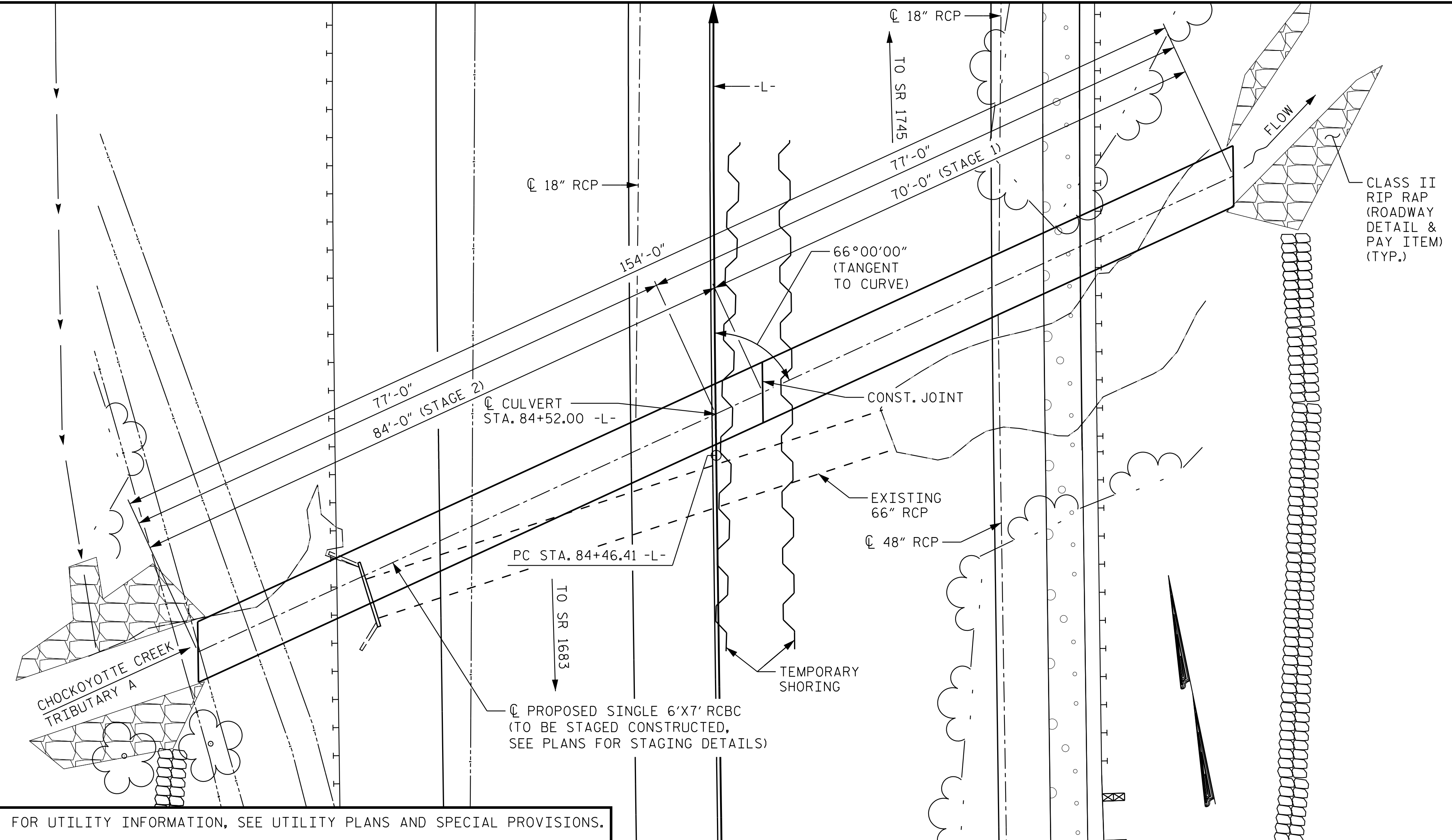


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BENCHMARK: #4: STA. 88+99.77 -L-, 90 FT. RIGHT, (BENCHTIE IN 12" PINE) EL. 114.93'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- DESIGN FILL = 6.68 FEET.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN STAGE I CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS, CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL AND SILL.
- CONCRETE IN STAGE II CULVERT TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS, CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL AND SILL.
- 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 18" Ø R.C. PIPES AND 48" Ø R.C. PIPE THROUGH THE SIDEWALLS OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPES.
- AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 66" Ø REINFORCED CONCRETE PIPE LOCATED AT THE SAME LOCATION AS THE PROPOSED CULVERT SHALL BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE STRUCTURE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- 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 LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- TRAFFIC ON NC 125 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN ON THESE PLANS AND/OR AS DIRECTED BY THE ENGINEER.
- TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- 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 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.
- THIS STRUCTURE IS LOCATED IN SEISMIC ZONE 1.
- SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING.
- EXCAVATE AT LEAST 1 FOOT BELOW THE CULVERT AND FOOTINGS, AND REPLACE THE EXCAVATED MATERIAL WITH CLASS VI SELECT MATERIAL MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.
- BACKFILL WING WALLS WITH CLASS II OR BETTER SELECT MATERIAL MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.

HYDRAULIC DATA

DESIGN DISCHARGE ----- 360 C.F.S.
 FREQUENCY OF DESIGN FLOOD ----- 50 YR.
 DESIGN HIGH WATER ELEVATION ----- 110.3 FT.
 DRAINAGE AREA ----- 0.87 SQ. MI.
 BASE DISCHARGE (Q100) ----- 400 C.F.S.
 FEMA 100 ----- 348 C.F.S.
 BASE HIGH WATER ELEVATION ----- 110.9 FT.
 FEMA 100 ----- 110.2 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ----- 550 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD ---> 500 YR.
 OVERTOPPING FLOOD ELEVATION ----- 114.31 FT.

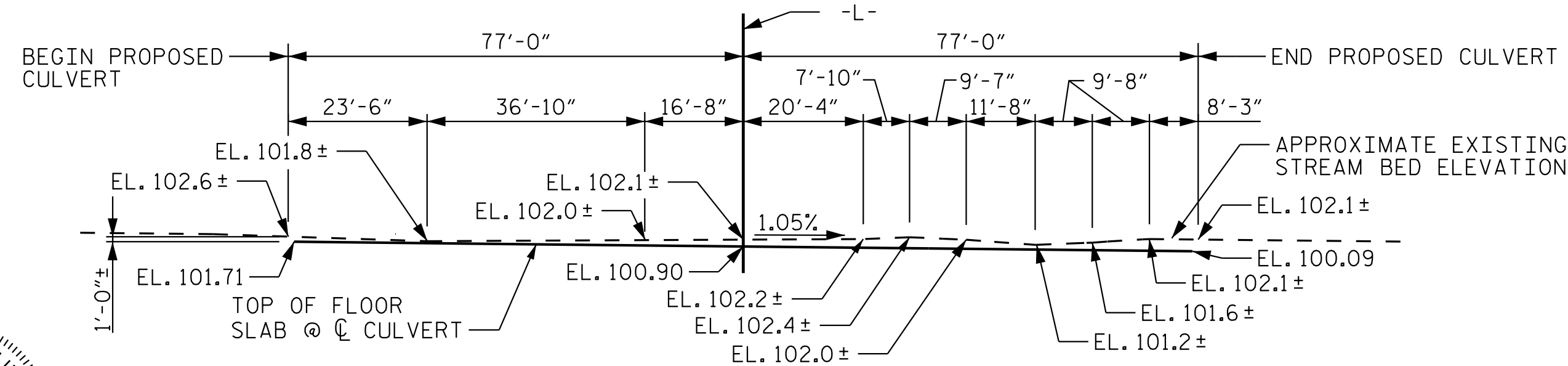
ROADWAY DATA

GRADE POINT ELEV. @ STA 84+52.00 -L- = 113.70'
 BED ELEVATION @ STA 84+52.00 -L- = 100.90'
 ROADWAY SLOPES 3 : 1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
STAGE 1	72.2 C.Y.
STAGE 2	81.8 C.Y.
TOTAL	154.0 C.Y.
REINFORCING STEEL	
STAGE 1	8,261 LBS.
STAGE 2	9,187 LBS.
TOTAL	17,448 LBS.
REMOVAL OF EXISTING STRUCTURES	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	
STAGE 1	67 TONS
STAGE 2	56 TONS
TOTAL	123 TONS

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.



PROFILE ALONG CULVERT

PROJECT NO. U-5725
 HALIFAX COUNTY
 STATION: 84+52.00 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			8

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SEAL
 040769
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 ANDREW L. PHILLIPS
 5/21/2018

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DRAWN BY: P.G. ROBBS DATE: 5/18
 CHECKED BY: C.T. POOLE DATE: 5/18
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 5/18

LOAD FACTORS: _____

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

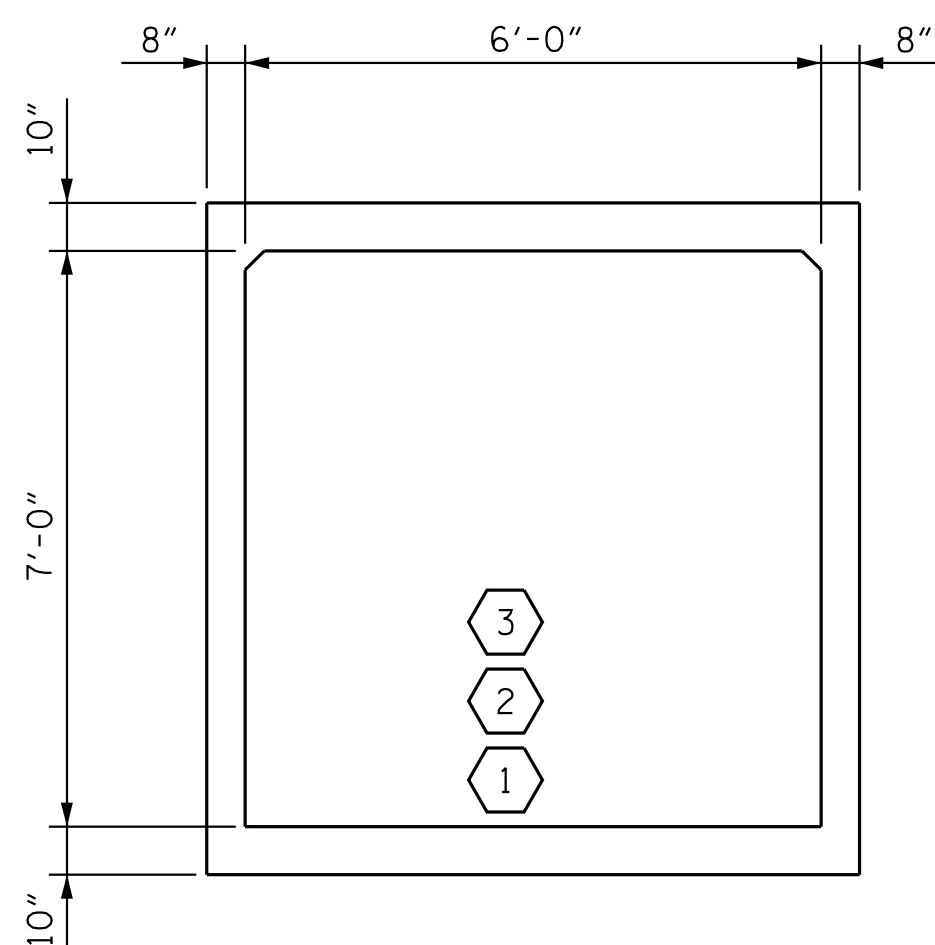
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.25	--	1.75	1.25	1	BOTTOM SLAB	3.67	3.55	1	BOTTOM SLAB	0.83		
	HL-93 (OPERATING)	N/A	.	1.62	--	1.35	1.62	1	BOTTOM SLAB	3.67	4.61	1	BOTTOM SLAB	0.83		
	HS-20 (INVENTORY)	36.000	②	1.40	50.40	1.75	1.40	1	BOTTOM SLAB	3.67	3.99	1	BOTTOM SLAB	0.83		
	HS-20 (OPERATING)	36.000	.	1.82	65.52	1.35	1.82	1	BOTTOM SLAB	3.67	5.17	1	BOTTOM SLAB	0.83		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	.	2.28	30.78	1.40	2.28	1	BOT CORNER WALL	0.33	7.26	1	BOTTOM SLAB	0.83	
		SNGARBS2	20.000	.	2.20	44.00	1.40	2.20	1	BOT CORNER WALL	0.33	6.79	1	BOTTOM SLAB	0.83	
		SNAGRIS2	22.000	.	2.28	50.16	1.40	2.28	1	BOT CORNER WALL	0.33	7.26	1	BOTTOM SLAB	0.83	
		SNCOTTS3	27.250	③	1.55	42.24	1.40	1.55	1	BOTTOM SLAB	3.67	4.45	1	BOTTOM SLAB	0.83	
		SNAGGRS4	34.925	.	1.66	57.98	1.40	1.66	1	BOTTOM SLAB	3.67	4.70	1	BOTTOM SLAB	0.83	
		SNS5A	35.550	.	1.67	59.37	1.40	1.67	1	BOTTOM SLAB	3.67	4.73	1	BOTTOM SLAB	0.83	
		SNS6A	39.950	.	1.67	66.72	1.40	1.67	1	BOTTOM SLAB	3.67	4.73	1	BOTTOM SLAB	0.83	
		SNS7B	42.000	.	1.67	70.14	1.40	1.67	1	BOTTOM SLAB	3.67	4.73	1	BOTTOM SLAB	0.83	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	.	2.27	74.91	1.40	2.27	1	BOT CORNER WALL	0.33	7.25	1	BOTTOM SLAB	0.83	
		TNT4A	33.075	.	1.84	60.86	1.40	1.84	1	BOTTOM SLAB	3.67	5.30	1	BOTTOM SLAB	0.83	
		TNT6A	41.600	.	1.68	69.89	1.40	1.68	1	BOTTOM SLAB	3.67	4.75	1	BOTTOM SLAB	0.83	
		TNT7A	42.000	.	1.77	74.34	1.40	1.77	1	BOTTOM SLAB	3.67	5.02	1	BOTTOM SLAB	0.83	
		TNT7B	42.000	.	1.67	70.14	1.40	1.67	1	BOTTOM SLAB	3.67	4.73	1	BOTTOM SLAB	0.83	
		TNAGRIT4	43.000	.	1.84	79.12	1.40	1.84	1	BOTTOM SLAB	3.67	5.30	1	BOTTOM SLAB	0.83	
TNAGT5A	45.000	.	1.84	82.80	1.40	1.84	1	BOTTOM SLAB	3.67	5.30	1	BOTTOM SLAB	0.83			
TNAGT5B	45.000	.	1.84	82.80	1.40	1.84	1	BOTTOM SLAB	3.67	5.30	1	BOTTOM SLAB	0.83			

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.

#	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
(LOOKING DOWNSTREAM)

PROJECT NO. U-5725
HALIFAX COUNTY
STATION: 84+52.00 -L-

SHEET 2 OF 8



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS**
(NON-INTERSTATE TRAFFIC)

REVISIONS

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

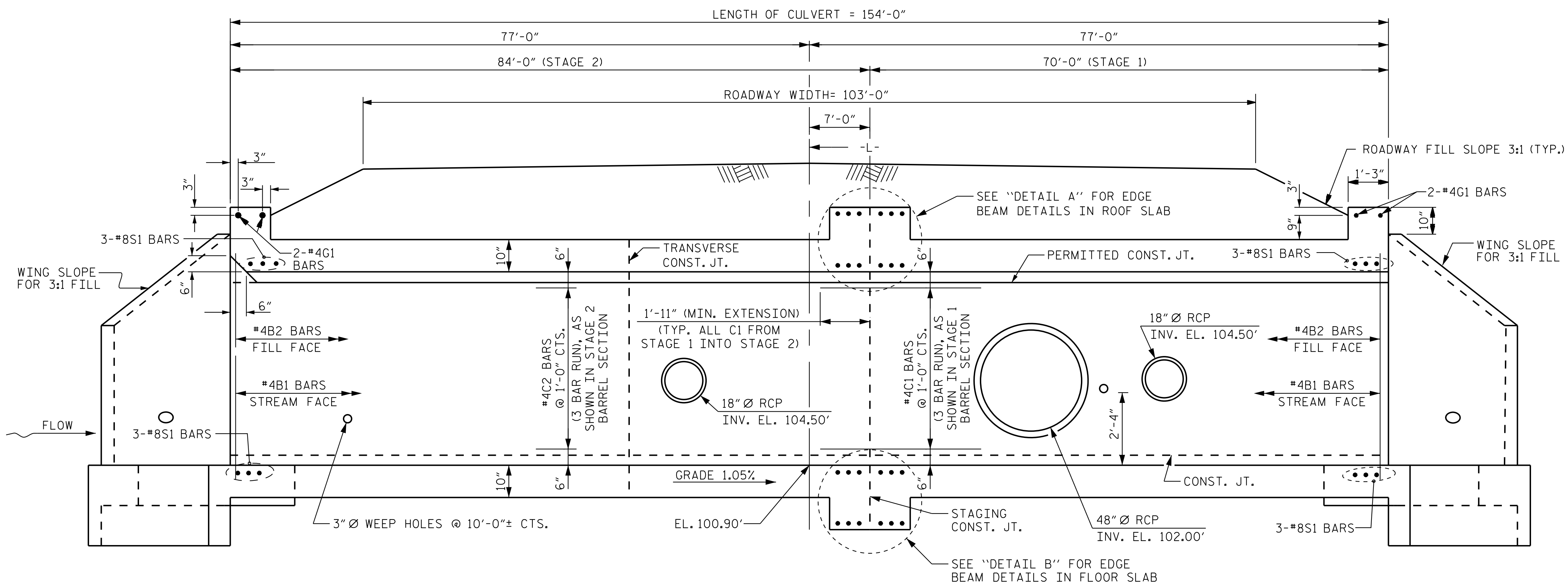
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C-2
TOTAL SHEETS
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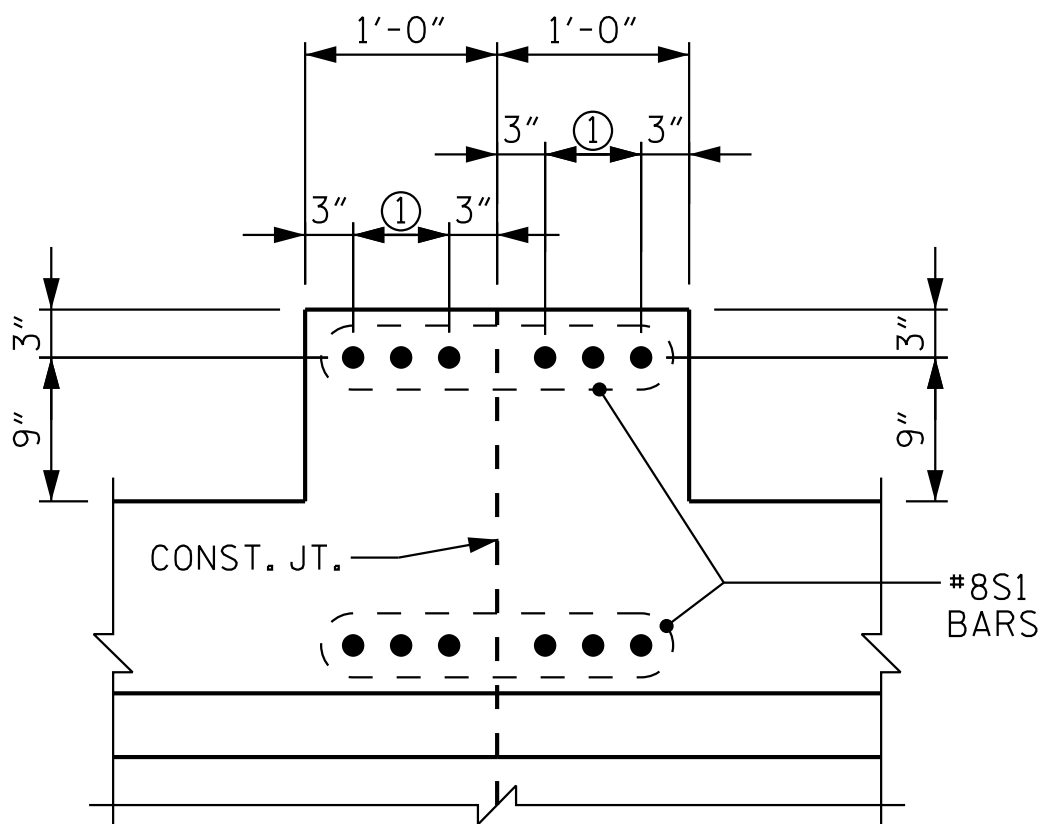
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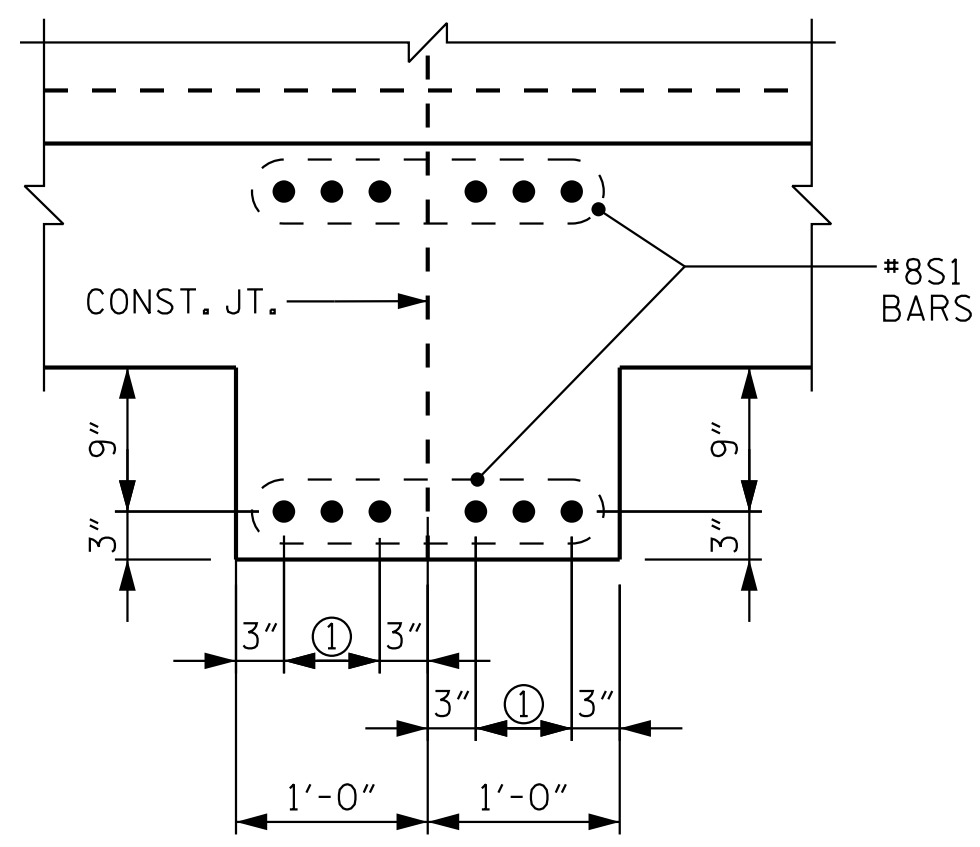
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DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 5/18



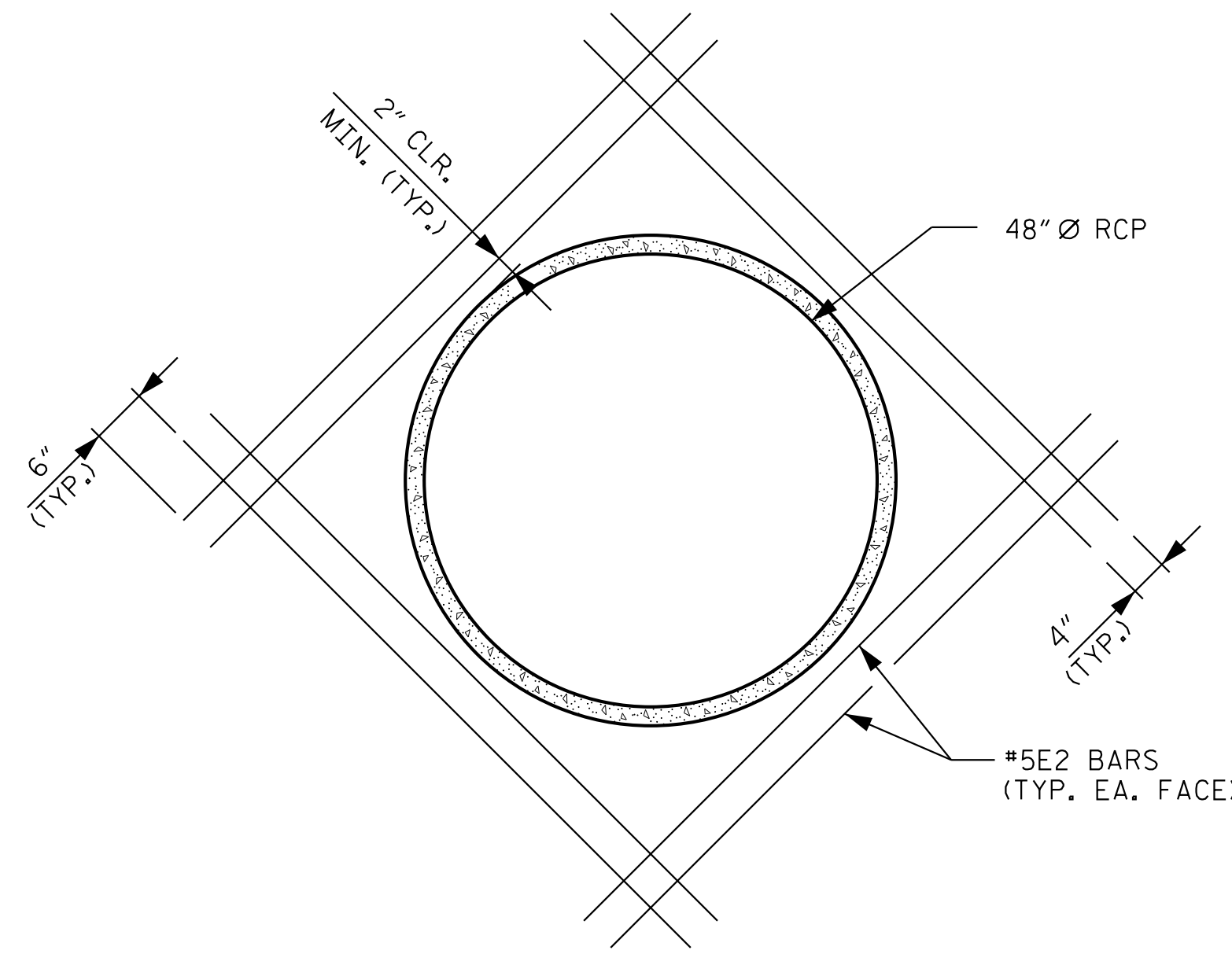
CULVERT SECTION NORMAL TO ROADWAY
 FOR APPROXIMATE PLAN VIEW LOCATIONS OF R.C. PIPES, SEE SHEET C1.



DETAIL A
 ① 2 SPA. @ 3"

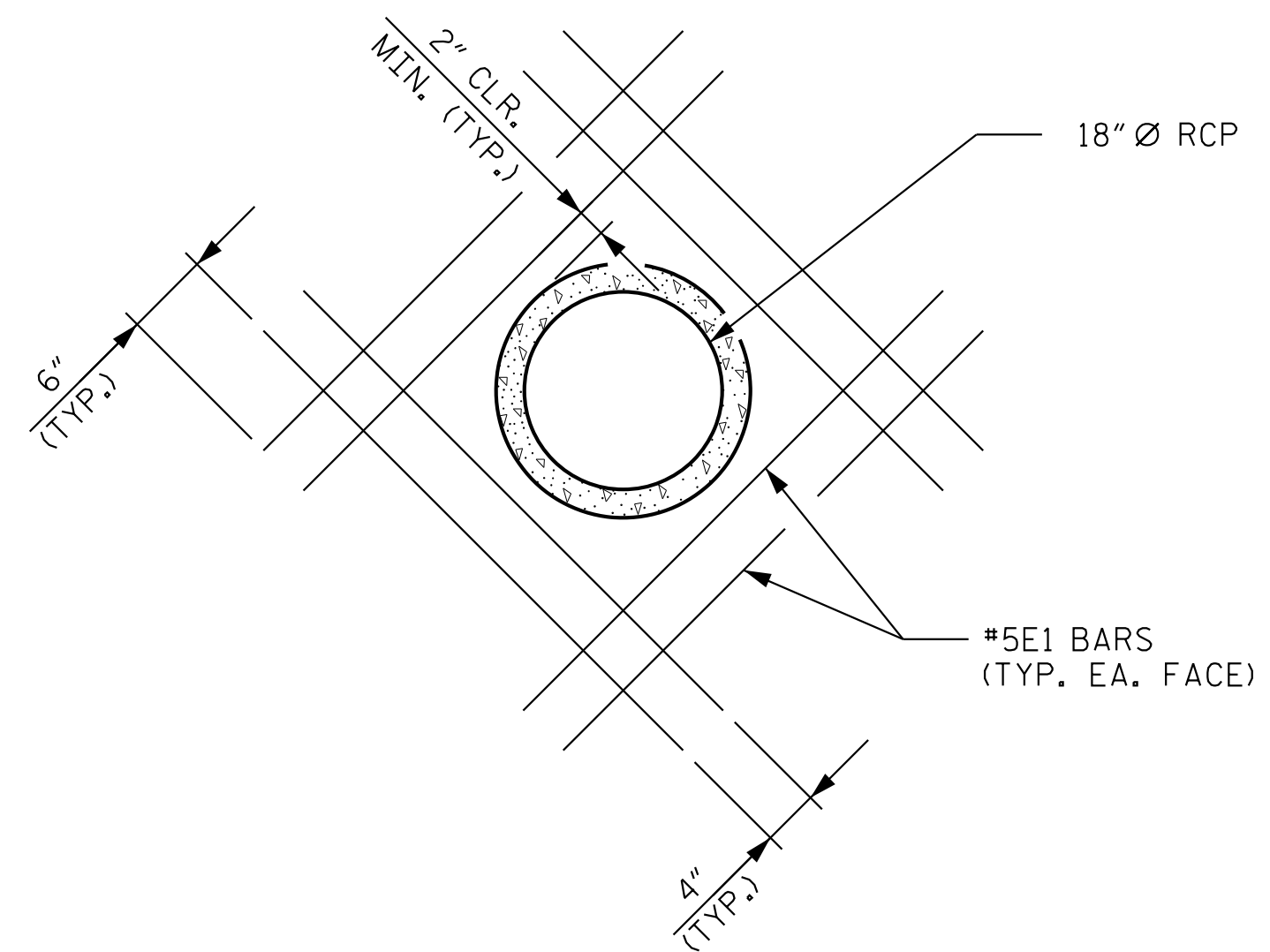


DETAIL B
 ① 2 SPA. @ 3"



DETAIL OF REINFORCING AROUND 48" DIA. RCP

E2 BARS MAYBE SHIFTED SLIGHTLY AS NECESSARY TO MAINTAIN CLEARANCES AND AVOID "A" BARS.



DETAIL OF REINFORCING AROUND 18" DIA. RCP

PROJECT NO. U-5725
 HALIFAX COUNTY
 STATION: 84+52.00 -L-

SHEET 3 OF 8
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW



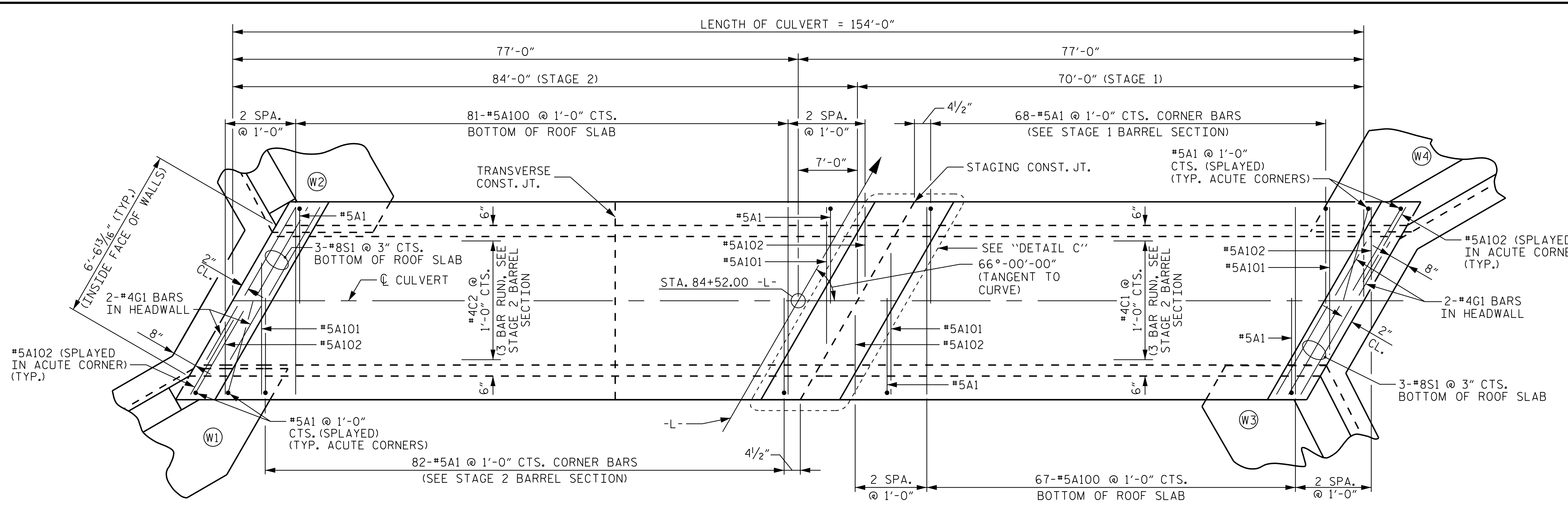
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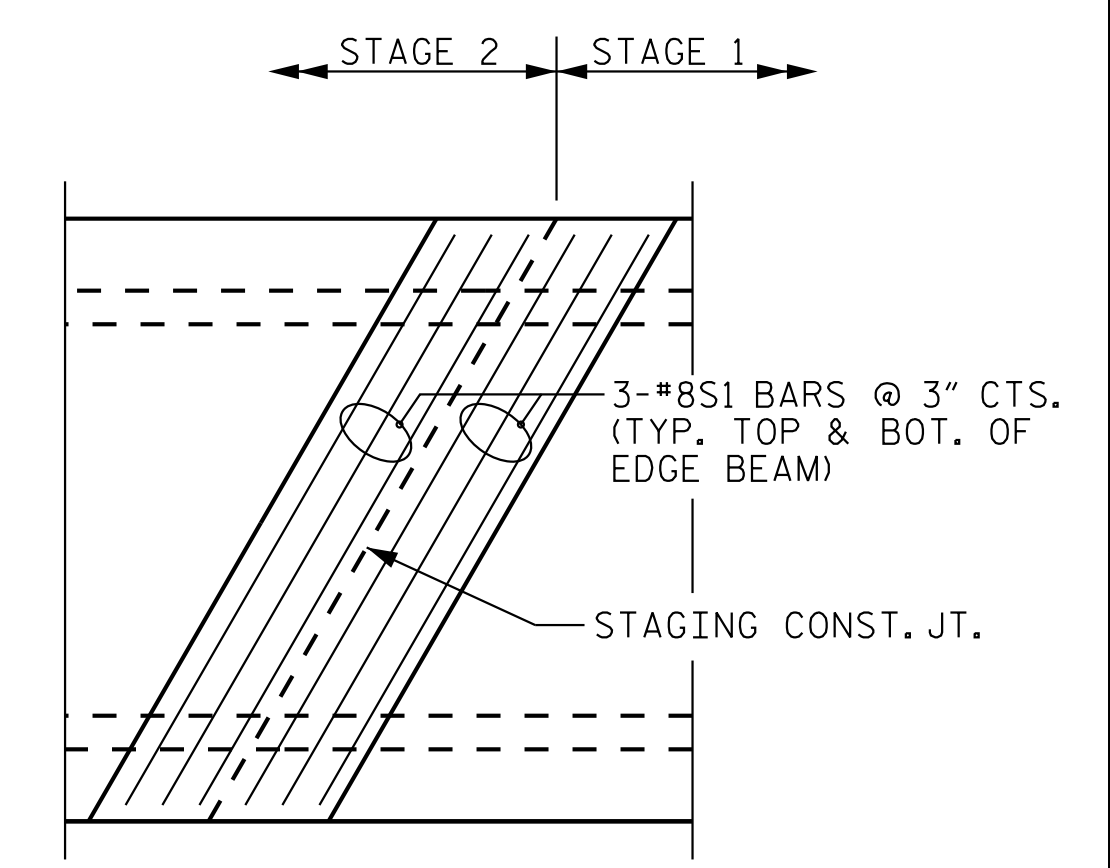
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DESIGN ENGINEER OF RECORD: A.L. PHILLIPS	DATE: 5/18

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1			3			TOTAL SHEETS
2			4			8

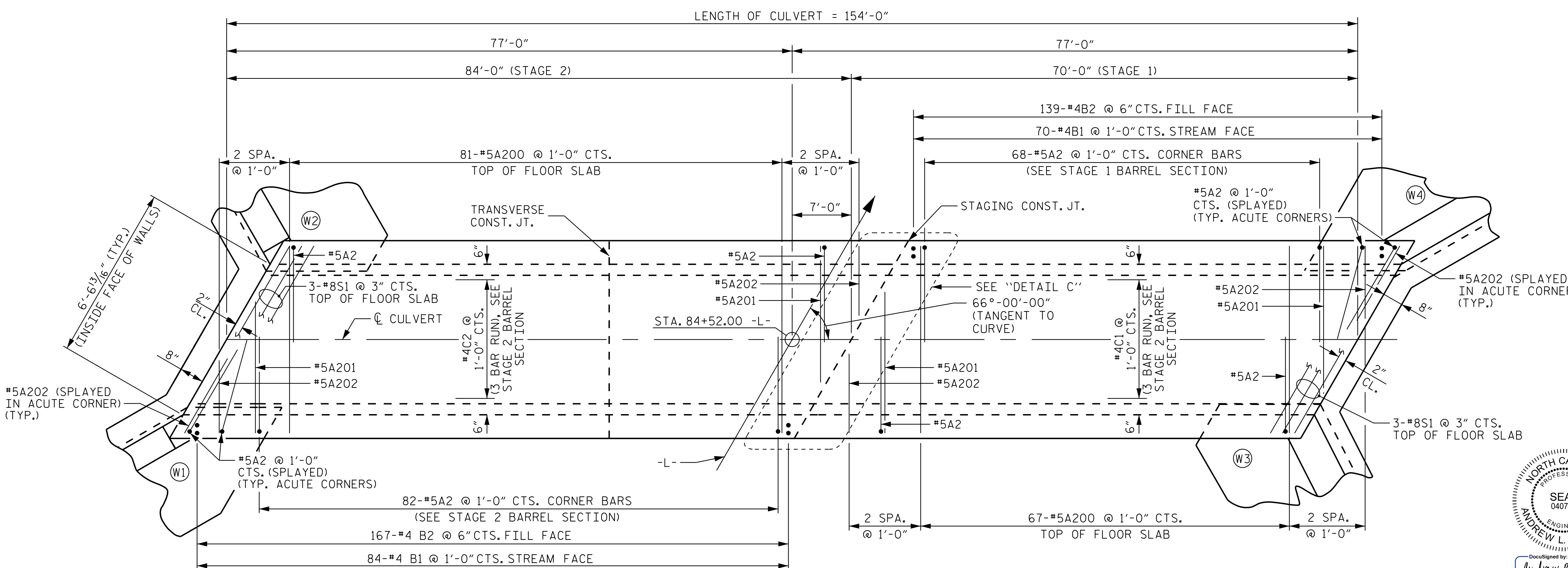
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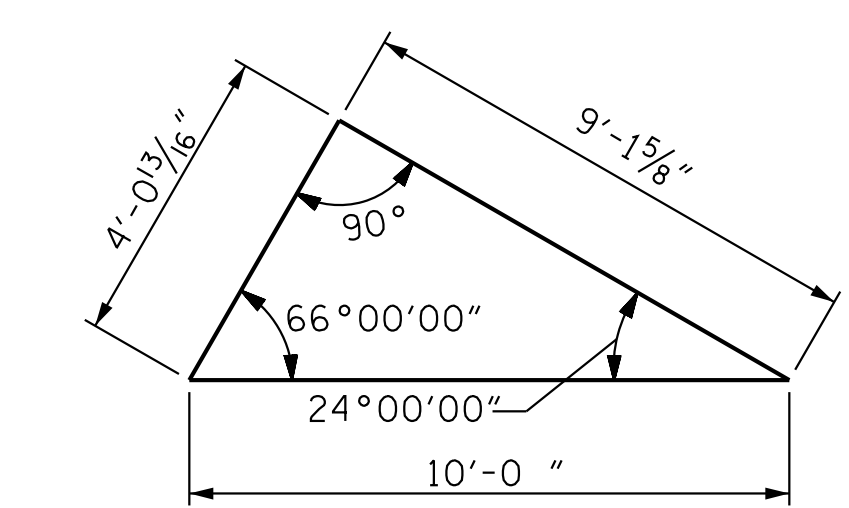
PLAN - ROOF SLAB



DETAIL C
ROOF SLAB EDGE BEAM SHOWN,
FLOOR SLAB SIMILAR



PLAN - FLOOR SLAB



SKEW TRIANGLE

PROJECT NO. U-5725
HALIFAX COUNTY
 STATION: 84+52.00 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW



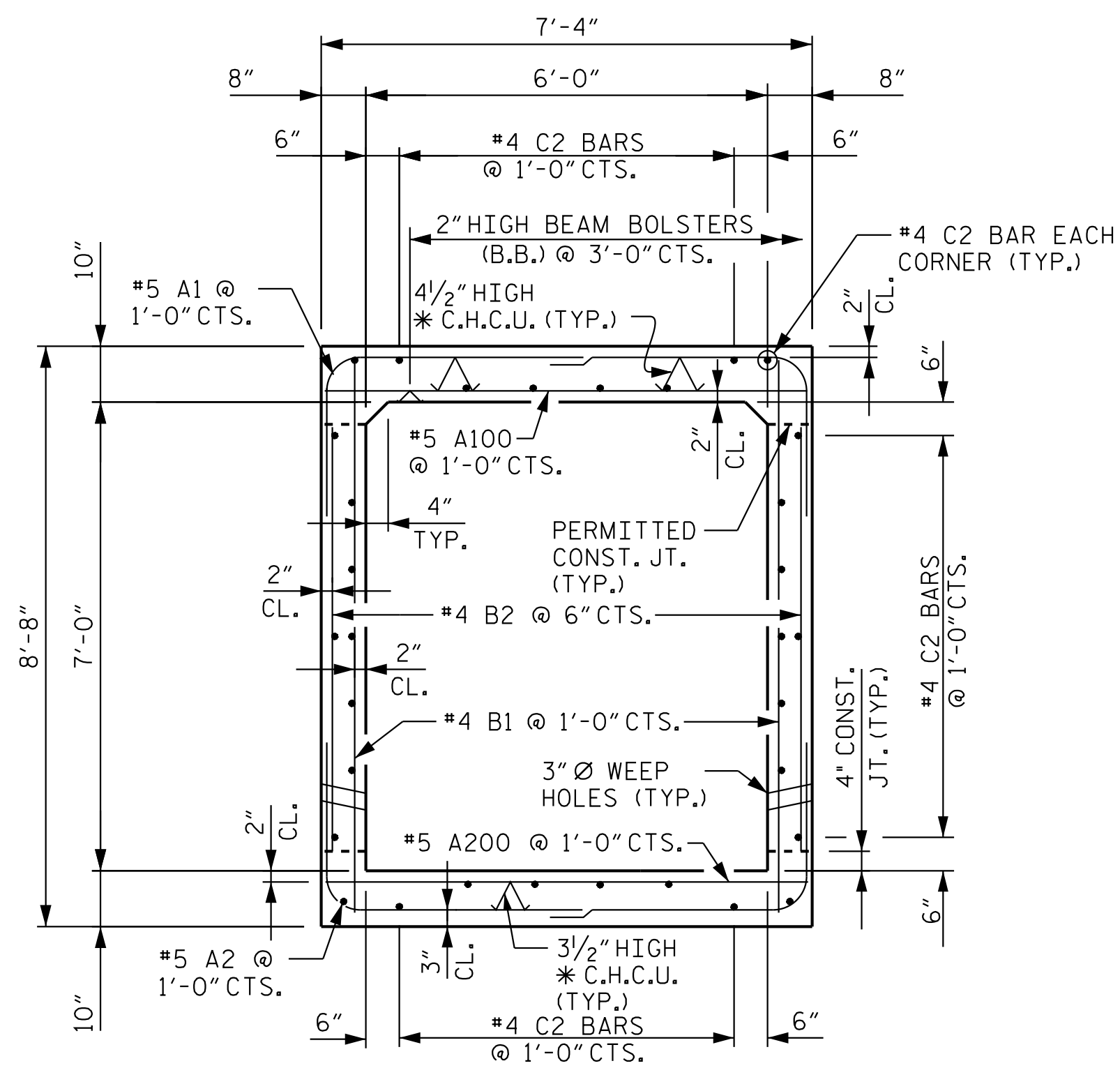
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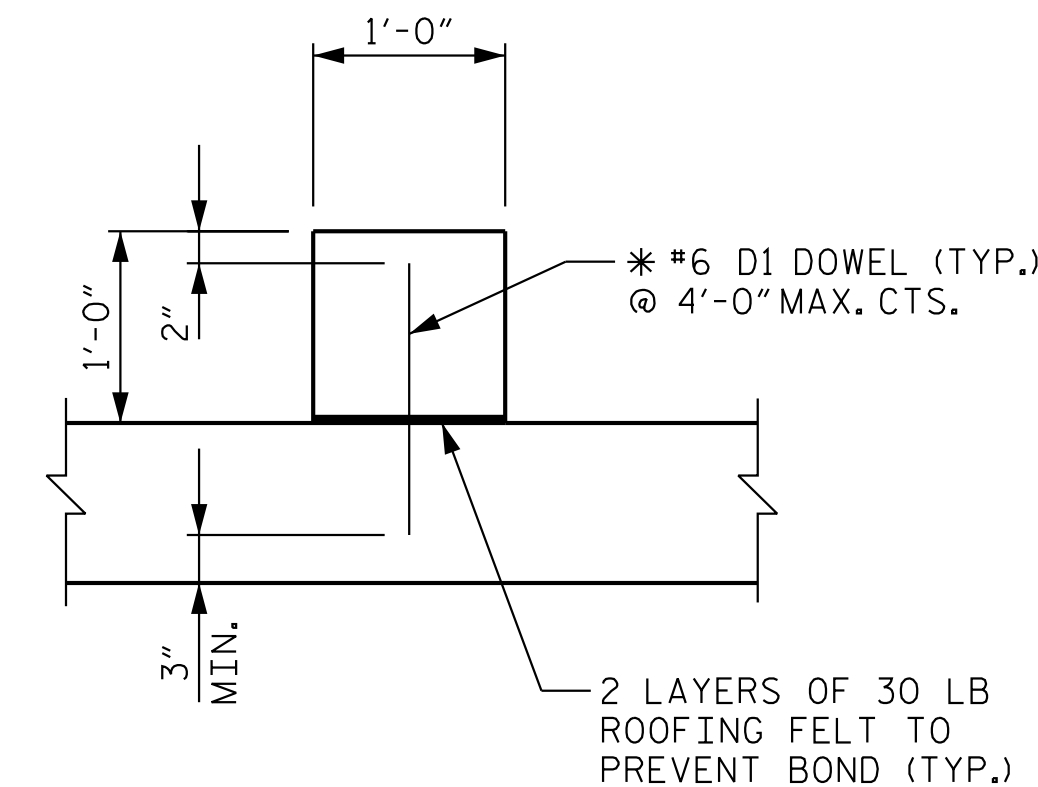
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2			4			8

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STAGE 2 RIGHT ANGLE SECTIONS OF BARREL

* ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.
THERE ARE 32 C2 BARS (3 BAR RUN) IN SECTION OF BARREL

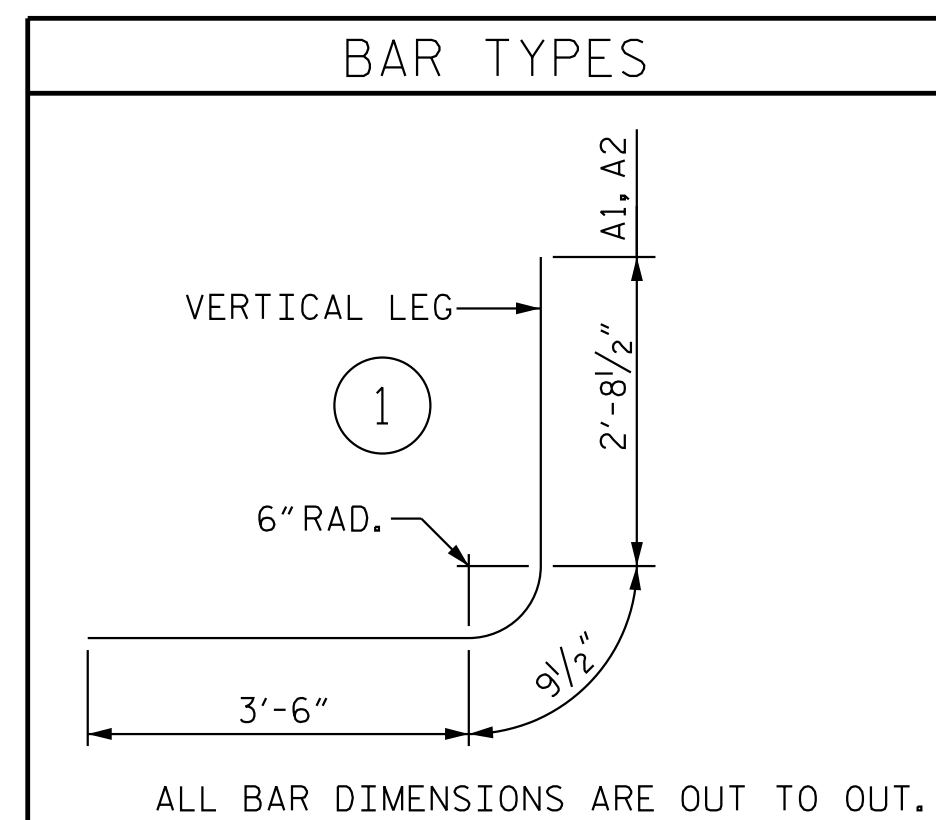


**SECTION A-A
CULVERT SILL DETAIL**

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

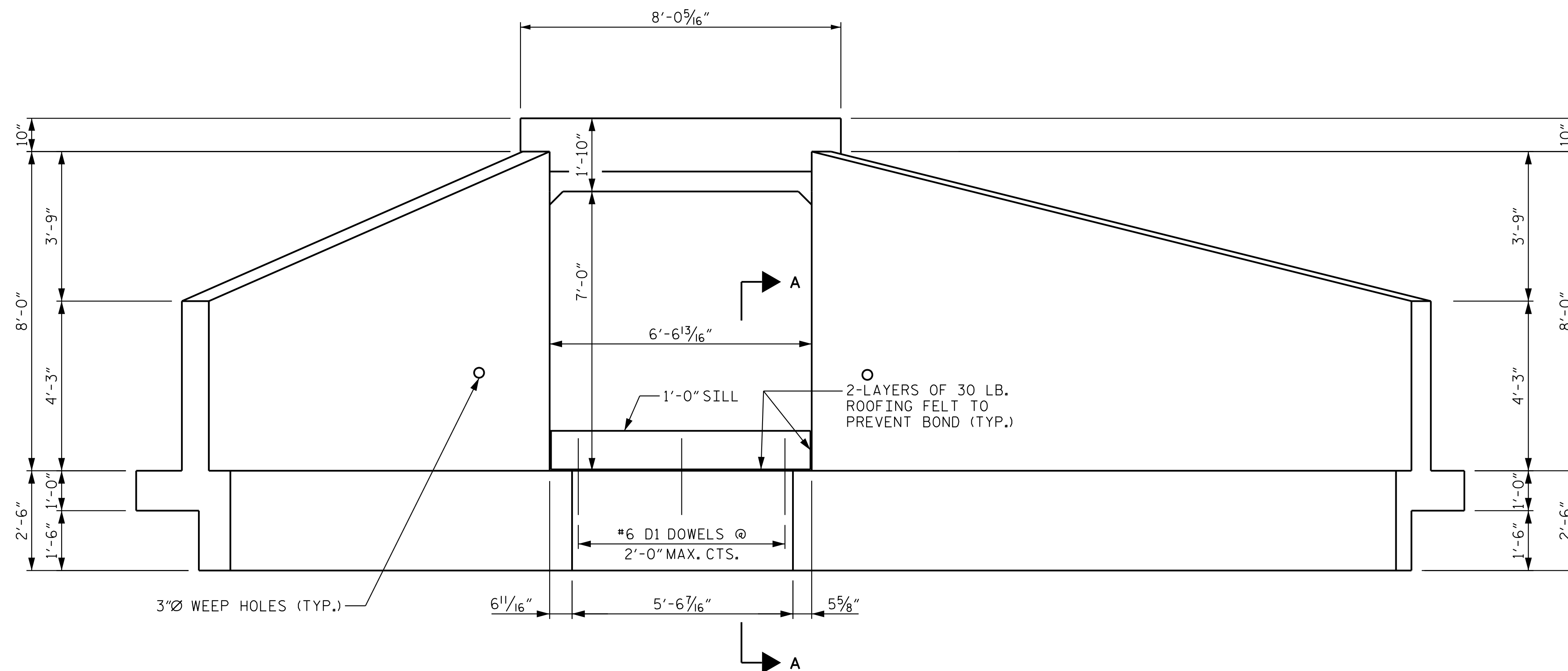
STAGE 2 QUANTITIES	
CLASS A CONCRETE	
BARREL @ 0.802 CY/FT	67.4 CY
WINGS, ETC.	13.6 CY
SILL	0.2 CY
EDGE BEAMS	0.6 CY
TOTAL	81.8 CY
REINFORCING STEEL	
BARREL, SILLS, & EDGE BEAMS	8,360 LBS
WINGS, ETC.	827 LBS
TOTAL	9,187 LBS

BILL OF MATERIAL STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	168	#5	1	7'-1"	1241
A2	168	#5	1	7'-1"	1241
A100	81	#5	STR	7'-0"	591
A101	2	#5	STR	5'-4"	11
A102	3	#5	STR	3'-1"	10
A200	81	#5	STR	7'-0"	591
A201	2	#5	STR	5'-4"	11
A202	3	#5	STR	3'-1"	10
B1	168	#4	STR	8'-3"	926
B2	334	#4	STR	6'-4"	1413
C2	96	#4	STR	29'-2"	1870
D1	3	#6	STR	1'-5"	6
E1	16	#5	STR	3'-11"	65
G1	2	#4	STR	7'-7"	10
S1	18	#8	STR	7'-7"	364
STAGE 2 REINFORCING STEEL					8,360 LBS



SPLICE LENGTHS

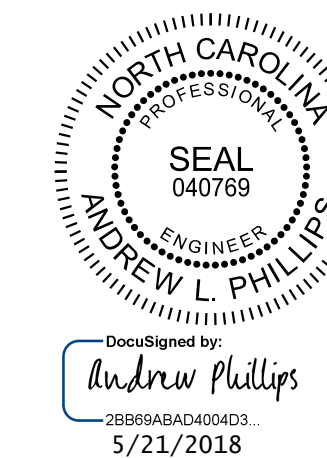
BAR	SIZE	LENGTH
B1	#4	1'-11"
C2	#4	1'-11"



INLET END ELEVATION NORMAL TO SKEW

PROJECT NO. U-5725
HALIFAX COUNTY
STATION: 84+52.00 -L-

SHEET 5 OF 8



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

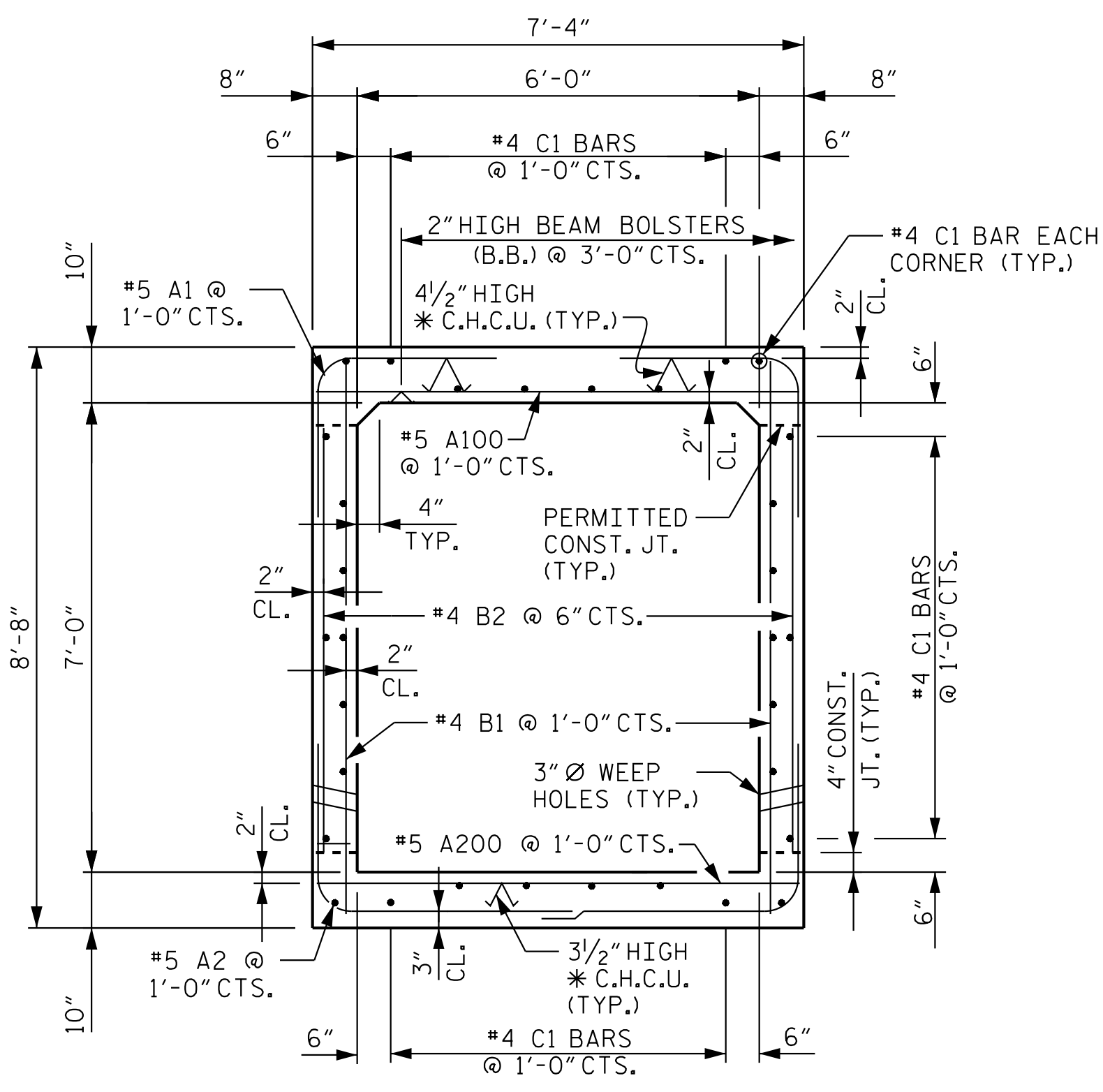
SINGLE 6 FT. X 7 FT.
CONCRETE BOX CULVERT
66° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			8

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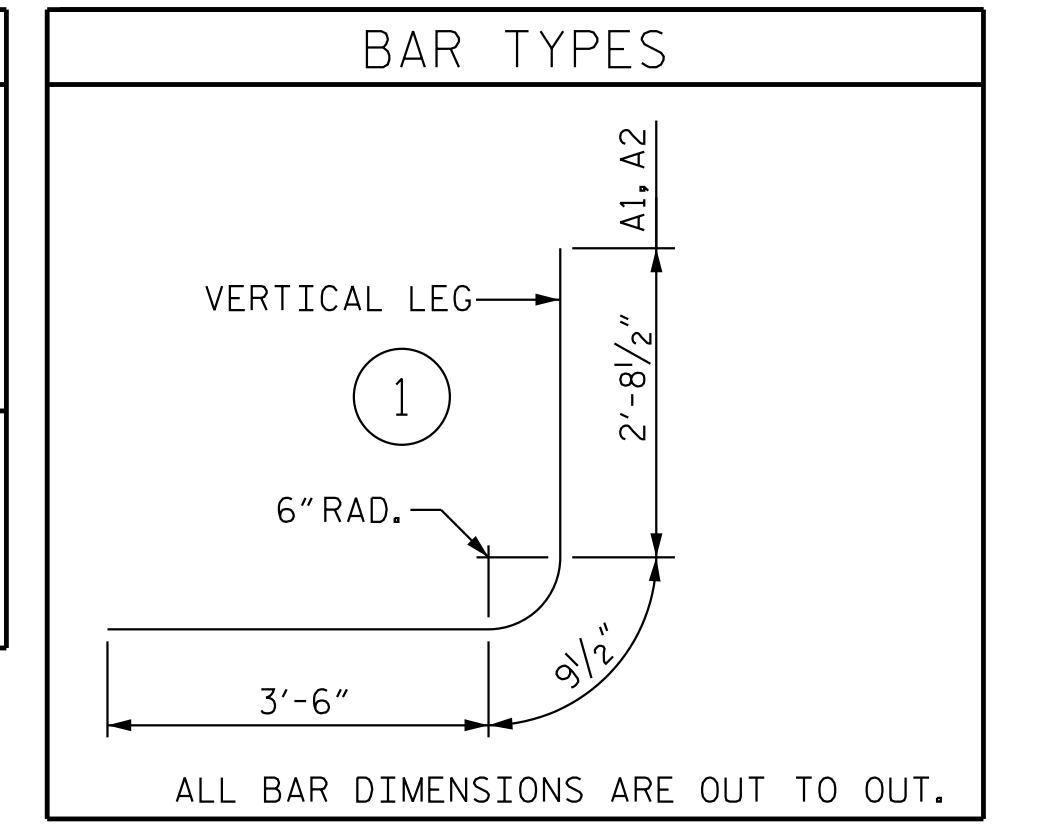
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DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 5/18



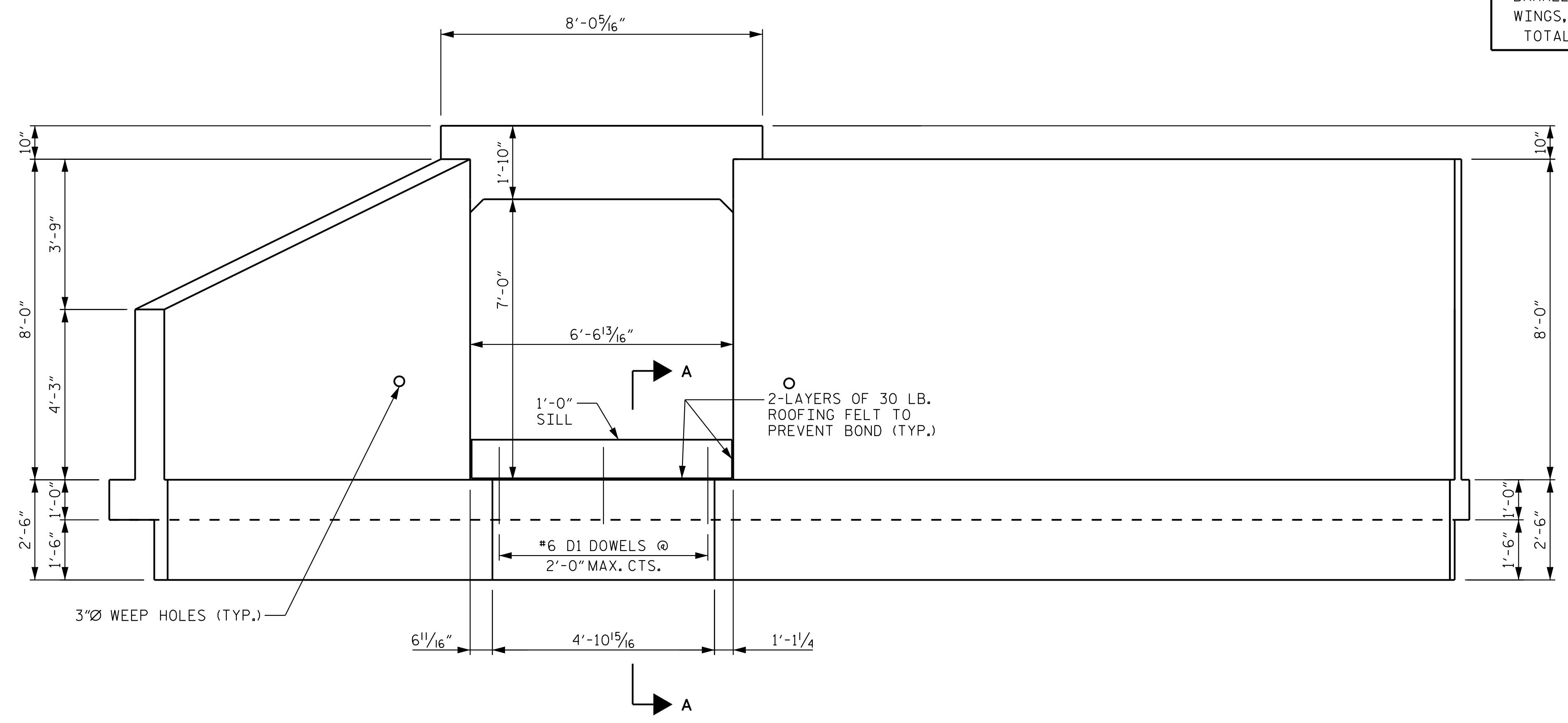
STAGE 1 RIGHT ANGLE SECTIONS OF BARREL
 * ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.
 THERE ARE 32 C1 BARS (3 BAR RUN) IN SECTION OF BARREL

BILL OF MATERIAL STAGE 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	140	#5	1	7'-1"	1034
A2	140	#5	1	7'-1"	1034
A100	67	#5	STR	7'-0"	489
A101	2	#5	STR	5'-4"	11
A102	3	#5	STR	3'-1"	10
A200	67	#5	STR	7'-0"	489
A201	2	#5	STR	5'-4"	11
A202	3	#5	STR	3'-1"	10
B1	140	#4	STR	8'-3"	772
B2	278	#4	STR	6'-4"	1176
C1	96	#4	STR	25'-3"	1619
D1	3	#6	STR	1'-5"	6
E1	16	#5	STR	3'-11"	65
E2	16	#5	STR	6'-10"	114
G1	2	#4	STR	7'-7"	10
S1	18	#8	STR	7'-7"	364
STAGE 1 REINFORCING STEEL					7,214 LBS

STAGE 1 QUANTITIES		
CLASS A CONCRETE		
BARREL 0.802 X CY/FT		56.2 CY
WINGS, ETC.		15.2 CY
SILL		0.2 CY
EDGE BEAMS		0.6 CY
TOTAL		72.2 CY
REINFORCING STEEL		
BARREL, SILLS, & EDGE BEAMS	7,214 LBS	
WINGS, ETC.	1,047 LBS	
TOTAL	8,261 LBS	

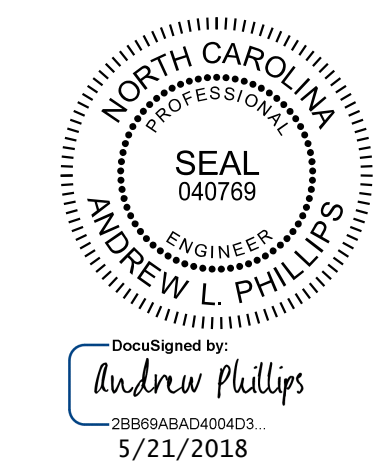


SPLICE LENGTHS		
BAR	SIZE	LENGTH
B1	#4	1'-11"
C1	#4	1'-11"



OUTLET END ELEVATION NORMAL TO SKEW

PROJECT NO. U-5725
HALIFAX COUNTY
 STATION: 84+52.00 -L-
 SHEET 6 OF 8



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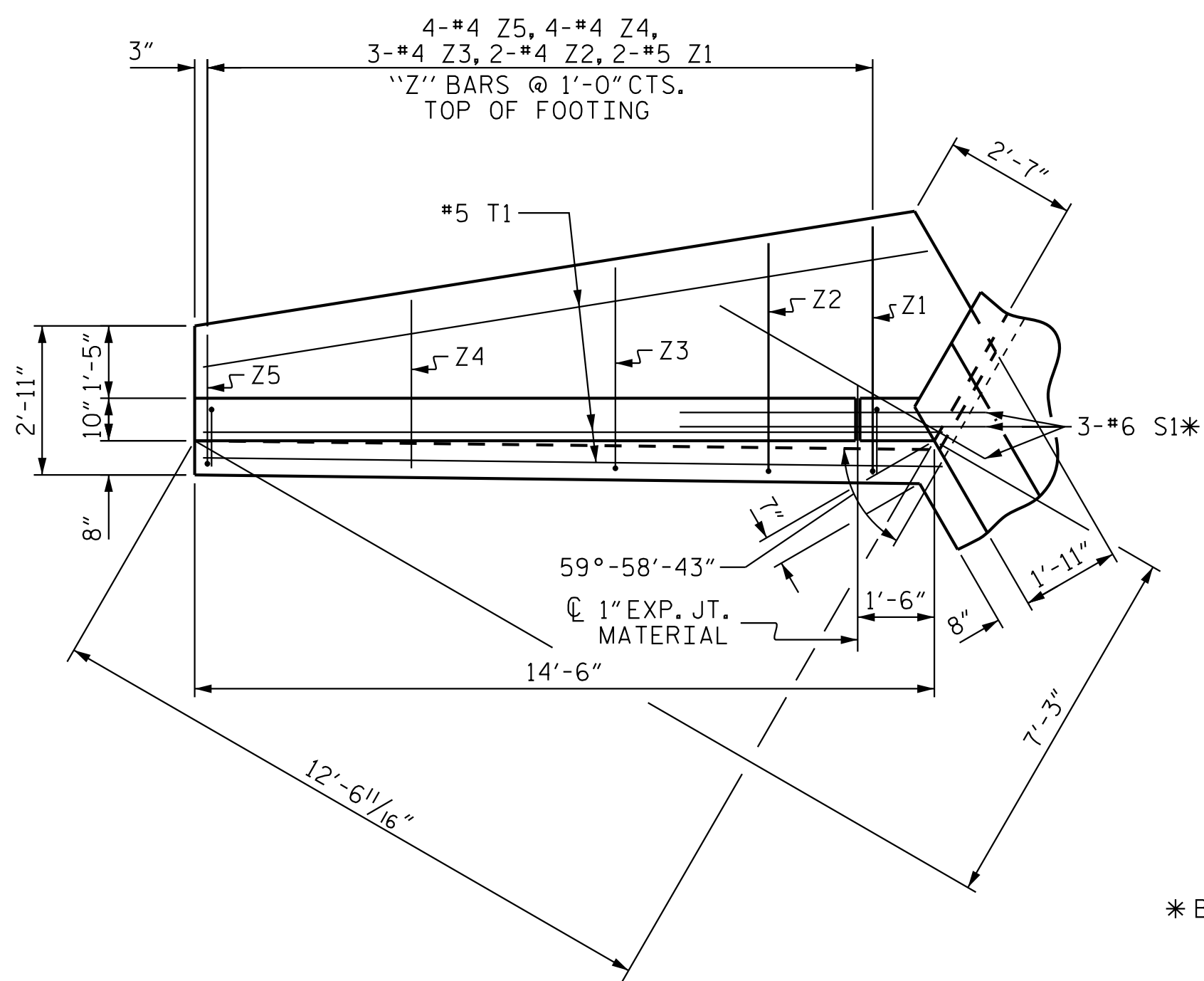
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			8

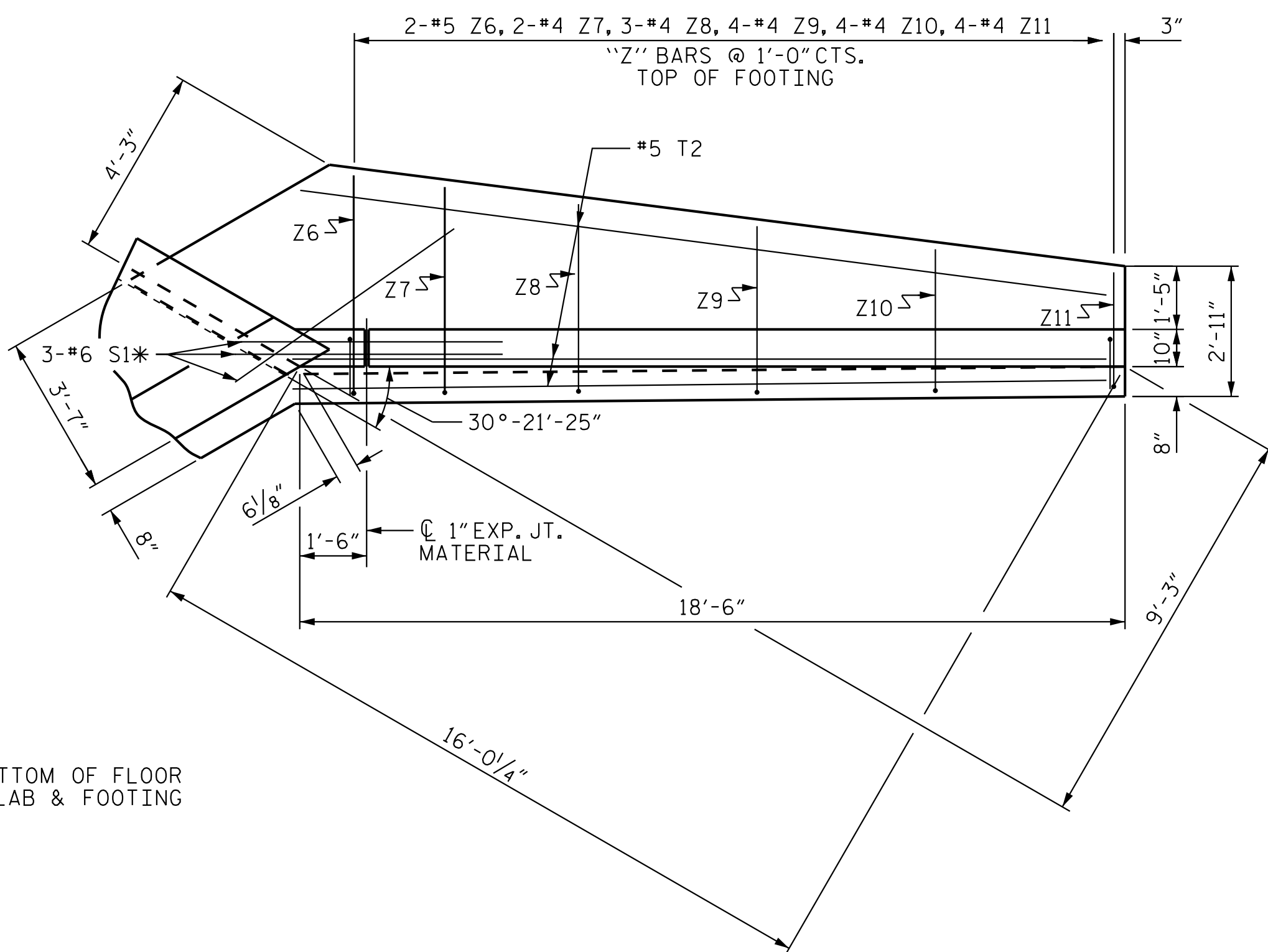
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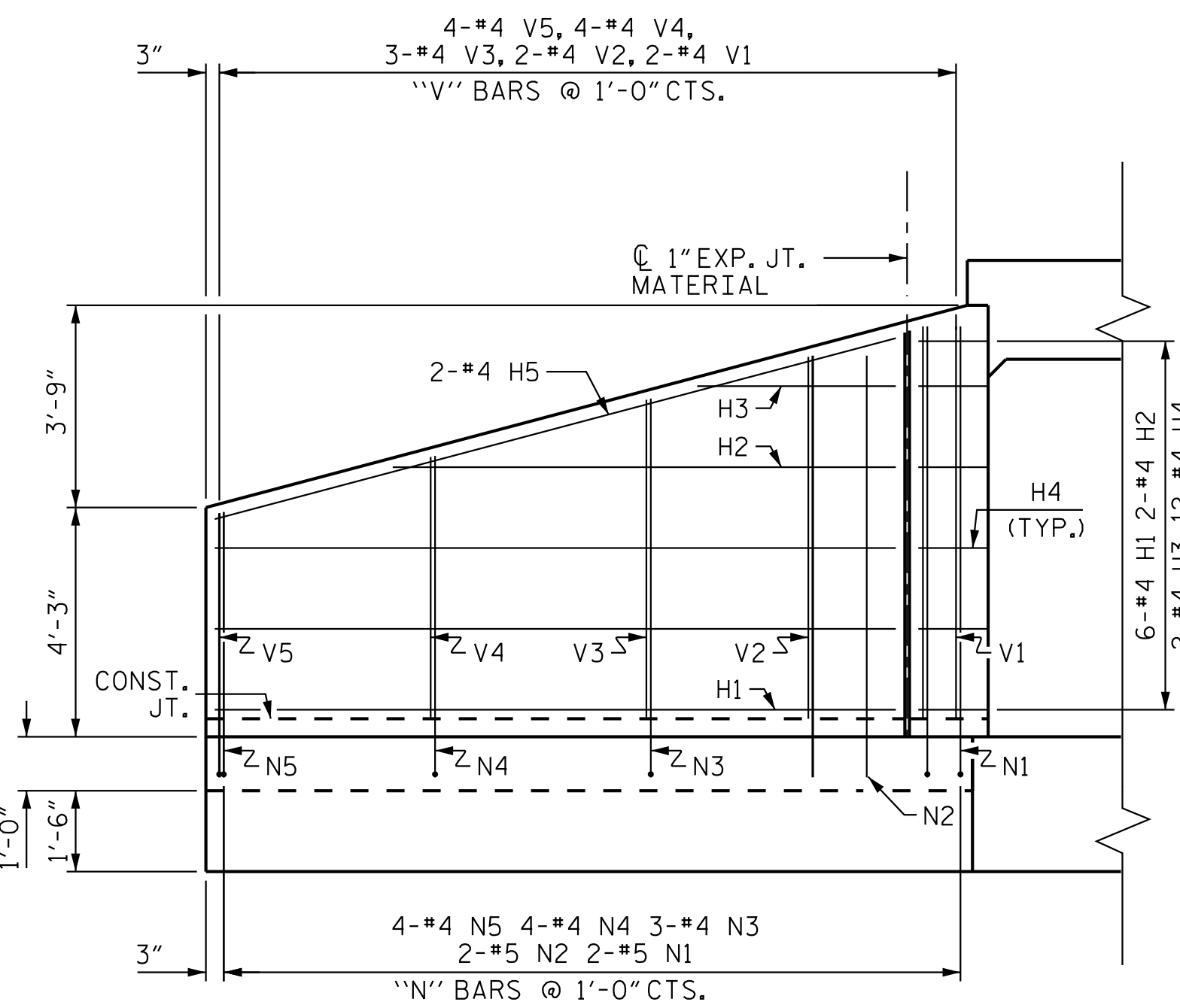
DRAWN BY: <u>P.G. ROBBS</u>	DATE: <u>5/18</u>
CHECKED BY: <u>C.T. POOLE</u>	DATE: <u>5/18</u>
DESIGN ENGINEER OF RECORD: <u>A.L. PHILLIPS</u>	DATE: <u>5/18</u>



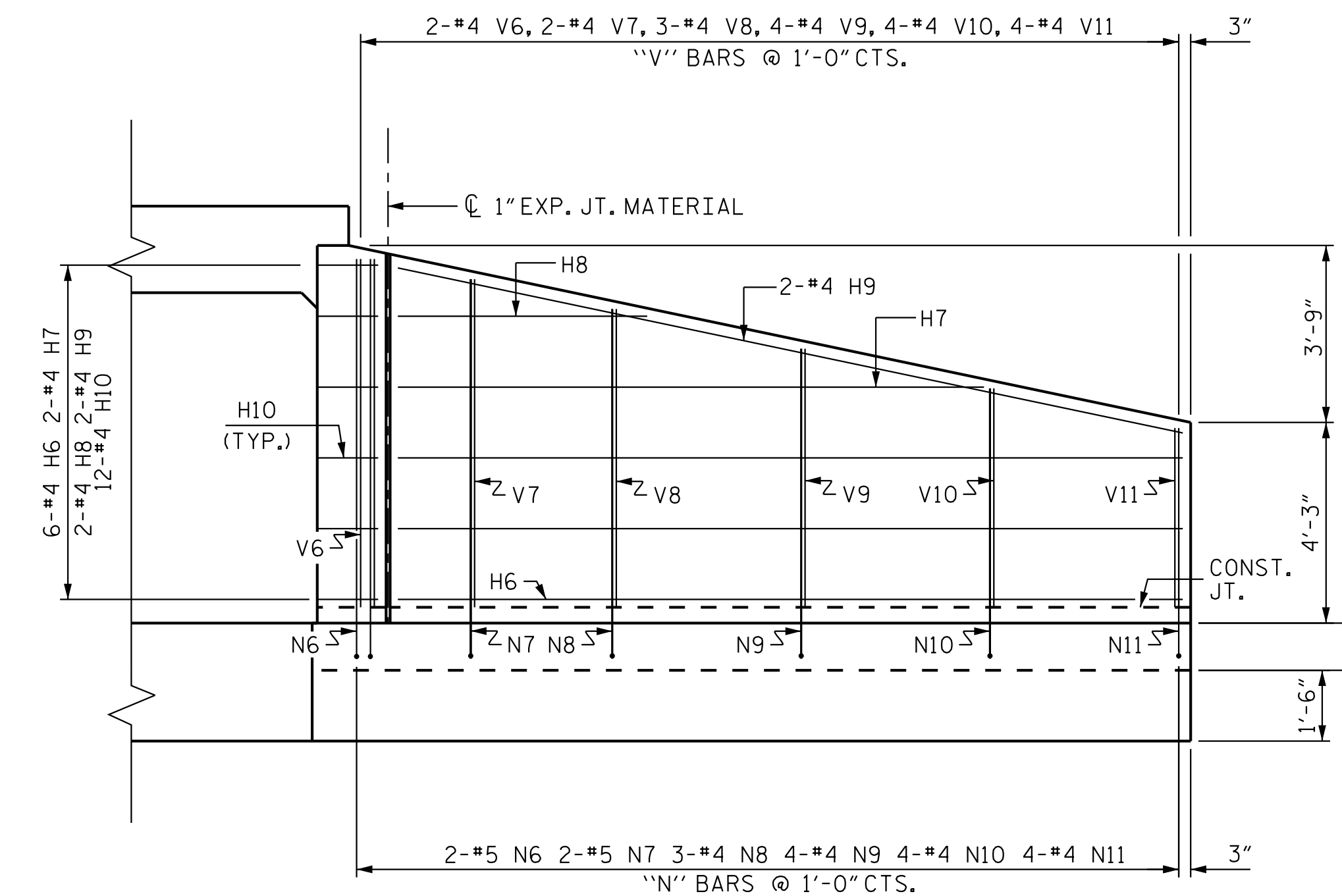
PLAN W2



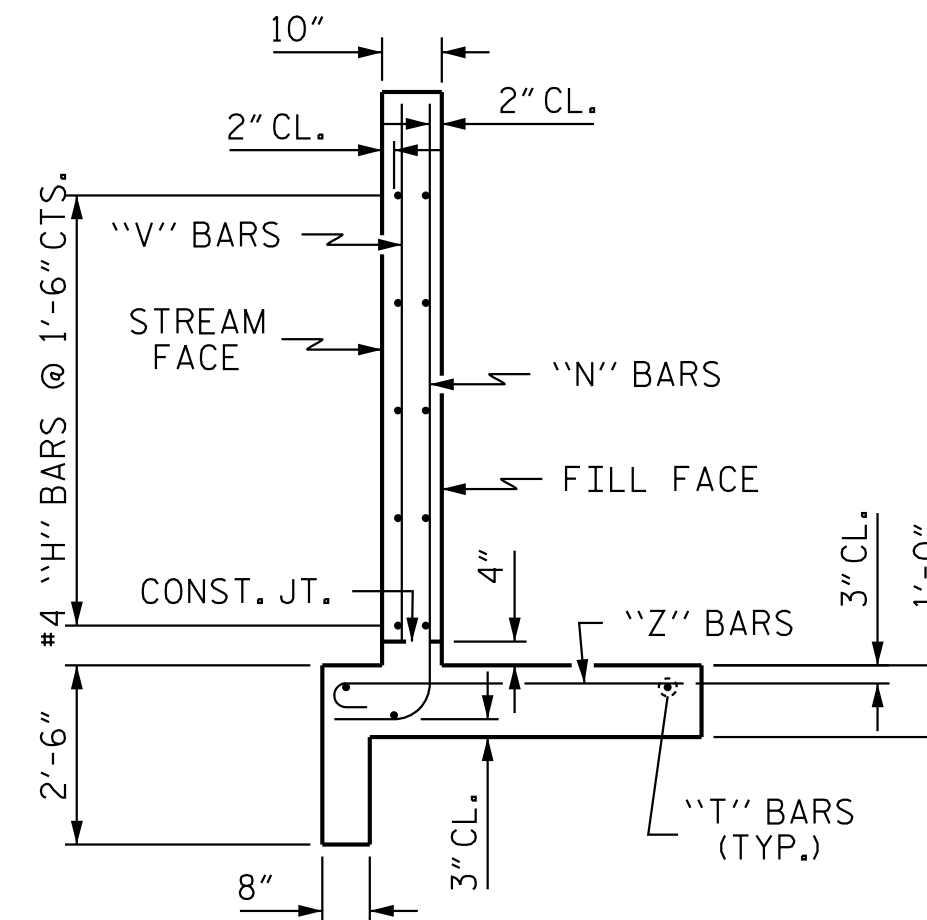
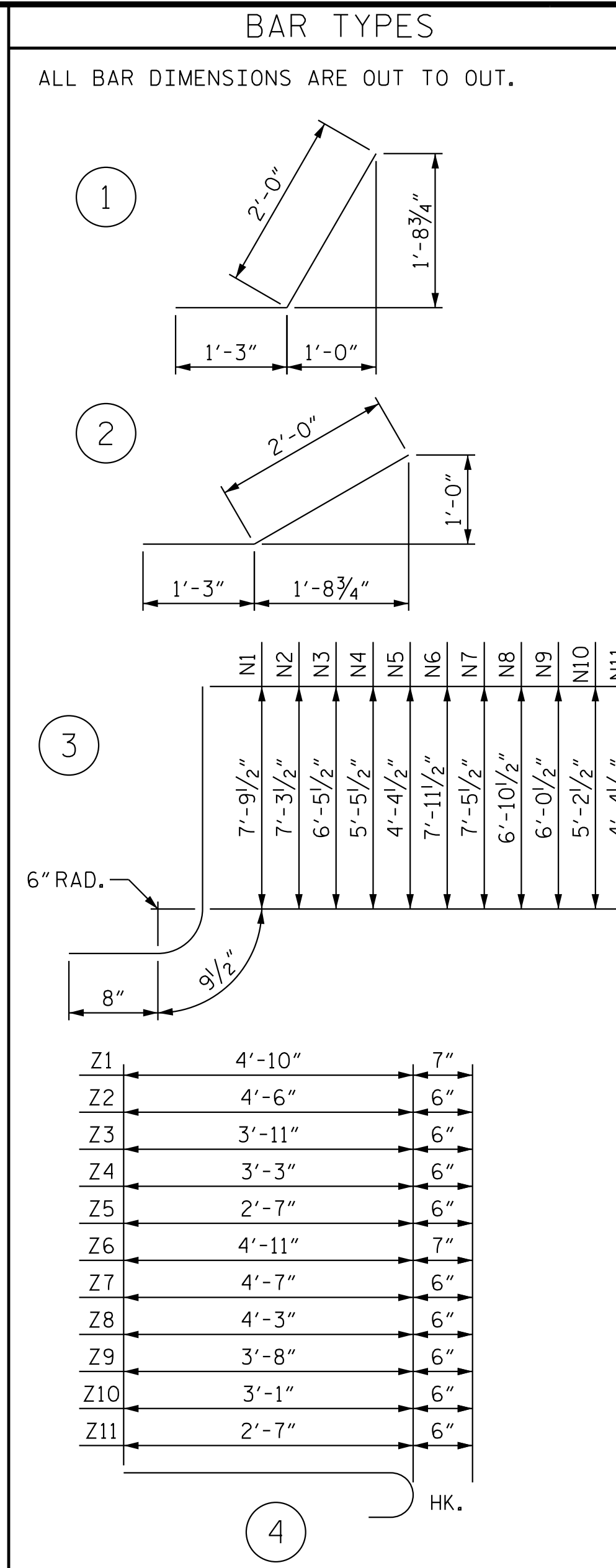
PLAN W1



ELEVATION W2



ELEVATION W1



TYPICAL WING SECTION

BILL OF MATERIAL STAGE 2 (W1 & W2)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	12'-7"	50
H2	2	#4	STR	9'-3"	12
H3	2	#4	STR	3'-8"	5
H4	12	#4	1	3'-3"	26
H5	2	#4	STR	13'-0"	17
H6	6	#4	STR	16'-7"	66
H7	2	#4	STR	12'-4"	17
H8	2	#4	STR	5'-3"	7
H9	2	#4	STR	16'-11"	23
H10	12	#4	2	3'-3"	26
N1	2	#5	3	9'-3"	19
N2	2	#5	3	8'-9"	18
N3	3	#4	3	7'-11"	16
N4	4	#4	3	6'-11"	18
N5	4	#4	3	5'-10"	16
N6	2	#5	3	9'-5"	20
N7	2	#5	3	8'-11"	19
N8	3	#4	3	8'-4"	17
N9	4	#4	3	7'-6"	20
N10	4	#4	3	6'-8"	18
N11	4	#4	3	5'-10"	16
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	14'-6"	45
T2	3	#5	STR	18'-6"	58
V1	2	#4	STR	7'-3"	10
V2	2	#4	STR	6'-8"	9
V3	3	#4	STR	5'-11"	12
V4	4	#4	STR	4'-10"	13
V5	4	#4	STR	3'-9"	10
V6	2	#4	STR	7'-4"	10
V7	2	#4	STR	6'-11"	9
V8	3	#4	STR	6'-3"	13
V9	4	#4	STR	5'-5"	14
V10	4	#4	STR	4'-7"	12
V11	4	#4	STR	3'-9"	10
Z1	2	#5	4	5'-5"	11
Z2	2	#4	4	5'-0"	7
Z3	3	#4	4	4'-5"	9
Z4	4	#4	4	3'-9"	10
Z5	4	#4	4	3'-1"	8
Z6	2	#5	4	5'-6"	11
Z7	2	#4	4	5'-1"	7
Z8	3	#4	4	4'-9"	10
Z9	4	#4	4	4'-2"	11
Z10	4	#4	4	3'-7"	10
Z11	4	#4	4	3'-1"	8

REINFORCING STEEL		827 LBS
FOR STAGE 2 WINGS		
CLASS A CONCRETE - STAGE 2		
2 WINGS		12.8 CY
1 HEADWALL		0.4 CY
1 END CURTAIN WALL		0.4 CY
TOTAL		13.6 CY

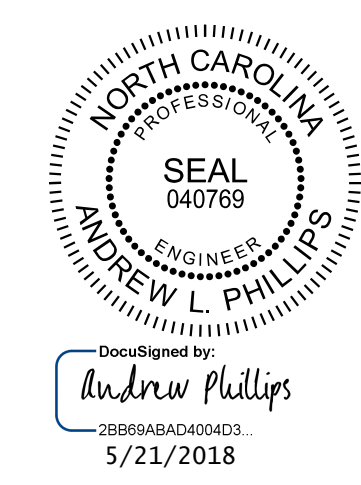
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HALIFAX COUNTY
 STATION: 84+52.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CULVERT WINGS
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW

REVISIONS						SHEET NO.
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2			4			8

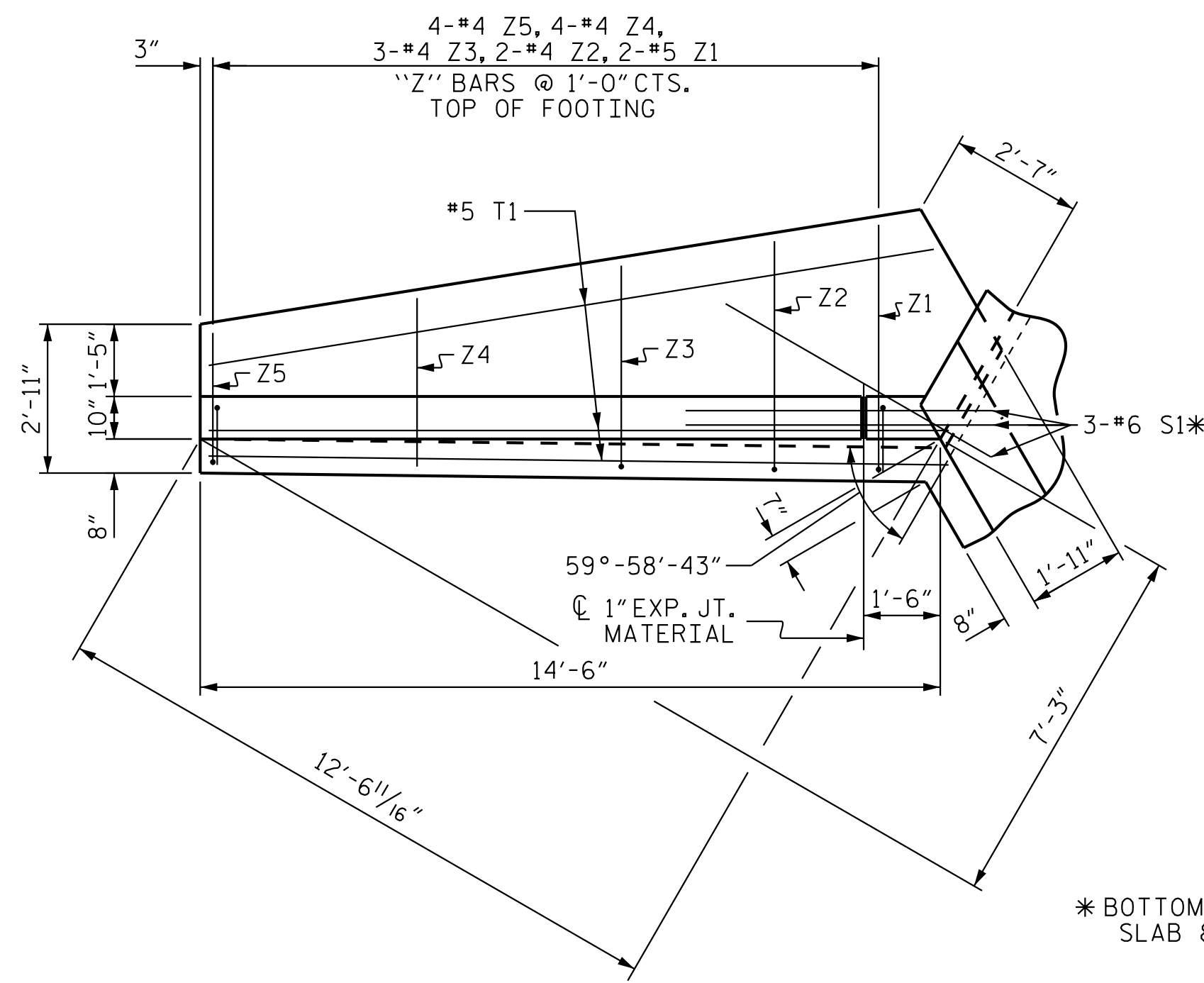


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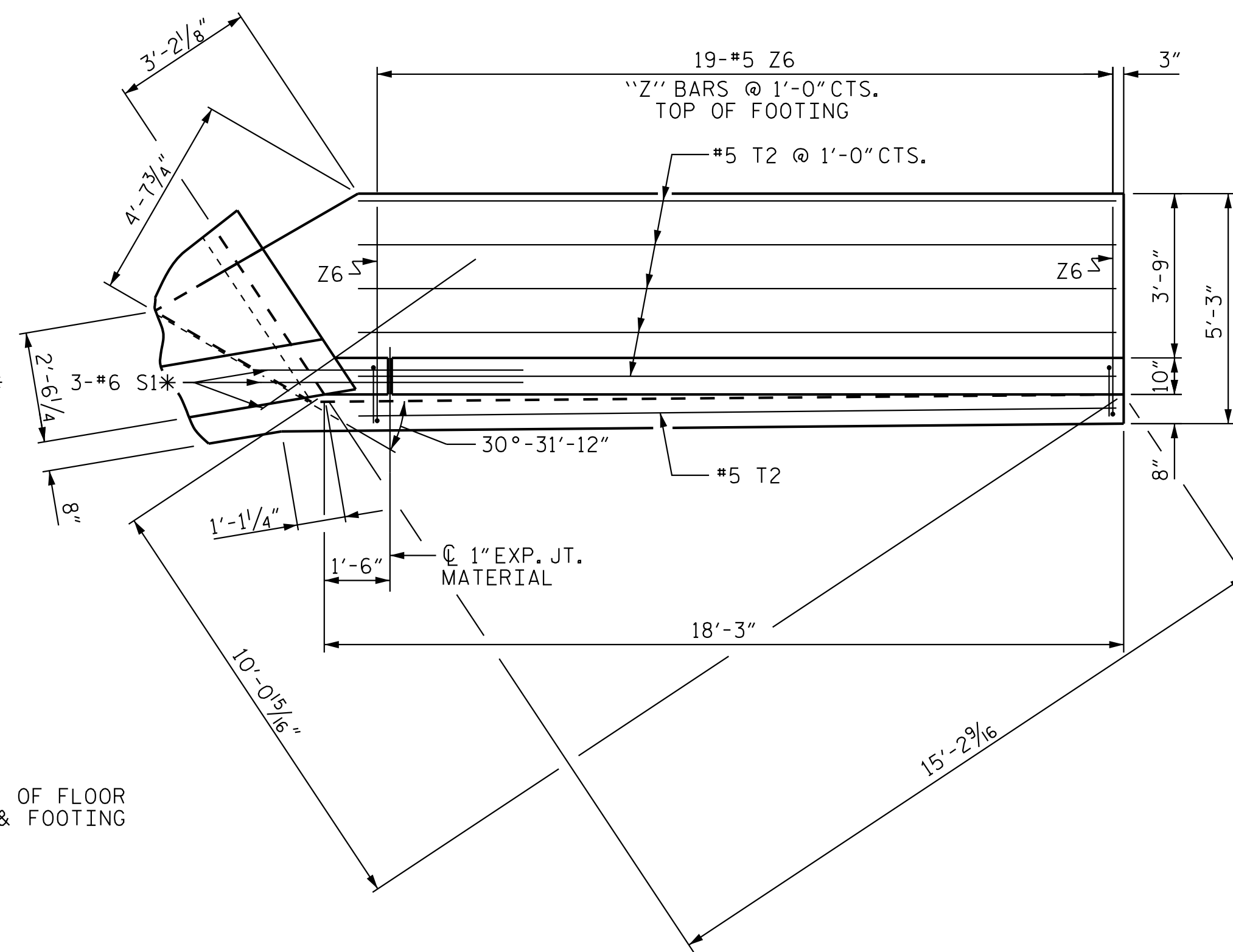
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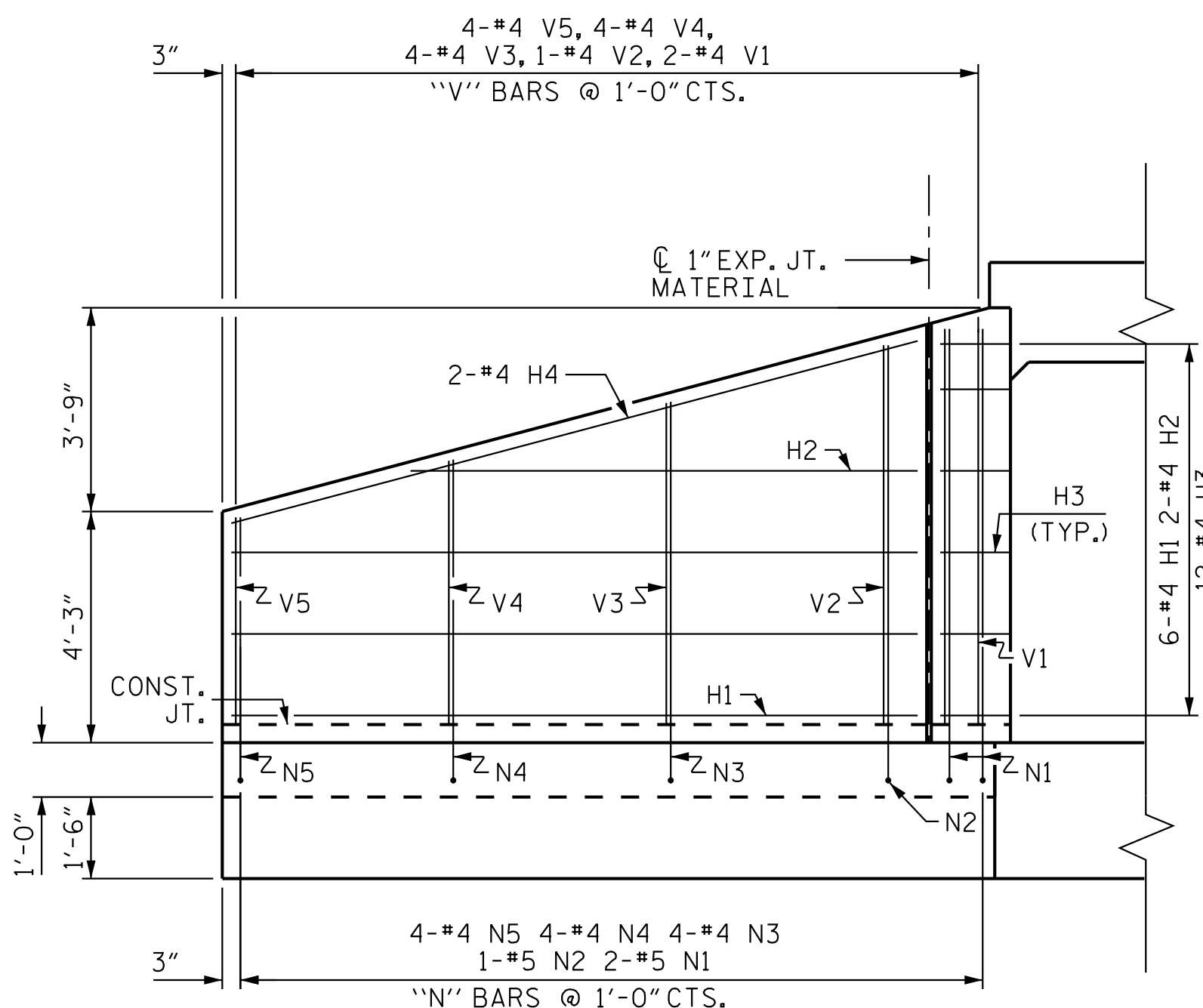
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 CHECKED BY: C.T. POOLE DATE: 5/18
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 5/18



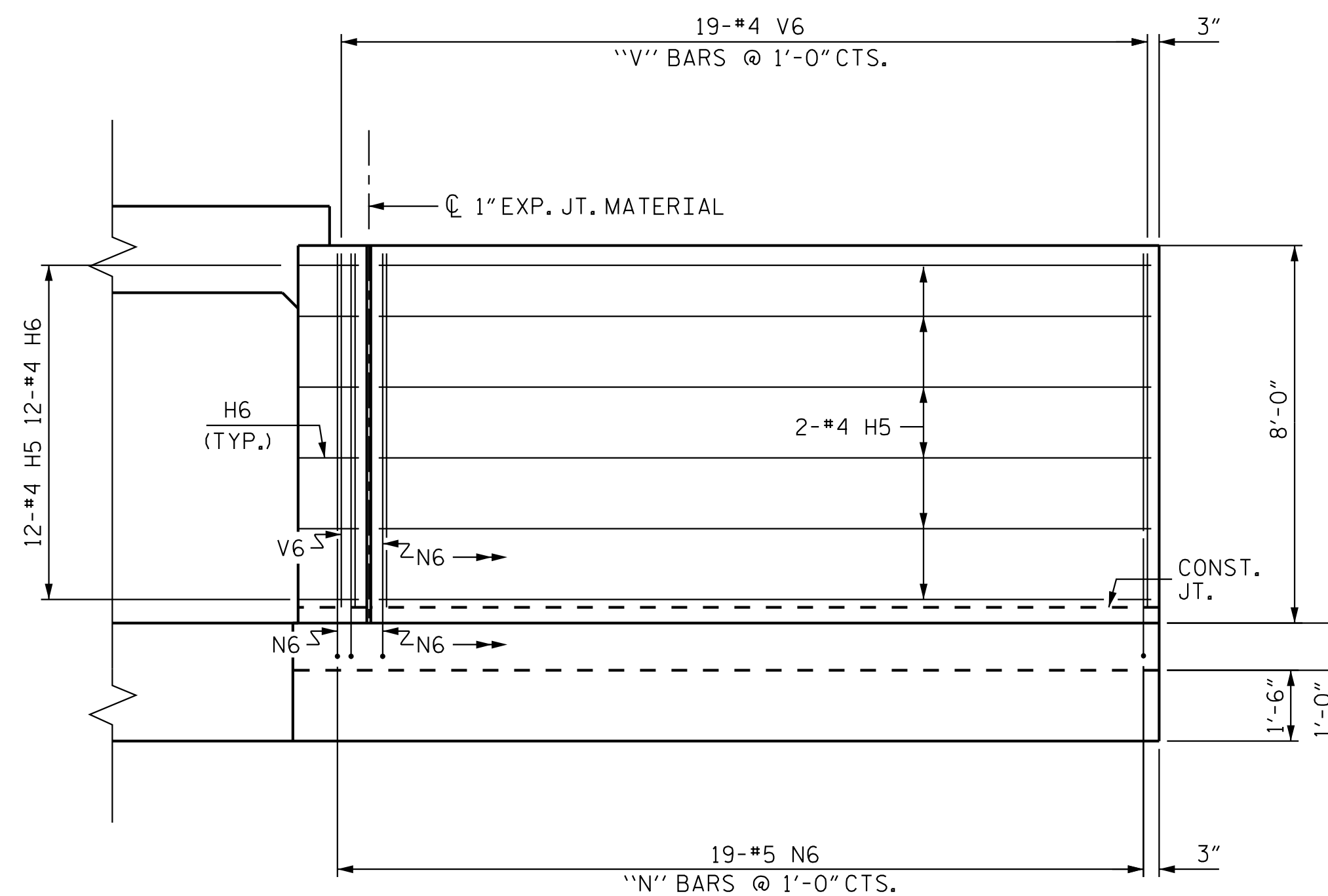
PLAN W3



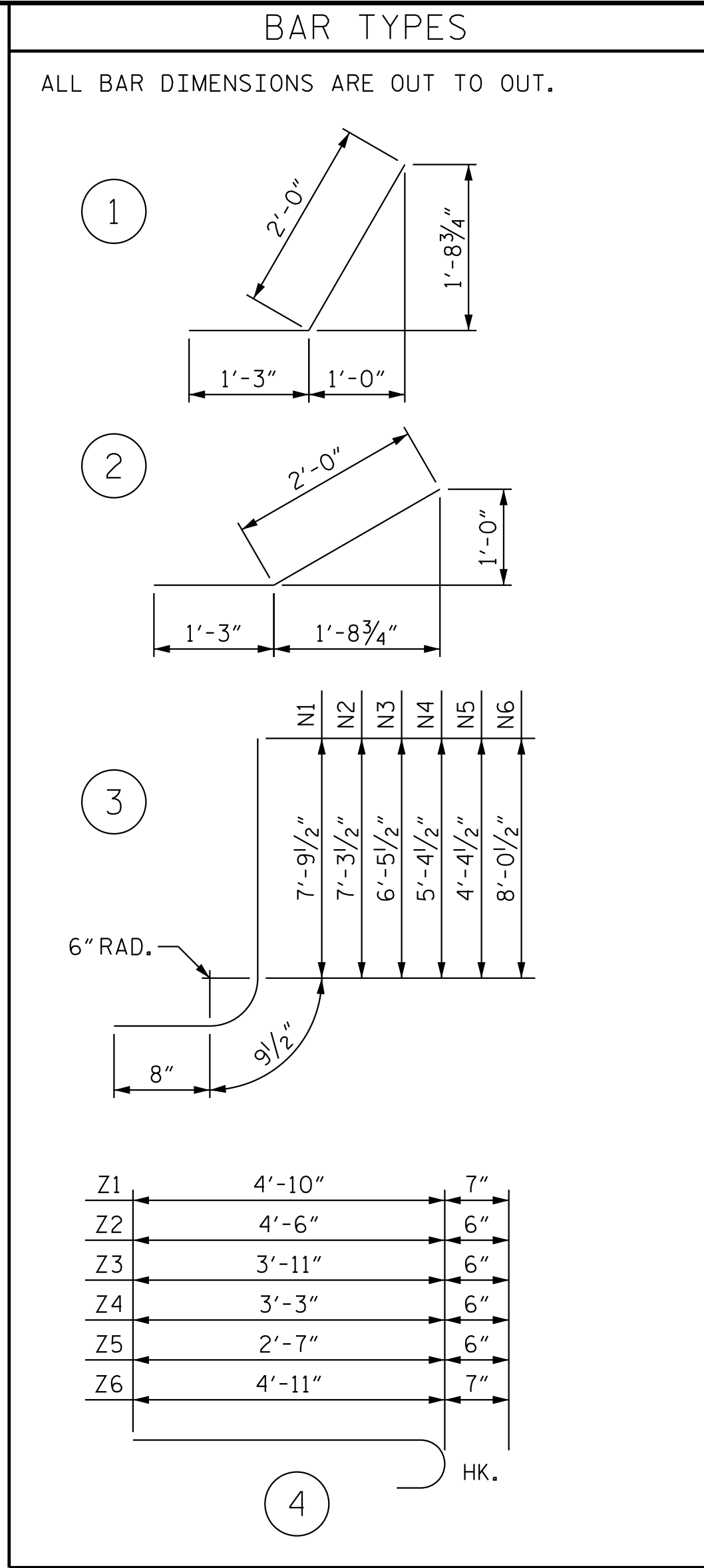
PLAN W4



ELEVATION W3



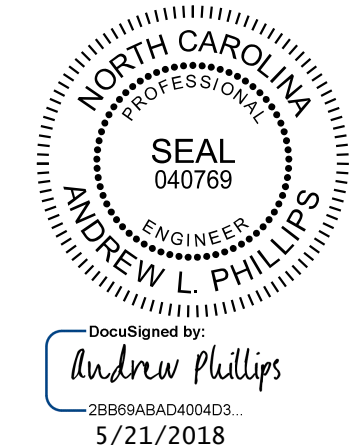
ELEVATION W4



Z1	4'-10"	7"
Z2	4'-6"	6"
Z3	3'-11"	6"
Z4	3'-3"	6"
Z5	2'-7"	6"
Z6	4'-11"	7"

BILL OF MATERIAL STAGE 1 (W3 & W4)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	12'-7"	50
H2	2	#4	STR	9'-3"	12
H3	12	#4	1	3'-3"	26
H4	2	#4	STR	13'-0"	17
H5	12	#4	STR	16'-4"	131
H6	12	#4	2	3'-3"	26
N1	2	#5	3	9'-3"	19
N2	2	#5	3	8'-9"	18
N3	3	#4	3	7'-11"	16
N4	4	#4	3	6'-10"	18
N5	4	#4	3	5'-10"	16
N6	19	#5	3	9'-6"	188
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	14'-6"	45
T2	6	#5	STR	17'-4"	108
V1	2	#4	STR	7'-3"	10
V2	2	#4	STR	6'-8"	9
V3	3	#4	STR	5'-11"	12
V4	4	#4	STR	4'-10"	13
V5	4	#4	STR	3'-9"	10
V6	19	#4	STR	7'-6"	95
Z1	2	#5	4	5'-5"	11
Z2	2	#4	4	5'-0"	7
Z3	3	#4	4	4'-5"	9
Z4	4	#4	4	3'-9"	10
Z5	4	#4	4	3'-1"	8
Z6	19	#5	4	5'-6"	109

REINFORCING STEEL FOR STAGE 1 WINGS 1,047 LBS
 CLASS A CONCRETE STAGE 1
 2 WINGS 14.5 CY
 1 HEADWALL 0.4 CY
 1 END CURTAIN WALL 0.3 CY
 TOTAL 15.2 CY



PROJECT NO. U-5725
 HALIFAX COUNTY
 STATION: 84+52.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 CULVERT WINGS
 SINGLE 6 FT. X 7 FT.
 CONCRETE BOX CULVERT
 66° SKEW

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DRAWN BY: P.G. ROBBS DATE: 5/18
 CHECKED BY: C.T. POOLE DATE: 5/18
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 5/18

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 2018 "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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{1}{16}$ 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