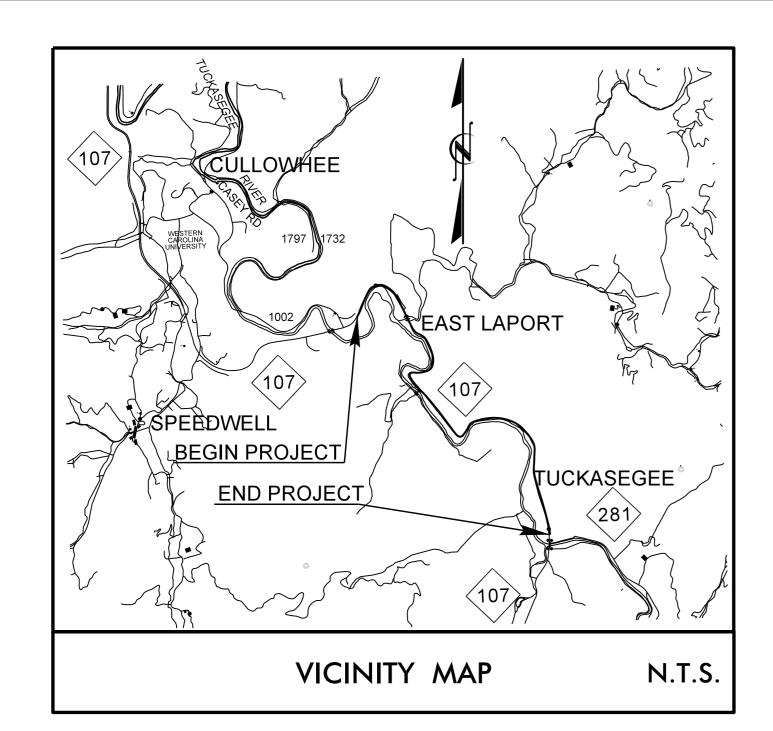
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DESIGN DATA

K = 10 %

D = 60 %

T = 9 % *

V = 40 MPH

* (TTST 2 %, DUAL 7 %)

FUNC CLASS = MINOR COLLECTOR

ADT 2016 = 6270

ADT 2035 = 8800

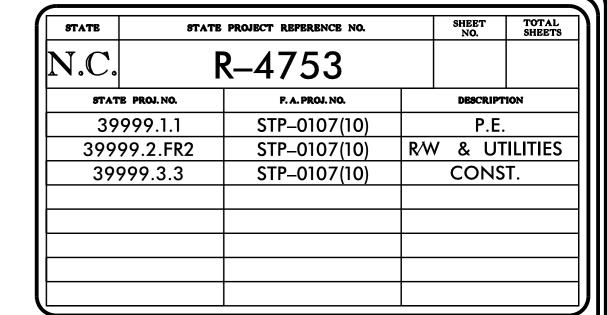
REGIONAL TIER

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

JACKSON COUNTY

LOCATION: NC 107 FROM NORTH OF SR 1002 TO NC 281

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS & CULVERTS



DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT

1000 BIRCH RIDGE DR.

RALEIGH, N.C. 27610

PROJECT ENGINEER

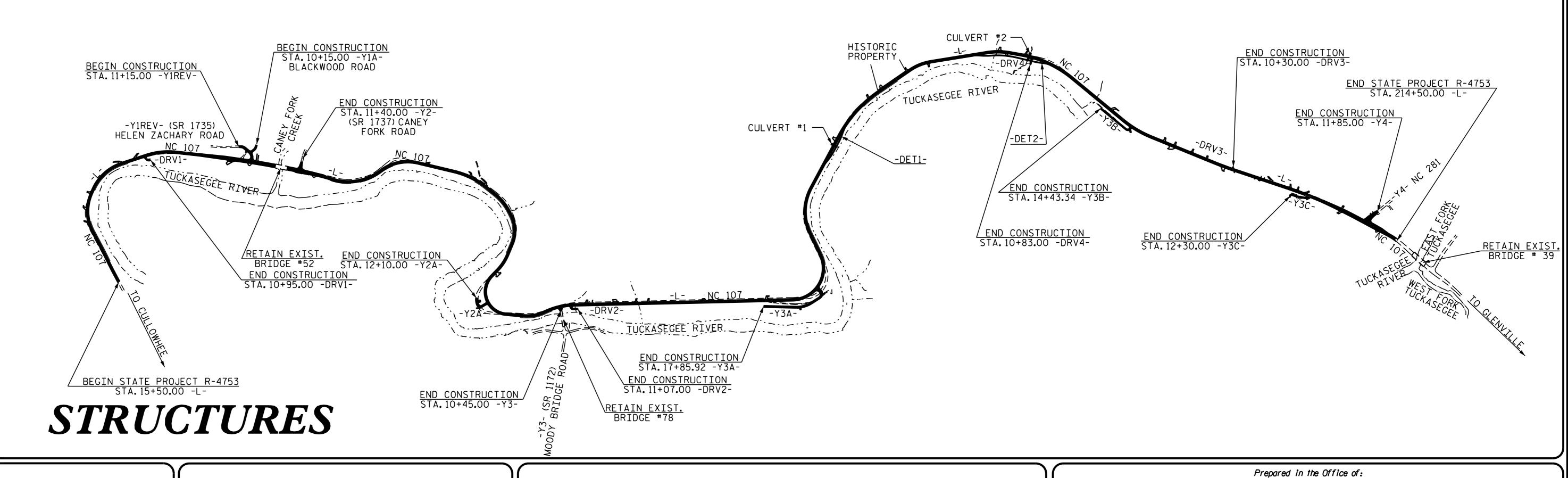
W. S. ARAFAT, P.E.

PROJECT DESIGN ENGINEER

2012 STANDARD SPECIFICATIONS

DECEMBER 20, 2016

LETTING DATE:



PROJECT LENGTH

= 0.026 MILES

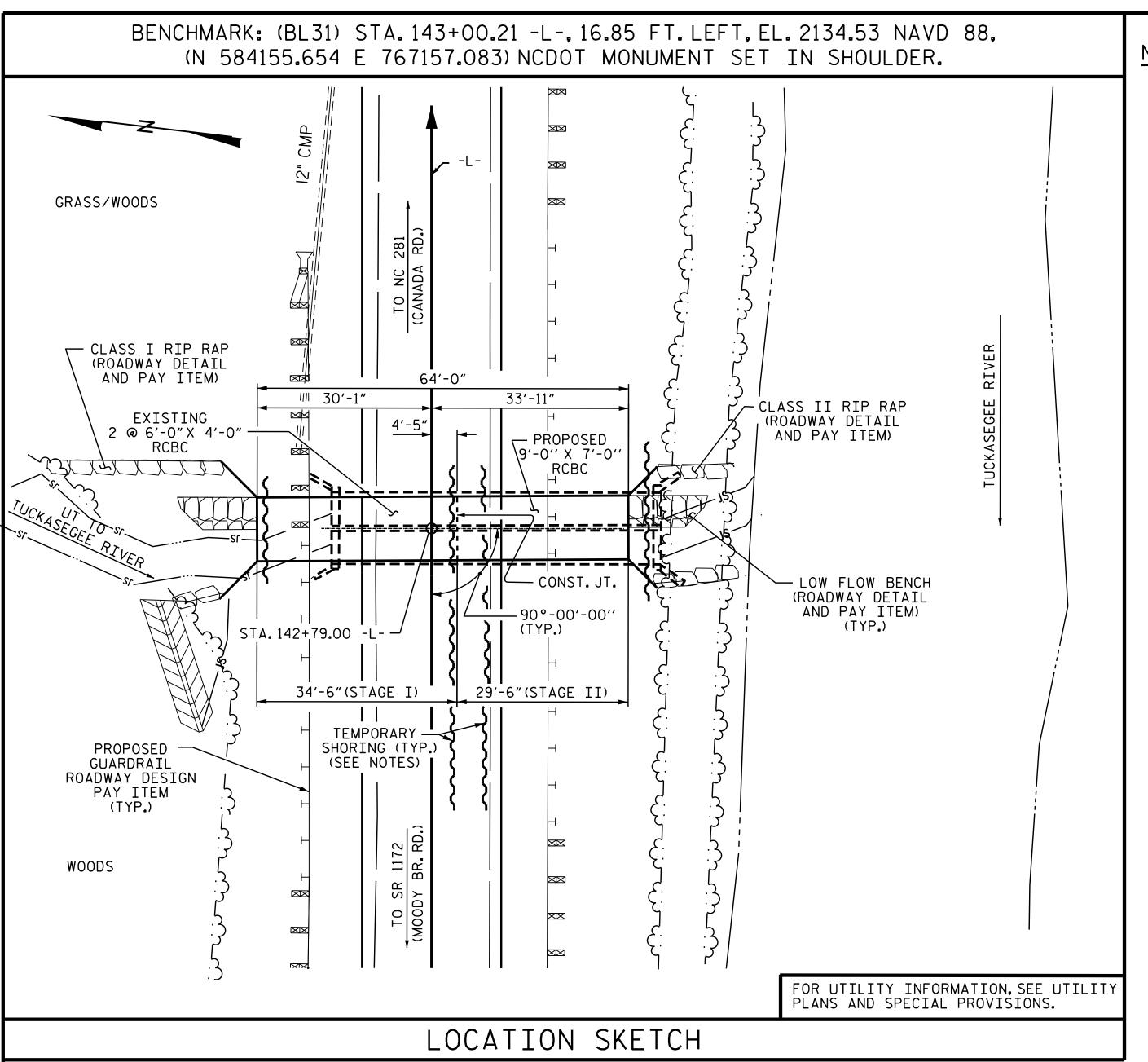
= 3.769 MILES

LENGTH ROADWAY TIP PROJECT R-4753 = 3.743 MILES

LENGTH EXISTING STRUCTURE #52

TOTAL LENGTH TIP PROJECT R-4753





ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 4.34 FT. MIN. AND 5.85 FT. MAX.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

CONCRETE IN STAGE I CULVERTS TO BE POURED IN THE FOLLOWING ORDER: 1. WING FOOTINGS. CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB. HEADWALL AND SILLS.

CONCRETE IN STAGE II CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS, CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL AND SILLS.

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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING DOUBLE 6'X 4'X 38' LONG RCBC AND LOCATED AT THE PROPOSED CULVERT SHALL BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE STRUCTURE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAYBE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

AT THE CONTRACTORS OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

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

TRAFFIC ON NC 107 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN ON THESE PLANS AND/OR AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

NOTES

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

ROADWAY DATA

GRADE POINT ELEV. @ STATION 142+79.00 -L-__ = 2136.09 BED ELEV. @ STATION 142+79.00 -L-___ = 2123.60 ROADWAY SLOPES = 2:1

F. A. PROJECT NO. STP-0107 (10)

HYDRAULIC DATA

DESIGN DISCHARGE	=	290 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	50 YEARS
DESIGN HIGH WATER ELEVATION	=	2131.0
DRAINAGE AREA	=	200 AC.
BASE DISCHARGE (Q100)	=	350 C.F.S.
BASE HIGH WATER ELEVATION	=	2132.1

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	630	C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500	YEARS+
OVERTOPPING FLOOD ELEVATION @ STA_141+97.00 -L-	=		2135.8

TOTAL STRUCTURE QUANTITIES CLASS A CONCRETE STAGE I 40.8 C.Y. STAGE II 35.9 C.Y. TOTAL 76.7 C.Y. REINFORCING STEEL 5,364 LBS. STAGE I STAGE II 4,569 LBS. TOTAL 9,933 LBS. FOUNDATION CONDITIONING MATERIAL STAGE I 35.0 TONS STAGE II 29.0 TONS TOTAL 64.0 TONS CULVERT EXCAVATION LUMP SUM

R-4753 PROJECT NO. ____ JACKSON _ COUNTY STATION: 142+79.00 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SINGLE 9 FT. X 7 FT. CONCRETE BOX CULVERT 90°-00'-00" SKEW

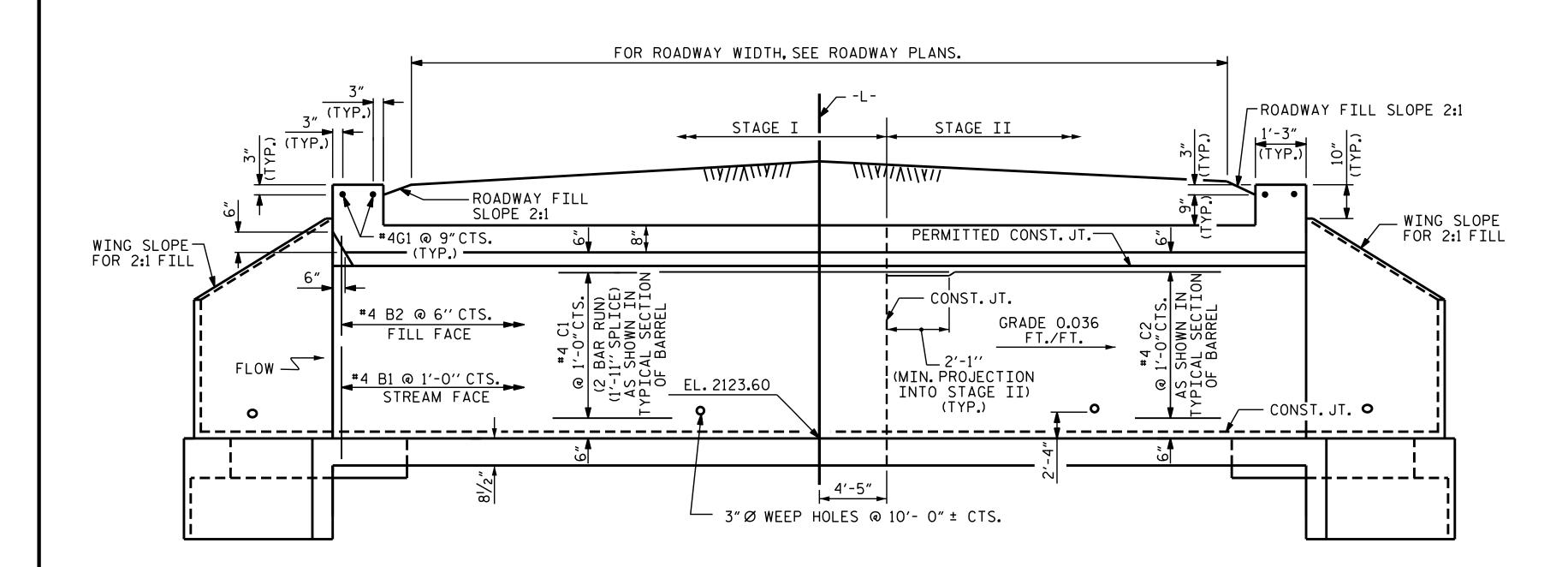
Wael Orafat 10/12/2016 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

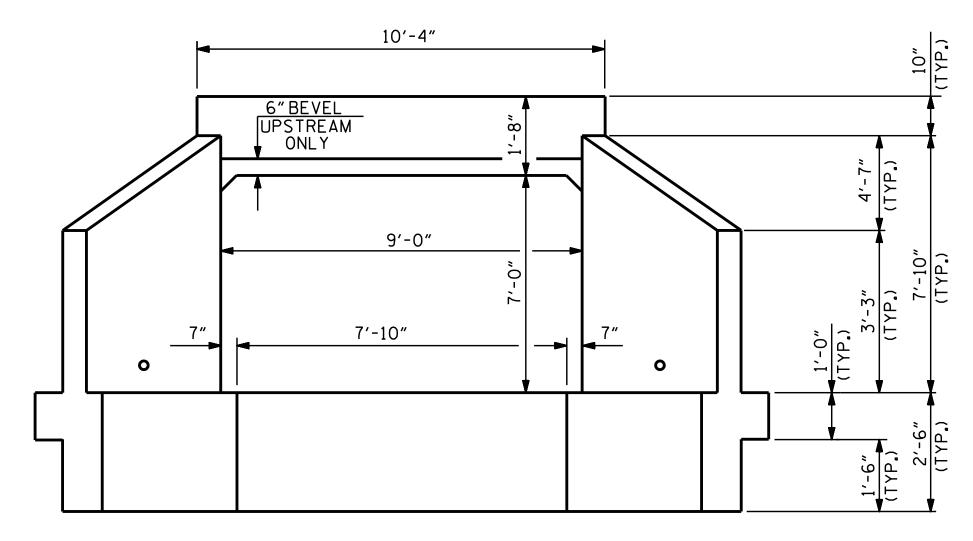
SHEET NO. REVISIONS C-1 DATE: DATE:

CULVERT #1

2/27.04 1011. 1011								
EL. 2135.0± EL. 2135.0± EL. 2135.0± EL. 2135.0± EL. 2135.0± EL. 2130.0± EL. 2120.0± EL. 2120.0± EL. 2120.0± EL. 2120.0± EL. 2120.0± EL. 2120.0± EL. 2130.0± EL. 2	9′-8″	9'-3"	12'-4" 3'-8"	13'-7"	10'-1"	9'-5" 11'-0"	4'-0"3'-7"	1'-4"
PROFILE ALONG © CULVERT DRAWN BY: V.X. NGUYEN DATE: 8-3-16 CHECKED BY: H.T. BARBOUR DATE: 8-8-16	EL. 2127.0±	EL. 2126.0±	EL. 2132.0± EL. 2132.0± EL. 2132.0± EL. 2132.0± EL. 2132.0±	EL. 2135.00 ±	EL. 2135.0±	EL. 2134.0±	EL. 2133.0± EL. 2133.0± EL. 2129.0± 2124.0±	17'-11"

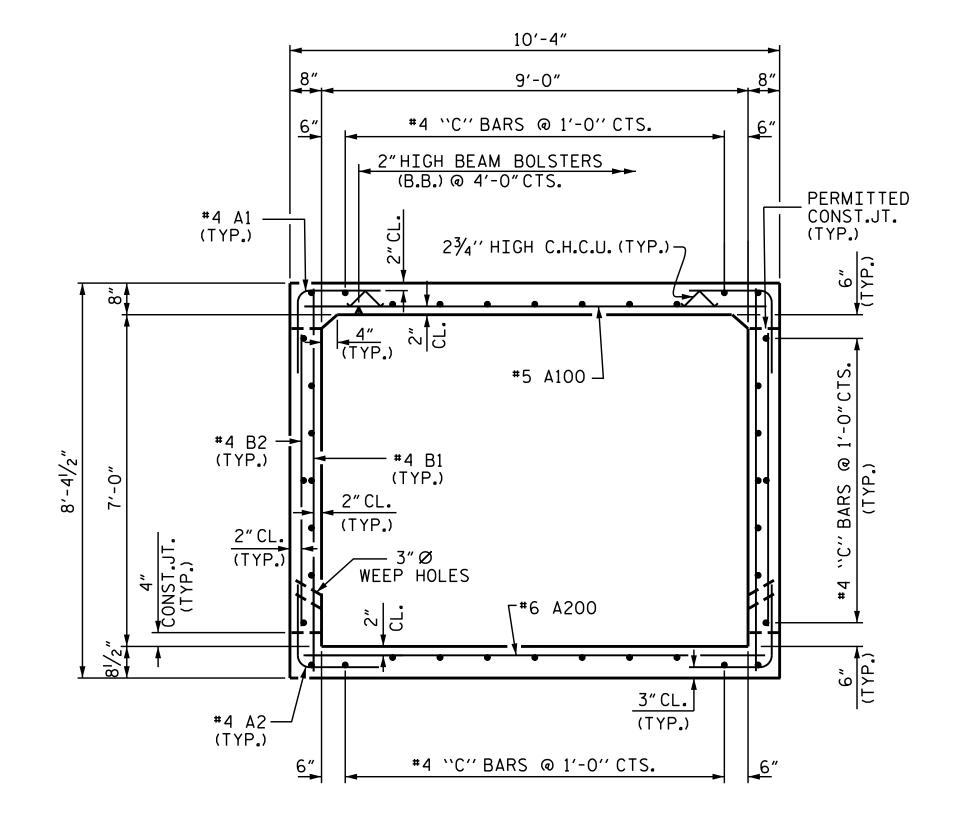
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CULVERT SECTION NORMAL TO ROADWAY

END ELEVATION



RIGHT ANGLE SECTION OF BARREL

THERE ARE 38 "C" BARS IN SECTION OF BARREL

PROJECT NO. R-4753 JACKSON _ COUNTY STATION: 142+79.00 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RALEIGH

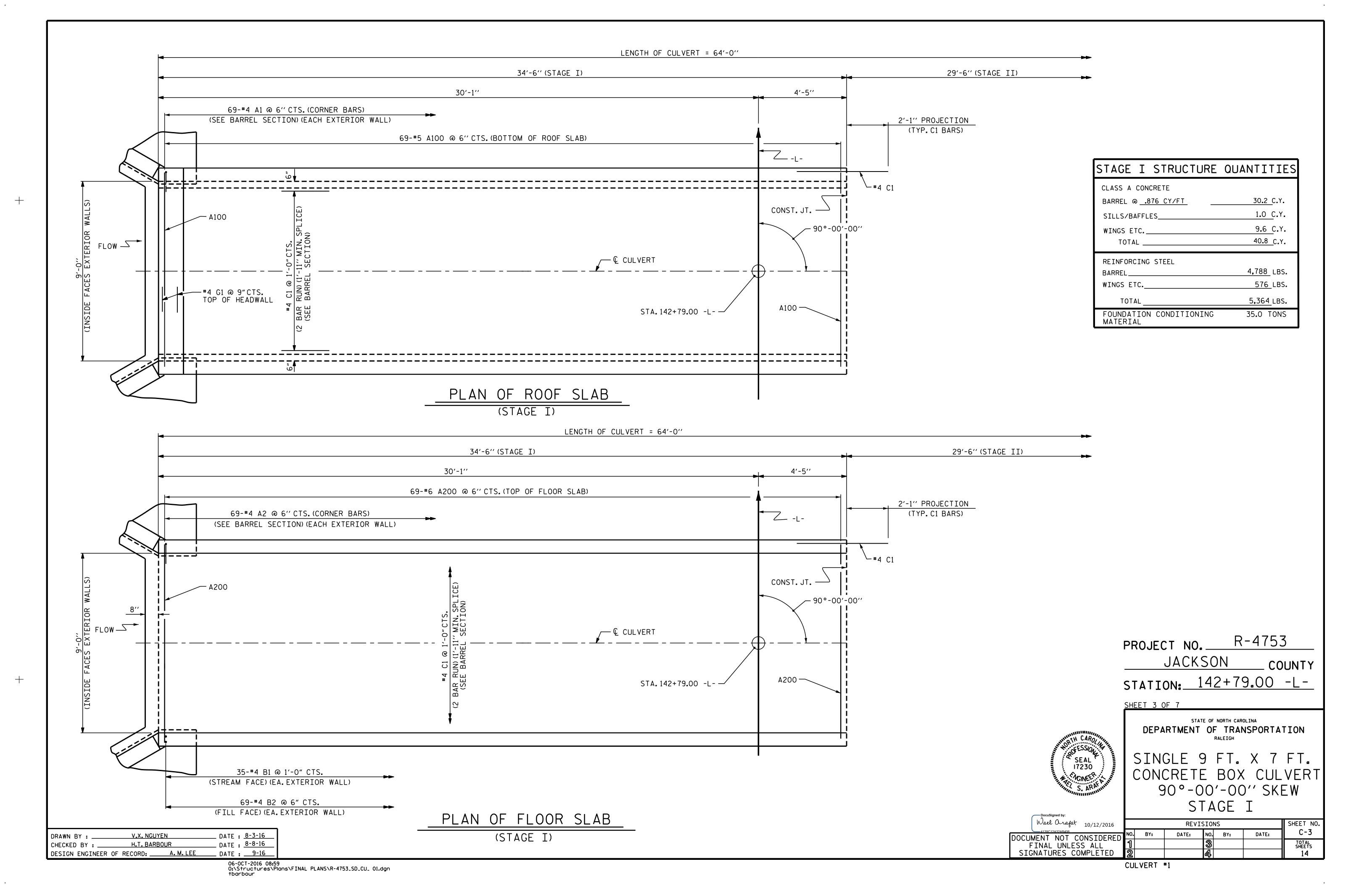
SINGLE 9 FT. X 7 FT. CONCRETE BOX CULVERT 90°-00'-00" SKEW

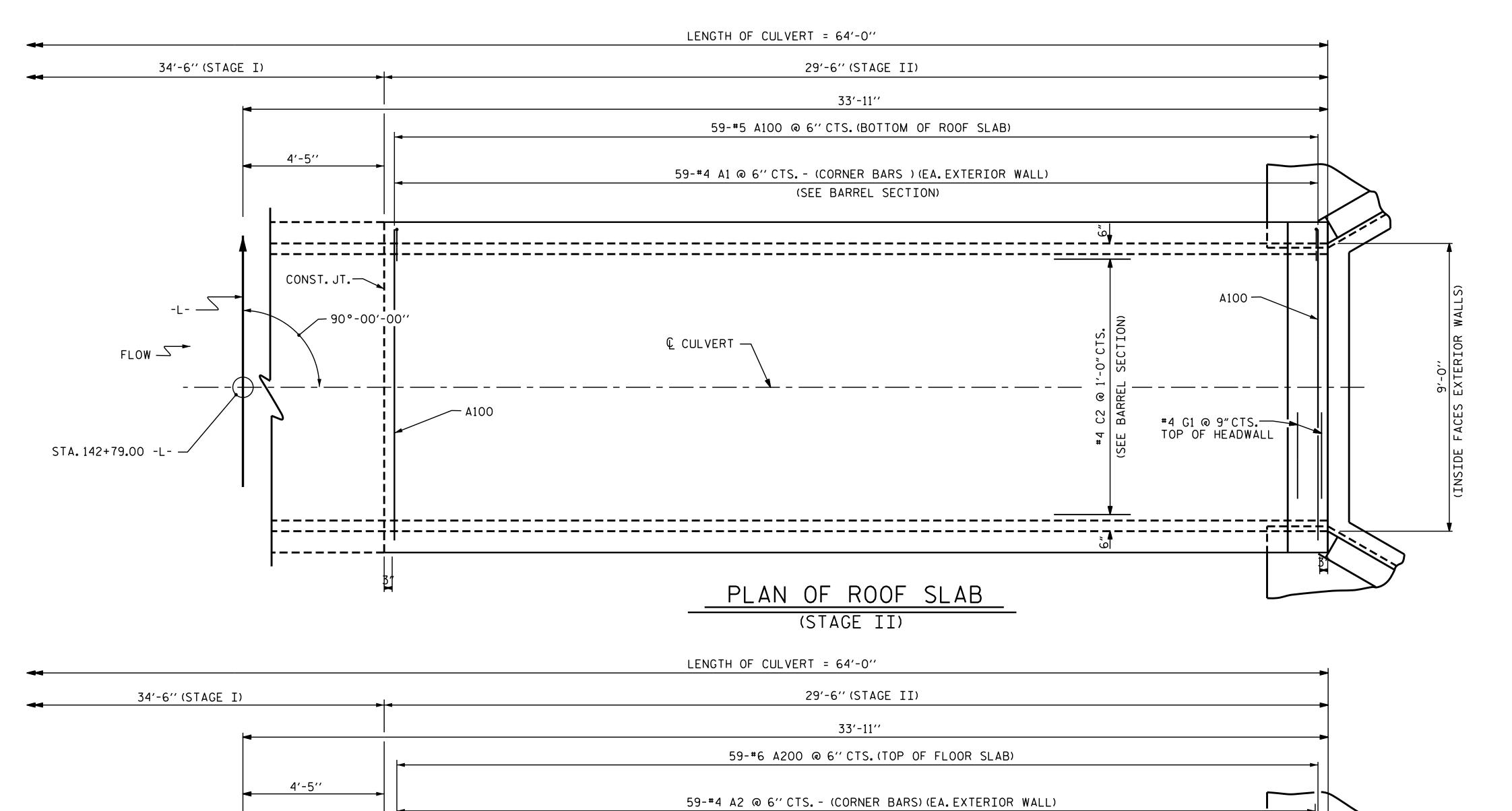
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DocuSigned by:							
Wael Orafat _{10/12/2016}			REVI	SION	1S		SHEET NO
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FINAL UNLESS ALL	1			3			TOTAL SHEETS
TONATURES COMPLETED	2						1 1 1⊿

__ DATE : <u>8-3-16</u> __ DATE : <u>8-8-16</u> __ DATE : <u>9-16</u> V.X. NGUYEN DRAWN BY : H.T. BARBOUR CHECKED BY : ___ DESIGN ENGINEER OF RECORD: A.M.LEE





STAGE II STRUCTURE QUANTITIES CLASS A CONCRETE BARREL @ .876 CY/FT 25.8 C.Y. 0.5 C.Y. SILLS_____ 9.6 C.Y. WINGS ETC. 35.9 C.Y. REINFORCING STEEL 3,993 LBS. BARREL __ <u>576</u>LBS. WINGS ETC.___ 4,569 LBS. FOUNDATION CONDITIONING 29.0 TONS MATERIAL

> PROJECT NO. R-4753 JACKSON COUNTY STATION: 142+79.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RALEIGH

SINGLE 9 FT. X 7 FT. CONCRETE BOX CULVERT 90°-00'-00'' SKEW STAGE IT

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ed by:			ا <u>ک</u>		<u>GL</u>	т т	
Drafat 10/12/2016			REVI	SIO	NS		SHEET NO.
NOT CONSIDERED	NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
UNLESS ALL	1			3			TOTAL SHEETS
RES COMPLETED	2			4			14

CULVERT #1

SHEET 4 OF 7

34'-6'' (STAGE I) ►	29'-6'' (STAGE II)
 ■	33′-11′′
	59-#6 A200 @ 6" CTS.(TOP OF FLOOR SLAB) ►
4′-5′′	59-#4 A2 @ 6" CTS (CORNER BARS) (EA. EXTERIOR WALL) (SEE BARREL SECTION)
CONST. JT.	A200
FLOW 5	© CULVERT—\ SECTION SE
	C5 @ 1,- BAREL BARREL
STA. 142+79.00 -L-	✓ A200 (SEE
•	30-#4 B1 @ 1'-0" CTS. (STREAM FACE) (EA. EXTERIOR WALL)
	59-#4 B2 @ 6" CTS. (FILL FACE)(EA.EXTERIOR WALL)
	PLAN OF FLOOR SLAB

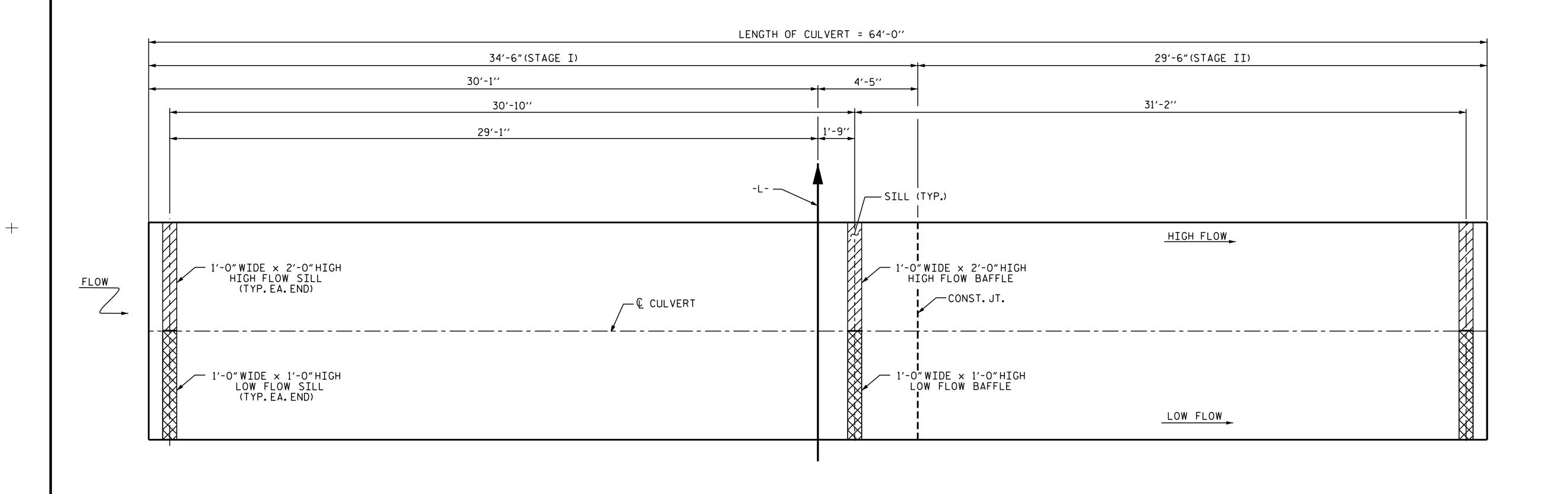
H.T. BARBOUR

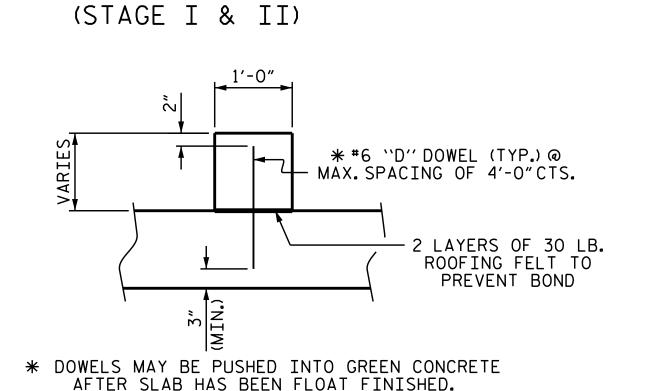
DESIGN ENGINEER OF RECORD: A.M.LEE

__ DATE : <u>9-16</u>

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(STAGE II)







PLAN OF SILL/BAFFLE LOCATIONS

BAR TYPE VERTICAL LEG— BAR DIMENSIONS ARE OUT TO OUT SPLICE LENGTH CHART LENGTH BAR SIZE 1′-5″ 1'-11"



BAR SCHEDULE									
	STAGE II								
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT				
Α1	118	#4	1	6′-0″	473				
A2	118	#4	1	5′-8″	447				
A100	59	#5	STR	9'-11"	610				
A200	59	#6	STR	9'-11"	879				
B1	60	#4	STR	7′-10″	314				
B2	118	#4	STR	6'-4"	499				
C2	38	#4	STR	29'-2"	740				
D1	4	#6	STR	2'-3"	14				
D2	2	#6	STR	1'-3"	4				
G1	2	#4	STR	10'-0"	13				
5									

3993 LBS.

PROJECT NO. R-4753 JACKSON COUNTY STATION: 142+79.00 -L-

REINFORCING STEEL

SHEET 5 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SINGLE 9 FT. X 7 FT. CONCRETE BOX CULVERT 90°-00'-00" SKEW

SHEET NO. **REVISIONS** C-5 DATE: DATE:

NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AND SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL AS SHOWN. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS B RIP RAP. STONES LARGER THAN 6 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER, AND MAY BE SUBJECT TO PERMIT CONDITIONS.

THE STOCKPILED MATERIAL SHALL BE PLACED TO PROVIDE A DEPTH OF 1 FOOT IN LOW FLOW CHANNEL, AND 2 FEET IN THE HIGH FLOW CHANNEL.

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

BED MATERIAL SHALL BE SUPPLEMENTED BY CLASS B RIP RAP AS NECESSARY IN THE HIGH FLOW CHANNEL ONLY.

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

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

V.X. NGUYEN _ DATE : <u>8-3-16</u> DRAWN BY : H.T. BARBOUR _ DATE : <u>8-8-16</u> CHECKED BY : __ _ DATE : <u>9-16</u> DESIGN ENGINEER OF RECORD: A.M.LEE

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warafat

9'-0"

4'-6''

LOW SILL -/BAFFLE

2-#6 D2

1'-0"

ELEVATION

CULVERT SILL DETAILS

(LOOKING DOWNSTREAM)

4'-6''

(TYP.)

4-#6 D1

@ 1'-0''

_ 2 LAYERS OF 30 LB. ROOFING FELT TO

PREVENT BOND

HIGH SILL — /BAFFLE

> FINAL UNLESS ALL SIGNATURES COMPLETED

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MOINEER

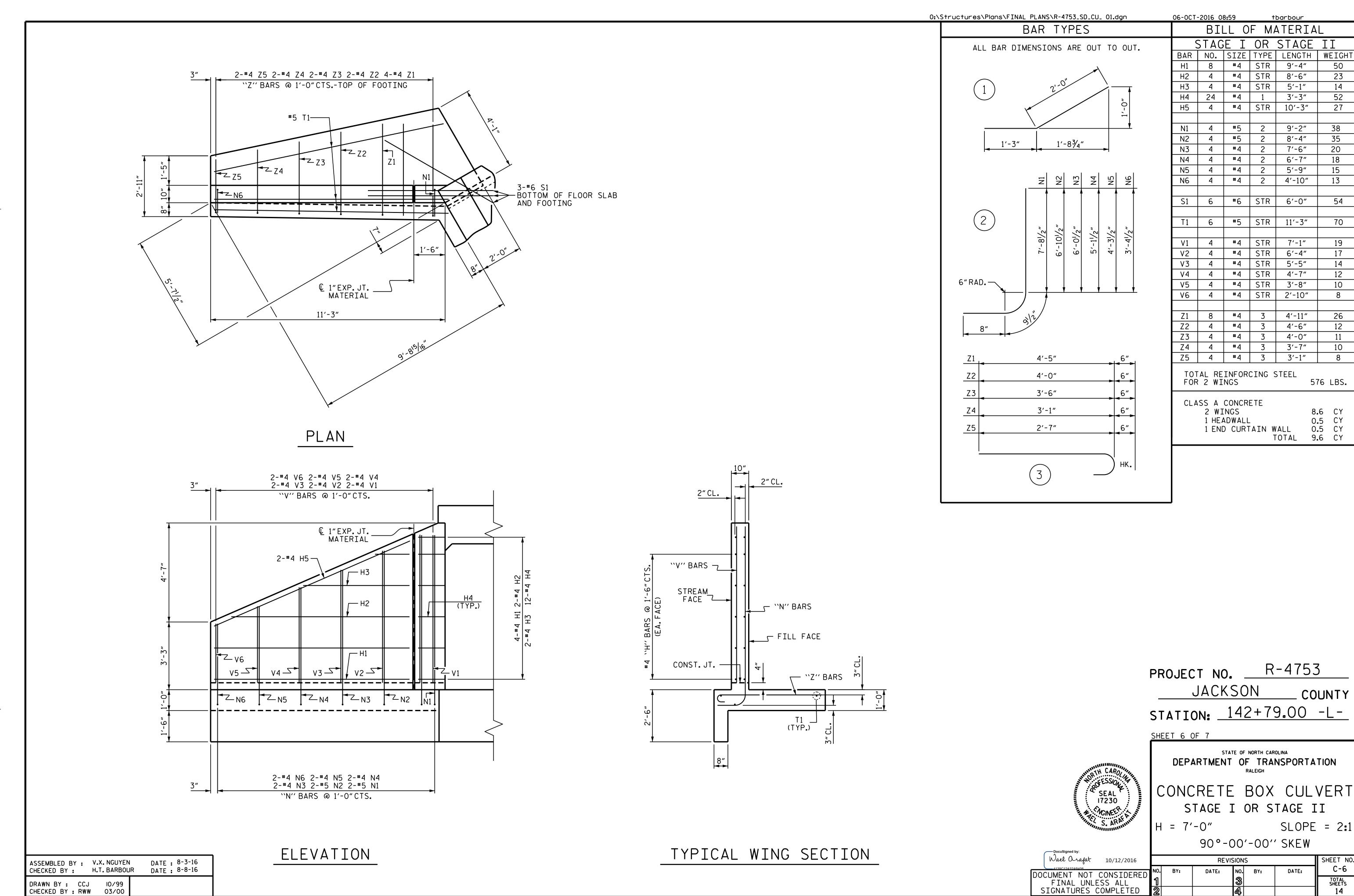
Wael Orafat

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10/18/2016

DOCUMENT NOT CONSIDERED

CULVERT #1



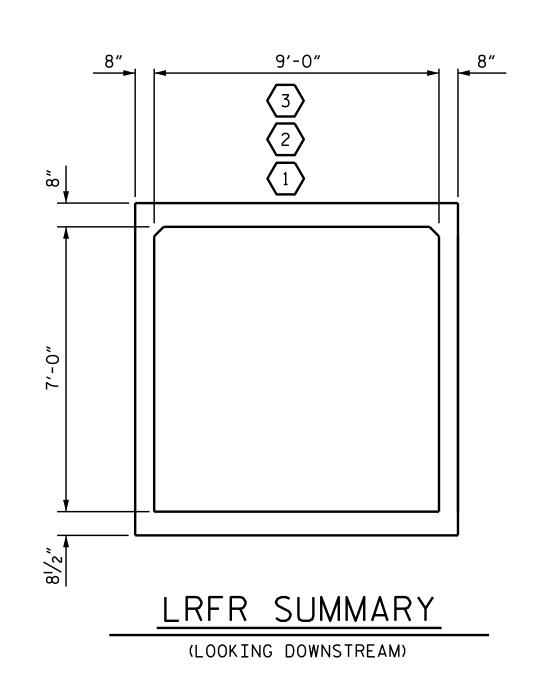
DRAWN BY: CCJ 10/99 CHECKED BY: RWW 03/00

CULVERT #1

C-6

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

										STRENGTH	I LIM	IT ST	ATE			
								MOMENT SHEAR								
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	LIVE-LOAD FACTORS (Y _{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	•on xoa	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	COMMENT NUMBER
		HL-93 (INVENTORY)	N/A	1	1.06		1.75	1.06	1	TOP SLAB	4.83	1.17	1	BOTTOM SLAB	8.82	
DESIGN LOAD		HL-93 (OPERATING)	N/A		1.37		1.35	1.37	1	TOP SLAB	4.83	1.52	1	BOTTOM SLAB	8.82	
RATING		HS-20 (INVENTORY)	36.00	2	1.28	45.97	1.75	1.28	1	TOP SLAB	4.83	1 . 51	1	TOP SLAB	0.81	
		HS-20 (OPERATING)	36.00		1.66	59.60	1.35	1.66	1	TOP SLAB	4.83	1.96	1	TOP SLAB	0.81	
		SNSH	13 . 50		2.32	31.32	1.40	2.32	1	TOP SLAB	4.83	2.75	1	TOP SLAB	0.81	
		SNGARBS2	20.00		2.17	43.35	1.40	2.17	1	TOP SLAB	4.83	2.57	1	TOP SLAB	0.81	
	ICLE	SNAGRIS2	22.00		2.32	51.04	1.40	2.32	1	TOP SLAB	4.83	2.75	1	TOP SLAB	0.81	
	: VEHICLE (SV)	SNCOTTS3	27 . 25	3	1.32	35.95	1.40	1.32	1	TOP SLAB	4.83	1.46	1	BOTTOM SLAB	0.84	
	LE (S)	SNAGGRS4	34.93		1.72	60.00	1.40	1.72	1	TOP SLAB	4.83	1.72	1	BOTTOM SLAB	0.84	
	SINGLE (§	SNS5A	35.56		1.57	55.83	1.40	1.57	1	TOP SLAB	4.83	1.71	1	BOTTOM SLAB	0.84	
		SNS6A	39 . 95		1 . 57	62.74	1.40	1.57	1	TOP SLAB	4.83	1.71	1	BOTTOM SLAB	0.84	
LEGAL		SNS7B	42.00		1 . 57	65.96	1.40	1.57	1	TOP SLAB	4.83	1.71	1	BOTTOM SLAB	0.84	
LOAD RATING	ER	TNAGRIT3	33.00		2.32	76.56	1.40	2.32	1	TOP SLAB	4.83	2.75	1	TOP SLAB	0.81	
	RAIL	TNT4A	33.08		1 . 57	51.94	1.40	1.57	1	TOP SLAB	4.83	1.75	1	BOTTOM SLAB	0.84	
	SEMI-TRAILER T)	TNT6A	41.60		1 . 57	65.19	1.40	1.57	1	TOP SLAB	4.83	1.68	1	BOTTOM SLAB	8.82	
	1 10	TNT7A	42.00		1.57	65.81	1.40	1.57	1	TOP SLAB	4.83	1.75	1	BOTTOM SLAB	0.84	
	TRACTOR (TTS	TNT7B	42.00		1.57	65.96	1.40	1.57	1	TOP SLAB	4.83	1.72	1	BOTTOM SLAB	0.84	
	TRAC	TNAGRIT4	43.00		1.50	64.46	1.40	1.50	1	TOP SLAB	4.83	1.67	1	BOTTOM SLAB	0.84	
		TNAGT5A	45.00		1.53	68.95	1.40	1.53	1	TOP SLAB	4.83	1.71	1	BOTTOM SLAB	0.84	
	TRUCK	TNAGT5B	45.00		1 . 57	70.51	1.40	1.57	1	TOP SLAB	4.83	1.75	1	BOTTOM SLAB	0.84	



ASSEMBLED BY: V.X. NGUYEN DATE: 8-4-16 CHECKED BY: H.T. BARBOUR DATE: 8-8-16

REV. 10/1/II MAA/GM DESIGN ENGINEER OF RECORD: DRAWN BY: WMC 7/II CHECKED BY: GM 7/II

A.M.LEE DATE : 9-16 06-0CT-2016 08:59
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tbarbour

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		
ЕН	1.35	0.90		
ES	1.35	0.90		
LS	1.75	-		
WA	1.00			

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

(#) CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. R-4753 JACKSON COUNTY STATION: 142+79.00 -L-

SHEET 7 OF 7

DEPARTMENT OF TRANSPORTATION

STANDARD

STATE OF NORTH CAROLINA

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

Docusigned by:
Wael Orafat 10/12/2016 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

		REVI:	SIO	NS		SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			A			14

CULVERT #1

F. A. PROJECT NO.: STP-0107(10)

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 2.83 FT. MIN. AND 4.34 FT. MAX.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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

1. WING FOOTINGS, CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.

CONCRETE IN STAGE I CULVERT TO BE POURED IN THE FOLLOWING ORDER:

2. THE REMAINING PORTIONS OF WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL, SILLS AND BAFFLES.

CONCRETE IN STAGE II CULVERT TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS, CURTAIN WALL AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB, HEADWALL, SILLS AND BAFFLES.

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 ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

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

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK. SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES. SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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 CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS; FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

TRAFFIC ON NC 107 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN ON THESE PLANS AND/OR AS DIRECTED BY THE ENGINEER.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING DOUBLE 6'X 4'X 38' LONG RCBC AND LOCATED AT THE PROPOSED CULVERT SHALL BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE STRUCTURE 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.

TOTAL STRUCTURE QUANTITIES CLASS A CONCRETE 51.0 C.Y. STAGE I _____ 27.2 C.Y. STAGE II _____ TOTAL _____ 78.2 C.Y. REINFORCING STEEL _7**,**552 LBS. STAGE I ____ STAGE II _____ _3,705 LBS. _ 11**,**257 LBS. TOTAL CULVERT EXCAVATION LUMP SUM FOUNDATION CONDITIONING MATERIAL 48 TONS STAGE I ___ 21 TONS STAGE II ____ 69 TONS TOTAL _____

PROJECT NO. R-4753 JACKSON COUNTY

STATION: 168+42.00 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

100°-00'-00" SKEW

DocuSigned by:							
Wael Orafat 10/12/2016			REV	'ISIONS	•		SHEET NO.
DOCUMENT NOT CONSIDERED	NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
FINAL UNLESS ALL	1			3			TOTAL SHEETS
SIGNATURES COMPLETED	2			4			14

ROADWAY DATA

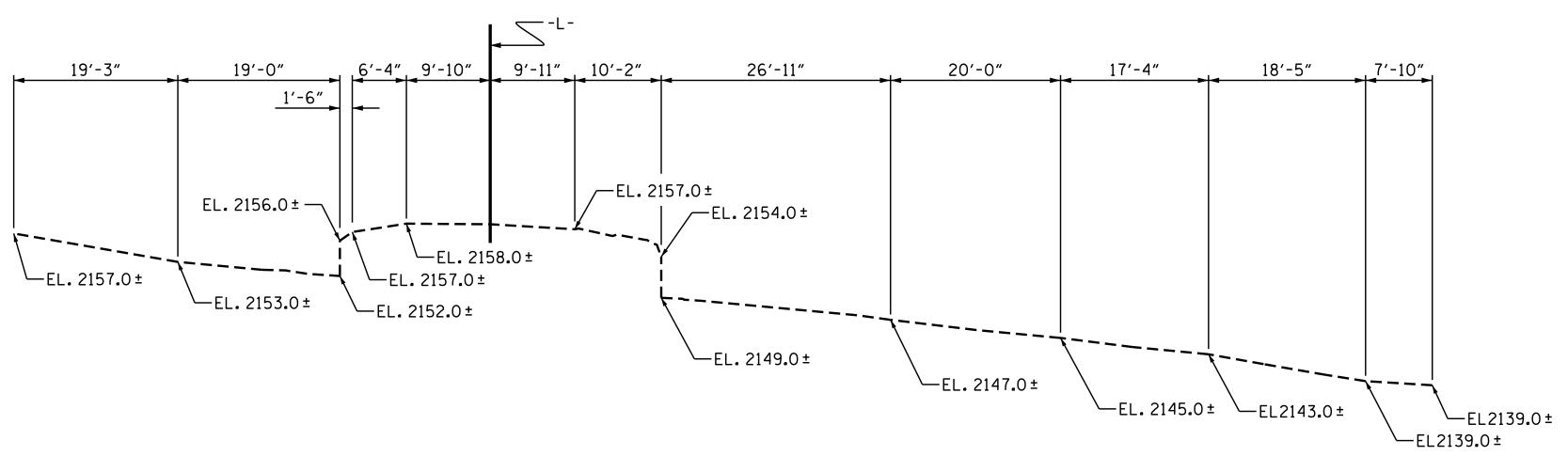
GRADE POINT EL. @ STA. 168+42.00 -L- ----- = 2158.90' BED EL. @ STA. 168+42.00 -L-----= = 2149.07' ROADWAY SLOPES ----- = VARIES

HYDRAULIC DATA

DESIGN DISCHARGE ----- = 280 C.F.S. FREQUENCY OF DESIGN FLOOD ----- = 50 YEARS DESIGN HIGH WATER ELEVATION ----- = 2156.6 DRAINAGE AREA ----- = 225 AC. BASE DISCHARGE (Q100) ----- = 330 C.F.S. BASE HIGH WATER ELEVATION ----- = 2157.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ----- = 500 C.F.S. FREQUENCY OF OVERTOPPING FLOOD ----- = 500 YEARS OVERTOPPING FLOOD ELEVATION ----- = 2159.2 @ STA.168+42.00 -L-



PROFILE ALONG & CULVERT

E.C.PHELPS/VXN DATE : 8-5-16 DRAWN BY : H.T. BARBOUR DATE : 8-8-16 CHECKED BY : DATE : 9-16 DESIGN ENGINEER OF RECORD: A.M.LEE

06-0CT-2016 08:59
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BENCHMARK: (BL36) (N 582713.461, E 769297.153), STA. 170+73 -L-, 30' LEFT. NCDOT

— 100°-00′-00′′

(TAN. TO CURVE)

36'-0"

19'-9"(STAGE II)

TEMPORARY SHORING

(SEE NOTES)

--DET 2-

-PROPOSED

RCBC

10'-0" × 6'-0"

PROPOSED

(ROADWAY DETAIL

AND PAY ITEM)

WOODS

TEMPORARY DETOUR

FOR UTILITY INFORMATION,

SEE UTILITY PLANS AND

SPECIAL PROVISIONS.

TEMPORARY GUARDRAIL

JOHN BROWN BRANCH

-100°-00′-00′′

(TYP.),

MONUMENT SET IN SHOULDER. EL. 2159.17'

64'-6"

16'-3"

LOCATION SKETCH

28′-6″

STA. 168+42.00 -L-

€ CULVERT

PROPOSED GUARDRAIL —

(ROADWAY DETAIL

AND PAY ITEM)

EXISTING -

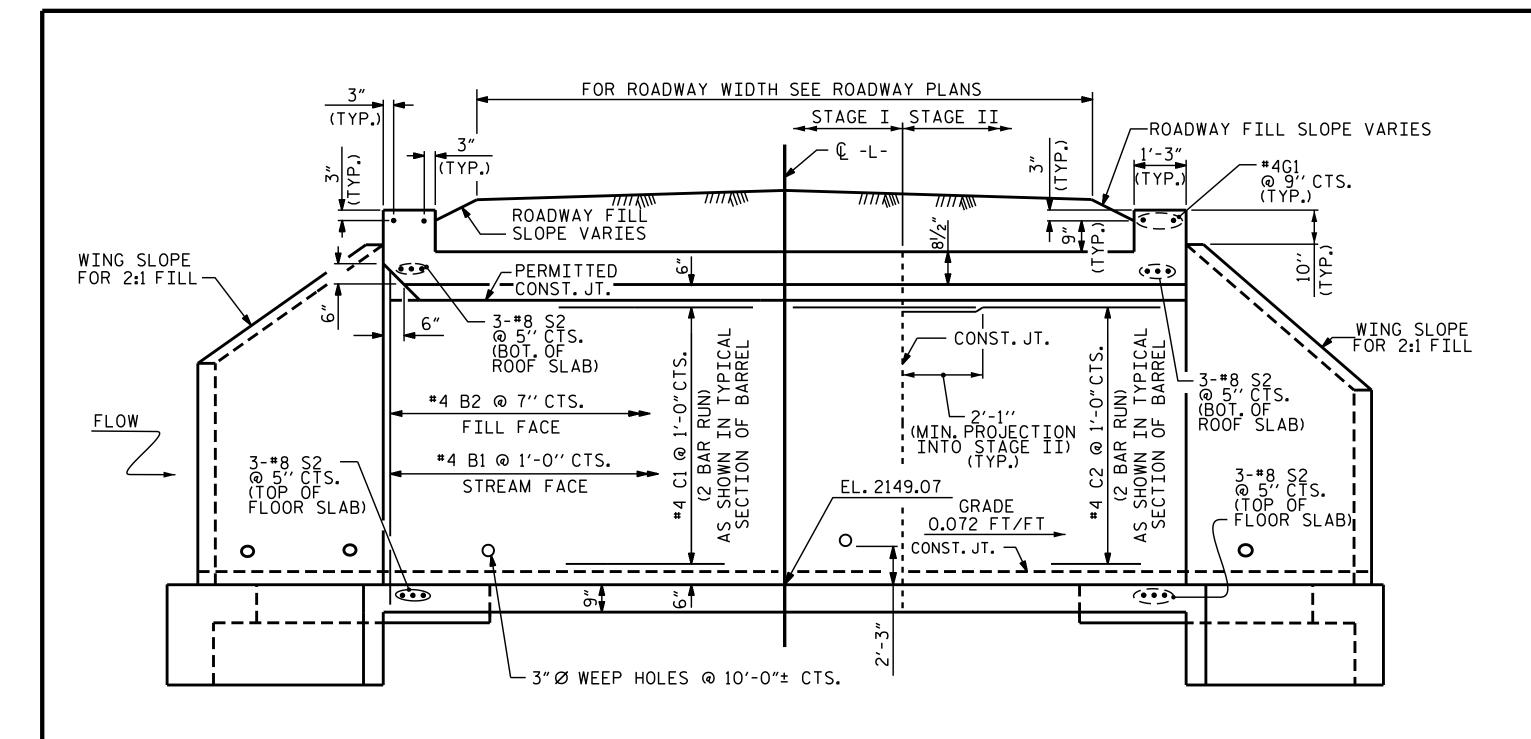
2 @ 6'-0" X 4'-0''

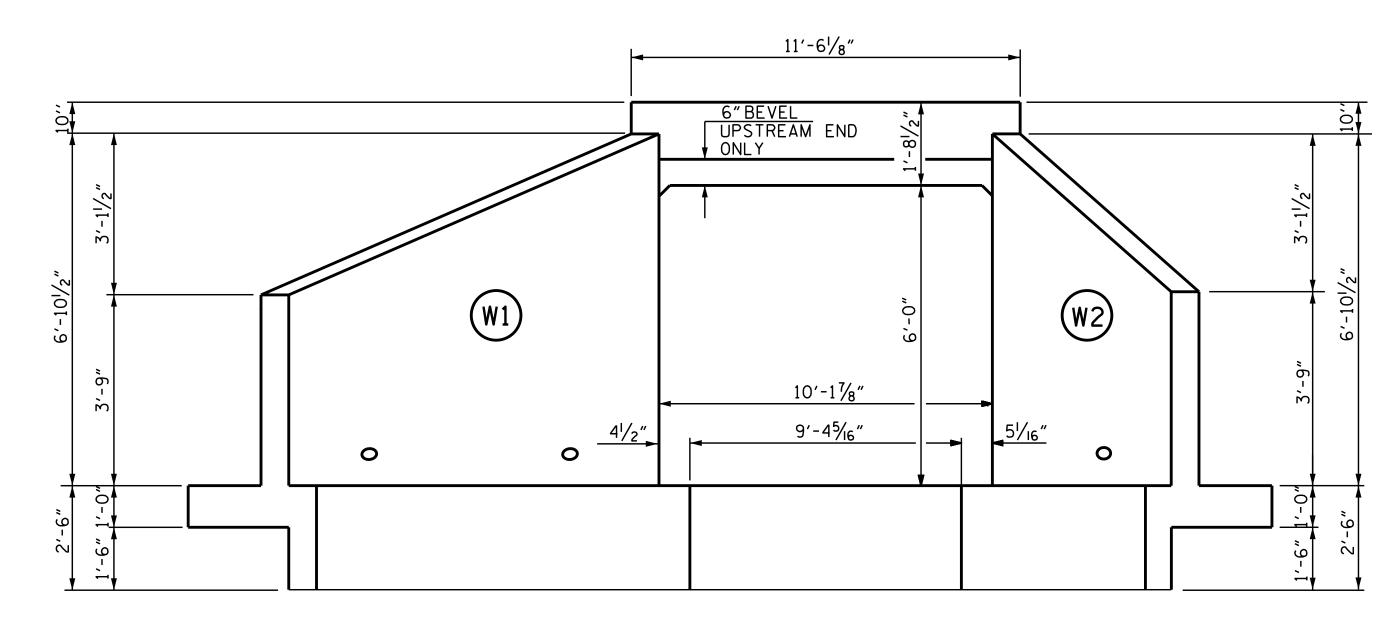
44'-9" (STAGE I)

TO SR 1172 MOODY BR. RD.)

CULVERT #2

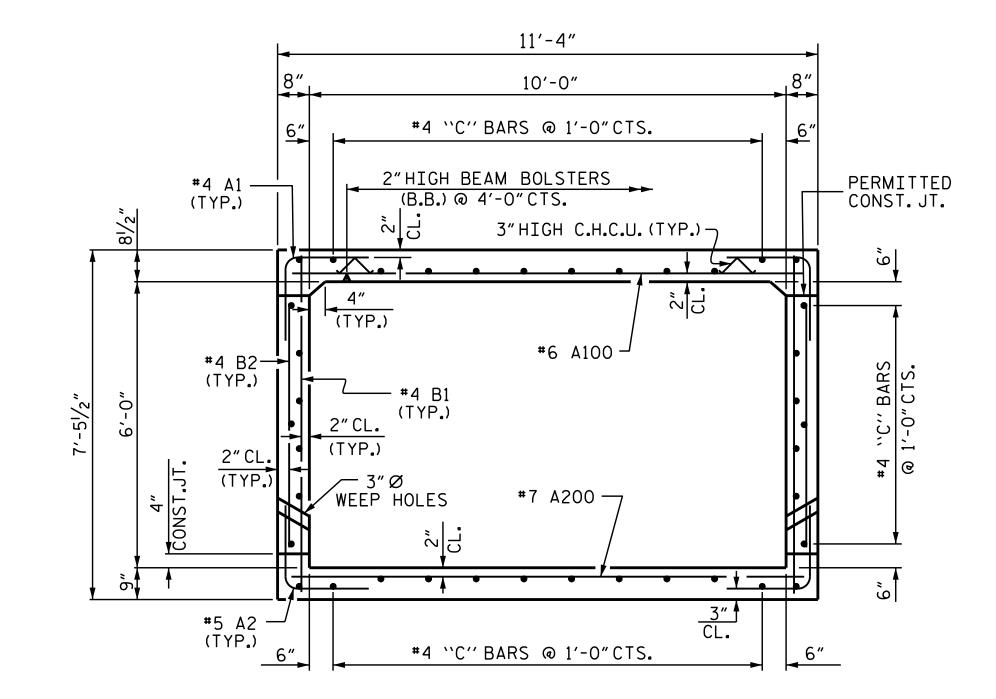
SEAL 17230





CULVERT SECTION NORMAL TO ROADWAY

END ELEVATION NORMAL TO SKEW (LOOKING DOWN STREAM)



RIGHT ANGLE SECTION OF BARREL

THERE ARE 38 "C" BARS IN SECTION OF BARREL

PROJECT NO. R-4753 JACKSON COUNTY STATION: 168+42.00 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

> CONCRETE BOX CULVERT 100°-00'-00" SKEW

Wael Orafat 10/12/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL 17230

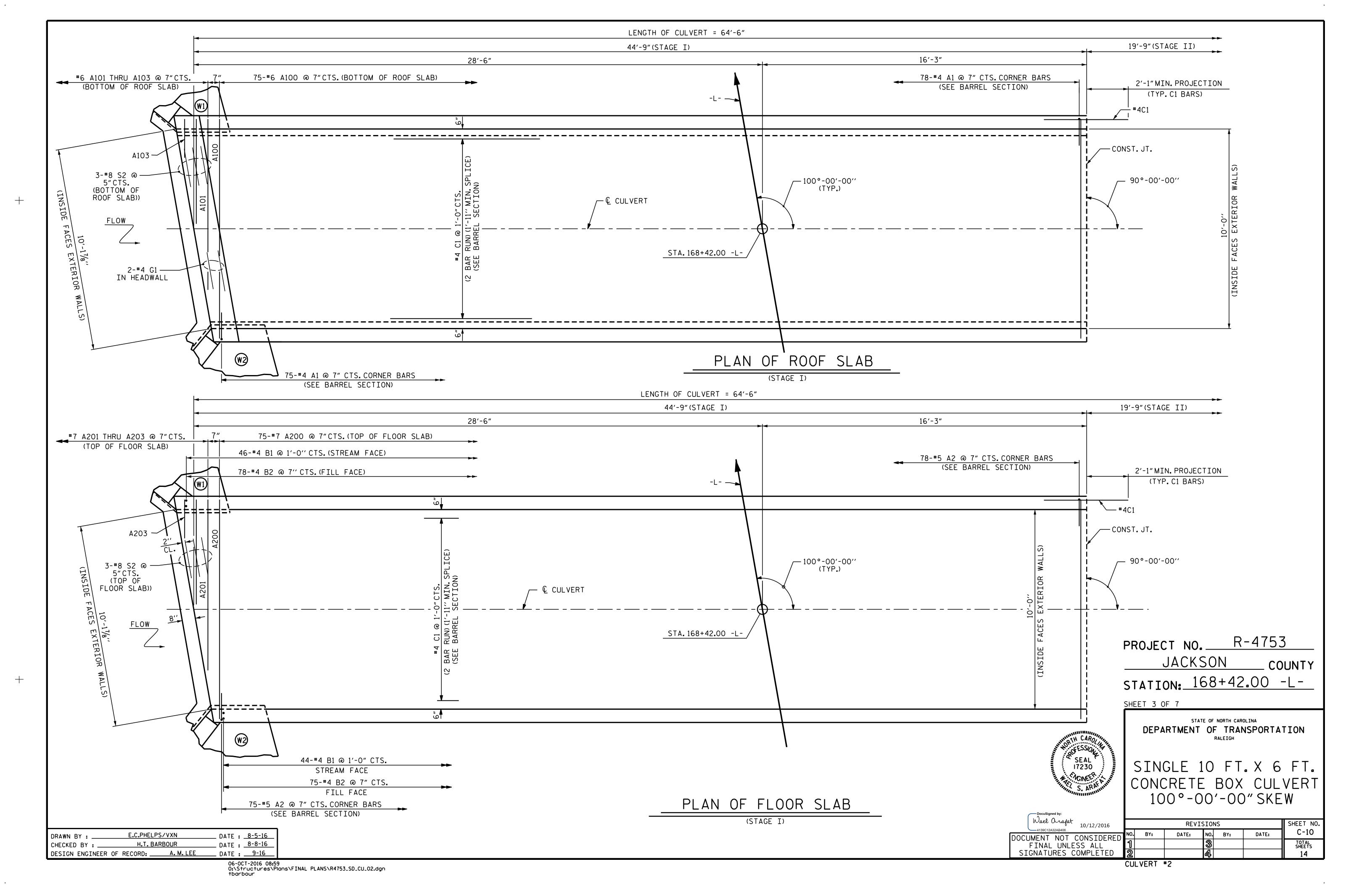
SHEET NO. REVISIONS C-9 DATE: DATE: NO. BY: CULVERT #2

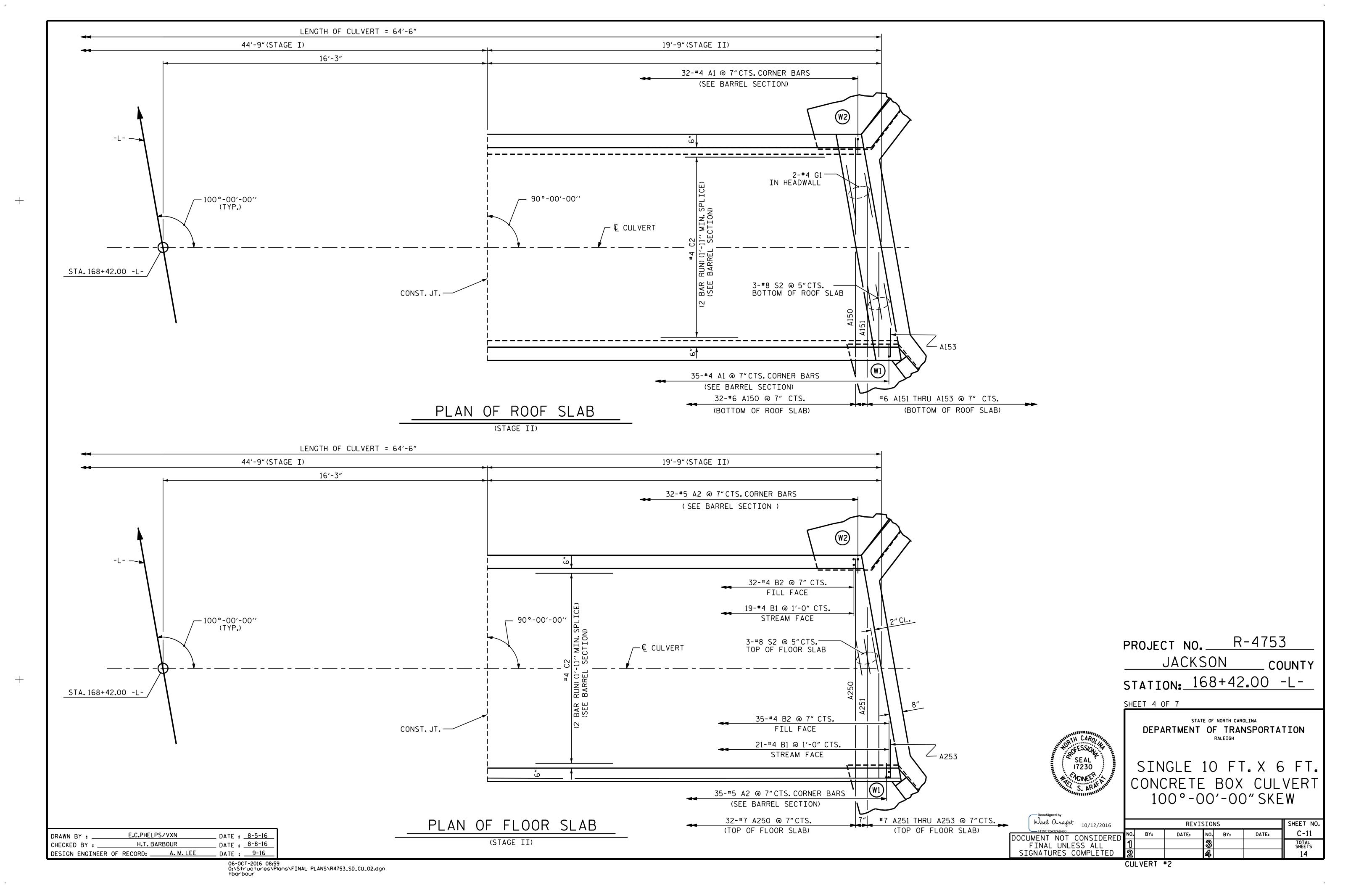
DATE : <u>8-5-16</u>
DATE : <u>8-8-16</u>
DATE : <u>9-16</u> DESIGN ENGINEER OF RECORD: A.M.LEE 06-0CT-2016 08:59
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E.C.PHELPS/VXN

H.T. BARBOUR

DRAWN BY :





NOTES

MATERIAL EXCAVATED FROM THE EXISTING BED SHALL BE STOCKPILED FOR USE IN THE PROPOSED CULVERT AND SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL AS SHOWN. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS B RIP RAP. STONES LARGER THAN 6 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER, AND MAY BE SUBJECT TO PERMIT CONDITIONS.

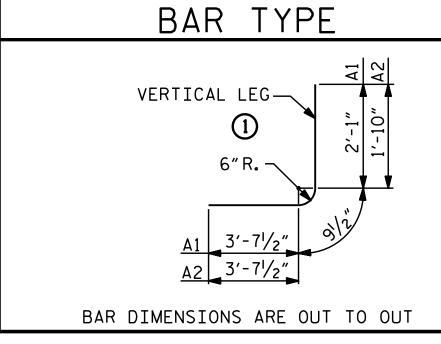
THE STOCKPILED MATERIAL SHALL BE PLACED TO PROVIDE A DEPTH OF 1 FOOT IN LOW FLOW CHANNEL, AND 1'-6"FEET IN THE HIGH FLOW CHANNEL.

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

BED MATERIAL SHALL BE SUPPLEMENTED BY CLASS B RIP RAP AS NECESSARY IN THE HIGH FLOW CHANNEL ONLY.

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

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



SP	LIC	E CHART
BAR	SIZE	SPLICE LENGTH
B1	#4	1′-5″
C1	#4	1'-11"

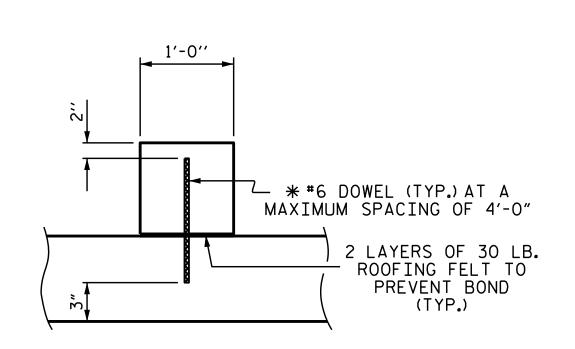
STAGE I						STAGE II						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	153	#4	1	6′-6″	664	A1	67	#4	1	6′-6″	291	
A2	153	#5	1	6'-3"	997	Α2	67	#5	1	6′-3″	437	
A100	75	#6	STR	10'-11"	1230	A150	32	#6	STR	10'-11"	525	
A101	1	#6	STR	8'-6"	13	A151	1	#6	STR	9'-0"	14	
A102	1	#6	STR	5′-2″	8	A152	1	#6	STR	5′-8″	9	
A103	1	#6	STR	1'-11"	3	A153	1	#6	STR	2'-4"	4	
A200	75	#7	STR	10'-11"	1674	A250	32	#7	STR	10'-11"	714	
A201	1	#7	STR	8'-6"	17	A251	1	#7	STR	9'-0"	18	
A202	1	#7	STR	5′-2″	11	A252	1	#7	STR	5′-8″	12	
A203	1	#7	STR	1'-11"	4	A253	1	#7	STR	2'-4"	5	
B1	90	#4	STR	6'-11"	416	B1	40	#4	STR	6'-11"	185	
B2	153	#4	STR	5'-4"	545	B2	67	#4	STR	5′-4″	239	
C1	76	#4	STR	24'-10"	1261	C2	76	#4	STR	11'-2"	567	
D1	12	#6	STR	1'-10"	33	D1	6	#6	STR	1'-10"	17	
D2	8	#6	STR	1'-4"	16	D2	4	#6	STR	1'-4"	8	
G1	2	#4	STR	11'-2"	15	G1	2	#4	STR	11'-2"	15	
S2	6	#8	STR	11'-2"	179	S2	6	#8	STR	11'-2"	179	
REIN	REINFORCING STEEL = 7,086 LBS						REINFORCING STEEL = 3,239 LBS					
1	•											

BAR SCHEDULE

BAR SCHEDULE

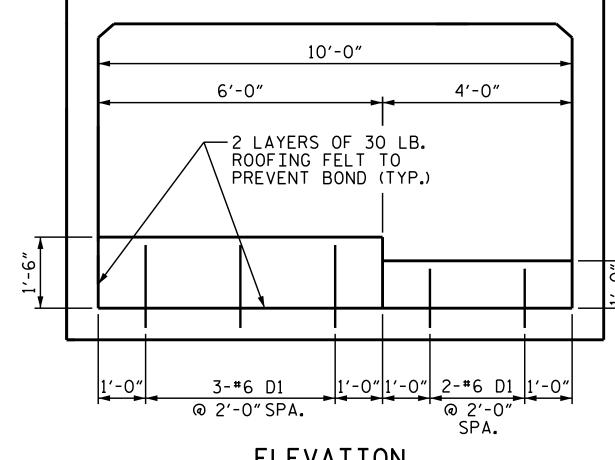
 -			LENGTH OF CULVERT = 64'-	6"					
4		44'-9"(STAGE		19'-9"(STAGE II) ►					
		-L	-						
FLOW	21'-0" WIDE × 1'-6" HIGH SILL (TYP. EA. END)	2 1'-0" WIDE × 1'-6" HIGH BAFFLE (TYP.)	100°-00'-00'' (TYP.)	CONST. JT.	90°-00′-00	HIGH FLOW © CULVERT		9,-0"	
	1'-0"WIDE × 1'-0"HIGH SILL (TYP.EA.END)	STA. 168+42.00 -L- 2 1'-0" WIDE × 1'-0" HIGH BAFFLE (TYP.)				LOW FLOW		4,-0"	
	12'-0"	12'-0"	2'-3" 9'-9"	12'-0"		12'-0"			

PLAN VIEW SHOWING SILL/BAFFLE LOCATIONS



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

SECTION THROUGH SILL/BAFFLE



ELEVATION
(LOOKING DOWNSTREAM)

CULVERT SILL/BAFFLE DETAILS

		COLVENT	JILL/ DAI I L
	1 -		
<u>5-16</u>			

STAGE I STRUCTURE QUANTITIES	STAGE II STRUCTURE QUANTITIES
CLASS A CONCRETE BARREL @ 0.913 CY/FT 40.9 C.Y. WINGS ETC. 8.2 C.Y. SILLS/BAFFLES 1.9 C.Y. TOTAL 51.0 C.Y.	CLASS A CONCRETE BARREL @
REINFORCING STEEL BARREL	REINFORCING STEEL BARREL
CULVERT EXCAVATION LUMP SUM FOUNDATION CONDITIONING MATERIAL 48 TONS	CULVERT EXCAVATION LUMP SUM FOUNDATION CONDITIONING MATERIAL 21 TONS

SHEET 5 OF 7

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SINGLE 10 FT.X 6FT. CONCRETE BOX CULVERT 100°-00'-00"SKEW

Docusigned by:
Wael Onafat
4139C12A32AB406...
10/18/2016

SEAL (17230

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REVISIONS

NO. BY: DATE: NO. BY: DATE: C-12

1 3 TOTAL SHEETS
14

CULVERT #2

18-OCT-2016 10:34 0:\Structures\Plans\FINAL PLANS\R4753_SD_CU_02.dgn warafat

_ DATE : 8-8-16

_ DATE : <u>9-16</u>

E.C.PHELPS/VXN

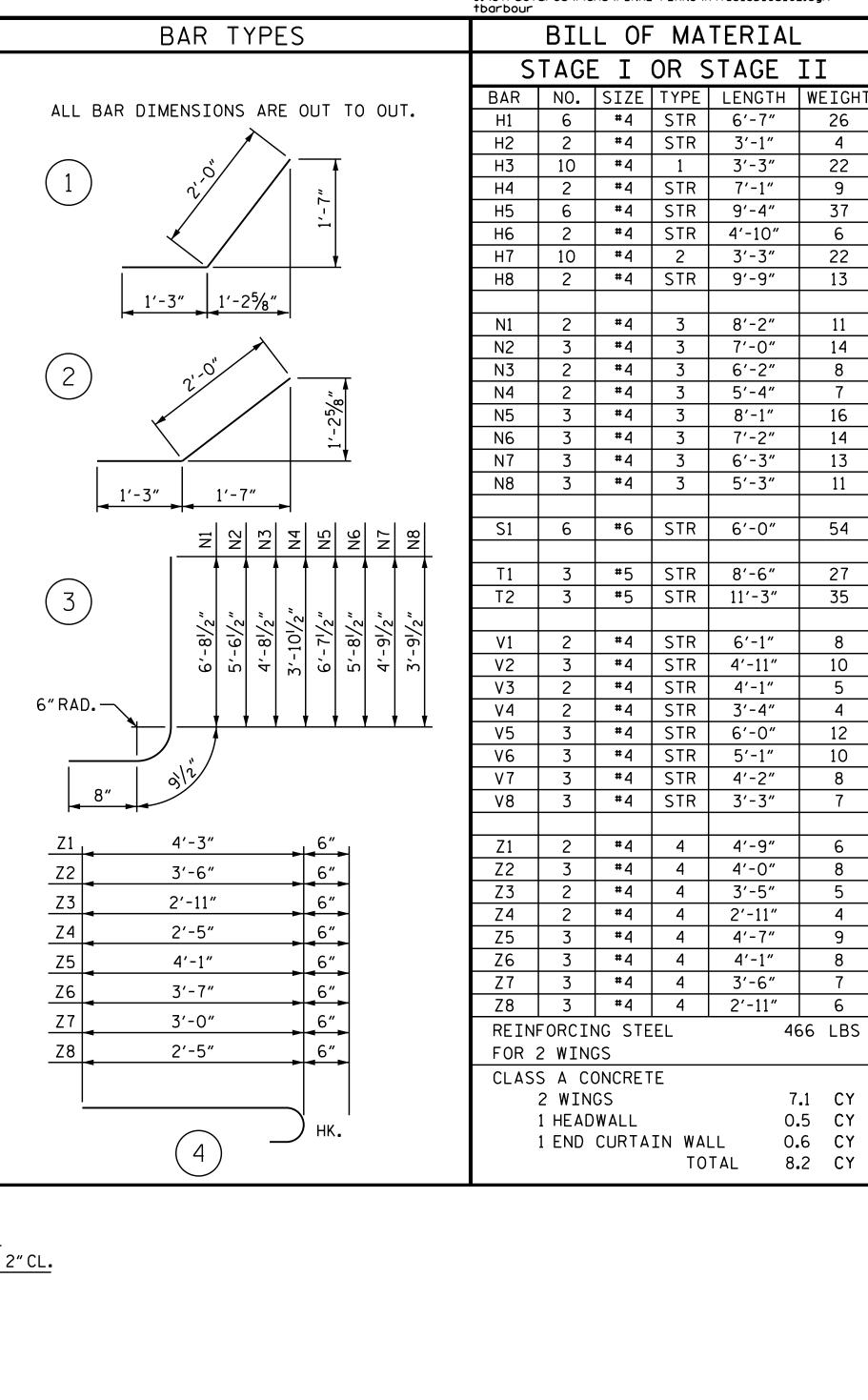
DESIGN ENGINEER OF RECORD: A.M.LEE

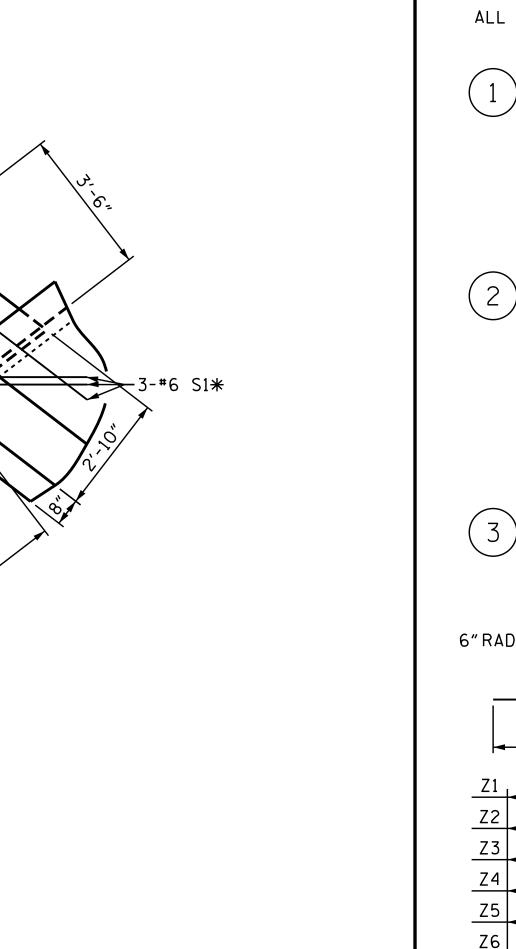
H.T. BARBOUR

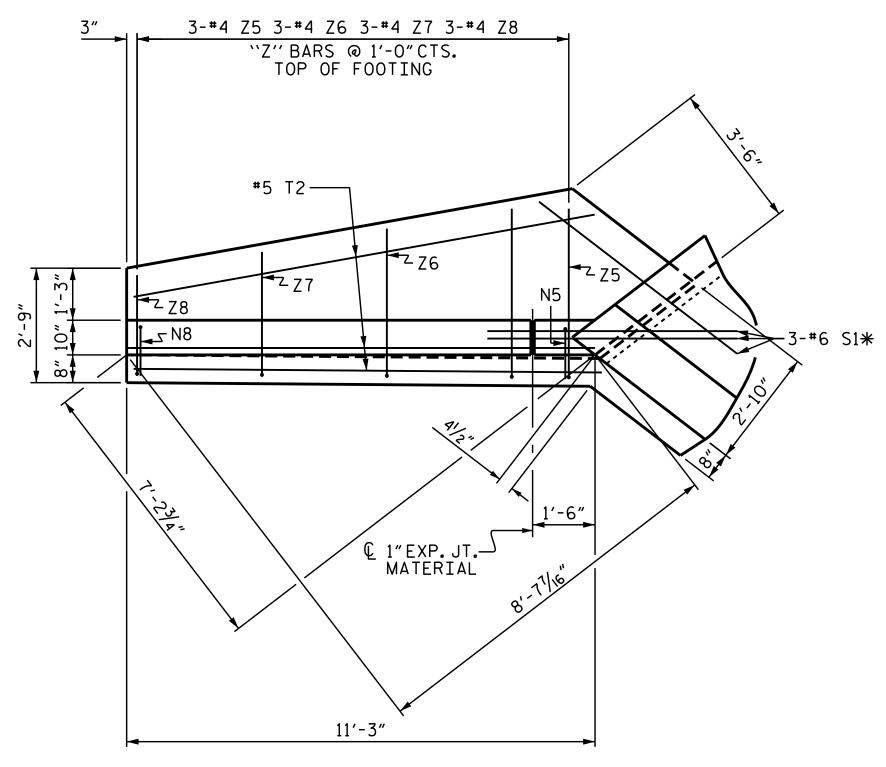
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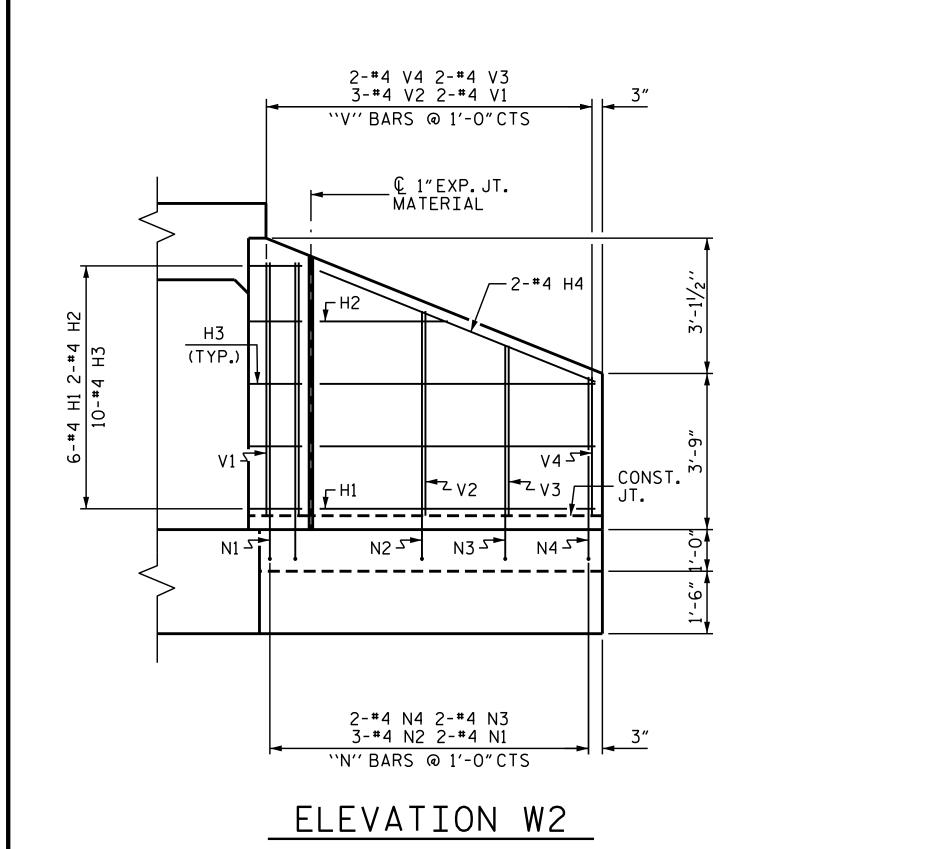
CHECKED BY : ___











2-#4 Z4 2-#4 Z3 3-#4 Z2 2-#4 Z1

"Z" BARS @ 1'-0" CTS.

TOP OF FOOTING

1′-6″

3-#6 S1*

— **#**5 T1

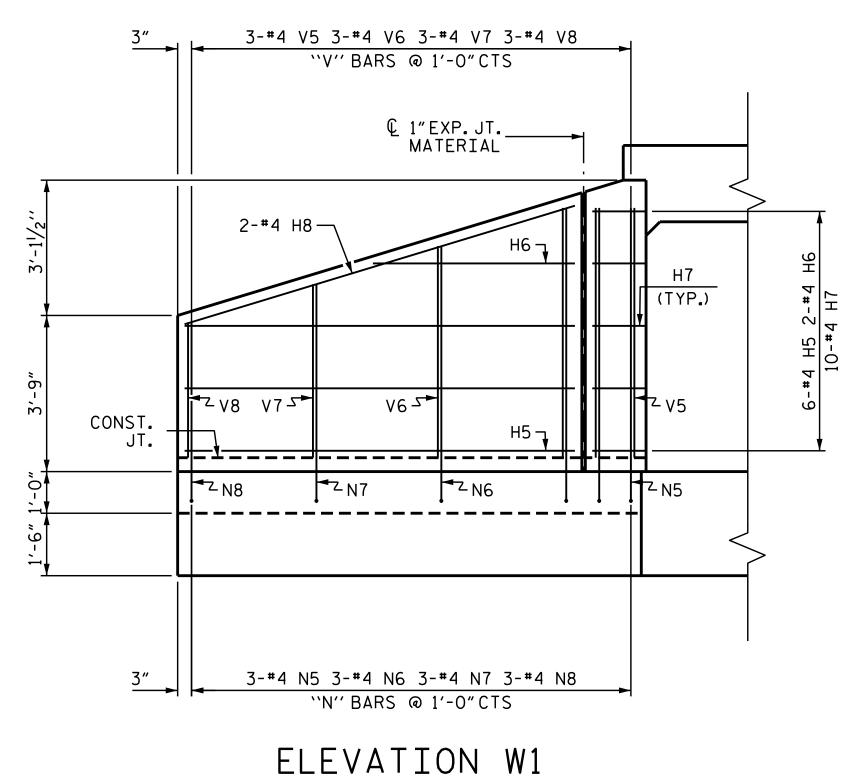
_Û 1″EXP.JT. MATERIAL ,

***** S1 @ BOTTOM OF FLOOR

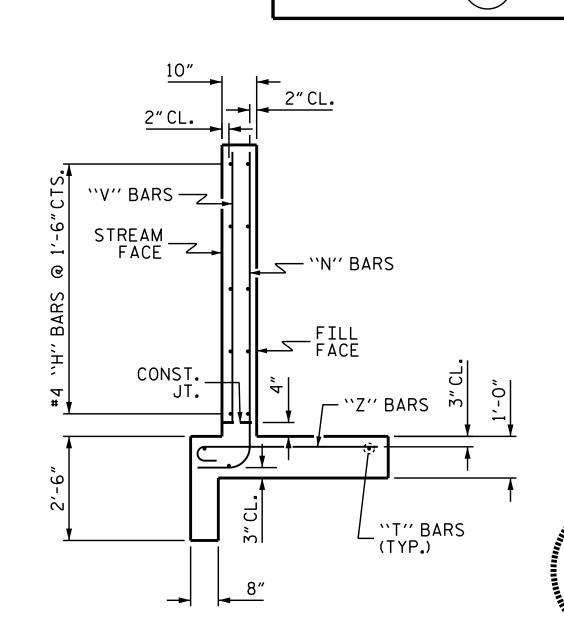
SLAB & FOOTING

8'-6"

PLAN W2



PLAN W1



PROJECT NO. R-4753 <u>JACKSON</u> COUNTY STATION: 168+42.00 -L-SHEET 6 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT 6'-0" SLOPE = 2:1 100°-00'-00" SKEW H = 6'-0''

STAGE I OR II

SHEET NO. **REVISIONS** C-13 DATE: DATE: TOTAL SHEETS

TYPICAL WING SECTION

Docusigned by: Wael Orafat DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL 3

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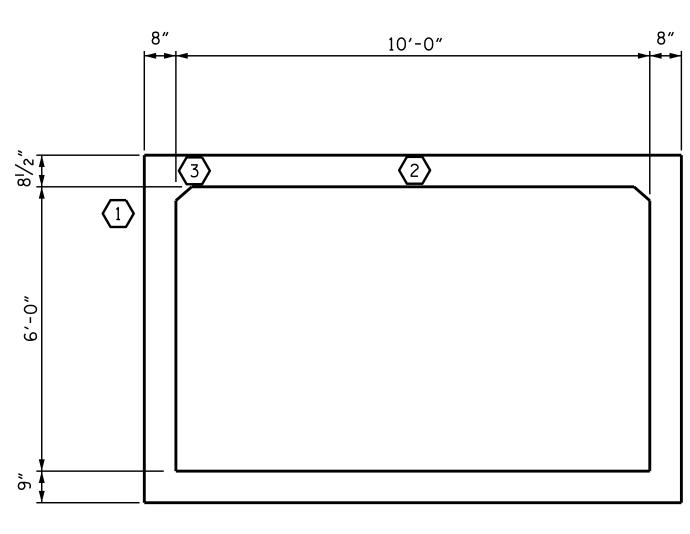
10/12/2016

ASSEMBLED BY: E.C. PHELPS/VXN DATE: 8/5/16 CHECKED BY: H.T. BARBOUR DATE: 8/8/16 DRAWN BY: CCJ 12/99 CHECKED BY: RWW 03/00

CULVERT *2

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

									STRENGTH I	LIMI	T STA	ΛΤΕ				
										MOMENT				SHEAR		
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	LIVE-LOAD FACTORS (Y _{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)	COMMENT NUMBER
		HL-93 (INVENTORY)	N/A	1	1.00		1.75	1.00	1	TOP CORNER WALL	0.67	1.00	1	TOP SLAB	0.84	
DESIGN LOAD		HL-93 (OPERATING)	N/A		1.30		1.35	1.30	1	TOP CORNER WALL	0.67	1.30	1	TOP SLAB	0.84	
RATING		HS-20 (INVENTORY)	36.000	2	1.08	39.00	1.75	1.08	1	TOP SLAB	5.33	1.18	1	TOP SLAB	0.84	
		HS-20 (OPERATING)	36.000		1.40	50 . 56	1.35	1.40	1	TOP SLAB	5.33	1.53	1	TOP SLAB	0.84	
		SNSH	13.500		1.96	26.52	1.40	1.96	1	TOP SLAB	5.33	2.15	1	TOP SLAB	0.84	
	Ш	SNGARBS2	20.000		1.84	36.77	1.40	1.84	1	TOP SLAB	5.33	2.01	1	TOP SLAB	0.84	
	ICL	SNAGRIS2	22.000		1.96	43.22	1.40	1.96	1	TOP SLAB	5.33	2.15	1	TOP SLAB	0.84	
	E VEHICLE (SV)	SNCOTTS3	27.250	3	1.21	33.04	1.40	1.21	1	TOP CORNER WALL	0.67	1.26	1	TOP SLAB	0.84	
	SLE (S	SNAGGRS4	34.925		1 . 39	48.66	1.40	1.52	1	TOP CORNER WALL	0.67	1.39	1	BOTTOM SLAB	9.79	
	SINGL	SNS5A	35.550		1.40	49.90	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
		SNS6A	39.950		1.40	56.08	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
LEGAL LOAD		SNS7B	42.000		1.40	58.95	1.40	1.40	1	TOP CORNER WALL	0.67	1.44	1	BOTTOM SLAB	9.79	
RATING	LER	TNAGRIT3	33.000		1.96	64.83	1.40	1.96	1	TOP SLAB	5 . 33	2.12	1	BOTTOM SLAB	0.87	
	TRAIL	TNT4A	33.075		1.41	46.73	1.40	1.41	1	TOP CORNER WALL	0.67	1.50	1	TOP SLAB	0.84	
	I-IM	TNT6A	41.600		1.40	58.29	1.40	1.41	1	TOP CORNER WALL	0.67	1.40	1	BOTTOM SLAB	9.79	
	SEMI-	TNT7A	42.000		1.41	59.39	1.40	1.41	1	TOP CORNER WALL	0.67	1.49	1	TOP SLAB	9.82	
	TOR (TNT7B	42.000		1.41	59.34	1.40	1.41	1	TOP CORNER WALL	0.67	1.45	1	BOTTOM SLAB	9.79	
	TRAC	TNAGRIT4	43.000		1.36	58.27	1.40	1.36	1	TOP CORNER WALL	0.67	1.43	1	TOP SLAB	0.84	
	TRUCK	TNAGT5A	45.000		1.39	62.47	1.40	1.39	1	TOP CORNER WALL	0.67	1.46	1	TOP SLAB	9.82	
	TRI	TNAGT5B	45.000		1.41	63.63	1.40	1.41	1	TOP CORNER WALL	0.67	1.50	1	TOP SLAB	0.84	



LRFR SUMMARY

(LOOKING DOWNSTREAM)

ASSEMBLED BY: E.C. PHELPS/V.X.N. DATE: 8-5-16
CHECKED BY: H.T. BARBOUR DATE: 8-8-16

DRAWN BY: WMC 7/II REV. IO/I/II
CHECKED BY: GM 7/II

MAA/GM DESIGN ENGINEER OF RECORD: _____A.M. LEE ___ DATE : ___9-16

06-0CT-2016 08:59
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tbarbour

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			

(#) CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. R-4753 JACKSON _ COUNTY

STATION: 168+42.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD

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

Docusigned by:
Wael Orafat

10/12/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS C-14

CULVERT #2

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 ---- 1.800 LBS. PER SQ. IN. UNTREATED - EXTREME FIBER STRESS COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER ----375 LBS. PER SQ. IN. EQUIVALENT FLUID PRESSURE OF EARTH 30 LBS. PER CU. FT.

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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS.

SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2"OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 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.

ENGLISH

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(MINIMUM)