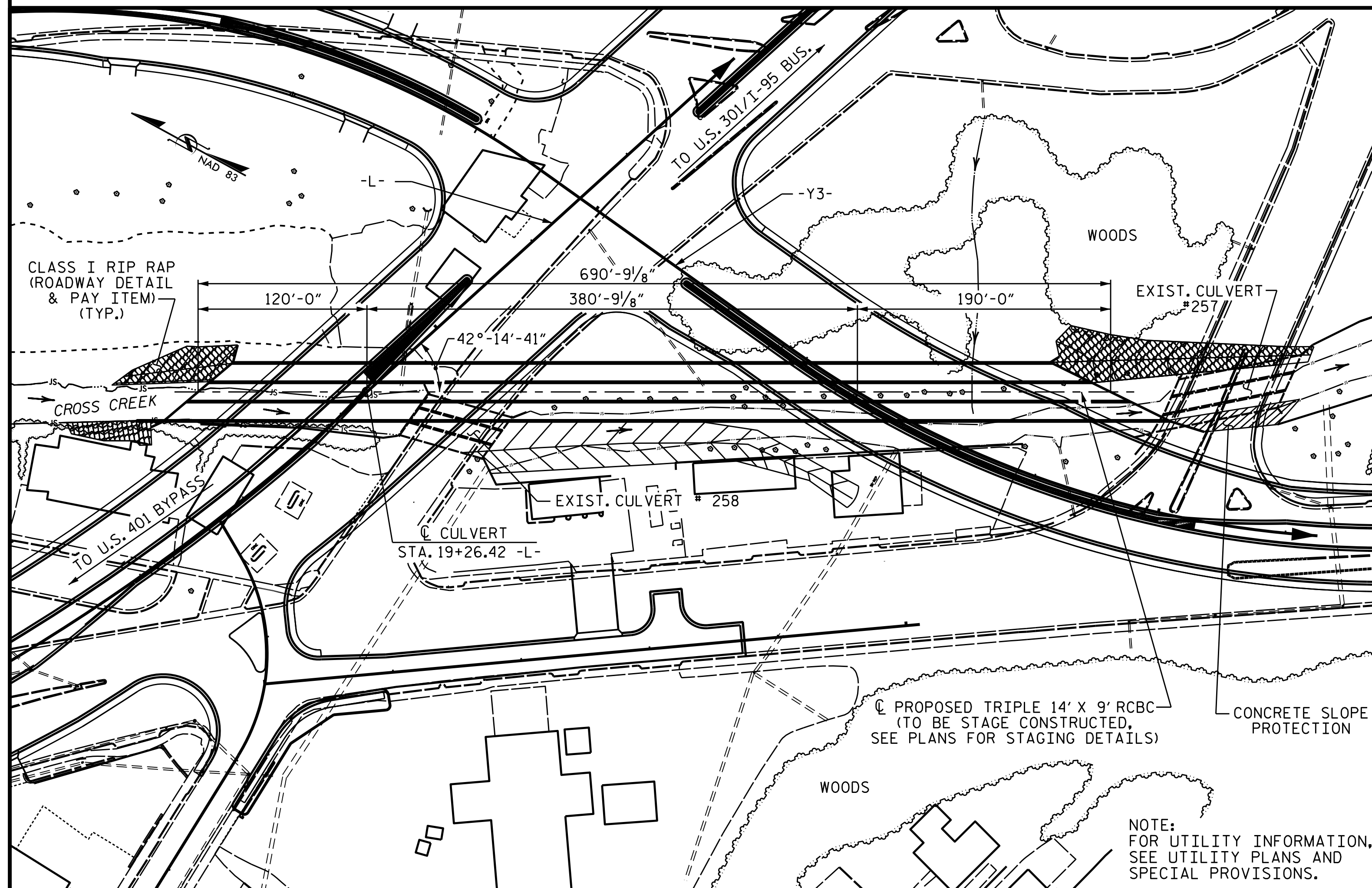


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LOCATION SKETCH

TEMPORARY SHORING NOT SHOWN FOR CLARITY. SEE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS.

HYDRAULIC DATA

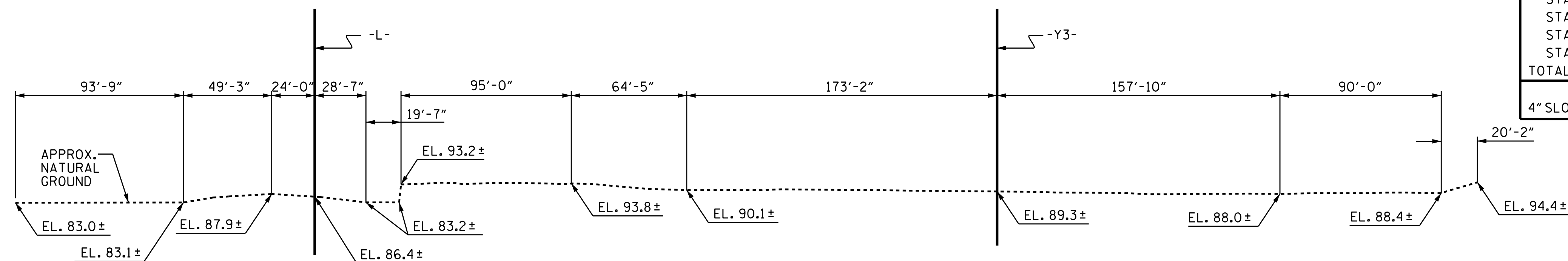
DESIGN DISCHARGE	=	4000 CFS
DESIGN FLOOD FREQUENCY	=	50 YR.
DESIGN HIGH WATER ELEVATION	=	100.3
BASE DISCHARGE (Q100)	=	4400 CFS
BASE ELEVATION (Q100)	=	101.40
DRAINAGE AREA	=	25.90 sq. mi.

GRADE DATA

GRADE POINT ELEV. @	=	94.65
STA. 19+26.42 -L-	=	81.75
BED ELEV. @ STA. 19+26.42 -L-	=	2:1
ROADWAY SLOPE	=	

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	1900 CFS
OVERTOPPING FLOOD FREQUENCY	=	2 YR+
OVERTOPPING FLOOD ELEVATION	=	95.0



PROFILE ALONG CULVERT

DRAWN BY : I.L. AVERETTE DATE : 07-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

NOTES

ASSUMED LIVE LOAD HL-93 OR ALTERNATE LOADING.
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

DESIGN FILL = 2.33 FEET (MIN. FILL)
 4.84 FEET (MAX. FILL)

FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.

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

FOR POURING SEQUENCE OF CONCRETE IN CULVERT, SEE "STAGING DETAILS", SHEET 4 OF 18.

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 SHEETS.

AT THE CONTRACTORS OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALLS AND BOTH FACES OF INTERIOR 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.

THE 48" Ø, 36" Ø, 18" Ø AND 15" Ø R.C. PIPES THROUGH THE SIDEWALLS OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

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 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.

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 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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 96'-7" LONG TRIPLE 12 FT. X 9 FT. REINFORCED BOX CULVERT LOCATED AT THE OUTLET END OF THE PROPOSED CULVERT SHALL BE REMOVED.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 67'-6" LONG TRIPLE 12 FT. X 9 FT. REINFORCED BOX CULVERT LOCATED APPROXIMATELY 160 FEET DOWNSTREAM FROM THE INLET END OF THE PROPOSED CULVERT SHALL BE REMOVED.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURES	LUMP SUM	
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION COND. MAT'L.	TONS	2175
CLASS A CONCRETE		
STAGE I (PART A)	CU. YDS.	137.5
STAGE I (PART B)	CU. YDS.	385.0
STAGE II	CU. YDS.	521.5
STAGE III	CU. YDS.	132.1
STAGE IV	CU. YDS.	2098.0
STAGE V	CU. YDS.	39.7
SILLS (STAGES VI & VII)	CU. YDS.	7.1
TOTAL	CU. YDS.	3320.9
REINFORCING STEEL		
STAGE I (PART A)	LBS.	22,286
STAGE I (PART B)	LBS.	63,148
STAGE II	LBS.	65,013
STAGE III	LBS.	22,036
STAGE IV	LBS.	241,411
STAGE V	LBS.	5,638
TOTAL	LBS.	419,533
4" SLOPE PROTECTION	SO. YDS.	150



DocuSigned by:
 F24583890BF40E...
 3/29/2016

DocuSigned by:
 J. M. Bailey
 908554D9528471...
 3/29/2016

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 1 OF 18 REPLACES BRIDGE NO. 258

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 (VLL)	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	1.13	--	1.75	1.13	1	TOP SLAB	5.87	1.25	1	TOP SLAB	13.26		
	HL-93 (OPERATING)	N/A		1.47	--	1.35	1.47	1	TOP SLAB	5.87	1.63	1	TOP SLAB	13.26		
	HS-20 (INVENTORY)	36.000	②	1.33	47.70	1.75	1.33	1	TOP SLAB	5.87	1.49	1	BOTTOM SLAB	13.67		
	HS-20 (OPERATING)	36.000		1.72	61.84	1.35	1.72	1	TOP SLAB	5.87	1.93	1	BOTTOM SLAB	13.67		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.42	32.61	1.40	2.42	1	TOP SLAB	6.23	4.37	1	TOP SLAB	13.26	
		SNGARBS2	20.000		2.26	45.26	1.40	2.26	1	TOP SLAB	5.87	3.35	1	BOTTOM SLAB	13.67	
		SNAGRIS2	22.000		2.42	53.15	1.40	2.42	1	TOP SLAB	6.23	3.04	1	BOTTOM SLAB	13.67	
		SNCOTTS3	27.250	③	1.42	38.58	1.40	1.42	1	TOP SLAB	5.87	1.73	1	TOP SLAB	13.26	
		SNAGGRS4	34.925		1.59	55.41	1.40	1.59	1	TOP SLAB	6.23	1.87	1	TOP SLAB	13.26	
		SNS5A	35.550		1.54	54.63	1.40	1.54	1	TOP SLAB	6.23	1.81	1	TOP SLAB	13.26	
		SNS6A	39.950		1.53	61.31	1.40	1.53	1	TOP SLAB	6.23	1.68	1	BOTTOM SLAB	13.67	
		SNS7B	42.000		1.57	65.98	1.40	1.57	1	TOP SLAB	5.87	1.59	1	TOP SLAB	13.26	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		2.03	67.00	1.40	2.38	1	TOP SLAB	5.50	2.03	1	BOTTOM SLAB	13.67	
		TNT4A	33.075		1.68	55.70	1.40	1.68	1	TOP SLAB	5.87	2.02	1	BOTTOM SLAB	13.67	
		TNT6A	41.600		1.59	66.24	1.40	1.66	1	TOP SLAB	6.23	1.59	1	TOP SLAB	13.26	
		TNT7A	42.000		1.61	67.46	1.40	1.80	1	TOP SLAB	5.87	1.61	1	BOTTOM SLAB	13.67	
		TNT7B	42.000		1.57	65.89	1.40	1.57	1	TOP SLAB	6.23	1.60	1	BOTTOM SLAB	13.67	
		TNAGRIT4	43.000		1.56	66.98	1.40	1.61	1	TOP SLAB	5.87	1.56	1	BOTTOM SLAB	13.67	
TNAGT5A	45.000		1.49	67.20	1.40	1.66	1	TOP SLAB	5.87	1.49	1	BOTTOM SLAB	13.67			
TNAGT5B	45.000		1.49	67.20	1.40	1.66	2	TOP SLAB	1.10	1.49	1	BOTTOM SLAB	13.67			

LOAD FACTORS:

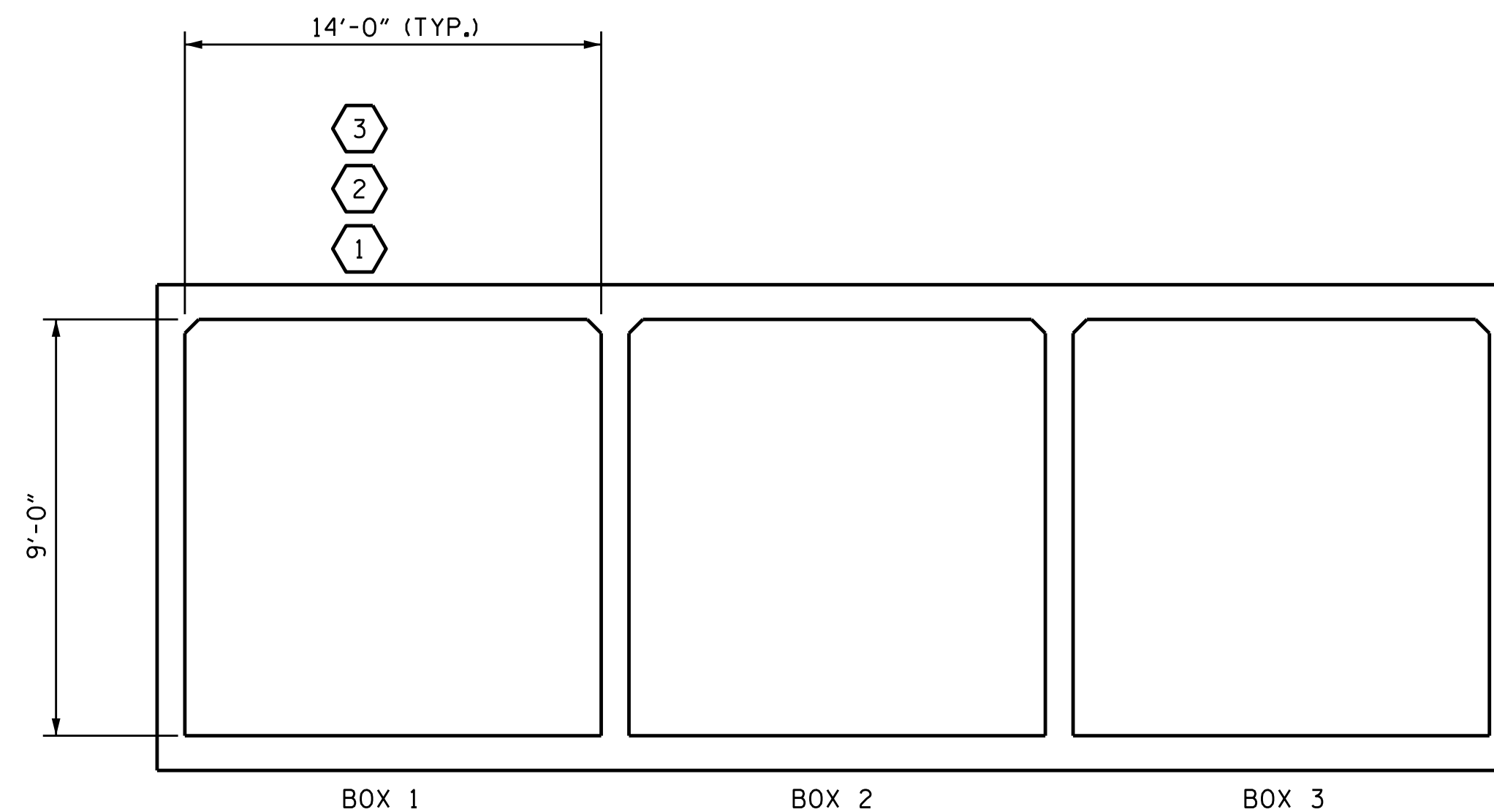
DESIGN LOAD RATING FACTORS

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.

#	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. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 2 OF 18



DocuSigned by:
 Kristy W. Alford
 F24583930BF40E...

3/29/2016

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

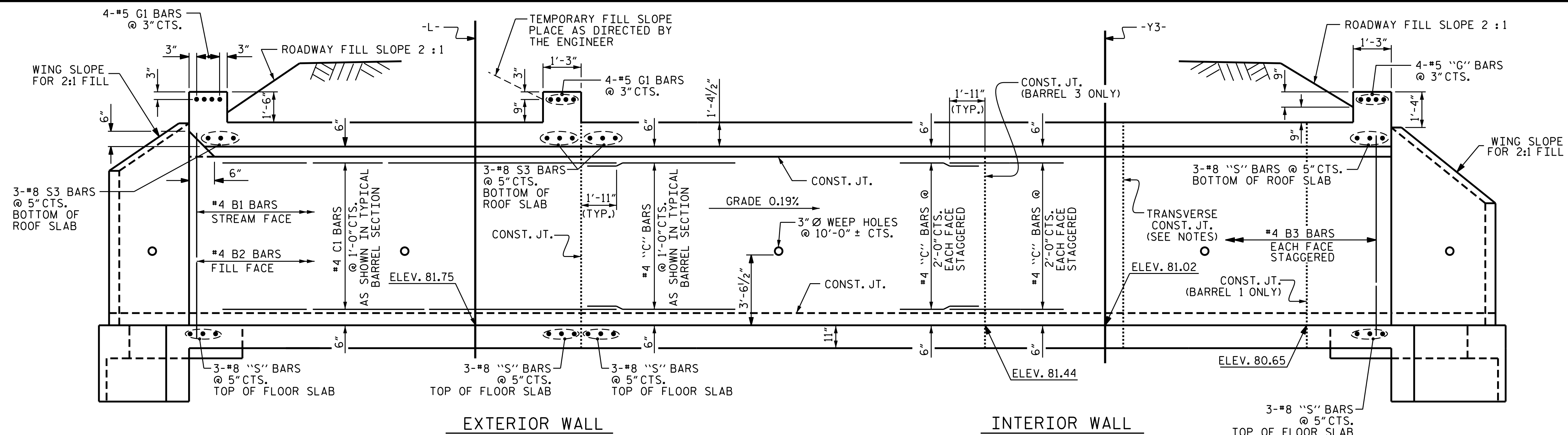
ASSEMBLED BY : T.L. AVERETTE	DATE : 06-15
CHECKED BY : J.P. ADAMS	DATE : 08-15
DRAWN BY : WMC	7/11
CHECKED BY : GM	7/11
REV. 10/1/11	MAA/GM

29-MAR-2016 09:20
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 jpodams

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C-2
2			4			18

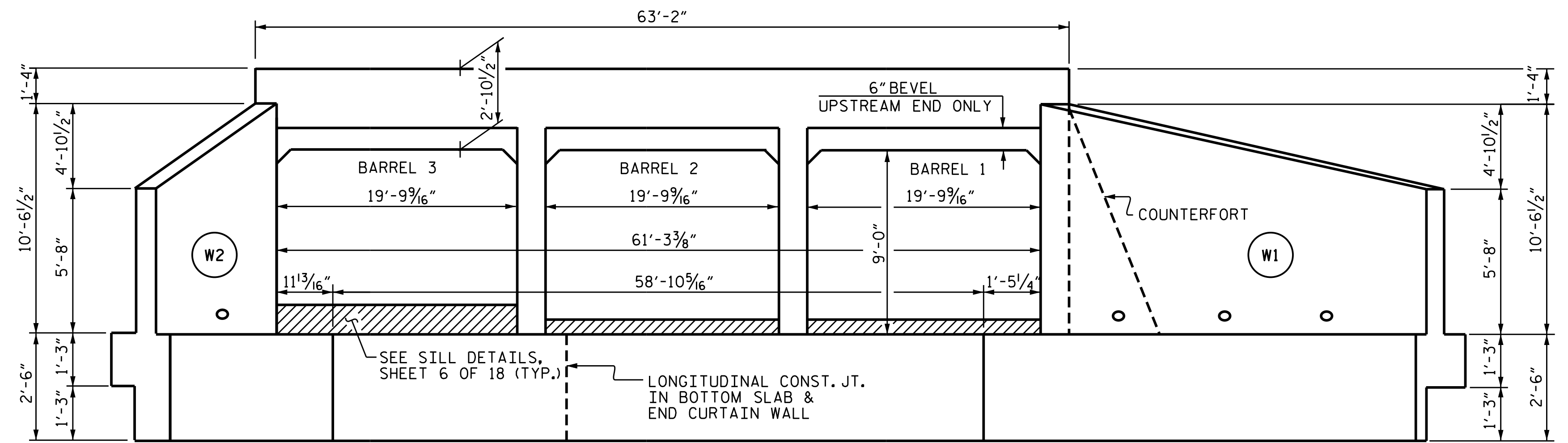
STD. NO. LRFR5



CULVERT SECTION NORMAL TO ROADWAY

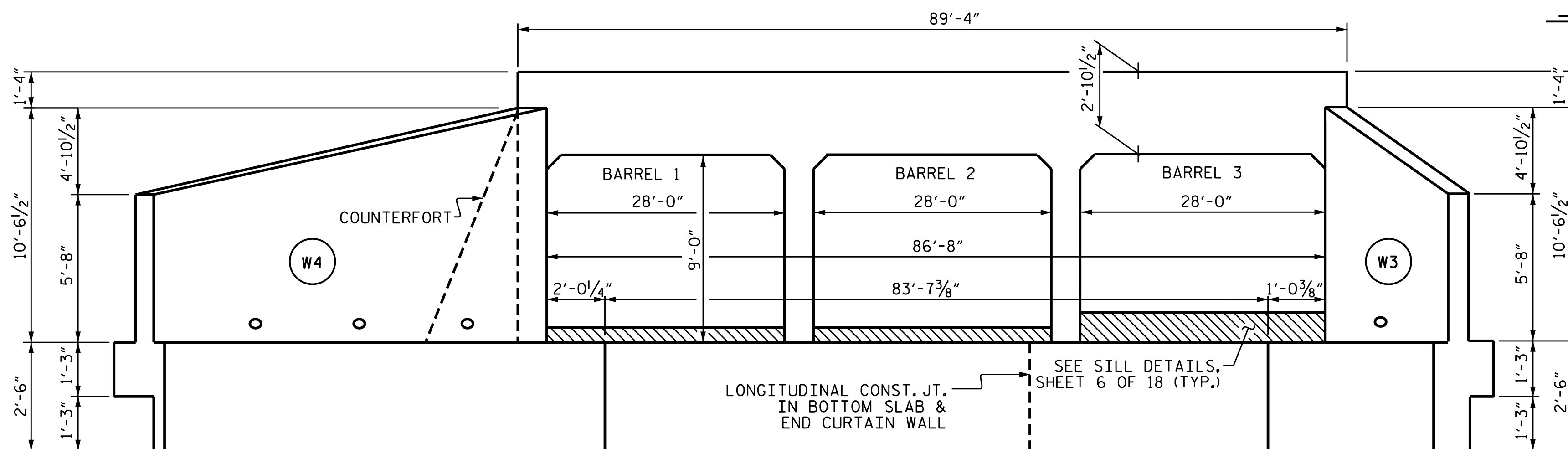
SEE SHEET 4 OF 18 FOR STAGING DETAILS
 SILLS NOT SHOWN FOR CLARITY, SEE SHEET 6 OF 18
 R.C. PIPES THROUGH SIDEWALLS OF CULVERT NOT SHOWN FOR CLARITY, SEE SHEETS 7, 9 AND 10 OF 18.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



INLET END ELEVATION

NORMAL TO SKEW (LOOKING DOWNSTREAM)



OUTLET END ELEVATION

NORMAL TO SKEW (LOOKING UPSTREAM)

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-
 SHEET 3 OF 18



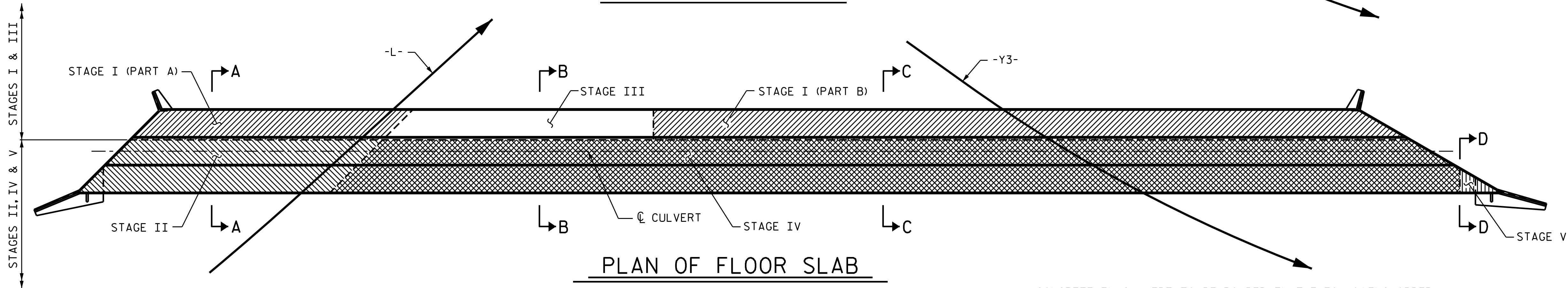
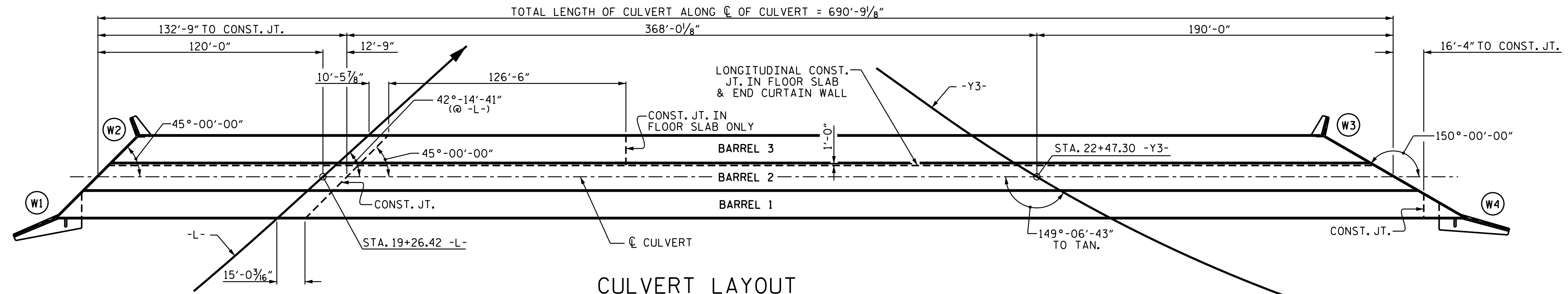
DocuSigned by:
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT

DRAWN BY: I.L. AVERETTE DATE: 07-15
 CHECKED BY: J.P. ADAMS DATE: 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE: 09-15

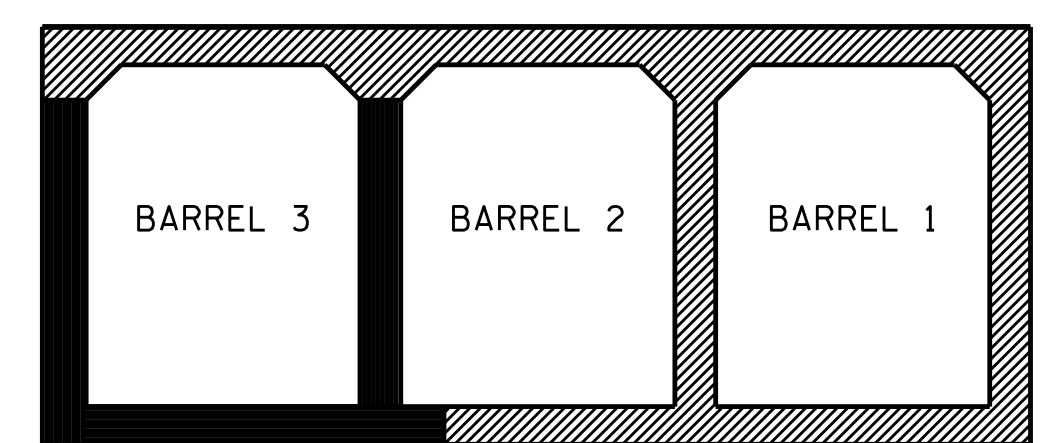
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1			3			TOTAL SHEETS
2			4			18

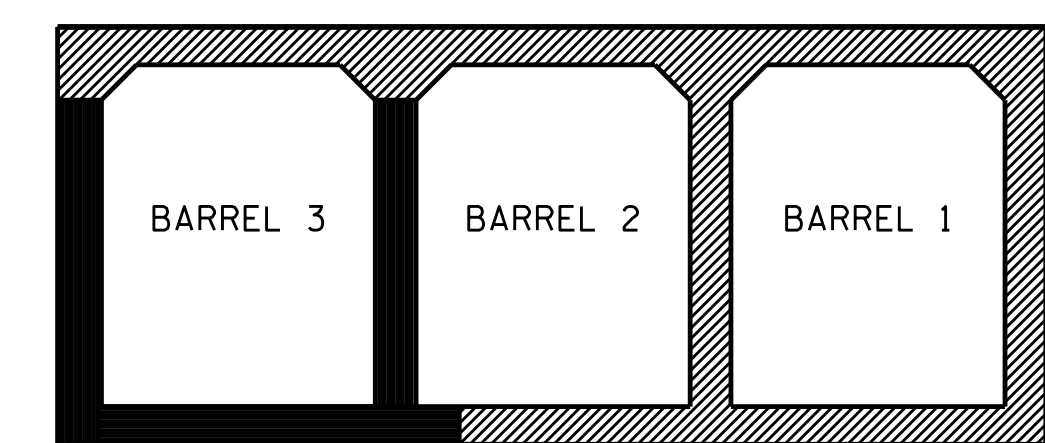


- STAGE I
- STAGE II
- STAGE III
- STAGE IV
- STAGE V

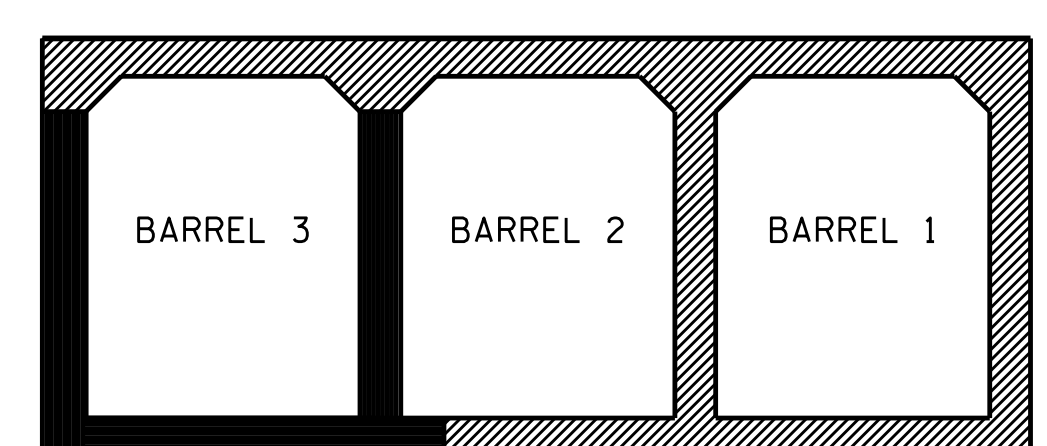
STAGE VI: INSTALL 1 FT SILLS IN BARRELS 1 & 2 AT THE INLET AND OUTLET.
 STAGE VII: INSTALL 2 FT SILL IN BARREL 3 AT THE INLET AND OUTLET.



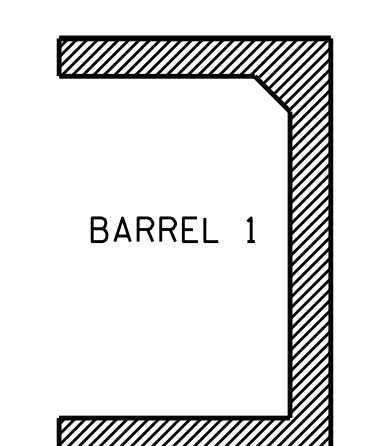
SECTION A-A
 ■ STAGE I (PART A)
 ▨ STAGE II



SECTION B-B
 ■ STAGE III
 ▨ STAGE IV



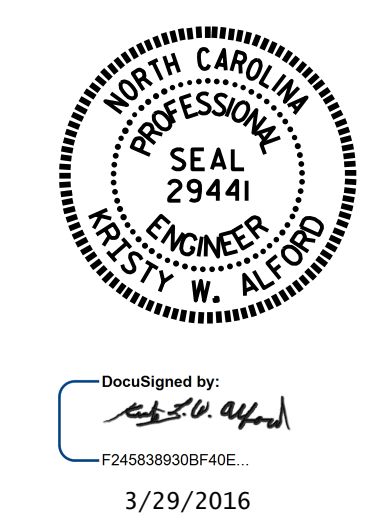
SECTION C-C
 ■ STAGE I (PART B)
 ▨ STAGE IV



SECTION D-D
 ▨ STAGE V

CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:

1. STAGE I PART A
 - INLET WING W2 FOOTING, BARREL 3 FLOOR SLAB, INCLUDING 4" OF BARREL 3 WALLS AND INLET WINGWALL W2
 - REMAINING PORTIONS OF BARREL 3 WALLS AND INLET WING W2 FULL HEIGHT
2. STAGE I PART B
 - OUTLET WING W3 FOOTING, BARREL 3 FLOOR SLAB, INCLUDING 4" OF BARREL 3 WALLS AND OUTLET WINGWALL W3
 - REMAINING PORTIONS OF BARREL 3 WALLS AND OUTLET WING W3 FULL HEIGHT
3. STAGE II
 - INLET WING W1 FOOTING, BARRELS 1 & 2 FLOOR SLAB, INCLUDING 4" OF INTERIOR AND EXTERIOR WALLS AND INLET WINGWALL W1
 - REMAINING PORTIONS OF BARREL 1 & 2 WALLS AND INLET WING W1 FULL HEIGHT
 - ROOF SLAB AND HEADWALLS FOR STAGE II & STAGE I PART A
4. STAGE III
 - BARREL 3 FLOOR SLAB, INCLUDING 4" OF BARREL 3 WALLS
 - REMAINING PORTIONS OF BARREL 3 WALLS
5. STAGE IV
 - BARRELS 1 & 2 FLOOR SLAB, INCLUDING 4" OF INTERIOR AND EXTERIOR WALLS
 - REMAINING PORTIONS OF BARREL 1 & 2 WALLS
 - ROOF SLAB AND HEADWALL FOR STAGE IV & STAGE I PART B
6. STAGE V
 - OUTLET WING W4 FOOTING, BARREL 1 FLOOR SLAB, INCLUDING 4" OF EXTERIOR WALL AND OUTLET WINGWALL W4
 - REMAINING PORTIONS OF BARREL 1 WALL AND OUTLET WING W4 FULL HEIGHT
 - ROOF SLAB AND HEADWALL FOR STAGE V
7. STAGE VI
 - SILLS IN BARRELS 1 & 2, INLET AND OUTLET ENDS
8. STAGE VII
 - SILLS IN BARREL 3, INLET AND OUTLET ENDS



PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 4 OF 18

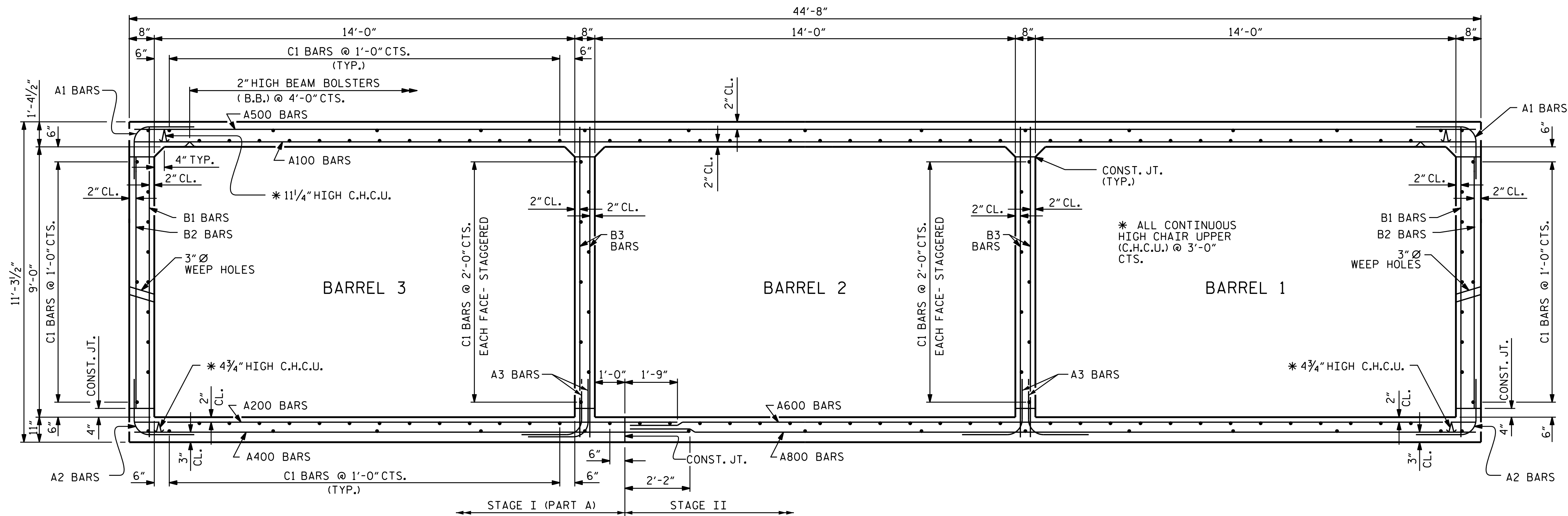
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STAGING DETAILS

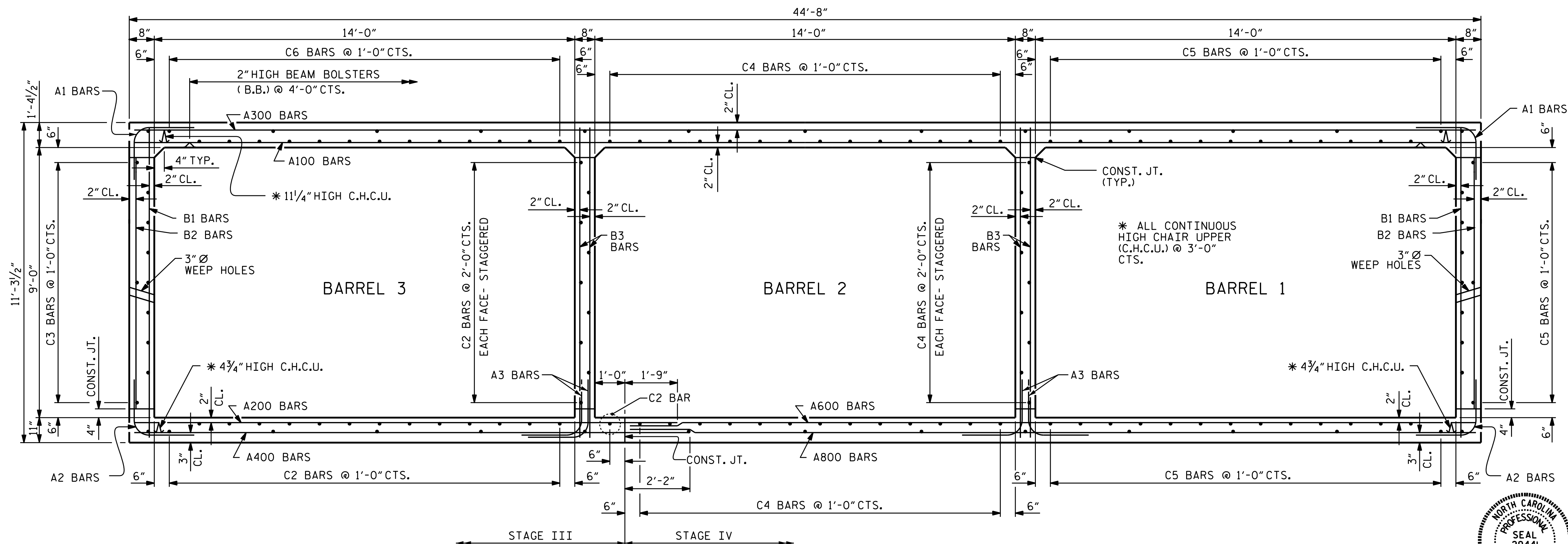
DRAWN BY : I.L. AVERETTE DATE : 07-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			18



SECTION A-A
 (LOOKING DOWNSTREAM)
 THERE ARE 148 "C" BARS IN SECTION OF BARREL.



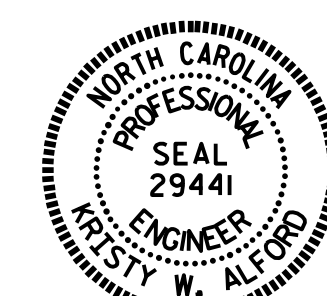
SECTION B-B
 (LOOKING DOWNSTREAM)
 THERE ARE 148 "C" BARS IN SECTION OF BARREL.

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 5 OF 18

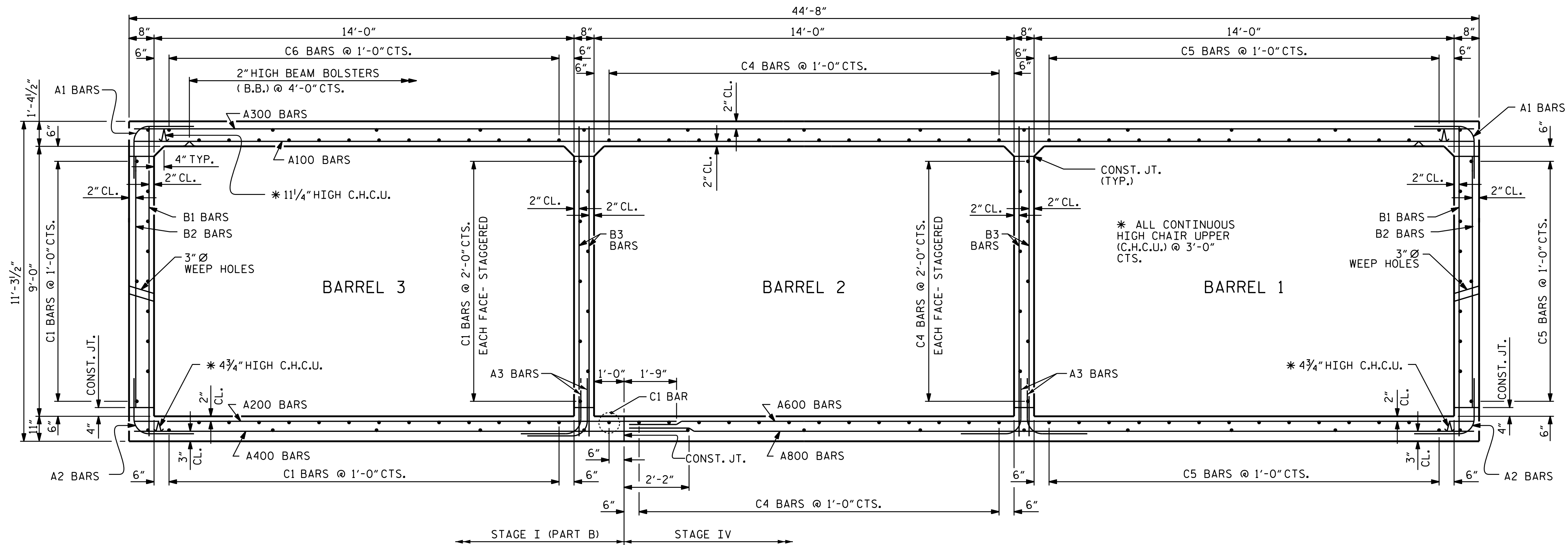
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT**



3/29/2016

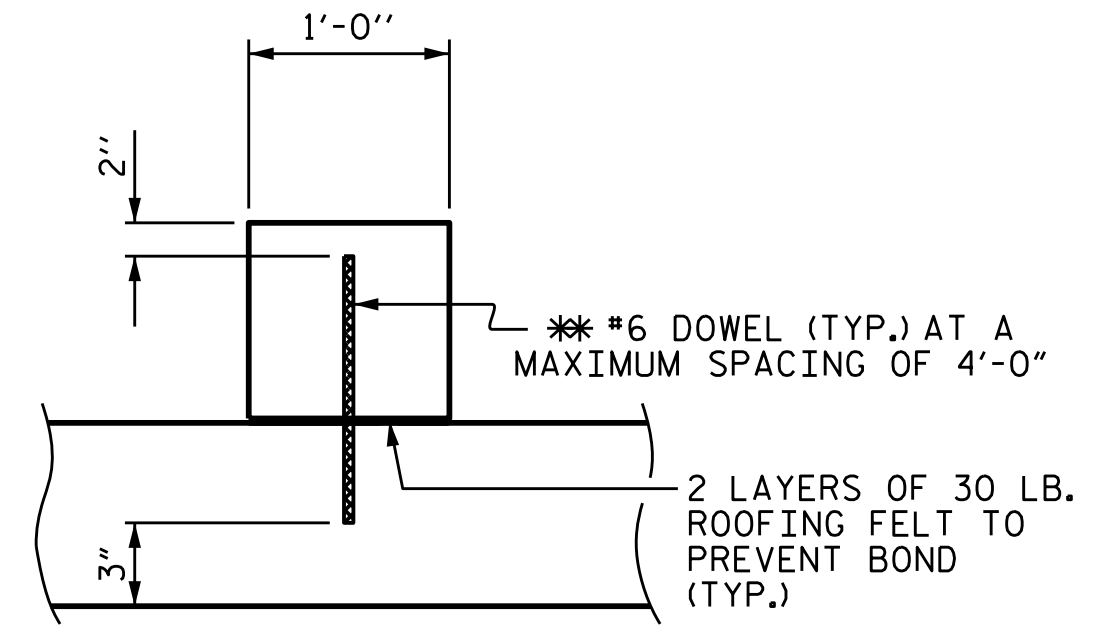
DRAWN BY: I.L. AVERETTE DATE: 07-15
 CHECKED BY: J.P. ADAMS DATE: 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE: 09-15

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5	
1			3			TOTAL SHEETS	
2			4			18	

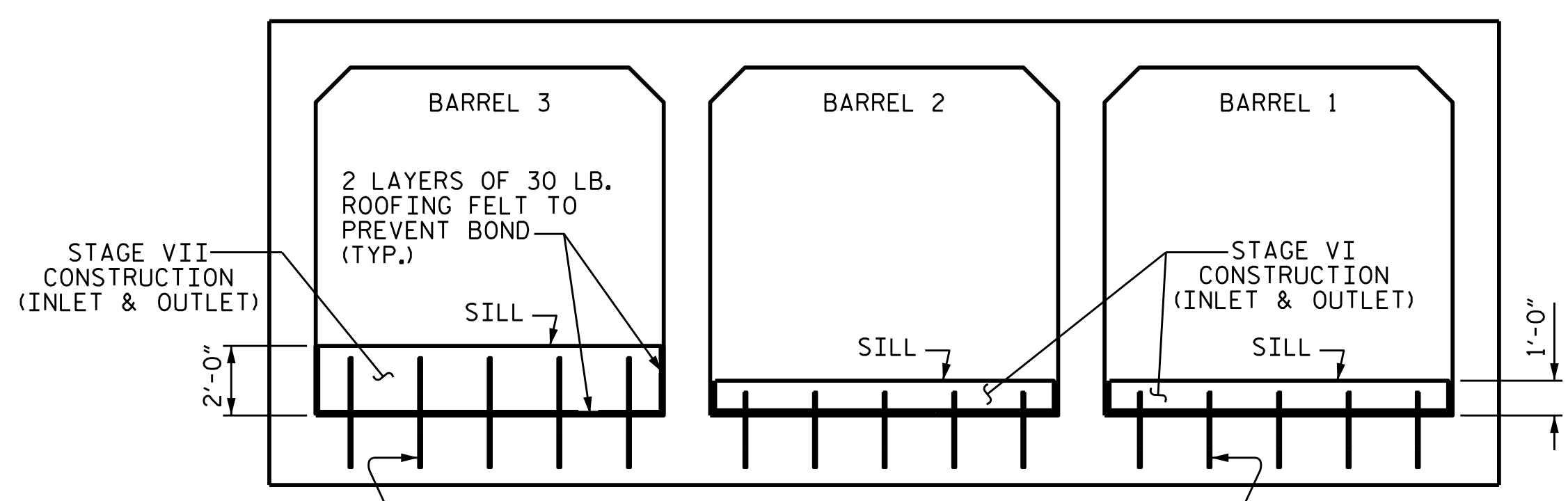


SECTION C-C

(LOOKING DOWNSTREAM)
THERE ARE 148 "C" BARS IN SECTION OF BARREL.



SECTION THROUGH SILL



ELEVATION

SILLS AT INLET LOOKING DOWNSTREAM SHOWN.
SILLS AT OUTLET SIMILAR EXCEPT NUMBER OF DOWELS REQUIRED.

SILL DETAILS

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

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 19+26.42 -L-

SHEET 6 OF 18



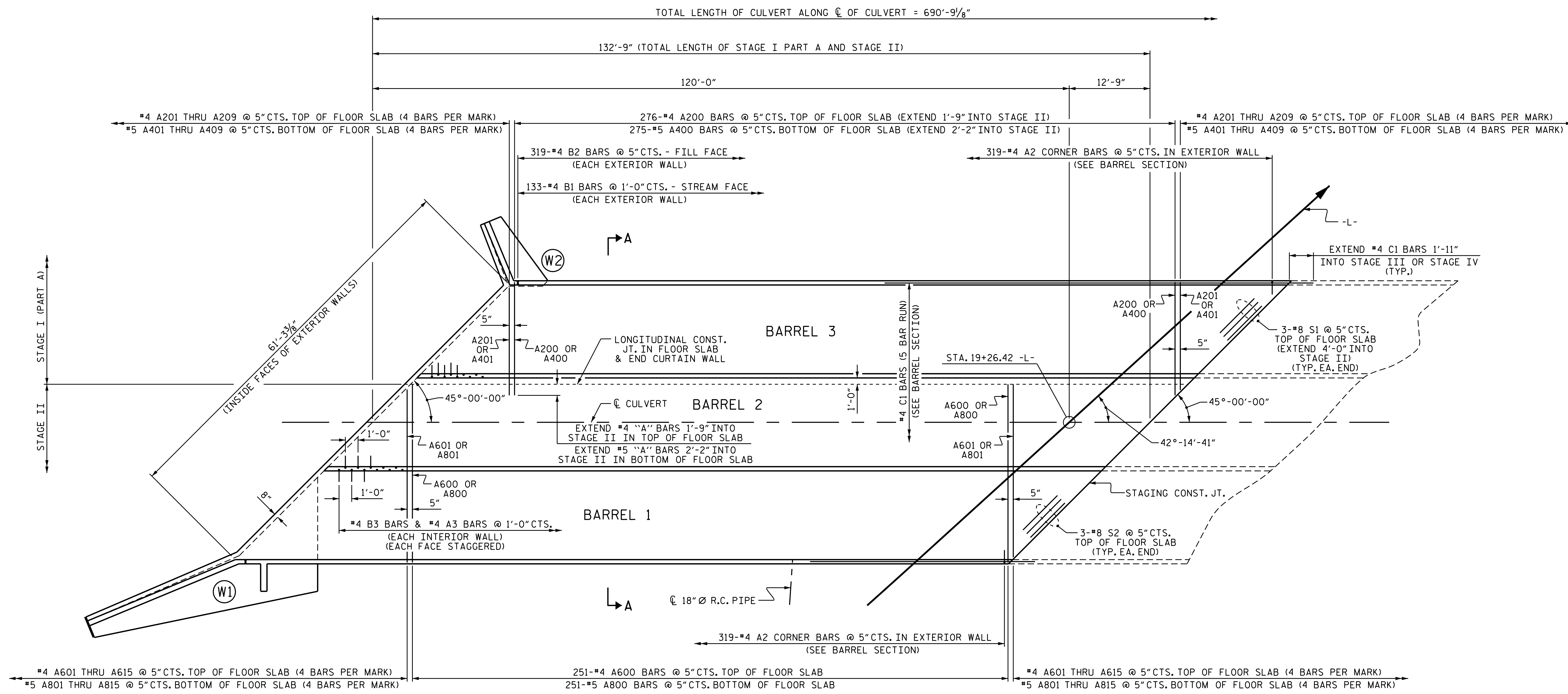
DocuSigned by:
F245838930F40E
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**TRIPLE 14 FT. X 9 FT.
CONCRETE BOX CULVERT**

DRAWN BY :	I.L. AVERETTE	DATE :	07-15
CHECKED BY :	J.P. ADAMS	DATE :	08-15
DESIGN ENGINEER OF RECORD :	I.L. AVERETTE	DATE :	09-15

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6	
1			3			TOTAL SHEETS	
2			4			18	

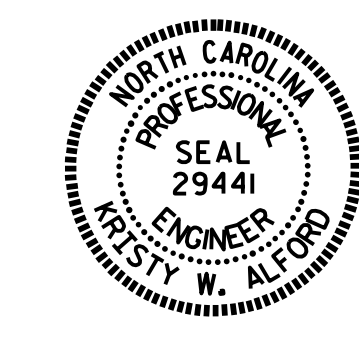


PLAN OF FLOOR SLAB - STAGE I (PART A) & STAGE II

FOR PLAN OF FLOOR SLAB -STAGE I (PART B), SEE SHEET 9 OF 18.
 SILLS FOR STAGES VI & VII NOT SHOWN FOR CLARITY. SEE "SILL DETAILS" ON SHEET 6 OF 18.
 THE 18" Ø R.C. PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER.
 THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE. SEE DETAILS ON SHEET 15 OF 18.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 7 OF 18



DocuSigned by:
 Kristy W. Alford
 3/29/2016

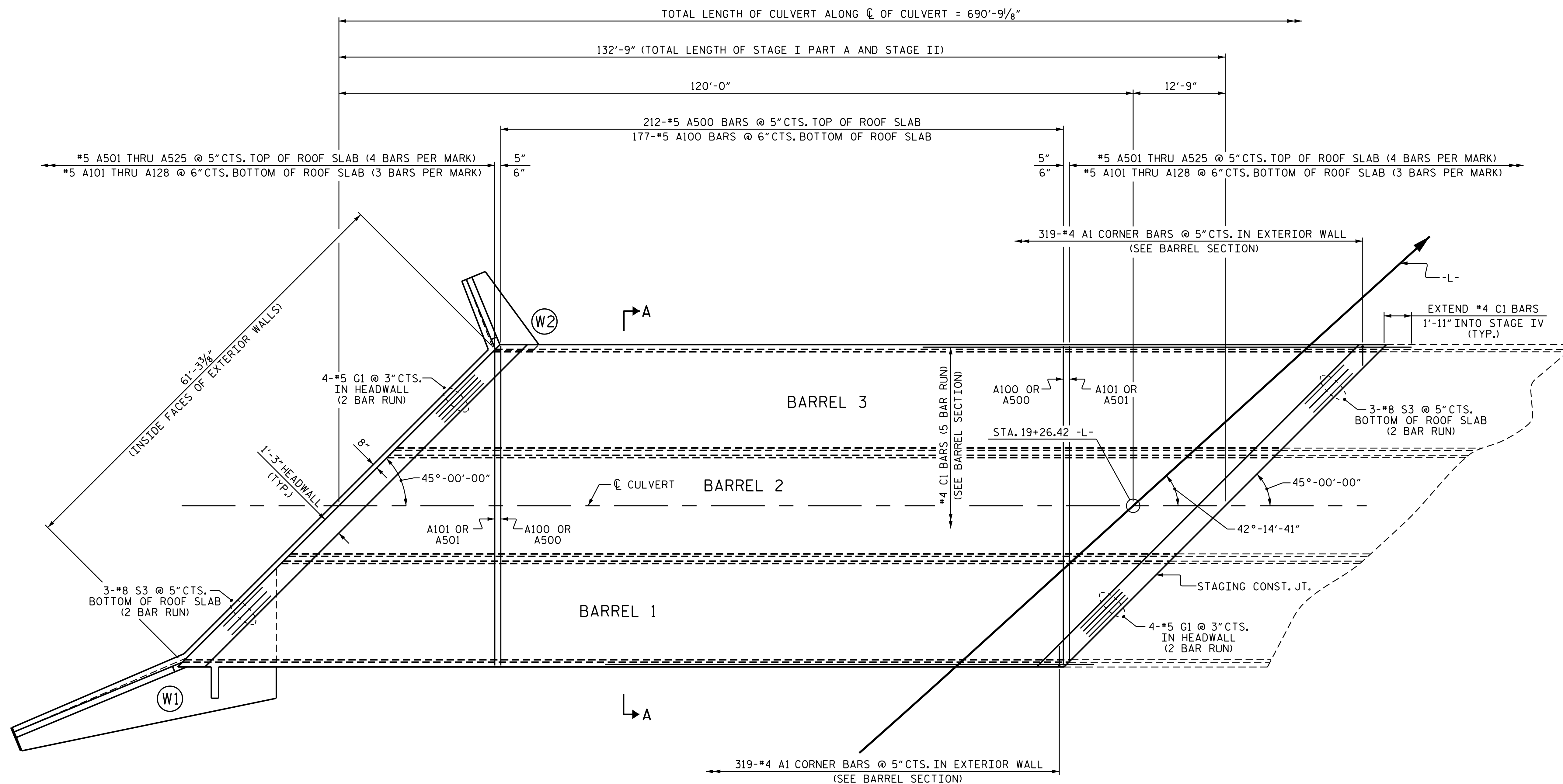
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT**

DRAWN BY : I.L. AVERETTE DATE : 07-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7	
1			3			TOTAL SHEETS	
2			4			18	



PLAN OF ROOF SLAB - STAGE II

THE 18" Ø R.C. PIPE THROUGH THE SIDEWALL OF THE CULVERT IS NOT SHOWN. SEE PLAN OF FLOOR SLAB SHEET 7 OF 18.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 8 OF 18

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT

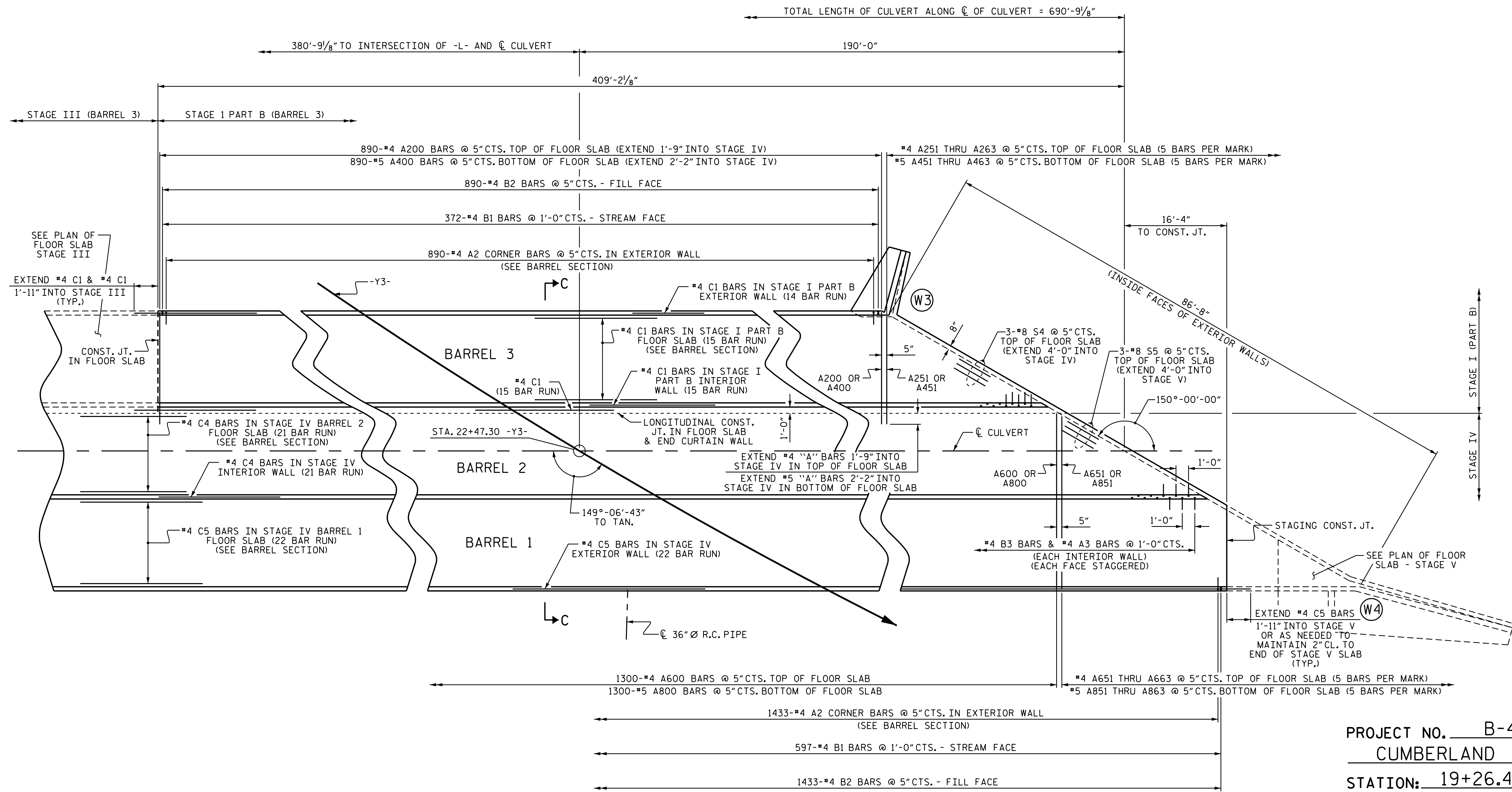


DocuSigned by:
 KIRSTY W. ALFORD
 3/29/2016

DRAWN BY : I.L. AVERETTE DATE : 07-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8	
1			3			TOTAL SHEETS	
2			4			18	



PLAN OF FLOOR SLAB - STAGE I (PART B) & PARTIAL PLAN OF FLOOR SLAB - STAGE IV

SILLS FOR STAGES VI & VII NOT SHOWN FOR CLARITY. SEE "SILL DETAILS" ON SHEET 6 OF 18.
 THE 36" Ø R.C. PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER.
 THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE. SEE DETAILS ON SHEET 15 OF 18.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 9 OF 18



DocuSigned by:
 Kristy W. Alford
 3/29/2016

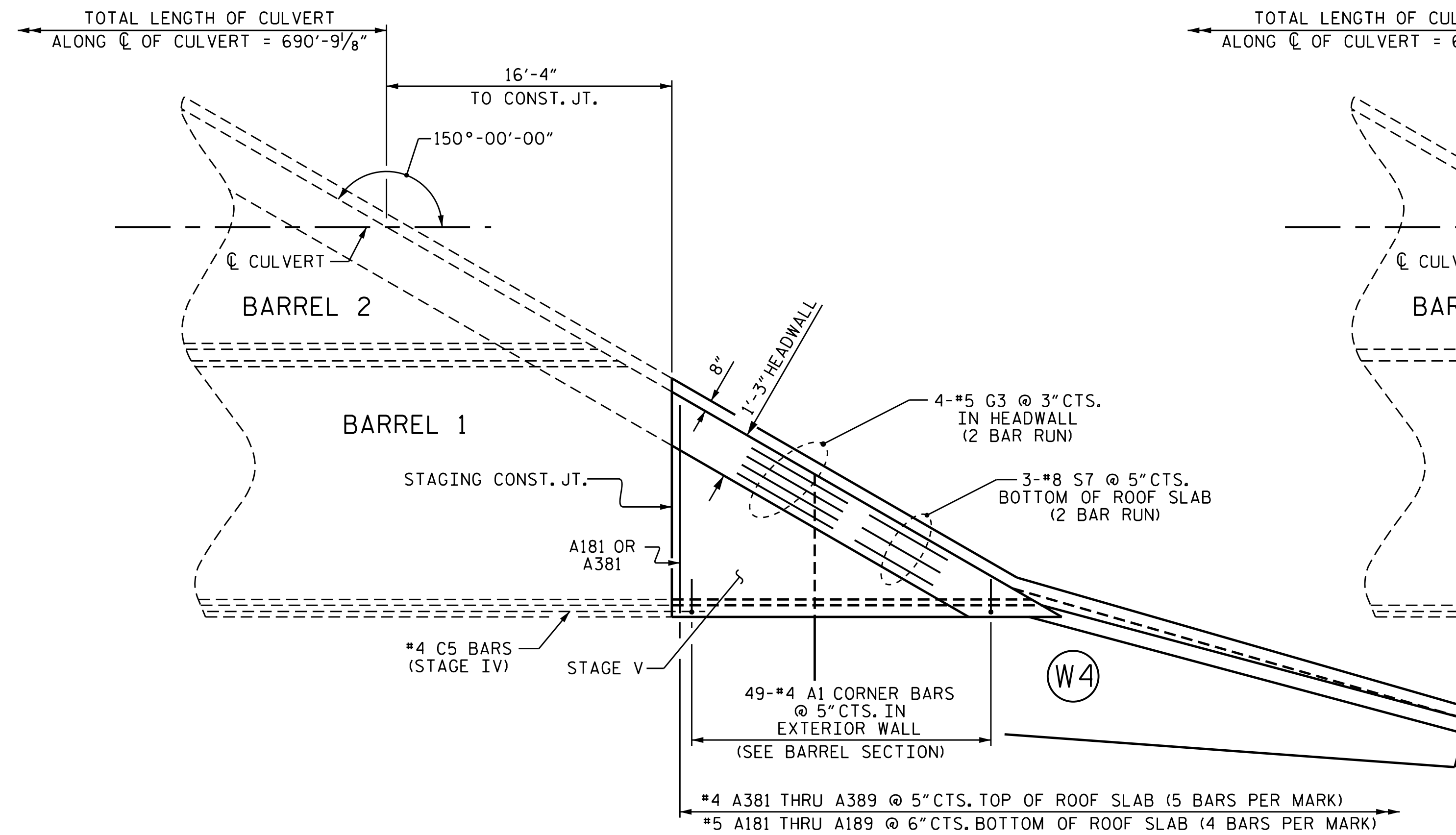
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE 14 FT. X 9 FT.
 CONCRETE BOX CULVERT

DRAWN BY : I.L. AVERETTE DATE : 07-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD : I.L. AVERETTE DATE : 09-15

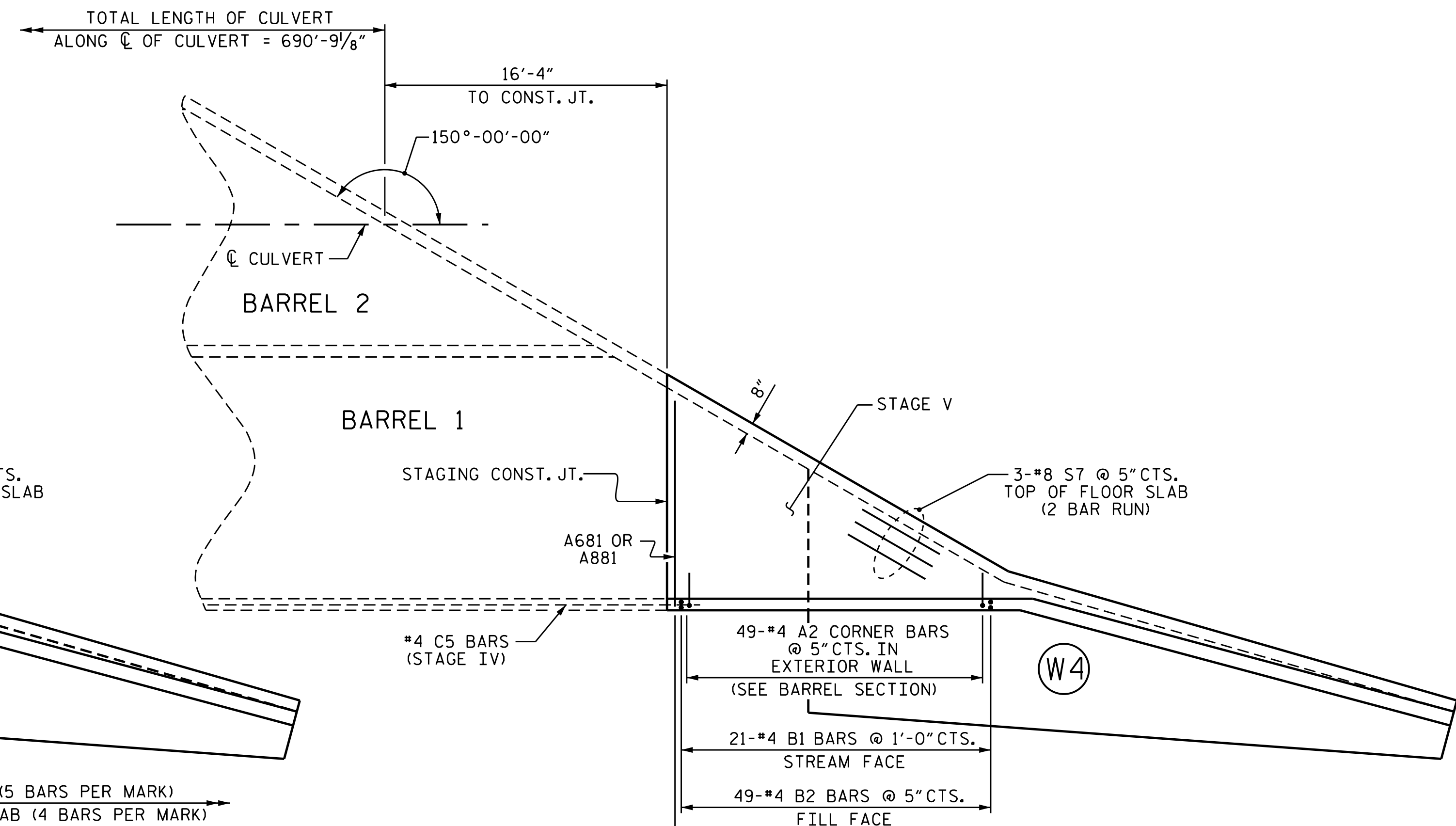
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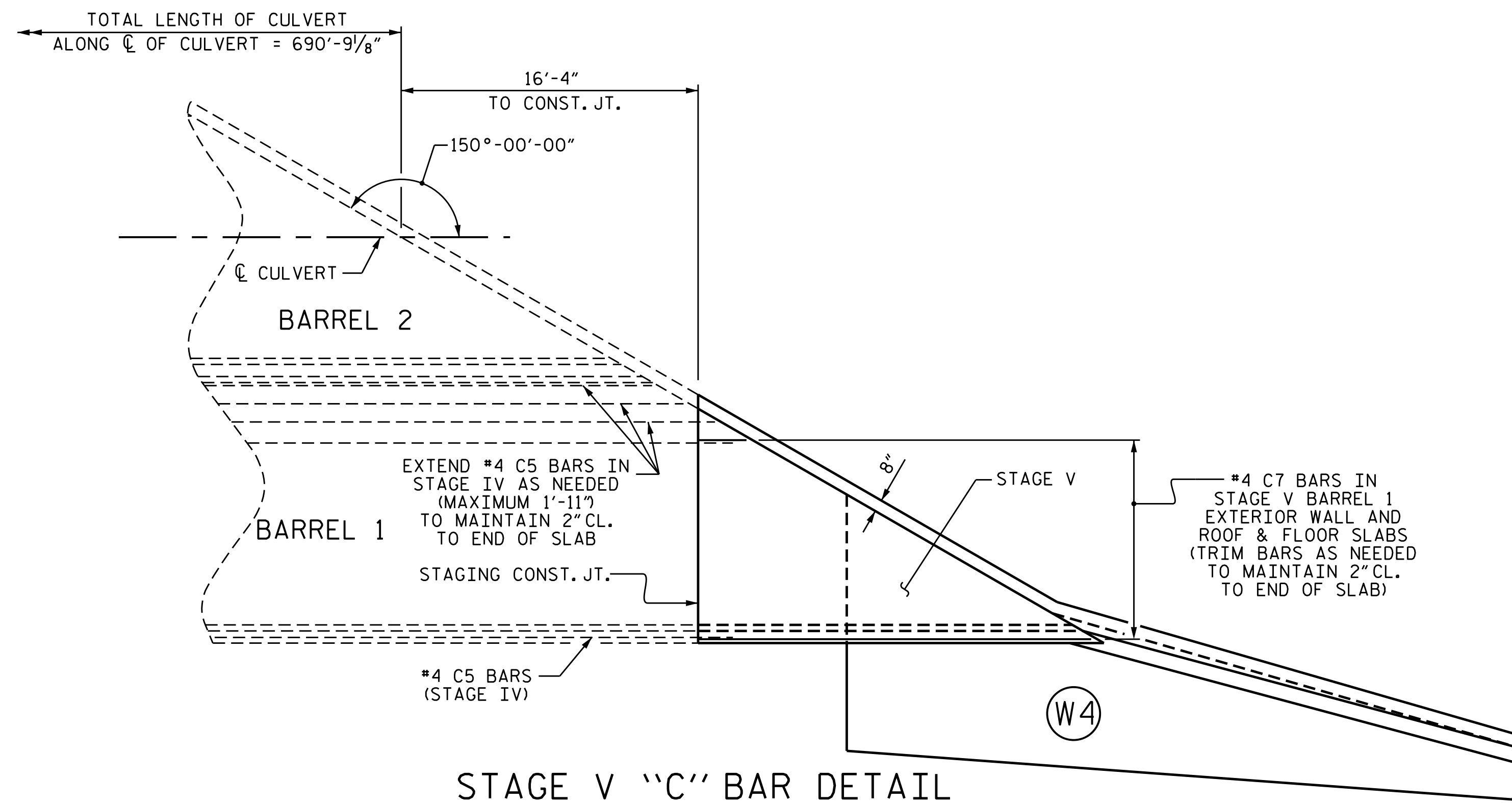
PLAN OF ROOF SLAB - STAGE V

FOR "C" BARS, SEE "STAGE V "C" BAR DETAIL"



PLAN OF FLOOR SLAB - STAGE V

FOR "C" BARS, SEE "STAGE V "C" BAR DETAIL"
SILLS FOR STAGES VI & VII NOT SHOWN FOR CLARITY. SEE "SILL DETAILS" ON SHEET 6 OF 18



STAGE V "C" BAR DETAIL

HEADWALL NOT SHOWN FOR CLARITY

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 19+26.42 -L-

SHEET 12 OF 18



DocuSigned by:
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

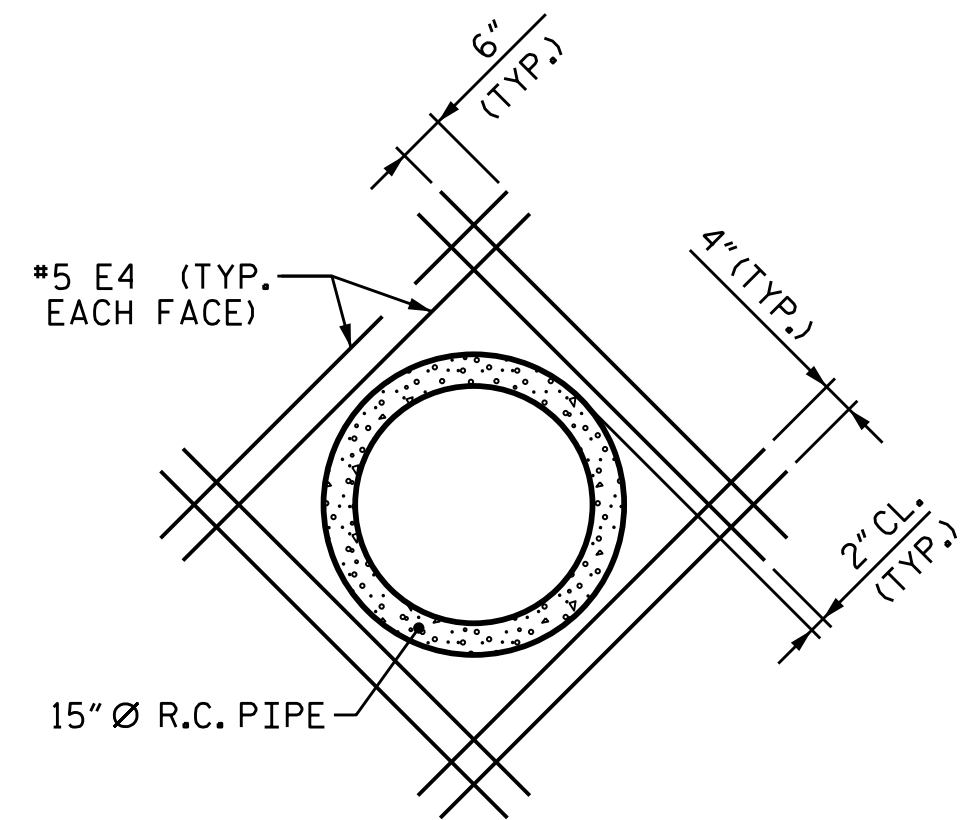
TRIPLE 14 FT. X 9 FT.
CONCRETE BOX CULVERT

DRAWN BY : I.L. AVERETTE DATE : 07-15
CHECKED BY : J.P. ADAMS DATE : 08-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

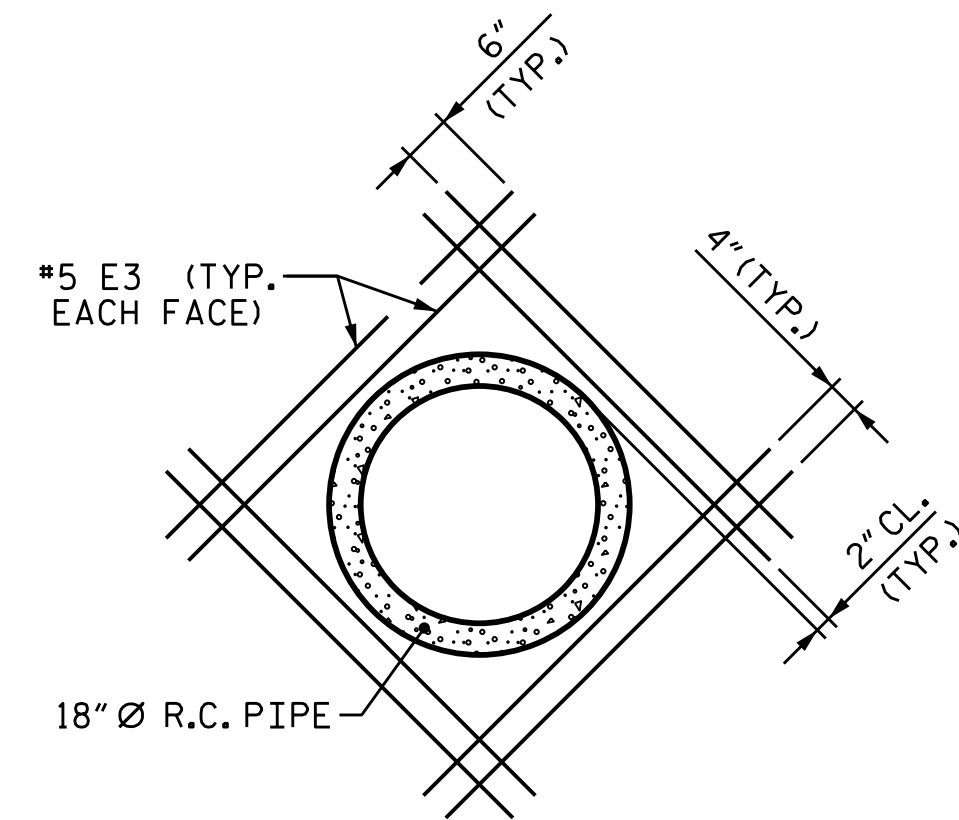
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2			4			18	

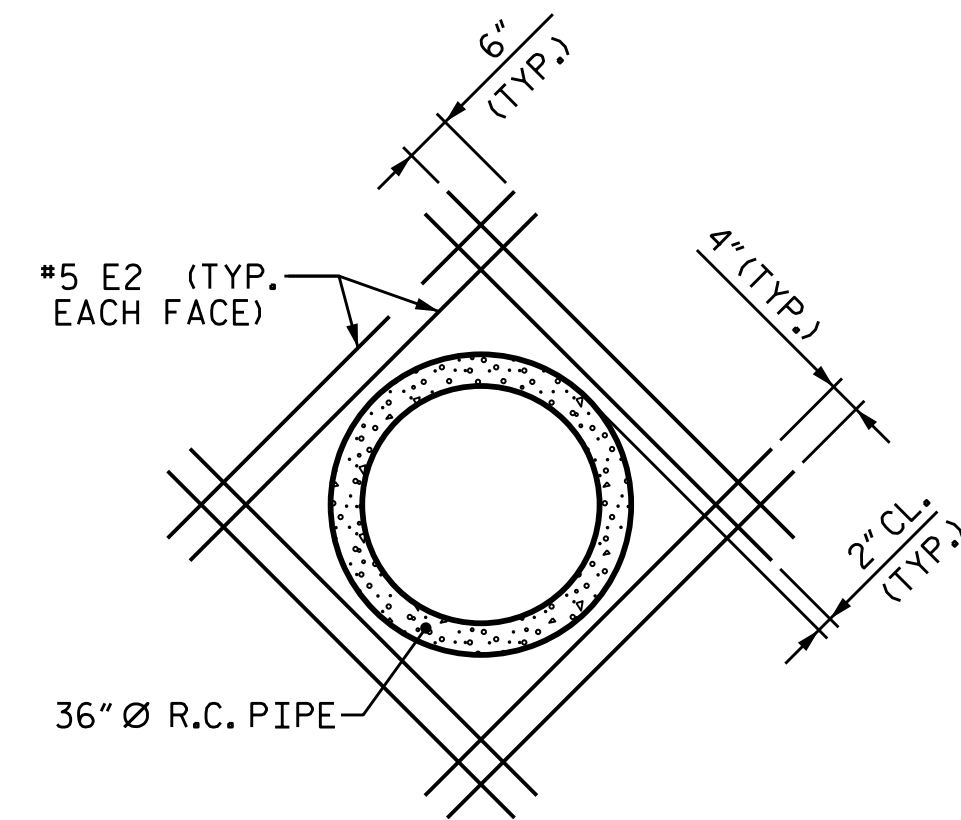
STRUCTURE QUANTITIES																	
STAGE I (PART A)			STAGE I (PART B)			STAGE II			STAGE III			STAGE IV			STAGE V		
CLASS A CONCRETE			CLASS A CONCRETE			CLASS A CONCRETE			CLASS A CONCRETE			CLASS A CONCRETE			CLASS A CONCRETE		
BARREL @ 0.983 CY/FT	CU. YDS.	130.4	BARREL @ 0.983 CY/FT	CU. YDS.	377.5	BARREL @ 3.710 CY/FT	CU. YDS.	492.5	BARREL @ 0.983 CY/FT	CU. YDS.	132.1	BARREL @ 3.710 CY/FT	CU. YDS.	2091.6	BARREL @ 1.319 CY/FT	CU. YDS.	17.1
WING, ETC.	CU. YDS.	7.1	WING, ETC.	CU. YDS.	7.5	WING, ETC.	CU. YDS.	29.0	END CURTAIN WALL & HEADWALL	CU. YDS.	6.4	END CURTAIN WALL & HEADWALL	CU. YDS.	6.4	WING, ETC.	CU. YDS.	22.6
TOTAL	CU. YDS.	137.5	TOTAL	CU. YDS.	385.0	TOTAL	CU. YDS.	521.5	TOTAL	CU. YDS.	132.1	TOTAL	CU. YDS.	2098.0	TOTAL	CU. YDS.	39.7
REINFORCING STEEL			REINFORCING STEEL			REINFORCING STEEL			REINFORCING STEEL			REINFORCING STEEL			REINFORCING STEEL		
BARREL	LBS.	21,890	BARREL	LBS.	62,752	BARREL	LBS.	62,373	BARREL	LBS.	22,036	BARREL	LBS.	241,411	BARREL	LBS.	2,943
WING, ETC.	LBS.	396	WING, ETC.	LBS.	396	WING, ETC.	LBS.	2,640	WING, ETC.	LBS.	22,036	WING, ETC.	LBS.	241,411	WING, ETC.	LBS.	2,695
TOTAL	LBS.	22,286	TOTAL	LBS.	63,148	TOTAL	LBS.	65,013	TOTAL	LBS.	22,036	TOTAL	LBS.	241,411	TOTAL	LBS.	5,638
FOUNDATION COND. MAT'L.	TONS	153	FOUNDATION COND. MAT'L.	TONS	443	FOUNDATION COND. MAT'L.	TONS	265	FOUNDATION COND. MAT'L.	TONS	155	FOUNDATION COND. MAT'L.	TONS	1149	FOUNDATION COND. MAT'L.	TONS	10



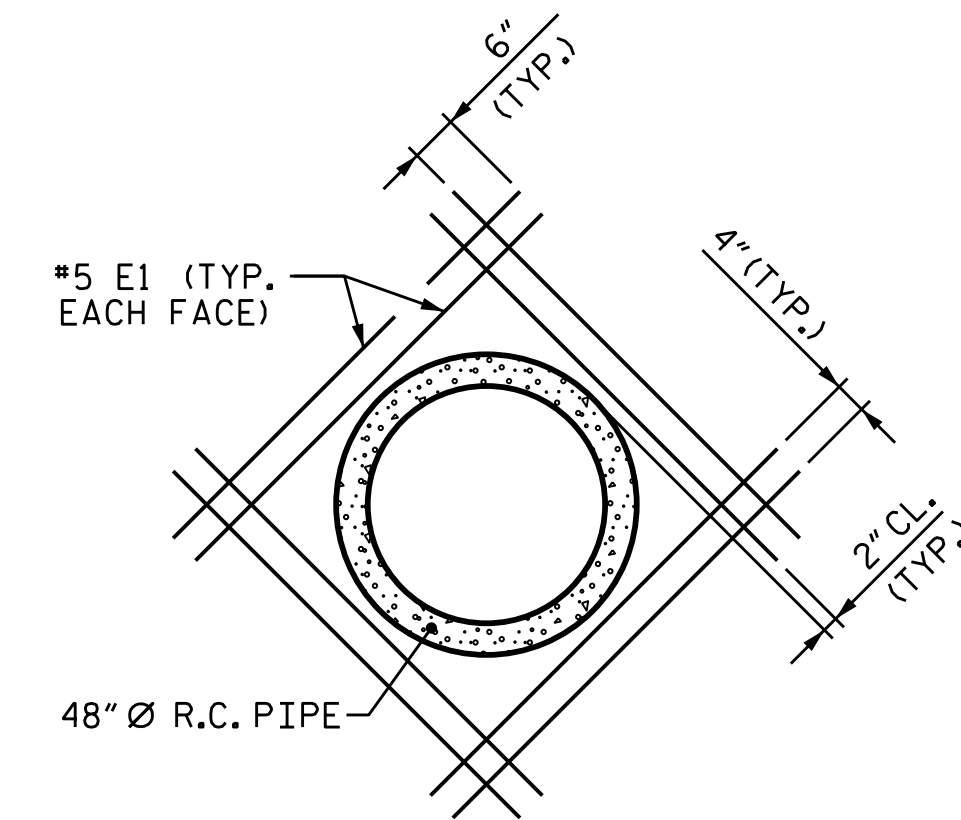
DETAIL OF REINFORCING
AROUND 15" Ø PIPE



DETAIL OF REINFORCING
AROUND 18" Ø PIPE



DETAIL OF REINFORCING
AROUND 36" Ø PIPE



DETAIL OF REINFORCING
AROUND 48" Ø PIPE

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 19+26.42 -L-

SHEET 15 OF 18



DocuSigned by:

F245838930BF40E...

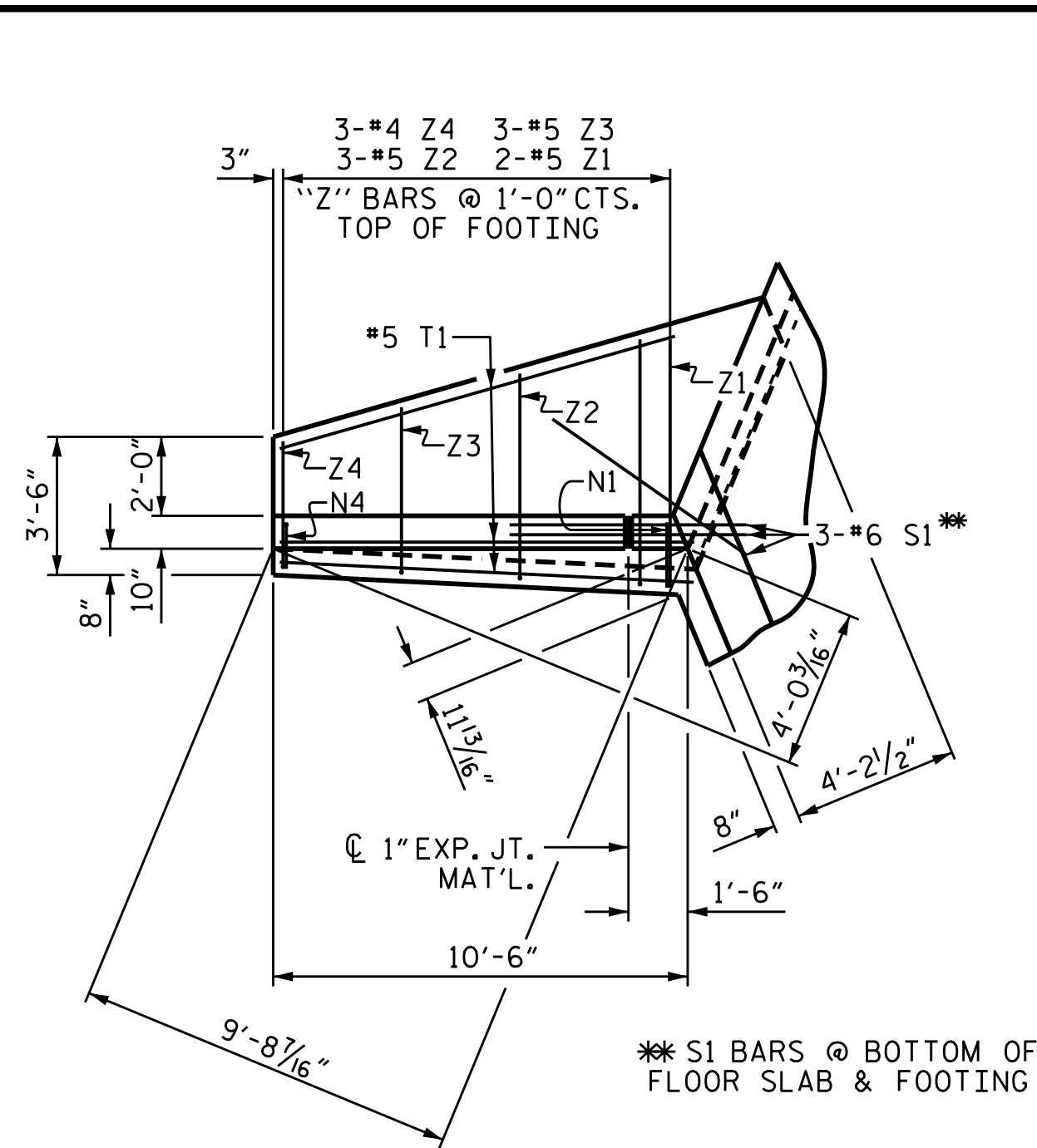
3/29/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
TRIPLE 14 FT. X 9 FT.
CONCRETE BOX CULVERT

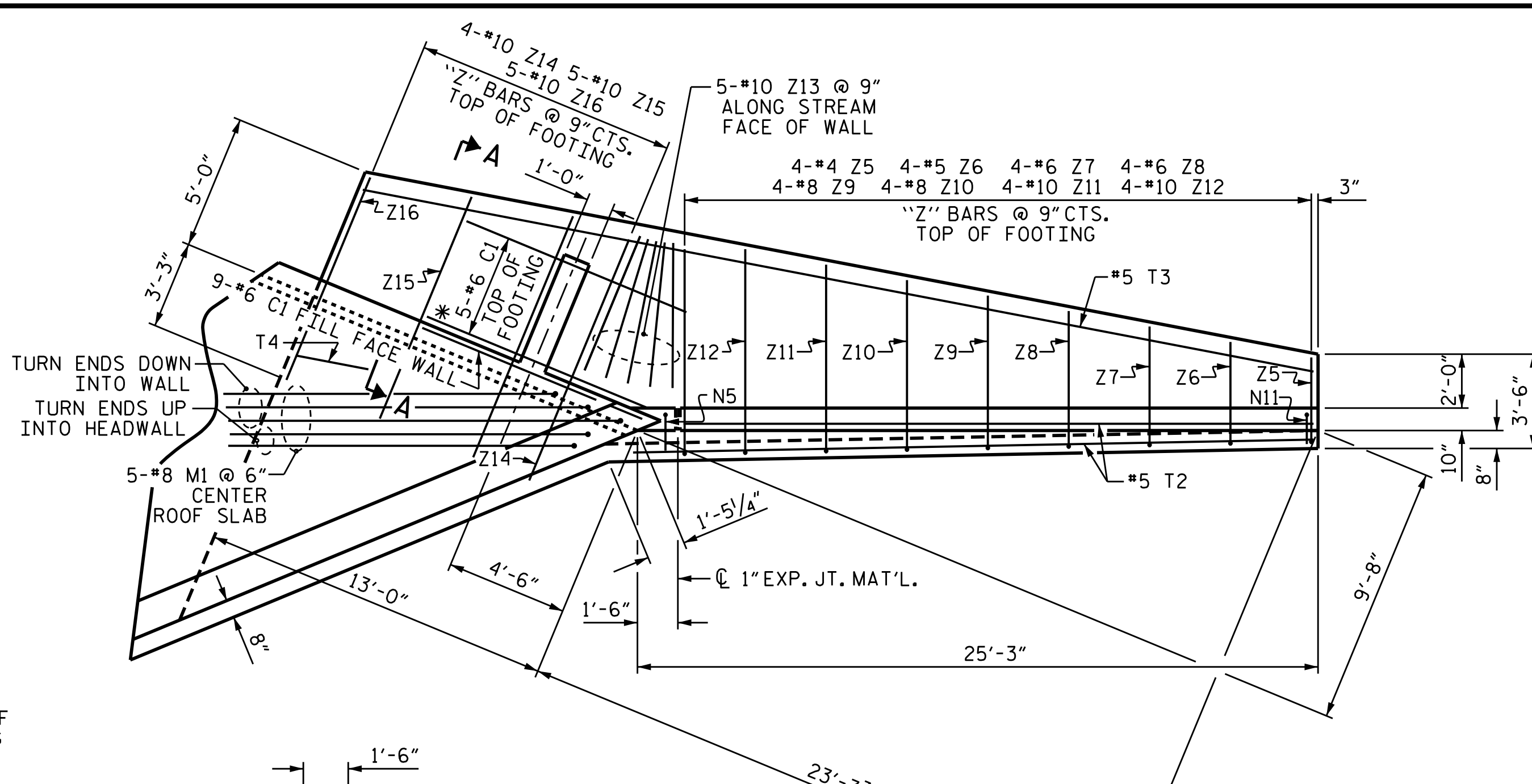
DRAWN BY : I.L. AVERETTE DATE : 06-15
CHECKED BY : J.P. ADAMS DATE : 08-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-15	
1			3			TOTAL	18
2			4			SHEETS	

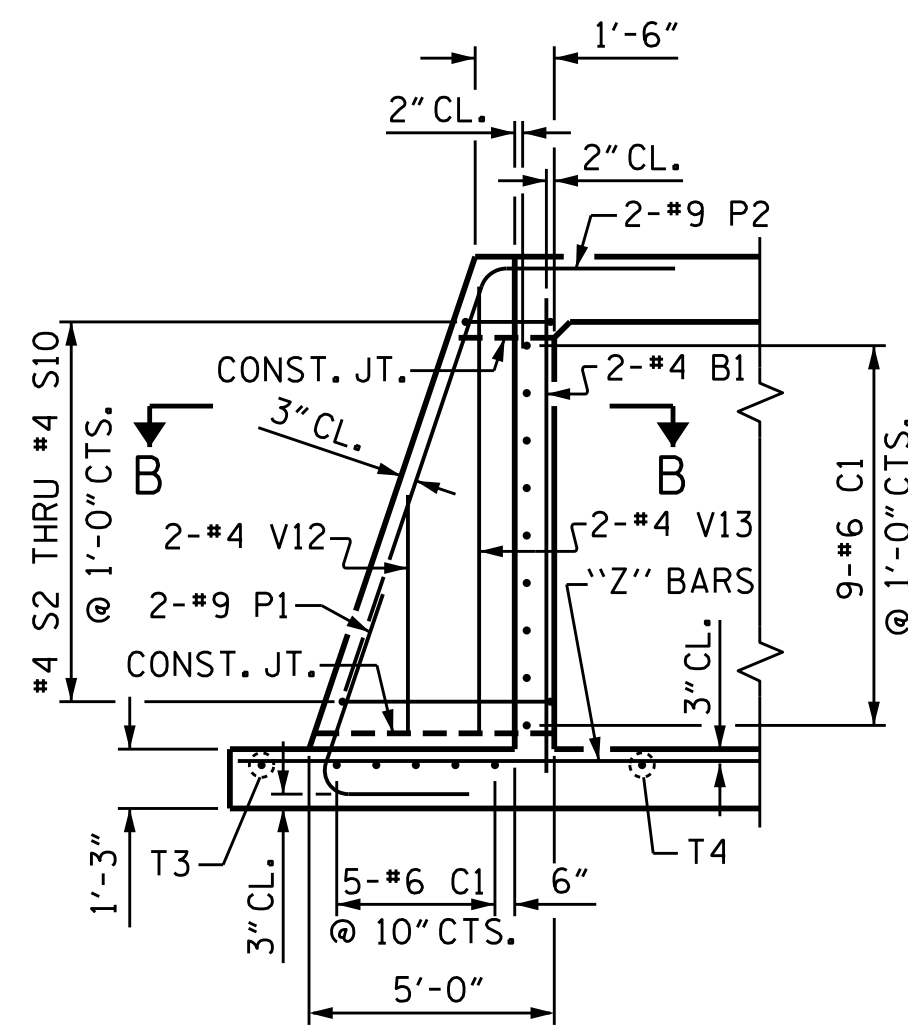


PLAN W2



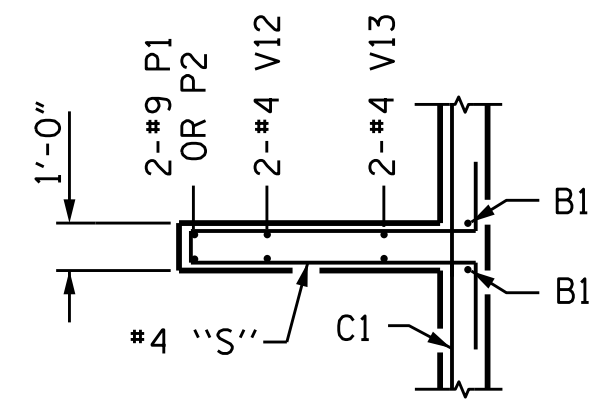
PLAN W1

* CENTER ALL #6 CI BARS ON C COUNTERFORT

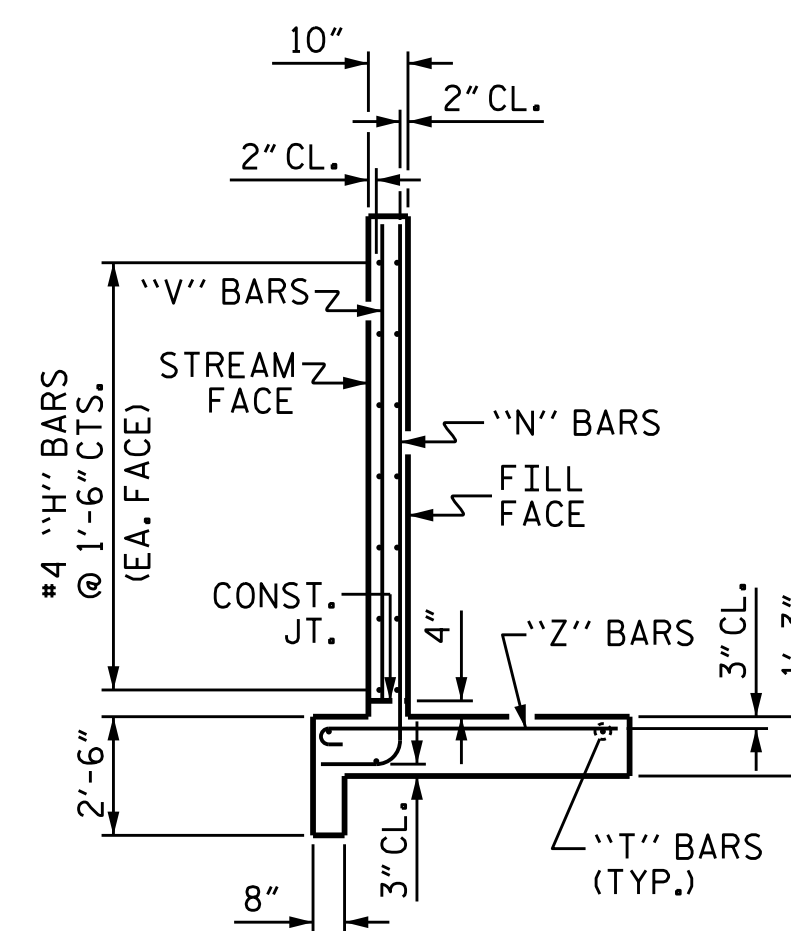


SECTION A-A

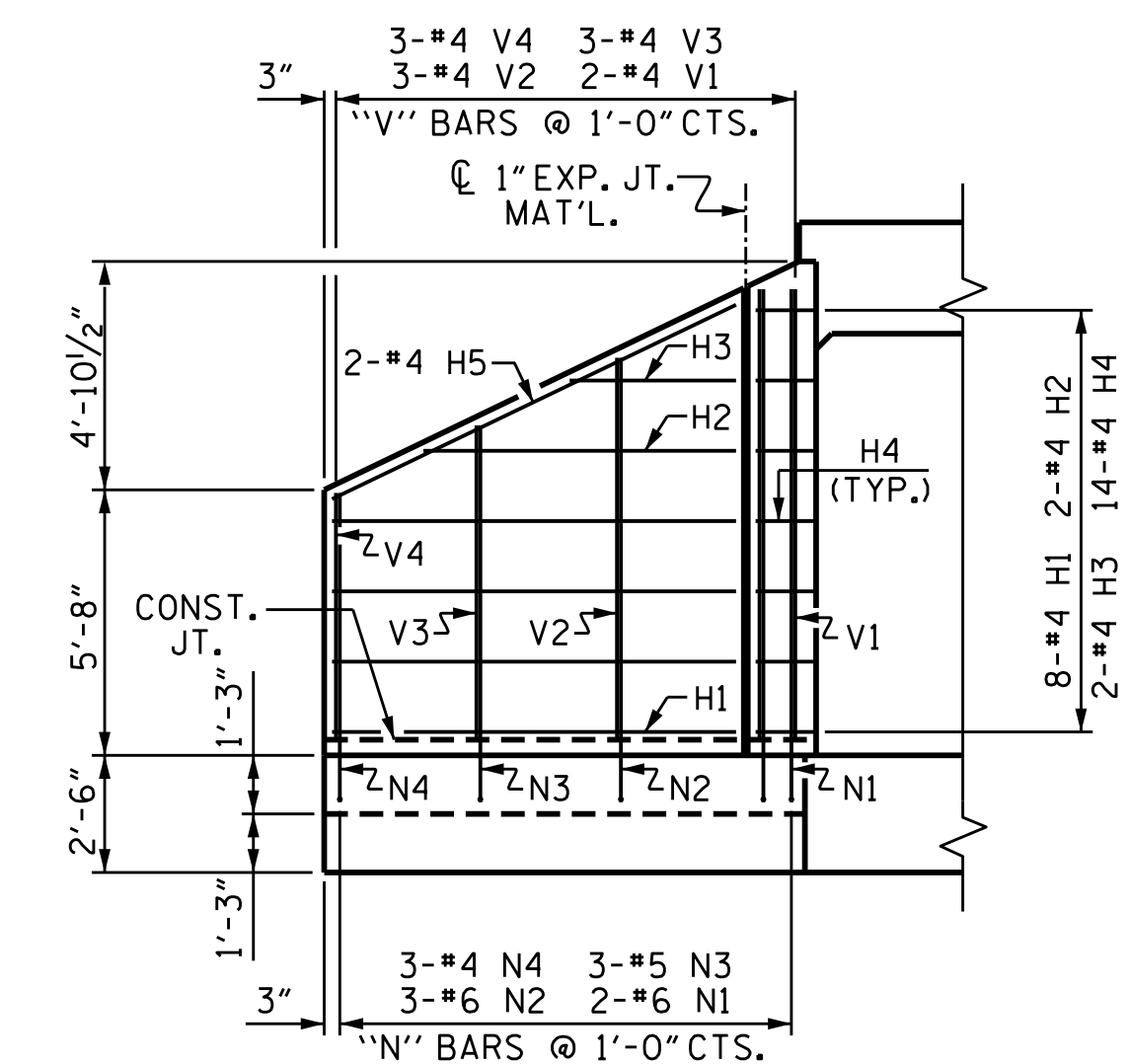
STANDARD REINFORCING STEEL IN BARREL NOT SHOWN



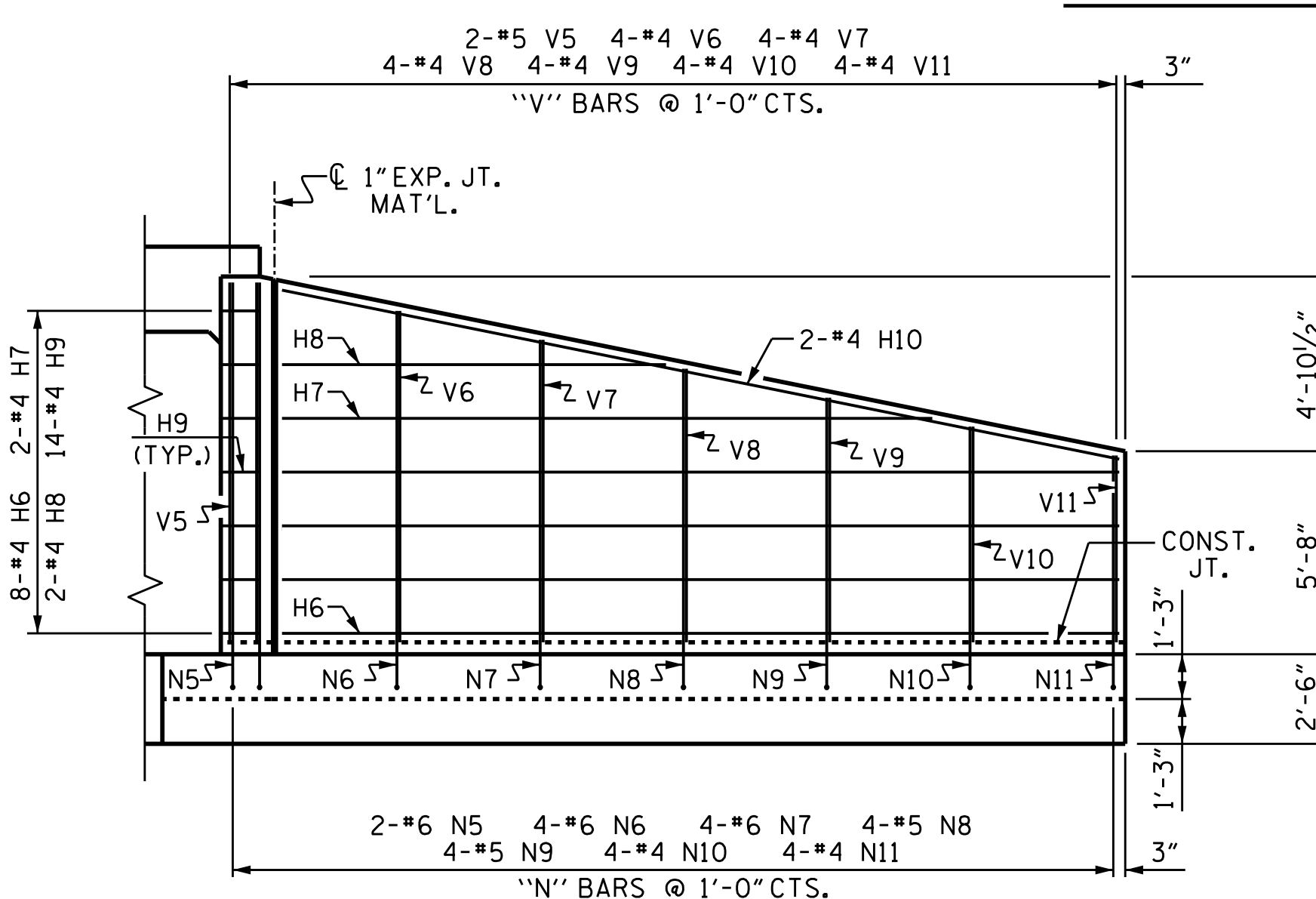
SECTION B-B



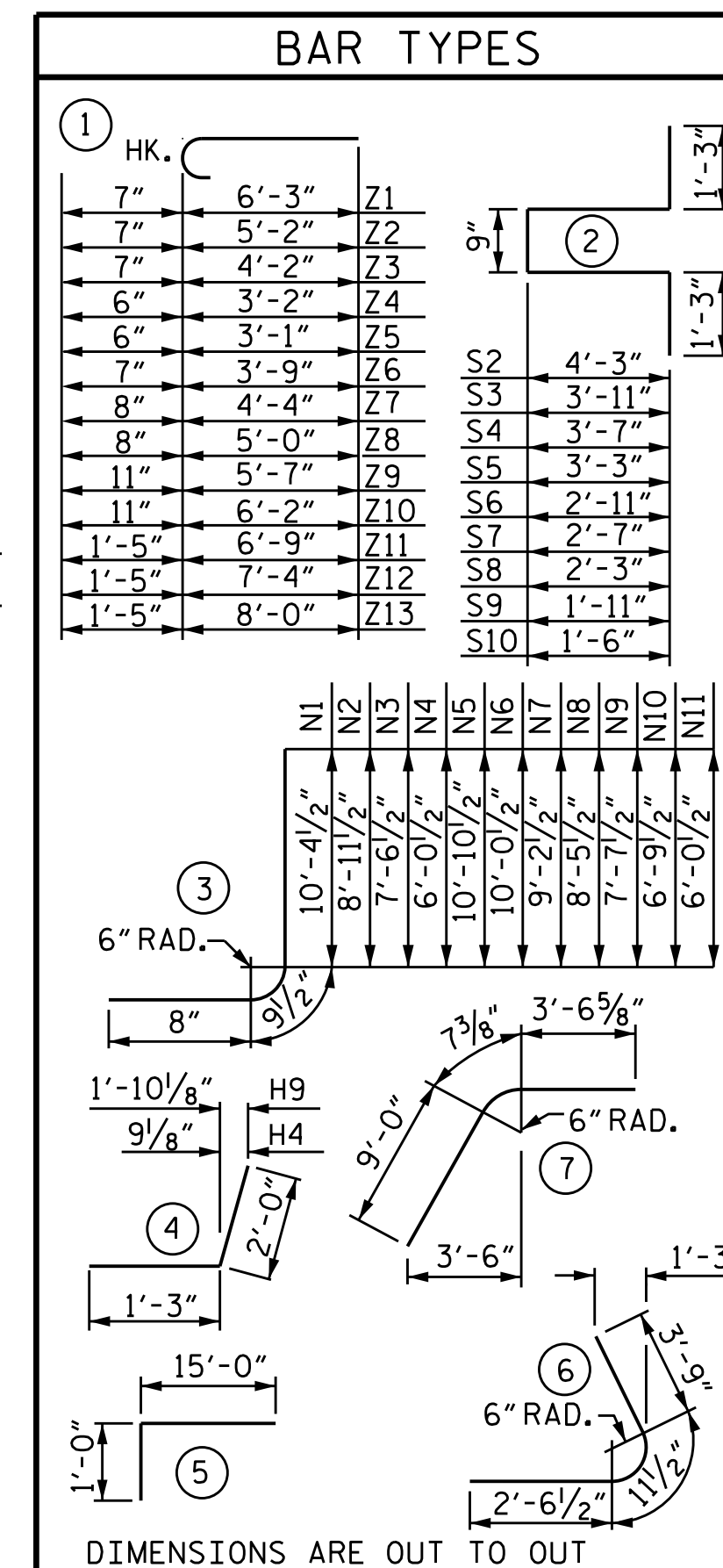
TYPICAL WING SECTION



ELEVATION W2



ELEVATION W1



DIMENSIONS ARE OUT TO OUT



DocuSigned by: J.P. Adams
F248389308F40E

3/29/2016

BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	8'-7"	46
H2	2	#4	STR	6'-8"	9
H3	2	#4	STR	3'-6"	5
H4	14	#4	4	3'-3"	30
H5	2	#4	STR	9'-6"	13
N1	2	#6	3	11'-10"	36
N2	3	#6	3	10'-5"	47
N3	3	#5	3	9'-0"	28
N4	3	#4	3	7'-6"	15
S1	3	#6	STR	6'-0"	27
T1	3	#5	STR	10'-6"	33
V1	2	#4	STR	9'-7"	13
V2	3	#4	STR	8'-1"	16
V3	3	#4	STR	6'-8"	13
V4	3	#4	STR	5'-3"	11
Z1	2	#5	1	6'-10"	14
Z2	3	#5	1	5'-9"	18
Z3	3	#5	1	4'-9"	15
Z4	3	#4	1	3'-8"	7
REINFORCING STEEL FOR 1 WING W2 (STAGE I PART A)					396 LBS.
CLASS A CONCRETE (STAGE I PART A)					
1 WING					5.8 C.Y.
END CURTAIN WALL					1.3 C.Y.
TOTAL					7.1 C.Y.

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#4	STR	10'-0"	13
C1	14	#6	STR	9'-0"	189
H6	8	#4	STR	23'-4"	125
H7	2	#4	STR	18'-1"	24
H8	2	#4	STR	10'-8"	14
H9	14	#4	4	3'-3"	30
H10	2	#4	STR	23'-10"	32
M1	5	#8	5	16'-0"	214
N5	2	#6	3	12'-4"	37
N6	4	#6	3	11'-6"	69
N7	4	#6	3	10'-8"	64
N8	4	#5	3	9'-11"	41
N9	4	#5	3	9'-1"	38
N10	4	#4	3	8'-3"	22
N11	4	#4	3	7'-6"	20
P1	2	#9	6	7'-3"	49
P2	2	#9	7	13'-2"	90
S2	1	#4	2	11'-9"	8
S3	1	#4	2	11'-1"	7
S4	1	#4	2	10'-5"	7
S5	1	#4	2	9'-9"	7
S6	1	#4	2	9'-1"	6
S7	1	#4	2	8'-5"	6
S8	1	#4	2	7'-9"	5
S9	1	#4	2	7'-1"	5
S10	1	#4	2	6'-3"	4
T2	2	#5	STR	25'-3"	53
T3	1	#5	STR	35'-10"	37
T4	1	#5	STR	13'-0"	14
V5	2	#5	STR	10'-0"	21
V6	4	#4	STR	9'-3"	25
V7	4	#4	STR	8'-5"	22
V8	4	#4	STR	7'-7"	20
V9	4	#4	STR	6'-9"	18
V10	4	#4	STR	6'-0"	16
V11	4	#4	STR	5'-2"	14
V12	2	#4	STR	4'-6"	6
V13	2	#4	STR	8'-9"	12
Z5	4	#4	1	3'-7"	10
Z6	4	#5	1	4'-4"	18
Z7	4	#6	1	5'-0"	30
Z8	4	#6	1	5'-8"	34
Z9	4	#8	1	6'-6"	69
Z10	4	#8	1	7'-1"	76
Z11	4	#10	1	8'-2"	141
Z12	4	#10	1	8'-9"	151
Z13	5	#10	1	9'-5"	203
Z14	4	#10	STR	9'-6"	164
Z15	5	#10	STR	8'-9"	188
Z16	5	#10	STR	8'-0"	172
REINFORCING STEEL FOR 1 WING W1 (STAGE II)					2,640 LBS.
CLASS A CONCRETE (STAGE II)					
1 WING					19.4 C.Y.
END CURTAIN WALL					2.3 C.Y.
2 HEADWALLS					7.3 C.Y.
TOTAL					29.0 C.Y.

PROJECT NO. B-4490
CUMBERLAND COUNTY
STATION: 19+26.42 -L-

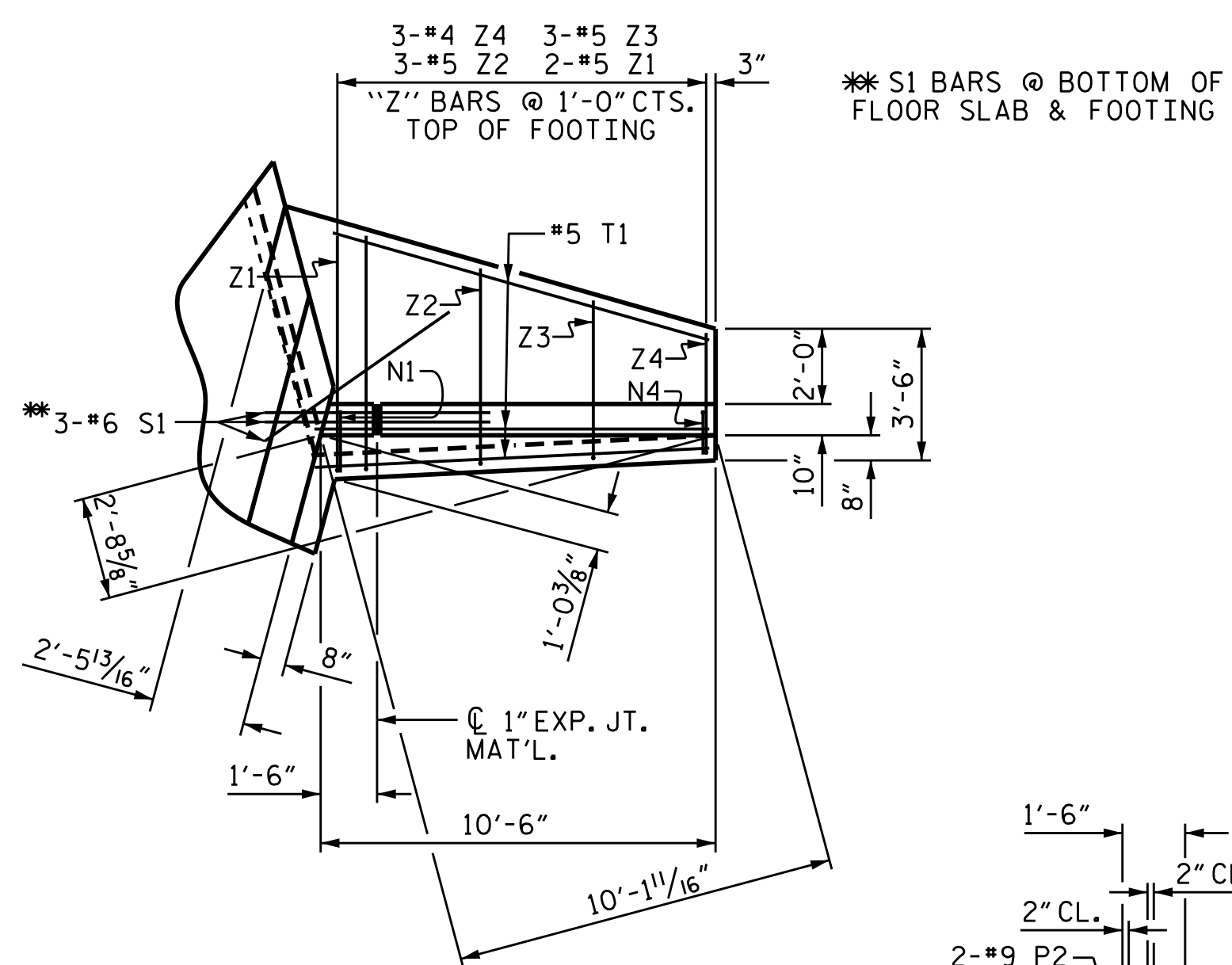
SHEET 16 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
INLET WINGS
FOR
CONCRETE BOX CULVERT
H = 9'-0" SLOPE = 2:1
45° SKEW

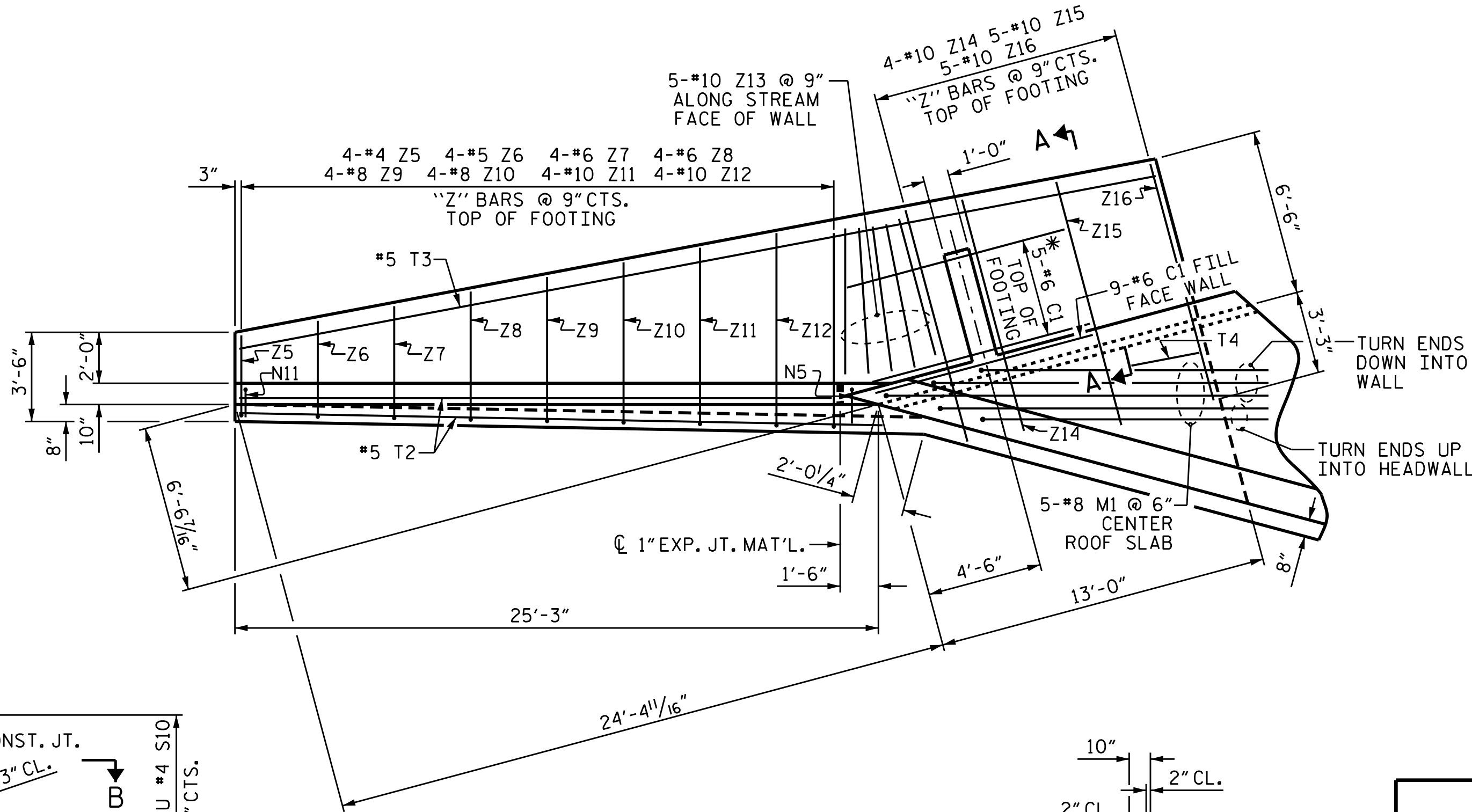
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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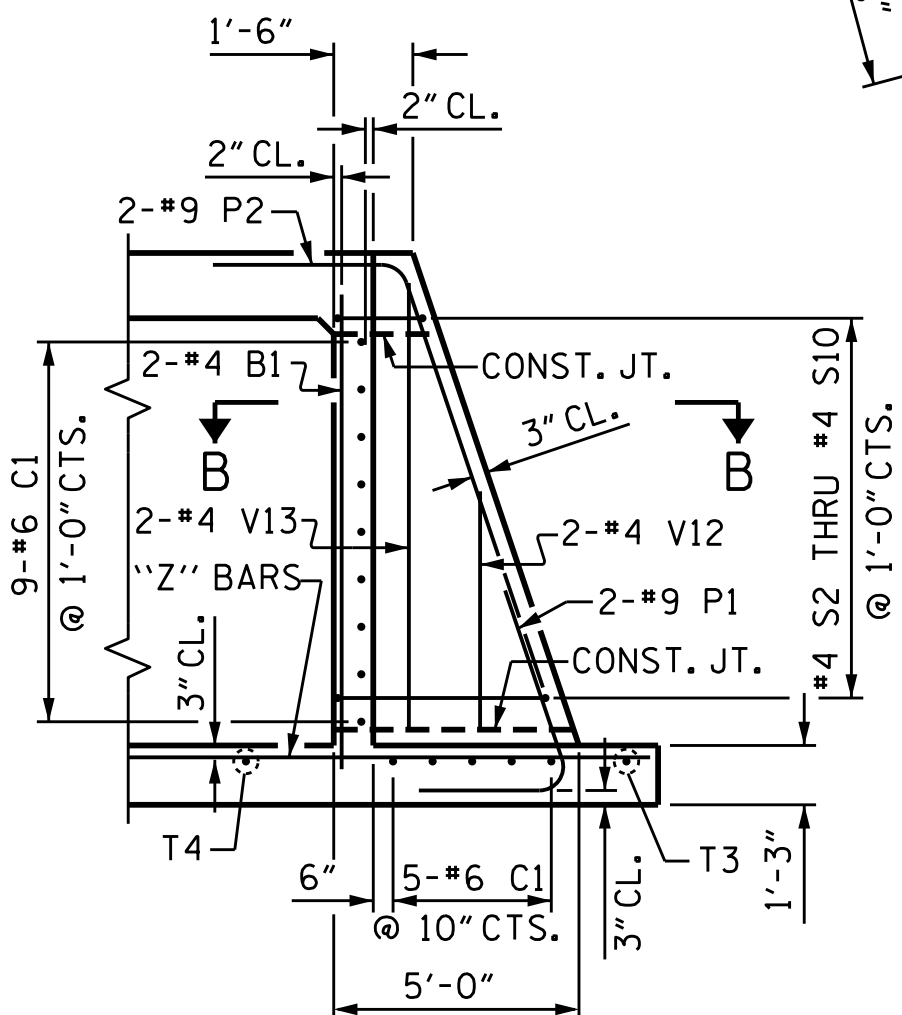
DRAWN BY: I.L. AVERETTE DATE: 07-15
CHECKED BY: J.P. ADAMS DATE: 08-15
DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE: 09-15



PLAN W3

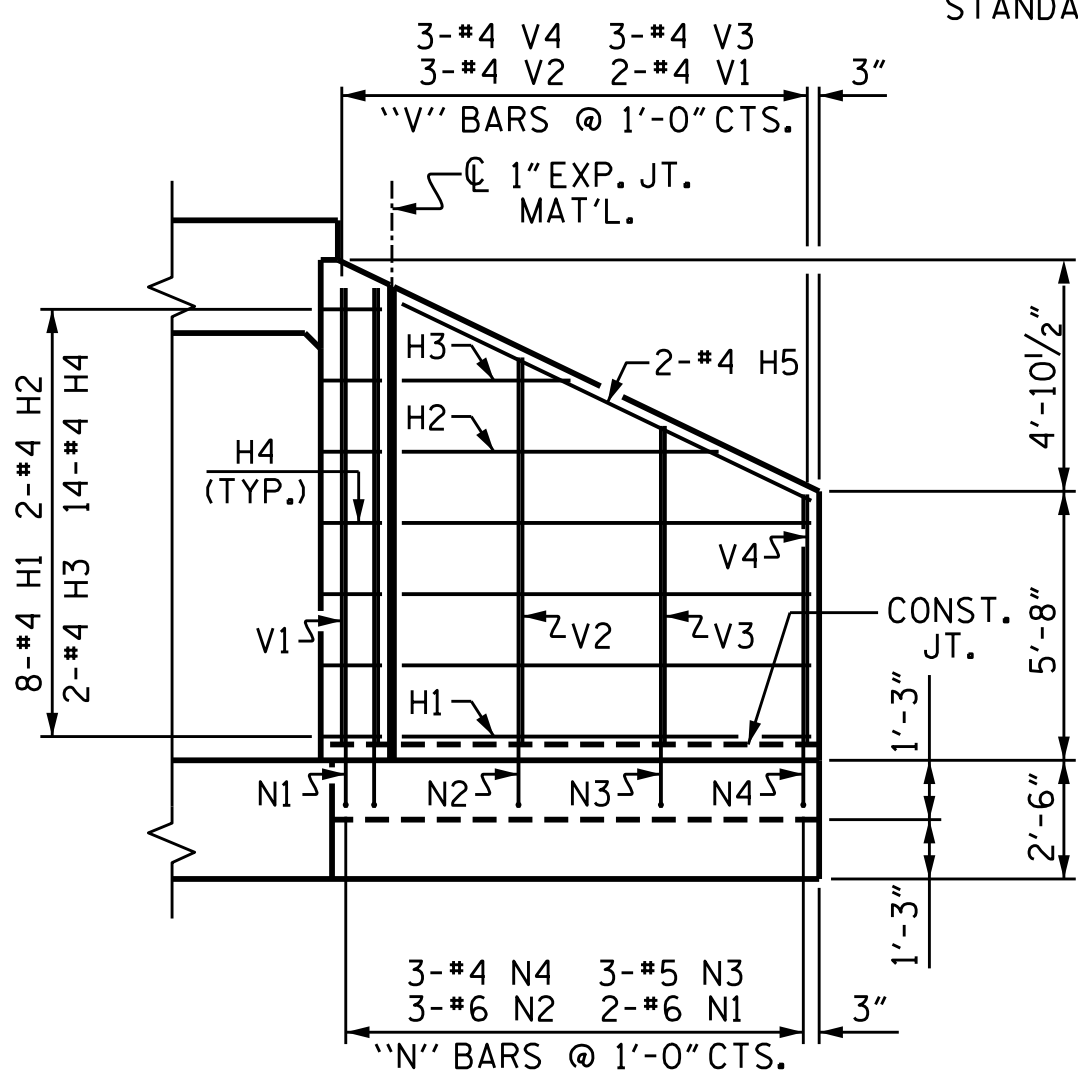


PLAN W4

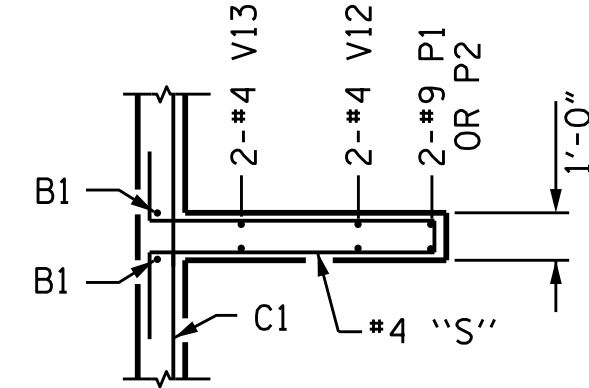


SECTION A-A

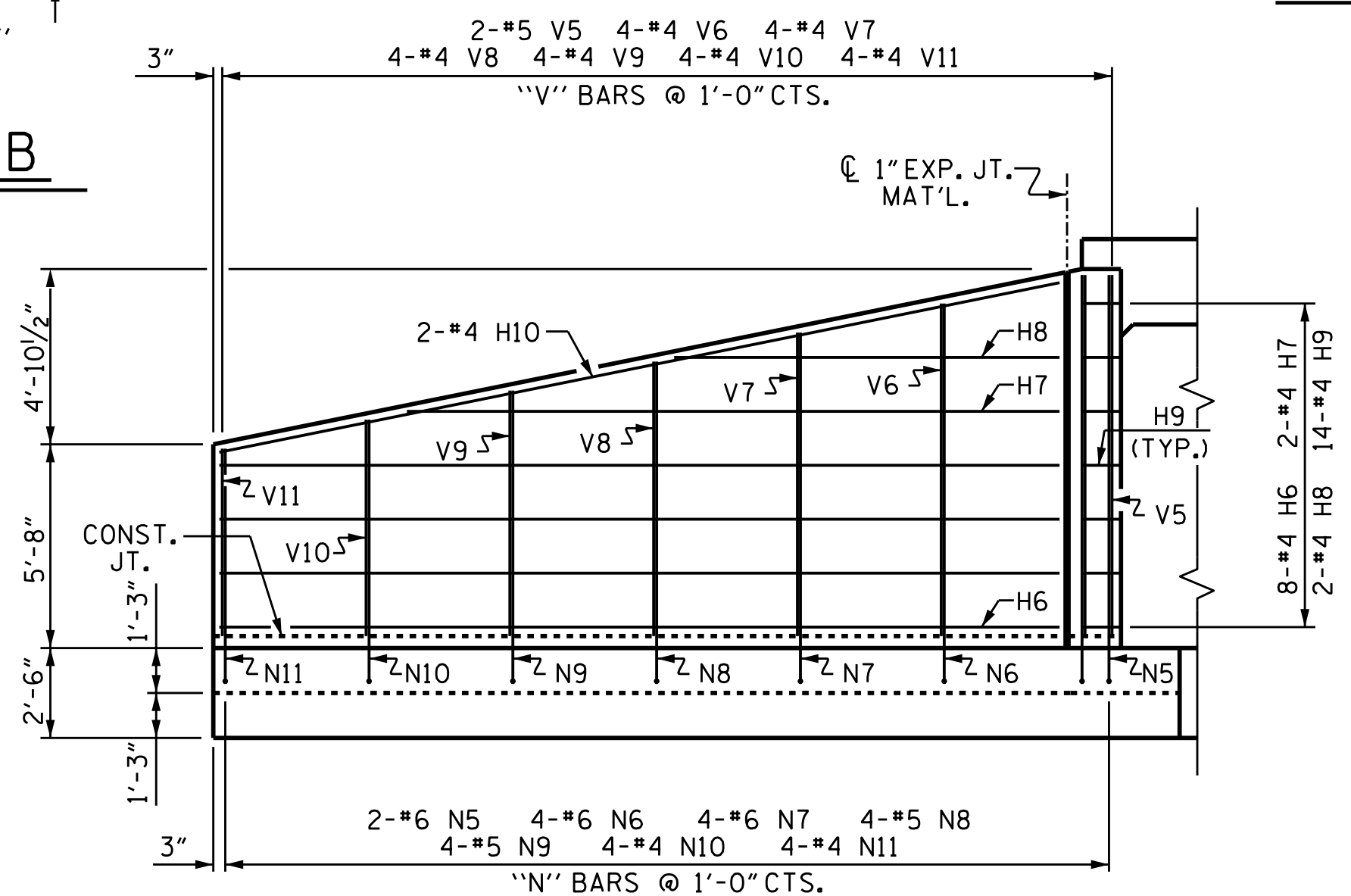
STANDARD REINFORCING STEEL IN BARREL NOT SHOWN



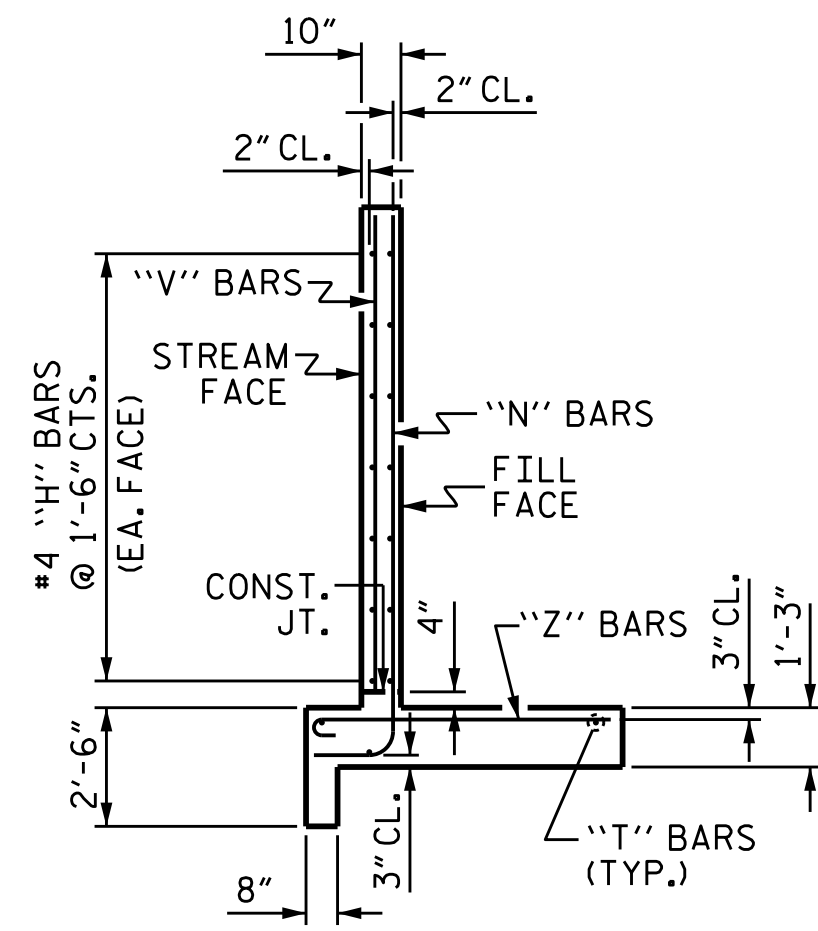
ELEVATION W3



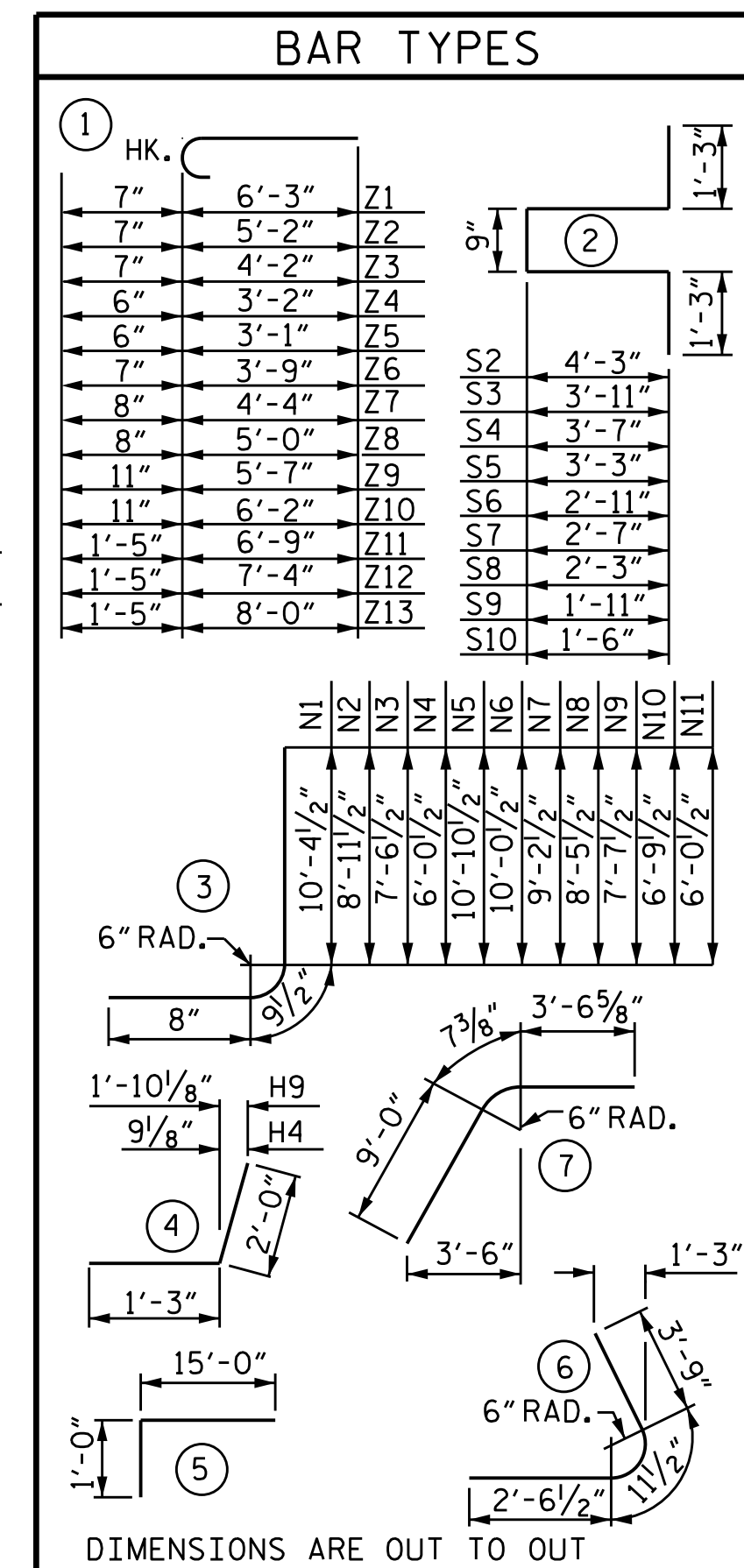
SECTION B-B



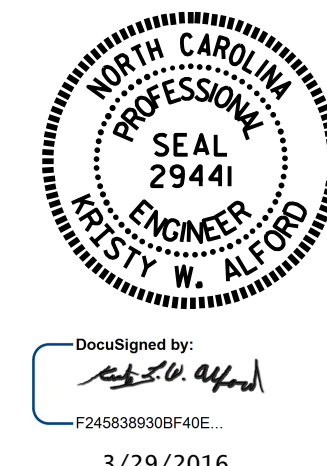
ELEVATION W4



TYPICAL WING SECTION



DIMENSIONS ARE OUT TO OUT



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	#4	STR	8'-7"	46
H2	#4	STR	6'-8"	9
H3	#4	STR	3'-6"	5
H4	#4	STR	3'-3"	30
H5	#4	STR	9'-6"	13
N1	#6	3	11'-10"	36
N2	#6	3	10'-5"	47
N3	#5	3	9'-0"	28
N4	#4	3	7'-6"	15
S1	#6	STR	6'-0"	27
T1	#5	STR	10'-6"	33
V1	#4	STR	9'-7"	13
V2	#4	STR	8'-1"	16
V3	#4	STR	6'-8"	13
V4	#4	STR	5'-3"	11
Z1	#5	1	6'-10"	14
Z2	#5	1	5'-9"	18
Z3	#5	1	4'-9"	15
Z4	#4	1	3'-8"	7
B1	#4	STR	10'-0"	13
C1	#6	STR	9'-0"	189
H6	#4	STR	23'-4"	125
H7	#4	STR	18'-1"	24
H8	#4	STR	10'-8"	14
H9	#4	STR	3'-3"	30
H10	#4	STR	23'-10"	32
M1	#8	5	16'-0"	214
N5	#6	3	12'-4"	37
N6	#6	3	11'-6"	69
N7	#6	3	10'-8"	64
N8	#5	3	9'-11"	41
N9	#5	3	9'-1"	38
N10	#4	3	8'-3"	22
N11	#4	3	7'-6"	20
P1	#9	6	7'-3"	49
P2	#9	7	13'-2"	90
S2	#4	2	11'-9"	8
S3	#4	2	11'-1"	7
S4	#4	2	10'-5"	7
S5	#4	2	9'-9"	7
S6	#4	2	9'-1"	6
S7	#4	2	8'-5"	6
S8	#4	2	7'-9"	5
S9	#4	2	7'-1"	5
S10	#4	2	6'-3"	4
T2	#5	STR	25'-3"	53
T3	#5	STR	36'-7"	38
T4	#5	STR	13'-0"	14
V5	#5	STR	10'-0"	21
V6	#4	STR	9'-3"	25
V7	#4	STR	8'-5"	22
V8	#4	STR	7'-7"	20
V9	#4	STR	6'-9"	18
V10	#4	STR	6'-0"	16
V11	#4	STR	5'-2"	14
V12	#4	STR	4'-6"	6
V13	#4	STR	8'-9"	12
Z5	#4	1	3'-7"	10
Z6	#5	1	4'-4"	18
Z7	#6	1	5'-0"	30
Z8	#6	1	5'-8"	34
Z9	#8	1	6'-6"	69
Z10	#8	1	7'-1"	76
Z11	#10	1	8'-2"	141
Z12	#10	1	8'-9"	151
Z13	#10	1	9'-5"	203
Z14	#10	STR	9'-4"	160
Z15	#10	STR	9'-10"	212
Z16	#10	STR	9'-7"	206

REINFORCING STEEL FOR 1 WING W3 (STAGE I PART B) 396 LBS.
 CLASS A CONCRETE (STAGE I PART B)
 1 WING 5.6 C.Y.
 END CURTAIN WALL 1.9 C.Y.
 TOTAL 7.5 C.Y.

REINFORCING STEEL FOR 1 WING W4 (STAGE V) 2,695 LBS.
 CLASS A CONCRETE (STAGE V)
 1 WING 19.5 C.Y.
 END CURTAIN WALL 1.4 C.Y.
 HEADWALL 1.7 C.Y.
 TOTAL 22.6 C.Y.

PROJECT NO. B-4490
 CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

DEPARTMENT OF TRANSPORTATION
 RALEIGH
 OUTLET WINGS FOR CONCRETE BOX CULVERT
 H = 9'-0" SLOPE = 2:1
 150° SKEW

REVISIONS

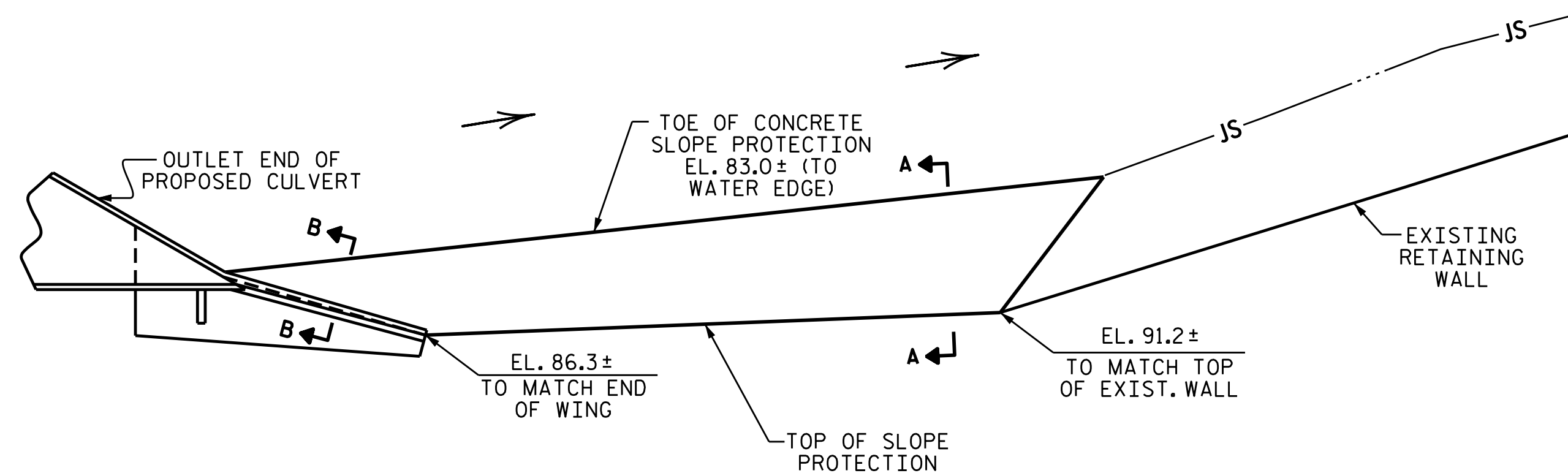
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2			4		

SHEET NO. C-17
 TOTAL SHEETS 18

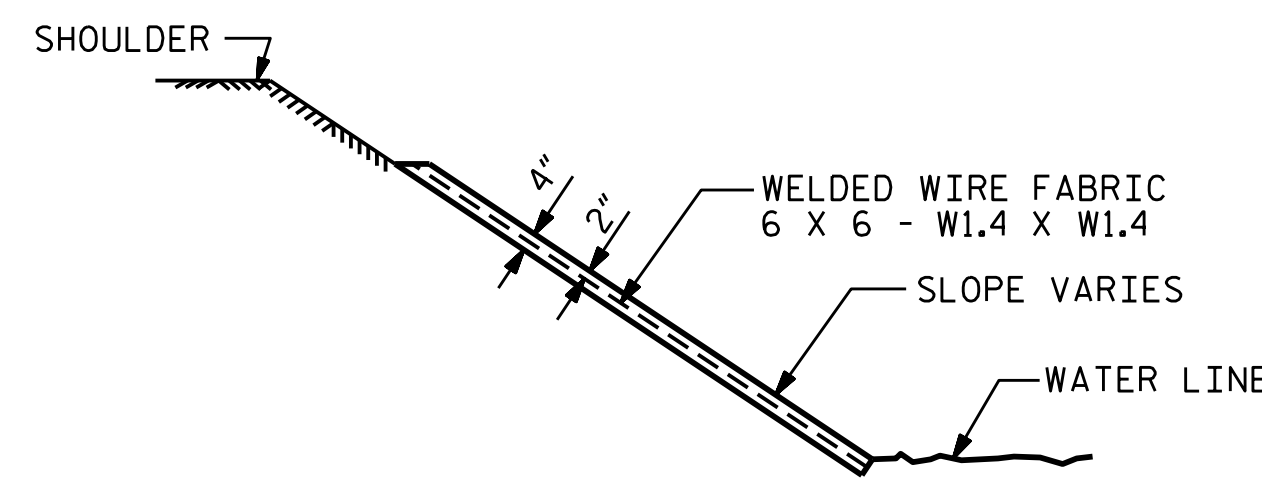
DRAWN BY: I.L. AVERETTE DATE: 07-15
 CHECKED BY: J.P. ADAMS DATE: 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE: 09-15

NOTE

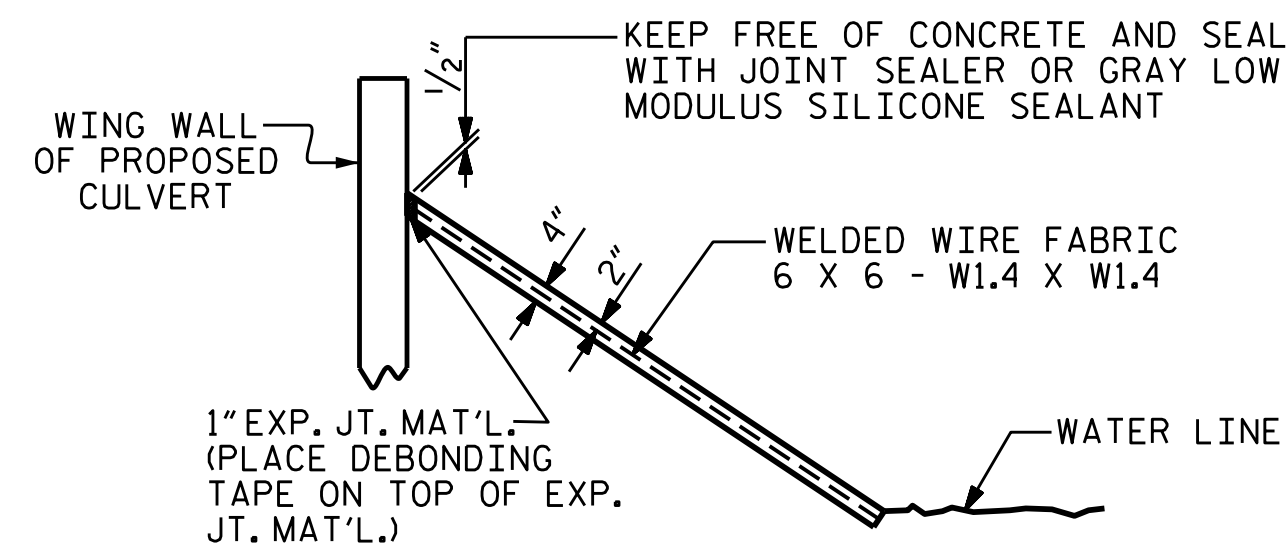
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.



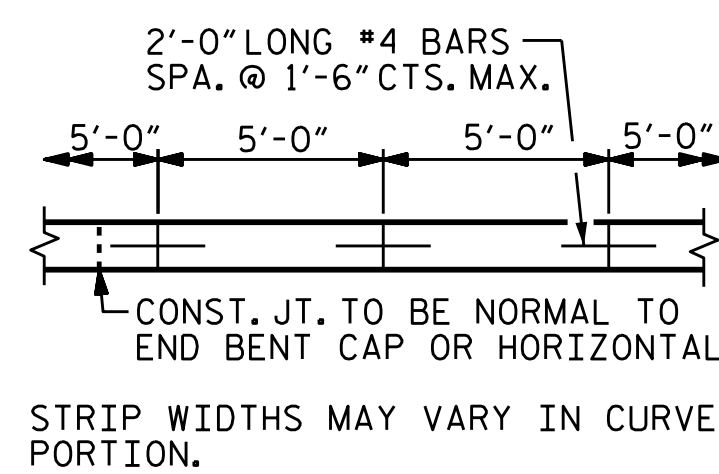
PLAN OF SLOPE PROTECTION



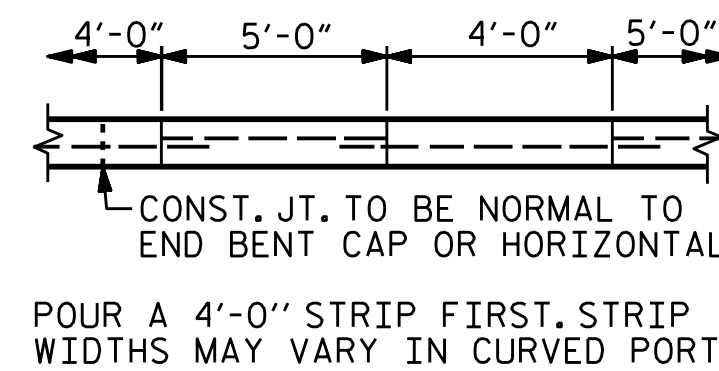
SECTION A-A



SECTION B-B



POURING DETAIL



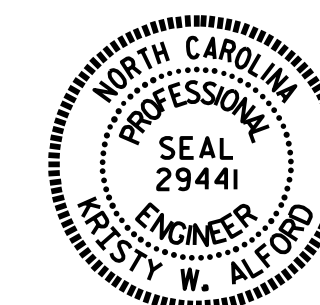
OPTIONAL POURING DETAIL

CULVERT @ STA. 19+26.42 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
	150	300

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. B-4490
CUMBERLAND COUNTY
 STATION: 19+26.42 -L-

SHEET 18 OF 18



DocuSigned by:
 F2458389306F40E...
 3/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SLOPE PROTECTION
 DETAILS**

DRAWN BY : I.L. AVERETTE DATE : 08-15
 CHECKED BY : J.P. ADAMS DATE : 08-15
 DESIGN ENGINEER OF RECORD: I.L. AVERETTE DATE : 09-15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-18	
1			3			TOTAL	18
2			4			SHEETS	