

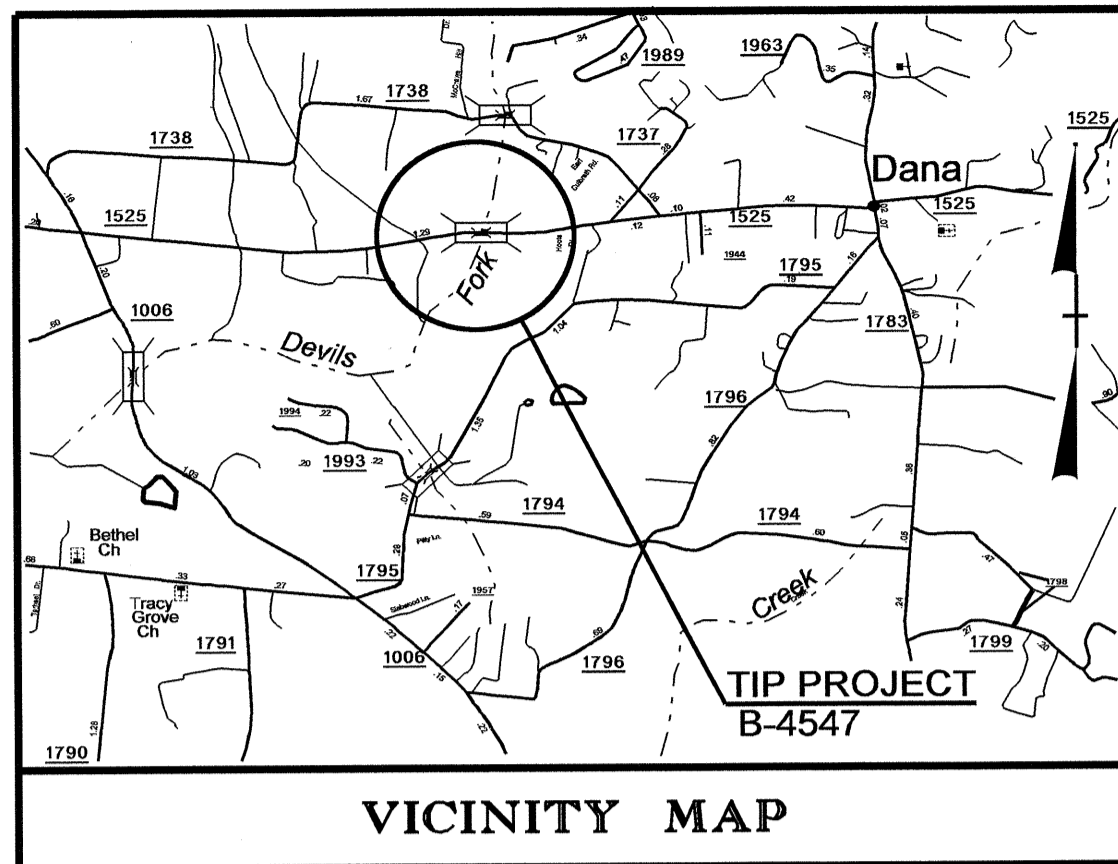
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

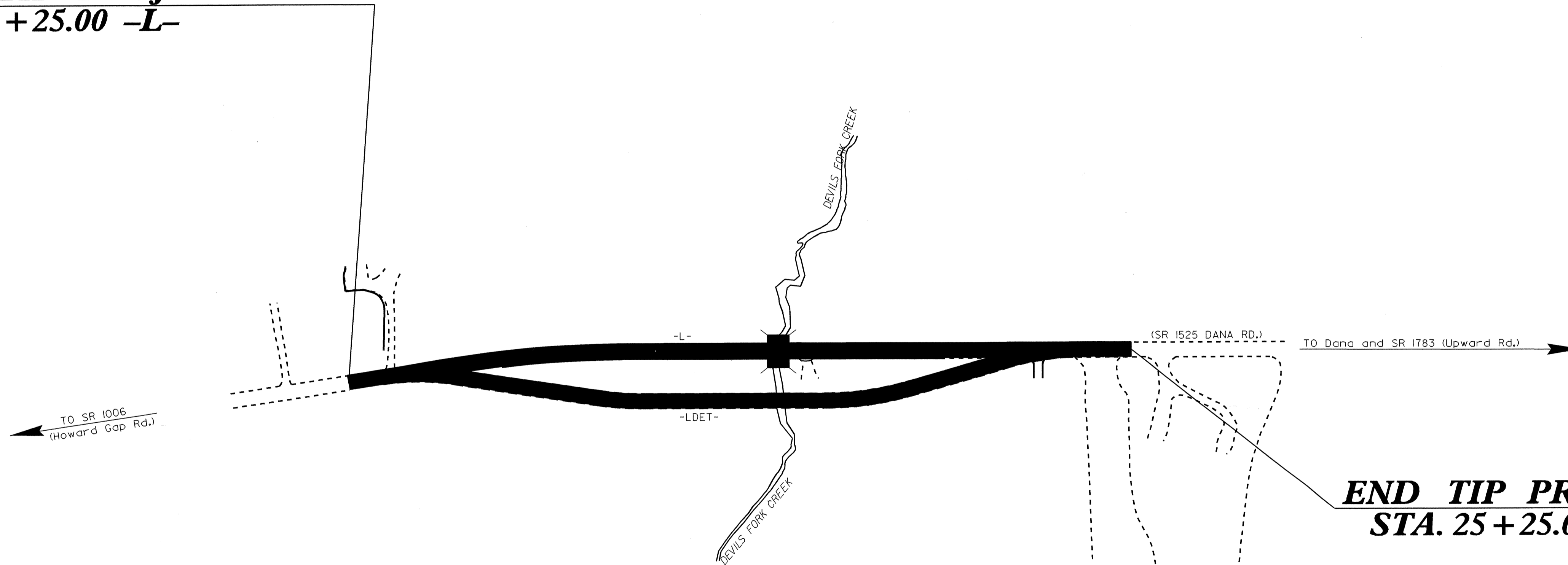
LOCATION: BRIDGE NO. 45 OVER DEVILS FORK CREEK
ON SR 1525 (DANA RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4547		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38407.1.1	BRSTP-1525(8)	PE	
38407.2.1	BRSTP-1525(8)	RW & UTIL	
38407.3.1	BRSTP-1525(8)	CONSTRUCTION	



BEGIN TIP PROJECT B-4547
STA. 14 + 25.00 -L-



END TIP PROJECT B-4547
STA. 25 + 25.00 -L-



TIP PROJECT: B-4547

CONTRACT: C203150

CULVERT



DESIGN DATA

ADT 2012 = 5400
ADT 2032 = 9400
DHV = 12 %
D = 60 %
T = 4 % *
V = 50 MPH
* TTST 1% DUAL 3%
FUNC. CLASS =
MINOR COLLECTOR
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4547 = 0.208 MILES
TOTAL LENGTH TIP PROJECT B-4547 = 0.208 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
May 21, 2013

Q. H. NGUYEN, P.E.
PROJECT ENGINEER

MARC G. CHEEK, P.E.
PROJECT DESIGN ENGINEER

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

STATE OF NORTH CAROLINA

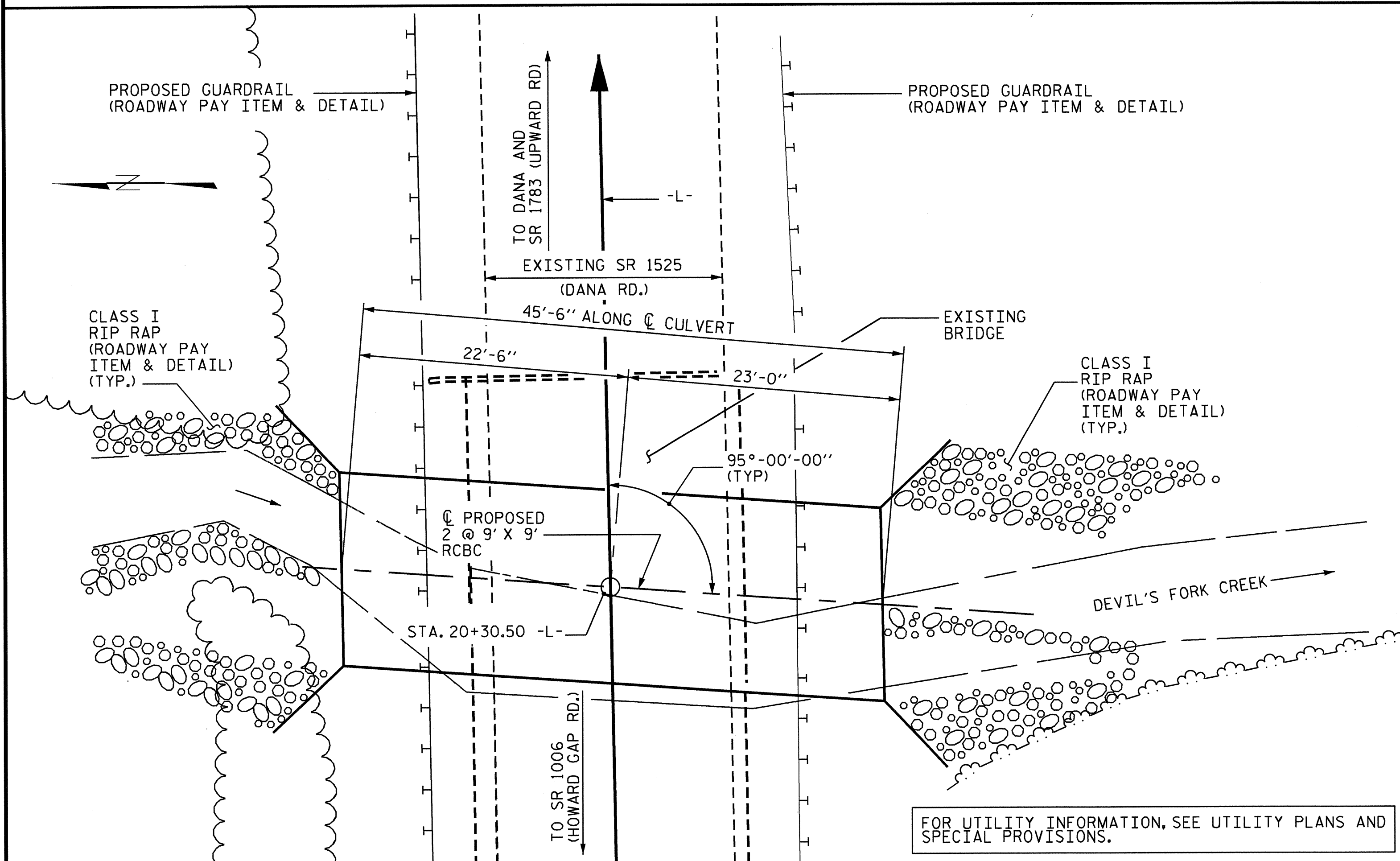
P.E.
STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR
DATE

31-JAN-2013 10:14
\$\$\$\$\$DGN\$\$\$\$\$
dgnodg

BENCHMARK #1: 8" SPIKE SET IN 30" WHITE PINE 45.93' RT OF STA. 16+79.03 -L-, ELEV. 2131.70

F.A. PROJECT No. : BRSTP-1525(8)



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 DESIGN FILL-----3.2 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 CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 1. PHASE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF PHASE I VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF PHASE I WALLS AND WINGS FULL HEIGHT.
 3. PHASE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF PHASE II VERTICAL WALLS.
 4. THE REMAINING PORTIONS OF PHASE II WALLS AND PHASE II WINGS FULL HEIGHT.
 5. 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 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 CULVERT 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 AND PAY ITEM, SEE EROSION CONTROL PLANS.

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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR TEMPORARY ON-SITE DETOUR, SEE ROADWAY PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 16'-0", 1 @ 15'-0", 1 @ 16'-0" WITH A CLEAR ROADWAY WIDTH OF 24'-0", WITH A 4" ASPHALT WEARING SURFACE ON A REINFORCED CONCRETE FLOOR ON TIMBER JOISTS, AND A SUBSTRUCTURE CONSISTING OF TIMBER CAPS AND TIMBER PILES, AND LOCATED AT THE SITE OF PROPOSED STRUCTURE, 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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
BARREL @ 2.126 CY/FT	96.7 C.Y.
WINGS, ETC.	30.2 C.Y.
SILLS	1.4 C.Y.
TOTAL	128.3 C.Y.
REINFORCING STEEL	
BARREL	14624 LBS.
WINGS, ETC.	1803 LBS.
TOTAL	16427 LBS.
FOUNDATION COND. MAT'L	64 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

HYDRAULIC DATA

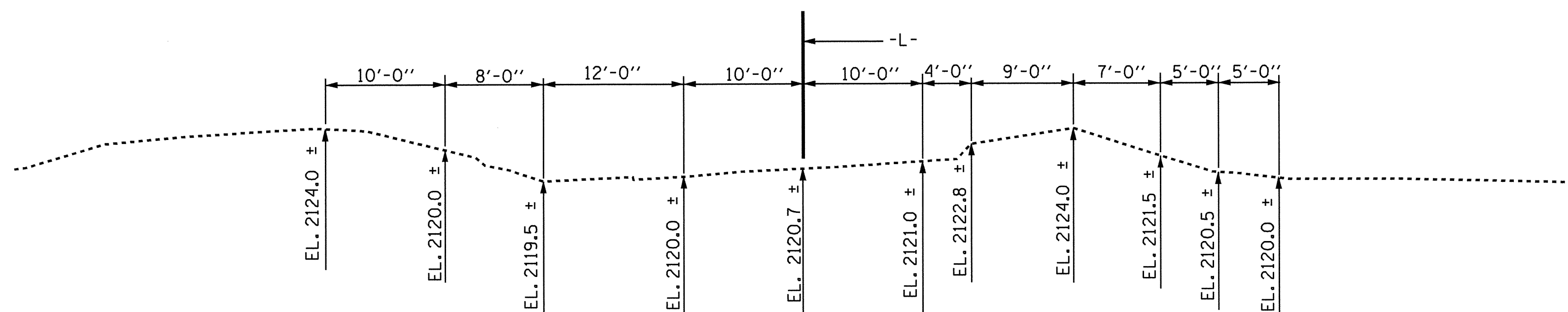
DESIGN DISCHARGE = 720 CFS
 FREQUENCY OF DESIGN FLOOD = 25 YEARS
 DESIGN HIGH WATER ELEVATION = 2127.8
 DRAINAGE AREA = 1.86 SQ. MI.
 BASE DISCHARGE (Q100) = 1100 CFS
 BASE HIGH WATER ELEVATION = 2129.2

OVERTOPPING FLOOD DATA

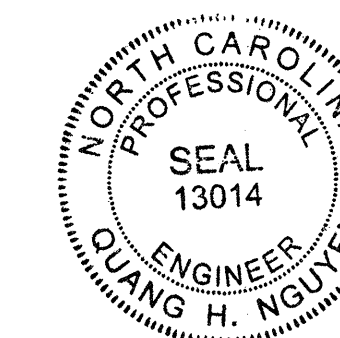
OVERTOPPING DISCHARGE.....1500 CFS
 FREQUENCY OF OVERTOPPING FLOOD.....200 + YRS.
 OVERTOPPING FLOOD ELEVATION.....2130.71

ROADWAY DATA

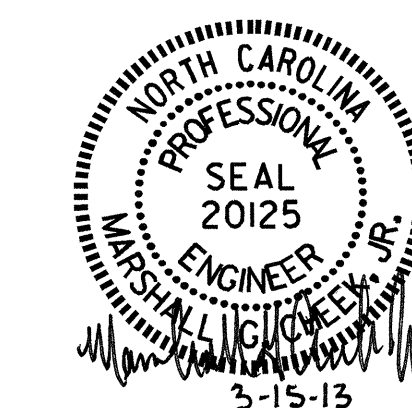
GRADE POINT ELEV. @ STATION 20+30.50 -L- = 2131.33
 BED ELEV. @ STATION 20+30.50 -L- = 2119.2
 ROADWAY SLOPES = 2:1



PROFILE ALONG CULVERT



Quang H. Nguyen 3-15-13



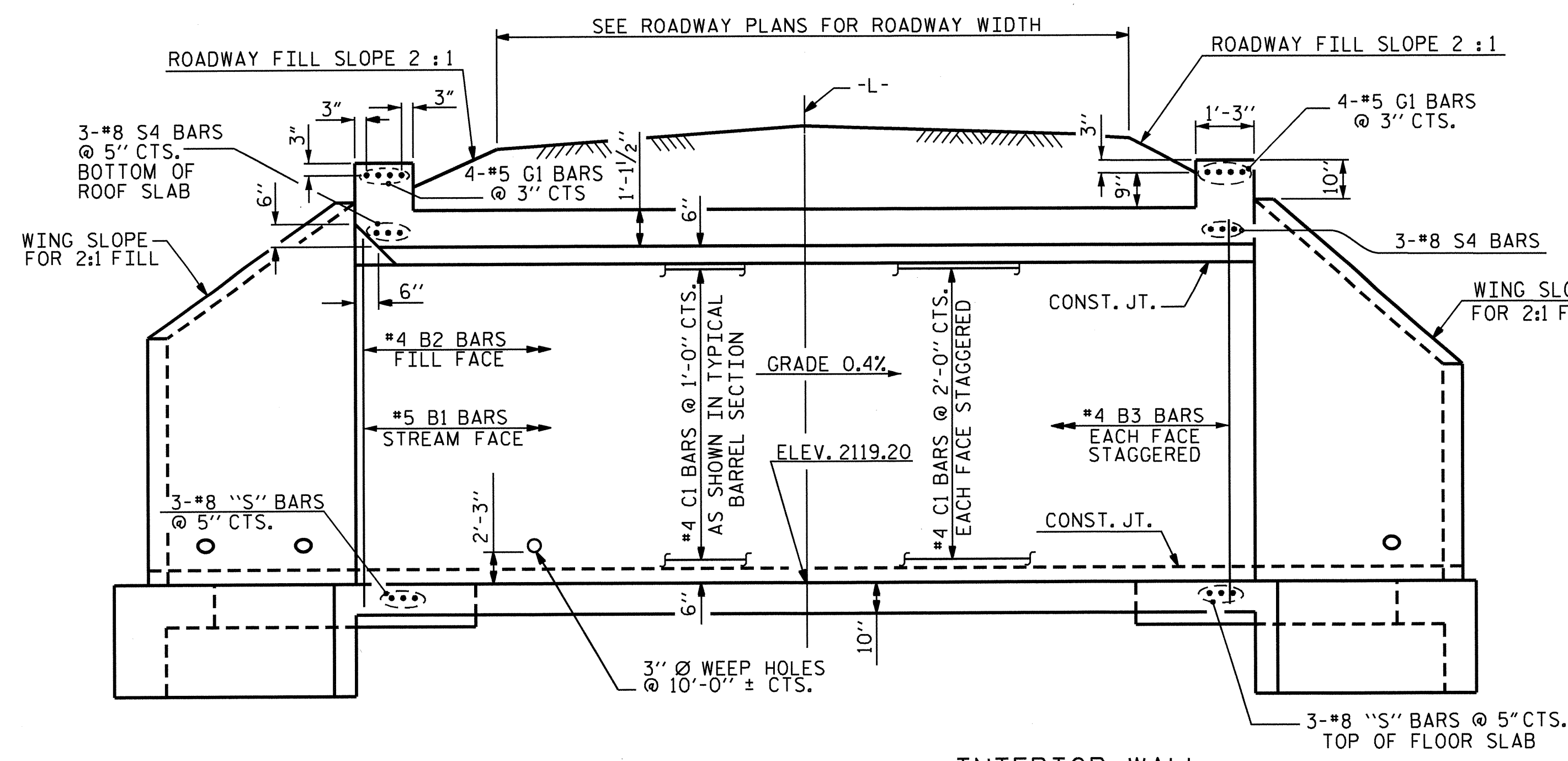
PROJECT NO. B-4547
 HENDERSON COUNTY
 STATION: 20+30.50 -L-

SHEET 1 OF 7 REPLACES BRIDGE No. 45

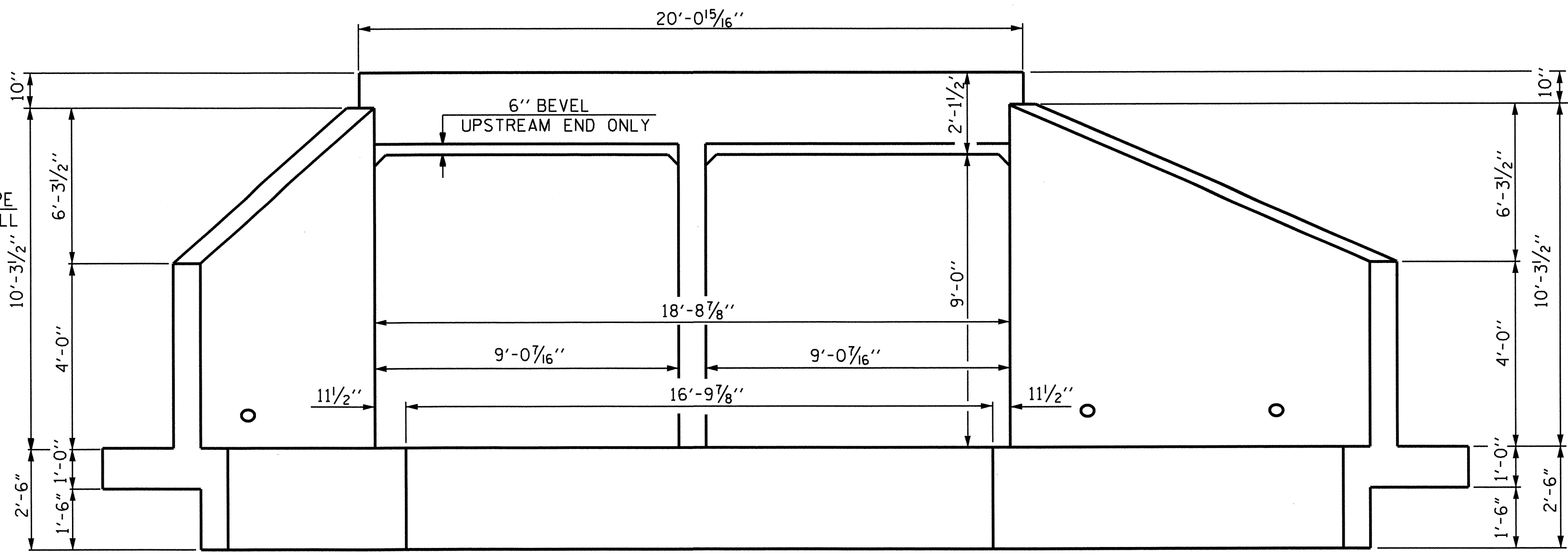
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 9 FT. X 9 FT.
 CONCRETE BOX CULVERT
 95° SKEW

REVISIONS						SHEET NO. C-1
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 7
2			4			

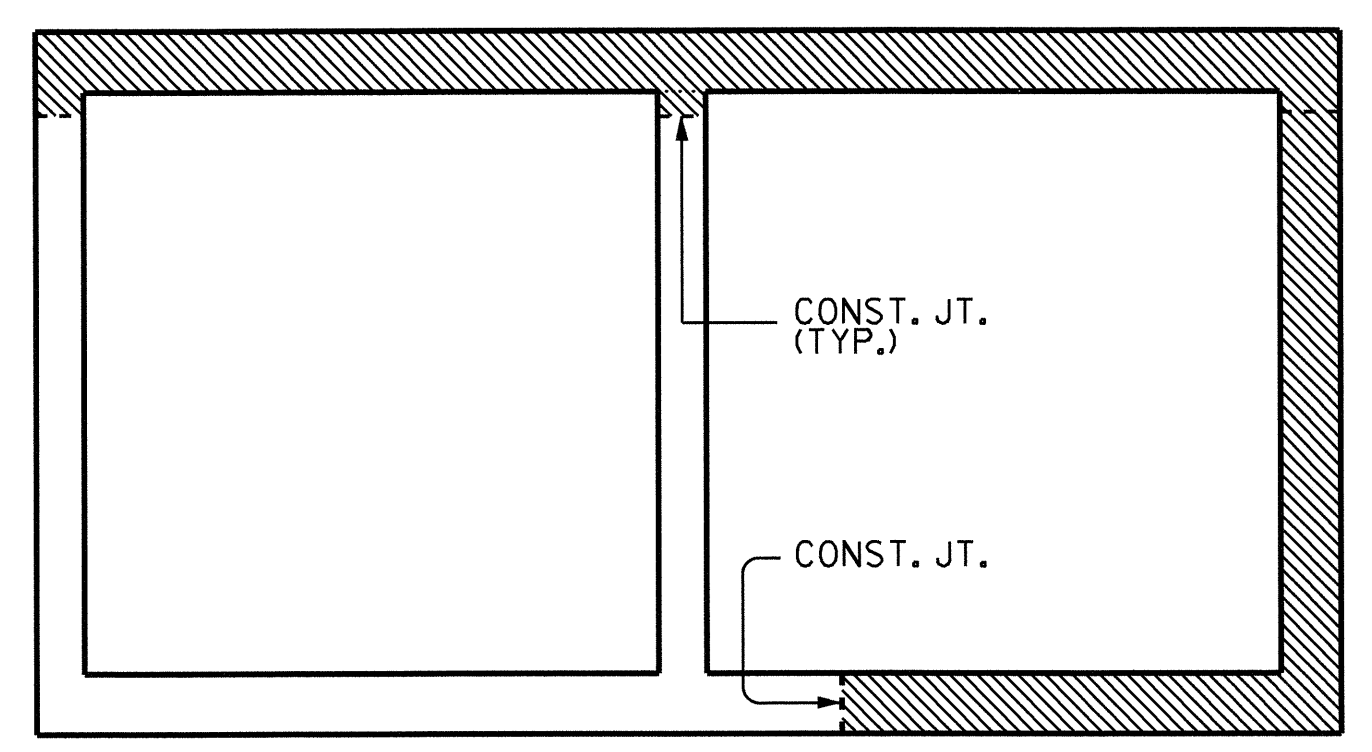
DRAWN BY : M. POOLE DATE : 12/11
 CHECKED BY : W. J. HARRIS DATE : 06/12
 DESIGN ENGINEER OF RECORD : J. R. MCROY DATE : 12/11



EXTERIOR WALL INTERIOR WALL
 CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW



PHASING SEQUENCE
 (LOOKING DOWNSTREAM)

PROJECT NO. B-4547
 HENDERSON COUNTY
 STATION: 20+30.50 -L-
 SHEET 2 OF 7

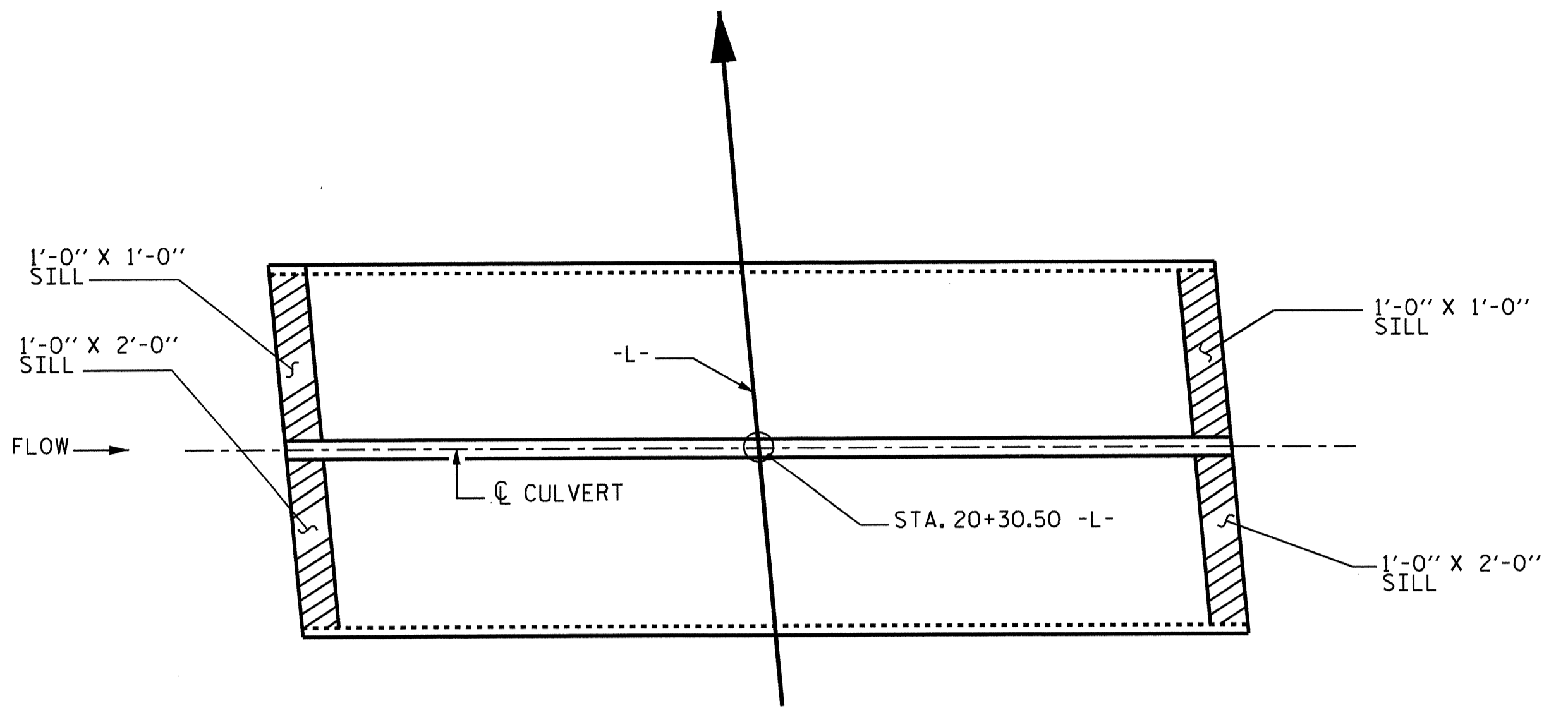
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 9 FT. X 9 FT.
 CONCRETE BOX CULVERT
 95° SKEW



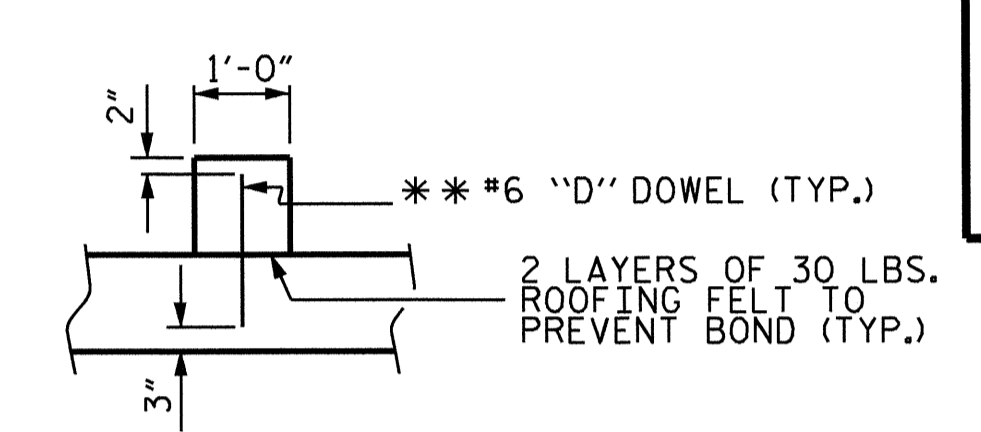
REVISED 11.18.99 BY M.M. CHECKED BY R.W.W.
 REDRAWN 10.1.1990 BY T.S. CHECKED BY ARB

ASSEMBLED BY: M. POOLE DATE: 12/11
 CHECKED BY: W. J. HARRIS DATE: 6/12
 DESIGN ENGINEER OF RECORD: J. R. MCROY DATE: 12/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			7

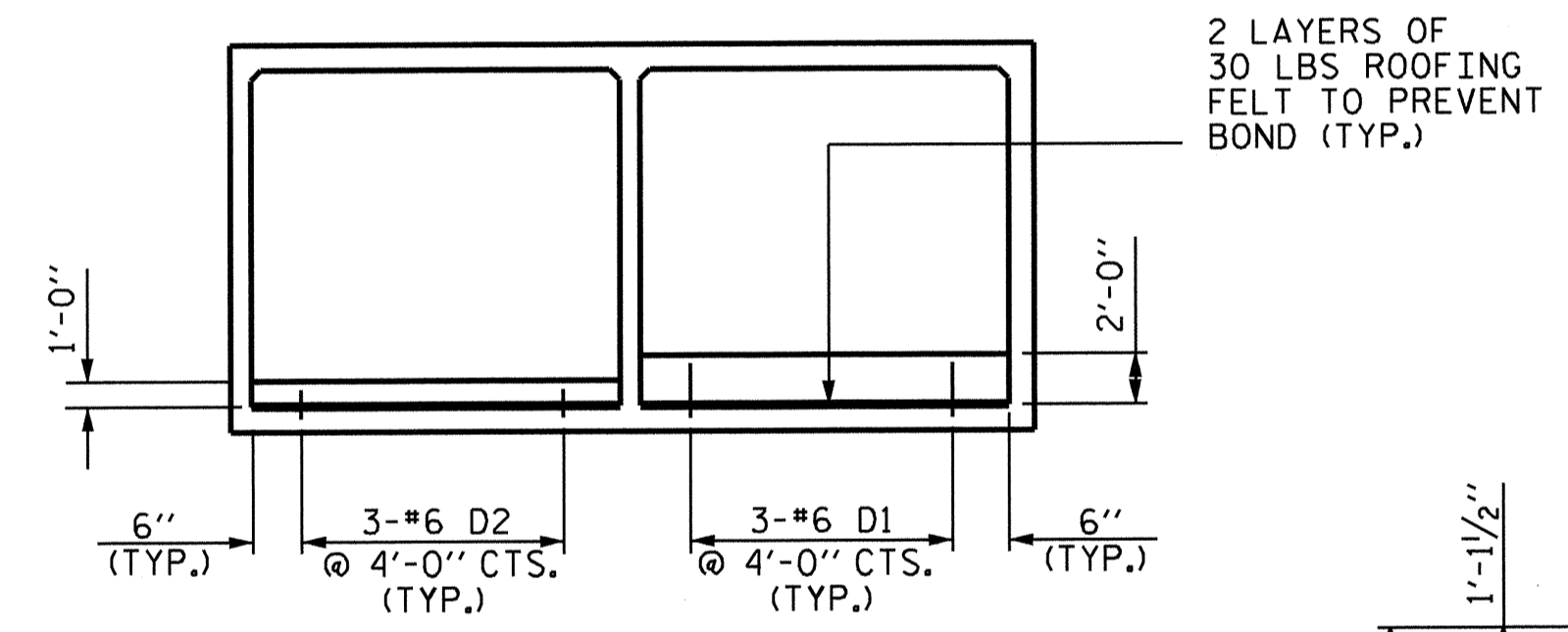


PLAN OF SILL LOCATION

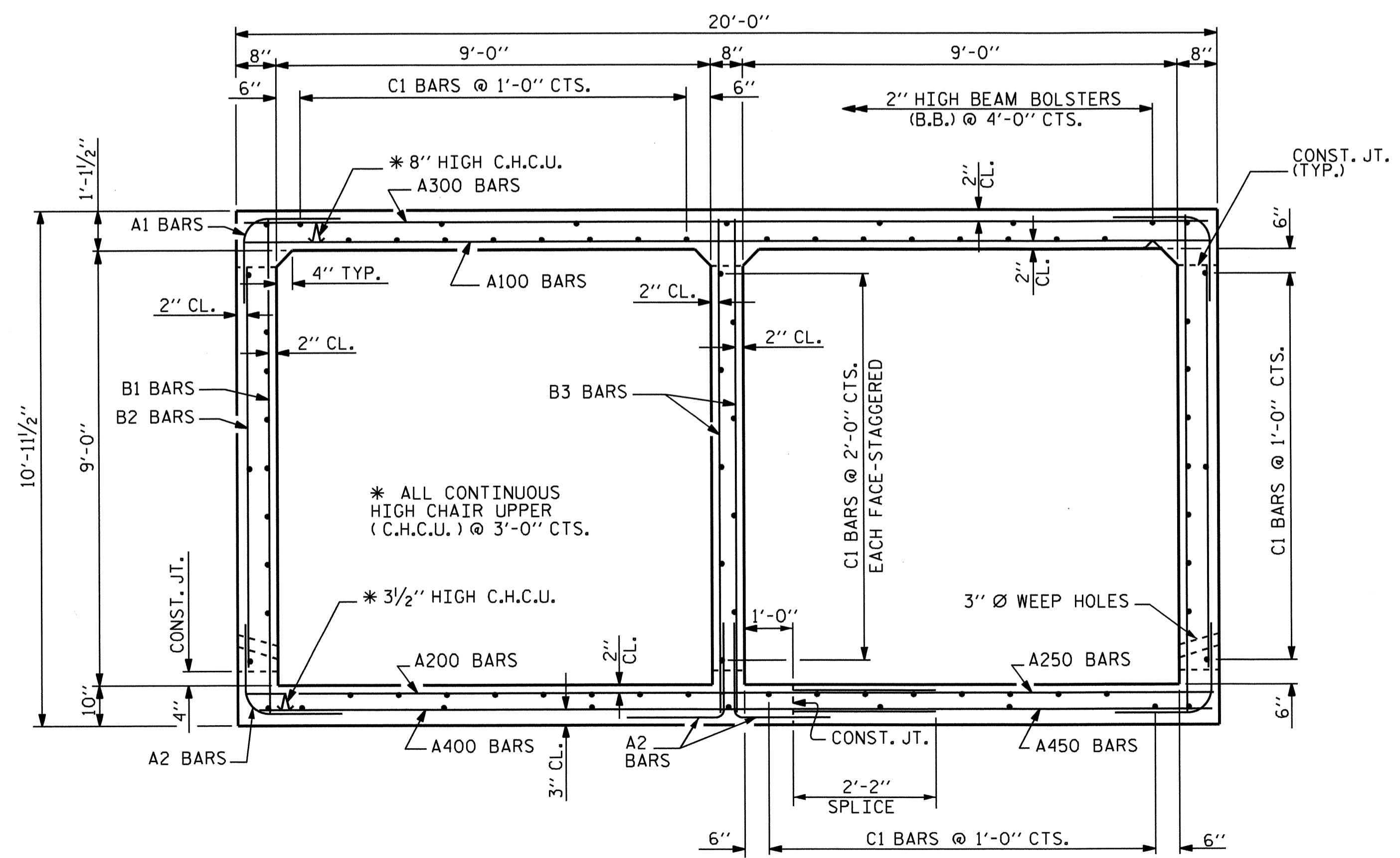


SECTION THRU SILLS

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



ELEVATION
(LOOKING DOWNSTREAM)



RIGHT ANGLE SECTION OF BARREL
(LOOKING DOWNSTREAM)

THERE ARE 79 "C" BARS IN SECTION OF BARREL.

BAR TYPE		
BAR DIMENSIONS ARE OUT TO OUT		
SPLICE LENGTH GHART		
BAR	SIZE	LENGTH
A200	5	2'-2"
A400	5	2'-2"
C1	4	1'-11"
S2	8	4'-11"

BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	92	5	6	4'-11"	472
A2	184	5	6	4'-6"	864
A100	88	5	STR	19'-7"	1797
A101	4	5	STR	6'-5"	27
A200	89	5	STR	13'-4"	1238
A201	1	5	STR	7'-6"	8
A202	1	5	STR	9'-8"	10
A250	89	5	STR	8'-4"	774
A251	1	5	STR	3'-6"	4
A252	1	5	STR	6'-11"	7
A300	88	5	STR	19'-7"	1797
A301	4	5	STR	6'-5"	27
A400	89	5	STR	13'-4"	1238
A401	1	5	STR	7'-6"	8
A402	1	5	STR	9'-8"	10
A450	89	5	STR	8'-4"	774
A451	1	5	STR	3'-6"	4
A452	1	5	STR	6'-11"	7
B1	92	5	STR	10'-5"	1000
B2	92	4	STR	8'-4"	512
B3	92	4	STR	10'-5"	640
C1	158	4	STR	23'-8"	2498
D1	6	6	STR	2'-5"	22
D2	6	6	STR	1'-5"	13
G1	8	5	STR	19'-8"	164
S2	6	8	STR	16'-3"	260
S3	6	8	STR	8'-4"	134
S4	6	8	STR	19'-8"	315
REINFORCING STEEL					14624 LBS.

PROJECT NO. B-4547
 HENDERSON COUNTY
 STATION: 20+30.50 -L-
 SHEET 3 OF 7

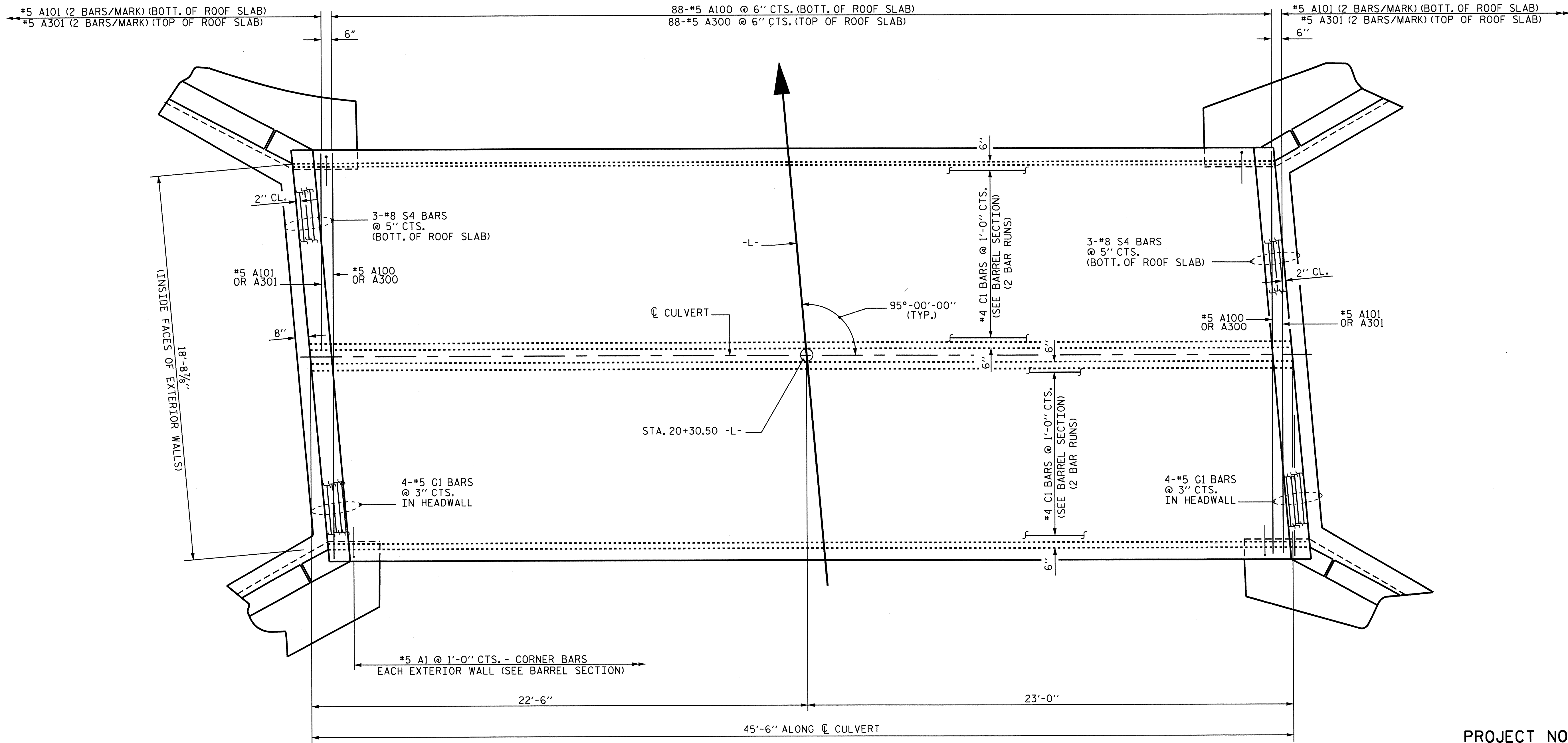
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 9 FT. X 9 FT.
 CONCRETE BOX CULVERT
 95° SKEW



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS 7
2			4			

ASSEMBLED BY : M. POOLE DATE : 12/11
 CHECKED BY : W. J. HARRIS DATE : 6/12
 DESIGN ENGINEER OF RECORD : J. R. MCROY DATE : 12/11

ADDED 11-1-90



PLAN OF ROOF SLAB

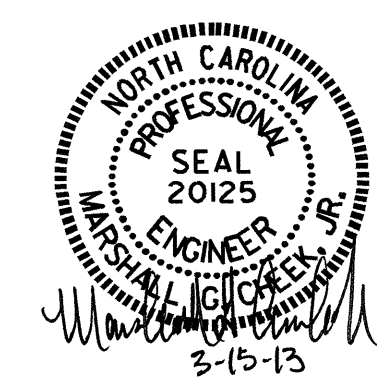
PROJECT NO. B-4547
HENDERSON COUNTY
 STATION: 20+30.50 -L-

SHEET 5 OF 7

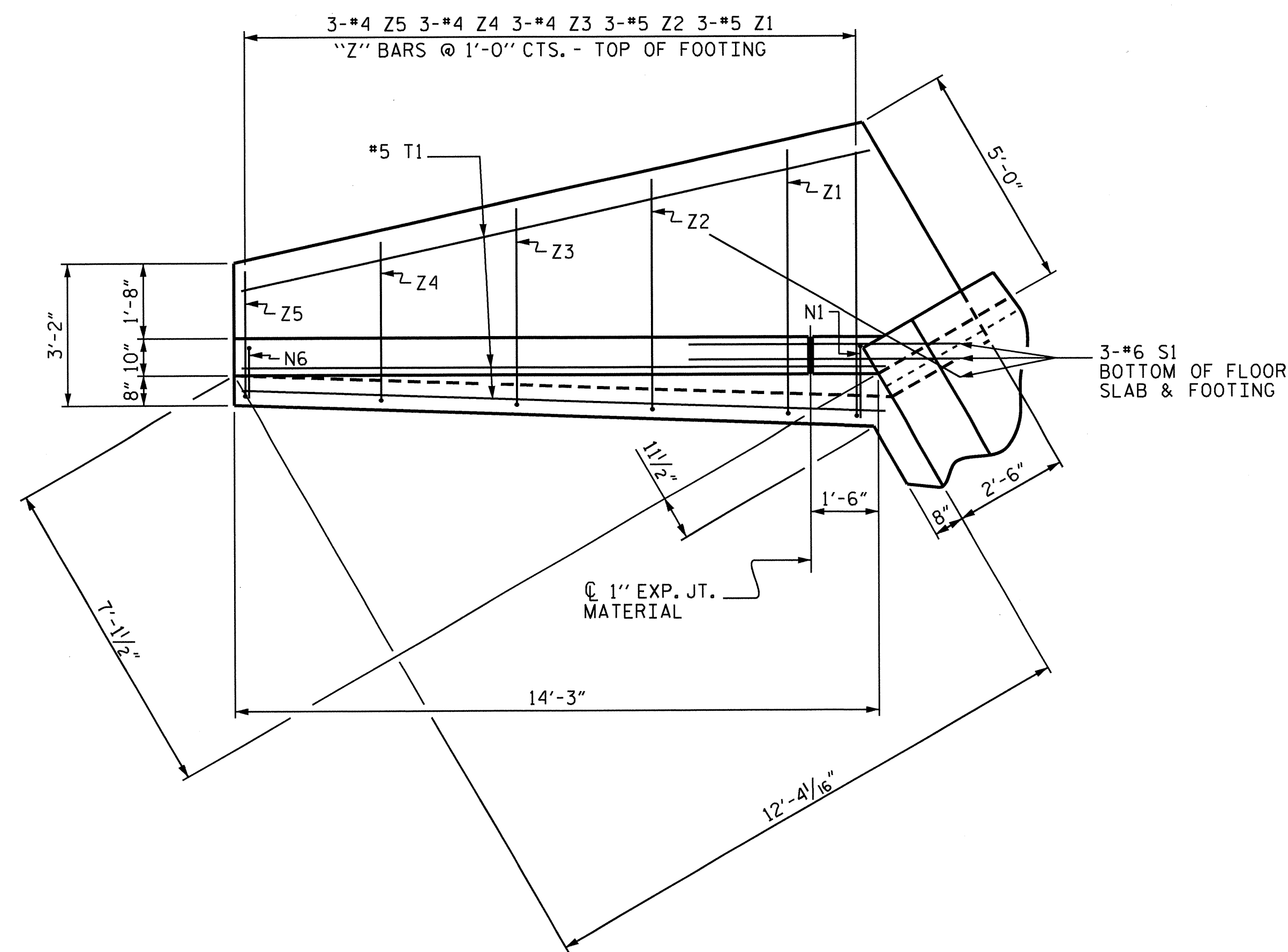
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 9 FT. X 9 FT.
 CONCRETE BOX CULVERT

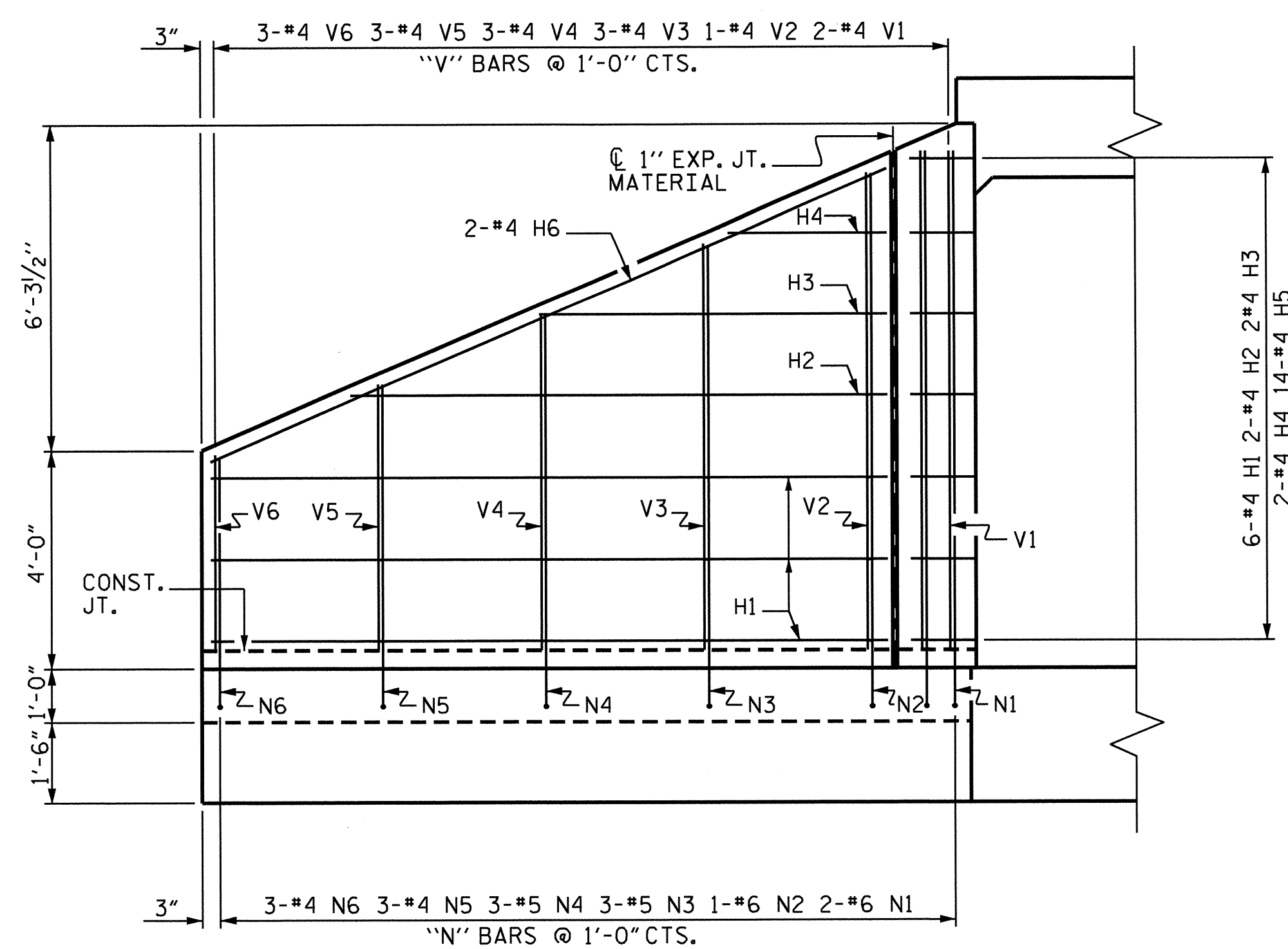
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			7



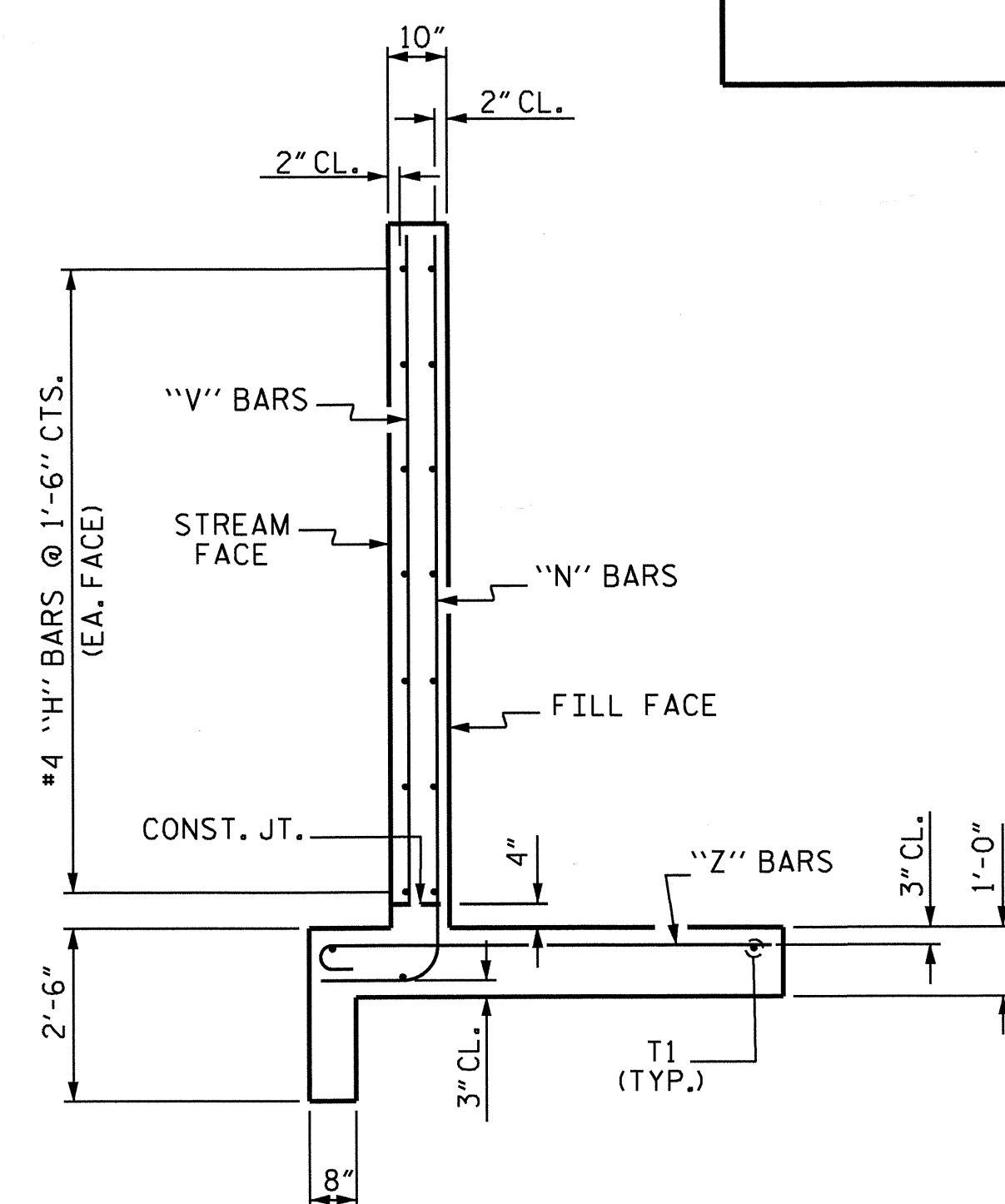
DRAWN BY : M. POOLE DATE : 03/12
 CHECKED BY : M. G. CHEEK DATE : 06/12
 DESIGN ENGINEER OF RECORD J. R. MCROY DATE : 12/11



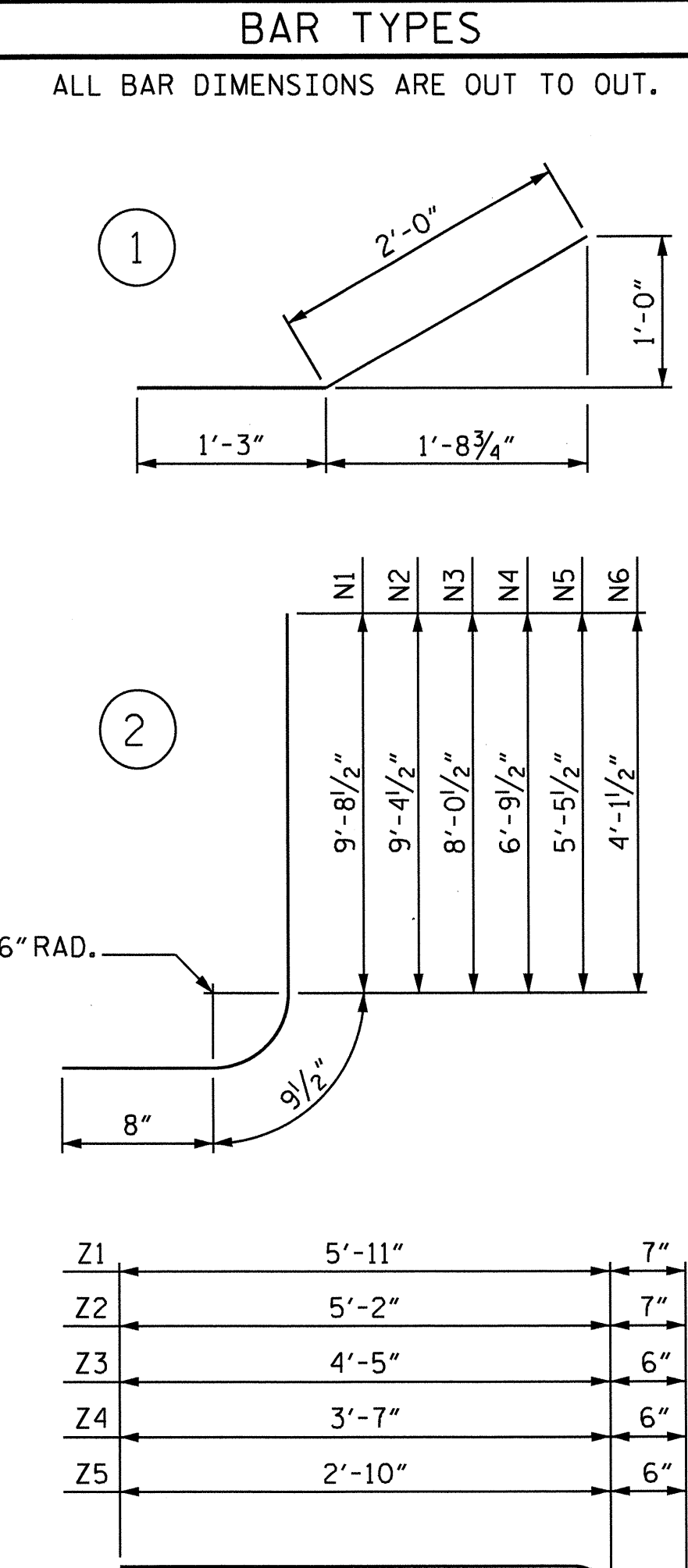
PLAN



ELEVATION



TYPICAL WING SECTION



BILL OF MATERIAL					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
H1	24	#4	STR	12'-5"	199
H2	8	#4	STR	9'-10"	53
H3	8	#4	STR	6'-5"	34
H4	8	#4	STR	2'-11"	16
H5	56	#4	1	3'-3"	122
H6	8	#4	STR	13'-6"	72
N1	8	#6	2	11'-2"	134
N2	4	#6	2	10'-10"	65
N3	12	#5	2	9'-6"	119
N4	12	#5	2	8'-3"	103
N5	12	#4	2	6'-11"	55
N6	12	#4	2	5'-7"	45
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	14'-3"	178
V1	8	#4	STR	9'-2"	49
V2	4	#4	STR	8'-9"	23
V3	12	#4	STR	7'-5"	59
V4	12	#4	STR	6'-2"	49
V5	12	#4	STR	4'-10"	39
V6	12	#4	STR	3'-7"	29
Z1	12	#5	3	6'-6"	81
Z2	12	#5	3	5'-9"	72
Z3	12	#4	3	4'-11"	39
Z4	12	#4	3	4'-1"	33
Z5	12	#4	3	3'-4"	27

REINFORCING STEEL FOR 4 WINGS 1803 LBS.

CLASS A CONCRETE
 4 WINGS 26.2 CY
 2 HEADWALLS 1.9 CY
 2 END CURTAIN WALLS 2.1 CY
 TOTAL 30.2 CY

NOTE
 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.

PROJECT NO. B-4547
HENDERSON COUNTY
 STATION: 20+30.50 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD WINGS FOR CONCRETE BOX CULVERT
 H = 9'-0" SLOPE = 2:1



ASSEMBLED BY : M. POOLE
 CHECKED BY : W. J. HARRIS
 DATE : 12/11
 DATE : 6/12

DRAWN BY : CCJ 10/99
 CHECKED BY : RWW 03/00

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6	
1			3			TOTAL SHEETS	
2			4			7	

**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 (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	1.29	1	BOTTOM SLAB	9.43	1.05	1	TOP SLAB	8.49		
	HL-93 (OPERATING)	N/A		1.36	--	1.35	1.67	1	BOTTOM SLAB	9.43	1.36	1	TOP SLAB	8.49		
	HS-20 (INVENTORY)	36.00	②	1.06	38.27	1.75	1.29	1	BOTTOM SLAB	9.43	1.06	1	BOTTOM SLAB	8.73		
	HS-20 (OPERATING)	36.00		1.38	49.61	1.35	1.67	1	BOTTOM SLAB	9.43	1.38	1	BOTTOM SLAB	8.73		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.18	29.37	1.40	3.27	1	TOP SLAB	4.11	2.18	1	TOP SLAB	8.49		
		SNGARBS2	20.00		2.03	40.62	1.40	2.54	1	BOTTOM SLAB	9.43	2.03	1	TOP SLAB	8.49	
		SNAGRIS2	22.00		1.93	42.42	1.40	2.34	1	BOTTOM SLAB	9.43	1.93	1	BOTTOM SLAB	8.73	
		SNCOTTS3	27.25		1.31	35.62	1.40	1.81	1	BOTTOM SLAB	9.43	1.31	1	TOP SLAB	8.49	
		SNAGGRS4	34.93		1.27	44.25	1.40	1.52	1	BOTTOM SLAB	9.43	1.27	1	BOTTOM SLAB	8.73	
		SNS5A	35.55		1.37	48.70	1.40	1.68	1	BOTTOM SLAB	9.43	1.37	1	BOTTOM SLAB	8.73	
		SNS6A	39.95		1.20	48.05	1.40	1.51	1	BOTTOM SLAB	9.43	1.20	1	BOTTOM SLAB	8.73	
		SNS7B	42.00		1.26	53.03	1.40	1.54	1	BOTTOM SLAB	9.43	1.26	1	BOTTOM SLAB	8.73	
	TRUCK TRACTOR SEMI-TRAILER (TST)	TNAGRIT3	33.00		1.57	51.81	1.40	1.94	1	BOTTOM SLAB	9.43	1.57	1	BOTTOM SLAB	8.73	
		TNT4A	33.08		1.56	51.53	1.40	1.87	1	BOTTOM SLAB	9.43	1.56	1	TOP SLAB	8.49	
		TNT6A	41.60		1.40	58.11	1.40	1.66	1	BOTTOM SLAB	9.43	1.40	1	BOTTOM SLAB	8.73	
		TNT7A	42.00		1.37	57.53	1.40	1.72	1	BOTTOM SLAB	9.43	1.37	1	BOTTOM SLAB	8.73	
		TNT7B	42.00		1.45	60.82	1.40	1.72	1	BOTTOM SLAB	9.43	1.45	1	BOTTOM SLAB	8.73	
		TNAGRIT4	43.00		1.31	56.30	1.40	1.58	1	BOTTOM SLAB	9.43	1.31	1	BOTTOM SLAB	8.73	
TNAGT5A	45.00		1.14	51.34	1.40	1.40	1	BOTTOM SLAB	9.43	1.14	1	BOTTOM SLAB	8.73			
TNAGT5B	45.00		③	1.05	47.38	1.40	1.30	1	BOTTOM SLAB	9.43	1.05	1	BOTTOM SLAB	8.73		

LOAD FACTORS:

STRENGTH LIMIT STATE	LOAD TYPE	MAX FACTOR	MIN FACTOR
	DC		1.25
DESIGN LOAD RATING FACTORS	DW		1.50
	EV		1.30
	EH		1.35
	ES		1.35
	LS		1.75
	WA		1.00

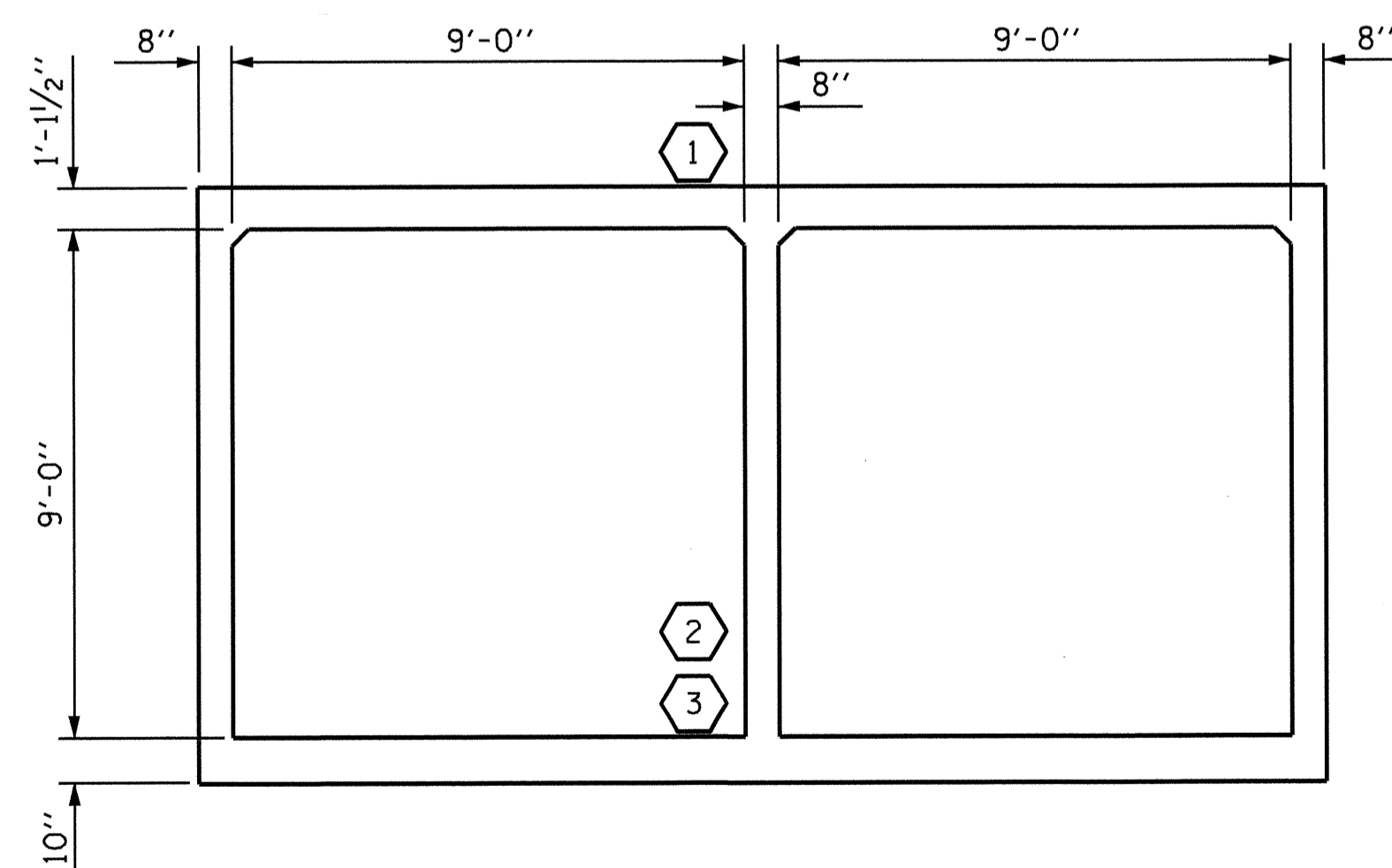
NOTE:

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

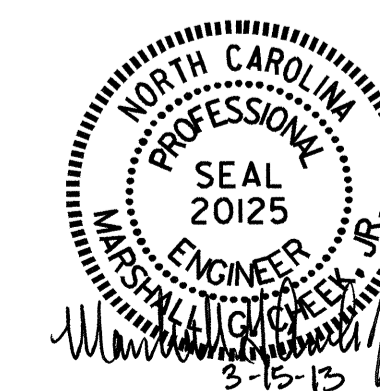


LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. B-4547
HENDERSON COUNTY
 STATION: 20+30.50 -L-

SHEET 7 OF 7

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			7

ASSEMBLED BY: M. POOLE DATE: 03/12
 CHECKED BY: W. J. HARRIS DATE: 06/12
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 12/11

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