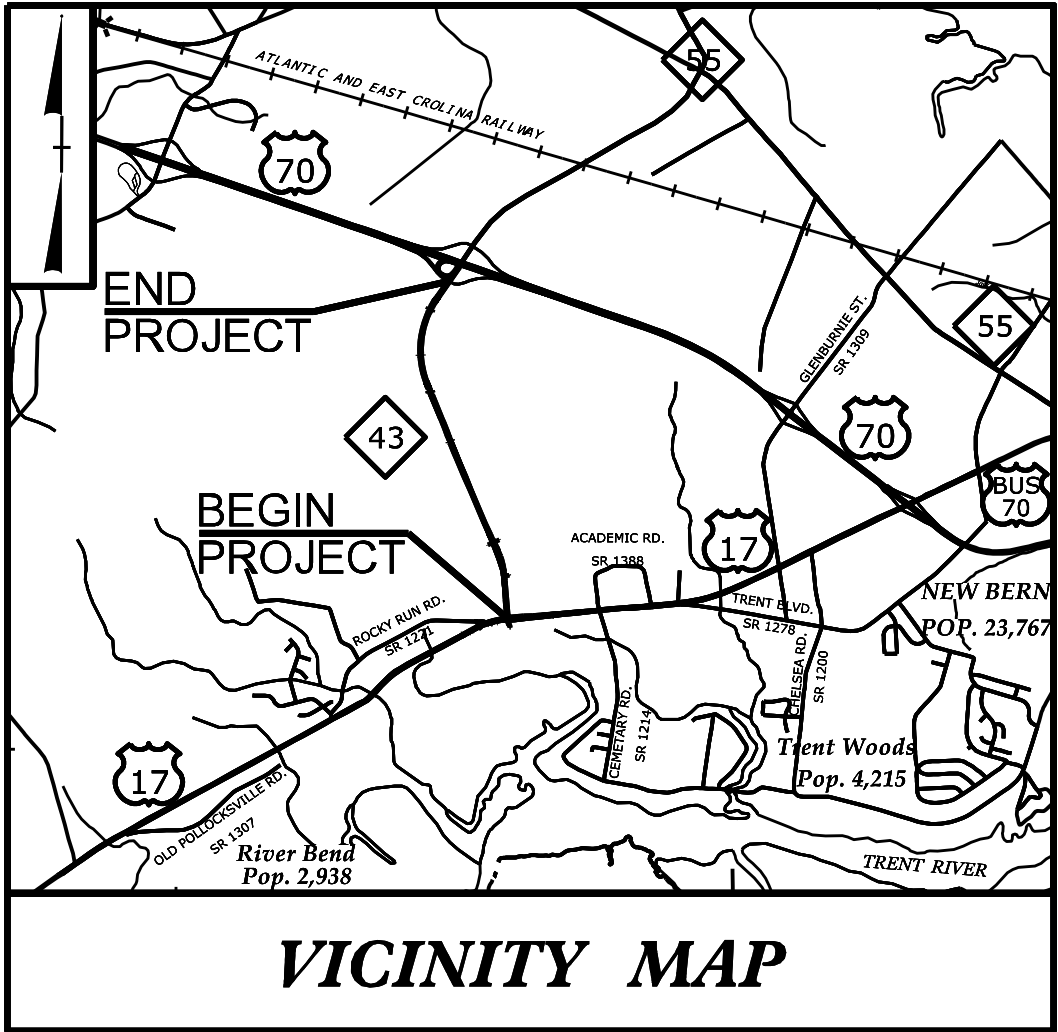


TIP PROJECT: R-4463A

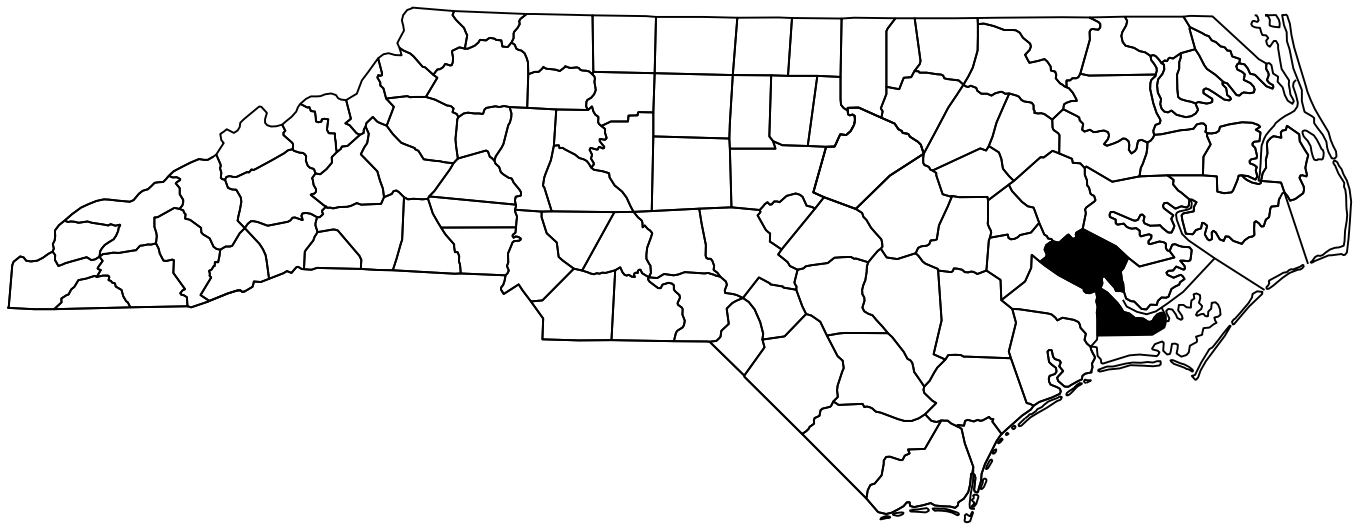
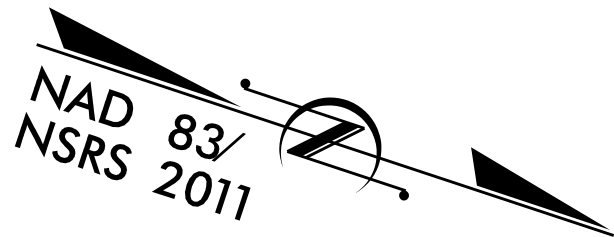
CONTRACT: C204421



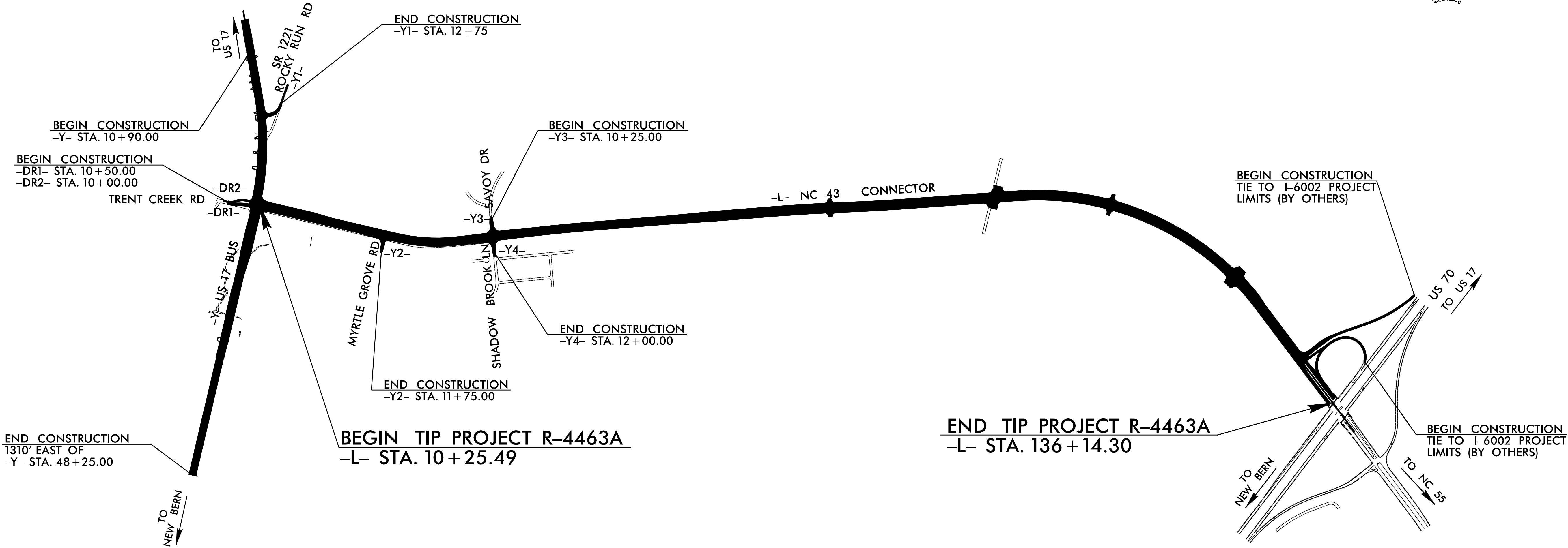
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CRAVEN COUNTY

LOCATION: NC 43 CONNECTOR FROM
US 17 BUSINESS TO US 70

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4463A		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35601.1.R2		PE	
35601.2.1		ROW	
35601.2.4		UTIL	
35601.3.4		CONSTRUCTION	



STRUCTURES

DESIGN DATA	
ADT 2025 =	25,300
ADT 2050 =	47,100
K =	10 %
D =	55 %
T =	6 % *
V =	60 MPH
(* TTST 4% + DUAL 2%)	
FUNC CLASS =	
ARTERIAL	
STATEWIDE TIER	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT R-4463A	= 2.384 MILES
TOTAL LENGTH TIP PROJECT R-4463A	= 2.384 MILES

NCDOT CONTACT: CATHRINE HOSSACK MEYER, PE
DIVISION 2 - PROJECT ENGINEER

Prepared for the
North Carolina Department
of Transportation
in the office of:

2024 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 15, 2025

HR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

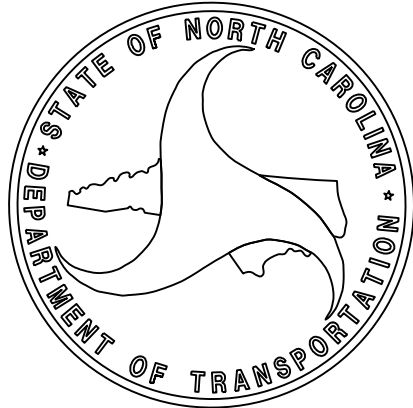
ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

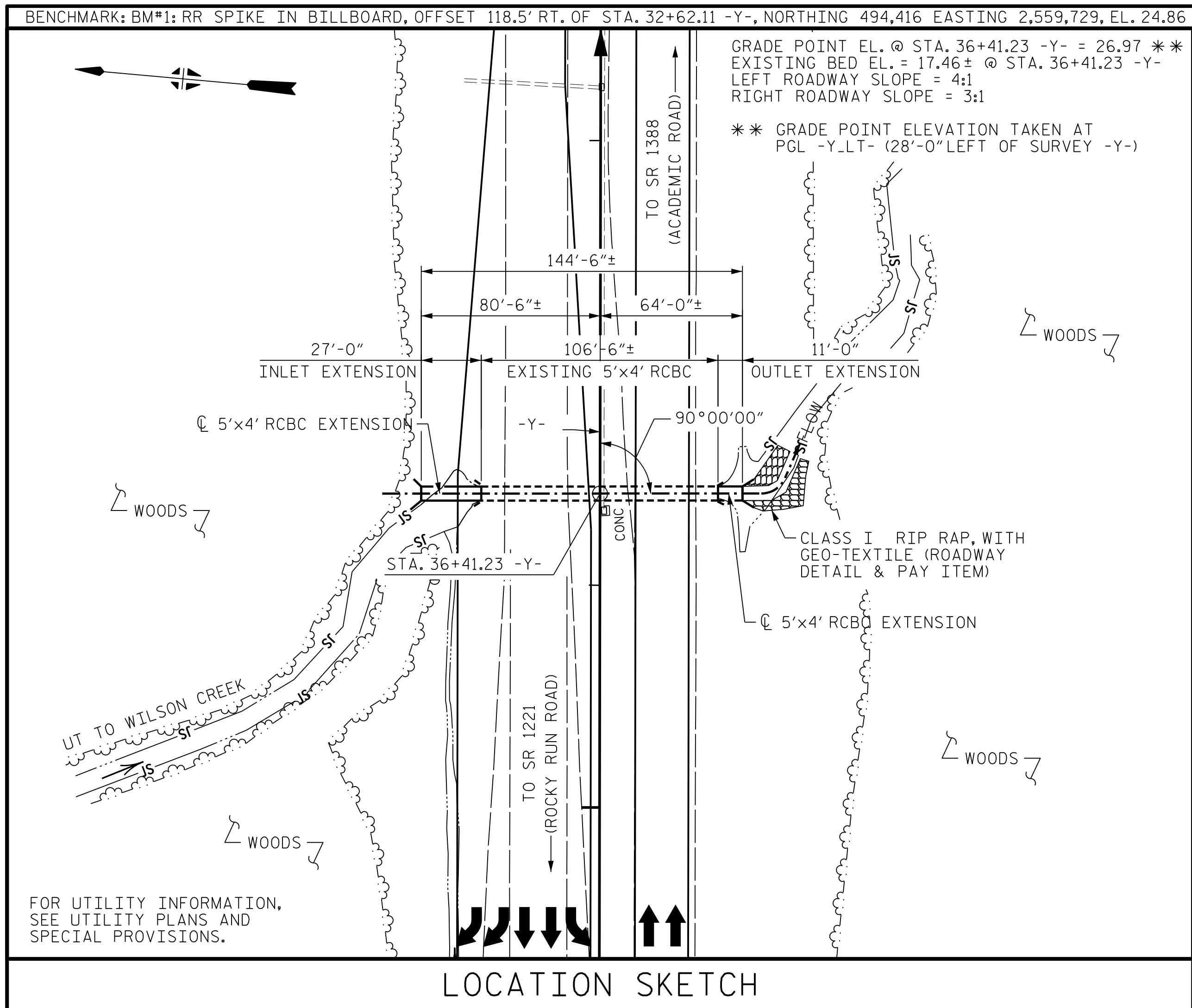
STRUCTURES ENGINEER

SEAL
045418
ENGINEER
DUPRELL J. MIST
6/11/2025
P.E.

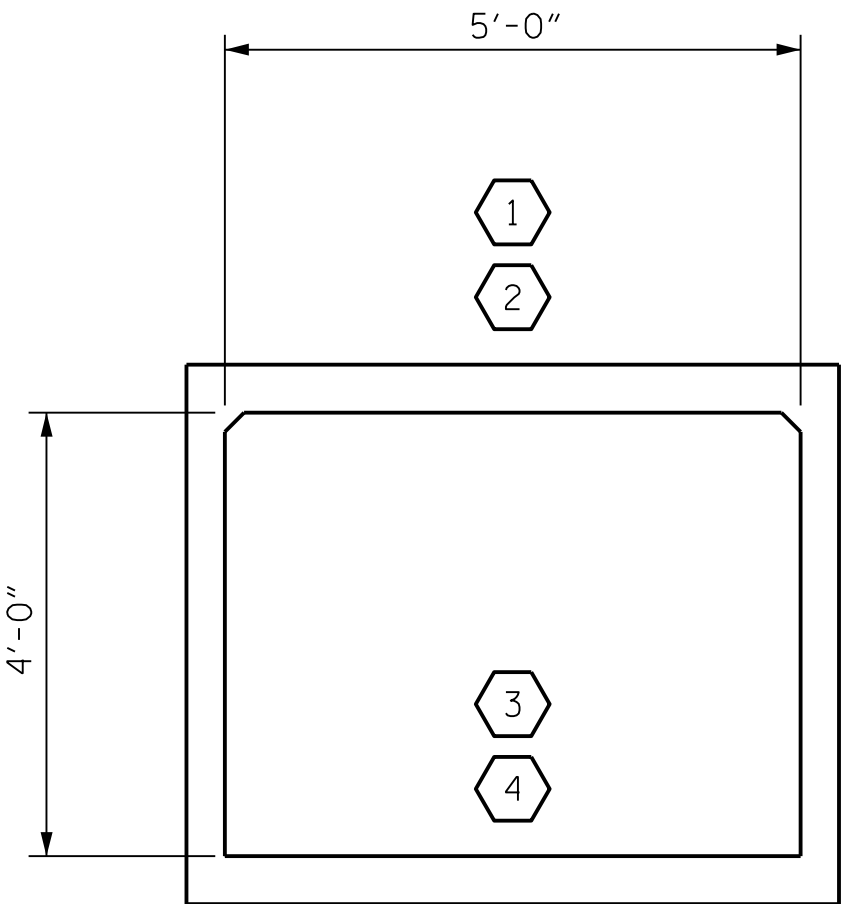
SIGNATURE: _____

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT				SHEAR				
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.63	--	1.75	1.63	1	TOP SLAB	3.17	2.58	1	BOTTOM SLAB	1.27	-
	HL-93 (OPERATING)	N/A		2.11	--	1.35	2.11	1	TOP SLAB	3.17	3.34	1	BOTTOM SLAB	1.27	-
	HS-20 (INVENTORY)	36.000	2	1.63	58.7	1.75	1.63	1	TOP SLAB	3.17	2.83	1	TOP SLAB	1.33	-
	HS-20 (OPERATING)	36.000		2.12	76.3	1.35	2.12	1	TOP SLAB	3.17	3.66	1	TOP SLAB	1.33	-
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		2.97	40.1	1.40	2.97	1	TOP SLAB	3.17	5.14	1	TOP SLAB	1.33	-
		SNGARBS2		2.78	55.6	1.40	2.78	1	TOP SLAB	3.17	4.81	1	TOP SLAB	1.33	-
		SNAGRIS2		2.97	65.3	1.40	2.97	1	TOP SLAB	3.17	5.14	1	TOP SLAB	1.33	-
		SNCOTTS3	3	2.14	58.3	1.40	2.14	1	BOTTOM SLAB	3.17	3.22	1	BOTTOM SLAB	1.27	-
		SNAGGRS4		2.81	98.1	1.40	2.81	1	BOTTOM SLAB	3.17	4.24	1	BOTTOM SLAB	1.27	-
		SNS5A		2.55	90.7	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		SNS6A		2.55	101.9	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		SNS7B		2.55	107.1	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3		2.97	98.0	1.40	2.97	1	TOP SLAB	3.17	5.14	1	TOP SLAB	1.33	-
		TNT4A		2.55	84.3	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		TNT6A		2.55	106.1	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		TNT7A		2.55	107.1	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		TNT7B		2.55	107.1	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		TNAGRIT4		2.55	109.7	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
		TNAGT5A		2.55	114.8	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-
TNAGT5B		2.55	114.8	1.40	2.55	1	BOTTOM SLAB	3.17	3.84	1	BOTTOM SLAB	1.27	-		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.10	60.4	1.30	2.10	1	TOP SLAB	3.17	3.63	1	TOP SLAB	1.33	-
	EV3	43.000	4	1.86	80.0	1.30	1.86	1	BOTTOM SLAB	3.17	2.80	1	BOTTOM SLAB	1.27	-



LRFR SUMMARY
(LOOKING DOWNSTREAM)

DES BY: R. BEAUCHAMP	DATE : 05/24	DWG BY: D. CHAPMAN	DATE : 05/24
DES CHK: D. MAST	DATE : 05/24	CHK BY: D. MAST	DATE : 05/24

HDR Engineering, Inc. of the Carolinas

555 Fayetteville St., Suite 900 Raleigh, N.C. 27601

N.C.B.E.L.S. License Number: F-0116

NORTH CAROLINA

PROFESSIONAL SEAL

045418

ENGINEER

DARRELL J. MAST

5/27/2025

Darrell J. Mast

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.
RATING FACTORS ARE FOR NON-INTERSTATE TRAFFIC

COMMENTS:

-
-
-
-

⬡ CONTROLLING LOAD RATING

⬡1 DESIGN LOAD RATING (HL-93)

⬡2 DESIGN LOAD RATING (HS-20)

⬡3 LEGAL LOAD RATING **

⬡4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 36+41.23 -Y-

SHEET 2 OF 6

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SINGLE BARREL

5 FT. X 4 FT.

CONCRETE BOX CULVERT

EXTENSIONS

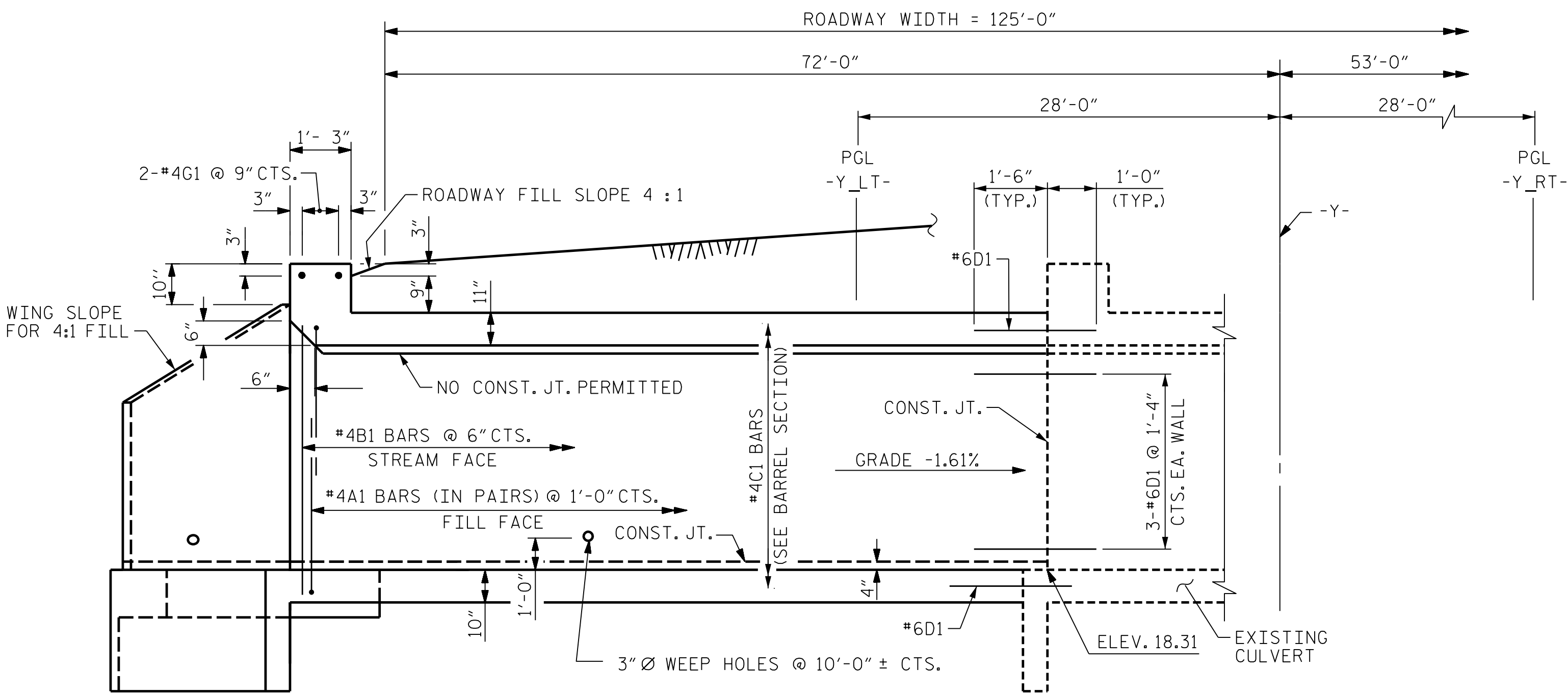
90° SKEW

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

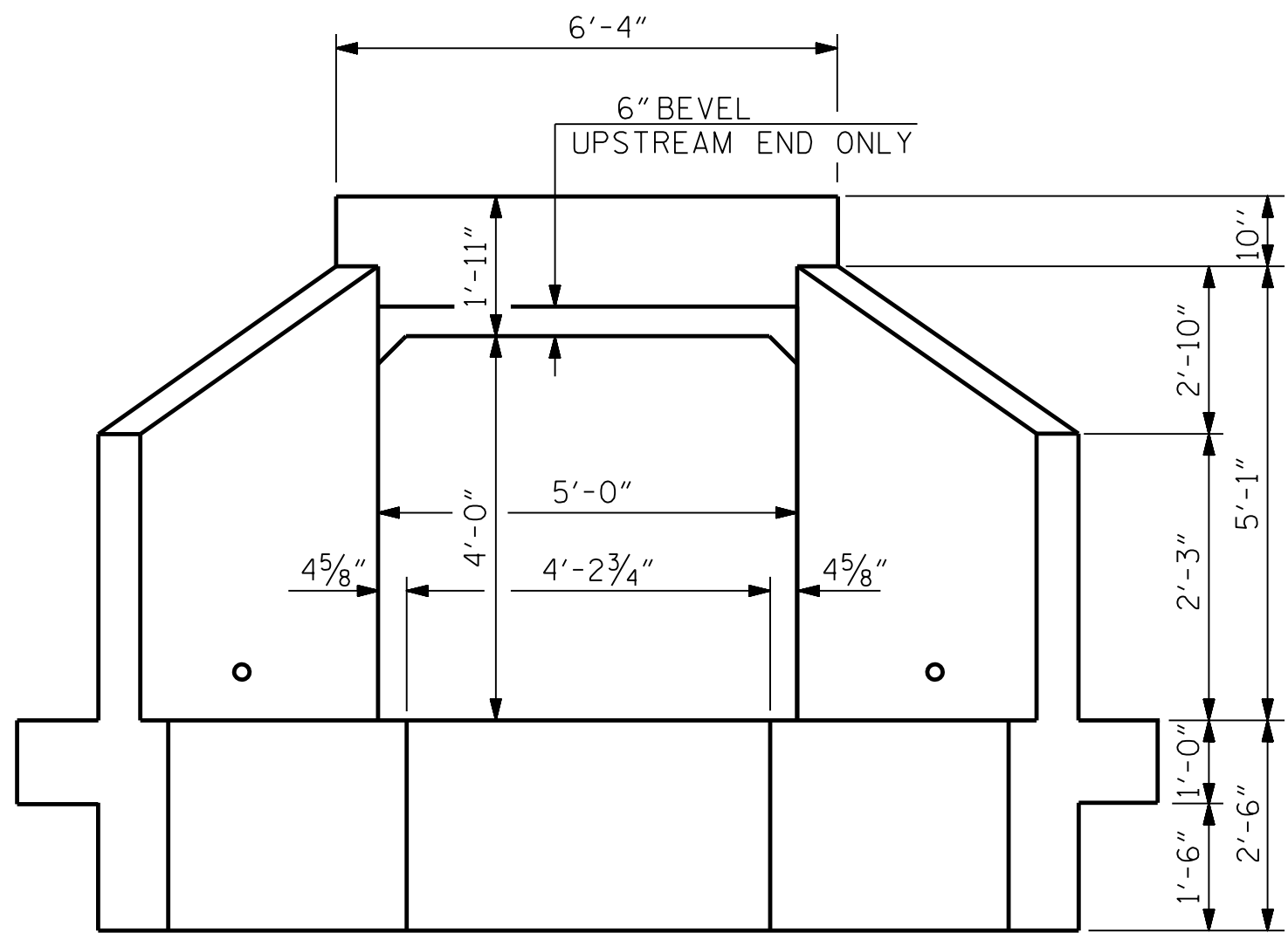
TOTAL SHEETS 6

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: NC00T_STRUCTURES_DEFAULT_PLOTTER.plt
PENTABLE: NC00T_STRUCTURES_DEFAULT_PEN.tbl
USER: MSELLS
DATE: 5/23/2025
FILE: ...\\410_007_R4463A_SMU_CU_004.dgn

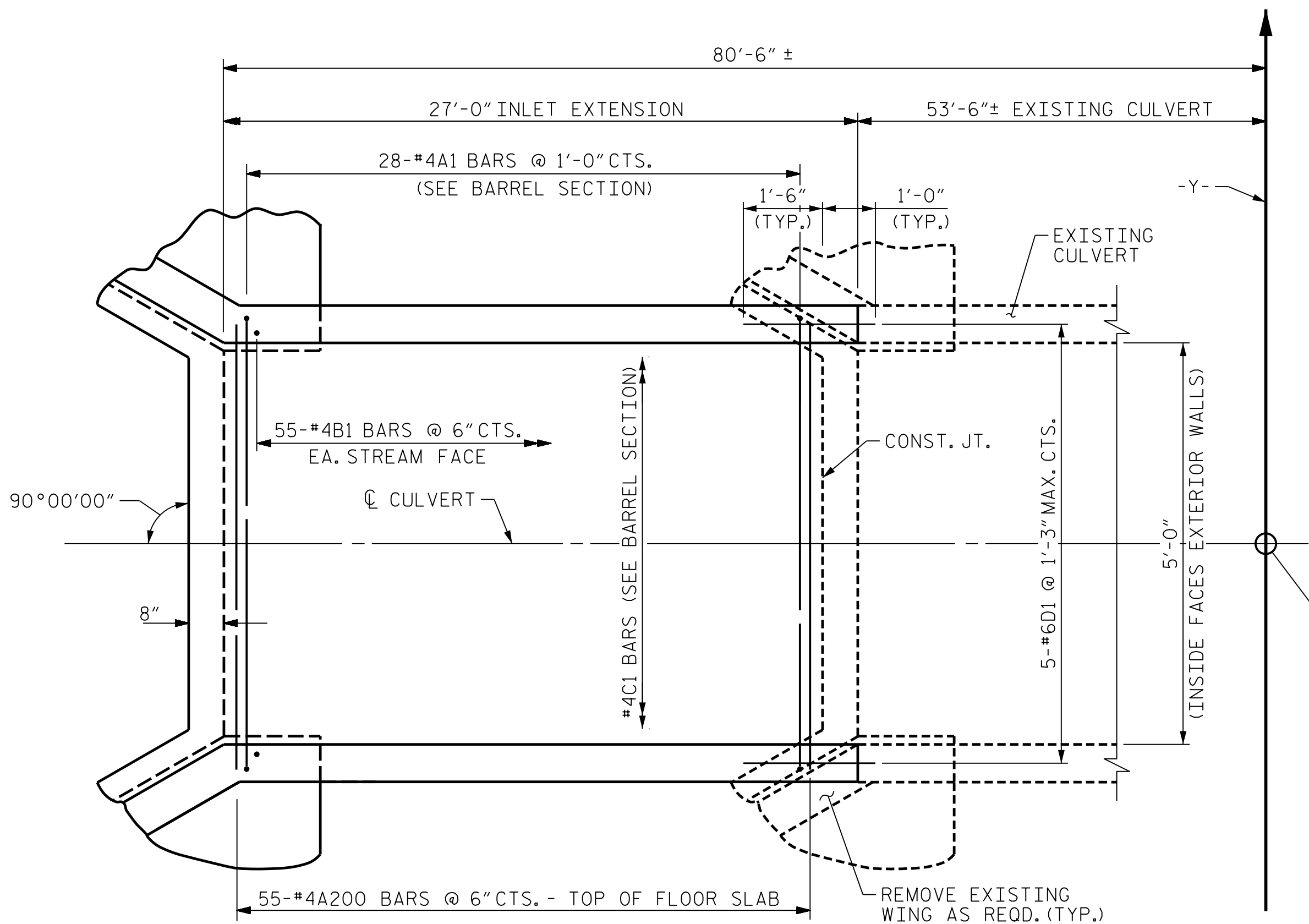


CULVERT SECTION NORMAL TO ROADWAY
(INLET EXTENSION)

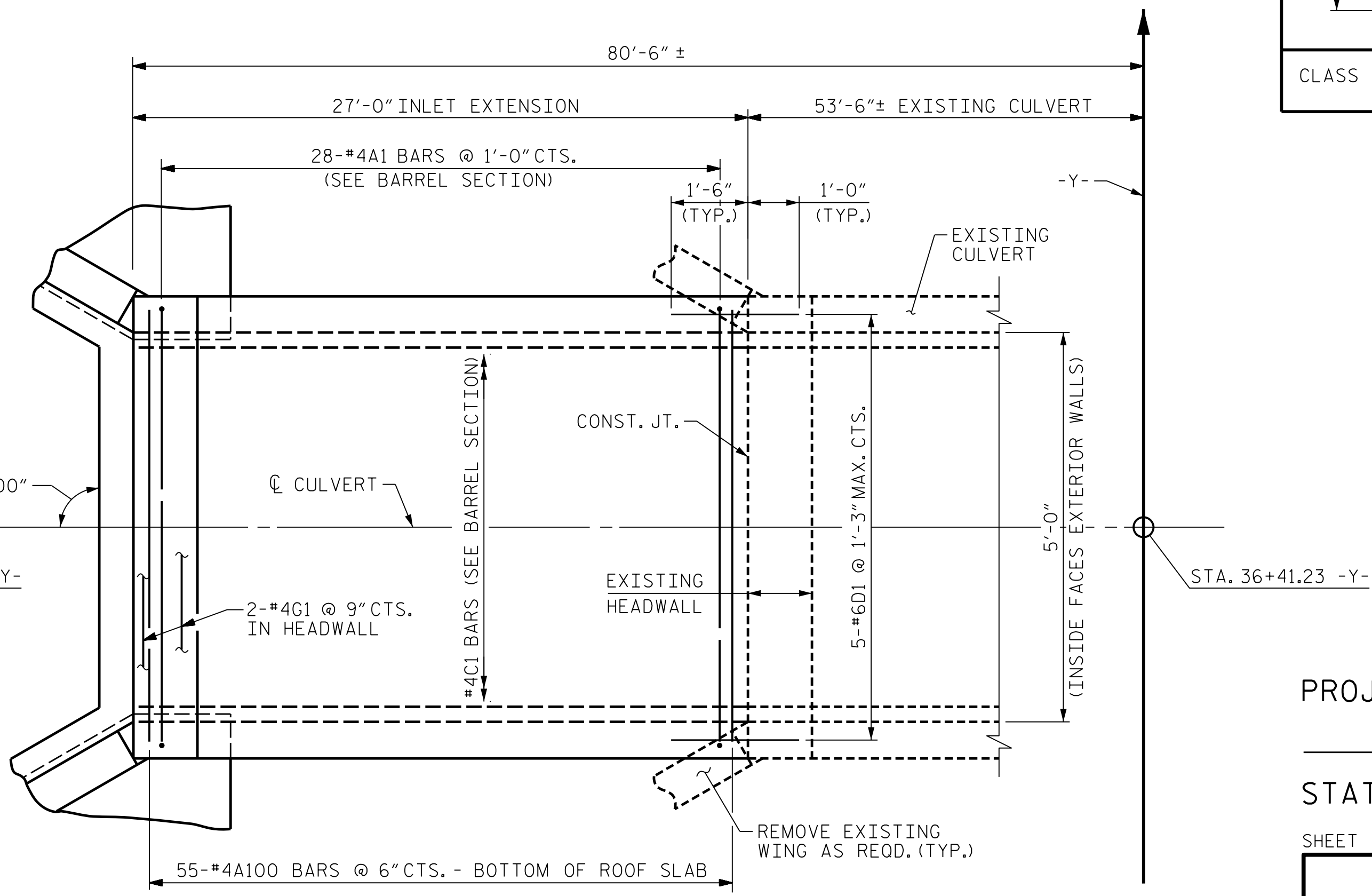


END ELEVATION
(TYPICAL FOR INLET AND OUTLET ENDS)

REINFORCING STEEL BAR SCHEDULE - INLET BARREL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	56	#4	4	12'-9"	477
A100	55	#4	STR	6'-0"	220
A200	55	#4	STR	6'-0"	220
B1	110	#4	STR	5'-4"	392
C1	28	#4	STR	26'-8"	499
D1	16	#6	STR	2'-6"	60
G1	2	#4	STR	6'-0"	8
REINFORCING STEEL					LBS. 1,876
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					
CLASS A CONCRETE BARREL @ 0.612 CY/FT 16.5 CY					



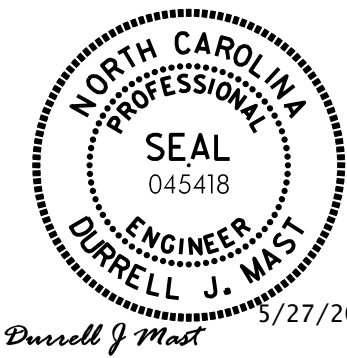
PLAN - FLOOR SLAB
(INLET EXTENSION)



PLAN - ROOF SLAB
(INLET EXTENSION)

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 36+41.23 -Y-

SHEET 3 OF 6

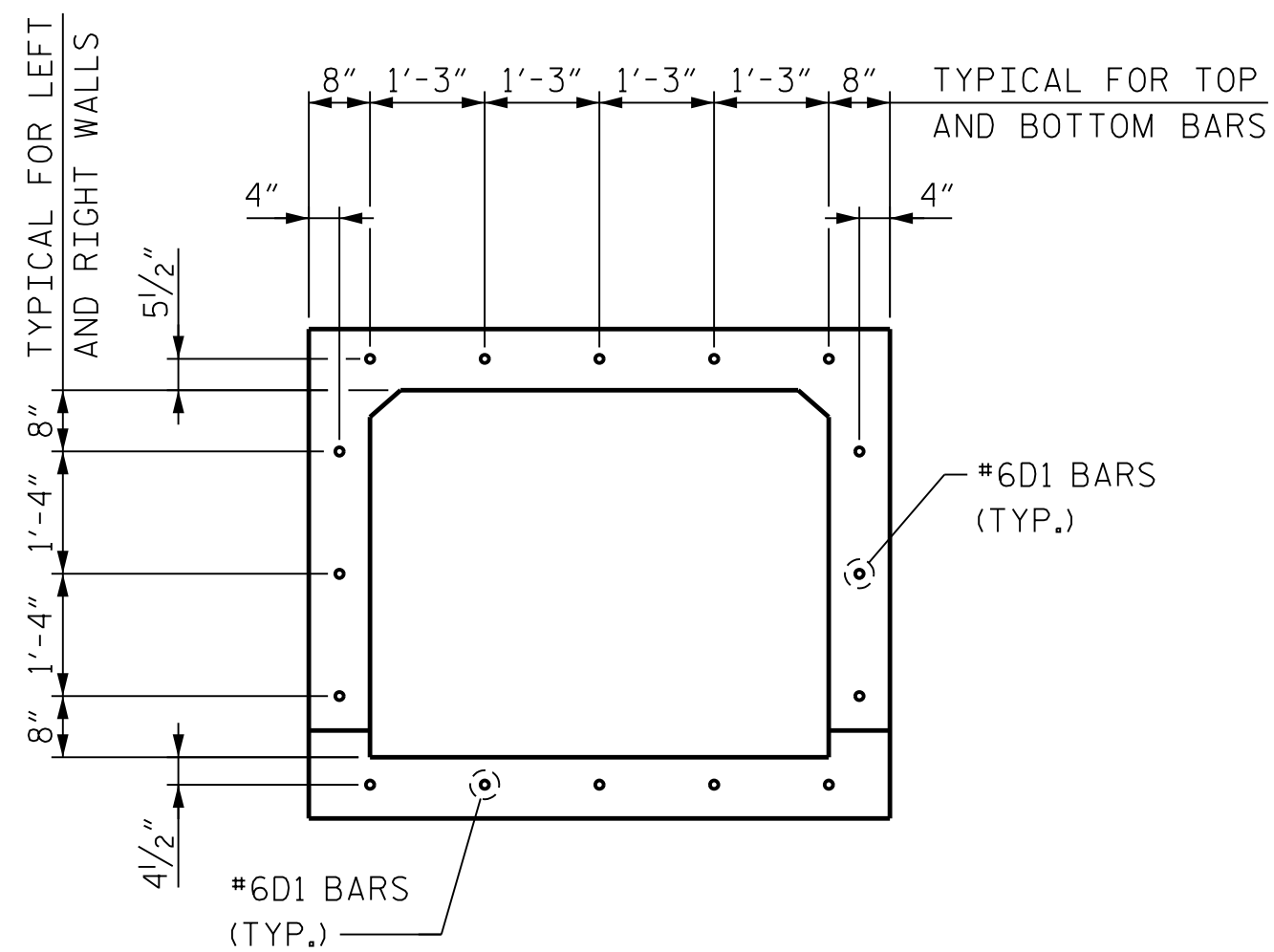


DES BY: R. BEAUCHAMP	DATE: 05/24	DWG BY: D. CHAPMAN	DATE: 05/24
DES CHK: D. MAST	DATE: 05/24	CHK BY: D. MAST	DATE: 05/24

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555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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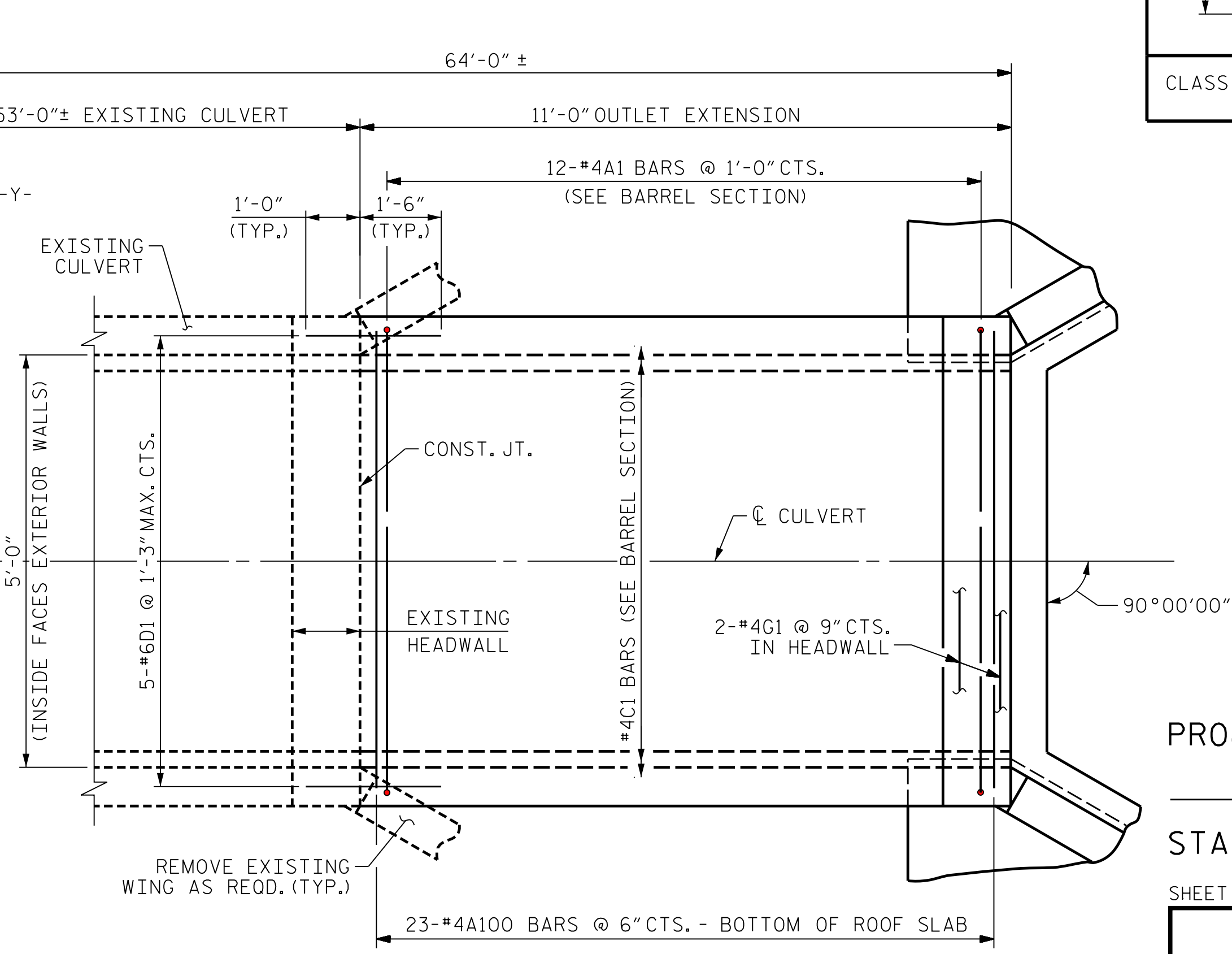
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--
SHEET NO. C1-3 TOTAL SHEETS 6					



DOWEL PLACEMENT DETAIL

(TYPICAL FOR INLET AND OUTLET ENDS)



PLAN - ROOF SLAB
(OUTLET EXTENSION)

REINFORCING STEEL LBS. 820

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

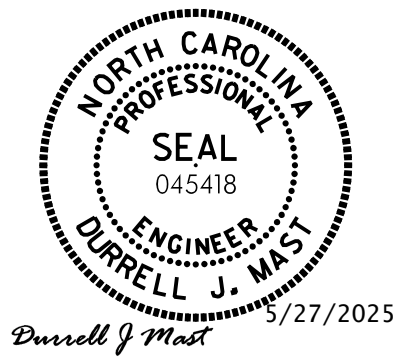
Diagram illustrating the dimensions for a U-shaped reinforcing bar (Bar Type 4). The dimensions are:

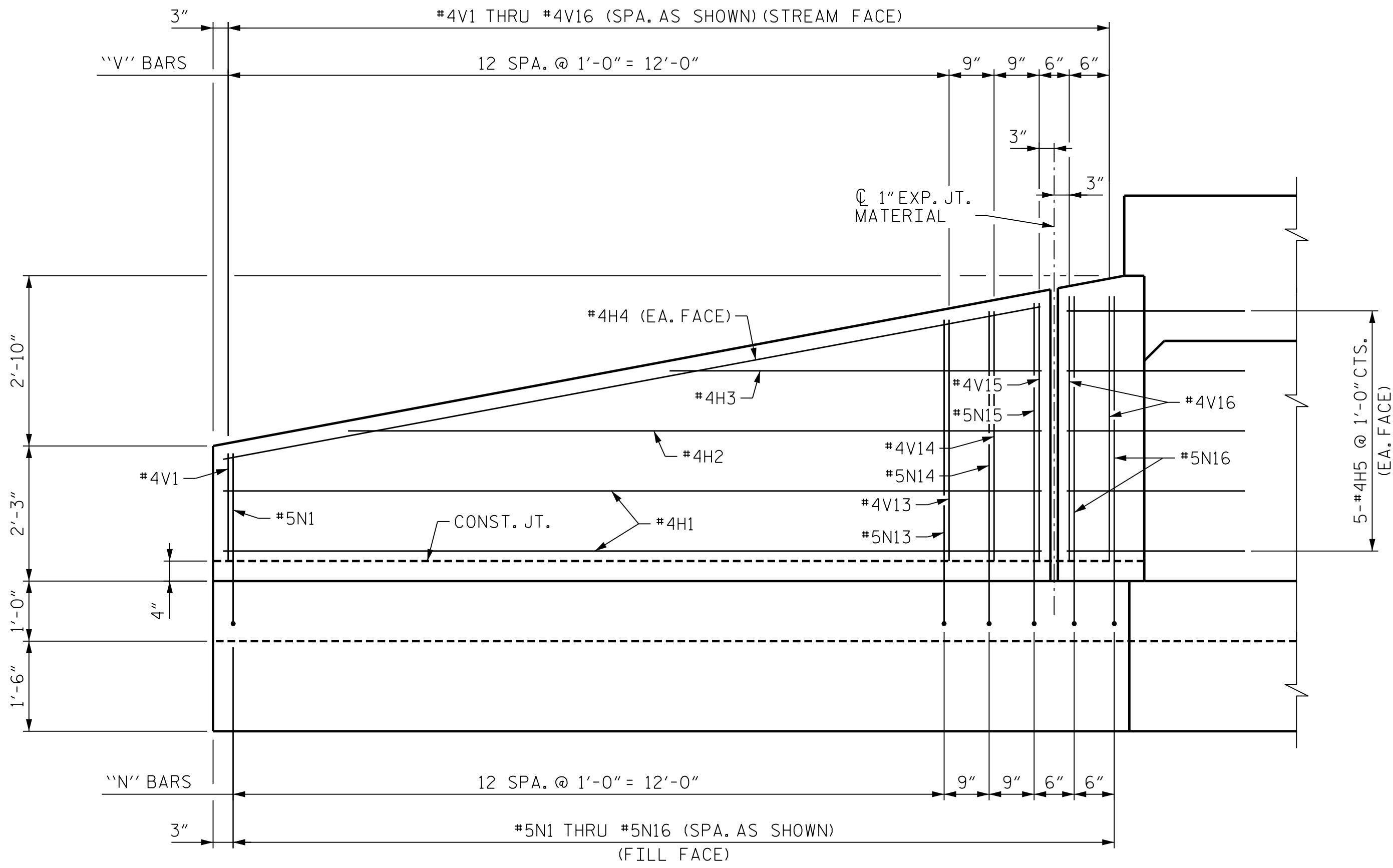
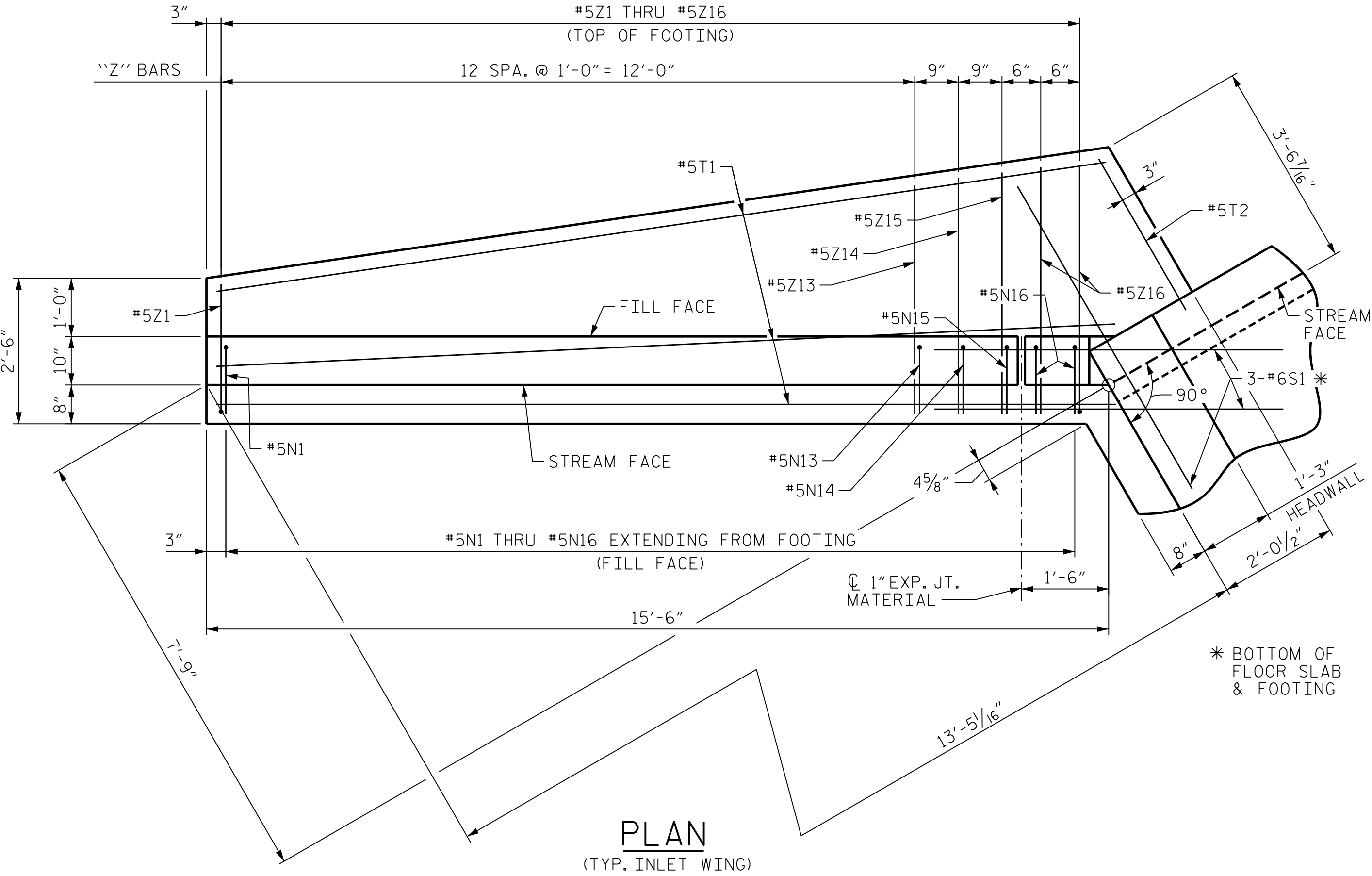
- Horizontal length: 5'-0"
- Vertical height: 3'-1"
- Hook length: 9 1/2"
- Fillet radius: 6" RAD.
- Callout (4) points to the vertical leg.

VERTICAL LEG

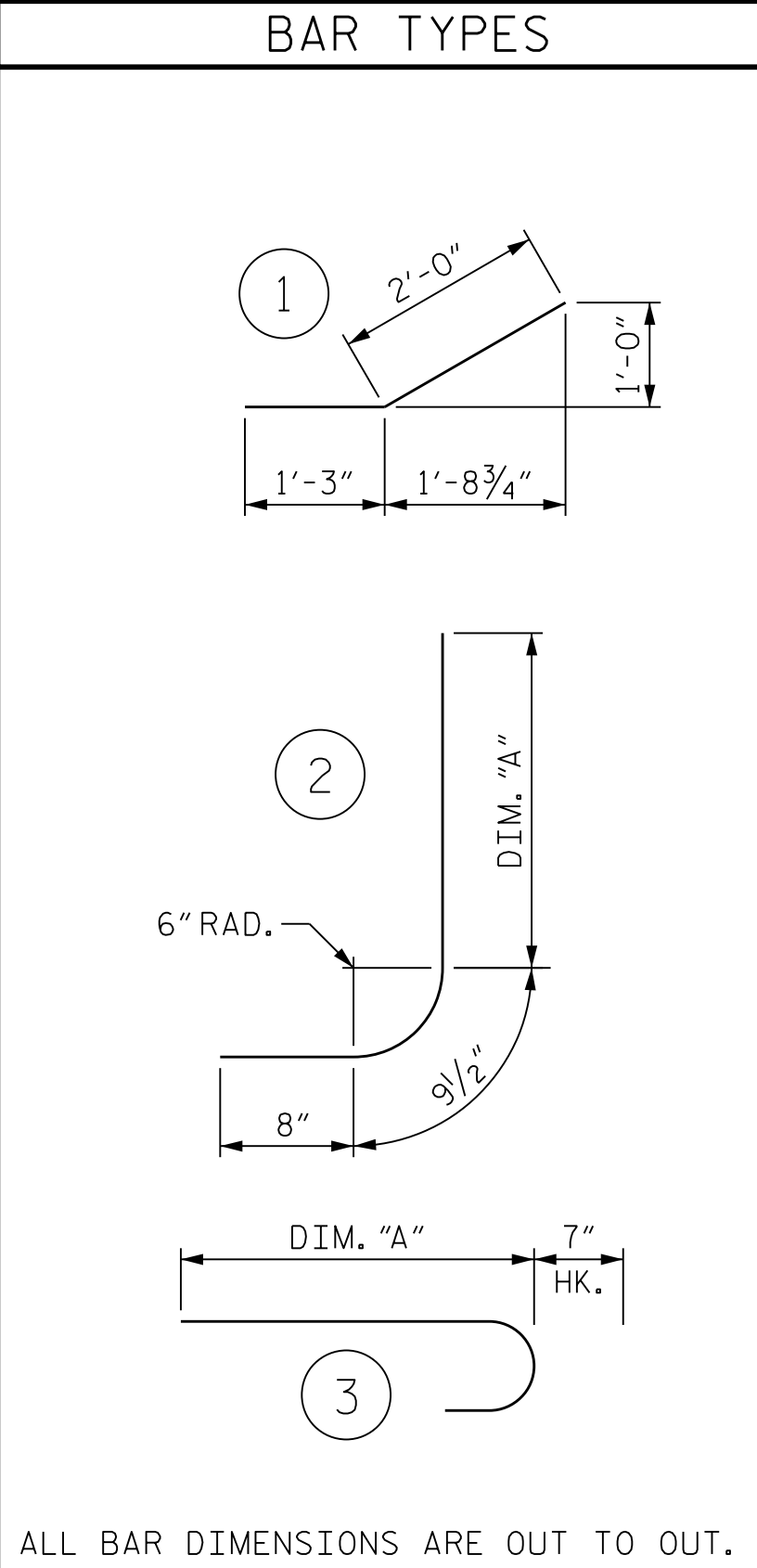
SHEET 4 OF 6

REVISIONS						SHEET NO. C1-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 6
2	--	--	4	--	--	

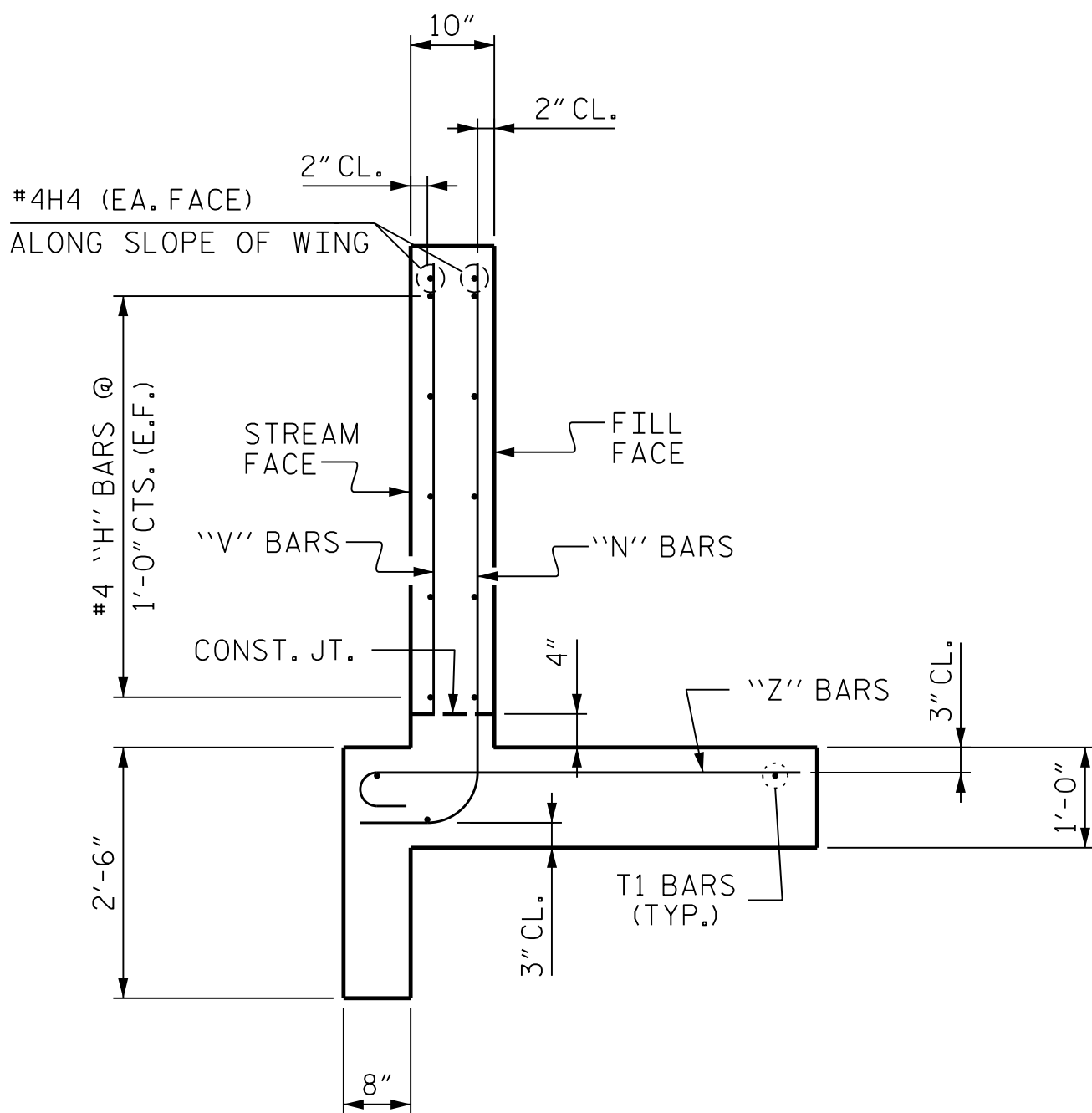




ELEVATION
(TYP. INLET WING)



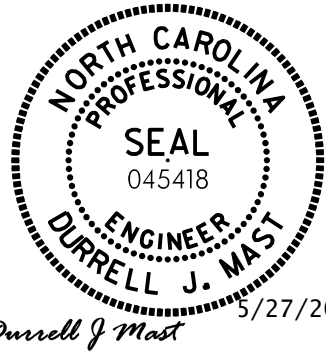
BILL OF MATERIAL - INLET WINGS													
MARK	NO.	SIZE	TYPE	DIM "A"	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	DIM "A"	LENGTH	WEIGHT
H1	8	#4	STR	--	13'-8"	73	V1	2	# 4	STR	--	1'-7"	2
H2	4	#4	STR	--	11'-5"	31	V2	2	# 4	STR	--	1'-9"	2
H3	4	#4	STR	--	5'-11"	16	V3	2	# 4	STR	--	1'-11"	3
H4	4	#4	STR	--	13'-10"	37	V4	2	# 4	STR	--	2'-2"	3
H5	20	#4	1	--	3'-3"	43	V5	2	# 4	STR	--	2'-4"	3
							V6	2	# 4	STR	--	2'-6"	3
							V7	2	# 4	STR	--	2'-8"	4
N1	2	#5	2	2'-3 1/2"	3'-9"	8	V8	2	# 4	STR	--	2'-10"	4
N2	2	#5	2	2'-6 1/2"	4'-0"	8	V9	2	# 4	STR	--	3'-1"	4
N3	2	#5	2	2'-8 1/2"	4'-2"	9	V10	2	# 4	STR	--	3'-3"	4
N4	2	#5	2	2'-10 1/2"	4'-4"	9	V11	2	# 4	STR	--	3'-5"	5
N5	2	#5	2	3'-0 1/2"	4'-6"	9	V12	2	# 4	STR	--	3'-7"	5
N6	2	#5	2	3'-2 1/2"	4'-8"	10	V13	2	# 4	STR	--	3'-9"	5
N7	2	#5	2	3'-5 1/2"	4'-11"	10	V14	2	# 4	STR	--	3'-11"	5
N8	2	#5	2	3'-7 1/2"	5'-1"	11	V15	2	# 4	STR	--	4'-1"	5
N9	2	#5	2	3'-9 1/2"	5'-3"	11	V16	4	# 4	STR	--	4'-2"	11
N10	2	#5	2	3'-11 1/2"	5'-5"	11							
N11	2	#5	2	4'-1 1/2"	5'-7"	12	Z1	2	# 5	3	2'-2"	2'-9"	6
N12	2	#5	2	4'-4 1/2"	5'-10"	12	Z2	2	# 5	3	2'-4"	2'-11"	6
N13	2	#5	2	4'-6 1/2"	6'-0"	13	Z3	2	# 5	3	2'-5"	3'-0"	6
N14	2	#5	2	4'-7 1/2"	6'-1"	13	Z4	2	# 5	3	2'-7"	3'-2"	7
N15	2	#5	2	4'-9 1/2"	6'-3"	13	Z5	2	# 5	3	2'-9"	3'-4"	7
N16	4	#5	2	4'-10 1/2"	6'-4"	26	Z6	2	# 5	3	2'-11"	3'-6"	7
							Z7	2	# 5	3	3'-0"	3'-7"	7
S1	6	#6	STR	--	6'-0"	54	Z8	2	# 5	3	3'-2"	3'-9"	8
							Z9	2	# 5	3	3'-4"	3'-11"	8
T1	6	#5	STR	--	15'-6"	97	Z10	2	# 5	3	3'-6"	4'-1"	9
T2	2	#5	STR	--	3'-0"	6	Z11	2	# 5	3	3'-7"	4'-2"	9
							Z12	2	# 5	3	3'-9"	4'-4"	9
							Z13	2	# 5	3	3'-11"	4'-6"	9
							Z14	2	# 5	3	4'-0"	4'-7"	10
							Z15	2	# 5	3	4'-1"	4'-8"	10
							Z16	4	# 5	3	4'-2"	4'-9"	20
							REINFORCING STEEL FOR 2 WINGS						
							748 LBS.						
							CLASS A CONCRETE						
							2 WINGS						
							1 HEADWALL						
							1 END CURTAIN WALL						
							TOTAL						
							9.2 C.Y.						
							0.3 C.Y.						
							0.3 C.Y.						
							9.8 C.Y.						



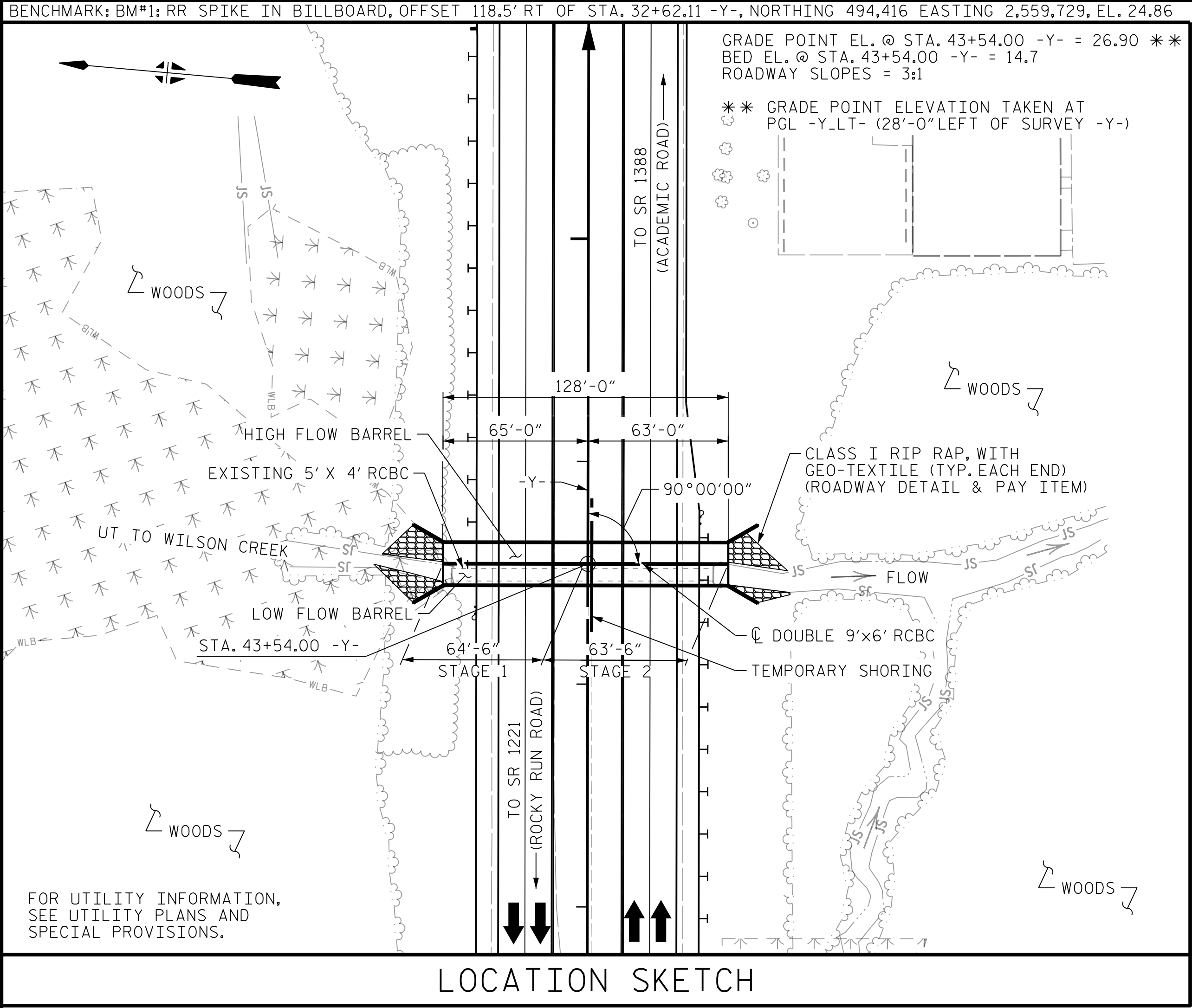
TYPICAL WING SECTION

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 36+41.23 -Y-

SHEET 5 OF 6



DEPARTMENT OF TRANSPORTATION RALEIGH					
WINGS FOR CONCRETE BOX CULVERT H = 4'-0" SLOPE = 4:1 90° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	--	--	3	--	--
2	--	--	4	--	--
TOTAL SHEETS					6



TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE BARREL @ 1.807 CY/FT	STAGE 1 = 116.6 C.Y. STAGE 2 = 114.7 C.Y.
WINGS, ETC.	STAGE 1 = 13.9 C.Y. STAGE 2 = 13.9 C.Y.
SILLS	STAGE 1 = 1.0 C.Y. STAGE 2 = 1.0 C.Y.
TOTAL, CLASS A CONCRETE	STAGE 1 = 131.5 C.Y. STAGE 2 = 129.6 C.Y. TOTAL = 261.1 C.Y.
REINFORCING STEEL BARREL, SILLS, HEADWALL	36,422 LBS.
WINGS, ETC.	2,702 LBS.
TOTAL, REINFORCING STEEL	39,124 LBS.
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	217 TONS
BOX CULVERT EXCAVATION, STA. 43+54.00 -Y-	LUMP SUM

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 6.21 FT. MAX. AND 4.28 FT. MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN EACH STAGE OF THE CULVERT TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4"OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

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

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

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

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

A 3-FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

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

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT 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 BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, 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. THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

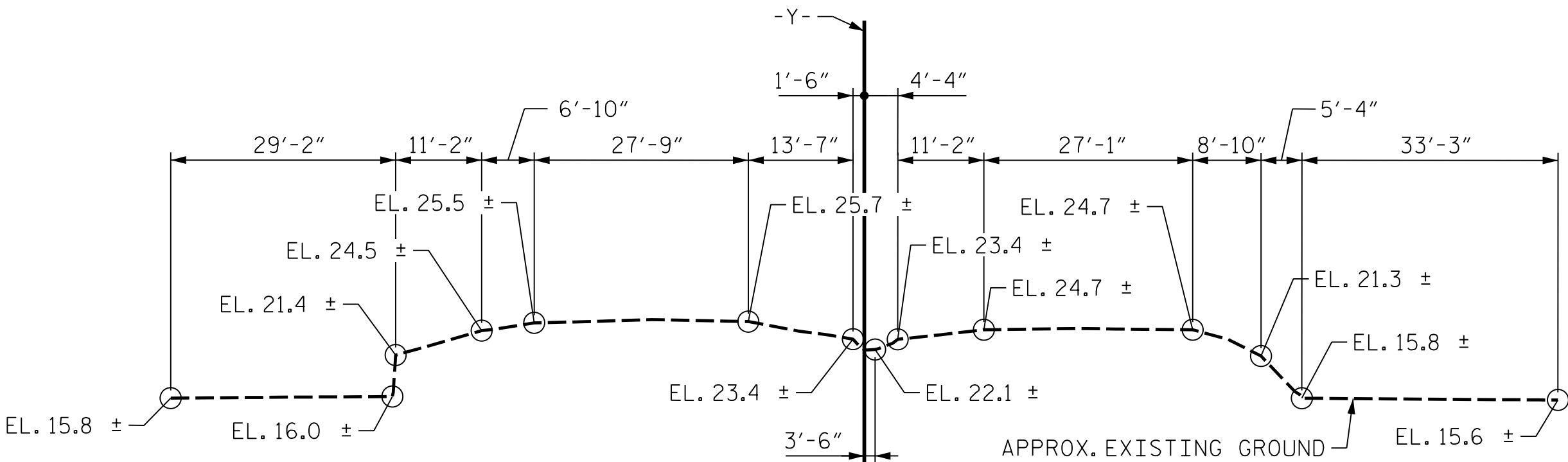
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE ENTIRE COST OF WORK REQUIRED TO REMOVE THE EXISTING SINGLE 5' X 4' CONCRETE BOX CULVERT SHALL BE INCLUDED IN THE LUMP SUM FOR CULVERT EXCAVATION.

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.

* OVERTOPPING FOR THE CULVERT CROSSING OCCURS IN THE ROADWAY DITCH AT STATION 36+50 -Y- LT, ELEVATION = 22.16'. HOWEVER, CULVERT WORKS IN CONJUNCTION WITH THE ADJACENT EXISTING 5'x4' RCBC AT STATION 36+41 -Y-. DISCHARGE FOR THE 50-YR DESIGN STORM OF THIS CULVERT IS 49 CFS.



PROJECT NO. R-4463A

CRAVEN COUNTY

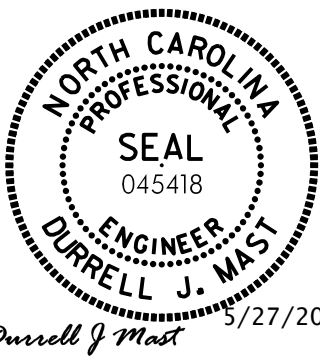
STATION: 43+54.00 -Y-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
9 FT. X 6 FT.
CONCRETE BOX CULVERT
90° SKEW

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



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DES BY: R. BEAUCHAMP	DATE : 05/24	DWG BY: D. CHAPMAN	DATE : 05/24
DES CHK: D. MAST	DATE : 05/24	CHK BY: D. MAST	DATE : 05/24

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.
RATING FACTORS ARE FOR NON-INTERSTATE TRAFFIC

COMMENTS:

1.
2.
3.
4.

CONTROLLING LOAD RATING

1

DESIGN LOAD RATING (HL-93)

2

DESIGN LOAD RATING (HS-20)

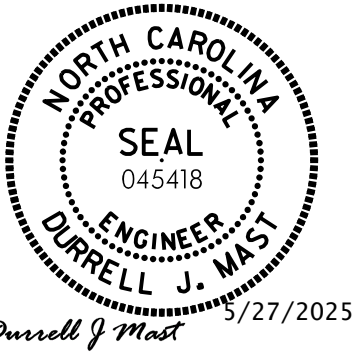
3

LEGAL LOAD RATING **

4

EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 43+54.00 -Y-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
9 FT. X 6 FT.
CONCRETE BOX CULVERT
90° SKEW

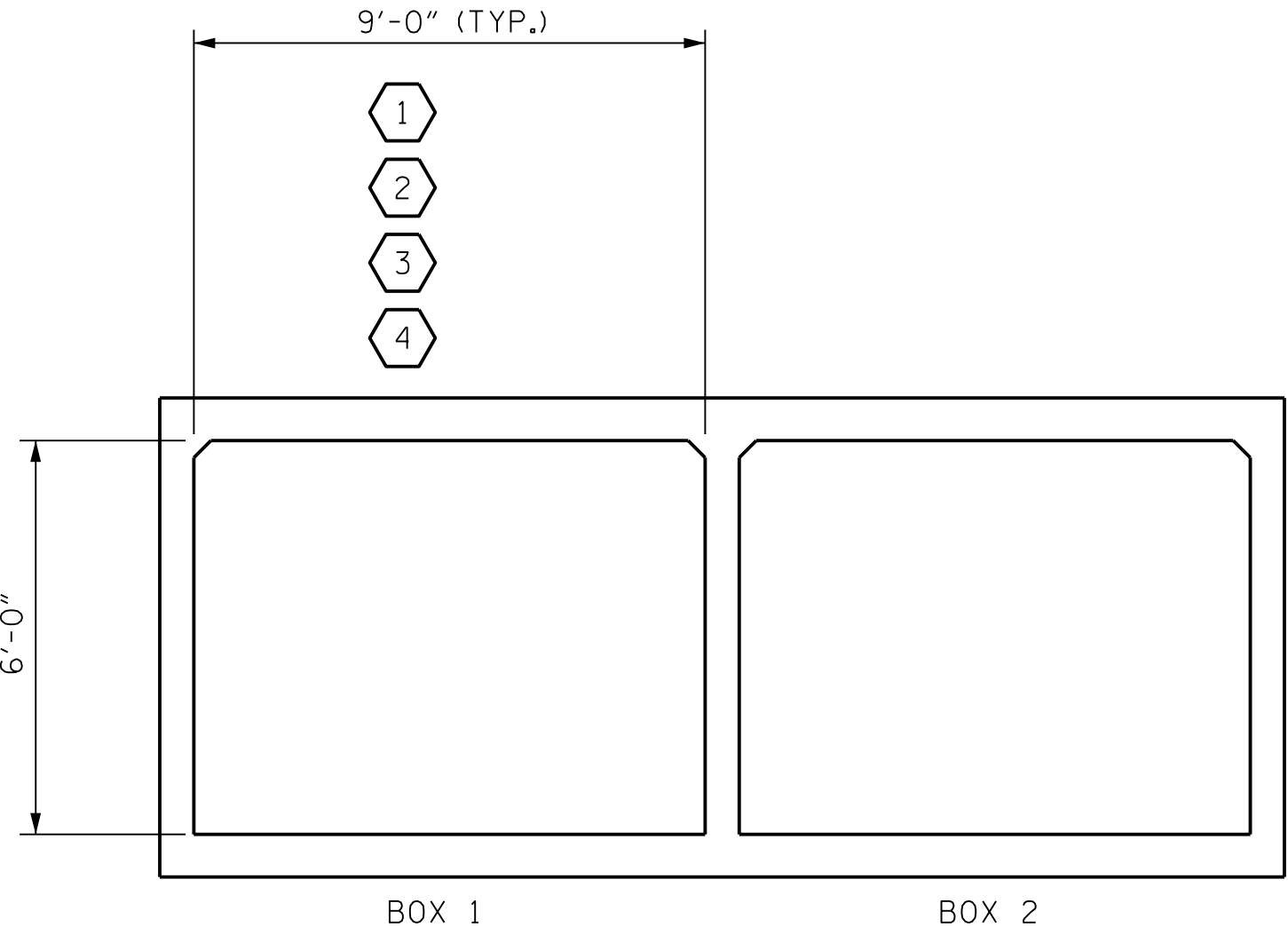
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2	--	--	4	--	--	

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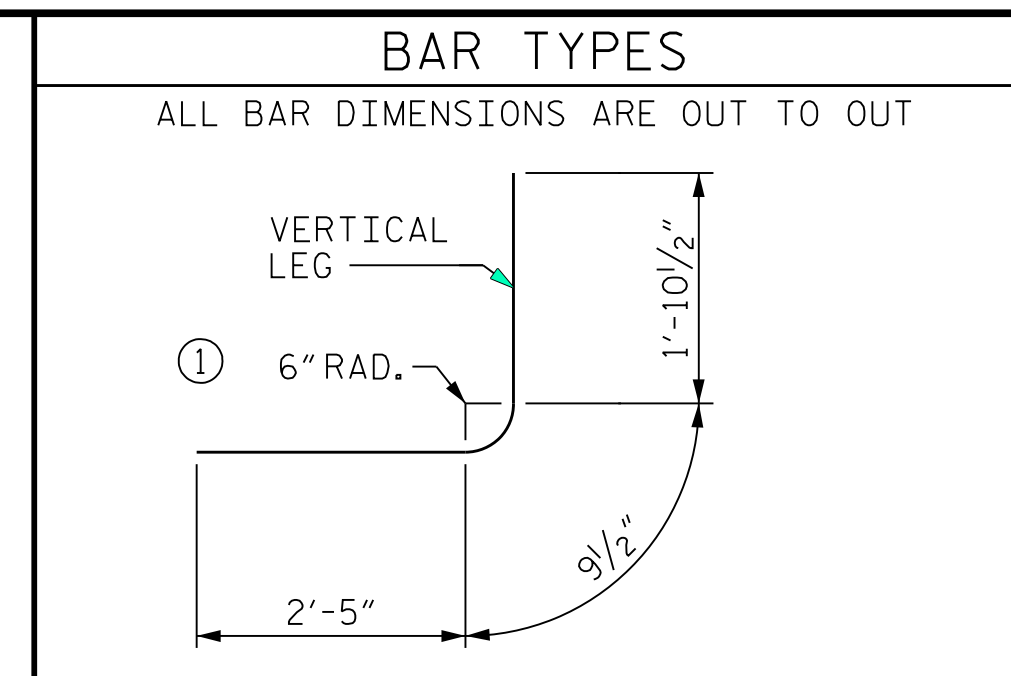
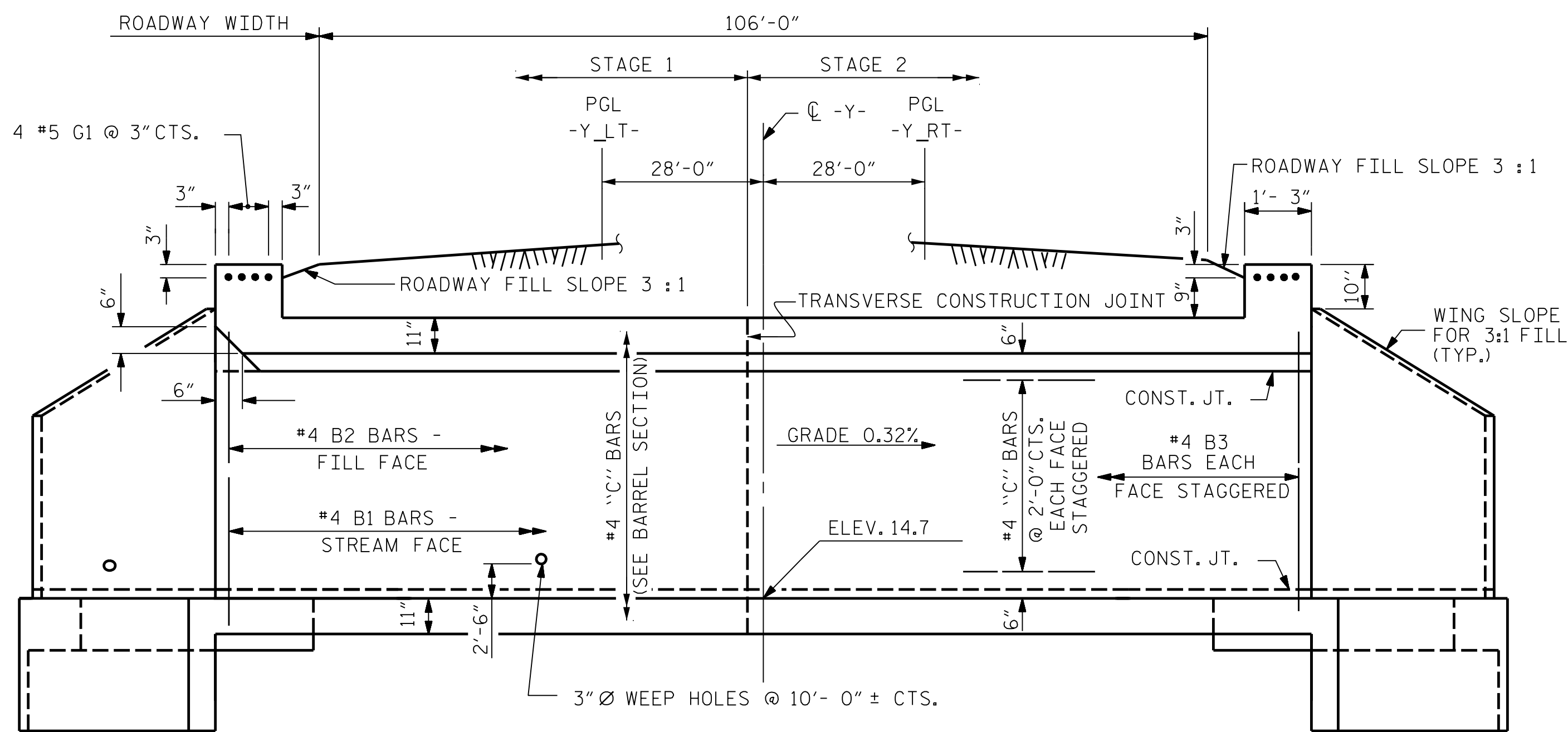
LOAD AND RESISTANCE FACTOR RATING (LRFR)
SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

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 × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER	
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.45	--	1.75	1.45	1	TOP SLAB	4.20	1.77	1	TOP SLAB	8.34	-	
	HL-93 (OPERATING)	N/A		1.88	--	1.35	1.88	1	TOP SLAB	4.20	2.30	1	TOP SLAB	8.34	-	
	HS-20 (INVENTORY)	36.000	②	1.56	56.2	1.75	1.56	1	TOP SLAB	4.20	1.87	1	TOP SLAB	8.34	-	
	HS-20 (OPERATING)	36.000		2.03	73.1	1.35	2.03	1	TOP SLAB	4.20	2.42	1	TOP SLAB	8.34	-	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.85	38.5	1.40	2.85	1	TOP SLAB	4.20	3.45	1	TOP SLAB	8.34	-
		SNGARBS2	20.000		2.66	53.2	1.40	2.66	1	TOP SLAB	4.20	3.20	1	TOP SLAB	8.34	-
		SNAGRIS2	22.000		2.85	62.7	1.40	2.85	1	TOP SLAB	4.20	3.38	1	TOP SLAB	8.34	-
		SNCOTTS3	27.250	③	1.81	49.3	1.40	1.81	1	TOP SLAB	4.20	2.21	1	TOP SLAB	8.34	-
		SNAGGRS4	34.925		2.19	76.5	1.40	2.19	1	TOP SLAB	4.20	2.48	1	TOP SLAB	8.34	-
		SNS5A	35.550		2.65	94.2	1.40	2.65	1	TOP SLAB	4.20	2.70	1	BOTTOM SLAB	8.34	-
		SNS6A	39.950		2.17	86.7	1.40	2.17	1	TOP SLAB	4.20	2.43	1	TOP SLAB	8.34	-
		SNS7B	42.000		2.25	94.5	1.40	2.25	1	TOP SLAB	4.20	2.37	1	TOP SLAB	8.34	-
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.85	94.1	1.40	2.85	1	TOP SLAB	4.20	3.07	1	TOP SLAB	8.34	-
		TNT4A	33.075		2.16	71.4	1.40	2.16	1	TOP SLAB	4.20	2.51	1	TOP SLAB	8.34	-
		TNT6A	41.600		2.20	91.5	1.40	2.20	1	TOP SLAB	4.20	2.42	1	TOP SLAB	8.34	-
		TNT7A	42.000		2.18	91.6	1.40	2.18	1	TOP SLAB	4.20	2.50	1	TOP SLAB	8.34	-
		TNT7B	42.000		2.12	89.0	1.40	2.12	1	TOP SLAB	4.20	2.38	1	TOP SLAB	8.34	-
		TNAGRIT4	43.000		2.16	92.9	1.40	2.16	1	TOP SLAB	4.20	2.41	1	TOP SLAB	8.34	-
		TNAGT5A	45.000		2.31	104.0	1.40	2.31	1	TOP SLAB	4.20	2.41	1	TOP SLAB	8.34	-
		TNAGT5B	45.000		2.16	97.2	1.40	2.16	1	TOP SLAB	4.20	2.24	1	BOTTOM SLAB	8.34	-
EMERGENCY VEHICLE (EV)	EV2	28.750		2.01	57.8	1.30	2.01	1	TOP SLAB	4.20	2.47	1	TOP SLAB	8.34	-	
	EV3	43.000	④	1.57	67.5	1.30	1.57	1	TOP SLAB	4.20	1.95	1	TOP SLAB	8.34	-	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

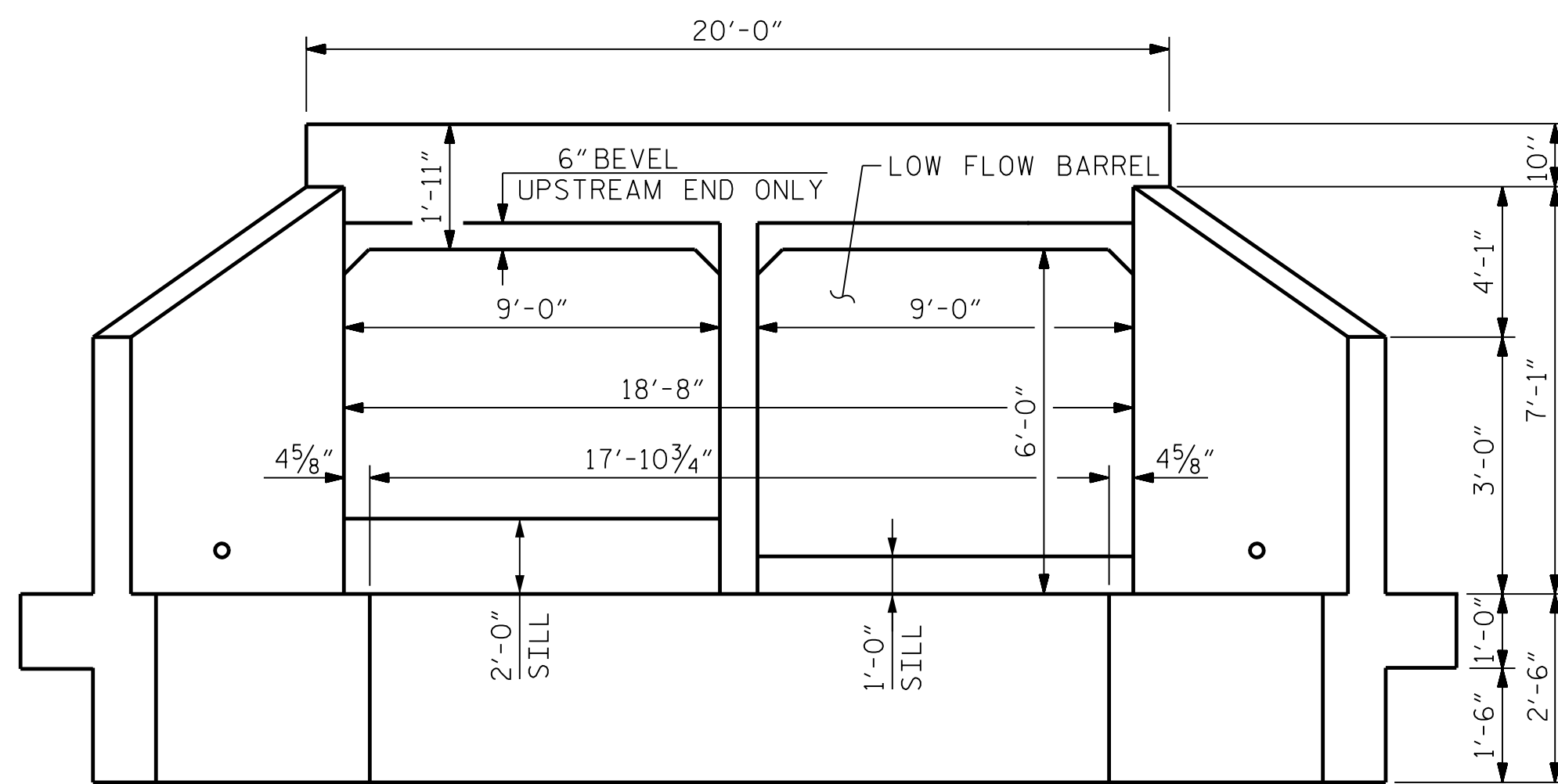
DES BY: R. BEAUCHAMP	DATE : 05/24	DWG BY: D. CHAPMAN	DATE : 05/24
DES CHK: D. MAST	DATE : 05/24	CHK BY: D. MAST	DATE : 05/24



SPLICE LENGTH CHART

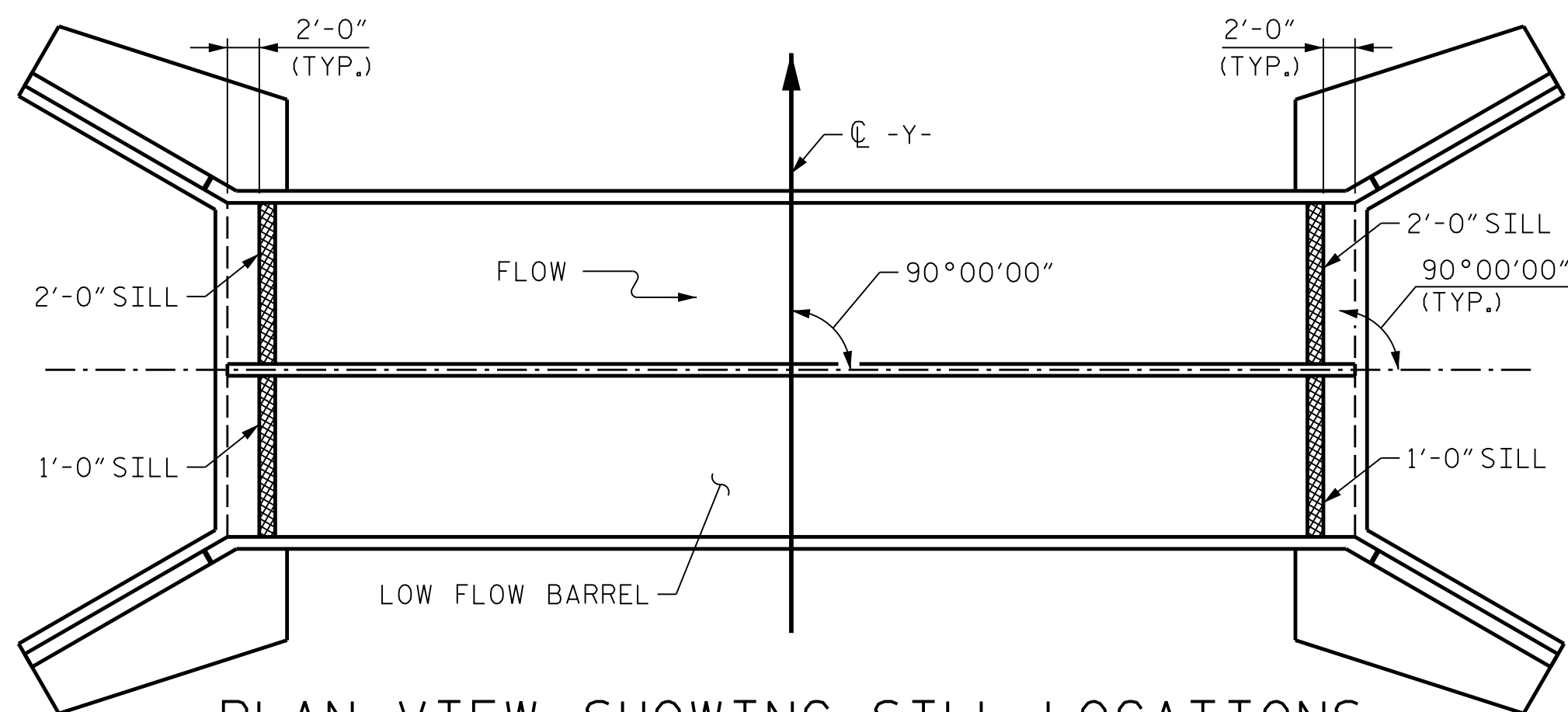
BAR	SIZE	SPLICE LENGTH
A200	#5	2'-4"
A400	#6	2'-9"
B1	#4	1'-10"
B3	#4	1'-10"
C1 OR C2	#4	2'-5"

REINFORCING STEEL BAR SCHEDULE - BARREL - STAGE 1						REINFORCING STEEL BAR SCHEDULE - BARREL - STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	520	#4	1	5'-1"	1766	A1	512	#4	1	5'-1"	1739
A100	97	#5	STR	19'-8"	1990	A100	96	#5	STR	19'-8"	1969
A200	97	#5	STR	19'-8"	1990	A200	96	#5	STR	19'-8"	1969
A300	130	#5	STR	19'-8"	2667	A300	128	#5	STR	19'-8"	2626
A400	130	#6	STR	19'-8"	3840	A400	128	#6	STR	19'-8"	3781
B1	192	#4	STR	7'-5"	961	B1	192	#4	STR	7'-5"	951
B2	260	#4	STR	5'-0"	868	B2	256	#4	STR	5'-0"	855
B3	194	#4	STR	7'-5"	961	B3	192	#4	STR	7'-5"	951
C1	140	#4	STR	34'-9"	3250	C2	140	#4	STR	33'-0"	3086
D1	3	#6	STR	2'-7"	12	D1	3	#6	STR	2'-7"	12
D2	3	#6	STR	1'-7"	7	D2	3	#6	STR	1'-7"	7
G1	4	#5	STR	19'-8"	82	G1	4	#5	STR	19'-8"	82
REINFORCING STEEL LBS. 18,394						REINFORCING STEEL LBS. 18,028					
CLASS A CONCRETE BARREL @ 1.807 CY/FT TOTAL 116.6 CY 1.0 CY 117.6 CY						CLASS A CONCRETE BARREL @ 1.807 CY/FT TOTAL 114.7 CY 1.0 CY 115.7 CY					

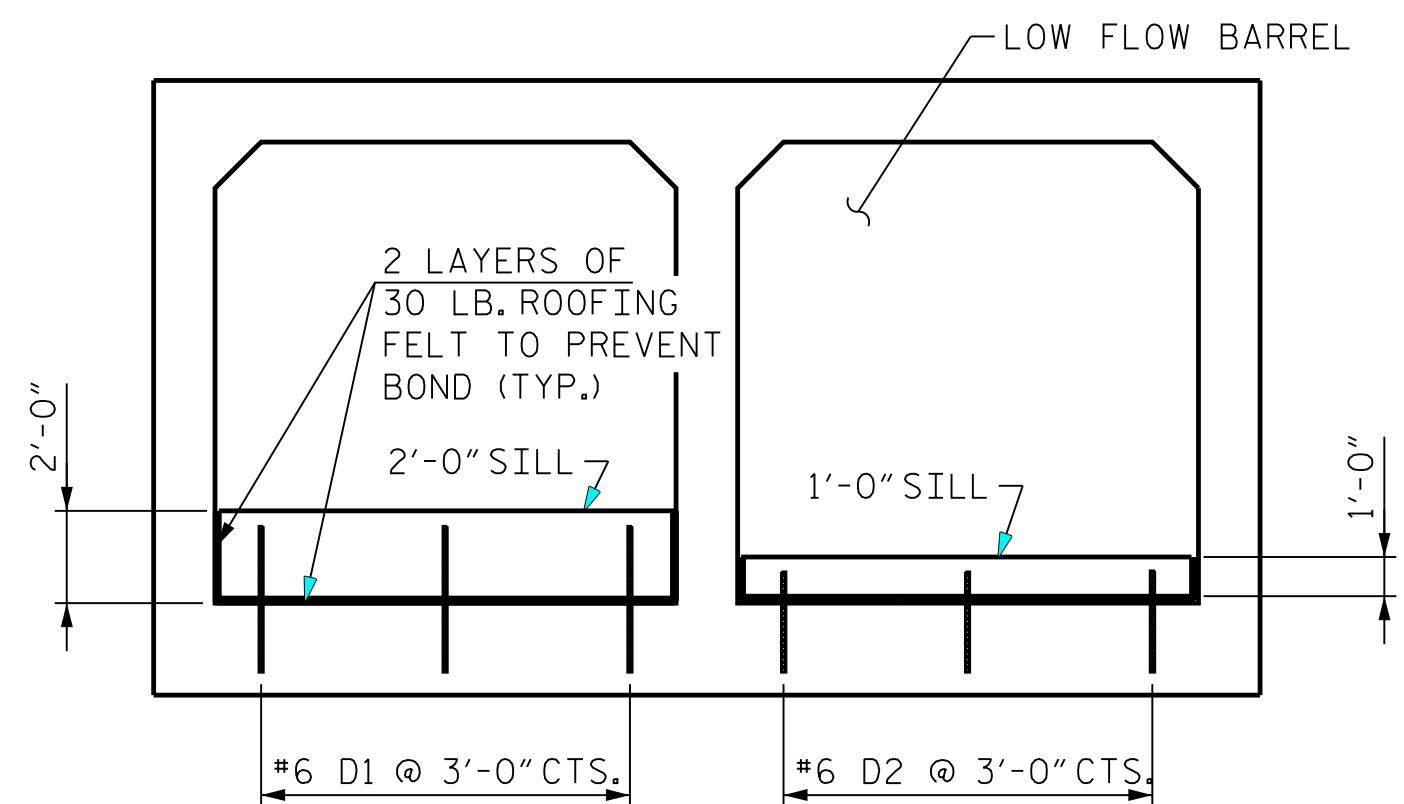


END ELEVATION

(LOOKING UPSTREAM)

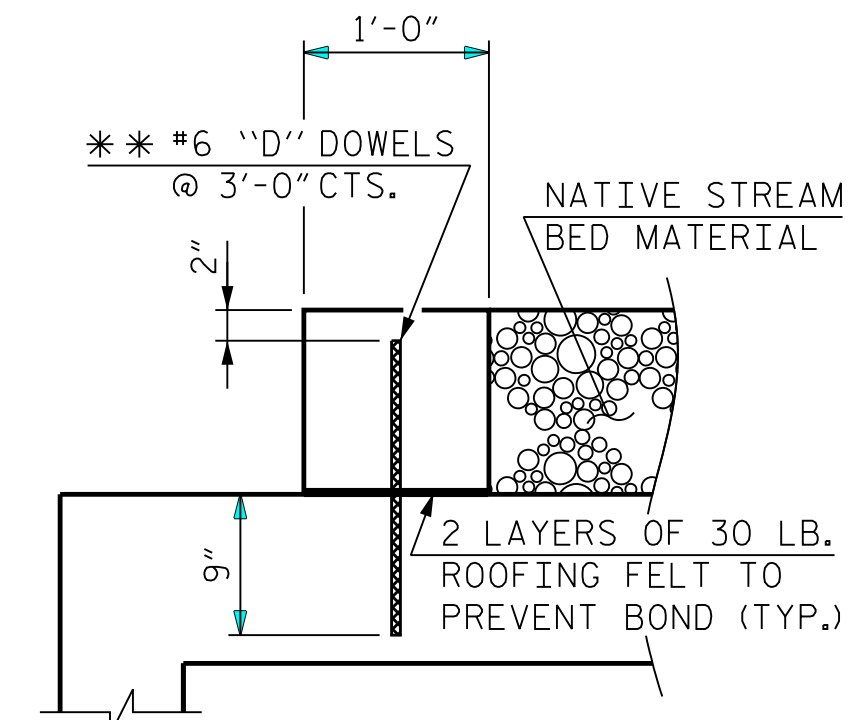


PLAN VIEW SHOWING SILL LOCATIONS



ELEVATION - LOOKING UPSTREAM

CULVERT SILL DETAILS



SECTION THROUGH SILL

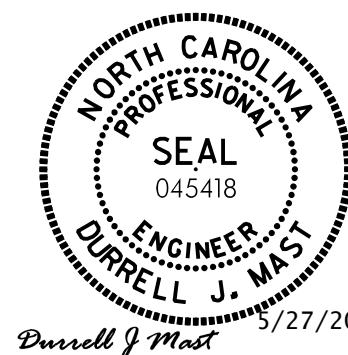
*** DOWELS MAY BE PUSHED INTO
GREEN CONCRETE AFTER SLAB
HAS BEEN FLOAT FINISHED

PROJECT NO. R-4463A

CRAVEN COUNTY

STATION: 43+54.00 -Y-

SHEET 3 OF 6



SHEET NO. C2-3

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

DOUBLE BARREL

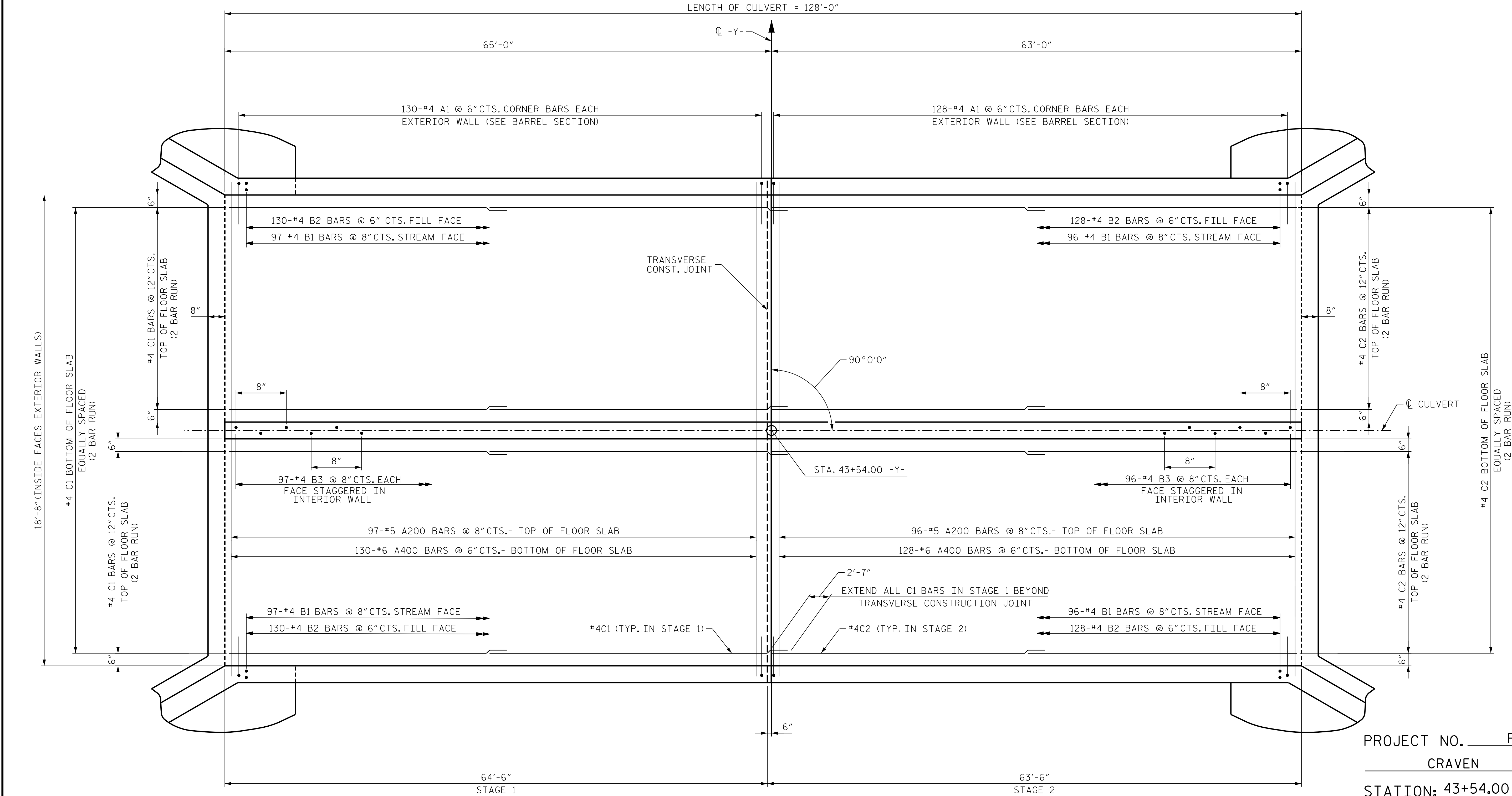
9 FT. X 6 FT.

CONCRETE BOX CULVERT

90° SKEW

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

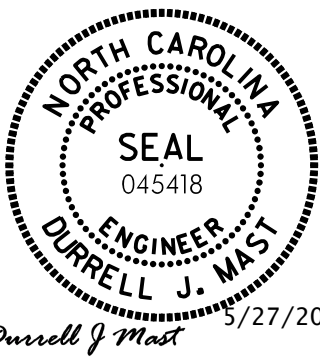
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PENTABLE: NCDOT_STRUCTURE_DEFAULT_PEN.tbl
USER: WSELLS
DATE: 5/23/2025
FILE: ...\\411.007_R4463A.SWU_CU.01.dgn



PLAN - FLOOR SLAB

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 43+54.00 -Y-

SHEET 4 OF 6



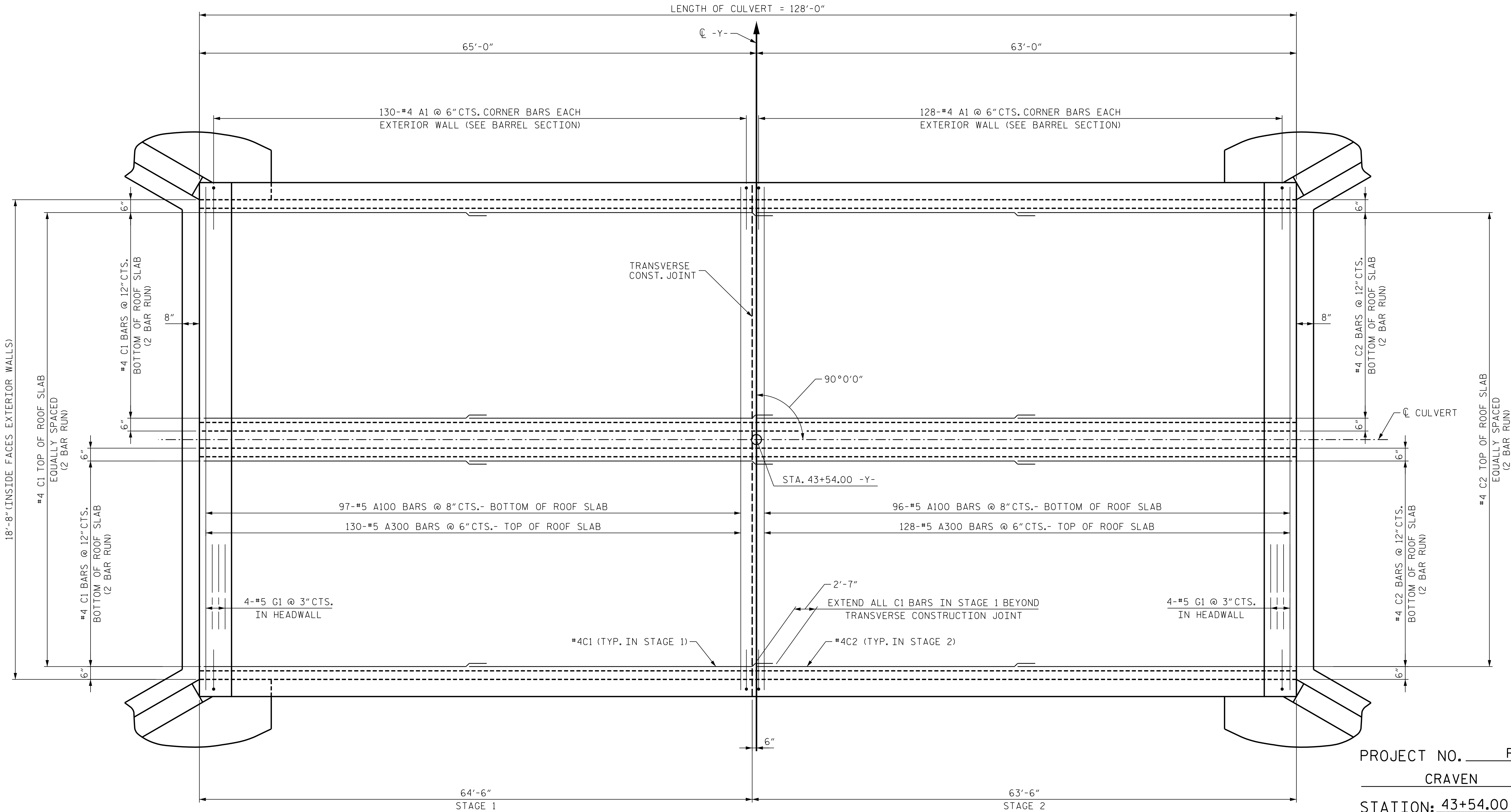
DES BY: <u>R. BEAUCHAMP</u>	DATE : <u>05/24</u>	DWG BY: <u>D. CHAPMAN</u>	DATE : <u>05/24</u>
DES CHK: <u>D. MAST</u>	DATE : <u>05/24</u>	CHK BY: <u>D. MAST</u>	DATE : <u>05/24</u>

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

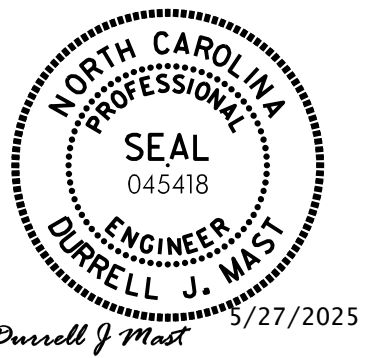
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DATE: 5/23/2025
FILE: ...\\411.009.R4463A.SWU.CU.012.dgn



PLAN - ROOF SLAB

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 43+54.00 -Y-

SHEET 5 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE BARREL
9 FT. X 6 FT.
CONCRETE BOX CULVERT
90° SKEW

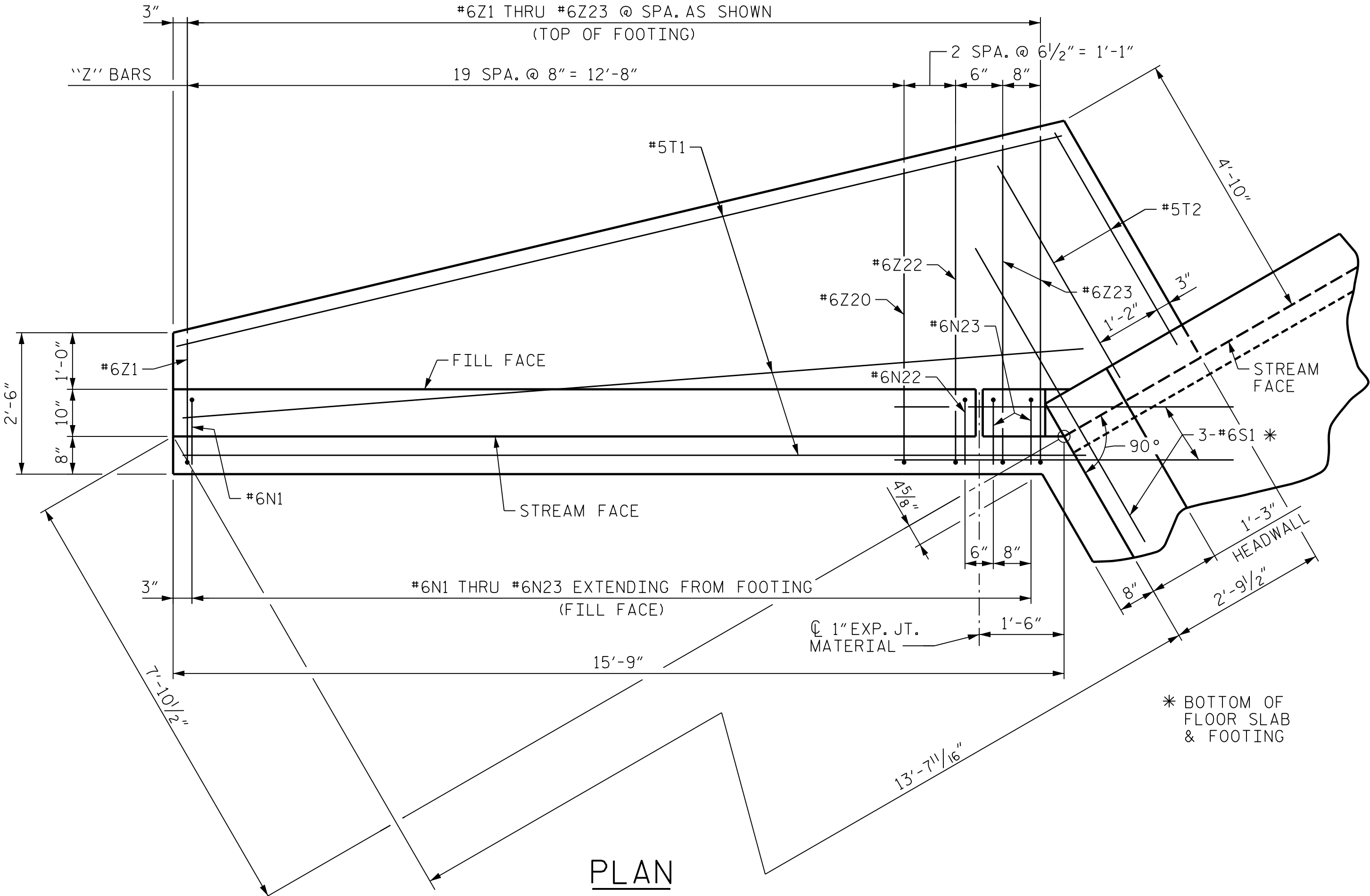
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SHEET NO. C2-5
TOTAL SHEETS 6

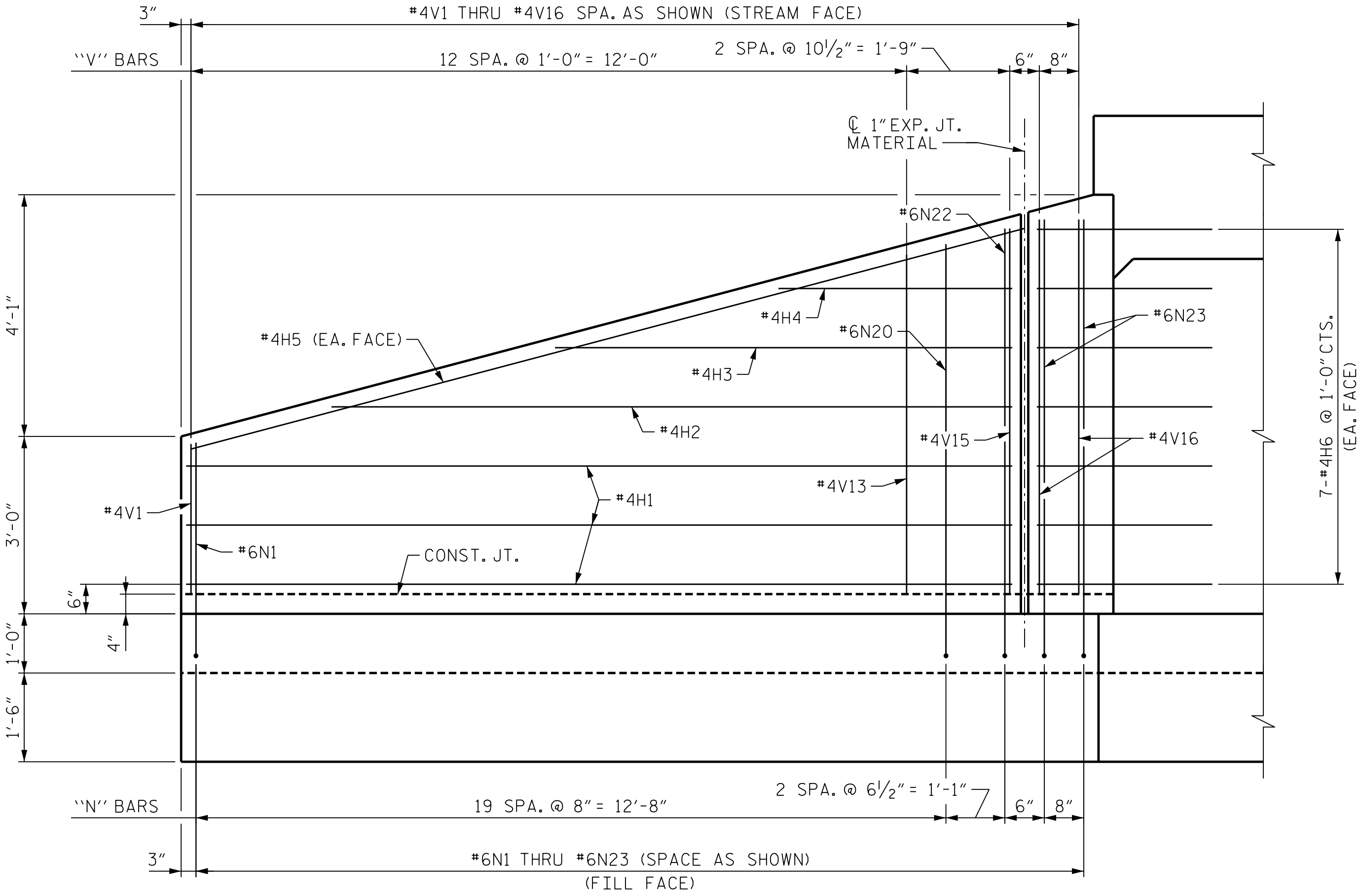
DES BY:	R. BEAUCHAMP	DATE :	05/24	DWG BY:	D. CHAPMAN	DATE :	05/24
DES CHK:	D. MAST	DATE :	05/24	CHK BY:	D. MAST	DATE :	05/24

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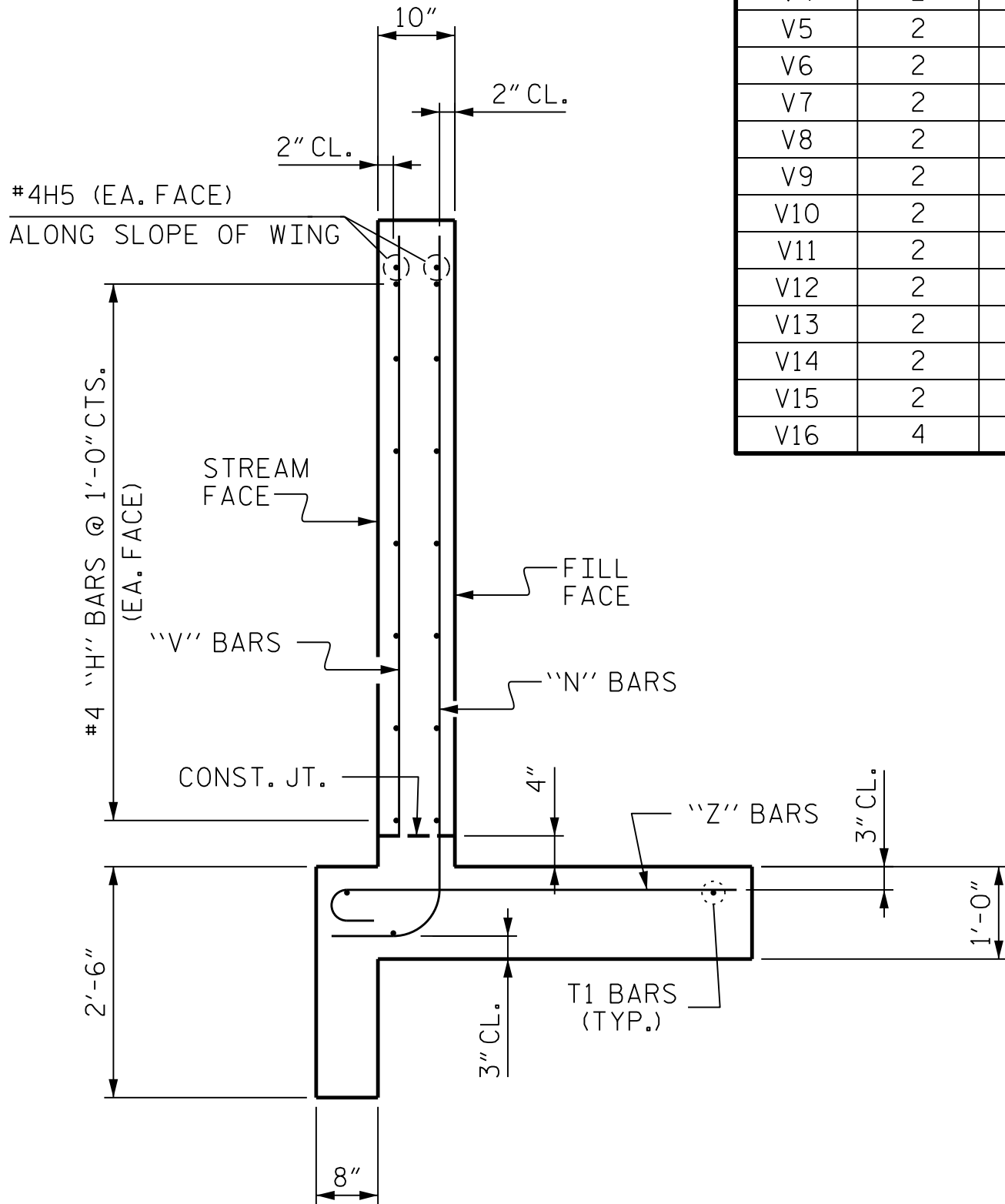
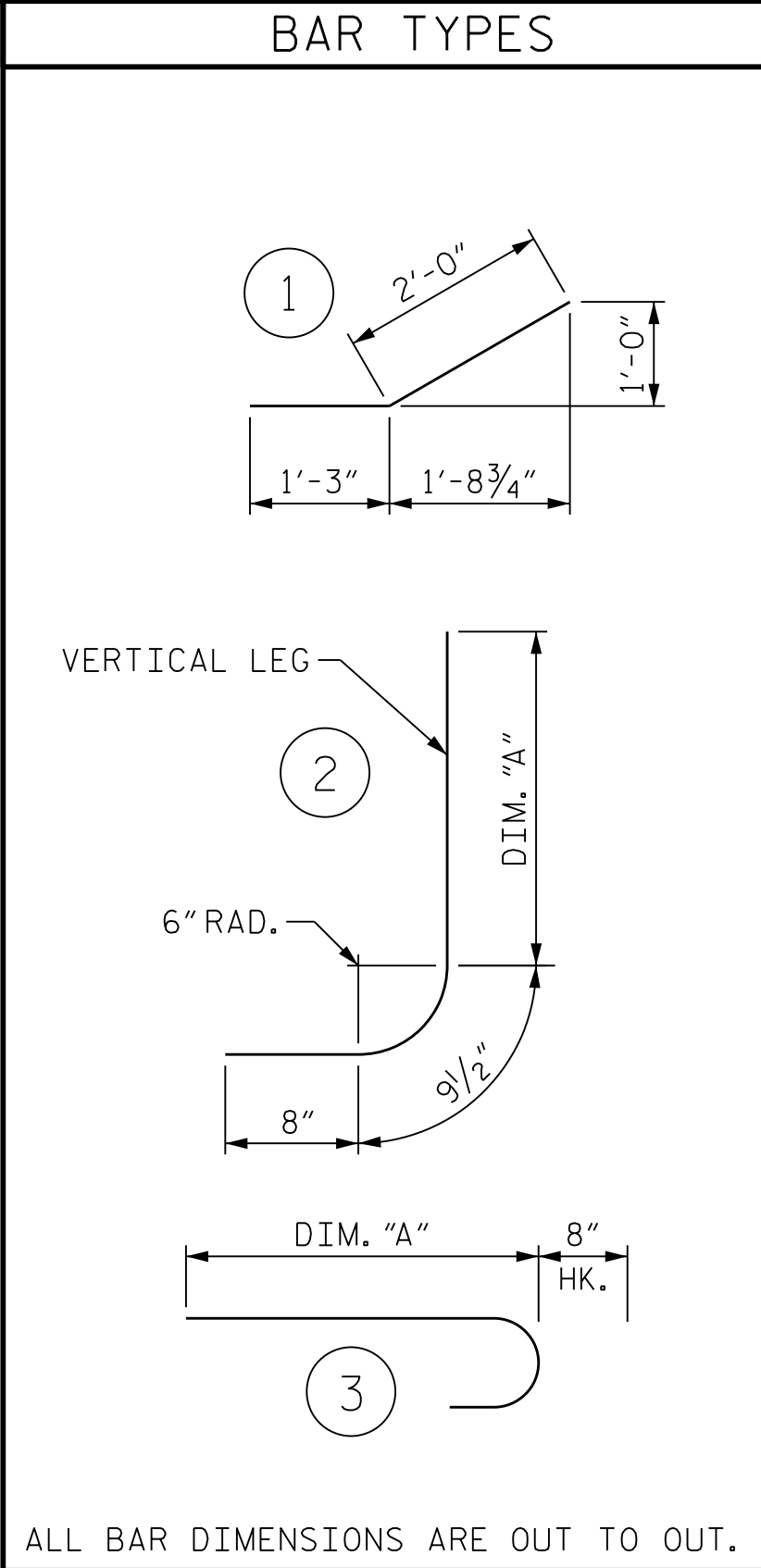
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PLAN



ELEVATION



TYPICAL WING SECTION

BILL OF MATERIAL															
FOR TWO WINGS															
BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT		
H1	12	#4	STR	--	13'-11"	112	Z1	2	#6	3	2'-2"	2'-10"	9		
H2	4	#4	STR	--	11'-4"	30	Z2	2	#6	3	2'-4"	3'-0"	9		
H3	4	#4	STR	--	7'-6"	20	Z3	2	#6	3	2'-6"	3'-2"	10		
H4	4	#4	STR	--	3'-8"	10	Z4	2	#6	3	2'-8"	3'-4"	10		
H5	4	#4	STR	--	14'-4"	38	Z5	2	#6	3	2'-10"	3'-6"	11		
H6	28	#4	1	--	3'-3"	61	Z6	2	#6	3	3'-0"	3'-8"	11		
							Z7	2	#6	3	3'-1"	3'-9"	11		
N1	2	#6	2	3'-1 1/2"	4'-7"	14	Z8	2	#6	3	3'-3"	3'-11"	12		
N2	2	#6	2	3'-3 1/2"	4'-9"	14	Z9	2	#6	3	3'-5"	4'-1"	12		
N3	2	#6	2	3'-5 1/2"	4'-11"	15	Z10	2	#6	3	3'-7"	4'-3"	13		
N4	2	#6	2	3'-7 1/2"	5'-1"	15	Z11	2	#6	3	3'-9"	4'-5"	13		
N5	2	#6	2	3'-9 1/2"	5'-3"	16	Z12	2	#6	3	3'-11"	4'-7"	14		
N6	2	#6	2	3'-11 1/2"	5'-5"	16	Z13	2	#6	3	4'-1"	4'-9"	14		
N7	2	#6	2	4'-1 1/2"	5'-7"	17	Z14	2	#6	3	4'-3"	4'-11"	15		
N8	2	#6	2	4'-3 1/2"	5'-9"	17	Z15	2	#6	3	4'-5"	5'-1"	15		
N9	2	#6	2	4'-5 1/2"	5'-11"	18	Z16	2	#6	3	4'-7"	5'-3"	16		
N10	2	#6	2	4'-7 1/2"	6'-1"	18	Z17	2	#6	3	4'-9"	5'-5"	16		
N11	2	#6	2	4'-9 1/2"	6'-3"	19	Z18	2	#6	3	4'-10"	5'-6"	17		
N12	2	#6	2	4'-11 1/2"	6'-5"	19	Z19	2	#6	3	5'-0"	5'-8"	17		
N13	2	#6	2	5'-2 1/2"	6'-8"	20	Z20	2	#6	3	5'-2"	5'-10"	18		
N14	2	#6	2	5'-4 1/2"	6'-10"	21	Z21	2	#6	3	5'-4"	6'-0"	18		
N15	2	#6	2	5'-6 1/2"	7'-0"	21	Z22	2	#6	3	5'-5"	6'-1"	18		
N16	2	#6	2	5'-8 1/2"	7'-2"	22	Z23	4	#6	3	5'-7"	6'-3"	38		
N17	2	#6	2	5'-10 1/2"	7'-4"	22									
N18	2	#6	2	6'-1 1/2"	7'-6"	23									
N19	2	#6	2	6'-2 1/2"	7'-8"	23									
N20	2	#6	2	6'-4 1/2"	7'-10"	24									
N21	2	#6	2	6'-6 1/2"	8'-0"	24									
N22	2	#6	2	6'-7 1/2"	8'-1"	24									
N23	4	#6	2	6'-9 1/2"	8'-3"	50									
							REINFORCING STEEL FOR 2 WINGS						1,351 LBS.		
S1	6	#6	STR	--	6'-0"	54									
T1	6	#5	STR	--	15'-9"	99	REINFORCING STEEL								
T2	4	#5	STR	--	4'-4"	18	STAGE 1 (2 WINGS)						1,351 LBS.		
							STAGE 2 (2 WINGS)						1,351 LBS.		
							TOTAL FOR 4 WINGS:								
V1	2	#4	STR	--	2'-4"	3	REINFORCING STEEL						2,702 LBS.		
V2	2	#4	STR	--	2'-7"	3									
V3	2	#4	STR	--	2'-10"	4	CLASS A CONCRETE								
V4	2	#4	STR	--	3'-1"	4	STAGE 1								
V5	2	#4	STR	--	3'-5"	5	2 WINGS						11.8	C.Y.	
V6	2	#4	STR	--	3'-8"	5	1 HEADWALL						0.9	C.Y.	
V7	2	#4	STR	--	3'-11"	5	END CURTAIN WALL						1.2	C.Y.	
V8	2	#4	STR	--	4'-2"	6	TOTAL						13.9	C.Y.	
V9	2	#4	STR	--	4'-5"	6									
V10	2	#4	STR	--	4'-8"	6	STAGE 2								
V11	2	#4	STR	--	4'-11"	7	2 WINGS						11.8	C.Y.	
V12	2	#4	STR	--	5'-2"	7	1 HEADWALL						0.9	C.Y.	
V13	2	#4	STR	--	5'-5"	7	END CURTAIN WALL						1.2	C.Y.	
V14	2	#4	STR	--	5'-8"	8	TOTAL						13.9	C.Y.	
V15	2	#4	STR	--	5'-11"	8	TOTAL FOR 4 WINGS, ETC.:								
V16	4	#4	STR	--	6'-0"	16	CLASS A CONCRETE						27.8	C.Y.	

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 43+54.00 -Y-

SHEET 6 OF 6



DEPARTMENT OF TRANSPORTATION RALEIGH											
WINGS FOR CONCRETE BOX CULVERT H = 6'-0" SLOPE = 3:1 90° SKEW											
REVISIONS											
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. C2-6					
1	--	--	3	--	--	TOTAL SHEETS 6					
2	--	--	4	--	--						

PLOT DRIVER: NCDOT_STRUCTURES_DEFAULT_PLOTTER.plt
PENTABLE: NCDOT_Structures.tbl
USER: WSELLS
DATE: 5/22/2025
FILE: ...\\411.013.R4463A.SMU.SN.dgn
TIME: 1:04:21 PM

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS - AASHTO (CURRENT)
LIVE LOAD - SEE PLANS
IMPACT ALLOWANCE - SEE AASHTO
STRESS IN EXTREME FIBER OF
STRUCTURAL STEEL - AASHTO M270 GRADE 36 - 20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W - 27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 - 27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60 - 24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - 1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - SEE AASHTO
STRUCTURAL TIMBER - TREATED OR UNTREATED
EXTREME FIBER STRESS - 1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN
OF TIMBER - 375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - 30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.
STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. R-4463A
CRAVEN COUNTY
STATION: 43+54.00 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

REVISIONS					SHEET NO. SN-01 TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	
1	--	--	3	--	--
2	--	--	4	--	--

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N.C.B.E.L.S. License Number: F-0116

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