

LOCATION SKETCH

ROADWAY DATA

GRADE POINT EL. @ STA. 32+29.90 -L-Rev. = 87.000
 BED ELEVATION @ STA. 32+29.90 -L-Rev. = 74.107
 ROADWAY SLOPE (RIGHT SIDE) = 3 : 1

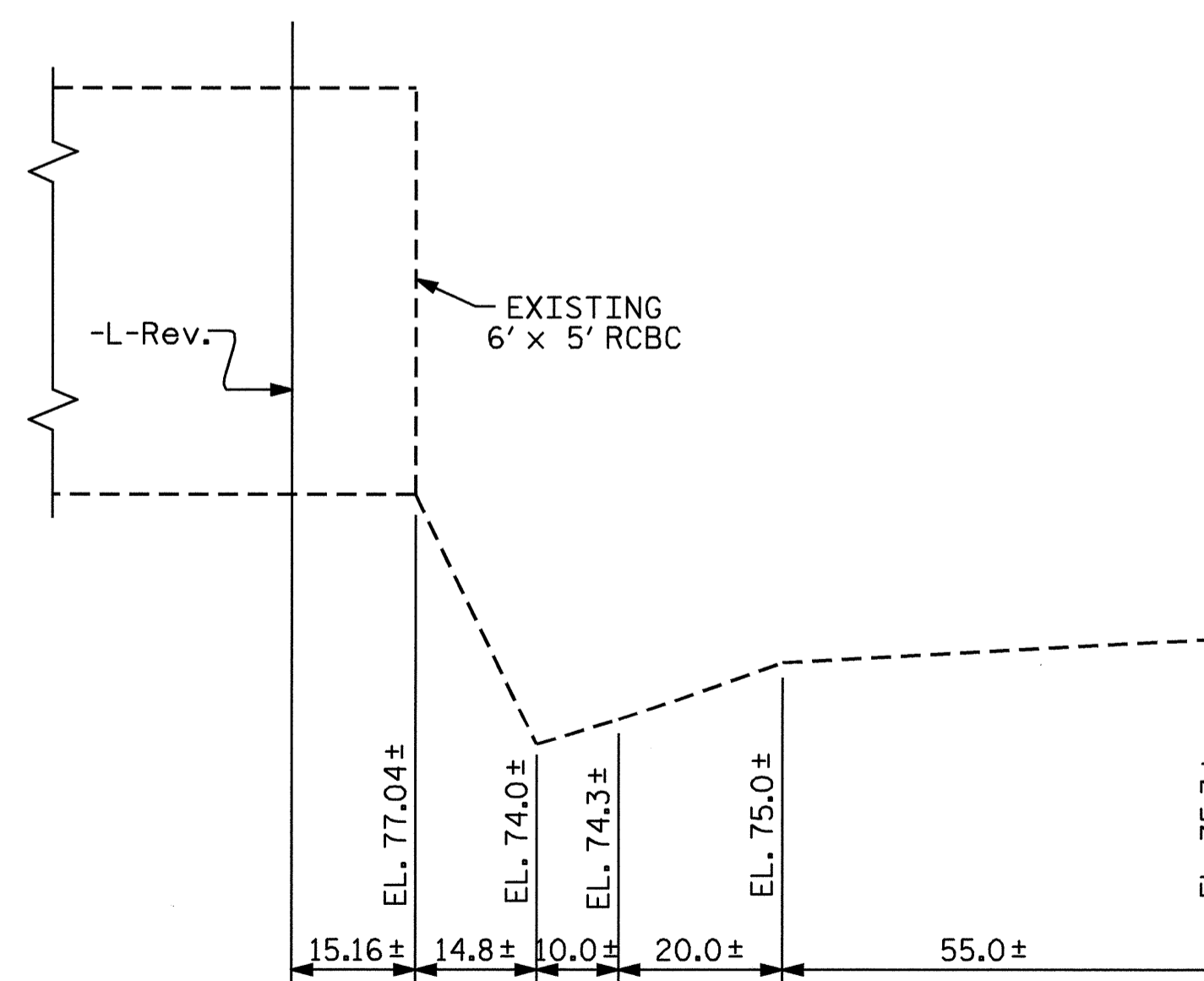
HYDRAULIC DATA

DESIGN DISCHARGE = 260 CFS.
 FREQUENCY OF DESIGN FLOOD = 50 YRS.
 DESIGN HIGH WATER ELEVATION = 83.500
 DRAINAGE AREA = 3.1 SQ. MILES
 BASIC DISCHARGE (Q100) = 310 CFS.
 BASIC HIGH WATER ELEVATION = 84.700

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 360 CFS.
 FREQUENCY OF OVERTOPPING FLOOD = 100 YRS. +
 OVERTOPPING FLOOD ELEVATION = 86.300

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE (C.Y.)	
CULVERT BARREL =	15.5
2 WINGS, HEADWALL, AND CURTAIN WALL =	16.4
TOTAL =	31.9
REINFORCING STEEL (Lbs)	
BARREL =	2,161
WINGS =	1,101
TOTAL =	3,262
FOUNDATION COND. MAT'L (TONS)	
CULVERT EXCAVATION =	LUMP SUM
STEEL PIPE SLEEVES =	2 EA.



PROFILE ALONG CULVERT

NOTES

ASSUMED LIVE LOAD ----- HS20-44 OR ALTERNATE LOADING.

DESIGN FILL = 4.50'.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN CULVERT EXTENSION 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 HEADWALL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT EXTENSION BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE LENGTH OF THE CULVERT EXTENSION IS BASED ON A 9 FT. SHOULDER SO THAT GUARDRAIL MAY BE PLACED 6 FT. OFF THE EDGE OF PAVEMENT IN THE FUTURE. DUE TO THIS EXTRA CULVERT LENGTH THE FILL SLOPE AT CULVERT WILL BE FLATTER THAN 3:1 AND WILL NEED TO BE GRADED TO FIT THE PROPOSED CULVERT LENGTH.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY 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 CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

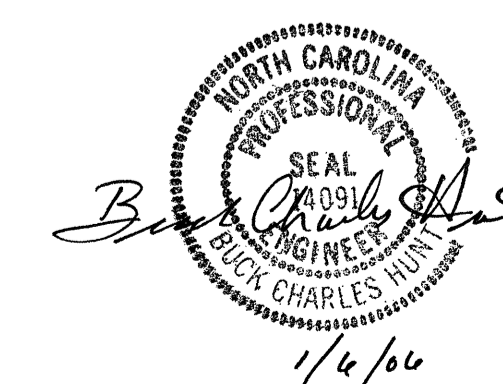
FOR STEEL PIPE SLEEVES, SEE SPECIAL PROVISIONS.

PROJECT NO. 35881
 COLUMBUS COUNTY
 STATION 32+29.90 -L-Rev.

SHEET 1 OF 4

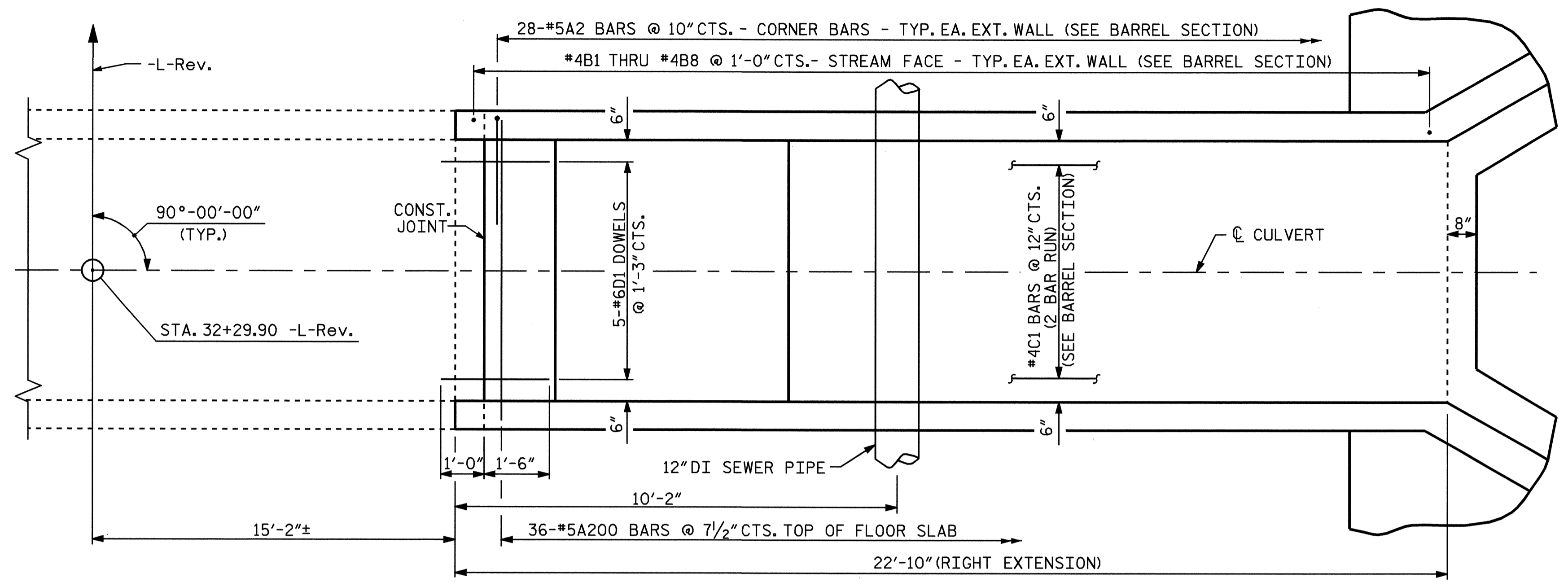
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE
 6'-0" x 8'-0"
 CONCRETE BOX CULVERT
 90° SKEW

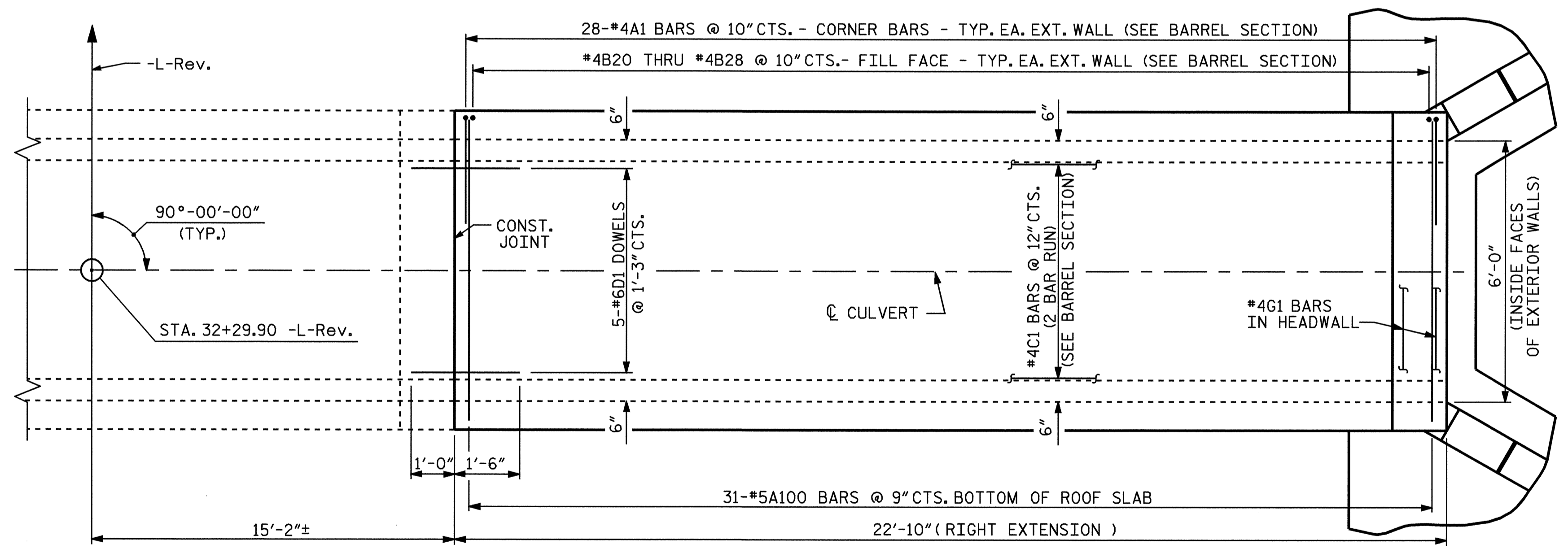


DRAWN BY: KEITH D. LAYNE DATE: 11-30-03
 CHECKED BY: CHARLES HUNT DATE: 11-4-03

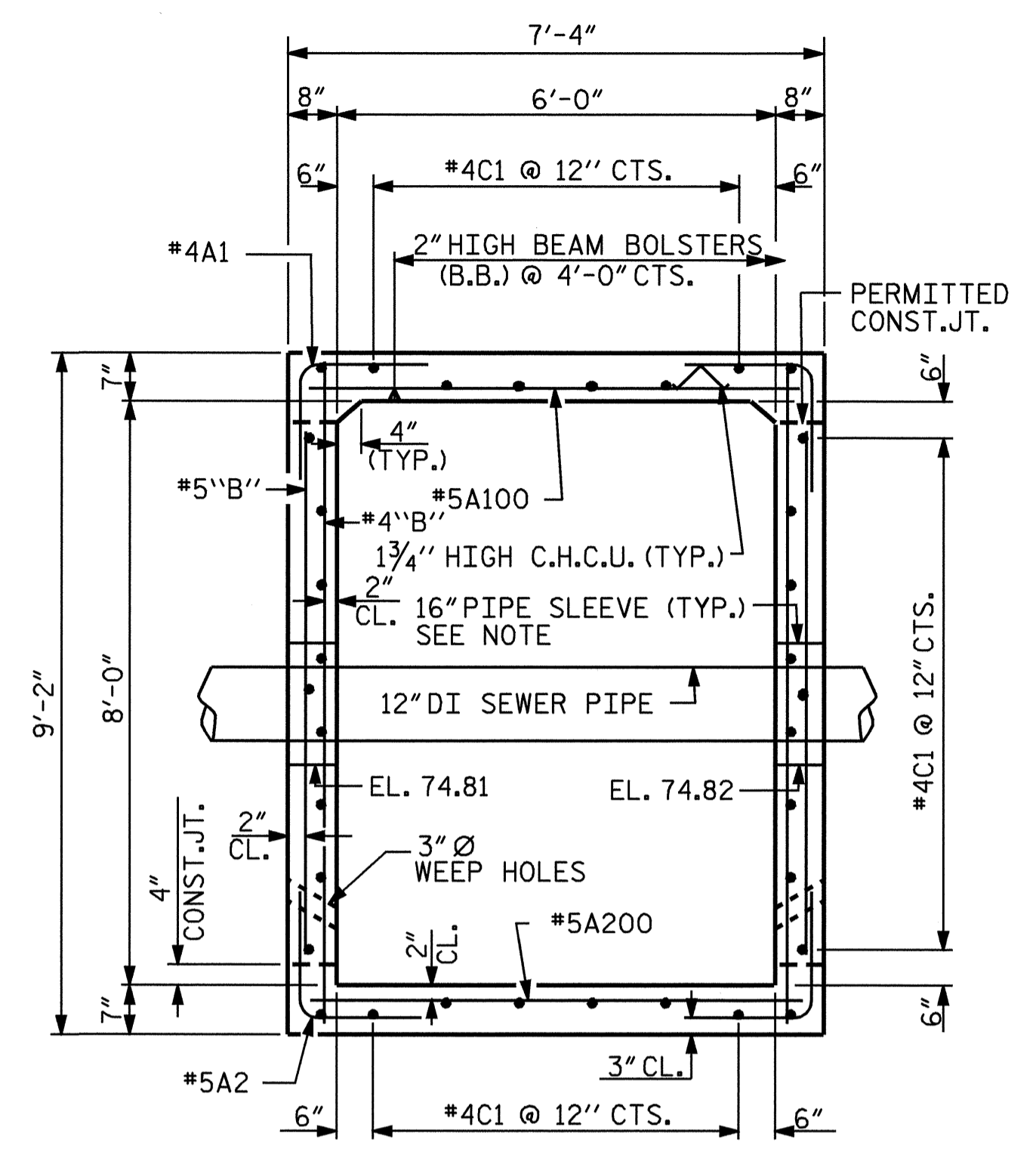
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2			4			4



PLAN - FLOOR SLAB



PLAN - ROOF SLAB



RIGHT ANGLE SECTION OF BARREL

THERE ARE 34 "C" BARS IN SECTION OF BARREL

AT THE CONTRACTOR'S OPTION AND IF APPROVED BY THE ENGINEER, THE 16" PIPE SLEEVE MAY BE ELIMINATED AND THE 12" DI SEWER PIPE MAY BE PLACED WHEN THE CULVERT WALLS ARE CAST.

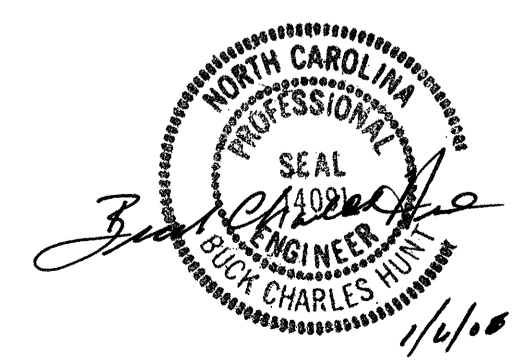
REINFORCING STEEL CONFLICTING WITH THE 12" DI SEWER PIPE SHALL BE FIELD BENT OR CUT TO AVOID INTERFERENCE.

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STATE OF NORTH CAROLINA
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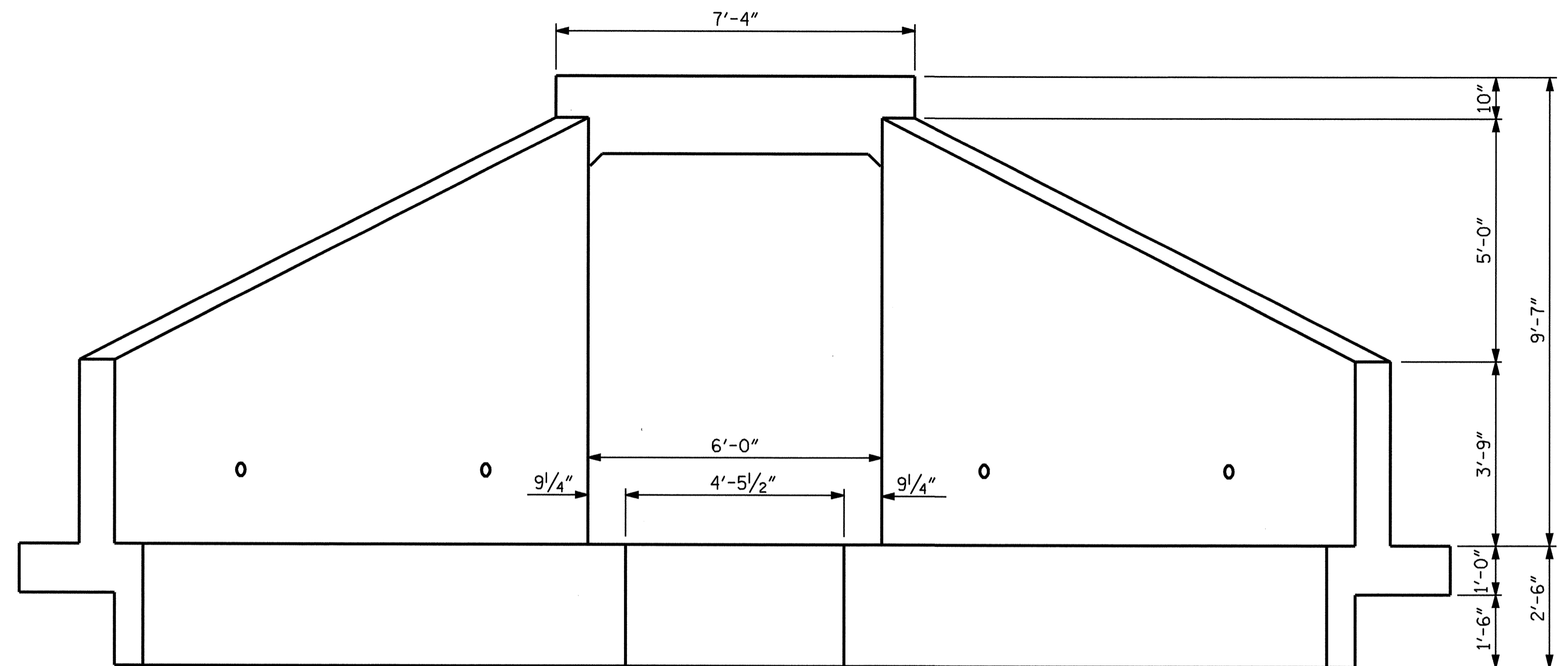
SINGLE 6'-0" x 8'-0"
 CONCRETE BOX CULVERT
 RIGHT EXTENSION
 90°-00'-00" SKEW



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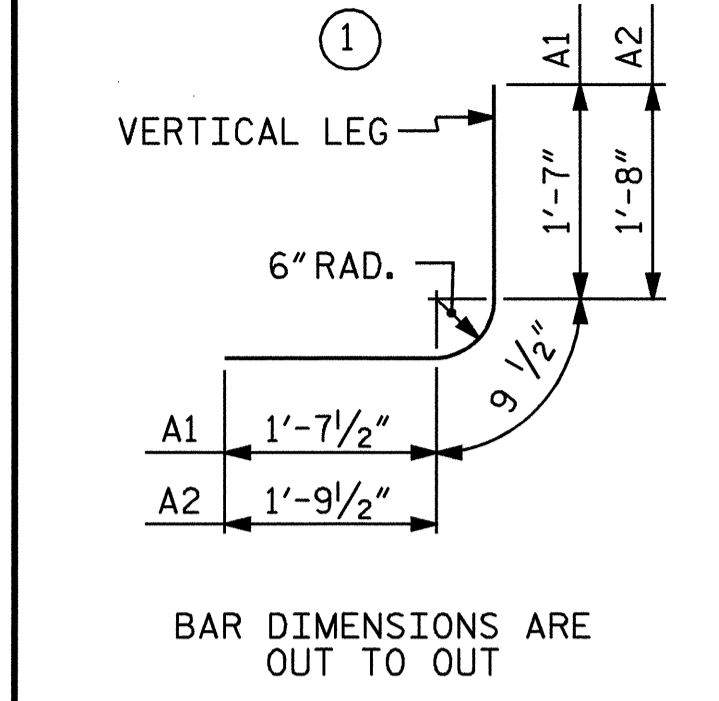
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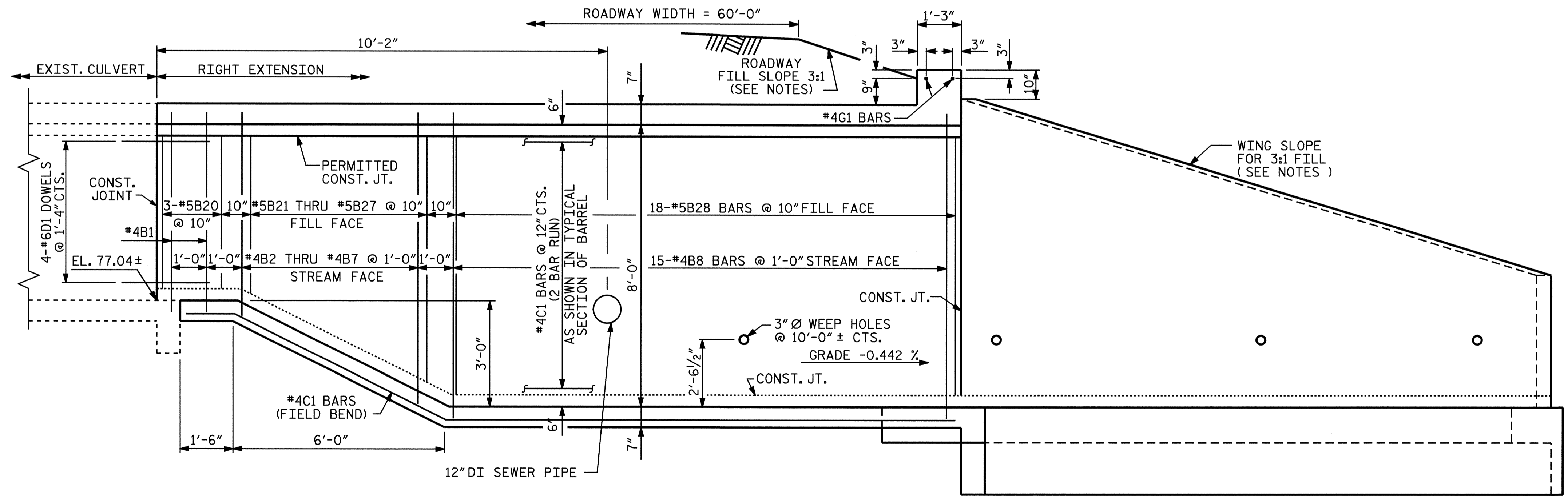
END ELEVATION

BAR TYPE	REINFORCING STEEL				
	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	31	5	STR	6-11	224
A200	36	5	STR	6-11	260
A1	56	4	1	4- 0	150
A2	56	5	1	4- 3	248
B1	4	4	STR	5- 8	15
B2	2	4	STR	5- 9	8
B3	2	4	STR	6- 3	8
B4	2	4	STR	6- 9	9
B5	2	4	STR	7- 3	10
B6	2	4	STR	7- 9	10
B7	2	4	STR	8- 3	11
B8	30	4	STR	8- 8	174
B20	6	5	STR	4- 4	27
B21	2	5	STR	4- 5	9
B22	2	5	STR	4-10	10
B23	2	5	STR	5- 3	11
B24	2	5	STR	5- 8	12
B25	2	5	STR	6- 1	13
B26	2	5	STR	6- 6	14
B27	2	5	STR	6-11	14
B28	36	5	STR	7- 4	275
C1	68	4	STR	12- 7	572
D1	18	6	STR	2- 6	68
G1	2	4	STR	7- 0	9
REINFORCING STEEL =				2,161 LBS.	



SPLICE LENGTHS CHART

BAR SIZE	SPLICE LENGTH
B1 #4	1'-9"
C1 #4	1'-11"



CULVERT SECTION NORMAL TO ROADWAY

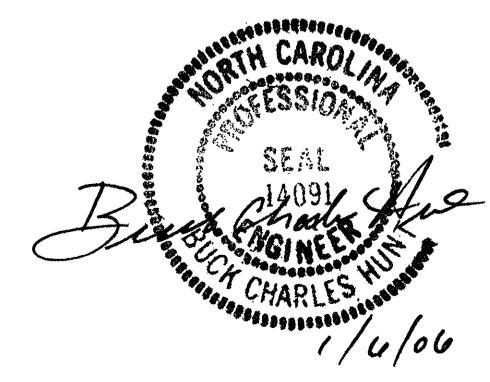
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SHEET 3 OF 4

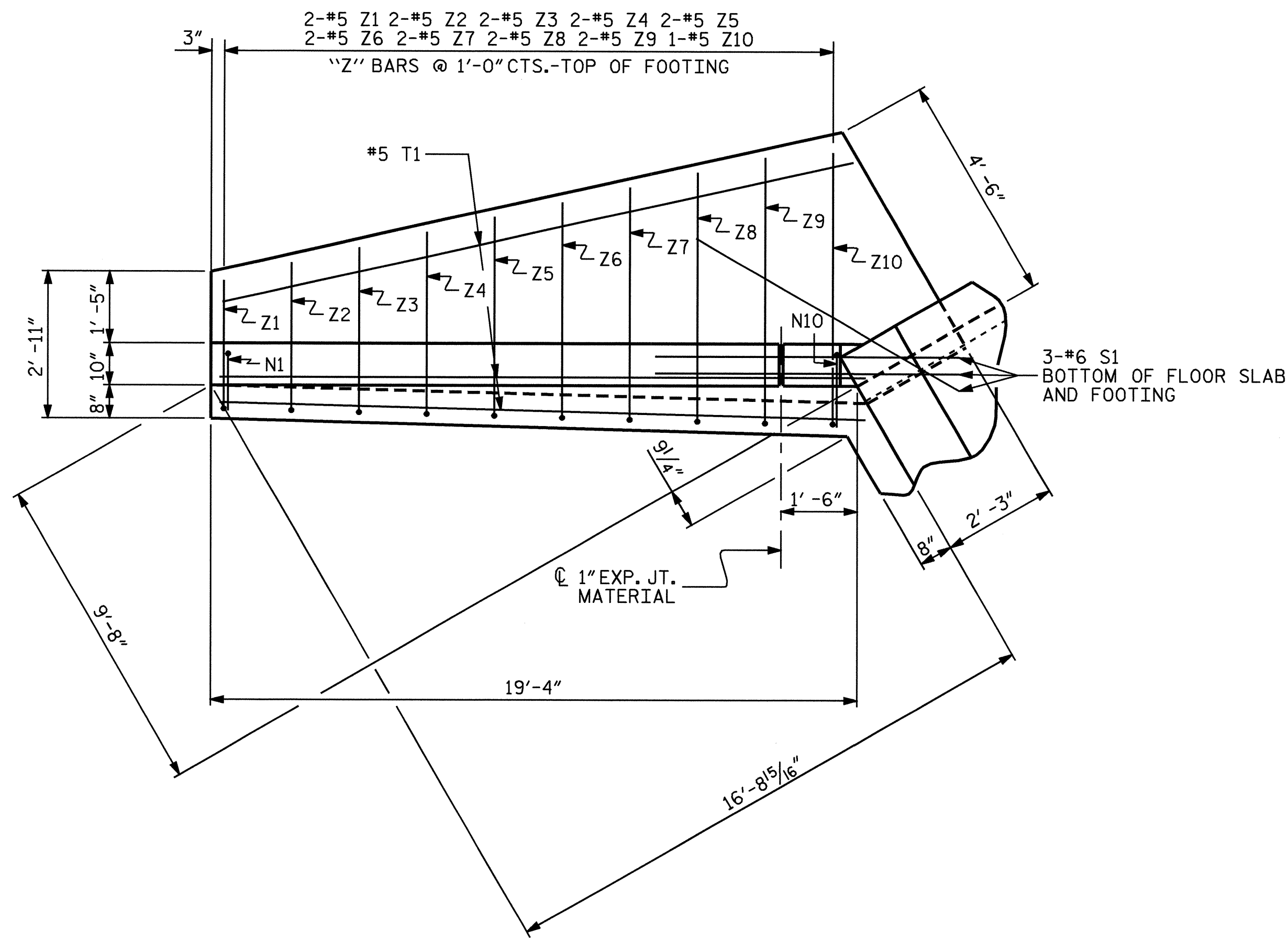
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE
 6'-0" X 8'-0"
 CONCRETE BOX CULVERT
 90°-00'-00" SKEW

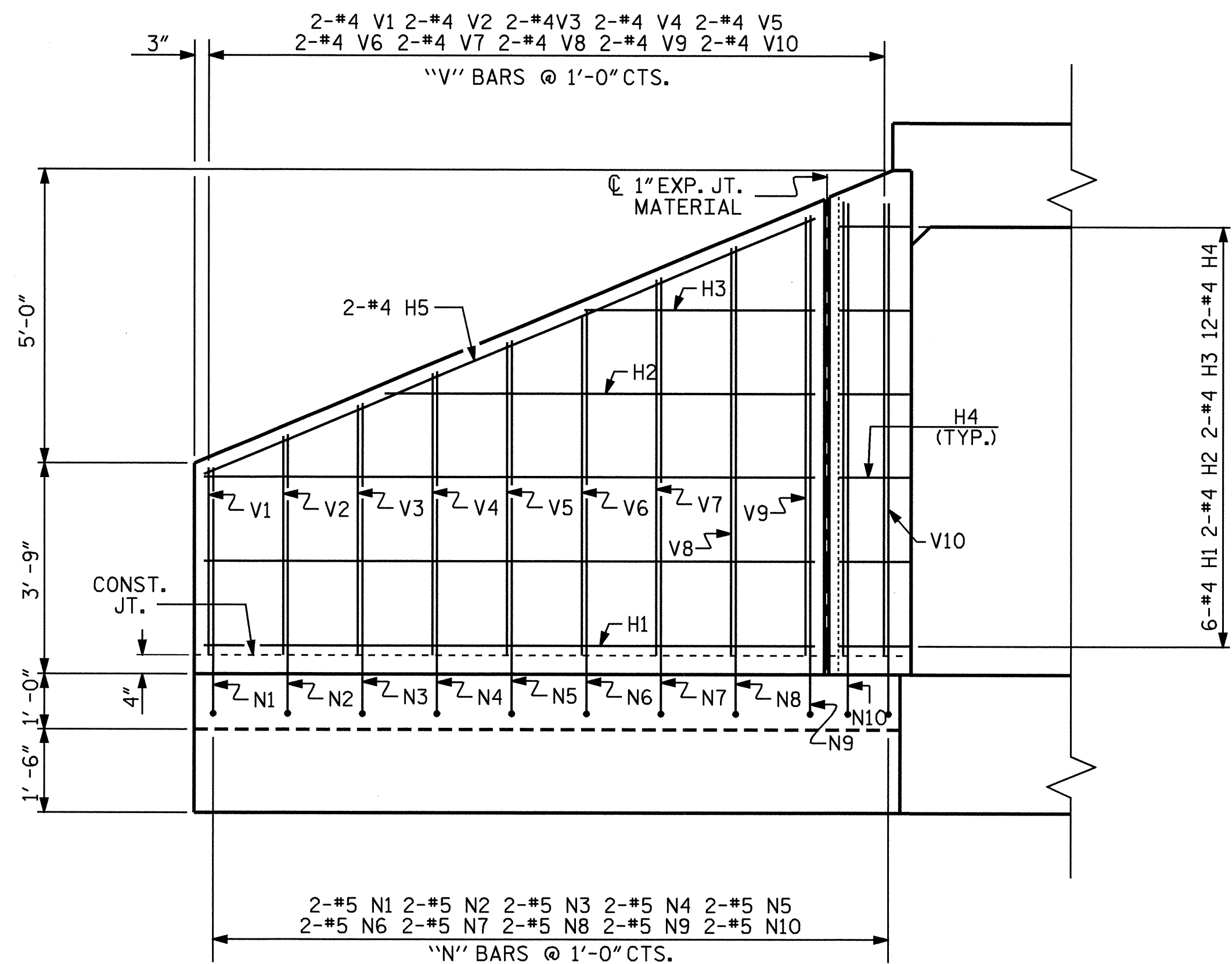
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2			4			SHEETS	



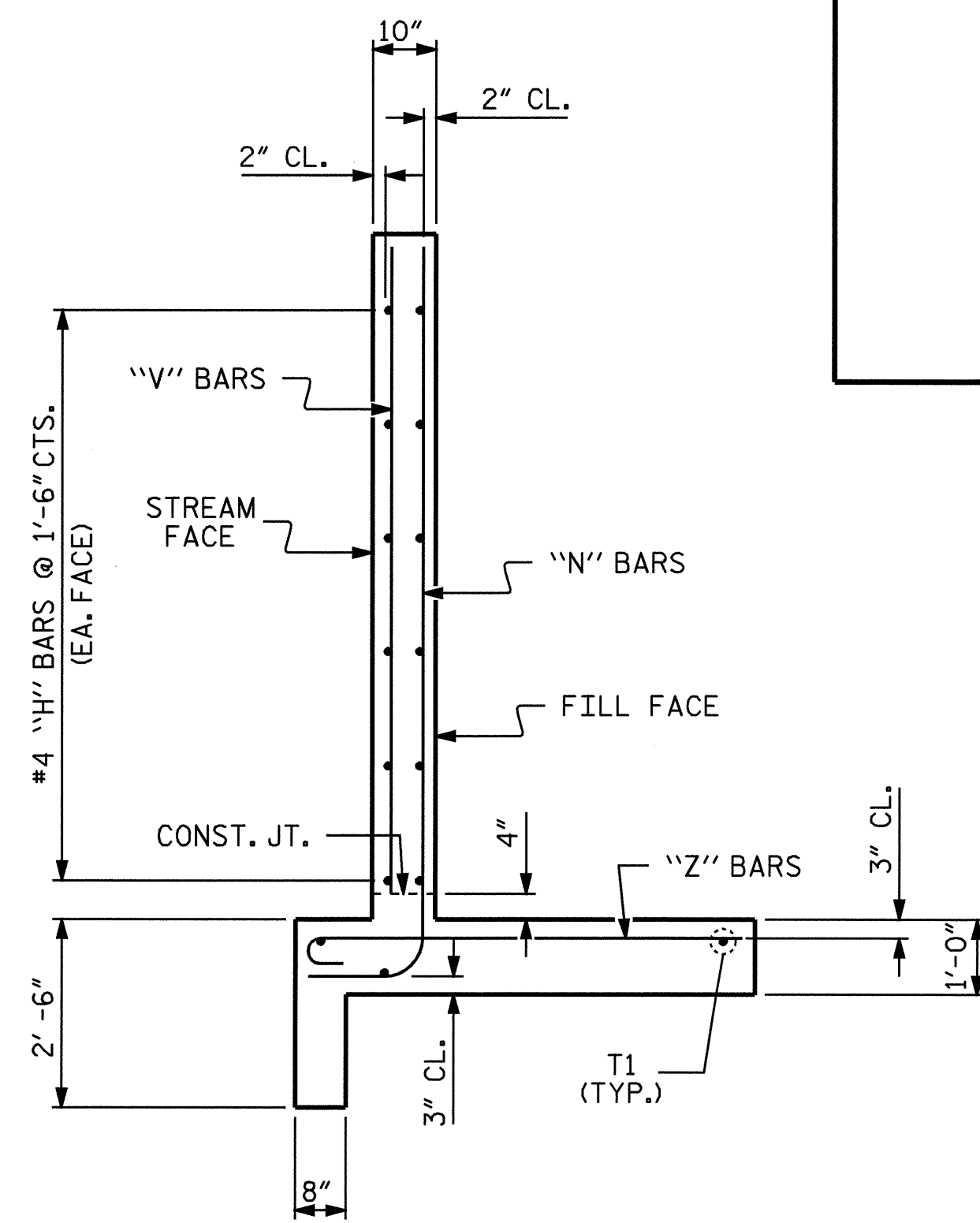
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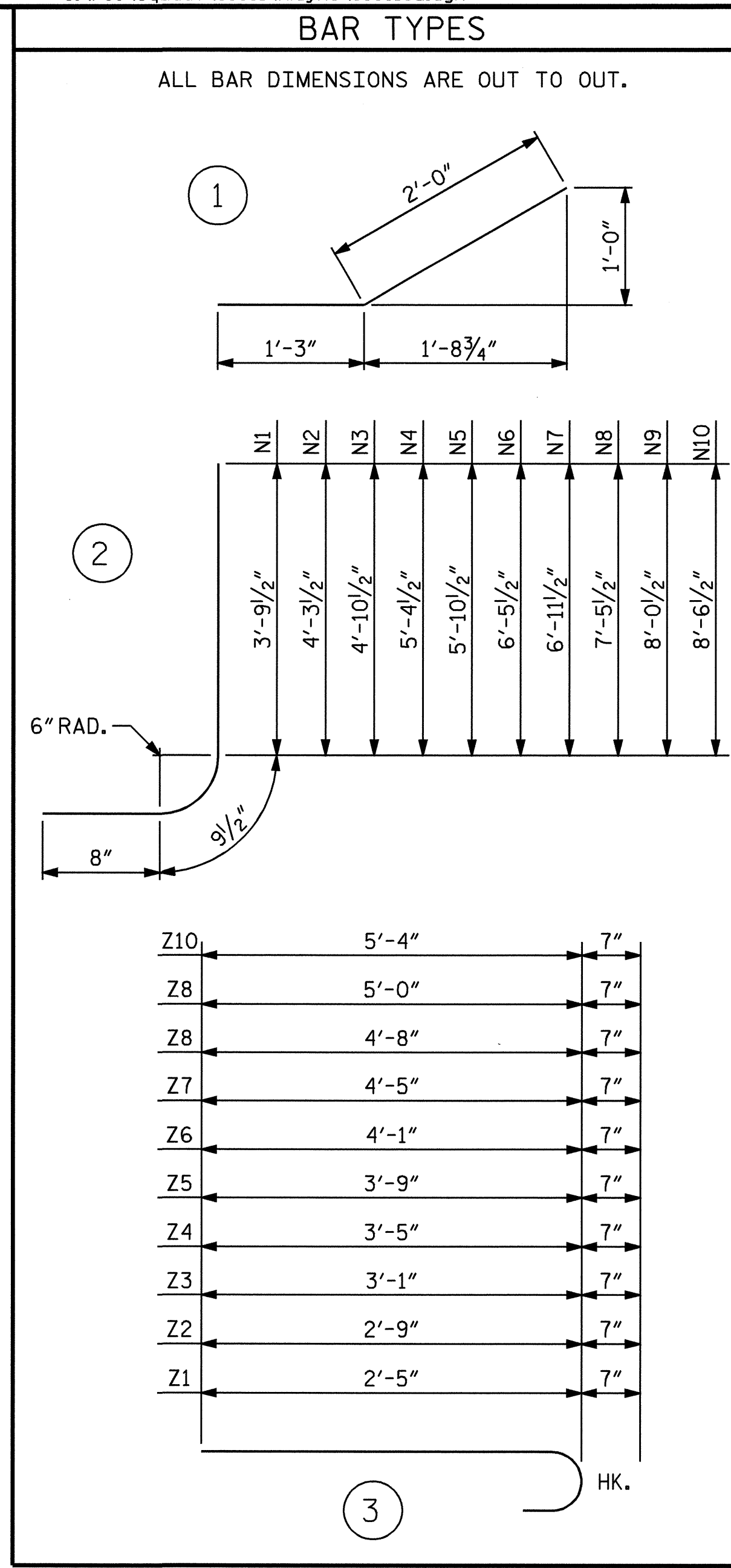
PLAN



ELEVATION



TYPICAL WING SECTION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	17'-3"	138
H2	4	#4	STR	11'-9"	31
H3	4	#4	STR	6'-1"	16
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	17'-10"	48
N1	4	#5	2	5'-3"	22
N2	4	#5	2	5'-9"	24
N3	4	#5	2	6'-4"	26
N4	4	#5	2	6'-10"	29
N5	4	#5	2	7'-4"	31
N6	4	#5	2	7'-11"	33
N7	4	#5	2	8'-5"	35
N8	4	#5	2	8'-11"	37
N9	4	#5	2	9'-6"	40
N10	4	#5	2	10'-0"	42
S1	6	#6	STR	6'-0"	54
T1	6	#5	STR	19'-4"	121
V1	4	#4	STR	3'-2"	8
V2	4	#4	STR	3'-9"	10
V3	4	#4	STR	4'-3"	11
V4	4	#4	STR	4'-9"	13
V5	4	#4	STR	5'-4"	14
V6	4	#4	STR	5'-10"	16
V7	4	#4	STR	6'-4"	17
V8	4	#4	STR	6'-10"	18
V9	4	#4	STR	7'-5"	20
V10	4	#4	STR	7'-11"	21
Z1	4	#5	3	3'-0"	13
Z2	4	#5	3	3'-4"	14
Z3	4	#5	3	3'-8"	15
Z4	4	#5	3	4'-0"	17
Z5	4	#5	3	4'-4"	18
Z6	4	#5	3	4'-8"	19
Z7	4	#5	3	5'-0"	21
Z8	4	#5	3	5'-3"	22
Z9	4	#5	3	5'-7"	23
Z10	2	#5	3	5'-11"	12
REINFORCING STEEL FOR 2 WINGS					1101 LBS
CLASS A CONCRETE					
2 WINGS					15.7 CY
1 HEADWALLS					0.3 CY
1 END CURTAIN WALLS					0.4 CY
TOTAL					16.4 CY

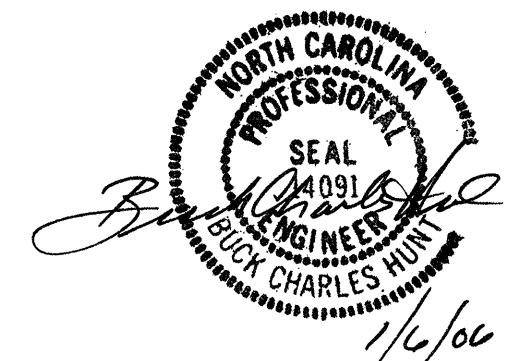
DRAWN BY: B. C. HUNT DATE: 12/21/05
 CHECKED BY: KEITH D. LAYNE DATE: 01-04-06

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 COLUMBUS COUNTY
 STATION: 32+29.90 -L-Rev.

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS FOR
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 3:1
 90° SKEW

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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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