STATE	STATE PROJECT REFERENCE NO.	SHEET NO	TOTAL SHEETS
N.C.	I-4401		

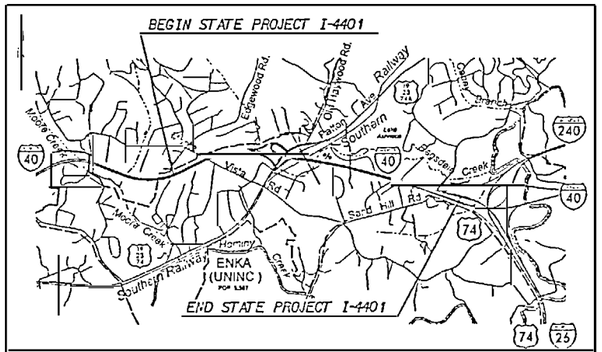
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.1845801	NHIMF-40-1(142)46	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

LOCATION: I-40 AUXILIARY LANES FROM WEST OF US 19-23 (SMOKY PARK HIGHWAY) TO THE I-240 /I-26 INTERCHANGE

TYPE OF WORK: GRADING, DRAINAGE, STRUCTURES, PAVING GUARDRAIL, SIGNALS AND SIGNING



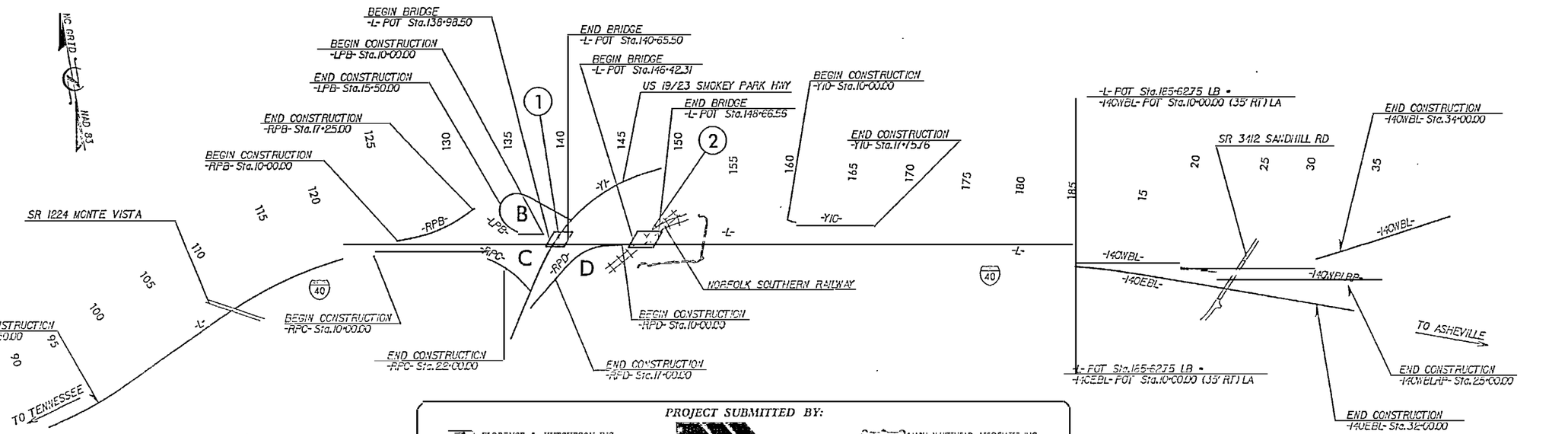
VINICITY MAP OF I-4401

RFC INDEX		
RFC	DESCRIPTION	DATE
RFC-S1-1A	STRUCTURAL STEEL AND BEARINGS	7-21-05
RFC-S1-1B	REVISED ELASTOMERIC BEARING DETAILS	9-27-05
RFC-S1-2A	SUBSTRUCTURE	11-18-05
RFC-S1-2B	REVISED SUBSTRUCTURE SHEETS	1-6-06
RFC-S1-3A	COMPLETE BRIDGE CONSTRUCTION PLANS	2-15-06

RFC-S1-3A

DATE: 2-15-06

BRIDGE ON I-40 OVER US 19/23
COMPLETE BRIDGE CONSTRUCTION PLANS
STRUCTURE 1 301



1726-59-14

PROJECT SUBMITTED BY:

FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
409 FAYETTEVILLE BLVD., SUITE 175
RALEIGH, NC 27603

TAYLOR & MURPHY

RALPH WHITEHEAD ASSOCIATES, INC.
Consulting Engineers
1000 W Hanover, Suite 200 • Charlotte, N.C. 28208

WBS # 34233.1.1

CONTRACT: C201277

TIP PROJECT: I-4401

STRUCTURES

8.1845801

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K-101
2-20-06

Prepared for:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2002 STANDARD SPECIFICATIONS

ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 ENGINEER MARK F. ROBBINS
2-15-06

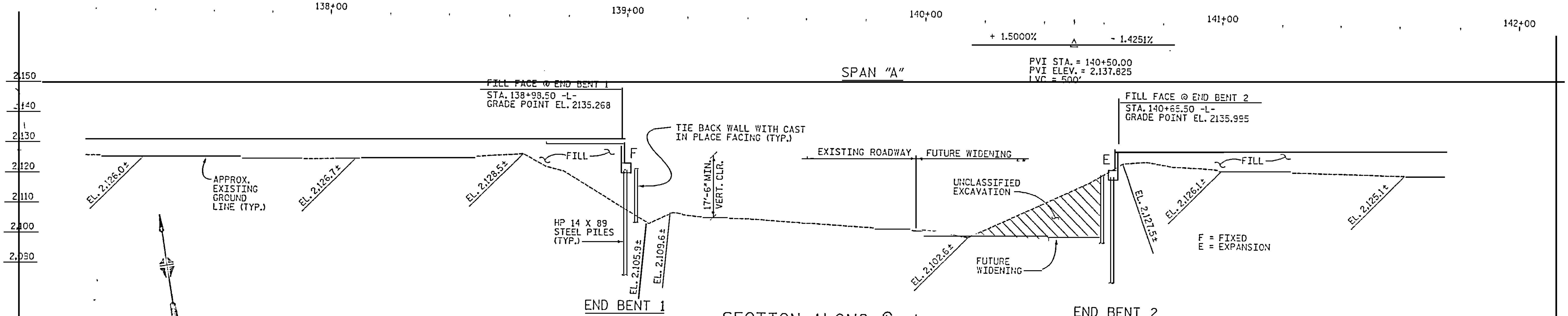
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 ENGINEER KEVIN G. BAILEY
2-15-06

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

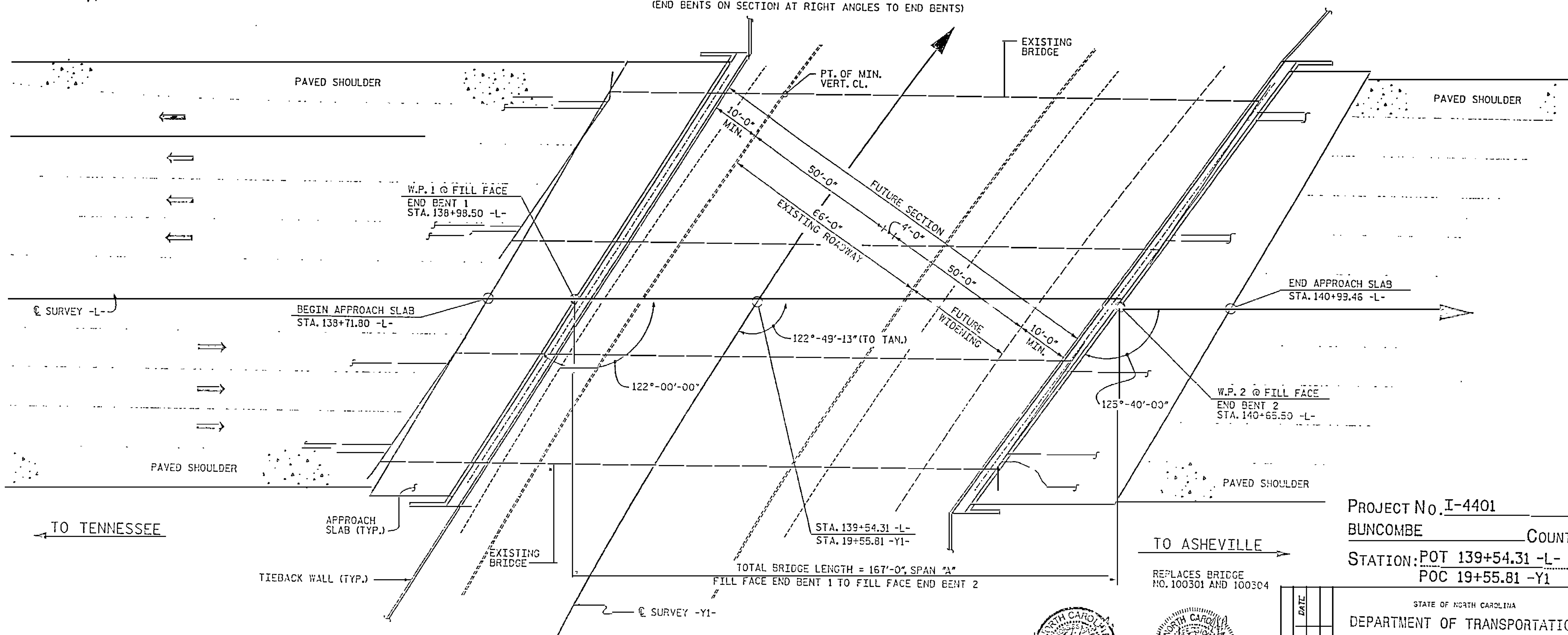
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE



SECTION ALONG ℄ -L-

(END BENTS ON SECTION AT RIGHT ANGLES TO END BENTS)



REPLACES BRIDGE NO. 100301 AND 100304

PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON I-40 OVER US 19-23

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19165 MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY LGH DATE 9-05
CHECKED BY MFR DATE 9-05

REVISIONS: NO. | BY | DATE

SHEET NO. S1-1
TOTAL SHEETS 30

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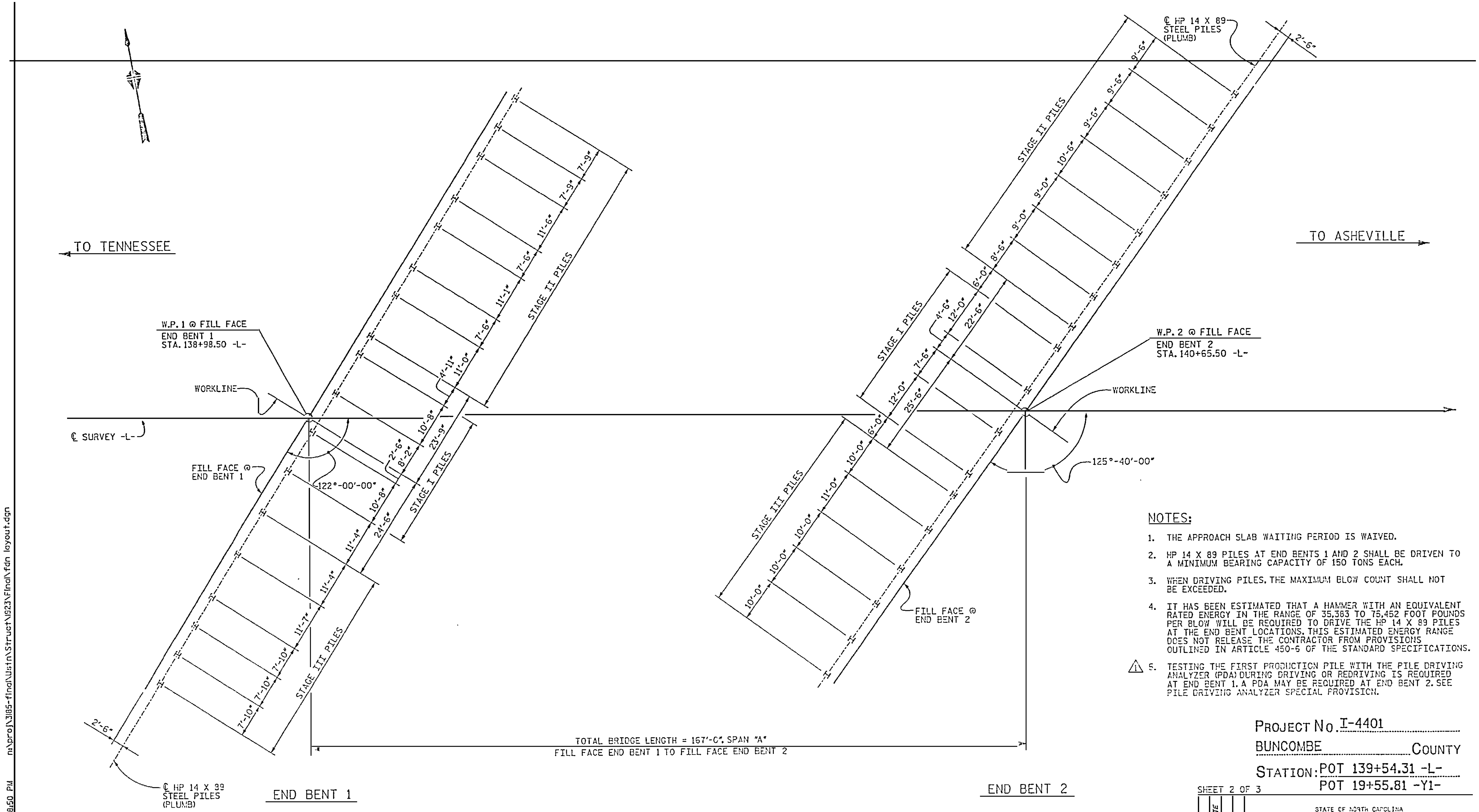

FOUNDATION LAYOUT

ALL END BENT PILES SHALL BE HP 14 X 89 STEEL PILES.

DIMENSIONS TO PILES ARE MEASURED TO ℄ OF PILE.

NOTES:

1. THE APPROACH SLAB WAITING PERIOD IS WAIVED.
2. HP 14 X 89 PILES AT END BENTS 1 AND 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 150 TONS EACH.
3. WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.
4. IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 35,363 TO 75,452 FOOT POUNDS PER BLOW WILL BE REQUIRED TO DRIVE THE HP 14 X 89 PILES AT THE END BENT LOCATIONS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVISIONS OUTLINED IN ARTICLE 450-6 OF THE STANDARD SPECIFICATIONS.
5. ⚠ TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING OR REDRIVING IS REQUIRED AT END BENT 1. A PDA MAY BE REQUIRED AT END BENT 2. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.

⚠ TEXT CHANGE

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POT 19+55.81 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 1-6-06

NORTH CAROLINA PROFESSIONAL SEAL 19155 ENGINEER MARK F. ROBBINS 1-6-06

REVISIONS NO.	BY	DATE	NO.	BY	DATE
1	KWA	1-06	3		
2			4		

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DRAWN BY LGH/TJT DATE 9-05 DWG. NO.
CHECKED BY JAD DATE 10-05 D-1735.02

SHEET NO. S1-2
TOTAL SHEETS 50

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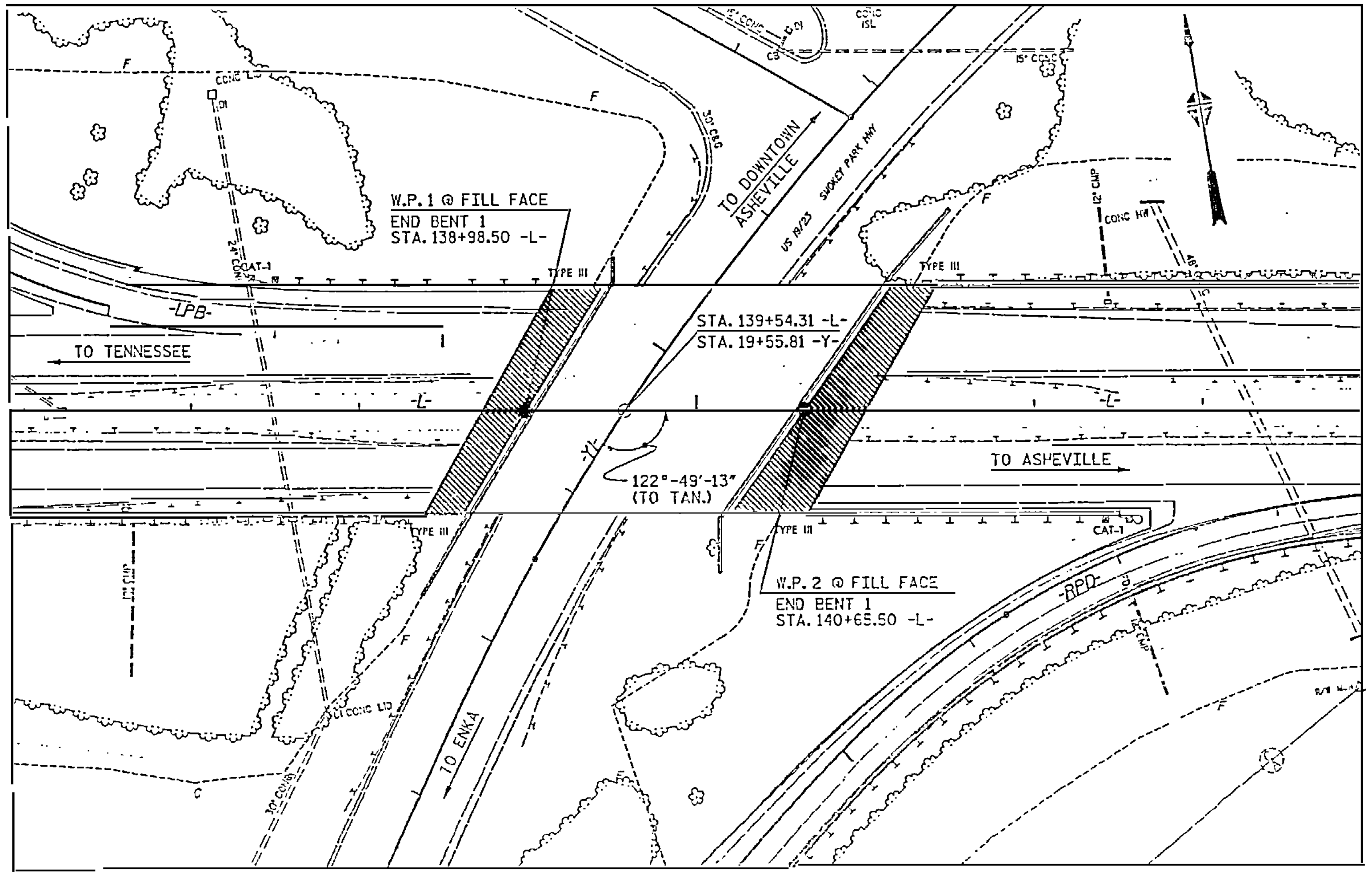
TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	REINFORCING STEEL	STRUCTURAL STEEL	HP 14 X 89 STEEL PILES		CONCRETE BARRIER RAIL	CONCRETE MEDIAN RAIL
	SQ. FT.	SQ. FT.	CU. YDS.	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE	21,976	20,894			971,300			330.1	164.5
END BENT 1			150.3	26,365		18	1440.0		
END BENT 2			155.3	27,255		18	1350.0		
TOTAL	21,976	20,894	305.6	53,620	971,300	36	2790.0	330.1	164.5



LOCATION SKETCH

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

FOR BENCHMARK DATA, SEE ROADWAY PLANS.

GENERAL NOTES:

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES" FOR SEISMIC PERFORMANCE CATEGORY B.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: ONE 30" SAMPLE 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 FOR BAR SIZE UP TO #8. FOR #9, #10 AND #11 BARS, THE FABRICATOR SHALL DESIGNATE THE BARS WHERE SAMPLES ARE GOING TO BE TAKEN. FOR DESIGNATED BARS, THE FABRICATOR SHALL PROVIDE ADDITIONAL 30" LENGTH AND THE SAMPLES SHALL BE TAKEN AT END OF BARS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED BRIDGE, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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 ADDITIONAL PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL.

THE EXISTING STRUCTURE CONSISTING OF A THREE SPAN STEEL GIRDER BRIDGE SHALL BE REMOVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

IN AS MUCH 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 MATERIAL CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE.

DRAWING INDEX:

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

NORTH CAROLINA SEAL 23479 KEVIN G. BAILEY 2-15-06

NORTH CAROLINA SEAL 18165 MARK F. ROBBINS 2-15-06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING, LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL

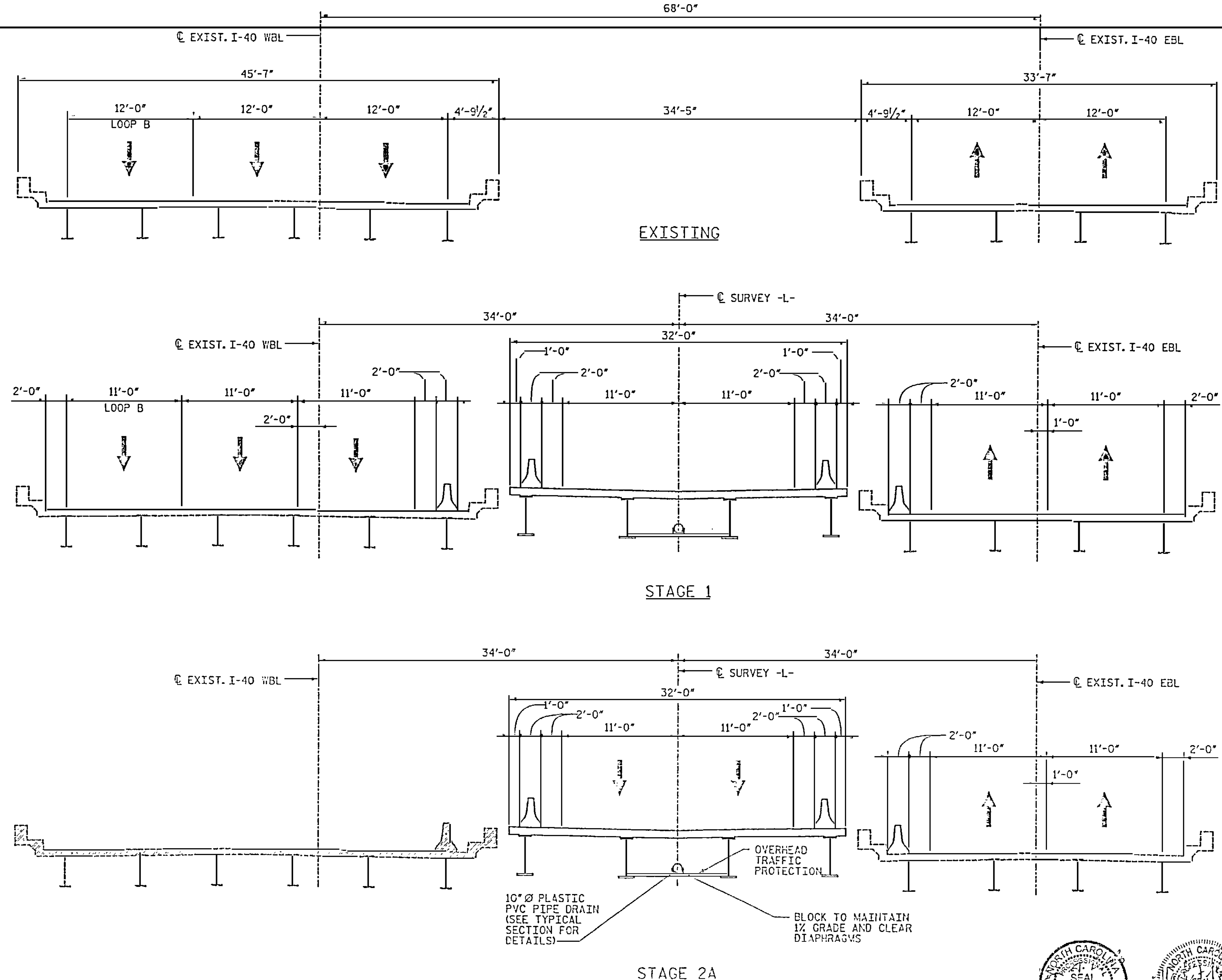
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 1-06 DWG. NO.
CHECKED BY KGB DATE 1-06 D-1755.03

SHEET NO. S1-3
TOTAL SHEETS 53



NOTES:

1. LOOP B EXIT LANE BEYOND BRIDGE. SEE TRAFFIC CONTROL PLANS.

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

REVISIONS: NO. | BY | DATE

SEAL 29479 KEVIN G BAILEY 2-15-06
SEAL 16185 MARK F. ROBBINS 2-15-06

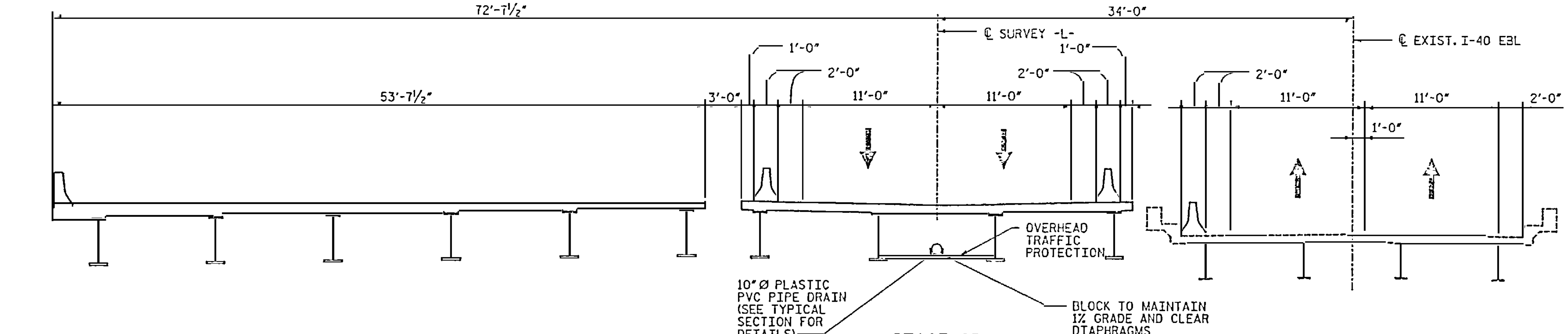
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

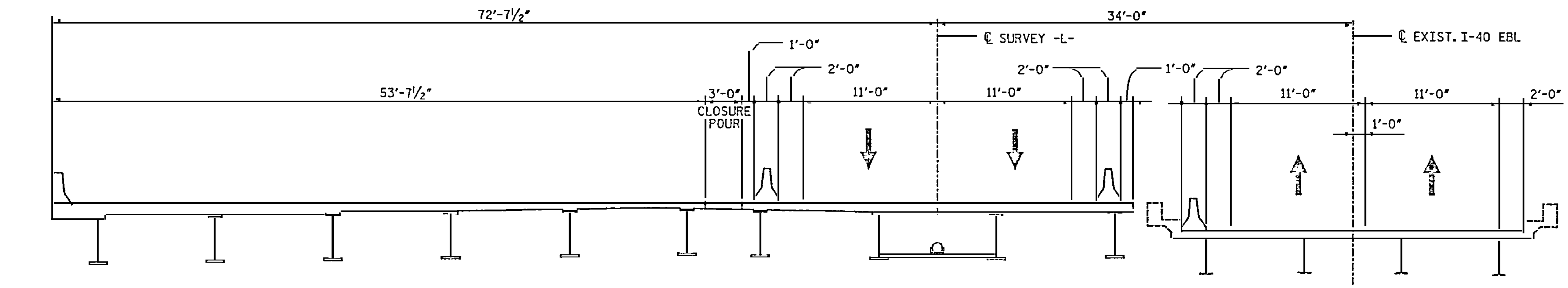
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY JRB DATE 5-05
CHECKED BY MFR DATE 6-05
D-1735.04

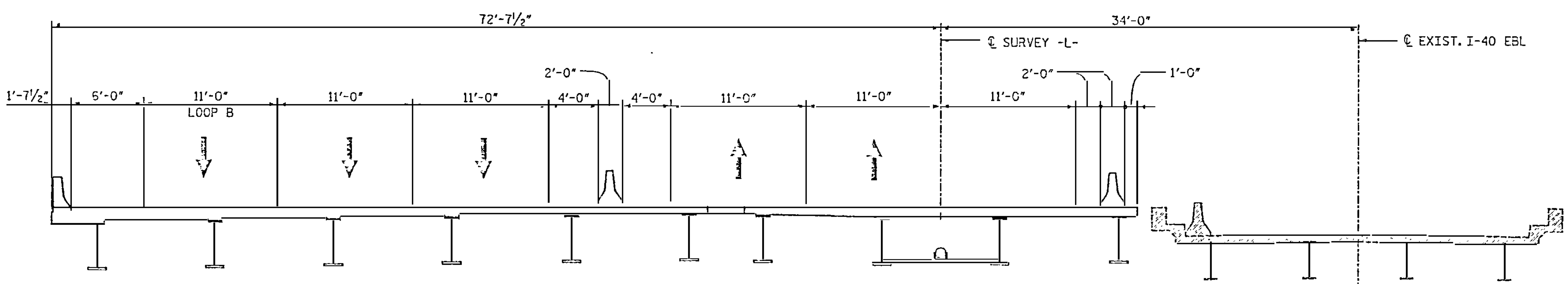
SHEET NO. S1-4
TOTAL SHEETS 53



STAGE 2B



STAGE 2C



STAGE 3A

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-

POC 19+55.81 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

CONSTRUCTION STAGING

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

SHEET NO. S1-5

TOTAL SHEETS 50

NORTH CAROLINA SEAL 23479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA SEAL 19165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35524 CHARLOTTE, N.C. 28235

DRAWN BY JRB DATE 5-05 DWG. NO.

CHECKED BY MFR DATE 6-05 D-1785.05

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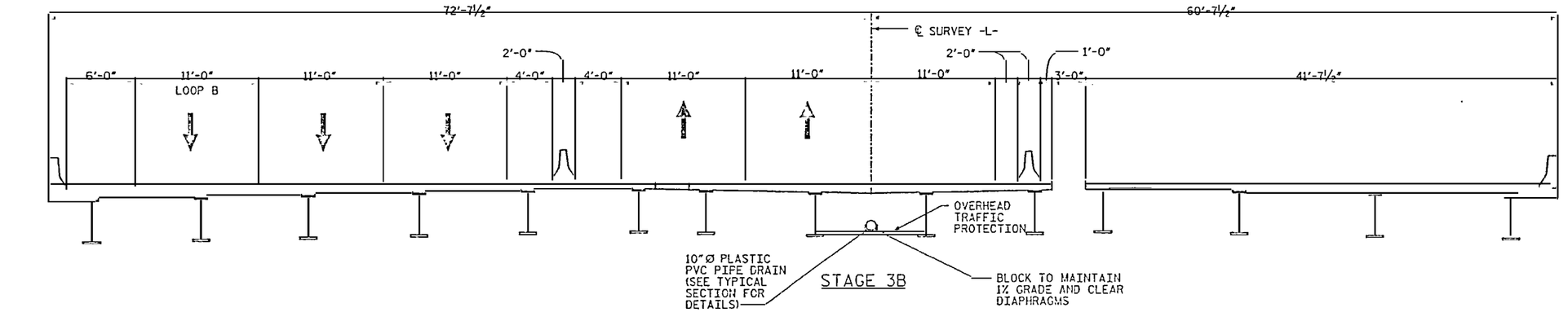
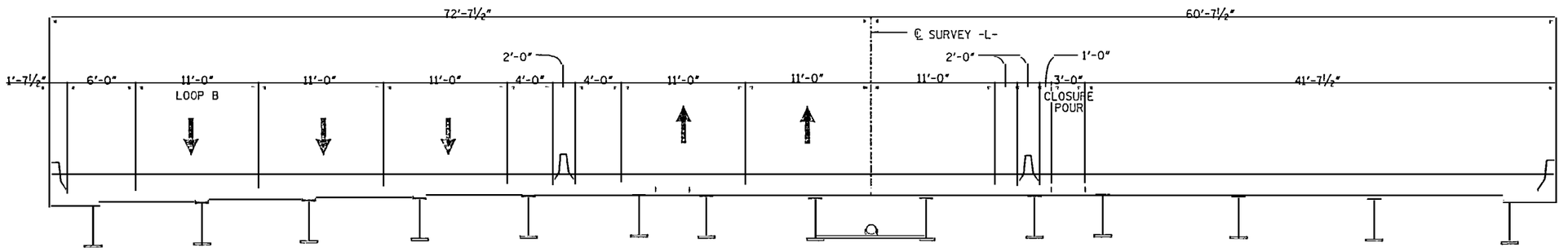


STAGE 3B



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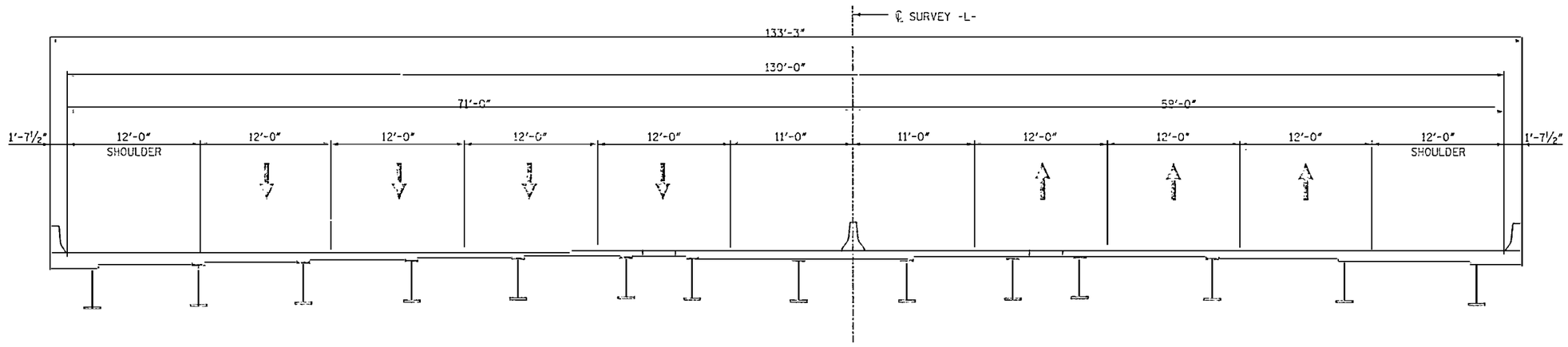


COMPLETE

PROJECT No. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29479 KEVIN G BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13165 MARK F. ROBBINS 2-15-06

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

SHEET NO. S1-5
TOTAL SHEETS 50

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC
CONSULTING ENGINEERS
420 HERITAGE PARK SUITE 415
RALEIGH, NC 27609

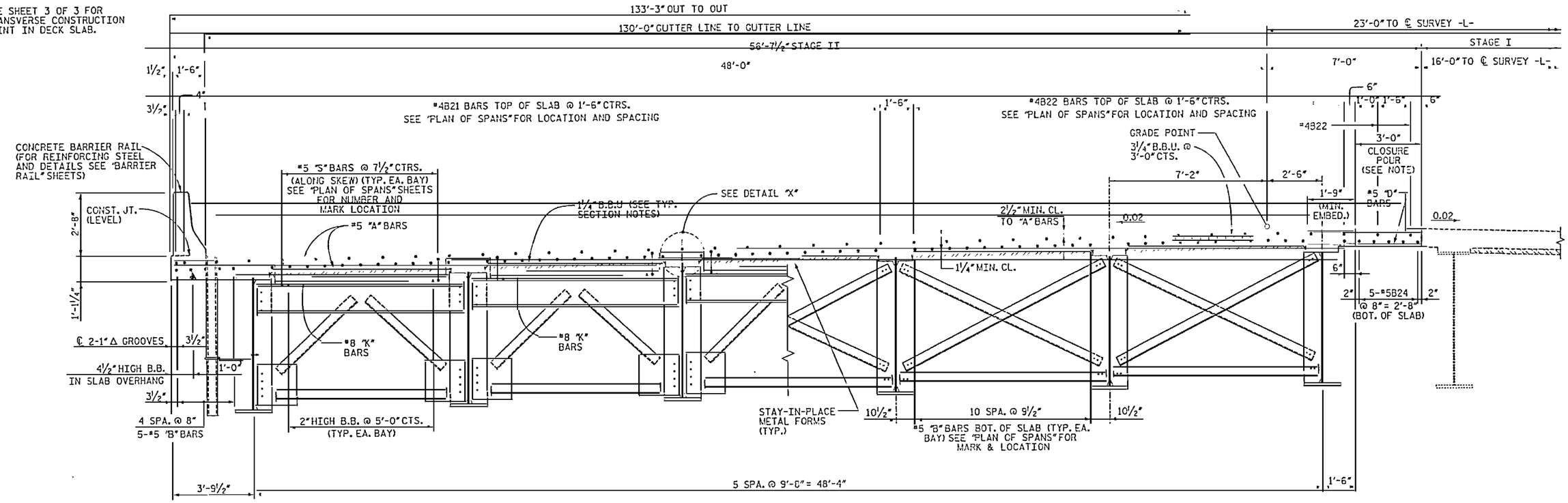
RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY MRB DATE 5-05
CHECKED BY MFR DATE 6-05
D-1785.06

NOTES:

SEE SHEET 1 OF 3 FOR NOTES.

SEE SHEET 3 OF 3 FOR TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB.

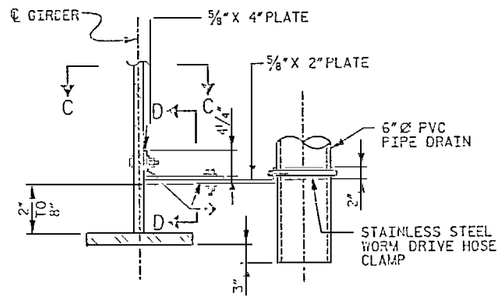


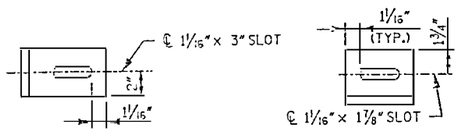
END CROSSFRAMES

INTERMEDIATE CROSSFRAMES

TYPICAL SECTION - STAGE II

NOTE : CONCRETE FOR CLOSURE POUR IS NOT TO BE CAST UNTIL CONCRETE FOR REST OF STAGE II HAS BEEN CAST AND ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.





SECTION C-C

SECTION D-D

DRAIN CONNECTOR DETAILS

PIPE DRAIN NOTES

COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

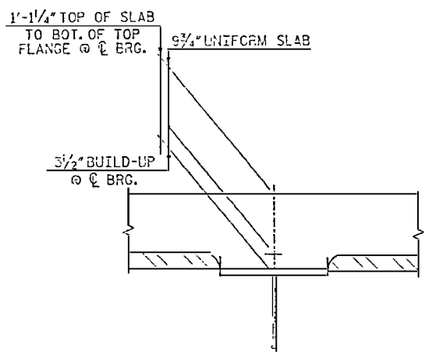
TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

(4) - ½" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

BOLT SIZES TO BE SAME AS CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.



DETAIL "X"

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23479 KEVIN G. BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROSSINI 2-15-06

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 3

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

REVISIONS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION STAGE II

SHEET NO. S1-1

TOTAL SHEETS 50

TAYLOR & MURPHY

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DRAWN BY LGH/TJT DATE 9-05 DWG. NO. 1783.07

CHECKED BY TVR DATE 1-06

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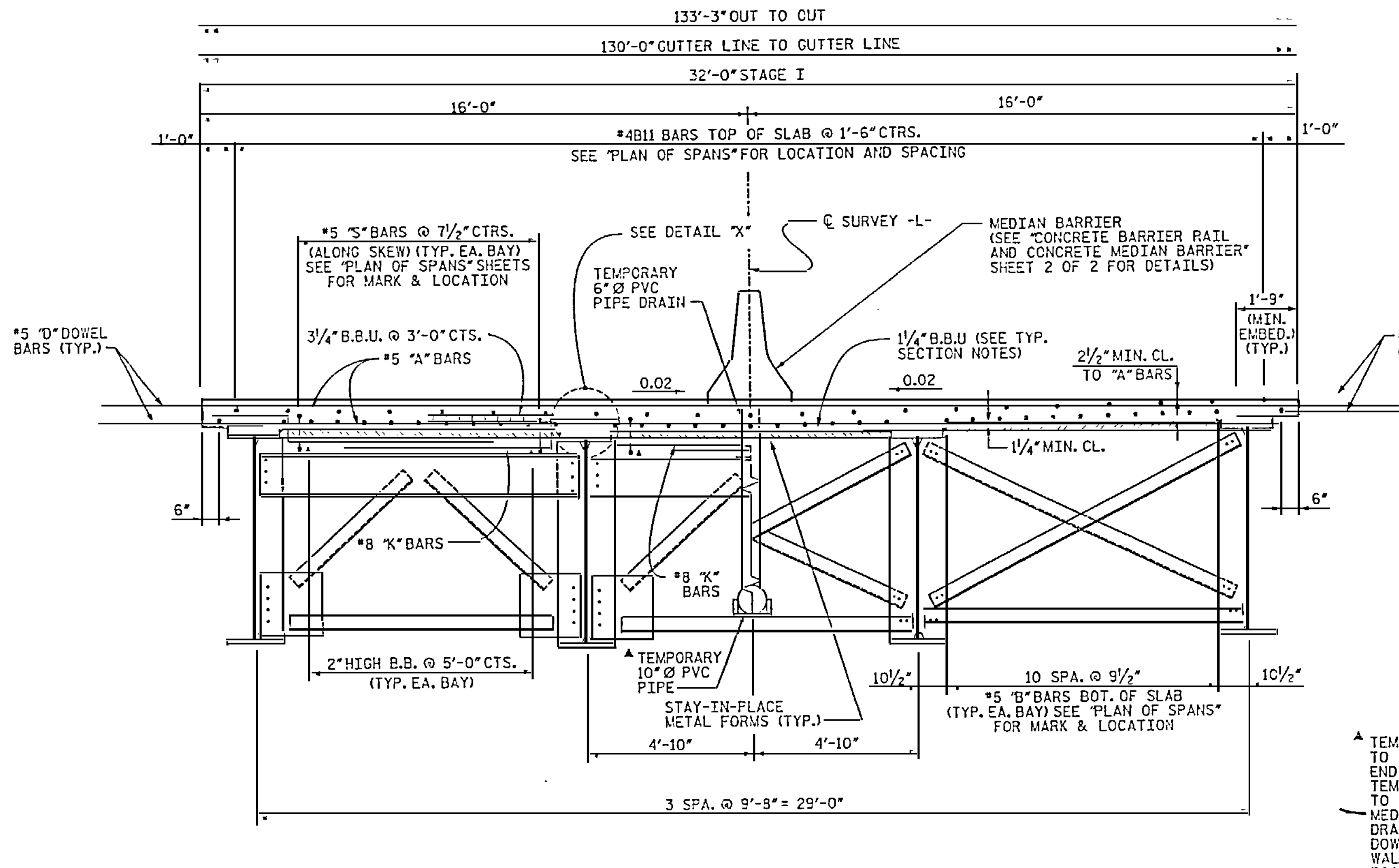


TYPICAL SECTION - STAGE I

▲ TEMPORARY 10" Ø PVC PIPE TO RUN CONTINUOUS FROM END BENT 2 TO END BENT 1. TEMPORARY DRAIN PIPES TO REMAIN IN PLACE UNTIL MEDIAN BARRIER IS POURED. DRAIN PIPES TO BE CARRIED DOWN AND ALONG TIE BACK WALL AT END BENT AND INTO ROADWAY DRAINAGE.

10" Ø PIPE TO BE SUPPORTED ON OVERHEAD TRAFFIC PROTECTION AND BLOCKED TO ATTAIN A MINIMUM 1% GRADE.

NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER (B.B.U.) AT 4'-0" CENTERS 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.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF REMOVABLE FORMS.

METAL STAY-IN-PLACE FORMS AND FALSEWORK SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE "STRUCTURAL STEEL DETAILS" SHEETS.

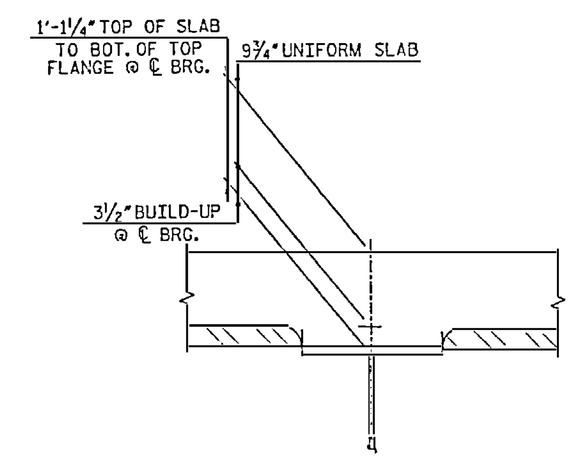
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENER 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.

SHIFT "B" BARS AS NECESSARY TO CLEAR 6" Ø PVC PIPE DRAINS.

THE BARRIER AND MEDIAN BARRIER RAILS SHALL NOT BE CAST UNTIL SLAB CONCRETE HAS BEEN CAST IN THE AFFECTED STAGE AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.



DETAIL "X"

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL SEAL 19165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY LGH/TJT	DATE 9-05	DWG. NO.	
CHECKED BY TVR	DATE 1-06	1783.07a	

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

SHEET NO. S1-1a
TOTAL SHEETS 50

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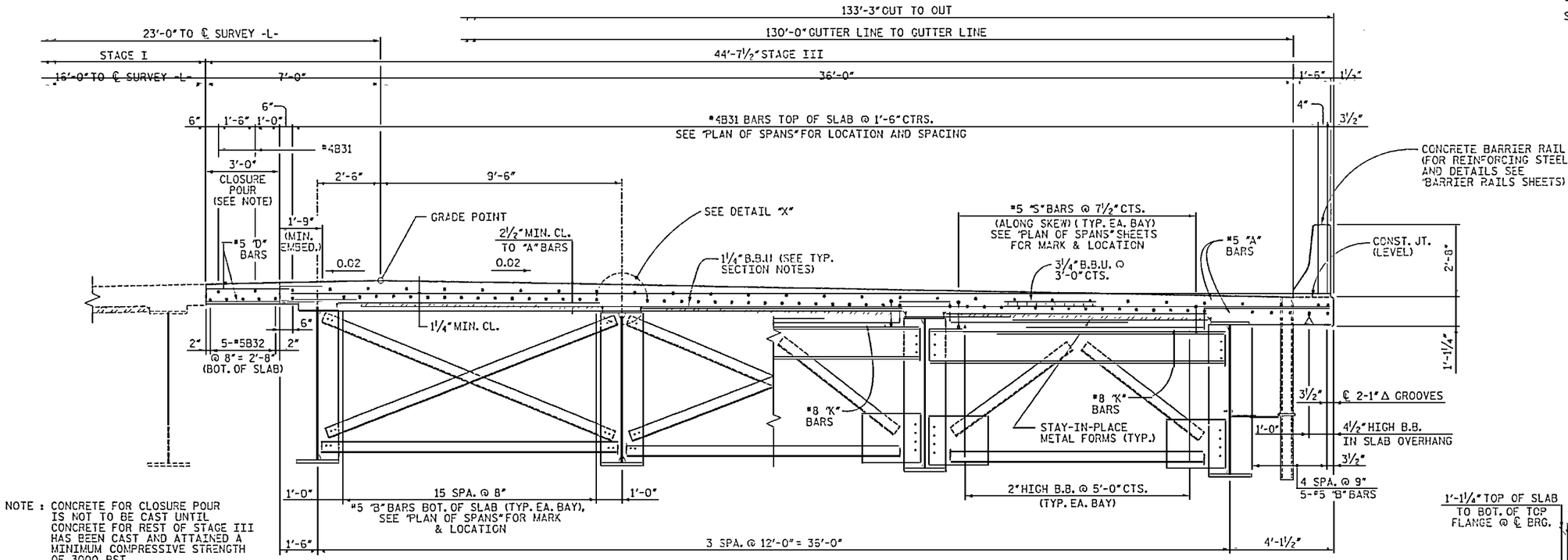
NOTES:

SEE SHEET 1 OF 3 FOR NOTES.

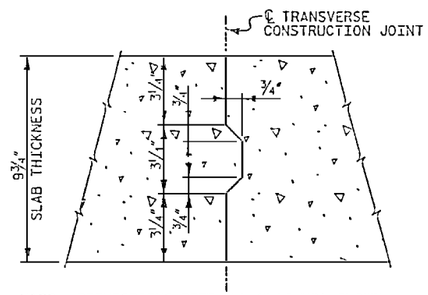


NOTE : CONCRETE FOR CLOSURE POUR IS NOT TO BE CAST UNTIL CONCRETE FOR REST OF STAGE III HAS BEEN CAST AND ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

INTERMEDIATE CROSSFRAMES

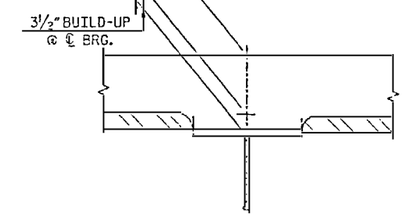
END CROSSFRAMES

TYPICAL SECTION - STAGE III



NOTE : REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB



DETAIL "X"

PROJECT No. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 26479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL SEAL 13165 ENGINEER MARK F. ROBBINS 2-15-06

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION STAGE III

SHEET NO. S1-7b

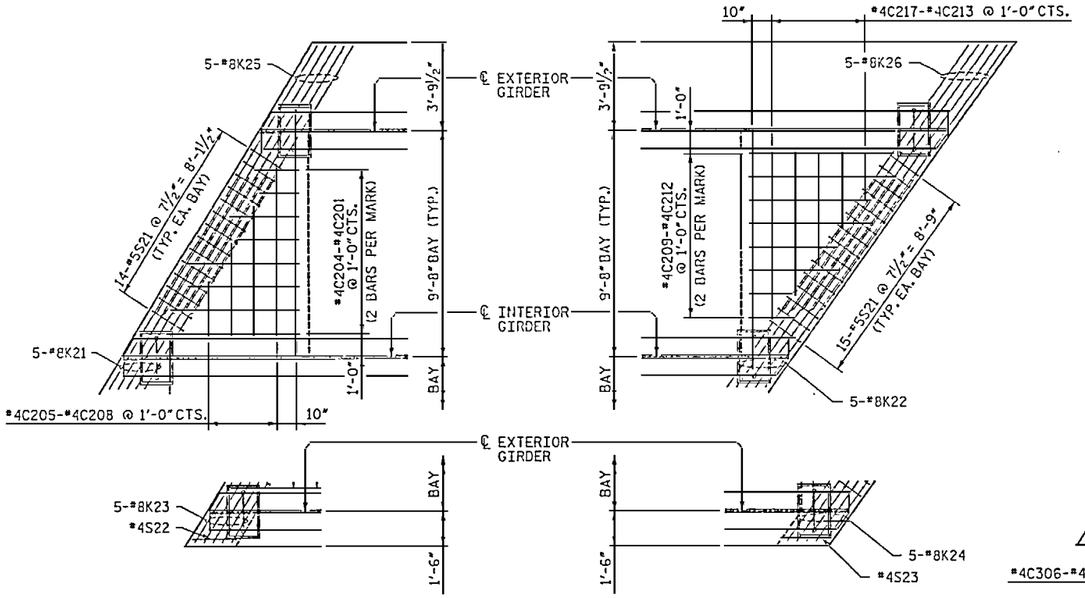
TOTAL SHEETS 50

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 4713 WESTCHASE BLVD., SUITE 415 RALEIGH, NC 27607

RALPH WHITEHEAD ASSOCIATES, LTD. CONSULTING ENGINEERS P.O. BOX 35824 CHARLOTTE, N.C. 28235

DRAWN BY LGH DATE 9-05
CHECKED BY TVR DATE 1-06
D.W.G. NO. 1735.07b

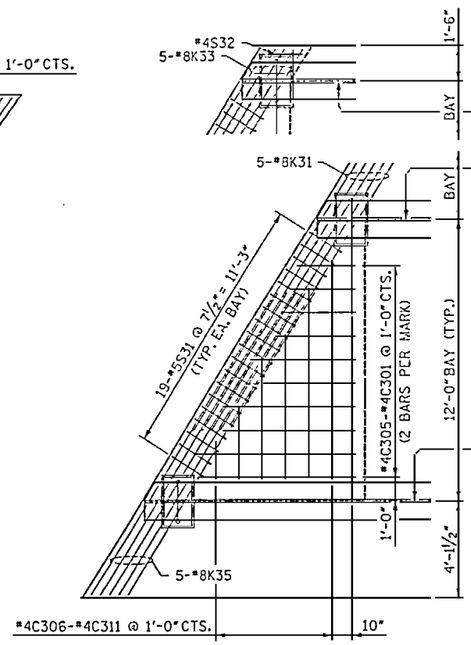


DETAIL "A"

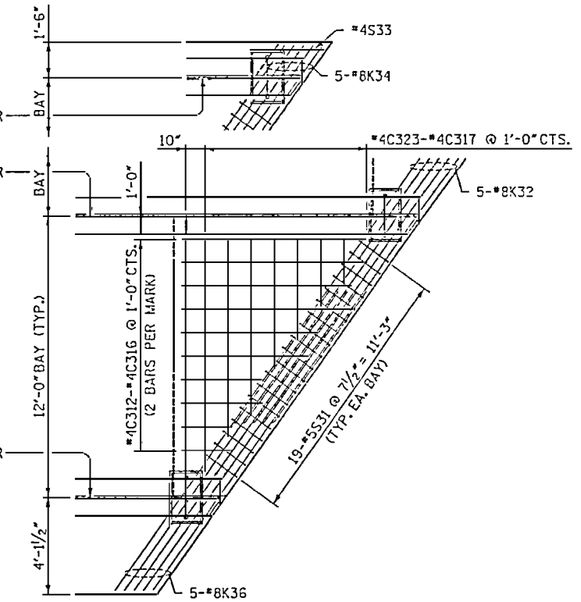
STAGE II SHOWN, STAGE I SIMILAR EXCEPT EXTERIOR GIRDER IS 1'-6" FROM EDGE OF SLAB ON BOTH SIDES OF STAGE I

DETAIL "B"

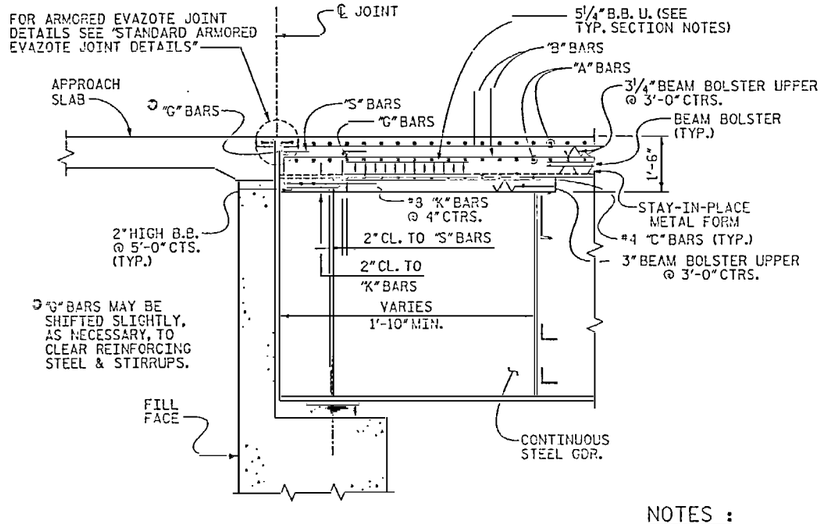
STAGE II SHOWN, STAGE I SIMILAR EXCEPT EXTERIOR GIRDER IS 1'-6" FROM EDGE OF SLAB ON BOTH SIDES OF STAGE I



DETAIL "C"



DETAIL "D"



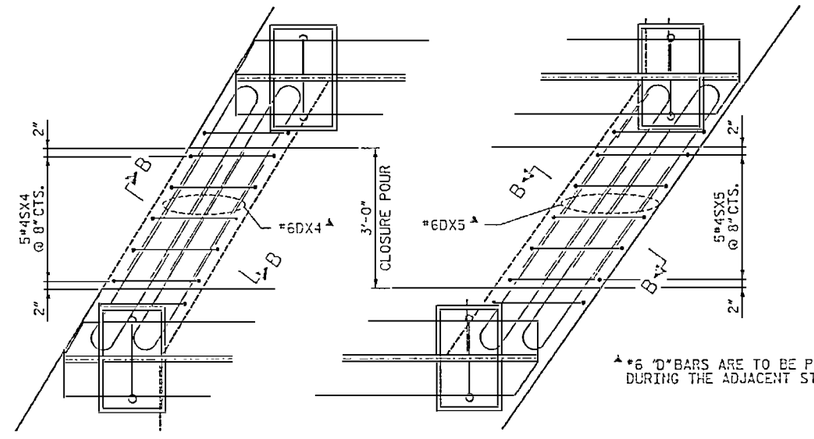
SECTION A-A

END BENT 1 SHOWN
END BENT 2 SIMILAR

NOTES :

¾" Ø X 4" SHEAR CONNECTORS @ 1'-0" CTRS. ARE REQUIRED ON C15x33.9 SECTION (TYP.).

FOR LOCATION OF SECTIONS, SEE "PLAN OF SPANS".

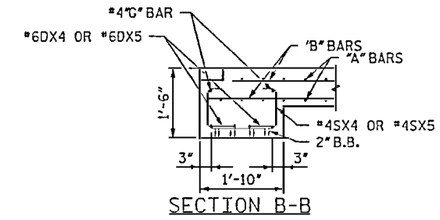


END BENT 1 END BENT 2

A #6 "D" BARS ARE TO BE PLACED DURING THE ADJACENT STAGE.

CLOSURE POUR REINFORCEMENT

"D" BARS MAY BE ROTATED SLIGHTLY FOR CLEARANCE OF BEARING STIFFENER.
"G" BARS NOT SHOWN FOR CLARITY.



SECTION B-B

REINFORCING BAR CALLOUT FOR CLOSURE POUR

(TYPICAL EXAMPLE)

PROJECT No. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA SEAL 18193 ENGINEER MARK F. ROBBINS 2-15-06

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DETAILS

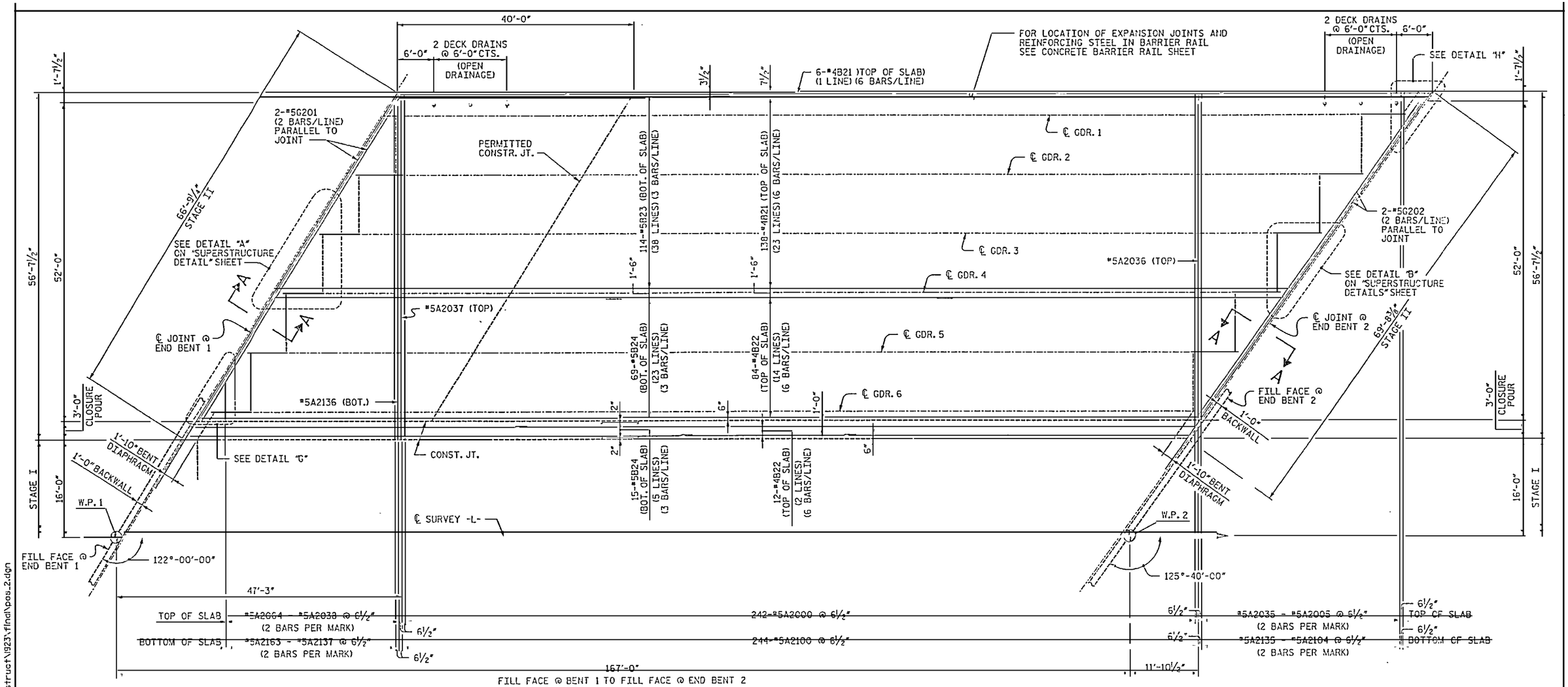
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

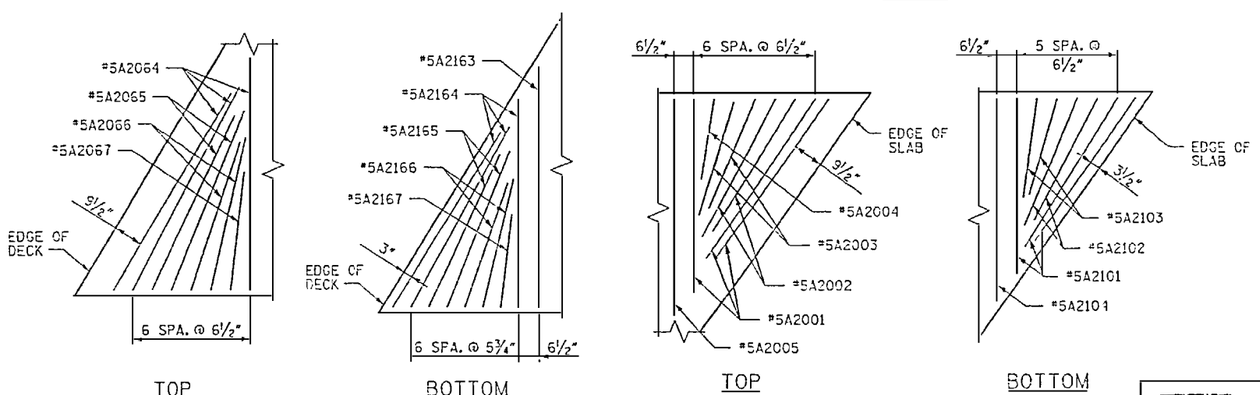
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35621 CHARLOTTE, N.C. 28235

DRAWN BY TJT DATE 10-05
CHECKED BY TVR DATE 1-06
DWG. NO. D-1783.08

SHEET NO. S1-3
TOTAL SHEETS 50



PLAN



DETAIL "G"

DETAIL "H"

NOTES:

1. FOR NOTES, SEE SHEET 2 OF 4.

PROJECT No. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
STAGE II

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROBBINS 2-15-06

REVISIONS

NO.	BY	DATE
1		
2		
3		
4		

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35924 CHARLOTTE, N.C. 28235

DRAWN BY DDL/TJT DATE 9-05
CHECKED BY TVR DATE 1-06
ENG. NO. D-1785.09

SHEET NO. S-1
TOTAL SHEETS 30

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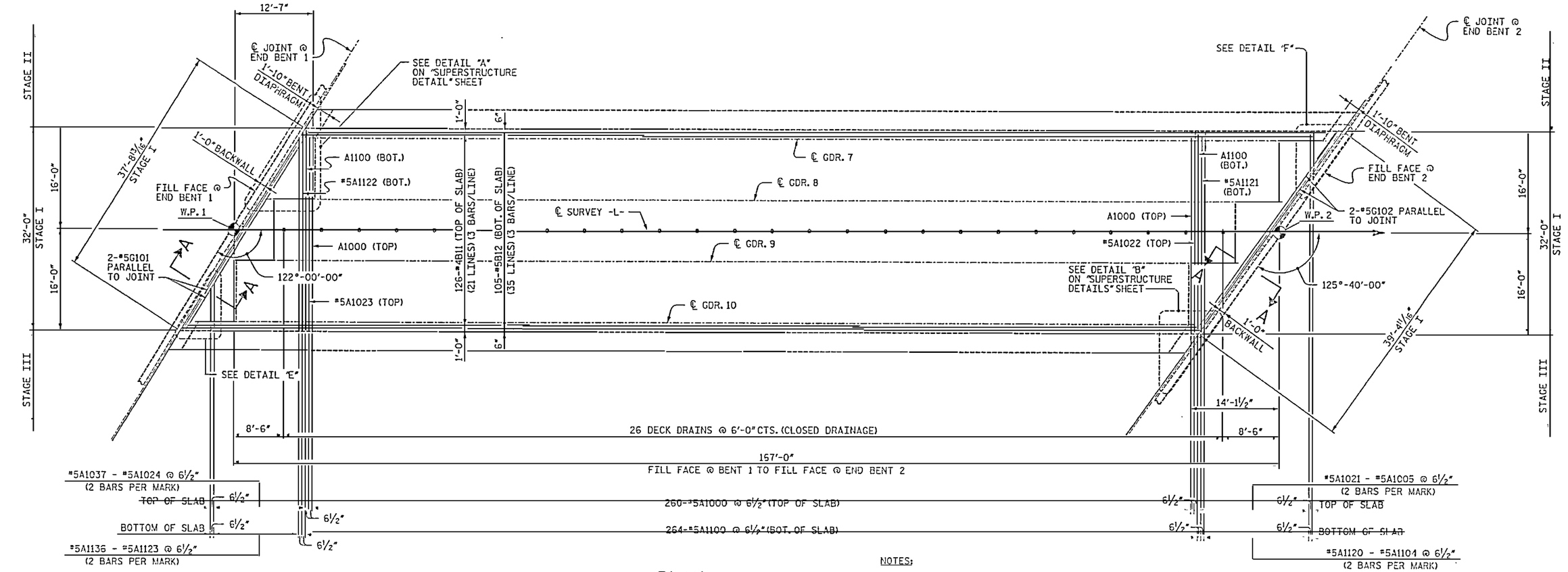
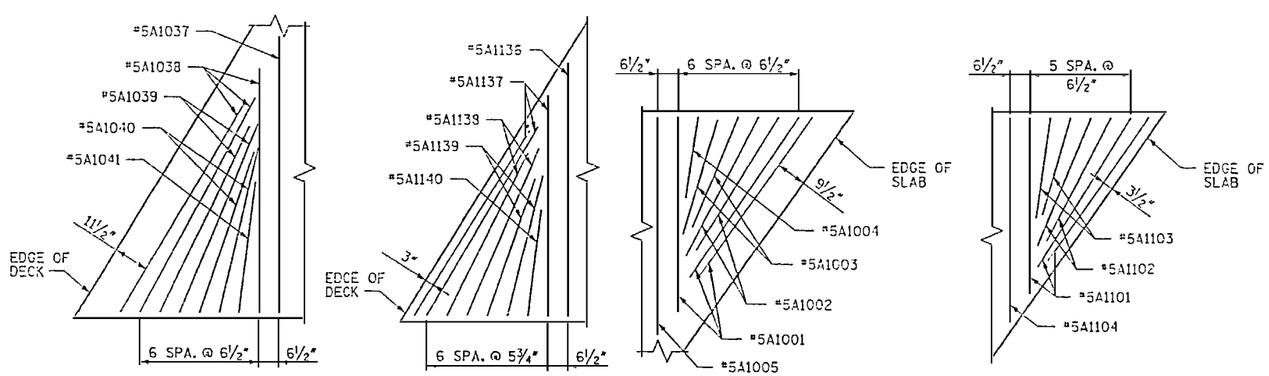


PLAN



TOP BOTTOM TOP BOTTOM

DETAIL "E" DETAIL "F"

NOTES:

1. FOR SPACING OF BOTTOM "B" BARS, SEE SHEETS TITLED "TYPICAL SECTION".
2. FOR POURING SEQUENCE, SEE SHEET TITLED "POURING DIAGRAM".
3. FOR LOCATION OF DIAPHRAGMS, SEE SHEET TITLED "FRAMING PLAN".
4. FOR SECTION A-A AND SECTION B-B, SEE SHEET TITLED "SUPERSTRUCTURE DETAILS".
5. "A" BARS TO BE PLACED PERPENDICULAR TO ℄ SURVEY -L-.
6. FOR DOWEL BAR LAYOUT, SEE SHEET 4 OF 4.
7. FOR END DIAPHRAGM DETAILS, SEE SHEET TITLED "SUPERSTRUCTURE DETAILS".
8. FOR TEMPORARY CLOSED DRAINAGE SYSTEM, SEE "TYPICAL SECTION" SHEET.
9. REINFORCING MAY BE SHIFTED TO CLEAR DECK DRAINS.

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
STAGE I

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

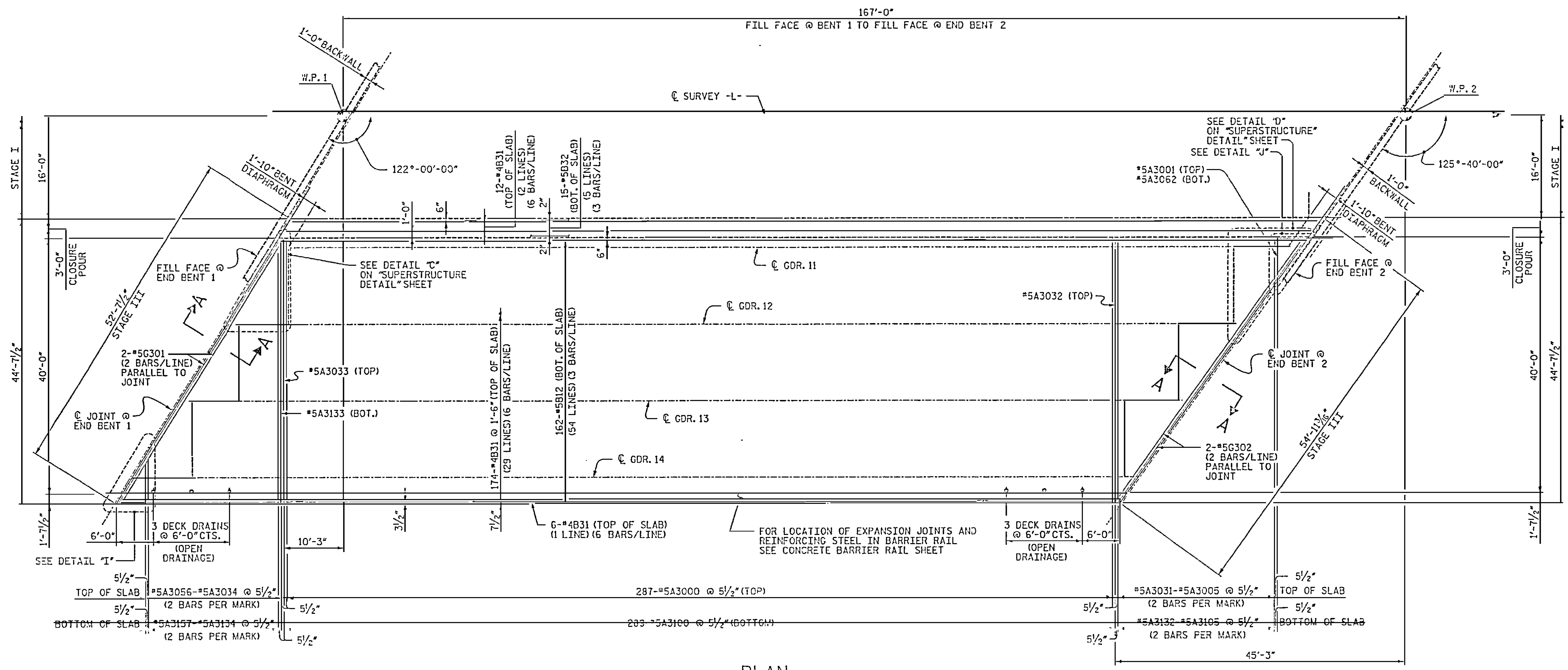
SHEET NO. S1-2c
TOTAL SHEETS 50

TAYLOR & MURPHY

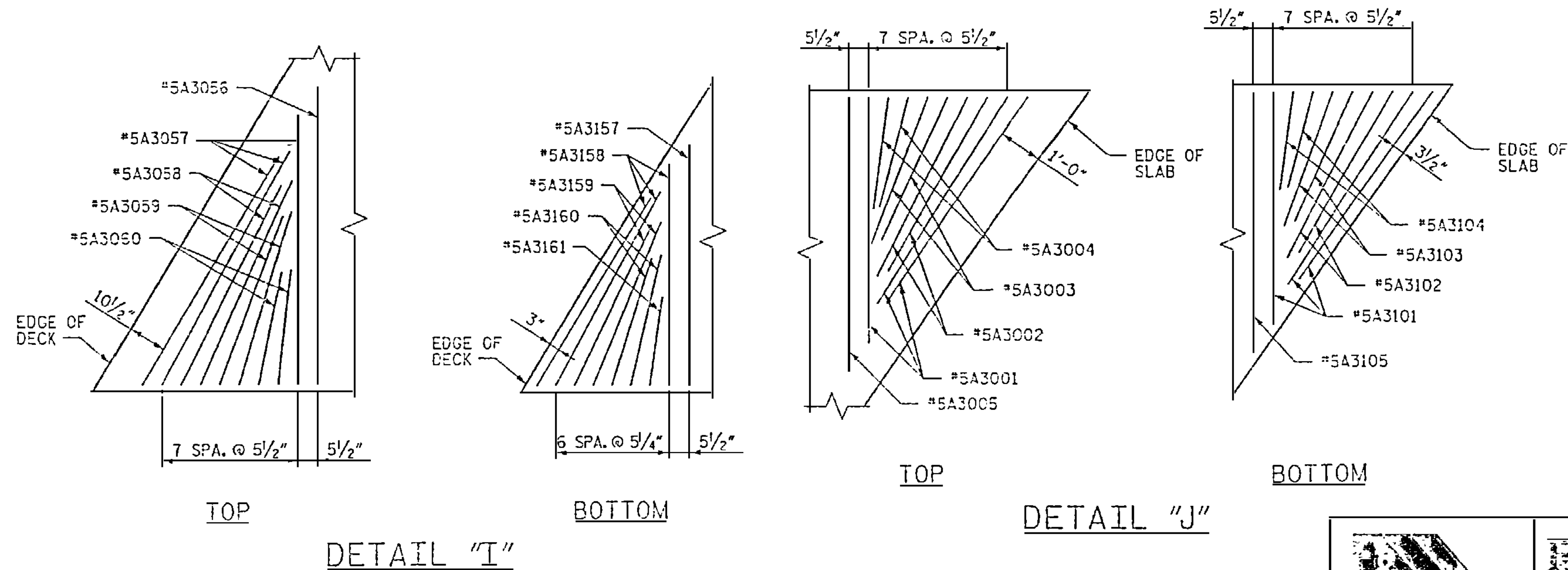
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 4520 WESTSHORE BLVD. SUITE 415 RALEIGH, NC 27607

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY DDL/TJT DATE 9-05 DRG. NO.
CHECKED BY TVR DATE 1-06 D-1785.03c



PLAN



NOTES:

1. FOR NOTES, SEE SHEET 2 OF 4.

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
STAGE III

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

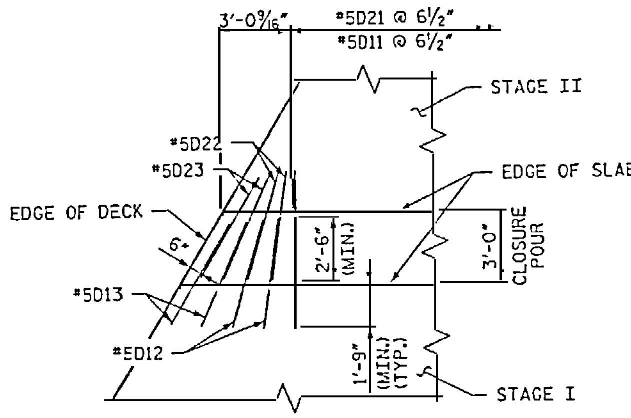
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY DDL/TJT DATE 9-05
CHECKED BY TVR DATE 1-06
DWG. NO. D-I785.005

REVISIONS: NO. 1, 2, 3, 4

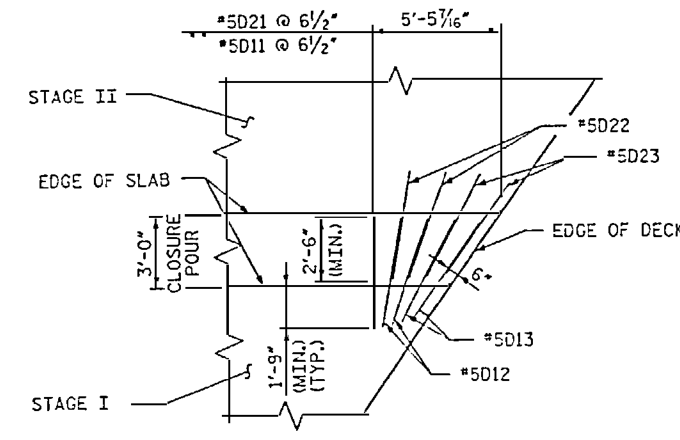
SHEET NO. S1-95
TOTAL SHEETS 50



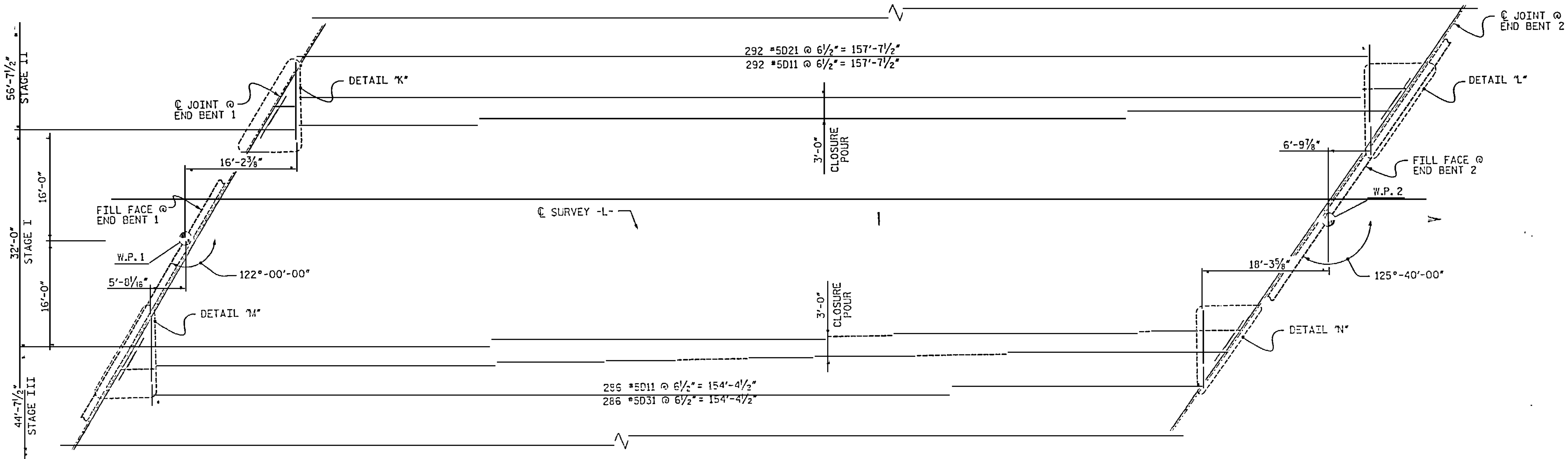
DETAIL "K"

NOTES

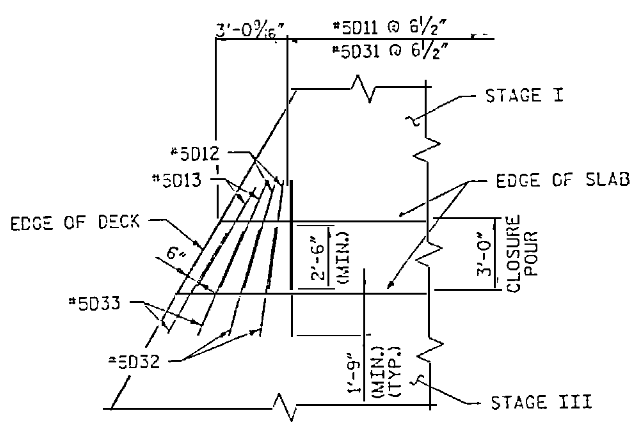
1. "D" BARS SHALL BE EPOXY COATED
2. "D" BARS MAY BE SHIFTED TO TO ACCOMODATE "A" BARS



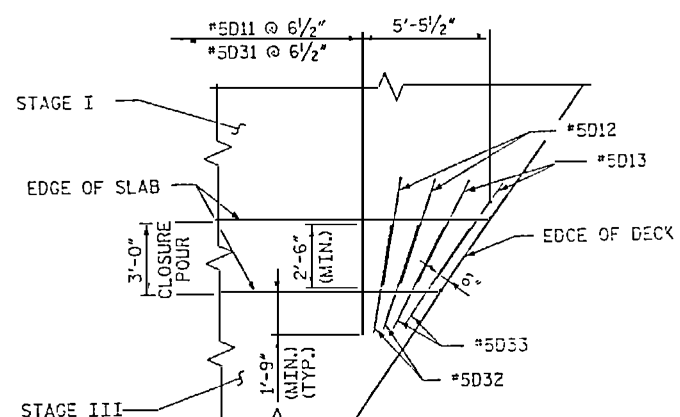
DETAIL "L"



DOWEL REINFORCEMENT LAYOUT



DETAIL "M"



DETAIL "N"

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
DOWEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TJT	DATE 10-05	DWG. NO.
CHECKED BY TVR	DATE 1-06	D-1785.03c

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

SHEET NO. S1-30
TOTAL SHEETS 50

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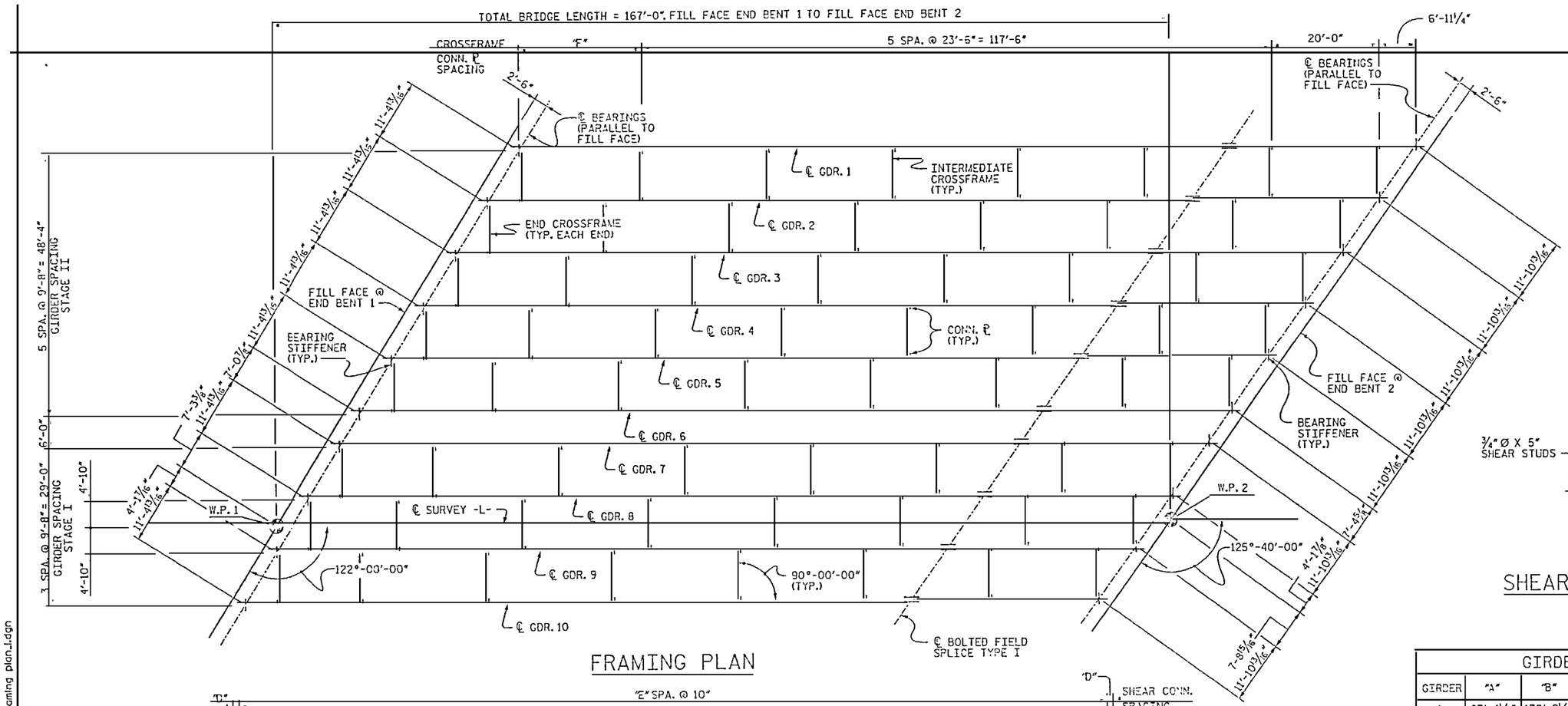
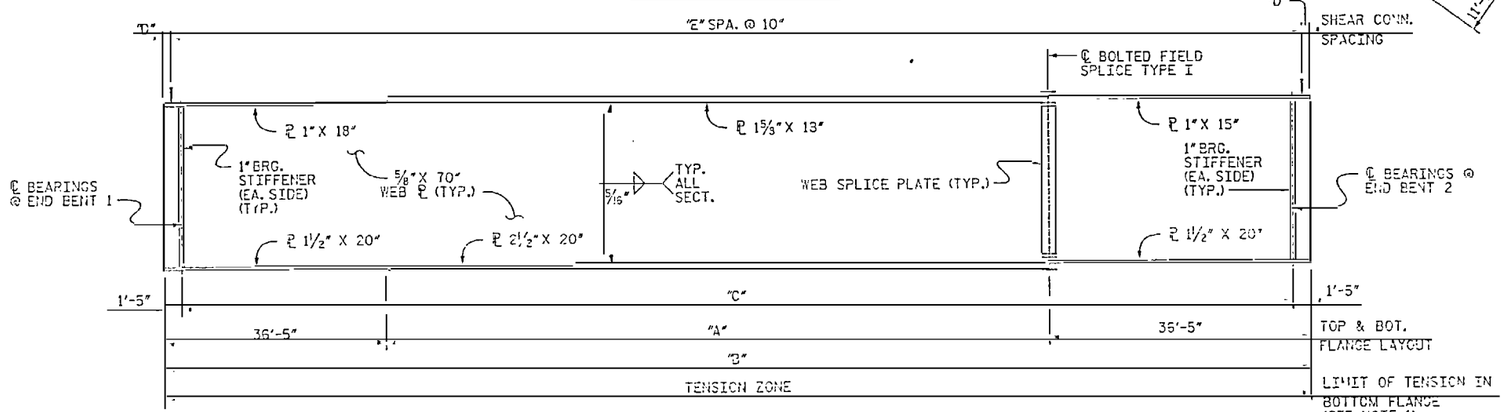
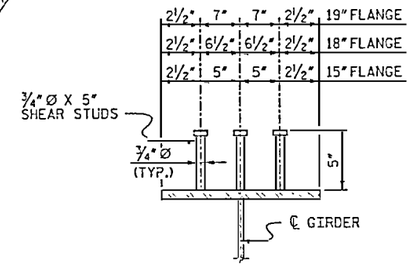


FRAMING PLAN



GIRDER ELEVATION (GIRDERS 1-10)

(CONNECTOR ℄S NOT SHOWN FOR CLARITY)



SHEAR CONNECTOR DETAIL

GIRDER DIMENSIONS						
GIRDER	"A"	"B"	"C"	"D"	"E"	"F"
1	97'-4¼"	170'-2¼"	167'-4¼"	6⅛"	203	22'-11"
2	95'-5½"	169'-3½"	166'-5½"	5¾"	202	22'-0¼"
3	95'-6¾"	168'-4¾"	165'-6¾"	5⅜"	201	21'-1½"
4	94'-8"	167'-6"	164'-8"	5"	200	20'-2¾"
5	93'-9¼"	166'-7¼"	163'-9¼"	4⅝"	199	19'-4"
6	92'-10½"	165'-8½"	162'-10½"	4¼"	198	18'-5¼"
7	92'-4"	165'-2"	162'-4"	6"	197	17'-10¾"
8	91'-5"	164'-3"	161'-5"	5½"	196	16'-11¾"
9	90'-6¼"	163'-4¼"	160'-6¼"	5⅛"	195	16'-1"
10	89'-7½"	162'-5½"	159'-7½"	4¾"	194	15'-2¼"

NOTES:

1. SEE "STRUCTURAL STEEL DETAILS" SHEET FOR STEEL NOTES, CHARPY V-NOTCH TESTING REQUIREMENTS AND SHOP SPLICE DETAILS.
2. ALL DIMENSIONS ON THIS SHEET ARE HORIZONTAL.
3. SHEAR CONNECTORS MAY BE MOVED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH GIRDER SECTION CHANGES AND HOLES FOR THE BOLTED FIELD SPLICE.
4. FOR TOP FLANGE CLIP DETAILS AT END BENTS 1 & 2, SEE "STRUCTURAL STEEL DETAIL" SHEET 1 OF 2.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 22479 ENGINEER KEVIN G. BAILEY 7-21-05

NORTH CAROLINA REGISTERED SEAL 18165 ENGINEER MARK F. ROBBINS 7-21-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35824 CHARLOTTE, N.C. 28235

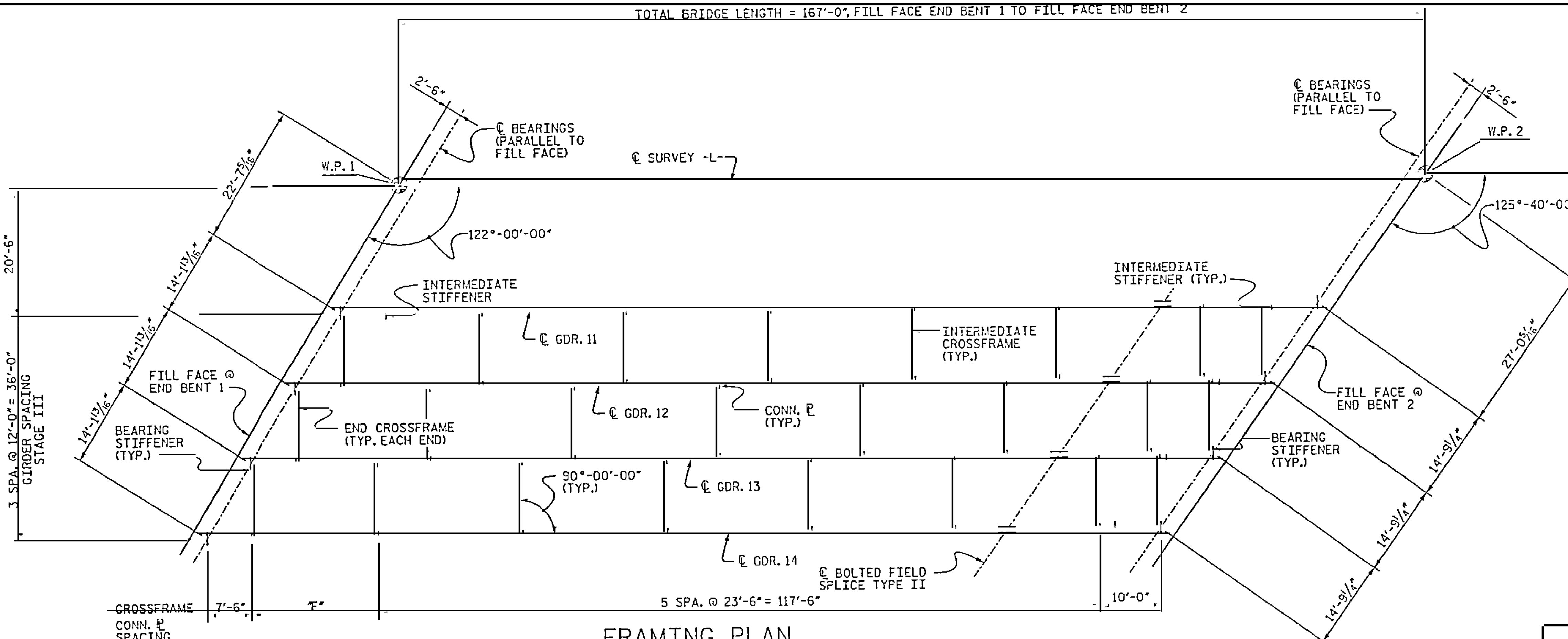
DRAWN BY TJT, LGH DATE 6-05
CHECKED BY KGB DATE 6-05
DWG. NO. D-1735.10

REVISIONS: NO. | BY | DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

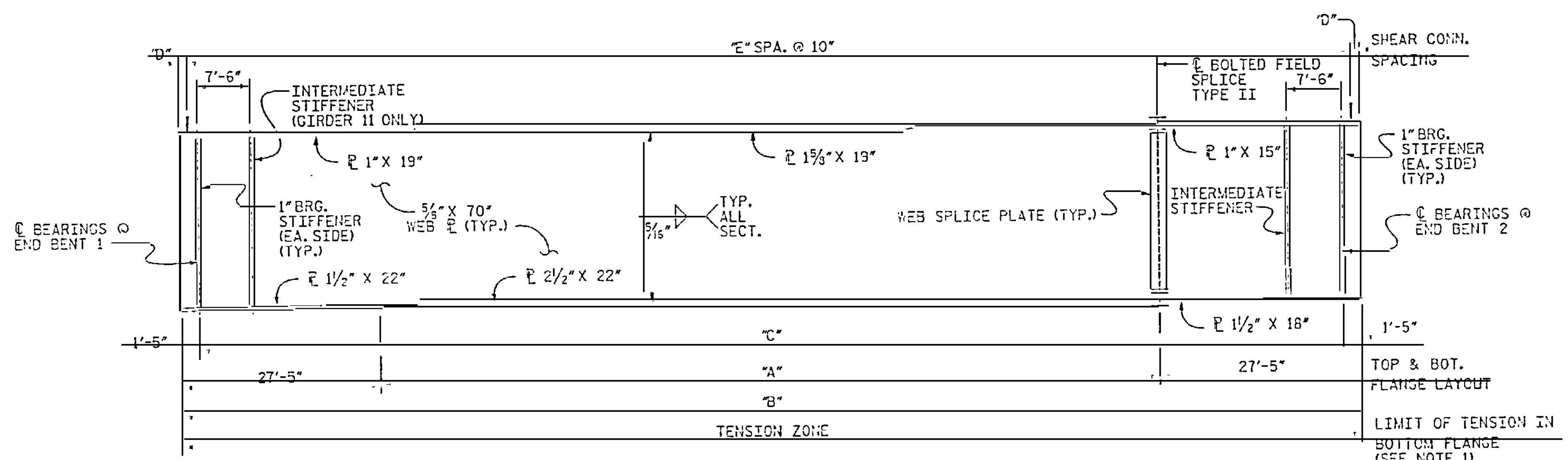
FRAMING PLAN & GIRDER DETAILS

SHEET NO. S1-10
TOTAL SHEETS 50



FRAMING PLAN

GIRDER DIMENSIONS						
GIRDER	"A"	"B"	"C"	"D"	"E"	"F"
11	107'-1"	161'-11"	159'-1"	6 1/2"	193	24'-1"
12	105'-11 1/2"	160'-9 1/2"	157'-11 1/2"	4 3/4"	192	22'-11 1/2"
13	104'-10"	159'-8"	156'-10"	8"	190	21'-10"
14	103'-9"	158'-7"	155'-9"	6 1/2"	189	20'-9"



GIRDER ELEVATION (GIRDERS 11-14)

(CONNECTOR ℄'S NOT SHOWN FOR CLARITY)

NOTE:

FOR NOTES AND SHEAR CONNECTOR DETAIL, SEE "FRAMING PLAN AND GIRDER DETAILS" SHEET 1 OF 2.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN & GIRDER DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 7-21-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18185 MARK F. ROBBINS 7-21-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

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D-1785.1

REVISIONS: NO. | BY | DATE

SHEET NO. S1-11
TOTAL SHEETS 56

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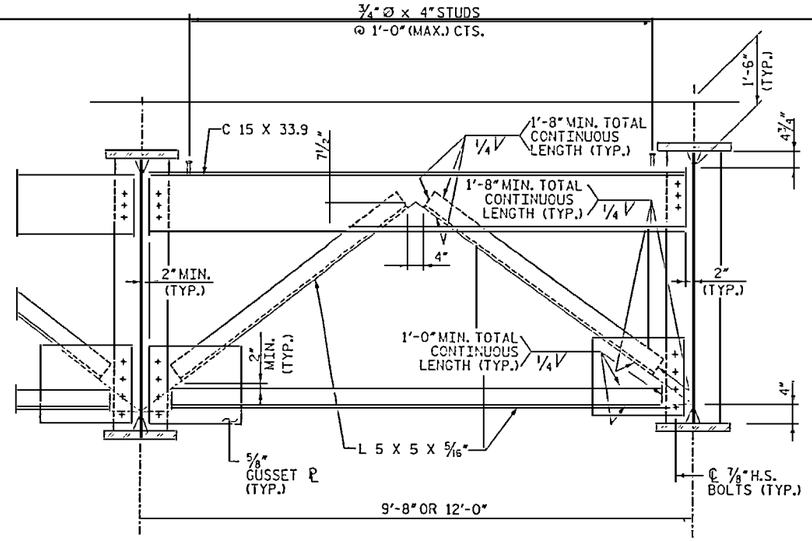
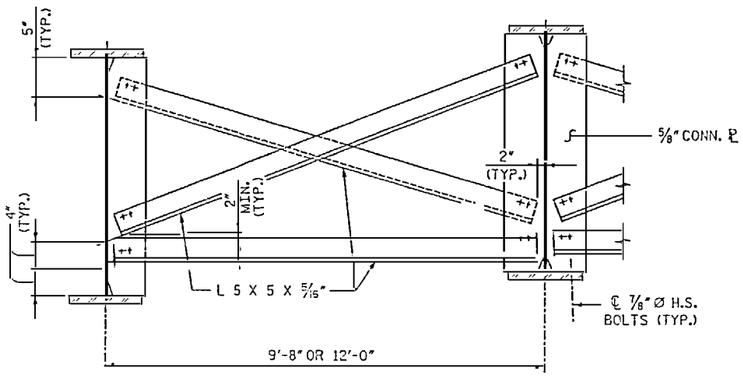
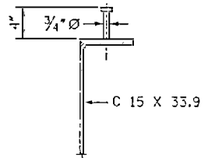


TYPICAL END CROSSFRAME



TYPICAL INTERMEDIATE CROSSFRAME



TOP OF CROSSFRAME SHEAR STUD DETAIL

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270, GRADE 50W 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.

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

MAIN TENSION MEMBERS SHALL BE CHARPY V-NOTCH (CVN) IMPACT TESTED IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS. FOR THE PURPOSE OF IMPACT TESTING, THE FOLLOWING PLATES AND SHAPES SHALL BE CLASSIFIED AS MAIN TENSION MEMBERS.

- ALL FLANGE PLATES WHICH FALL WITHIN THE "TENSION ZONE", SEE "FRAMING PLAN AND GIRDER DETAILS" SHEET.
- ALL WEB PLATES
- ALL GIRDER SPLICE PLATES

CAMBERED GIRDER LENGTHS SHALL BE ADJUSTED AND BEARINGS ARE TO BE PLACED ON THE CAMBERED GIRDER SO AS TO BE ALIGNED WITH THE ANCHORS AFTER THE DEAD LOAD DEFLECTION HAS OCCURRED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

ALL FIELD CONNECTIONS SHALL BE MADE WITH ⅞" DIA. HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED.

FOR EXTERIOR GIRDERS, CONNECTOR PLATES SHALL BE PLACED ON THE INSIDE FACE ONLY.

ENDS OF THE CONTINUOUS PLATE GIRDERS SHALL BE IN A PLUMB POSITION AFTER THE TOTAL DEAD LOAD DEFLECTION HAS OCCURRED.

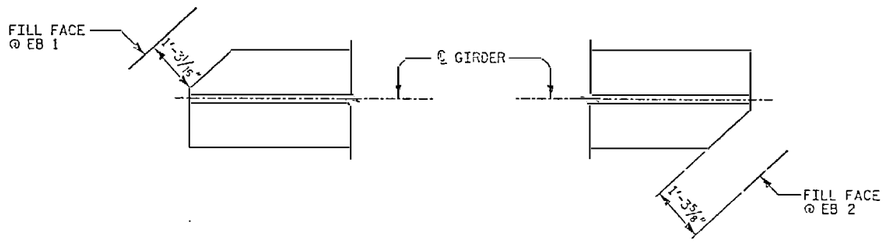
SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 46 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6 IN. MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELDS, FIELD CONNECTION BOLTS AND FLANGE SPLICE PLATES.

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

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



AT END BENT 1 AT END BENT 2

TOP AND BOTT. FLANGE CLIP DETAILS

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- =
POC 19+55.81 -Y1-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 7-21-05

NORTH CAROLINA PROFESSIONAL SEAL 13163 ENGINEER MARK F. ROBBINS 7-21-05

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURAL STEEL DETAILS

SHEET NO. S1-12
TOTAL SHEETS 50

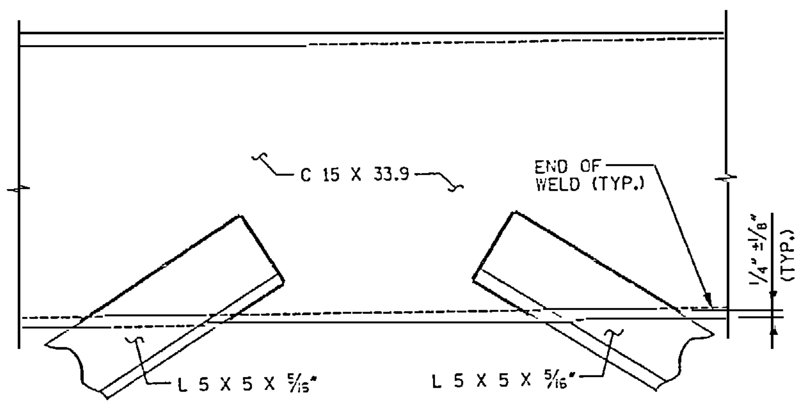
TAYLOR & MURPHY

FLORENCE & HUTCHESON INC. CONSULTING ENGINEERS

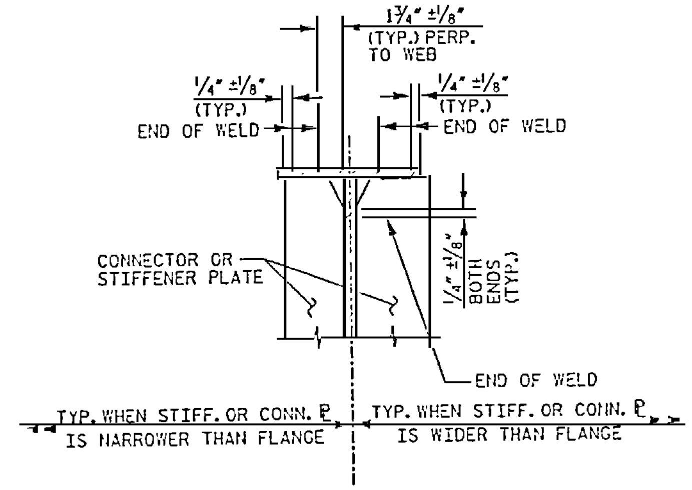
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TJT DATE 6-05 DWG. NO.
CHECKED BY JTG DATE 6-05 D-1783.12

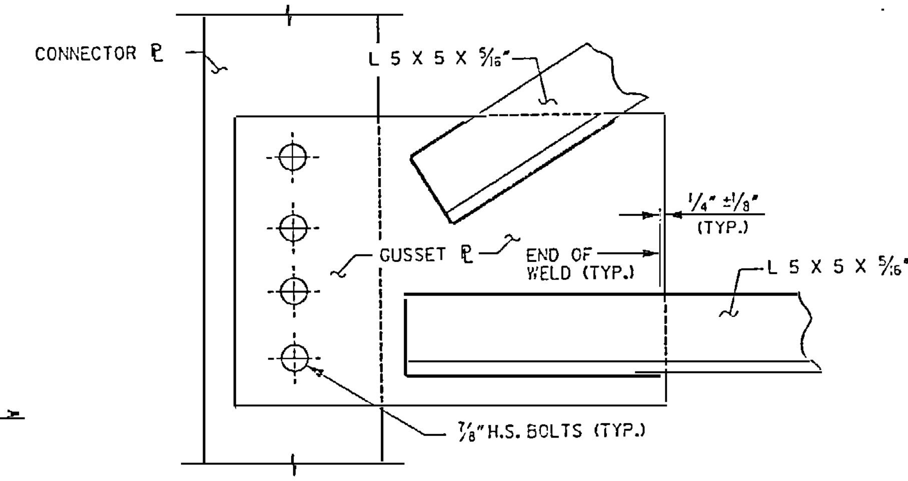
adam.peter 07/21/2005 11:20:20 AM n:\proj\3105-Final\Struct\1923\Final\structural steel details.dgn



TYPICAL ANGLE TO CHANNEL CONNECTION



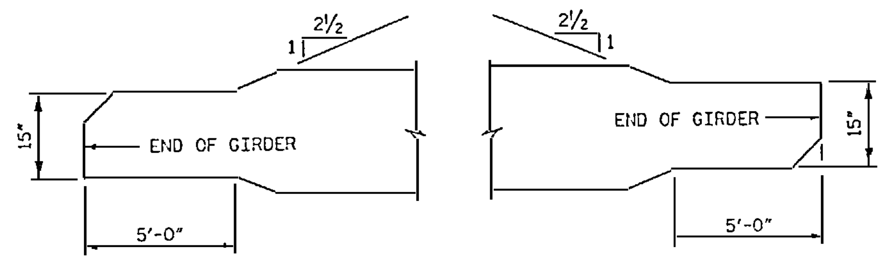
TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



TYPICAL GUSSET P AND ANGLE CONNECTION

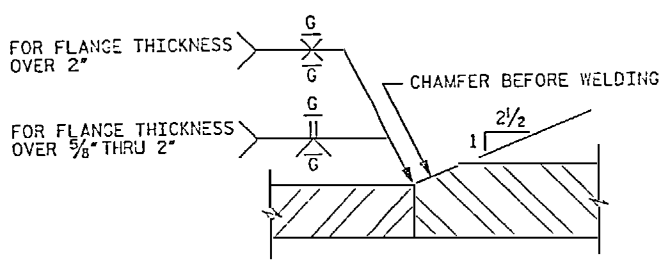
MINIMUM FILLET WELD SIZE	
BASE METAL THICKNESS OF THICKER PART JOINED (T)	MINIMUM SIZE OF FILLET WELD
≤ 3/4"	1/4"
> 3/4"	5/16"

WELD TERMINATION DETAILS

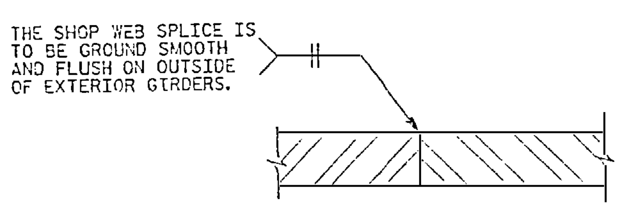


BOTTOM FLANGE DETAILS

(TYP. FOR ALL GIRDERS)



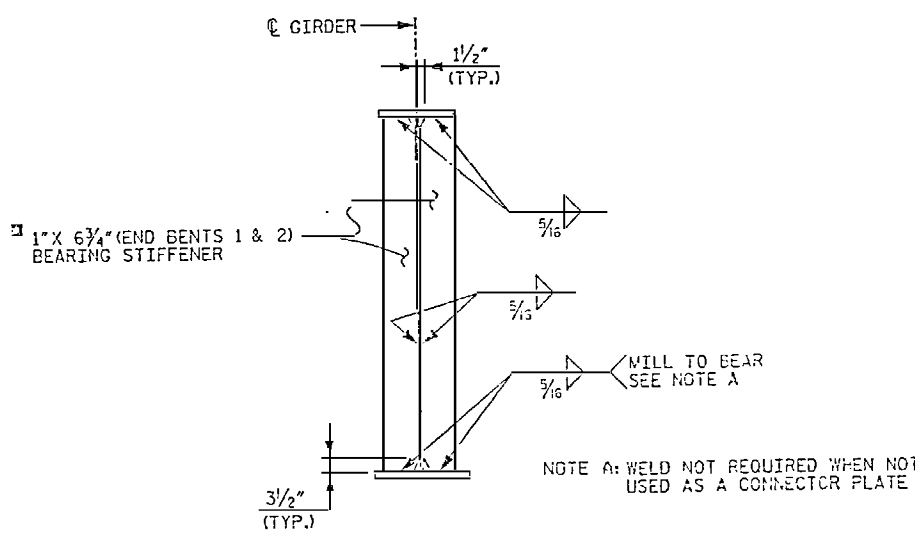
ELEVATION - FLANGE



PLAN - WEB

(UNIFORM THICKNESS)

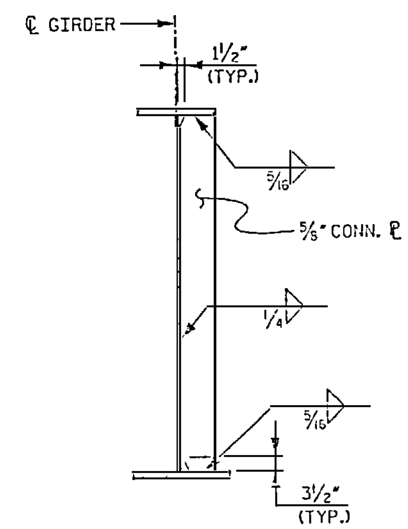
SHOP SPLICE DETAILS



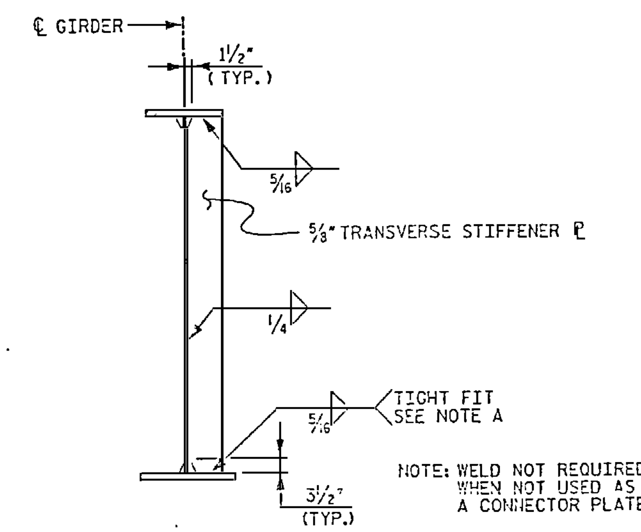
NOTE A: WELD NOT REQUIRED WHEN NOT USED AS A CONNECTOR PLATE

BEARING STIFFENER

INCREASE BEARING STIFFENER WIDTH AS REQUIRED WHEN USED AS A CROSSFRAME CONNECTOR PLATE. INCREASE BEARING STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 9.5.



CONNECTOR P DETAIL



NOTE: WELD NOT REQUIRED WHEN NOT USED AS A CONNECTOR PLATE.

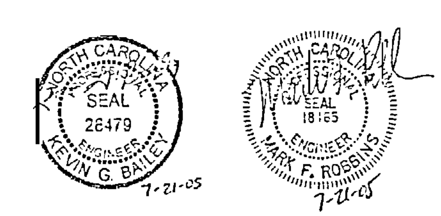
TRANSVERSE STIFFENER P DETAIL

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-=
POC 19+55.81 -Y1-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURAL STEEL DETAILS

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35621 CHARLOTTE, N.C. 28235

DRAWN BY ARH DATE 06-05
CHECKED BY JTG DATE 06-05
DRAWING NO. D-1735.13

SHEET NO. S1-13
TOTAL SHEETS 50

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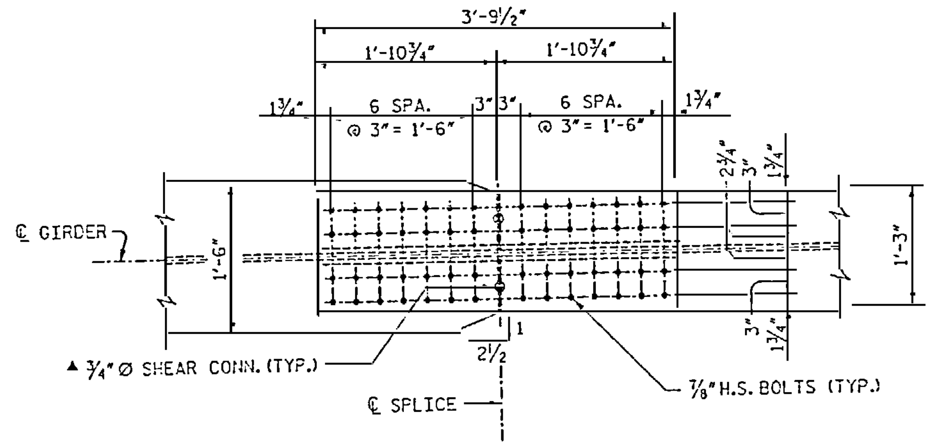
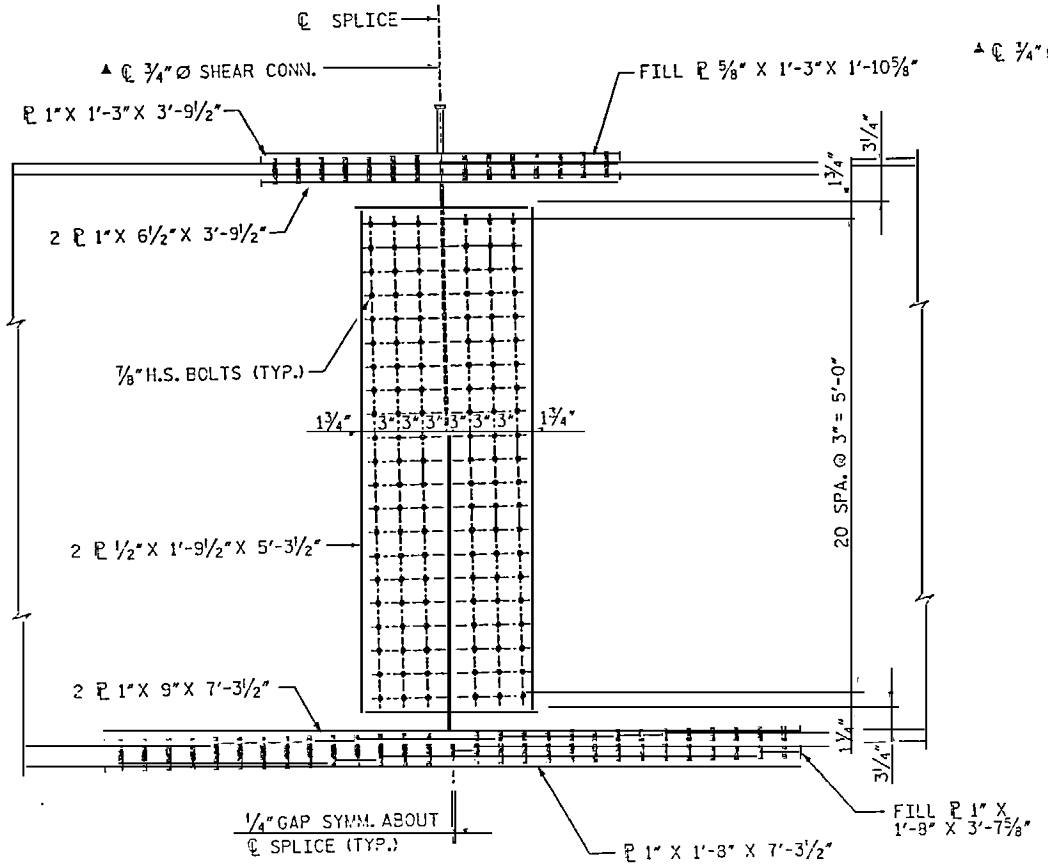
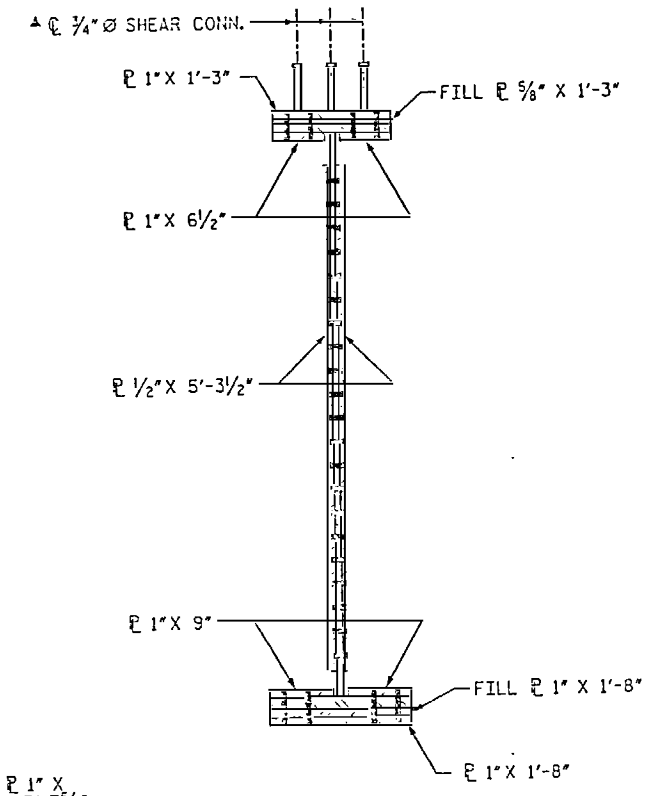


TOP FLANGE

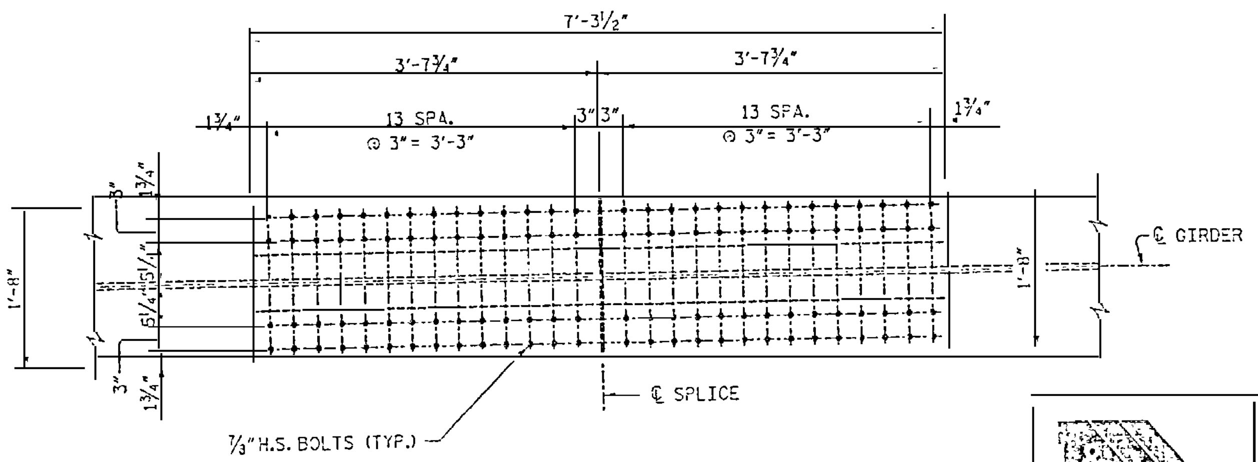
▲ SEE SHEAR CONNECTOR DETAIL ON "FRAMING PLAN AND GIRDER DETAILS" FOR SPACING AND DETAILS.



ELEVATION



SECTION



BOTTOM FLANGE

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BOLTED FIELD SPLICE
TYPE I

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY DDL DATE 5-05
CHECKED BY KGB DATE 6-05
DWG. NO. 0-1785.14

NORTH CAROLINA SEAL 23479 ENGINEER KEVIN G. BAILEY 7-21-05

NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 7-21-05

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

SHEET NO. S1-14
TOTAL SHEETS 50

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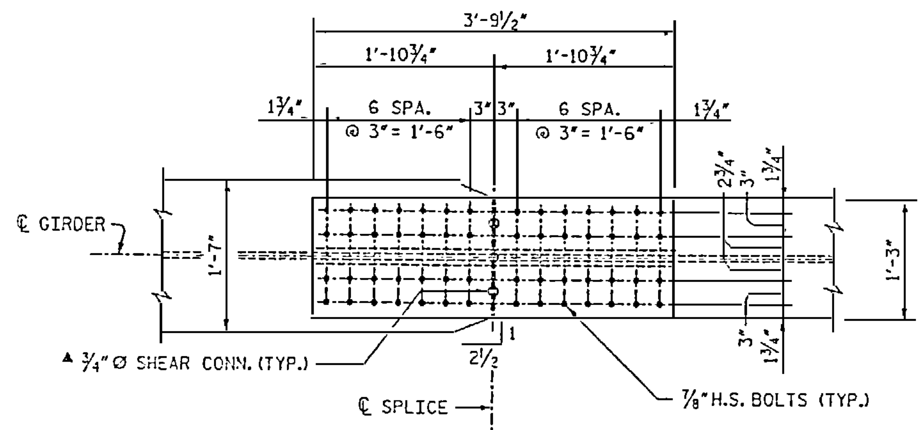
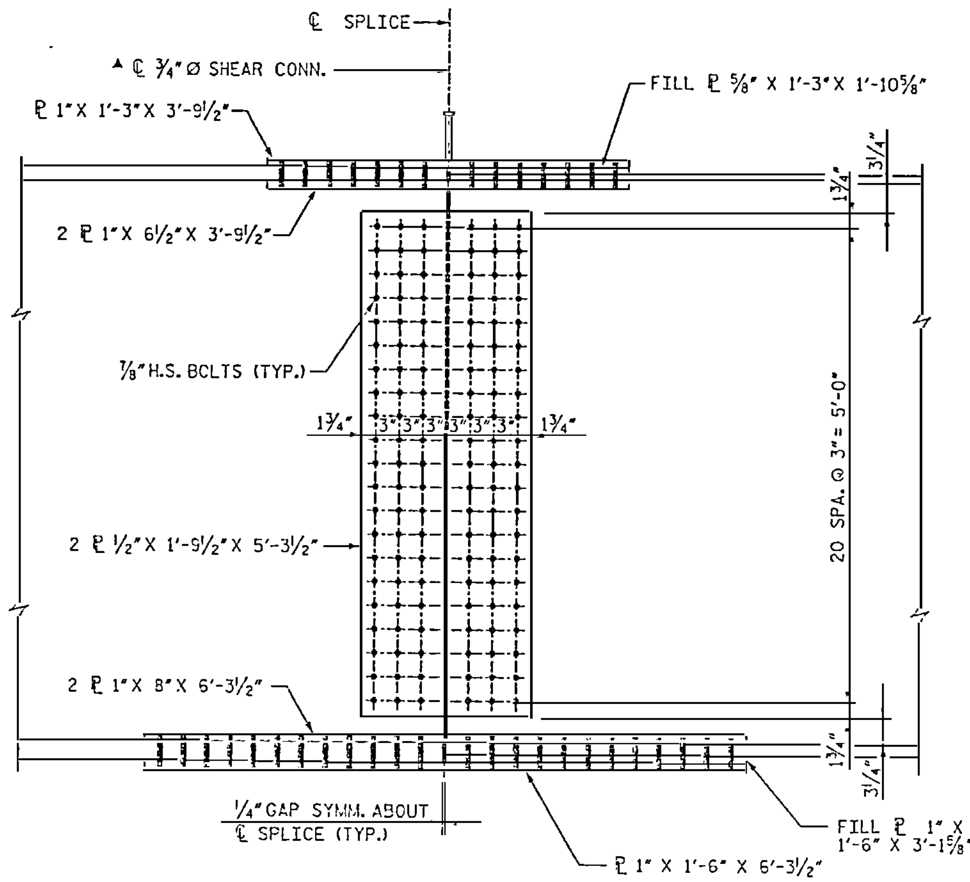
adam.patel

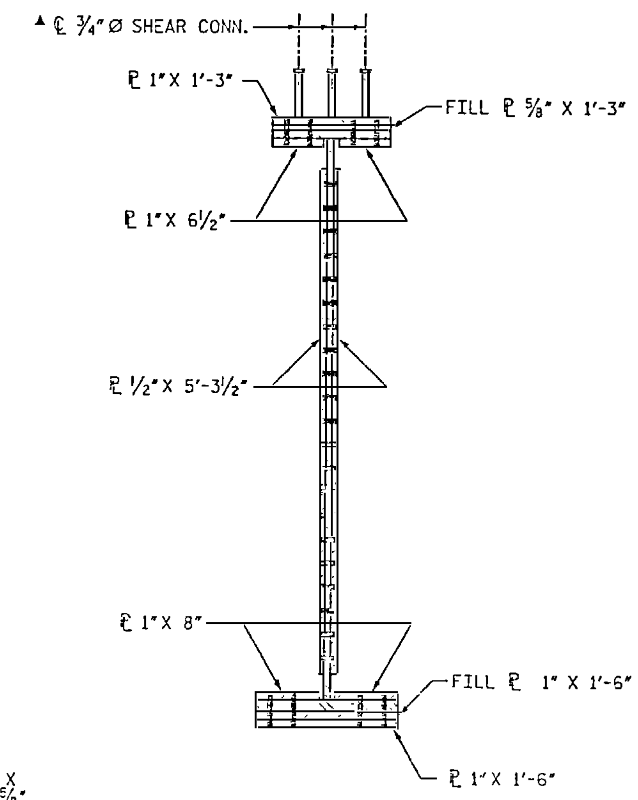


TOP FLANGE

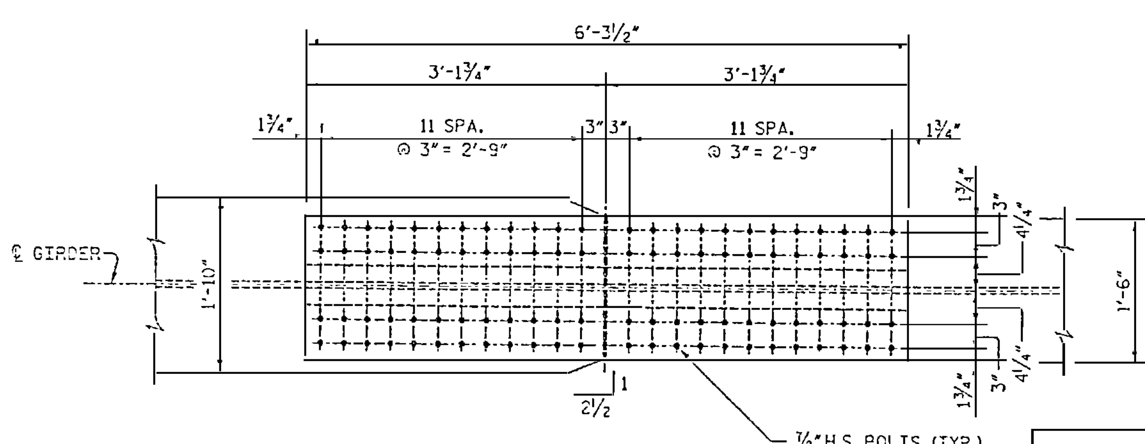
▲ SEE SHEAR CONNECTOR DETAIL ON "FRAMING PLAN AND GIRDER DETAILS" FOR SPACING AND DETAILS.



ELEVATION



SECTION



BOTTOM FLANGE

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G BAILEY 7-21-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13165 MARK F. ROBBINS 7-21-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BOLTED FIELD SPLICE TYPE II

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

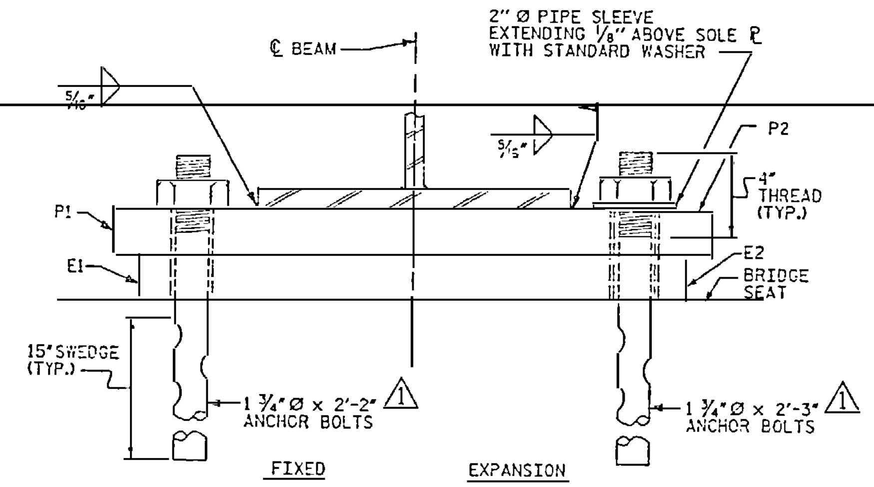
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

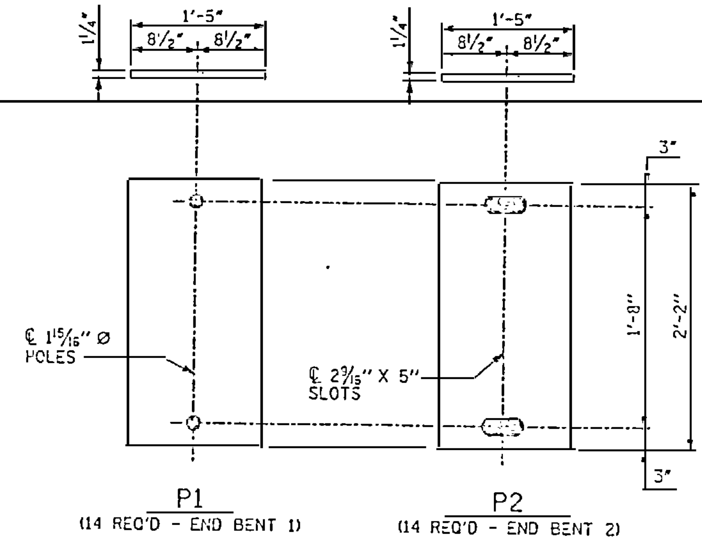
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY: DDL DATE: 6-05
CHECKED BY: KGB DATE: 6-05
DWG. NO. D-1785.15

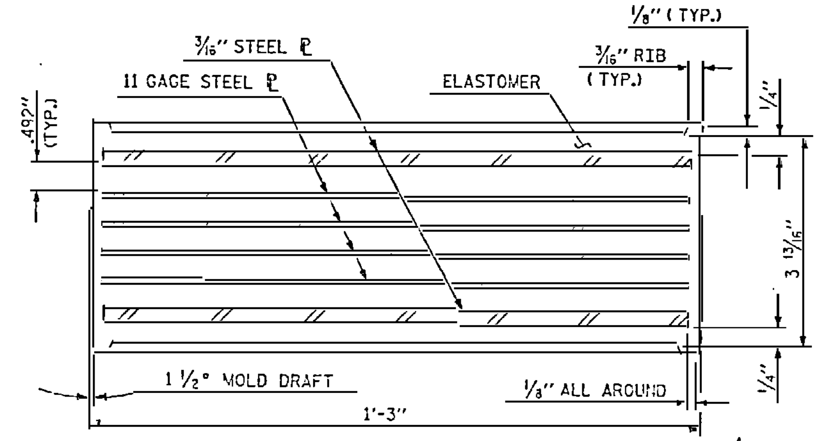
SHEET NO. S1-15
TOTAL SHEETS 50



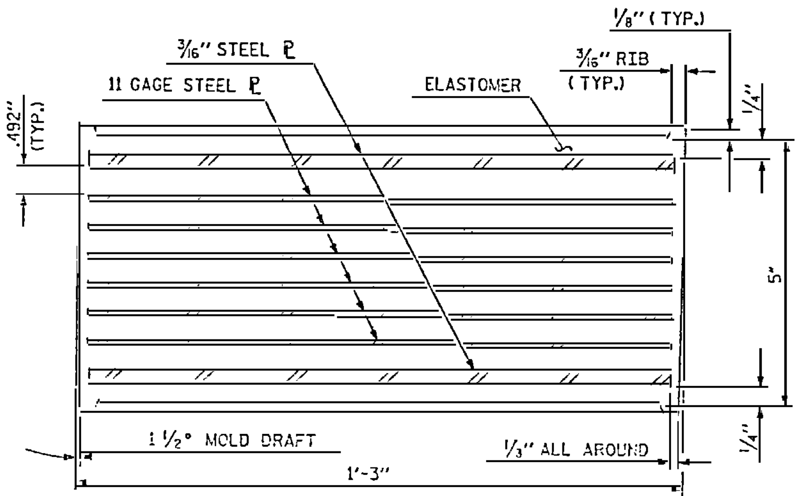
END VIEW



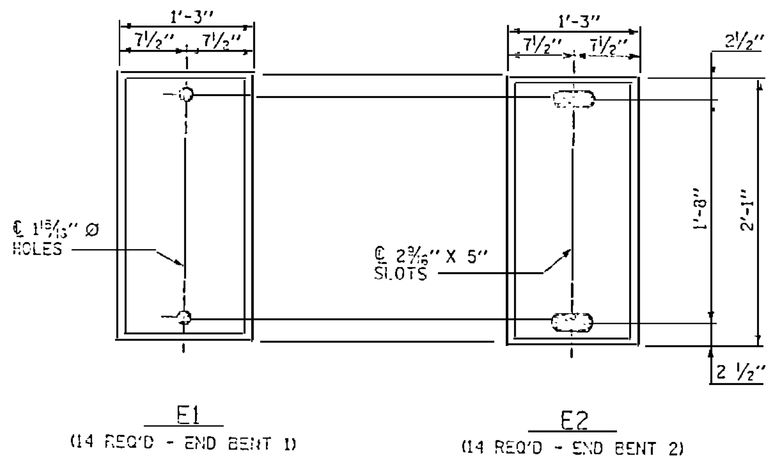
SOLE PLATE DETAILS



TYPICAL SECTION OF ELASTOMERIC BEARING ⚠1
TYPE VI (FIXED - END BENT 1)



TYPICAL SECTION OF ELASTOMERIC BEARING ⚠1
(EXPANSION - END BENT 2)



PLAN VIEW OF ELASTOMERIC BEARING

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 2" 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 PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS 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 M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. 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 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

⚠1 REVISION #1: MODIFIED END BENT 2 ELASTOMERIC BEARING AND ANCHOR BOLT LENGTHS
BY: TLS DATE: 9-05
CK'D BY: KGB DATE: 9-05

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
(STEEL SUPERSTRUCTURE)

OCTOBER 1995

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1	RWA	9-05	3			TOTAL SHEETS
2			4			50

STD. No. EB2

NORTH CAROLINA PROFESSIONAL SEAL 23479 ENGINEER KEVIN G BAILEY 9-27-05

NORTH CAROLINA PROFESSIONAL SEAL 13165 ENGINEER MARK F. ROBBINS 9-27-05

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

TAYLOR & MURPHY

D-1785.16

ASSEMBLED BY : TLS DATE : 6-05
CHECKED BY : JRB DATE : 6-05
DRAWN BY : EEM 10/95 REV. 3/13/99 MAB/LES
CHECKED BY : FEK 10/95 REV. 10/17/00 RWW/LES
REV. 7/10/01 LES/FCR

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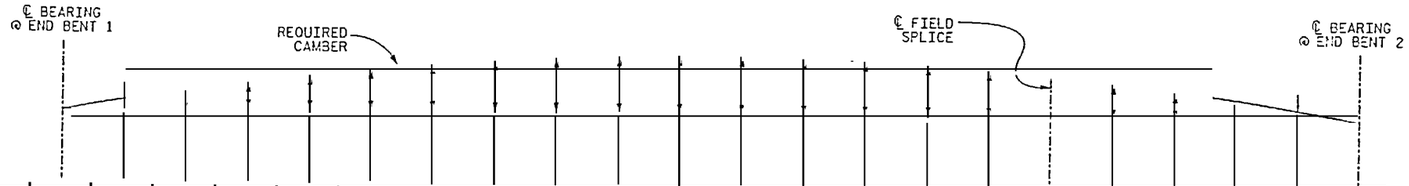

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GIRDER 1	DEFLECTION DUE TO WT. OF STEEL	0.000	0.033	0.065	0.095	0.121	0.143	0.162	0.177	0.188	0.195	0.197	0.195	0.188	0.177	0.162	0.144	0.125	0.122	0.096	0.066	0.034	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.091	0.178	0.259	0.330	0.391	0.443	0.484	0.515	0.526	0.540	0.534	0.516	0.486	0.445	0.394	0.345	0.334	0.262	0.181	0.092	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ●	0.000	0.007	0.013	0.019	0.025	0.029	0.033	0.037	0.039	0.040	0.041	0.040	0.039	0.037	0.033	0.029	0.026	0.025	0.019	0.013	0.007	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.131	0.256	0.373	0.476	0.563	0.638	0.698	0.742	0.761	0.778	0.769	0.743	0.700	0.640	0.567	0.497	0.481	0.377	0.260	0.133	0.000
	VERTICAL CURVE ORDINATE	0.000	0.039	0.074	0.104	0.132	0.154	0.172	0.186	0.196	0.202	0.205	0.203	0.197	0.186	0.172	0.153	0.136	0.131	0.105	0.074	0.039	0.000
	REQUIRED CAMBER	0"	2"	4"	5¾"	7¼"	8⅝"	9¾"	10⅝"	11¼"	11½"	11¾"	11⅝"	11¼"	10⅝"	9¾"	8⅝"	7⅝"	7⅜"	5¾"	4"	2⅛"	0"
GIRDER 2	DEFLECTION DUE TO WT. OF STEEL	0.000	0.033	0.064	0.093	0.118	0.140	0.158	0.173	0.184	0.190	0.193	0.191	0.184	0.174	0.159	0.141	0.124	0.119	0.094	0.065	0.033	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.105	0.206	0.299	0.382	0.452	0.512	0.559	0.594	0.616	0.623	0.616	0.596	0.561	0.514	0.455	0.400	0.385	0.303	0.209	0.107	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ●	0.000	0.006	0.013	0.018	0.024	0.028	0.032	0.035	0.037	0.038	0.039	0.038	0.037	0.035	0.032	0.028	0.024	0.024	0.018	0.013	0.006	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.144	0.283	0.410	0.524	0.620	0.702	0.767	0.815	0.844	0.855	0.845	0.817	0.770	0.705	0.624	0.548	0.528	0.415	0.287	0.146	0.000
	VERTICAL CURVE ORDINATE	0.000	0.038	0.072	0.103	0.129	0.152	0.170	0.184	0.194	0.200	0.202	0.200	0.194	0.184	0.170	0.151	0.134	0.130	0.104	0.073	0.039	0.000
	REQUIRED CAMBER	0"	2⅛"	4¼"	6⅛"	7⅞"	9¼"	10½"	11⅜"	1'-0⅛"	1'-0½"	1'-0⅝"	1'-0½"	1'-0⅛"	11½"	10½"	9¼"	8⅛"	7⅞"	6¼"	4⅜"	2¼"	0"
GIRDER 3	DEFLECTION DUE TO WT. OF STEEL	0.000	0.032	0.062	0.091	0.116	0.137	0.155	0.169	0.180	0.186	0.189	0.187	0.180	0.170	0.156	0.138	0.122	0.117	0.092	0.063	0.032	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.103	0.202	0.293	0.374	0.443	0.501	0.548	0.582	0.603	0.610	0.604	0.584	0.550	0.504	0.446	0.394	0.378	0.297	0.205	0.105	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ●	0.000	0.006	0.012	0.018	0.023	0.027	0.031	0.034	0.036	0.038	0.038	0.038	0.036	0.034	0.031	0.027	0.024	0.023	0.018	0.012	0.006	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.141	0.276	0.402	0.513	0.607	0.687	0.751	0.798	0.827	0.837	0.829	0.800	0.754	0.691	0.611	0.540	0.518	0.407	0.280	0.143	0.000
	VERTICAL CURVE ORDINATE	0.000	0.038	0.072	0.102	0.128	0.150	0.168	0.182	0.192	0.198	0.200	0.199	0.193	0.183	0.169	0.151	0.133	0.129	0.103	0.072	0.038	0.000
	REQUIRED CAMBER	0"	2⅛"	4⅛"	6"	7¾"	9⅛"	10¼"	11¼"	11⅞"	1'-0¼"	1'-0½"	1'-0⅜"	11⅞"	11¼"	10⅜"	9⅛"	8⅛"	7¾"	6⅛"	4¼"	2⅛"	0"
GIRDER 4	DEFLECTION DUE TO WT. OF STEEL	0.000	0.031	0.061	0.089	0.113	0.134	0.152	0.166	0.176	0.182	0.185	0.183	0.177	0.166	0.152	0.135	0.119	0.114	0.090	0.062	0.032	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.101	0.198	0.287	0.366	0.434	0.491	0.537	0.570	0.591	0.598	0.591	0.571	0.539	0.493	0.437	0.387	0.370	0.291	0.201	0.102	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.132	0.259	0.376	0.479	0.568	0.643	0.703	0.746	0.773	0.783	0.774	0.748	0.705	0.645	0.572	0.506	0.484	0.381	0.263	0.134	0.000
	VERTICAL CURVE ORDINATE	0.000	0.038	0.071	0.101	0.127	0.149	0.166	0.180	0.190	0.196	0.198	0.196	0.190	0.180	0.166	0.148	0.133	0.127	0.101	0.071	0.037	0.000
	REQUIRED CAMBER	0"	2"	4"	5¾"	7¼"	8⅝"	9¾"	10⅝"	11¼"	11⅝"	11¾"	11⅝"	11¼"	10⅝"	9¾"	8⅝"	7⅝"	7⅜"	5¾"	4"	2"	0"
GIRDER 5	DEFLECTION DUE TO WT. OF STEEL	0.000	0.031	0.060	0.087	0.111	0.131	0.148	0.162	0.172	0.179	0.181	0.179	0.173	0.163	0.149	0.132	0.117	0.112	0.088	0.061	0.031	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.099	0.194	0.282	0.359	0.425	0.481	0.526	0.558	0.579	0.585	0.579	0.560	0.528	0.483	0.423	0.380	0.363	0.285	0.197	0.100	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.130	0.254	0.369	0.470	0.556	0.629	0.688	0.730	0.758	0.766	0.758	0.733	0.691	0.632	0.560	0.497	0.475	0.373	0.258	0.131	0.000
	VERTICAL CURVE ORDINATE	0.000	0.037	0.070	0.100	0.125	0.147	0.164	0.178	0.188	0.194	0.196	0.195	0.189	0.179	0.165	0.148	0.132	0.126	0.100	0.071	0.038	0.000
	REQUIRED CAMBER	0"	2"	3⅞"	5⅝"	7⅛"	8⅜"	9½"	10⅜"	11"	11⅜"	11½"	11⅜"	11⅛"	10½"	9⅝"	8½"	7½"	7¼"	5⅝"	4"	2"	0"

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS

● INCLUDES BARRIER RAIL

NOTES:

1. VALUES ARE SHOWN IN FEET, EXCEPT 'REQUIRED CAMBER' WHICH IS GIVEN IN INCHES.
2. FOR GIRDER DESIGNATIONS, SEE 'FRAMING PLAN AND GIRDER DETAILS' SHEETS.
3. DEFLECTIONS IN THE DOWNWARD DIRECTION ARE POSITIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE.

SCHEMATIC CAMBER ORDINATES - SPAN 'A'

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-=
POC 19+55.81 -Y1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CAMBER AND DEFLECTIONS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 7-21-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROBBINS 7-21-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35524 CHARLOTTE, N.C. 28235

DRAWN BY ASH DATE 06-05 D.R.C. NO.
CHECKED BY BMS DATE 06-05 D-1785.17

REVISIONS

NO.	DATE	BY	NO.	DATE	BY
1			3		
2			4		

SHEET NO. S1-17
TOTAL SHEETS 50

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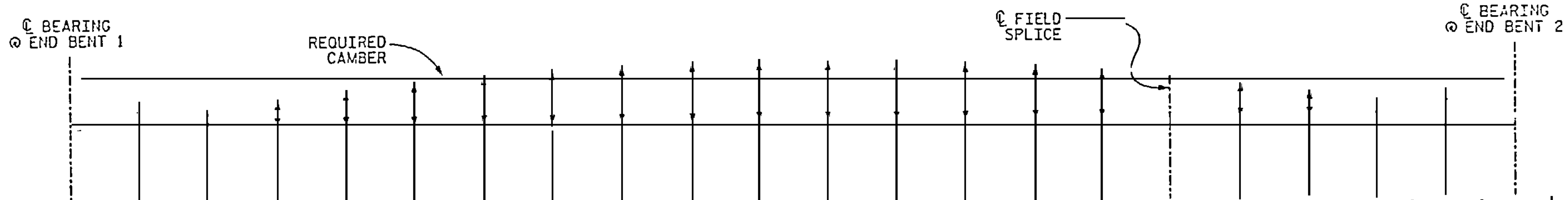

Girder	Item	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	F.S.	1.16	1.17	1.18	1.19	1.20
GIRDER 6	DEFLECTION DUE TO WT. OF STEEL	0.000	0.030	0.059	0.085	0.108	0.128	0.145	0.159	0.169	0.175	0.177	0.175	0.169	0.159	0.146	0.129	0.115	0.110	0.086	0.059	0.030	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.063	0.123	0.178	0.227	0.269	0.304	0.333	0.353	0.366	0.370	0.366	0.354	0.334	0.306	0.271	0.242	0.230	0.180	0.124	0.064	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◘	0.000	0.009	0.018	0.026	0.033	0.039	0.044	0.048	0.051	0.053	0.054	0.053	0.051	0.048	0.044	0.039	0.035	0.033	0.026	0.018	0.009	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.102	0.200	0.289	0.368	0.436	0.493	0.540	0.573	0.594	0.601	0.594	0.574	0.541	0.496	0.439	0.392	0.373	0.292	0.201	0.103	0.000
	VERTICAL CURVE ORDINATE	0.000	0.036	0.069	0.098	0.124	0.146	0.163	0.177	0.186	0.192	0.194	0.192	0.186	0.176	0.163	0.145	0.131	0.125	0.099	0.070	0.037	0.000
	REQUIRED CAMBER	0"	1⅝"	3¼"	4⅝"	5⅞"	7"	7⅞"	8⅝"	9⅛"	9⅜"	9½"	9⅜"	9⅛"	8⅝"	7⅞"	7"	6¼"	6"	4¾"	3¼"	1⅝"	0"
GIRDER 7	DEFLECTION DUE TO WT. OF STEEL	0.000	0.029	0.058	0.084	0.107	0.127	0.143	0.157	0.166	0.172	0.174	0.173	0.167	0.157	0.144	0.128	0.114	0.108	0.085	0.059	0.030	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.062	0.121	0.176	0.224	0.266	0.300	0.328	0.349	0.361	0.366	0.362	0.349	0.329	0.302	0.267	0.239	0.227	0.178	0.123	0.063	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◇	0.000	0.014	0.027	0.039	0.050	0.060	0.068	0.074	0.079	0.082	0.083	0.082	0.079	0.074	0.068	0.060	0.054	0.051	0.040	0.027	0.014	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.105	0.206	0.299	0.381	0.453	0.511	0.559	0.594	0.615	0.623	0.617	0.595	0.560	0.514	0.455	0.407	0.386	0.303	0.209	0.107	0.000
	VERTICAL CURVE ORDINATE	0.000	0.036	0.070	0.099	0.123	0.144	0.162	0.176	0.185	0.190	0.193	0.191	0.185	0.175	0.162	0.145	0.131	0.123	0.098	0.070	0.037	0.000
	REQUIRED CAMBER	0"	1¾"	3¼"	4¾"	6"	7⅛"	8⅛"	8⅞"	9⅜"	9⅝"	9¾"	9¾"	9⅜"	8⅞"	8⅛"	7¼"	6½"	6⅛"	4¾"	3⅜"	1¾"	0"
GIRDER 8	DEFLECTION DUE TO WT. OF STEEL	0.000	0.029	0.057	0.082	0.105	0.124	0.140	0.153	0.163	0.169	0.171	0.169	0.163	0.154	0.141	0.125	0.112	0.106	0.083	0.057	0.029	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.093	0.183	0.266	0.340	0.402	0.455	0.497	0.528	0.547	0.554	0.548	0.529	0.499	0.457	0.405	0.364	0.344	0.270	0.186	0.095	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ●	0.000	0.004	0.009	0.013	0.016	0.019	0.022	0.024	0.025	0.026	0.026	0.026	0.025	0.024	0.022	0.019	0.017	0.016	0.013	0.009	0.004	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.126	0.249	0.361	0.461	0.545	0.617	0.674	0.716	0.742	0.751	0.743	0.717	0.677	0.620	0.549	0.493	0.466	0.366	0.252	0.128	0.000
	VERTICAL CURVE ORDINATE	0.000	0.036	0.069	0.098	0.122	0.144	0.160	0.173	0.183	0.189	0.191	0.189	0.183	0.174	0.160	0.143	0.130	0.123	0.097	0.068	0.037	0.000
	REQUIRED CAMBER	0"	2"	3⅞"	5½"	7"	8¼"	9⅜"	10⅛"	10¾"	11⅛"	11¼"	11⅛"	10¾"	10¼"	9⅜"	8¼"	7½"	7⅛"	5½"	3⅞"	2"	0"
GIRDER 9	DEFLECTION DUE TO WT. OF STEEL	0.000	0.028	0.055	0.080	0.103	0.121	0.137	0.150	0.159	0.165	0.167	0.165	0.160	0.150	0.138	0.122	0.110	0.104	0.081	0.056	0.029	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.092	0.180	0.261	0.333	0.394	0.446	0.487	0.517	0.536	0.542	0.536	0.518	0.489	0.445	0.397	0.358	0.336	0.264	0.182	0.093	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ●	0.000	0.004	0.008	0.012	0.016	0.019	0.021	0.023	0.025	0.025	0.026	0.025	0.025	0.023	0.021	0.019	0.017	0.016	0.012	0.008	0.004	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.124	0.243	0.353	0.452	0.534	0.604	0.660	0.701	0.726	0.735	0.726	0.703	0.662	0.607	0.538	0.485	0.456	0.357	0.246	0.126	0.000
	VERTICAL CURVE ORDINATE	0.000	0.035	0.068	0.095	0.120	0.142	0.158	0.171	0.181	0.186	0.188	0.187	0.181	0.172	0.158	0.140	0.129	0.120	0.095	0.067	0.035	0.000
	REQUIRED CAMBER	0"	1⅞"	3¾"	5⅜"	6⅞"	8⅛"	9⅛"	10"	10⅝"	11"	11⅛"	11"	10⅝"	10"	9⅛"	8⅛"	7⅜"	6⅞"	5⅜"	3¾"	1⅞"	0"
GIRDER 10	DEFLECTION DUE TO WT. OF STEEL	0.000	0.028	0.054	0.079	0.100	0.119	0.134	0.147	0.156	0.161	0.163	0.161	0.156	0.147	0.135	0.120	0.108	0.101	0.080	0.055	0.028	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.058	0.114	0.165	0.211	0.249	0.282	0.308	0.327	0.339	0.343	0.339	0.328	0.309	0.283	0.251	0.228	0.213	0.167	0.115	0.059	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◇	0.000	0.013	0.025	0.037	0.047	0.056	0.064	0.070	0.074	0.077	0.078	0.077	0.074	0.070	0.064	0.056	0.051	0.047	0.037	0.026	0.013	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.099	0.193	0.281	0.358	0.424	0.480	0.525	0.557	0.577	0.584	0.577	0.558	0.526	0.482	0.427	0.387	0.361	0.264	0.196	0.100	0.000
	VERTICAL CURVE ORDINATE	0.000	0.036	0.067	0.095	0.119	0.140	0.156	0.170	0.179	0.184	0.186	0.185	0.179	0.170	0.157	0.140	0.127	0.119	0.095	0.068	0.035	0.000
	REQUIRED CAMBER	0"	1⅝"	3⅛"	4½"	5¾"	6¾"	7⅝"	8⅜"	8⅞"	9⅛"	9¼"	9⅛"	8⅞"	8⅜"	7⅝"	6¾"	6⅛"	5¼"	4½"	3⅛"	1⅝"	0"

SCHEMATIC CAMBER ORDINATES - SPAN 'A'

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS
● INCLUDES BARRIER RAIL
◘ INCLUDES CLOSURE POUR
◇ INCLUDES BARRIER RAIL AND CLOSURE POUR

NOTES:

1. VALUES ARE SHOWN IN FEET, EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
2. FOR GIRDER DESIGNATIONS, SEE "FRAMING PLAN AND GIRDER DETAILS" SHEETS.
3. DEFLECTIONS IN THE DOWNWARD DIRECTION ARE POSITIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-=
POC 19+55.81 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CAMBER AND DEFLECTIONS

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G. BAILEY 7-21-05

NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 7-21-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON INC CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY ARH DATE 06-05
CHECKED BY HMS DATE 06-05
DWG. NO. D-1785.18

REVISIONS: NO. BY DATE | NO. BY DATE (1, 2, 3, 4)

SHEET NO. S1-18
TOTAL SHEETS 50

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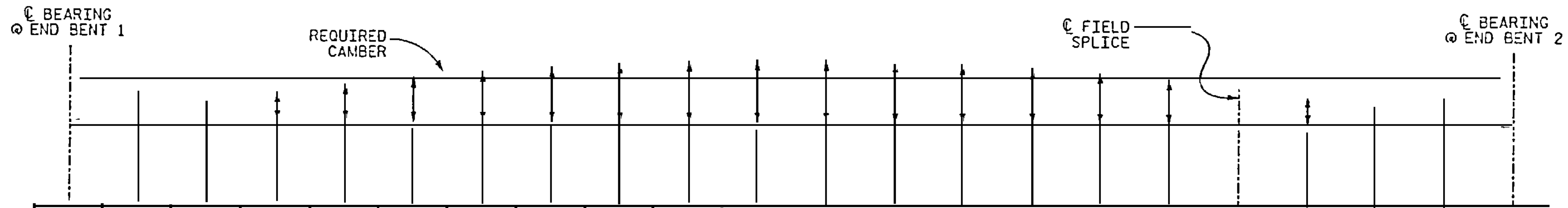


▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS

◘ INCLUDES CLOSURE POUR

◑ INCLUDES BARRIER RAIL

NOTES:

1. VALUES ARE SHOWN IN FEET, EXCEPT 'REQUIRED CAMBER' WHICH IS GIVEN IN INCHES.
2. FOR GIRDER DESIGNATIONS, SEE 'FRAMING PLAN AND GIRDER DETAILS' SHEETS.
3. DEFLECTIONS IN THE DOWNWARD DIRECTION ARE POSITIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE.

Girder	Item	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	F.S.	1.17	1.18	1.19	1.20
GIRDER 11	DEFLECTION DUE TO WT. OF STEEL	0.000	0.026	0.051	0.075	0.095	0.114	0.129	0.141	0.151	0.156	0.158	0.156	0.151	0.142	0.130	0.115	0.097	0.081	0.076	0.053	0.027	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.061	0.119	0.173	0.221	0.263	0.299	0.328	0.349	0.362	0.366	0.362	0.350	0.329	0.301	0.265	0.224	0.189	0.176	0.122	0.062	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◘	0.000	0.007	0.014	0.020	0.026	0.031	0.036	0.039	0.042	0.043	0.044	0.043	0.042	0.039	0.036	0.031	0.026	0.022	0.021	0.014	0.007	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.094	0.184	0.268	0.342	0.408	0.464	0.508	0.542	0.561	0.568	0.561	0.543	0.510	0.467	0.411	0.347	0.292	0.273	0.189	0.096	0.000
	VERTICAL CURVE ORDINATE	0.000	0.036	0.067	0.095	0.119	0.139	0.155	0.168	0.178	0.183	0.185	0.183	0.176	0.169	0.156	0.139	0.118	0.101	0.094	0.066	0.035	0.000
	REQUIRED CAMBER	0"	1½"	3"	4⅜"	5½"	6⅝"	7⅜"	8⅛"	8⅝"	8⅞"	9"	8⅞"	8⅝"	8⅛"	7½"	6⅝"	5⅝"	4¾"	4⅜"	3"	1⅝"	0"
GIRDER 12	DEFLECTION DUE TO WT. OF STEEL	0.000	0.026	0.050	0.073	0.093	0.110	0.125	0.138	0.146	0.152	0.154	0.152	0.147	0.138	0.126	0.111	0.094	0.080	0.074	0.051	0.026	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.096	0.188	0.272	0.347	0.414	0.470	0.516	0.549	0.569	0.576	0.570	0.550	0.518	0.473	0.418	0.352	0.299	0.277	0.192	0.098	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◑	0.000	0.005	0.009	0.014	0.018	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.018	0.015	0.014	0.010	0.005	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.127	0.247	0.359	0.458	0.545	0.619	0.680	0.723	0.750	0.759	0.751	0.725	0.682	0.623	0.550	0.464	0.394	0.365	0.253	0.129	0.000
	VERTICAL CURVE ORDINATE	0.000	0.034	0.066	0.093	0.117	0.137	0.153	0.167	0.175	0.180	0.183	0.180	0.175	0.166	0.153	0.136	0.117	0.100	0.093	0.066	0.034	0.000
	REQUIRED CAMBER	0"	1⅞"	3¾"	5⅜"	6⅞"	8⅛"	9¼"	10⅛"	10¾"	11⅛"	11¼"	11⅛"	10¾"	10⅛"	9¼"	8¼"	7"	5⅞"	5½"	3⅞"	2"	0"
GIRDER 13	DEFLECTION DUE TO WT. OF STEEL	0.000	0.025	0.049	0.071	0.090	0.107	0.122	0.134	0.142	0.148	0.149	0.148	0.143	0.134	0.123	0.108	0.091	0.078	0.072	0.050	0.026	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.093	0.183	0.265	0.338	0.403	0.458	0.502	0.534	0.553	0.560	0.554	0.535	0.504	0.461	0.406	0.342	0.293	0.270	0.187	0.096	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◘	0.000	0.005	0.009	0.013	0.017	0.020	0.023	0.026	0.027	0.028	0.029	0.028	0.027	0.026	0.023	0.021	0.017	0.015	0.014	0.009	0.005	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.123	0.241	0.349	0.445	0.530	0.603	0.662	0.703	0.729	0.738	0.730	0.705	0.664	0.607	0.535	0.450	0.386	0.356	0.246	0.127	0.000
	VERTICAL CURVE ORDINATE	0.000	0.034	0.064	0.091	0.115	0.135	0.151	0.163	0.172	0.178	0.180	0.178	0.173	0.164	0.151	0.135	0.115	0.100	0.092	0.065	0.034	0.000
	REQUIRED CAMBER	0"	1⅞"	3⅝"	5¼"	6¾"	8"	9"	9⅞"	10½"	10⅞"	11"	10⅞"	10½"	9⅞"	9⅛"	8"	6¾"	5⅞"	5⅜"	3¾"	1⅞"	0"
GIRDER 14	DEFLECTION DUE TO WT. OF STEEL	0.000	0.024	0.047	0.069	0.088	0.104	0.119	0.130	0.138	0.143	0.145	0.144	0.139	0.131	0.119	0.105	0.089	0.076	0.070	0.048	0.025	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.067	0.131	0.190	0.243	0.289	0.329	0.360	0.383	0.398	0.403	0.398	0.385	0.362	0.331	0.292	0.246	0.212	0.194	0.134	0.069	0.000
	DEFL. DUE TO WT. OF SUPERIMPOSED DL ◑	0.000	0.005	0.009	0.013	0.017	0.020	0.023	0.025	0.027	0.028	0.028	0.028	0.027	0.025	0.023	0.020	0.017	0.015	0.013	0.009	0.005	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.096	0.187	0.272	0.348	0.413	0.471	0.515	0.548	0.569	0.576	0.570	0.551	0.518	0.473	0.417	0.352	0.303	0.277	0.191	0.099	0.000
	VERTICAL CURVE ORDINATE	0.000	0.034	0.064	0.090	0.113	0.133	0.149	0.162	0.170	0.175	0.177	0.176	0.171	0.161	0.149	0.133	0.114	0.099	0.091	0.063	0.033	0.000
	REQUIRED CAMBER	0"	1½"	3"	4⅜"	5½"	6½"	7½"	8⅛"	8⅝"	8⅞"	9"	9"	8⅝"	6⅛"	7½"	6⅝"	5⅝"	4⅞"	4⅜"	3"	1⅝"	0"

SCHEMATIC CAMBER ORDINATES - SPAN 'A'

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-= POC 19+55.81 -Y1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

CAMBER AND DEFLECTIONS

REVISIONS			
NO.	BY	DATE	
1			
2			
3			
4			

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 7-21-05

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 7-21-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY ARH DATE 06-05

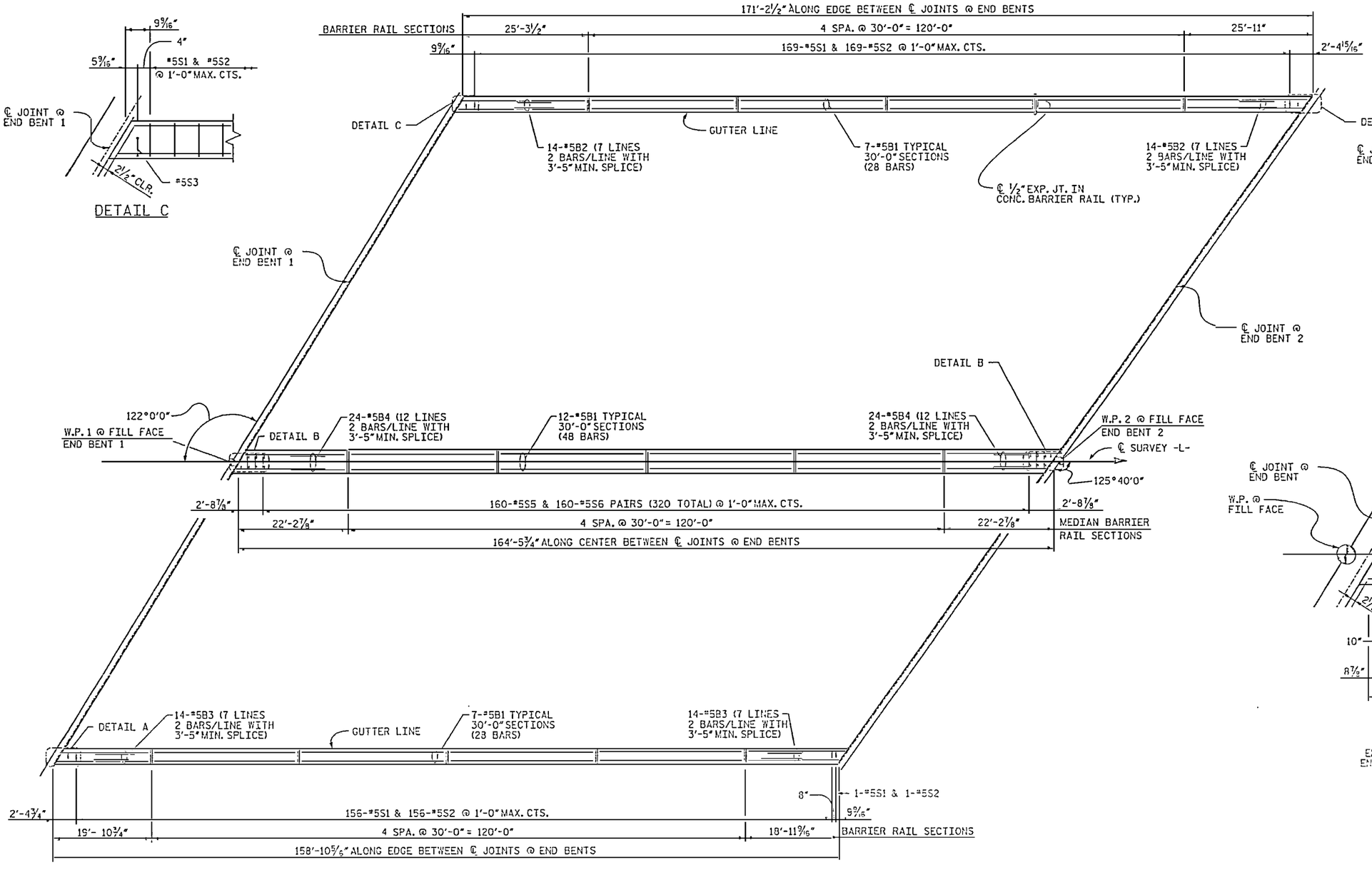
CHECKED BY HMS DATE 06-05

DWG. NO. D-1785.19

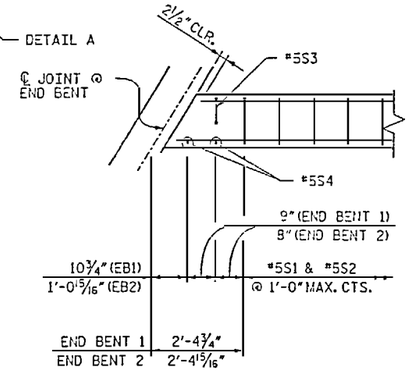
SHEET NO. S1-19

TOTAL SHEETS 50

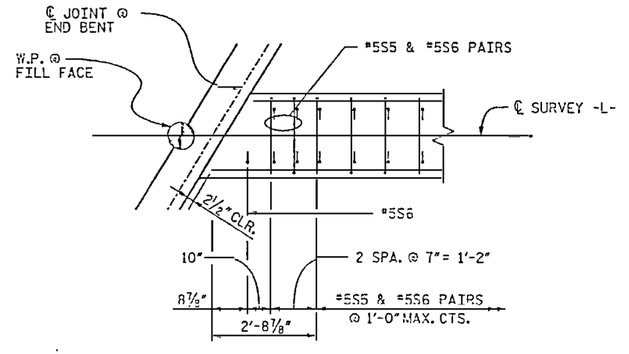
DETAIL C



PLAN



DETAIL A
END BENT 1 SHOWN
END BENT 2 SIMILAR



DETAIL B
END BENT 1 SHOWN
END BENT 2 SIMILAR

NOTES:

ADHESIVELY ANCHOR #5S3 AND #5S4 AFTER DECK HAS CURED. SEE NOTES SHEET 2 OF 2.

THE FORMED OPENING IN THE BARRIER RAILS AND MEDIAN SHALL MATCH THE FORMED JOINT OPENINGS FOR END BENT 1 AND 2. FOR OPENING WIDTHS SEE THE "STANDARD ARMORED EVAZOTE JOINT DETAILS" SHEET.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G DAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROBBINS 2-15-06

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

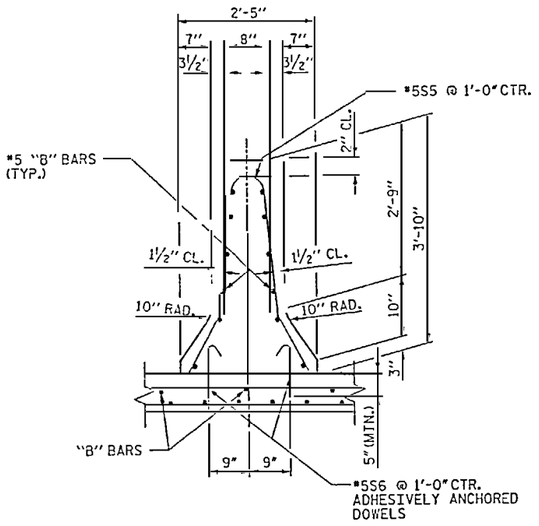
SHEET NO. S1-20
TOTAL SHEETS 50

TAYLOR & MURPHY

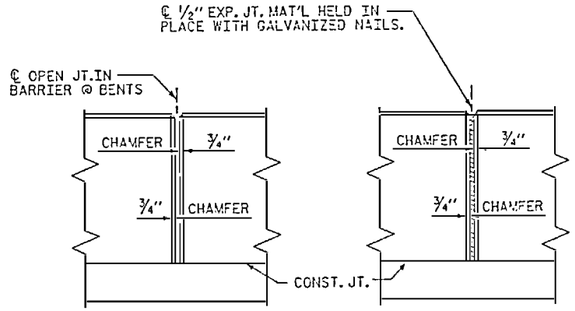
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4339 WESTERGATE BLVD., SUITE 475
RALEIGH, N.C. 27609

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TJT DATE 08-05 DES. NO.
CHECKED BY BAC DATE 09-05 D-1785.20



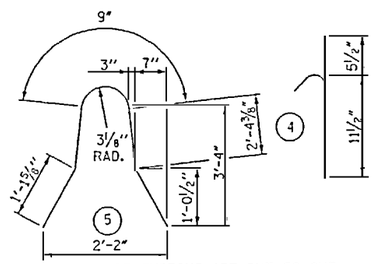
SECTION THRU MEDIAN BARRIER



ELEVATION AT EXPANSION JOINTS

MEDIAN BARRIER DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

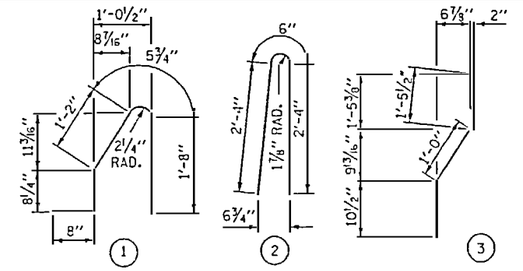
BILL OF MATERIAL

FOR CONCRETE MEDIAN BARRIER ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	48	#5	STR	29'-6"	1,477
✳ B4	48	#5	STR	13'-0"	651
✳ S5	164	#5	5	7'-9"	1326
✳ S6	330	#5	4	1'-5"	488

✳ EPOXY COATED REINFORCING STEEL	3,942 LBS.
CLASS AA CONCRETE	29.0 CU. YDS.
CONCRETE MEDIAN BARRIER	164.5 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	56	#5	STR	29'-6"	1.724
✳ B2	28	#5	STR	14'-6"	423
✳ B3	28	#5	STR	11'-5"	333
✳ S1	326	#5	1	4'-8"	1,587
✳ S2	326	#5	2	5'-2"	1,757
✳ S3	3	#5	3	3'-4"	10
✳ S4	4	#5	STR	3'-2"	14

✳ EPOXY COATED REINFORCING STEEL	5,848 LBS.
CLASS AA CONCRETE	33.1 CU. YDS.
CONCRETE BARRIER RAIL	330.1 LIN. FT.

NOTES

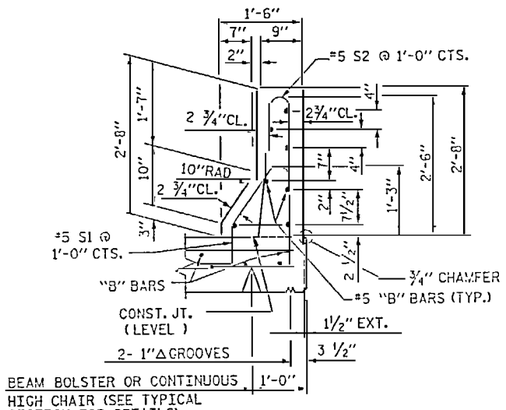
THE BARRIER RAIL AND MEDIAN BARRIER IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS AND MEDIAN BARRIER SHALL BE EPOXY COATED.

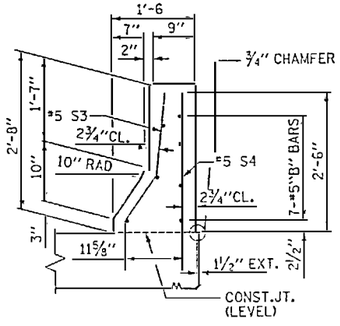
VERTICAL GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE #5 S3 AND #5 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 #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

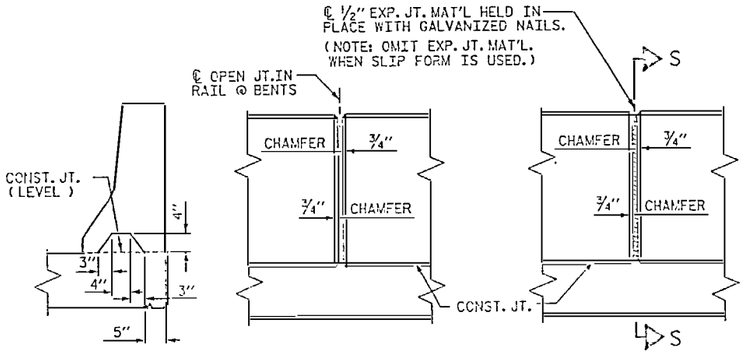
THE FORMED OPENING IN THE BARRIER RAILS AND MEDIAN SHALL MATCH THE FORMED JOINT OPENINGS FOR END BENT 1 AND 2. FOR OPENING WIDTHS SEE THE 'STANDARD ARMORED EVAZOTE JOINT DETAILS' SHEET.



SECTION THRU RAIL



END VIEW



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER

SEAL 28479 ENGINEER KEVIN G. BAILEY 2-15-06

SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			50

ASSEMBLED BY : JWR DATE : 9-05
CHECKED BY : EAC DATE : 9-05

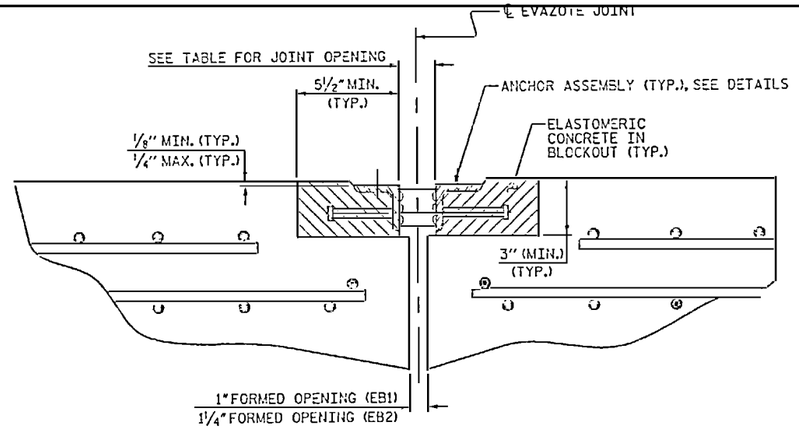
DRAWN BY : AR3 5/97	REV. 8/16/99	RWW/LES
CHECKED BY : SJD 9/97	REV. 10/17/00	RWW/LES
	REV. 5/17/03	RWW/JTE

D-1765.21

TAYLOR & MURPHY

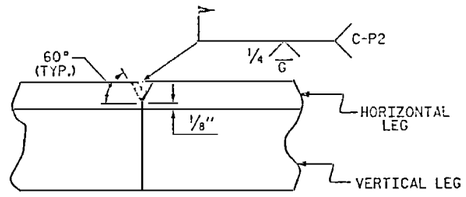
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

STD. NO. CBR1



ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT BENT



DETAIL- FIELD WELD SPLICE OF ANGLE

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE ½" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

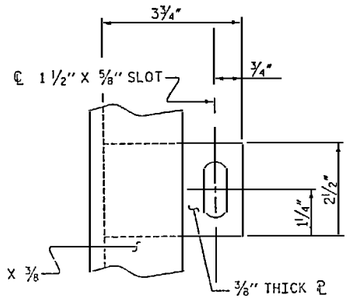
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR ⅜" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

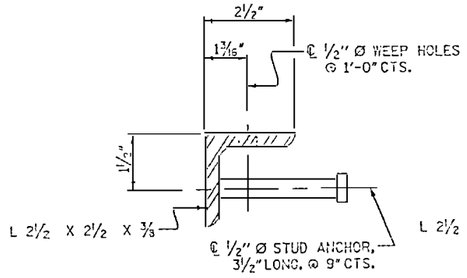
AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

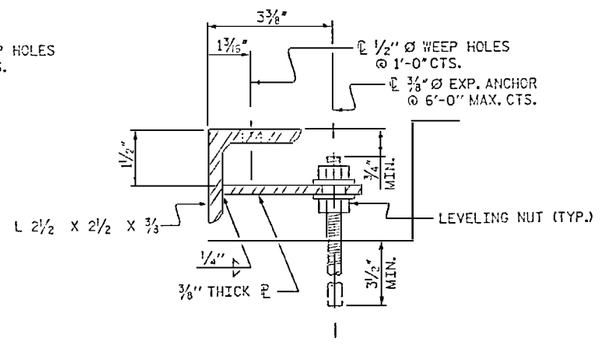
SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.



PLAN VIEW OF TAB



SECTION VIEW OF STUD



SECTION VIEW OF TAB

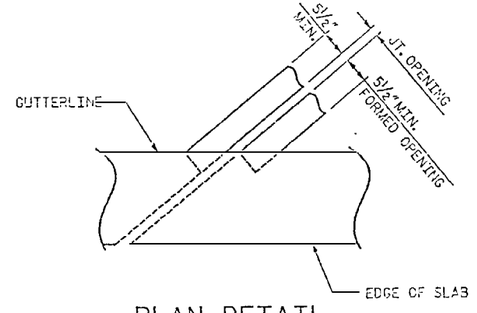
ARMORED JOINT ANCHOR ASSEMBLY DETAILS

MOVEMENT AND SETTING AT EVAZOTE JOINT						
END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	122°00'00"	3⅞"	0"	1 13/16"	1 13/16"	1 13/16"
2	125°40'00"	3⅞"	1⅜"	3¼"	2⅜"	1 13/16"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY.
JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

BILL OF MATERIAL		
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	35.2	307'-2"
2	36.8	320'-9"

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



PLAN DETAIL

D1785.22

TAYLOR & MURPHY

HIGGINS & HUTCHESON, P.C. CONSULTING ENGINEERS 4209 HILLSBOROUGH ROAD, SUITE 102 RALEIGH, N.C. 27609

NORTH CAROLINA PROFESSIONAL SEAL 23479 ENGINEER KEVIN G BAILEY 2-1-06

NORTH CAROLINA PROFESSIONAL SEAL 13155 ENGINEER MARK F. ROBBINS 2-1-06

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ARMORED EVAZOTE JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			50

SID NO. AF 11

ASSEMBLED BY : MFR	DATE : 08/05		
CHECKED BY : KGB	DATE : 01/06		
DRAWN BY : EEM W/SS	REV. 10/17/CO	RWW/LES	
CHECKED BY : RGW W/SS	REV. 7/10/SI	LES/RGR	
	REV. 5/17/03FR	RWW/JTE	

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REINFORCING BAR SCHEDULE STAGE I

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1000	260	#5	STR.	31'-8"	8,587
* A1001	3	#5	STR.	5'-2"	16
* A1002	2	#5	STR.	4'-2"	9
* A1003	2	#5	STR.	3'-2"	7
* A1004	1	#5	STR.	2'-2"	2
* A1005	2	#5	STR.	5'-11"	12
* A1006	2	#5	STR.	7'-5"	15
* A1007	2	#5	STR.	8'-11"	19
* A1008	2	#5	STR.	10'-5"	22
* A1009	2	#5	STR.	11'-11"	25
* A1010	2	#5	STR.	13'-5"	28
* A1011	2	#5	STR.	14'-11"	31
* A1012	2	#5	STR.	16'-5"	34
* A1013	2	#5	STR.	18'-0"	38
* A1014	2	#5	STR.	19'-6"	41
* A1015	2	#5	STR.	21'-0"	44
* A1016	2	#5	STR.	22'-6"	47
* A1017	2	#5	STR.	24'-0"	50
* A1018	2	#5	STR.	25'-6"	53
* A1019	2	#5	STR.	27'-0"	56
* A1020	2	#5	STR.	28'-6"	59
* A1021	2	#5	STR.	30'-0"	63
* A1022	1	#5	STR.	31'-7"	33
* A1023	1	#5	STR.	31'-7"	33
* A1024	2	#5	STR.	29'-10"	62
* A1025	2	#5	STR.	28'-2"	59
* A1026	2	#5	STR.	26'-5"	55
* A1027	2	#5	STR.	24'-8"	51
* A1028	2	#5	STR.	22'-11"	48
* A1029	2	#5	STR.	21'-2"	44
* A1030	2	#5	STR.	19'-6"	41
* A1031	2	#5	STR.	17'-9"	37
* A1032	2	#5	STR.	16'-0"	33
* A1033	2	#5	STR.	14'-3"	30
* A1034	2	#5	STR.	12'-6"	26
* A1035	2	#5	STR.	10'-10"	23
* A1036	2	#5	STR.	9'-1"	19
* A1037	2	#5	STR.	7'-4"	15
* A1038	3	#5	STR.	6'-6"	20
* A1039	2	#5	STR.	5'-6"	11
* A1040	2	#5	STR.	4'-6"	9
* A1041	1	#5	STR.	3'-6"	4
A1100	264	#5	STR.	31'-8"	8,719
A1101	3	#5	STR.	4'-8"	15
A1102	2	#5	STR.	3'-8"	8
A1103	2	#5	STR.	2'-8"	6
A1104	2	#5	STR.	5'-4"	11
A1105	2	#5	STR.	6'-11"	14
A1106	2	#5	STR.	8'-5"	18
A1107	2	#5	STR.	9'-11"	21
A1108	2	#5	STR.	11'-5"	24
A1109	2	#5	STR.	12'-11"	27
A1110	2	#5	STR.	14'-5"	30
A1111	2	#5	STR.	15'-11"	33
A1112	2	#5	STR.	17'-5"	36
A1113	2	#5	STR.	19'-0"	40
A1114	2	#5	STR.	20'-6"	43
A1115	2	#5	STR.	22'-0"	46
A1116	2	#5	STR.	23'-6"	49
A1117	2	#5	STR.	25'-0"	52
A1118	2	#5	STR.	26'-6"	55
A1119	2	#5	STR.	28'-0"	58
A1120	2	#5	STR.	29'-6"	62
A1121	1	#5	STR.	31'-0"	32
A1122	1	#5	STR.	31'-0"	32
A1123	2	#5	STR.	29'-1"	61
A1124	2	#5	STR.	27'-6"	57
A1125	2	#5	STR.	25'-9"	54

REINFORCING BAR SCHEDULE STAGE I

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1126	2	#5	STR.	24'-0"	50
A1127	2	#5	STR.	22'-4"	47
A1128	2	#5	STR.	20'-7"	43
A1129	2	#5	STR.	18'-10"	39
A1130	2	#5	STR.	17'-1"	36
A1131	2	#5	STR.	15'-4"	32
A1132	2	#5	STR.	13'-8"	29
A1133	2	#5	STR.	11'-11"	25
A1134	2	#5	STR.	10'-2"	21
A1135	2	#5	STR.	8'-5"	18
A1136	2	#5	STR.	6'-9"	14
A1137	3	#5	STR.	5'-10"	18
A1138	2	#5	STR.	4'-10"	10
A1139	2	#5	STR.	3'-10"	8
A1140	1	#5	STR.	2'-10"	3
* B11	126	#4	STR.	29'-1"	2,448
B12	105	#5	STR.	56'-7"	6,197
C101	6	#4	STR.	1'-9"	7
C102	6	#4	STR.	3'-0"	12
C103	6	#4	STR.	4'-3"	17
C104	6	#4	STR.	5'-6"	22
C105	3	#4	STR.	2'-11"	6
C106	3	#4	STR.	4'-7"	9
C107	3	#4	STR.	6'-2"	12
C108	3	#4	STR.	7'-9"	16
C109	6	#4	STR.	1'-10"	7
C110	6	#4	STR.	3'-3"	13
C111	6	#4	STR.	4'-9"	19
C112	6	#4	STR.	6'-2"	25
C113	3	#4	STR.	2'-4"	5
C114	3	#4	STR.	3'-8"	7
C115	3	#4	STR.	5'-1"	10
C116	3	#4	STR.	6'-6"	13
C117	3	#4	STR.	7'-11"	16
* D11	1156	#5	STR.	4'-6"	5,426
* D12	16	#5	STR.	4'-9"	79
* D13	16	#5	STR.	5'-7"	93
* D14	4	#6	(5)	9'-10"	59
* D15	4	#6	(5)	10'-2"	61
* G101	2	#5	STR.	37'-4"	78
* G102	2	#5	STR.	38'-11"	81
* K11	10	#8	(1)	20'-4"	543
* K12	10	#8	(1)	21'-0"	561
* K13	10	#8	(2)	11'-10"	316
* K14	10	#8	(2)	12'-2"	325
* S11	67	#5	(3)	4'-7"	416
* S12	2	#4	(3)	4'-10"	6
* S13	2	#4	(3)	4'-11"	7

REINFORCING BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A2000	242	#5	STR.	53'-3"	13,441
* A2001	3	#5	STR.	5'-2"	16
* A2002	2	#5	STR.	4'-2"	9
* A2003	2	#5	STR.	3'-2"	7
* A2004	1	#5	STR.	2'-2"	2
* A2005	2	#5	STR.	5'-11"	12
* A2006	2	#5	STR.	7'-5"	15
* A2007	2	#5	STR.	8'-11"	19
* A2008	2	#5	STR.	10'-5"	22
* A2009	2	#5	STR.	11'-11"	25
* A2010	2	#5	STR.	13'-5"	28
* A2011	2	#5	STR.	14'-11"	31
* A2012	2	#5	STR.	16'-5"	34
* A2013	2	#5	STR.	18'-0"	38
* A2014	2	#5	STR.	19'-6"	41
* A2015	2	#5	STR.	21'-0"	44
* A2016	2	#5	STR.	22'-6"	47
* A2017	2	#5	STR.	24'-0"	50
* A2018	2	#5	STR.	25'-6"	53
* A2019	2	#5	STR.	27'-0"	56
* A2020	2	#5	STR.	28'-6"	59
* A2021	2	#5	STR.	30'-0"	63
* A2022	2	#5	STR.	31'-7"	66
* A2023	2	#5	STR.	33'-1"	69
* A2024	2	#5	STR.	34'-7"	72
* A2025	2	#5	STR.	36'-1"	75
* A2026	2	#5	STR.	37'-7"	78
* A2027	2	#5	STR.	39'-1"	82
* A2028	2	#5	STR.	40'-7"	85
* A2029	2	#5	STR.	42'-1"	88
* A2030	2	#5	STR.	43'-7"	91
* A2031	2	#5	STR.	45'-2"	94
* A2032	2	#5	STR.	46'-8"	97
* A2033	2	#5	STR.	48'-2"	100
* A2034	2	#5	STR.	49'-8"	104
* A2035	2	#5	STR.	51'-2"	107
* A2036	1	#5	STR.	52'-8"	55
* A2037	1	#5	STR.	53'-0"	55
* A2038	2	#5	STR.	51'-3"	107
* A2039	2	#5	STR.	49'-6"	103
* A2040	2	#5	STR.	47'-9"	100
* A2041	2	#5	STR.	46'-0"	96
* A2042	2	#5	STR.	44'-4"	92
* A2043	2	#5	STR.	42'-7"	89
* A2044	2	#5	STR.	40'-10"	85
* A2045	2	#5	STR.	39'-1"	82
* A2046	2	#5	STR.	37'-4"	78
* A2047	2	#5	STR.	35'-8"	74
* A2048	2	#5	STR.	33'-11"	71
* A2049	2	#5	STR.	32'-2"	67
* A2050	2	#5	STR.	30'-5"	63
* A2051	2	#5	STR.	28'-8"	60
* A2052	2	#5	STR.	27'-0"	56
* A2053	2	#5	STR.	25'-3"	53
* A2054	2	#5	STR.	23'-6"	49
* A2055	2	#5	STR.	21'-9"	45
* A2056	2	#5	STR.	20'-0"	42
* A2057	2	#5	STR.	18'-4"	38
* A2058	2	#5	STR.	16'-7"	35
* A2059	2	#5	STR.	14'-10"	31
* A2060	2	#5	STR.	13'-1"	27
* A2061	2	#5	STR.	11'-4"	24
* A2062	2	#5	STR.	9'-8"	20
* A2063	2	#5	STR.	7'-11"	17
* A2064	4	#5	STR.	6'-2"	26
* A2065	2	#5	STR.	5'-2"	11
* A2066	2	#5	STR.	4'-2"	9
* A2067	1	#5	STR.	3'-2"	3

REINFORCING BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2100	244	#5	STR.	53'-3"	13,552
A2101	3	#5	STR.	4'-8"	15
A2102	2	#5	STR.	3'-8"	8
A2103	2	#5	STR.	2'-8"	6
A2104	2	#5	STR.	5'-4"	11
A2105	2	#5	STR.	6'-11"	14
A2106	2	#5	STR.	8'-5"	18
A2107	2	#5	STR.	9'-11"	21
A2108	2	#5	STR.	11'-5"	24
A2109	2	#5	STR.	12'-11"	27
A2110	2	#5	STR.	14'-5"	30
A2111	2	#5	STR.	15'-11"	33
A2112	2	#5	STR.	17'-5"	36
A2113	2	#5	STR.	19'-0"	40
A2114	2	#5	STR.	20'-6"	43
A2115	2	#5	STR.	22'-0"	46
A2116	2	#5	STR.	23'-6"	49
A2117	2	#5	STR.	25'-0"	52
A2118	2	#5	STR.	26'-6"	55
A2119	2	#5	STR.	28'-0"	58
A2120	2	#5	STR.	29'-6"	62
A2121	2	#5	STR.	31'-0"	65
A2122	2	#5	STR.	32'-7"	68
A2123	2	#5	STR.	34'-1"	71
A2124	2	#5	STR.	35'-7"	74
A2125	2	#5	STR.	37'-1"	77
A2126	2	#5	STR.	38'-7"	80
A2127	2	#5	STR.	40'-1"	84
A2128	2	#5	STR.	41'-7"	87
A2129	2	#5	STR.	43'-1"	90
A2130	2	#5	STR.	44'-7"	93
A2131	2	#5	STR.	46'-2"	96
A2132	2	#5	STR.	47'-8"	99
A2133	2	#5	STR.	49'-2"	103
A2134	2	#5	STR.	50'-8"	106
A2135	2	#5	STR.	52'-2"	109
A2136	1	#5	STR.	53'-2"	55
A2137	2	#5	STR.	51'-6"	107
A2138	2	#5	STR.	49'-9"	104
A2139	2	#5	STR.	48'-0"	100
A2140	2	#5	STR.	46'-3"	96
A2141	2	#5	STR.	44'-6"	93
A2142	2	#5	STR.	42'-10"	89
A2143	2	#5	STR.	41'-1"	86
A2144	2	#5	STR.	39'-4"	82
A2145	2	#5	STR.	37'-7"	78
A2146	2	#5	STR.	35'-10"	75
A2147	2	#5	STR.	34'-2"	71
A2148	2	#5	STR.	32'-5"	68
A2149	2	#5	STR.	30'-8"	64
A2150	2	#5	STR.	28'-11"	60
A2151	2	#5	STR.	27'-2"	57
A2152	2	#5	STR.	25'-6"	53
A2153	2	#5	STR.	23'-9"	50
A2154	2	#5	STR.	22'-0"	46
A2155	2	#5	STR.	20'-3"	42
A2156	2	#5	STR.	18'-6"	39
A2157	2	#5	STR.	16'-10"	35
A2158	2	#5	STR.	15'-1"	31
A2159	2	#5	STR.	13'-4"	28
A2160	2	#5	STR.	11'-7"	24
A2161	2	#5	STR.	9'-10"	21
A2162	2	#5	STR.	8'-2"	17
A2163	2	#5	STR.	6'-5"	13
A2164	3	#5	STR.	5'-6"	17
A2165	2	#5	STR.	4'-6"	9
A2166	2	#5	STR.	3'-6"	7
A2167	1	#5	STR.	2'-6"	3

REINFORCING BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B21	138	#4	STR.	30'-0"	2,766
* B22	96	#4	STR.	29'-6"	1,892
B23	114	#5	STR.	58'-5"	6,946
B24	84	#5	STR.	57'-4"	5,023
C201	10	#4	STR.	1'-9"	12
C202	10	#4	STR.	3'-0"	20
C203	10	#4	STR.	4'-3"	28
C204	10	#4	STR.	5'-6"	37
C205	5	#4	STR.	2'-11"	10
C206	5	#4	STR.	4'-7"	15
C207	5	#4	STR.	6'-2"	21
C208	5	#4	STR.	7'-9"	26
C209	10	#4	STR.	1'-10"	12
C210	10	#4	STR.	3'-3"	22
C211	10	#4	STR.	4'-9"	32
C212	10	#4	STR.	6'-2"	41
C213	5	#4	STR.	2'-4"	8
C214	5	#4	STR.	3'-8"	12
C215	5	#4	STR.	5'-1"	17
C216	5	#4	STR.	6'-6"	22
C217	5	#4	STR.	7'-11"	26
* D21	584	#5	STR.	4'-6"	2,741
* D22	8	#5	STR.	4'-9"	40
* D23	8	#5	STR.	5'-7"	47
* D24	2	#6	(5)	9'-10"	30
* D25	2	#6	(5)	10'-2"	31
* G201	2	#5	STR.	32'-8"	68
* G202	2	#5	STR.	34'-1"	71
* G203	2	#4	STR.	3'-2"	4
* G204	2	#4	STR.	3'-5"	5
* K21	20	#8	(1)	20'-4"	1,086
* K22	20	#8	(1)	21'-0"	1,121
* K23	5	#8	(2)	11'-10"	158
* K24	5	#8	(2)	12'-2"	162
* K25	5	#8	(2)	14'-6"	194
* K26	5	#8	(2)	15'-0"	200
* S21	145	#5	(3)	4'-7"	693
* S22	1	#4	(3)	4'-10"	3
* S23	1	#4	(3)	4'-11"	3
* S24	5	#4	(4)	4'-3"	14
* S25	5	#4	(4)	4'-4"	14

* DENOTES EPOXY COATED REINFORCING STEEL

NOTE: FOR CONSTRUCTION JOINT LOCATION, SEE "PLAN OF SPANS" SHEETS.

FOR CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SPAN" SHEETS.

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 2

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS: NO. | BY | DATE | NO. | BY | DATE — 1, 2, 3, 4

TAYLOR & MURPHY

FLORENCE & HUTCHESON INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TJT DATE 9-05
CHECKED BY FEK DATE 1-06
DWG. NO. D-1735.23

SHEET NO. S1-23
TOTAL SHEETS 50

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REINFORCING BAR SCHEDULE STAGE III

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A3000	287	#5	STR.	41'-3"	12,348
✱A3001	3	#5	STR.	5'-7"	17
✱A3002	2	#5	STR.	4'-7"	10
✱A3003	2	#5	STR.	3'-7"	7
✱A3004	2	#5	STR.	2'-7"	5
✱A3005	2	#5	STR.	6'-2"	13
✱A3006	2	#5	STR.	7'-6"	16
✱A3007	2	#5	STR.	8'-9"	18
✱A3008	2	#5	STR.	10'-0"	21
✱A3009	2	#5	STR.	11'-4"	24
✱A3010	2	#5	STR.	12'-7"	25
✱A3011	2	#5	STR.	13'-10"	29
✱A3012	2	#5	STR.	15'-2"	32
✱A3013	2	#5	STR.	16'-5"	34
✱A3014	2	#5	STR.	17'-8"	37
✱A3015	2	#5	STR.	19'-0"	40
✱A3016	2	#5	STR.	20'-3"	42
✱A3017	2	#5	STR.	21'-6"	45
✱A3018	2	#5	STR.	22'-9"	47
✱A3019	2	#5	STR.	24'-1"	50
✱A3020	2	#5	STR.	25'-4"	53
✱A3021	2	#5	STR.	26'-7"	55
✱A3022	2	#5	STR.	27'-11"	58
✱A3023	2	#5	STR.	29'-2"	61
✱A3024	2	#5	STR.	30'-5"	63
✱A3025	2	#5	STR.	31'-9"	66
✱A3026	2	#5	STR.	33'-0"	69
✱A3027	2	#5	STR.	34'-3"	71
✱A3028	2	#5	STR.	35'-7"	74
✱A3029	2	#5	STR.	36'-10"	77
✱A3030	2	#5	STR.	38'-1"	79
✱A3031	2	#5	STR.	39'-5"	82
✱A3032	1	#5	STR.	40'-8"	42
✱A3033	1	#5	STR.	40'-7"	42
✱A3034	2	#5	STR.	39'-1"	82
✱A3035	2	#5	STR.	37'-8"	79
✱A3036	2	#5	STR.	36'-2"	75
✱A3037	2	#5	STR.	34'-9"	72
✱A3038	2	#5	STR.	33'-3"	69
✱A3039	2	#5	STR.	31'-9"	66
✱A3040	2	#5	STR.	30'-4"	63
✱A3041	2	#5	STR.	28'-10"	60
✱A3042	2	#5	STR.	27'-4"	57
✱A3043	2	#5	STR.	25'-11"	54
✱A3044	2	#5	STR.	24'-5"	51
✱A3045	2	#5	STR.	22'-11"	48
✱A3046	2	#5	STR.	21'-6"	45
✱A3047	2	#5	STR.	20'-0"	42
✱A3048	2	#5	STR.	18'-7"	39
✱A3049	2	#5	STR.	17'-1"	36
✱A3050	2	#5	STR.	15'-7"	33
✱A3051	2	#5	STR.	14'-2"	30
✱A3052	2	#5	STR.	12'-8"	26
✱A3053	2	#5	STR.	11'-3"	23
✱A3054	2	#5	STR.	9'-9"	20
✱A3055	2	#5	STR.	8'-3"	17
✱A3056	2	#5	STR.	6'-10"	14
✱A3057	3	#5	STR.	6'-1"	19
✱A3058	2	#5	STR.	5'-1"	11
✱A3059	2	#5	STR.	4'-1"	9
✱A3060	2	#5	STR.	3'-1"	6

REINFORCING BAR SCHEDULE STAGE III

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3100	289	#5	STR.	41'-3"	12,434
A3101	3	#5	STR.	5'-3"	16
A3102	2	#5	STR.	4'-3"	9
A3103	2	#5	STR.	3'-3"	7
A3104	2	#5	STR.	2'-3"	5
A3105	2	#5	STR.	5'-11"	12
A3106	2	#5	STR.	7'-2"	15
A3107	2	#5	STR.	8'-5"	18
A3108	2	#5	STR.	9'-9"	20
A3109	2	#5	STR.	11'-0"	23
A3110	2	#5	STR.	12'-2"	25
A3111	2	#5	STR.	13'-7"	28
A3112	2	#5	STR.	14'-10"	31
A3113	2	#5	STR.	16'-1"	34
A3114	2	#5	STR.	17'-5"	36
A3115	2	#5	STR.	18'-8"	39
A3116	2	#5	STR.	19'-11"	42
A3117	2	#5	STR.	21'-3"	44
A3118	2	#5	STR.	22'-6"	47
A3119	2	#5	STR.	23'-9"	50
A3120	2	#5	STR.	25'-1"	52
A3121	2	#5	STR.	26'-4"	55
A3122	2	#5	STR.	27'-7"	58
A3123	2	#5	STR.	28'-11"	60
A3124	2	#5	STR.	30'-2"	63
A3125	2	#5	STR.	31'-5"	66
A3126	2	#5	STR.	32'-9"	68
A3127	2	#5	STR.	34'-0"	71
A3128	2	#5	STR.	35'-3"	74
A3129	2	#5	STR.	36'-7"	76
A3130	2	#5	STR.	37'-10"	79
A3131	2	#5	STR.	39'-1"	82
A3132	2	#5	STR.	40'-5"	84
A3133	1	#5	STR.	40'-11"	43
A3134	2	#5	STR.	39'-6"	82
A3135	2	#5	STR.	38'-0"	79
A3136	2	#5	STR.	36'-6"	76
A3137	2	#5	STR.	35'-1"	73
A3138	2	#5	STR.	33'-7"	70
A3139	2	#5	STR.	32'-2"	67
A3140	2	#5	STR.	30'-8"	64
A3141	2	#5	STR.	29'-2"	61
A3142	2	#5	STR.	27'-9"	58
A3143	2	#5	STR.	26'-3"	55
A3144	2	#5	STR.	24'-9"	52
A3145	2	#5	STR.	23'-4"	49
A3146	2	#5	STR.	21'-10"	46
A3147	2	#5	STR.	20'-5"	43
A3148	2	#5	STR.	18'-11"	39
A3149	2	#5	STR.	17'-5"	36
A3150	2	#5	STR.	16'-0"	33
A3151	2	#5	STR.	14'-6"	30
A3152	2	#5	STR.	13'-1"	27
A3153	2	#5	STR.	11'-7"	24
A3154	2	#5	STR.	10'-1"	21
A3155	2	#5	STR.	8'-8"	18
A3156	2	#5	STR.	7'-2"	15
A3157	2	#5	STR.	5'-9"	12
A3158	3	#5	STR.	5'-0"	16
A3159	2	#5	STR.	4'-0"	8
A3160	2	#5	STR.	3'-0"	6
A3161	1	#5	STR.	2'-0"	2

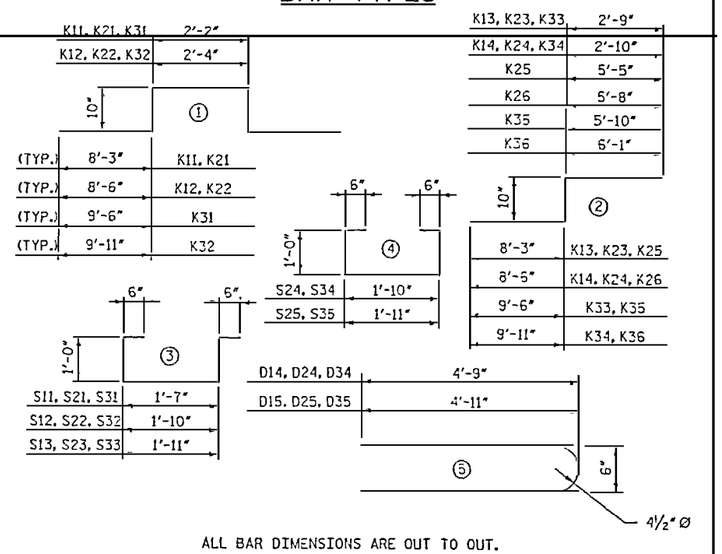
REINFORCING BAR SCHEDULE STAGE III

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B31	185	#4	STR.	28'-7"	3,551
B32	177	#5	STR.	55'-8"	10,277
C301	6	#4	STR.	2'-2"	9
C302	6	#4	STR.	3'-4"	13
C303	6	#4	STR.	4'-6"	18
C304	6	#4	STR.	5'-8"	23
C305	6	#4	STR.	6'-10"	27
C306	3	#4	STR.	1'-6"	3
C307	3	#4	STR.	3'-2"	6
C308	3	#4	STR.	5'-2"	10
C309	3	#4	STR.	6'-3"	13
C310	3	#4	STR.	8'-2"	16
C311	3	#4	STR.	9'-4"	19
C312	6	#4	STR.	2'-4"	9
C313	6	#4	STR.	3'-10"	15
C314	6	#4	STR.	5'-5"	22
C315	6	#4	STR.	7'-0"	28
C316	6	#4	STR.	8'-2"	33
C317	3	#4	STR.	2'-4"	5
C318	3	#4	STR.	3'-2"	6
C319	3	#4	STR.	4'-4"	9
C320	3	#4	STR.	5'-6"	11
C321	3	#4	STR.	7'-4"	15
C322	3	#4	STR.	8'-6"	17
C323	3	#4	STR.	10'-0"	20
✱D31	572	#5	STR.	4'-6"	2,685
✱D32	8	#5	STR.	4'-9"	40
✱D33	8	#5	STR.	5'-7"	47
✱D34	2	#6	(5)	9'-10"	6
✱D35	2	#6	(5)	10'-2"	6
✱G301	2	#5	STR.	48'-8"	102
✱G302	2	#5	STR.	50'-9"	106
✱G303	2	#4	STR.	3'-2"	4
✱G304	2	#4	STR.	3'-5"	6
✱K31	10	#8	(1)	22'-10"	610
✱K32	10	#8	(1)	23'-10"	636
✱K33	5	#8	(2)	13'-1"	175
✱K34	5	#8	(2)	13'-7"	181
✱K35	5	#8	(2)	16'-2"	216
✱K36	5	#8	(2)	16'-10"	225
✱S31	114	#5	(3)	4'-7"	545
✱S32	1	#4	(3)	4'-10"	3
✱S33	1	#4	(3)	4'-11"	3
✱S34	5	#4	(4)	4'-3"	14
✱S35	5	#4	(4)	4'-4"	14

QUANTITIES

EPOXY COATED REINFORCING STEEL (LBS)	STAGE I	20,410
	STAGE II	28,426
	STAGE III	24,074
REINFORCING STEEL (LBS)	STAGE I	16,409
	STAGE II	29,552
	STAGE III	25,552
CONCRETE (CLASS AA) (CU. YD.)	STAGE I	174.2
	STAGE II	302.8
	CLOSURE POUR	15.3
	STAGE III	226.0
	CLOSURE POUR	15.0
	TOTAL	733.3
GROOVING BRIDGE FLOORS (SQ. FT.)	20,894	
REINFORCED CONCRETE DECK SLAB (SQ. FT.)	21,976	

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

✱ DENOTES EPOXY COATED REINFORCING STEEL

NOTE: FOR CONSTRUCTION JOINT LOCATIONS, SEE "PLAN OF SPAN" SHEETS.

FOR CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION" SHEETS.

NORTH CAROLINA PE SEAL 26479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA PE SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 1128 WESTGATE BLVD. SUITE 415 RALEIGH, NC 27607

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TJT DATE 9-05 DGN. NO.

CHECKED BY PEK DATE 1-06 0-1735.24

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

REVISIONS

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-

POC 19+55.81 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

SHEET NO. S1-24

TOTAL SHEETS 50

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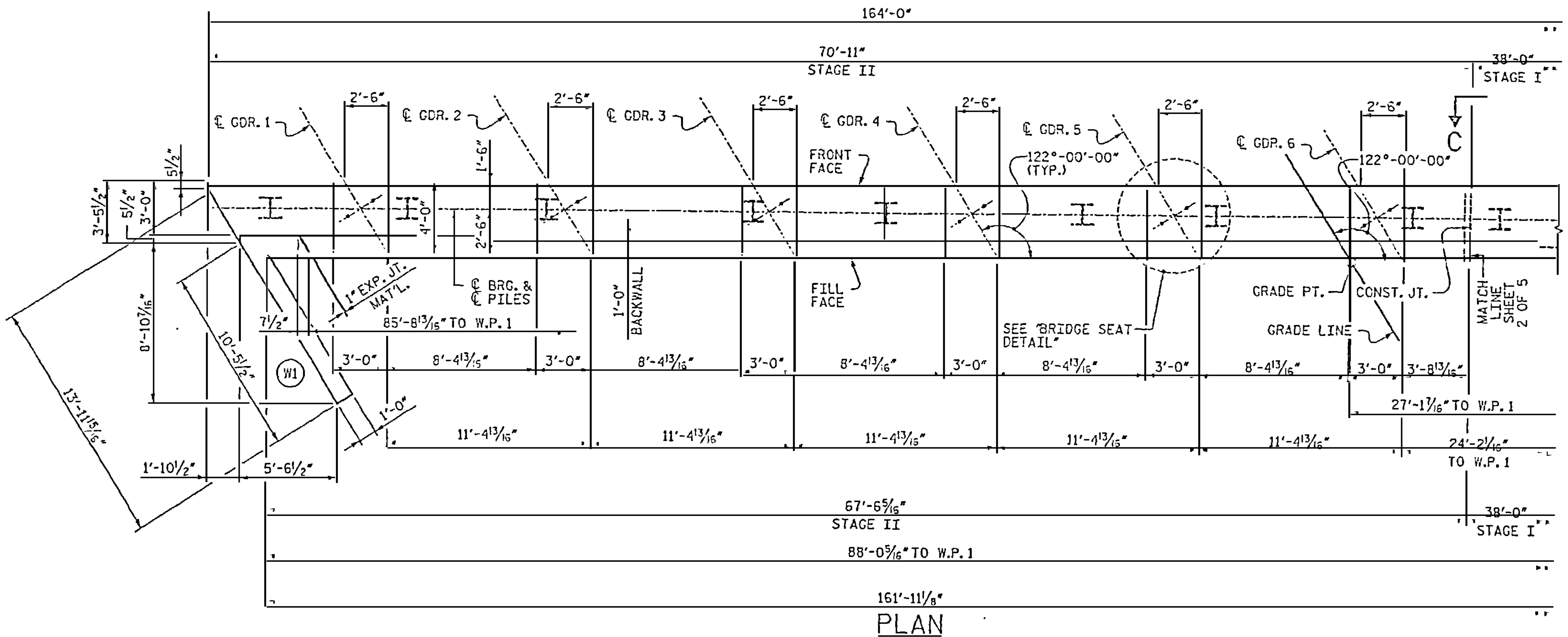
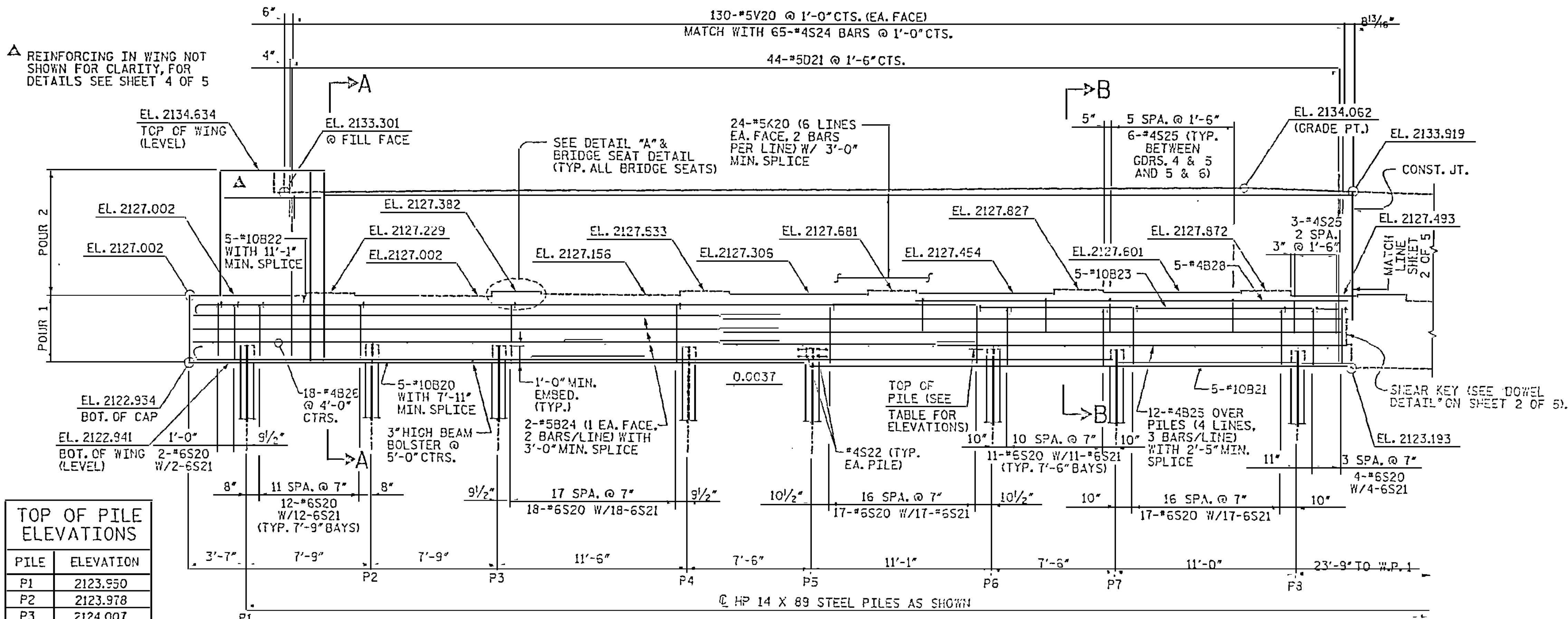


PLAN
(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)



ELEVATION
(LOOKING IN THE DIRECTION OF STATIONING)

PILE	ELEVATION
P1	2123.950
P2	2123.978
P3	2124.007
P4	2124.049
P5	2124.077
P6	2124.118
P7	2124.146
P8	2124.187

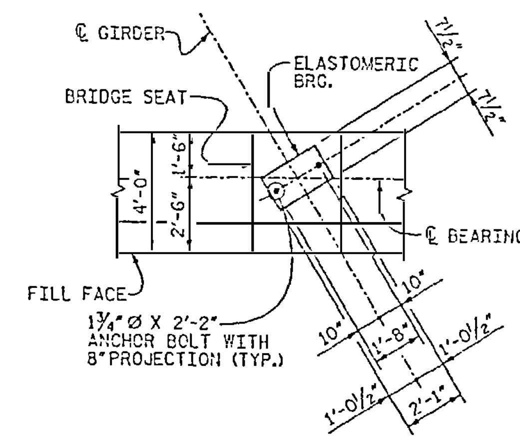
TOP OF PILE ELEVATIONS

ELEVATIONS BASED ON 1'-0" EMBEDMENT.

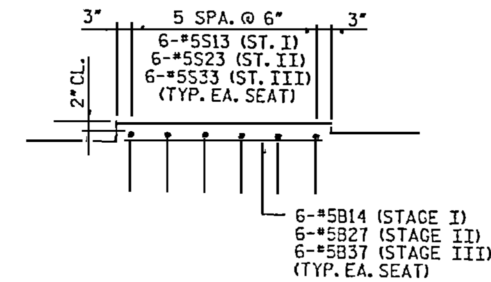
NOTES:

SEE SHEET 5 OF 5 FOR SECTIONS A-A AND B-B.

SEE SHEET 5 OF 5 FOR NOTES.



BRIDGE SEAT DETAIL



DETAIL "A"

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G BAILEY 11-18-05

NORTH CAROLINA SEAL 19165 ENGINEER MARK F. ROBBINS 11-18-05

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POT 19+55.81 -Y1-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1
STAGE II

REVISIONS: NO. 1, 2, 3, 4 — BY — DATE

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DRAWN BY DDL, LGH — DATE 9-05 — DWG. NO.
CHECKED BY JAD — DATE 10-05 — D-1785.25

SHEET NO. S1-25
TOTAL SHEETS 50

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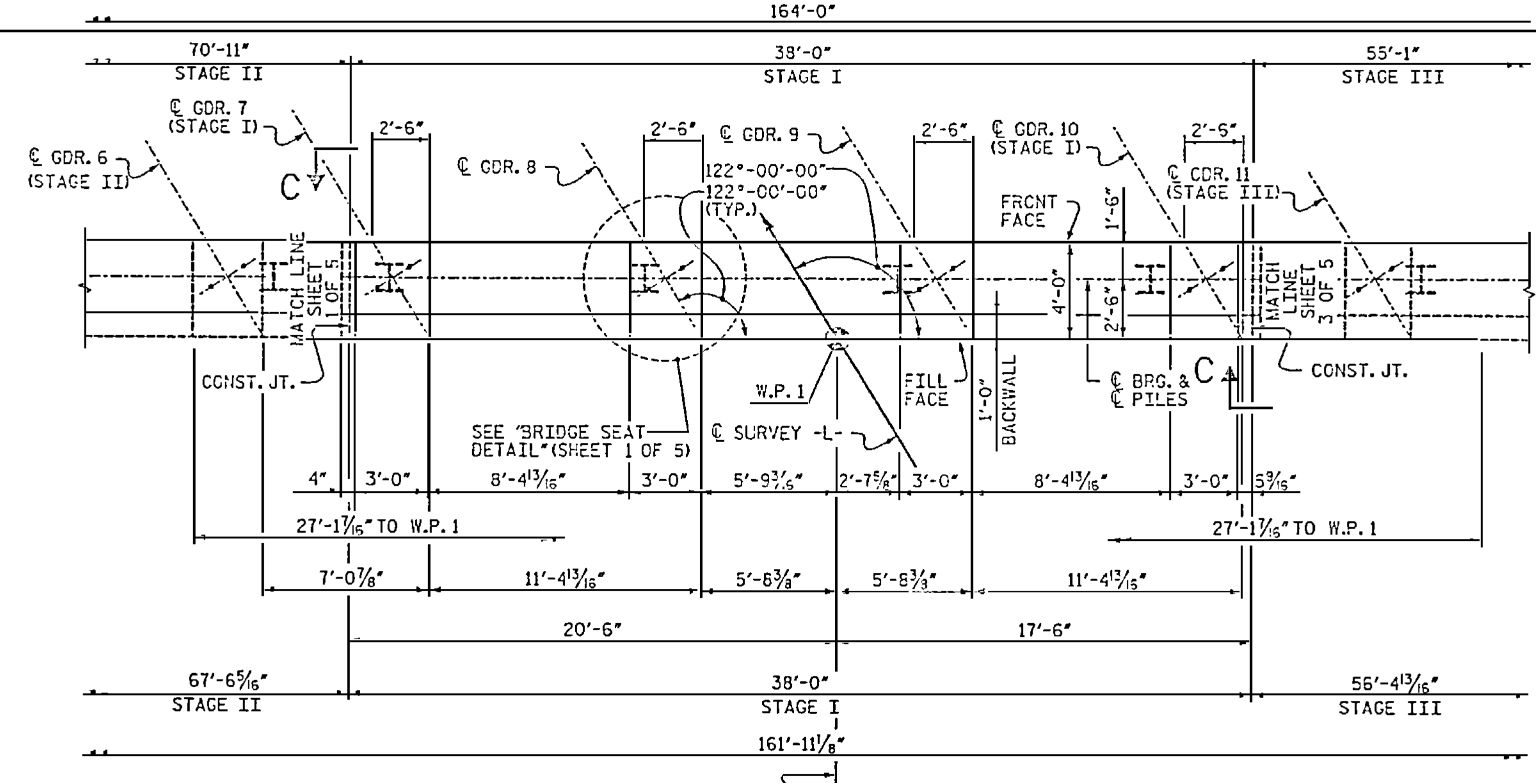
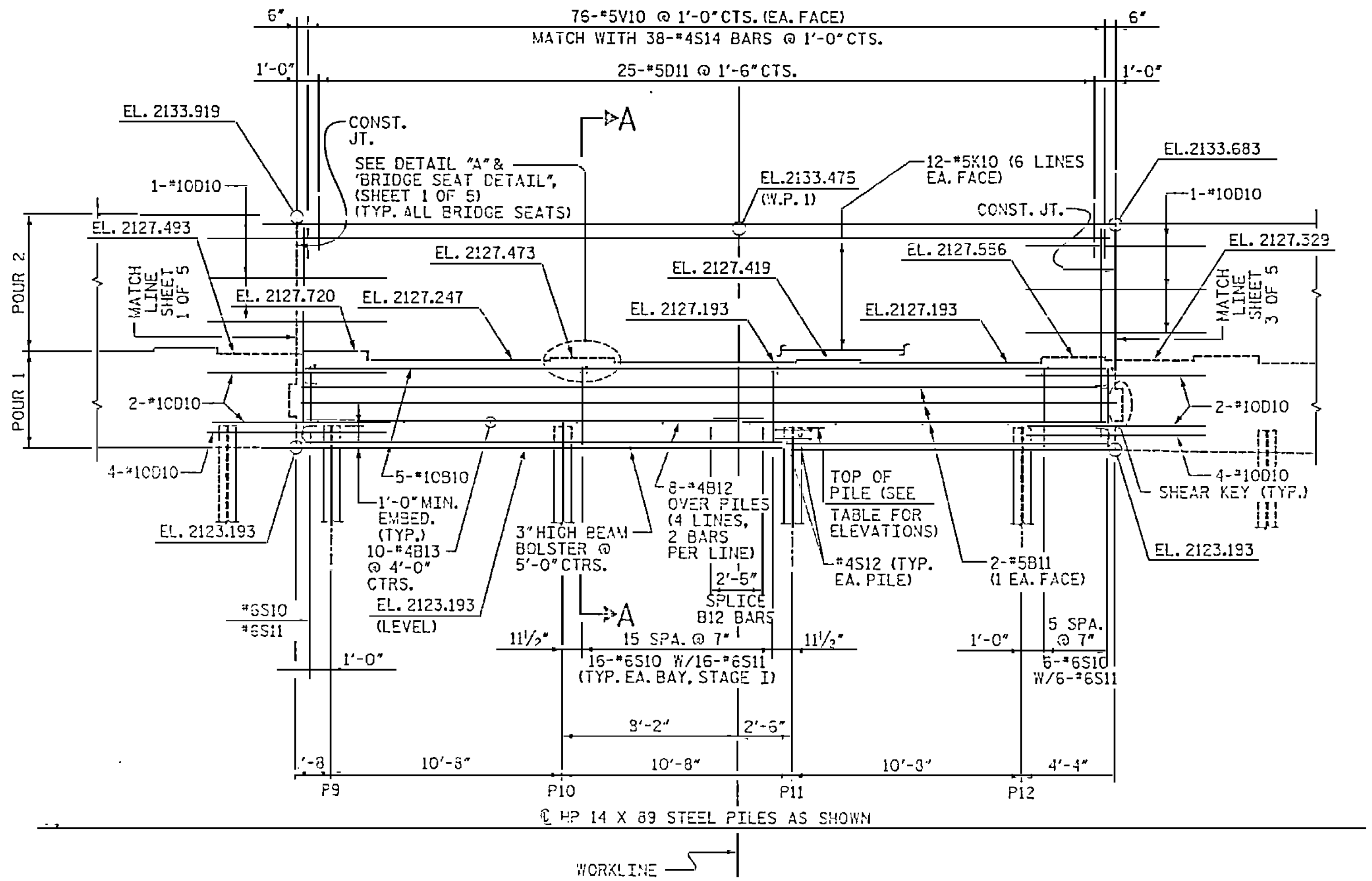


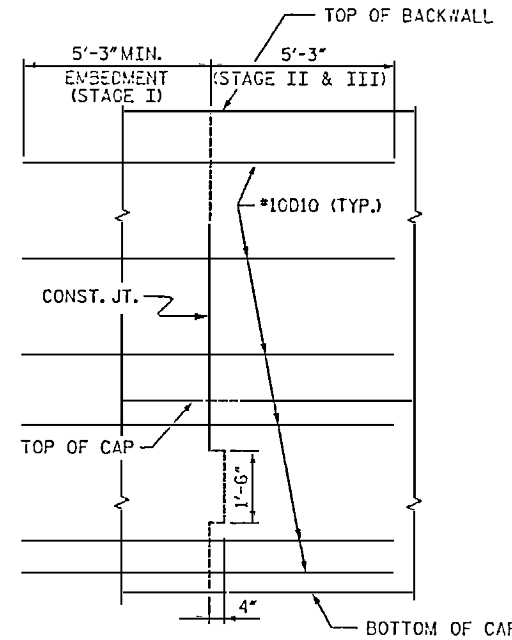
PLAN

(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)

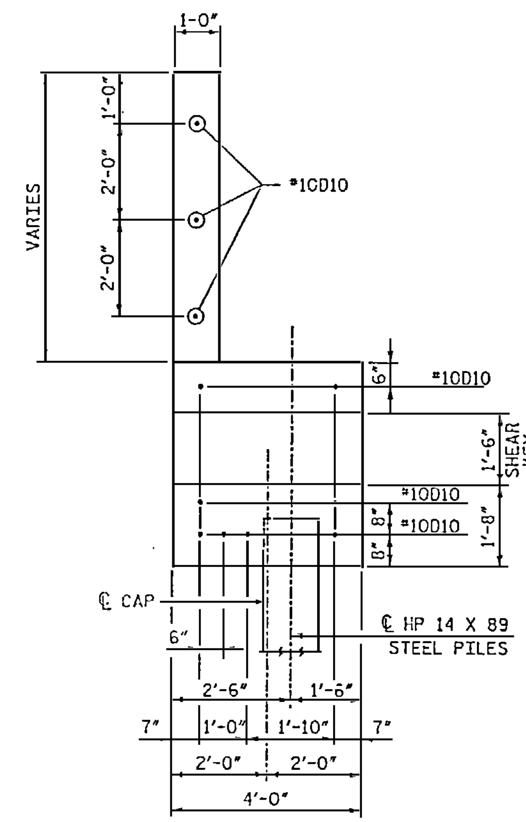


ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)



ELEVATION C



DOWEL DETAIL

(SEE NOTES FOR #10D10 DOWEL BARS)

NOTES:

SEE SHEET 5 OF 5 FOR SECTIONS A-A AND B-B.

SEE SHEET 5 OF 5 FOR NOTES.

CONTRACTOR SHALL INSTALL #10D10 DOWEL BARS AS DETAILED, PROVIDED THERE IS ENOUGH CLEARANCE IN THE FIELD. CONTRACTOR MAY USE ADHESIVELY ANCHORED #10 DOWEL BARS OR MECHANICALLY SPLICED #10 DOWEL BARS IN LIEU OF DETAILS SHOWN IN THESE PLANS. ADHESIVELY ANCHORED OR MECHANICALLY SPLICED DOWEL BARS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER.

TOP OF PILE ELEVATIONS

PILE	ELEVATION
P9	2124.193
P10	2124.193
P11	2124.193
P12	2124.193

ELEVATIONS BASED ON 1'-0" EMBEDMENT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROBBINS 11-18-05

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- = POT 19+55.81 -Y1-

SHEET 2 OF 5

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

END BENT 1

STAGE I

TAYLOR & MURPHY

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RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35524 CHARLOTTE, N.C. 28235

DRAWN BY DDL, LGH DATE 9-05

CHECKED BY JAD DATE 10-05

DWG. NO. D-1725.26

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

REVISIONS

SHEET NO. S1-25

TOTAL SHEETS 50

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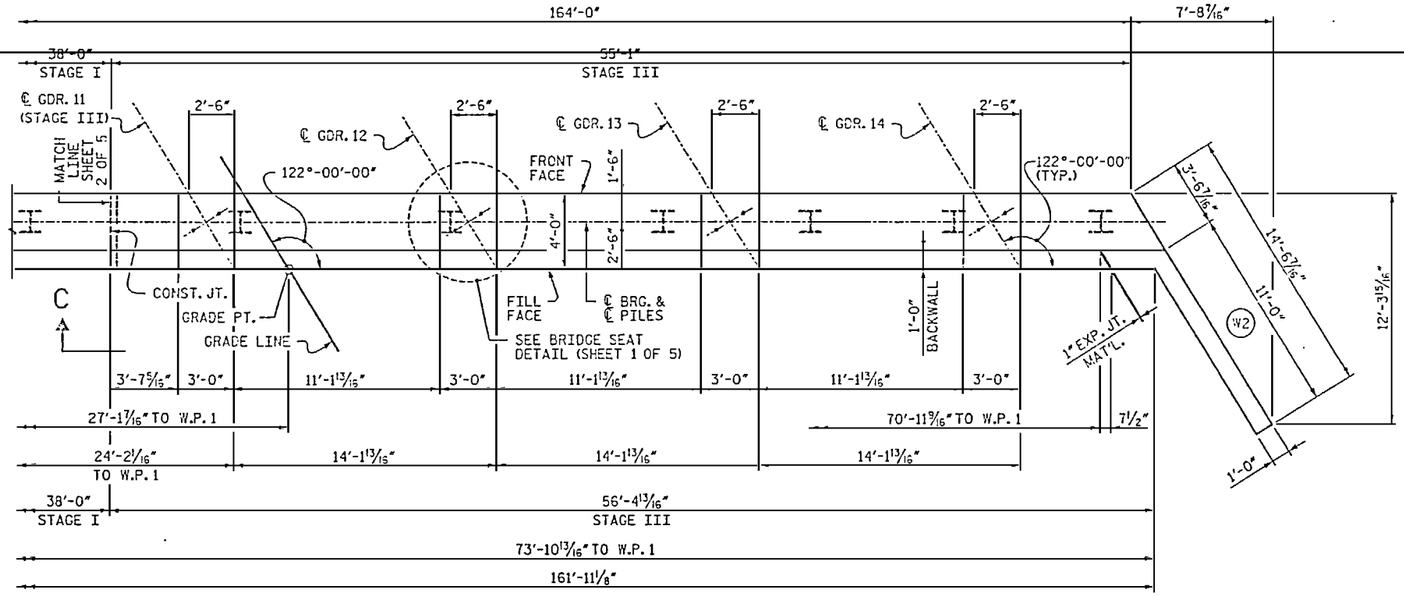
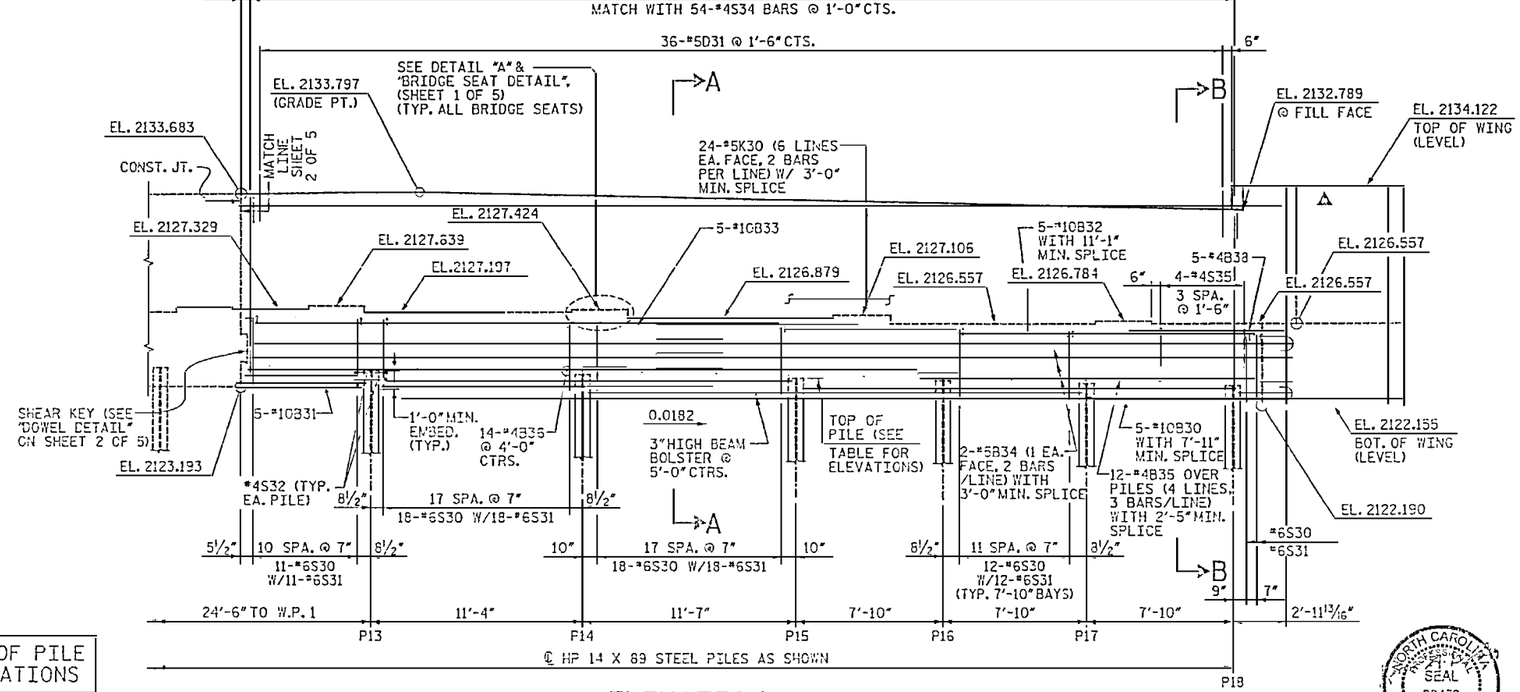


PLAN

(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
	2124.077
P14	2123.870
P15	2123.660
P16	2123.517
P17	2123.375
P18	2123.232

ELEVATIONS BASED ON 1'-0" EMBEDMENT.

NOTES:

SEE SHEET 5 OF 5 FOR SECTIONS A-A & B-B.

SEE SHEET 5 OF 5 FOR NOTES.

⚠ REINFORCING IN WING NOT SHOWN FOR CLARITY, FOR DETAILS SEE SHEET 4 OF 5.

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- =
POT 19+55.81 -Y1-

SHEET 3 OF 5

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

END BENT 1
STAGE III

NO.	BY	DATE
1		
2		
3		
4		

REVISIONS

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DRAWN BY DDL, LGH DATE 9-05 C.A.D. NO.

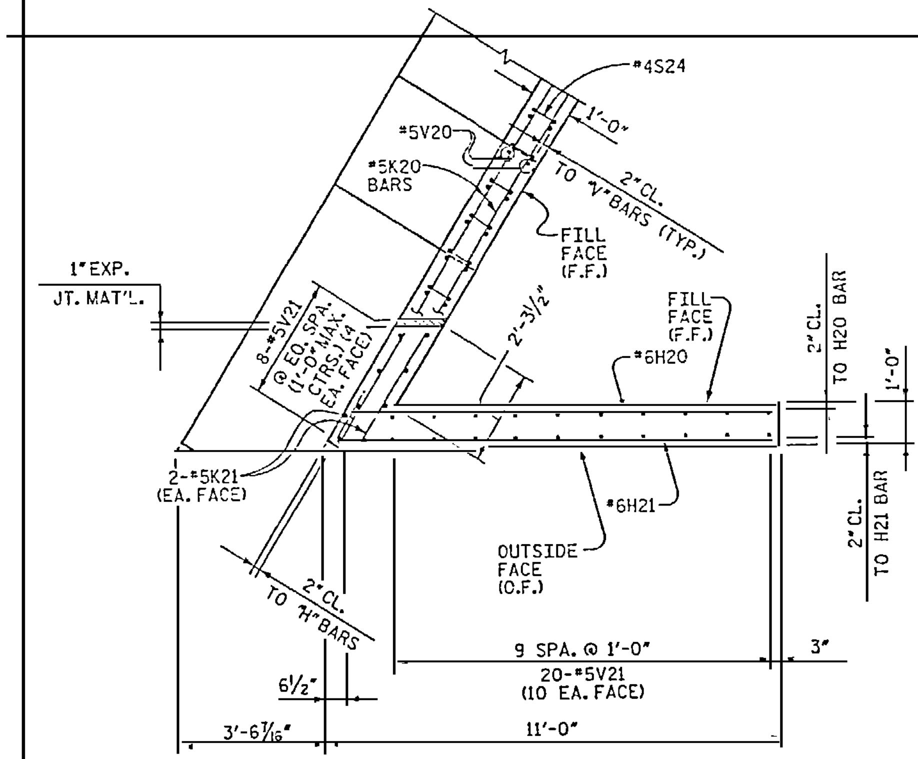
CHECKED BY JAD DATE 10-05 D-1795.27

SEAL 28479 ENGINEER KEVIN G. BAILEY 11-18-05

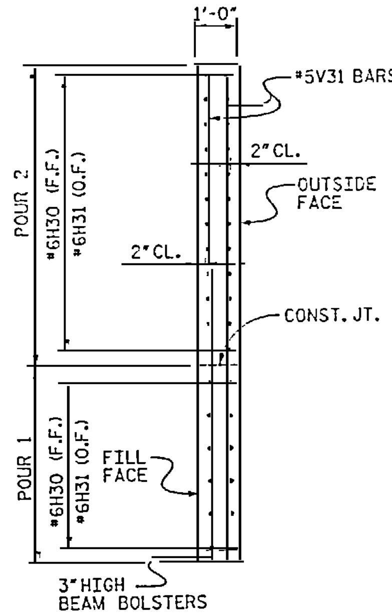
SEAL 18185 ENGINEER MARK F. ROBBINS 11-18-05

SHEET NO. S1-27

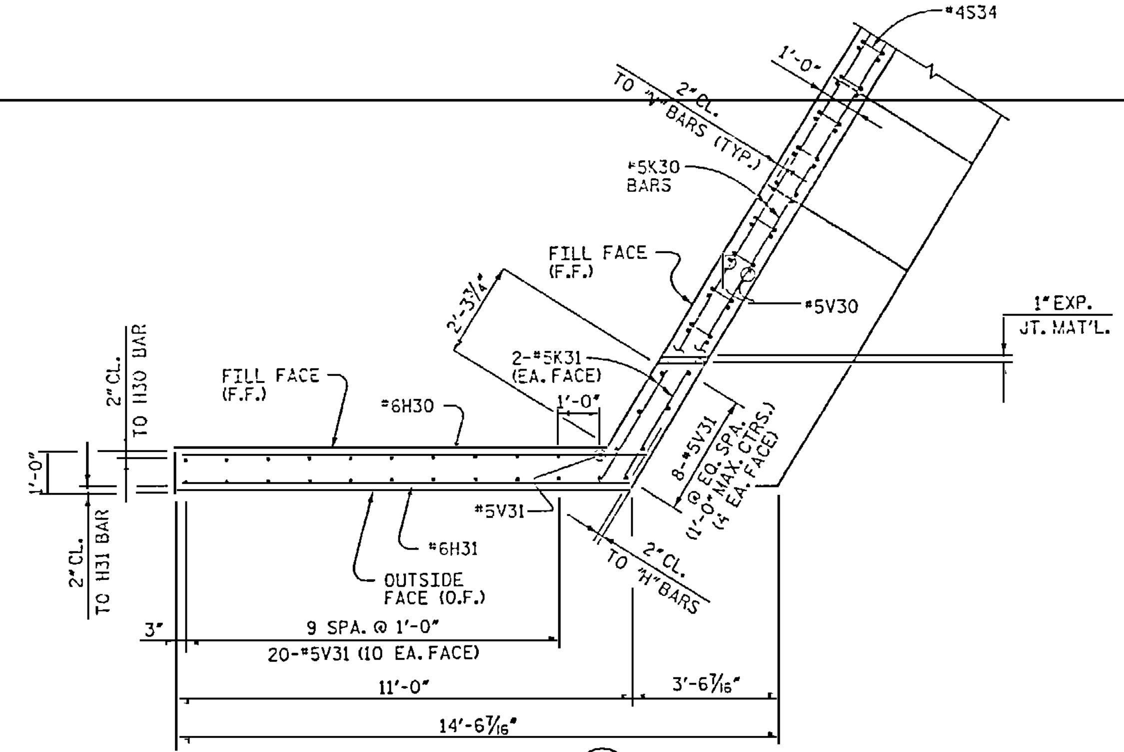
TOTAL SHEETS 50



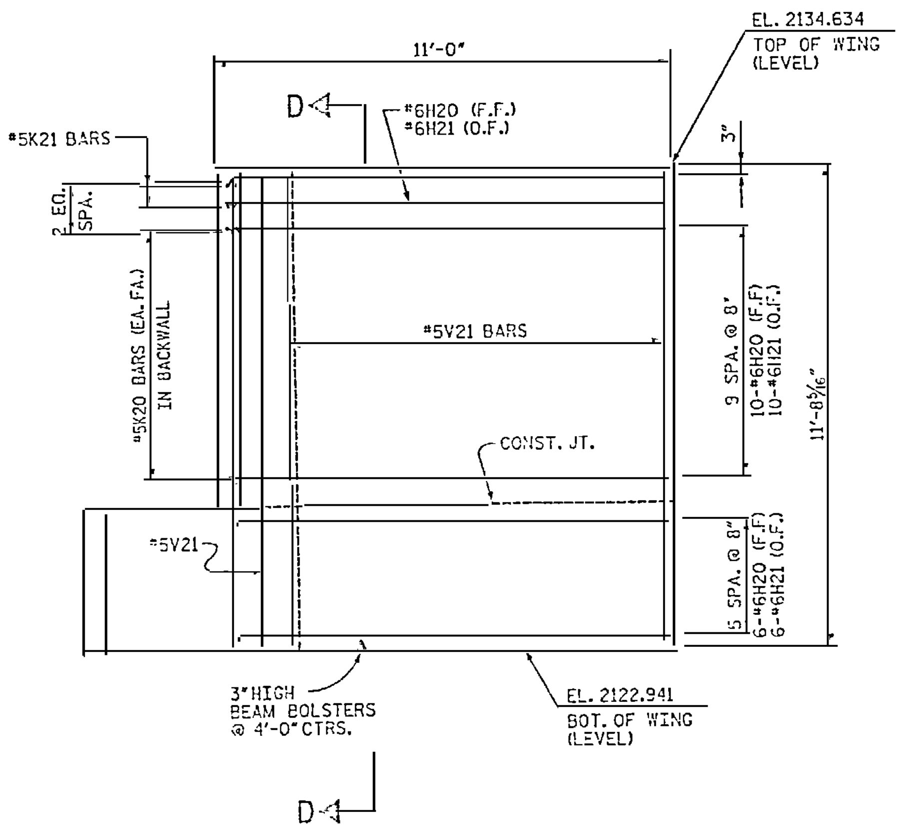
PLAN WING (W1)



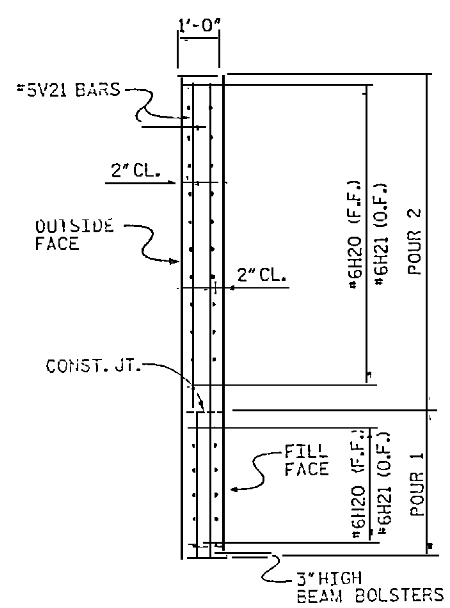
SECTION E-E



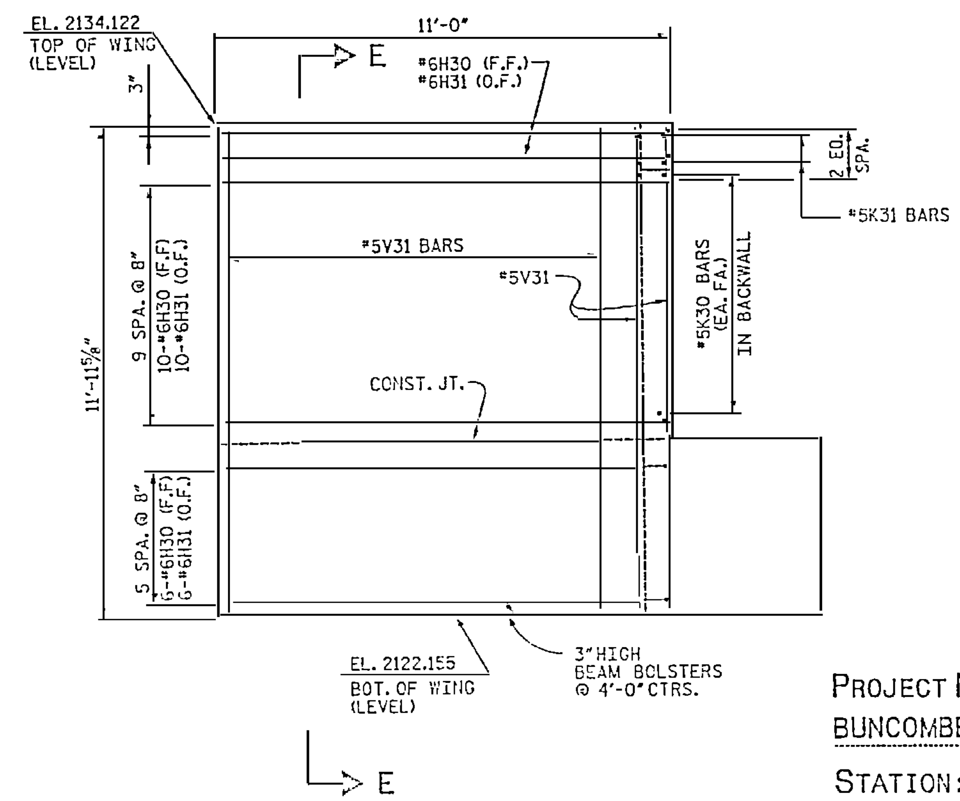
PLAN WING (W2)



ELEVATION WING (W1)



SECTION D-D



ELEVATION WING (W2)

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

SEAL 23479 — KEVIN G. BAILEY — 11-18-05

SEAL 18165 — MARK F. ROBBINS — 11-18-05

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

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

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SHEET NO. S1-28

TOTAL SHEETS 56

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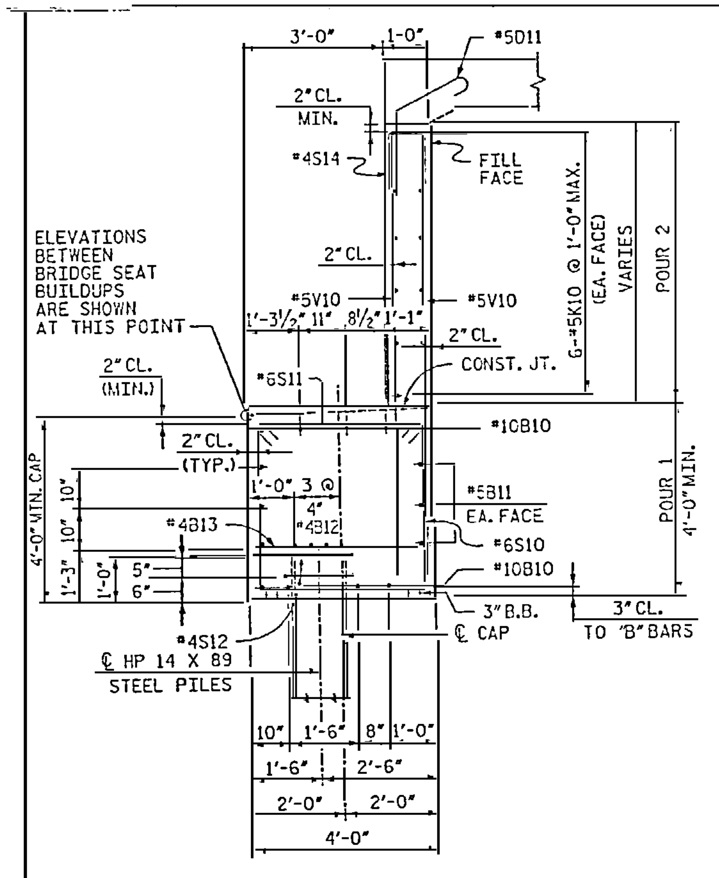
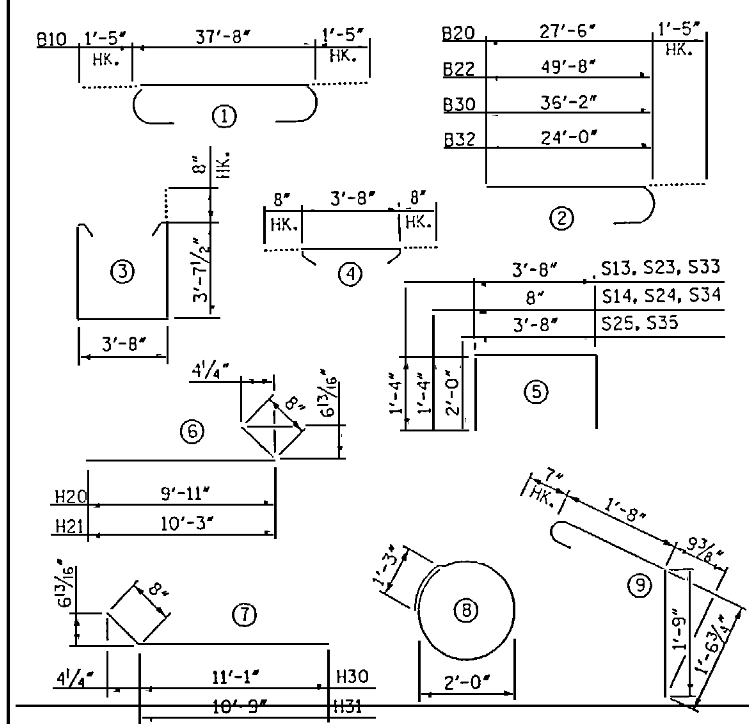


SECTION A-A

(STAGE I SHOWN, STAGES II AND III SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 1

BILL OF REINFORCING (STAGE I)					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B10	10	#10	(1)	40'-6"	1,743
B11	6	#5	STR.	37'-8"	236
B12	8	#4	STR.	20'-1"	107
B13	10	#4	STR.	3'-8"	24
B14	24	#5	STR.	2'-9"	67
D10	22	#10	STR.	10'-6"	994
D11	25	#5	(9)	4'-0"	104
K10	12	#5	STR.	37'-8"	471
S10	55	#5	(3)	12'-3"	1,012
S11	55	#6	(4)	5'-0"	413
S12	8	#4	(8)	7'-7"	41
S13	24	#5	(5)	6'-4"	159
S14	39	#4	(5)	3'-4"	85
V10	76	#5	STR.	9'-10"	779

TOTAL REINFORCING STEEL (STAGE I) = 6,235 LBS.

BILL OF REINFORCING (STAGE II)					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B20	5	#10	(2)	28'-11"	622
B21	5	#10	STR.	51'-0"	1,097
B22	5	#10	(2)	51'-1"	1,099
B23	5	#10	STR.	32'-0"	688
B24	12	#5	STR.	36'-10"	461
B25	12	#4	STR.	25'-2"	202
B26	18	#4	STR.	3'-8"	44
B27	36	#5	STR.	2'-8"	100
B28	5	#4	STR.	26'-6"	89
D21	44	#5	(9)	4'-0"	184
H20	18	#6	(6)	10'-7"	286
H21	18	#6	(6)	10'-11"	295
K20	24	#5	STR.	35'-11"	899
K21	4	#5	STR.	2'-11"	12
S20	104	#6	(3)	12'-3	1,914
S21	104	#6	(4)	5'-0"	781
S22	16	#4	(8)	7'-7"	81
S23	36	#5	(5)	6'-4"	238
S24	65	#4	(5)	3'-4"	145
S25	15	#4	(5)	7'-8"	77
V20	130	#5	STR.	9'-10"	1,333
V21	28	#5	STR.	11'-2"	326

TOTAL REINFORCING STEEL (STAGE II) = 10,973 LBS.

BILL OF REINFORCING (STAGE III)					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B30	5	#10	(2)	37'-7"	809
B31	5	#10	STR.	29'-0"	624
B32	5	#10	(2)	25'-5"	547
B33	5	#10	STR.	44'-4"	954
B34	12	#5	STR.	30'-2"	378
B35	12	#4	STR.	20'-9"	166
B36	14	#4	STR.	3'-8"	34
B37	24	#5	STR.	2'-8"	67
B38	5	#4	STR.	5'-6"	18
D31	36	#5	(9)	4'-0"	150
H30	18	#6	(7)	11'-9"	318
H31	18	#6	(7)	11'-5"	309
K30	24	#5	STR.	30'-2"	755
K31	4	#5	STR.	3'-1"	13
S30	85	#6	(3)	12'-3"	1,564
S31	85	#6	(4)	5'-0"	638
S32	12	#4	(8)	7'-7"	61
S33	24	#5	(5)	6'-4"	159
S34	54	#4	(5)	3'-4"	120
S35	4	#4	(5)	7'-8"	20
V30	108	#5	STR.	9'-10"	1,108
V31	29	#5	STR.	11'-5"	345

TOTAL REINFORCING STEEL (STAGE III) = 9,157 LBS.

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 CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

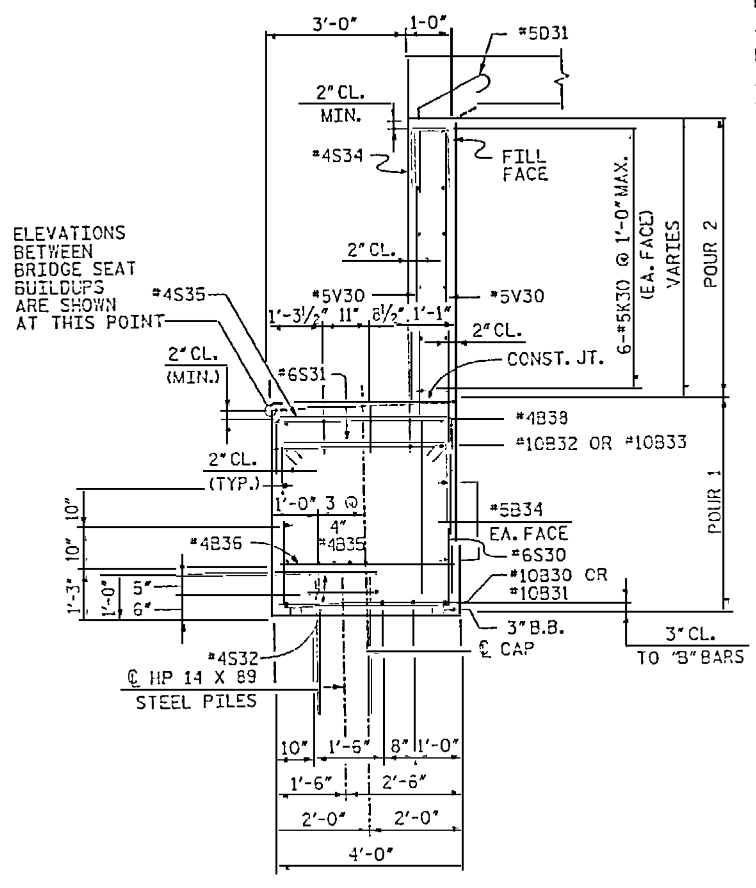
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

FOR OTHER NOTES, SEE "GENERAL DRAWING, FOUNDATION LAYOUT" SHEET.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4 IN. Ø DRAIN PIPE THROUGH THE WING WALLS AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALLS MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

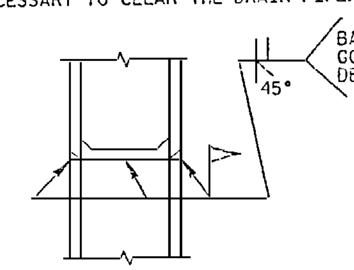
END BENT 1 QUANTITIES

		STAGE I	STAGE II	STAGE III	EB 1 (TOTAL)
REINFORCING STEEL	LBS.	6,235	10,973	9,157	26,365
CLASS A CONCRETE					
SUBSTRUCTURE POUR 1:	CU. YARDS	23.3	46.0	37.0	106.3
SUBSTRUCTURE POUR 2:	CU. YARDS	8.9	18.8	16.3	44.0
SUBSTRUCTURE TOTAL:	CU. YARDS	32.2	64.8	53.3	150.3
HP 14 X 89 STEEL PILES	(NO.)	4	8	6	18
	LIN. FEET	320.0	640.0	480.0	1,440.0

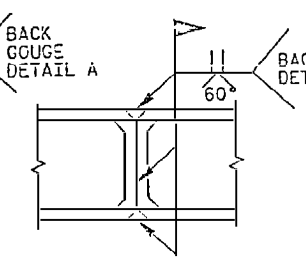


SECTION B-B

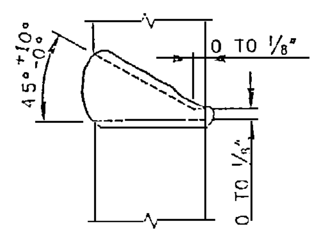
(STAGE III SHOWN, STAGE II SIMILAR)



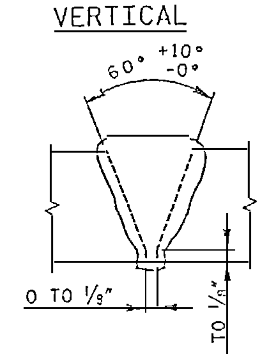
▲PILE VERTICAL



▲PILE HORIZONTAL OR VERTICAL



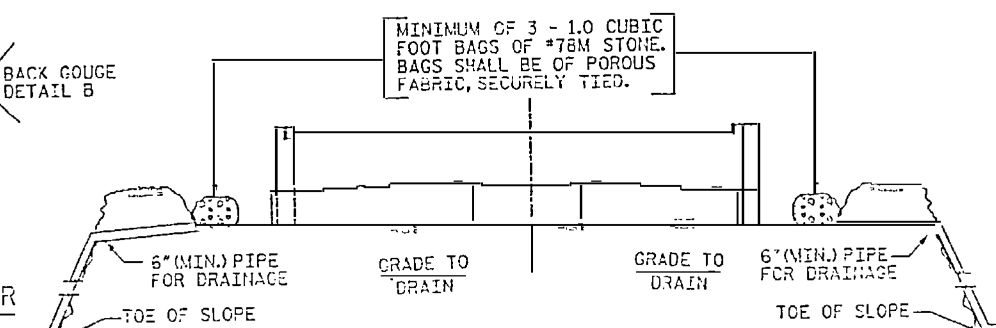
DETAIL A



DETAIL B

▲POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

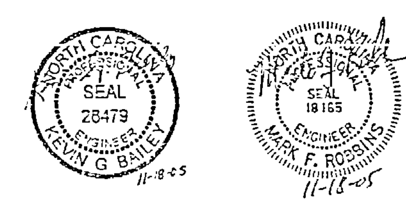


TEMPORARY DRAINAGE AT END BENT

DRAINAGE NOTES:

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.



PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POT 19+55.81 -Y1-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

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

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

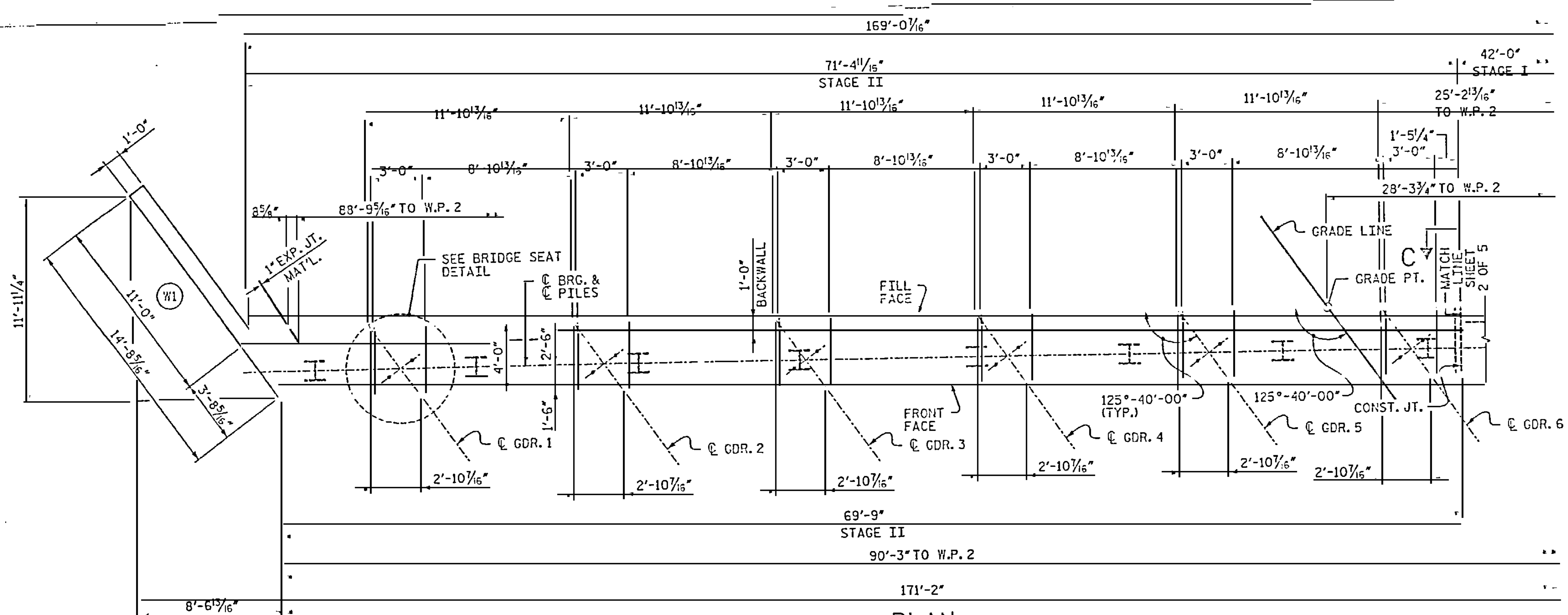
DRAWN BY LGH DATE 9-05
CHECKED BY JAD DATE 10-05
DWG. NO. D-1785.29

SHEET NO. S1-29
TOTAL SHEETS 50

NOTES:

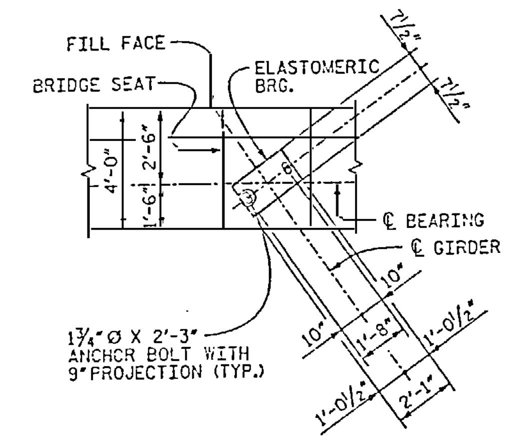
SEE SHEET 5 OF 5 FOR SECTIONS A-A & B-B.

SEE SHEET 5 OF 5 FOR NOTES.

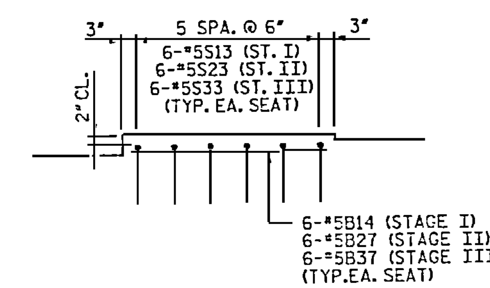


PLAN

(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)

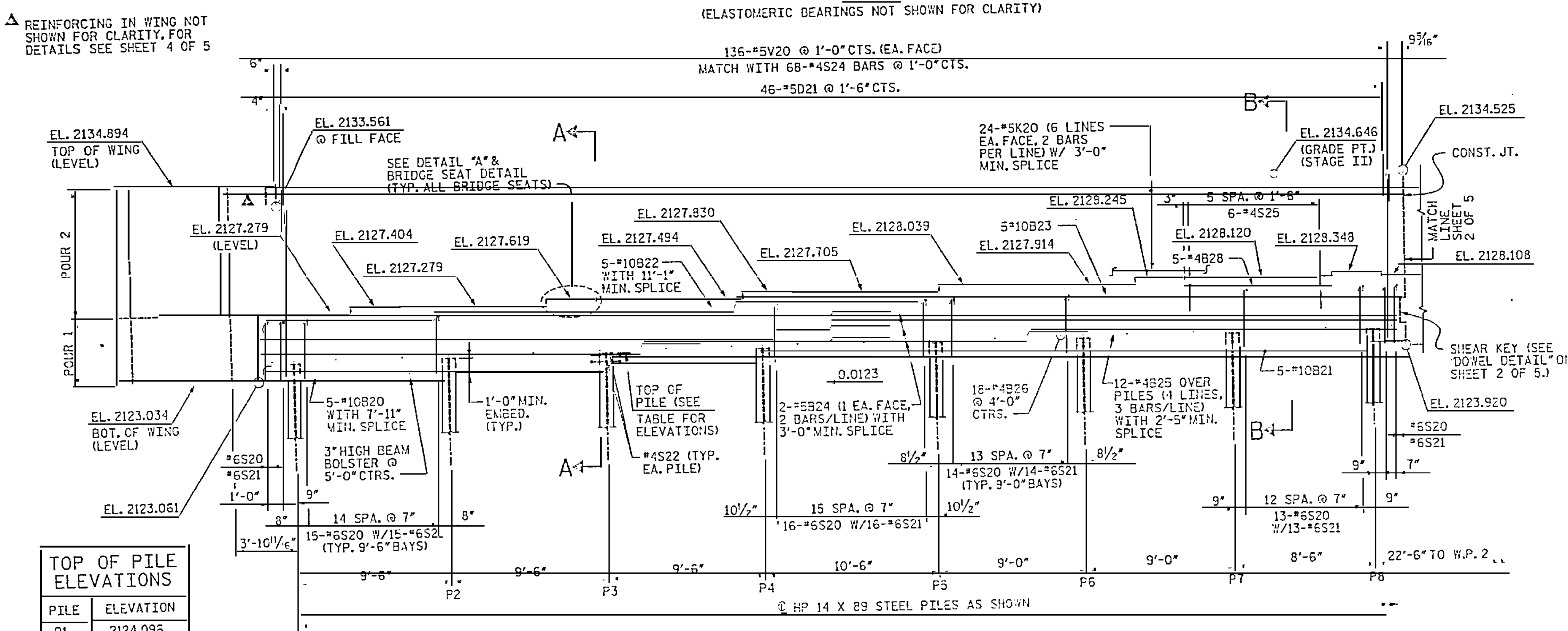


BRIDGE SEAT DETAIL



DETAIL "A"

△ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS SEE SHEET 4 OF 5



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
P1	2124.095
P2	2124.213
P3	2124.329
P4	2124.446
P5	2124.575
P6	2124.686
P7	2124.797
P8	2124.901

ELEVATIONS BASED ON 1'-0" EMBEDMENT

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- = POT 19+55.81 -Y1-

SHEET 1 OF 5

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

END BENT 2

STAGE II

SEAL 28479 KEVIN G. BAILEY 11-15-05

SEAL 18165 MARK F. ROBBINS 11-11-05

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FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY CCL, LGH DATE 9-05

CHECKED BY JAD DATE 10-05

DWG. NO. D-1735.30

SHEET NO. M3 S1-30

TOTAL SHEETS 50

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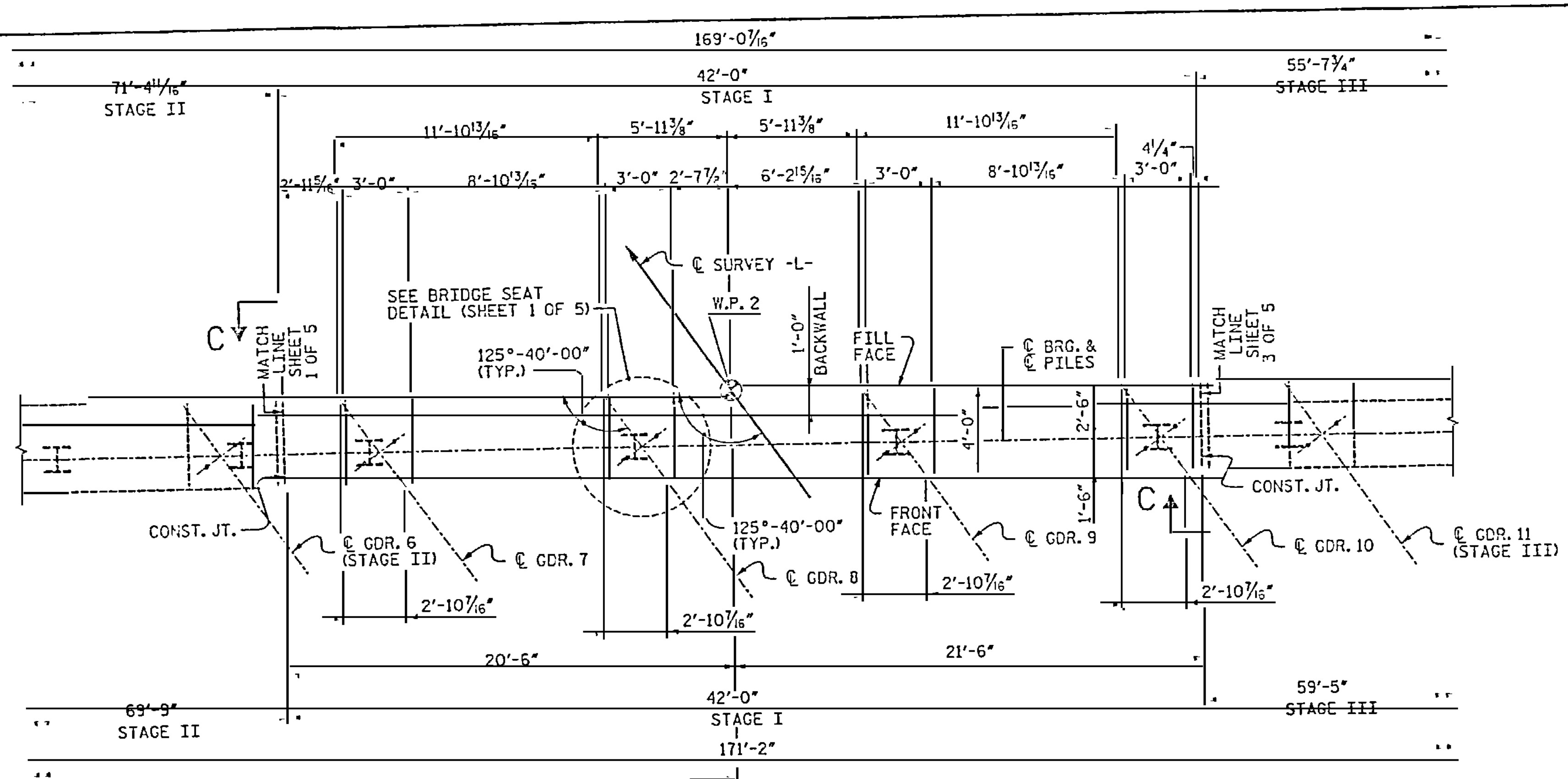
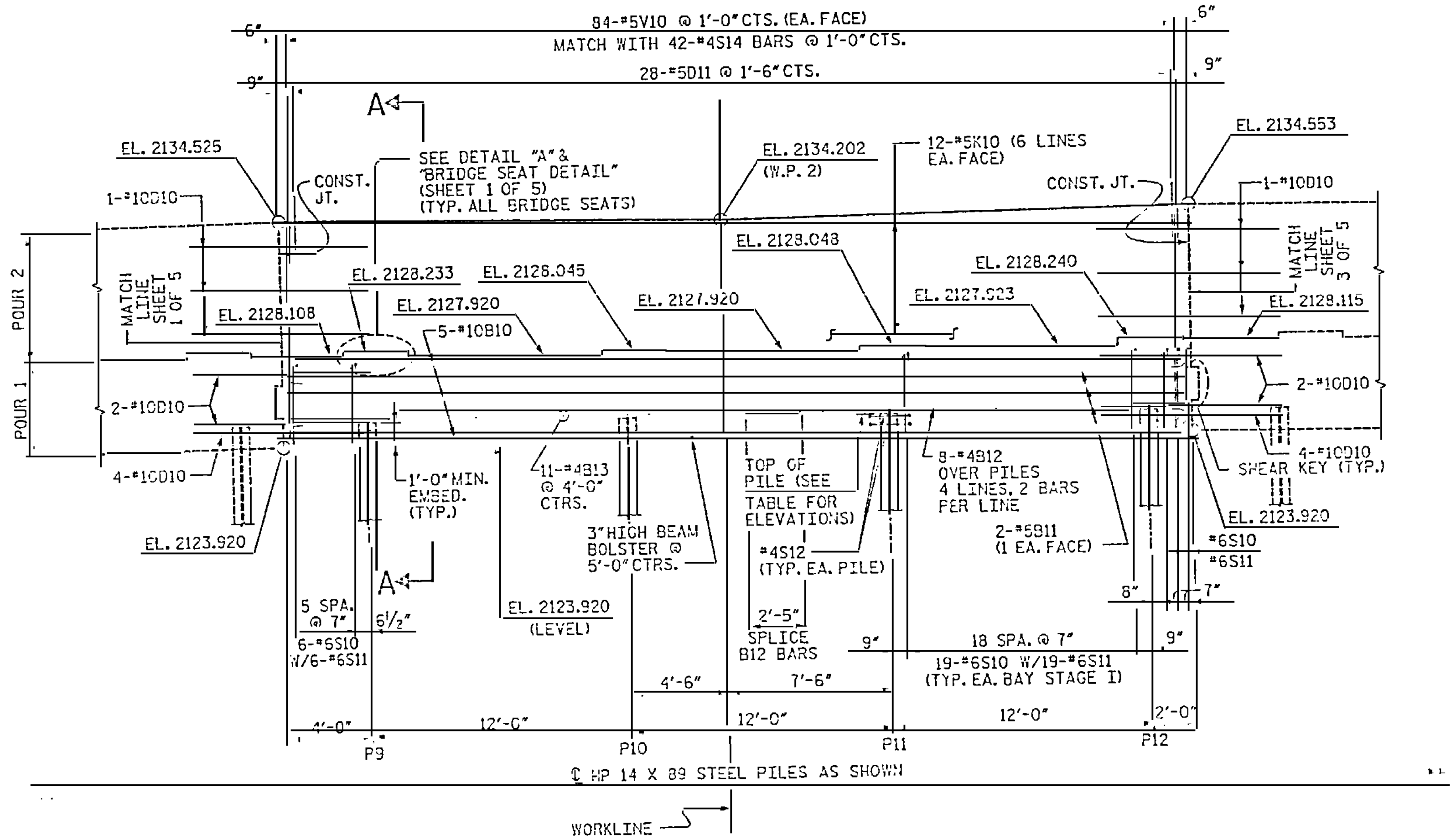


PLAN

(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)



ELEVATION

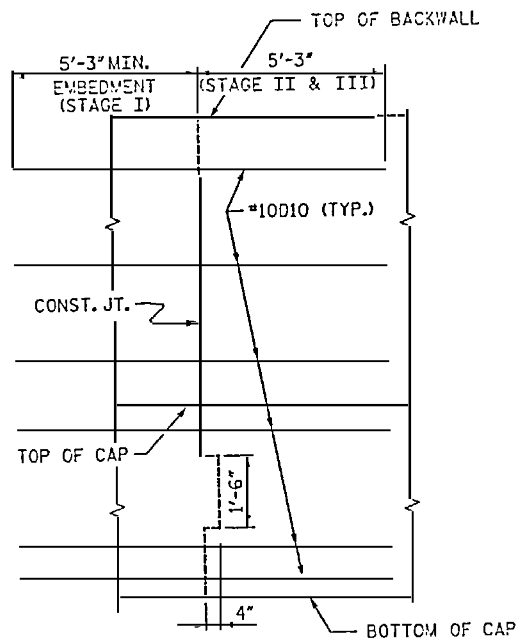
(LOOKING IN THE DIRECTION OF STATIONING)

NOTES:

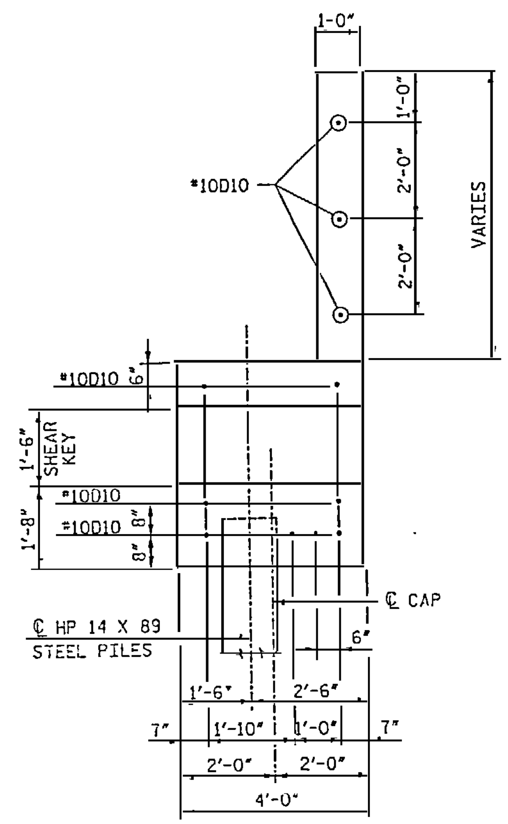
SEE SHEET 5 OF 5 FOR SECTIONS A-A & B-B.

SEE SHEET 5 OF 5 FOR NOTES.

CONTRACTOR SHALL INSTALL #10D10 DOWEL BARS AS DETAILED, PROVIDED THERE IS ENOUGH CLEARANCE IN THE FIELD. CONTRACTOR MAY USE ADHESIVELY ANCHORED #10 DOWEL BARS OR MECHANICALLY SPLICED #10 DOWEL BARS IN LIEU OF DETAILS SHOWN IN THESE PLANS. ADHESIVELY ANCHORED OR MECHANICALLY SPLICED DOWEL BARS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER.



ELEVATION C



DOWEL DETAIL

(SEE NOTES FOR #10D10 DOWEL BARS)

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
P9	2124.920
P10	2124.920
P11	2124.920
P12	2124.920

ELEVATIONS BASED ON 1'-0" EMBEDMENT

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- = POT 19+55.81 -Y1-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2
STAGE I

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G BAILEY 11-18-05

NORTH CAROLINA SEAL 19165 ENGINEER MARK F. ROBBINS 11-18-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS RALEIGH, NC

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY DDL/LGH DATE 9-05
CHECKED BY JAD DATE 10-05
D-1795.31

SHEET NO. S1-31
TOTAL SHEETS 50

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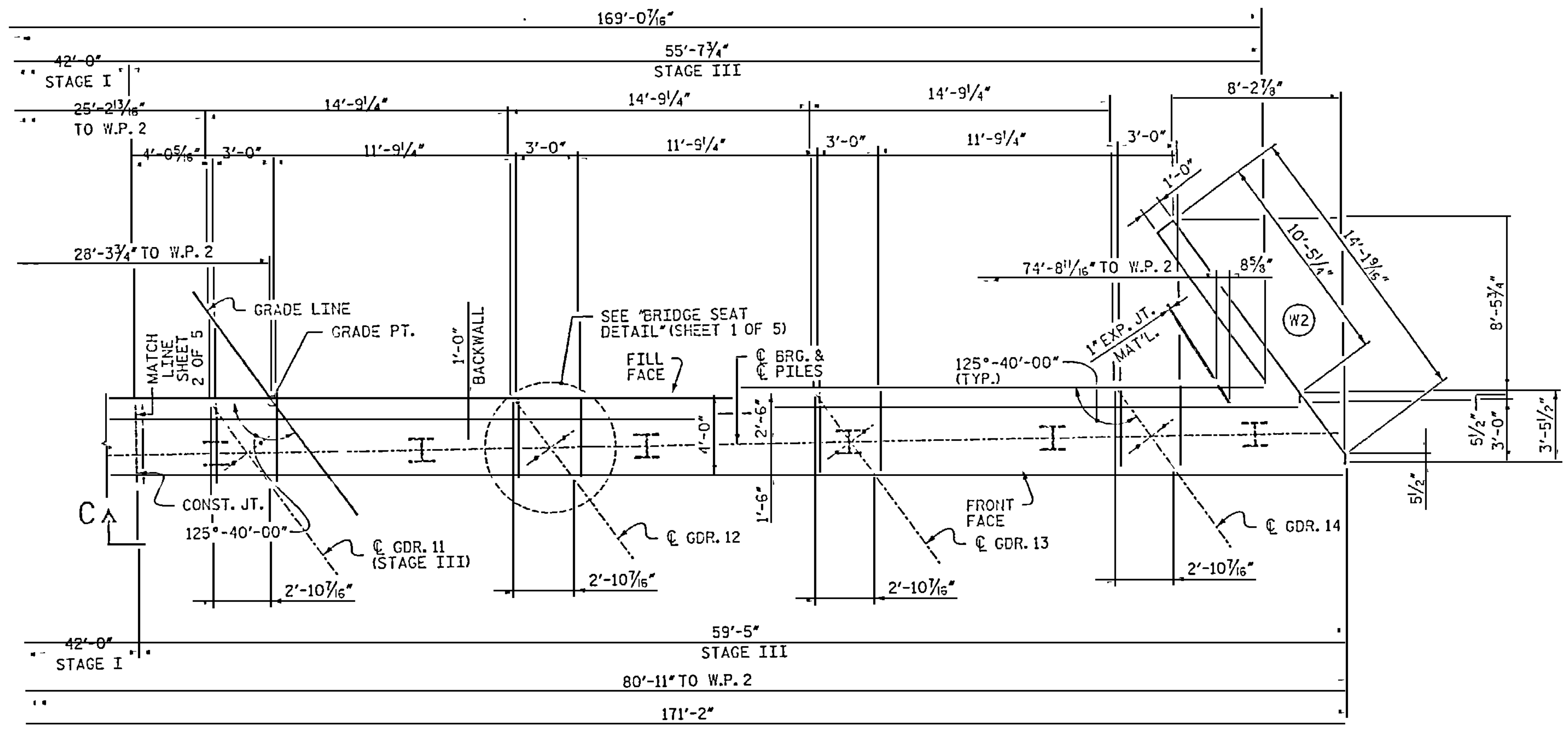
NOTES:

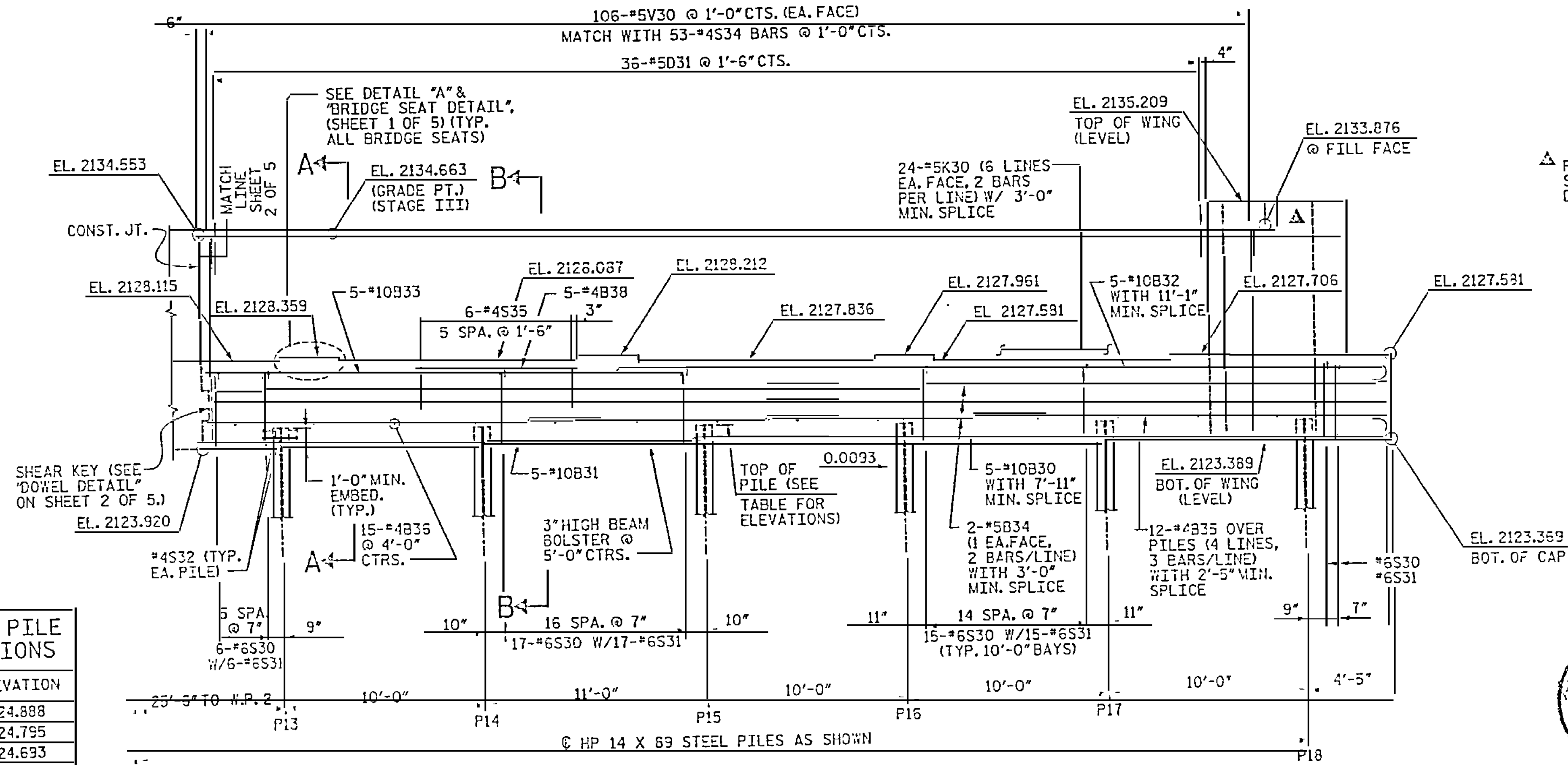
SEE SHEET 5 OF 5 FOR SECTIONS A-A & B-B.

SEE SHEET 5 OF 5 FOR NOTES.



PLAN

(ELASTOMERIC BEARINGS NOT SHOWN FOR CLARITY)



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

△ REINFORCING IN WING NOT SHOWN FOR CLARITY, FOR DETAILS SEE SHEET 4 OF 5.

TOP OF PILE ELEVATIONS

PILE	ELEVATION
P13	2124.888
P14	2124.795
P15	2124.693
P16	2124.600
P17	2124.507
P18	2124.414

ELEVATIONS BASED ON 1'-0" EMBEDMENT

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- = POT 19+55.81 -Y1-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2
STAGE III

NORTH CAROLINA PROFESSIONAL SEAL 28473 ENGINEER KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 11-18-05

TAYLOR & MURPHY

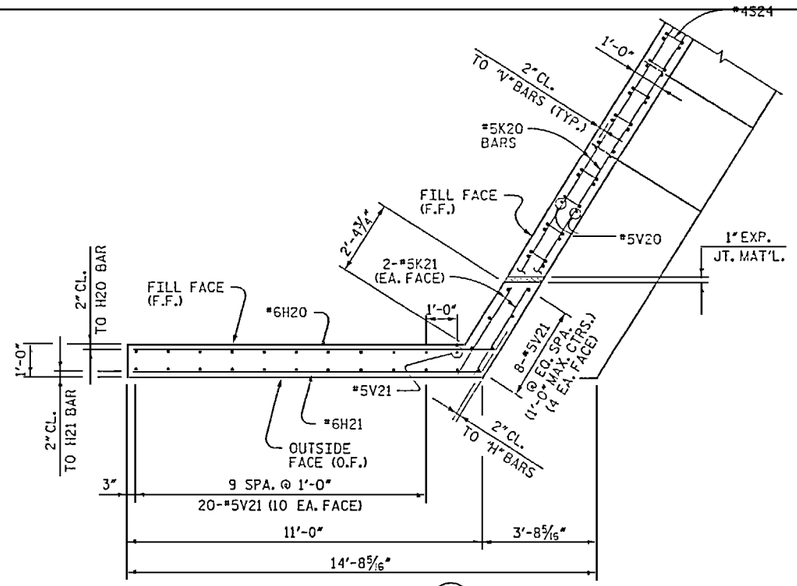
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

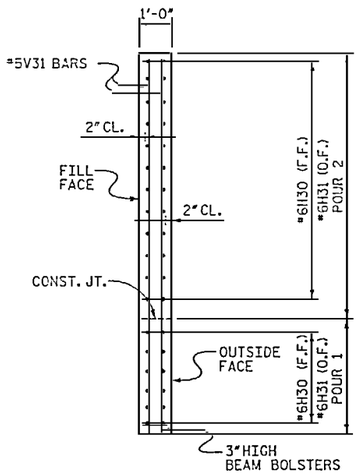
DRAWN BY COL, LGH DATE 9-05
CHECKED BY JAD DATE 10-05
DWG. NO. D-1785.32

REVISIONS: NO. BY DATE

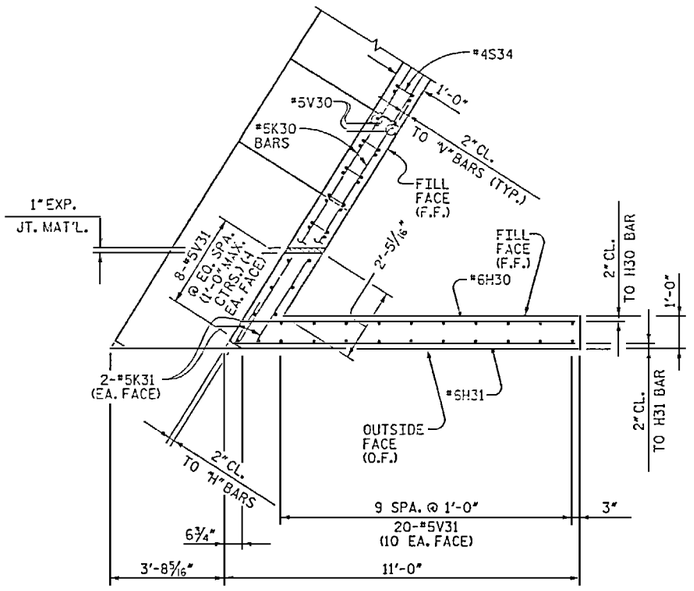
SHEET NO. S1-32
TOTAL SHEETS 50



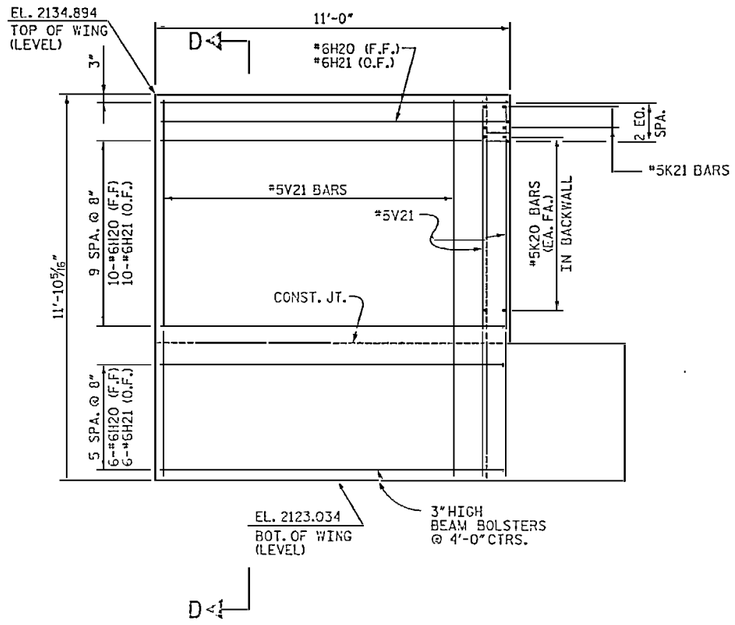
PLAN WING (W1)



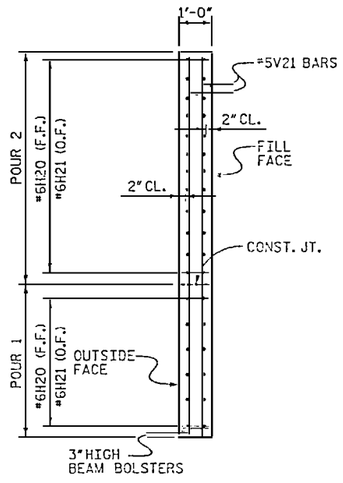
SECTION E-E



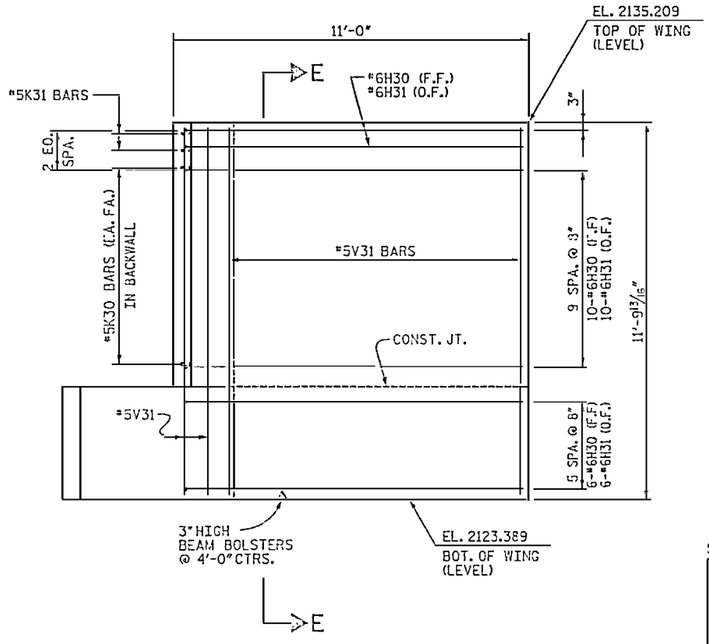
PLAN WING (W2)



ELEVATION WING (W1)



SECTION D-D



ELEVATION WING (W2)

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POT 19+55.81 -Y1-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

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

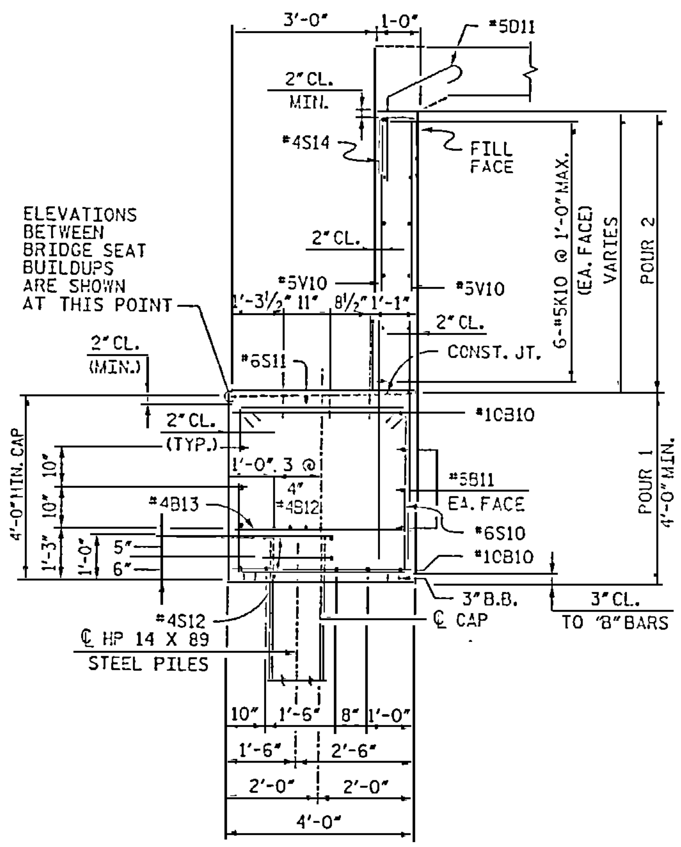
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS FOR WESTVILLE ROAD, SUITE 115 RALEIGH, NC 27607

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 31624 CHARLOTTE, N.C. 28235

DRAWN BY LCH DATE 9-05
CHECKED BY JAD DATE 10-05
W.O. NO. D-1785.23

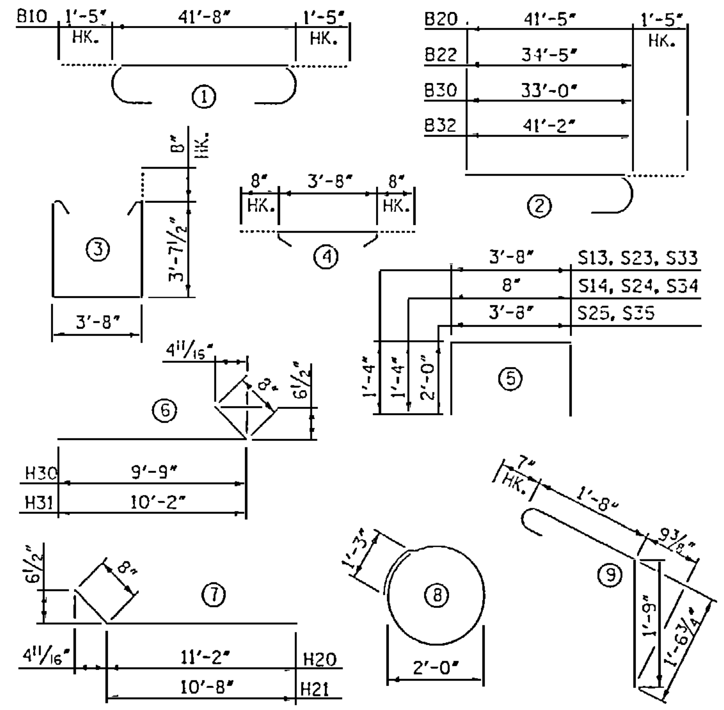
SHEET NO. S1-33
TOTAL SHEETS 50



SECTION A-A

(STAGE I SHOWN, STAGES II AND III SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 2

BILL OF REINFORCING (STAGE I)

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B10	10	#10	(1)	44'-6"	1,915
B11	6	#5	STR.	41'-8"	261
B12	8	#4	STR.	22'-1"	118
B13	11	#4	STR.	3'-8"	27
B14	24	#5	STR.	2'-8"	67
D10	22	#10	STR.	10'-6"	994
D11	28	#5	(9)	4'-0"	117
K10	12	#5	STR.	41'-8"	522
S10	66	#6	(3)	12'-3"	1,214
S11	65	#6	(4)	5'-0"	496
S12	8	#4	(8)	7'-7"	41
S13	24	#5	(5)	6'-4"	159
S14	42	#4	(5)	3'-4"	94
V10	84	#5	STR.	9'-10"	862

TOTAL REINFORCING STEEL (STAGE I) = 6,887 LBS.

BILL OF REINFORCING (STAGE II)

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B20	5	#10	(2)	42'-10"	922
B21	5	#10	STR.	38'-10"	835
B22	5	#10	(2)	35'-10"	771
B23	5	#10	STR.	49'-0"	1,054
B24	12	#5	STR.	37'-8"	471
B25	12	#4	STR.	25'-4"	203
B26	18	#4	STR.	3'-8"	44
B27	36	#5	STR.	2'-8"	100
B28	5	#4	STR.	8'-0"	27
D21	46	#5	(9)	4'-0"	192
H20	18	#6	(7)	11'-10"	320
H21	18	#6	(7)	11'-4"	306
K20	24	#5	STR.	37'-8"	943
K21	4	#5	STR.	3'-3"	14
S20	106	#6	(3)	12'-3"	1,950
S21	106	#5	(4)	5'-0"	796
S22	16	#4	(8)	7'-7"	81
S23	36	#5	(5)	6'-4"	238
S24	68	#4	(5)	3'-4"	151
S25	6	#4	(5)	7'-8"	31
V20	136	#5	STR.	9'-10"	1,395
V21	29	#5	STR.	11'-4"	343

TOTAL REINFORCING STEEL (STAGE II) = 11,187 LBS.

BILL OF REINFORCING (STAGE III)

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B30	5	#10	(2)	34'-5"	740
B31	5	#10	STR.	34'-0"	732
B32	5	#10	(2)	42'-7"	916
B33	5	#10	STR.	29'-0"	624
B34	12	#5	STR.	31'-1"	389
B35	12	#4	STR.	21'-4"	171
B36	15	#4	STR.	3'-8"	37
B37	24	#5	STR.	2'-8"	67
B38	5	#4	STR.	8'-0"	27
D31	36	#5	(9)	4'-0"	150
H30	18	#6	(6)	10'-5"	282
H31	19	#6	(6)	10'-10"	293
K30	24	#5	STR.	30'-0"	751
K31	4	#5	STR.	3'-1"	13
S30	85	#6	(3)	12'-3"	1,564
S31	85	#6	(4)	5'-0"	638
S32	12	#4	(8)	7'-7"	61
S33	24	#5	(5)	6'-4"	159
S34	53	#4	(5)	3'-4"	118
S35	6	#4	(5)	7'-8"	31
V30	106	#5	STR.	9'-10"	1,087
V31	28	#5	STR.	11'-4"	331

TOTAL REINFORCING STEEL (STAGE III) = 9,181 LBS.

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 CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

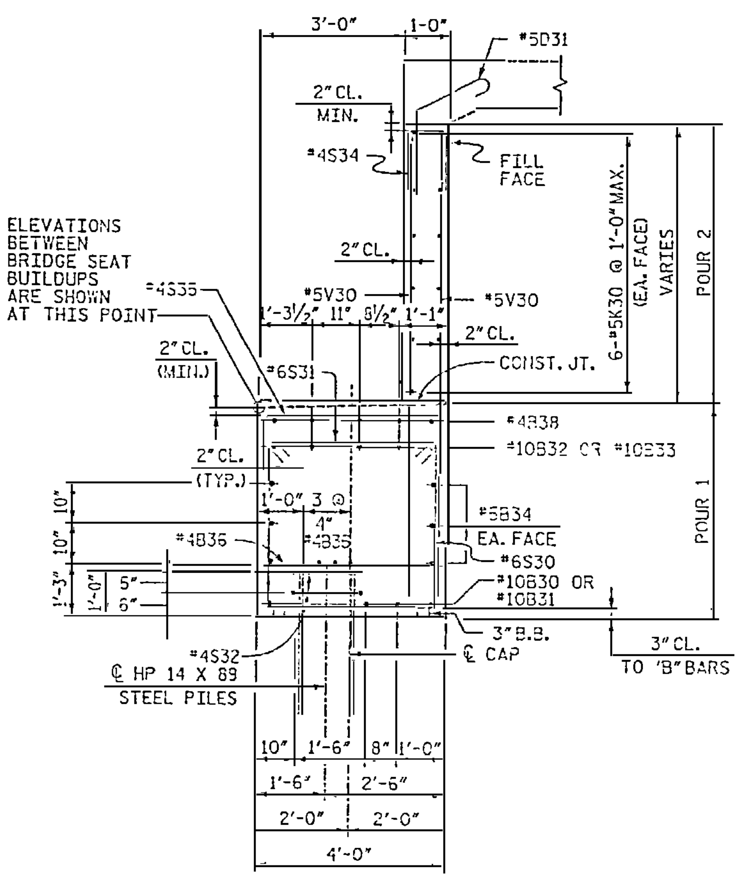
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

FOR OTHER NOTES, SEE "GENERAL DRAWING, FOUNDATION LAYOUT" SHEET.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4 IN. Ø DRAIN PIPE THROUGH THE WING WALLS AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALLS MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

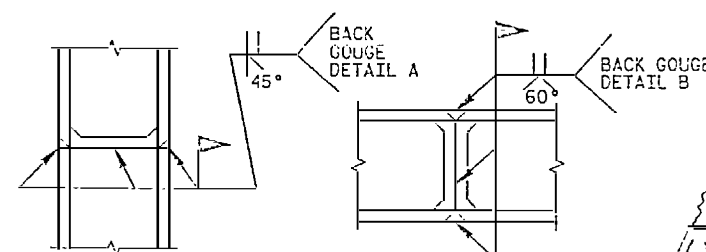
END BENT 2 QUANTITIES

		STAGE I	STAGE II	STAGE III	EB 2 (TOTAL)
REINFORCING STEEL	LBS.	6,887	11,187	9,181	27,255
CLASS A CONCRETE					
SUBSTRUCTURE POUR 1:	CU. YARDS	25.4	46.1	37.9	109.4
SUBSTRUCTURE POUR 2:	CU. YARDS	9.9	20.0	16.0	45.9
SUBSTRUCTURE TOTAL:	CU. YARDS	35.3	66.1	53.9	155.3
HP 14 X 89 STEEL PILES	(NO.)	4	8	6	18
	LIN. FEET	300.0	600.0	450.0	1,350.0

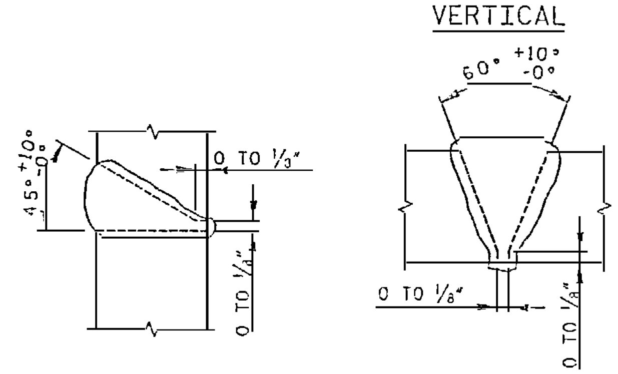


SECTION B-B

(STAGE III SHOWN, STAGE II SIMILAR)



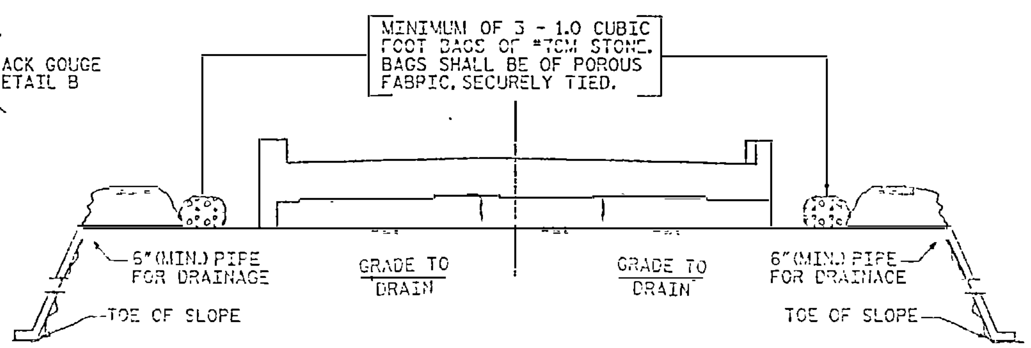
▲PILE VERTICAL ▲PILE HORIZONTAL OR VERTICAL



DETAIL A DETAIL B

▲POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

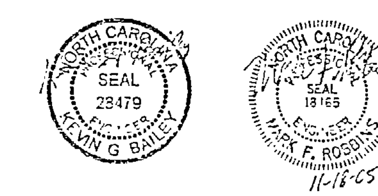


TEMPORARY DRAINAGE AT END BENT

DRAINAGE NOTES:

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.



PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POT 19+55.81 -Y1-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

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

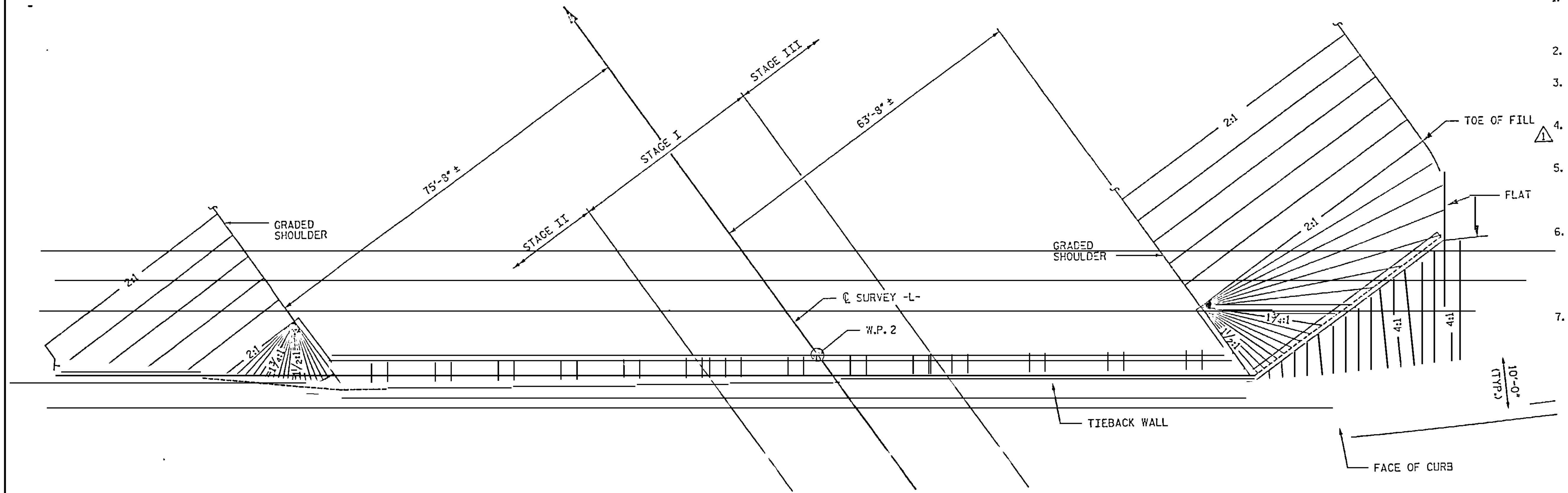
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

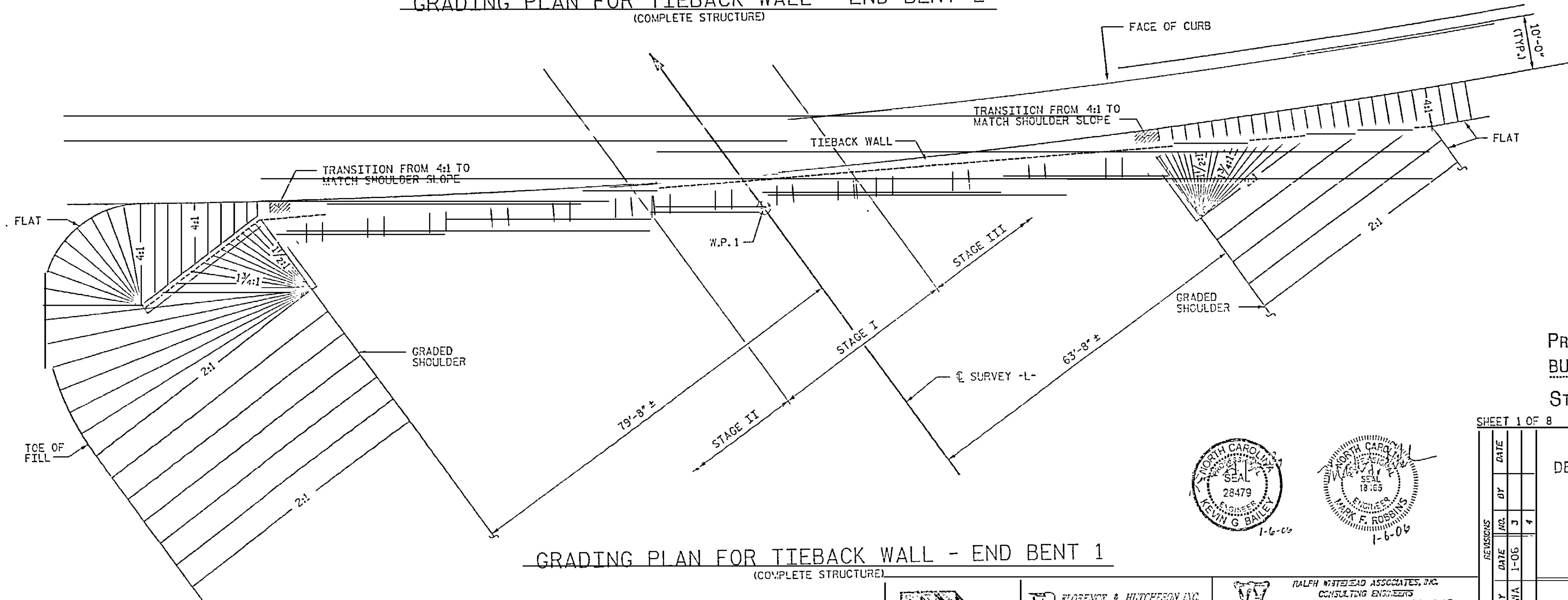
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY LGH DATE 9-05
CHECKED BY JAD DATE 10-05
DWG. NO. D-1735.34

SHEET NO. S1-34
TOTAL SHEETS 50



GRADING PLAN FOR TIEBACK WALL - END BENT 2
(COMPLETE STRUCTURE)



GRADING PLAN FOR TIEBACK WALL - END BENT 1
(COMPLETE STRUCTURE)

NOTES:

1. AREAS BETWEEN SHOULDER AND FACE OF TIEBACK WALL TO MATCH THE GRADE OF THE SHOULDER UNLESS OTHERWISE NOTED.
2. FOR TIEBACK WALL, SEE SPECIAL PROVISIONS.
3. SEE ROADWAY PLANS FOR SLOPE PROTECTION CONTINUATION BEYOND WHAT IS SHOWN IN THESE PLANS.
4. ⚠ FOR END BENT PILE LAYOUT, SEE "GENERAL DRAWING FOUNDATION LAYOUT."
5. FOR SELECT BACKFILL MATERIAL BEHIND TIEBACK WALL, SEE SPECIAL PROVISIONS. FOR BACKFILL MATERIAL BEHIND END BENTS, SEE APPROACH SLAB DETAILS AND SHEET 2 OF 8.
6. ALL TIEBACK ANCHORS SHALL BE TESTED TO 1.33 TIMES THE DESIGN ANCHOR LOAD AS SPECIFIED IN PLANS PROVIDED BY WURSTER ENGINEERING. SEE SPECIAL PROVISIONS FOR TESTING PROCEDURE.
7. ALL END BENT 1 TIEBACK PILES SHALL BE TESTED TO 1.33 TIMES THE DESIGN ANCHOR LOAD ONLY AFTER ALL BACKFILL CONSTRUCTION IS COMPLETE, INCLUDING END BENT BACKFILL.

⚠ TEXT CHANGE

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 1-6-06

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 1-6-06

REVISIONS				
NO.	BY	DATE	NO.	BY	DATE
1	RWA	1-06	3		
2			4		

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 4020 WESTCHASE BLVD SUITE 475 RALEIGH, NC 27607

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 10-05
CHECKED BY KGB DATE 10-05
DWG. NO. C-1785.35

SHEET NO. S1-35
TOTAL SHEETS 50

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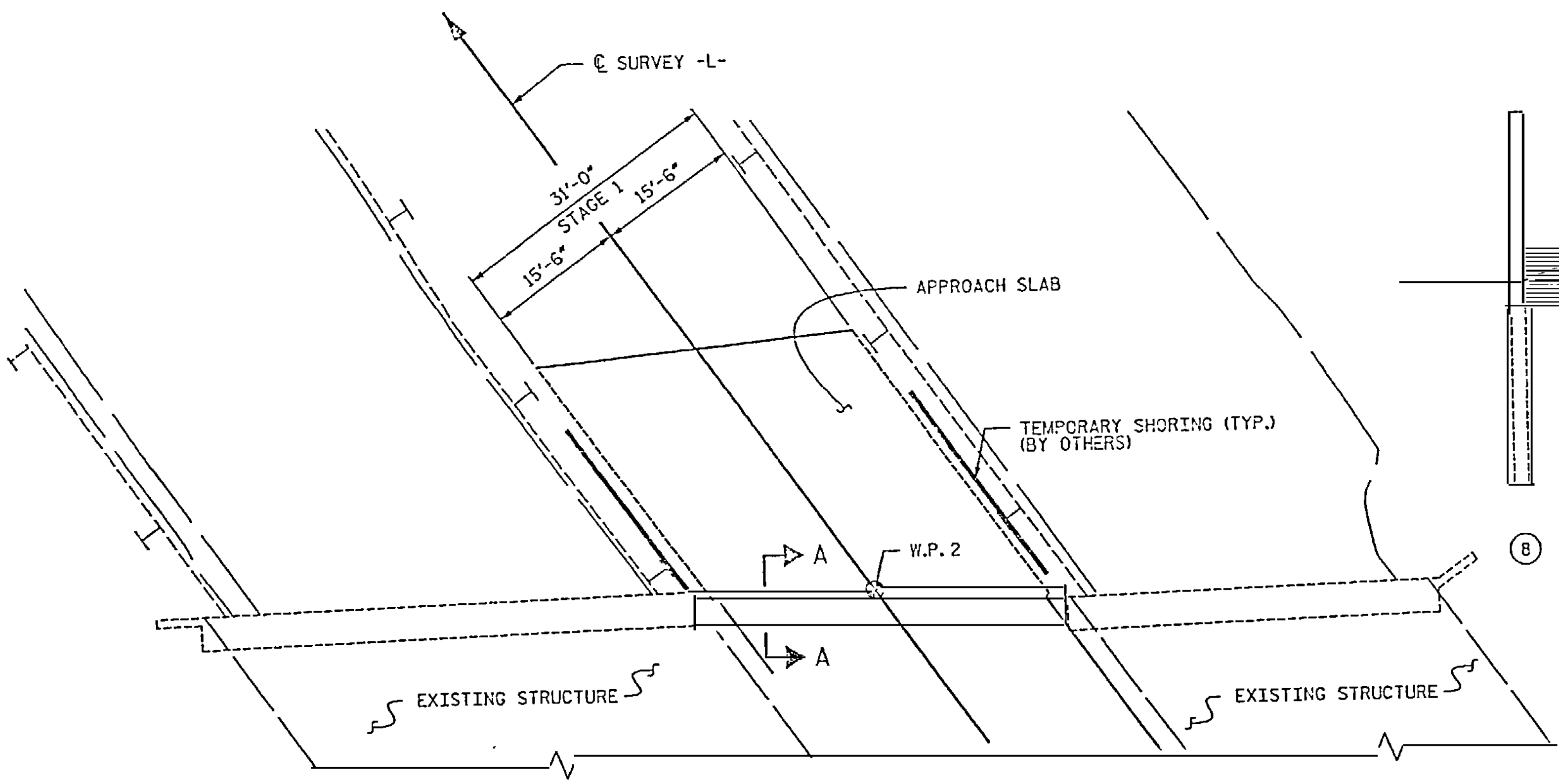
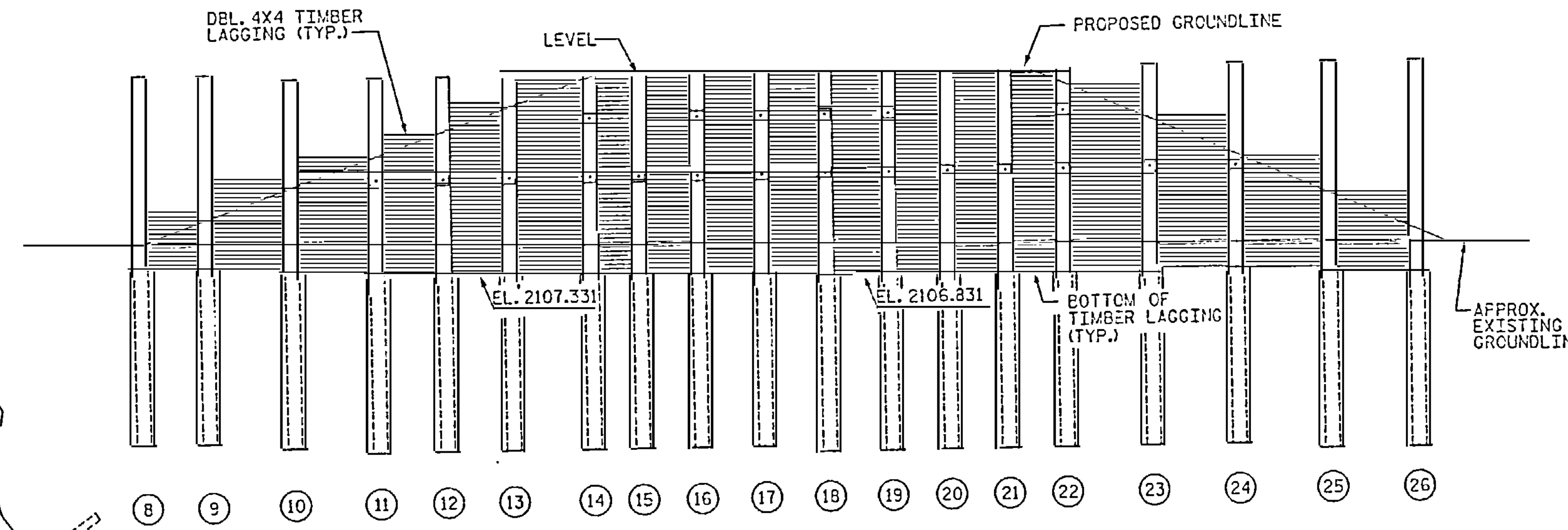
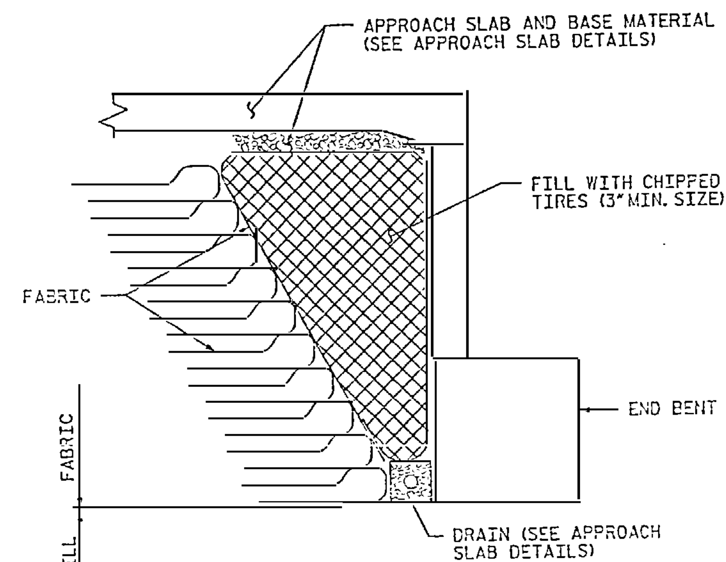
⊡ - TIEBACK ANCHOR
ANCHOR 1 = UPPER LEVEL
ANCHOR 2 = LOWER LEVEL



GRADING PLAN FOR TIEBACK WALL - END BENT 2
(STAGE I)



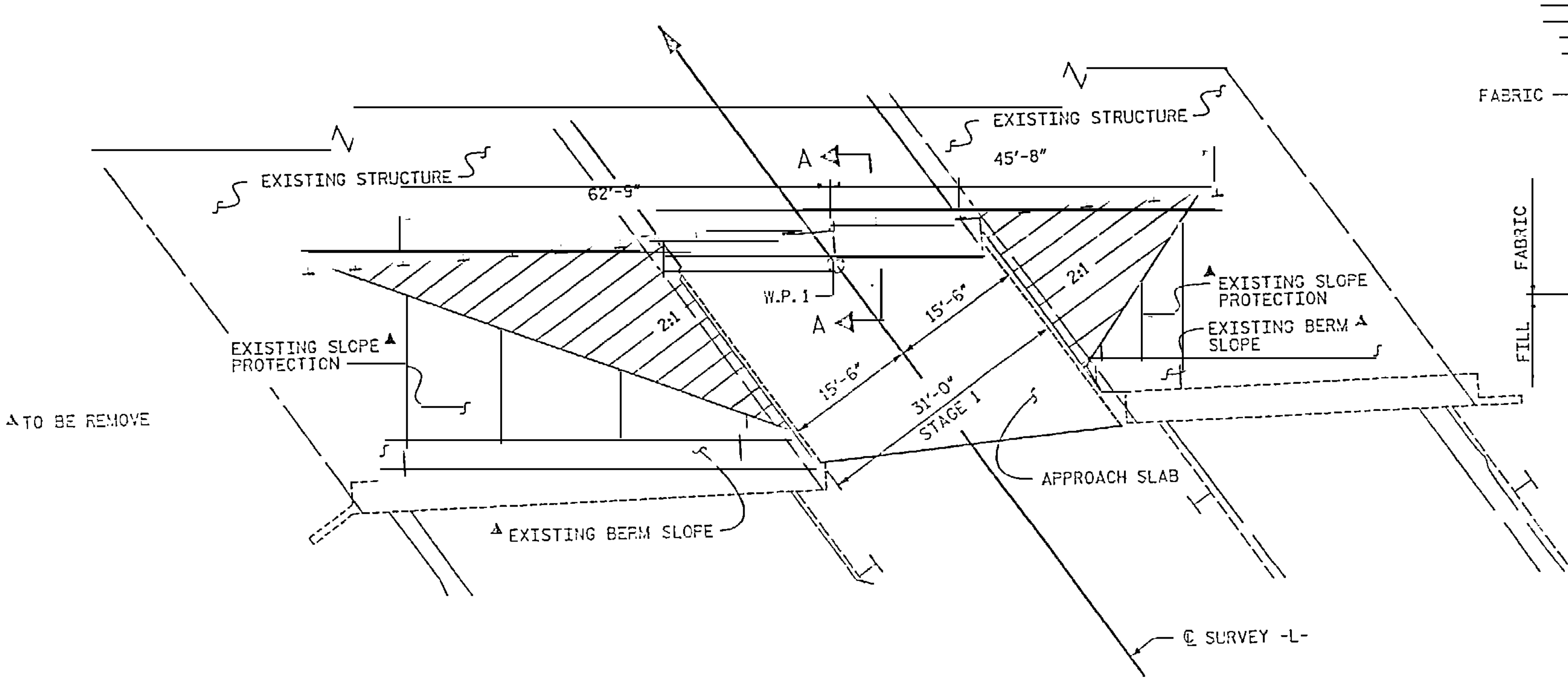
ELEVATION OF TIEBACK WALL AT END BENT 1 - STAGE 1
(MINIMUM PORTION OF TIEBACK WALL TO BE CONSTRUCTED FOR STAGE I)
(FOR COMPLETE WALL ELEVATION SEE SHEET 3 OF 8)



SECTION A-A
NOTE: FABRIC WALL ON EACH SIDE OF STAGE I APPROACH FILL. TYPICAL EACH END BENT.

NOTES:
1. FOR ADDITIONAL NOTES, SEE SHEET 1 OF 8.
2. CONSTRUCTION SEQUENCE FOR REMAINING TIEBACK WALL FOR STAGE I @ END BENT 1 SHALL FOLLOW THE SAME SEQUENCE AS LISTED BELOW.
3. ANCHOR 2 INSTALLLATION FOR PILES 15, 20 AND 21 FOR STAGE I SHALL BE INSTALLED TO 60% OF DESIGN LOAD. FULL DESIGN LOAD SHALL NOT BE APPLIED UNTIL AFTER BACKFILL CONSTRUCTION IS COMPLETE.

TIEBACK WALL CONSTRUCTION SEQUENCE (STAGE I @ END BENT 1):
1. REMOVE EXISTING SLOPE PROTECTION AS NECESSARY FOR STAGE I CONSTRUCTION.
2. INSTALL STAGE I TIEBACK WALL PILES. ALL PILES SHALL BE PLUMB.
3. INSTALL STAGE I TIMBER LAGGING.
4. CONSTRUCT BACKFILL UP TO LEVEL JUST BELOW LOWER LEVEL TIEBACK ANCHORS.
5. INSTALL LOWER LEVEL TIEBACK ANCHORS FOR STAGE I. SEE NOTE 3.
6. CONSTRUCT BACKFILL UP TO UPPER LEVEL TIEBACK ANCHORS.
7. INSTALL UPPER LEVEL TIEBACK ANCHORS FOR STAGE I.
8. COMPLETE BACKFILL CONSTRUCTION.



▲ TO BE REMOVE

GRADING PLAN FOR TIEBACK WALL - END BENT 1
(STAGE I)

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 2 OF 8

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G BAILEY 11-18-05
NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 11-18-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

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

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RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 10-05
CHECKED BY KGB DATE 10-05
DRAWING NO. 0-1725.36

SHEET NO. S1-36
TOTAL SHEETS 50

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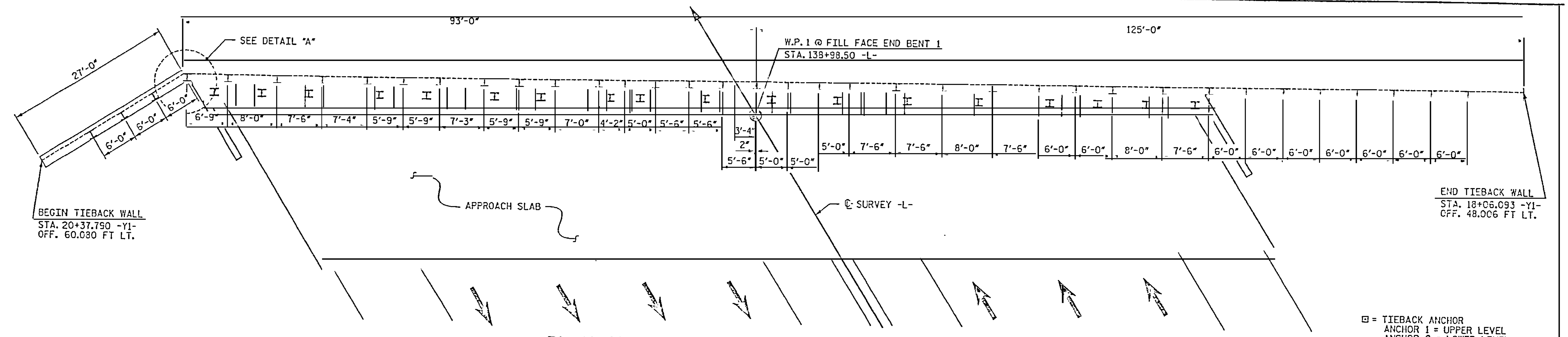
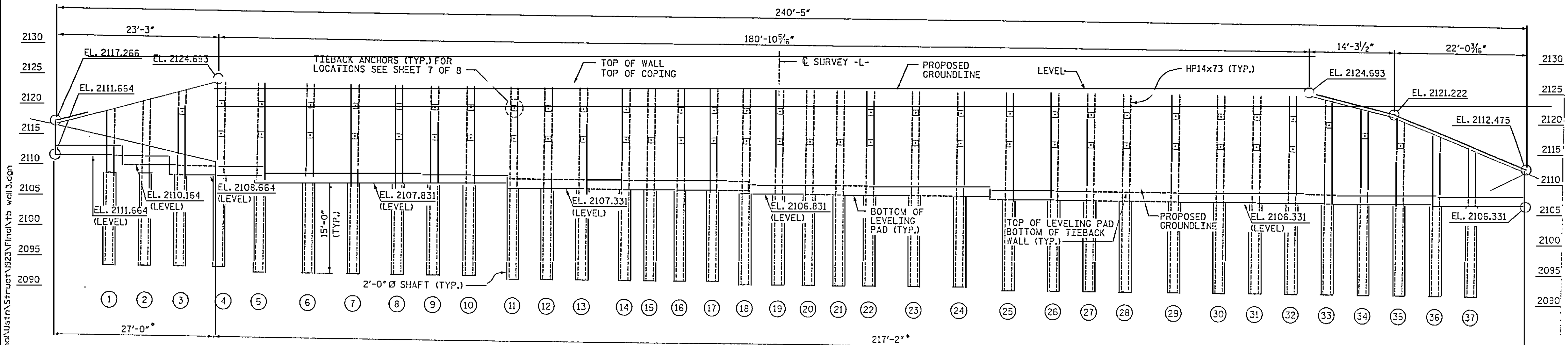


PLAN OF TIEBACK WALL AT END BENT 1
(BRIDGE SUPERSTRUCTURE NOT SHOWN FOR CLARITY)



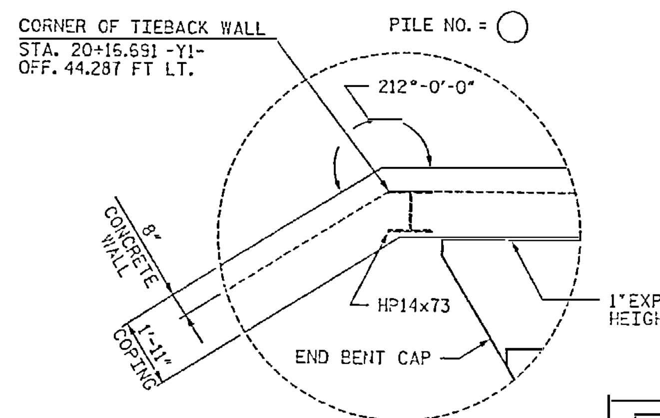
ELEVATION OF TIEBACK WALL AT END BENT 1
(* MEASURED ALONG FILL FACE OF TIEBACK WALL)

TIEBACK WALL CONSTRUCTION SEQUENCE (END BENT 1):

APPLICABLE FOR COMPLETION OF STAGE 1 TIEBACK WALL CONSTRUCTION AND ALL OF STAGE II AND STAGE III TIEBACK WALL CONSTRUCTION

1. FOR STAGE 1 CONSTRUCTION, SEE SEQUENCE ON SHEET 2 OF 8.
2. REMOVE EXISTING SLOPE PROTECTION AS NECESSARY FOR TIEBACK WALL CONSTRUCTION.
3. INSTALL TIEBACK WALL PILES. ALL PILES SHALL BE PLUMB.
4. INSTALL TIMBER LAGGING.
5. CONSTRUCT BACKFILL UP TO ANCHOR 2 LEVEL.
6. INSTALL ANCHOR 2.
7. CONSTRUCT BACKFILL UP TO ANCHOR 1 LEVEL.
8. INSTALL ANCHOR 1.
9. COMPLETE BACKFILL CONSTRUCTION.
10. CONSTRUCT 8" CONCRETE WALL.

NOTE: FOR NOTES, SEE SHEET 1 OF 8.



DETAIL "A"

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 11-18-05

TAYLOR & MURPHY

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DRAWN BY TLS	DATE 10-05	DWG. NO.	
CHECKED BY KCB	DATE 10-05	D-1725.37	

REVISIONS: NO. BY DATE | NO. BY DATE (1, 2, 3, 4)

SHEET NO. S1-37
TOTAL SHEETS 59

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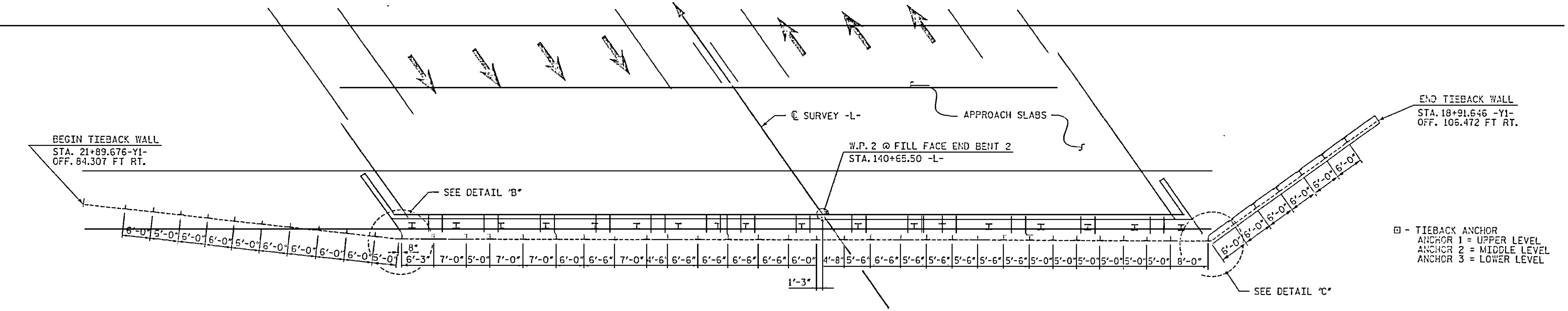
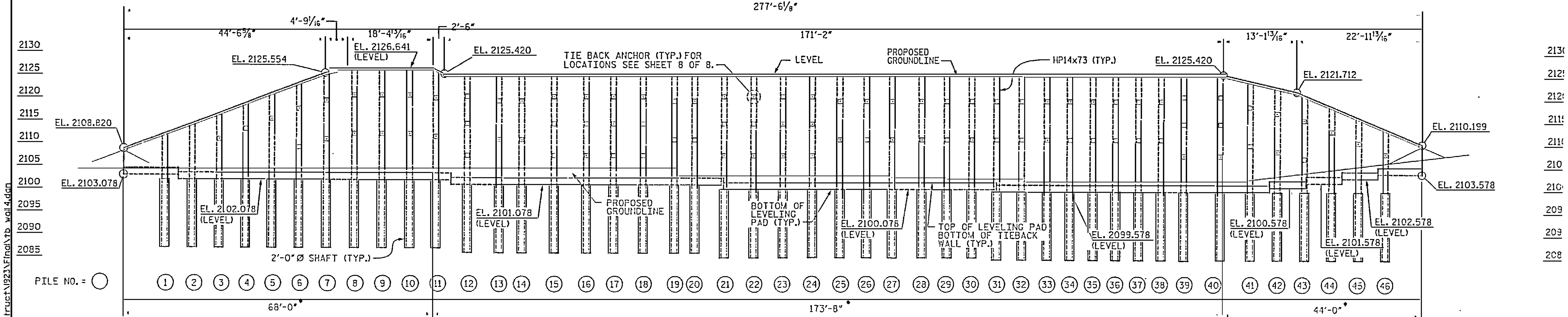


PLAN OF TIEBACK WALL AT END BENT 2

(BRIDGE SUPERSTRUCTURE NOT SHOWN FOR CLARITY)



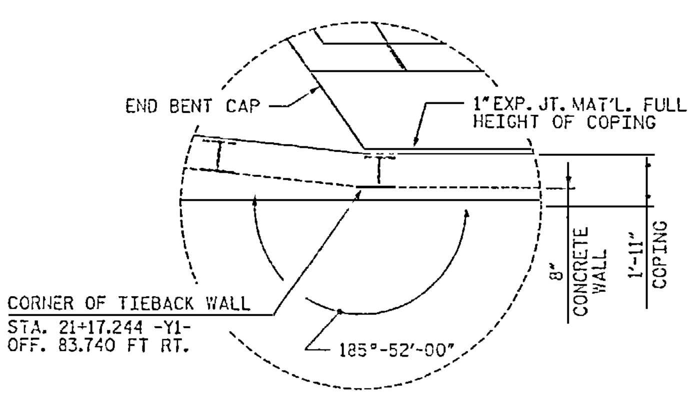
ELEVATION OF TIEBACK WALL AT END BENT 2

(* MEASURED ALONG FILL FACE OF TIEBACK WALL)

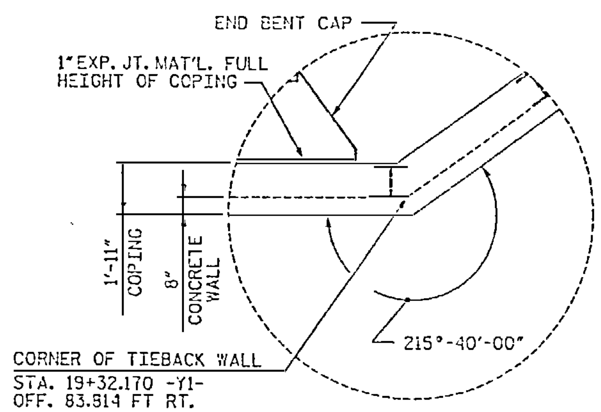
TIEBACK WALL CONSTRUCTION SEQUENCE (END BENT 2):

1. INSTALL ALL PILES FOR EACH STAGE DURING EACH STAGE CONSTRUCTION.
2. AFTER BRIDGE CONSTRUCTION IS COMPLETE, EXCAVATE DOWN TO ANCHOR 1 LEVEL. INSTALL TIMBER LAGGING AS EXCAVATION PROCEEDS.
3. INSTALL ANCHOR 1.
4. CONTINUE EXCAVATION AND TIMBER LAGGING ADVANCEMENT DOWN TO ANCHOR 2 LEVEL.
5. INSTALL ANCHOR 2.
6. CONTINUE EXCAVATION AND TIMBER LAGGING ADVANCEMENT DOWN TO ANCHOR 3 LEVEL.
7. INSTALL ANCHOR 3.
8. COMPLETE EXCAVATION AND TIMBER LAGGING ADVANCEMENT.
9. CONSTRUCT 8" CONCRETE WALL.

NOTE: FOR NOTES, SEE SHEET 1 OF 8.



DETAIL "B"



DETAIL "C"

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29479 ENGINEER KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 11-18-05

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

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DWG. NO. D-1735.38

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

SHEET NO. S1-38
TOTAL SHEETS 50

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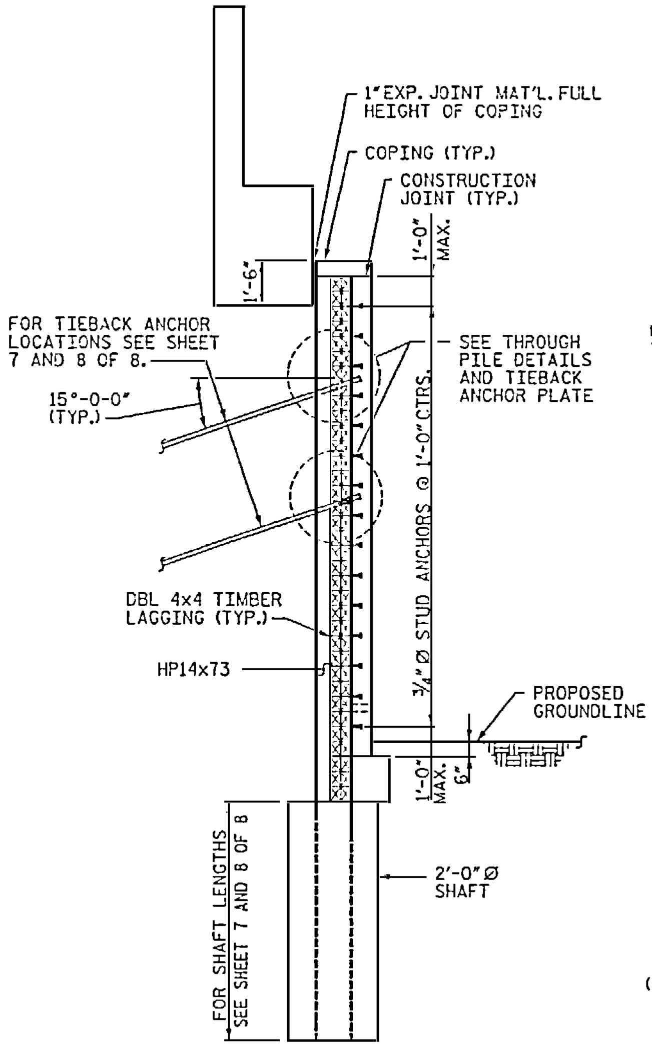
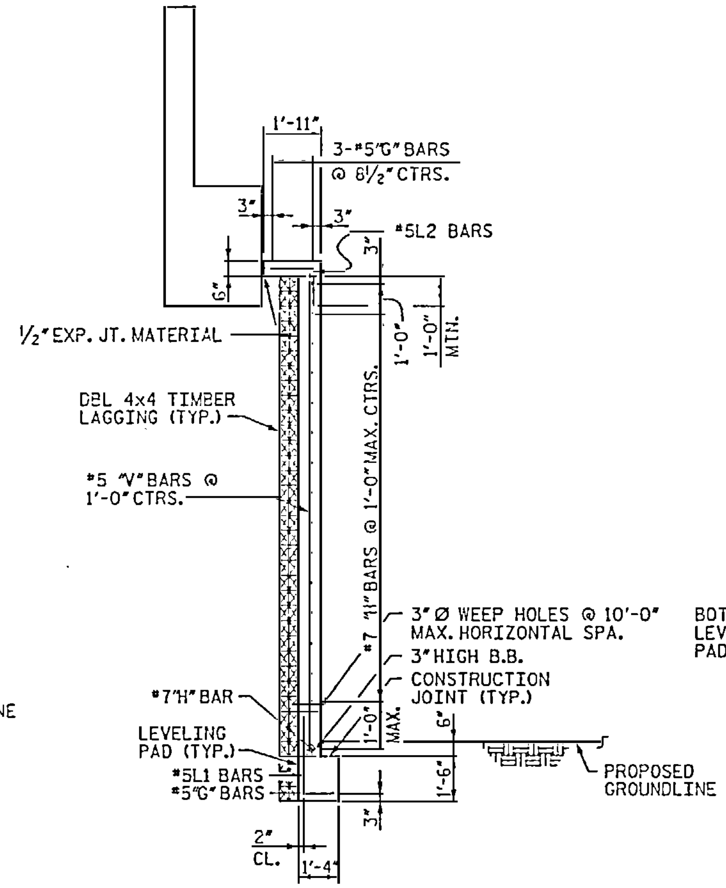
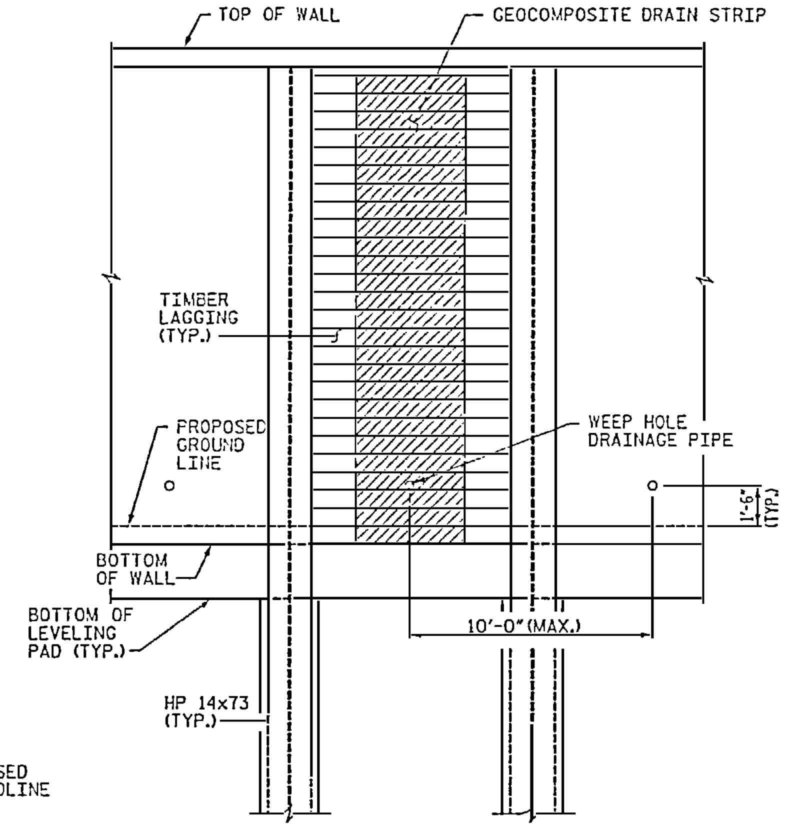


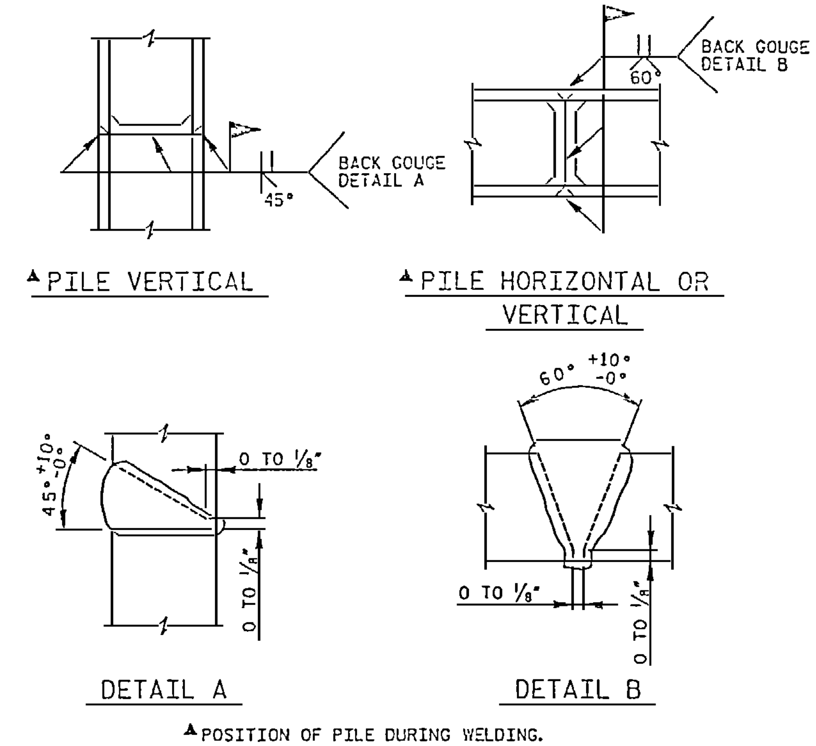
SECTION THROUGH PILE
(WALL SECTION ADJACENT TO END BENTS)



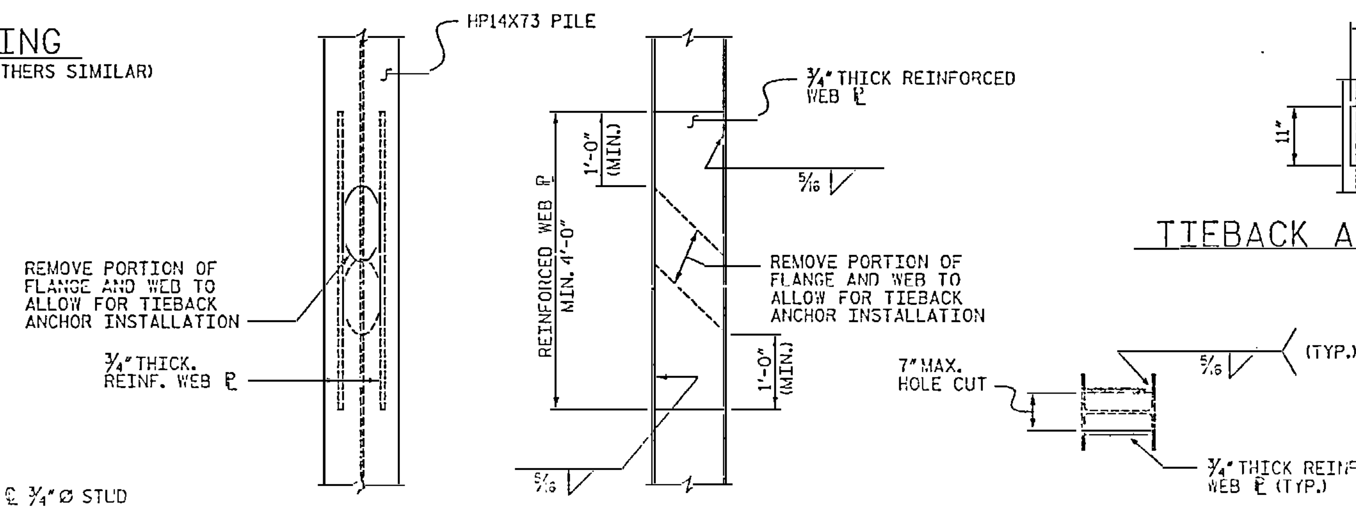
SECTION THRU LAGGING
(WALL SECTION ADJACENT TO END BENTS SHOWN, OTHERS SIMILAR)



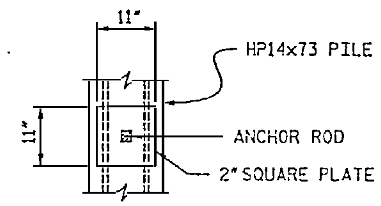
ELEVATION



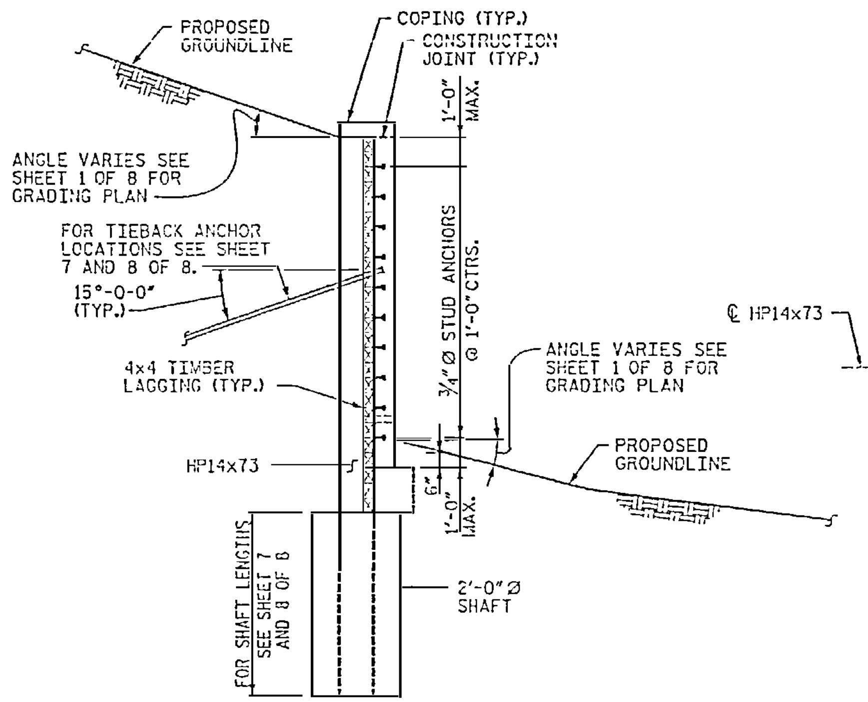
PILE SPLICE DETAILS



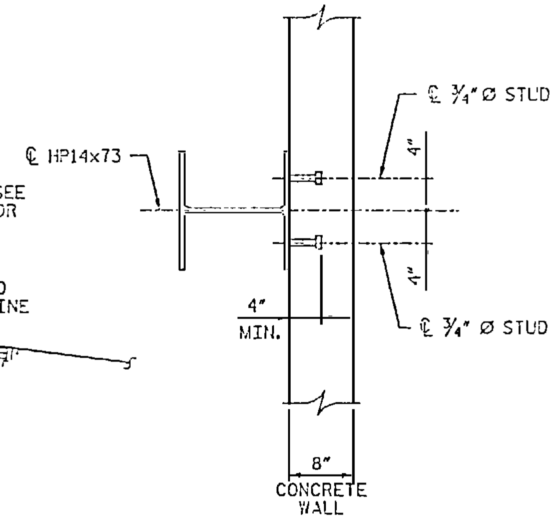
THROUGH PILE DETAILS



TIEBACK ANCHOR PLATE



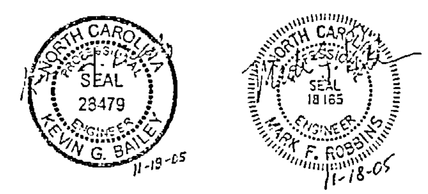
SECTION THROUGH PILE
(WALL SECTION AWAY FROM END BENTS)



STUD DETAIL
(REINFORCING NOT SHOWN FOR CLARITY)

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- =
POC 19+55.81 -Y1-

SHEET 5 OF 8



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

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

TAYLOR & MURPHY

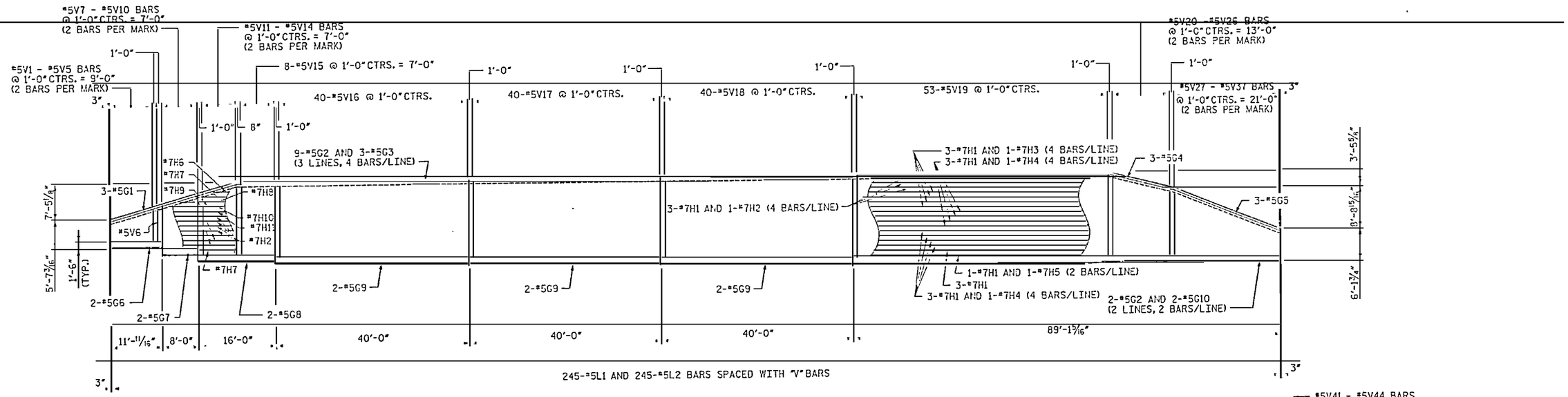
FLORENCE & HUTCHESON, INC
CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 10-05 DWG NO.
CHECKED BY KGB DATE 10-05 D-1785.39

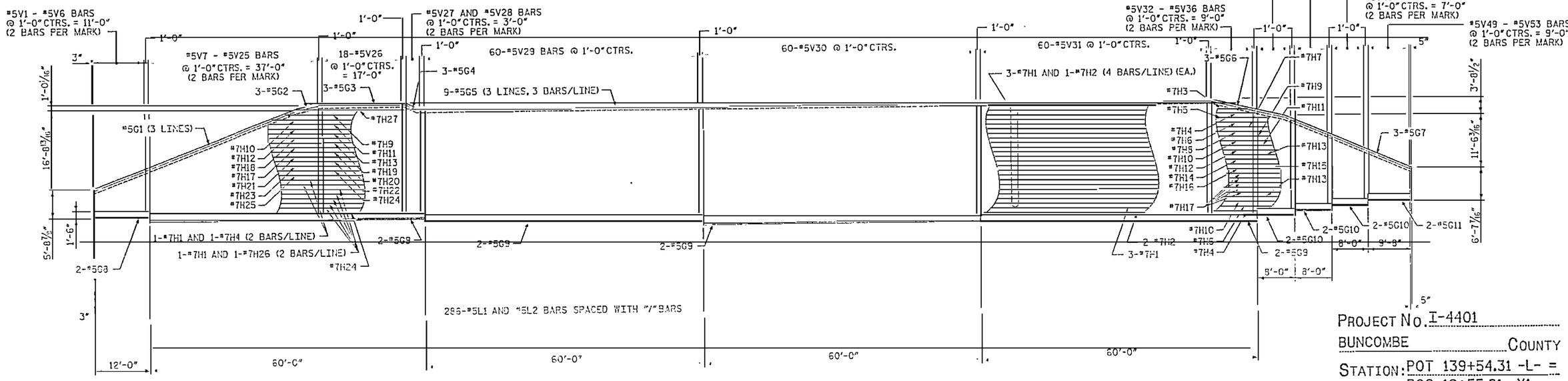
SHEET NO. S1-39
TOTAL SHEETS 50

NOTE: MIN. SPLICE LENGTH FOR ALL #5 BARS SHALL BE 3'-0" AND #7 BARS SHALL BE 5'-3".



ELEVATION OF TIEBACK WALL AT END BENT 1 - REINFORCING

(ALL DIMENSIONS ARE ALONG FILL FACE OF WALL)



ELEVATION OF TIEBACK WALL AT END BENT 2 - REINFORCING

(ALL DIMENSIONS ARE ALONG FILL FACE OF WALL)

PROJECT No. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L- =
POC 19+55.81 -Y1-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18163 MARK F. ROBBINS 11-15-05

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 400 WESTCHASE BLVD. SUITE 415 RALEIGH, N.C. 27607

RALPH WHITEHEAD ASSOCIATES, P.A. CONSULTING ENGINEERS P.O. BOX 35524 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 10-05 DWG. NO.
CHECKED BY KGB DATE 10-05 D-1765-10

SHEET NO. S1-10

TOTAL SHEETS 50

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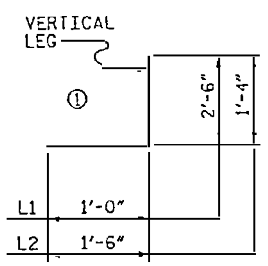
BILL OF MATERIAL

TIEBACK WALL AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
G1	3	#5	STR.	27'-9"	87
G2	11	#5	STR.	60'-0"	688
G3	3	#5	STR.	10'-0"	31
G4	3	#5	STR.	14'-9"	46
G5	3	#5	STR.	23'-5"	73
G6	2	#5	STR.	10'-6"	22
G7	2	#5	STR.	7'-5"	16
G8	2	#5	STR.	15'-6"	32
G9	5	#5	STR.	39'-6"	247
G10	2	#5	STR.	31'-8"	66
H1	49	#7	STR.	60'-0"	6,009
H2	7	#7	STR.	26'-9"	383
H3	4	#7	STR.	38'-9"	317
H4	8	#7	STR.	44'-9"	732
H5	1	#7	STR.	34'-3"	70
H6	1	#7	STR.	4'-6"	9
H7	2	#7	STR.	8'-0"	33
H8	1	#7	STR.	11'-8"	24
H9	3	#7	STR.	15'-6"	95
H10	1	#7	STR.	18'-11"	39
H11	1	#7	STR.	22'-8"	46
L1	245	#5	①	3'-6"	894
L2	245	#5	①	2'-10"	724
V1	2	#5	STR.	3'-8"	8
V2	2	#5	STR.	4'-3"	9
V3	2	#5	STR.	4'-10"	10
V4	2	#5	STR.	5'-4"	11
V5	2	#5	STR.	5'-10"	12
V6	1	#5	STR.	6'-6"	7
V7	2	#5	STR.	8'-4"	17
V8	2	#5	STR.	8'-11"	19
V9	2	#5	STR.	9'-6"	20
V10	2	#5	STR.	10'-0"	21
V11	2	#5	STR.	11'-10"	25
V12	2	#5	STR.	12'-5"	26
V13	2	#5	STR.	13'-0"	27
V14	2	#5	STR.	13'-6"	28
V15	9	#5	STR.	14'-0"	131
V16	40	#5	STR.	14'-10"	619
V17	40	#5	STR.	15'-4"	640
V18	40	#5	STR.	15'-10"	661
V19	53	#5	STR.	16'-4"	903
V20	2	#5	STR.	15'-11"	33
V21	2	#5	STR.	15'-5"	32
V22	2	#5	STR.	14'-11"	31
V23	2	#5	STR.	14'-5"	30
V24	2	#5	STR.	13'-11"	29
V25	2	#5	STR.	13'-5"	28
V26	2	#5	STR.	12'-11"	27
V27	2	#5	STR.	12'-2"	25
V28	2	#5	STR.	11'-5"	24
V29	2	#5	STR.	10'-8"	22
V30	2	#5	STR.	9'-10"	21
V31	2	#5	STR.	9'-0"	19
V32	2	#5	STR.	8'-3"	17
V33	2	#5	STR.	7'-6"	16
V34	2	#5	STR.	6'-7"	14
V35	2	#5	STR.	5'-9"	12
V36	2	#5	STR.	5'-0"	10
V37	2	#5	STR.	4'-3"	9

REINFORCING STEEL	14,276 LBS.
CLASS A CONCRETE-WALL	85.2 C.Y.
CLASS A CONCRETE-COPING	8.7 C.Y.
CLASS A CONCRETE-LEVELING PAD	18.1 C.Y.
CLASS S CONCRETE-SHAFT	64.5 C.Y.

BAR TYPE



TIEBACK WALL AT END BENT 1

LOCATION	PILE NO.	PILE TYPE	STATION ALONG -Y1-	DISTANCE FROM BEGIN OF WALL	TOP OF WALL ELEVATION	BOTTOM OF WALL ELEVATION	WALL HEIGHT	PILE/SHAFT TIP ELEVATION	PILE ABOVE TOP OF SHAFT	PILE BELOW TOP OF SHAFT	TOTAL PILE LENGTH	NO. OF ANCHORS	LOCATION OF ANCHOR 1 FROM TOP OF WALL	LOCATION OF ANCHOR 2 FROM TOP OF WALL	PILE NO.
BEGIN WALL		-	20-37.790	0"	2117.255	2113.164	4'-1"	-	-	-	-				
	1	HP14x73	20+30.809	9'-0"	2119.742	2113.164	6'-7"	2095.164	9'-1"	15'-0"	24'-1"	-	-	-	1
	2	HP14x73	20+26.126	15'-0"	2121.392	2111.664	9'-9"	2095.164	10'-9"	15'-0"	25'-9"	-	-	-	2
	3	HP14x73	20+21.420	21'-0"	2123.043	2110.164	12'-11"	2093.664	13'-11"	15'-0"	28'-11"	1	5'-0"	-	3
CORNER		-	20+16.634	27'-0"	2124.693	2110.164	14'-6"	-	-	-	-				
	4	HP14x73	20+16.046	27'-8"	2124.693	2110.164	14'-6"	2093.664	15'-6"	15'-0"	30'-6"	2	5'-0"	10'-0"	4
	5	HP14x73	20+09.516	34'-5"	2124.693	2110.164	14'-6"	2093.664	15'-6"	15'-0"	30'-6"	2	5'-0"	10'-0"	5
	6	HP14x73	20+01.772	42'-5"	2124.693	2109.331	15'-4"	2092.831	16'-4"	15'-0"	31'-4"	2	5'-0"	10'-0"	6
	7	HP14x73	19+94.508	49'-11"	2124.693	2109.331	15'-4"	2092.831	15'-4"	15'-0"	31'-4"	2	5'-0"	10'-0"	7
	8	HP14x73	19+87.403	57'-3"	2124.693	2109.331	15'-4"	2092.831	16'-4"	15'-0"	31'-4"	2	5'-0"	10'-0"	8
	9	HP14x73	19+81.829	63'-0"	2124.693	2109.331	15'-4"	2092.831	16'-4"	15'-0"	31'-4"	2	5'-0"	10'-0"	9
	10	HP14x73	19+76.255	68'-9"	2124.693	2109.331	15'-4"	2092.831	16'-4"	15'-0"	31'-4"	2	5'-0"	10'-0"	10
	11	HP14x73	19+69.224	76'-0"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	11
	12	HP14x73	19+63.646	81'-9"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	12
	13	HP14x73	19+58.068	87'-6"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	13
	14	HP14x73	19+51.276	94'-6"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	14
	15	HP14x73	19+47.233	98'-8"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	1	10'-0"	-	15
	16	HP14x73	19+42.381	103'-8"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	16
	17	HP14x73	19+37.043	109'-2"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	17
	18	HP14x73	19+31.706	114'-8"	2124.693	2108.831	15'-10"	2092.381	16'-10"	15'-0"	31'-10"	2	5'-0"	10'-0"	18
	19	HP14x73	19+26.368	120'-2"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	2	5'-0"	10'-0"	19
	20	HP14x73	19+21.516	125'-2"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	1	10'-0"	-	20
	21	HP14x73	19+16.665	130'-2"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	1	10'-0"	-	21
	22	HP14x73	19+11.814	135'-2"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	2	5'-0"	10'-0"	22
	23	HP14x73	19+04.538	142'-8"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	2	5'-0"	10'-0"	23
	24	HP14x73	18+97.265	150'-2"	2124.693	2108.331	16'-4"	2091.831	17'-4"	15'-0"	32'-4"	2	5'-0"	10'-0"	24
	25	HP14x73	18+89.509	158'-2"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	25
	26	HP14x73	18+82.240	165'-6"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	26
	27	HP14x73	18+76.426	171'-8"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	27
	28	HP14x73	18+70.610	177'-8"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	28
	29	HP14x73	18+62.854	185'-8"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	29
	30	HP14x73	18+55.581	193'-2"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	30
	31	HP14x73	18+49.762	199'-2"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	31
	32	HP14x73	18+43.942	205'-2"	2124.693	2107.831	16'-10"	2091.331	17'-10"	15'-0"	32'-10"	2	5'-0"	10'-0"	32
SLOPE BREAK PT.		-	18+41.329	207'-10"	2124.693	2107.831	16'-10"	-	-	-	-				
	33	HP14x73	18+38.121	211'-2"	2123.890	2107.831	16'-1"	2091.331	17'-1"	15'-0"	32'-1"	1	5'-0"	-	33
	34	HP14x73	18+32.299	217'-2"	2122.433	2107.831	14'-7"	2091.331	15'-7"	15'-0"	30'-7"	1	5'-0"	-	34
SLOPE BREAK PT.		-	18+27.433	222'-2"	2121.222	2107.831	13'-5"	-	-	-	-				
	35	HP14x73	18+26.477	223'-2"	2120.818	2107.831	13'-0"	2091.331	14'-0"	15'-0"	29'-0"	1	5'-0"	-	35
	36	HP14x73	18+20.654	229'-2"	2118.435	2107.831	10'-7"	2091.331	11'-7"	15'-0"	26'-7"	-	-	-	36
	37	HP14x73	18+14.830	235'-2"	2116.051	2107.831	9'-3"	2091.331	9'-3"	15'-0"	24'-3"	-	-	-	37
END WALL		-	18+06.093	244'-2"	2112.475	2107.831	4'-8"	-	-	-	-				

NOTE: "TOP OF WALL ELEVATION" INCLUDES THE COPING HEIGHT.
"PILE BELOW TOP OF SHAFT" IS ALSO EQUAL TO THE LENGTH OF 2'-0" Ø SHAFT.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 7 OF 8

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28479 KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18165 MARK F. ROBBINS 11-18-05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

REVISIONS: NO. BY DATE — 1, 2, 3, 4

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35521 CHARLOTTE, N.C. 28235

DRAWN BY: TLS DATE: 10-05
CHECKED BY: KGB DATE: 10-05
DWG. NO. D-1735.41

SHEET NO. S1-41
TOTAL SHEETS 50

timothy.townsend 11/18/2005 03:22:33 PM H:\PROJ\385-final\Ustn\Struct\923\Final\tb wall7.dgn

TIEBACK WALL AT END BENT 2

LOCATION	PILE NO.	PILE TYPE	STATION ALONG -Y1-	DISTANCE FROM BEGIN OF WALL	TOP OF WALL ELEVATION	BOTTOM OF WALL ELEVATION	WALL HEIGHT	PILE/SHAFT TIP ELEVATION	PILE ABOVE TOP OF SHAFT	PILE BELOW TOP OF SHAFT	TOTAL PILE LENGTH	NO. OF ANCHORS	LOCATION OF ANCHOR 1 FROM TOP OF WALL	LOCATION OF ANCHOR 2 FROM TOP OF WALL	LOCATION OF ANCHOR 3 FROM TOP OF WALL	PILE NO.
BEGIN WALL		-	21+89.676	0"	2108.820	2104.578	4'-3"	-	-	-	-					
	1	HP14x73	21+80.089	9'-0"	2112.188	2104.578	7'-7"	2088.078	8'-7"	15'-0"	23'-7"	-	-	-	-	1
	2	HP14x73	21+73.696	15'-0"	2114.433	2103.578	10'-10"	2087.078	11'-10"	15'-0"	26'-10"	-	-	-	-	2
	3	HP14x73	21+67.303	21'-0"	2116.678	2103.578	13'-1"	2087.078	14'-1"	15'-0"	29'-1"	1	6'-0"	-	-	3
	4	HP14x73	21+60.911	27'-0"	2118.923	2103.578	15'-4"	2087.078	16'-4"	15'-0"	31'-4"	1	6'-0"	-	-	4
	5	HP14x73	21+54.518	33'-0"	2121.168	2103.578	17'-7"	2087.078	18'-7"	15'-0"	33'-7"	1	6'-0"	-	-	5
	6	HP14x73	21+48.125	39'-0"	2123.414	2103.578	19'-10"	2087.078	20'-10"	15'-0"	35'-10"	2	6'-0"	14'-6"	-	6
SLOPE BREAK PT.		-	21+42.032	44'-9"	2125.554	2103.578	22'-0"	-	-	-	-					
	7	HP14x73	21+41.734	45'-0"	2125.659	2103.578	22'-1"	2087.078	23'-1"	15'-0"	38'-1"	2	6'-0"	14'-6"	-	7
SLOPE BREAK PT.		-	21+36.941	49'-6"	2126.641	2103.578	23'-1"	-	-	-	-					
	8	HP14x73	21+35.343	51'-0"	2126.641	2103.578	23'-1"	2087.078	24'-1"	15'-0"	39'-1"	2	6'-0"	14'-6"	-	8
	9	HP14x73	21+28.954	57'-0"	2126.641	2103.578	23'-1"	2087.078	24'-1"	15'-0"	39'-1"	2	6'-0"	14'-6"	-	9
	10	HP14x73	21+22.566	63'-0"	2126.641	2103.578	23'-1"	2087.078	24'-1"	15'-0"	39'-1"	2	6'-0"	14'-6"	-	10
CORNER		-	21+17.244	68'-0"	2126.641	2103.578	23'-1"	-	-	-	-					
	11	HP14x73	21+16.536	68'-8"	2126.316	2103.578	22'-9"	2087.078	23'-9"	15'-0"	38'-9"	2	6'-0"	14'-6"	-	11
SLOPE BREAK PT.		-	21+14.588	70'-6"	2125.420	2103.578	21'-10"	-	-	-	-					
	12	HP14x73	21+09.185	75'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	3	5'-0"	11'-0"	18'-0"	12
	13	HP14x73	21+07.740	82'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	2	6'-0"	14'-6"	-	13
	14	HP14x73	20+96.419	87'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	2	6'-0"	14'-6"	-	14
	15	HP14x73	20+88.967	94'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	3	5'-0"	11'-0"	18'-0"	15
	16	HP14x73	20+81.510	101'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	3	5'-0"	11'-0"	18'-0"	16
	17	HP14x73	20+75.116	107'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	3	5'-0"	11'-0"	18'-0"	17
	18	HP14x73	20+68.187	114'-1"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	3	5'-0"	11'-0"	18'-0"	18
	19	HP14x73	20+60.723	121'-1"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	2	6'-0"	14'-6"	-	19
	20	HP14x73	20+55.923	125'-7"	2125.420	2102.578	22'-10"	2086.078	23'-10"	15'-0"	38'-10"	2	6'-0"	14'-6"	-	20
	21	HP14x73	20+48.988	132'-1"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	3	5'-0"	11'-0"	18'-0"	21
	22	HP14x73	20+42.053	138'-7"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	3	5'-0"	11'-0"	18'-0"	22
	23	HP14x73	20+35.116	145'-1"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	3	5'-0"	11'-0"	18'-0"	23
	24	HP14x73	20+28.179	151'-7"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	3	5'-0"	11'-0"	18'-0"	24
	25	HP14x73	20+21.775	157'-7"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	25
	26	HP14x73	20+15.460	163'-6"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	26
	27	HP14x73	20+09.590	169'-0"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	27
	28	HP14x73	20+02.654	175'-6"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	28
	29	HP14x73	19+96.786	181'-0"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	29
	30	HP14x73	19+90.919	186'-6"	2125.420	2101.578	23'-10"	2085.078	24'-10"	15'-0"	39'-10"	2	6'-0"	14'-6"	-	30
	31	HP14x73	19+85.053	192'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	31
	32	HP14x73	19+79.188	197'-6"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	32
	33	HP14x73	19+73.325	203'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	33
	34	HP14x73	19+67.996	208'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	34
	35	HP14x73	19+62.670	213'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	35
	36	HP14x73	19+57.345	218'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	36
	37	HP14x73	19+52.022	223'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	37
	38	HP14x73	19+46.701	228'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	2	6'-0"	14'-6"	-	38
	39	HP14x73	19+41.383	233'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	3	5'-0"	11'-0"	18'-0"	39
	40	HP14x73	19+32.873	241'-0"	2125.420	2101.078	24'-4"	2084.578	25'-4"	15'-0"	40'-4"	3	5'-0"	11'-0"	13'-0"	40
CORNER		-	19+32.170	241'-8"	2125.420	2101.078	24'-4"	-	-	-	-					
	41	HP14x73	19+26.729	247'-8"	2125.273	2101.078	24'-2"	2084.578	25'-2"	15'-0"	40'-2"	2	6'-0"	14'-6"	-	41
	42	HP14x73	19+21.260	253'-8"	2125.360	2102.078	23'-3"	2084.578	25'-3"	15'-0"	40'-3"	2	6'-0"	14'-6"	-	42
SLOPE BREAK PT.		-	19+17.427	257'-10"	2121.712	2102.078	19'-8"	-	-	-	-					
	43	HP14x73	19+15.765	259'-8"	2120.962	2102.078	18'-11"	2084.578	20'-11"	15'-0"	35'-11"	2	6'-0"	14'-6"	-	43
	44	HP14x73	19+10.244	265'-8"	2118.478	2103.078	15'-5"	2084.578	18'-5"	15'-0"	33'-5"	1	6'-0"	-	-	44
	45	HP14x73	19+04.696	271'-8"	2115.995	2103.078	12'-11"	2083.578	16'-11"	15'-0"	31'-11"	1	6'-0"	-	-	45
	~~46~~	~~HP14x73~~	~~18+99.121~~	~~277'-8"~~	~~2113.511~~	~~2104.078~~	9'-5"	2083.578	14'-5"	15'-0"	29'-5"	1	6'-0"	-	-	46
END WALL		-	18+91.646	285'-8"	2110.199	2104.078	6'-1"	-	-	-	-					

NOTE: "TOP OF WALL ELEVATION" INCLUDES THE COPING HEIGHT.
"PILE BELOW TOP OF SHAFT" ALSO EQUAL TO THE LENGTH OF 2'-0"Ø SHAFT.

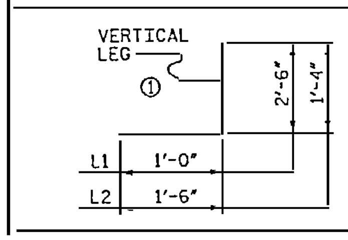
BILL OF MATERIAL

TIEBACK WALL AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
G1	3	#5	STR.	47'-6"	149
G2	3	#5	STR.	4'-11"	15
G3	3	#5	STR.	18'-6"	58
G4	3	#5	STR.	2'-9"	9
G5	9	#5	STR.	60'-0"	563
G6	3	#5	STR.	16'-7"	52
G7	3	#5	STR.	29'-10"	93
G8	2	#5	STR.	11'-6"	24
G9	8	#5	STR.	59'-6"	496
G10	6	#5	STR.	7'-6"	47
G11	2	#5	STR.	9'-2"	19
H1	78	#7	STR.	60'-0"	9,566
H2	22	#7	STR.	13'-9"	618
H3	1	#7	STR.	5'-6"	11
H4	4	#7	STR.	10'-0"	82
H5	1	#7	STR.	14'-2"	29
H6	2	#7	STR.	17'-8"	72
H7	1	#7	STR.	20'-0"	41
H8	1	#7	STR.	22'-3"	45
H9	2	#7	STR.	24'-3"	99
H10	3	#7	STR.	26'-6"	162
H11	2	#7	STR.	29'-7"	121
H12	2	#7	STR.	32'-0"	131
H13	3	#7	STR.	34'-3"	210
H14	1	#7	STR.	36'-9"	75
H15	1	#7	STR.	39'-2"	80
H16	1	#7	STR.	41'-8"	85
H17	6	#7	STR.	43'-6"	533
H18	1	#7	STR.	37'-8"	77
H19	1	#7	STR.	40'-3"	82
H20	1	#7	STR.	45'-8"	93
H21	1	#7	STR.	48'-3"	99
H22	1	#7	STR.	51'-0"	104
H23	1	#7	STR.	53'-8"	110
H24	2	#7	STR.	56'-0"	229
H25	1	#7	STR.	59'-0"	121
H26	5	#7	STR.	13'-0"	133
H27	1	#7	STR.	21'-6"	44
L1	286	#5	①	3'-6"	1,044
L2	286	#5	①	2'-10"	845

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
V1	2	#5	STR.	3'-10"	12
V2	2	#5	STR.	4'-7"	14
V3	2	#5	STR.	5'-4"	16
V4	2	#5	STR.	6'-1"	18
V5	2	#5	STR.	6'-10"	21
V6	2	#5	STR.	7'-7"	23
V7	2	#5	STR.	9'-4"	28
V8	2	#5	STR.	10'-1"	30
V9	2	#5	STR.	10'-10"	33
V10	2	#5	STR.	11'-7"	35
V11	2	#5	STR.	12'-4"	37
V12	2	#5	STR.	13'-1"	39
V13	2	#5	STR.	13'-10"	42
V14	2	#5	STR.	14'-7"	44
V15	2	#5	STR.	15'-4"	46
V16	2	#5	STR.	16'-1"	48
V17	2	#5	STR.	16'-10"	51
V18	2	#5	STR.	17'-7"	53
V19	2	#5	STR.	18'-4"	55
V20	2	#5	STR.	19'-1"	57
V21	2	#5	STR.	19'-10"	60
V22	2	#5	STR.	20'-7"	62
V23	2	#5	STR.	21'-1"	63
V24	2	#5	STR.	21'-10"	66
V25	2	#5	STR.	22'-4"	67
V26	18	#5	STR.	22'-7"	611
V27	2	#5	STR.	21'-10"	66
V28	2	#5	STR.	21'-4"	64
V29	60	#5	STR.	22'-4"	2,013
V30	60	#5	STR.	23'-4"	2,103
V31	50	#5	STR.	23'-10"	1,790
V32	2	#5	STR.	23'-6"	71
V33	2	#5	STR.	23'-1"	69
V34	2	#5	STR.	22'-7"	68
V35	2	#5	STR.	22'-2"	67
V36	2	#5	STR.	21'-8"	65
V37	2	#5	STR.	20'-2"	61
V38	2	#5	STR.	19'-9"	59
V39	2	#5	STR.	19'-3"	58
V40	2	#5	STR.	18'-8"	56
V41	2	#5	STR.	16'-9"	50
V42	2	#5	STR.	15'-11"	48
V43	2	#5	STR.	15'-1"	45
V44	2	#5	STR.	14'-3"	43
V45	2	#5	STR.	12'-6"	38
V46	2	#5	STR.	11'-8"	35
V47	2	#5	STR.	10'-10"	33
V48	2	#5	STR.	10'-0"	30
V49	2	#5	STR.	8'-1"	24
V50	2	#5	STR.	7'-3"	22
V51	2	#5	STR.	6'-5"	19
V52	2	#5	STR.	5'-7"	17
V53	2	#5	STR.	4'-10"	15

BAR TYPE



REINFORCING STEEL	25,126 LBS.
CLASS A CONCRETE-WALL	142.7 C.Y.
CLASS A CONCRETE-COPING	10.2 C.Y.
CLASS A CONCRETE-LEVELING PAD	21.2 C.Y.
CLASS S CONCRETE-SHAFT	80.3 C.Y.

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L- = POC 19+55.81 -Y1-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TIEBACK WALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY 11-18-05

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 11-18-05

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

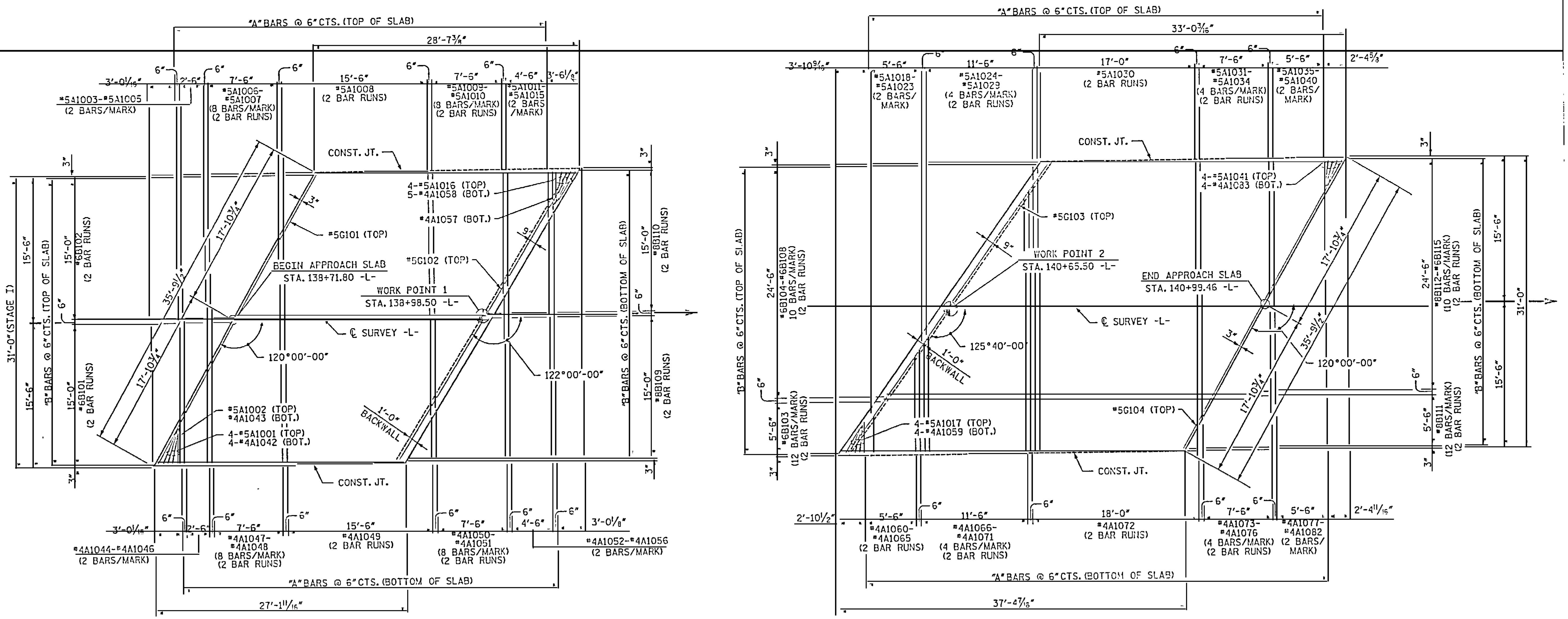
TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

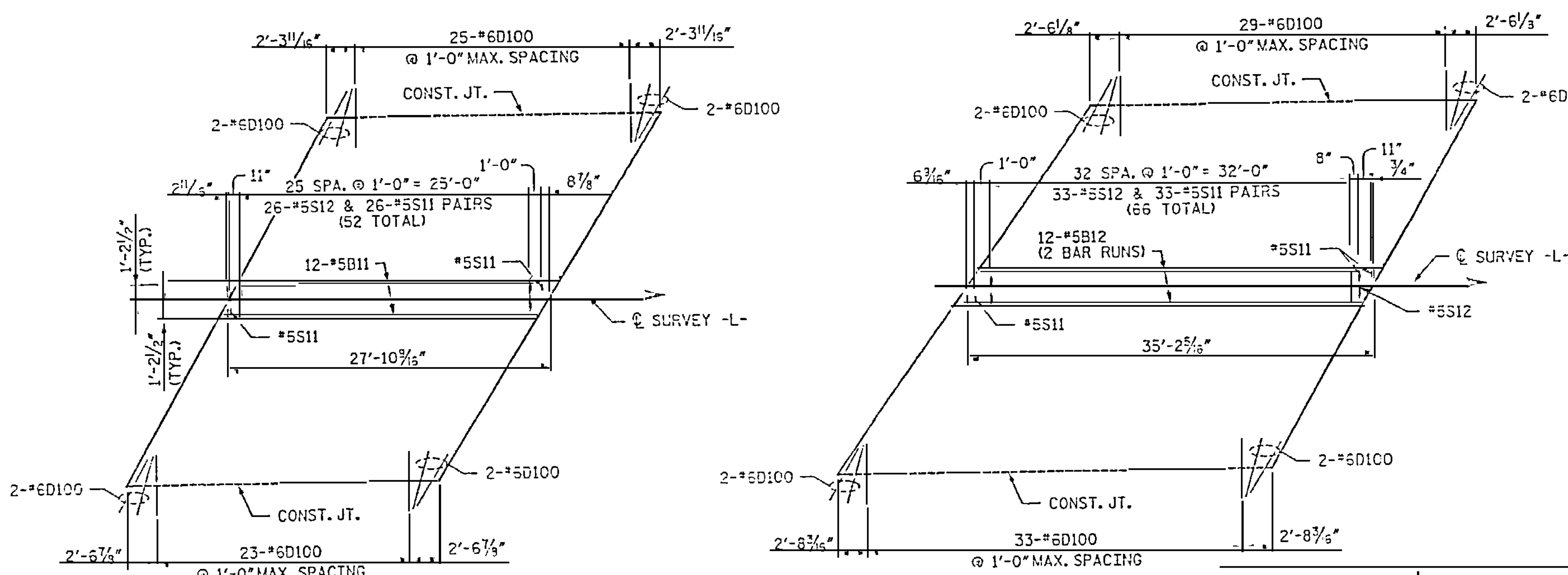
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY TLS DATE 10-05
CHECKED BY KGB DATE 10-05
DWG. NO. D-1785.42

SHEET NO. S1-42
TOTAL SHEETS 50



PLAN



DOWEL AND MEDIAN BARRIER DETAILS

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

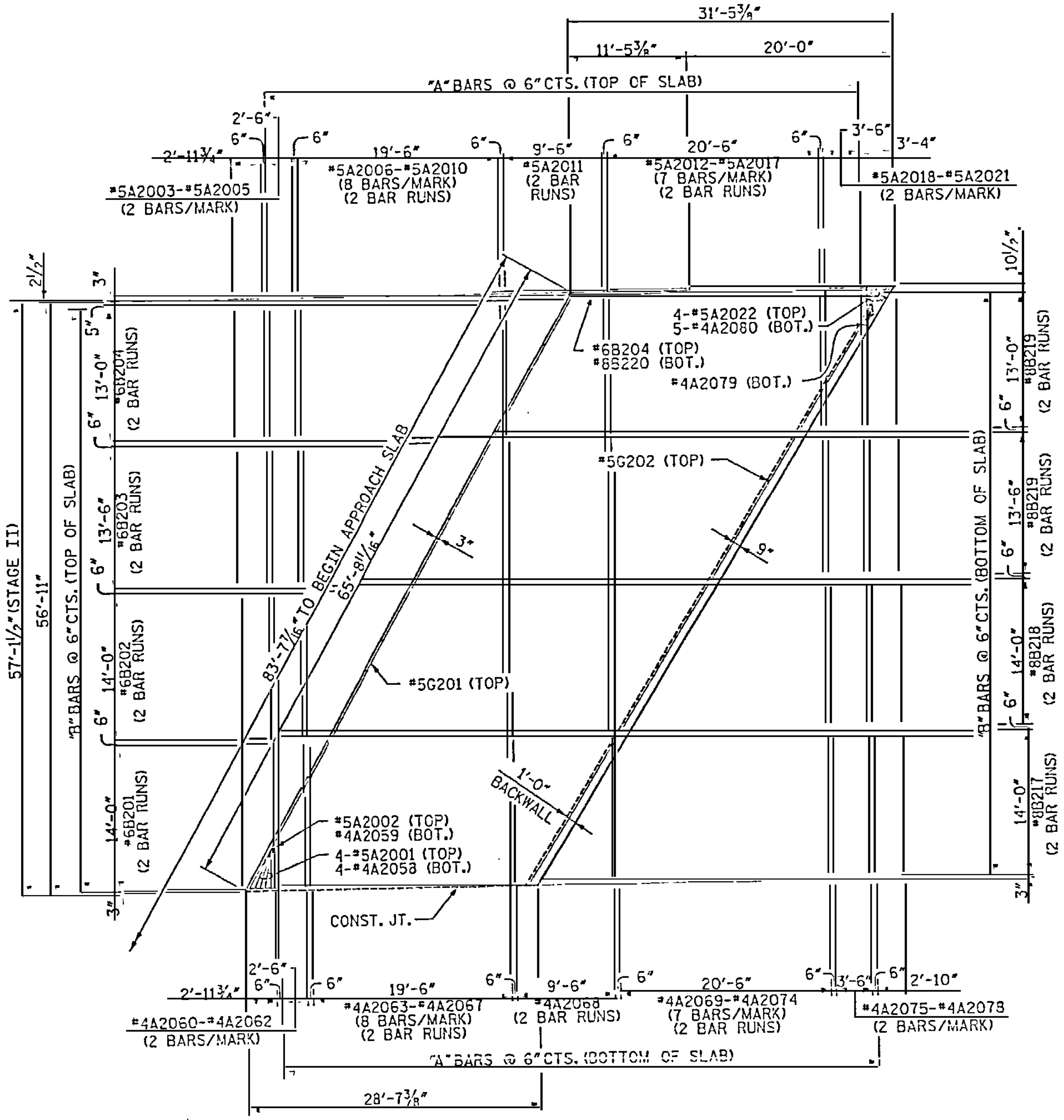
BRIDGE APPROACH SLAB PLAN
STAGE I

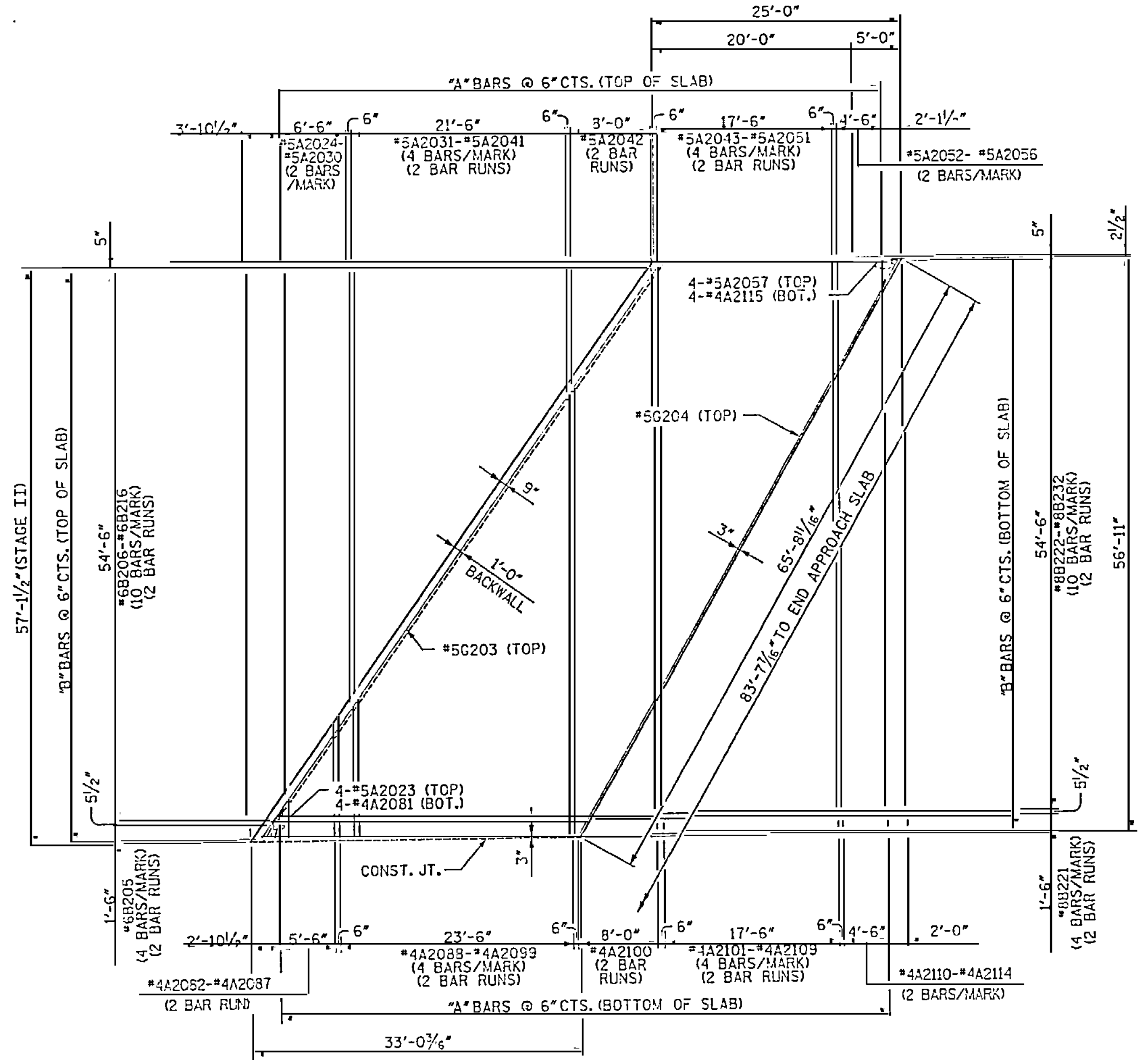
SEAL 28479 KEVIN G BAILEY 2-15-06
SEAL 18165 MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS
RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35524 CHARLOTTE, N.C. 28235

DRAWN BY AJP DATE 1-06
CHECKED BY FEK DATE 1-06
DWG. NO. D-1735.43

SHEET NO. S1-43
TOTAL SHEETS 50





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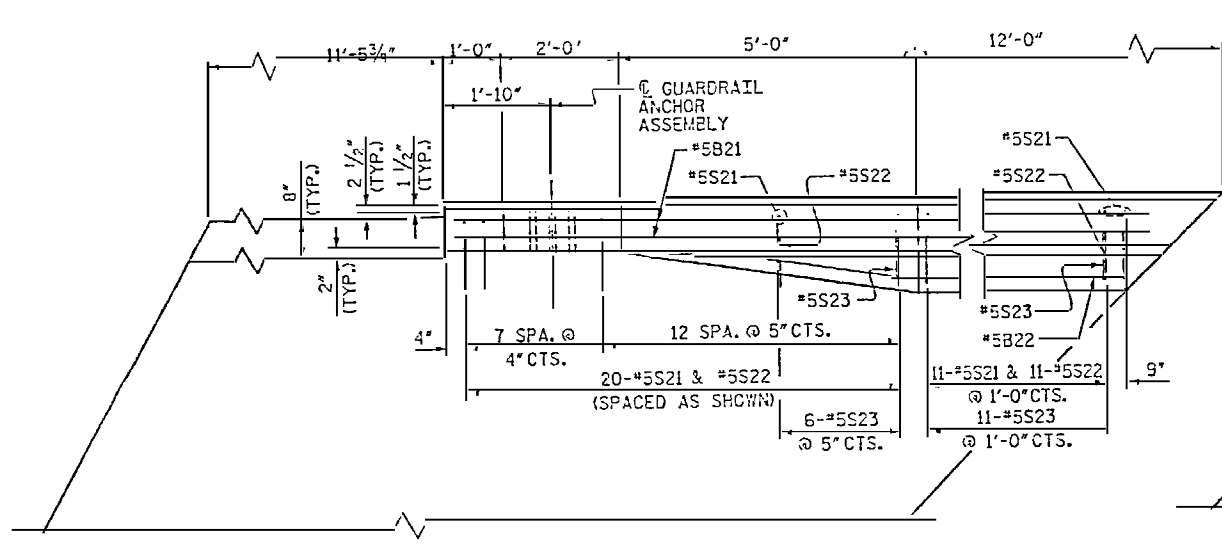
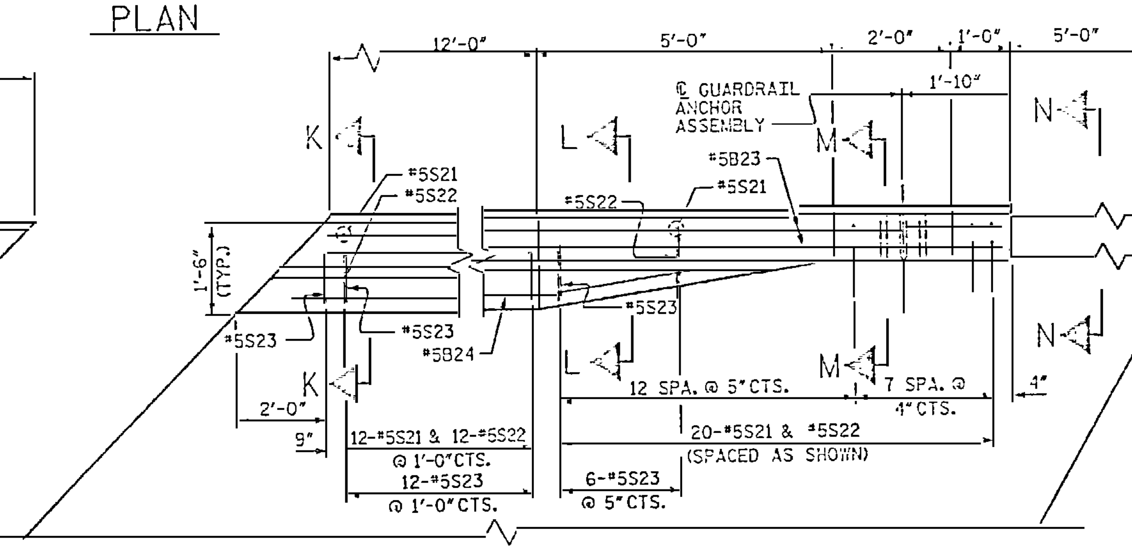
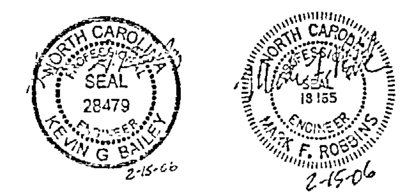




BARRIER RAIL DETAILS



PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB PLAN
STAGE II

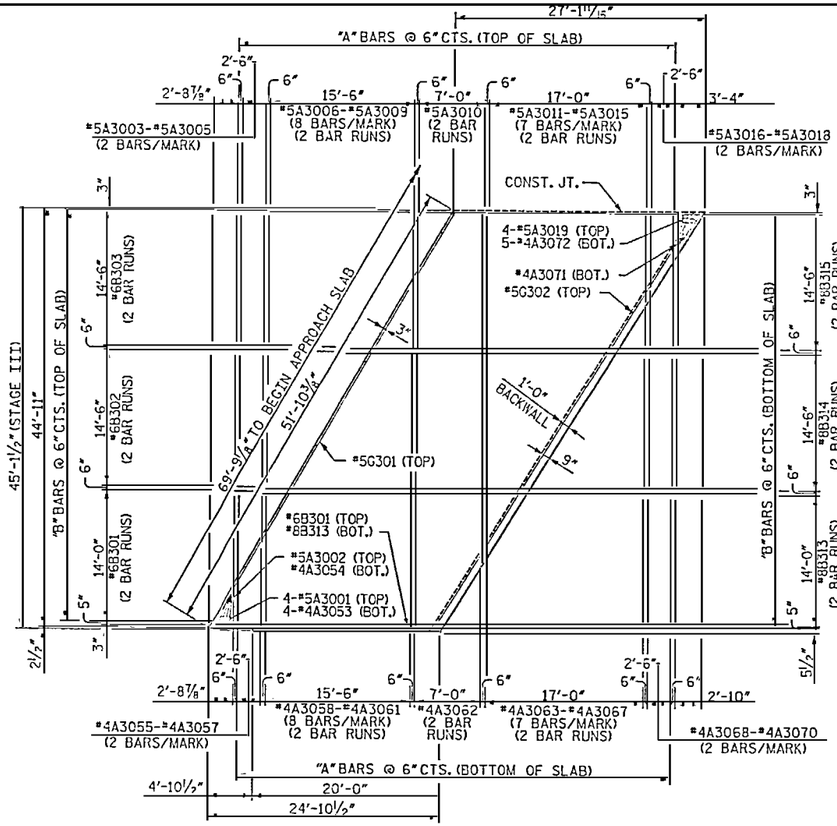
TAYLOR & MURPHY

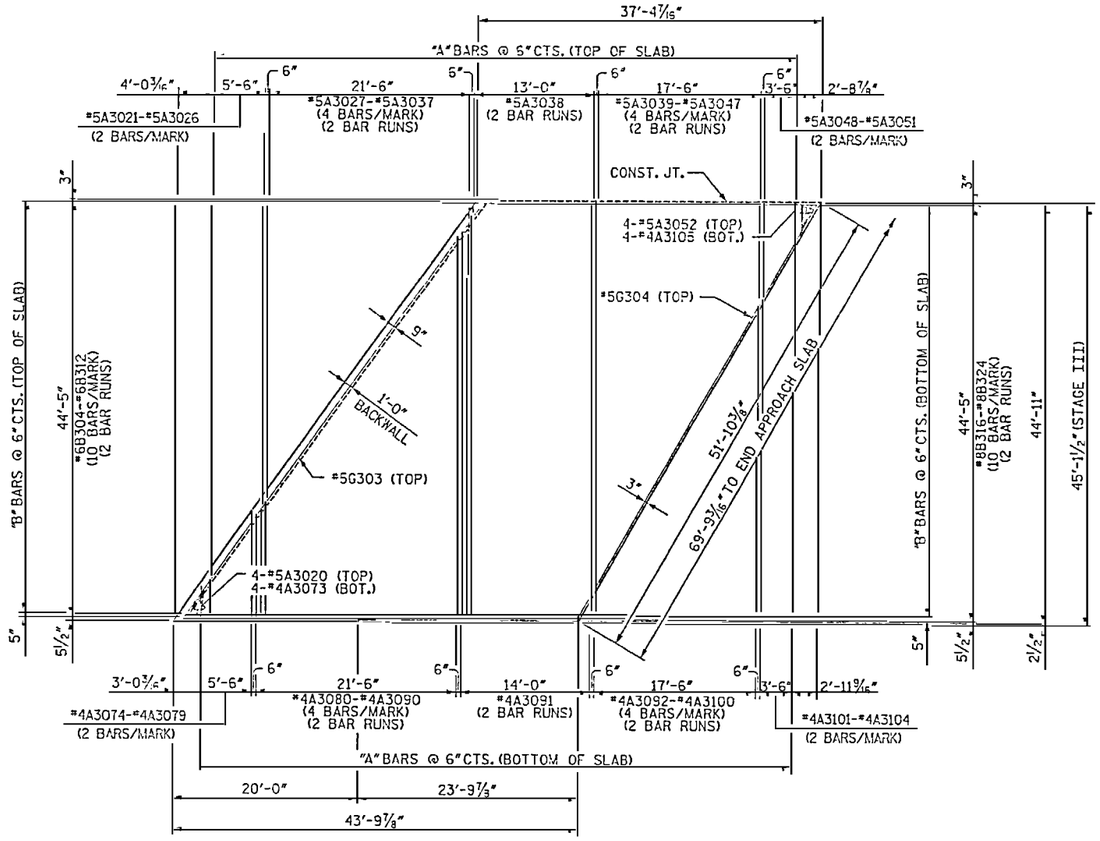
FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS
P.O. BOX 35624 CHARLOTTE, N.C. 28235

DRAWN BY AJP DATE 1-06
CHECKED BY PEK DATE 1-06
DWG. NO. D-1785.44

SHEET NO. S1-44
TOTAL SHEETS 50





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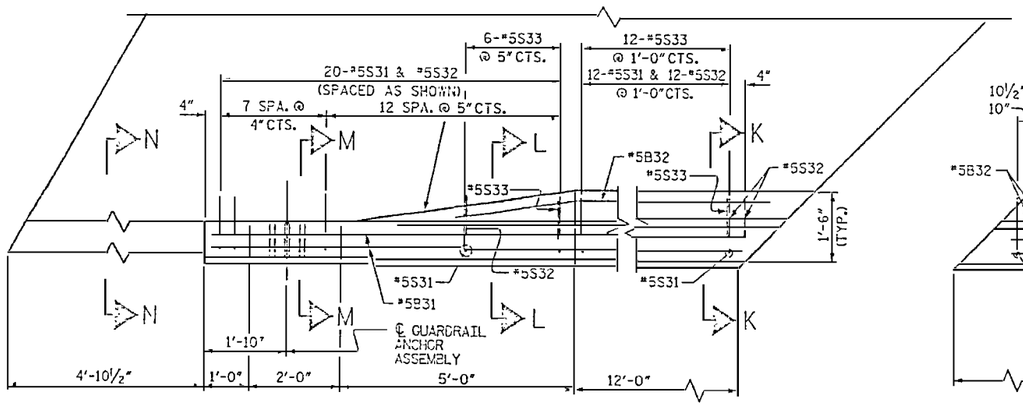
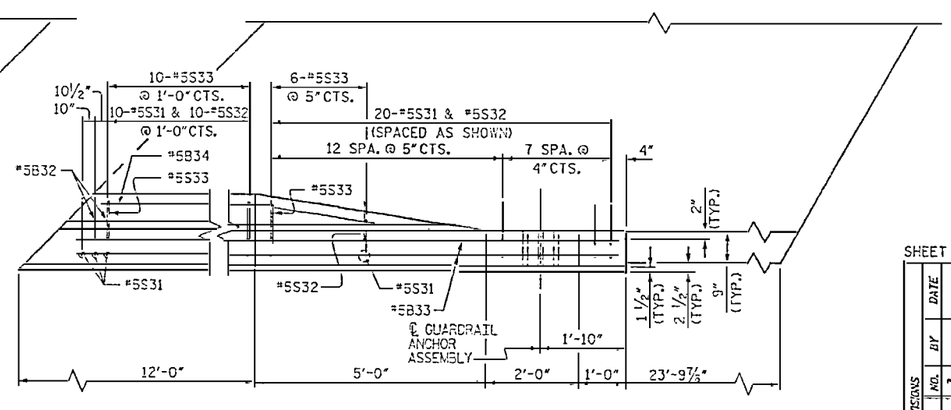




BARRIER RAIL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23479 ENGINEER KEVIN G. BAILEY 2-15-06

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 1816 ENGINEER MARK F. ROBBINS 2-16-06

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB PLAN
STAGE III

REVISIONS	NO.	BY	DATE
	3		
	4		

SHEET NO. S1-45
TOTAL SHEETS 50

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 400 HORTICULTURE BLVD. SUITE 105 RALEIGH, N.C. 27607

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35621 CHARLOTTE, N.C. 28235

DRAWN BY A.N.P. DATE 1-06
CHECKED BY P.E.K. DATE 1-06
W.O. NO. D-1785.45

timothy.townsend 02/14/2006 02:56:51 PM n:\proj\3185-final\ustn\struct\1923\final\as3.dgn

APPROACH SLAB BAR SCHEDULE STAGE I

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1001	4	#5	STR.	3'-11"	16
* A1002	1	#5	STR.	4'-5"	5
* A1003	2	#5	STR.	5'-3"	11
* A1004	2	#5	STR.	7'-0"	15
* A1005	2	#5	STR.	8'-9"	18
* A1006	16	#5	STR.	9'-6"	159
* A1007	16	#5	STR.	13'-0"	217
* A1008	62	#5	STR.	16'-6"	1,067
* A1009	16	#5	STR.	13'-3"	221
* A1010	16	#5	STR.	10'-1"	168
* A1011	2	#5	STR.	10'-5"	22
* A1012	2	#5	STR.	8'-9"	18
* A1013	2	#5	STR.	7'-2"	15
* A1014	2	#5	STR.	5'-7"	12
* A1015	2	#5	STR.	4'-0"	8
* A1016	4	#5	STR.	3'-7"	15
* A1017	4	#5	STR.	3'-0"	13
* A1018	2	#5	STR.	3'-11"	8
* A1019	2	#5	STR.	5'-4"	11
* A1020	2	#5	STR.	6'-9"	14
* A1021	2	#5	STR.	8'-1"	17
* A1022	2	#5	STR.	9'-6"	20
* A1023	2	#5	STR.	10'-11"	23
* A1024	8	#5	STR.	8'-5"	70
* A1025	8	#5	STR.	9'-10"	82
* A1026	8	#5	STR.	11'-3"	94
* A1027	8	#5	STR.	12'-8"	106
* A1028	8	#5	STR.	14'-0"	117
* A1029	8	#5	STR.	15'-5"	129
* A1030	70	#5	STR.	16'-6"	1,205
* A1031	8	#5	STR.	14'-8"	122
* A1032	8	#5	STR.	12'-11"	108
* A1033	8	#5	STR.	11'-2"	93
* A1034	8	#5	STR.	9'-6"	79
* A1035	2	#5	STR.	12'-1"	25
* A1036	2	#5	STR.	10'-4"	22
* A1037	2	#5	STR.	8'-7"	18
* A1038	2	#5	STR.	6'-10"	14
* A1039	2	#5	STR.	5'-1"	11
* A1040	2	#5	STR.	3'-5"	7
* A1041	4	#5	STR.	3'-0"	13
A1042	4	#4	STR.	3'-11"	10
A1043	1	#4	STR.	4'-5"	3
A1044	2	#4	STR.	5'-3"	7
A1045	2	#4	STR.	7'-0"	9
A1046	2	#4	STR.	8'-9"	12
A1047	16	#4	STR.	9'-2"	98
A1048	16	#4	STR.	12'-8"	135
A1049	62	#4	STR.	16'-2"	670
A1050	16	#4	STR.	13'-4"	143
A1051	16	#4	STR.	10'-2"	109
A1052	2	#4	STR.	11'-3"	15
A1053	2	#4	STR.	9'-8"	13
A1054	2	#4	STR.	8'-1"	11
A1055	2	#4	STR.	6'-4"	8
A1056	2	#4	STR.	4'-10"	6
A1057	1	#4	STR.	4'-1"	3
A1058	5	#4	STR.	3'-7"	12
A1059	4	#4	STR.	3'-0"	8
A1060	2	#4	STR.	3'-4"	4
A1061	2	#4	STR.	4'-9"	6
A1062	2	#4	STR.	6'-1"	8
A1063	2	#4	STR.	7'-6"	10
A1064	2	#4	STR.	8'-11"	12
A1065	2	#4	STR.	10'-4"	14
A1066	3	#4	STR.	8'-2"	44
A1067	8	#4	STR.	9'-6"	51
A1068	8	#4	STR.	10'-11"	58
A1069	8	#4	STR.	12'-4"	66
A1070	8	#4	STR.	13'-9"	73

APPROACH SLAB BAR SCHEDULE STAGE I

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1071	8	#4	STR.	15'-2"	81
A1072	74	#4	STR.	16'-6"	815
A1073	8	#4	STR.	14'-8"	78
A1074	8	#4	STR.	12'-11"	69
A1075	8	#4	STR.	11'-2"	60
A1076	8	#4	STR.	9'-6"	51
A1077	2	#4	STR.	12'-1"	16
A1078	2	#4	STR.	10'-4"	14
A1079	2	#4	STR.	8'-7"	11
A1080	2	#4	STR.	6'-10"	9
A1081	2	#4	STR.	5'-1"	7
A1082	2	#4	STR.	3'-5"	5
A1083	4	#4	STR.	3'-0"	8
* B101	62	#6	STR.	15'-4"	1,428
* B102	62	#6	STR.	15'-8"	1,459
* B103	24	#6	STR.	19'-5"	528
* B104	20	#6	STR.	19'-0"	536
* B105	20	#6	STR.	18'-8"	548
* B106	20	#6	STR.	18'-3"	561
* B107	20	#6	STR.	17'-10"	571
* B108	20	#6	STR.	17'-7"	700
B109	62	#8	STR.	16'-0"	2,649
B110	62	#8	STR.	16'-5"	2,718
B111	24	#8	STR.	20'-8"	1,006
B112	20	#8	STR.	20'-3"	1,024
B113	20	#8	STR.	19'-11"	1,046
B114	20	#8	STR.	19'-7"	1,064
B115	20	#8	STR.	19'-2"	1,081
B116	20	#8	STR.	18'-10"	1,324
* G101	1	#5	STR.	35'-2"	37
* G102	1	#5	STR.	35'-11"	37
* G103	1	#5	STR.	37'-8"	39
* G104	1	#5	STR.	35'-4"	37
* D100	126	#6	STR.	5'-0"	946

APPROACH SLAB BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A2001	4	#5	STR.	3'-10"	16
* A2002	1	#5	STR.	4'-4"	5
* A2003	2	#5	STR.	5'-3"	11
* A2004	2	#5	STR.	7'-0"	15
* A2005	2	#5	STR.	8'-8"	18
* A2006	16	#5	STR.	9'-7"	160
* A2007	16	#5	STR.	13'-0"	217
* A2008	16	#5	STR.	16'-6"	275
* A2009	16	#5	STR.	19'-11"	332
* A2010	16	#5	STR.	23'-5"	391
* A2011	40	#5	STR.	25'-5"	1,060
* A2012	14	#5	STR.	22'-8"	331
* A2013	14	#5	STR.	19'-11"	291
* A2014	14	#5	STR.	17'-1"	249
* A2015	14	#5	STR.	14'-4"	209
* A2016	14	#5	STR.	11'-6"	168
* A2017	14	#5	STR.	8'-9"	128
* A2018	2	#5	STR.	8'-6"	18
* A2019	2	#5	STR.	6'-11"	14
* A2020	2	#5	STR.	5'-4"	11
* A2021	2	#5	STR.	3'-9"	8
* A2022	4	#5	STR.	3'-3"	14
* A2023	4	#5	STR.	3'-0"	13
* A2024	2	#5	STR.	4'-3"	9
* A2025	2	#5	STR.	5'-4"	11
* A2026	2	#5	STR.	6'-9"	14
* A2027	2	#5	STR.	8'-1"	17
* A2028	2	#5	STR.	9'-6"	20
* A2029	2	#5	STR.	10'-11"	23
* A2030	2	#5	STR.	12'-3"	26
* A2031	8	#5	STR.	9'-2"	76
* A2032	8	#5	STR.	10'-6"	88
* A2033	8	#5	STR.	11'-11"	99
* A2034	8	#5	STR.	13'-4"	111
* A2035	8	#5	STR.	14'-9"	123
* A2036	8	#5	STR.	16'-1"	134
* A2037	8	#5	STR.	17'-6"	146
* A2038	8	#5	STR.	18'-11"	158
* A2039	8	#5	STR.	20'-4"	170
* A2040	8	#5	STR.	21'-8"	181
* A2041	8	#5	STR.	23'-1"	193
* A2042	34	#5	STR.	23'-5"	830
* A2043	8	#5	STR.	22'-0"	184
* A2044	8	#5	STR.	20'-5"	170
* A2045	8	#5	STR.	18'-9"	156
* A2046	8	#5	STR.	17'-0"	142
* A2047	8	#5	STR.	15'-3"	127
* A2048	8	#5	STR.	13'-6"	113
* A2049	8	#5	STR.	11'-9"	98
* A2050	8	#5	STR.	10'-1"	84
* A2051	8	#5	STR.	8'-4"	70
* A2052	2	#5	STR.	9'-7"	20
* A2053	2	#5	STR.	7'-10"	16
* A2054	2	#5	STR.	6'-2"	13
* A2055	2	#5	STR.	4'-5"	9
* A2056	2	#5	STR.	2'-8"	6
* A2057	4	#5	STR.	2'-3"	9
A2058	4	#4	STR.	3'-10"	10
A2059	1	#4	STR.	4'-4"	3
A2060	2	#4	STR.	5'-3"	7
A2061	2	#4	STR.	7'-0"	9
A2062	2	#4	STR.	8'-8"	12
A2063	16	#4	STR.	9'-2"	98
A2064	16	#4	STR.	12'-7"	134
A2065	16	#4	STR.	16'-1"	172
A2066	16	#4	STR.	19'-6"	208
A2067	16	#4	STR.	23'-0"	246
A2068	40	#4	STR.	25'-6"	681
A2069	14	#4	STR.	22'-8"	212
A2070	14	#4	STR.	19'-11"	186

APPROACH SLAB BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2071	14	#4	STR.	17'-1"	160
A2072	14	#4	STR.	14'-4"	134
A2073	14	#4	STR.	11'-6"	108
A2074	14	#4	STR.	8'-9"	82
A2075	2	#4	STR.	9'-4"	12
A2076	2	#4	STR.	7'-9"	10
A2077	2	#4	STR.	6'-2"	8
A2078	2	#4	STR.	4'-7"	6
A2079	1	#4	STR.	3'-9"	3
A2080	5	#4	STR.	3'-3"	11
A2081	4	#4	STR.	3'-0"	8
A2082	2	#4	STR.	3'-4"	4
A2083	2	#4	STR.	4'-9"	6
A2084	2	#4	STR.	6'-1"	8
A2085	2	#4	STR.	7'-6"	10
A2086	2	#4	STR.	8'-11"	12
A2087	2	#4	STR.	10'-3"	14
A2088	8	#4	STR.	8'-2"	44
A2089	8	#4	STR.	9'-6"	51
A2090	8	#4	STR.	10'-11"	58
A2091	8	#4	STR.	12'-4"	66
A2092	8	#4	STR.	13'-9"	73
A2093	8	#4	STR.	15'-1"	81
A2094	8	#4	STR.	16'-6"	88
A2095	8	#4	STR.	17'-11"	96
A2096	8	#4	STR.	19'-4"	103
A2097	8	#4	STR.	20'-8"	110
A2098	8	#4	STR.	22'-1"	118
A2099	8	#4	STR.	23'-5"	125
A2100	34	#4	STR.	23'-10"	541
A2101	8	#4	STR.	22'-2"	118
A2102	8	#4	STR.	20'-5"	109
A2103	8	#4	STR.	18'-9"	100
A2104	8	#4	STR.	17'-0"	91
A2105	8	#4	STR.	15'-3"	81
A2106	8	#4	STR.	13'-6"	72
A2107	8	#4	STR.	11'-9"	63
A2108	8	#4	STR.	10'-1"	54
A2109	8	#4	STR.	8'-4"	45
A2110	2	#4	STR.	9'-7"	13
A2111	2	#4	STR.	7'-10"	10
A2112	2	#4	STR.	6'-2"	8
A2113	2	#4	STR.	4'-5"	6
A2114	2	#4	STR.	2'-8"	4
A2115	4	#4	STR.	2'-3"	6
* B201	58	#6	STR.	16'-0"	1,394
* B202	58	#6	STR.	16'-4"	1,423
* B203	56	#6	STR.	16'-8"	1,402
* B204	56	#6	STR.	17'-1"	1,437
* B205	8	#6	STR.	17'-4"	208
* B206	20	#6	STR.	17'-2"	516
* B207	20	#6	STR.	16'-10"	506
* B208	20	#6	STR.	16'-6"	496
* B209	20	#6	STR.	16'-2"	486
* B210	20	#6	STR.	15'-9"	473
* B211	20	#6	STR.	15'-5"	463
* B212	20	#6	STR.	15'-1"	453
* B213	20	#6	STR.	14'-9"	443
* B214	20	#6	STR.	14'-4"	431
* B215	20	#6	STR.	14'-0"	421
* B216	20	#6	STR.	13'-8"	411
B217	58	#8	STR.	16'-8"	2,581
B218	58	#8	STR.	17'-0"	2,633
B219	56	#8	STR.	17'-4"	2,592
B220	56	#8	STR.	17'-3"	2,642
B221	8	#8	STR.	18'-7"	397
B222	20	#8	STR.	18'-5"	983
B223	20	#8	STR.	18'-1"	966
B224	20	#8	STR.	17'-9"	948

APPROACH SLAB BAR SCHEDULE STAGE II

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B225	20	#8	STR.	17'-5"	930
B226	20	#8	STR.	17'-0"	908
B227	20	#8	STR.	16'-8"	890
B228	20	#8	STR.	16'-4"	872
B229	20	#8	STR.	16'-0"	854
B230	20	#8	STR.	15'-8"	837
B231	20	#8	STR.	15'-3"	814
B232	20	#8	STR.	14'-11"	797
* G201	2	#5	STR.	34'-0"	71
* G202	2	#5	STR.	34'-8"	72
* G203	2	#5	STR.	36'-1"	75
* G204	2	#5	STR.	33'-11"	71

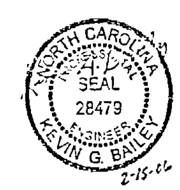
* DENOTES EPOXY COATED REINFORCING STEEL

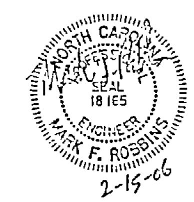
PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 4 OF 7





STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC.
CONSULTING ENGINEERS
P.O. BOX 35621 CHARLOTTE, N.C. 28235

DRAWN BY AJP DATE 1-06 DWG. NO.
CHECKED BY PEK DATE 1-06 D-1785.45

SHEET NO. S1-46
TOTAL SHEETS 53

APPROACH SLAB BAR SCHEDULE STAGE III

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A3001	4	#5	STR.	3'-5"	14
✳ A3002	1	#5	STR.	3'-11"	4
✳ A3003	2	#5	STR.	4'-9"	10
✳ A3004	2	#5	STR.	6'-6"	14
✳ A3005	2	#5	STR.	8'-6"	18
✳ A3006	16	#5	STR.	9'-6"	159
✳ A3007	16	#5	STR.	12'-11"	216
✳ A3008	16	#5	STR.	16'-5"	274
✳ A3009	16	#5	STR.	19'-10"	331
✳ A3010	30	#5	STR.	22'-1"	691
✳ A3011	14	#5	STR.	19'-2"	280
✳ A3012	14	#5	STR.	16'-5"	240
✳ A3013	14	#5	STR.	13'-6"	197
✳ A3014	14	#5	STR.	10'-9"	157
✳ A3015	14	#5	STR.	8'-0"	117
✳ A3016	2	#5	STR.	6'-11"	14
✳ A3017	2	#5	STR.	5'-4"	11
✳ A3018	2	#5	STR.	3'-9"	8
✳ A3019	4	#5	STR.	3'-3"	14
✳ A3020	4	#5	STR.	3'-6"	15
✳ A3021	2	#5	STR.	4'-2"	9
✳ A3022	2	#5	STR.	5'-6"	11
✳ A3023	2	#5	STR.	6'-11"	14
✳ A3024	2	#5	STR.	8'-4"	17
✳ A3025	2	#5	STR.	9'-8"	20
✳ A3026	2	#5	STR.	11'-1"	23
✳ A3027	8	#5	STR.	8'-7"	72
✳ A3028	8	#5	STR.	9'-11"	83
✳ A3029	8	#5	STR.	11'-4"	95
✳ A3030	8	#5	STR.	12'-9"	106
✳ A3031	8	#5	STR.	14'-2"	118
✳ A3032	8	#5	STR.	15'-6"	129
✳ A3033	8	#5	STR.	16'-11"	141
✳ A3034	8	#5	STR.	18'-4"	153
✳ A3035	8	#5	STR.	19'-8"	164
✳ A3036	8	#5	STR.	21'-1"	176
✳ A3037	8	#5	STR.	22'-5"	187
✳ A3038	54	#5	STR.	23'-7"	1,328
✳ A3039	8	#5	STR.	21'-11"	183
✳ A3040	8	#5	STR.	20'-2"	168
✳ A3041	8	#5	STR.	18'-5"	154
✳ A3042	8	#5	STR.	16'-8"	139
✳ A3043	8	#5	STR.	15'-0"	125
✳ A3044	8	#5	STR.	13'-3"	111
✳ A3045	8	#5	STR.	11'-6"	96
✳ A3046	8	#5	STR.	9'-9"	81
✳ A3047	8	#5	STR.	8'-0"	67
✳ A3048	2	#5	STR.	9'-2"	19
✳ A3049	2	#5	STR.	7'-6"	16
✳ A3050	2	#5	STR.	5'-9"	12
✳ A3051	2	#5	STR.	4'-0"	8
✳ A3052	4	#5	STR.	3'-0"	13
A3053	4	#4	STR.	3'-5"	9
A3054	1	#4	STR.	3'-11"	3
A3055	2	#4	STR.	4'-9"	6
A3056	2	#4	STR.	6'-6"	9
A3057	2	#4	STR.	8'-6"	11
A3058	16	#4	STR.	9'-1"	97
A3059	16	#4	STR.	12'-6"	134
A3060	16	#4	STR.	16'-0"	171
A3061	16	#4	STR.	19'-5"	208
A3062	30	#4	STR.	22'-1"	443
A3063	14	#4	STR.	19'-2"	179
A3064	14	#4	STR.	16'-5"	154
A3065	14	#4	STR.	13'-7"	127
A3066	14	#4	STR.	10'-9"	101
A3067	14	#4	STR.	8'-0"	75
A3068	2	#4	STR.	7'-9"	10
A3069	2	#4	STR.	6'-2"	8
A3070	2	#4	STR.	4'-7"	6

APPROACH SLAB BAR SCHEDULE STAGE III

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3071	1	#4	STR.	3'-9"	3
A3072	5	#4	STR.	3'-3"	11
A3073	4	#4	STR.	3'-0"	8
A3074	2	#4	STR.	3'-6"	5
A3075	2	#4	STR.	4'-11"	7
A3076	2	#4	STR.	6'-4"	8
A3077	2	#4	STR.	7'-8"	10
A3078	2	#4	STR.	9'-1"	12
A3079	2	#4	STR.	10'-6"	14
A3080	8	#4	STR.	8'-3"	44
A3081	8	#4	STR.	9'-8"	52
A3082	8	#4	STR.	11'-0"	59
A3083	8	#4	STR.	12'-5"	66
A3084	8	#4	STR.	13'-9"	73
A3085	8	#4	STR.	15'-3"	81
A3086	8	#4	STR.	16'-7"	89
A3087	8	#4	STR.	18'-0"	96
A3088	8	#4	STR.	19'-5"	104
A3089	8	#4	STR.	20'-10"	111
A3090	8	#4	STR.	22'-2"	118
A3091	58	#4	STR.	23'-7"	914
A3092	8	#4	STR.	21'-11"	117
A3093	8	#4	STR.	20'-2"	108
A3094	8	#4	STR.	18'-5"	98
A3095	8	#4	STR.	16'-8"	89
A3096	8	#4	STR.	15'-0"	80
A3097	8	#4	STR.	13'-3"	71
A3098	8	#4	STR.	11'-6"	61
A3099	8	#4	STR.	9'-9"	52
A3100	8	#4	STR.	8'-0"	43
A3101	2	#4	STR.	9'-2"	12
A3102	2	#4	STR.	7'-6"	10
A3103	2	#4	STR.	5'-9"	8
A3104	2	#4	STR.	4'-0"	5
A3105	4	#4	STR.	3'-6"	9
✳ B301	60	#6	STR.	14'-3"	1,284
✳ B302	60	#6	STR.	14'-7"	1,314
✳ B303	60	#6	STR.	14'-11"	1,344
✳ B304	20	#6	STR.	22'-8"	681
✳ B305	20	#6	STR.	22'-4"	671
✳ B306	20	#6	STR.	22'-0"	661
✳ B307	20	#6	STR.	21'-7"	648
✳ B308	20	#6	STR.	21'-3"	638
✳ B309	20	#6	STR.	20'-11"	628
✳ B310	20	#6	STR.	20'-7"	618
✳ B311	20	#6	STR.	20'-3"	608
✳ B312	20	#6	STR.	19'-10"	596
B313	60	#8	STR.	14'-10"	2,376
B314	60	#8	STR.	15'-2"	2,430
B315	60	#8	STR.	15'-6"	2,483
B316	20	#8	STR.	23'-11"	1,277
B317	20	#8	STR.	23'-7"	1,259
B318	20	#8	STR.	23'-3"	1,242
B319	20	#8	STR.	22'-10"	1,219
B320	20	#8	STR.	22'-4"	1,193
B321	20	#8	STR.	21'-9"	1,161
B322	20	#8	STR.	21'-1"	1,126
B323	20	#8	STR.	20'-5"	1,090
B324	20	#8	STR.	19'-8"	1,050
✳ G301	1	#5	STR.	51'-3"	53
✳ G302	1	#5	STR.	52'-7"	55
✳ G303	1	#5	STR.	54'-10"	57
✳ G304	1	#5	STR.	51'-5"	54

✳ DENOTES EPOXY COATED REINFORCING STEEL

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	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"		4'-7"	

APPROACH SLAB QUANTITIES FOR 2 APPROACH SLABS

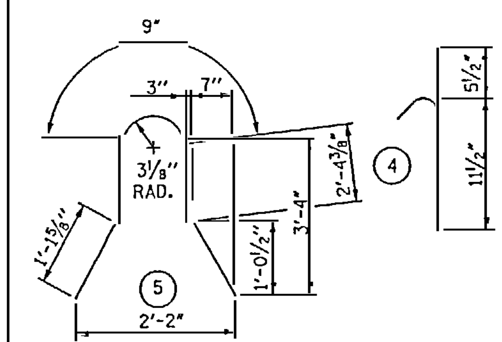
EPOXY COATED REINFORCING STEEL (LBS.)	STAGE I	11,835
	STAGE II	18,852
	STAGE III	16,732
	TOTAL	47,419
REINFORCING STEEL (LBS.)	STAGE I	14,755
	STAGE II	25,552
	STAGE III	22,305
	TOTAL	62,612
CONCRETE (CLASS AA) (CU. YD.)	STAGE I	73.6
	STAGE II	127.0
	STAGE III	113.0
	TOTAL	313.6

BILL OF MATERIAL
FOR CONCRETE MEDIAN BARRIER

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B11	12	#5	STR	27'-4"	342
✳ B12	24	#5	STR	19'-4"	484
✳ S11	124	#5	4	1'-5"	183
✳ S12	60	#5	5	7'-9"	485

✳ EPOXY COATED REINFORCING STEEL 1,494 LBS.
CLASS AA CONCRETE 9.4 CU. YDS.
CONCRETE MEDIAN BARRIER 63.1 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL (STAGE II)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B21	7	#5	STR	18'-7"	136
✳ B22	1	#5	(3)	13'-6"	14
✳ B23	7	#5	STR	19'-11"	145
✳ B24	1	#5	(3)	15'-5"	16
✳ S21	64	#5	STR	3'-3"	217
✳ S22	64	#5	(1)	4'-1"	273
✳ S23	36	#5	(2)	2'-3"	84

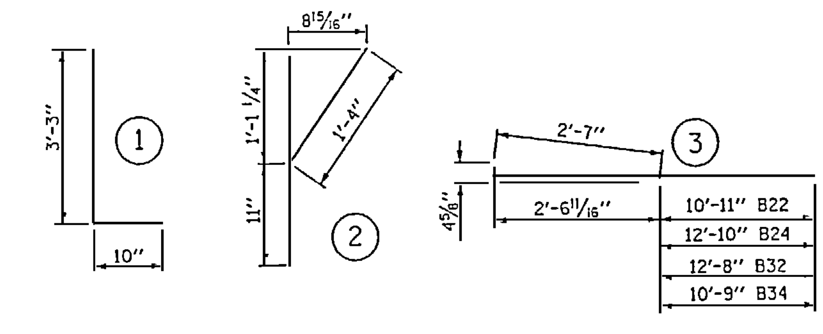
✳ EPOXY COATED REINFORCING STEEL 885 LBS.
CLASS AA CONCRETE 3.7 CU. YDS.
CONCRETE BARRIER RAIL 40.0 LIN. FT.

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL (STAGE III)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B31	7	#5	STR	19'-10"	145
✳ B32	1	#5	(3)	15'-3"	16
✳ B33	7	#5	STR	19'-2"	140
✳ B34	1	#5	(3)	13'-4"	14
✳ S31	64	#5	STR	3'-3"	217
✳ S32	64	#5	(1)	4'-1"	273
✳ S33	35	#5	(2)	2'-3"	82

✳ EPOXY COATED REINFORCING STEEL 887 LBS.
CLASS AA CONCRETE 3.7 CU. YDS.
CONCRETE BARRIER RAIL 40.0 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. I-4401
BUNCOMBE COUNTY
STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB

REVISIONS: NO. | BY | DATE — 1, 2, 3, 4

NORTH CAROLINA SEAL 28479 ENGINEER KEVIN G. BAILEY 2-15-06
NORTH CAROLINA SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

RALPH WHITEHEAD ASSOCIATES, INC. CONSULTING ENGINEERS P.O. BOX 35821 CHARLOTTE, N.C. 28235

DRAWN BY AJP DATE 1-06
CHECKED BY FEK DATE 1-06
DWG. NO. D-1735.47

SHEET NO. S1-47
TOTAL SHEETS 50

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, 4" 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 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF THE SLAB.

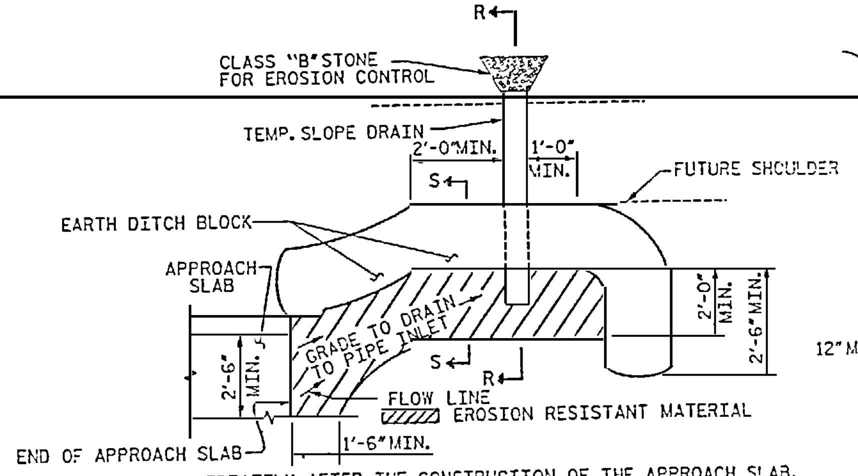
THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" 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 30 LB 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.

WITH EVAZOTE JOINT SEAL

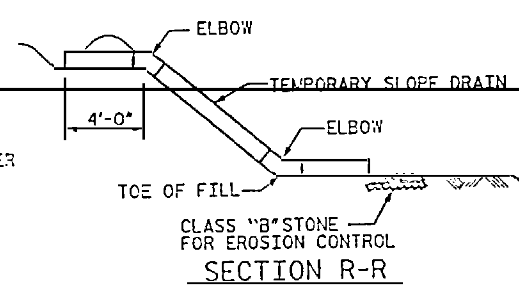
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 ½".

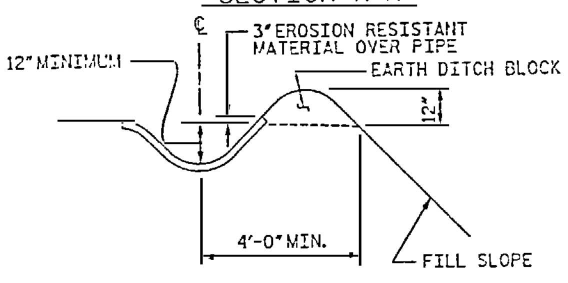


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" 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, 12 INCHES IN DIAMETER.

PLAN VIEW

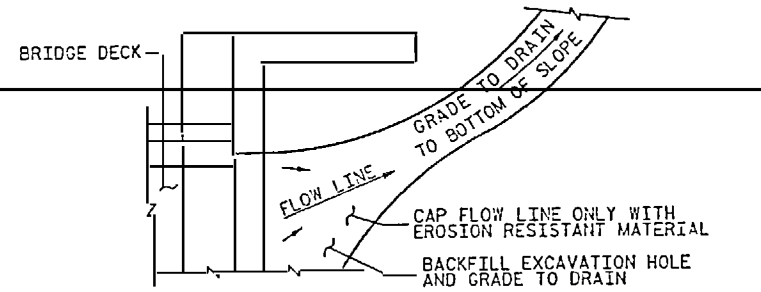


SECTION R-R



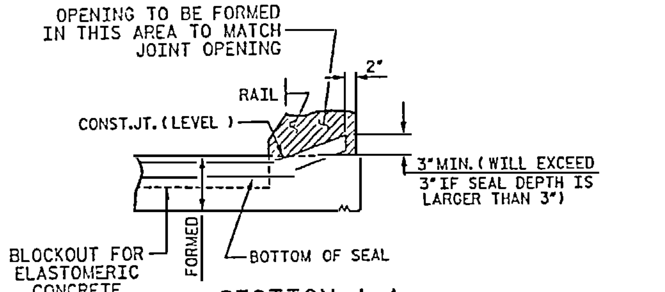
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

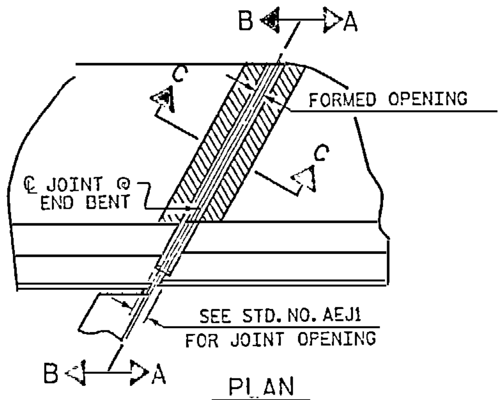


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

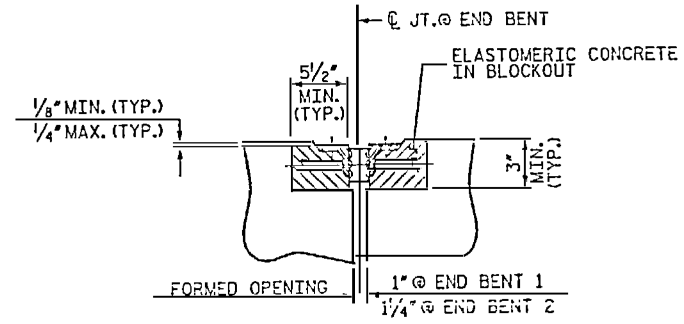
TEMPORARY DRAINAGE DETAIL



SECTION A-A

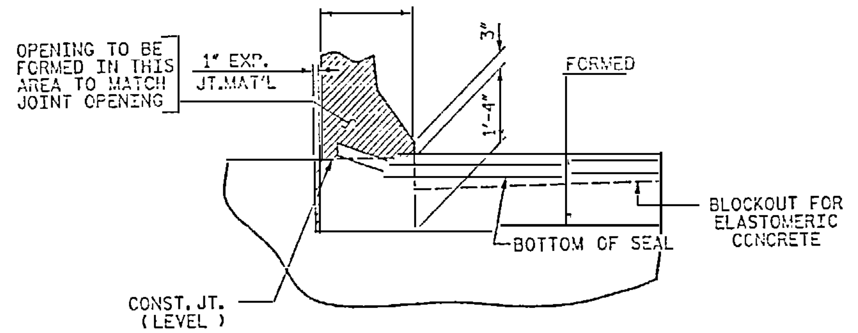


PLAN



SECTION C-C

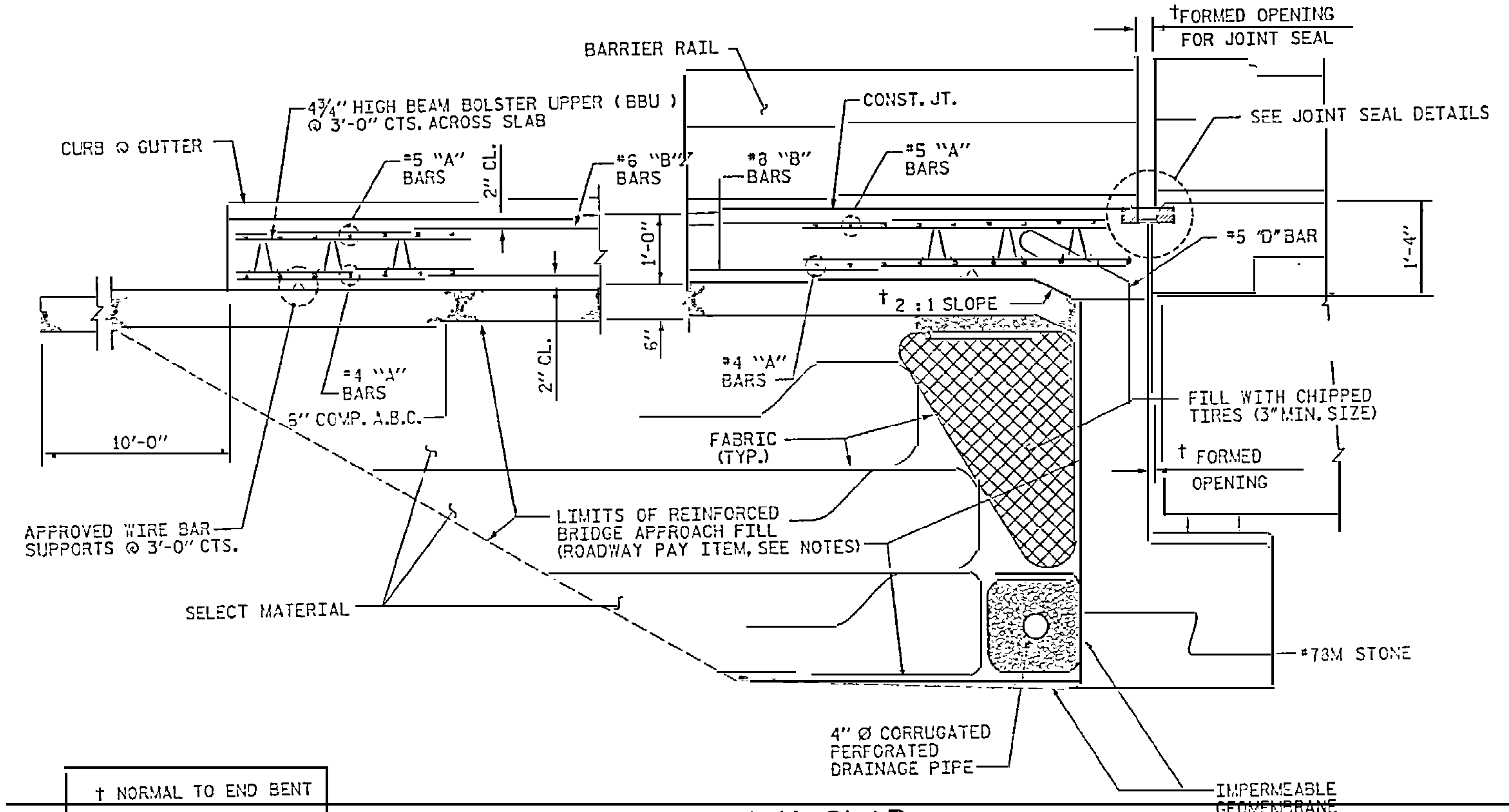
FOR DETAILS, SEE "STANDARD ARMORED EVAZOTE JOINT DETAILS"



SECTION B-B

JOINT SEAL DETAILS @ END BENT

(FOR BARRIER RAIL)



† NORMAL TO END BENT

SECTION THRU SLAB

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-
POC 19+55.81 -Y1-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS FOR RIGID PAVEMENT WITH BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G BAILEY 2-15-06

NORTH CAROLINA PROFESSIONAL SEAL 18165 ENGINEER MARK F. ROBBINS 2-15-06

TAYLOR & MURPHY

FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

D-1785.48

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S1-43
1			3					TOTAL SHEETS
2			4					50

STD. NO. BAS2

ASSEMBLED BY : AJP DATE : 1/06
CHECKED BY : FEK DATE : 1/06
DRAWN BY : LES 8/01
CHECKED BY : RDR 9/01
REV. 5/1/03R RWW/JTE

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NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

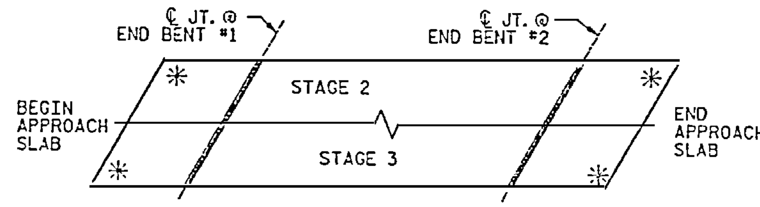
THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

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 7/8" 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.

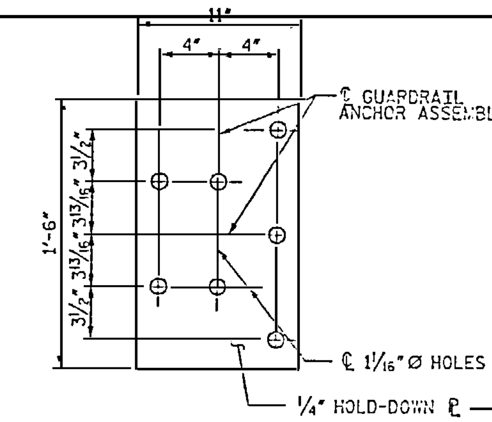
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE BID FOR BRIDGE APPROACH SLABS.

THE 1 1/4" 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.

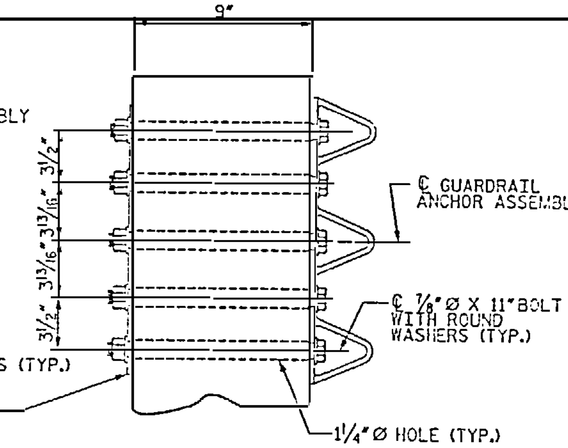


SKETCH SHOWING POINTS OF ATTACHMENT

* INDICATES POINTS OF ATTACHMENT

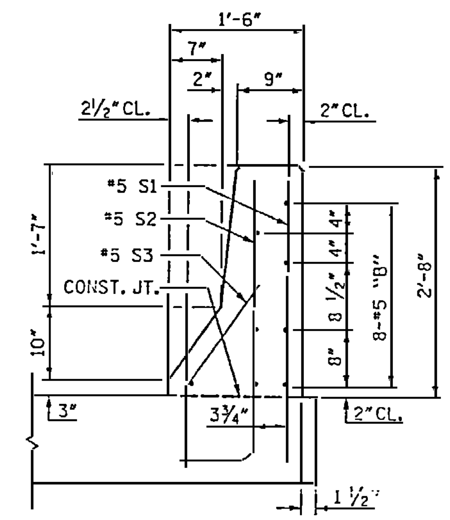


PLAN

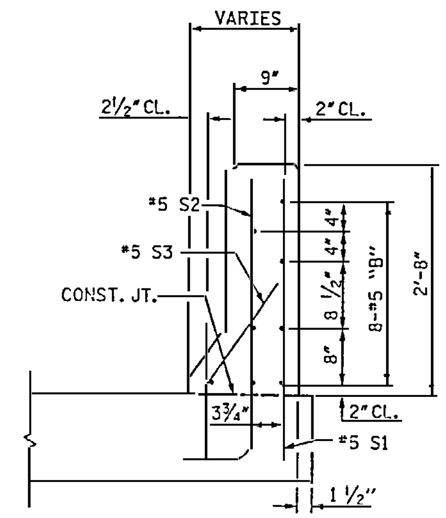


SECTION E-E

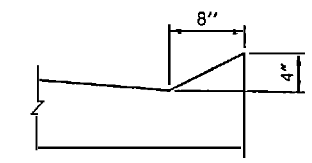
GUARDRAIL ANCHOR ASSEMBLY DETAILS



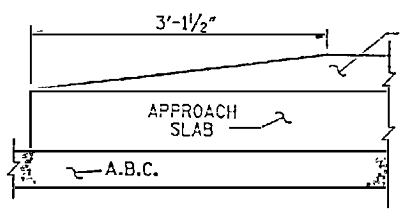
SECTION K-K



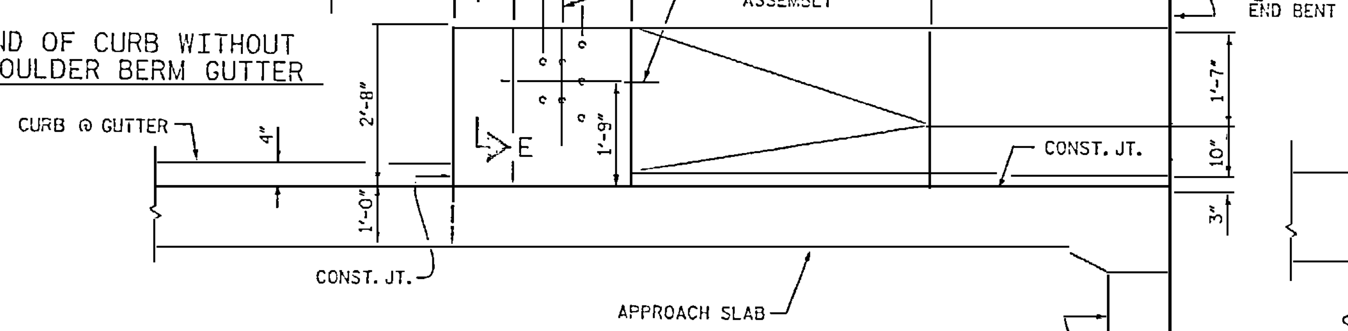
SECTION L-L



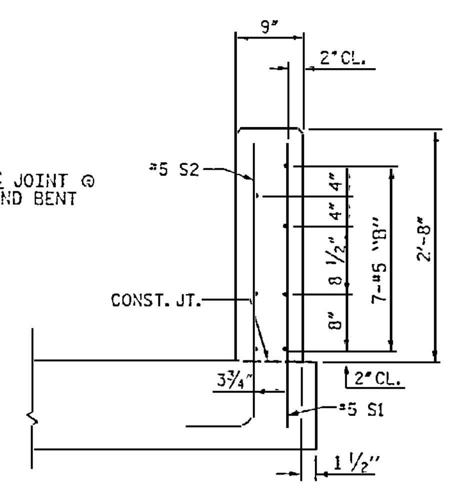
SECTION N-N



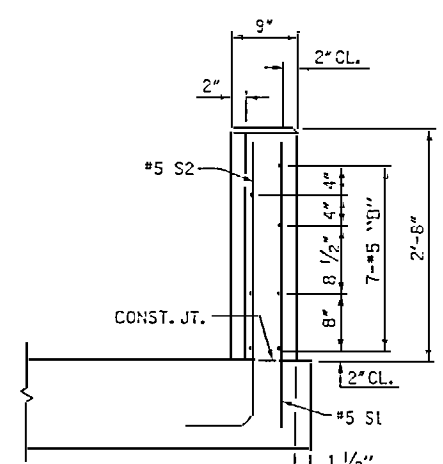
END OF CURB WITHOUT SHOULDER BERM GUTTER



ELEVATION



SECTION M-M



END VIEW

PROJECT NO. I-4401

BUNCOMBE COUNTY

STATION: POT 139+54.31 -L-

POC 19+55.81 -Y1-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS FOR RIGID PAVEMENT WITH BARRIER RAIL

D-1785.49

ASSEMBLED BY : VJP DATE : 1/06
CHECKED BY : RFK DATE : 1/06
DRAWN BY : LES 9/01
CHECKED BY : RDR 8/01
REV. 5/1/03R RAN/JTE

TAYLOR & MURPHY

FLORENCE & HUTCHESON INC. CONSULTING ENGINEERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-49
1			3			TOTAL SHEETS
2			4			50

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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 36 -	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60 - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - - - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS - - - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT. (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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" 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 1/4" 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 12" 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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" 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 1072-11.

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 1/16 INCH 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.

ENGLISH

JANUARY, 1990

STD. NO. SN