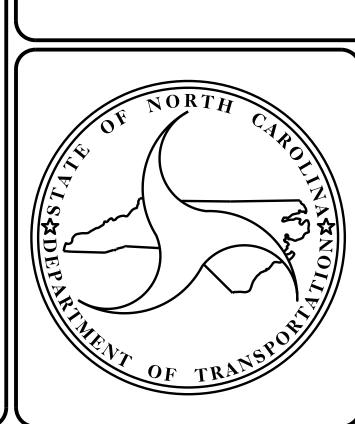
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TIP PROJECT: B-5370

RACT: C204063



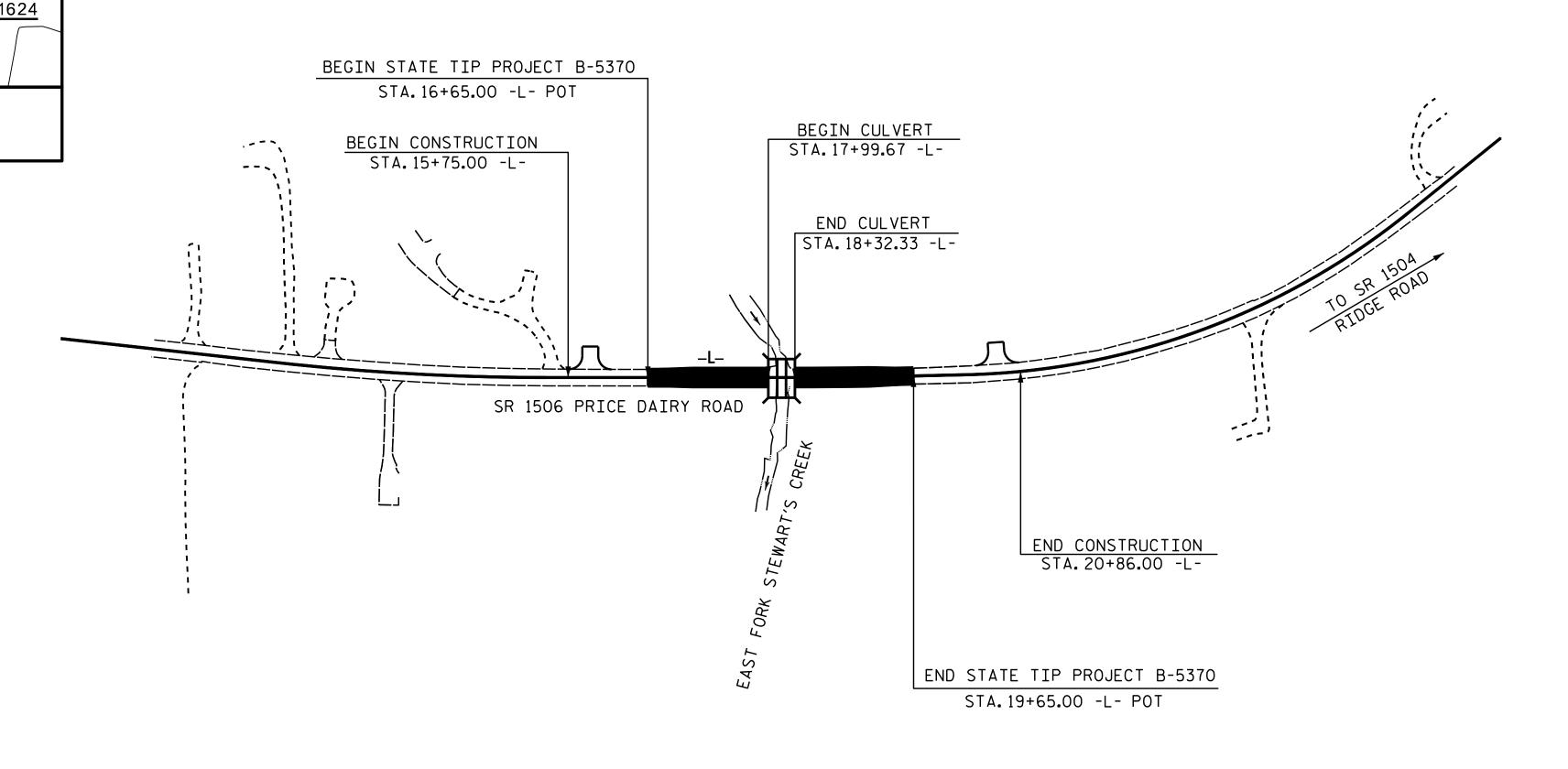


UNION COUNTY

LOCATION: BRIDGE NO. 444 ON SR 1506 (PRICE DAIRY RD)
OVER EAST FORK STEWART'S CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERT

STATE	STATE	SHEET NO.	TOTAL SHEETS					
N.C.	B-5370							
STAT	E PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION					
46	085.1.1	BRZ-1506(3)	P.E	•				
46	085.2.1		R∕W, U	ITIL.				
46	085.3.1		CON	ST.				



CULVERT

PROJECT SITE

<u>1009</u>

1550 HILLCREST CHURCH RD

VICINITY MAP

DETOUR ROUTE

601

ADT 2018 = 345 ADT 2038 = 527 K = 12 % D = 55 % T = 21 % * V = 50 MPH * (TTST = 6% DUAL = 15%)

FUNC. CLASS. = LOCAL SUB-REGIONAL TIER

DESIGN DATA

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5370 = 0.051 MILES

LENGTH OF STRUCTURE TIP PROJECT B-5370 = 0.006 MILES

TOTAL LENGTH OF TIP PROJECT B-5370 = 0.057 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS

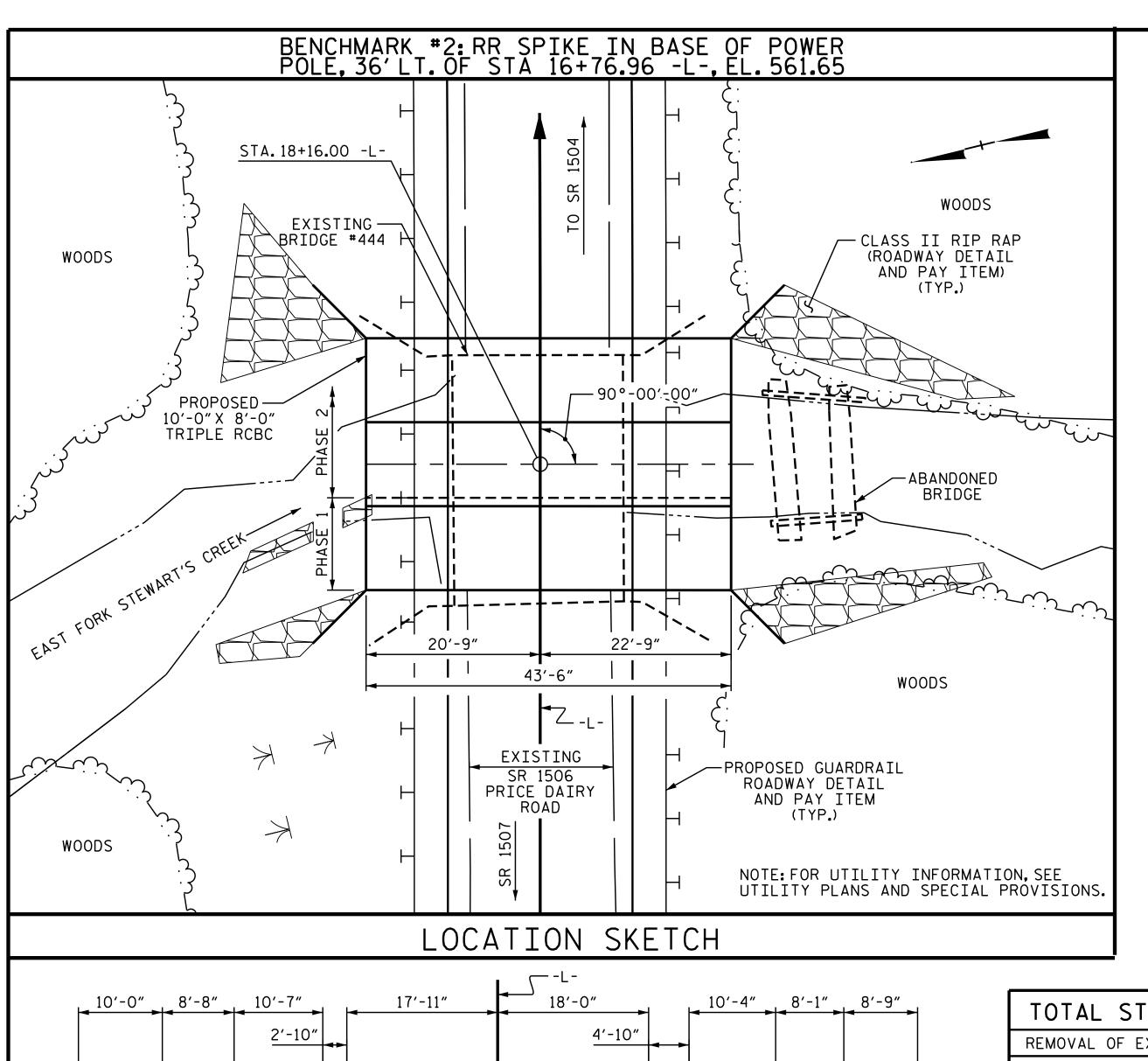
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

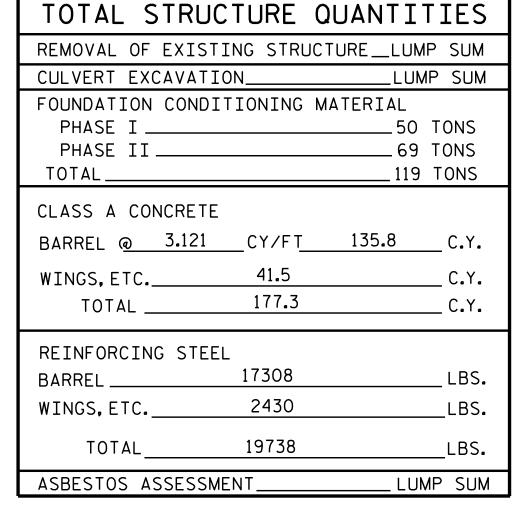
2018 STANDARD SPECIFICATIONS

LETTING DATE: FEBRUARY 20, 2018

A. KEITH PASCHAL, P.E.

PROJECT ENGINEER





DESIGN FILL----2.70 (MIN.), 3.64 (MAX.) FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

ASSUMED LIVE LOAD = HL - 93 OR ALTERNATE LOADING.

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

CONCRETE IN PHASE I CULVERT TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4"OF PHASE I VERTICAL WALLS.

2. THE REMAINING PORTIONS OF PHASE I WALLS AND PHASE I WING FULL HEIGHT.

3. PHASE I SILLS.

CONCRETE IN PHASE II CULVERT TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4"OF PHASE II VERTICAL WALLS.

2. THE REMAINING PORTIONS OF PHASE II WALLS AND PHASE II WING FULL HEIGHT, FOLLOWED BY ROOF SLAB AND HEADWALLS.

3. PHASE II SILLS.

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 AND BOTH FACES OF INTERIOR WALLS 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.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERI IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

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

FOR GROUT FOR STRUCTURES, 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 CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

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."

THE EXISTING STRUCTURE CONSISTING OF ONE SPAN @ 30'-6" WITH A TIMBER DECK WITH 2"ASPHALT WEARING SURFACE ON 9 LINES OF W14 X 30 I-BEAMS @ 2'-4" CENTERS; WITH A CLEAR ROADWAY WIDTH OF 19'-2" ON END BENTS WITH TIMBER CAPS ON POST AND SILLS AND TIMBER BULKHEADS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. IN ADDITION, THE ABANDONED BRIDGE ADJACENT TO BRIDGE No. 444 SHALL BE REMOVED. THIS REMOVAL SHALL BE PAID FOR UNDER THE CONTRACT LUMP SUM PRICE BID FOR "REMOVAL OF EXISTING STRUCTURE".

THE SUBSTRUCTURE OF THE EXISTING BRIDGE No.444 AND THE ABANDONED 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 AT THE PROJECT SITE.

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.

FOR BOX CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 12-INCH BLANKET OF FOUNDATION CONDITIONING MATERIAL.

THE REQUIRED BEARING CAPACITY AT THE BASE OF THE CULVERT IS 2 TSF. THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS

SOFESSION,

SEAL 22005

CHINEER

A Keith Paschal 12/20/2017

PHASE I STRUCTURE QUA	ANTITIES	PHASE II STRUCTURE	QUANTITIES
CULVERT EXCAVATION	LUMP SUM	CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATER	[AL 50 TONS	FOUNDATION CONDITIONING M	ATERIAL 69 TONS
CLASS A CONCRETE BARREL WINGS, ETC. TOTAL	18.4 C.Y.	CLASS A CONCRETE BARREL WINGS, ETC. TOTAL	23.1 C.Y.
REINFORCING STEEL BARREL WINGS, ETC TOTAL	1215 LBS.	REINFORCING STEEL BARREL WINGS, ETC TOTAL	1215 LBS.

= 2:1

NOTES

HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

B-5370 PROJECT NO. __ UNION COUNTY STATION: 18+16.00 -L-

REPLACES BRIDGE #444 SHEET 1 OF 8

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TRIPLE 10 FT.X 8 FT. CONCRETE BOX CULVERT 90°-00'-00" SKEW

SHEET NO REVISIONS DATE: C-1 DATE: NO. BY: DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HYDRAULIC DATA OVERTOPPING FLOOD DATA

= 558**.**33

DESIGN DISCHARGE = 1200 CFS FREQUENCY OF DESIGN FLOOD = 25 YRS. DESIGN HIGH WATER ELEVATION = 555.8 DRAINAGE AREA = 3.6 SQ.MI. = 1690 CFS BASE DISCHARGE (Q100)

BASE HIGH WATER ELEVATION

OVERTOPPING DISCHARGE = 1618 CFS FREQUENCY OF OVERTOPPING FLOOD = 100 ± YRS. OVERTOPPING FLOOD ELEVATION = 558**.**1 ***** * SAG @ STA. 18+02.00

GRADE DATA

GRADE POINT ELEVATION @ STA. 18+16.00 -L-= 557.81 BED ELEVATION @ STA. 18+16.00 -L-= 546.70

ROADWAY FILL SLOPES

DESIGN ENGINEER OF RECORD: <u>G.KOUCHEKI</u> DATE: <u>12-17</u>

PHASE II CONSTRUCTION

PROFILE ALONG & CULVERT

PHASE II

-CONSTRUCTION JOINT

CONSTRUCTION PHASING

LOOKING UPSTREAM

_ DATE : <u>2-10-17</u>

DATE : <u>3-17</u>

CONSTRUCTION JOINT (TYP.)

PHASE I CONSTRUCTION

H. T. BARBOUR

M. POOLE

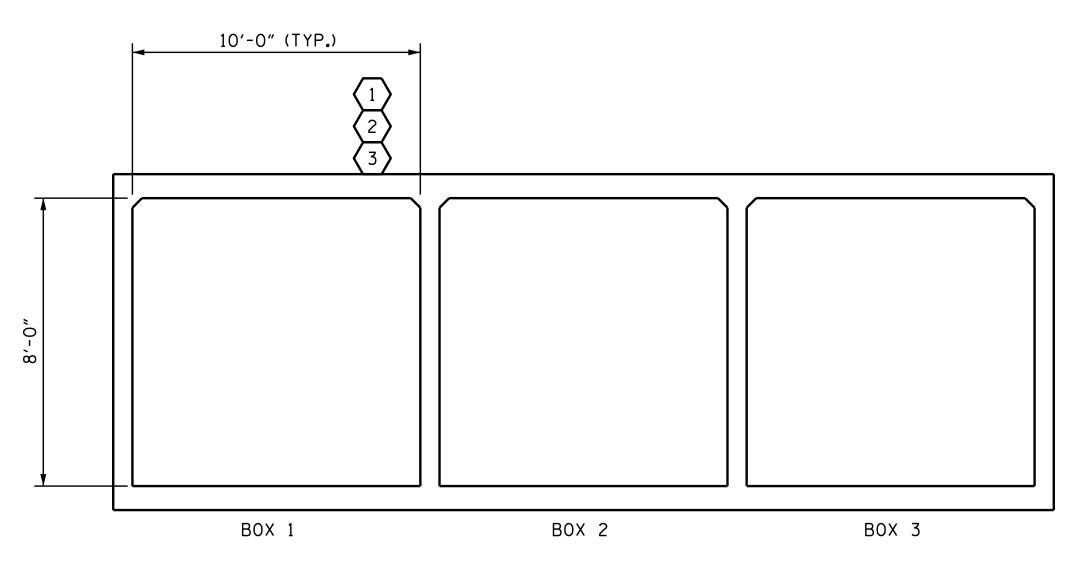
PHASE I-

DRAWN BY : .

CHECKED BY :

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

						STRENGTH I LIMIT STATE										
										MOMENT				SHEAR		
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	LIVE-LOAD FACTORS (Y _{LL})	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)	COMMENT NUMBER
		HL-93 (INVENTORY)	N/A	1	1.01		1.75	1.37	1	TOP SLAB	4.27	1.01	1	TOP SLAB	9.46	
DESIGN LOAD		HL-93 (OPERATING)	N/A		1.30		1.35	1.78	1	TOP SLAB	4.27	1.30	1	TOP SLAB	9.46	
RATING		HS-20 (INVENTORY)	36.00	2	1.21	43.39	1.75	1.47	1	TOP SLAB	4.27	1.21	1	TOP SLAB	9.46	
		HS-20 (OPERATING)	36.00		1.56	56 . 25	1.35	1.90	1	TOP SLAB	4 . 27	1.56	1	TOP SLAB	9.46	
		SNSH	13 . 50		2.20	29.74	1.40	2.67	1	TOP SLAB	4 . 53	2.20	1	TOP SLAB	9.46	
	Щ	SNGARBS2	20.00		2.05	41.07	1.40	2.50	1	TOP SLAB	4 . 53	2.05	1	TOP SLAB	9.46	
	ICL	SNAGRIS2	22.00		2.20	48.30	1.40	2.67	1	TOP SLAB	4 . 53	2.20	1	TOP SLAB	9.46	
	VEHICLI V)	SNCOTTS3	27 . 25	3	1.26	34.38	1.40	1.71	1	TOP SLAB	4.27	1.26	1	TOP SLAB	9.46	
	I ш(S)	SNAGGRS4	34.93		1.62	56.58	1.40	2.15	1	TOP SLAB	4 . 53	1.62	1	TOP SLAB	9.46	
	SINGL	SNS5A	35 . 55		1.44	51.03	1.40	2.04	1	TOP SLAB	4 . 53	1.44	1	TOP SLAB	9.46	
		SNS6A	39 . 95		1.43	56.99	1.40	2.00	1	BOTTOM SLAB	9.87	1.43	1	BOTTOM SLAB	9.79	
LEGAL LOAD		SNS7B	42.00		1.36	56.96	1.40	1.90	1	BOTTOM SLAB	9.87	1.36	1	BOTTOM SLAB	9.79	
RATING	-ER	TNAGRIT3	33.00		1.73	57.03	1.40	2.45	1	BOTTOM SLAB	9.87	1.73	1	BOTTOM SLAB	9.79	
	TRAIL	TNT4A	33.08		1 . 51	49.94	1.40	2.04	1	TOP SLAB	4.27	1 . 51	1	TOP SLAB	9.46	
		TNT6A	41.60		1.41	58.79	1.40	1.97	1	BOTTOM SLAB	9.87	1.41	1	BOTTOM SLAB	9.79	
	SEMI:	TNT7A	42.00		1.43	59.91	1.40	2.04	1	BOTTOM SLAB	9.87	1.43	1	BOTTOM SLAB	9.79	
	TRACTOR (TTS	TNT7B	42.00		1.43	59.91	1.40	2.01	1	TOP SLAB	4.53	1.43	1	BOTTOM SLAB	9.79	
	TRA(TNAGRIT4	43.00		1.33	57.28	1.40	1.93	1	BOTTOM SLAB	9.87	1.33	1	BOTTOM SLAB	9.79	
	TRUCK	TNAGT5A	45.00		1.27	56.94	1.40	1.80	1	BOTTOM SLAB	9.87	1.27	1	BOTTOM SLAB	9.79	
	TRI	TNAGT5B	45.00		1.27	56.94	1.40	1.78	1	BOTTOM SLAB	9.87	1.27	1	BOTTOM SLAB	9.79	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

ASSEMBLED BY: H. T. BARBOUR DATE: 12/20/2016 CHECKED BY: M. POOLE DATE: 1/17

DRAWN BY: WMC 7/II REV. IO/I/II MAA/GM
CHECKED BY: GM 7/II

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		
ЕН	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.

(#) CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

 $\sqrt{3}$ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. B-5370

UNION COUNTY

STATION: 18+16.00 -L-

SHEET 2 OF 8



DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

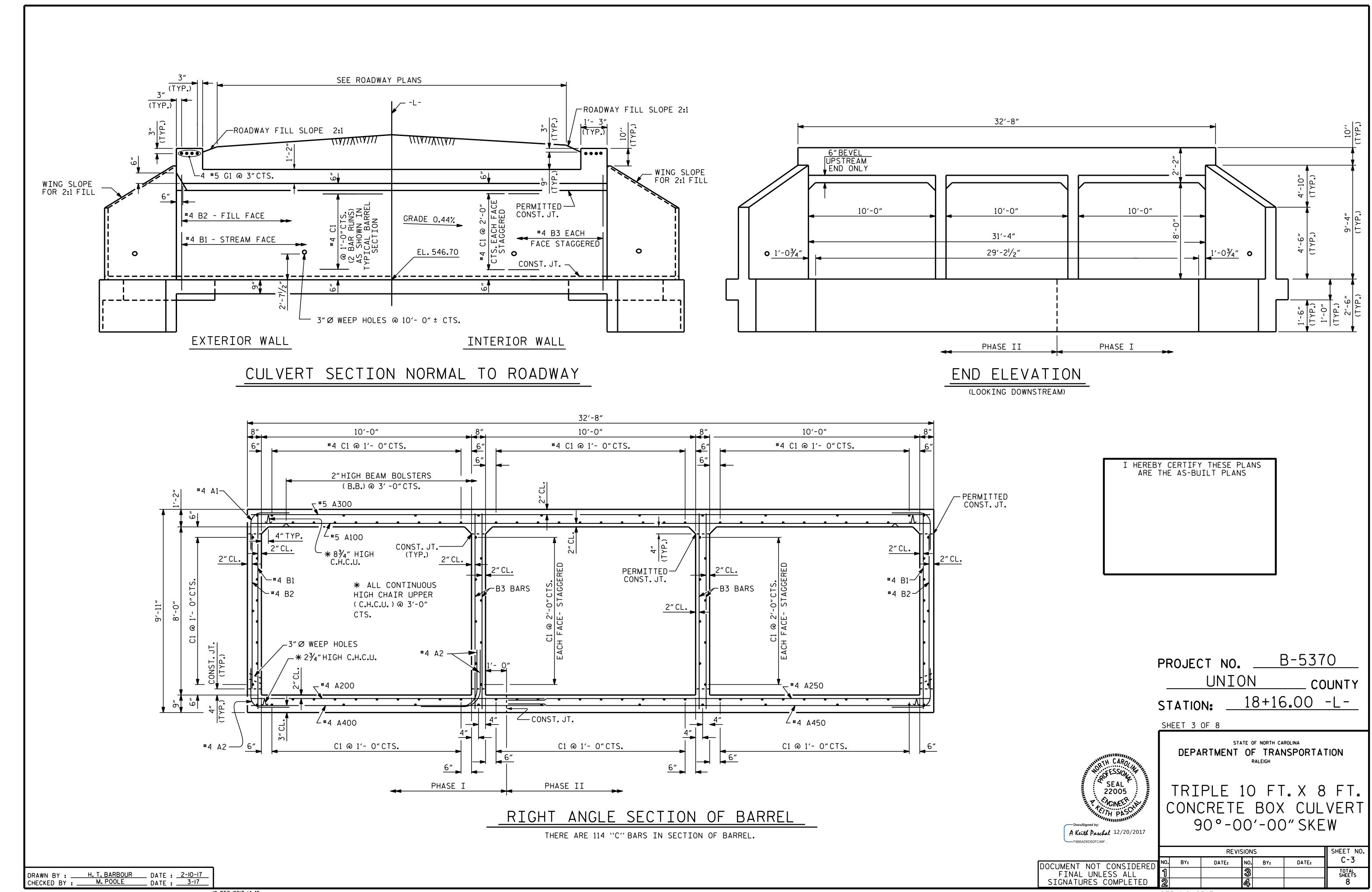
LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

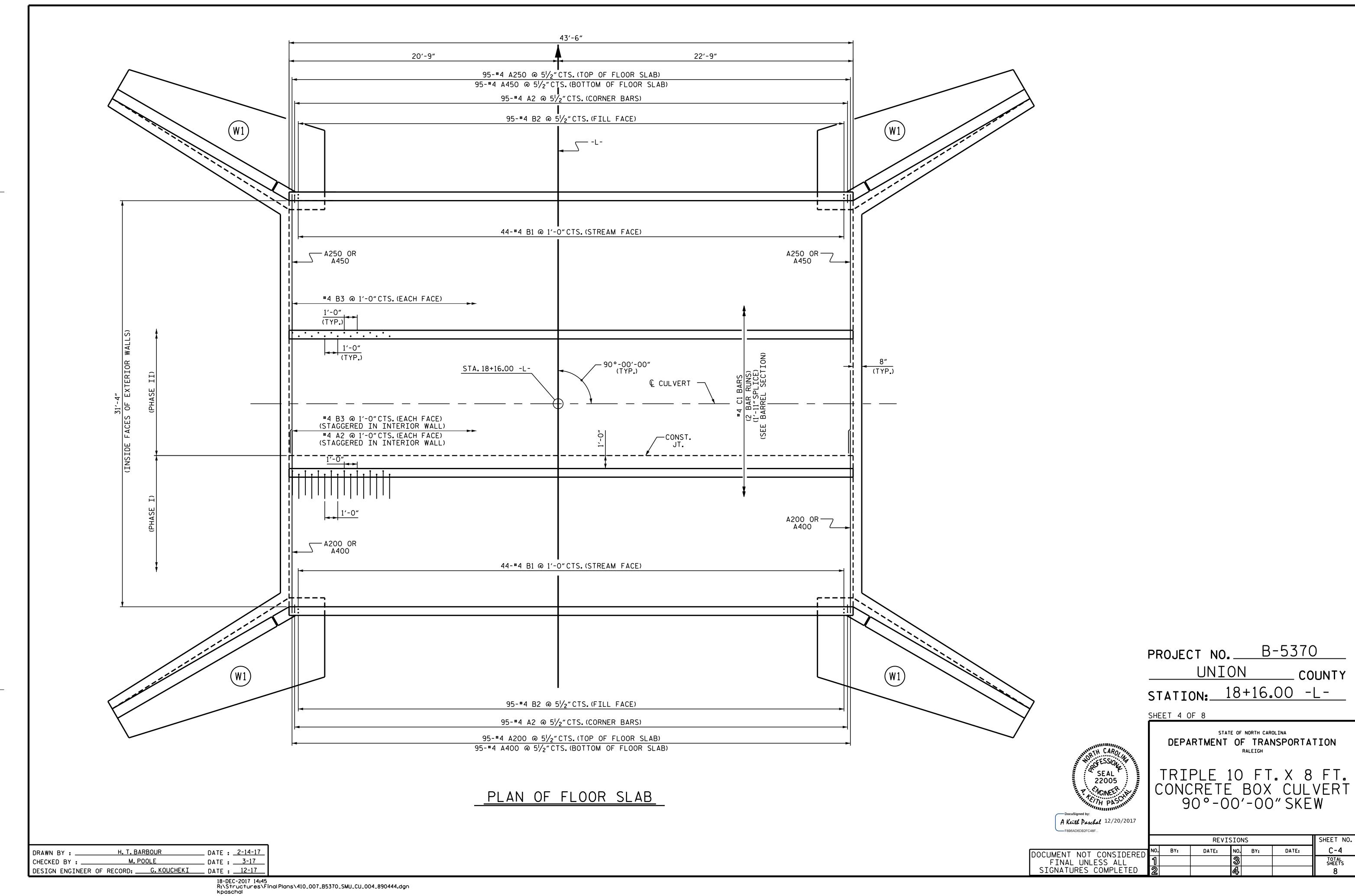
REVISIONS

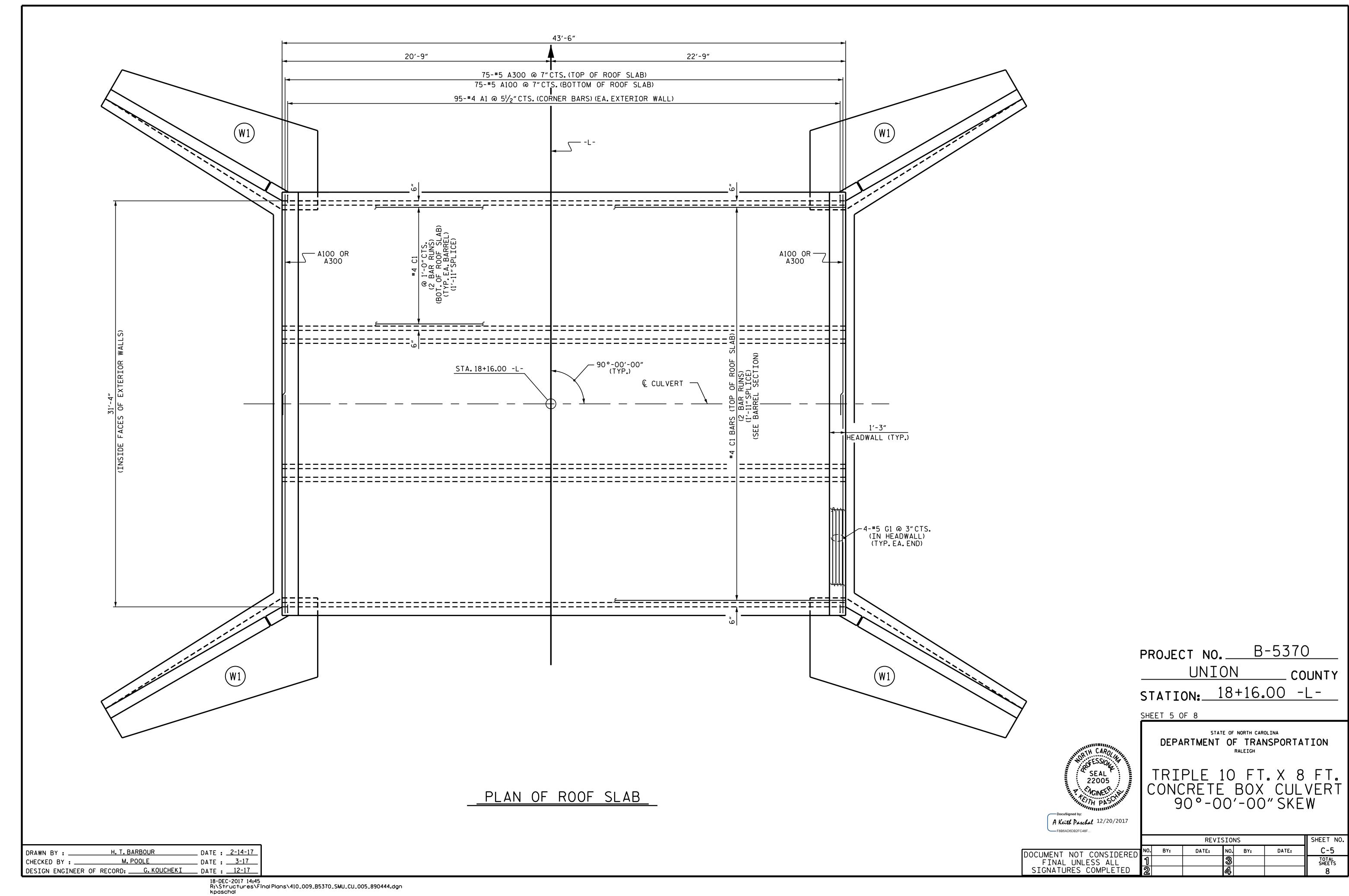
BY: DATE: NO. BY: DATE:

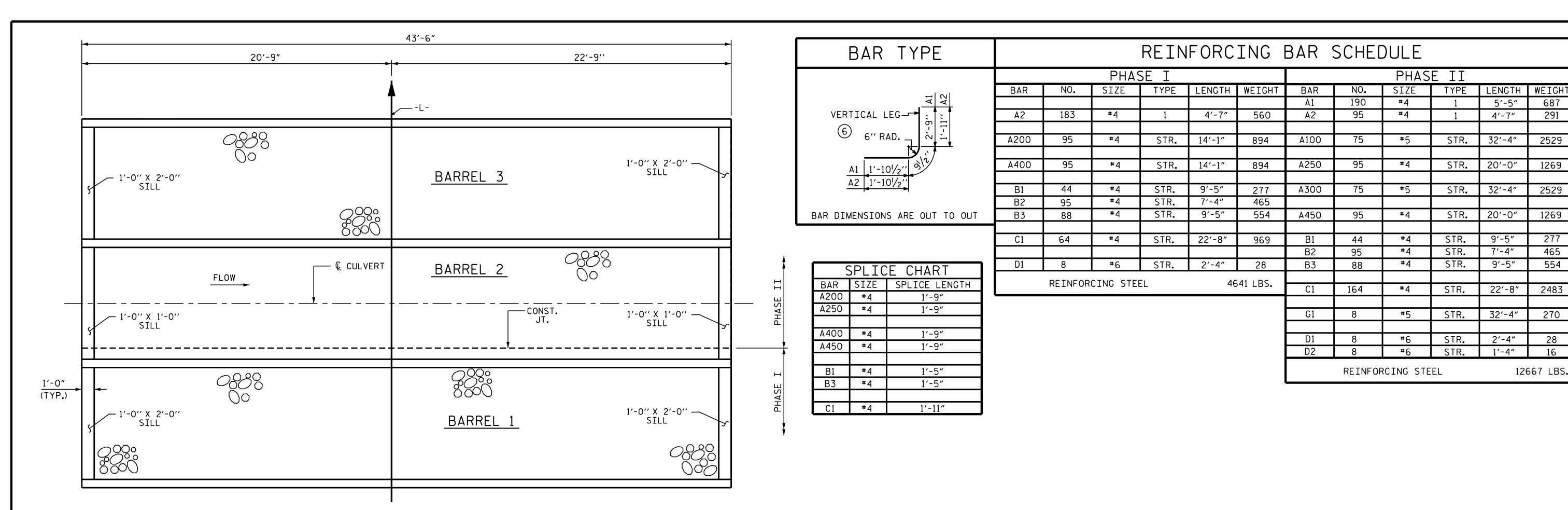
C-2

TOTAL SHEETS
8

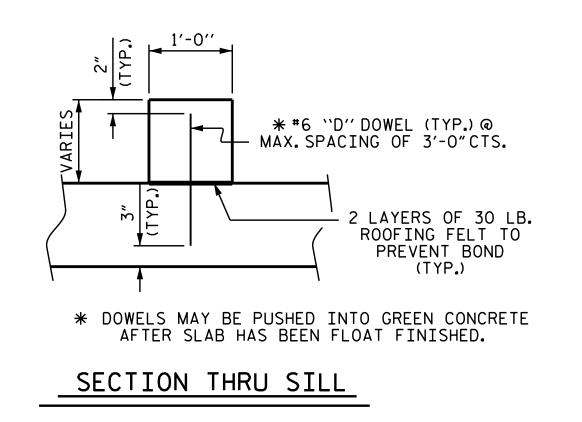


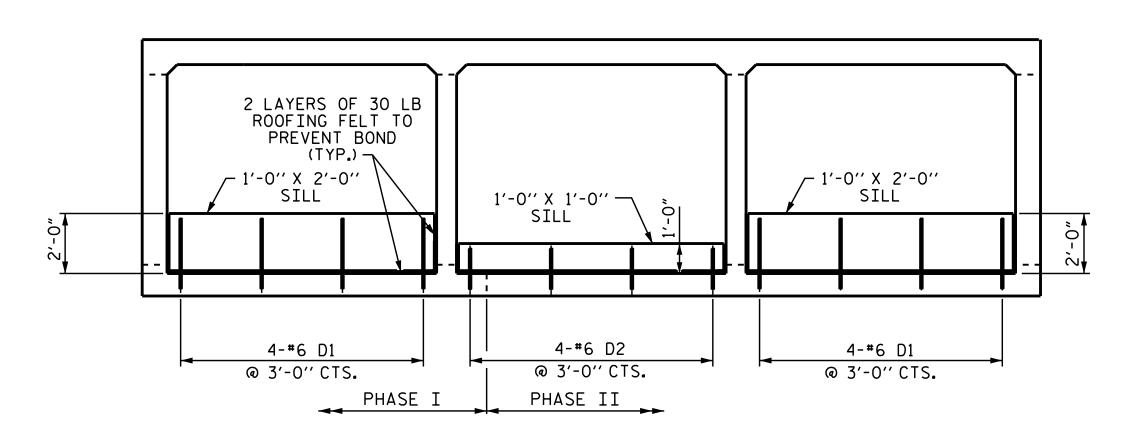






PLAN OF FLOOR SILL LAYOUT





ELEVATION

LOOKING UPSTREAM

B-5370 PROJECT NO. __

> UNION COUNTY

5′-5"

4'-7"

9′-5″

7′-4″

9′-5″

22'-8"

32′-4″

2'-4"

1'-4"

687

291

2529

1269

2529

1269

277

465

554

2483

270

28

16

12667 LBS.

18+16.00 -L-STATION:

SHEET 6 OF 8

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

TRIPLE 10 FT. X 8 FT. CONCRETE BOX CULVERT 90°-00'-00" SKEW

TOTAL SHEETS

SHEET NO. REVISIONS C-6

SEAL F 22005 NOINEER A Keith Paschal 12/20/2017

NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AS SHOWN IN THE "PLAN OF FLOOR SILL LAYOUT". THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS B RIP RAP. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

THE STOCKPILED MATERIAL SHALL BE PLACED LEVEL WITH THE TOP OF THE SILLS.

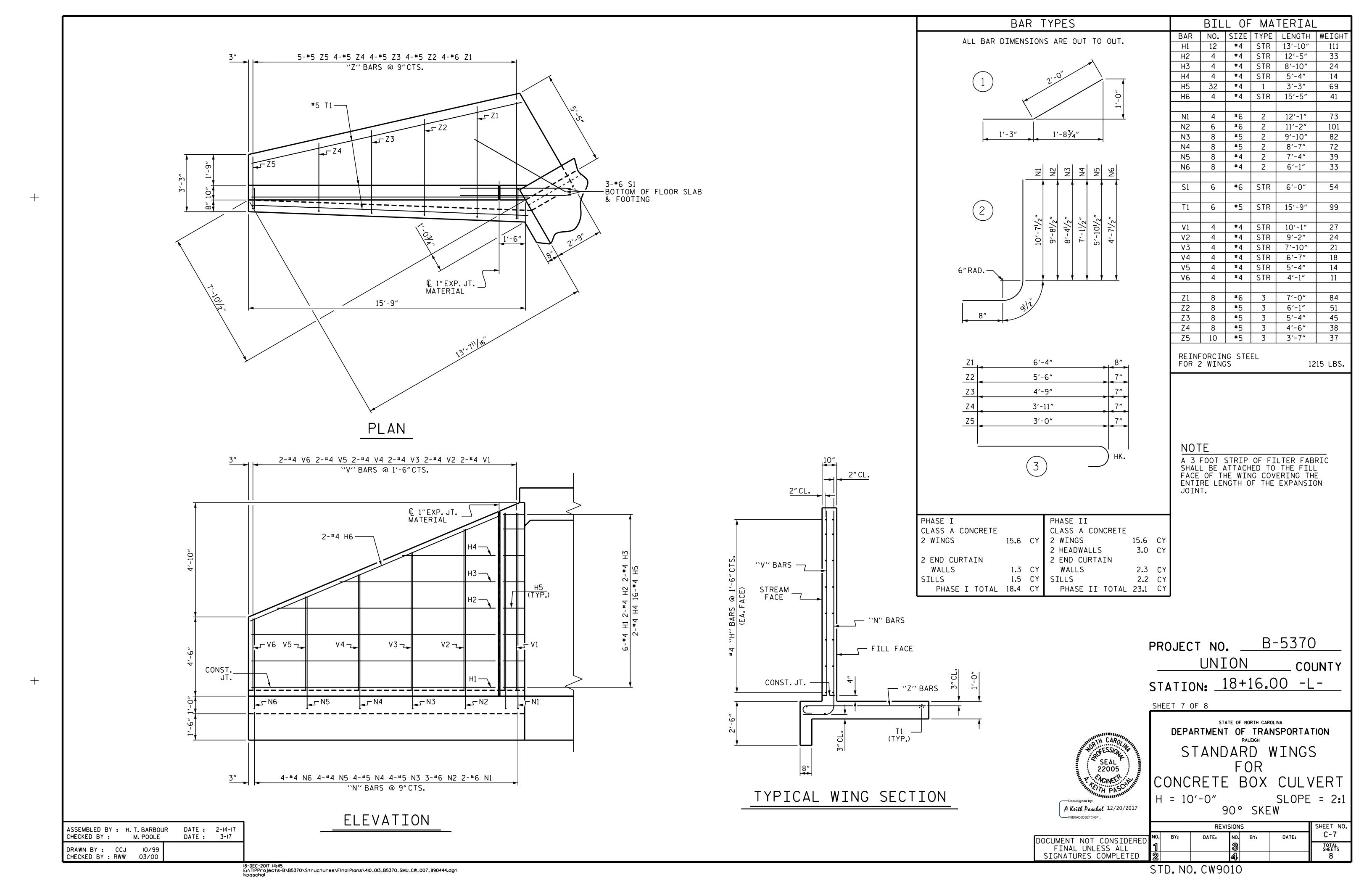
BED MATERIAL SHALL BE SUPPLEMENTED BY CLASS B RIP RAP AS NECESSARY.

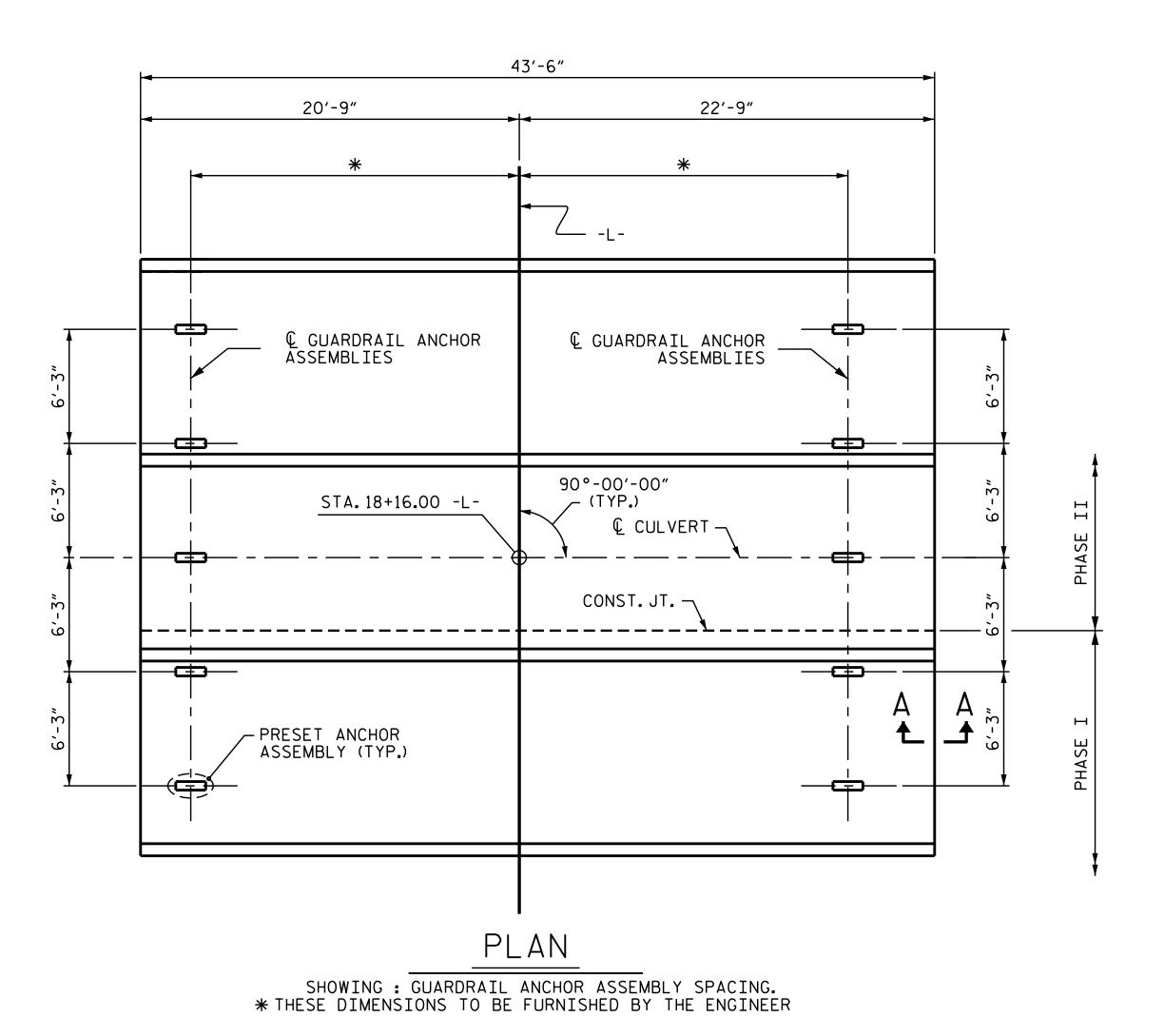
THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

DRAWN BY :	н.т. В.	ARBOUR	DATE :	2-14-17
CHECKED BY :	M. P	OOLE	DATE :	3-17
DESIGN ENGINEER	OF RECORD: _	G. KOUCHEKI	DATE : .	12-17

CUMENT NOT CONSIDERED	NO.	BY:	DATE:	NO.	BY:	DATE:
FINAL UNLESS ALL	1			3		
SIGNATURES COMPLETED	2			4		





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 $2^{1}/2^{n}$.
- 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 21/4" 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 $\%_6$ " 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.

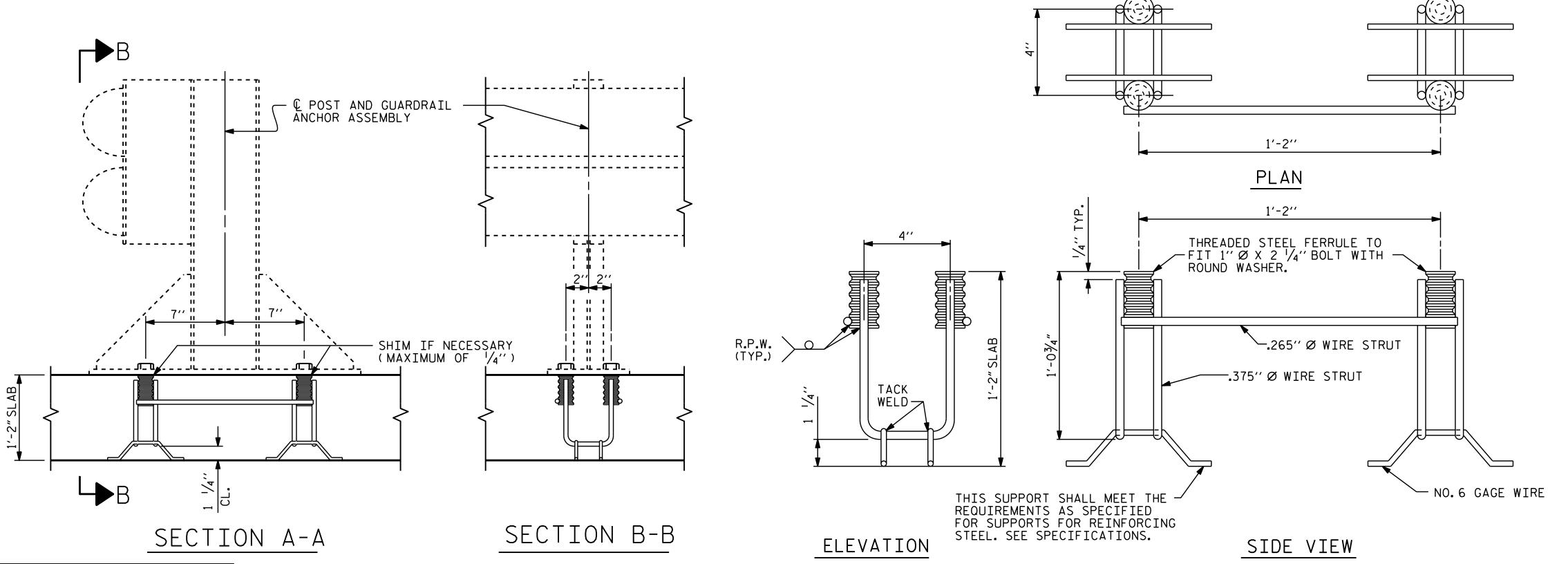
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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. B-5370

UNION COUNTY

STATION: 18+16.00 -L-

SHEET 8 OF 8

SEAL 22005

MOINEER

A Keith Parchal 12/20/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NO. BY: DATE: NO. BY: DATE:

O . BY: DATE: NO. BY: DATE: DATE: C-8

O . BY: DATE: NO. BY: DATE: NO.

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

ASSEMBLED BY : H. T. BARBOUR

DRAWN BY: FCJ 6/88 REV. 5/1/03 REV. 5/1/06R REV. 10/1/II

CHECKED BY : M. POOLE

DATE : 2-14-17 DATE : 3-17

> KMM/GM MAA/GM

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 375 LBS. PER SQ. IN. OF TIMBER - - - -EQUIVALENT FLUID PRESSURE OF EARTH 30 LBS. PER CU. FT.

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.

(MINIMUM)

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 $rac{3}{4}$ " 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. 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.

ENGLISH