

BM\*30: R/R SPIKE IN BASE OF 10" PINE 290' N 11°22'46.3" W OF  
N 75768 E 2286901, EL. 32.34

F. A. PROJECT NO. STP-0211(21)

**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 MAXIMUM DESIGN FILL ----- 8.46 FT.  
 MINIMUM DESIGN FILL ----- 4.20 FT.  
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.  
 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.  
 CONCRETE IN EACH STAGE OF THE 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.

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.  
 THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.  
 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.  
 ALL BAR SUPPORTS USED IN THE CULVERT AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATION.  
 FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.  
 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.

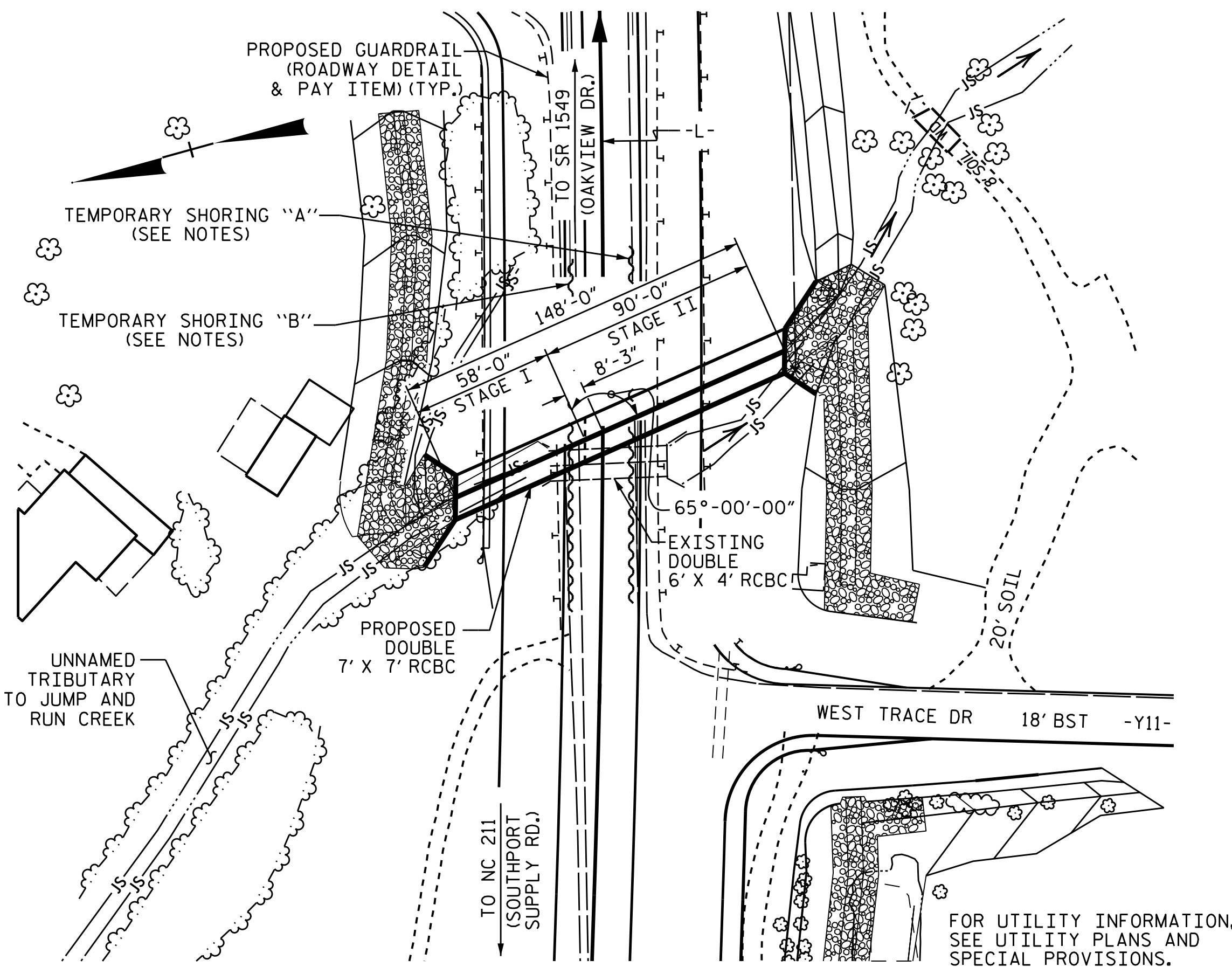
AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING 6' X 4' RCBC LOCATED JUST WEST OF THE PROPOSED DOUBLE 7' X 7' RCBC SHALL BE REMOVED.

TRAFFIC ON NC211 (SOUTHPORT - SUPPLY RD.) SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS DIRECTED BY THE ENGINEER. FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

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.

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 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.

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



LOCATION SKETCH

**HYDRAULIC DATA**

DESIGN DISCHARGE = 830 CFS  
 FREQUENCY OF DESIGN FLOOD = 50 YRS.  
 DESIGN HIGH WATER ELEVATION = 27.6 FT.  
 DRAINAGE AREA = 0.83 SQ. MI.  
 BASE DISCHARGE (Q100) = 870 CFS  
 BASE HIGH WATER ELEVATION = 27.8 FT.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 950+ CFS  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION = \* 31.87 FT.  
 \* SHD @ SAG STA. 316+83.31 (RT) -L-

**GRADE DATA -L-**

GRADE POINT ELEV. @ STA. 316+72.00 -L- = 31.39'  
 BED ELEVATION @ STA. 316+72.00 -L- = 17.58'  
 ROADWAY SLOPES = 3:1

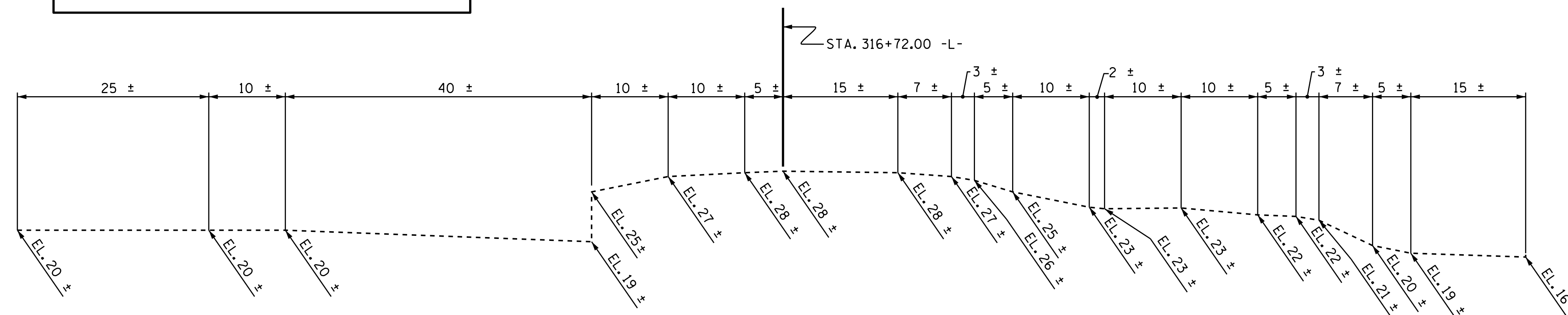
**TOTAL STRUCTURE QUANTITIES**

CULVERT EXCAVATION	_____	LUMP SUM
REMOVAL OF EXISTING STRUCTURE	_____	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	_____	209 TONS
<b>CLASS A CONCRETE</b>		
BARREL @	1.317	CY/FT
STAGE I	_____	76.4 C.Y.
STAGE II	_____	118.5 C.Y.
<b>WINGS ETC.</b>		
STAGE I	_____	17.6 C.Y.
STAGE II	_____	17.6 C.Y.
TOTAL	_____	228.3 C.Y.
<b>REINFORCING STEEL</b>		
<b>BARREL</b>		
STAGE I	_____	11,364 LBS.
STAGE II	_____	17,290 LBS.
<b>WINGS ETC.</b>		
STAGE I	_____	936 LBS.
STAGE II	_____	936 LBS.
TOTAL	_____	30,526 LBS.

**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"

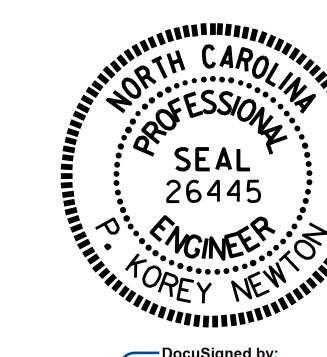
NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_y = 60\text{ksi}$ .



PROFILE ALONG CULVERT

PROJECT NO. R-5021  
 BRUNSWICK COUNTY  
 STATION: 316+72.00 -L-

SHEET 1 OF 5



DocuSigned by:  
 P. Corey Newton  
 1/21/2019 11:40:07 AM

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE 7 FT. X 7 FT.  
 CONCRETE BOX CULVERT  
 60° SKEW**

ASSEMBLED BY : O. T. NGUYEN DATE : 9/10/18  
 CHECKED BY : P. K. NEWTON DATE : 12/11/18  
 DRAWN BY : B. WYNN/D.DONOVAN DATE : SEPT. 1990  
 CHECKED BY : A.R.BISSETTE DATE : OCT. 90

**SPECIAL  
 STANDARD**

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C4-1
1			3			TOTAL SHEETS
2			4			5

ADDED 10-1-90