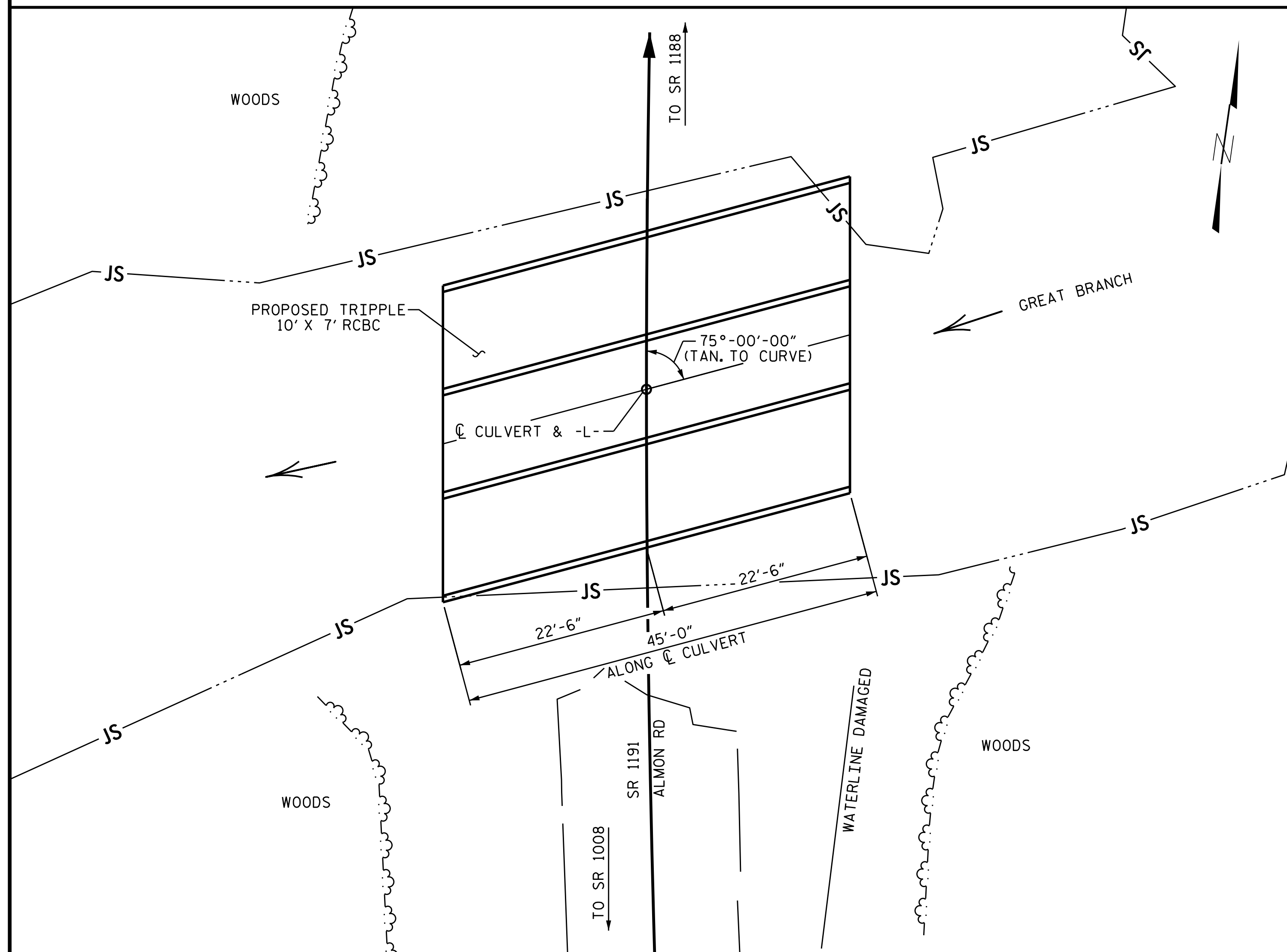


BM #1 : 60D NAIL IN 18" OAK, EL. 120.78



LOCATION SKETCH

**NOTES**

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- MAXIMUM DESIGN FILL----- 4.46'
- MINIMUM DESIGN FILL----- 2.25'
- FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.
- 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN 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 WING SHEET.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- THE EXISTING STRUCTURE LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED.
- 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.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FILL EXISTING SCOUR HOLE, AT INLET END, WITH CLASS I RIP RAP TO EL. 112.4'.

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE	
BARREL @ 3.073 CY/FT	138.3 C.Y.
WINGS, ETC.	27.1 C.Y.
<b>TOTAL</b>	<b>165.4 C.Y.</b>
REINFORCING STEEL	
BARREL	18,137 LBS.
WINGS, ETC.	1,277 LBS.
<b>TOTAL</b>	<b>19,414 LBS.</b>
FOUNDATION CONDITIONING MATERIAL	116 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

PROJECT NO. 2051095  
JOHNSTON COUNTY  
 STATION: GREAT BRANCH

SHEET 1 OF 6



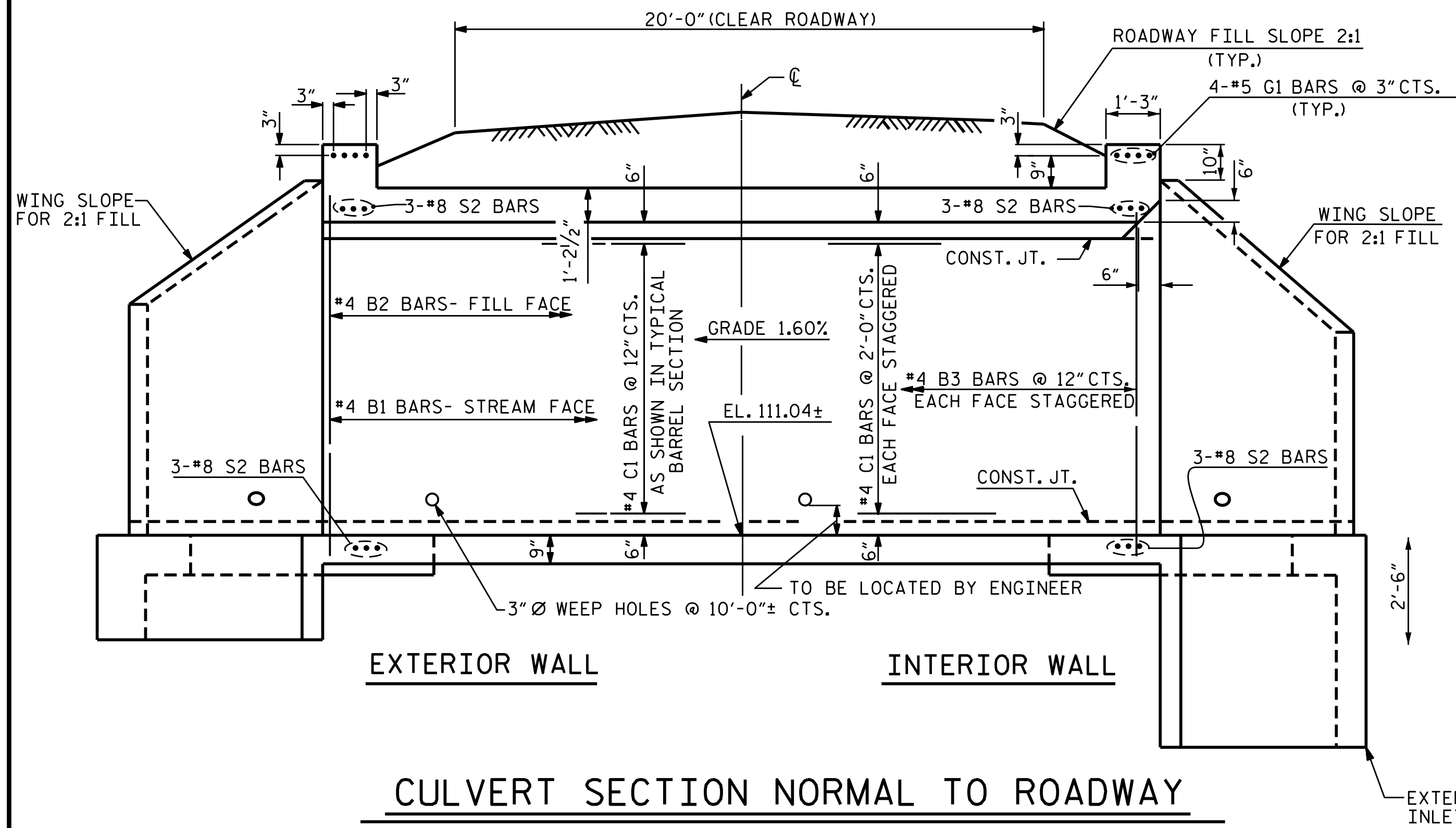
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BARREL STANDARD  
 TRIPLE 10 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 75° SKEW**

NOVEMBER 1990

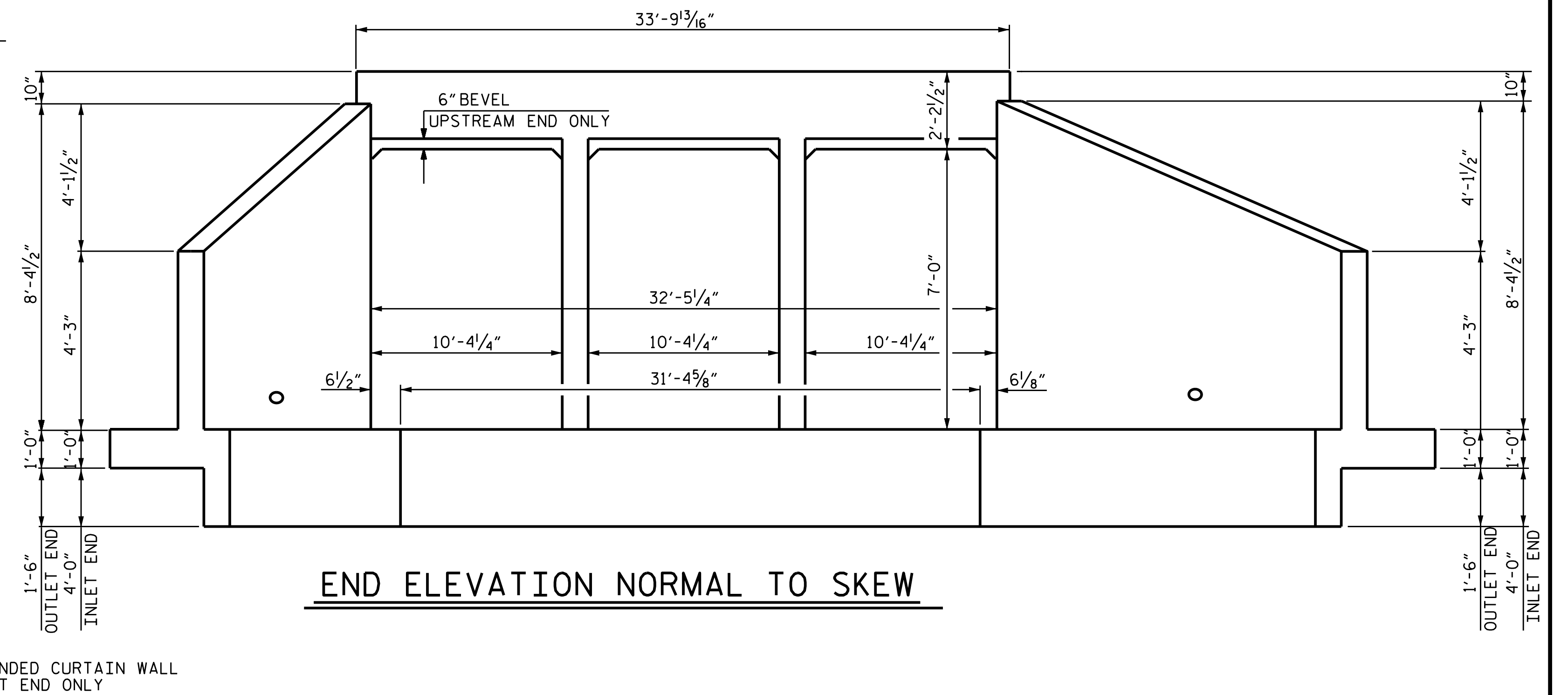
DRAWN BY : A. K. PATEL DATE : 12/2016  
 CHECKED BY : M. K. BEARD DATE : 12/2016  
 DESIGN ENGINEER OF RECORD: K. P. SEDA DATE : 12/2016

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

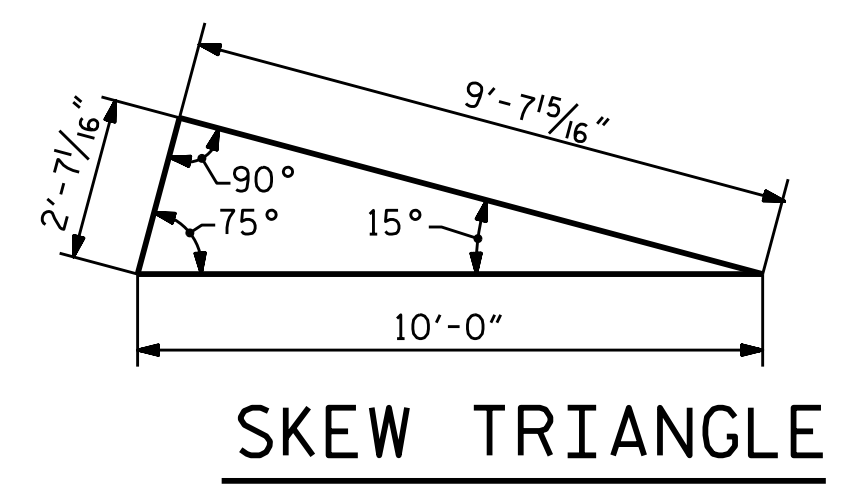
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			6



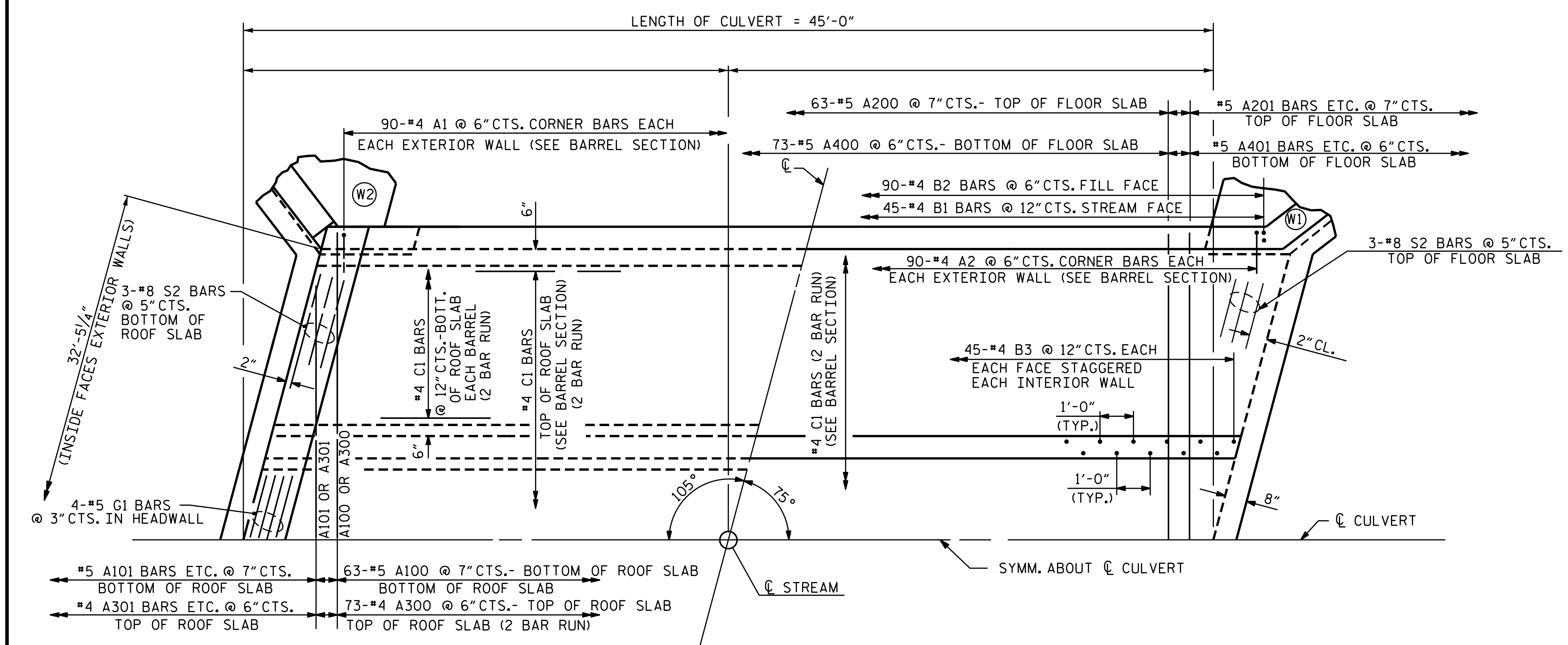
**CULVERT SECTION NORMAL TO ROADWAY**



**END ELEVATION NORMAL TO SKEW**



**SKEW TRIANGLE**



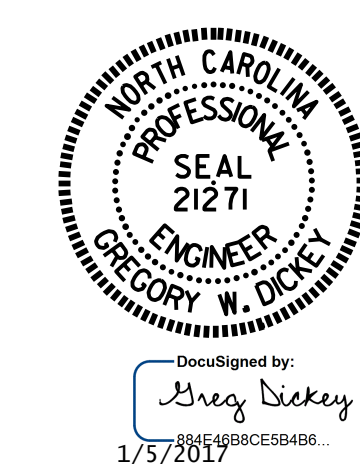
**PART PLAN - ROOF SLAB**

**PART PLAN - FLOOR SLAB**

PROJECT NO. 2051095  
JOHNSTON COUNTY  
 STATION: GREAT BRANCH

SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BARREL STANDARD  
 TRIPLE 10 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 75° SKEW**  
 1971



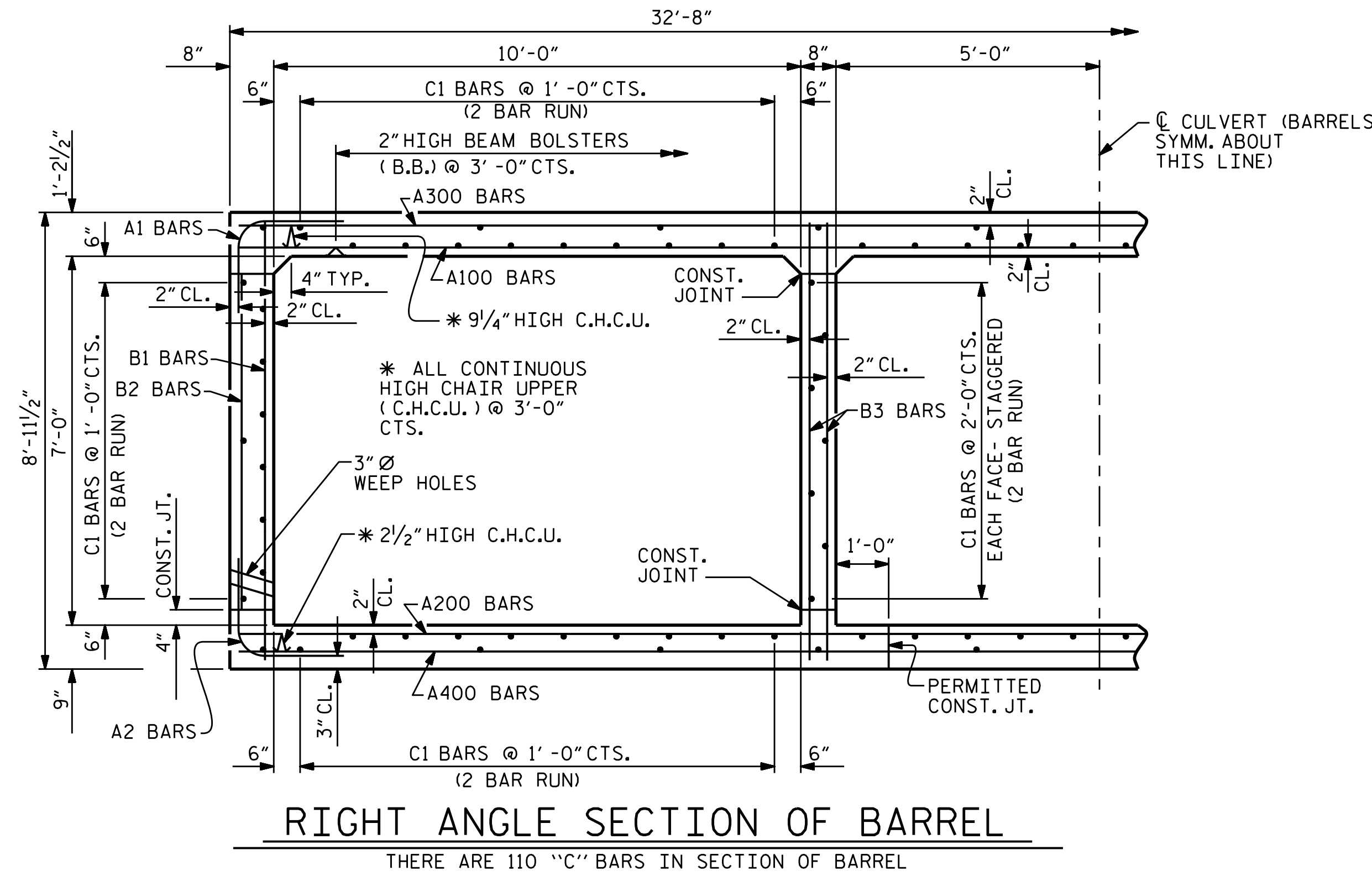
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

REVISED 11-18-09 BY M.M. CHECKED BY R.W.H.  
 REVISED 8-29-09 BY F.L. CHECKED BY R.P.  
 REDRAWN 10-16-09 BY R.W.H. / BY A.R.B.

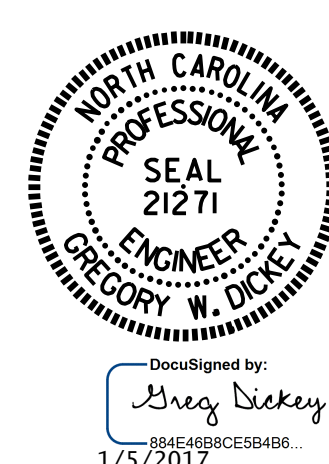
ASSEMBLED BY : <u>A. K. PATEL</u>	DATE : <u>12/2016</u>	<b>SPECIAL</b>
CHECKED BY : <u>M. K. BEARD</u>	DATE : <u>12/2016</u>	
DRAWN BY : <u>R.F. HOLMES</u>	DATE : <u>NOV. 1971</u>	<b>STANDARD</b>
CHECKED BY : <u>J.A. JOHNSON</u>	DATE : <u>NOV. 1971</u>	

BAR TYPE						BAR SCHEDULE											
						BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
						A100	63	#5	STR	32'-3"	2119	A400	73	#5	STR	32'-3"	2455
BAR DIMENSIONS ARE OUT TO OUT  SPLICE LENGTH CHART BAR SIZE LENGTH C1 #4 1'-11"						A101	4	#5	STR	27'-6"	115	A401	4	#5	STR	28'-1"	117
						A102	4	#5	STR	23'-1"	96	A402	4	#5	STR	24'-4"	102
						A103	4	#5	STR	18'-9"	78	A403	4	#5	STR	20'-7"	86
						A104	4	#5	STR	14'-5"	60	A404	4	#5	STR	16'-11"	71
						A105	4	#5	STR	10'-1"	42	A405	4	#5	STR	13'-2"	55
						A106	4	#5	STR	5'-8"	24	A406	4	#5	STR	9'-5"	39
						A200	63	#5	STR	32'-3"	2119	A407	4	#5	STR	5'-8"	24
						A201	4	#5	STR	27'-6"	115	A1	180	#4	1	5'-0"	601
						A202	4	#5	STR	23'-1"	96	A2	180	#4	1	4'-1"	491
						A203	4	#5	STR	18'-9"	78						
						A204	4	#5	STR	14'-5"	60	B1	90	#4	STR	8'-5"	506
						A205	4	#5	STR	10'-1"	42	B2	180	#4	STR	6'-4"	762
						A206	4	#5	STR	5'-8"	24	B3	180	#4	STR	8'-5"	1012
						A300	146	#4	STR	16'-10"	1642	C1	220	#4	STR	23'-5"	3441
						A301	4	#4	STR	28'-1"	75						
						A302	4	#4	STR	24'-4"	65	G1	8	#5	STR	33'-5"	279
						A303	4	#4	STR	20'-7"	55						
						A304	4	#4	STR	16'-11"	45	S2	12	#8	STR	33'-5"	1071
						A305	4	#4	STR	13'-2"	35						
						A306	4	#4	STR	9'-5"	25						
						A307	4	#4	STR	5'-8"	15						
						REINFORCING STEEL = 18,137 LBS											



PROJECT NO. 2051095  
JOHNSTON COUNTY  
 STATION: GREAT BRANCH

SHEET 3 OF 6

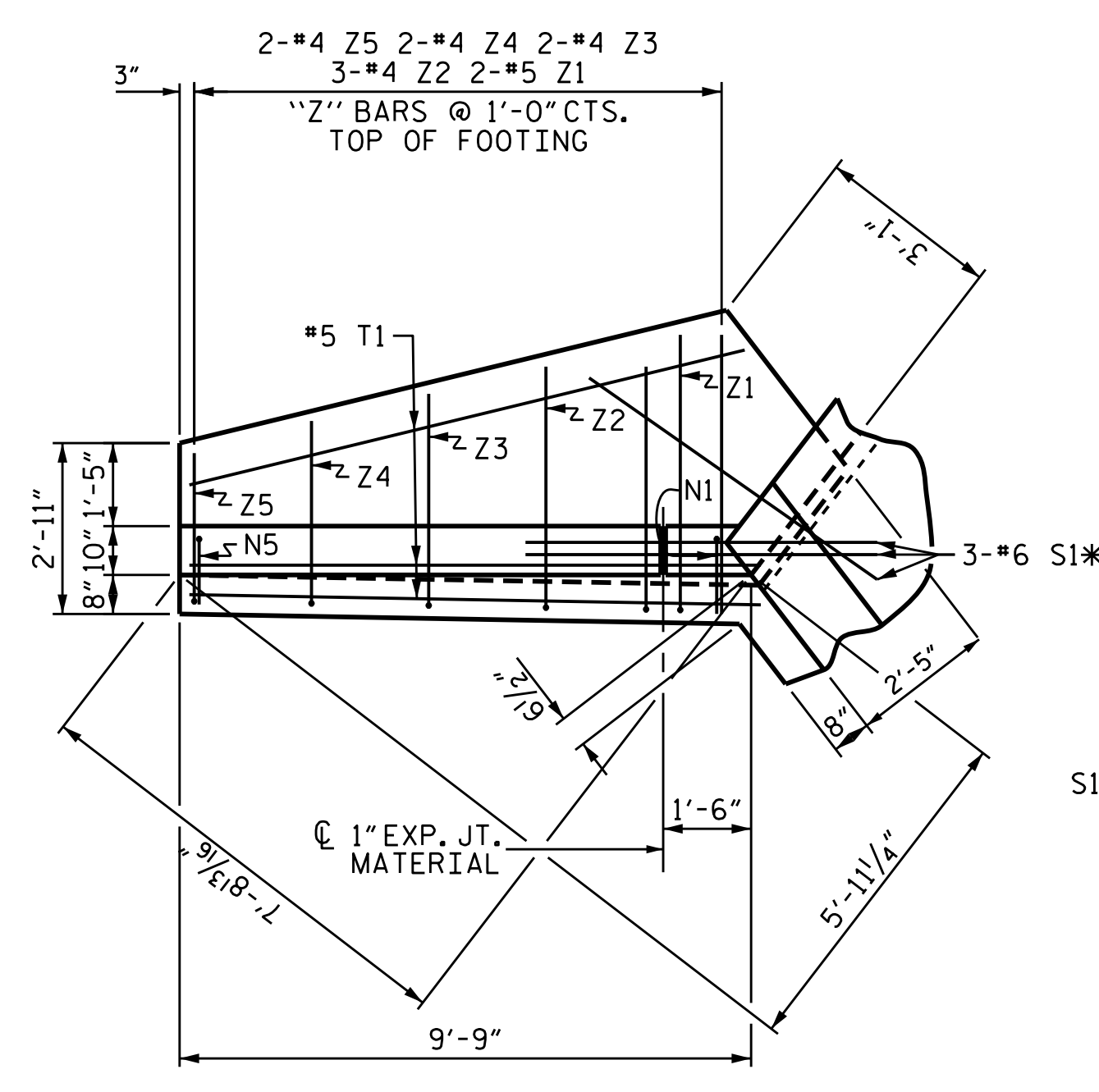


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**TRIPLE 10 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 75° SKEW**

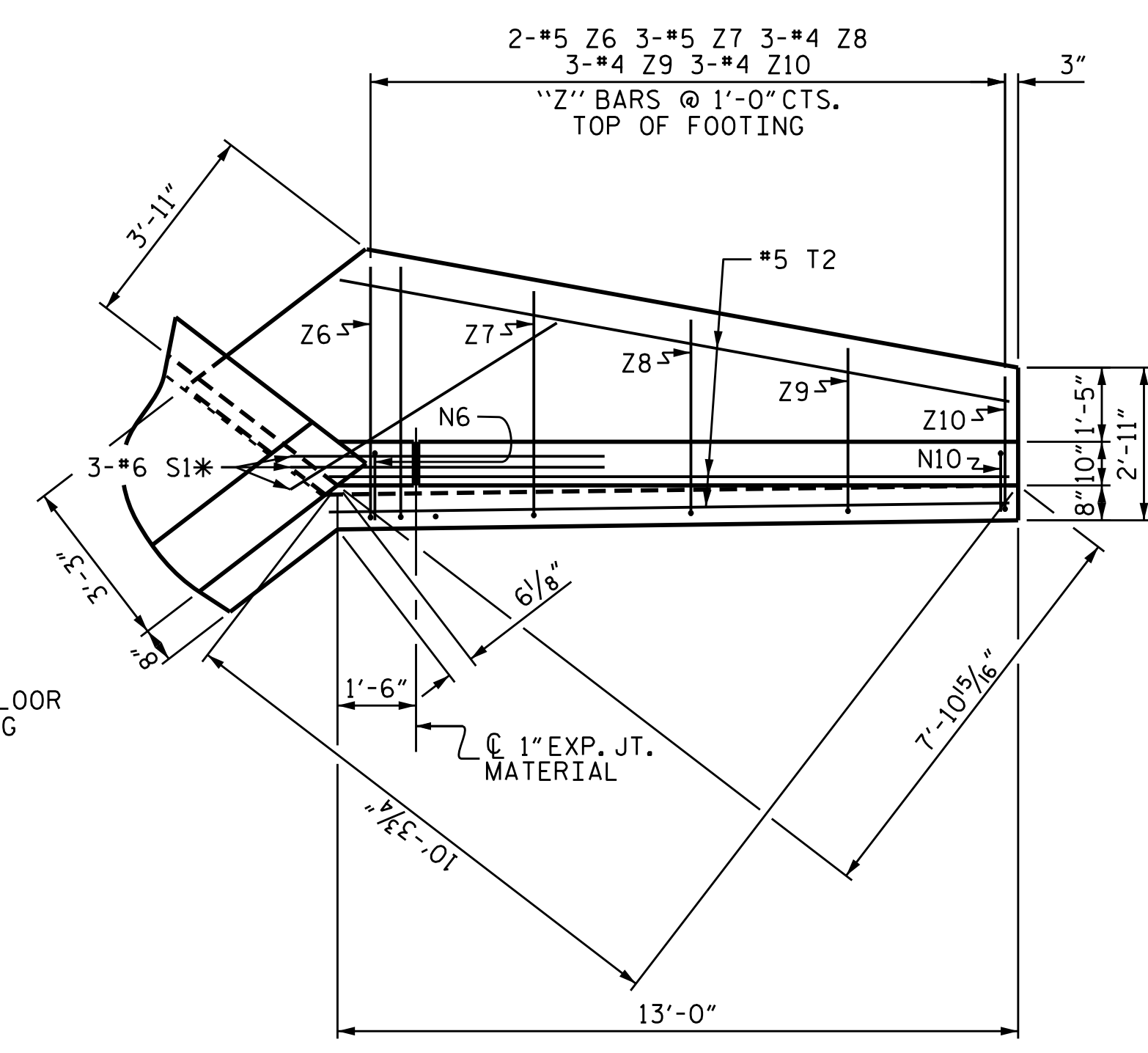
DRAWN BY : A. K. PATEL DATE : 12/2016  
 CHECKED BY : M. K. BEARD DATE : 12/2016  
 DESIGN ENGINEER OF RECORD: K. P. SEDA DATE : 12/2016

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

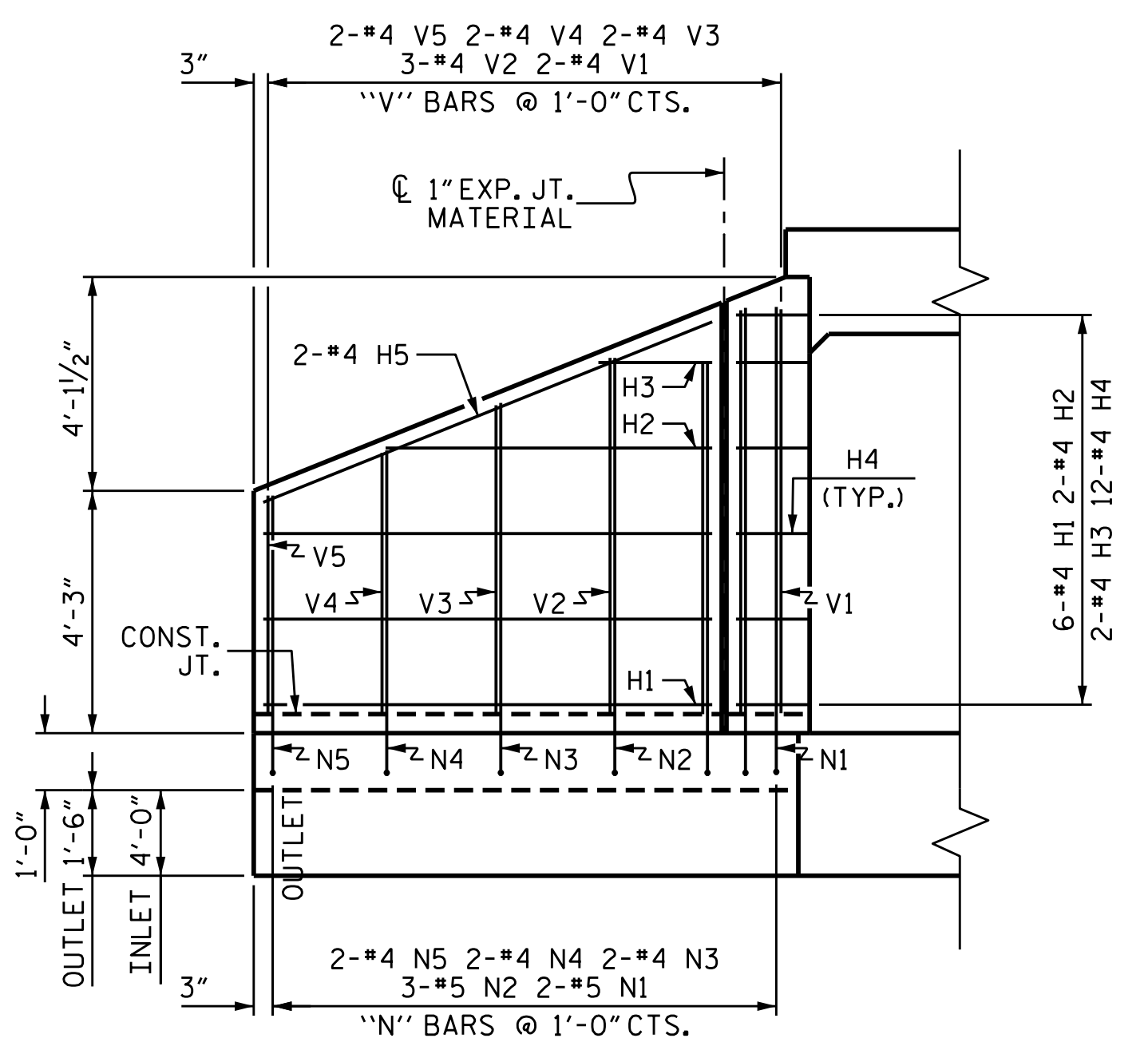
REVISIONS					SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			6



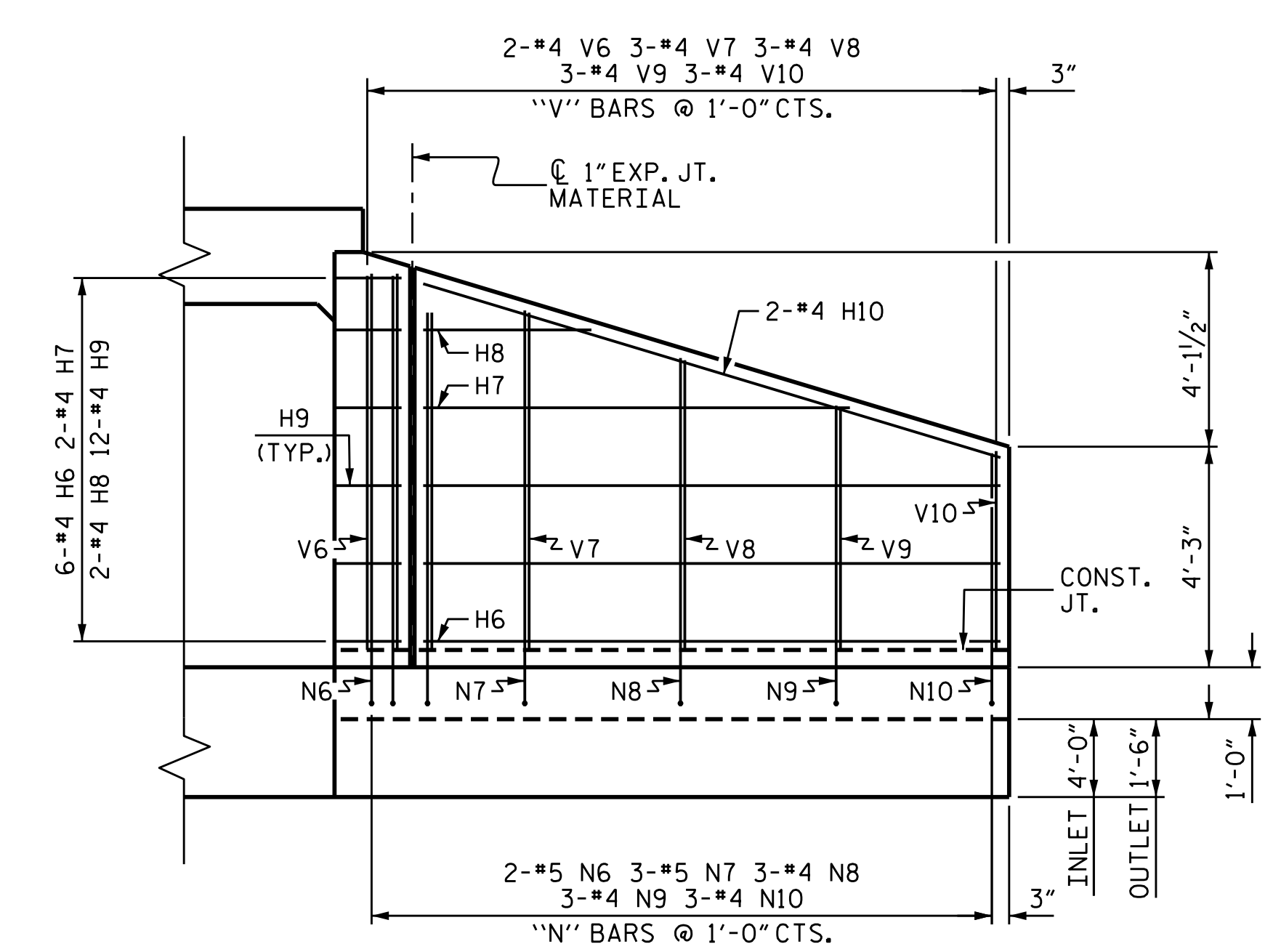
PLAN W2



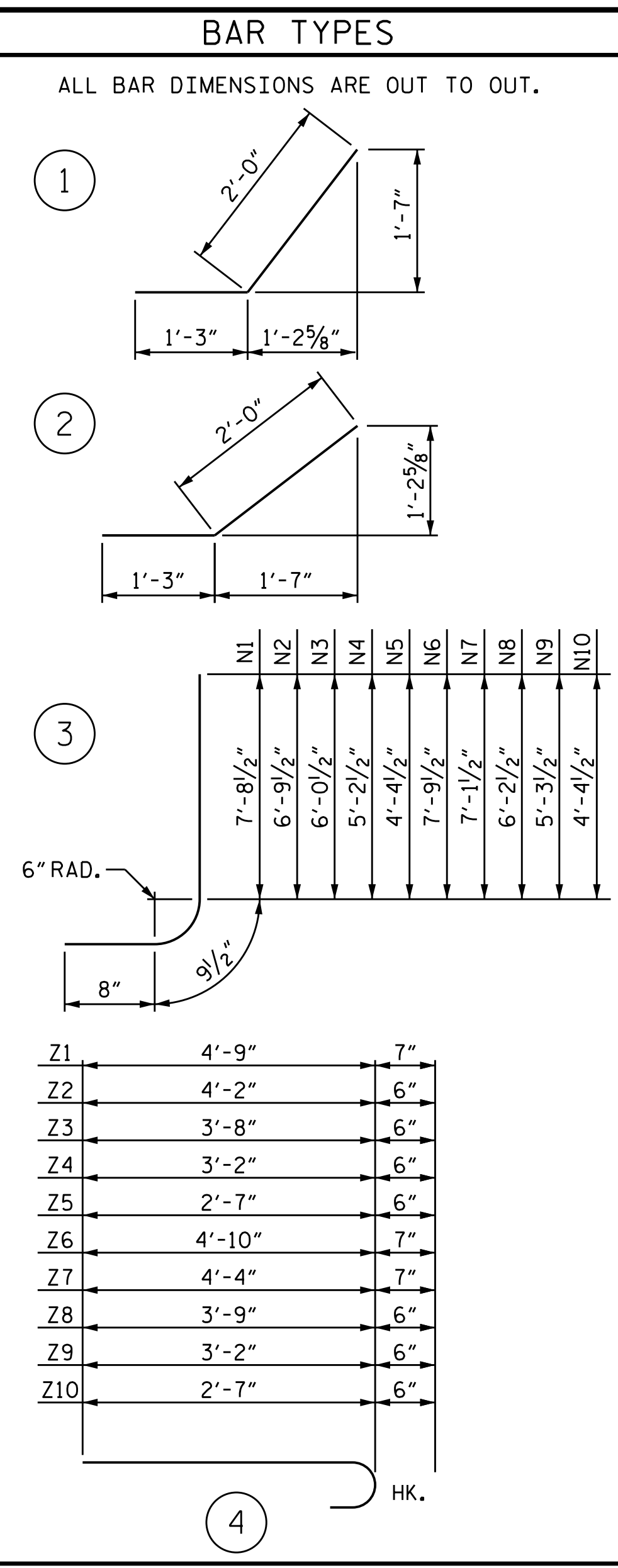
PLAN W1



ELEVATION W2



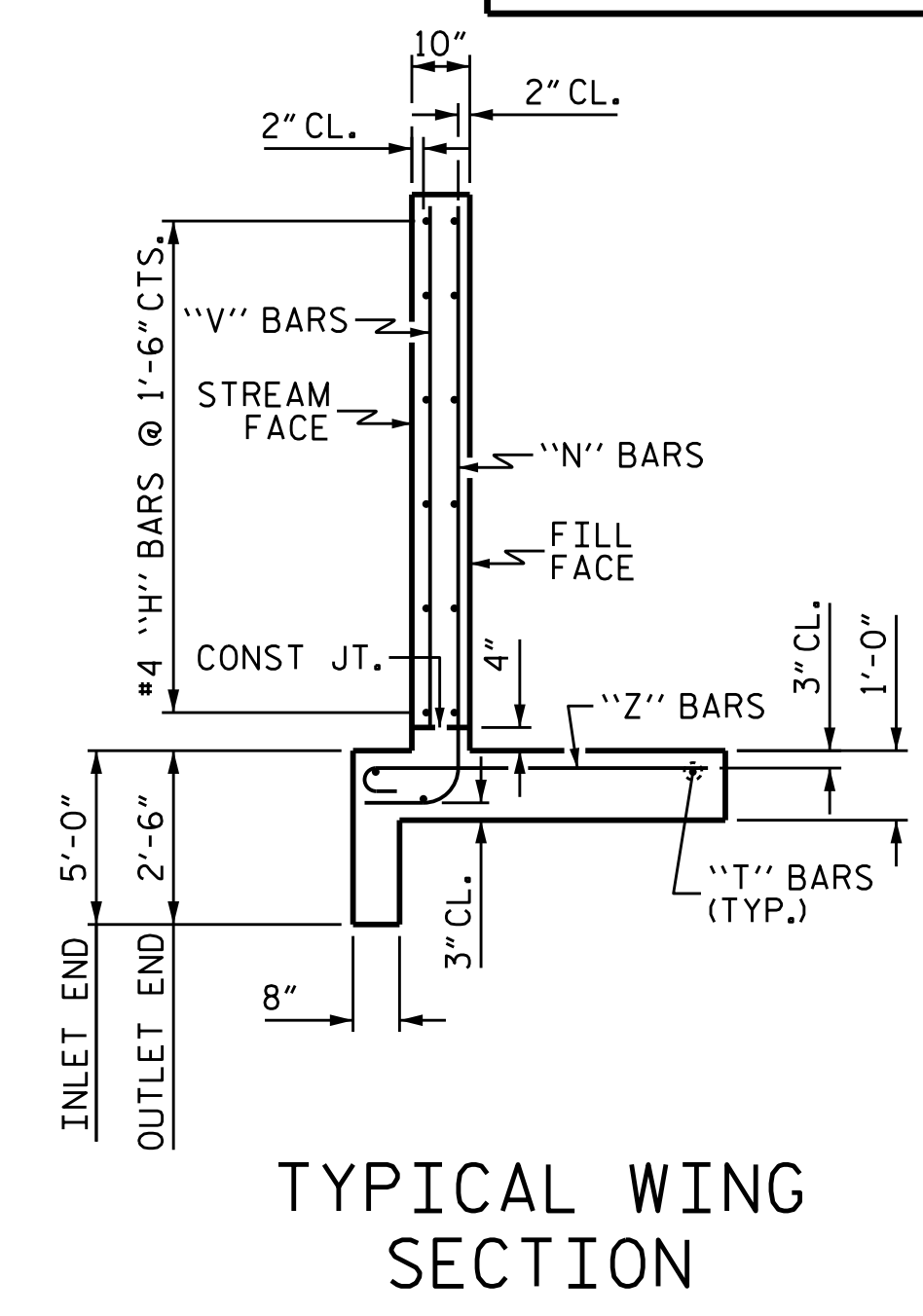
ELEVATION W1



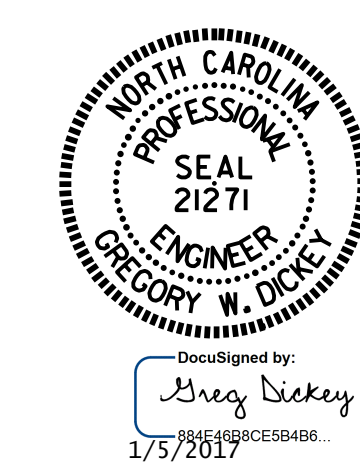
Z1	4'-9"	7"
Z2	4'-2"	6"
Z3	3'-8"	6"
Z4	3'-2"	6"
Z5	2'-7"	6"
Z6	4'-10"	7"
Z7	4'-4"	7"
Z8	3'-9"	6"
Z9	3'-2"	6"
Z10	2'-7"	6"

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	7'-10"	63
H2	4	#4	STR	5'-8"	15
H3	4	#4	STR	2'-0"	5
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	8'-5"	22
H6	12	#4	STR	11'-1"	89
H7	4	#4	STR	8'-2"	22
H8	4	#4	STR	3'-3"	9
H9	24	#4	2	3'-3"	52
H10	4	#4	STR	11'-7"	31
N1	4	#5	3	9'-2"	38
N2	6	#5	3	8'-3"	52
N3	4	#4	3	7'-6"	20
N4	4	#4	3	6'-8"	18
N5	4	#4	3	5'-10"	16
N6	4	#5	3	9'-3"	39
N7	6	#5	3	8'-7"	54
N8	6	#4	3	7'-8"	31
N9	6	#4	3	6'-9"	27
N10	6	#4	3	5'-10"	23
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	9'-9"	61
T2	6	#5	STR	13'-0"	81
V1	4	#4	STR	7'-1"	19
V2	6	#4	STR	6'-3"	25
V3	4	#4	STR	5'-5"	14
V4	4	#4	STR	4'-7"	12
V5	4	#4	STR	3'-10"	10
V6	4	#4	STR	7'-3"	19
V7	6	#4	STR	6'-6"	26
V8	6	#4	STR	5'-7"	22
V9	6	#4	STR	4'-8"	19
V10	6	#4	STR	3'-10"	15
Z1	4	#5	4	5'-4"	22
Z2	6	#4	4	4'-8"	19
Z3	4	#4	4	4'-2"	11
Z4	4	#4	4	3'-8"	10
Z5	4	#4	4	3'-1"	8
Z6	4	#5	4	5'-5"	23
Z7	6	#5	4	4'-11"	31
Z8	6	#4	4	4'-3"	17
Z9	6	#4	4	3'-8"	15
Z10	6	#4	4	3'-1"	12

REINFORCING STEEL FOR 4 WINGS	1277 LBS
CLASS A CONCRETE	
4 WINGS	18.2 CY
2 HEADWALLS	3.1 CY
2 END CURTAIN WALLS	5.8 CY
<b>TOTAL</b>	<b>27.1 CY</b>



TYPICAL WING SECTION



PROJECT NO. 2051095  
JOHNSTON COUNTY  
 STATION: GREAT BRANCH

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD WINGS FOR CONCRETE BOX CULVERT**  
 H = 7'-0" SLOPE = 2:1  
 75° SKEW

ASSEMBLED BY : A. K. PATEL	DATE : 12/2016
CHECKED BY : M. K. BEARD	DATE : 12/2016
DRAWN BY : CCJ 12/99	
CHECKED BY : RWW 03/00	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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 1/16" 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.

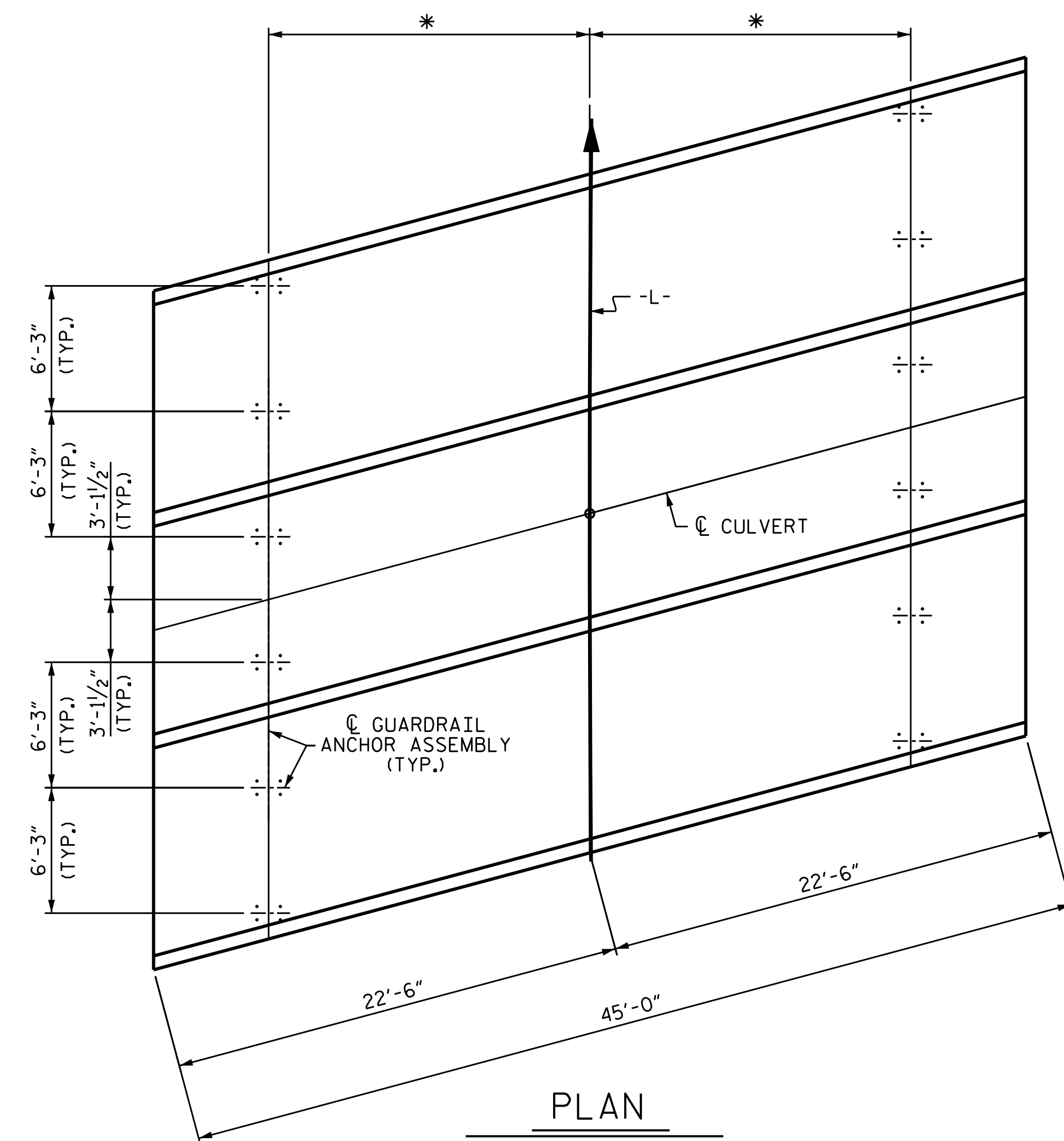
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

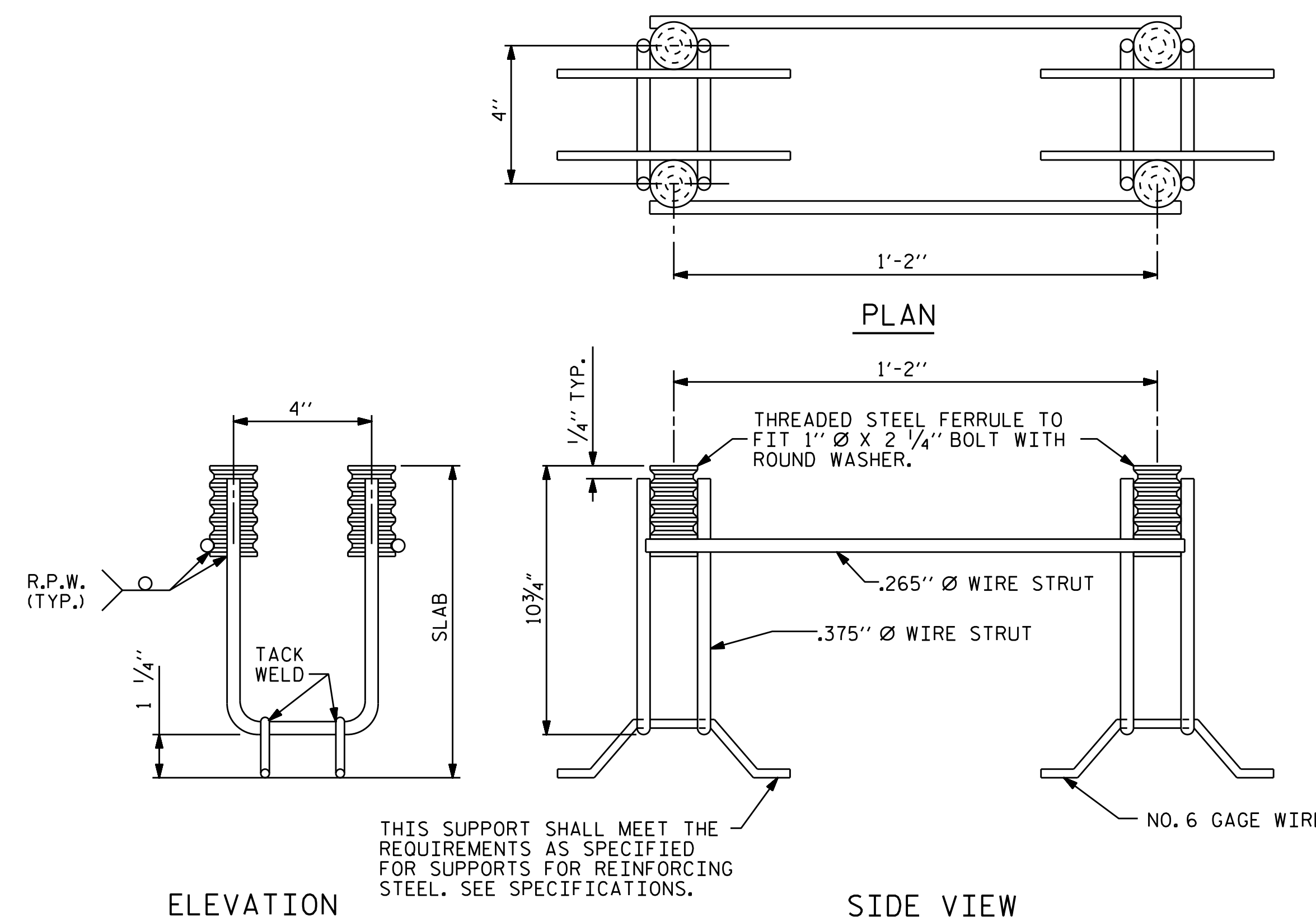
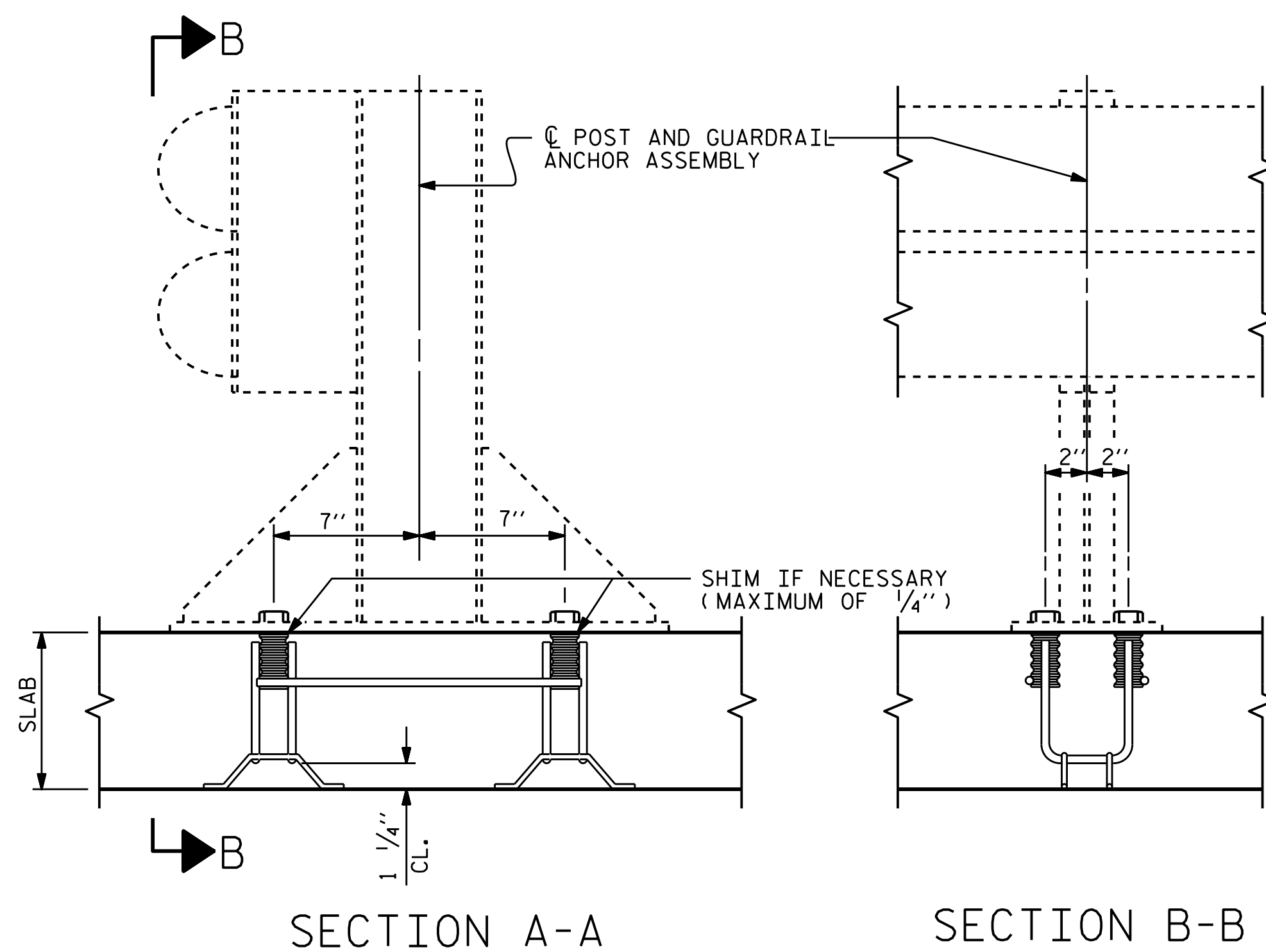
PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

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 SPECIAL PROVISIONS.



PLAN  
SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.  
\* THIS DIMENSION TO BE FURNISHED BY THE FIELD ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 2051095  
JOHNSTON COUNTY  
STATION: GREAT BRANCH

SHEET 5 OF 6

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

ASSEMBLED BY :	A. K. PATEL	DATE :	12/2016
CHECKED BY :	M. K. BEARD	DATE :	12/2016
DRAWN BY :	FCJ 6/88	REV. 7/10/01	LES/RDR
CHECKED BY :	ARB 6/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06R	KMM/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			6

## 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		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (VLL)	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	1.05	--	1.75	1.42	1	TOP SLAB	4.00	1.05	1	TOP SLAB	9.41		
	HL-93 (OPERATING)	N/A		1.36	--	1.35	1.83	1	TOP SLAB	4.00	1.36	1	TOP SLAB	9.41		
	HS-20 (INVENTORY)	36.000	②	1.27	45.67	1.75	1.48	1	TOP SLAB	4.27	1.27	1	TOP SLAB	9.42		
	HS-20 (OPERATING)	36.000		1.64	59.20	1.35	1.91	1	TOP SLAB	4.27	1.64	1	TOP SLAB	9.42		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.32	31.39	1.40	2.69	1	TOP SLAB	4.53	2.32	1	TOP SLAB	9.41	
		SNGARBS2	20.000		2.17	43.46	1.40	2.52	1	TOP SLAB	4.53	2.17	1	TOP SLAB	9.41	
		SNAGRIS2	22.000		2.32	50.99	1.40	2.69	1	TOP SLAB	4.53	2.32	1	TOP SLAB	9.41	
		SNCOTTS3	27.250	③	1.31	35.76	1.40	1.77	1	TOP SLAB	4.00	1.31	1	TOP SLAB	9.41	
		SNAGGRS4	34.925		1.67	58.26	1.40	2.20	1	TOP SLAB	4.80	1.67	1	TOP SLAB	9.41	
		SNS5A	35.550		1.49	53.02	1.40	2.13	1	TOP SLAB	4.00	1.49	1	TOP SLAB	9.41	
		SNS6A	39.950		1.49	59.59	1.40	2.13	1	TOP SLAB	4.00	1.49	1	TOP SLAB	9.41	
		SNS7B	42.000		1.47	61.76	1.40	2.20	1	TOP SLAB	4.00	1.47	1	TOP SLAB	9.41	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.89	62.24	1.40	2.69	1	TOP SLAB	4.27	1.89	1	BOTTOM SLAB	9.79	
		TNT4A	33.075		1.56	51.65	1.40	2.11	1	TOP SLAB	4.00	1.56	1	TOP SLAB	9.41	
		TNT6A	41.600		1.50	62.30	1.40	2.11	1	TOP SLAB	4.53	1.50	1	TOP SLAB	9.41	
		TNT7A	42.000		1.51	63.55	1.40	2.15	1	TOP SLAB	4.27	1.51	1	TOP SLAB	9.41	
		TNT7B	42.000		1.54	64.48	1.40	2.09	1	TOP SLAB	4.53	1.54	1	TOP SLAB	9.41	
		TNAGRIT4	43.000		1.45	62.41	1.40	2.01	1	TOP SLAB	4.00	1.45	1	BOTTOM SLAB	9.79	
TNAGT5A	45.000		1.38	62.08	1.40	2.10	1	TOP SLAB	4.00	1.38	1	BOTTOM SLAB	9.79			
TNAGT5B	45.000		1.38	62.08	1.40	2.11	1	TOP SLAB	4.00	1.38	1	BOTTOM SLAB	9.79			

### 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	0.50 OR 0.90
ES	1.35	0.50 OR 0.90
LS	1.75	0.00
WA	1.00	0.00

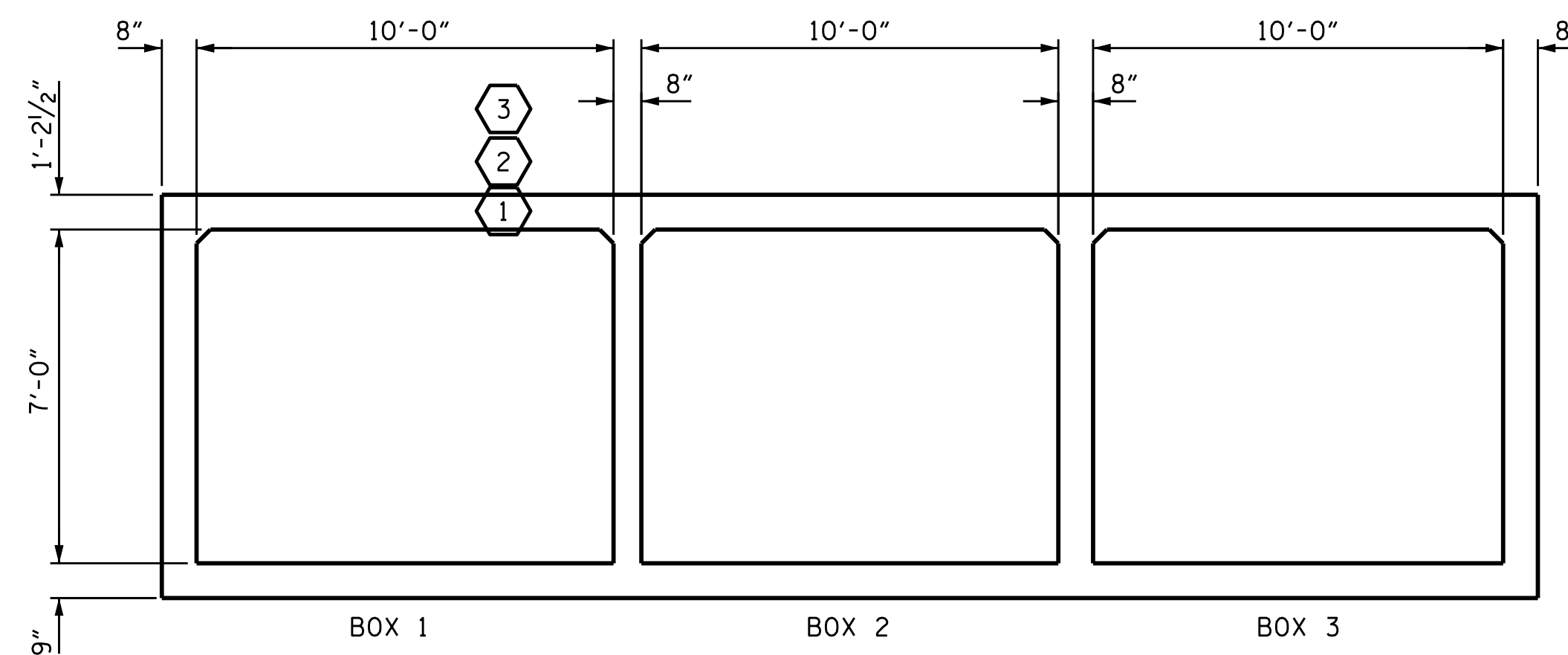
### NOTE:

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	

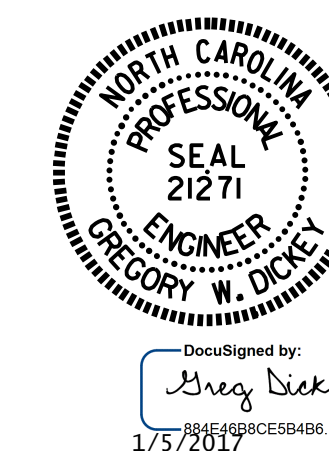


### LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. 2051095  
JOHNSTON COUNTY  
 STATION: GREAT BRANCH

SHEET 6 OF 6



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 REINFORCED CONCRETE  
 BOX CULVERTS  
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : A. K. PATEL	DATE : 12/2016
CHECKED BY : G. W. DICKEY	DATE : 12/2016
DRAWN BY : WMC	7/11
CHECKED BY : GM	7/11
REV. 10/1/11	MAA/GM

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

## 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 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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 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 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" 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 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" 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" 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

JANUARY, 1990

STD. NO. SN