

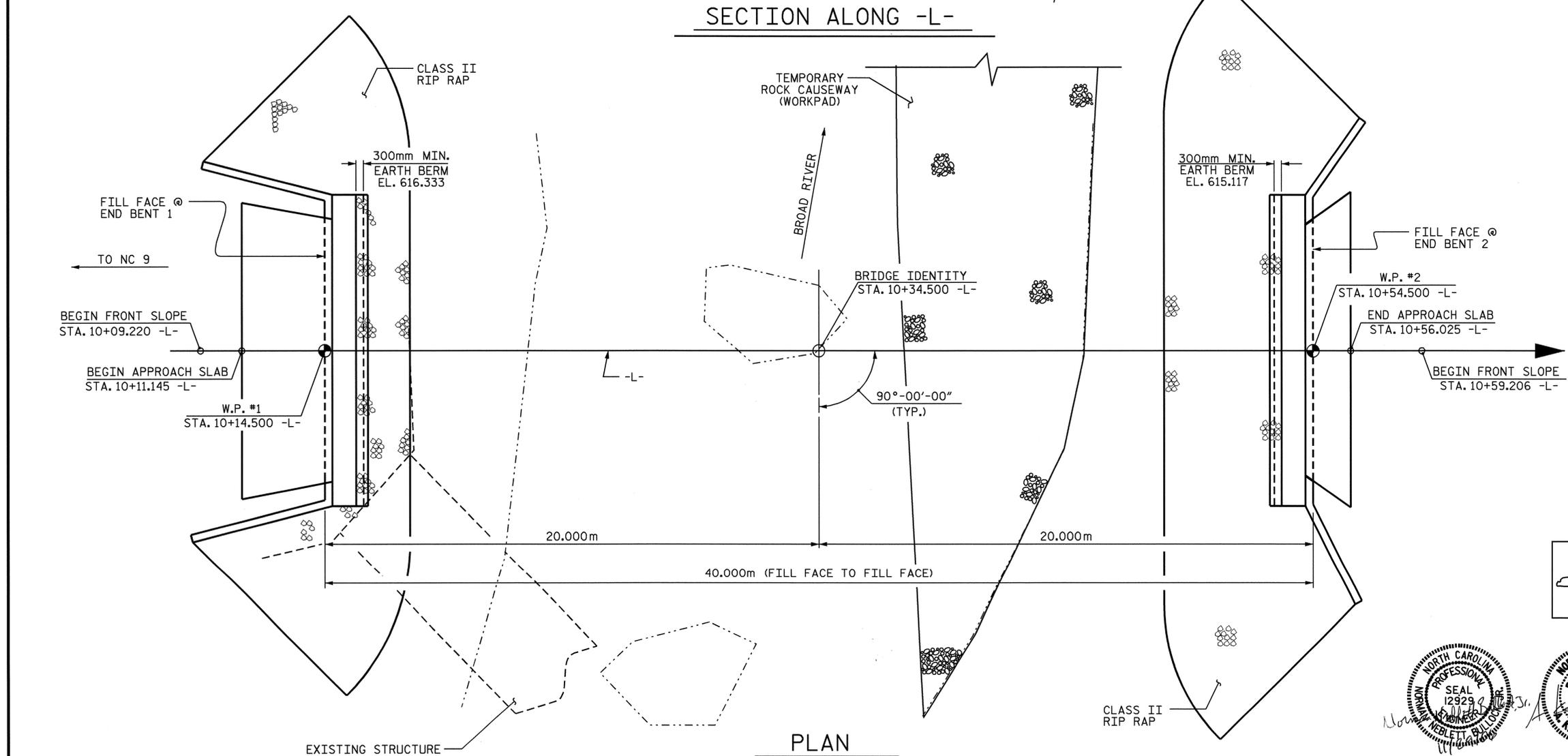
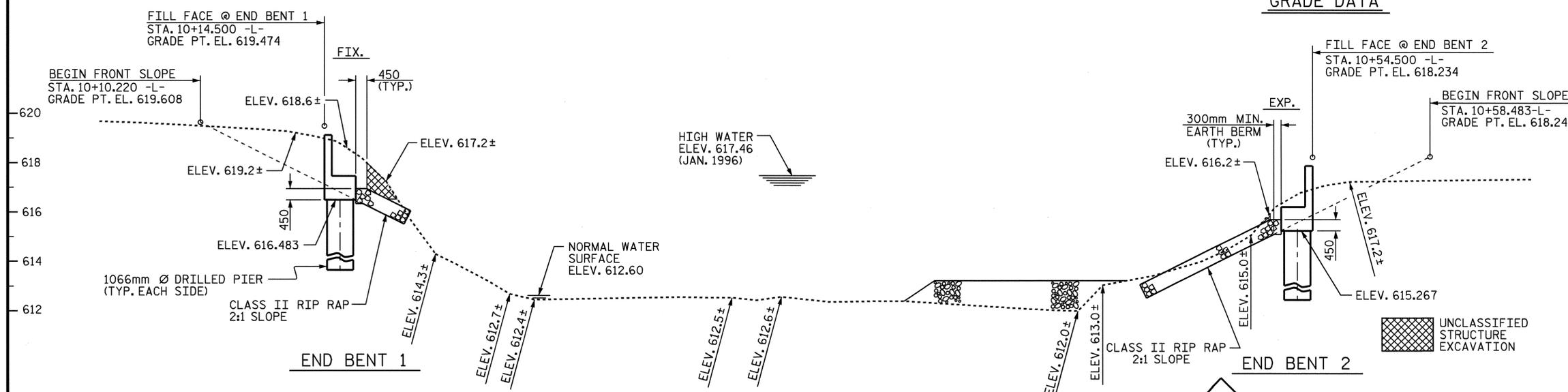


**NOTES**

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.  
 ALL ELEVATIONS ARE IN METERS.  
 ASSUMED LIVE LOAD = MS 18 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR MS 22.5.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SNSM.  
 THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 37.186m ON HIGH STEEL TRUSSES, WITH A CLEAR ROADWAY WIDTH OF 11.700m ON A TIMBER FLOOR ON ABUTMENTS AND LOCATED DOWNSTREAM SHALL BE REMOVED.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 15m EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THE ESTIMATED QUANTITY IS LESS THAN 380 CUBIC METERS. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SPECIAL PROVISIONS.  
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", NOVEMBER, 1995.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY B.  
 FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.  
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.  
 SEE SHEET 3 OF 3, FOR ADDITIONAL NOTES.

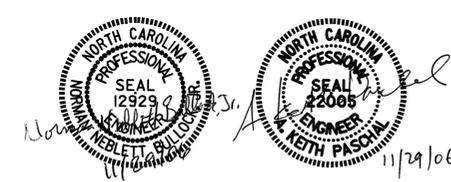
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 PI = 10+07.800  
 EL. = 619.690  
 VC = 9m  
**GRADE DATA**

-3.2178% +2.0000%  
 PI = 10+55.000  
 EL. = 618.171  
 VC = 9m  
**GRADE DATA**



DRAWN BY: G.M.P. / A.M.K. DATE: 7-26-04  
 CHECKED BY: J.KHARVA DATE: 12-5-05

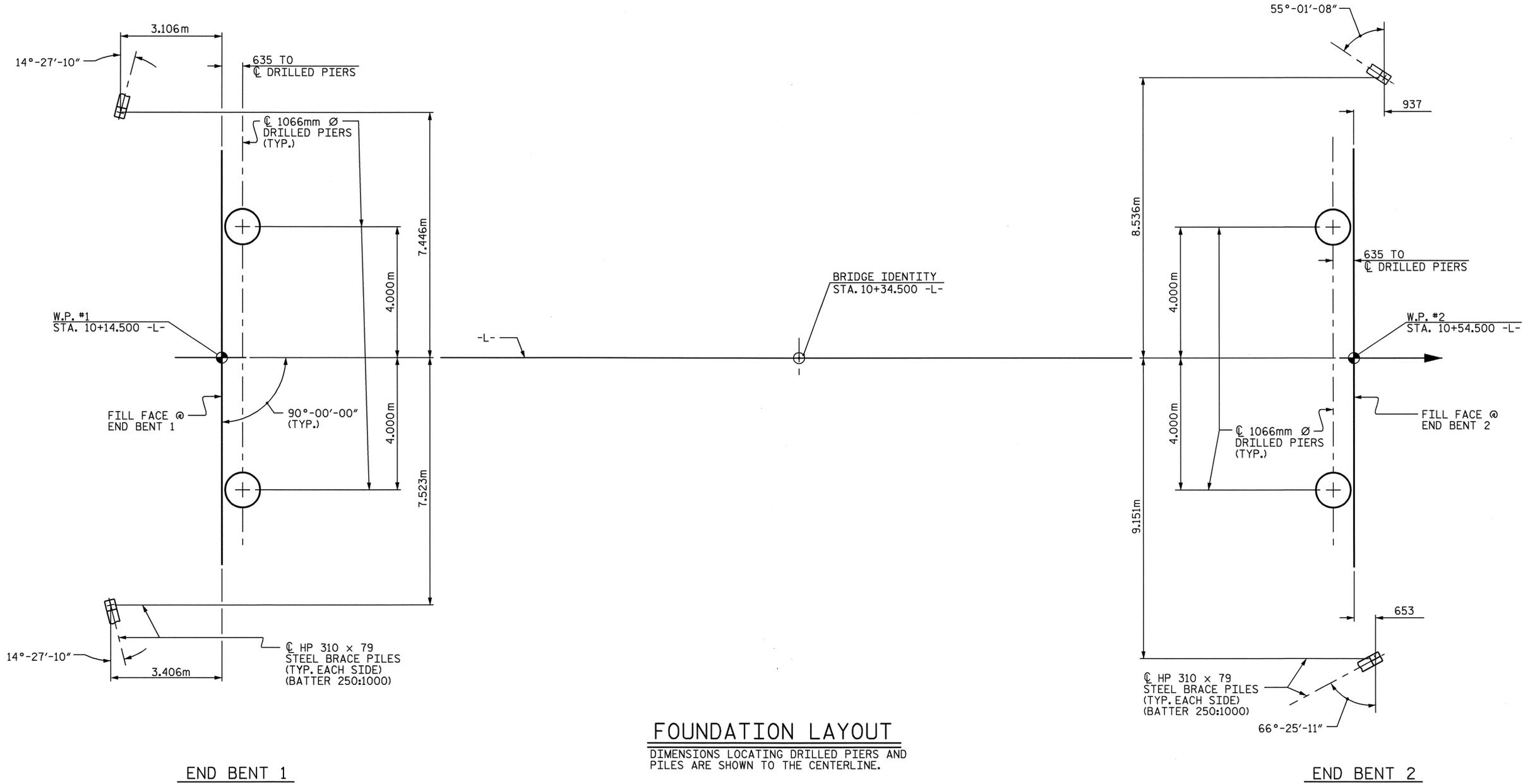
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 omeadows



PROJECT NO. B-3119  
 BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 653

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON SR 2804  
 OVER BROAD RIVER  
 BETWEEN NC 9 AND SR 2786

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



**FOUNDATION LAYOUT**

DIMENSIONS LOCATING DRILLED PIERS AND PILES ARE SHOWN TO THE CENTERLINE.

END BENT 1

END BENT 2

**NOTES:**

THE DRILLED PIERS AT END BENT 1 AND END BENT 2 HAVE BEEN DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 2900 kPa.

DRILLED PIERS FOR END BENT 1 AND END BENT 2 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 1950 kN EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS NOT REQUIRED FOR DRILLED PIERS AT END BENT 1 OR END BENT 2.

DRILLED PIERS AT END BENT 1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 611.0m AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT END BENT 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 611.6m AND SATISFY THE REQUIRED END BEARING CAPACITY.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISIONS.

SID INSPECTIONS MAYBE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS AT END BENT 1 OR END BENT 2. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. SEE DRILLED PIERS SPECIAL PROVISIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISIONS.

SPT TESTING IS NOT REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT END BENT 1 OR END BENT 2.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT END BENT 1 OR END BENT 2.

PILE EXCAVATION SHALL BE USED TO INSTALL PILES FOR WING WALLS AT END BENT 1 AND END BENT 2 TO ELEVATION 612.5m. SEE SPECIAL PROVISION FOR PILE EXCAVATION.

FOR STEEL H PILES, SEE SPECIAL PROVISIONS.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE ON SR 2804  
 OVER BROAD RIVER  
 BETWEEN NC 9 AND SR 2786



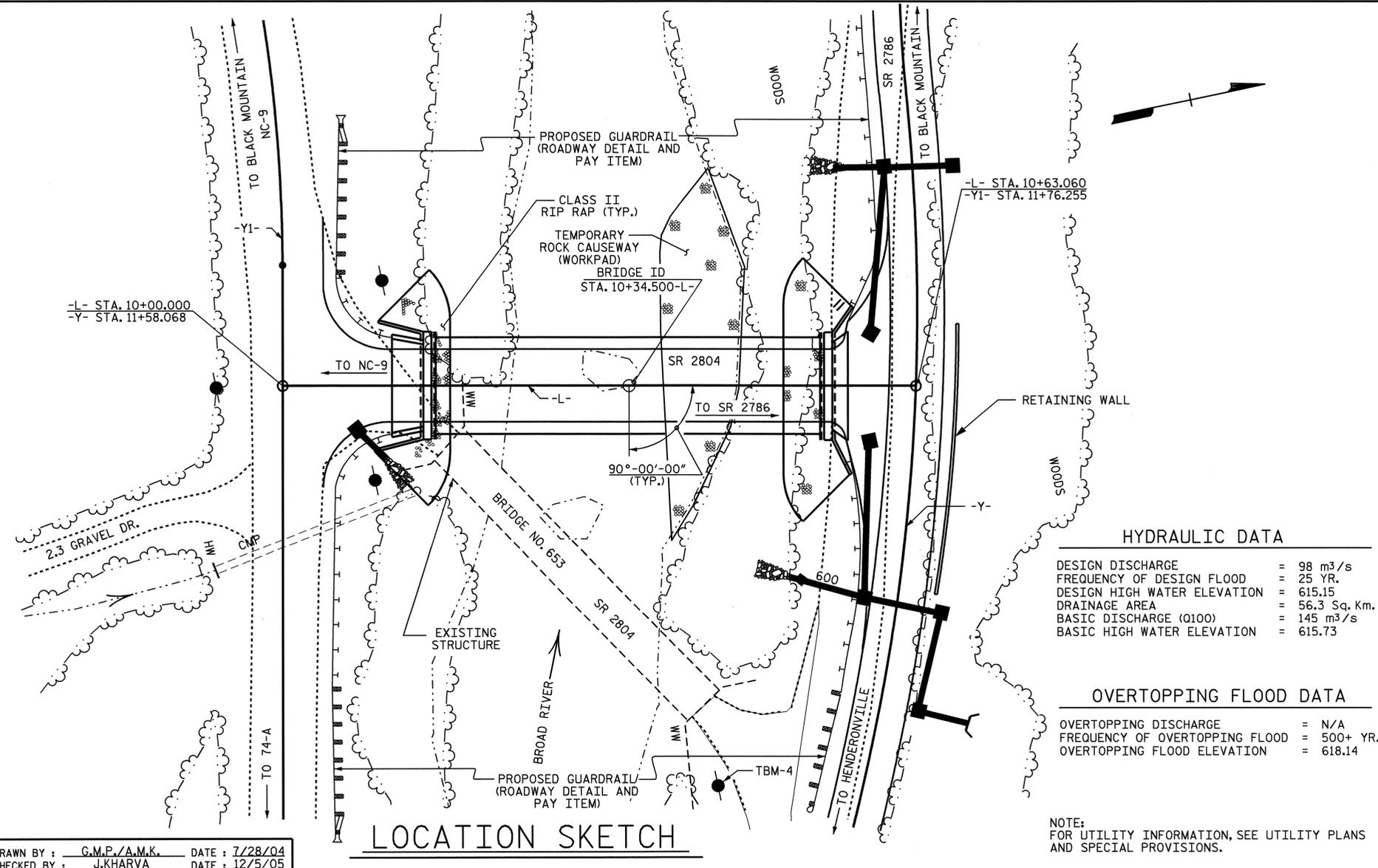
DRAWN BY : A.M.KEETER DATE : 7/28/04  
 CHECKED BY : J.KHARVA DATE : 12/5/05

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

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	1066mm Ø DRILLED PIERS IN SOIL	1066mm Ø DRILLED PIERS NOT IN SOIL	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL (APPROX.)	HP 310 x 79 STEEL PILES	CONCRETE BARRIER RAIL	PLAIN RIP RAP CLASS II (600mm THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	LUMP SUM	METERS	METERS	METERS	METERS	EACH	EACH	LUMP SUM	SQ. METERS	SQ. METERS	CU. METERS	LUMP SUM	kg	kg	kg	METERS	METERS	METRIC TONS	SQ. METER	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										416.6	383.3		LUMP SUM			66400		78.730			LUMP SUM	LUMP SUM
END BENT 1			6.0	1.0	8.0	3.0		1				32.9		5404	356		7.0		95	106		
END BENT 2			4.6	1.0	4.4	3.0						30.4		4719	244		5.6		160	178		
TOTAL	LUMP SUM	LUMP SUM	10.6	2.0	12.4	6.0	1	1	LUMP SUM	416.6	383.3	63.3	LUMP SUM	10123	600	66400	12.6	78.730	255	284	LUMP SUM	LUMP SUM

BENCHMARK: TBM-4, RAILROAD SPIKE IN POWER POLE AT NORTH END OF BRIDGE 40.032m RT. -L- STA. 10+43.066 ELEV. 619.423



**NOTES CONT.:**

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 345W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 360,000 kg OF REINFORCING STEEL, ONE 760mm SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 360,000 kg OF REINFORCING STEEL, TWO 760mm 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.

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 10+34.500 -L-."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR METRIC STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 10+34.500 -L-.

**HYDRAULIC DATA**

DESIGN DISCHARGE	=	98 m <sup>3</sup> /s
FREQUENCY OF DESIGN FLOOD	=	25 YR.
DESIGN HIGH WATER ELEVATION	=	615.15
DRAINAGE AREA	=	56.3 Sq. Km.
BASIC DISCHARGE (Q100)	=	145 m <sup>3</sup> /s
BASIC HIGH WATER ELEVATION	=	615.73

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	=	N/A
FREQUENCY OF OVERTOPPING FLOOD	=	500+ YR.
OVERTOPPING FLOOD ELEVATION	=	618.14

NOTE:  
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE ON SR 2804  
 OVER BROAD RIVER  
 BETWEEN NC 9 AND SR 2786



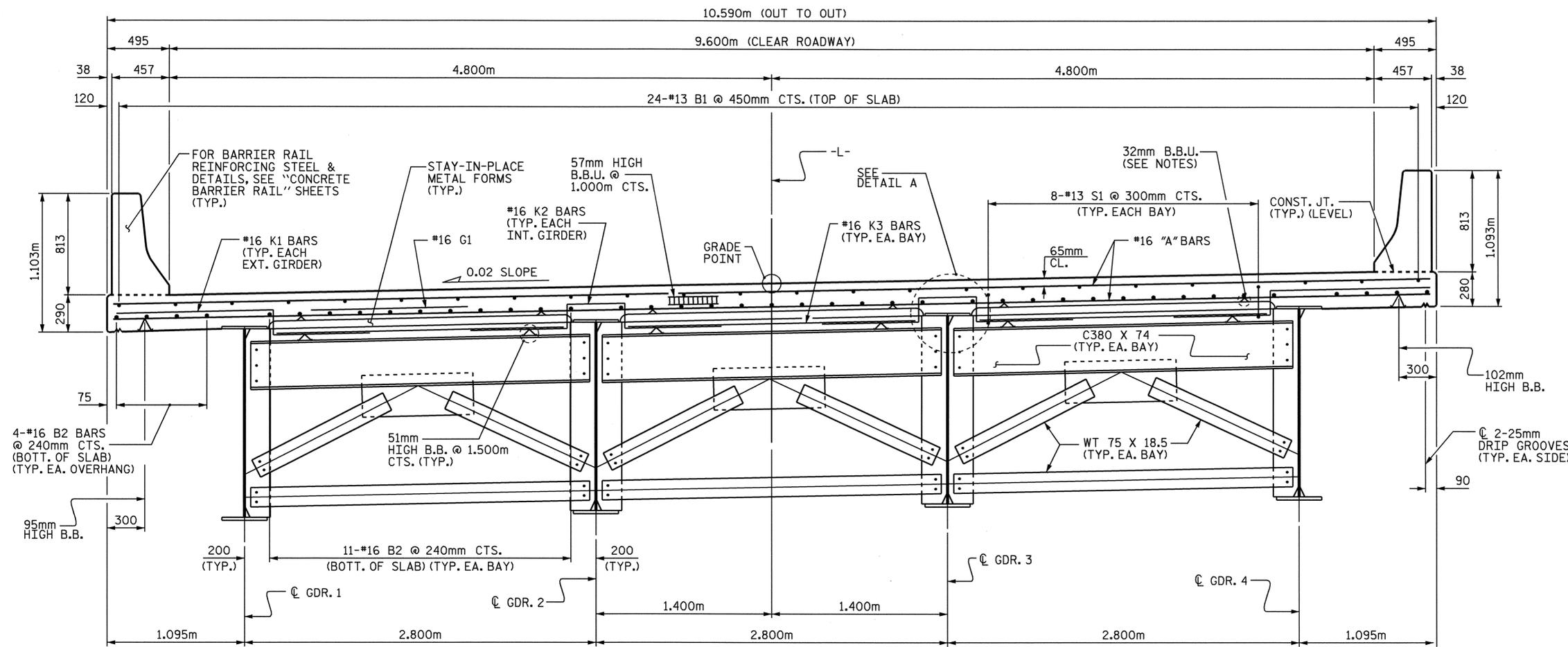
DRAWN BY: G.M.P./A.M.K. DATE: 7/28/04  
 CHECKED BY: J.KHARVA DATE: 12/5/05

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

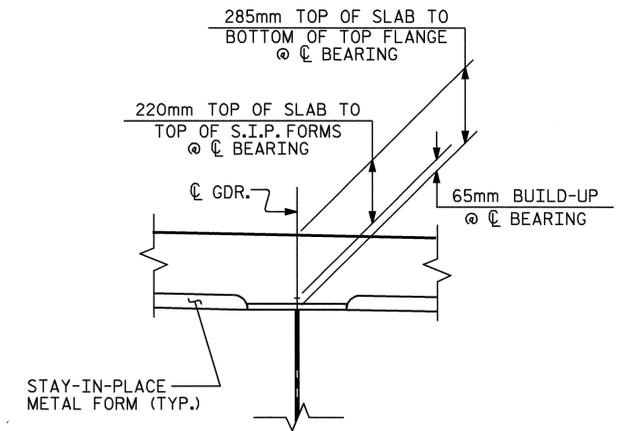
**NOTES**

PROVIDE 32mm HIGH BEAM BOLSTERS UPPER AT 1.200m CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 1.200m CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 65mm ABOVE THE TOP OF THE REMOVABLE FORM.

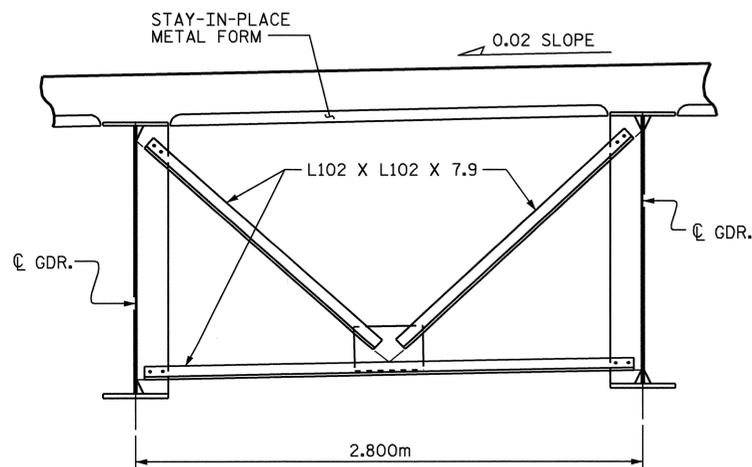
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.



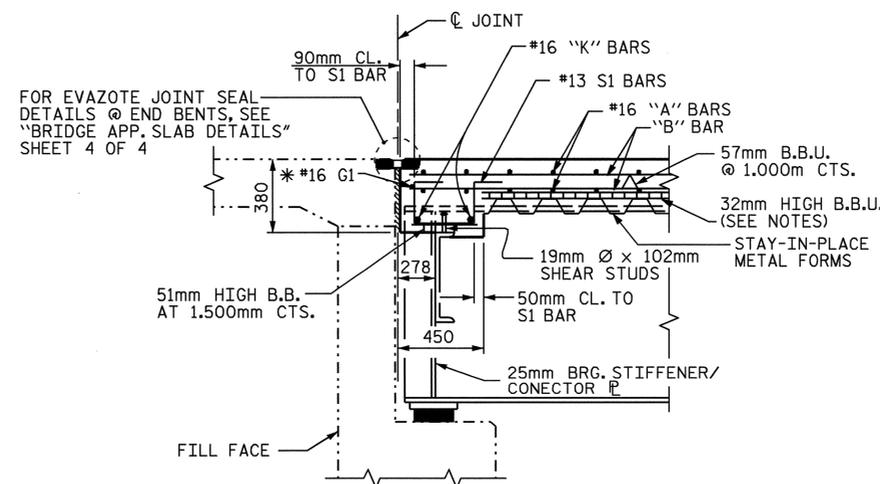
**TYPICAL SECTION**  
SHOWING END BENT DIAPHRAGMS



**DETAIL A**



**TYPICAL SECTION**  
SHOWING INTERMEDIATE DIAPHRAGM  
(TYPICAL EACH BAY)



**SECTION A-A**

\* #16 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

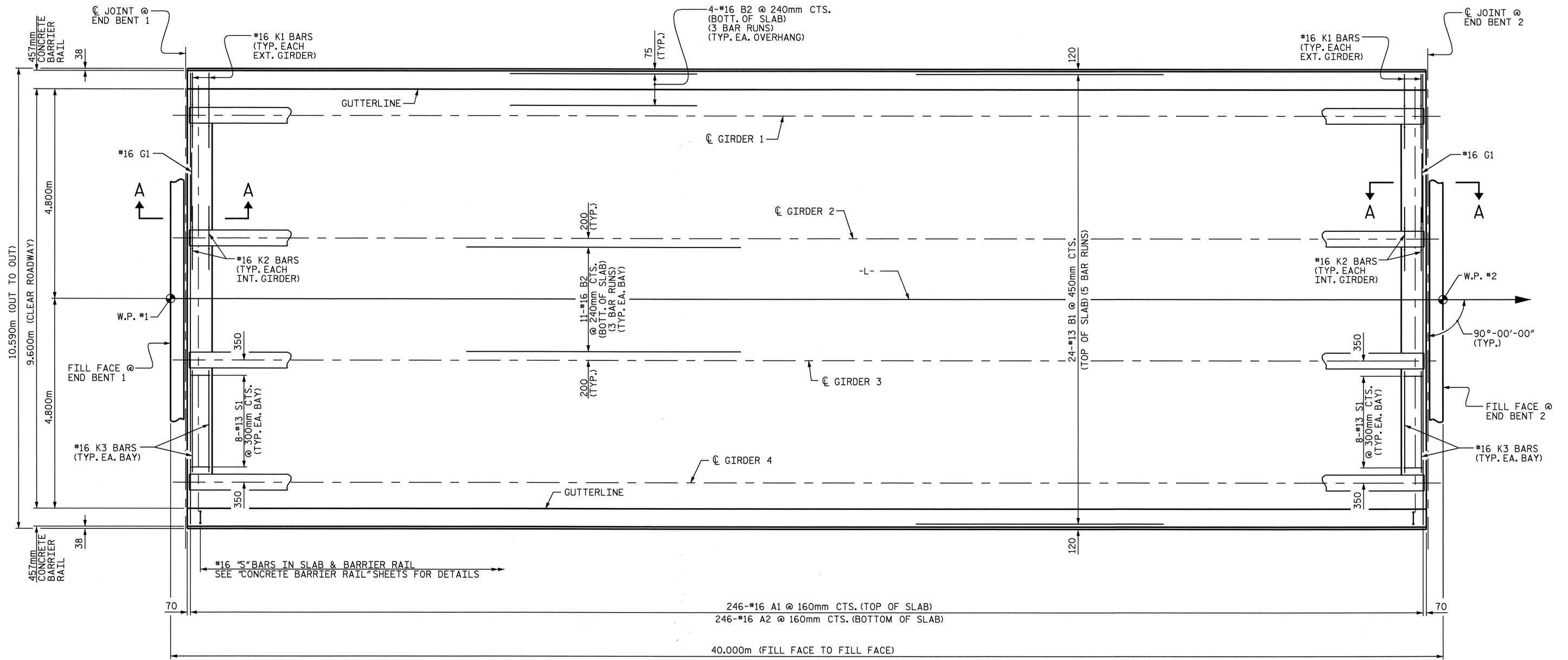
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
TYPICAL SECTION**



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

DRAWN BY : K. M.M. / A.M.K. DATE : 1/6/04  
CHECKED BY : J.KHARVA DATE : 12/5/05



**NOTES**

FOR SECTION VIEWS, SEE "TYPICAL SECTION" SHEET.

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. B-3119

BUNCOMBE COUNTY

STATION: 10+34.500 -L-



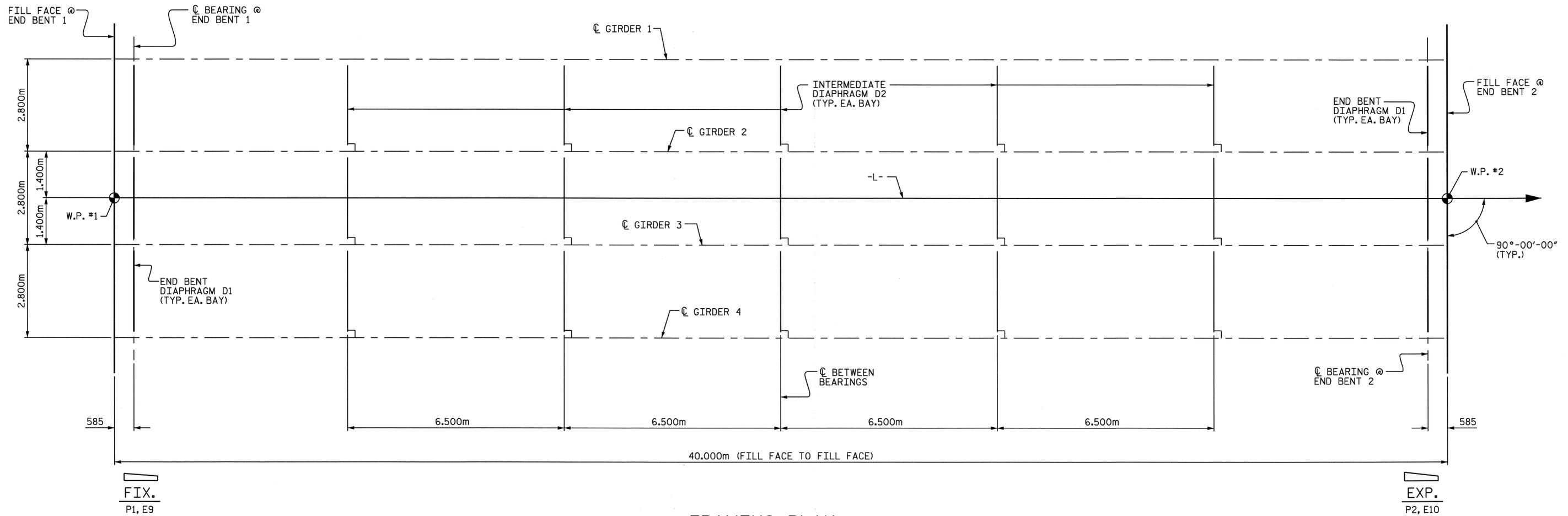
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN

DRAWN BY : K.M.M. / A.M.K. DATE : 1/13/04

CHECKED BY : J.KHARVA DATE : 12/5/05

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5	
1			3			TOTAL SHEETS	
2			4			24	



**FRAMING PLAN**

DEAD LOAD DEFLECTION FOR GIRDERS																					
GIRDERS 1 THRU 4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.005	0.010	0.014	0.018	0.021	0.024	0.027	0.028	0.029	0.030	0.029	0.028	0.027	0.024	0.021	0.018	0.014	0.010	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.015	0.038	0.058	0.076	0.091	0.104	0.115	0.122	0.127	0.129	0.127	0.122	0.115	0.104	0.091	0.076	0.058	0.038	0.015	0.000
DEFLECTION DUE TO WEIGHT OF RAIL ↓	0.000	0.002	0.004	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.011	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.022	0.052	0.077	0.101	0.120	0.137	0.152	0.161	0.167	0.170	0.167	0.161	0.152	0.137	0.120	0.101	0.077	0.052	0.022	0.000
VERTICAL CURVE ORDINATE	-0.000	-0.002	-0.003	-0.005	-0.007	-0.009	-0.010	-0.012	-0.014	-0.015	-0.017	-0.019	-0.020	-0.022	-0.024	-0.025	-0.027	-0.029	-0.030	-0.026	-0.000
REQUIRED CAMBER ↑	0	20	49	72	94	111	127	140	147	152	153	148	141	130	113	95	74	48	22	-3	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN METERS, EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN MILLIMETERS.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

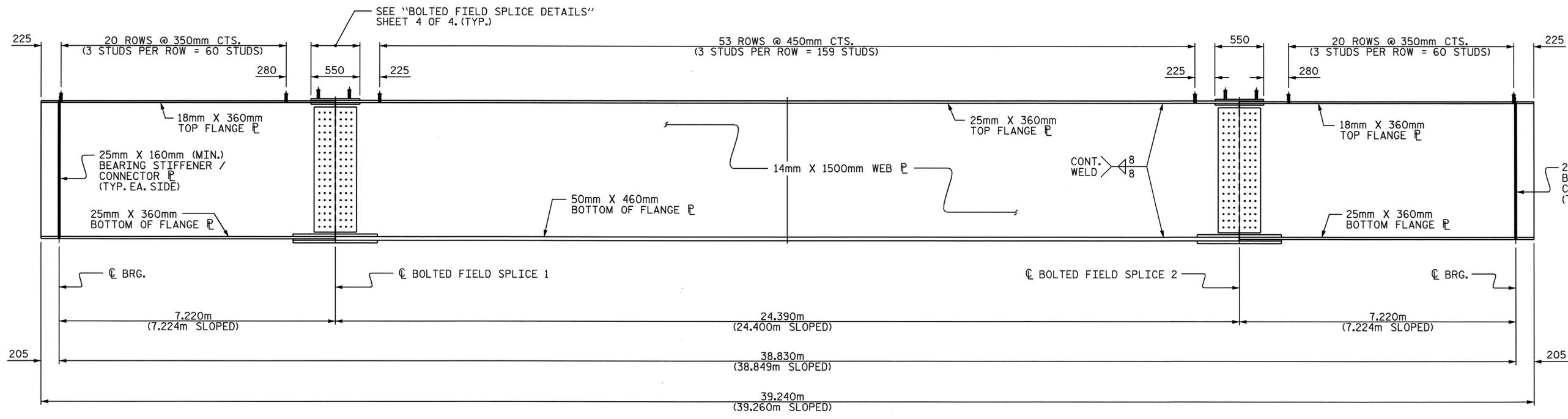
SHEET 1 OF 4



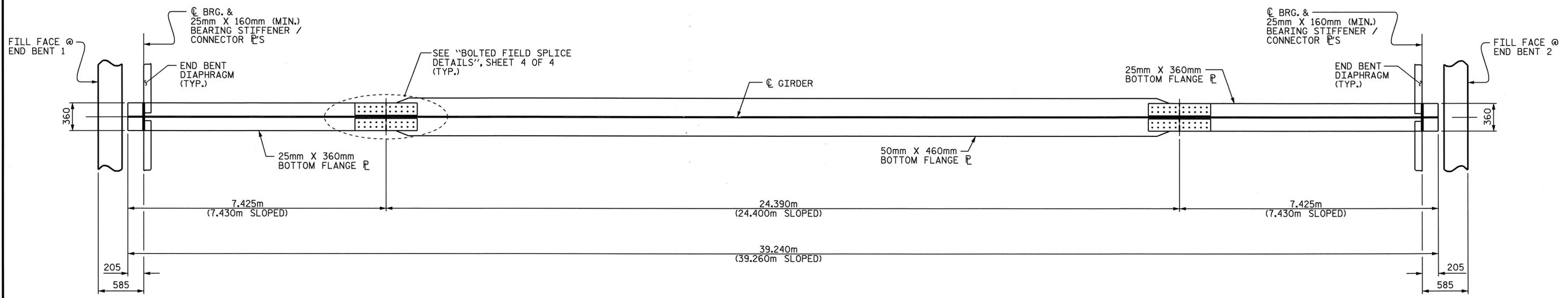
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 FRAMING PLAN

DRAWN BY: K.M.K. / A.M.K. DATE: 1/07/04  
 CHECKED BY: J.KHARVA DATE: 12/5/05

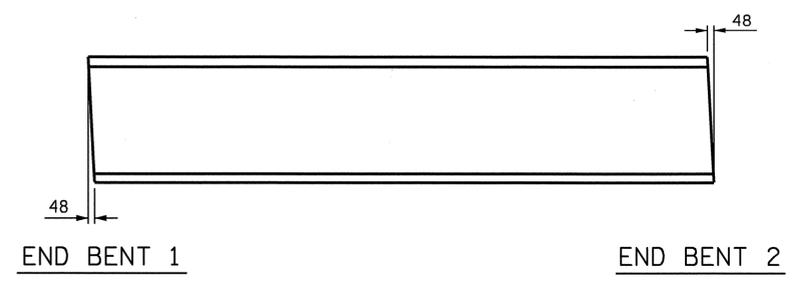
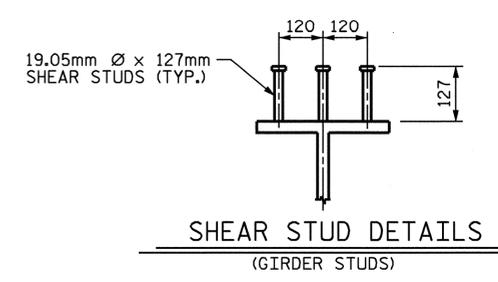
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
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**PLATE GIRDER ELEVATION**  
(CONNECTOR P's NOT SHOWN)



**BOTTOM FLANGE DETAIL**



PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 2 OF 4

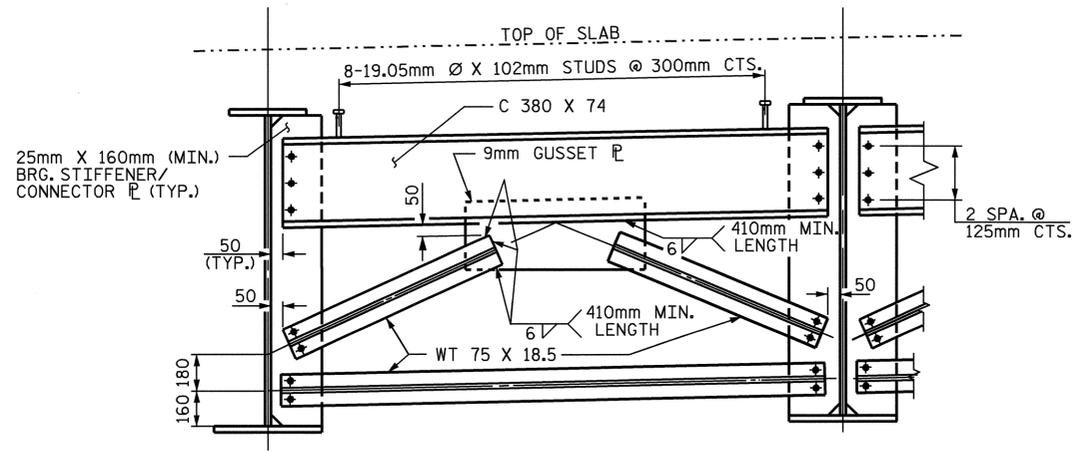
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 STRUCTURAL  
 STEEL DETAILS

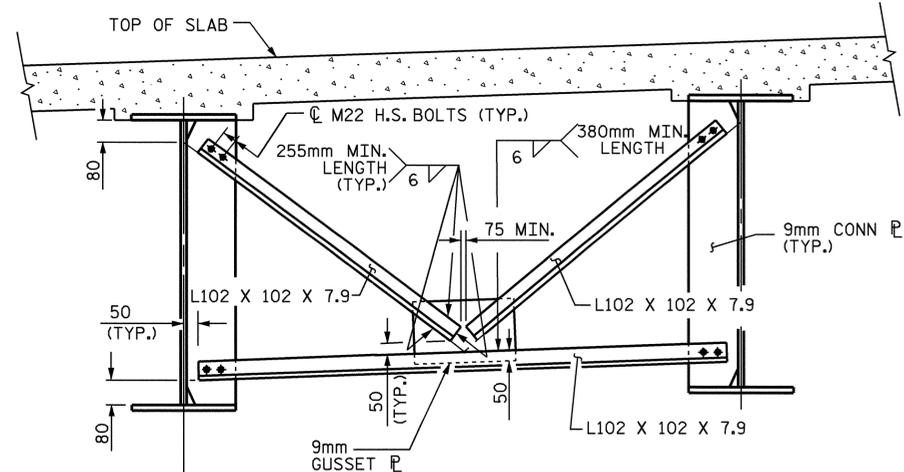


DRAWN BY: K.M.M. / A.M.K. DATE: 1/13/04  
 CHECKED BY: J.KHARVA DATE: 12/5/05

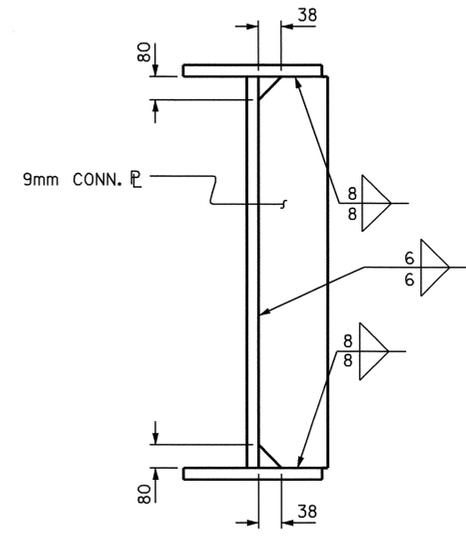
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1			3			TOTAL SHEETS
2			4			24



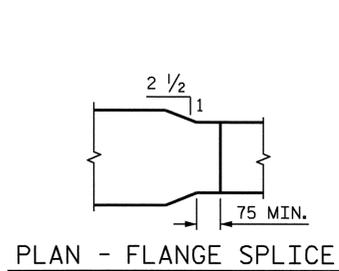
TYPICAL END BENT DIAPHRAGM (D1)



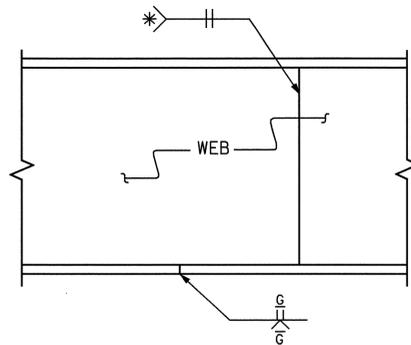
TYPICAL INTERMEDIATE DIAPHRAGM (D2)



CONNECTOR PLATE



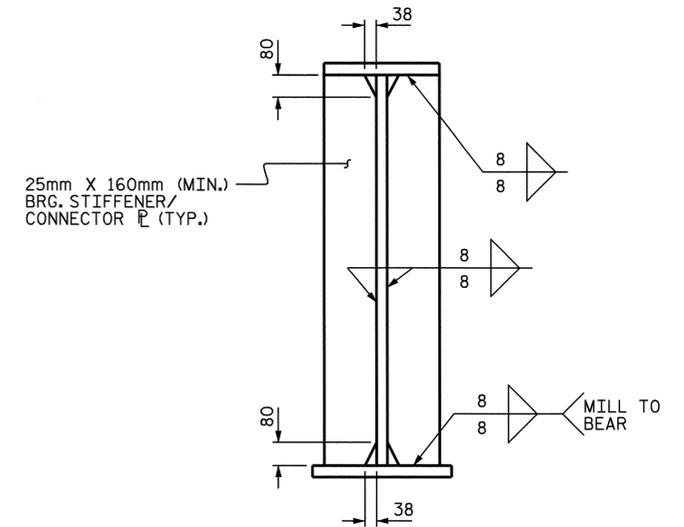
PLAN - FLANGE SPLICE



ELEVATION

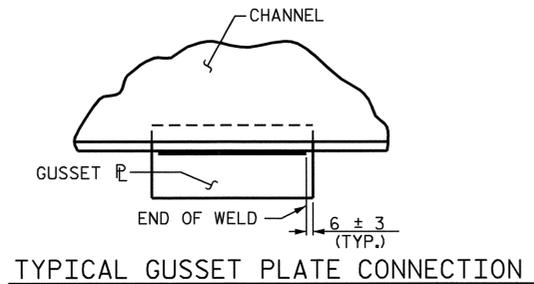
TYPICAL FLANGE AND WEB BUTT JOINT

\* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

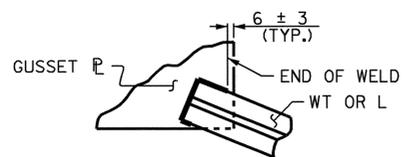


BEARING STIFFENER/CONN. PL

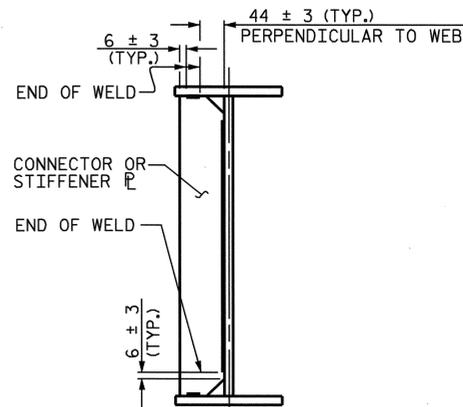
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.



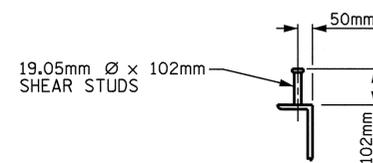
TYPICAL GUSSET PLATE CONNECTION



TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



SHEAR STUD DETAILS (CHANNEL STUDS)

WELD TERMINATION DETAILS

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
STRUCTURAL  
STEEL DETAILS



DRAWN BY: K.M.M. / A.M.K. DATE: 1/12/04  
CHECKED BY: J.KHARVA DATE: 12/5/05

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			24

STR. #1

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 345W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 22.23mm Ø HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

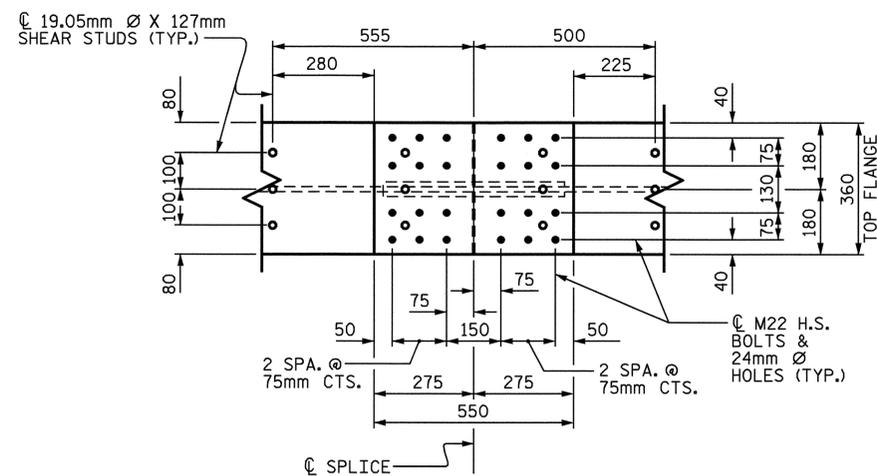
A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 18 METERS AND WEB PIECE LENGTHS TO 14 METERS. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 4.5 METERS OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 4.5 METERS OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 600mm MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 150mm MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

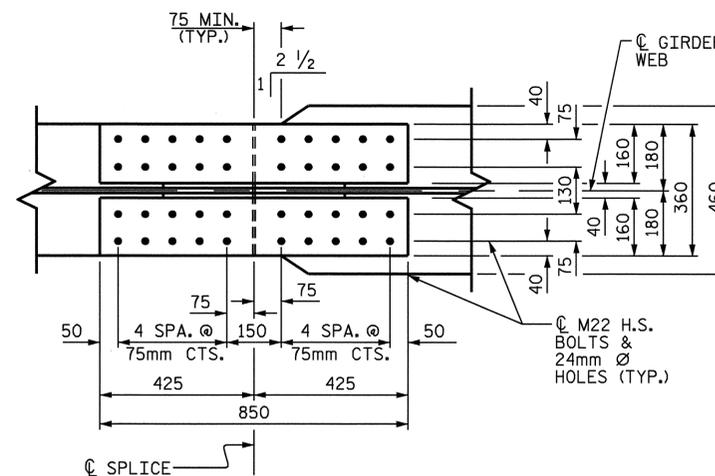
STUDS ON GIRDERS MAY BE SHIFTED UP TO 25mm IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

END OF BEAMS AND GIRDERS SHALL BE PLUMB.

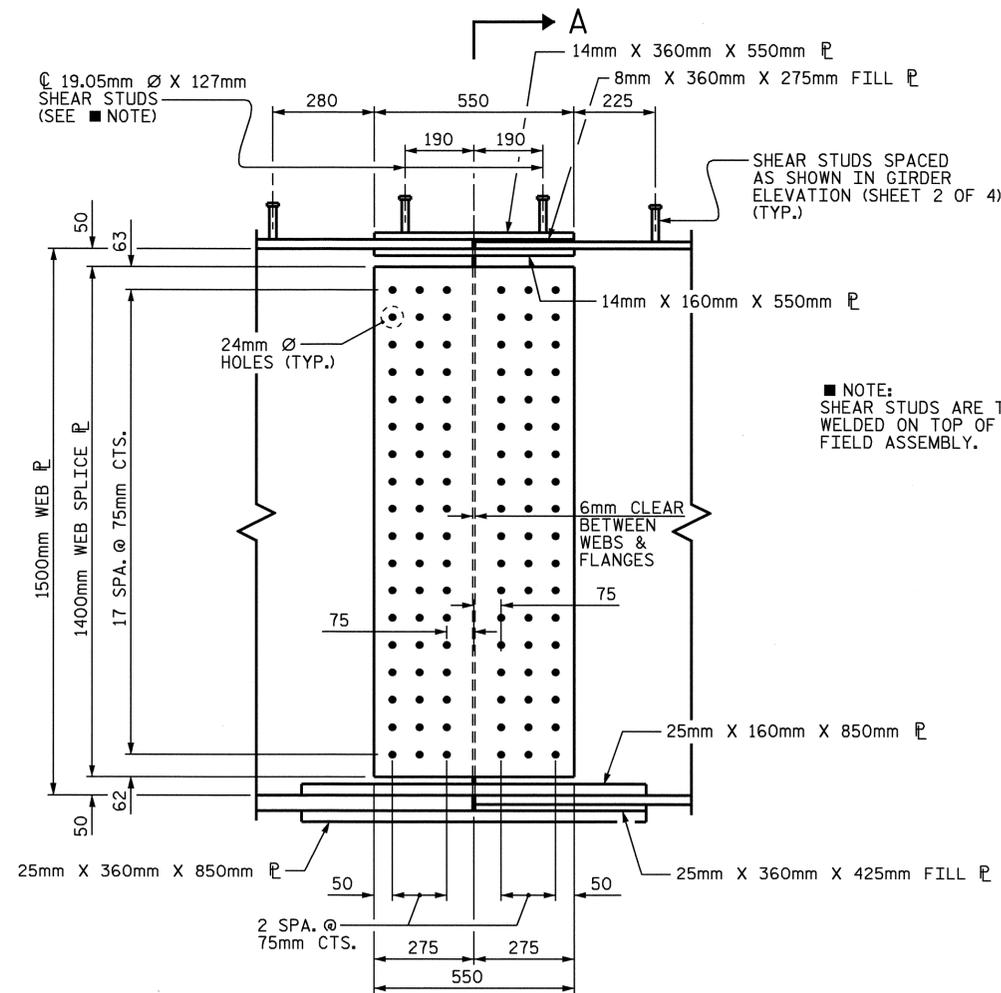
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-10 OF THE STANDARD SPECIFICATIONS.



PLAN (TOP OF TOP FLANGE)



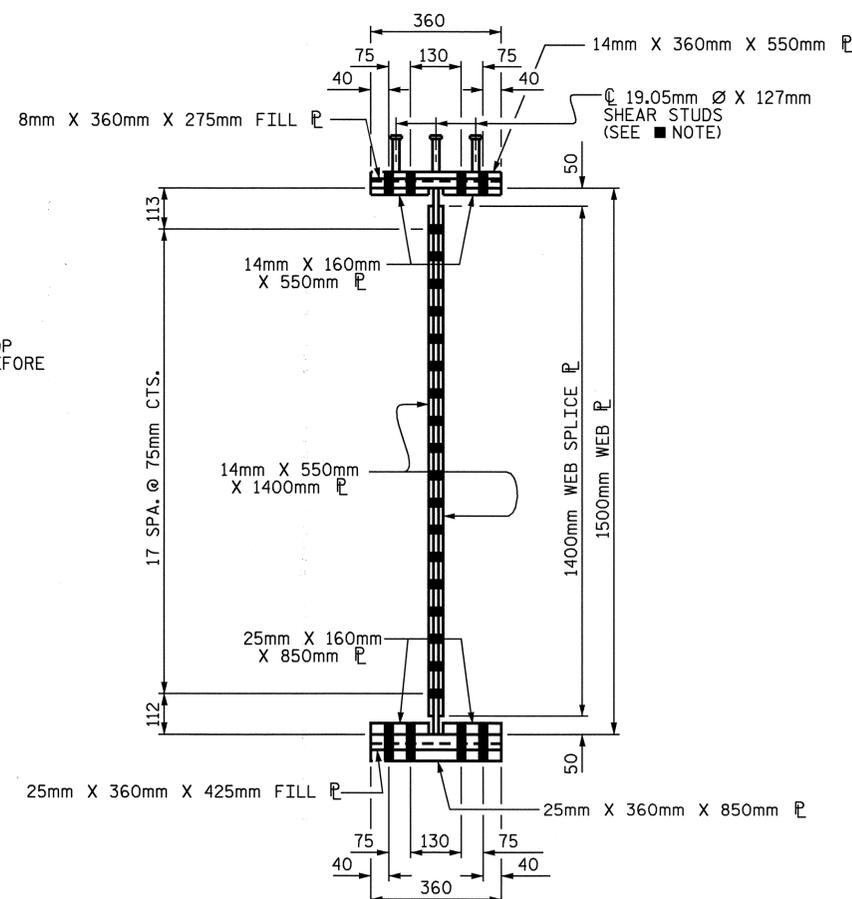
PLAN (TOP OF BOTTOM FLANGE)



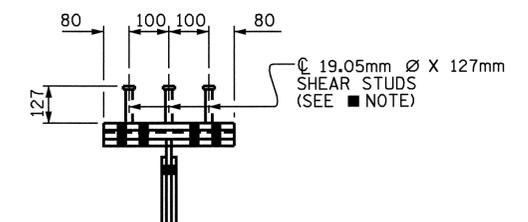
ELEVATION

BOLTED FIELD SPLICE DETAIL

(BOLTED FIELD SPLICE 2 SHOWN, BOLTED FIELD SPLICE 1 SIMILAR.)



SECTION A-A



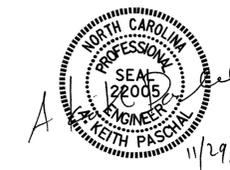
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
STRUCTURAL  
STEEL DETAILS



DRAWN BY: K.M.M. / A.M.K. DATE: 1/12/04  
CHECKED BY: J.KHARVA DATE: 12/5/05

07-NOV-2006 11:16  
R:\STRUCT-N\3119\str\Namkeeter\MICROS-N\FINALP-N\B32312-LDGN  
ameadows

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

TOTAL SHEETS: 24

STR. #1

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 51mm Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 345W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 345W AND SHALL NOT BE GALVANIZED, ANCHOR BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291M-12 OR AASHTO M292M-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293M. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 149°C. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

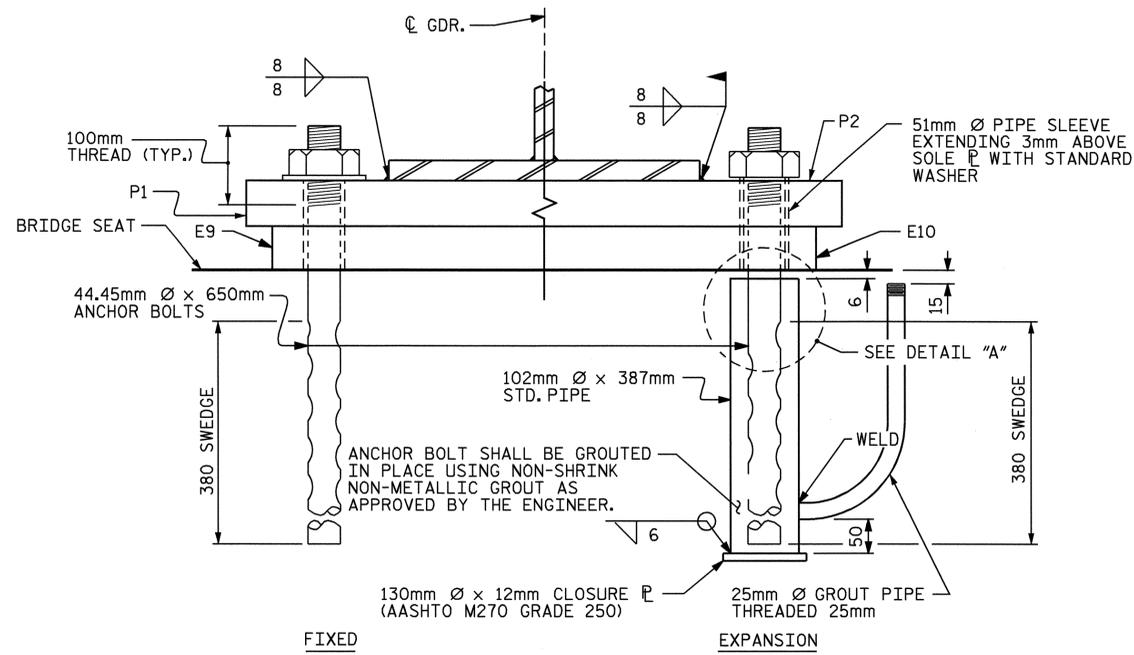
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION BEARING ASSEMBLY NEED NOT BE GALVANIZED.

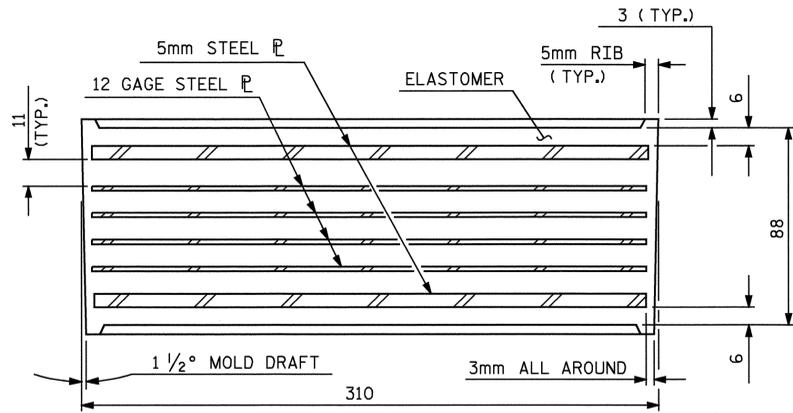
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES TO ACCOMMODATE GIRDER TRANSLATION AND END ROTATION:

- ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ANCHOR BOLTS, SOLE PLATE, AND ELASTOMERIC BEARING SLOTS SHALL BE CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 16° C.
- AFTER CENTERING THE SLOTS AND ANCHOR BOLTS, THE SOLE PLATES SHALL BE FIELD WELDED TO THE GIRDER FLANGES AND ANCHOR BOLTS GROUTED.

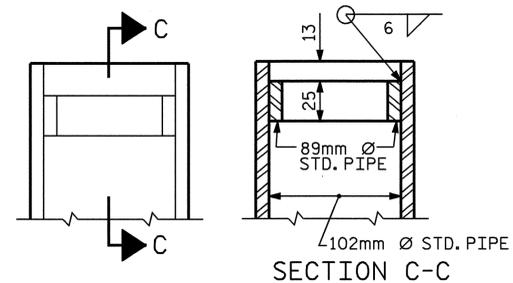
THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS. PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



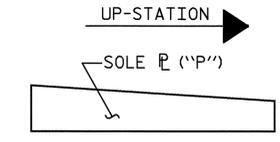
END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARING

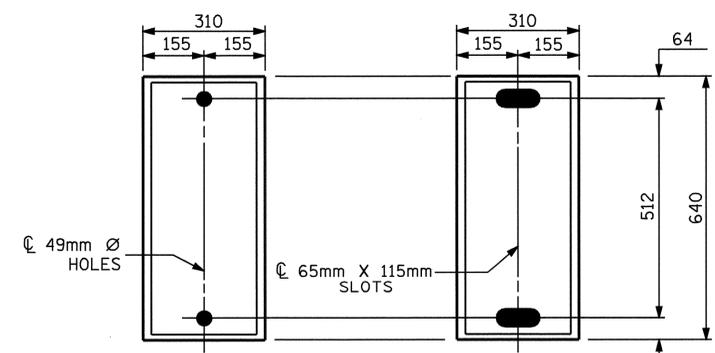


DETAIL "A"



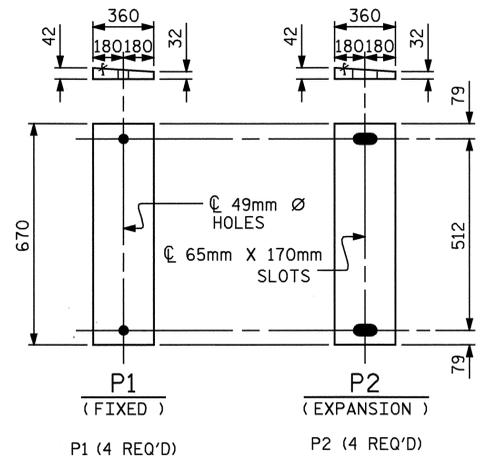
SOLE PLATE PLACEMENT DETAIL

-LOAD RATINGS-	
TYPE V	MAX. D.L.+ L.L. 943 kN



PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



SOLE PLATE DETAILS ("P")

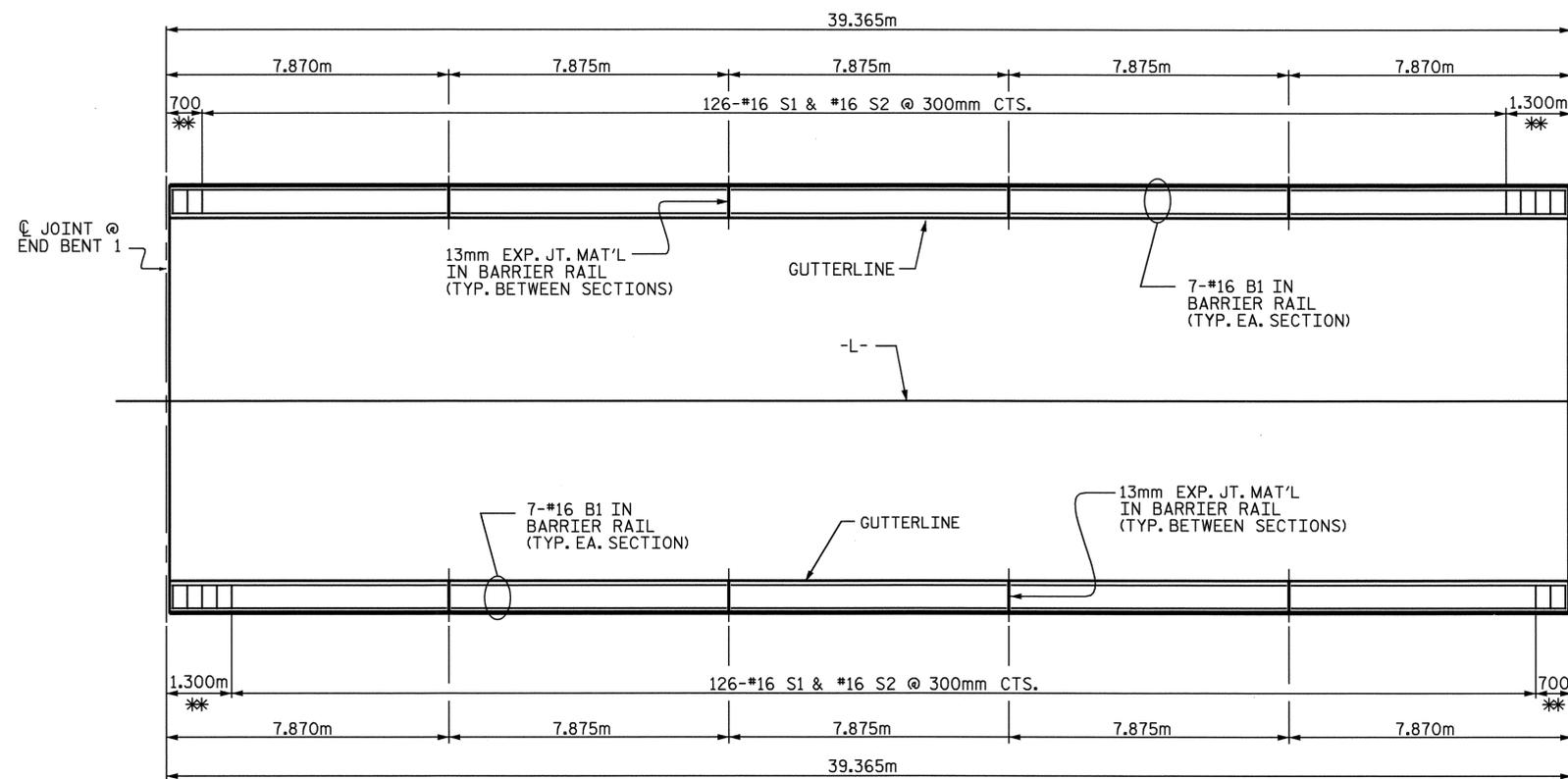
PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
(STEEL SUPERSTRUCTURE)



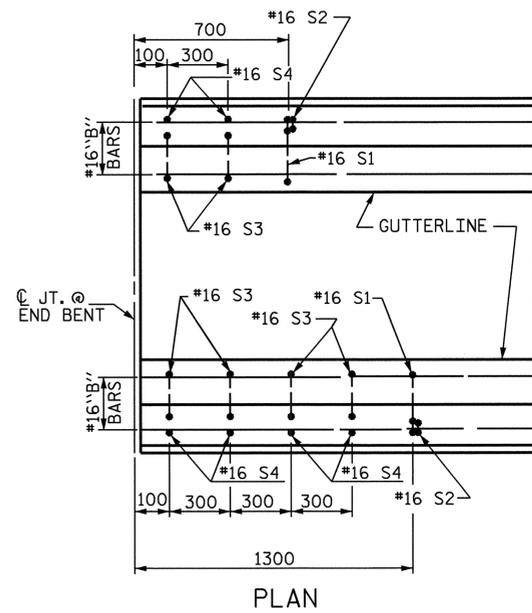
ASSEMBLED BY : K.M.M. / A.M.K.	DATE : 1/06/04
CHECKED BY : J.KHARVA	DATE : 12/5/05
DRAWN BY : EEM 10/95	REV. 7/17/98 RWW/LES
CHECKED BY : PEK 10/95	REV. 8/16/99 MAB/LES
	REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			24

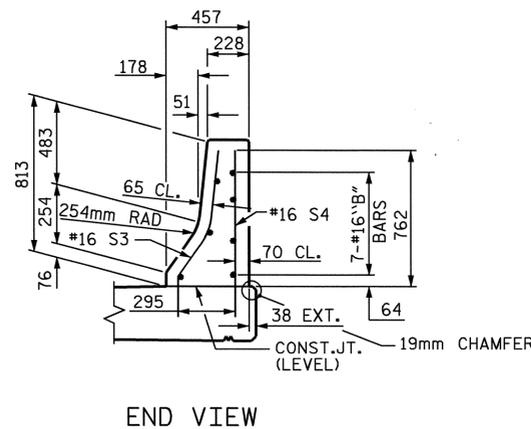


**PLAN OF BARRIER RAIL**

\*\* SEE END OF RAIL DETAILS FOR ADDITIONAL REINFORCING STEEL IN BARRIER RAIL.



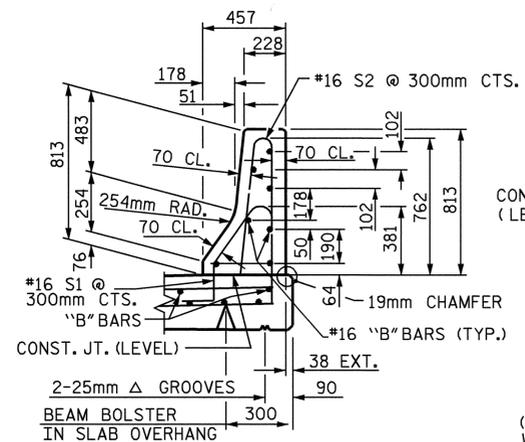
PLAN



END VIEW

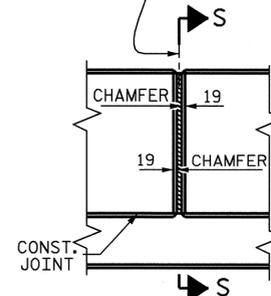
**END OF RAIL DETAILS**

FOR ADHESIVE ANCHORING AT SAWED JOINTS



SECTION THRU RAIL

© 13mm EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

**BARRIER RAIL DETAILS**

**NOTES**

THE BARRIER RAIL IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa.

WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

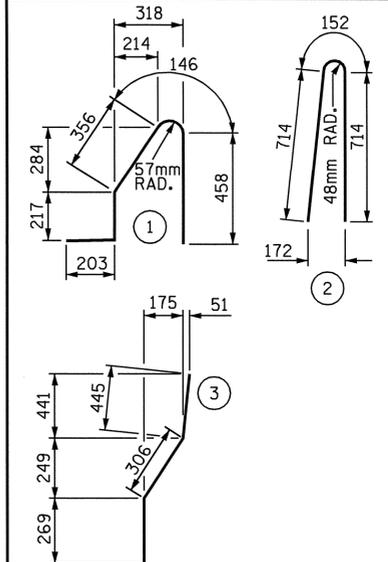
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #16 S3 AND #16 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. THE YIELD LOAD FOR THE #16 S3 AND #16 S4 BARS IS 82.7 KN. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

VERTICAL GROOVED CONTRACTION JOINTS, 12mm IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 6.1m IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 3.5m IN LENGTH.

THE #16 S1 & S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 50mm MINIMUM CLEARANCE TO THE 13mm EXPANSION JOINT MATERIAL IN BARRIER RAIL.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	70	#16	STR	7760	843
* S1	252	#16	1	1380	540
* S2	252	#16	2	1580	618
* S3	12	#16	3	1020	19
* S4	12	#16	STR	960	18
* EPOXY COATED REINFORCING STEEL					2038 kg
CLASS AA CONCRETE					19.8 m <sup>3</sup>
CONCRETE BARRIER RAIL					78.730m

PROJECT NO. B-3119  
 BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 CONCRETE  
 BARRIER RAIL



ASSEMBLED BY : K.M.M. / A.M.K.	DATE : 1/8/04
CHECKED BY : J.KHARVA	DATE : 12/7/05
DRAWN BY : ARB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 10/17/00 RWW/LES
	REV. 5/7/03 RWW/JTE

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 6mm HOLD DOWN PLATE AND 4 - 22.23mm Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 22.23mm Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

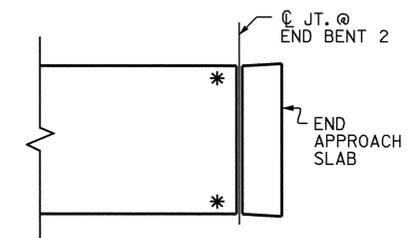
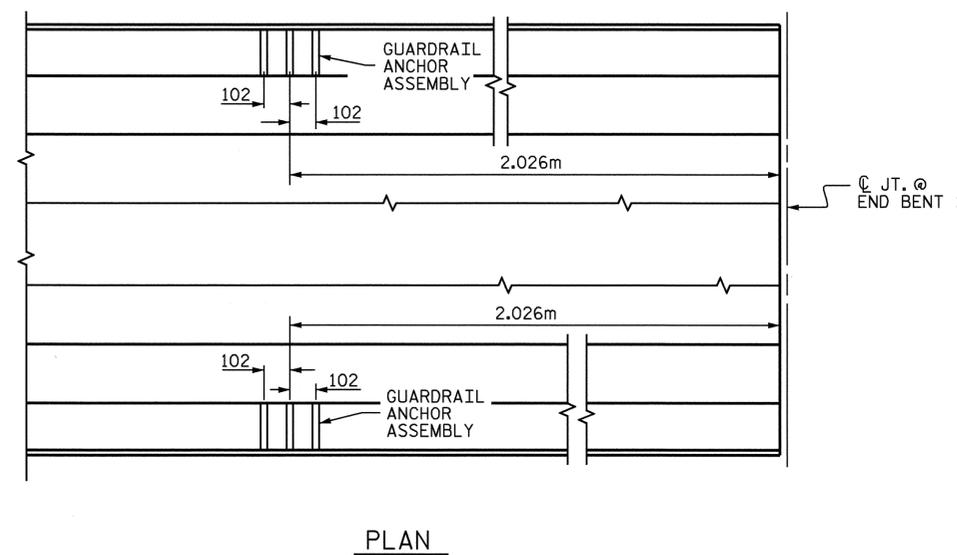
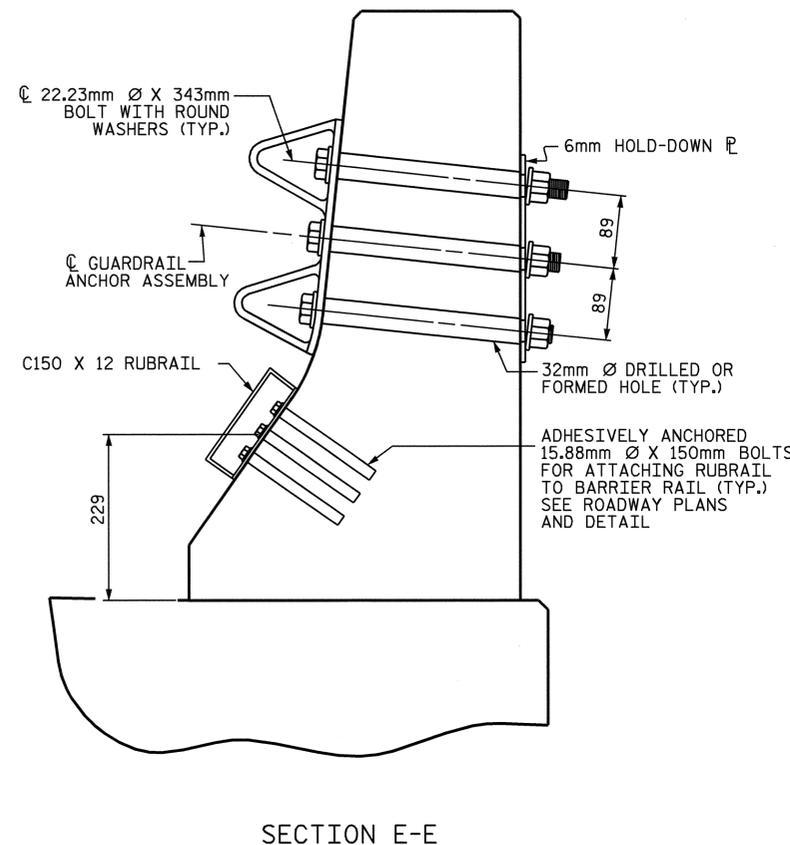
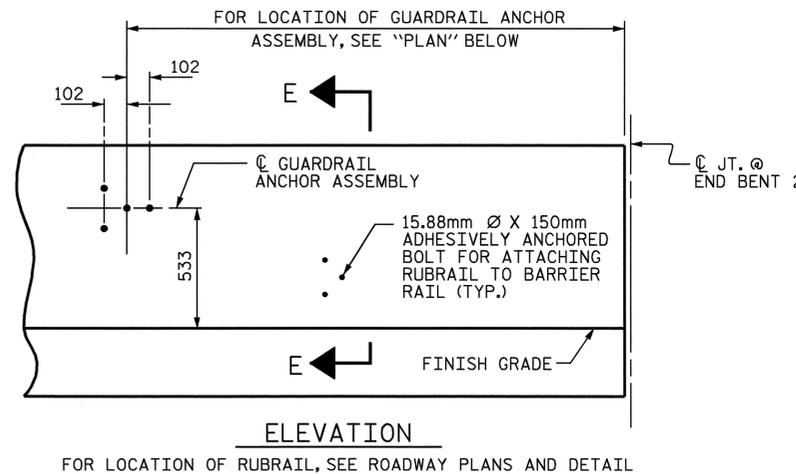
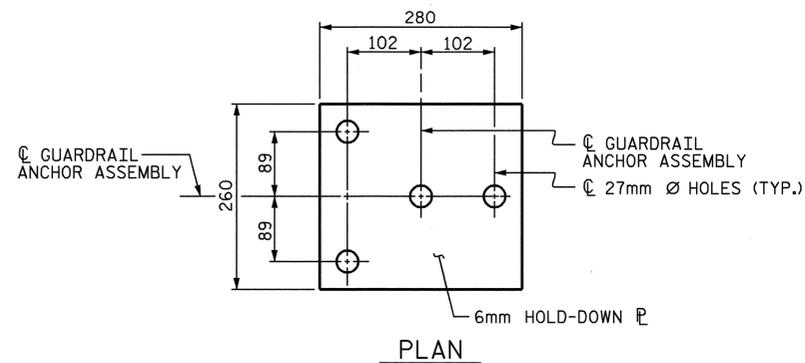
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 32mm Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C150 X 12 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 15.88mm Ø X 150mm BOLTS WITH WASHERS. SEE ROADWAY PLANS AND DETAIL FOR LOCATION OF THE RUBRAIL. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY @ END BENT 2. FOR GUARDRAIL ANCHOR ASSEMBLY @ END BENT 1, SEE APPROACH SLAB SHEET 3 OF 4.

GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL

(END BENT 2 ONLY)

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL



ASSEMBLED BY : A.M. KEETER	DATE : 9/20/06
CHECKED BY : J.G. KHARVA	DATE : 12/7/06
DRAWN BY : TLA 5/06	ADDED 5/1/06
CHECKED BY : GM 5/06	

30-NOV-2006 08:08  
R:\structures\b3119\str\amkeeter\Microstation\FINAL PLANS 2006\B3119.sd.BR.01.dgn  
kpaschal

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			24

STD. NO. GRA2SM STR. #1

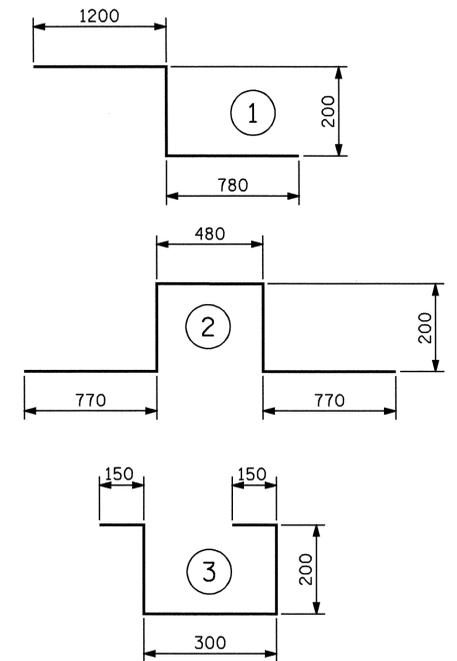
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#13	610	540	610	540	840
#16	770	660	770	660	1050
#19	920	790	1190	790	1330
#22	1580	1060			
#25	2080	1390			

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	246	#16	STR	10480	4001
A2	246	#16	STR	10480	4001
* B1	120	#13	STR	8340	995
B2	123	#16	STR	13520	2581
* G1	2	#16	STR	10480	33
* K1	8	#16	1	2180	27
* K2	8	#16	2	2420	30
K3	12	#16	STR	2680	50
* S1	48	#13	3	1000	48
REINFORCING STEEL =					6632 kg
* EPOXY COATED REINFORCING STEEL =					5134 kg

BAR TYPES



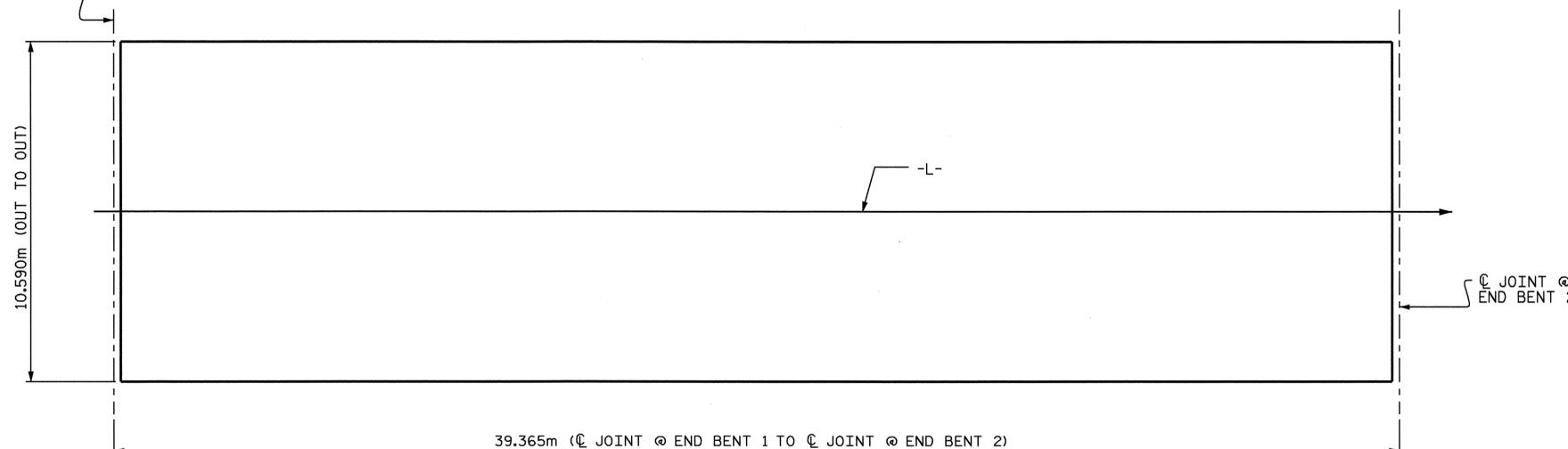
ALL BAR DIMENSIONS ARE OUT TO OUT

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE (CU.METER)	REINFORCING STEEL (kg)	EPOXY COATED REINFORCING STEEL (kg)
TOTALS **	110.0	6632	5134

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

CL. JOINT @ END BENT 1



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. METER = 416.6)

GROOVING BRIDGE FLOORS	
APPROACH SLABS	42.5 m <sup>2</sup>
BRIDGE DECK	340.8 m <sup>2</sup>
TOTAL	383.3 m <sup>2</sup>

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

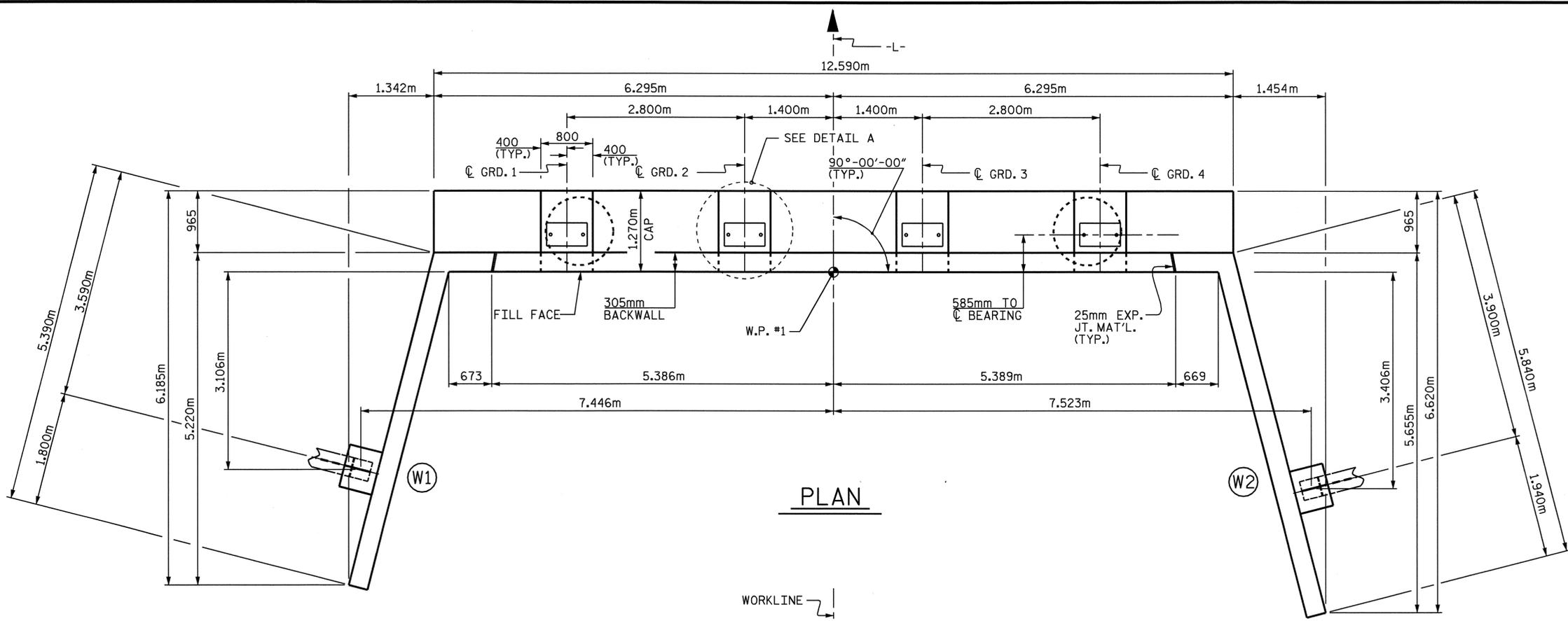
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
BILL OF MATERIAL



DRAWN BY : K.M.M. / A.M.K. DATE : 1/13/04  
CHECKED BY : J.KHARVA DATE : 12/7/05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			24



**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

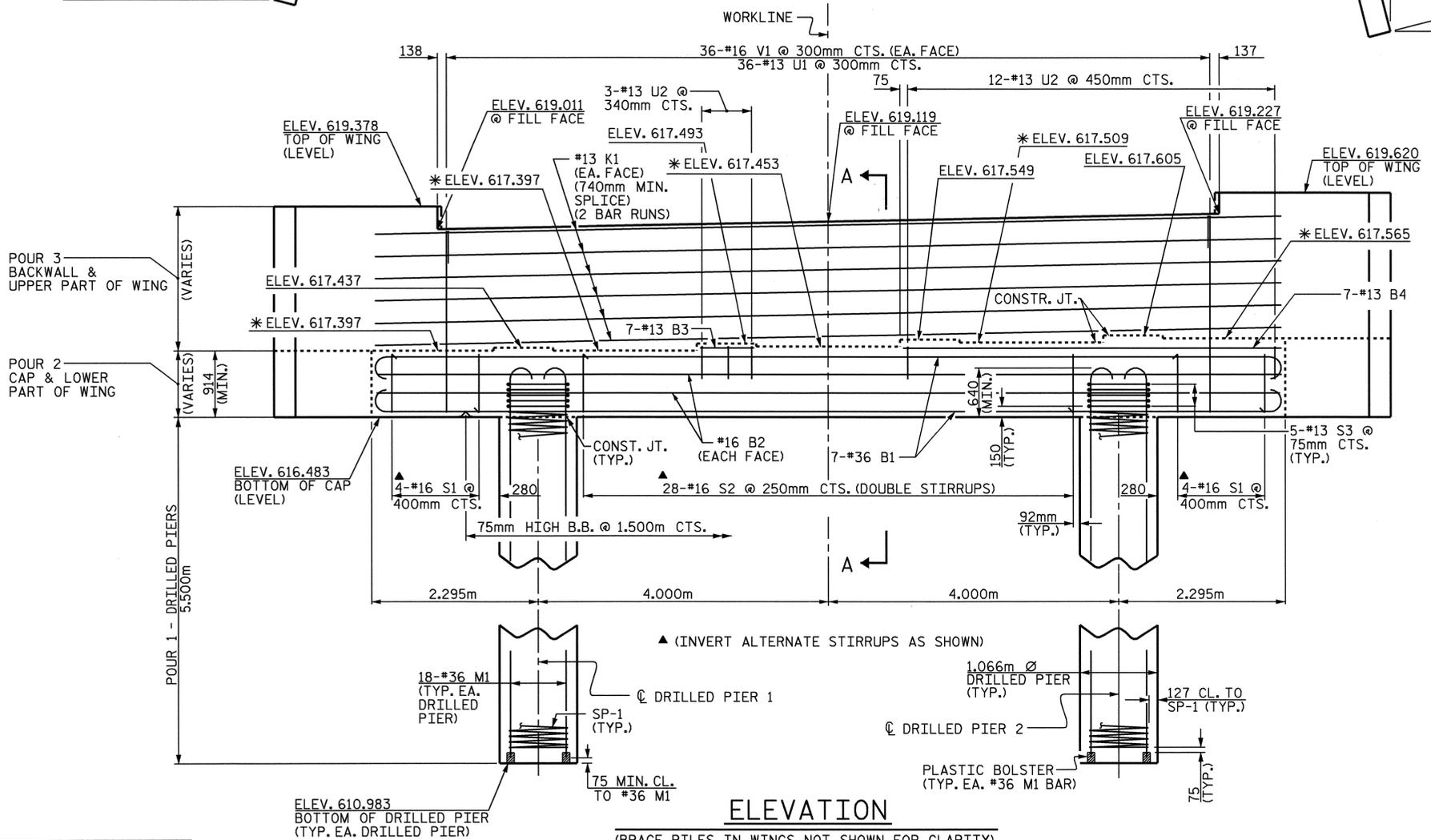
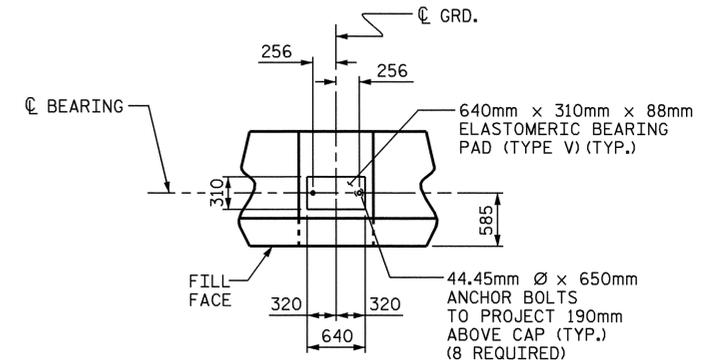
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH ONE METER OF EXTRA LENGTH.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 102mm DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PROJECT NO. B-3119  
 BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1**

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

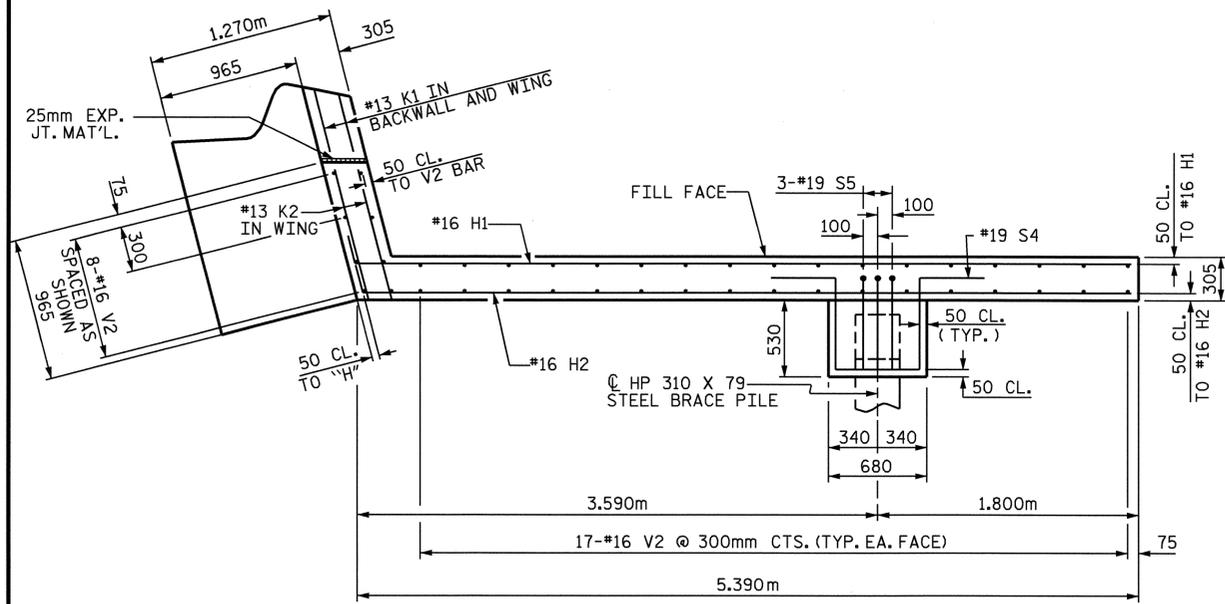
SHEET NO. S-14



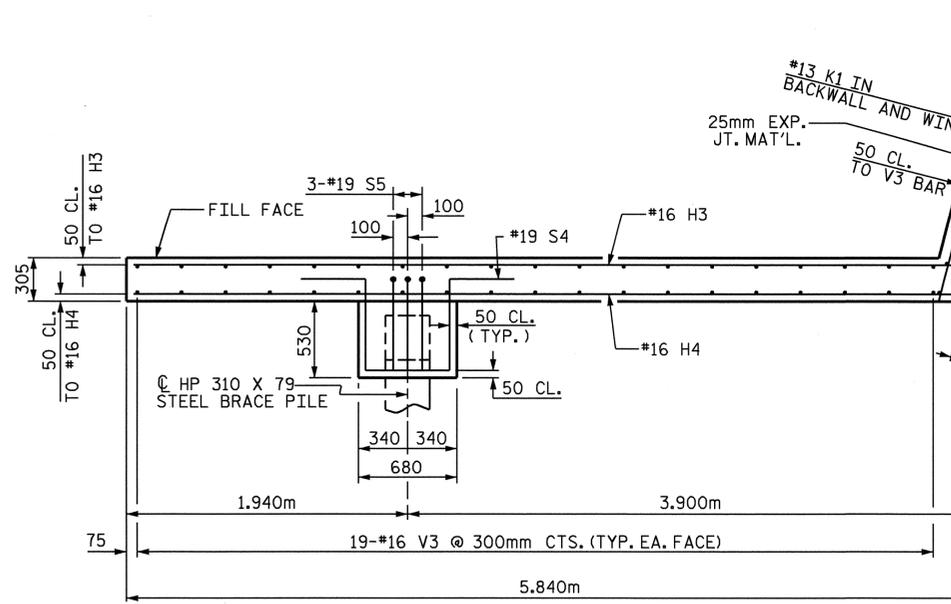
DRAWN BY: J.D.HAWK DATE: 9/25/06  
 CHECKED BY: A.M.KEETER DATE: 1/11/06

29-NOV-2006 08:53  
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 jdhawk

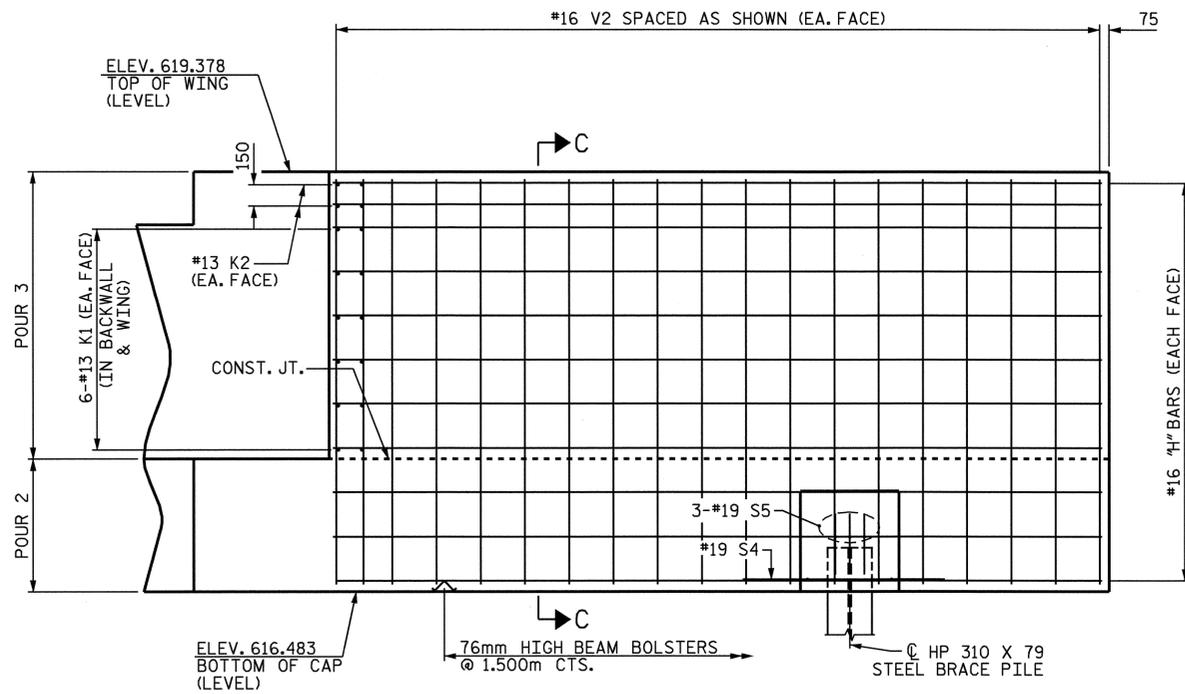
(BRACE PILES IN WINGS NOT SHOWN FOR CLARITY)  
 \*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.



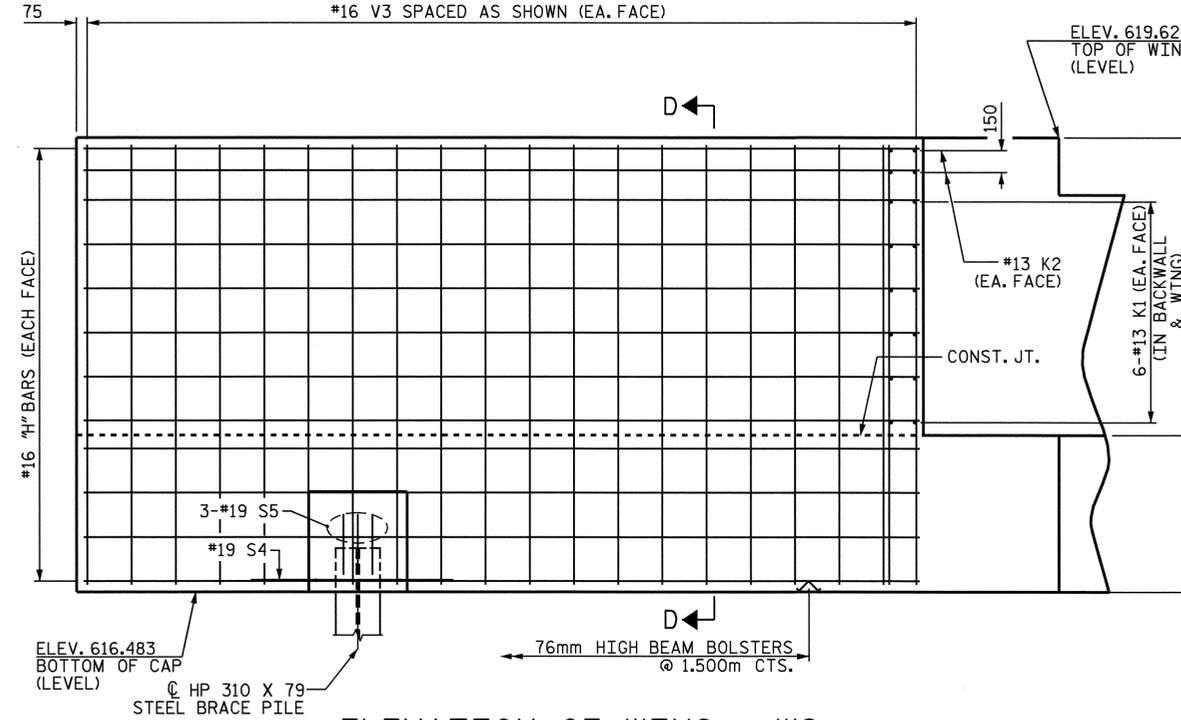
PLAN OF WING - W1



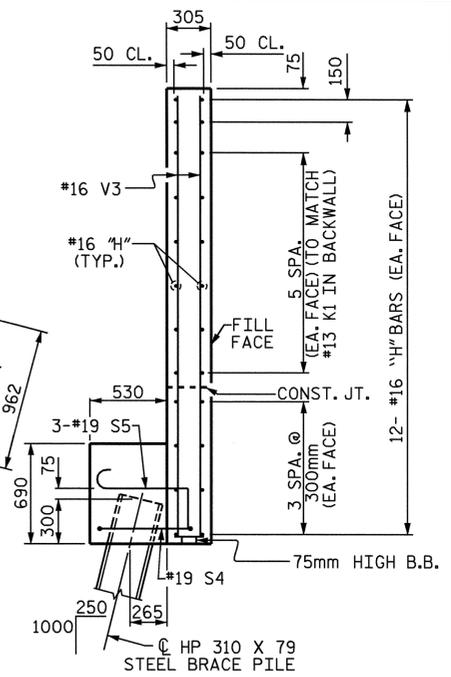
PLAN OF WING - W2



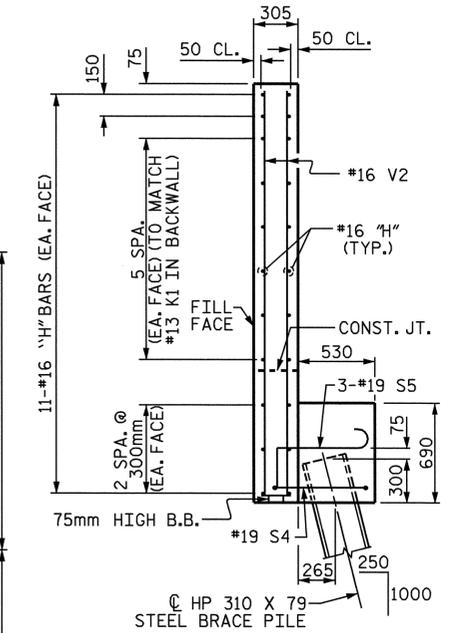
ELEVATION OF WING - W1



ELEVATION OF WING - W2



SECTION D-D



SECTION C-C

PROJECT NO. B-3119  
 BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1



DRAWN BY: J.D. HAWK DATE: 9/25/05  
 CHECKED BY: A.M. KEETER DATE: 1/11/06

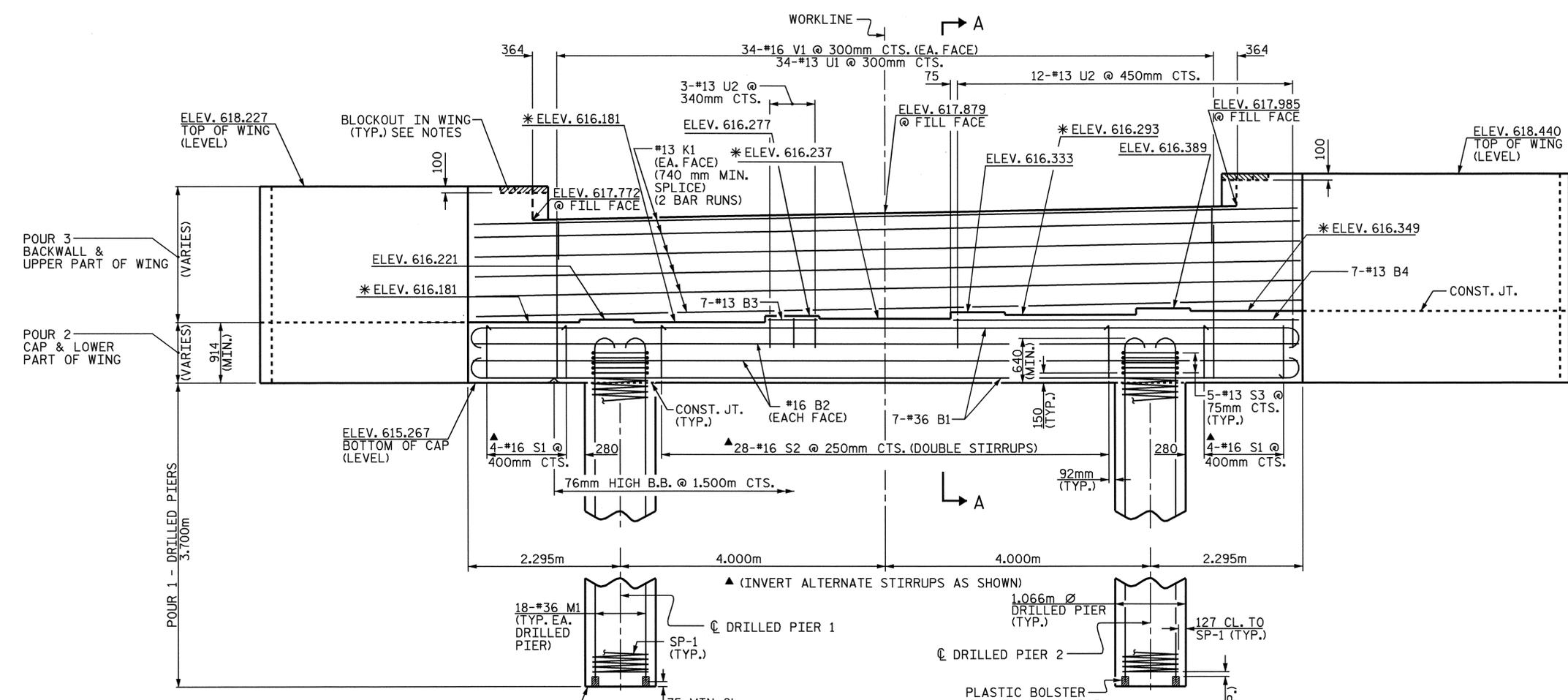
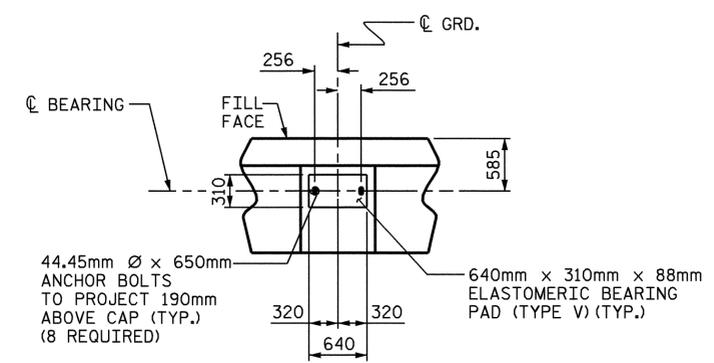
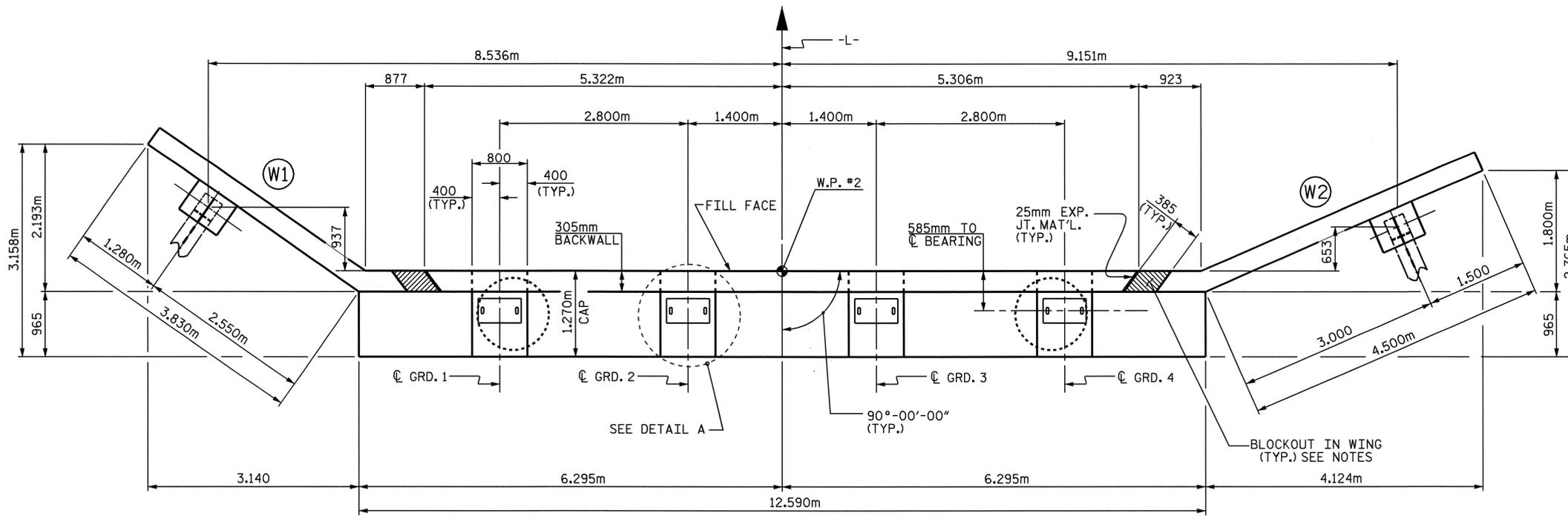
29-NOV-2006 08:54  
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 jdhawk

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	
2			4			24	



**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH ONE METER OF EXTRA LENGTH.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 102mm DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

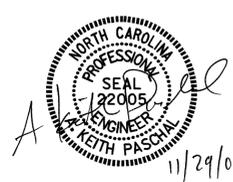


PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2**

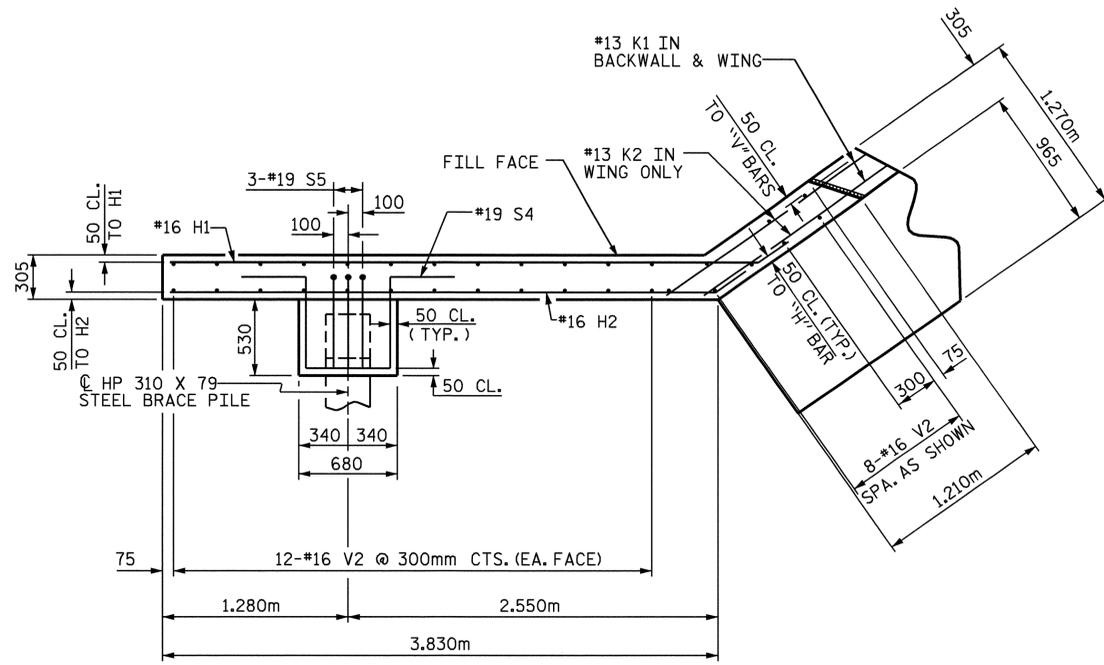


REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	24
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2			4			

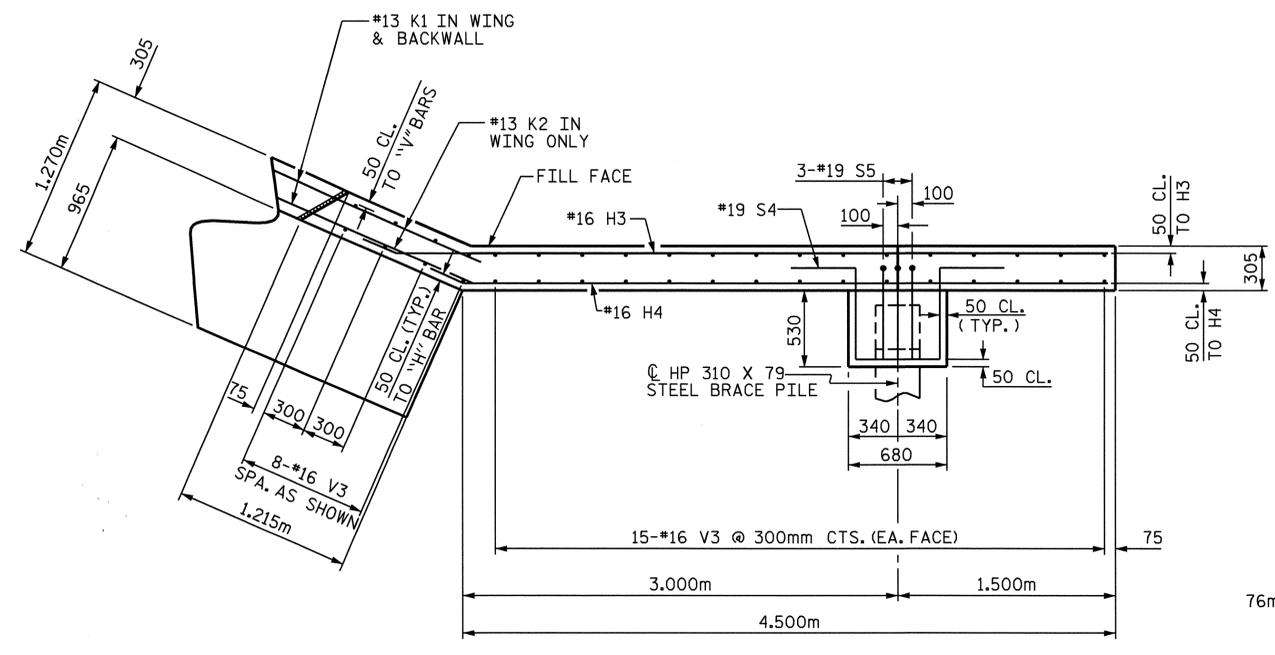
DRAWN BY: J. D. HAWK DATE: 12/22/05  
 CHECKED BY: A.M. KEETER DATE: 1/11/06

29-NOV-2006 08:54  
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 jdhawk

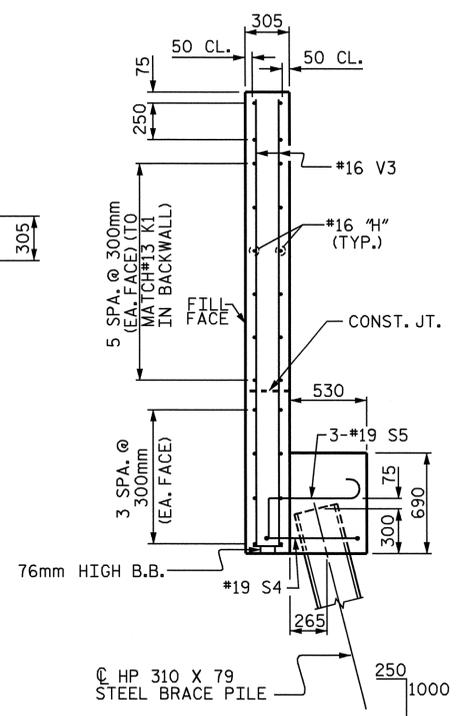
\* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.



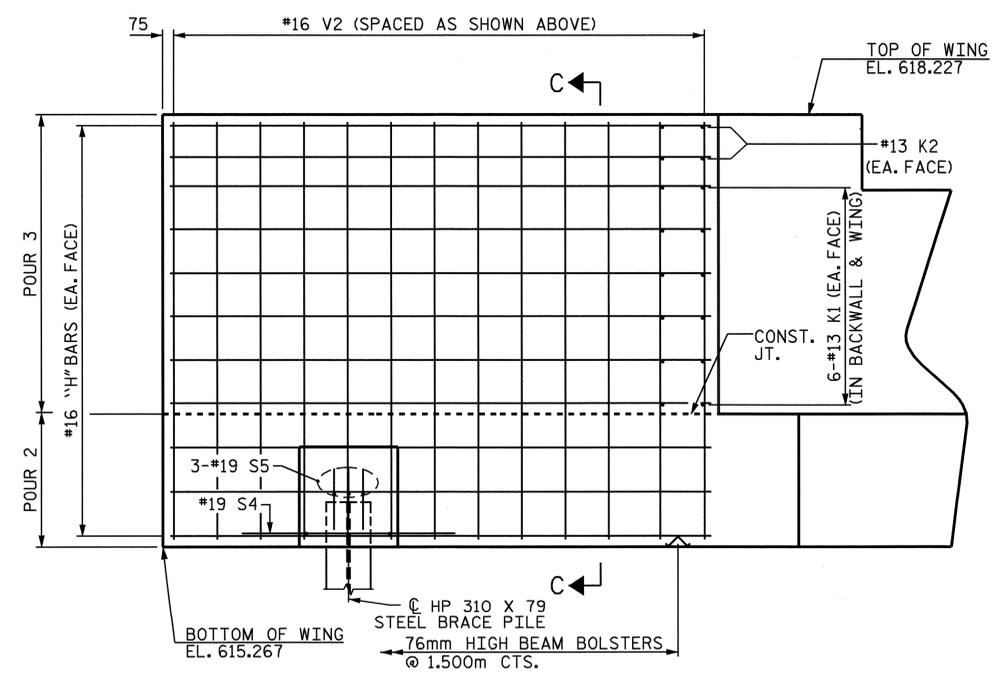
**PLAN OF WING W1**



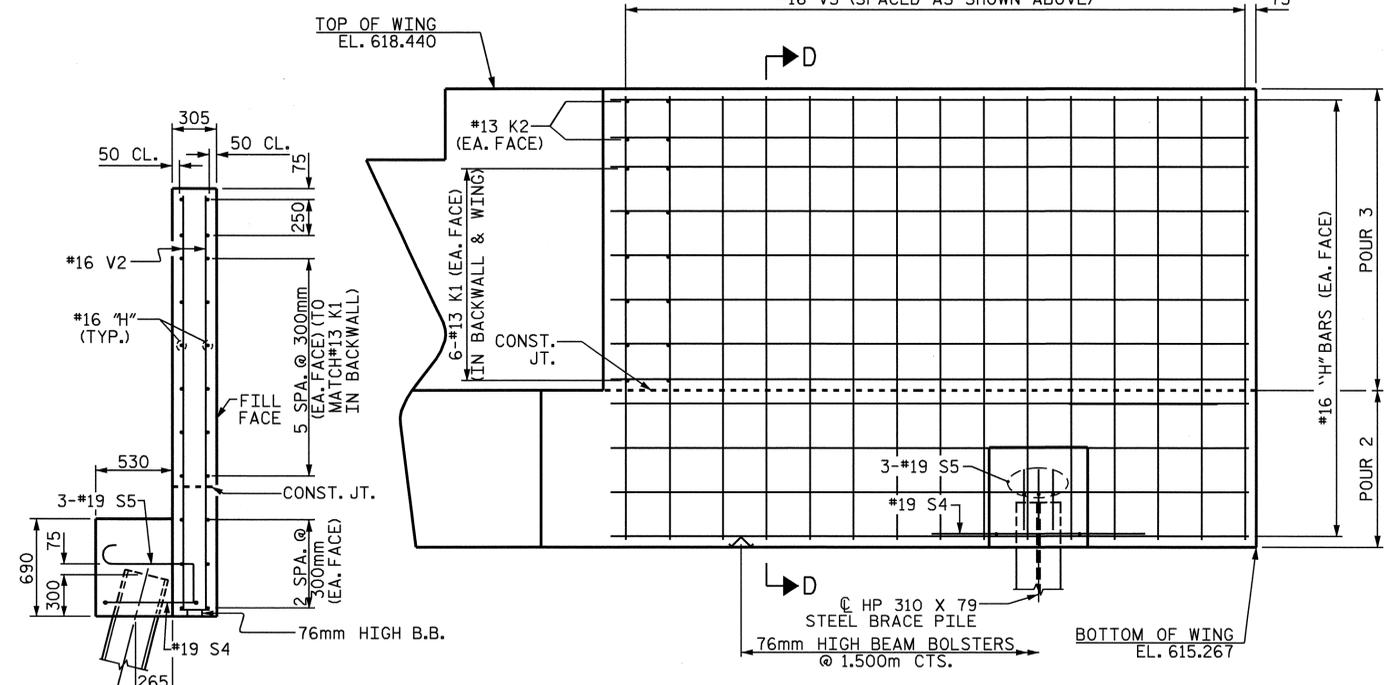
**PLAN OF WING W2**



**SECTION D-D**



**ELEVATION OF WING W1**



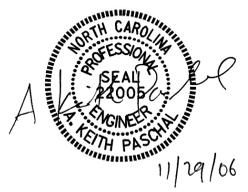
**ELEVATION OF WING W2**

**SECTION C-C**

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 2 OF 3

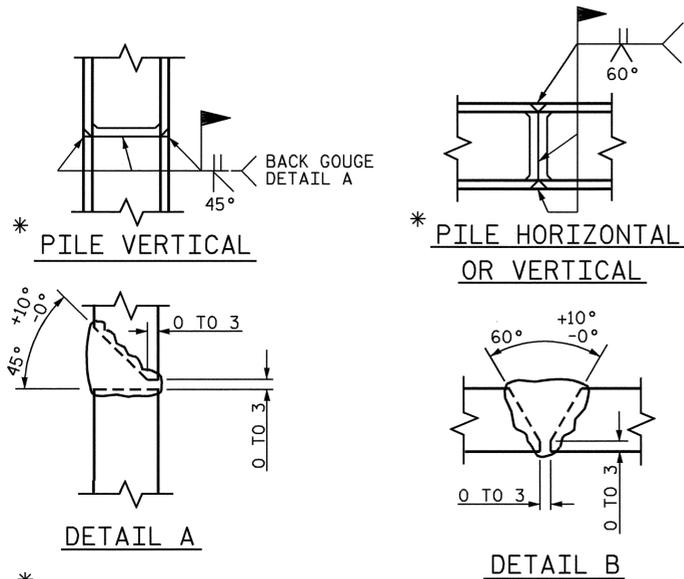
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-18
TOTAL SHEETS					24



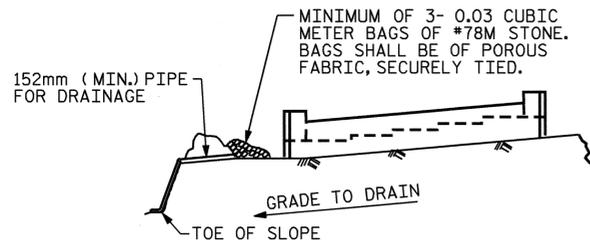
11/19/06

DRAWN BY: J.D. HAWK DATE: 9/25/05  
 CHECKED BY: A.M. KEETER DATE: 1/11/06

28-NOV-2006 10:19  
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 jdhawk



**PILE SPLICE DETAILS**

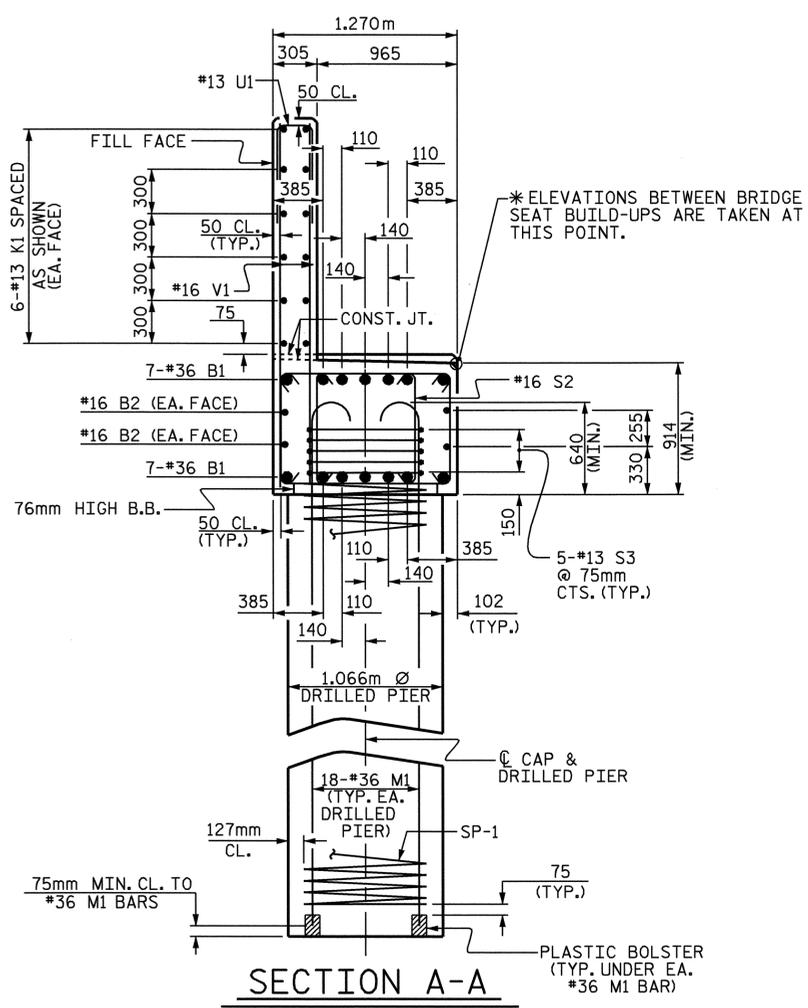


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC, PERFORATED PIPE WILL NOT BE ALLOWED.

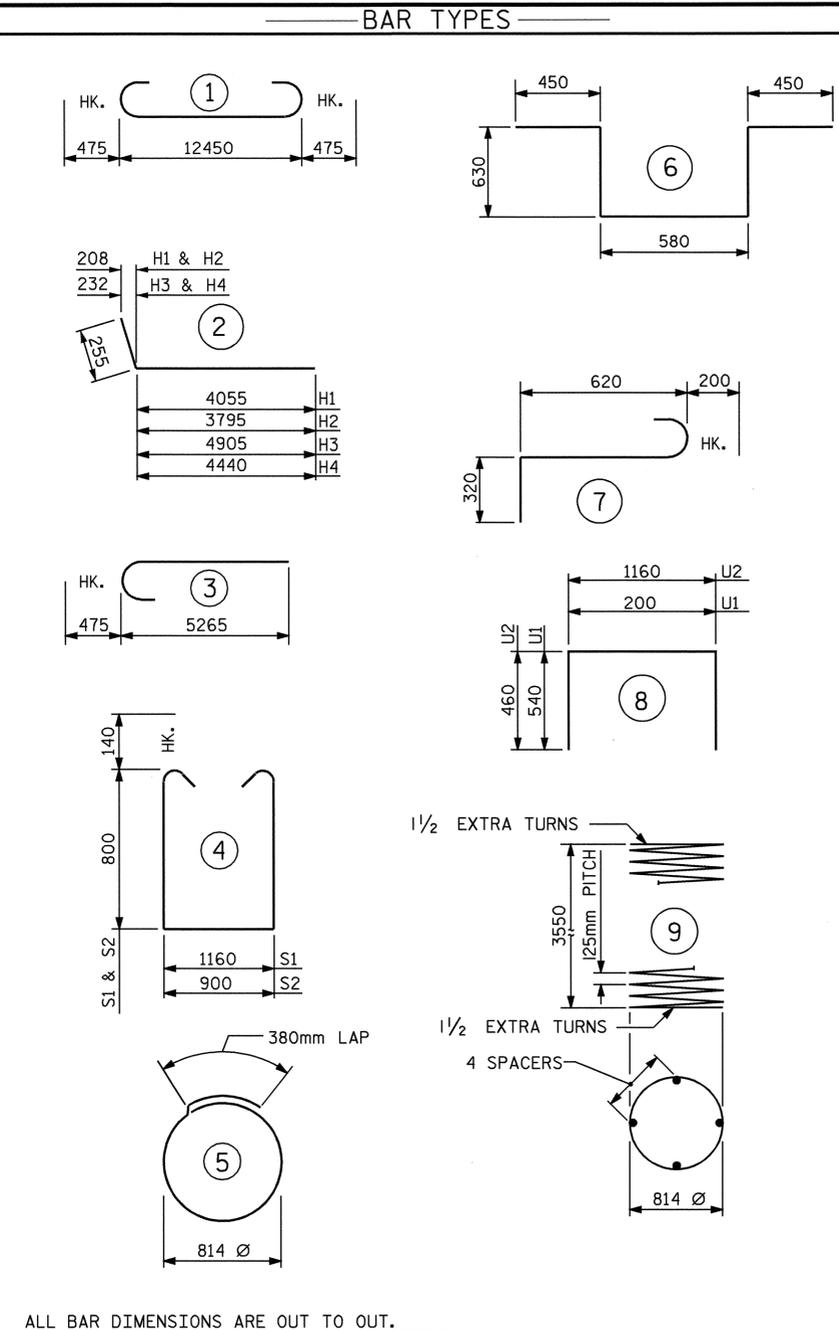
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**

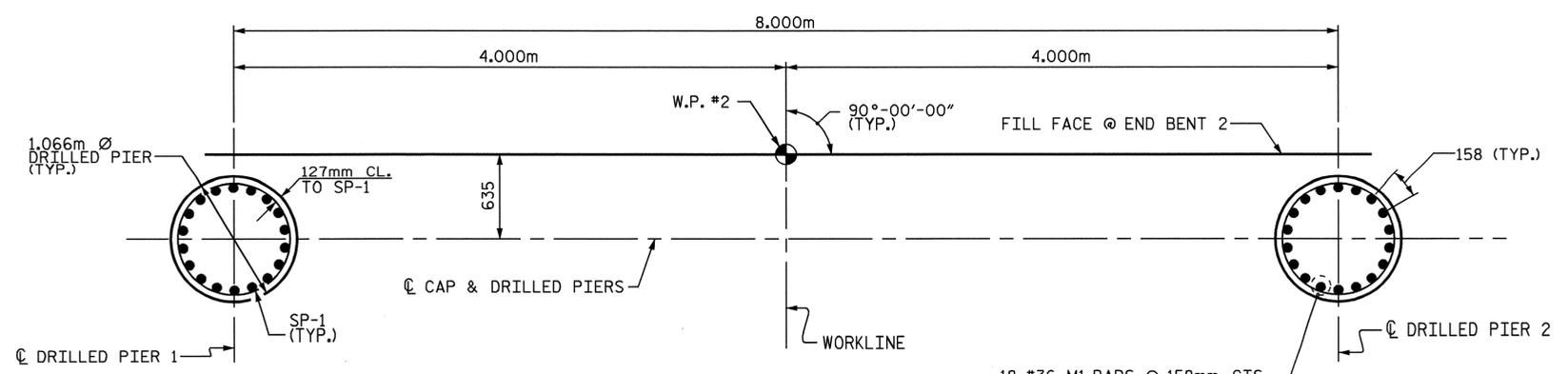


**SECTION A-A**



ALL BAR DIMENSIONS ARE OUT TO OUT.  
 \*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #16 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#36	1	13400	1483
B2	4	#16	STR	12480	78
B3	7	#13	STR	700	5
B4	7	#13	STR	5180	36
H1	11	#16	2	4300	73
H2	11	#16	2	4040	69
H3	12	#16	2	5160	96
H4	12	#16	2	4700	88
K1	24	#13	STR	6620	158
K2	8	#13	STR	1200	10
M1	36	#36	3	5740	1634
S1	8	#16	4	3040	38
S2	56	#16	4	2780	243
S3	10	#13	5	2940	29
S4	2	#19	6	2740	12
S5	6	#19	7	1140	15
U1	36	#13	8	1280	46
U2	15	#13	8	2080	31
V1	72	#16	STR	2400	253
V2	32	#16	STR	2860	142
V3	38	#16	STR	3060	180
REINFORCING STEEL					4719
SP-1	2	**	9	78640	244
SPIRAL COLUMN REINFORCING STEEL					kg. 244
CLASS A CONCRETE BREAKDOWN					
POUR 2: (CAP & LOWER PART OF WINGS)					19.0m <sup>3</sup>
POUR 3: (BACKWALL & UPPER PART OF WINGS)					11.4m <sup>3</sup>
TOTAL CONCRETE					30.4m <sup>3</sup>
DRILLED PIER CONCRETE					
POUR 1					6.6m <sup>3</sup>
1066mm Ø DRILLED PIERS IN SOIL					4.4m
NOT IN SOIL					3.0m
HP 310 x 79 STEEL PILES					No. 2
LENGTH					5.6m
PILE EXCAVATION IN SOIL					4.6m
PILE EXCAVATION NOT IN SOIL					1.0m



**PLAN OF DRILLED PIERS**

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

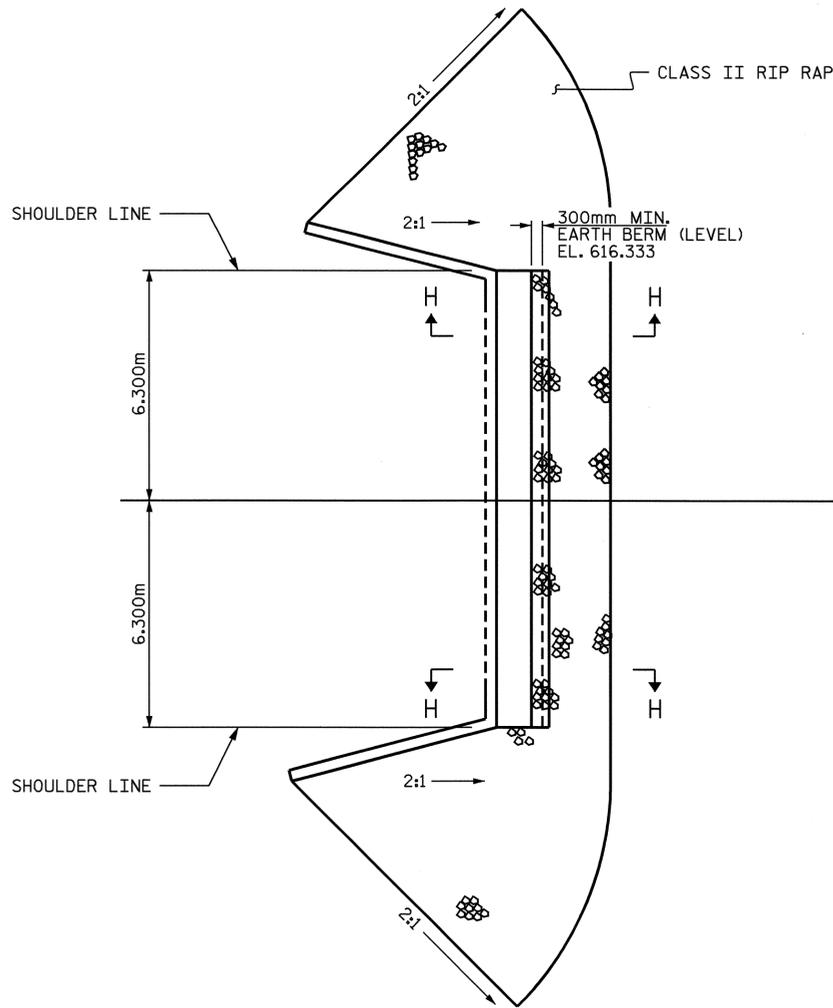
**SUBSTRUCTURE  
 END BENT 2**



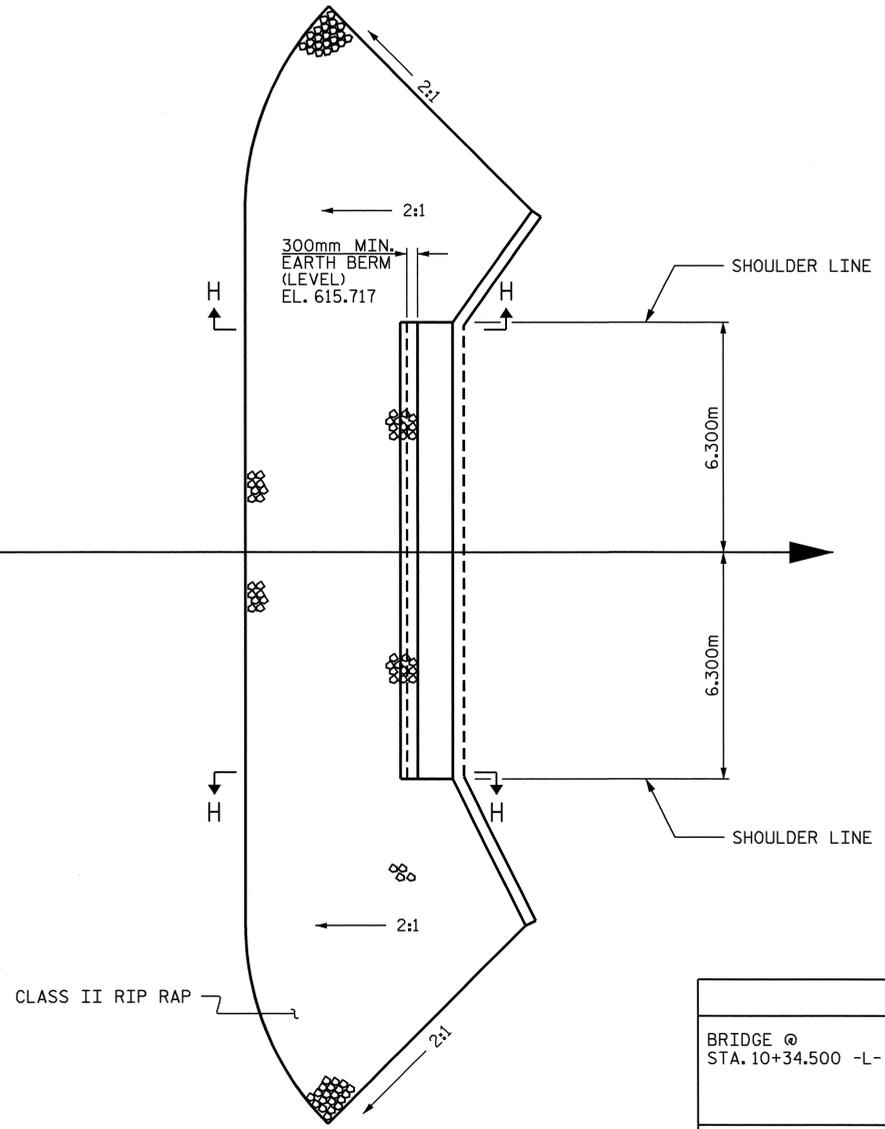
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: J.D. HAWK DATE: 9/25/05  
 CHECKED BY: A.M. KEETER DATE: 1/11/06

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

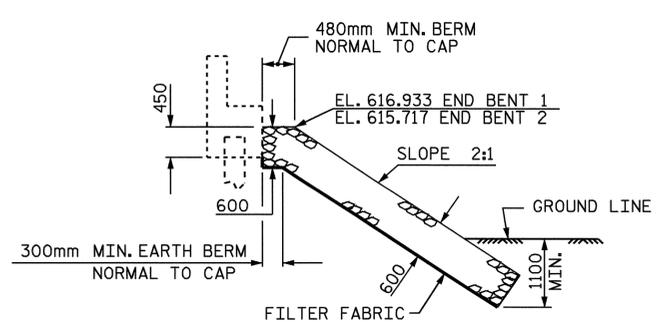


PLAN @ END BENT 1

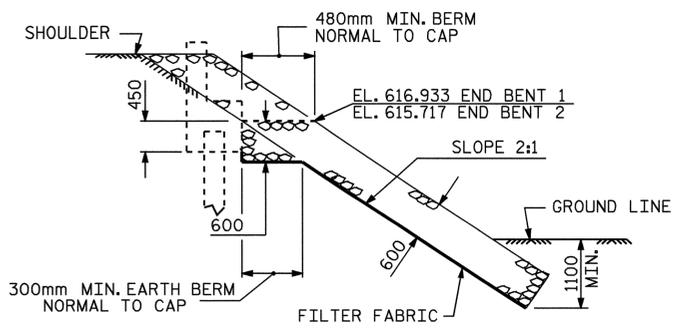


PLAN @ END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 10+34.500 -L-	PLAIN RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	METRIC TONS	SQUARE METERS
END BENT 1	95	106
END BENT 2	160	178



SECTION  
BERM RIP RAPPED



SECTION H-H

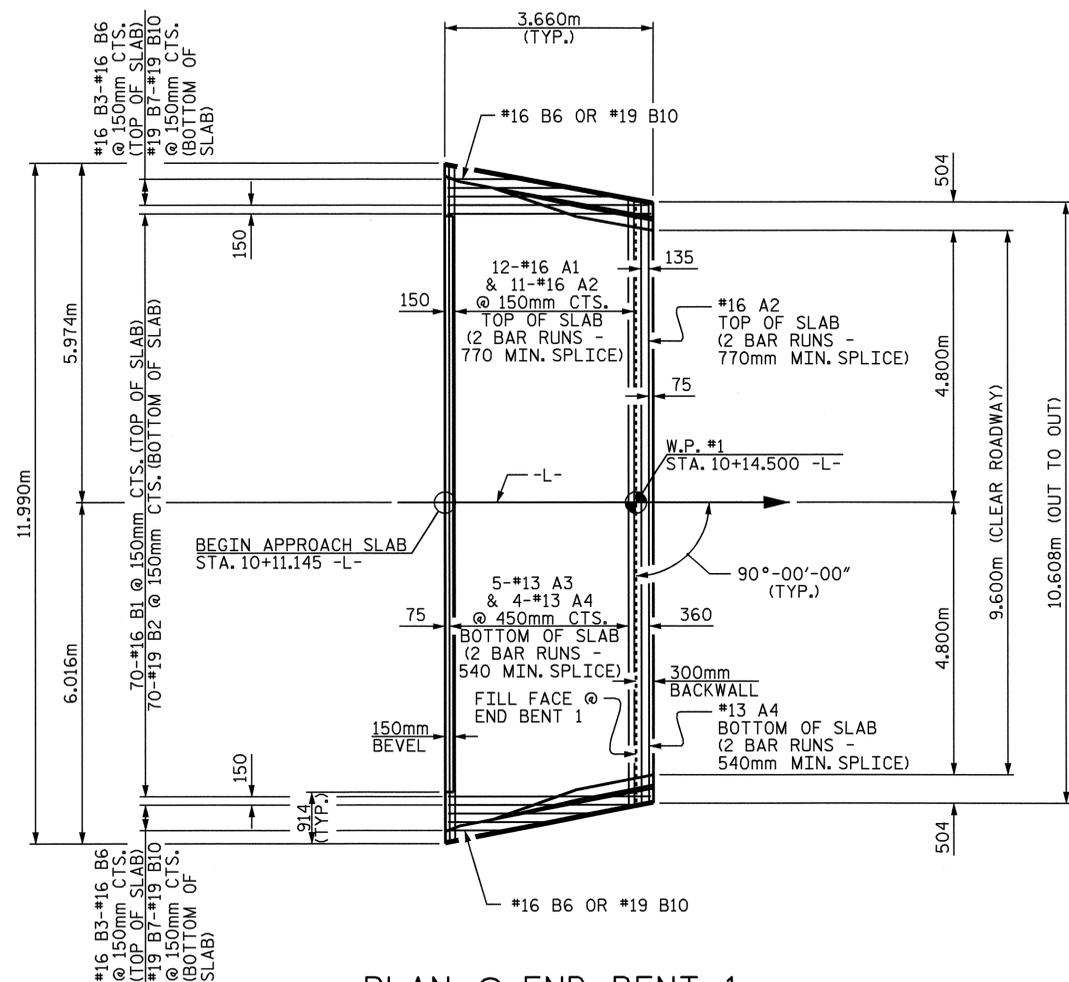
PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
—RIP RAP DETAILS—

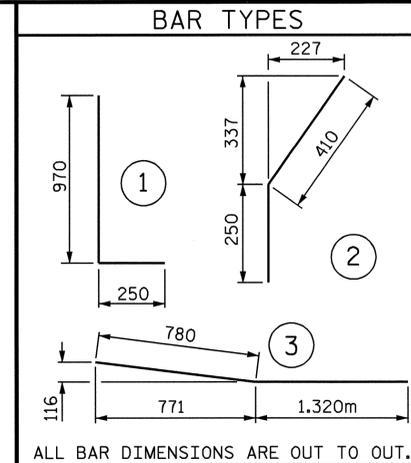


ASSEMBLED BY : A.M.KEETER	DATE : 9/5/05
CHECKED BY : J.KHARVA	DATE : 12/9/05
DRAWN BY : FCJ 2/88	REV. 7/17/98 REK/RWW
CHECKED BY : ARB 8/88	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			24



PLAN @ END BENT 1



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#16	STR	6300	235
*A2	24	#16	STR	5960	222
A3	10	#13	STR	6200	62
A4	8	#13	STR	5740	46
*B1	70	#16	STR	3400	369
B2	70	#19	STR	3560	557
*B3	2	#16	STR	3200	9
*B4	2	#16	STR	2440	8
*B5	2	#16	STR	1660	5
B7	2	#19	STR	3200	14
B8	2	#19	STR	2440	11
B9	2	#19	STR	1660	7
B10	2	#19	STR	900	4
*B11	2	#16	3	2100	7
*B12	14	#16	STR	3640	79
REINFORCING STEEL				kg.	701
*EPOXY COATED REINFORCING STEEL				kg.	1142
CLASS AA CONCRETE BREAKDOWN					
POUR 1 SLAB				C. M.	10.9
POUR 2 RAIL				C. M.	2.4
CLASS AA CONCRETE				C. M.	13.3

NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE BID FOR BRIDGE APPROACH SLABS.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 102mm Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE.

THE 150mm COMP. A.B.C. SHALL EXTEND 3m BEYOND THE END OF THE APPROACH SLAB AND 300mm OUTSIDE OF EACH EDGE OF THE SLAB.

THE CONTRACTOR MAY USE 100mm TYPE B-25.0B ASPHALT CONCRETE COURSE IN LIEU OF 150mm COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 300mm BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

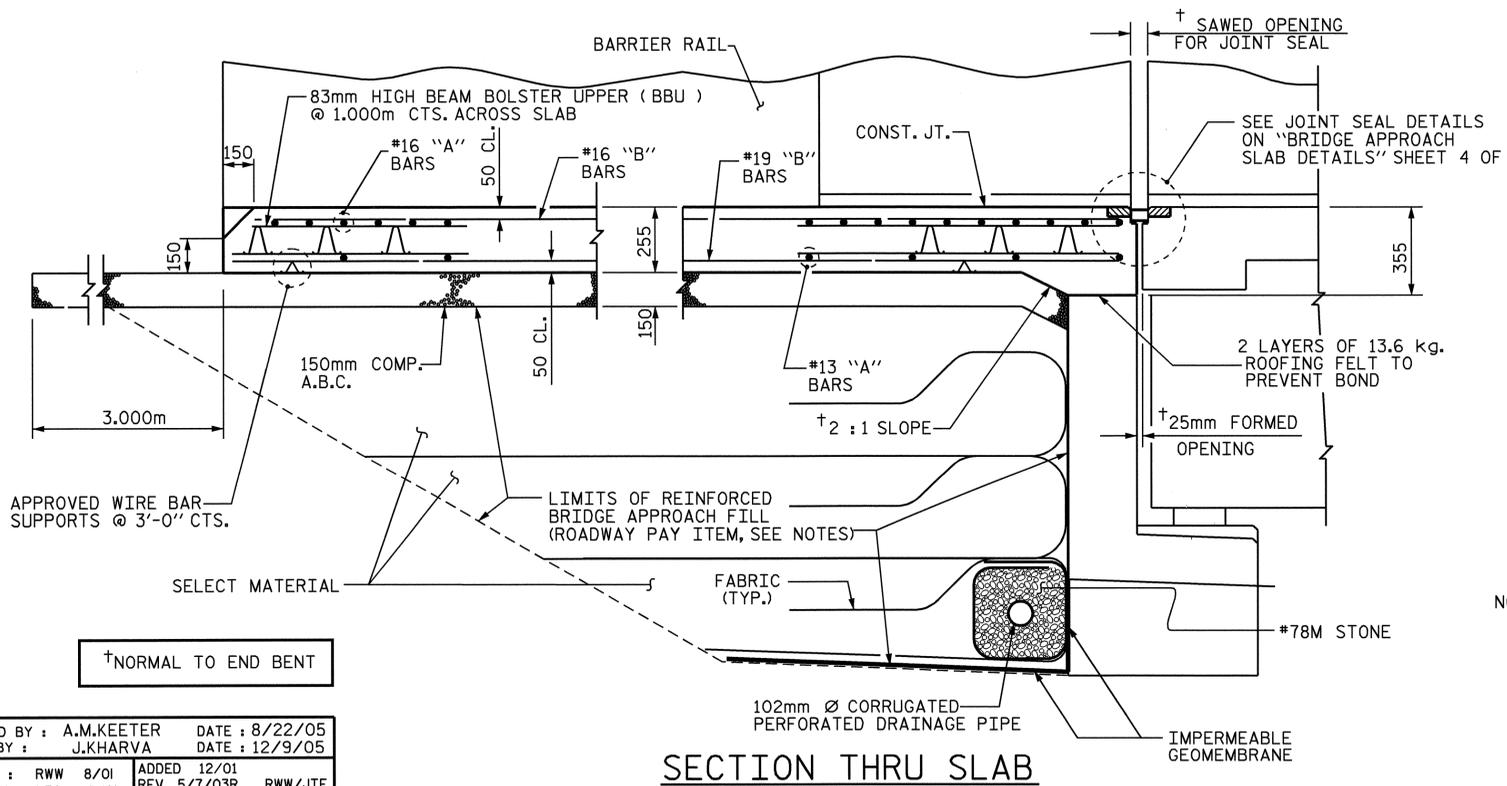
THE CONTRACTOR MAY USE 125mm CLASS "A" CONCRETE BASE IN LIEU OF 150mm COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 300mm BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 13.6 kg. ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

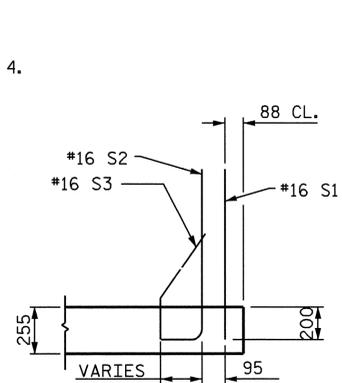
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 64mm.

THE JOINT SHALL BE SAWS PRIOR TO CASTING THE BARRIER RAIL.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

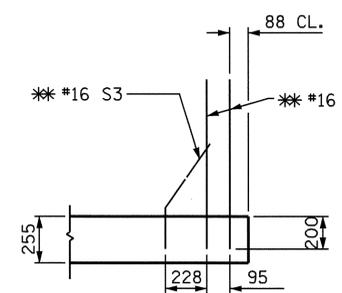


SECTION THRU SLAB

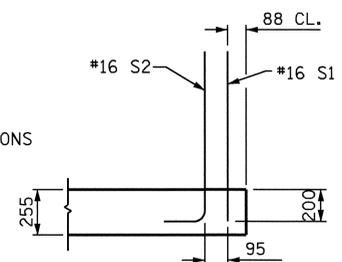


SECTION L-L

NOTE: FOR LOCATION OF SECTIONS SEE SHEET 3 OF 4.



SECTION K-K  
\*\* ADHESIVELY ANCHORED



SECTION M-M

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT WITH BARRIER RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-21
					TOTAL SHEETS 24



ASSEMBLED BY: A.M.KEETER DATE: 8/22/05  
CHECKED BY: J.KHARVA DATE: 12/9/05  
DRAWN BY: RWW 8/01  
CHECKED BY: LES 8/01  
ADDED 12/01  
REV. 5/7/03R RWW/JTE

**BILL OF MATERIAL  
FOR END BENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	8	#13	STR	5900	47
*A2	6	#13	STR	6560	39
A3	8	#13	STR	5920	47
A4	6	#13	STR	6600	39
*B1	68	#16	STR	1580	167
B2	68	#19	STR	1720	261
*B3	2	#16	STR	1320	4
*B4	2	#16	STR	1120	3
*B5	2	#16	STR	920	3
*B6	2	#16	STR	720	2
*B7	2	#16	STR	540	2
*B8	2	#16	STR	340	1
*B9	2	#16	STR	300	1
B10	2	#19	STR	1560	7
B11	2	#19	STR	1360	6
B12	2	#19	STR	1160	5
B13	2	#19	STR	960	4
B14	2	#19	STR	780	3
B15	2	#19	STR	580	2
B16	2	#19	STR	380	2
REINFORCING STEEL				kg.	376
* EPOXY COATED REINFORCING STEEL				kg.	270
CLASS AA CONCRETE				C.M.	5.34

**NOTES**

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 102mm Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE 150mm COMP. A.B.C. SHALL EXTEND 3m BEYOND THE END OF THE APPROACH SLAB AND 300mm OUTSIDE OF EACH EDGE OF THE SLAB.

THE CONTRACTOR MAY USE 100mm TYPE B-25.0B ASPHALT CONCRETE COURSE IN LIEU OF 150mm COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 300mm BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

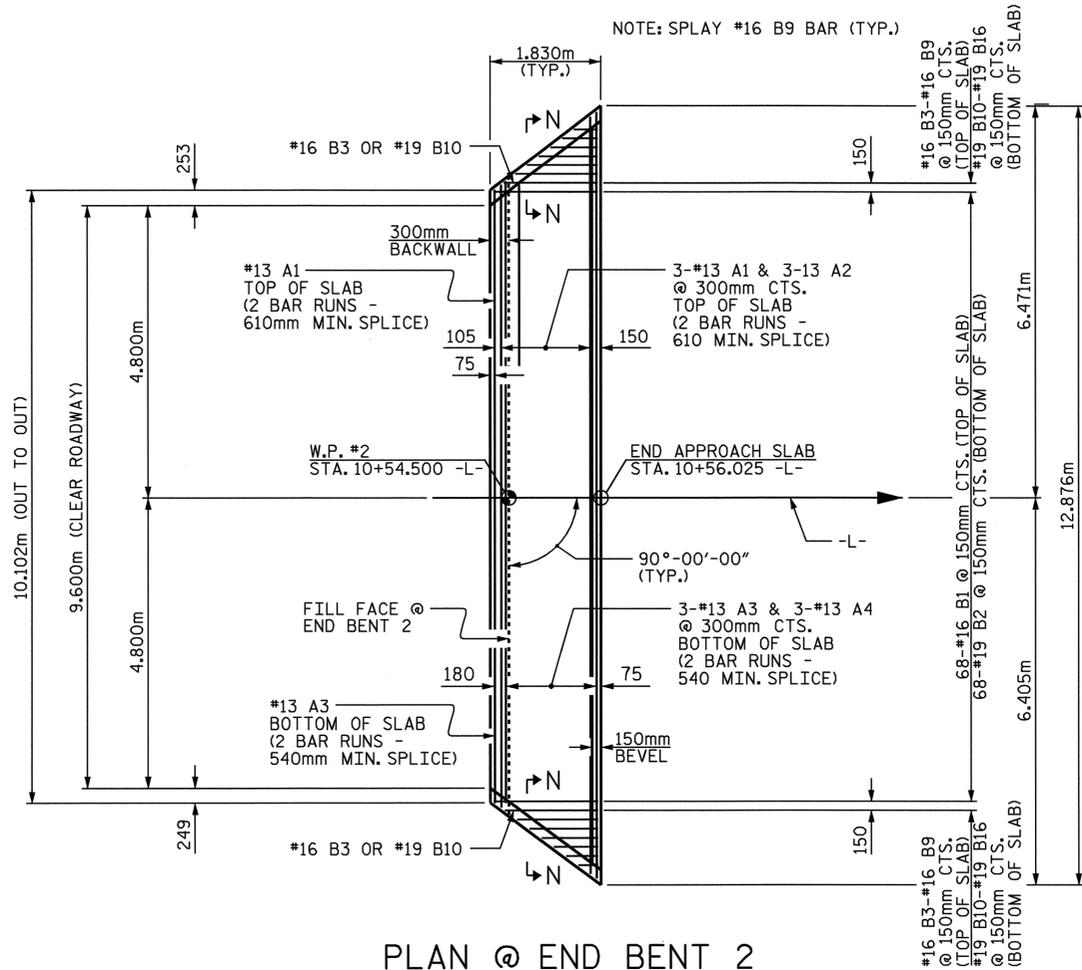
THE CONTRACTOR MAY USE 125mm CLASS "A" CONCRETE BASE IN LIEU OF 150mm COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 300mm BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 13.6 kg ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

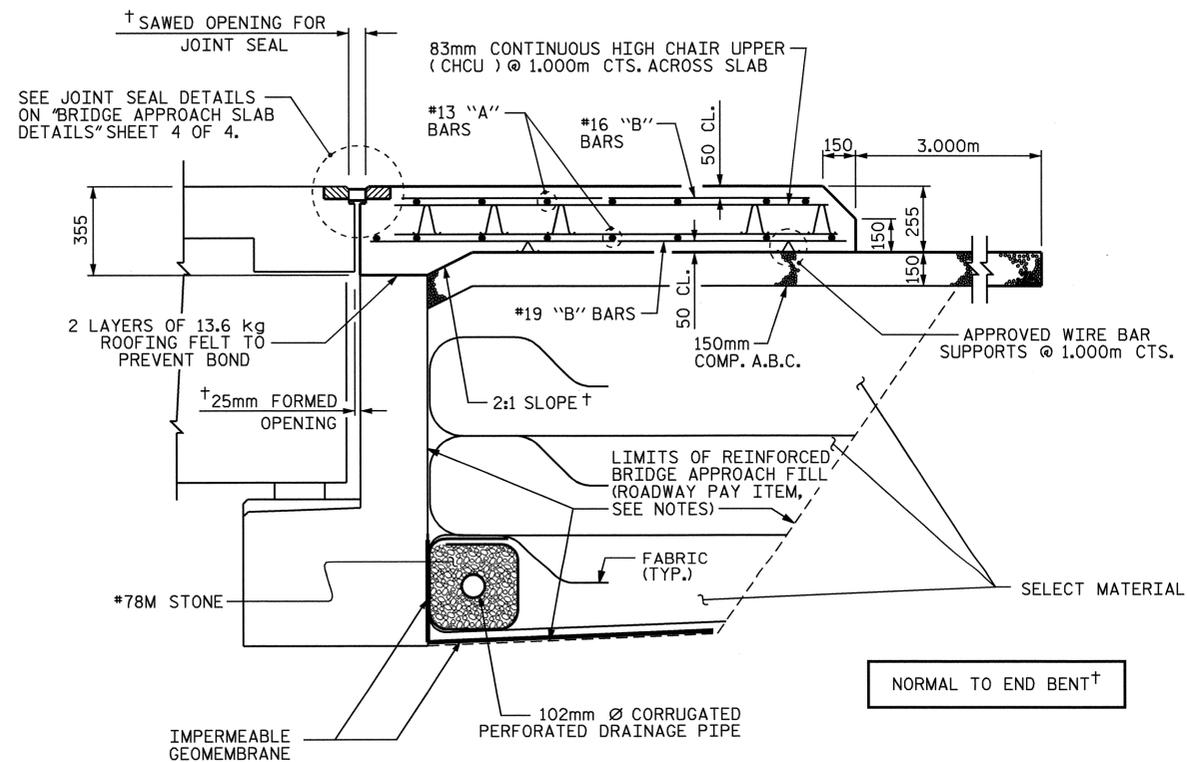
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 64mm.

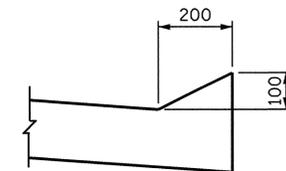
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



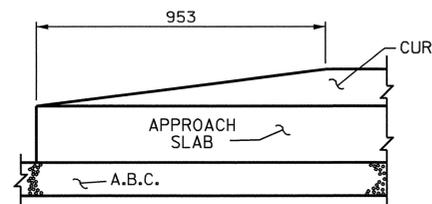
**PLAN @ END BENT 2**



**SECTION THRU SLAB**



**SECTION N-N**



**END OF CURB WITHOUT SHOULDER BERM GUTTER**

**CURB DETAILS**

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+34.500 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT



ASSEMBLED BY : A.M. KEETER	DATE : 8/15/05
CHECKED BY : J.G. KHARVA	DATE : 12/9/05
DRAWN BY : FCJ 6/87	REV. 7/10/01 RWW/LES
CHECKED BY : EGA 6/87	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			22
2			4			24

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 6mm HOLD DOWN PLATE AND 7 - 22.23mm Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 250. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

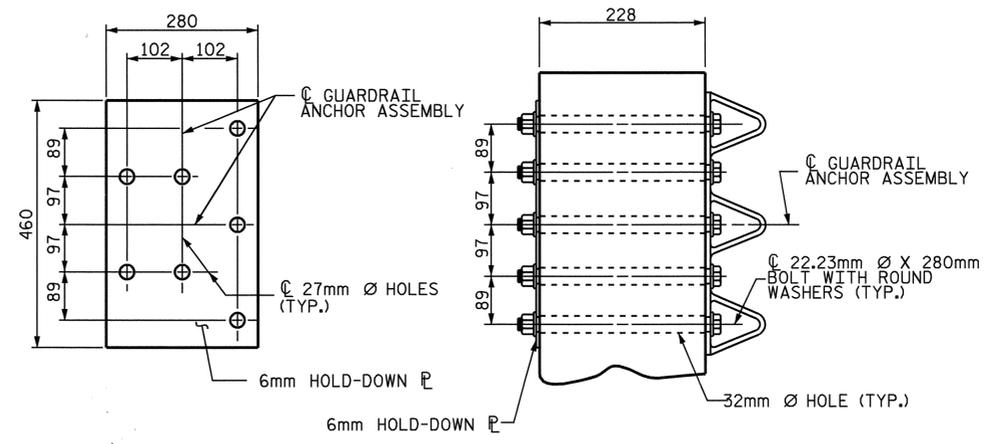
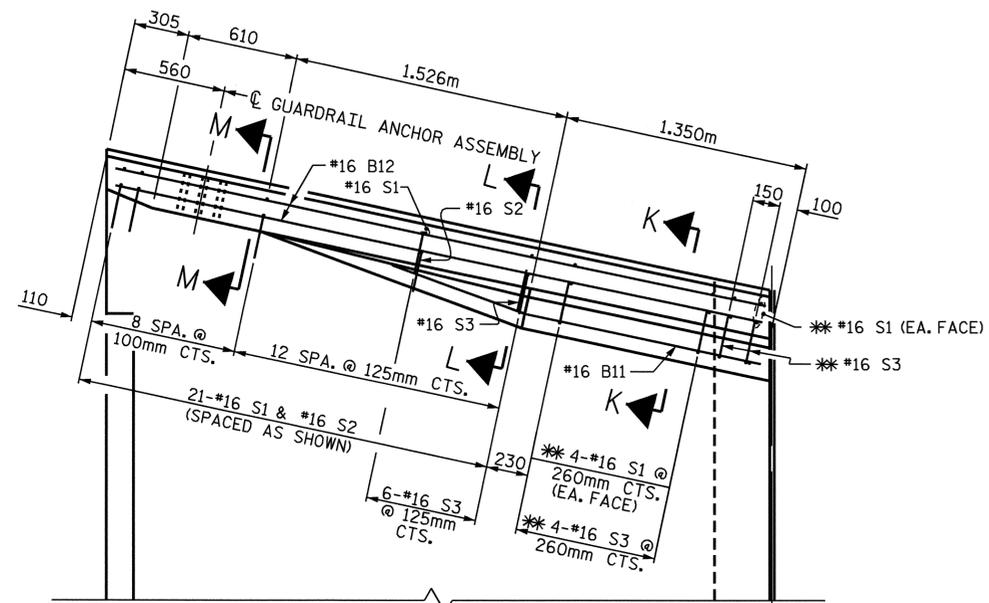
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291M. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 22.23mm Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

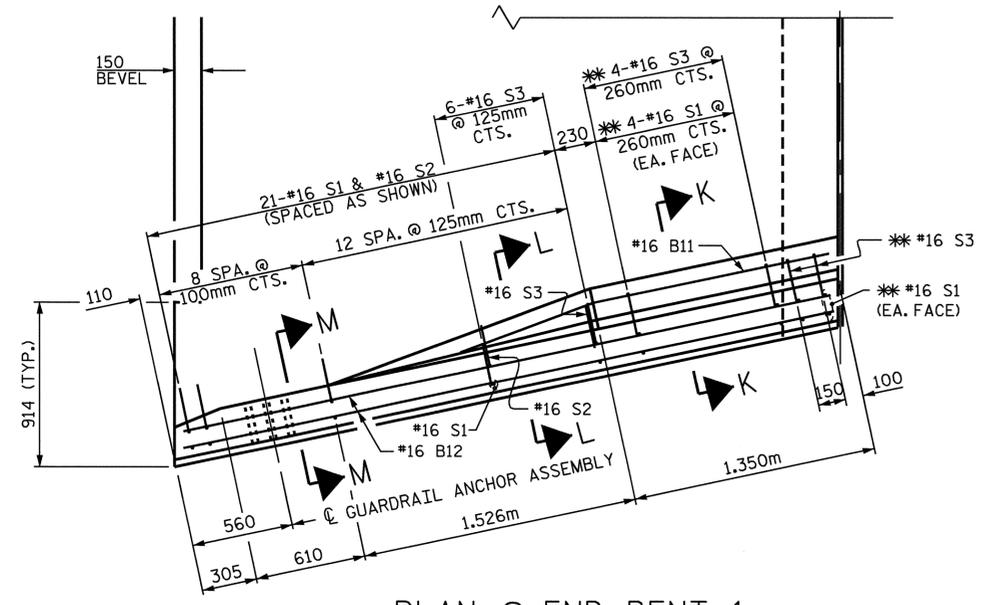
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE BID FOR BRIDGE APPROACH SLABS.

THE 32mm Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

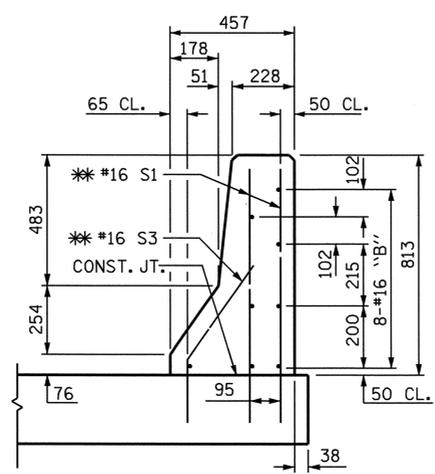
THE #16 S1 AND #16 S3 BARS SHALL BE INSTALLED, WHERE NOTED ON THE PLANS, USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS; SEE SPECIAL PROVISIONS. THE YIELD LOAD FOR THE #16 S1 AND #16 S3 BARS IS 82.7 kN. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



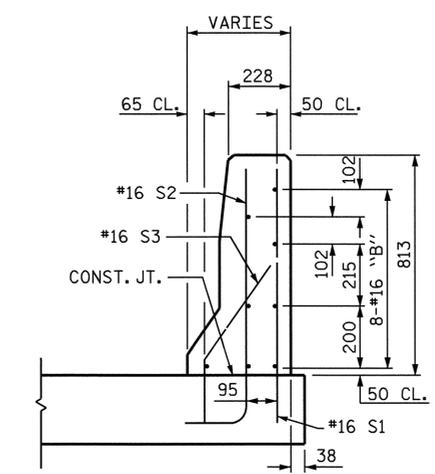
PLAN SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



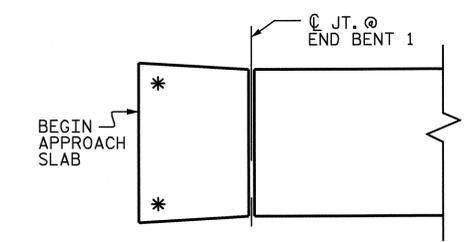
PLAN @ END BENT 1



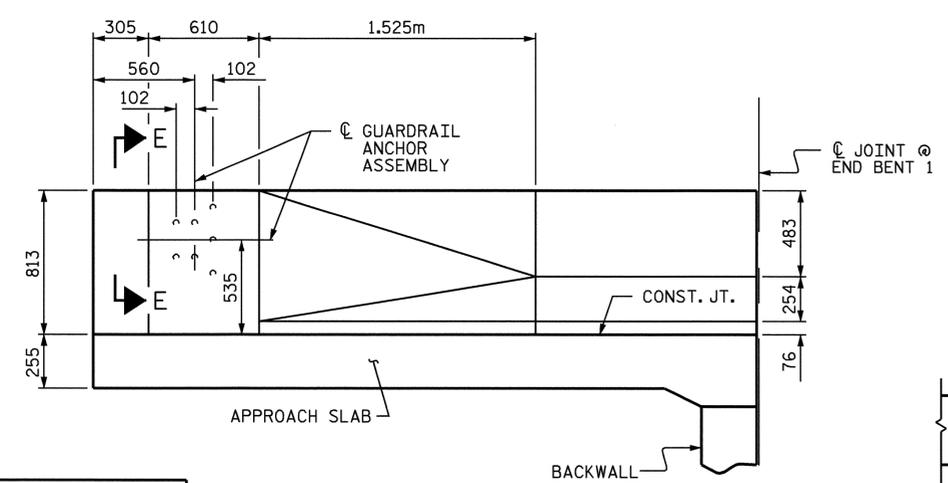
SECTION K-K  
\* ADHESIVELY ANCHORED



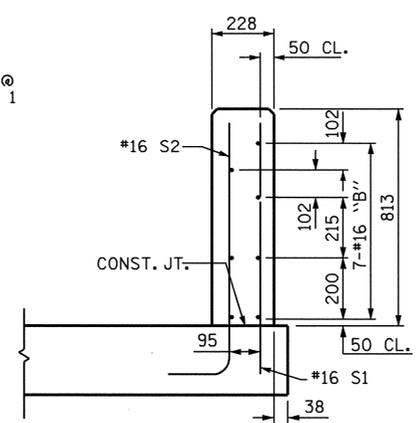
SECTION L-L



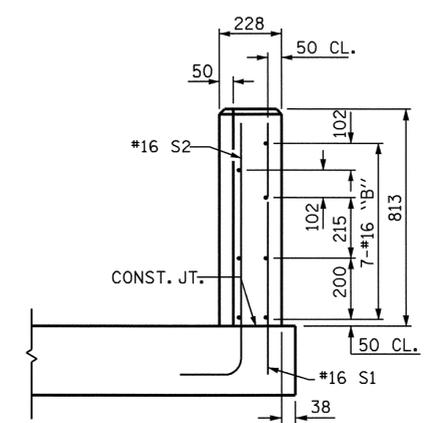
SKETCH SHOWING POINTS OF ATTACHMENT  
\* INDICATES POINTS OF ATTACHMENT @ END BENT 1. FOR ATTACHMENT @ END BENT 2, SEE CONCRETE BARRIER RAIL SHEET 3 OF 3.



ELEVATION



SECTION M-M



END VIEW

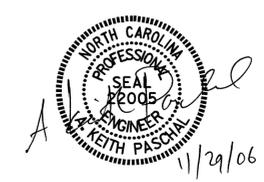
ASSEMBLED BY : A.M. KEETER DATE : 9/09/04  
CHECKED BY : J.KHARVA DATE : 12/9/05  
DRAWN BY : RWW 8/01 REV. 5/7/03R RWW/JTE  
CHECKED BY : LES 8/01

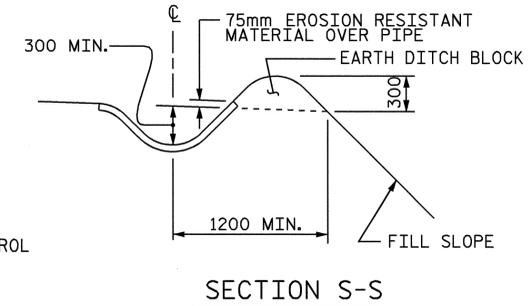
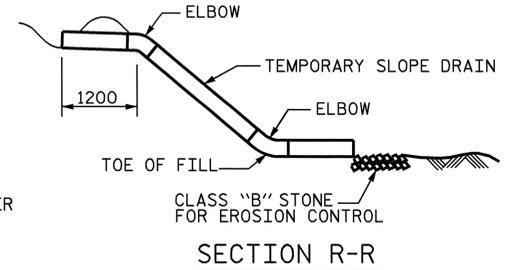
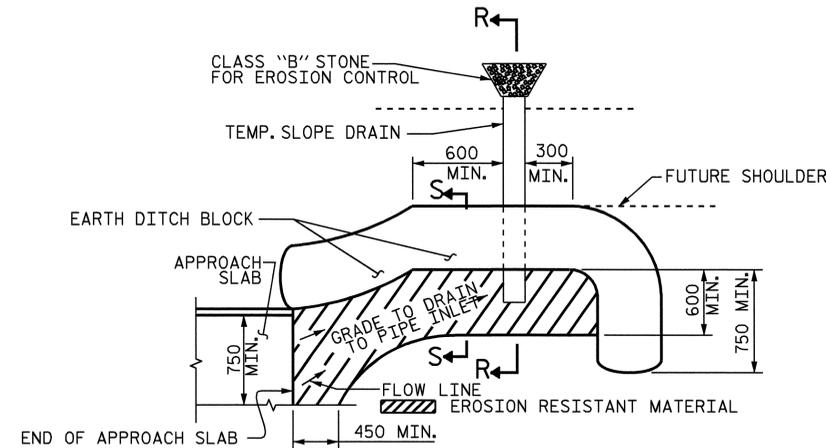
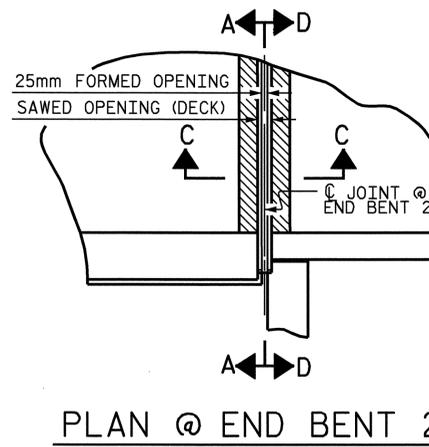
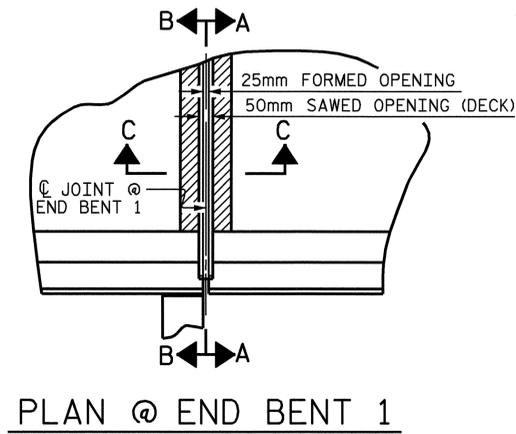
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R:\STRUCT-1\B3119\str\amkeeter\MICROS-1\FINALP-1\B-3119-L.DGN  
ameadows

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 3 OF 4

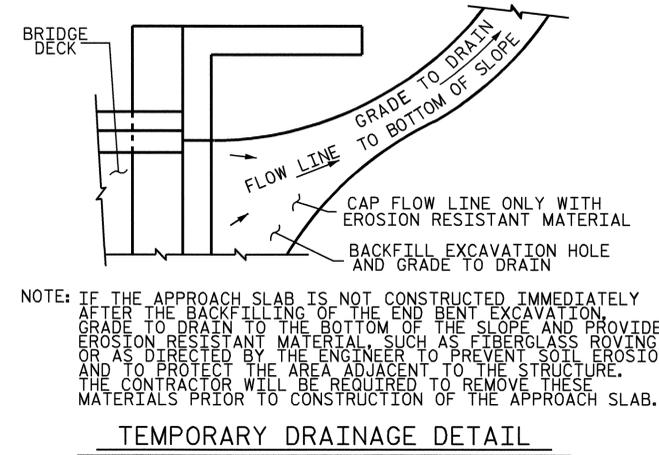
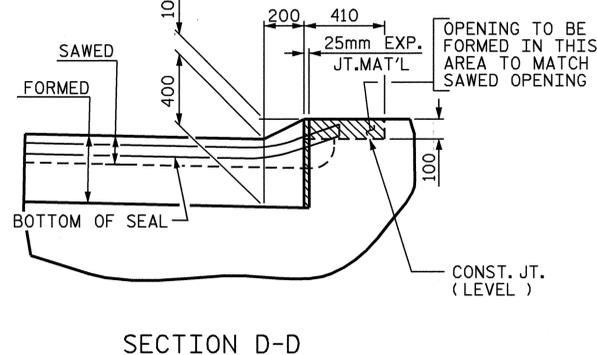
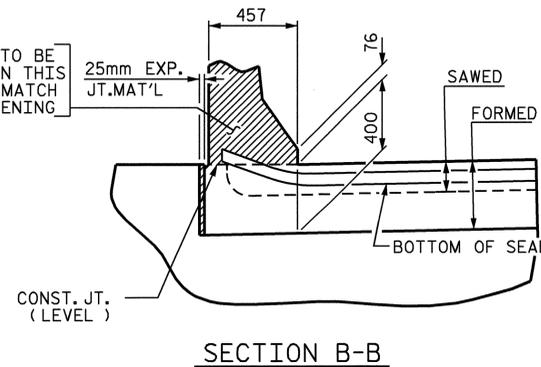
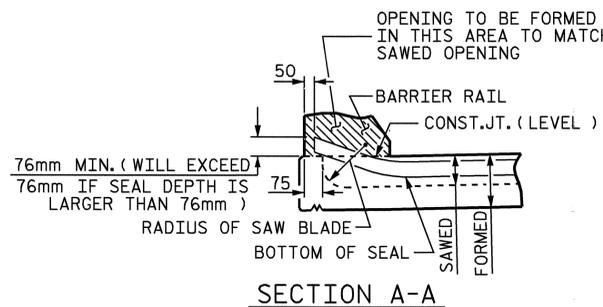
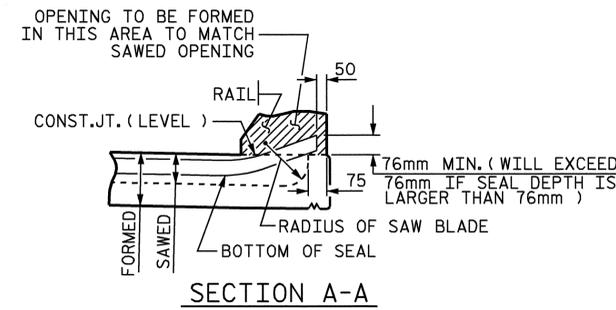
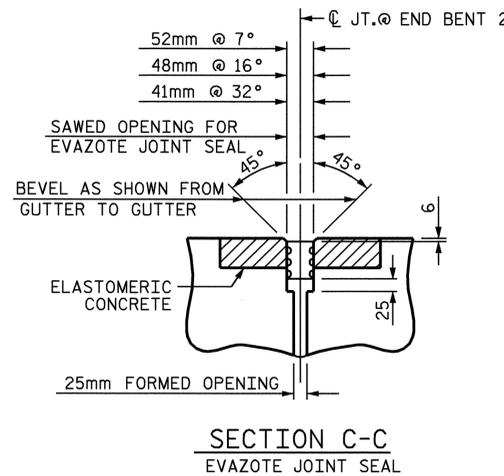
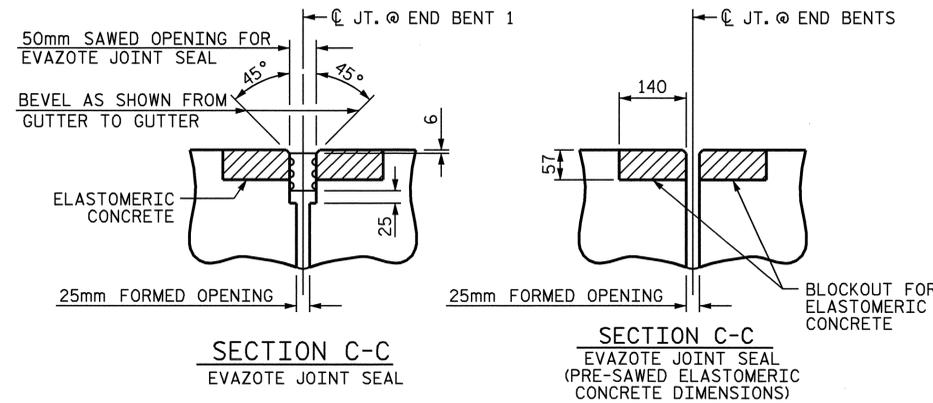
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			24





NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 50mm DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 305mm IN DIAMETER.

TEMPORARY BERM AND SLOPE DRAIN DETAILS  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. m)
1	0.15
2	0.15
TOTAL	0.30

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+34.500 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH  
SLAB DETAILS



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

STD. NO. BAS10SM STR. #1

ASSEMBLED BY: A.M.KEETER DATE: 9/9/04  
CHECKED BY: J.KHARVA DATE: 12/9/05  
DRAWN BY: FCJ 11/88 REV. 8/16/99 RAL/LES  
CHECKED BY: ARB 11/88 REV. 10/17/00 RWW/LES  
REV. 5/7/03 RWW/JTE

BENCH MARK: TBM-7 RAILROAD SPIKE SET IN 24" WATER OAK -L2- STA. 10+37.351 25.618m RT. ELEV. 620.565

**GRADE DATA**

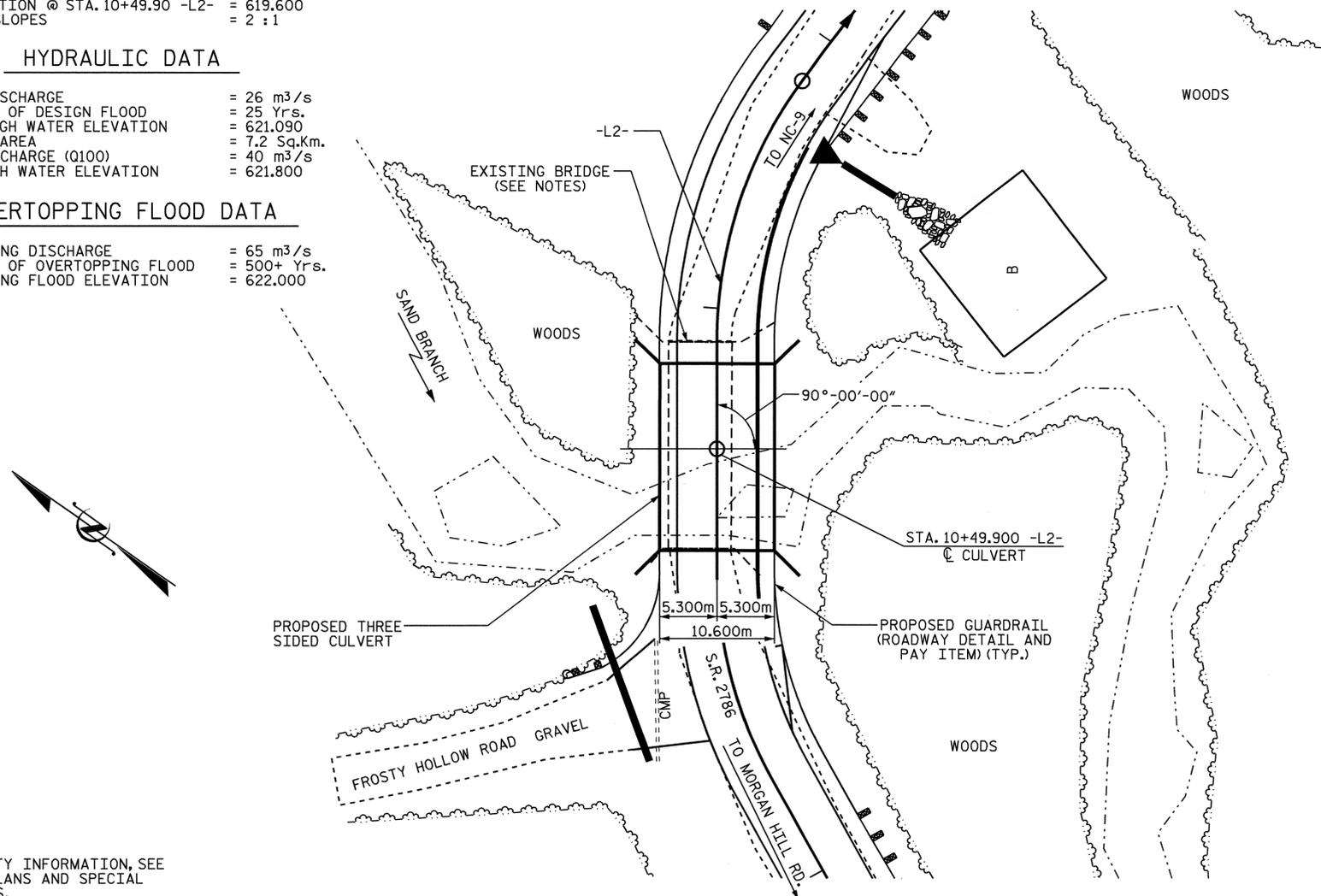
GRADE PT. EL. @ STA. 10+49.90 -L2- = 623.780  
 BED ELEVATION @ STA. 10+49.90 -L2- = 619.600  
 ROADWAY SLOPES = 2 : 1

**HYDRAULIC DATA**

DESIGN DISCHARGE = 26 m<sup>3</sup>/s  
 FREQUENCY OF DESIGN FLOOD = 25 Yrs.  
 DESIGN HIGH WATER ELEVATION = 621.090  
 DRAINAGE AREA = 7.2 Sq.Km.  
 BASIC DISCHARGE (Q100) = 40 m<sup>3</sup>/s  
 BASIC HIGH WATER ELEVATION = 621.800

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 65 m<sup>3</sup>/s  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ Yrs.  
 OVERTOPPING FLOOD ELEVATION = 622.000

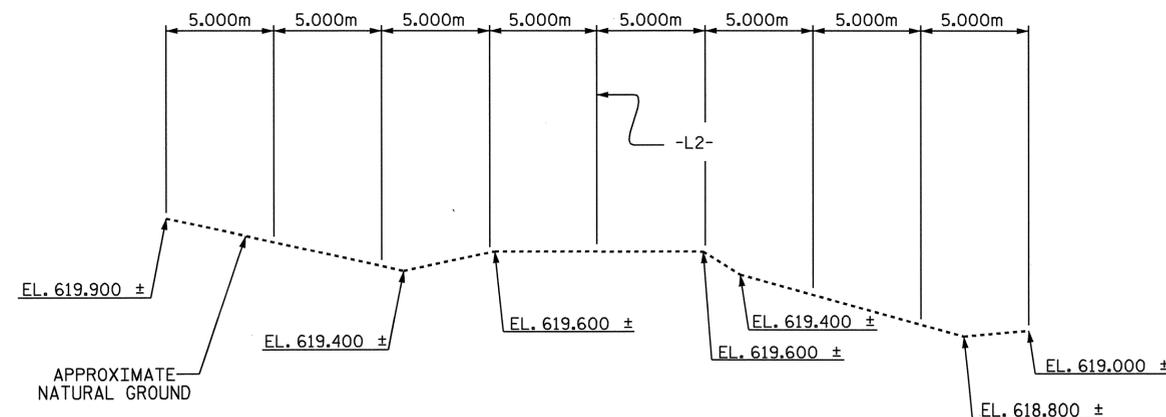


FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**LOCATION SKETCH**

**NOTES**

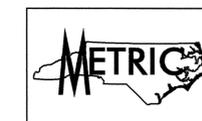
- ASSUMED LIVE LOAD -----MS18 OR ALTERNATE LOADING.
- MAXIMUM DESIGN FILL ----- 1.140m
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE IN METERS.
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 14.6m WITH ASPHALT WEARING SURFACE OVER A TIMBER DECK ON STEEL TRUSS SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 3.96m ON A SUBSTRUCTURE CONSISTING OF END BENTS WITH CONCRETE ABUTMENTS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED.
- 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.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- THE REQUIRED BEARING CAPACITY OF THE SPREAD FOOTINGS IS 475 kPa. THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.
- FOOTINGS SHALL BE CARRIED AT LEAST 305mm INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.
- THE BOTTOM OF FOOTING ELEVATION MAY BE LOWERED IN ORDER TO SATISFY BEARING CAPACITY OR MINIMUM ROCK EMBEDMENT REQUIREMENTS.
- TO PROVIDE PROTECTION FROM POSSIBLE SCOUR, THE FOOTINGS SHALL NOT BE CONSTRUCTED AT AN ELEVATION HIGHER THAN SHOWN ON THE PLANS.
- FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT, SEE SPECIAL PROVISIONS.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 360,000kg OF REINFORCING STEEL, ONE 760mm SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 360,000kg OF REINFORCING STEEL, TWO 760mm SAMPLE OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPICE OF THIRTY BAR DIAMETERS.
- NO PRECAST WING OR HEADWALL OPTION WILL BE ALLOWED.
- THIS STRUCTURE HAS DESIGNED IN ACCORDANCE WITH HEC 18 "EVALUATING SCOUR AT BRIDGES", NOVEMBER 1995.
- THE SCOUR CRITICAL ELEVATION IS THE BOTTOM OF FOOTING ELEVATION. THE SCOUR CRITICAL ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE STANDARD SPECIFICATIONS ARTICLE 410-12.
- 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 10+49.900 -L2-."
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.



**PROFILE ALONG CULVERT**

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE -----	LUMP SUM
PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 10+49.900 -L2- -----	LUMP SUM
▲ CLASS A CONCRETE -----	35.0 m <sup>3</sup>

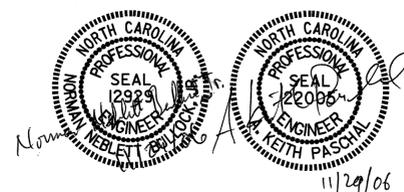
▲ INCLUDES CULVERT & WING FOOTINGS



PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+49.900 -L2-

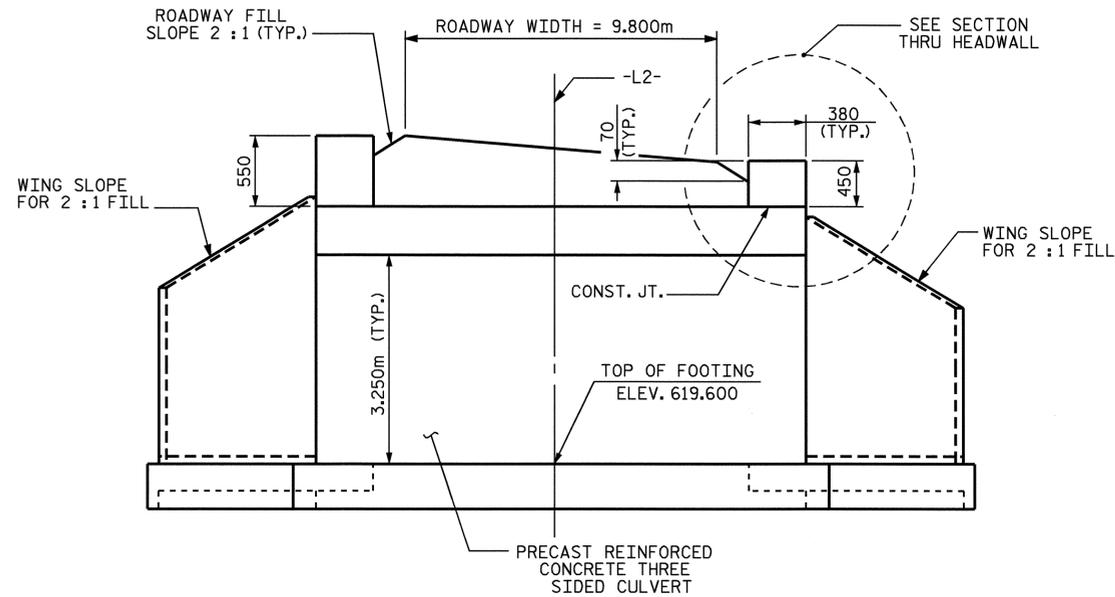
SHEET 1 OF 4 REPLACES BRIDGE NO. 654

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT**  
 90° SKEW

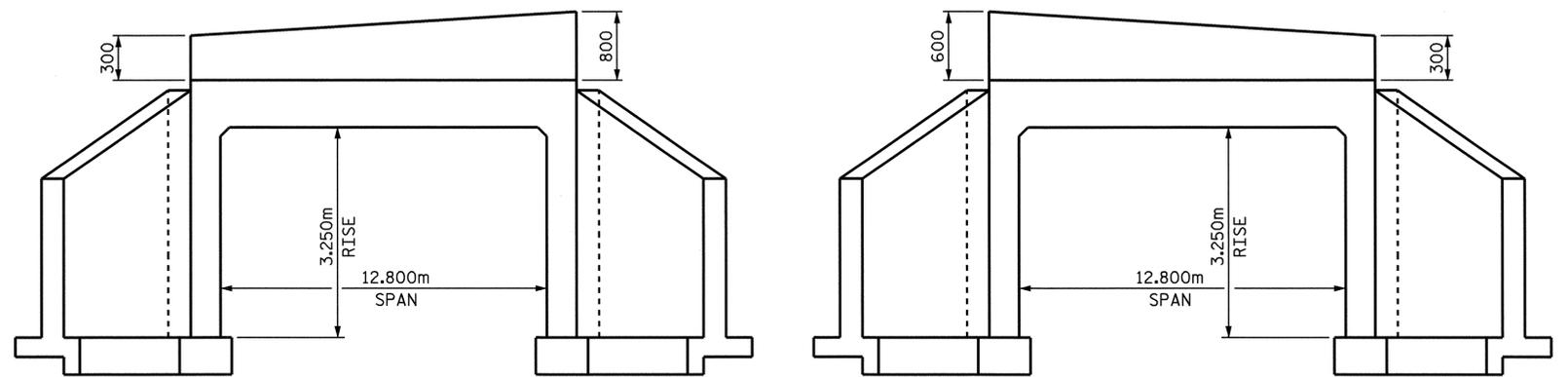


DRAWN BY : J.D. HAWK DATE : 7/15/05  
 CHECKED BY : A.M. KEETER DATE : 9/12/05

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



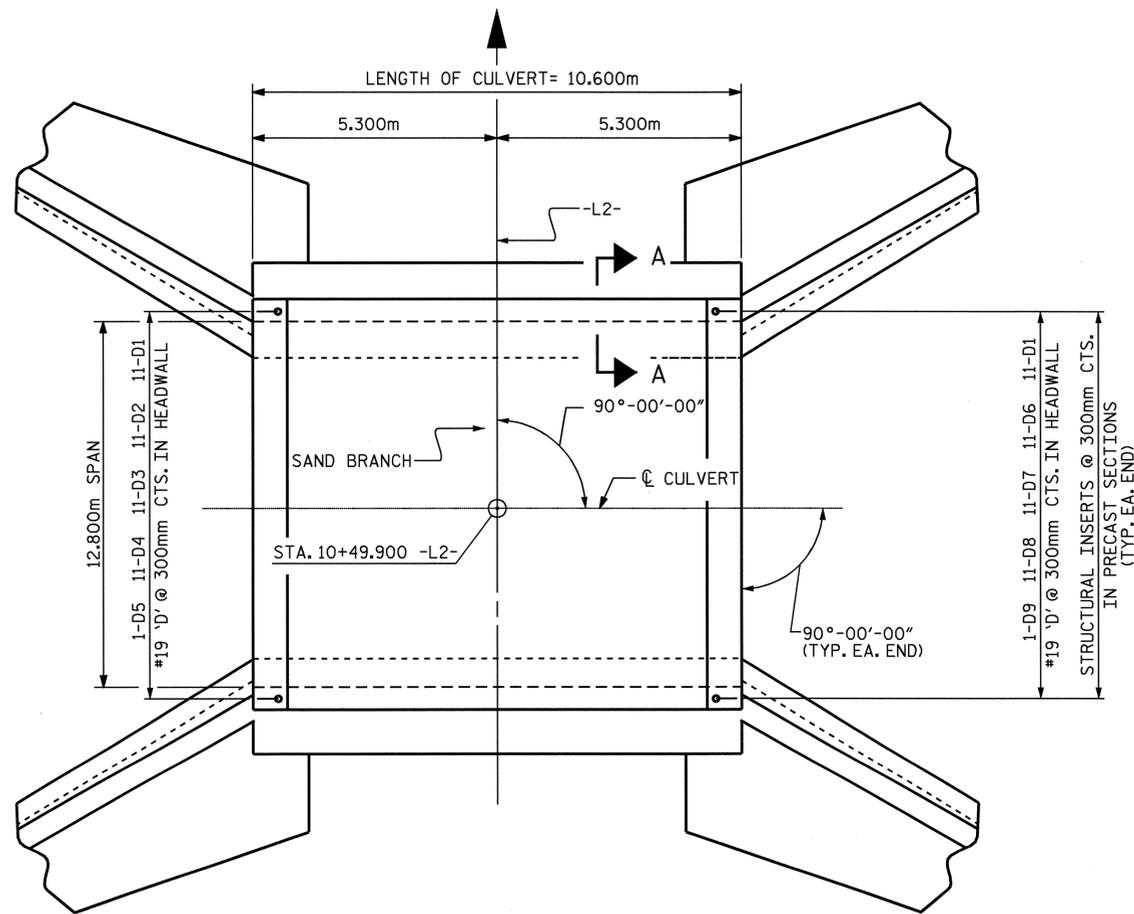
**CULVERT SECTION NORMAL TO ROADWAY**



**INLET**

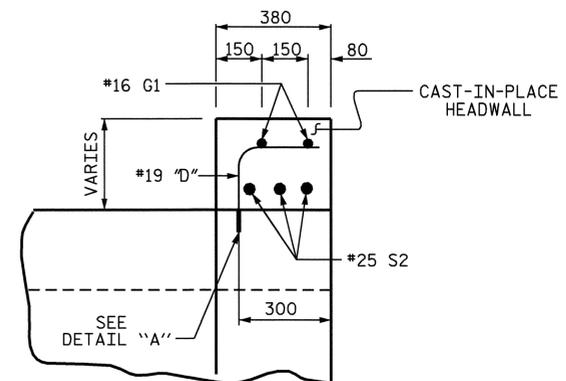
**OUTLET**

**END ELEVATION**

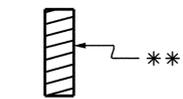


**PLAN FOR PRECAST THREE-SIDED CULVERT**

NOTE : SEE SHEET 3 OF 4 FOR SECTION A-A



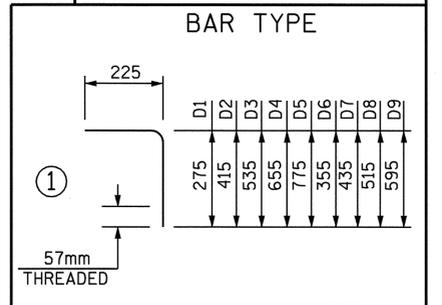
**SECTION THRU HEADWALL**



**DETAIL A**

\*\* RICHMOND STRUCTURAL CONNECTION INSERTS  
19mm TYPE EC-2, 2 STRUT OR EQUAL;  
LENGTH = 114mm, INSERT WIDTH = 50mm,  
DIA. = 19mm. NO. REQUIRED 90

BAR SCHEDULE					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	22	19	1	500	25
D2	11	19	1	640	16
D3	11	19	1	760	19
D4	11	19	1	880	22
D5	1	19	1	1000	2
D6	11	19	1	580	14
D7	11	19	1	660	16
D8	11	19	1	740	18
D9	1	19	1	820	2
G1	4	16	STR	13300	83
S2	6	25	STR	13300	317
TOTAL					kg. 534



PROJECT NO. **B-3119**  
**BUNCOMBE** COUNTY  
 STATION: **10+49.900 -L2-**

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PRECAST REINFORCED  
 CONCRETE THREE-SIDED  
 CULVERT**

**90° SKEW**

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

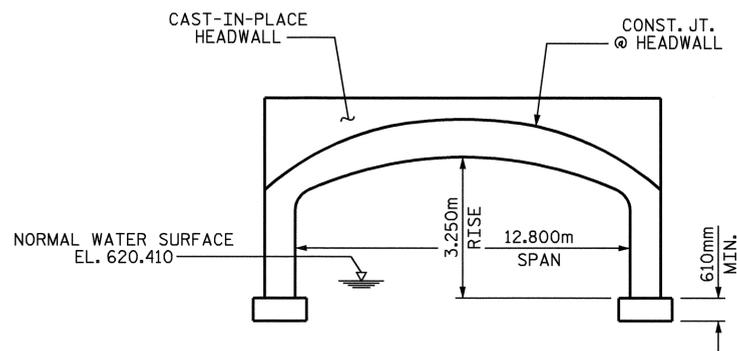
DRAWN BY : **J. D. HAWK** DATE : **7/15/05**  
 CHECKED BY : **A.M. KEETER** DATE : **9/12/05**

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 Jdhawk

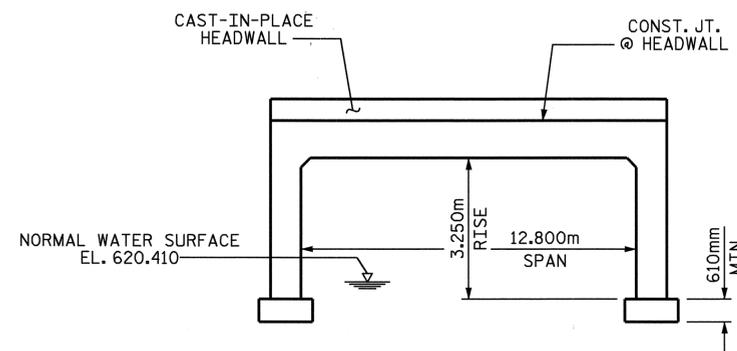
Jdhawk



STR. 2

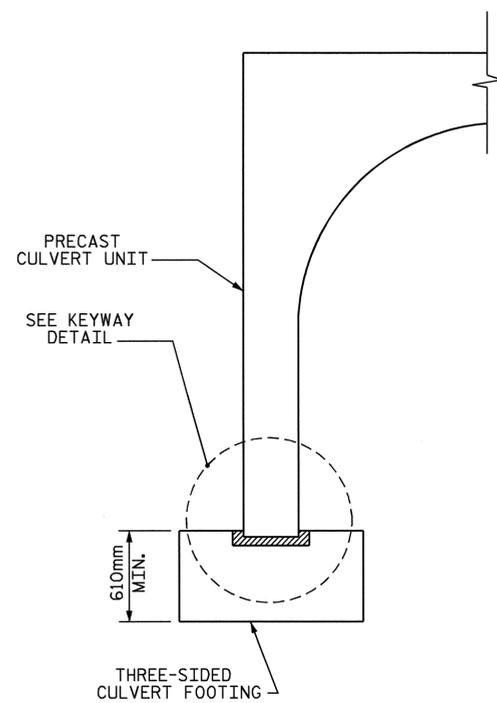


ARCH ALTERNATIVE



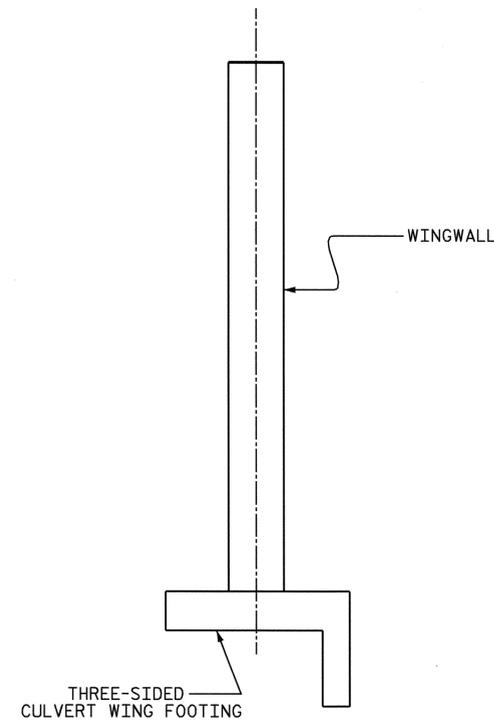
FLAT TOPPED ALTERNATIVE

RIGHT ANGLE SECTION OF PRECAST CONCRETE THREE-SIDED CULVERT

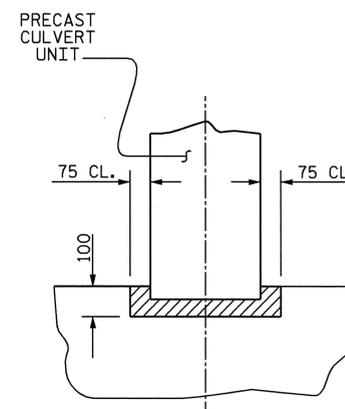


SECTION A-A

FOOTING REINFORCEMENT NOT SHOWN  
CONTRACTOR SHALL PROVIDE REINFORCEMENT DETAIL.



SECTION THRU WING WALL



KEYWAY DETAIL

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 10+49.900 -L2-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PRECAST REINFORCED  
CONCRETE THREE-SIDED  
CULVERT

90° SKEW



DRAWN BY : J. D. HAWK DATE : 7/15/05  
CHECKED BY : A.M. KEETER DATE : 9/12/05

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Jdhawk

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

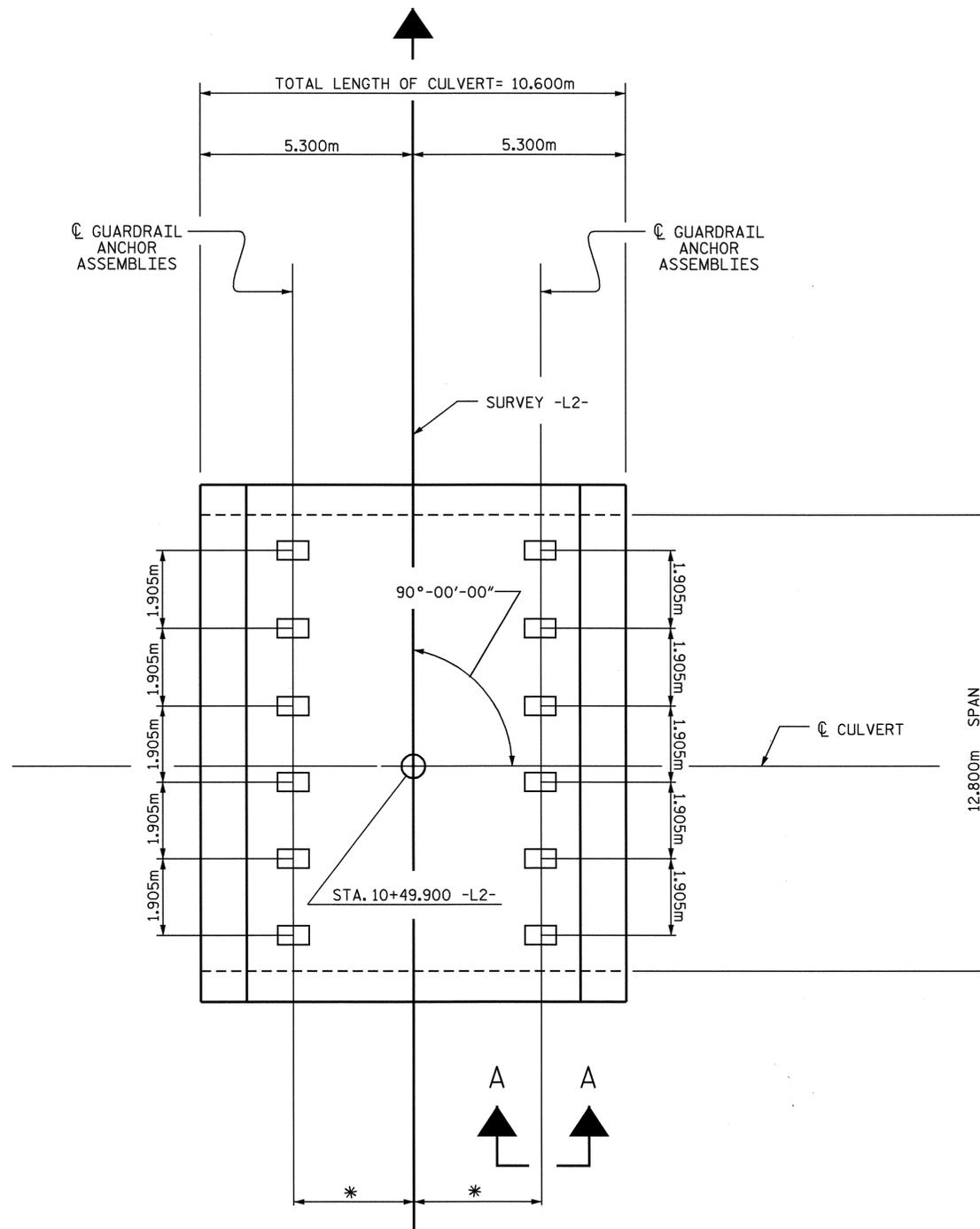
NOTES

ALL GUARDRAIL ATTACHMENTS SHALL BE MADE USING ADHESIVELY ANCHORED ANCHOR BOLTS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. SEE SPECIAL PROVISIONS.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE 19.05mm Ø AND MEET THE REQUIREMENTS OF ASTM A307. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

THE YIELD LOAD OF THE 25.40mm Ø BOLT IS 97.0 KN. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS."

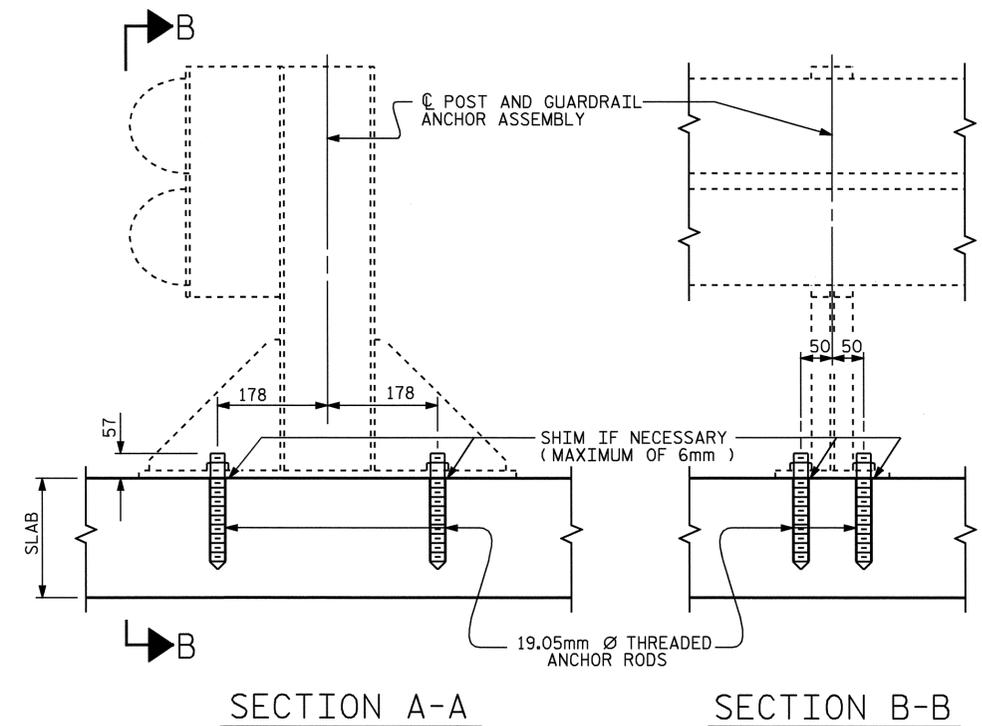
PAYMENT FOR GUARDRAIL POST AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.



\* THIS DIMENSION TO BE FURNISHED BY THE ENGINEER IN THE FIELD.

PLAN OF PRECAST CULVERT GUARDRAIL POST SPACING

NOTE: GUARDRAIL POSTS PLACEMENT AS SHOWN. GUARDRAIL POSTS AND THREADED ANCHOR RODS MUST CLEAR ALL JOINTS OF PRECAST CONCRETE CULVERT UNITS.



PROJECT NO. B-3119  
BUNCOMBE COUNTY  
 STATION: 10+49.900 -L2-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

ANCHORAGE DETAILS FOR GUARDRAIL ATTACHMENTS FOR THREE SIDED CULVERT

DRAWN BY: J.D. HAWK DATE: 11/05  
 CHECKED BY: A.M. KEETER DATE: 11/05

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

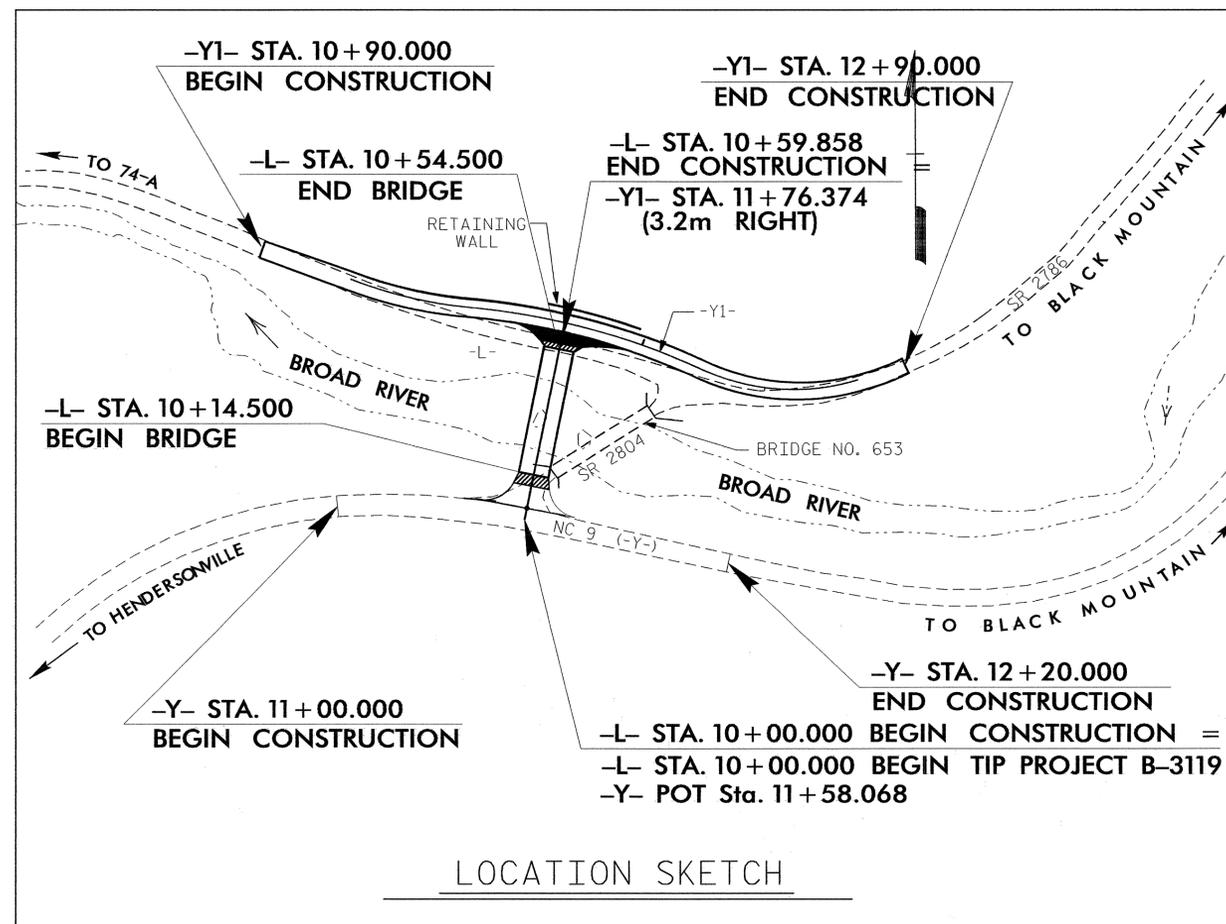
NOTES:

1. PILES SHALL BE INSTALLED TO THE CUT OFF ELEVATIONS AND LENGTHS SHOWN ON THE PLANS BY PRE-AUGERING OR DRILLING. THE EXCAVATED HOLE SHALL BE 610mm MINIMUM DIAMETER AND BACKFILLED WITH CONCRETE TO THE BOTTOM OF THE CUSHIONING MATERIAL.
2. PILES SHALL BE ASTM A36 GRADE WITH THE ADDITION OF 0.2% MINIMUM COPPER.
3. PILES SHALL BE PAINTED BLACK FROM THE TOP OF THE PILE TO 450mm BELOW FINISHED GRADE.
4. SPLICING OF PILES IS ONLY ALLOWED IN THE PORTION OF THE PILE PERMANENTLY BELOW GROUND.
5. THE TOP OF THE INSTALLED PILES SHALL BE WITHIN 50mm OF THEIR PLAN LOCATION IN ANY DIRECTION.
6. CONCRETE PANELS SHALL HAVE A MINIMUM BEARING DISTANCE OF 50mm ON THE PILE FLANGE. 50mm THICK EXPANSION JOINT MATERIAL SHALL BE PLACED BETWEEN THE CONCRETE PANELS AND PILE FLANGES FOR THE WIDTH OF THE BEARING SURFACE.
7. THE CONCRETE PANELS SHALL HAVE A DARK GRAY EXPOSED AGGREGATE FACE. SEE SPECIAL PROVISIONS FOR COLOR, TEXTURE AND AGGREGATE REQUIREMENTS.
8. EXCAVATION TO INSTALL PANELS AND TIMBER LAGGING SHALL BE LIMITED TO 150mm BEHIND THE PILES. ANY OVEREXCAVATION SHALL BE BACKFILLED WITH NO. 57 STONE.
9. CONCRETE PANELS SHALL BE HELD SECURELY AGAINST PILES UNTIL BACKFILL IS PLACED.
10. BOTH CUSHIONING MATERIAL AND BACKFILL MATERIAL BEHIND THE PANELS SHALL BE NO. 57 STONE AND COMPACTED AS REQUIRED BY THE ENGINEER. THE STONE SHALL BE RODDED AND SPREAD IN ORDER TO FILL ALL VOIDS AND INSURE MAXIMUM DENSITY. FLUSHING THE STONE WITH WATER TO AID COMPACTION WILL NOT BE ALLOWED.
11. BACKFILLING SHALL BE COMPLETED PRIOR TO FORMING THE COPING.
12. THE TOP OF COPING IS TO BE ADJUSTED BY THE ENGINEER TO GIVE A UNIFORM APPEARANCE.
13. CONSTRUCTION JOINTS IN COPING ARE PERMITTED AT LOCATIONS WHERE COPING CHANGES SLOPE AND AT 27 METER CENTERS. EXPANSION JOINTS ARE NOT PERMITTED.
14. THE CONTRACTOR SHALL VERIFY THE LOCATION OF DRAINAGE STRUCTURES AND UTILITIES PRIOR TO INSTALLING PILES.

15. EXCAVATION SEQUENCE:

- DRILL MINIMUM 610mm DIA. SHAFTS FOR 310mm PILES FROM NATURAL GROUND, INSTALL PILES AND BACKFILL WITH CONCRETE TO THE TOP OF SHAFT ELEVATIONS BEFORE EXCAVATING TO INSTALL PANELS OR TIMBER LAGGING.
  - EXCAVATION TO INSTALL THE PANELS OR LAGGING SHALL BE VERTICAL, HAVE A MAXIMUM LIFT HEIGHT OF 1.219 m AND BE LIMITED IN EXTENT TO ONLY WHAT IS NECESSARY.
  - TIMBER LAGGING IS NEEDED ONLY TO MEET OSHA REQUIREMENTS FOR SAFE EXCAVATION HEIGHTS.
  - THE LAGGING SHALL BE EXTENDED TO THE ELEVATION INDICATED IN THE PLAN OR THE ROCK LINE, WHICHEVER IS SHALLOWER AND IS CONSIDERED INCIDENTAL TO THE WALL CONSTRUCTION.
  - THE LAGGING SHALL HAVE A MINIMUM BEARING DISTANCE OF 75mm ON THE PILE FLANGE.
  - UNTREATED STRUCTURAL TIMBERS SHALL BE A MINIMUM OF 75mm THICK AND SHALL CONFORM TO THE APPLICABLE PARTS OF SECTIONS 445 AND 1082 OF THE STANDARD SPECIFICATIONS.
  - PLACE BACKFILL BEHIND THE LAGGING IMMEDIATELY AFTER INSTALLATION.
  - WHERE PRACTICAL, THE TOP FEW PIECES OF LAGGING SHALL BE REMOVED PRIOR TO BACKFILLING BEHIND PANELS. ALL OTHER LAGGING SHALL BE LEFT IN PLACE.
  - THE CONTRACTOR MAY ELECT TO USE AN ALTERNATE METHOD OF PROVIDING A SAFE EXCAVATION, HOWEVER, THE ALTERNATE METHOD MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
16. IF NECESSARY, SPECIAL MEASURES SHALL BE TAKEN TO INSURE THE STABILITY OF THE SHAFT SUCH AS INSTALLING TEMPORARY CASINGS PRIOR TO DRILLING, INSTALLING THE PILE AND PLACING CONCRETE IMMEDIATELY AFTER A SHAFT IS EXCAVATED BEFORE CAVING OCCURS, INSTALLING WELL POINTS, OR OTHER MEASURES. IF CAVING OCCURS, THE SHAFT EXCAVATION OPERATION SHALL BE HALTED UNTIL SPECIAL MEASURES ARE IMPLEMENTED.
  17. THE THICKNESS OF THE EXPANSION JOINT MATERIAL BETWEEN THE BARRIER AND THE PANELS WILL NEED TO BE INCREASED BY APPROXIMATELY 250mm, OR AS DIRECTED BY THE ENGINEER, TO ACCOUNT FOR THE THICKNESS OF THE PILE FLANGES AND EXPANSION JOINT MATERIAL BETWEEN THE PANELS AND FLANGES. THE PURPOSE OF THIS MATERIAL IS TO INSURE THAT ALL GAPS BETWEEN THE BARRIER AND THE WALL ARE COMPLETELY FILLED.
  18. SHAFT EXCAVATION MAY REQUIRE SPECIALTY DRILLING EQUIPMENT TO PENETRATE INTO WEATHERED ROCK AND FRESH ROCK.
  19. THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT PLACING OF PANELS AT STATION 12+03.140 -Y1- MAY REQUIRE SOME ROCK EXCAVATION DUE TO A HIGH ROCK LINE.

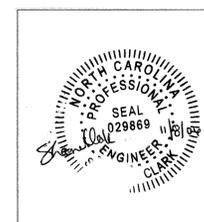
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.  
ALL ELEVATIONS ARE IN METERS.



TOTAL BID PAY ITEM		
PILE PANEL/RETAINING WALL :		
	SQ. METERS	93.90
NOTE : FOR PILE/PANEL RETAINING WALL, SEE SPECIAL PROVISIONS.		

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 11+68.05 -Y1-

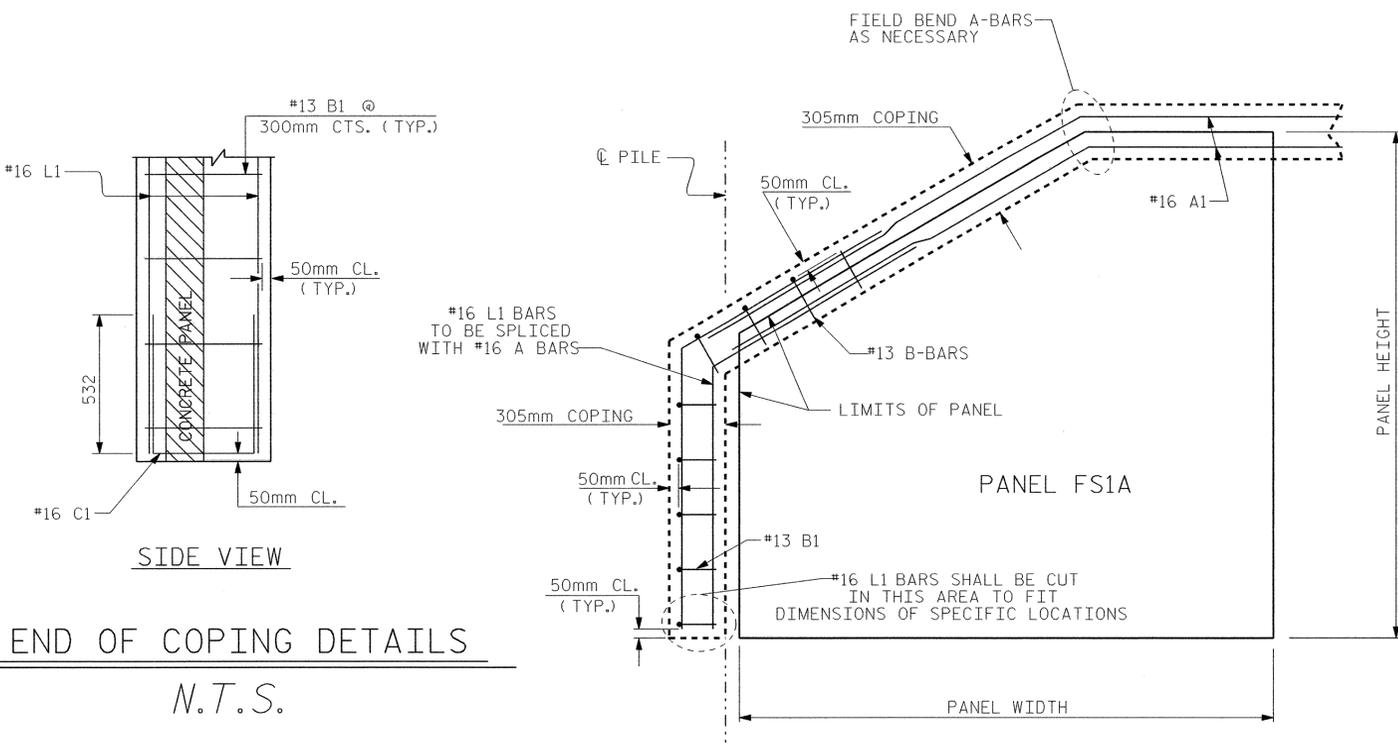
SHEET 1 OF 4



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PILE PANEL RETAINING WALL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. W-1
					TOTAL SHEETS 4

DRAWN BY : E. G. ALLEN DATE : 4-17-06  
CHECKED BY : J. A. HARRIS DATE : 5-17-06

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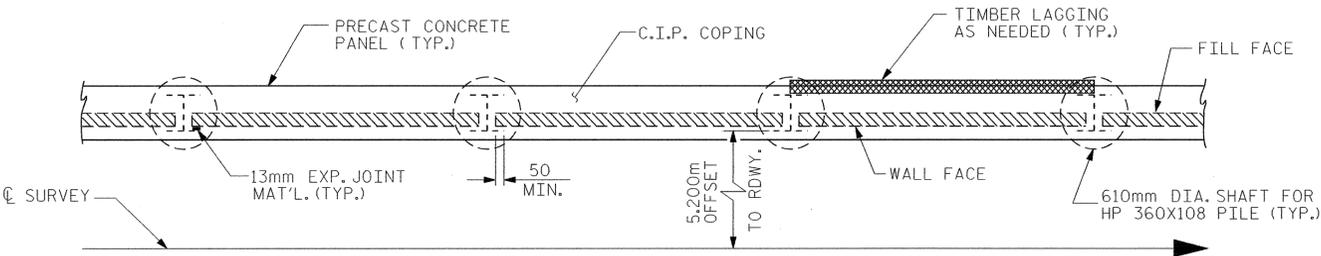
END OF COPING DETAILS

N.T.S.

VERTICAL COPING DETAILS

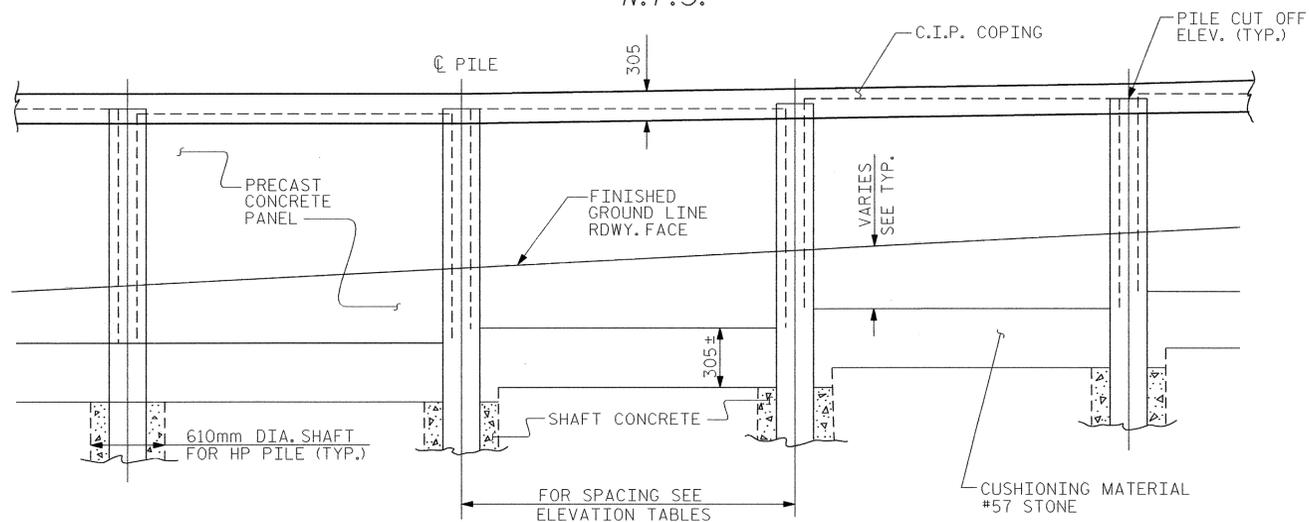
NOTE: PANEL FS1A SHOWN, PANEL FS1B SIMILAR

N.T.S.



PART-PLAN

N.T.S.



PART-ELEVATION

N.T.S.

### BILL OF MATERIALS FOR RETAINING WALL

#### PRECAST CONCRETE PANELS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (KG)
H1	114	#13	STR	2800	317
H2	120	#13	STR	2020	241
H3	1	#13	STR	2540	3
H4	1	#13	STR	2280	2
H5	1	#13	STR	2000	2
H6	1	#13	STR	1740	2
H7	1	#13	STR	1480	1
H8	1	#13	STR	1220	1
H9	1	#13	STR	960	1
H10	1	#13	STR	2600	3
H11	1	#13	STR	2340	2
H12	1	#13	STR	2080	2
H13	1	#13	STR	1820	2
H14	1	#13	STR	1540	2
H15	1	#13	STR	1280	1
H16	1	#13	STR	1020	1
H17	1	#13	STR	760	1
H18	1	#13	STR	500	1
V1	68	#13	STR	2640	178
V2	122	#13	STR	2940	357
V3	1	#13	STR	2560	3
V4	1	#13	STR	2480	2
V5	1	#13	STR	2380	2
V6	1	#13	STR	2300	2
V7	1	#13	STR	2220	2
V8	1	#13	STR	2120	2
V9	1	#13	STR	2040	2
V10	1	#13	STR	1940	2
V11	1	#13	STR	1860	2
V12	1	#13	STR	1780	2
V13	1	#13	STR	1680	2
V14	1	#13	STR	1600	2
V15	1	#13	STR	2560	3
V16	1	#13	STR	2480	2
V17	1	#13	STR	2380	2
V18	1	#13	STR	2300	2
V19	1	#13	STR	2200	2
V20	1	#13	STR	2120	2
V21	1	#13	STR	2040	2
V22	1	#13	STR	1940	2
V23	1	#13	STR	1860	2
V24	1	#13	STR	1780	2
V25	1	#13	STR	1680	2
V26	1	#13	STR	1600	2
V27	1	#13	STR	1500	1
V28	1	#13	STR	1420	1
V29	1	#13	STR	1340	1

REINFORCING STEEL (PANELS) KG. 1173

CLASS A CONCRETE (PANELS) CU. METERS 14.3

#### CAST-IN-PLACE (C.I.P.) COPING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (KG)
A	21	#16	STR	13000	424
B	132	#13	STR	460	60
C	4	#16	STR	406	3
L1	14	#16	STR	2600	56

REINFORCING STEEL (COPING) KG. 543

CLASS A CONCRETE (COPING) CU. METERS 6.7

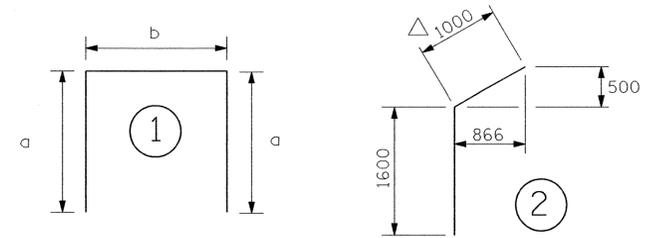
#### ESTIMATED QUANTITIES

PRECAST CONCRETE PANEL TYPE "F1SA"	NO. 1
PRECAST CONCRETE PANEL TYPE "F1SB"	NO. 1
PRECAST CONCRETE PANEL TYPE "F1"	NO. 3
PRECAST CONCRETE PANEL TYPE "G1"	NO. 2
PRECAST CONCRETE PANEL TYPE "G2"	NO. 6

HP360X108 STEEL PILES NO. = 14 LM = 78.6

C.I.P. COPING	LIN. METERS	39.0
NO. 57 STONE	CU. METERS	1.0
SHAFT EXCAVATION	LIN. METERS	39.3
SHAFT CONCRETE, CLASS A	CU METERS	5.9

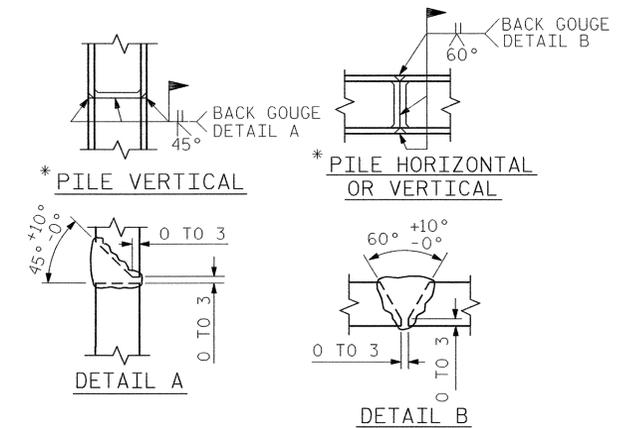
#### COPING BAR TYPES



ALL DIMENSIONS OUT TO OUT

BAR	COPING TYPE	PILE SIZE	DIMENSION a	DIMENSION b
B	FULL	ALL	205	460
C	COPING	PILES	532	406

NOTE: ALL BAR DIMENSIONS ARE SHOWN IN MILLIMETERS.  
NOTE: 1600mm LEG OF L1 BAR TO BE CUT AS NECESSARY TO FIT LOCATION.  
△ NOTE: THIS LEG OF L1 BAR TO BE SPLICED WITH #16 A-BARS IN COPING



\* POSITION OF PILE DURING WELDING.

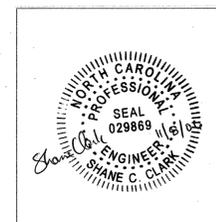
#### PILE SPLICE DETAILS

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 11+68.05 -Y1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PILE PANEL  
RETAINING WALL



#### REVISIONS

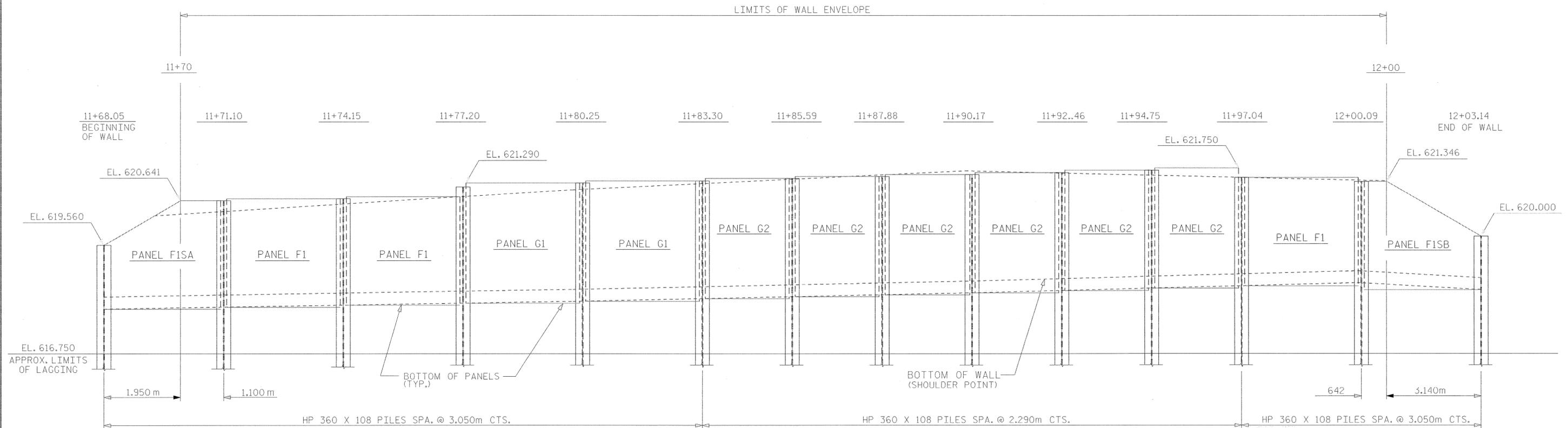
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SHEET NO.

W-2  
TOTAL SHEETS  
4

DRAWN BY: E. G. ALLEN DATE: 4-17-06  
CHECKED BY: J. A. HARRIS DATE: 5-17-06

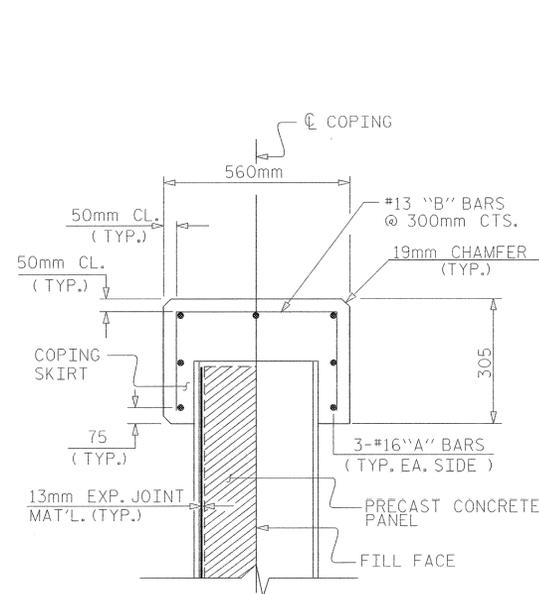
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ELEVATION OF WALL

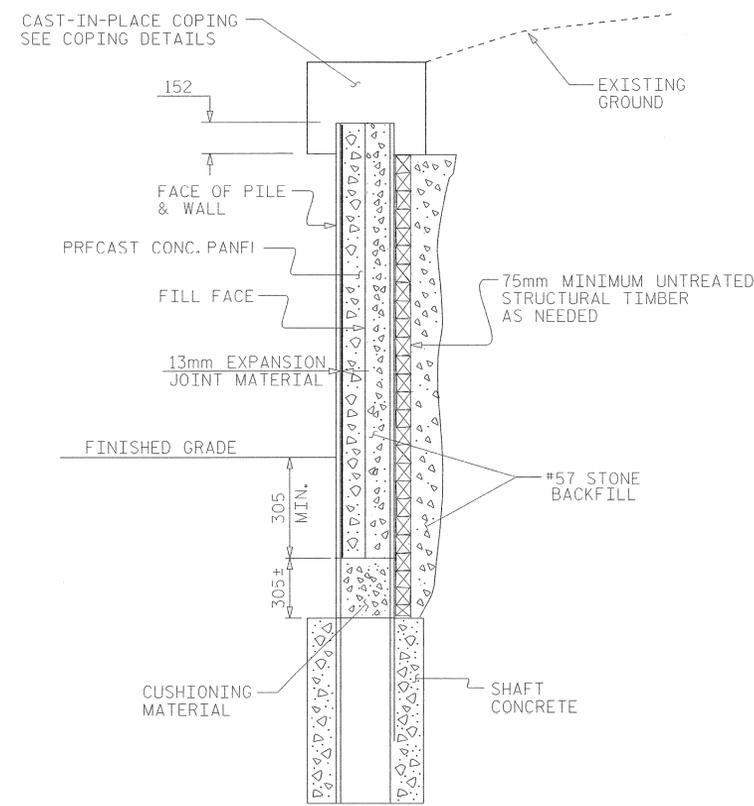
( STA. 11+68.05 -Y1- TO STA. 12+03.14 -Y1- )

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.  
ALL ELEVATIONS ARE IN METERS.



FULL COPING DETAIL

NOTE: FOR END OF COPING DETAILS, SEE SHEET 2 OF 4.



TYPICAL SECTION

N.T.S.

PILE ELEVATIONS AND PANEL TYPES FOR RETAINING WALL				
PILE STATION (OFFSET FROM -Y1- (5.2 m))	PILE SIZE (m)	PILE LENGTH (m)	TOP OF SHAFT CONC. ELEV.	CUTOFF ELEV.
11+68.05	HP 360 X 108	4.280	617.59	619.560
11+71.10	HP 360 X 108	5.920	617.79	620.890
11+74.15	HP 360 X 108	5.820	617.89	620.990
11+77.20	HP 360 X 108	5.820	617.89	621.290
11+80.25	HP 360 X 108	5.930	617.89	621.300
11+83.30	HP 360 X 108	6.240	617.89	621.310
11+85.59	HP 360 X 108	6.420	617.99	621.390
11+87.88	HP 360 X 108	6.220	617.99	621.390
11+90.17	HP 360 X 108	6.130	618.09	621.500
11+92.46	HP 360 X 108	6.330	618.19	621.600
11+94.75	HP 360 X 108	6.330	618.29	621.700
11+97.04	HP 360 X 108	5.780	618.39	621.750
12+00.09	HP 360 X 108	4.680	618.39	621.540
12+03.14	HP 360 X 108	2.630	618.29	620.000

HP 360X108 STEEL PILES ARE ASTM GRADE A36 STEEL

LOCATION OF FIRST PILE: AT STATION 11+68.10 -Y1- A PERPENDUCULAR LINE IS DRAWN THAT INTERSECTS A CONCENTRIC ARC THAT IS OFFSET FROM THE -Y1- LINE 5.2m. THIS INTERSECTION IS THE LOCATION OF THE FIRST PILE (STA. 11+68.05 OFFSET 5.2 m). THE LOCATIONS OF THE REMAINING PILES ARE SPACED ALONG THIS OFFSET LINE.

PROJECT NO. B-3119  
BUNCOMBE COUNTY  
STATION: 11+68.05 -Y1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

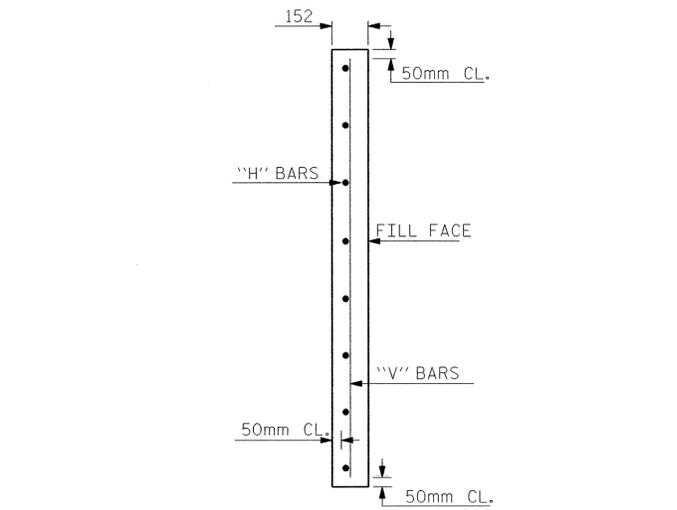
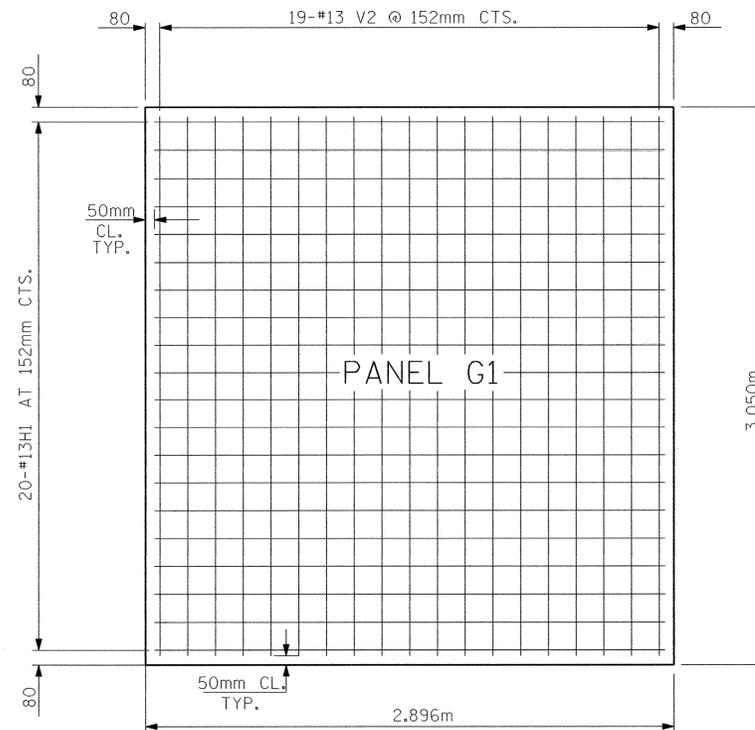
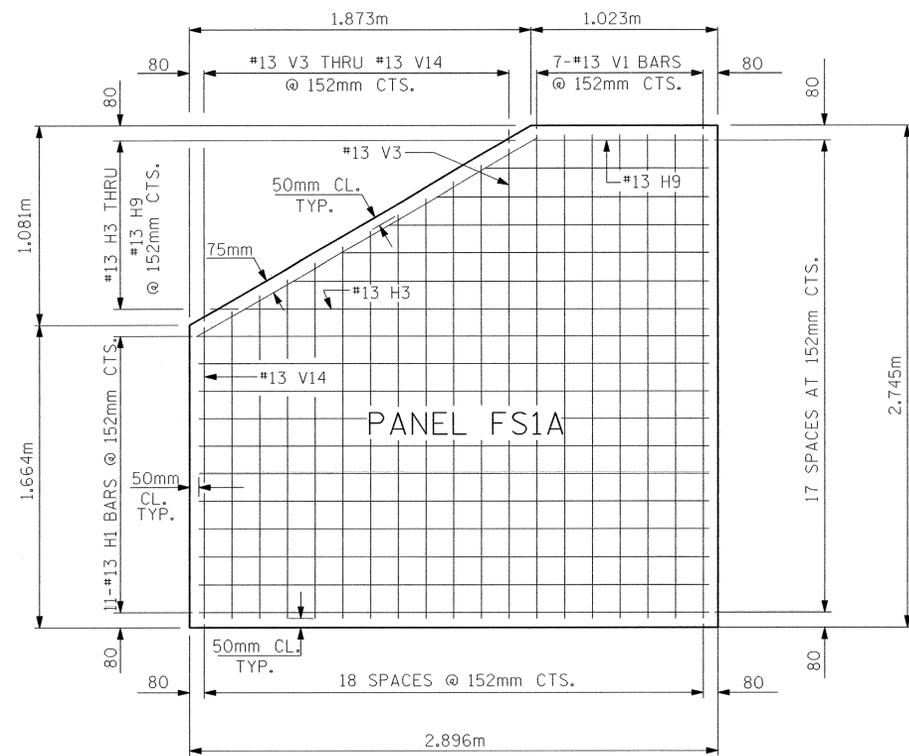
PILE PANEL RETAINING WALL



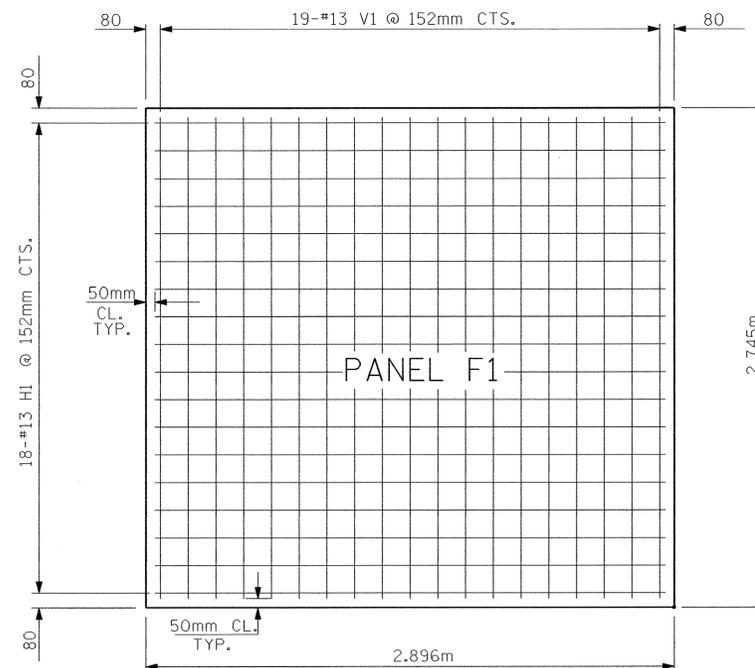
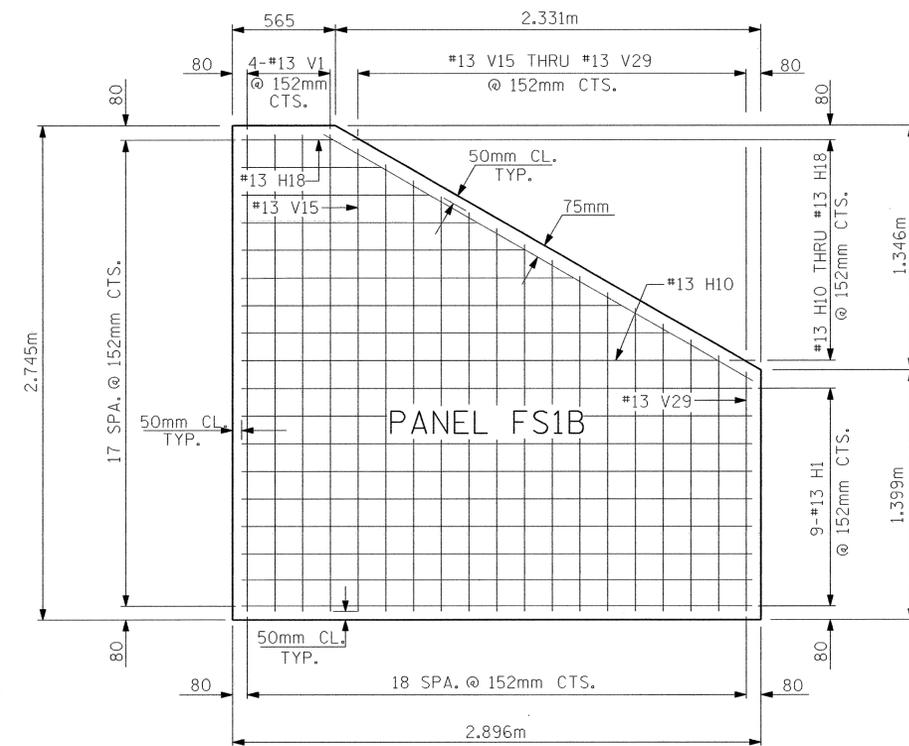
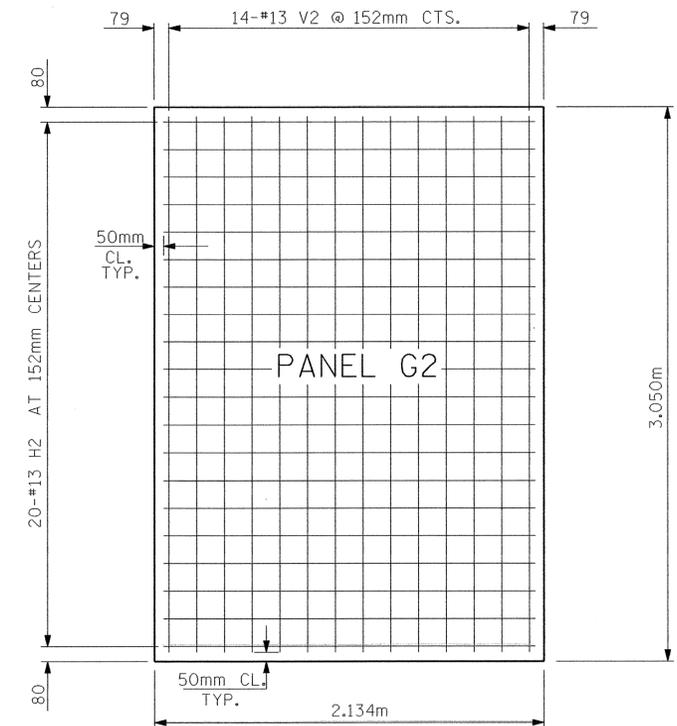
DRAWN BY: E. G. ALLEN DATE: 4-17-06  
CHECKED BY: T. A. HARRIS DATE: 5-17-06

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REVISIONS						SHEET NO.
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SECTION THRU PANELS



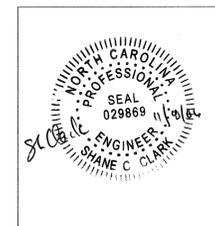
PRECAST PANEL DETAILS

PROJECT NO. B-3119  
 BUNCOMBE COUNTY  
 STATION: 11+68.05 -Y1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PILE PANEL  
 RETAINING WALL



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

DRAWN BY : E. G. ALLEN DATE : 4-17-06  
 CHECKED BY : J. A. HARRIS DATE : 5-17-06

09-NOV-2006 08:07  
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## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 250	--	140 MPa
- AASHTO M270 GRADE 345W	--	190 MPa
- AASHTO M270 GRADE 345	--	190 MPa
REINFORCING STEEL IN TENSION		
	GRADE 420	-- 165 MPa
CONCRETE IN COMPRESSION	-----	8.3 MPa
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	12 MPa
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	2.6 MPa
EQUIVALENT FLUID PRESSURE OF EARTH	-----	480 kg/m <sup>3</sup>
		(MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 19mm WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 38mm RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 6mm FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 6mm RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 300mm INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE. ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 22.23mm Ø SHEAR STUDS FOR THE 19.05mm Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 22.23mm Ø STUDS ALONG THE BEAM AS SHOWN FOR 19.05mm Ø STUDS BASED ON THE RATIO OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 610mm.

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 8mm IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 50mm OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-1.1.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 2mm OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

# METRIC

JANUARY, 1990