

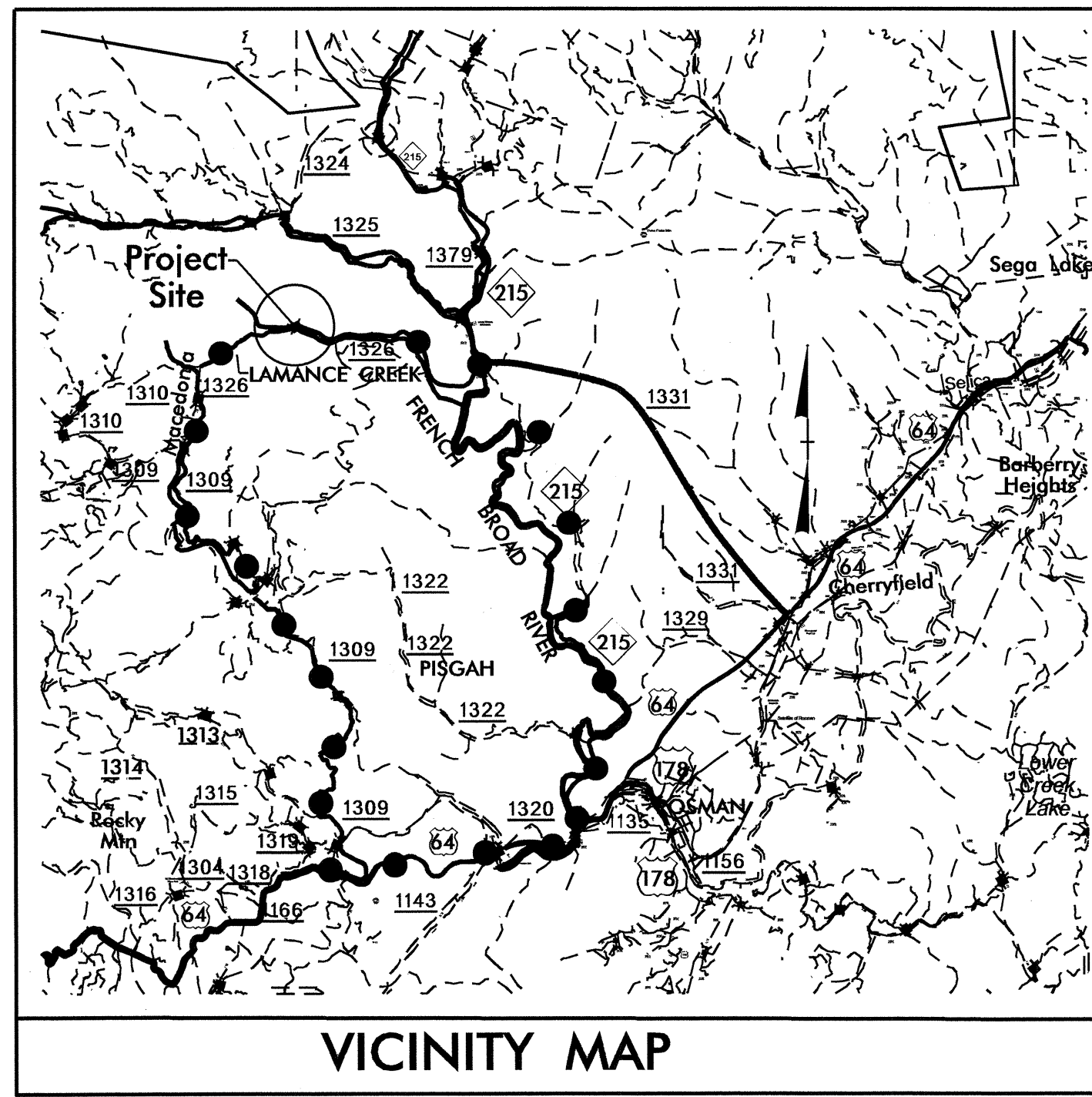
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TIP PROJECT: B-4989

CONTRACT: C202785

CULVERT



VICINITY MAP
DETOUR ROUTE ●●●●

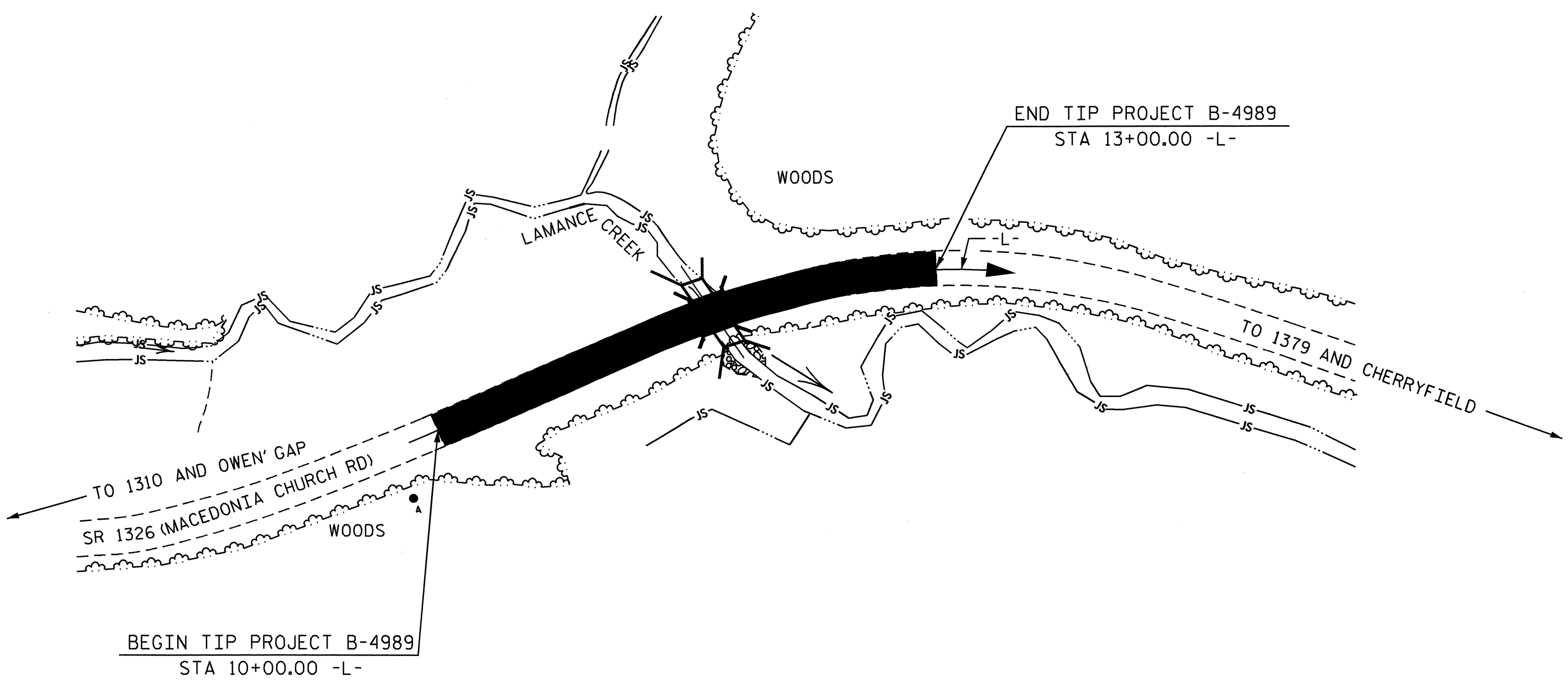
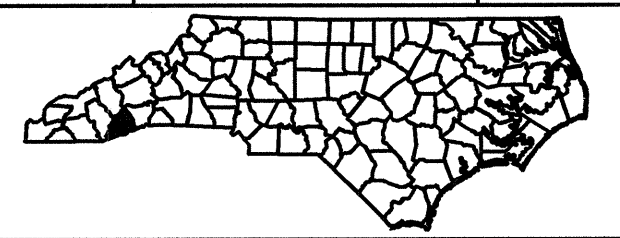
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

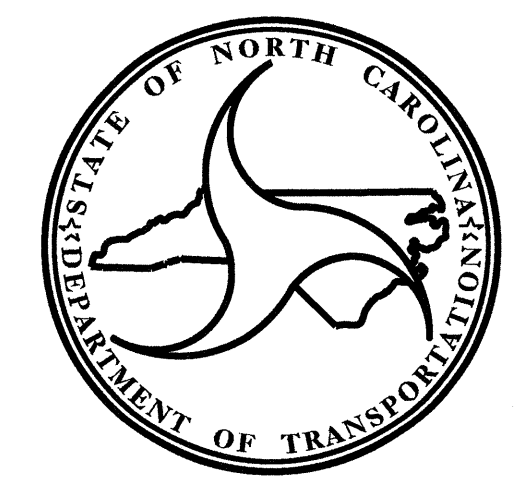
LOCATION: BRIDGE No. 148 ON SR 1326 (MACEDONIA CHURCH RD) OVER LAMANCE CREEK

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4989		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
40461.1.1	BRZ-1326(3)	PE	
40461.2.1	BRZ-1326(3)	R / W	
40461.3.1	BRZ-1326(3)	CONSTRUCTION	



CULVERT



DESIGN DATA

ADT 2010 = 475
ADT 2030 = 1100
DHV = 60 %
D = 12 %
* T = 6 %
** V = 40 MPH
* TTST 1% DUAL 4%

FUNCTIONAL CLASSIFICATION
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4989 = 0.057 MILES
TOTAL LENGTH TIP PROJECT B-4989 = 0.057 MILES

PLANS PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
MARCH 20, 2012

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

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

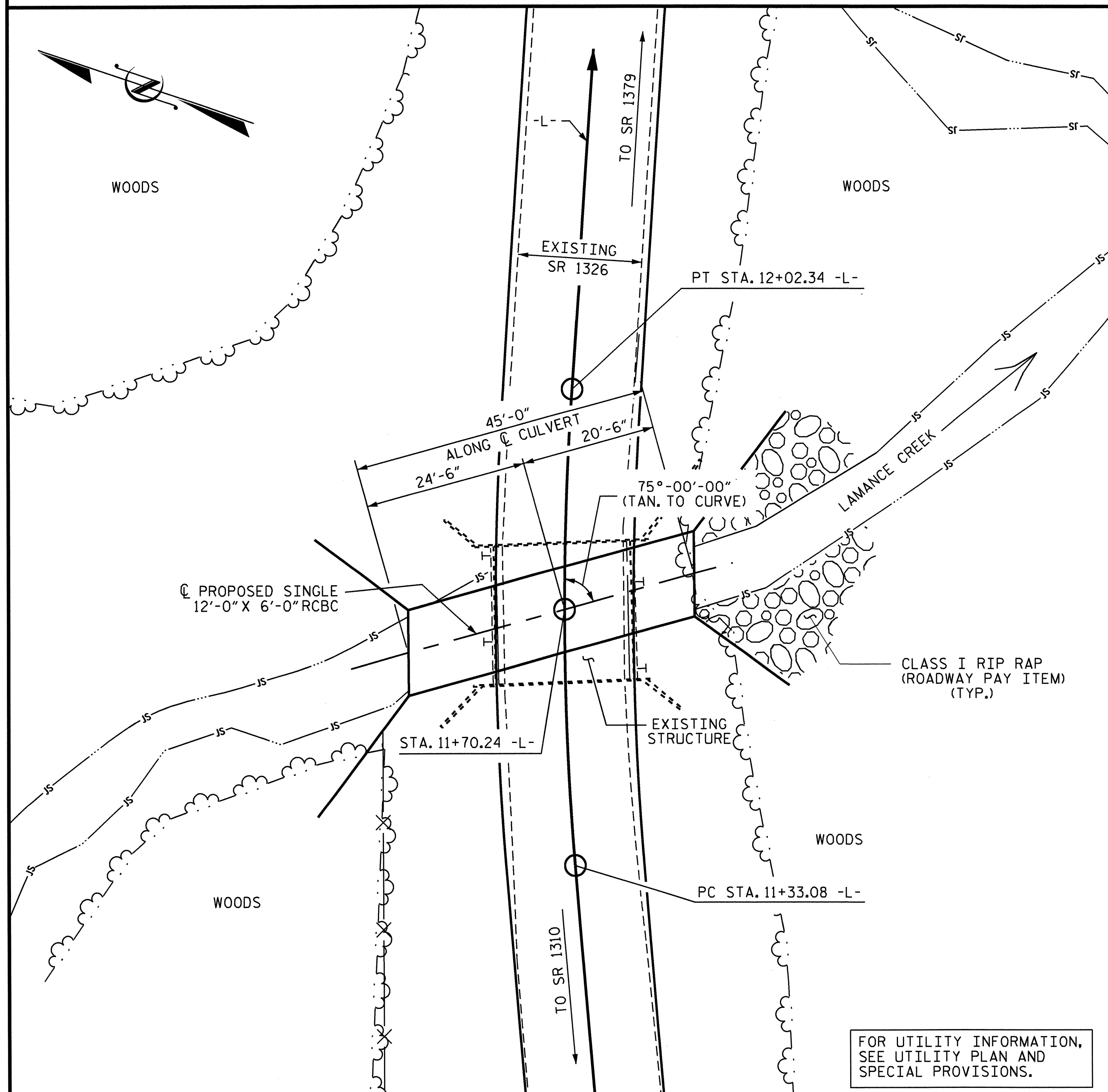
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DRIVE
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR

P.E.
DATE



LOCATION SKETCH

ROADWAY DATA	
GRADE POINT ELEV. @ STATION 11+70.24 -L-	2759.72
BED ELEV. @ STATION 11+70.24 -L-	2750.70
ROADWAY SLOPES	4:1

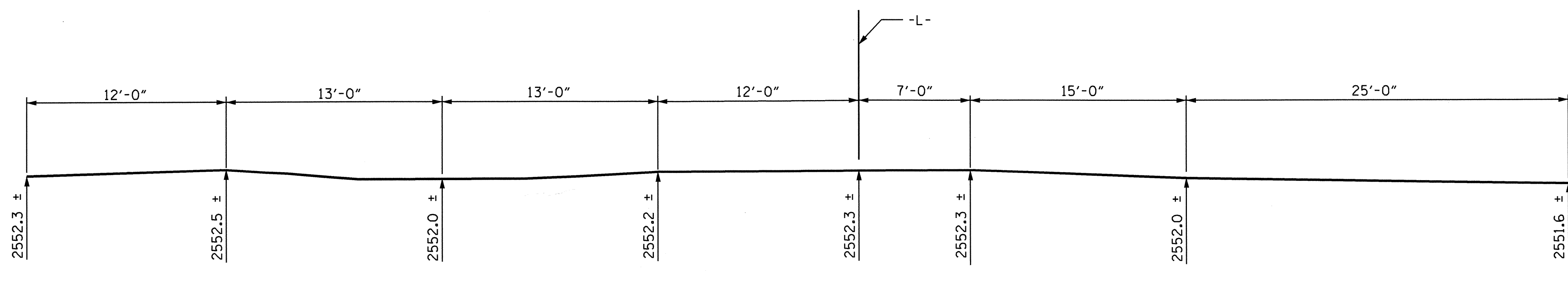
HYDRAULIC DATA	
DESIGN DISCHARGE	370 C.F.S.
FREQUENCY OF DESIGN FLOOD	25 YRS
DESIGN HIGH WATER ELEVATION	2756.7
DRAINAGE AREA	0.67 SQ. MI
BASE DISCHARGE (Q100)	600 C.F.S.
BASE HIGH WATER ELEVATION	2758.7

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	695 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	100+ YR.
OVERTOPPING FLOOD ELEVATION	2759.4

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE	
BARREL @ 1.165 CY/FT	52.4 C.Y.
WINGS, ETC.	31.0 C.Y.
SILLS	1.1 C.Y.
TOTAL	84.5 C.Y.
REINFORCING STEEL	
BARREL, HEADWALLS & SILLS	10,110 LBS.
WINGS, ETC.	2,062 LBS.
TOTAL	12,172 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L.	55 TONS
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

NOTES

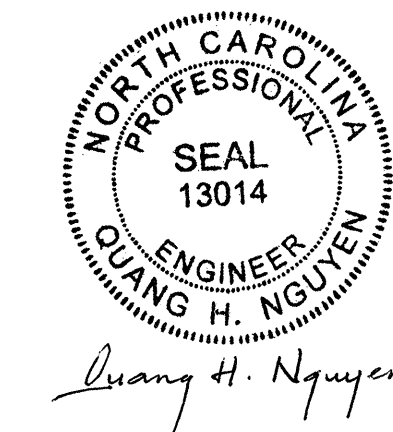
- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL----- 3.6 FT.
- FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS AND FLOOR 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.
- 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.
- 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.
- THE EXISTING 2 SPAN STRUCTURE (2 @ 10'-3" WITH A SUPERSTRUCTURE CONSISTING OF A TIMBER FLOOR ON 10 LINES OF TIMBER JOISTS WITH A 5/2" ASPHALT WEARING SURFACE, AND A SUBSTRUCTURE CONSISTING TIMBER POST AND SILLS END BENTS AND CRUTCH BENT, AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED.
- 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 THE ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACES OF THE EXTERIOR 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.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



PROFILE ALONG CULVERT

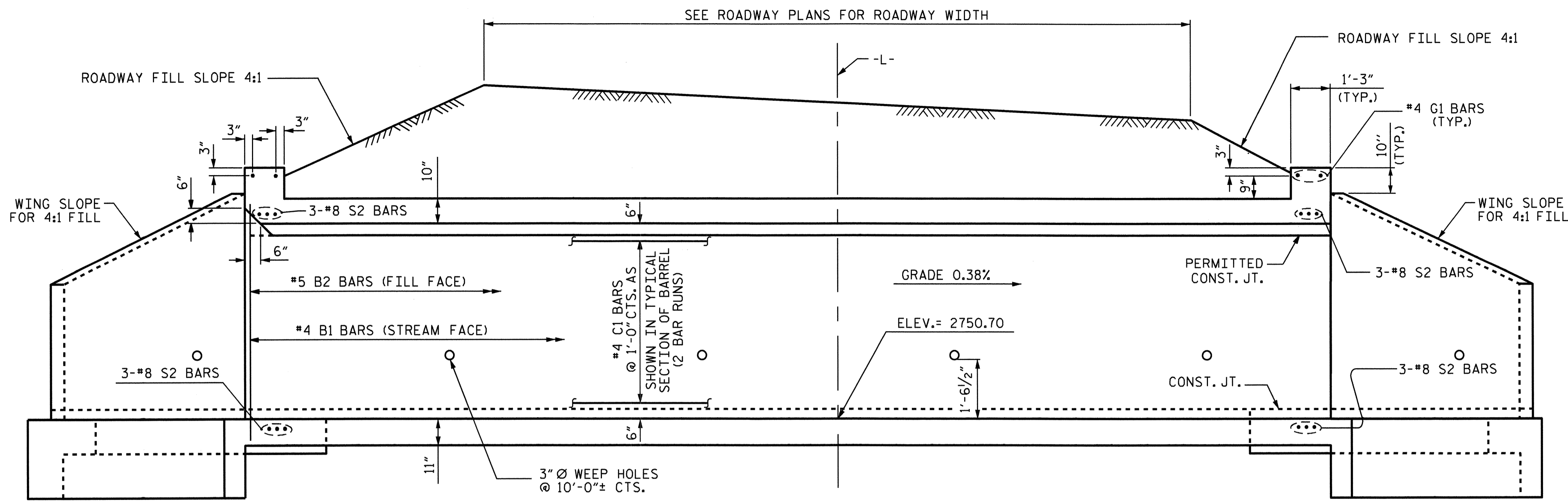
DRAWN BY : A.L.FIGUEROA/JRM DATE : 09-12-11
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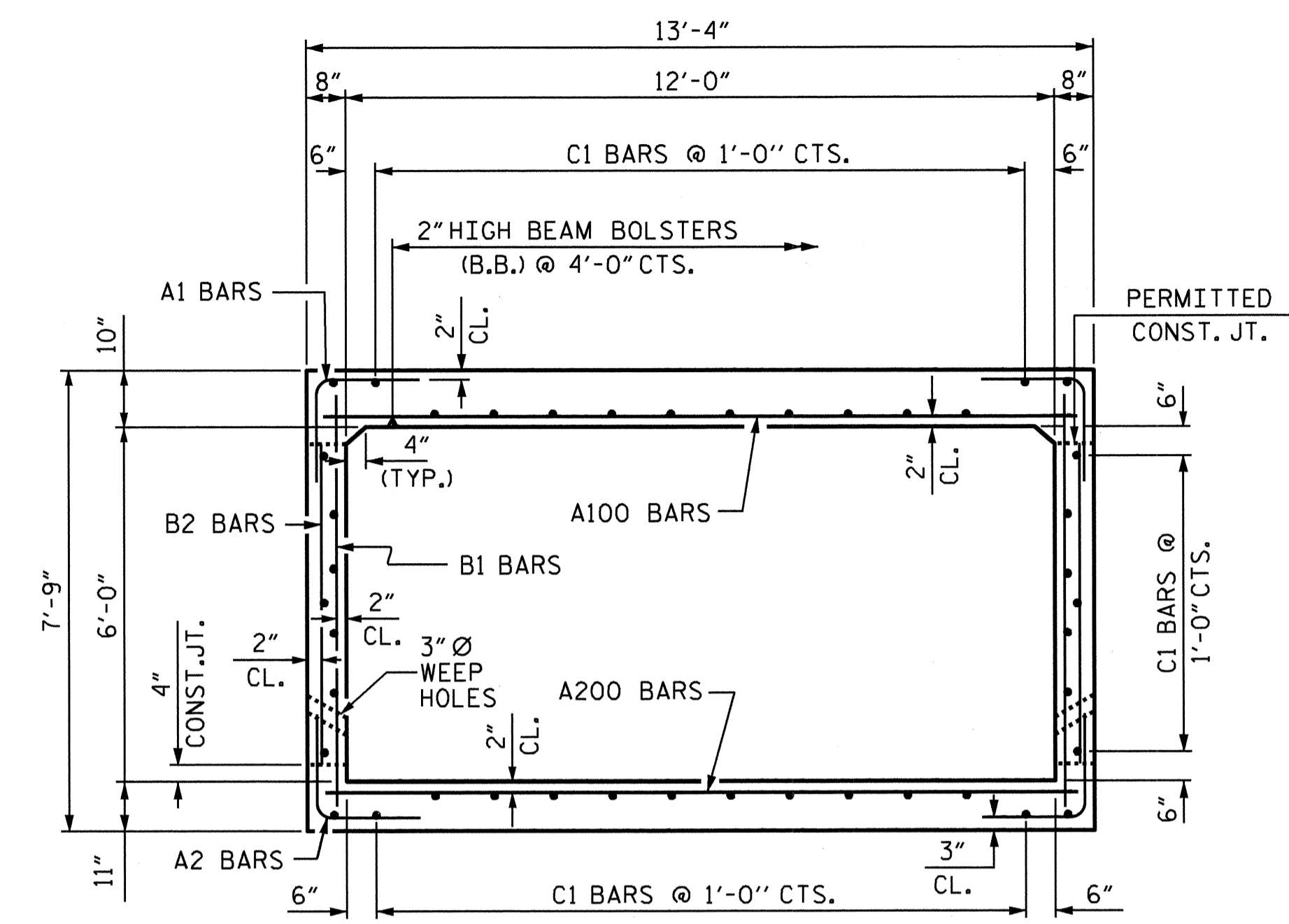


PROJECT NO. B-4989
TRANSYLVANIA COUNTY
 STATION: 11+70.24 -L-
 SHEET 1 OF 6 REPLACES BRIDGE #148

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SINGLE 12 FT. X 6 FT. CONCRETE BOX CULVERT					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					C-1
					TOTAL SHEETS 6

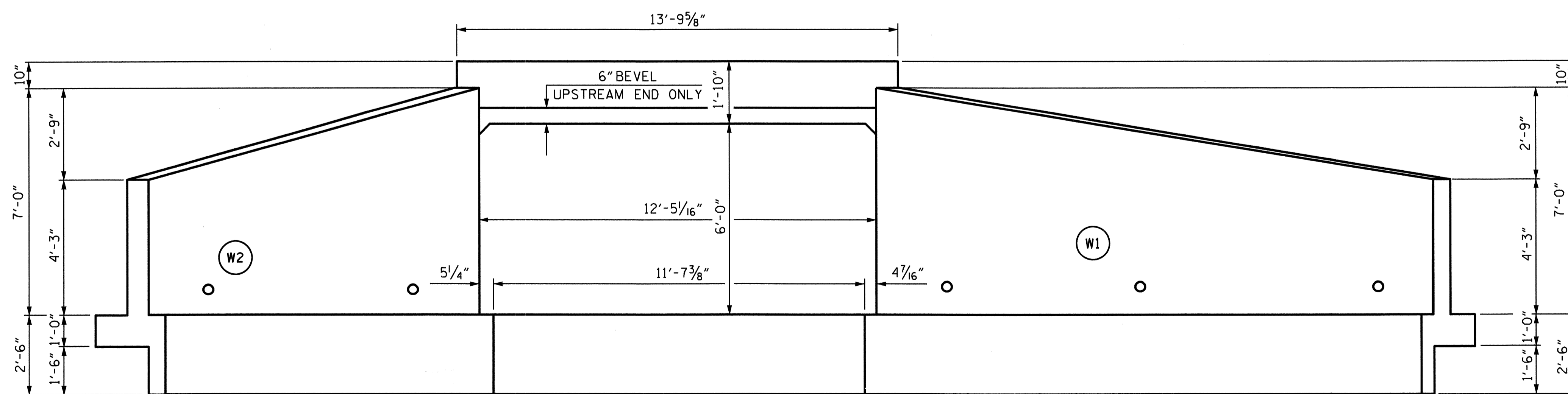


CULVERT SECTION NORMAL TO ROADWAY



RIGHT ANGLE SECTION OF BARREL

THERE ARE 42 "C" BARS IN SECTION OF BARREL



END ELEVATION NORMAL TO SKEW

PROJECT NO. B-4989
TRANSYLVANIA COUNTY
 STATION: 11+70.24 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 75° SKEW

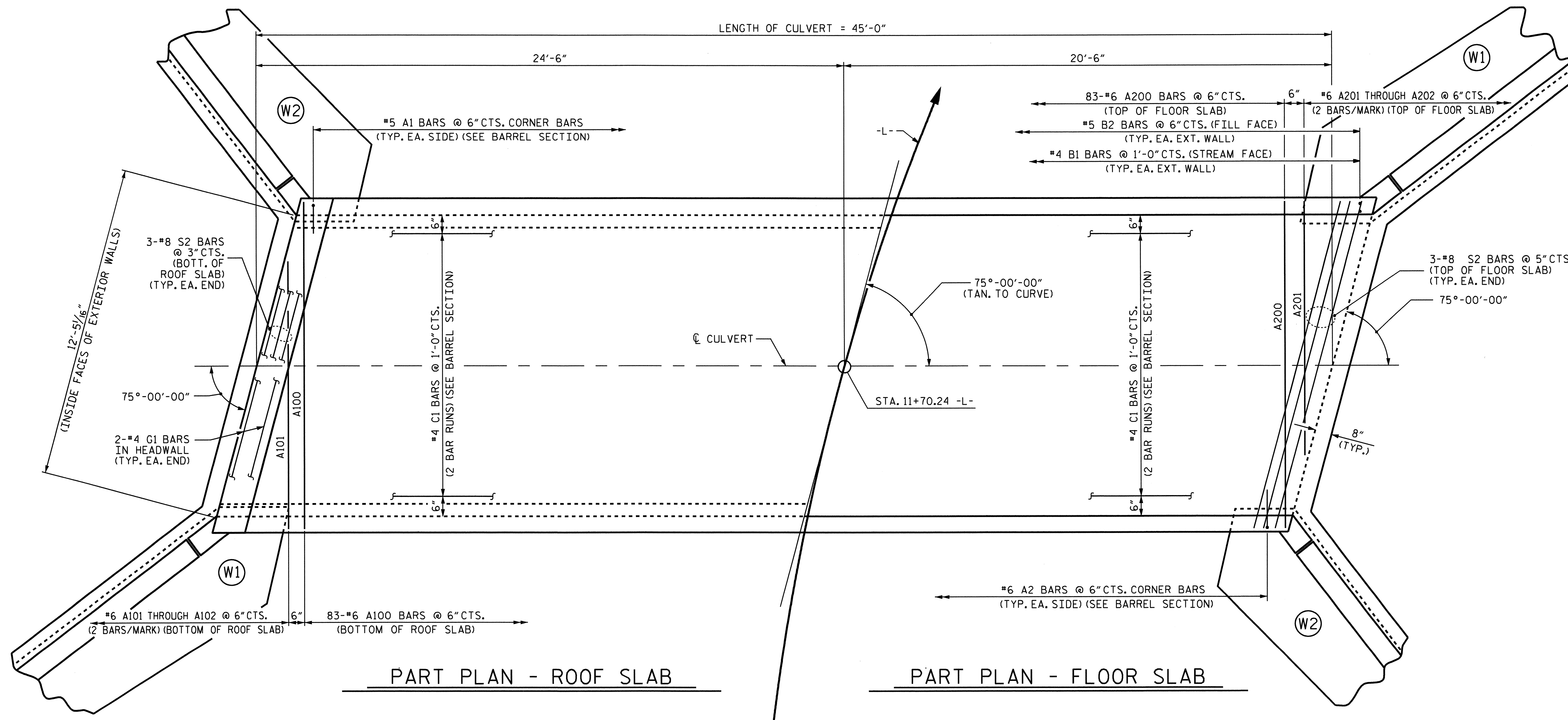


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1			3			TOTAL SHEETS
2			4			6

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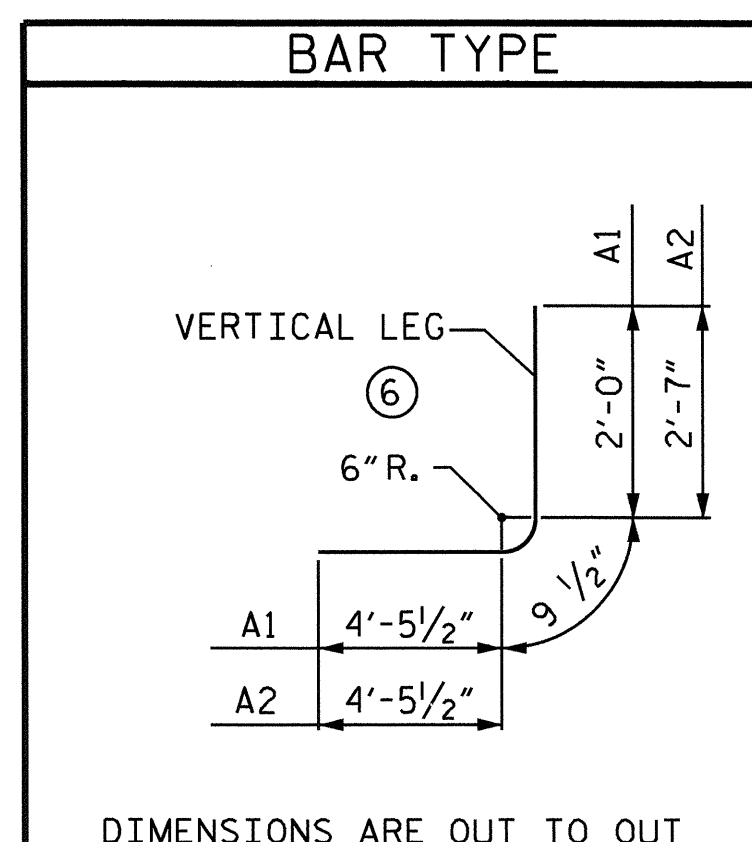


PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

BAR TYPE		BAR SCHEDULE				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
A1	#5	6	7'-3"	1361		
A2	#6	6	7'-10"	2118		
A100	83	#6 STR	12'-11"	1610		
A101	4	#6 STR	8'-9"	53		
A102	4	#6 STR	5'-0"	30		
A200	83	#6 STR	12'-11"	1610		
A201	4	#6 STR	8'-9"	53		
A202	4	#6 STR	5'-0"	30		
B1	90	#4 STR	7'-3"	436		
B2	180	#5 STR	5'-4"	1001		
C1	84	#4 STR	23'-5"	1314		
D1	6	#6 STR	1'-6"	14		
D2	9	#6 STR	1'-0"	14		
G1	4	#4 STR	13'-5"	36		
S2	12	#8 STR	13'-5"	430		
TOTAL REINFORCING STEEL					10,110	LBS.

SPLICE LENGTHS CHART		
BAR	SIZE	SPLICE LENGTHS
C1	4	1'-11"



DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4989
TRANSYLVANIA COUNTY
 STATION: 11+70.24 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 75° SKEW

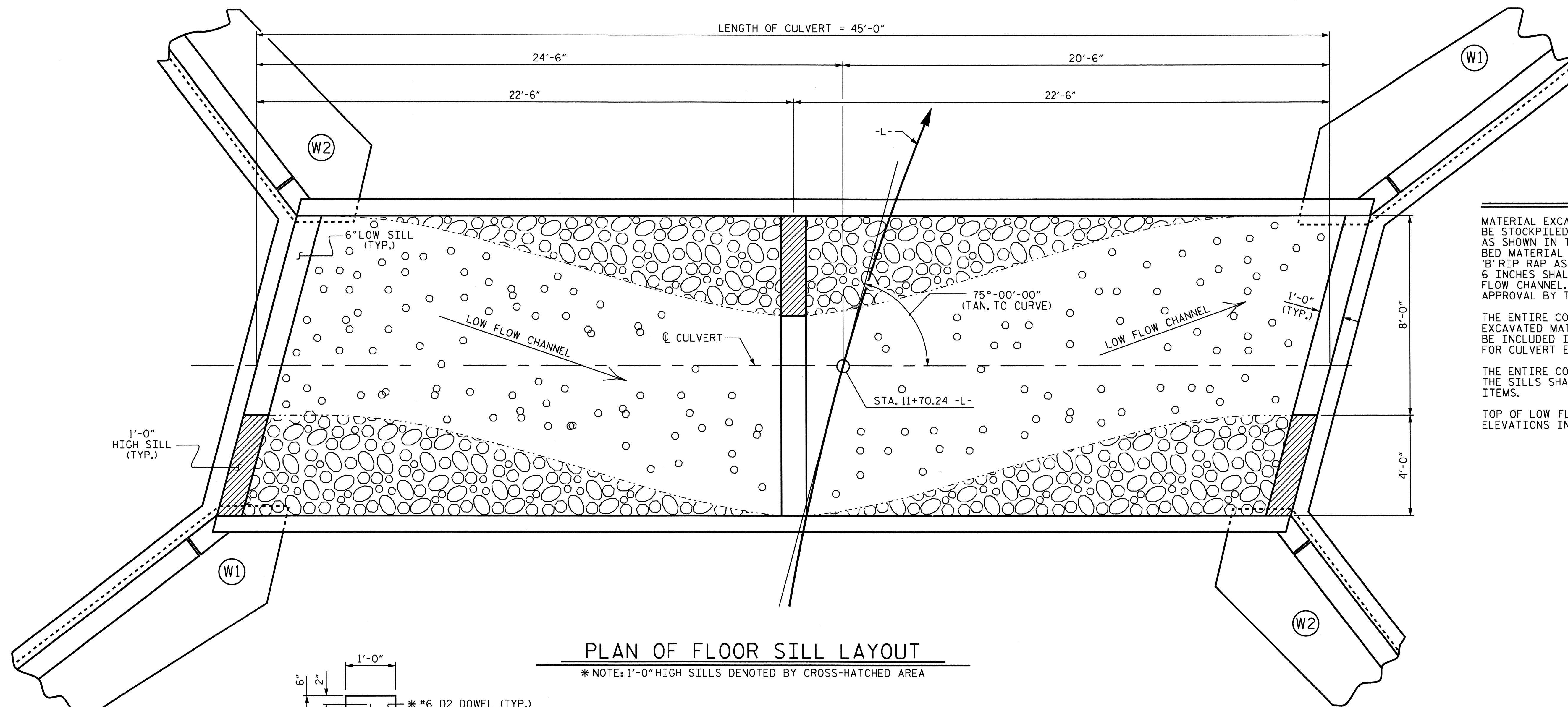


REVISIONS						TOTAL SHEETS	SHEET NO.
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1			3				
2			4				

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PLAN OF FLOOR SILL LAYOUT

* NOTE: 1'-0" HIGH SILLS DENOTED BY CROSS-HATCHED AREA

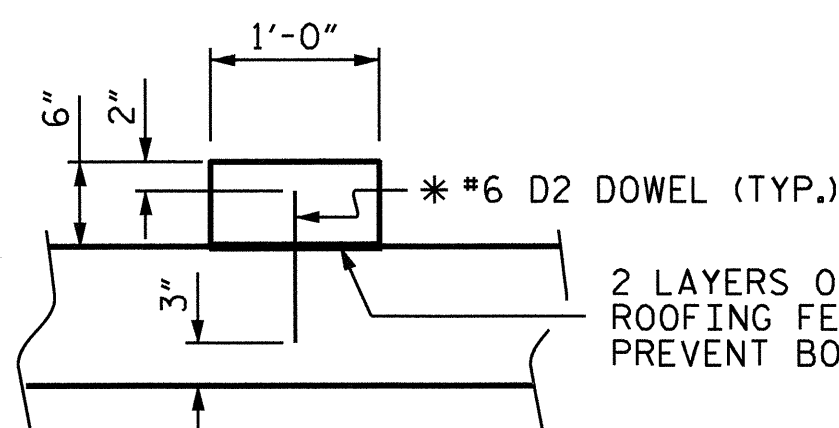
NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AS SHOWN IN THE FLOOR SILL LAYOUT. BED MATERIAL SHALL BE SUPPLEMENTED WITH CLASS 'B' RIP RAP AS NECESSARY. STONE LARGER THAN 6 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

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

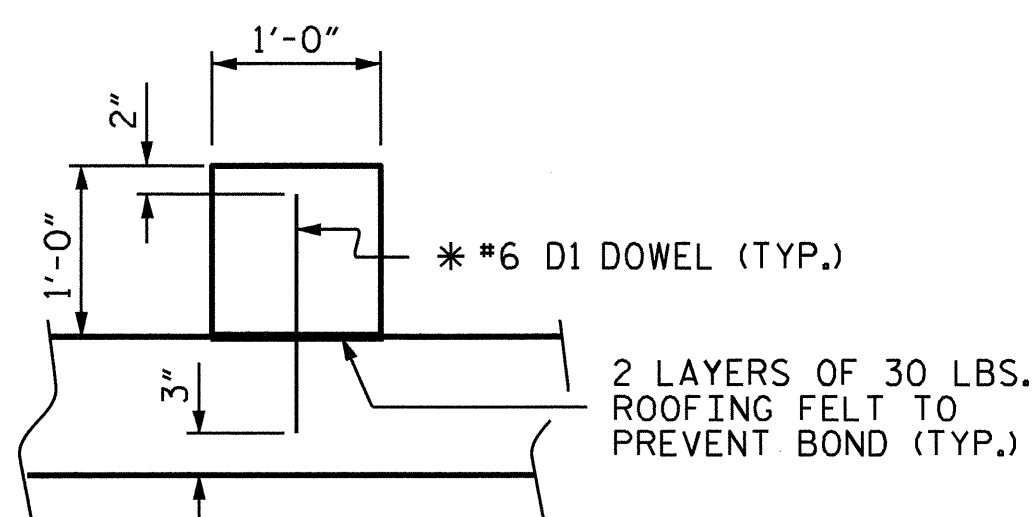
THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT THE SILLS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

TOP OF LOW FLOW SILL SHOULD MATCH STREAM BED ELEVATIONS IN LOW FLOW CHANNEL OF STREAM.



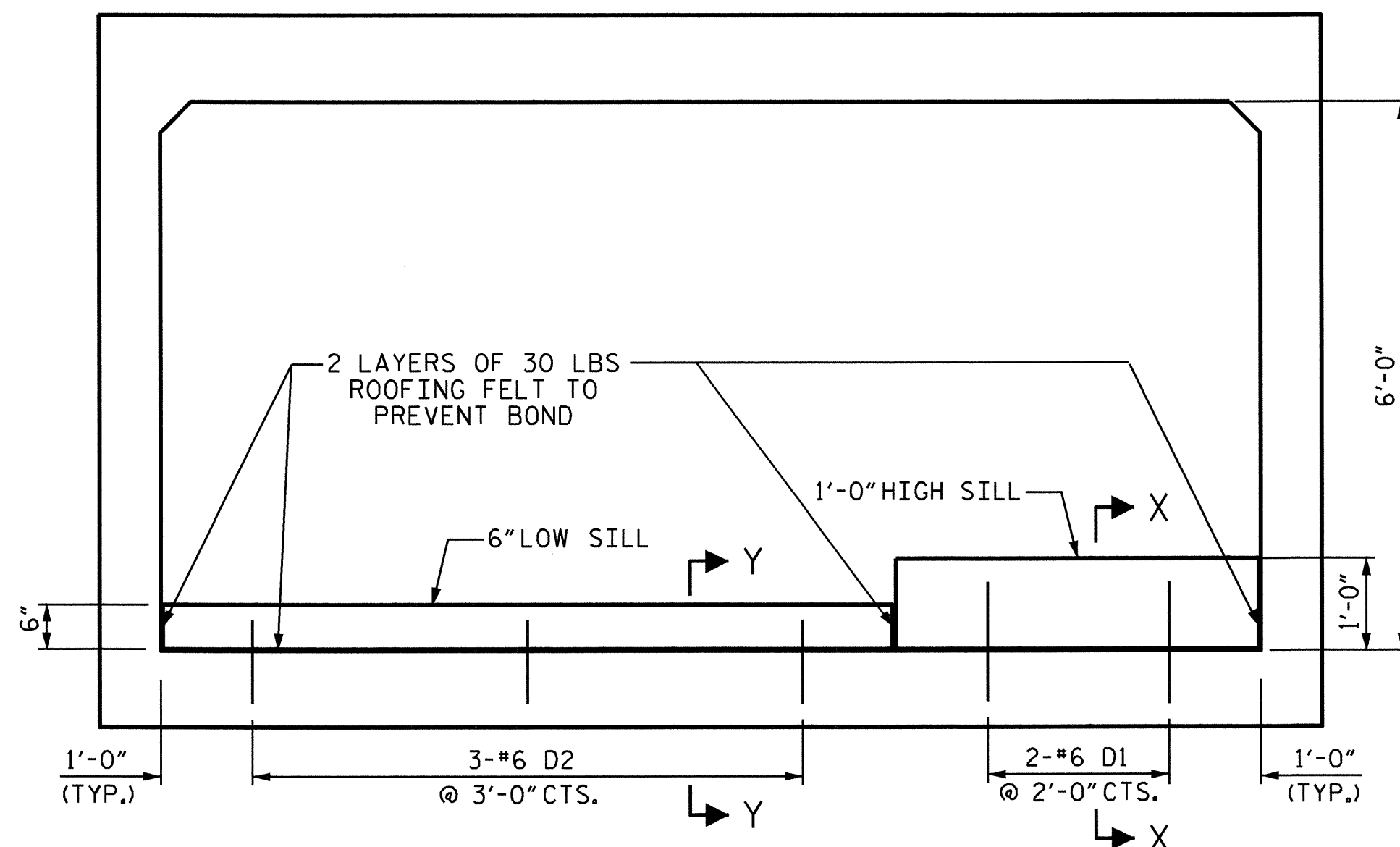
* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

SECTION Y-Y



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

SECTION X-X



SECTION THRU SILLS

PROJECT NO. B-4989

TRANSYLVANIA COUNTY

STATION: 11+70.24 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SINGLE 12 FT. X 6 FT.
CONCRETE BOX CULVERT
75° SKEW**

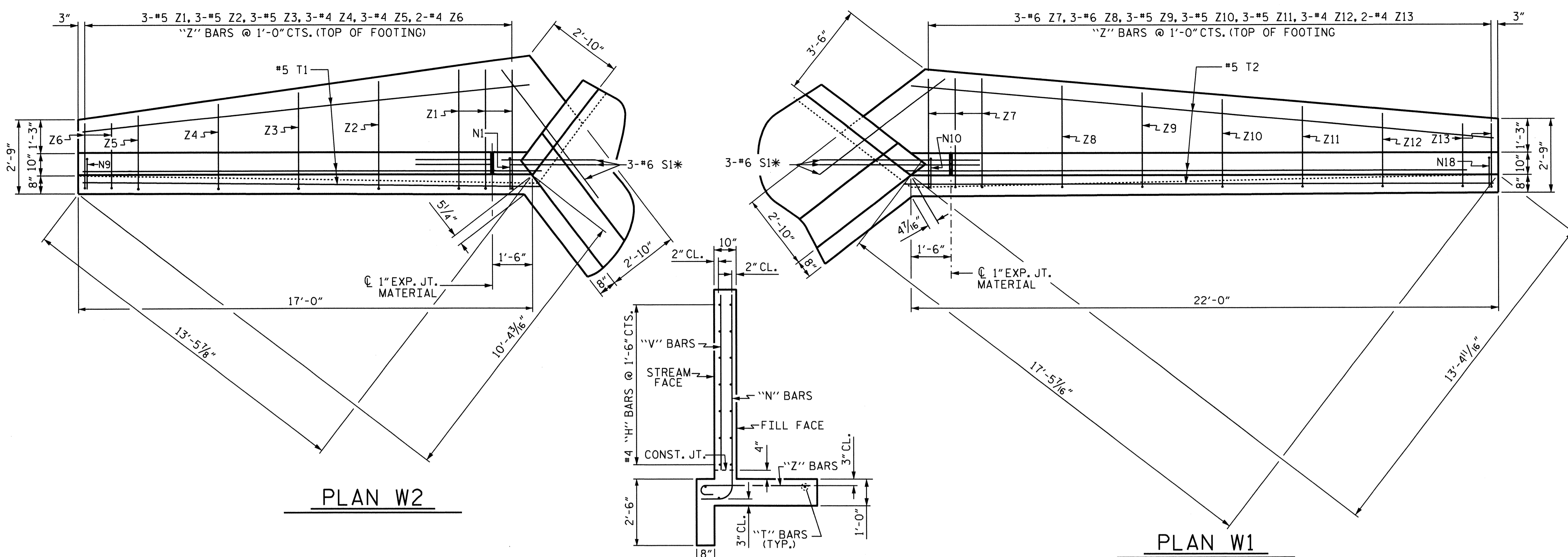
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			6



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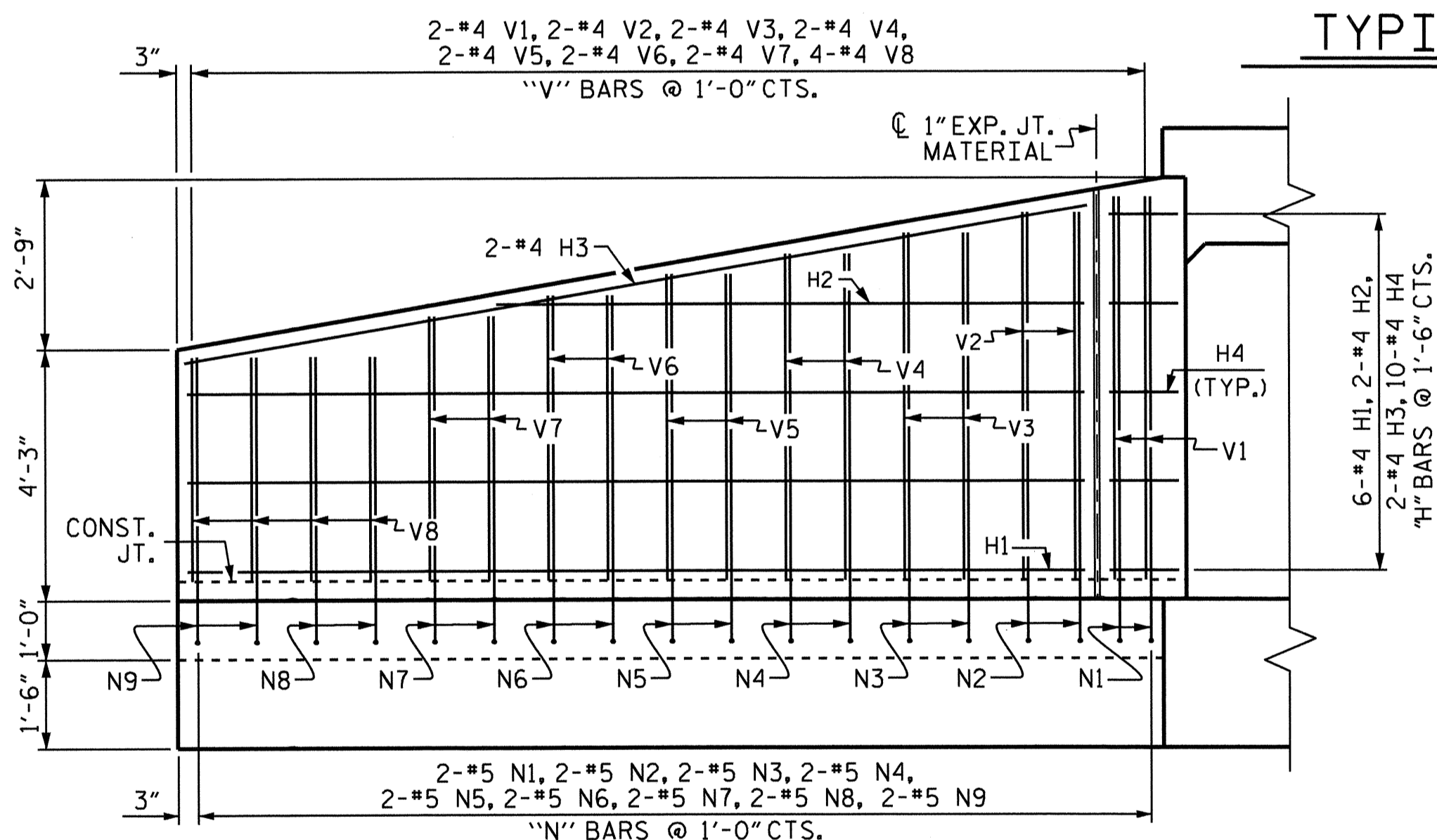
NC005



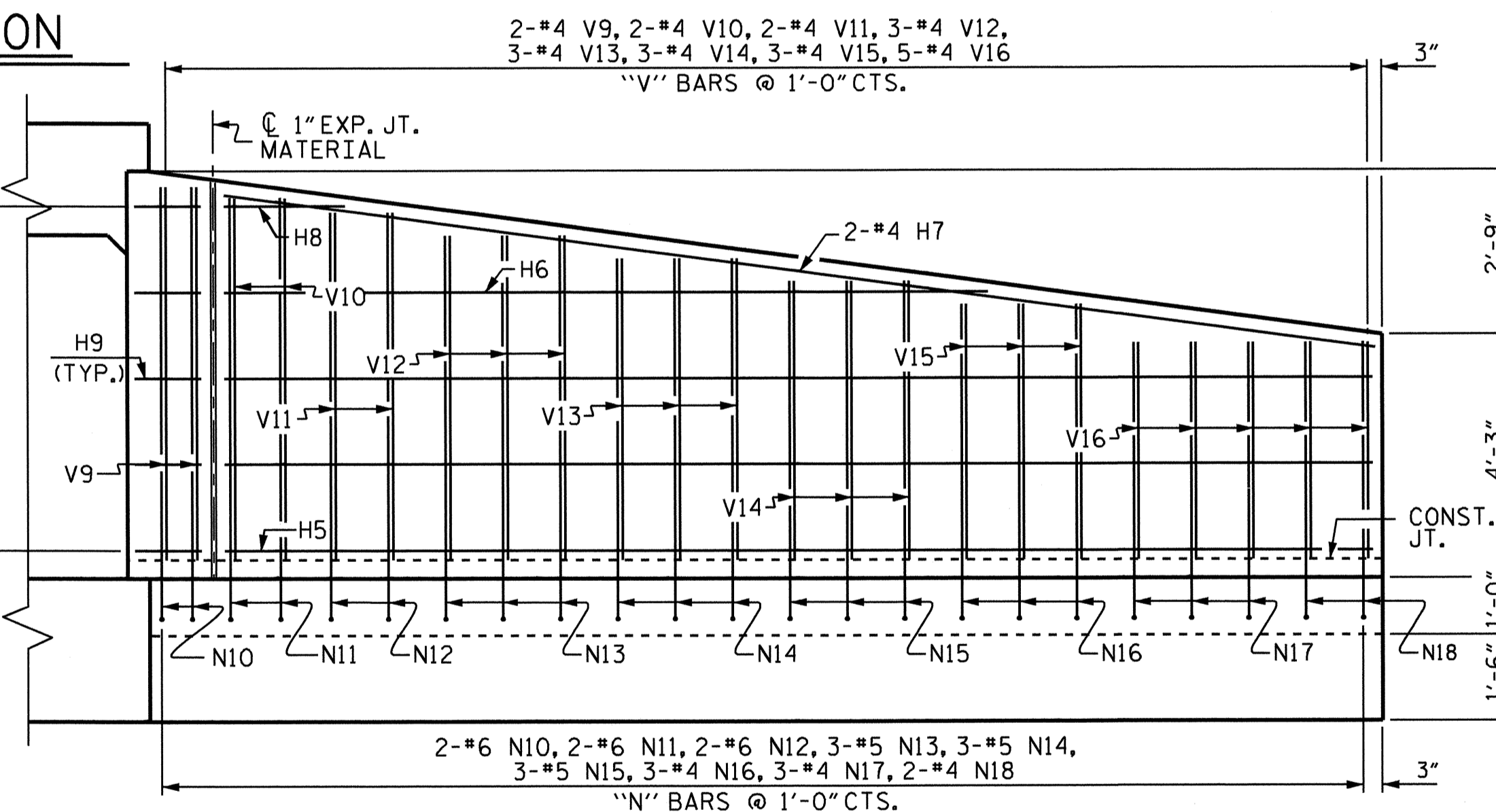
PLAN W2

PLAN W1

TYPICAL WING SECTION



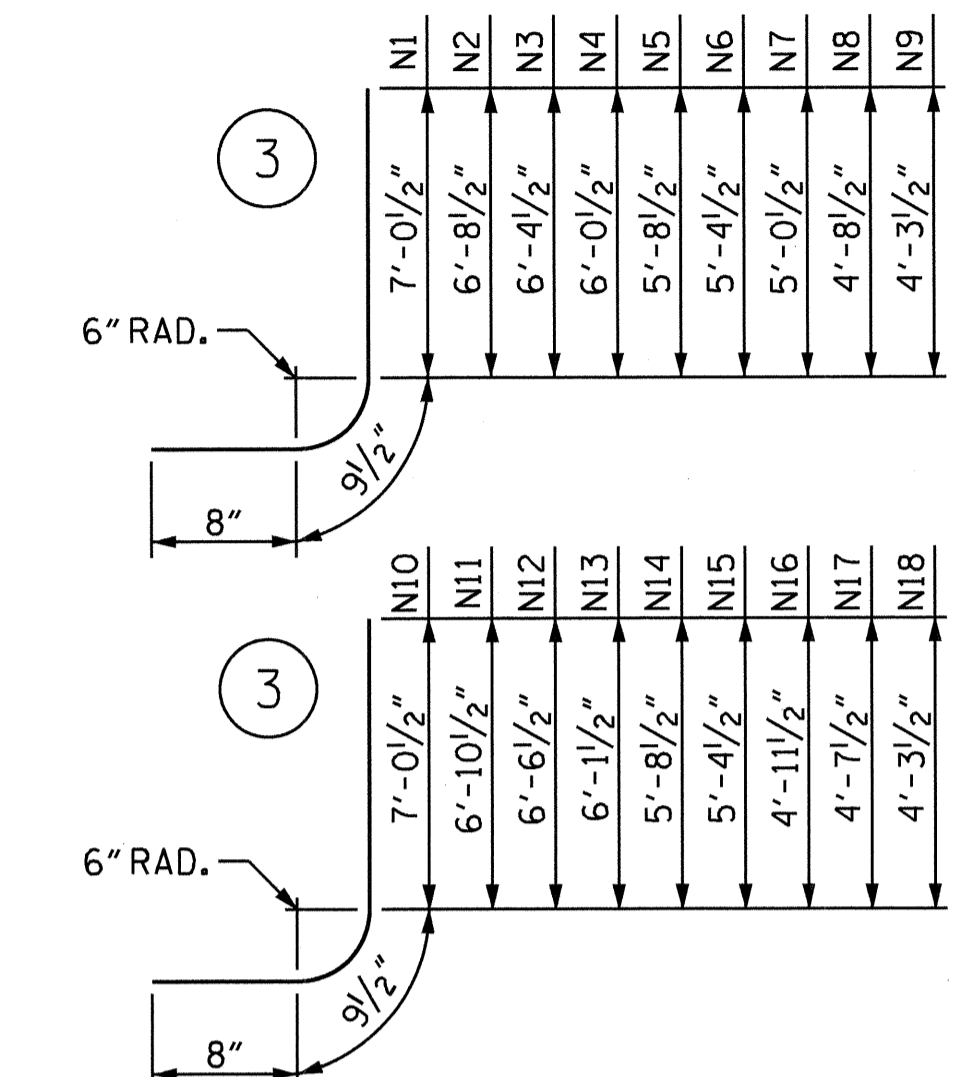
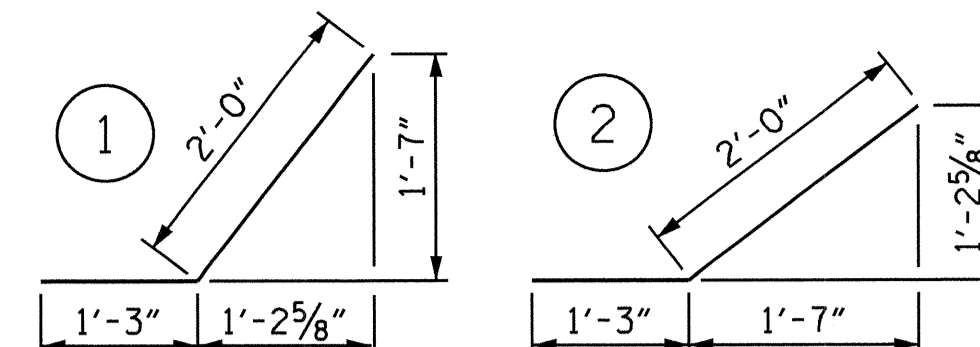
ELEVATION W2



ELEVATION W1

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

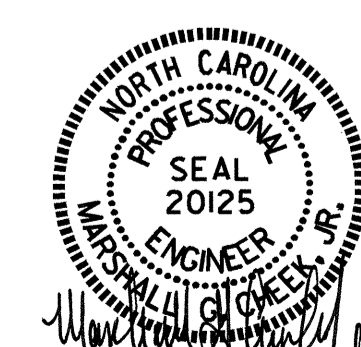


Z1	4'-6"	7"
Z2	4'-0"	7"
Z3	3'-7"	7"
Z4	3'-2"	6"
Z5	2'-8"	6"
Z6	2'-5"	6"
Z7	4'-1"	8"
Z8	3'-10"	8"
Z9	3'-7"	7"
Z10	3'-3"	7"
Z11	3'-0"	7"
Z12	2'-9"	6"
Z13	2'-4"	6"

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	15'-2"	122	N6	4	#5	3	6'-10"	29	T1	6	#5	STR	16'-10"	105	V13	6	#4	STR	5'-0"	20	
H2	4	#4	STR	9'-6"	25	N7	4	#5	3	6'-6"	27	T2	6	#5	STR	21'-11"	137	V14	6	#4	STR	4'-7"	18	
H3	4	#4	STR	15'-4"	41	N8	4	#5	3	6'-2"	26							V15	6	#4	STR	4'-3"	17	
H4	20	#4	1	3'-3"	43	N9	4	#5	3	5'-9"	24	V1	4	#4	STR	6'-2"	16	V16	10	#4	STR	3'-8"	24	
H5	12	#4	STR	20'-0"	160	N10	4	#6	3	8'-6"	51	V2	4	#4	STR	5'-10"	16							
H6	4	#4	STR	13'-0"	35	N11	4	#6	3	8'-4"	50	V3	4	#4	STR	5'-6"	15	Z1	6	#5	4	5'-1"	32	
H7	4	#4	STR	20'-2"	55	N12	4	#6	3	8'-0"	48	V4	4	#4	STR	5'-2"	14	Z2	6	#5	4	4'-7"	29	
H8	4	#4	STR	2'-1"	6	N13	6	#5	3	7'-7"	47	V5	4	#4	STR	4'-11"	13	Z3	6	#5	4	4'-2"	26	
H9	20	#4	2	3'-3"	43	N14	6	#5	3	7'-2"	45	V6	4	#4	STR	4'-7"	12	Z4	6	#4	4	3'-8"	15	
						N15	6	#5	3	6'-10"	43	V7	4	#4	STR	4'-3"	11	Z5	6	#4	4	3'-2"	13	
N1	4	#5	3	8'-6"	35	N16	6	#4	3	6'-5"	26	V8	8	#4	STR	3'-8"	20	Z6	4	#4	4	2'-11"	8	
N2	4	#5	3	8'-2"	34	N17	6	#4	3	6'-1"	24	V9	4	#4	STR	6'-2"	16	Z7	6	#6	4	4'-9"	43	
N3	4	#5	3	7'-10"	33	N18	4	#4	3	5'-9"	15	V10	4	#4	STR	5'-11"	16	Z8	6	#6	4	4'-6"	41	
N4	4	#5	3	7'-6"	31							V11	4	#4	STR	5'-8"	15	Z9	6	#5	4	4'-2"	26	
N5	4	#5	3	7'-2"	30	S1	12	#6	STR	6'-0"	108	V12	6	#4	STR	5'-4"	21	Z10	6	#5	4	3'-10"	24	

REINFORCING STEEL FOR 4 WINGS 2,062 LBS.
 CLASS A CONCRETE
 4 WINGS 28.3 C.Y.
 2 HEADWALLS 1.3 C.Y.
 2 END CURTAIN WALLS 1.4 C.Y.
 TOTAL 31.0 C.Y.



PROJECT NO. B-4989
 TRANSYLVANIA COUNTY
 STATION: 11+70.24 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 WINGS FOR CONCRETE BOX CULVERT
 12'-0" X 6'-0" SLOPE =4:1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS 6
2			4			

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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		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (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)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.00	--	1.75	1.00	1	Top Slab	6.33	1.20	1	Top Slab	0.93		
	HL-93 (OPERATING)	N/A		1.30	--	1.35	1.30	1	Top Slab	6.33	1.55	1	Top Slab	0.93		
	HS-20 (INVENTORY)	36.000	②	1.22	44.06	1.75	1.22	1	Top Slab	6.33	1.49	1	Top Slab	0.93		
	HS-20 (OPERATING)	36.000		1.59	57.11	1.35	1.59	1	Top Slab	6.33	1.93	1	Top Slab	0.93		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.23	30.04	1.40	2.23	1	Top Slab	6.33	2.71	1	Top Slab	0.93		
		SNGARBS2	20.000		2.08	41.68	1.40	2.08	1	Top Slab	6.33	2.54	1	Top Slab	0.93	
		SNAGRIS2	22.000		2.23	48.95	1.40	2.23	1	Top Slab	6.33	2.71	1	Top Slab	0.93	
		SNCOTTS3	27.250		1.25	34.06	1.40	1.25	1	Top Slab	6.33	1.50	1	Top Slab	0.93	
		SNAGGRS4	34.925	③	1.48	51.84	1.40	1.48	1	Top Slab	6.33	1.81	1	Top Slab	11.73	
		SNS5A	35.550		1.40	49.75	1.40	1.40	1	Top Slab	6.33	1.71	1	Top Slab	0.93	
		SNS6A	39.950		1.40	55.85	1.40	1.40	1	Top Slab	6.33	1.71	1	Top Slab	0.93	
		SNS7B	42.000		1.40	58.71	1.40	1.40	1	Top Slab	6.33	1.71	1	Top Slab	0.93	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.23	73.43	1.40	2.23	1	Top Slab	6.33	2.38	1	Bottom Slab	0.99	
		TNT4A	33.075		1.49	49.25	1.40	1.49	1	Top Slab	6.33	1.78	1	Top Slab	0.93	
		TNT6A	41.600		1.42	58.95	1.40	1.42	1	Top Slab	6.33	1.69	1	Top Slab	11.73	
		TNT7A	42.000		1.46	61.52	1.40	1.46	1	Top Slab	6.33	1.75	1	Top Slab	11.73	
		TNT7B	42.000		1.43	60.21	1.40	1.43	1	Top Slab	6.33	1.71	1	Top Slab	11.73	
		TNAGRIT4	43.000		1.42	61.06	1.40	1.42	1	Top Slab	6.33	1.70	1	Top Slab	0.93	
TNAGT5A	45.000		1.45	65.42	1.40	1.45	1	Top Slab	6.33	1.74	1	Top Slab	11.73			
TNAGT5B	45.000		1.49	67.01	1.40	1.49	1	Top Slab	6.33	1.78	1	Top Slab	0.93			

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
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

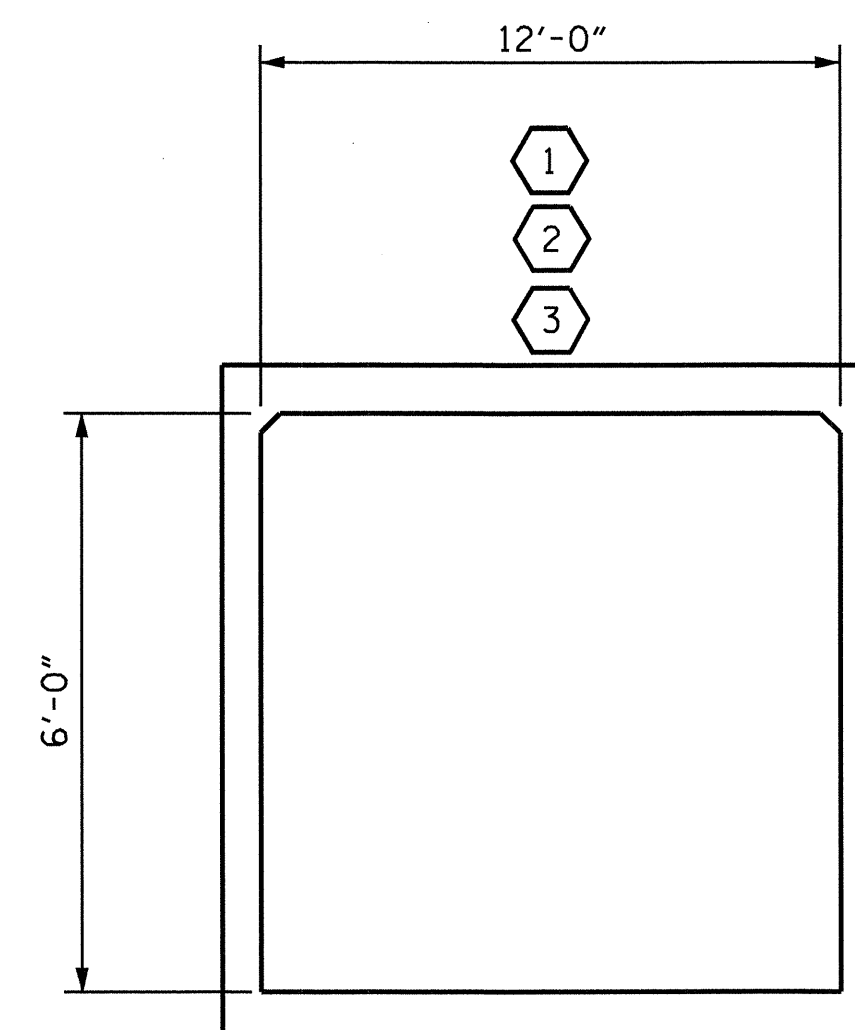
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

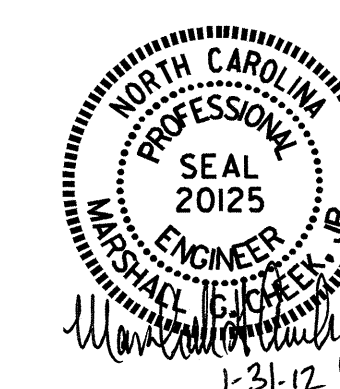
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



LRFR SUMMARY

PROJECT NO. B-4989
TRANSYLVANIA COUNTY
 STATION: 11+70.24 -L-

SHEET 6 OF 6



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

ASSEMBLED BY : J.R. MCROY DATE : 01-2012
 CHECKED BY : M.G. CHEEK DATE : 1-2012
 DRAWN BY : WMC 7/11
 CHECKED BY : GM 7/11

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

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. 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