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PROJECT WBS: 17BP.14.R.159

CONTRACT: DN01048

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

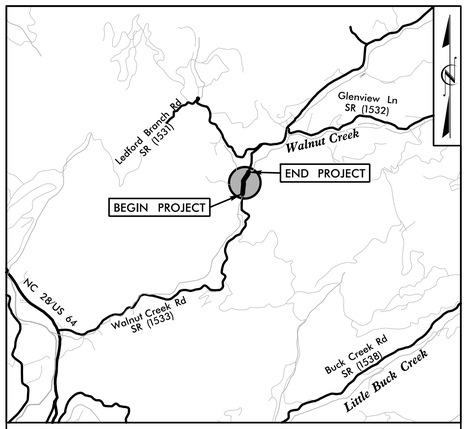
MACON COUNTY

LOCATION: BRIDGE #550204 OVER WALNUT CREEK ON SR 1533 (WALNUT CREEK RD)

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

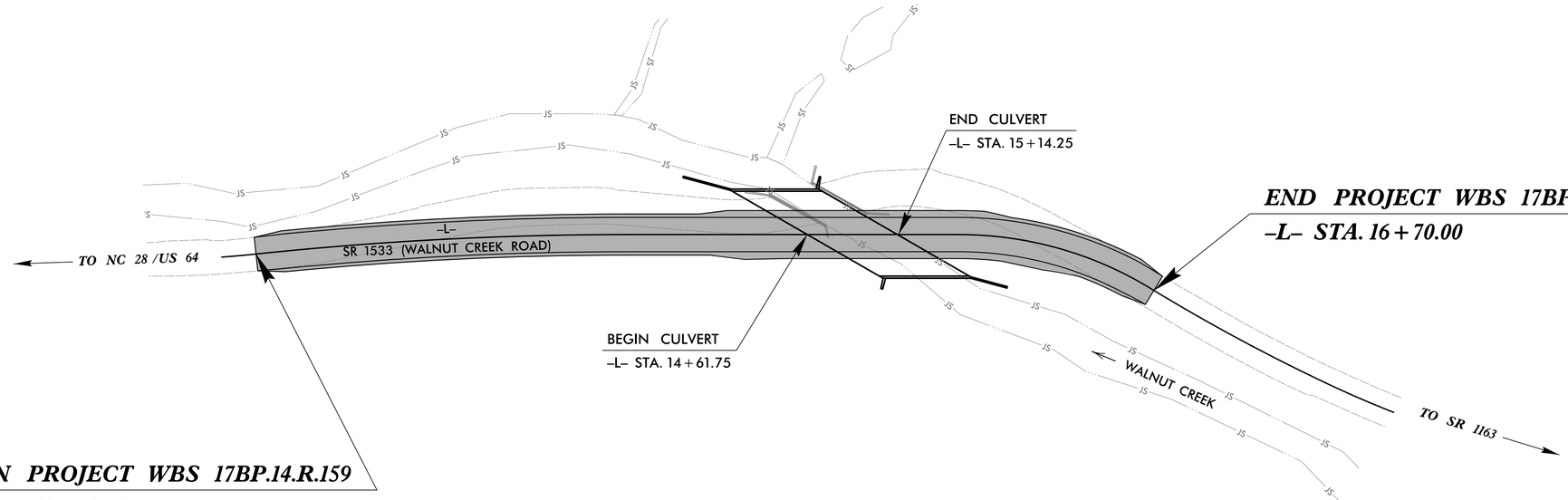
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.159		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.159		P.E.
17BP.14.R.159		ROW & UTILITIES
17BP.14.R.159		CONSTRUCTION



VICINITY MAP N.T.S.

NAD 83 NA 2011



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2010 = 1100
ADT 2025 = 2200
DHV = N/A
D = N/A
T = 6%
V = 25 MPH

FUNC. CLASSIFICATION: SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT WBS 17BP.14.R.159 = 0.090 MILES

LENGTH OF STRUCTURE PROJECT WBS 17BP.14.R.159 = 0.010 MILES

TOTAL LENGTH OF PROJECT WBS 17BP.14.R.159 = 0.100 MILES

NCDOT CONTACT: ADAM DOCKERY
Division Bridge Manager

PLANS PREPARED FOR THE NCDOT BY:

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 25, 2017

LETTING DATE: MARCH 25, 2025

J. WESLEY JONES, PE
PROJECT ENGINEER

MICHAEL B. CHITKHIN, PE
PROJECT DESIGNER

STRUCTURES ENGINEER

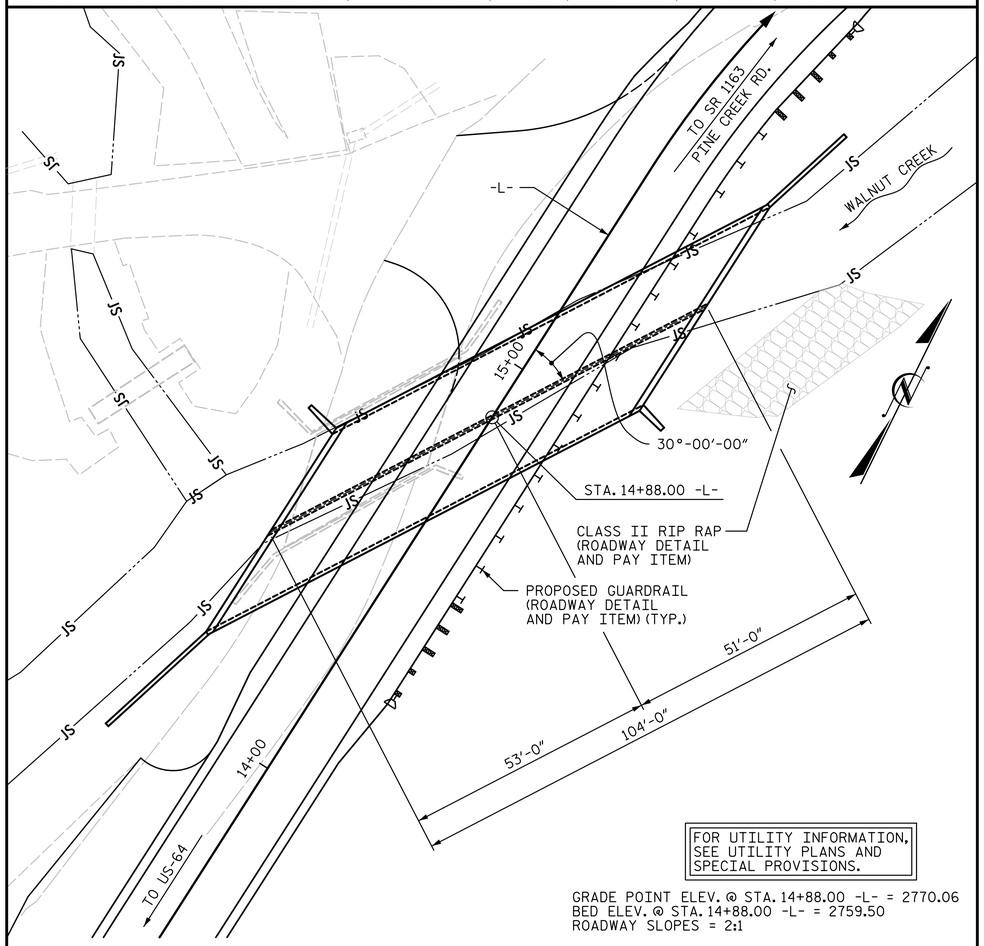
2/14/2025

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER J. WESLEY JONES

DocuSigned by: D. Wesley Jones P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

BENCHMARK BM-2: NAIL IN BASE OF 15" OAK, STA. 15+56.63 -L-, 51.89' LT., ELEV. 2773.37, N 537685.21, E 727252.46



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GRADE POINT ELEV. @ STA. 14+88.00 -L- = 2770.06
BED ELEV. @ STA. 14+88.00 -L- = 2759.50
ROADWAY SLOPES = 2:1

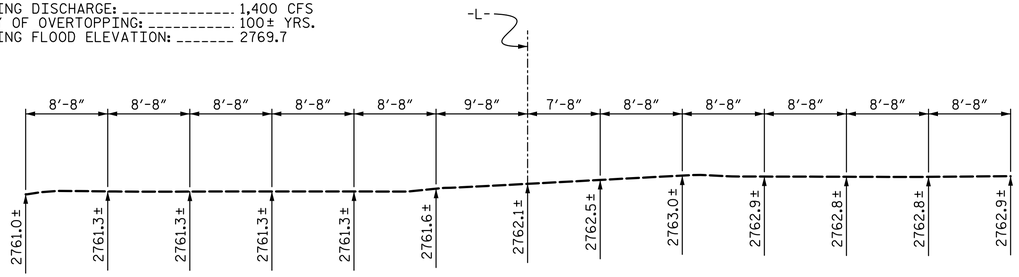
LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE:	900 CFS
FREQUENCY OF DESIGN FLOOD:	25 YRS.
DESIGN HIGH WATER ELEVATION:	2768.1
DRAINAGE AREA:	3.31 SQ. MI.
BASE DISCHARGE (Q100):	1,400 CFS
BASE HIGH WATER ELEVATION:	2769.25

OVERTOPPING DATA

OVERTOPPING DISCHARGE:	1,400 CFS
FREQUENCY OF OVERTOPPING:	100± YRS.
OVERTOPPING FLOOD ELEVATION:	2769.7



PROFILE ALONG ℄ CULVERT

NOTES:

ASSUMED LIVE LOAD----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL----------5.33' MAX. AND 3.23' MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

THE EXISTING STRUCTURE CONSISTING OF (2) 13'-0" SPANS WITH TIMBER FLOORS ON I-BEAMS AND A CLEAR ROADWAY WIDTH OF 24'-0" AND SUPPORTED BY YOUNT MASONRY ABUTMENTS AND A CRUTCH BENT CONSISTING OF A TIMBER CAP AND TIMBER POSTS AND SILLS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. SEE SHEETS C-2 AND C-3 FOR CONSTRUCTION PHASING DIAGRAM. THE EXISTING STRUCTURE IS PRESENTLY NOT POSTED FOR A LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE."

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

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

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

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF THE EXTERIOR WALL AND BOTH FACES OF INTERIOR WALL ABOVE THE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 2'-2" FOR #5 BARS AND 1'-9" FOR #4 BARS. EXTRA WEIGHT OF STEEL DUE TO 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.

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 SHALL BE PAID FOR BY THE CONTRACTOR.

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.

EXCAVATE 1 FOOT BELOW CULVERT FLOOR AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414 OF THE STANDARD SPECIFICATIONS.

NO WORK SHALL BE DONE ON THE CULVERT UNTIL THE AREA OF THE BOX CULVERT HAS BEEN UNDERCUT AND UNSUITABLE MATERIAL REPLACED WITH SUITABLE MATERIAL, PROPERLY COMPACTED TO THE ELEVATION OF THE BOTTOM OF THE PROPOSED FLOOR SLAB. THE LIMITS OF THE UNDERCUT EXCAVATION SHALL BE AT LEAST THE LIMITS OF THE BOX CULVERT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS OF THE PROJECT SITE.

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 ENGINEER, IN CONSULTATION WITH DEO STAFF, SHALL REVIEW ALL MATERIAL TO BE USED AS BACKFILL PRIOR TO CONDUCTING THE BACKFILL ACTIVITY. BACKFILL SHALL CONSIST OF NATIVE MATERIAL ONLY UNLESS THE ENGINEER, IN CONSULTATION WITH DEO STAFF, DETERMINES THAT (1) THE NATIVE MATERIAL IS UNSUITABLE, OR (2) ADDITIONAL MATERIAL IS REQUIRED TO SUPPLEMENT THE NATIVE MATERIAL. THE CHOSEN BACKFILL MATERIAL SHALL NOT HAVE ADVERSE EFFECTS TO AQUATIC LIFE, AQUATIC LIFE PASSAGE, OR WATER QUALITY. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. PAYMENT FOR PLACEMENT OF NATIVE MATERIAL IN THE BARRELS, WHICH INCLUDES BUT IS NOT LIMITED TO PLACING NATIVE MATERIAL IN THE BARRELS, PLACING RIP RAP IN THE BARRELS, AND ALL TOOLS, EQUIPMENT, AND LABOR NECESSARY SHALL BE INCLUDED IN LUMP SUM PRICE BID FOR "CULVERT EXCAVATION, STA. 14+88.00 -L-".

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

UNO = UNLESS NOTED OTHERWISE.

UPSTATION - IN DIRECTION OF INCREASING STATIONING.

DOWNSTATION - IN DIRECTION OF DECREASING STATIONING.

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM
CULVERT EXCAVATION, STA. 14+88.00 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	223 TONS
CLASS A CONCRETE	
BARREL:	2.777 CY/FT = 288.8 C.Y.
WINGS, ETC.:	48.1 C.Y.
TOTAL:	336.9 C.Y.
REINFORCING STEEL	
BARREL:	48,188 LBS.
WINGS, ETC.:	2,189 LBS.
TOTAL:	50,377 LBS.

DRAWN BY : MBC DATE : 11-17
CHECKED BY : JAD DATE : 1-18
DESIGN ENGINEER OF RECORD : JWJ DATE : 3-24

3/5/2024
STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES
DocuSigned by: Wesley Jones 68C7E5EFD4F844E...

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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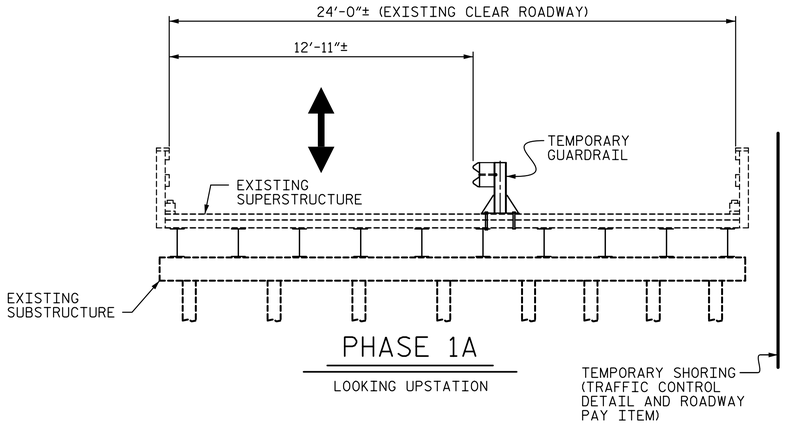
PROJECT NO. 17BP.14.R.159
MACON COUNTY
STATION: 14+88.00 -L-

SHEET 1 OF 13 REPLACES BRIDGE NO. 204

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

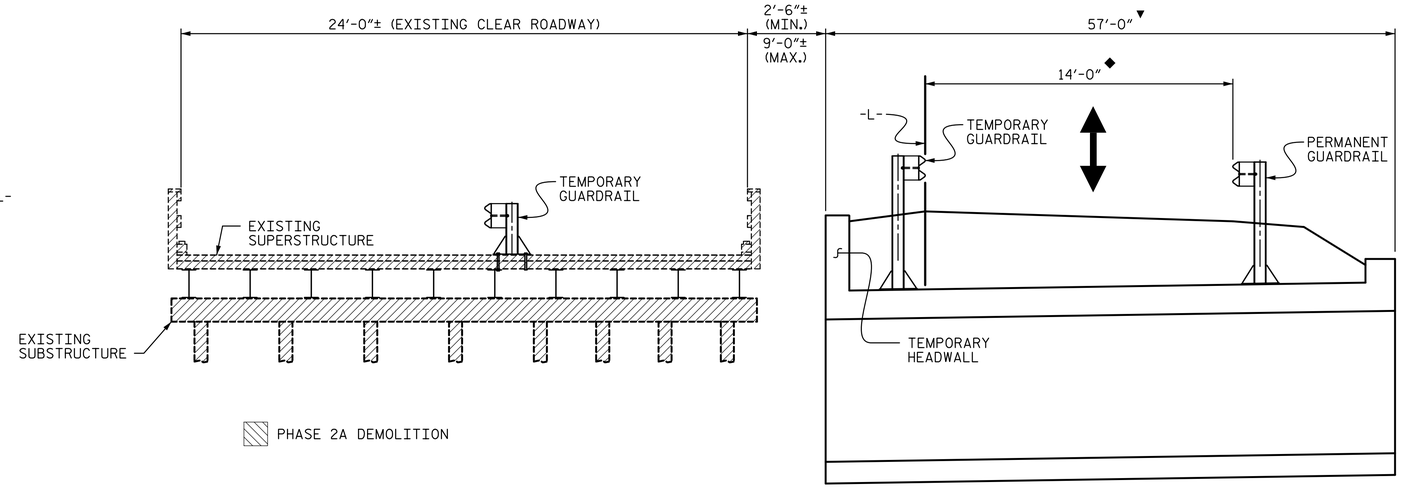
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			13



PHASE 1A

LOOKING UPSTATION

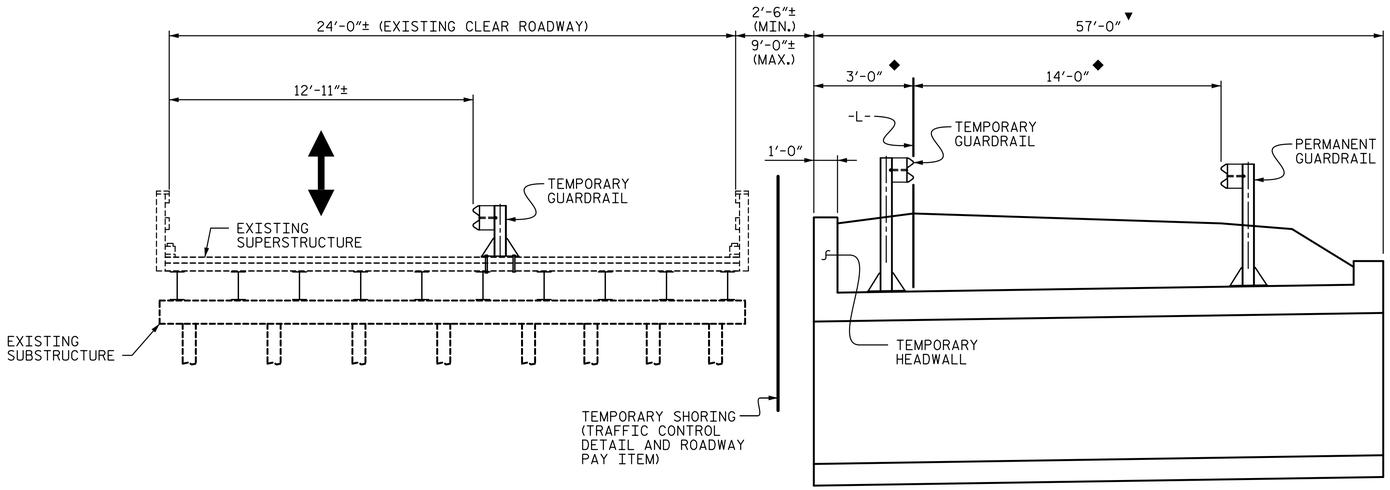
1. VERIFY EXISTING BRIDGE DIMENSIONS. CONTACT ENGINEER IF FIELD MEASUREMENTS VARY FROM PLAN DIMENSIONS.
2. ANCHOR TEMPORARY GUARDRAIL THROUGH EXISTING BRIDGE DECK AND TOP FLANGE OF BEAM AS SHOWN.
3. REMOVE PORTION OF EXISTING RIGHT DOWNSTATION WING.
4. INSTALL TEMPORARY SHORING.



PHASE 2A

LOOKING UPSTATION
(PROPOSED CULVERT WINGS NOT SHOWN FOR CLARITY)

1. SHIFT TRAFFIC TO RIGHT SIDE OF CULVERT.
2. REMOVE EXISTING BRIDGE AND TEMPORARY SHORING.



PHASE 1B

LOOKING UPSTATION
(PROPOSED CULVERT WINGS NOT SHOWN FOR CLARITY)

1. CONSTRUCT RIGHT PORTION OF PROPOSED CULVERT.
2. CONSTRUCT TEMPORARY HEADWALL.
3. ANCHOR TEMPORARY GUARDRAIL TO CULVERT.

◆ MEASURED PERPENDICULAR TO PROPOSED -L-
▼ MEASURED ALONG PROPOSED CULVERT

PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 2 OF 13

3/5/2024

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES

DocuSigned by: D. Wesley Jones 68C7E5EFD4F844E...

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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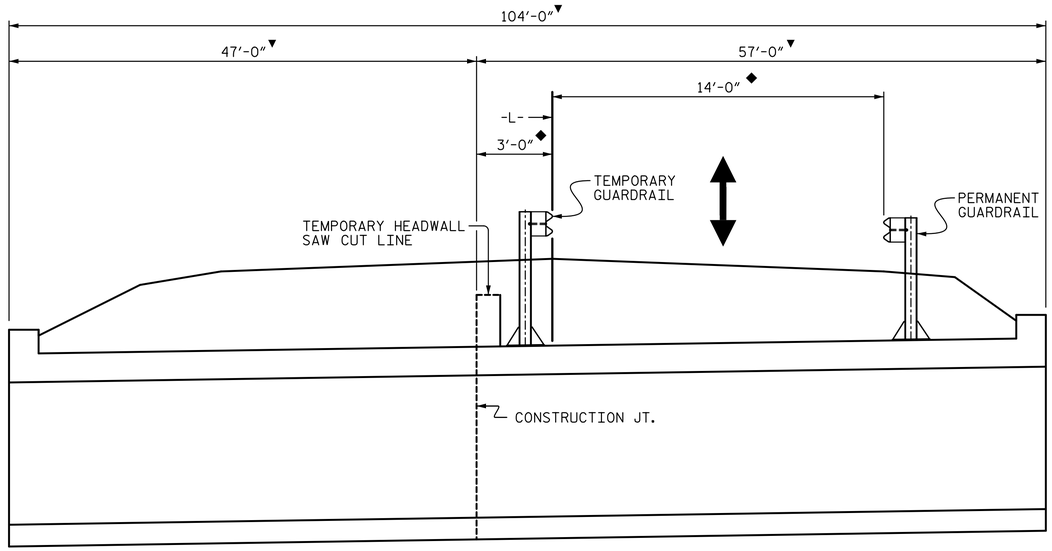
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT STAGING PLAN (SHEET 1 OF 2)

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

DRAWN BY :	MBC	DATE :	11-17
CHECKED BY :	JAD	DATE :	1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-24

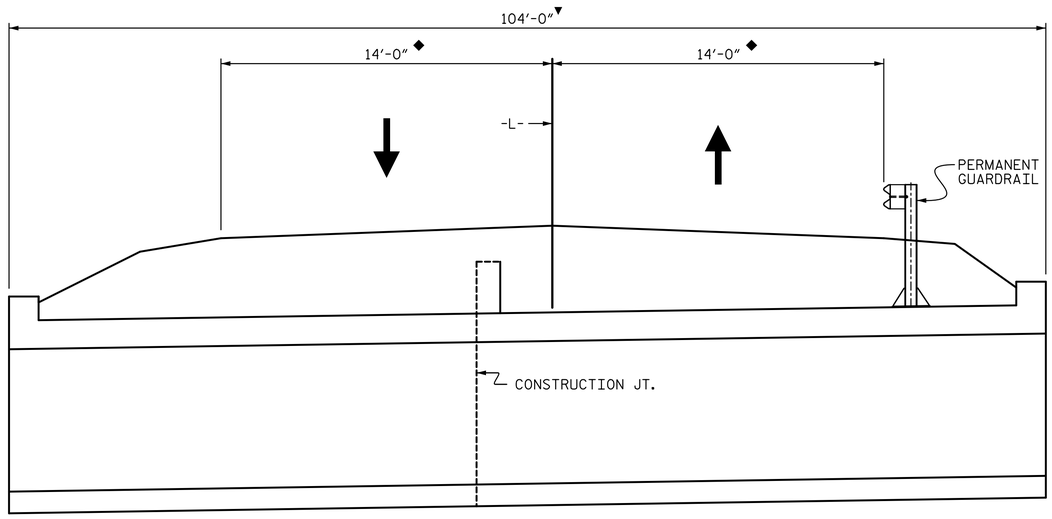
JJones 3/4/2024 5:33:18 PM R:\Structures\station\401_003_17BP.14.R.159_SMU_RCBC02.dgn



PHASE 2B

LOOKING UPSTATION

1. CONSTRUCT LEFT PORTION OF CULVERT.
2. SAWCUT TEMPORARY HEADWALL 1'-0" MIN. BELOW TOP OF TEMPORARY HEADWALL.
3. REMOVE G2 BARS COMPLETELY AND CUT S2 BARS 2" MIN. BELOW SAW CUT OF TEMPORARY HEADWALL. REPAIR AREAS WHERE S2 BARS ARE REMOVED USING A BONDING AGENT AND GROUT. SUBMIT A REPAIR PLAN TO THE RESIDENT ENGINEER FOR APPROVAL PRIOR TO BEGINNING REPAIR WORK.



PHASE 3

LOOKING UPSTATION

1. REMOVE TEMPORARY GUARDRAIL AND REPAIR TOP SLAB IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. RESIDENT ENGINEER TO DETERMINE IF REPAIRS TO TOP SLAB ARE NEEDED.
2. PAVE ROADWAY IN ACCORDANCE WITH THE ROADWAY PLANS.

NOTES:

ALL MATERIALS AND LABOR REQUIRED FOR REMOVING PORTIONS OF THE TEMPORARY HEADWALL, REMOVING REBAR FROM THE TEMPORARY HEADWALL, AND REPAIRING AREAS WHERE REBAR WAS REMOVED FROM THE TEMPORARY HEADWALL ARE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVING AND/OR REPAIRING THE TEMPORARY HEADWALL.

ALL MATERIALS AND LABOR REQUIRED FOR REPAIR OF TOP SLAB FROM REMOVING TEMPORARY GUARDRAIL, IF NECESSARY, ARE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REPAIRING THE TOP SLAB.

PROPOSED CULVERT WINGS NOT SHOWN FOR CLARITY.

◆ MEASURED PERPENDICULAR TO PROPOSED -L-
▼ MEASURED ALONG PROPOSED CULVERT

PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 3 OF 13

3/5/2024

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER J. WESLEY JONES

DocuSigned by: J. Wesley Jones 68C7E5EFD4F844E...

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Charlotte, NC 28202
NC License Number F-0991

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT STAGING PLAN (SHEET 2 OF 2)

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

DRAWN BY :	MBC	DATE :	11-17
CHECKED BY :	JAD	DATE :	1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-24

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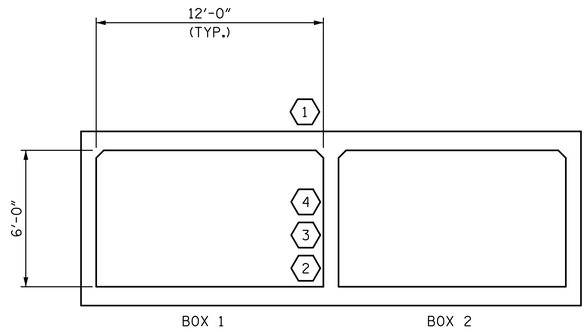
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	⬡# CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	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		HL-93 (INVENTORY)	N/A	⬡1	1.30	--	1.75	1.31	1 & 2	FLOOR SLAB	12.75′	1.30	1 & 2	ROOF SLAB	11.74′	
		HL-93 (OPERATING)	N/A		1.69	--	1.35	1.69	1 & 2	FLOOR SLAB	12.75′	1.69	1 & 2	ROOF SLAB	11.74′	
		HS-20 (INVENTORY)	36.000	⬡2	1.52	54.720	1.75	1.52	1 & 2	FLOOR SLAB	12.75′	1.61	1 & 2	FLOOR SLAB	12.03′	
		HS-20 (OPERATING)	36.000		1.97	70.920	1.35	1.97	1 & 2	FLOOR SLAB	12.75′	2.09	1 & 2	FLOOR SLAB	12.03′	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.89	39.015	1.40	2.89	1 & 2	ROOF SLAB	5.48′	3.29	1 & 2	ROOF SLAB	11.74′	
		SNGARBS2	20.000		2.70	54.000	1.40	2.70	1 & 2	ROOF SLAB	5.48′	2.98	1 & 2	ROOF SLAB	11.74′	
		SNAGRIS2	22.000		2.75	60.500	1.40	2.75	1 & 2	FLOOR SLAB	12.75′	2.93	1 & 2	FLOOR SLAB	12.03′	
		SNCOTTS3	27.250		1.79	48.778	1.40	1.79	1 & 2	ROOF SLAB	5.48′	1.80	1 & 2	ROOF SLAB	11.74′	
		SNAGGRS4	34.925		1.67	58.325	1.40	1.67	1 & 2	FLOOR SLAB	12.75′	1.85	1 & 2	FLOOR SLAB	12.03′	
		SNS5A	35.550		1.63	57.947	1.40	1.63	1 & 2	FLOOR SLAB	12.75′	1.82	1 & 2	FLOOR SLAB	12.03′	
		SNS6A	39.950		1.52	60.724	1.40	1.52	1 & 2	FLOOR SLAB	12.75′	1.78	1 & 2	FLOOR SLAB	12.03′	
		SNS7B	42.000		1.59	66.780	1.40	1.59	1 & 2	FLOOR SLAB	12.75′	1.71	1 & 2	FLOOR SLAB	12.03′	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.87	61.710	1.40	1.87	1 & 2	FLOOR SLAB	12.75′	1.97	1 & 2	FLOOR SLAB	12.03′	
		TNT4A	33.075		1.75	57.881	1.40	1.75	1 & 2	FLOOR SLAB	12.75′	1.95	1 & 2	FLOOR SLAB	12.03′	
		TNT6A	41.600		1.65	68.640	1.40	1.65	1 & 2	FLOOR SLAB	12.75′	1.82	1 & 2	FLOOR SLAB	12.03′	
		TNT7A	42.000		1.52	63.840	1.40	1.52	1 & 2	FLOOR SLAB	12.75′	1.69	1 & 2	FLOOR SLAB	12.03′	
		TNT7B	42.000		1.58	66.360	1.40	1.58	1 & 2	FLOOR SLAB	12.75′	1.82	1 & 2	FLOOR SLAB	12.03′	
		TNAGRIT4	43.000	⬡3	1.40	60.200	1.40	1.40	1 & 2	FLOOR SLAB	12.75′	1.51	1 & 2	FLOOR SLAB	12.03′	
		TNAGT5A	45.000		1.61	72.450	1.40	1.61	1 & 2	FLOOR SLAB	12.75′	1.70	1 & 2	FLOOR SLAB	12.03′	
		TNAGT5B	45.000		1.46	65.700	1.40	1.46	1 & 2	FLOOR SLAB	12.75′	1.54	1 & 2	FLOOR SLAB	12.03′	
EMERGENCY VEHICLE (EV)		EV2	28.750		2.04	58.650	1.30	2.04	1 & 2	ROOF SLAB	5.48′	2.29	1 & 2	ROOF SLAB	11.74′	
		EV3	43.000	⬡4	1.43	61.490	1.30	1.43	1 & 2	FLOOR SLAB	12.75′	1.45	1 & 2	ROOF SLAB	11.74′	

◆ MEASURED FROM OUTSIDE EDGE OF CULVERT



LRFR SUMMARY

(LOOKING DOWNSTREAM)

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.
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. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 4 OF 13

3/5/2024

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES

DocuSigned by: Wesley Jones 6BC7E5EFD4F844E...

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

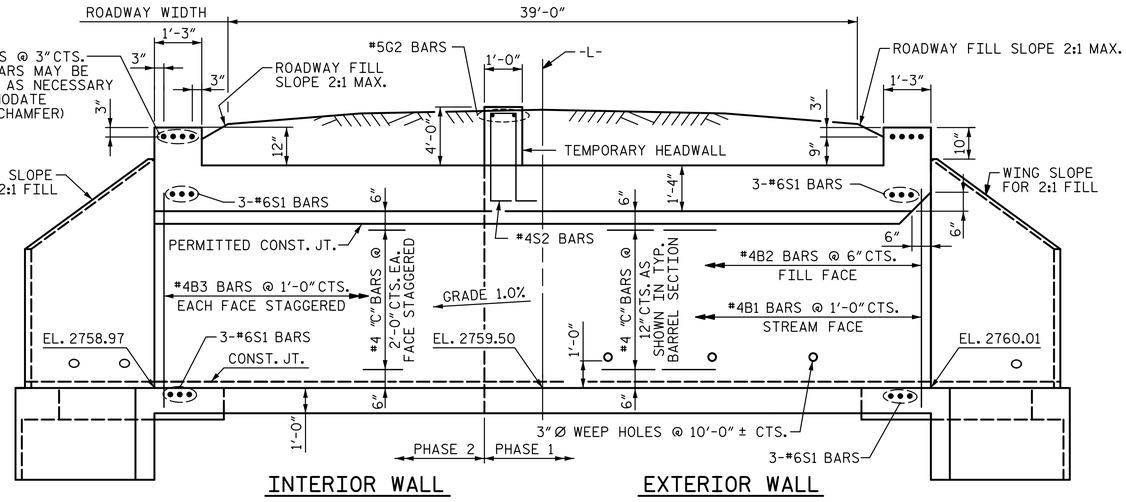
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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

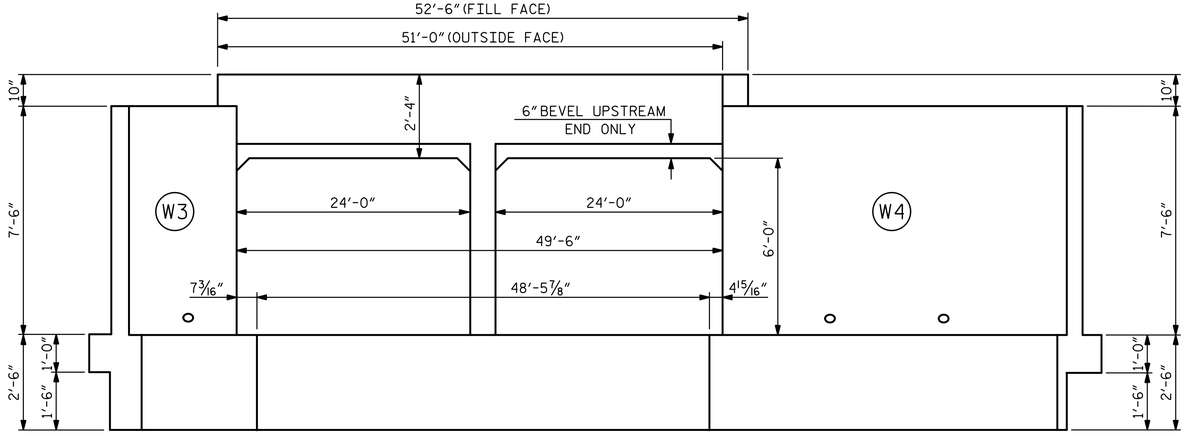
DRAWN BY :	MBC	DATE : 11-17
CHECKED BY :	JAD	DATE : 1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-24

JJones 2/22/2024 10:33:30 AM R:\Structures\ustation\401_007_17BP.14.R.159_SMU_RCBC04.dgn

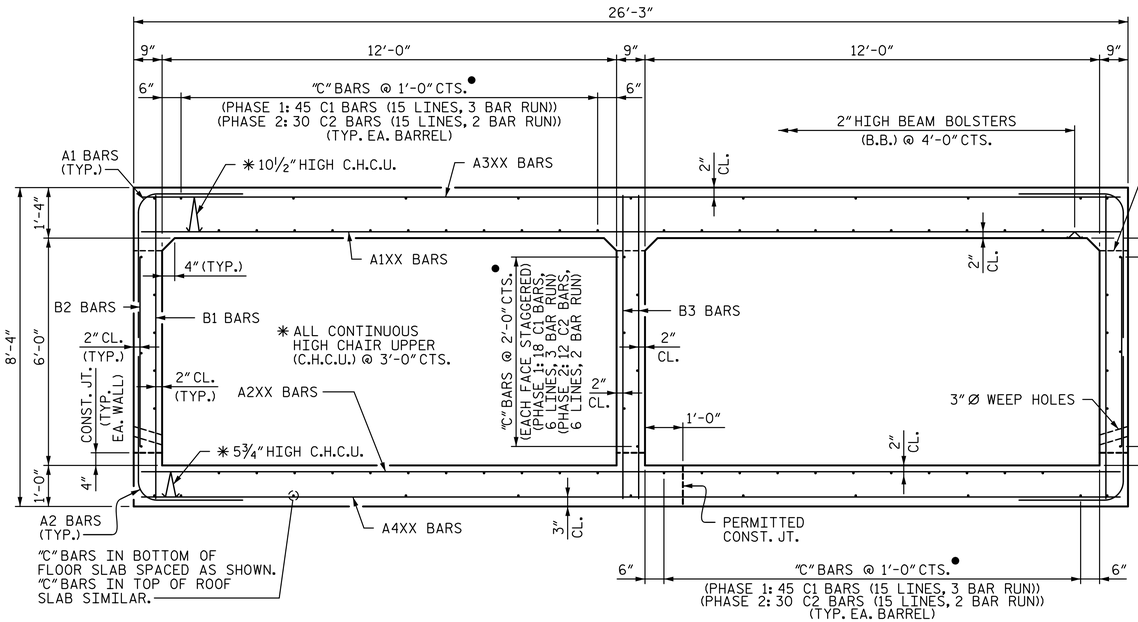


CULVERT SECTION NORMAL TO ROADWAY

(ONLY SLOPED WINGS SHOWN FOR CLARITY)
(GUARDRAIL NOT SHOWN FOR CLARITY)



END ELEVATION AT INLET NORMAL TO SKEW



RIGHT ANGLE SECTION OF BARREL

THERE ARE 86 "C" BARS IN SECTION OF BARREL
SEE SHEET C-6 FOR ROOF PLAN.
SEE SHEET C-7 FOR FLOOR PLAN.

• PHASE 1: C1 BARS ARE IN 3 BAR RUNS WITH A MINIMUM SPLICE LENGTH OF 2'-5".
PHASE 2: C2 BARS ARE IN 2 BAR RUNS WITH A MIMINUM SPLICE LENGTH OF 2'-5", SPLICED TO THE C1 BARS FROM PHASE 1 WITH A MINIMUM SPLICE LENGTH OF 2'-5".

NOTE: IF FIELD CONDITIONS DO NOT PROVIDE THE NECESSARY SPACE FOR A 2'-5" LAP SPLICE BETWEEN SOME/ALL OF THE PHASE 1 C1 BARS AND THE PHASE 2 C2 BARS, MECHANICAL SPLICES ARE PERMITTED TO MAKE THIS SPLICE. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDING AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "REINFORCING STEEL".

END ELEVATION AT OUTLET NORMAL TO SKEW

PROJECT NO. 17BP.14.R.159
MACON COUNTY
STATION: 14+88.00 -L-
SHEET 5 OF 13

3/5/2024
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			13

DRAWN BY :	MBC	DATE : 11-17
CHECKED BY :	JAD	DATE : 1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-24

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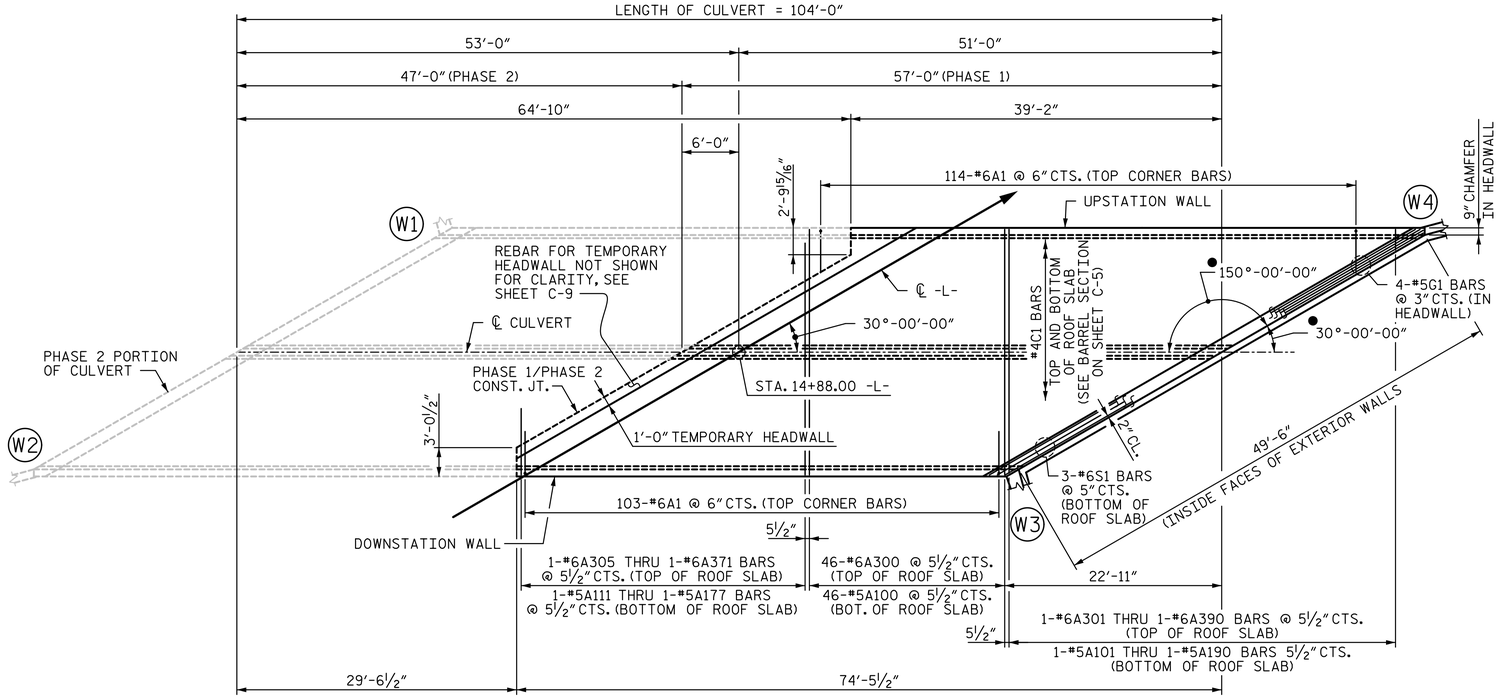
2/22/2024 10:33:31 AM
JJones



PHASE 1 ROOF PLAN

NOTES:

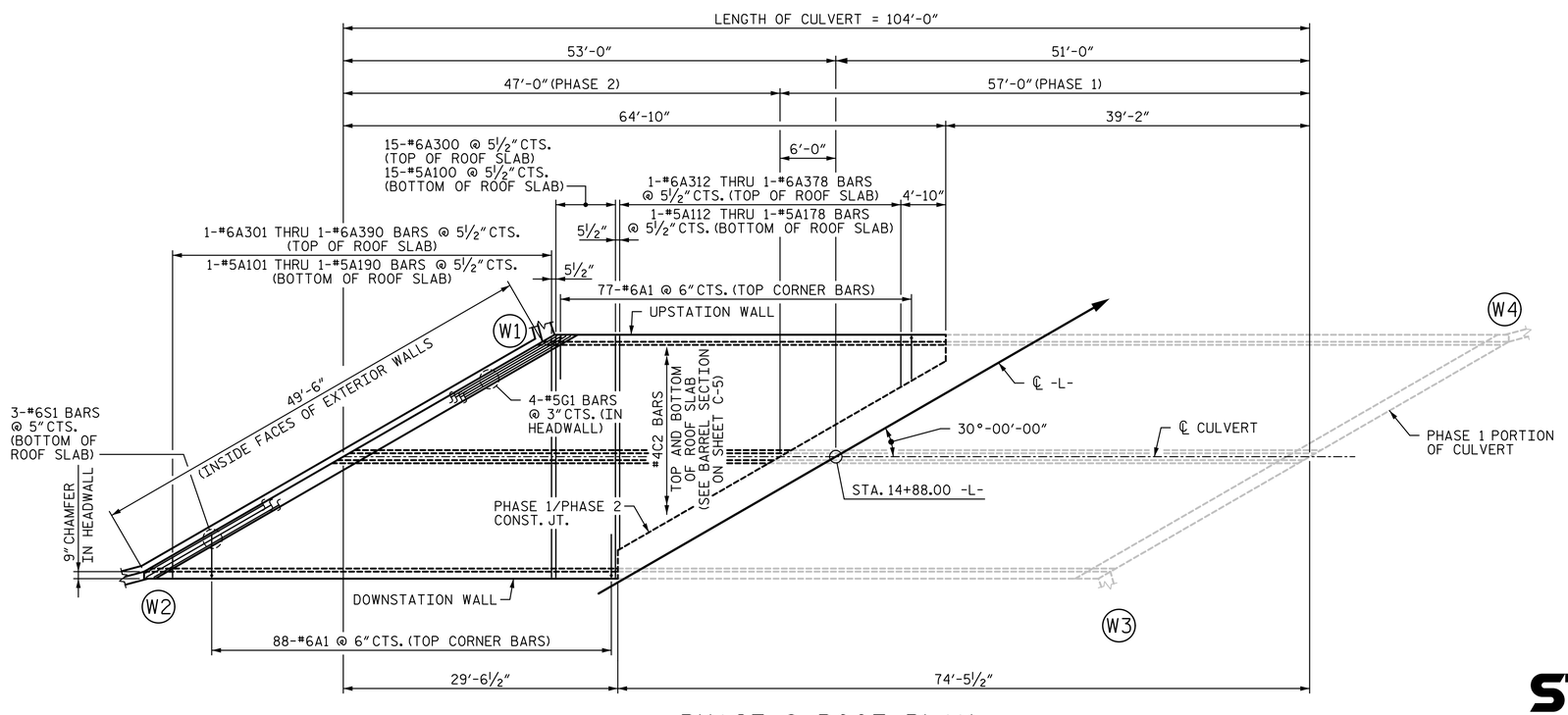
SEE SHEET C-7 FOR FLOOR PLAN.

MECHANICAL SPLICES MAY BE USED IF THE REBAR CONFLICTS WITH ANY EXISTING STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDING AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "REINFORCING STEEL".

MIN. SPLICE LENGTH FOR A3XX BARS IN TOP OF ROOF SLAB SHALL BE 3'-10".

MIN. SPLICE LENGTH FOR A1XX BARS IN BOTTOM OF ROOF SLAB SHALL BE 2'-2".

● TYP. @ EACH END OF CULVERT AND PHASE 1/PHASE 2 CONST. JT.



PHASE 2 ROOF PLAN

DRAWN BY :	MBC	DATE :	11-17
CHECKED BY :	JAD	DATE :	1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-24

3/5/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES

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PROJECT NO. 17BP.14.R.159

MACON COUNTY

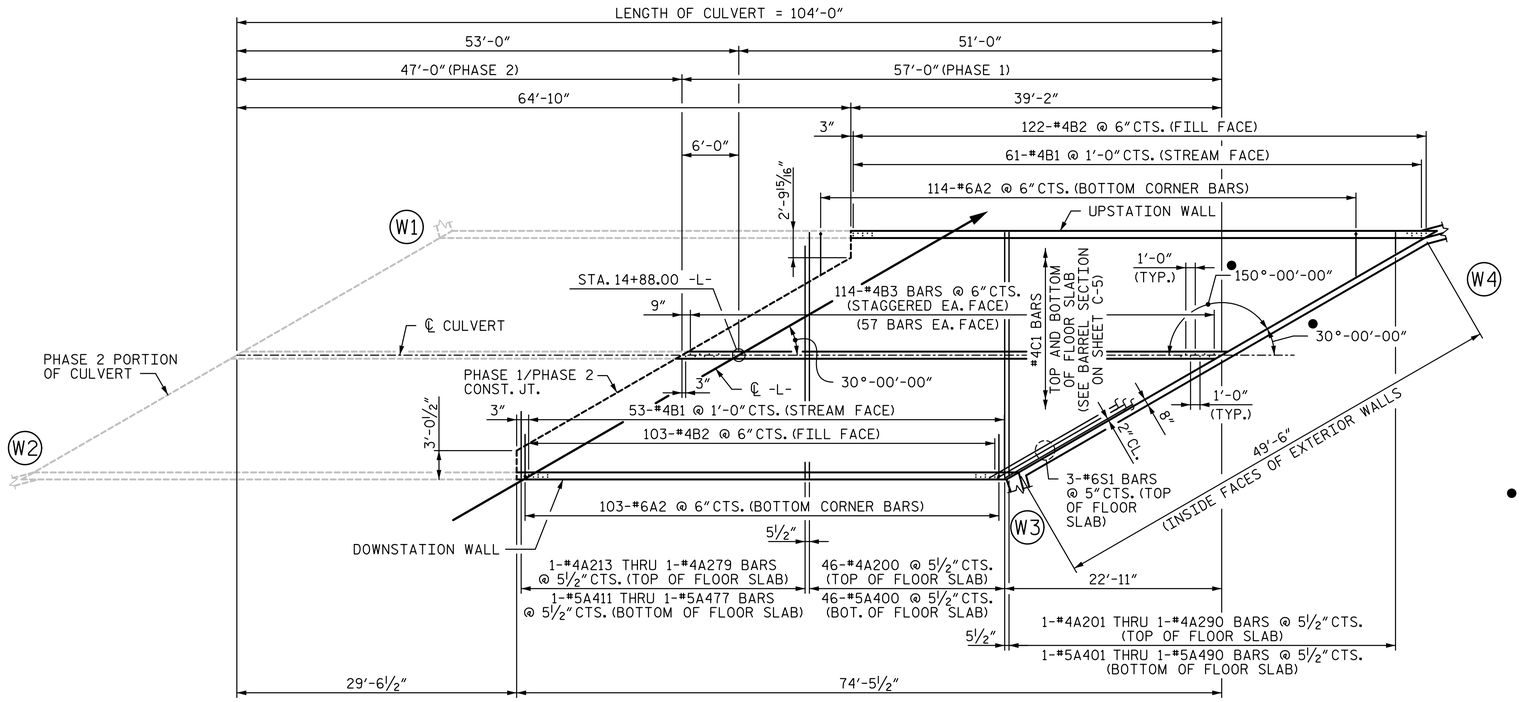
STATION: 14+88.00 -L-

SHEET 6 OF 13

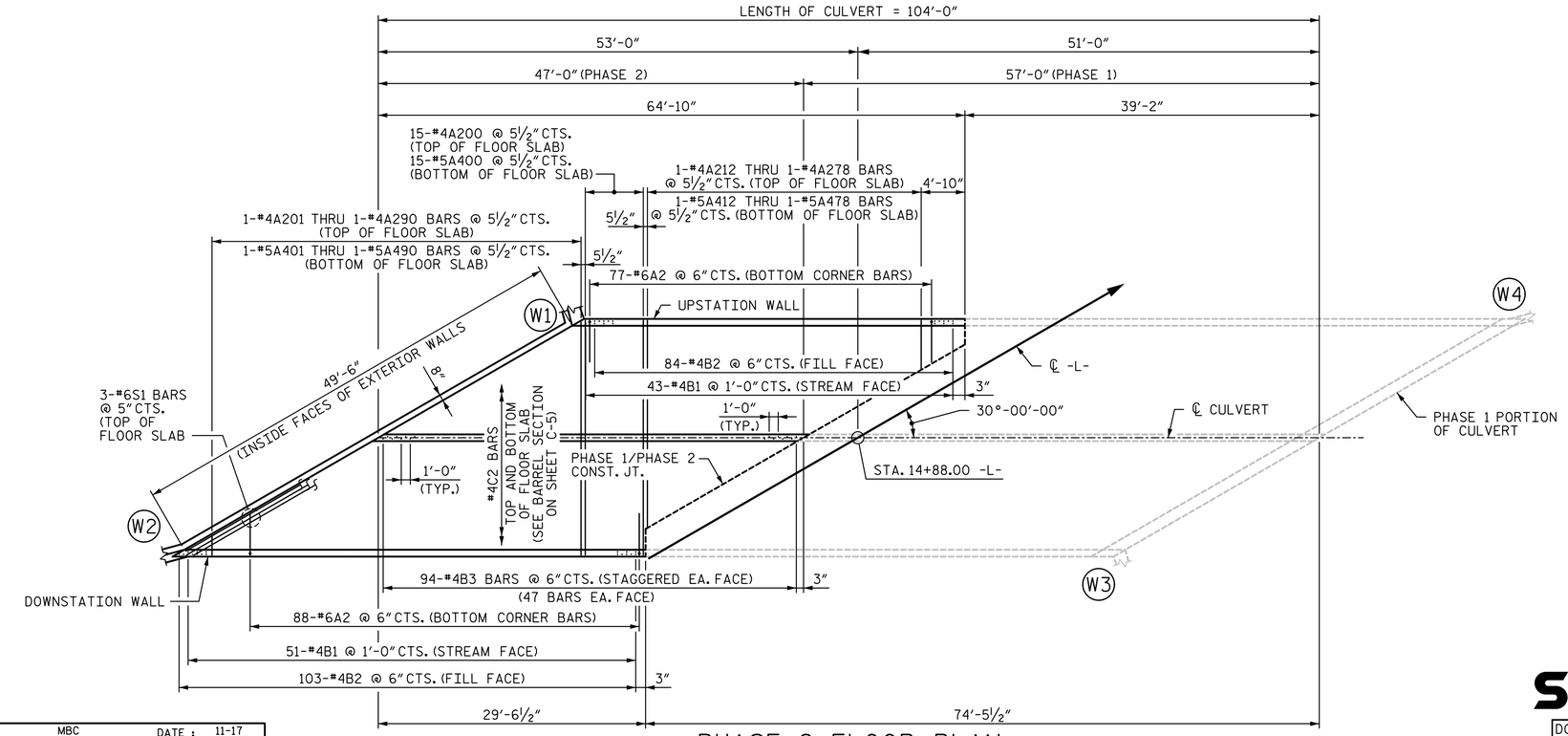
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			13



PHASE 1 FLOOR PLAN



PHASE 2 FLOOR PLAN

NOTES:

SEE SHEET C-6 FOR ROOF PLAN.

MECHANICAL SPLICES MAY BE USED IF THE REBAR CONFLICTS WITH ANY EXISTING STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDING AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "REINFORCING STEEL".

MIN. SPLICE LENGTH FOR AV2XX BARS IN TOP OF FLOOR SLAB SHALL BE 1'-9".

MIN. SPLICE LENGTH FOR AV4XX BARS IN BOTTOM OF FLOOR SLAB SHALL BE 2'-2".

SILLS NOT SHOWN FOR CLARITY. SEE SHEET C-12 FOR SILL DETAILS.

● TYP. @ EACH END OF CULVERT AND PHASE 1/PHASE 2 CONST. JT.

DRAWN BY :	MBC	DATE :	11-17
CHECKED BY :	JAD	DATE :	1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE :	3-24

3/5/2024

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES

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PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			13

BILL OF REINFORCING FOR BARREL

MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)
A100	46	15	#5	STR	25'-11"	1243	405
A101	1	1	#5	STR	25'-8"	27	27
A102	1	1	#5	STR	25'-5"	27	27
A103	1	1	#5	STR	25'-2"	26	26
A104	1	1	#5	STR	24'-10"	26	26
A105	1	1	#5	STR	24'-7"	26	26
A106	1	1	#5	STR	24'-4"	25	25
A107	1	1	#5	STR	24'-1"	25	25
A108	1	1	#5	STR	23'-10"	25	25
A109	1	1	#5	STR	23'-7"	25	25
A110	1	1	#5	STR	23'-3"	24	24
A111	2	1	#5	STR	23'-0"	48	24
A112	2	2	#5	STR	22'-9"	47	47
A113	2	2	#5	STR	22'-6"	47	47
A114	2	2	#5	STR	22'-3"	46	46
A115	2	2	#5	STR	22'-0"	46	46
A116	2	2	#5	STR	21'-8"	45	45
A117	2	2	#5	STR	21'-5"	45	45
A118	2	2	#5	STR	21'-2"	44	44
A119	2	2	#5	STR	20'-11"	44	44
A120	2	2	#5	STR	20'-8"	43	43
A121	2	2	#5	STR	20'-4"	42	42
A122	2	2	#5	STR	20'-1"	42	42
A123	2	2	#5	STR	19'-10"	41	41
A124	2	2	#5	STR	19'-7"	41	41
A125	2	2	#5	STR	19'-4"	40	40
A126	2	2	#5	STR	19'-1"	40	40
A127	2	2	#5	STR	18'-9"	39	39
A128	2	2	#5	STR	18'-6"	39	39
A129	2	2	#5	STR	18'-3"	38	38
A130	2	2	#5	STR	18'-0"	38	38
A131	2	2	#5	STR	17'-9"	37	37
A132	2	2	#5	STR	17'-6"	37	37
A133	2	2	#5	STR	17'-2"	36	36
A134	2	2	#5	STR	16'-11"	35	35
A135	2	2	#5	STR	16'-8"	35	35
A136	2	2	#5	STR	16'-5"	34	34
A137	2	2	#5	STR	16'-2"	34	34
A138	2	2	#5	STR	15'-11"	33	33
A139	2	2	#5	STR	15'-7"	33	33
A140	2	2	#5	STR	15'-4"	32	32
A141	2	2	#5	STR	15'-1"	31	31
A142	2	2	#5	STR	14'-10"	31	31
A143	2	2	#5	STR	14'-7"	30	30
A144	2	2	#5	STR	14'-3"	30	30
A145	2	2	#5	STR	14'-0"	29	29
A146	2	2	#5	STR	13'-9"	29	29
A147	2	2	#5	STR	13'-6"	28	28
A148	2	2	#5	STR	13'-3"	28	28
A149	2	2	#5	STR	13'-0"	27	27
A150	2	2	#5	STR	12'-8"	26	26
A151	2	2	#5	STR	12'-5"	26	26
A152	2	2	#5	STR	12'-2"	25	25
A153	2	2	#5	STR	11'-11"	25	25
A154	2	2	#5	STR	11'-8"	24	24
A155	2	2	#5	STR	11'-5"	24	24
A156	2	2	#5	STR	11'-1"	23	23
A157	2	2	#5	STR	10'-10"	23	23
A158	2	2	#5	STR	10'-7"	22	22
A159	2	2	#5	STR	10'-4"	22	22
A160	2	2	#5	STR	10'-1"	21	21
A161	2	2	#5	STR	9'-9"	20	20
A162	2	2	#5	STR	9'-6"	20	20
A163	2	2	#5	STR	9'-3"	19	19
A164	2	2	#5	STR	9'-0"	19	19
A165	2	2	#5	STR	8'-9"	18	18
A166	2	2	#5	STR	8'-6"	18	18
A167	2	2	#5	STR	8'-2"	17	17
A168	2	2	#5	STR	7'-11"	17	17
A169	2	2	#5	STR	7'-8"	16	16
A170	2	2	#5	STR	7'-5"	15	15
A171	2	2	#5	STR	7'-2"	15	15
A172	2	2	#5	STR	6'-11"	14	14
A173	2	2	#5	STR	6'-7"	14	14
A174	2	2	#5	STR	6'-4"	13	13
A175	2	2	#5	STR	6'-1"	13	13
A176	2	2	#5	STR	5'-10"	12	12
A177	2	2	#5	STR	5'-7"	12	12
A178	1	2	#5	STR	5'-3"	5	11
A179	1	1	#5	STR	5'-0"	5	5
A180	1	1	#5	STR	4'-9"	5	5
A181	1	1	#5	STR	4'-6"	5	5
A182	1	1	#5	STR	4'-3"	4	4
A183	1	1	#5	STR	4'-0"	4	4
A184	1	1	#5	STR	3'-8"	4	4
A185	1	1	#5	STR	3'-5"	4	4
A186	1	1	#5	STR	3'-2"	3	3
A187	1	1	#5	STR	2'-11"	3	3
A188	1	1	#5	STR	2'-8"	3	3
A189	1	1	#5	STR	2'-5"	3	3
A190	1	1	#5	STR	2'-1"	2	2
A200	46	15	#4	STR	25'-11"	796	260
A201	1	1	#4	STR	25'-8"	17	17
A202	1	1	#4	STR	25'-5"	17	17
A203	1	1	#4	STR	25'-2"	17	17
A204	1	1	#4	STR	24'-10"	17	17
A205	1	1	#4	STR	24'-7"	16	16
A206	1	1	#4	STR	24'-4"	16	16
A207	1	1	#4	STR	24'-1"	16	16
A208	1	1	#4	STR	23'-10"	16	16
A209	1	1	#4	STR	23'-7"	16	16
A210	1	1	#4	STR	23'-3"	16	16
A211	1	1	#4	STR	23'-0"	15	15
A212	1	2	#4	STR	22'-9"	15	30
A213	2	2	#4	STR	22'-6"	30	30
A214	2	2	#4	STR	22'-3"	30	30
A215	2	2	#4	STR	22'-0"	29	29
A216	2	2	#4	STR	21'-8"	29	29
A217	2	2	#4	STR	21'-5"	29	29
A218	2	2	#4	STR	21'-2"	28	28
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A220	2	2	#4	STR	20'-8"	28	28
A221	2	2	#4	STR	20'-4"	27	27
A222	2	2	#4	STR	20'-1"	27	27
A223	2	2	#4	STR	19'-10"	26	26
A224	2	2	#4	STR	19'-7"	26	26
A225	2	2	#4	STR	19'-4"	26	26
A226	2	2	#4	STR	19'-1"	25	25
A227	2	2	#4	STR	18'-9"	25	25
A228	2	2	#4	STR	18'-6"	25	25
A229	2	2	#4	STR	18'-3"	24	24
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A231	2	2	#4	STR	17'-9"	24	24
A232	2	2	#4	STR	17'-6"	23	23
A233	2	2	#4	STR	17'-2"	23	23
A234	2	2	#4	STR	16'-11"	23	23
A235	2	2	#4	STR	16'-8"	22	22
A236	2	2	#4	STR	16'-5"	22	22
A237	2	2	#4	STR	16'-2"	22	22
A238	2	2	#4	STR	15'-11"	21	21
A239	2	2	#4	STR	15'-7"	21	21
A240	2	2	#4	STR	15'-4"	20	20
A241	2	2	#4	STR	15'-1"	20	20
A242	2	2	#4	STR	14'-10"	20	20
A243	2	2	#4	STR	14'-7"	19	19
A244	2	2	#4	STR	14'-3"	19	19
A245	2	2	#4	STR	14'-0"	19	19
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A250	2	2	#4	STR	12'-8"	17	17
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A256	2	2	#4	STR	11'-1"	15	15
A257	2	2	#4	STR	10'-10"	14	14
A258	2	2	#4	STR	10'-7"	14	14
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A266	2	2	#4	STR	8'-6"	11	11
A267	2	2	#4	STR	8'-2"	11	11
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A269	2	2	#4	STR	7'-8"	10	10
A270	2	2	#4	STR	7'-5"	10	10
A271	2	2	#4	STR	7'-2"	10	10
A272	2	2	#4	STR	6'-11"	9	9
A273	2	2	#4	STR	6'-7"	9	9
A274	2	2	#4	STR	6'-4"	8	8
A275	2	2	#4	STR	6'-1"	8	8
A276	2	2	#4	STR	5'-10"	8	8
A277	2	2	#4	STR	5'-7"	7	7
A278	2	2	#4	STR	5'-3"	7	7
A279	2	1	#4	STR	5'-0"	7	3
A280	1	1	#4	STR	4'-9"	3	3
A281	1	1	#4	STR	4'-6"	3	3
A282	1	1	#4	STR	4'-3"	3	3
A283	1	1	#4	STR	4'-0"	3	3
A284	1	1	#4	STR	3'-8"	2	2
A285	1	1	#4	STR	3'-5"	2	2
A286	1	1	#4	STR	3'-2"	2	2
A287	1	1	#4	STR	2'-11"	2	2
A288	1	1	#4	STR	2'-8"	2	2
A289	1	1	#4	STR	2'-5"	2	2
A290	1	1	#4	STR	2'-1"	1	1
A300	46	15	#6	STR	25'-11"	1791	584
A301	1	1	#6	STR	25'-8"	39	39
A302	1	1	#6	STR	25'-5"	38	38
A303	1	1	#6	STR	25'-2"	38	38
A304	1	1	#6	STR	24'-10"	37	37
A305	2	1	#6	STR	24'-7"	74	37
A306	2	1	#6	STR	24'-4"	73	37
A307	2	1	#6	STR	24'-1"	72	36
A308	2	1	#6	STR	23'-10"	72	36
A309	2	1	#6	STR	23'-7"	71	35
A310	2	1	#6	STR	23'-3"	70	35
A311	2	1	#6	STR	23'-0"	69	35
A312	2	2	#6	STR	22'-9"	68	68
A313	2	2	#6	STR	22'-6"	68	68
A314	2	2	#6	STR	22'-3"	67	67
A315	2	2	#6	STR	22'-0"	66	66
A316	2	2	#6	STR	21'-8"	65	65
A317	2	2	#6	STR	21'-5"	64	64
A318	2	2	#6	STR	21'-2"	64	64
A319	2	2	#6	STR	20'-11"	63	63
A320	2	2	#6	STR	20'-8"	62	62
A321	2	2	#6	STR	20'-4"	61	61
A322	2	2	#6	STR	20'-1"	60	60
A323	2	2	#6	STR	19'-10"	60	60
A324	2	2	#6	STR	19'-7"	59	59
A325	2	2	#6	STR	19'-4"	58	58
A326	2	2	#6	STR	19'-1"	57	57
A327	2	2	#6	STR	18'-9"	56	56
A328	2	2	#6	STR	18'-6"	56	56
A329	2	2	#6	STR	18'-3"	55	55
A330	2	2	#6	STR	18'-0"	54	54
A331	2	2	#6	STR	17'-9"	53	53
A332	2	2	#6	STR	17'-6"	53	53
A333	2	2	#6	STR	17'-2"	52	52
A334	2	2	#6	STR	16'-11"	51	51
A335	2	2	#6	STR	16'-8"	50	50
A336	2	2	#6	STR	16'-5"	49	49
A337	2	2	#6	STR	16'-2"	49	49
A338	2	2	#6	STR	15'-11"	48	48
A339	2	2	#6	STR	15'-7"	47	47
A340	2	2	#6	STR	15'-4"	46	46
A341	2	2	#6	STR	15'-1"	45	45
A342	2	2	#6	STR	14'-10"	45	45
A343	2	2	#6	STR	14'-7"	44	44
A344	2	2	#6	STR	14'-3"	43	43
A345	2	2	#6	STR	14'-0"	42	42
A346	2	2	#6	STR	13'-9"	41	41
A347	2	2	#6	STR	13'-6"	41	41
A348	2	2	#6	STR	13'-3"	40	40
A349	2	2	#6	STR	13'-0"	39	39
A350	2	2	#6	STR	12'-8"	38	38
A351	2	2	#6	STR	12'-5"	37	37
A352	2	2	#6	STR	12'-2"	37	37
A353	2	2	#6	STR	11'-11"	36	36
A354	2	2	#6	STR	11'-8"	35	35
A355	2	2	#6	STR	11'-5"	34	34
A356	2	2	#6	STR	11'-1"	33	33
A357	2	2	#6	STR	10'-10"	33	33
A358	2	2	#6	STR	10'-7"	32	32
A359	2	2	#6	STR	10'-4"	31	31
A360	2	2	#6	STR	10'-1"	30	30
A361	2	2	#6	STR	9'-9"	29	29
A362	2	2	#6	STR	9'-6"	29	29
A363	2	2	#6	STR	9'-3"	28	28
A364	2	2	#6	STR	9'-0"	27	27
A365	2	2	#6	STR	8'-9"	26	26
A366	2	2	#6	STR	8'-6"	26	26
A367	2	2	#6	STR	8'-2"	25	25
A368	2	2	#6	STR	7'-11"	24	24
A369	2	2	#6	STR	7'-8"	23	23
A370	2	2	#6	STR	7'-5"	22	22
A371	2	2	#6	STR	7'-2"	22	22
A372	1	2	#6	STR	6'-11"	10	21
A373	1	2	#6	STR	6'-7"	10	20
A374	1	2	#6	STR	6'-4"	10	19
A375	1	2	#6	STR	6'-1"	9	18
A376	1	2	#6	STR	5'-10"	9	18
A377	1	2	#6	STR	5'-7"	8	17
A378	1	2	#6	STR	5'-3"	8	16
A379	1	1	#6	STR	5'-0"	8	8
A380	1	1	#6	STR	4'-9"	7	7
A381	1	1	#6	STR	4'-6"	7	7
A382	1	1	#6	STR	4'-3"	6	6
A383	1	1	#6	STR	4'-0"	6	6
A384	1	1	#6	STR	3'-8"	6	6
A385	1	1	#6	STR	3'-5"	5	5
A386	1	1	#6	STR	3'-2"	5	5
A387	1	1	#6	STR	2'-11"	4	4
A388	1	1	#6	STR	2'-8"	4	4
A389	1	1	#6	STR	2'-5"	4	4
A390	1	1	#6	STR	2'-1"	3	3

DRAWN BY : MBC DATE : 11-17
CHECKED BY : JAD DATE : 1-18
DESIGN ENGINEER OF RECORD : JWJ DATE : 3-24

PROJECT NO. 17BP.14.R.159
MACON COUNTY
STATION: 14+88.00 -L-

SHEET 8 OF 13

3/5/2024
NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			13

JJones 2/22/2024 10:33:33 AM R:\Structures\ustation\v01_015_17BP.14.R.159_SMU_RCBC08.dgn

BILL OF REINFORCING FOR BARREL (CON'T)

MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)	MARK	NO. (PHASE 1)	NO. (PHASE 2)	SIZE	TYPE	LENGTH	WEIGHT (PHASE 1)	WEIGHT (PHASE 2)
A400	46	15	#5	STR	25'-11"	1243	405	A471	2	2	#5	STR	7'-2"	15	15
A401	1	1	#5	STR	25'-8"	27	27	A472	2	2	#5	STR	6'-11"	14	14
A402	1	1	#5	STR	25'-5"	27	27	A473	2	2	#5	STR	6'-7"	14	14
A403	1	1	#5	STR	25'-2"	26	26	A474	2	2	#5	STR	6'-4"	13	13
A404	1	1	#5	STR	24'-10"	26	26	A475	2	2	#5	STR	6'-1"	13	13
A405	1	1	#5	STR	24'-7"	26	26	A476	2	2	#5	STR	5'-10"	12	12
A406	1	1	#5	STR	24'-4"	25	25	A477	2	2	#5	STR	5'-7"	12	12
A407	1	1	#5	STR	24'-1"	25	25	A478	1	2	#5	STR	5'-3"	5	11
A408	1	1	#5	STR	23'-10"	25	25	A479	1	1	#5	STR	5'-0"	5	5
A409	1	1	#5	STR	23'-7"	25	25	A480	1	1	#5	STR	4'-9"	5	5
A410	1	1	#5	STR	23'-3"	24	24	A481	1	1	#5	STR	4'-6"	5	5
A411	2	1	#5	STR	23'-0"	48	24	A482	1	1	#5	STR	4'-3"	4	4
A412	2	2	#5	STR	22'-9"	47	47	A483	1	1	#5	STR	4'-0"	4	4
A413	2	2	#5	STR	22'-6"	47	47	A484	1	1	#5	STR	3'-8"	4	4
A414	2	2	#5	STR	22'-3"	46	46	A485	1	1	#5	STR	3'-5"	4	4
A415	2	2	#5	STR	22'-0"	46	46	A486	1	1	#5	STR	3'-2"	3	3
A416	2	2	#5	STR	21'-8"	45	45	A487	1	1	#5	STR	2'-11"	3	3
A417	2	2	#5	STR	21'-5"	45	45	A488	1	1	#5	STR	2'-8"	3	3
A418	2	2	#5	STR	21'-2"	44	44	A489	1	1	#5	STR	2'-5"	3	3
A419	2	2	#5	STR	20'-11"	44	44	A490	1	1	#5	STR	2'-1"	2	2
A420	2	2	#5	STR	20'-8"	43	43								
A421	2	2	#5	STR	20'-4"	42	42	A1	217	165	#6	①	9'-11"	3232	2458
A422	2	2	#5	STR	20'-1"	42	42	A2	217	165	#6	①	7'-10"	2553	1941
A423	2	2	#5	STR	19'-10"	41	41								
A424	2	2	#5	STR	19'-7"	41	41	B1	114	94	#4	STR	8'-0"	609	502
A425	2	2	#5	STR	19'-4"	40	40	B2	225	187	#4	STR	5'-0"	752	625
A426	2	2	#5	STR	19'-1"	40	40	B3	114	94	#4	STR	8'-0"	609	502
A427	2	2	#5	STR	18'-9"	39	39								
A428	2	2	#5	STR	18'-6"	39	39	C1	258	0	#4	STR	22'-11"	3950	0
A429	2	2	#5	STR	18'-3"	38	38	C2	0	172	#4	STR	27'-1"	0	3112
A430	2	2	#5	STR	18'-0"	38	38								
A431	2	2	#5	STR	17'-9"	37	37	D1	4	4	#6	STR	2'-7"	16	16
A432	2	2	#5	STR	17'-6"	37	37	D2	4	4	#6	STR	1'-7"	10	10
A433	2	2	#5	STR	17'-2"	36	36								
A434	2	2	#5	STR	16'-11"	35	35	G1	4	4	#5	STR	51'-10"	216	216
A435	2	2	#5	STR	16'-8"	35	35	G2	2	0	#5	STR	47'-10"	100	0
A436	2	2	#5	STR	16'-5"	34	34								
A437	2	2	#5	STR	16'-2"	34	34	S1	6	6	#6	STR	51'-10"	467	467
A438	2	2	#5	STR	15'-11"	33	33	S2	31	0	#4	②	11'-6"	238	0
A439	2	2	#5	STR	15'-7"	33	33								
A440	2	2	#5	STR	15'-4"	32	32								
A441	2	2	#5	STR	15'-1"	31	31								
A442	2	2	#5	STR	14'-10"	31	31								
A443	2	2	#5	STR	14'-7"	30	30								
A444	2	2	#5	STR	14'-3"	30	30								
A445	2	2	#5	STR	14'-0"	29	29								
A446	2	2	#5	STR	13'-9"	29	29								
A447	2	2	#5	STR	13'-6"	28	28								
A448	2	2	#5	STR	13'-3"	28	28								
A449	2	2	#5	STR	13'-0"	27	27								
A450	2	2	#5	STR	12'-8"	26	26								
A451	2	2	#5	STR	12'-5"	26	26								
A452	2	2	#5	STR	12'-2"	25	25								
A453	2	2	#5	STR	11'-11"	25	25								
A454	2	2	#5	STR	11'-8"	24	24								
A455	2	2	#5	STR	11'-5"	24	24								
A456	2	2	#5	STR	11'-1"	23	23								
A457	2	2	#5	STR	10'-10"	23	23								
A458	2	2	#5	STR	10'-7"	22	22								
A459	2	2	#5	STR	10'-4"	22	22								
A460	2	2	#5	STR	10'-1"	21	21								
A461	2	2	#5	STR	9'-9"	20	20								
A462	2	2	#5	STR	9'-6"	20	20								
A463	2	2	#5	STR	9'-3"	19	19								
A464	2	2	#5	STR	9'-0"	19	19								
A465	2	2	#5	STR	8'-9"	18	18								
A466	2	2	#5	STR	8'-6"	18	18								
A467	2	2	#5	STR	8'-2"	17	17								
A468	2	2	#5	STR	7'-11"	17	17								
A469	2	2	#5	STR	7'-8"	16	16								
A470	2	2	#5	STR	7'-5"	15	15								

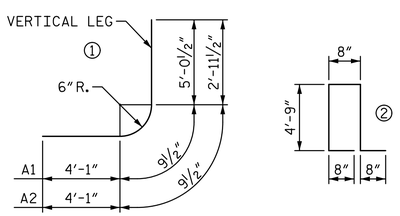
PHASE 1 BARREL REINFORCING STEEL = 27,360 LBS.
PHASE 2 BARREL REINFORCING STEEL = 20,828 LBS.
TOTAL BARREL REINFORCING STEEL = 48,188 LBS.

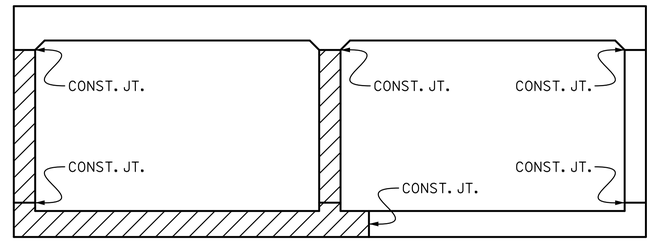
PHASE 1 BARREL CONCRETE = 2.777 CY/FT = 158.3 CY
PHASE 2 BARREL CONCRETE = 2.777 CY/FT = 130.5 CY
TOTAL BARREL CONCRETE = 288.8 CY

FOUNDATION CONDITIONING MATERIAL
PHASE 1 = 122 TONS
PHASE 2 = 101 TONS
TOTAL = 223 TONS

BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT





STAGE 1

STAGE 2

STAGE 1
POUR 1. STAGE 1 FLOOR SLAB (INCLUDING WING FOOTING) WITH 4" OF VERTICAL WALLS/WING.

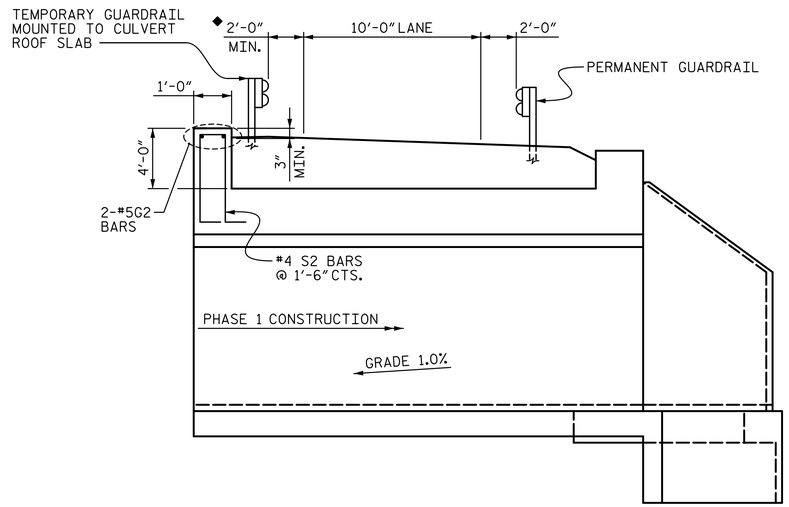
POUR 2. REMAINING PORTIONS OF STAGE 1 WALLS/WING TO FULL HEIGHT.

STAGE 2
POUR 1. STAGE 2 FLOOR SLAB (INCLUDING WING FOOTING) WITH 4" OF VERTICAL WALL/WING.

POUR 2. REMAINING PORTIONS OF STAGE 2 WALL/WING TO FULL HEIGHT.

POUR 3. ENTIRE ROOF SLAB AND HEADWALL(S).

OPTIONAL STAGING WITHIN A CONSTRUCTION PHASE



PHASE 1 CONSTRUCTION DETAIL

(LOOKING UPSTATION)

◆ TEMPORARY GUARDRAIL SHALL BE ALIGNED PARALLEL WITH -L-.

PROJECT NO. 17BP.14.R.159
MACON COUNTY
STATION: 14+88.00 -L-

SHEET 9 OF 13

3/5/2024
STATE OF NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES
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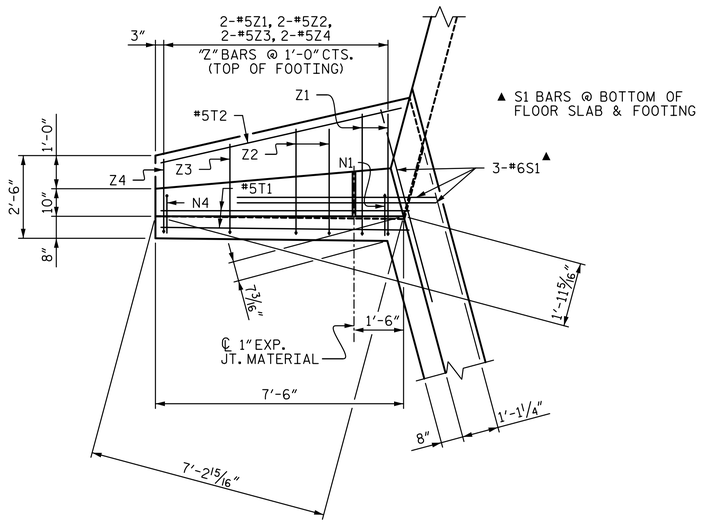
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

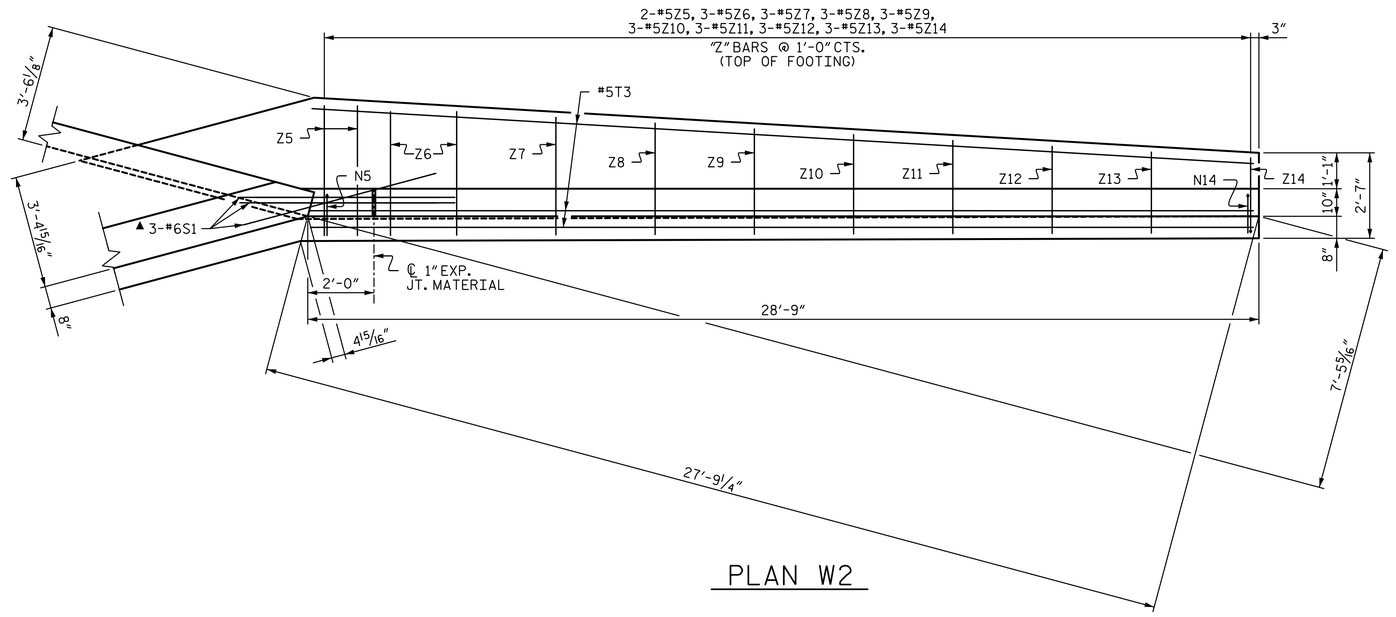
DOUBLE 12'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT WALNUT CREEK 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			13

DRAWN BY : MBC DATE : 11-17
CHECKED BY : JAD DATE : 1-18
DESIGN ENGINEER OF RECORD : JWJ DATE : 3-24

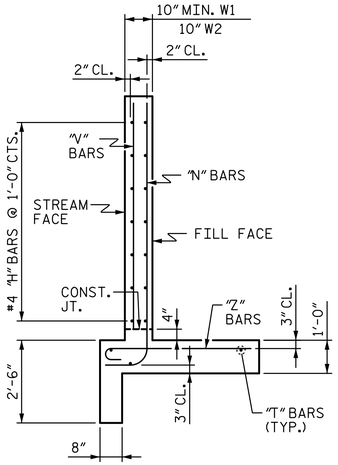


PLAN W1



PLAN W2

ELEVATION W1



TYPICAL WING SECTION

ELEVATION W2

PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 10 OF 13

3/5/2024

NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER J. WESLEY JONES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT H=6'-0" SLOPE=2:1 30°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-10
1			3			TOTAL SHEETS
2			4			13

DRAWN BY :	MBC	DATE : 11-17
CHECKED BY :	JAD	DATE : 1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-24

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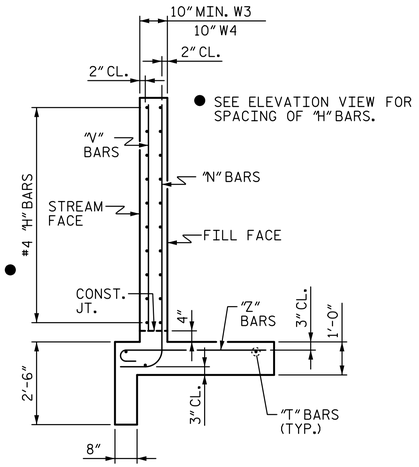


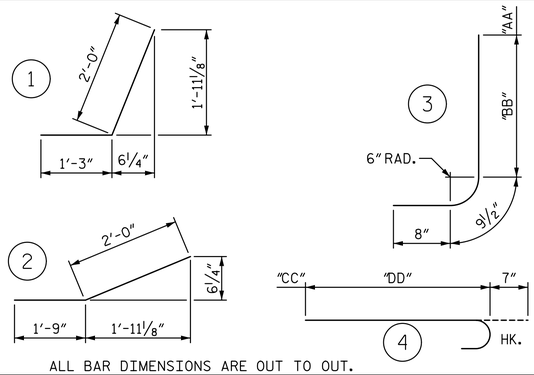
REINFORCING STEEL	PHASE 1	1,136	LBS.
	PHASE 2	1,053	LBS.
	TOTAL	2,189	LBS.

CLASS A CONCRETE

PHASE 1		
2 WINGS (INCLUDING FOOTINGS)	11.5	CY
1 HEADWALL	2.4	CY
1 TEMPORARY HEADWALL	7.7	CY
2 SILLS	1.3	CY
1 END CURTAIN WALL	4.9	CY
TOTAL	27.8	CY

PHASE 2		
2 WINGS (INCLUDING FOOTINGS)	11.2	CY
1 HEADWALL	2.4	CY
2 SILLS	1.3	CY
1 END CURTAIN WALL	5.4	CY
TOTAL	20.3	CY

BAR TYPES



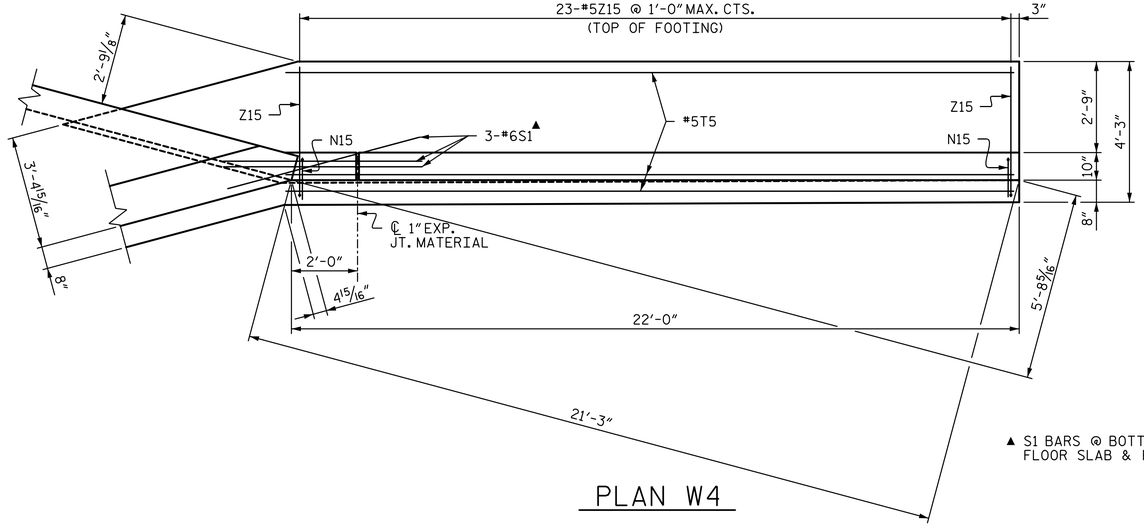
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	PHASE 1 NO.	PHASE 2 NO.	SIZE	TYPE	LENGTH	PHASE 1 WEIGHT	PHASE 2 WEIGHT
H1	0	8	#4	STR	5'-7"	0	30
H2	0	2	#4	STR	4'-2"	0	6
H3	0	2	#4	STR	2'-1"	0	3
H4	0	14	#4	1	3'-3"	0	30
H5	0	2	#4	STR	6'-3"	0	8
H6	0	8	#4	STR	26'-4"	0	141
H7	0	2	#4	STR	21'-10"	0	29
H8	0	2	#4	STR	13'-3"	0	18
H9	0	2	#4	STR	4'-8"	0	6
H10	0	14	#4	2	3'-9"	0	35
H11	0	2	#4	STR	26'-5"	0	35
H12	20	0	#4	STR	4'-7"	61	0
H13	20	0	#4	1	3'-3"	43	0
H14	20	0	#4	STR	19'-7"	262	0
H15	20	0	#4	2	3'-9"	50	0

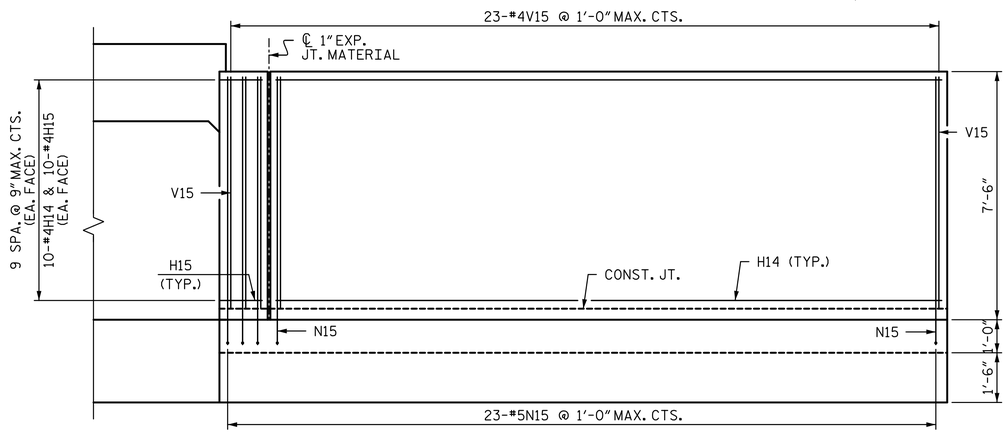
BAR	PHASE 1 NO.	PHASE 2 NO.	SIZE	TYPE	LENGTH	PHASE 1 WEIGHT	PHASE 2 WEIGHT
N1	0	2	#5	3	8'-7"	0	18
N2	0	2	#5	3	7'-7"	0	16
N3	0	2	#5	3	6'-7"	0	14
N4	0	2	#5	3	5'-7"	0	12
N5	0	2	#5	3	8'-10"	0	18
N6	0	3	#5	3	8'-6"	0	27
N7	0	3	#5	3	8'-2"	0	26
N8	0	3	#5	3	7'-10"	0	25
N9	0	3	#5	3	7'-5"	0	23
N10	0	3	#5	3	7'-1"	0	22
N11	0	3	#5	3	6'-8"	0	21
N12	0	3	#5	3	6'-5"	0	20
N13	0	3	#5	3	6'-1"	0	19
N14	0	3	#5	3	5'-8"	0	18
N15	31	0	#5	3	9'-0"	291	0
S1	6	6	#6	STR	6'-0"	54	54
T1	0	2	#5	STR	7'-6"	0	16
T2	0	1	#5	STR	7'-5"	0	8
T3	0	3	#5	STR	28'-6"	0	89
T4	3	0	#5	STR	6'-6"	20	0
T5	3	0	#5	STR	22'-0"	69	0
V1	0	2	#4	STR	6'-6"	0	9
V2	0	2	#4	STR	5'-6"	0	7
V3	0	2	#4	STR	4'-7"	0	6
V4	0	2	#4	STR	3'-7"	0	5
V5	0	2	#4	STR	6'-10"	0	9
V6	0	3	#4	STR	6'-5"	0	13
V7	0	3	#4	STR	6'-1"	0	12
V8	0	3	#4	STR	5'-9"	0	12
V9	0	3	#4	STR	5'-5"	0	11
V10	0	3	#4	STR	5'-1"	0	10
V11	0	3	#4	STR	4'-9"	0	10
V12	0	3	#4	STR	4'-4"	0	9
V13	0	3	#4	STR	4'-0"	0	8
V14	0	3	#4	STR	3'-8"	0	7
V15	31	0	#4	STR	7'-0"	145	0
Z1	0	2	#5	4	4'-2"	0	9
Z2	0	2	#5	4	3'-9"	0	8
Z3	0	2	#5	4	3'-3"	0	7
Z4	0	2	#5	4	2'-9"	0	6
Z5	0	2	#5	4	4'-6"	0	9
Z6	0	3	#5	4	4'-3"	0	13
Z7	0	3	#5	4	4'-1"	0	13
Z8	0	3	#5	4	3'-11"	0	12
Z9	0	3	#5	4	3'-9"	0	12
Z10	0	3	#5	4	3'-7"	0	11
Z11	0	3	#5	4	3'-4"	0	10
Z12	0	3	#5	4	3'-2"	0	10
Z13	0	3	#5	4	3'-0"	0	9
Z14	0	3	#5	4	2'-10"	0	9
Z15	30	0	#5	4	4'-6"	141	0

TYPICAL WING SECTION

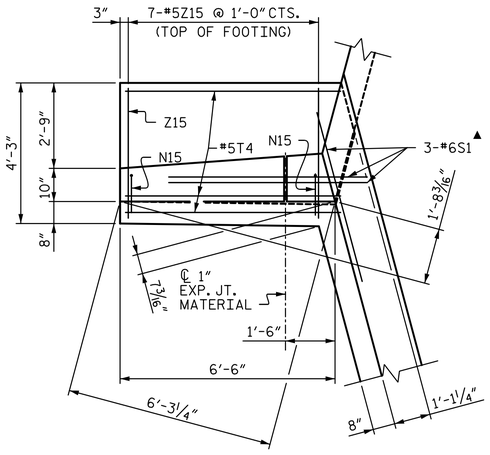


▲ S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

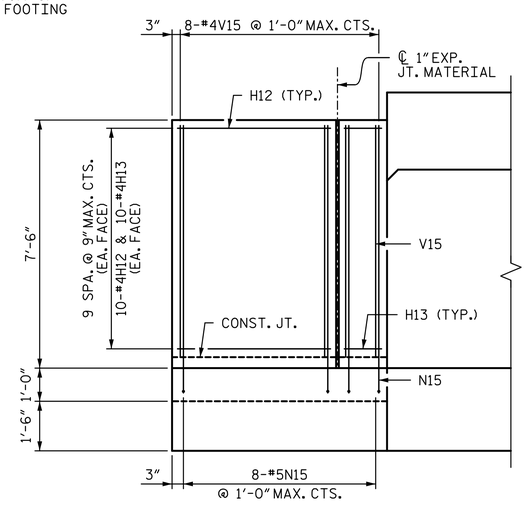
PLAN W4



ELEVATION W4



PLAN W3



ELEVATION W3

TABLE A	
"AA"	"BB"
N1	7'-1½"
N2	6'-1½"
N3	5'-1½"
N4	4'-1½"
N5	7'-4½"
N6	7'-0½"
N7	6'-8½"
N8	6'-4½"
N9	5'-11½"
N10	5'-7½"
N11	5'-2½"
N12	4'-11½"
N13	4'-7½"
N14	4'-2½"
N15	7'-6½"

TABLE B	
"CC"	"DD"
Z1	3'-7"
Z2	3'-2"
Z3	2'-8"
Z4	2'-2"
Z5	3'-11"
Z6	3'-8"
Z7	3'-6"
Z8	3'-4"
Z9	3'-2"
Z10	3'-0"
Z11	2'-9"
Z12	2'-7"
Z13	2'-5"
Z14	2'-3"
Z15	3'-11"

PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 11 OF 13

3/5/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038640 WESLEY JONES

DocuSigned by: Wesley Jones 68C7E5EFD4F844E...

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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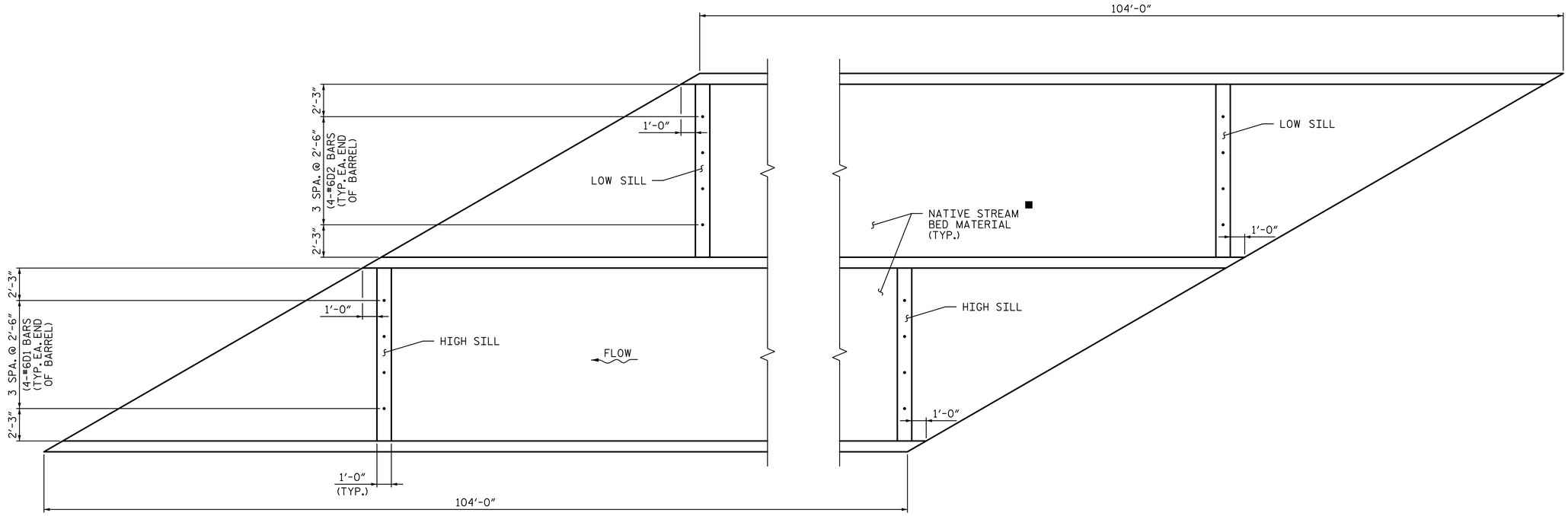
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT H=6'-0" SLOPE=2:1 30°-00'-00" SKEW

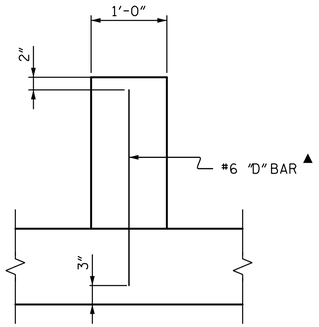
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			13

DRAWN BY :	MBC	DATE : 11-17
CHECKED BY :	JAD	DATE : 1-18
DESIGN ENGINEER OF RECORD :	JWJ	DATE : 3-24



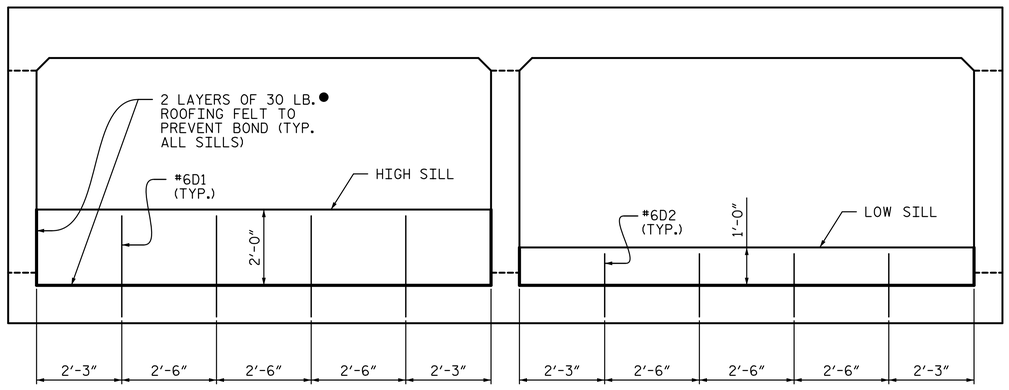
PLAN VIEW - LOCATION OF SILLS

■ NATIVE STREAM BED MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN SILLS. (SEE NOTE ON SHEET C-1)



SECTION THROUGH SILL

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



ELEVATION

(INLET VIEW SHOWN)

● THE COST OF THE ROOFING FELT IS INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

PROJECT NO. 17BP.14.R.159

MACON COUNTY

STATION: 14+88.00 -L-

SHEET 12 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SILL DETAILS

3/5/2024
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1			3			TOTAL SHEETS
2			4			13

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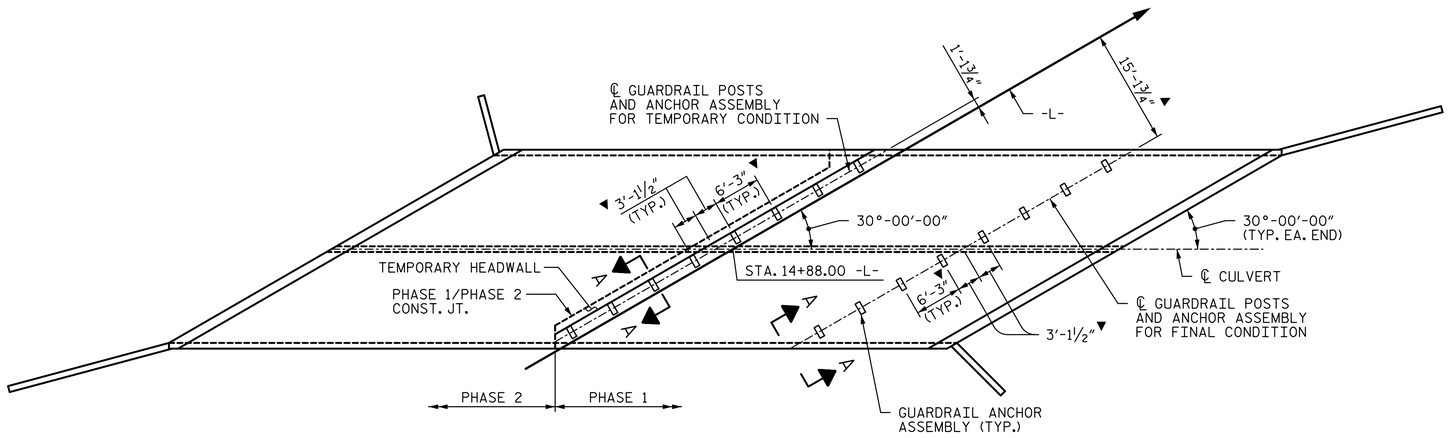


PLAN

▼ MEASURED ALONG ℄ GUARDRAIL POST AND ANCHOR ASSEMBLY
▲ THIS DIMENSION TO BE VERIFIED BY THE ENGINEER IN THE FIELD.

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 2½".

B. 4 - 1" Ø X 2¼" 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 2¼" 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 7/16" 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.

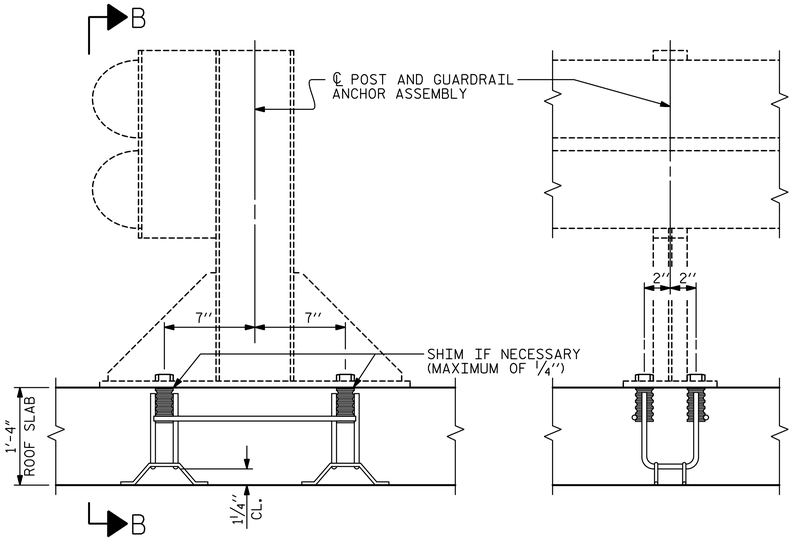
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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.

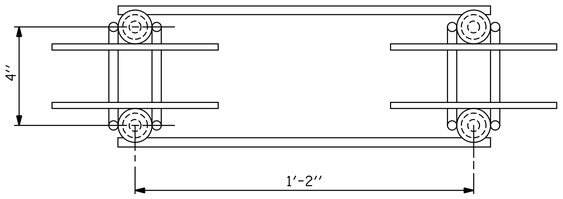
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

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.

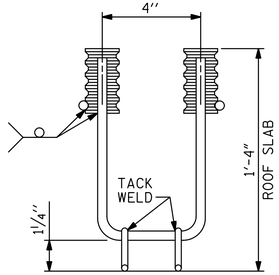


SECTION A-A

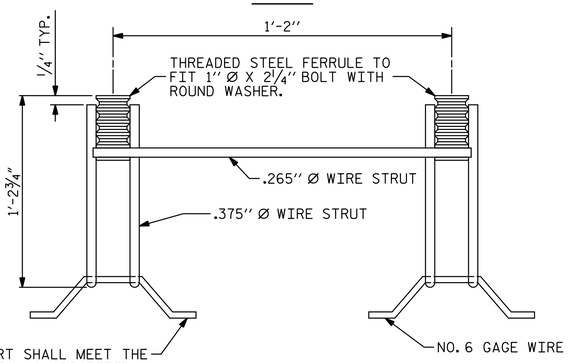
SECTION B-B



PLAN



ELEVATION



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

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 17BP.14.R.159
MACON COUNTY
STATION: 14+88.00 -L-

SHEET 13 OF 13

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

3/5/2024
NORTH CAROLINA PROFESSIONAL SEAL 038640 ENGINEER WESLEY JONES
DocuSigned by: Wesley Jones 68C7E5EFD4F844E...

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STD. NO. GRA1

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 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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" 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 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.