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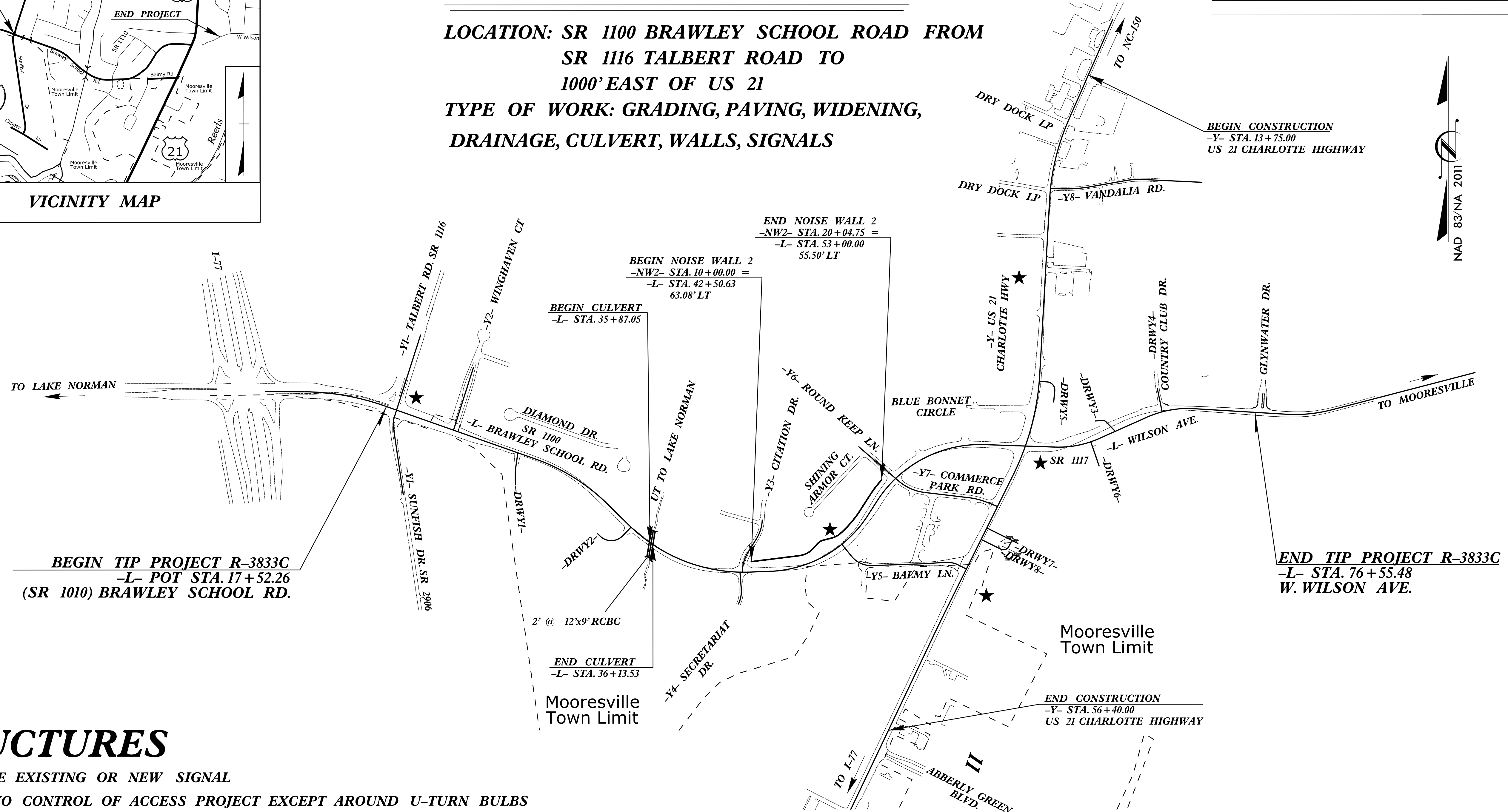
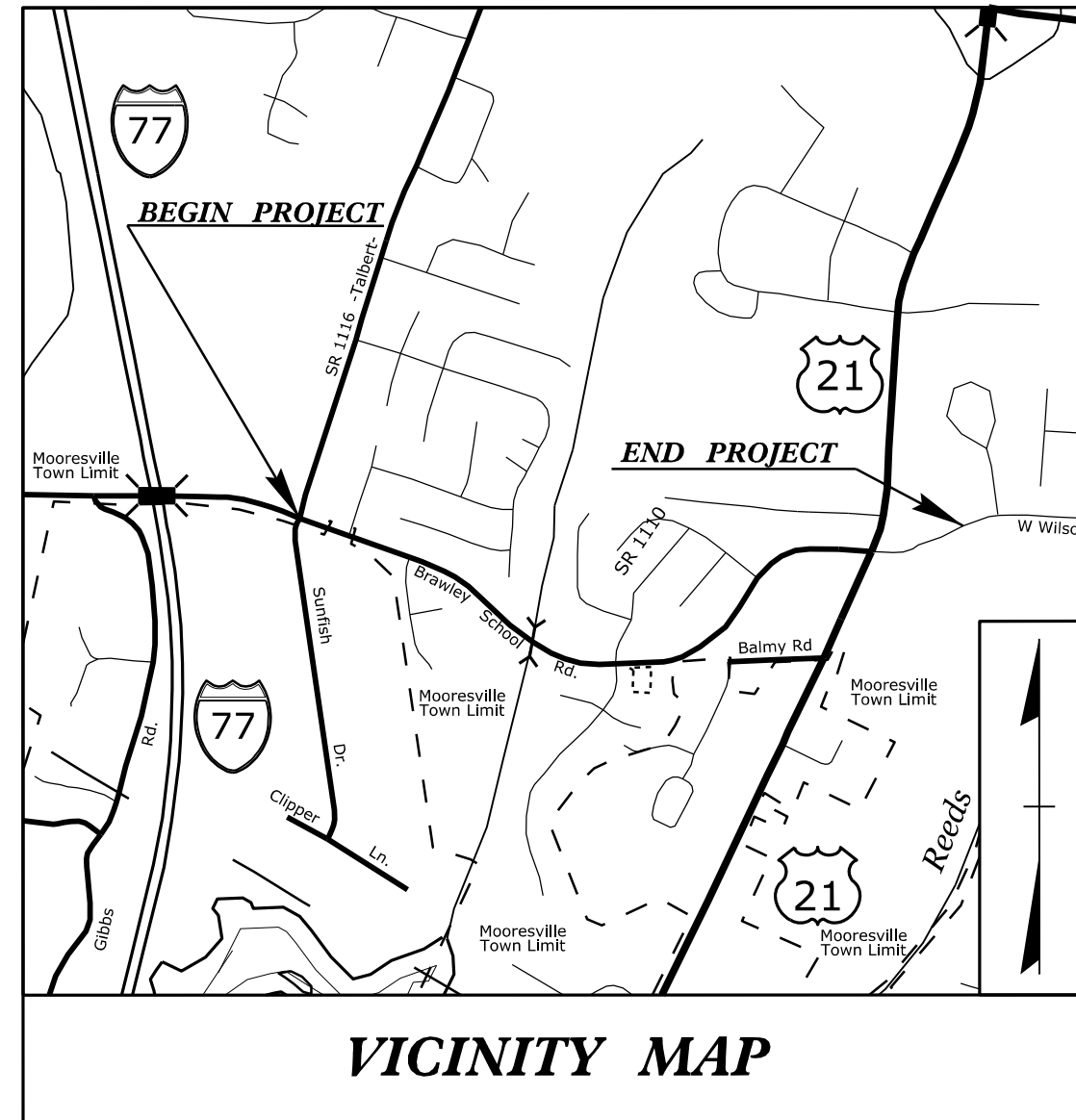
CONTRACT: C204852 **TIP PROJECT: R-3833C**

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

IREDELL COUNTY

**LOCATION: SR 1100 BRAWLEY SCHOOL ROAD FROM
 SR 1116 TALBERT ROAD TO
 1000' EAST OF US 21**
**TYPE OF WORK: GRADING, PAVING, WIDENING,
 DRAINAGE, CULVERT, WALLS, SIGNALS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3833C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34554.1.3		P.E	
34554.2.4		R.W	
34554.2.5		UTIL	
34554.3.3		CONSTRUCTION	



STRUCTURES

★ UPGRADE EXISTING OR NEW SIGNAL
 THIS IS A NO CONTROL OF ACCESS PROJECT EXCEPT AROUND U-TURN BULBS

DESIGN DATA

ADT 2023 = 21172
 ADT 2040 = 28200
 K = 10 %
 D = 55 %
 T = 4 % *
 V = 45 MPH
 * TTST = 1% DUAL = 3%
 FUNCTIONAL CLASSIFICATION = MAJOR RURAL COLLECTOR

PROJECT LENGTH

ROADWAY LENGTH TIP PROJECT R-3833C = 1.113 MI.
 STRUCTURE LENGTH TIP PROJECT R-3833C = 0.005 MI.
 TOTAL LENGTH OF TIP PROJECT R-3833C = 1.118 MI.

PREPARED IN THE OFFICE OF:
Stantec
 Stantec Consulting Services Inc. Tel. (919) 851-8866
 801 Jones Franklin Road Fax. (919) 851-7024
 Suite 300 www.stantec.com
 Raleigh, NC 27606 License No. F-0672

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

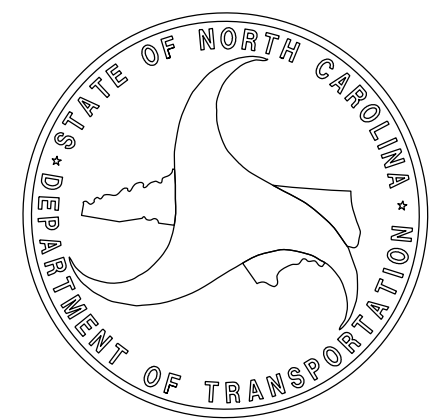
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 09 /30 /2018

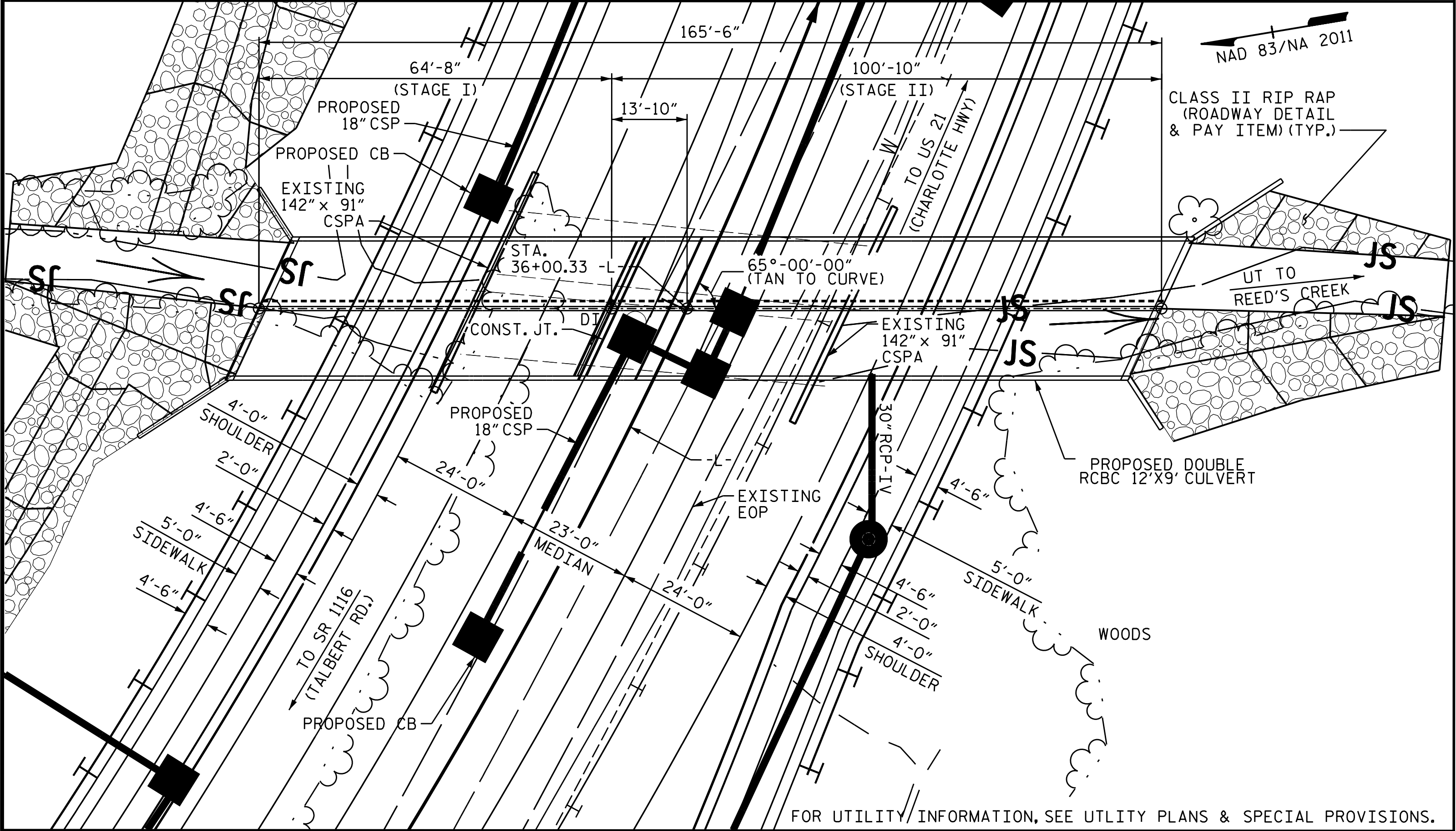
LETTING DATE:
 11 /21 /2023

A. DEAN SARVIS, P.E.
 PROJECT ENGINEER

BRYAN SOWELL, P.E.
 NCDOT DIVISON 12



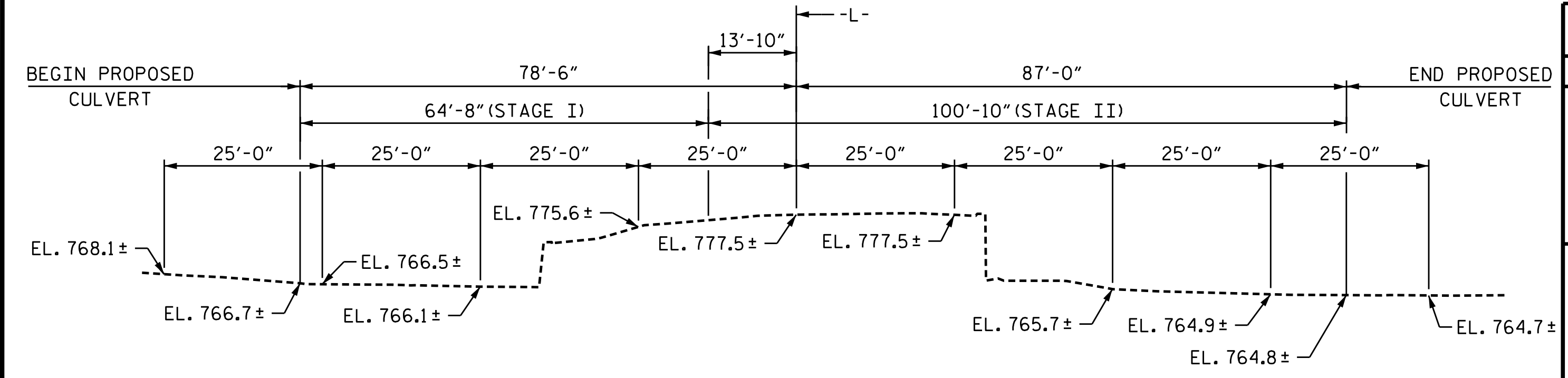
BL-45: 18" REBAR W/ ALUMINUM CAP N670091.02 E1450619.06, STA. 36+75.22 -L-, 29.79' RT., EL.777.24



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.
- DESIGN FILL-----13.25'
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- THE 30" DIA. PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER, THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.
- AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 142" X 91" CMAP LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. SHOULD THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURE DETERIORATE DURING CONSTRUCTION, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- TRAFFIC ON SR 1100 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS DIRECTED BY 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.
- 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.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- 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.
- 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 CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS BOX CULVERT SHALL BE SUBMITTED. SEE SHEET SN.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.



PROFILE ALONG CULVERT

TOTAL STRUCTURE QUANTITIES BY STAGE/PHASE

STAGE I, PHASE A			STAGE I, PHASE B		
CLASS A CONCRETE			CLASS A CONCRETE		
BARREL @ 1.287 CY/FT	83.3	C.Y.	BARREL @ 2.388 CY/FT	154.5	C.Y.
WING ETC.	13.0	C.Y.	WING ETC.	8.0	C.Y.
TOTAL	96.3	C.Y.	TOTAL	162.5	C.Y.
REINFORCING STEEL			REINFORCING STEEL		
BARREL	19,460	LBS.	BARREL	25,955	LBS.
WINGS ETC.	733	LBS.	WINGS ETC.	433	LBS.
TOTAL	20,193	LBS.	TOTAL	26,388	LBS.
STAGE II, PHASE C			STAGE II, PHASE D		
CLASS A CONCRETE			CLASS A CONCRETE		
BARREL @ 1.287 CY/FT	129.8	C.Y.	BARREL @ 2.388 CY/FT	240.8	C.Y.
WING ETC.	8.0	C.Y.	WING ETC.	12.0	C.Y.
TOTAL	137.8	C.Y.	TOTAL	252.8	C.Y.
REINFORCING STEEL			REINFORCING STEEL		
BARREL	30,138	LBS.	BARREL	39,850	LBS.
WINGS ETC.	433	LBS.	WINGS ETC.	733	LBS.
TOTAL	30,571	LBS.	TOTAL	40,583	LBS.

FOUNDATION NOTES

EXCAVATE FOUNDATION A MINIMUM OF 3.0 FEET BELOW CULVERT BEARING ELEVATION. PLACE 3.0 FEET OF CLASS VI FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS. ENCAPSULATE FOUNDATION CONDITIONING MATERIAL WITH TYPE 2 GEOTEXTILE, SEE SPECIAL PROVISION.

CONSTRUCT THE REINFORCED CONCRETE BOX CULVERT AT -L- STATION 36+00.33 WITH 4" OF CAMBER TO ACCOUNT FOR ANTICIPATED SETTLEMENT.

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE AT STATION 36+00.33 -L-	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
CLASS A CONCRETE	649.4 C.Y.
REINFORCING STEEL	117,735 LBS
FOUNDATION CONDITIONING GEOTEXTILE, BOX CULVERT	
PHASE A	356 S.Y.
PHASE B	304 S.Y.
PHASE C	513 S.Y.
PHASE D	438 S.Y.
TOTAL	1611 S.Y.
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	
PHASE A	199 TONS
PHASE B	161 TONS
PHASE C	310 TONS
PHASE D	251 TONS
TOTAL	921 TONS

HYDRAULIC DATA

DESIGN DISCHARGE	=	1600 CFS
FREQUENCY OF DESIGN FLOOD	=	50 YR
DESIGN HIGH WATER ELEVATION	=	774.3
DRAINAGE AREA	=	1.0 SQ. MI.
BASIC DISCHARGE (Q100)	=	1800 CFS
BASIC HIGH WATER ELEVATION	=	775.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	N/A
FREQUENCY OF OVERTOPPING FLOOD	=	>500+ YR
OVERTOPPING FLOOD ELEVATION	=	785.7

ROADWAY DATA

GRADE POINT ELEV. @ STATION 36+00.33 -L-	=	783.32
BED ELEV. @ STATION	=	764.20
ROADWAY SLOPES	=	2:1

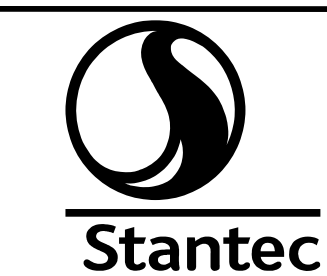
PROJECT NO. R-3833C
 IREDELL COUNTY
 STATION: 36+00.33 -L-

REPLACES BRIDGE NO. 480045

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT.
 CONCRETE BOX CULVERT
 65° 00'00" SKEW

DRAWN BY: J. B. GEILE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE: 05/04/23



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-01
1			3			TOTAL SHEETS 16
2			4			

5/14/2023 4:00:40 PM jgelle

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 (γ _{LL})	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	2.25	--	1.75	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.21	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HL-93 (OPERATING)	N/A		2.25	--	1.35	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.16	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HS-20 (INVENTORY)	36.000	②	2.25	83.52	1.75	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	2.26	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HS-20 (OPERATING)	36.000		2.25	83.52	1.35	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	2.94	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.70	37.53	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	9.02	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNGARBS2	20.000		2.70	55.60	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	6.49	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNAGRIS2	22.000		2.70	61.16	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	6.05	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNCOTTS3	27.250		2.70	75.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.37	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNAGGRS4	34.925		2.70	97.09	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.69	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNS5A	35.550		2.70	98.83	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.64	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNS6A	39.950		2.69	111.06	1.40	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.39	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.70	91.74	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.22	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT4A	33.075		2.70	91.95	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.18	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT6A	41.600		2.70	115.65	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.58	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT7A	42.000		2.70	116.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.53	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT7B	42.000		2.70	116.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.69	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNAGRIT4	43.000		2.70	119.54	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.33	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNAGT5A	45.000		2.70	125.10	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.33	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
TNAGT5B	45.000	③	2.69	125.10	1.40	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.04	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.70	77.62	1.30	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	5.00	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	EV3	43.000	④	2.69	115.67	1.30	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.44	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	

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	--

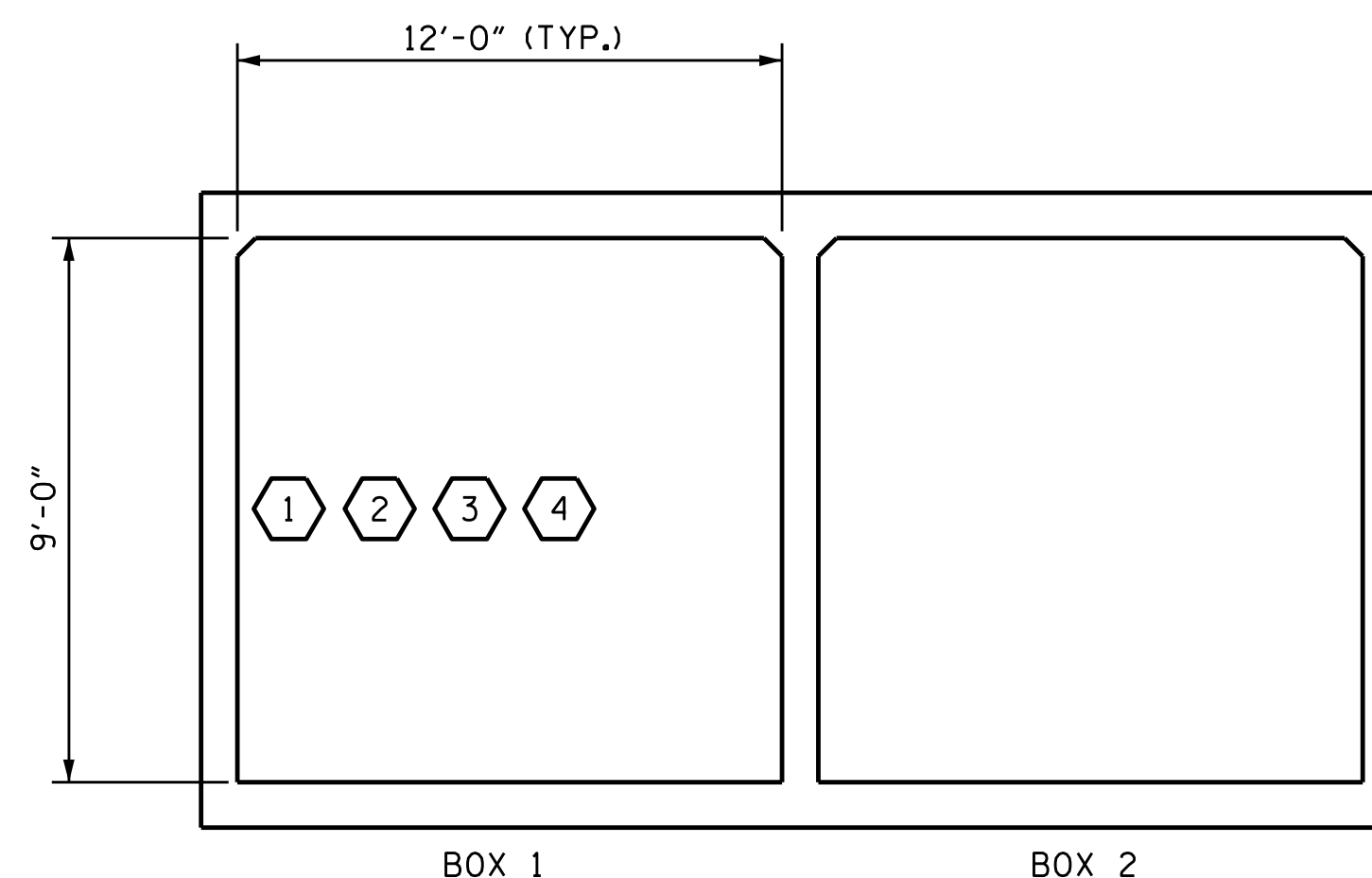
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1. MAXIMUM FILL CONDITION CONTROLS
- 2.
- 3.
- 4.

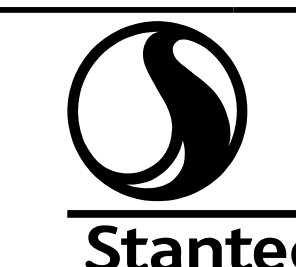
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
④	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



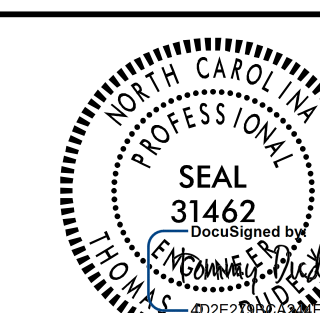
LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY: J. B. GETLE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 08/22/23



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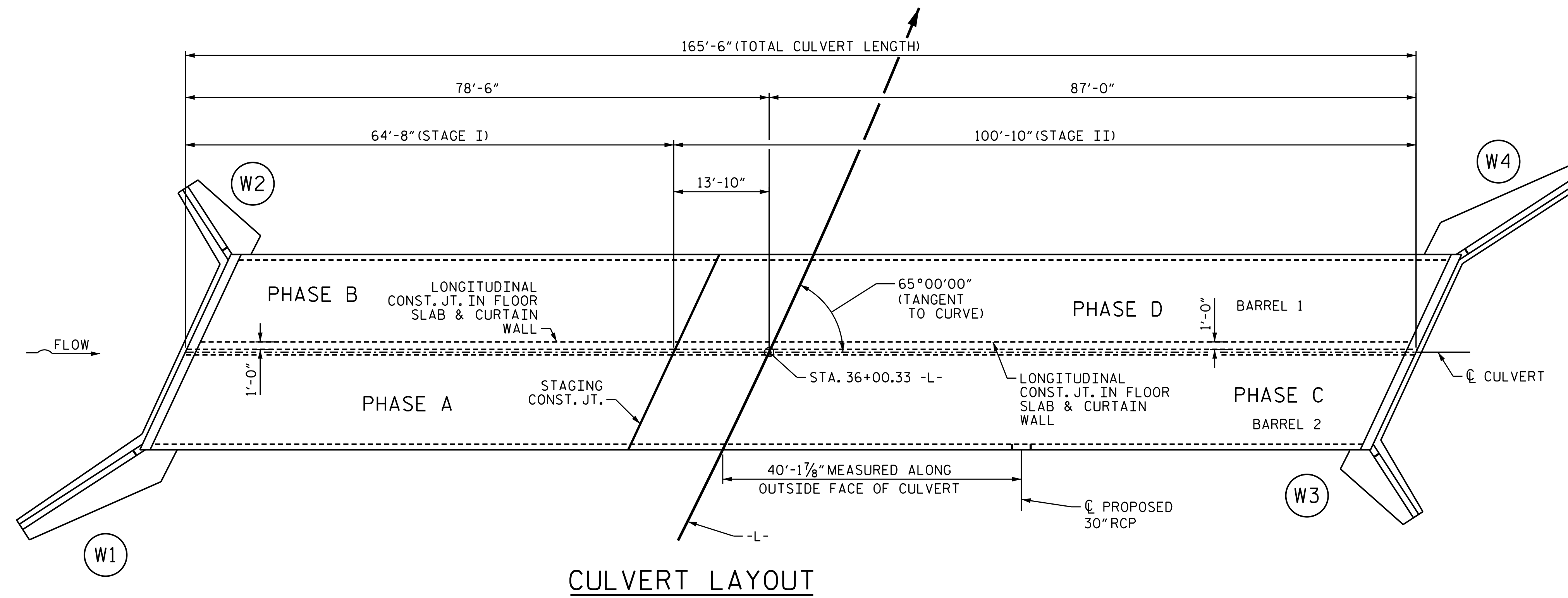
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

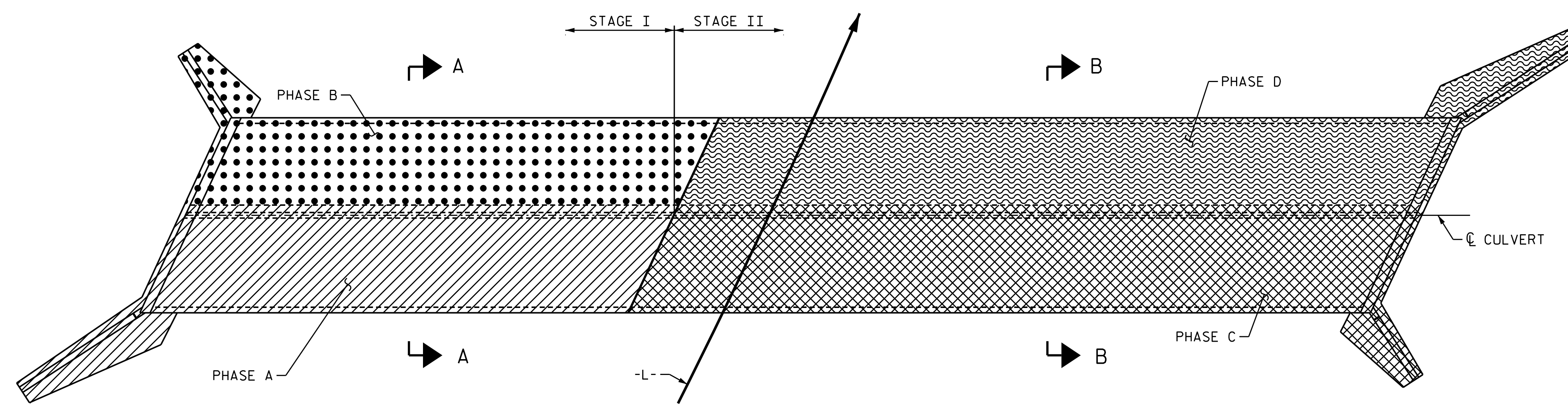
**LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-02
1			3			TOTAL SHEETS
2			4			16

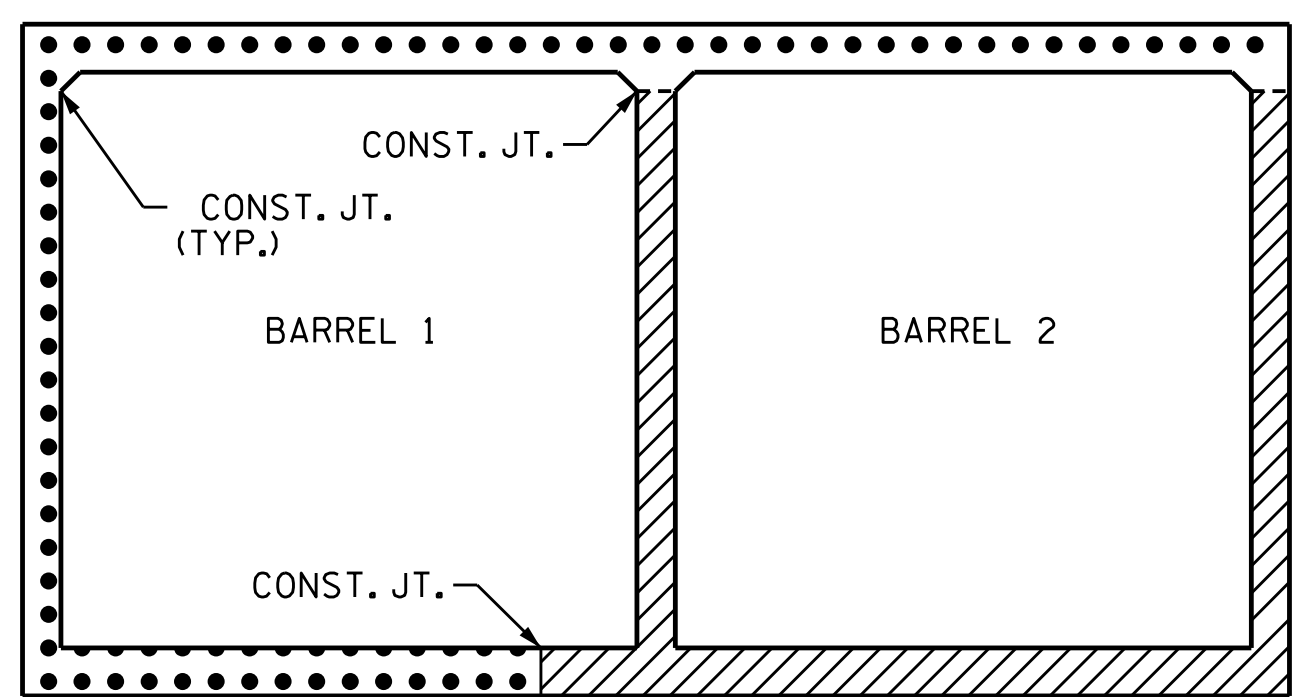
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CULVERT LAYOUT

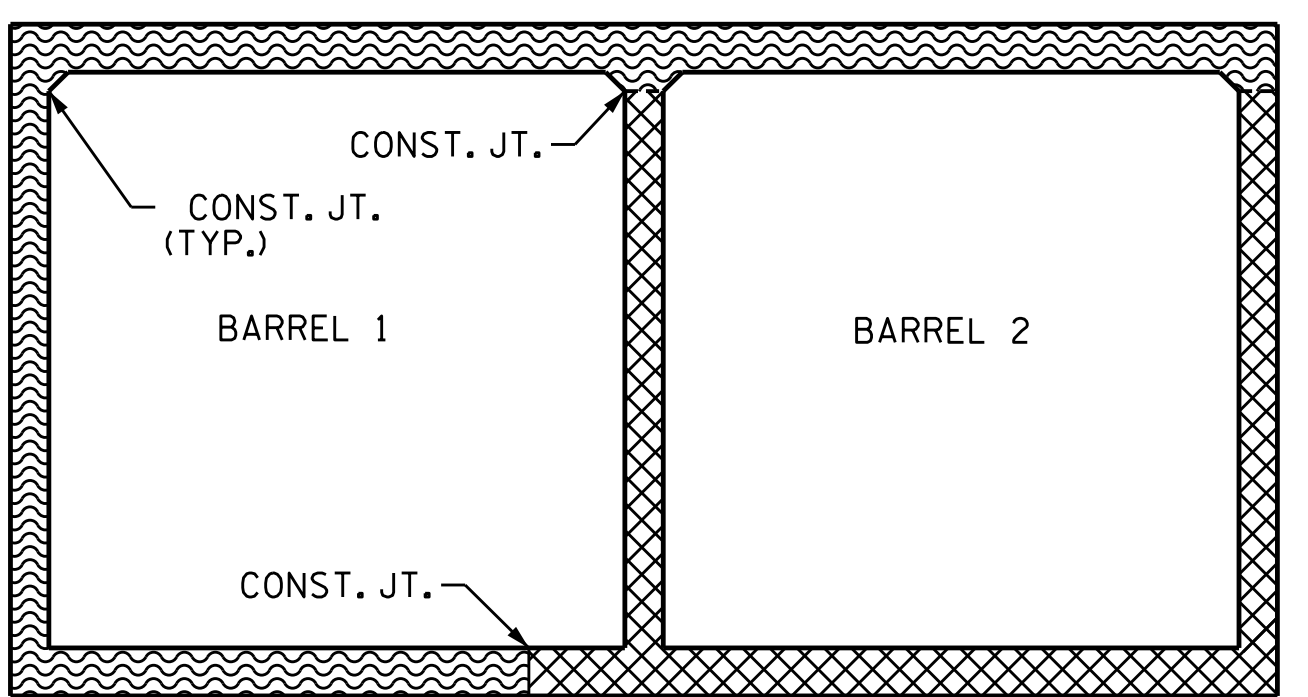


PLAN OF FLOOR SLAB



SECTION A-A

STAGE I (PHASE A)
 STAGE I (PHASE B)



SECTION B-B

STAGE II (PHASE C)
 STAGE II (PHASE D)

CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:

STAGE I:

PHASE A
 CONSTRUCT WING W1 FOOTING AND WALL TO CONSTRUCTION JOINT, BARREL 2 FLOOR SLAB, 1'-0" FLOOR SLAB EXTENSION INTO BARREL 1, 4" HEIGHT OF BARREL 2 WALLS (EXTERIOR AND INTERIOR) TO CONSTRUCTION JOINT, LOWER CURTAIN WALL AT CULVERT INLET OF BARREL 2 TO CONSTRUCTION JOINT, AND LOWER EDGE BEAM OF BARREL 2 TO CONSTRUCTION JOINT.

CONSTRUCT REMAINING PORTION OF BARREL 2 WALLS (EXTERIOR AND INTERIOR) ABOVE CONSTRUCTION JOINT AND WING W1 ABOVE CONSTRUCTION JOINT TO FULL HEIGHT.

PHASE B
 CONSTRUCT WING W2 FOOTING AND WALL TO CONSTRUCTION JOINT, REMAINING BARREL 1 FLOOR SLAB, 4" HEIGHT OF BARREL 1 WALL (EXTERIOR) TO CONSTRUCTION JOINT, REMAINING LOWER CURTAIN WALL AT CULVERT INLET OF BARREL 1 TO CONSTRUCTION JOINT, AND REMAINING LOWER EDGE BEAM OF BARREL 1 TO CONSTRUCTION JOINT.

CONSTRUCTION REMAINING PORTION OF BARREL 1 WALL (EXTERIOR) ABOVE CONSTRUCTION JOINT AND WING W2 ABOVE CONSTRUCTION JOINT TO FULL HEIGHT.

CONSTRUCT, ROOF SLAB, UPPER EDGE BEAM AT CONSTRUCTION JOINT, AND HEADWALL AT INLET END.

STAGE II:

PHASE C
 CONSTRUCT WING W3 FOOTING AND WALL TO CONSTRUCTION JOINT, BARREL 2 FLOOR SLAB, 1'-0" FLOOR SLAB EXTENSION INTO BARREL 1, 4" HEIGHT OF BARREL 2 WALLS (EXTERIOR AND INTERIOR) TO CONSTRUCTION JOINT, LOWER CURTAIN WALL AT CULVERT OUTLET OF BARREL 2 TO CONSTRUCTION JOINT, AND LOWER EDGE BEAM OF BARREL 2 TO CONSTRUCTION JOINT.

CONSTRUCT REMAINING PORTION OF BARREL 2 WALLS (EXTERIOR AND INTERIOR) ABOVE CONSTRUCTION JOINT AND WING W3 ABOVE CONSTRUCTION JOINT TO FULL HEIGHT.

PHASE D
 CONSTRUCT WING W4 FOOTING AND WALL TO CONSTRUCTION JOINT, REMAINING BARREL 1 FLOOR SLAB, 4" HEIGHT OF BARREL 1 WALL (EXTERIOR) TO CONSTRUCTION JOINT, REMAINING LOWER CURTAIN WALL AT CULVERT OUTLET OF BARREL 1 TO CONSTRUCTION JOINT, AND REMAINING LOWER EDGE BEAM OF BARREL 1 TO CONSTRUCTION JOINT.

CONSTRUCTION REMAINING PORTION OF BARREL 1 WALL (EXTERIOR) ABOVE CONSTRUCTION JOINT, AND WING W4 ABOVE CONSTRUCTION JOINT TO FULL HEIGHT.

CONSTRUCT ROOF SLAB, UPPER EDGE BEAM AT CONSTRUCTION JOINT, AND HEADWALL AT OUTLET END.

NOTE:
 FOR TRAFFIC PHASING AND SHORING REQUIREMENTS,
 SEE PROJECT TRANSPORTATION MANAGEMENT PLANS

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STAGING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-03
1			3			TOTAL SHEETS
2			4			16

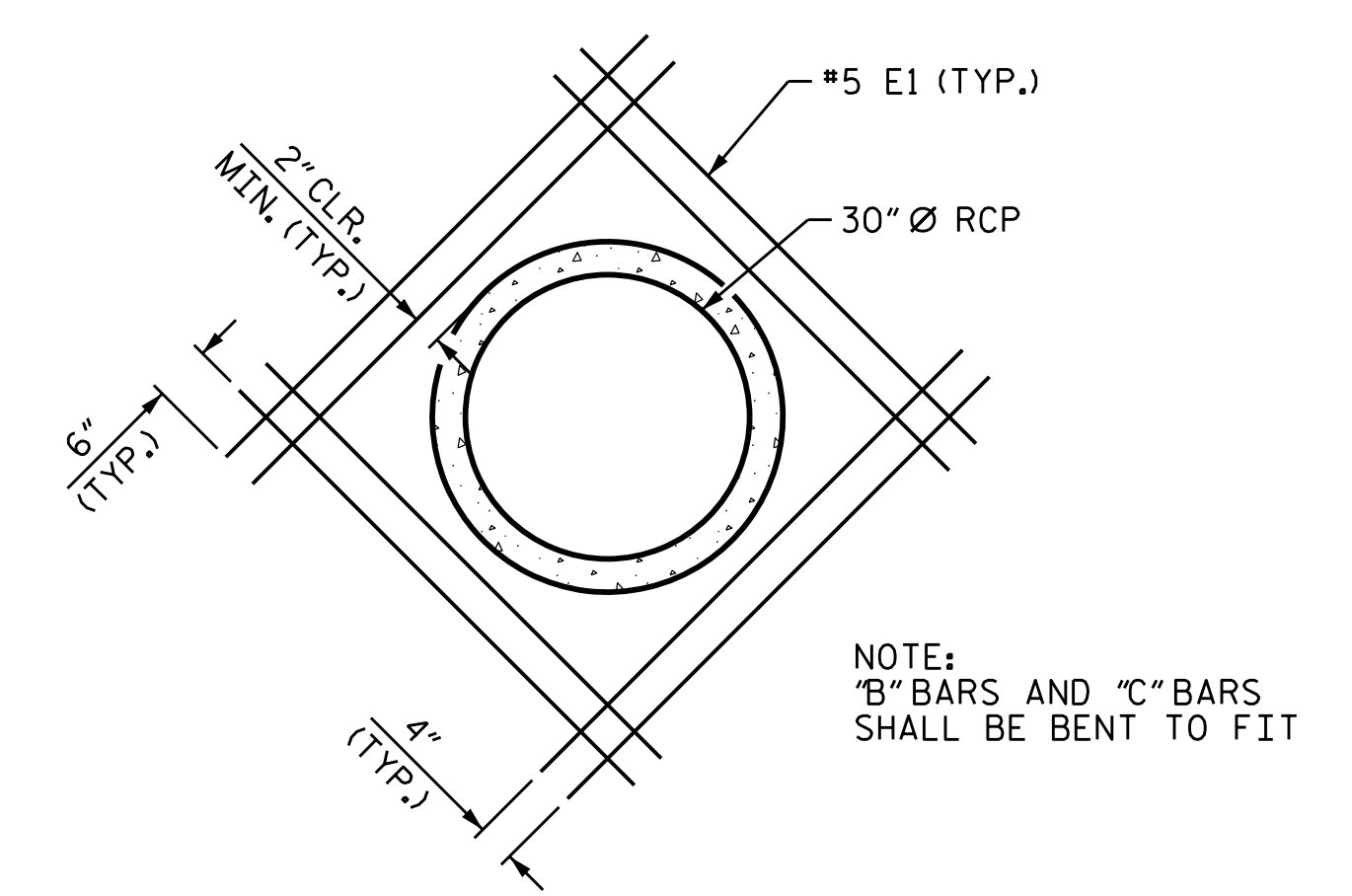
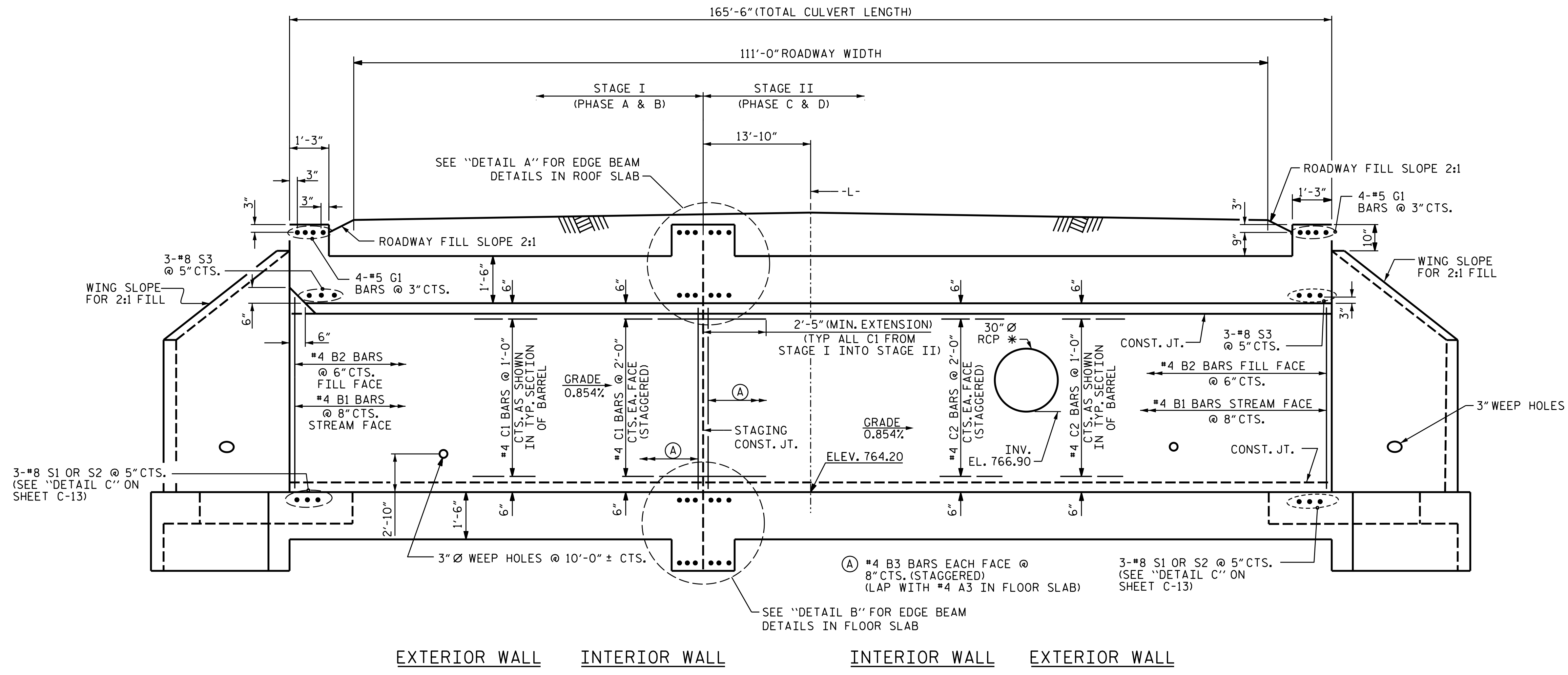
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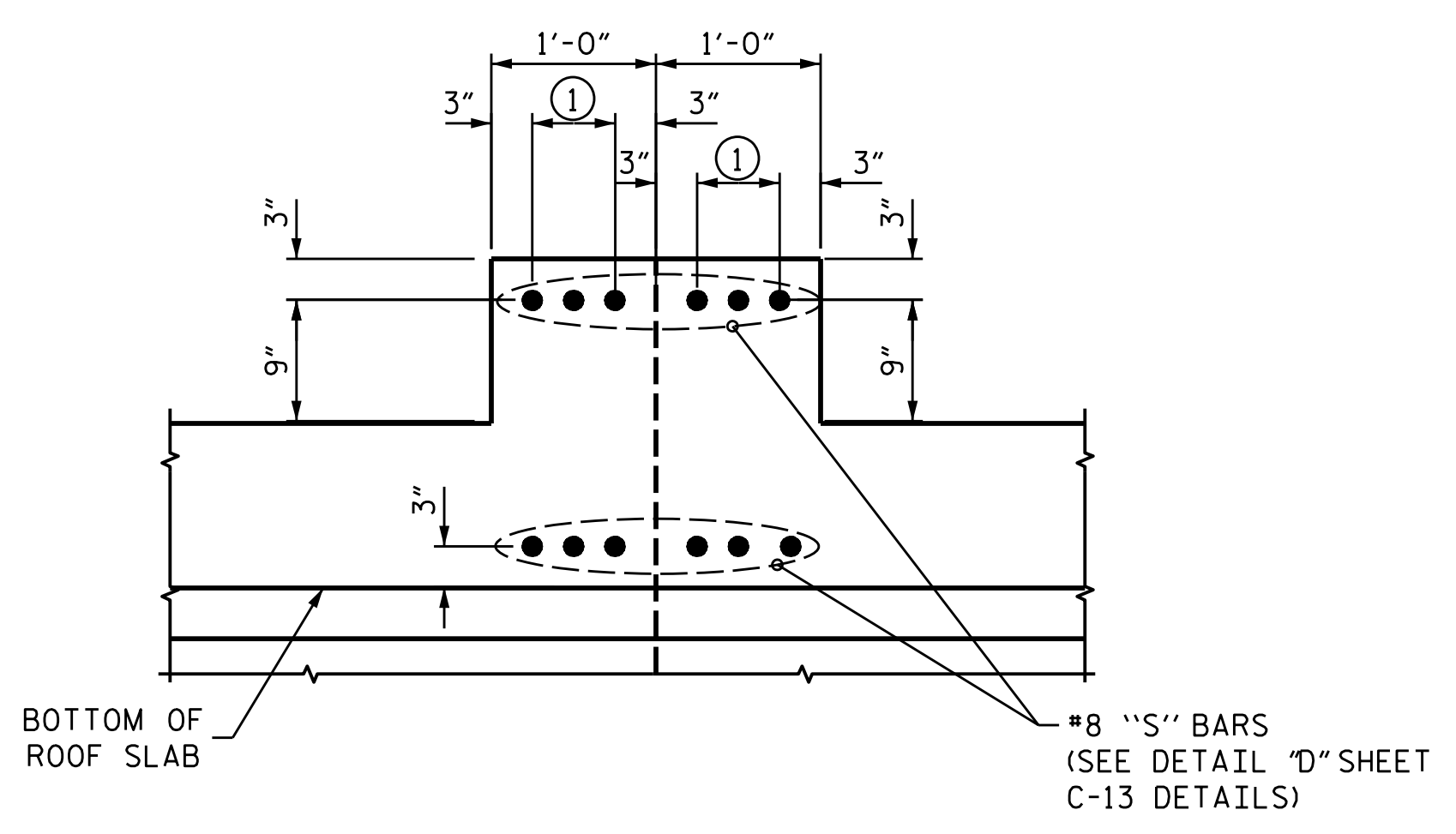
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CULVERT SECTION NORMAL TO ROADWAY

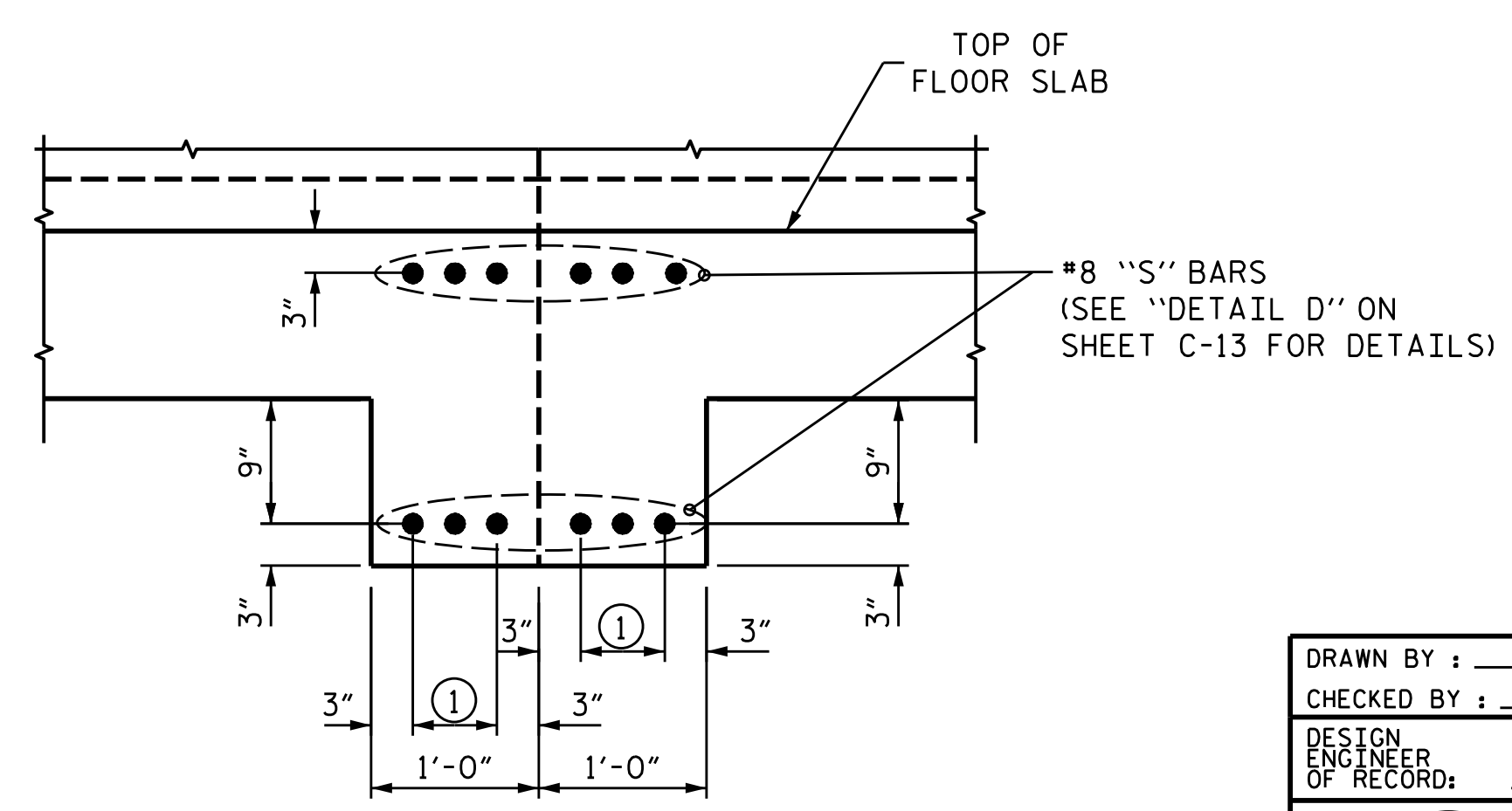
* SEE "DETAILS OF REINFORCING AROUND 30" RCP" FOR REINFORCING DETAILS, SEE SHEET C-03 FOR PLAN VIEW LOCATION OF 30" RCP.

DETAIL OF REINFORCING AROUND 30" RCP



DETAIL A

① 2 SPACES @ 3" CTS.



DETAIL B

① 2 SPACES @ 3" CTS.

DRAWN BY: J. B. GETLE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE: 05/04/23



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PROJECT NO. R-3833C
 IREDELL COUNTY
 STATION: 36+00.33 -L-

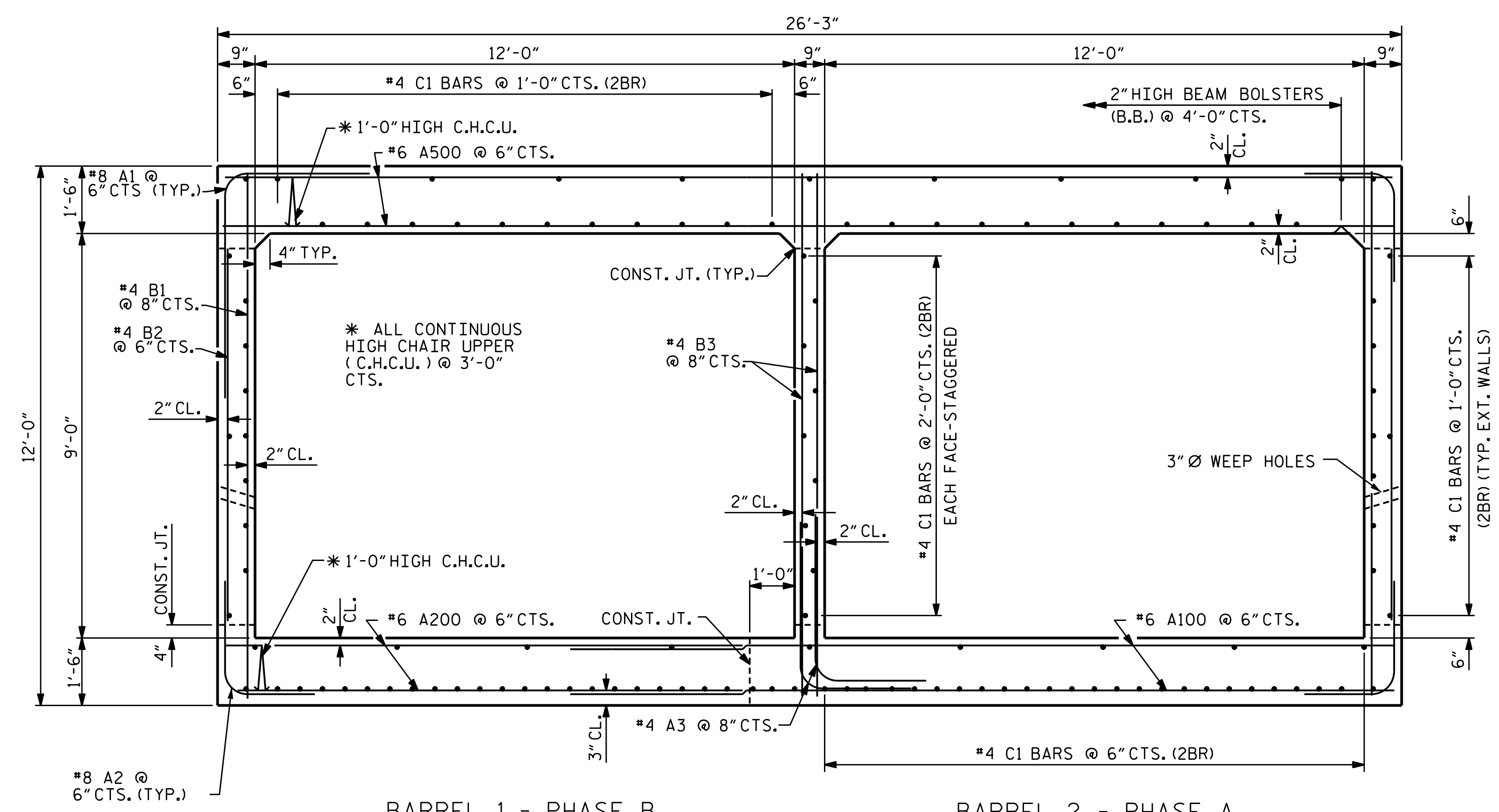
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
 65°00'00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-04
1			3			TOTAL SHEETS
2			4			16

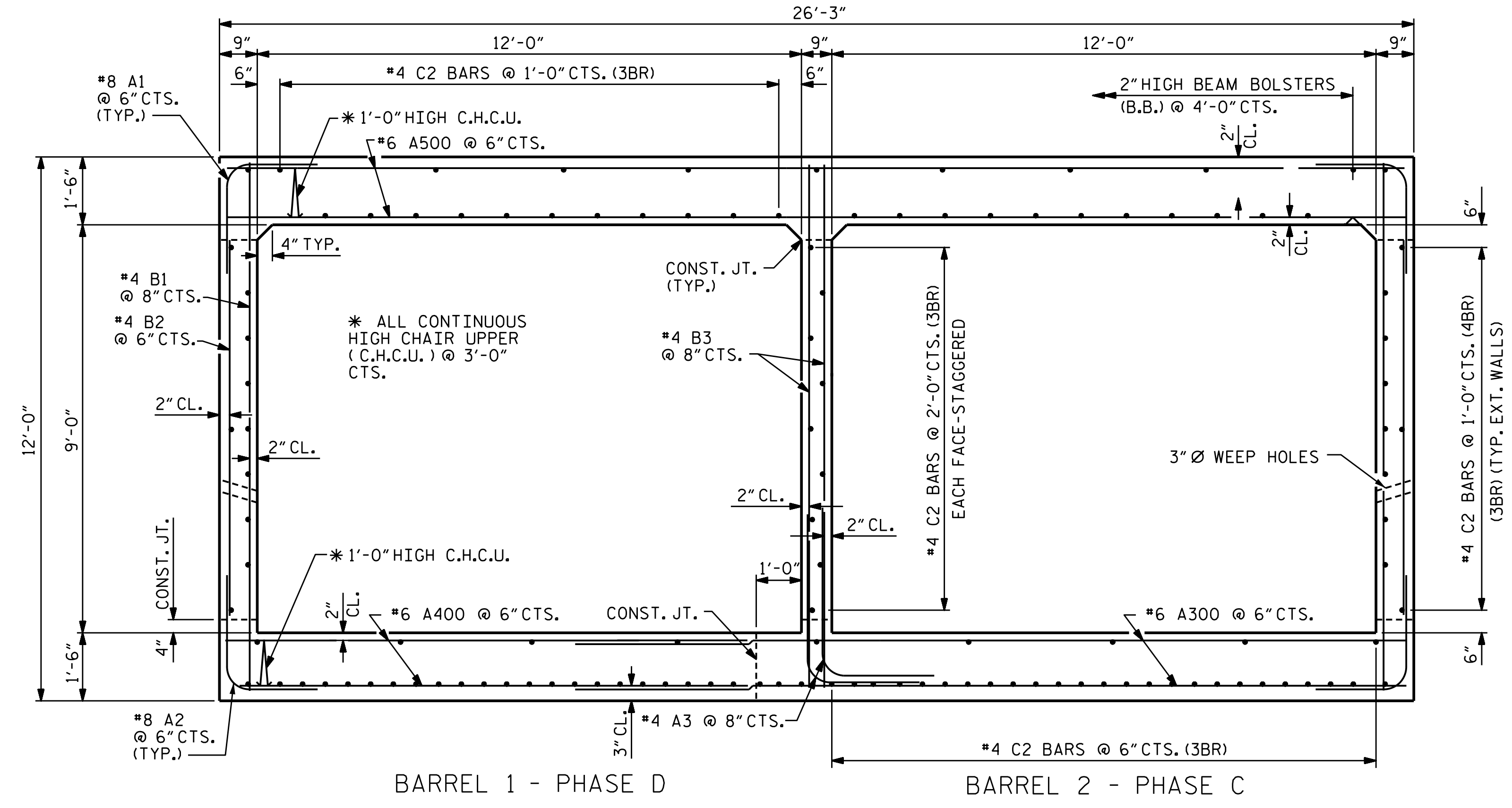
5/14/2023 4:40:02 PM jgelle

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BARREL 1 - PHASE B BARREL 2 - PHASE A
RIGHT ANGLE SECTION OF BARREL - STAGE I

THERE ARE 121 "C" BARS IN SECTION OF BARREL.
 (LOOKING DOWNSTREAM)



BARREL 1 - PHASE D BARREL 2 - PHASE C
RIGHT ANGLE SECTION OF BARREL - STAGE II

THERE ARE 121 "C" BARS IN SECTION OF BARREL.
 (LOOKING DOWNSTREAM)

NOTES:

- (2BR) DENOTES 2 BAR RUN
- (3BR) DENOTES 3 BAR RUN
- REFER TO SHEET 14 OF 16 FOR SILL AND BAFFLE DETAIL
- "C" BARS MAY BE SHIFTED AS NECESSARY FOR LONGITUDINAL CONSTRUCTION JOINT.

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**DOUBLE 12 FT. X 9 FT.
 CONCRETE BOX CULVERT
 65°00'00" SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-05
1			3			TOTAL SHEETS
2			4			16

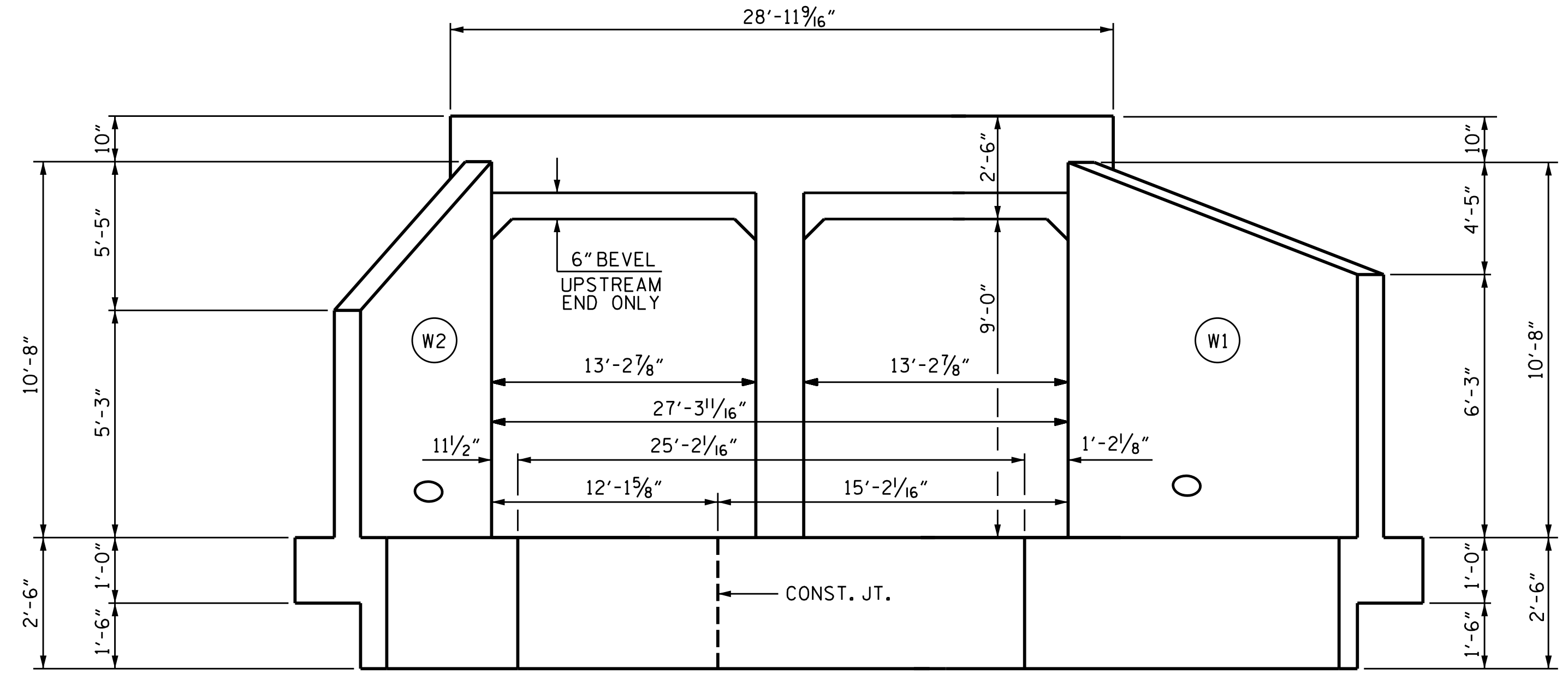
DRAWN BY: J. B. GETLE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE: 05/04/23

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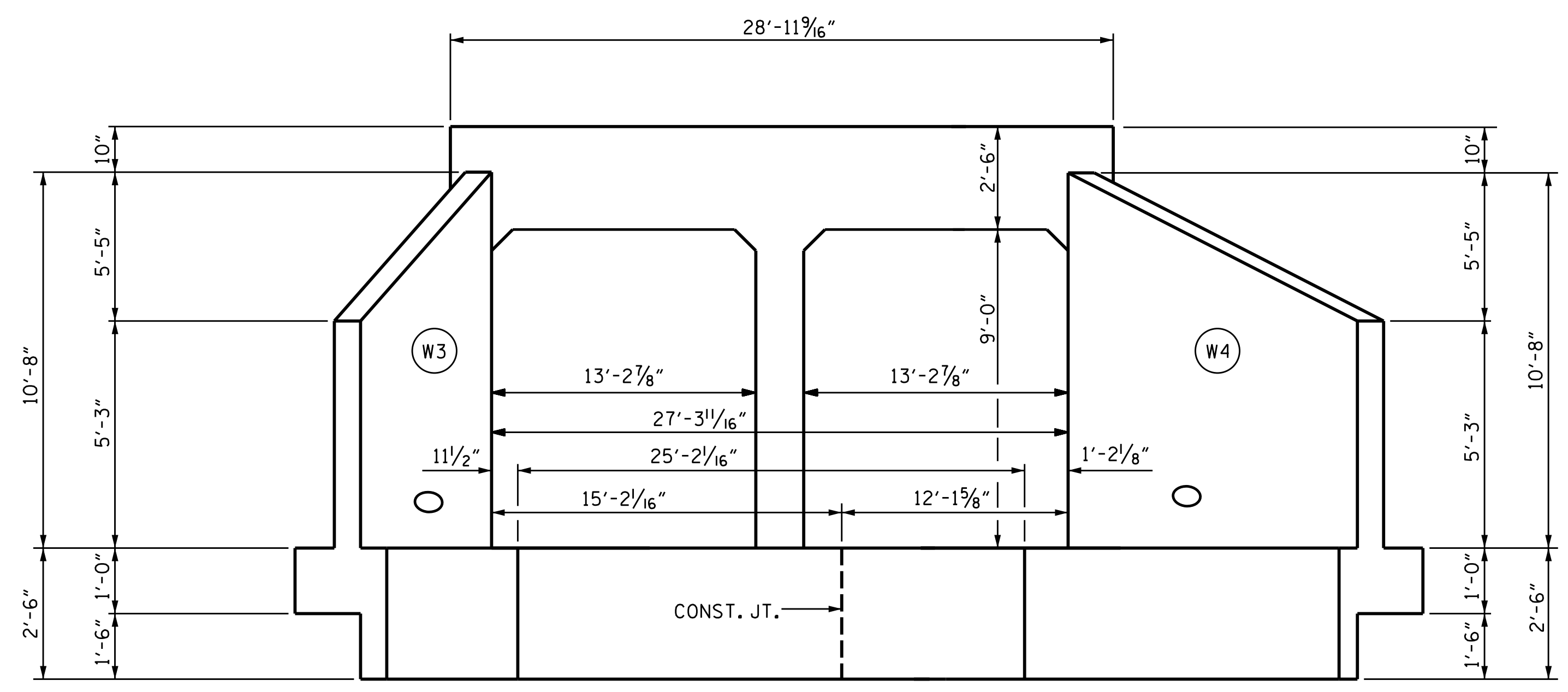
Malinda Isenhour
 57472023

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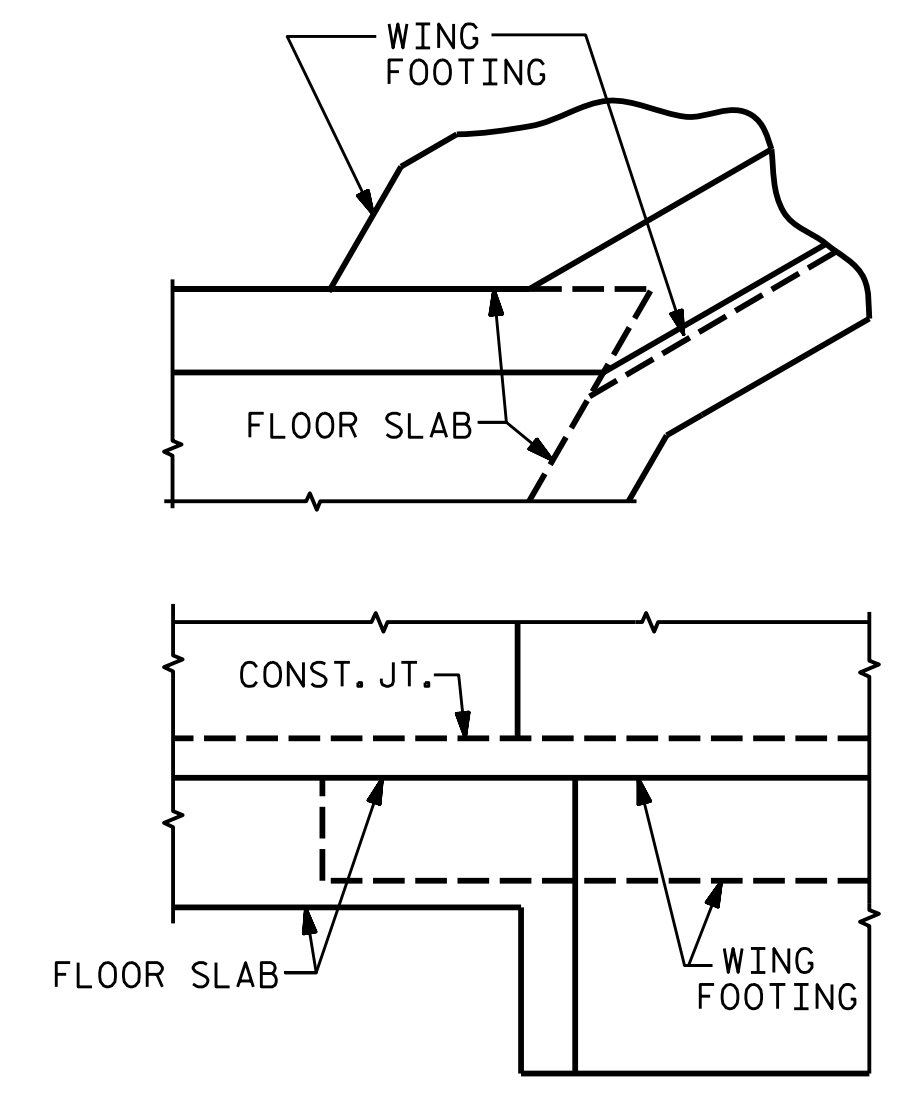
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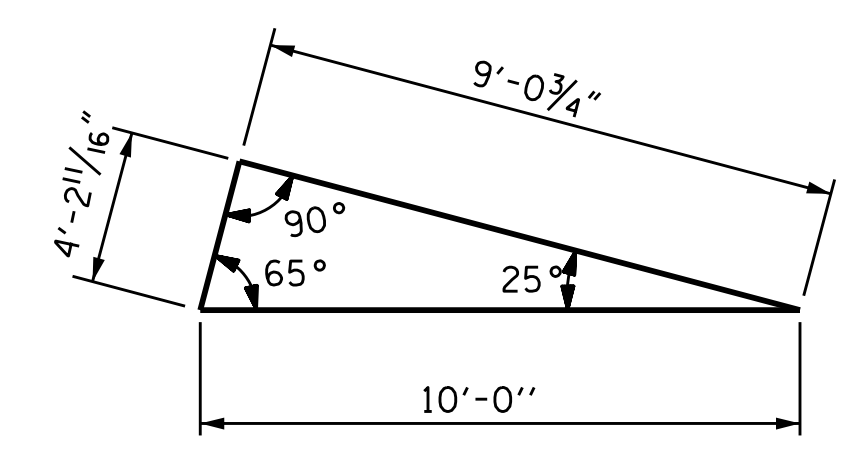
END ELEVATION NORMAL TO SKEW - INLET
(LOOKING DOWNSTREAM)



END ELEVATION NORMAL TO SKEW - OUTLET
(LOOKING UPSTREAM)




DETAIL
CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING




SKEW TRIANGLE

PROJECT NO. R-3833C
IREDELL COUNTY
STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23



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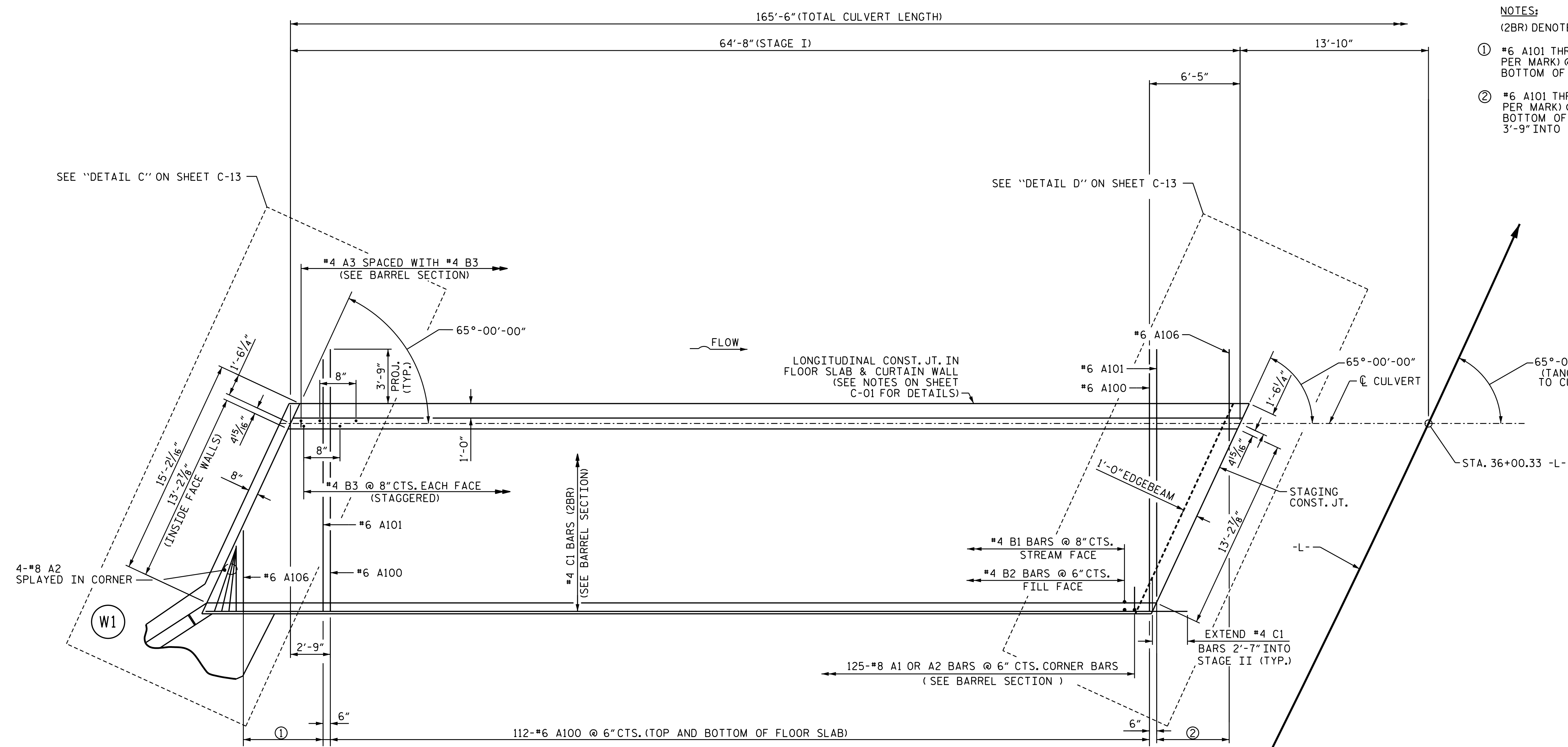
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD
DOUBLE 12 FT. X 9 FT.
CONCRETE BOX CULVERT
65°00'00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-06
1			3			TOTAL SHEETS
2			4			16

5/14/2023 4:11:36 PM jgeille

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- NOTES:**
 (2BR) DENOTES 2 BAR RUN
- ① #6 A101 THRU #6 A106 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB)
 - ② #6 A101 THRU #6 A106 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB) (EXTEND 3'-9" INTO STAGE I PHASE B)

FLOOR SLAB PLAN - STAGE I PHASE A

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23

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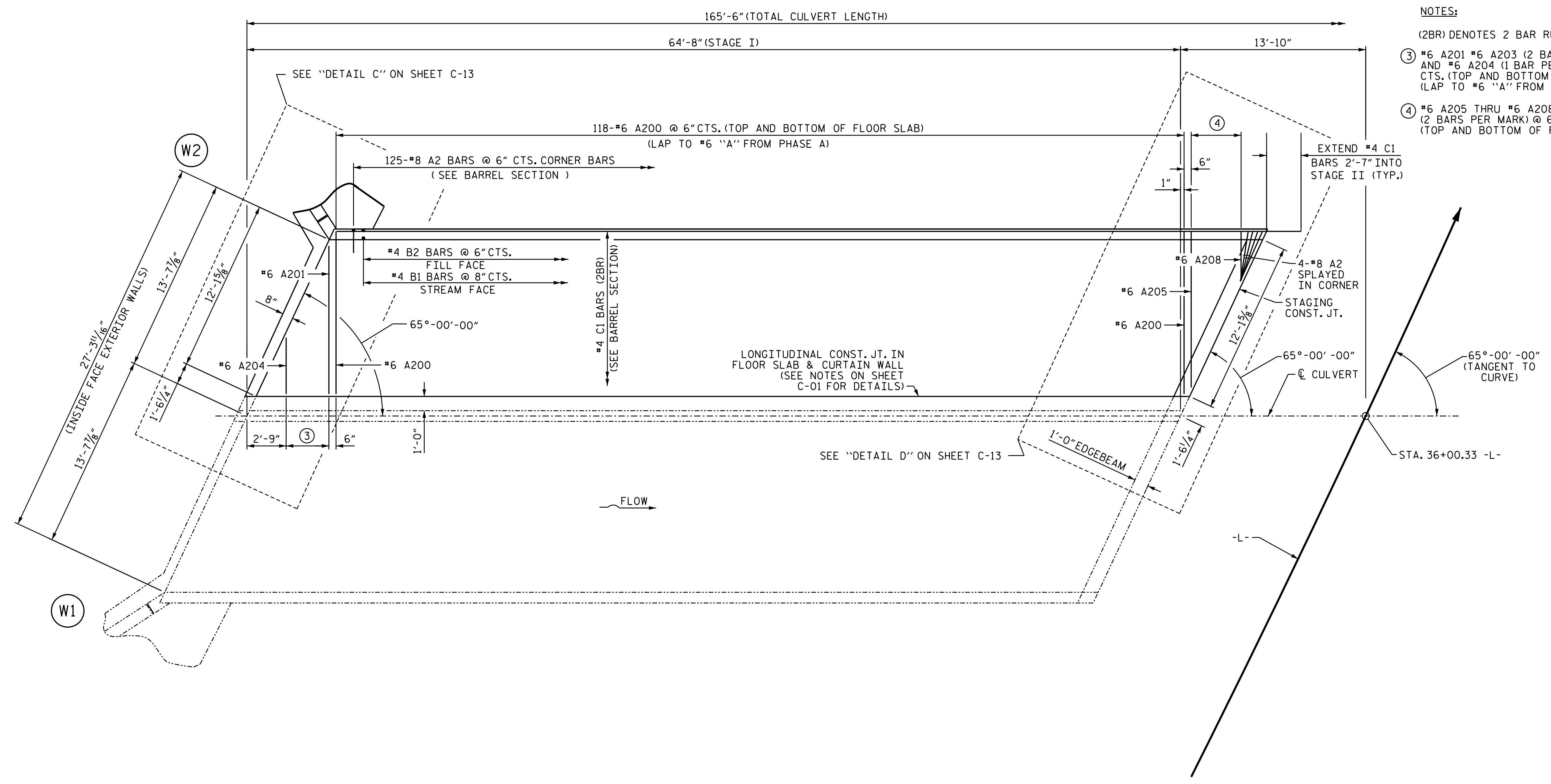
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
65°00'00" SKEW
STAGE I - PHASE A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-07
1			3			TOTAL SHEETS
2			4			16

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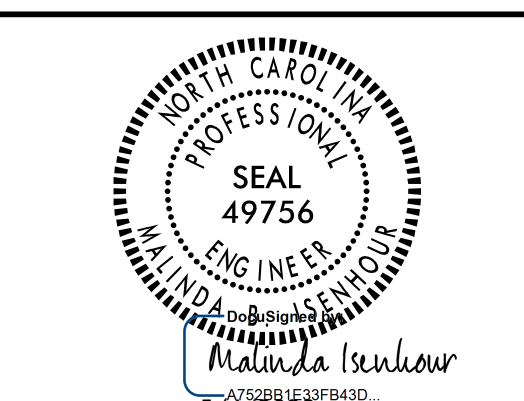
- NOTES:**
- (2BR) DENOTES 2 BAR RUN
 - ③ #6 A201 #6 A203 (2 BARS PER MARK) AND #6 A204 (1 BAR PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB) (LAP TO #6 "A" FROM PHASE A)
 - ④ #6 A205 THRU #6 A208 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB)

FLOOR SLAB PLAN - STAGE I PHASE B

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23

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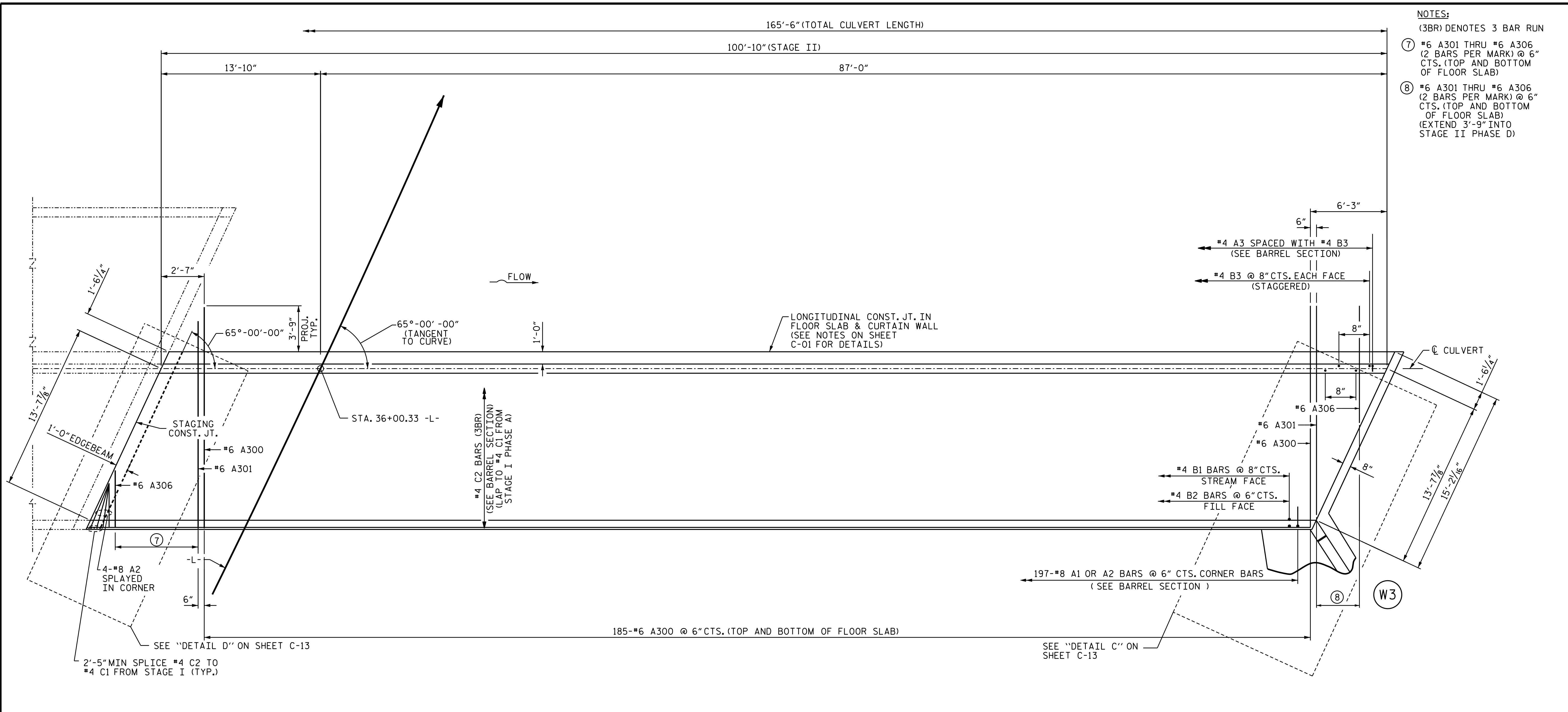
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
 65°00'00" SKEW
 STAGE I PHASE B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-08
1			3			TOTAL SHEETS
2			4			16

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- NOTES:**
 (3BR) DENOTES 3 BAR RUN
 (7) #6 A301 THRU #6 A306 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB)
 (8) #6 A301 THRU #6 A306 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB) (EXTEND 3'-9" INTO STAGE II PHASE D)

FLOOR SLAB PLAN - STAGE II PHASE C

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23

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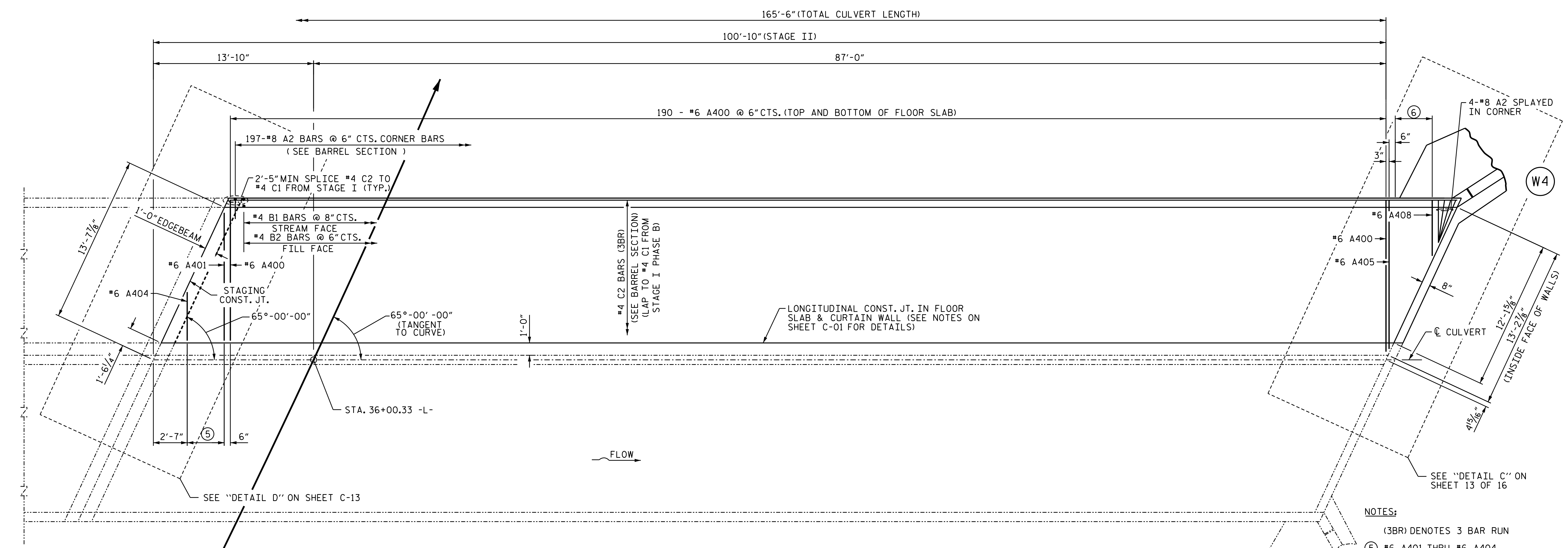
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
 65°00'00" SKEW
 STAGE II - PHASE C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-09
1			3			TOTAL SHEETS
2			4			16

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FLOOR SLAB PLAN - STAGE II PHASE D

- NOTES:**
- (3BR) DENOTES 3 BAR RUN
 - ⑤ #6 A401 THRU #6 A404 (2 BARS PER MARK) AND @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB) (LAP TO #6 "A" FROM PHASE C)
 - ⑥ #6 A405 THRU #6 A408 (2 BARS PER MARK) @ 6" CTS. (TOP AND BOTTOM OF FLOOR SLAB)

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY: J. B. GETLE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
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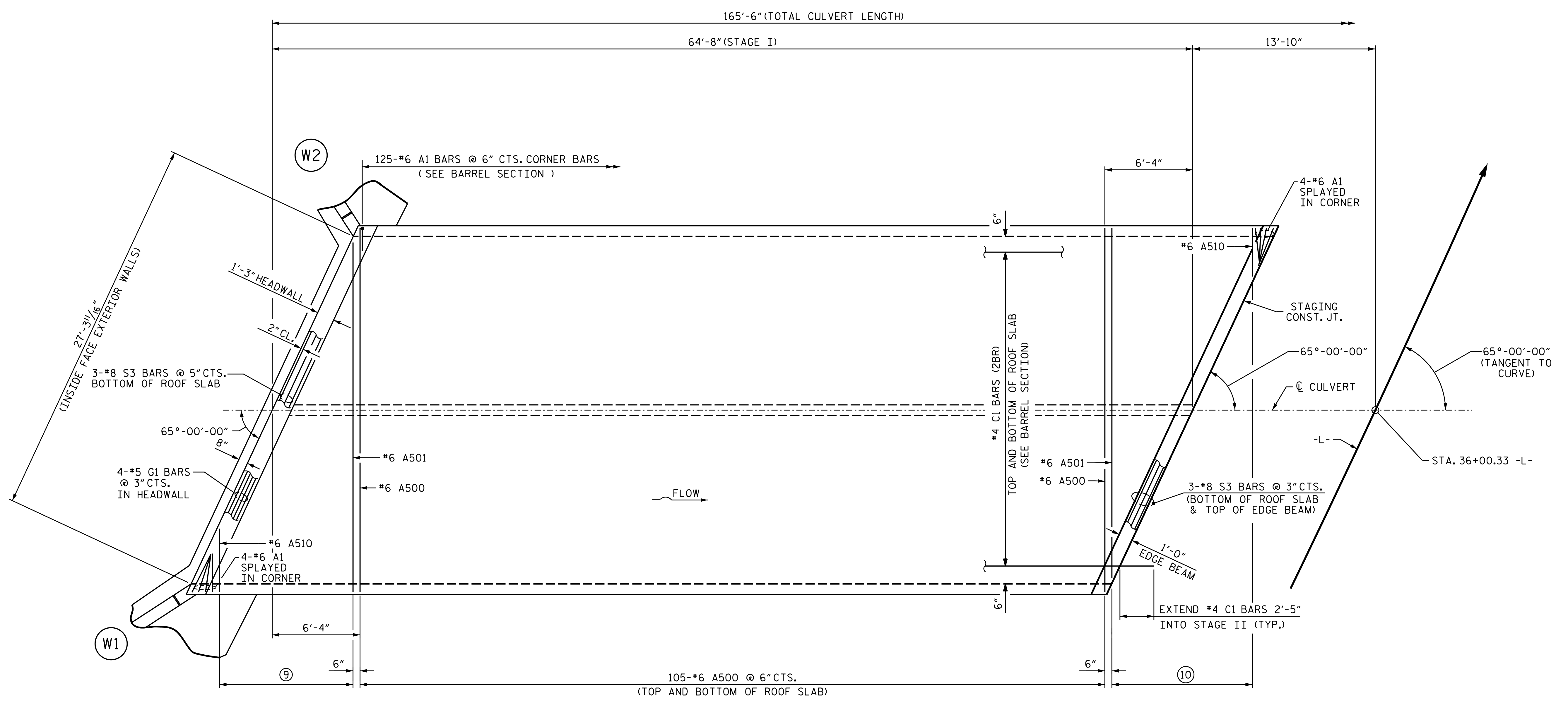
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
 65°00'00" SKEW
 STAGE II - PHASE D

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

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ROOF SLAB PLAN - STAGE I

(2BR) DENOTES 2 BAR RUN

⑨ AND ⑩ #6 A501 THRU #6 A510 (2 BARS PER MARK) @ 6" CTS. TOP AND BOTTOM OF ROOF SLAB

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23



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STATE OF NORTH CAROLINA
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 RALEIGH

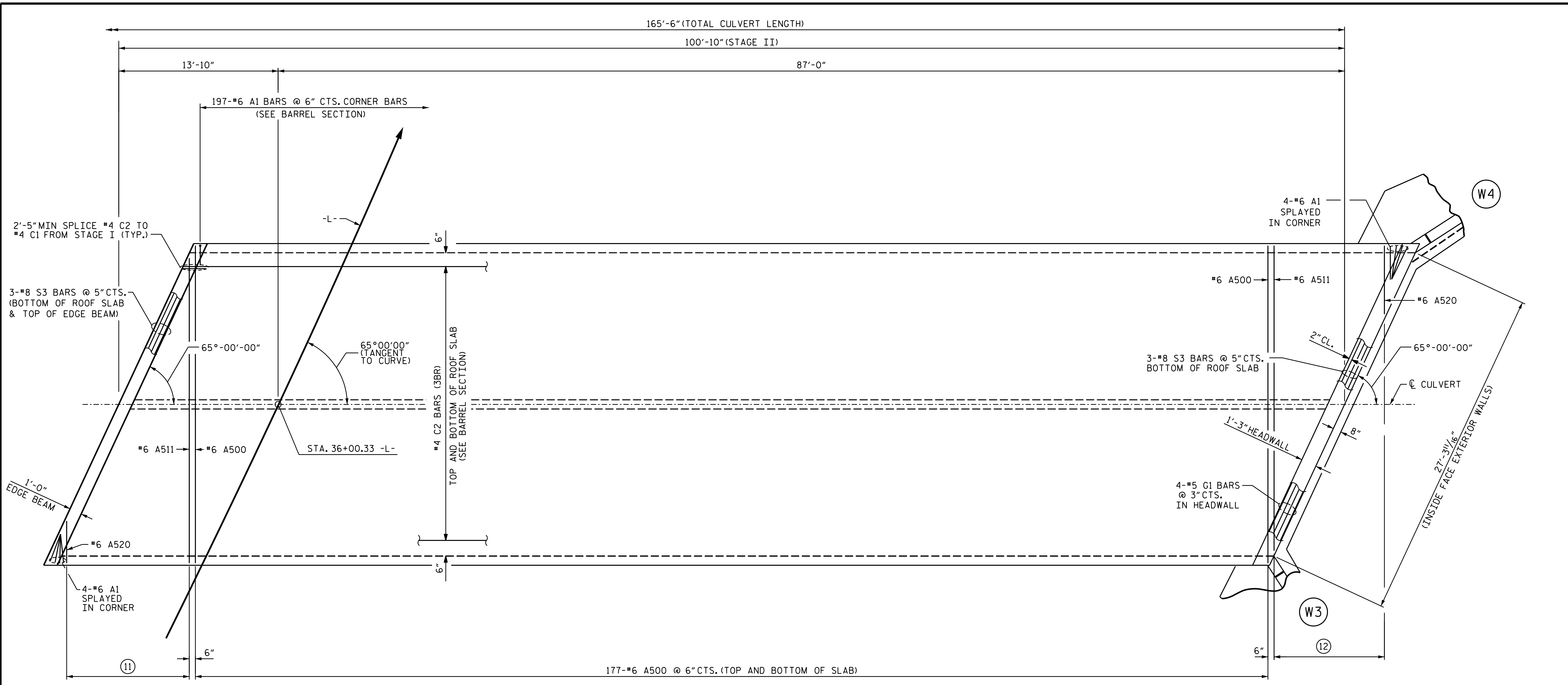
DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
 65°00'00" SKEW
 STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			16

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5/14/2023 4:44:55 PM jgeille

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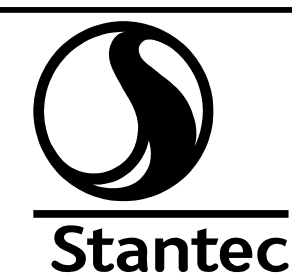
ROOF SLAB PLAN - STAGE II

(3BR) DENOTES 3 BAR RUN

(11) AND (12) #6 A511 THRU #6 A520 (2 BARS PER MARK) @ 6" CTS. TOP AND BOTTOM OF ROOF SLAB

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 05/04/23



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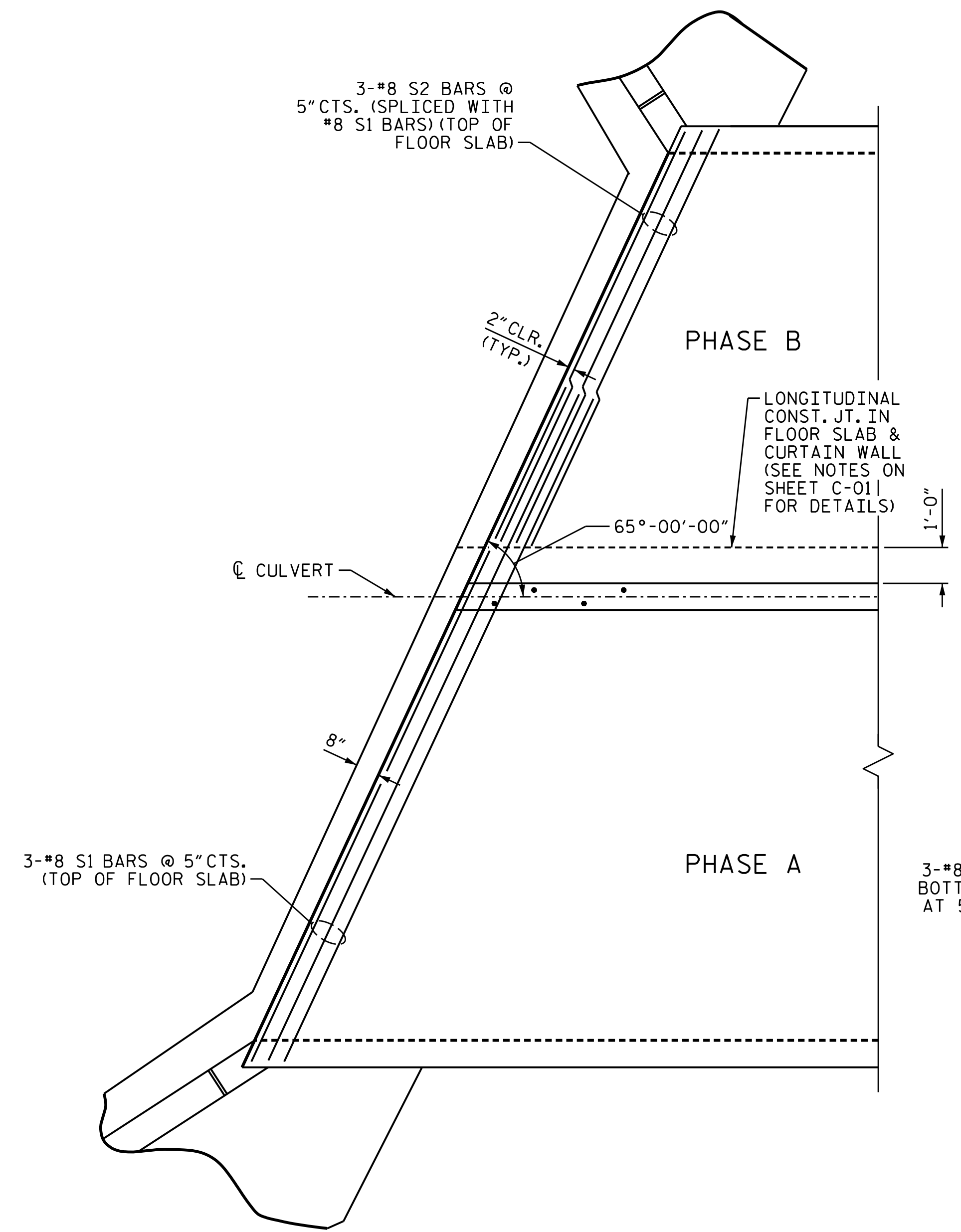
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 12 FT. X 9 FT. CONCRETE BOX CULVERT
65°00'00" SKEW
STAGE II

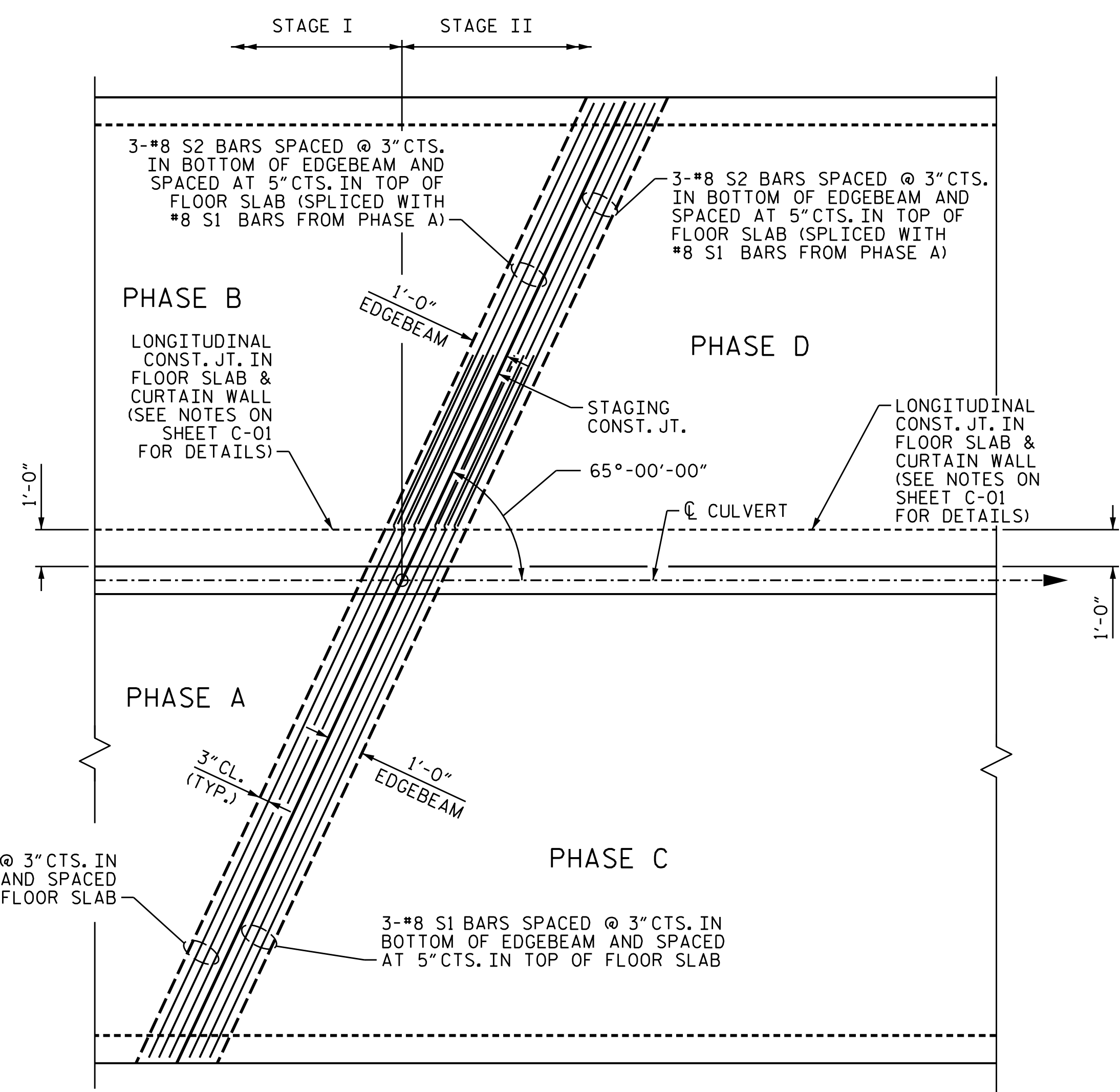
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NO.	BY:	DATE:	NO.	BY:	DATE:	C-12
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2			4			16

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DETAIL C
 STAGE I (PHASES A & B) SHOWN,
 STAGE II (PHASES C & D) SIMILAR



DETAIL D

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

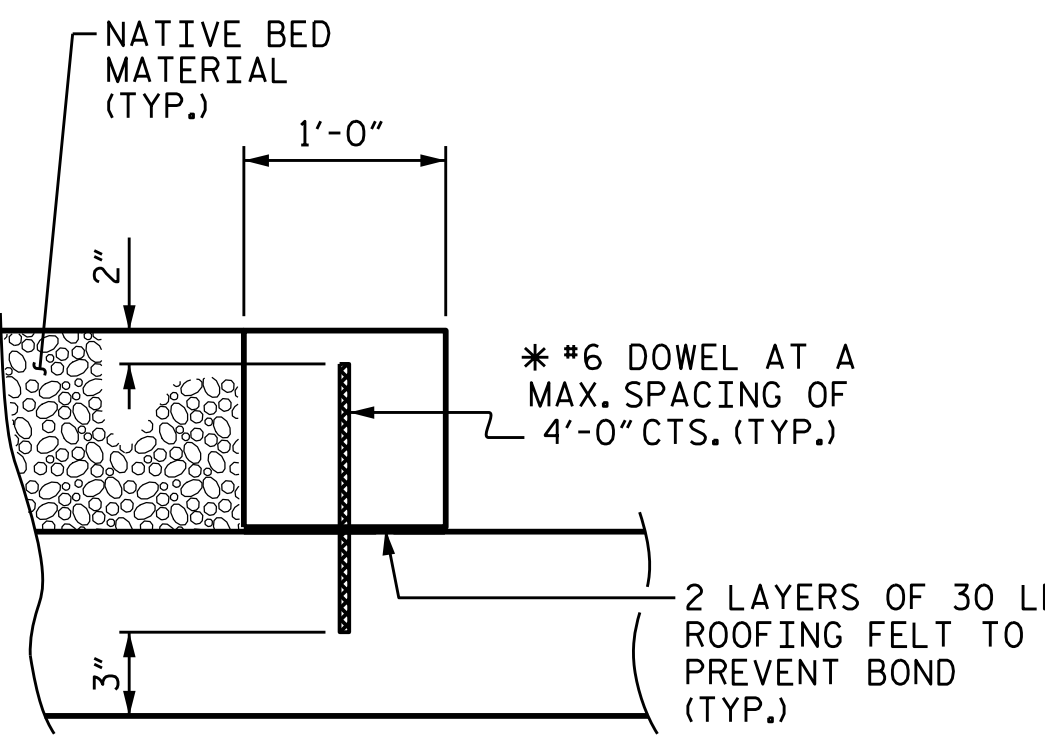
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 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE: 05/04/23



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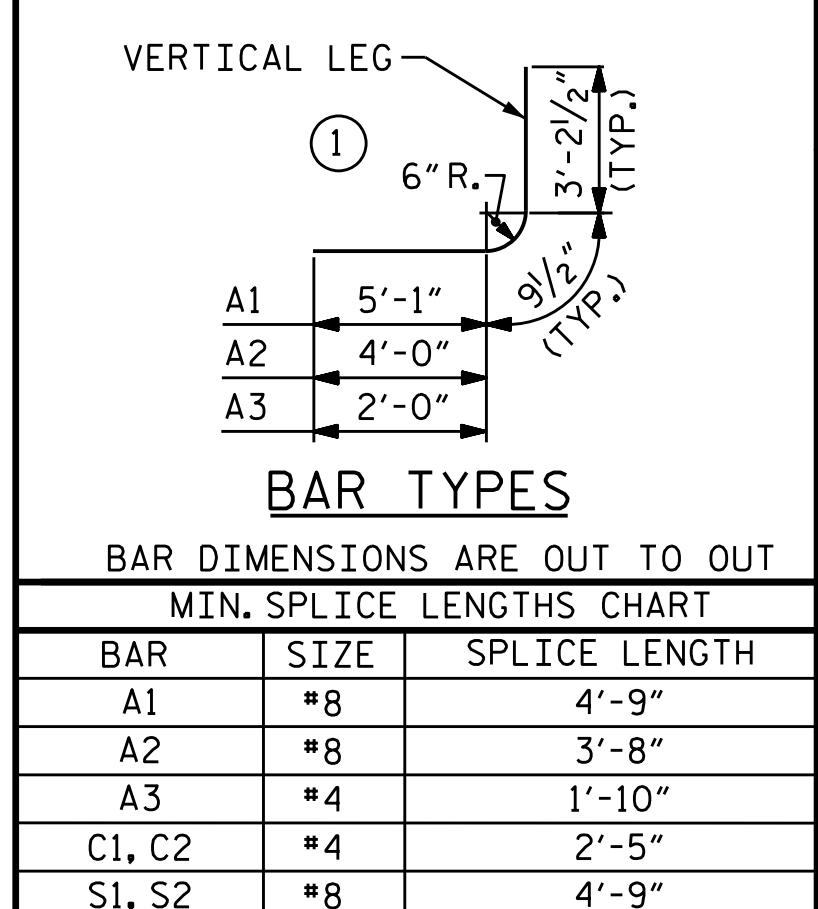
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 12 FT. X 9 FT.
 CONCRETE BOX CULVERT
 65°00'00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-13
1			3			TOTAL SHEETS
2			4			16

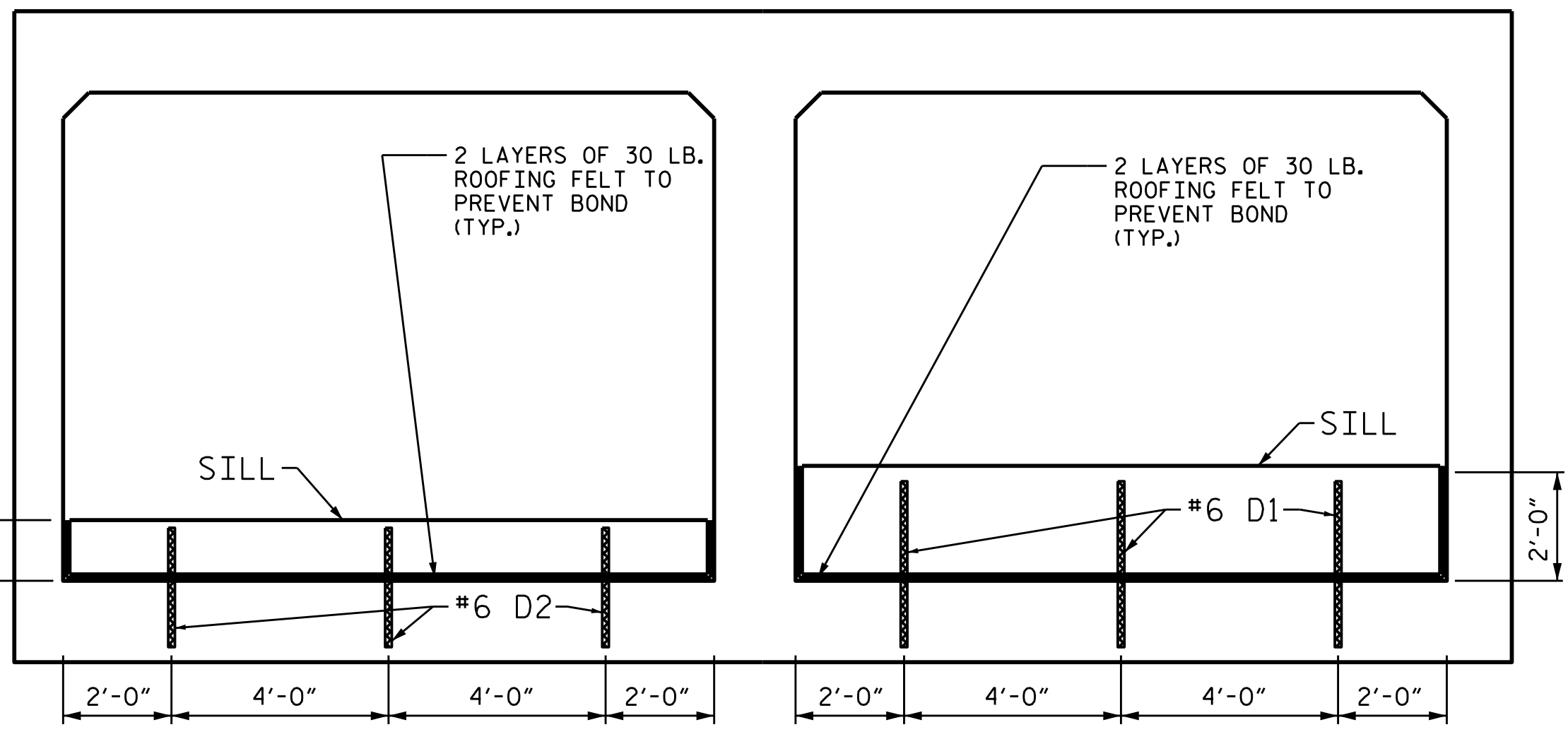


SECTION THROUGH SILL/BAFFLE

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



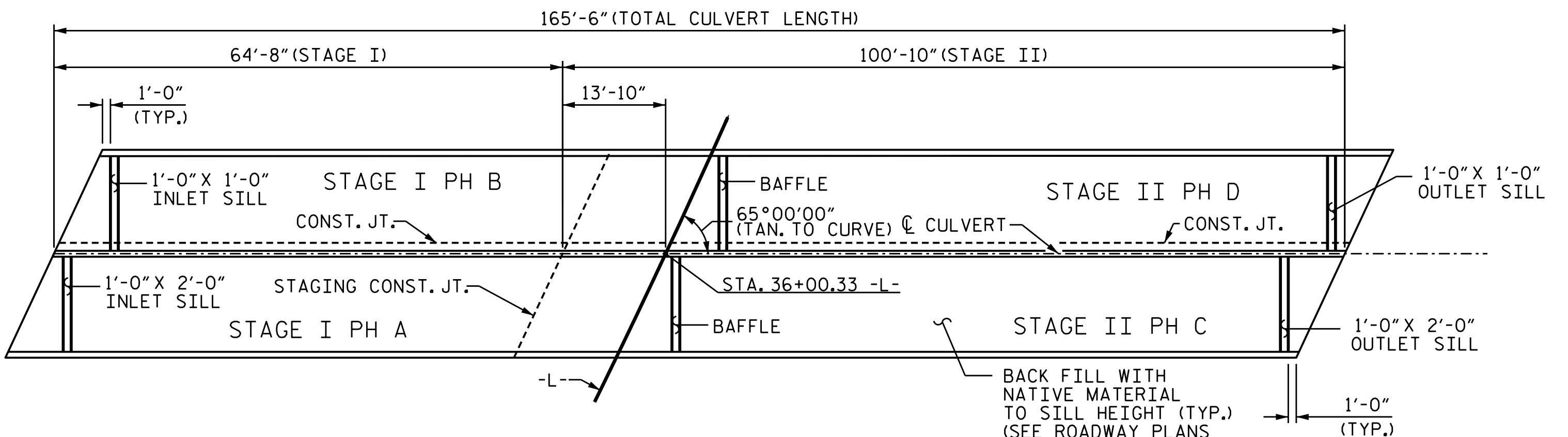
BILL OF MATERIAL (PHASE A)											BILL OF MATERIAL (PHASE B)											BILL OF MATERIAL (PHASE C)								BILL OF MATERIAL (PHASE D)							
STAGE I											STAGE II											STAGE III								STAGE IV							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT								
A1	129	#8	1	9'-1"	3,129	A1	129	#8	1	9'-1"	3,129	A1	201	#8	1	9'-1"	4,875	A1	201	#8	1	9'-1"	4,875														
A2	129	#8	1	8'-0"	2,756	A2	129	#8	1	8'-0"	2,756	A2	201	#8	1	8'-0"	4,294	A2	201	#8	1	8'-0"	4,294														
A3	194	#4	1	6'-0"	778							A3	302	#4	1	6'-0"	1,211																				
A100	224	#6	STR.	18'-1"	6,085	A200	236	#6	STR.	11'-5"	4,047							A400	380	#6	STR.	11'-5"	6,517														
A101	8	#6	STR.	16'-3"	196	A201	4	#6	STR.	9'-3"	56	A300	370	#6	STR.	18'-1"	10,050	A401	4	#6	STR.	10'-0"	61														
A102	8	#6	STR.	14'-2"	171	A202	4	#6	STR.	7'-2"	44	A301	8	#6	STR.	15'-11"	192	A402	4	#6	STR.	7'-10"	48														
A103	8	#6	STR.	12'-0"	145	A203	4	#6	STR.	5'-0"	31	A302	8	#6	STR.	13'-9"	166	A403	4	#6	STR.	5'-9"	35														
A104	8	#6	STR.	9'-10"	119	A204	2	#6	STR.	3'-11"	12	A303	8	#6	STR.	11'-8"	141	A404	4	#6	STR.	3'-7"	22														
A105	8	#6	STR.	7'-8"	93	A205	4	#6	STR.	10'-2"	62	A304	8	#6	STR.	9'-6"	115	A405	4	#6	STR.	9'-10"	60														
A106	8	#6	STR.	5'-7"	68	A206	4	#6	STR.	8'-1"	49	A305	8	#6	STR.	7'-4"	89	A406	4	#6	STR.	7'-8"	47														
B1	97	#4	STR.	11'-8"	756	A207	4	#6	STR.	5'-11"	36	A306	8	#6	STR.	5'-2"	63	A407	4	#6	STR.	5'-7"	34														
B2	129	#4	STR.	8'-4"	719	A208	4	#6	STR.	3'-9"	23							A408	4	#6	STR.	3'-5"	21														
B3	194	#4	STR.	11'-8"	1,512	A500	210	#6	STR.	25'-11"	8,175	B1	151	#4	STR.	11'-8"	1,177	A500	354	#6	STR.	25'-11"	13,781														
C1	104	#4	STR.	34'-10"	2,420	A501	8	#6	STR.	24'-0"	289	B2	202	#4	STR.	8'-4"	1,125	A511	8	#6	STR.	24'-2"	146														
D1	3	#6	STR.	3'-1"	14	A502	8	#6	STR.	21'-10"	263	B3	302	#4	STR.	11'-8"	2,354	A512	8	#6	STR.	22'-0"	133														
S1	9	#8	STR.	20'-9"	499	A503	8	#6	STR.	19'-8"	237							A513	8	#6	STR.	19'-10"	120														
STAGE I (PHASE A) REINFORCING STEEL 19,460											A504	8	#6	STR.	17'-6"	211	C2	156	#4	STR.	35'-3"	3,674	A514	8	#6	STR.	17'-8"	107									
STAGE I (PHASE B) REINFORCING STEEL 25,955											A505	8	#6	STR.	15'-5"	186							A515	8	#6	STR.	15'-7"	94									
STAGE II (PHASE C) REINFORCING STEEL 30,138											A506	8	#6	STR.	13'-3"	160	D1	6	#6	STR.	3'-1"	28	A516	8	#6	STR.	13'-5"	81									
STAGE II (PHASE D) REINFORCING STEEL 39,850											A507	8	#6	STR.	11'-1"	134							A517	8	#6	STR.	11'-3"	68									
											A508	8	#6	STR.	8'-11"	108	E1	16	#5	STR.	5'-1"	85	A518	8	#6	STR.	9'-2"	56									
											A509	8	#6	STR.	6'-10"	83							A519	8	#6	STR.	7'-0"	43									
											A510	8	#6	STR.	4'-8"	57	S1	9	#8	STR.	20'-9"	499	A520	8	#6	STR.	4'-10"	30									



NOTES:

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. 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 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.

CULVERT SILL/BAFFLE DETAILS



PROJECT NO. R-3833C
IREDELL COUNTY
STATION: 36+00.33 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. X 9 FT.
CONCRETE BOX CULVERT

65°00'00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C- 14
1			3			TOTAL SHEETS 16
2			4			

DRAWN BY : V. T. THOMPSON DATE : 08/15/19
CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
DESIGN ENGINEER OF RECORD : M. B. ISENHOUR DATE : 05/04/23

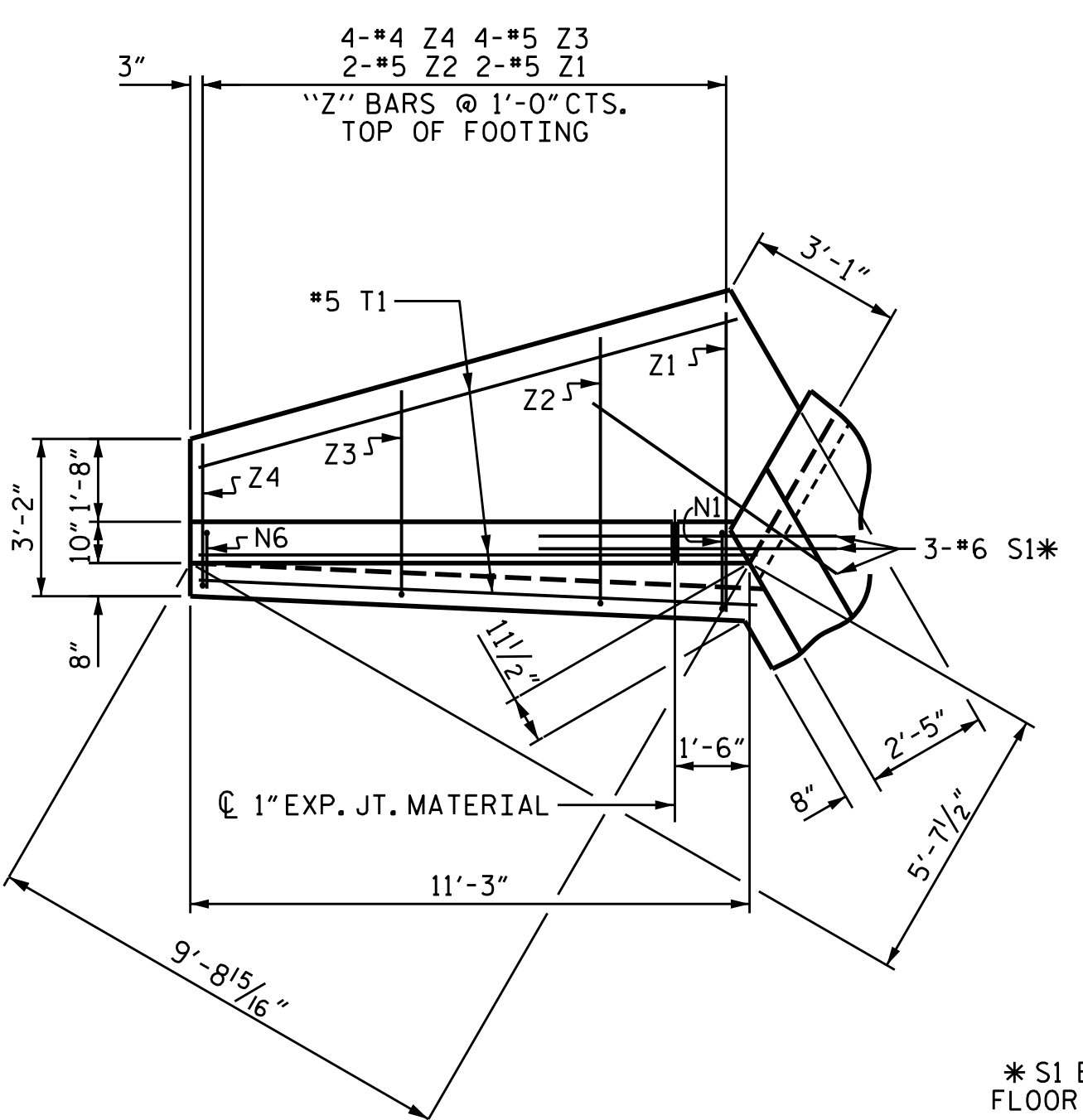
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Professional Seal
NORTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
SEAL 49756
M. B. ISENHOUR
5/7/2023

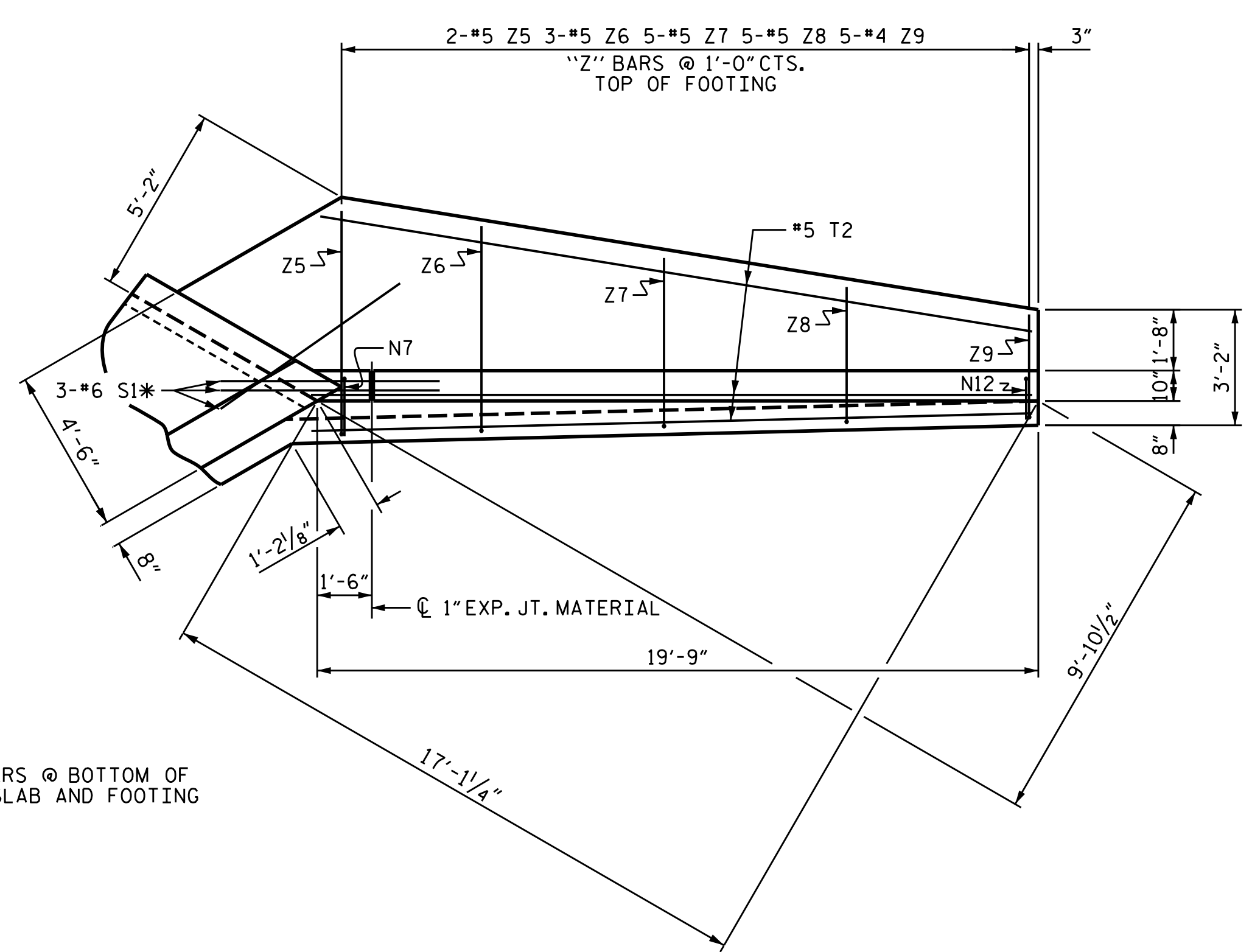
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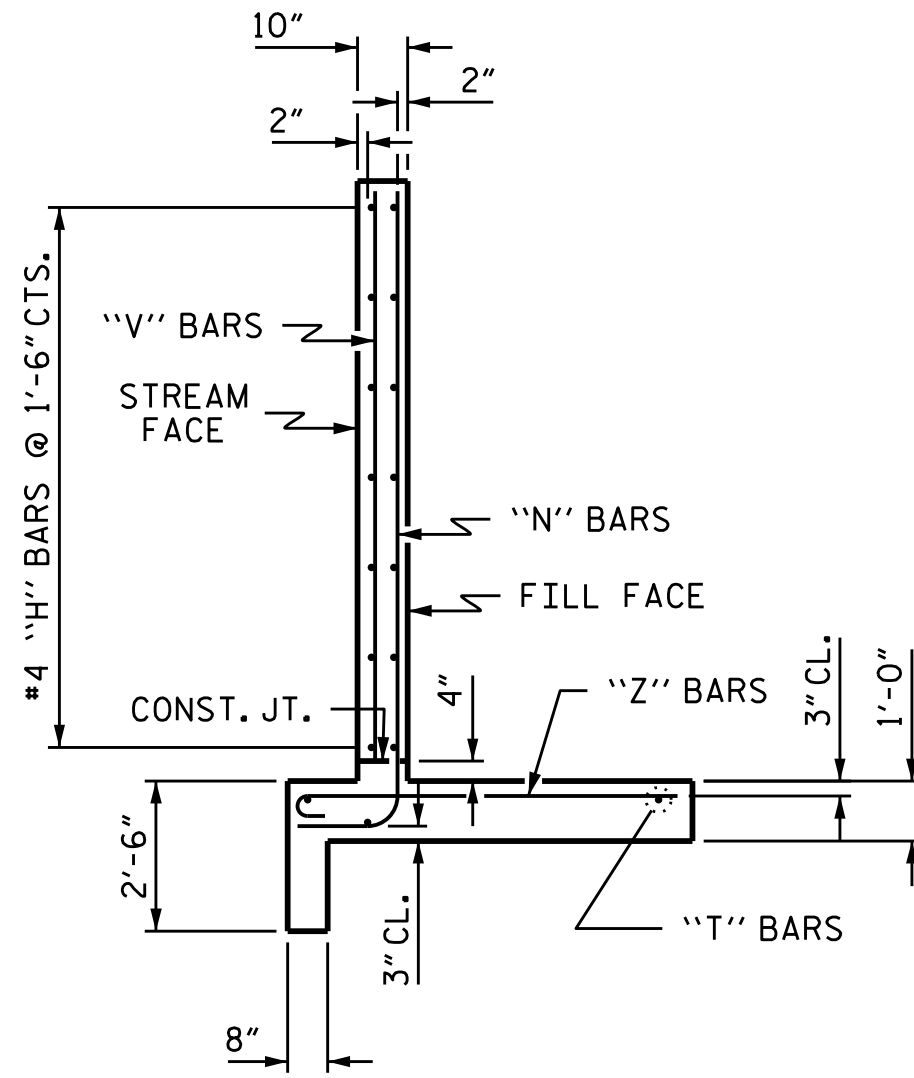
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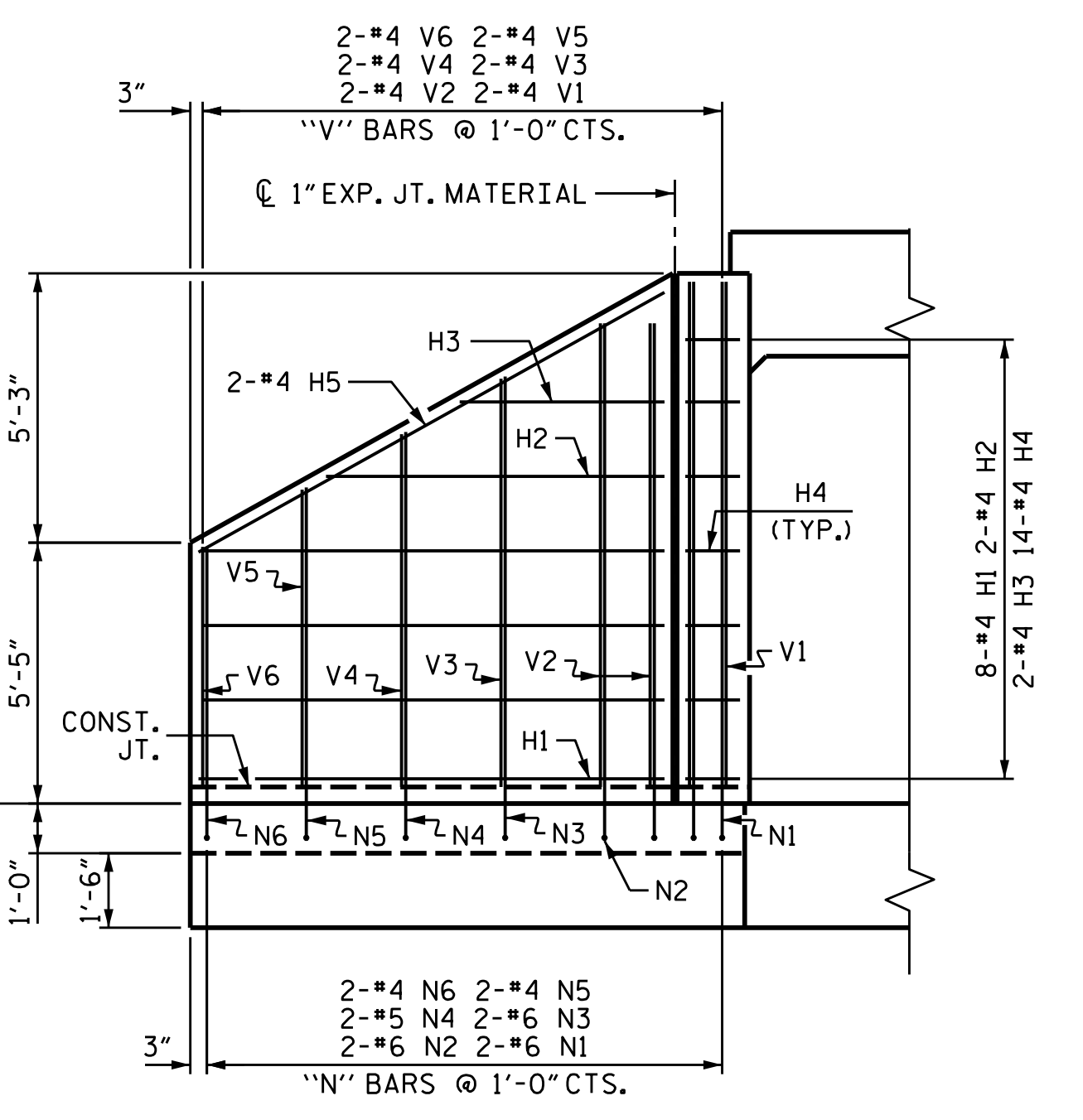
PLAN W2 & W3



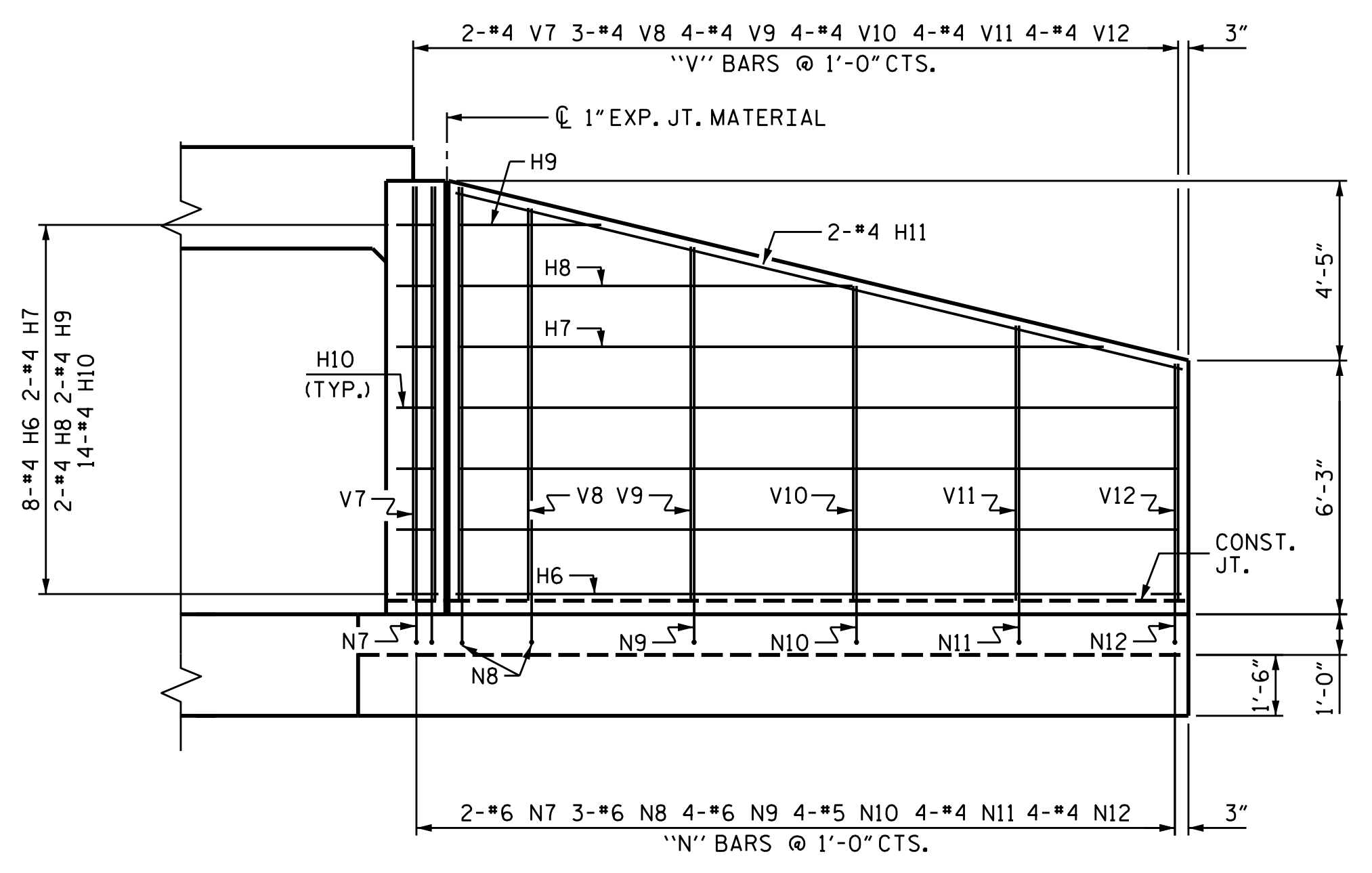
PLAN W1



TYPICAL WING SECTION



ELEVATION W2 & W3



ELEVATION W1

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 9'-0" SLOPE = 2:1
 60°00'00" SKEW

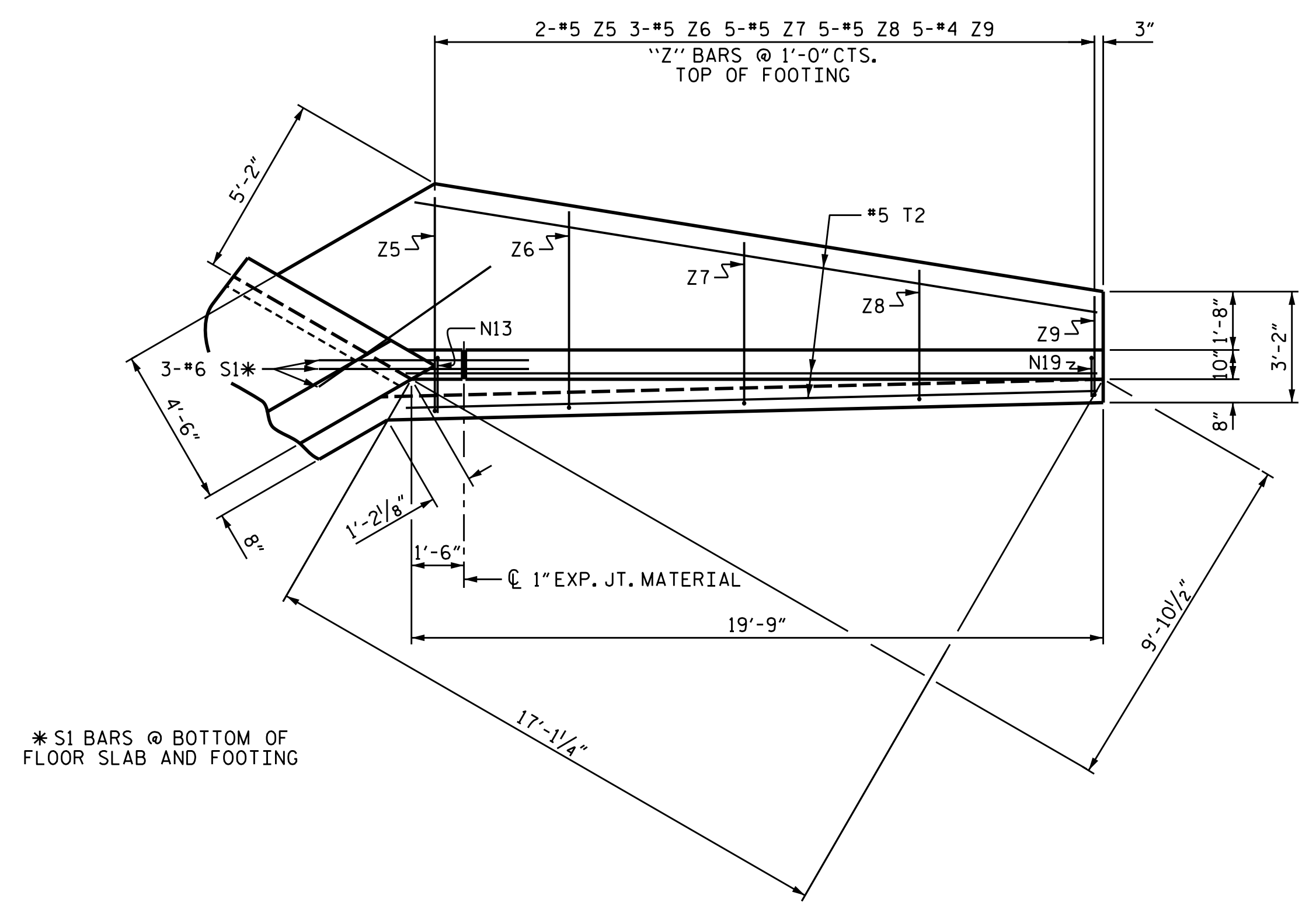
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-15
1			3			TOTAL SHEETS
2			4			16

DRAWN BY : J. B. GETLE DATE : 08/01/19
 CHECKED BY : M. B. ISENHOUR DATE : 02/06/20
 DESIGN ENGINEER OF RECORD : M. B. ISENHOUR DATE : 05/04/23

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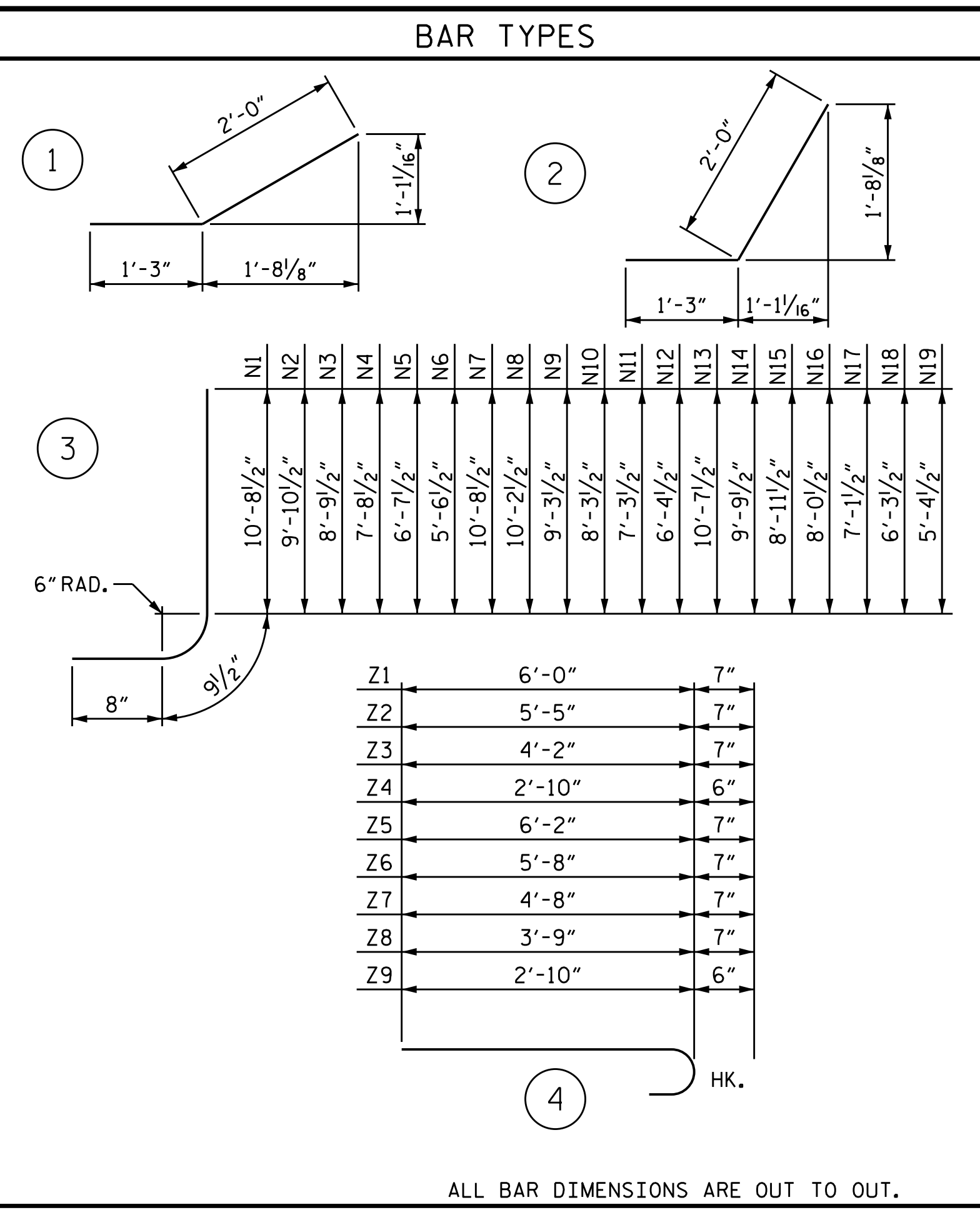
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5/14/2023 4:21:13 PM jgeile



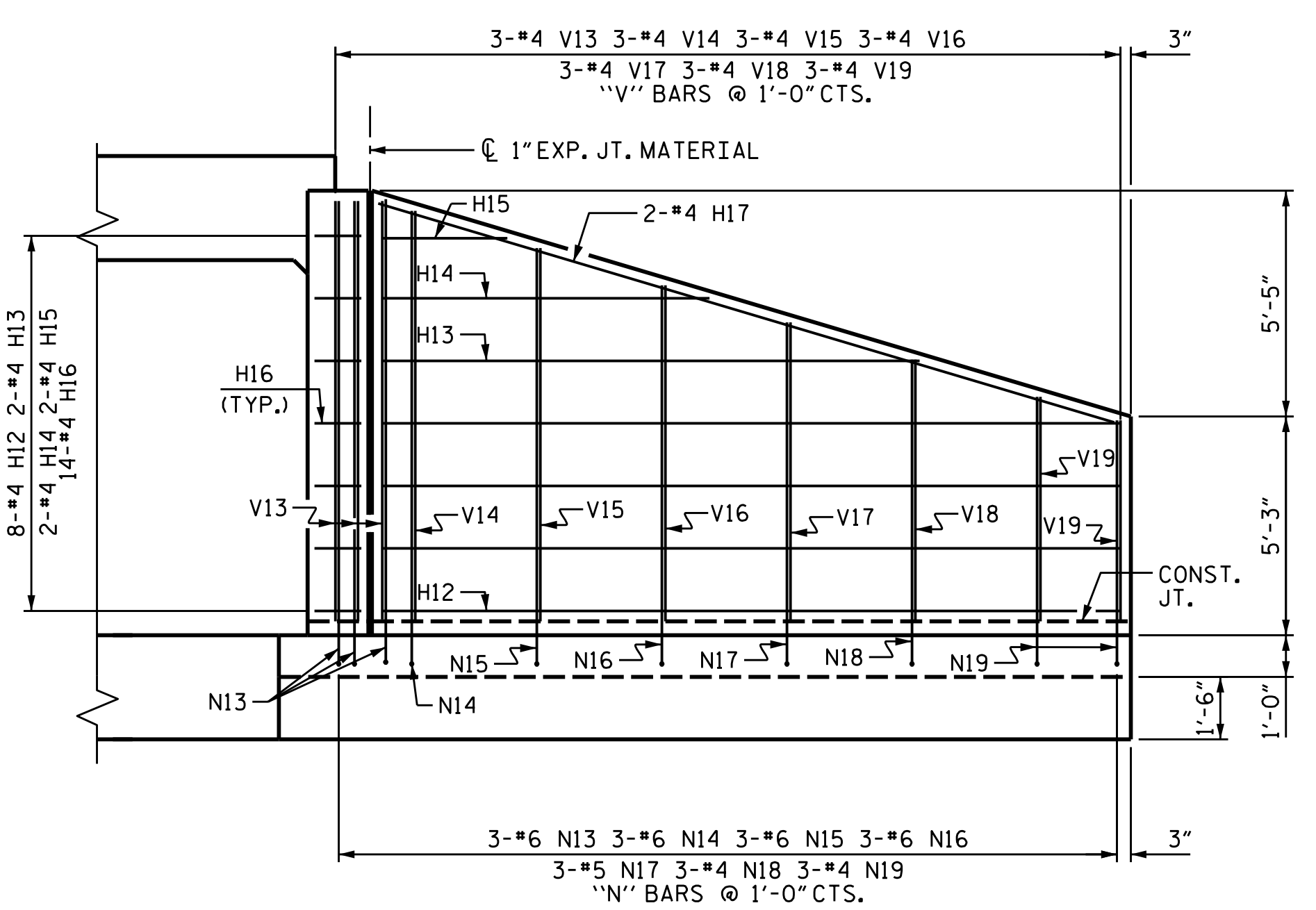
PLAN W4

* S1 BARS @ BOTTOM OF FLOOR SLAB AND FOOTING



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	9'-3"	99	T1	6	#5	STR	11'-3"	71
H2	4	#4	STR	6'-9"	19	T2	6	#5	STR	19'-9"	124
H3	4	#4	STR	4'-1"	11						
H4	28	#4	2	3'-3"	61	V1	4	#4	STR	10'-2"	28
H5	4	#4	STR	10'-6"	29	V2	4	#4	STR	9'-4"	25
H6	8	#4	STR	17'-8"	95	V3	4	#4	STR	8'-3"	23
H7	2	#4	STR	15'-10"	22	V4	4	#4	STR	7'-2"	20
H8	2	#4	STR	9'-8"	13	V5	4	#4	STR	6'-1"	17
H9	2	#4	STR	3'-6"	5	V6	4	#4	STR	5'-0"	14
H10	14	#4	1	3'-3"	31	V7	2	#4	STR	10'-2"	14
H11	2	#4	STR	18'-2"	25	V8	3	#4	STR	9'-8"	20
H12	8	#4	STR	17'-8"	95	V9	4	#4	STR	8'-8"	24
H13	2	#4	STR	12'-10"	18	V10	4	#4	STR	7'-8"	21
H14	2	#4	STR	7'-10"	11	V11	4	#4	STR	6'-9"	19
H15	2	#4	STR	3'-0"	5	V12	4	#4	STR	5'-9"	16
H16	14	#4	1	3'-3"	31	V13	3	#4	STR	10'-1"	21
H17	2	#4	STR	18'-5"	25	V14	3	#4	STR	9'-3"	19
						V15	3	#4	STR	8'-4"	17
N1	4	#6	3	12'-2"	74	V16	3	#4	STR	7'-5"	15
N2	4	#6	3	11'-4"	69	V17	3	#4	STR	6'-7"	14
N3	4	#6	3	10'-3"	62	V18	3	#4	STR	5'-8"	12
N4	4	#5	3	9'-2"	39	V19	3	#4	STR	4'-9"	10
N5	4	#4	3	8'-1"	22						
N6	4	#4	3	7'-0"	19	Z1	4	#5	4	6'-7"	28
N7	2	#6	3	12'-2"	37	Z2	4	#5	4	6'-0"	26
N8	3	#6	3	11'-8"	53	Z3	8	#5	4	4'-9"	40
N9	4	#6	3	10'-9"	65	Z4	8	#4	4	3'-4"	18
N10	4	#5	3	9'-9"	41	Z5	4	#5	4	6'-9"	29
N11	4	#4	3	8'-9"	24	Z6	6	#5	4	6'-3"	40
N12	4	#4	3	7'-10"	21	Z7	10	#5	4	5'-3"	55
N13	3	#6	3	12'-1"	55	Z8	10	#5	4	4'-4"	46
N14	3	#6	3	11'-3"	51	Z9	10	#4	4	3'-4"	23
N15	3	#6	3	10'-5"	47						
N16	3	#6	3	9'-6"	43						
N17	3	#5	3	8'-7"	27						
N18	3	#4	3	7'-9"	16						
N19	3	#4	3	6'-10"	14						
S1	12	#6	STR	6'-0"	109						
REINFORCING STEEL										2332	LBS
CLASS A CONCRETE											
4 WINGS										30.7	CY
2 HEADWALLS										2.7	CY
2 END CURTAIN WALL										3.1	CY
EDGE BEAM										4.3	CY
TOTAL										40.8	CY

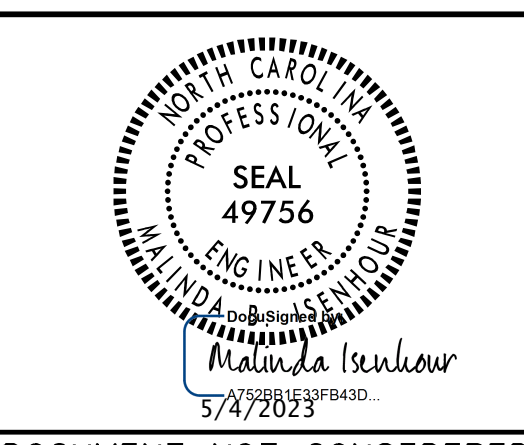


ELEVATION W4

PROJECT NO. R-3833C
 IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY: J. B. GETILE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE: 05/04/23

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

WINGS FOR
 CONCRETE BOX CULVERT
 H = 9'-0" SLOPE = 2:1
 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-16
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.
	- -	27,000 LBS. PER SQ. IN.
	- -	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. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN