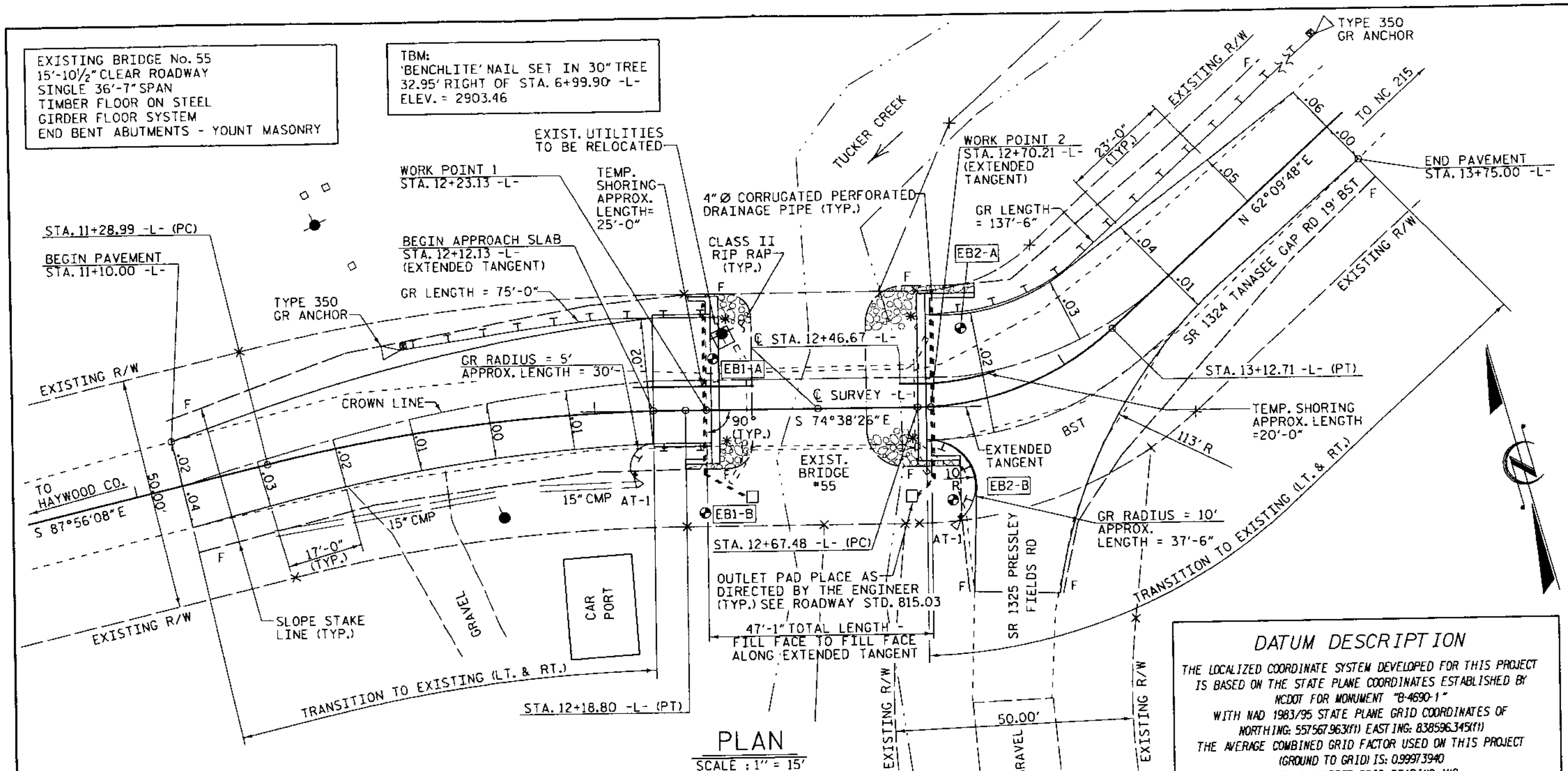
B-4690

#55 TRANSYLVANIA

F. A. PROJ. NO. PFH-150(1)

EXISTING BRIDGE No. 55
15'-10½" CLEAR ROADWAY
SINGLE 36'-7" SPAN
TIMBER FLOOR ON STEEL
GIRDER FLOOR SYSTEM
END BENT ABUTMENTS - YOUNT MASONRY

TBM:
'BENCHLITE' NAIL SET IN 30" TREE
32.95' RIGHT OF STA. 6+99.90 -L-
ELEV. = 2903.46



PLAN
SCALE : 1" = 15'

HORIZONTAL CURVE DATA

PI STA. 11+74.10 -L-	PI STA. 12+91.23 -L-
Δ = 13°17'43" (RT)	Δ = 43°11'47" (LT)
D = 14°48'18"	D = 95°29'35"
L = 89.80'	L = 45.24'
R = 387'	R = 60'

DENOTES GEO-TECH BORE HOLE LOCATIONS.

* DENOTES B-77 GUARDRAIL ANCHORAGE REQ'D.. SEE "GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET.

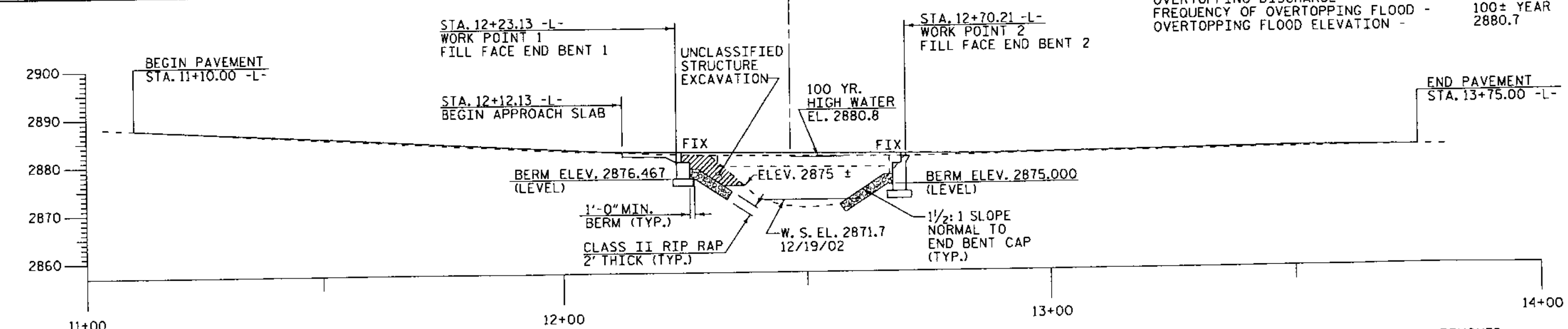
NOTE: GUARDRAIL LENGTHS AS SHOWN INCLUDE ANCHOR UNITS.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4690-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 557567.963(ft) EASTING: 838596.345(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99973940
THE NC LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4690-1" TO -L- STATION 11+00.00 IS S 86°18'32" E 372.83'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GRADE DATA -L- (SR 1324)

	(-) 5.3442%	(-) 5.5020%	(-) 1.3693%	(+) 0.9203%	(-) 0.5812%
STA. 11+10.00 ELEV. 2887.63'	STA. 11+50.00 ELEV. 2885.49'	STA. 12+10.00 ELEV. 2882.19' V.C.= 30'	STA. 12+85.00 ELEV. 2881.17'	STA. 13+50.00 ELEV. 2881.76'	STA. 13+75.00 ELEV. 2881.62'



PROFILE ALONG © SURVEY
SCALE : 1" = 15'

DENOTES ROADWAY FILL TO BE REMOVED

HYDROGRAPHIC DATA:

DESIGN DISCHARGE -	1400 CFS
FREQUENCY OF DESIGN FLOOD -	25 YEAR
DESIGN HIGH WATER ELEVATION -	2878.2
DRAINAGE AREA -	5.5 SQ. MI.
BASIC DISCHARGE (Q 100) -	2200 CFS
BASIC HIGH WATER ELEVATION -	2880.8

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE -	2200± CFS
FREQUENCY OF OVERTOPPING FLOOD -	100± YEAR
OVERTOPPING FLOOD ELEVATION -	2880.7

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT CORED SLAB UNITS HAVE BEEN DESIGNED FOR HS 25.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE AS DESCRIBED ON THIS SHEET AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR THE DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY 2001.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1, OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "STRUCTURE REMOVAL."

THE REQUIRED BEARING CAPACITY OF THE SPREAD FOOTINGS AT END BENTS 1 & 2 IS 4 TSF (8 KSF). THE REQUIRED BEARING CAPACITY SHALL BE VERIFIED.

FOOTINGS SHALL BE KEYED AT LEAST 12" INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

ADT = 540 FOR YEAR 2005.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR TEMPORARY SHORING, SEE SPECIAL PROVISIONS.

THE QUANTITY OF RIP RAP TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF TONS OF EACH CLASS OF RIP RAP WHICH HAS BEEN INCORPORATED INTO THE COMPLETED AND ACCEPTED WORK. THE RIP RAP WILL BE MEASURED BY BEING WEIGHED IN TRUCKS ON CERTIFIED PLATFORM SCALES OR OTHER CERTIFIED WEIGHING DEVICES. THE QUANTITY OF RIP RAP WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON:

RIP RAP CLASS II (2'-0" THICK)		
	END BENT No. 1	50 TONS
	END BENT No. 2	65 TONS
	TOTAL	140 TONS

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19661 KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		1
1			3				TOTAL SHEETS
2			4				27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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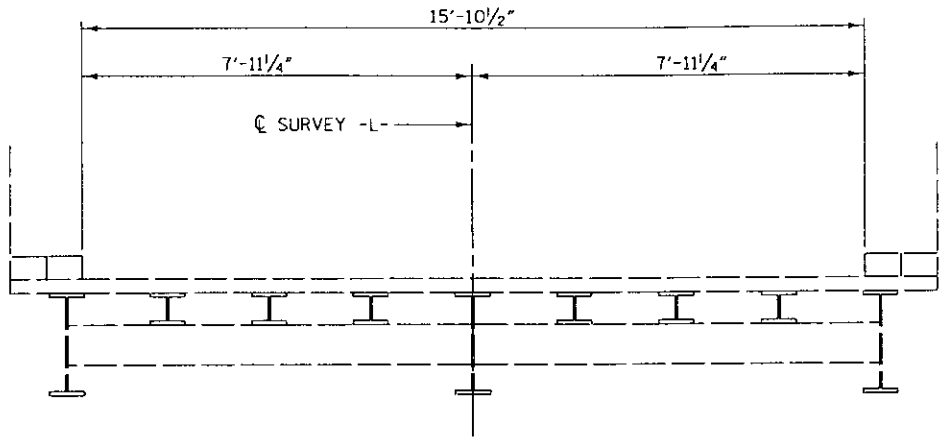
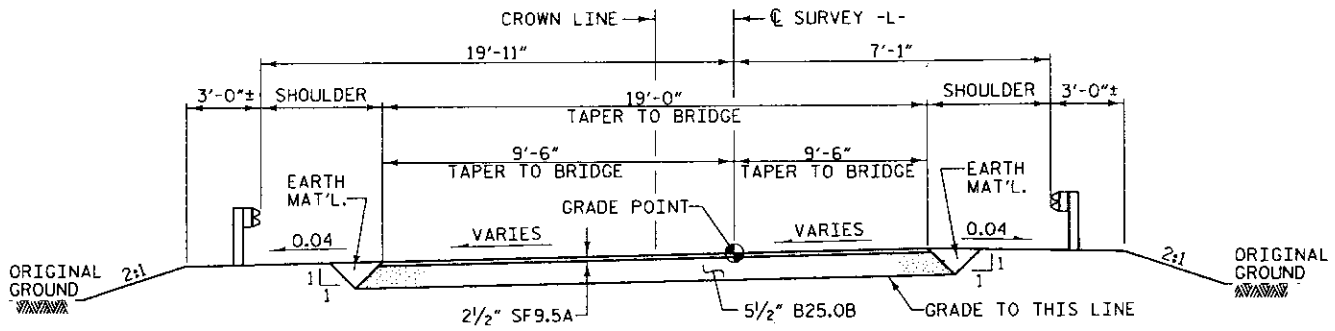
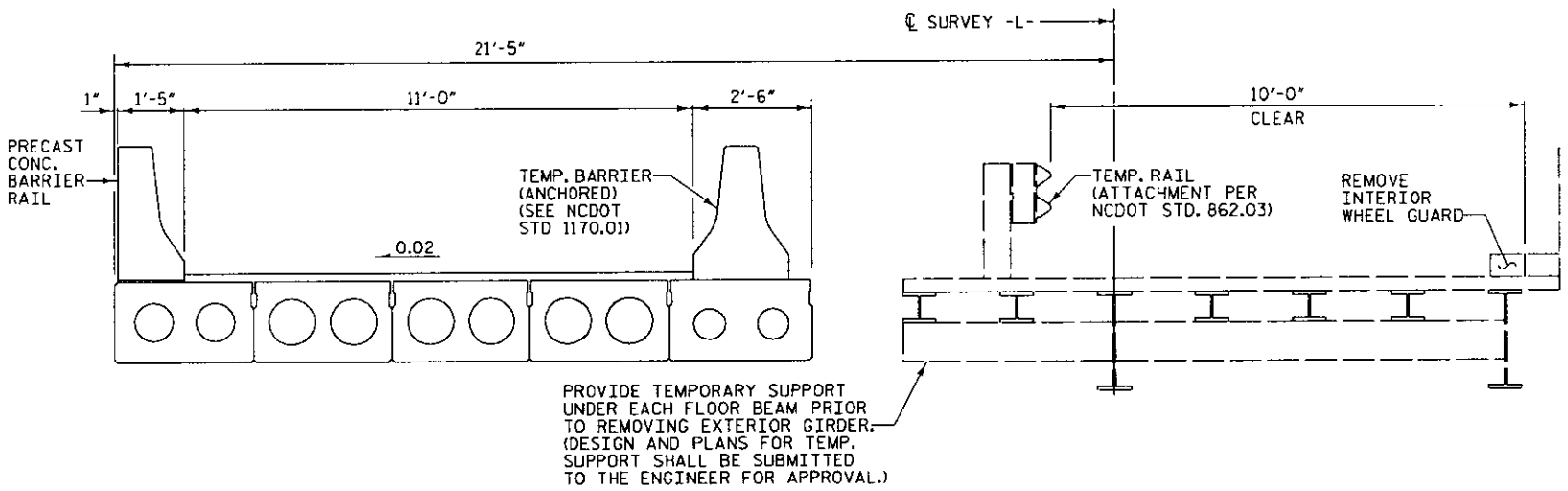


EXISTING BRIDGE

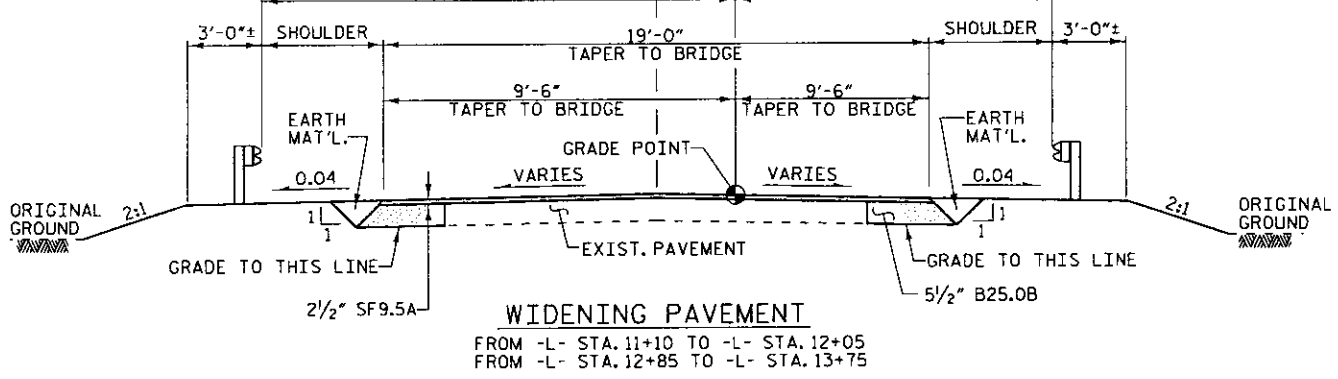


FULL DEPTH PAVEMENT

FROM -L- STA. 12+05 TO BEGIN BRIDGE
FROM END BRIDGE TO -L- STA. 12+85



STAGE 1 CONSTRUCTION

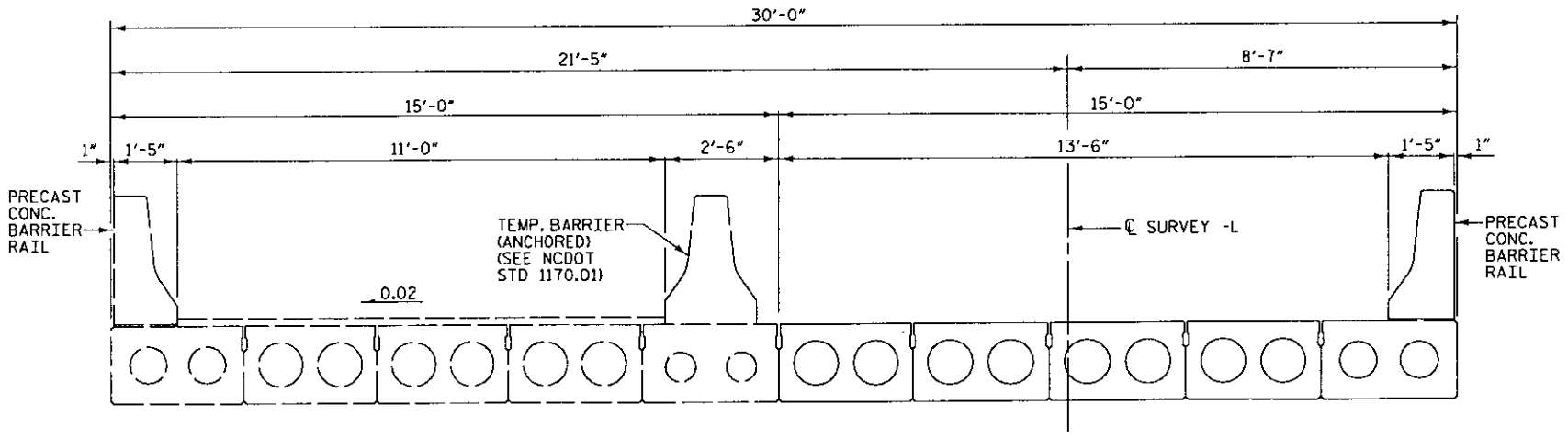


WIDENING PAVEMENT

FROM -L- STA. 11+10 TO -L- STA. 12+05
FROM -L- STA. 12+85 TO -L- STA. 13+75

TYPICAL ROADWAY SECTION

WITHIN CONSTRUCTION LIMITS



STAGE 2 CONSTRUCTION

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

NORTH CAROLINA PROFESSIONAL 1966 ENGINEER KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 93187
Raleigh, N.C. 27624
(919) 851-1912
(919) 851-1917 FAX
WWW.MULKEYINC.COM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING AND TYPICAL ROADWAY SECTION

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	2
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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8/23/99

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	B-4690	3

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2905 2900 2895 2890 2885 2880 2875

EXIST. R/W

CROWN LINE

2885.495

0.020

0.016

2885.27

2.5%

2.5%

EOP

EOP

S.S. 2884.58

S.S. 2884.95

11+50.00

BEGIN PAVEMENT
-L- STA 11+10.00

2888.22

11+00.00

-L-

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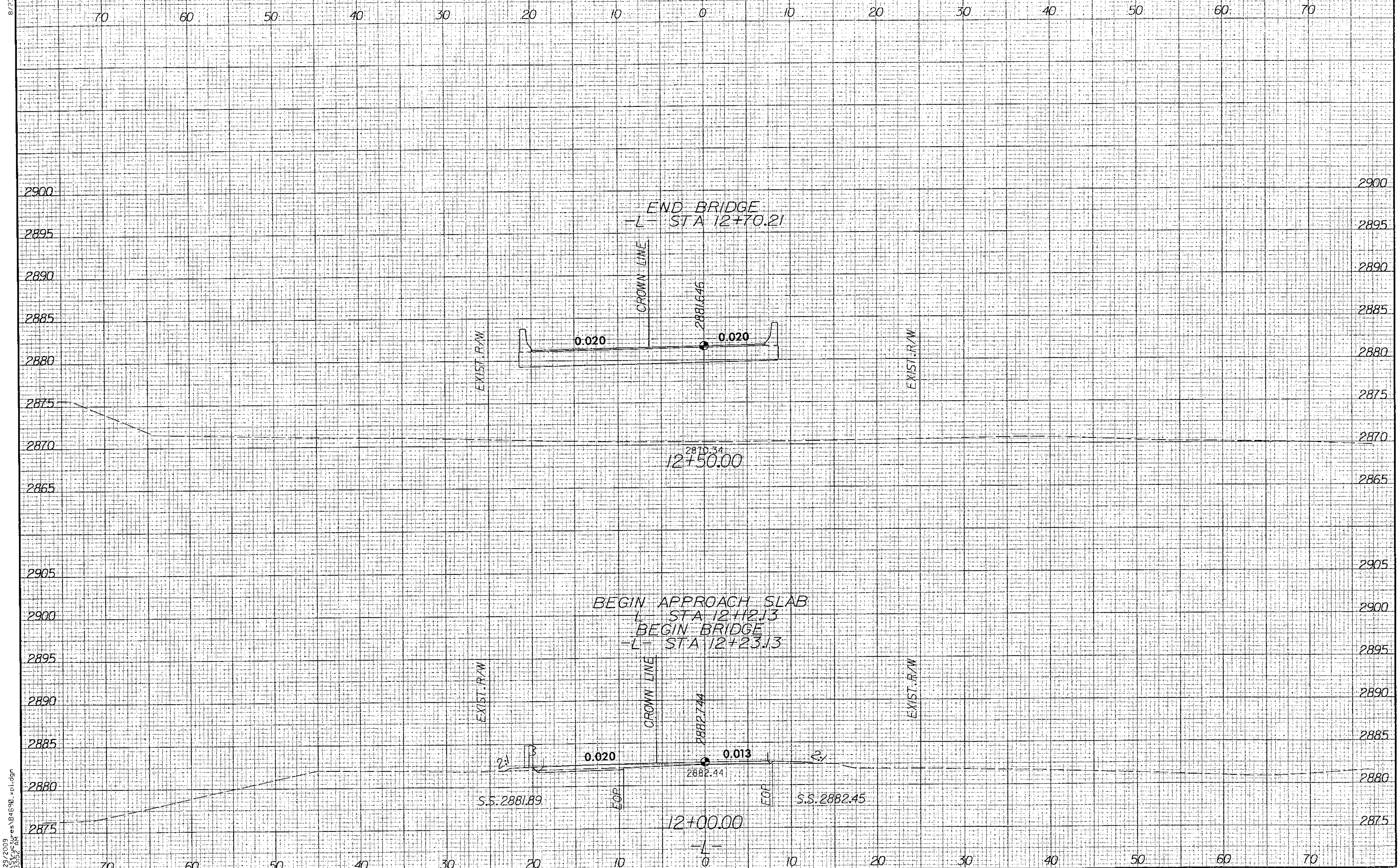

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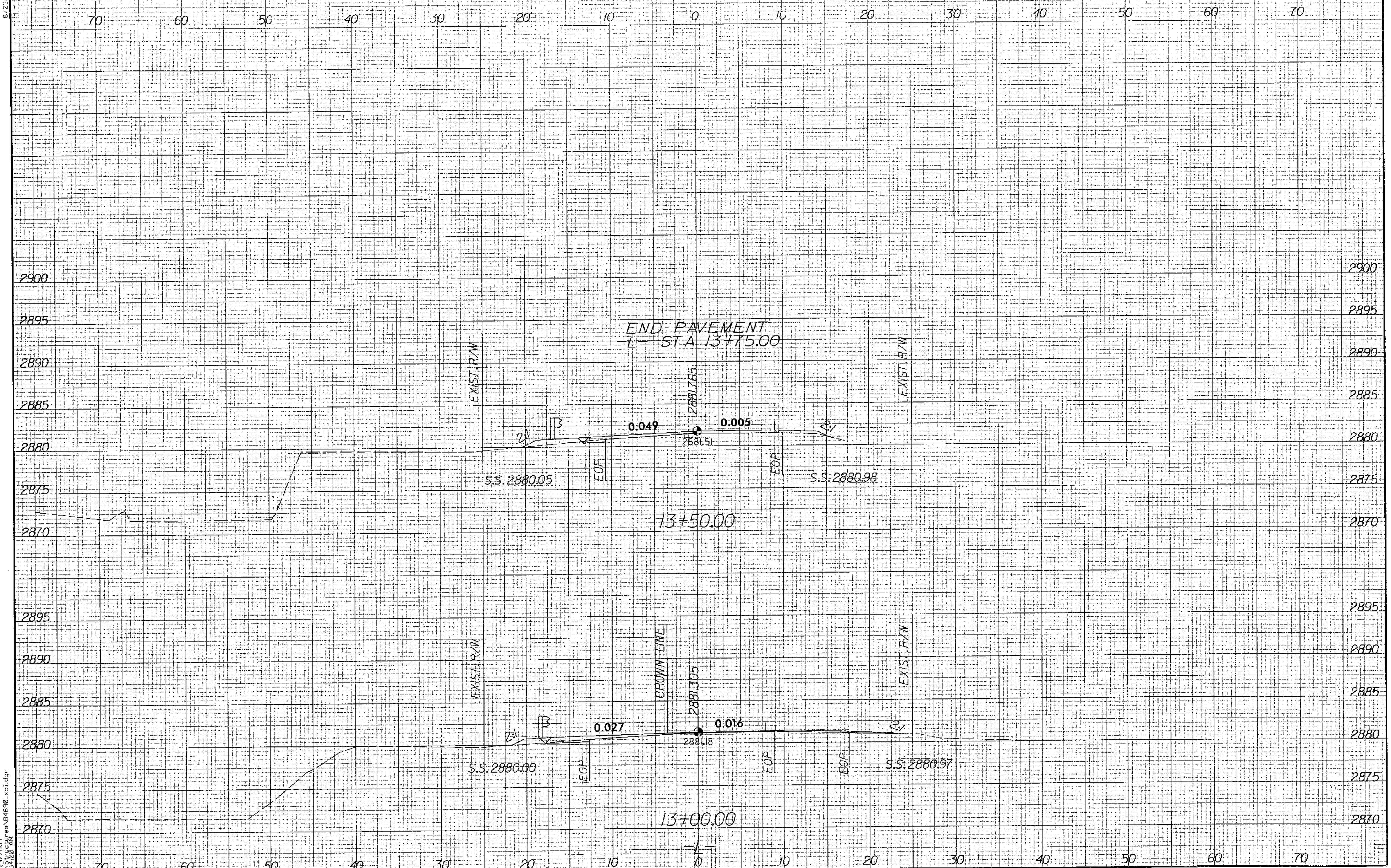

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9/29/2009

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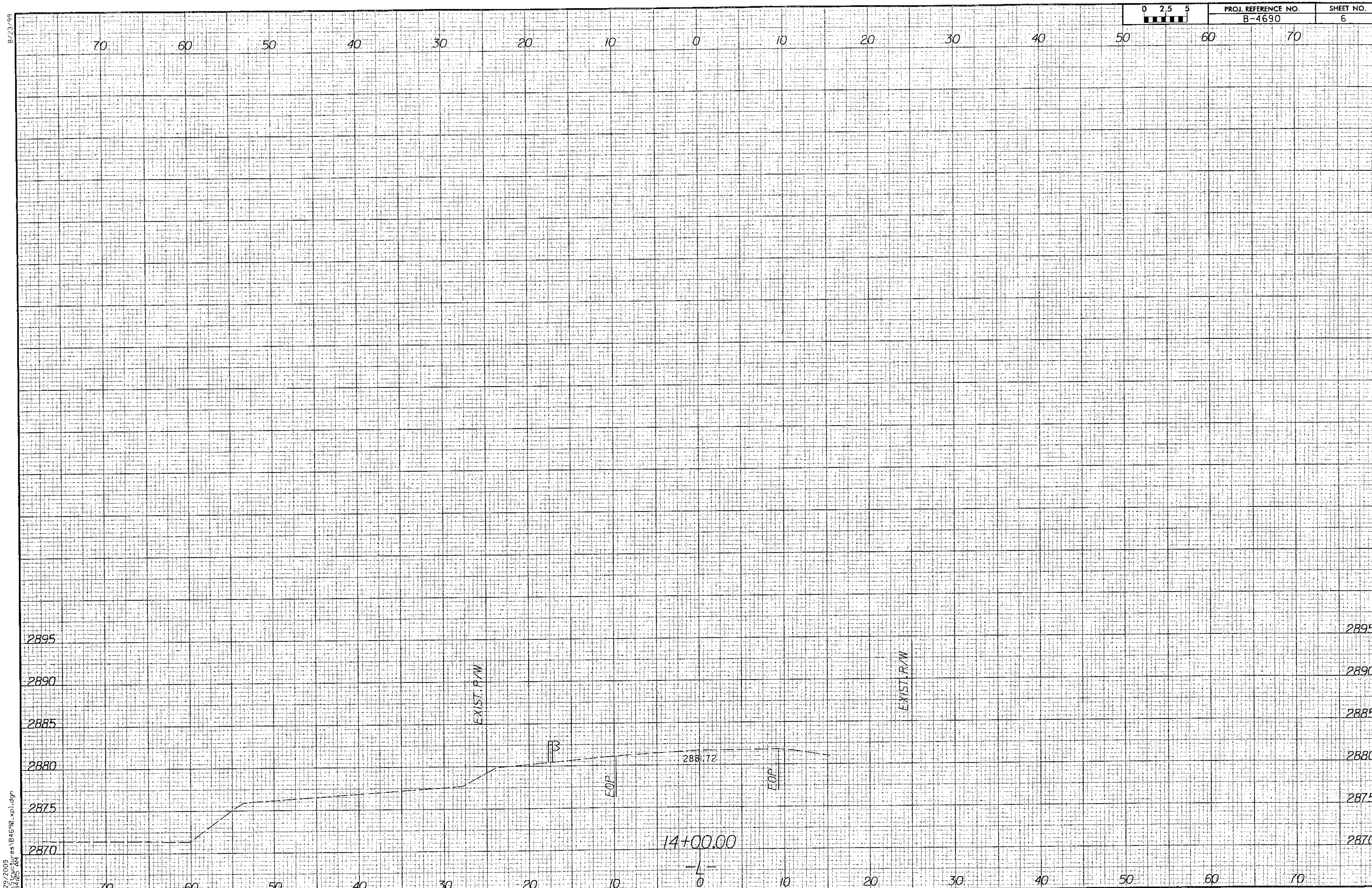

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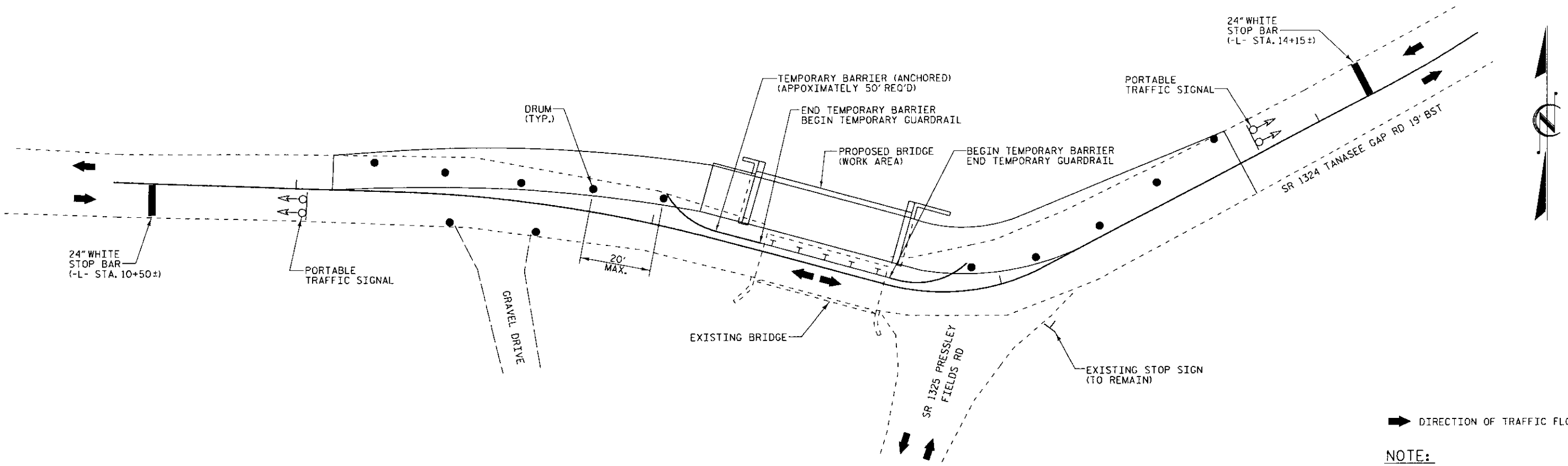
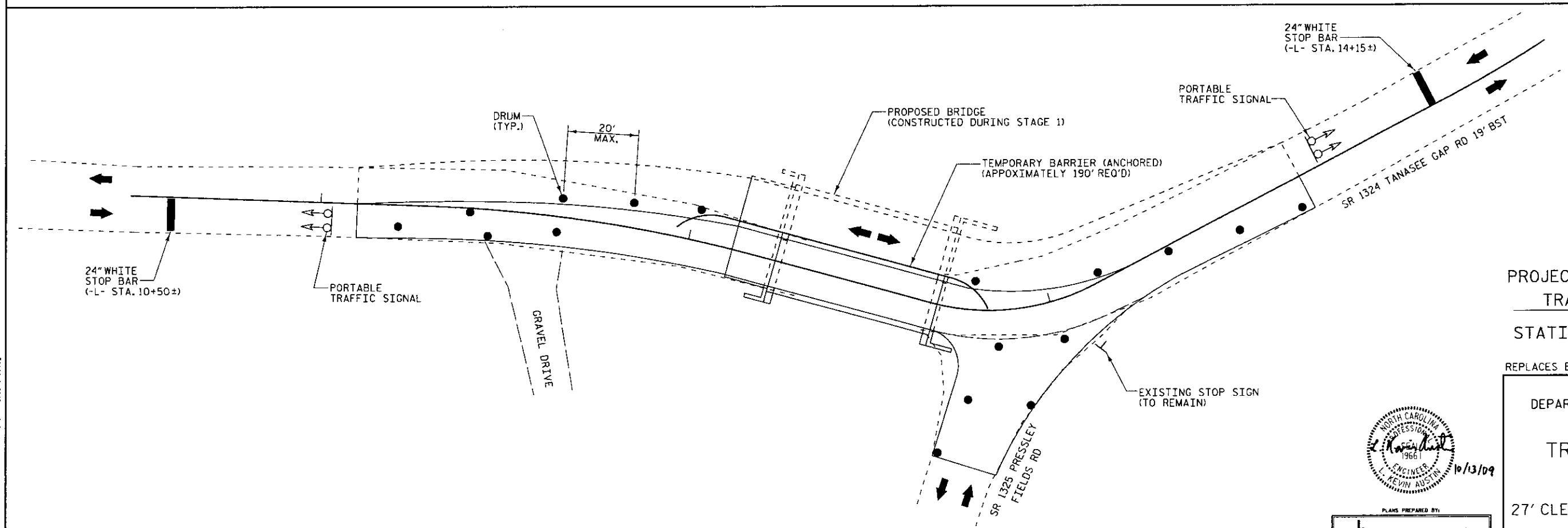


STAGE I CONSTRUCTION

DIRECTION OF TRAFFIC FLOW

NOTE:

FOR LOCATION OF PORTABLE SIGNS AND DETAILS SEE "TEMPORARY LANE CLOSURES USING PORTABLE TRAFFIC SIGNAL" SHEET.



STAGE II CONSTRUCTION

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TRAFFIC CONTROL DETAILS

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER 1966 L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1212
(919) 851-1818 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	7
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L.K. AUSTIN DATE : 5/09

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PROJ. REFERENCE NO.	SHEET NO.
B-4690	8

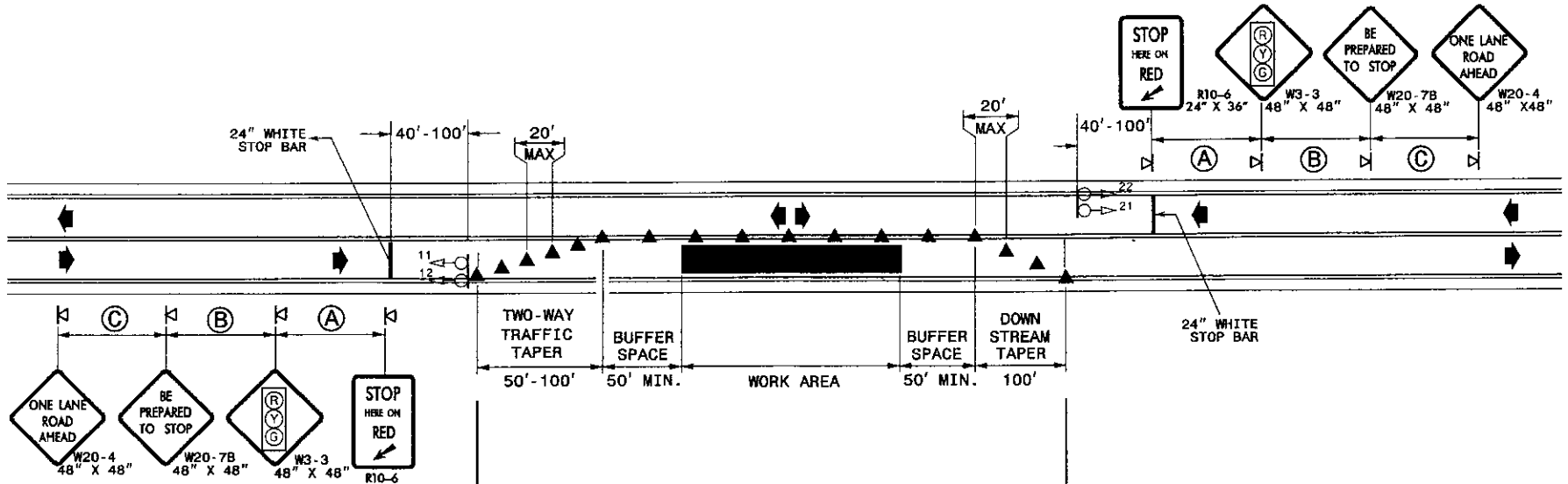
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

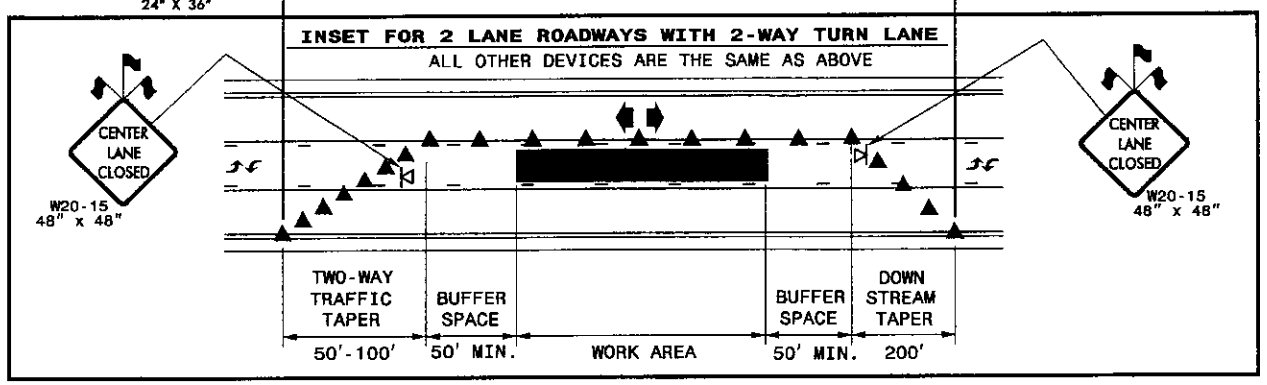
TEMPORARY LANE CLOSURES

USING PORTABLE TRAFFIC SIGNAL

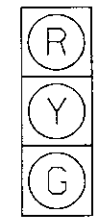
SHEET 1 OF 1



INSET FOR 2 LANE ROADWAYS WITH 2-WAY TURN LANE
ALL OTHER DEVICES ARE THE SAME AS ABOVE



SIGNAL FACE I.D.



11, 12
21, 22

PHASING DIAGRAM

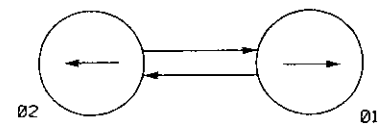


TABLE OF OPERATION			
SIGNAL FACE	PHASE 2	PHASE 1	FLASH
11 · 12	R	G	R
21 · 22	G	R	R

LEGEND

- WARNING FLAGS
- CONE
- TRAFFIC SIGNAL HEAD
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

GENERAL NOTES

-REFER TO STD. DWG. 1101.11-SHEET 4, FOR SIGN SPACING.
-INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.
-REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
-PLACE CONES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
-EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE STOP BAR. (REFER TO STD. DWG. 1101.11-SHEET 2)
-DRUMS MAY BE USED IN LIEU OF CONES.
-USE STD. DWG. 1705.01 SHEET 2 OF 2 WHEN CLEARING FROM ONE PHASE TO ANOTHER.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY LANE CLOSURES

USING PORTABLE TRAFFIC SIGNAL

SHEET 1 OF 1

APPROVED: M M McDiarmid DATE: 5/25/2006

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025895 ENGINEER MEREDITH M. McDIARMID

TEMPORARY LANE CLOSURES
USING PORTABLE TRAFFIC SIGNALS

SCALE:	NONE
DATE:	5/25/2006
DWG. BY:	
DESIGN BY:	
REVIEWED BY:	JPG

REVISIONS

CADD FILE

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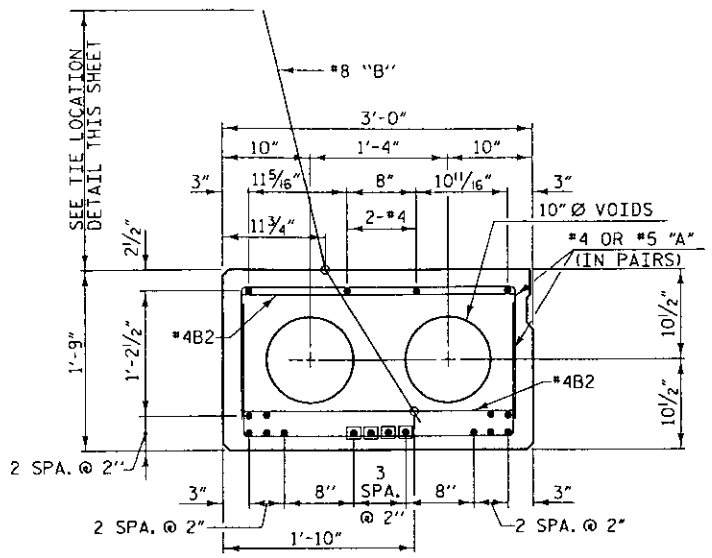
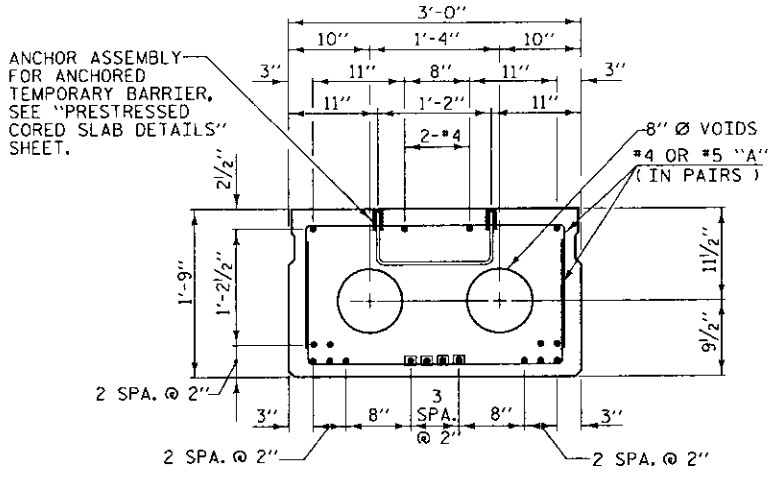


45' SPAN

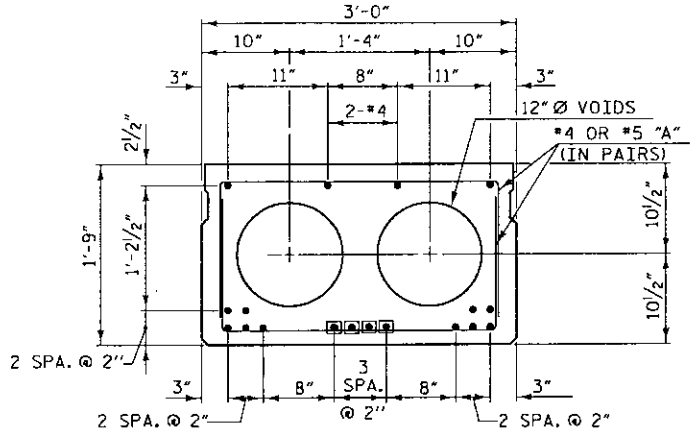
16 - 0.6" Ø L.R. STRANDS
EXTERIOR SLAB SECTIONS



45' SPAN

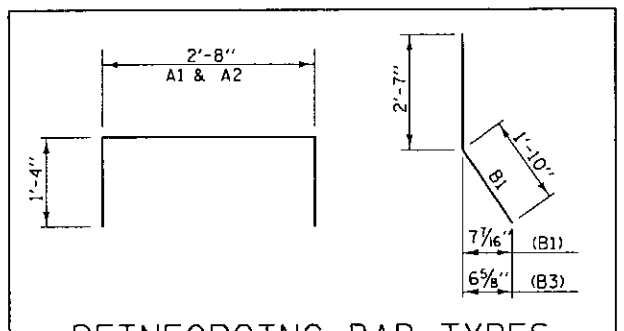
16 - 0.6" Ø L.R. STRANDS
INTERIOR SLAB SECTION
(CORED SLAB UNIT #5)

● DENOTES SHEATHED STRAND
(SEE SHEATH CHART)



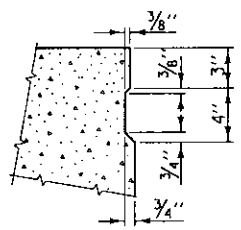
45' SPAN

16 - 0.6" Ø L.R. STRANDS
INTERIOR SLAB SECTION



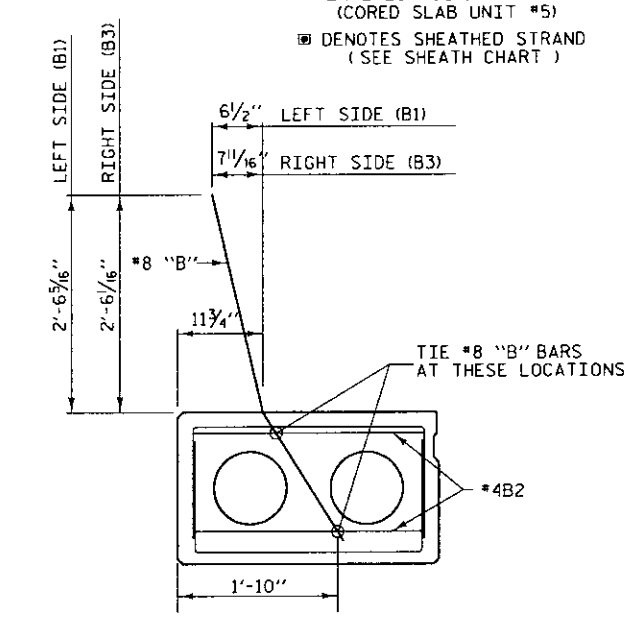
REINFORCING BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT

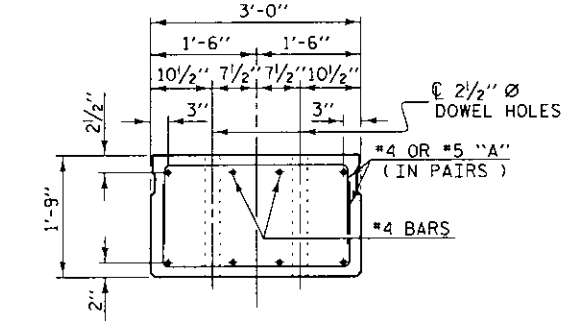


SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE OF EXTERIOR CORED SLAB



TIE LOCATION FOR #8 "B" BARS

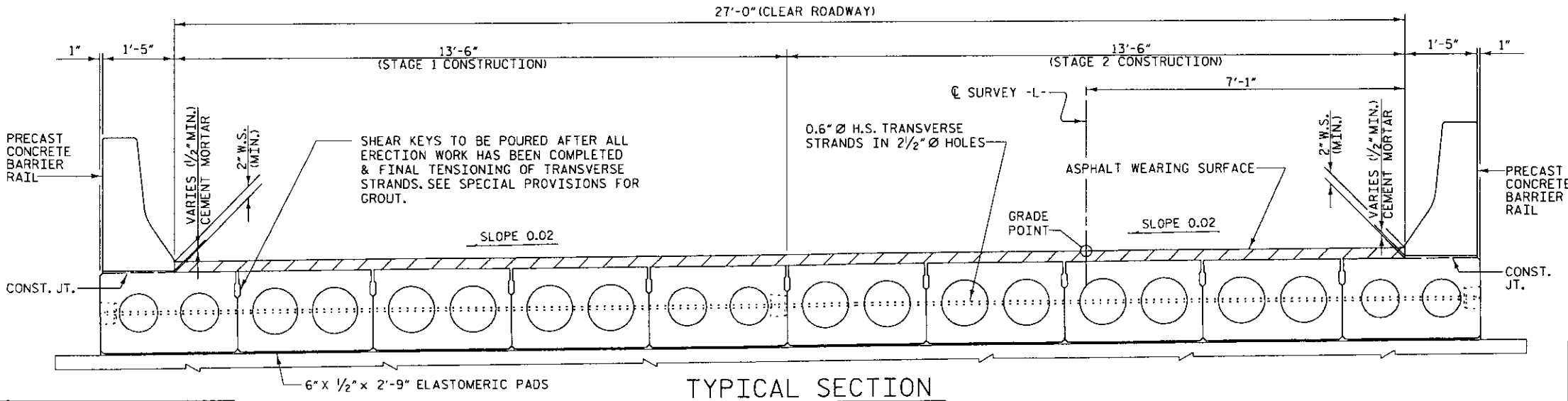


SLAB END ELEVATION

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. SEE SPECIAL PROVISIONS.

SHEATH CHART		
SPAN LENGTH	NUMBER OF SHEATHED STRANDS PER EXTERIOR SLAB SECTIONS	NUMBER OF SHEATHED STRANDS PER INTERIOR SLAB SECTIONS
45'	4	4

BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF SLAB



TYPICAL SECTION

GENERAL NOTES

CONCRETE = f'c - 6000psi (MIN. COMP. STRENGTH @ 28 DAYS).

f'ci - 4500psi (MIN. COMP. STRENGTH @ TRANSFER OF STRESSING FORCE).

SIZE	TYPE	AREA	ULTIMATE STR.	APPLIED FORCE
0.6" Ø	LOW RELAX.	0.217 SQ. IN. PER CABLE	58,600 LBS.	43,950 LBS. PER CABLE

STRUCTURAL STEEL ITEMS SHALL BE OF A GRADE CONFORMING TO EITHER ASTM A36 OR A373, EXCEPT HIGH STRENGTH BOLTS. HIGH STRENGTH BOLTS SHALL BE ASTM A325. ALL STRUCTURAL STEEL SHALL BE GALVANIZED AS PER THE SPECIFICATION.

ALL MATERIAL AND WORKMANSHIP SHALL COMPLY WITH THE APPLICABLE REQUIREMEMNTS OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OF THE NC DEPARTMENT OF TRANSPORTATION DATED JULY 2006 AND WITH THE SPECIAL PROVISIONS.

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF SUPERSTRUCTURE.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER , SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS. THE JOINT SHALL BE FILLED WITH GROUT.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾".

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR DEFLECTION TABLE, SEE "PRECAST CONCRETE BARRIER RAIL SECTIONS" SHEET.

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CORED SLAB 45' SPAN

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19661 L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:

MULKEY ENGINEERS & CONSULTANTS
PO Box 83127
Raleigh, NC 27838
(919) 851-1918
(919) 851-1919 (FAX)
www.mulkeyinc.com

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	9
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/04

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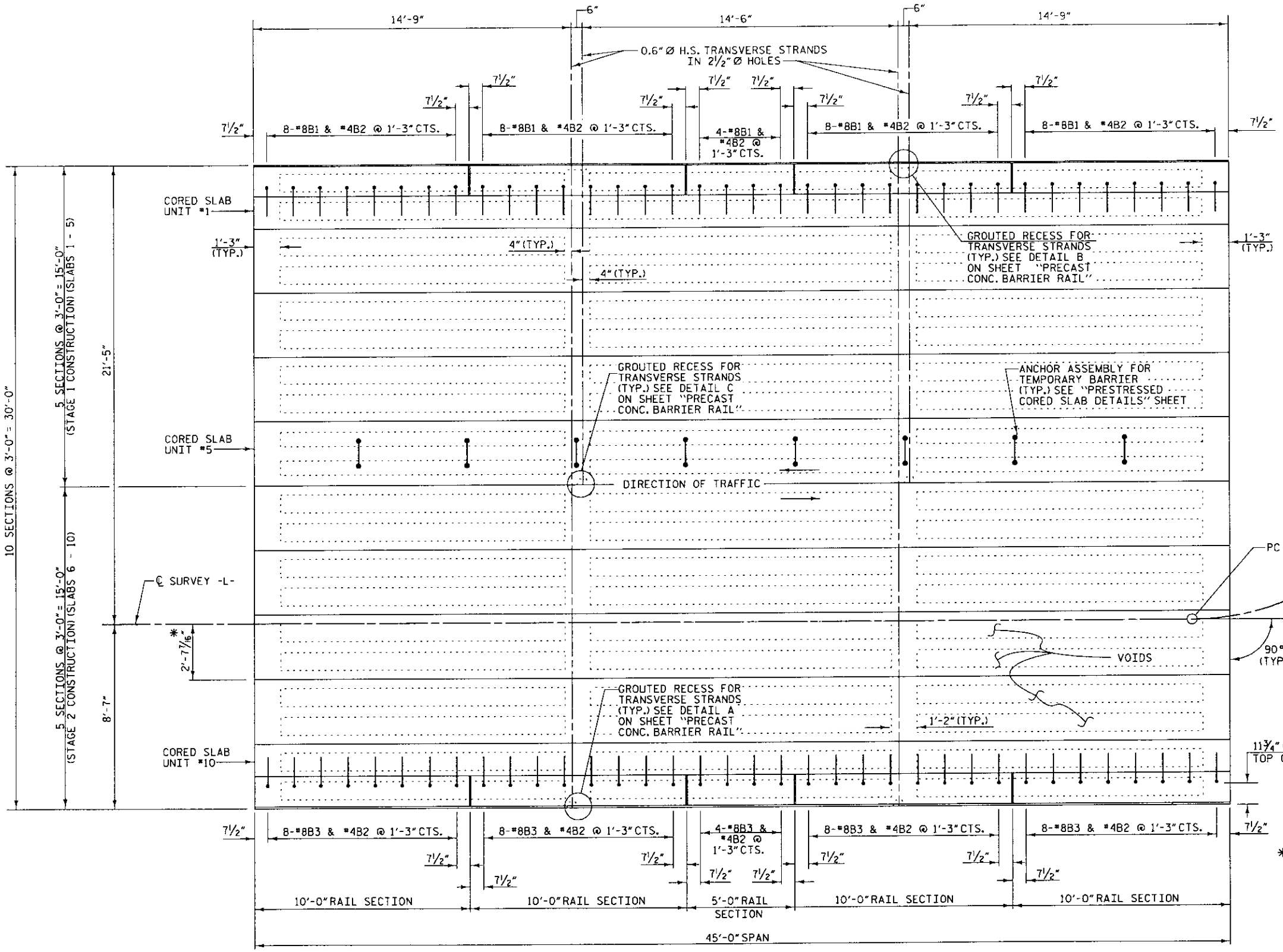
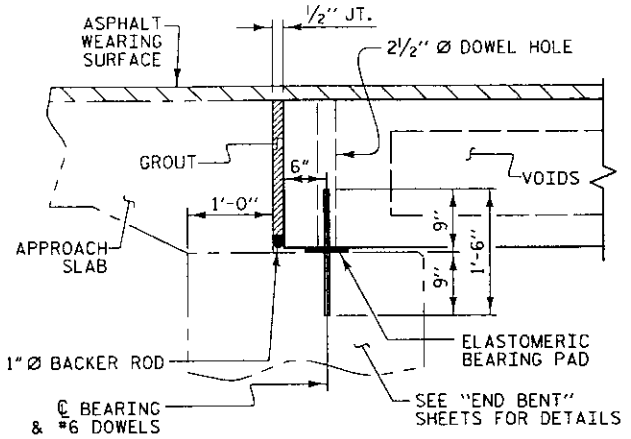


PLAN OF SPAN

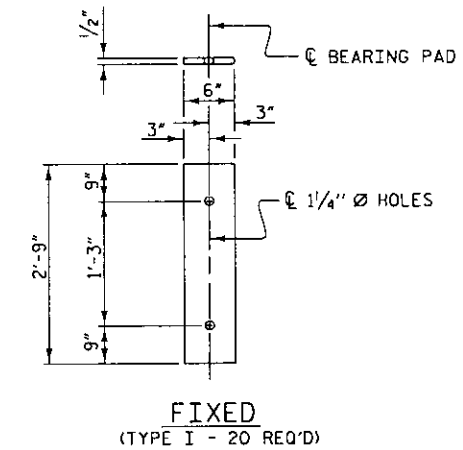
* DISTANCE FROM THE ℄ SURVEY -L- TO THE BOTTOM EDGE OF CORED SLAB UNIT #8 & #9.

FIXED END



SECTION AT END BENT

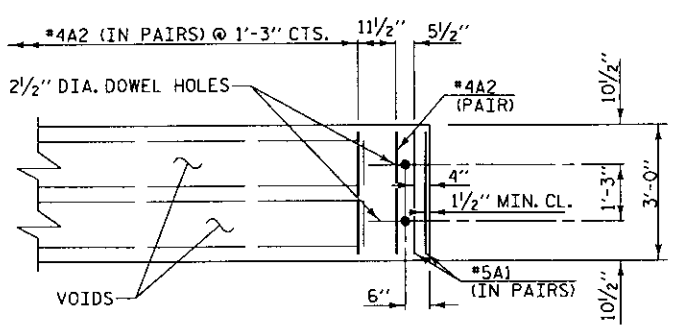
(END BENT 1 SHOWN, END BENT 2 SIMILAR EXCEPT NO APPROACH SLAB)



FIXED
(TYPE I - 20 REQ'D)

ELASTOMERIC BEARING DETAILS

NOTE: ELASTOMER HARDNESS SHALL BE 60 DUROMETERS.



PART PLAN - SLAB SECTION

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

PRESTRESSED CORED SLAB 45' SPAN

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19661 L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 93287 RALEIGH, N.C. 27636
(919) 851-1912 (919) 851-1916 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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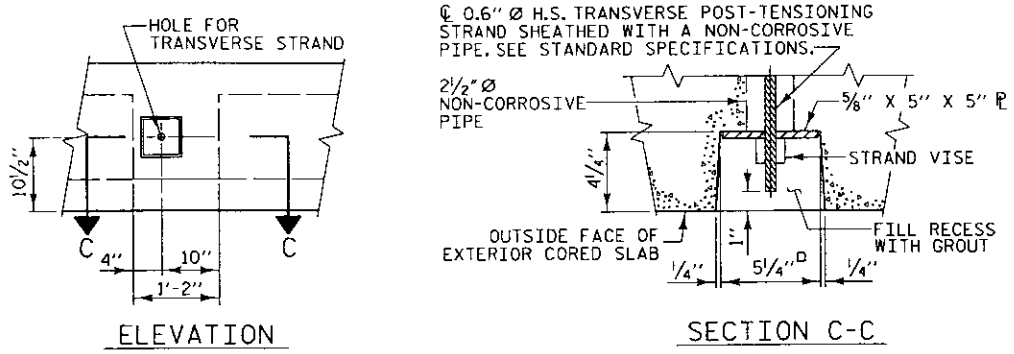


DETAIL A
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLAB
(CORED SLAB UNIT #10)

EXTERIOR SLAB UNIT	45'
CAMBER (SLAB UNIT ALONE IN PLACE)	1¾" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	* 3/16" (DOWN)
FINAL DEFLECTION	1 9/16" (UP)
* INCLUDES FUTURE WEARING SURFACE	

INTERIOR SLAB UNIT	45'
CAMBER (SLAB UNIT ALONE IN PLACE)	2" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	* 3/16" (DOWN)
FINAL DEFLECTION	1 13/16" (UP)
* INCLUDES FUTURE WEARING SURFACE	

NOTES

EACH PRECAST RAIL UNIT SHALL BE CAST WITH CLASS AA CONCRETE.

RAIL TO BE FLUSH WITH CORED SLAB UNITS AT EACH END OF SPAN.

GROUT SHALL BE 5" ABOVE BOTTOM OF RAIL BETWEEN RAIL SECTIONS EXCEPT AT BENTS WHERE LOW MODULUS SILICONE SHALL BE SUBSTITUTED IN PLACE OF GROUT.

EACH PRECAST RAIL UNIT SHALL BE SUPPLIED WITH LIFTING DEVICE(S). NO CABLES ARE TO BE WRAPPED AROUND THE RAIL UNITS FOR LIFTING.

THE EXPANSION JOINT SEALER SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.

CONCRETE CHAMFERS:
UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE ON PLANS.

DECK DRAINS ARE NOT PERMITTED.

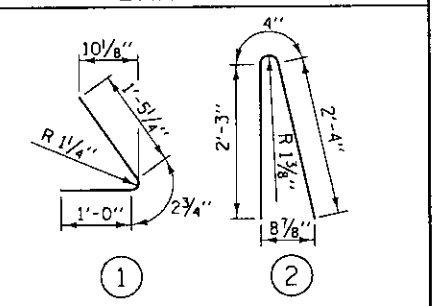
BILL OF MATERIAL FOR ONE 5'-0" RAIL SECTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	5	#5	1	2'-8"	14
B4	5	#5	2	4'-11"	26
B5	5	#5	STR.	4'-7"	24
REINFORCING STEEL LBS. =					64
CLASS AA CONCRETE CU. YDS. =					0.5

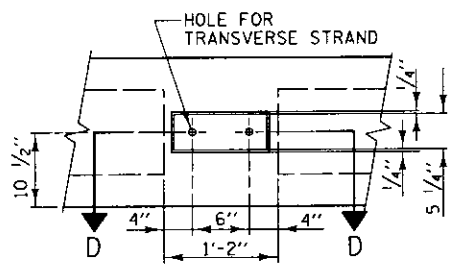
BILL OF MATERIAL FOR ONE 10'-0" RAIL SECTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	9	#5	1	2'-8"	25
B4	9	#5	2	4'-11"	46
B6	5	#5	STR.	9'-7"	50
REINFORCING STEEL LBS. =					121
CLASS AA CONCRETE CU. YDS. =					1.0

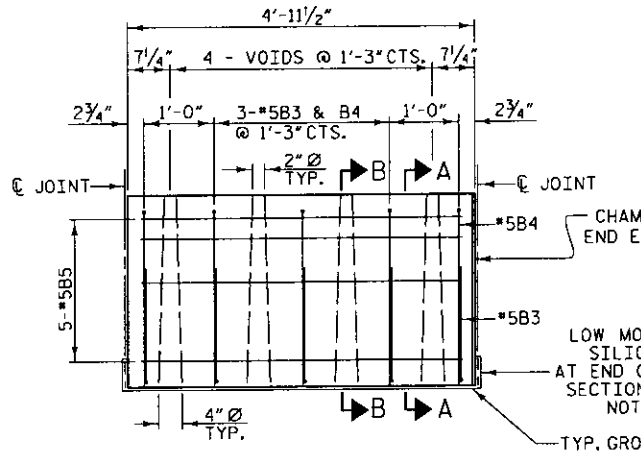
BAR TYPES



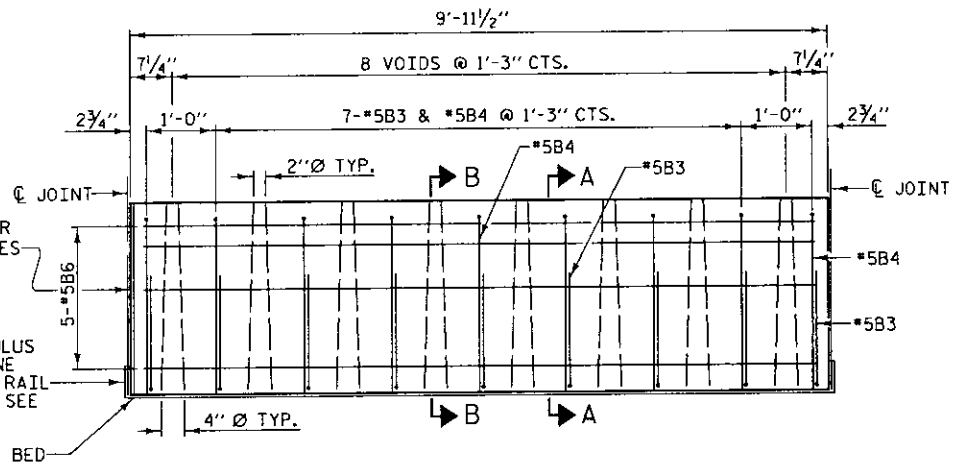
ALL BAR DIMENSIONS ARE OUT TO OUT



DETAIL B
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLAB
(CORED SLAB UNIT #1)

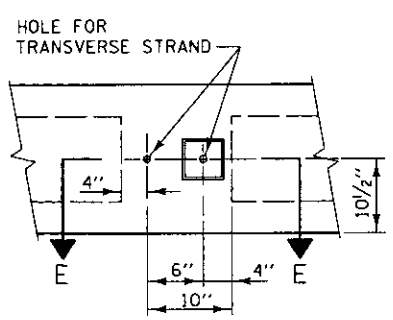


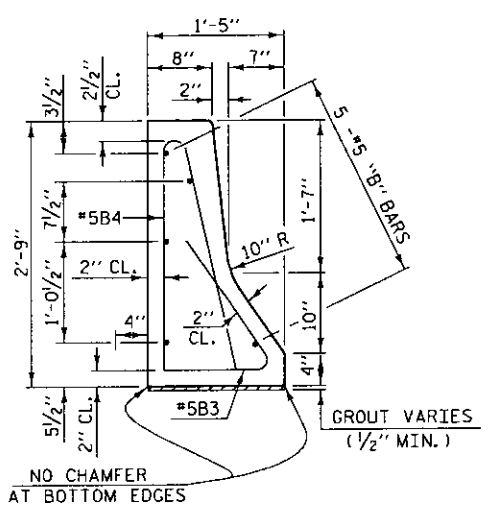
TYPICAL 5'-0" PRECAST UNIT



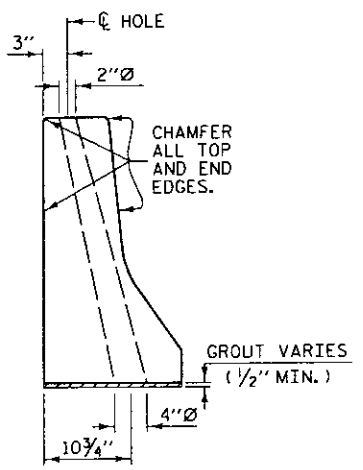
TYPICAL 10'-0" PRECAST UNIT

DETAIL C
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLAB
(CORED SLAB UNIT #5)





SECTION A-A



SECTION B-B

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRECAST CONCRETE BARRIER RAIL SECTIONS
45' SPAN
27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 19661 ENGINEER L. KEVIN AUSTIN
10/13/09

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 30187 Raleigh, N.C. 27622
(919) 851-1918
(919) 851-1918 (FAX)
www.mulkeyinc.com

REVISIONS						SHEET NO.
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2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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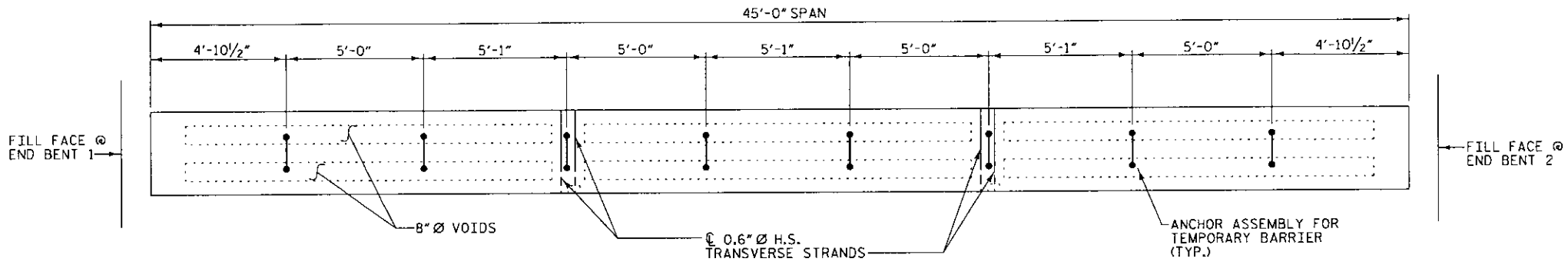
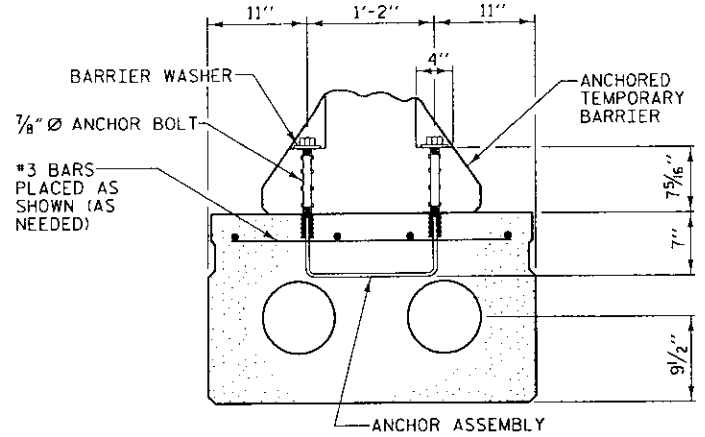


SPAN A

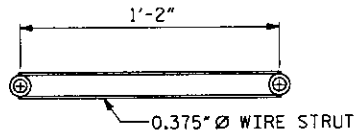
ANCHOR ASSEMBLY LAYOUT FOR CORED SLAB UNIT #5



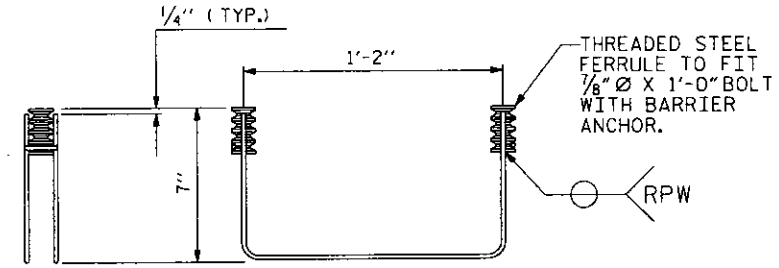
CORED SLAB UNIT #5

(SHOWING PLACEMENT OF ANCHOR ASSEMBLY)

THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR CONSTRUCTION OF SUPERSTRUCTURE.



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 2½"

ANCHOR ASSEMBLY FOR TEMPORARY BARRIER

(8 ASSEMBLIES REQUIRED)

NOTES

THE ANCHOR ASSEMBLY FOR TEMPORARY BARRIER SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 2 - ⅞" Ø X 1'-0" ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. ANCHOR BOLTS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø X 1'-0" GALVANIZED ANCHOR BOLTS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE ANCHOR ASSEMBLY DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE ANCHOR ASSEMBLY COMPLETE IN PLACE, SHALL BE INCLUDED, IN THE UNIT CONTRACT PRICE BID FOR CONSTRUCTION OF SUPERSTRUCTURE, SEE SPECIAL PROVISIONS.

FERRULES TO BE PLUGGED DURING CASTING OF THE CORED SLAB UNITS AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

FOR 4" X 3¼" X ½" BARRIER WASHER TO BE USED WITH ANCHOR ASSEMBLY, SEE ROADWAY PLANS.

PAYMENT FOR ANCHORED TEMPORARY BARRIER AND BARRIER WASHER ARE INCLUDED IN TRAFFIC CONTROL PAY ITEM, SEE SPECIAL PROVISIONS.

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

NORTH CAROLINA PROFESSIONAL 19661 ENGINEER L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1915 (FAX)
WWW.MULKEYINC.COM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CORED SLAB DETAILS

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			27

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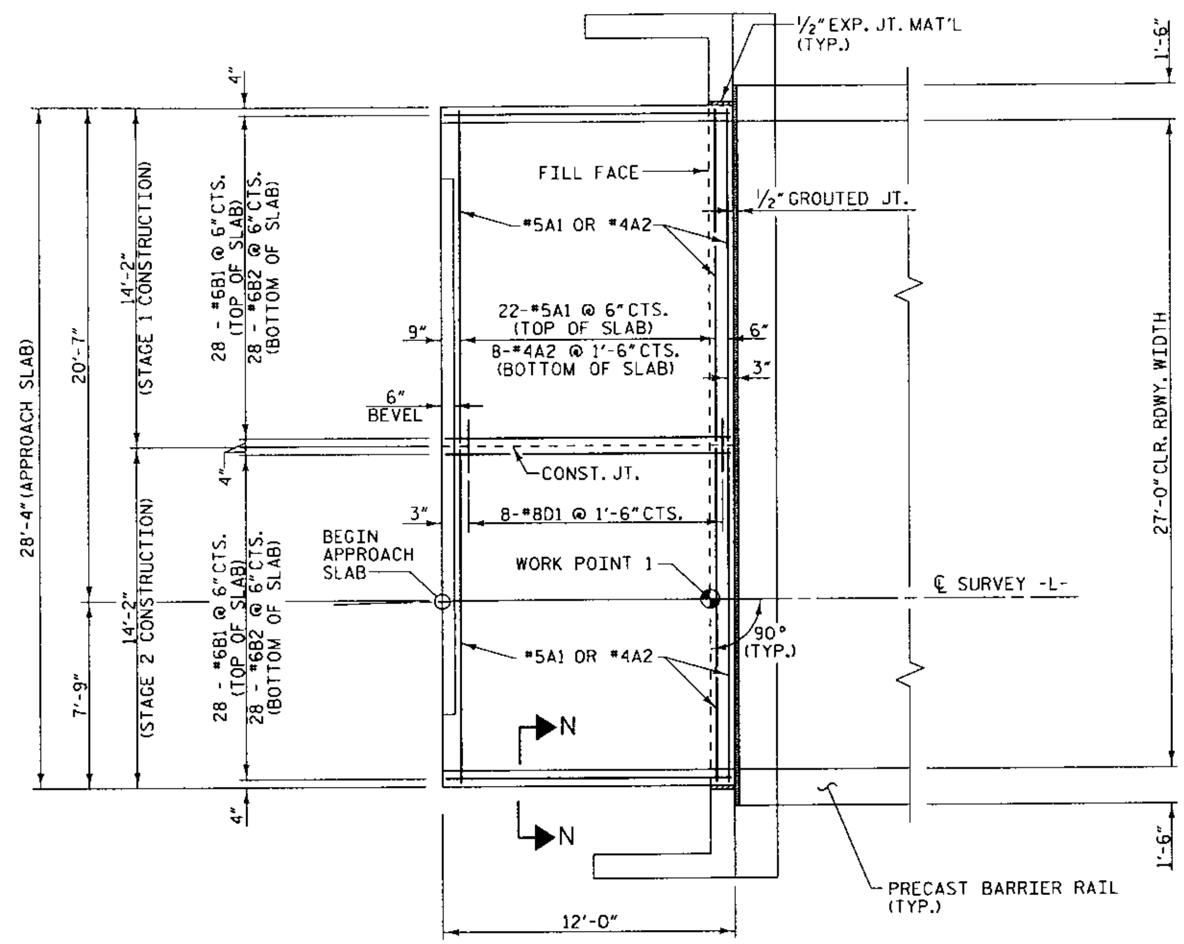


PLAN

NOTES

REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SHALL BE INCLUDED IN THE LUMP SUM CONTRACT BID PRICE FOR BRIDGE APPROACH SLAB.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH 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 BE FLUSH WITH THE ROADWAY 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 BE FLUSH WITH THE ROADWAY 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.

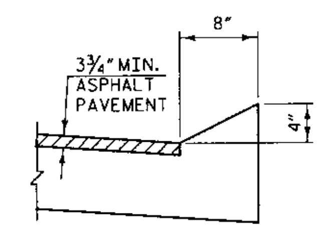
FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB" SHEETS.

THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

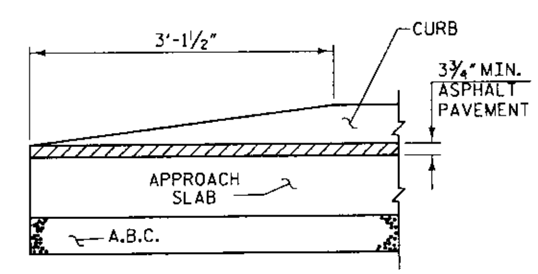
APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL
FOR APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	46	#5	STR	13'-10"	664
A2	18	#4	STR	13'-10"	166
* B1	56	#6	STR	11'-1"	932
B2	56	#6	STR	11'-7"	974
* D1	8	#8	STR	2'-2"	46
REINFORCING STEEL				LBS.	1140
* EPOXY COATED REINFORCING STEEL				LBS.	1642
CLASS AA CONCRETE				C.Y.	13.9

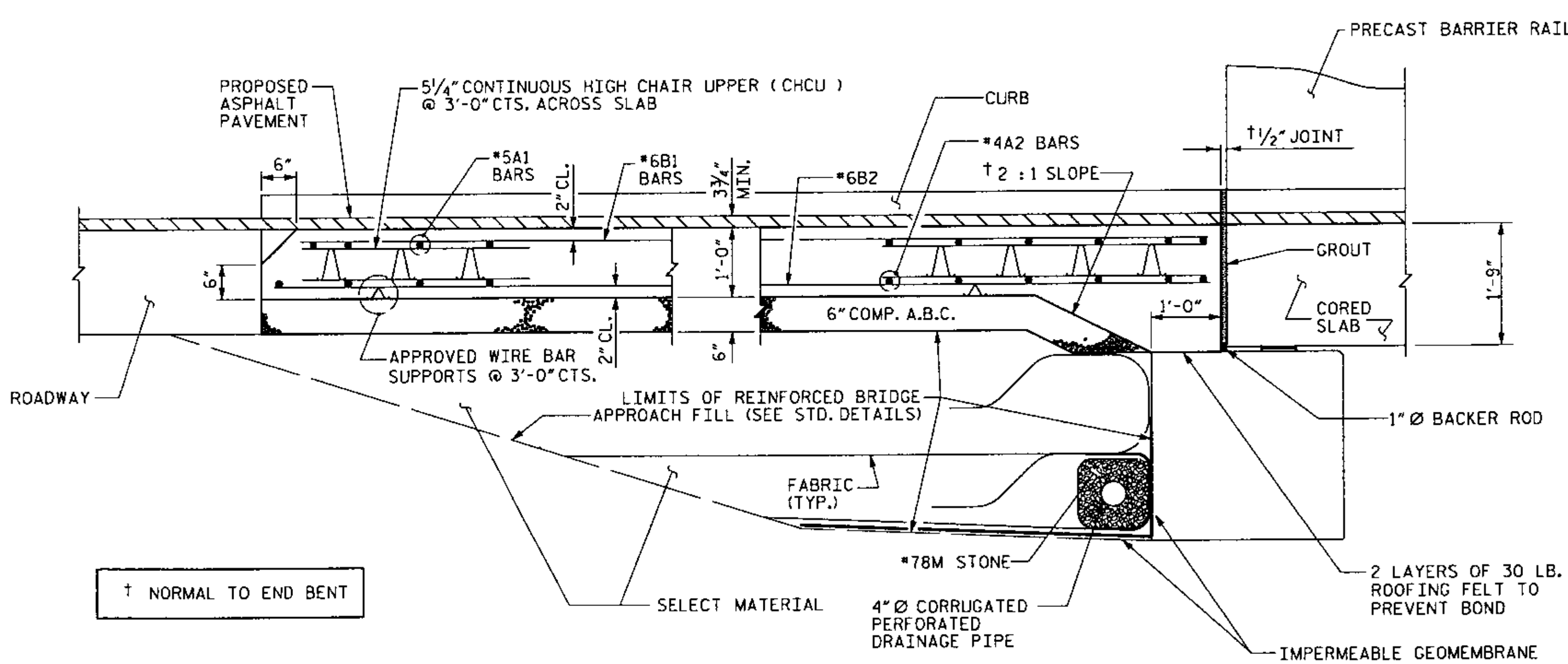


SECTION N-N



END OF CURB

CURB DETAILS



† NORMAL TO END BENT

SECTION THRU SLAB

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55 SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB

27' CLEAR ROADWAY - 90° SKEW

REVISIONS								SHEET NO. 13
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1			3					
2			4					

NORTH CAROLINA PROFESSIONAL ENGINEER 19661 L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY: MULKEY ENGINEERS & CONSULTANTS

DRAWN BY : W. B. ALLEN DATE : 4/09
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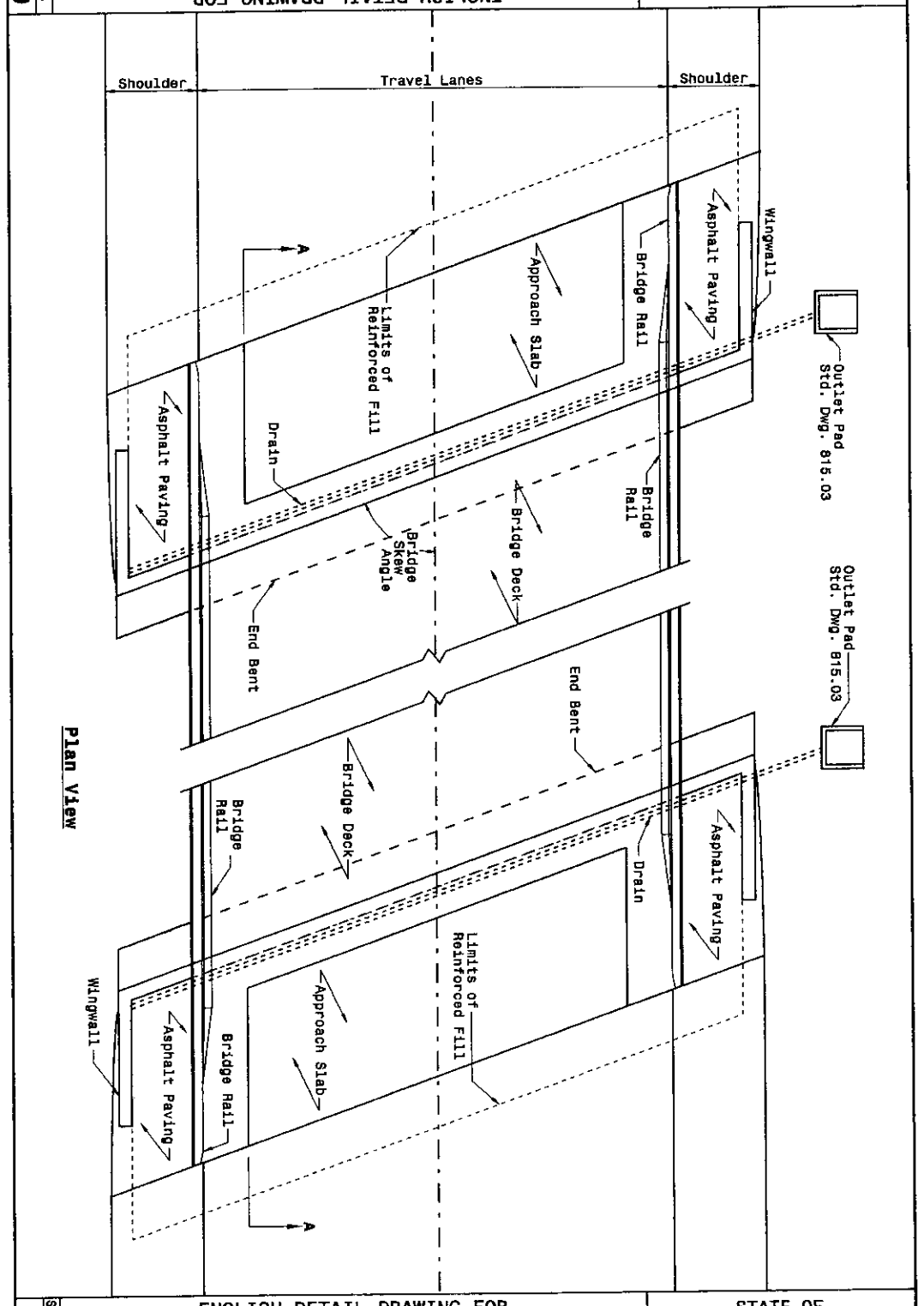
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS

SHEET 1 OF 4
422D10

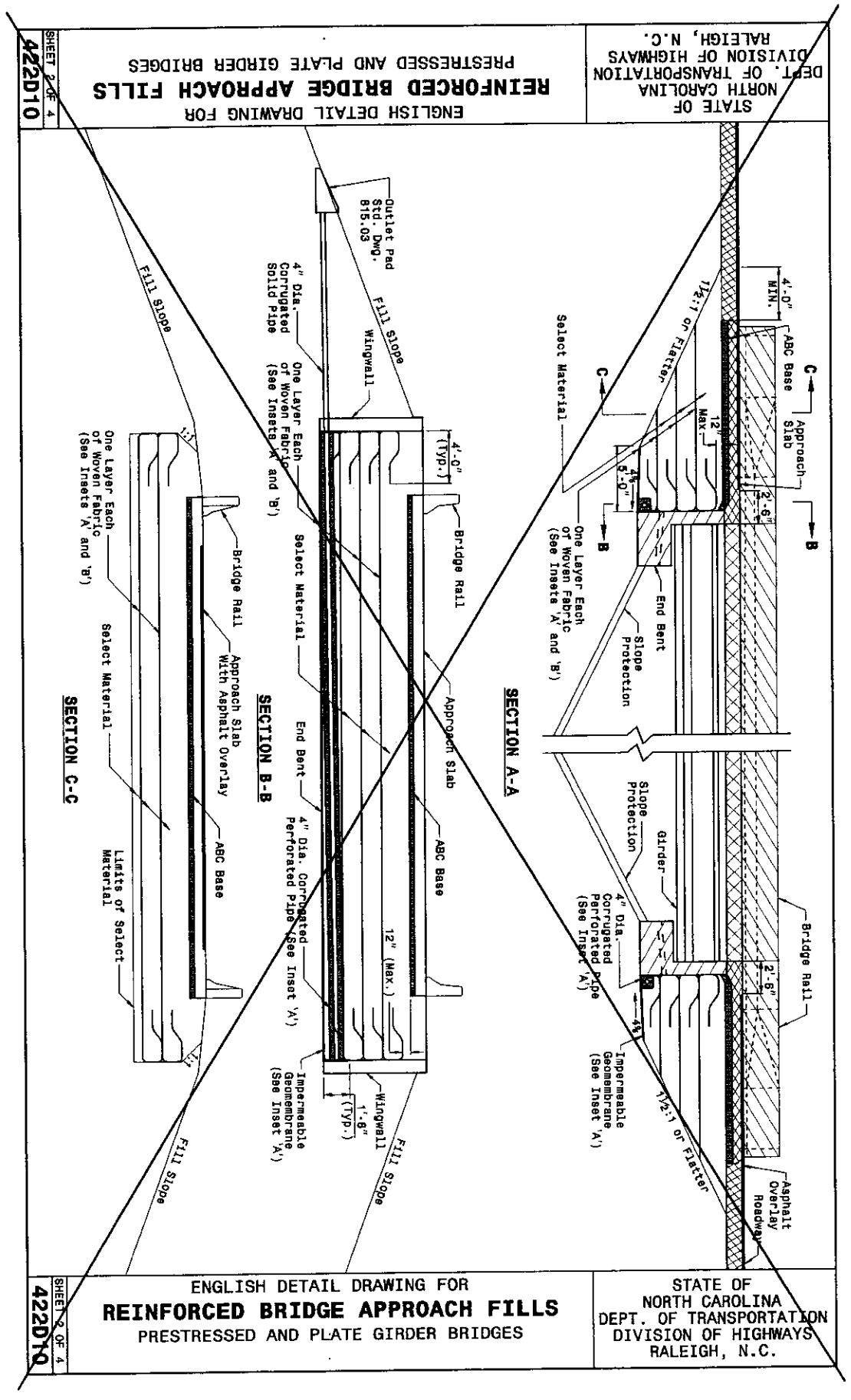


Plan View

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 2 OF 4
422D10



SECTION C-C

SECTION B-B

SECTION A-A

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 2 OF 4
422D10

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
OFFICE 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY:	2002 STANDARDS	DATE:	01-15-02
MODIFIED BY:	E.E. MAAD	DATE:	03-26-03
CHECKED BY:		DATE:	
FILE SPEC.:	stds/02stdstodetails/english/422d10.dgn		

PROJECT REFERENCE NO.	B-4690
SHEET NO.	14

5/14/99

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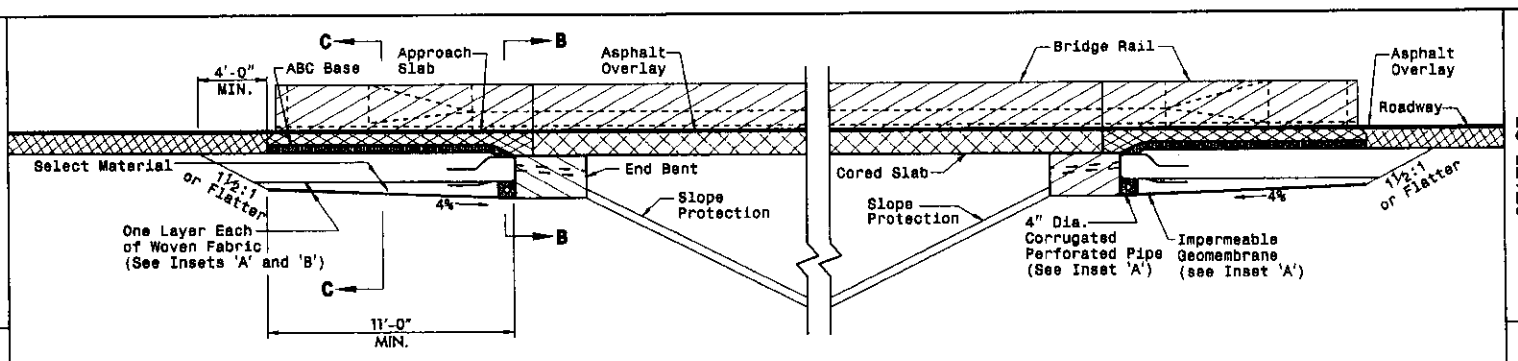
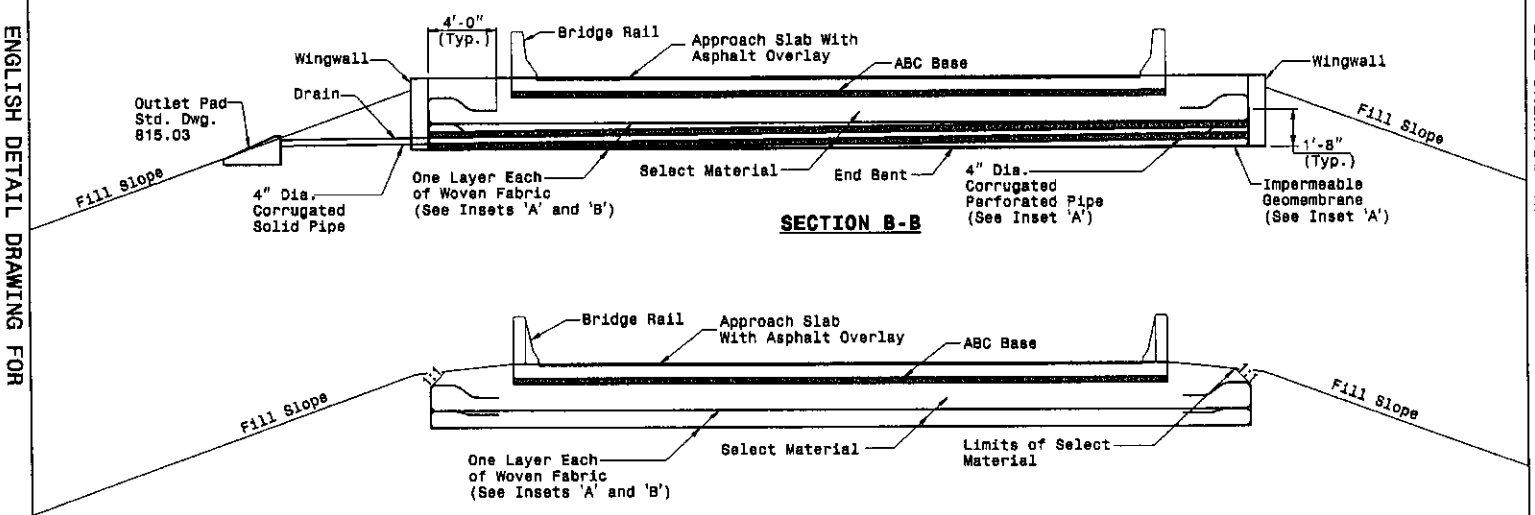
5/14/99

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES



SECTION A-A



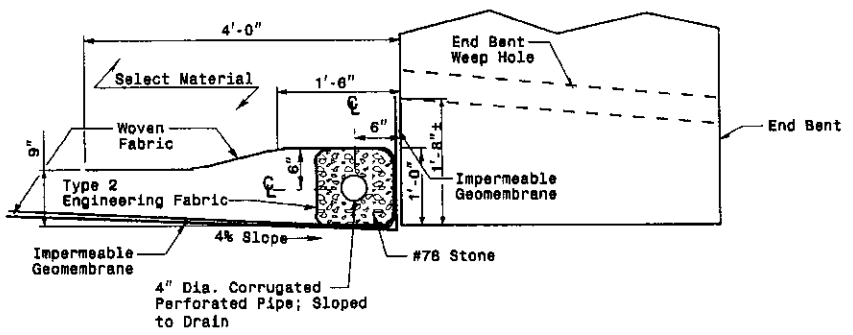
SECTION B-B

SECTION C-C

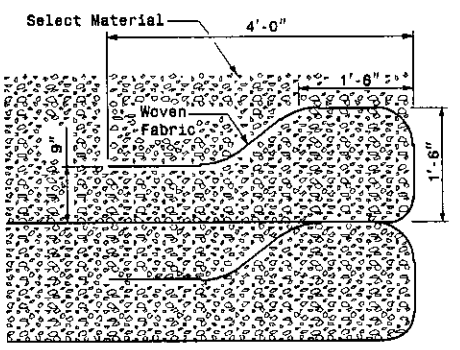
SHEET 3 OF 4
422D10

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

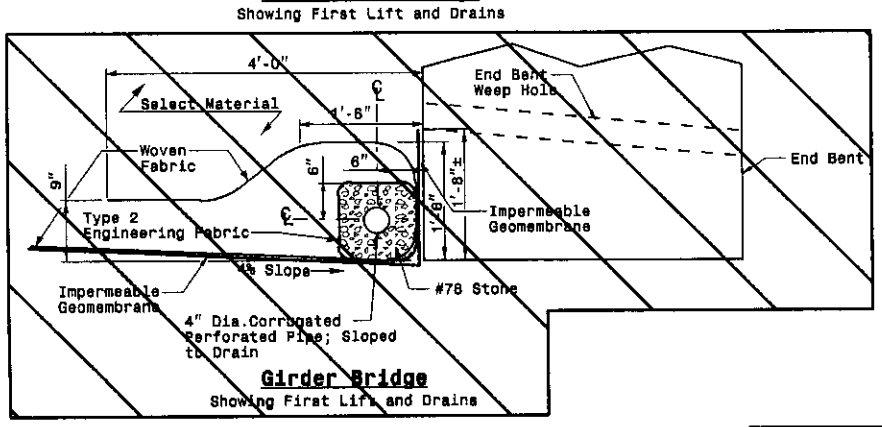
ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES



Cored Slab Bridge
Showing First Lift and Drains



Typical Fabric Lift and Wrap
Showing Second and Above Lifts



Girder Bridge
Showing First Lift and Drains

Inset 'A'

Inset 'B'

Height of Backwall	Number of Fabric Layers
4'-6" - 5'-9"	3
5'-10" - 7'-2"	4
7'-3" - 8'-8"	5
8'-9" - 10'-1"	6
10'-2" - 11'-8"	7

Note: Cored Slab Structures Require 2 Fabric Layers.

Length of Bridge End Bent Inside Wingwalls
If Bridge Skew is Less Than or Equal to 90°: $\frac{\text{(Roadway Width + 7'-0")}}{\text{Sin (Bridge Skew Angle)}}$ = Dis. Between Wingwalls
If Bridge Skew is Greater Than 90°: $\frac{\text{(Roadway Width + 7'-0")}}{\text{Cos (Bridge Skew Angle - 90°)}}$ = Dis. Between Wingwalls

SHEET 4 OF 4
422D10

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

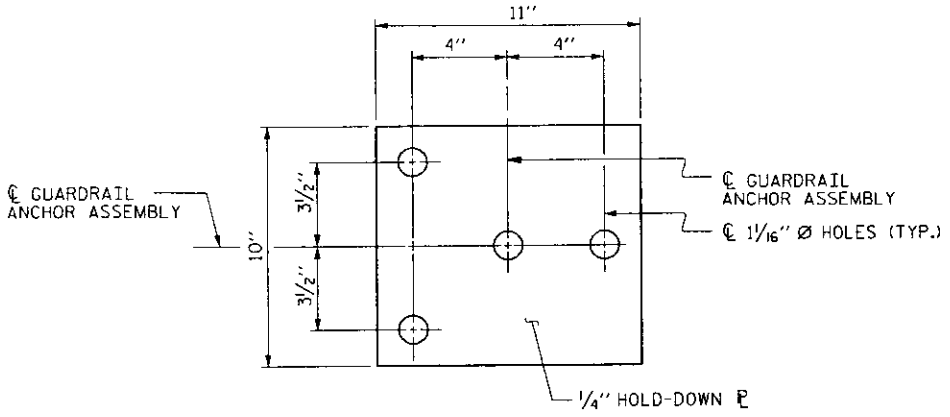
ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

DESIGN SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

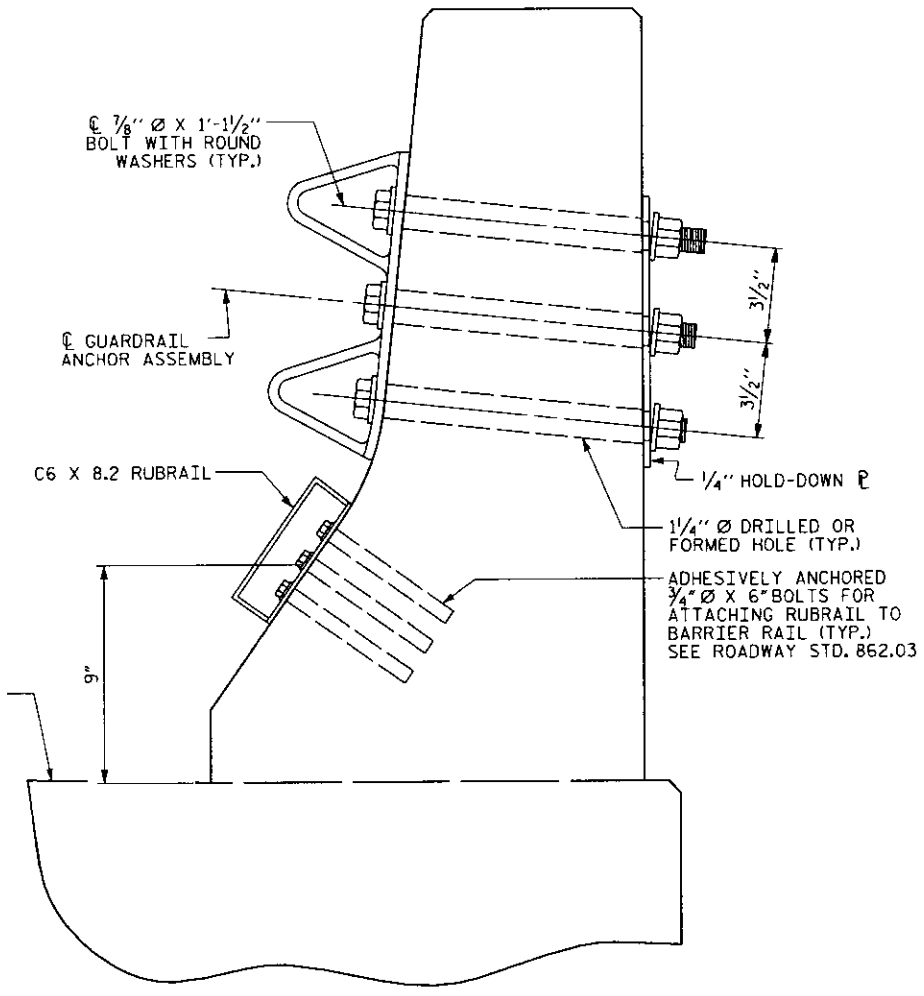
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 03-26-03
CHECKED BY: DATE:
FILE SPEC.: stds/02stdstodetails/english/422d10.dgn

PROJECT REFERENCE NO. B-4690
SHEET NO. 15

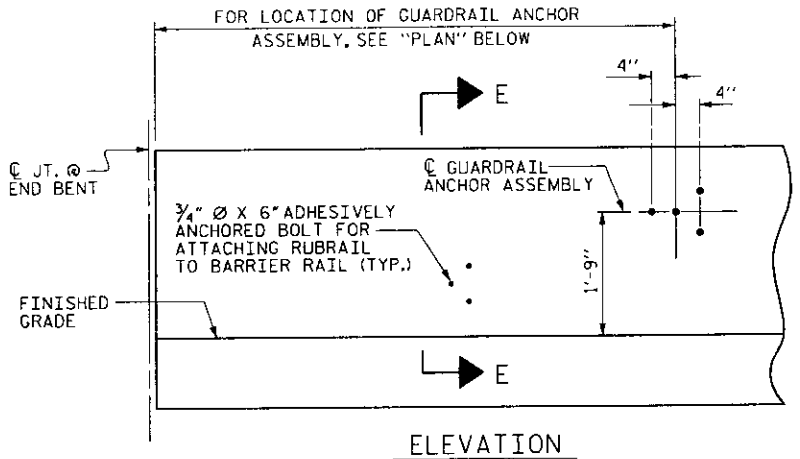


PLAN



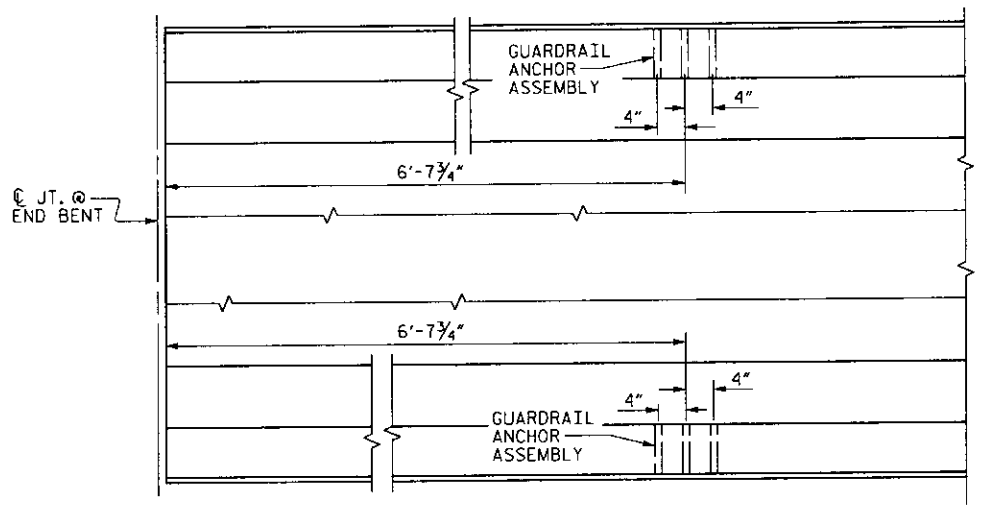
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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.)

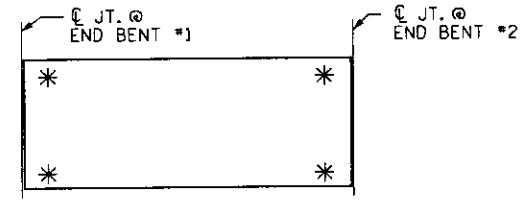
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR STEEL BM GUARDRAIL .

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	16
1			3			TOTAL SHEETS
2			4			27

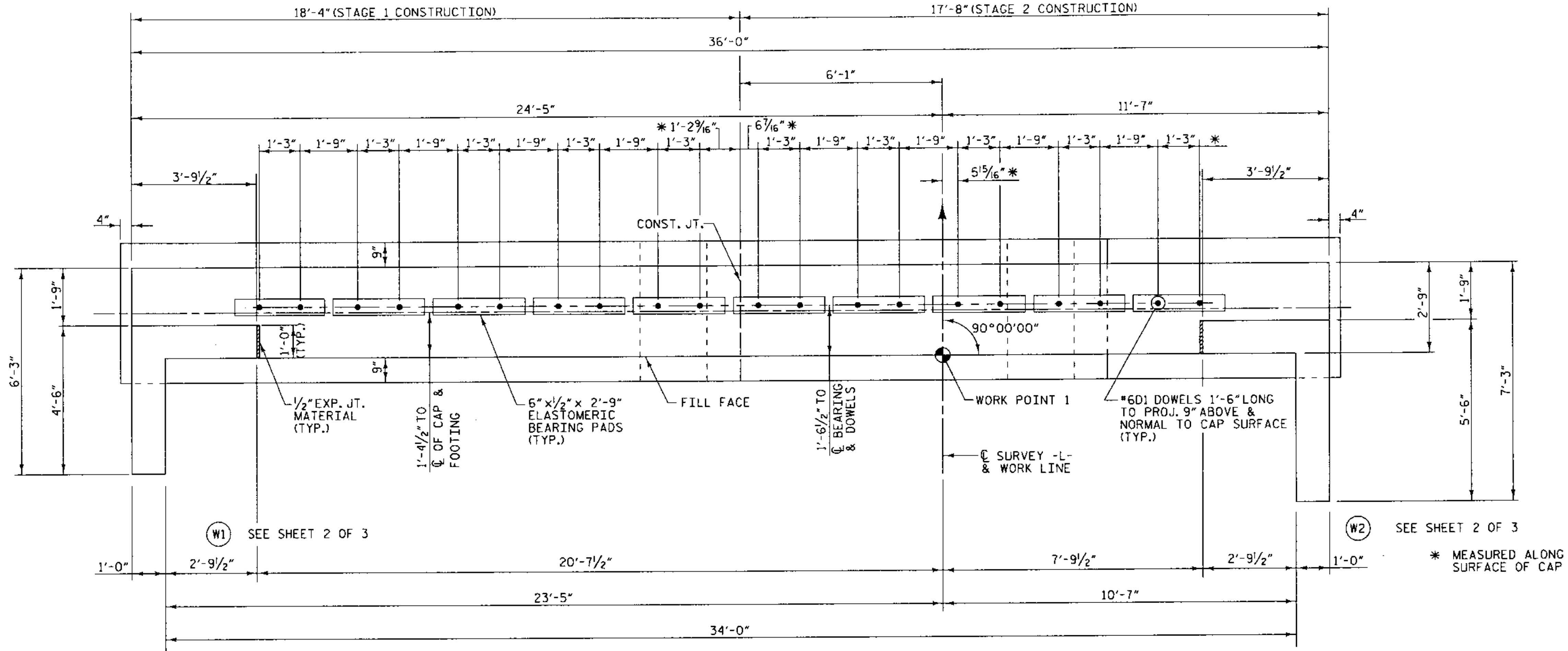
THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL ENGINEER L. KEVIN AUSTIN 19661 — 10/13/09

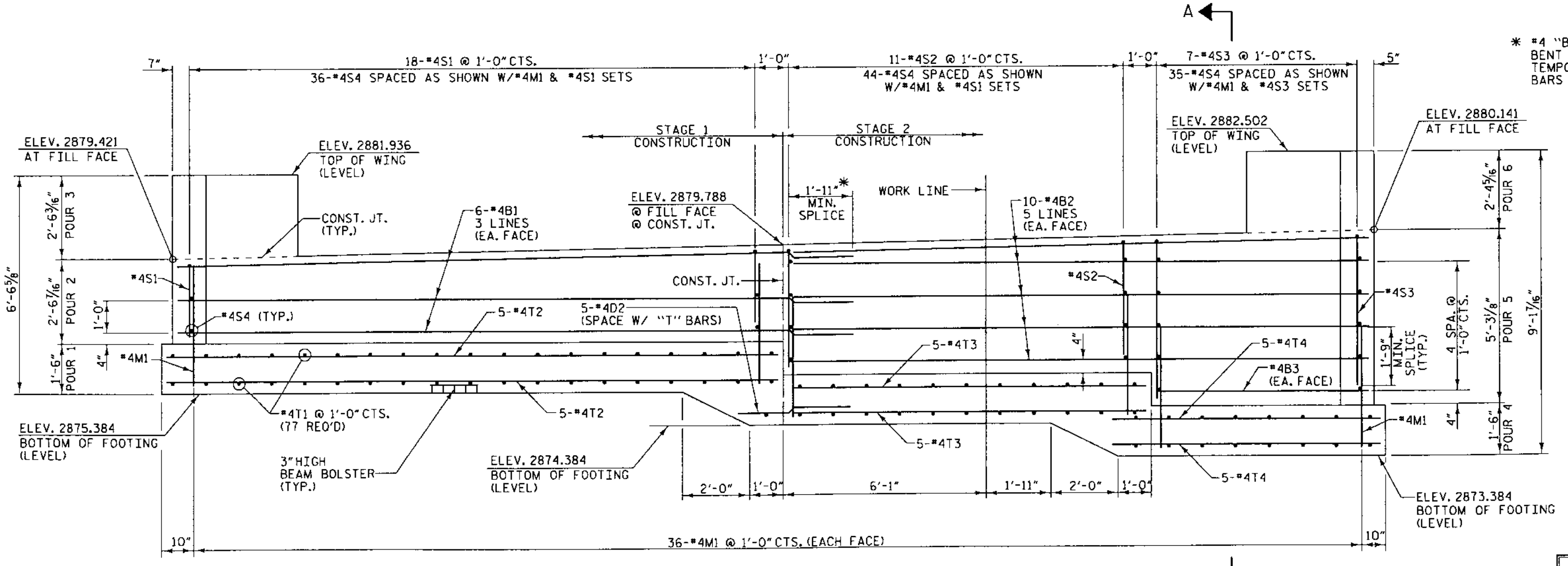
PLANS PREPARED BY:
MULKEY
ENGINEERS & CONSULTANTS
PO BOX 32127
RALEIGH, NC 27627
(919) 851-1918 PHONE
(919) 851-1918 FAX
WWW.MULKEYINC.COM

ASSEMBLED BY : W. B. ALLEN	DATE : 4/09		
CHECKED BY : L. K. AUSTIN	DATE : 4/09		
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM		
CHECKED BY : GM 5/06			

10/8/2009 10:09:07 PM R:\Structures\34690_SD_GR.dgn



PLAN



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6D1 DOWELS.

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

* #4 "B" OR #4 "D" BARS MAY BE FIELD BENT TO AVOID CONFLICT WITH TEMPORARY SHORING. STRAIGHTEN BARS DURING STAGE 2 CONSTRUCTION.

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55 — SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1

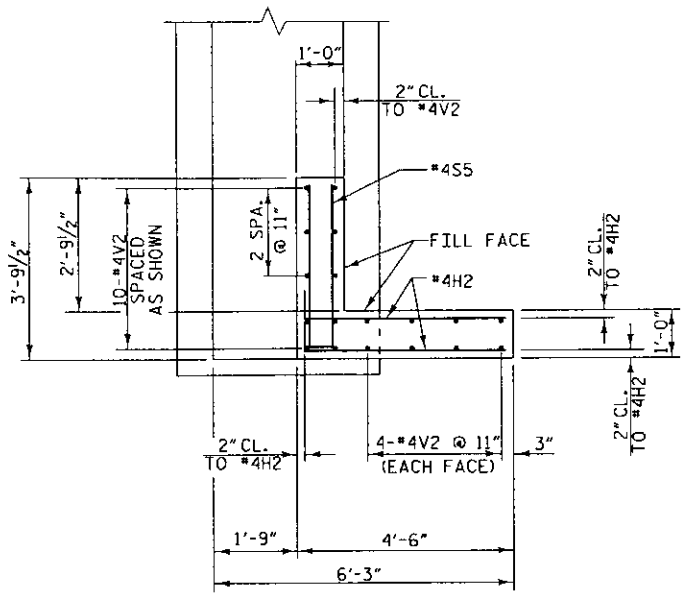
27' CLEAR ROADWAY - 90° SKEW

PLANS PREPARED BY: MULKEY ENGINEERS & CONSULTANTS

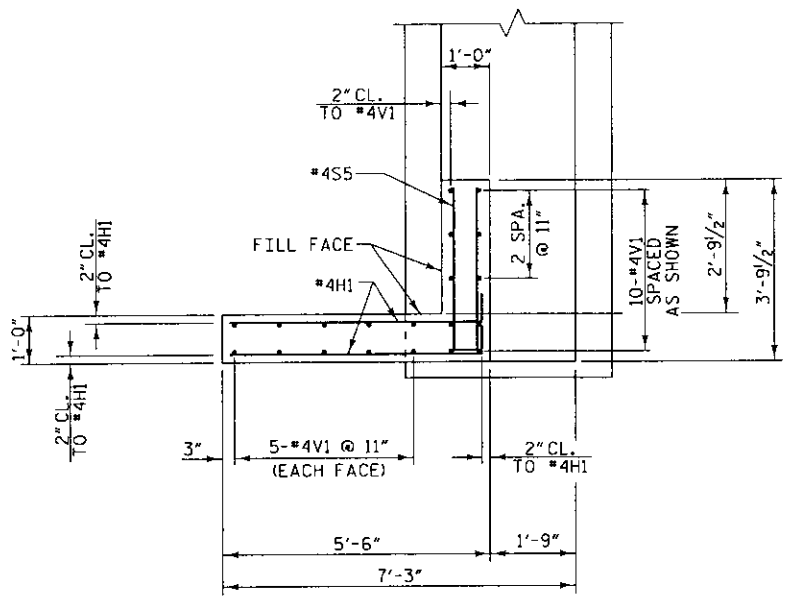
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. 17 — TOTAL SHEETS 27

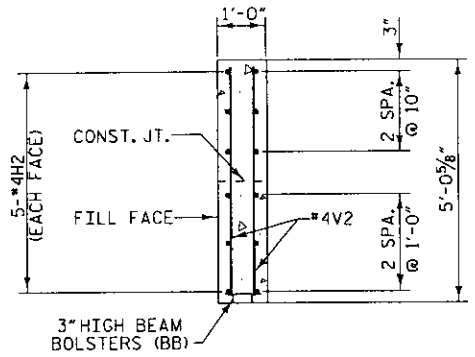
DRAWN BY: W. B. ALLEN — DATE: 4/09
CHECKED BY: L. K. AUSTIN — DATE: 5/09



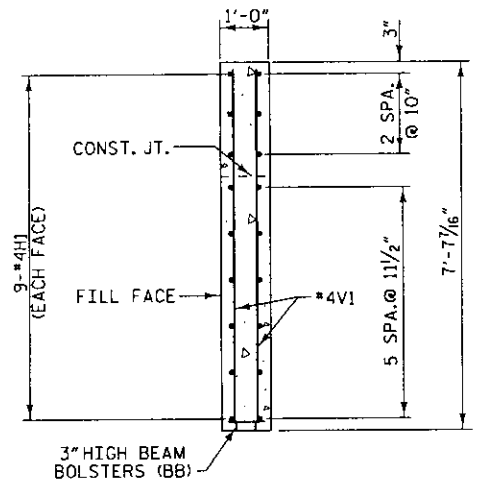
W1 PLAN OF LEFT WING



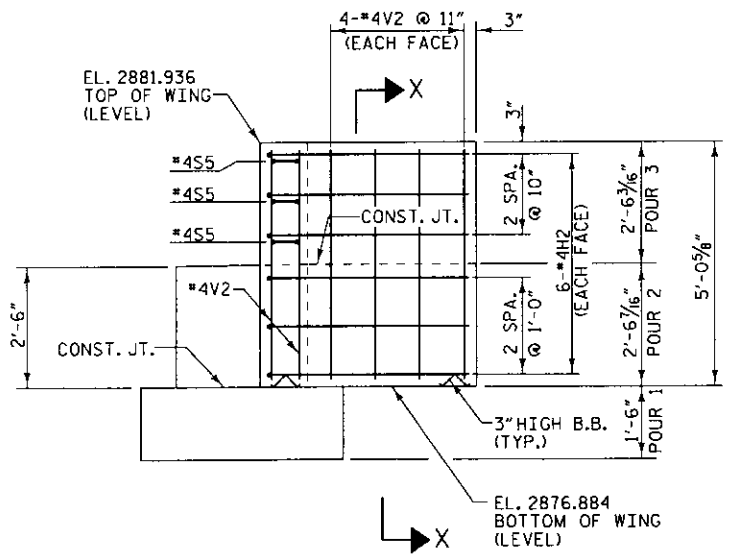
W2 PLAN OF RIGHT WING



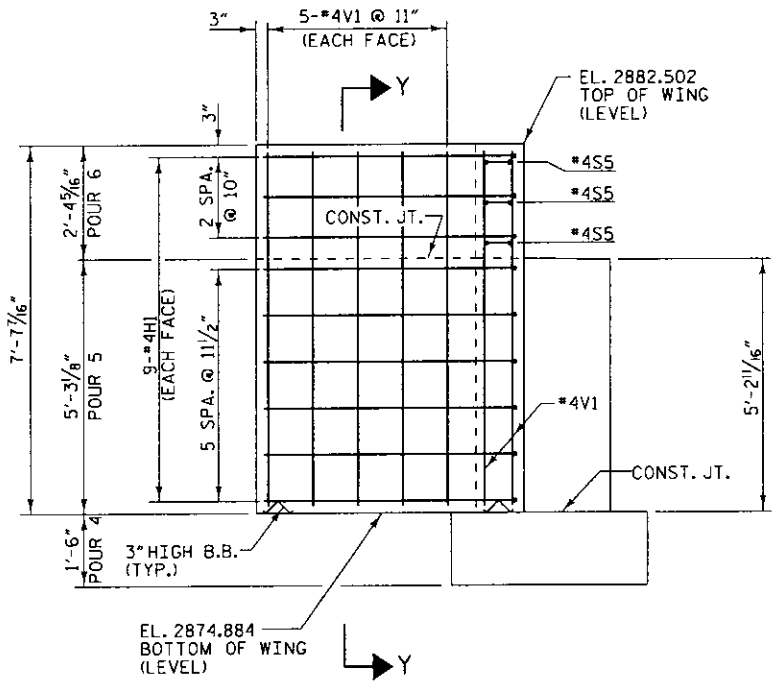
SECTION X-X



SECTION Y-Y



W1 ELEVATION OF LEFT WING



W2 ELEVATION OF RIGHT WING

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55 SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19661 L. KEVIN AUSTIN

10/13/09

PLANS PREPARED BY:

MULKEY ENGINEERS & CONSULTANTS
P.O. Box 33127
Raleigh, North Carolina 27636
(919) 851-1918
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	18
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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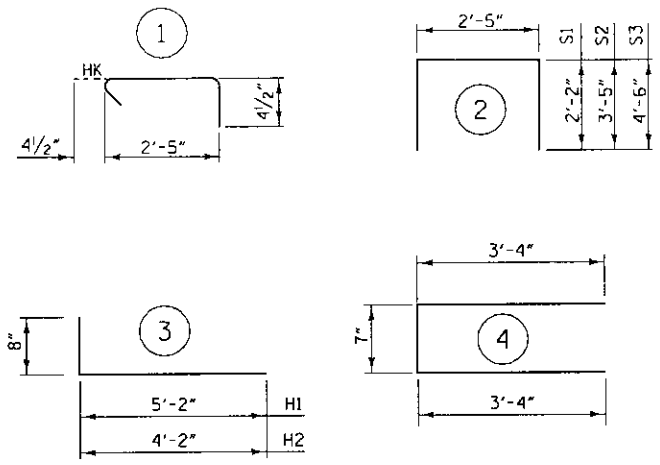
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

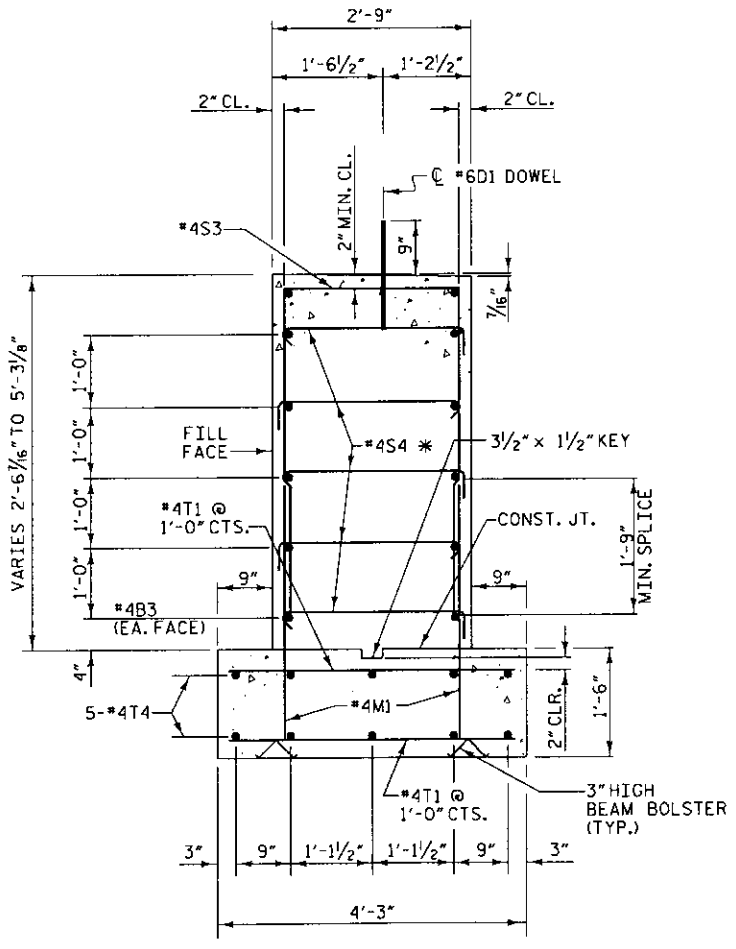
FOR END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	20'-2"	81
B2	10	#4	STR	17'-5"	116
B3	2	#4	STR	6'-3"	8
D1	20	#6	STR	1'-6"	45
D2	5	#4	STR	3'-0"	10
H1	18	#4	3	5'-10"	70
H2	12	#4	3	4'-10"	39
M1	72	#4	STR	3'-7"	152
S1	18	#4	2	6'-9"	81
S2	11	#4	2	9'-3"	68
S3	7	#4	2	11'-5"	53
S4	115	#4	1	3'-2"	243
S5	6	#4	4	7'-3"	29
T1	77	#4	STR	3'-11"	201
T2	10	#4	STR	18'-4"	122
T3	10	#4	STR	10'-9"	72
T4	10	#4	STR	8'-0"	53
V1	20	#4	STR	7'-3"	97
V2	18	#4	STR	4'-8"	56

TOTAL REINFORCING STEEL = 1596 lbs.

CLASS "A" CONCRETE - CU. YARDS

POUR 1	4.7 cu. yds.
POUR 2	5.6 cu. yds.
POUR 3	0.7 cu. yds.
POUR 4	4.6 cu. yds.
POUR 5	8.7 cu. yds.
POUR 6	0.7 cu. yds.
TOTAL	25.0 cu. yds.



SECTION A-A

* ALTERNATE HOOKS ON ADJACENT TIES AS SHOWN IN BOTH HORIZONTAL AND VERTICAL DIRECTIONS.

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55 SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER 19661 L. KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 93197
RALEIGH, N.C. 27624
(919) 851-1212
(919) 851-1213 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	19
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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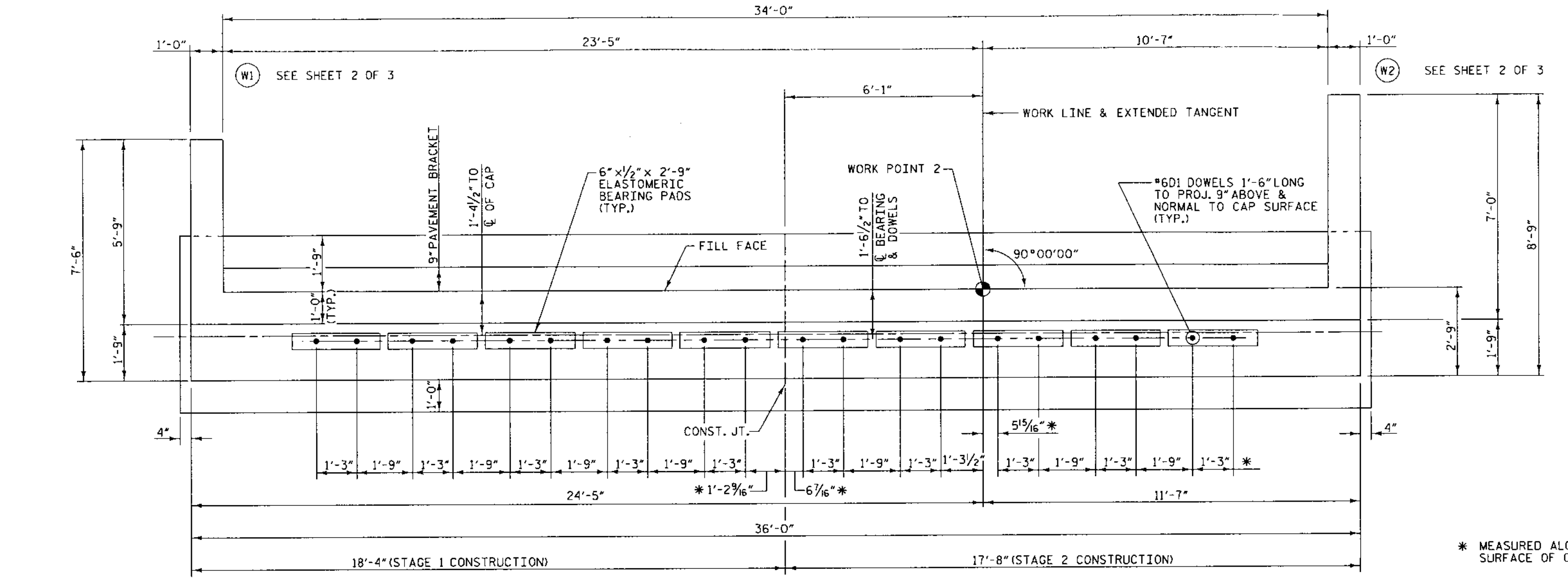
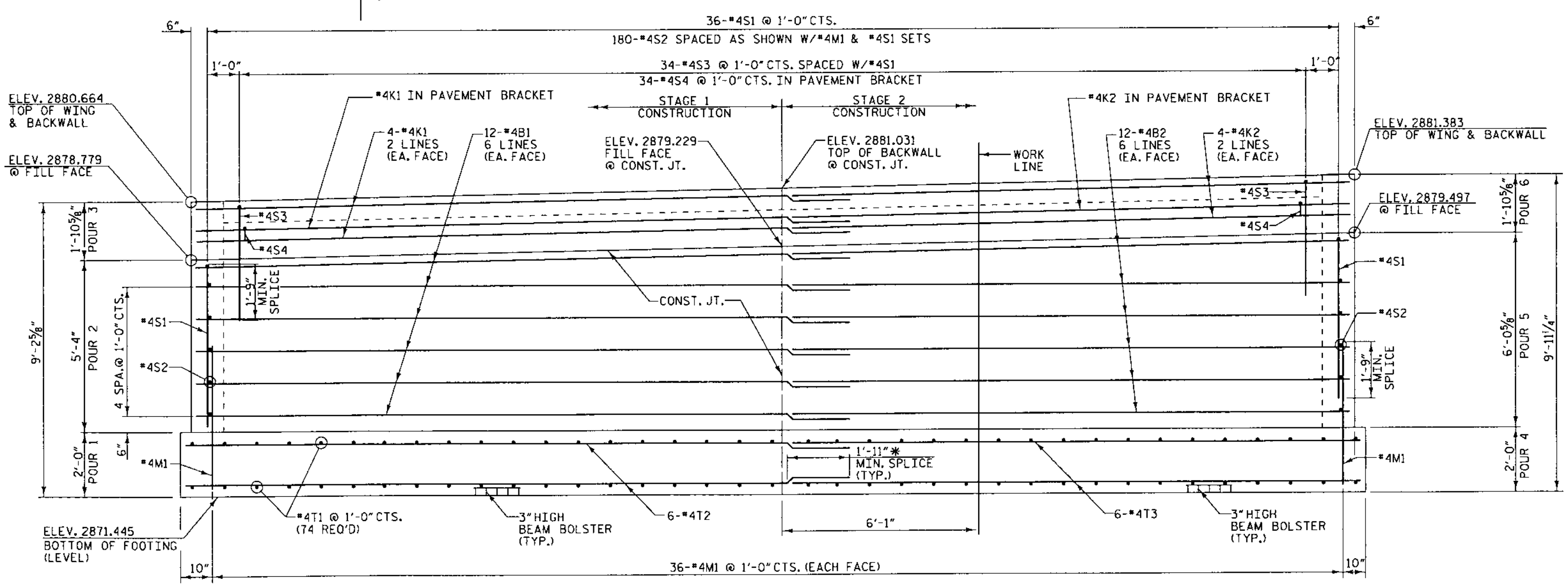


PLAN

* MEASURED ALONG SURFACE OF CAP



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6D1 DOWELS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4"Ø CORRUGATED PERFORATED DRAIN PIPE THROUGH THE WING WALL. REINFORCING IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

* #4 "B", #4 "T", OR #4 "K" BARS MAY BE FIELD BENT TO AVOID CONFLICT WITH TEMPORARY SHORING. STRAIGHTEN BARS DURING STAGE 2 CONSTRUCTION.

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55 — SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO. 20
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 27
1			3			
2			4			

PLANS PREPARED BY: MULKEY ENGINEERS & CONSULTANTS

NORTH CAROLINA PROFESSIONAL ENGINEER 19661 L. KEVIN AUSTIN 10/13/09

DRAWN BY: W. B. ALLEN DATE: 4/09
CHECKED BY: L. K. AUSTIN DATE: 5/09

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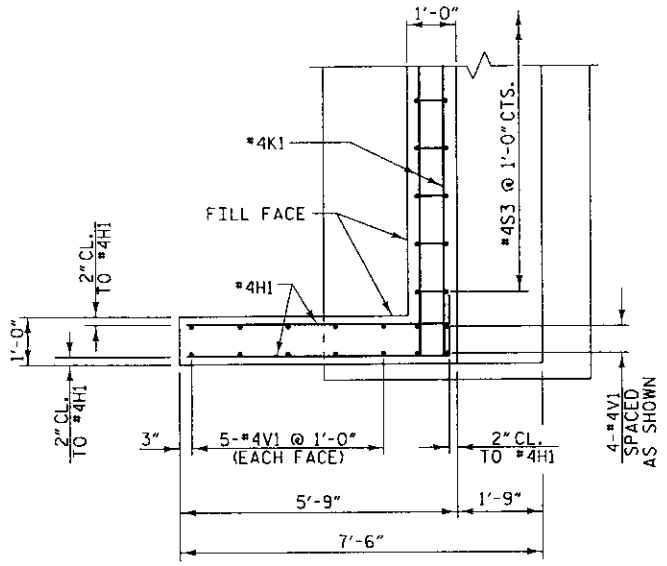
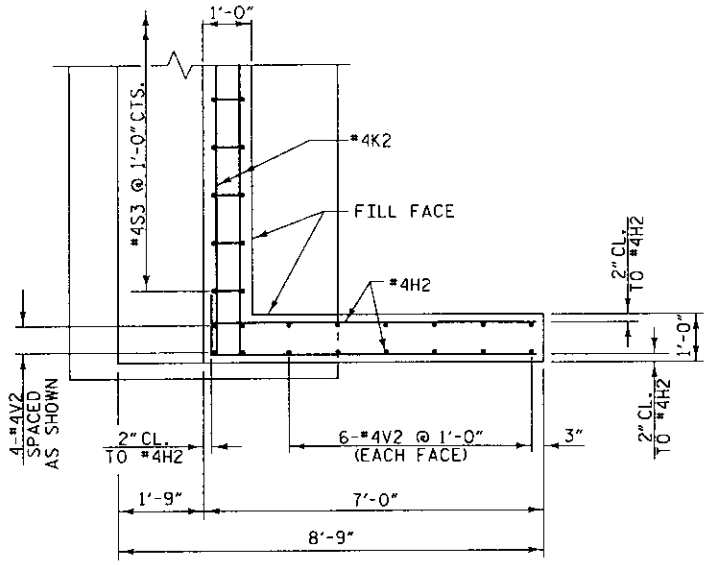
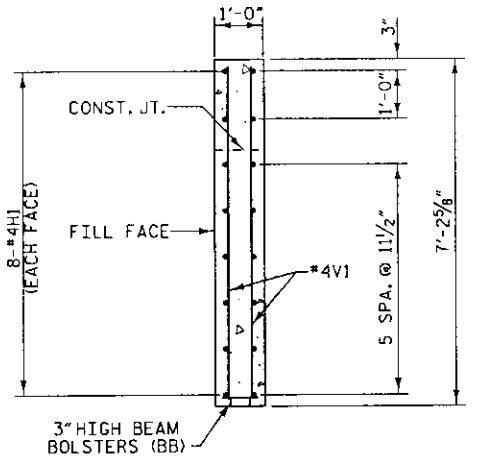


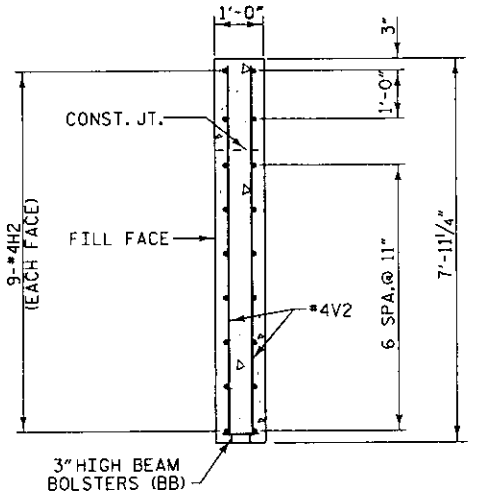
W1 PLAN OF LEFT WING



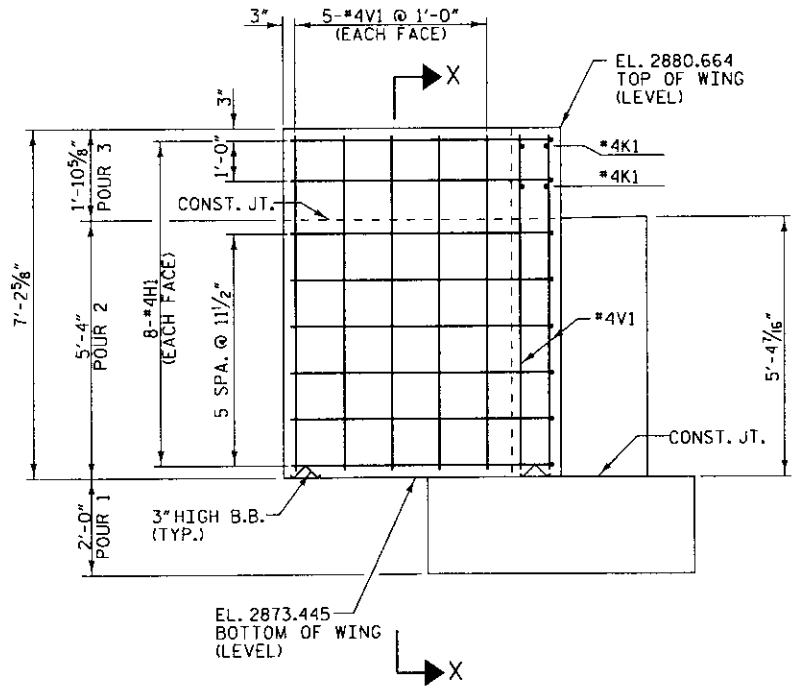
W2 PLAN OF RIGHT WING



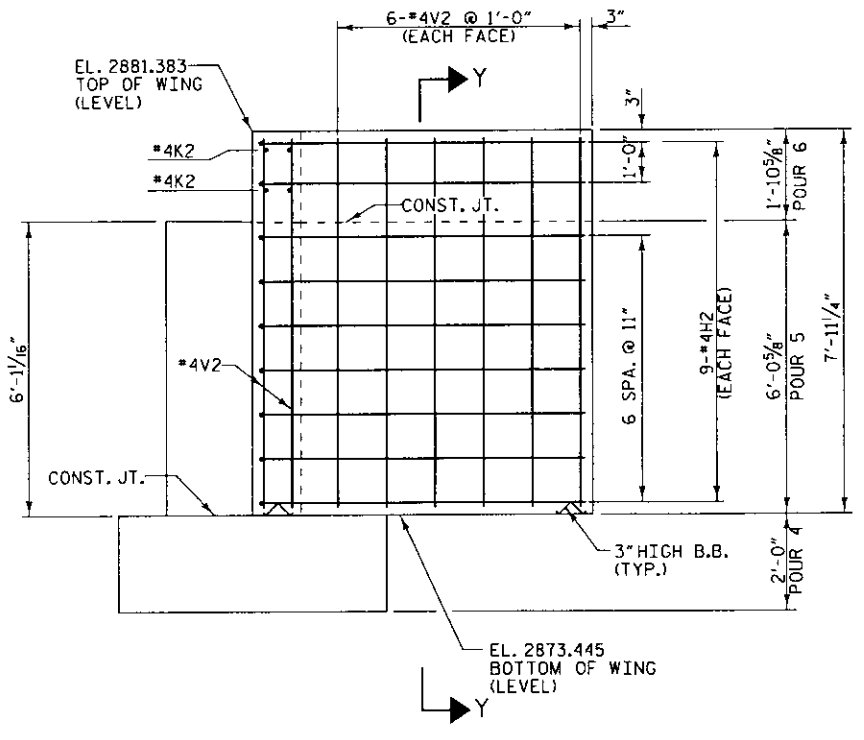
SECTION X-X



SECTION Y-Y



W1 ELEVATION OF LEFT WING



W2 ELEVATION OF RIGHT WING

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55 SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL 19661 ENGINEER KEVIN AUSTIN 10/13/09

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 33127 Raleigh, N.C. 27636
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	21
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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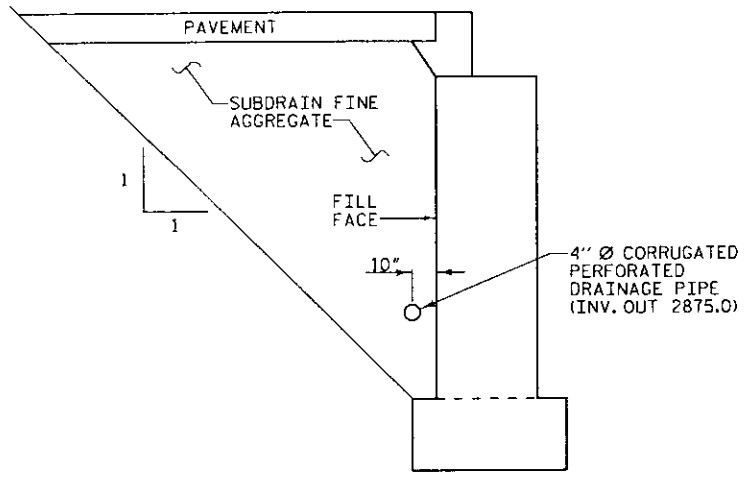
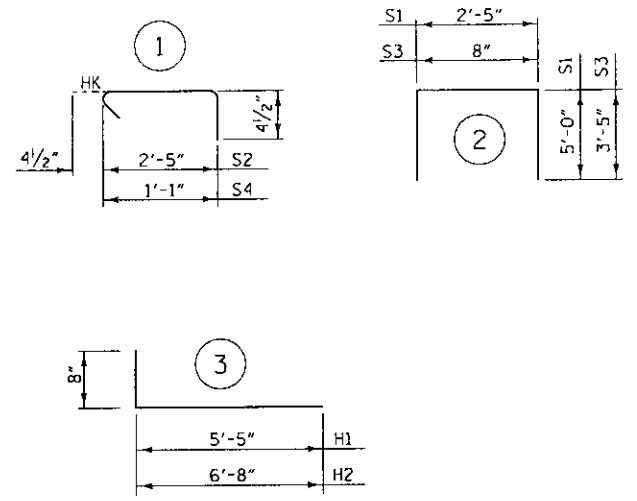


SUBDRAIN DETAIL AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

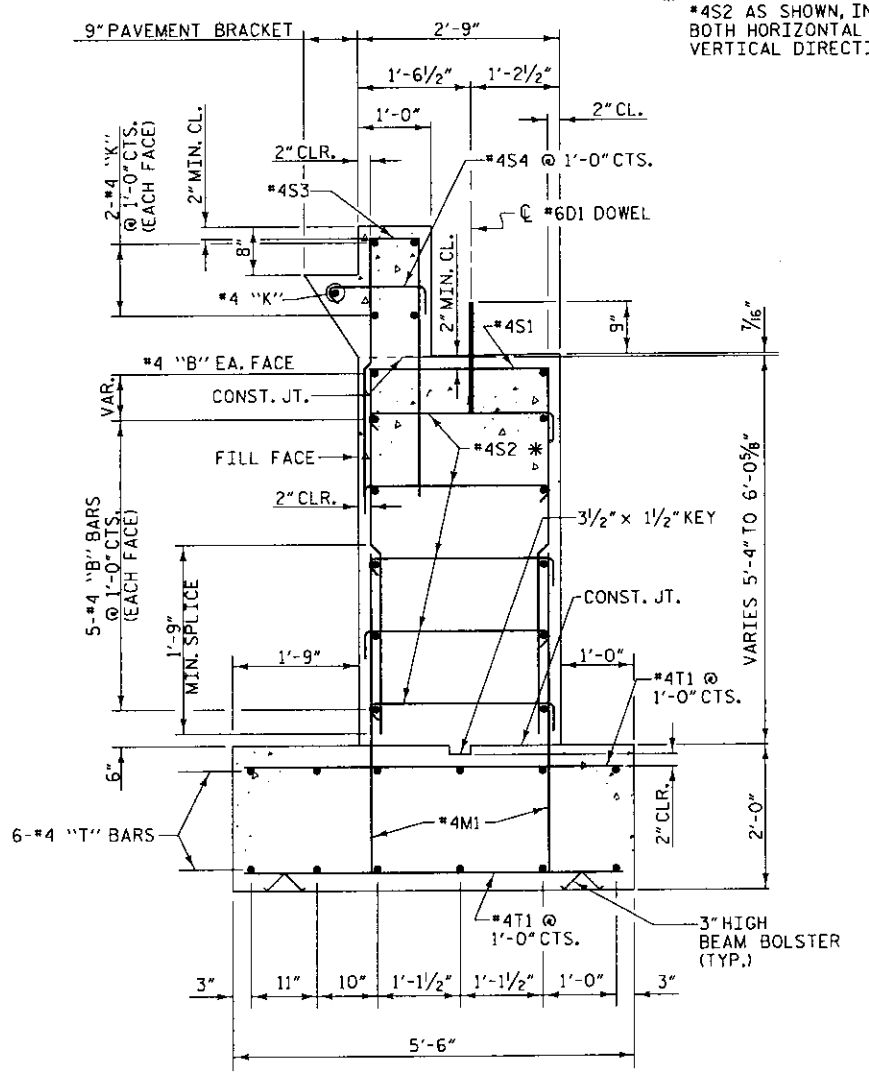
FOR END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#4	STR	20'-2"	162
B2	12	#4	STR	17'-5"	140
D1	20	#6	STR	1'-6"	45
H1	16	#4	3	6'-1"	65
H2	18	#4	3	7'-4"	88
K1	5	#4	STR	20'-2"	67
K2	5	#4	STR	17'-5"	58
M1	72	#4	STR	4'-5"	212
S1	36	#4	2	12'-5"	299
S2	180	#4	1	3'-2"	381
S3	34	#4	2	7'-6"	170
S4	34	#4	1	1'-10"	42
T1	74	#4	STR	5'-2"	255
T2	12	#4	STR	20'-6"	164
T3	12	#4	STR	17'-9"	142
V1	14	#4	STR	6'-9"	63
V2	16	#4	STR	7'-6"	80

TOTAL REINFORCING STEEL = 2433 lbs.

CLASS "A" CONCRETE - CU. YARDS

POUR 1	7.6 cu. yds.
POUR 2	11.2 cu. yds.
POUR 3	1.8 cu. yds.
POUR 4	7.3 cu. yds.
POUR 5	11.9 cu. yds.
POUR 6	1.8 cu. yds.
TOTAL	41.6 cu. yds.



* ALTERNATE HOOK ON #4S2 AS SHOWN, IN BOTH HORIZONTAL AND VERTICAL DIRECTIONS.

SECTION A-A

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

27' CLEAR ROADWAY - 90° SKEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19661 KEVIN AUSTIN
10/13/09

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 32187 Raleigh, N.C. 27636
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	22
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : W. B. ALLEN DATE : 4/09
CHECKED BY : L. K. AUSTIN DATE : 5/09

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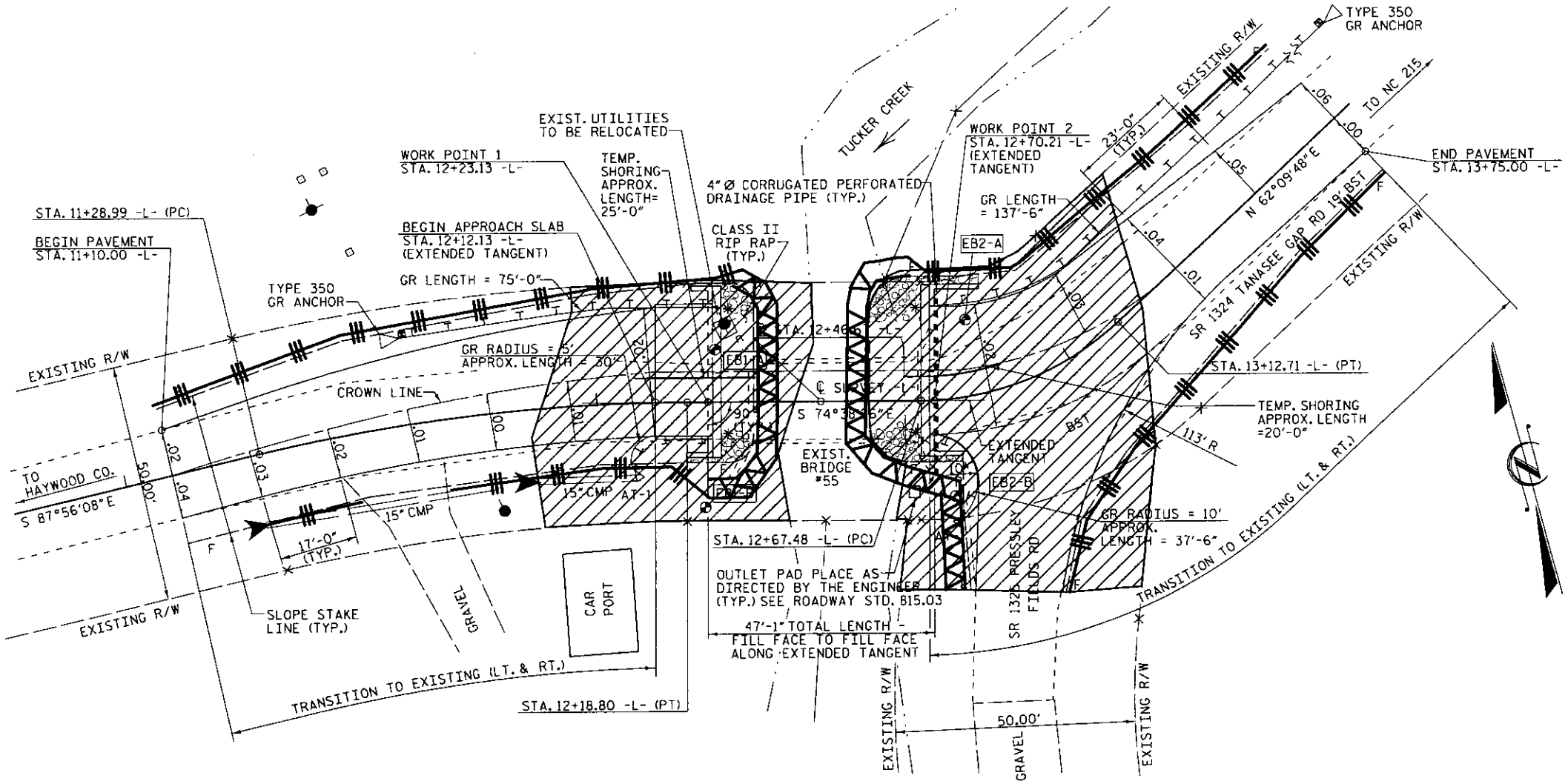
EROSION CONTROL PLAN



Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1630.06	Special Stilling Basin	
	Temporary Rock Silt Check Type-B	

ENVIRONMENTALLY SENSITIVE AREA PLEASE SEE NOTE

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	23
1			3			TOTAL SHEETS
2			4			27

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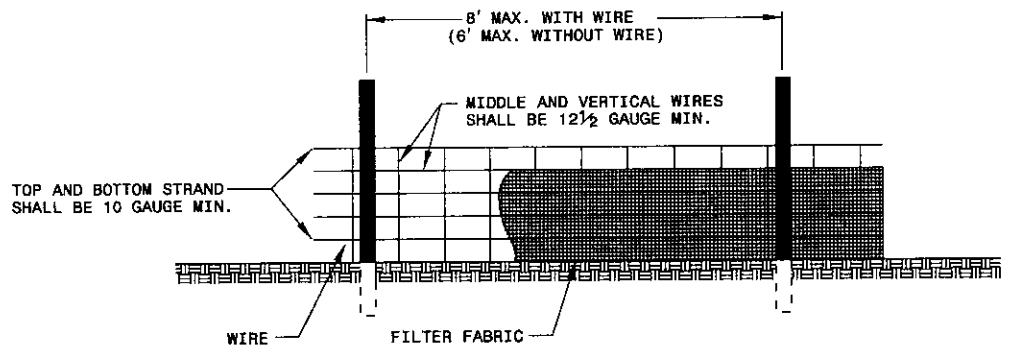
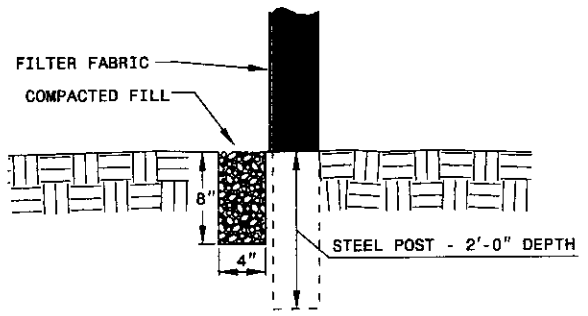
EROSION CONTROL PLAN

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE



NOTES
USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.



EXTENSION OF FABRIC AND WIRE INTO TRENCH

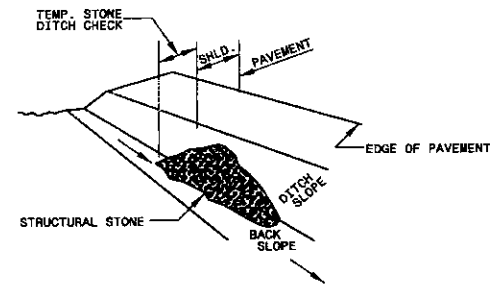
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01

SHEET 1 OF 1
1605.01

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

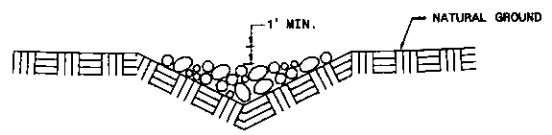


ISOMETRIC VIEW

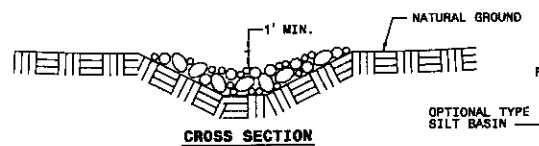
NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

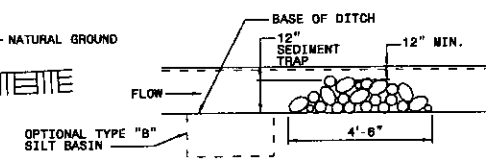
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH



ELEVATION VIEW

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	24
1			3			TOTAL SHEETS
2			4			27

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EROSION CONTROL PLAN

Special Sediment Control Fence:

Description:

The work covered by this section consists of the construction, maintenance, and removal of special sediment control fence. Place special sediment control fence as shown on the plans or as directed by the Engineer.

Materials:

(A) Posts:

Steel posts shall be at least 5 feet in length, approximately 1 3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.25 lb/ft of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches, and shall have a means of retaining wire in the desired position without displacement.

(B) 1/4 inch Hardware Cloth:

Hardware cloth shall have 1/4 inch openings constructed from #24 gauge wire. Install hardware cloth according to the detail shown on the plans.

(C) Sediment Control Stone:

Sediment control stone shall meet the requirements of Section 1005. Install stone according to the detail shown on the plans.

Maintenance and Removal:

The Contractor shall maintain the special sediment control fence until the project is accepted or until the fence is removed, and shall remove and dispose of silt accumulations at the fence when so directed by the Engineer in accordance with Section 1630.

The quantity of posts, sediment control stone and hardware cloth as measured above will be paid for at the contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, installation, and removal and disposal of silt accumulations and materials.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01

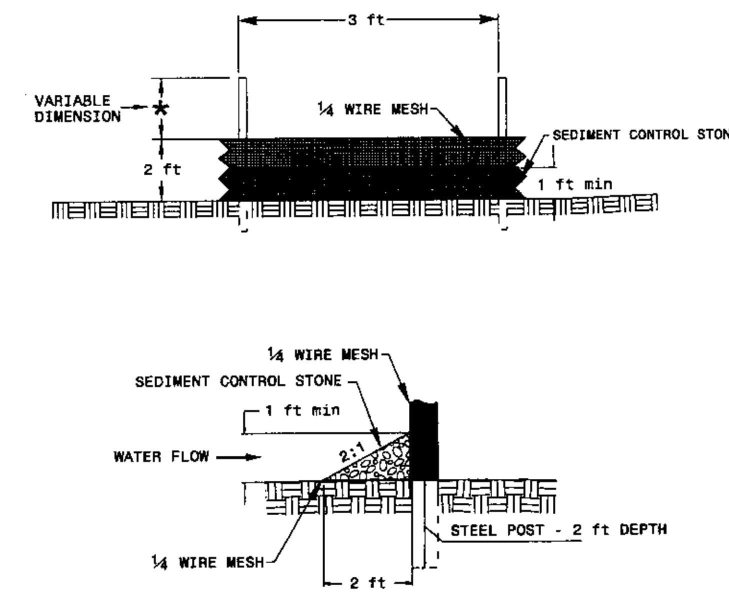
GENERAL NOTES:

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

SPACE POST A MAXIMUM OF 3 FT.



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01

PROJECT NO. 33836
TRANSYLVANIA COUNTY
STATION: 12+46.67

REPLACES BRIDGE NO. 55

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

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ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	25
1			3			TOTAL SHEETS
2			4			27

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EROSION CONTROL PLAN

SPECIAL STILLING BASIN:

Description

This work consists of furnishing, placing, and removing special stilling basin(s) as directed. The special stilling basin shall be used to filter pumped water during construction of drilled piers, footing excavation, and/or culvert construction. The special stilling basin shall also be used for sediment storage at the outlet of temporary slope drain pipe(s).

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Sediment Control Stone	1005

The filter fabric and sediment control stone shall be clean and shall not contain debris.

The special stilling basin shall be a water permeable fabric bag that traps sand, silt, and fines as sediment-laden water is pumped into it, or as runoff flows into it through the temporary slope drain pipe(s).

The special stilling basin shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8" (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications
Weight	ASTM D-3776	8.0 oz/yd
Grab tensile	ASTM D-4632	200.0 lb
Puncture	ASTM D-4833	130.0 lb
Flow rate	ASTM D-4491	80.0 gal/min/sf
Permittivity	ASTM D-4491	1.2 1/sec
UV Resistance	ASTM D-4355	70.0%

Construction Methods

The Contractor shall install the special stilling basin(s), filter fabric, and stone in accordance with Standard Drawing No. 1630.06 and at locations on the plans and as directed.

The special stilling basin(s) shall be constructed such that it is portable and can be used adjacent to each drilled pier, footing, and/or culvert. Temporary slope drain pipe(s) shall be attached to the special stilling basin(s) so that the runoff in the slope drain pipe(s) flows directly into the special stilling basin(s). The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls. If applicable, the neck or spout of the silt bag shall be cut to allow for a slope drain pipe to be inserted into the special stilling basin, and tied off tightly to stop the water from flowing out of the bag.

The special stilling basin(s) shall be replaced and disposed of when it is * full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer shall be received before removal and replacement.

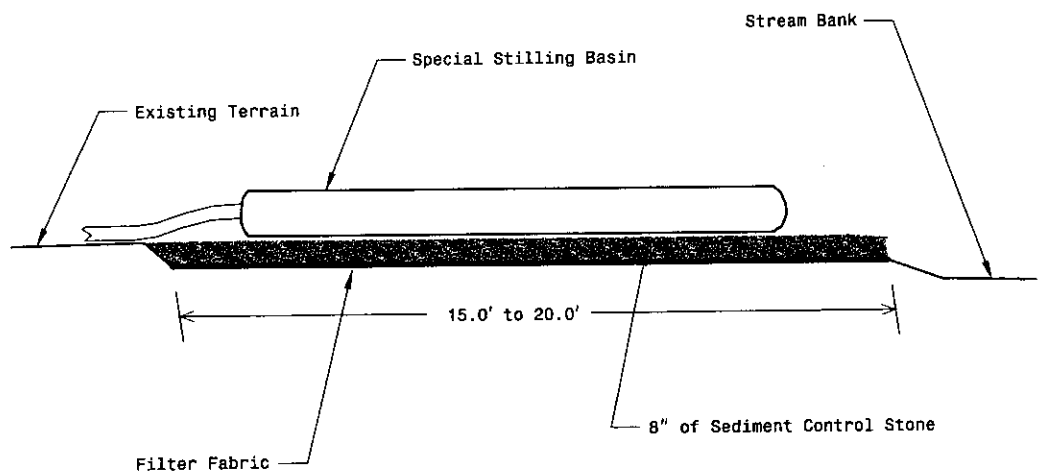
The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers, footing excavation, and/or culvert construction. A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limted to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN



Note: Provide Stabilized Outlet to Streambank
Not To Scale

SHEET 1 OF 1
1630.06

7-06

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06

PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	26
1			3			TOTAL SHEETS
2			4			27

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EROSION CONTROL PLAN

Environmentally Sensitive Areas:

This project is located in an "Environmentally Sensitive Area." This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the area identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

Clearing and Grubbing:

In areas identified on the erosion control plans as "Environmentally Sensitive Areas", the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Section 200, Article 200-1, in the Standard Specifications. The "Environmentally Sensitive Area" shall be defined as a 50 foot buffer zone on both sides of the stream (or depression), measured from top of streambank, (or center of depression). Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

Grading:

Once grading operations begin in identified "Environmentally Sensitive Areas", work will progress in a continuous manner until complete. All construction within these areas must progress in a continuous manner such that each phase is complete and areas permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in "Environmentally Sensitive Areas" as specified will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

Temporary Stream Crossings:

Any crossing of streams within the limits of this project must be accomplished in accordance with Section 107-13(b) of the Standard Specifications.

Seeding and Mulching:

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the "Environmentally Sensitive Areas" as indicated on the erosion control plans.

Stage Seeding:

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes which are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

All work described above will be paid for at the contract price for "Lump Sum for Erosion Control" established in the contract for the work involved. Additional payments will not be made for the requirements of this section as the cost for this work should be included in the contract price for "Lump Sum for Erosion Control" for the work involved.

SAFETY FENCE:

Description

Safety Fence shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland or water. The fence shall be installed prior to any land disturbing activities.

Materials

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft. of length.

Construction Methods

No additional clearing and grubbing is anticipated for the installation of this fence; however, if any clearing and grubbing is required, it will be the minimum required for the installation of the safety fence. Such clearing shall include satisfactory removal and disposal of all trees, brush, stumps and other objectionable material.

The fence shall be erected to conform to the general contour of the ground. When determined necessary, minor grading along the fence line shall be performed to meet this requirement provided no obstructions to proper drainage are created.

Posts shall be set and maintained in a vertical position and may be hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence fabric shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

Measurement and Payment

Safety Fence will be paid for at the contract price for "Lump Sum for Erosion Control". Such payment will be full compensation including but not limited to clearing and grading, furnishing and installing fence fabric with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

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PROJECT NO. 33836

TRANSYLVANIA COUNTY

STATION: 12+46.67

REPLACES BRIDGE NO. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE ON SR 1324
OVER TUCKER CREEK
WEST OF NC 215

27' CLEAR ROADWAY - 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	27
1			3			TOTAL SHEETS
2			4			27