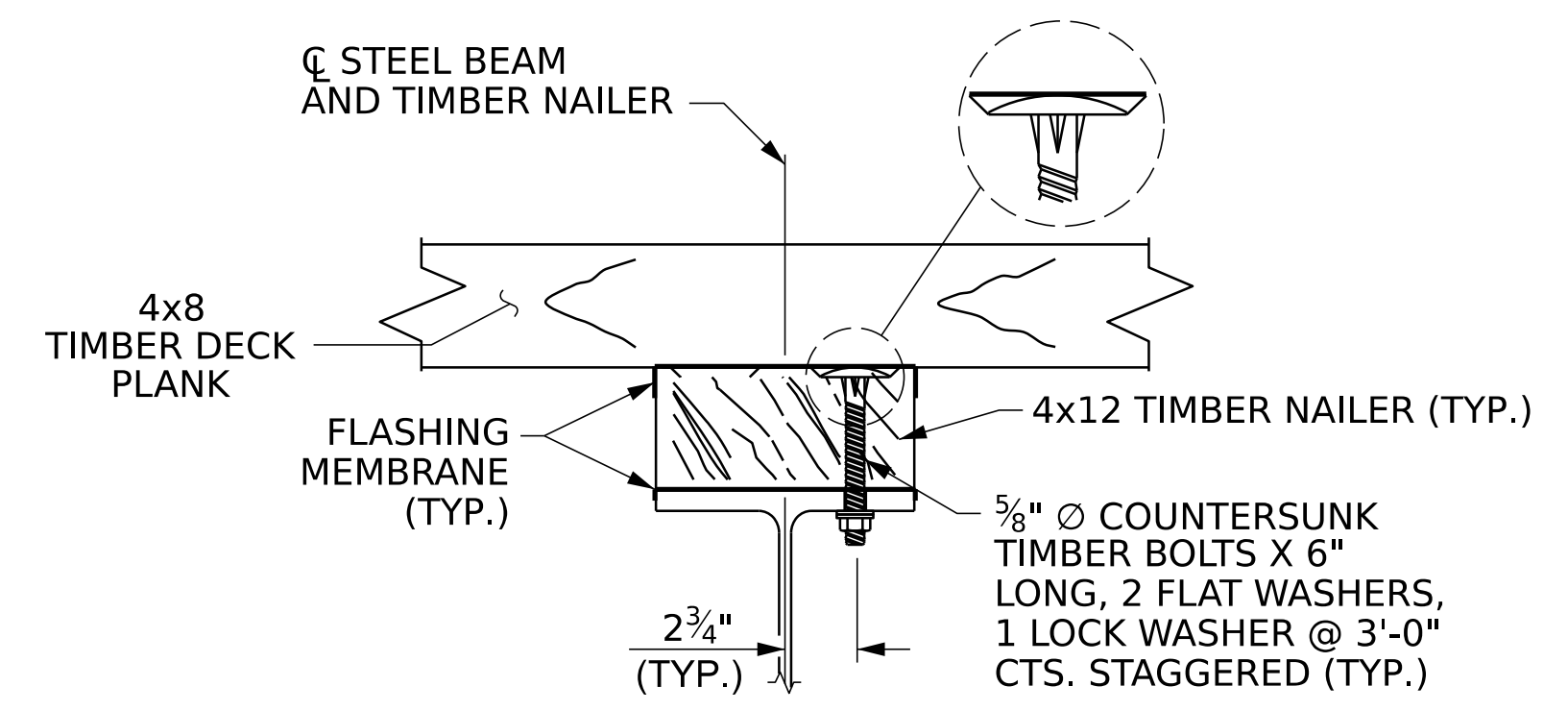


**BILL OF MATERIAL  
FOR 50 FT. SPAN**

TREATED LUMBER			
ITEM	SIZE	LIN. FT.	
TIMBER DECK PLANKS	4x8	1925	
TIMBER NAILERS	4x12	485	
TIMBER EDGE NAILERS	4x12	46	
TOTAL TREATED LUMBER _____ 2456 LIN. FT.			
FLASHING MEMBRANE			
ITEM	SIZE	LIN. FT.	
TOP OF BEAM	25 MILS	500	
TOP OF TIMBER NAILERS	25 MILS	485	
TOP OF TIMBER EDGE NAILERS	25 MILS	46	
FLASHING MEMBRANE _____ 1030 LIN. FT.			
HARDWARE			
ITEM	No.	SIZE	LBS.
5/8" Ø TIMBER BOLTS	400	5/8"	100
HEAVY HEX NUTS	400	5/8"	20
STANDARD WASHER	400	5/8"	4
LOCK WASHER	400	5/8"	4
FLAT HEAD STR. SCREWS	1,680	6 3/4"	135
HARDWARE FOR CONNECTIONS _____ 263 LBS.			

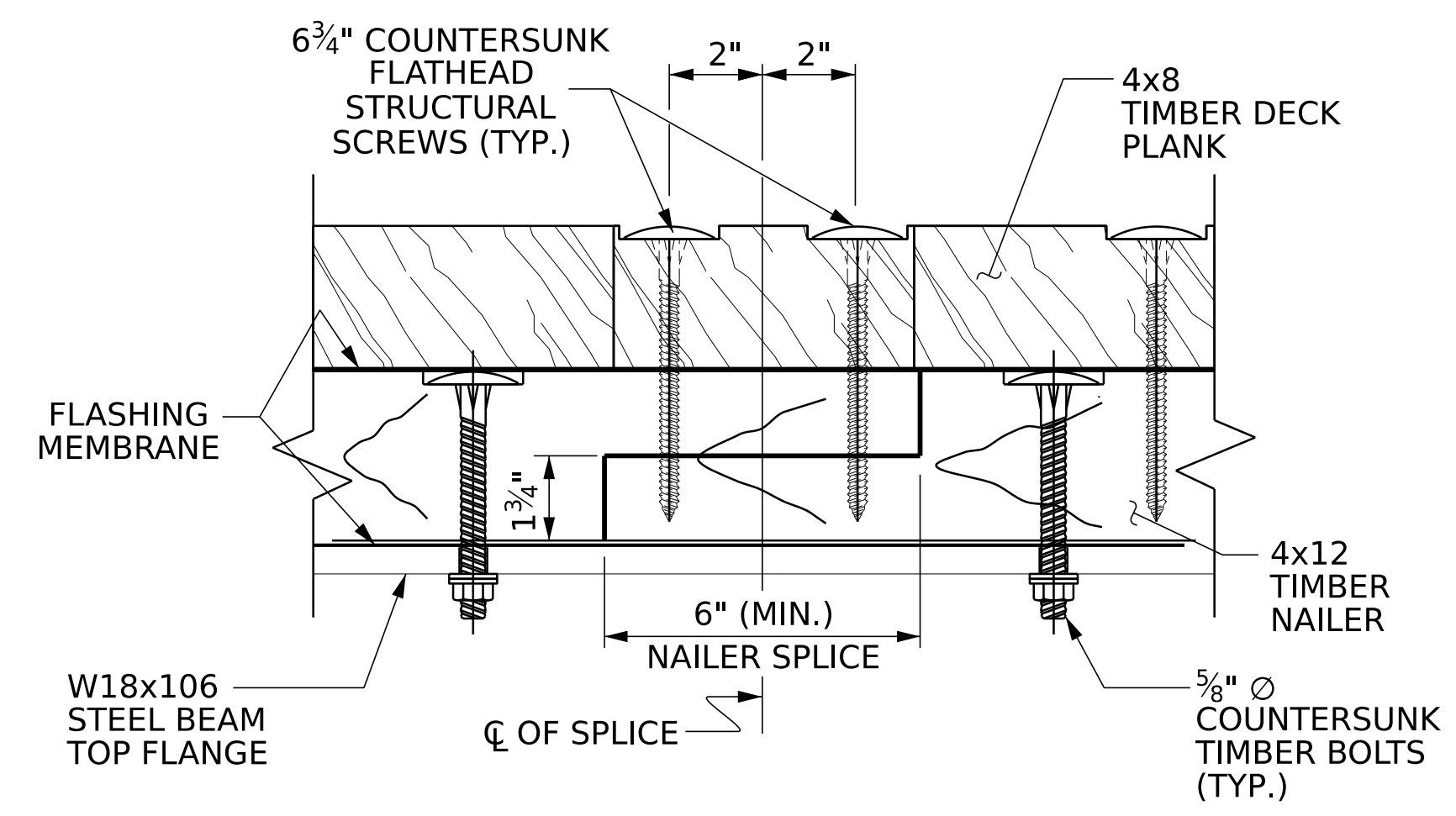


**TYPICAL DECK DETAIL AT END BENT**

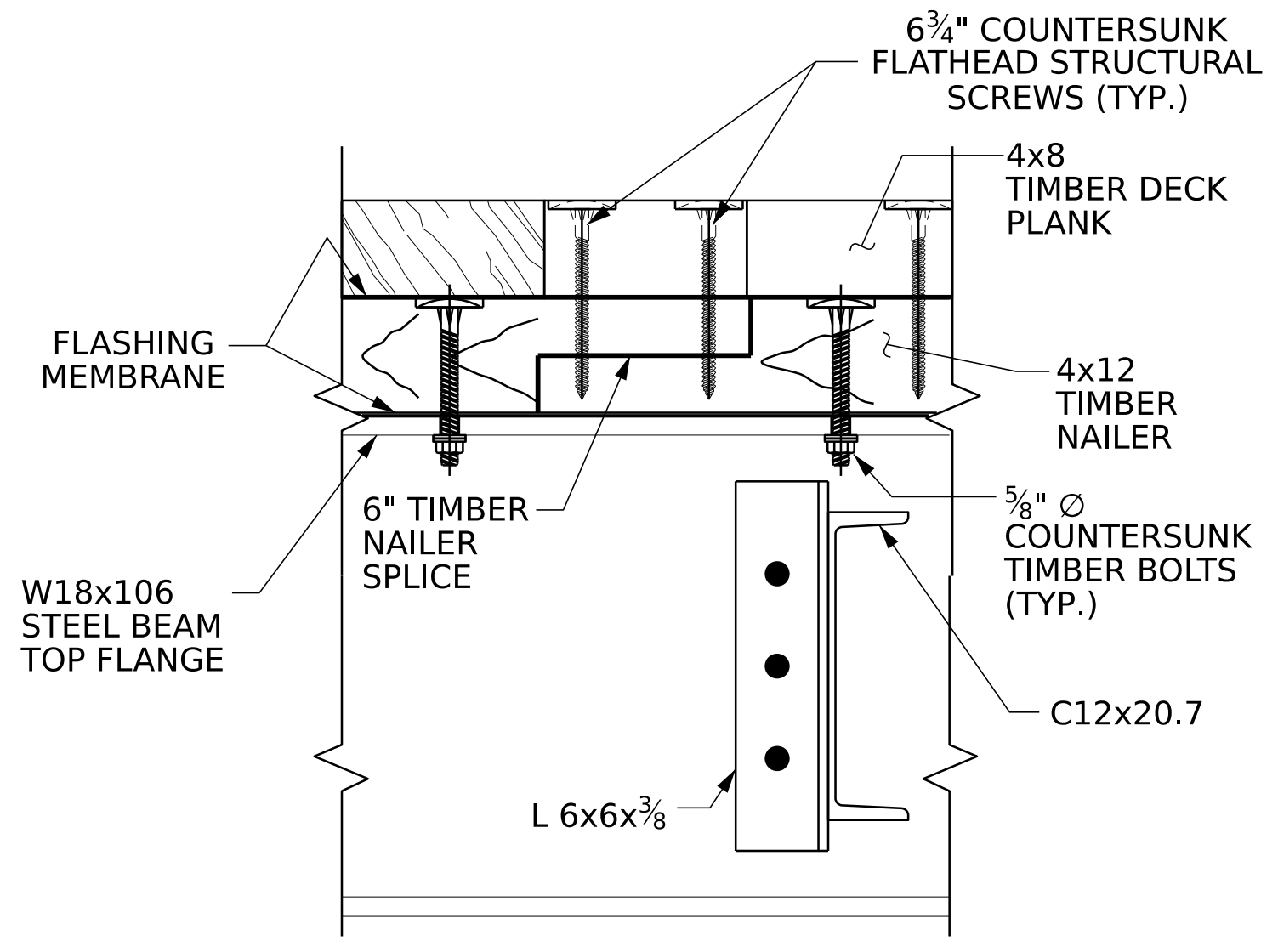


**SECTION A-A**

TIMBER NAILER ATTACHMENT DETAILS



**NAILER SPLICE DETAILS**



**SECTION B-B**

NAILER SPLICE & TIMBER PLANK ATTACHMENT DETAILS

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-  
 SHEET 2 OF 2



**SUPERSTRUCTURE  
PLAN OF SPAN  
DETAILS**

DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
 CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

12/11/2025  
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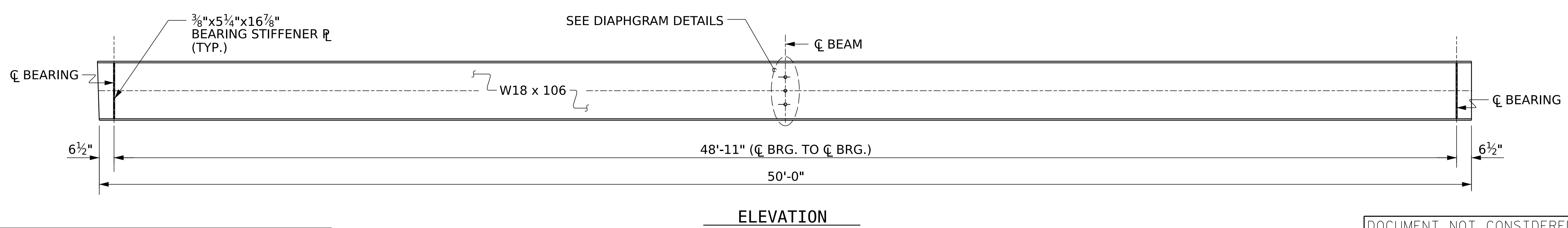
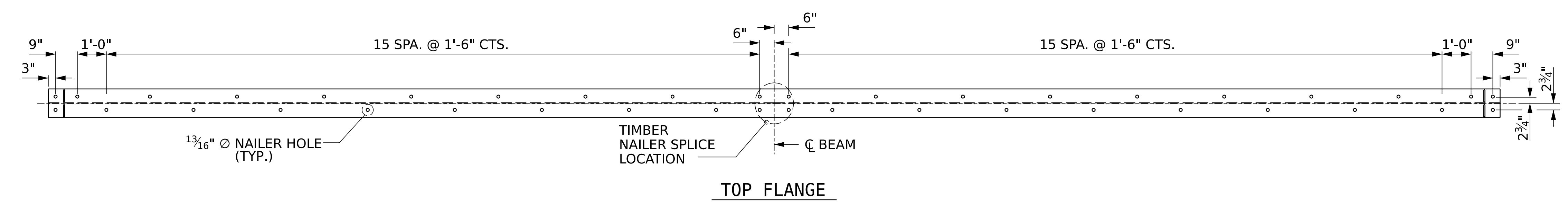
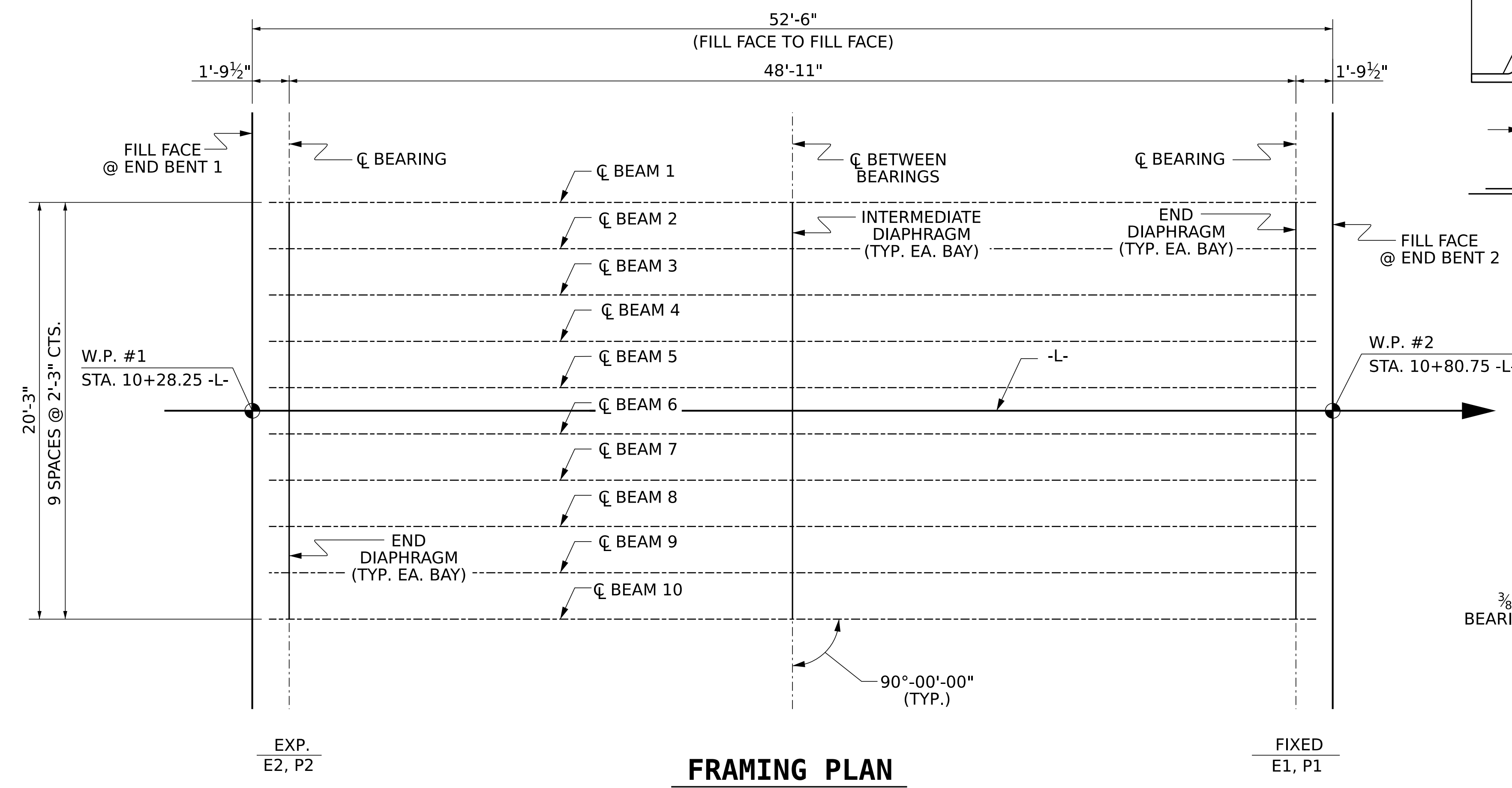
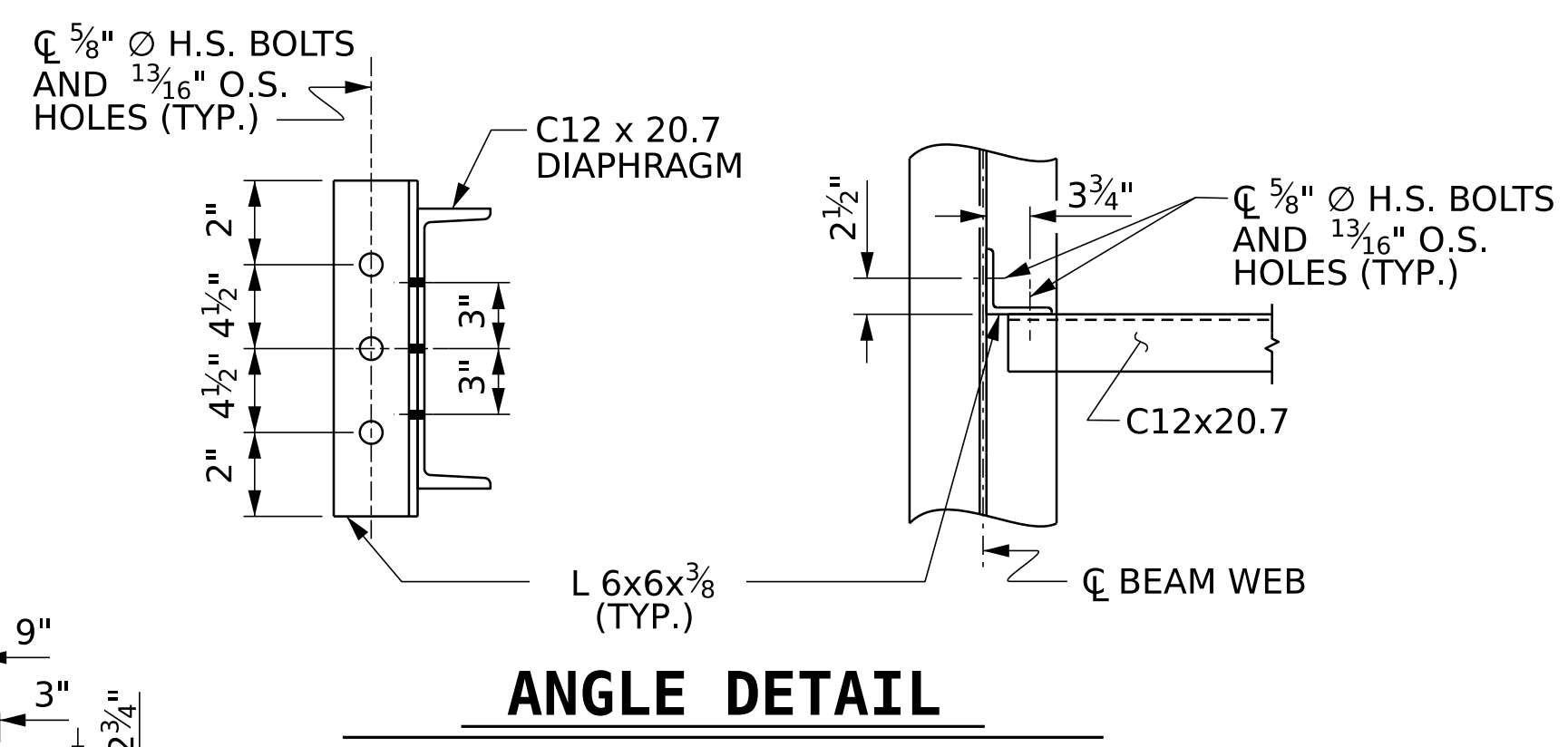
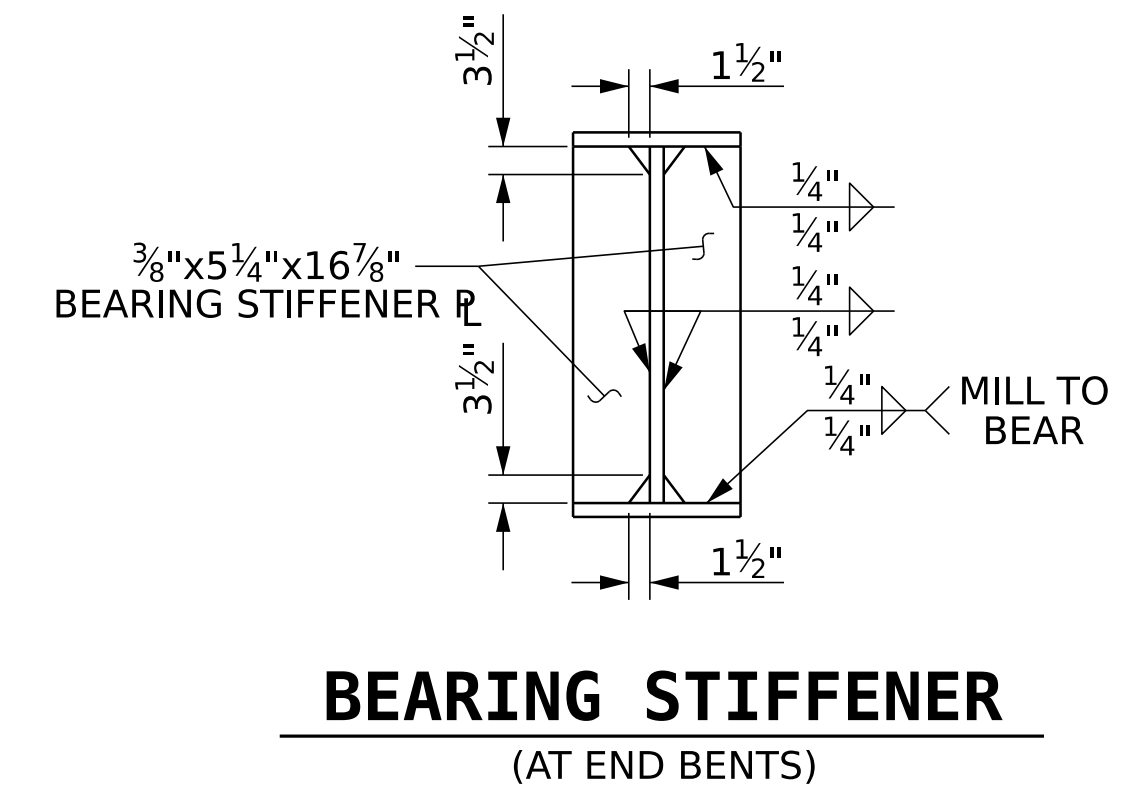
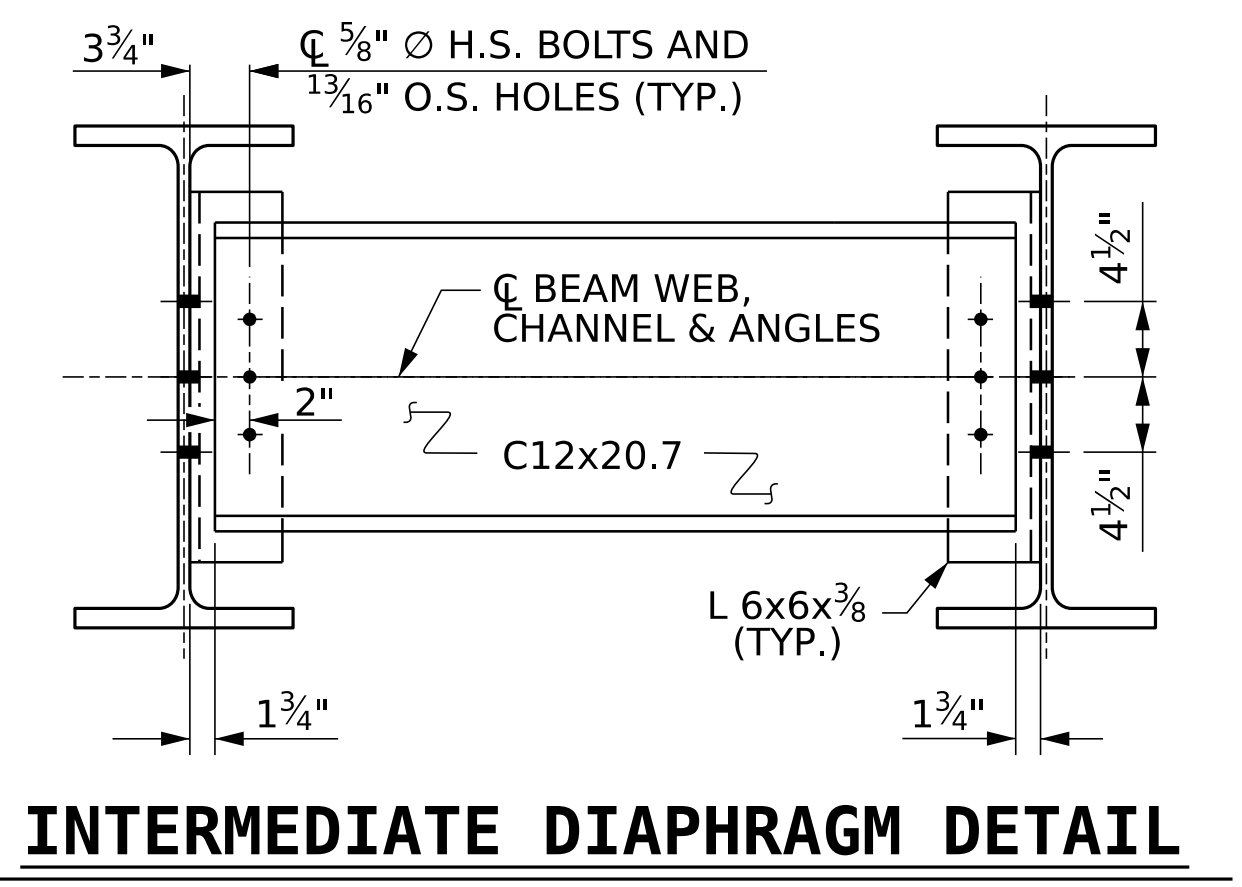
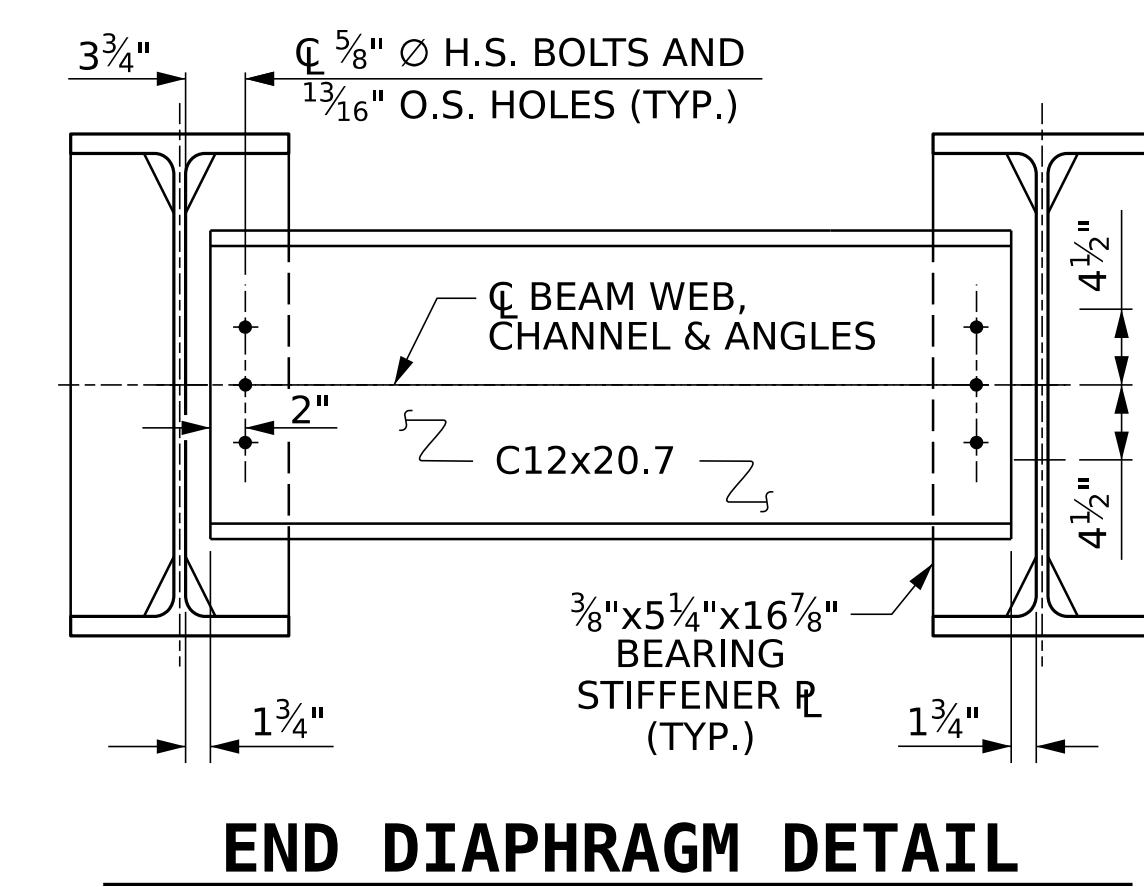
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 SIGNATURES COMPLETED

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 NC FIRM LICENSE: C-1506

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1			3			15
2			4			

**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 5/8" 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.
- END OF BEAMS SHALL BE PLUMB.



PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-



**KCA**  
 KISINGER CAMPO  
 & ASSOCIATES

**SUPERSTRUCTURE**  
**FRAMING PLAN**  
 50' STEEL BEAM  
 90° SKEW

DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
 CHECKED BY : AIDAN J. HALPERN DATE : 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025

DOCUMENT NOT CONSIDERED  
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REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

S-8  
 TOTAL SHEETS  
 15

**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 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

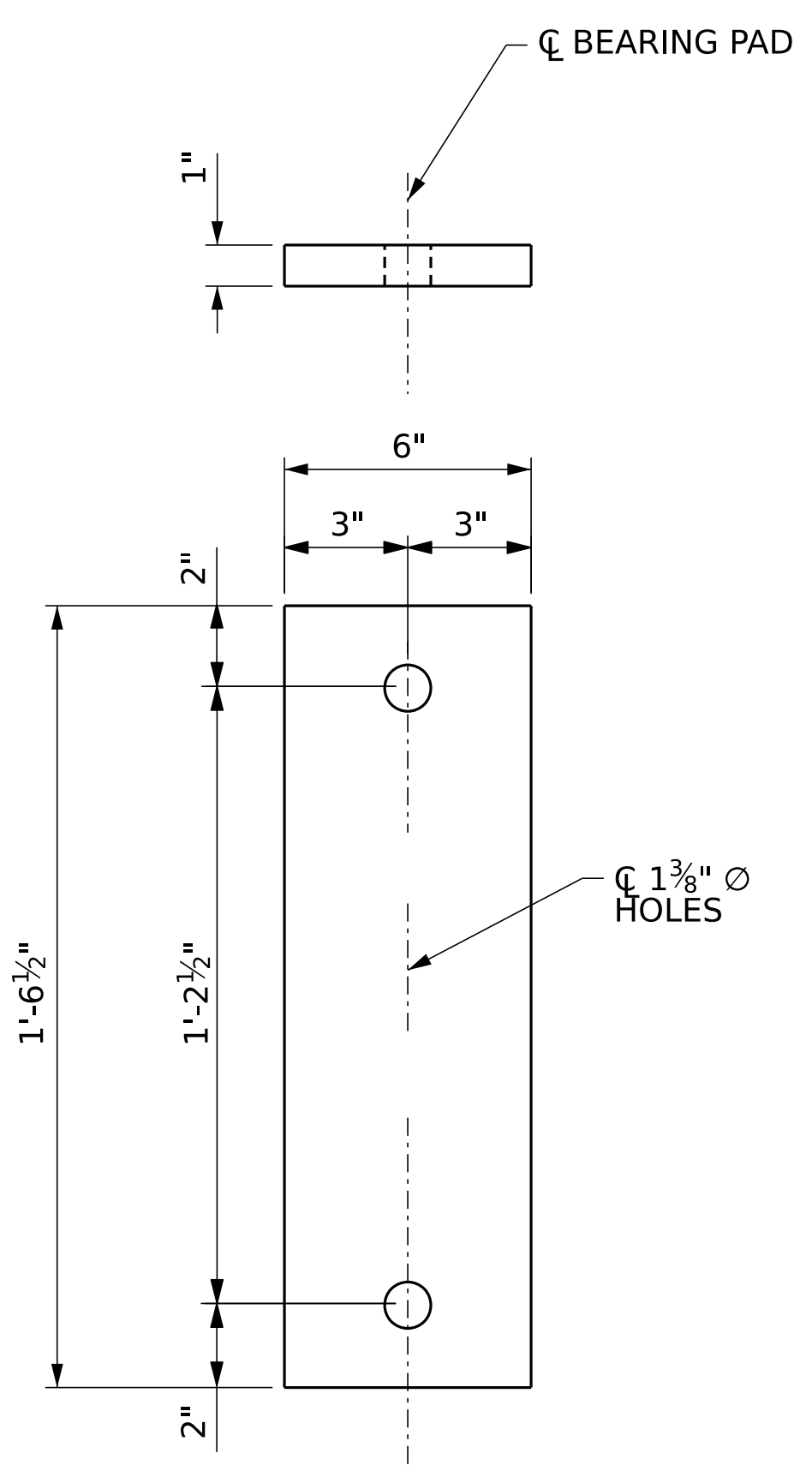
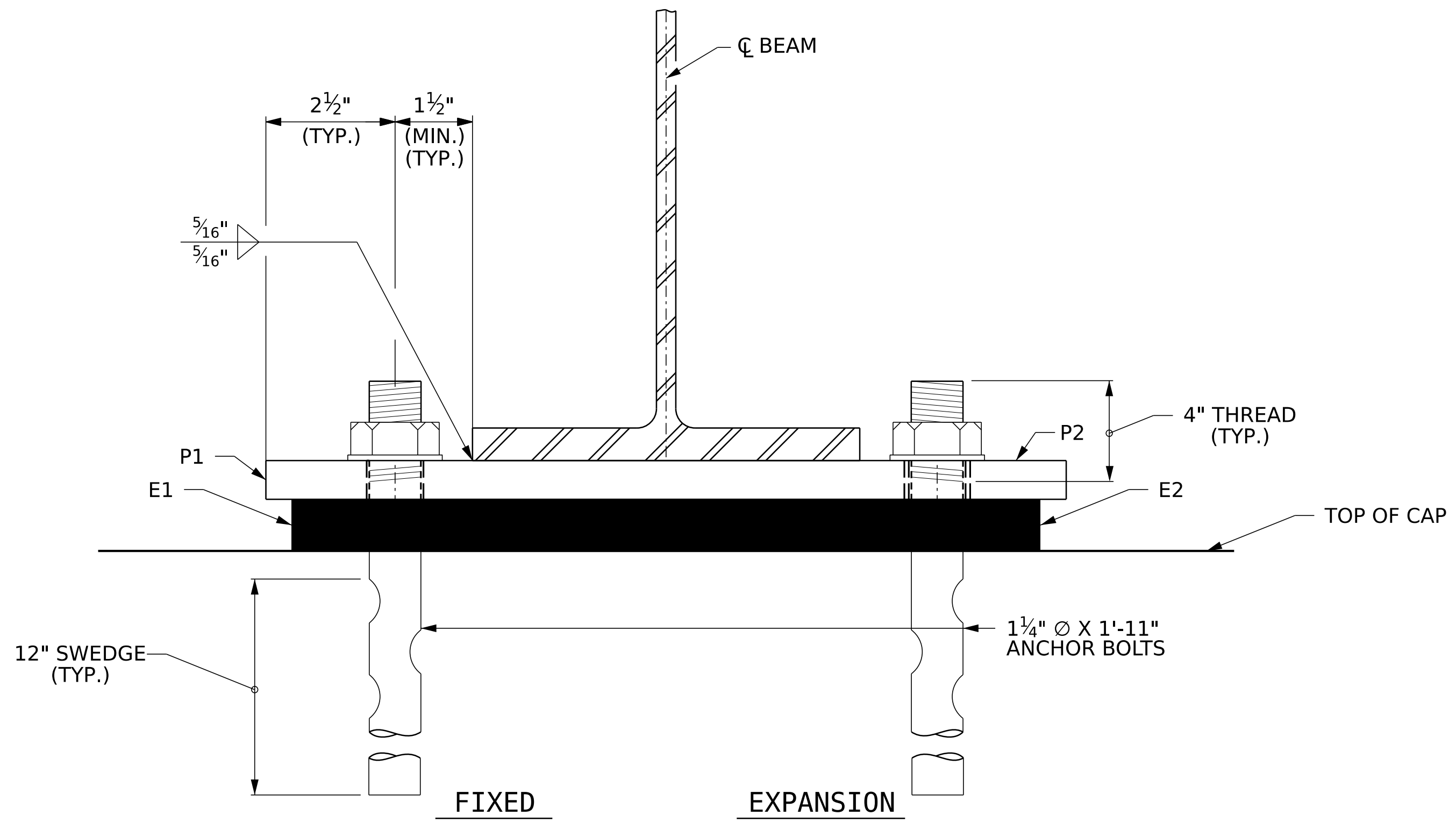
AT THE APPROVAL OF THE ENGINEER, SOLE PLATES AT THE EXPANSION END MAY BE FIELD WELDED.

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.

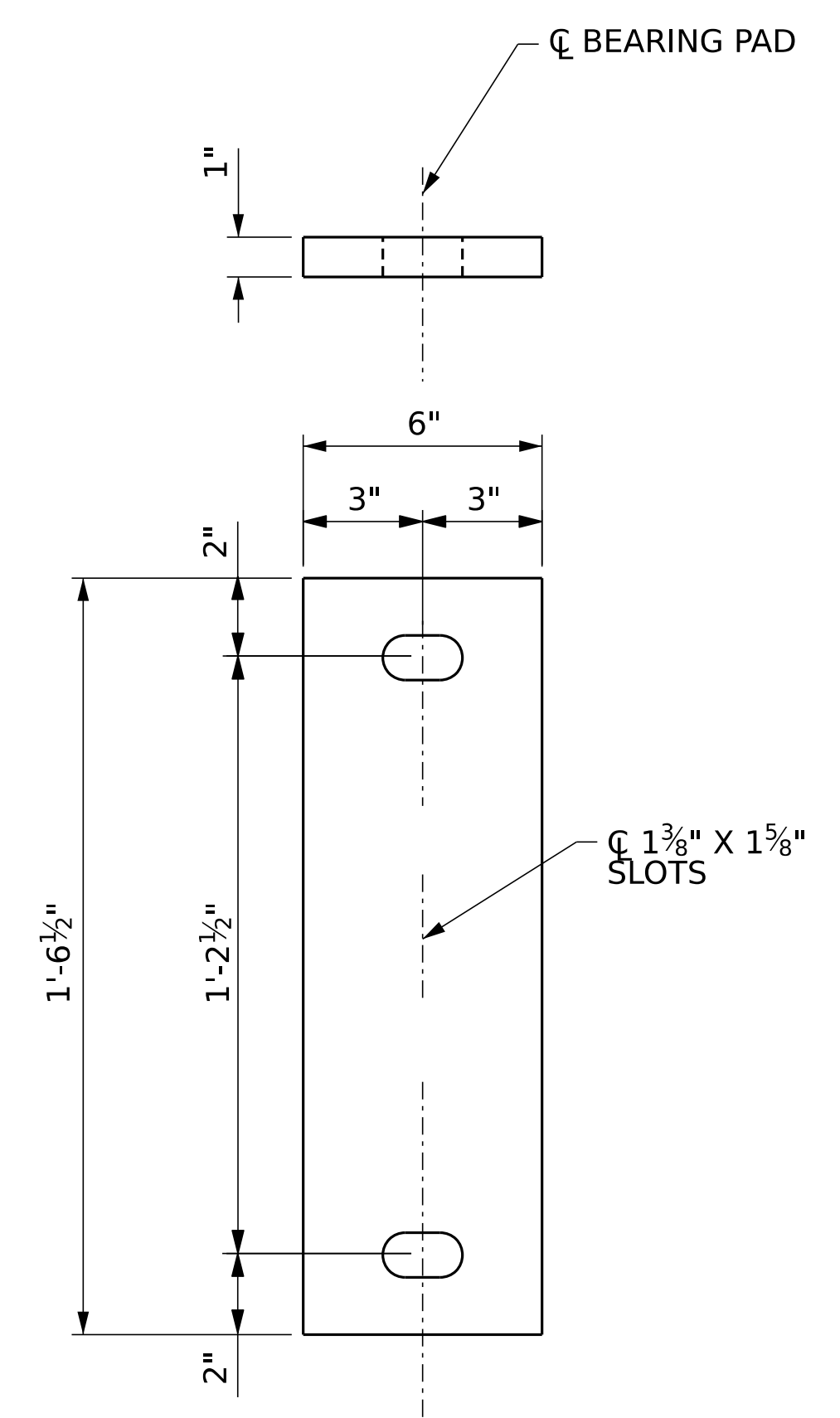
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

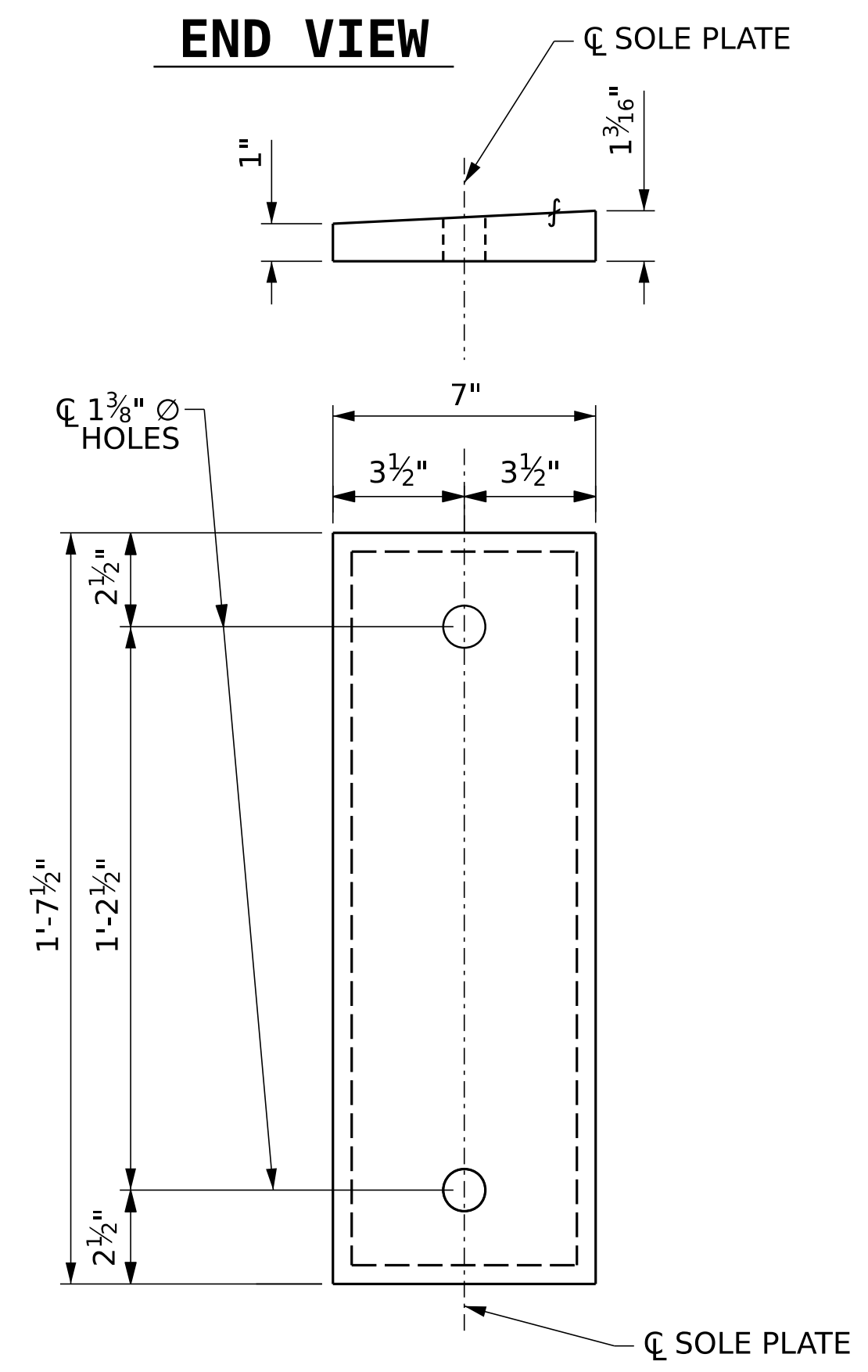
ADHESIVELY ANCHORED ANCHOR BOLTS SHALL BE THREADED FULL LENGTH.



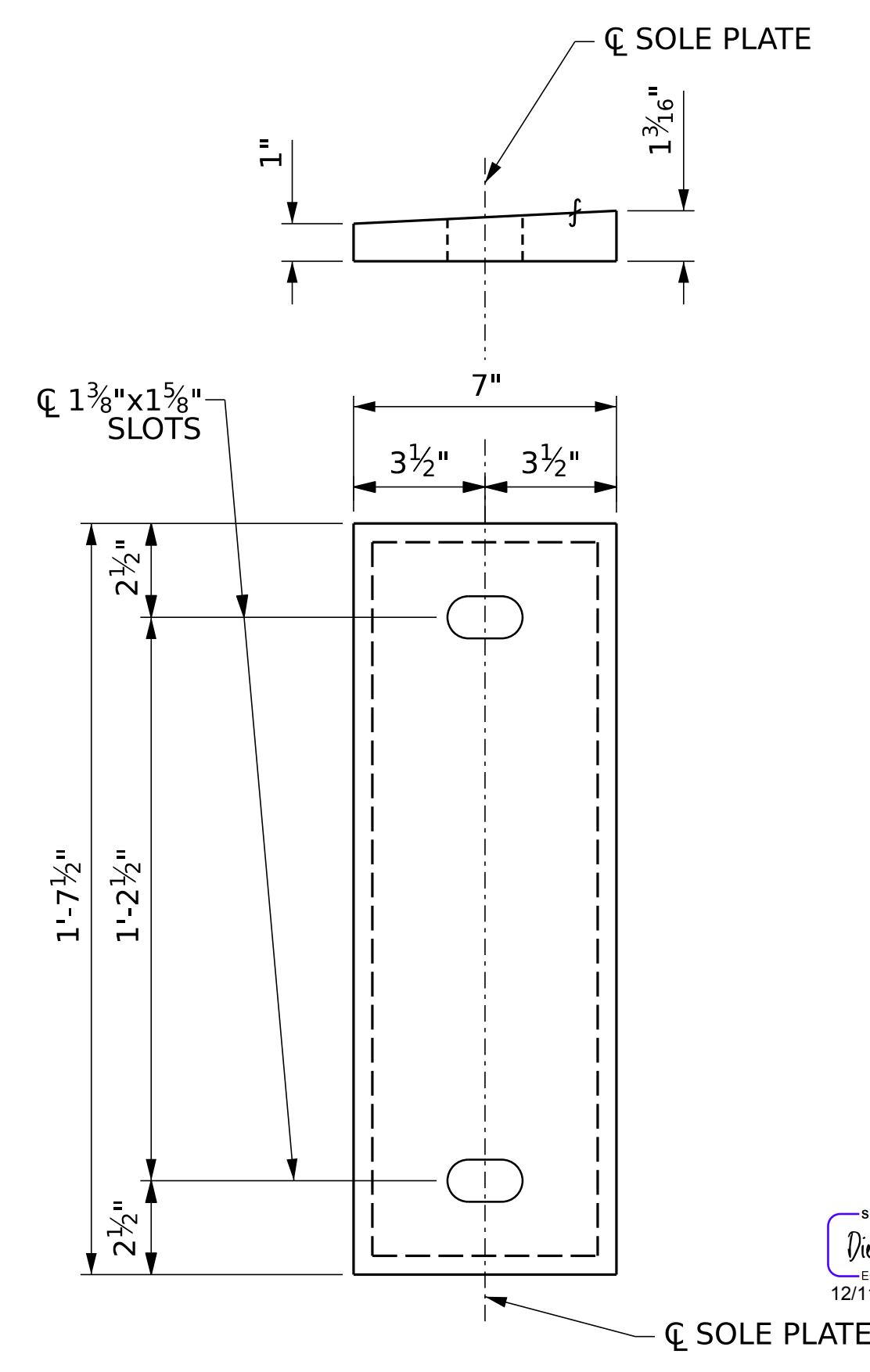
**E1 ELASTOMERIC BEARING DETAILS**  
(10 REQ'D)  
FIXED



**E2 ELASTOMERIC BEARING DETAILS**  
(10 REQ'D)  
EXPANSION

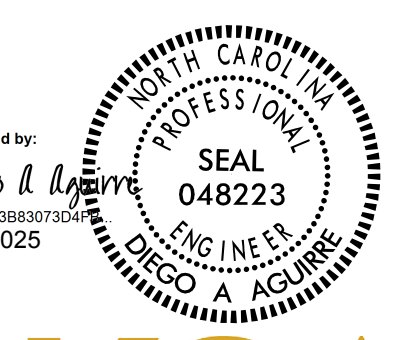


**P1 SOLE PLATE DETAILS**  
(10 REQ'D)  
FIXED



**P2 SOLE PLATE DETAILS**  
(10 REQ'D)  
EXPANSION

Signed by:  
*Diego A. Aguirre*  
ECF 438307504  
12/11/2025



**KCA**  
KISINGER CAMPO  
& ASSOCIATES

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
STATION: 10+54.50 -L-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-9
1			3			TOTAL SHEETS
2			4			15

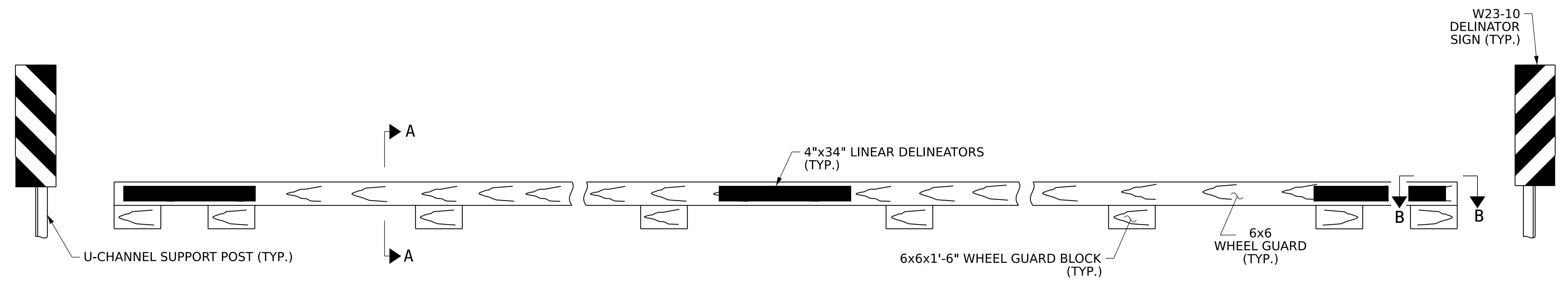
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NC FIRM LICENSE: C-1506

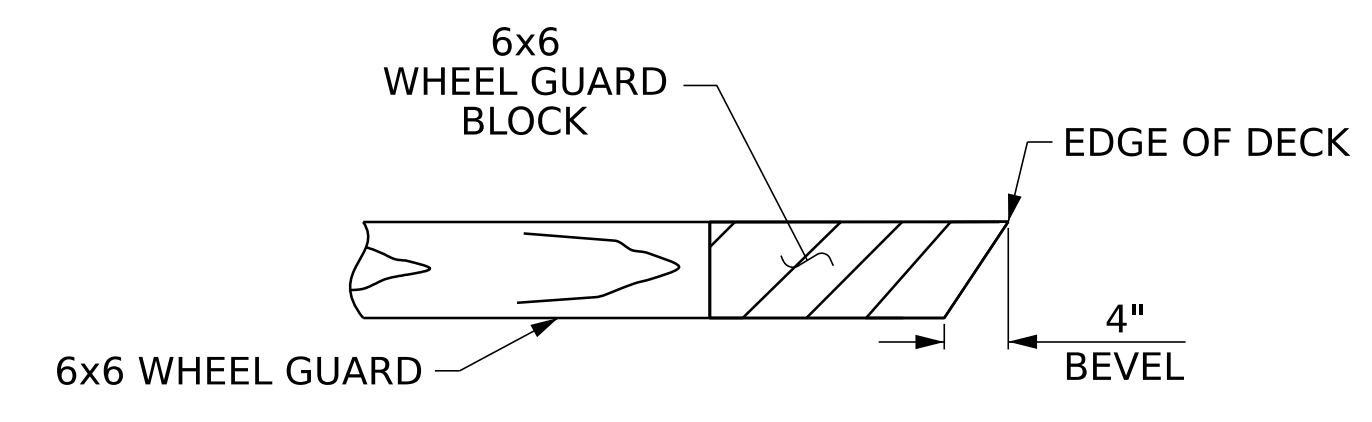
DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

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

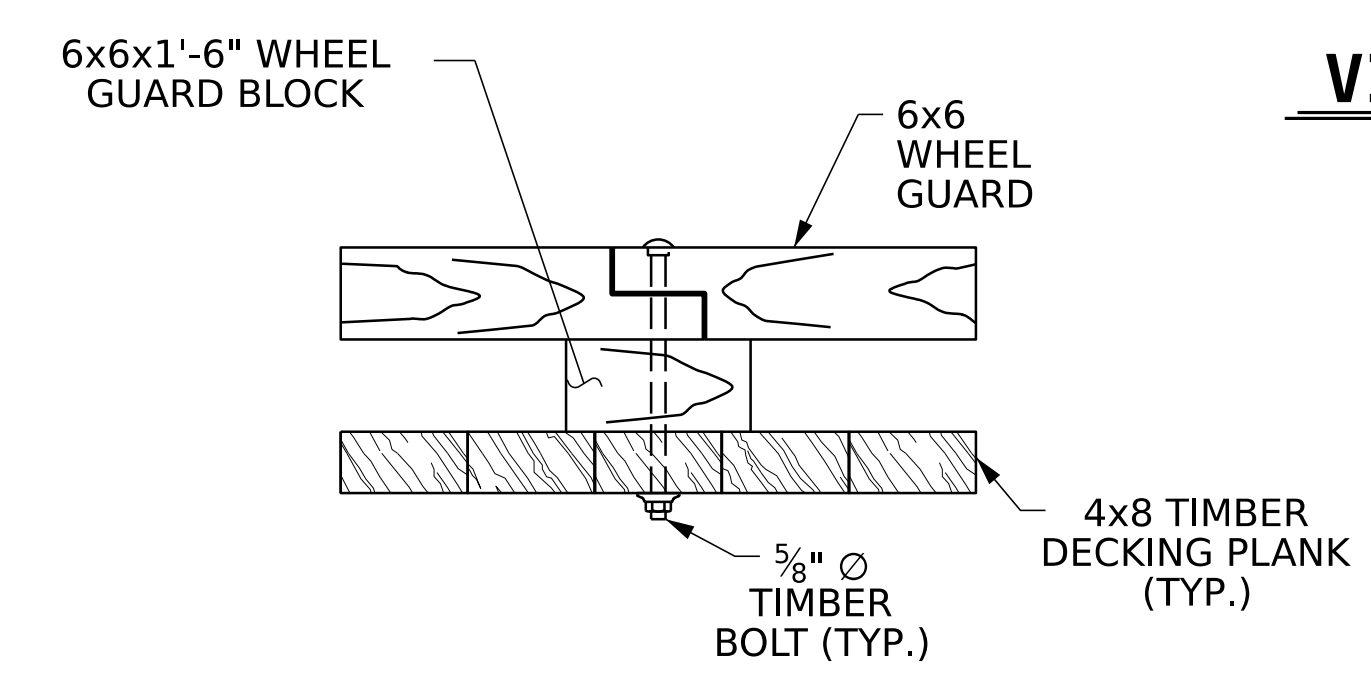
TREATED LUMBER			
ITEM	SIZE	LIN. FT.	
WHEEL GUARD	6x6	50.5	
WHEEL GUARD BLOCK	6x6	16.5	
HARDWARE			
ITEM	No.	SIZE	LBS.
TIMBER BOLTS (WHEEL GUARD)	11	5/8" Ø	16
HEAVY HEX NUTS	11	5/8" Ø	1
OGEE WASHERS	11	5/8" Ø	7
STANDARD WASHERS	11	5/8" Ø	1
HARDWARE FOR CONNECTIONS		APPROX. 25 LBS.	
ACCESSORIES			
ITEM	No.		
W23-10 12x36 DELINEATOR	2		
U-CHANNEL SUPPORT POST	2		
4X34 LINEAR DELINEATOR	6		
PAY LENGTH = <u>50.5</u> LIN. FT.			



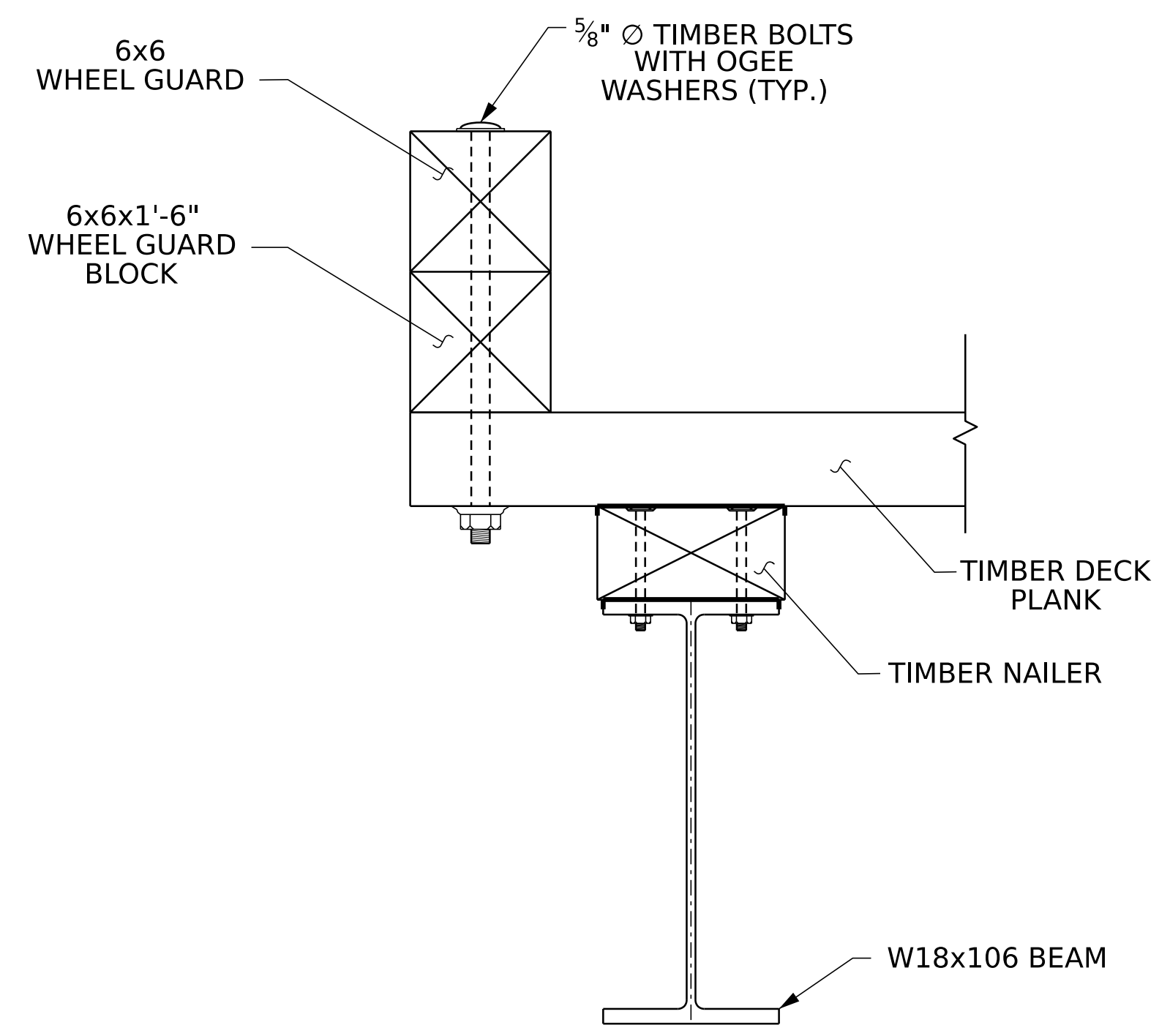
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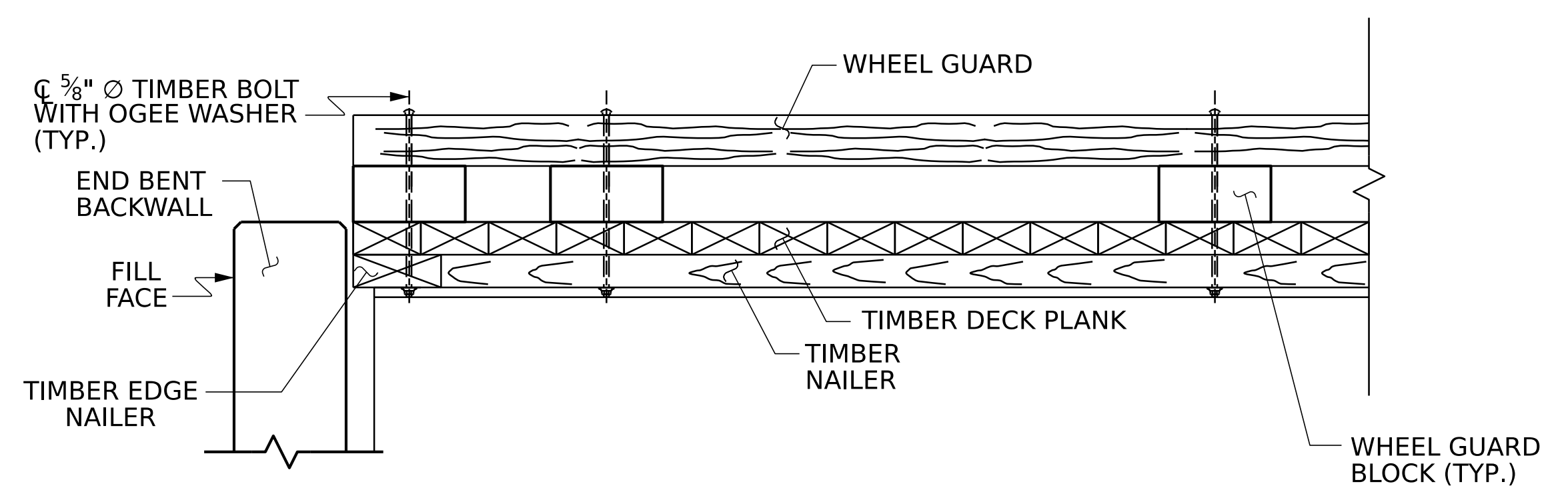
**VIEW B-B**



**WHEEL GUARD SPLICE DETAIL**



**SECTION A-A**

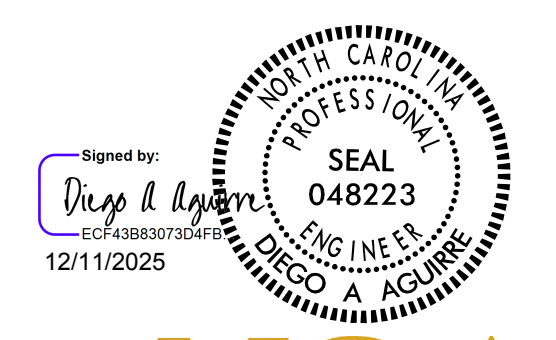


**WHEEL GUARD DETAIL AT END BENTS**

### 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 "TIMBER BRIDGE DECK ON STEEL BEAMS" SPECIAL PROVISIONS.

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-



**SUPERSTRUCTURE**  
**TIMBER BRIDGE**  
**WHEEL GUARD SYSTEM**

DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
 CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

12/11/2025  
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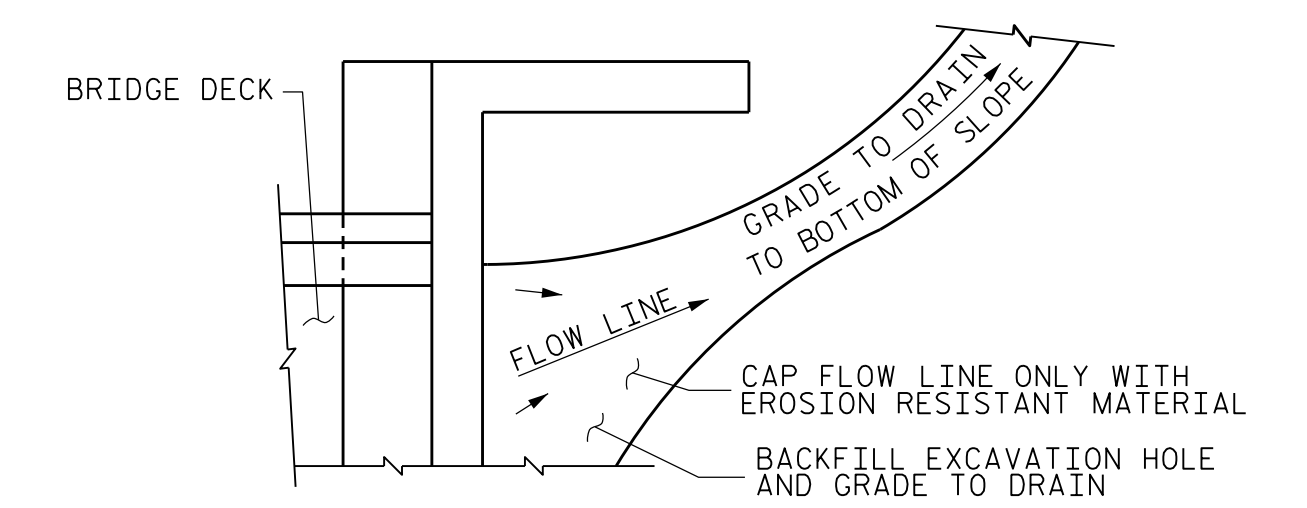
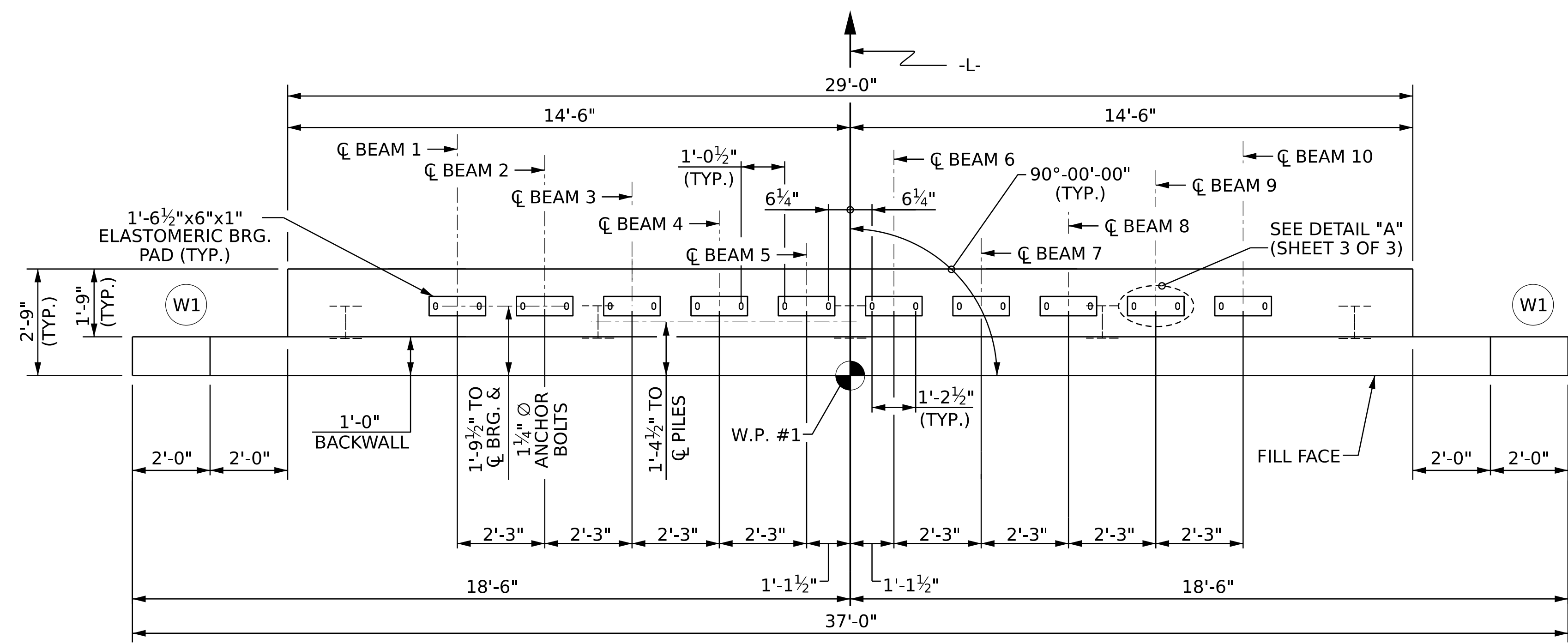
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 NC FIRM LICENSE: C-1506

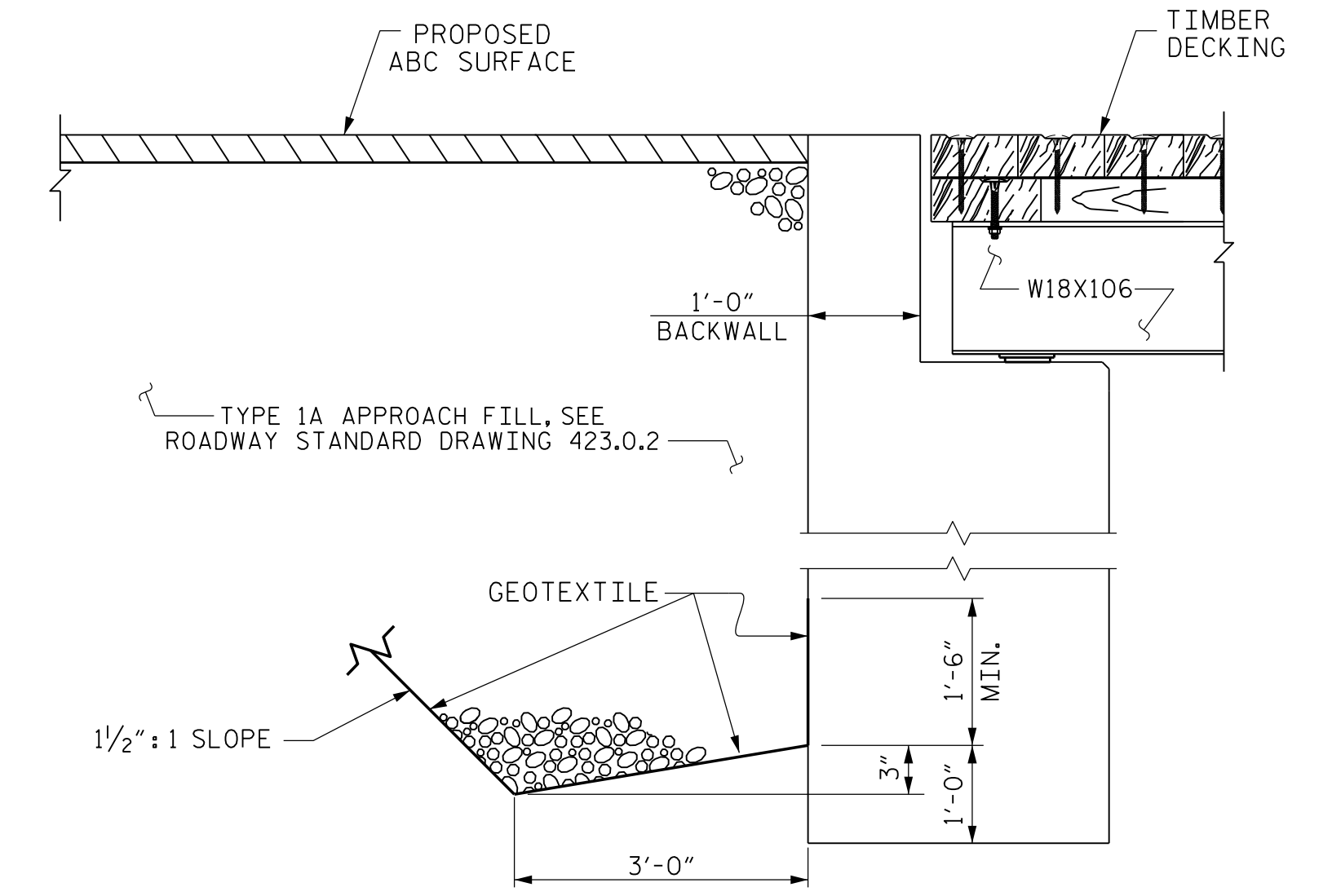
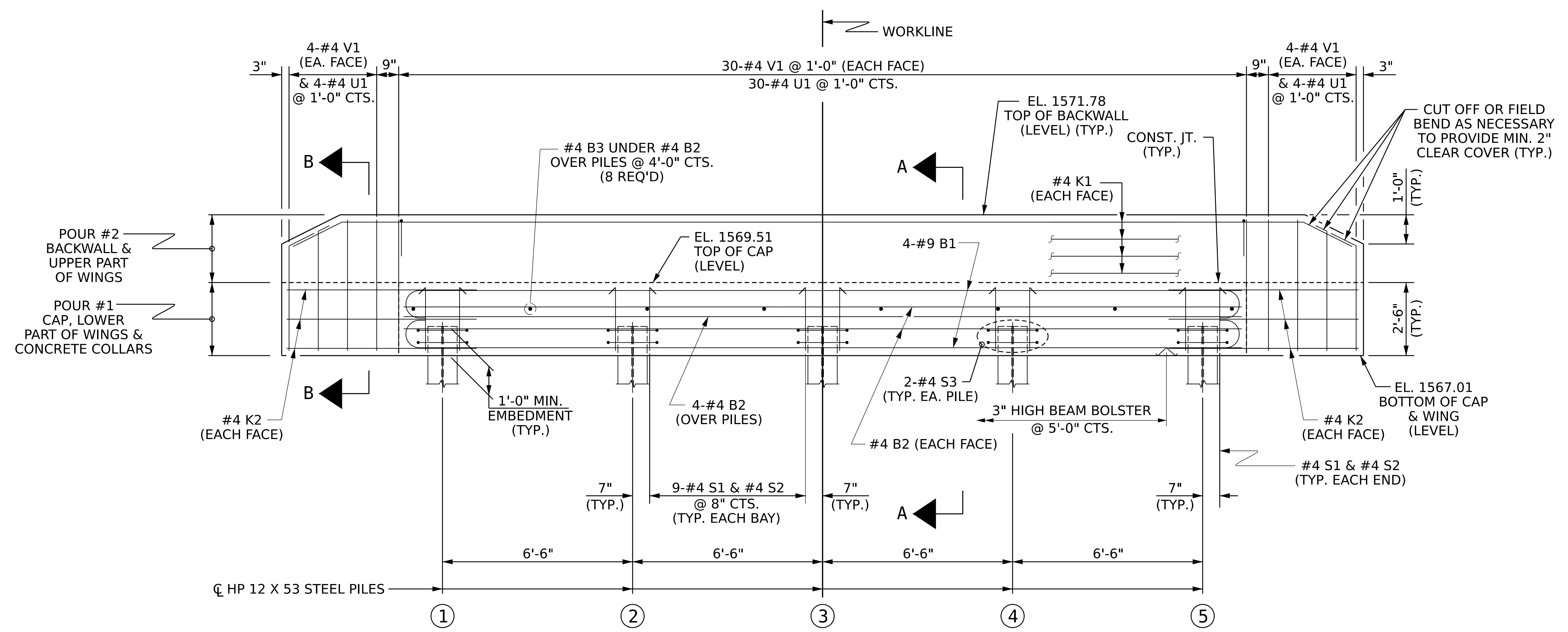
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-10
2			4			15

**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.  
 FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

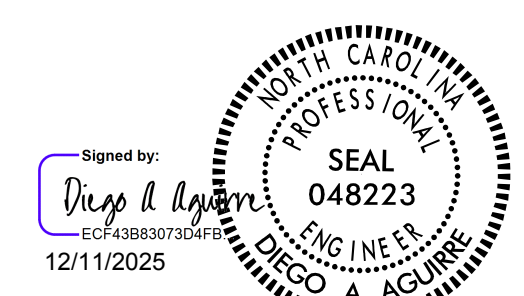


NOTE: IF THE APPROACH ROADWAY IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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



FOR SECTION A-A, SEE SHEET 3 OF 3.  
 FOR SECTION B-B, SEE SHEET 3 OF 3.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-  
 SHEET 1 OF 3



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

**SUBSTRUCTURE**  
**END BENT 1**

TOTAL SHEETS: **15**

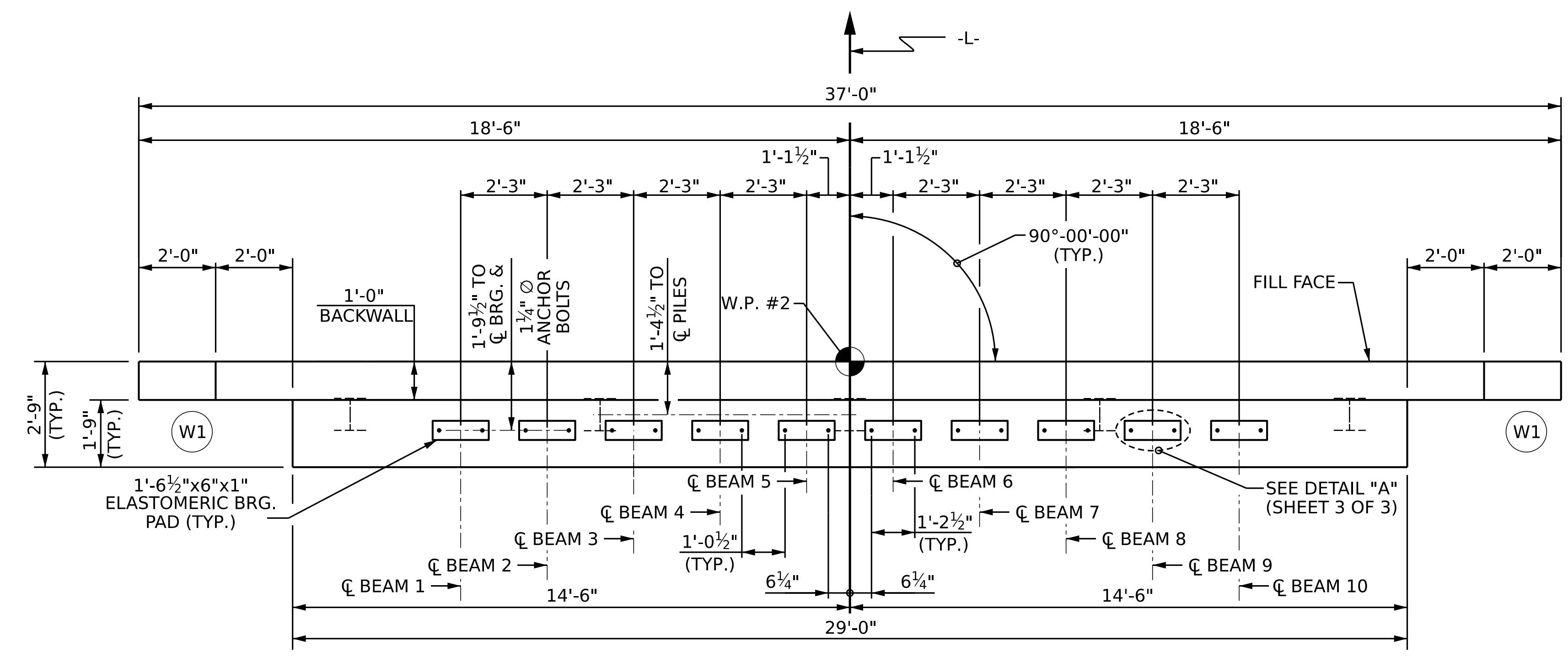
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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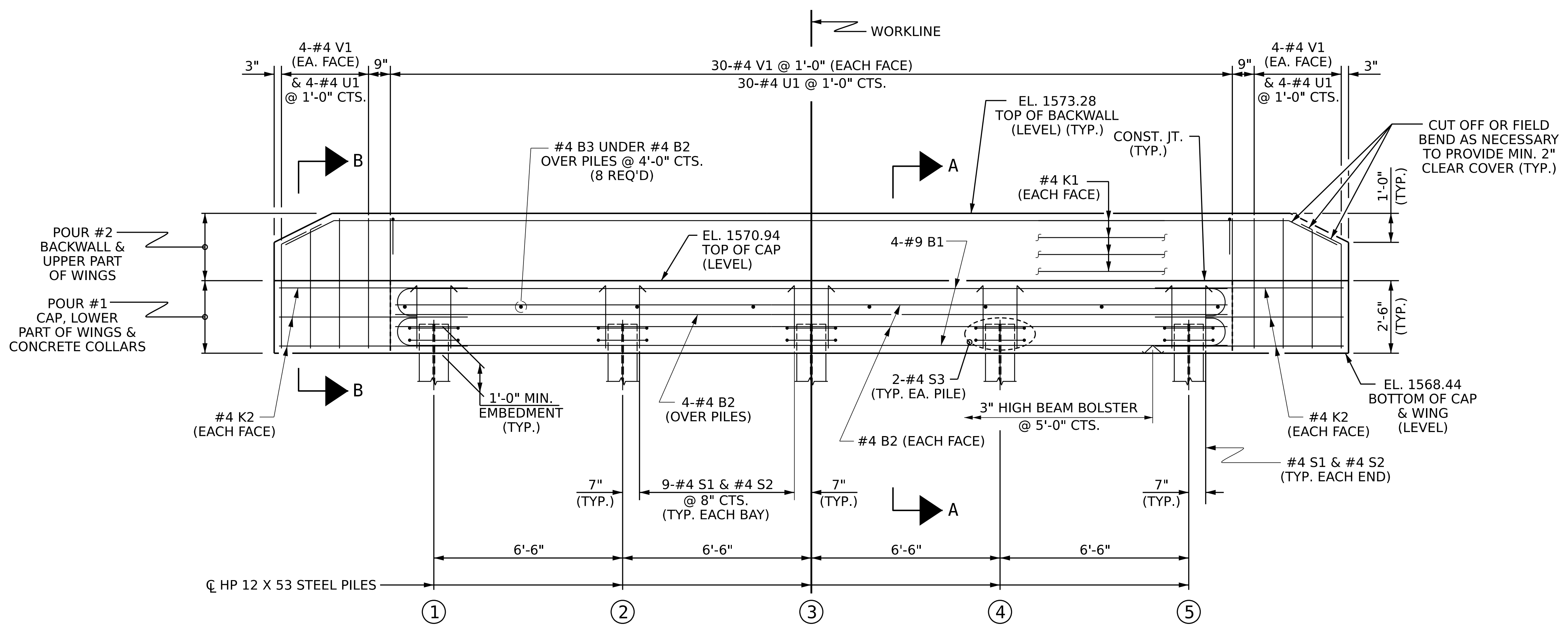
DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
 CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.
- FOR TEMPORARY DRAINAGE DETAIL, SEE SHEET 1 OF 3.
- FOR SECTION THRU APPROACH FILL, SEE SHEET 1 OF 3.



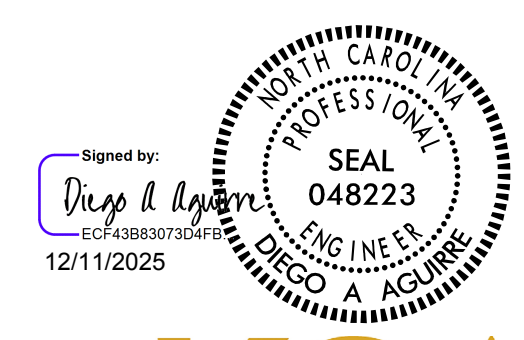
**PLAN**



**ELEVATION**

FOR SECTION A-A, SEE SHEET 3 OF 3.  
 FOR SECTION B-B, SEE SHEET 3 OF 3.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-  
 SHEET 2 OF 3



SUBSTRUCTURE		END BENT 2	
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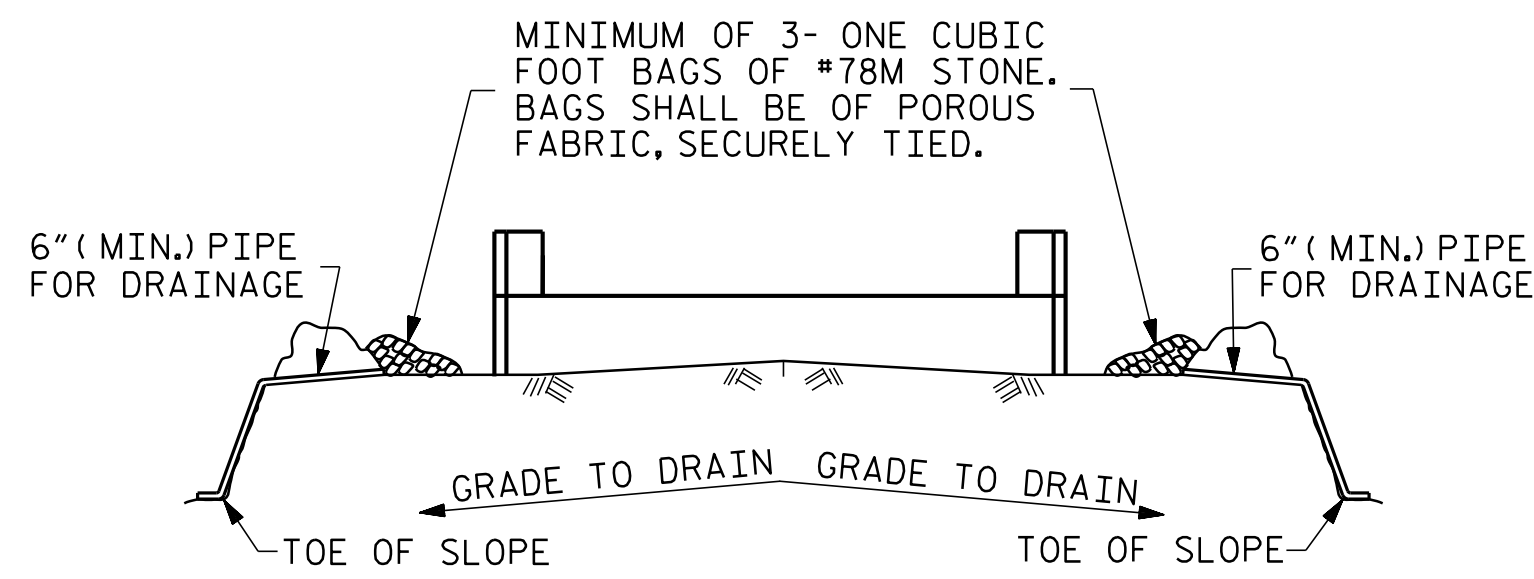
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TOTAL SHEETS: 15

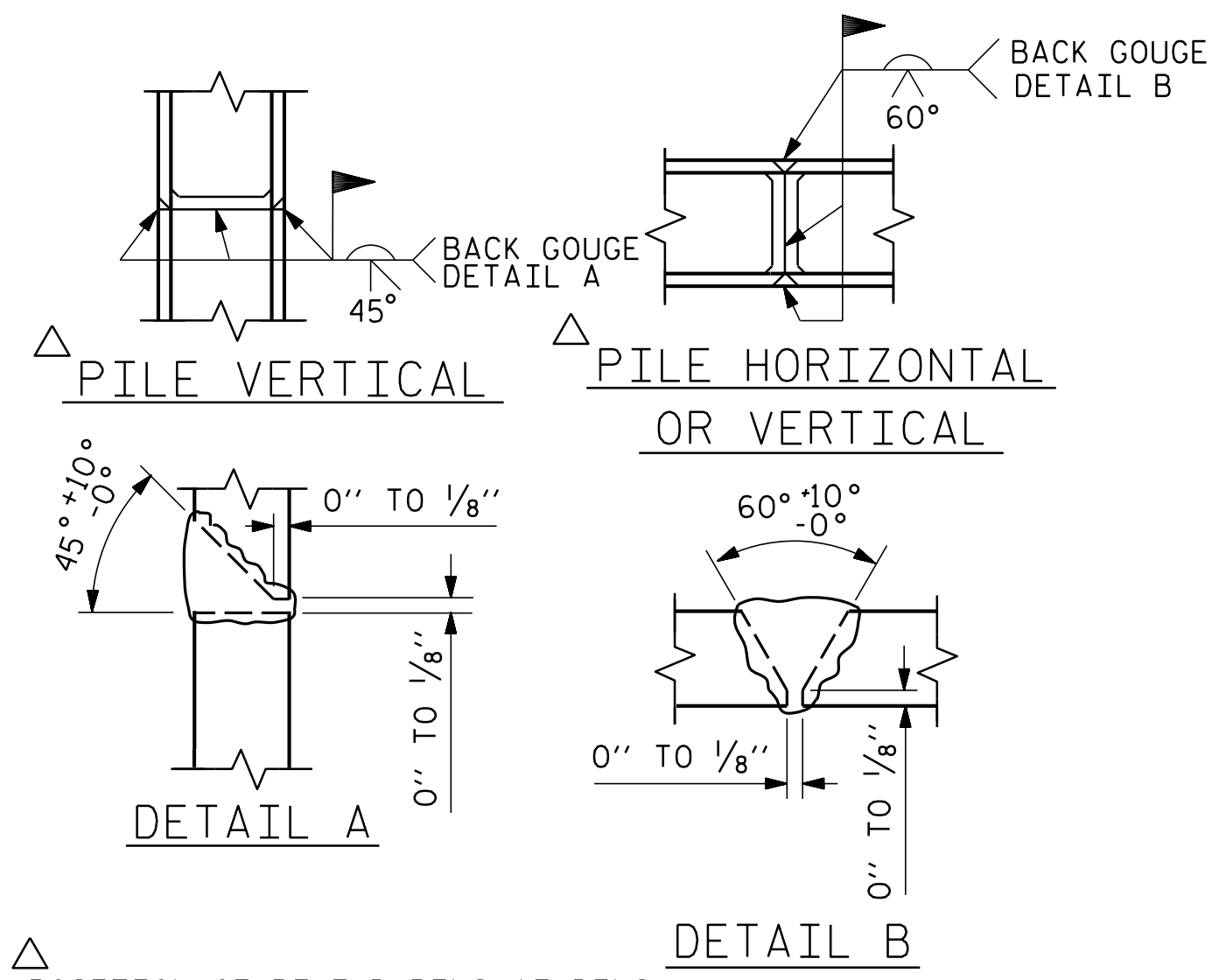


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

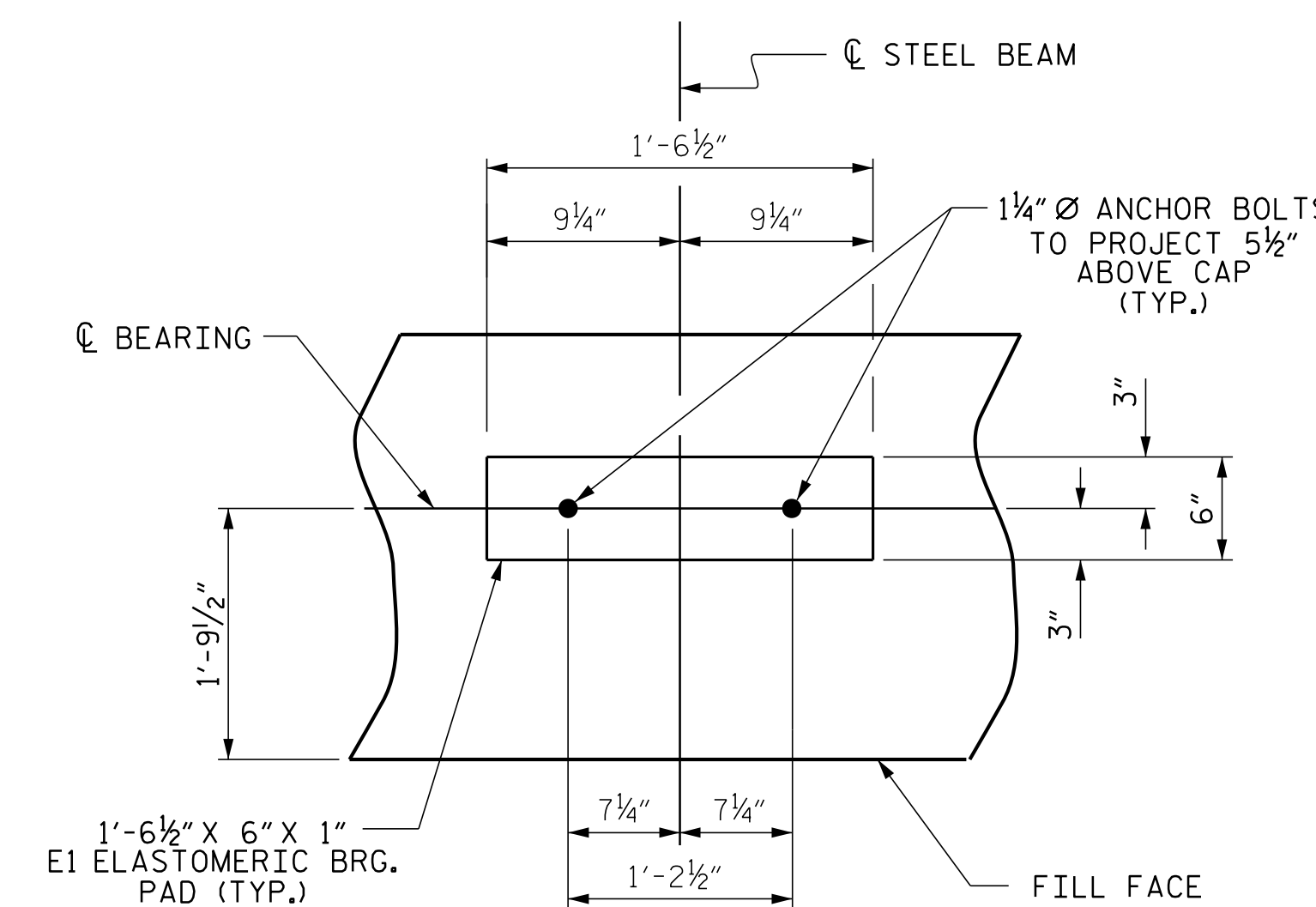
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



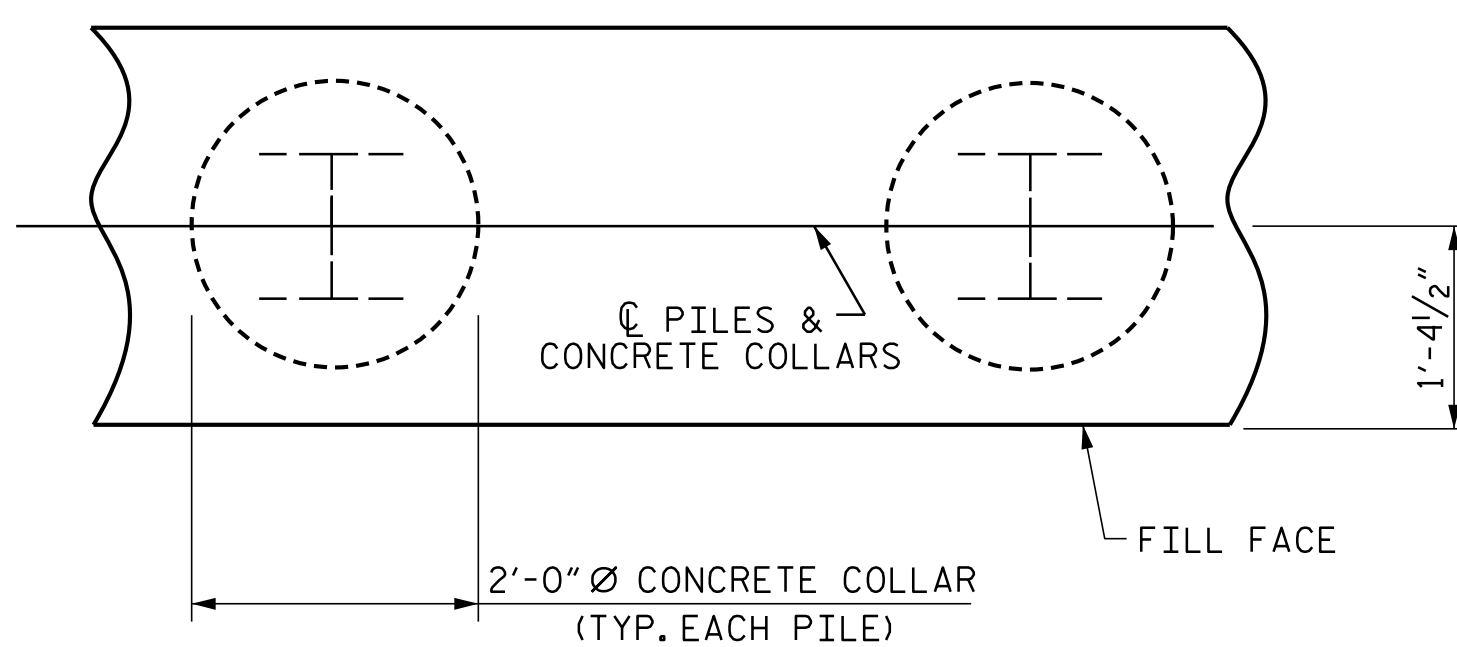
### PILE SPLICE DETAILS

BILL OF MATERIAL					
FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	31'-0"	843
B2	8	#4	STR	28'-8"	153
B3	8	#4	STR	2'-5"	13
K1	8	#4	STR	36'-8"	196
K2	12	#4	STR	6'-6"	52
S1	38	#4	2	7'-5"	188
S2	38	#4	3	3'-2"	80
S3	10	#4	4	6'-6"	43
U1	38	#4	5	3'-2"	80
V1	76	#4	STR	4'-4"	220
REINFORCING STEEL (FOR ONE END BENT)					1868 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					9.0 C.Y.
POUR #2 UPPER PART OF WINGS					3.1 C.Y.
TOTAL CLASS A CONCRETE					12.1 C.Y.



### DETAIL "A"

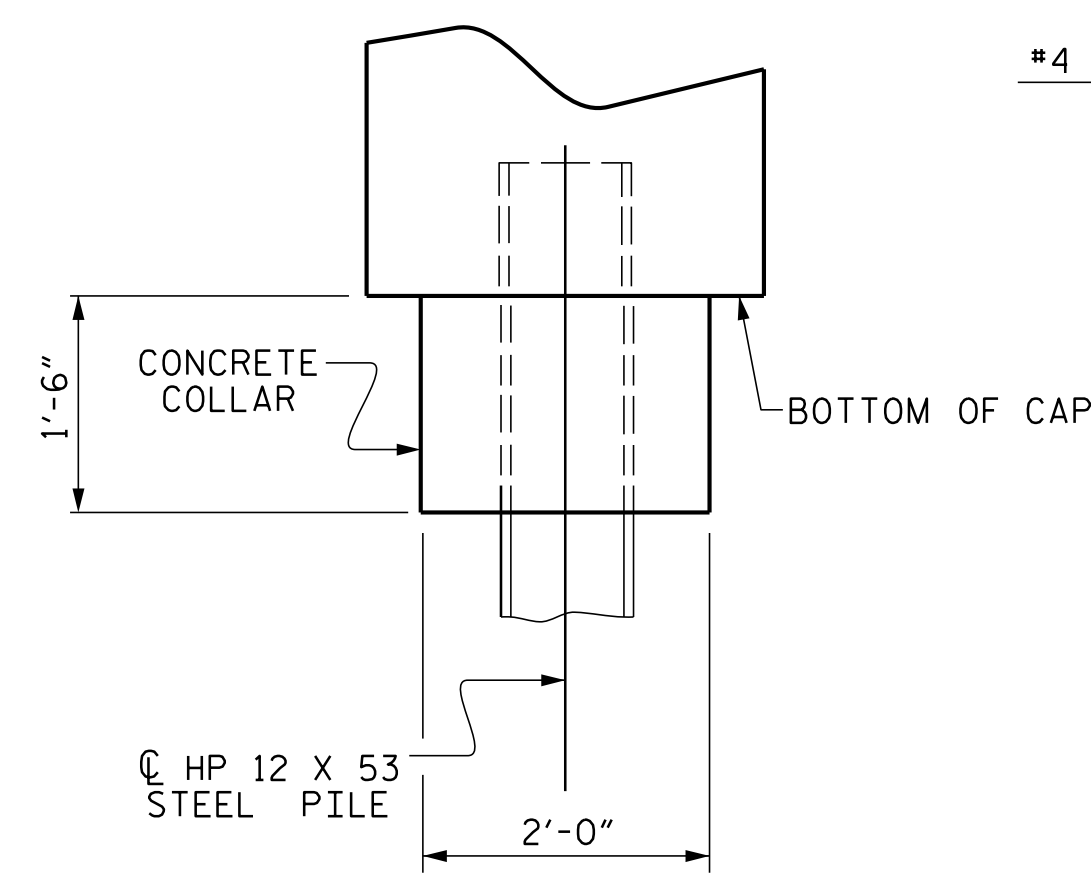
(END BENT 2 SHOWN, END BENT 1 SIMILAR BY ROTATION EXCEPT USE E2 ELASTOMERIC BEARING PAD)



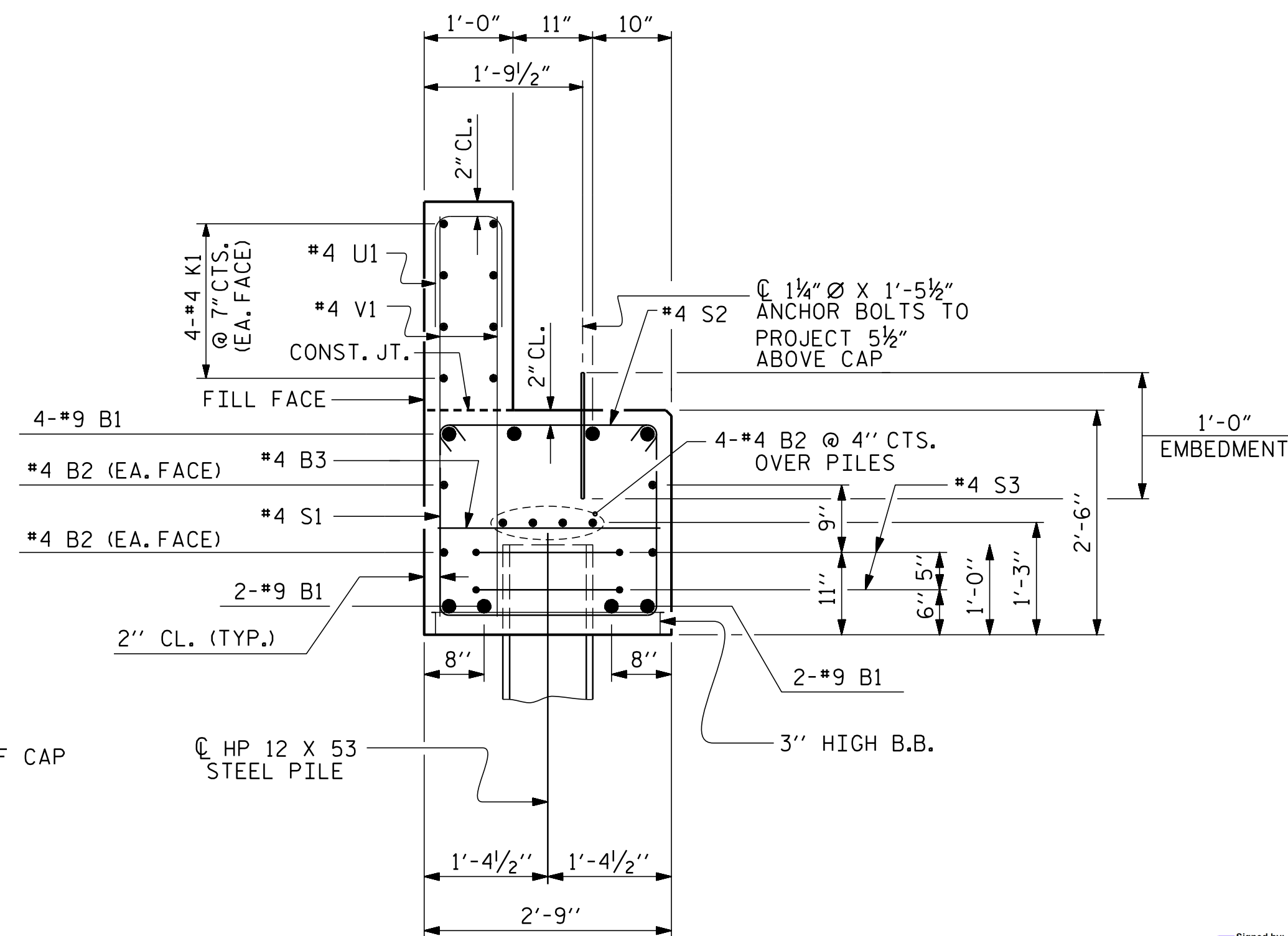
### PLAN

### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

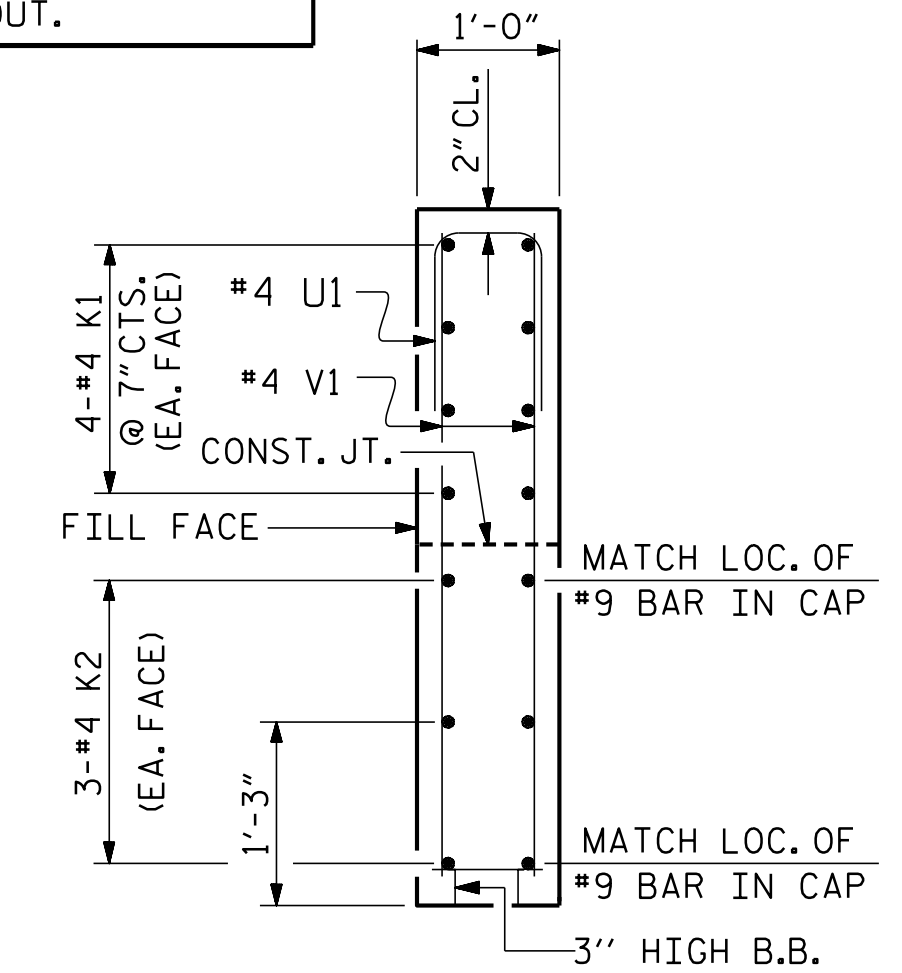


### ELEVATION



### SECTION A-A

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



### SECTION B-B

CUT OFF OR FIELD BEND #4 V1 BARS AS NECESSARY TO PROVIDE 2" MIN. CLEAR COVER

PROJECT NO. 059-01-9d41f

MCDOWELL COUNTY

STATION: 10+54.50 -L-

SHEET 3 OF 3



### SUBSTRUCTURE

### END BENT 1 & 2 DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

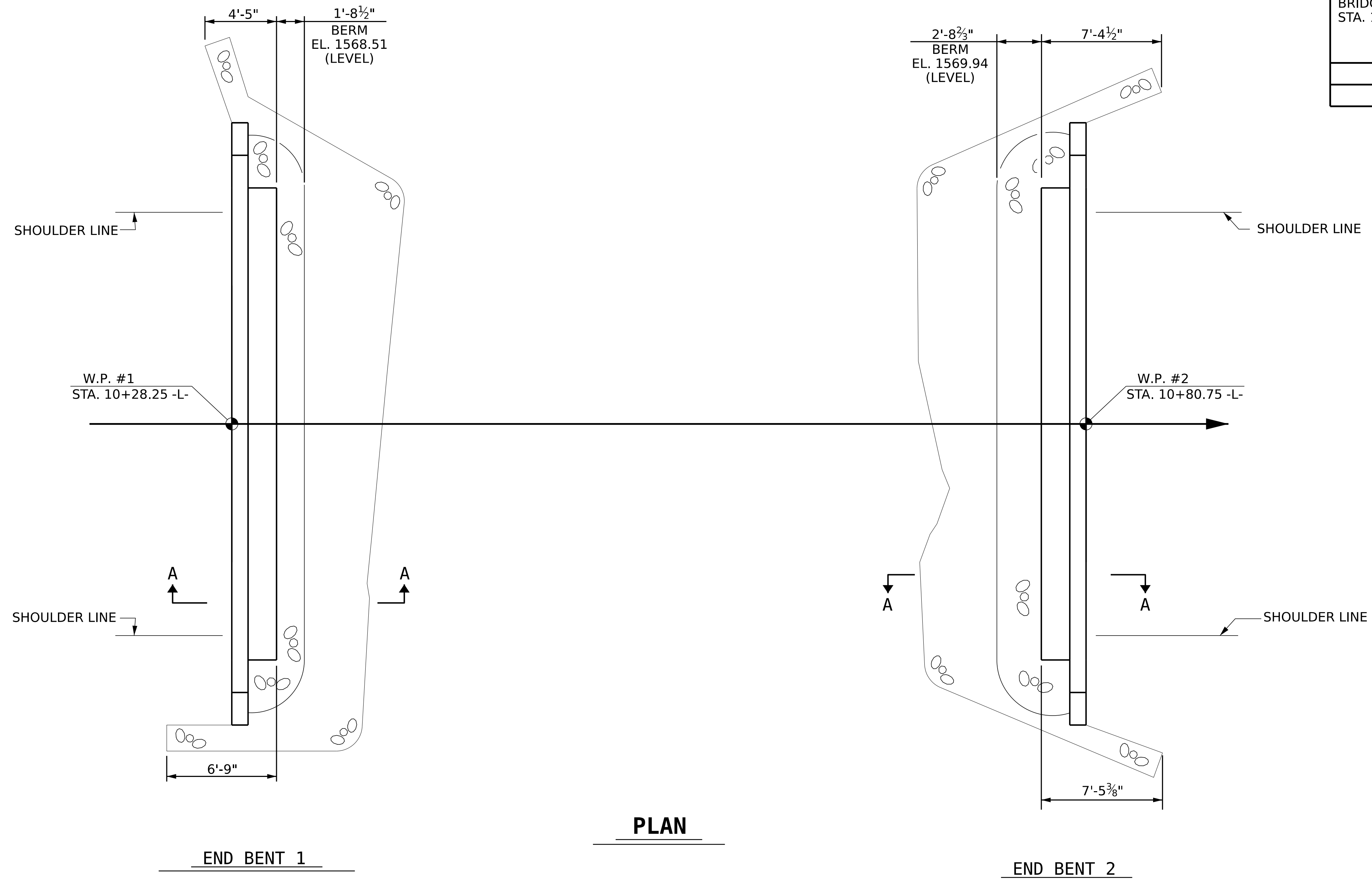
301 FAYETTEVILLE ST., SUITE 1500  
 RALEIGH, NC 27601 (919) 882-7839  
 NC FIRM LICENSE: C-1506

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

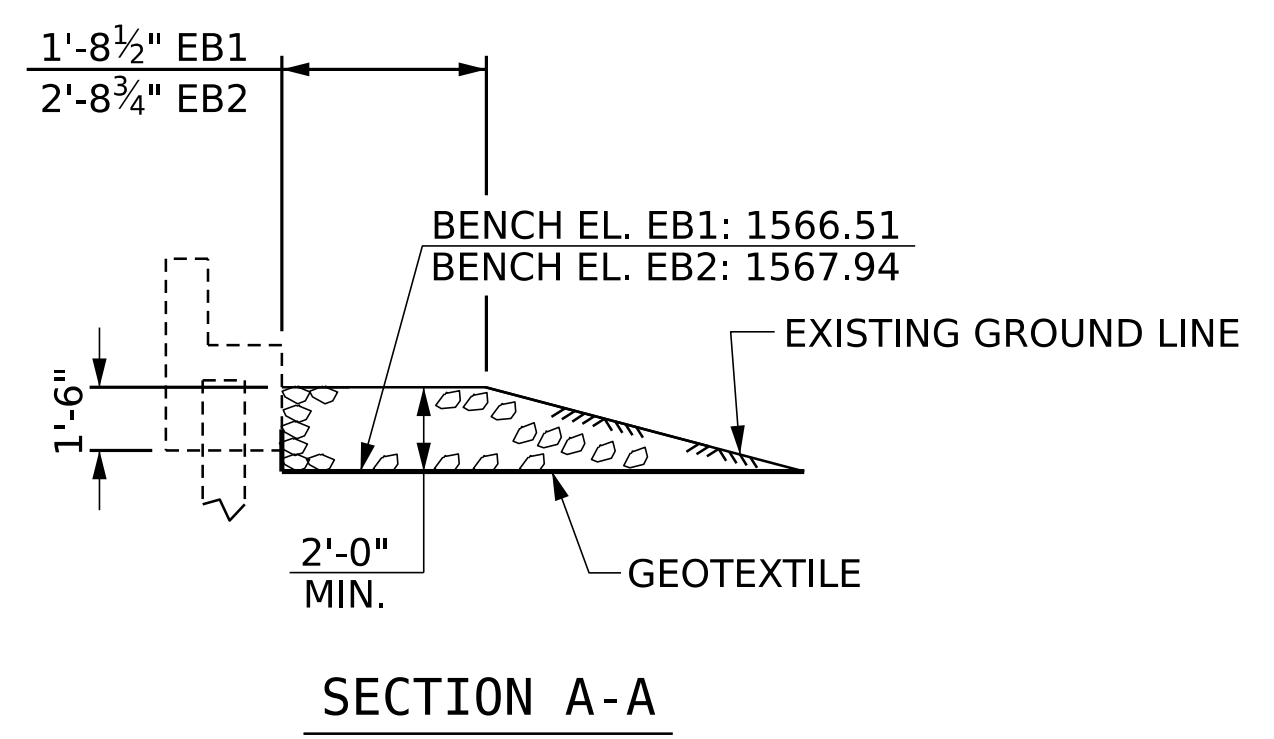
TOTAL SHEETS: 15

DRAWN BY: MIGUEL A. LEMOS DATE: 11/2025  
 CHECKED BY: AIDAN J. HALPERN DATE: 11/2025  
 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE: 12/2025

ESTIMATED QUANTITIES		
BRIDGE @ STA. 10+54.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	34	42
END BENT 2	36	43

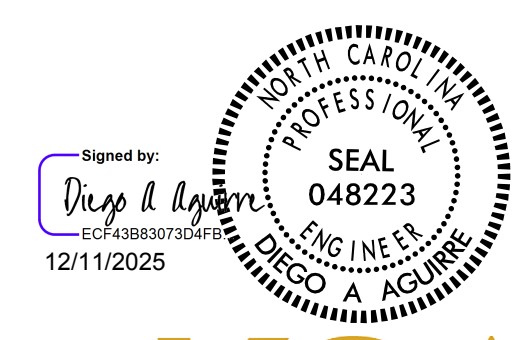


**PLAN**



**SECTION A-A**

PROJECT NO. 059-01-9d41f  
MCDOWELL COUNTY  
 STATION: 10+54.50 -L-



RIP RAP DETAILS

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

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 SIGNATURES COMPLETED

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DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
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 DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025

**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 PROFESSIONAL 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 END BENTS. 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**

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**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 PILES 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 20 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 COMPONENTS.

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.

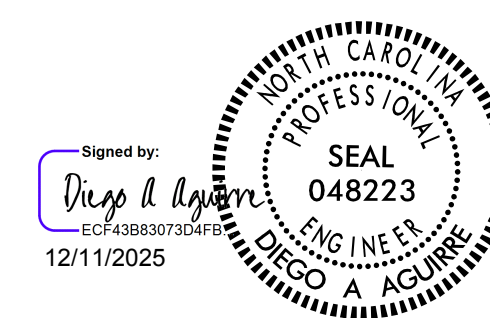
REPAINT ANY EXPOSED STEEL PILE SURFACES EVERY 5 YEARS TO PREVENT CORROSION.

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. 059-01-9d41f

MCDOWELL COUNTY

STATION: 10+54.50 -L-



**MAINTENANCE RECOMMENDATION NOTES**

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TOTAL SHEETS: **15**

DRAWN BY : MIGUEL A. LEMOS DATE : 11/2025  
CHECKED BY : AIDAN J. HALPERN DATE : 11/2025  
DESIGN ENGINEER OF RECORD: DIEGO A. AGUIRRE DATE : 12/2025