

CONTRACT: C201502 TIP PROJECT: B-4192

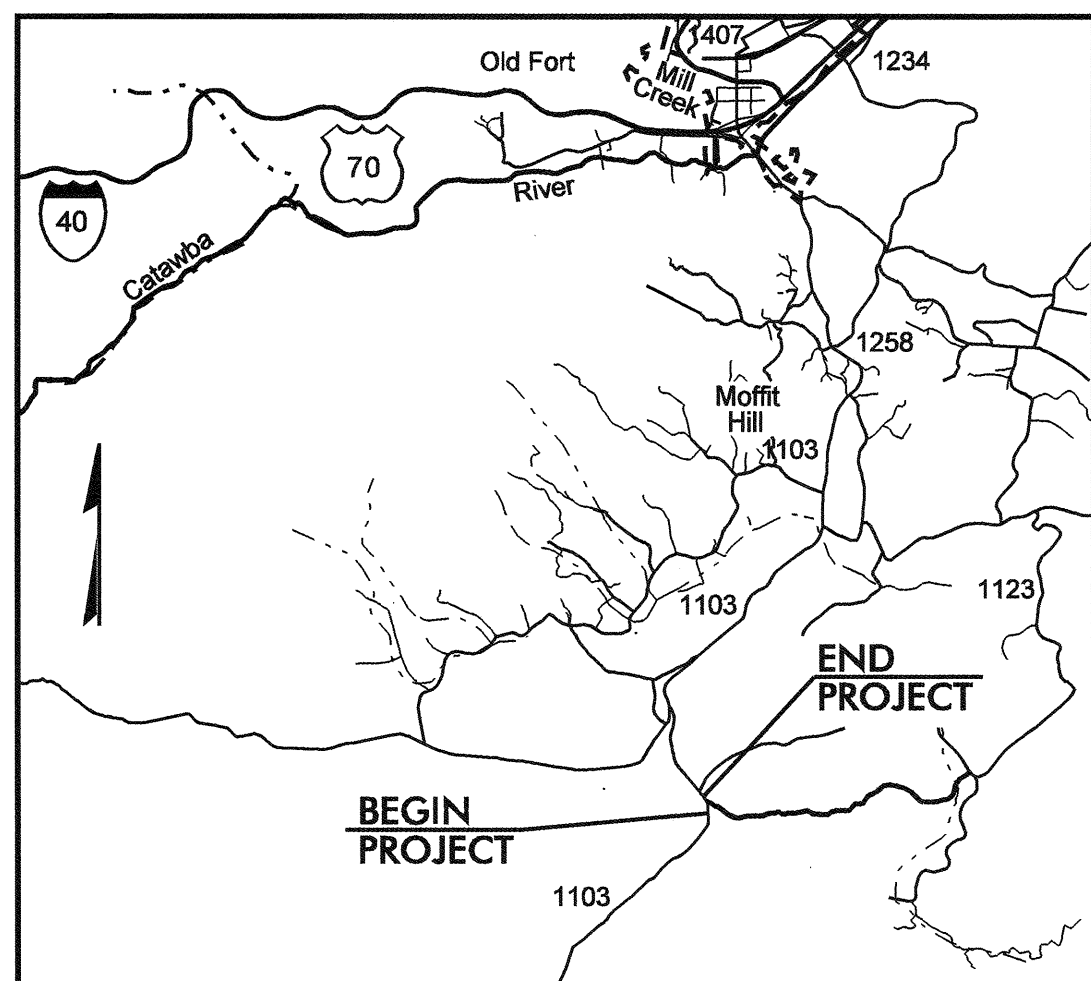
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4192		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33539.1.1	BRZ-1103(12)	P.E.	
33539.2.1	BRZ-1103(12)	RW & UTIL.	
33539.3.1	BRZ-1103(12)	CONST.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

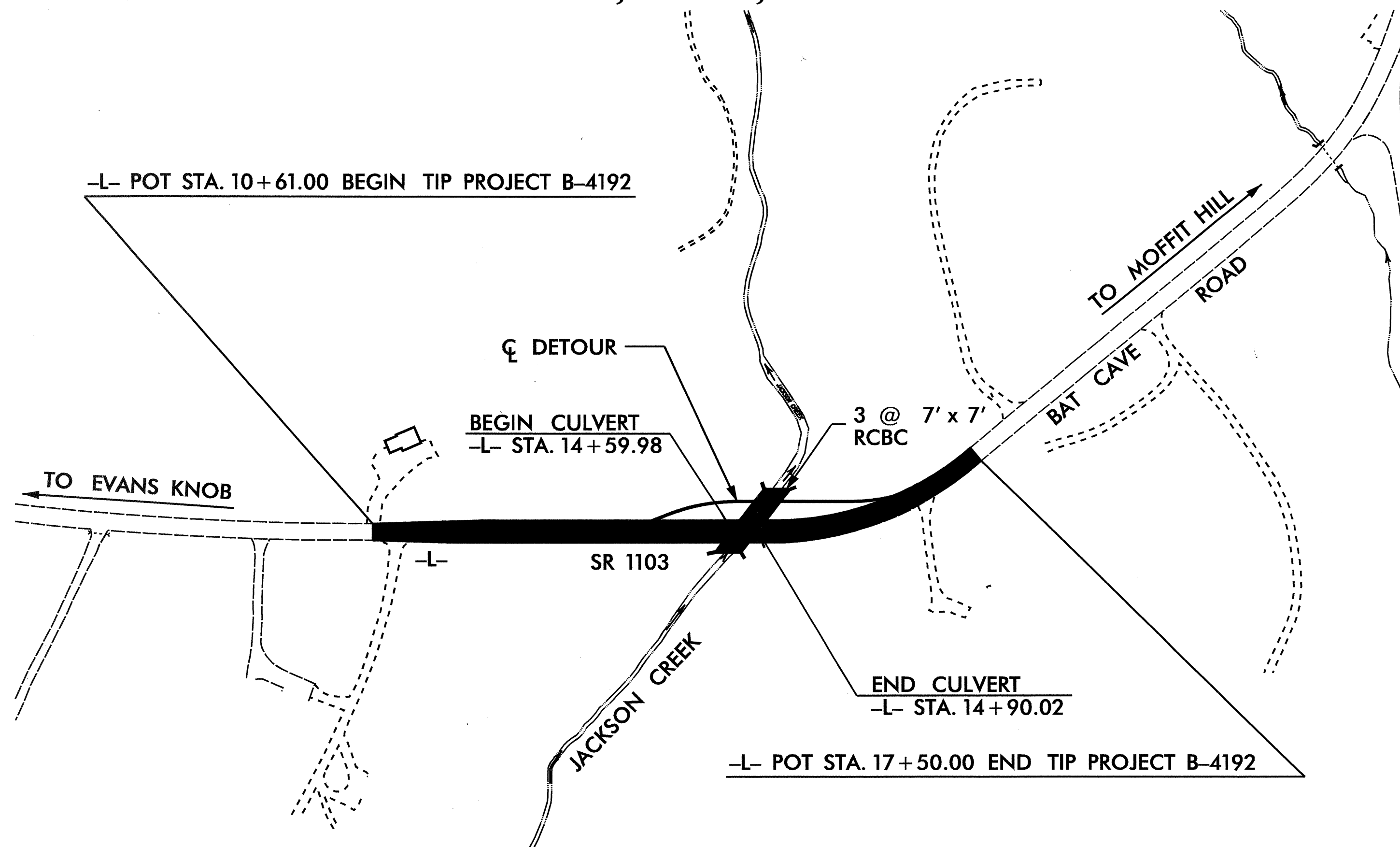
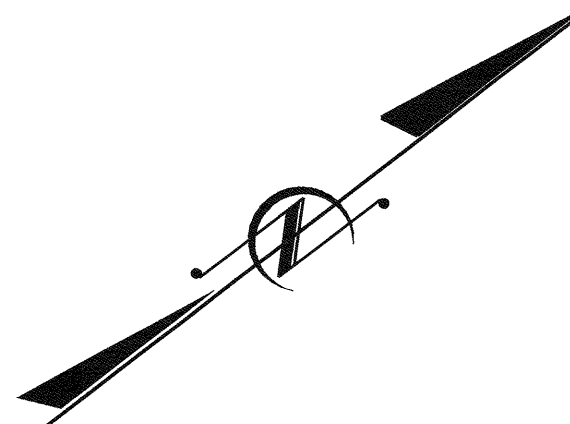
McDOWELL COUNTY

LOCATION: BRIDGE NO. 264 ON SR 1103 (BAT CAVE ROAD) OVER JACKSON CREEK

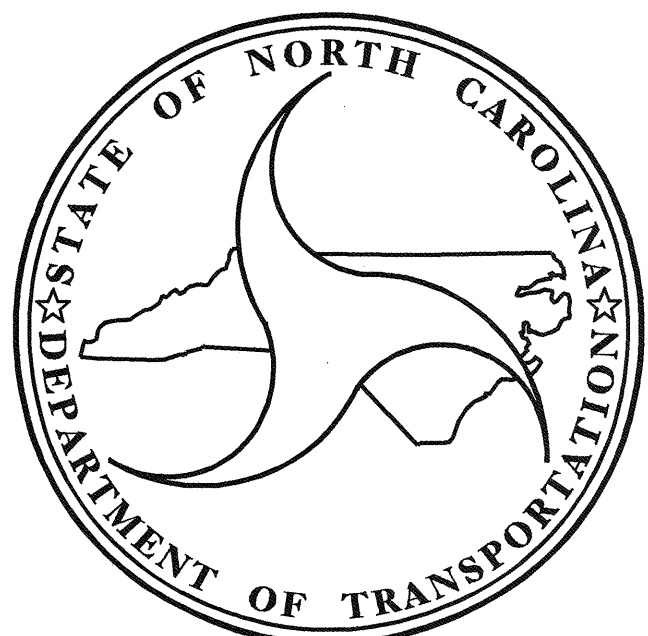
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



VICINITY MAP



CULVERT



DESIGN DATA

ADT 2006	=	1,109
ADT 2025	=	1,900
DHV	=	12 %
D	=	65 %
T	=	3 % *
** V	=	60 MPH
* TTST	1%	DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY OF TIP PROJECT B-4192	=	0.124 MI
LENGTH STRUCTURE OF TIP PROJECT B-4192	=	0.006 MI
TOTAL LENGTH OF TIP PROJECT B-4192	=	0.130 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :
APRIL 17, 2007

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

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

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

Gregory R. Perrett
3-9-07

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

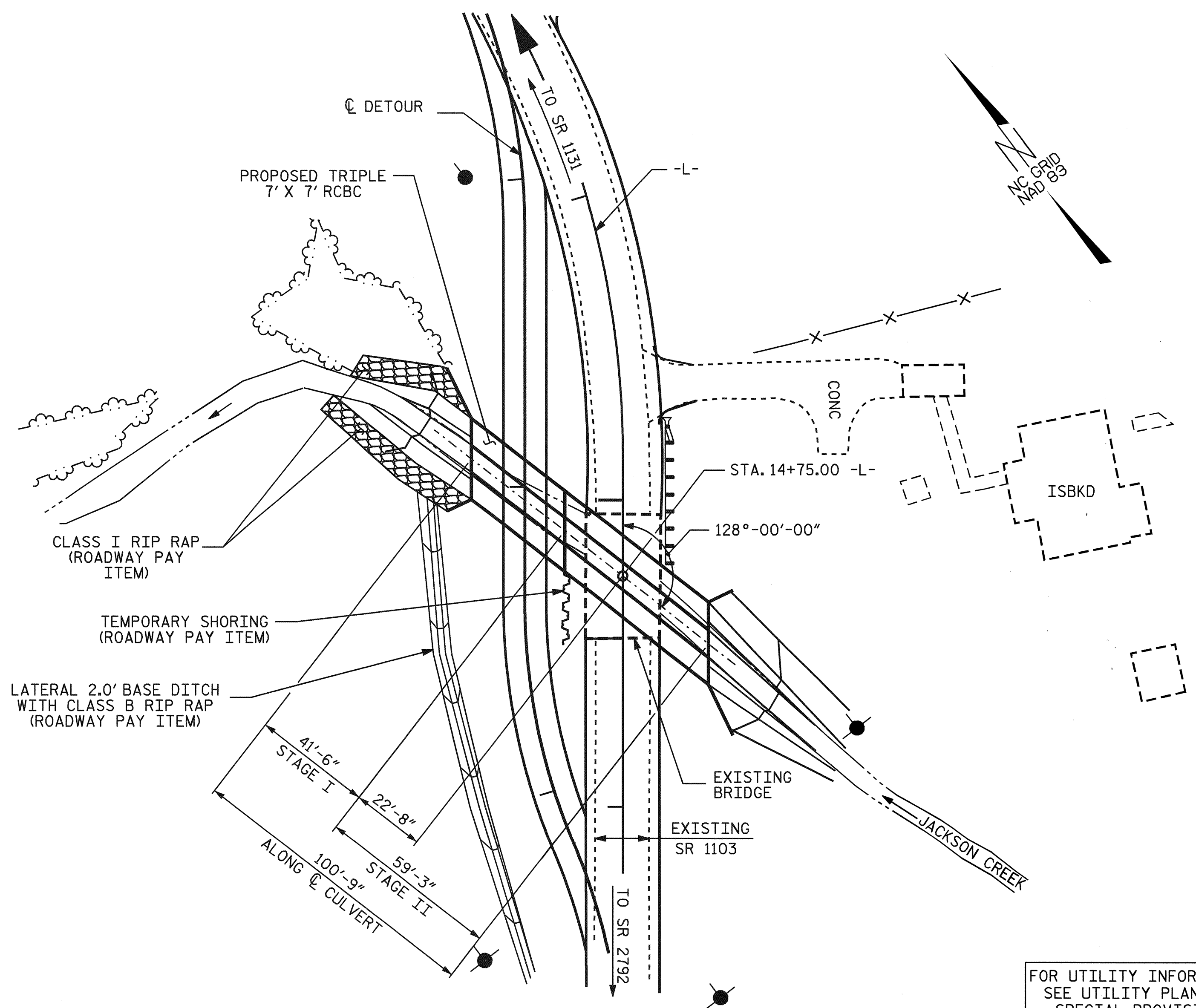
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

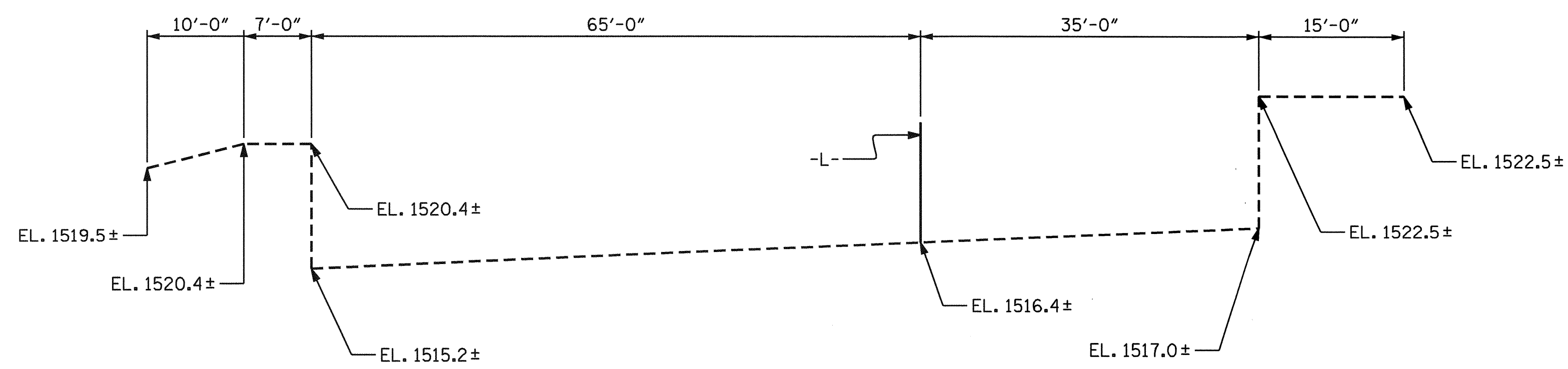
P.E.

DATE



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.



PROFILE ALONG Q CULVERT

NOTES

ASSUMED LIVE LOAD -----HS20-44 OR ALTERNATE LOADING.
 DESIGN FILL----- 2.95'
 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. PHASE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF PHASE I VERTICAL WALL.
 2. THE REMAINING PORTIONS OF PHASE I WALL AND PHASE I 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 IN IT'S ENTIRETY 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.

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.

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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 1 SPAN (1 @ 41'-3/2") STRUCTURE WITH A CLEAR ROADWAY WIDTH OF 22'-3" AND 2" ASPHALT WEARING SURFACE ON A TIMBER DECK ON STEEL I-BEAMS ON A SUBSTRUCTURE CONSISTING OF MASONRY ABUTMENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS CURRENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMIT 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 COST 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."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CULVERT DIVERSION DETAILS, SEE EROSION CONTROL PLANS.
 FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.
 FOLLOWING COMPLETION OF THE STAGE II CULVERT, THE STAGE I EXTENDED HEADWALL MAY BE REMOVED AS NECESSARY AT THE DIRECTION OF THE ENGINEER.
 DOWELS SHALL BE USED TO CONNECT THE STAGE II CULVERT WITH THE STAGE I CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

HYDRAULIC DATA

DESIGN DISCHARGE	= 690 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 1523.30
DRAINAGE AREA	= 1.78 SQ. MI.
BASIC DISCHARGE (0100)	= 1100 CFS
BASIC HIGH WATER ELEVATION	= 1525.70

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= <1300 CFS
FREQUENCY OF OVERTOPPING FLOOD	= <500 YRS.
OVERTOPPING FLOOD ELEVATION	= 1526.20

GRADE DATA

GRADE POINT ELEVATION @ STA. 14+75.00 -L-	= 1527.772'
BED ELEVATION @ STA. 14+75.00 -L-	= 1516.35'
ROADWAY FILL SLOPES	= 2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
STAGE I	103.3 C.Y.
STAGE II	136.7 C.Y.
TOTAL	240.0 C.Y.
REINFORCING STEEL	
STAGE I	17,756 LBS.
STAGE II	24,366 LBS.
TOTAL	42,122 LBS.
FOUNDATION CONDITIONING MATERIAL	
STAGE I	69 TONS
STAGE II	99 TONS
TOTAL	168 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

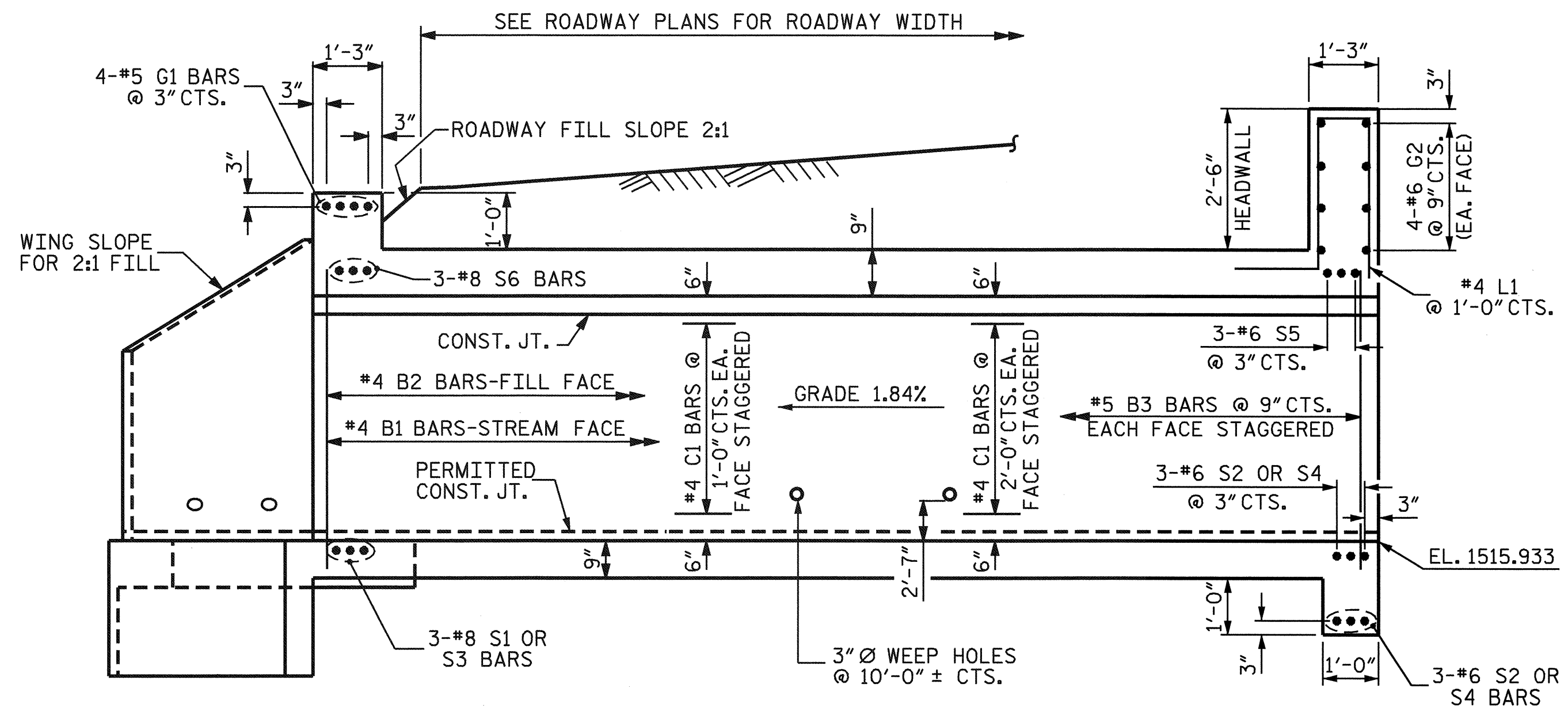
PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-
 SHEET 1 OF 11 REPLACES BRIDGE NO. 264

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT. X 7 FT.
 CONCRETE BOX CULVERT
 STAGE I & II
 128° SKEW

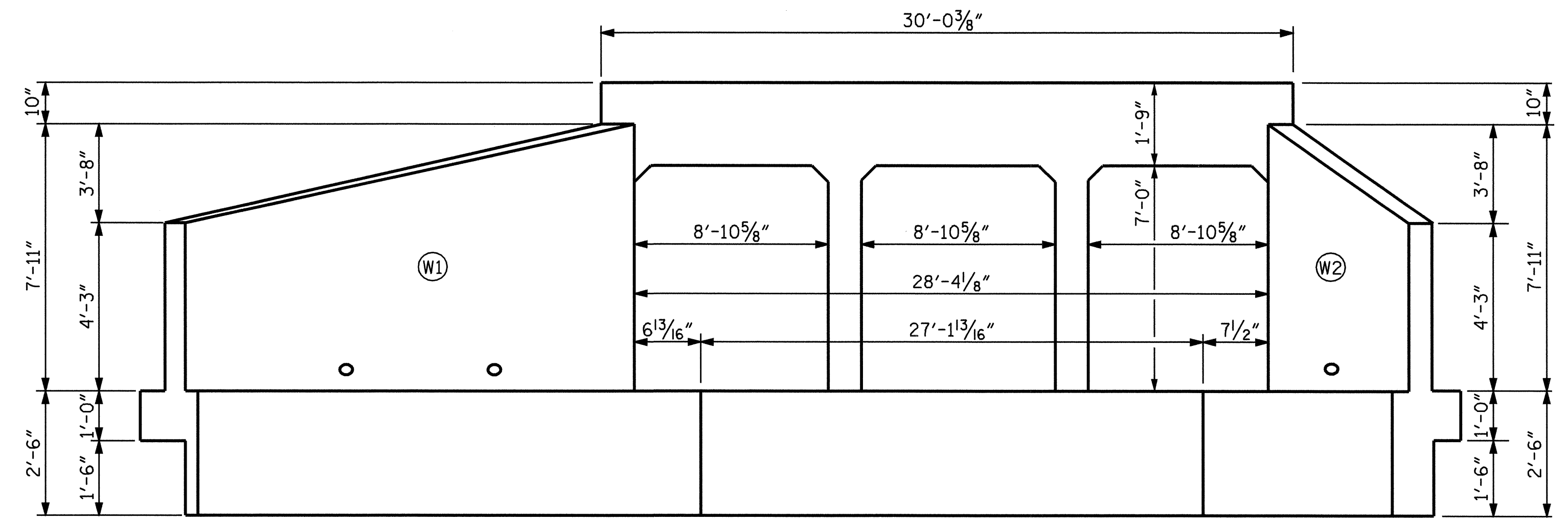


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			11

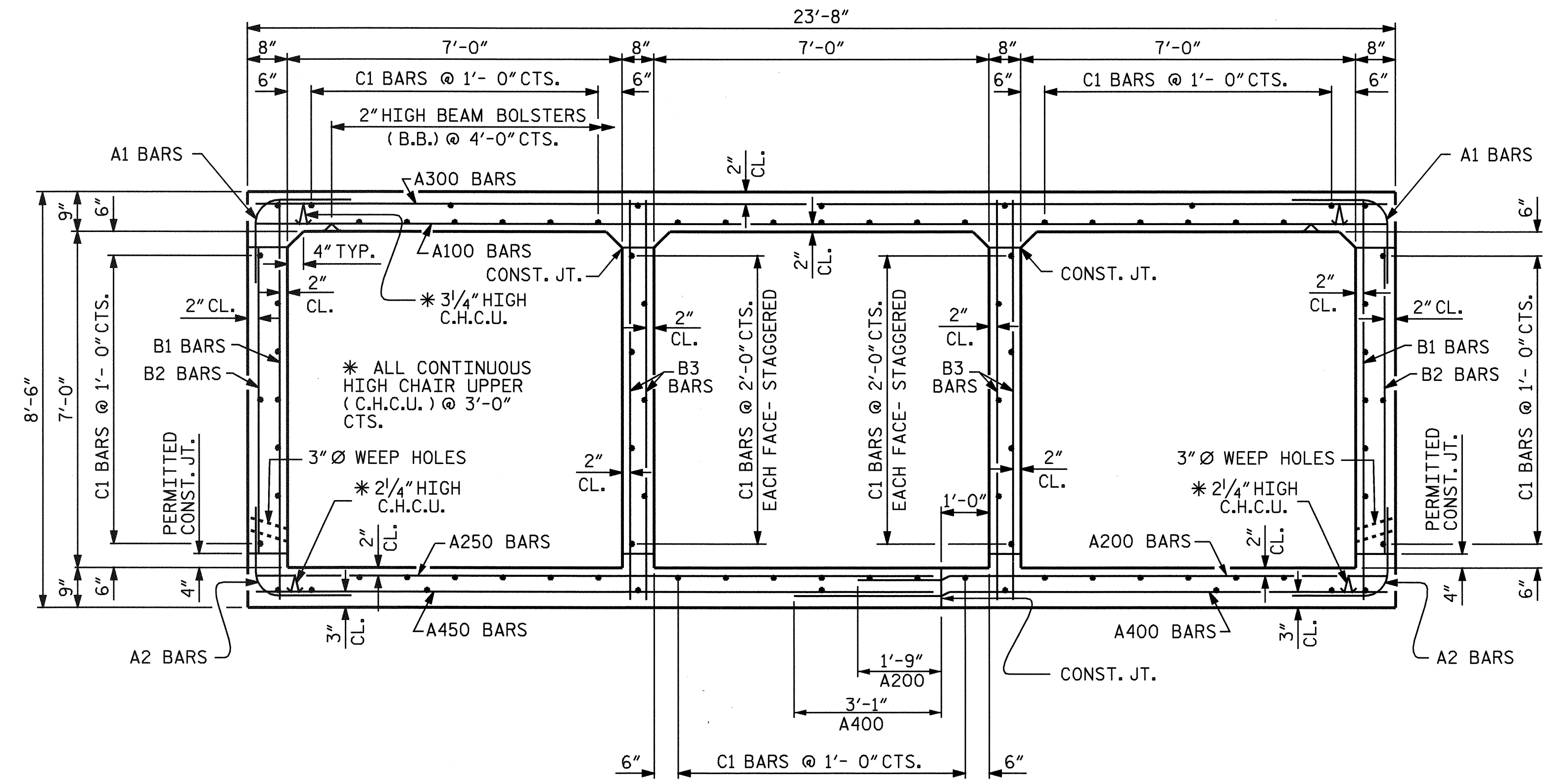
ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/24/07



EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY
 STAGE I



OUTLET END ELEVATION NORMAL TO SKEW
 STAGE I



RIGHT ANGLE SECTION OF BARREL
 THERE ARE 86 "C" BARS IN SECTION OF BARREL.
 (LOOKING UPSTREAM)

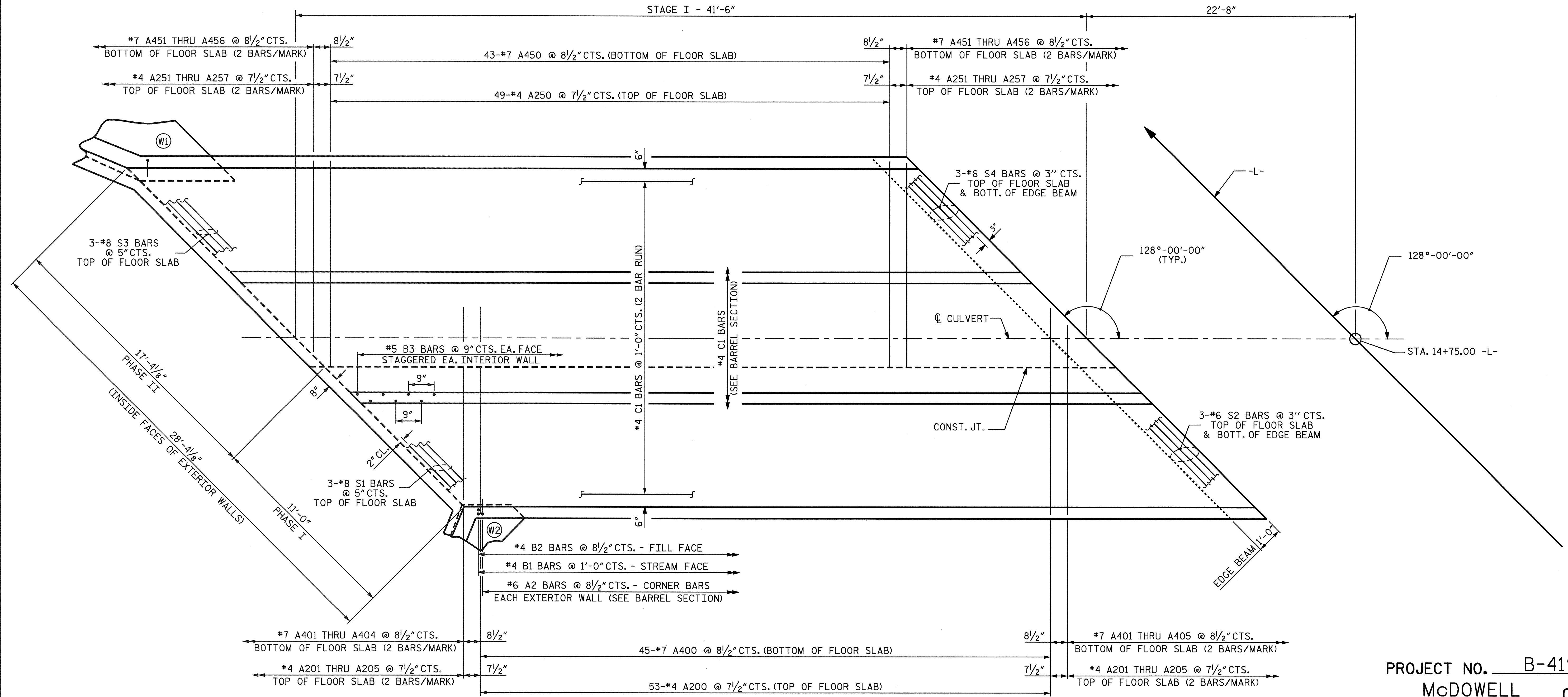
PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-
 SHEET 2 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE I
 128° SKEW**



ASSEMBLED BY: A. SORSENGINH DATE: 3/2/06
 CHECKED BY: M.G. CHEEK DATE: 1/19/07

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2	
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2			4				

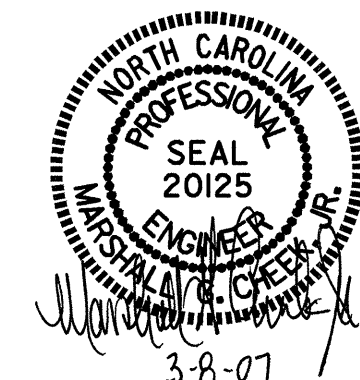


STAGE I
 PLAN OF FLOOR SLAB

PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-

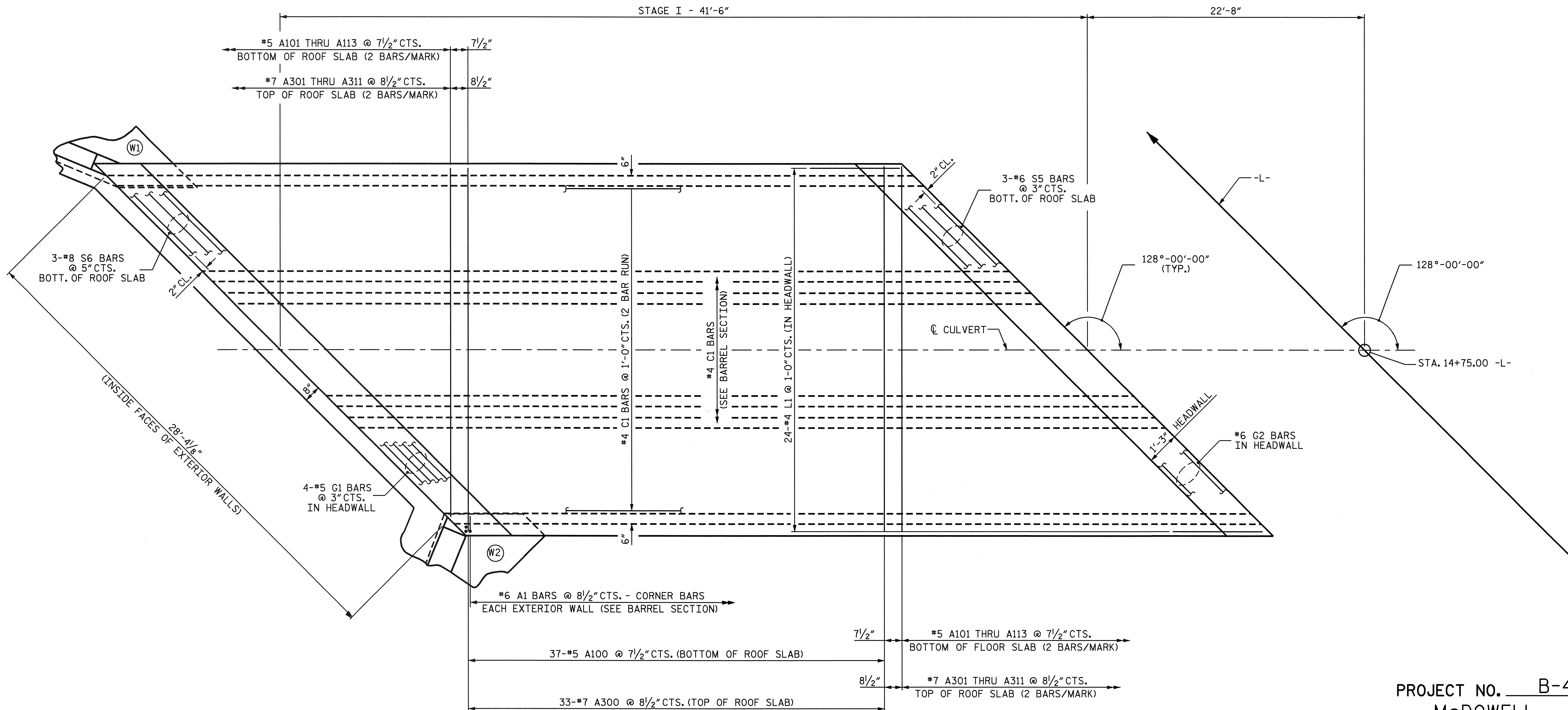
SHEET 3 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE I
 128° SKEW



ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/12/07

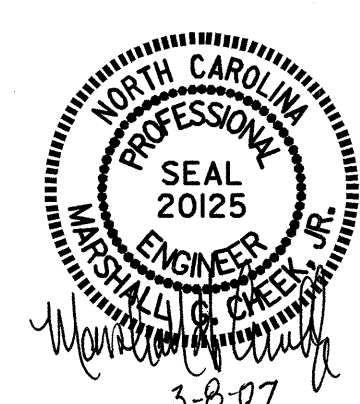
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1			3			TOTAL SHEETS	
2			4			11	



STAGE I
 PLAN OF ROOF SLAB

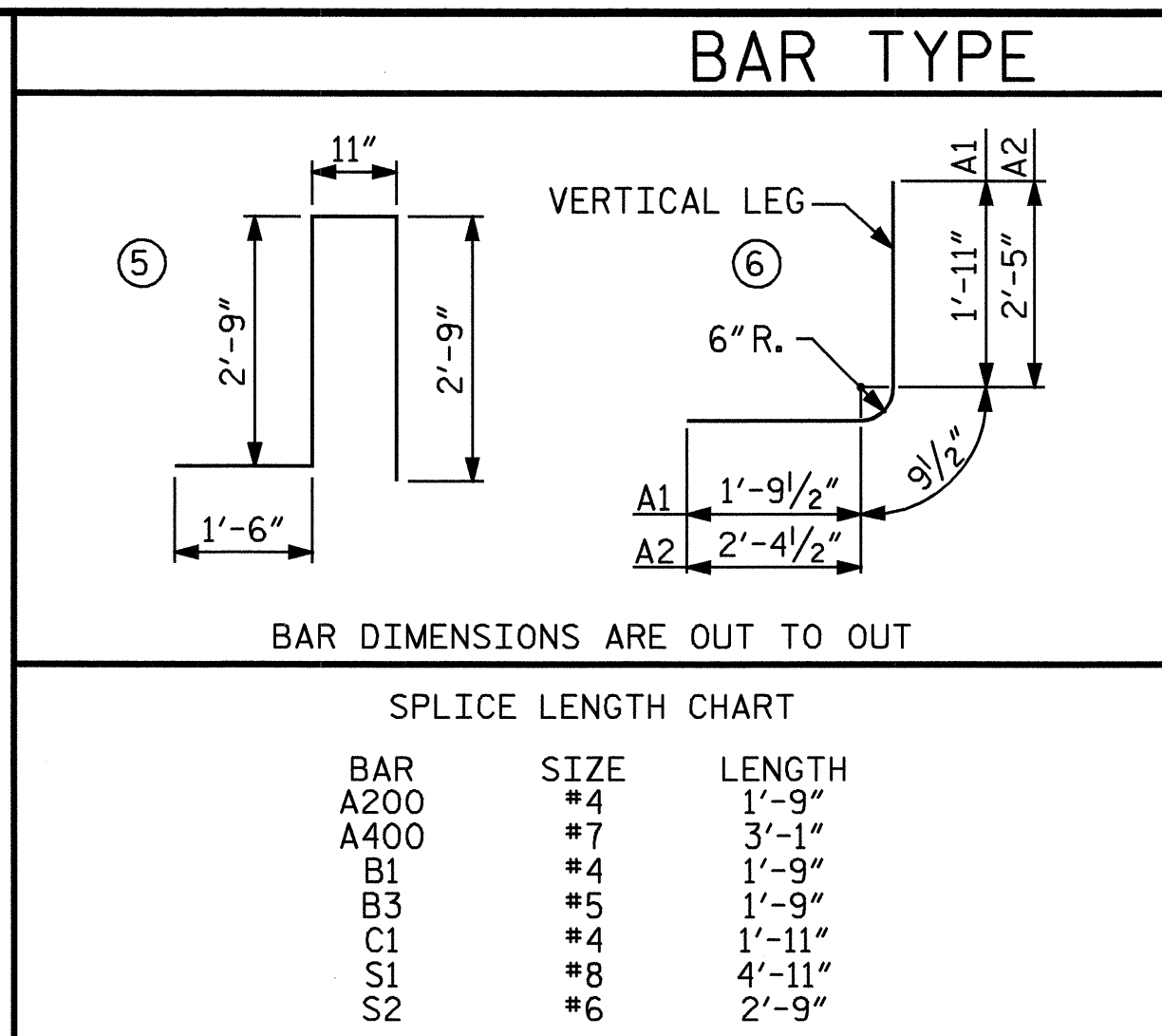
PROJECT NO. B-4192
MCDOWELL COUNTY
 STATION: 14+75.00 -L-
 SHEET 4 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE I
 128° SKEW



ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/12/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			11

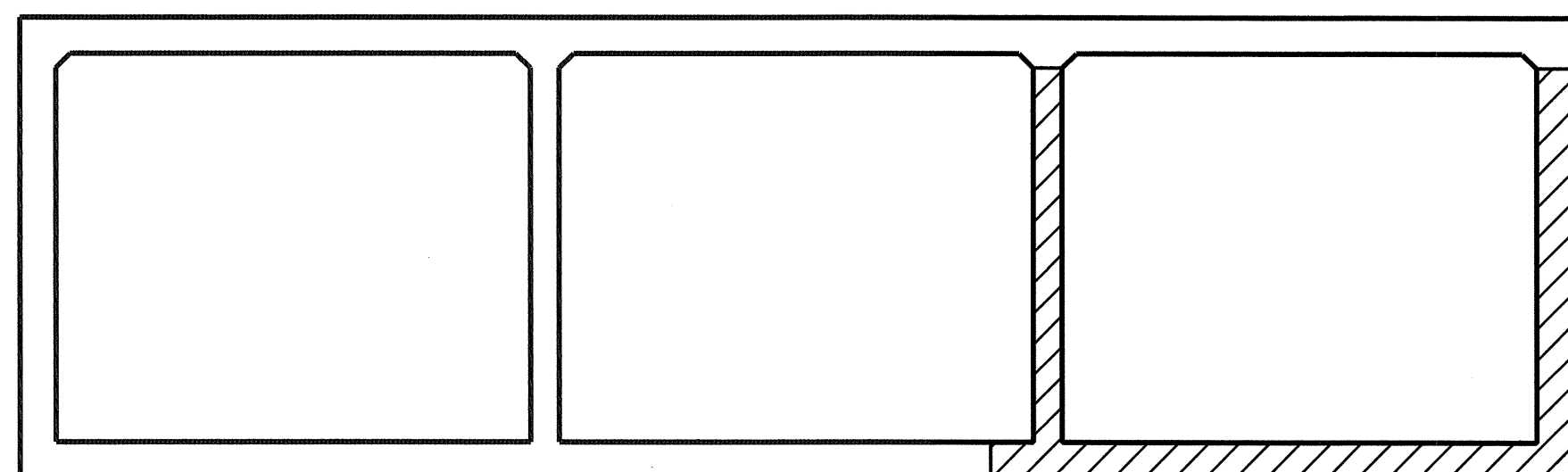


BAR SCHEDULE

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	37	#5	STR	23'-3"	897	A252	4	#4	STR	10'-9"	29	A404	4	#7	STR	5'-2"	42
A101	4	#5	STR	21'-11"	91	A253	4	#4	STR	9'-4"	25	A405	2	#7	STR	3'-5"	14
A102	4	#5	STR	20'-4"	85	A254	4	#4	STR	7'-9"	21						
A103	4	#5	STR	18'-9"	78	A255	4	#4	STR	6'-2"	16	A450	43	#7	STR	14'-2"	1245
A104	4	#5	STR	17'-1"	71	A256	4	#4	STR	4'-6"	12	A451	4	#7	STR	12'-6"	102
A105	4	#5	STR	15'-6"	65	A257	4	#4	STR	2'-11"	8	A452	4	#7	STR	10'-8"	87
A106	4	#5	STR	13'-11"	58							A453	4	#7	STR	8'-10"	72
A107	4	#5	STR	12'-4"	51	A300	33	#7	STR	23'-3"	1568	A454	4	#7	STR	7'-0"	57
A108	4	#5	STR	10'-9"	45	A301	4	#7	STR	21'-8"	177	A455	4	#7	STR	5'-3"	43
A109	4	#5	STR	9'-1"	38	A302	4	#7	STR	19'-11"	163	A456	4	#7	STR	3'-5"	28
A110	4	#5	STR	7'-6"	31	A303	4	#7	STR	18'-1"	148						
A111	4	#5	STR	5'-11"	25	A304	4	#7	STR	16'-3"	133	A1	118	#6	6	4'-6"	798
A112	4	#5	STR	4'-4"	18	A305	4	#7	STR	14'-5"	118	A2	118	#6	6	5'-7"	990
A113	4	#5	STR	2'-9"	11	A306	4	#7	STR	12'-8"	104						
						A307	4	#7	STR	10'-10"	89	B1	84	#4	STR	8'-0"	449
A200	53	#4	STR	10'-11"	386	A308	4	#7	STR	9'-0"	74	B2	118	#4	STR	6'-4"	499
A201	4	#4	STR	9'-4"	25	A309	4	#7	STR	7'-2"	59	B3	224	#5	STR	8'-0"	1869
A202	4	#4	STR	7'-9"	21	A310	4	#7	STR	5'-5"	44						
A203	4	#4	STR	6'-1"	16	A311	4	#7	STR	3'-7"	29	C1	172	#4	STR	21'-7"	2480
A204	4	#4	STR	4'-6"	12												
A205	4	#4	STR	2'-11"	8	A400	45	#7	STR	12'-3"	1127	G1	4	#5	STR	29'-7"	123
						A401	4	#7	STR	10'-8"	87	G2	8	#6	STR	29'-7"	355
A250	49	#4	STR	14'-2"	464	A402	4	#7	STR	8'-10"	72						
A251	4	#4	STR	12'-6"	33	A403	4	#7	STR	7'-0"	57	L1	24	#4	5	7'-11"	127

S1	3	#8	STR	16'-7"	133
S2	6	#6	STR	14'-6"	131
S3	3	#8	STR	17'-10"	143
S4	6	#6	STR	17'-10"	161
S5	3	#6	STR	29'-7"	133
S6	3	#8	STR	29'-7"	237

REINFORCING STEEL = 17,007 LBS



**STAGE I
CONSTRUCTION PHASING**
(LOOKING UPSTREAM)

PHASE I CONSTRUCTION
 PHASE II CONSTRUCTION

TOTAL STAGE I QUANTITIES

CLASS A CONCRETE	
BARREL @ 2.019	CY/FT 83.8 C.Y.
WINGS, ETC.	19.5 C.Y.
TOTAL	103.3 C.Y.
REINFORCING STEEL	
BARREL	17,007 LBS.
WINGS, ETC.	749 LBS.
TOTAL	17,756 LBS.
FOUNDATION CONDITIONING MATERIAL	69 TONS
CULVERT EXCAVATION	LUMP SUM

PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-

SHEET 5 OF 11

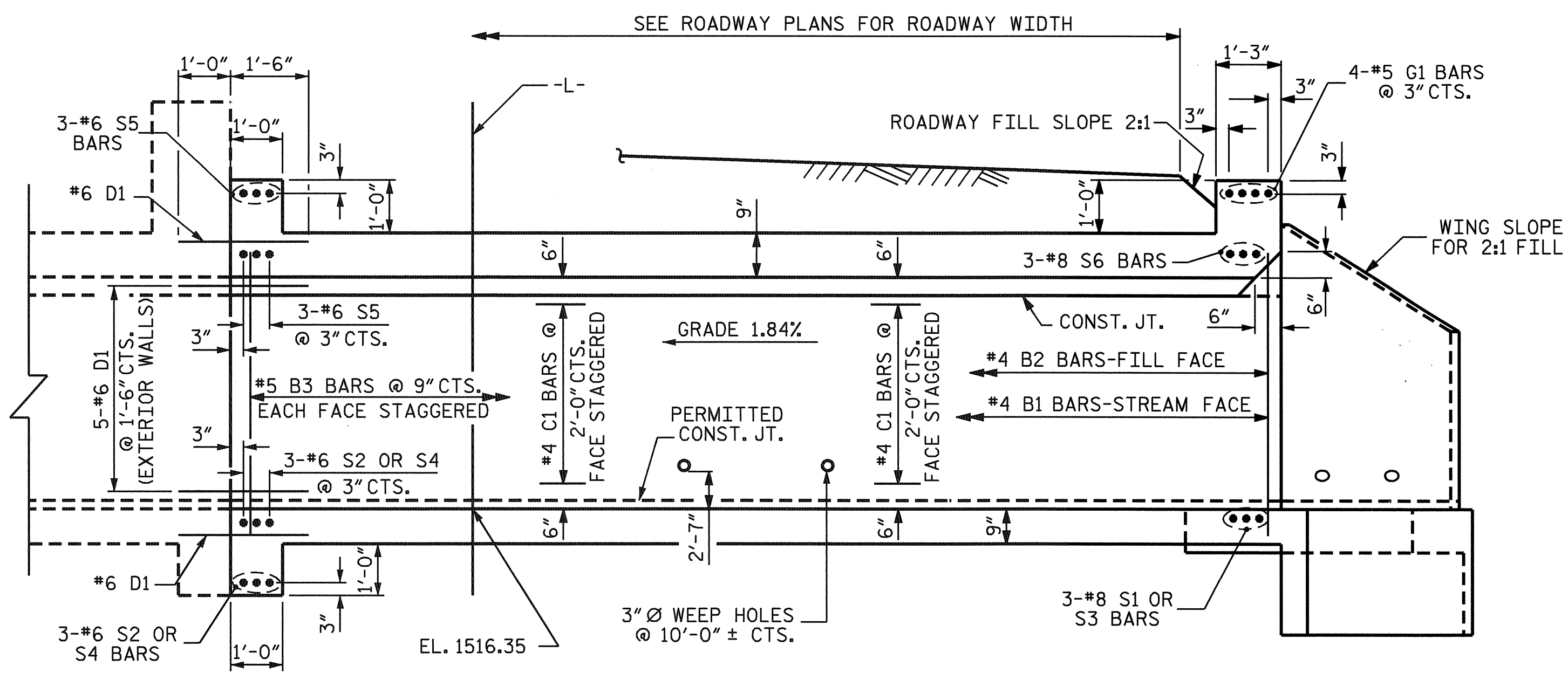
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE I
 128° SKEW

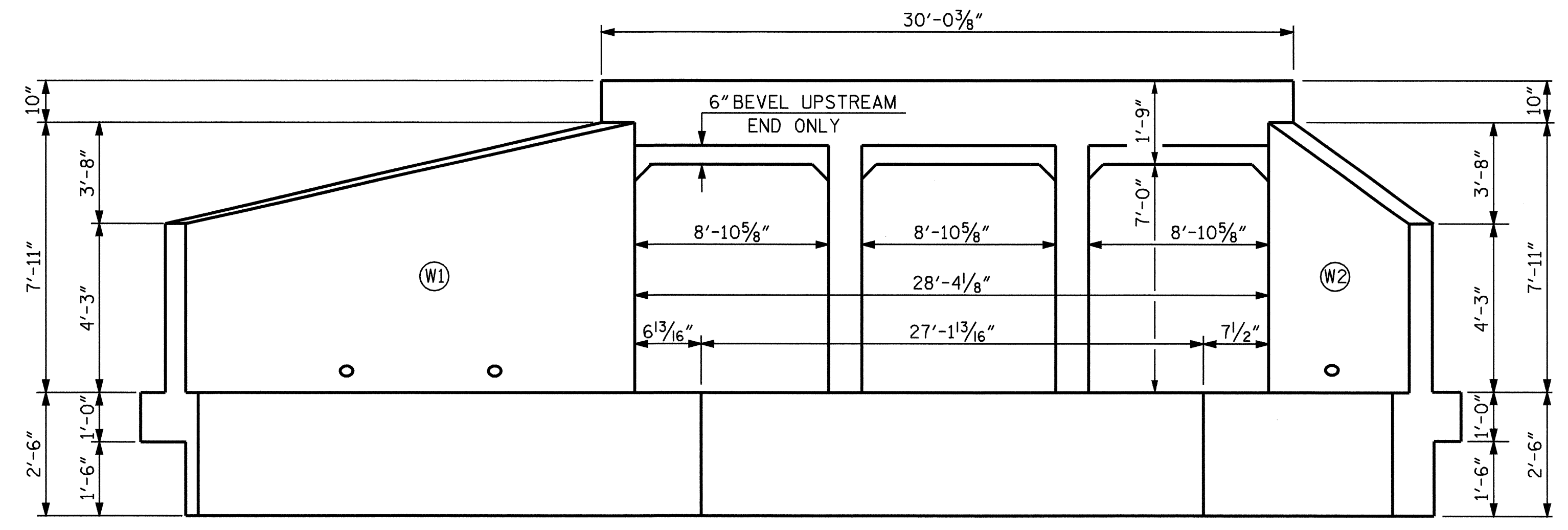


ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/19/07

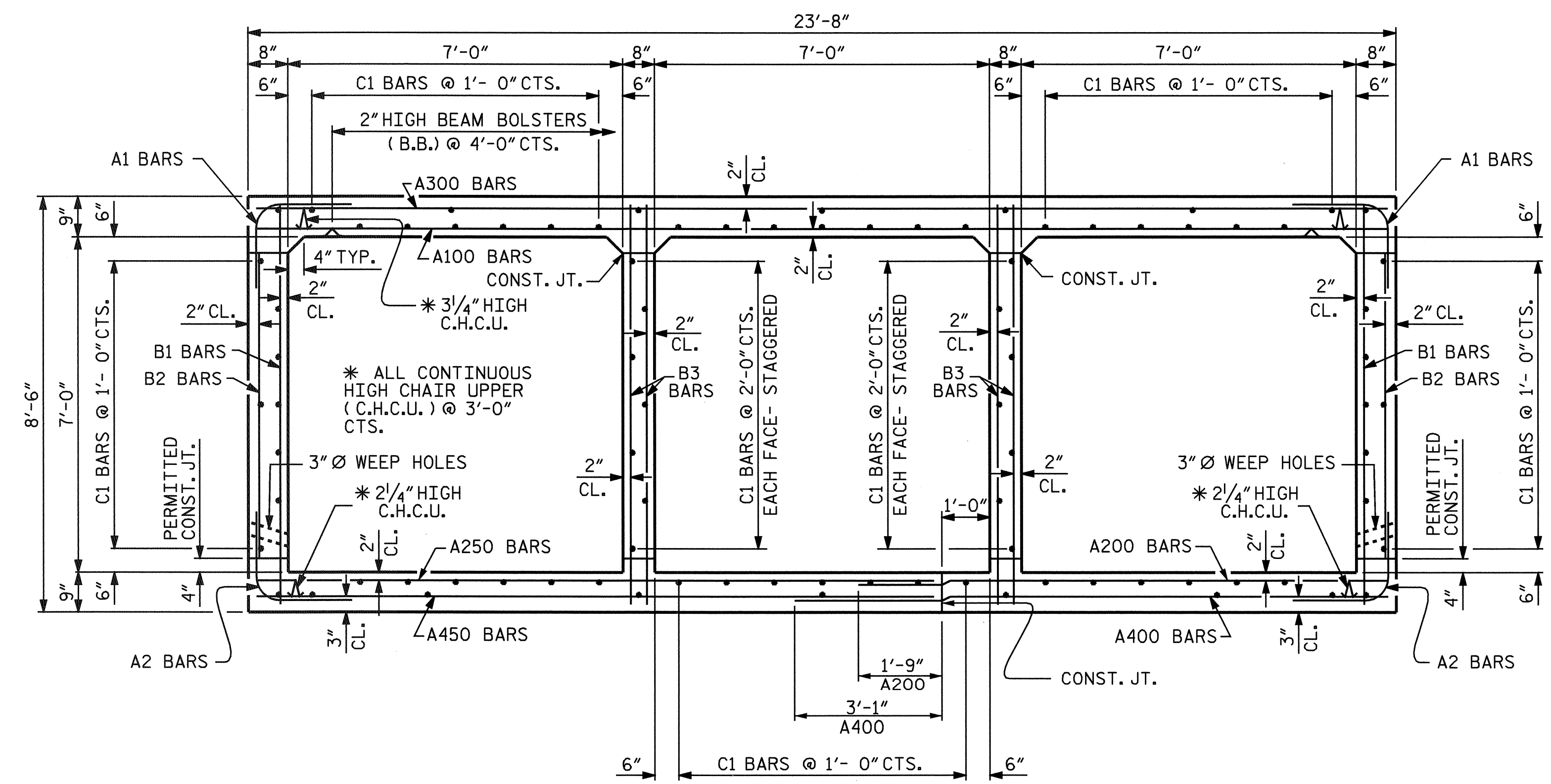
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			11



INTERIOR WALL
 EXTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY
 STAGE II



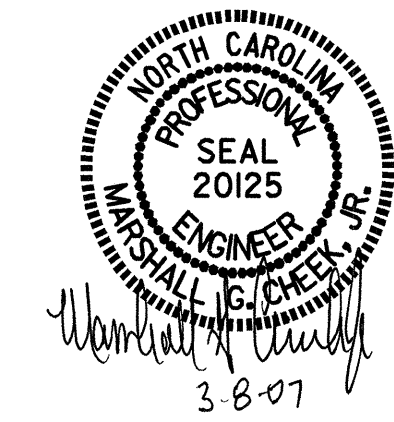
INLET END ELEVATION NORMAL TO SKEW
 STAGE II



RIGHT ANGLE SECTION OF BARREL
 THERE ARE 86 "C" BARS IN SECTION OF BARREL.
 (LOOKING UPSTREAM)

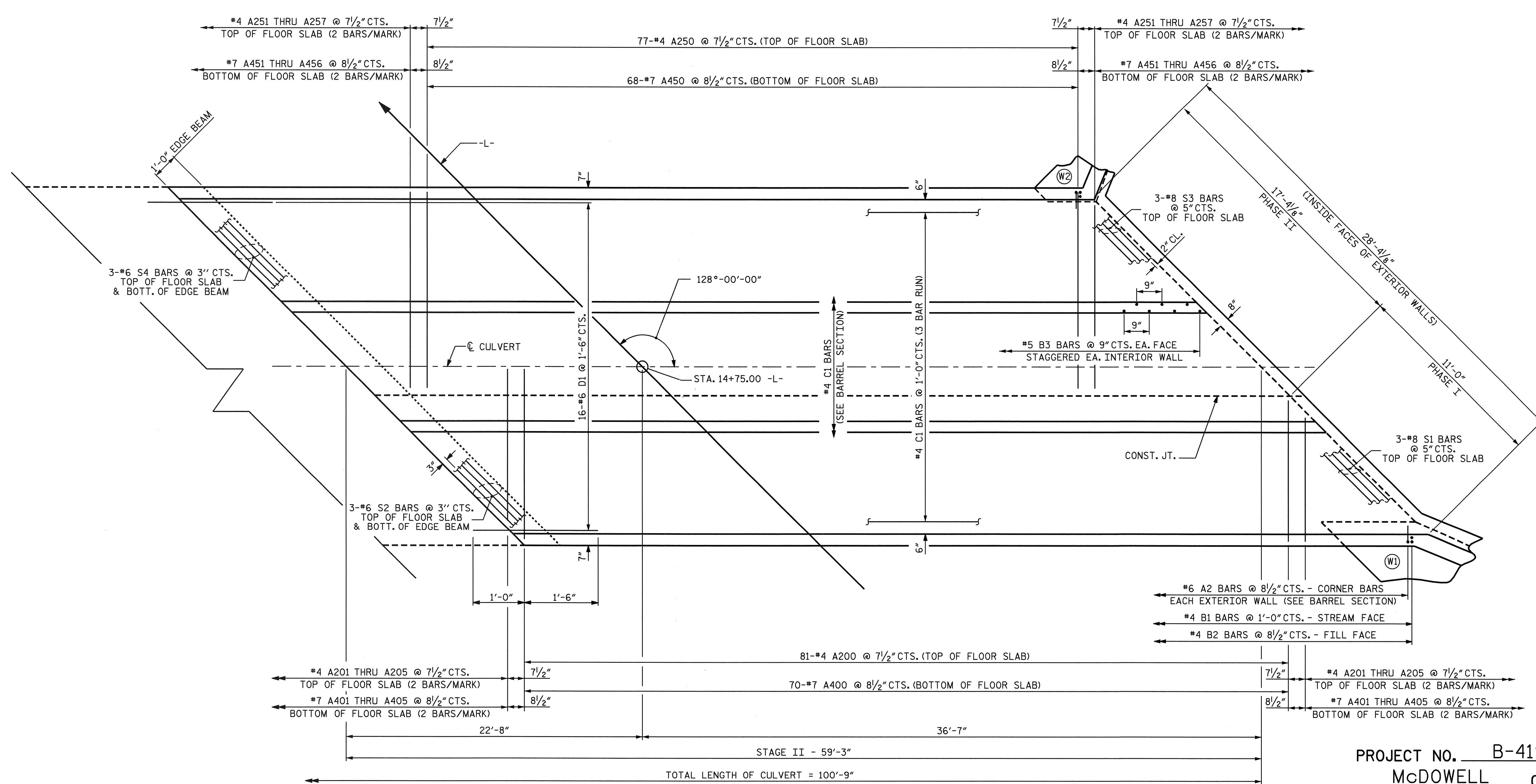
PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-
 SHEET 6 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE II
 128° SKEW



ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/19/07

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6	
1			3			TOTAL SHEETS	
2			4			11	

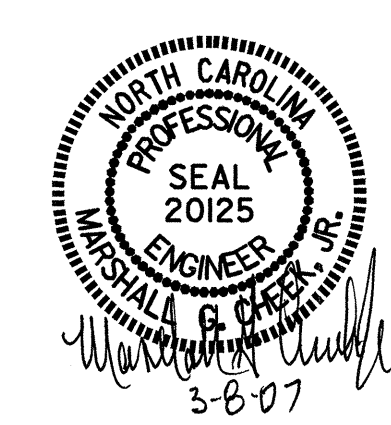


**STAGE II
 PLAN OF FLOOR SLAB**

PROJECT NO. B-4192
MCDOWELL COUNTY
 STATION: 14+75.00 -L-

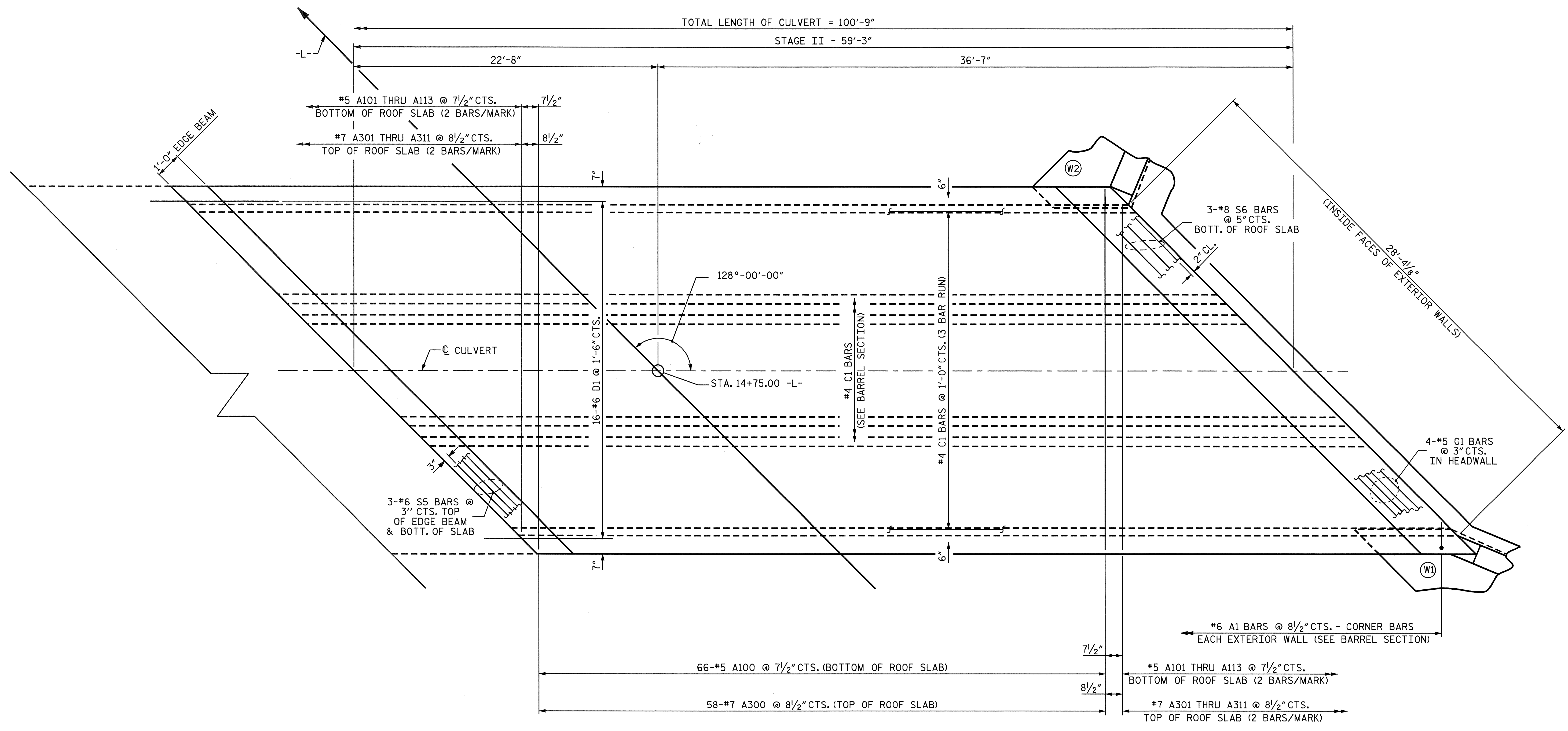
SHEET 7 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE II
 128° SKEW



ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/12/07

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7	
1			3			TOTAL SHEETS	
2			4			11	



STAGE II
 PLAN OF ROOF SLAB

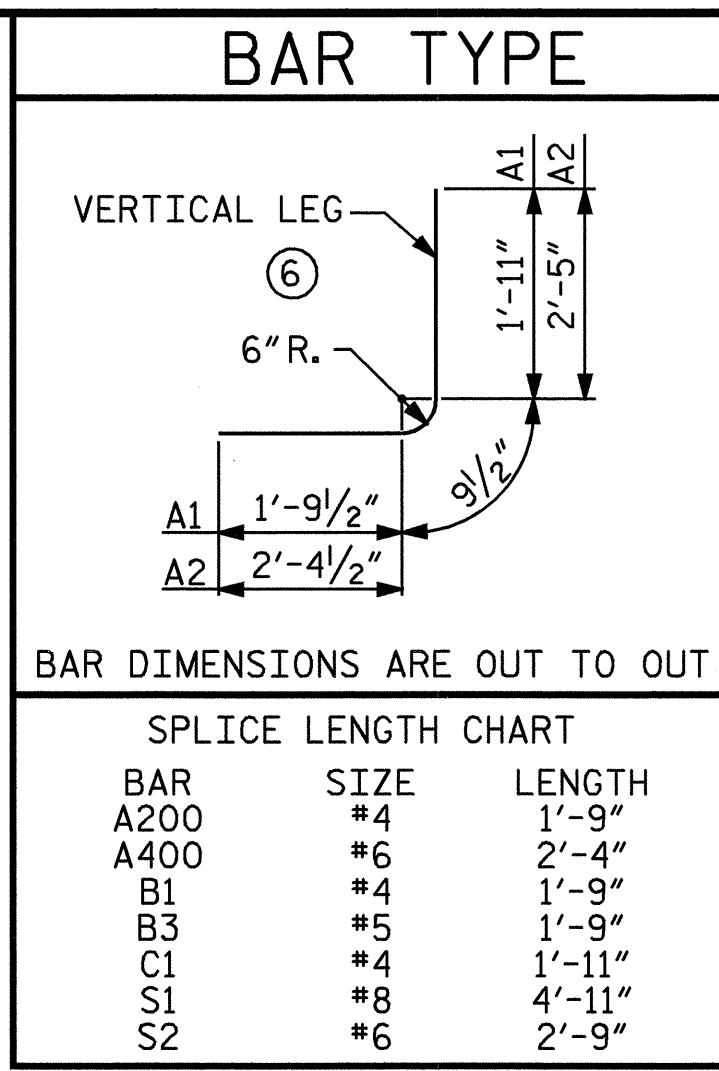
PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-

SHEET 8 OF 11
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE II
 128° SKEW



ASSEMBLED BY : A. SORSENGINH DATE : 3/2/06
 CHECKED BY : M.G. CHEEK DATE : 1/12/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			11

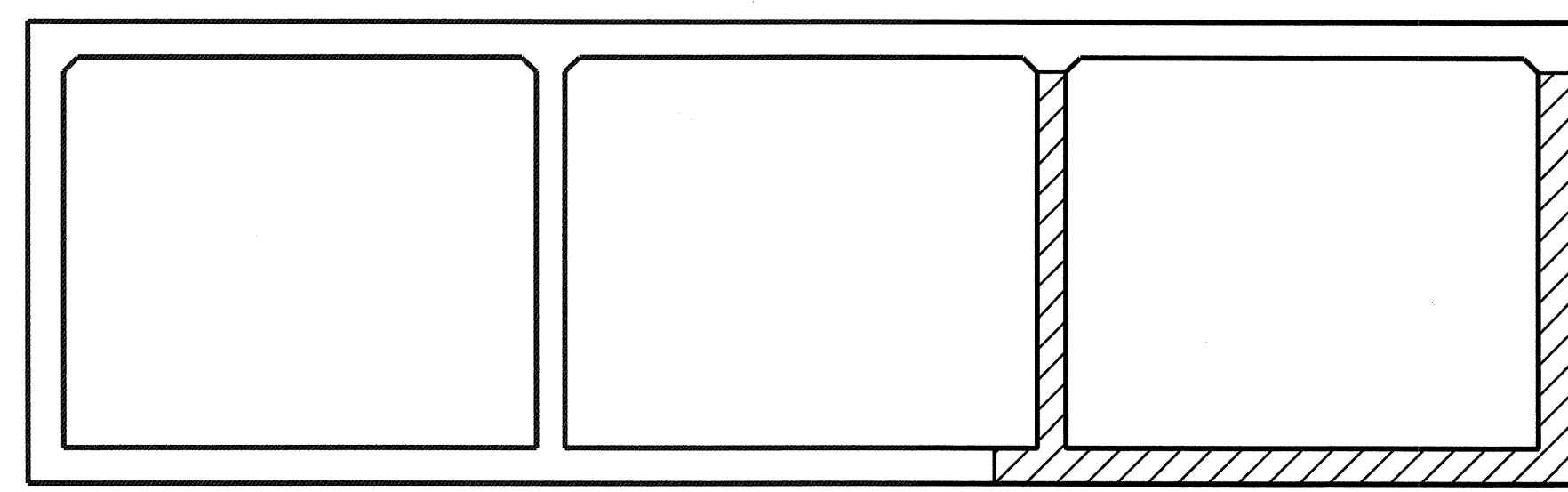


BAR SCHEDULE

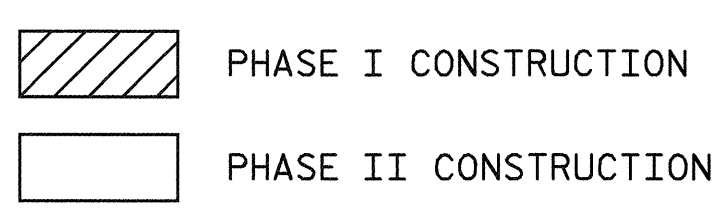
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	66	#5	STR	23'-3"	1600	A252	4	#4	STR	11'-1"	30	A404	4	#7	STR	5'-3"	43
A101	4	#5	STR	21'-11"	91	A253	4	#4	STR	9'-6"	25	A405	4	#7	STR	3'-5"	28
A102	4	#5	STR	20'-4"	85	A254	4	#4	STR	7'-11"	21						
A103	4	#5	STR	18'-9"	78	A255	4	#4	STR	6'-4"	17	A450	68	#7	STR	14'-2"	1969
A104	4	#5	STR	17'-1"	71	A256	4	#4	STR	4'-8"	12	A451	4	#7	STR	12'-6"	102
A105	4	#5	STR	15'-6"	65	A257	4	#4	STR	3'-1"	8	A452	4	#7	STR	10'-8"	87
A106	4	#5	STR	13'-11"	58							A453	4	#7	STR	8'-11"	73
A107	4	#5	STR	12'-4"	51	A300	58	#7	STR	23'-3"	2756	A454	4	#7	STR	7'-1"	58
A108	4	#5	STR	10'-9"	45	A301	4	#7	STR	21'-8"	177	A455	4	#7	STR	5'-3"	43
A109	4	#5	STR	9'-1"	38	A302	4	#7	STR	19'-11"	163	A456	4	#7	STR	3'-5"	28
A110	4	#5	STR	7'-6"	31	A303	4	#7	STR	18'-1"	148						
A111	4	#5	STR	5'-11"	25	A304	4	#7	STR	16'-3"	133	A1	168	#6	6	4'-6"	1136
A112	4	#5	STR	4'-4"	18	A305	4	#7	STR	14'-5"	118	A2	168	#6	6	5'-7"	1409
A113	4	#5	STR	2'-9"	11	A306	4	#7	STR	12'-8"	104						
						A307	4	#7	STR	10'-10"	89	B1	120	#4	STR	8'-0"	641
A200	81	#4	STR	10'-11"	591	A308	4	#7	STR	9'-0"	74	B2	168	#4	STR	6'-4"	711
A201	4	#4	STR	9'-6"	25	A309	4	#7	STR	7'-2"	59	B3	316	#5	STR	8'-0"	2637
A202	4	#4	STR	7'-11"	21	A310	4	#7	STR	5'-5"	44						
A203	4	#4	STR	6'-3"	17	A311	4	#7	STR	3'-7"	29	C1	258	#4	STR	21'-0"	3619
A204	4	#4	STR	4'-8"	12												
A205	4	#4	STR	3'-1"	8	A400	70	#7	STR	12'-3"	1753	D1	42	#6	STR	2'-6"	158
						A401	4	#7	STR	10'-8"	87						
A250	77	#4	STR	14'-2"	729	A402	4	#7	STR	8'-10"	72	G1	4	#5	STR	29'-7"	123
A251	4	#4	STR	12'-8"	34	A403	4	#7	STR	7'-0"	57						

S1	3	#8	STR	16'-7"	133
S2	6	#6	STR	14'-6"	131
S3	3	#8	STR	17'-10"	143
S4	6	#6	STR	17'-10"	161
S5	6	#6	STR	29'-7"	267
S6	3	#8	STR	29'-7"	237

REINFORCING STEEL = 23,617 LBS



STAGE II CONSTRUCTION PHASING
 (LOOKING UPSTREAM)



TOTAL STAGE II QUANTITIES

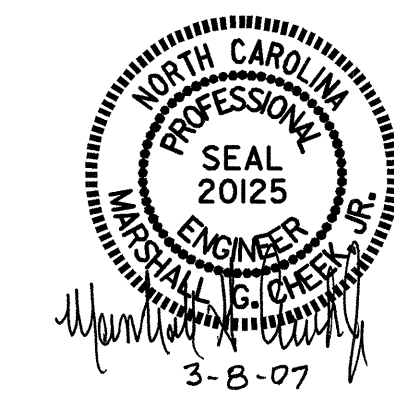
CLASS A CONCRETE	
BARREL @ 2.019 CY/FT	119.6 C.Y.
WINGS, ETC.	17.1 C.Y.
TOTAL	136.7 C.Y.
REINFORCING STEEL	
BARREL	23,617 LBS.
WINGS, ETC.	749 LBS.
TOTAL	24,366 LBS.
FOUNDATION CONDITIONING MATERIAL	99 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

PROJECT NO. B-4192
McDOWELL COUNTY
 STATION: 14+75.00 -L-

SHEET 9 OF 11

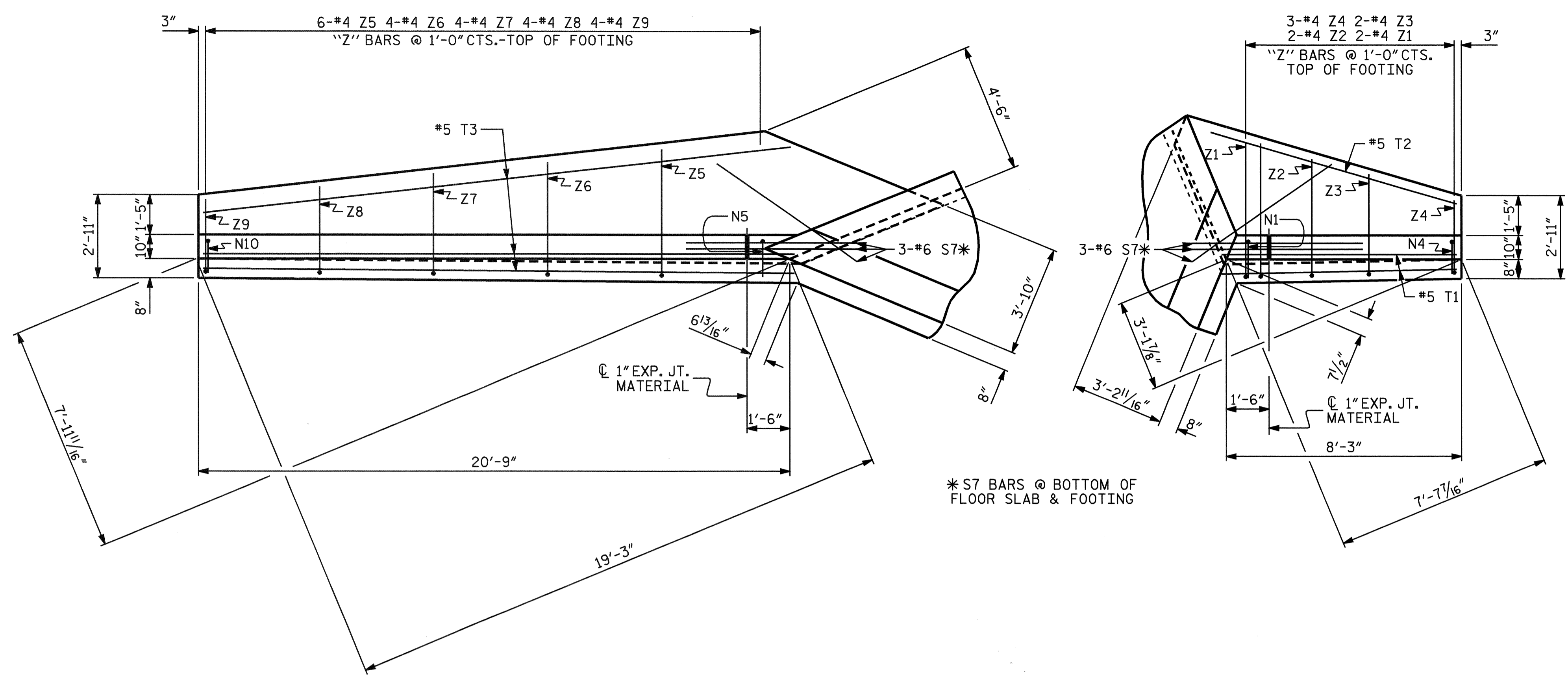
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE 7 FT X 7 FT
 CONCRETE BOX CULVERT
 STAGE II
 128° SKEW



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			11

ASSEMBLED BY: A. SORSENGINH DATE: 3/2/06
 CHECKED BY: M.G. CHEEK DATE: 1/12/07



PLAN W1

PLAN W2

NOTES

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.
 #1 BARS IN HEADWALL ARE INCLUDED WITH BARREL REINFORCING STEEL.

BAR TYPES

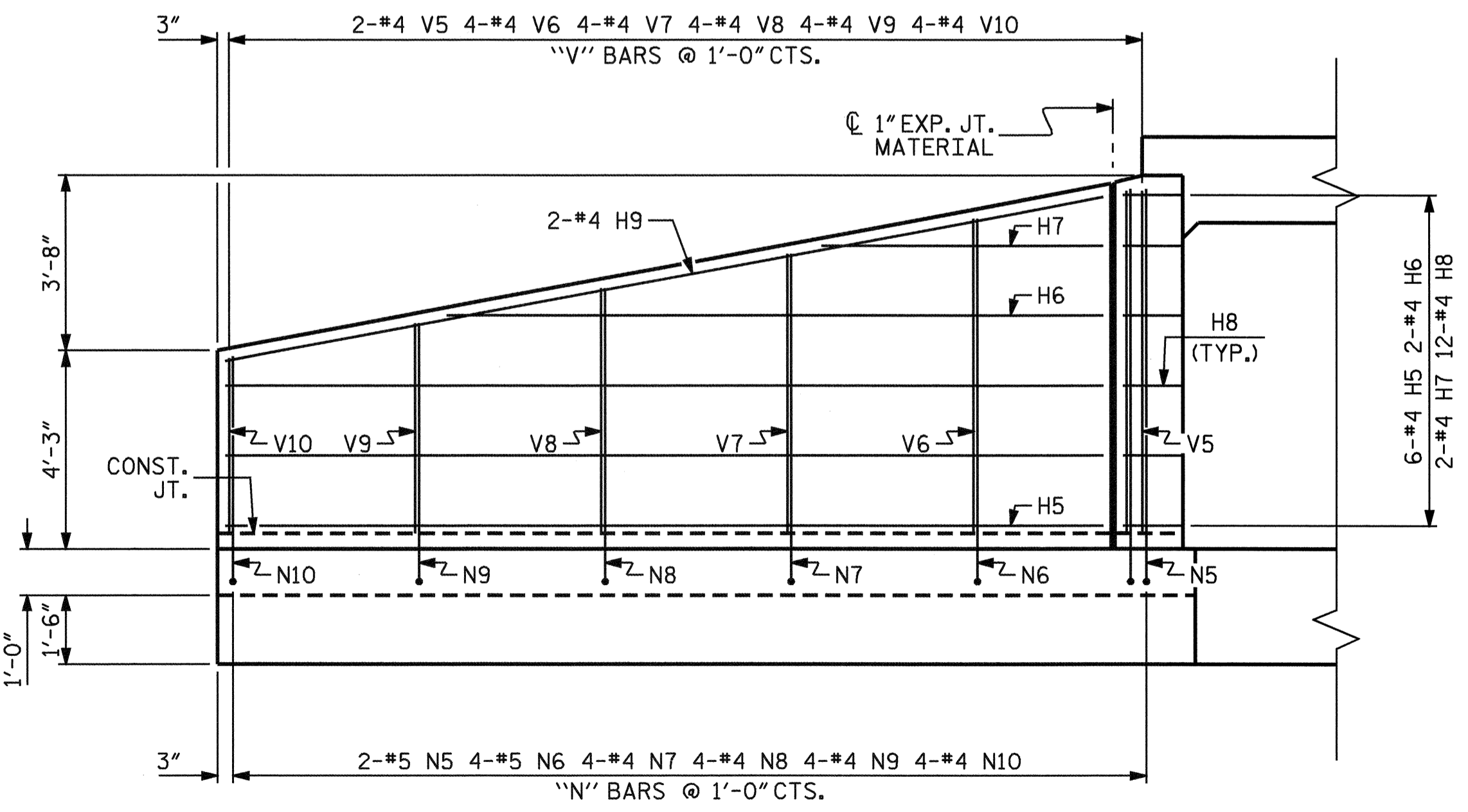
ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	#4	STR	6'-4"	25
H2	#4	STR	4'-6"	6
H3	#4	1	3'-3"	26
H4	#4	STR	7'-0"	9
H5	#4	STR	18'-10"	75
H6	#4	STR	14'-1"	19
H7	#4	STR	6'-0"	8
H8	#4	2	3'-3"	26
H9	#4	STR	19'-2"	26
N1	#5	3	9'-1"	19
N2	#5	3	8'-3"	17
N3	#4	3	7'-4"	10
N4	#4	3	5'-7"	11
N5	#5	3	9'-5"	20
N6	#5	3	8'-9"	37
N7	#4	3	8'-0"	21
N8	#4	3	7'-3"	19
N9	#4	3	6'-6"	17
N10	#4	3	5'-10"	16
S7	#6	STR	6'-0"	54
T1	#5	STR	8'-3"	17
T2	#5	STR	9'-0"	9
T3	#5	STR	20'-9"	65
V1	#4	STR	7'-1"	9
V2	#4	STR	6'-2"	8
V3	#4	STR	5'-3"	7
V4	#4	STR	3'-9"	8
V5	#4	STR	7'-4"	10
V6	#4	STR	6'-9"	18
V7	#4	STR	6'-0"	16
V8	#4	STR	5'-3"	14
V9	#4	STR	4'-6"	12
V10	#4	STR	3'-9"	10
Z1	#4	4	5'-3"	7
Z2	#4	4	4'-8"	6
Z3	#4	4	4'-1"	5
Z4	#4	4	3'-1"	6
Z5	#4	4	5'-0"	20
Z6	#4	4	4'-6"	12
Z7	#4	4	4'-1"	11
Z8	#4	4	3'-7"	10
Z9	#4	4	3'-1"	8

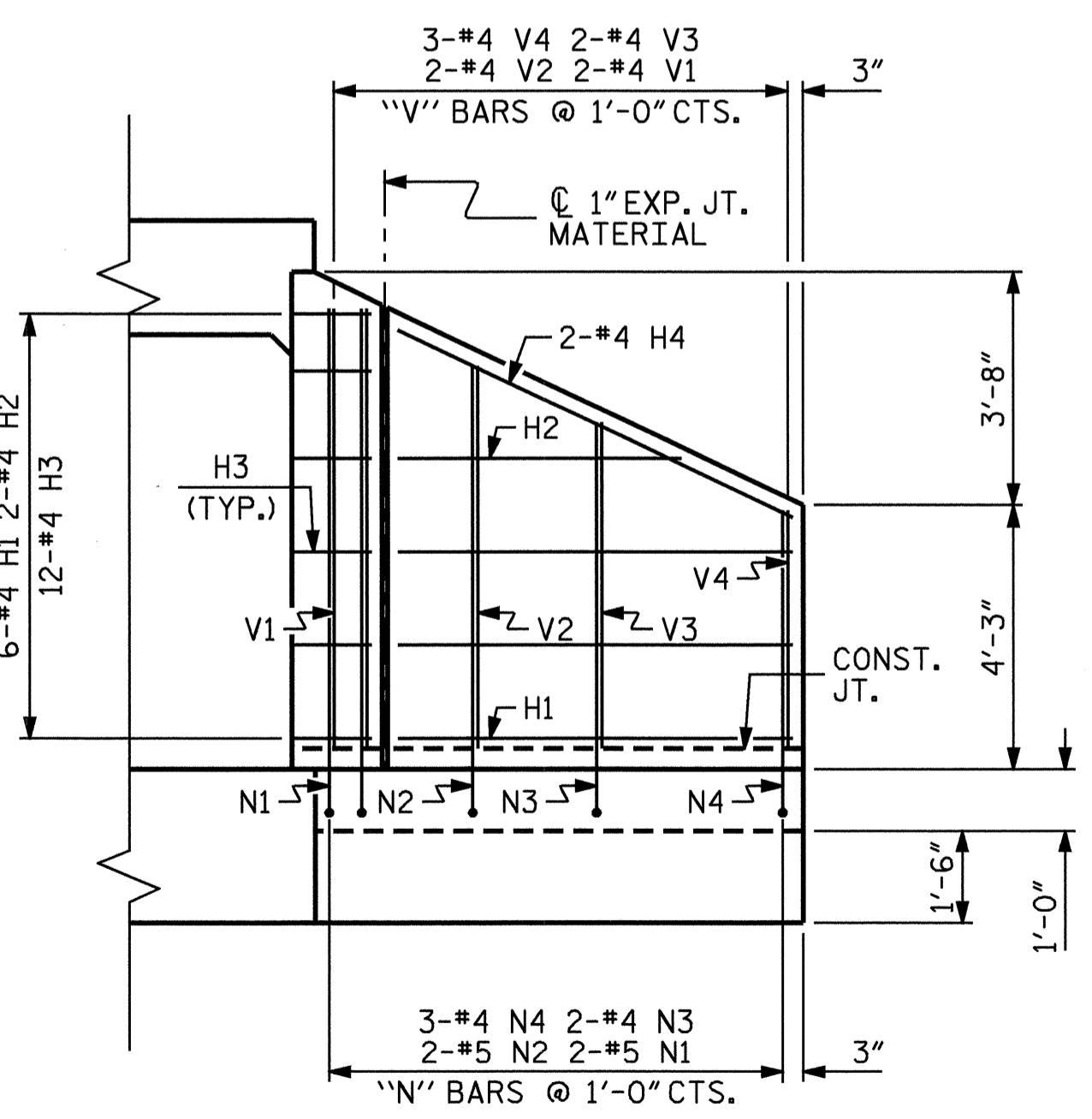
REINFORCING STEEL FOR 2 WINGS: 749 LBS

CLASS A CONCRETE STAGE I
 2 WINGS 11.8 CY
 2 HEADWALLS 4.9 CY
 1 END CURTAIN WALL 1.7 CY
 1 EDGE BEAM 1.1 CY
 TOTAL 19.5 CY

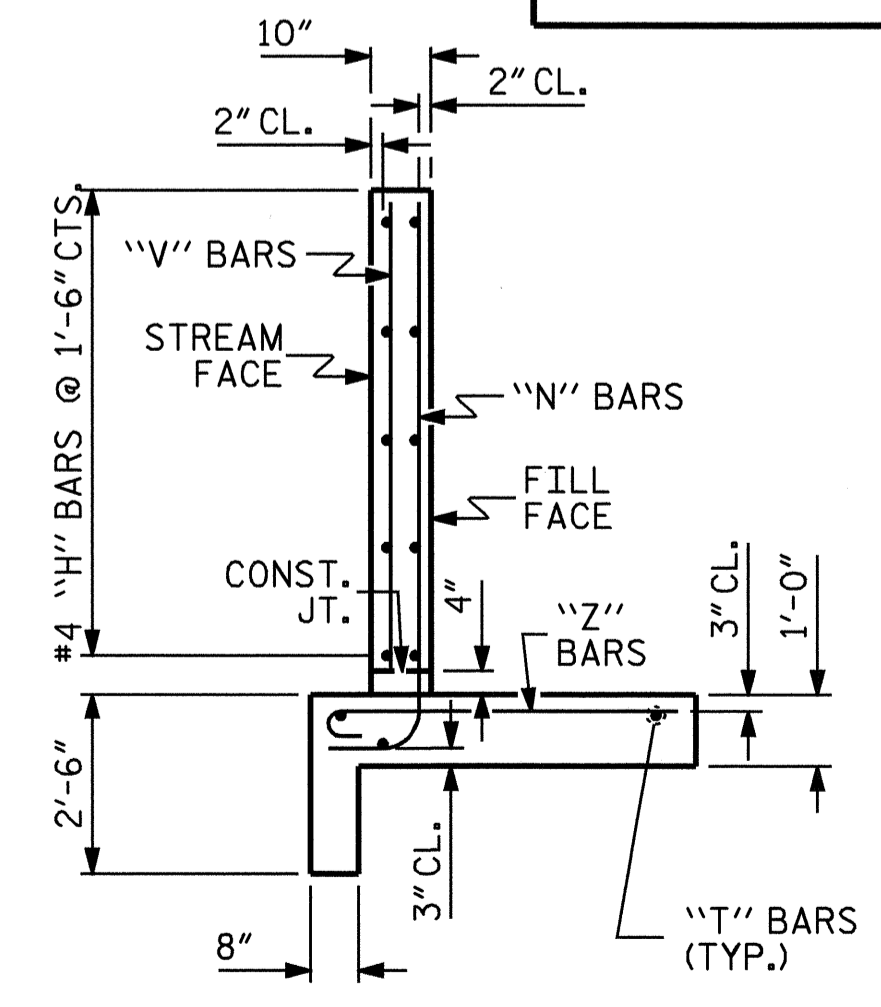
CLASS A CONCRETE STAGE II
 2 WINGS 11.8 CY
 1 HEADWALL 1.4 CY
 1 END CURTAIN WALL 1.7 CY
 2 EDGE BEAMS 2.2 CY
 TOTAL 17.1 CY



ELEVATION W1



ELEVATION W2



TYPICAL WING SECTION



PROJECT NO. B-4192
MCDOWELL COUNTY
 STATION: 14+75.00 -L-

SHEET 10 OF 11
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
WINGS FOR CONCRETE BOX CULVERT
 STAGE I OR II
 H = 7'-0" SLOPE = 2:1
 128° SKEW

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

ASSEMBLED BY: A. SORSENGINH DATE: 3/2/06
 CHECKED BY: M.G. CHEEK DATE: 1/16/07
 DRAWN BY: CCJ 01/00
 CHECKED BY: RWW 03/00

NOTES

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

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

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

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

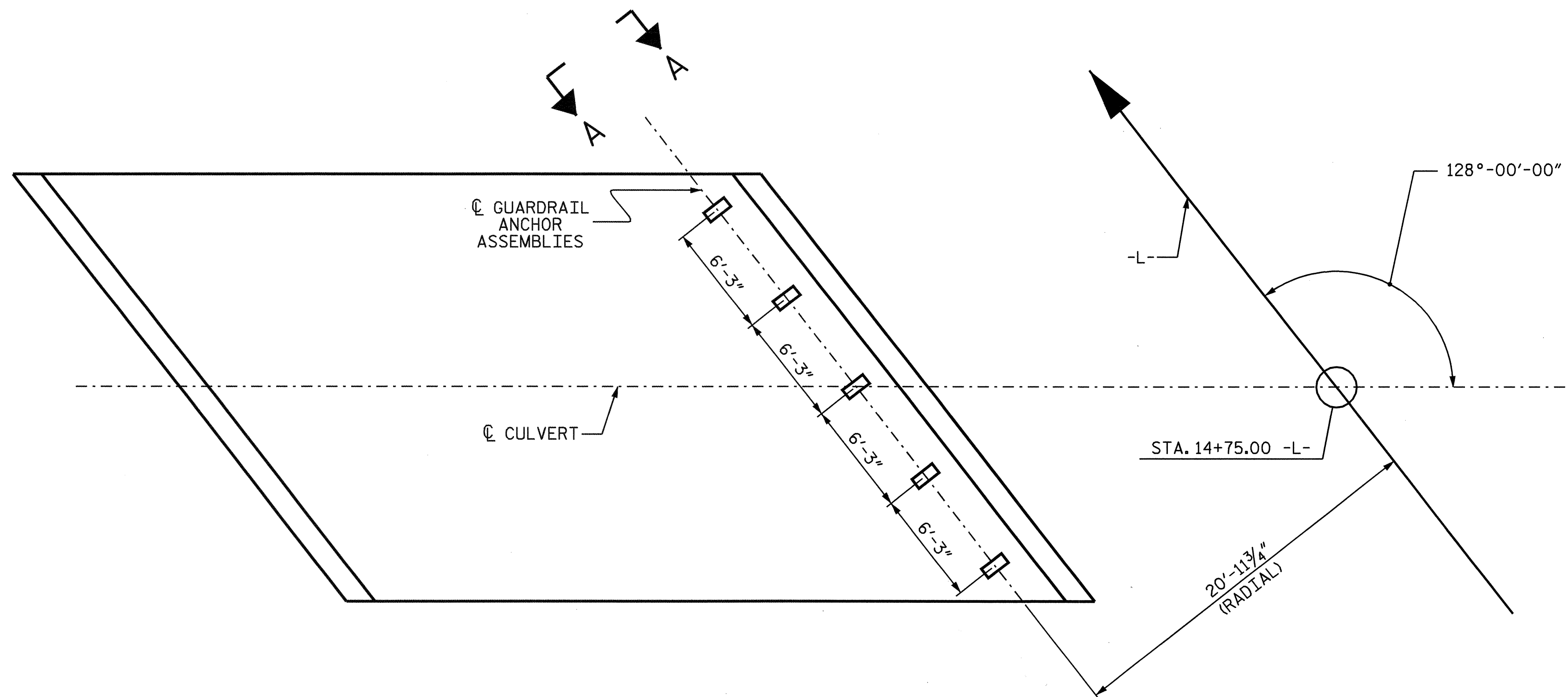
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

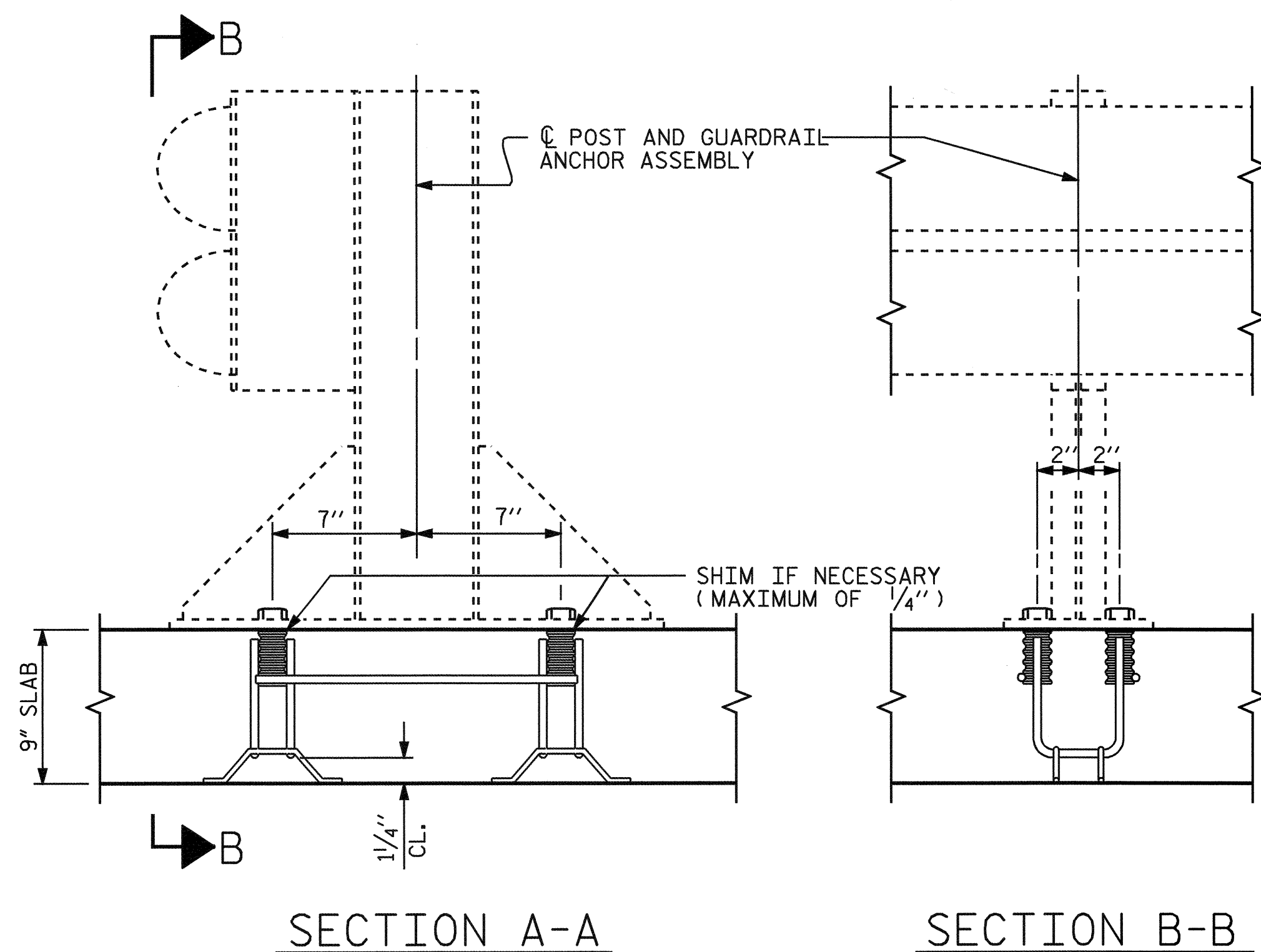
PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

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

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED.

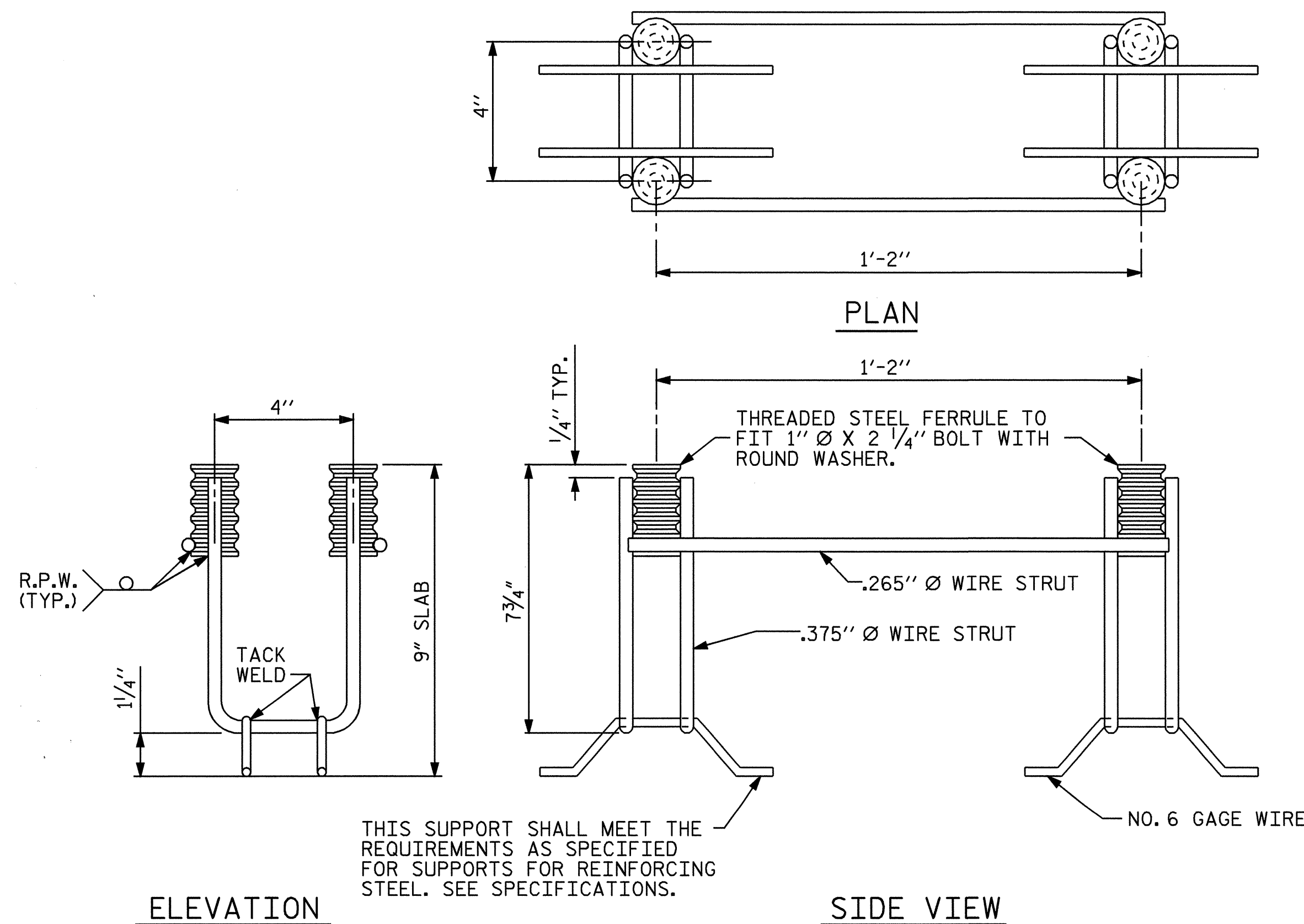


PLAN STAGE I
THE LOCATION OF THE GUARDRAIL ANCHORAGE ASSEMBLIES SHALL BE VERIFIED BY THE ENGINEER.



SECTION A-A

SECTION B-B



ELEVATION

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS



PROJECT NO. B-4192
McDOWELL COUNTY
STATION: 14+75.00 -L-

SHEET 11 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE DETAILS FOR
GUARDRAIL ANCHOR ASSEMBLY
STAGE I

ASSEMBLED BY :	A. SORSENGINH	DATE :	7/11/06
CHECKED BY :	M.G. CHEEK	DATE :	1/12/07
DRAWN BY :	FCJ	REV. 7/10/01	LES/RDR
CHECKED BY :	ARB	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			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 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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