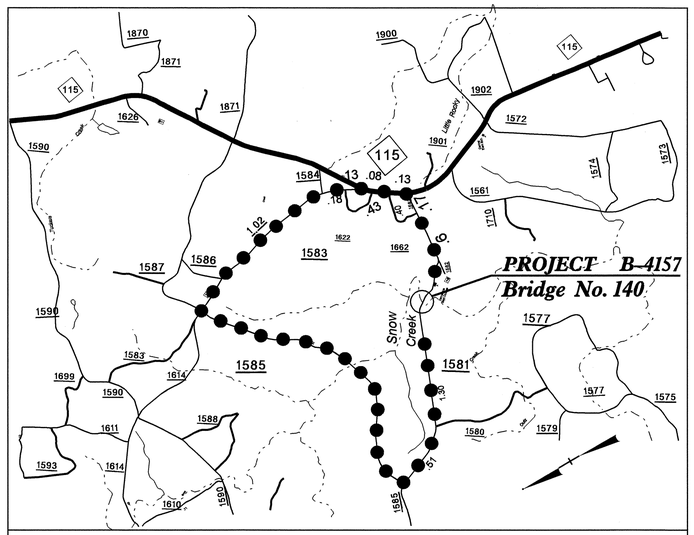
CONTRACT: C201782 TIP PROJECT: B–4157

STRUCTURE



VICINITY MAP

OFF–SITE DETOUR

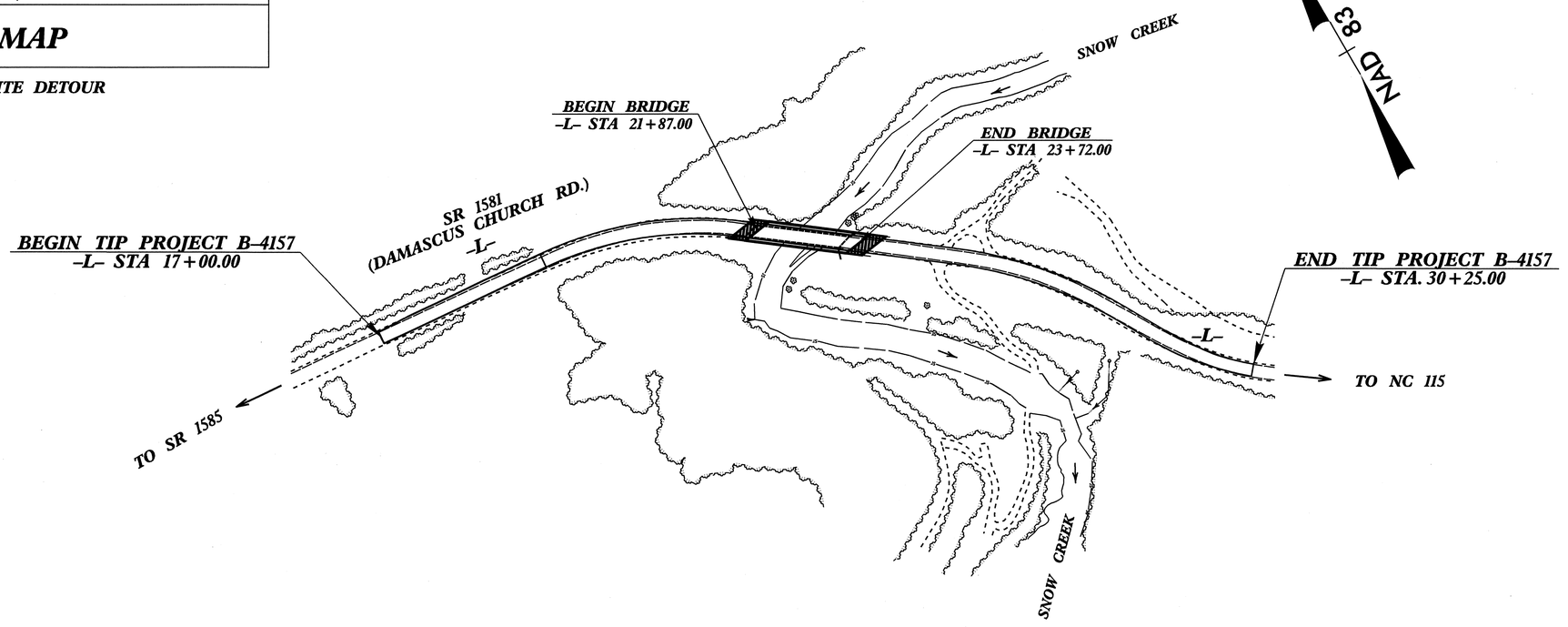
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
IREDELL COUNTY

LOCATION: BRIDGE No. 140 OVER SNOW CREEK ON SR 1581

TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4157		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33505.1.1	BRZ–1581(2)	P.E.
33505.2.1	BRZ–1581(2)	UTIL. & R/W
33505.3.1	BRZ–1581(2)	CONST.



**DESIGN EXCEPTION REQUIRED FOR THE DESIGN SPEED FROM 60 MPH TO 25 MPH.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2006 = 1060
ADT 2025 = 1800
DHV = 10 %
D = 60 %
T = 3 % *
** V = 60 MPH
* TTST 1% DUAL 2%
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4157 = 0.216 MI
LENGTH STRUCTURE TIP PROJECT B–4157 = 0.035 MI
TOTAL LENGTH TIP PROJECT B–4157 = 0.251 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :

MARCH 18, 2008

J. C. FRYE, P.E.
PROJECT ENGINEER

T. H. FANG, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

F.A. PROJECT NO. BRZ-1581 (2)

21+50 22+00 22+50 23+00 23+50 24+00

935 925 915 905 895

FILL FACE @ END BENT #1
STA. 21+87.00 -L-
G.P. EL. 926.641

BEGIN FRONT SLOPE
STA. 21+75.73 -L-
G.P. EL. 926.892

1'-0" EARTH BERM
NORMAL TO CAP
(TYP.)

SPAN A

SPAN B

SPAN C

1'-7" BERM
NORMAL TO CAP
(TYP.)

FILL FACE @ END BENT #2
STA. 23+72.00 -L-
G.P. EL. 922.509

BEGIN FRONT SLOPE
STA. 23+82.43 -L-
G.P. EL. 922.276

EXP.

1.5:1 SLOPE
NORMAL TO CAP

FILL

APPROXIMATE
NATURAL GROUND

EL. 923 ±

1'-6"

EL. 917 ±

EL. 920 ±

HP 12 X 53
STEEL PILES

(-)10.9496%

(-)2.2332%

PI STA. 20+20.00 -L-
EL. = 930.37
VC = 315.00'

END BENT 1

EXISTING
STRUCTURE
(TYP.)

FIX FIX

EL. 908 ±

EL. 905 ±

EL. 901.5

EL. 906±

1½

1

HP 14 X 73
GALVANIZED
STEEL PILES
(TYP.)

TEMPORARY
CAUSEWAY

EL. 899 ±

EL. 897 ±

EL. 898 ±

BENT 1

N.W.S.
EL. 900.3
2/06

EL. 907.3
(Q25)

EL. 911.1
(Q500)

FIX FIX

EL. 902.5

EL. 902 ±

EL. 900 ±

EL. 900 ±

EL. 907 ±

EL. 902 ±

TEMPORARY
CAUSEWAY

BENT 2

EL. 917 ±

1.5:1 SLOPE
NORMAL TO CAP

EXP.

FILL

1'-6"

EL. 917 ±

HP 12 X 53
STEEL PILES

CLASS II
RIP RAP
(TYP.)

END BENT 2

EXISTING
STRUCTURE

CLASS "A"
RIP RAP

1'-0"

1½

1

CLASS II RIP RAP

TYPICAL CAUSEWAY DETAIL

UNCLASSIFIED
EXCAVATION

GRADE DATA

SECTION ALONG -L-

SECTION TAKEN AT RIGHT ANGLES TO BENTS AND END BENTS

1'-0" MIN. EARTH BERM
NORMAL TO CAP
ELEV. 917.634
(LEVEL)

-L- PT STA. 21+77.99

BEGIN FRONT SLOPE
STA. 21+75.73 -L-

BEGIN APPR. SLAB
STA. 21+73.15 -L-

TANGENT
EXTENSION

TO SR 1580

W.P. #1
STA. 21+87.00 -L-

FILL FACE @
END BENT 1

CLASS II
RIP RAP

BENT 1
CONTROL LINE

SNOW CREEK

W.P. #2
STA. 22+42.00 -L-

CENTER OF BRIDGE
STA. 22+79.50 -L-

120°-00'-00"
(TYP.)

EXISTING STRUCTURE

TEMPORARY
CAUSEWAY

BENT 2
CONTROL LINE

W.P. #3
STA. 23+17.00 -L-

TEMPORARY
CAUSEWAY

1'-0" MIN. EARTH BERM
NORMAL TO CAP
ELEV. 913.631
(LEVEL)

CLASS II
RIP RAP

FILL FACE @
END BENT 2

END APPR. SLAB
STA. 23+85.80 -L-

-L-

TO SR 1582

BEGIN FRONT SLOPE
STA. 23+82.43 -L-

W.P. #4
STA. 23+72.00 -L-

37'-6" 37'-6"

55'-0" 75'-0" 55'-0"

TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE ALONG -L-) = 185'-0"

PLAN

(PILES NOT SHOWN FOR CLARITY)

CURVE DATA

PI STA. 20+40.70 -L-
Δ = 32°-31'-04.5" (RT)
L = 282.320
T = 145.030
R = 500.000

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER DAVID T. FREY
2/1/08

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG
2/07/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE #140

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
SNOW CREEK ON
SR 1581 BETWEEN
SR 1580 AND SR 1582

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : J.L. WALTON DATE : 6/06
CHECKED BY : T.H. FANG DATE : 6/06

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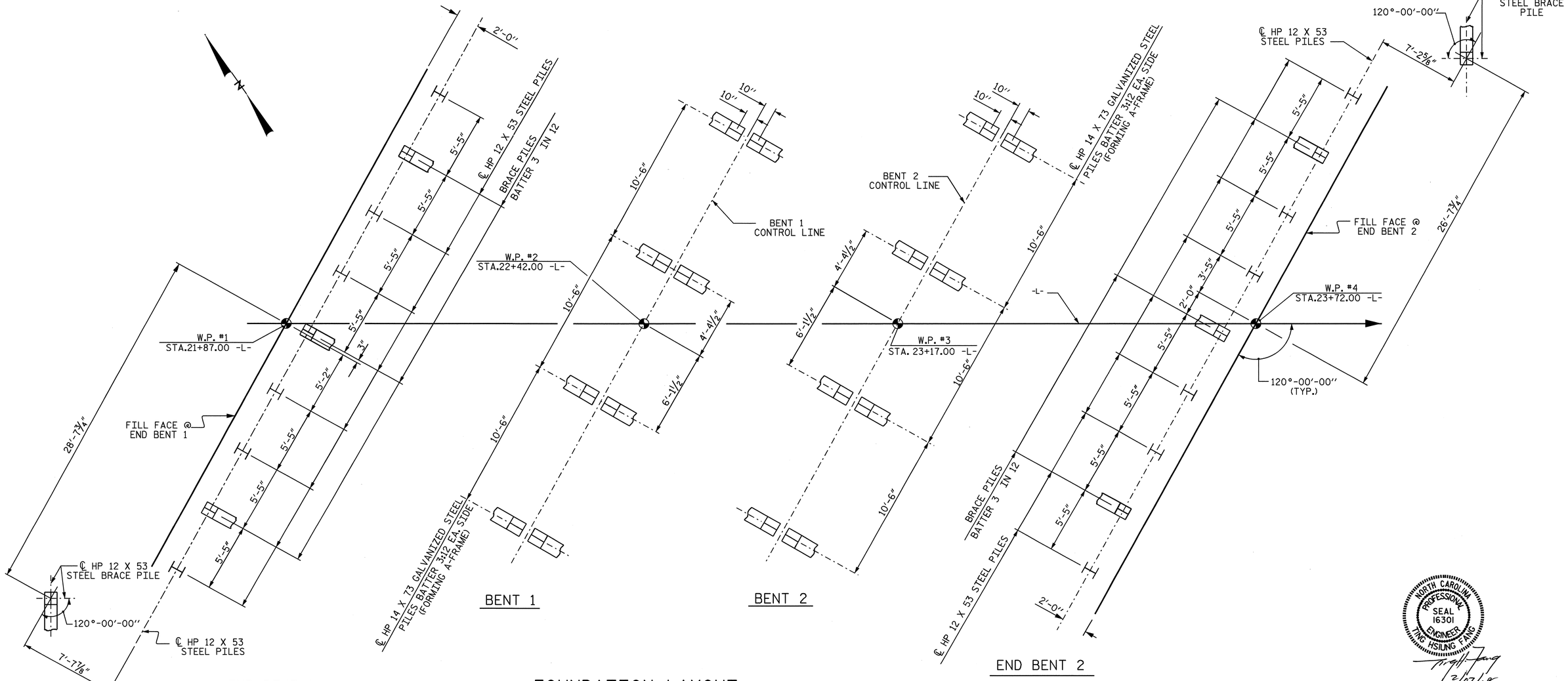

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

NOTES

DRIVE PILES AT END BENTS NO.1 & NO.2 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO. THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENTS NO.1 & NO.2 ARE 50 TONS PER PILE.

DRIVE PILES AT BENTS NO.1 & NO.2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO. THE ALLOWABLE BEARING CAPACITY FOR PILES AT BENTS NO.1 & NO.2 ARE 75 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 860 FT (LT) AND 864 FT (RT).

DRIVE PILES AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 878 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 870.0 FT., BENT NO.2 IS ELEVATION 884.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/07/08

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
SNOW CREEK ON
SR 1581 BETWEEN
SR 1580 AND SR 1582

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : HARISH SHAH DATE : 09/07
CHECKED BY : T.H. FANG DATE : 10/07

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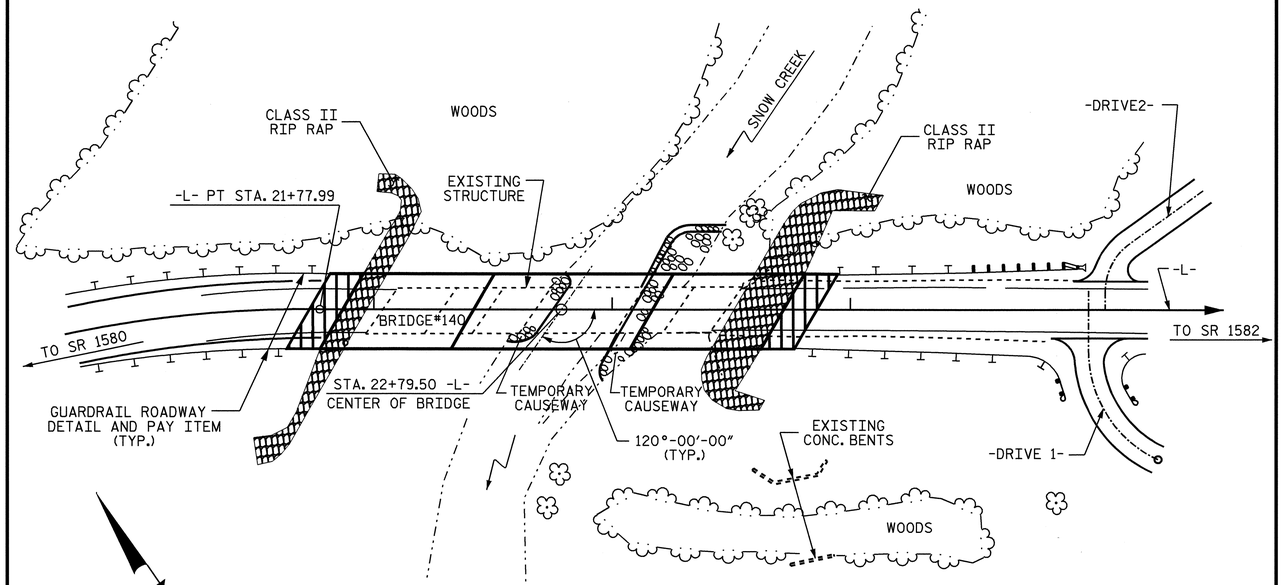
TOTAL BILL OF MATERIAL

	CONST., MAINT. & REMOVAL OF TEMP.ACCESS	REMOVAL OF EXISTING STRUCTURE	UNCLASSFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		HP 14 X 73 GALVANIZED STEEL PILES		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				6345	5930				12	715.96					365.19			LUMP SUM	LUMP SUM
END BENT 1			LUMP SUM			32.9		4278			10	550				120	135		
BENT 1						18.3		3040					8	480					
BENT 2						18.3		3040					8	320					
END BENT 2			LUMP SUM			31.7		4220			10	150				190	210		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	6345	5930	101.2	LUMP SUM	14,578	12	715.96	20	700	16	800	365.19	310	345	LUMP SUM	LUMP SUM

BENCH MARK NO. 2: RAILROAD SPIKE IN 30" SYCAMORE TREE, -L- STA.25+18.40 119.38' RIGHT, EL. 905.17



HYDRAULIC DATA

DESIGN DISCHARGE	=	2,700 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	907.3
DRAINAGE AREA	=	15.0 SQ. MI.
BASIC DISCHARGE (Q100)	=	4,000 C.F.S.
BASIC HIGH WATER ELEVATION	=	908.8

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	15,800 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500 YRS.+
OVERTOPPING FLOOD ELEVATION	=	920.9

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. LEFT SIDE, 20 FT. RIGHT SIDE @ END BENT 1 AND 25 FT. LEFT SIDE, 40 FT RIGHT SIDE @ END BENT 2 OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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 DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICED OF THIRTY BAR DIAMETERS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 22+79.50 -L-..

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 6 SPANS; 1 @ 25'-6", 2 @ 20'-0", 1 @ 40'-0", 2 @ 20'-0"; 19.2 FEET CLEAR ROADWAY WIDTH AND TIMBER DECK ON I-BEAMS; END BENT 1 AND ALL INTERIOR BENTS: TIMBER CAP ON TIMBER PILES, END BENT 2: MASS CONCRETE, AND LOCATED AT THE SITE OF 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.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 22+79.50 -L-."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

ALL HP 14 X73 STEEL PILES SHOULD BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/07/08

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER SNOW CREEK ON SR 1581 BETWEEN SR 1580 AND SR 1582

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : J.L. WALTON/HBS DATE : 10/07
CHECKED BY : T.H. FANG DATE : 10/07

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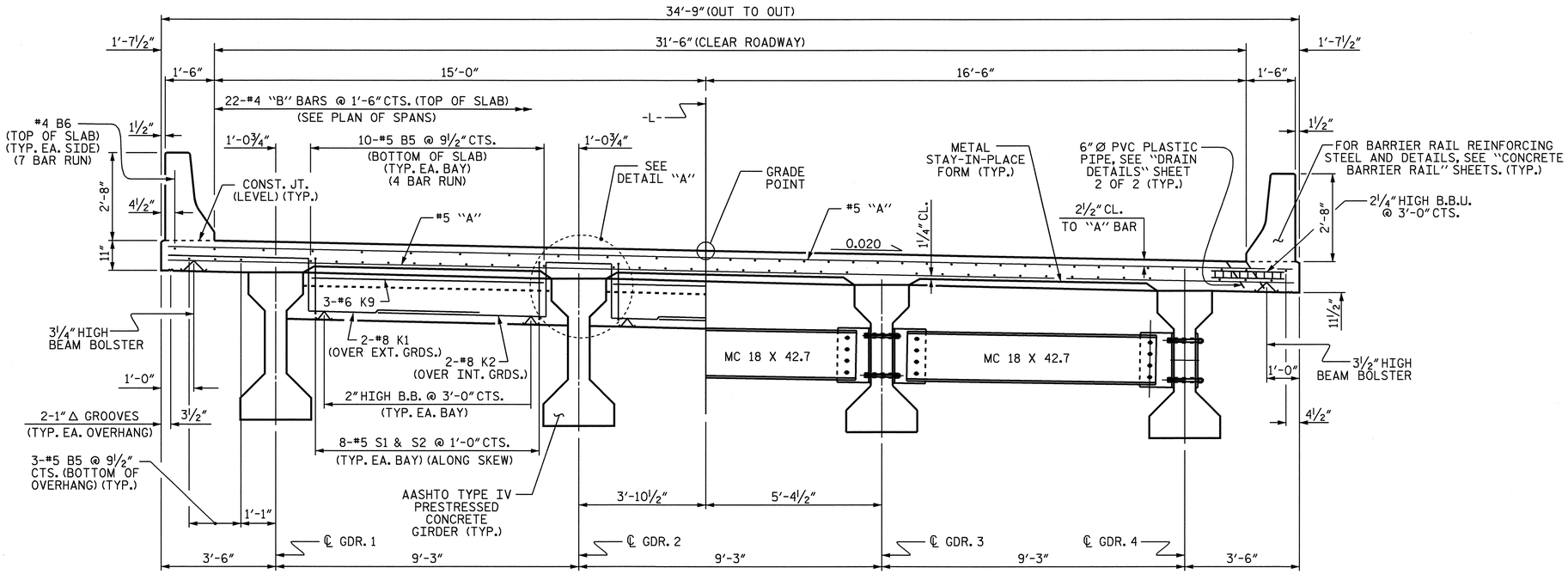
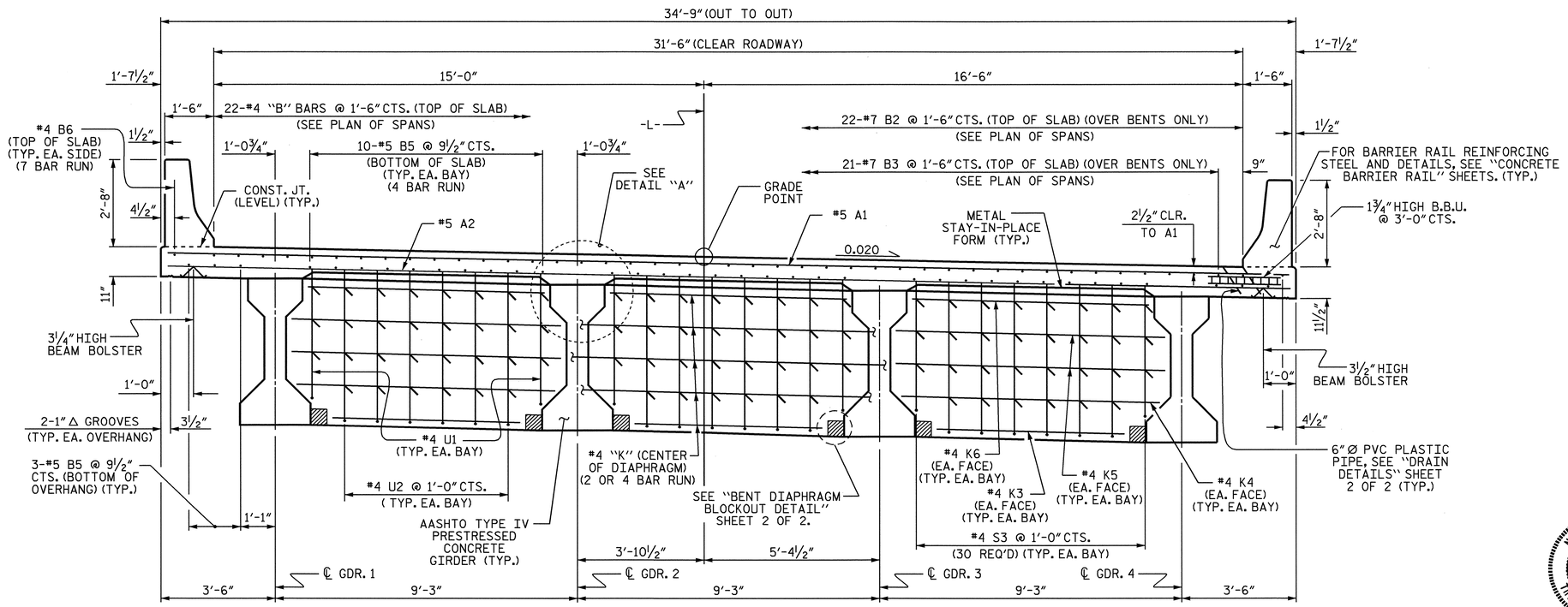


PART TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

PART TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

TYPICAL SECTION



TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS)

NOTES

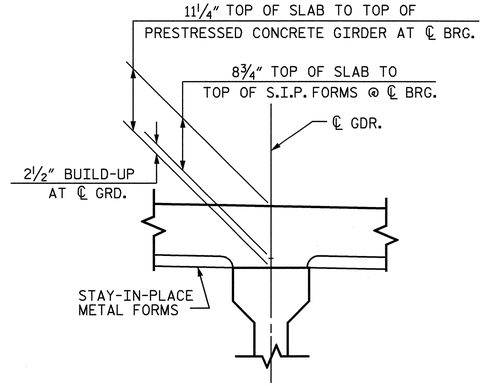
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



DETAIL "A"

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG
2/07/08

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

07-FEB-2008 11:00
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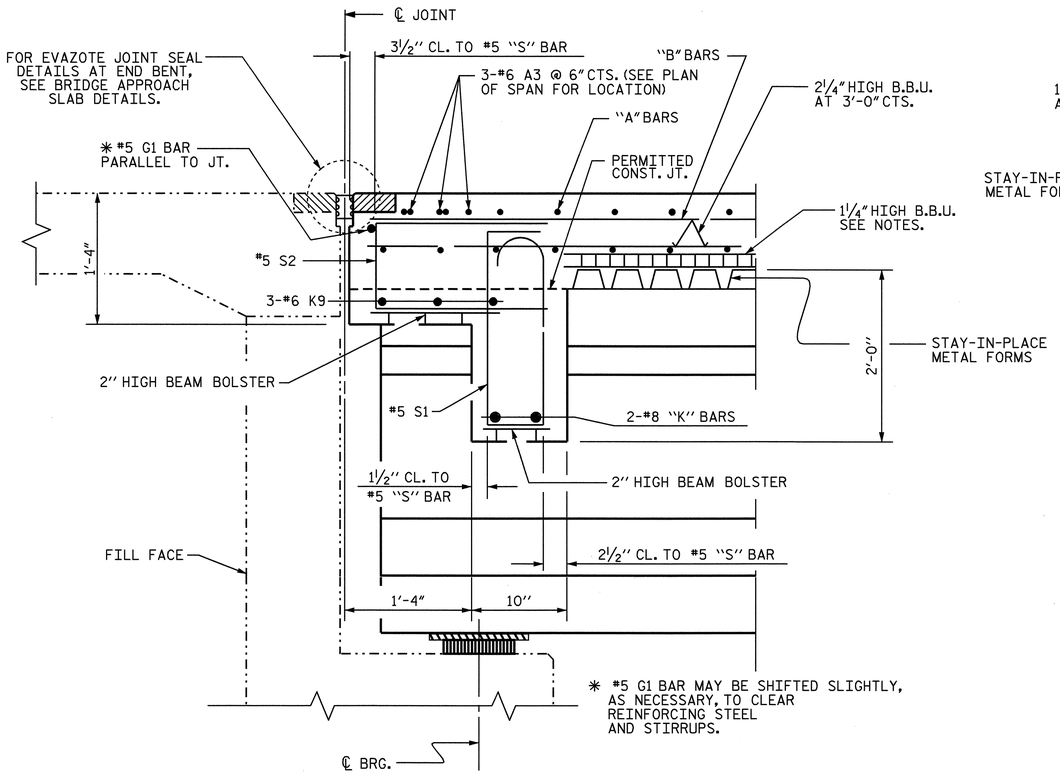
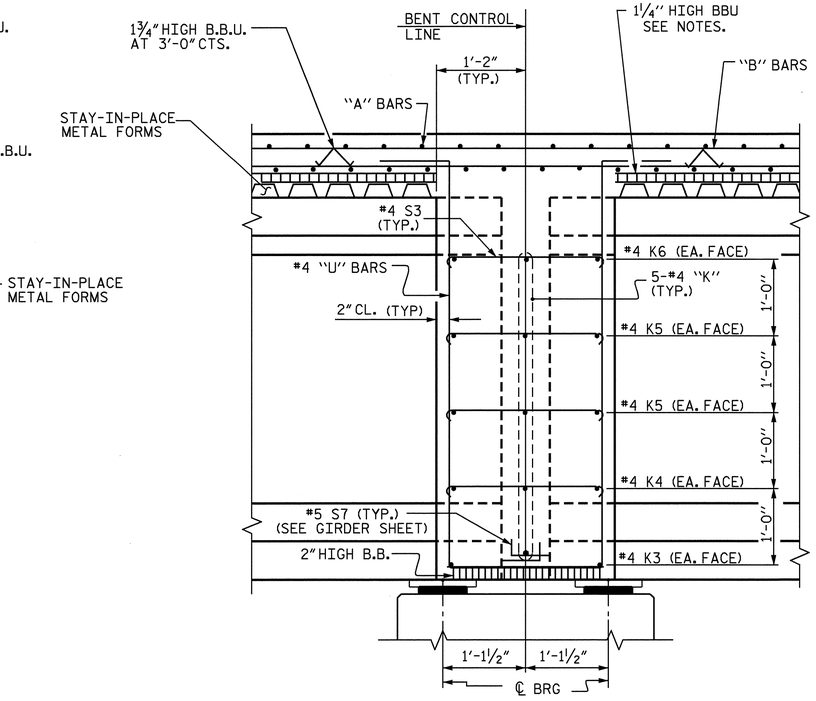
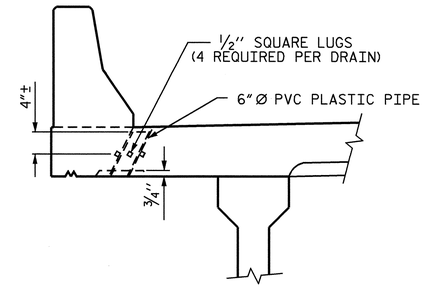


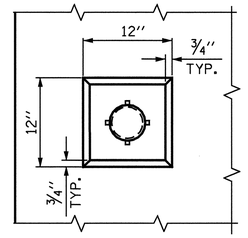
SECTION THRU END BENT DIAPHRAGMS



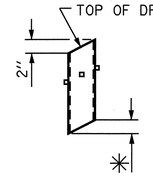
SECTION THRU BENT DIAPHRAGMS



ELEVATION



PLAN OF RECESS



✳ TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (10 DRAINS REQUIRED)

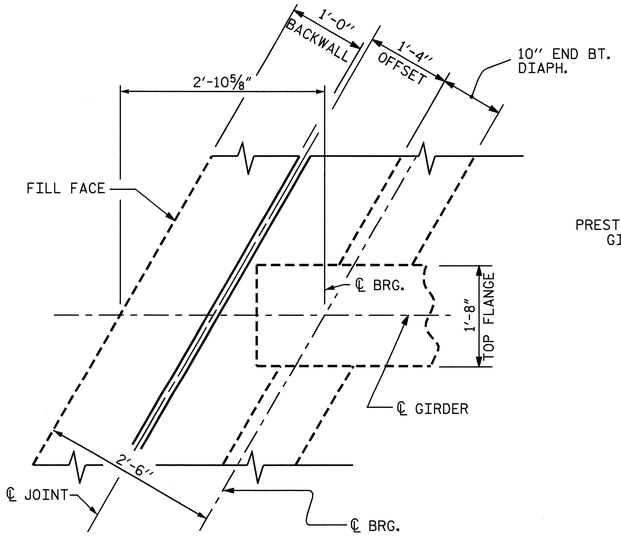
PIPE DETAIL

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

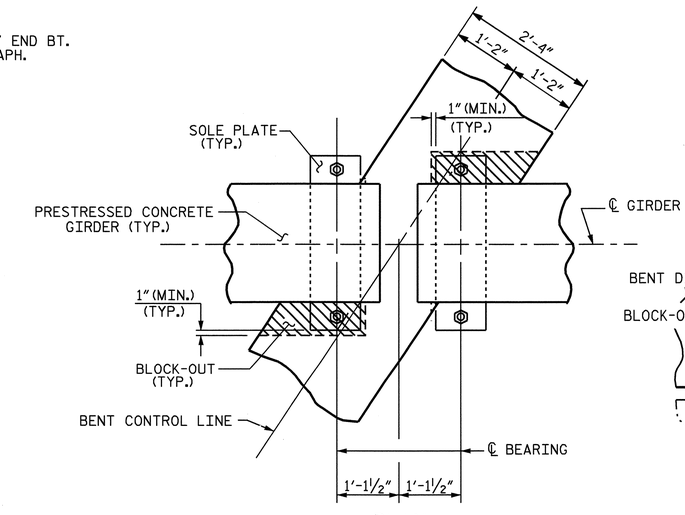
4 - ½" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

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

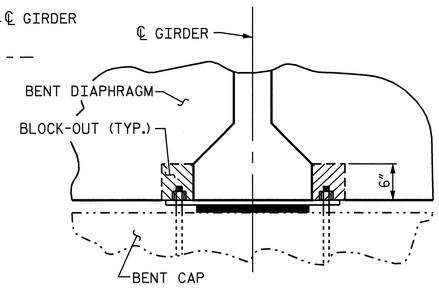
DRAIN DETAILS



PLAN VIEW OF END BENT DIAPHRAGM



PLAN



SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

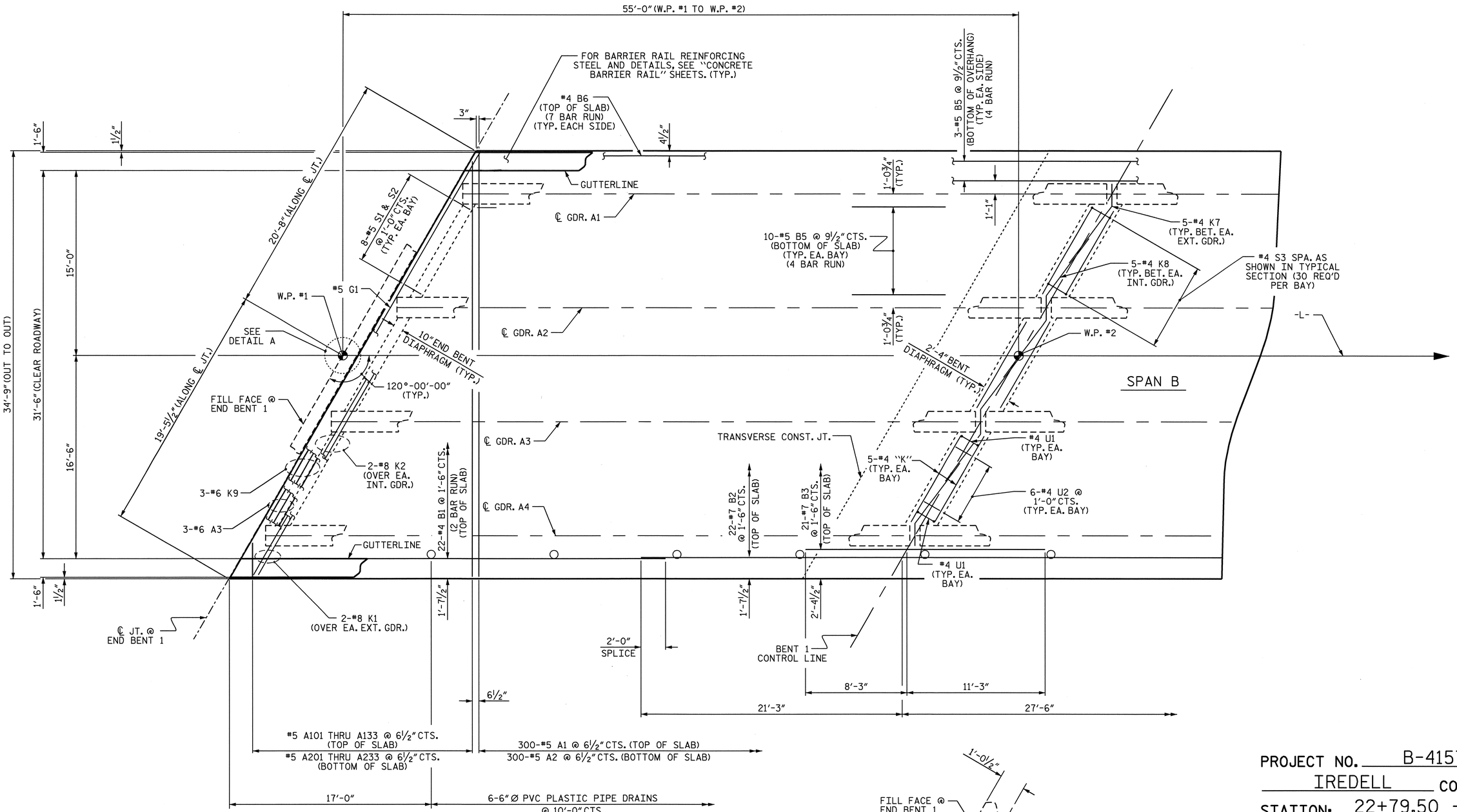
PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

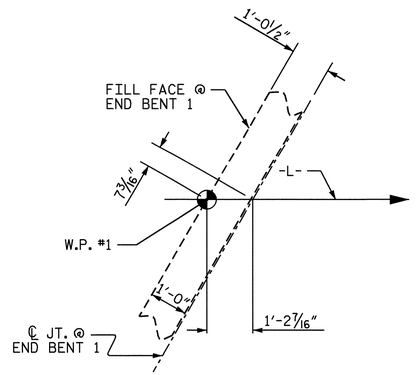
SUPERSTRUCTURE
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			33



PLAN OF SPAN A

FOR TRANSVERSE CONSTRUCTION JOINT, SEE SUPERSTRUCTURE BILL OF MATERIAL



DETAIL A

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang
01/11/08

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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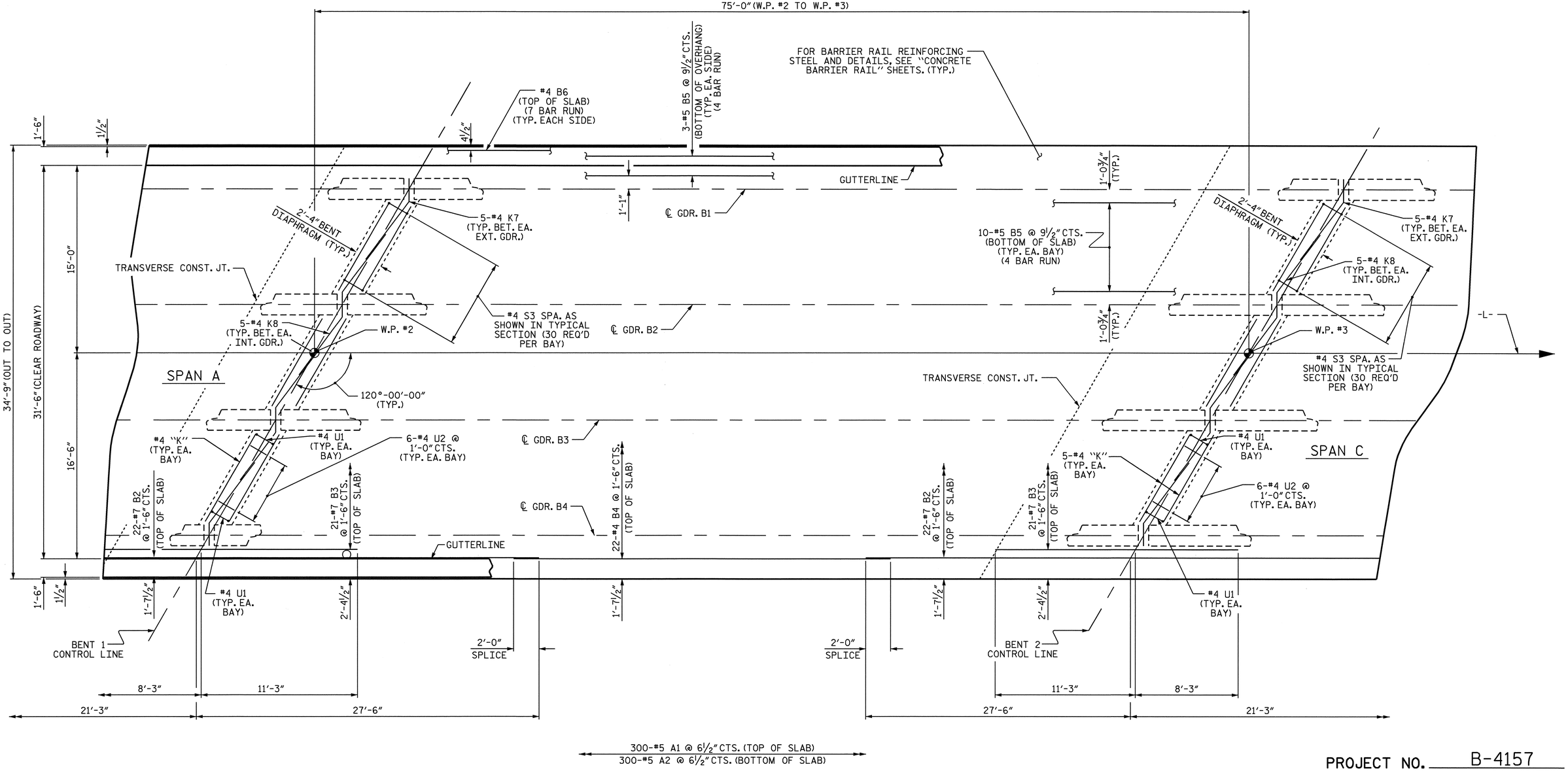

PLAN OF SPAN B

FOR TRANSVERSE CONSTRUCTION JOINT, SEE SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting H. Fang 1/11/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. G. ELY DATE : 7/07

CHECKED BY : Q. T. NGUYEN DATE : 8/07

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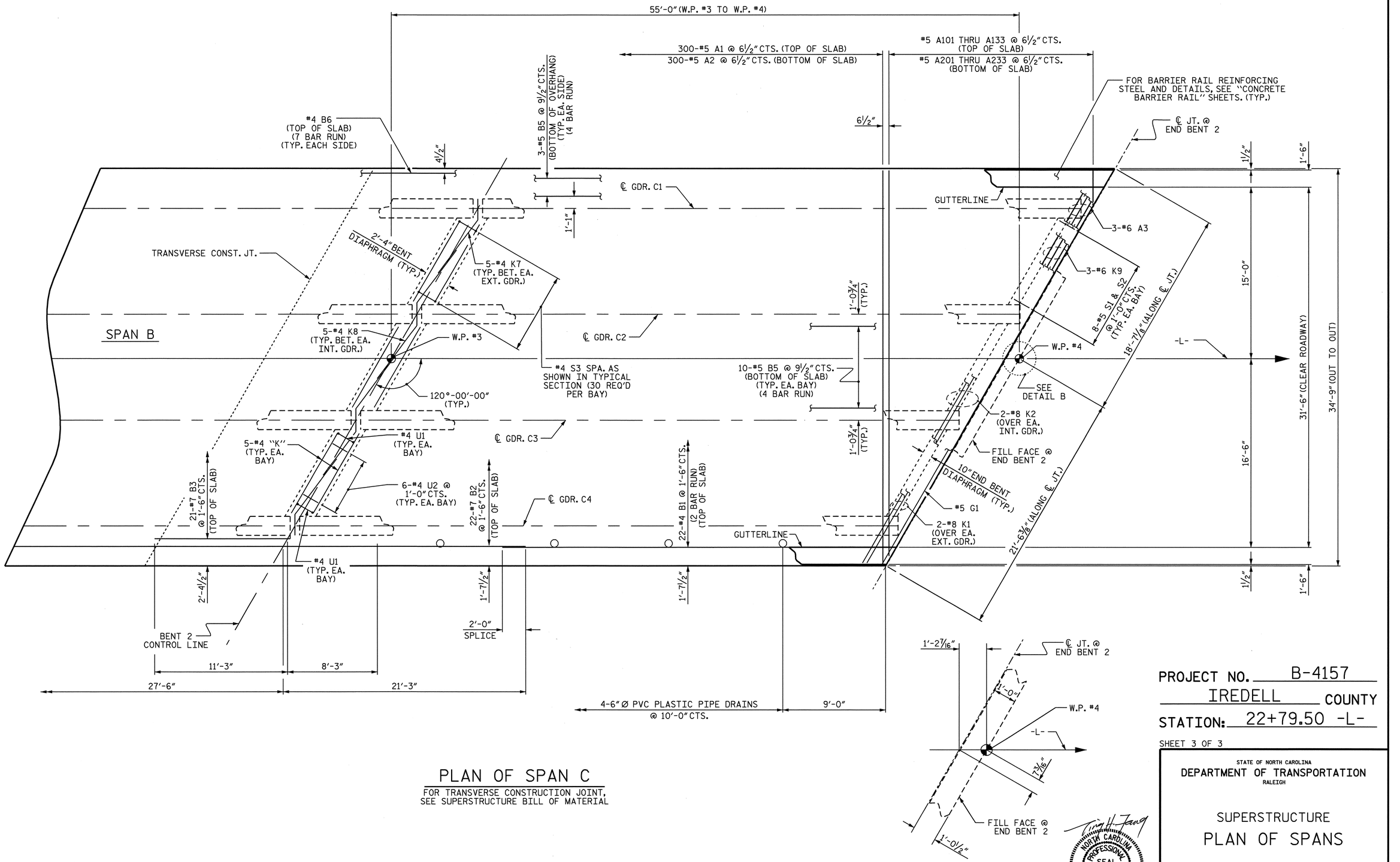

PLAN OF SPAN C

FOR TRANSVERSE CONSTRUCTION JOINT, SEE SUPERSTRUCTURE BILL OF MATERIAL

DETAIL B

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
1/11/08

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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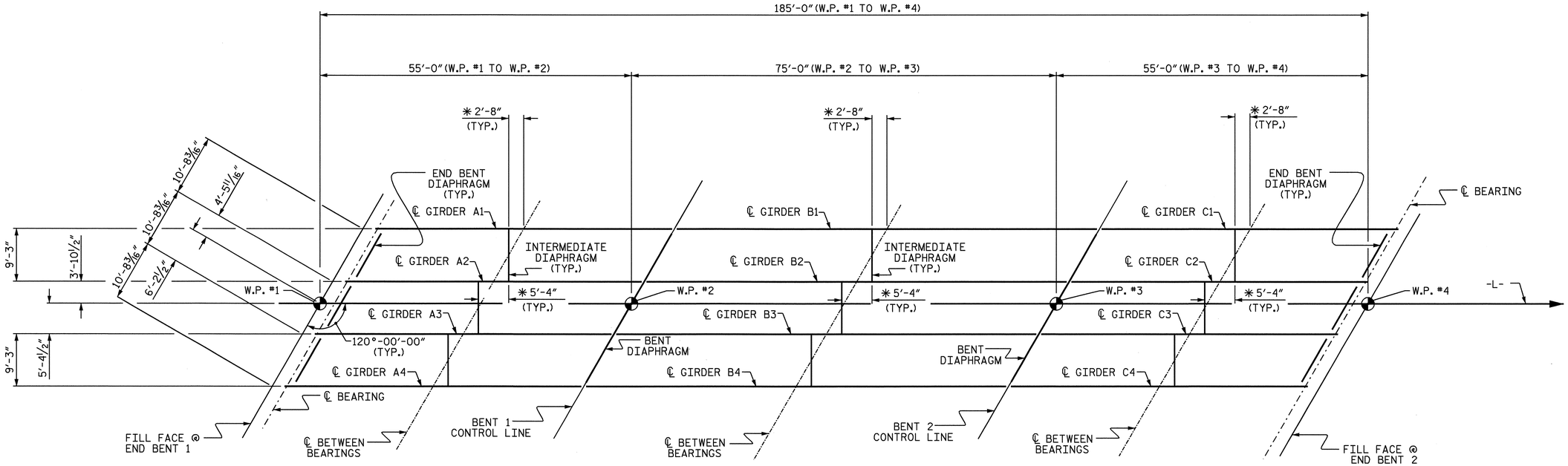

EXP.

E3, P1
(FOR ALL GIRDERS)

FIX

GIRDER A1 - E3, P4
GIRDER A2 - E3, P5
GIRDER A3 - E3, P2
GIRDER A4 - E3, P4

FIX

GIRDER B1 - E3, P2
GIRDER B2 - E3, P3
GIRDER B3 - E3, P5
GIRDER B4 - E3, P2

FIX

GIRDER B1 - E3, P4
GIRDER B2 - E3, P5
GIRDER B3 - E3, P2
GIRDER B4 - E3, P4

FIX

GIRDER C1 - E3, P2
GIRDER C2 - E3, P3
GIRDER C3 - E3, P5
GIRDER C4 - E3, P2

EXP.

E3, P1
(FOR ALL GIRDERS)

SPAN A

SPAN B

SPAN C

FRAMING PLAN

* DIMENSIONS MEASURING INTERMEDIATE DIAPHRAGMS ARE SHOWN TO THE BACK FACE OF CHANNEL.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

2/07/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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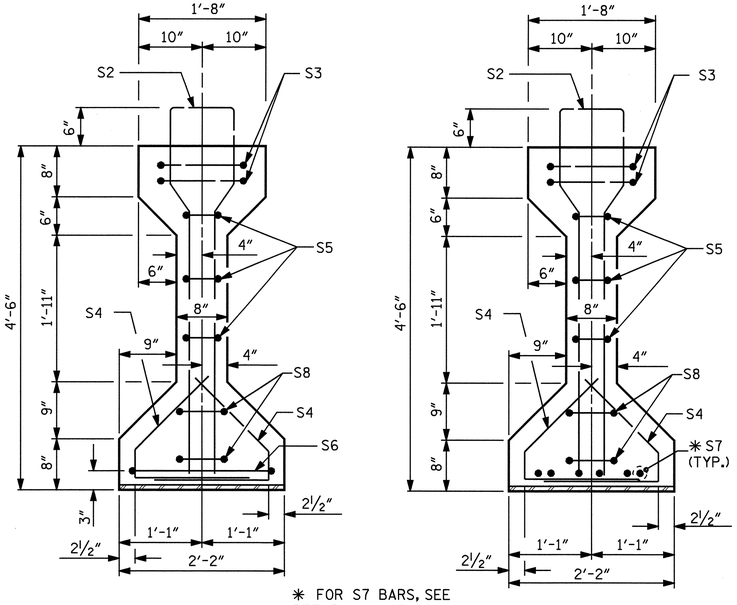
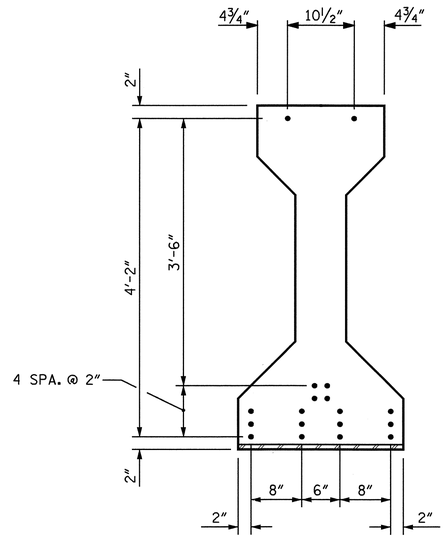


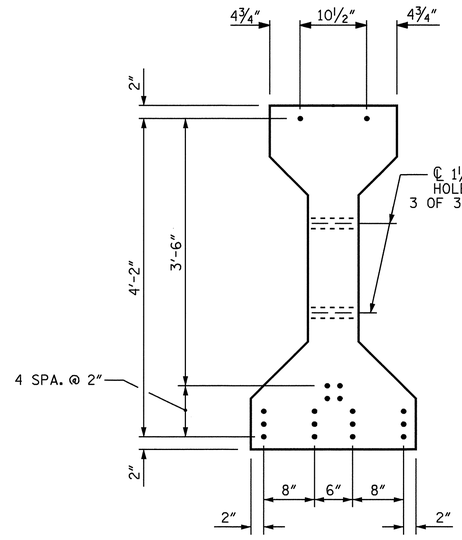
* FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION A-A

SECTION B-B



AT END OF GIRDER



AT ℄ OF GIRDER

½" Ø LOW RELAXATION STRAND LAYOUT

(18 STRANDS, ALL STRAIGHT, NO DEBONDED STRANDS)

½" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

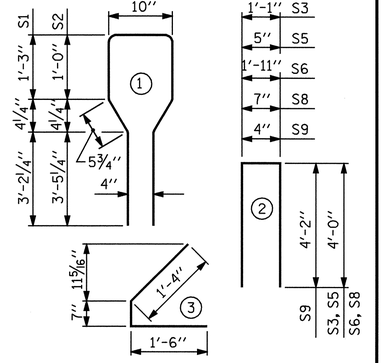
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	50	#4	1	10'-8"	356
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	✳S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
EXTERIOR GDR.	S9	2	#5	2	8'-8"	18
INTERIOR GDR.	S9	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	5	#4	STR	7'-0"	23
INTERIOR GDR.	S11	5	#4	STR	12'-5"	41

✳NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

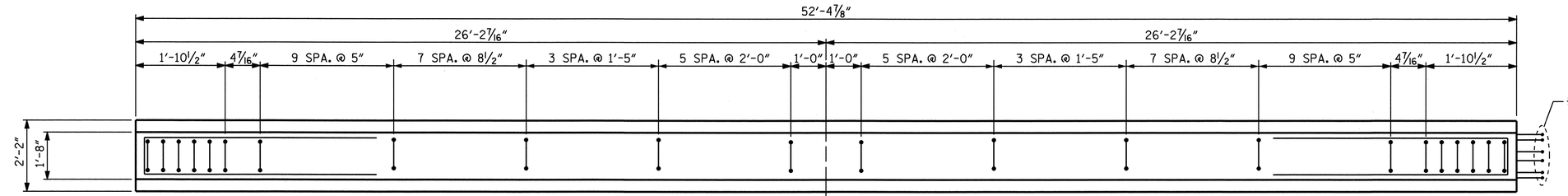


QUANTITIES FOR ONE GIRDER

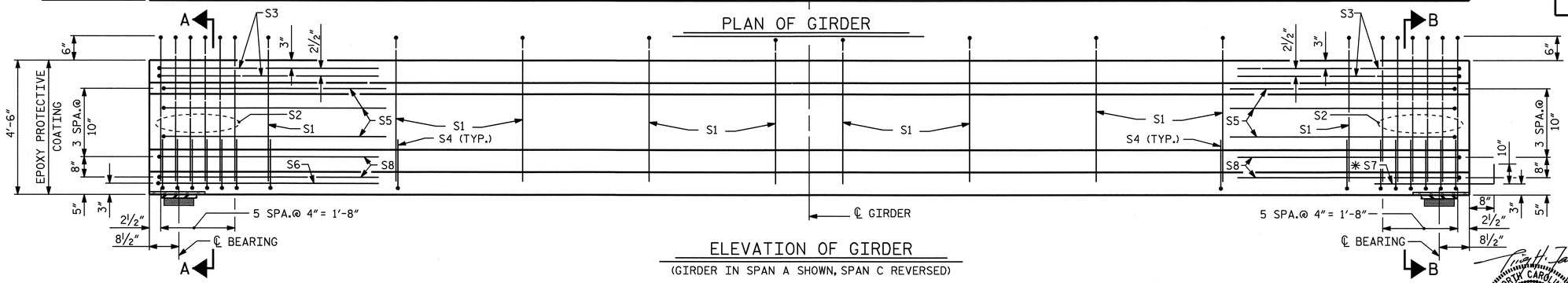
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	½" Ø L.R. STRANDS No.
EXTERIOR GDR.	846	10.635	18
INTERIOR GDR.	882	10.635	18

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
A	4	52.406	209.63
C	4	52.406	209.63



PLAN OF GIRDER



ELEVATION OF GIRDER

(GIRDER IN SPAN A SHOWN, SPAN C REVERSED)

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD

SPANS A & C

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

2/07/08

ASSEMBLED BY : D. G. ELY	DATE : 7/07
CHECKED BY : Q. T. NGUYEN	DATE : 8/07
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			33

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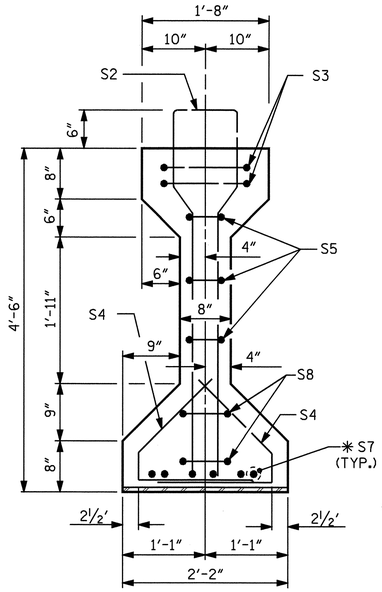
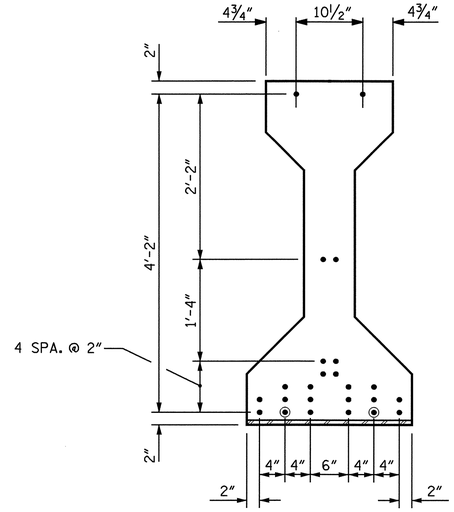
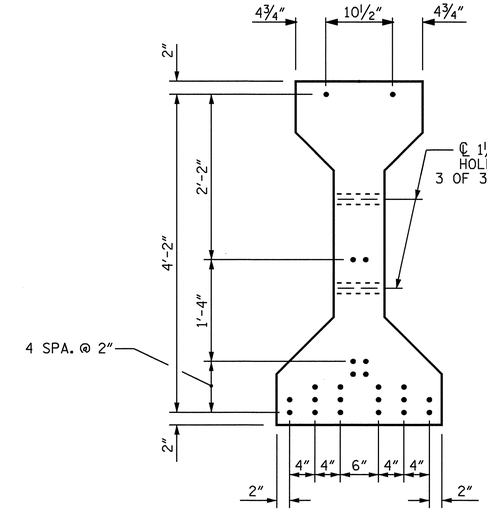


✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION A-A



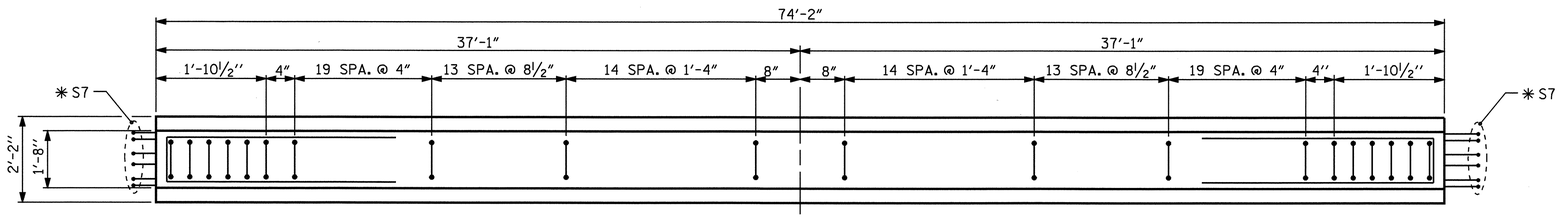
AT END OF GIRDER



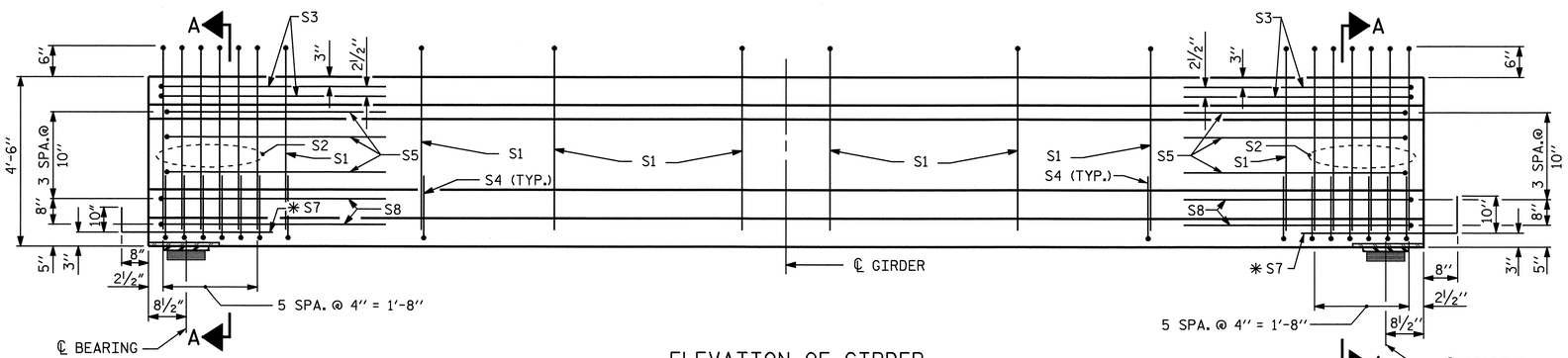
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(24 STRANDS, 22 STRAIGHT, 2 DEBONDED STRANDS)



PLAN OF GIRDER



ELEVATION OF GIRDER

FIX

FIX

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 8-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

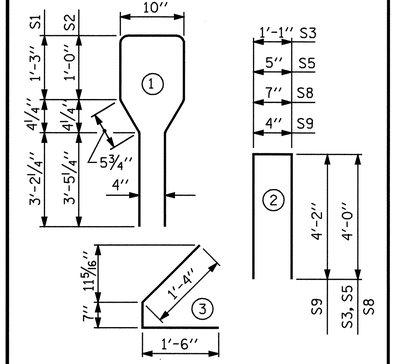
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	94	#4	1	10'-8"	670
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	104	#4	3	3'-5"	237
	S5	6	#4	2	8'-5"	34
	✱S7	12	#5	STR	3'-8"	46
	S8	4	#4	2	8'-7"	23
EXTERIOR GDR.	S9	2	#5	2	8'-8"	18
INTERIOR GDR.	S9	4	#5	2	8'-8"	36
EXTERIOR GDR.	S10	5	#4	STR	7'-0"	23
INTERIOR GDR.	S11	5	#4	STR	12'-5"	41

✱ NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	6000 PSI CONCRETE (C.Y.)	0.6" Ø L.R. STRANDS (No.)
EXTERIOR GDR.	1267	15.051	24
INTERIOR GDR.	1303	15.051	24

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	74.167	296.70

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD

SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

2/07/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	D. G. ELY	DATE :	7/07
CHECKED BY :	Q. T. NGUYEN	DATE :	8/07
DRAWN BY :	ELR 8/91	REV. 7/17/98	RWW/LES
CHECKED BY :	GRP 8/91	REV. 10/17/00R	RWW/LES
		REV. 5/1/06	TLA/GM

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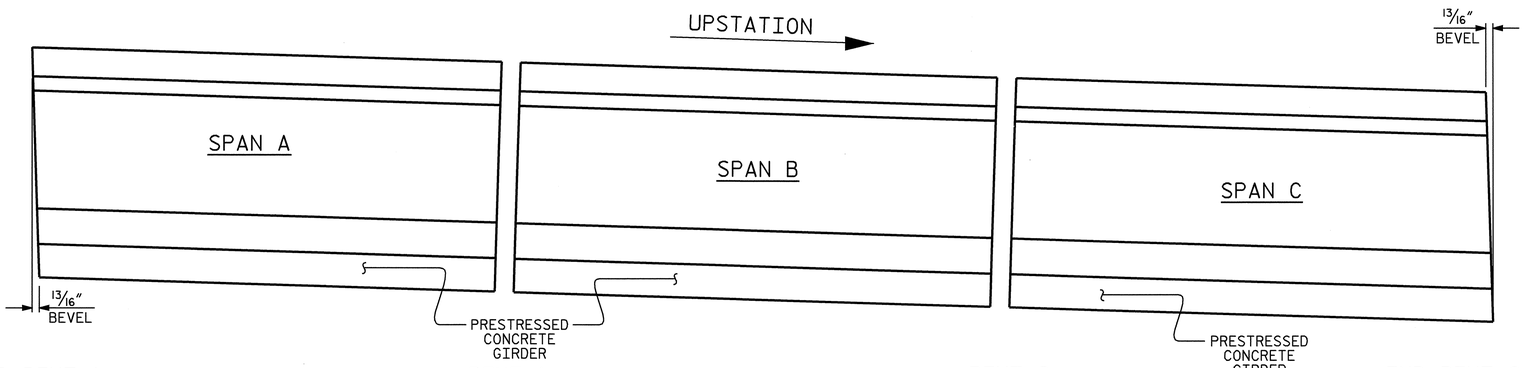
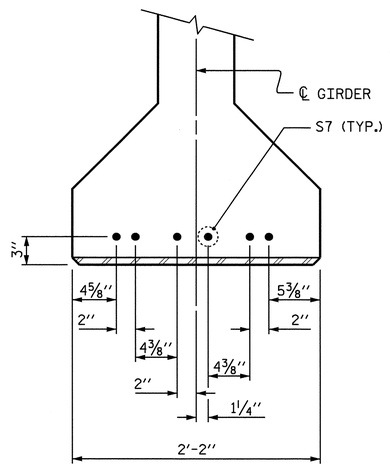
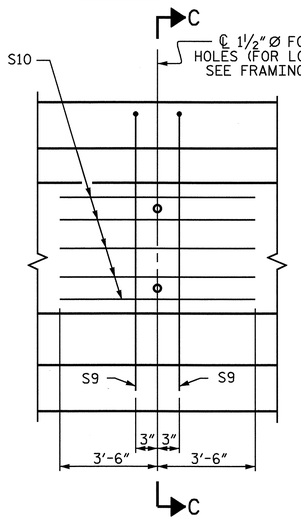


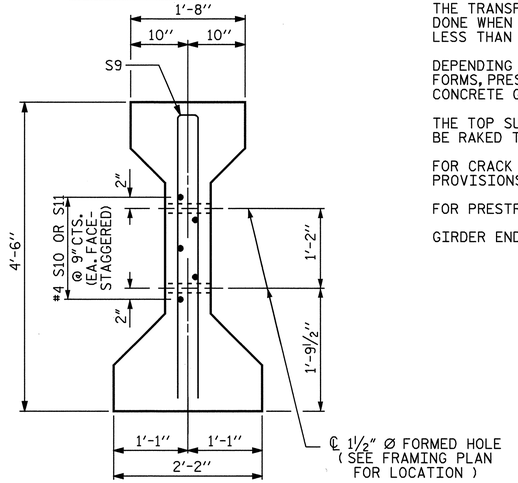
GIRDER BEVEL DETAILS

NO BEVEL REQUIRED @ BENT 1 & BENT 2.
THE DIFFERENCE BETWEEN GIRDER HORIZONTAL LENGTH & SLOPED LENGTH SHOULD BE NEGLECTED FOR ALL GIRDERS.



DETAIL "A"

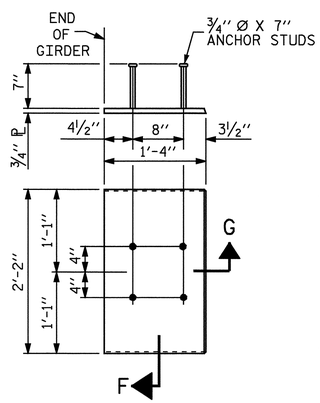


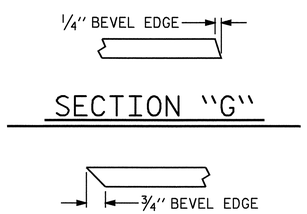


SECTION C-C
(S1 BARS NOT SHOWN)

PARTIAL ELEVATION OF 1½" Ø FORMED HOLE

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1 & 4



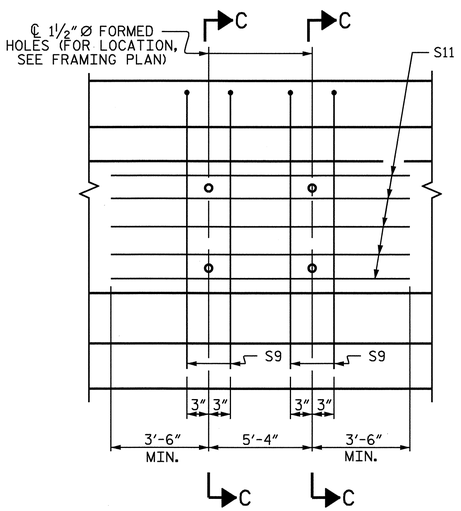


SECTION "G"

SECTION "F"
(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQUIRED PER GIRDER)



PARTIAL ELEVATION OF 1½" Ø FORMED HOLE

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 2 & 3

NOTES

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

GIRDER ENDS OVER BENTS SHALL BE PLUMB.

PROJECT NO. B-4157
IRDELL COUNTY
STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG
Ting H Fang 2/07/08

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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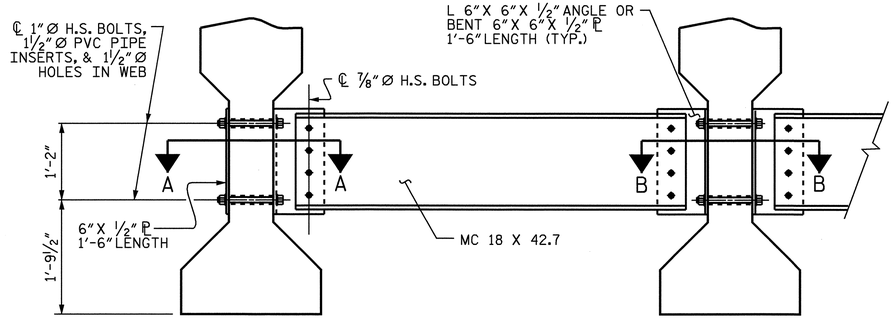
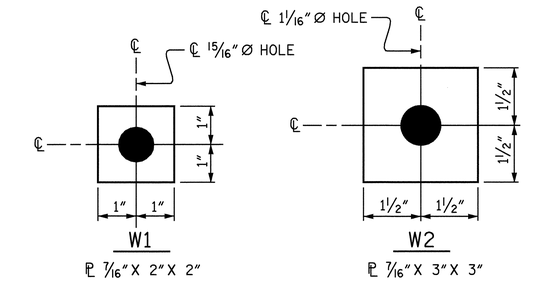


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



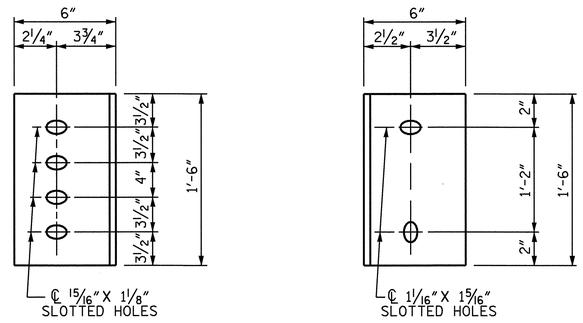
ℙ 7/16"X 2"X 2"

USE WITH ⅞"Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

ℙ 7/16"X 3"X 3"

USE WITH 1"Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

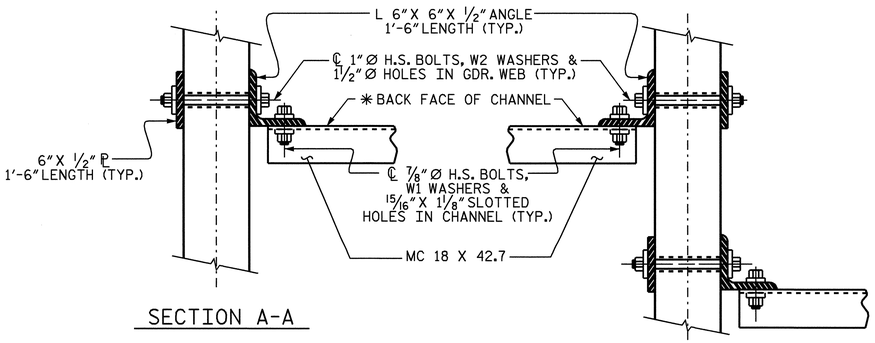
WASHER DETAILS



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS



SECTION A-A

SECTION B-B

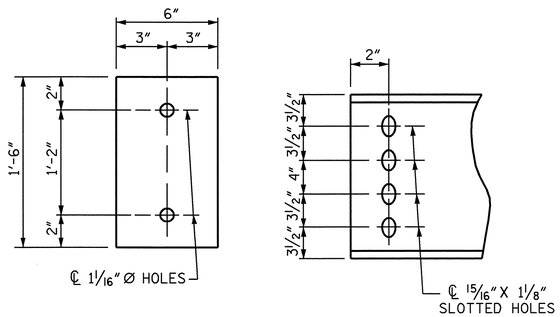


PLATE DETAILS

CHANNEL END

CONNECTION DETAILS

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

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE CHANNELS, ANGLES, WASHERS, PLATE WASHERS, AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

2/07/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY : D. G. ELY	DATE : 7/07
CHECKED BY : Q. T. NGUYEN	DATE : 8/07
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06R KMM/GM

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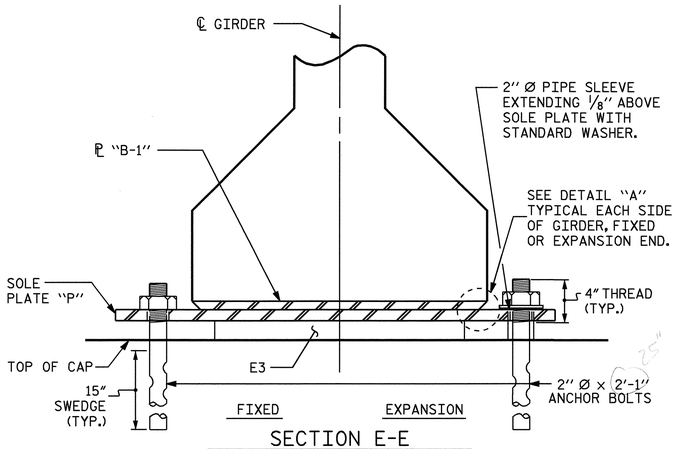
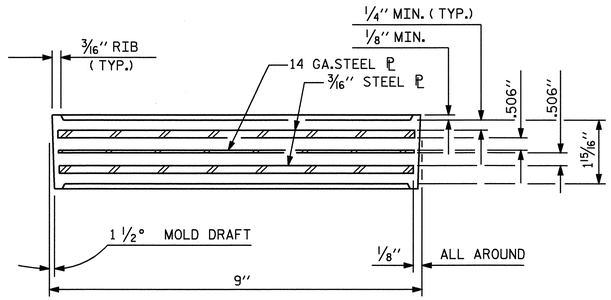
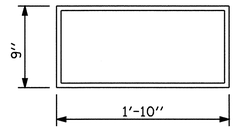


SECTION E-E



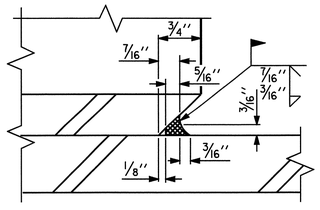
TYPICAL SECTION OF ELASTOMERIC BEARINGS



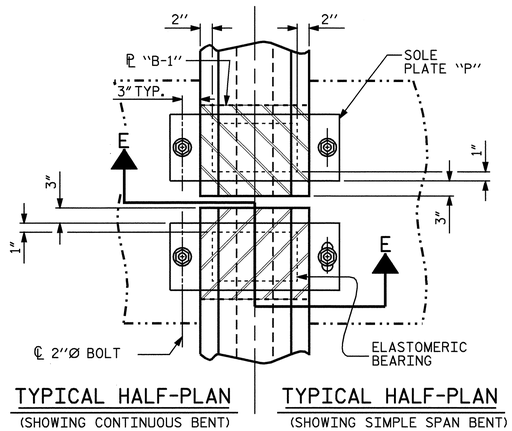
E3 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



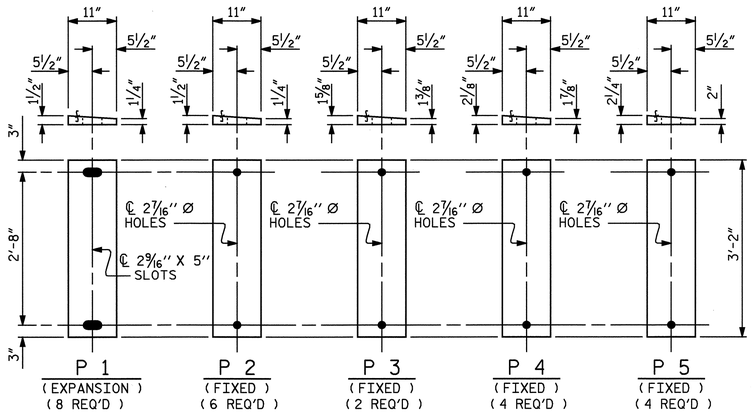
DETAIL "A"



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS



SOLE PLATE DETAILS ("P")

NOTES

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

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

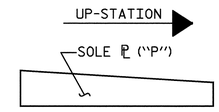
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

— LOAD RATINGS —	
	MAX.D.L.+L.L.
54"PCG -TYPE IV	137 K



SOLE ℄ PLACEMENT DETAIL

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER JIAN HSIUNG TANG

1/11/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY : D. G. ELY		DATE :	7/07
CHECKED BY : Q. T. NGUYEN		DATE :	8/07
DRAWN BY : WJH 8/89	REV. 10/17/00		RWW/LES
CHECKED BY : CRK 8/89	REV. 7/10/01		RWW/LES
	REV. 5/1/06		TLA/GM

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DEAD LOAD DEFLECTION TABLE FOR SPAN A

1/2" LOW RELAXATION	GIRDER A1											GIRDERS A2 & A3											GIRDER A4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.0	0.0	0.006	0.011	0.014	0.017	0.018	0.017	0.014	0.011	0.006	0.0	0.0	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.0
FINAL CAMBER ↑	0.0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0.0	0.0	1/8"	3/16"	3/8"	5/16"	3/8"	5/16"	3/8"	3/16"	1/8"	0.0	0.0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6" LOW RELAXATION	GIRDER B1											GIRDERS B2 & B3											GIRDER B4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.052	0.098	0.134	0.156	0.164	0.156	0.134	0.098	0.052	0.0	0.0	0.052	0.098	0.134	0.156	0.164	0.156	0.134	0.098	0.052	0.0	0.0	0.052	0.098	0.134	0.156	0.164	0.156	0.134	0.098	0.052	0.0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.019	0.035	0.049	0.057	0.060	0.057	0.049	0.035	0.019	0.0	0.0	0.021	0.039	0.054	0.063	0.066	0.063	0.054	0.039	0.021	0.0	0.0	0.019	0.035	0.049	0.057	0.060	0.057	0.049	0.035	0.019	0.0
FINAL CAMBER ↑	0.0	3/8"	3/4"	1"	1 3/16"	1 1/4"	1 3/16"	1"	3/4"	3/8"	0.0	0.0	3/8"	11/16"	1"	1 1/8"	1 3/16"	1 1/8"	1"	11/16"	3/8"	0.0	0.0	3/8"	3/4"	1"	1 3/16"	1 1/4"	1 3/16"	1"	3/4"	3/8"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN C

1/2" LOW RELAXATION	GIRDER C1											GIRDERS C2 & C3											GIRDER C4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0	0.0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0.0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.0	0.0	0.006	0.011	0.014	0.017	0.018	0.017	0.014	0.011	0.006	0.0	0.0	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.0
FINAL CAMBER ↑	0.0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0.0	0.0	1/8"	3/16"	3/8"	5/16"	3/8"	5/16"	3/8"	3/16"	1/8"	0.0	0.0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0.0

✳ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM) EXCEPT CAMBER, WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-4157
IRDELL COUNTY
STATION: 22+79.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
1/11/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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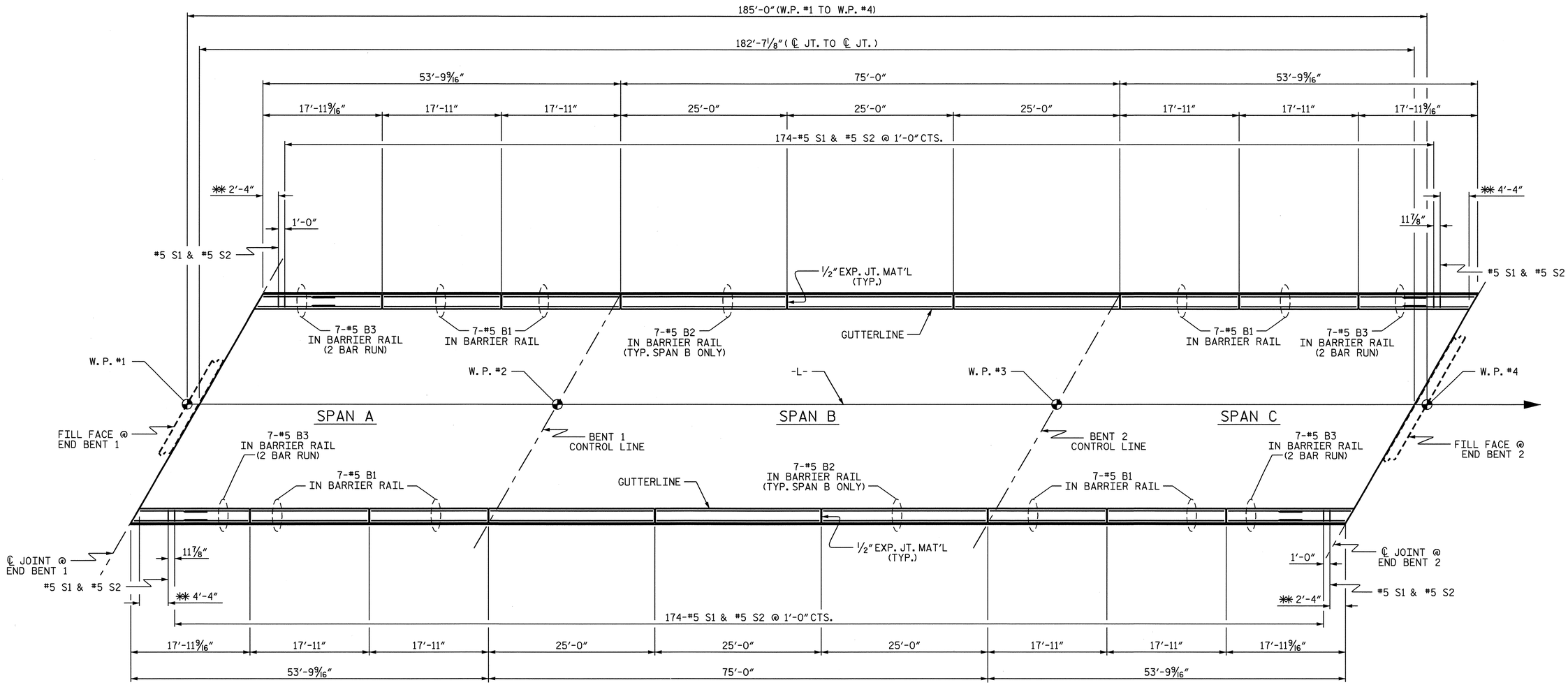

PLAN OF BARRIER RAIL

** FOR REINFORCING STEEL IN THIS AREA, SEE "END OF RAIL DETAILS", SHEET 2 OF 2.

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting H. Fang 1/11/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. G. ELY DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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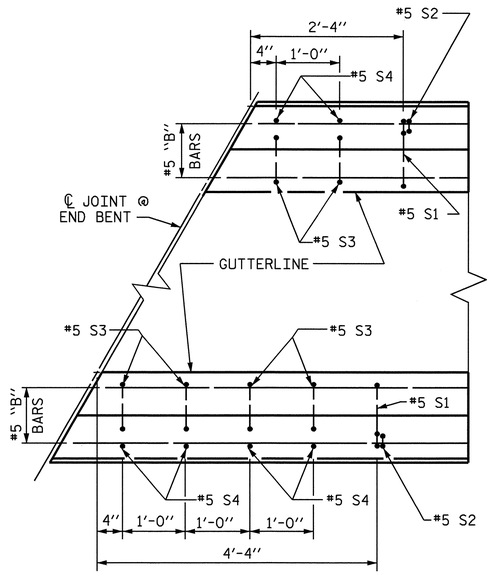
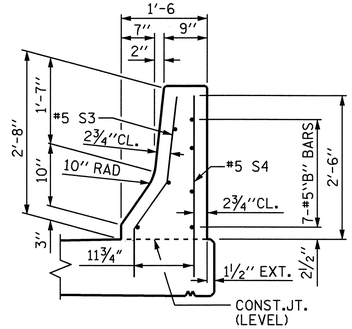


PLAN



END VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

NOTES

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

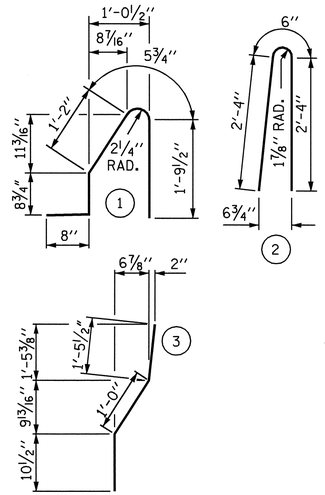
WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

BAR TYPES



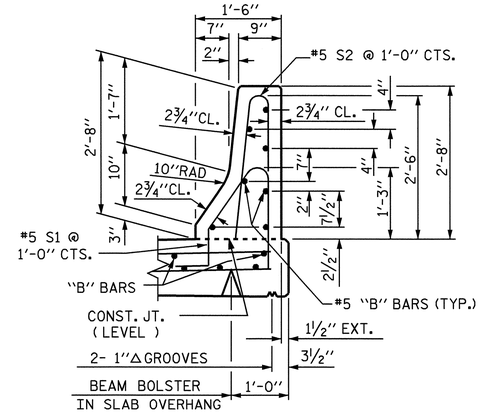
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

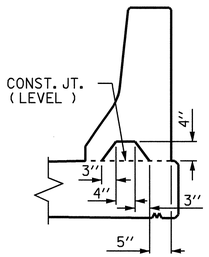
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	56	#5	STR	17'-6"	1022
* B2	42	#5	STR	24'-7"	1077
* B3	56	#5	STR	10'-10"	633
* S1	352	#5	1	4'-10"	1774
* S2	352	#5	2	5'-2"	1897
* S3	12	#5	3	3'-4"	42
* S4	12	#5	STR	3'-2"	40

* EPOXY COATED REINFORCING STEEL	6485	LBS.
CLASS AA CONCRETE	36.6	CU. YDS.
CONCRETE BARRIER RAIL	365.19	LIN. FT.

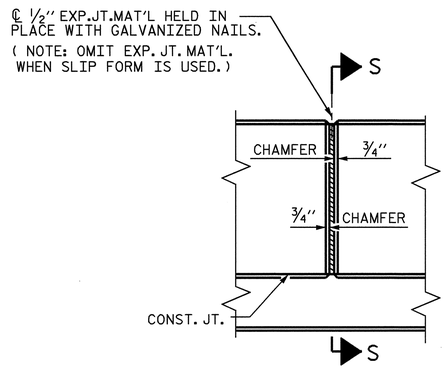


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang 2/07/08

ASSEMBLED BY :	D. G. ELY	DATE :	7/07
CHECKED BY :	Q. T. NGUYEN	DATE :	8/07
DRAWN BY : ARB 5/87	REV. 10/17/00		RWW/LES
CHECKED BY : SJD 9/87	REV. 5/17/03R		RWW/JTE
	REV. 5/1/06		TLA/GM

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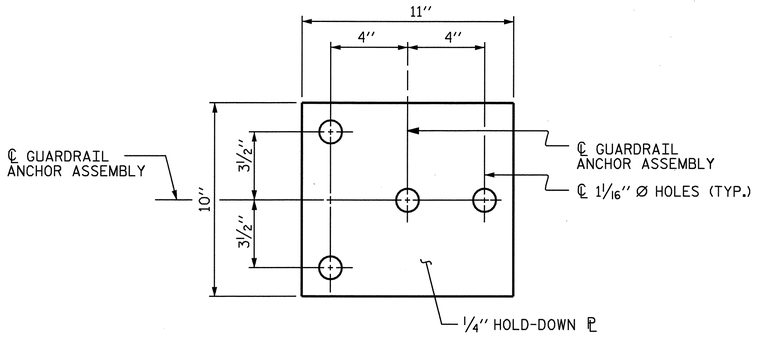
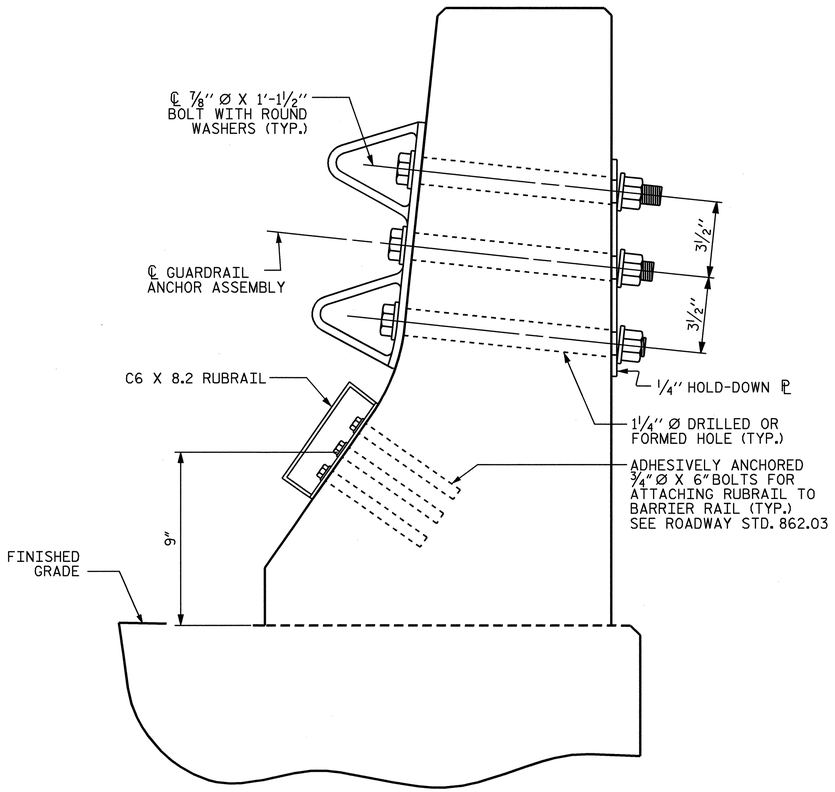
STD. NO. CBR1

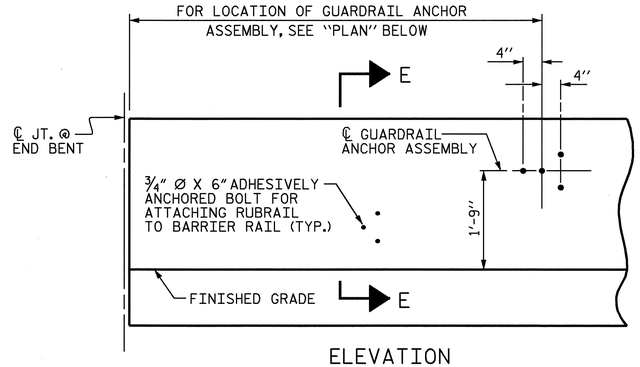


PLAN



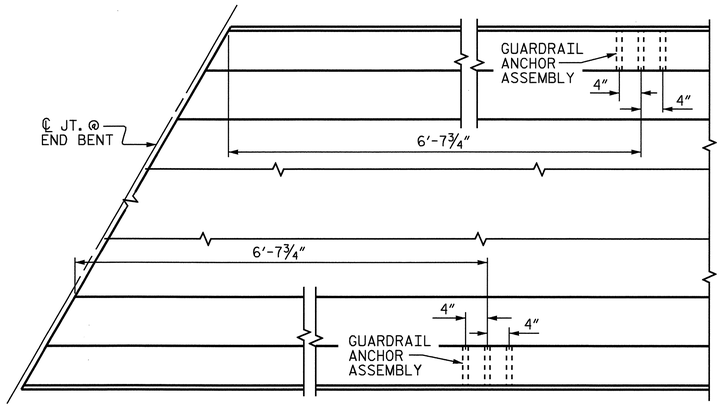
SECTION E-E

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.)

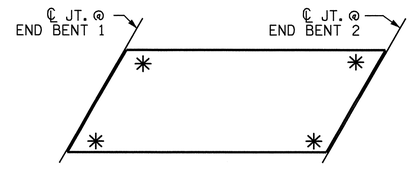
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting Hsiung Fang 1/11/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY : D. G. ELY	DATE : 1/8/08
CHECKED BY : T. H. FANG	DATE : 1/10/08
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

11-JAN-2008 10:23
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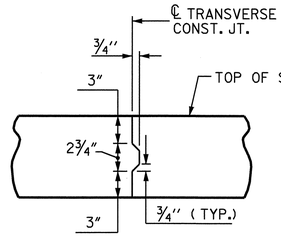
STD. NO. GRA2

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2′-0″	1′-9″	2′-0″	1′-9″	2′-9″
#5	2′-6″	2′-2″	2′-6″	2′-2″	3′-5″
#6	3′-0″	2′-7″	3′-10″	2′-7″	4′-4″
#7	5′-3″	3′-6″			
#8	6′-10″	4′-7″			

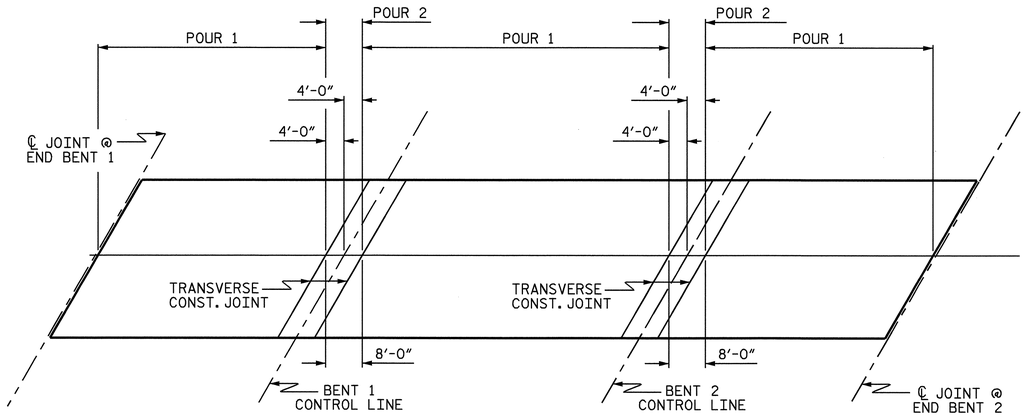
GROOVING BRIDGE FLOORS

APPROACH SLABS	770	SQ.FT.
BRIDGE DECK	5160	SQ.FT.
TOTAL	5930	SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



OPTIONAL POURING SEQUENCE

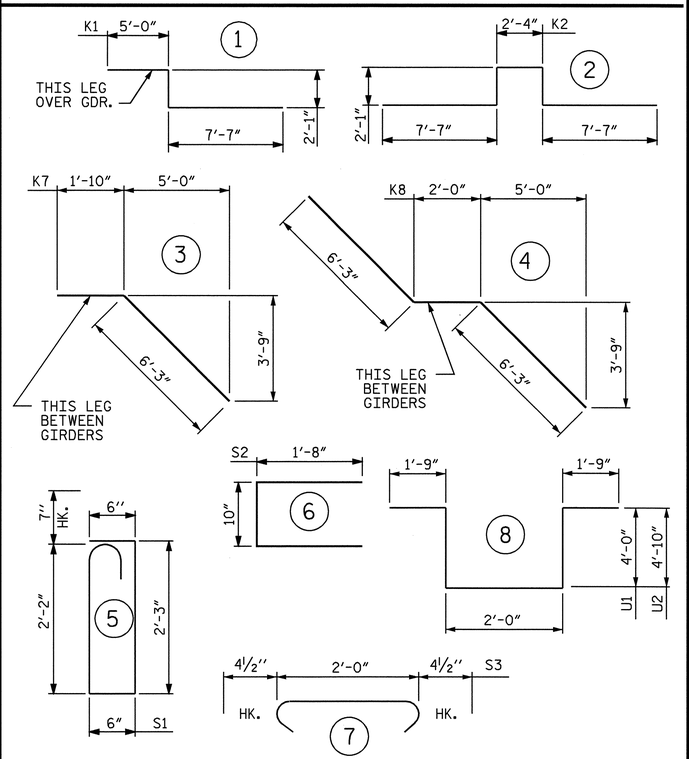
POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POUR 1 REACH A MINIMUM OF 3000 PSI.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	300	#5	STR	34′-5″	10769	A214	2	#5	STR	21′-6″	45
A2	300	#5	STR	34′-5″	10769	A215	2	#5	STR	20′-7″	43
✳A3	6	#6	STR	14′-6″	131	A216	2	#5	STR	19′-7″	41
						A217	2	#5	STR	18′-8″	39
✳A101	2	#5	STR	33′-8″	70	A218	2	#5	STR	17′-9″	37
✳A102	2	#5	STR	32′-9″	68	A219	2	#5	STR	16′-9″	35
✳A103	2	#5	STR	31′-10″	66	A220	2	#5	STR	15′-10″	33
✳A104	2	#5	STR	30′-10″	64	A221	2	#5	STR	14′-11″	31
✳A105	2	#5	STR	29′-11″	62	A222	2	#5	STR	14′-0″	29
✳A106	2	#5	STR	29′-0″	60	A223	2	#5	STR	13′-0″	27
✳A107	2	#5	STR	28′-1″	59	A224	2	#5	STR	12′-1″	25
✳A108	2	#5	STR	27′-1″	57	A225	2	#5	STR	11′-2″	23
✳A109	2	#5	STR	26′-2″	55	A226	2	#5	STR	10′-3″	21
✳A110	2	#5	STR	25′-3″	53	A227	2	#5	STR	9′-3″	19
✳A111	2	#5	STR	24′-4″	51	A228	2	#5	STR	8′-4″	17
✳A112	2	#5	STR	23′-4″	49	A229	2	#5	STR	7′-5″	15
✳A113	2	#5	STR	22′-5″	47	A230	2	#5	STR	6′-6″	14
✳A114	2	#5	STR	21′-6″	45	A231	2	#5	STR	5′-6″	11
✳A115	2	#5	STR	20′-7″	43	A232	2	#5	STR	4′-7″	10
✳A116	2	#5	STR	19′-7″	41	A233	2	#5	STR	3′-8″	8
✳A117	2	#5	STR	18′-8″	39						
✳A118	2	#5	STR	17′-9″	37	✳B1	88	#4	STR	18′-3″	1073
✳A119	2	#5	STR	16′-9″	35	✳B2	44	#7	STR	48′-9″	4384
✳A120	2	#5	STR	15′-10″	33	✳B3	42	#7	STR	19′-6″	1674
✳A121	2	#5	STR	14′-11″	31	✳B4	22	#4	STR	24′-0″	353
✳A122	2	#5	STR	14′-0″	29	B5	144	#5	STR	47′-2″	7084
✳A123	2	#5	STR	13′-0″	27	✳B6	14	#4	STR	27′-9″	260
✳A124	2	#5	STR	12′-1″	25						
✳A125	2	#5	STR	11′-2″	23	✳G1	2	#5	STR	39′-9″	83
✳A126	2	#5	STR	10′-3″	21						
✳A127	2	#5	STR	9′-3″	19	✳K1	8	#8	1	19′-4″	413
✳A128	2	#5	STR	8′-4″	17	✳K2	8	#8	2	21′-8″	463
✳A129	2	#5	STR	7′-5″	15	✳K3	12	#4	STR	7′-2″	57
✳A130	2	#5	STR	6′-6″	14	✳K4	12	#4	STR	9′-0″	72
✳A131	2	#5	STR	5′-6″	11	✳K5	24	#4	STR	9′-6″	152
✳A132	2	#5	STR	4′-7″	10	✳K6	12	#4	STR	8′-6″	68
✳A133	2	#5	STR	3′-8″	8	✳K7	20	#4	3	8′-1″	108
						✳K8	20	#4	4	14′-6″	194
A201	2	#5	STR	33′-8″	70	✳K9	18	#6	STR	7′-3″	196
A202	2	#5	STR	32′-9″	68						
A203	2	#5	STR	31′-10″	66	✳S1	48	#5	5	6′-0″	300
A204	2	#5	STR	30′-10″	64	✳S2	48	#5	6	4′-2″	209
A205	2	#5	STR	29′-11″	62	✳S3	180	#4	7	2′-9″	331
A206	2	#5	STR	29′-0″	60						
A207	2	#5	STR	28′-1″	59	U1	12	#4	8	13′-6″	108
A208	2	#5	STR	27′-1″	57	U2	36	#4	8	15′-2″	365
A209	2	#5	STR	26′-2″	55						
A210	2	#5	STR	25′-3″	53						
A211	2	#5	STR	24′-4″	51						
A212	2	#5	STR	23′-4″	49	REINFORCING STEEL = 19,610 LBS					
A213	2	#5	STR	22′-5″	47	✳EPOXY COATED REINF. STEEL= 22,574 LBS					

✳DENOTES EPOXY COATED REINFORCING STEEL

BAR TYPES

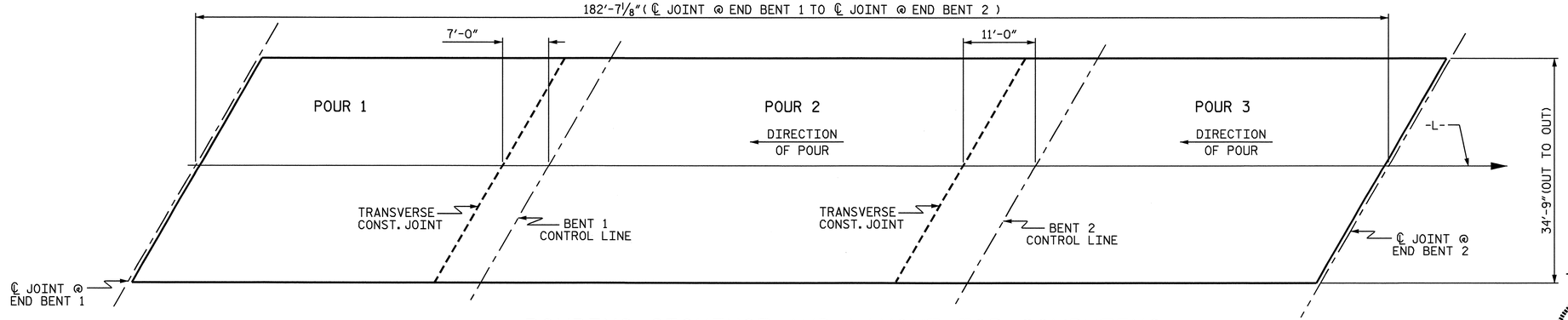


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

SPANS A, B, & C	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	50.9		
POUR 2	85.3		
POUR 3	81.6		
TOTAL ✳✳	217.8	19,610	22,574

✳✳QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 6,345)

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

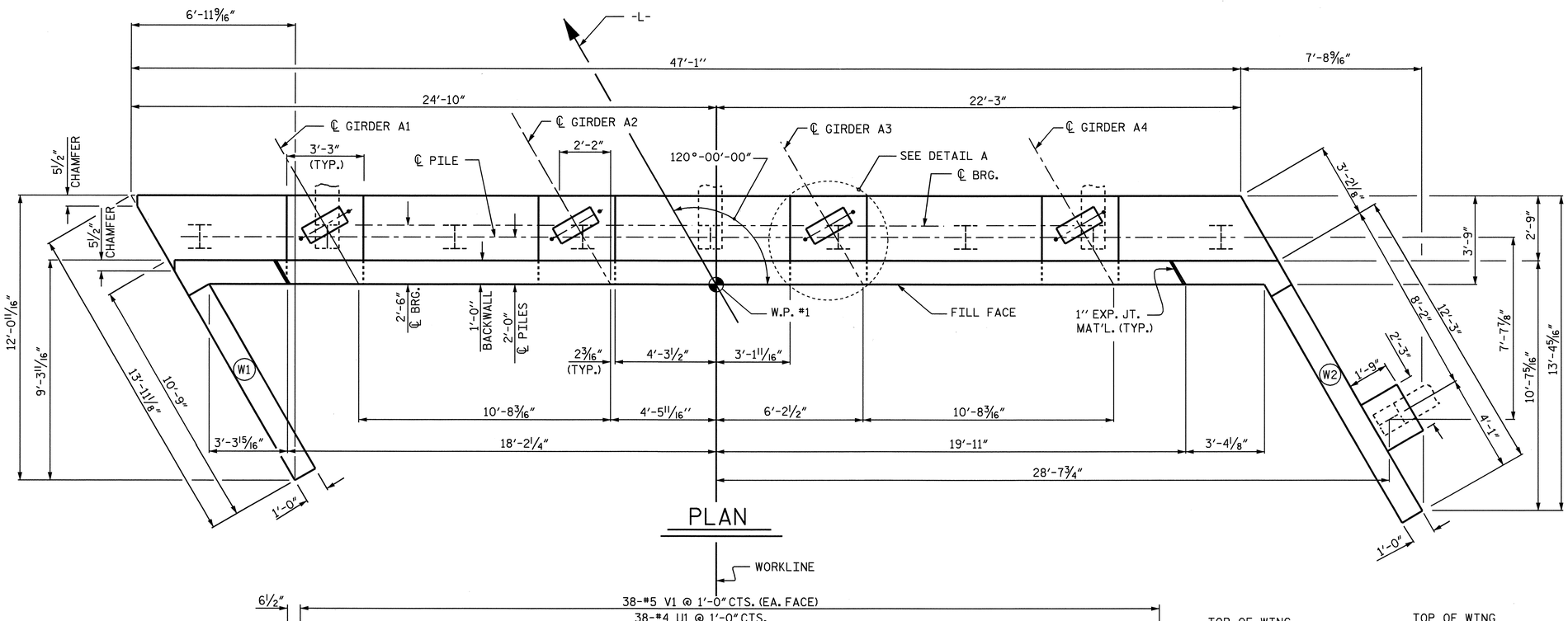
STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

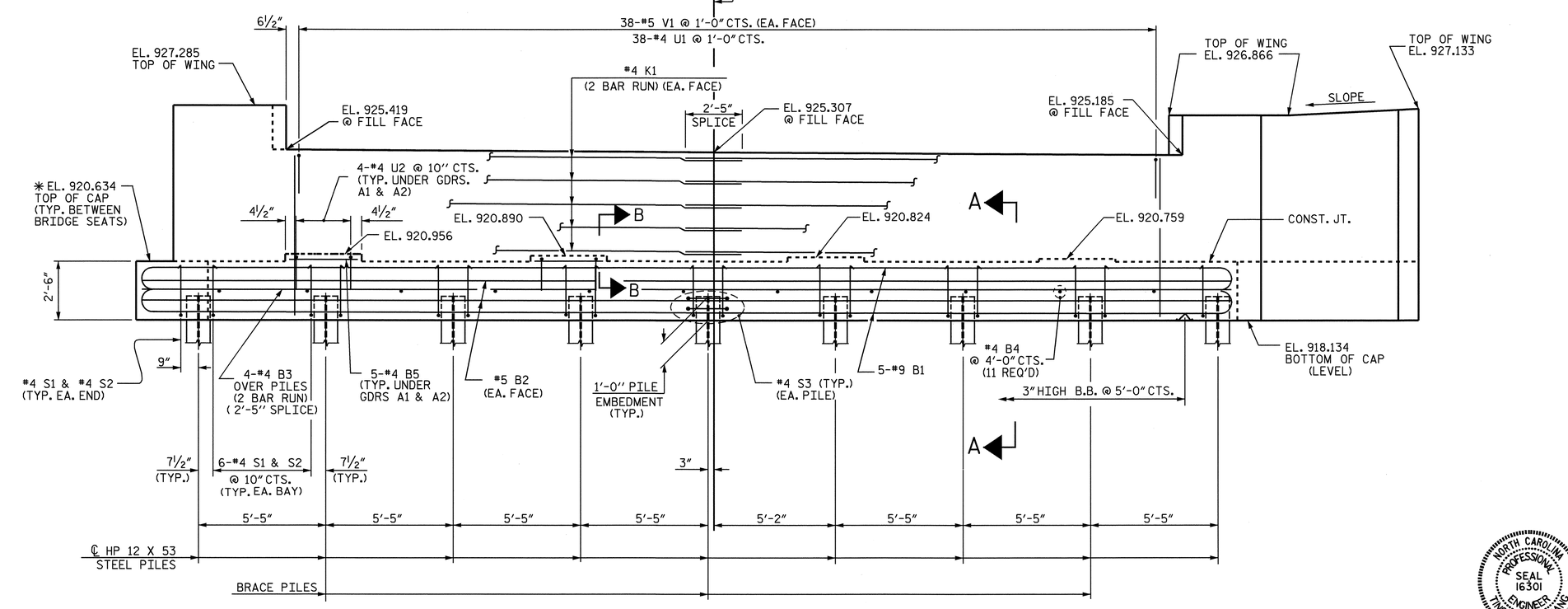
ASSEMBLED BY : D. G. ELY	DATE : 7/07		
CHECKED BY : Q. T. NGUYEN	DATE : 8/07		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	
	REV. 5/1/06	TLA/GM	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			33

STD. NO. BOM2



PLAN



ELEVATION

BRACE PILE IN RIGHT WING WALL AND DETAILS OF LEFT WING WALL NOT SHOWN FOR CLARITY.

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

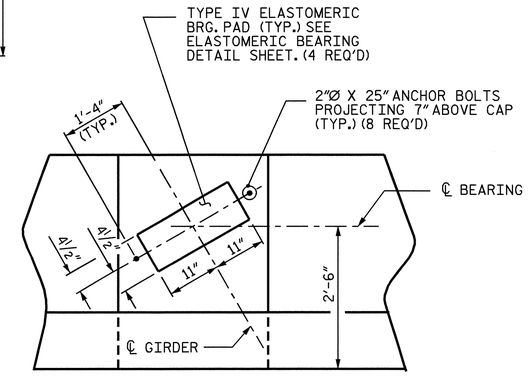
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

FOR TEMPORARY DRAINAGE DETAIL, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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



DETAIL A

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/07/08

DRAWN BY : HARISH SHAH DATE : 02/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

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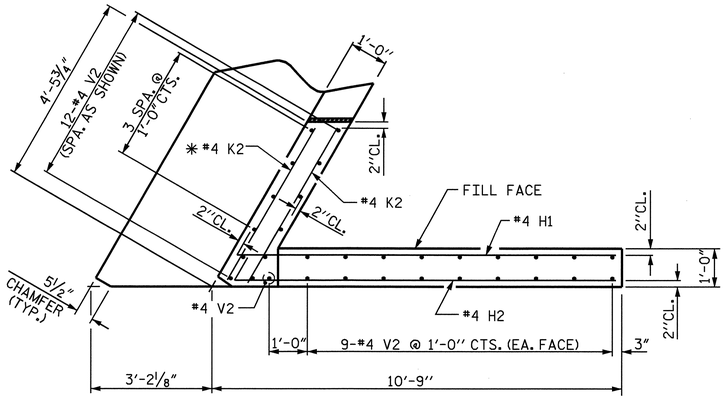
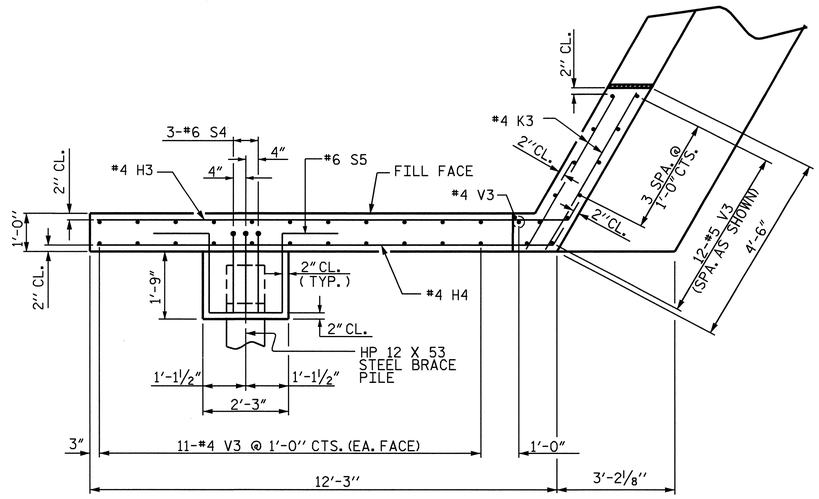
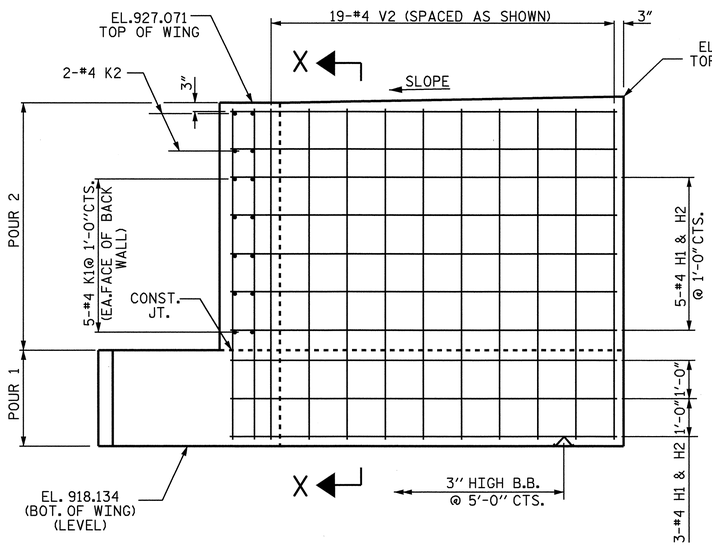


PLAN OF WING W1

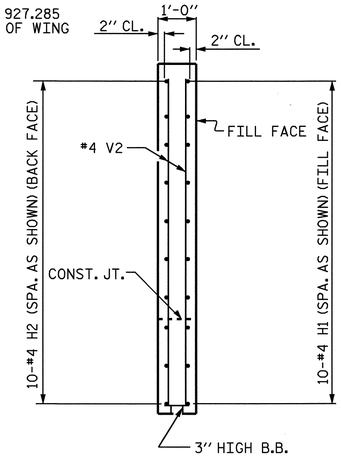
*#4 K2 FIELD CUT AS NECESSARY TO GIVE 2" MIN. CLEARANCE FROM CHAMFER.



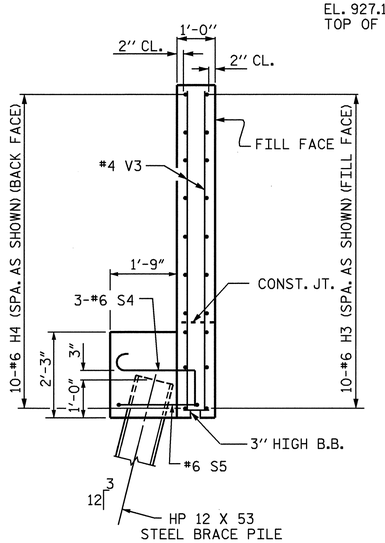
PLAN OF WING W2



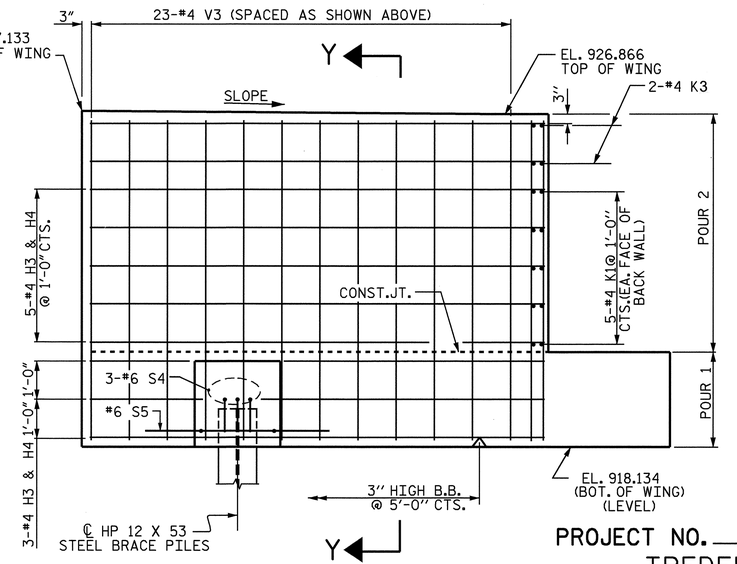
ELEVATION OF WING W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING W2

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
Ting H. Fang 1/11/08

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : HARISH SHAH DATE : 02/12/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

11-JAN-2008 10:22
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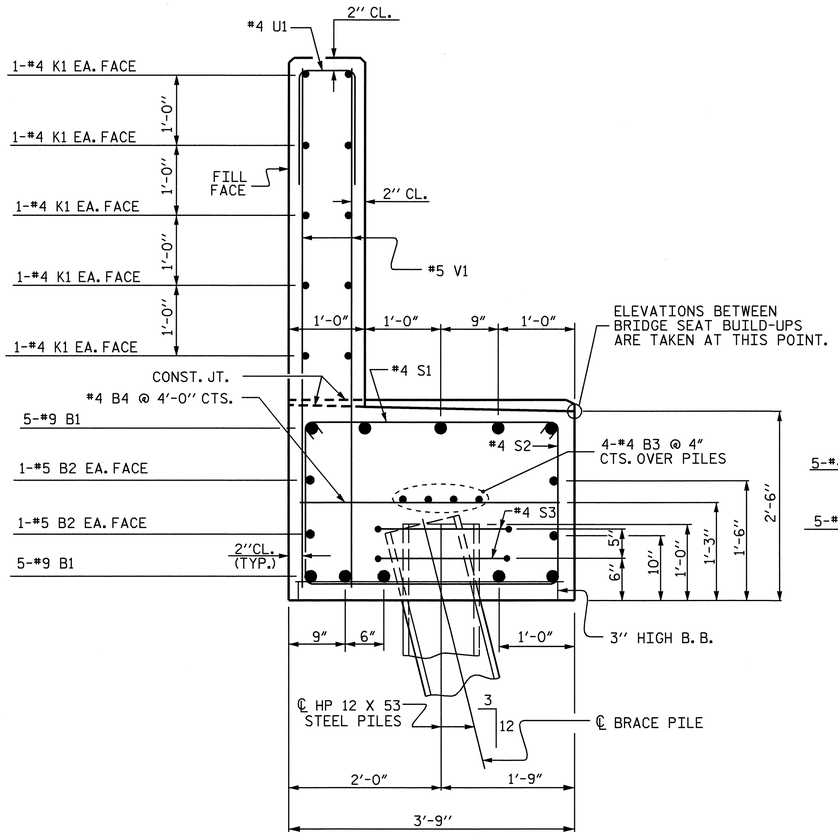
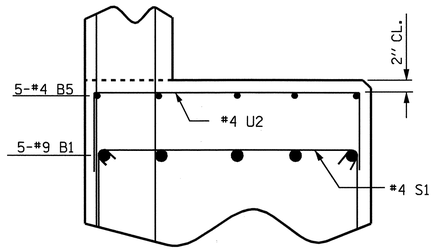
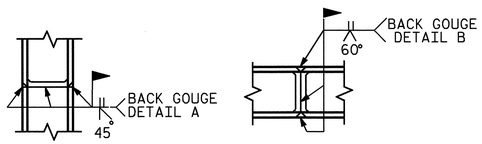


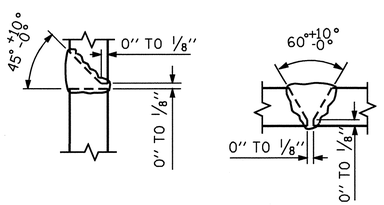
SECTION A-A



SECTION B-B



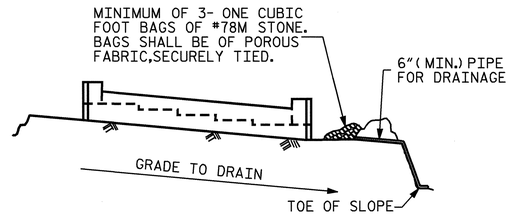
*PILE VERTICAL *PILE HORIZONTAL OR VERTICAL



DETAIL A DETAIL B

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



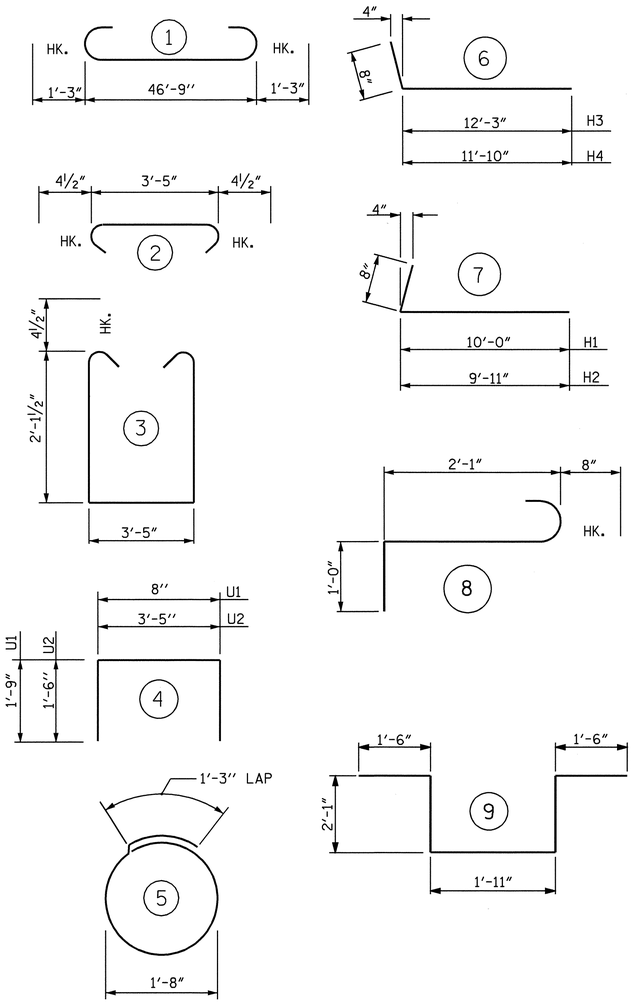
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
K1	#4	2'-5"
B3	#4	2'-5"

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	49'-3"	1675
B2	4	#5	STR	46'-9"	195
B3	8	#4	STR	24'-7"	131
B4	11	#4	STR	3'-5"	25
B5	10	#4	STR	2'-11"	19
H1	10	#4	7	10'-8"	71
H2	10	#4	7	10'-7"	71
H3	10	#4	6	12'-11"	86
H4	10	#4	6	12'-6"	84
K1	20	#4	STR	24'-7"	328
K2	4	#4	STR	4'-1"	11
K3	4	#4	STR	4'-2"	11
S1	50	#4	2	4'-2"	139
S2	50	#4	3	8'-5"	281
S3	18	#4	5	6'-6"	78
S4	3	#6	8	3'-9"	17
S5	1	#6	9	9'-1"	14
U1	38	#4	4	4'-2"	106
U2	8	#4	4	6'-5"	34
V1	76	#5	STR	6'-8"	528
V2	31	#4	STR	8'-7"	178
V3	35	#4	STR	8'-4"	196

REINFORCING STEEL = 4,278 LBS

CLASS A CONCRETE

POUR 1 (CAP & LOWER WINGS)	19.0 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	13.9 C.Y.
TOTAL	32.9 C.Y.

HP 12 X 53 STEEL PILES

NUMBER = 10 LIN. FT. = 550.0

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

Ting H Fang 1/11/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : HARISH SHAH DATE : 02/14/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

11-JAN-2008 10:22
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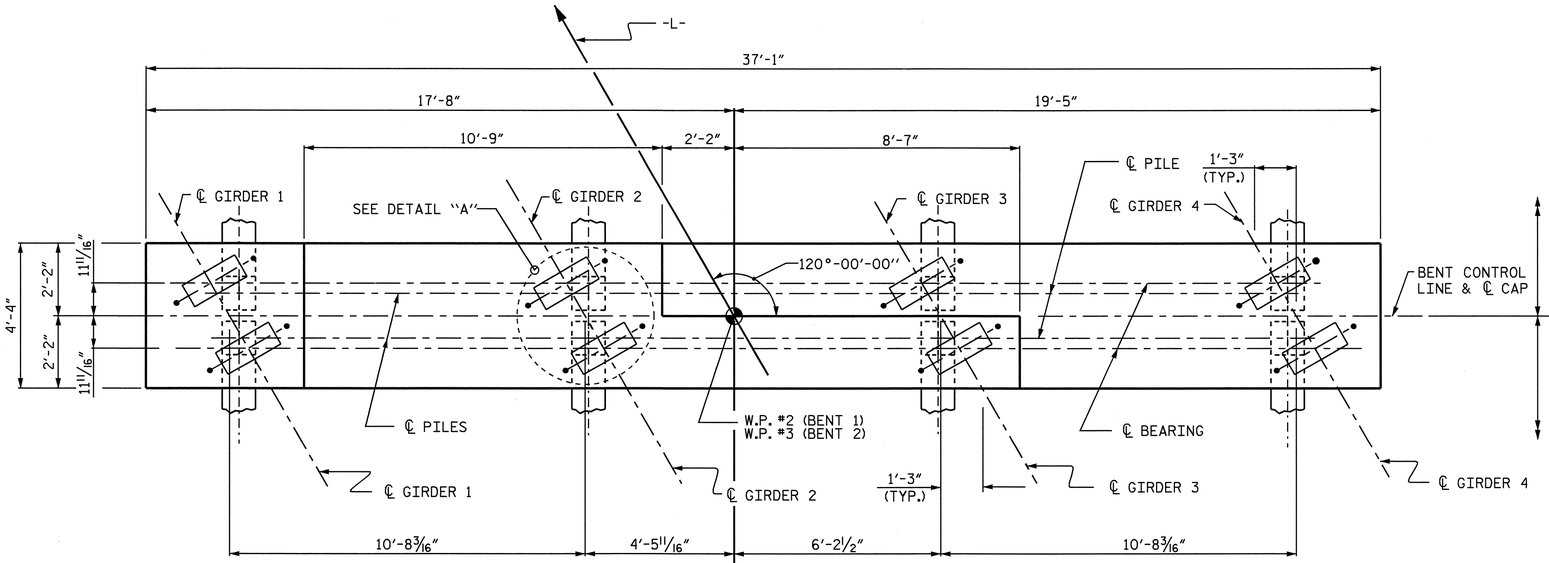
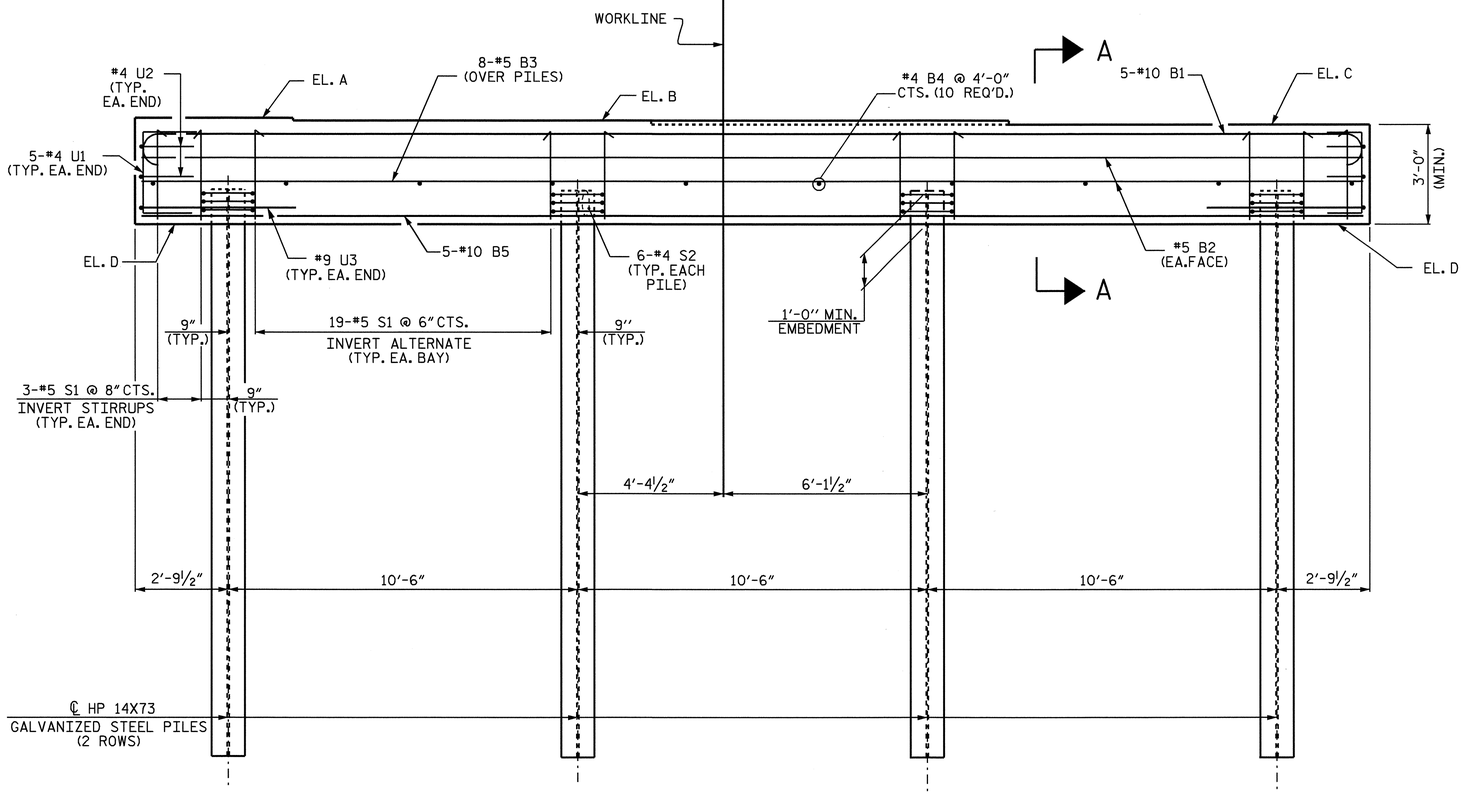


PLAN



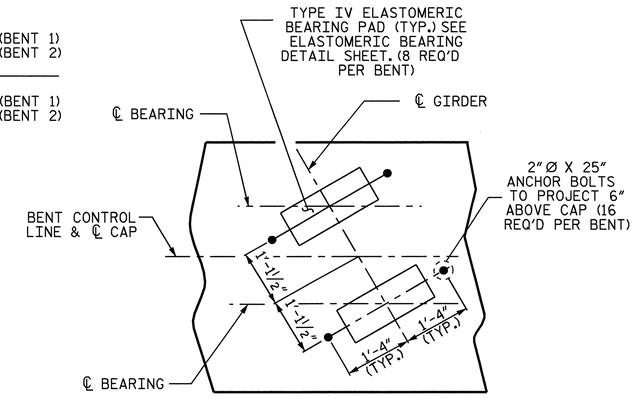
ELEVATION

NOTE

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

ALL HP 14 X 73 STEEL PILES SHOULD BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.



DETAIL A

	EL. A	EL. B	EL. C	EL. D
BENT 1	919.767	919.686	919.570	916.570
BENT 2	918.092	918.011	917.895	914.895

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 AND 2

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/07/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : HARISH SHAH DATE : 7/07
CHECKED BY : Q. T. NGUYEN DATE : 8/07

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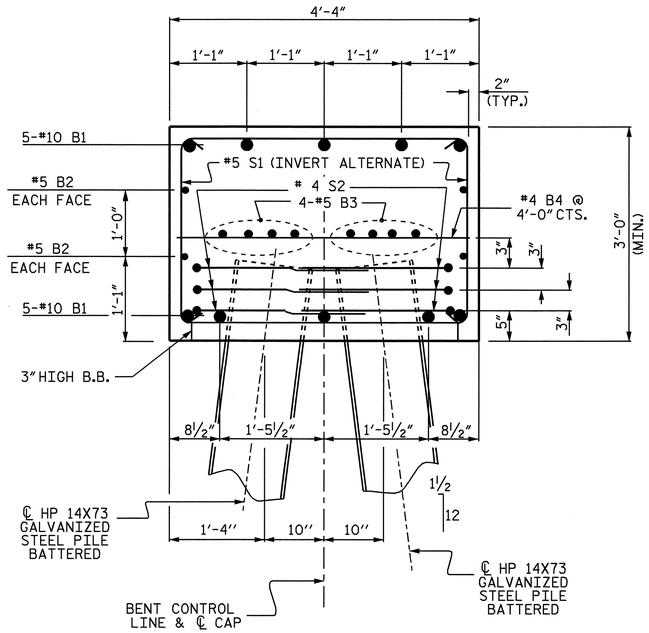
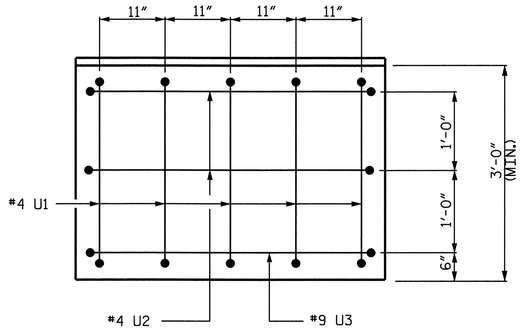
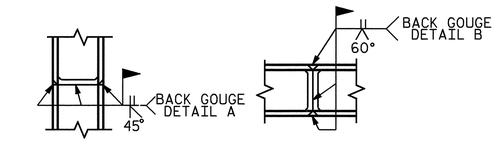


SECTION A-A

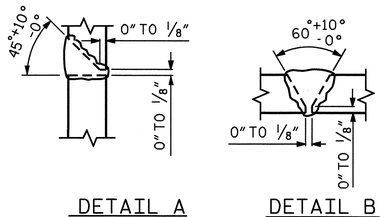


END VIEW



*PILE VERTICAL

*PILE HORIZONTAL OR VERTICAL



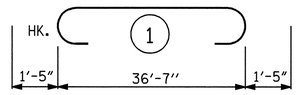
DETAIL A

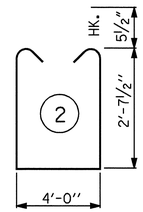
DETAIL B

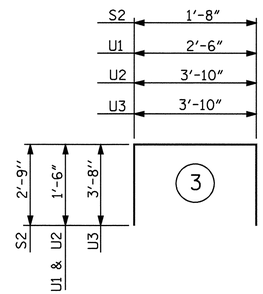
PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	39'-5''	848
B2	4	#5	STR	36'-9"	153
B3	8	#5	STR	36'-9"	307
B4	10	#4	STR	4'-0"	27
B5	5	#10	STR	36'-9''	791
S1	63	#5	2	10'-2''	668
S2	24	#4	3	7'-2''	115
U1	10	#4	3	5'-6"	37
U2	4	#4	3	6'-10"	18
U3	2	#9	3	11'-2"	76

REINFORCING STEEL 3040 LBS.

CLASS A CONCRETE
CAP 18.3 C.Y.

HP 14X73 GALVANIZED STEEL PILES
NO. 8 480 LIN. FT.

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	39'-5"	848
B2	4	#5	STR	36'-9"	153
B3	8	#5	STR	36'-9"	307
B4	10	#4	STR	4'-0"	27
B5	5	#10	STR	36'-9"	791
S1	63	#5	2	10'-2"	668
S2	24	#4	3	7'-2"	115
U1	10	#4	3	5'-6"	37
U2	4	#4	3	6'-10"	18
U3	2	#9	3	11'-2"	76

REINFORCING STEEL 3040 LBS.

CLASS A CONCRETE
CAP 18.3 C.Y.

HP 14X73 GALVANIZED STEEL PILES
NO. 8 320 LIN. FT.

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 AND 2

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILUNG CHANG

2/07/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : H.B.SHAH DATE : 07/11/07
CHECKED BY : Q.T.NGUYEN DATE : 08/07

07-FEB-2008 10:53
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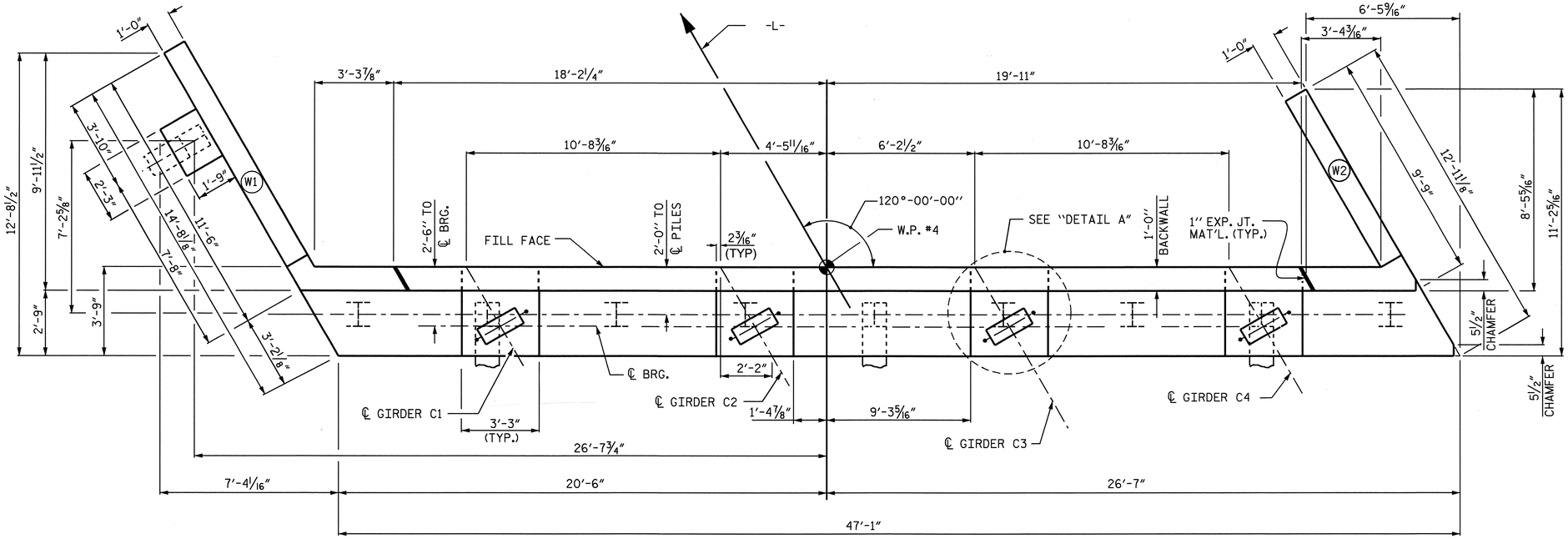
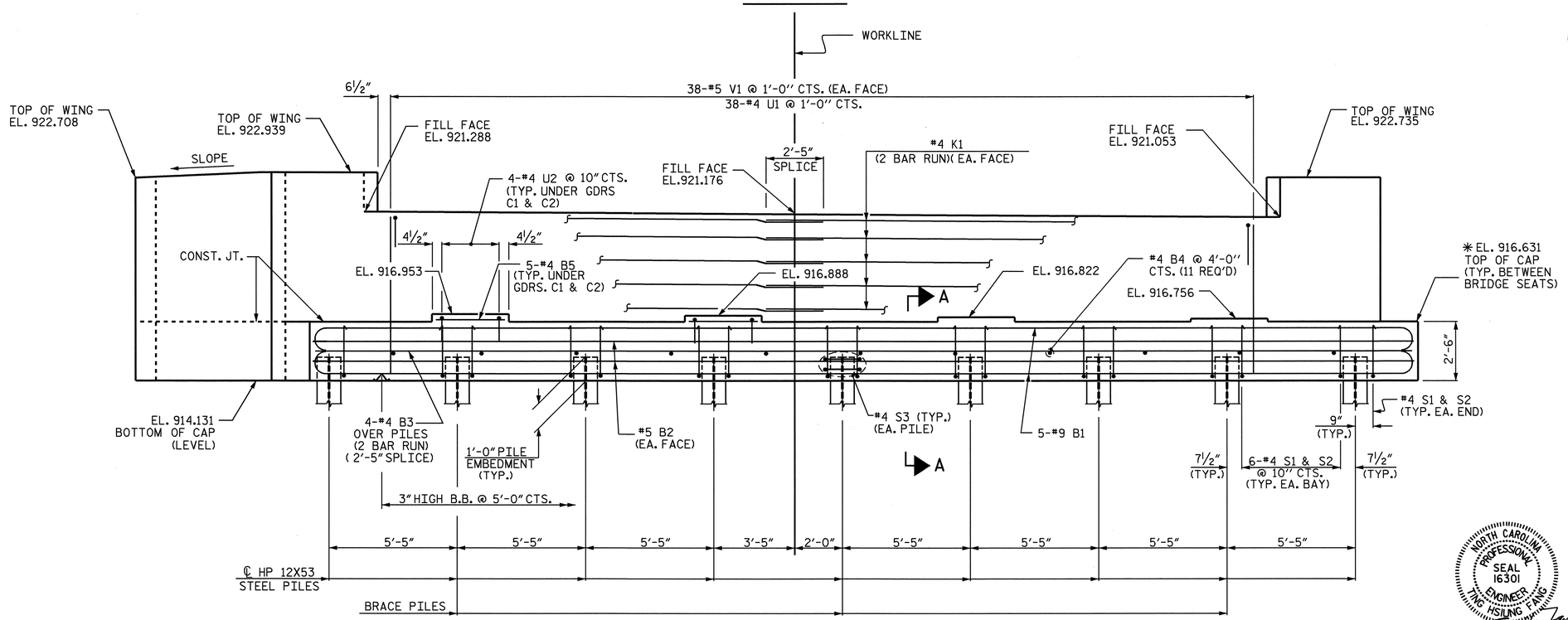


PLAN



ELEVATION

BRACE PILE IN LEFT WING WALL AND DETAILS OF RIGHT WING WALL NOT SHOWN FOR CLARITY.

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

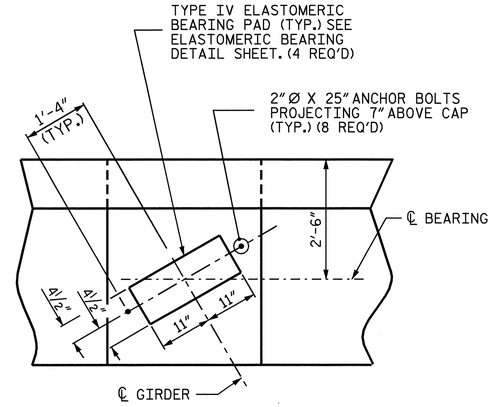
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

FOR TEMPORARY DRAINAGE DETAIL, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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



DETAIL A

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG
2/07/08

DRAWN BY : HARISH SHAH DATE : 02/07/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

07-FEB-2008 14:46
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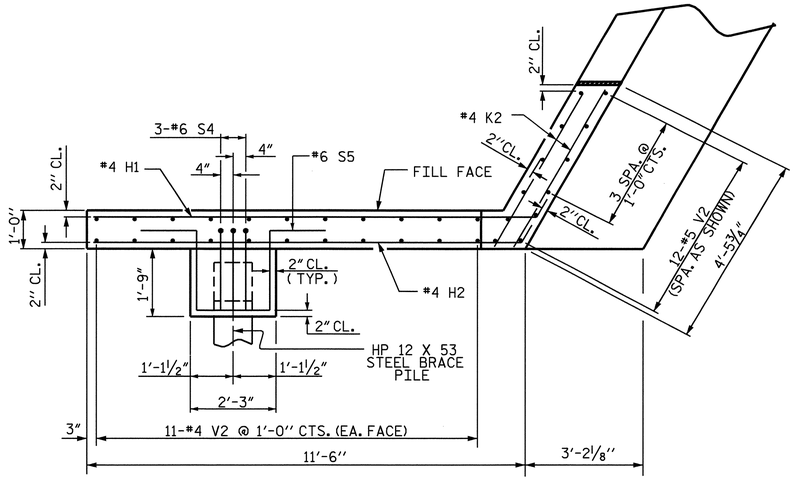
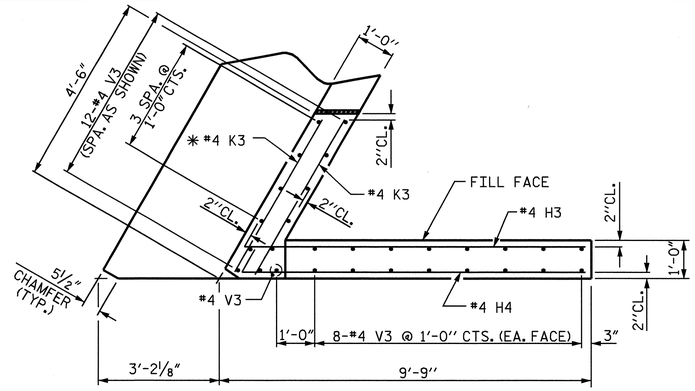
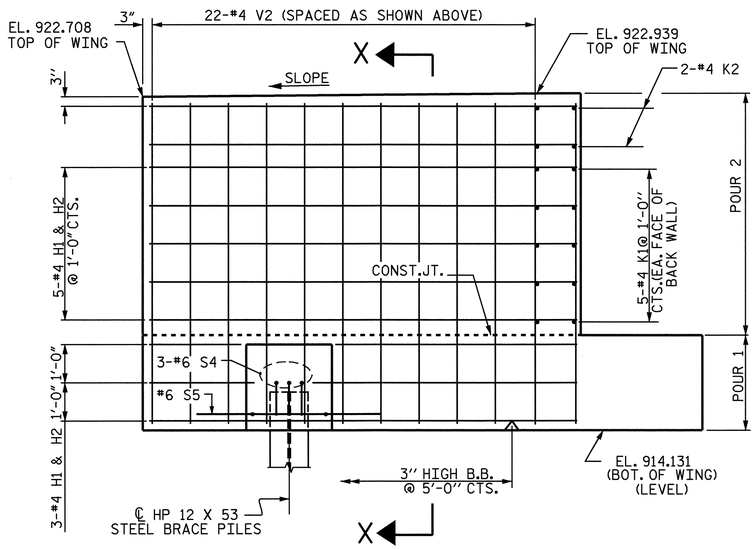


PLAN OF WING W1

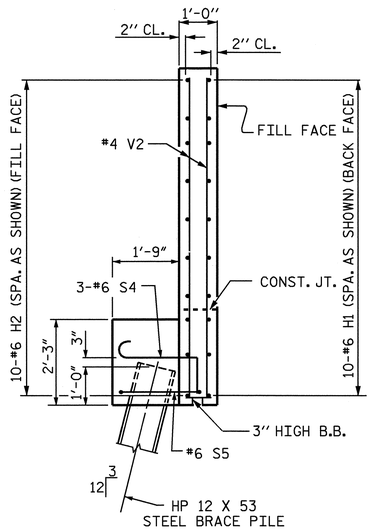


PLAN OF WING W2

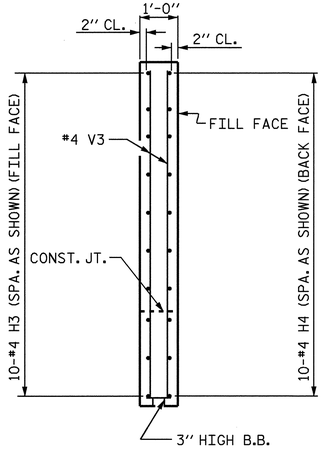
**#4 K3 FIELD CUT AS NECESSARY TO GIVE 2" MIN. CLEARANCE FROM CHAMFER.



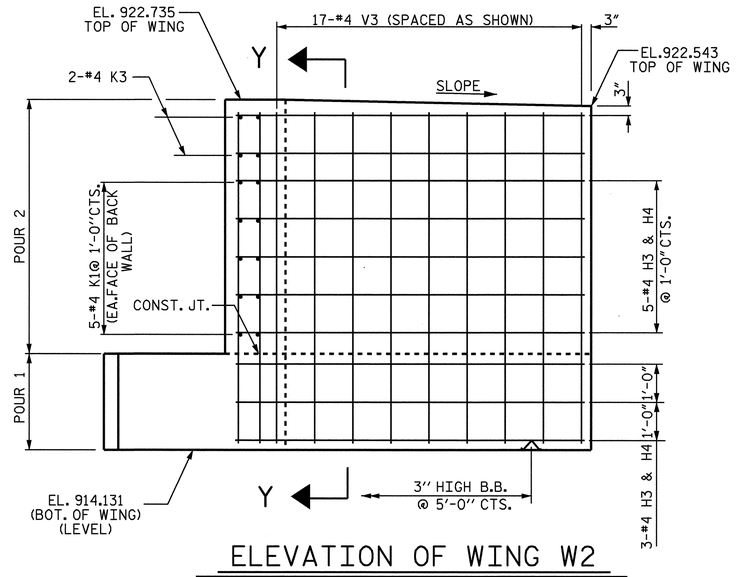
ELEVATION OF WING W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING W2

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
1/11/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : HARISH SHAH DATE : 02/12/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

11-JAN-2008 10:19
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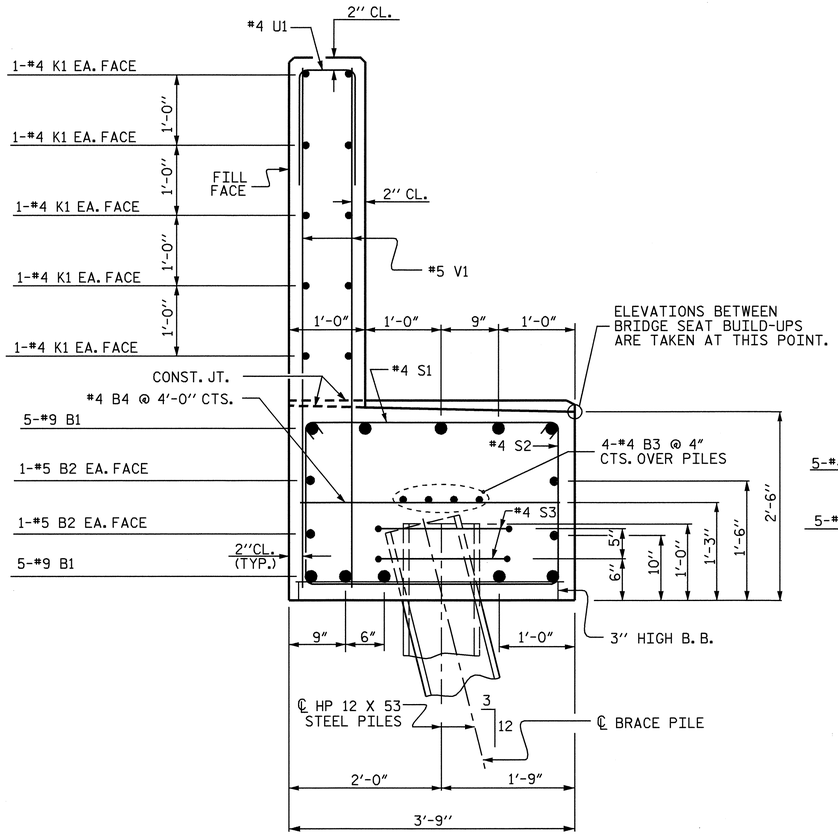
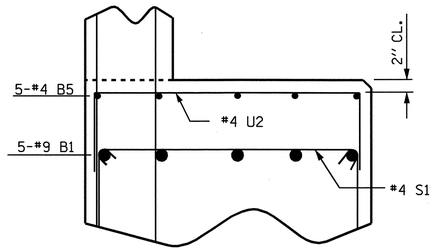
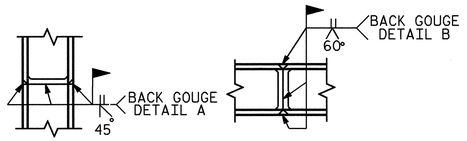


SECTION A-A

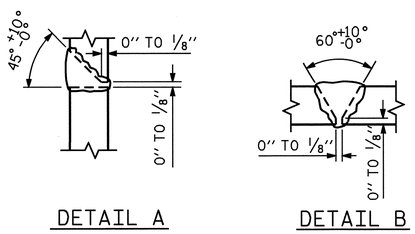


SECTION B-B



*PILE VERTICAL

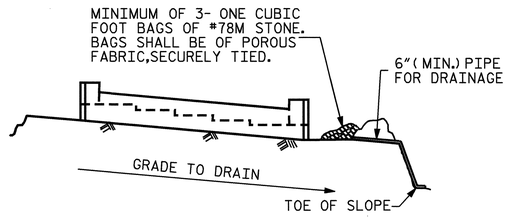
*PILE HORIZONTAL OR VERTICAL



DETAIL A DETAIL B

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



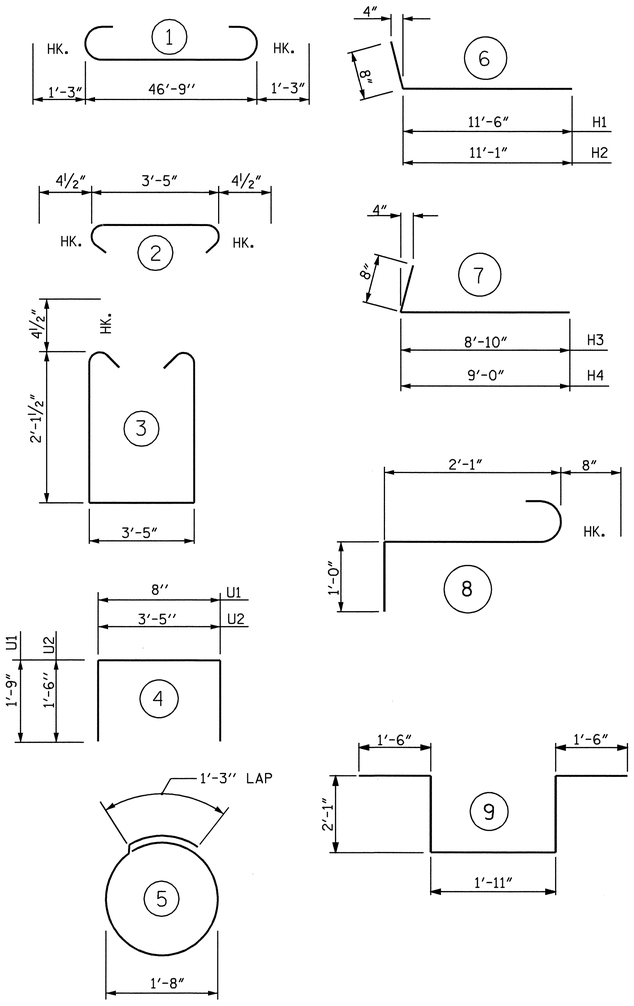
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
K1	#4	2'-5"
B3	#4	2'-5"

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	49'-3"	1675
B2	4	#5	STR	46'-9"	195
B3	8	#4	STR	24'-7"	131
B4	11	#4	STR	3'-5"	25
B5	10	#4	STR	2'-11"	19
H1	10	#4	6	12'-2"	81
H2	10	#4	6	11'-9"	78
H3	10	#4	7	9'-6"	63
H4	10	#4	7	9'-8"	65
K1	20	#4	STR	24'-7"	328
K2	4	#4	STR	4'-1"	11
K3	4	#4	STR	4'-2"	11
S1	50	#4	2	4'-2"	139
S2	50	#4	3	8'-5"	281
S3	18	#4	5	6'-6"	78
S4	3	#6	8	3'-9"	17
S5	1	#6	9	9'-1"	14
U1	38	#4	4	4'-2"	106
U2	8	#4	4	6'-5"	34
V1	76	#5	STR	6'-7"	522
V2	34	#4	STR	8'-5"	191
V3	29	#4	STR	8'-0"	156

REINFORCING STEEL = 4,220 LBS

CLASS A CONCRETE

POUR 1 (CAP & LOWER WINGS)	18.8 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	12.9 C.Y.
TOTAL	31.7 C.Y.

HP 12 X 53 STEEL PILES

NUMBER = 10 LIN. FT. = 150.0

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

Ting H. Fang 1/11/08

DRAWN BY : HARISH SHAH DATE : 02/14/07
CHECKED BY : Q.T. NGUYEN DATE : 08/07

11-JAN-2008 10:19
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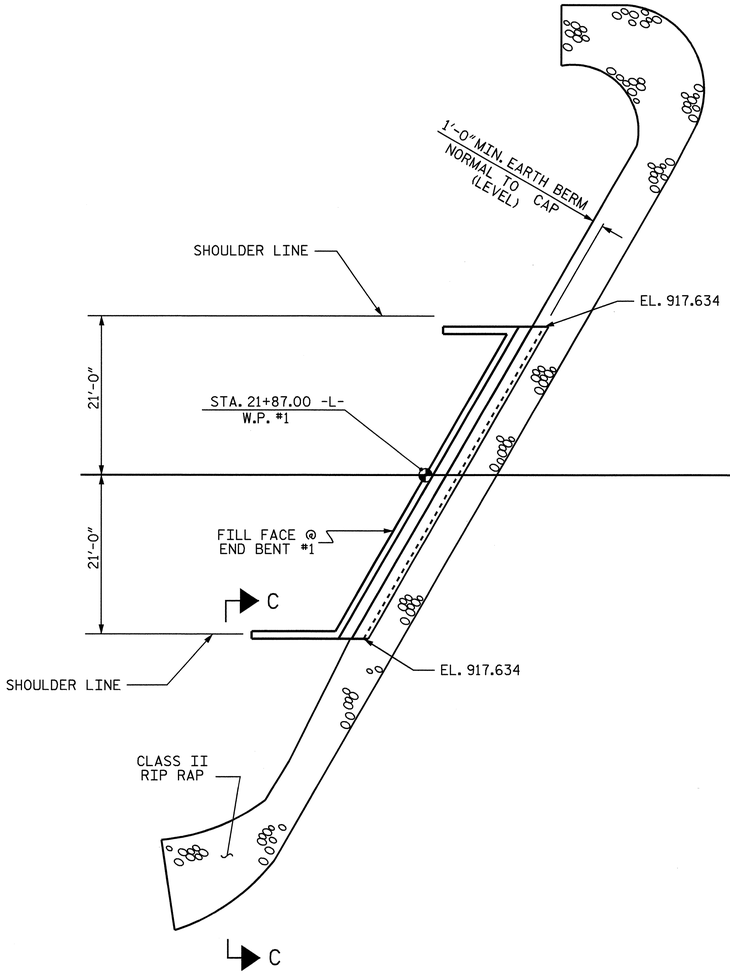
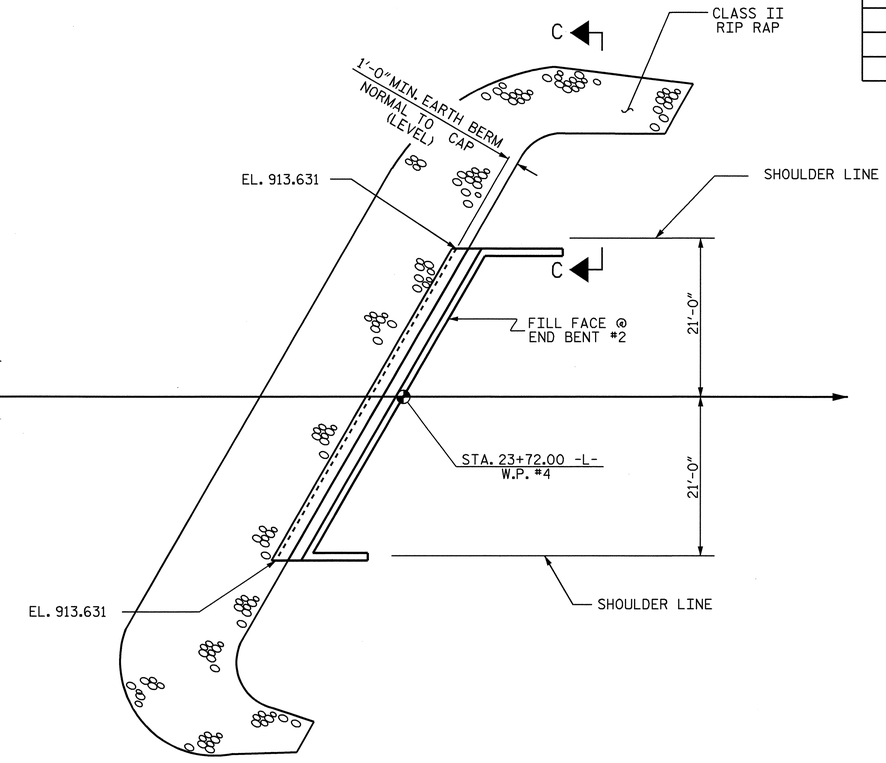
ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+79.50 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQ. YARDS
END BENT 1	120	135
END BENT 2	190	210
TOTAL	310	345

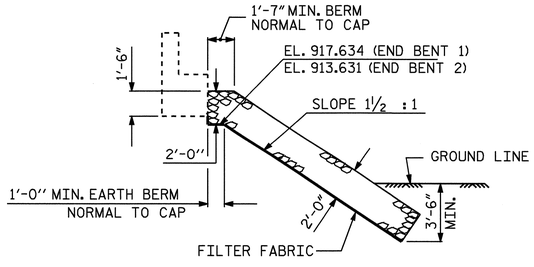


@ END BENT 1



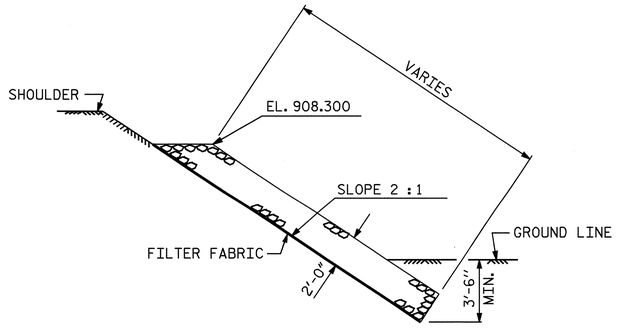
@ END BENT 2

PLAN



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSILING FANG

2/07/08

DRAWN BY : HARISH SHAH DATE : 09/07

CHECKED BY : T. H. FANG DATE : 11/07

07-FEB-2008 10:51
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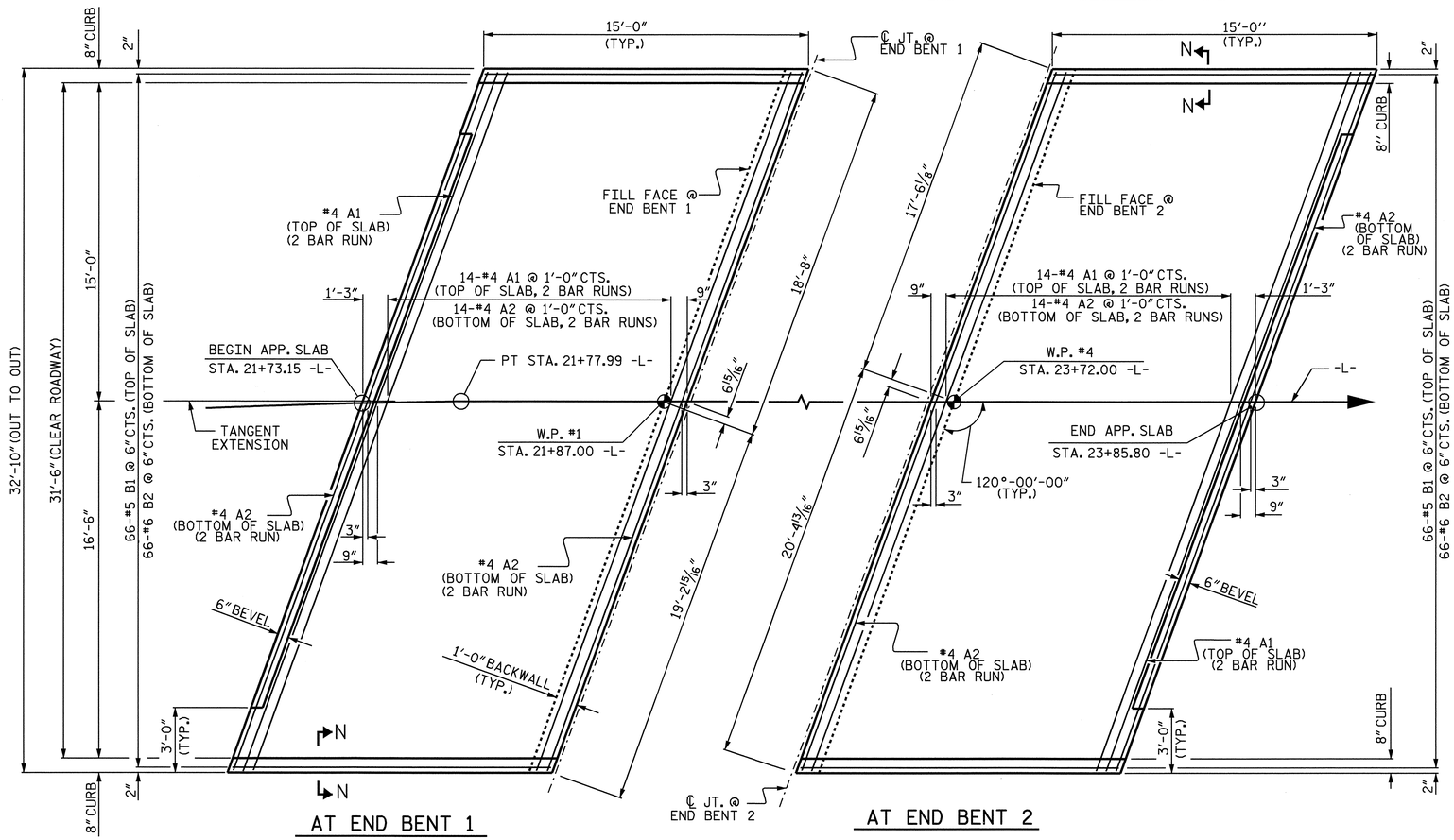
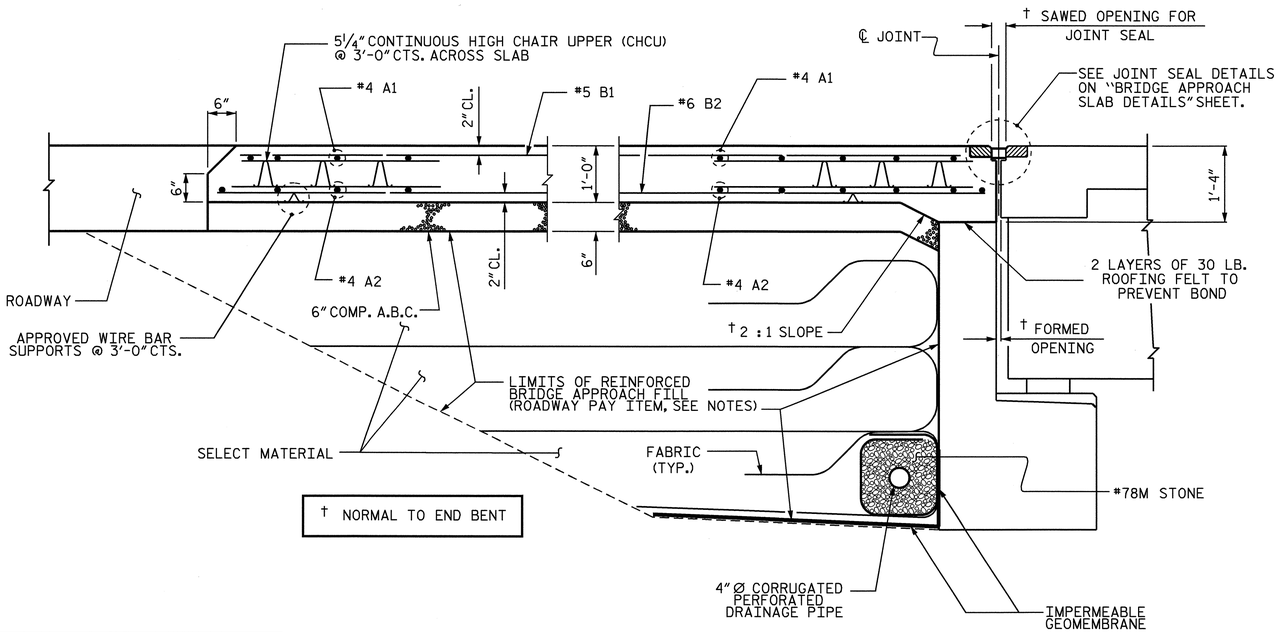
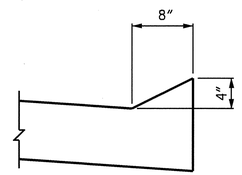
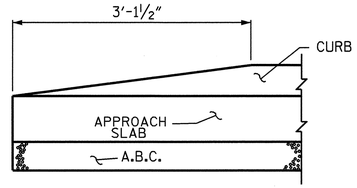




SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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 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.

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

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	30	#4	STR	19'-10"	397
A2	32	#4	STR	19'-8"	420
✱B1	66	#5	STR	13'-8"	941
B2	66	#6	STR	14'-8"	1454
REINFORCING STEEL				LBS.	1874
✱EPOXY COATED REINFORCING STEEL				LBS.	1338
CLASS AA CONCRETE				C. Y.	18.7

APPROACH SLAB @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	30	#4	STR	19'-10"	397
A2	32	#4	STR	19'-8"	420
✱B1	66	#5	STR	13'-8"	941
B2	66	#6	STR	14'-8"	1454
REINFORCING STEEL				LBS.	1874
✱EPOXY COATED REINFORCING STEEL				LBS.	1338
CLASS AA CONCRETE				C. Y.	18.7

SPLICE CHART	
#4 A1	2'-0"
#4 A2	1'-9"

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/07/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY : HARISH SHAH DATE : 07/07
CHECKED BY : T.H. FANG DATE : 11/07

DRAWN BY : EEM 3/95
CHECKED BY : VAP 3/95

REV. 7/10/01 LES/RDR
REV. 5/7/03R RWW/JTE
REV. 5/1/06 TLA/GM

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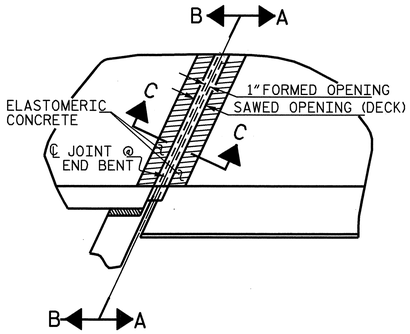
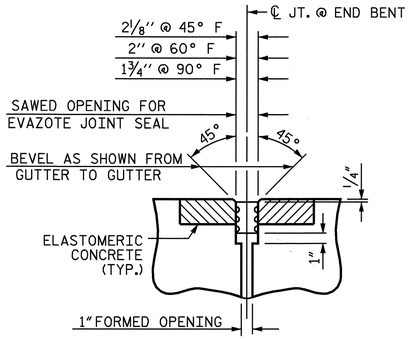
STD. NO. BAS4 (SHT 3)

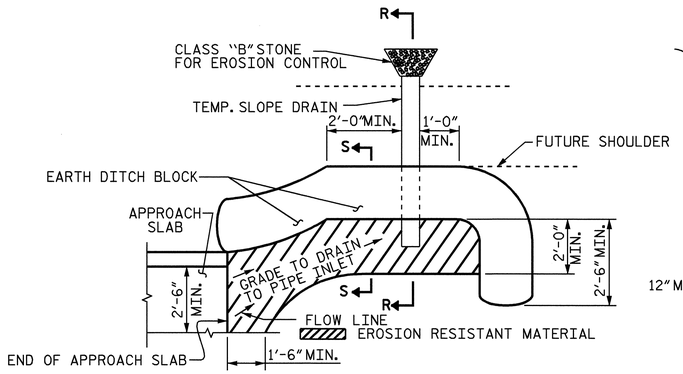


PLAN



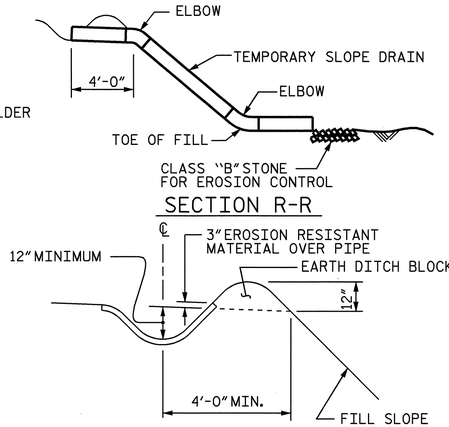
SECTION C-C

EVAZOTE JOINT SEAL @ END BENTS 1 & 2



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

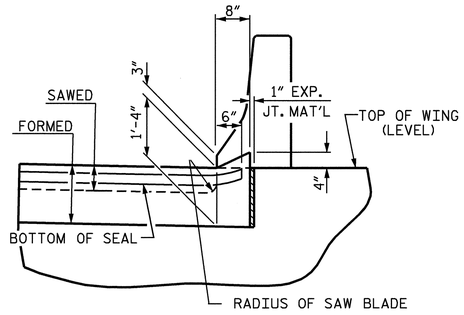


SECTION R-R

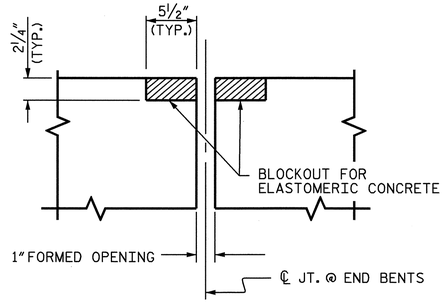
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER REQUIRED)

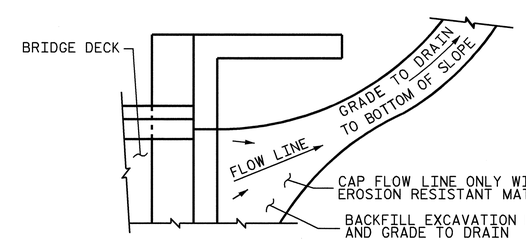


SECTION A-A



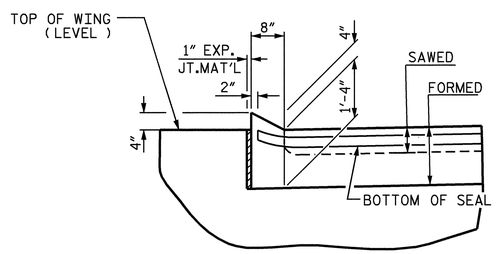
SECTION OF CONCRETE

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



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

TEMPORARY DRAINAGE DETAIL



SECTION B-B

JOINT SEAL DETAILS @ END BENTS

ELASTOMERIC CONCRETE	
END BENT NO.	(CU. FT.) *
1	6.3
2	6.3
TOTAL	12.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

4/11/08

PROJECT NO. B-4157

IREDELL COUNTY

STATION: 22+79.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY : H.B.SHAH		DATE : 07/07	
CHECKED BY : T.H. FANG		DATE : 11/07	
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES	
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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STD. NO. BAS10 (SHT 4)

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

1. RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
2. CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED R = 1.5. SLPB = R X W. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
3. WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
4. CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
5. CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
6. WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45 HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
7. CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
8. CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
9. CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
10. RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
11. SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON **UP TO 2'-0" OVERHANG** Ⓛ & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (In)	BRACKET Ⓚ DIMENSION (In)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	40					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	50					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
14	30					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	40					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	50					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
16	30					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	40					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	50					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000

TABLE 1-2 (FOR USE ON **OVER 2'-0" TO 2'-6" OVERHANG** Ⓛ & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (In)	BRACKET Ⓚ DIMENSION (In)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
14	30					2'-3"	2'-7"	3'-0"	4'-1"	4000	
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	40					2'-3"	2'-7"	3'-0"	4'-1"	4000	
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	50					2'-3"	2'-7"	3'-0"	4'-1"	4000	
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
16	30					2'-1"	2'-5"	2'-9"	3'-9"	4000	
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	40					2'-1"	2'-5"	2'-9"	3'-9"	4000	
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	50					2'-1"	2'-5"	2'-9"	3'-9"	4000	
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000

TABLE 1-3 (FOR USE ON **OVER 2'-6" TO 3'-0" OVERHANG** Ⓛ & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (In)	BRACKET Ⓚ DIMENSION (In)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
						4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
12	30						2'-2"	2'-7"	2'-11"	4'-0"	4000
						3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	40						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	50						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
14	30						2'-0"	2'-4"	2'-8"	3'-8"	4000
						3'-2"	3'-6"	3'-10"	4'-2"	5'-6"	6000
	40						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
	50						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
16	30							2'-1"	2'-5"	3'-4"	4000
					2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	40							2'-1"	2'-5"	3'-4"	4000
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	50							2'-1"	2'-5"	3'-4"	4000
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000

TABLE 1-4 (FOR USE ON **OVER 3'-0" TO 3'-6" OVERHANG** Ⓛ & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (In)	BRACKET Ⓚ DIMENSION (In)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30						2'-1"	2'-5"	2'-9"	3'-10"	4000
						2'-3"	2'-11"	3'-7"	4'-3"	5'-9"	6000
	40						2'-1"	2'-5"	2'-9"	3'-10"	4000
					2'-4"	3'-0"	3'-7"	4'-1"	4'-5"	5'-9"	6000
	50						2'-1"	2'-5"	2'-9"	3'-10"	4000
		2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
12	30							2'-2"	2'-6"	3'-5"	4000
						2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	40							2'-2"	2'-6"	3'-5"	4000
					2'-2"	2'-9"	3'-4"	3'-7"	3'-11"	4'-3"	6000
	50							2'-2"	2'-6"	3'-5"	4000
		2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
14	30							2'-3"	3'-1"	4000	
						2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	6000
	40							2'-3"	3'-1"	4000	
					2'-0"	2'-7"	3'-0"	3'-3"	3'-6"	4'-8"	6000
	50							2'-3"	3'-1"	4000	
				2'-2"	2'-5"	2'-8"	3'-0"	3'-3"	3'-6"	4'-8"	6000
16	30							2'-0"	2'-9"	4000	
							2'-4"	2'-10"	3'-5"	4'-3"	6000
	40							2'-0"	2'-9"	4000	
						2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	4'-3"	6000
	50							2'-0"	2'-9"	4000	
					2'-2"	2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	4'-3"	6000

DEFINITIONS

SLPB = SCREED LOAD PER BRACKET (R x W)
R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
W = WHEEL LOAD
S = BRACKET SPACING
T = AVERAGE SLAB THICKNESS
SWL = SAFE WORKING LOAD
K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO
Chang-Chuan Victor Chao
1-11-2008

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

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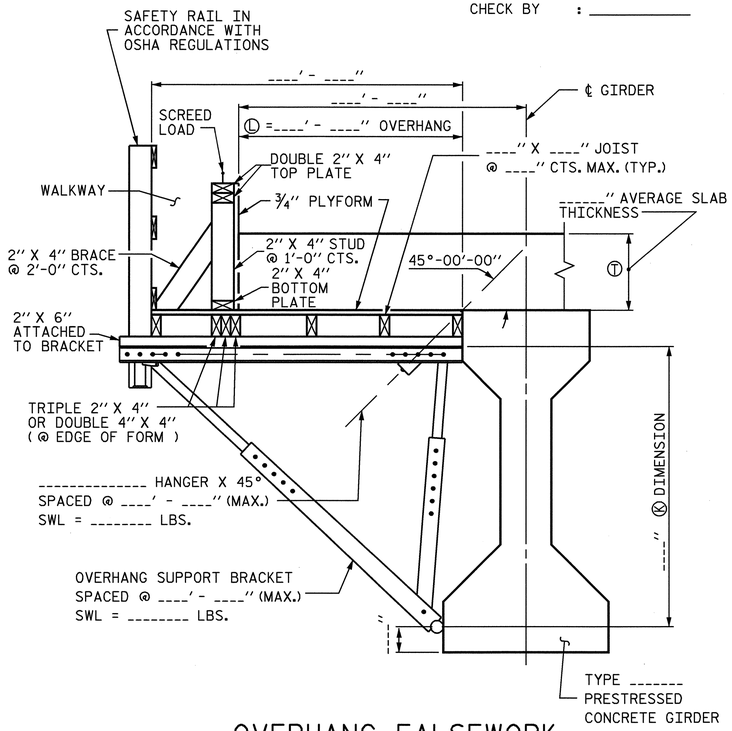
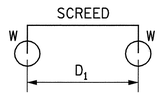
BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
NUMBER OF SCREED WHEELS = _____
SCREED WHEEL LOAD (W) = _____LBS.
SCREED LOAD PER BRACKET = _____ LBS.

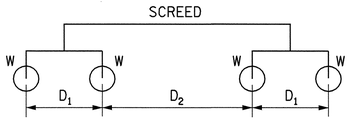
PROJECT No. : _____
COUNTY : _____
STATION : _____
DESCRIPTION : _____
DATE : _____
DESIGN BY : _____
CHECK BY : _____



OVERHANG FALSEWORK



4-WHEEL MACHINE



8-WHEEL MACHINE

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75

TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D_2																	
S/D_1		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
	2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67
	2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73
	2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79
	3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83
	3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93
	4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00

NOTES

DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS Ⓣ (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	———	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	———	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	———	4' - 0"	4' - 6"	5' - 0"
	4 X 4	———	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	———	4' - 0"	4' - 3"	4' - 9"
	4 X 4	———	5' - 3"	5' - 9"	6' - 3"

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
1-11-2008

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

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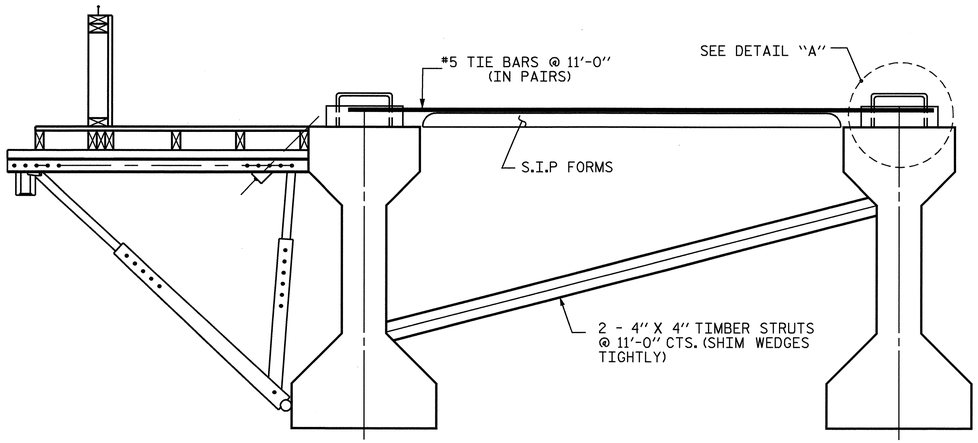
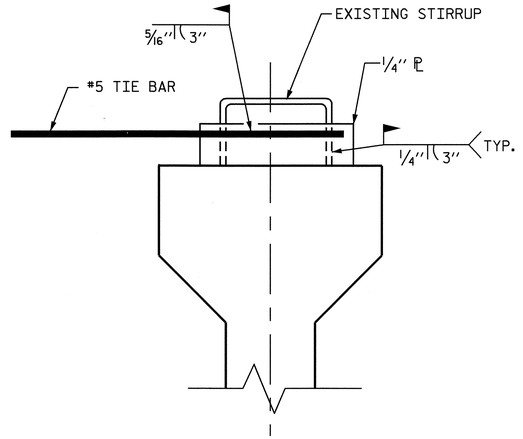


EXTERIOR GIRDER INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 11'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
1-11-2008

PROJECT NO. B-4157
IREDELL COUNTY
STATION: 22+79.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: R. WRIGHT 06/04 DATE : _____
CHECKED BY: C. V. CHAO 06/04 DATE : _____

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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