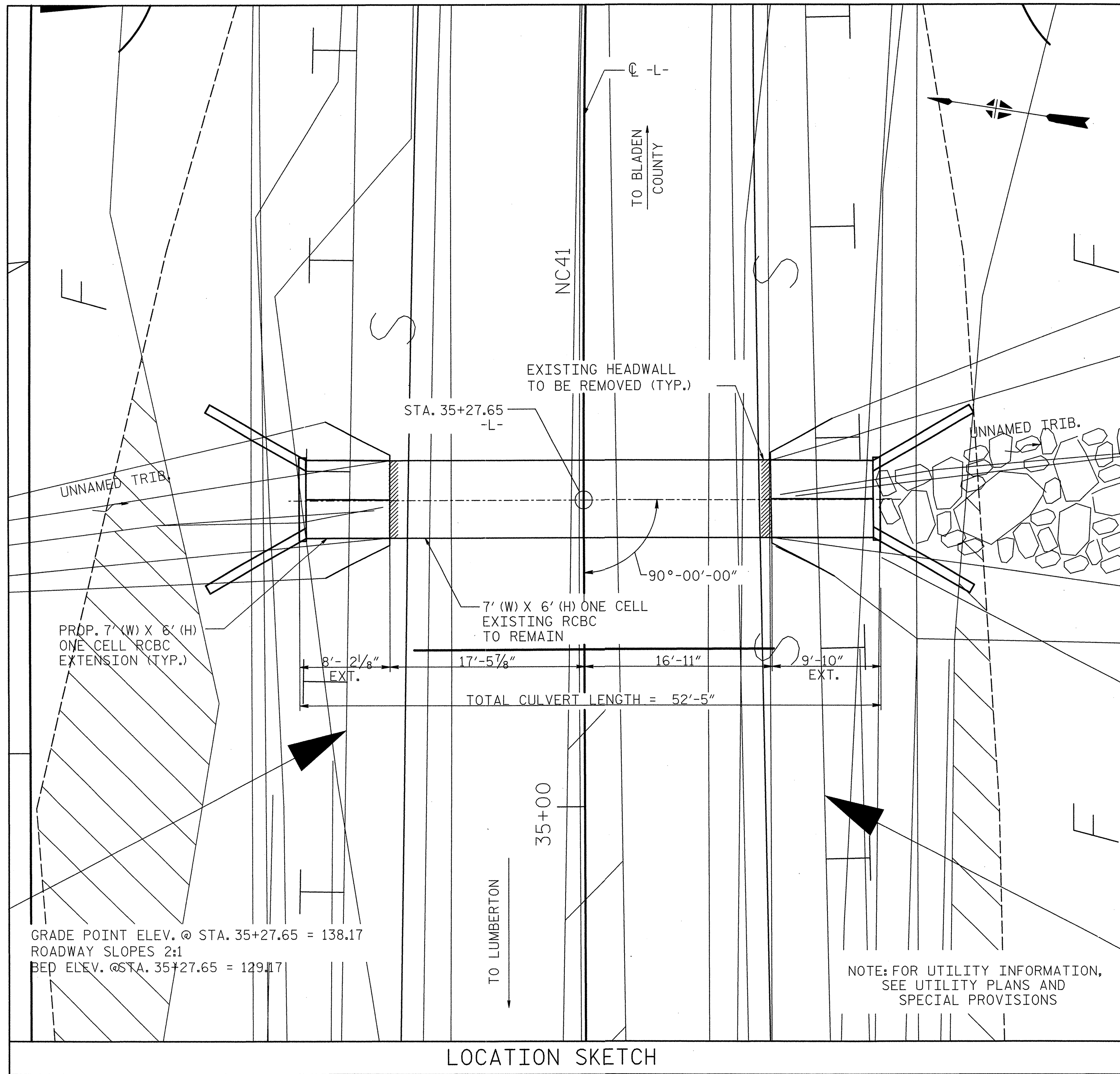


BENCH MARK IS RR SPIKE IN 12" POPLAR TREE, 36.6' RT. STA. 31+40.3 -L-, EL. = 137.02. DATUM = NAVD 1988



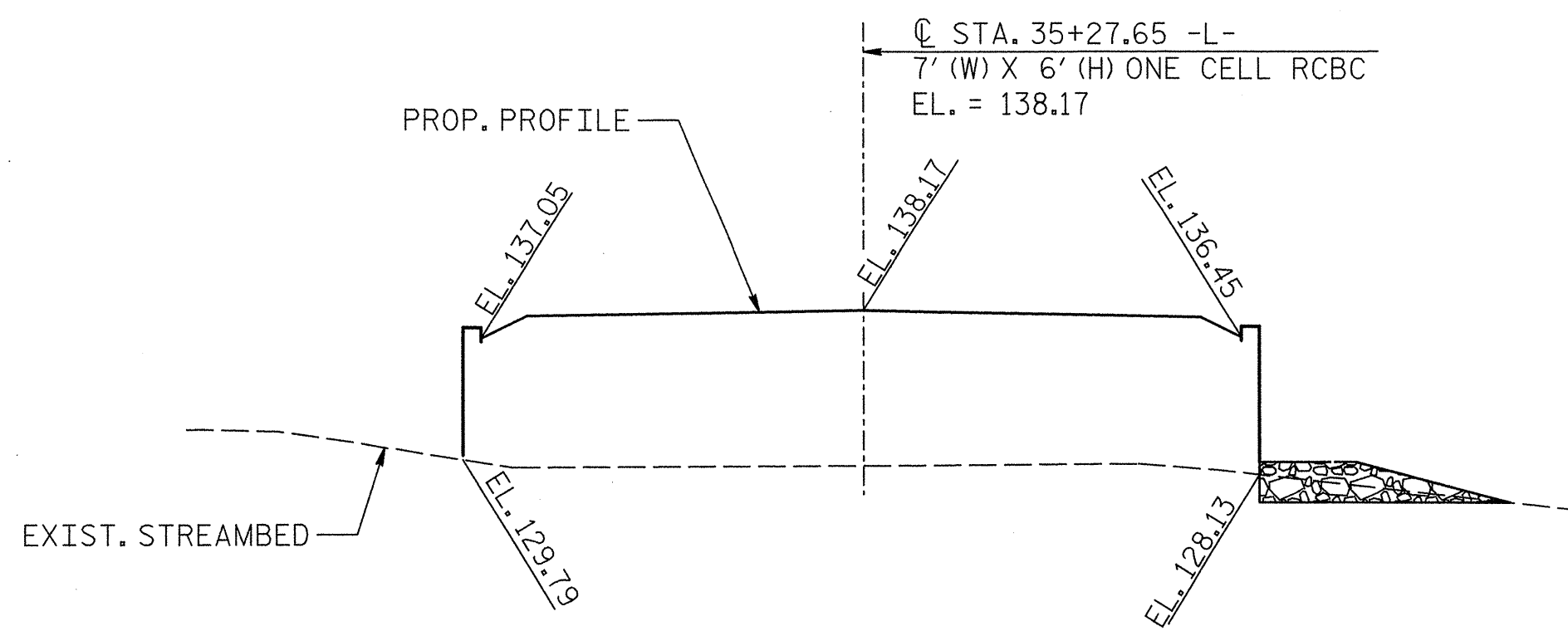
GRADE POINT ELEV. @ STA. 35+27.65 = 138.17
 ROADWAY SLOPES 2:1
 BED ELEV. @ STA. 35+27.65 = 129.17

NOTE: FOR UTILITY INFORMATION,
 SEE UTILITY PLANS AND
 SPECIAL PROVISIONS

LOCATION SKETCH

MINIMUM SPLICE LENGTHS

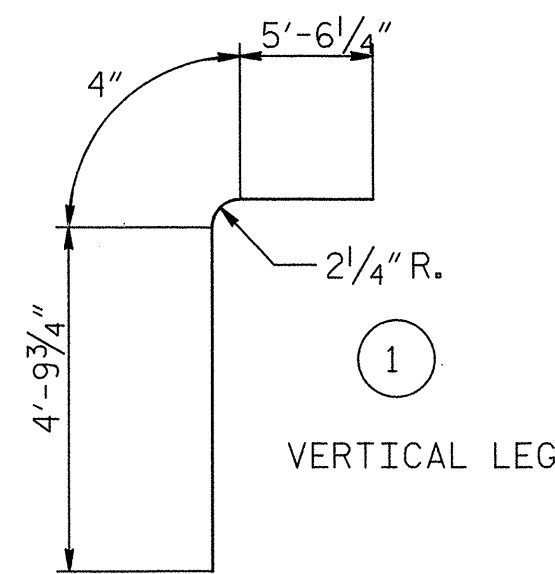
BAR	SIZE	SPLICE LENGTH
A1	6	2'-9"
A2	6	2'-9"



PROFILE ALONG CULVERT

BILL OF MATERIALS
 (WINGWALLS NOT INCLUDED)

BAR MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	38	6	1	10'-8"	609
A2	38	6	1	10'-8"	609
A100	21	6	STR.	8'-8"	273
A200	19	6	STR.	8'-8"	247
B1	20	4	STR.	7'-2"	96
C1	12	4	STR.	9'-0"	72
C2	12	4	STR.	10'-8"	86
C3	31	4	STR.	7'-10"	162
C4	31	4	STR.	9'-6"	197
D1	48	6	STR.	2'-6"	180
G1	8	5	STR.	8'-8"	72



CONC. BREAKDOWN BY POURS

POUR NO.	CY
1 (FLOOR SLAB)	6.2
2 (WALLS)	7.1
3 (TOP SLAB)	6.3

AT THE CONTRACTOR'S OPTION, POUR
 NOS. 2 & 3 MAY BE COMBINED.

STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @	19.6	CY
WINGS ETC.	14.6	CY
TOTAL	34.2	CY
REINFORCING STEEL		
BARREL	2603	LBS.
WINGS ETC.	793	LBS.
TOTAL	3396	LBS.
CULVERT EXCAVATION		LUMP SUM
FOUNDATION COND. MAT'L.		34.2 TONS

NOTES

ALL ELEVATIONS ARE IN FEET.

SPECIFICATIONS = AASHTO 1996 WITH INTERIMS TO 2002.

DESIGN FILL = 1.90 FT

REMOVAL OF EXISTING CONCRETE AND BONDING OF THE NEW CONCRETE SHALL BE IN ACCORDANCE WITH ARTICLE 420-11 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT EXISTING REINFORCING STEEL IN THE WINGS SHALL BE CUT OFF FLUSH WITH THE CONCRETE. DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30" SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30" SAMPLES OF EACH BAR USED. THE BARS FROM WHICH THESE 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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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 THE 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.

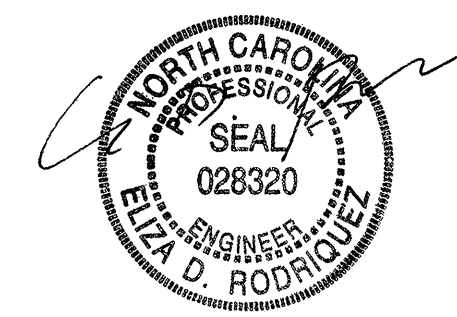
THE CONTRACTOR SHALL USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO THE CUTTING OF THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

AT THE CONTRACTOR'S OPTION, HE MAY INSTEAD USE TEMPORARY SHORING, AT NO ADDITIONAL COST TO THE OWNER.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

PROJECT No. R-5017
ROBESON COUNTY
 STATION: 35+27.65



11/09

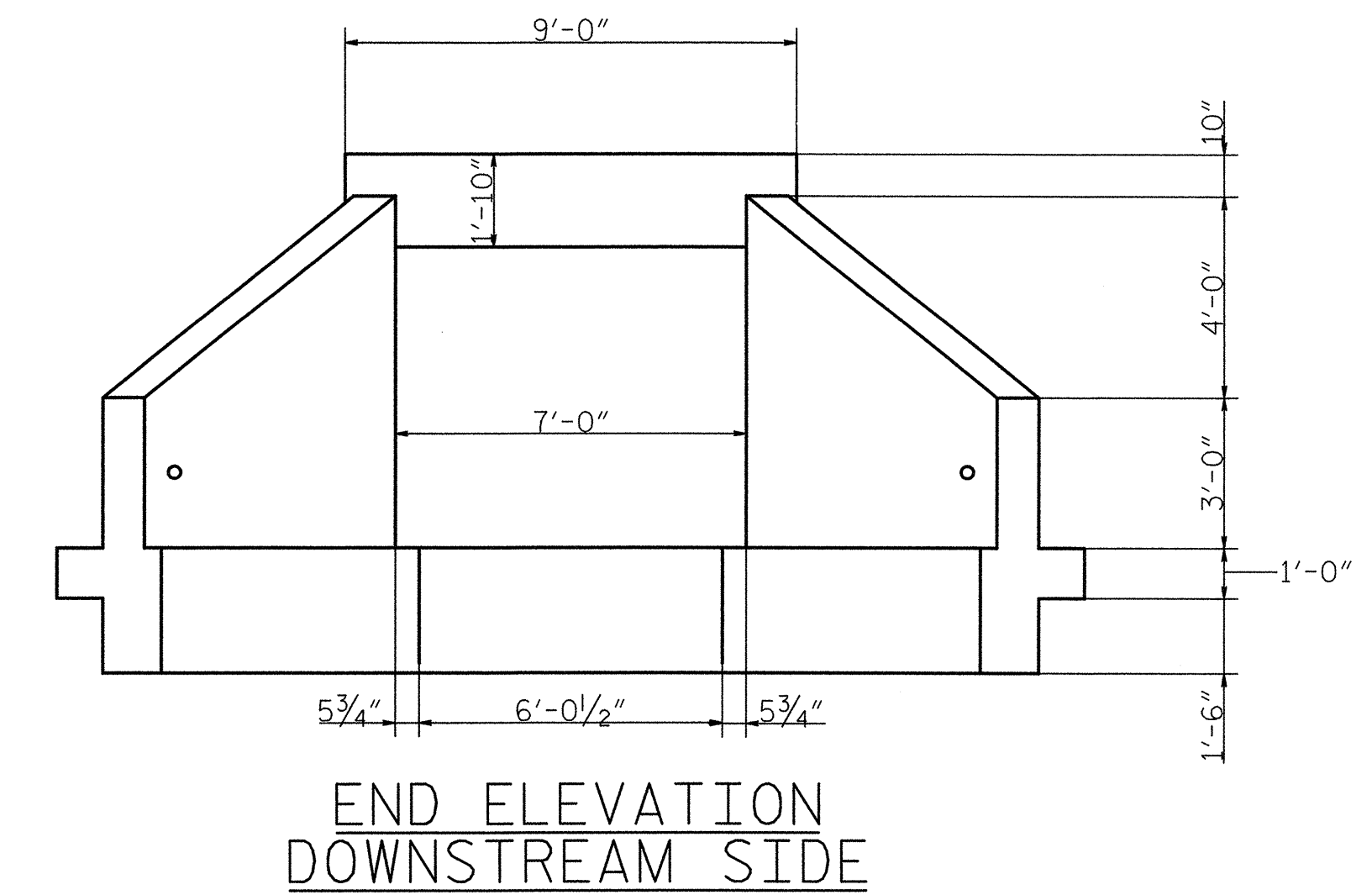
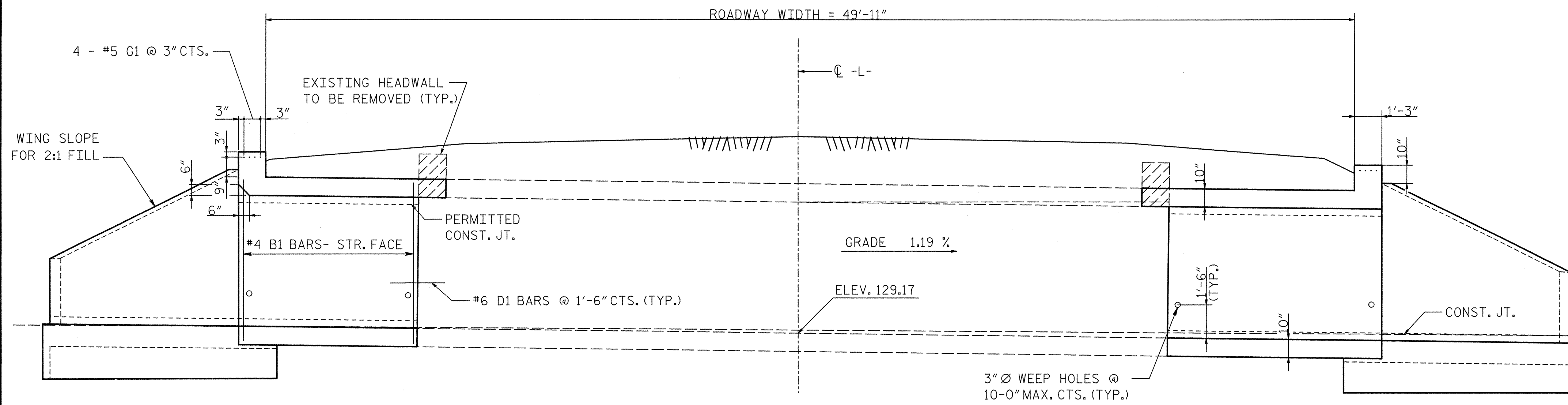
REVISIONS		NO.	BY	DATE
		1		
		2		
		3		
		4		

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 7' X 6'
 CONCRETE BOX CULVERT
 EXTENSION
 90°-00'-00" SKEW

SHEET NO.	C-1
TOTAL SHEETS	C-4

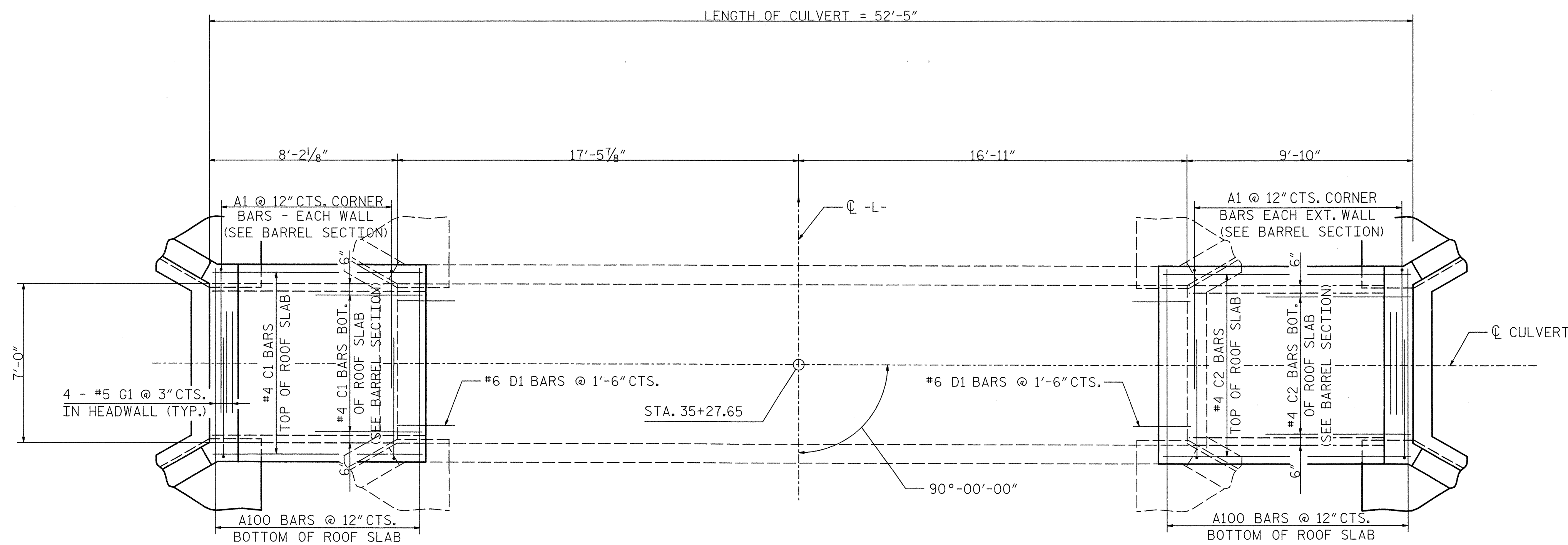
DRAWN BY: D. CHAPMAN DATE: 02/05
 CHECKED BY: E. RODRIGUEZ DATE: 02/05

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CULVERT SECTION NORMAL TO ROADWAY

C BARS NOT SHOWN. SEE RIGHT ANGLE SECTION OF BARREL FOR LOCATION.



PLAN OF ROOF SLAB

PROJECT No. R-5017
ROBESON COUNTY
 STATION: 35+27.65



9/13/07

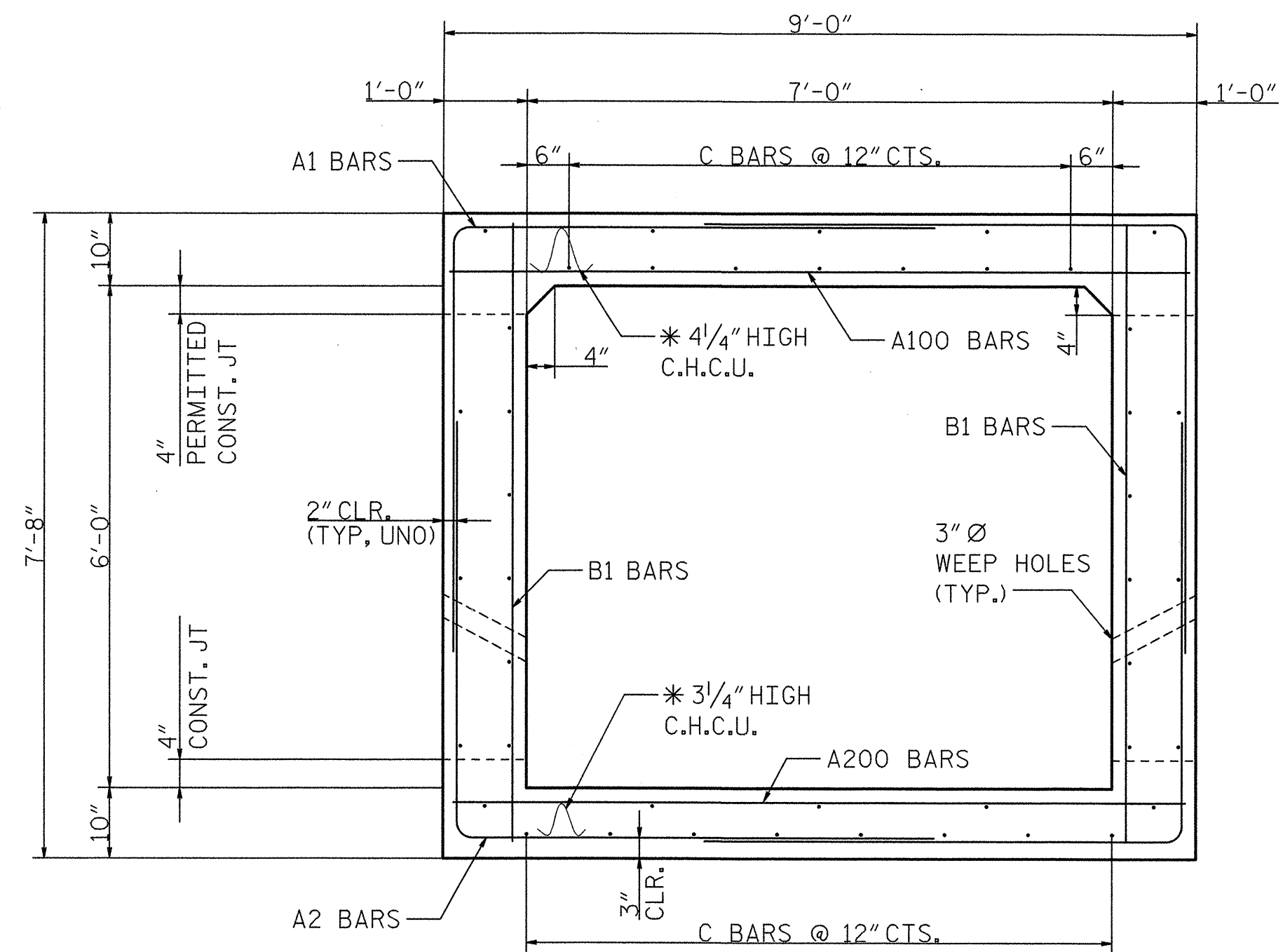
REVISIONS		NO.	BY	DATE
1		1		
2		2		
3		3		
4		4		

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 7' X 6'
 CONCRETE BOX CULVERT
 EXTENSION
 90°-00'-00" SKEW

SHEET NO. C-2	TOTAL SHEETS C-4
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DRAWN BY: D. CHAPMAN DATE: 02/05
 CHECKED BY: E. RODRIQUEZ DATE: 02/05

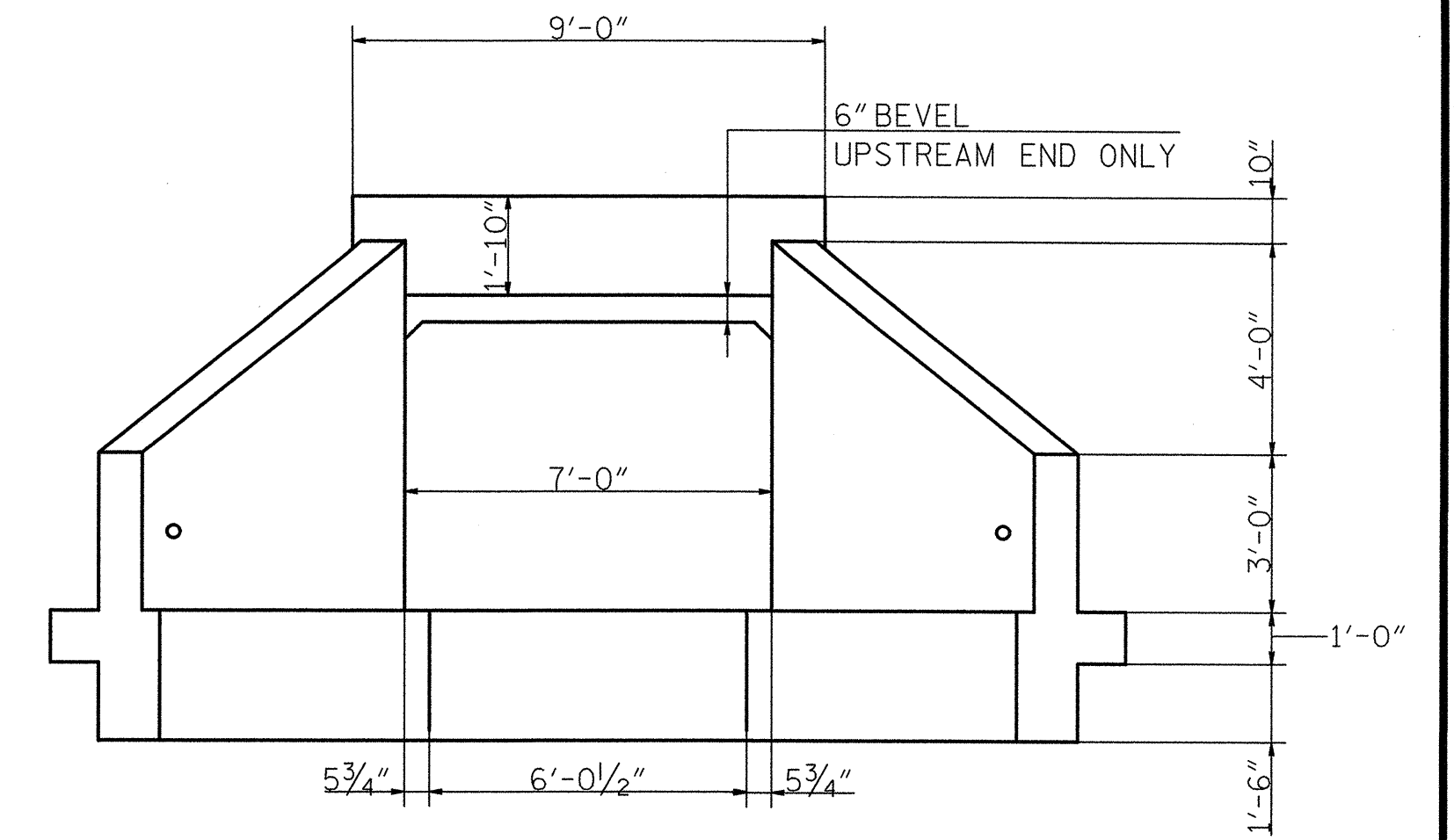
P:\0016619035\018\HDR Proposed\Culvert\NC41 CULVERT-02.DGN



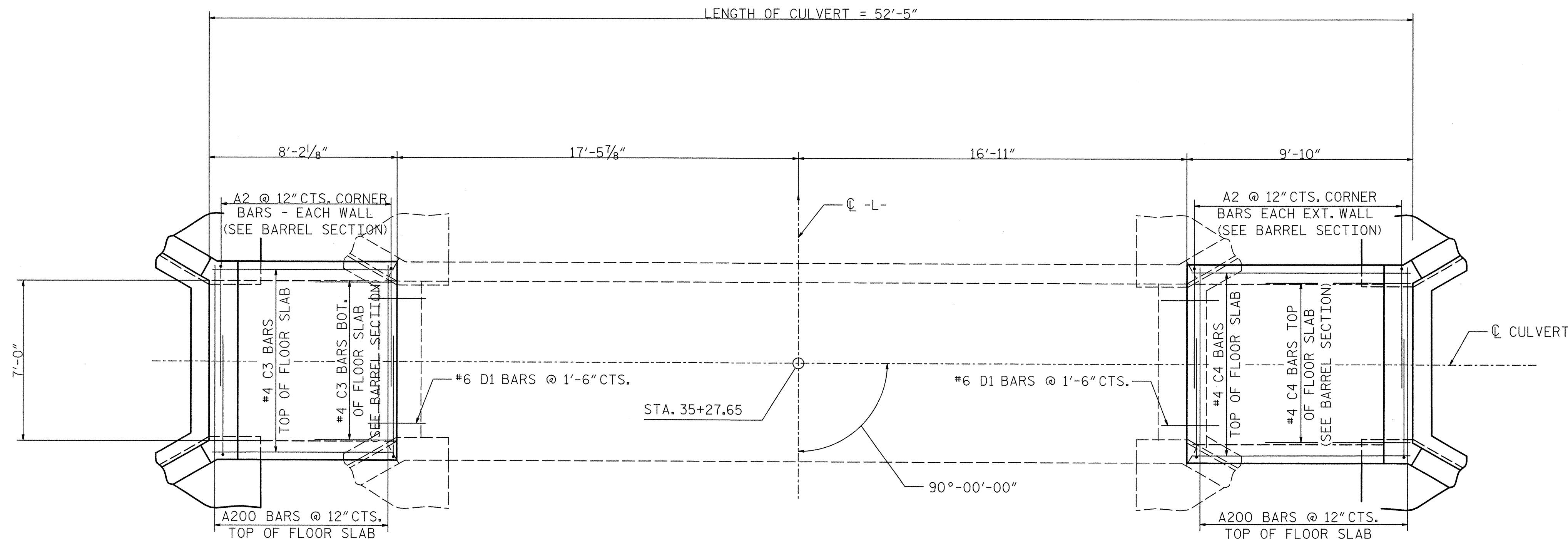
* ALL C.H.C.U. AT 3'-0" CTS.

RIGHT ANGLE SECTION OF BARREL

THERE ARE 43 "C" BARS IN SECTION OF BARREL.

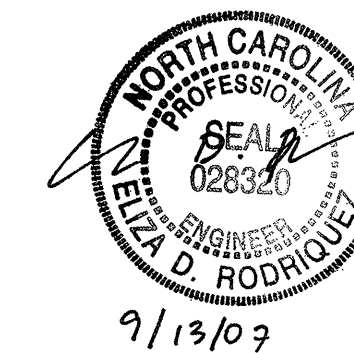


**END ELEVATION
UPSTREAM SIDE**



PLAN OF FLOOR SLAB

PROJECT No. R-5017
ROBESON COUNTY
 STATION: 35+27.65

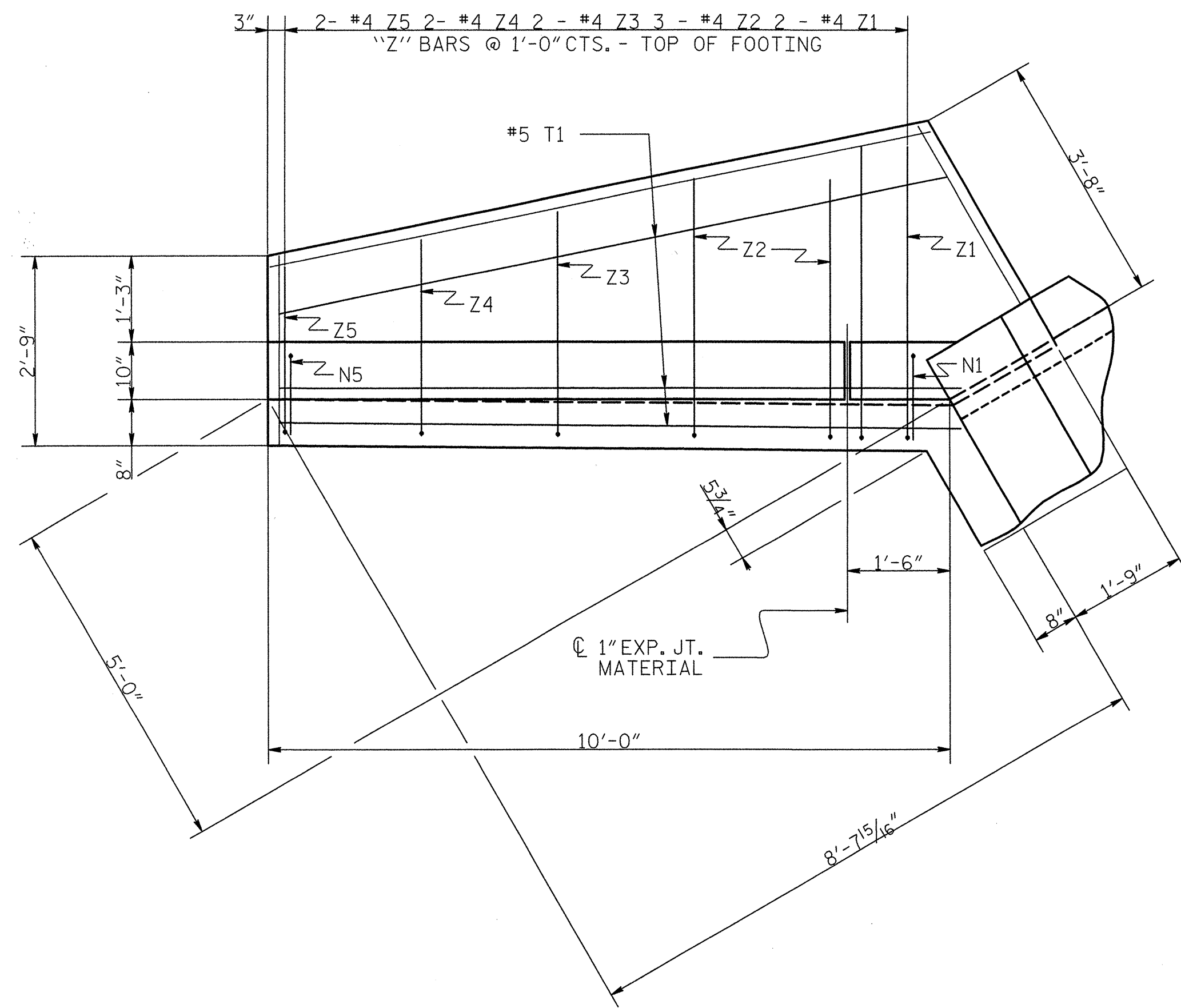


REVISIONS		DATE	BY
NO.	DATE	NO.	BY
1		3	
2		4	

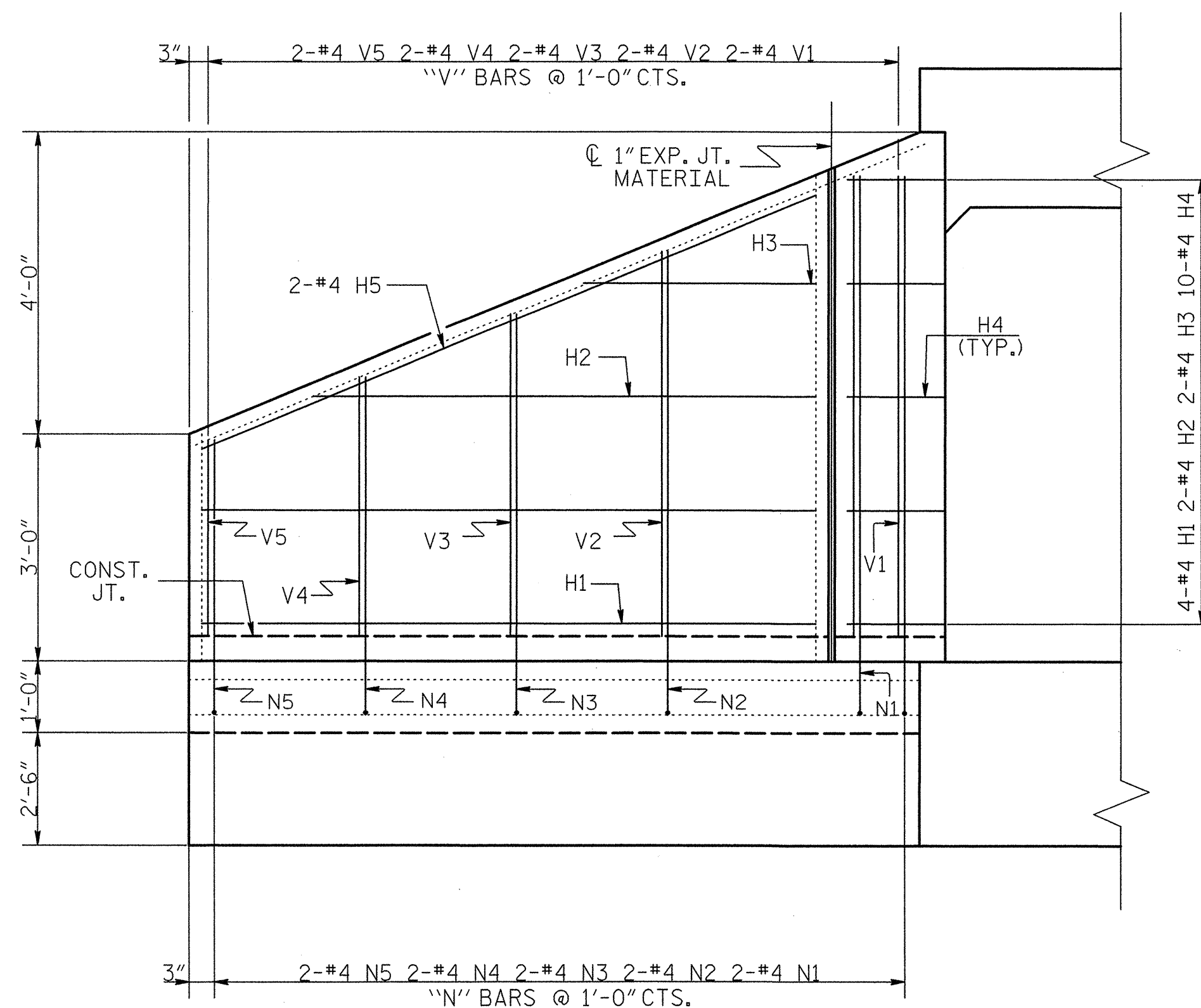
STATE OF NORTH CAROLINA	
DEPARTMENT OF TRANSPORTATION	
RALEIGH	
SINGLE 7' X 6'	
CONCRETE BOX CULVERT	
EXTENSION	
90°-00'-00" SKEW	

SHEET NO. C-3
TOTAL SHEETS C-4

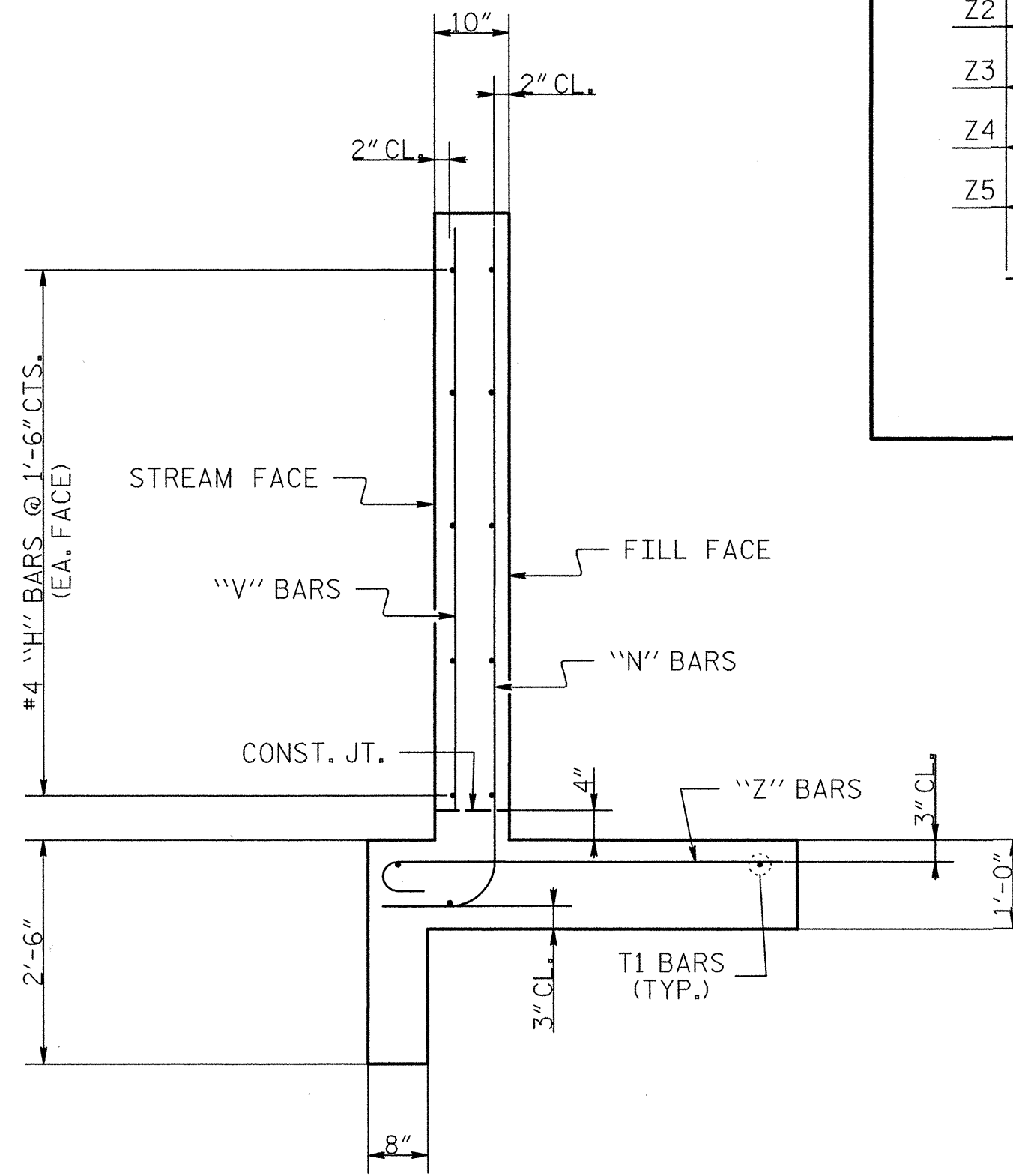
DRAWN BY: D. CHAPMAN DATE: 02/05
 CHECKED BY: E. RODRIQUEZ DATE: 02/05



PLAN



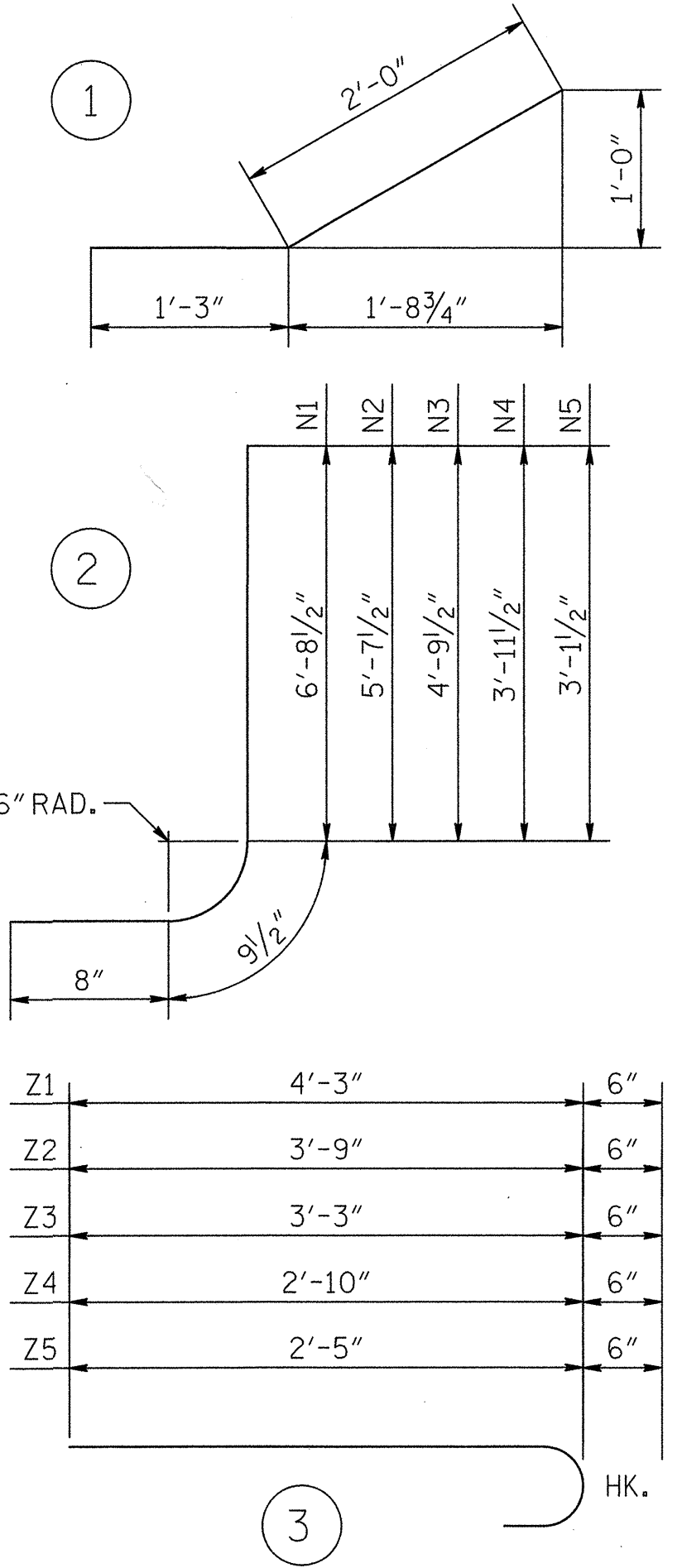
ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

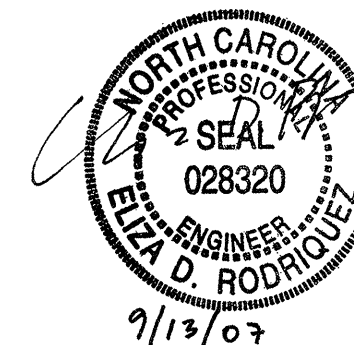


BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	8'-1"	86
H2	8	#4	STR	6'-8"	36
H3	8	#4	STR	3'-1"	16
H4	40	#4	1	3'-3"	87
H5	8	#4	STR	8'-9"	47
N1	8	#4	2	8'-2"	44
N2	8	#4	2	7'-1"	38
N3	8	#4	2	6'-3"	33
N4	8	#4	2	5'-5"	29
N5	8	#4	2	4'-7"	24
T1	12	#5	STR	10'-0"	125
V1	8	#4	STR	6'-1"	33
V2	8	#4	STR	5'-1"	27
V3	8	#4	STR	4'-3"	23
V4	8	#4	STR	3'-5"	18
V5	8	#4	STR	2'-7"	14
Z1	8	#4	3	4'-9"	25
Z2	12	#4	3	4'-3"	34
Z3	8	#4	3	3'-9"	20
Z4	8	#4	3	3'-4"	18
Z5	8	#4	3	2'-11"	16

REINFORCING STEEL FOR 4 WINGS	793 LBS
CLASS A CONCRETE 4 WINGS	13.8 CY
2 HEADWALLS	0.8 CY
TOTAL	14.6 CY

P:\0016619035.018\HDR Proposed\Culvert\NC41 CULVERT-04.DGN

ASSEMBLED BY : D. CHAPMAN DATE : 2/05
 CHECKED BY : E. RODRIGUEZ DATE : 2/05
 DRAWN BY : CCJ 10/99
 CHECKED BY : RWW 03/00



REVISIONS			
NO.	BY	DATE	DATE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 6'-0" SLOPE = 2:1
 90° SKEW

SHEET NO. C-4	TOTAL SHEETS C-4
---------------	------------------

PROJECT No. R-5017
 ROBESON COUNTY
 STATION: 35+27.65

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 2006 "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. 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

JANUARY, 1990

STD. NO. SN