

**GRADE DATA**

0.5237%      3.0417%  
 PI = 12+60.000 -L-  
 EL = 51.602  
 VC = 110m

**ROADWAY DATA**

GRADE POINT ELEVATION @ STA. 12+42.500 -Y2- = 51.671  
 BED ELEVATION @ STA. 12+4.500 -Y2- = 47.680  
 ROADWAY SLOPES = 3.5 : 1

**HYDRAULIC DATA**

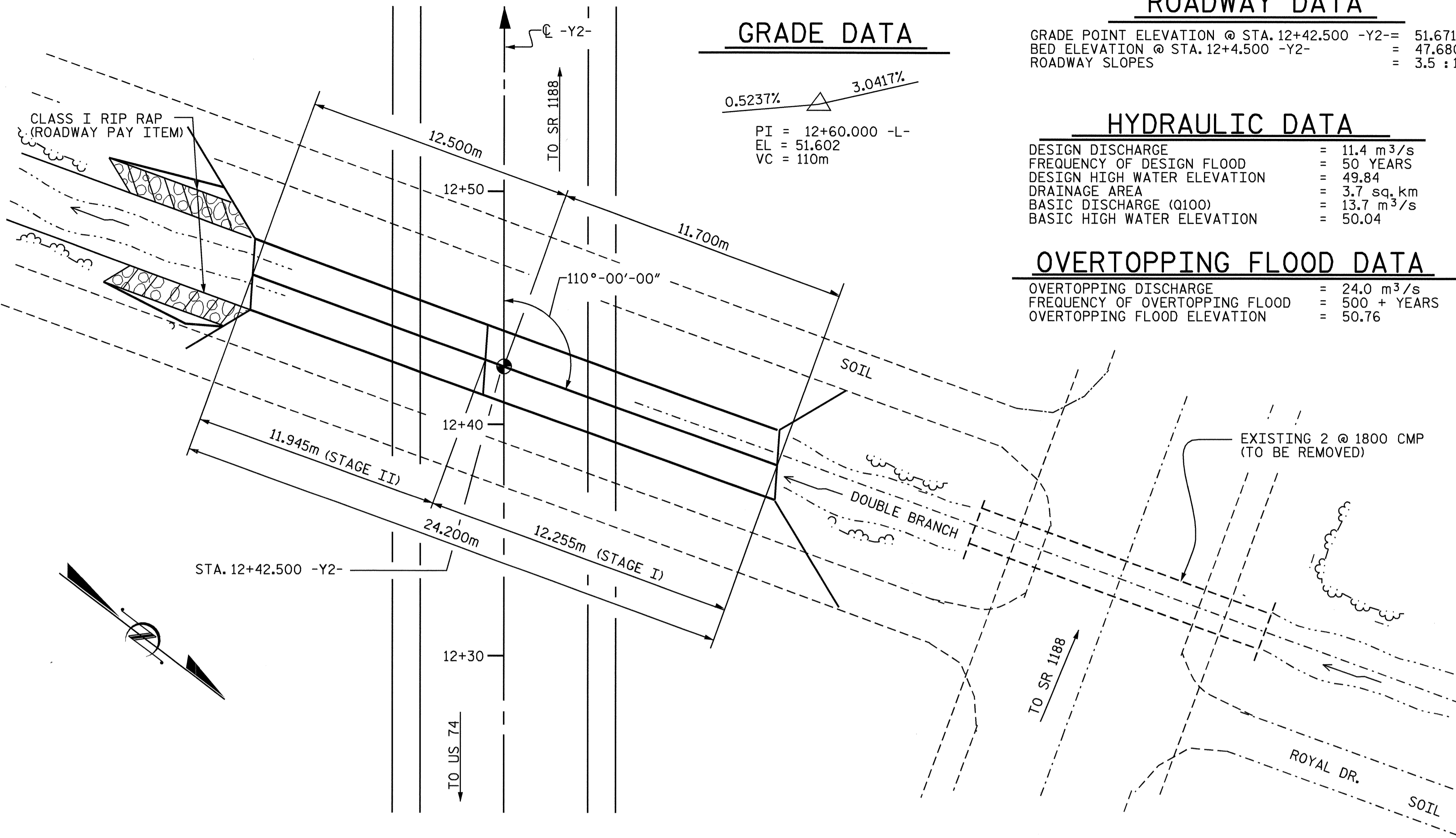
DESIGN DISCHARGE = 11.4 m<sup>3</sup>/s  
 FREQUENCY OF DESIGN FLOOD = 50 YEARS  
 DESIGN HIGH WATER ELEVATION = 49.84  
 DRAINAGE AREA = 3.7 sq. km  
 BASIC DISCHARGE (Q100) = 13.7 m<sup>3</sup>/s  
 BASIC HIGH WATER ELEVATION = 50.04

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 24.0 m<sup>3</sup>/s  
 FREQUENCY OF OVERTOPPING FLOOD = 500 + YEARS  
 OVERTOPPING FLOOD ELEVATION = 50.76

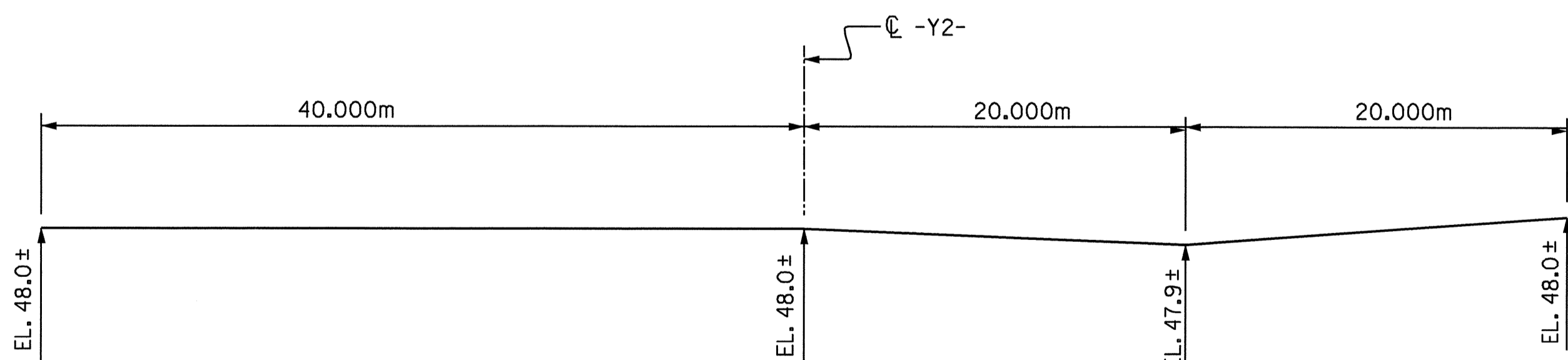
**NOTES**

ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.  
 DESIGN FILL----- 1.93m  
 FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.  
 76mm Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.  
 CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:  
 1. STAGE I, WING FOOTINGS AND FLOOR SLAB INCLUDING 100mm OF ALL VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF STAGE I, THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL.  
 3. STAGE II, WING FOOTINGS AND FLOOR SLAB INCLUDING 100mm OF ALL VERTICAL WALLS.  
 4. THE REMAINING PORTIONS OF STAGE II, THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL.  
 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 21.0m. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.  
 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.  
 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.  
 A 900mm STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.  
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.  
 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.  
 ALL ELEVATIONS ARE IN METERS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 TOP OF BOTTOM SLAB IS TO BE BURIED 305mm BELOW STREAMBED.  
 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.



**LOCATION SKETCH**

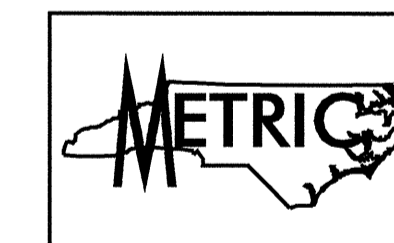
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS



**PROFILE ALONG CULVERT**

**TOTAL STRUCTURE QUANTITIES**

<b>CLASS A CONCRETE</b>	
STAGE I: BARREL @ 3.84 m <sup>3</sup> /m	47.1 m <sup>3</sup>
STAGE II: BARREL @ 3.84 m <sup>3</sup> /m	45.9 m <sup>3</sup>
WINGS ETC.	28.7 m <sup>3</sup>
<b>TOTAL</b>	<b>121.7 m<sup>3</sup></b>
<b>REINFORCING STEEL</b>	
STAGE I: BARREL	5,620 kg
STAGE II: BARREL	5,436 kg
WINGS ETC.	925 kg
<b>TOTAL</b>	<b>11,981 kg</b>
CULVERT EXCAVATION ----- LUMP SUM	
FOUNDATION COND. MAT'L -- 89.0 METRIC TONS	



PROJECT NO. R-513A  
ROBESON COUNTY  
 STATION: 12+42.500 -Y2-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE 2.4m X 2.1m  
 CONCRETE BOX CULVERT**

*Professional Engineer Seal*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 16301  
 TING HSILING YANG  
 8/24/04

ASSEMBLED BY : N. Q. TRAN DATE : 2-6-03  
 CHECKED BY : M. A. ALLEN DATE : 2-6-03  
 DRAWN BY : EEM 6/97  
 CHECKED BY : ARB 7/97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			C-1
2			4			TOTAL SHEETS 24