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CONTRACT: C204060 **TIP PROJECT: U-3334B**

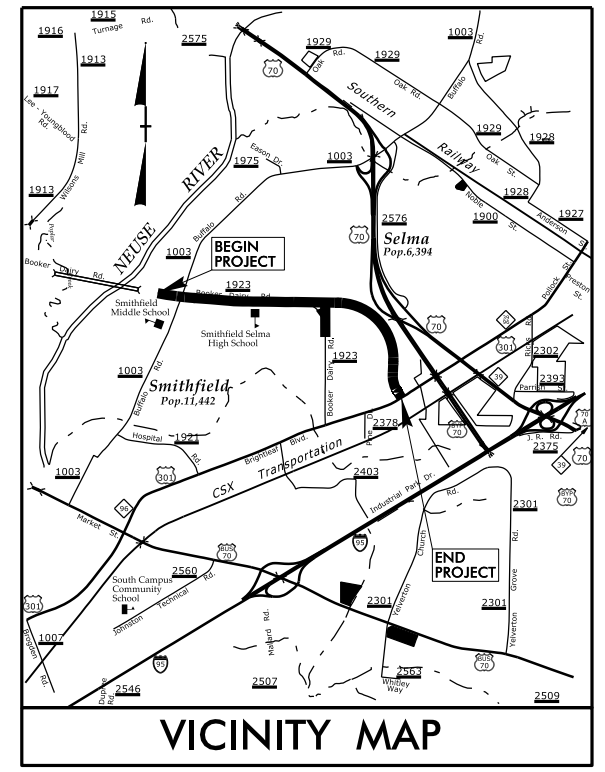
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

JOHNSTON COUNTY

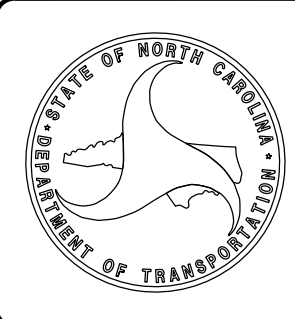
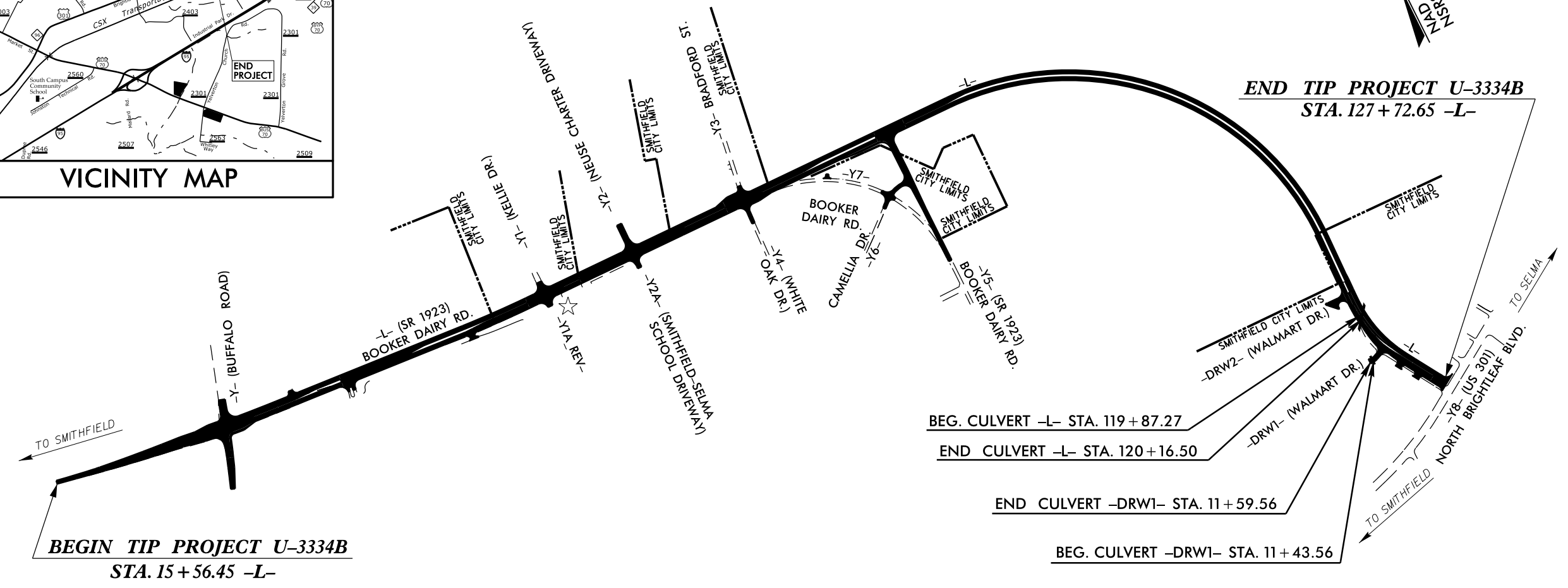
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3334B		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34929.1.4	STP-1923(12)	P.E.	
34929.2.5	STP-1923(12)	RW	
34929.2.6	STP-1923(12)	UTIL.	
34929.3.3	STP-1923(12)	CONSTR.	

LOCATION: SR 1923 EXTENSION (BOOKER DAIRY ROAD) FROM SR 1003 (BUFFALO ROAD) TO US 301 (BRIGHTLEAF BOULEVARD)

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



CULVERTS



DESIGN DATA

ADT 2018 =	10,987
ADT 2038 =	18,532
K =	9 %
D =	55 %
T =	3 % *
V =	50 MPH
* (1% TTST + 2% DUALS)	
FUNC CLASS =	
URBAN COLLECTOR	
SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-3334B =	2.119 MILES
LENGTH OF STRUCTURE TIP PROJECT U-3334B =	0.005 MILES
TOTAL LENGTH OF TIP PROJECT U-3334B =	2.124 MILES

Prepared in the Office of.
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR., RALEIGH, NC, 27610

2018 STANDARD SPECIFICATIONS

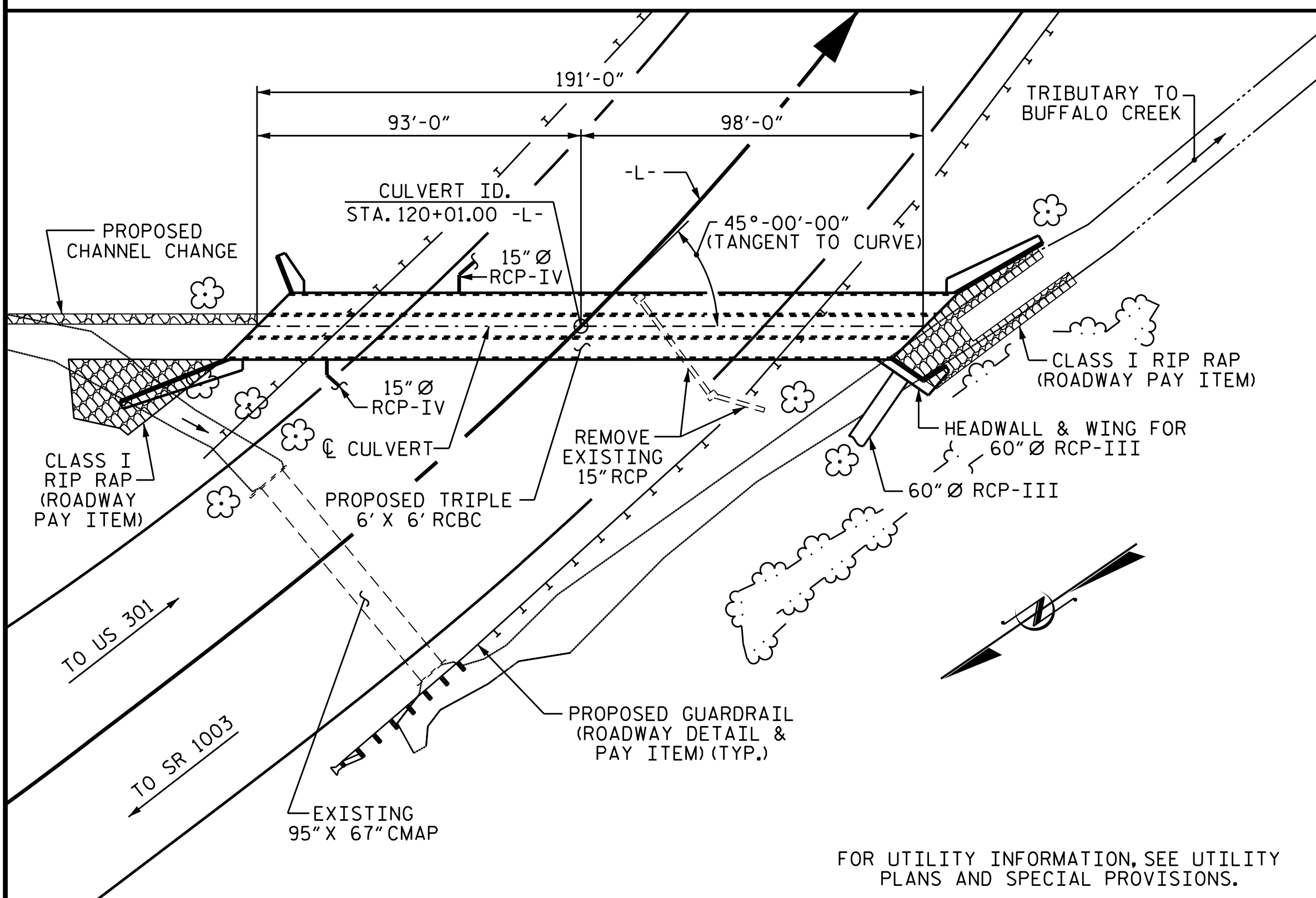
LETTING DATE:
JANUARY 16, 2018

GREG DICKEY, P.E.
PROJECT ENGINEER

ASTER ABRAHA, P.E.
PROJECT DESIGN ENGINEER

27-NOV-2017 11:04
 \$\$\$DGN\$\$\$\$\$
 gabraha

BM #5: RR SPIKE IN BASE OF 15" PINE, STA. 100+37.46 -L-, 300.26' LT., EL. 153.00



LOCATION SKETCH

ROADWAY DATA

GRADE POINT EL. @ STA. 120+01.00 -L-	= 145.32
BED EL. @ STA. 120+01.00 -L-	= 135.55
ROADWAY FILL SLOPES	= 3:1

HYDRAULIC DATA

DESIGN DISCHARGE	= 390 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 144.6
DRAINAGE AREA	= 0.96 SQ. MI.
BASE DISCHARGE (Q100)	= 430 C.F.S.
BASE HIGH WATER ELEVATION	= 145.1

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 520+ C.F.S
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 147.3 *

* OCCURS @ RT. SHOULDER POINT @ STA. 118+75± -L-

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 DESIGN FILL = 6.36 FEET.
 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, HEADWALL FOOTING, CURTAIN WALLS 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 THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

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.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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 SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE 15" DIA. PIPES THROUGH THE SIDEWALLS OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR THE PIPES.

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

NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

SILLS ARE TO BE 1 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM.

DO NOT SET ELEVATION OF HIGH SILL ABOVE BANK FULL ELEVATION.

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

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.

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

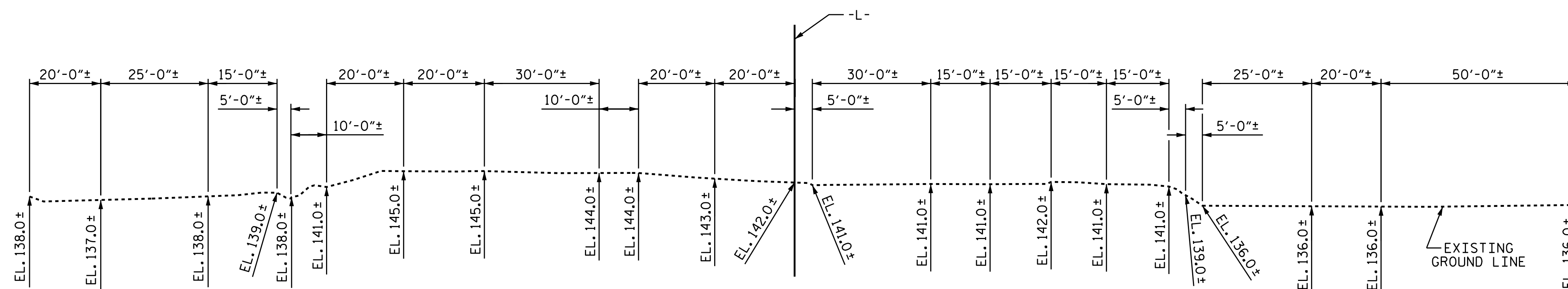
DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON THE WING SHEETS.

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.

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 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.

TOTAL STRUCTURE QUANTITIES

CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	279 TONS
CLASS A CONCRETE	
BARRELS @ 1.817 C.Y./FT.	347.0 C.Y.
SILLS	1.8 C.Y.
WINGS, ETC.	38.8 C.Y.
TOTAL	387.6 C.Y.
REINFORCING STEEL	
BARRELS	39,391 LBS.
WINGS, ETC.	2,444 LBS.
TOTAL	41,835 LBS.



PROFILE ALONG CULVERT

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 1 OF 10

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TRIPLE 6 FT. X 6 FT.
 CONCRETE BOX CULVERT

45° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-1
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : M.K. BEARD DATE : 08/17
 CHECKED BY : A. ABRAHA DATE : 10/13/17
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 8/4/17



DocuSigned by:
 Gregory W. Dickey
 11/21/2017



DocuSigned by:
 Aster Abraha
 11/21/2017

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	1.08	--	1.75	1.59	1	TOP SLAB	3.00	1.08	1	TOP SLAB	5.67		
	HL-93 (OPERATING)	N/A		1.40	--	1.35	2.06	1	TOP SLAB	3.00	1.40	1	TOP SLAB	5.67		
	HS-20 (INVENTORY)	36.000	②	1.08	38.86	1.75	1.59	1	TOP SLAB	3.00	1.08	1	TOP SLAB	5.67		
	HS-20 (OPERATING)	36.000		1.40	50.38	1.35	2.06	1	TOP SLAB	3.00	1.40	1	TOP SLAB	5.67		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.96	26.48	1.40	2.98	1	TOP SLAB	3.00	1.96	1	TOP SLAB	5.67	
		SNGARBS2	20.000		1.84	36.74	1.40	2.73	1	TOP SLAB	3.00	1.84	1	TOP SLAB	5.67	
		SNAGRIS2	22.000		1.96	43.15	1.40	2.88	1	TOP SLAB	3.00	1.96	1	TOP SLAB	5.67	
		SNCOTTS3	27.250	③	1.51	41.12	1.40	2.57	1	TOP SLAB	3.00	1.51	1	TOP SLAB	5.67	
		SNAGGRS4	34.925		1.87	65.47	1.40	3.41	1	TOP SLAB	2.83	1.87	1	TOP SLAB	5.67	
		SNS5A	35.550		1.71	60.82	1.40	3.10	1	TOP SLAB	2.83	1.71	1	TOP SLAB	5.67	
		SNS6A	39.950		1.73	69.22	1.40	3.10	1	TOP SLAB	2.50	1.73	1	TOP SLAB	5.67	
		SNS7B	42.000		1.72	72.31	1.40	3.12	1	TOP SLAB	2.50	1.72	1	TOP SLAB	5.67	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.93	63.82	1.40	3.01	1	TOP SLAB	2.83	1.93	1	TOP SLAB	5.67	
		TNT4A	33.075		1.79	59.36	1.40	3.09	1	TOP SLAB	2.83	1.79	1	TOP SLAB	5.67	
		TNT6A	41.600		1.78	73.94	1.40	2.99	1	TOP SLAB	2.83	1.78	1	TOP SLAB	5.67	
		TNT7A	42.000		1.79	75.38	1.40	2.98	1	TOP SLAB	2.83	1.79	1	TOP SLAB	5.67	
		TNT7B	42.000		1.79	75.14	1.40	3.07	1	TOP SLAB	3.00	1.79	1	TOP SLAB	5.67	
		TNAGRIT4	43.000		1.72	73.80	1.40	2.95	1	TOP SLAB	2.83	1.72	1	TOP SLAB	5.67	
TNAGT5A	45.000		1.72	77.48	1.40	2.96	1	TOP SLAB	2.83	1.72	1	TOP SLAB	5.67			
TNAGT5B	45.000		1.61	72.63	1.40	2.89	1	TOP SLAB	2.83	1.61	1	BOTTOM SLAB	5.85			

LOAD FACTORS:

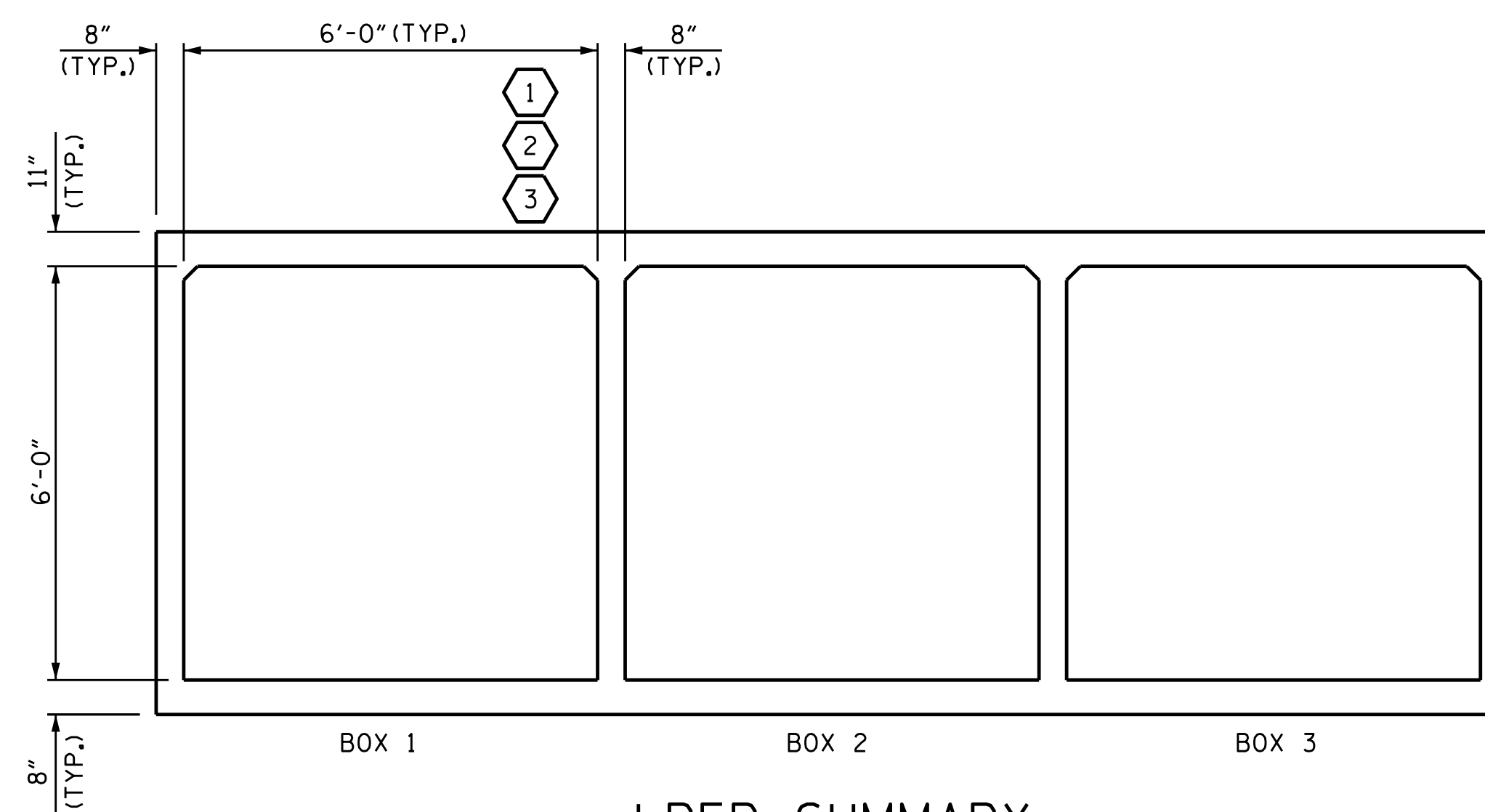
DESIGN LOAD RATING FACTORS

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	0
WA	1.00	0

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	

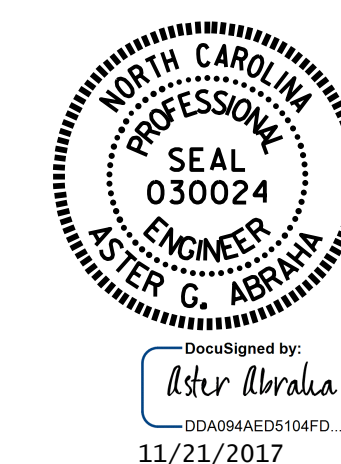


LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 2 OF 10



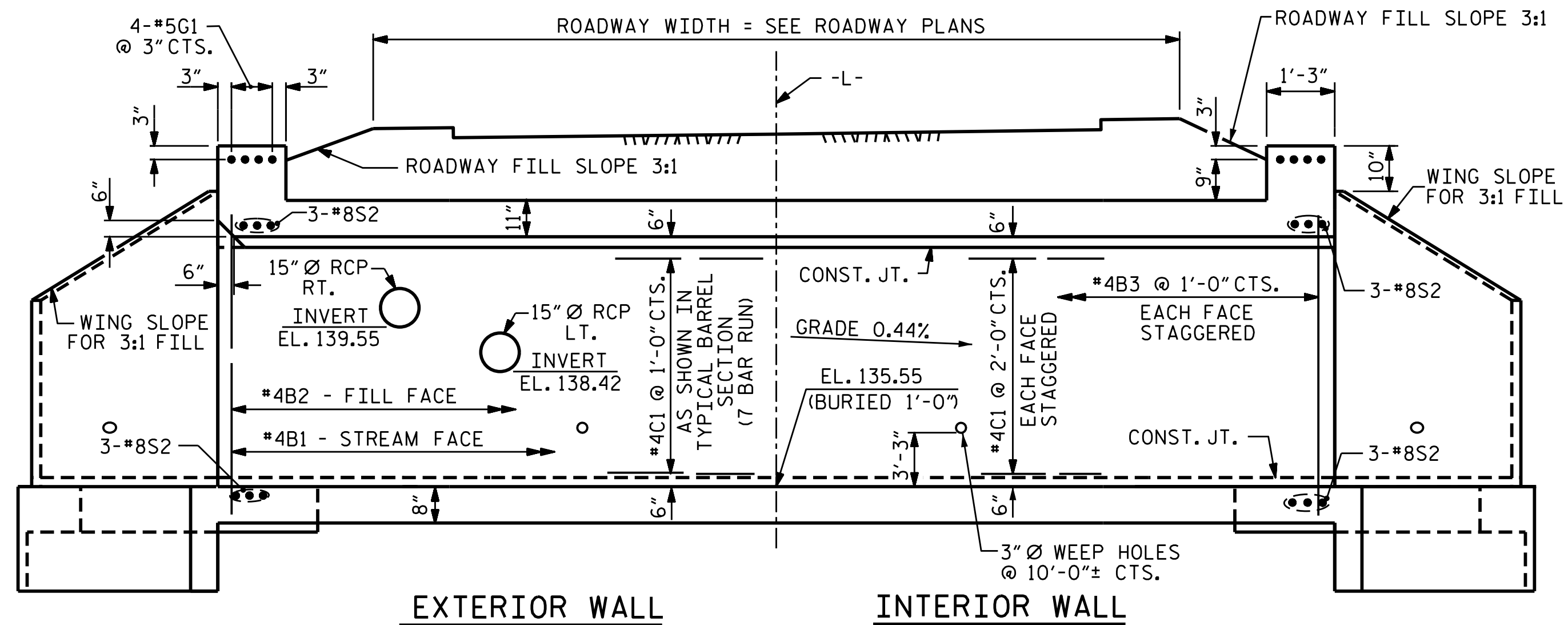
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : M.K. BEARD DATE : 08/17
 CHECKED BY : A. ABRAHA DATE : 10/13/17

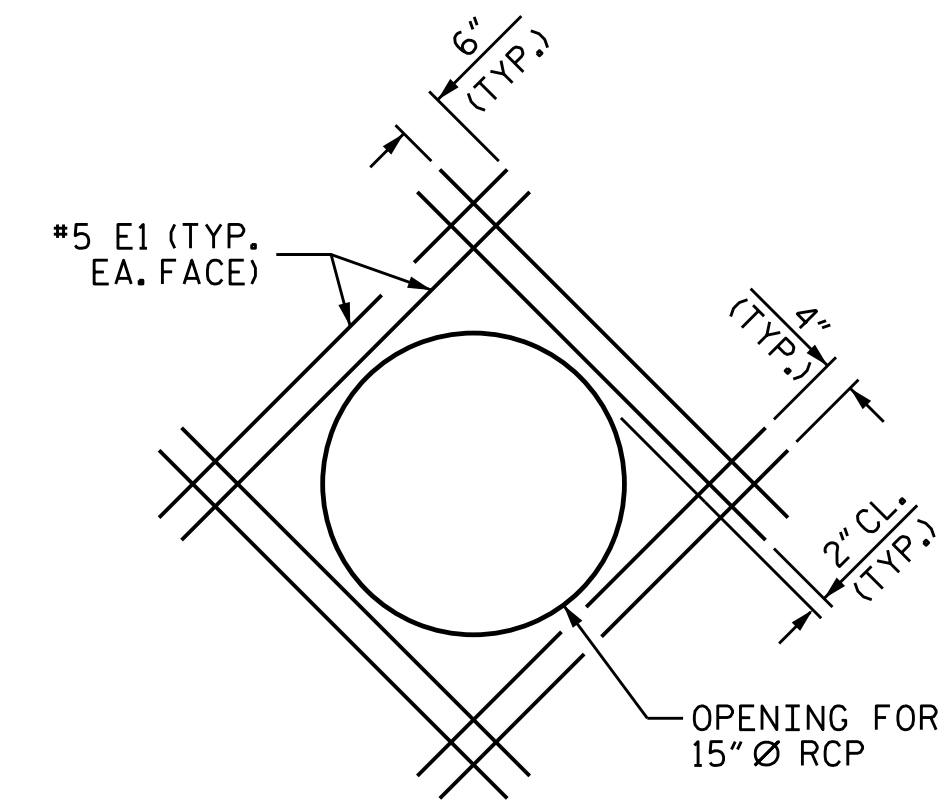
DESIGN ENGINEER OF RECORD:
 M.M. AHMED DATE : 8/4/17

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-2
1			3			TOTAL SHEETS
2			4			16

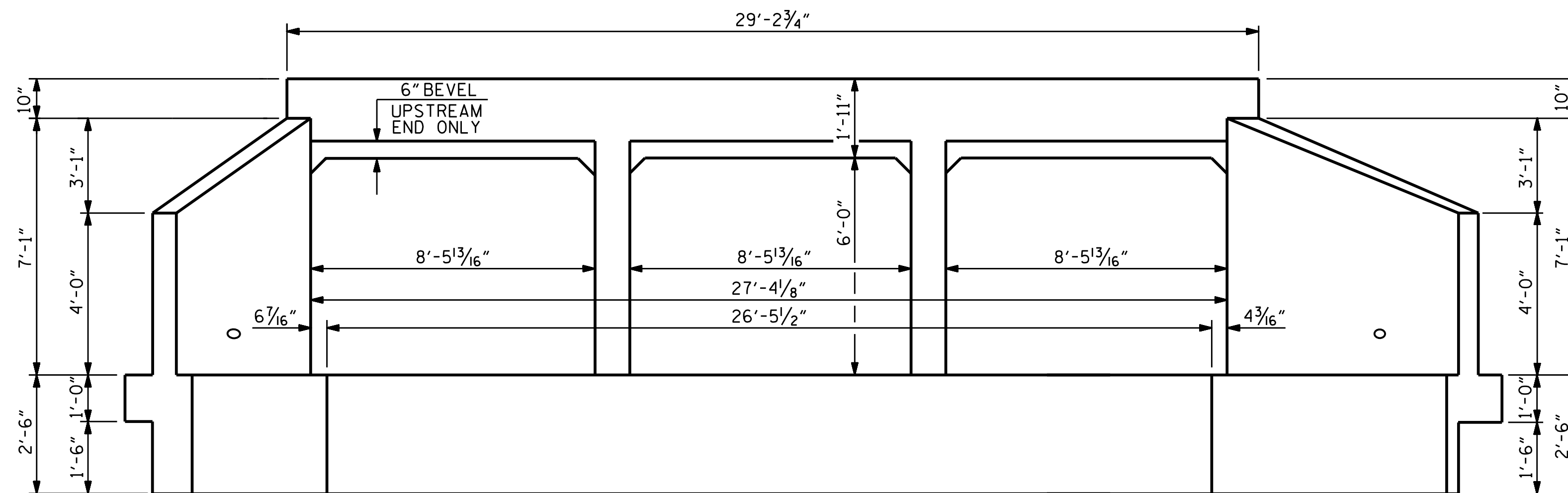


CULVERT SECTION NORMAL TO ROADWAY

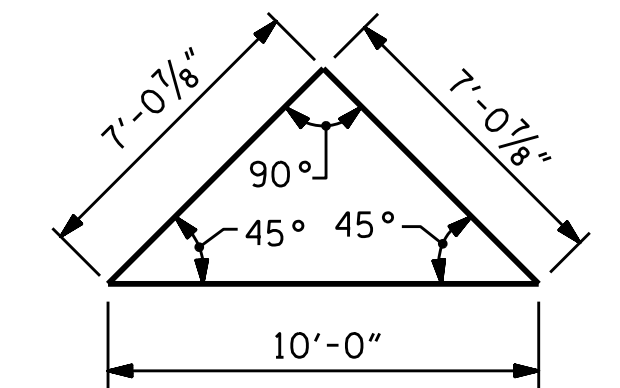


DETAIL OF REINFORCING AROUND 15" Ø PIPES

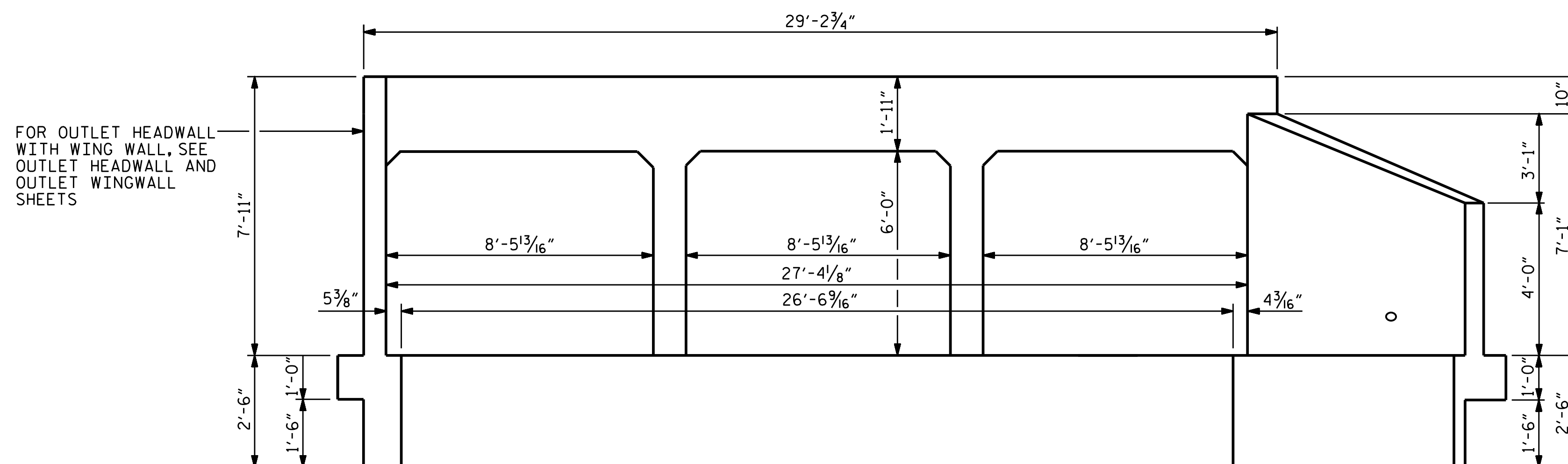
FOR 15" Ø PIPES THRU EXTERIOR WALLS, FIELD CUT & BEND "B" & "C" BARS AS NEEDED TO CLEAR PIPES.



INLET END ELEVATION NORMAL TO SKEW



SKEW TRIANGLE

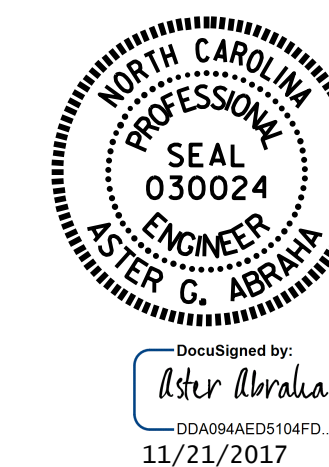


OUTLET END ELEVATION NORMAL TO SKEW

FOR OUTLET HEADWALL WITH WING WALL, SEE OUTLET HEADWALL AND OUTLET WINGWALL SHEETS

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 3 OF 10



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**TRIPLE 6 FT. X 6 FT.
 CONCRETE BOX CULVERT
 WITH VERTICAL
 CLEARANCE OF 6 FT.
 45° SKEW**

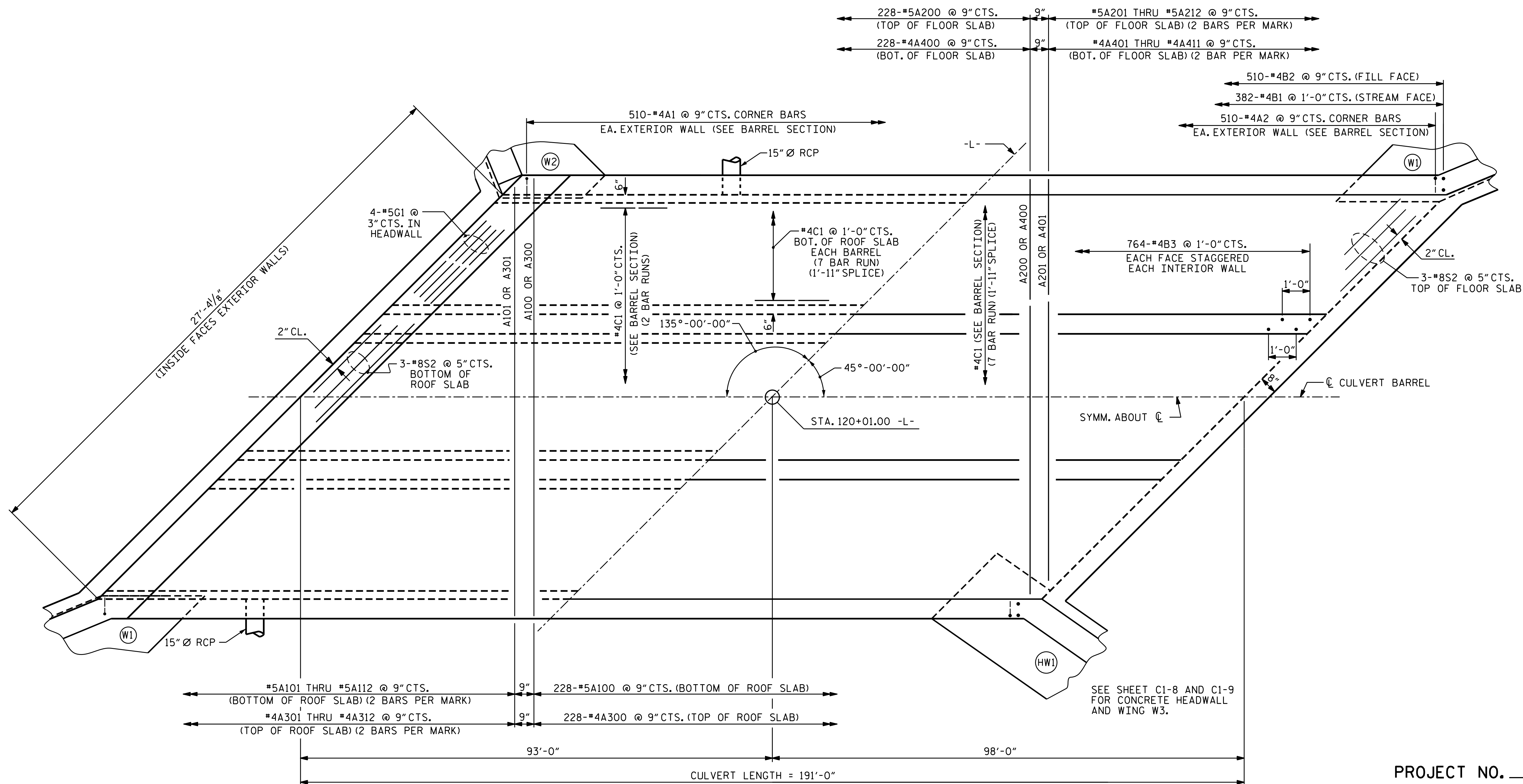
ASSEMBLED BY : M.K. BEARD	DATE : 08/17	SPECIAL
CHECKED BY : A. ABRAHA	DATE : 10/13/17	
DRAWN BY : DANNY SHERROD	DATE : 4-24-72	STANDARD
CHECKED BY : F.M.H.	DATE : 5-3-72	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO. C1-3
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			16

STR. #1

REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.
 REVISED 8-28-92 BY E.L.P. CHECKED BY G.R.P.
 REDRAWN BY B.M. MEYERS OCT., 1990 CHECKED BY A.R. BISSETTE

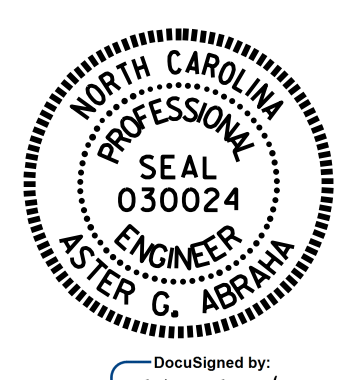


PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 4 OF 10



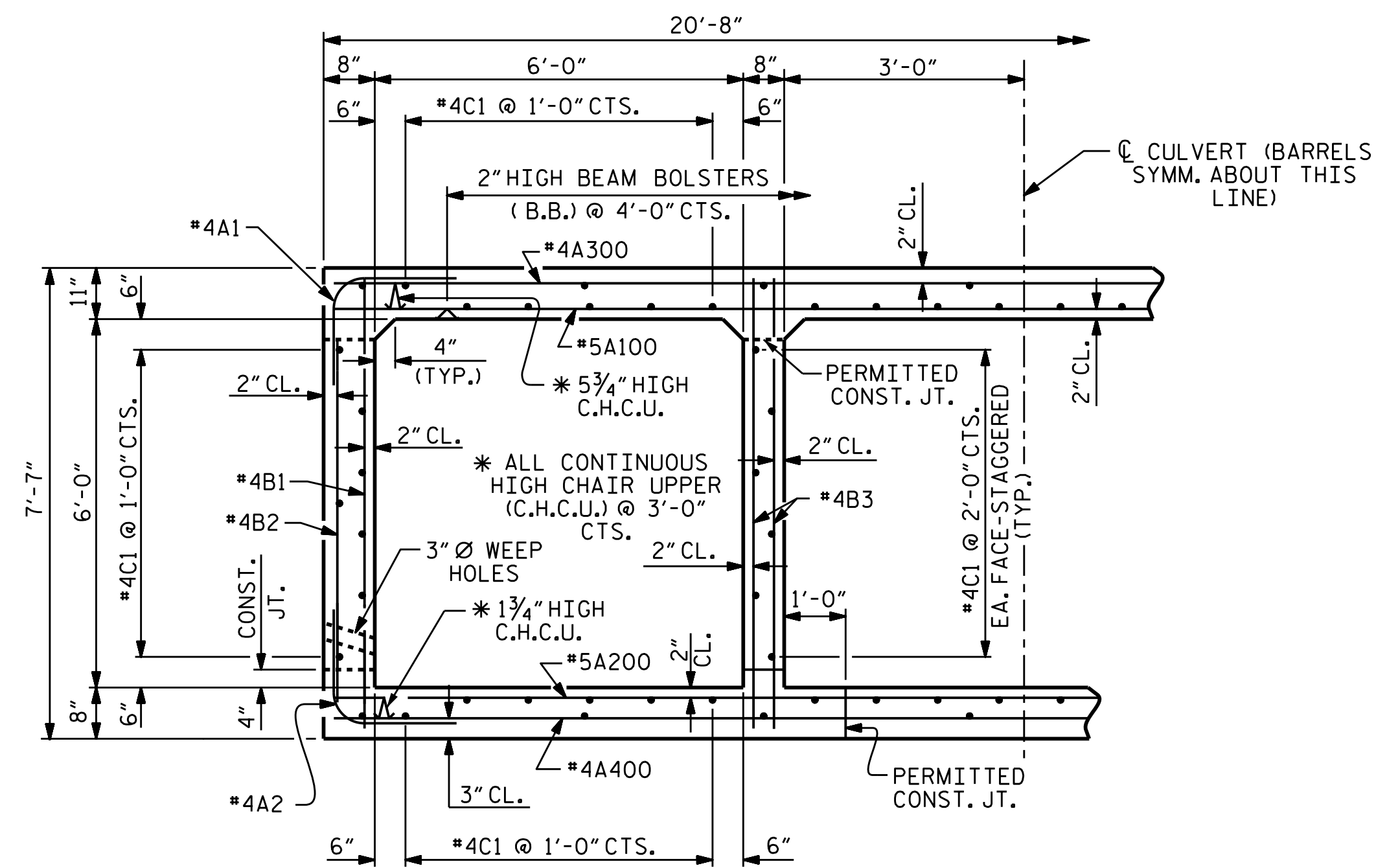
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 6 FT. X 6 FT.
 CONCRETE BOX CULVERT
 WITH VERTICAL
 CLEARANCE OF 6 FT.
 45° SKEW

ASSEMBLED BY : M.K. BEARD	DATE : 08/17	SPECIAL
CHECKED BY : A. ABRAHA	DATE : 10/13/17	
DRAWN BY : DANNY SHERROD	DATE : 4-24-72	STANDARD
CHECKED BY : F.M.H.	DATE : 5-3-72	

REVISIONS						SHEET NO. C1-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

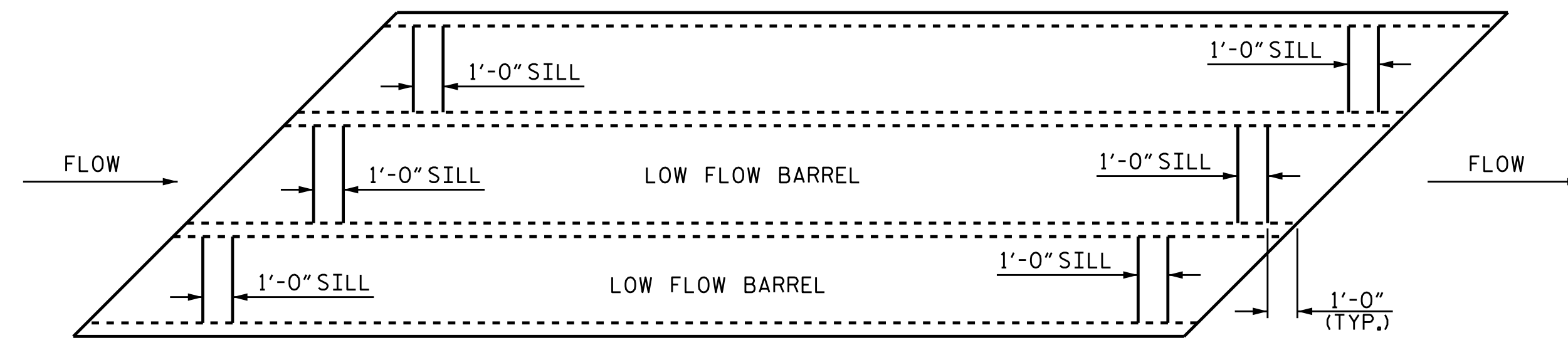
DOCUMENT NOT CONSIDERED
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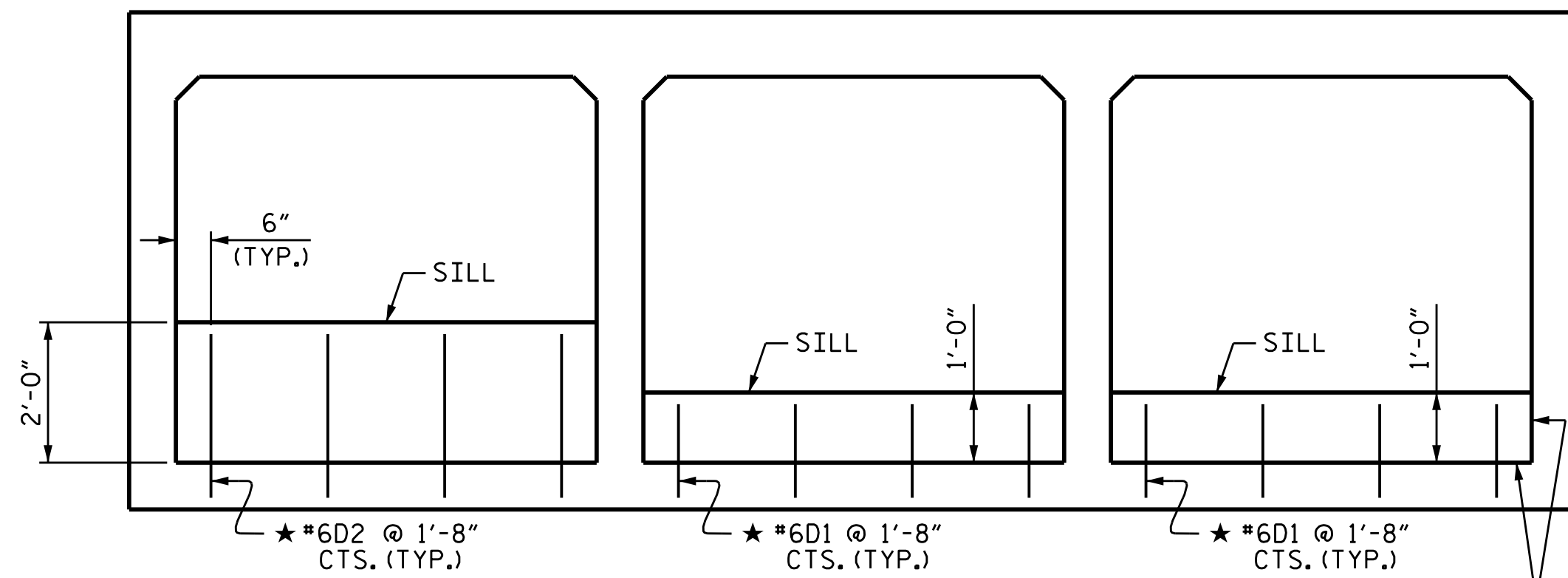


RIGHT ANGLE SECTION OF BARREL

THERE ARE 76 "C" BARS IN SECTION OF BARREL.



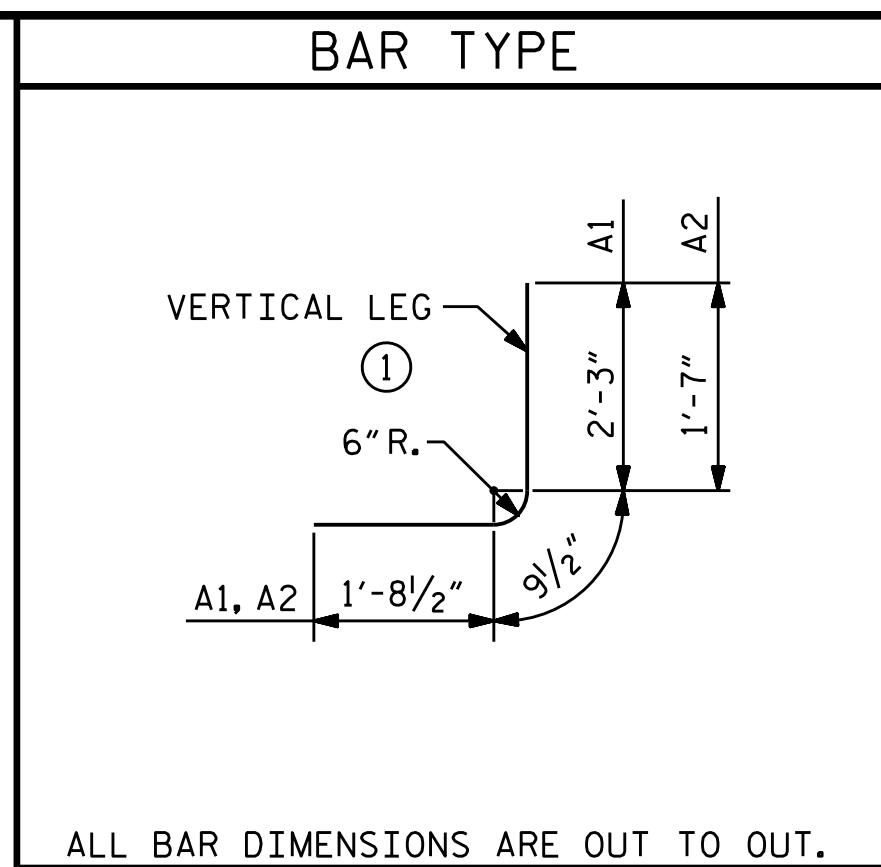
PLAN



**ELEVATION
(LOOKING DOWNSTREAM)**

SILL DETAILS

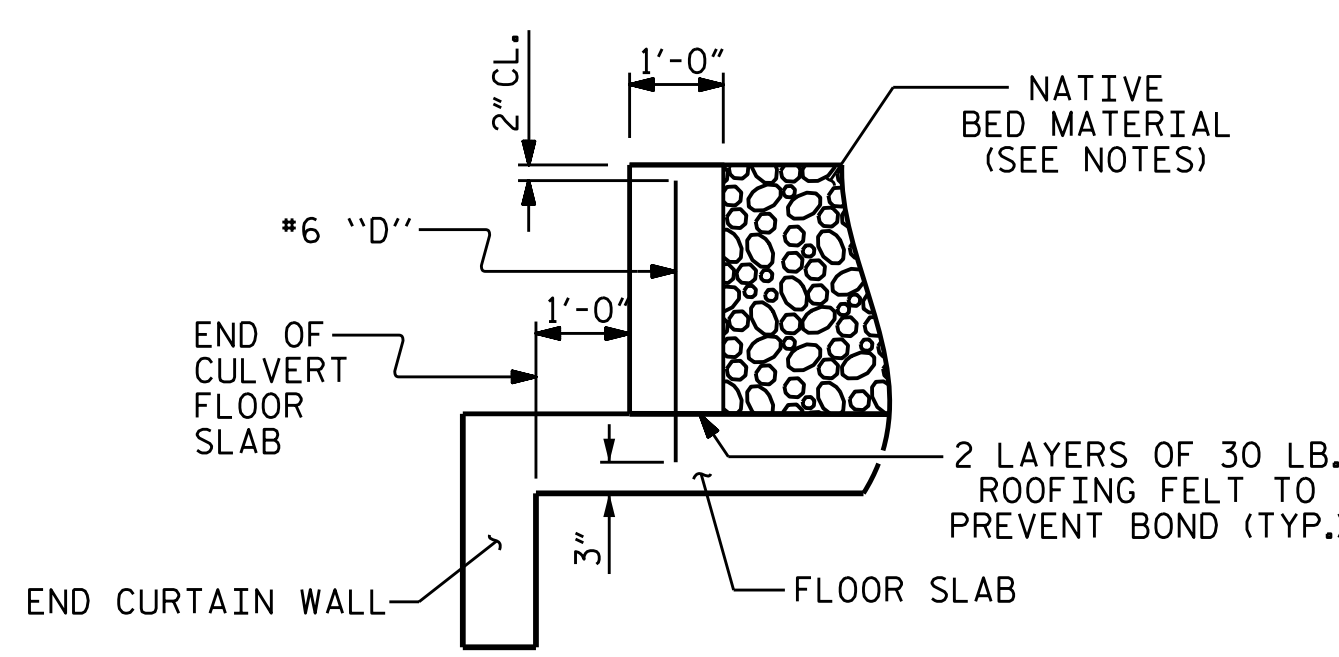
SILLS AT INLET AND OUTLET



BAR TYPE						BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	510	#4	1	4'-8"	1590	A300	228	#4	STR	20'-3"	3084
A2	510	#4	1	4'-0"	1363	A301	4	#4	STR	18'-9"	50
						A302	4	#4	STR	17'-3"	46
A100	228	#5	STR	20'-3"	4816	A303	4	#4	STR	15'-9"	42
A101	4	#5	STR	18'-9"	78	A304	4	#4	STR	14'-3"	38
A102	4	#5	STR	17'-3"	72	A305	4	#4	STR	12'-9"	34
A103	4	#5	STR	15'-9"	66	A306	4	#4	STR	11'-3"	30
A104	4	#5	STR	14'-3"	59	A307	4	#4	STR	9'-9"	26
A105	4	#5	STR	12'-9"	53	A308	4	#4	STR	8'-3"	22
A106	4	#5	STR	11'-3"	47	A309	4	#4	STR	6'-9"	18
A107	4	#5	STR	9'-9"	41	A310	4	#4	STR	5'-3"	14
A108	4	#5	STR	8'-3"	34	A311	4	#4	STR	3'-9"	10
A109	4	#5	STR	6'-9"	28	A312	4	#4	STR	2'-3"	6
A110	4	#5	STR	5'-3"	22						
A111	4	#5	STR	3'-9"	16	A400	228	#4	STR	20'-3"	3084
A112	4	#5	STR	2'-3"	9	A401	4	#4	STR	18'-9"	50
						A402	4	#4	STR	17'-3"	46
A200	228	#5	STR	20'-3"	4816	A403	4	#4	STR	15'-9"	42
A201	4	#5	STR	18'-9"	78	A404	4	#4	STR	14'-3"	38
A202	4	#5	STR	17'-3"	72	A405	4	#4	STR	12'-9"	34
A203	4	#5	STR	15'-9"	66	A406	4	#4	STR	11'-3"	30
A204	4	#5	STR	14'-3"	59	A407	4	#4	STR	9'-9"	26
A205	4	#5	STR	12'-9"	53	A408	4	#4	STR	8'-3"	22
A206	4	#5	STR	11'-3"	47	A409	4	#4	STR	6'-9"	18
A207	4	#5	STR	9'-9"	41	A410	4	#4	STR	5'-3"	14
A208	4	#5	STR	8'-3"	34	A411	4	#4	STR	3'-9"	10
A209	4	#5	STR	6'-9"	28	A412	4	#4	STR	2'-3"	6
A210	4	#5	STR	5'-3"	22						
A211	4	#5	STR	3'-9"	16	B1	382	#4	STR	7'-1"	1808
A212	4	#5	STR	2'-3"	9	B2	510	#4	STR	5'-4"	1817
						B3	764	#4	STR	7'-1"	3615

SPlice CHART		
BAR	SIZE	SPlice LENGTH
A200	#5	1'-9"
A400	#4	1'-5"
B1	#4	1'-5"
B3	#4	1'-5"
C1	#4	1'-11"

C1	532	#4	STR	29'-1"	10336
D1	16	#6	STR	1'-3"	30
D2	8	#6	STR	2'-3"	27
E1	32	#5	STR	3'-8"	122
G1	8	#5	STR	28'-9"	240
S2	12	#8	STR	28'-9"	921
REINFORCING STEEL					LBS. 39,391
CLASS A CONCRETE					
BARRELS:				C.Y.	347.0
SILLS:				C.Y.	1.8

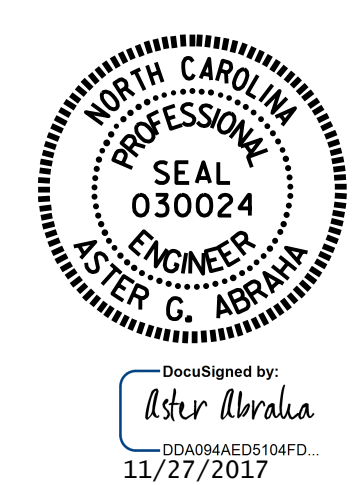


SECTION THROUGH SILL

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

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 5 OF 10

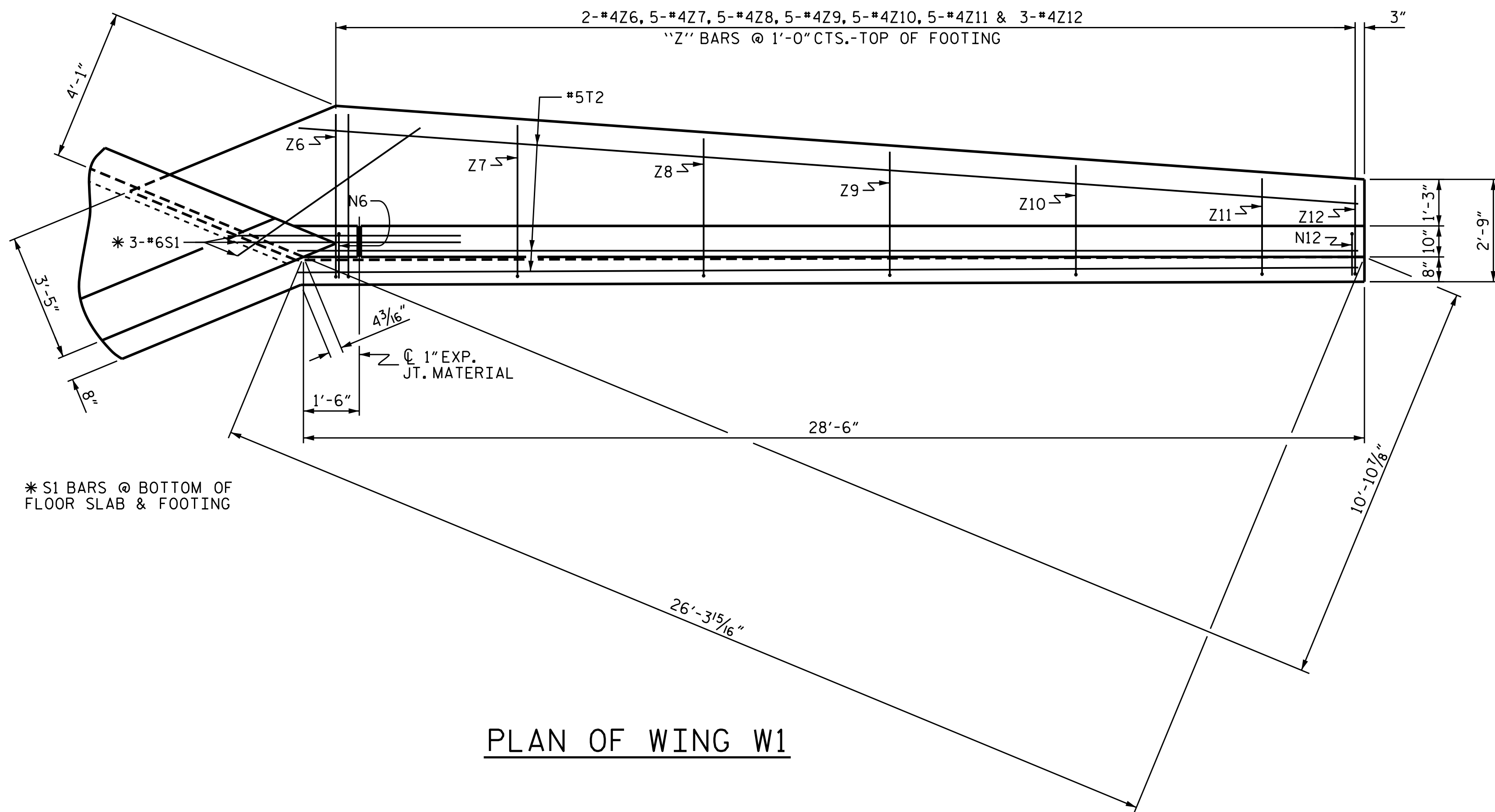


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**TRIPLE 6 FT. X 6 FT.
 CONCRETE BOX CULVERT**
 45° SKEW

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	16
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: M.K. BEARD DATE: 08/17
 CHECKED BY: A. ABRAHA DATE: 10/13/17
 DESIGN ENGINEER OF RECORD: M.M. AHMED DATE: 8/4/17

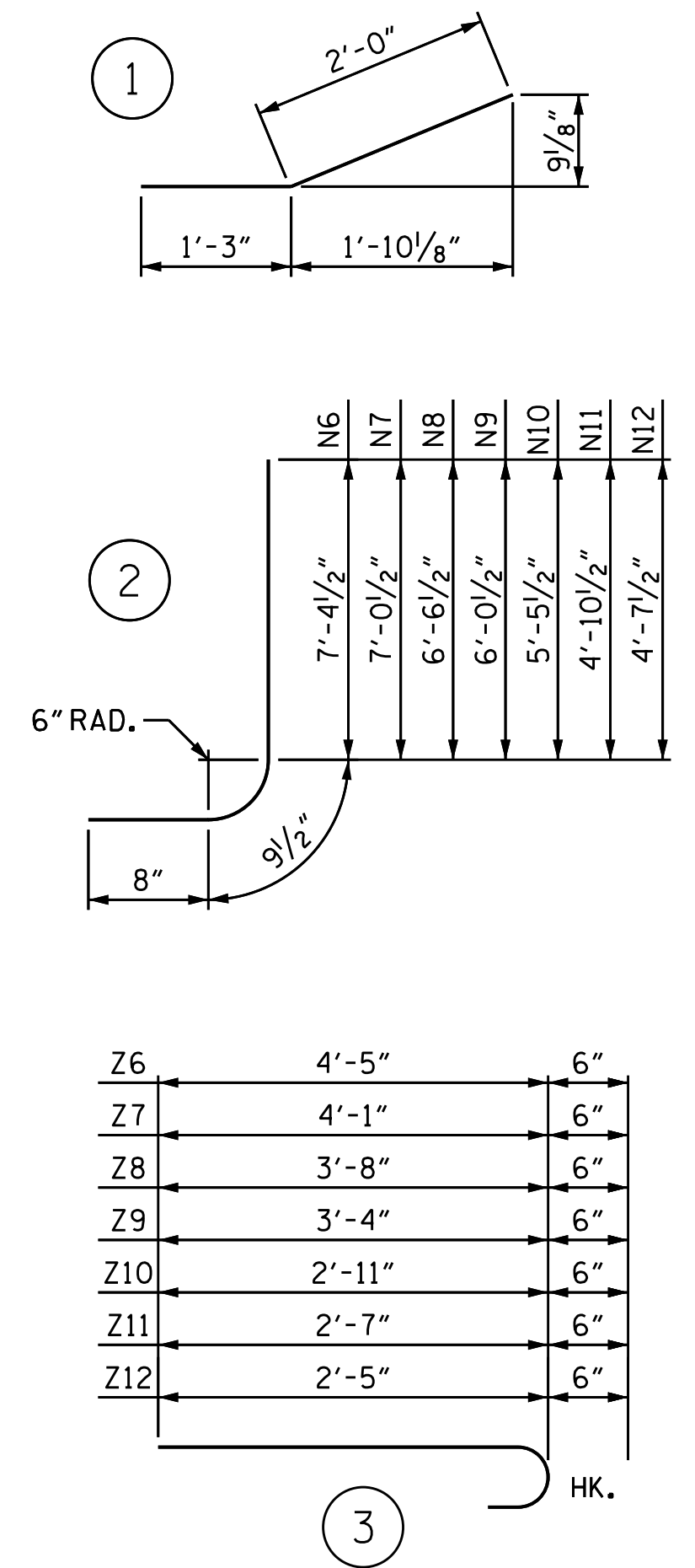


PLAN OF WING W1

* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

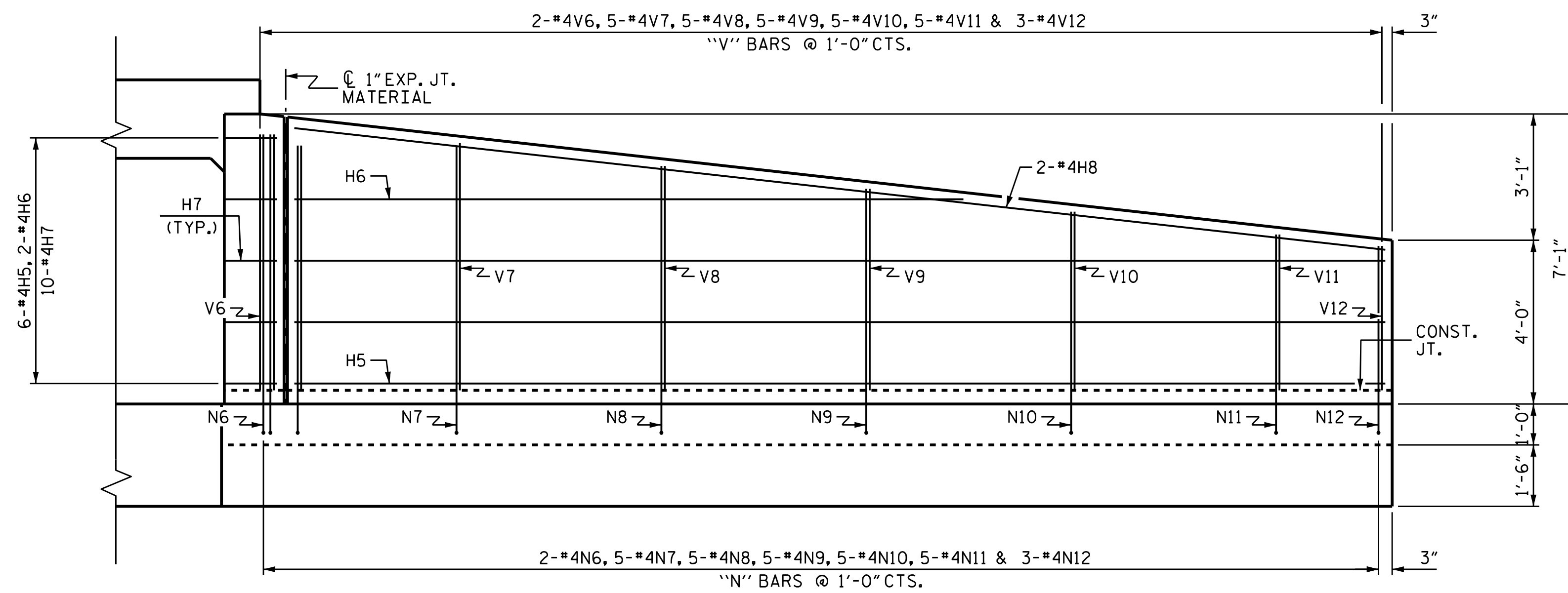
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

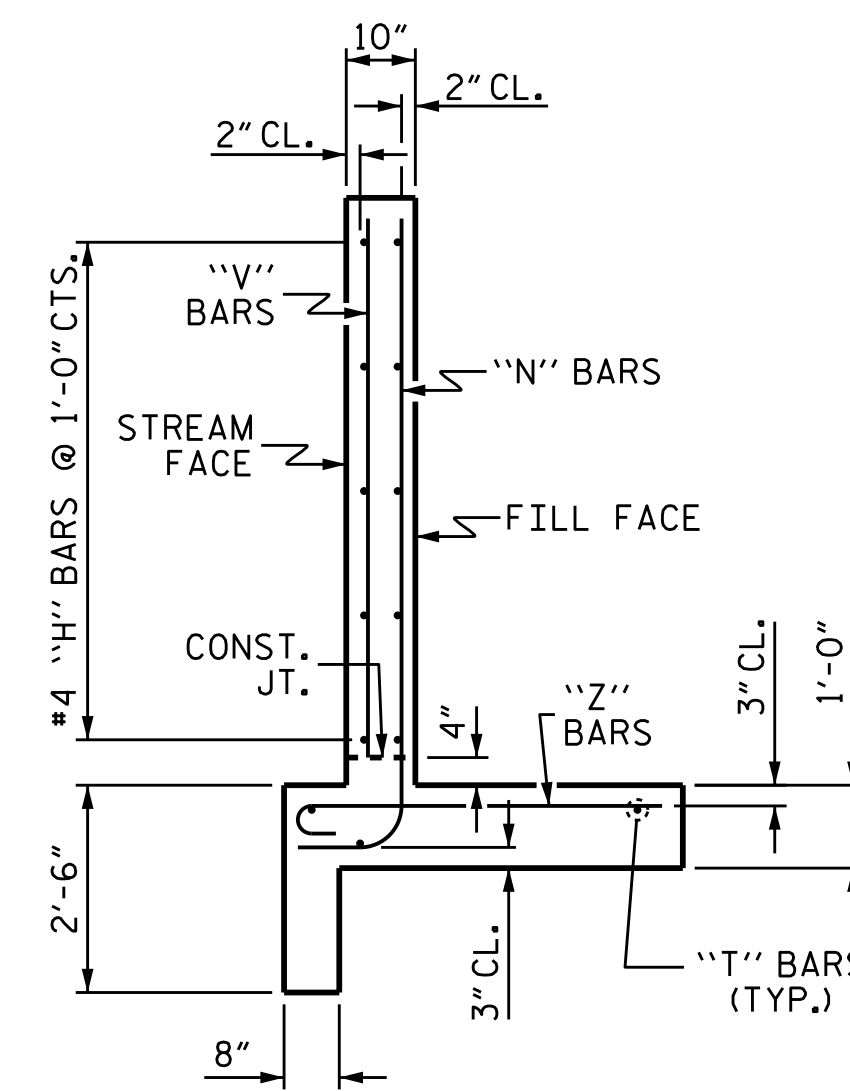


BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H5	12	#4	STR	26'-7"	213
H6	4	#4	STR	16'-3"	43
H7	20	#4	1	3'-3"	43
H8	4	#4	STR	26'-9"	71
N6	4	#4	2	8'-10"	24
N7	10	#4	2	8'-6"	57
N8	10	#4	2	8'-0"	53
N9	10	#4	2	7'-6"	50
N10	10	#4	2	6'-11"	46
N11	10	#4	2	6'-4"	42
N12	6	#4	2	6'-1"	24
S1	6	#6	STR	6'-0"	54
T2	6	#5	STR	28'-6"	178
V6	4	#4	STR	6'-3"	17
V7	10	#4	STR	6'-0"	40
V8	10	#4	STR	5'-5"	36
V9	10	#4	STR	4'-11"	33
V10	10	#4	STR	4'-4"	29
V11	10	#4	STR	3'-9"	25
V12	6	#4	STR	3'-6"	14
Z6	4	#4	3	4'-11"	13
Z7	10	#4	3	4'-7"	31
Z8	10	#4	3	4'-2"	28
Z9	10	#4	3	3'-10"	26
Z10	10	#4	3	3'-5"	23
Z11	10	#4	3	3'-1"	21
Z12	6	#4	3	2'-11"	12
REINFORCING STEEL (FOR 2 WINGS)					1,246 LBS
CLASS A CONCRETE					
2 WINGS					16.8 CY
1 CULVERT HEADWALL (INLET END)					1.7 CY
1 CULVERT END CURTAIN WALL (INLET END)					1.4 CY
TOTAL					19.9 CY



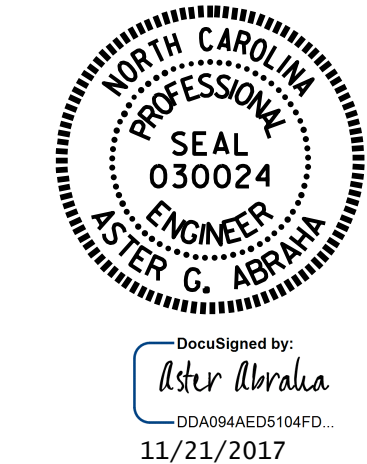
ELEVATION OF WING W1



TYPICAL WING SECTION

PROJECT NO. U-3334B
 JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 6 OF 10

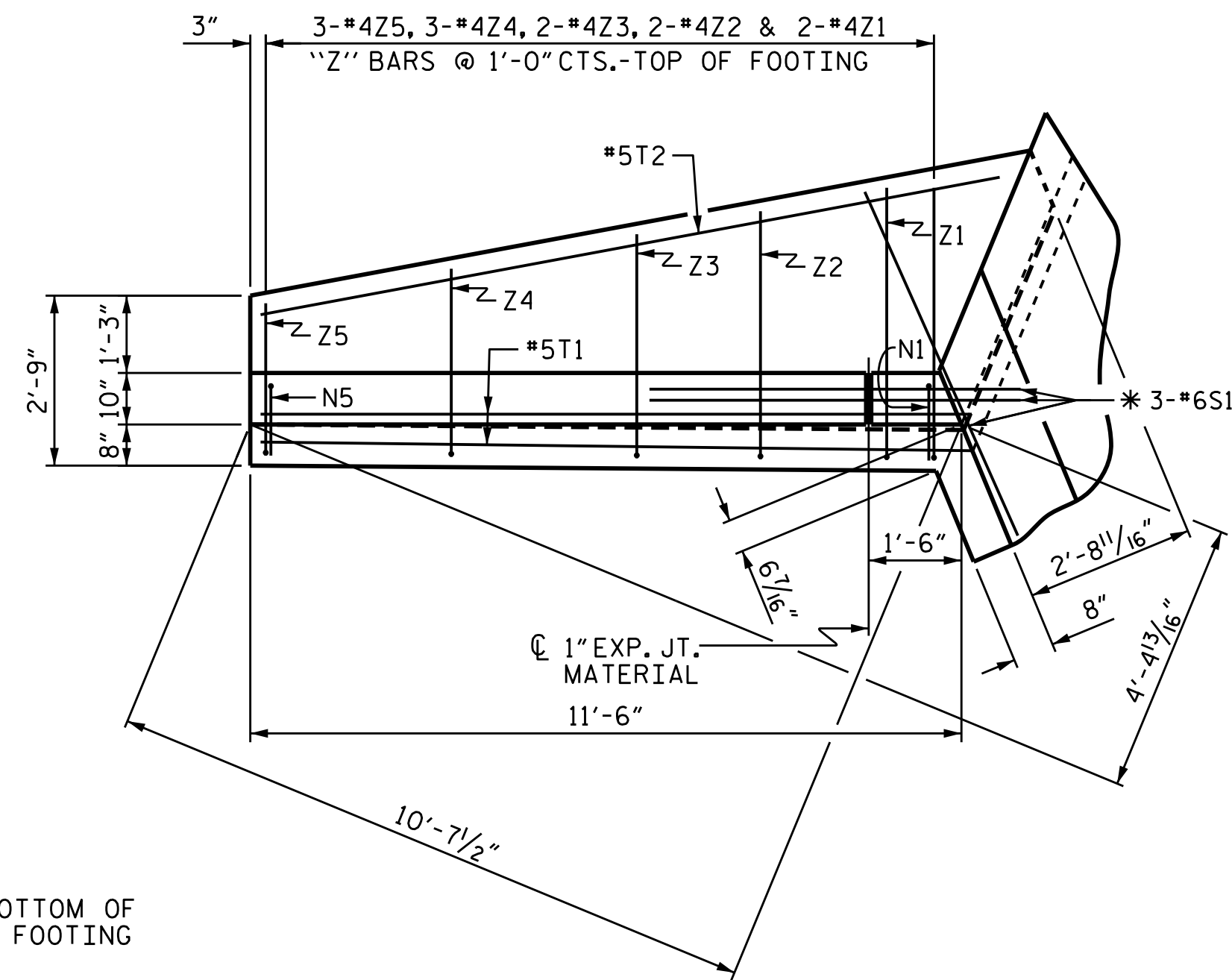


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS FOR CONCRETE BOX CULVERT
 H = 6'-0" SLOPE = 3:1
 45° SKEW

ASSEMBLED BY : M.K. BEARD	DATE : 08/17
CHECKED BY : S. WANCE	DATE : 09/17
DRAWN BY : CCJ 01/00	
CHECKED BY : RWW 03/00	

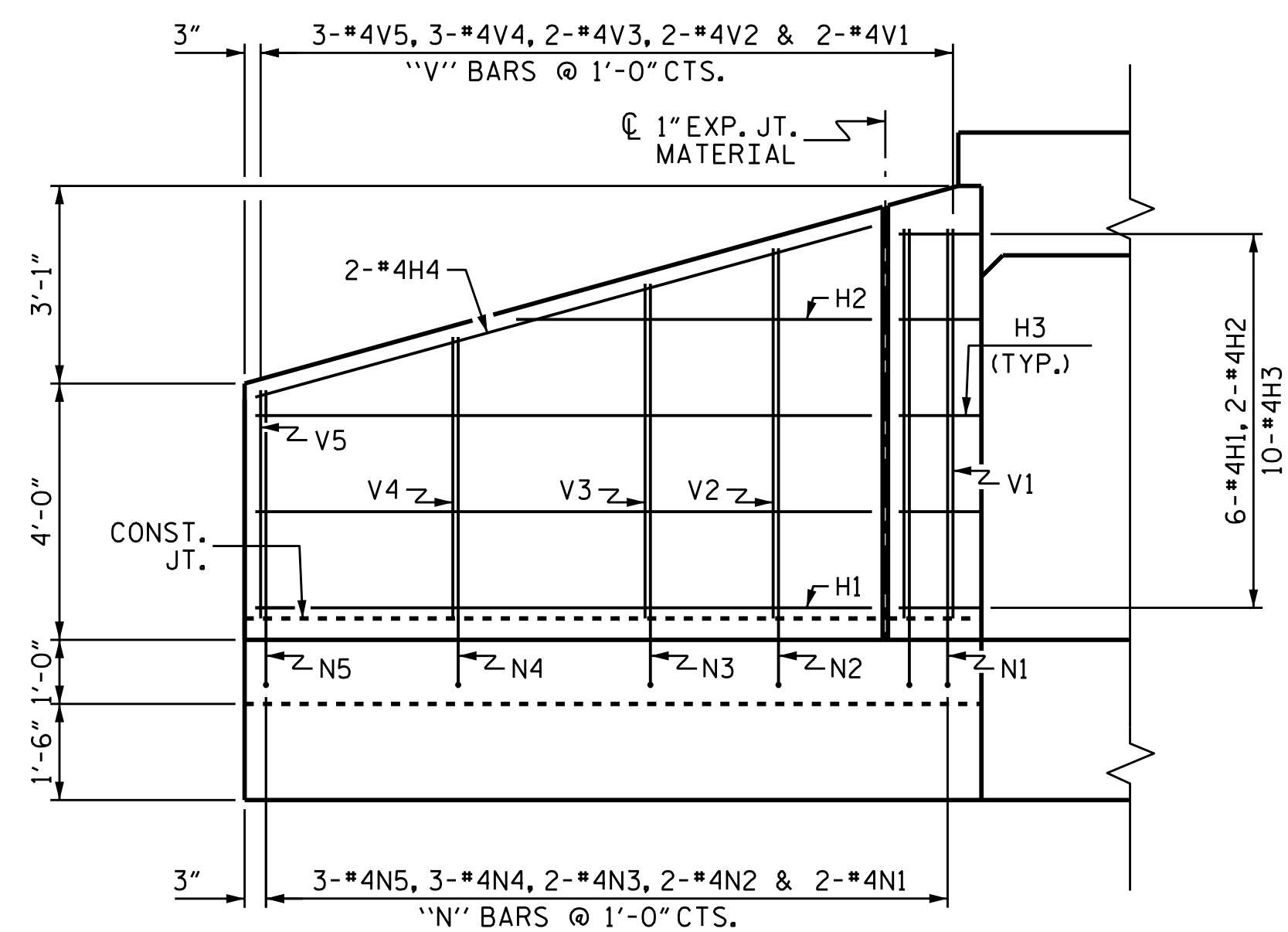
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS		SHEET NO.	
NO.	DATE	BY	CI-6
1			16
2			
3			
4			

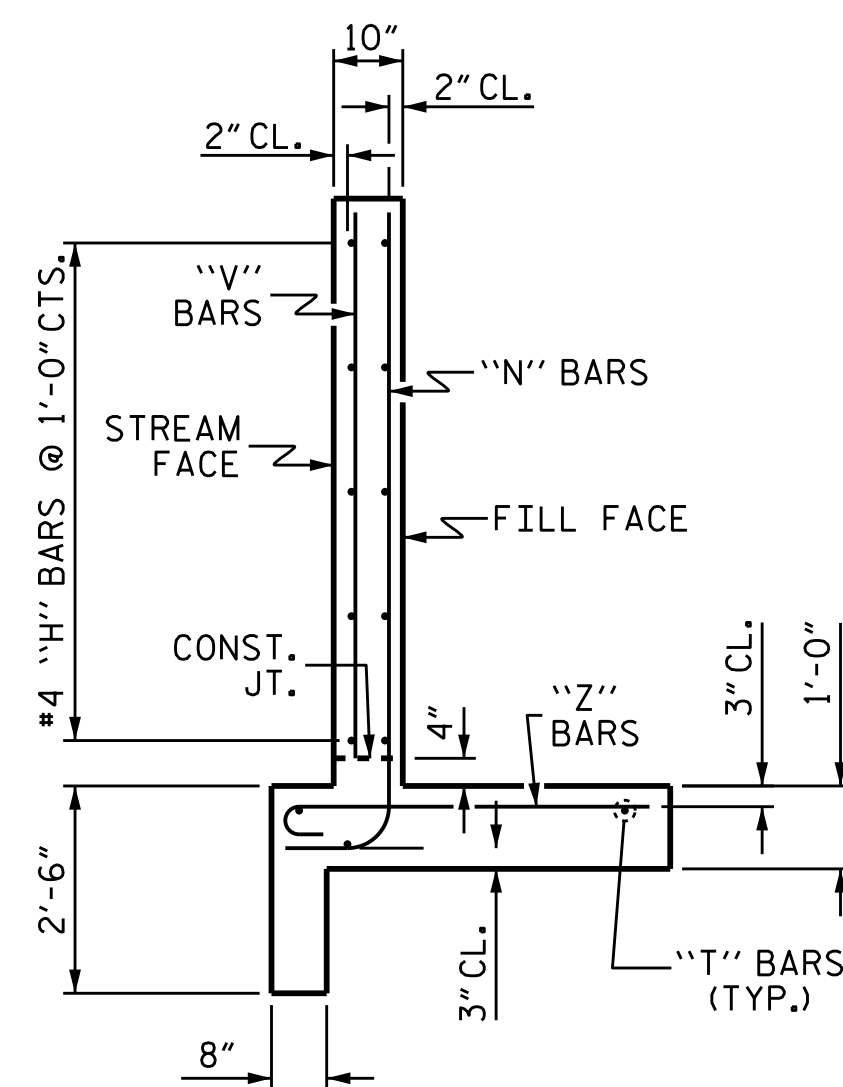


* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

PLAN OF WING W2



ELEVATION OF WING W2



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

①

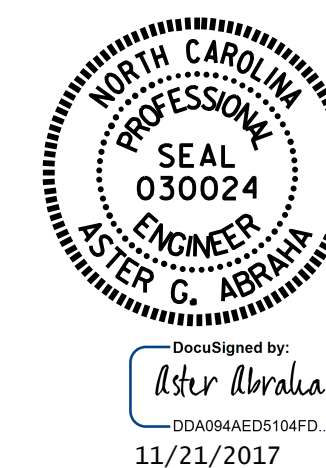
②

③

BILL OF MATERIAL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	9'-7"	38
H2	2	#4	STR	5'-6"	7
H3	10	#4	1	3'-3"	22
H4	2	#4	STR	9'-11"	13
N1	2	#4	2	8'-8"	6
N2	2	#4	2	8'-4"	11
N3	2	#4	2	7'-9"	11
N4	2	#4	2	6'-11"	14
N5	2	#4	2	6'-1"	12
S1	3	#6	STR	6'-0"	27
T1	2	#5	STR	11'-6"	24
V1	2	#4	STR	6'-1"	8
V2	2	#4	STR	5'-9"	8
V3	2	#4	STR	5'-2"	7
V4	2	#4	STR	4'-4"	9
V5	3	#4	STR	3'-6"	7
Z1	2	#4	3	4'-10"	7
Z2	2	#4	3	4'-6"	6
Z3	2	#4	3	4'-1"	6
Z4	3	#4	3	3'-6"	7
Z5	3	#4	3	2'-11"	6
REINFORCING STEEL FOR 1 WINGS				256 LBS	
CLASS A CONCRETE				4.1 CY	
1 WING				1.7 CY	
1 CULVERT HEADWALL (OUTLET END)				1.4 CY	
1 CULVERT END CURTAIN WALL (OUTLET END)				7.2 CY	
TOTAL					

ASSEMBLED BY : M.K. BEARD	DATE : 08/17
CHECKED BY : S. WANCE	DATE : 09/17
DRAWN BY : CCJ 01/00	
CHECKED BY : RWW 03/00	

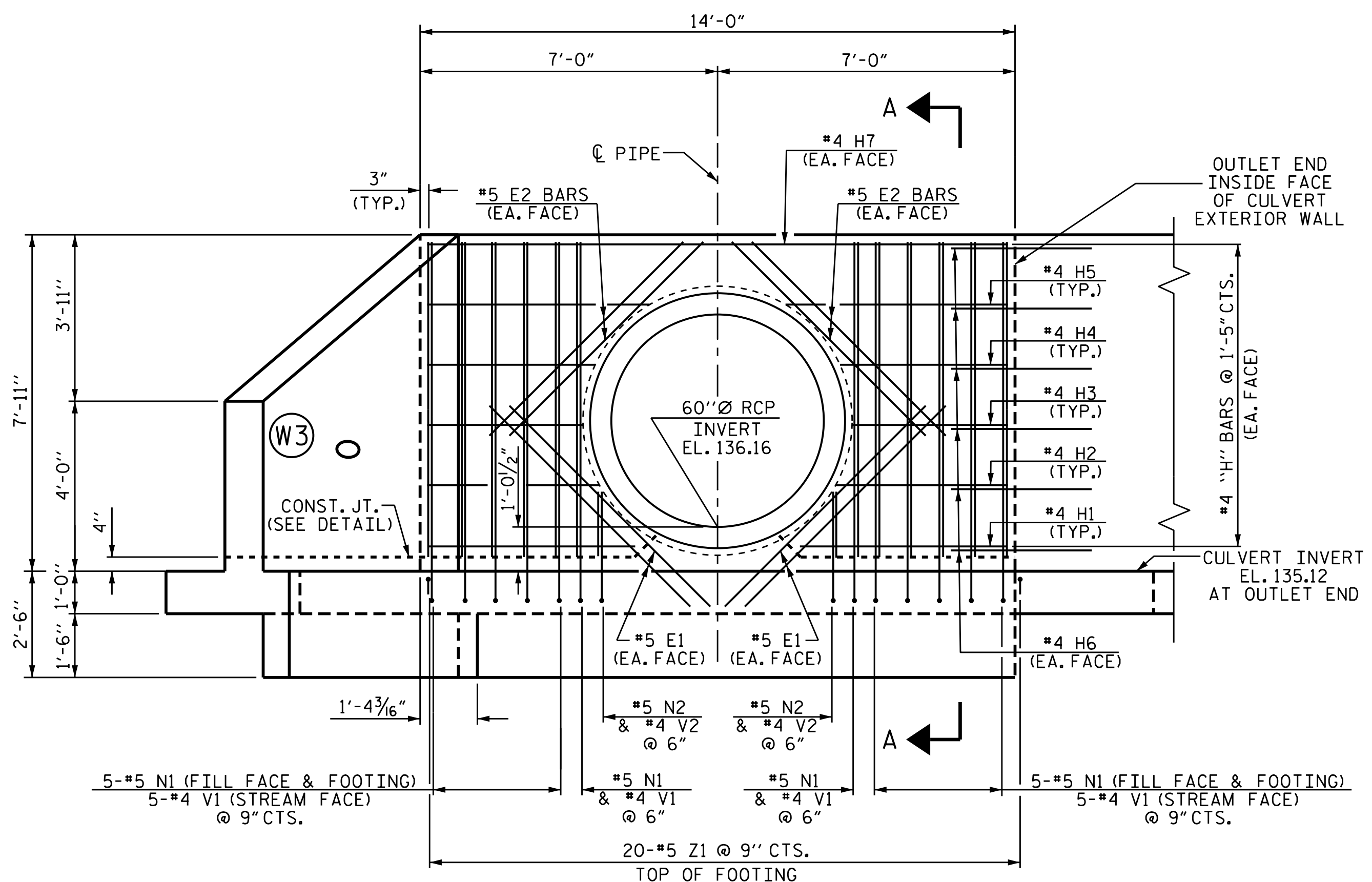
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 aabraha



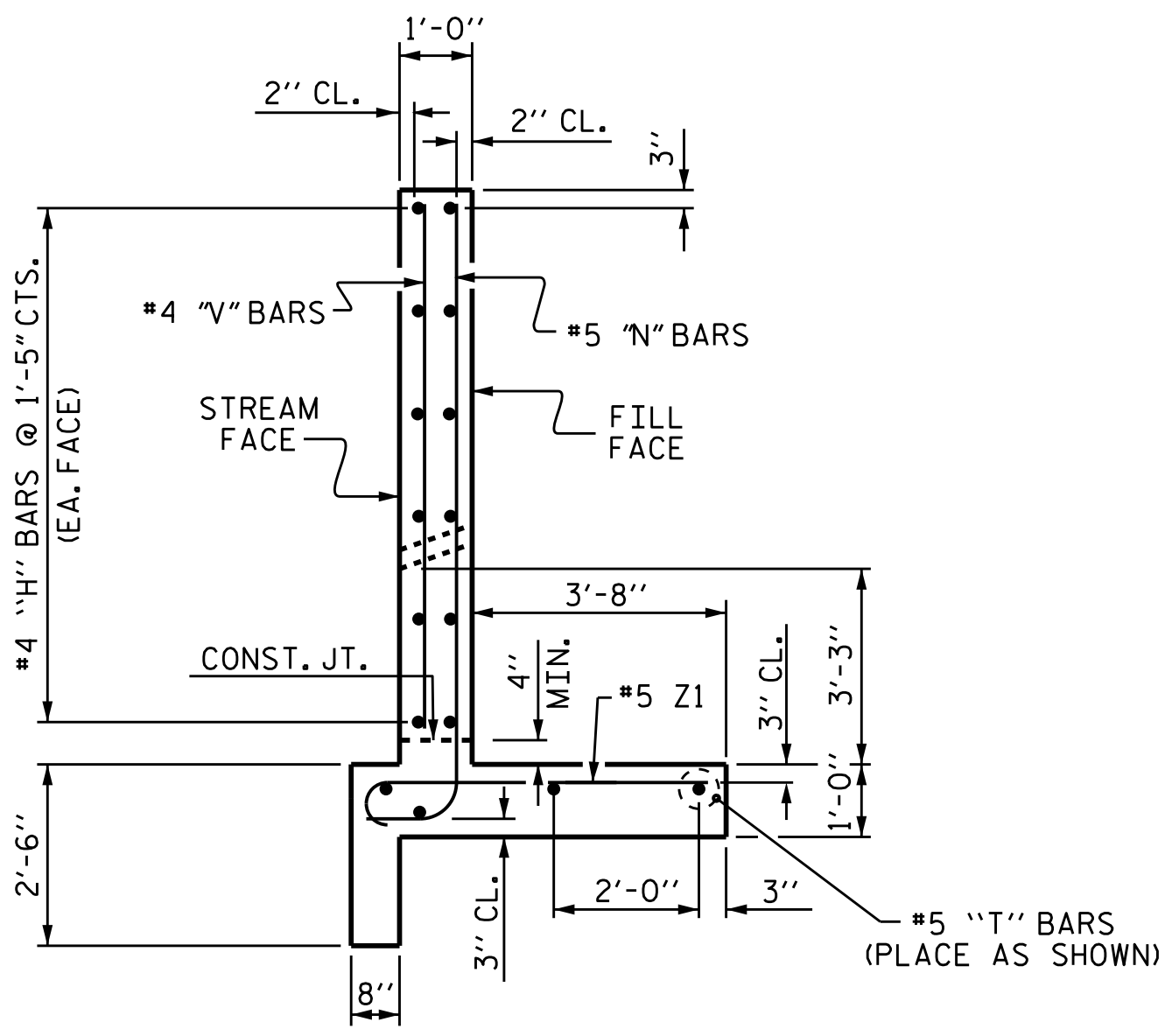
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-
 SHEET 7 OF 10

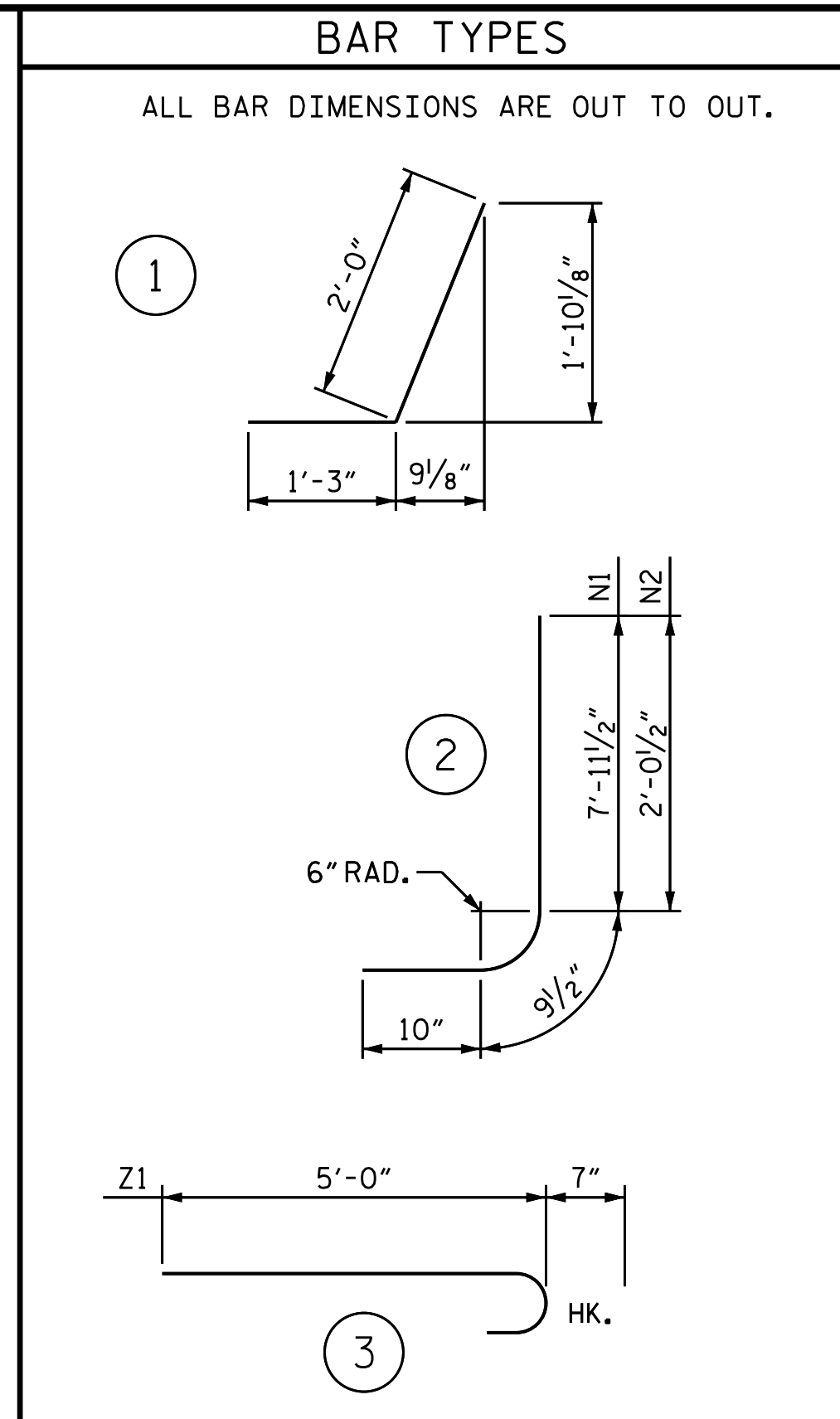
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
WING FOR CONCRETE BOX CULVERT H = 6'-0" SLOPE = 3:1 45° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. CI-7
					TOTAL SHEETS 16



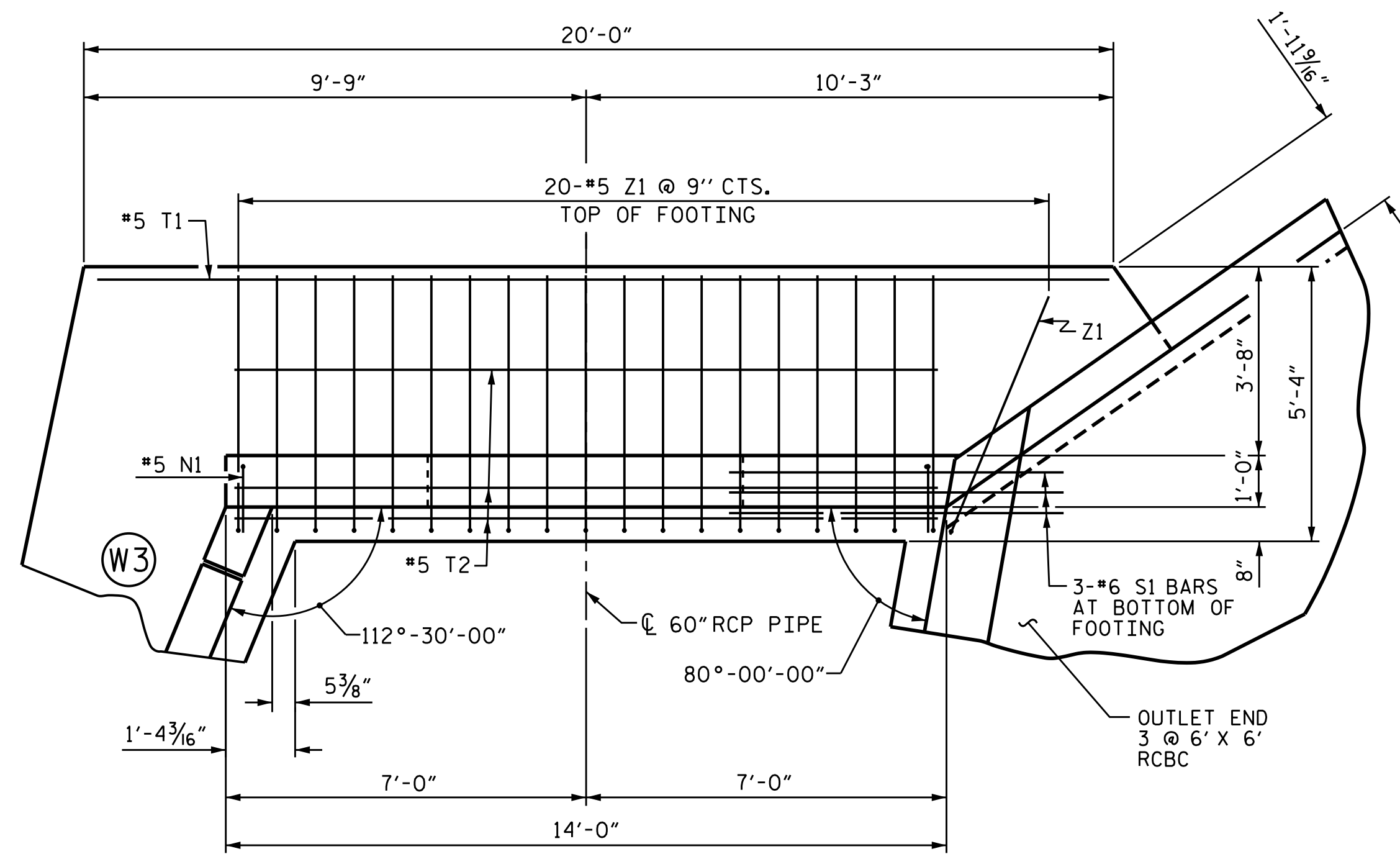
ELEVATION - NORMAL TO HEADWALL HW1
(OUTLET END)
(SOME CULVERT OBJECT LINES NOT SHOWN FOR CLARITY)



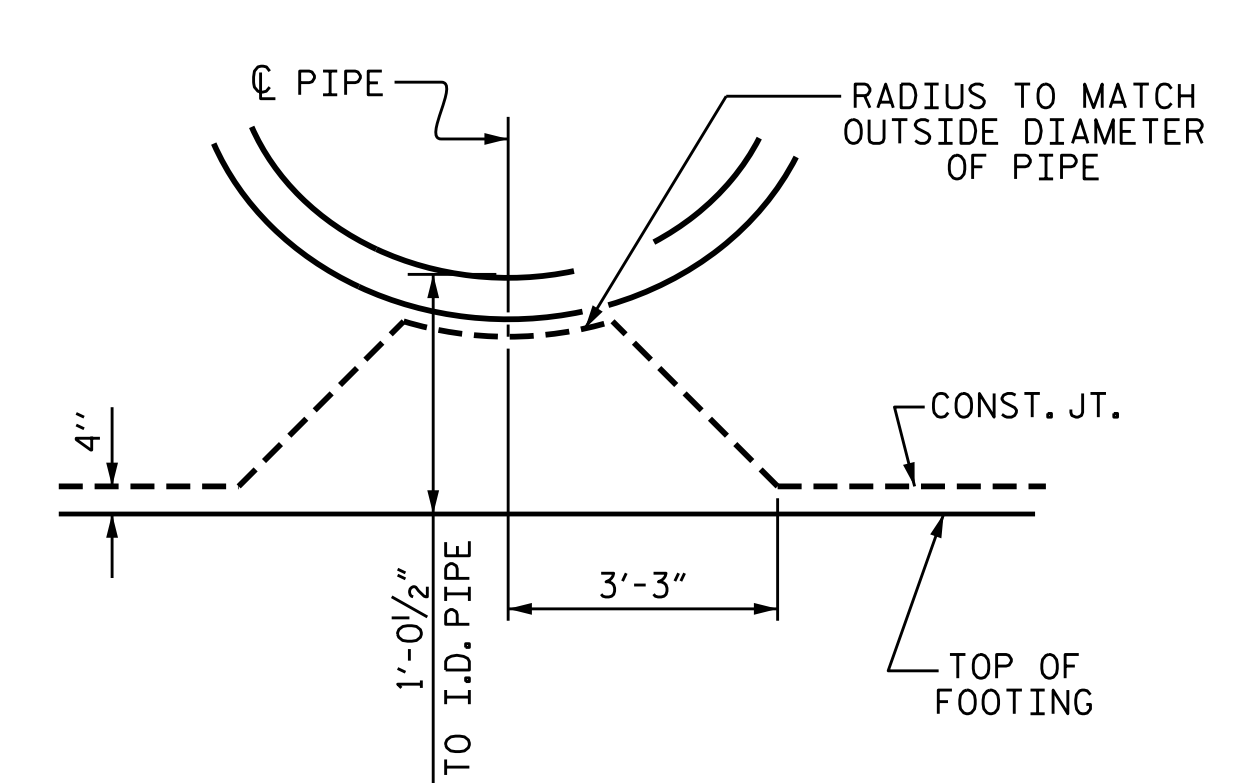
SECTION A-A



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
E1	8	#5	STR	6'-8"	56
E2	8	#5	STR	6'-6"	54
H1	4	#4	STR	4'-11"	13
H2	4	#4	STR	4'-0"	11
H3	4	#4	STR	3'-8"	10
H4	4	#4	STR	3'-11"	10
H5	4	#4	STR	5'-2"	14
H6	12	#4	STR	3'-3"	26
H7	2	#4	STR	13'-8"	18
N1	12	#5	2	9'-7"	120
N2	2	#5	2	3'-8"	8
S1	3	#6	STR	6'-6"	29
T1	1	#5	STR	19'-8"	21
T2	3	#5	STR	13'-8"	43
V1	12	#4	STR	7'-5"	59
V2	2	#4	STR	1'-6"	2
Z1	20	#5	3	5'-7"	116
REINFORCING STEEL FOR 1 HEADWALL					610 LBS
CLASS A CONCRETE FOR 1 HEADWALL					6.8 CY

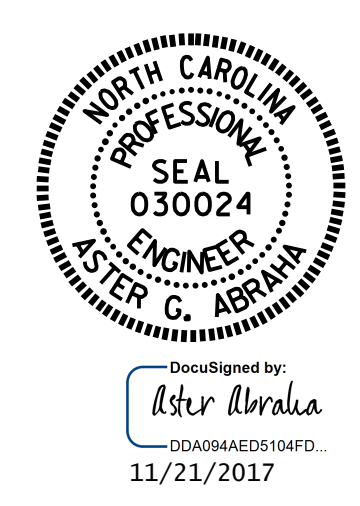


PLAN - HEADWALL HW1



CONSTRUCTION JOINT DETAIL
(OUTLET END - 60" RCP)

PROJECT NO. U-3334B
JOHNSTON COUNTY
STATION: 120+01.00 -L-
SHEET 8 OF 10

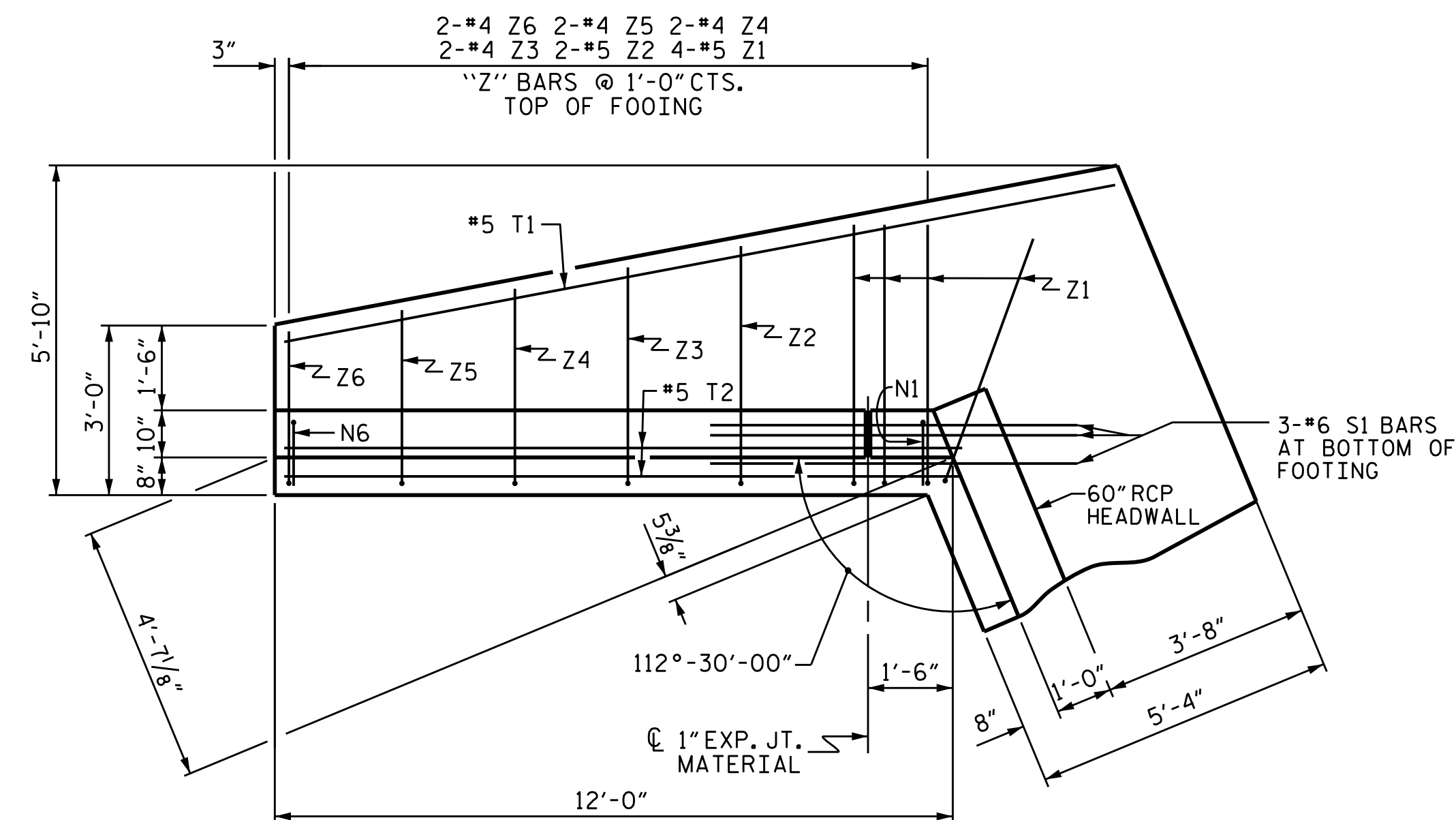


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CONCRETE HEADWALL FOR 60" RCP PIPE AT OUTLET END

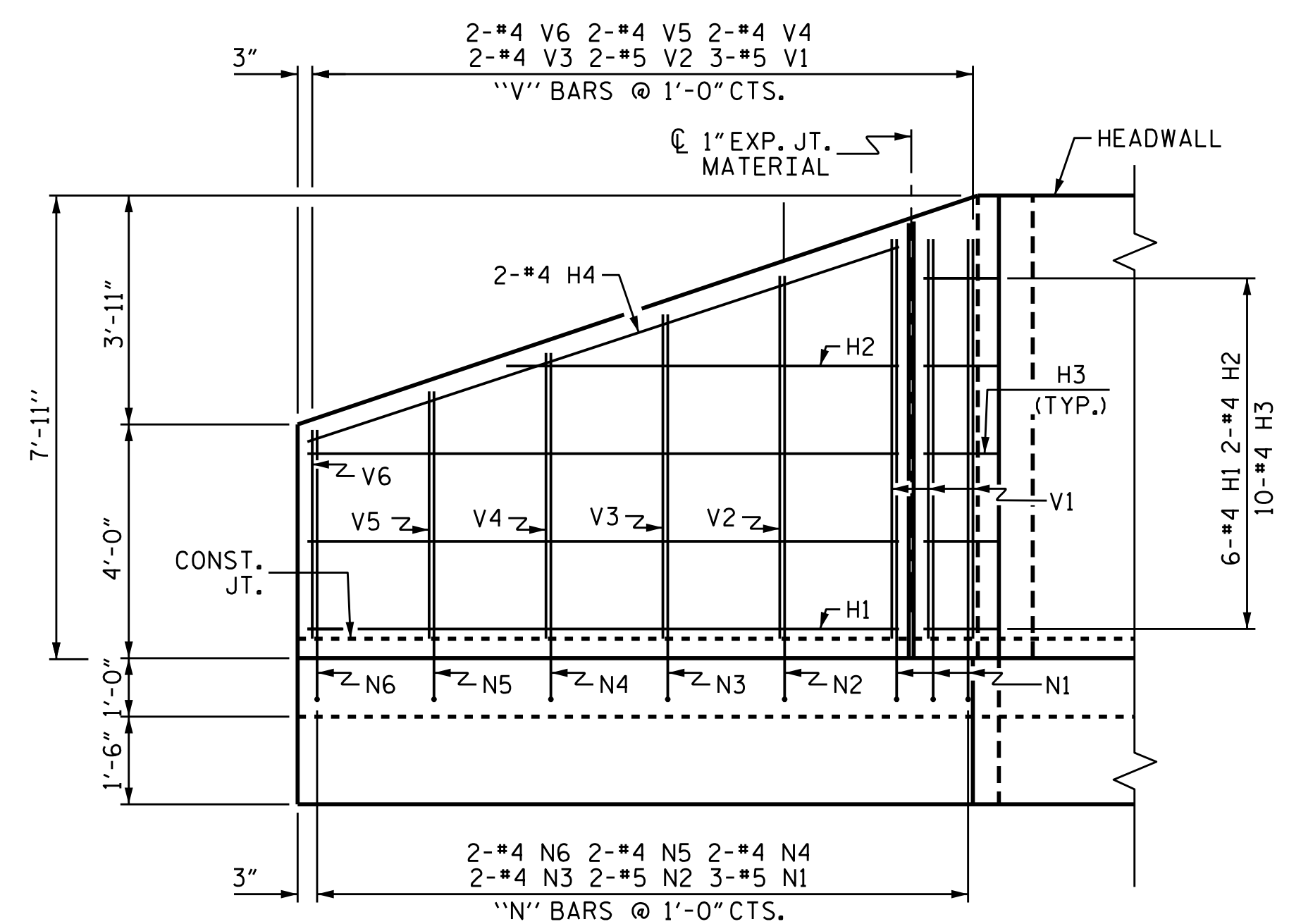
DRAWN BY: S. Wance DATE: 10/2017
CHECKED BY: MMA DATE: 10/2017
DESIGN ENGINEER OF RECORD: S. Wance DATE: 10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

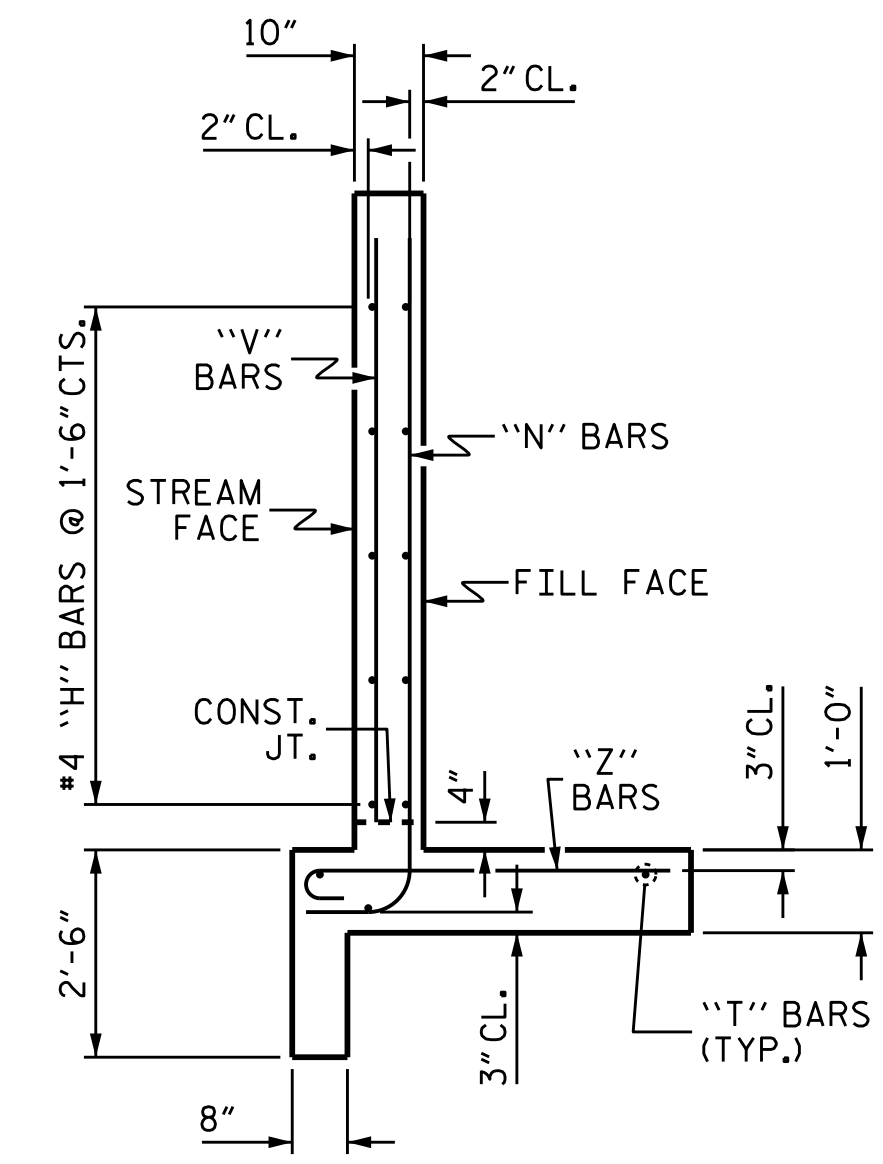
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-8	
1			3			TOTAL SHEETS 16	
2			4				



PLAN W3



ELEVATION W3



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

Z1	4'-7"	7"
Z2	4'-2"	7"
Z3	3'-10"	6"
Z4	3'-5"	6"
Z5	3'-1"	6"
Z6	2'-8"	6"

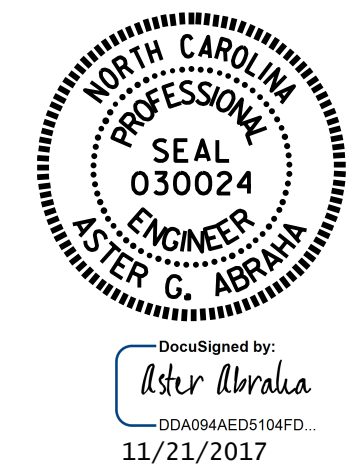
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	10'-1"	40
H2	2	#4	STR	6'-8"	9
H3	10	#4	1	3'-6"	23
H4	2	#4	STR	10'-8"	14
N1	3	#5	2	8'-10"	28
N2	2	#5	2	8'-3"	17
N3	2	#4	2	7'-7"	10
N4	2	#4	2	6'-11"	9
N5	2	#4	2	6'-3"	8
N6	2	#4	2	5'-7"	7
S1	3	#6	STR	6'-6"	29
T1	1	#5	STR	14'-10"	15
T2	2	#5	STR	12'-0"	25
V1	3	#4	STR	6'-10"	14
V2	2	#4	STR	6'-2"	8
V3	2	#4	STR	5'-6"	7
V4	2	#4	STR	4'-10"	6
V5	2	#4	STR	4'-2"	6
V6	2	#4	STR	3'-6"	5
Z1	4	#5	3	5'-2"	22
Z2	2	#5	3	4'-9"	10
Z3	2	#4	3	4'-4"	6
Z4	2	#4	3	3'-11"	5
Z5	2	#4	3	3'-7"	5
Z6	2	#4	3	3'-2"	4

REINFORCING STEEL FOR 1 WING 332 LBS
 CLASS A CONCRETE 1 WING 4.9 CY

ASSEMBLED BY : S. Wance DATE : 10/2017
 CHECKED BY : MMA DATE : 10/2017
 DRAWN BY : CCJ 01/00
 CHECKED BY : RWW 03/00

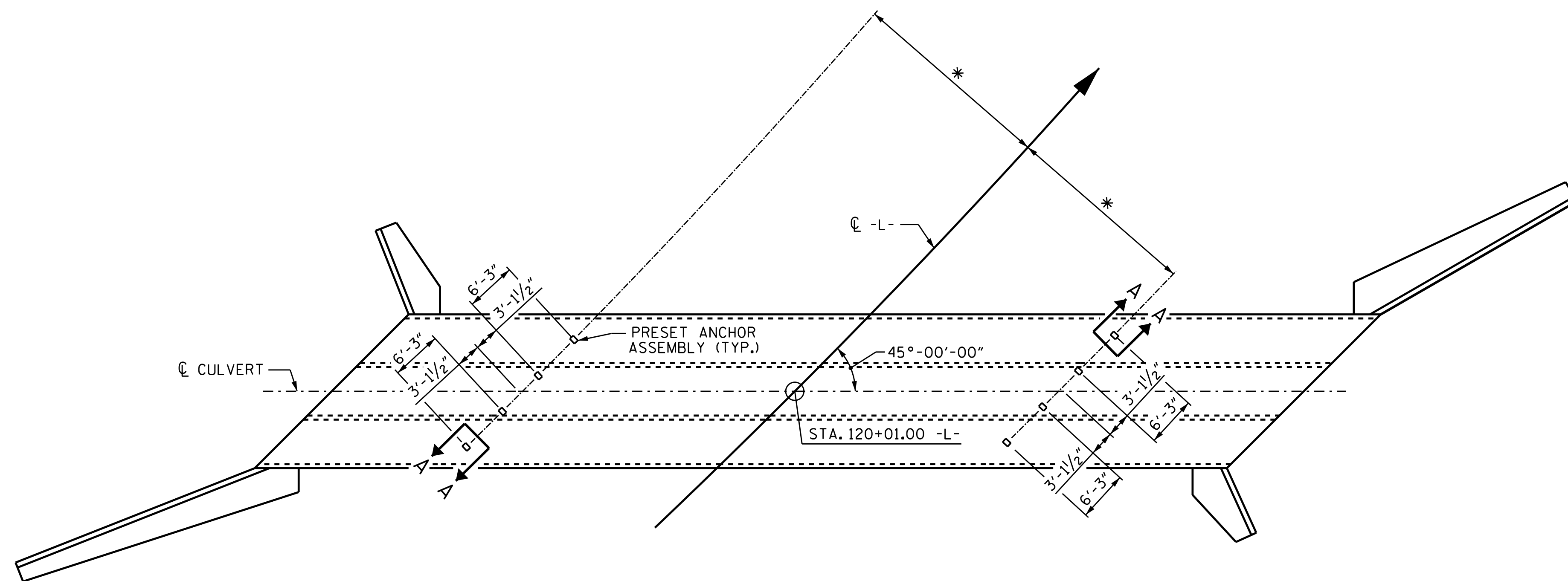
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 9 OF 10
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
WING FOR HEADWALL AT OUTLET END

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-9	
1			3			TOTAL SHEETS 16	
2			4				



PLAN
 SHOWING: GUARDRAIL ANCHOR ASSEMBLY SPACING.
 * THIS DIMENSION TO BE FURNISHED BY THE RESIDENT ENGINEER.

NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
 - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

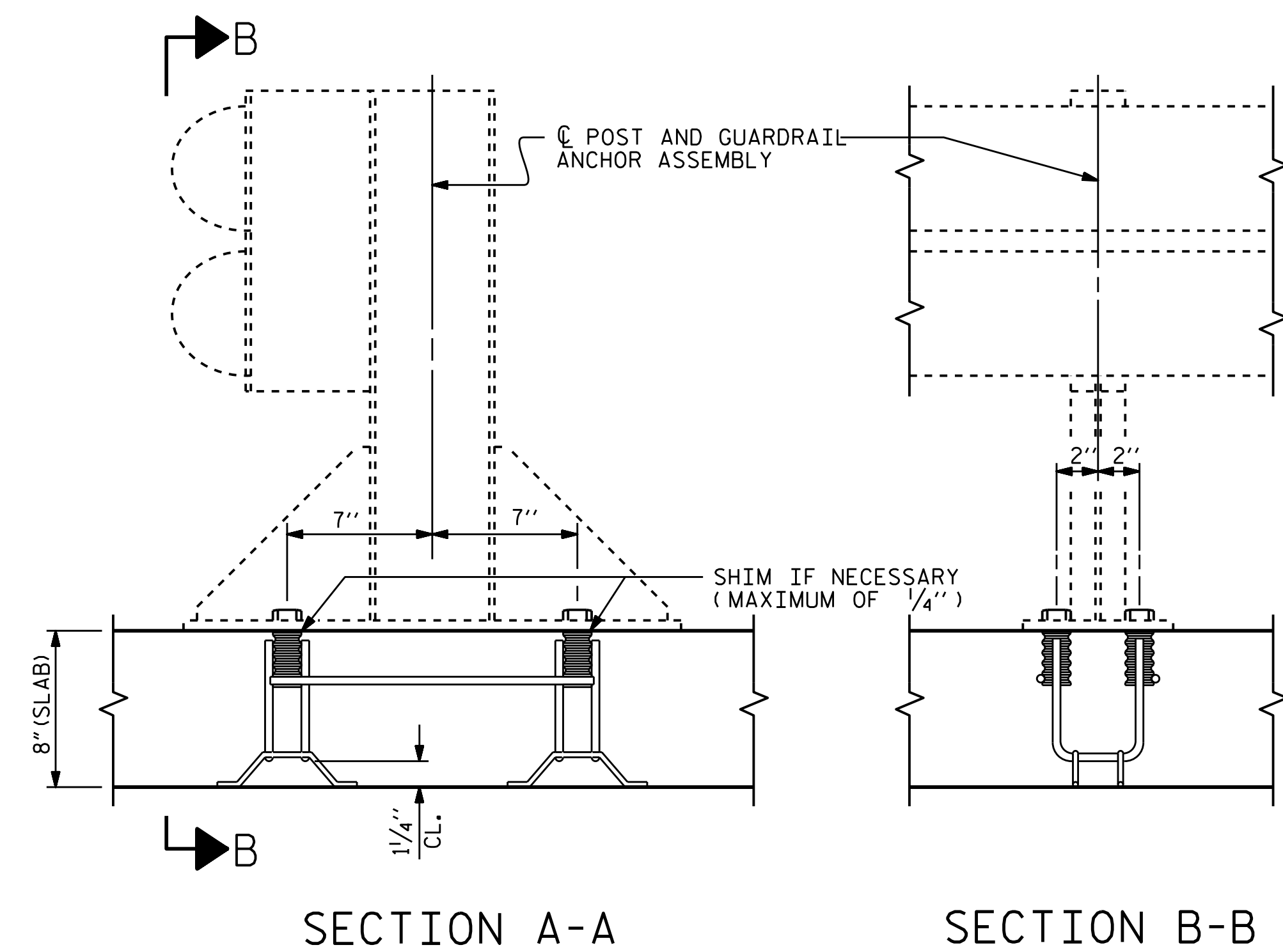
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

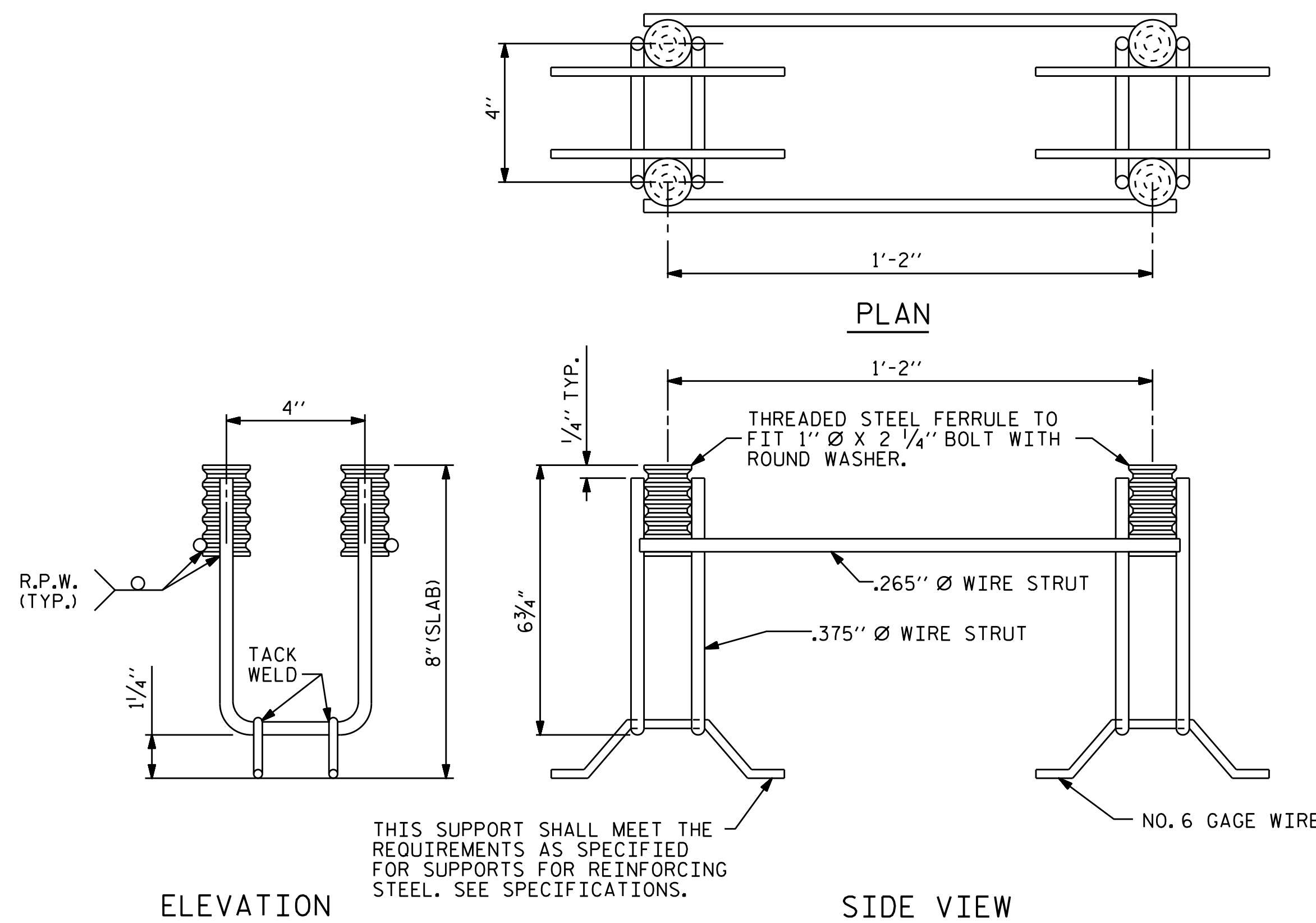
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



SECTION A-A

SECTION B-B



ELEVATION

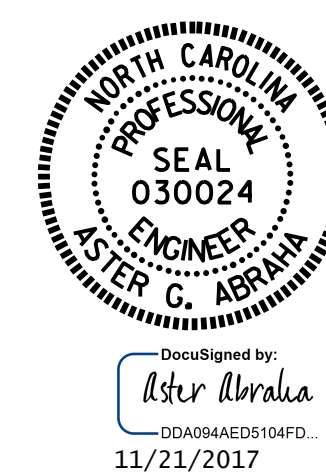
SIDE VIEW

THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 120+01.00 -L-

SHEET 10 OF 10

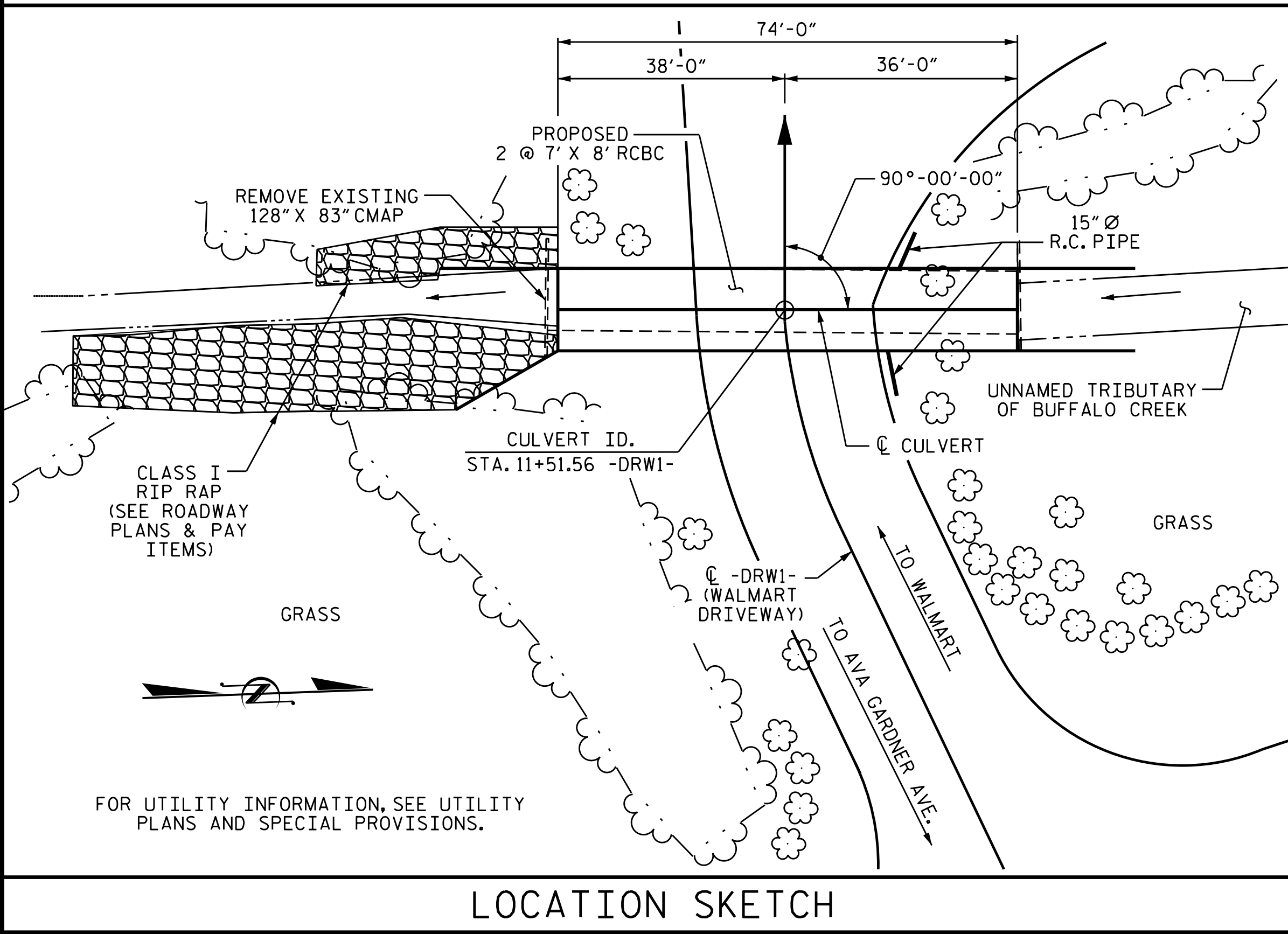


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ANCHORAGE DETAILS FOR
 GUARDRAIL ANCHOR ASSEMBLY
 FOR CULVERTS

ASSEMBLED BY : M.K. BEARD	DATE : 08/17
CHECKED BY : A. ABRAHA	DATE : 09/17
DRAWN BY : FCJ 6/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 6/88	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			C1-10
2			4			16



LOCATION SKETCH

ROADWAY DATA	
GRADE POINT EL. @ STA. 11+51.56 -DRW1- (WALMART DRIVEWAY)	= 146.50
BED EL. @ STA. 11+56.51 -DRW1- ROADWAY FILL SLOPES	= 135.57 = 4:1

HYDRAULIC DATA	
DESIGN DISCHARGE	= 330 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 10 YRS.
DESIGN HIGH WATER ELEVATION	= 142.6
DRAINAGE AREA	= 1.2 SQ. MI.
BASE DISCHARGE (0100)	= 500 C.F.S.
BASE HIGH WATER ELEVATION	= 143.8

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 600+ C.F.S
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 146.8 *

* OCCURS @ SHOULDER POINT @ STA. 11+32.20 -DRW1-

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 DESIGN FILL = 2.55 FEET.
 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, CURTAIN WALLS 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 THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

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.

STEEL IN THE BOTTOM SLAB MAY BE SPliced AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPlice THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL 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 SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE 15" DIA. PIPES THROUGH THE SIDEWALLS OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR THE PIPES.

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

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.

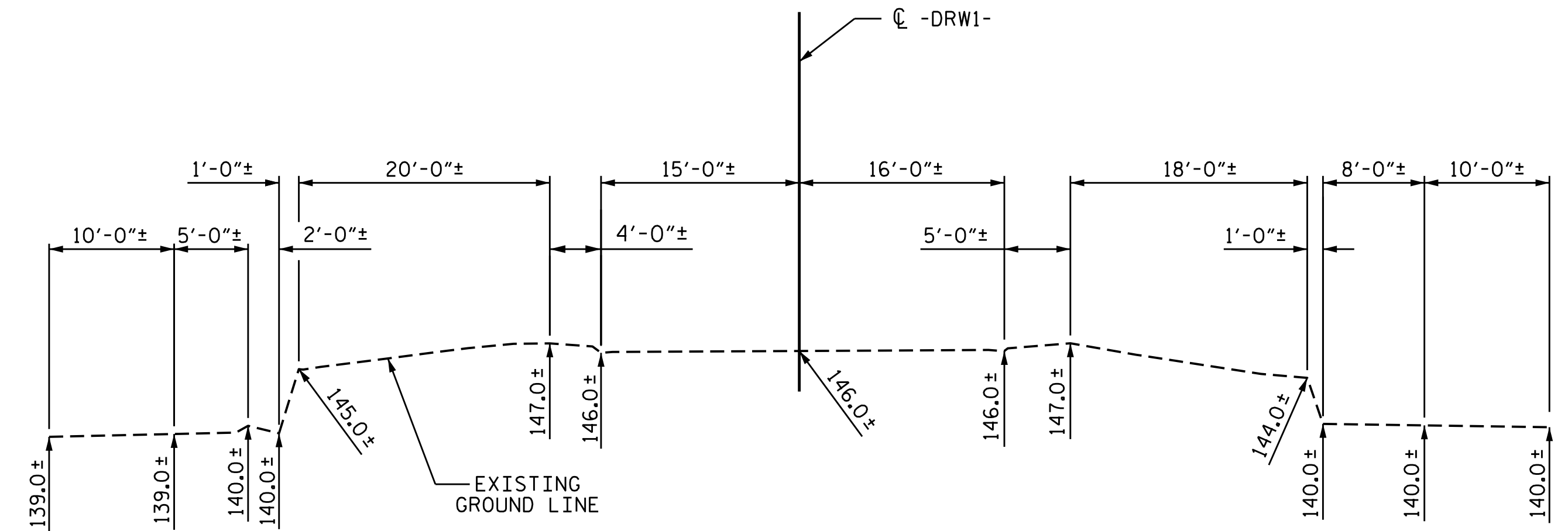
FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON THE WING SHEETS.

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.

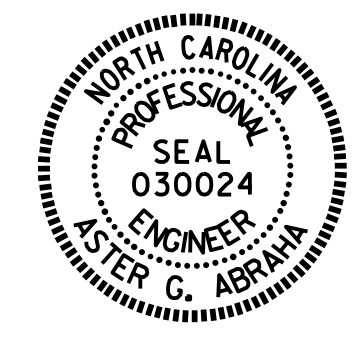
THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED AND FOR PROJECTS REQUIRING 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS 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.

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	84 TONS
CLASS A CONCRETE	
BARRELS @ 1.638 C.Y./FT.	121.2 C.Y.
WINGS, ETC.	41.7 C.Y.
TOTAL	162.9 C.Y.
REINFORCING STEEL	
BARRELS	14,776 LBS.
WINGS, ETC.	3,076 LBS.
TOTAL	17,852 LBS.



PROFILE ALONG CULVERT

DRAWN BY :	M.K. BEARD	DATE :	08/17
CHECKED BY :	S. WANCE	DATE :	09/17
DESIGN ENGINEER OF RECORD :	M.M. AHMED	DATE :	08/04/17



DocuSigned by:
 Aster Abraham
 004084AED510AFD
 11/21/2017

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**DOUBLE 7 FT. X 8 FT.
 CONCRETE BOX CULVERT**
 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-1
1			3			TOTAL SHEETS
2			4			16

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	1.12	--	1.75	1.49	1	TOP SLAB	3.26	1.12	1	TOP SLAB	6.60		
	HL-93 (OPERATING)	N/A		1.45	--	1.35	1.93	1	TOP SLAB	3.26	1.45	1	TOP SLAB	6.60		
	HS-20 (INVENTORY)	36.00	②	1.12	40.32	1.75	1.49	1	TOP SLAB	3.26	1.12	1	TOP SLAB	6.60		
	HS-20 (OPERATING)	36.00		1.45	52.26	1.35	1.93	1	TOP SLAB	3.26	1.45	1	TOP SLAB	6.60		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.04	27.49	1.40	2.72	1	TOP SLAB	3.26	2.04	1	TOP SLAB	6.60		
		SNGARBS2	20.00		1.90	38.09	1.40	2.54	1	TOP SLAB	3.26	1.90	1	TOP SLAB	6.60	
		SNAGRIS2	22.00		2.04	44.81	1.40	2.72	1	TOP SLAB	3.26	2.04	1	TOP SLAB	6.60	
		SNCOTTS3	27.25		1.42	38.79	1.40	2.08	1	TOP SLAB	3.07	1.42	1	TOP SLAB	6.60	
		SNAGGRS4	34.93		1.60	55.84	1.40	2.33	1	BOTTOM SLAB	7.09	1.60	1	BOTTOM SLAB	6.79	
		SNS5A	35.55	③	1.39	49.26	1.40	2.16	1	BOTTOM SLAB	7.09	1.39	1	BOTTOM SLAB	6.79	
		SNS6A	39.95		1.45	58.10	1.40	2.13	1	BOTTOM SLAB	7.09	1.45	1	BOTTOM SLAB	6.79	
		SNS7B	42.00		1.45	61.08	1.40	2.13	1	BOTTOM SLAB	7.09	1.45	1	BOTTOM SLAB	6.79	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		1.95	64.31	1.40	2.72	1	TOP SLAB	3.26	1.95	1	TOP SLAB	6.60	
		TNT4A	33.08		1.70	56.07	1.40	2.34	1	BOTTOM SLAB	7.09	1.70	1	TOP SLAB	6.60	
		TNT6A	41.60		1.64	68.37	1.40	2.34	1	BOTTOM SLAB	7.09	1.64	1	BOTTOM SLAB	6.79	
		TNT7A	42.00		1.66	69.79	1.40	2.49	1	TOP SLAB	3.07	1.66	1	TOP SLAB	6.60	
		TNT7B	42.00		1.47	61.58	1.40	2.14	1	BOTTOM SLAB	7.09	1.47	1	BOTTOM SLAB	6.79	
		TNAGRIT4	43.00		1.41	60.54	1.40	2.00	1	BOTTOM SLAB	7.09	1.41	1	BOTTOM SLAB	6.79	
		TNAGT5A	45.00		1.42	64.12	1.40	2.03	1	BOTTOM SLAB	7.09	1.42	1	BOTTOM SLAB	6.79	
		TNAGT5B	45.00		1.45	65.17	1.40	2.06	1	BOTTOM SLAB	7.09	1.45	1	BOTTOM SLAB	6.79	

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	0.50 OR 0.90
ES	1.35	0.50 OR 0.90
LS	1.75	0
WA	1.00	0

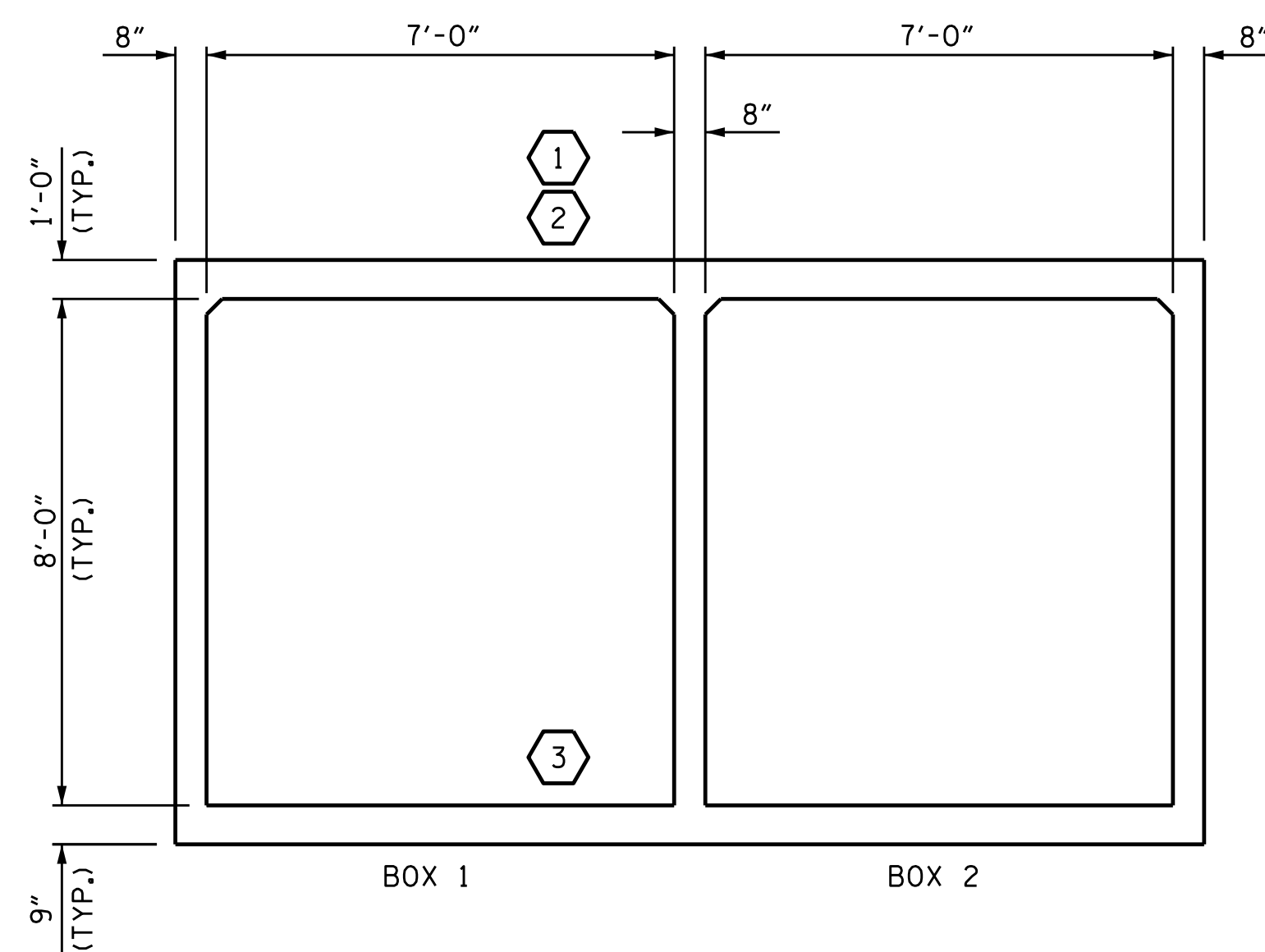
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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

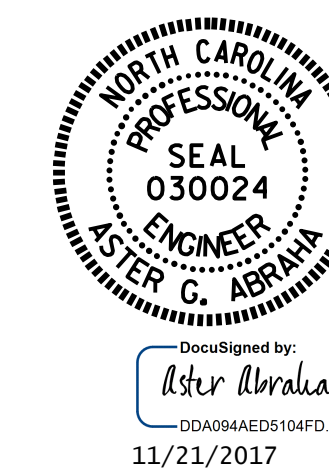
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-

SHEET 2 OF 6



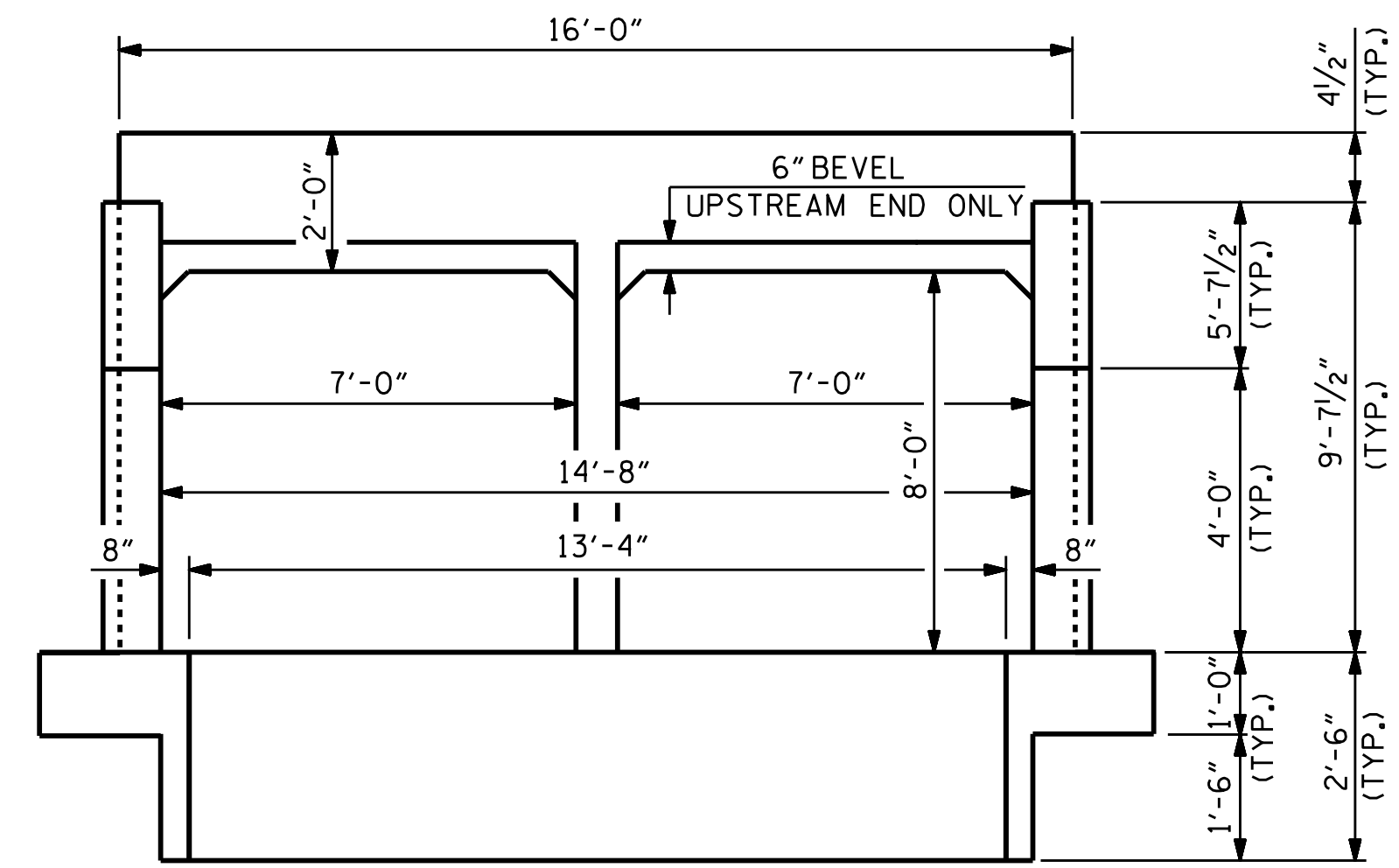
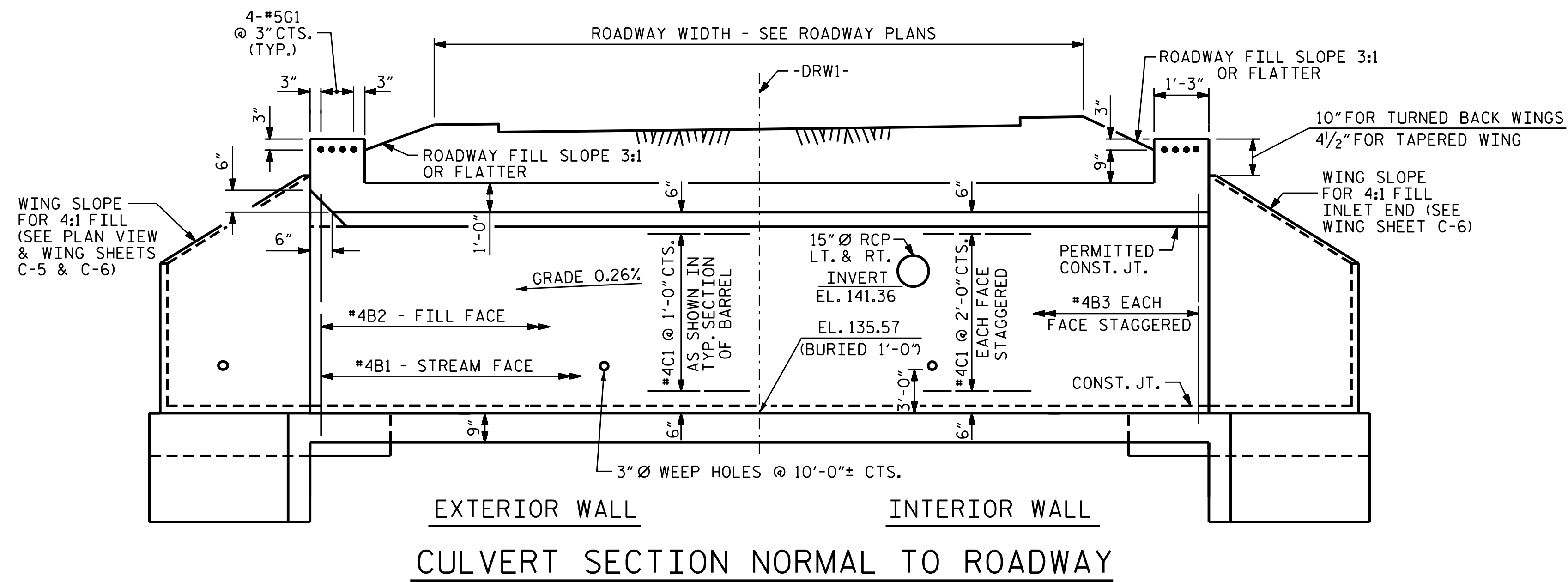
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-2
1			3			TOTAL SHEETS 16
2			4			

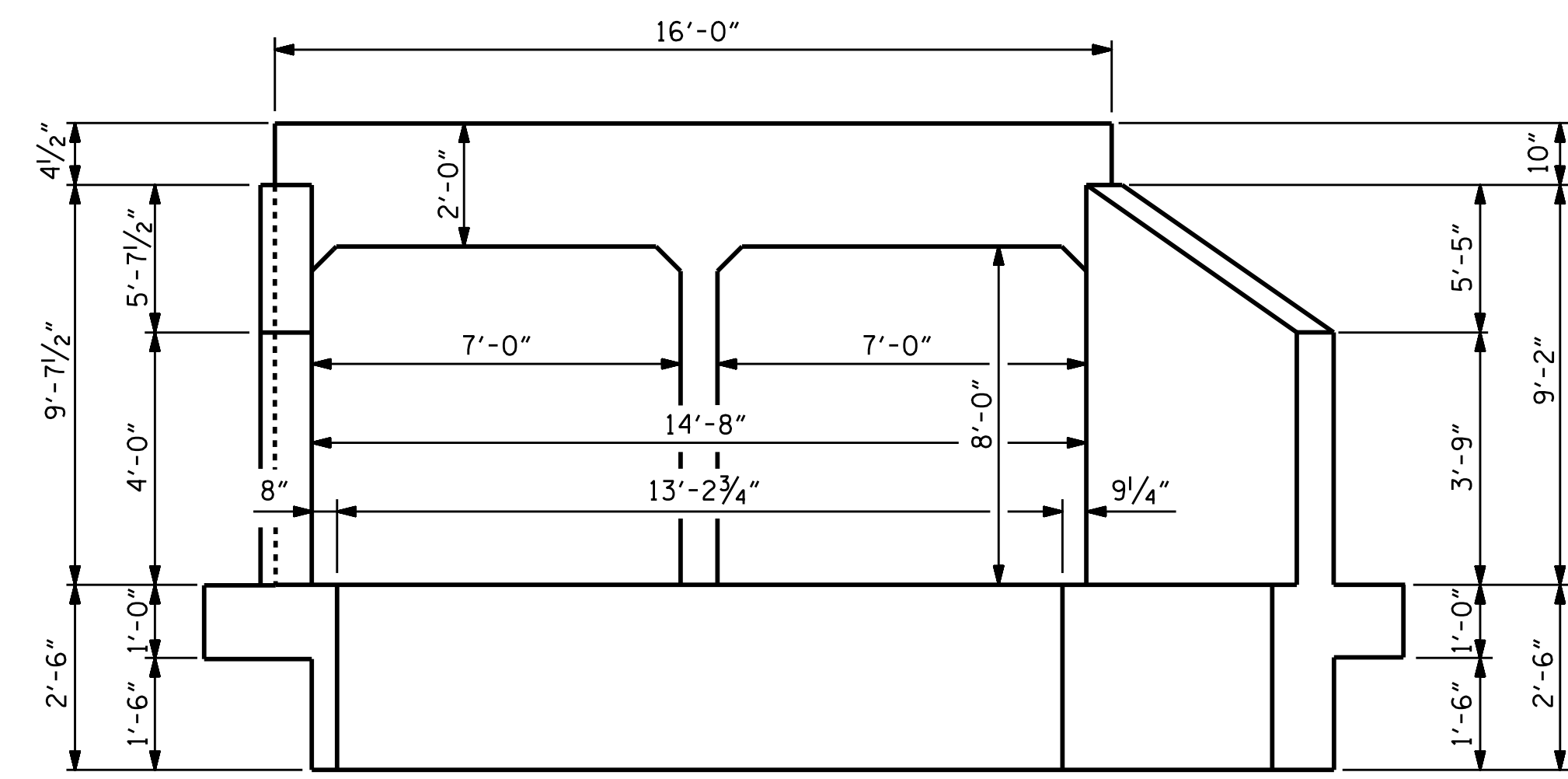
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

ASSEMBLED BY : M.K. BEARD	DATE : 08/17
CHECKED BY : S. WANCE	DATE : 09/17

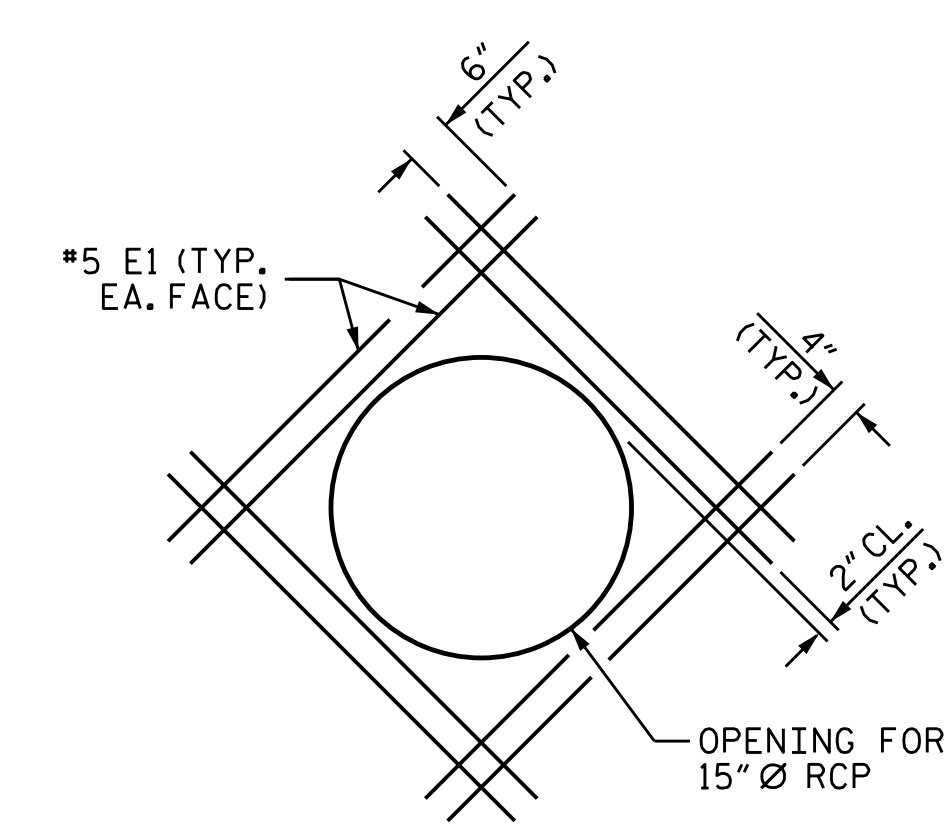
DRAWN BY : WMC	7/11	REV. 10/1/11	MAA/GM	DESIGN ENGINEER OF RECORD:	DATE : 08/04/17
CHECKED BY : GM	7/11			M. AHMED	



INLET END ELEVATION

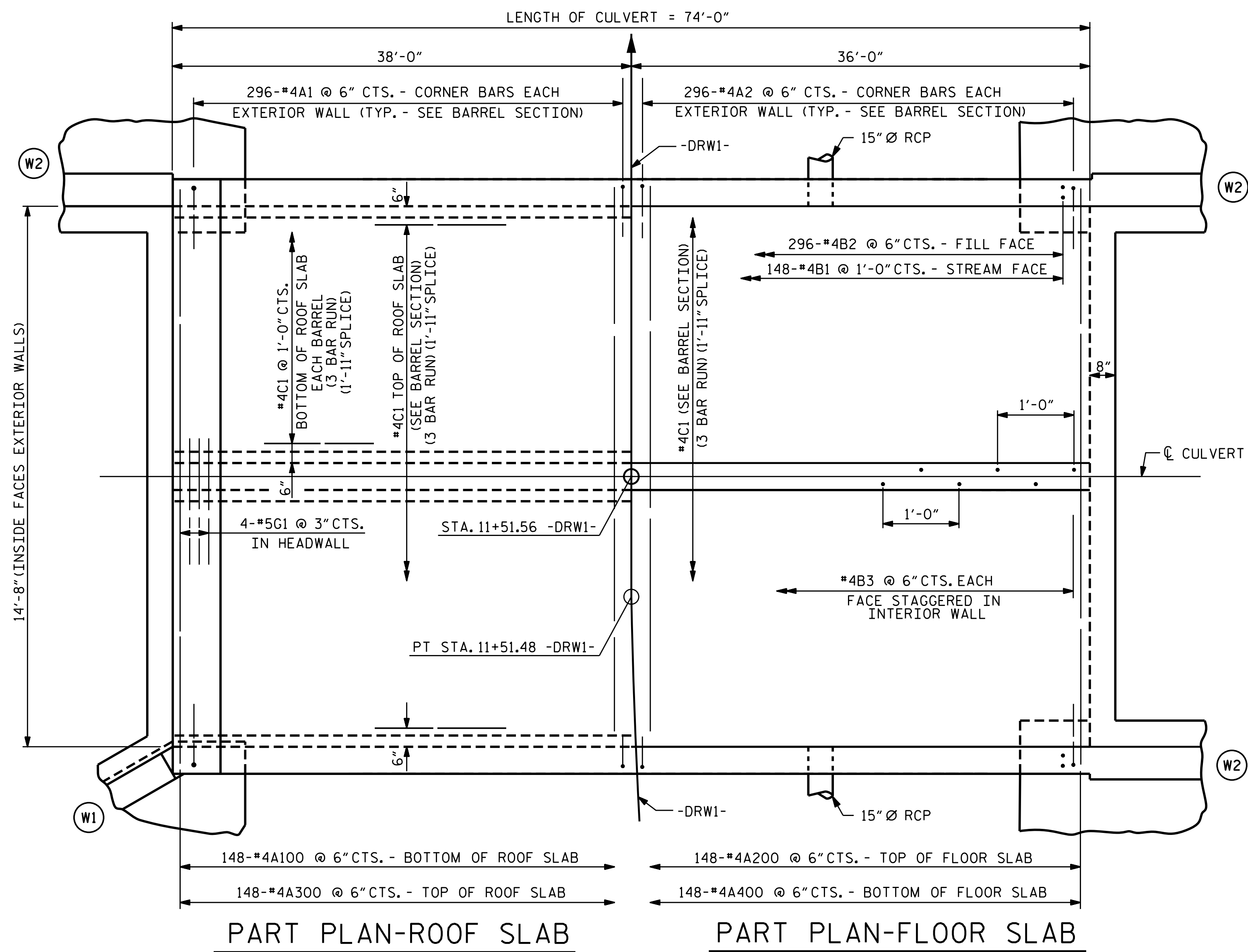


OUTLET END ELEVATION



DETAIL OF REINFORCING AROUND 15" Ø PIPES

FOR 15" Ø PIPES THRU EXTERIOR WALLS. FIELD CUT & BEND "B" & "C" BARS AS NEEDED TO CLEAR PIPES.



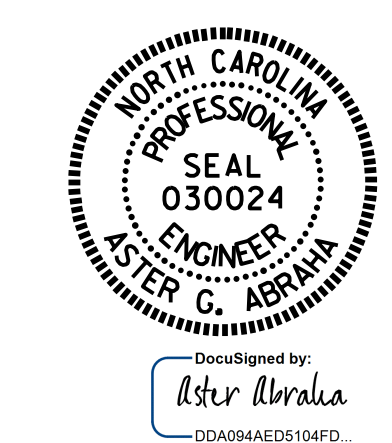
PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 7 FT. X 8 FT.
 CONCRETE BOX CULVERT
 90° SKEW



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			C2-3
2			4			16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISED 11-19-99 BY M.M. CHECKED BY R.W.W. REDRAWN NOV. 1990 BY T.S.S. CHECKED BY ARB

ASSEMBLED BY : M.K. BEARD DATE : 08/17
 CHECKED BY : S. WANCE DATE : 09/17
 DRAWN BY : RALPH D. UNDERWOOD DATE : MAY 1971
 CHECKED BY : JOEL A. JOHNSON DATE : JULY 1971

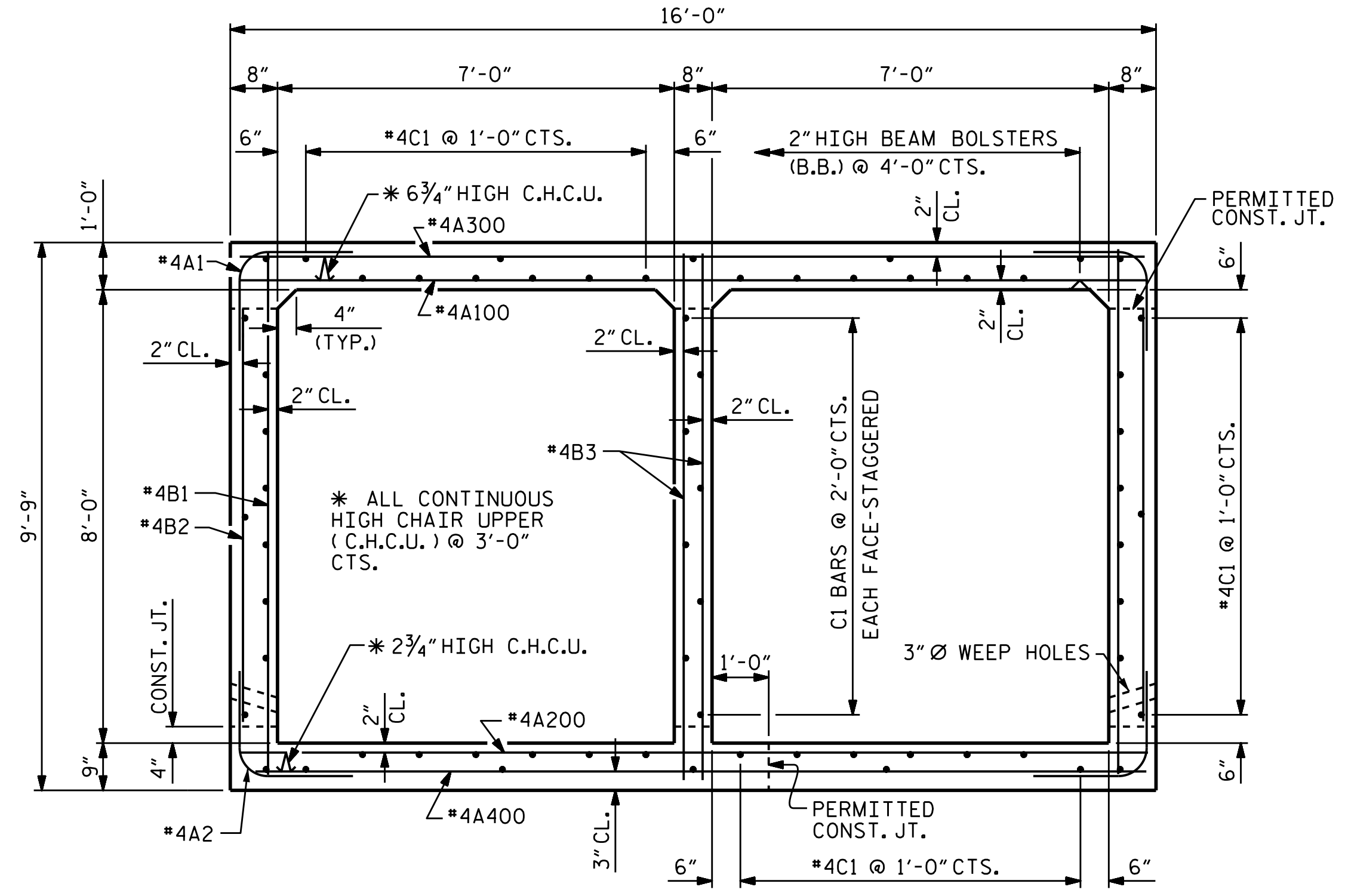
SPECIAL
STANDARD

ADDED NOV. 1, 1990

ASSEMBLED BY : M.K. BEARD DATE : 08/17
 CHECKED BY : S. WANCE DATE : 09/17
 DRAWN BY : R.W. WRIGHT DATE : JULY, 1990
 CHECKED BY : D.A. GLADDEN DATE : JULY, 1990

SPECIAL
STANDARD

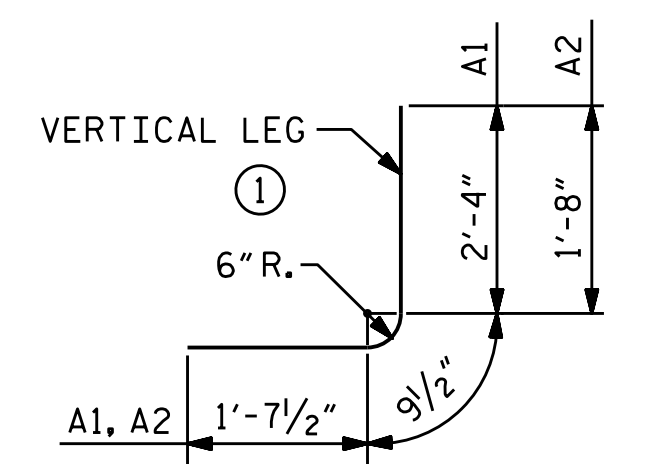
21-NOV-2017 14:48
 R:\Structures\Plans\Final\U3334B.SMU. CU.500002.dgn



RIGHT ANGLE SECTION OF BARREL

THERE ARE 64 "C" BARS IN SECTION OF BARREL.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	296	#4	1	4'-9"	939
A2	296	#4	1	4'-1"	807
A100	148	#4	STR	15'-7"	1541
A200	148	#4	STR	15'-7"	1541
A300	148	#4	STR	15'-7"	1541
A400	148	#4	STR	15'-7"	1541
B1	148	#4	STR	9'-3"	914
B2	296	#4	STR	7'-4"	1450
B3	148	#4	STR	9'-3"	914

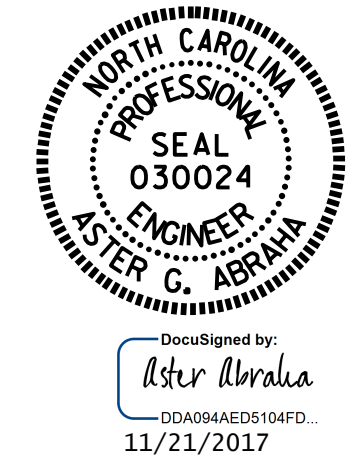
SPLICE CHART

BAR	SIZE	SPLICE LENGTH
A200	#4	1'-5"
A400	#4	1'-5"
B1	#4	1'-5"
B3	#4	1'-5"
C1	#4	1'-11"

C1	192	#4	STR	26'-0"	3335
E1	32	#5	STR	3'-8"	122
G1	8	#5	STR	15'-8"	131
REINFORCING STEEL				LBS.	14,776
CLASS A CONCRETE				BARRELS:	C.Y. 121.2

PROJECT NO. U-3334B
JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-

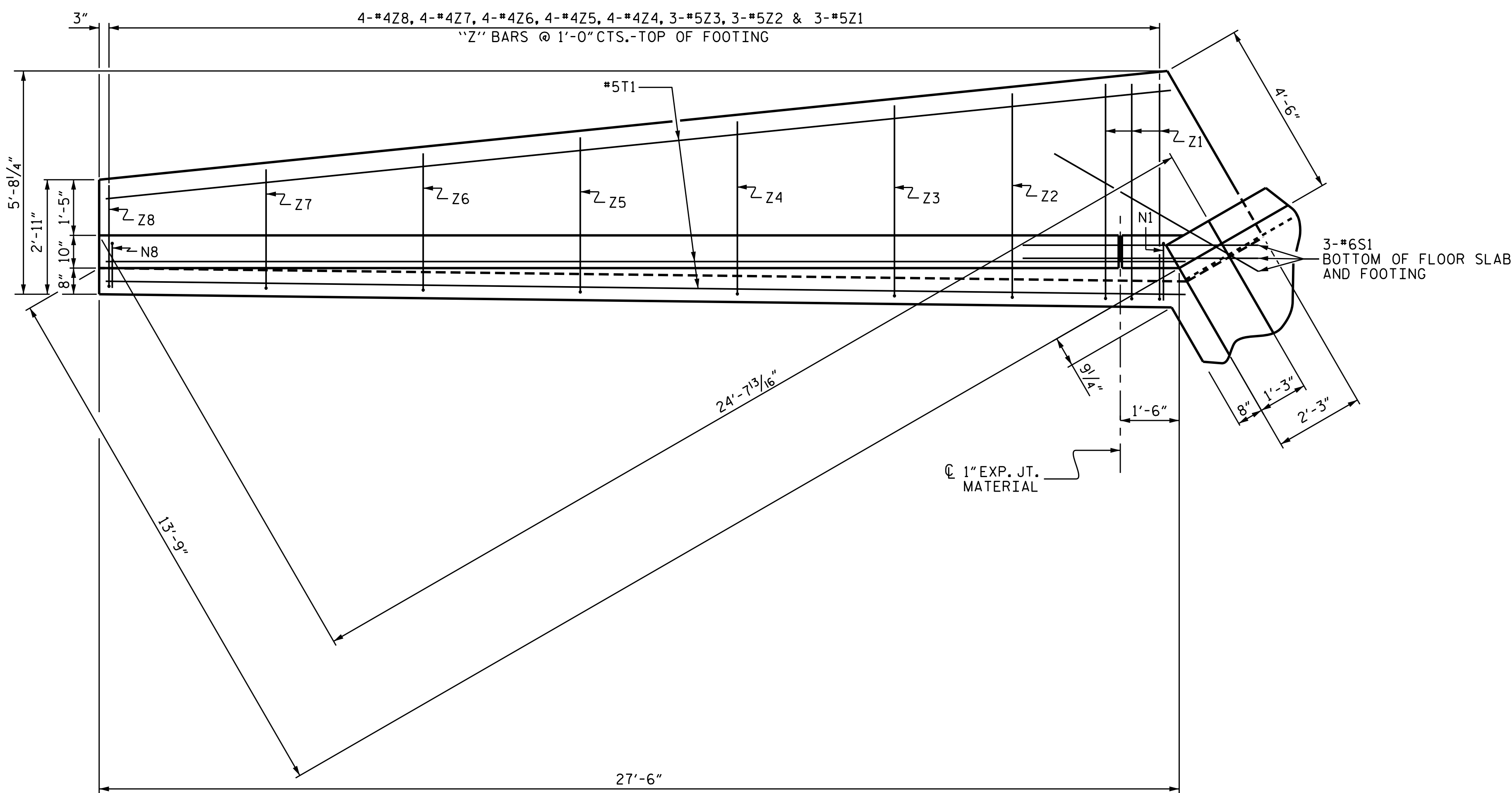
SHEET 4 OF 6



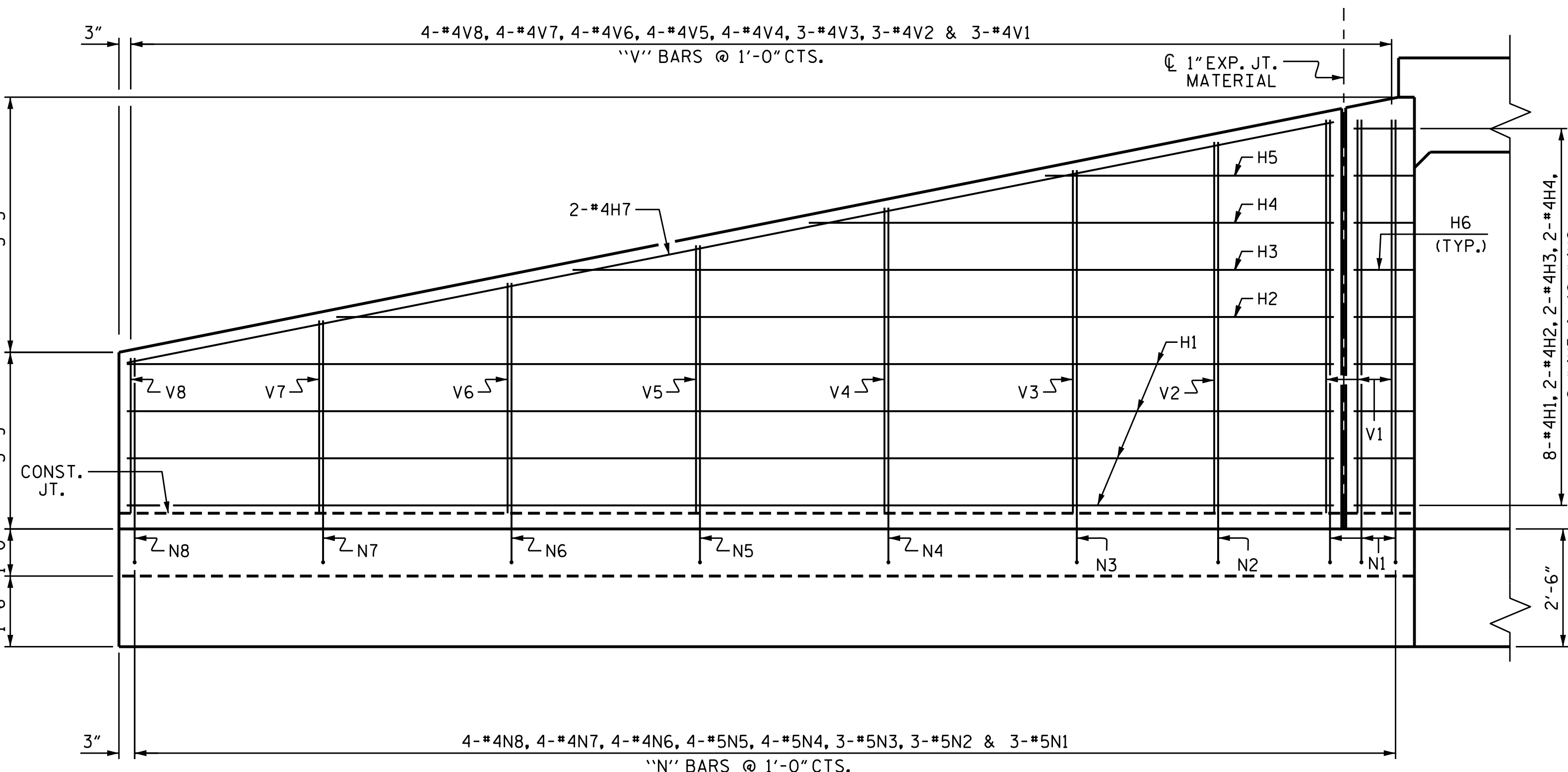
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BARREL STANDARD
DOUBLE 7 FT. X 8 FT.
CONCRETE BOX CULVERT
90° SKEW

NOVEMBER		REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				C2-4	
				TOTAL SHEETS 16	

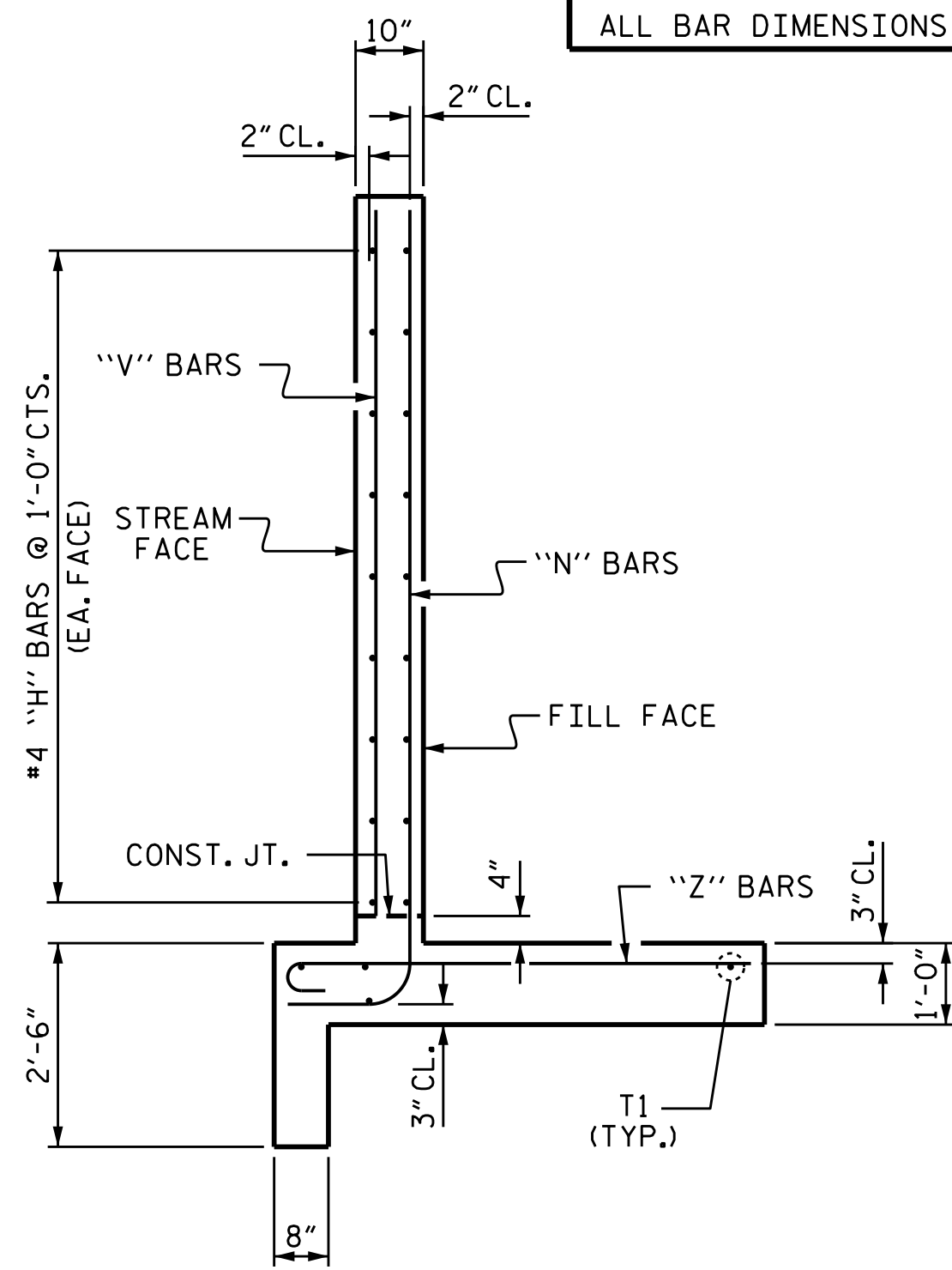
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



PLAN



ELEVATION



TYPICAL WING SECTION

BAR TYPES

Z1	5'-6"	7"
Z2	5'-3"	7"
Z3	4'-11"	7"
Z4	4'-5"	6"
Z5	4'-0"	6"
Z6	3'-6"	6"
Z7	3'-1"	6"
Z8	2'-7"	6"

ALL BAR DIMENSIONS ARE OUT TO OUT.

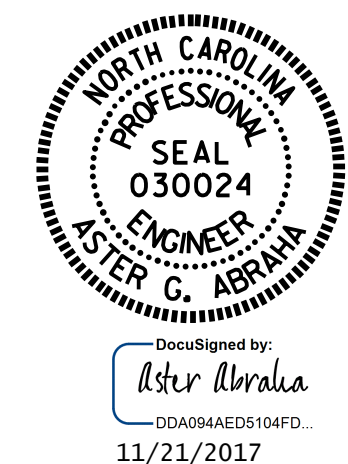
BILL OF MATERIAL FOR ONE TURNED BACK WING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	25'-7"	137
H2	2	#4	STR	21'-2"	28
H3	2	#4	STR	16'-2"	22
H4	2	#4	STR	11'-2"	15
H5	2	#4	STR	6'-2"	8
H6	18	#4	1	3'-3"	39
H7	2	#4	STR	26'-1"	35
N1	3	#5	2	10'-5"	33
N2	3	#5	2	9'-11"	31
N3	3	#5	2	9'-4"	29
N4	4	#5	2	8'-6"	35
N5	4	#5	2	7'-9"	32
N6	4	#4	2	6'-10"	18
N7	4	#4	2	6'-1"	16
N8	4	#4	2	5'-4"	14
S1	3	#6	STR	6'-0"	27
T1	3	#5	STR	27'-6"	86
V1	3	#4	STR	8'-4"	17
V2	3	#4	STR	7'-10"	16
V3	3	#4	STR	7'-3"	15
V4	4	#4	STR	6'-5"	17
V5	4	#4	STR	5'-8"	15
V6	4	#4	STR	4'-10"	13
V7	4	#4	STR	4'-1"	11
V8	4	#4	STR	3'-3"	9
Z1	3	#5	3	6'-1"	19
Z2	3	#5	3	5'-10"	18
Z3	3	#5	3	5'-6"	17
Z4	4	#4	3	4'-11"	13
Z5	4	#4	3	4'-6"	12
Z6	4	#4	3	4'-0"	11
Z7	4	#4	3	3'-7"	10
Z8	4	#4	3	3'-1"	8

REINFORCING STEEL FOR 1 TURNED BACK WING 826 LBS
 CLASS A CONCRETE FOR 1 TURNED BACK WING 9.6 CY

PROJECT NO. U-3334B
 JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-

SHEET 5 OF 6

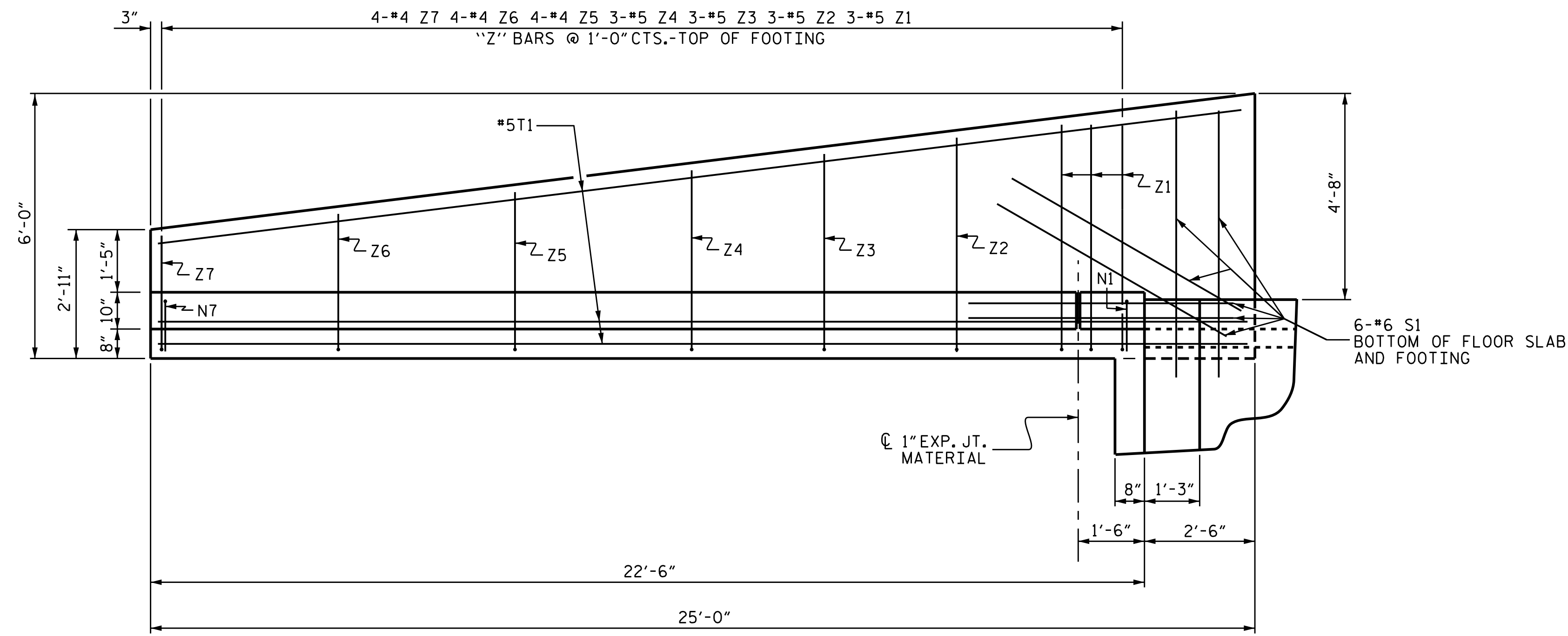


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
TURNED BACK WING FOR CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 4:1
 90° SKEW

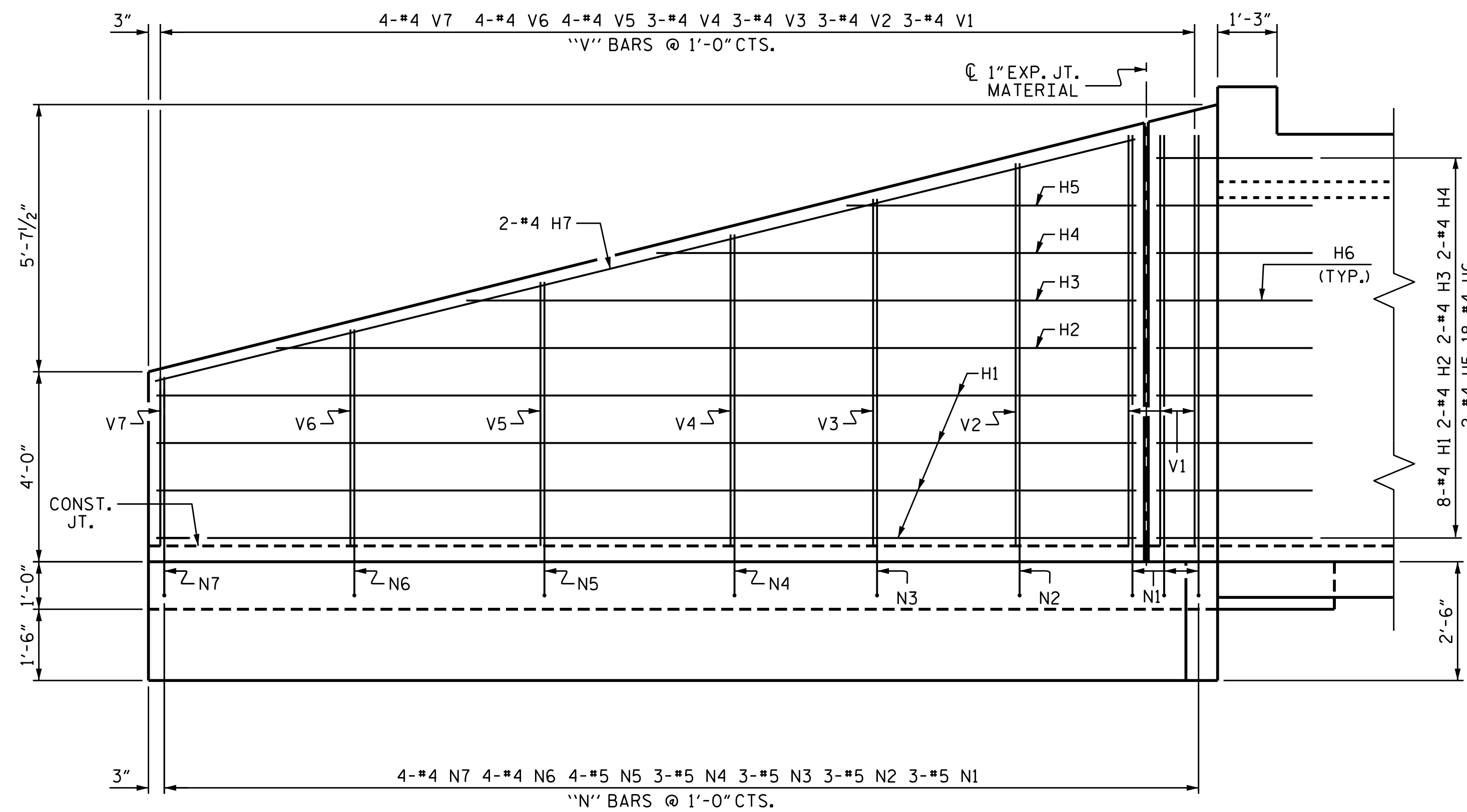
DRAWN BY: M.M. AHMED DATE: 8/25/17
 CHECKED BY: S. WANCE DATE: 09/17
 DESIGN ENGINEER OF RECORD: M.M. AHMED DATE: 8/4/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

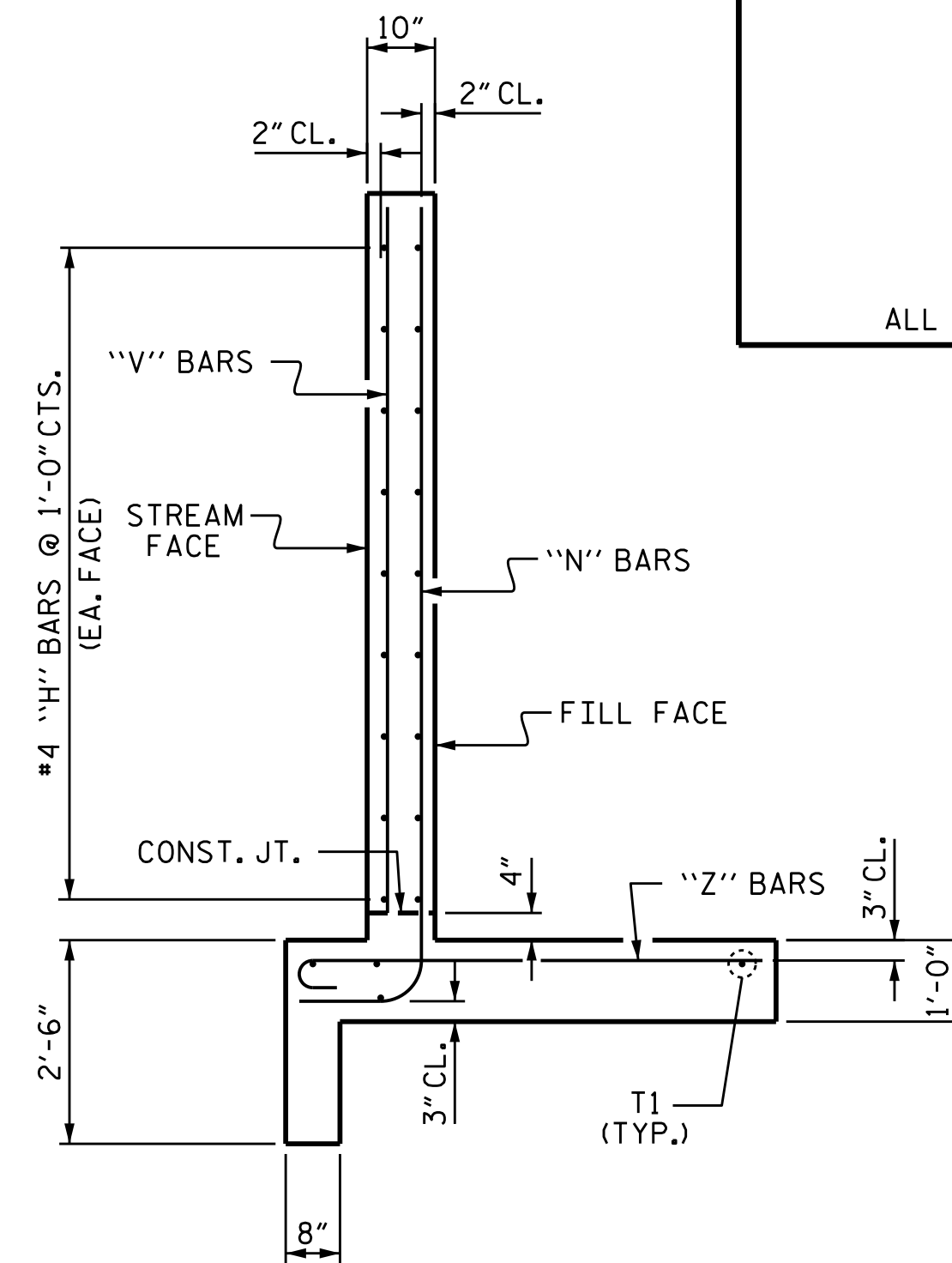
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-5
1			3			TOTAL SHEETS
2			4			16



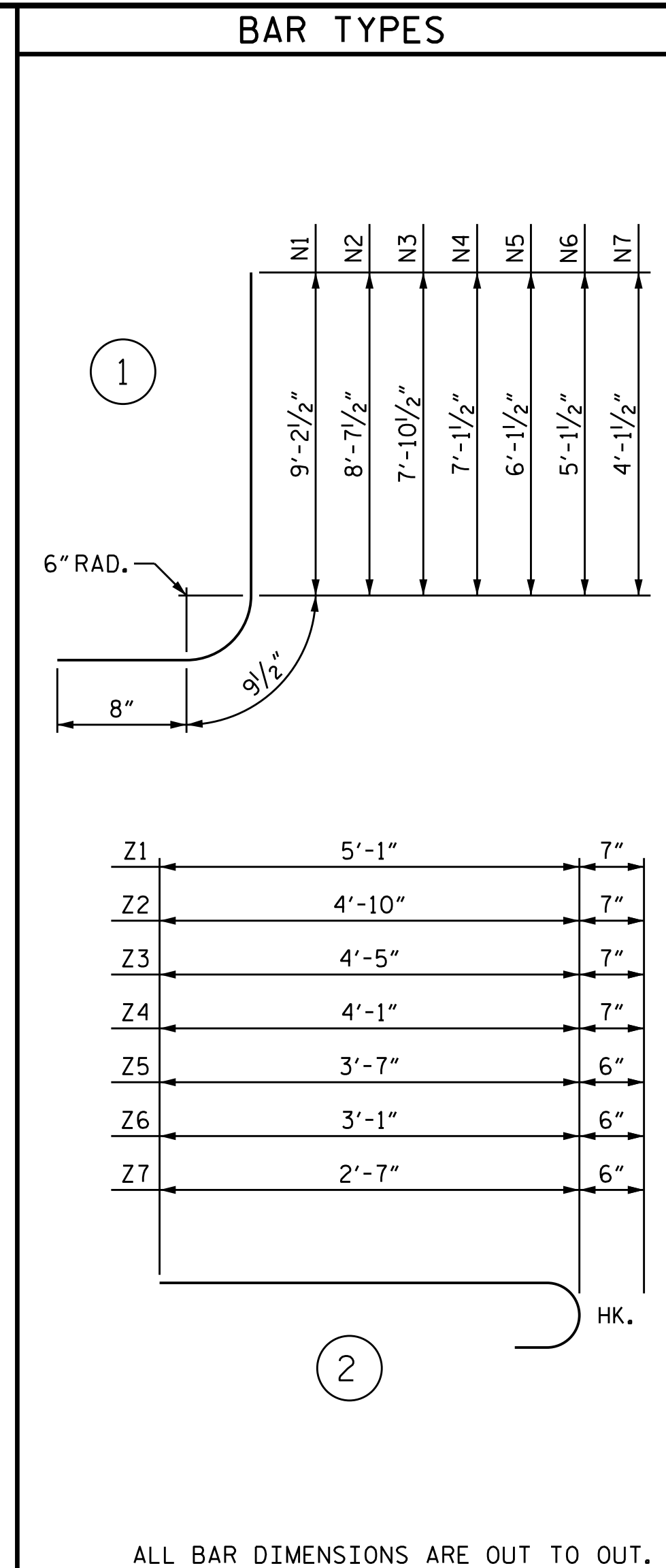
PLAN



ELEVATION



TYPICAL WING SECTION



BILL OF MATERIAL FOR ONE WING (THREE REQUIRED)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	20'-7"	110
H2	2	#4	STR	18'-1"	24
H3	2	#4	STR	14'-1"	19
H4	2	#4	STR	10'-1"	13
H5	2	#4	STR	6'-1"	8
H6	18	#4	STR	3'-3"	39
H7	2	#4	STR	21'-3"	28
N1	3	#5	1	10'-8"	33
N2	3	#5	1	10'-1"	32
N3	3	#5	1	9'-4"	29
N4	3	#5	1	8'-7"	27
N5	4	#5	1	7'-7"	32
N6	4	#4	1	6'-7"	18
N7	4	#4	1	5'-7"	15
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	24'-8"	77
V1	3	#4	STR	8'-7"	17
V2	3	#4	STR	8'-0"	16
V3	3	#4	STR	7'-3"	15
V4	3	#4	STR	6'-6"	13
V5	4	#4	STR	5'-6"	15
V6	4	#4	STR	4'-6"	12
V7	4	#4	STR	3'-6"	9
Z1	3	#5	2	5'-8"	18
Z2	3	#5	2	5'-5"	17
Z3	3	#5	2	5'-0"	16
Z4	3	#5	2	4'-8"	15
Z5	4	#4	2	4'-1"	11
Z6	4	#4	2	3'-7"	10
Z7	4	#4	2	3'-1"	8
REINFORCING STEEL FOR 1 WING (3 REQUIRED)					750 LBS
CLASS A CONCRETE FOR 1 WING (3 REQUIRED)					9.6 CY
2 HEADWALL					1.5 CY
2 END CURTAIN WALL					1.8 CY

ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-3334B
 JOHNSTON COUNTY
 STATION: 11+51.56 -DRW1-
 SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 INLET & LEFT OUTLET
 WINGS FOR
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 4:1
 90° SKEW



DRAWN BY : S.WANCE DATE : 09/26/17
 CHECKED BY : M.M. AHMED DATE : 10/6/17
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 8/4/17

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-6
1			3			TOTAL SHEETS
2			4			16

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 $\frac{3}{16}$ " 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. 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.

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