

### HYDRAULIC DATA

DESIGN DISCHARGE ----- = 733 CFS  
FREQUENCY OF DESIGN FLOOD ----- = 10 YR.  
DESIGN HIGH WATER ELEVATION ----- = 534.6  
DRAINAGE AREA ----- = 3.00 SQ. MI.  
BASE DISCHARGE (Q<sub>100</sub>) ----- = 1564 CFS  
BASE HIGH WATER ELEVATION ----- = 537.52

TOTAL STRUCTURE QUANTITIES			
CLASS A CONCRETE			
BARREL @	3,126	C.Y./FT.	129.7
WINGS, SILLS, ETC.			30.6
TOTAL			160.3
REINFORCING STEEL			
BARRELS, SILLS & HEADWALLS			17,786
WINGS			1,506
TOTAL			19,292
CULVERT EXCAVATION			LUMP SUM
PLACEMENT OF NATIVE MATERIAL			LUMP SUM
REMOVAL OF EXSITING STRUCTURE			LUMP SUM
FOUNDATION CONDITIONING MATERIAL			107 TONS

### NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 3.60 FT.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN THE CULVERTS 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 ROOF SLAB AND HEADWALLS.

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 THE WING SHEETS.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN (1 @ 24'-6") WITH A TIMBER DECK ON I-BEAMS AND A CLEAR ROADWAY OF 19'-2" ON TIMBER CAPS, POSTS AND SILLS AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+36.72".

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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 WILL BE PAID FOR BY THE CONTRACTOR.

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.

THE REQUIRED BEARING CAPACITY AT THE BASE OF THE CULVERT IS 1 TSF. THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

NATIVE MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN THE SILLS. SEE SPECIAL PROVISIONS FOR "PLACEMENT OF NATIVE MATERIAL".

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

### OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ----- = 900 CFS  
FREQUENCY OF OVERTOPPING FLOOD ----- = <25 YR.  
OVERTOPPING FLOOD ELEVATION ----- = 536.2

PROJECT NO. [REDACTED]

UNION COUNTY

STATION: 13+36.72 -L-

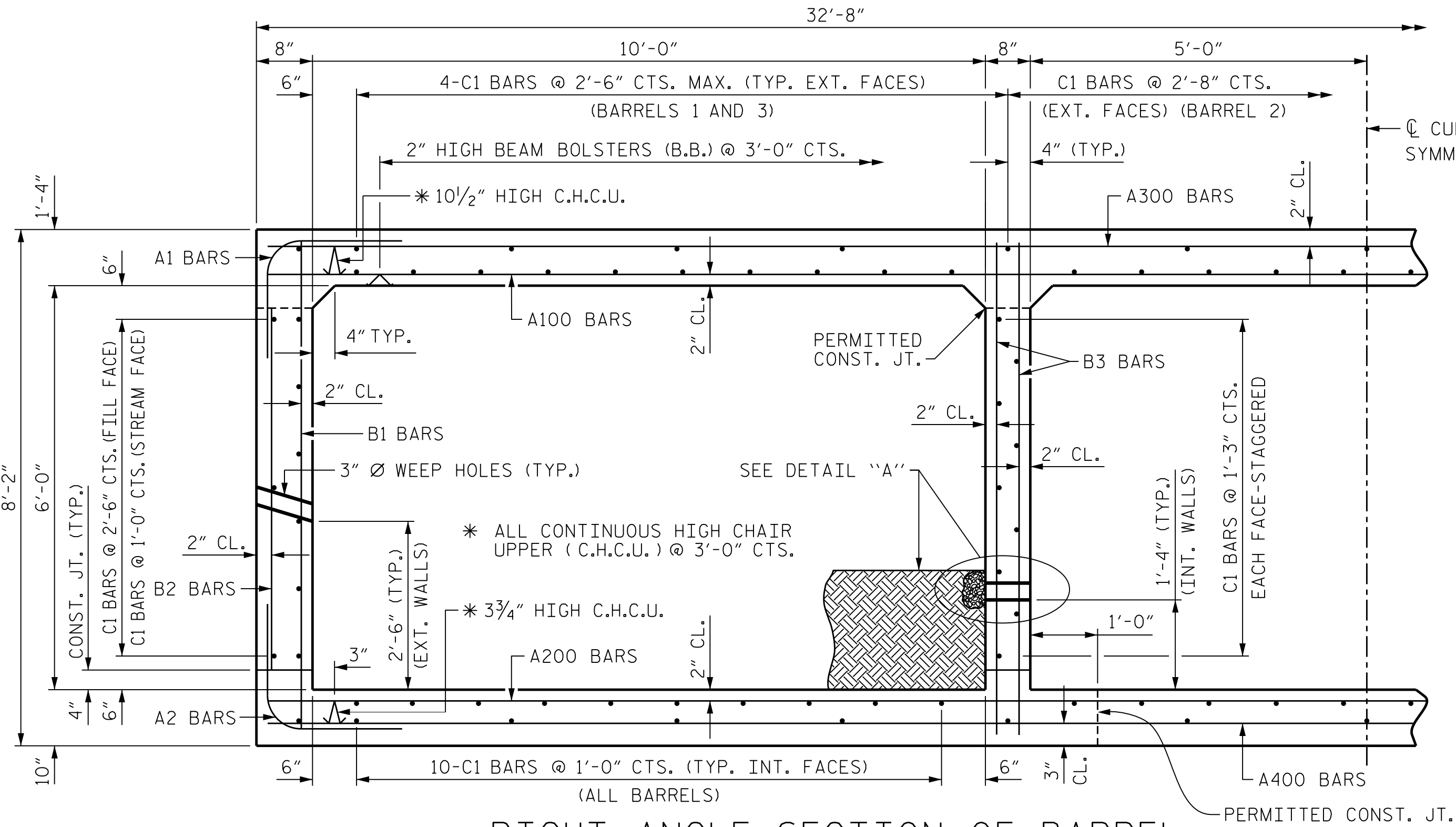
SHEET 1 OF 7 REPLACES BRIDGE NO. 410

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

TRIPLE BARREL  
10 FT. X 6 FT.  
CONCRETE BOX CULVERT  
105° SKEW

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

SHEET  
NO.  
S-01  
TOTAL  
SHEETS  
8

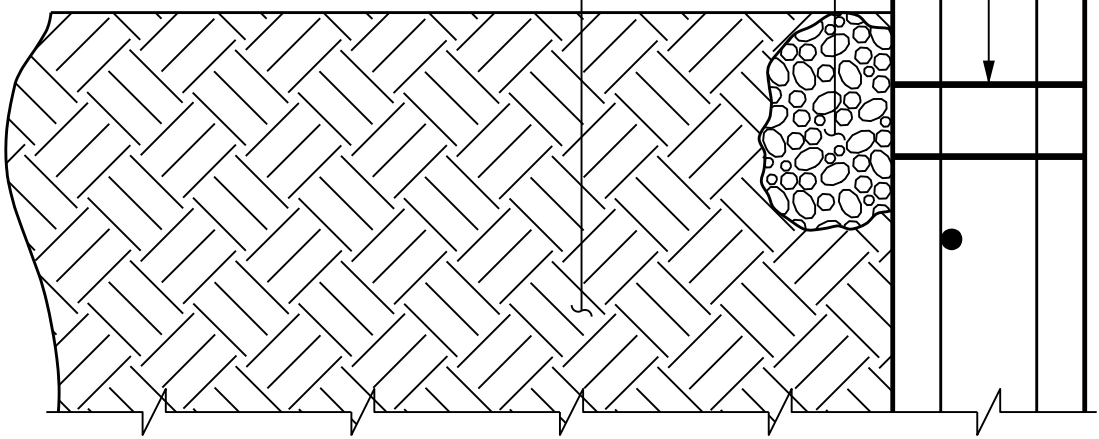


(LOOKING DOWNSTREAM)  
THERE ARE 126 "C" BARS IN SECTION OF BARREL

I Hereby Certify These Plans  
Are The As-Built Plans

ONE CUBIC FOOT OF #78 STONE IN  
BAG OF POROUS FABRIC SECURELY TIED.  
USE AT EACH INTERIOR WALL WEEP HOLE

NATIVE MATERIAL BACKFILL  
(EXTERIOR BARRELS ONLY)  
DEPTH OF BACKFILL TO  
MATCH HEIGHT OF SILLS



DETAIL "A"  
(NOT TO SCALE)

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER	
						LIVE-LOAD, FACTORS (γ <sub>LL</sub> )	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	⬡1	1.07	--	1.75	1.64	1	TOP SLAB	4.60	1.07	1	TOP SLAB	9.65	-	
	HL-93 (OPERATING)	N/A		1.39	--	1.35	2.12	1	TOP SLAB	4.60	1.39	1	TOP SLAB	9.65	-	
	HS-20 (INVENTORY)	36.000	⬡2	1.13	40.6	1.75	1.64	1	TOP SLAB	4.60	1.13	1	TOP SLAB	9.65	-	
	HS-20 (OPERATING)	36.000		1.47	52.9	1.35	2.12	1	TOP SLAB	4.60	1.47	1	TOP SLAB	9.65	-	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.00	40.5	1.40	3.00	1	TOP SLAB	4.60	3.23	1	TOP SLAB	9.65	-
		SNGARBS2	20.000		2.80	56.0	1.40	2.80	1	TOP SLAB	4.60	2.96	1	TOP SLAB	9.65	-
		SNAGRIS2	22.000		2.73	60.6	1.40	2.99	1	TOP SLAB	4.60	2.73	1	BOTTOM SLAB	10.07	-
		SNCOTTS3	27.250		1.43	38.9	1.40	2.06	1	TOP SLAB	4.60	1.43	1	TOP SLAB	9.65	-
		SNAGGRS4	34.925		1.73	60.4	1.40	2.18	1	BOTTOM SLAB	10.67	1.73	1	BOTTOM SLAB	10.07	-
		SNS5A	35.550		1.69	60.0	1.40	2.15	1	BOTTOM SLAB	10.67	1.69	1	TOP SLAB	9.65	-
		SNS6A	39.950		1.52	60.7	1.40	1.95	1	BOTTOM SLAB	10.67	1.52	1	BOTTOM SLAB	10.07	-
		SNS7B	42.000		1.45	60.9	1.40	1.86	1	BOTTOM SLAB	10.67	1.45	1	BOTTOM SLAB	10.07	-
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.84	60.7	1.40	2.36	1	BOTTOM SLAB	10.67	1.84	1	BOTTOM SLAB	10.07	-
		TNT4A	33.075		1.79	59.2	1.40	2.38	1	BOTTOM SLAB	10.67	1.79	1	TOP SLAB	9.65	-
		TNT6A	41.600		1.46	60.7	1.40	1.86	1	BOTTOM SLAB	10.67	1.46	1	BOTTOM SLAB	10.07	-
		TNT7A	42.000		1.52	63.8	1.40	1.97	1	BOTTOM SLAB	10.67	1.52	1	BOTTOM SLAB	10.07	-
		TNT7B	42.000		1.52	63.8	1.40	2.00	1	BOTTOM SLAB	10.67	1.52	1	BOTTOM SLAB	10.07	-
		TNAGRIT4	43.000		1.41	60.6	1.40	1.84	1	BOTTOM SLAB	10.67	1.41	1	BOTTOM SLAB	10.07	-
		TNAGT5A	45.000	⬡3	1.34	60.3	1.40	1.74	1	BOTTOM SLAB	10.67	1.34	1	BOTTOM SLAB	10.07	-
		TNAGT5B	45.000	⬡3	1.34	60.3	1.40	1.72	1	BOTTOM SLAB	10.67	1.34	1	BOTTOM SLAB	10.07	-

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.

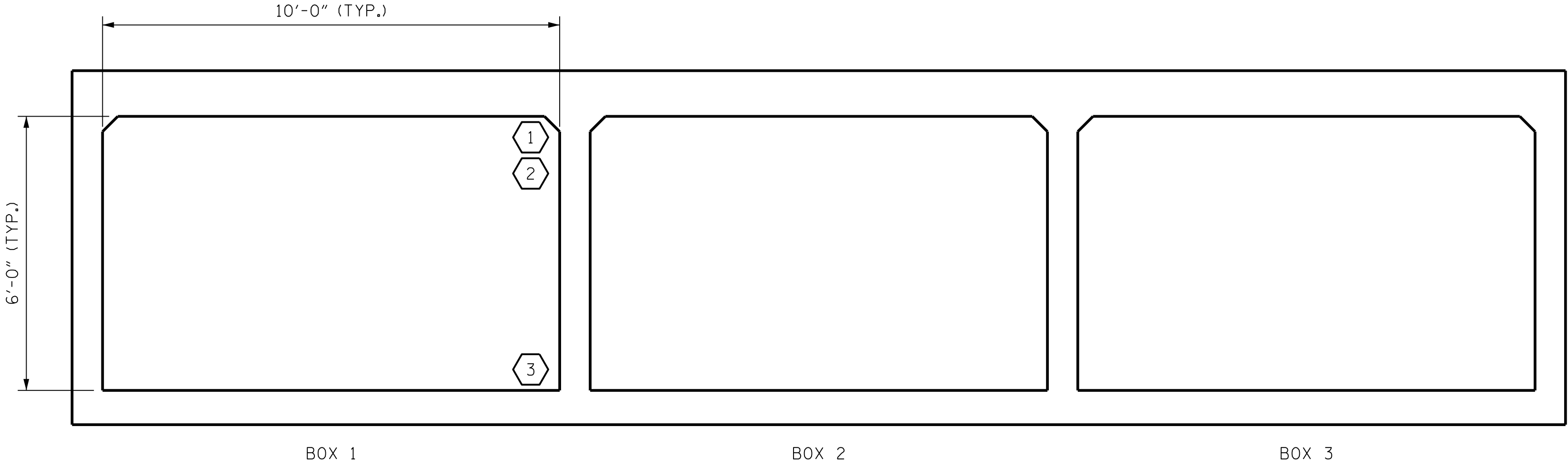
⬡# CONTROLLING LOAD RATING

⬡1 DESIGN LOAD RATING (HL-93)

⬡2 DESIGN LOAD RATING (HS-20)

⬡3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE



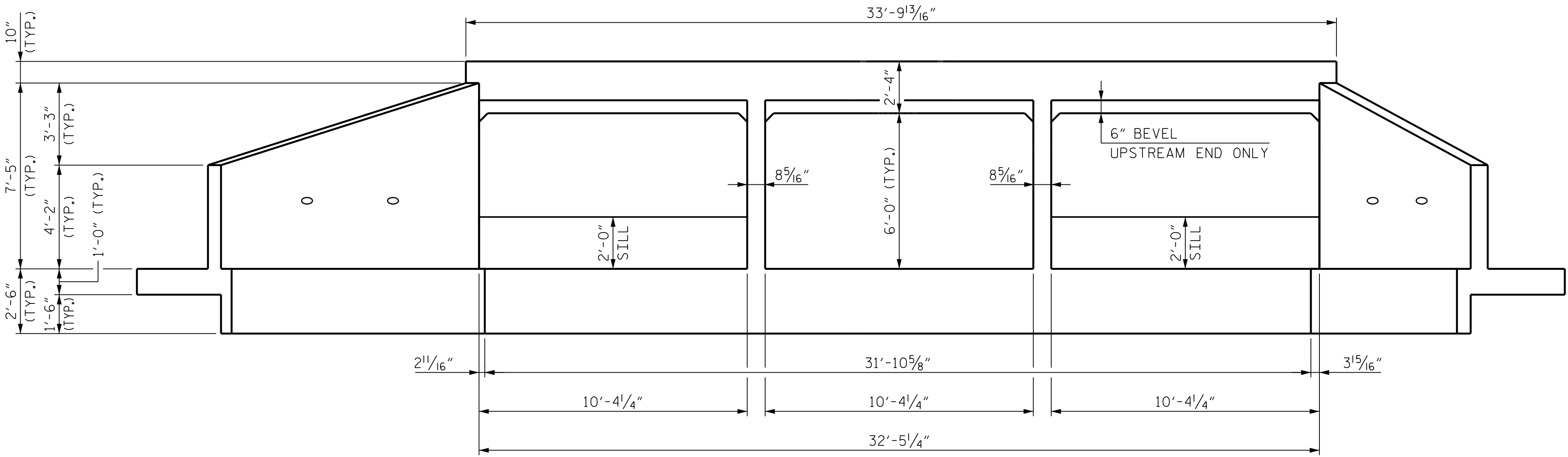
PROJECT NO. [REDACTED]  
UNION COUNTY  
STATION: 13+36.72 -L-

SHEET 2 OF 7

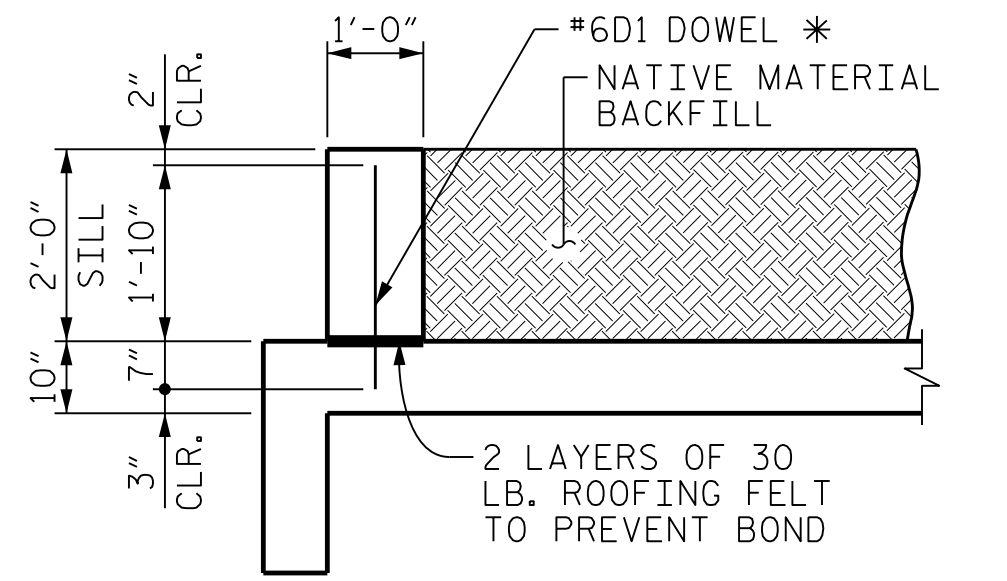
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
TRIPLE BARREL  
10 FT. X 6 FT.  
CONCRETE BOX CULVERT  
105° SKEW

REVISIONS					SHEET NO. S-02
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS 8
2			4		



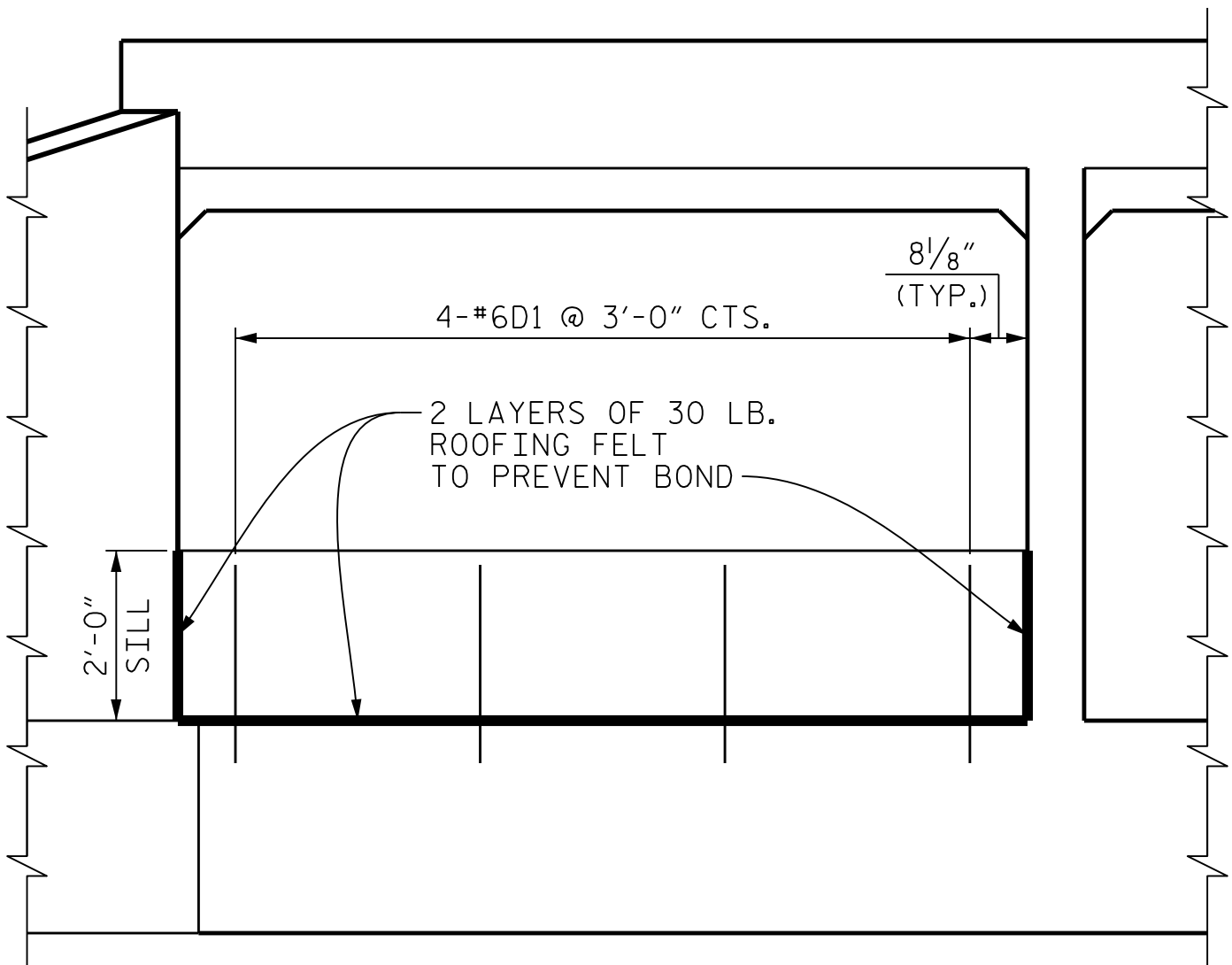


INLET END ELEVATION NORMAL TO SKEW



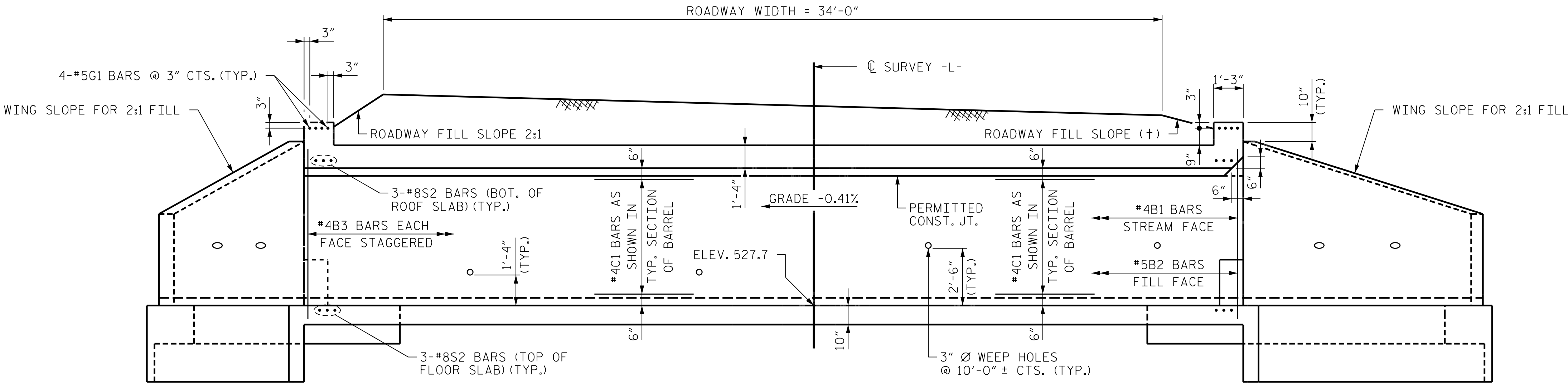
\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

SECTION THRU SILL



END ELEVATION NORMAL TO SKEW  
(LOOKING DOWNSTREAM)

CULVERT SILL DETAILS



INTERIOR WALL

EXTERIOR WALL

CULVERT SECTION NORMAL TO ROADWAY

(+) SLOPE AS NEEDED TO OBTAIN 9" FILL DEPTH AT FILL FACE OF HEADWALL OR AS DIRECTED BY THE ENGINEER.

I Hereby Certify These Plans  
Are The As-Built Plans

PROJECT NO. [REDACTED]

UNION COUNTY

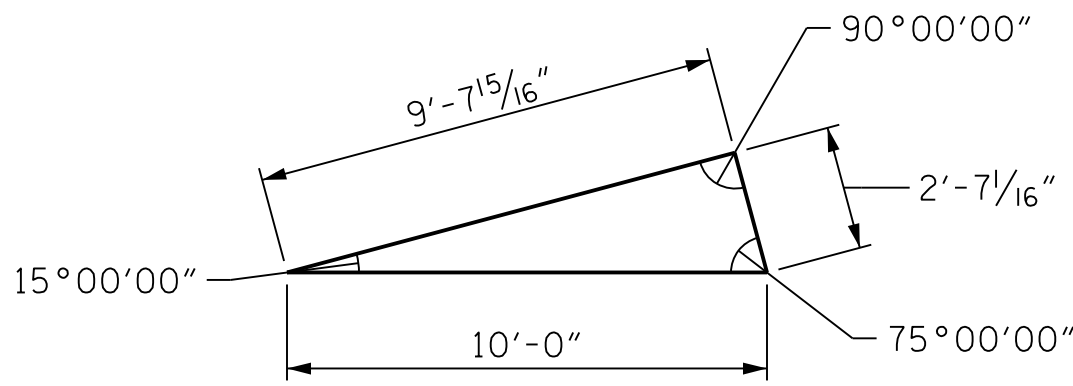
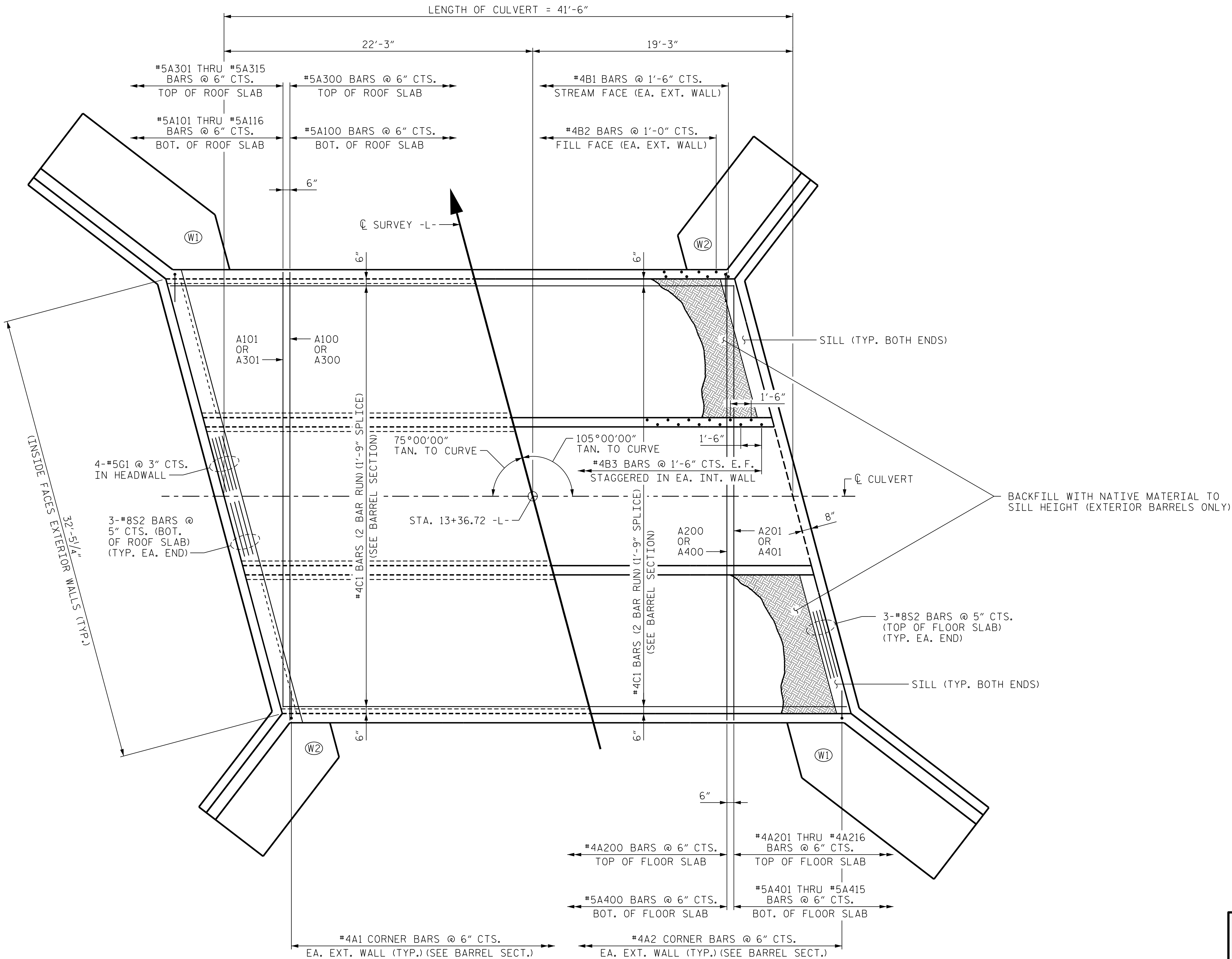
STATION: 13+36.72 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

TRIPLE BARREL  
10 FT. X 6 FT.  
CONCRETE BOX CULVERT  
105° SKEW

REVISIONS						SHEET NO. S-03
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 8
2			4			



SKIEW TRIANGLE

PROJECT NO. [REDACTED]

UNION COUNTY

STATION: 13+36.72 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

TRIPLE BARREL  
10 FT. X 6 FT.  
CONCRETE BOX CULVERT  
105° SKEW

REVISIONS						SHEET NO. S-04
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 8
2			4			



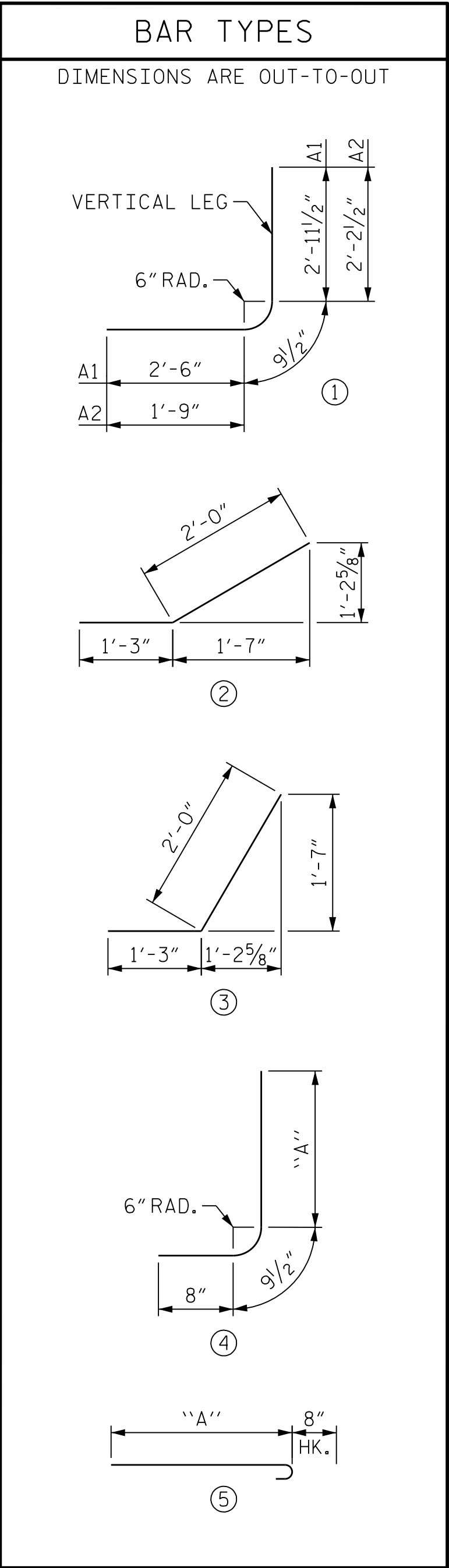


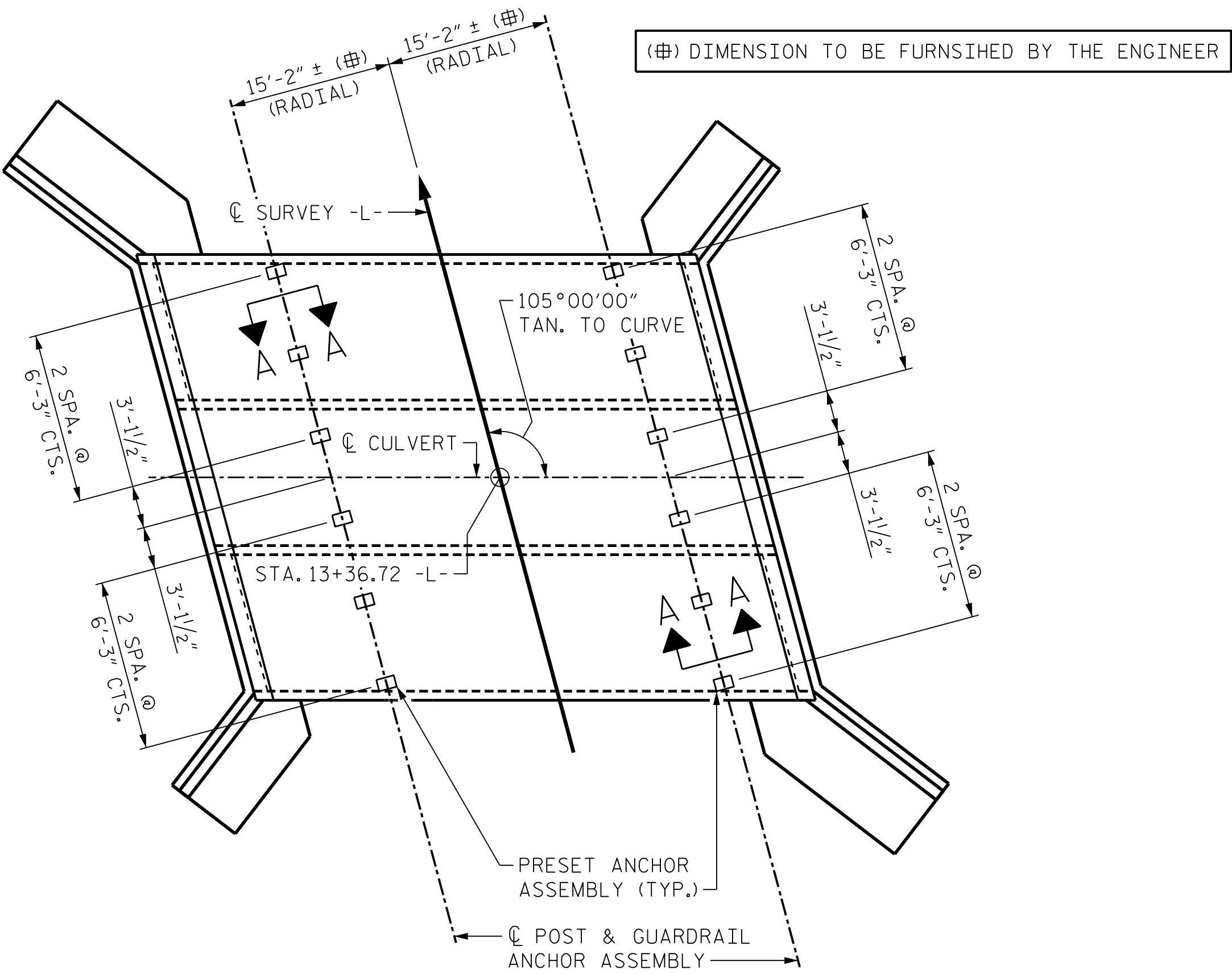
CULVERT BARREL					
REINFORCING STEEL BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	166	#4	1	6'-3"	693
A2	166	#4	1	4'-9"	527
A100	66	#5	STR.	32'-4"	2,226
A101	2	#5	STR.	30'-9"	64
A102	2	#5	STR.	28'-11"	60
A103	2	#5	STR.	27'-1"	56
A104	2	#5	STR.	25'-2"	52
A105	2	#5	STR.	23'-4"	49
A106	2	#5	STR.	21'-5"	45
A107	2	#5	STR.	19'-7"	41
A108	2	#5	STR.	17'-9"	37
A109	2	#5	STR.	15'-10"	33
A110	2	#5	STR.	14'-0"	29
A111	2	#5	STR.	12'-1"	25
A112	2	#5	STR.	10'-3"	21
A113	2	#5	STR.	8'-5"	18
A114	2	#5	STR.	6'-6"	14
A115	2	#5	STR.	4'-8"	10
A116	2	#5	STR.	2'-9"	6
A200	132	#4	STR.	17'-1"	1,506
A201	4	#4	STR.	16'-4"	44
A202	2	#4	STR.	28'-11"	39
A203	2	#4	STR.	27'-1"	36
A204	2	#4	STR.	25'-2"	34
A205	2	#4	STR.	23'-4"	31
A206	2	#4	STR.	21'-5"	29
A207	2	#4	STR.	19'-7"	26
A208	2	#4	STR.	17'-9"	24
A209	2	#4	STR.	15'-10"	21
A210	2	#4	STR.	14'-0"	19
A211	2	#4	STR.	12'-1"	16
A212	2	#4	STR.	10'-3"	14
A213	2	#4	STR.	8'-5"	11
A214	2	#4	STR.	6'-6"	9
A215	2	#4	STR.	4'-8"	6
A216	2	#4	STR.	2'-9"	4

CULVERT BARREL					
REINFORCING STEEL BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A300	66	#5	STR.	32'-4"	2,226
A301	2	#5	STR.	30'-9"	64
A302	2	#5	STR.	28'-11"	60
A303	2	#5	STR.	27'-1"	56
A304	2	#5	STR.	25'-2"	52
A305	2	#5	STR.	23'-4"	49
A306	2	#5	STR.	21'-5"	45
A307	2	#5	STR.	19'-7"	41
A308	2	#5	STR.	17'-9"	37
A309	2	#5	STR.	15'-10"	33
A310	2	#5	STR.	14'-0"	29
A311	2	#5	STR.	12'-1"	25
A312	2	#5	STR.	10'-3"	21
A313	2	#5	STR.	8'-5"	18
A314	2	#5	STR.	6'-6"	14
A315	2	#5	STR.	4'-8"	10
A400	66	#5	STR.	32'-4"	2,226
A401	2	#5	STR.	30'-9"	64
A402	2	#5	STR.	28'-11"	60
A403	2	#5	STR.	27'-1"	56
A404	2	#5	STR.	25'-2"	52
A405	2	#5	STR.	23'-4"	49
A406	2	#5	STR.	21'-5"	45
A407	2	#5	STR.	19'-7"	41
A408	2	#5	STR.	17'-9"	37
A409	2	#5	STR.	15'-10"	33
A410	2	#5	STR.	14'-0"	29
A411	2	#5	STR.	12'-1"	25
A412	2	#5	STR.	10'-3"	21
A413	2	#5	STR.	8'-5"	18
A414	2	#5	STR.	6'-6"	14
A415	2	#5	STR.	4'-8"	10
B1	84	#4	STR.	7'-9"	435
B2	84	#4	STR.	5'-1"	285
B3	116	#4	STR.	7'-9"	601
C1	252	#4	STR.	21'-6"	3,619
D1	16	#6	STR.	2'-5"	58
G1	8	#5	STR.	33'-6"	280
S2	12	#8	STR.	33'-6"	1,073
REINFORCING STEEL				LBS.	17,786

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A200	5	2'-2"
A400	5	2'-2"
C1	4	1'-9"

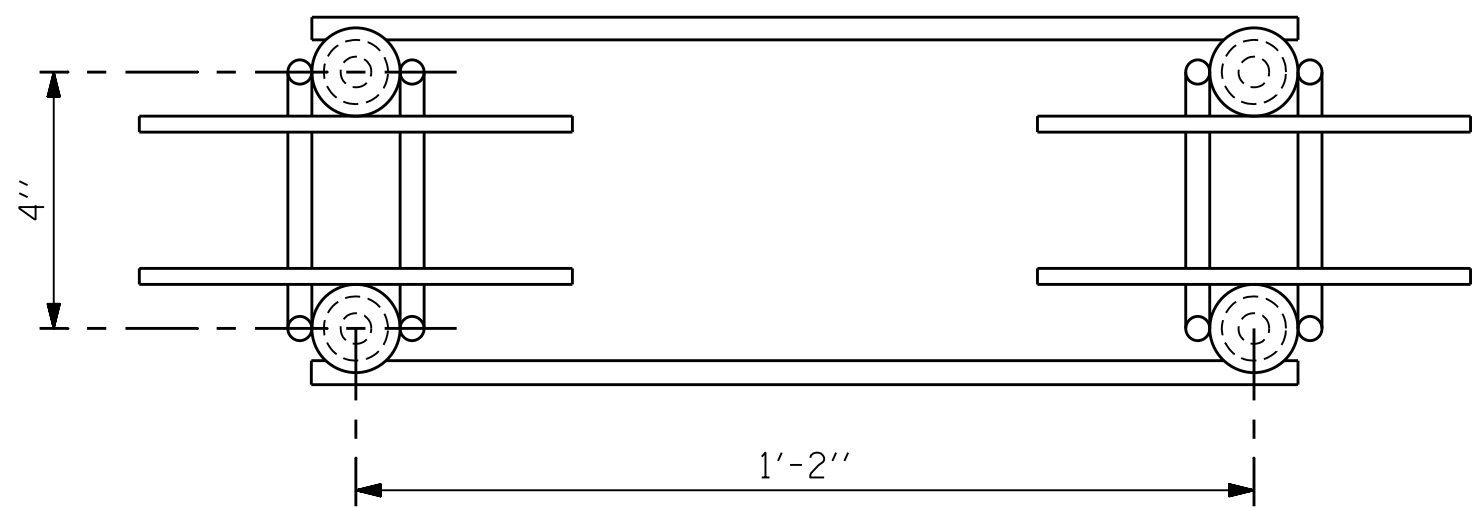
CULVERT WING WALL						
REINFORCING STEEL BAR SCHEDULE						
BAR	NO.	SIZE	TYPE	LENGTH	DIM. A	WEIGHT
H1	12	#4	STR.	10'-2"		81
H2	4	#4	STR.	6'-7"		18
H3	4	#4	STR.	10'-6"		28
H4	20	#4	2	3'-3"		43
H5	12	#4	STR.	7'-2"		57
H6	4	#4	STR.	4'-6"		12
H7	4	#4	STR.	7'-7"		20
H8	20	#4	3	3'-3"		43
N1	4	#5	4	8'-8"	7'-2½"	36
N2	2	#5	4	8'-6"	7'-0½"	18
N3	2	#5	4	8'-3"	6'-9½"	17
N4	2	#5	4	7'-11"	6'-5½"	17
N5	2	#5	4	7'-8"	6'-2½"	16
N6	2	#5	4	7'-5"	5'-11½"	15
N7	2	#5	4	7'-1"	5'-7½"	15
N8	2	#5	4	6'-10"	5'-4½"	14
N9	2	#5	4	6'-7"	5'-1½"	14
N10	2	#5	4	6'-3"	4'-9½"	13
N11	2	#5	4	6'-0"	4'-6½"	13
N12	2	#5	4	5'-9"	4'-3½"	12
N13	4	#5	4	8'-6"	7'-0½"	35
N14	2	#5	4	8'-4"	6'-10½"	17
N15	2	#5	4	8'-0"	6'-6½"	17
N16	2	#5	4	7'-7"	6'-1½"	16
N17	2	#5	4	7'-3"	5'-9½"	15
N18	2	#5	4	6'-10"	5'-4½"	14
N19	2	#5	4	6'-6"	5'-0½"	14
N20	2	#5	4	6'-1"	4'-7½"	13
N21	2	#5	4	5'-9"	4'-3½"	12
S1	12	#6	STR.	6'-0"		108
T1	6	#5	STR.	12'-0"		75
T2	6	#5	STR.	9'-0"		56
V1	4	#4	STR.	6'-7"		18
V2	2	#4	STR.	6'-6"		9
V3	2	#4	STR.	6'-2"		8
V4	2	#4	STR.	5'-11"		8
V5	2	#4	STR.	5'-8"		8
V6	2	#4	STR.	5'-4"		7
V7	2	#4	STR.	5'-1"		7
V8	2	#4	STR.	4'-10"		6
V9	2	#4	STR.	4'-6"		6
V10	2	#4	STR.	4'-3"		6
V11	2	#4	STR.	4'-0"		5
V12	2	#4	STR.	3'-8"		5
V13	4	#4	STR.	6'-6"		17
V14	2	#4	STR.	6'-3"		8
V15	2	#4	STR.	5'-11"		8
V16	2	#4	STR.	5'-7"		7
V17	2	#4	STR.	5'-2"		7
V18	2	#4	STR.	4'-10"		6
V19	2	#4	STR.	4'-5"		6
V20	2	#4	STR.	4'-1"		5
V21	2	#4	STR.	3'-8"		5
Z1	26	#6	5	6'-10"	6'-2"	267
Z2	20	#6	5	6'-1"	5'-5"	183
REINFORCING STEEL					1,506 LBS.	
FOR 4 WINGS						
CLASS A CONCRETE						
4 WINGS					19.8 CY	
2 HEADWALLS					3.8 CY	
4 CULVERT SILLS					3.1 CY	
2 END CURTAIN WALLS					3.9 CY	
					TOTAL: 30.6 CY	



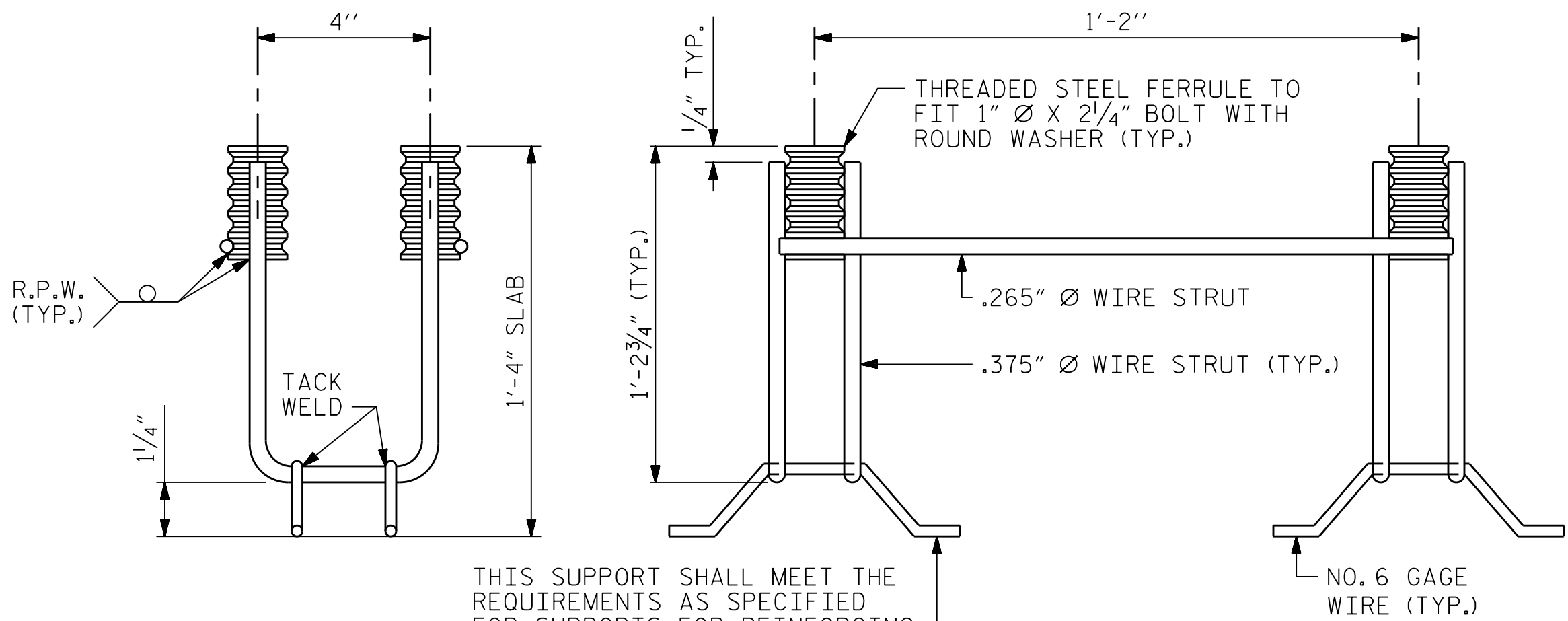


PLAN

SHOWING: GUARDRAIL ANCHOR ASSEMBLY SPACING.



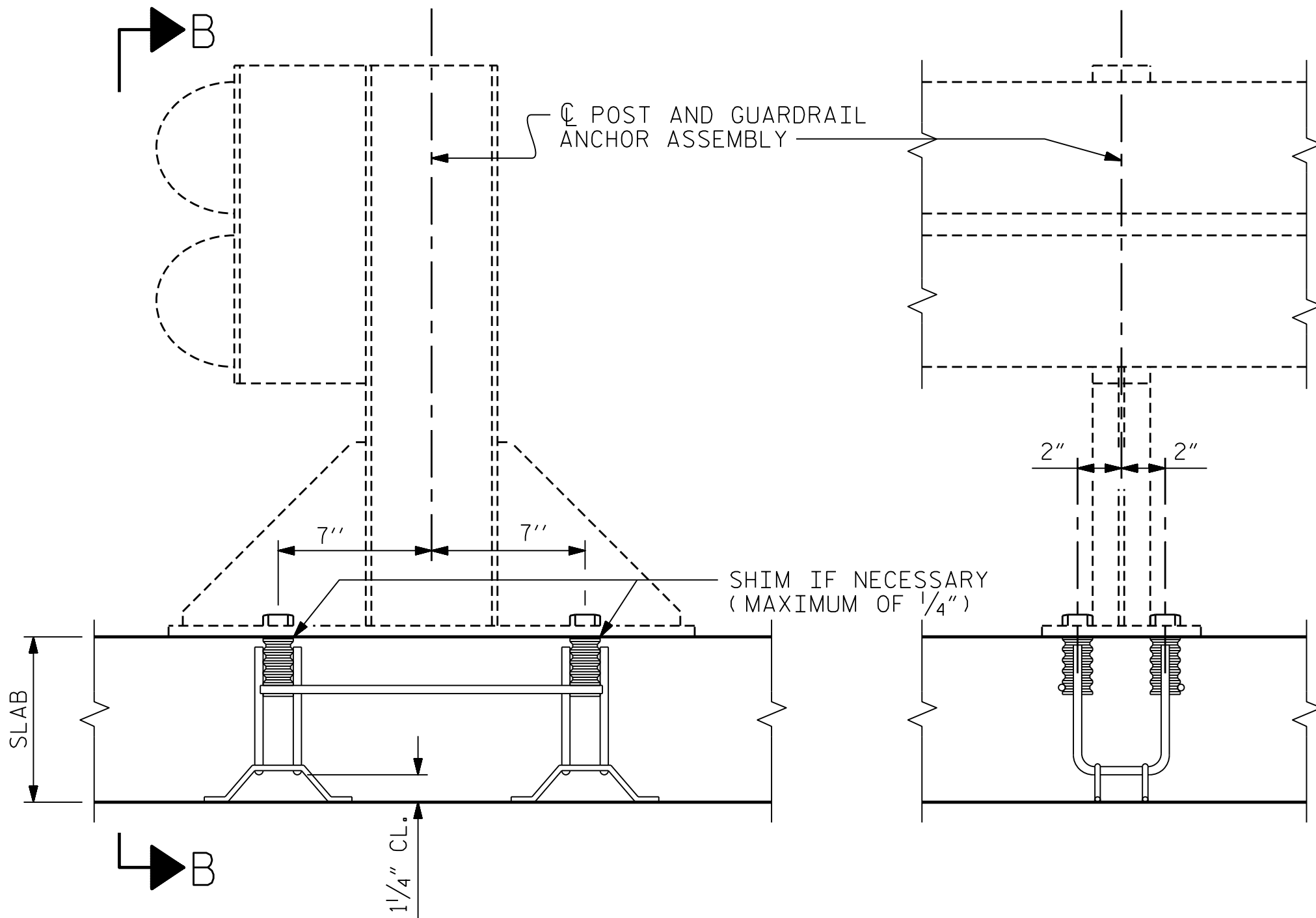
PLAN



ELEVATION

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS



SECTION A-A

SECTION B-B

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- 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".
- 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.)
- 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 PSI 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.

PROJECT NO. [REDACTED]

UNION COUNTY

STATION: 13+36.72 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

TRIPLE BARREL  
10 FT. X 6 FT.  
CONCRETE BOX CULVERT  
105° SKEW

REVISIONS						SHEET NO. S-07
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			8

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	- - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	- - - - -	HL 93
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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE. ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER. DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS. WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0". EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED. WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

PROJECT NO. \_\_\_\_\_ UNION \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 13+36.72 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
STANDARD NOTES						
REVISIONS					SHEET NO. S-08	
NO.	BY:	DATE:	NO.	BY:		DATE:
1			3			TOTAL SHEETS 8
2			4			