



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

MEMORANDUM TO: Project Engineers
Project Design Engineers

FROM: G. R. Perfetti, P. E.
State Structures Management Engineer

DATE: July 8, 2011 (Rev. May 22, 2014 & June 20, 2014)

SUBJECT: AS-BUILT PLAN CERTIFICATION FOR FEMA-REGULATED
STREAM CROSSINGS

At the request of the Hydraulics Unit, for bridge projects involving FEMA-regulated stream crossings, reserve an area on the first sheet of the General Drawing for a Professional Engineer's seal and place the following note above the area:

I hereby certify these plans are the as-built plans.

For culvert projects involving FEMA-regulated stream crossings, reserve an area for a Professional Engineer's seal on the sheet(s) that include the following:

- the location sketch
- the profile along the centerline of the culvert
- the culvert section normal to the roadway
- the end elevation of the culvert

Place the following note above the area:

I hereby certify these plans are the as-built plans.

Refer to the Project Commitments sheets ("green sheets") in the Planning Document or the Bridge/Culvert Survey Report to determine if the proposed structure involves a FEMA-regulated stream. The as-built plans for FEMA-regulated stream crossings will be sealed by the Resident Engineer or the appropriate Division personnel administering the contract.

Attached are three examples of the reserved area for as-built plan certification for your reference.

This policy is effective with the August 2014 letting.

GRP/TMG/kaw

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
STRUCTURES MANAGEMENT UNIT
1581 MAIL SERVICE CENTER
RALEIGH NC 27699-1581

TELEPHONE: 919-707-6400
FAX: 919-250-4082

WEBSITE: WWW.NCDOT.ORG

LOCATION:
CENTURY CENTER COMPLEX
BUILDING A
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Project Engineers
Page 2
Rev June 20, 2014

Attachments

Cc: T. K. Koch, P. E.
B. C. Hanks, P. E.
E. B. Nelson, P. E.
H. A. Black, P. E.
D. S. Chang, P. E.
R. A. Hancock, P. E.; Attn: K. G. Bowen, P. E.
Director of the Transportation Program Management Unit
E. E. Dubin, P. E., FHWA
Division Bridge Program Managers

117+60

117+80

118+00

118+20

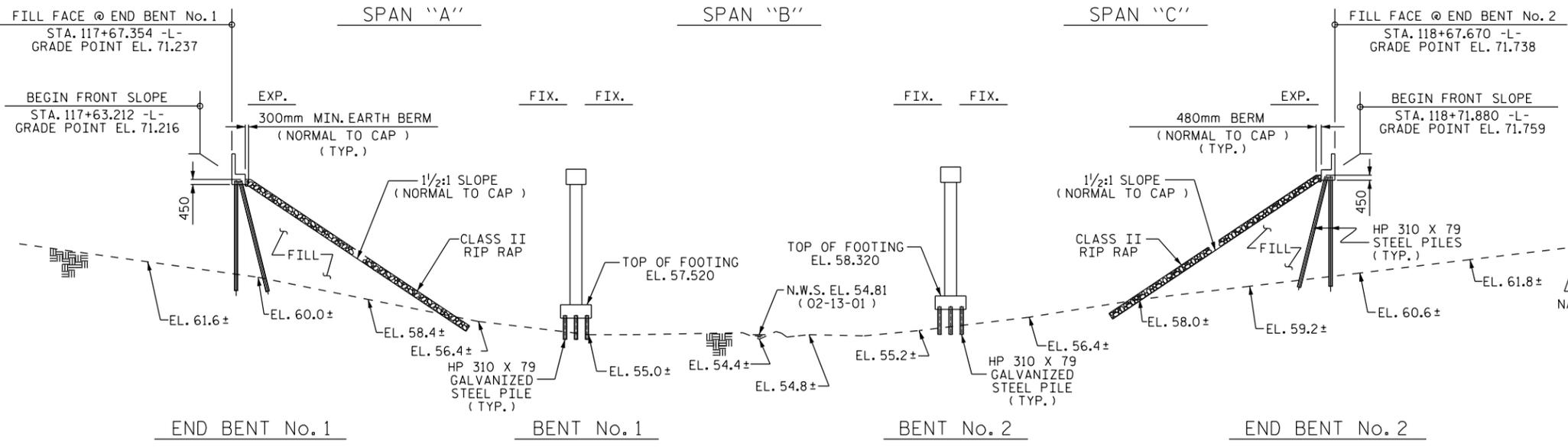
118+40

118+60

118+80

119+00

72
68
64
60
56
52



-0.5000% Δ +0.5000%
 PI = 114+30.000 -L-
 EL. = 69.550
 VC = 100m
 GRADE DATA -L-

HORIZONTAL CURVE DATA -L-
 PI STA. = 116+37.531 -L-
 Δ = 90°-06'-47.2" (RT.)
 L = 1100.939m
 T = 701.383m
 R = 700.000m

HYDRAULIC DATA

DESIGN DISCHARGE----- 21.7 m³/s
 FREQUENCY OF DESIGN FLOOD----- 50 YR.
 DESIGN HIGH WATER ELEVATION----- 56.59
 DRAINAGE AREA----- 156 Ha
 BASE DISCHARGE (0100)----- 25.0 m³/s
 BASE HIGH WATER ELEVATION----- 56.65

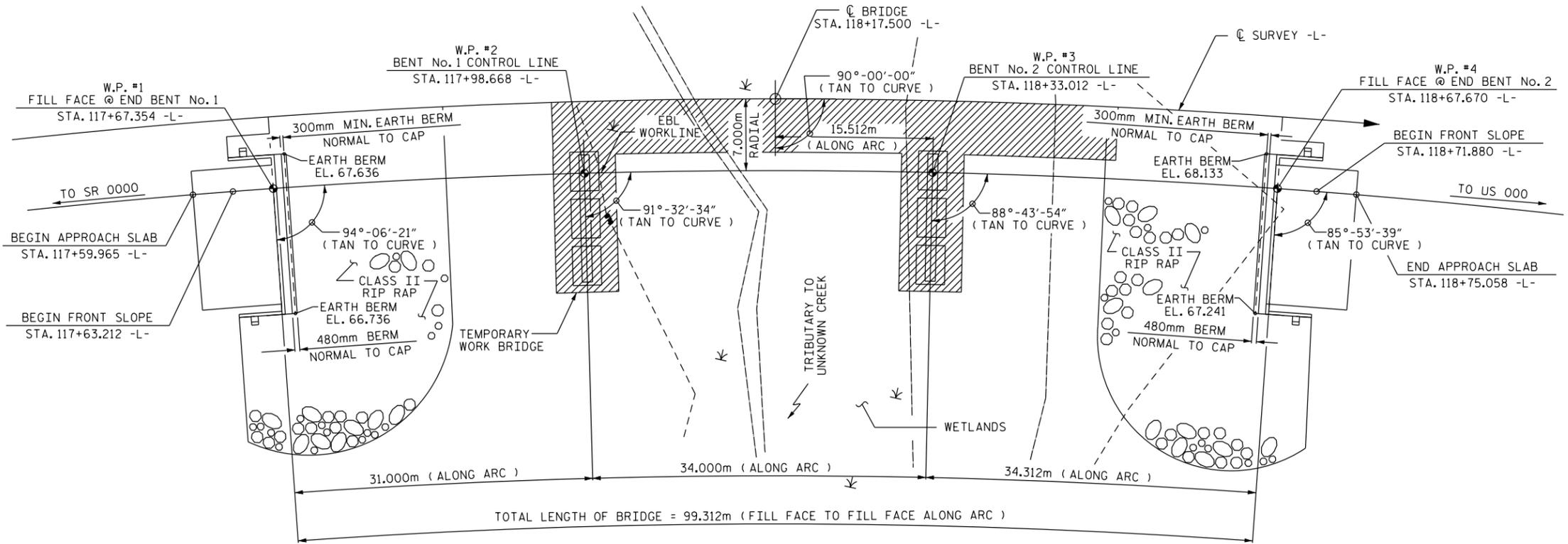
OVERTOPPING FLOOD DATA
 OVERTOPPING DISCHARGE----- 39.0 m³/s
 FREQUENCY OF OVERTOPPING FLOOD----- 500+ YRS.
 OVERTOPPING FLOOD ELEVATION----- 70.30
 OVERTOPPING ROADWAY STA. 114+30.00 -L-

SECTION ALONG EBL WORKLINE

(SECTIONS @ BENTS & END BENTS ARE AT RIGHT ANGLES)
 (FOR CLARITY, TEMPORARY WORK BRIDGE NOT SHOWN)



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROJECT NO. _____
 _____ COUNTY
 STATION: _____
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

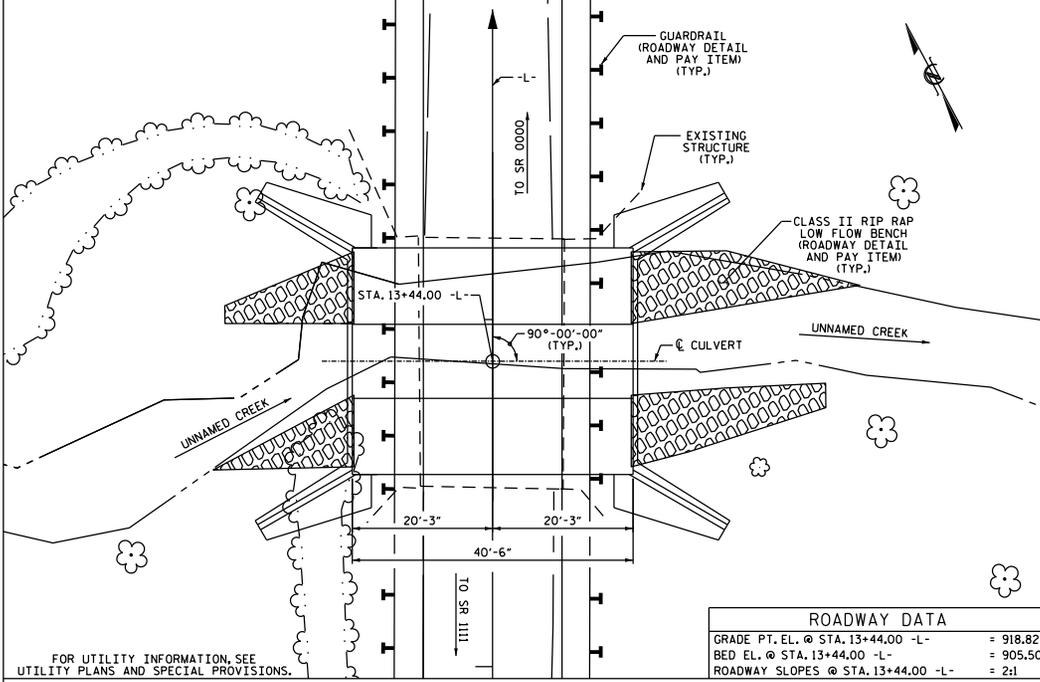
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			
2			4			

DRAWN BY : _____ DATE : _____
 CHECKED BY : _____ DATE : _____

*****SYSTEM*****
 *****DGN*****
 *****USERNAME*****

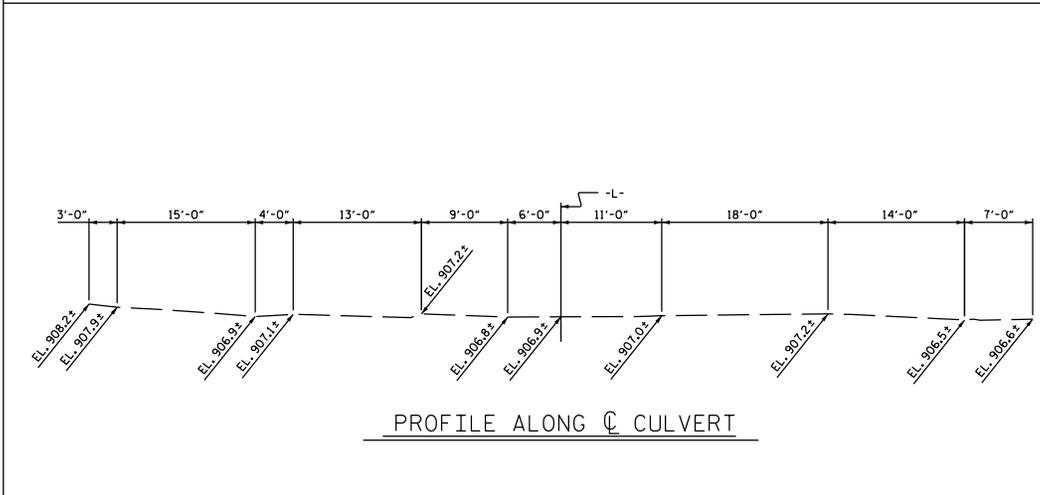


BMI R.R. SPIKE IN 18" BLACK WALNUT, 187' RT. AT STA. 9+91.00 -BL-. EL. 914.68



ROADWAY DATA	
GRADE PT. EL. @ STA. 13+44.00 -L-	= 918.82
BED EL. @ STA. 13+44.00 -L-	= 905.50
ROADWAY SLOPES @ STA. 13+44.00 -L-	= 2:1

LOCATION SKETCH



PROFILE ALONG CULVERT

ASSEMBLED BY : _____	DATE : _____	SPECIAL	DESIGN ENGINEER OF RECORD: _____
CHECKED BY : _____	DATE : _____		
DRAWN BY : _____	DATE : _____	STANDARD	DATE : _____
CHECKED BY : _____	DATE : _____		

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 DESIGN FILL = 3.45' (MAX.), 3.0' (MIN.).
 FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.
 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, FLOOR SLAB AND 4" OF THE VERTICAL WALLS FOR BARRELS 2 AND 3 IN STAGE I.
 2. THE REMAINING PORTIONS OF THE WALLS, WINGS FULL HEIGHT, AND SILLS FOR BARRELS 2 AND 3 IN STAGE I.
 3. WING FOOTINGS, FLOOR SLAB AND 4" OF THE VERTICAL WALL FOR BARREL 1 IN STAGE II.
 4. THE REMAINING PORTIONS OF THE WALL, WINGS FULL HEIGHT, AND SILLS FOR BARREL 1 IN STAGE II.
 5. THE ENTIRE 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 THE WING SHEET.
 AT THE CONTRACTOR'S OPTION, THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT MAY BE SPLICED. 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.

HYDRAULIC DATA	
DESIGN DISCHARGE	= 1183 C.F.S
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 914.5
DRAINAGE AREA	= 2.9 SQ. MI.
BASE DISCHARGE (Q100)	= 1767 C.F.S
BASE HIGH WATER ELEVATION	= 915.7
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 3000 C.F.S
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YR.
OVERTOPPING FLOOD ELEVATION	= 919.0

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	105 TONS
CLASS A CONCRETE	
STAGE I	75.0 C.Y.
STAGE II	90.8 C.Y.
TOTAL	165.8 C.Y.
REINFORCING STEEL	
STAGE I	9,149 LBS.
STAGE II	9,882 LBS.
TOTAL	19,031 LBS.
PLACEMENT OF NATURAL STREAM BED MATERIAL	LUMP SUM

F. A. PROJECT NO. XXX-XXXXX

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS AT 18'-3" WITH AN ASPHALT WEARING SURFACE ON TIMBER DECK AND I-BEAMS WITH A 19.3' CLEAR ROADWAY AND SUBSTRUCTURE OF TIMBER CAPS, PILES, AND BULKHEADS LOCATED AT 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. SEE SPECIAL PROVISIONS FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+44.00 -L-".

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 AT STATION 13+44.00 -L-".

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.

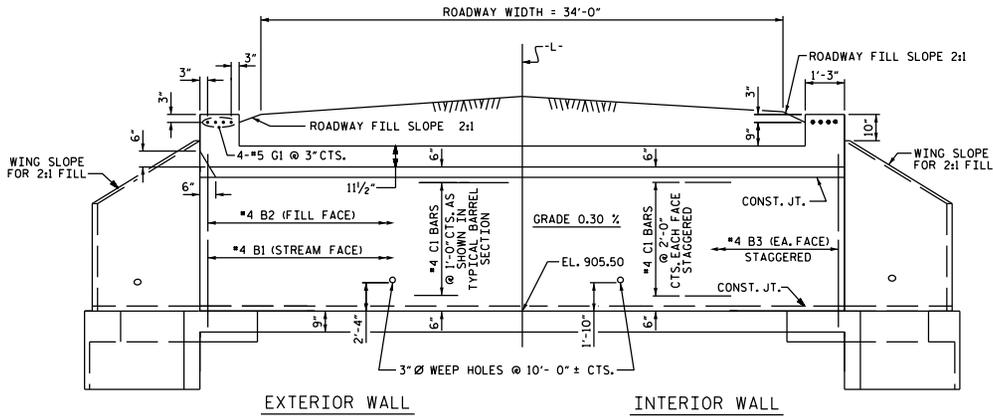
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

NATURAL STREAM BED MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN SILLS. SEE SPECIAL PROVISIONS FOR "PLACEMENT OF NATURAL STREAM BED MATERIAL".

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

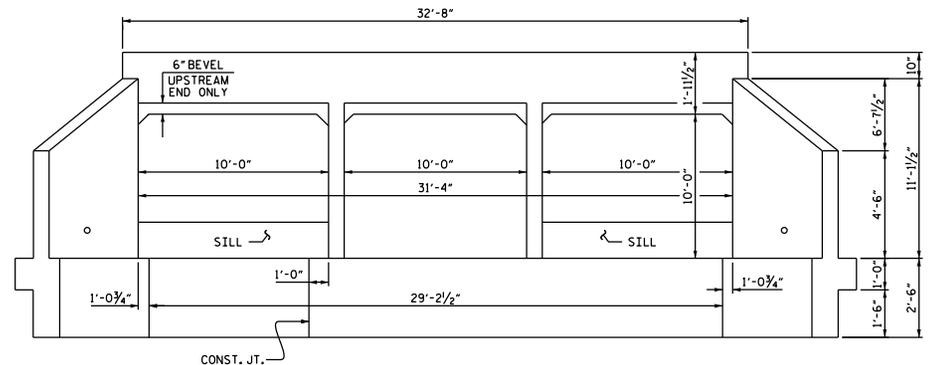
PROJECT NO. _____
 _____ COUNTY
 STATION: _____
 SHEET 1 OF 6

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
BARREL STANDARD					
TRIPLE 10 FT. X 10 FT. CONCRETE BOX CULVERT					
90° SKEW					
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	C-1
1			3		10/17/04
2			4		6



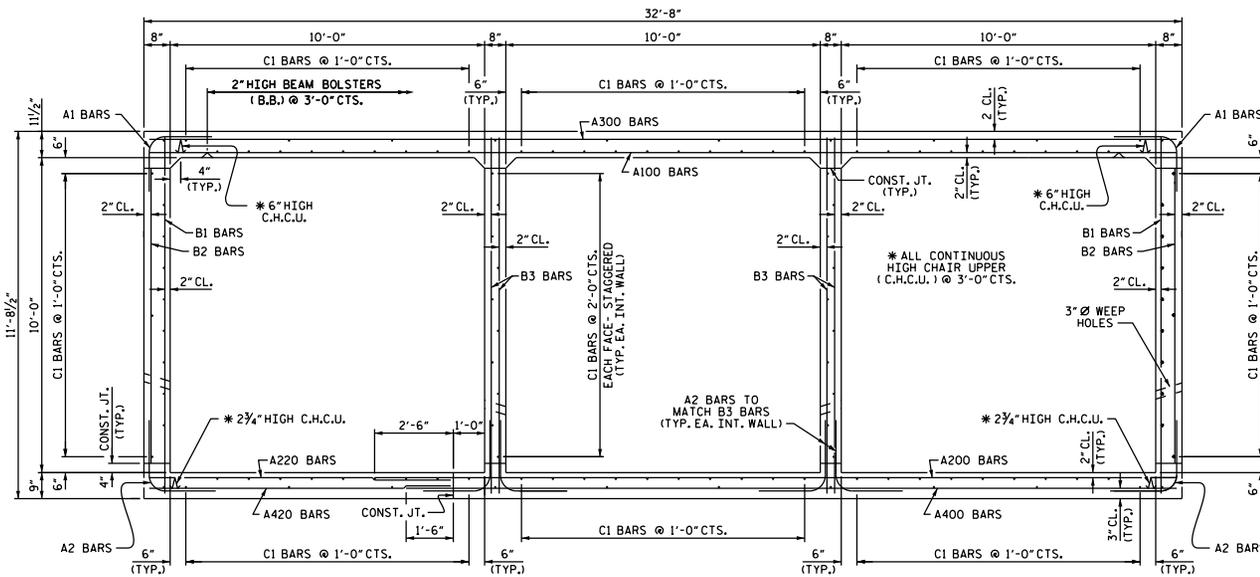
EXTERIOR WALL INTERIOR WALL

CULVERT SECTION NORMAL TO ROADWAY



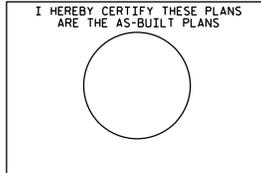
END ELEVATION

LOOKING DOWNSTREAM
FOR SILL DETAILS, SEE SHEET 4 OF 6.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 122 "C" BARS IN SECTION OF BARREL



PROJECT NO. _____

COUNTY _____

STATION: _____

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD
TRIPLE 10 FT. X 10 FT.
CONCRETE BOX CULVERT
90° SKEW

ASSEMBLED BY : _____	DATE : _____	SPECIAL	DESIGN ENGINEER OF RECORD: _____
CHECKED BY : _____	DATE : _____		
DRAWN BY : _____	DATE : _____	STANDARD	DATE : _____
CHECKED BY : _____	DATE : _____		

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

STD. NO. CB13