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PROJECT: 17BP.14.R.51

CONTRACT: DN00177

STATE OF NORTH CAROLINA

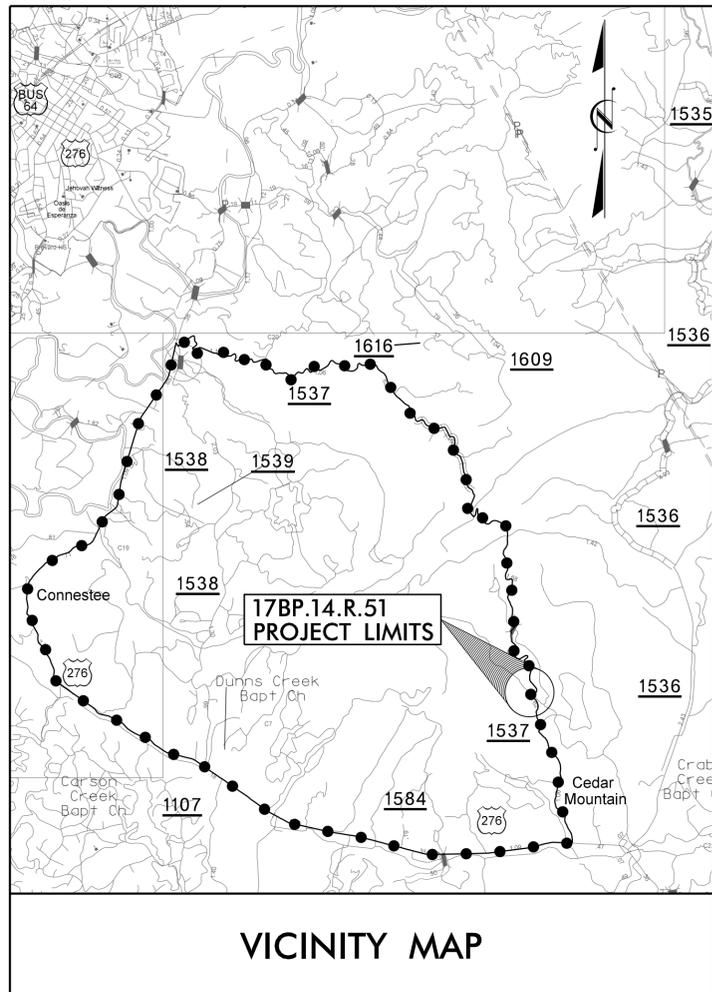
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

**LOCATION: BRIDGE NO. 159 ON SR 1537 (RICH MOUNTAIN ROAD)
OVER BRANCH OF BUCKHORN CREEK**

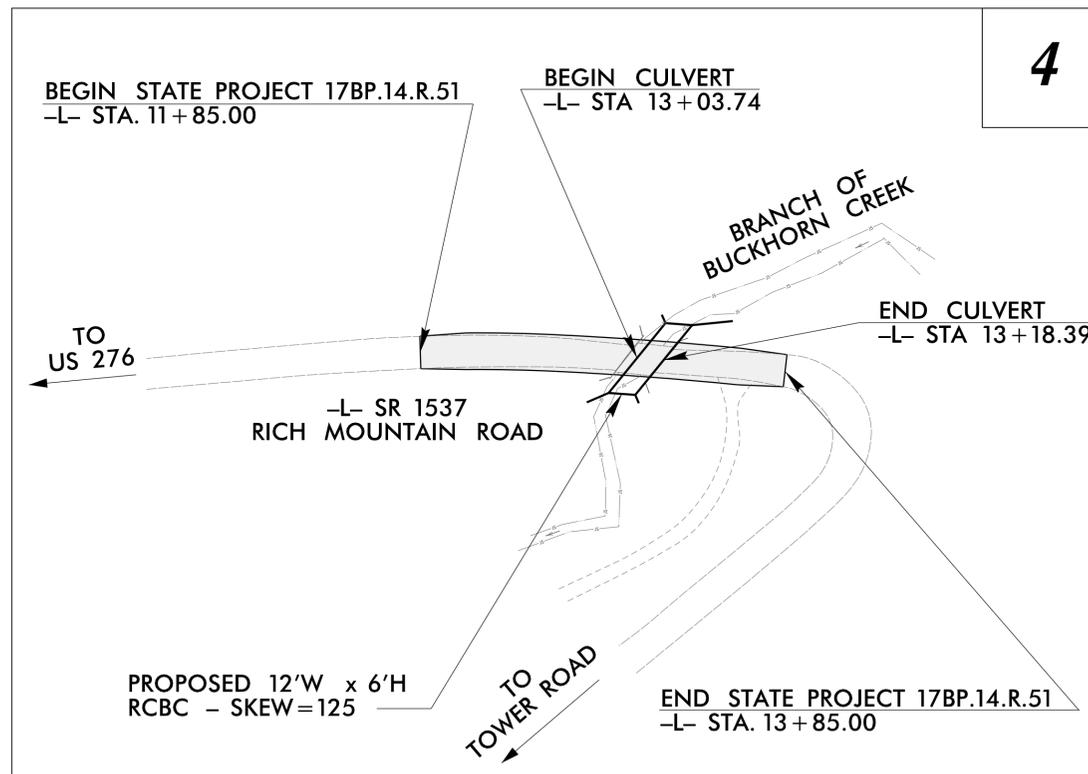
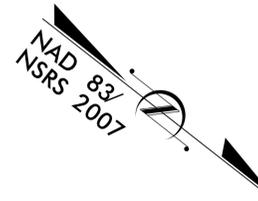
**TYPE OF WORK: PAVING, GRADING, GUARDRAIL, DRAINAGE
AND CULVERT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.51	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
17BP.14.R.51		PE	
17BP.14.R.51		ROW & UTIL	
17BP.14.R.51		CONST.	

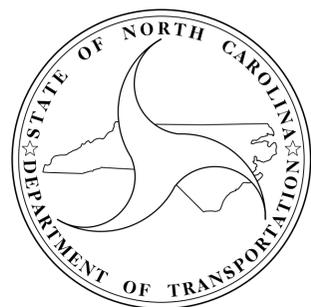


VICINITY MAP

● ● ● ● ● DETOUR



CULVERT



DESIGN DATA

ADT 2013	=	40
ADT 2033	=	70
DHV	=	N/A %
D	=	N/A %
T	=	6 % *
V	=	30 MPH
* TTST	=	N/A DUAL 6%
FUNC CLASS	=	
LOCAL		
SUBREGIONAL TIER		

PROJECT LENGTH

LENGTH ROADWAY OF PROJECT 17BP.14.R.51	=	0.035 mi.
LENGTH STRUCTURE OF PROJECT 17BP.14.R.51	=	0.003 mi.
TOTAL LENGTH OF STATE PROJECT 17BP.14.R.51	=	0.038mi.

Prepared for NCDOT in the Office of:

moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

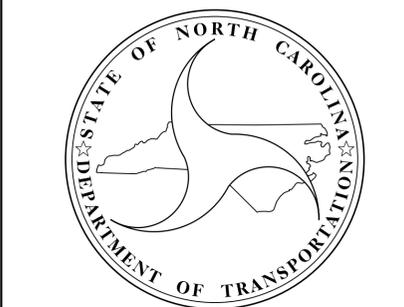
2012 STANDARD SPECIFICATIONS

LETTING DATE :
NOVEMBER 10, 2015

TIM REID, P.E.
PROJECT ENGINEER

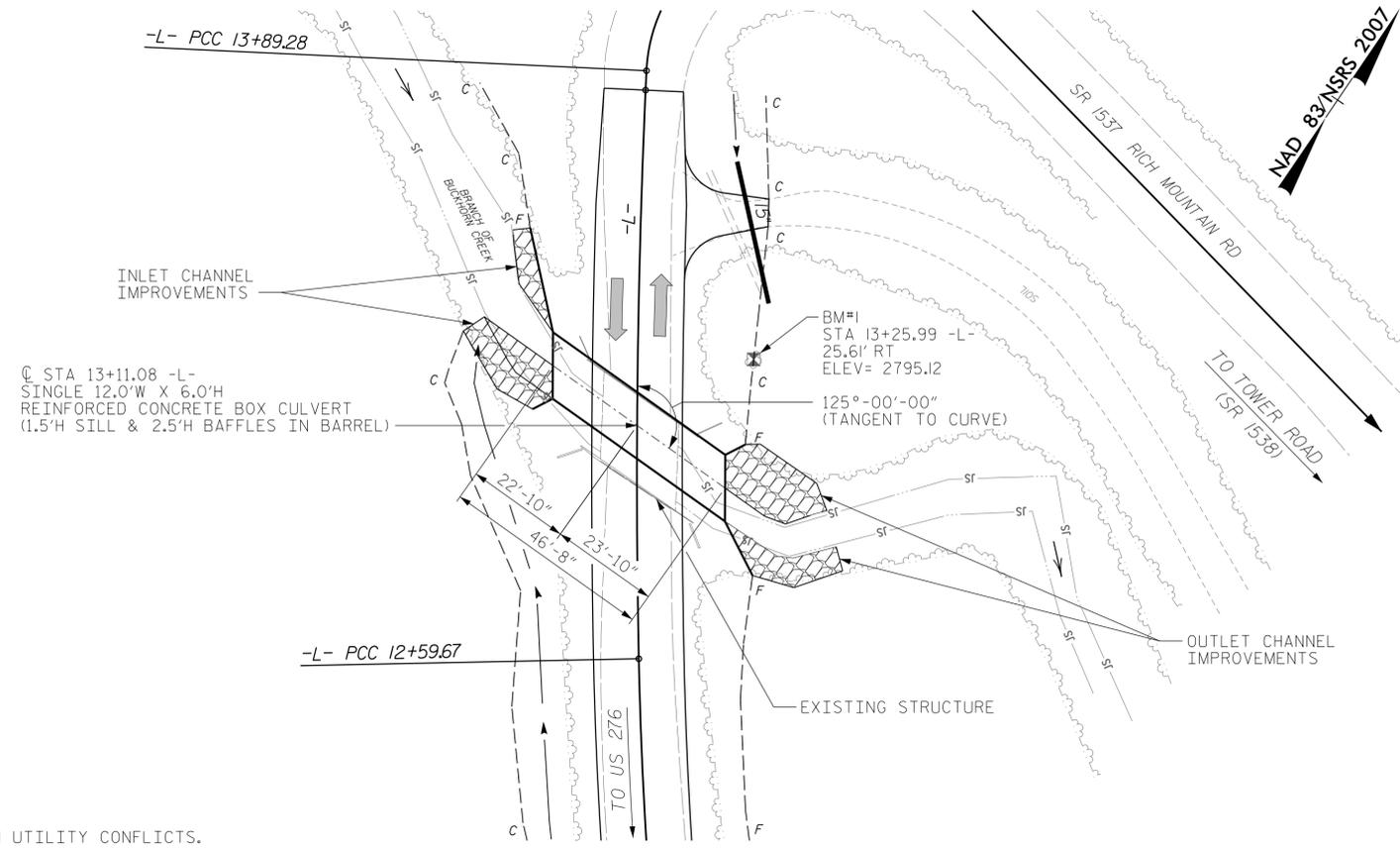
MIKELE WINTERS, P.E.
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610



10/5/2015
R:\structures\870159_str_tsh.dgn
thuffman

TBM BM#1 RR SPIKE IN 18" WHITE PINE LOCATED AT STA 13+25.99 -L-; 25.61' RT, EL 2795.12



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- DESIGN FILL = 2.9'
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- THE EXISTING STRUCTURE CONSISTING OF ONE SPAN, 1 @ 20'-3" WITH A TIMBER FLOOR ON TIMBER JOISTS AND A CLEAR ROADWAY WIDTH OF 14'-0" ON TIMBER CAPS AND TIMBER POSTS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 - THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY 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 WALL 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.
- 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 THREE FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- BED MATERIAL PLACED BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL BETWEEN THE LOWER SILLS. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THE OF CLASS B RIP RAP. STONES LARGER 12 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER.
- 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.

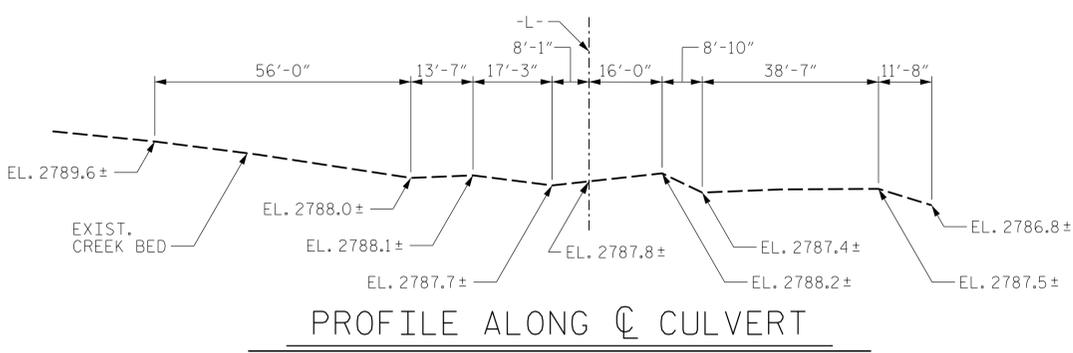
NO KNOWN UTILITY CONFLICTS.

TOTAL STRUCTURE QUANTITIES

CLASS AA CONCRETE	
BARREL @ 1.288 CY/FT	60.1 C.Y.
TOTAL	60.1 C.Y.
CLASS A CONCRETE	
WING ETC.	22.7 C.Y.
TOTAL	22.7 C.Y.
REINFORCING STEEL	
BARREL	9,834 LBS.
WING ETC.	1,038 LBS.
TOTAL	10,872 LBS.
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	44 TONS
STRUCTURE REMOVAL	LUMP SUM

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

HYDRAULIC DATA	
DESIGN DISCHARGE	= 290 CFS
FREQUENCY OF DESIGN FLOOD	= 25-YR
DESIGN HIGH WATER ELEVATION	= 2792.4
DRAINAGE AREA	= 0.74 SQ MI
BASIC DISCHARGE (Q100)	= 460 CFS
BASIC HIGH WATER ELEVATION	= 2793.95
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 540 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >100+-YR
OVERTOPPING FLOOD ELEVATION	= 2795.1
GRADE DATA	
GRADE POINT ELEV. @ STATION 13+11.08	= 2795.12
BED ELEV. @ STATION 13+11.08	= 2787.85
ROADWAY SLOPES	= 2:1



PROFILE ALONG CULVERT

PROJECT NO. 17BP.14.R.51
TRANSYLVANIA COUNTY
 STATION: 13+11.08 -L-

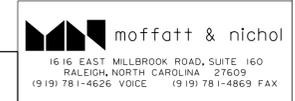
SHEET 1 OF 6 REPLACES BRIDGE No. 159

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE BARREL
 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 125° SKEW

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

REVISED 11-13-91 BY E.L.R. CHECKED BY G.R.P. ADDED 8-22-89

DRAWN BY : C. POWELL	DATE : 12/2012	SPECIAL
CHECKED BY : M. WINTERS	DATE : 04/2013	
DESIGN ENGINEER OF RECORD : M. WINTERS	DATE :	STANDARD
DRAWN BY : B.M. MEYERS	DATE : 08/1989	
CHECKED BY : A.R. BISSETTE	DATE : 08/1989	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⊕	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ _{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.10	--	1.75	1.10	1.00	TOP SLAB	6.33	2.22	1.00	TOP SLAB	1.05		
	HL-93 (OPERATING)	N/A	--	1.43	--	1.35	1.43	1.00	TOP SLAB	6.33	2.88	1.00	TOP SLAB	1.05		
	HS-20 (INVENTORY)	36.000	2	1.24	44.64	1.75	1.24	1.00	TOP SLAB	6.33	2.48	1.00	TOP SLAB	1.05		
	HS-20 (OPERATING)	36.000	--	1.60	57.60	1.35	1.60	1.00	TOP SLAB	6.33	3.22	1.00	TOP SLAB	1.05		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500	--	2.67	36.045	1.40	2.67	1.00	TOP SLAB	6.33	5.31	1.00	TOP SLAB	1.05	
		SNGARBS2	20,000	--	2.50	50.00	1.40	2.50	1.00	TOP SLAB	6.33	4.97	1.00	TOP SLAB	1.05	
		SNAGRIS2	22,000	--	2.67	58.74	1.40	2.67	1.00	TOP SLAB	6.33	5.31	1.00	TOP SLAB	1.05	
		SNCOTTS3	27,250	--	2.34	63.765	1.40	2.34	1.00	BOTTOM SLAB	6.33	5.85	1.00	TOP SLAB	1.05	
		SNAGGRS4	34,925	3	2.02	70.549	1.40	2.02	1.00	BOTTOM SLAB	6.33	5.03	1.00	TOP SLAB	1.05	
		SNS5A	35,550	--	2.36	83.898	1.40	2.36	1.00	BOTTOM SLAB	6.33	5.87	1.00	TOP SLAB	1.05	
		SNS6A	39,950	--	2.43	97.079	1.40	2.43	1.00	BOTTOM SLAB	6.33	6.05	1.00	TOP SLAB	1.05	
	SNS7B	42,000	--	2.63	110.46	1.40	2.63	1.00	BOTTOM SLAB	6.33	6.55	1.00	TOP SLAB	1.05		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000	--	2.13	70.29	1.40	2.13	1.00	BOTTOM SLAB	6.33	4.91	1.00	TOP SLAB	1.05	
		TNT4A	33,075	--	2.63	86.987	1.40	2.63	1.00	BOTTOM SLAB	6.33	6.56	1.00	TOP SLAB	1.05	
		TNT6A	41,600	--	2.73	113.57	1.40	2.73	1.00	BOTTOM SLAB	6.33	6.81	1.00	TOP SLAB	1.05	
		TNT7A	42,000	--	3.02	126.84	1.40	3.02	1.00	BOTTOM SLAB	6.33	7.53	1.00	TOP SLAB	1.05	
		TNT7B	42,000	--	3.02	126.84	1.40	3.02	1.00	BOTTOM SLAB	6.33	7.53	1.00	TOP SLAB	1.05	
		TNAGRIT4	43,000	--	2.02	86.86	1.40	2.02	1.00	BOTTOM SLAB	6.33	5.05	1.00	TOP SLAB	1.05	
TNAGT5A		45,000	--	2.23	100.35	1.40	2.23	1.00	BOTTOM SLAB	6.33	5.56	1.00	TOP SLAB	1.05		
TNAGT5B	45,000	--	2.23	100.35	1.40	2.23	1.00	BOTTOM SLAB	6.33	5.56	1.00	TOP SLAB	1.05			

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	--

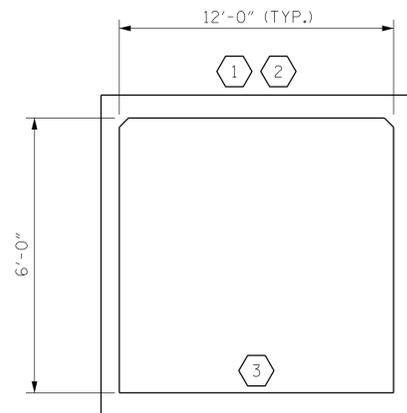
NOTE:

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 **
** SEE CHART FOR VEHICLE TYPE	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.14.R.51
TRANSYLVANIA COUNTY
 STATION: 13+11.08 -L-

SHEET 2 OF 6

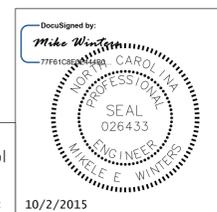
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : <u>C. POWELL</u> DATE : <u>12/2012</u>
CHECKED BY : <u>M. WINTERS</u> DATE : <u>04/2013</u>
DESIGN ENGINEER OF RECORD : <u>M. WINTERS</u> DATE : _____
DRAWN BY : WMC 7/11 REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11

10/2/2015
 R:\Structures\870159_C2_LRFR.dgn
 thuffman

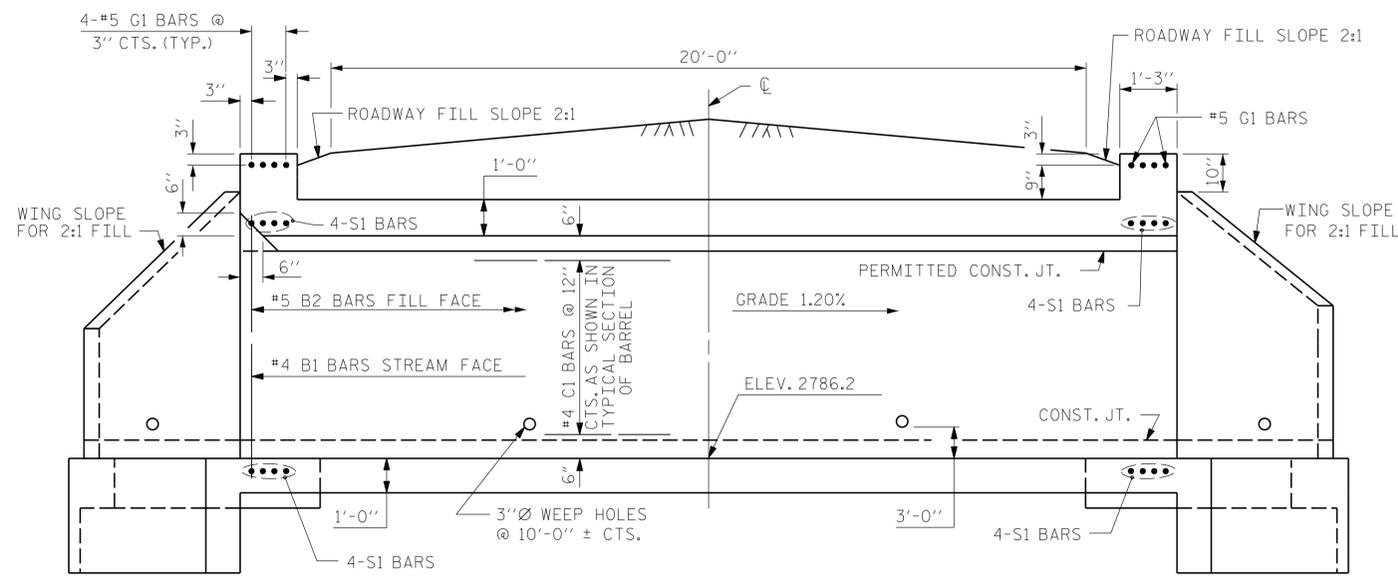
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

moffatt & nichol
 1616 EAST MILLBROOK ROAD, SUITE 160
 RALEIGH, NORTH CAROLINA 27609
 (919) 781-4626 VOICE (919) 781-4869 FAX

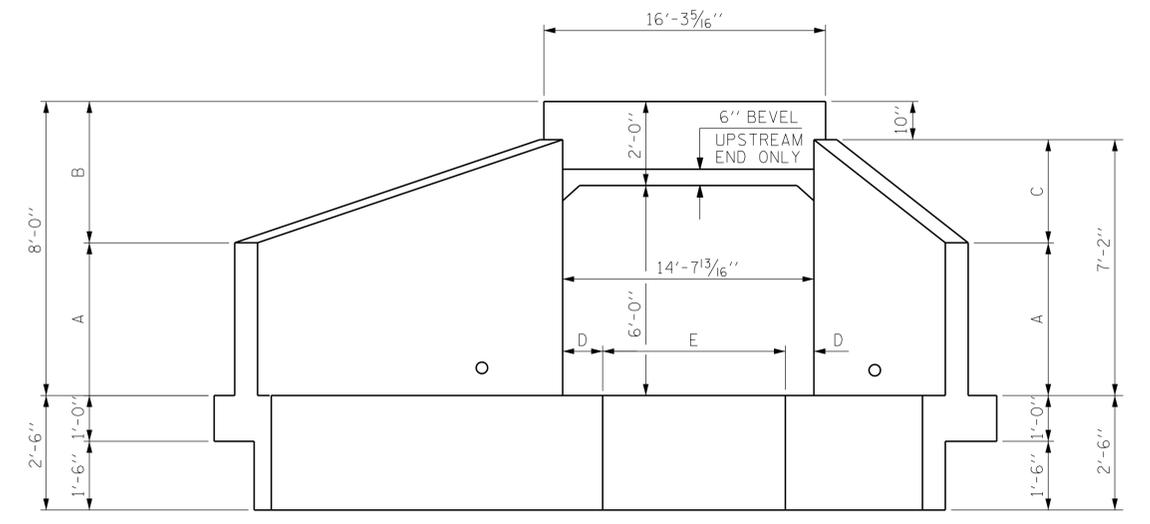


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			6

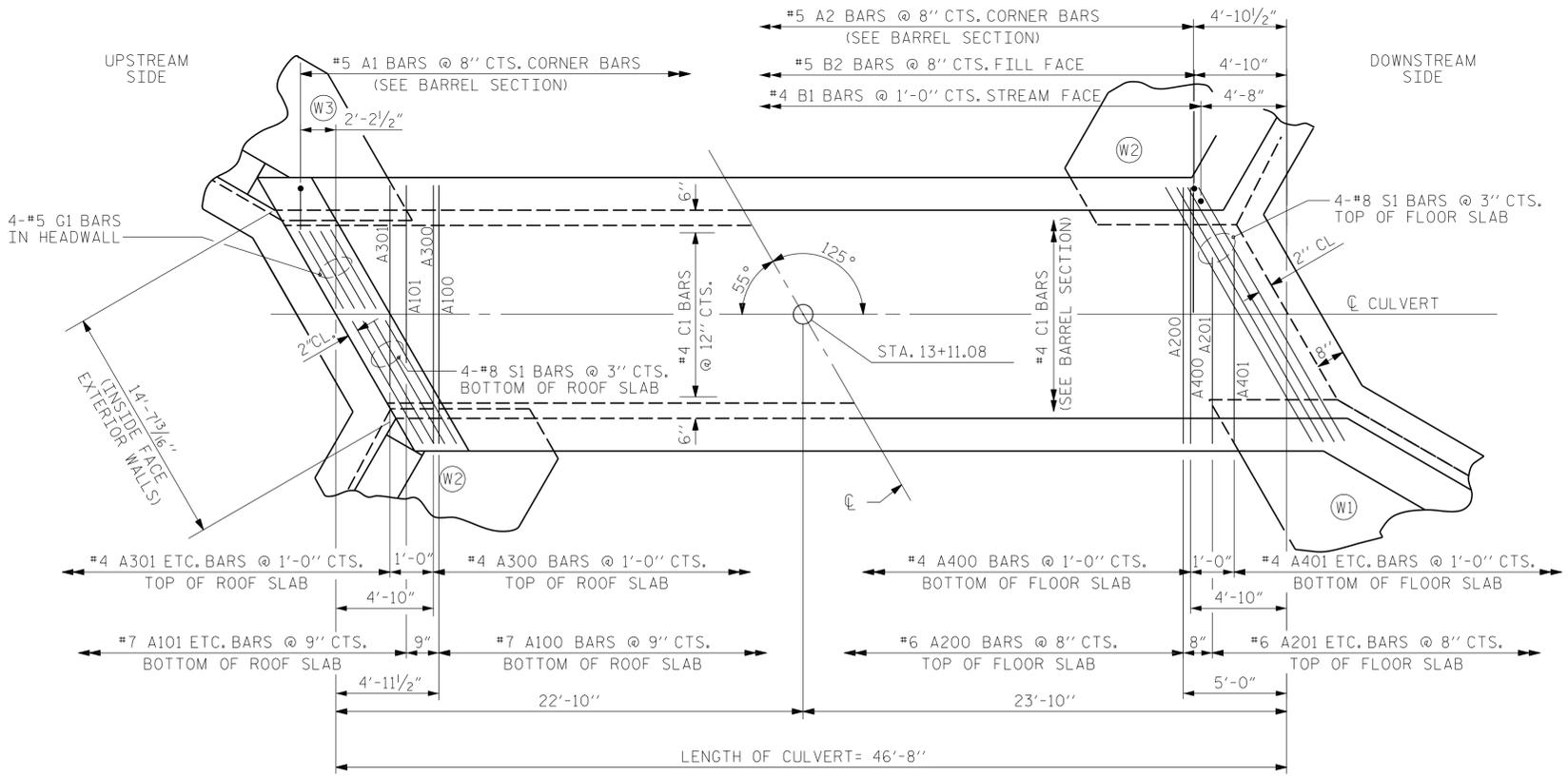
STD. NO. LRFR5



CULVERT SECTION NORMAL TO ROADWAY

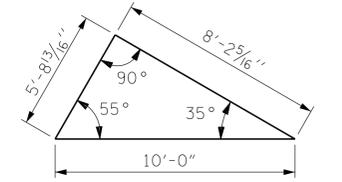


END ELEVATION NORMAL TO SKEW



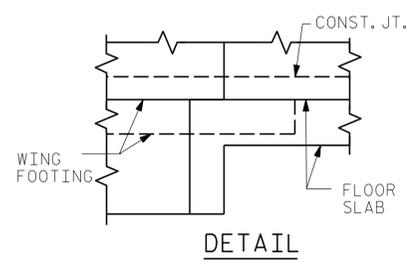
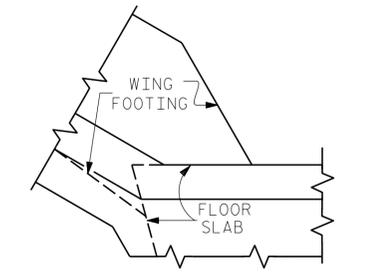
PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB



SKEW TRIANGLE

WING DIMENSION TABLE				
WING	A	B	C	D
W1	3'-9"	4'-3"	3'-5"	4 1/8"
W2	3'-9"	4'-3"	3'-5"	5 3/4"
W3	5'-0"	3'-0"	2'-2"	3"
E				
INLET END	11'-3 1/4"			
OUTLET END	11'-2 1/8"			



DETAIL

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

PROJECT NO. 17BP.14.R.51
TRANSYLVANIA COUNTY
 STATION: 13+11.08 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SINGLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 125° SKEW



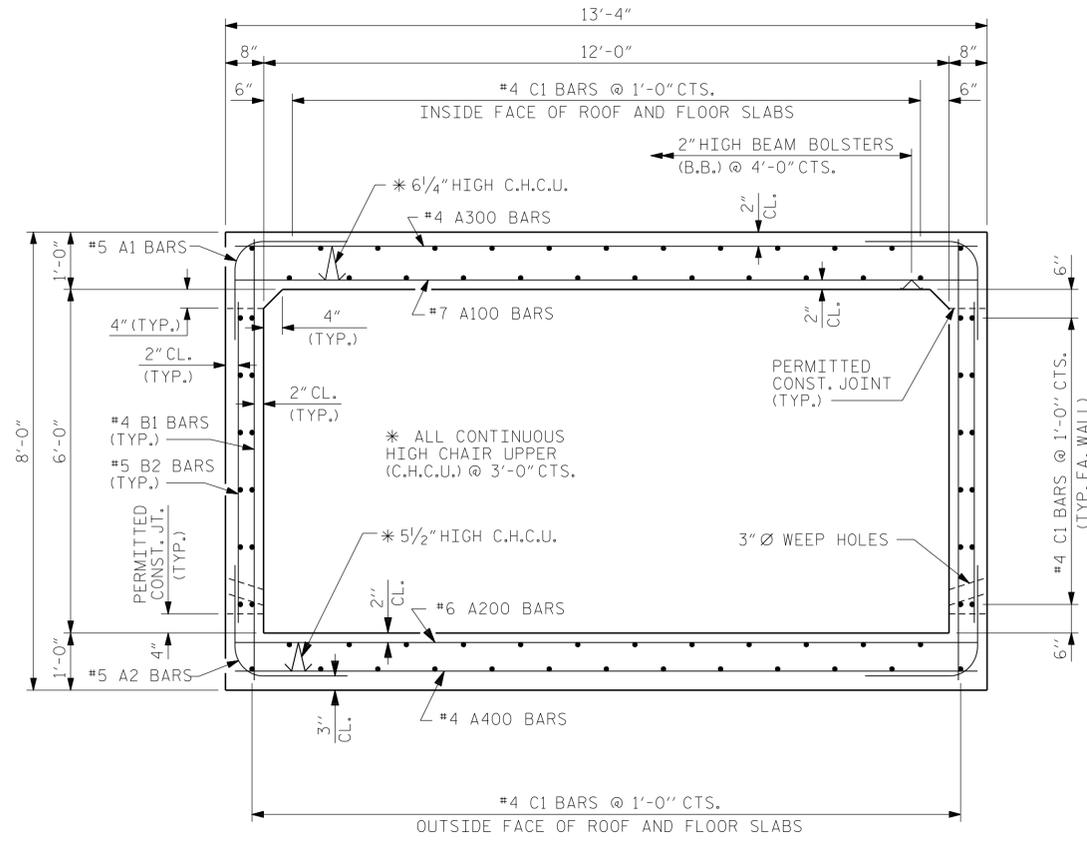
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REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

REVISED 8-28-92 BY E.L.R. CHECKED BY C.R.P.
 REVISED 8-22-89 BY A.R.B. CHECKED BY C.R.K.
 REDRAWN 8-22-89
 REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.

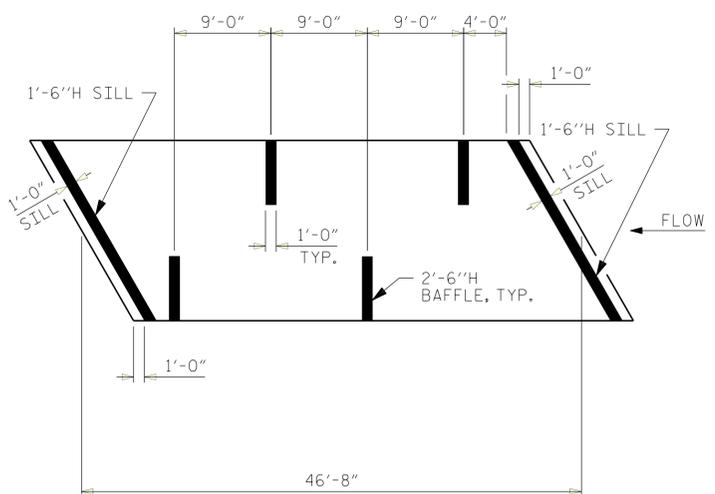
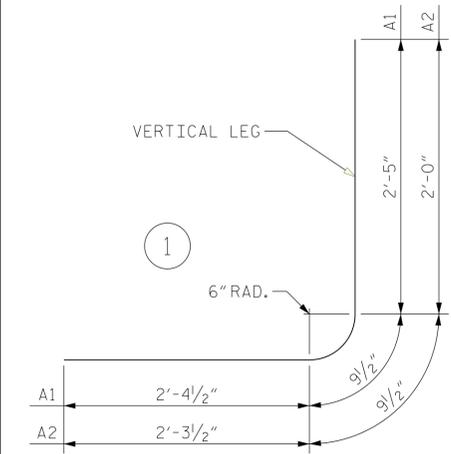
ASSEMBLED BY : <u>C. POWELL</u> DATE : <u>12/2012</u>	SPECIAL
CHECKED BY : <u>M. WINTERS</u> DATE : <u>04/2013</u>	
DESIGN ENGINEER OF RECORD : <u>M. WINTERS</u> DATE : _____	
DRAWN BY : <u>J.W. ROUSE</u> DATE : <u>07/1989</u>	STANDARD
CHECKED BY : <u>A.R. BISSETTE</u> DATE : <u>08/1989</u>	



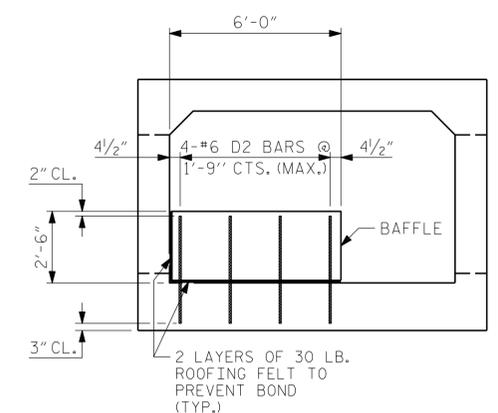
RIGHT ANGLE SECTION OF BARREL

THERE ARE 74 "C" BARS IN SECTION OF BARREL, LOOKING DOWNSTREAM

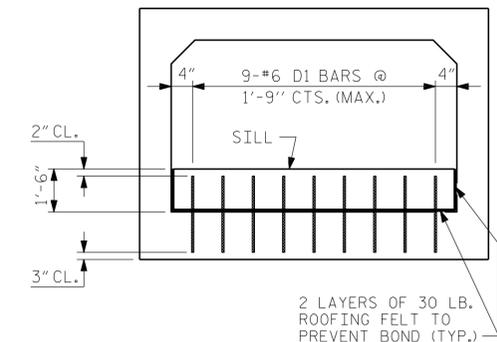
BAR TYPES				BILL OF MATERIAL		
ALL BAR DIMENSIONS ARE OUT TO OUT.						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	134	#5	1	5'-7"	780	
A2	134	#5	1	5'-1"	710	
A100	50	#7	STR	13'-0"	1329	
A101	4	#7	STR	11'-1"	91	
A102	4	#7	STR	9'-0"	74	
A103	4	#7	STR	6'-10"	56	
A104	4	#7	STR	4'-8"	38	
A105	4	#7	STR	2'-6"	20	
A200	57	#6	STR	13'-0"	1093	
A201	4	#6	STR	11'-5"	69	
A202	4	#6	STR	9'-6"	57	
A203	4	#6	STR	7'-7"	46	
A204	4	#6	STR	5'-8"	34	
A205	4	#6	STR	3'-9"	23	
A206	4	#6	STR	1'-11"	12	
A300	38	#4	STR	13'-0"	330	
A301	2	#4	STR	11'-8"	16	
A302	2	#4	STR	10'-3"	14	
A303	2	#4	STR	8'-9"	12	
A304	2	#4	STR	7'-4"	10	
A305	2	#4	STR	5'-11"	8	
A306	2	#4	STR	4'-6"	6	
A307	2	#4	STR	3'-1"	4	
A308	2	#4	STR	1'-8"	2	
A400	38	#4	STR	13'-0"	330	
A401	2	#4	STR	11'-8"	16	
A402	2	#4	STR	10'-3"	14	
A403	2	#4	STR	8'-9"	12	
A404	2	#4	STR	7'-4"	10	
A405	2	#4	STR	5'-11"	8	
A406	2	#4	STR	4'-6"	6	
A407	2	#4	STR	3'-1"	4	
A408	2	#4	STR	1'-8"	2	
B1	94	#4	STR	7'-6"	471	
B2	140	#5	STR	5'-4"	779	
C1	148	#4	STR	24'-0"	2373	
D1	18	#6	STR	2'-1"	56	
D2	24	#6	STR	3'-1"	111	
G1	8	#5	STR	15'-10"	132	
S1	16	#8	STR	15'-10"	676	
TOTAL REINFORCING STEEL					9,834	LBS



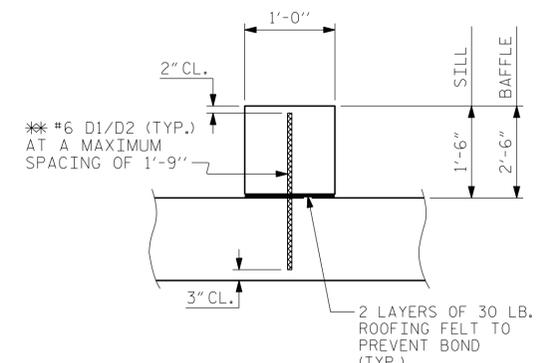
KEY PLAN



ELEVATION OF BAFFLE



ELEVATION OF SILL



SECTION THROUGH SILL/BAFFLE

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

SPLICE CHART		
BAR	SIZE	SPLICE LENGTH
B1	#4	1'-9"
C1	#4	1'-9"

PROJECT NO. 17BP.14.R.51
TRANSYLVANIA COUNTY
 STATION: 13+11.08 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SINGLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 125° SKEW**

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

ASSEMBLED BY : C. POWELL DATE : 12/2012
 CHECKED BY : M. WINTERS DATE : 04/2013
 DESIGN ENGINEER OF RECORD : M. WINTERS DATE : _____
 DRAWN BY : CCJ 10/99
 CHECKED BY : RWW 03/00

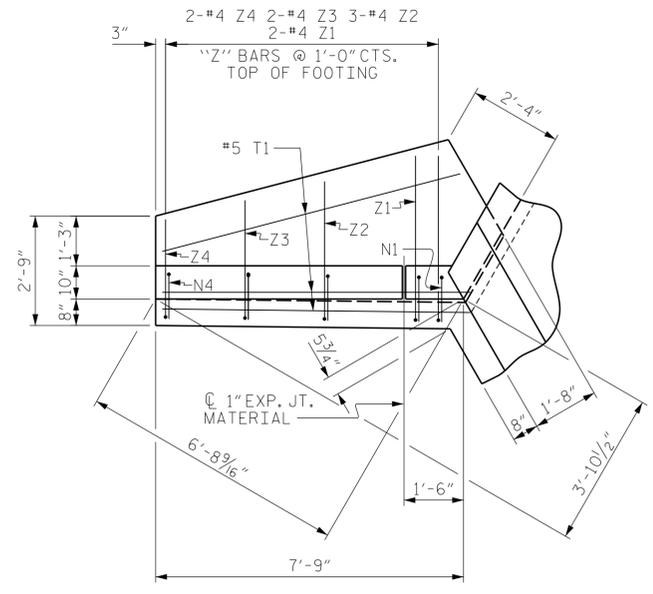
**DOCUMENT NOT CONSIDERED FINAL
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moffatt & nichol
 1616 EAST MILLBROOK ROAD, SUITE 160
 RALEIGH, NORTH CAROLINA 27609
 (919) 781-4626 VOICE (919) 781-4869 FAX

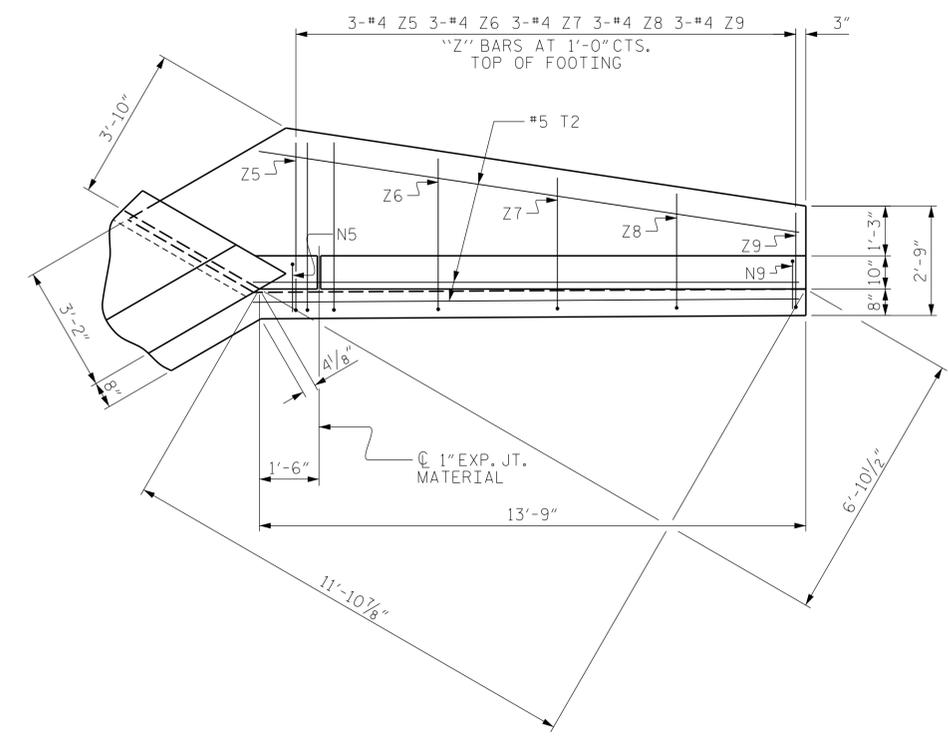


10/2/2015

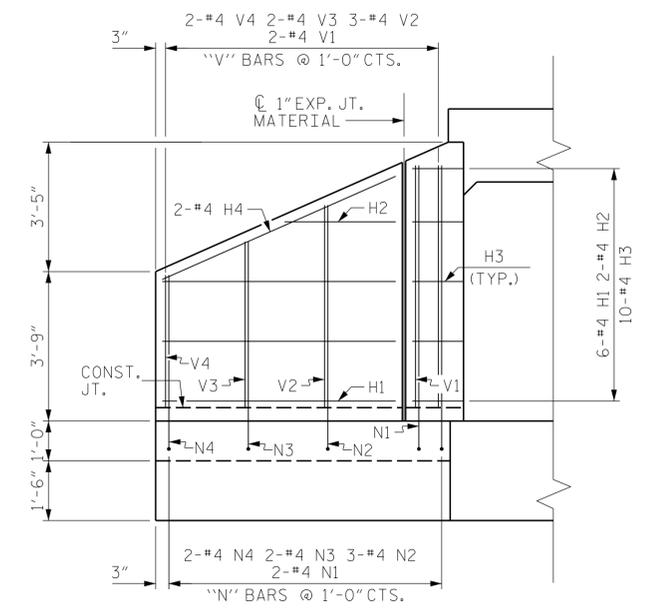
NOTE:
SEE SHEET C-6 FOR BILL OF MATERIAL.



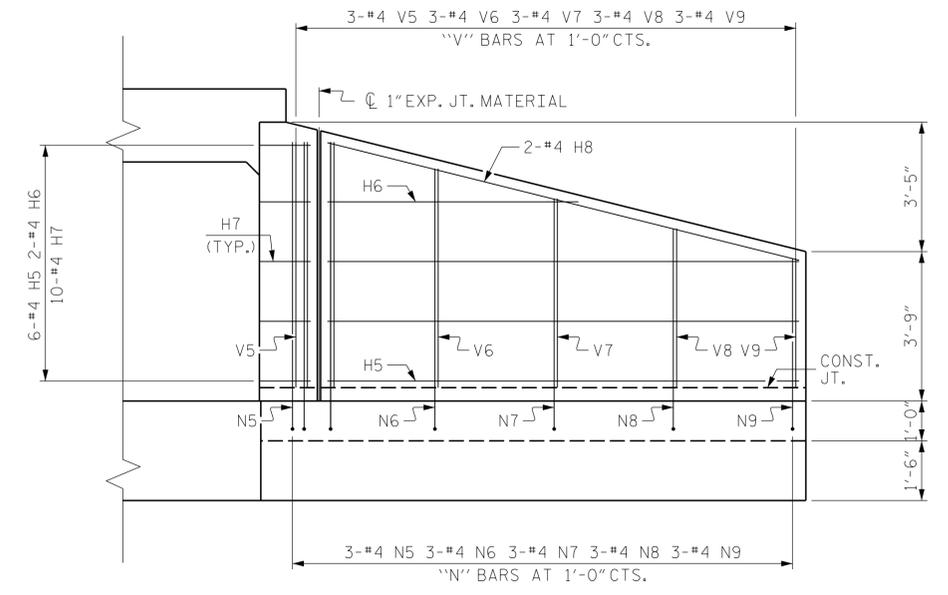
PLAN W2



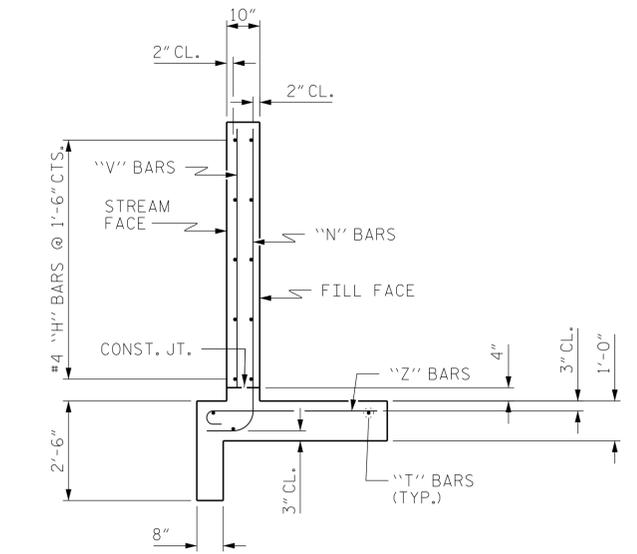
PLAN W1



ELEVATION W2



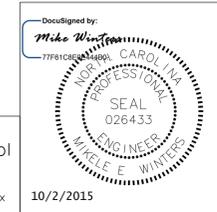
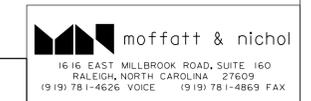
ELEVATION W1



TYPICAL WING SECTION

ASSEMBLED BY : C. POWELL	DATE : 12/2012
CHECKED BY : M. WINTERS	DATE : 04/2013
DESIGN ENGINEER OF RECORD : M. WINTERS	DATE :
DRAWN BY : CCJ	11/99
CHECKED BY : RWW	03/00

DOCUMENT NOT CONSIDERED FINAL
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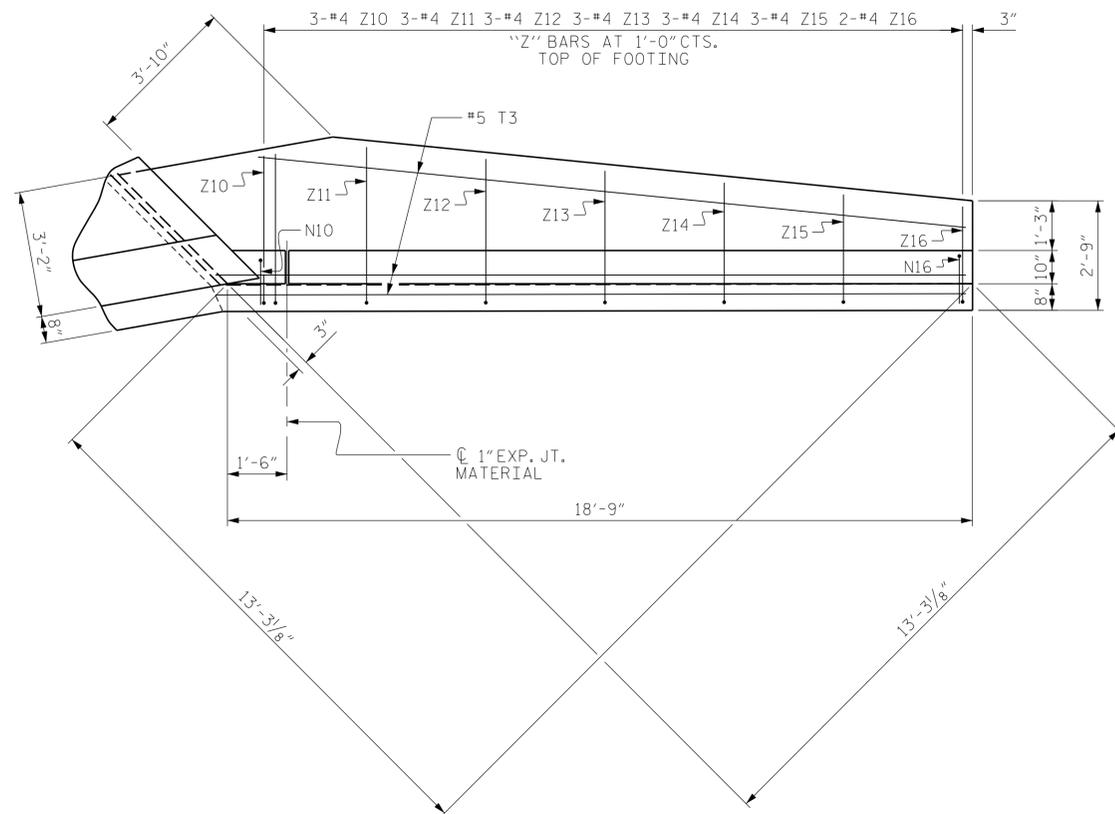


PROJECT NO. 17BP.14.R.51
TRANSYLVANIA COUNTY
STATION: 13+11.08 -L-

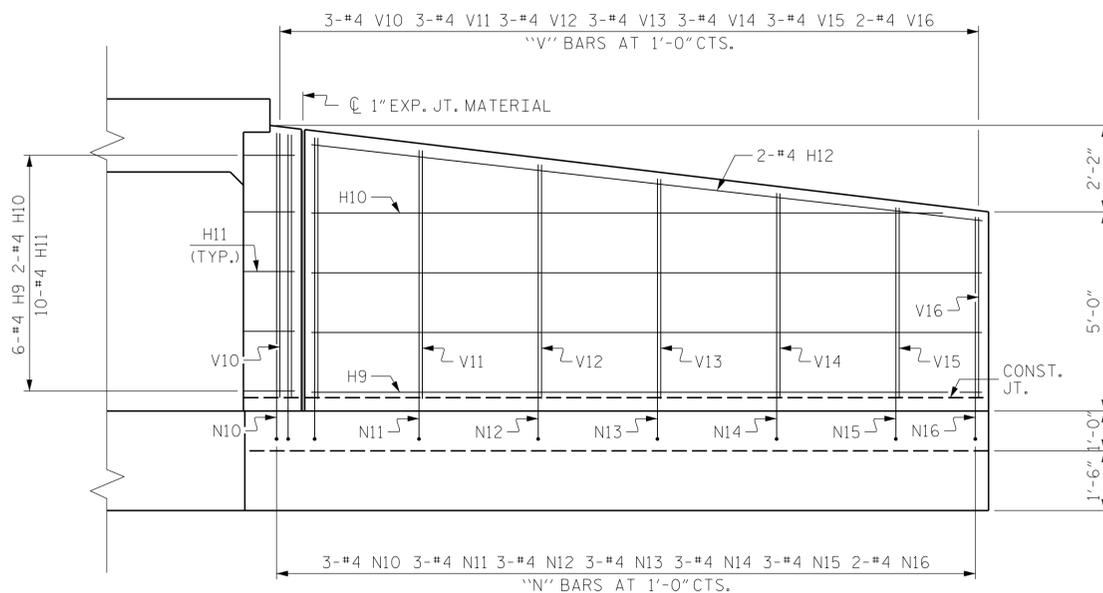
SHEET 5 OF 6
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD WINGS
FOR
CONCRETE BOX CULVERT
H = 6'-0" SLOPE = 2:1
60° OR 120° SKEW

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

STD. NO. CW6006



PLAN W3

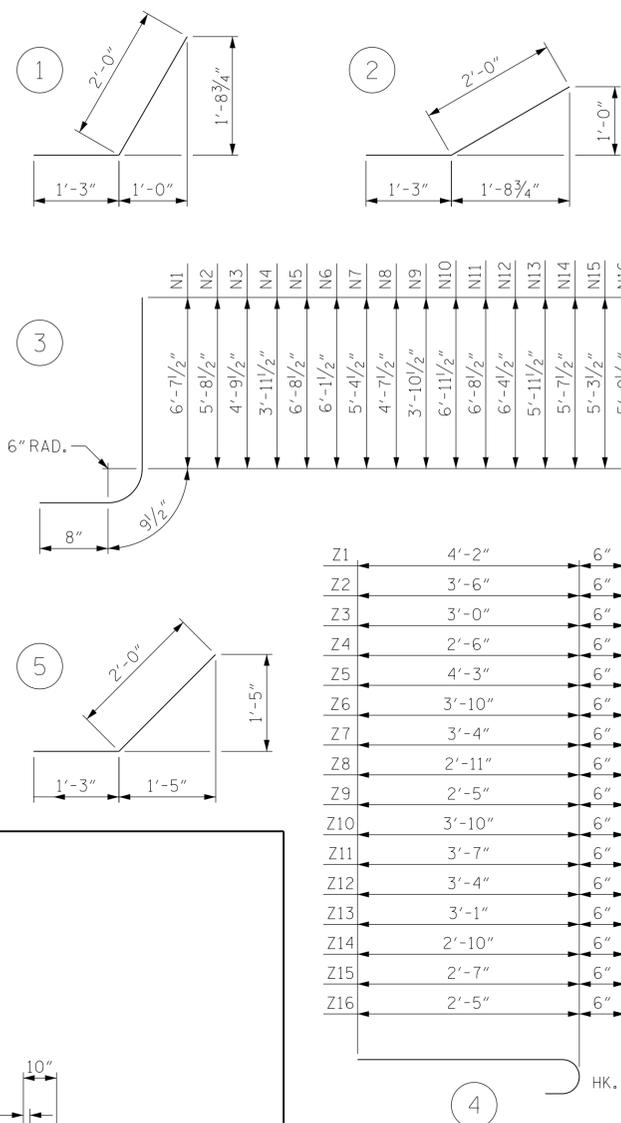


ELEVATION W3

ASSEMBLED BY : C. POWELL DATE : 12/2012
 CHECKED BY : M. WINTERS DATE : 04/2013
 DESIGN ENGINEER OF RECORD : M. WINTERS DATE :
 DRAWN BY : CCJ 11/99
 CHECKED BY : RWW 03/00

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



Z1	4'-2"	6"
Z2	3'-6"	6"
Z3	3'-0"	6"
Z4	2'-6"	6"
Z5	4'-3"	6"
Z6	3'-10"	6"
Z7	3'-4"	6"
Z8	2'-11"	6"
Z9	2'-5"	6"
Z10	3'-10"	6"
Z11	3'-7"	6"
Z12	3'-4"	6"
Z13	3'-1"	6"
Z14	2'-10"	6"
Z15	2'-7"	6"
Z16	2'-5"	6"

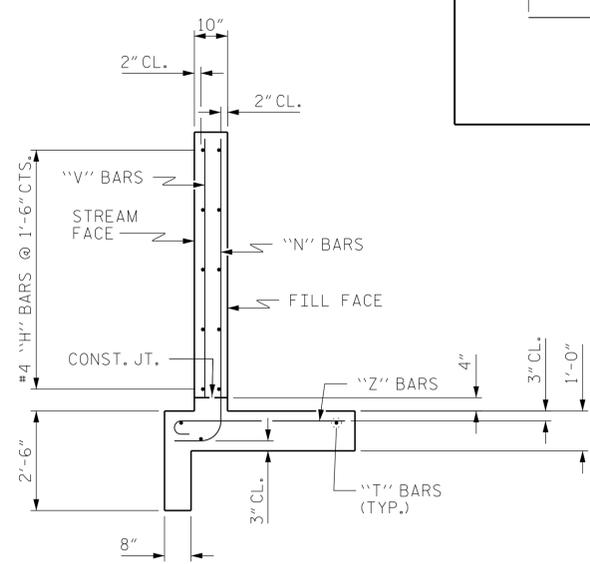
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	5'-10"	47	V1	4	#4	STR	6'-1"	16
H2	4	#4	STR	2'-9"	7	V2	6	#4	STR	5'-1"	20
H3	20	#4	1	3'-3"	43	V3	4	#4	STR	4'-2"	11
H4	4	#4	STR	6'-5"	17	V4	4	#4	STR	3'-4"	9
H5	6	#4	STR	11'-10"	47	V5	3	#4	STR	6'-2"	12
H6	2	#4	STR	6'-3"	8	V6	3	#4	STR	5'-6"	11
H7	10	#4	2	3'-3"	22	V7	3	#4	STR	4'-9"	10
H8	2	#4	STR	12'-2"	16	V8	3	#4	STR	4'-0"	8
H9	6	#4	STR	16'-10"	67	V9	3	#4	STR	3'-3"	7
H10	2	#4	STR	5'-1"	7	V10	3	#4	STR	6'-4"	13
H11	10	#4	5	3'-3"	22	V11	3	#4	STR	6'-1"	12
H12	2	#4	STR	16'-11"	23	V12	3	#4	STR	5'-9"	12
						V13	3	#4	STR	5'-4"	11
						V14	3	#4	STR	5'-0"	10
						V15	3	#4	STR	4'-8"	9
						V16	2	#4	STR	4'-5"	6
N1	4	#4	3	8'-1"	22	Z1	4	#4	4	4'-8"	12
N2	6	#4	3	7'-2"	29	Z2	6	#4	4	4'-0"	16
N3	4	#4	3	6'-3"	17	Z3	4	#4	4	3'-6"	9
N4	4	#4	3	5'-5"	14	Z4	4	#4	4	3'-0"	8
N5	3	#4	3	8'-2"	16	Z5	3	#4	4	4'-9"	10
N6	3	#4	3	7'-7"	15	Z6	3	#4	4	4'-4"	9
N7	3	#4	3	6'-10"	14	Z7	3	#4	4	3'-10"	8
N8	3	#4	3	6'-1"	12	Z8	3	#4	4	3'-5"	7
N9	3	#4	3	5'-4"	11	Z9	3	#4	4	2'-11"	6
N10	3	#4	3	8'-5"	17	Z10	3	#4	4	4'-4"	9
N11	3	#4	3	8'-2"	16	Z11	6	#4	4	4'-1"	8
N12	3	#4	3	7'-10"	16	Z12	3	#4	4	3'-10"	8
N13	3	#4	3	7'-5"	15	Z13	3	#4	4	3'-7"	7
N14	3	#4	3	7'-1"	14	Z14	3	#4	4	3'-4"	7
N15	3	#4	3	6'-9"	14	Z15	3	#4	4	3'-1"	6
N16	2	#4	3	6'-6"	9	Z16	2	#4	4	2'-11"	4
T1	6	#5	STR	7'-9"	48						
T2	3	#5	STR	13'-9"	43						
T3	3	#5	STR	18'-9"	59						

REINFORCING STEEL FOR 4 WINGS 1,038 LBS

CLASS A CONCRETE

4 WINGS	16.3	CY
2 HEADWALLS	1.5	CY
2 END CURTAIN WALLS	1.4	CY
2 SILLS	1.3	CY
4 BAFFLES	2.2	CY
TOTAL	22.7	CY



TYPICAL WING SECTION

PROJECT NO. 17BP.14.R.51
 TRANSYLVANIA COUNTY
 STATION: 13+11.08 -L-
 SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 6'-0" SLOPE = 2:1
 60° OR 120° SKEW

REVISIONS		NO.		DATE		BY	
1	BY:	3	NO.	DATE:	4	BY:	DATE:
2							

SHEET NO. C-6
 TOTAL SHEETS 6

moffatt & nichol
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