

**NOTES**

ASSUMED LIVE LOAD ----- HL-93

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.

THE EXISTING STRUCTURE CONSISTING OF A SINGLE 22.5' CONCRETE ARCH WITH A CLEAR ROADWAY WIDTH OF 18.5', SUPPORTED BY CONCRETE ABUTMENTS AND WINGWALLS, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.

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

CONCRETE IN HEADWALLS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS INCLUDING 4' OF ALL VERTICAL WALLS.
2. REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

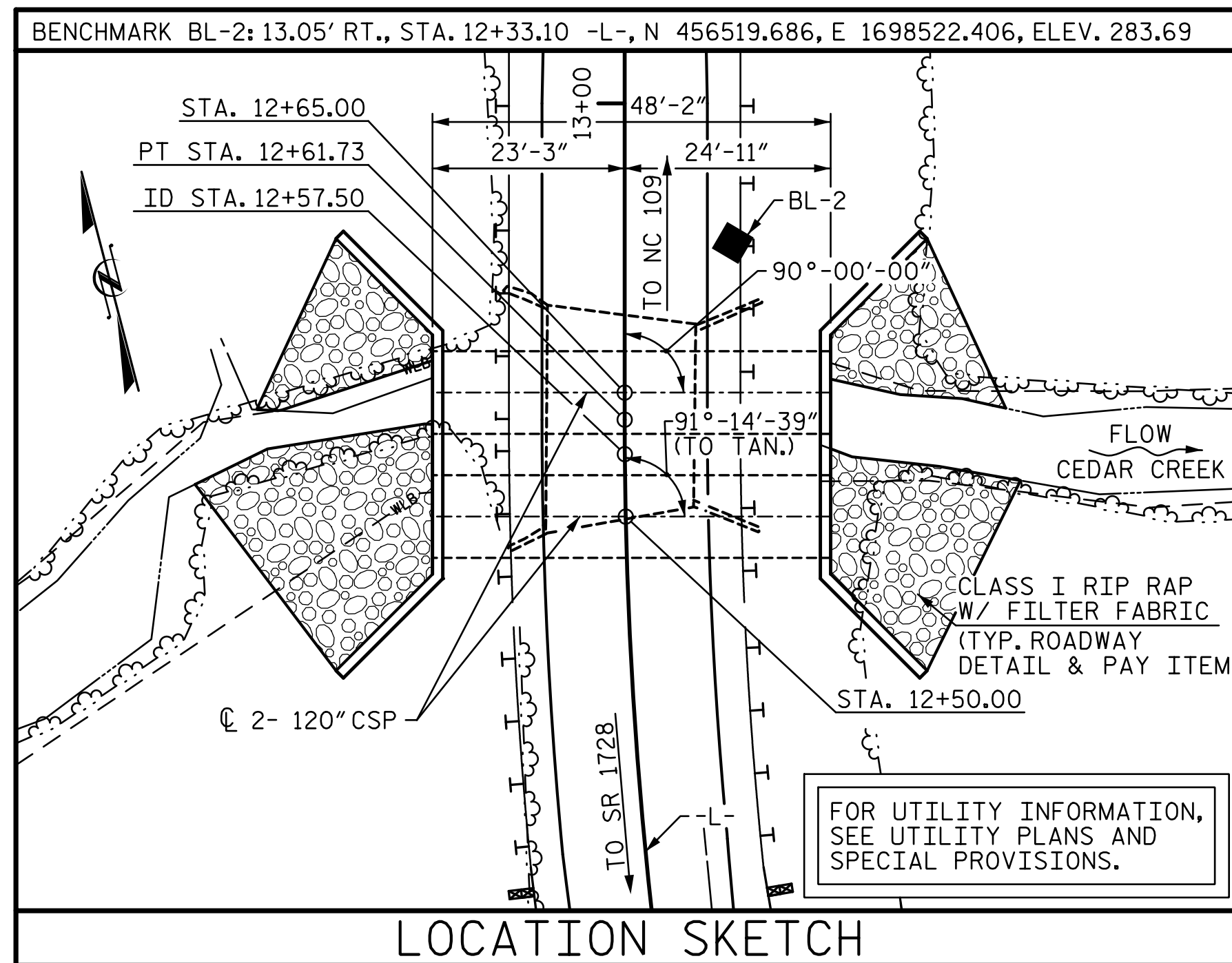
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

A MINIMUM BEARING OF 3,500 PSF SHALL BE VERIFIED PRIOR TO CONSTRUCTION. IF NECESSARY, CONTRACTOR SHALL PREPARE AND/OR MAKE GROUND MODIFICATIONS IN ORDER TO SATISFY MINIMUM BEARING PRESSURE.

NO WORK SHALL BE DONE ON THE CSP CULVERT UNTIL THE AREA OF THE CULVERT HAS BEEN UNDERCUT AND UNSUITABLE MATERIAL REPLACED WITH SUITABLE MATERIAL, PROPERLY COMPACTED TO THE ELEVATION OF THE BOTTOM OF THE PROPOSED BEDDING MATERIAL. THE LIMITS OF THE UNDERCUT EXCAVATION SHALL BE AT LEAST THE LIMITS OF THE CULVERT INCLUDING THE HEADWALLS.

EXCAVATE 1 FOOT BELOW FOOTING AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.

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



**HYDRAULIC DATA**

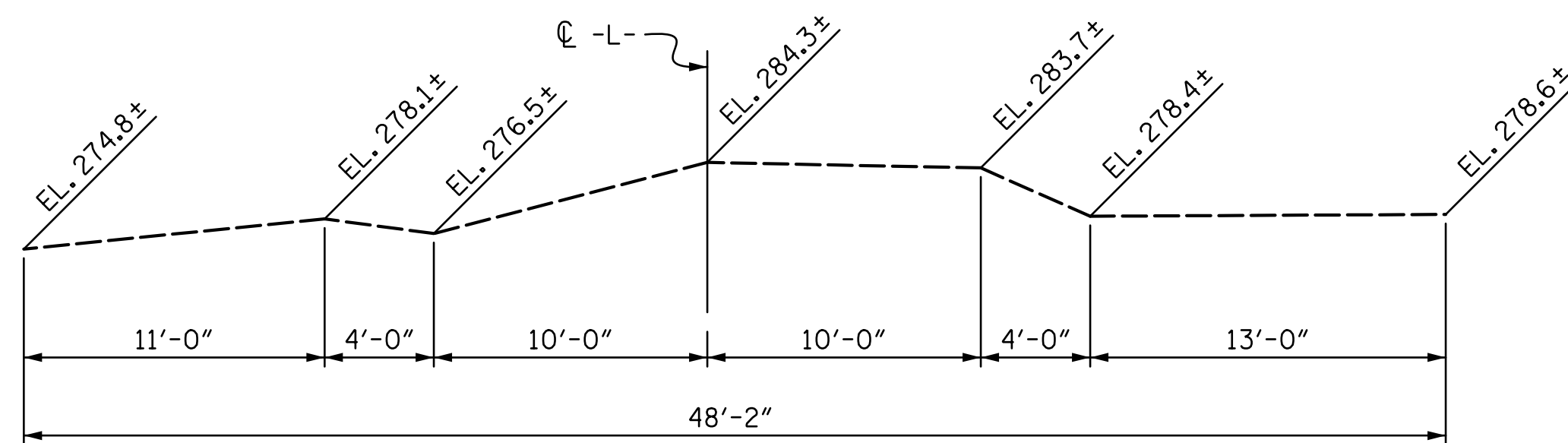
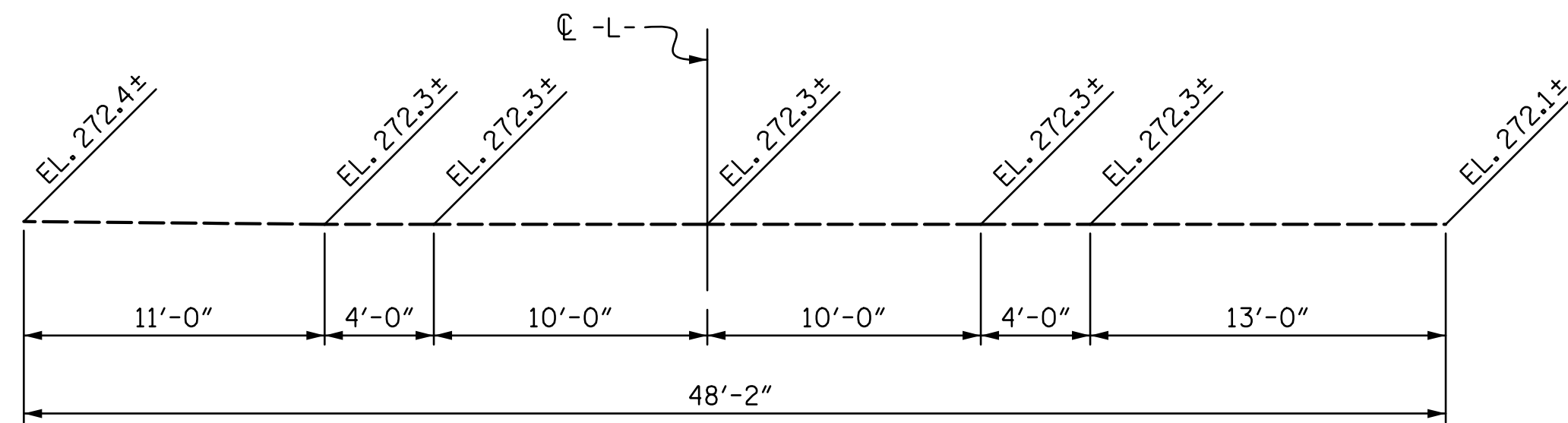
DESIGN DISCHARGE: 770 CFS  
 FREQUENCY OF DESIGN FLOOD: 25 YRS.  
 DESIGN HIGH WATER ELEVATION: 281.84  
 DRAINAGE AREA: 2.1 SQ. MI.  
 BASIC DISCHARGE (Q100): 1,197 CFS  
 BASIC HIGH WATER ELEVATION: 284.70

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE: 2,000+ CFS  
 FREQUENCY OF OVERTOPPING FLOOD: 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION: 285.3

**GRADE DATA**

GRADE POINT ELEVATION @ STA. 12+57.50 -L- 285.41  
 BED ELEVATION @ STA. 12+57.50 -L- 271.25  
 ROADWAY FILL SLOPES 2:1 (MAX)

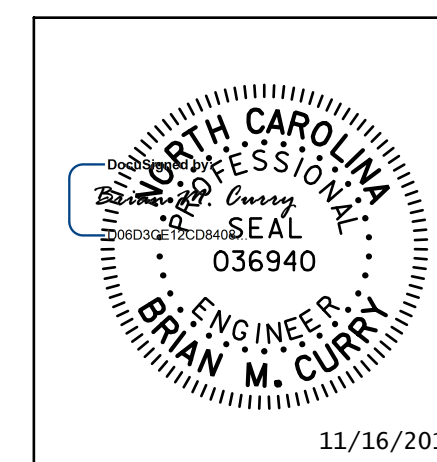


TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE AT STA 12+57.50	LUMP SUM
CULVERT EXCAVATION STA 12+57.50	LUMP SUM
120" C.S. PIPE CULVERTS, 0.168" THICK	96.3 LF
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT TOTAL:	70 TONS
CLASS A CONCRETE WINGS & HEADWALL:	94.8 C.Y.
REINFORCING STEEL WINGS & HEADWALL:	8,083 LBS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.10.R.69  
ANSON COUNTY  
 STATION: 12+57.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 016



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE 120" DIA. PIPE CONCRETE HEADWALL 90° SKEW**

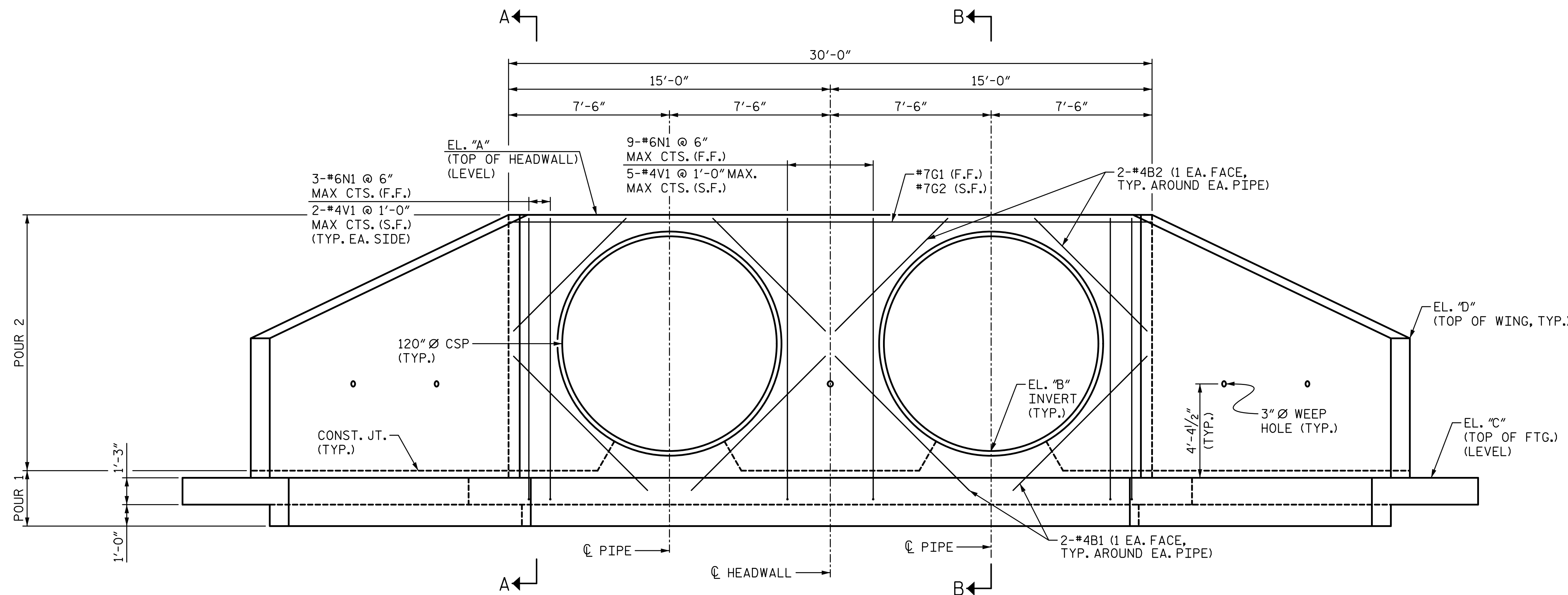
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DRAWN BY : LEM DATE : 08-14  
 CHECKED BY : MLO DATE : 08-14  
 DESIGN ENGINEER OF RECORD : BMC DATE : 08-14

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STV ENGINEERS, INC.  
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 Charlotte, NC 28202  
 NC License Number F-0991

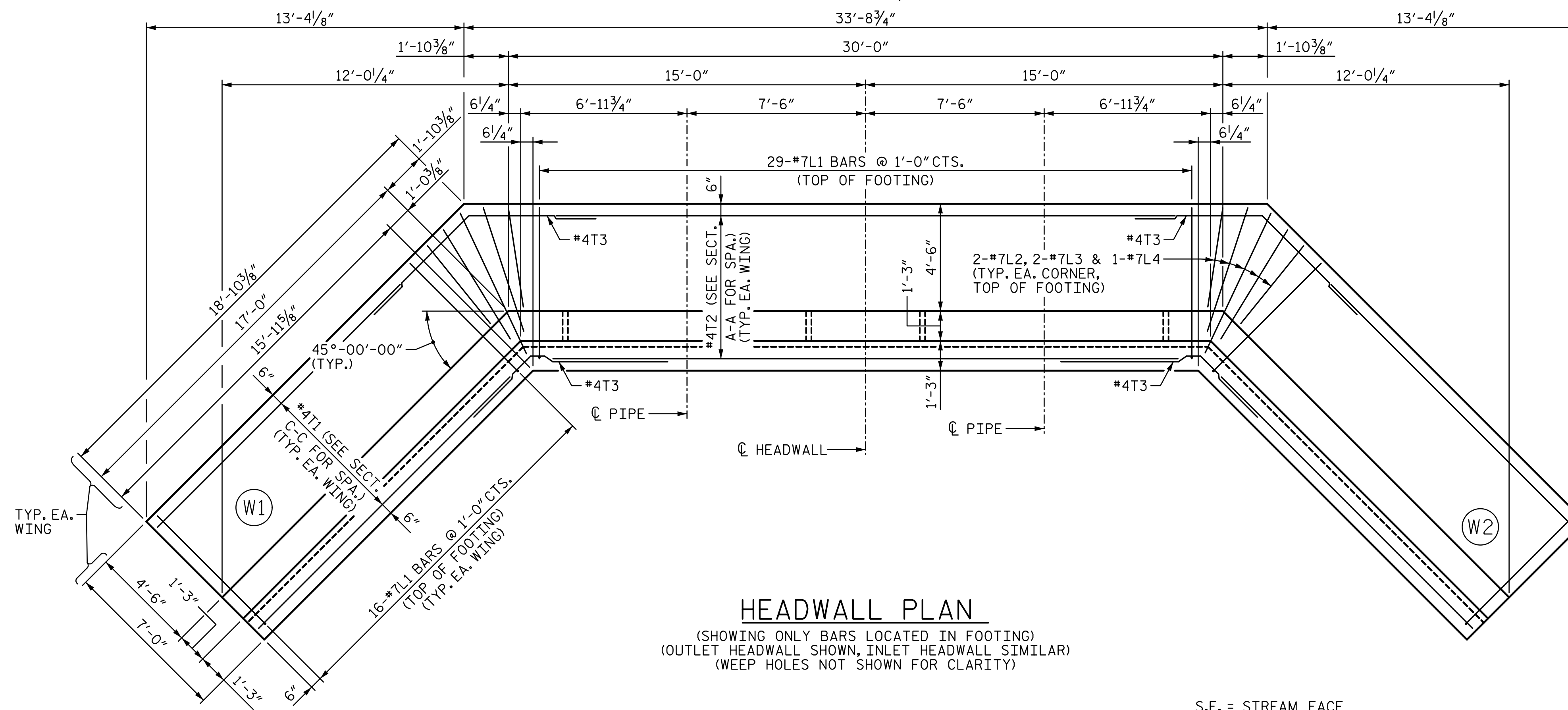


**HEADWALL ELEVATION**  
 (SHOWING ONLY BARS LOCATED IN WALL PORTION)  
 (LOOKING TOWARD OUTLET HEADWALL, INLET HEADWALL SIMILAR)

- NOTES:**
- SEE SHEET 1 OF 3 FOR ADDITIONAL NOTES.
  - THE 5-#7 "L" BARS SPLAYED IN EACH CORNER OF THE FOOTING SHALL BE PLACED AS SHOWN AND HAVE A SPACING OF APPROXIMATELY 1'-0" BETWEEN BARS.
  - #4 "T" BARS IN FOOTING SHALL HAVE A MIN. SPLICE LENGTH OF 1'-9".
  - FOR REINFORCING IN WINGS, SEE SHEET 3 OF 3.

LOCATION	TOP OF HEADWALL EL. "A"	INVERT EL. "B"	TOP OF FTG. EL. "C"	TOP OF WING EL. "D"
INLET HEADWALL	282.48	271.48	270.23	276.73
OUTLET HEADWALL	282.00	271.00	269.75	276.25

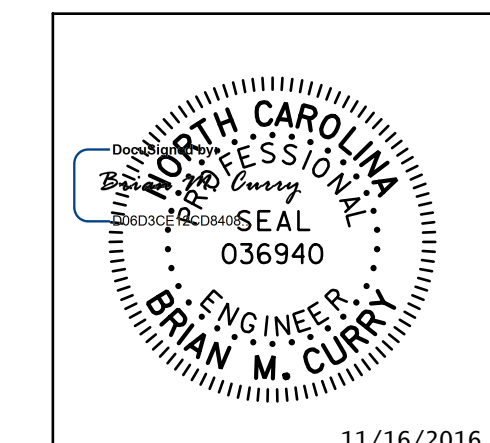
NOTE: CONTRACTOR SHALL FIELD VERIFY ELEVATIONS.



**HEADWALL PLAN**  
 (SHOWING ONLY BARS LOCATED IN FOOTING)  
 (OUTLET HEADWALL SHOWN, INLET HEADWALL SIMILAR)  
 (WEEP HOLES NOT SHOWN FOR CLARITY)

S.F. = STREAM FACE  
 F.F. = FILL FACE

PROJECT NO. 17BP.10.R.69  
ANSON COUNTY  
 STATION: 12+57.50 -L-  
 SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 120" DIA. PIPE  
 CONCRETE HEADWALL  
 90° SKEW**

DRAWN BY: LEM DATE: 08-14  
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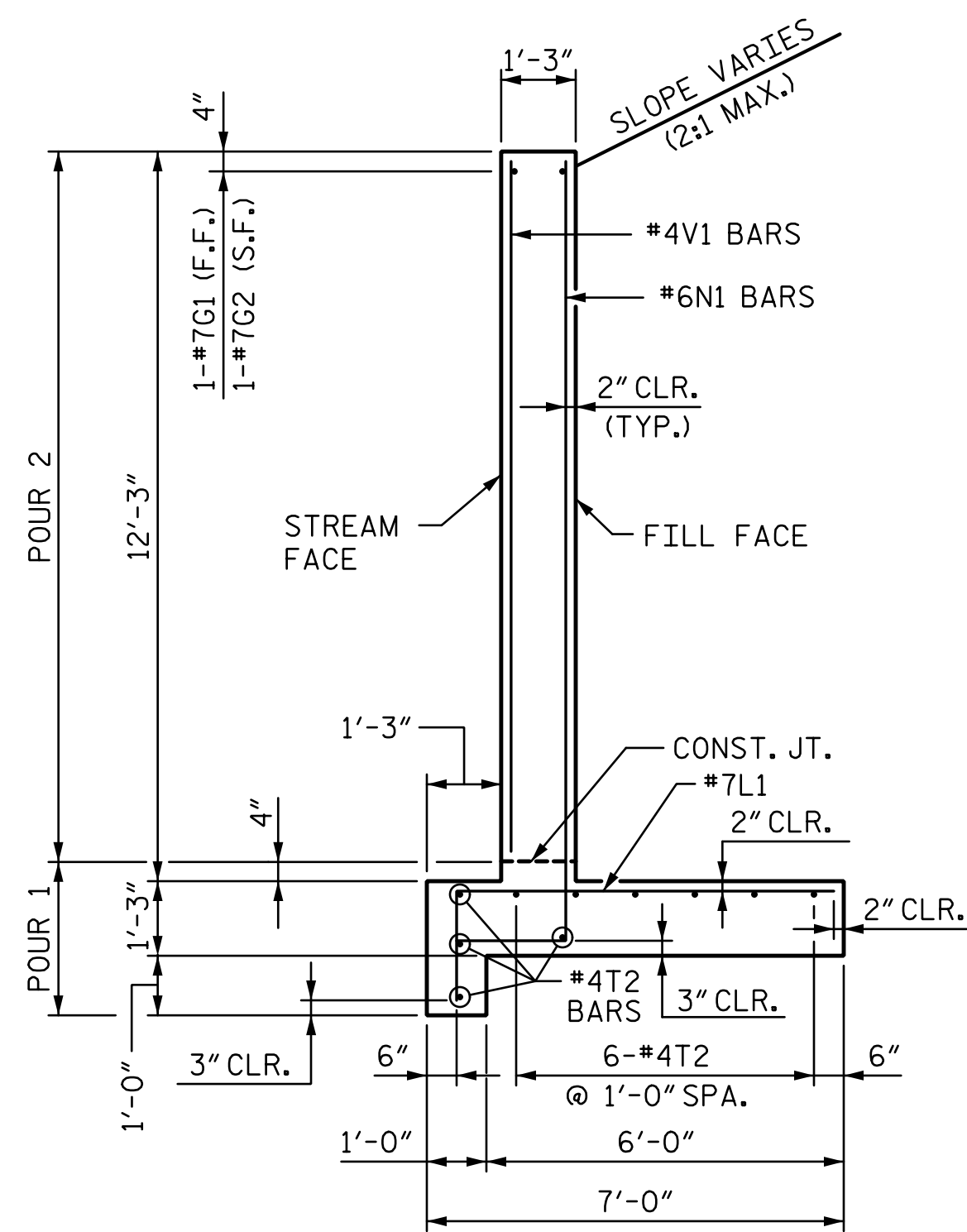


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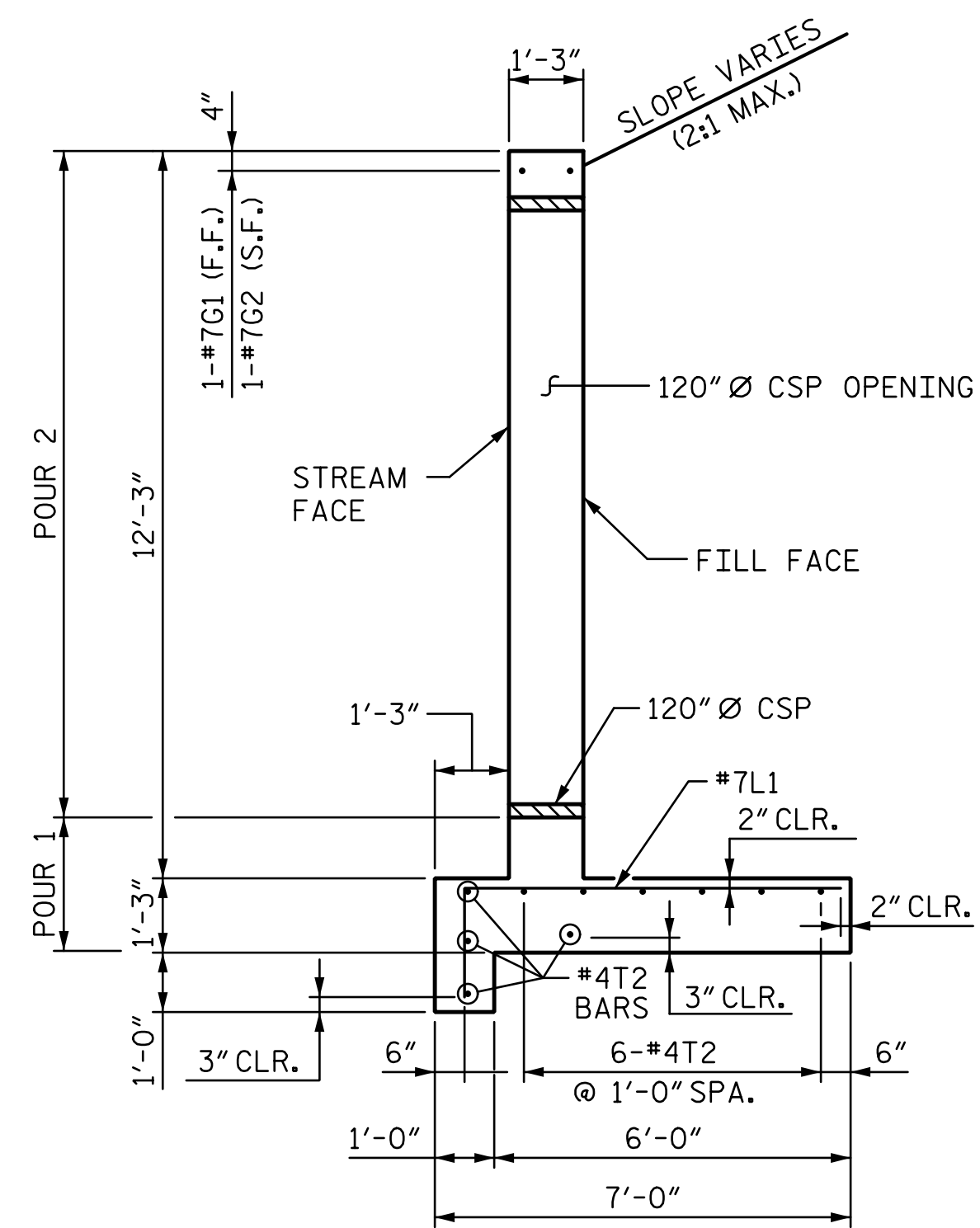
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C-2  
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SECTION A-A

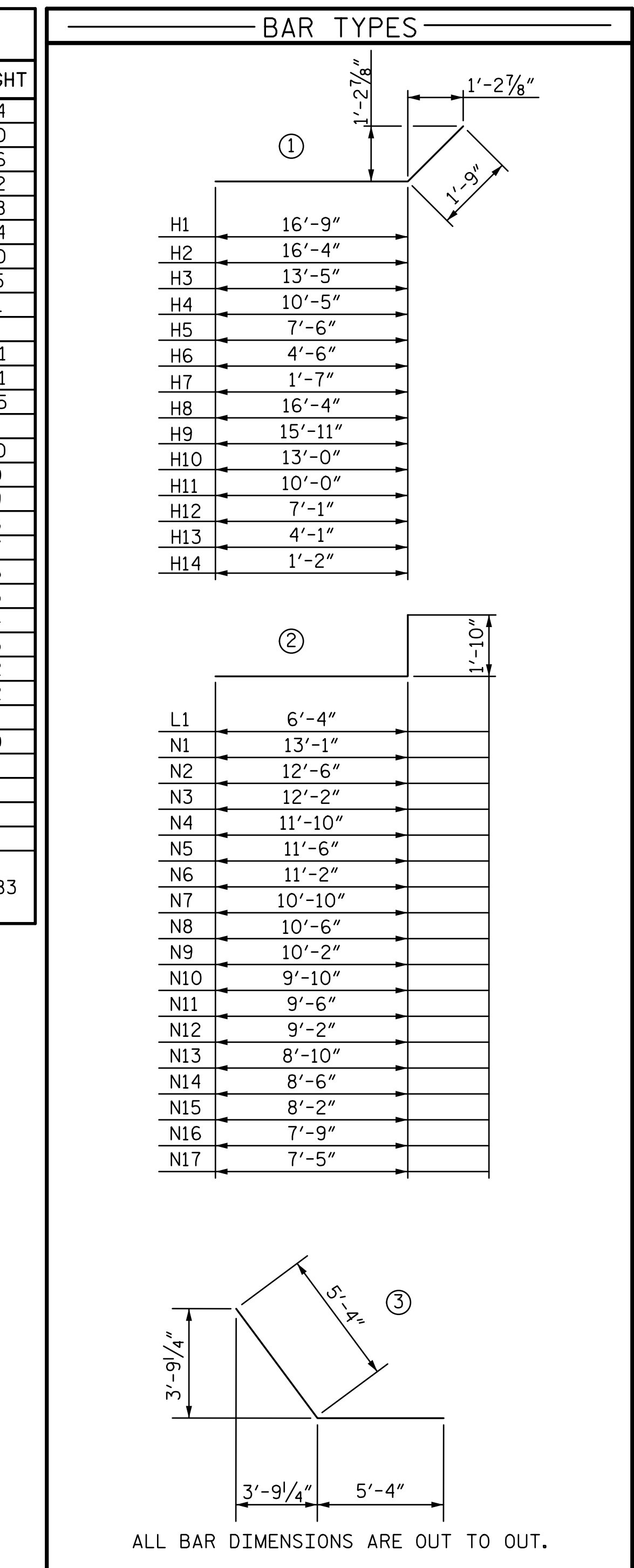


SECTION B-B

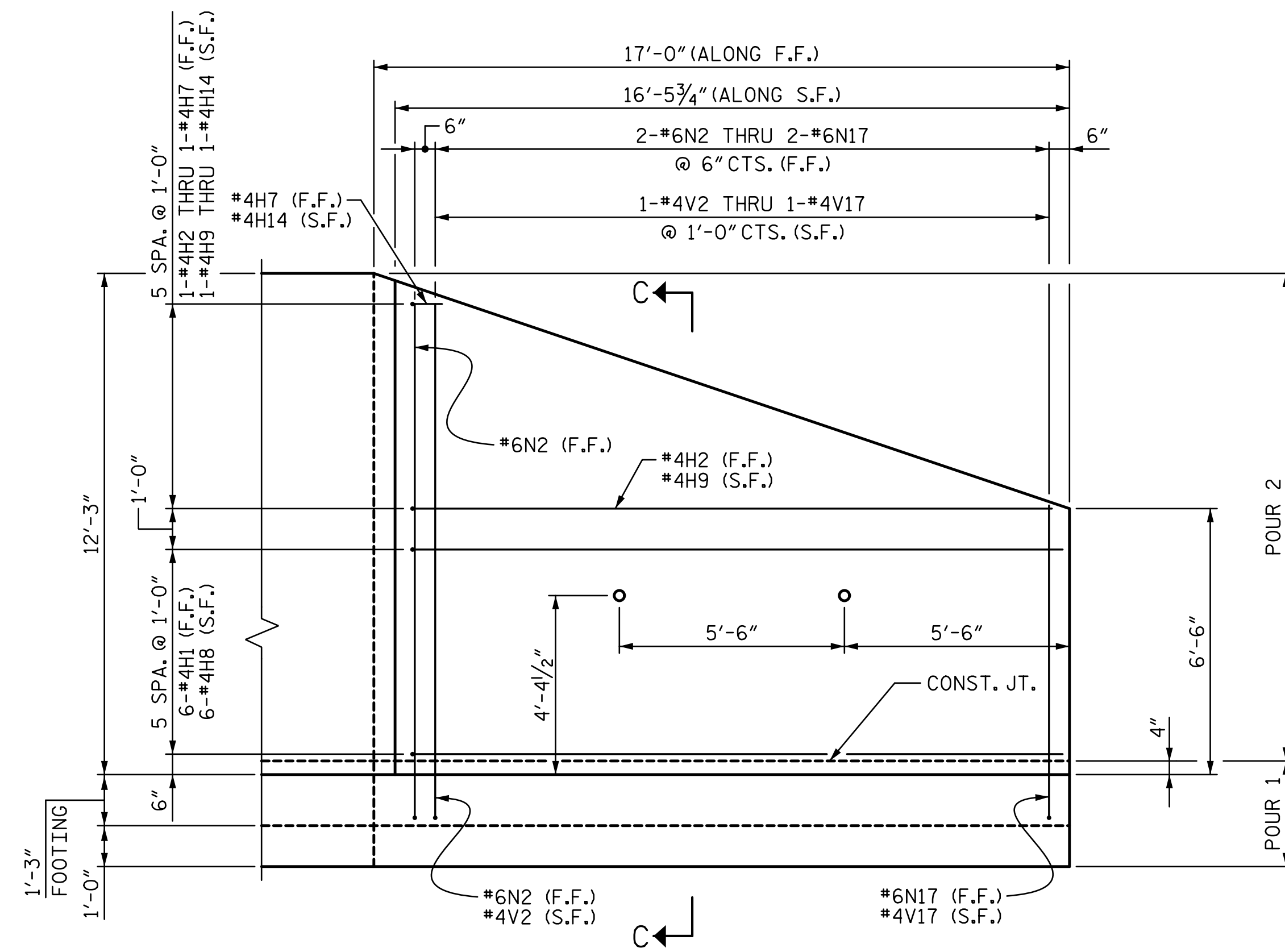
(BARS AT PIPE SHALL BE SHIFTED OR CUT, AS NECESSARY, TO WITHIN 2" CLEAR DISTANCE OF PIPE)

REINFORCING BAR SCHEDULE											
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#4	STR	8'-10"	94	N9	8	#6	②	12'-0"	144
B2	16	#4	STR	7'-5"	79	N10	8	#6	②	11'-8"	140
						N11	8	#6	②	11'-4"	136
G1	2	#7	STR	29'-8"	121	N12	8	#6	②	11'-0"	132
G2	2	#7	STR	28'-7"	117	N13	8	#6	②	10'-8"	128
						N14	8	#6	②	10'-4"	124
H1	24	#4	①	18'-6"	297	N15	8	#6	②	10'-0"	120
H2	4	#4	①	18'-1"	48	N16	8	#6	②	9'-7"	115
H3	4	#4	①	15'-2"	41	N17	8	#6	②	9'-3"	111
H4	4	#4	①	12'-2"	33						
H5	4	#4	①	9'-3"	25	T1	40	#4	STR	15'-0"	401
H6	4	#4	①	6'-3"	17	T2	20	#4	STR	27'-0"	361
H7	4	#4	①	3'-4"	9	T3	40	#4	③	10'-8"	285
H8	24	#4	①	18'-1"	290						
H9	4	#4	①	17'-8"	47	V1	18	#4	STR	11'-8"	140
H10	4	#4	①	14'-9"	39	V2	4	#4	STR	11'-1"	30
H11	4	#4	①	11'-9"	31	V3	4	#4	STR	10'-9"	29
H12	4	#4	①	8'-10"	24	V4	4	#4	STR	10'-5"	28
H13	4	#4	①	5'-10"	16	V5	4	#4	STR	10'-1"	27
H14	4	#4	①	2'-11"	8	V6	4	#4	STR	9'-9"	26
						V7	4	#4	STR	9'-5"	25
L1	122	#7	②	8'-4"	2,078	V8	4	#4	STR	9'-1"	24
L2	8	#7	STR	4'-3"	69	V9	4	#4	STR	8'-9"	23
L3	8	#7	STR	5'-6"	90	V10	4	#4	STR	8'-5"	22
L4	4	#7	STR	6'-9"	55	V11	4	#4	STR	8'-1"	22
						V12	4	#4	STR	7'-9"	21
N1	30	#6	②	14'-11"	672	V13	4	#4	STR	7'-5"	20
N2	8	#6	②	14'-4"	172	V14	4	#4	STR	7'-1"	19
N3	8	#6	②	14'-0"	168	V15	4	#4	STR	6'-9"	18
N4	8	#6	②	13'-8"	164	V16	4	#4	STR	6'-4"	17
N5	8	#6	②	13'-4"	160	V17	4	#4	STR	6'-0"	16
N6	8	#6	②	13'-0"	156						
N7	8	#6	②	12'-8"	152						
N8	8	#6	②	12'-4"	148						
TOTAL REINFORCING STEEL (LBS.)										8,083	

QUANTITIES PER HEADWALL	
	CLASS A CONCRETE (CU. YDS.)
POUR 1	25.1
POUR 2	22.3
TOTAL	47.4



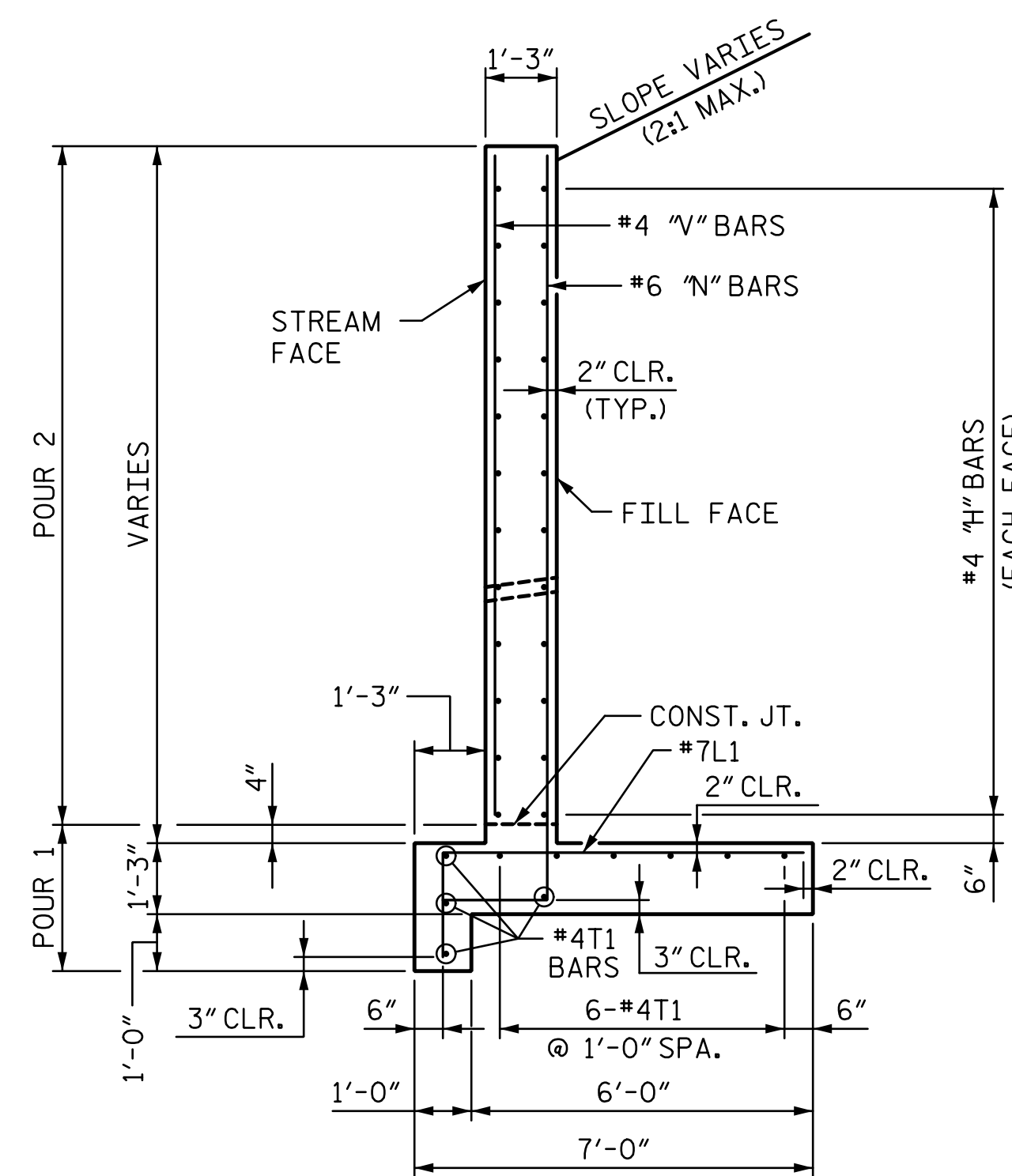
ALL BAR DIMENSIONS ARE OUT TO OUT.



ELEVATION W1

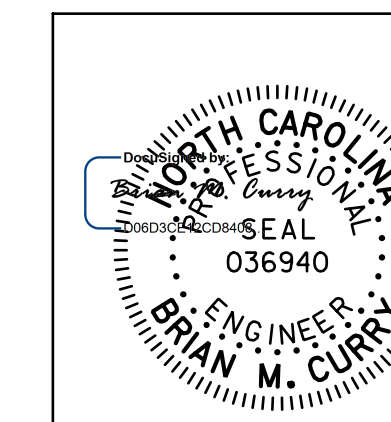
W2 SHOWN, W1 SIMILAR (FOOTING REINFORCEMENT NOT SHOWN FOR CLARITY)

S.F. = STREAM FACE  
F.F. = FILL FACE



SECTION C-C

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11/16/2016



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ANSON COUNTY  
STATION: 12+57.50 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
DOUBLE 120" DIA. PIPE  
CONCRETE HEADWALL  
90° SKEW

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C-3  
TOTAL SHEETS  
3

## 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 2012 "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