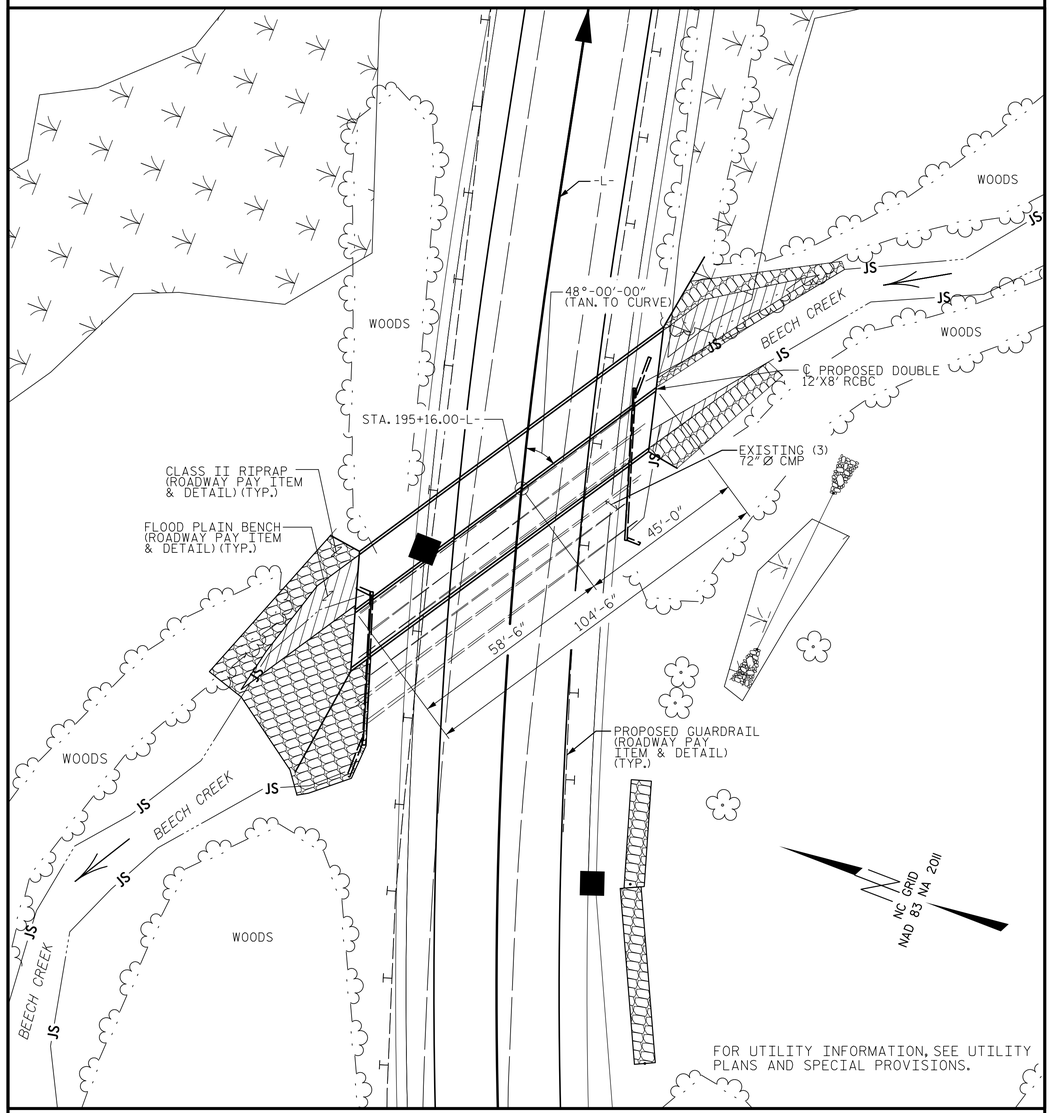
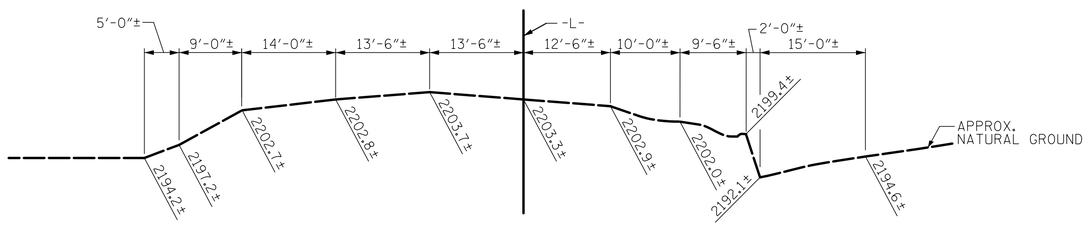
F.A. PROJECT NO.: APD-0074(178)

BENCH MARK #10: SPIKE NAIL IN BASE OF 14" DBL POPLAR; 40' RT OF STA. 197+38 -L-; ELEV. = 2200.60



LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

DRAWN BY :	ZCS	DATE :	1/21
CHECKED BY :	MGC	DATE :	6/21
DESIGN ENGINEER OF RECORD :	ZCS	DATE :	11/21

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 3.02 CY/FT	315.6	C.Y.
WINGS, ETC.	45.5	C.Y.
SILLS	8.0	C.Y.
TOTAL	369.1	C.Y.
REINFORCING STEEL		
BARREL & SILLS	39,286	LBS.
WINGS, ETC.	4,751	LBS.
TOTAL	44,037	LBS.
CULVERT EXCAVATION	LUMP SUM	
FOUNDATION COND. MAT'L.	223 TONS	

ROADWAY DATA

GRADE POINT ELEV. @ STA. 195+16.00-L- = 2203.83'
BED ELEV. @ STA. 195+16.00-L- _____ = 2190.0'
ROADWAY SLOPES _____ = 2:1

HYDROGRAPHIC DATA

DESIGN DISCHARGE _____ = 1400 CFS
FREQUENCY OF DESIGN FLOOD _____ = 50 YRS
DESIGN HIGH WATER ELEVATION _____ = 2200.3'
DRAINAGE AREA _____ = 4.39 SQ. MI.
BASE DISCHARGE (Q100) _____ = 1700 CFS
BASE HIGH WATER ELEVATION _____ = 2201.4'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = 1600 CFS
FREQUENCY OF OVERTOPPING FLOOD _ = >50 YRS
OVERTOPPING FLOOD ELEVATION _____ = 2201.0'

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"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30"(SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f, = 60ksi.

NOTES:

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

DESIGN FILL---------- 7.4' MAX.; 1.0' MIN.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.

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

CONCRETE IN CULVERT 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.

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

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.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPICED 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.

EXCAVATE 1 FOOT BELOW CULVERT AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414-4 OF THE STANDARD SPECIFICATIONS. FOUNDATION CONDITIONING MATERIAL SHOULD CONSIST OF SELECT MATERIAL CLASS V OR VI FOR RCBC.

IF REQUIRED, UNDERCUT LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE BOTTOM OF THE FOUNDATION CONDITIONING MATERIAL. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL.

PROJECT NO. A-0009CA
GRAHAM COUNTY
STATION: 195+16.00 -L-

SHEET 1 OF 7

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 — Marshall G. Cheek, Jr. — ENGINEER — MARSHALL G. CHEEK, JR.
6/1/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 12 FT. x 8 FT. CONCRETE BOX CULVERT 48° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C6-1
1			3			TOTAL SHEETS
2			4			7

STR #6