

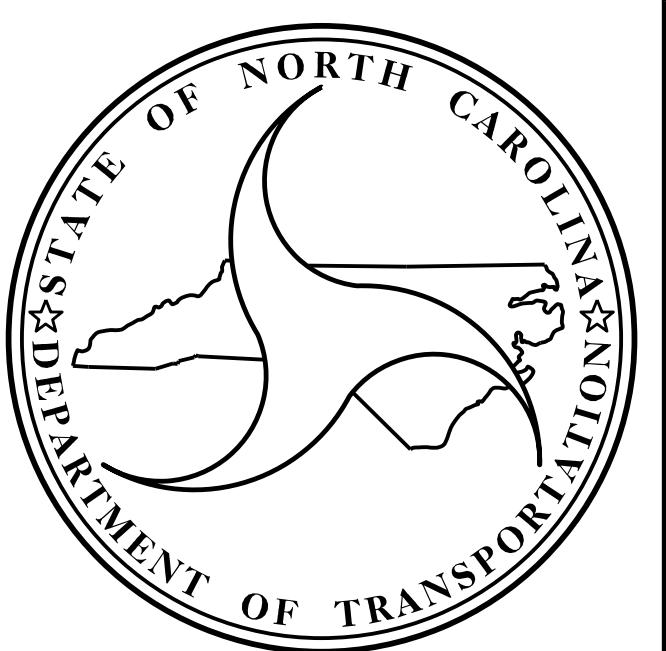
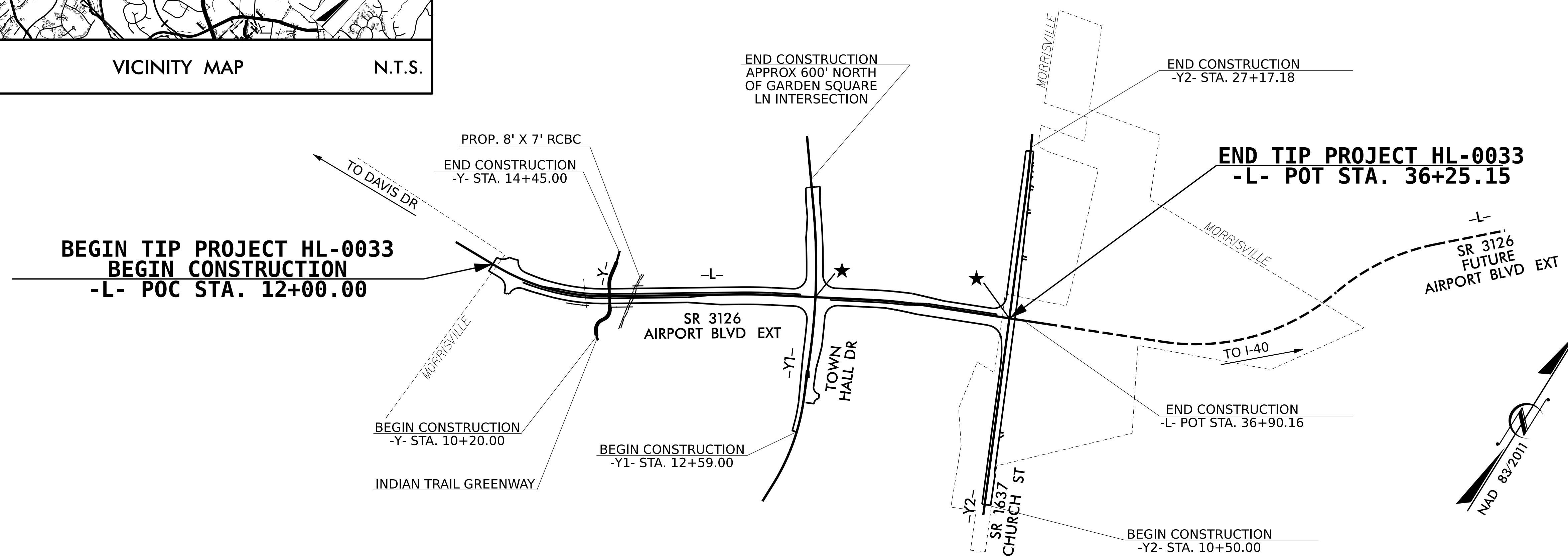
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.		HL-0033	1	
STATE PROJ. NO.		F. A. PROJ. NO.	DESCRIPTION	
36249.4033		N/A	PE	
49618.2.1		N/A	R/W	
49618.2.2		N/A	UTIL	
49618.3.1		3126001	CONST.	

**LOCATION: EXTENSION OF AIRPORT BOULEVARD (SR 3126)
FROM GARDEN SQUARE LANE TO CHURCH ST (SR 1637)
IN MORRISVILLE**

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



DESIGN DATA

ADT 2026	=	6,450
ADT 2046	=	17,600
K	=	11 %
D	=	60 %
T	=	4 % *
V	=	50 MPH
* (TTST 1 %, DUAL 3		

FUNC CLASS = MINOR ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HL-0033 = 0.459 MILE

TOTAL LENGTH TIP PROJECT HL-0033 = 0.459 MIL

Prepared in the Office of:

SION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

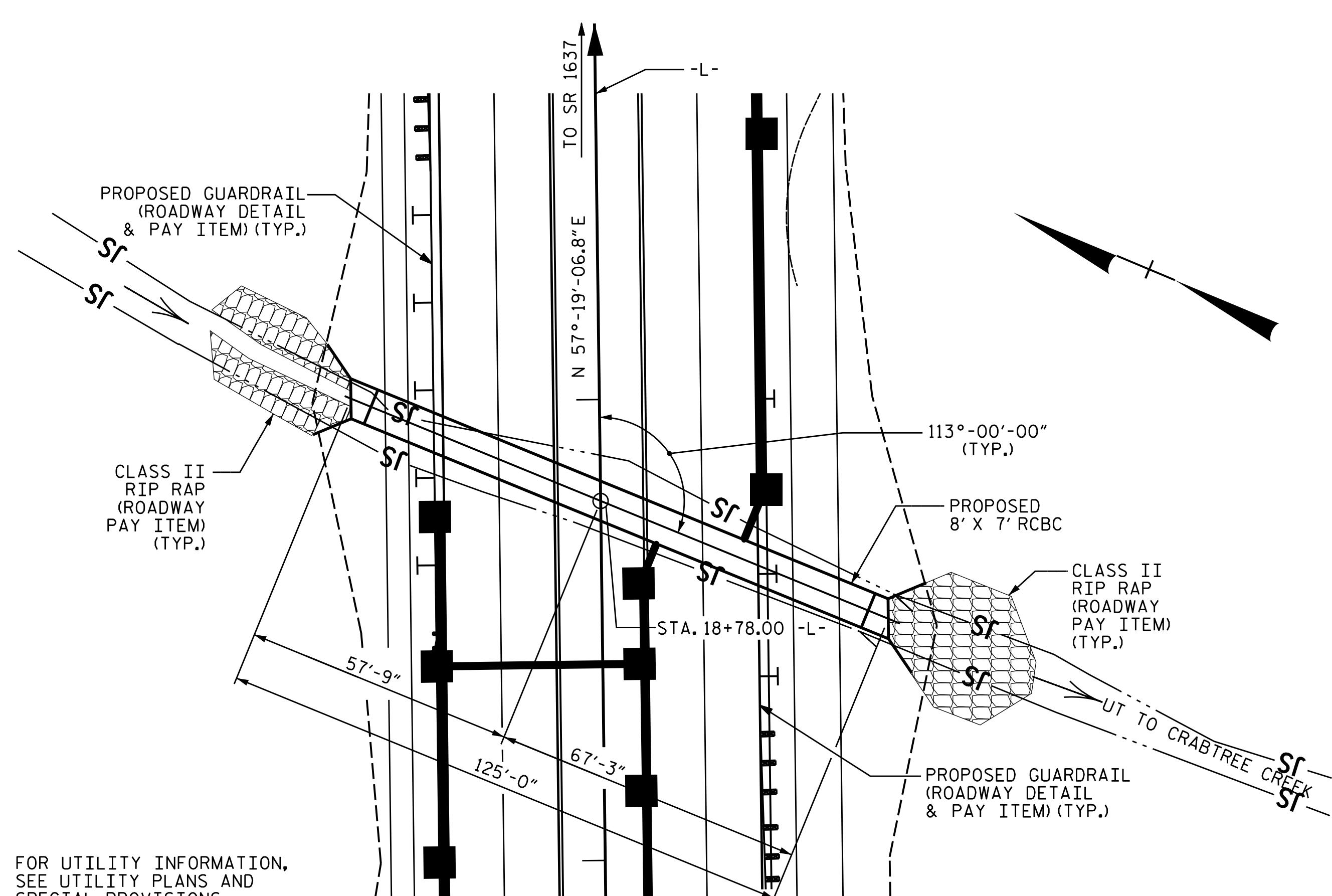
1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

2024 STANDARD SPECIFICATIONS

KRISTY ALFORD, P.E.

FRANCESCA LEA, P.E.
PROJECT DESIGN ENGINEER



LOCATION SKETCH

HYDRAULIC DATA	
DESIGN DISCHARGE	= 307 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 328.7 FT.
DRAINAGE AREA	= 0.24 SQ. MI.
BASE DISCHARGE (Q100)	= 312 CFS
BASE HIGH WATER ELEVATION	= 328.7 FT.
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 488 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS+.
OVERTOPPING FLOOD ELEVATION	= * 330.8 FT.
* ROADWAY SAG AT STA. 18+42 -L-, EL. 330.70' (LT. SHOULDER POINT)	

GRADE DATA -L-	
GRADE POINT EL. @ STA. 18+78.00 -L-	= 330.89'
BED ELEVATION @ STA. 18+78.00 -L-	= 320.32'
ROADWAY SLOPES	= 2:1

TOTAL STRUCTURE QUANTITIES	
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	117.5 TONS
CLASS A CONCRETE	
BARREL @ 0.825 CY/FT	103.1 C.Y.
OUTLET WINGS ETC.	22.6 C.Y.
TOTAL	125.7 C.Y.
REINFORCING STEEL	
BARREL	18,402 LBS.
WINGS ETC.	1,321 LBS.
TOTAL	19,723 LBS.

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR
REPLACEMENT
LENGTHS BASED ON
30" (SAMPLE LENGTH)
PLUS TWO SPLICE
LENGTHS AND $f_y = 60\text{ksi}$.

NOTES

ASSUMED LIVE LOAD ----- HL 93 OR ALTERNATE LOADING.

DESIGN FILL (MAX) ----- 4.92 FT.

DESIGN FILL (MIN) ----- 2.73 FT.

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. 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.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICER 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.

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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

EXCAVATE FOUNDATION FOR THE CULVERT AT 18+78 A MINIMUM OF 1.0 FT BELOW CULVERT BEARING ELEVATION. PLACE 1.0 FT OF CLASS VI FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.

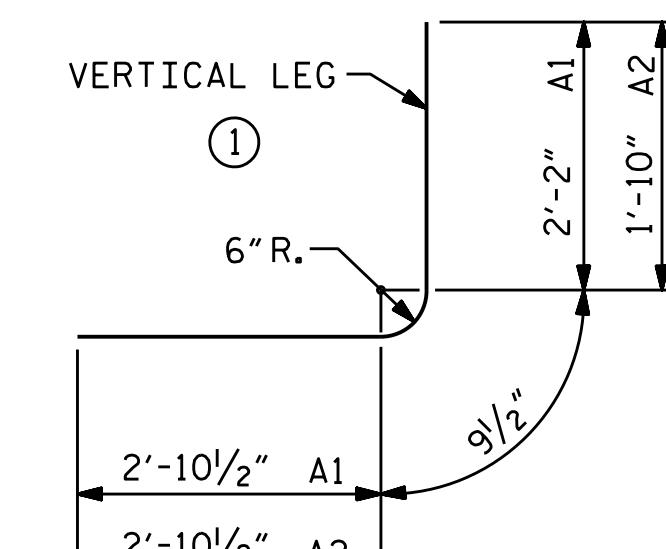
EXCAVATION FOR THE CULVERT AT STATION 18+78 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. PLACE FOUNDATION CONDITIONING MATERIAL AFTER THE EXCAVATION IS COMPLETED.

KEY FOOTINGS FOR THE REINFORCED BOX CULVERT AT STATION 18+78 AT LEAST 12" INTO WEATHERED ROCK WITH A MINIMUM THICKNESS AS SHOWN ON THE PLANS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	500	#4	1	5'-10"	1948
A2	500	#4	1	5'-6"	1837
A100	359	#5	STR.	8'-11"	3339
A101	8	#5	STR.	6'-6"	54
A102	8	#5	STR.	4'-2"	35
A200	359	#5	STR.	8'-11"	3339
A201	8	#5	STR.	6'-6"	54
A202	8	#5	STR.	4'-2"	35
A300	60	#4	STR.	8'-11"	357
A301	2	#4	STR.	5'-4"	7
A400	60	#4	STR.	8'-11"	357
A401	2	#4	STR.	5'-4"	7
B1	250	#4	STR.	7'-10"	1308
B2	500	#4	STR.	6'-4"	2115
C1	144	#4	STR.	33'-0"	3174
D1	8	#6	STR.	1'-3"	15
E1	8	#5	STR.	3'-3"	28
E2	8	#5	STR.	4'-0"	34
G1	4	#4	STR.	10'-4"	28
S2	12	#8	STR.	10'-4"	331
REINFORCING STEEL =					18,402 LBS.



BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

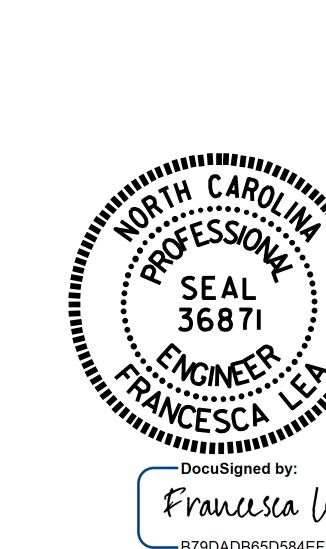
BAR	SIZE	SPLICE LENGTH
B1	#4	1'-10"
C1	#4	2'-5"

PROJECT NO. HL-0033

WAKE COUNTY

STATION: 18+78.00 -L-

SHEET 1 OF 4

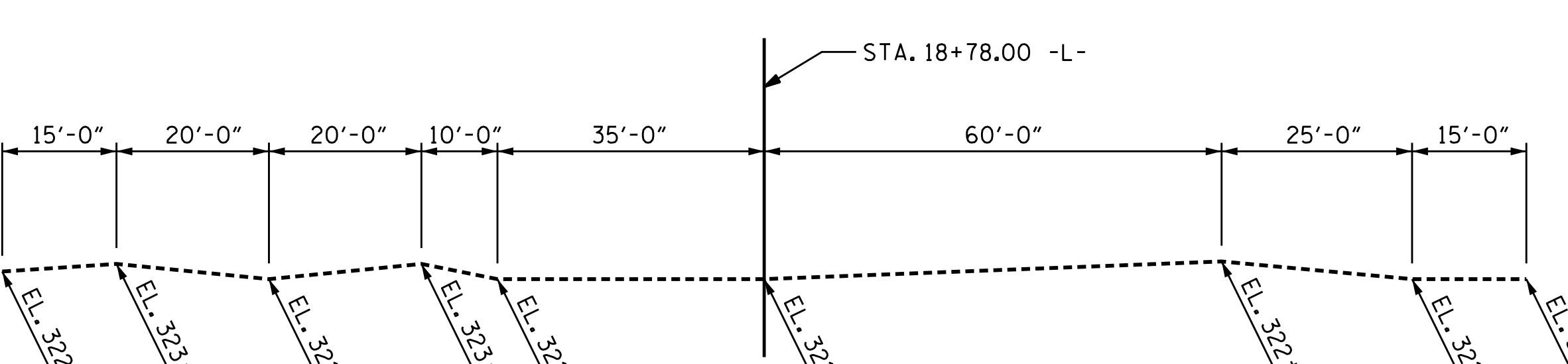


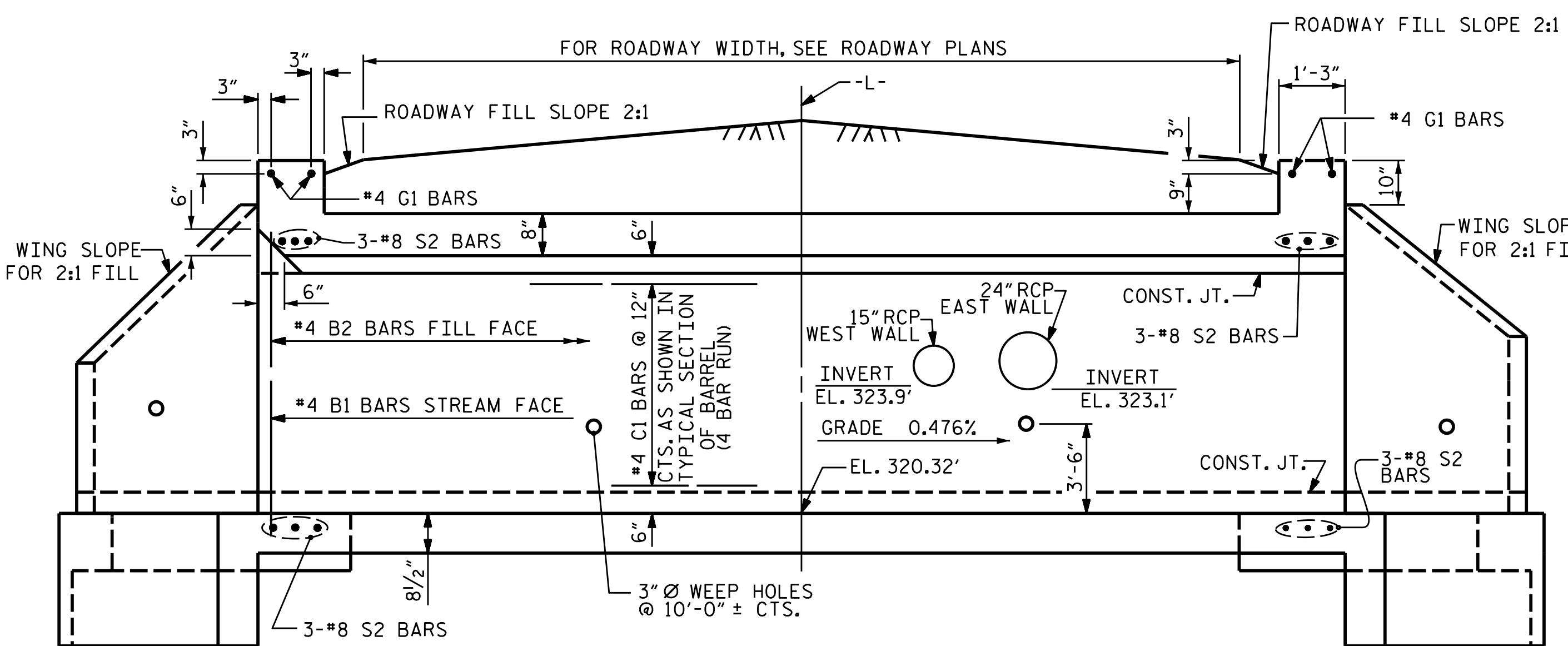
STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

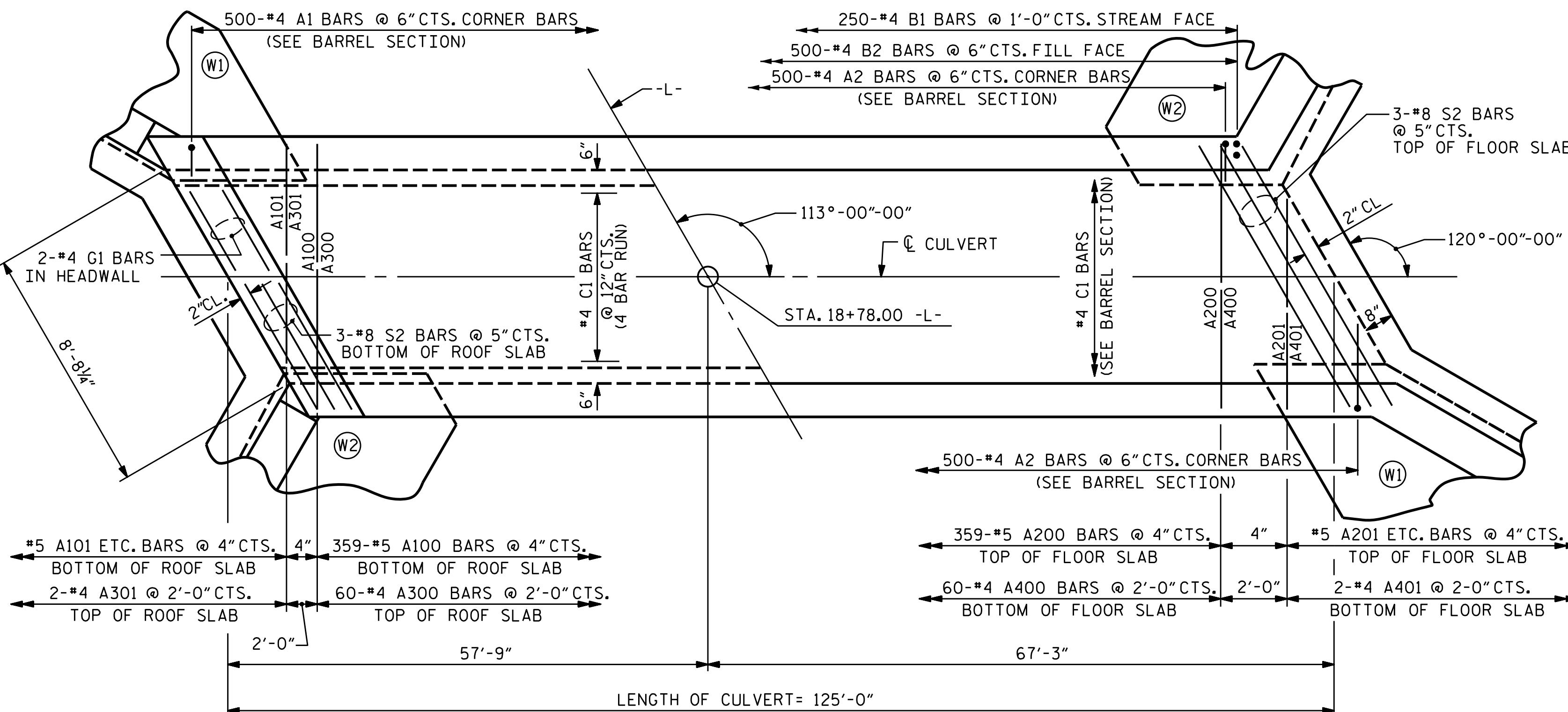
RALEIGH

SINGLE 8 FT. X 7 FT. CONCRETE BOX CULVERT 113° SKEW



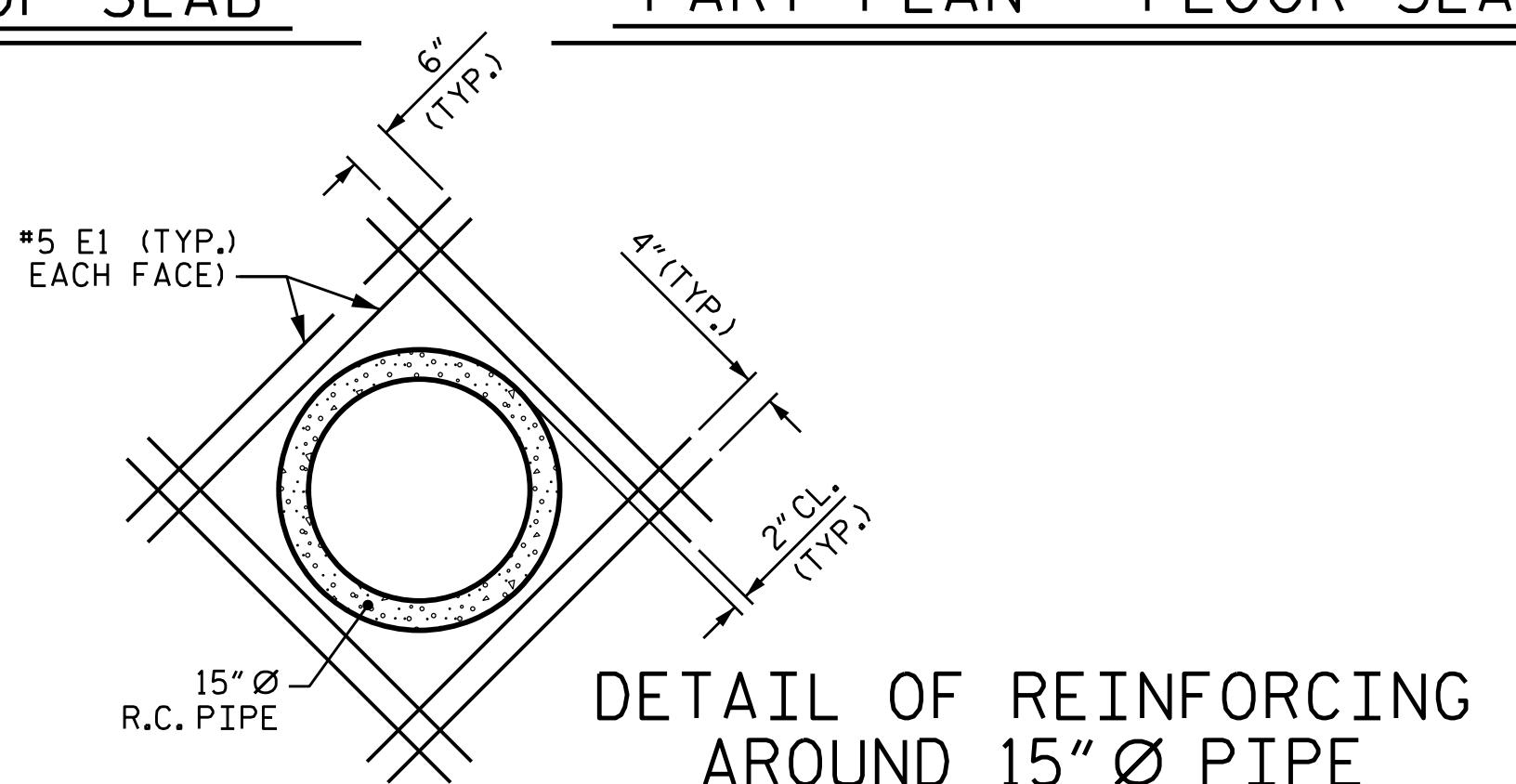


CULVERT SECTION NORMAL TO ROADWAY

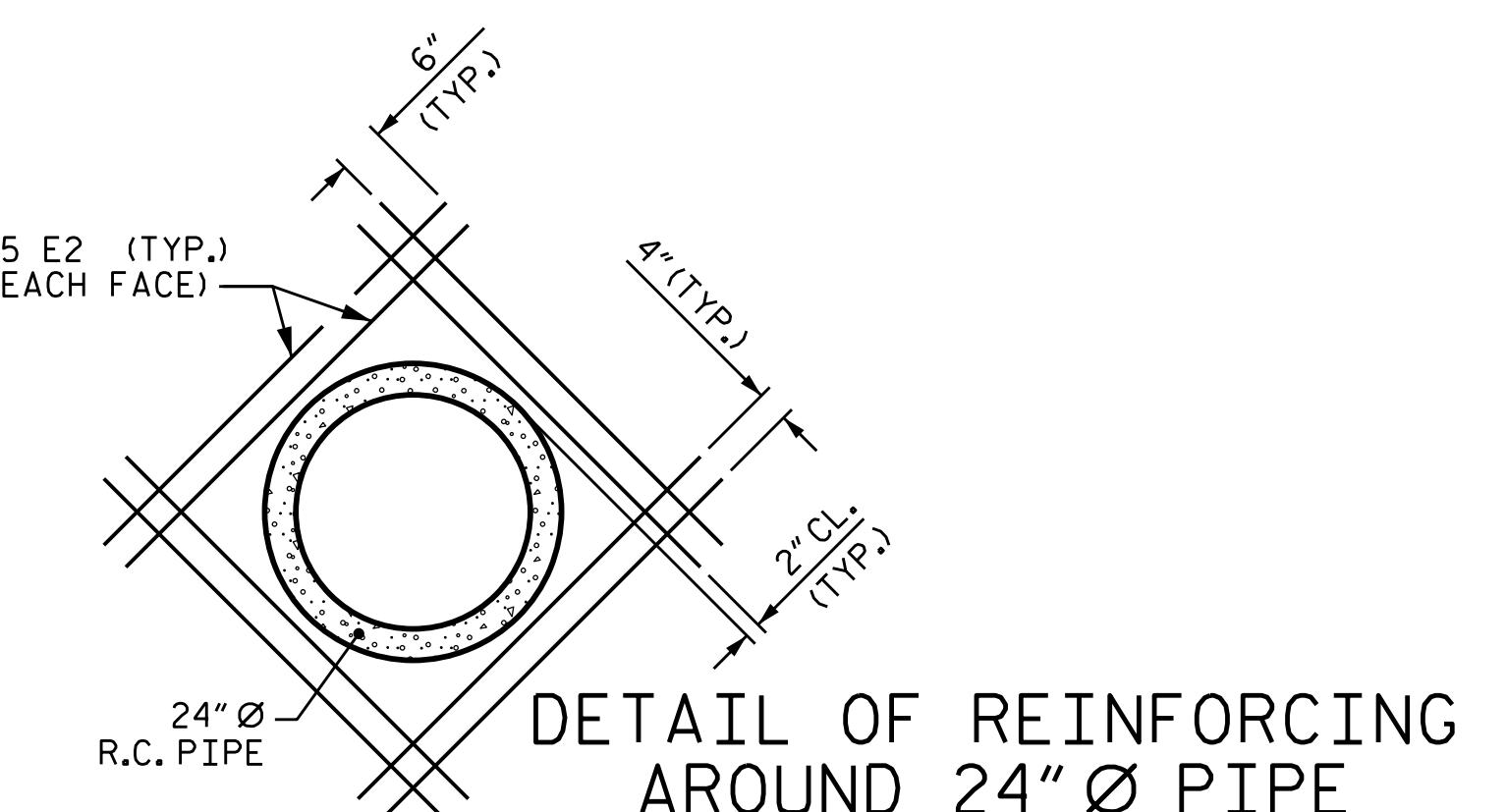


PART PLAN - ROOF SLAB

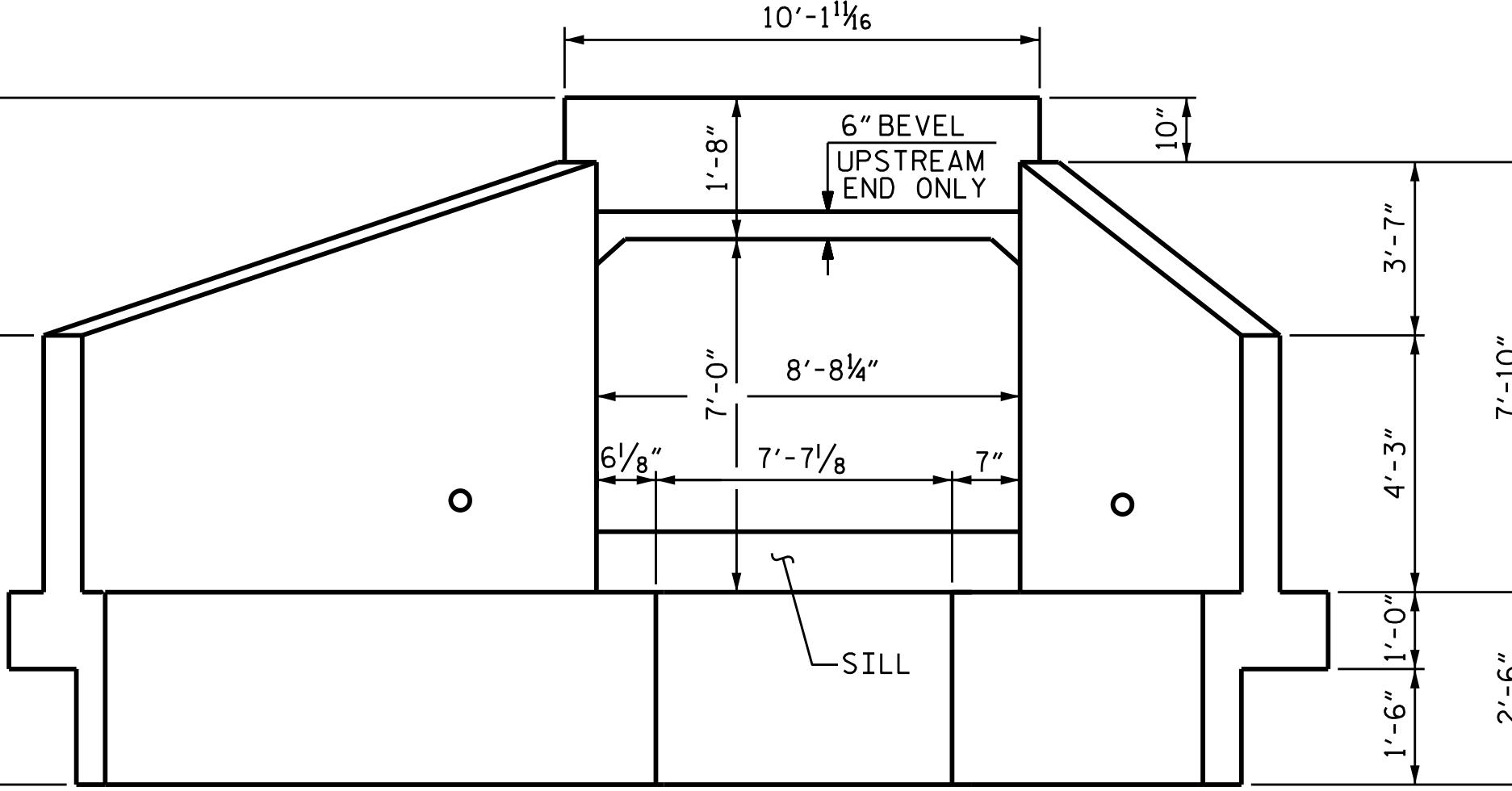
PART PLAN - FLOOR SLAB



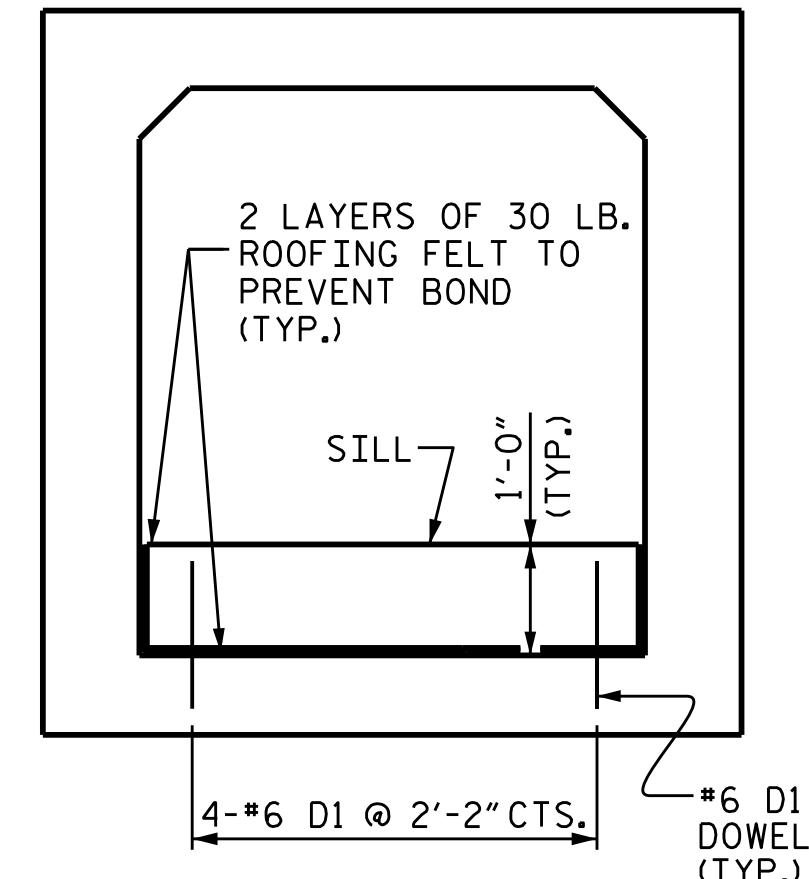
DETAIL OF REINFORCING AROUND 15" Ø PIPE



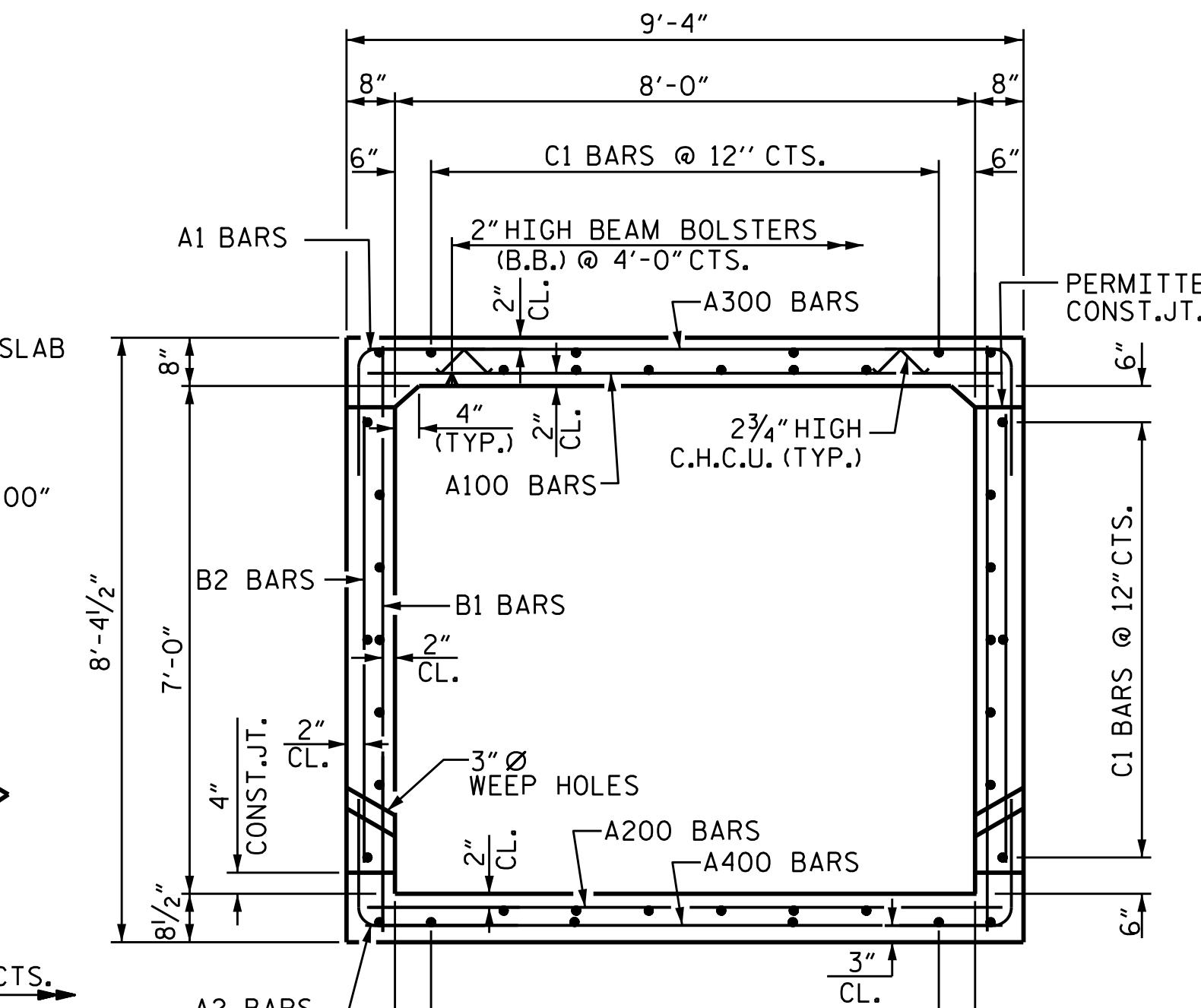
DETAIL OF REINFORCING AROUND 24" Ø PIPE



END ELEVATION NORMAL TO SKEW



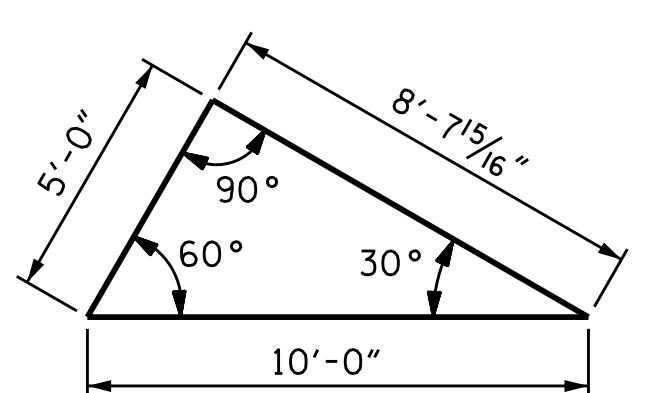
LOOKING UPSTREAM
INSTALL 1 FT CONCRETE SILL
(3 FT OFFSET FROM INLET AND OUTLET FACE)



RIGHT ANGLE SECTION OF BARRI

The diagram illustrates a concrete column base. At the top, a vertical column is shown with a width of 1'-0" and a height of 2'. A vertical reinforcement bar (dowel) is positioned in the center of the column. Below the column, a horizontal concrete slab is shown with a thickness of 3". The slab is supported by a central vertical column. A note on the left indicates 'LAYERS OF 30 LB. FELT PREVENT BOND (TYP.)' with an arrow pointing to the interface between the slab and the column. A callout on the right specifies '*** #6 D1 DOWEL' with an arrow pointing to the reinforcement bar.

SECTION THROUGH SIL STILL DETAILS



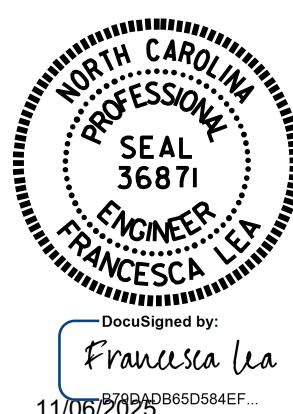
SKFW TRTANGI F

PROJECT NO. HL-0033

WAKE COUNTY

STATION: 18+78.00 -L -

SHEET 2 OF 4



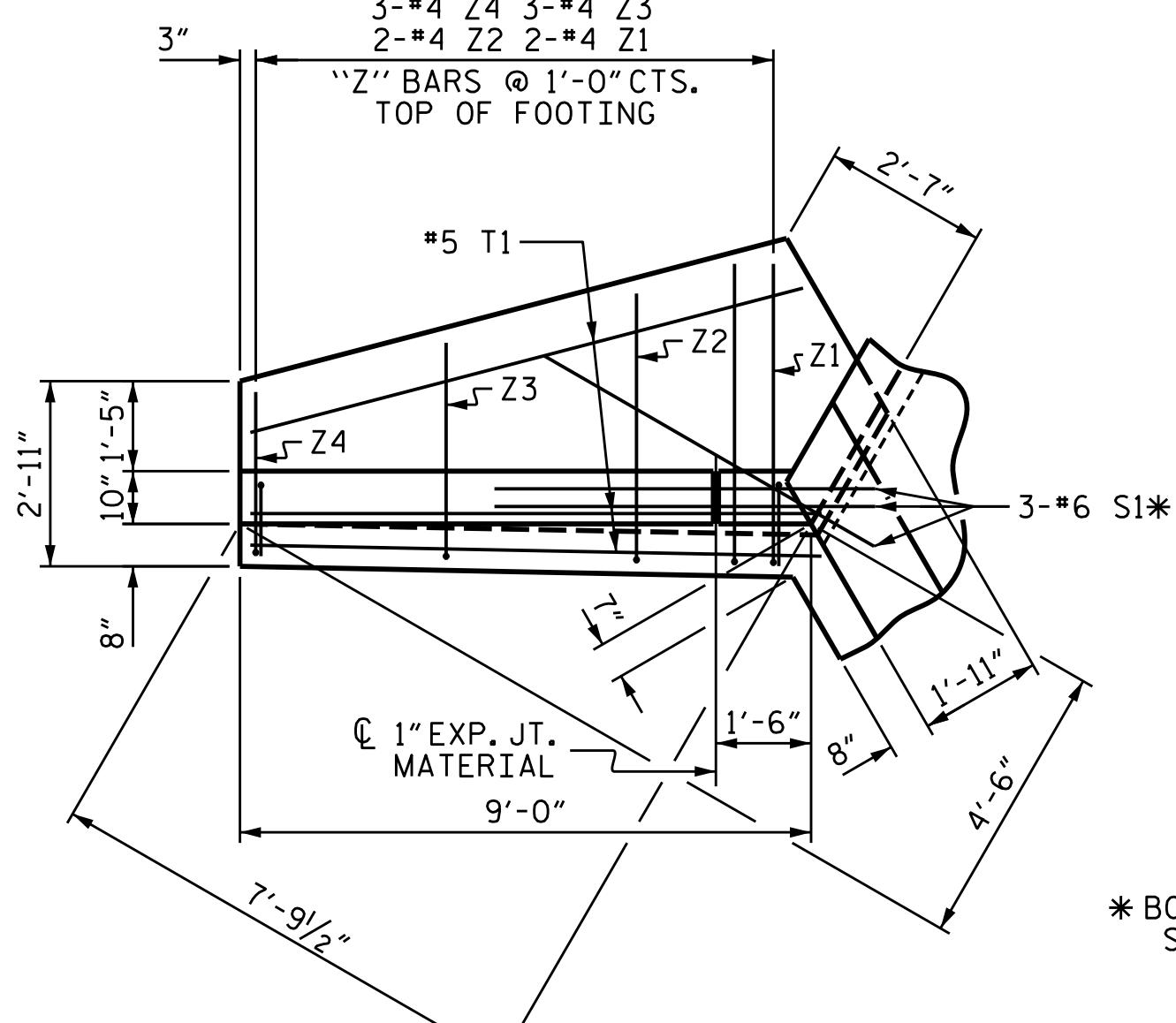
**SINGLE 8 FT. X 7 FT.
CONCRETE BOX CULVERT
113° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-2
1			3			TOTAL SHEETS 4
2			4			

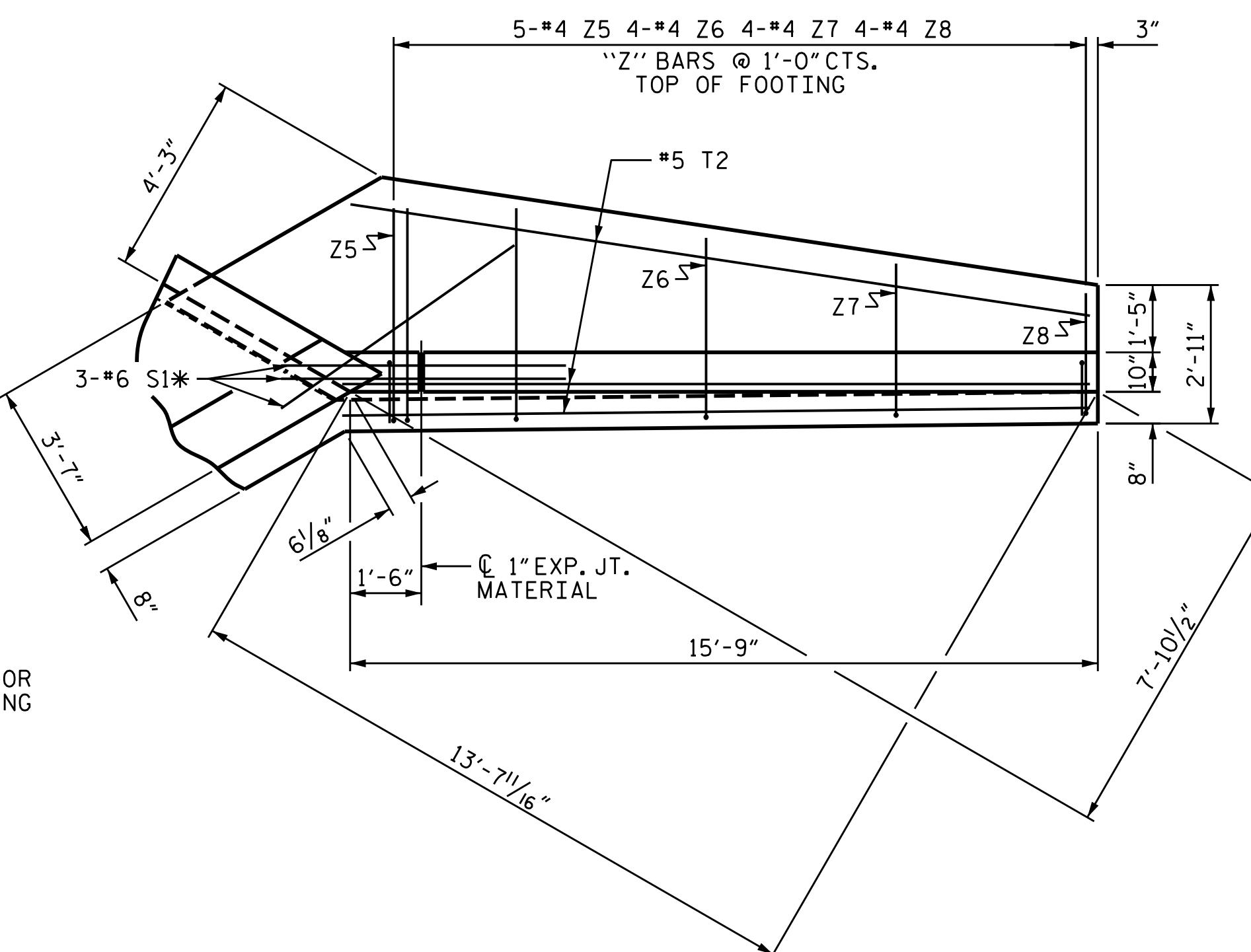
isilon5\HL-0033\Final Plans\410-003-HL0033-SMU-CL-S02_910000.dwg

11/5/2025
S:\DPC1\Division5\HL-0033\Final Plans\410_003_HL0033_SML.CU.S03.810000.dwg

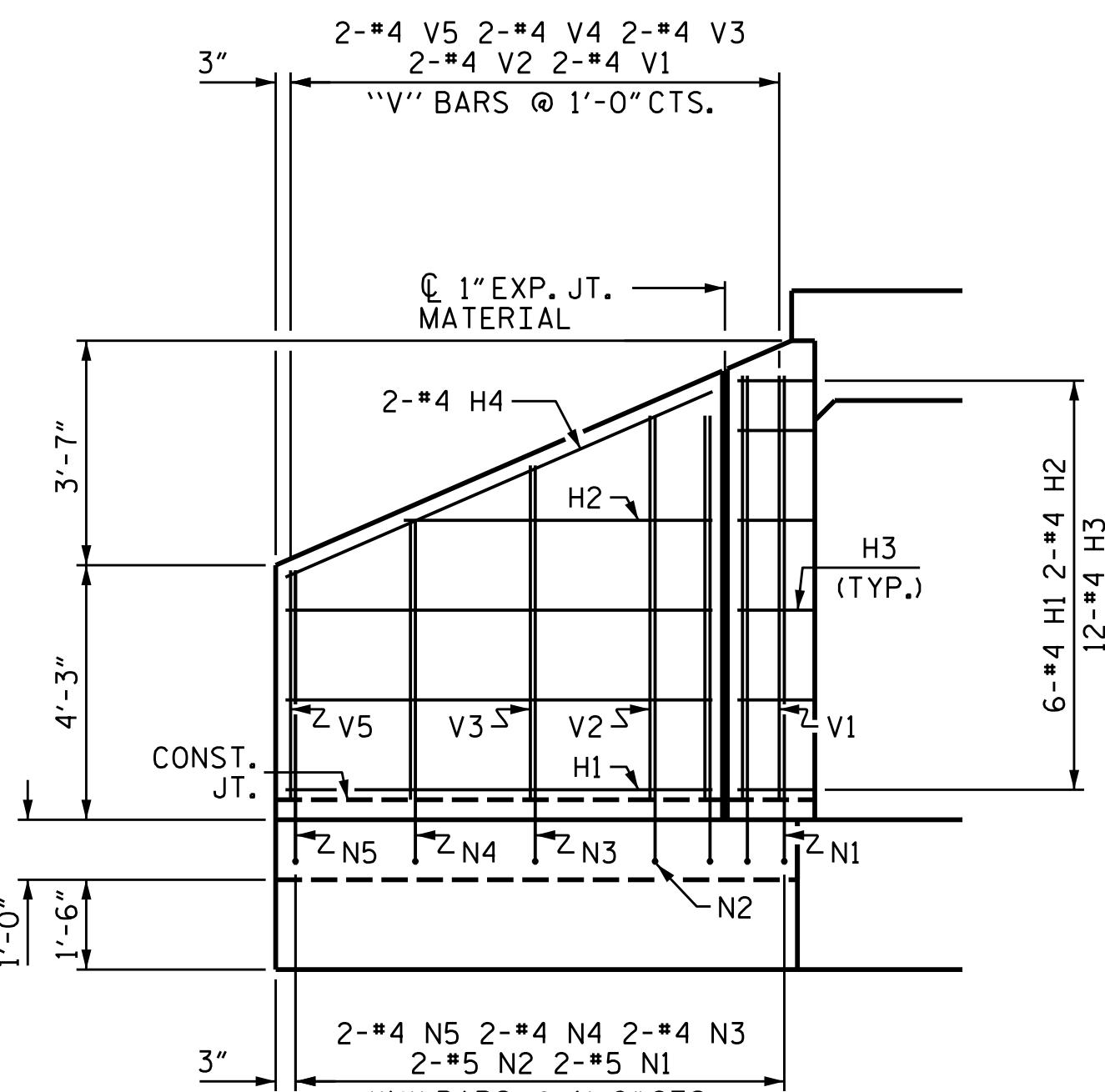
FOR PIPE THRU EXTERIOR WALL, FIELD CUT AND
BEND "B" AND "C" BARS AS NEEDED TO CLEAR PIPE



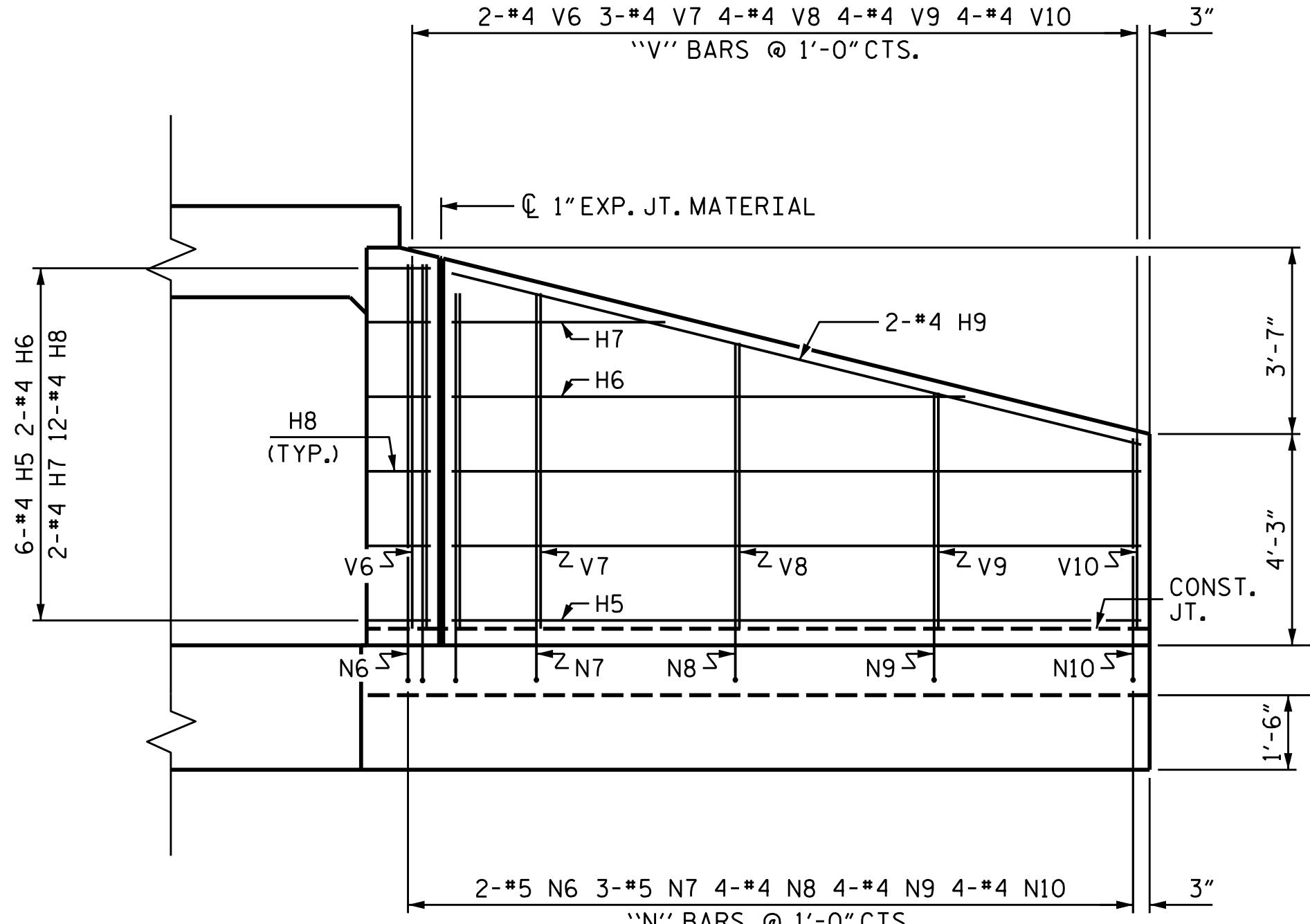
PLAN W2



PLAN W1



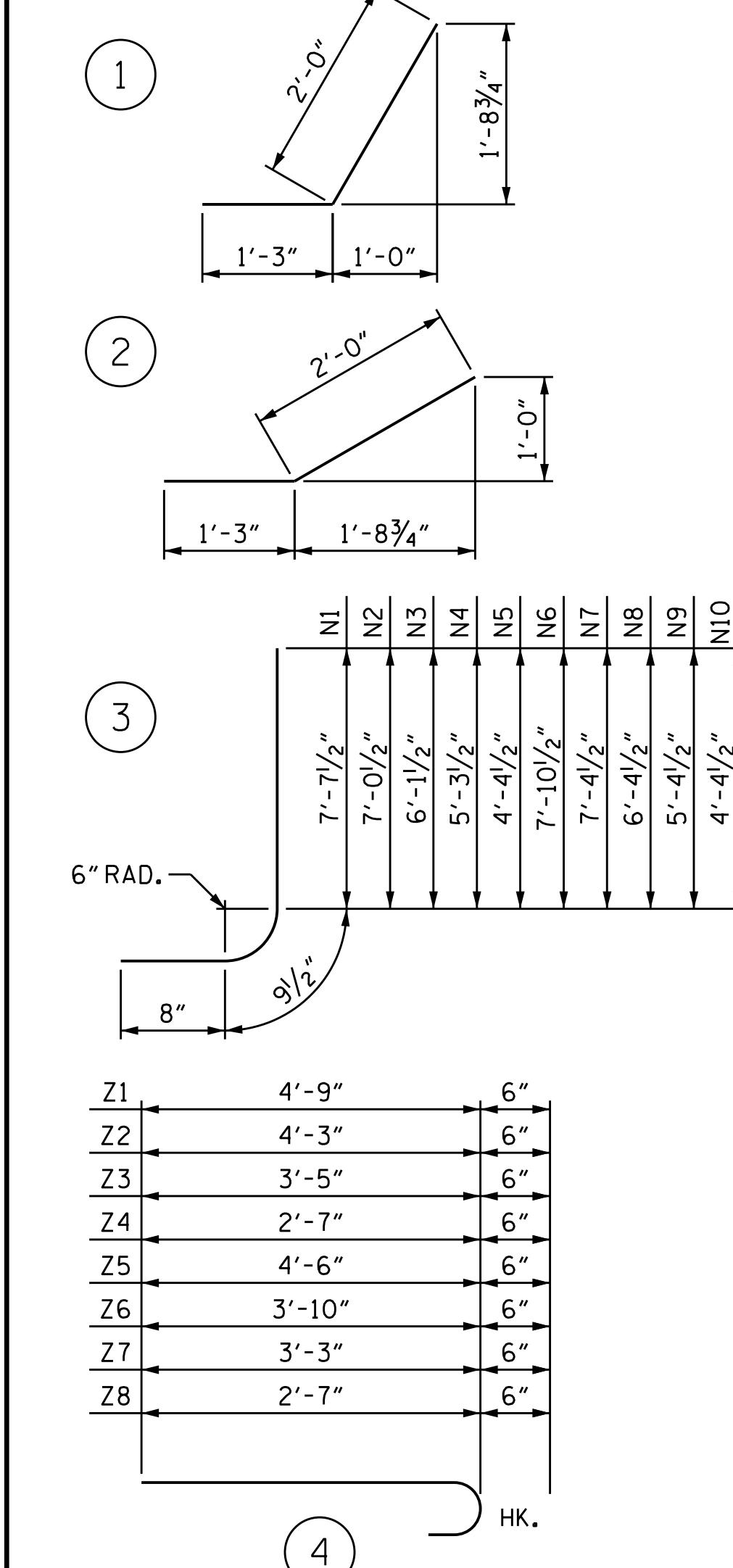
ELEVATION W2



ELEVATION W1

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



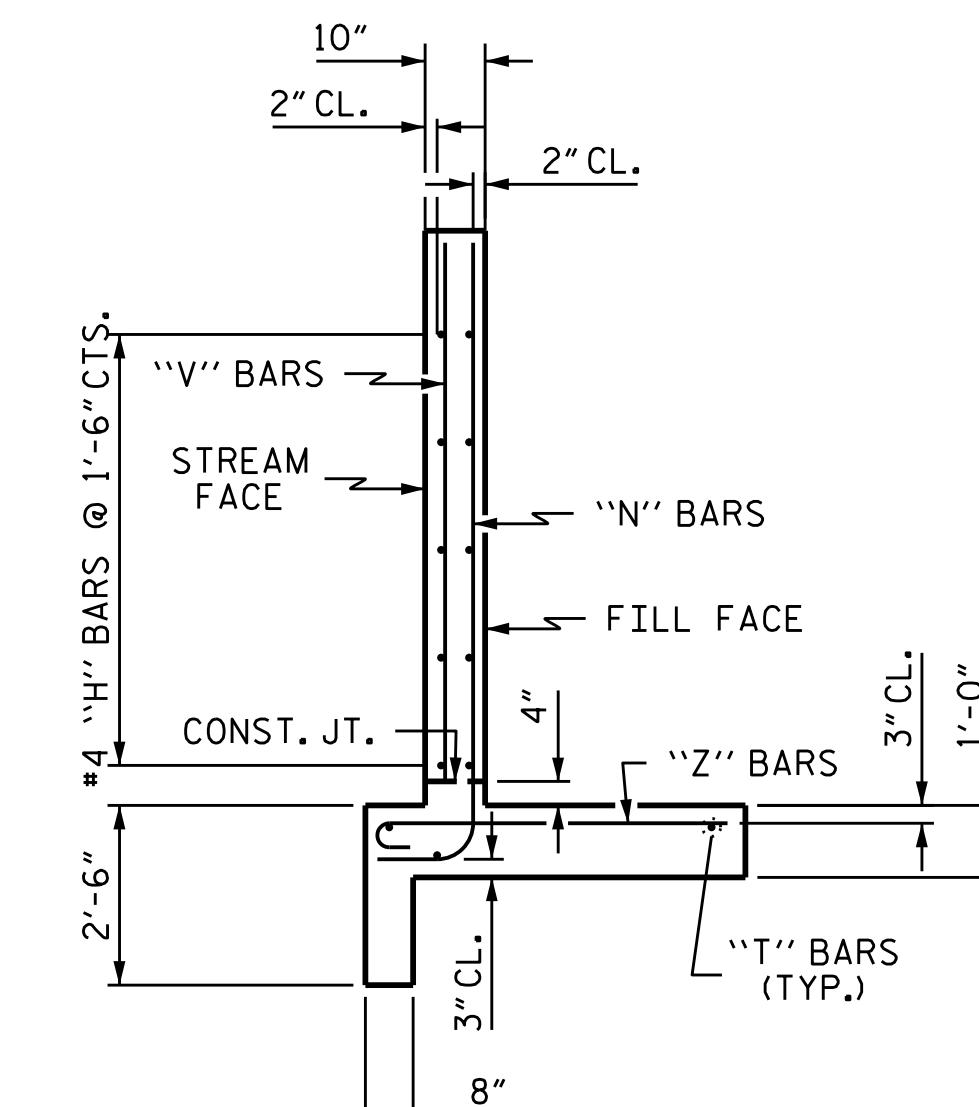
BILL OF MATERIAL

PROJECT NO. HL-0033

WAKE COUNTY

STATION: 18+78.00 -L-

SHEET 3 OF 4



TYPICAL WING SECTION



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD WINGS
FOR
CONCRETE BOX CULVERT
H = 7'-0" SLOPE = 2:1
120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-3
1			3			
2			4			

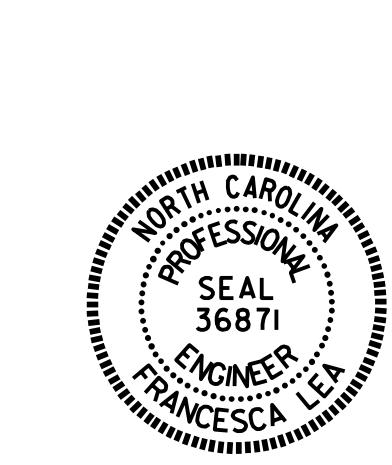
LOAD FACTORS:

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	0.5 OR 0.9
ES	1.35	0.5 OR 0.9
LS	1.75	0.00
WA	1.00	0.00

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER	
						LIVE-LOAD FACTORS (γ_L)	MOMENT			SHEAR					
							BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)			
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	1.56	1	TOP SLAB	4.33	1.09	1	BOTTOM SLAB	0.84	
	HL-93 (OPERATING)	N/A		1.42	--	1.35	2.03	1	TOP SLAB	4.33	1.42	1	BOTTOM SLAB	0.84	
	HS-20 (INVENTORY)	36.000	②	1.19	42.86	1.75	1.56	1	TOP SLAB	4.33	1.19	1	TOP SLAB	0.81	
	HS-20 (OPERATING)	36.000		1.54	55.57	1.35	2.03	1	TOP SLAB	4.33	1.54	1	TOP SLAB	0.81	
LEGAL LOAD RATING	SINGLE VEHICLE	SNSH	13.500	2.16	29.18	1.40	2.84	1	TOP SLAB	4.33	2.16	1	TOP SLAB	0.81	
		SNGARBS2	20.000	2.03	40.61	1.40	2.66	1	TOP SLAB	4.33	2.03	1	TOP SLAB	0.81	
		SNAGRIS2	22.000	2.16	47.56	1.40	2.84	1	TOP SLAB	4.33	2.16	1	TOP SLAB	0.81	
		SNCOTTS3	27.250	③	1.37	37.28	1.40	1.99	1	TOP SLAB	4.12	1.37	1	BOTTOM SLAB	0.84
		SNAGGRS4	34.925		1.80	62.71	1.40	2.57	1	TOP SLAB	4.33	1.80	1	BOTTOM SLAB	0.84
		SNS5A	35.550		1.63	57.95	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		SNS6A	39.950		1.63	65.12	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		SNS7B	42.000		1.63	68.46	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	2.16	71.34	1.40	2.84	1	TOP SLAB	4.33	2.16	1	TOP SLAB	0.81	
		TNT4A	33.075		1.63	53.91	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		TNT6A	41.600		1.63	67.81	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		TNT7A	42.000		1.63	68.46	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		TNT7B	42.000		1.63	68.46	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		TNAGRIT4	43.000		1.55	66.78	1.40	2.26	1	TOP SLAB	4.12	1.55	1	BOTTOM SLAB	0.84
		TNAGT5A	45.000		1.59	71.57	1.40	2.29	1	TOP SLAB	4.55	1.59	1	BOTTOM SLAB	0.84
		TNAGT5B	45.000		1.63	73.35	1.40	2.37	1	TOP SLAB	4.12	1.63	1	BOTTOM SLAB	0.84
		EV2	28.750		1.53	44.01	1.30	2.01	1	TOP SLAB	4.33	1.53	1	TOP SLAB	0.81
		EV3	43.000	④	1.19	51.05	1.30	1.73	1	TOP SLAB	4.12	1.19	1	BOTTOM SLAB	0.84

① CONTROLLING LOAD RATING
② DESIGN LOAD RATING (HL-93)
③ DESIGN LOAD RATING (HS-20)
④ LEGAL LOAD RATING **
⑤ EMERGENCY VEH. LOAD RATING **

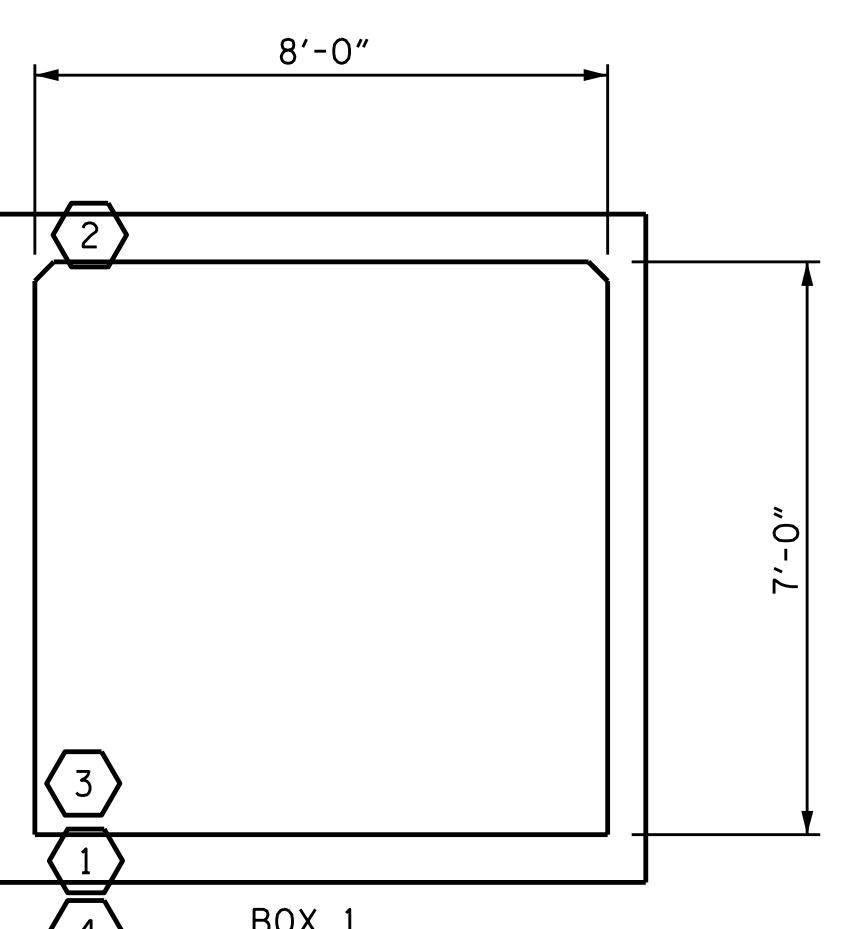
** SEE CHART FOR VEHICLE TYPE



PROJECT NO. HL-0033
WAKE COUNTY
STATION: 18+78.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
SHEET NO. C1-4					
DOCUMENT NOT CONSIDERED	NO.	BY:	DATE:	NO.	BY:
FINAL UNLESS ALL SIGNATURES COMPLETED	1			3	
	2			4	
TOTAL SHEETS 4					



LRFR SUMMARY

(LOOKING DOWNSTREAM)

ASSEMBLED BY : O. T. NGUYEN	DATE : 11/21
CHECKED BY : W. D. REAMS	DATE : 01/22
DRAWN BY : WMC 7/II	REV. 10/1/II MAA/GM
CHECKED BY : GM 7/II	REV. 12/17 MAA/THC

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " Ø SHEAR STUDS FOR THE $\frac{3}{4}$ " Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " Ø STUDS FOR 4 - $\frac{3}{4}$ " Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " Ø STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " Ø STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " Ø STUDS FOR 4 - $\frac{3}{4}$ " 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 $\frac{5}{16}$ " 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 $\frac{1}{16}$ " 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.