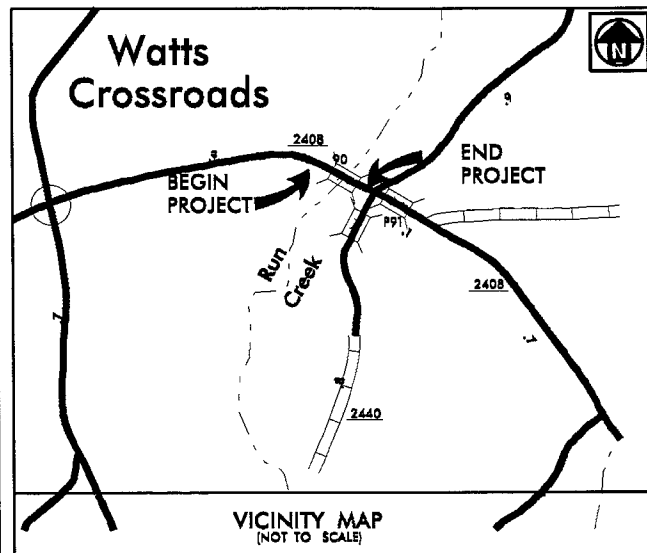


STATES
PALE

WBS 33417 TIP PROJECT: B-4051

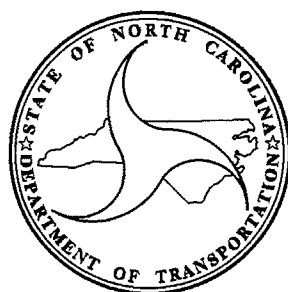
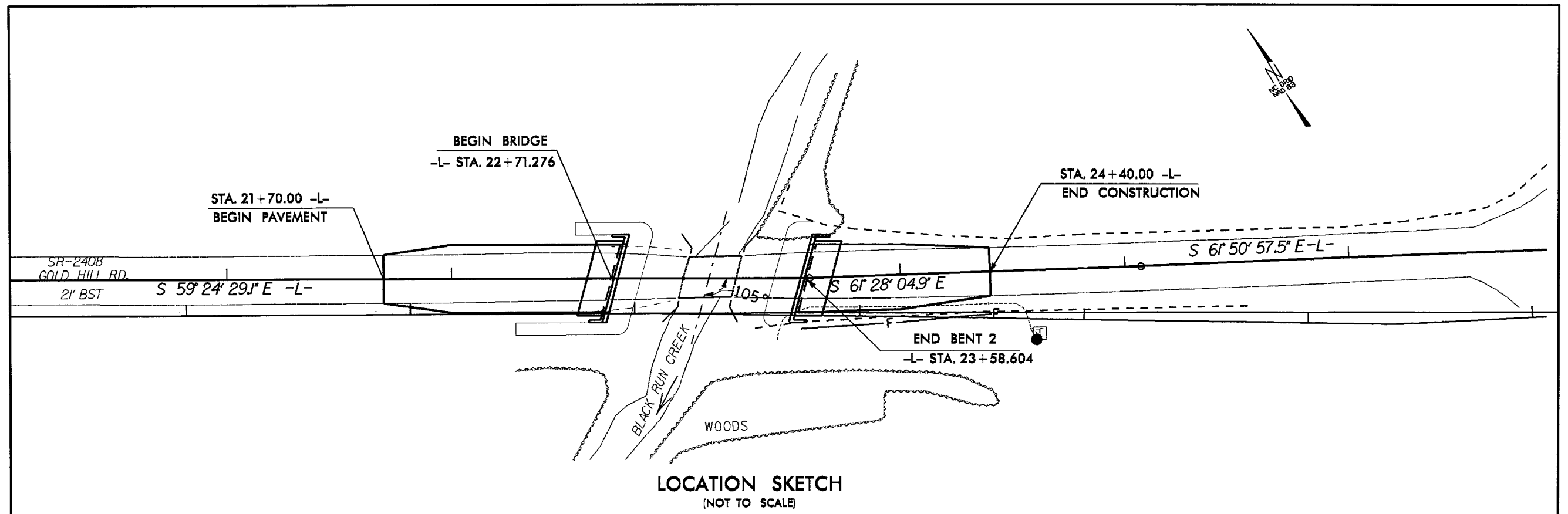


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CABARRUS COUNTY

LOCATION: SR 2408 BRIDGE NO. 90 OVER RUN CREEK

TYPE OF WORK: REPLACE EXISTING BRIDGE WITH ONE SPAN BOX BEAM AND RESURFACE EXISTING ROADWAY.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4051	1	24
STATE PROJECT NO.	P.A. PROJ. NO.	DESCRIPTION	
33417.1.1		P.E.	
33417.3.1		CONSTRUCTION	



DESIGN DATA

ADT 2004 = 1200

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT = 0.036 MILE
LENGTH STRUCTURE TIP PROJECT = 0.015 MILE
TOTAL LENGTH TIP PROJECT = 0.051 MILE

Prepared In the Office of:
BRIDGE MANAGEMENT UNIT

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

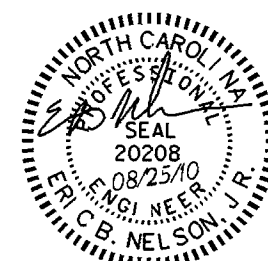
2006 STANDARD SPECIFICATIONS

LETTING DATE:
SEPTEMBER 23, 2010

NCDOT CONTACT:

DAN HOLDERMAN, PE
STATE BRIDGE
MANAGEMENT ENGINEER

MIKE SUMMERS
BRIDGE MANAGEMENT
PROJECT MANAGER



ERIC NELSON, PE
DESIGN ENGINEER

POINT	NORTH	EAST
- BL 1- STA. 5+00	630410.317	1571365.893
- BL2- STA. 11+03.38	630104.343	1571885.112
- BL- STA. 14+38.51	629929.777	1572172.014
- BL- STA. 29+30.81	629240.388	1573495.535

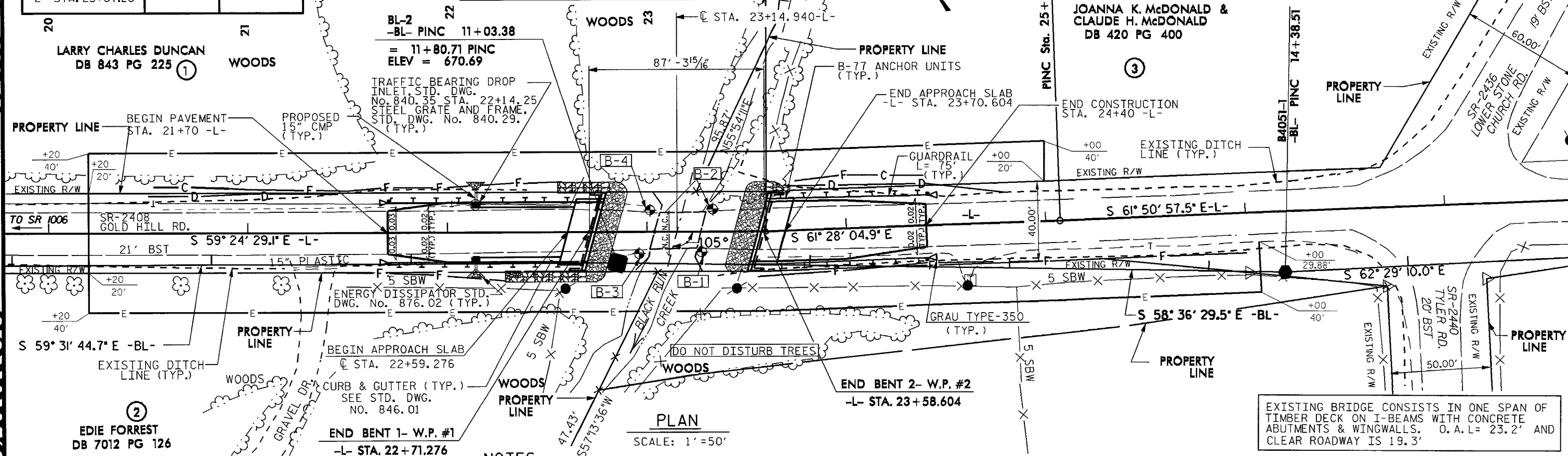
POINT	NORTH	EAST
PINC		
-L- STA. 23+59.60	630079.868	1571958.029
PINC		
-L- STA. 25+07.20	630009.368	1572087.701

BM #2
-BL- STA 10+37.98
245.82' LEFT
ELEV. 672.29'

BM #1	630388.356	1571002.356
BM #2	630349.375	1571954.225
BM #3	629746.7812	1572874.0125
BEGIN PROJECT		
-L- STA. 21+70.00	630176.356	1571794.819
END PROJECT		
-L- STA. 24+40.00	630041.462	1572028.662

POINT	NORTH	EAST
WORK POINT #1		
-L- STA. 22+71.276	630124.815	1571882.002
CENTER LINE		
-L- STA. 23+14.940	630102.585	1571919.583
WORK POINT #2		
-L- STA. 23+58.604	630080.372	1571957.176

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4051-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 629929.777(E) EASTING: 1572172.014(F) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999851 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4051-1" TO L- STATION IS ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88



EXISTING BRIDGE CONSISTS IN ONE SPAN OF TIMBER DECK ON I-BEAMS WITH CONCRETE ABUTMENTS & WINGWALLS. O.A.L= 23.2' AND CLEAR ROADWAY IS 19.3'

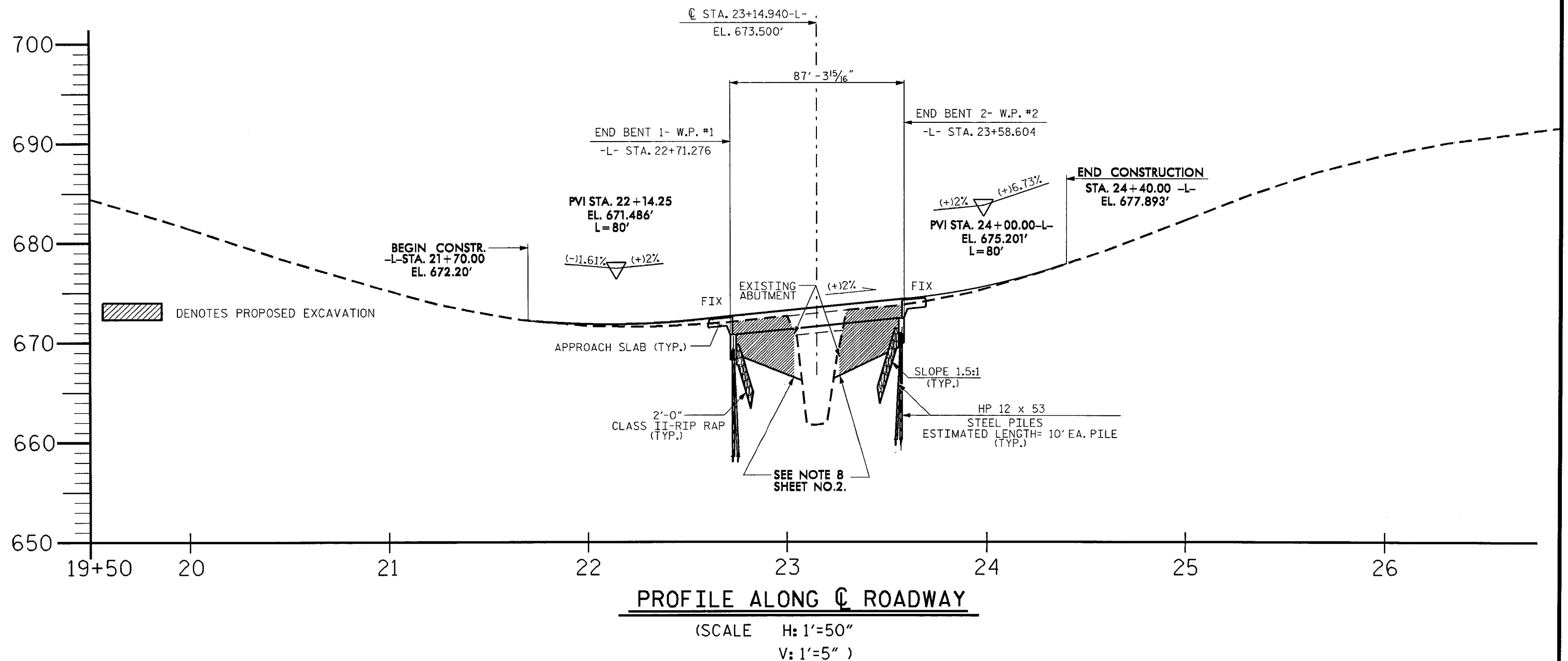
NOTES

- 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:
PLAIN RIP RAP CLASS II (2'-0" THICK) WITH FILTER FABRIC
END BENT NO. 1 100 To.
END BENT NO. 2 70 To.
TOTAL RIP RAP CLASS II 170 To.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH FHWA'S TECHNICAL ADVISORY T5140.20 (SCOUR AT BRIDGES).
- DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY OF 50 TONS PER PILE WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- WHEN DRIVING PILES DO NOT EXCEED THE MAXIMUM BLOW COUNT.
- PILING SHALL BE DRIVEN CONTINUOUSLY IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 450-8 UNTIL THE LOAD IS OBTAINED AT OR PAST THE MINIMUM TIP TO THE ESTIMATED LENGTH SHOWN ON THE PLANS. IF LOAD IS STILL NOT OBTAINED AT THIS POINT THE CONTRACTOR MAY SUSPEND DRIVING AND ALLOW THE PILE TO SET BEFORE RESUMING PILE DRIVING. WHEN DRIVING IS RESUMED, THE HAMMER SHALL BE WARM AND OPERATED A SUFFICIENT NUMBER OF BLOWS TO OVERCOME THE FRICTION FORCE (MIN. 10 BLOWS) BEFORE FINAL BEARING IS CHECKED.
- STEEL H-PILE POINTS ARE REQUIRED FOR H-PILES AT END BENT 1 AND END BENT 2.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES" NOVEMBER, 1995.
- THE EXISTING BRIDGE SHALL BE REMOVED BY SAWING AND/OR NON-SHATTERING METHODS SUCH THAT DEBRIS WILL NOT FALL INTO WATER. THE EXISTING BRIDGE ABUTMENTS WILL BE SAW CUT TO ELEVATION AS DIRECTED BY ENGINEER.

⬢ DENOTES GEO-TECH. BORING HOLE LOCATIONS.

PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
REPLACES BRIDGE NO. 90

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF BRIDGE #90 ON SR 2408 OVER BLACK RUN CREEK -29'-10" FT. CL. RDWY.-					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
					SHEET NO. 2 TOTAL SHEETS 24



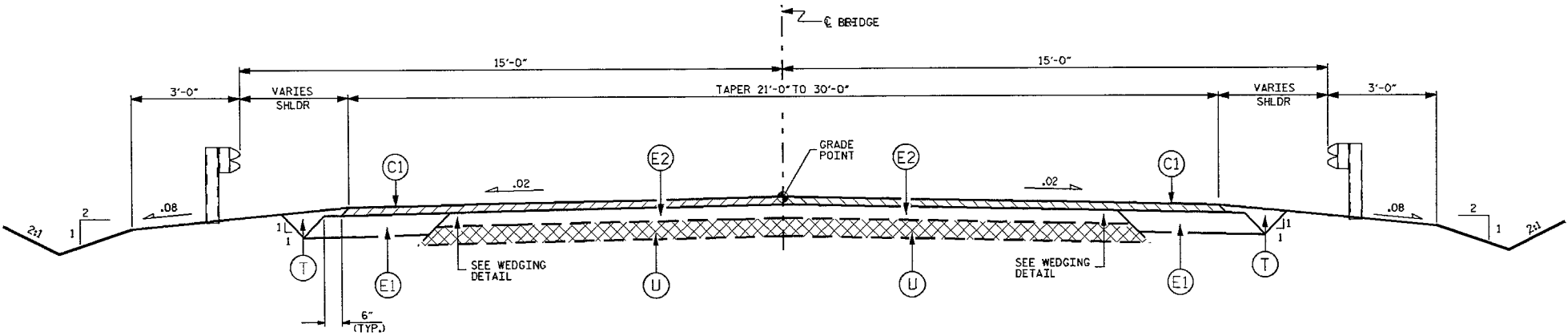
PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
REPLACES BRIDGE NO. 90

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PROFILE OF BRIDGE #90 ON SR 2408 OVER BLACK RUN CREEK -29'-10" CLEAR RDWY.-					
REVISIONS					
BY	DATE	NO.	BY	DATE	SHEET NO.
		3			3
		4			24

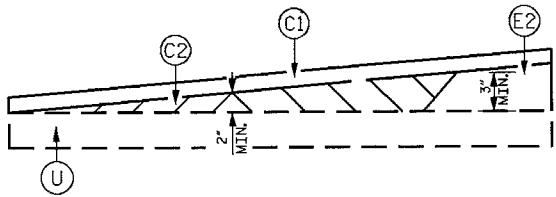
DRAWN BY: S. T. SANDOR DATE: 9/25/09
CHECKED BY: P. BRYANT/ R. WEISZ DATE: 10/2/09

NOTES

1. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
2. FOR METHOD OF SHOULDER CONSTRUCTION, SEE STD. DWG. 560.01



TYPICAL ROADWAY SECTION



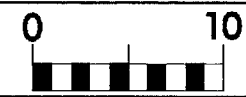
WEDGING DETAIL FOR RESURFACING

C1	PROPOSED APPROXIMATE 3.0" MIN. ASPHALT CONCRETE SURFACE COURSE, TYPE S 9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S 9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1 1/2" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

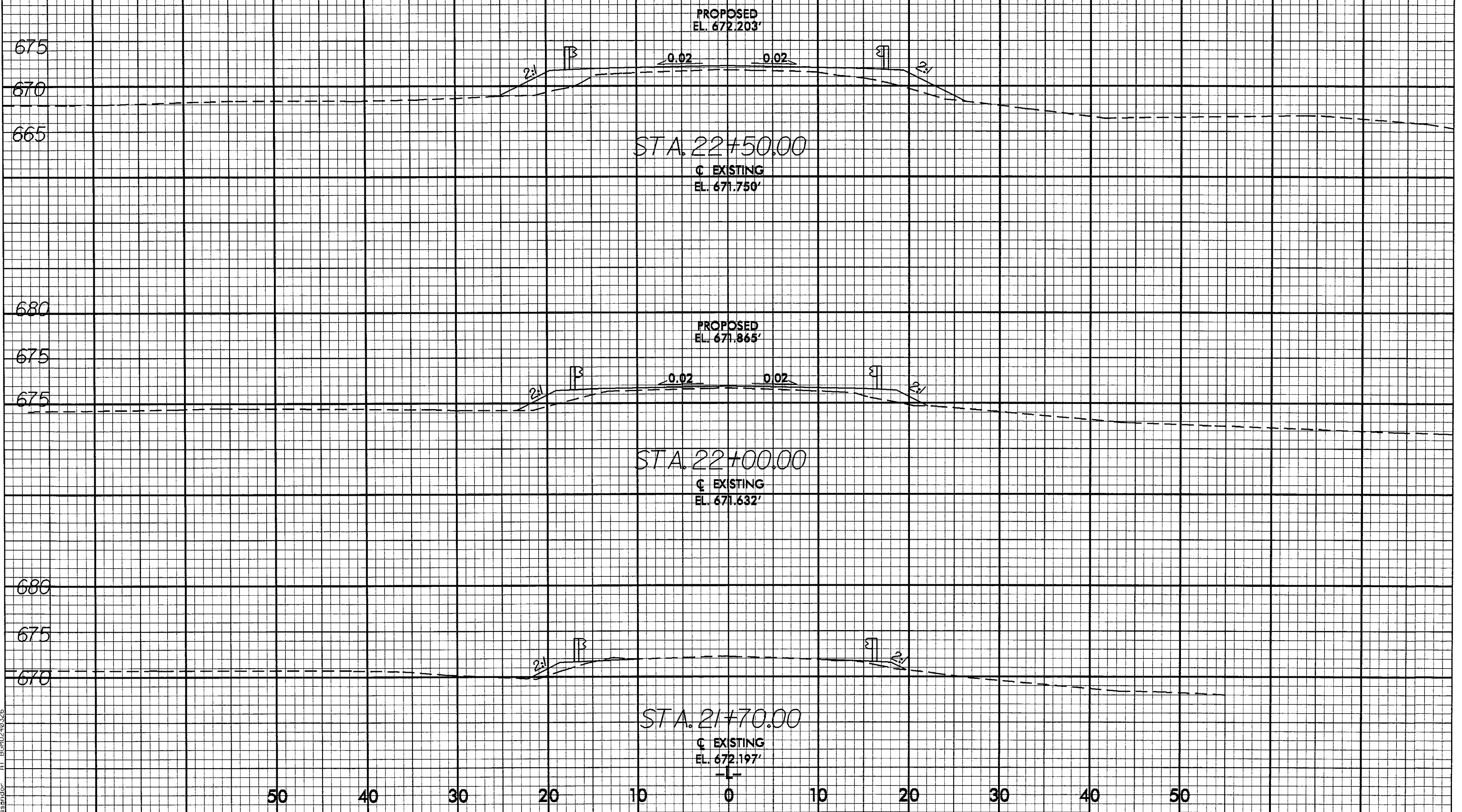
PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
BRIDGE NO. 90

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TYPICAL ROADWAY SECTION					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
SHEET NO. 4					TOTAL SHEETS 24

DRAWN BY : S. T. SANDOR DATE : JUNE/2010
CHECKED BY : P. BRYANT/ A. ABRAHA DATE : AUG./2010

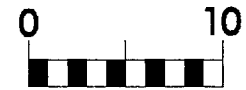


PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHT.
WBS. 33417	6	24



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ssondor



PROJ. REFERENCE NO.

WBS. 33417

SHEET NO.

7

TOTAL SHT.

24

680

675

670

STA. 24+40.00

C EXISTING
EL. 677.901'

PROPOSED
EL. 675.672'

680

675

670

STA. 24+00.00

C EXISTING
EL. 675.435'

PROPOSED
EL. 674.767'

680

675

670

STA. 23+75.00

C EXISTING
EL. 674.356'

±

50

40

30

20

10

0

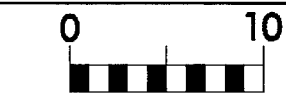
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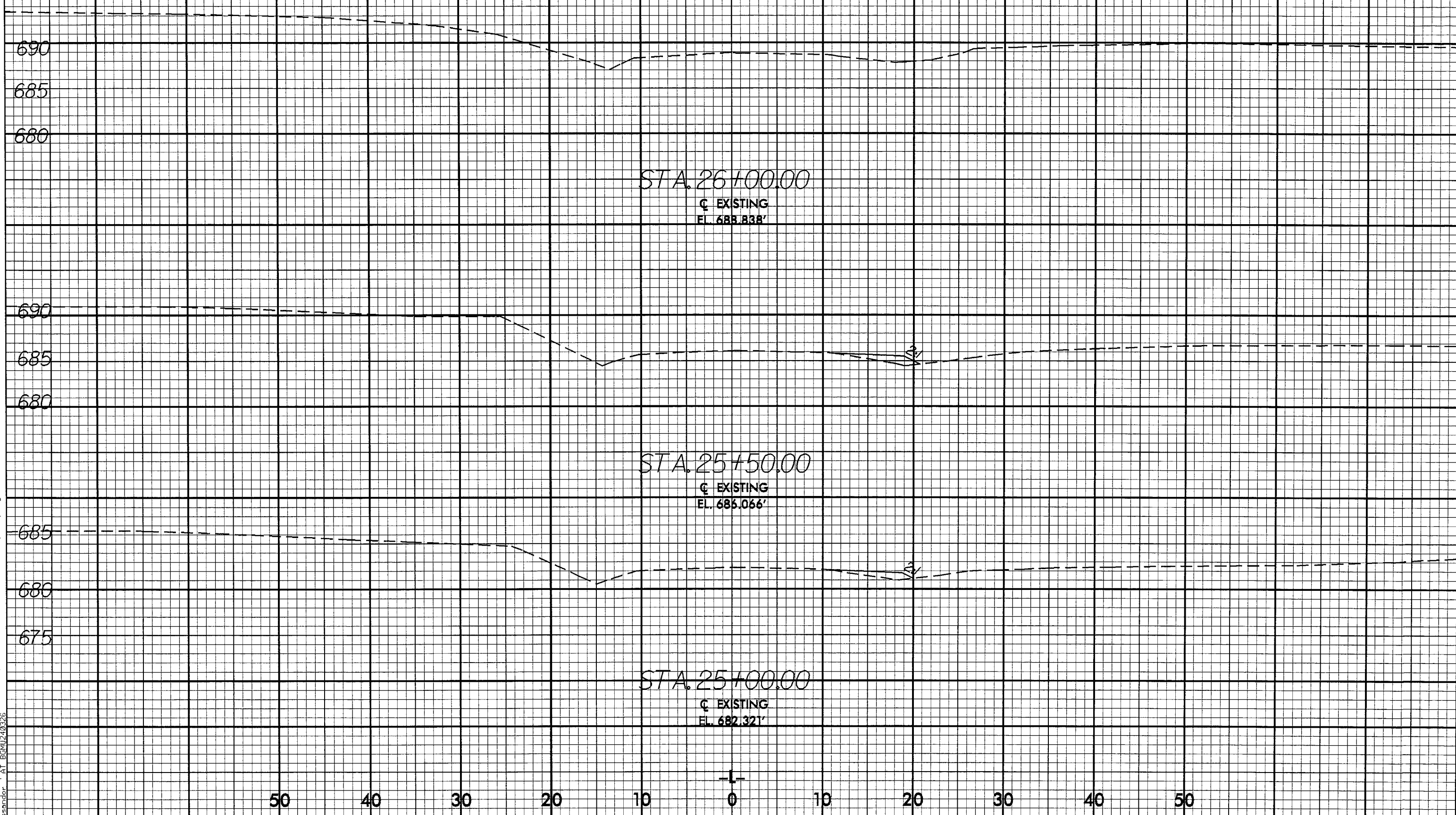
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40

50



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHT.
WBS. 33417	8	24



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ssander At B4051.dgn

NOTES

ASSUMED LIVE LOAD-HS20 OR ALTERNATE LOADING, EXCEPT THAT THE BEAMS HAS BEEN DESIGNED FOR HS25.

CONCRETE : $f'_c = 6500\text{psi}$ (MINIMUM COMPRESSIVE STRENGTH @ 28 DAYS)

$f'_{ci} = 5200\text{psi}$ (MINIMUM COMPRESSIVE STRENGTH @ TRANSFER OF STRESSING FORCE).

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.

SIZE TYPE $\square$ AREA ULTIMATE STRENGTH APPLIED FORCE
0.6" ϕ HIGH STR. 0.217" 58,600 LBS/STRAND 43,950 LBS. PER CABLE

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

THE $2\frac{1}{2}" \phi$ DOWEL HOLES AT EACH END OF THE BOX BEAM SECTION SHALL BE FILLED WITH GROUT. SEE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5200 PSI.

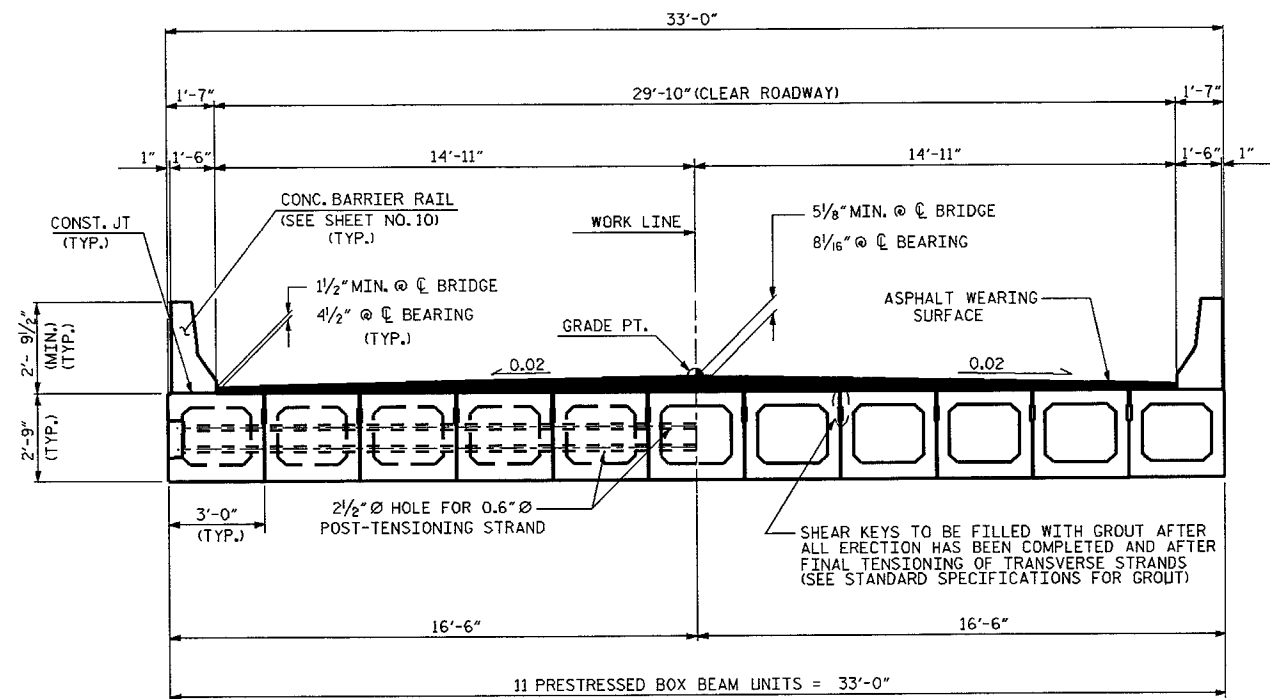
PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE STANDARD SPECIFICATIONS.

FOR PRESTRESSED CONCRETE BOX BEAMS AND ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

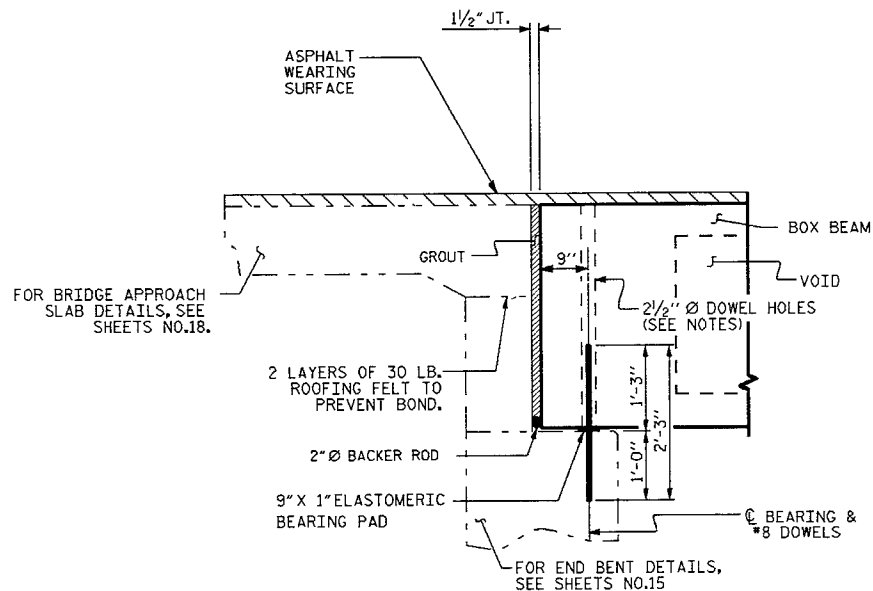
THE JOINT SEALER MATERIAL SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.



HALF-SECTION AT
INTERMEDIATE DIAPHRAGMS

HALF-SECTION AT VOIDS

TYPICAL SECTION



SECTION AT END BENT

PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
BRIDGE NO. 90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
30' CL. ROADWAY 105° SKEW

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			2			9
2			3			24

DRAWN BY : S. T. SANDOR
CHECKED BY : A. ABRAHA
DATE : JUNE/2010
DATE : AUG./2010

20-AUG-2010 07:56

ssandor AT BGMU240326

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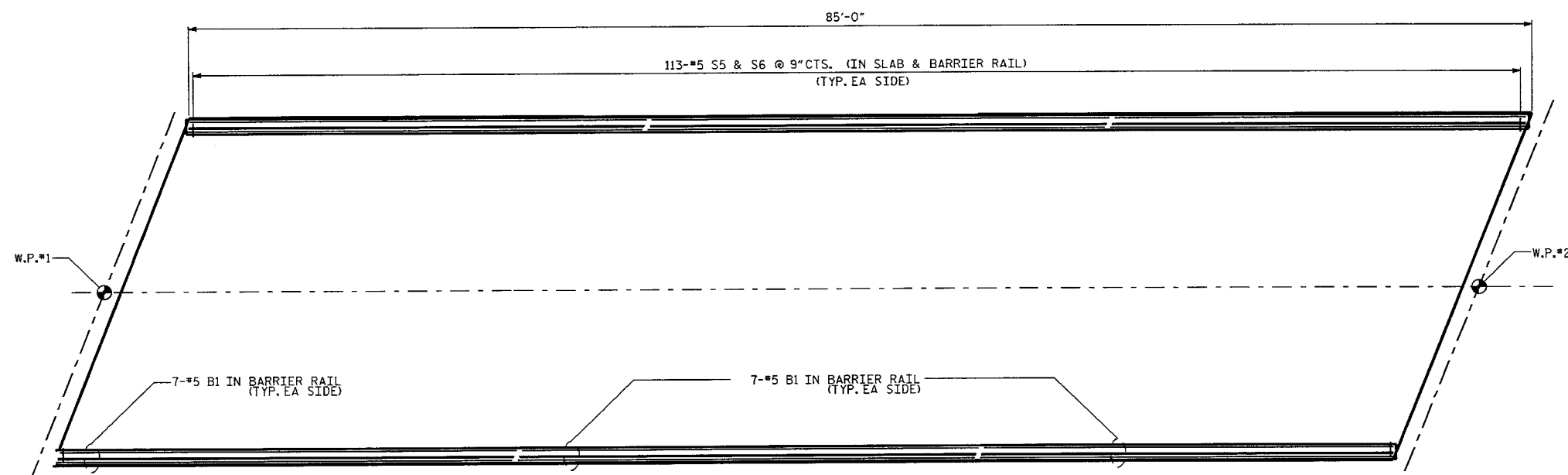
STD. NO. PCB51

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOoled IN ALL EXPOSED FACES OF THE BARRIER RAIL AND, IN ACCORDANCE WITH SECTION 25.05 OF THE STANDARD SPECIFICATIONS, A VERTICAL 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.

Figure 6 shows the elevation and end view of a propeller. The elevation view includes the following dimensions: total length 11 1/8", hub diameter 1 1/2", propeller diameter 2 7/16", and a 2 1/2" rod passing through the center. The end view shows a propeller with a 1 1/8" rod and a hub diameter of 2".

BAR	BARS PER SPAN	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A					
* B1	42	42	#5	STR	27'-11"	1223
* S5	226	226	#5	6	6'-3"	1754
* S6	226	226	#5	7	5'-8"	1336
*EPOXY COATED REINFORCING STEEL LBS.						4313
CLASS AA CONCRETE CU.YDS.						19.8
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL						170'-0"



Technical drawing of a beam-column joint showing reinforcement details. The drawing includes dimensions for beam width (1'-5"), column width (1"), and various reinforcement bar spacings and lengths. Key features include 7 #5 BI BARS, 5 #5 S6 @ 9" CTS., 2 3/4" CL., 10" Rad., 2 3/4" CL., 7 1/2", 2", 1" T/4", and 5 #5 S5 @ 9" CTS. The joint is labeled "CONST. JT.".

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

PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
REPLACE BRIDGE NO. 90

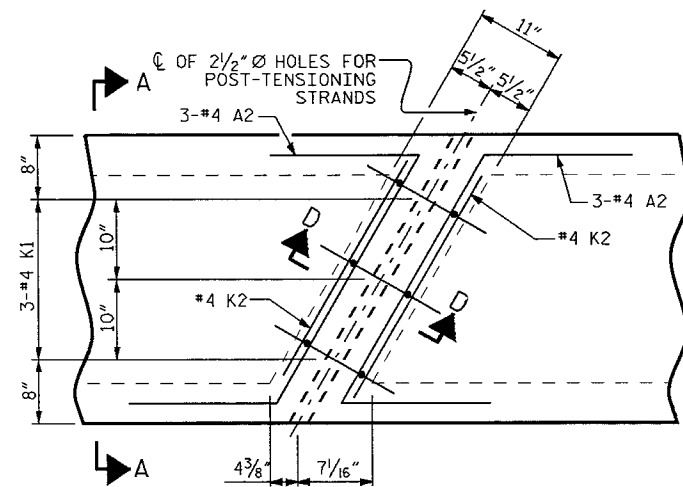
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE
BARRIER RAIL SECTION

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

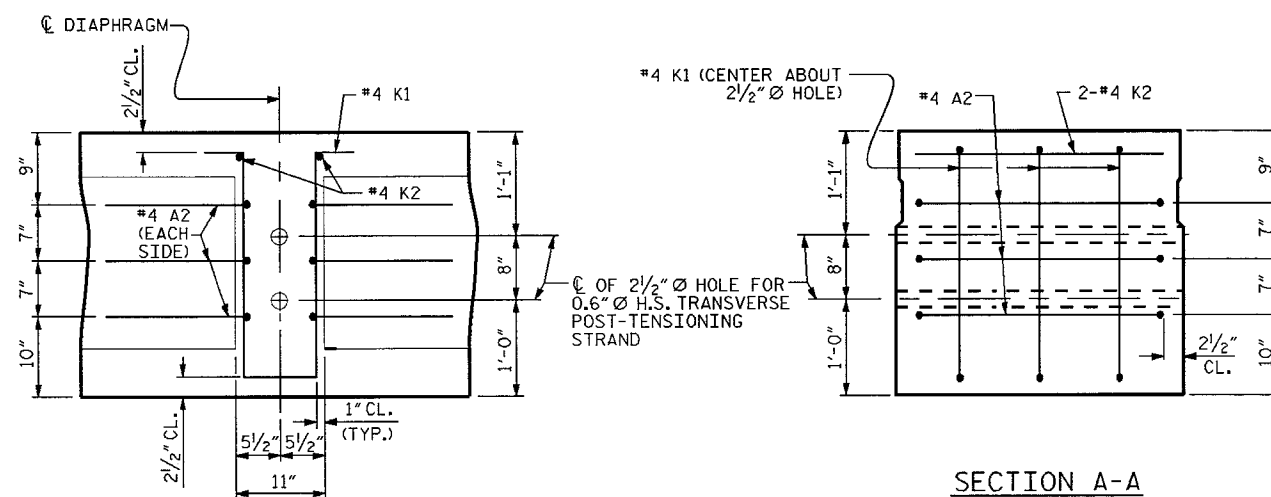
DRAWN BY : S. T. SANDOR DATE : AUG./2010
CHECKED BY : A. ABRAHA DATE : AUG./2010

12-AUG-2010 14:39 ssandor AT BGMU240326 S:\POC\Squad B\Current\Cabarrus90,wbs33417\Feb2010RW\B4051-bgmU_SD_BR.dgn



PLAN

90° < SKEW ≤ 120°

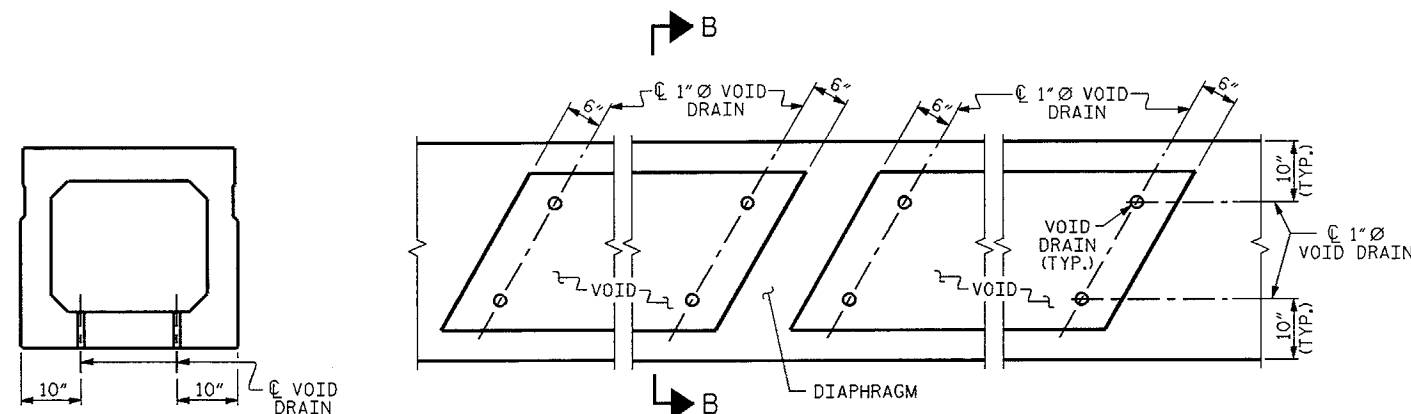


SECTION A-A
VOIDS NOT SHOWN

SECTION D-D

DOUBLE DIAPHRAGM DETAILS

*4 "S" BARS NOT SHOWN. *4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.

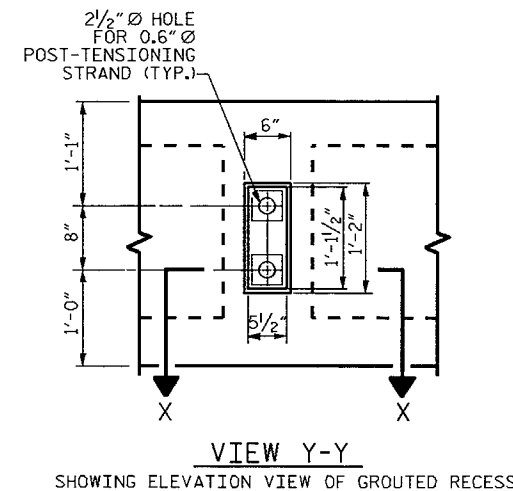


SECTION B-B

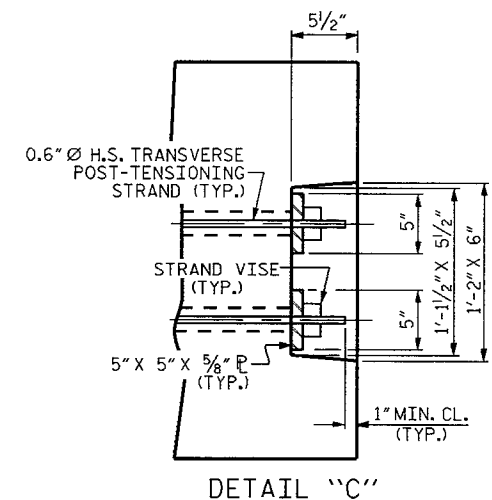
PART PLAN
90° < SKEW ≤ 120°

VOID DRAIN DETAILS

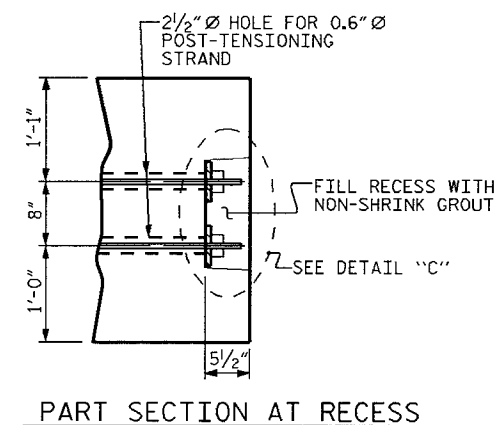
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



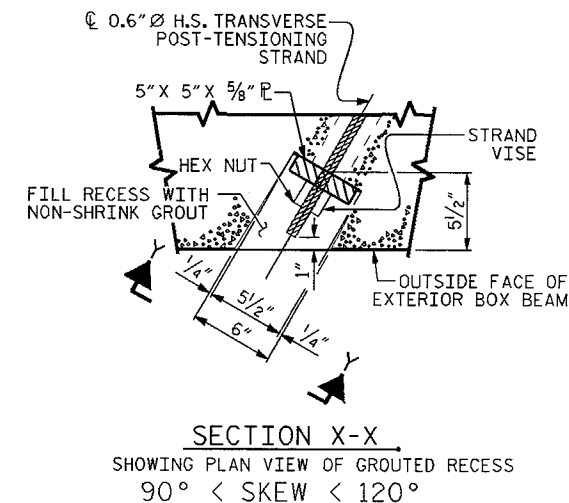
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUED RECESS
90° < SKEW ≤ 120°

GROUED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

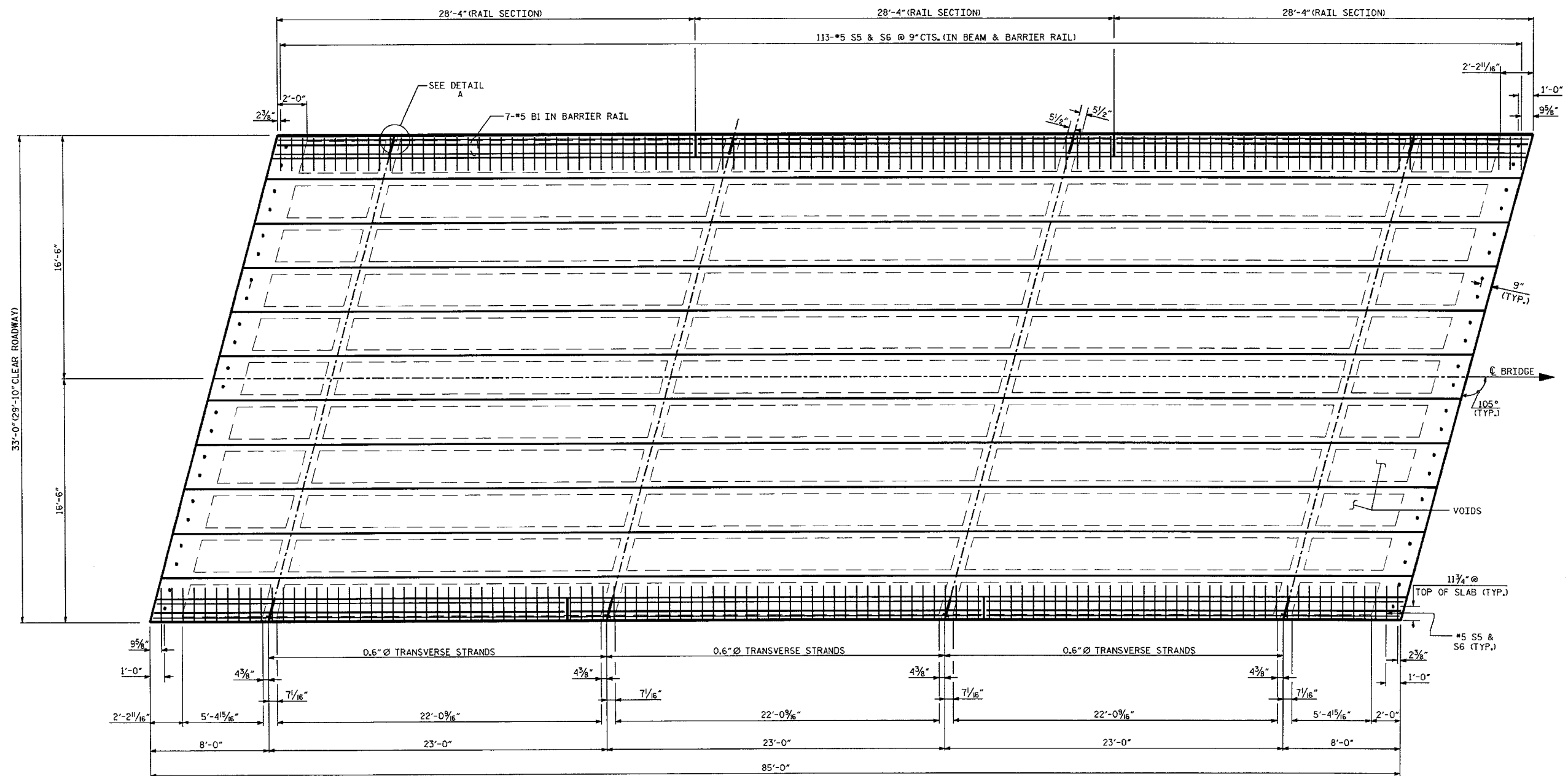
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
	0.6" Ø L.R. STRAND
CAMBER (BEAM ALONE IN PLACE)	0.312" = 3 3/4" (UP)
DEFLECTION DUE TO CONCRETE WEARING SURFACE	0.07" = 7/8" (DOWN)
FINAL CAMBER	0.242" = 2 7/8"

PROJECT NO. WBS 37315
COUNTY: CABARRUS
STATION: 23+14.940-L-
REPLACES BRIDGE NO. 90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			12
2			4			24

ASSEMBLED BY : S.T. SANDOR DATE : JUNE/2009
CHECKED BY : R. WEISZ/ P. BRYANT DATE : OCT./2009
DRAWN BY : TLA 5/05
CHECKED BY : GM 6/05
ADDED 7/11/05
REV. 5/1/06 TLA/GM



PROJECT NO. WBS 33417
 COUNTY: CABARRUS
 STATION: 14+15.00-L-
 BRIDGE NO. 90

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPANS
 105° SKEW
 29'-10" CL. RDWY.

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			13
2			4			24

DRAWN BY : S. T. SANDOR DATE : MAY/2010
 CHECKED BY : P. BRYANT/A. ABRAHA DATE : AUG./2010

13-AUG-2010 12:12 ssandor AT BGMU240326

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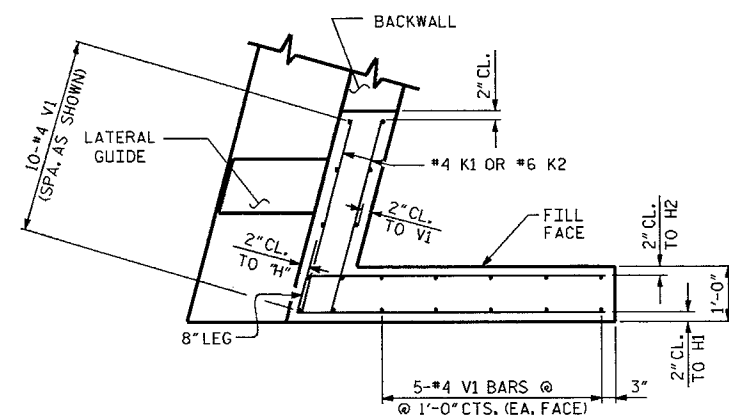
1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
2. THE CONTRACTOR SHALL PROVIDE FOR THE INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
3. FOR PILE SPLICE DETAILS, SEE SHEET 15.
4. FOR LATERAL GUIDE DETAILS, SEE SHEET 15.
5. HP 12x53 STEEL PILES SHALL BE GALVANIZED FULL LENGTH LENGTH IN ACCORDANCE WITH ARTICLE 1076-1 OF THE STANDARD SPECIFICATIONS.



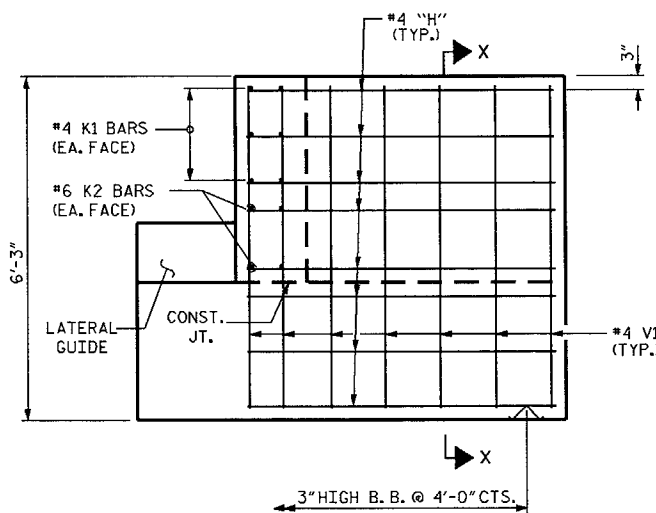
SUBSTRUCTURE
END BENT 1
29'-10" CL. ROADWAY

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	14
1			3			TOTAL SHEETS
2			4			24

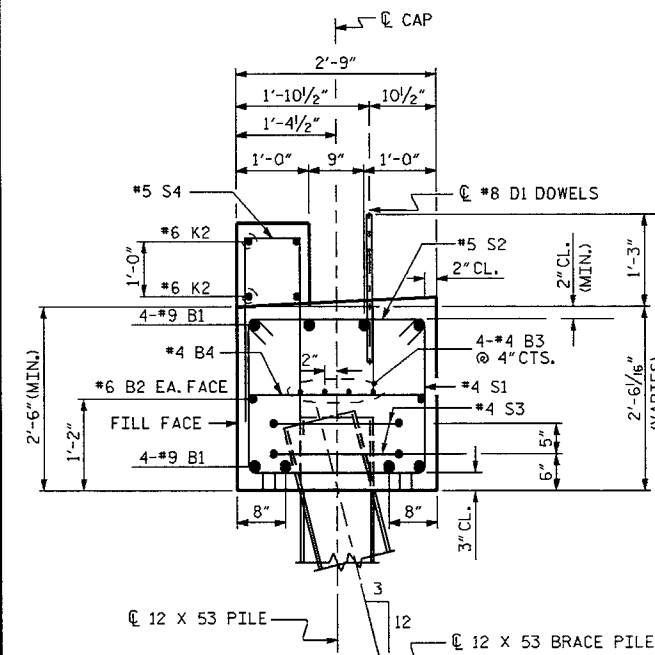
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PLAN OF WING (W1)

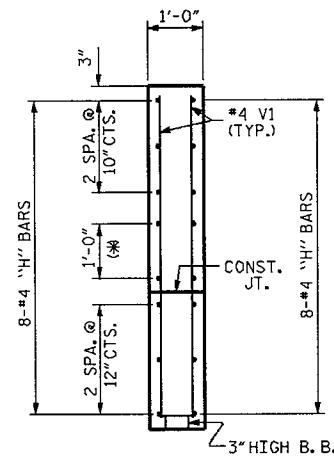


ELEVATION OF WING (W1)



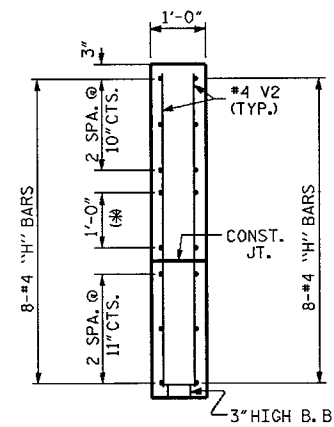
SECTION A-A

(NOT TO SCALE)



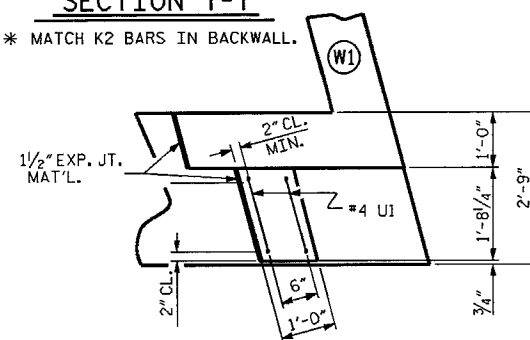
SECTION X-X

* MATCH K2 BARS IN BACKWALL.

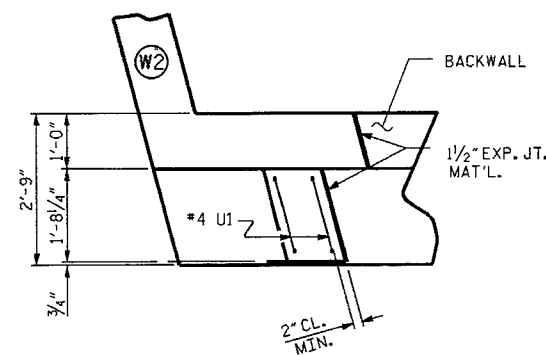


SECTION Y-Y

* MATCH K2 BARS IN BACKWALL.



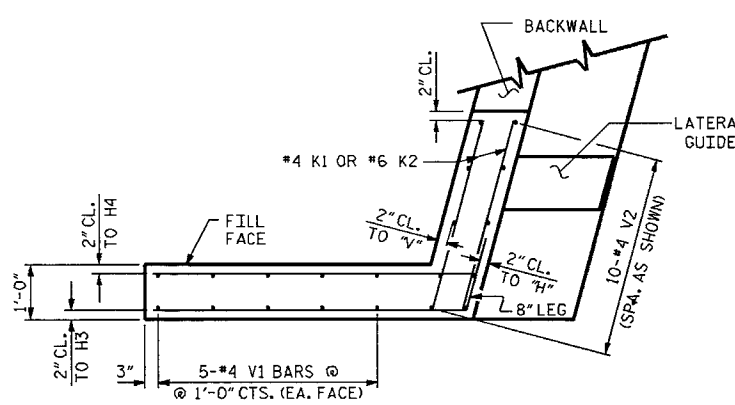
PLAN



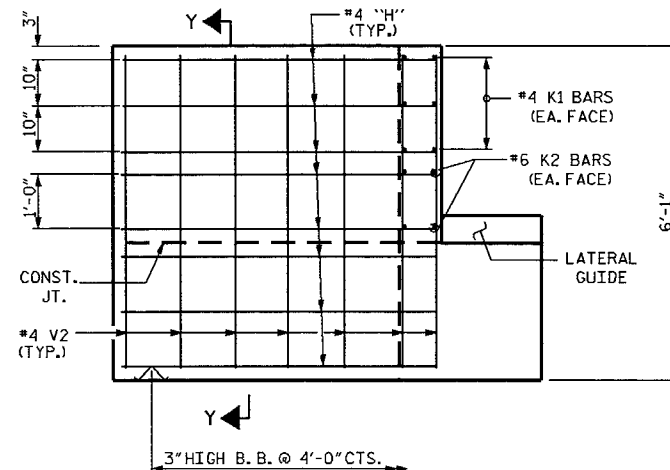
PLAN

LATERAL GUIDE DETAILS

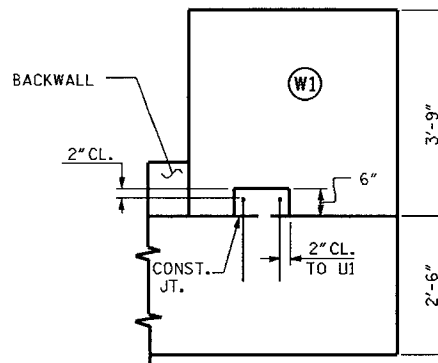
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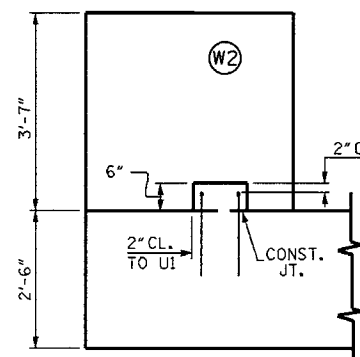
PLAN OF WING (W2)



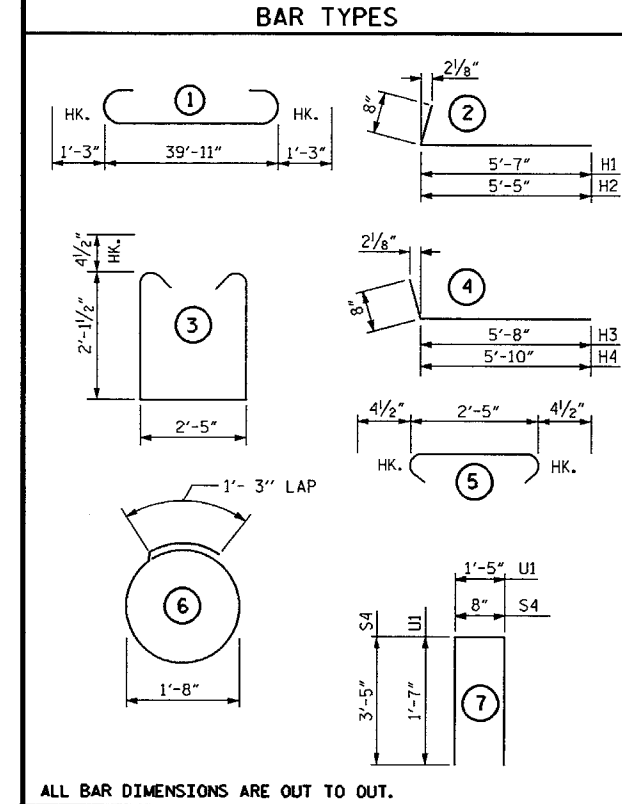
ELEVATION OF WING (W2)



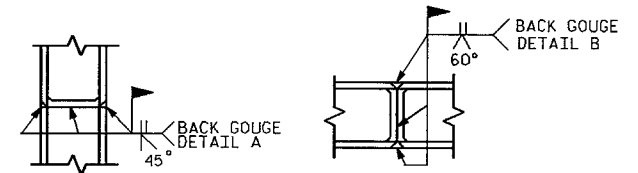
ELEVATION



ELEVATION

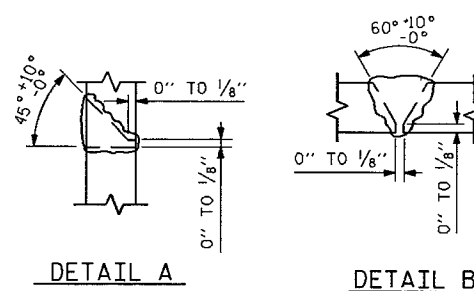


ALL BAR DIMENSIONS ARE OUT TO OUT.



*PILE VERTICAL

*PILE HORIZONTAL OR VERTICAL



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	42'-5"	1154
B2	2	6	STR	40'-0"	120
B3	8	4	STR	21'-3"	114
B4	10	4	STR	2'-5"	16
D1	22	8	STR	2'-3"	132
H1	8	4	2	6'-3"	33
H2	8	4	2	6'-1"	32
H3	8	4	4	6'-4"	34
H4	8	4	4	6'-6"	35
K1	12	4	STR	3'-5"	27
K2	4	6	STR	40'-0"	240
S1	40	4	3	7'-5"	198
S2	40	4	5	3'-2"	85
S3	20	4	6	6'-6"	87
S4	32	5	7	7'-6"	250
U1	4	4	7	4'-7"	12
V1	20	4	STR	5'-10"	78
V2	20	4	STR	5'-8"	76

REINFORCING STEEL = 2722 LBS
 CLASS A CONCRETE
 POUR 1 CAP & LOWER PART OF WINGS C.Y. 11.2
 POUR 2 UPPER PART OF WINGS AND BACKWALL C.Y. 5.2
 POUR 3 LATERAL GUIDE 0.1
 TOTAL C.Y. 16.5
 HP 12 X 53 STEEL PILE =100 LN. FT.

PROJECT NO. WBS. 33417
 COUNTY: CABARRUS
 STATION: 23+14.94-L-
 BRIDGE NO. 90

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			15
2			4			24

DRAWN BY : S. T. SANDOR
 CHECKED BY : P. BRYANT
 DATE : JULY/2010
 DATE : AUG./2010

20-AUG-2010 08:14

ssandor AT BGMU240326

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 17.

FOR LATERAL GUIDE DETAILS, SEE SHEET 17.

HP 12x53 STEEL PILES SHALL BE GALVANIZED FULL LENGTH LENGTH IN ACCORDANCE WITH ARTICLE 1076-1 OF THE STANDARD SPECIFICATIONS.

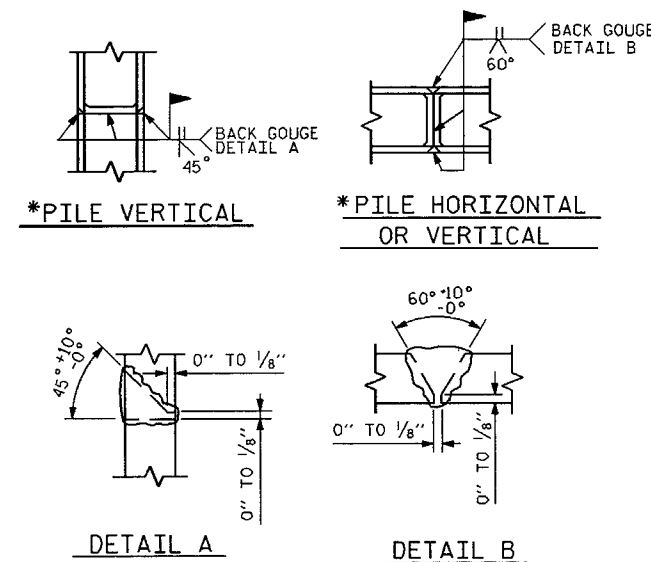
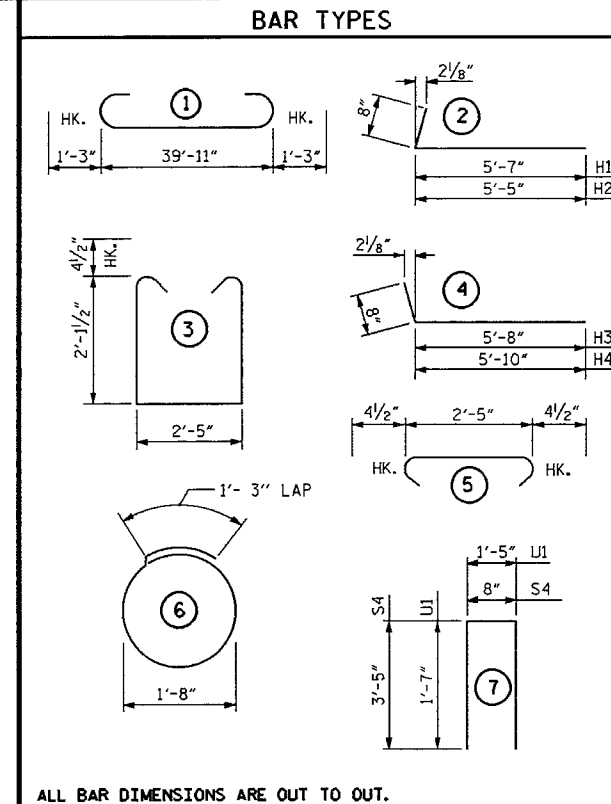
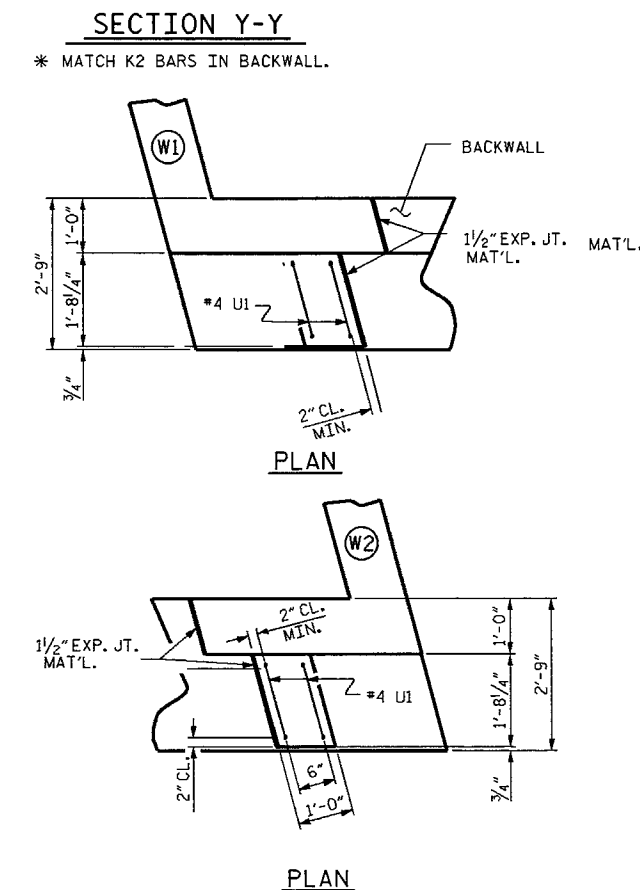
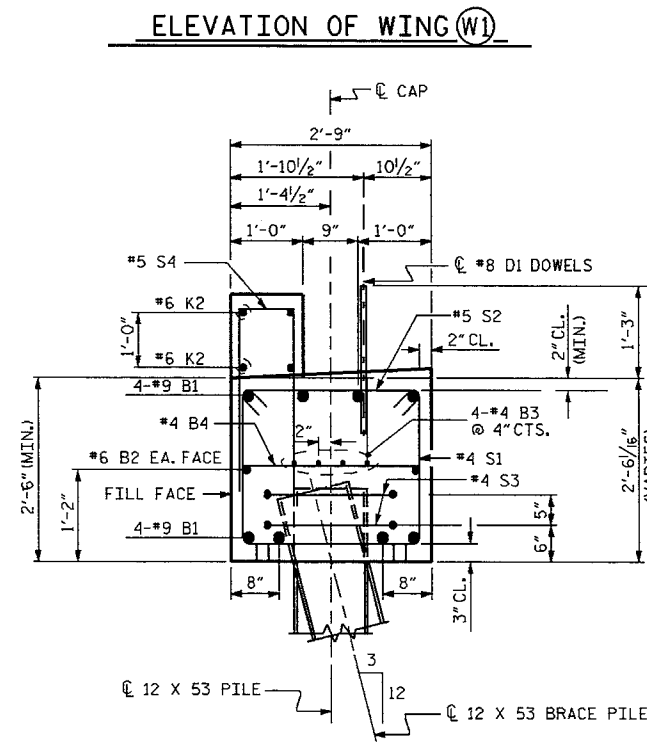
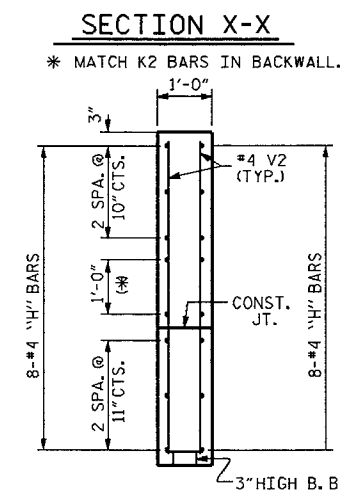
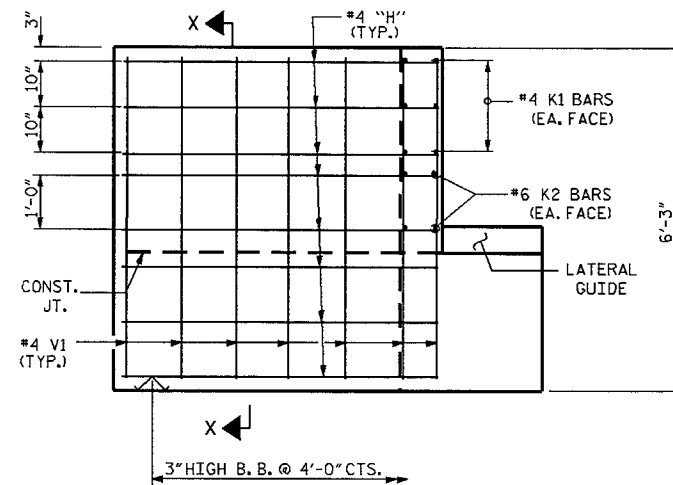
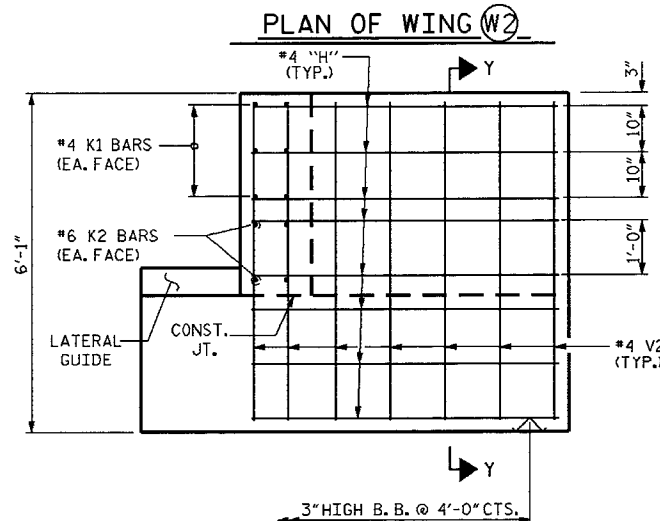
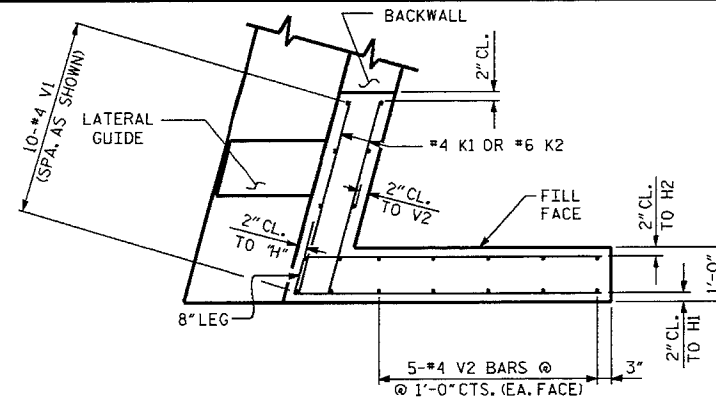
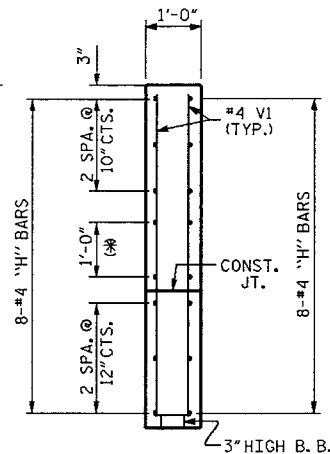
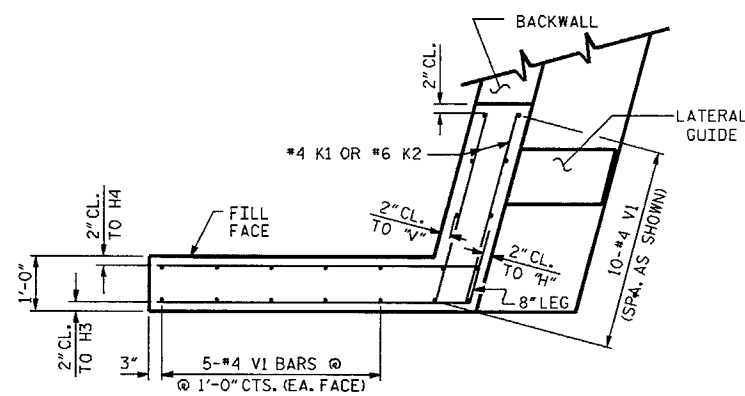


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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
29'-10" CL. ROADWAY

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	16 TOTAL SHEETS 24
1			3			
2			4			



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	42'-5"	1154
B2	2	6	STR	40'-0"	120
B3	8	4	STR	21'-3"	114
B4	10	4	STR	2'-5"	16
D1	22	8	STR	2'-3"	132
H1	8	4	2	6'-3"	33
H2	8	4	2	6'-1"	32
H3	8	4	4	6'-4"	34
H4	8	4	4	6'-6"	35
K1	12	4	STR	3'-5"	27
K2	4	6	STR	40'-0"	240
S1	40	4	3	7'-5"	198
S2	40	4	5	3'-2"	85
S3	20	4	6	6'-6"	87
S4	32	5	7	7'-6"	250
U1	4	4	7	4'-7"	12
V1	20	4	STR	5'-10"	78
V2	20	4	STR	5'-8"	76
REINFORCING STEEL					= 2722 LBS
CLASS A CONCRETE					
POUR 1 CAP & LOWER PART OF WINGS					C.Y. 11.2
POUR 2 UPPER PART OF WINGS AND BACKWALL					C.Y. 5.2
POUR 3 LATERAL GUIDE					0.1
TOTAL					C.Y. 16.5
HP 12 X 53 STEEL PILE					=100 LN. FT.

DRAWN BY : S. T. SANDOR DATE : JULY/2010
 CHECKED BY : P. BRYANT DATE : AUG./2010

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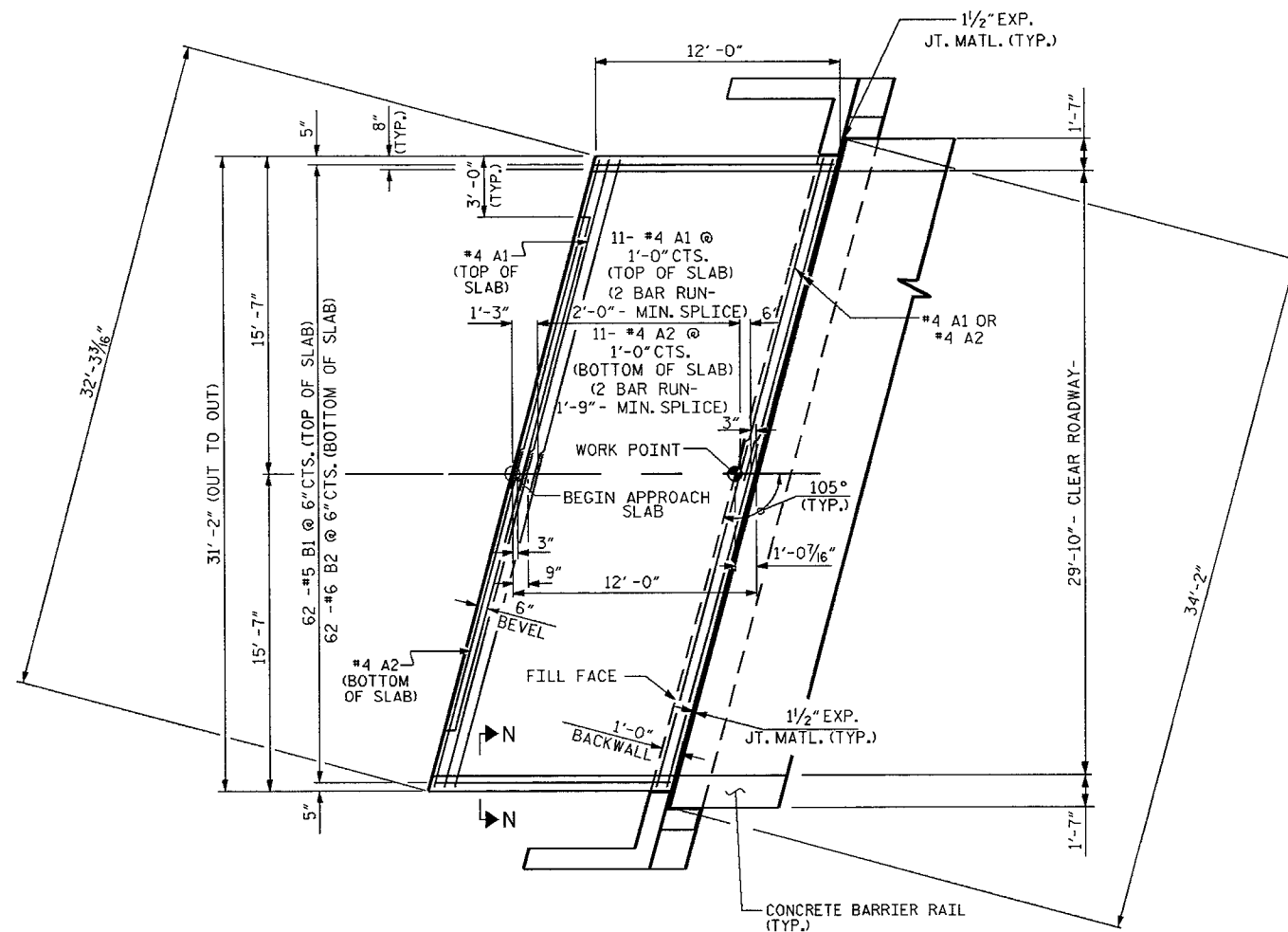
PROJECT NO. WBS. 33417
 COUNTY: CABARRUS
 STATION: 23+14.94-L
 BRIDGE NO. 90

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

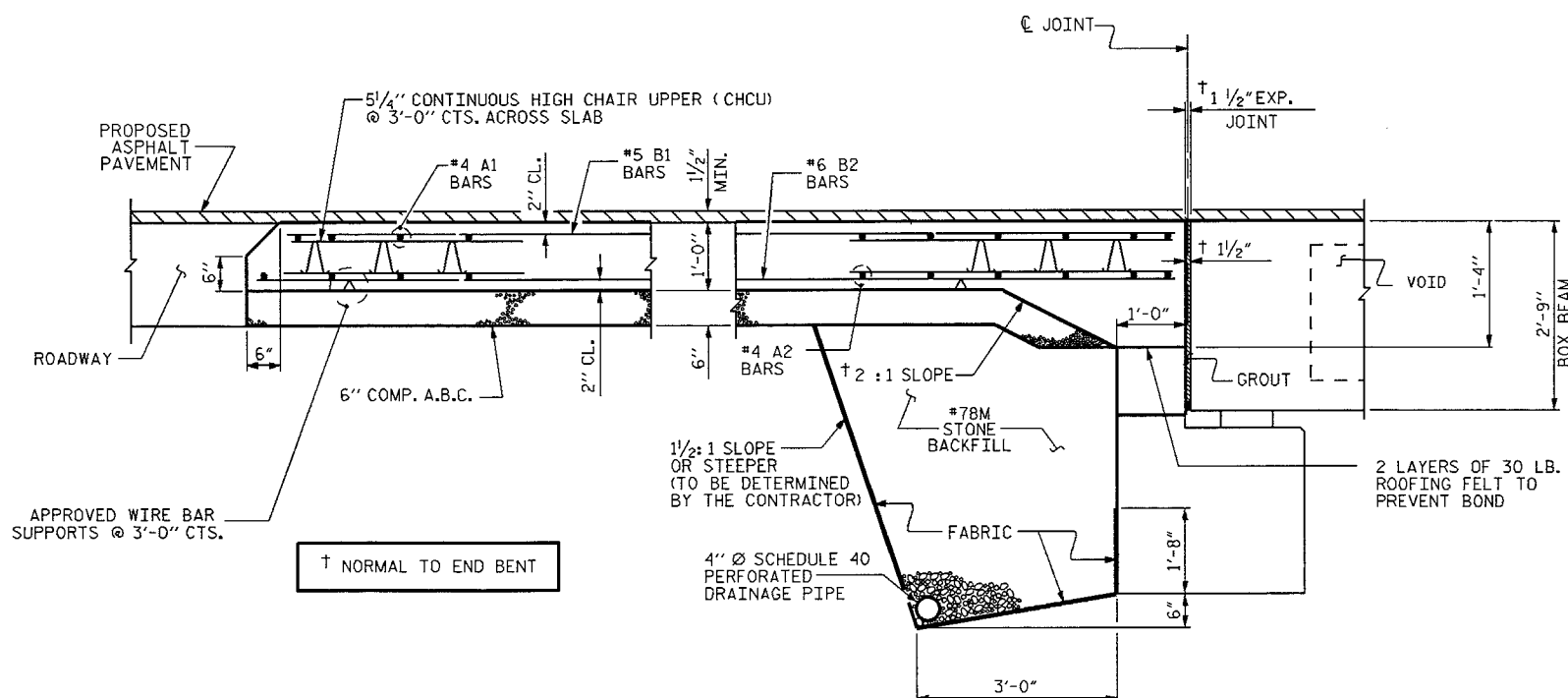
SUBSTRUCTURE
 END BENT 2 DETAILS

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

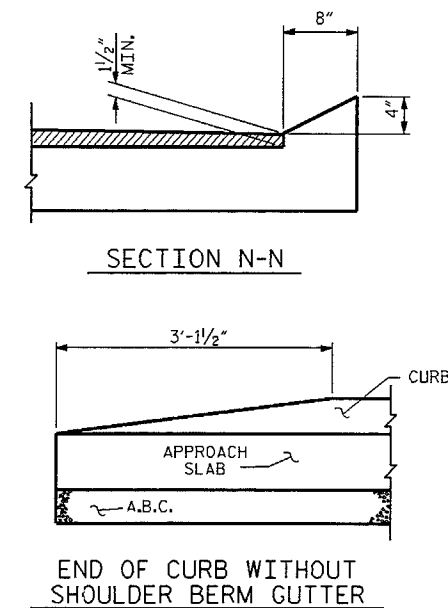
SHEET NO.
 17
 TOTAL SHEETS
 24



PLAN OF APPROACH SLAB



SECTION THRU SLAB



CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4"Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY STANDARD 422.10.

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

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

*78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

*78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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 WITH 4" OF INTERMEDIATE OR SURFACE COURSE ASPHALT.

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 SHEET NO. 9.

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.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR APPROACH SLABS. SEE ROADWAY STANDARD 1622.01.

WORK SHOWN ON THIS DRAWING WILL BE PAID UNDER THE LUMP SUM PRICE FOR APPROACH SLABS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	4	STR.	17'-1"	297
A2	26	4	STR.	16'-11"	294
*B1	62	5	STR.	11'-3"	727
B2	62	6	STR.	11'-7"	1079

REINFORCING STEEL LBS. 1373

*EPOXY COATED REINFORCING STEEL LBS. 1024

CLASS AA CONCRETE C. Y. 15.5

PROJECT NO. WBS 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
BRIDGE NO. 90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BRIDGE APPROACH SLAB
BRIDGE # 90 ON SR-2408
OVER BLACK RUN CREEK

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			18
2			4			24

STD. NO. RA513

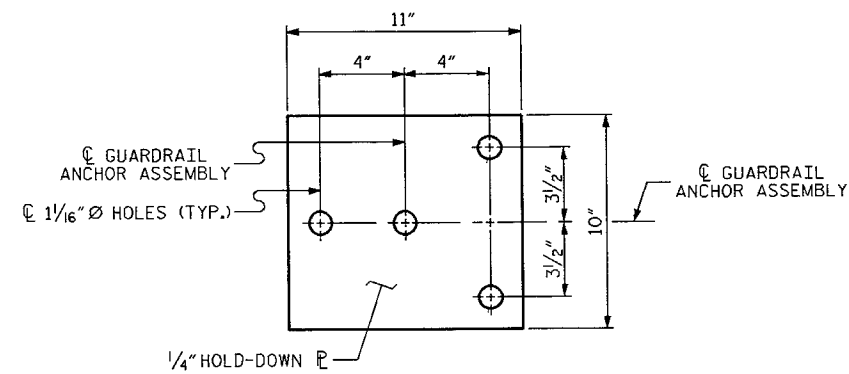
ASSEMBLED BY : S. T. SANDOR DATE : 09/2009
CHECKED BY : R. WEISZ/ P. BRYANT DATE : 10/2009

DRAWN BY : KMM 3-08
CHECKED BY : GM 3-08

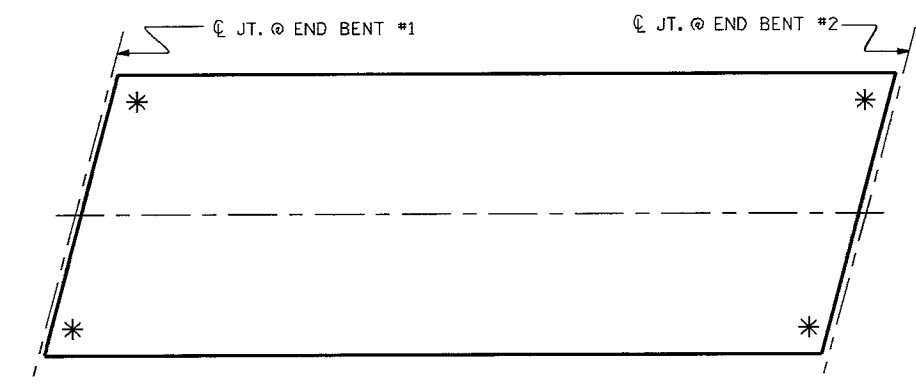
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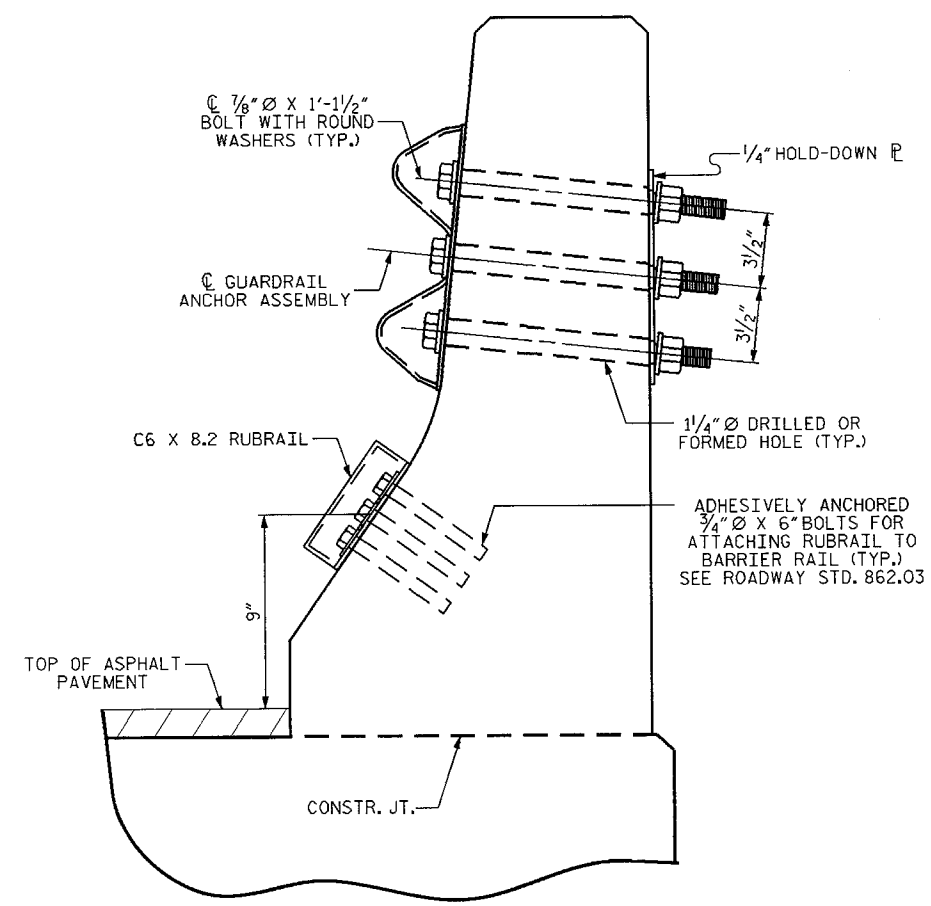
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PLAN

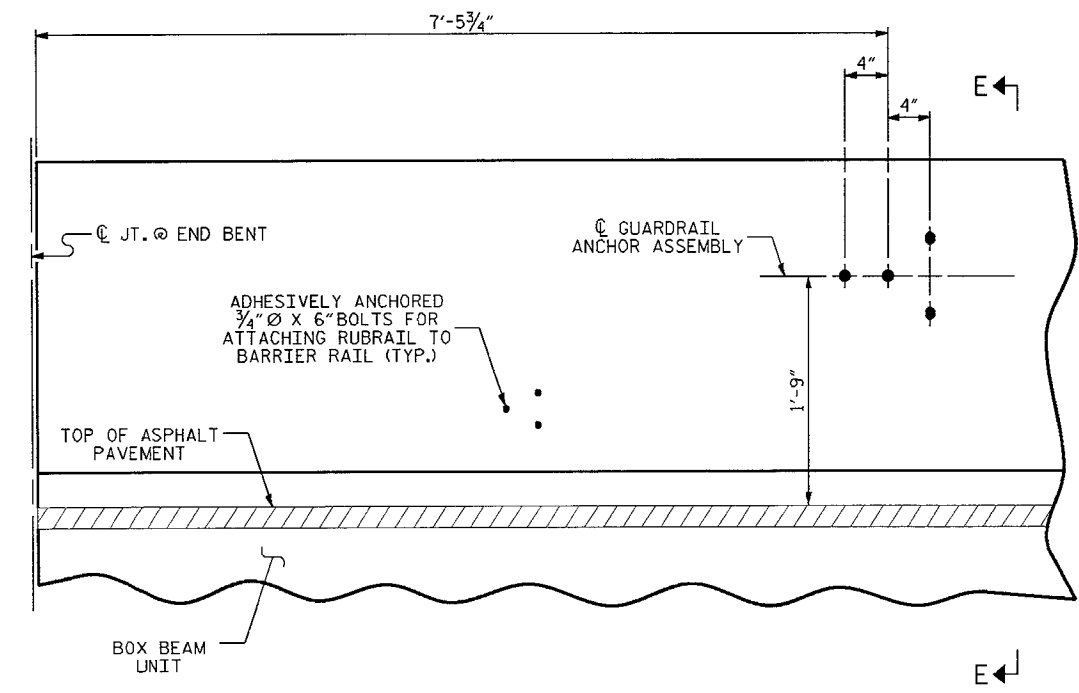


SKETCH SHOWING POINTS OF ATTACHMENT



SECTION E-E

TYPE B-77 GUARDRAIL ANCHOR ASSEMBLY DETAILS



ELEVATION

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

NOTES

1. THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.
2. 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.
3. 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 1/8" Ø GALVANIZED BOLTS, NUTS, AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THE ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
4. 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.
5. AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
6. THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR STEEL BM GUARDRAIL.
7. THE 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.
8. THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.
9. SHIFT FIRST GUARDRAIL POST AS NECESSARY TO CLEAR END BENT CAP.

PROJECT NO. WBS. 33417
COUNTY: CABARRUS
STATION: 23+14.94-L-
REPLACES BRIDGE NO. 90

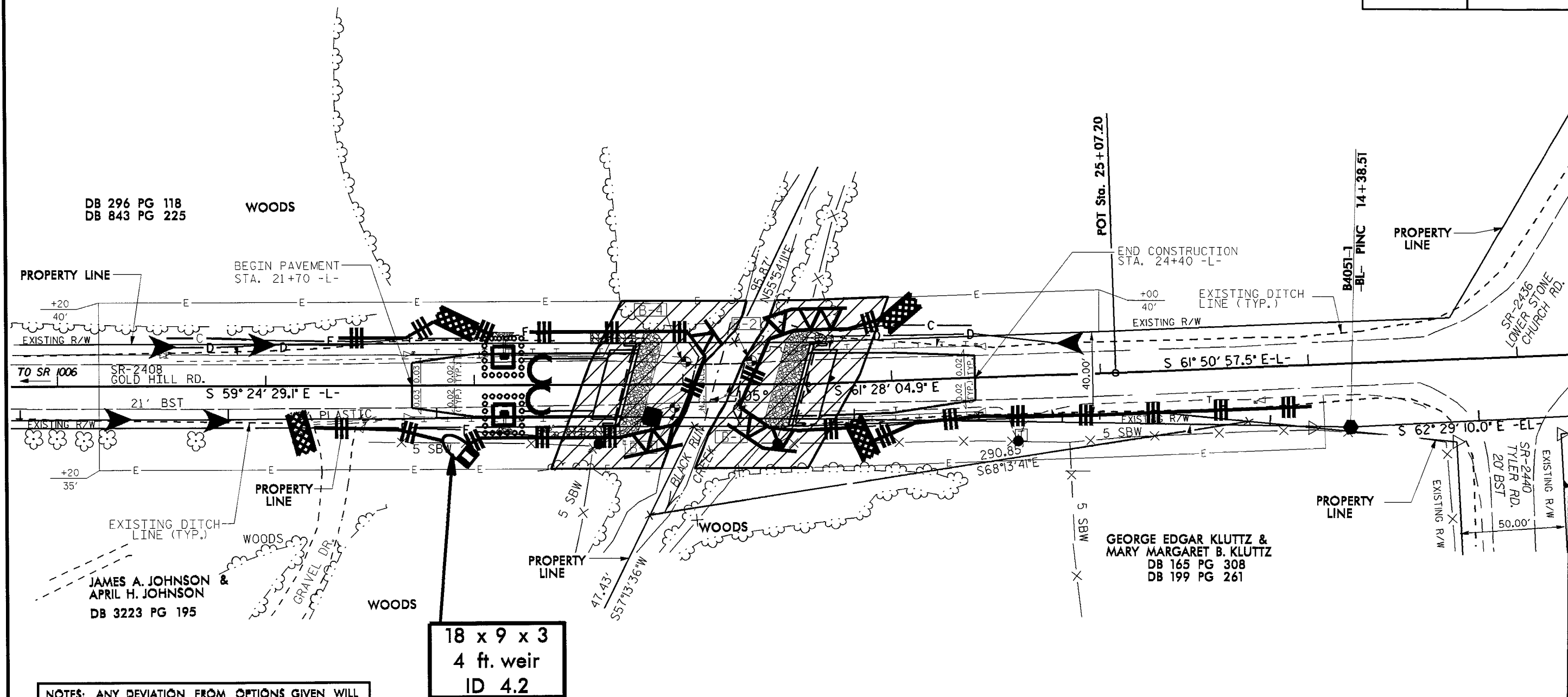
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL
TYPE B-77

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			19
2			4			24

DRAWN BY : S. T. SANDOR DATE : AUG./2009
CHECKED BY : R. WEISZ DATE : SEPT./2009

EROSION CONTROL PLAN

PROJECT REFERENCE NO. B-4051	SHEET NO. 20 OF 24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

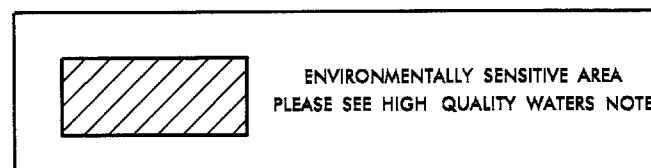


NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

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

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

2006 STANDARD SPECIFICATIONS



Std. #	Description	Symbol
1605.01	Temporary Silt Fence	— — — — —
1606.01	Special Sediment Control Fence	— — — — —
1632.03	Rock Inlet Sediment Trap Type C	□
1633.01	Temporary Rock Silt Check Type-A	⊗
	Temporary Rock Silt Check Type-B	→
1634.02	Temporary Rock Sediment Dam Type-B	⊕

PROJECT REFERENCE NO.		SHEET NO.	
B-4051		21 OF 24	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

**ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
2006 STANDARD SPECIFICATIONS**

SHEET 1 OF 1 1606.01	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH STANDARD DRAWING FOR SPECIAL SEDIMENT CONTROL FENCE
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GENERAL NOTES:

SEDIMENT CONTROL STONE SHALL BE NO. 5 OR NO. 57 AND SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON "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.

POST SPACING SHALL BE A MAXIMUM OF 3 FT.

3 ft

1/4 WIRE MESH

SEDIMENT CONTROL STONE

1 ft min

2 ft

VARIABLE DIMENSION

2:1

WATER FLOW

1/4 WIRE MESH

SEDIMENT CONTROL STONE

1 ft min

STEEL POST - 2 ft DEPTH

2 ft

SHEET 1 OF 1
1606.01

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

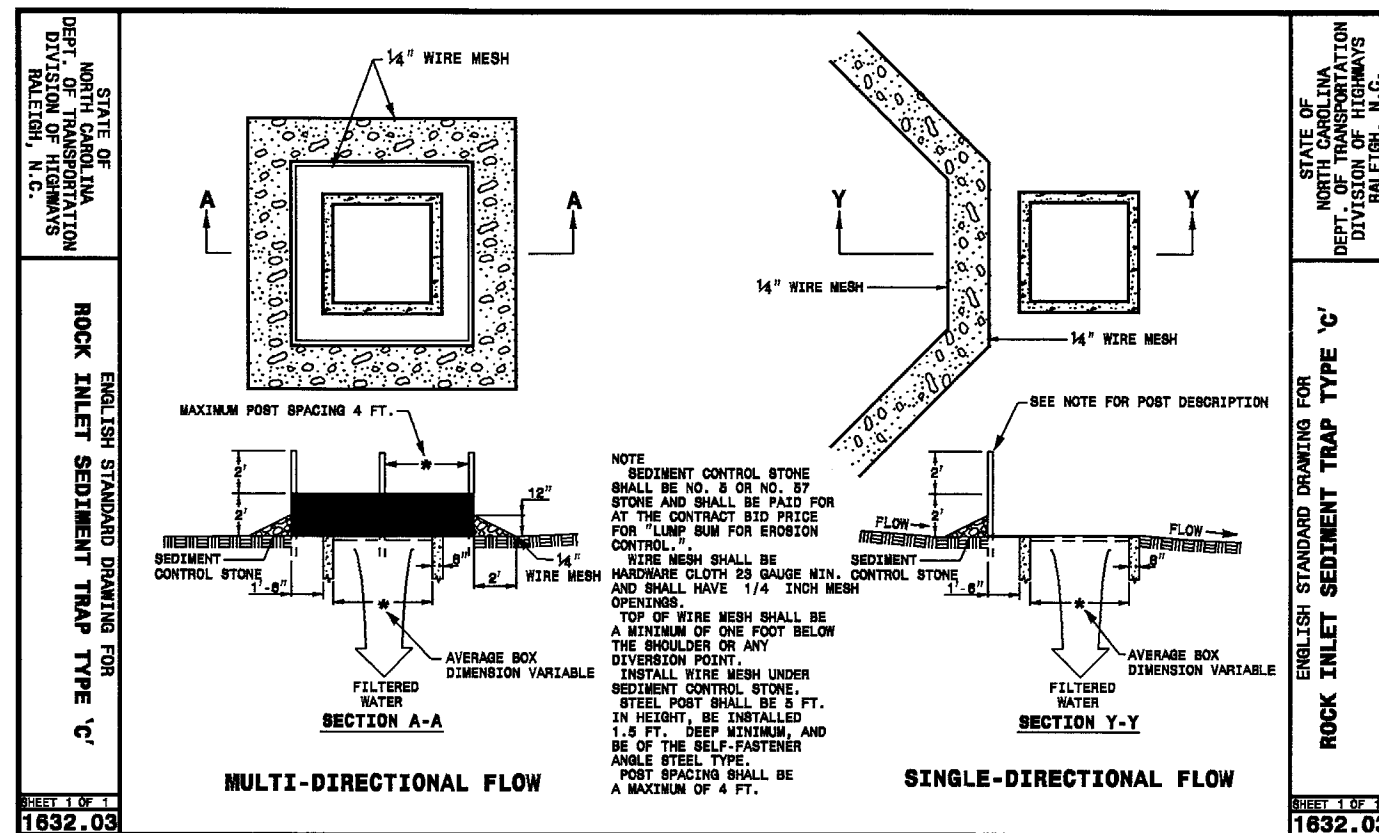
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01

EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4051	22 OF 24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

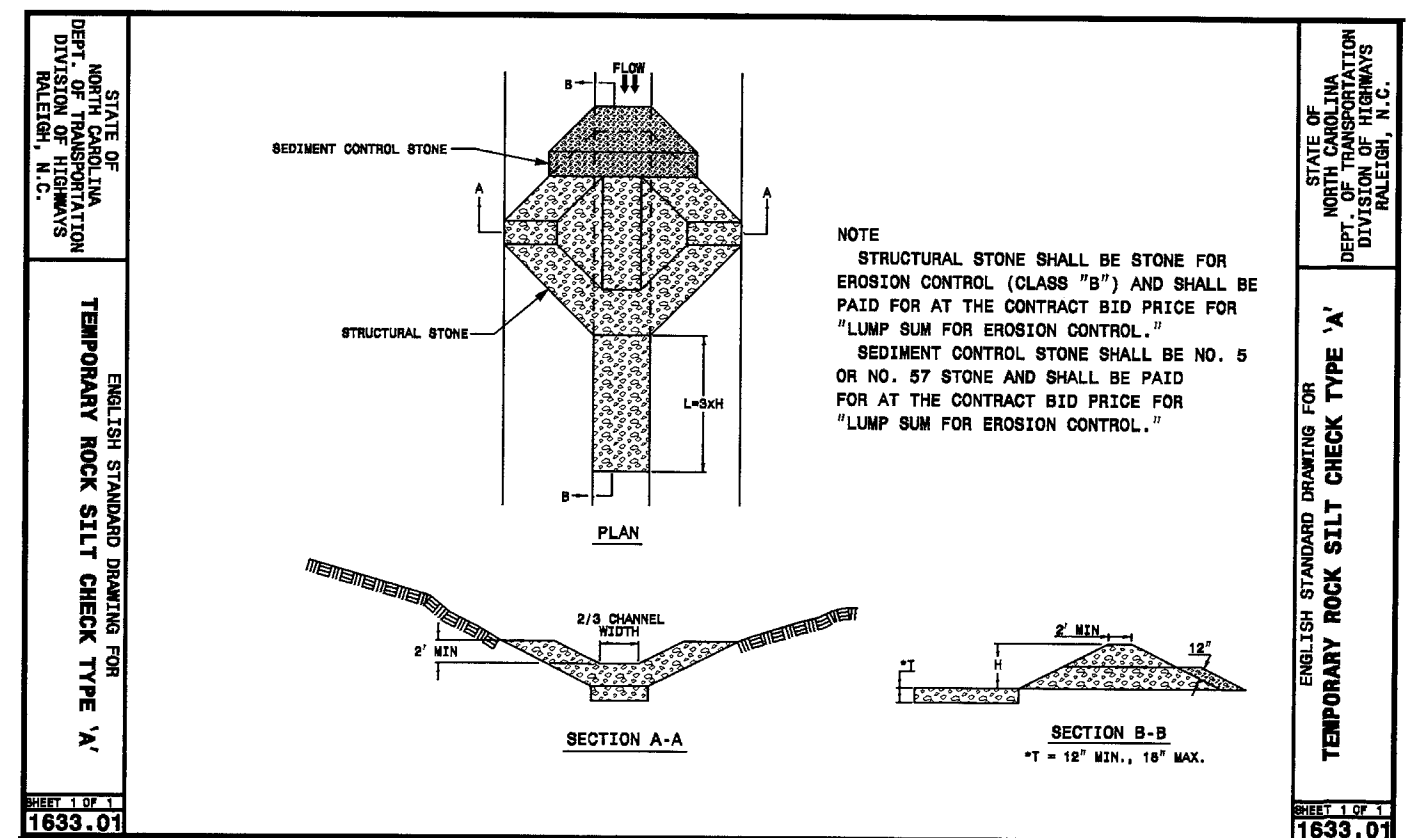


NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

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

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

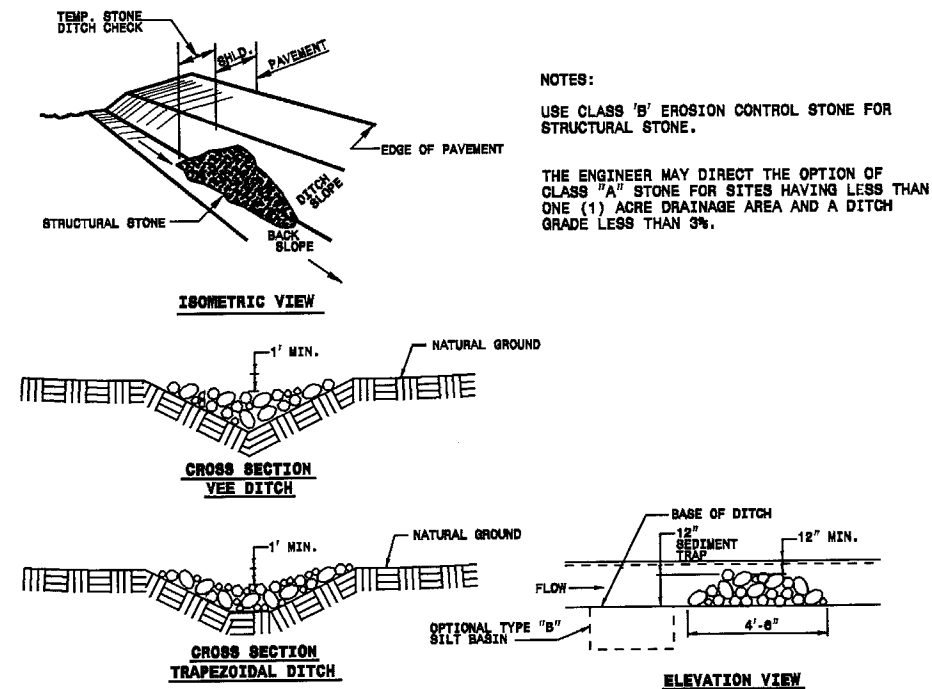
2006 STANDARD SPECIFICATIONS



EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4051	23 OF 24
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

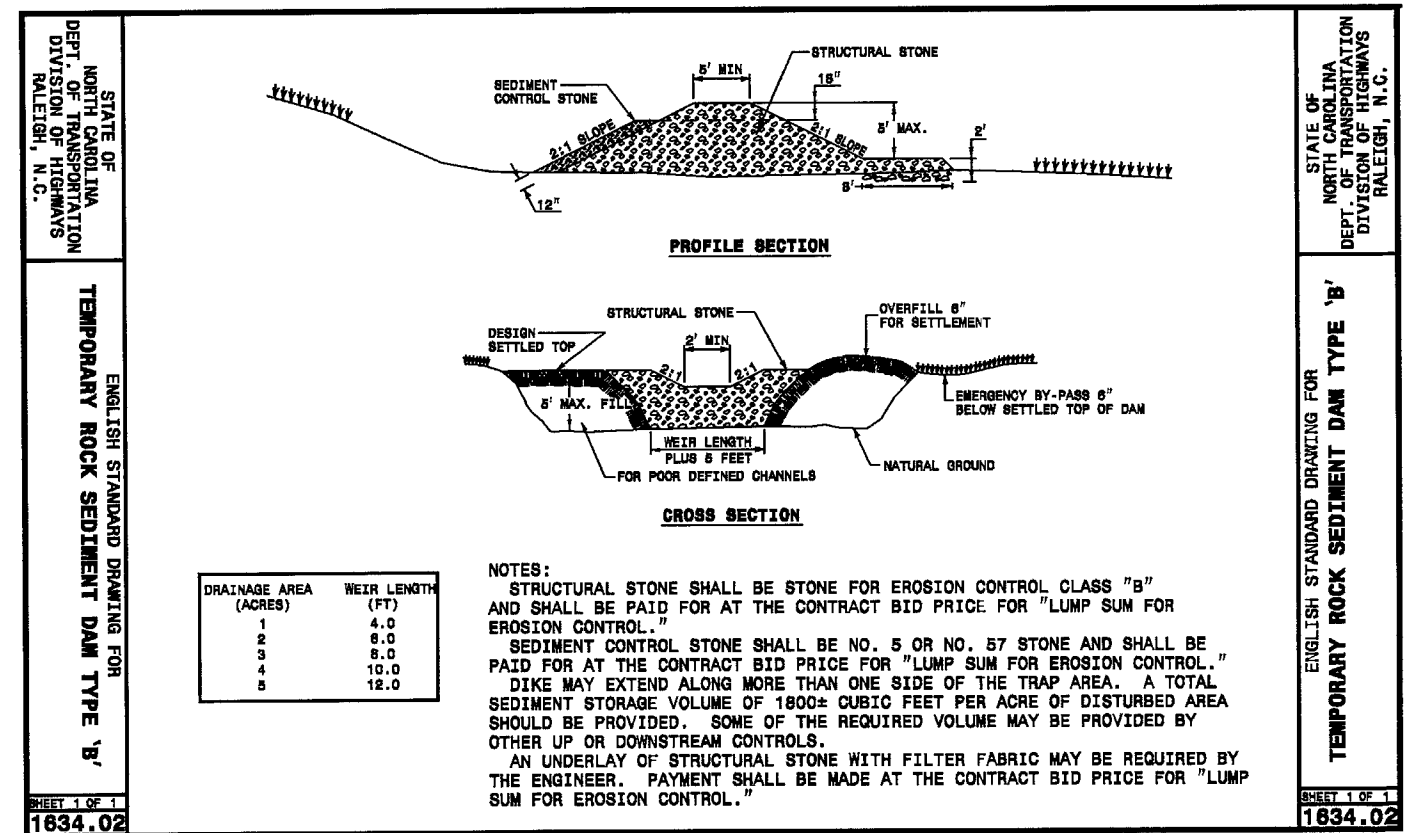


NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

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

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

2006 STANDARD SPECIFICATIONS



EROSION CONTROL PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4051	24 OF 24
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER MAT:

Description

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat with stakes, steel reinforcement bars or staples as directed.

Materials

Provide coir fiber mat to meet the following requirements:

100% coconut fiber (coir) twine woven into high strength matrix

Thickness - 0.30 in. minimum

Tensile Strength 1348 x 626 lb/ft minimum

Elongation 34% x 38% maximum

Flexibility (mg-cm) 65030 x 29590

Flow Velocity Observed 11 ft/sec

Weight 20 oz/SY

Size 6.6 x 164 ft (120 SY)

1/32 C⁹/32 Factor 0.002

Open Area (measured) 50%

Anchor: Stakes, reinforcement bars, or staples shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"-24" long with a 2"x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"-2" long head at the top with a 1"-2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a U shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Place the coir fiber mat immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the mat with the soil. Unroll the mat and apply without stretching such that it will lie smoothly but loosely on the soil surface.

For stream relocation applications, take care to preserve the required line, grade, and cross section of the area covered. Bury the top slope end of each piece of mat in a narrow trench at least 6 in. deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. overlap. Construct check trenches at least 12 in. deep every 50 ft, longitudinally along the edges of the mat or as directed. Fold over and bury mat to the full depth of the trench, close and tamp firmly. Overlap mat at least 6 in. where 2 or more widths of mat are installed side by side.

Place anchors across the mat at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the mat 3 ft. apart.

Adjustments in the trenching or anchoring requirements to fit individual site conditions may be required.

Measurement and Payment

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

No measurement will be made for anchor items.

Payment will be made under:

Pay Item Pay Unit

Coir Fiber Mat Square Yard

High Quality Waters:

The XXXX XXXX has been identified as high quality water. This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the "Environmentally Sensitive Areas" 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 Mulchings:

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 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." 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 the work involved.

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