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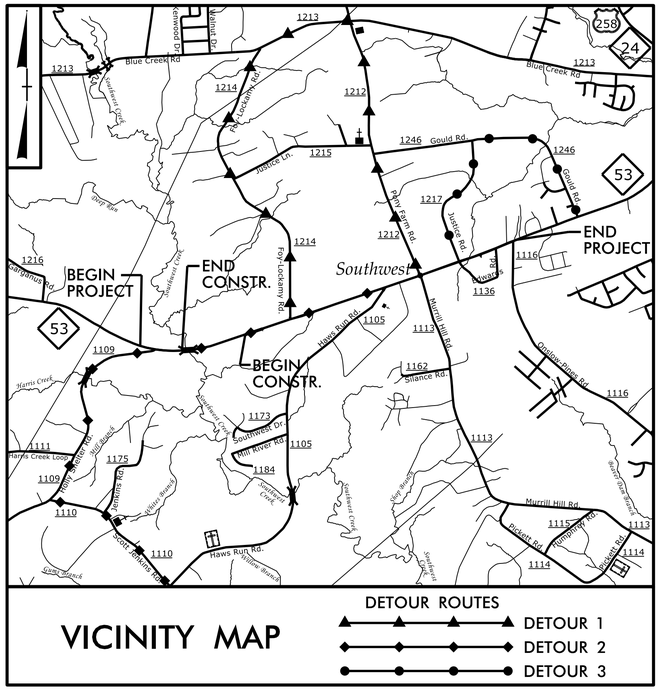
CONTRACT: C202176 TIP PROJECT: R-5023B, R-5023C, SF-4903F



VICINITY MAP

DETOUR ROUTES
DETOUR 1
DETOUR 2
DETOUR 3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

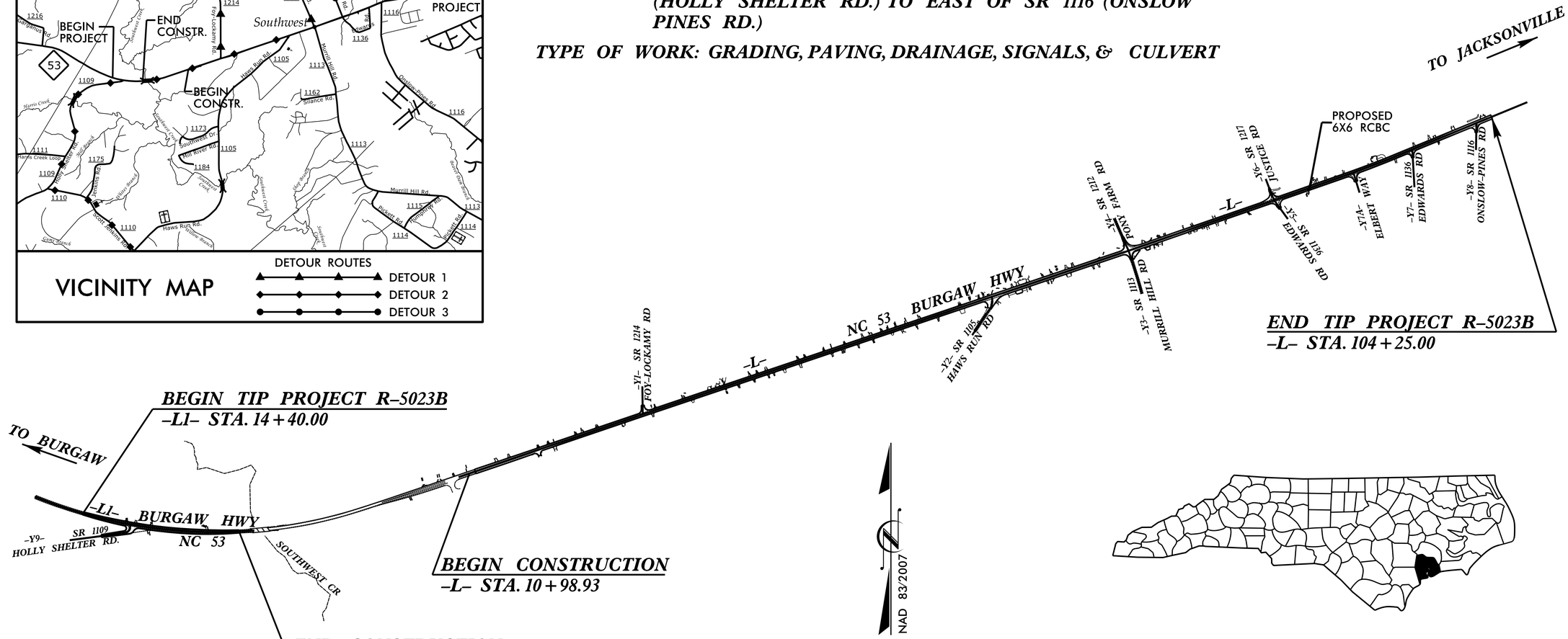
ONSLOW COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5023B, R-5023C SF-4903F		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41922.1.1		R-5023B/C (P.E.)
43463.1.1	HRRR-0053(11)	SF-4903F (P.E.)
41922.2.2	STP-0053(9)	R-5023B (R/W/UTIL)
43463.2.1	HRRR-0053(11)	SF-4903F (R/W/UTIL)
41922.3.4	STP-0053(9)	R-5023B/C & SF-4903F (CONST.)

LOCATION: *NC 53 (BURGAW HIGHWAY) FROM WEST OF SR 1109 (HOLLY SHELTER RD.) TO EAST OF SR 1116 (ONSLOW PINES RD.)*

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



STRUCTURE

DESIGN DATA

ADT 2014 = 12,000
V = 60 MPH FOR -L1-
V = 50 MPH FOR -L-

FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5023B = 2.024 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

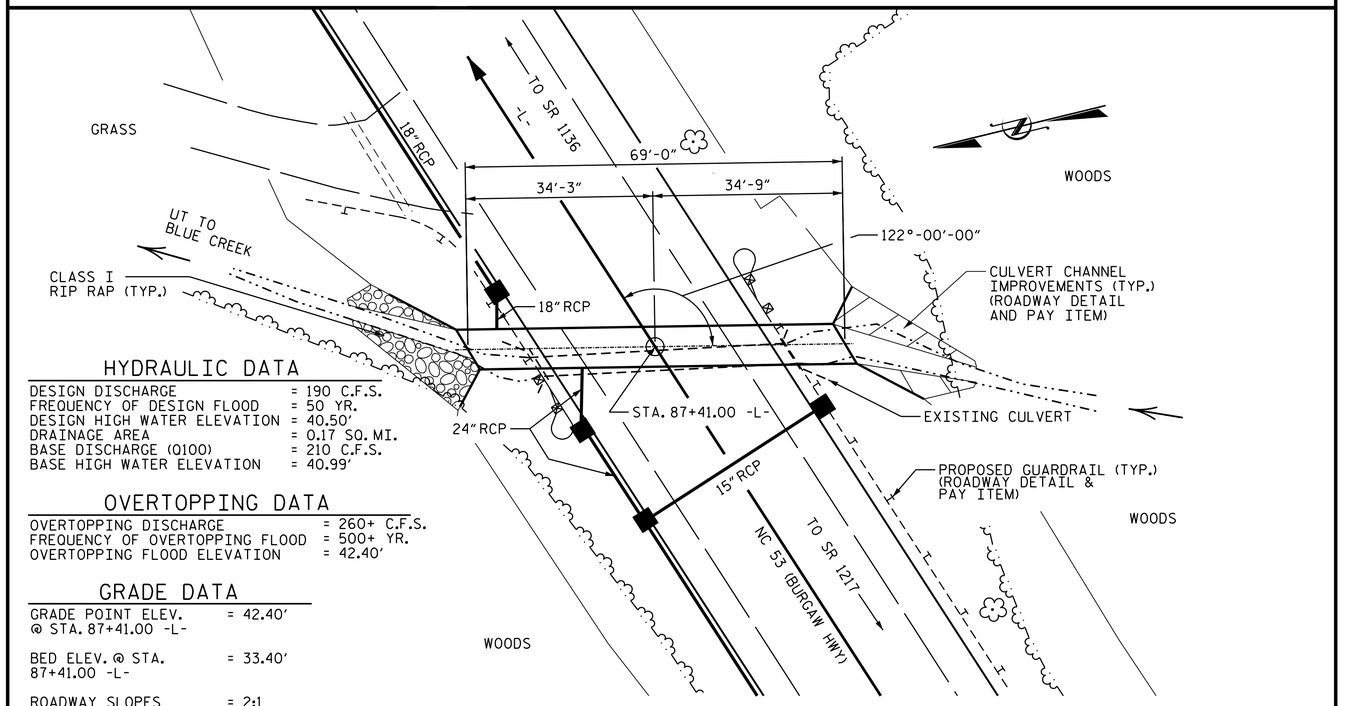
2012 STANDARD SPECIFICATIONS

LETTING DATE:
JANUARY 17, 2017

09-AUG-2016 08:00
R:\Structures\Final Plans\R5023B_SD_CU.dgn
kpaschal

F.A. PROJECT NO. STP-0053(9)

BASELINE MARKER "BL-10", 19.01' RIGHT OF STA. 87+50.97 -L- EL. 40.85 NAVD 88



HYDRAULIC DATA

DESIGN DISCHARGE	= 190 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YR.
DESIGN HIGH WATER ELEVATION	= 40.50'
DRAINAGE AREA	= 0.17 SQ. MI.
BASE DISCHARGE (Q100)	= 210 C.F.S.
BASE HIGH WATER ELEVATION	= 40.99'

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 260+ C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YR.
OVERTOPPING FLOOD ELEVATION	= 42.40'

GRADE DATA

GRADE POINT ELEV. @ STA. 87+41.00 -L-	= 42.40'
BED ELEV. @ STA. 87+41.00 -L-	= 33.40'
ROADWAY SLOPES	= 2:1

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

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

DESIGN FILL---------- 2.47'

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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 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 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.

THE 18"& 24"DIA. PIPE THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT OR CUT AS NECESSARY TO CLEAR PIPE.

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 DIVERSIONS DETAILS AND PAY ITEMS, SEE EROSION CONTROL PLANS.

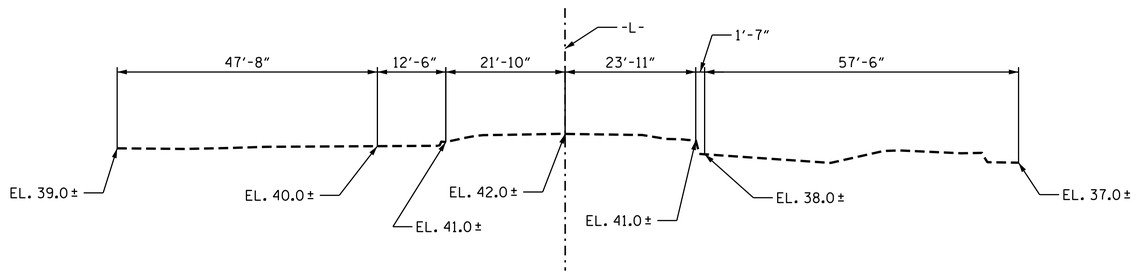
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 0.663 CY/FT	45.7	C.Y.
WINGS ETC.	16.0	C.Y.
TOTAL	61.7	C.Y.
REINFORCING STEEL		
BARREL	5,687	LBS.
WINGS ETC.	926	LBS.
TOTAL	6,613	LBS.
FOUNDATION COND. MAT'L.	55.0	TONS
CULVERT EXCAVATION ----------	LUMP SUM	

PROJECT NO. R-5023B

ONSLOW COUNTY

STATION: 87+41.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
SINGLE 6 FT. X 6 FT.
CONCRETE BOX CULVERT
122° SKEW

AUGUST 1989

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

STD. NO. CB331A

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

8/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : P. N. HOLDER DATE : 10/15
CHECKED BY : A.K.PATEL DATE : 10/15
DESIGN ENGINEER OF RECORD: P.N.HOLDER DATE : 10/15

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

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.08	--	1.75	1.08	1	TOP SLAB	3.33	1.34	1	TOP SLAB	0.81	
		HL-93 (OPERATING)	N/A		1.41	--	1.35	1.41	1	TOP SLAB	3.33	1.73	1	TOP SLAB	0.81	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.08	39.05	1.75	1.08	1	TOP SLAB	3.33	1.34	1	TOP SLAB	0.81	
		HS-20 (OPERATING)	36.000		1.41	50.63	1.35	1.41	1	TOP SLAB	3.33	1.73	1	TOP SLAB	0.81	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.98	26.68	1.40	1.98	1	TOP SLAB	3.33	2.43	1	TOP SLAB	0.81	
		SNGARBS2	20.000		1.85	36.98	1.40	1.85	1	TOP SLAB	3.33	2.28	1	TOP SLAB	0.81	
		SNAGRIS2	22.000		1.98	43.47	1.40	1.98	1	TOP SLAB	3.33	2.43	1	TOP SLAB	0.81	
		SNCOTTS3	27.250	⟨3⟩	1.61	43.91	1.40	1.61	1	TOP SLAB	3.50	1.82	1	BOTTOM SLAB	5.85	
		SNAGGRS4	34.925		2.12	74.00	1.40	2.12	1	TOP SLAB	3.50	2.39	1	BOTTOM SLAB	0.81	
		SNS5A	35.550		1.92	68.16	1.40	1.92	1	TOP SLAB	3.50	2.16	1	BOTTOM SLAB	0.81	
		SNS6A	39.950		1.92	76.60	1.40	1.92	1	TOP SLAB	3.50	2.16	1	BOTTOM SLAB	0.81	
		SNS7B	42.000		1.92	80.53	1.40	1.92	1	TOP SLAB	3.50	2.16	1	BOTTOM SLAB	0.81	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.98	65.21	1.40	1.98	1	TOP SLAB	3.33	2.43	1	TOP SLAB	0.81	
		TNT4A	33.075		1.92	63.42	1.40	1.92	1	TOP SLAB	3.50	2.16	1	BOTTOM SLAB	5.85	
		TNT6A	41.600		1.92	79.78	1.40	1.92	1	TOP SLAB	3.17	2.17	1	BOTTOM SLAB	0.81	
		TNT7A	42.000		1.92	80.54	1.40	1.92	1	TOP SLAB	3.17	2.17	1	BOTTOM SLAB	0.81	
		TNT7B	42.000		1.92	80.53	1.40	1.92	1	TOP SLAB	3.50	2.16	1	BOTTOM SLAB	5.85	
		TNAGRIT4	43.000		1.83	78.82	1.40	1.83	1	TOP SLAB	3.50	2.07	1	BOTTOM SLAB	5.85	
		TNAGT5A	45.000		1.84	82.95	1.40	1.84	1	TOP SLAB	3.50	2.11	1	BOTTOM SLAB	5.85	
		TNAGT5B	45.000		1.92	86.30	1.40	1.92	1	TOP SLAB	3.17	2.16	1	BOTTOM SLAB	5.85	

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.

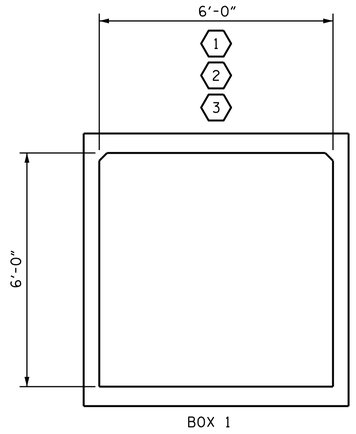
⟨#⟩ CONTROLLING LOAD RATING

⟨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)

ASSEMBLED BY :	P.N.HOLDER	DATE : 10/15
CHECKED BY :	A.K.PATEL	DATE : 10/15
DESIGN ENGINEER OF RECORD :	P.N.HOLDER	DATE : 10/15

09-AUG-2016 08:00
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kpaschal

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NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

8/9/2016

PROJECT NO. R-5023B

ONSLOW COUNTY

STATION: 87+41.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

STD. NO. LRFR5

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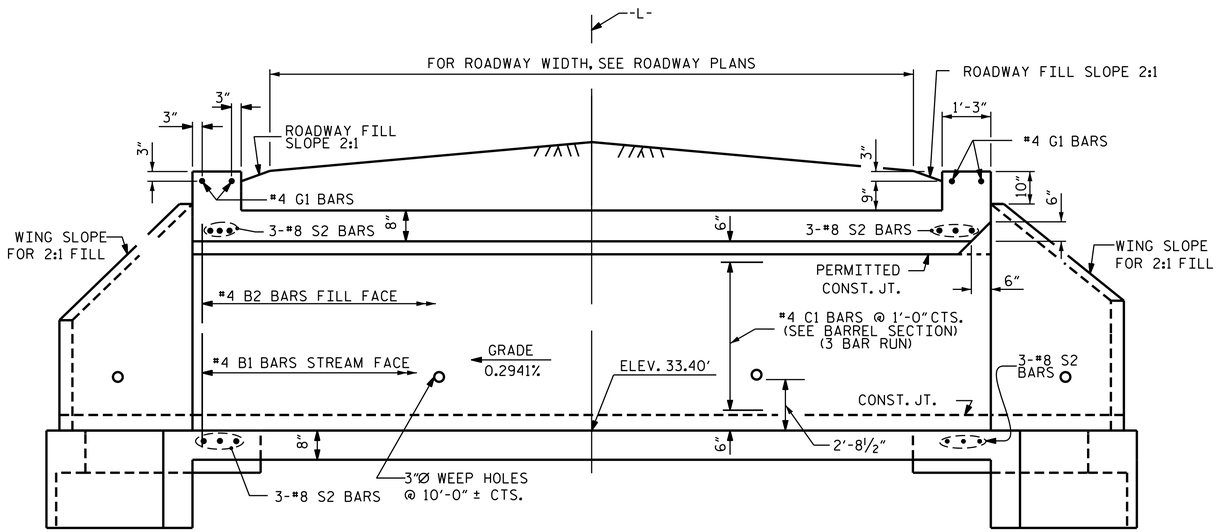
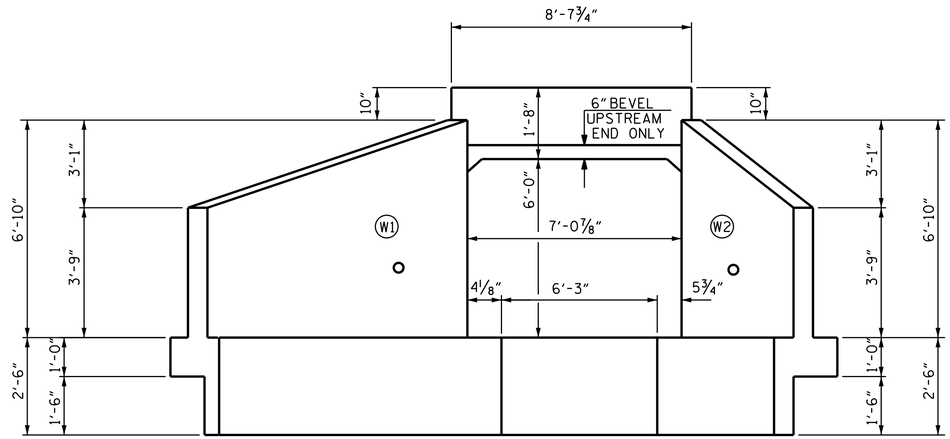
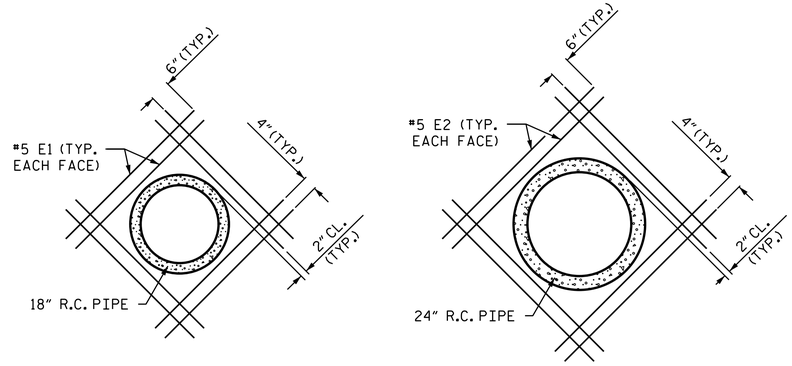


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW



DETAIL OF REINFORCING AROUND 18" OR 24" Ø PIPE

PROJECT NO. R-5023B
ONSLOW COUNTY
STATION: 87+41.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

SINGLE 6 FT. X 6 FT. CONCRETE BOX CULVERT 122° SKEW

1971

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

STD. NO. CB331

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...

8/9/2016

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ASSEMBLED BY : P. N. HOLDER DATE : 10/15
CHECKED BY : A.K.PATEL DATE : 10/15
DESIGN ENGINEER OF RECORD : P.N.HOLDER DATE : 10/15

REVISED 8-28-92 BY E.L.R. CHECKED BY G.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.

09-AUG-2016 08:00
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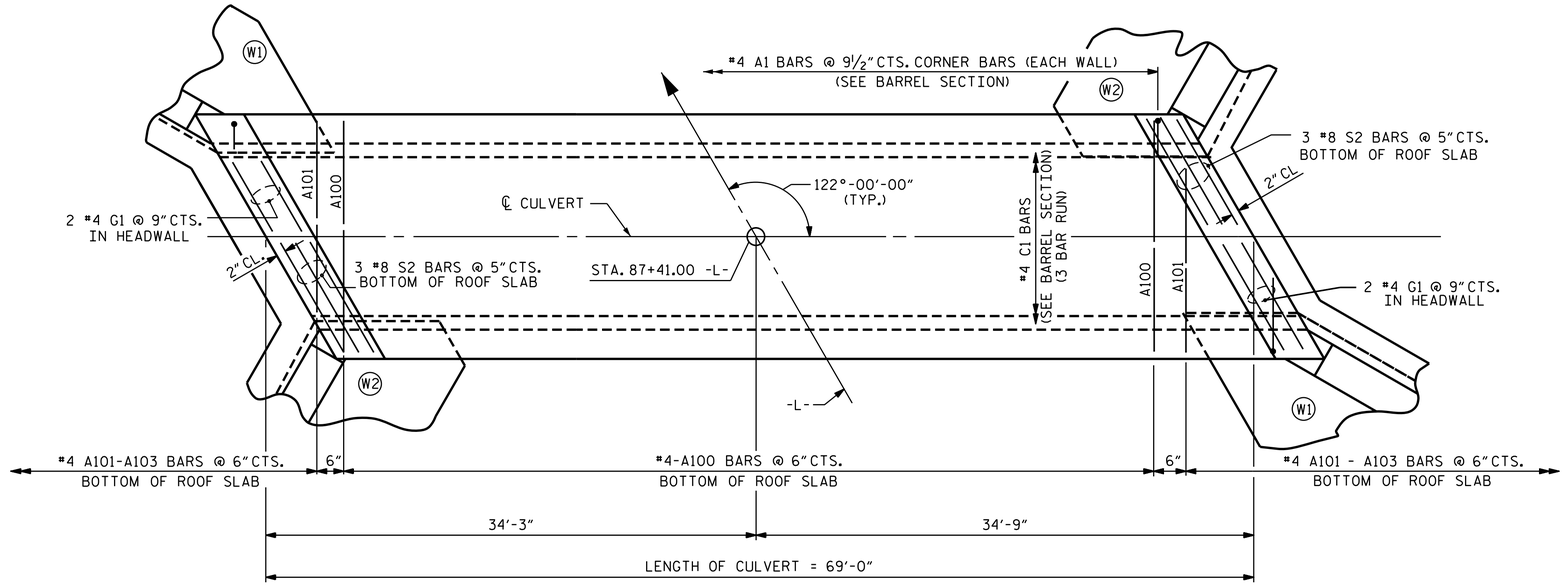
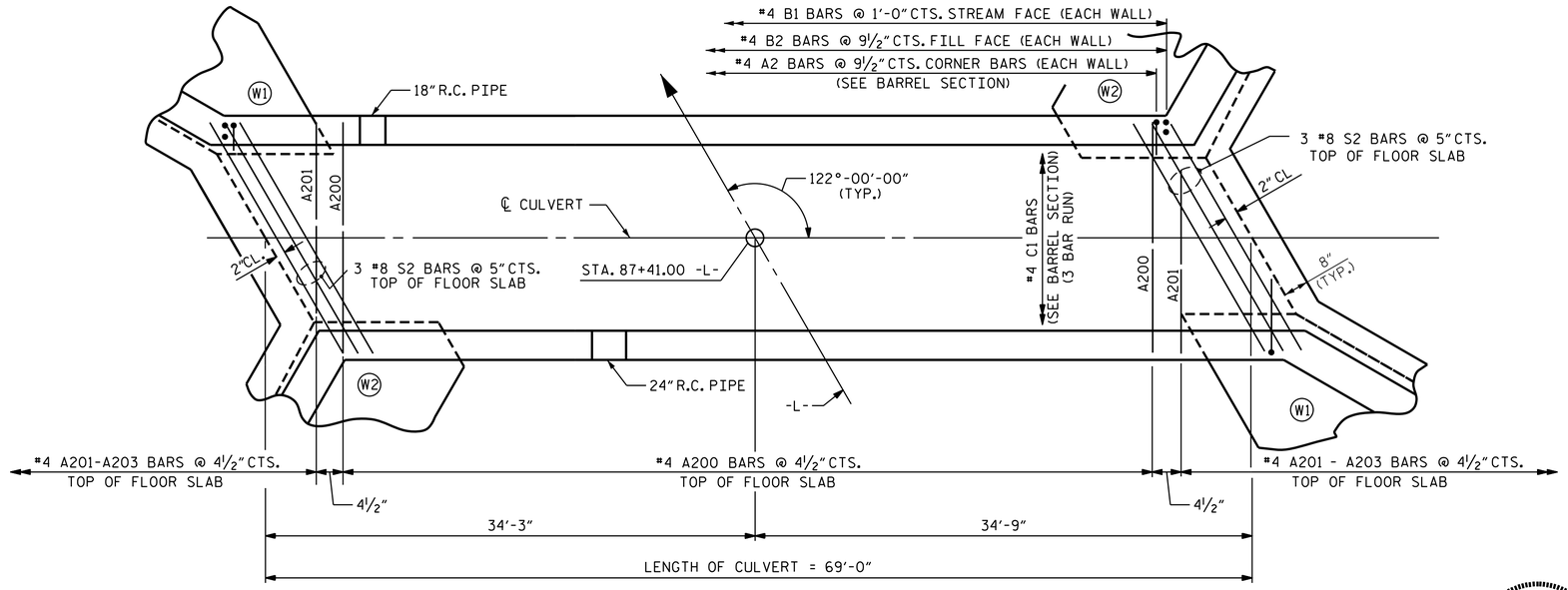
kpaschal



PLAN - ROOF SLAB



PLAN - FLOOR SLAB

REVISED 8-28-92 BY E.L.R. CHECKED BY G.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 : P. N. HOLDER DATE : 10/15
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DESIGN ENGINEER OF RECORD : P. N. HOLDER DATE : 10/15

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8/9/2016

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by:
A. Keith Paschal
F8B6AD6DB2FC48F...

PROJECT NO. R-5023B
ONSLOW COUNTY
STATION: 87+41.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD

SINGLE 6 FT. X 6 FT. CONCRETE BOX CULVERT 122° SKEW

1971

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

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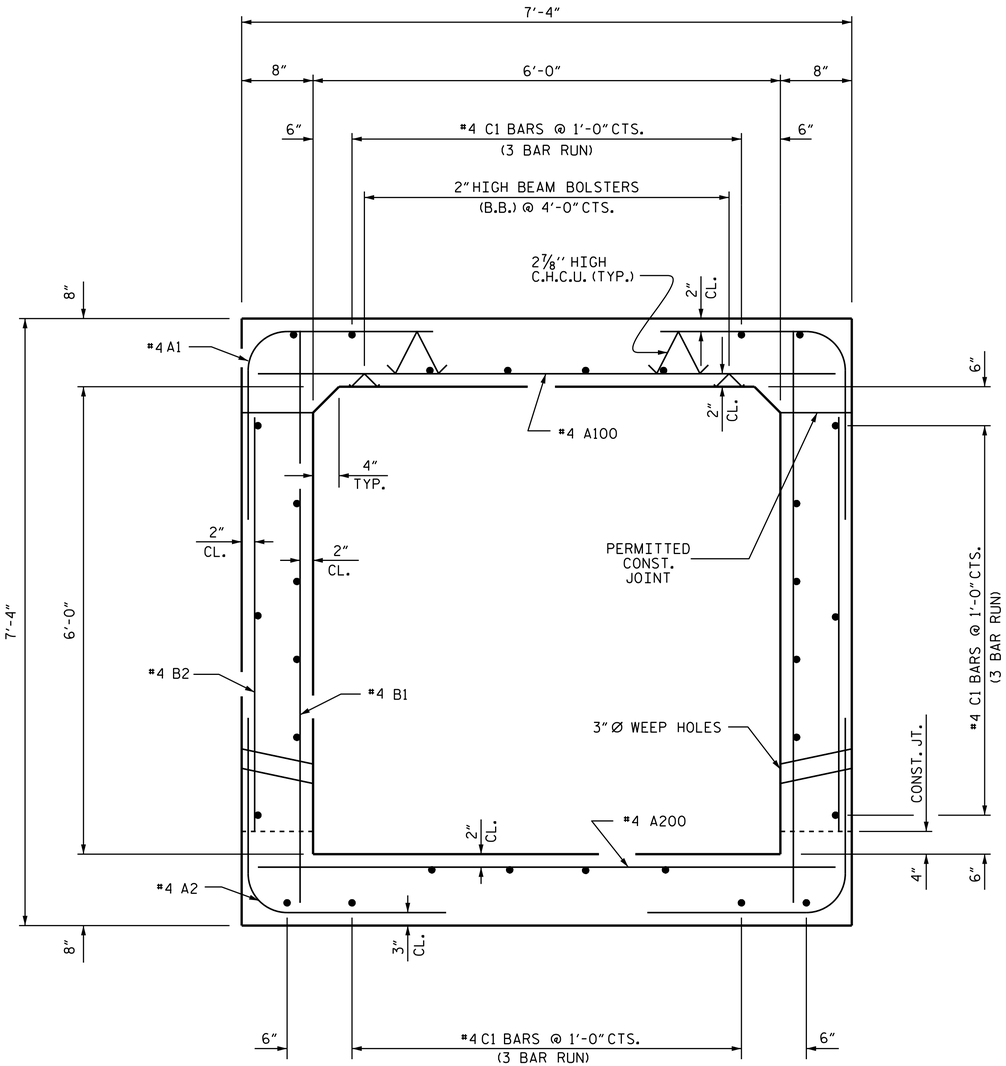
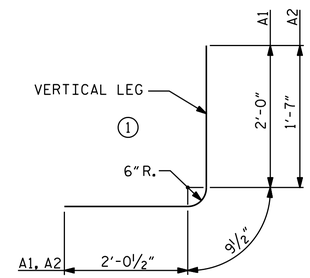


RIGHT ANGLE SECTION OF BARREL

THERE ARE 30 "C" BARS IN SECTION OF BARREL

BAR TYPE



DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
B1	#4	1'-5''
C1	#4	1'-11''

BILL OF MATERIAL

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A100	129	#4	STR	7'-0"	603
A101	4	#4	STR	5'-7"	15
A102	4	#4	STR	3'-11"	10
A103	4	#4	STR	2'-4"	6
A200	172	#4	STR	7'-0"	804
A201	6	#4	STR	5'-3"	21
A202	6	#4	STR	3'-6"	14
A203	6	#4	STR	1'-8"	7
A1	174	#4	1	4'-10"	562
A2	174	#4	1	4'-5"	513
B1	138	#4	STR	6'-10"	630
B2	174	#4	STR	5'-4"	620
C1	90	#4	STR	24'-2"	1453
E1	16	#5	STR	4'-0"	67
E2	16	#5	STR	4'-7"	76
G1	4	#4	STR	8'-3"	22
S2	12	#8	STR	8'-3"	264

TOTAL REINFORCING STEEL 5687 LBS

REVISED 8-28-92 BY E.L.R. CHECKED BY G.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 : P. N. HOLDER DATE : 10/15
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DESIGN ENGINEER OF RECORD : P.N.HOLDER DATE : 10/15

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8/9/2016

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by:
A. Keith Paschal
F8B6AD6DB2FC48F...

PROJECT NO. R-5023B
ONSLOW COUNTY
STATION: 87+41.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
SINGLE 6 FT. X 6 FT. CONCRETE BOX CULVERT 122° SKEW

1971

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			6

STD. NO. CB331

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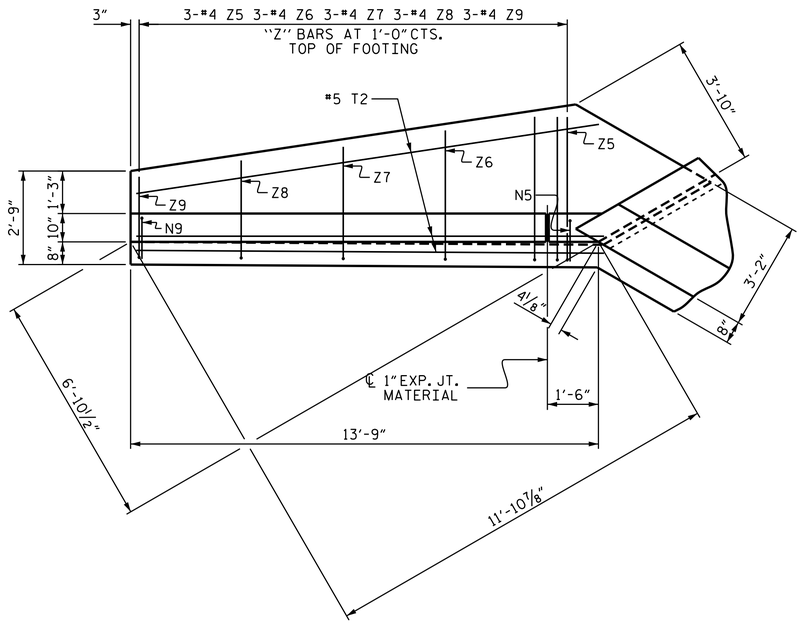
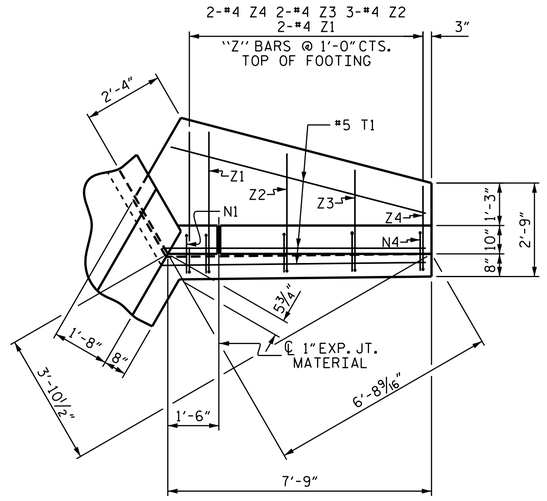
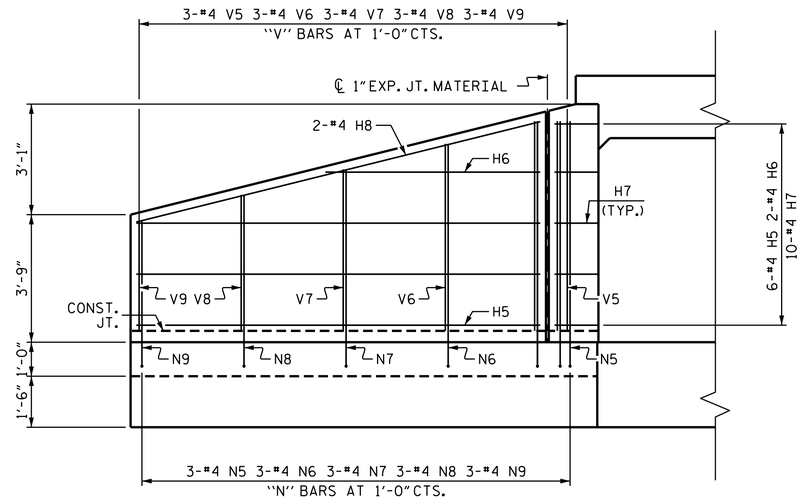


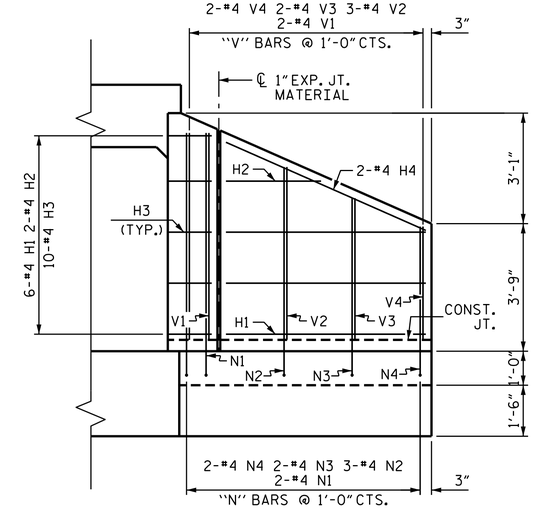
PLAN W1



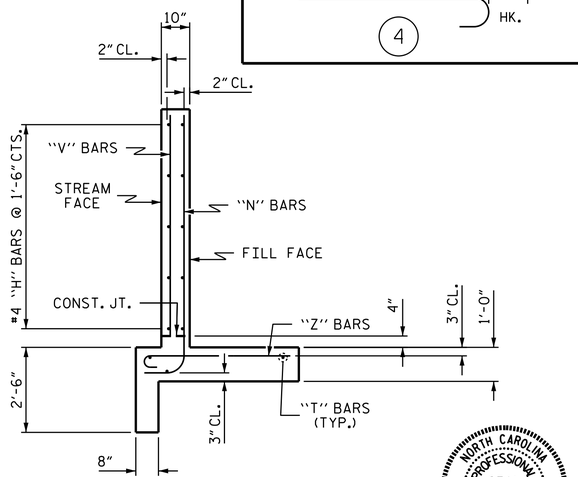
PLAN W2



ELEVATION W1



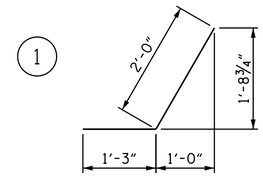
ELEVATION W2

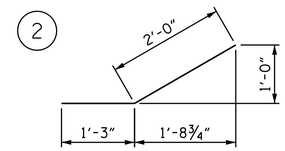


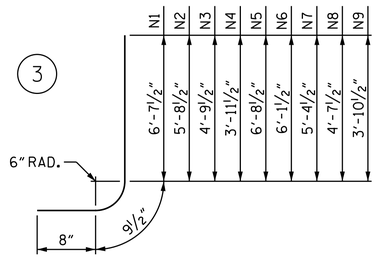
TYPICAL WING SECTION

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"

HK.

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BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	5'-10"	47
H2	4	#4	STR	2'-9"	7
H3	20	#4	1	3'-3"	43
H4	4	#4	STR	6'-5"	17
H5	12	#4	STR	11'-10"	95
H6	4	#4	STR	6'-3"	17
H7	20	#4	2	3'-3"	43
H8	4	#4	STR	12'-2"	33
N1	4	#4	3	8'-1"	22
N2	6	#4	3	7'-2"	29
N3	4	#4	3	6'-3"	17
N4	4	#4	3	5'-5"	14
N5	6	#4	3	8'-2"	33
N6	6	#4	3	7'-7"	30
N7	6	#4	3	6'-10"	27
N8	6	#4	3	6'-1"	24
N9	6	#4	3	5'-4"	21
T1	6	#5	STR	7'-9"	48
T2	6	#5	STR	13'-9"	86
V1	4	#4	STR	6'-1"	16
V2	6	#4	STR	5'-1"	20
V3	4	#4	STR	4'-2"	11
V4	4	#4	STR	3'-4"	9
V5	6	#4	STR	6'-2"	25
V6	6	#4	STR	5'-6"	22
V7	6	#4	STR	4'-9"	19
V8	6	#4	STR	4'-0"	16
V9	6	#4	STR	3'-3"	13
Z1	4	#4	4	4'-8"	12
Z2	6	#4	4	4'-0"	16
Z3	4	#4	4	3'-6"	9
Z4	4	#4	4	3'-0"	8
Z5	6	#4	4	4'-9"	19
Z6	6	#4	4	4'-4"	17
Z7	6	#4	4	3'-10"	15
Z8	6	#4	4	3'-5"	14
Z9	6	#4	4	2'-11"	12

REINFORCING STEEL FOR 4 WINGS	926 LBS
CLASS A CONCRETE	
4 WINGS	14.4 CY
2 HEADWALLS	0.8 CY
2 END CURTAIN WALLS	0.8 CY
TOTAL	16.0 CY

PROJECT NO. R-5023B

ONSLOW COUNTY

STATION: 87+41.00 -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

122° SKEW

ASSEMBLED BY : P. N. HOLDER	DATE : 10/15				
CHECKED BY : A.K.PATEL	DATE : 10/15				
DRAWN BY : CCJ 11/99					
CHECKED BY : RWW 03/00					

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

SHEET NO. C-6

TOTAL SHEETS 6

DocuSigned by:
A. Keith Paschal
F8B6AD6DB2FC48F...

8/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STD. NO. CW6006

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 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

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM

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kpaschal