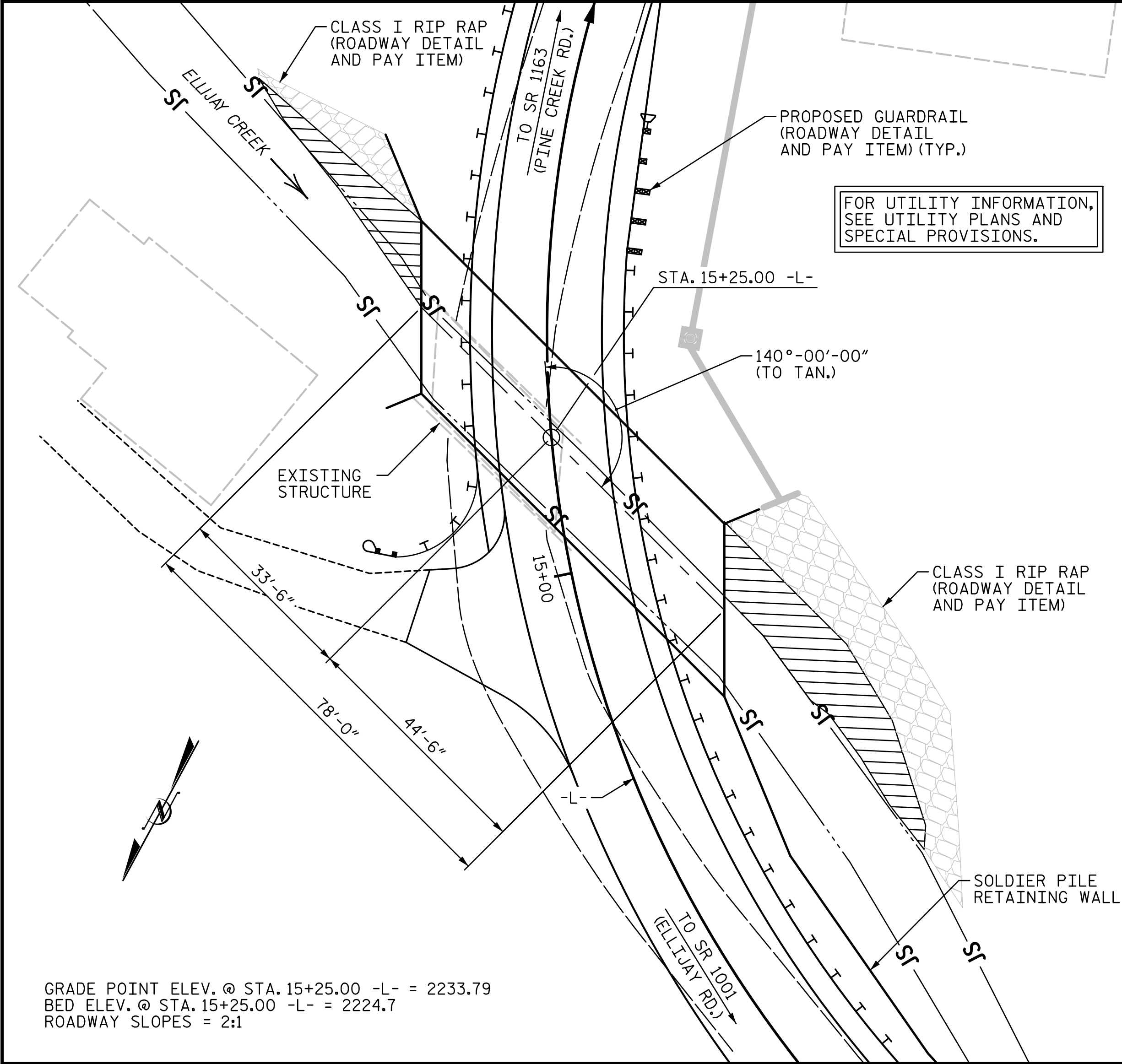


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BENCHMARK BM-1: 10" SPIKE IN BASE OF 34" OAK TREE, STA. 12+58.68 -L-, 14.60' RT., ELEV. 2231.76, N 552831.951, E 724149.954



LOCATION SKETCH

GRADE POINT ELEV. @ STA. 15+25.00 -L- = 2233.79  
BED ELEV. @ STA. 15+25.00 -L- = 2224.7  
ROADWAY SLOPES = 2:1

### TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM
CULVERT EXCAVATION, STA. 15+25.00 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	123 TONS
CLASS A CONCRETE	
BARREL:	2,259 CY/FT = 176.2 C.Y.
WINGS, ETC.:	24.2 C.Y.
TOTAL:	200.4 C.Y.
REINFORCING STEEL	
BARREL:	29,660 LBS.
WINGS, ETC.:	824 LBS.
TOTAL:	30,484 LBS.
PLACEMENT OF NATURAL STREAM BED MATERIAL	LUMP SUM

### HYDRAULIC DATA

DESIGN DISCHARGE: ----- 850 CFS  
 FREQUENCY OF DESIGN FLOOD: ----- 10 YRS.  
 DESIGN HIGH WATER ELEVATION: ----- 2231.0  
 DRAINAGE AREA: ----- 4.2 SQ. MI.  
 BASE DISCHARGE (Q100): ----- 1,840 CFS  
 BASE HIGH WATER ELEVATION: ----- 2235.07

### OVERTOPPING DATA

OVERTOPPING DISCHARGE: ----- 1,000 CFS  
 FREQUENCY OF OVERTOPPING: ----- 10± YRS.  
 OVERTOPPING FLOOD ELEVATION: ----- 2233.4

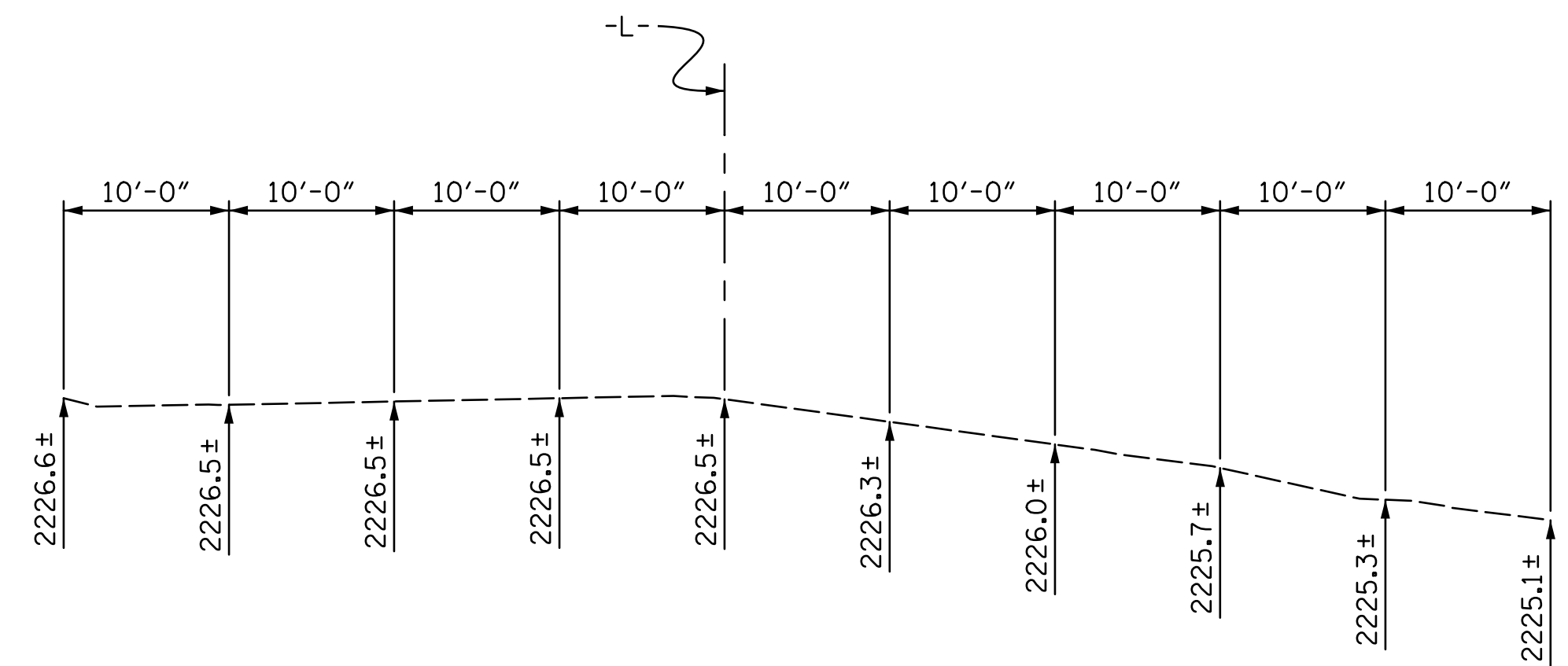
I HEREBY CERTIFY THESE PLANS  
 ARE THE AS-BUILT PLANS

### NOTES:

- ASSUMED LIVE LOAD-----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL-----2.91' MAX. AND 1.15' MIN.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- THE EXISTING STRUCTURE CONSISTING OF ONE 20'-6" TIMBER DECK ON TIMBER JOIST SPAN WITH A CLEAR ROADWAY WIDTH OF 24'-2" ON TIMBER CAPS AND TIMBER POST AND STILLS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED IN STAGES. SEE SHEETS C-2 AND C-3 FOR CONSTRUCTION PHASING DIAGRAM. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE PORTION OF THE BRIDGE THAT REMAINS DURING PHASE 1 FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:  
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE ROOF SLAB AND HEADWALLS.
- FOR OPTIONAL STAGING OF BARRELS, SEE SHEET C-7.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEETS.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF THE EXTERIOR WALL AND BOTH FACES OF INTERIOR WALL ABOVE THE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 2'-2" FOR #5 BARS AND 1'-9" FOR #4 BARS. EXTRA WEIGHT OF STEEL DUE TO SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- EXCAVATE 1 FOOT BELOW THE BOTTOM OF THE PROPOSED CULVERT BARREL AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.
- NO WORK SHALL BE DONE ON THE CULVERT UNTIL THE AREA OF THE BOX CULVERT HAS BEEN UNDERCUT AND UNSUITABLE MATERIAL REPLACED WITH SUITABLE MATERIAL, PROPERLY COMPACTED TO THE ELEVATION OF THE BOTTOM OF THE PROPOSED FLOOR SLAB. THE LIMITS OF THE UNDERCUT EXCAVATION SHALL BE AT LEAST THE LIMITS OF THE BOX CULVERT.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS OF THE PROJECT SITE.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

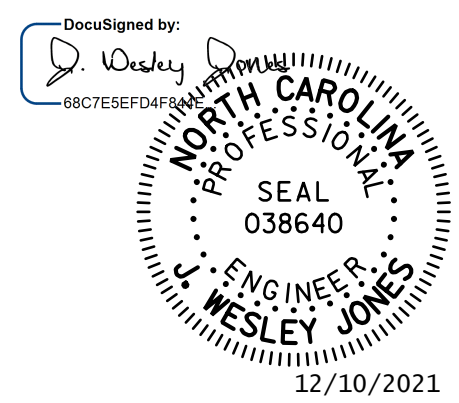
NOTE:  
 SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_y = 60\text{ksi}$ .



PROFILE ALONG CULVERT

- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR PLACEMENT OF NATURAL STREAM BED MATERIAL, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- UNO = UNLESS NOTED OTHERWISE
- UPSTATION - IN DIRECTION OF INCREASING STATIONING
- DOWNSTATION - IN DIRECTION OF DECREASING STATIONING

PROJECT NO. **B-6028**  
**MACON** COUNTY  
 STATION: **15+25.00 -L-**  
 SHEET 1 OF 11 REPLACES BRIDGE NO. 150



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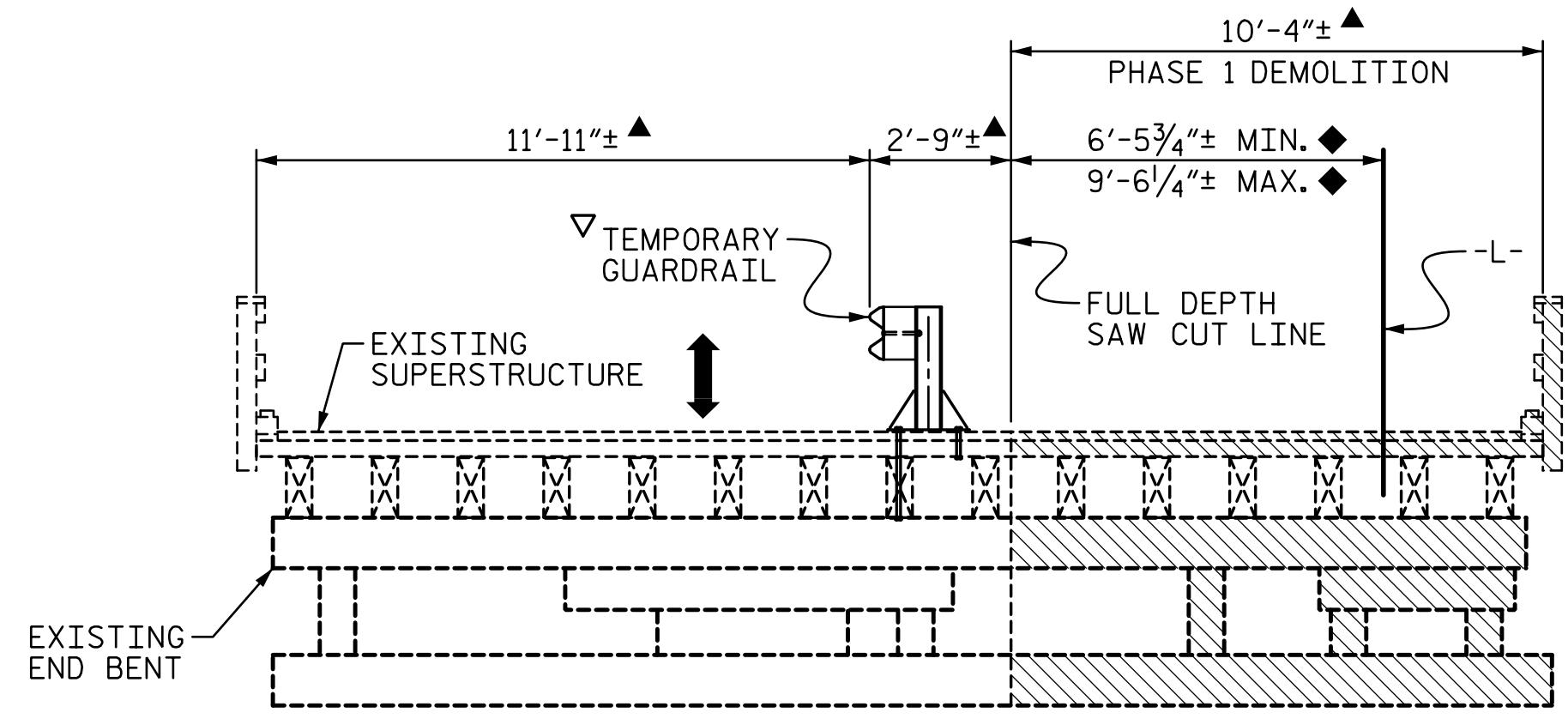
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 10'-0" X 6'-0"**  
**CONCRETE BOX CULVERT**  
 ON SR 1528  
 AT ELLIJAY CREEK  
 135°-00'-00" SKEW

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

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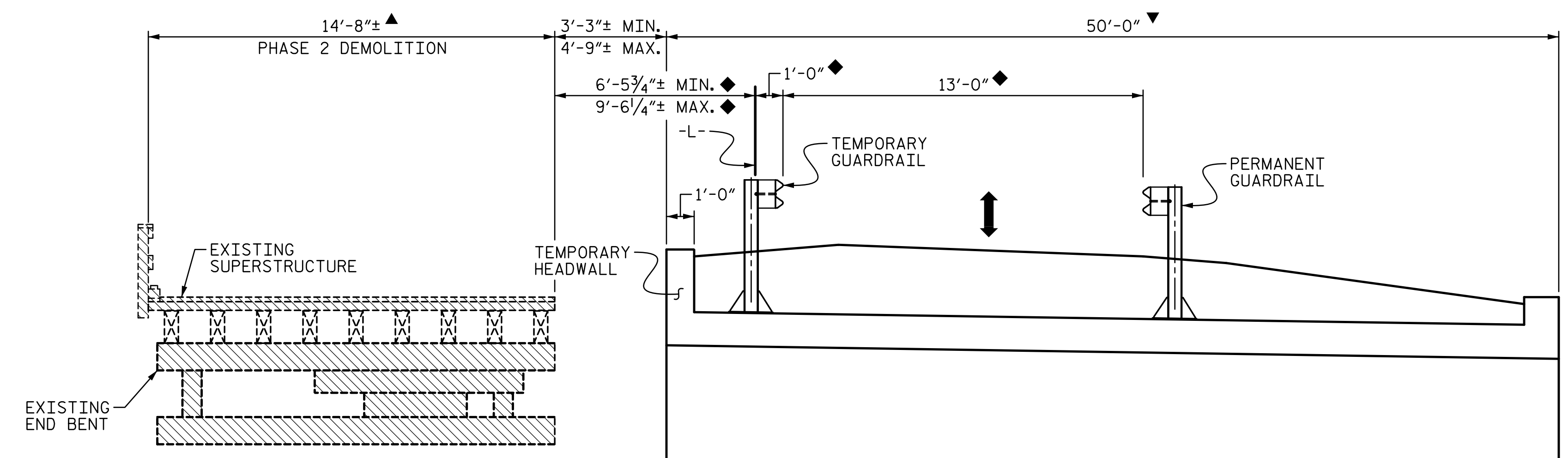




**PHASE 1A**

LOOKING UPSTATION  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

1. VERIFY EXISTING BRIDGE DIMENSIONS. CONTACT ENGINEER IF FIELD MEASUREMENTS VARY FROM PLAN DIMENSIONS.
2. ANCHOR TEMPORARY GUARDRAIL THROUGH EXISTING BRIDGE DECK AND JOIST WITH 1" Ø BOLTS, WASHERS AND NUTS AS SHOWN.
3. SAW CUT AND REMOVE RIGHT PORTION OF EXISTING BRIDGE.



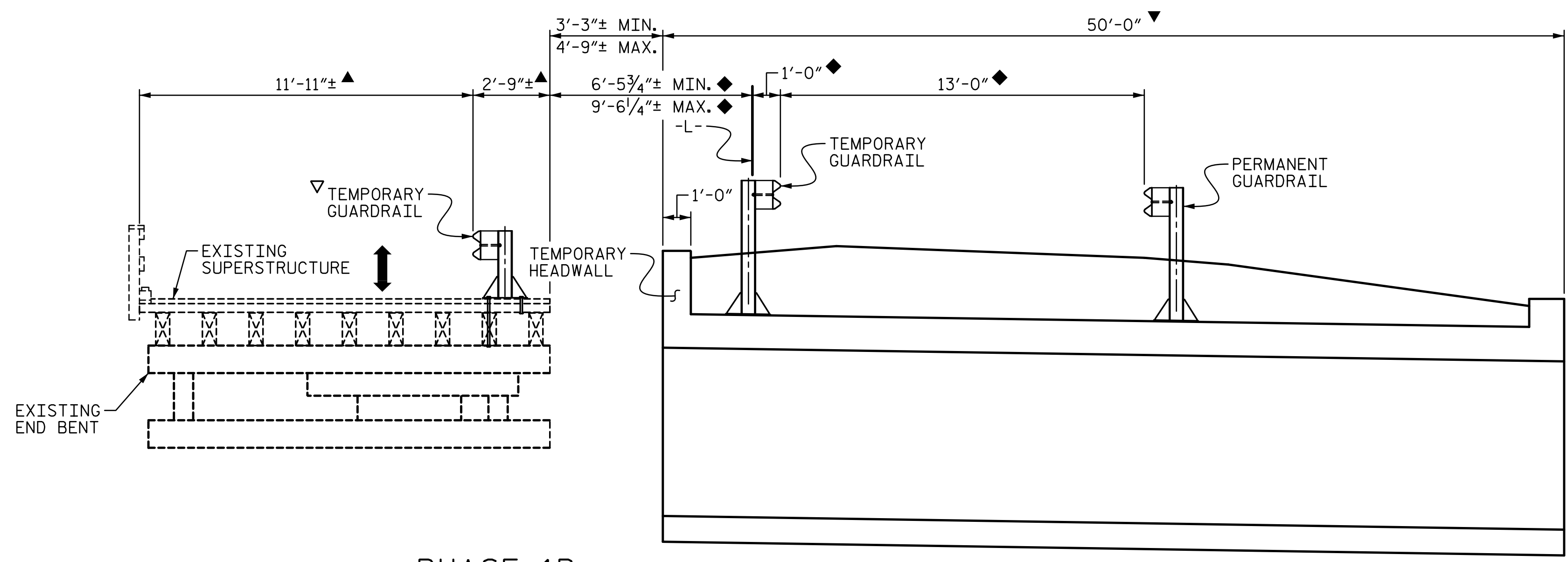
**PHASE 2A**

LOOKING UPSTATION  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

1. SHIFT TRAFFIC TO NEWLY CONSTRUCTED RIGHT SIDE OF CULVERT.
2. REMOVE REMAINDER OF EXISTING BRIDGE.

▨ PORTION OF EXISTING STRUCTURE TO BE DEMOLISHED

- ▲ MEASURED PERPENDICULAR FROM EDGE OF EXISTING BRIDGE
- ◆ MEASURED RADIAL TO PROPOSED -L-
- ▼ MEASURED ALONG PROPOSED CULVERT
- ▽ MAXIMUM GUARDRAIL POST SPACING ON EXISTING BRIDGE SHALL BE 3'-1/2"

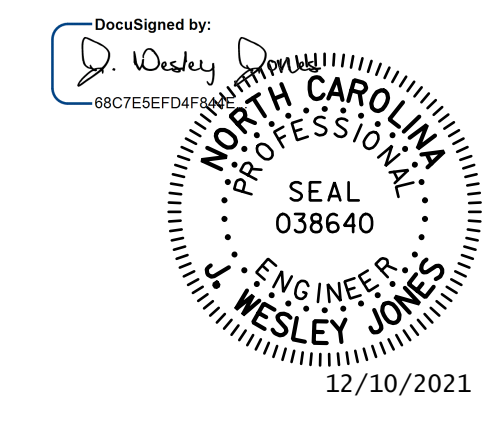


**PHASE 1B**

LOOKING UPSTATION  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

1. CONSTRUCT RIGHT PORTION OF PROPOSED CULVERT.
2. CONSTRUCT TEMPORARY HEADWALL.
3. ANCHOR TEMPORARY GUARDRAIL TO CULVERT, SEE SHEET C-11 FOR DETAILS.

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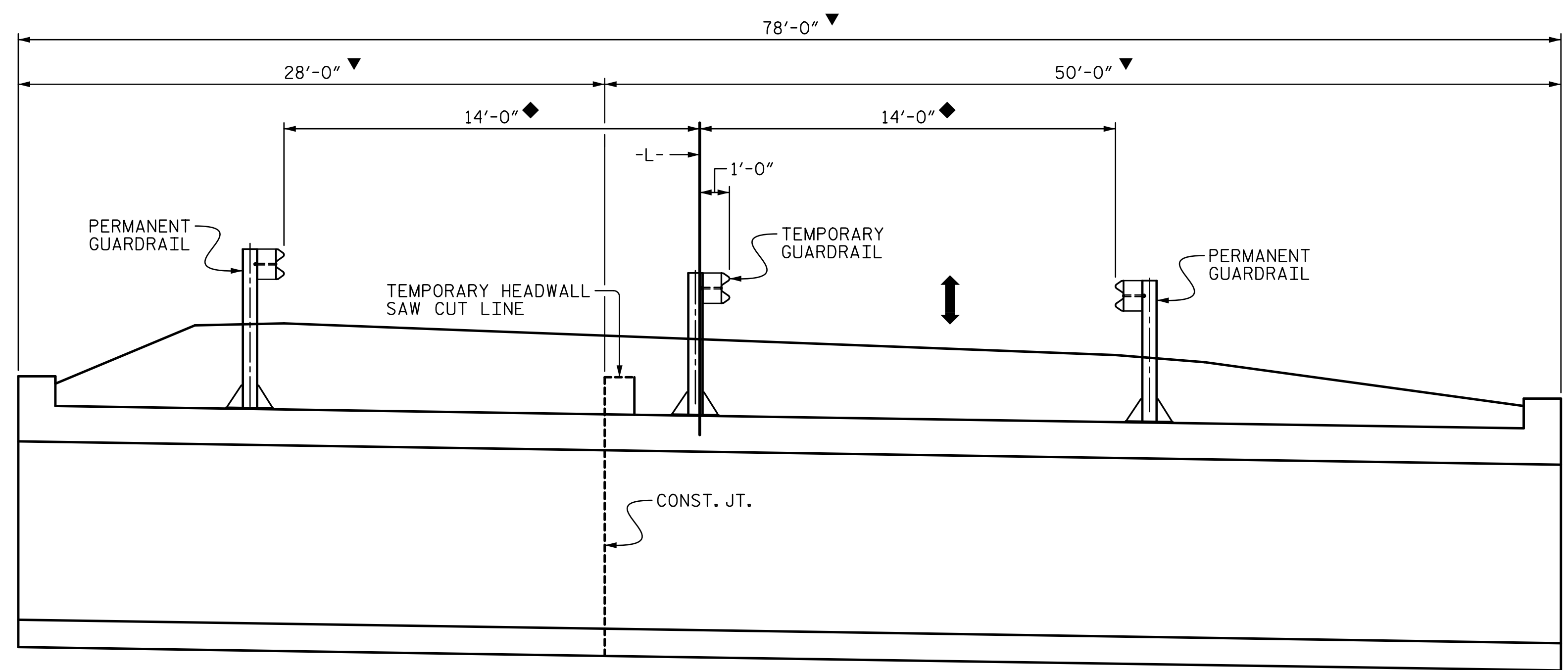
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SIGNATURES COMPLETED

PROJECT NO. B-6028  
MACON COUNTY  
STATION: 15+25.00 -L-  
SHEET 2 OF 11

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>CULVERT STAGING PLAN (SHEET 1 OF 2)</b>					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 14
					C-2

DRAWN BY :	LEM	DATE :	8-17
CHECKED BY :	JAD	DATE :	11-17
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	12-21



### PHASE 2B

LOOKING UPSTATION

1. CONSTRUCT LEFT PORTION OF PROPOSED CULVERT.
2. SAWCUT TEMPORARY HEADWALL 1'-0" MIN. BELOW TOP OF TEMPORARY HEADWALL.
3. REMOVE G2 BARS COMPLETELY AND CUT S2 BARS 2" MIN. BELOW SAW CUT OF TEMPORARY HEADWALL. REPAIR AREAS WHERE S2 BARS ARE REMOVED USING A BONDING AGENT AND GROUT. SUBMIT A REPAIR PLAN TO RESIDENT ENGINEER FOR APPROVAL PRIOR TO BEGINNING REPAIR WORK.

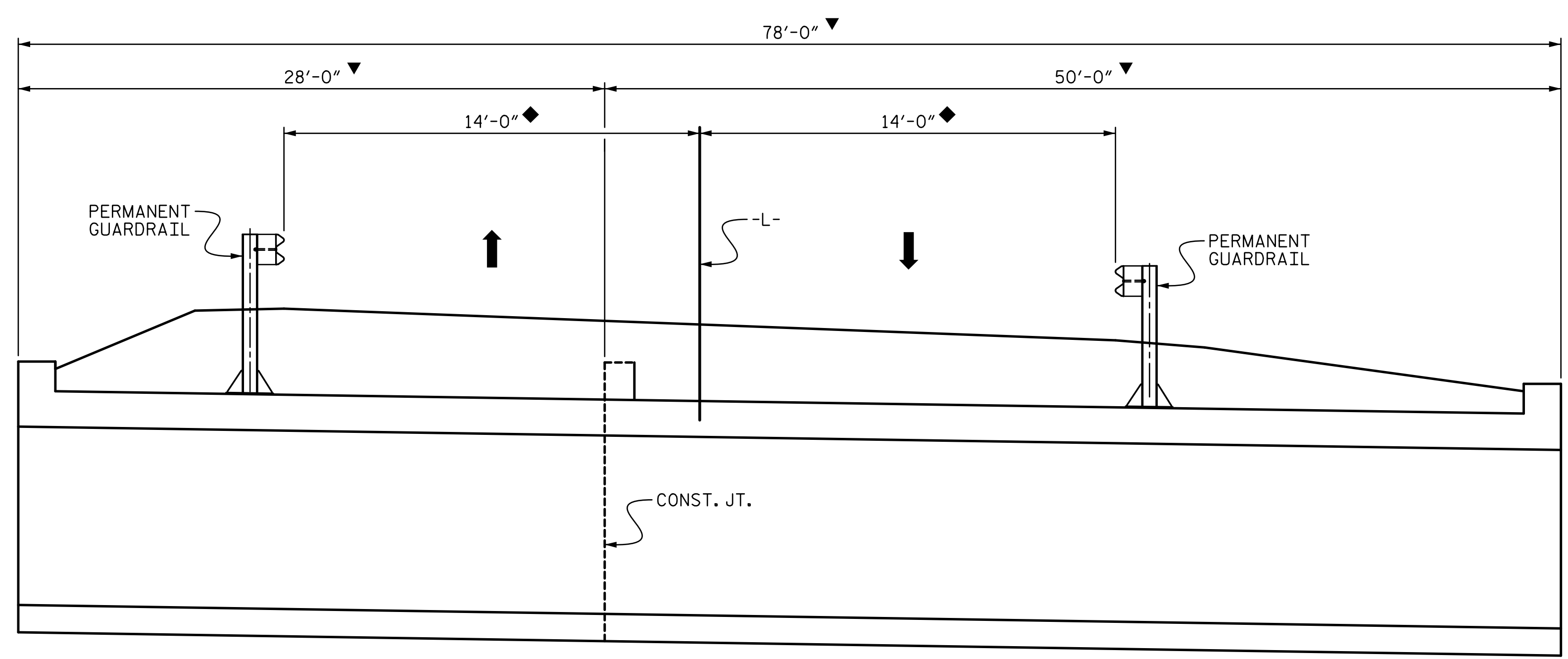
### NOTES

ALL MATERIALS AND LABOR REQUIRED FOR REMOVING PORTIONS OF THE TEMPORARY HEADWALL, REMOVING REBAR FROM TEMPORARY HEADWALL, AND REPAIRING AREAS WHERE REBAR WAS REMOVED FROM TEMPORARY HEADWALL ARE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVING AND/OR REPAIRING THE TEMPORARY HEADWALL.

ALL MATERIALS AND LABOR REQUIRED FOR REPAIR OF TOP SLAB FROM REMOVING TEMPORARY GUARDRAIL, IF NECESSARY, ARE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVING AND/OR REPAIRING THE TOP SLAB.

PROPOSED CULVERT WINGS NOT SHOWN FOR CLARITY.

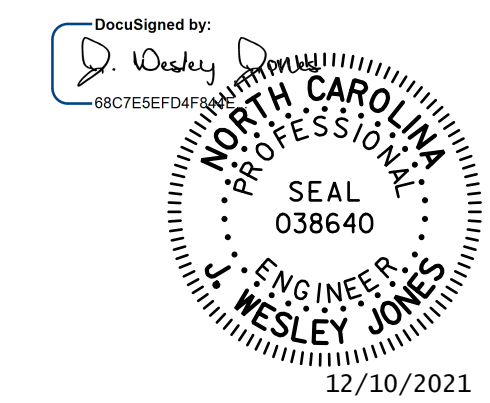
- ◆ MEASURED RADIAL TO PROPOSED -L-
- ▼ MEASURED ALONG PROPOSED CULVERT



### PHASE 3

LOOKING UPSTATION

1. REMOVE TEMPORARY GUARDRAIL AND REPAIR TOP SLAB, IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. RESIDENT ENGINEER TO DETERMINE IF REPAIRS TO TOP SLAB ARE NEEDED.
2. PAVE ROAD IN ACCORDANCE WITH ROADWAY PLANS.



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PROJECT NO. B-6028

MACON COUNTY

STATION: 15+25.00 -L-

SHEET 3 OF 11

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## CULVERT STAGING PLAN

(SHEET 2 OF 2)

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

C-3
TOTAL SHEETS
14

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## LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (%LL)	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (±)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (±)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.060	--	1.75	1.77	1 & 2	ROOF SLAB	4.68'	1.06	1 & 2	ROOF SLAB	9.85'		
	HL-93 (OPERATING)	N/A		1.380	--	1.35	2.29	1 & 2	ROOF SLAB	4.68'	1.38	1 & 2	ROOF SLAB	9.85'		
	HS-20 (INVENTORY)	36.000	②	1.280	46.080	1.75	1.85	1 & 2	ROOF SLAB	4.68'	1.28	1 & 2	ROOF SLAB	9.85'		
	HS-20 (OPERATING)	36.000		1.660	59.760	1.35	2.40	1 & 2	ROOF SLAB	4.68'	1.66	1 & 2	ROOF SLAB	9.85'		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.350	31.725	1.40	3.37	1 & 2	ROOF SLAB	4.68'	2.35	1 & 2	ROOF SLAB	9.85'		
		SNGARBS2	20.000		2.190	43.800	1.40	3.15	1 & 2	ROOF SLAB	4.68'	2.19	1 & 2	ROOF SLAB	9.85'	
		SNAGRIS2	22.000		2.330	51.260	1.40	3.37	1 & 2	ROOF SLAB	4.68'	2.33	1 & 2	ROOF SLAB	9.85'	
		SNCOTTS3	27.250	③	1.320	35.970	1.40	2.21	1 & 2	ROOF SLAB	4.68'	1.32	1 & 2	ROOF SLAB	9.85'	
		SNAGGRS4	34.925		1.670	58.325	1.40	2.74	1 & 2	FLOOR SLAB	4.68'	1.67	1 & 2	ROOF SLAB	9.85'	
		SNS5A	35.550		1.520	54.036	1.40	2.63	1 & 2	ROOF SLAB	4.68'	1.52	1 & 2	ROOF SLAB	9.85'	
		SNS6A	39.950		1.480	59.126	1.40	2.63	1 & 2	ROOF SLAB	4.68'	1.48	1 & 2	ROOF SLAB	9.85'	
		SNS7B	42.000		1.480	62.160	1.40	2.76	1 & 2	ROOF SLAB	4.68'	1.48	1 & 2	ROOF SLAB	9.85'	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.890	62.370	1.40	3.12	1 & 2	FLOOR SLAB	4.68'	1.89	1 & 2	FLOOR SLAB	10.09'	
		TNT4A	33.075		1.530	50.605	1.40	2.63	1 & 2	ROOF SLAB	4.68'	1.53	1 & 2	ROOF SLAB	9.85'	
		TNT6A	41.600		1.510	62.816	1.40	2.69	1 & 2	ROOF SLAB	4.68'	1.51	1 & 2	ROOF SLAB	9.85'	
		TNT7A	42.000		1.520	63.840	1.40	2.66	1 & 2	ROOF SLAB	4.68'	1.52	1 & 2	ROOF SLAB	9.85'	
		TNT7B	42.000		1.510	63.420	1.40	2.60	1 & 2	ROOF SLAB	4.68'	1.51	1 & 2	ROOF SLAB	9.85'	
		TNAGRIT4	43.000		1.490	64.070	1.40	2.63	1 & 2	ROOF SLAB	4.68'	1.49	1 & 2	ROOF SLAB	9.85'	
		TNACT5A	45.000		1.490	67.050	1.40	2.83	1 & 2	FLOOR SLAB	4.68'	1.49	1 & 2	ROOF SLAB	9.85'	
TNACT5B	45.000		1.470	66.150	1.40	2.36	1 & 2	FLOOR SLAB	4.68'	1.47	1 & 2	FLOOR SLAB	10.09'			

### LOAD FACTORS:

#### DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

### NOTE:

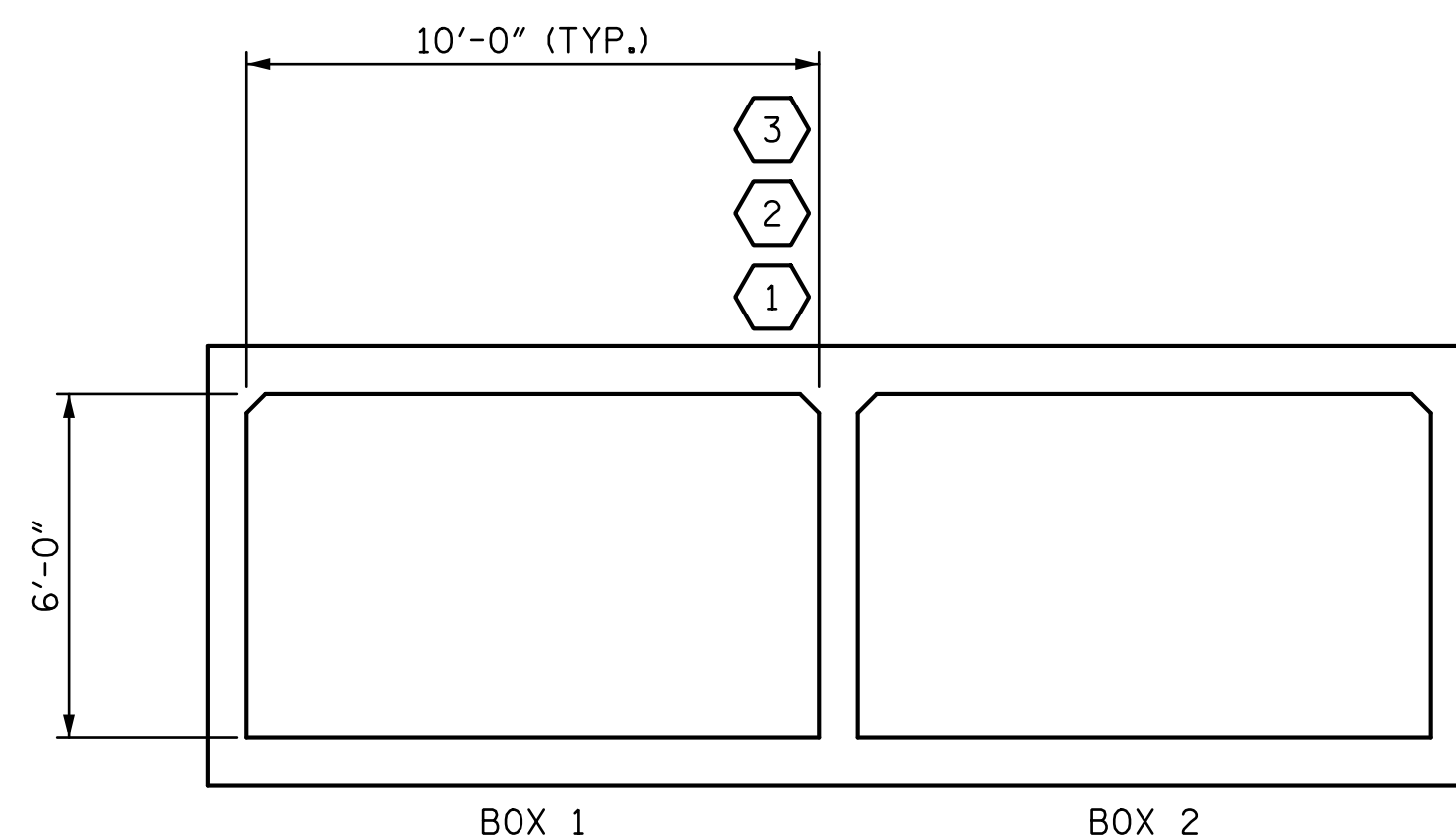
RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

### COMMENTS:

- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
	** SEE CHART FOR VEHICLE TYPE

◆ MEASURED FROM OUTSIDE EDGE OF CULVERT



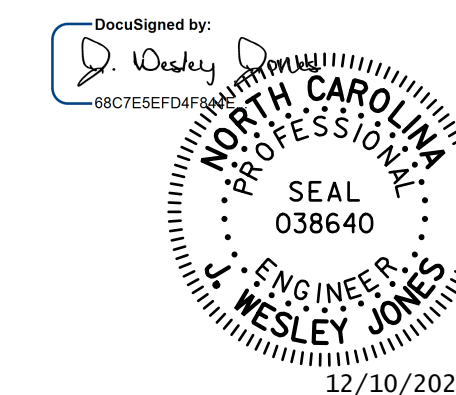
**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

PROJECT NO. B-6028

MACON COUNTY

STATION: 15+25.00 -L-

SHEET 4 OF 11



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

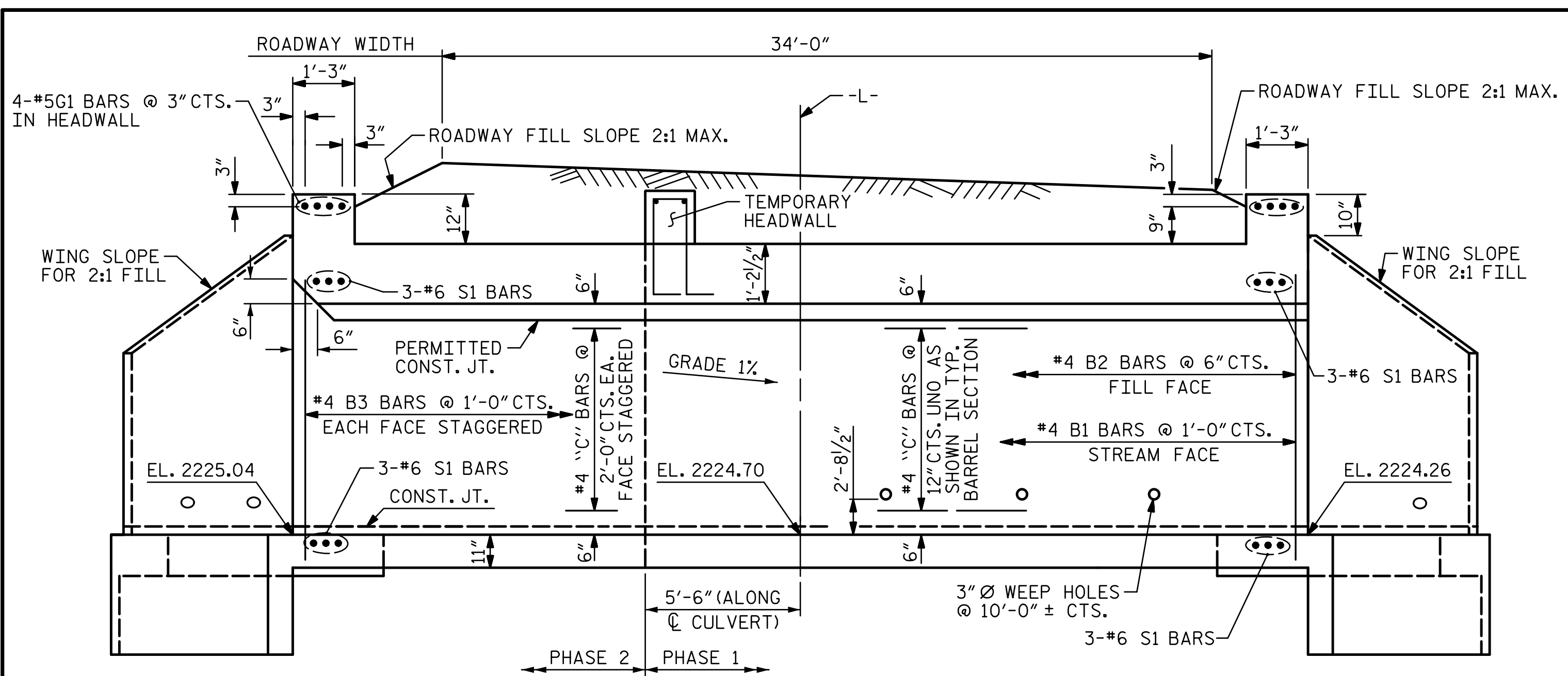
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REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			14
2			4			

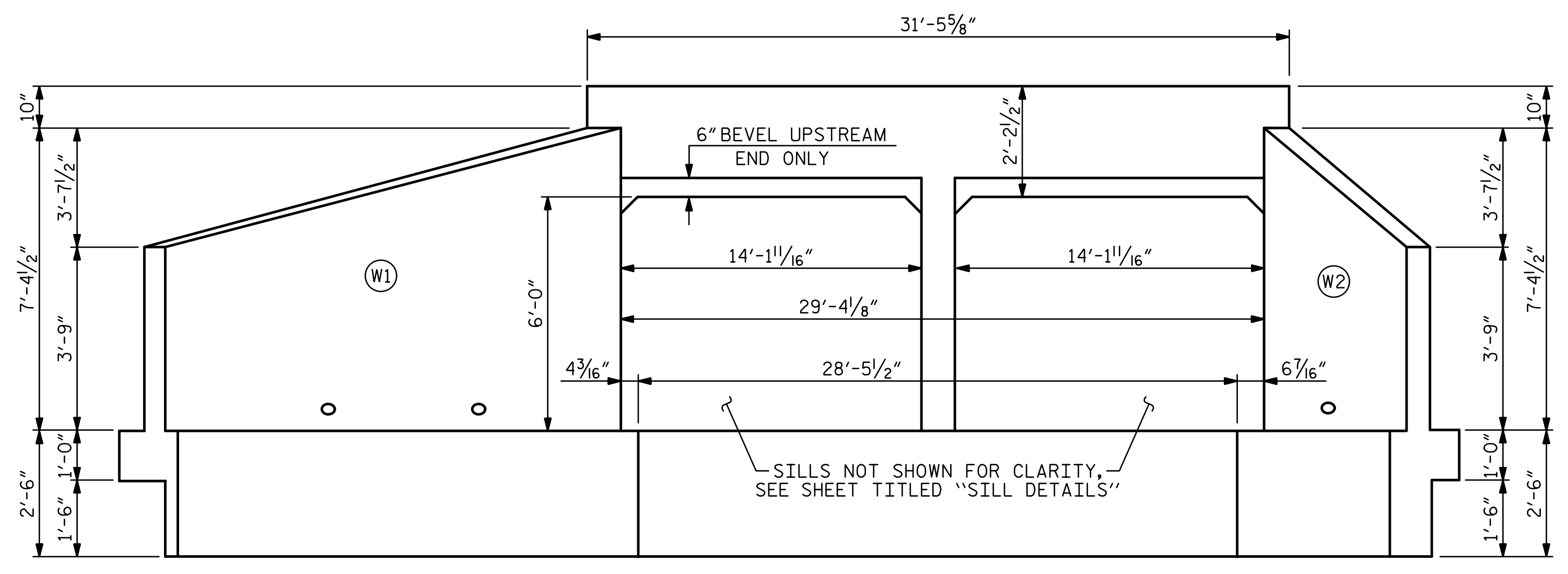
DRAWN BY : LEM      DATE : 8-17  
 CHECKED BY : JAD      DATE : 9-17  
 DESIGN ENGINEER OF RECORD : JWJ      DATE : 12-21





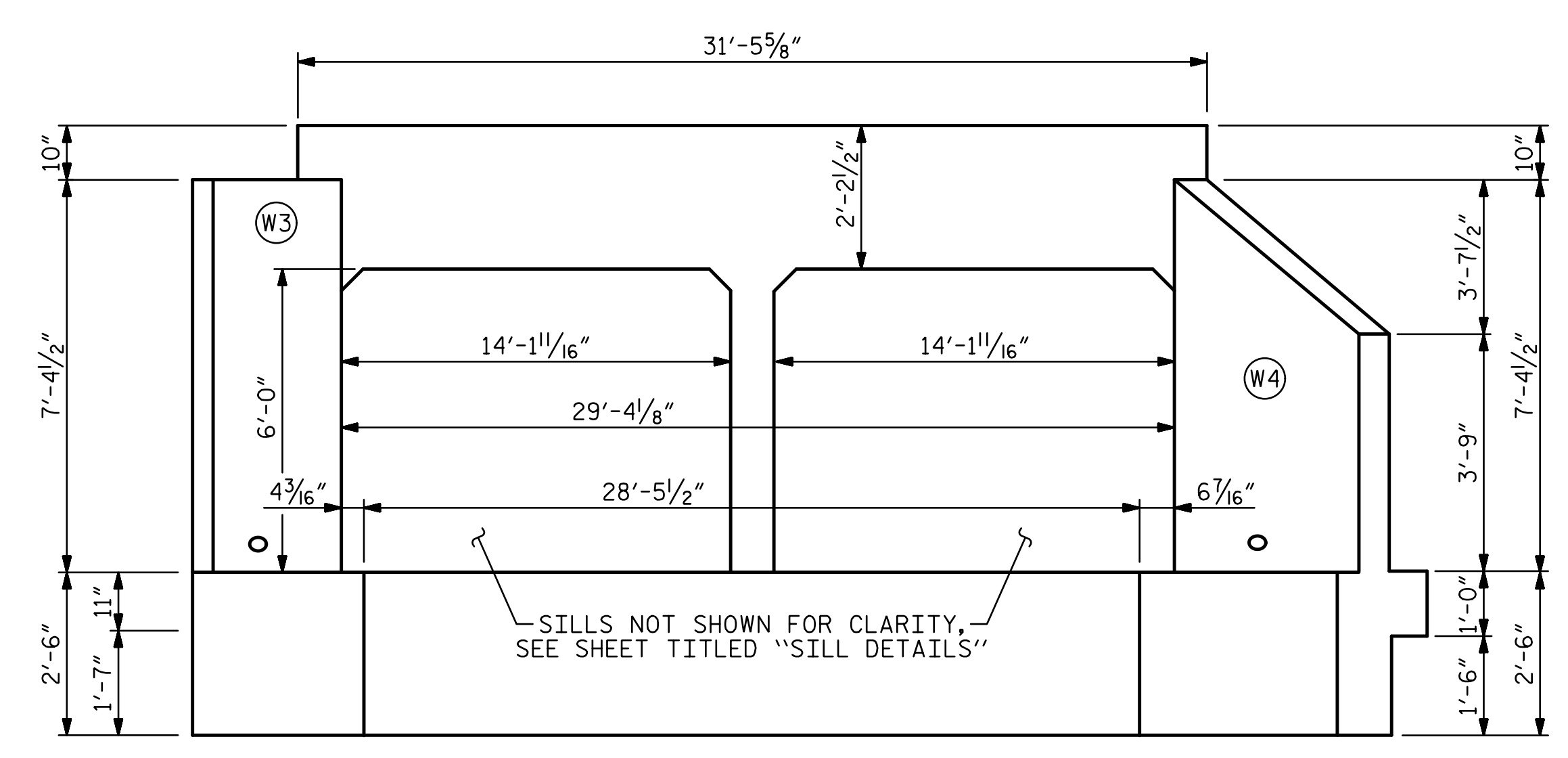
**INTERIOR WALL                      EXTERIOR WALL**  
**CULVERT SECTION NORMAL TO ROADWAY**

(FOR TEMPORARY HEADWALL, SEE SHEET C-2)  
 (GUARDRAIL NOT SHOWN FOR CLARITY)

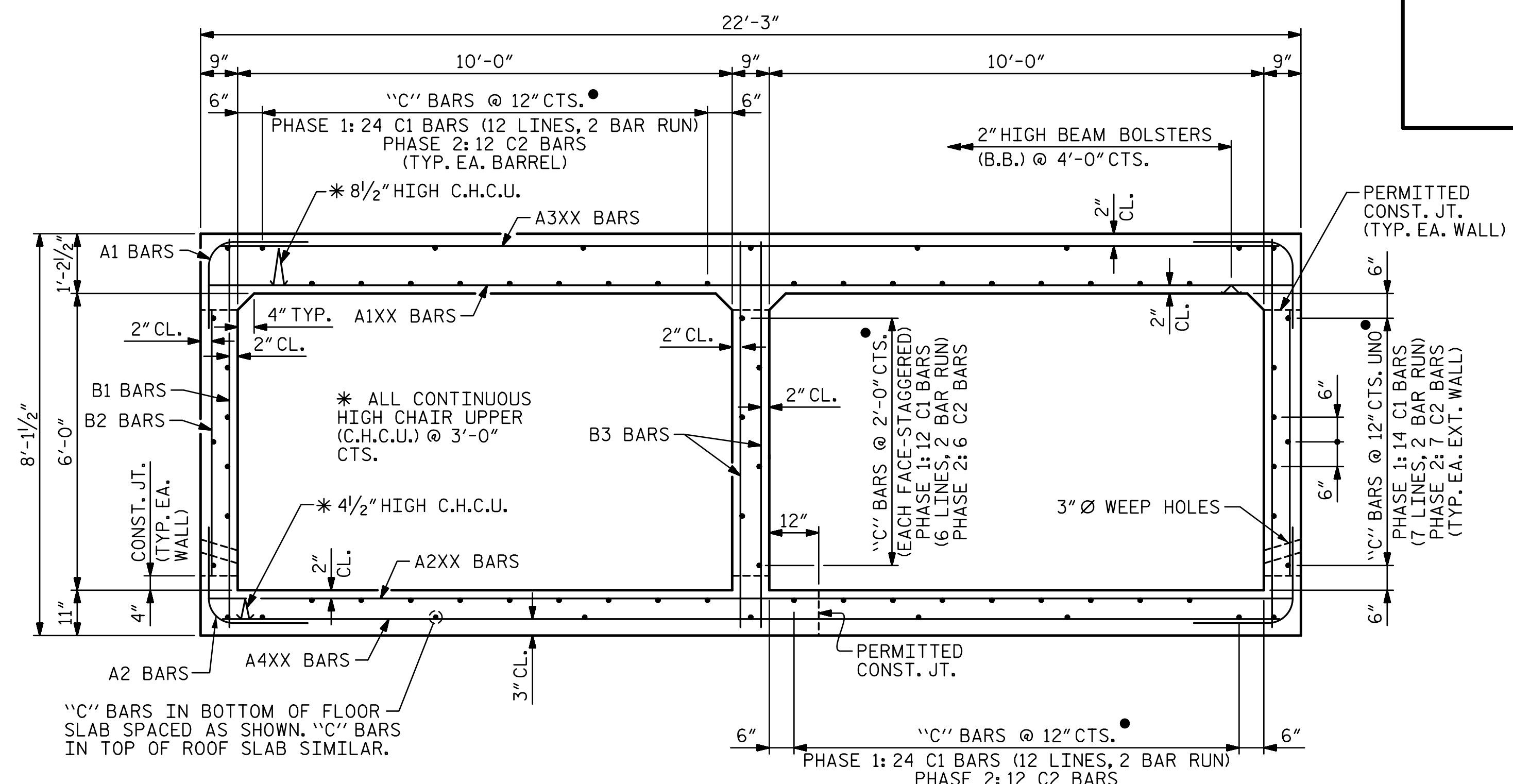


**END ELEVATION AT INLET NORMAL TO SKEW**

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



**END ELEVATION AT OUTLET NORMAL TO SKEW**

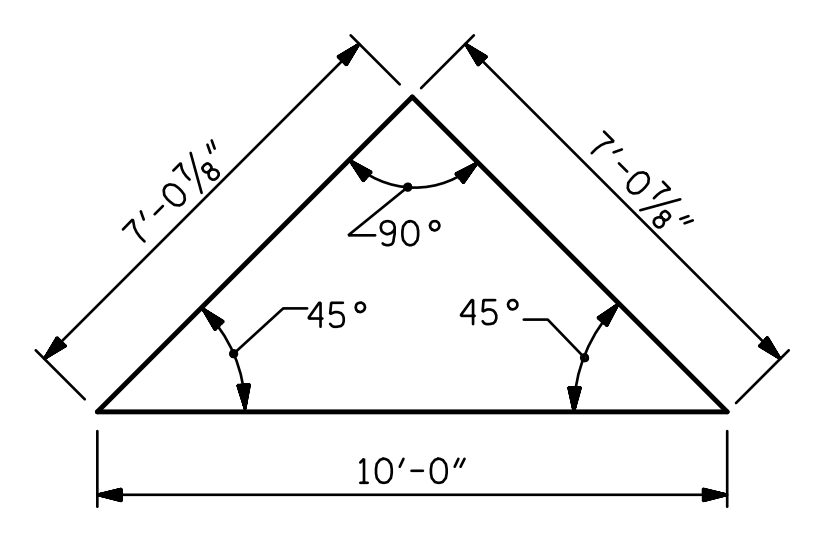


**RIGHT ANGLE SECTION OF BARREL**

THERE ARE 74 "C" BARS IN SECTION OF BARREL.

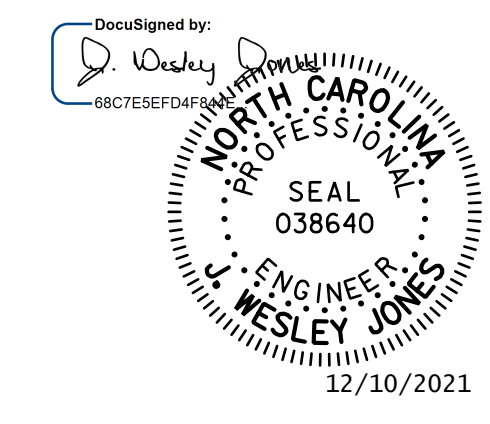
- PHASE 1: C1 BARS ARE IN 2 BAR RUNS WITH A MINIMUM SPLICE LENGTH OF 2'-5".
- PHASE 2: C2 BARS ARE IN A SINGLE BAR RUN, SPLICED TO THE C1 BARS FROM PHASE 1 WITH A MINIMUM SPLICE LENGTH OF 2'-5".

NOTE: IF FIELD CONDITIONS DO NOT PROVIDE THE NECESSARY SPACE FOR A 2'-5" LAP SPLICE BETWEEN SOME/ALL OF THE PHASE 1 C1 BARS AND THE PHASE 2 C2 BARS, MECHANICAL SPLICES ARE PERMITTED TO MAKE THIS SPLICE. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDING AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "REINFORCING STEEL".



**SKEW TRIANGLE**

PROJECT NO. **B-6028**  
**MACON** COUNTY  
 STATION: **15+25.00 -L-**  
 SHEET 5 OF 11



**STV** 100 YEARS  
 STV ENGINEERS, INC.  
 900 West Trade St., Suite 715  
 Charlotte, NC 28202  
 NC License Number F-0991

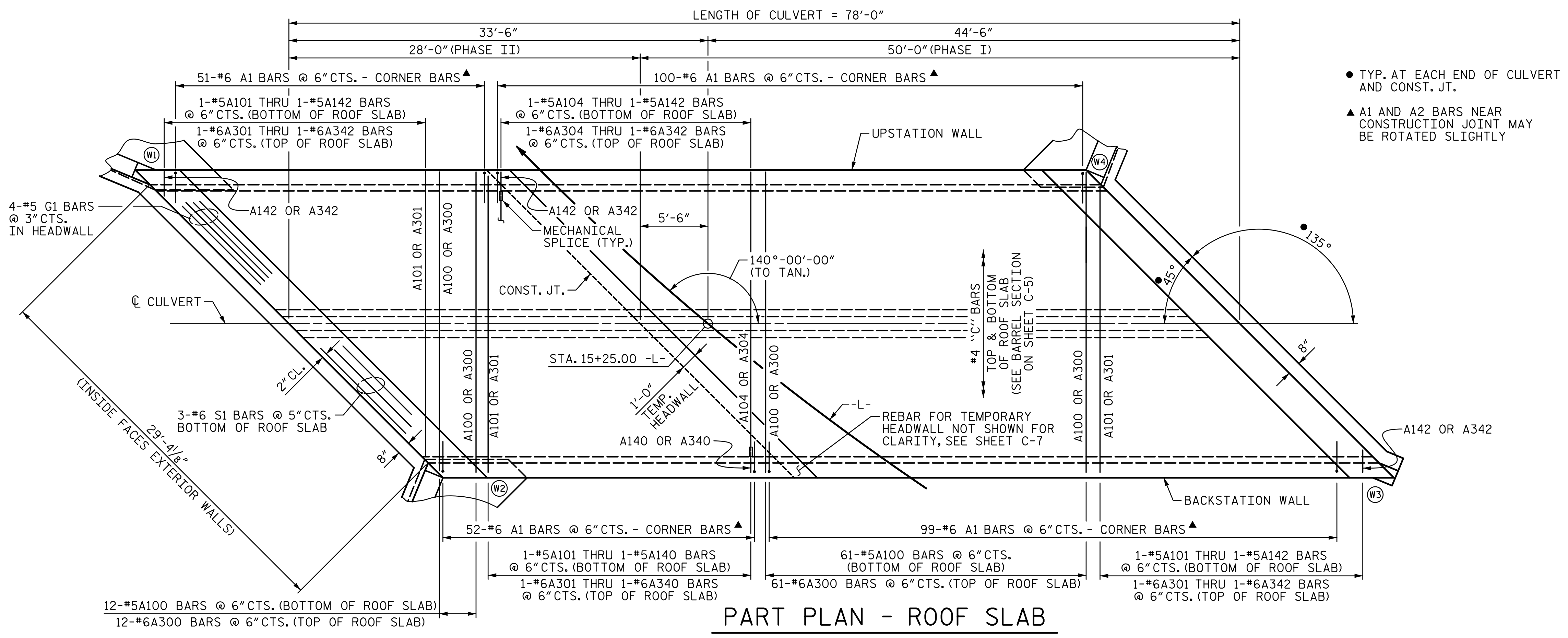
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 10'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1528 AT ELLIJAY CREEK 135°-00'-00" SKEW**

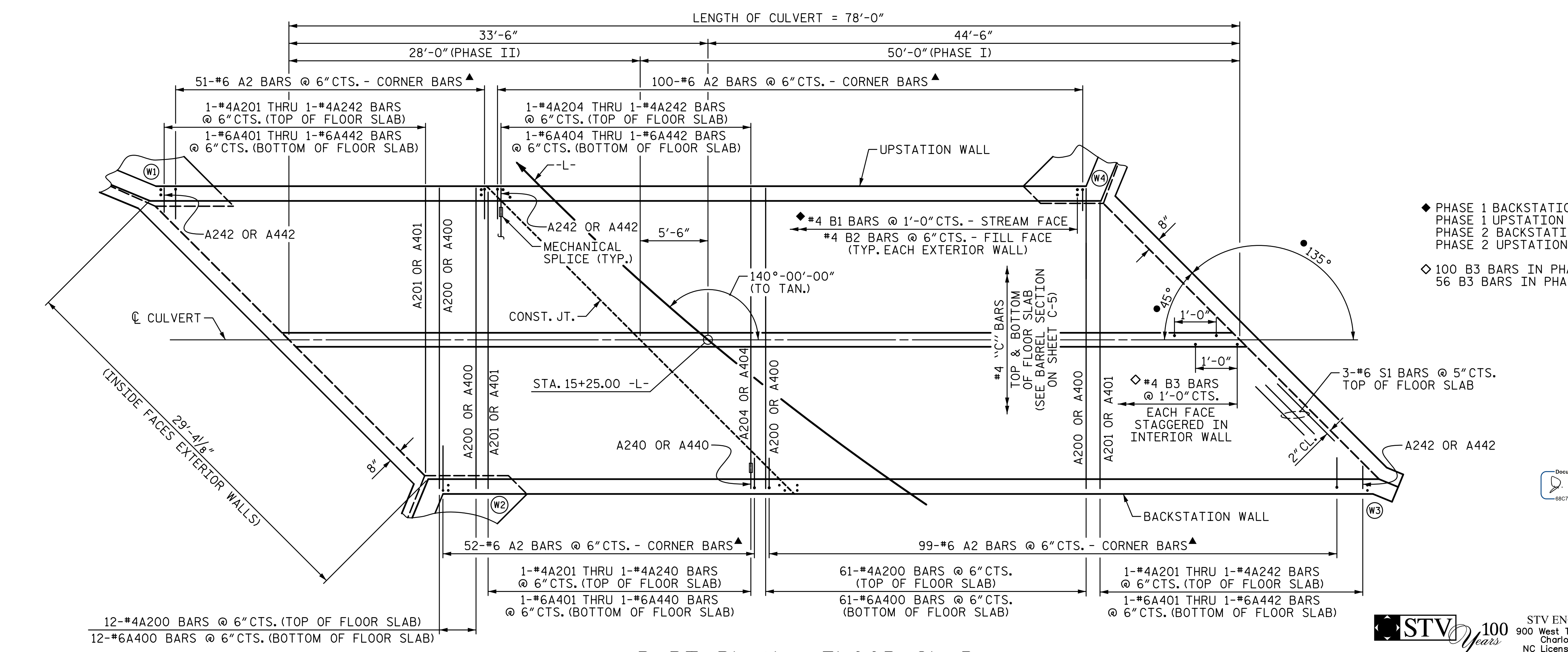
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C-5  
 TOTAL SHEETS 14

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**PART PLAN - ROOF SLAB**

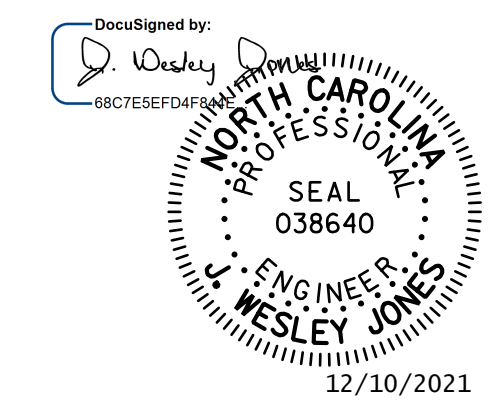


**PART PLAN - FLOOR SLAB**

● TYP. AT EACH END OF CULVERT AND CONST. JT.  
▲ A1 AND A2 BARS NEAR CONSTRUCTION JOINT MAY BE ROTATED SLIGHTLY

◆ PHASE 1 BACKSTATION WALL: 50 B1 BARS, 100 B2 BARS  
 PHASE 1 UPSTATION WALL: 50 B1 BARS, 100 B2 BARS  
 PHASE 2 BACKSTATION WALL: 28 B1 BARS, 56 B2 BARS  
 PHASE 2 UPSTATION WALL: 28 B1 BARS, 56 B2 BARS  
 ◇ 100 B3 BARS IN PHASE 1 (50 EA. FACE)  
 56 B3 BARS IN PHASE 2 (28 EA. FACE)

PROJECT NO. B-6028  
MACON COUNTY  
 STATION: 15+25.00 -L-  
 SHEET 6 OF 11



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 10'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1528 AT ELLIJAY CREEK 135°-00'-00" SKEW**

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
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C-6	TOTAL SHEETS 14
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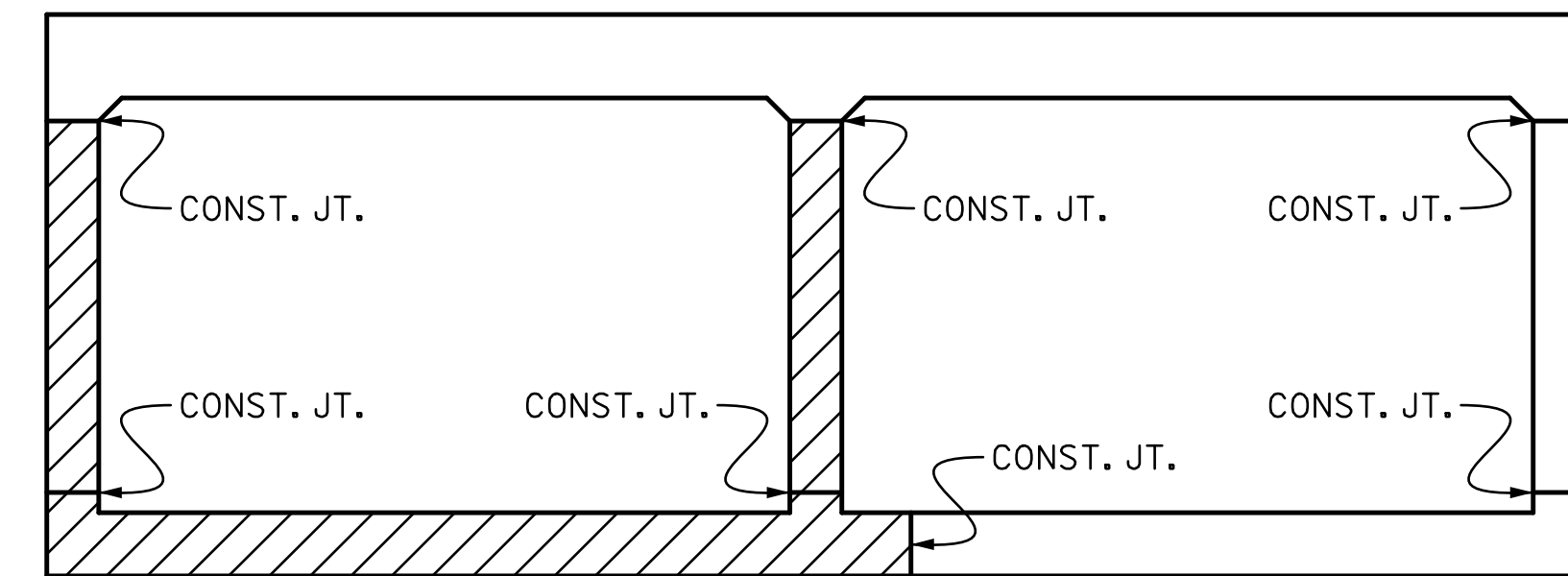
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DRAWN BY : LEM DATE : 8-17  
 CHECKED BY : JAD DATE : 9-17  
 DESIGN ENGINEER OF RECORD : JWJ DATE : 12-21



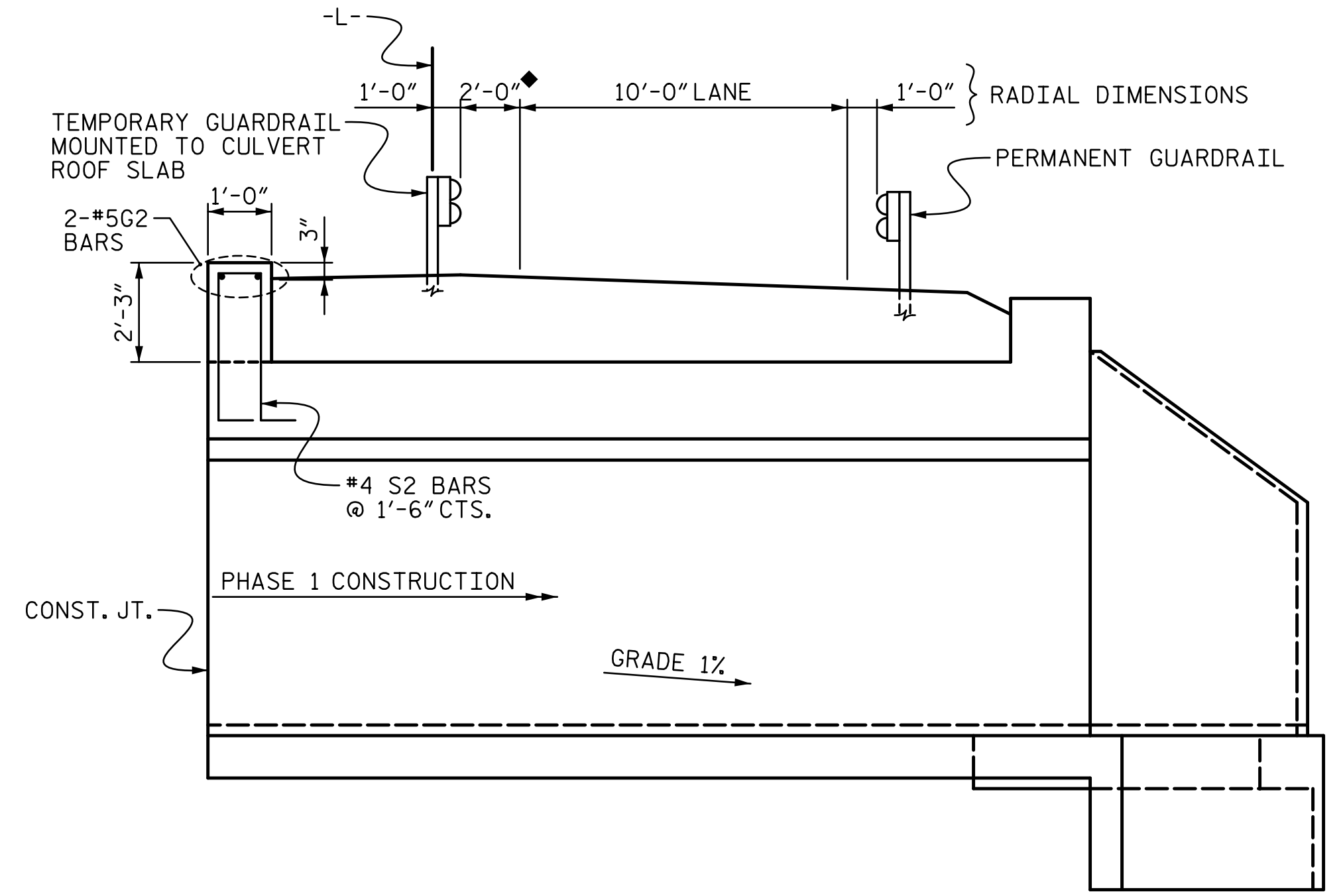
BILL OF REINFORCING FOR BARREL

MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)	MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)	MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)		
A100	61	12	#5	STR	21'-11"	1394	274	A231	2	2	#4	STR	6'-5"	9	9	A418	2	2	#6	STR	12'-11"	39	39		
A101	1	2	#5	STR	21'-5"	22	45	A232	2	2	#4	STR	5'-11"	8	8	A419	2	2	#6	STR	12'-5"	37	37		
A102	1	2	#5	STR	20'-11"	22	44	A233	2	2	#4	STR	5'-5"	7	7	A420	2	2	#6	STR	11'-11"	36	36		
A103	1	2	#5	STR	20'-5"	21	43	A234	2	2	#4	STR	4'-11"	7	7	A421	2	2	#6	STR	11'-5"	34	34		
A104	2	2	#5	STR	19'-11"	42	42	A235	2	2	#4	STR	4'-5"	6	6	A422	2	2	#6	STR	10'-11"	33	33		
A105	2	2	#5	STR	19'-5"	41	41	A236	2	2	#4	STR	3'-11"	5	5	A423	2	2	#6	STR	10'-5"	31	31		
A106	2	2	#5	STR	18'-11"	39	39	A237	2	2	#4	STR	3'-5"	5	5	A424	2	2	#6	STR	9'-11"	30	30		
A107	2	2	#5	STR	18'-5"	38	38	A238	2	2	#4	STR	2'-11"	4	4	A425	2	2	#6	STR	9'-5"	28	28		
A108	2	2	#5	STR	17'-11"	37	37	A239	2	2	#4	STR	2'-5"	3	3	A426	2	2	#6	STR	8'-11"	27	27		
A109	2	2	#5	STR	17'-5"	36	36	A240	2	2	#4	STR	1'-11"	3	3	A427	2	2	#6	STR	8'-5"	25	25		
A110	2	2	#5	STR	16'-11"	35	35	A241	2	1	#4	STR	1'-5"	2	1	A428	2	2	#6	STR	7'-11"	24	24		
A111	2	2	#5	STR	16'-5"	34	34	A242	2	1	#4	STR	11"	1	1	A429	2	2	#6	STR	7'-5"	22	22		
A112	2	2	#5	STR	15'-11"	33	33								A430	2	2	#6	STR	6'-11"	21	21			
A113	2	2	#5	STR	15'-5"	32	32	A300	61	12	#6	STR	21'-11"	2008	395	A431	2	2	#6	STR	6'-5"	19	19		
A114	2	2	#5	STR	14'-11"	31	31	A301	1	2	#6	STR	21'-5"	32	64	A432	2	2	#6	STR	5'-11"	18	18		
A115	2	2	#5	STR	14'-5"	30	30	A302	1	2	#6	STR	20'-11"	31	63	A433	2	2	#6	STR	5'-5"	16	16		
A116	2	2	#5	STR	13'-11"	29	29	A303	1	2	#6	STR	20'-5"	31	61	A434	2	2	#6	STR	4'-11"	15	15		
A117	2	2	#5	STR	13'-5"	28	28	A304	2	2	#6	STR	19'-11"	60	60	A435	2	2	#6	STR	4'-5"	13	13		
A118	2	2	#5	STR	12'-11"	27	27	A305	2	2	#6	STR	19'-5"	58	58	A436	2	2	#6	STR	3'-11"	12	12		
A119	2	2	#5	STR	12'-5"	26	26	A306	2	2	#6	STR	18'-11"	57	57	A437	2	2	#6	STR	3'-5"	10	10		
A120	2	2	#5	STR	11'-11"	25	25	A307	2	2	#6	STR	18'-5"	55	55	A438	2	2	#6	STR	2'-11"	9	9		
A121	2	2	#5	STR	11'-5"	24	24	A308	2	2	#6	STR	17'-11"	54	54	A439	2	2	#6	STR	2'-5"	7	7		
A122	2	2	#5	STR	10'-11"	23	23	A309	2	2	#6	STR	17'-5"	52	52	A440	2	2	#6	STR	1'-11"	6	6		
A123	2	2	#5	STR	10'-5"	22	22	A310	2	2	#6	STR	16'-11"	51	51	A441	2	1	#6	STR	1'-5"	4	2		
A124	2	2	#5	STR	9'-11"	21	21	A311	2	2	#6	STR	16'-5"	49	49	A442	2	1	#6	STR	11"	3	1		
A125	2	2	#5	STR	9'-5"	20	20	A312	2	2	#6	STR	15'-11"	48	48										
A126	2	2	#5	STR	8'-11"	19	19	A313	2	2	#6	STR	15'-5"	46	46	A1	199	103	#6	①	6'-4"	1893	980		
A127	2	2	#5	STR	8'-5"	18	18	A314	2	2	#6	STR	14'-11"	45	45	A2	199	103	#6	①	6'-4"	1893	980		
A128	2	2	#5	STR	7'-11"	17	17	A315	2	2	#6	STR	14'-5"	43	43										
A129	2	2	#5	STR	7'-5"	15	15	A316	2	2	#6	STR	13'-11"	42	42	B1	100	56	#4	STR	7'-9"	518	290		
A130	2	2	#5	STR	6'-11"	14	14	A317	2	2	#6	STR	13'-5"	40	40	B2	200	112	#4	STR	5'-4"	713	399		
A131	2	2	#5	STR	6'-5"	13	13	A318	2	2	#6	STR	12'-11"	39	39	B3	100	56	#4	STR	7'-9"	518	290		
A132	2	2	#5	STR	5'-11"	12	12	A319	2	2	#6	STR	12'-5"	37	37										
A133	2	2	#5	STR	5'-5"	11	11	A320	2	2	#6	STR	11'-11"	36	36	C1	148	0	#4	STR	27'-5"	2711	0		
A134	2	2	#5	STR	4'-11"	10	10	A321	2	2	#6	STR	11'-5"	34	34	C2	0	74	#4	STR	27'-7"	0	1363		
A135	2	2	#5	STR	4'-5"	9	9	A322	2	2	#6	STR	10'-11"	33	33										
A136	2	2	#5	STR	3'-11"	8	8	A323	2	2	#6	STR	10'-5"	31	31	D1	3	3	#6	STR	2'-6"	11	11		
A137	2	2	#5	STR	3'-5"	7	7	A324	2	2	#6	STR	9'-11"	30	30	D2	3	3	#6	STR	1'-6"	7	7		
A138	2	2	#5	STR	2'-11"	6	6	A325	2	2	#6	STR	9'-5"	28	28										
A139	2	2	#5	STR	2'-5"	5	5	A326	2	2	#6	STR	8'-11"	27	27	G1	4	4	#5	STR	30'-11"	129	129		
A140	2	2	#5	STR	1'-11"	4	4	A327	2	2	#6	STR	8'-5"	25	25	G2	2	0	#5	STR	30'-11"	64	0		
A141	2	1	#5	STR	1'-5"	3	1	A328	2	2	#6	STR	7'-11"	24	24										
A142	2	1	#5	STR	11"	2	1	A329	2	2	#6	STR	7'-5"	22	22	S1	6	6	#6	STR	30'-11"	279	279		
								A330	2	2	#6	STR	6'-11"	21	21	S2	22	0	#4	②	8'-0"	118	0		
A200	61	12	#4	STR	21'-11"	893	176	A331	2	2	#6	STR	6'-5"	19	19	PHASE 1 BARREL REINFORCING STEEL = 19,282 LBS.									
A201	1	2	#4	STR	21'-5"	14	29	A332	2	2	#6	STR	5'-11"	18	18	PHASE 2 BARREL REINFORCING STEEL = 10,378 LBS.									
A202	1	2	#4	STR	20'-11"	14	28	A333	2	2	#6	STR	5'-5"	16	16	TOTAL BARREL REINFORCING STEEL = 29,660 LBS.									
A203	1	2	#4	STR	20'-5"	14	27	A334	2	2	#6	STR	4'-11"	15	15	PHASE 1 BARREL CONCRETE = 2,259 CY/FT = 112.9 CY									
A204	2	2	#4	STR	19'-11"	27	27	A335	2	2	#6	STR	4'-5"	13	13	PHASE 2 BARREL CONCRETE = 2,259 CY/FT = 63.3 CY									
A205	2	2	#4	STR	19'-5"	26	26	A336	2	2	#6	STR	3'-11"	12	12	TOTAL BARREL CONCRETE = 176.2 CY									
A206	2	2	#4	STR	18'-11"	25	25	A337	2	2	#6	STR	3'-5"	10	10	FOUNDATION CONDITIONING MATERIAL									
A207	2	2	#4	STR	18'-5"	25	25	A338	2	2	#6	STR	2'-11"	9	9	PHASE 1 = 79 TONS									
A208	2	2	#4	STR	17'-11"	24	24	A339	2	2	#6	STR	2'-5"	7	7	PHASE 2 = 44 TONS									
A209	2	2	#4	STR	17'-5"	23	23	A340	2	2	#6	STR	1'-11"	6	6	TOTAL = 123 TONS									
A210	2	2	#4	STR	16'-11"	23	23	A341	2	1	#6	STR	1'-5"	4	2	BAR TYPES									
A211	2	2	#4	STR	16'-5"	22	22	A342	2	1	#6	STR	11"	3	1	BAR DIMENSIONS ARE OUT TO OUT									
A212	2	2	#4	STR	15'-11"	21	21	A400	61	12	#6	STR	21'-11"	2008	395	VERTICAL LEG									
A213	2	2	#4	STR	15'-5"	21	21	A401	1	2	#6	STR	21'-5"	32	64	①									
A214	2	2	#4	STR	14'-11"	20	20	A402	1	2	#6	STR	20'-11"	31	63	6" R.									
A215	2	2	#4	STR	14'-5"	19	19	A403	1	2	#6	STR	20'-5"	31	61	3'-3 1/2"									
A216	2	2	#4	STR	13'-11"	19	19	A404	2	2	#6	STR	19'-11"	60	60	3'-3 1/2"									
A217	2	2	#4	STR	13'-5"	18	18	A405	2	2	#6	STR	19'-5"	58	58	8"									
A218	2	2	#4	STR	12'-11"	17	17	A406	2	2	#6	STR	18'-11"	57	57	8"									
A219	2	2	#4	STR	12'-5"	17	17	A407	2	2	#6	STR	18'-5"	55	55	3'-0"									
A220	2	2	#4	STR	11'-11"	16	16	A408	2	2	#6	STR	17'-11"	54	54	8"									
A221	2	2	#4	STR	11'-5"	15	15	A409	2	2	#6	STR	17'-5"	52	52	8"									
A222	2	2	#4	STR	10'-11"	15	15	A410	2	2	#6	STR	16'-11"	51	51	8"									
A223	2	2	#4	STR	10'-5"	14	14	A411	2	2	#6	STR	16'-5"	49	49	8"									
A224	2	2	#4	STR	9'-11"	13	13	A412	2	2	#6	STR	15'-11"	48	48	8"									
A225	2	2	#4	STR	9'-5"	13	13	A413	2	2	#6	STR	15'-5"	46	46	8"									
A226	2	2	#4	STR	8'-11"	12	12	A414	2	2	#6	STR	14'-11"	45	45	8"									
A227	2	2	#4	STR	8'-5"	11	11	A415	2	2	#6	STR	14'-5"	43	43	8"									
A228	2	2	#4	STR	7'-11"	11	11	A416	2	2	#6	STR	13'-11"	42	42	8"									
A229	2	2	#4	STR	7'-5"	10	10	A417	2	2	#6	STR	13'-5"	40	40	8"									
A230	2	2	#4	STR	6'-11"	9	9									8"									



- STAGE 1
  - POUR 1. STAGE 1 FLOOR SLAB (INCLUDING WING FOOTING) WITH 4" OF VERTICAL WALLS/WING.
  - POUR 2. REMAINING PORTIONS OF STAGE 1 WALLS/WING TO FULL HEIGHT.
- STAGE 2
  - POUR 1. STAGE 2 FLOOR SLAB (INCLUDING WING FOOTING) WITH 4" OF VERTICAL WALL/WING.
  - POUR 2. REMAINING PORTIONS OF STAGE 2 WALL/WING TO FULL HEIGHT.
  - POUR 3. ENTIRE ROOF SLAB AND HEADWALL(S).

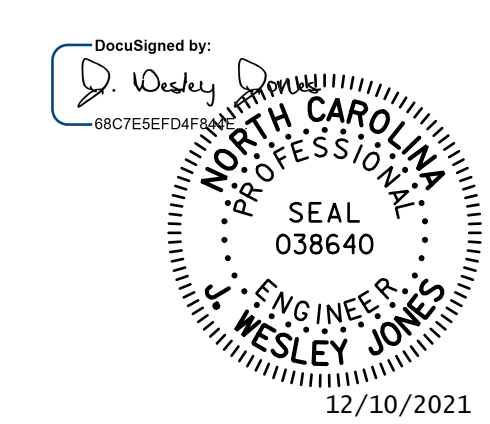
OPTIONAL STAGING WITHIN A CONSTRUCTION PHASE



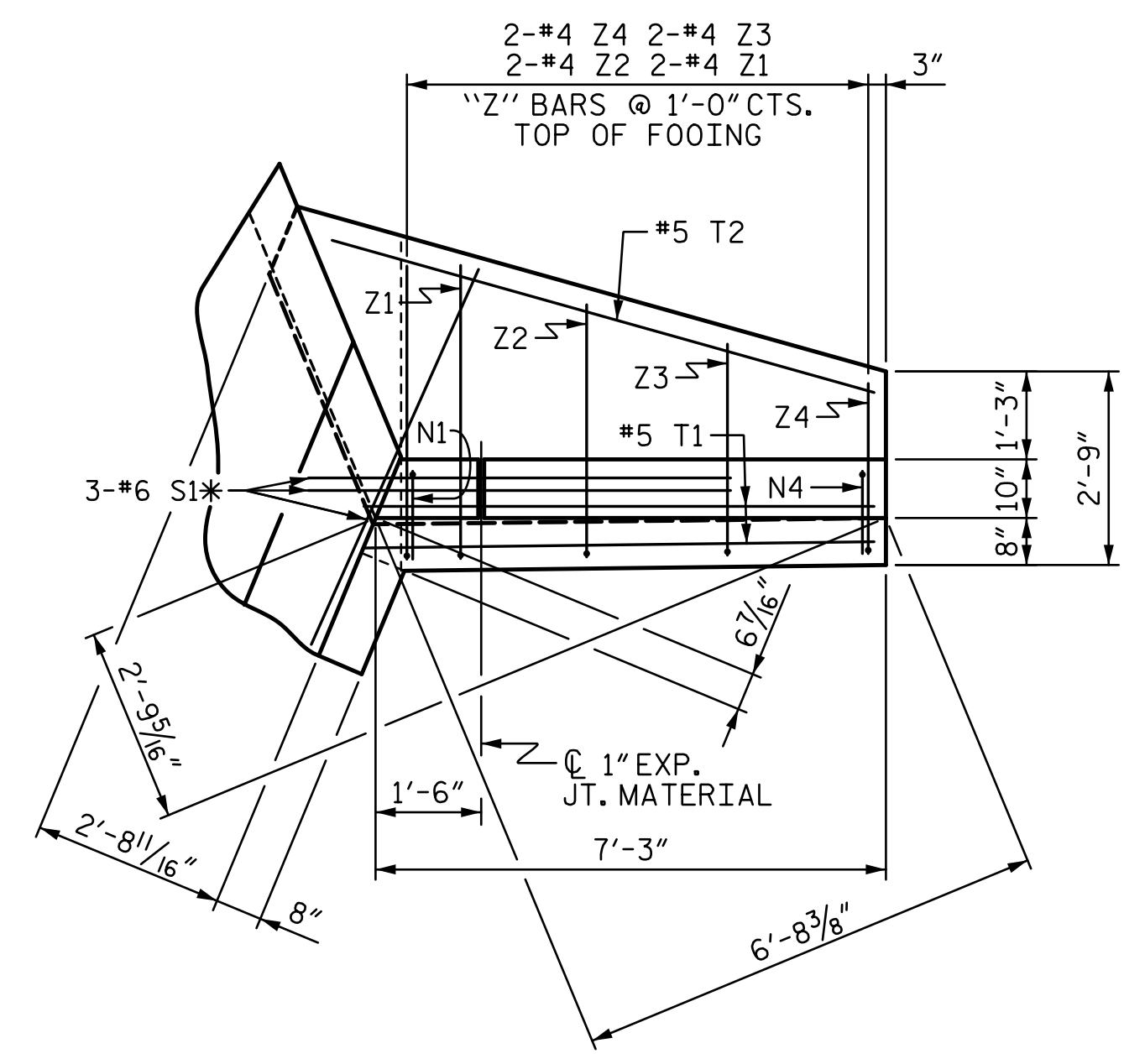
PHASE 1 CONSTRUCTION ROADWAY SECTION VIEW (LOOKING UPSTATION)

TEMPORARY GUARDRAIL SHALL BE ALIGNED PARALLEL (RADIAL) WITH -L-.

PROJECT NO. B-6028  
 MACON COUNTY  
 STATION: 15+25.00 -L-

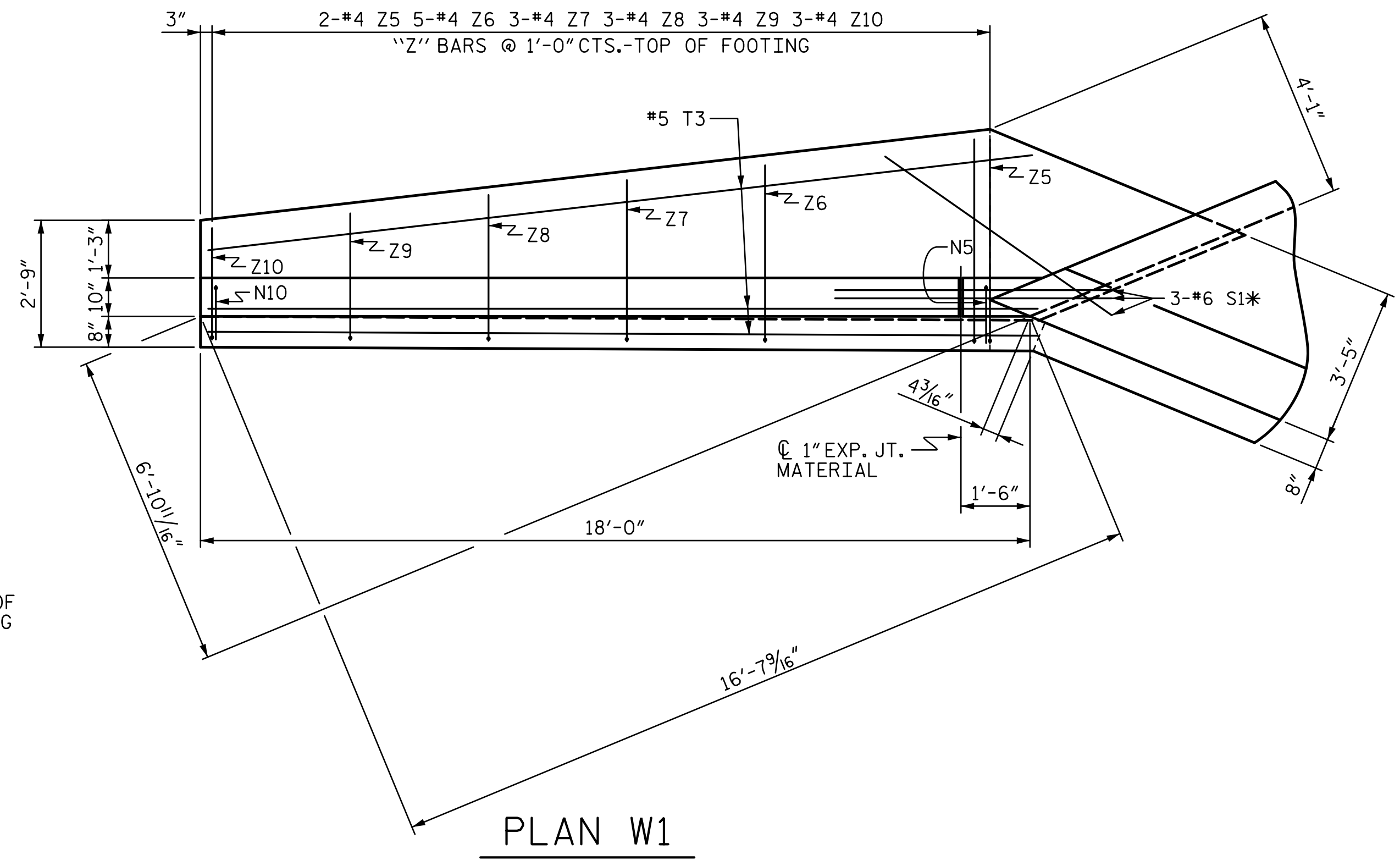




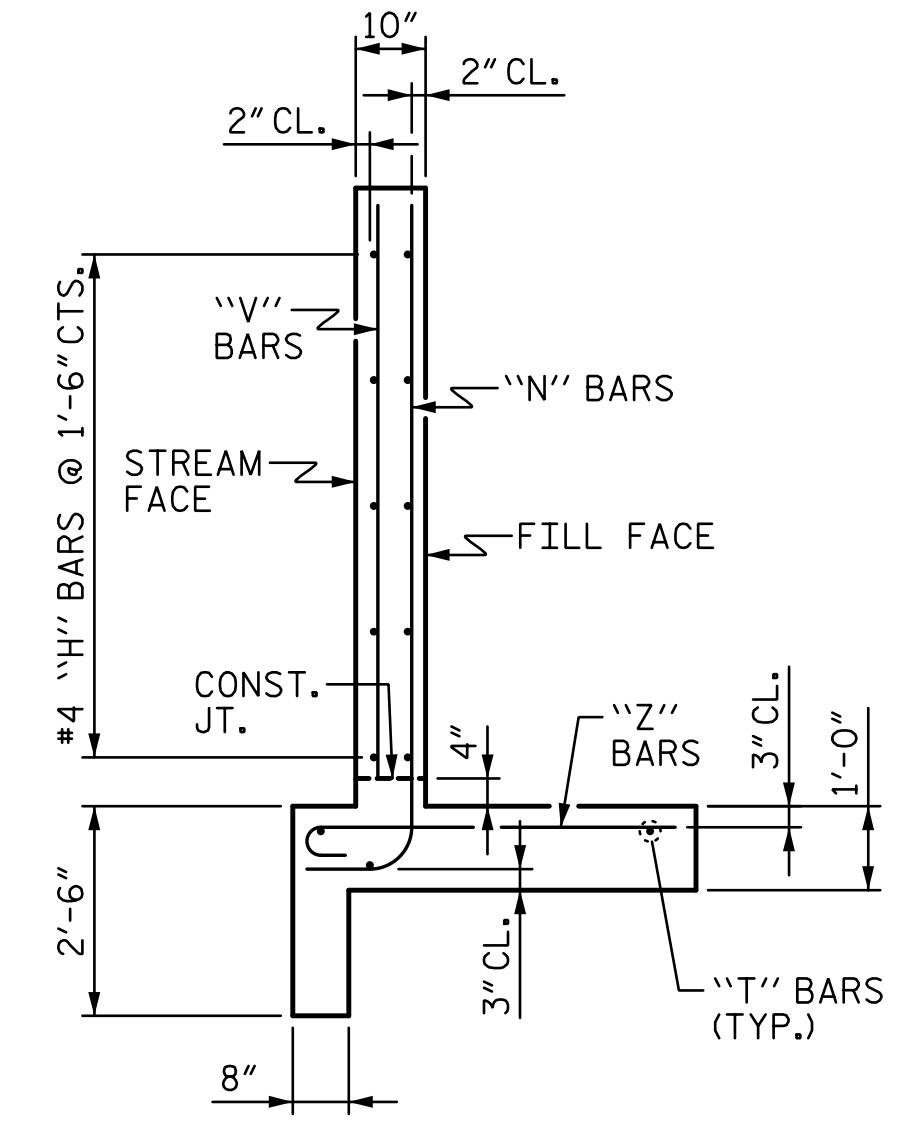


PLAN W2

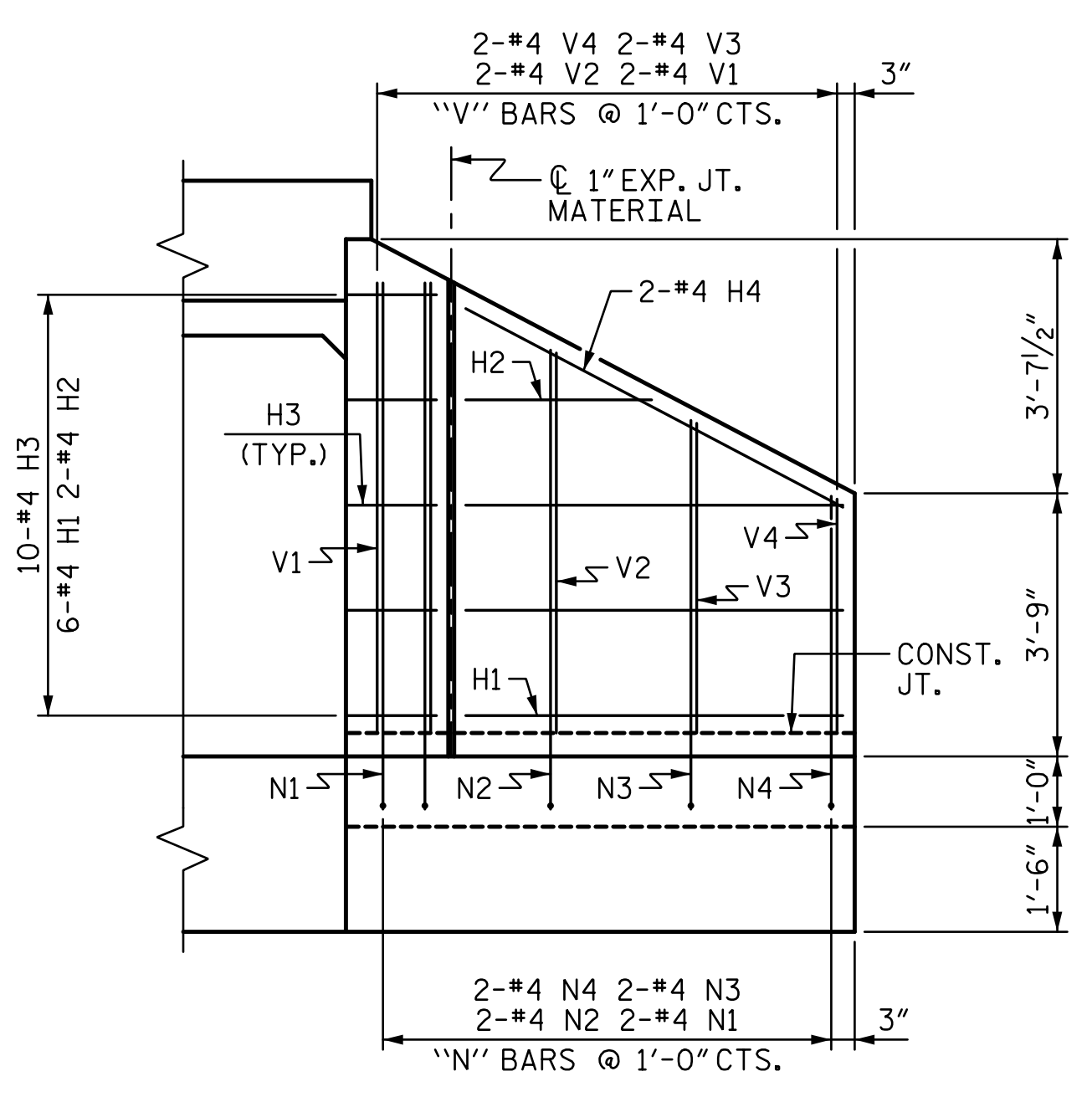
\* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING



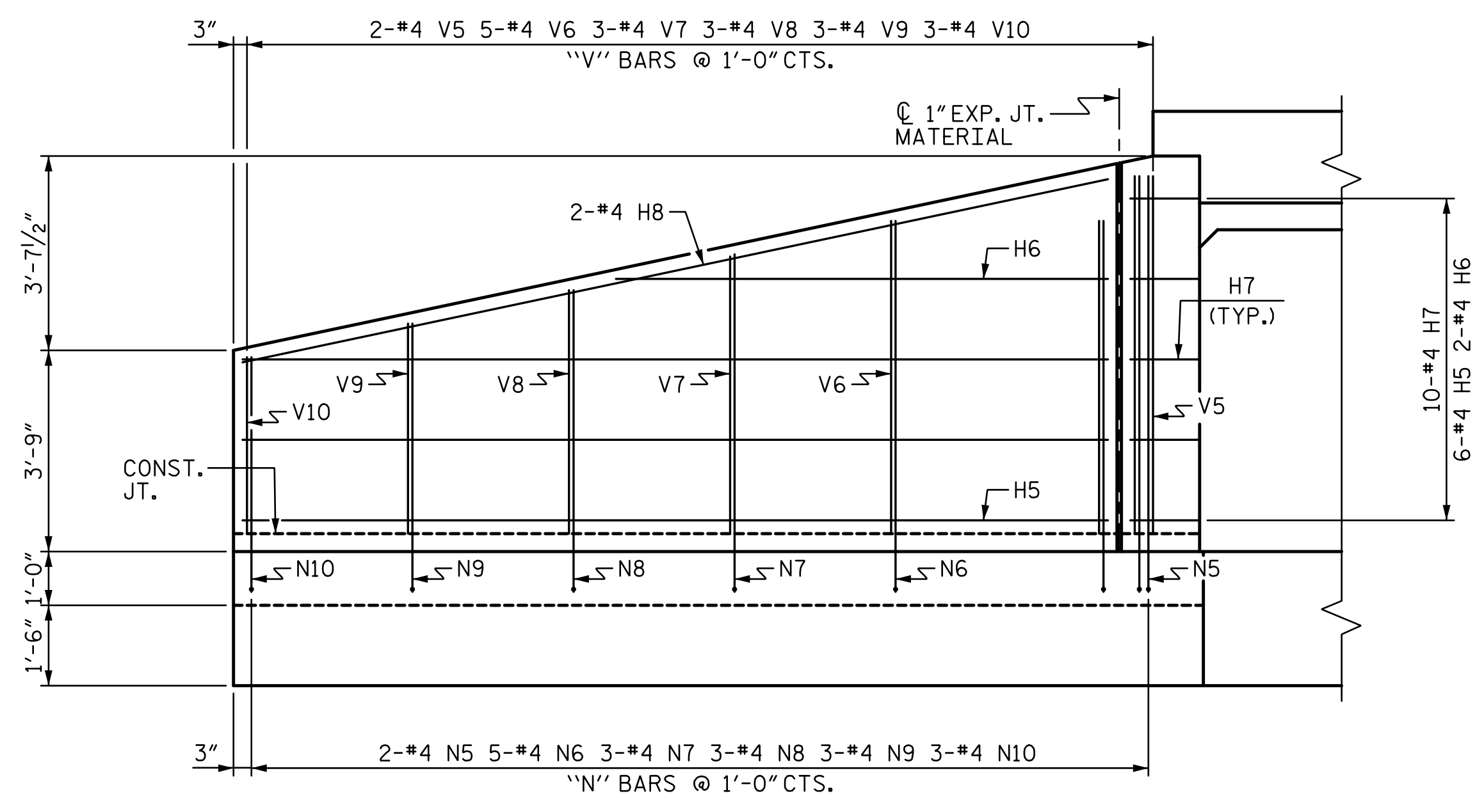
PLAN W1



TYPICAL WING SECTION

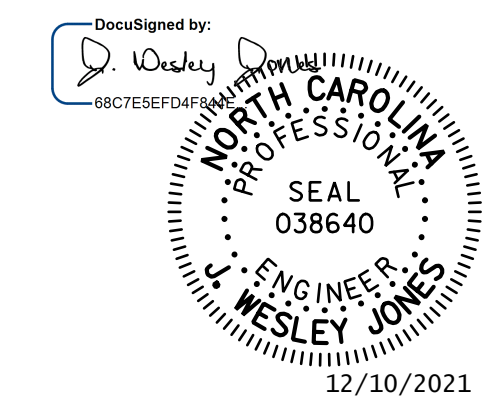


ELEVATION W2



ELEVATION W1

PROJECT NO. B-6028  
MACON COUNTY  
 STATION: 15+25.00 -L-  
 SHEET 8 OF 11



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 NC License Number F-0991

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**WINGS FOR  
 CONCRETE BOX CULVERT**  
 H = 6'-0" SLOPE = 2:1  
 135°-00'-00" SKEW

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
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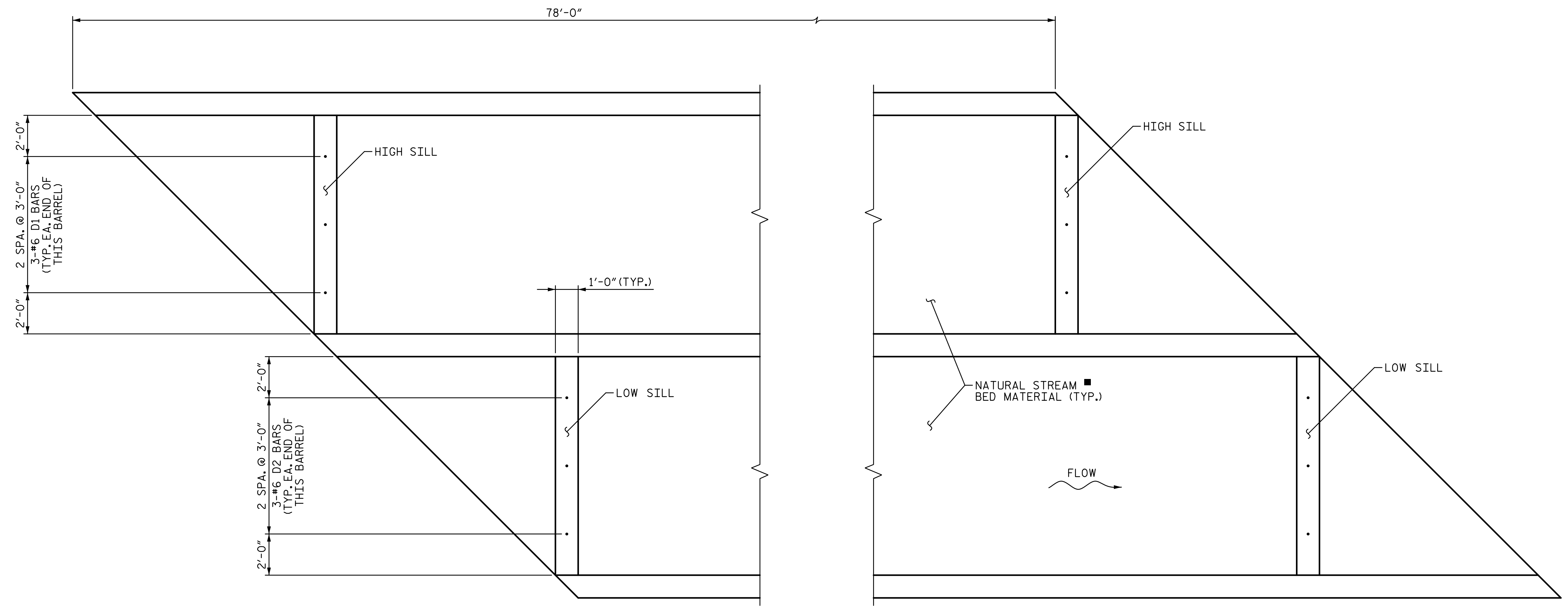
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TOTAL SHEETS  
14

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 DESIGN ENGINEER OF RECORD : JWJ DATE : 12-21

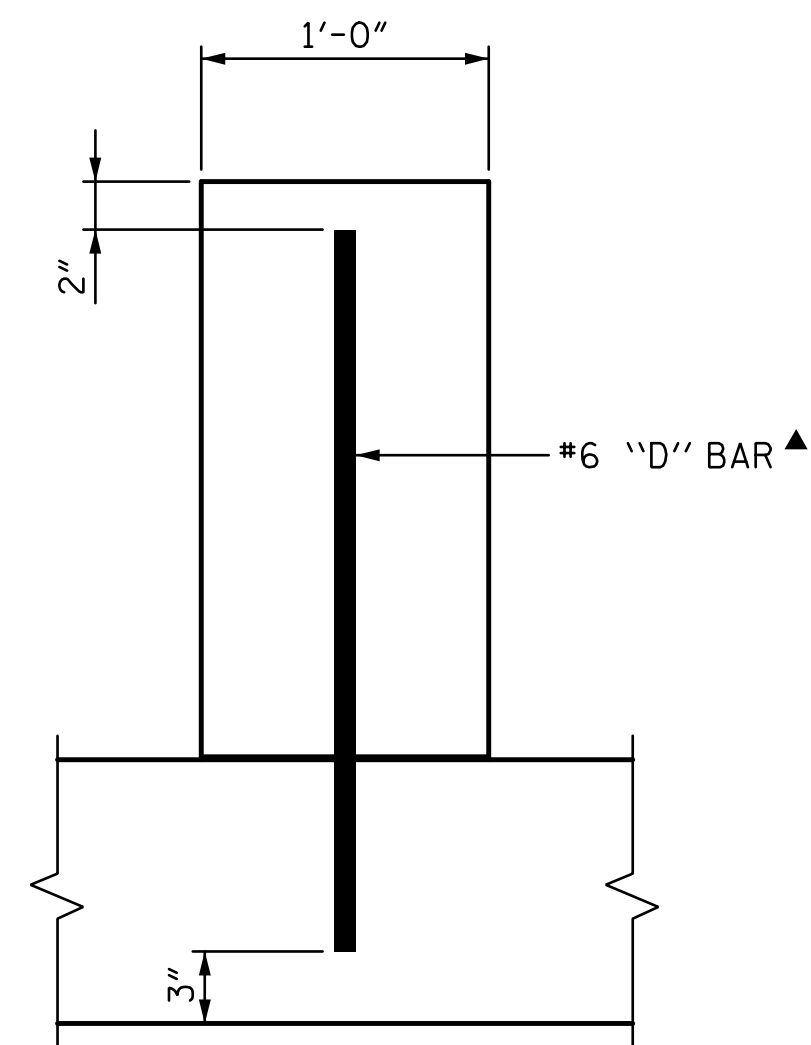




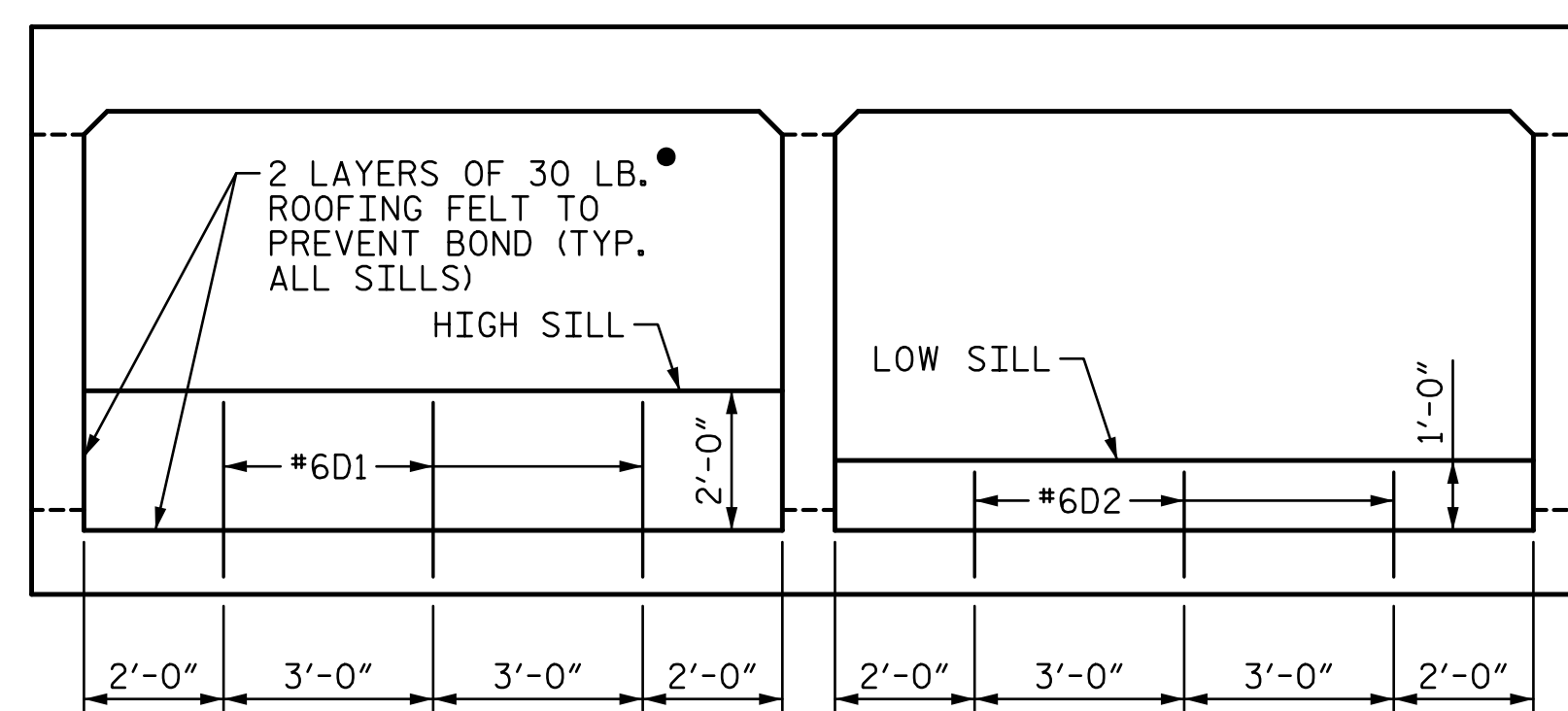


PLAN VIEW - LOCATION OF SILLS

■ NATURAL STREAM BED MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN SILLS. SEE SPECIAL PROVISION FOR "PLACEMENT OF NATURAL STREAM BED MATERIAL".



▲ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.



ELEVATION

(INLET VIEW SHOWN)

● THE COST OF THE ROOFING FELT IS INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

PROJECT NO. B-6028

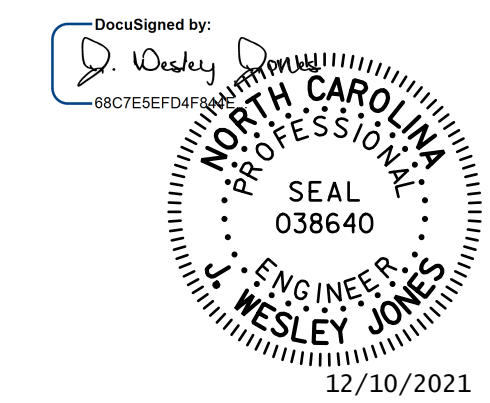
MACON COUNTY

STATION: 15+25.00 -L-

SHEET 10 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SILL DETAILS



STV 100 YEARS STV ENGINEERS, INC.  
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Charlotte, NC 28202  
NC License Number F-0991

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1			3		
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C-10  
TOTAL SHEETS  
14

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CHECKED BY : JAD	DATE : 9-17
DESIGN ENGINEER OF RECORD : JWJ	DATE : 12-21

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**NOTES**

- THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
  - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

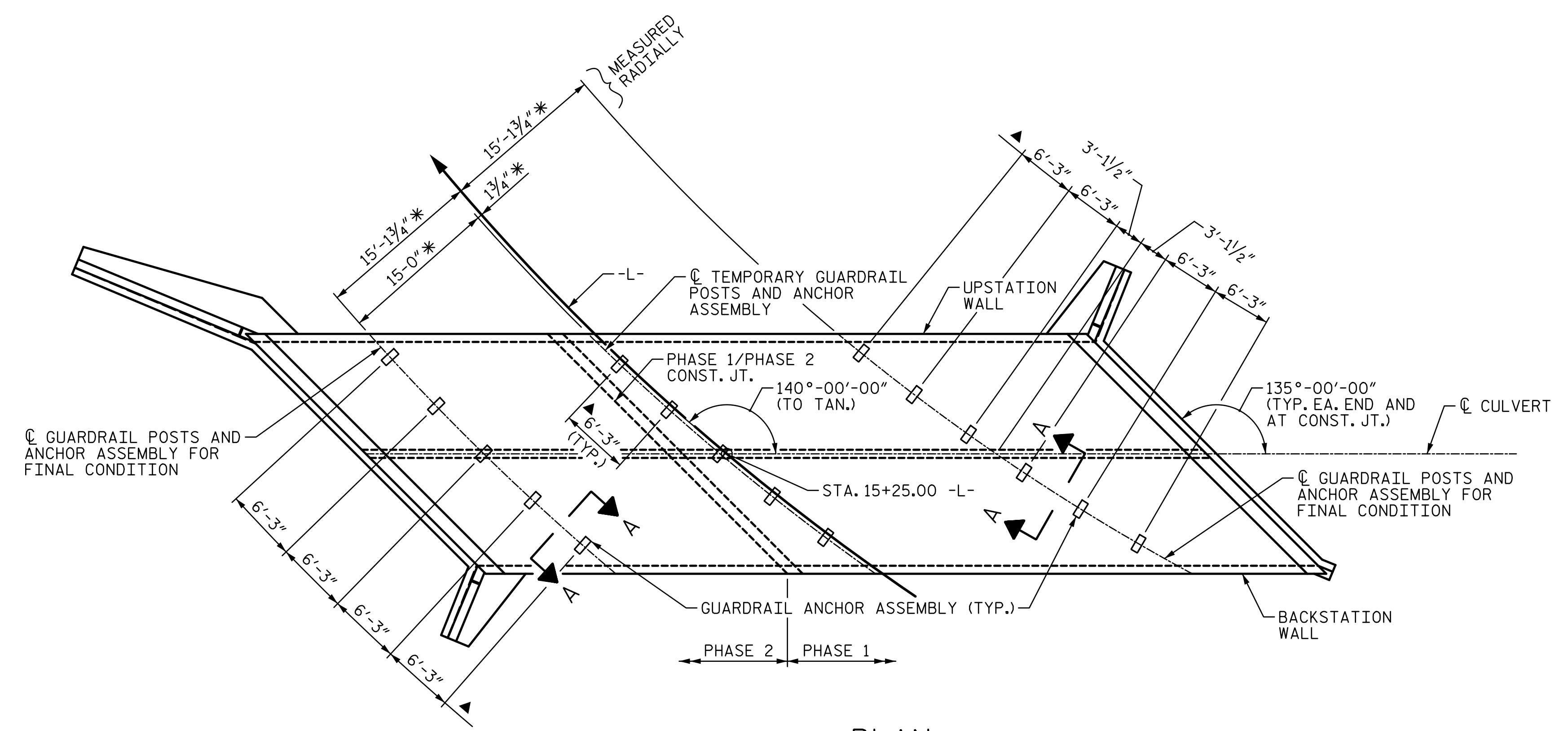
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

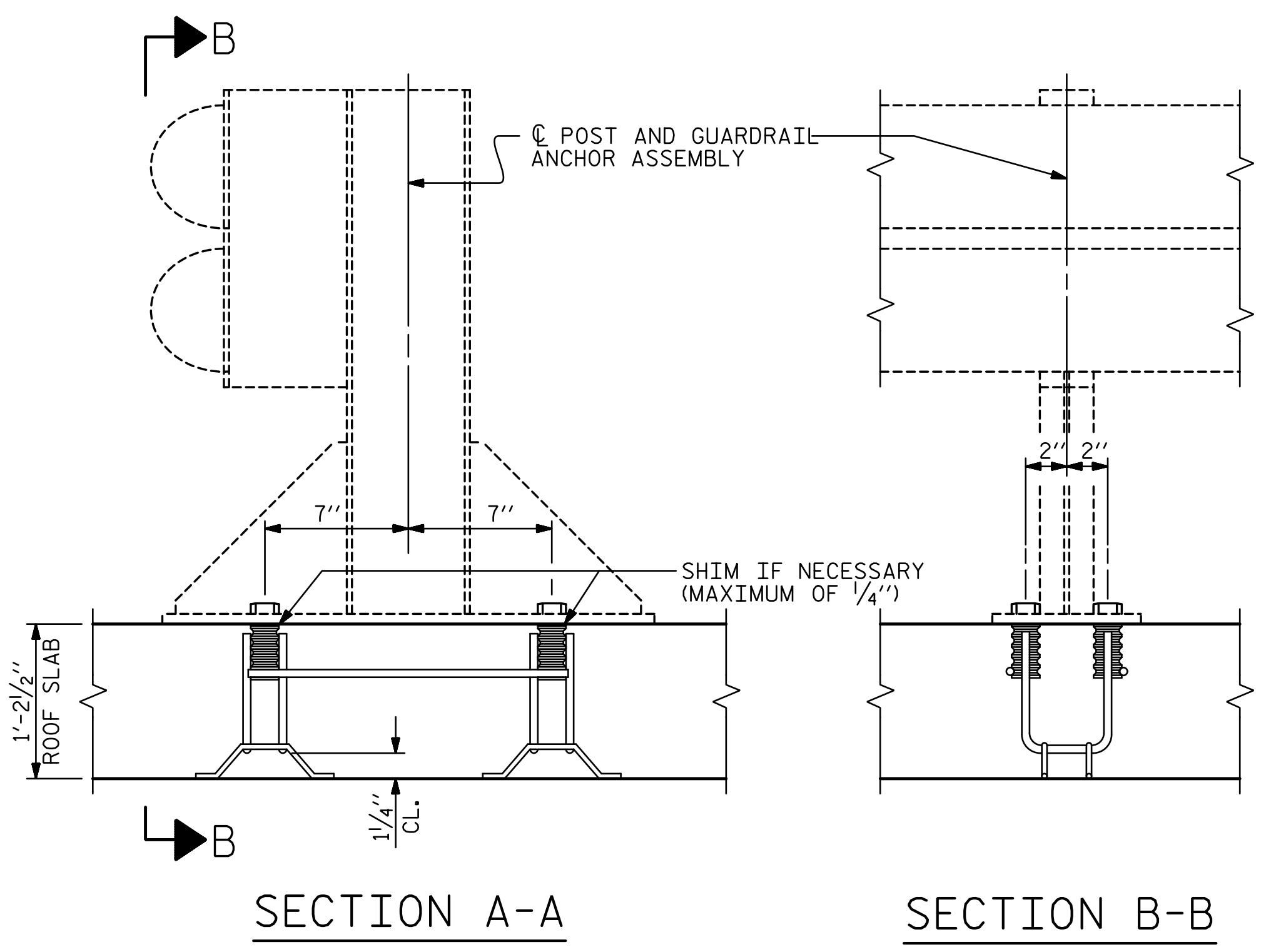
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



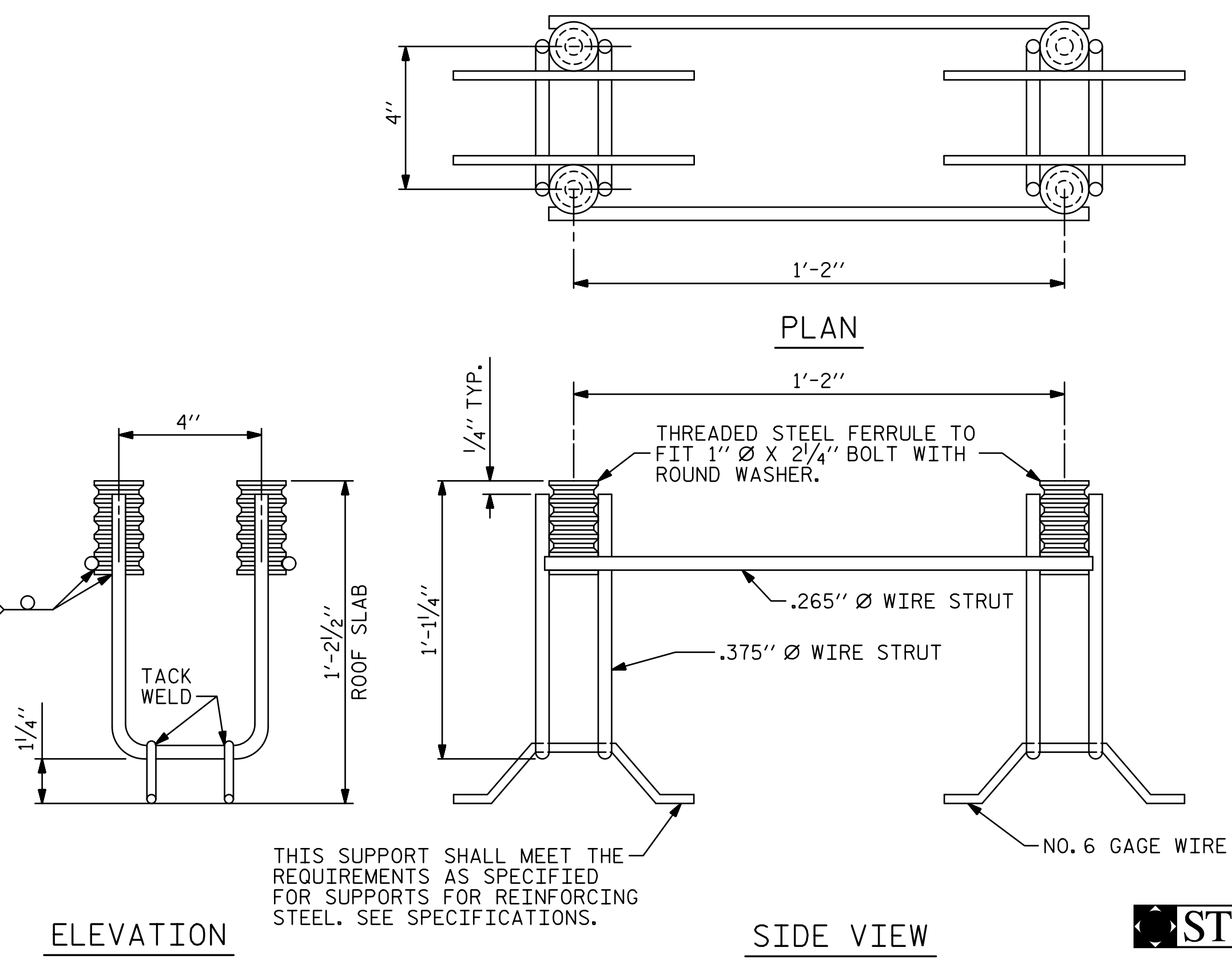
**PLAN**

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING  
 ▲ (MEASURED ALONG C GUARDRAIL POST AND ANCHOR ASSEMBLY)  
 \* THIS DIMENSION TO BE CONFIRMED BY THE ENGINEER IN THE FIELD.



**SECTION A-A**

**SECTION B-B**

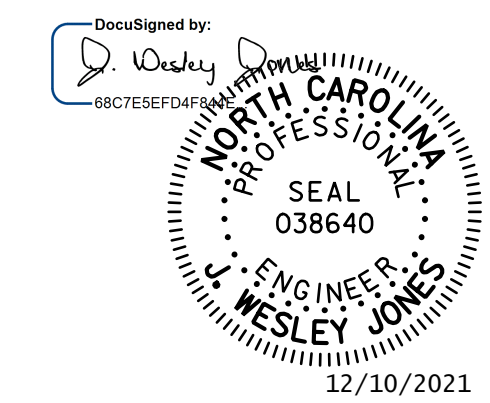


**ELEVATION**

**SIDE VIEW**

**GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS**

ASSEMBLED BY : LEM	DATE : 8-17
CHECKED BY : JAD	DATE : 8-17
DESIGN ENGINEER OF RECORD : JWJ	DATE : 9-18
DRAWN BY : FCJ 6/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 6/88	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM



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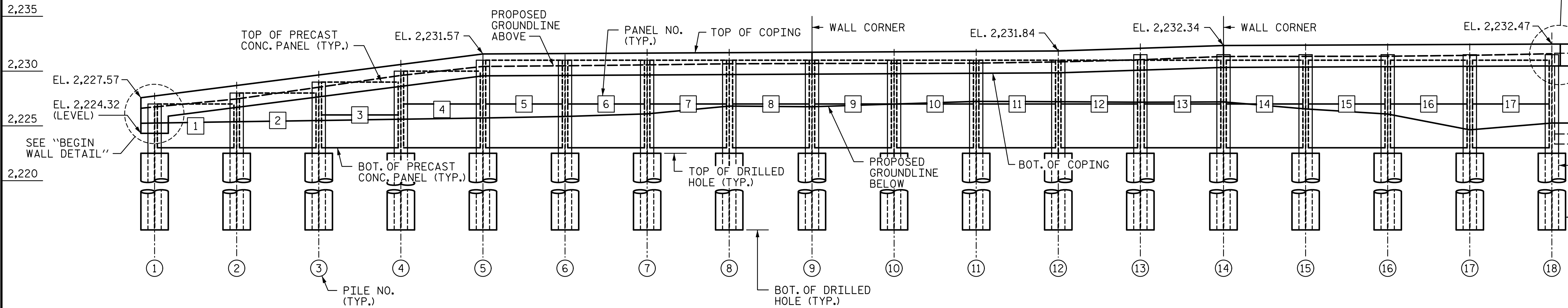
PROJECT NO. B-6028  
MACON COUNTY  
 STATION: 15+25.00 -L-  
 SHEET 11 OF 11

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ANCHORAGE DETAILS FOR  
 GUARDRAIL ANCHOR ASSEMBLY  
 FOR CULVERTS

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
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SHEET NO. C-11  
 TOTAL SHEETS 14

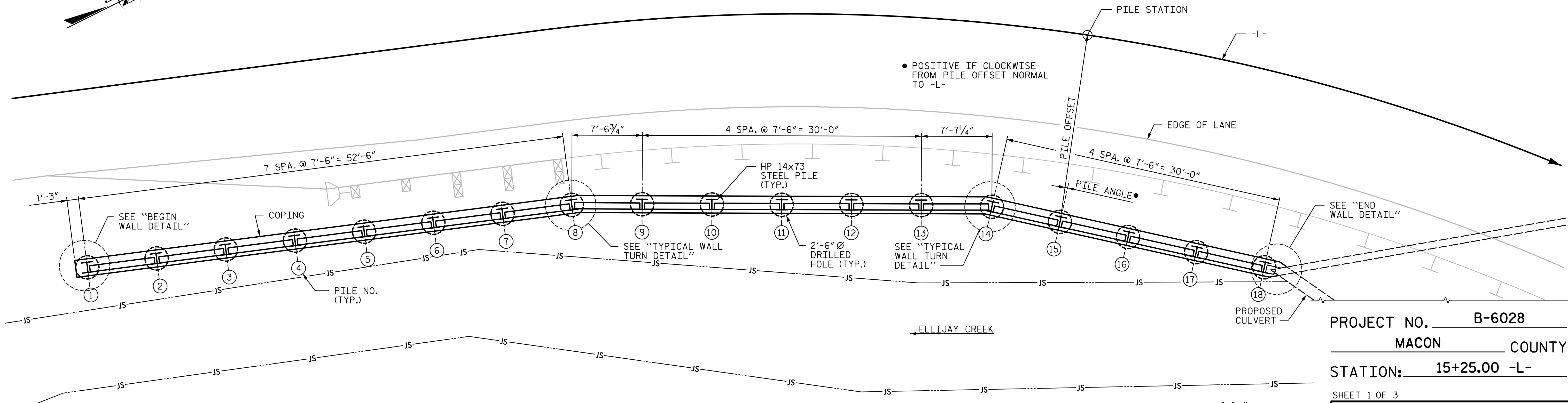
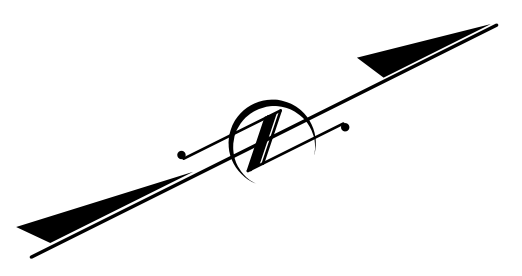




### ELEVATION

(SEE "PILE INFORMATION" TABLE ON SHEET 3 OF 3.)

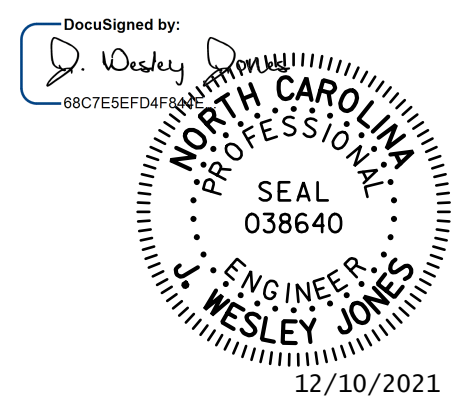
NOTE: CONTRACTOR'S ATTENTION IS DRAWN TO THE FACT THAT PILE 18 SHALL BE INSTALLED PRIOR TO POURING CONCRETE FOR THE BOX CULVERT.



### PLAN

(SOLDIER PILE RETAINING WALL STATIONS, OFFSETS, ANGLES, AND DIMENSIONS ARE AT THE CENTER OF PILES AND DRILLED HOLE.)  
 (SEE "PILE INFORMATION" TABLE ON SHEET 3 OF 3.)

PROJECT NO. **B-6028**  
**MACON** COUNTY  
 STATION: **15+25.00 -L-**  
 SHEET 1 OF 3



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RAI FTGH					
<b>SOLDIER PILE RETAINING WALL</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					W-1
TOTAL SHEETS					14

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### PANEL INFORMATION

PANEL NO.	BOT. OF PANEL ELEV.	TOP OF PANEL ELEV.	HEIGHT	NO. OF PANELS ◆		
				3' PANEL	4' PANEL	5' PANEL
1	2223.00	2227.00	4.00		1	
2	2223.00	2228.00	5.00			1
3	2223.00	2229.00	6.00	2		
4	2223.00	2230.00	7.00	1	1	
5	2223.00	2231.00	8.00		2	
6	2223.00	2231.00	8.00		2	
7	2223.00	2231.00	8.00		2	
8	2223.00	2231.00	8.00		2	
9	2223.00	2231.00	8.00		2	
10	2223.00	2231.00	8.00		2	
11	2223.00	2231.00	8.00		2	
12	2223.00	2231.00	8.00		2	
13	2223.00	2231.00	8.00		2	
14	2223.00	2231.00	8.00		2	
15	2223.00	2231.00	8.00		2	
16	2223.00	2231.00	8.00		2	
17	2223.00	2231.00	8.00		2	

◆ IF 2 PANELS ARE REQUIRED TO CREATE REQUIRED PANEL HEIGHT, CONSTRUCT THE PANELS USING THE "PANEL END DETAILS".

#### 3' PRECAST PANEL (3 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#4	STR.	6'-8"	53
B2	18	#4	STR.	2'-8"	32
REINFORCING STEEL					LBS. 85
CLASS A CONCRETE					CU. YDS. 0.5

#### 4' PRECAST PANEL (28 REQUIRED)

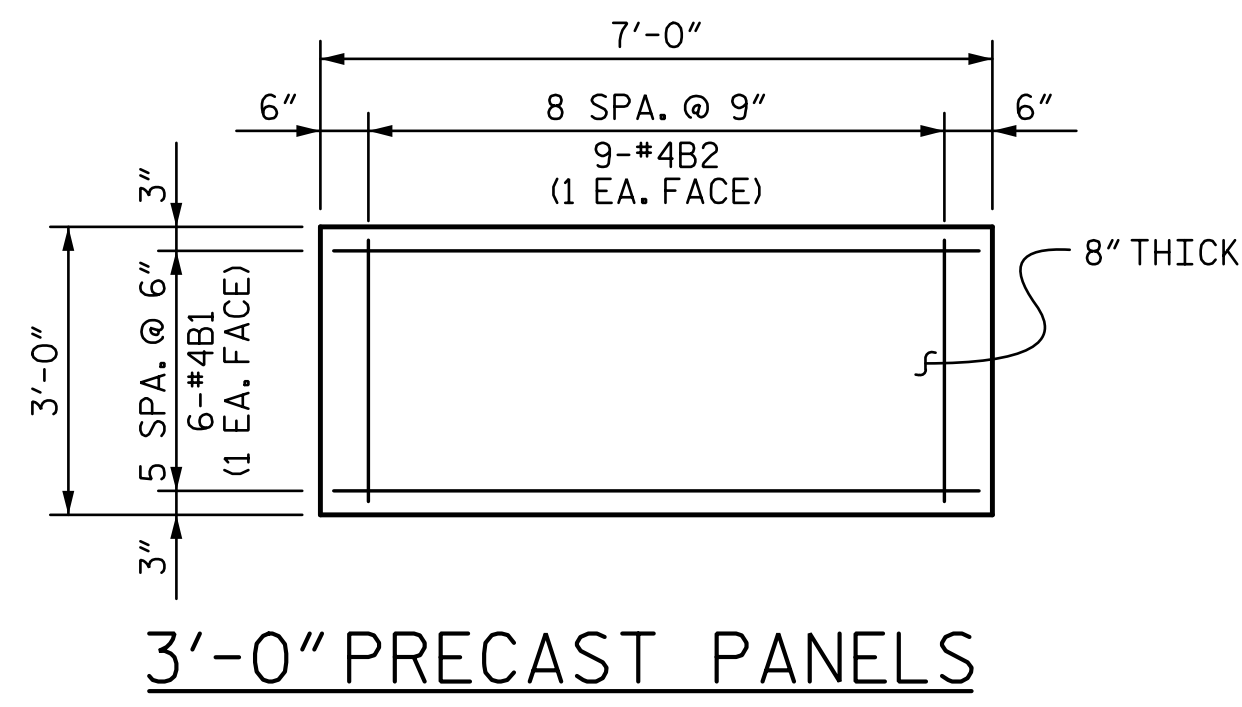
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#4	STR.	6'-8"	71
B2	18	#4	STR.	3'-8"	44
REINFORCING STEEL					LBS. 115
CLASS A CONCRETE					CU. YDS. 0.7

#### 5' PRECAST PANEL (1 REQUIRED)

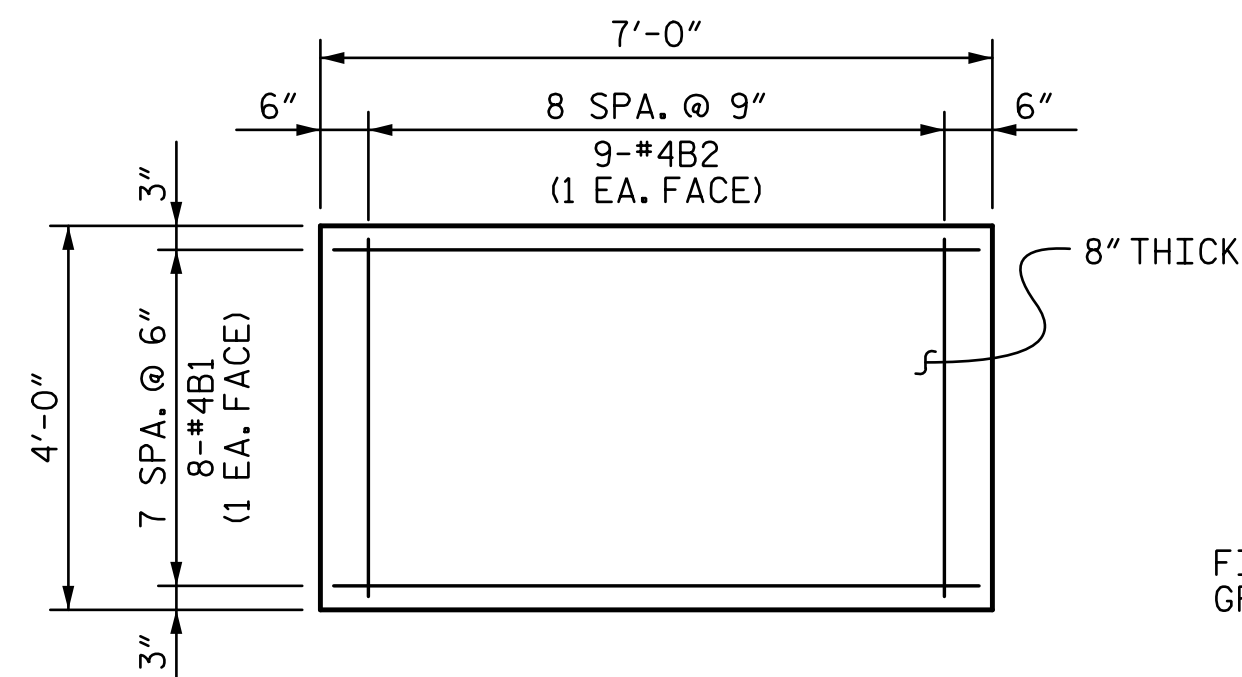
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#4	STR.	6'-8"	89
B2	18	#4	STR.	4'-8"	56
REINFORCING STEEL					LBS. 145
CLASS A CONCRETE					CU. YDS. 0.9

#### BILL OF MATERIAL

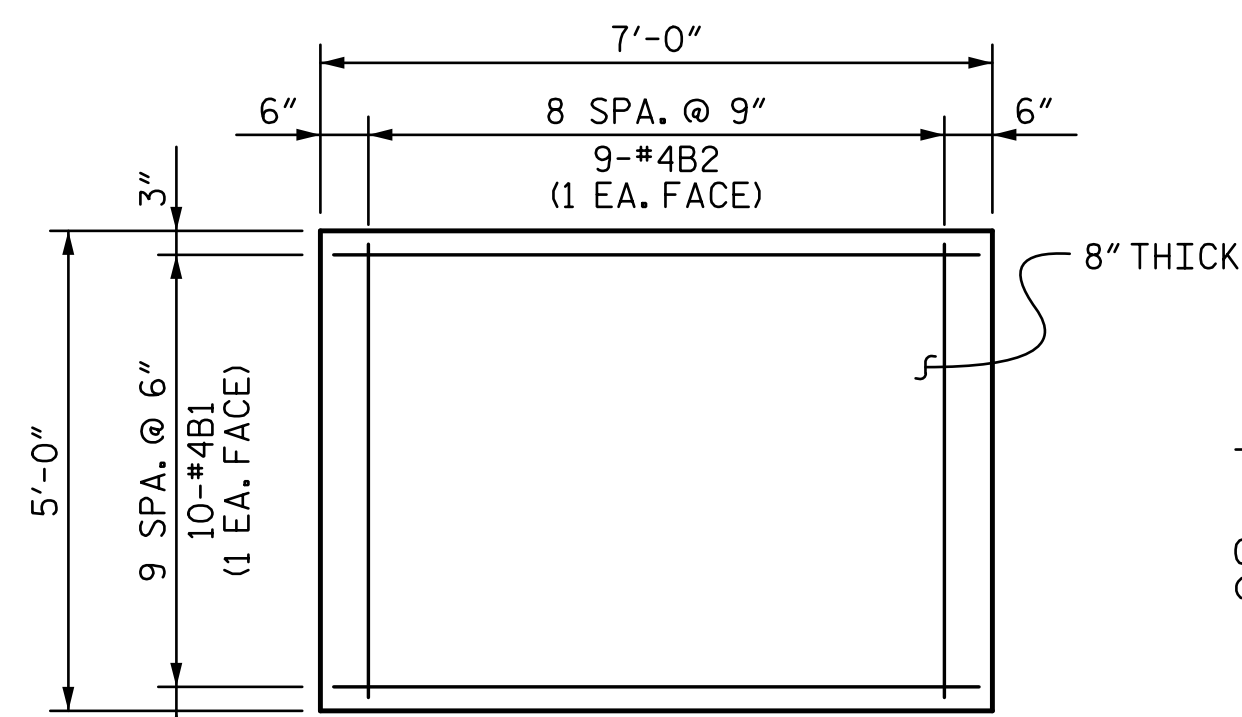
SOLDIER PILE RETAINING WALL	SQ. FT. 1,076.5
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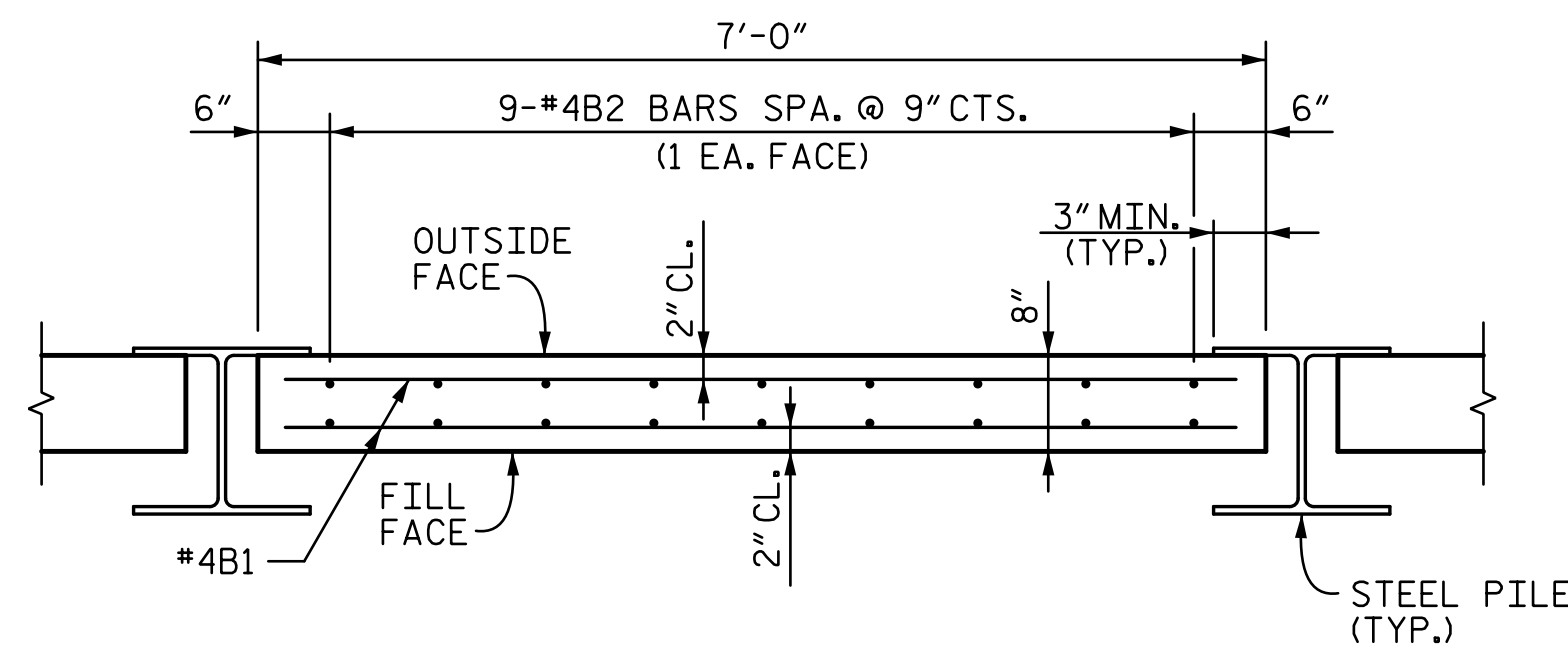
3'-0" PRECAST PANELS



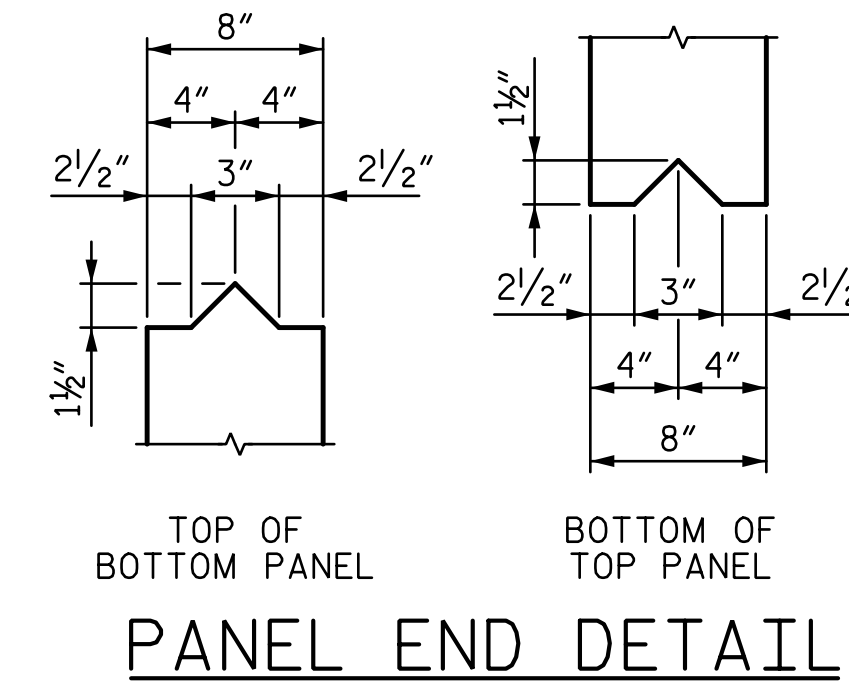
4'-0" PRECAST PANELS



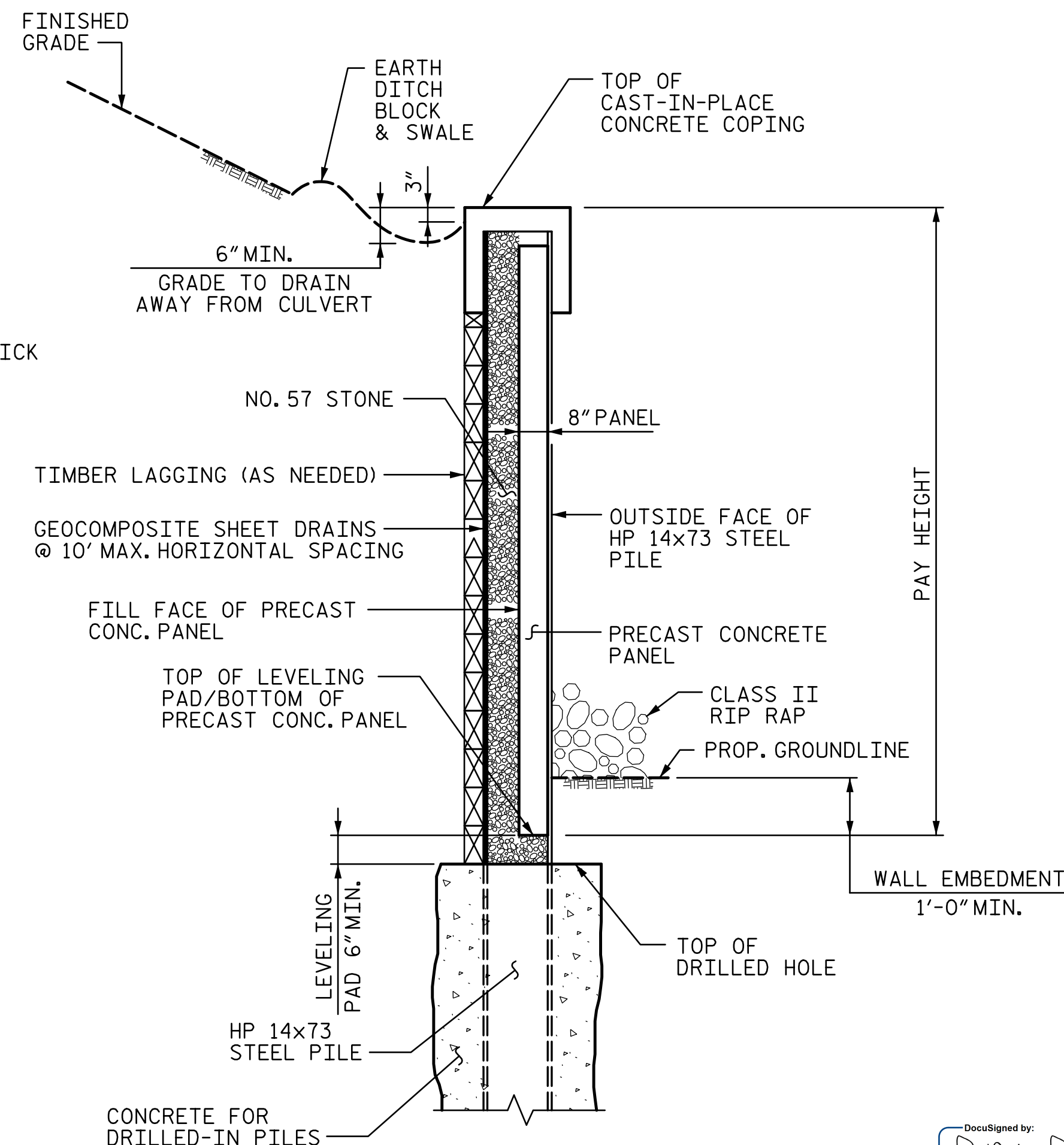
5'-0" PRECAST PANELS



TYPICAL SECTION THRU PRECAST CONCRETE PANEL



PANEL END DETAIL



TYPICAL SECTION OF SOLDIER PILE RETAINING WALL

### NOTES:

ALL PILES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONTRACTOR SHALL FIELD VERIFY THAT THERE ARE NO CONFLICTS BETWEEN WALL SYSTEM AND EXISTING UTILITIES PRIOR TO INSTALLING ANY PORTION OF THE WALL.

THE BASE OF EACH BOTTOM PANEL SHALL BE LEVEL.

FOR SOLDIER PILE RETAINING WALLS, SEE SOLDIER PILE RETAINING WALLS PROVISION.

DRILLED IN PILES ARE REQUIRED.

USE A SOLDIER PILE RETAINING WALL WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS.

PAINT GALVANIZED PILES GRAY OR BLACK IN ACCORDANCE WITH ARTICLE 442-12 OF THE STANDARD SPECIFICATIONS.

BEFORE BEGINNING SOLDIER PILE WALL CONSTRUCTION, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

1/2" EXPANSION JOINT MATERIAL SHALL BE PLACED EVERY 30' MAX. DO NOT PLACE EXPANSION JOINT ABOVE A PILE. IF THE LOCATION FOR THE EXPANSION DIFFERS FROM WHAT IS DETAILED, THE CONTRACTOR IS RESPONSIBLE FOR FITTING REINFORCING STEEL IN COPING SUCH THAT 2" CL. IS MAINTAINED FROM THE EXPANSION JOINT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

PROJECT NO. B-6028

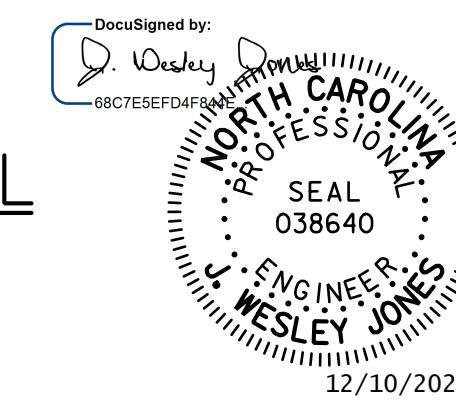
MACON COUNTY

STATION: 15+25.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RAI FTGH

## SOLDIER PILE RETAINING WALL



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TOTAL SHEETS 14

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DRAWN BY : TJT DATE : 11-17  
CHECKED BY : JTG DATE : 11-17  
DESIGN ENGINEER OF RECORD : JWJ DATE : 9-18

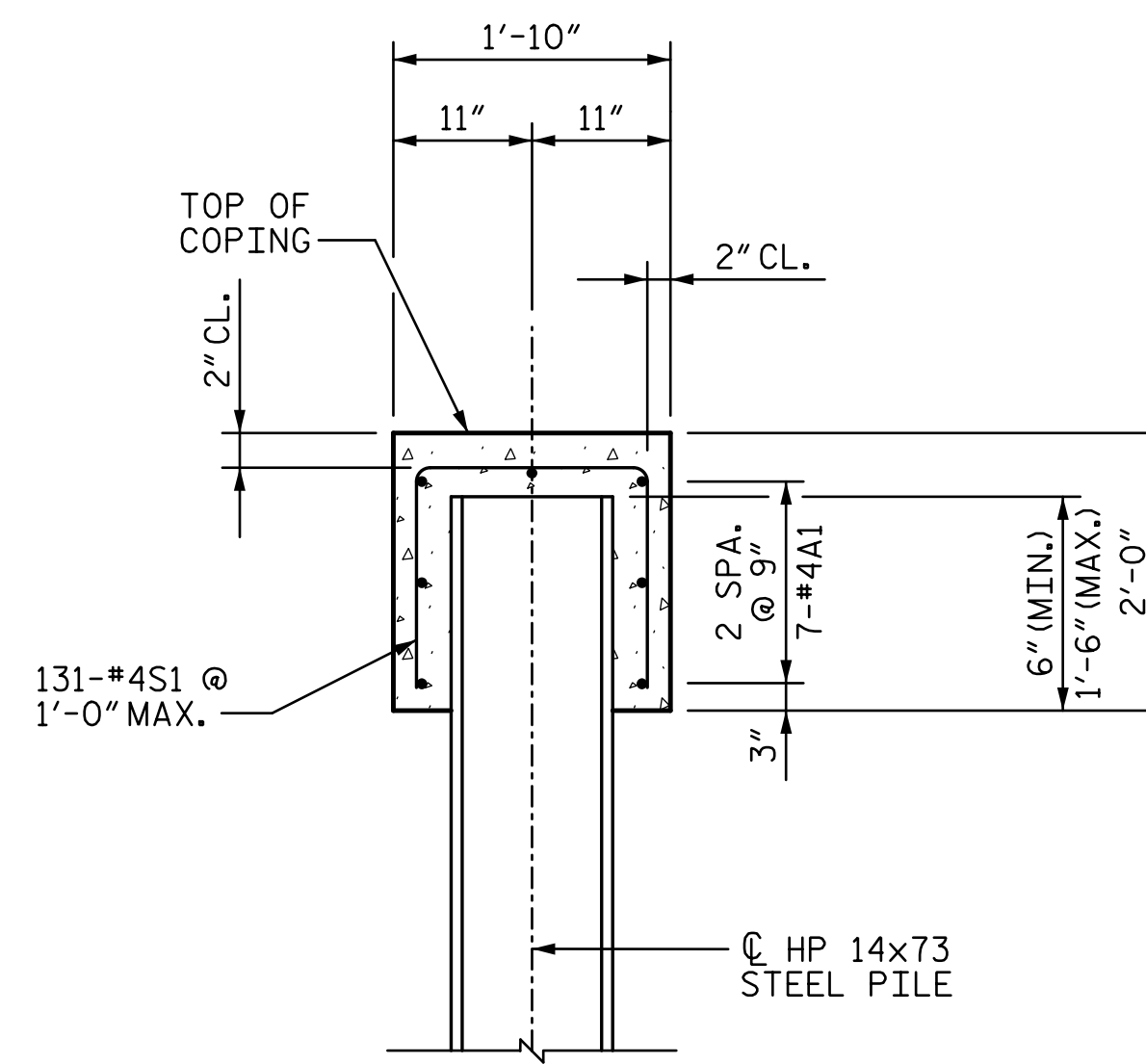


### PILE INFORMATION

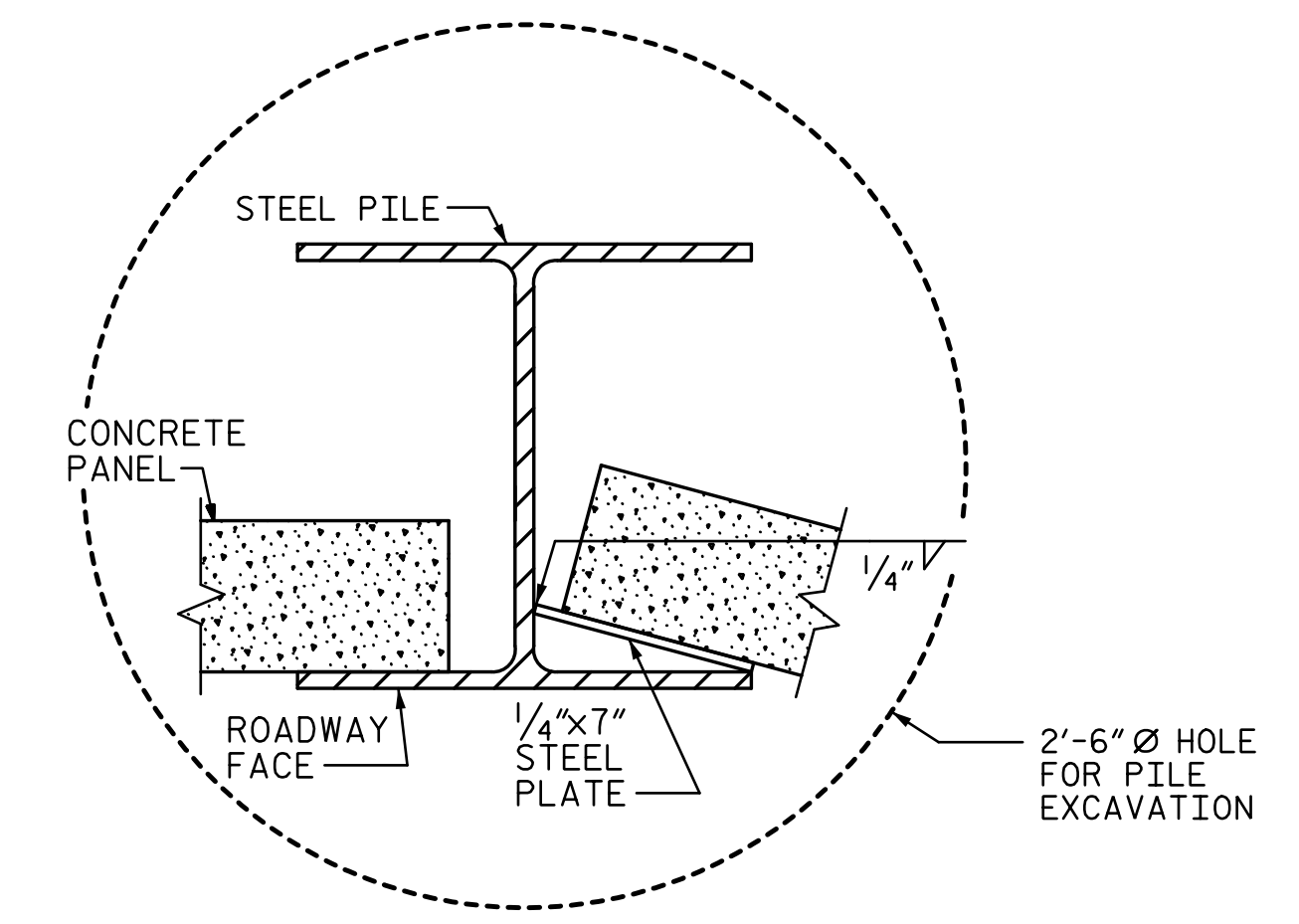
PILE NO.	PILE SIZE	STATION ▲	OFFSET ▲	ANGLE ▲	TOP OF COPING ELEV.	TOP OF PILE ELEV.	TOP OF 2'-6" Ø EXCAVATION	BOT. OF PILE DRILLED HOLE ELEV. ■	TOTAL PILE LENGTH (FT.)
1	HP 14x73	13+33.05	19.06'	00°-00'-00"	2227.73	2227.00	2222.50	2197.50	29.50
2	HP 14x73	13+40.55	19.06'	00°-00'-00"	2228.69	2228.00	2222.50	2197.50	30.50
3	HP 14x73	13+48.05	19.06'	00°-00'-00"	2229.65	2229.00	2222.50	2197.50	31.50
4	HP 14x73	13+55.55	19.06'	00°-00'-00"	2230.61	2230.00	2222.50	2197.50	32.50
5	HP 14x73	13+63.05	19.06'	00°-00'-00"	2231.57	2231.00	2222.50	2197.50	33.50
6	HP 14x73	13+70.55	19.06'	00°-00'-00"	2231.61	2231.00	2222.50	2197.50	33.50
7	HP 14x73	13+78.05	19.06'	00°-00'-00"	2231.65	2231.00	2222.50	2197.50	33.50
8	HP 14x73	13+85.64	19.06'	00°-16'-10"	2231.69	2231.00	2222.50	2197.50	33.50
9	HP 14x73	13+93.92	19.79'	05°-04'-07"	2231.72	2231.00	2222.50	2197.50	33.50
10	HP 14x73	14+02.17	20.31'	02°-52'-10"	2231.76	2231.00	2222.50	2197.50	33.50
11	HP 14x73	14+10.45	20.54'	00°-39'-43"	2231.80	2231.00	2222.50	2197.50	33.50
12	HP 14x73	14+18.75	20.48'	-01°-32'-51"	2231.84	2231.00	2222.50	2197.50	33.50
13	HP 14x73	14+27.02	20.13'	-03°-45'-09"	2232.09	2231.50	2222.50	2197.50	34.00
14	HP 14x73	14+35.38	19.63'	06°-23'-04"	2232.34	2231.50	2222.50	2197.50	34.00
15	HP 14x73	14+43.61	20.32'	04°-11'-25"	2232.37	2231.50	2222.50	2197.50	34.00
16	HP 14x73	14+51.89	20.72'	01°-59'-01"	2232.41	2231.50	2222.50	2197.50	34.00
17	HP 14x73	14+60.19	20.84'	00°-13'-44"	2232.44	2231.50	2222.50	2197.50	34.00
18	HP 14x73	14+68.49	20.66'	-02°-26'-26"	2232.47	2231.50	2222.50	2197.50	34.00

▲ ALL STATIONING AND OFFSETS ARE ALONG THE C-L. OFFSET IS TO CENTER OF PILE AND DRILLED HOLE.

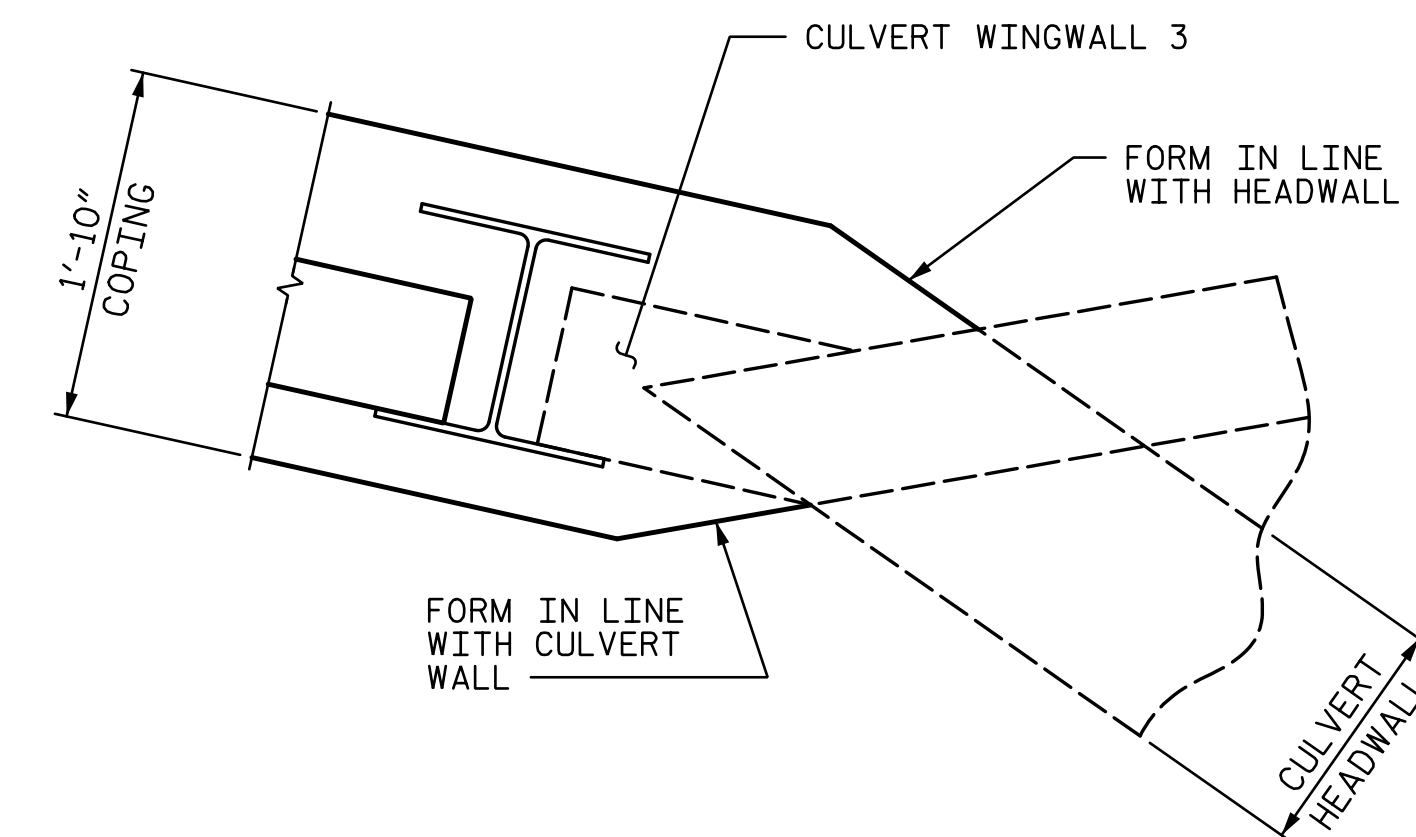
■ BOTTOM OF PILE & DRILLED HOLE ELEVATIONS ARE BASED ON A DRILLED HOLE LENGTH OF 25'. IF ROCK IS ENCOUNTERED SHALLOWER, DRILL A 4.5' ROCK SOCKET AND ADJUST THE PILE LENGTH/ELEVATION APPROPRIATELY.



COPING DETAIL



TYPICAL WALL TURN DETAIL  
(CORNER AT PILE 8 SHOWN, CORNER AT PILE 14 SIMILAR)



END WALL DETAIL

CAST-IN-PLACE COPING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
◆ A1	35	#4	STR.	26'-6"	620
H1	7	#4	STR.	2'-11"	14
S1	131	#4	①	4'-10"	423
S2	2	#4	②	5'-10"	8
REINFORCING STEEL				LBS.	1,065
CLASS A CONCRETE				CU. YDS.	15.0

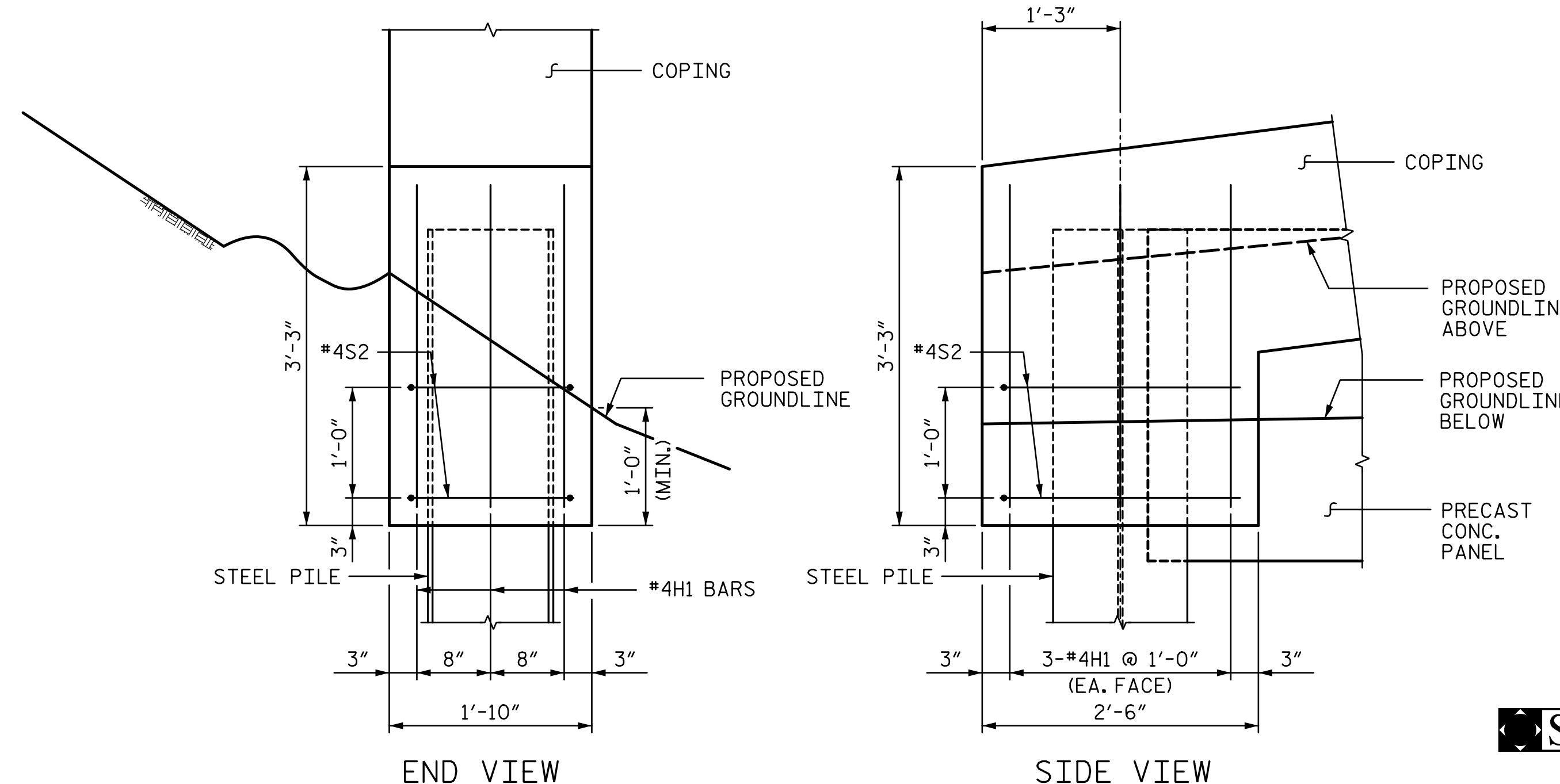
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②

DIMENSIONS ARE OUT-TO-OUT

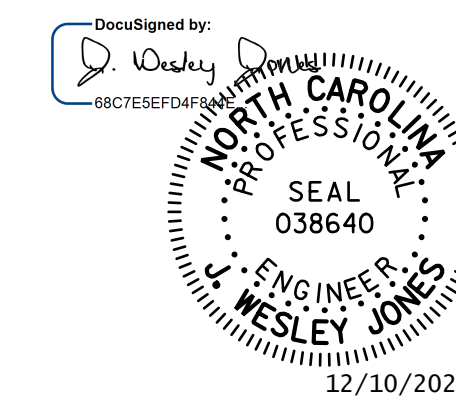
◆ COPING REINFORCEMENT LENGTH IS BASED ON 27'-0" LONG SEGMENTS.

IF THE CONTRACTOR ELECTS TO PLACE CONSTRUCTION JOINTS AT ANY OTHER INTERVALS, REINFORCEMENT SHALL BE ADJUSTED ACCORDINGLY AT NO ADDITIONAL COST.



BEGIN WALL DETAIL

PROJECT NO. B-6028  
MACON COUNTY  
 STATION: 15+25.00 -L-  
 SHEET 3 OF 3



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1			3		
2			4		

W-3  
TOTAL SHEETS 14

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A  $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

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