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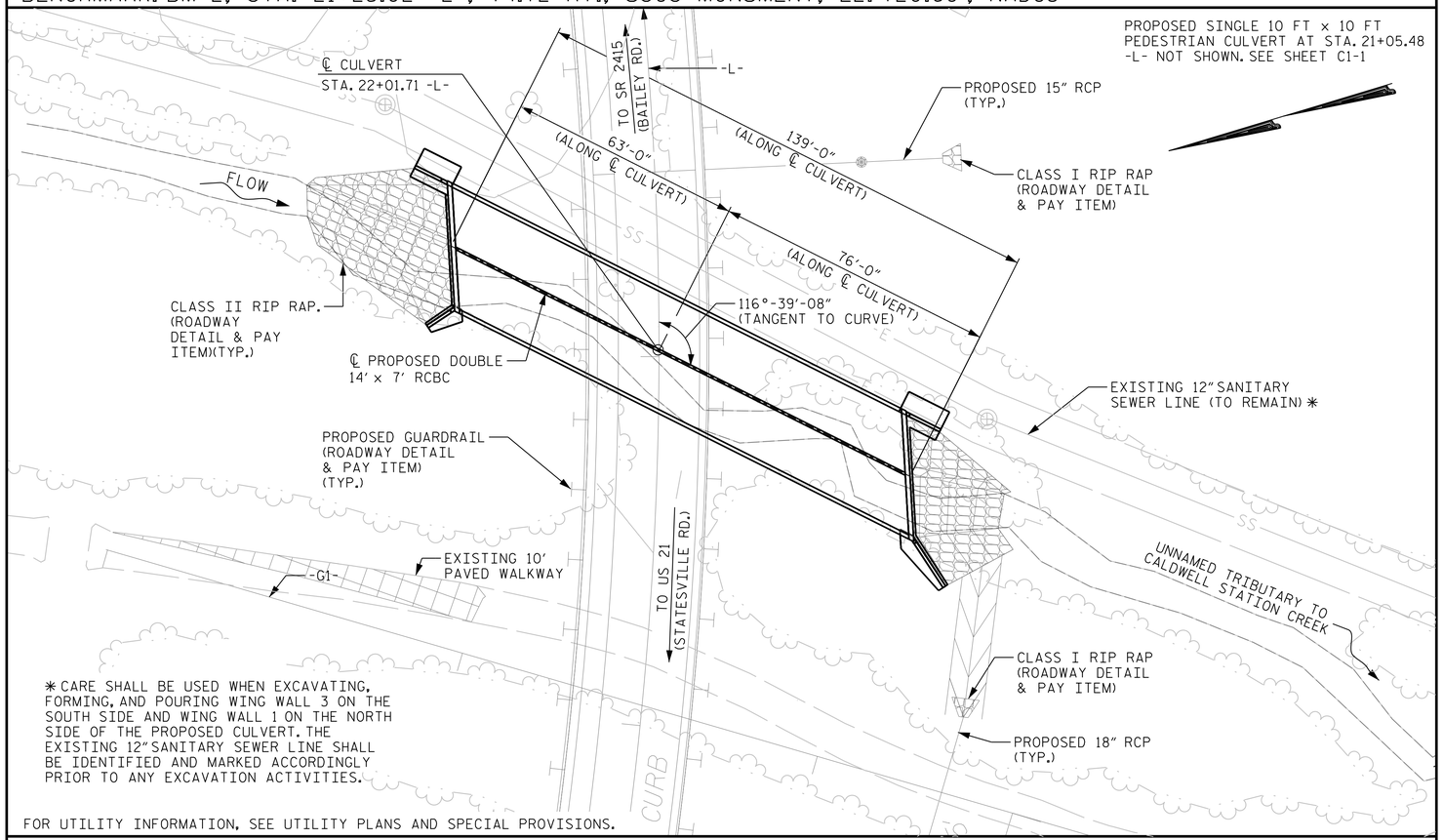
BENCHMARK: BM#2, STA. 21+25.02 -L-, 74.72' RT., USGS MONUMENT, EL. 720.69', NAD83

F.A. PROJECT NO. STBGDA-2415(001)



✱ CARE SHALL BE USED WHEN EXCAVATING, FORMING, AND POURING WING WALL 3 ON THE SOUTH SIDE AND WING WALL 1 ON THE NORTH SIDE OF THE PROPOSED CULVERT. THE EXISTING 12" SANITARY SEWER LINE SHALL BE IDENTIFIED AND MARKED ACCORDINGLY PRIOR TO ANY EXCAVATION ACTIVITIES.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD ---------- HL-93

DESIGN FILL ---------- 18'-9" (MAX.)

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

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

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.

CONCRETE IN THE CULVERT TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS, CURTAIN WALLS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY SILLS/BAFFLES, ROOF SLAB AND HEADWALLS.

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

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

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.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

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

EXCAVATE A MINIMUM OF 1 FOOT BELOW CULVERT BEARING ELEVATION AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL PER SECTION 414 OF THE STANDARD SPECIFICATIONS.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

BACKFILL WITH SELECT MATERIAL, CLASS VI MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.

BURY IN FOOTINGS FOR THE REINFORCED BOX CULVERT AT STATION 22+01.71 -L- AT LEAST 12" INTO NCDOT NO. 57 STONE WITH A MINIMUM THICKNESS AS SHOWN ON THE PLANS.

CULVERT SHOULD BE BACK FILLED WITH NATIVE MATERIAL TO SILL/BAFFLE HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS (360,000 KG) OF REINFORCING STEEL, ONE 30 INCH (760 MM) SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS (360,000 KG) OF REINFORCING STEEL, TWO 30 INCH (760 MM) SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS 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.

INSTALL TYPE 4 GEOTEXTILE AT THE BOTTOM OF EXCAVATION PRIOR TO PLACING FOUNDATION CONDITIONING MATERIAL. THE GEOTEXTILE SHOULD BE PLACED AT THE BOTTOM OF THE EXCAVATION AND WRAPPED UP THE SIDE WALLS OF THE EXCAVATION.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

-L- HORIZONTAL CURVE DATA

PI STA. 23+25.18
△ = 32°-54'-56.4" (LT)
D = 5°-40'-22.3"
L = 580.23'
T = 298.37'
R = 1,010.00'

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

HYDRAULIC DATA

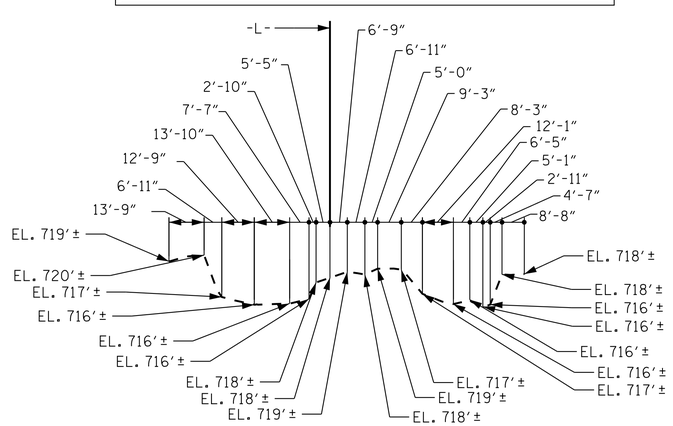
DESIGN DISCHARGE ---------- 750 CFS
FREQUENCY OF DESIGN FLOOD ------- 25 YR.
DESIGN HIGH WATER ELEVATION ----- 721.2
DRAINAGE AREA ---------- 0.92 SQ. MI.
BASE DISCHARGE (Q100) ---------- 850 CFS
BASE HIGH WATER ELEVATION ------ 721.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE ---------- 4800 CFS
FREQUENCY OF OVERTOPPING FLOOD --->500 YR.
OVERTOPPING FLOOD ELEVATION ------ 738.0 ✱
✱ OVERTOPPING WILL OCCUR AT STA. 17+75.00 -L- AND DOES NOT TAKE INTO ACCOUNT THE PEDESTRIAN CULVERT
WS EL. TAKE @ RIVER STATION 378

ROADWAY DATA

GRADE POINT EL. @ STA. 22+01.71 -L- = 740.25'
INVERT ELEVATION @ STA. 22+01.71 -L- = 714.94'
ROADWAY SLOPES 2 :1



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE				
BARREL @	4.864	CY/FT	676.1	C.Y.
WINGS ETC.			41.7	C.Y.
SILLS			6.0	C.Y.
TOTAL			723.8	C.Y.
REINFORCING STEEL				
BARREL			81,431	LBS.
WINGS ETC.			3,062	LBS.
TOTAL			84,493	LBS.
BOX CULVERT EXCAVATION STA. 22+01.71 -L-				LUMP SUM
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT				340 TONS

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS
11/6/2025

PROJECT NO. U-6105
MECKLENBURG COUNTY
STATION: 22+01.71 -L-

SHEET 1 OF 8 BRIDGE NO. 591669

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 14 FT. X 7 FT. CONCRETE BOX CULVERT 116°-39'-05" SKEW

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-1
1			3			TOTAL SHEETS
2			4			8

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DRAWN BY: D. D. LOWERY DATE: 05/2024
CHECKED BY: B. M. KROL DATE: 05/2024
DESIGN ENGINEER OF RECORD: A. L. PHILLIPS DATE: 05/2024

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11/6/2025

CULVERT 42C002