IOWA DOT

Highway Division

H30SI–12 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE STANDARDS

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STRUCTURAL RESISTANCE LEVEL-1 (SRL-1) REPLACES THE 50 TON STEEL PILE DESIGNATION.

STRUCTURAL RESISTANCE LEVEL-2 (SRL-2) REPLACES THE 75 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON STRUCTURAL RESISTANCE LEVELS (SRL-1 & SRL-2), SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATIONS, OFFICE OF BRIDGES AND STRUCTURES, WEBSITE.

REVISED 05-13 - THE GENERAL NOTES AND SPECIFICATIONS MOVED TO STANDARD SHEET H30-01A-06. SRL NOTATION ADDED.

05-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

INDEX SHEET | H30SI-01-12

EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS:

THE DESIGNER SHALL SHOW ON THE PLANS THE 5 ELEVATIONS AND THE 4 STEP DIMENSIONS REQUIRED FOR THE ABUTMENT BRIDGE SEATS.

THE BOXED IN DETAILS IN THE FOLLOWING EXAMPLES SHOW HOW THE INFORMATION SHOULD BE INDICATED ON THE PLANS.

EXAMPLE NO. 1
A STRAIGHT GRADE OF -3.25% WITH THE P.I. STATION OF 103+75.00 AND ELEVATION OF 653.29. THE BRIDGE LENGTH IS 80'-0 ℄ TO ℄ OF ABUTMENT BEARINGS WITH 30° SKEW RIGHT AHEAD.

STATIONS

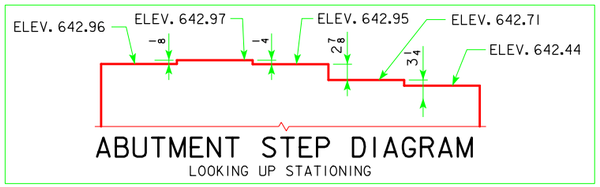
℄ BRIDGE STA.	=	105+85.00	
℄ ½ OF SPAN LENGTH	±	40.00	
℄ ABUT. BRGS.	=	106+25.00	105+45.00

ELEVATIONS ALONG PROFILE GRADE LINE (P.G.L. ELEV.)
℄ ABUT. BRG. = 653.29-[(105+45.00)-(103+75.00)](0.0325) = 647.77
℄ ABUT. BRG. = 653.29-[(106+25.00)-(103+75.00)](0.0325) = 645.17

ELEVATIONS TOP OF SLAB FACING ALONG THE STATIONING
(BEAM SPACING)(TAN. SK.△)(GRADE) = (7.0)TAN 30°(0.0325) = 0.13'

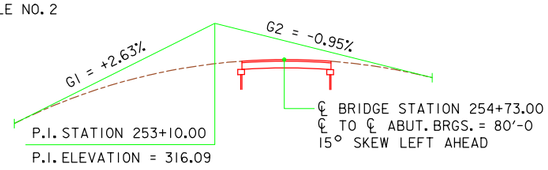
ABUTMENT NO. 1

BEAMS	EXTERIOR	INTERIOR	CENTER	INTERIOR	EXTERIOR
PGL ELEV.	647.77	647.77	647.77	647.77	647.77
SK. △CORRECT	+ 0.26	+ 0.13	0.00	- 0.13	- 0.26
SLAB CROWN	- 0.25	- 0.11	0.00	- 0.11	- 0.25
TOP SLAB ELEV.	647.78	647.79	647.77	647.53	647.26
-"U" (4'-9 7/8)	- 4.82	- 4.82	- 4.82	- 4.82	- 4.82
BR. SEAT ELEV.	642.96	642.97	642.95	642.71	642.44



ABUTMENT STEP DIAGRAM
LOOKING UP STATIONING

EXAMPLE NO. 2



FROM SHEET H30SI-1-12 { LENGTH OF VERTICAL CURVE = (20000)(0.0358) = 716 FEET
M.O. = (0.0358)(716)(1/8) = 3.204 FEET

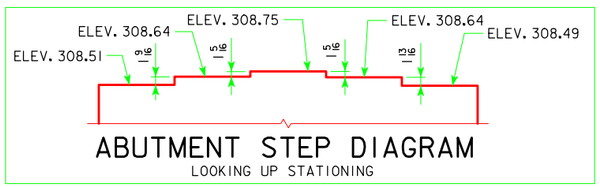
STATIONS

℄ BRIDGE STA.	=	254+73.00		P.I. STA.	253+10.00
℄ ½ OF SPAN LENGTH	±	40.00	±(½)(LENGTH V.C.)		3+58.00
℄ ABUT. BRGS.	=	255+13.00	254+33.00	P.C. STA.	249+52.00
				P.T. STA.	256+68.00

ELEVATIONS TOP OF SLAB FACING ALONG THE STATIONING
(BEAM SPACING)(TAN. SK.△) = (7.0)TAN 15° = 1.88'

ABUTMENT NO. 1

BEAMS	EXTERIOR	INTERIOR	CENTER	INTERIOR	EXTERIOR
STATION	254+36.75	254+34.88	254+33.00	254+31.12	254+29.25
PGL ELEV.	313.55	313.54	313.54	313.54	313.53
SLAB CROWN	- 0.25	- 0.11	0.00	- 0.11	- 0.25
TOP SLAB ELEV.	313.30	313.43	313.54	313.43	313.28
-"U" (4'-9 7/16)	- 4.79	- 4.79	- 4.79	- 4.79	- 4.79
BR. SEAT ELEV.	308.51	308.64	308.75	308.64	308.49



ABUTMENT STEP DIAGRAM
LOOKING UP STATIONING

GENERAL NOTES:

THE H30SI-12 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT SINGLE SPAN 30' ROADWAY PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES WITH LENGTHS OF 46'-8, 55'-0, 67'-6, 80'-0, 90'-0, 100'-0, AND 110'-0.

THESE BRIDGES MAY BE BUILT ON A 0°, 15° OR 30° SKEW. THESE PLANS SHOW THE BRIDGES SKEWED IN ONE DIRECTION, BUT ALL DIMENSIONS AND DETAILS WOULD BE THE SAME FOR THE OPPOSITE SKEW.

NOTE THAT WHEN APPROACH PAVEMENT IS TO BE PLACED, THE TEMPORARY PAVING BLOCKS SHALL BE REMOVED AND A PROPER JOINT FOR EXPANSION SHALL BE PROVIDED BETWEEN THE BRIDGE AND THE APPROACH PAVING.

THE ABUTMENTS FOR THESE STANDARDS HAVE BEEN DESIGNED FOR FRICTION OR POINT BEARING PILES. IT IS NECESSARY THAT THE LENGTH OF THE ABUTMENT PILES BE DESIGNATED ON THE FRONT SHEET OF THE PLANS.

THE INTEGRAL ABUTMENTS FOR THESE H30SI STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS AS FOLLOWS.

- INTEGRAL ABUTMENTS: TIMBER PILES (LIMITED BY BRIDGE LENGTH) OR HP10x57 PILES AT BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-1 (SRL-1)

STRUCTURAL RESISTANCE LEVEL-1 (SRL-1) REPLACES THE 50 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON SRL-1 AND SRL-2, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATION, OFFICE OF BRIDGES AND STRUCTURES WEB SITE.

THESE STANDARDS GIVE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES ON EITHER A CREST VERTICAL CURVE OR A STRAIGHT GRADE. BECAUSE OF THE INFINITE NUMBER OF GRADE POSSIBILITIES IT WILL BE NECESSARY TO SHOW ON THE PLANS THE ABUTMENT STEP DIMENSIONS. TO HELP IN OBTAINING THIS STEP INFORMATION SEE "EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS" ON THIS SHEET.

PROVIDE TOP OF SLAB ELEVATIONS AND WING ELEVATIONS A, B, AND C AS NOTED ON THE STANDARD SHEETS (LONGITUDINAL SECTION).

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a) IS 5/8 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

BECAUSE THESE BRIDGE STANDARDS HAVE BEEN REVISED FOR LRFD BASED ON 2012-COMPLETED IOWA STATE UNIVERSITY RESEARCH, FOR PILE FOUNDATIONS THE DESIGNER WILL NEED TO DETERMINE THE CONSTRUCTION CONTROL METHOD, CONTRACT LENGTH, AND DRIVING TARGET AND GIVE THAT INFORMATION ON THE FRONT SHEET OF THE PLANS. BRIDGE DESIGN MANUAL CADD NOTES E177, E718, E719, E818, AND E819 ARE APPROPRIATE FOR THAT PURPOSE. THE NOTES, AS WELL AS THE BRIDGE DESIGN MANUAL AND DESIGN EXAMPLES, ARE AVAILABLE ON THE OFFICE OF BRIDGES AND STRUCTURES WEB SITE: HTTP://WWW.IOWADOT.GOV/BRIDGE/INDEX.HTM.

THESE STANDARDS CAN BE USED FOR BRIDGES WITH OR WITHOUT EPOXY COATED REINFORCING. REINFORCING BAR LAP LENGTHS ARE BASED ON THE USE OF EPOXY COATED REINFORCING, BUT NEED NOT BE MODIFIED IF NON-COATED BARS ARE TO BE USED. THE DESIGNER SHALL SPECIFY THE APPROPRIATE BID ITEM NO. FOR THE EPOXY COATED OR NON-EPOXY COATED REINFORCING.

IT IS RECOMMENDED THAT THE EPOXY COATED REINFORCING OPTION BE USED IF IT IS ANTICIPATED THAT THE BRIDGE DECK AND/OR THE BRIDGE APPROACHES WILL BE CHEMICALLY TREATED FOR THE REMOVAL OF ICE OR SNOW.

IF EPOXY COATED BARS ARE USED IN THE DECK, THEN ALL BARS USED IN THE ABUTMENT (FOOTING AND BACKWALL) AND BARRIER RAILS SHALL BE EPOXY COATED.

CONCRETE INTERMEDIATE DIAPHRAGMS SHALL BE USED FOR OVERPASS BRIDGES. THE DESIGNER SHALL ADJUST THE CONCRETE AND REINFORCING QUANTITIES ACCORDINGLY.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 5th Ed, SERIES OF 2010.
REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI.
FOR 30' STANDARD PRESTRESSED CONCRETE BEAMS, SEE SHEETS H30SI-21-12, H30SI-23-12, H30SI-25-12, AND H30SI-27-12.

SPECIFICATIONS:

DESIGN:
AASHTO, SERIES OF 2010.

CONSTRUCTION:
IOWA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

05-13
LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

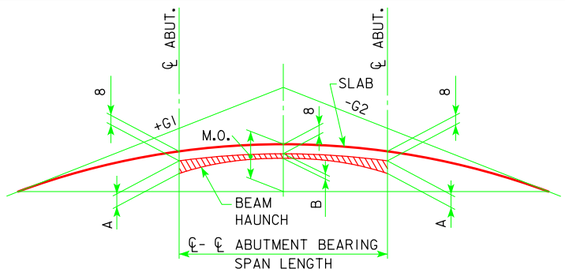
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

GENERAL NOTES & GENERAL INFORMATION

H30SI-01A-12

REVISED 05-13 - THIS STANDARD RENAMED TO H30SI-01A-12. INDEX SHEET INFORMATION ON STANDARD H30SI-01-12.

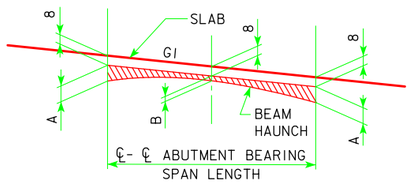


SPAN / THICKNESS	46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
A	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$1\frac{7}{16}$	$1\frac{3}{16}$	$1\frac{11}{16}$	$2\frac{5}{16}$
B	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

LENGTH OF VERTICAL CURVE REQUIRED = (20,000)(G1-G2)
M.O. = $\frac{(G1-G2)(\text{LENGTH OF V.C.})}{8}$

(G1-G2) IS THE ALGEBRAIC DIFFERENCE OF THE APPROACH GRADES EXPRESSED IN DECIMAL FORM. G1 NEED NOT HAVE THE SAME VALUE AS G2. MAXIMUM VALUE OF G1 OR G2 IS 5%. LENGTH OF CURVE AND M.O. ARE IN FEET.

SLAB AND HAUNCH THICKNESS AT BEAMS FOR VERTICAL CURVE



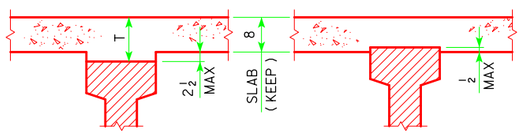
LENGTH OF S3 x 7.5
(ABUTMENT BEAM SEAT)

BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1′-5	$1'-3\frac{1}{2}$
1′-8	$1'-6\frac{1}{2}$
1′-10	$1'-8\frac{1}{2}$

SPAN / THICKNESS	46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
A	$1\frac{5}{16}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$1\frac{15}{16}$	$1\frac{13}{16}$	$2\frac{7}{16}$	$3\frac{1}{4}$
B	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

G1 MAY HAVE A + OR - SIGN. THE MINIMUM NUMERICAL VALUE OF THE GRADE IS 0.3% AND THE MAXIMUM VALUE IS 8%.

SLAB AND HAUNCH THICKNESS AT BEAMS FOR STRAIGHT GRADE

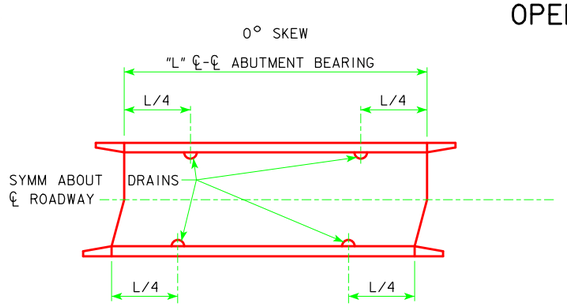


SLAB THICKNESS DETAIL

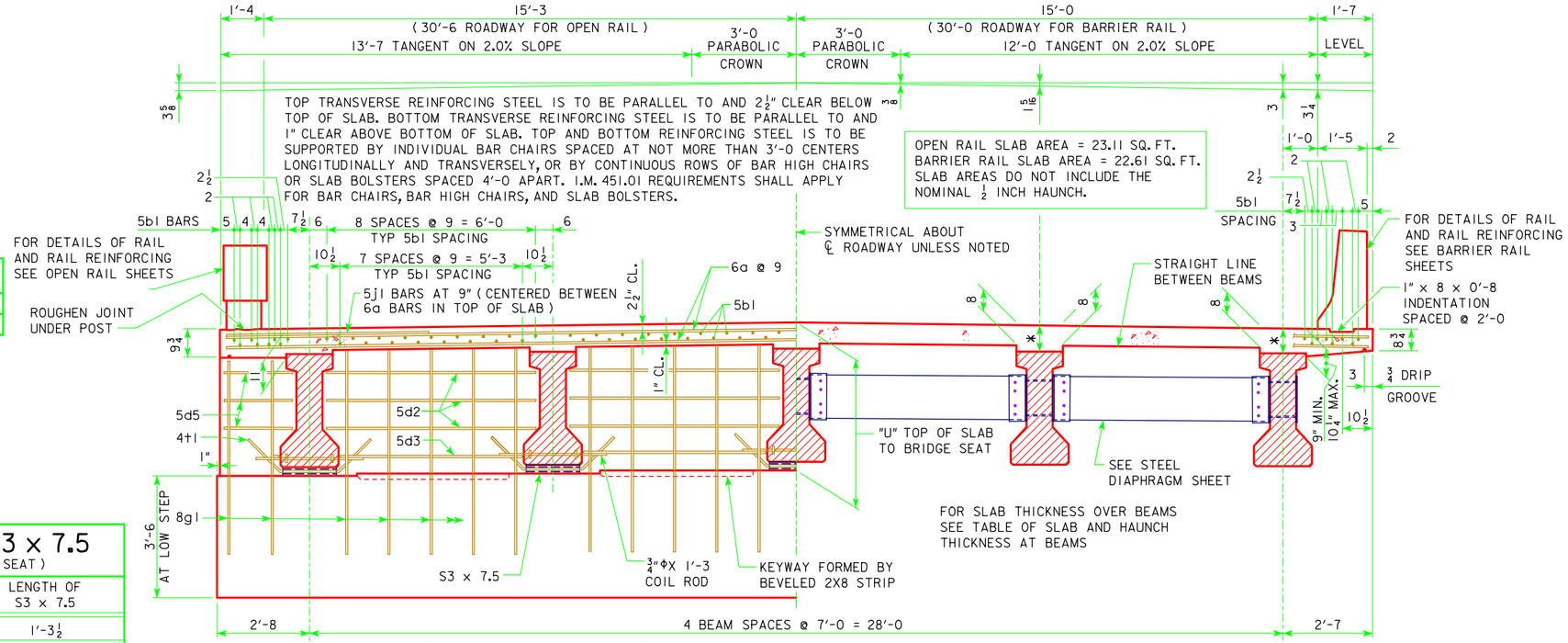
NOTE:
THE SLAB THICKNESS T AT THE BEAMS, (8" SLAB PLUS HAUNCH), IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED INCREASE THE HAUNCH THICKNESS OVER THE BEAM AT THE MIDPOINT OF THE SPANS (POINT B). IF THE BEAM IS OVER CAMBERED DECREASE THE HAUNCH THICKNESS OVER THE BEAM AT THE MIDPOINT OF THE SPANS (POINT B) TO A MAXIMUM OF $\frac{1}{2}$" EMBEDMENT IN THE SLAB. IF MORE THAN $\frac{1}{2}$" EMBEDMENT IS REQUIRED OR IF THE HAUNCH EXCEEDS $2\frac{1}{2}$", THE GRADE LINE IS TO BE REVISED.

CONCRETE SEALER SHALL BE APPLIED TO BOTH SIDES OF BRIDGE SLAB ON THE TOP, EDGE OF SLAB AND UNDER THE SLAB. THE CONCRETE SEALER SHALL ALSO BE APPLIED TO THE OPEN RAIL ON THE TOP, TRAFFIC FACE SIDE, BOTTOM OF RAIL, AND ON ALL SIDES OF THE OPEN RAIL POSTS.

THE CONCRETE SEALER LIMITS ARE SHOWN IN THE DETAIL AND SHALL APPLY TO THE FULL LENGTH OF BRIDGE. CONCRETE SEALER SHALL BE APPLIED IN ACCORDANCE WITH ARTICLE 2403.03, P, 3, OF THE STANDARD SPECIFICATIONS.

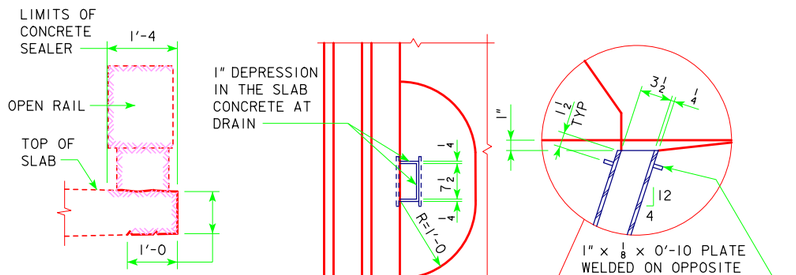


SITUATION SKETCH

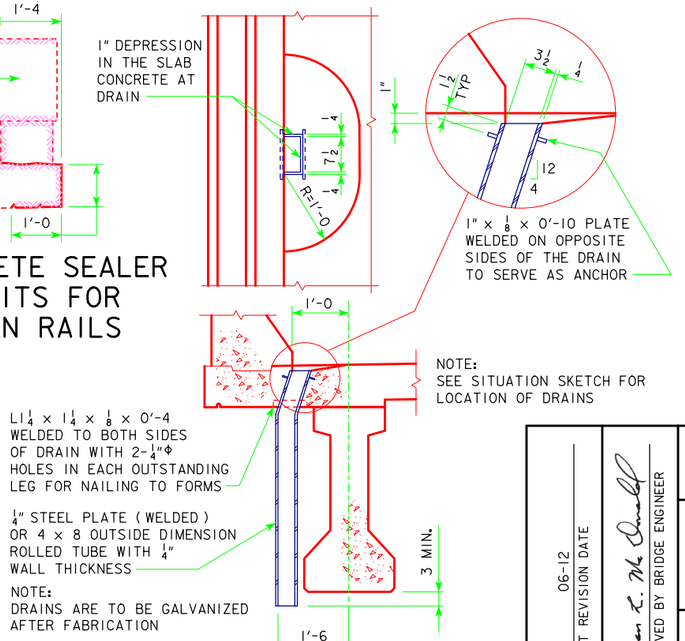


HALF SECTION NEAR ABUTMENT
(OPEN RAIL SHOWN)

HALF SECTION NEAR MID SPAN
(BARRIER RAIL SHOWN)



CONCRETE SEALER LIMITS FOR OPEN RAILS



DRAIN DETAILS
(USE FOR BARRIER RAIL ONLY, NOT REQUIRED FOR OPEN RAIL)

GENERAL NOTES:

THESE BRIDGES ARE DESIGNED FOR HL-93 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.

SLAB THICKNESS INCLUDES ½" INTEGRAL WEARING SURFACE.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

ALL PRESTRESSED BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE SLAB AND RAILS ARE TO BE SUPPORTED BY THE PRESTRESSED BEAMS.

COST OF DRAINS IS TO BE INCLUDED IN PRICE BID FOR STRUCTURAL STEEL.

THE ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHIC WITH THE FLOOR SLAB.

ALL REINFORCING STEEL IS TO BE GRADE 60.

COST OF BEARING MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR PRETENSIONED, PRESTRESSED CONCRETE BEAM.

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE. CONCRETE SEALER AREA CHANGED AND SEALER NOTES WERE CHANGED.

06-12
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

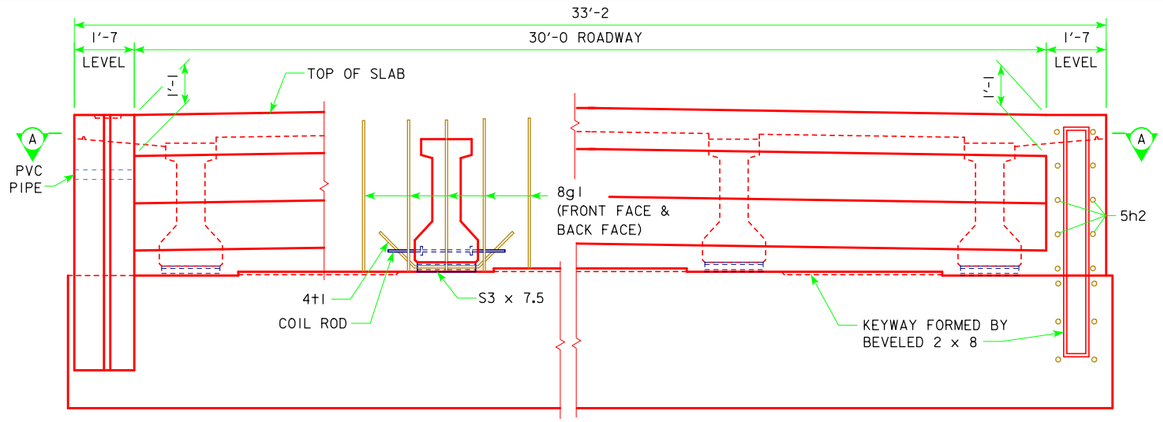
IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

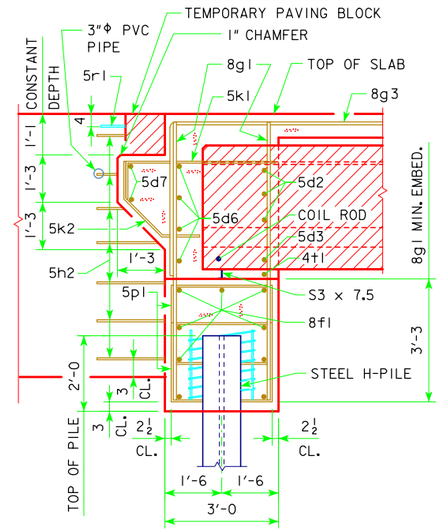
APRIL, 2012

SUPERSTRUCTURE DETAILS | H30SI-02-12



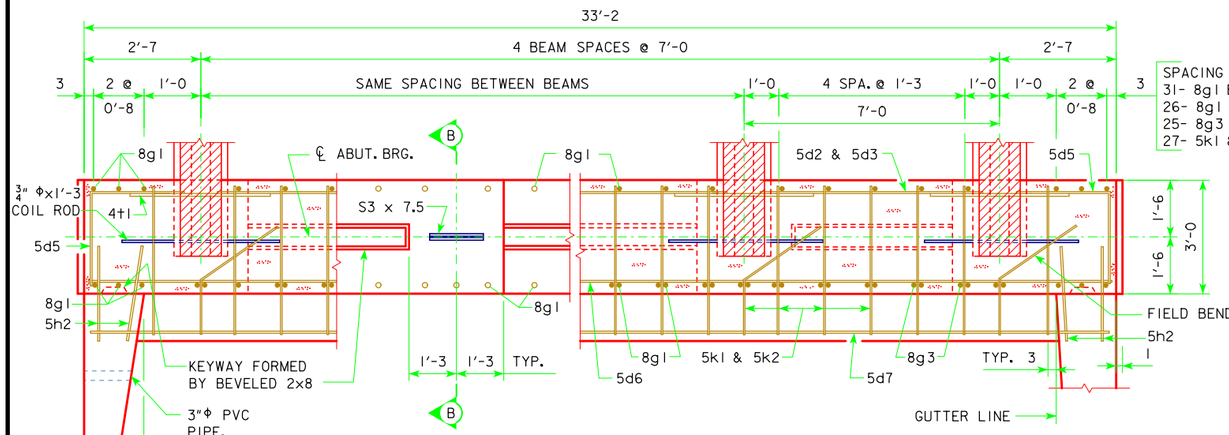
PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)



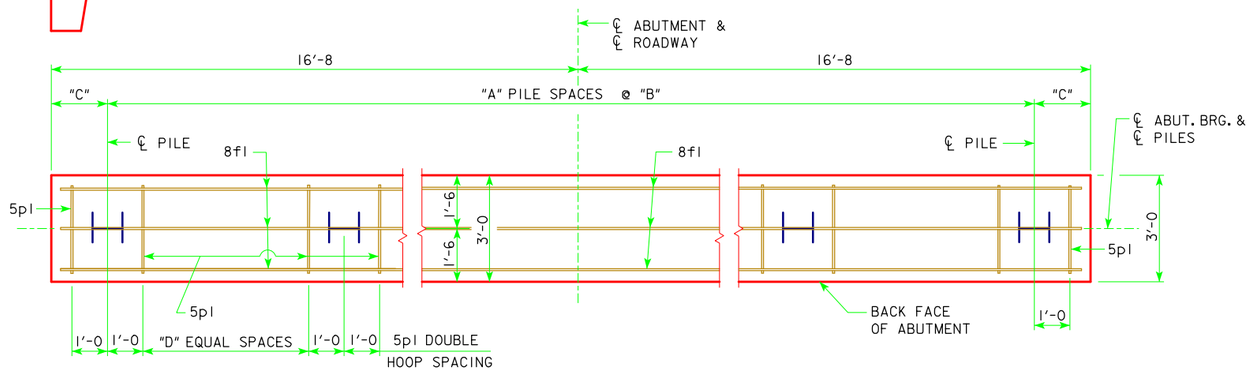
PART SECTION B-B

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF NO. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



PART SECTION A-A

NOTE:
PLACE 5h2 BARS AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE (BOTH SIDES TYPICAL).



ABUTMENT PILE PLAN

ABUTMENT PILE SPACING

DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING		
	46'-8	55'-0	67'-6
"A" PILE SPACES	4	4	5
"B" (FT. - IN.)	7'-6	7'-6	6'-0
"C" (FT. - IN.)	1'-8	1'-8	1'-8
"D" EQUAL SPACES	6	6	4
NO. OF PILES PER ABUT.	5	5	6
PU, STRENGTH I DESIGN LOAD (KIPS)	129	139	133

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

05-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

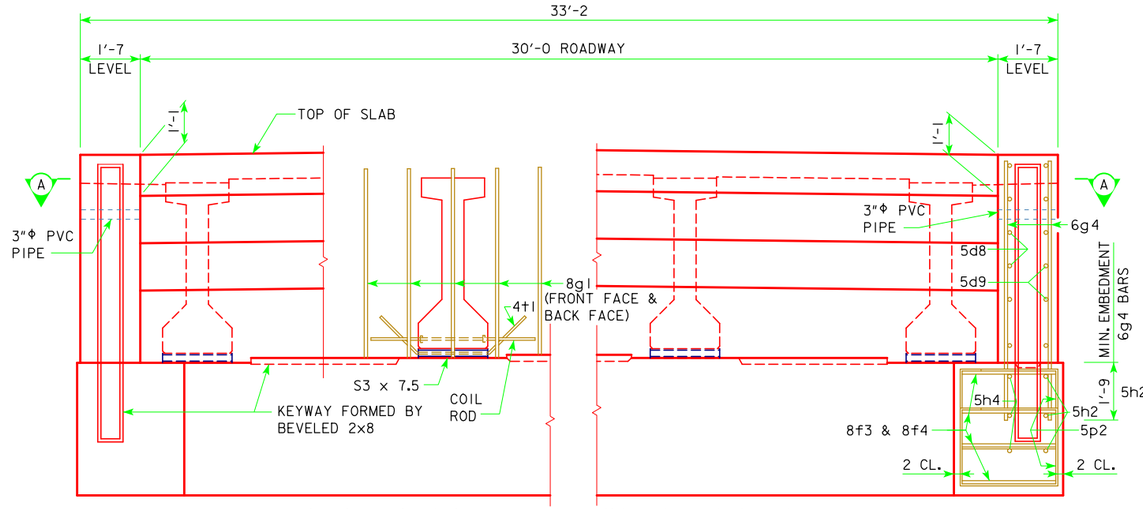
APRIL, 2012

ABUTMENT DETAILS

0° SKEW A & B BEAMS

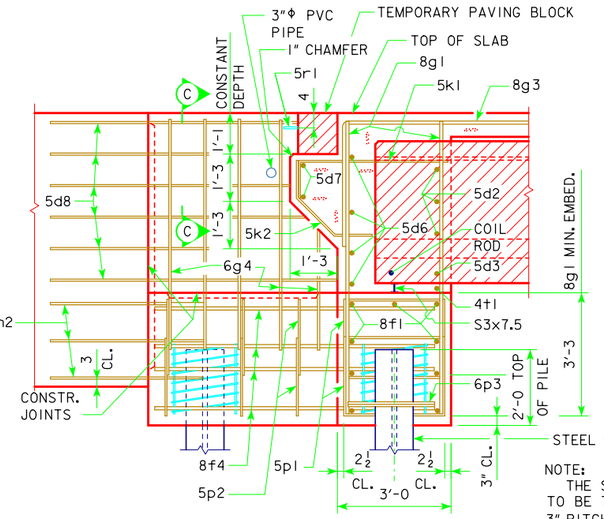
H30S1-03-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.



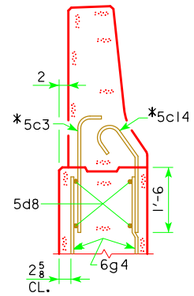
PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL AND WINGS NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)



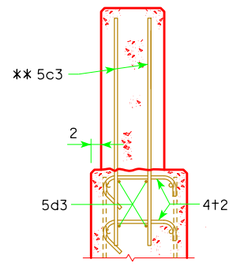
PART SECTION B-B

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - $L\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRAL.



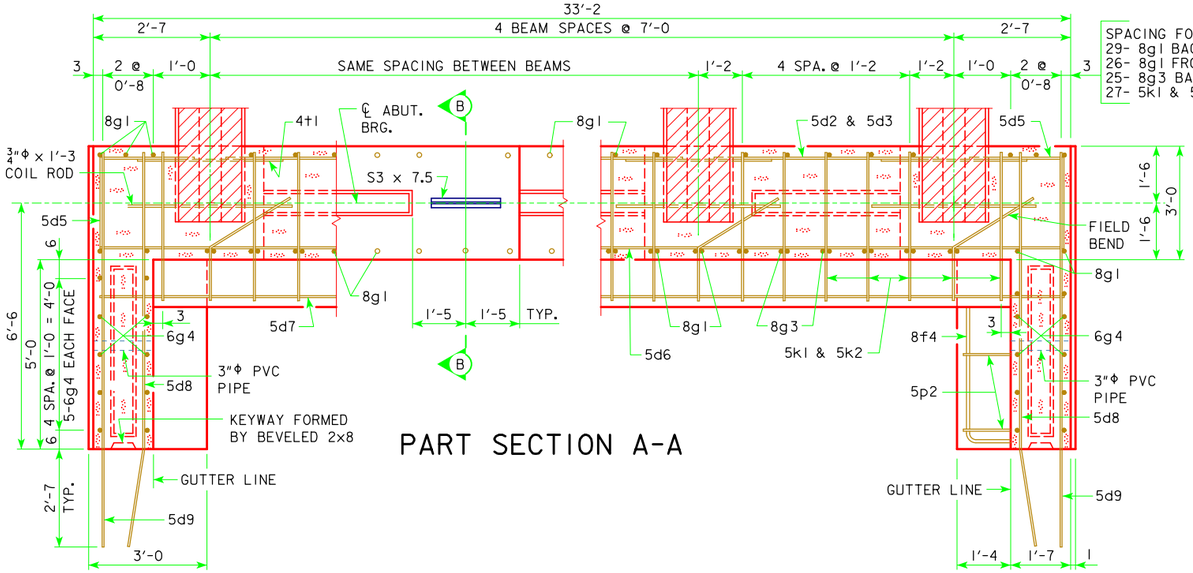
PART SECTION C-C

* NOTE: SEE BARRIER RAIL SHEET FOR DETAILS.
REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.

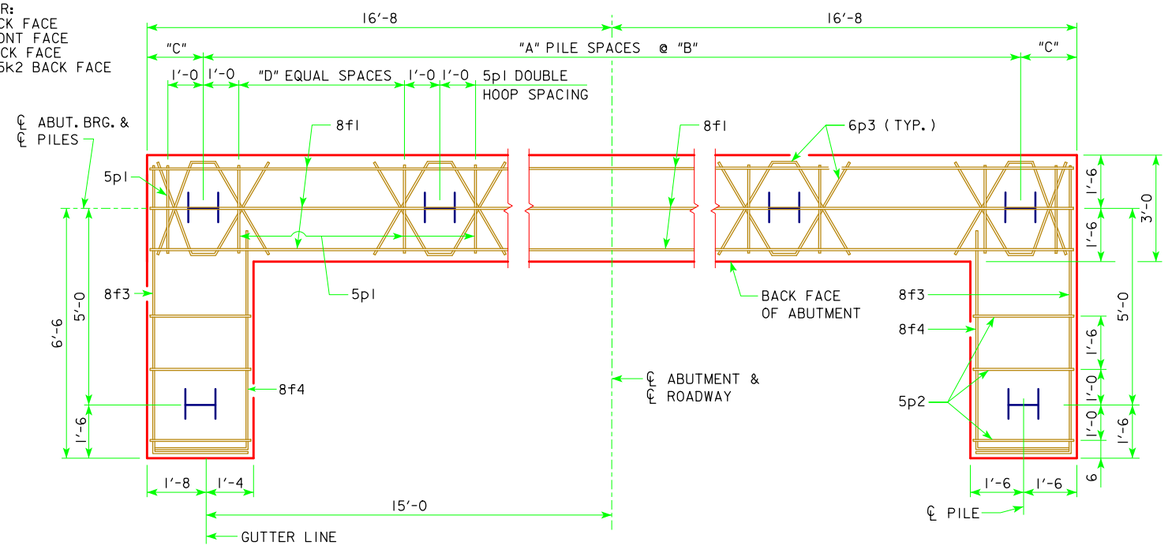


PART SECTION C-C

** NOTE: SEE OPEN RAIL SHEET H30SI-34-12 FOR DETAILS.
REINFORCING BARS 5c3 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING			
	80'-0	90'-0	100'-0	110'-0
"A" PILE SPACES	6	7	8	8
"B" (FT. - IN.)	5'-0	4'-4	3'-9	3'-9
"C" (FT - IN.)	1'-8	1'-6	1'-8	1'-8
"D" EQUAL SPACES	3	3	2	2
NO. OF PILES PER ABUT.	9	10	11	11
Pu, STRENGTH I DESIGN LOAD (KIPS)	137	133	126	133

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

05-13
LATEST REVISION DATE

Marcia K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

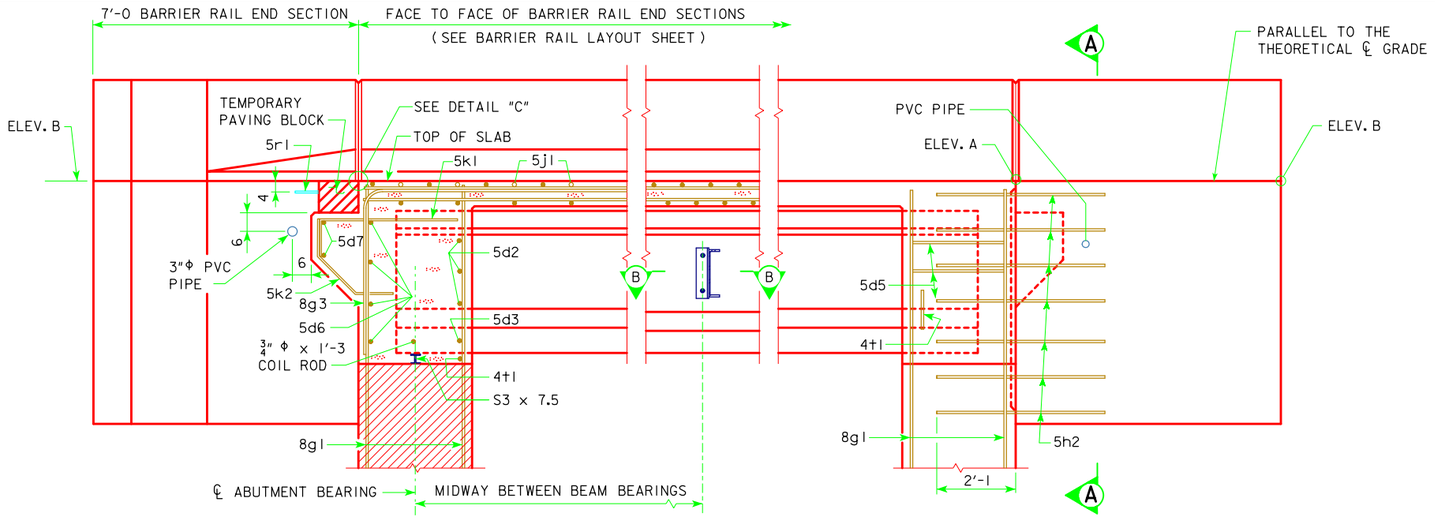
APRIL, 2012

ABUTMENT DETAILS

0° SKEW C & D BEAMS

H30SI-04-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.



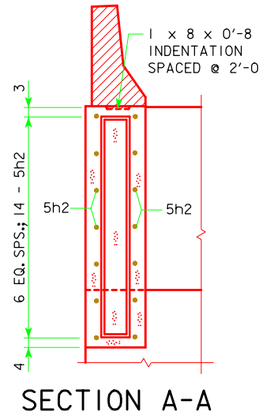
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

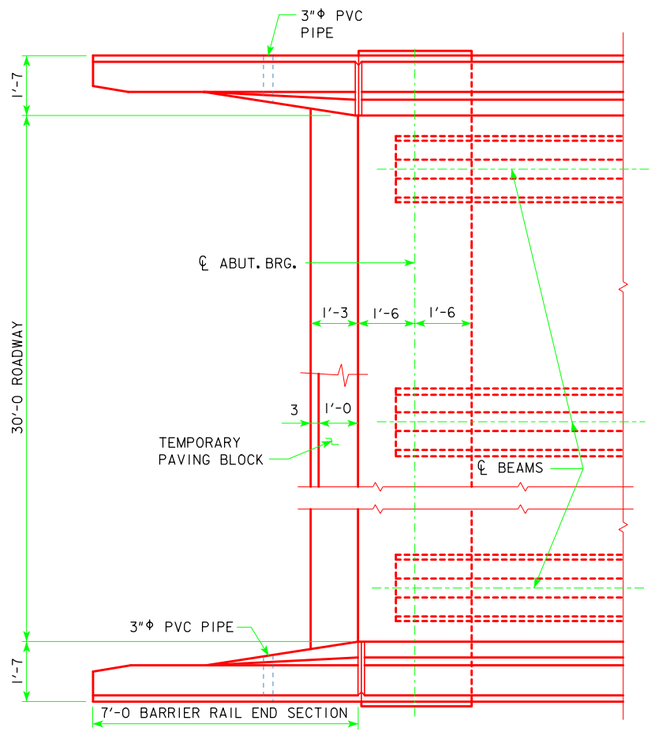
NOTE: PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BENIND ABUTMENTS.

PART END VIEW AT ABUTMENT

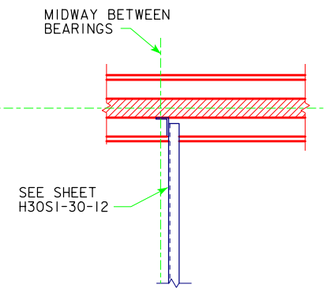
PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.



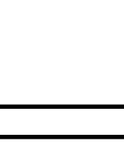
SECTION A-A



PART PLAN

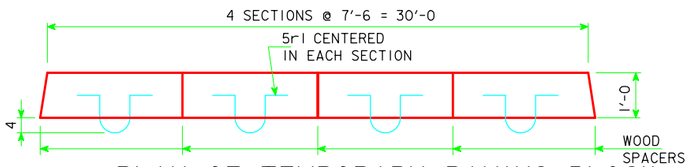


SECTION B-B



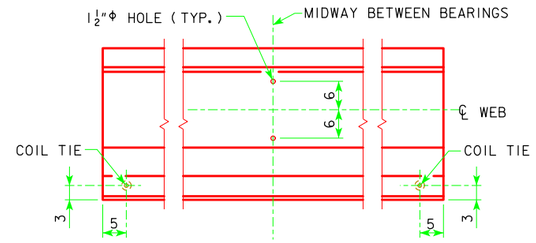
DETAIL "C"

(PAVING BLOCK NOT SHOWN)



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

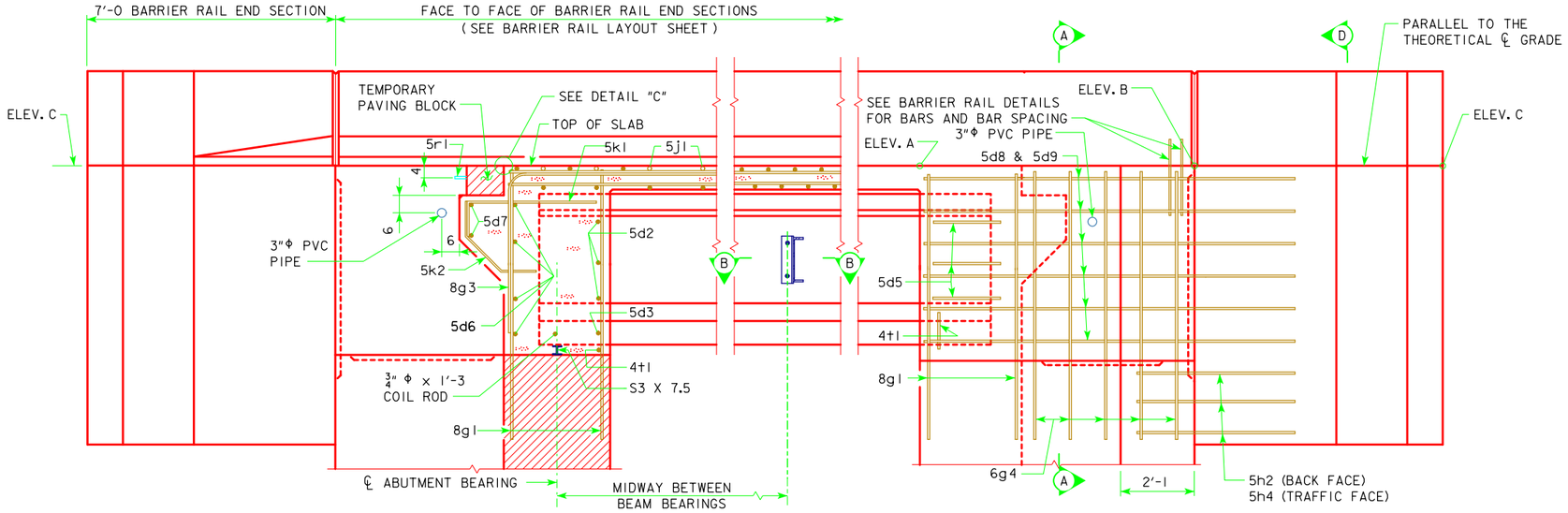
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

0° SKEW A & B BEAMS

H30SI-05-12

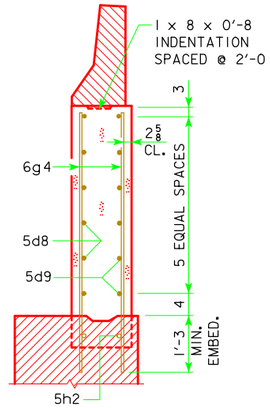


PART LONGITUDINAL SECTION NEAR GUTTER

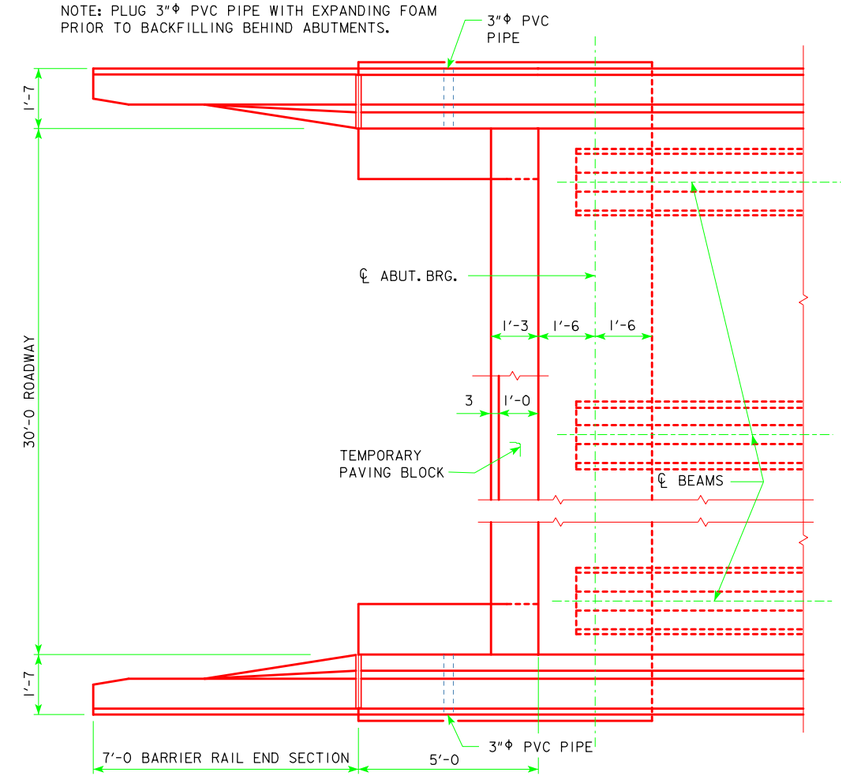
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

PART END VIEW AT ABUTMENT

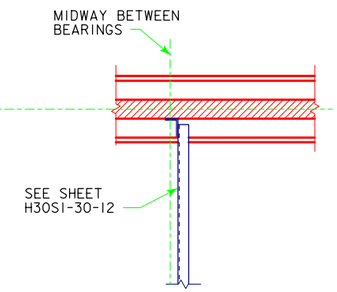
PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.



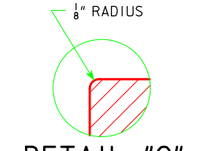
SECTION A-A



PART PLAN

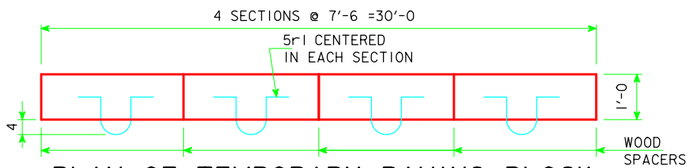


SECTION B-B



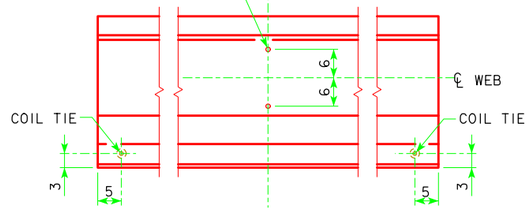
DETAIL "C"

(PAVING BLOCK NOT SHOWN)



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

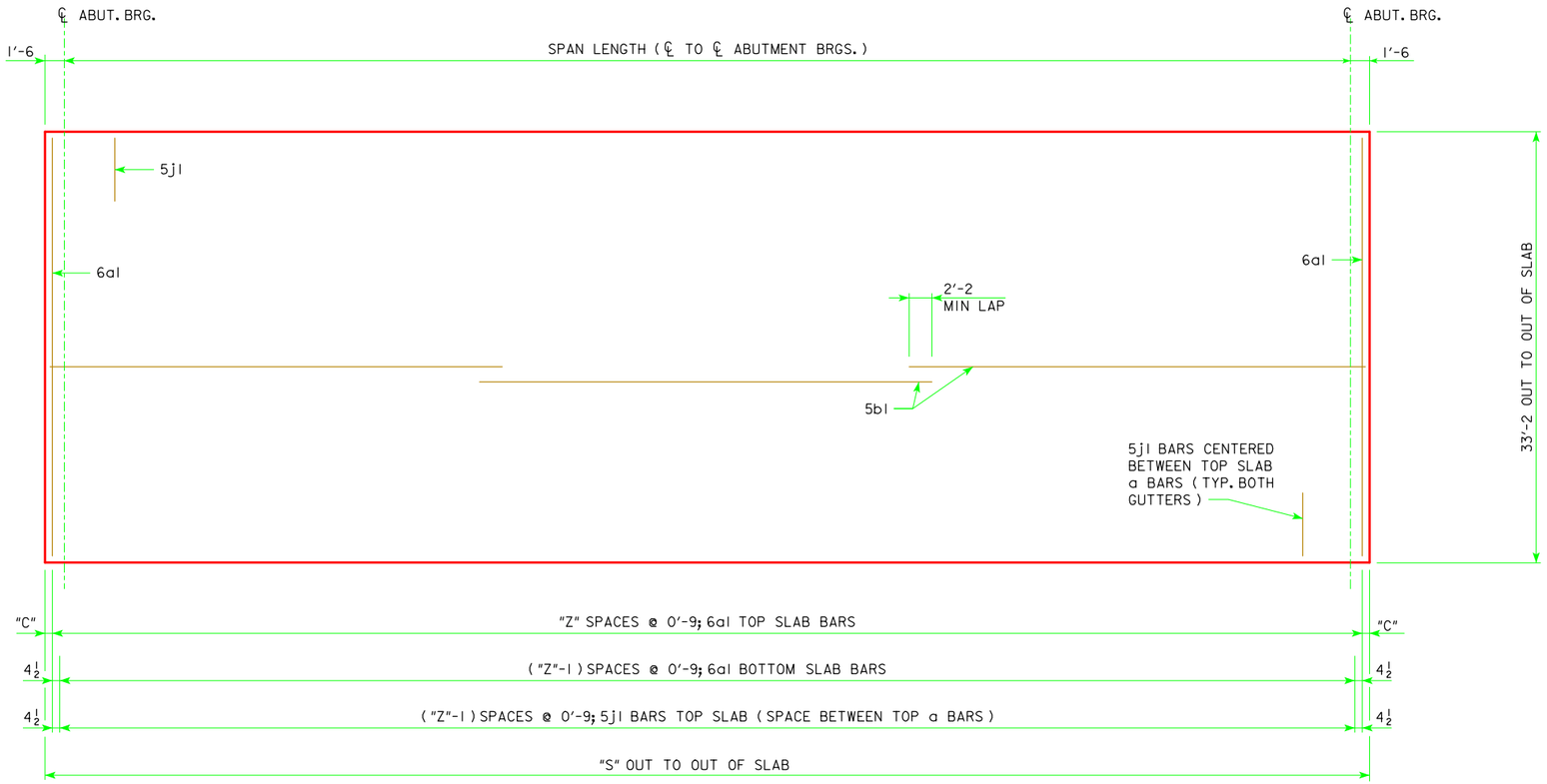
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

0° SKEW C & D BEAMS

H30SI-06-12



SLAB REINFORCING LAYOUT

GENERAL DATA								
SPAN LENGTH (℄ - ℄ ABUTMENT BRGS.)		46'-8	55'-0	67'-6	80'-0	90'-0	100'-0	110'-0
LOCATION OF EXTREME 6a1 TOP BAR FROM END OF SLAB	"C"	5½	6	4½	3	4½	6	3
NO. OF SPACES FOR 6a1 TOP BARS	"Z"	65	76	93	110	123	136	150
OUT TO OUT OF SLAB	"S"	49'-8	58'-0	70'-6	83'-0	93'-0	103'-0	113'-0
VERTICAL CURVE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3'-8 1/8	3'-8 1/2	4'-3 7/8	4'-9 7/16	5'-6 3/16	5'-6 11/16	5'-7 5/16
STRAIGHT GRADE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3'-8 5/16	3'-8 3/4	4'-4 3/16	4'-9 15/16	5'-6 13/16	5'-7 7/16	5'-8 1/4
SERVICE D.L. ABUTMENT REACTION (D.L. + F.W.S.) SERIVE LOADS	KIPS	297.9	325.0	388.8	502.5	575.0	616.0	657.2
SERVICE L.L. ABUTMENT REACTION (HL-93) NO IMPACT SERVICE LOADS	KIPS	152.8	162.4	175.0	186.0	194.4	202.2	209.8

05-13
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STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

SUPERSTRUCTURE
0° SKEW

H30S1-07-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

BRIDGE LENGTH

BAR	LOCATION	SHAPE	46′-8 A NO.	46′-8 A LENGTH	46′-8 A WEIGHT	55′-0 A NO.	55′-0 A LENGTH	55′-0 A WEIGHT	67′-6 B NO.	67′-6 B LENGTH	67′-6 B WEIGHT	80′-0 C NO.	80′-0 C LENGTH	80′-0 C WEIGHT	90′-0 D NO.	90′-0 D LENGTH	90′-0 D WEIGHT	100′-0 D NO.	100′-0 D LENGTH	100′-0 D WEIGHT	110′-0 D NO.	110′-0 D LENGTH	110′-0 D WEIGHT
6a1	SLAB TRANSVERSE, TOP & BOTTOM		131	32′-10	6461	153	32′-10	7546	187	32′-10	9223	221	32′-10	10,899	247	32′-10	12,181	273	32′-10	13,464	301	32′-10	14,845
5b1	SLAB LONGITUDINAL TOP & BOTTOM		168	25′-9	4513	168	29′-11	5242	168	36′-2	6337	252	29′-0	7622	252	32′-4	8498	252	35′-8	9374	252	39′-0	10,251
5d2	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F		24	6′-2	155	24	6′-2	155	24	5′-11	149	24	5′-11	149	24	6′-1	153	24	6′-1	153	24	6′-1	153
5d3	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F		8	5′-3	44	8	5′-3	44	8	5′-0	42	8	5′-0	42	8	4′-10	41	8	4′-10	41	8	4′-10	41
5d5	ABUTMENT DIAPHRAGM, LONGITUDINAL - END		12	4′-7	58	12	4′-7	58	12	4′-7	58	12	4′-7	58	12	4′-7	58	12	4′-7	58	12	4′-7	58
5d6	ABUTMENT DIAPHRAGM LONGITUDINAL - B.F.		8	32′-9	274	8	32′-9	274	8	32′-9	274	8	32′-9	274	8	32′-9	274	8	32′-9	274	8	32′-9	274
5d7	PAVING NOTCH, LONGITUDINAL		4	32′-8	137	4	32′-8	137	4	32′-8	137	4	32′-8	137	4	32′-8	137	4	32′-8	137	4	32′-8	137
5d8	ABUTMENT DIAPH. WING EXT. LONGIT.		-	-	-	-	-	-	-	-	-	24	10′-9	269	24	10′-9	269	24	10′-9	269	24	10′-9	269
5d9	ABUTMENT DIAPH. WING EXT. LONGIT.											24	10′-8	267	24	10′-8	267	24	10′-8	267	24	10′-8	267
8f1	ABUTMENT FOOTING LONGITUDINAL		18	32′-11	1582	18	32′-11	1582	18	32′-11	1582	18	32′-11	1582	18	32′-11	1582	18	32′-11	1582	18	32′-11	1582
8f3	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	10′-2	435	16	10′-2	435	16	10′-2	435	16	10′-2	435
8f4	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	8′-8	371	16	8′-8	371	16	8′-8	371	16	8′-8	371
8g1	ABUTMENT VERTICAL		114	6′-7	2004	114	6′-7	2004	114	7′-2	2181	110	7′-8	2252	110	8′-5	2472	110	8′-5	2472	110	8′-5	2472
8g3	ABUTMENT DIAPHRAGM VERTICAL - B.F.		50	15′-3	2036	50	15′-3	2036	50	15′-3	2036	50	15′-9	2103	50	15′-9	2103	50	15′-9	2103	50	15′-9	2103
6g4	ABUT. DIAPH. WING EXT. VERT.		-	-	-	-	-	-	-	-	-	40	5′-8	341	40	6′-5	386	40	6′-5	386	40	6′-5	386
5h1	ABUTMENT TO WING ANCHOR		28	6′-8	196	28	6′-8	196	28	6′-8	196	36	6′-8	252	36	6′-8	252	36	6′-8	252	36	6′-8	252
5h2	ABUTMENT TO WING ANCHOR		56	4′-11	288	56	4′-11	288	56	4′-11	288	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5h3	ABUTMENT TO WING ANCHOR		28	6′-9	198	28	6′-9	198	28	6′-9	198	36	6′-9	256	36	6′-9	256	36	6′-9	256	36	6′-9	256
5h4	ABUTMENT TO WING ANCHOR		-	-	-	-	-	-	-	-	-	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5j1	SLAB TRANSV. TOP AT RAIL		130	6′-3	848	152	6′-3	991	186	6′-3	1213	220	6′-3	1435	246	6′-3	1604	272	6′-3	1774	300	6′-3	1956
5k1	PAVING NOTCH, TRANSVERSE		54	4′-11	277	54	4′-11	277	54	4′-11	277	54	4′-11	277	54	4′-11	277	54	4′-11	277	54	4′-11	277
5k2	PAVING NOTCH, TRANSVERSE		54	3′-5	193	54	3′-5	193	54	3′-5	193	54	3′-5	193	54	3′-5	193	54	3′-5	193	54	3′-5	193
5p1	ABUTMENT HOOPS		120	10′-6	1314	120	10′-6	1314	108	10′-6	1183	104	10′-6	1139	120	10′-6	1315	104	10′-6	1139	104	10′-6	1139
5p2	ABUTMENT EXTENSIONS HOOPS		-	-	-	-	-	-	-	-	-	24	10′-8	268	24	10′-8	268	24	10′-8	268	24	10′-8	268
6p3	ABUT. BOTT. AT PILES		-	-	-	-	-	-	-	-	-	28	6′-8	281	32	6′-8	321	36	6′-8	361	36	6′-8	361
5r1	PAVING BLOCK LIFTING HOOPS		8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24
5s1	WING, VERTICAL		64	5′-10	390	64	5′-10	390	64	6′-2	412	64	6′-11	462	64	7′-8	512	64	7′-8	512	64	7′-8	512
4t1	UNDER BEAMS AT ABUTMENTS		10	4′-8	32	10	4′-8	32	10	4′-8	32	10	4′-8	32	10	4′-10	33	10	4′-10	33	10	4′-10	33
#2	PILE SPIRAL - NO. 2 BAR		10	38′-6	64	10	38′-6	64	12	38′-6	77	18	38′-6	115	20	38′-6	128	22	38′-6	141	22	38′-6	141
	SPIRAL SPACER $L\frac{7}{8}\times\frac{7}{8}\times\frac{1}{8}\times$ 0.70		20	1′-10	27	20	1′-10	27	24	1′-10	32	36	1′-10	48	40	1′-10	53	44	1′-10	58	44	1′-10	58
	REINFORCING STEEL - (LBS.)				2111S			23072			26144			31707			34587			36798			39238
	SEE BARRIER RAIL DETAILS (LBS.)				4054			4410			4968			6002			6438			6875			7353
	SEE OPEN RAIL DETAILS (LBS.)				4179			4572			5277			6816			7478			7900			8322

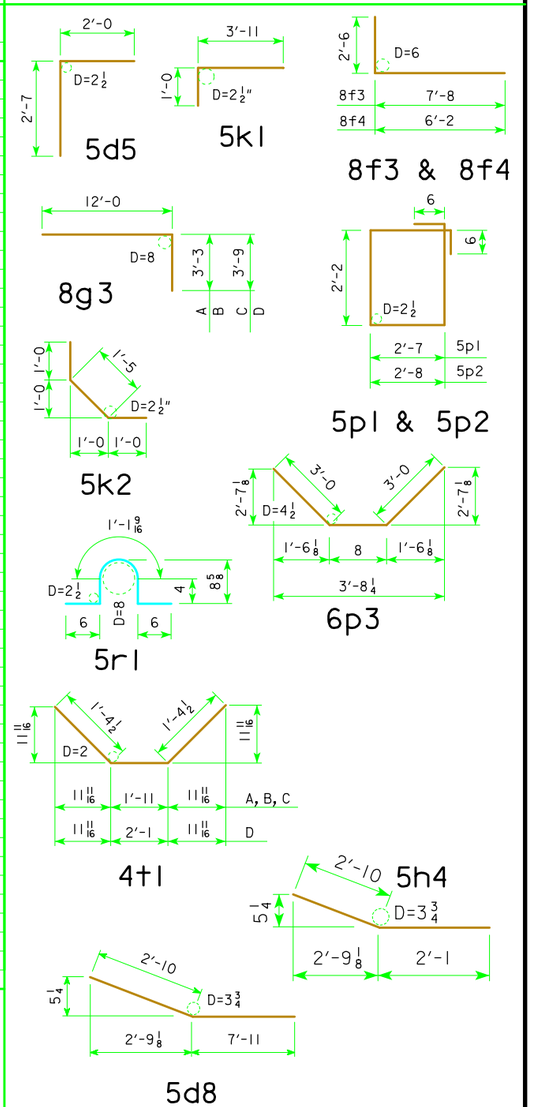
CONCRETE PLACEMENT QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

			46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
SLAB, AND ABUT. DIAPHRAGM	WITH BARRIER RAIL	CU.YD.	69.1	76.3	91.0	111.1	126.9	136.1	145.2
	WITH OPEN RAIL	CU.YD.	70.6	78.0	93.1	113.6	129.6	139.2	148.6
PAVING BLOCKS		CU.YD.	2.3	2.3	2.3	2.3	2.3	2.3	2.3
ABUTMENT WINGS		CU.YD.	7.2	7.2	7.6	8.4	9.2	9.2	9.2
ABUTMENT FOOTINGS		CU.YD.	26.6	26.6	26.6	34.4	34.4	34.4	34.4

ESTIMATED QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

			46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP10X57)		NO.	10	10	12	18	20	22	22
STRUCTURAL CONCRETE, (BRIDGE)	WITH BARRIER RAIL	CU.YD.	104.4	111.6	126.7	155.4	172	181.2	190.3
	WITH OPEN RAIL	CU.YD.	105.9	113.3	128.8	157.9	174.7	184.3	193.7
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	127.3	144	169	214	234	254	274
REINFORCING STEEL	WITH BARRIER RAIL	LBS.	24,969	27,282	30,912	37,500	40,816	43,464	46,382
	WITH OPEN RAIL	LBS.	25,294	27,644	31,421	38,523	42,065	44,698	47,560
STRUCTURAL STEEL	WITH BARRIER RAIL	LBS.	1480	1471	1515	1555	1642	1642	1642
	WITH OPEN RAIL	LBS.	1190	1180	1180	1180	1212	1212	1212

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER

REVISED 09-14 - CORRECTED THE BARRIER RAIL REINFORCING STEEL QUANTITIES FOR ALL THE BRIDGE LENGTHS.
REVISED 05-15 - CORRECTED THE CONCRETE QUANTITIES OF THE PAVING BLOCKS FOR ALL THE BRIDGE LENGTHS. (WAS 1.5 CU.YD.)

05-15
LATEST REVISION DATE

Marian K. Nelson
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

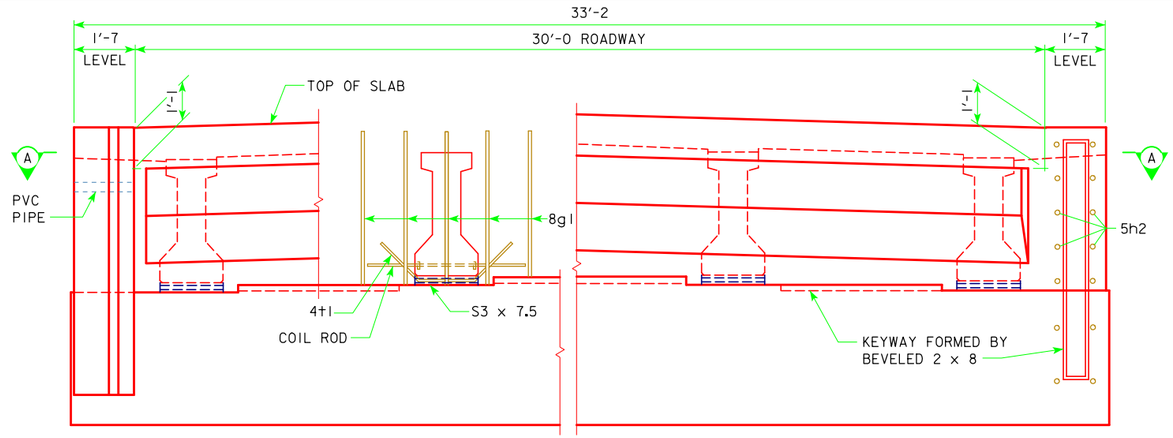
STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

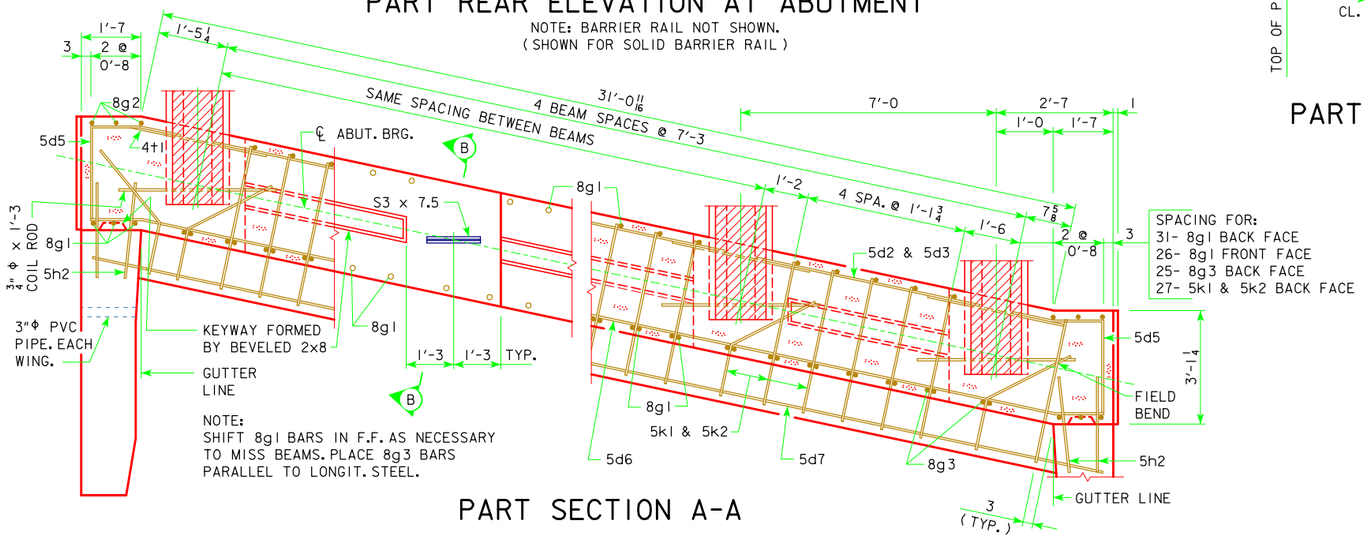
DECK & ABUTMENT REINF.
0° SKEW

H30SI-08-12



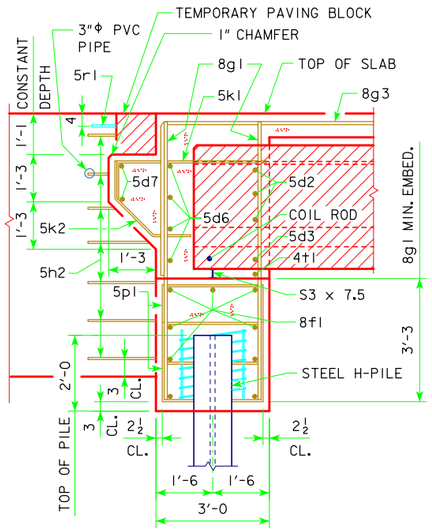
PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)



NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

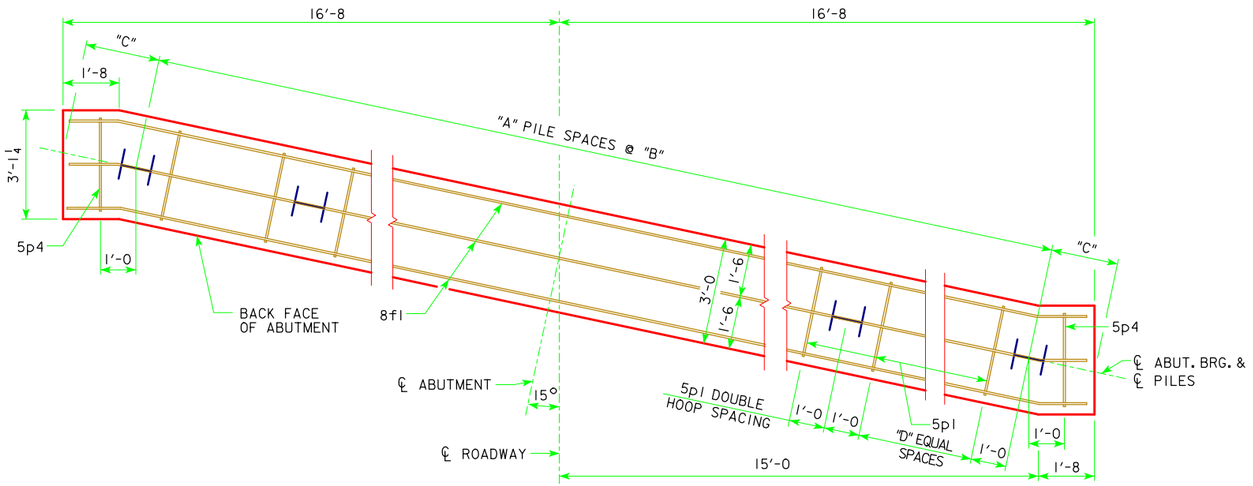
PART SECTION A-A



PART SECTION B-B

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF NO. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.

NOTE:
PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE (BOTH SIDES TYPICAL).



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING		
	46'-8	55'-0	67'-6
"A" PILE SPACES	4	4	5
"B" (FT. - IN.)	7'-6	7'-6	6'-0
"C" (FT. - IN.)	2'-3 1/16	2'-3 1/16	2'-3 1/16
"D" EQUAL SPACES	6	6	4
NO. OF PILES PER ABUT.	5	5	6
STRENGTH I DESIGN LOAD (KIPS)	130	140	134

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

05-13 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

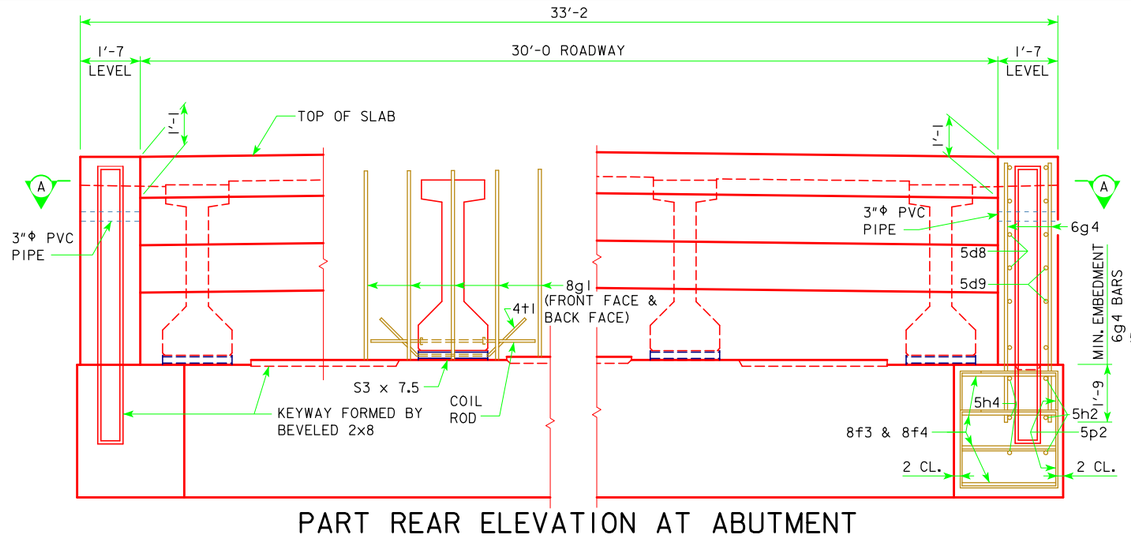
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT DETAILS

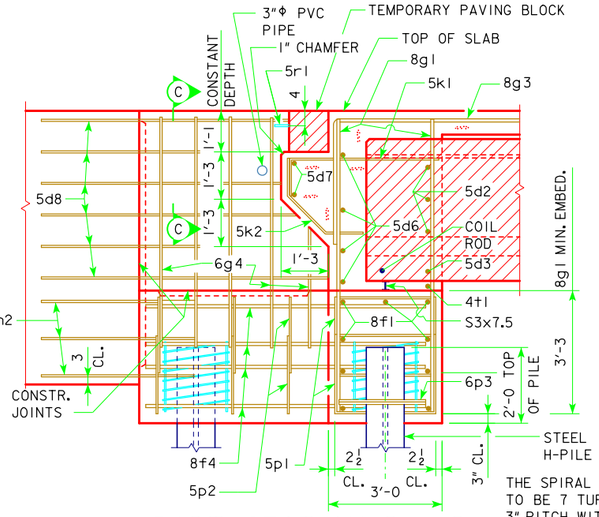
15° SKEW A & B BEAMS

H30SI-09-12



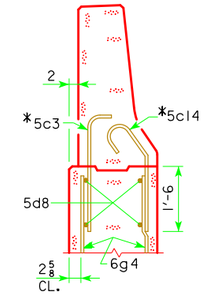
PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL AND WINGS NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)



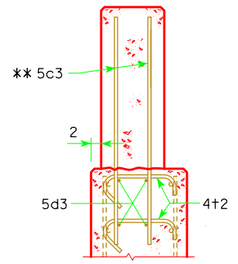
PART SECTION B - B

THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



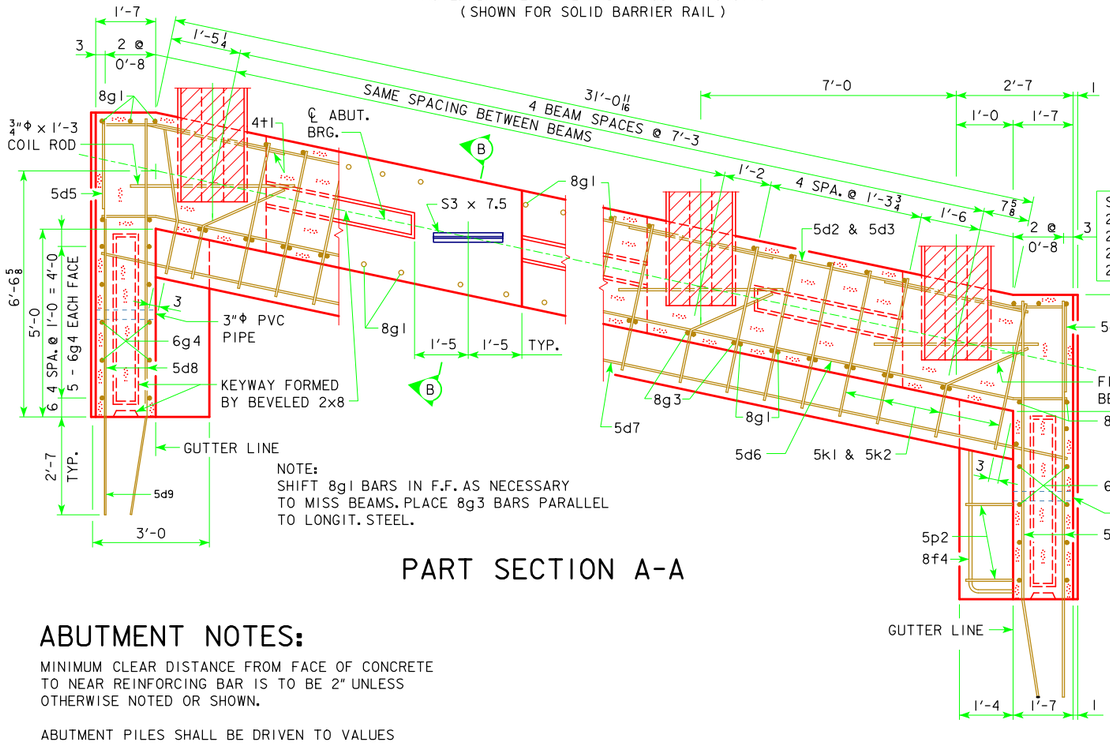
PART SECTION C-C

* NOTE: SEE BARRIER RAIL SHEET FOR DETAILS.
REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



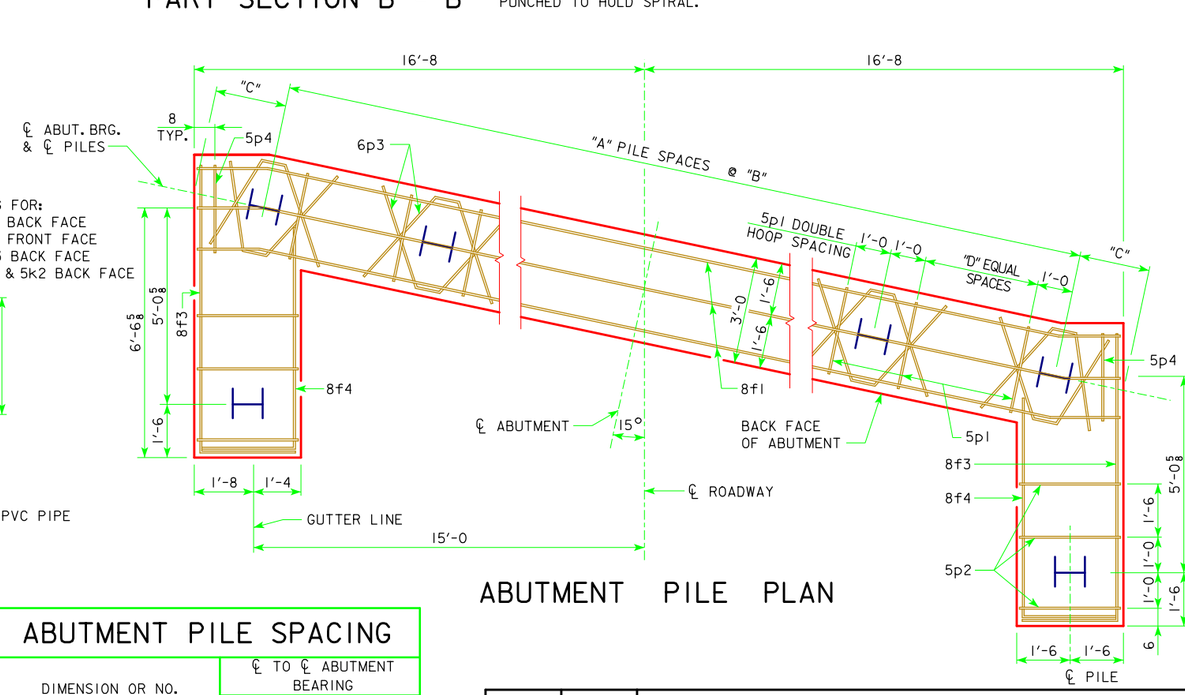
PART SECTION C-C

** NOTE: SEE OPEN RAIL SHEET FOR DETAILS.
REINFORCING BARS 5c3 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING			
	80'-0	90'-0	100'-0	110'-0
"A" PILE SPACES	6	7	8	8
"B" (FT - IN)	5'-2	4'-5	3'-10	3'-10
"C" (FT - IN)	1'-9 1/16	1'-9 3/16	1'-11 1/16	1'-11 1/16
"D" EQUAL SPACES	4	3	2	2
NO. OF PILES PER ABUT.	9	10	11	11
STRENGTH I DESIGN LOAD (KIPS)	138	134	126	134

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

05-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

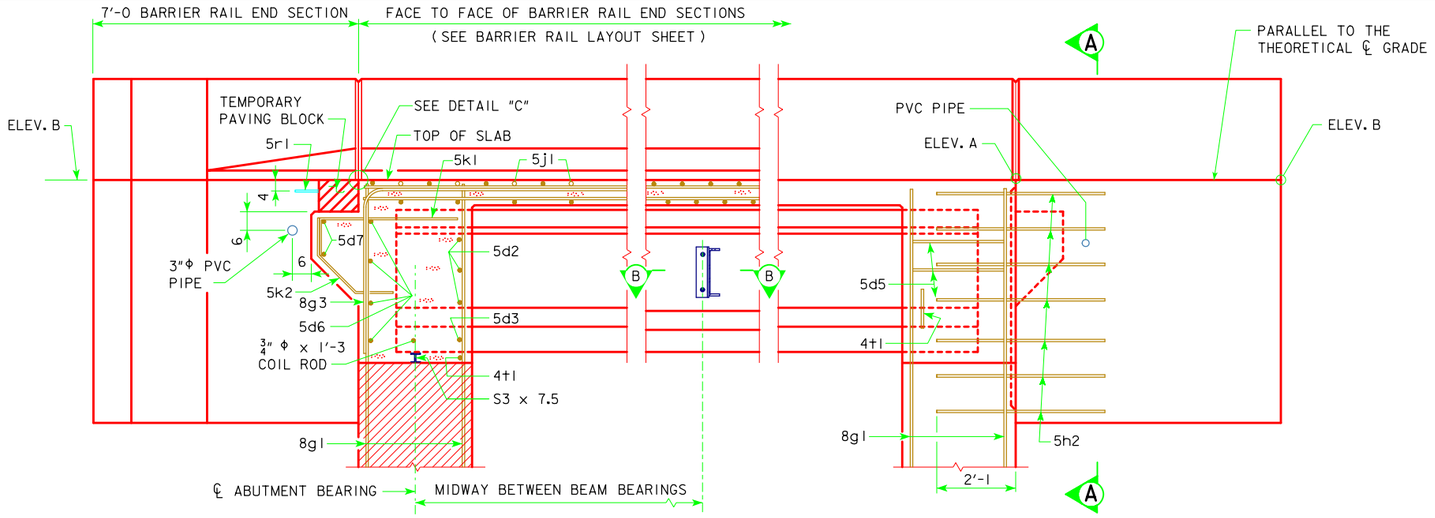
APRIL, 2012

ABUTMENT DETAILS

15° SKEW C & D BEAMS

H30SI-10-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.



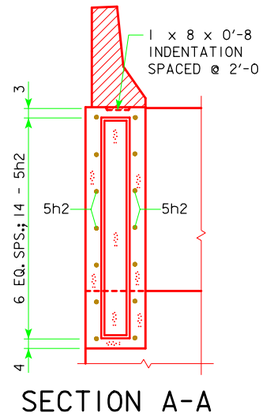
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

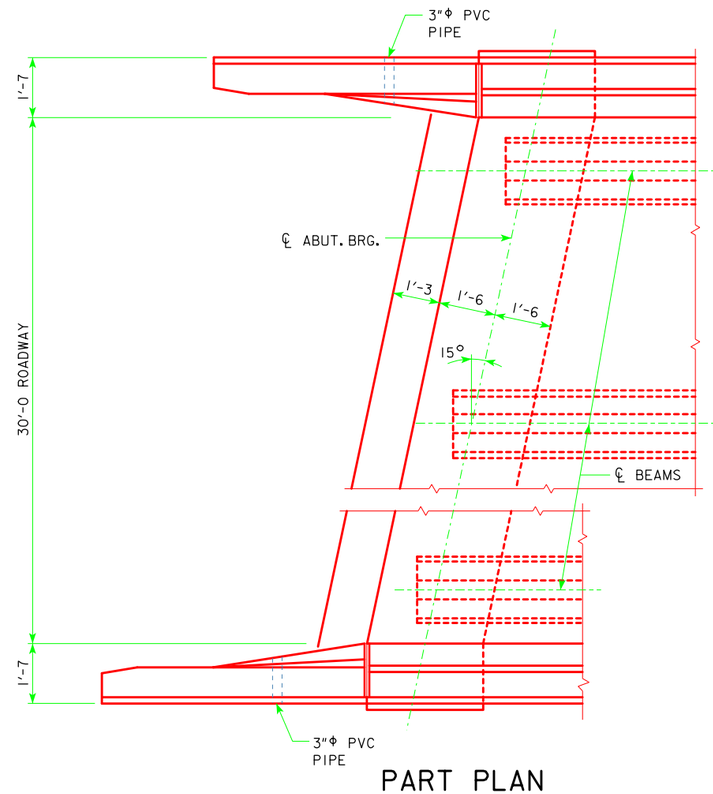
NOTE: PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BENIND ABUTMENTS.

PART END VIEW AT ABUTMENT

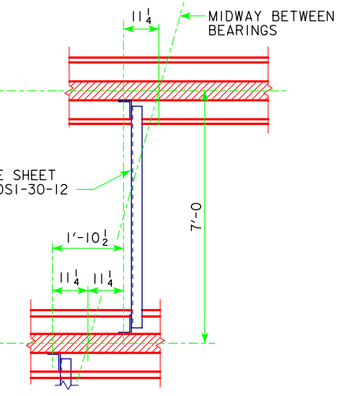
PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.



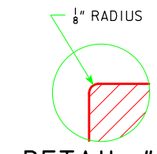
SECTION A-A



PART PLAN

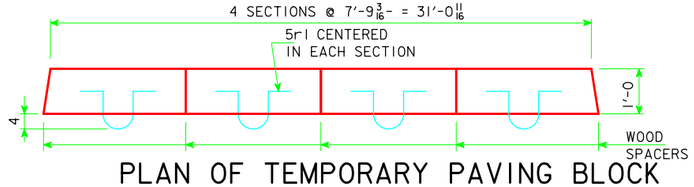


SECTION B-B



DETAIL "C"

(PAVING BLOCK NOT SHOWN)



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.

LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

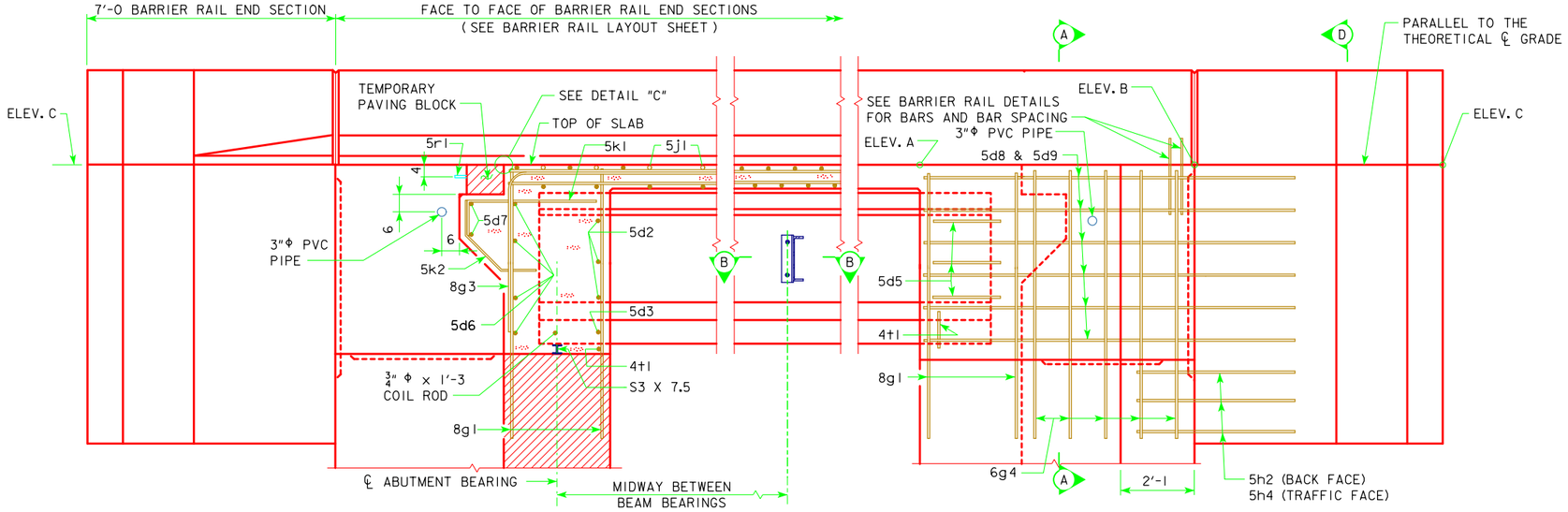
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

15° SKEW A & B BEAMS

H30SI-11-12



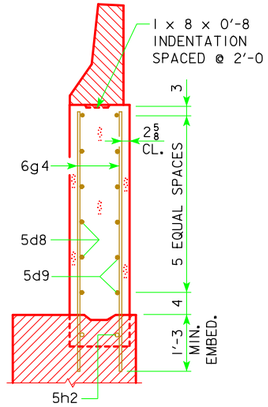
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

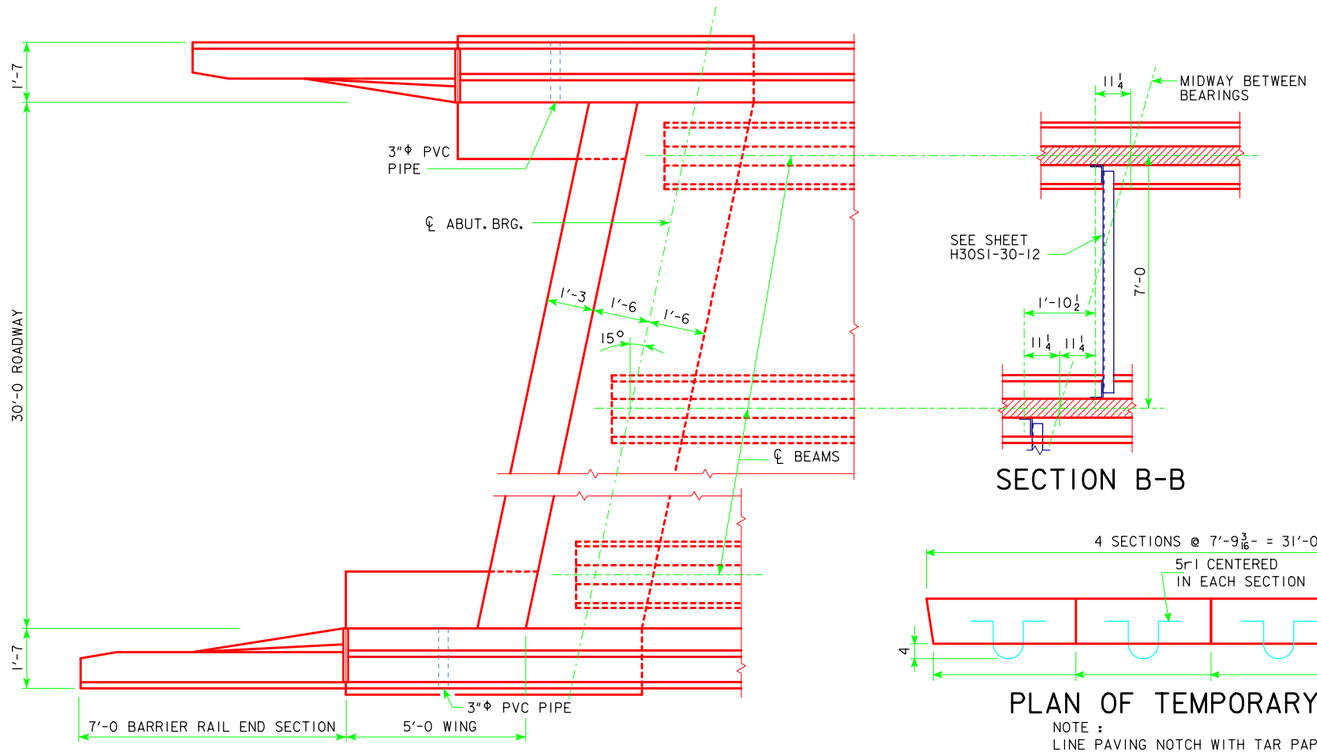
NOTE: PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.

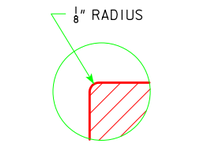


SECTION A-A



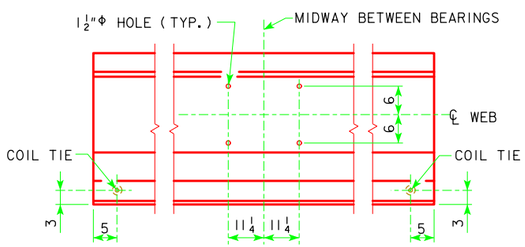
PART PLAN

SECTION B-B

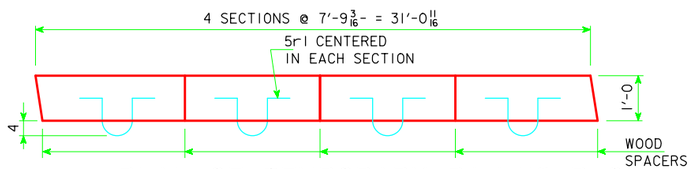


DETAIL "C"

(PAVING BLOCK NOT SHOWN)



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

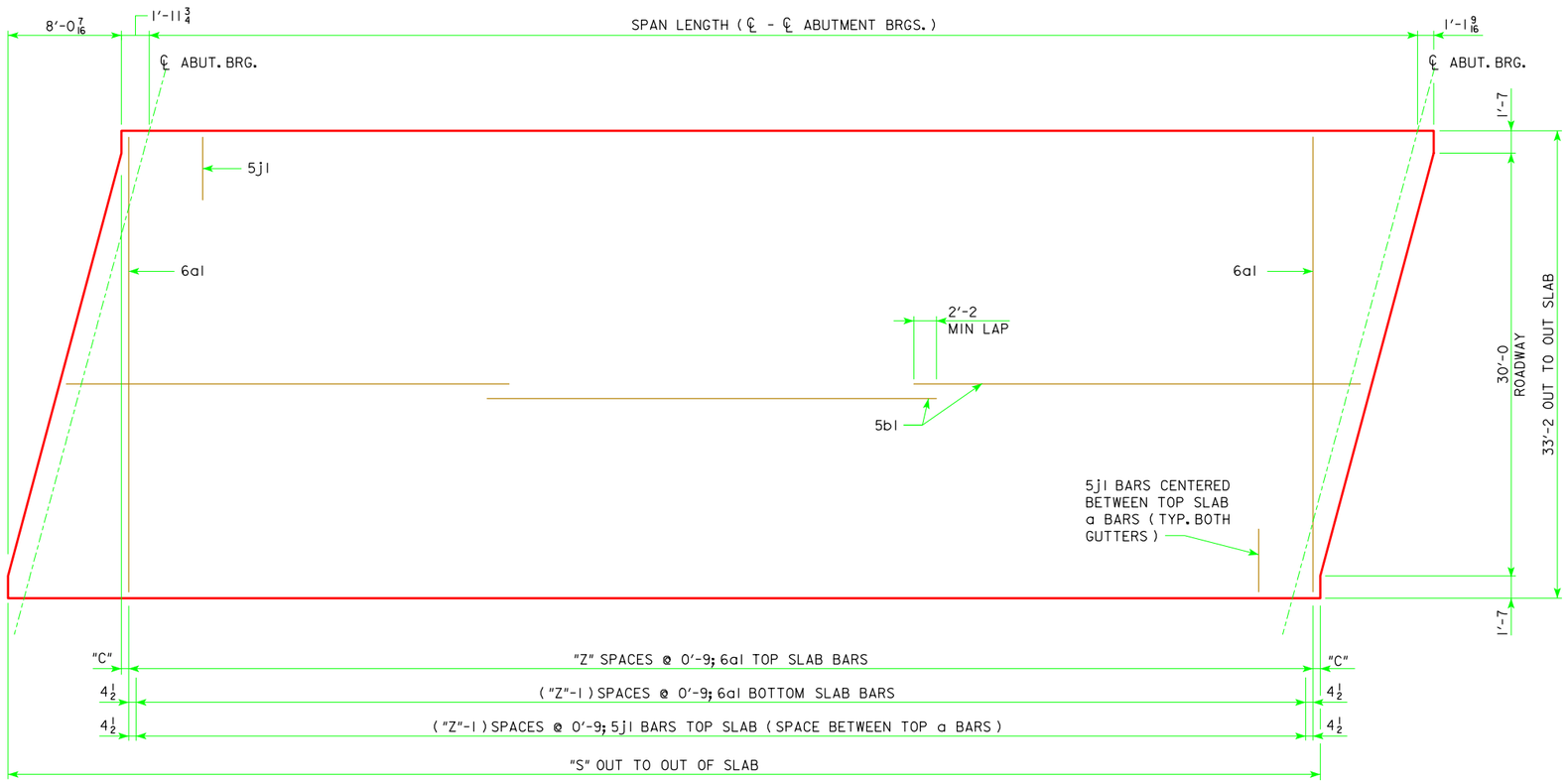
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

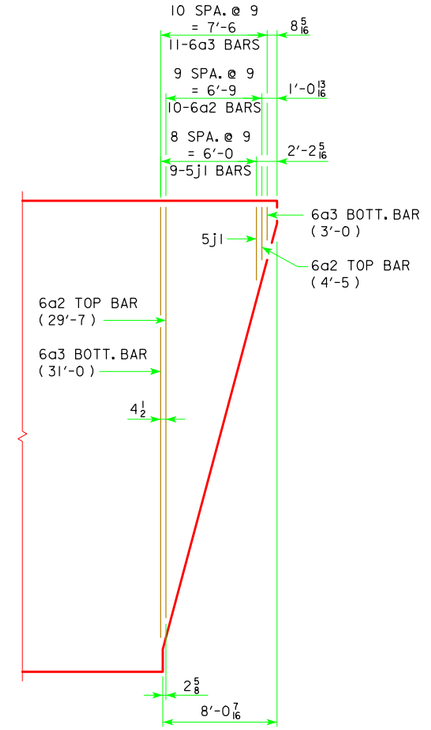
15° SKEW C & D BEAMS

H30SI-12-12



SLAB LAYOUT

(LEFT AHEAD SKEW SHOWN, RIGHT AHEAD SKEW SIMILAR)



END OF SLAB REINFORCING

(TYPICAL EACH END OF DECK)

GENERAL DATA

SPAN LENGTH (℄ - ℄ ABUTMENT BRGS.)		46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
LOCATION OF EXTREME 6a1 TOP BAR FROM END OF SLAB	"C"	2 7/8	3 3/8	6 3/8	4 7/8	6 3/8	3 3/8	4 7/8
NO. OF SPACES FOR 6a1 TOP BARS	"Z"	55	66	82	99	112	126	139
OUT TO OUT OF SLAB	"S"	49′-9 1/4	58′-1 1/4	70′-7 1/4	83′-1 1/4	93′-1 1/4	103′-1 1/4	113′-1 1/4
VERTICAL CURVE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3′-8 1/8	3′-8 1/2	4′-3 7/8	4′-9 7/16	5′-6 3/16	5′-6 11/16	5′-7 5/16
STRAIGHT GRADE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3′-8 5/16	3′-8 3/4	4′-4 3/16	4′-9 15/16	5′-6 13/16	5′-7 7/16	5′-8 1/4
SERVICE D.L. ABUTMENT REACTION (D.L. + F.W.S.) SERVICE LOADS	KIPS	301.8	328.9	392.9	506.9	579.8	620.9	662.0
SERVICE L.L. ABUTMENT REACTION (HL-93) NO IMPACT SERVICE LOADS	KIPS	152.8	162.4	175.0	186.0	194.4	202.2	209.8

05-13
LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

SUPERSTRUCTURE

15° SKEW

H30S1-13-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

REVISED 09-14 - CORRECTED THE BARRIER RAIL REINFORCING STEEL QUANTITIES FOR ALL THE BRIDGE LENGTHS.
REVISED 05-15 - CORRECTED THE CONCRETE QUANTITIES OF THE PAVING BLOCKS FOR ALL THE BRIDGE LENGTHS.(WAS 1.5 CU.YD. FOR 46'-8 THRU 67'-6 & 1.6 CU.YD. FOR 80'-0 THRU 110'-0)
REVISED 11-15 - REMOVED THE NOTE "- NON-EPOXY COATED" FROM THE "REINFORCING STEEL (LBS.)" LINE IN THE REINFORCING BAR CHART LIST.

REINFORCING BAR LIST

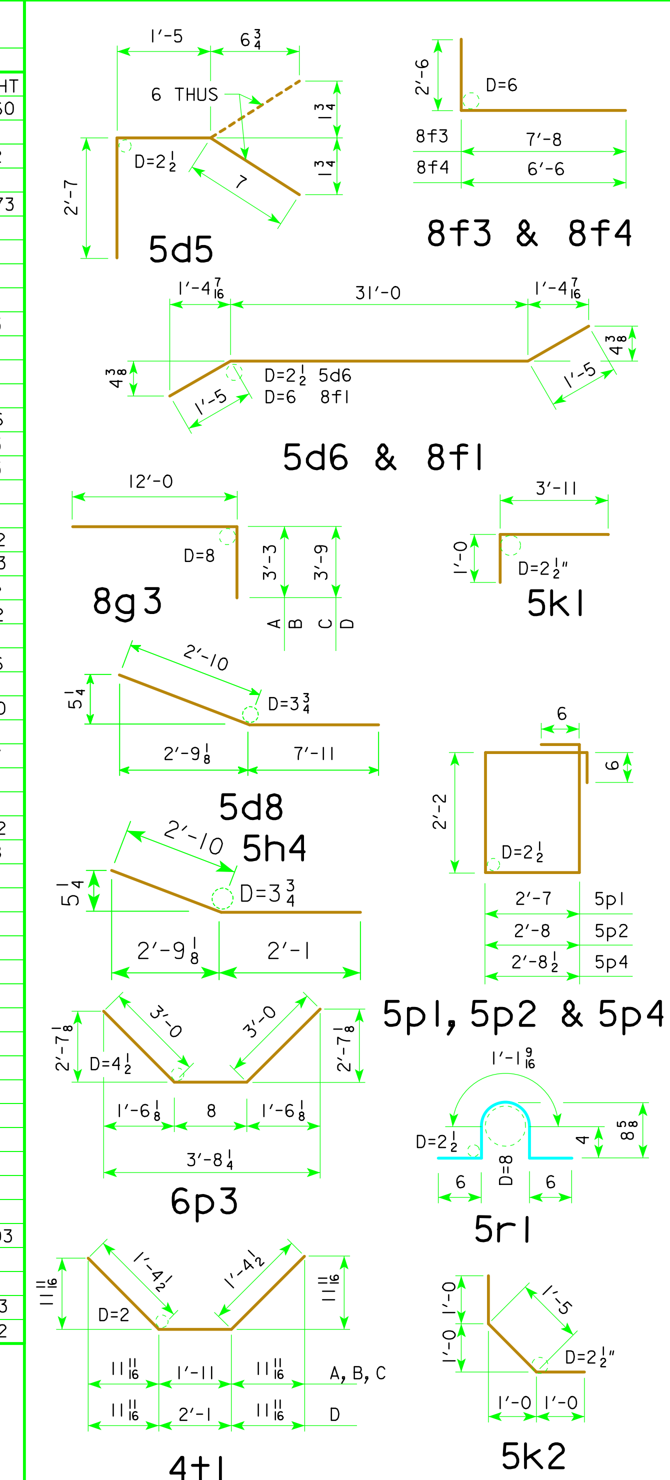
ONE SUPERSTRUCTURE AND TWO ABUTMENTS

BRIDGE LENGTH

BAR	LOCATION	SHAPE	46'-8 A NO.	LENGTH	WEIGHT	55'-0 A NO.	LENGTH	WEIGHT	67'-6 B NO.	LENGTH	WEIGHT	80'-0 C NO.	LENGTH	WEIGHT	90'-0 D NO.	LENGTH	WEIGHT	100'-0 D NO.	LENGTH	WEIGHT	110'-0 D NO.	LENGTH	WEIGHT
6a1	SLAB TRANSVERSE, TOP & BOTTOM		111	32'-10	5475	133	32'-10	6559	165	32'-10	8138	199	32'-10	9814	225	32'-10	11,097	253	32'-10	12,477	279	32'-10	13,760
6a2	SLAB TRANSVERSE END, TOP		20	*	511	20	*	511	20	*	511	20	*	511	20	*	511	20	*	511	20	*	511
6a3	SLAB TRANSVERSE END, BOTTOM		22	**	562	22	**	562	22	**	562	22	**	562	22	**	562	22	**	562	22	**	562
5b1	SLAB LONGITUDINAL TOP & BOTTOM		168	25'-10	4527	168	30'-0	5257	168	36'-3	6352	252	29'-1	7644	252	32'-5	8520	252	35'-9	9396	252	39'-1	10,273
5d2	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F.		24	6'-4	159	24	6'-4	159	24	6'-4	159	24	6'-1	153	24	6'-3	157	24	6'-3	157	24	6'-3	157
5d3	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F.		8	5'-5	46	8	5'-5	46	8	5'-5	46	8	5'-2	44	8	5'-0	42	8	5'-0	42	8	5'-0	42
5d5	ABUTMENT DIAPHRAGM, LONGITUDINAL - END		12	4'-7	58	12	4'-7	58	12	4'-7	58	12	4'-7	58	12	4'-7	58	12	4'-7	58	12	4'-7	58
5d6	ABUTMENT DIAPHRAGM LONGITUDINAL - B.F.		8	33'-10	283	8	33'-10	283	8	33'-10	283	8	33'-10	283	8	33'-10	283	8	33'-10	283	8	33'-10	283
5d7	PAVING NOTCH, LONGITUDINAL		4	33'-11	142	4	33'-11	142	4	33'-11	142	4	33'-11	142	4	33'-11	142	4	33'-11	142	4	33'-11	142
5d8	ABUTMENT DIAPH. WING EXT. LONGIT.		-	-	-	-	-	-	-	-	-	24	10'-9	269	24	10'-9	269	24	10'-9	269	24	10'-9	269
5d9	ABUT. DIAPH. WING EXT. LONGIT.											24	10'-8	267	24	10'-8	267	24	10'-8	267	24	10'-8	267
8f1	ABUTMENT FOOTING LONGITUDINAL		18	33'-10	1626	18	33'-10	1626	18	33'-10	1626	18	33'-10	1626	18	33'-10	1626	18	33'-10	1626	18	33'-10	1626
8f3	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	10'-2	435	16	10'-2	435	16	10'-2	435	16	10'-2	435
8f4	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	9'-0	385	16	9'-0	385	16	9'-0	385	16	9'-0	385
8g1	ABUTMENT VERTICAL		114	6'-7	2004	114	6'-7	2004	114	7'-2	2181	110	7'-8	2252	110	8'-5	2472	110	8'-5	2472	110	8'-5	2472
8g3	ABUTMENT DIAPHRAGM VERTICAL - B.F.		50	15'-3	2036	50	15'-3	2036	50	15'-3	2036	50	15'-9	2103	50	15'-9	2103	50	15'-9	2103	50	15'-9	2103
6g4	ABUT. DIAPH. WING EXT. VERT.		-	-	-	-	-	-	-	-	-	40	5'-8	341	40	6'-5	386	40	6'-5	386	40	6'-5	386
5h1	ABUTMENT TO WING ANCHOR		28	6'-8	196	28	6'-8	196	28	6'-8	196	36	6'-8	252	36	6'-8	252	36	6'-8	252	36	6'-8	252
5h2	ABUTMENT TO WING ANCHOR		56	4'-11	288	56	4'-11	288	56	4'-11	288	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5h3	ABUTMENT TO WING ANCHOR		28	6'-9	198	28	6'-9	198	28	6'-9	198	36	6'-9	256	36	6'-9	256	36	6'-9	256	36	6'-9	256
5h4	ABUTMENT TO WING ANCHOR		-	-	-	-	-	-	-	-	-	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5j1	SLAB TRANSV. TOP AT RAIL		128	6'-3	835	150	6'-3	978	182	6'-3	1187	216	6'-3	1409	242	6'-3	1578	270	6'-3	1761	296	6'-3	1930
5k1	PAVING NOTCH, TRANSVERSE		54	4'-11	277	54	4'-11	277	54	4'-11	277	54	4'-11	277	54	4'-11	277	54	4'-11	277	54	4'-11	277
5k2	PAVING NOTCH, TRANSVERSE		54	3'-5	193	54	3'-5	193	54	3'-5	193	54	3'-5	193	54	3'-5	193	54	3'-5	193	54	3'-5	193
5p1	ABUTMENT HOOPS		112	10'-6	1227	112	10'-6	1227	100	10'-6	1096	120	10'-6	1315	112	10'-6	1227	96	10'-6	1052	96	10'-6	1052
5p2	ABUTMENT EXT.HOOPS		-	-	-	-	-	-	-	-	-	24	10'-8	268	24	10'-8	268	24	10'-8	268	24	10'-8	268
6p3	ABUT. BOTT. AT PILES		-	-	-	-	-	-	-	-	-	28	6'-8	281	32	6'-8	321	36	6'-8	361	36	6'-8	361
5p4	ABUTMENT HOOPS AT ENDS		8	10'-9	90	8	10'-9	90	8	10'-9	90	8	10'-9	90	8	10'-9	90	8	10'-9	90	8	10'-9	90
5r1	PAVING BLOCK LIFTING HOOPS		8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24
5s1	WING, VERTICAL		64	5'-10	390	64	5'-10	390	64	6'-2	412	64	6'-11	462	64	7'-8	512	64	7'-8	512	64	7'-8	512
4t1	UNDER BEAMS AT ABUTMENTS		10	4'-8	32	10	4'-8	32	10	4'-8	32	10	4'-8	32	10	4'-10	33	10	4'-10	33	10	4'-10	33
#2	PILE SPIRAL - NO. 2 BAR		10	38'-6	64	10	38'-6	64	12	38'-6	77	18	38'-6	115	20	38'-6	128	22	38'-6	141	22	38'-6	141
	SPIRAL SPACER $L\frac{7}{8}\times\frac{7}{8}\times\frac{1}{8}\times$ 0.70		20	1'-10	26	20	1'-10	26	24	1'-10	32	36	1'-10	48	40	1'-10	53	44	1'-10	59	44	1'-10	59
	REINFORCING STEEL (LBS.)				21269			23226			26196			32035			34651			36974			39303
	SEE BARRIER RAIL DETAILS (LBS.)				4054			4410			4968			6002			6438			6875			7353
	SEE OPEN RAIL DETAILS (LBS.)				4179			4572			5277			6816			7478			7900			8322

* VARIES FROM 4'-5 TO 29'-7 ** VARIES FROM 3'-0 TO 31'-0

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER

CONCRETE PLACEMENT QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)			46'-8	55'-0	67'-6	80'-0	90'-0	100'-0	110'-0
SLAB, AND	WITH BARRIER RAIL	CU.YD.	70.1	77.4	92.3	112.5	128.4	137.7	146.8
ABUT. DIAPHRAGM	WITH OPEN RAIL	CU.YD.	71.6	79.1	94.4	114.9	131.2	140.7	150.2
PAVING BLOCKS		CU.YD.	2.5	2.5	2.5	2.5	2.5	2.5	2.5
ABUTMENT WINGS		CU.YD.	7.2	7.2	7.6	8.4	9.2	9.2	9.2
ABUTMENT FOOTINGS		CU.YD.	27.6	27.6	27.6	35.3	35.3	35.3	35.3

ESTIMATED QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)			46'-8	55'-0	67'-6	80'-0	90'-0	100'-0	110'-0
NO. OF STEEL H-PILES FOR TWO ABUTS. (HP10X57)		NO.	10	10	12	18	20	22	22
STRUCTURAL CONCRETE, (BRIDGE)	WITH BARRIER RAIL	CU.YD.	106.4	113.7	129	157.8	174.5	183.8	192.9
	WITH OPEN RAIL	CU.YD.	107.9	115.4	131.1	160.2	177.3	186.8	196.3
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	127.5	144.2	169.2	214.2	234.2	254.2	274.2
REINFORCING STEEL	WITH BARRIER RAIL	LBS.	25,123	27,436	30,964	37,828	40,880	43,640	46,447
	WITH OPEN RAIL	LBS.	25,448	27,798	31,473	38,851	42,129	44,874	47,625
STRUCTURAL STEEL	WITH BARRIER RAIL	LBS.	1532	1526	1570	1610	1695	1695	1695
	WITH OPEN RAIL	LBS.	1242	1235	1235	1235	1265	1265	1265

11-15
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

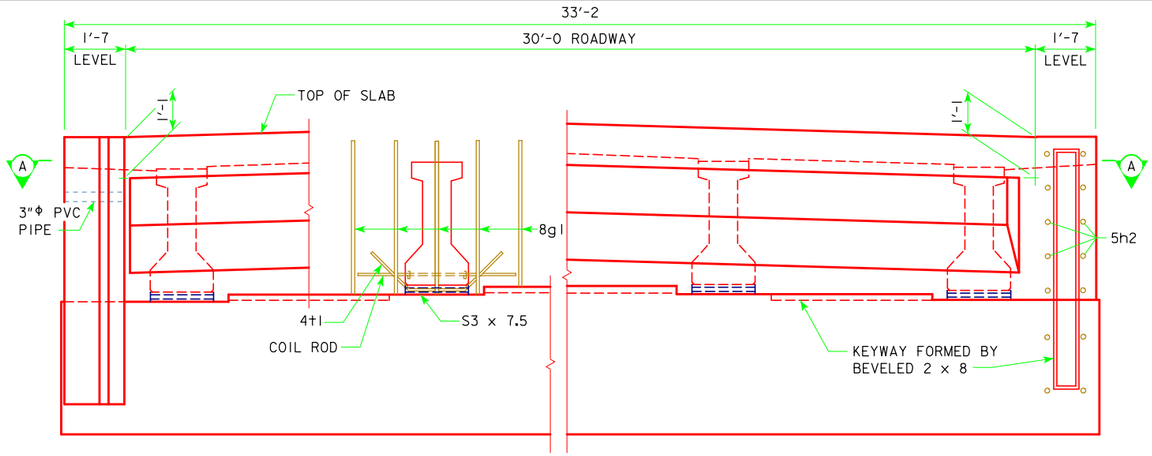
STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

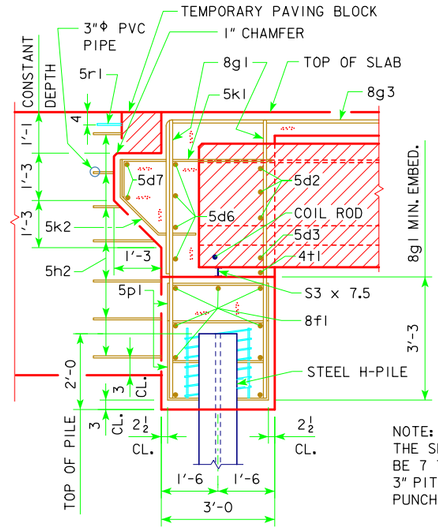
DECK & ABUTMENT REINF.
15° SKEW

H30SI-14-12



PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)

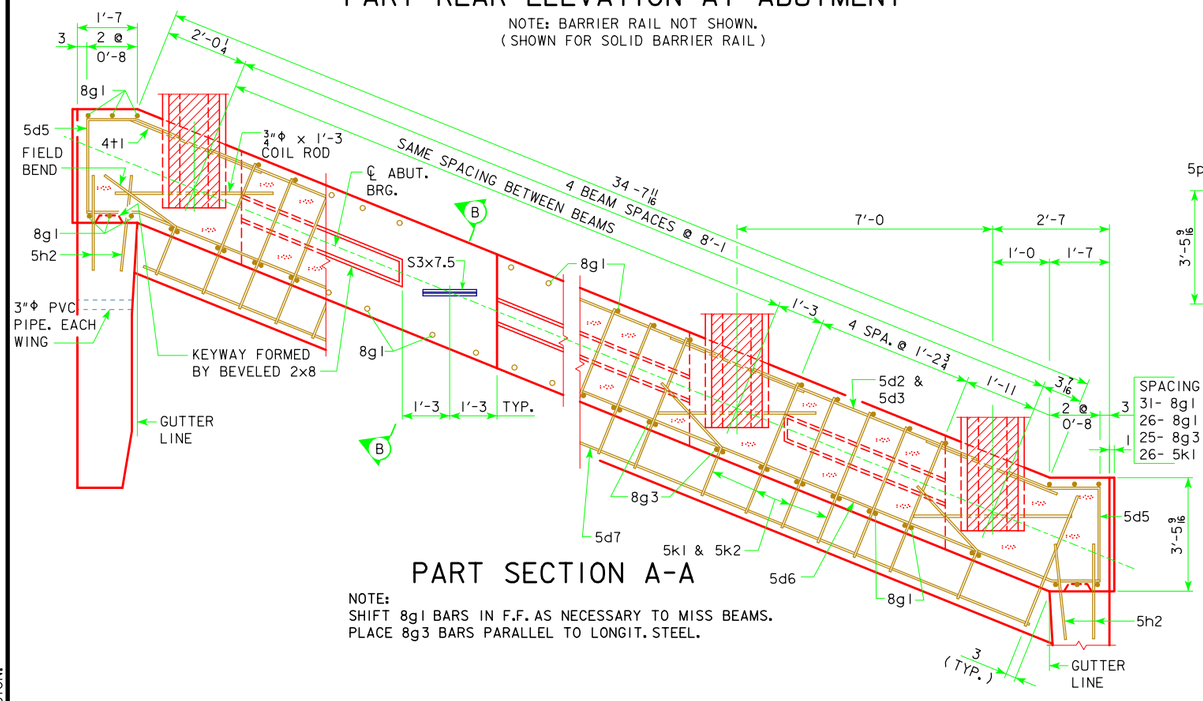


NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF NO. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 1⅞ x ⅞ x ⅛ SPACERS PUNCHED TO HOLD SPIRAL.

ABUTMENT PILE SPACING

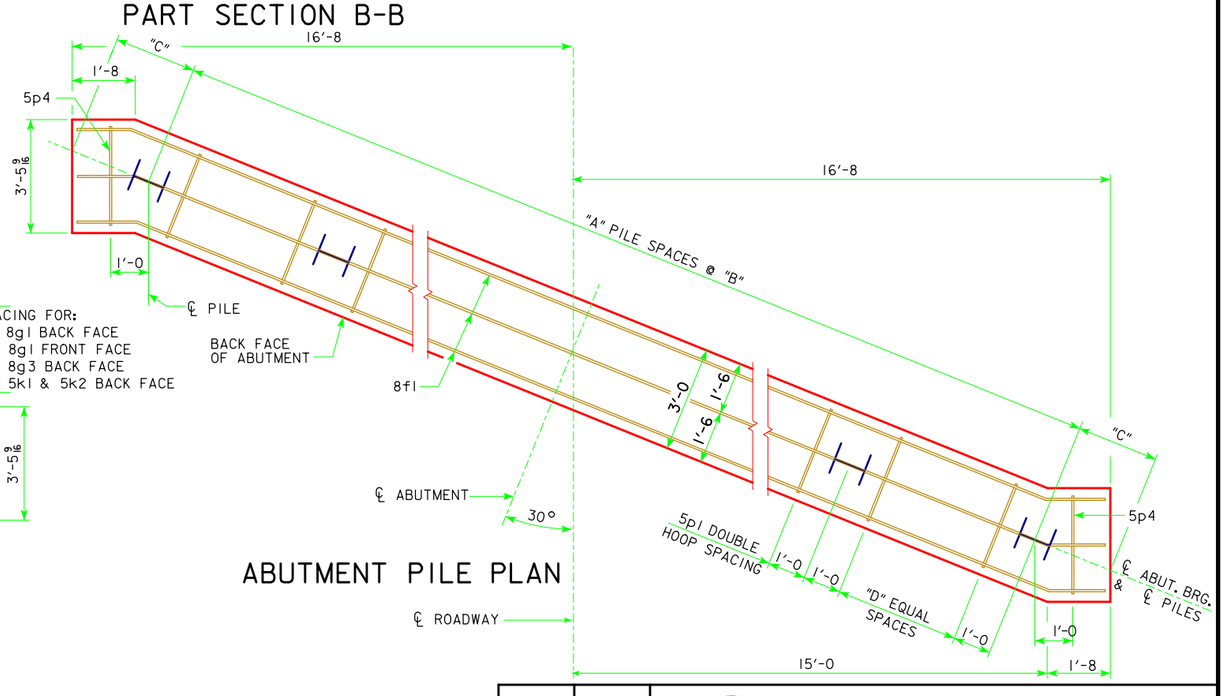
DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING		
	46'-8	55'-0	67'-6
"A" PILE SPACES	5	5	5
"B" (FT. - IN.)	6'-11	6'-11	6'-11
"C" (FT. - IN.)	1'-11 7/16	1'-11 7/16	1'-11 7/16
"D" EQUAL SPACES	5	5	5
NO. OF PILES PER ABUT.	6	6	6
STRENGTH I DESIGN LOAD (KIPS)	111	119	137

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



PART SECTION A-A

NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS.
PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

05-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

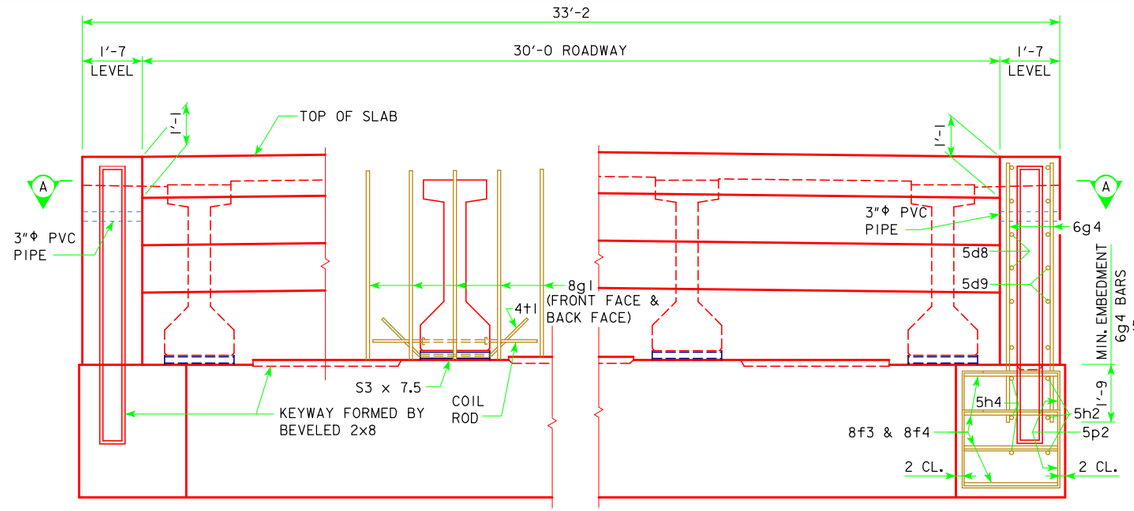
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT DETAILS

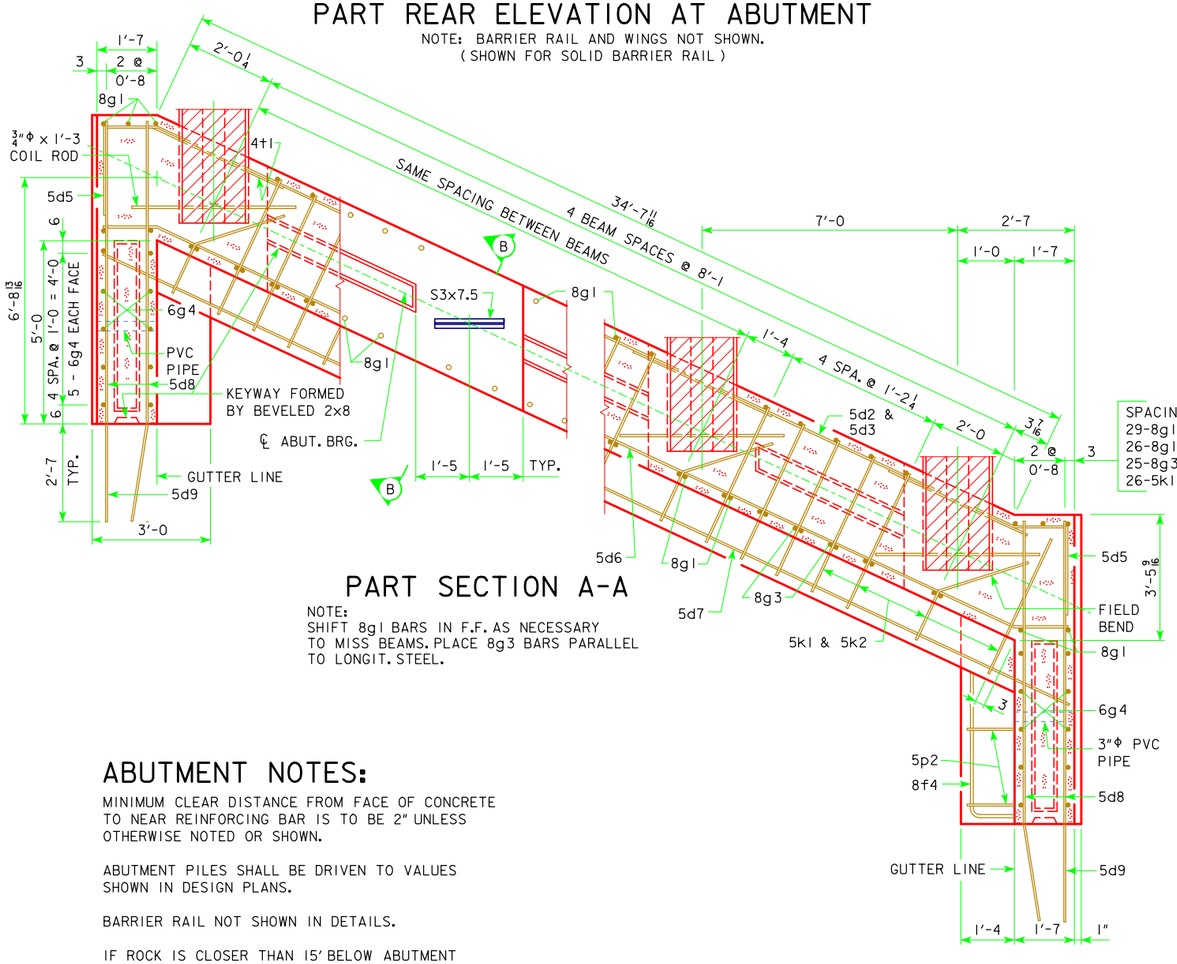
30° SKEW A & B BEAMS

H30SI-15-12



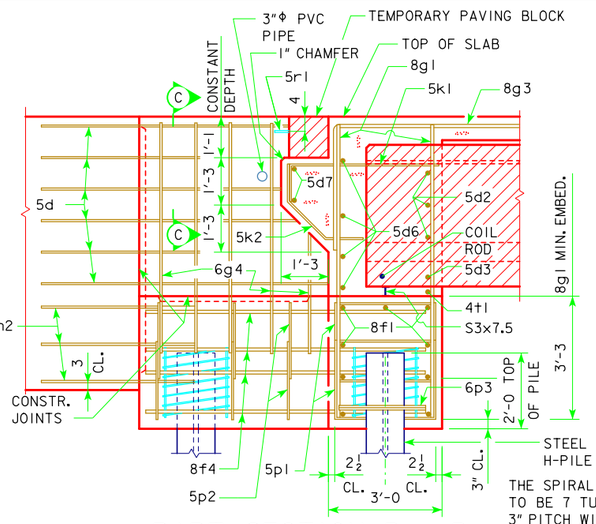
PART REAR ELEVATION AT ABUTMENT

NOTE: BARRIER RAIL AND WINGS NOT SHOWN.
(SHOWN FOR SOLID BARRIER RAIL)



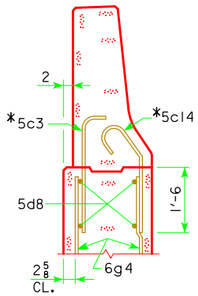
PART SECTION A-A

NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.



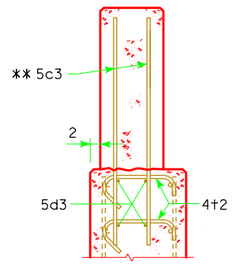
PART SECTION B - B

THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



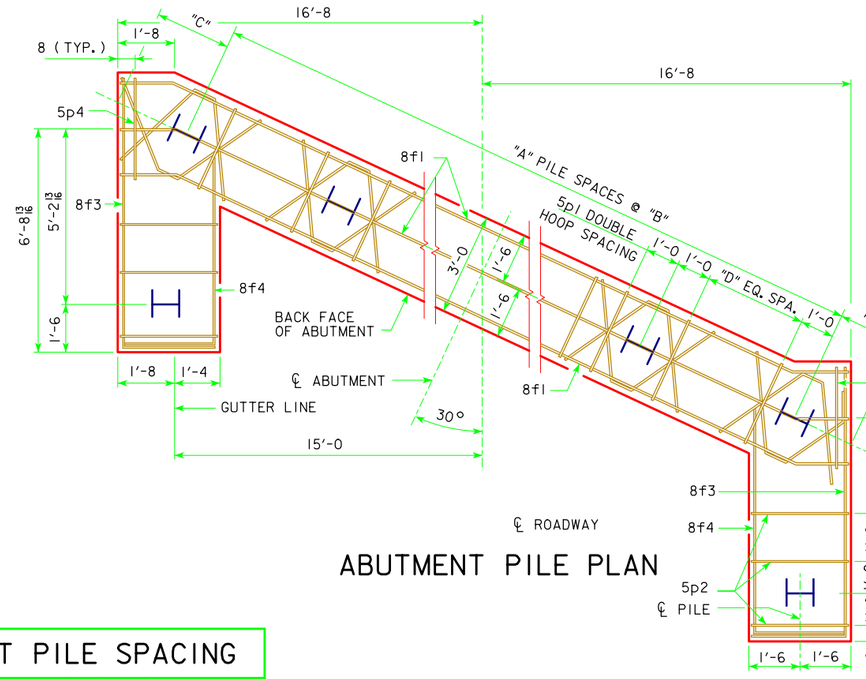
PART SECTION C-C

* NOTE: SEE BARRIER RAIL SHEET FOR DETAILS.
REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



PART SECTION C-C

** NOTE: SEE OPEN RAIL SHEET FOR DETAILS.
REINFORCING BARS 5c3 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



ABUTMENT PILE PLAN

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ABUTMENT PILE SPACING

DIMENSION OR NO.	℄ TO ℄ ABUTMENT BEARING			
	80'-0	90'-0	100'-0	110'-0
"A" PILE SPACES	6	7	8	8
"B" (FT. - IN.)	5'-8	4'-11	4'-3	4'-3
"C" (FT. - IN.)	2'-2 15/16	2'-0 7/16	2'-2 15/16	2'-2 15/16
"D" EQUAL SPACES	4	3	3	3
NO. OF PILES PER ABUT.	9	10	11	11
STRENGTH I DESIGN LOAD (KIPS)	141	137	129	136

NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

05-13
LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

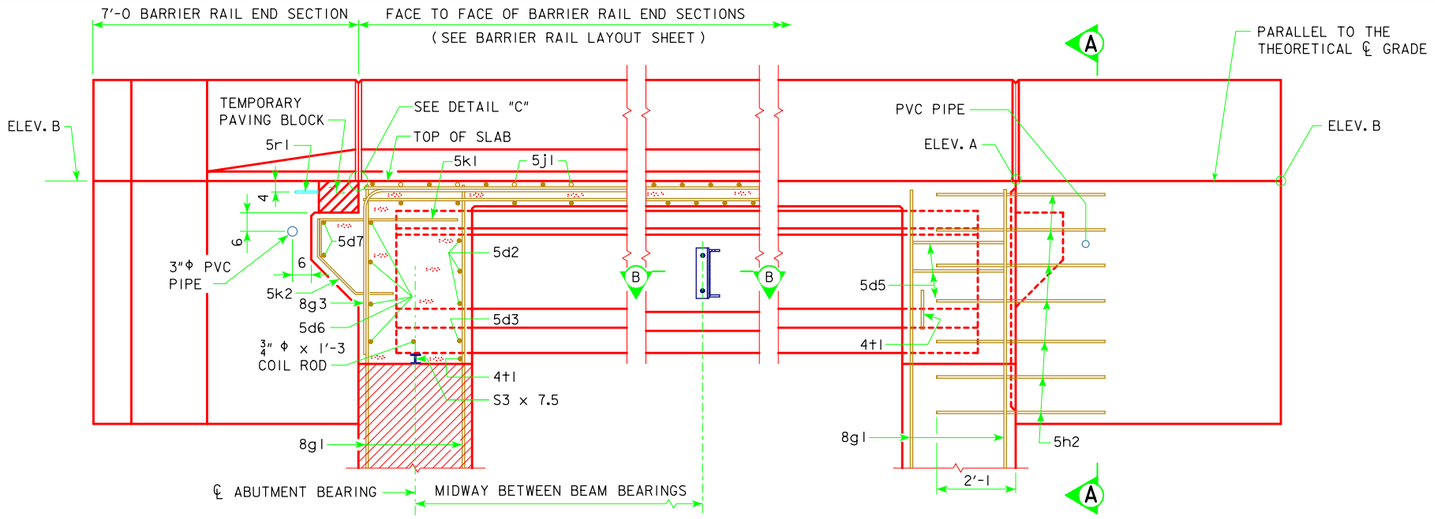
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT DETAILS

30° SKEW C & D BEAMS

H30SI-16-12



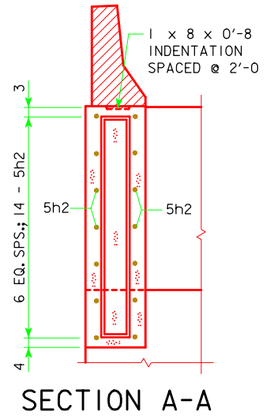
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

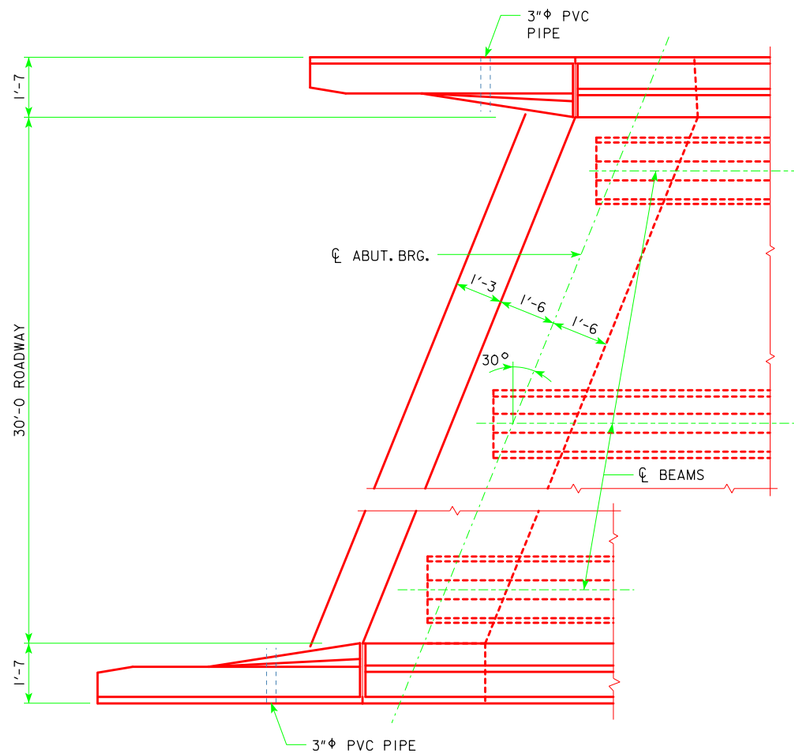
NOTE: PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BENIND ABUTMENTS.

PART END VIEW AT ABUTMENT

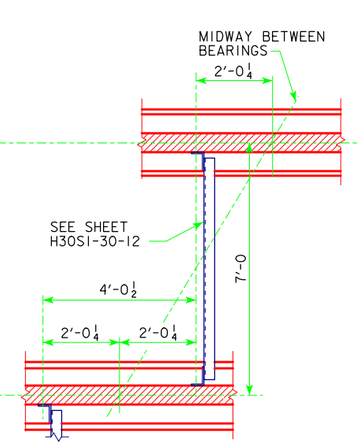
PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.



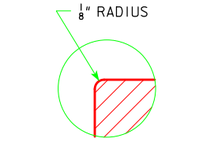
SECTION A-A



PART PLAN

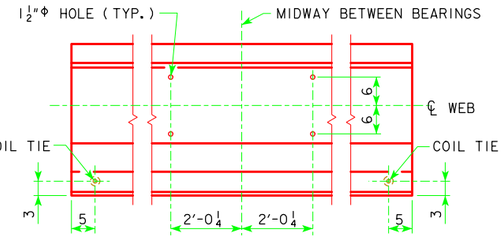


SECTION B-B

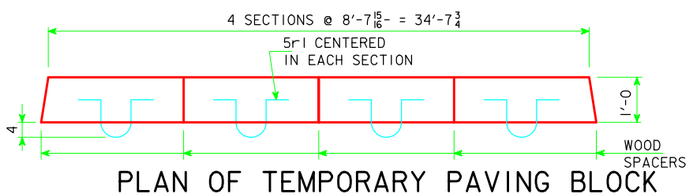


DETAIL "C"

(PAVING BLOCK NOT SHOWN)



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

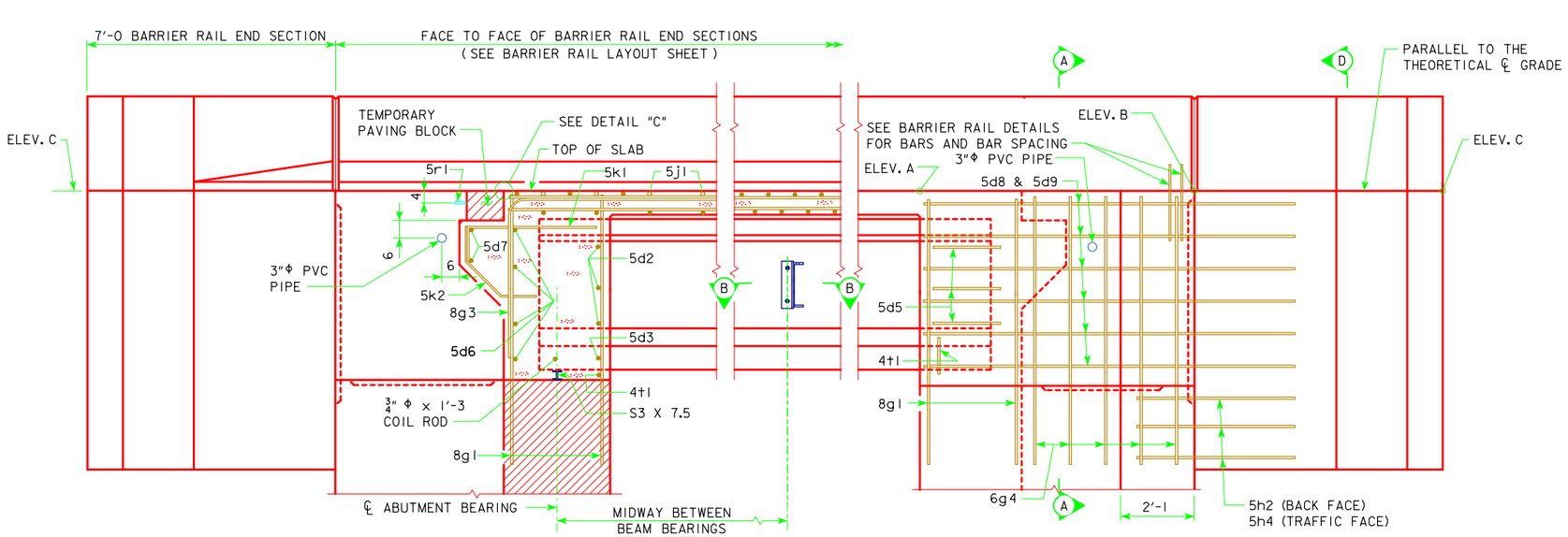
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

30° SKEW A & B BEAMS

H30SI-17-12



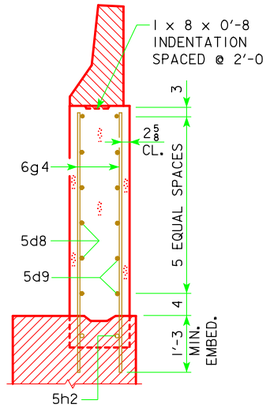
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30SI-30-12)

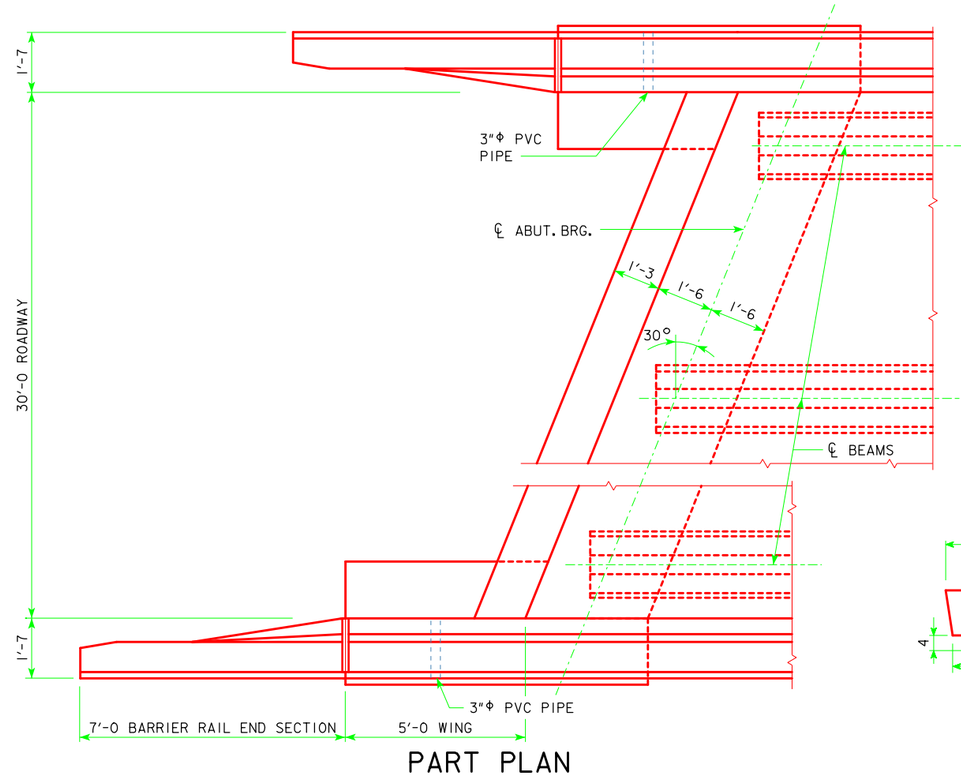
PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.

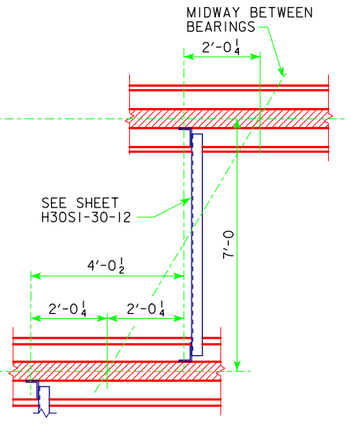
NOTE: PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM
PRIOR TO BACKFILLING BEHIND ABUTMENTS.



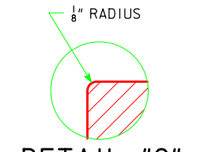
SECTION A-A



PART PLAN

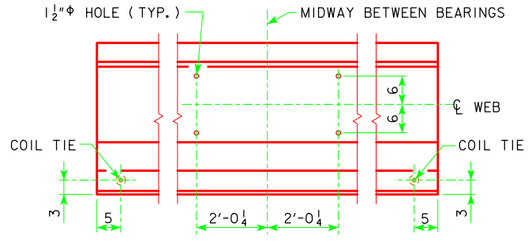


SECTION B-B

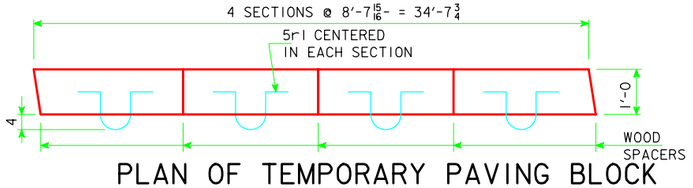


DETAIL "C"

(PAVING BLOCK NOT SHOWN)



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



PLAN OF TEMPORARY PAVING BLOCK

NOTE :
LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

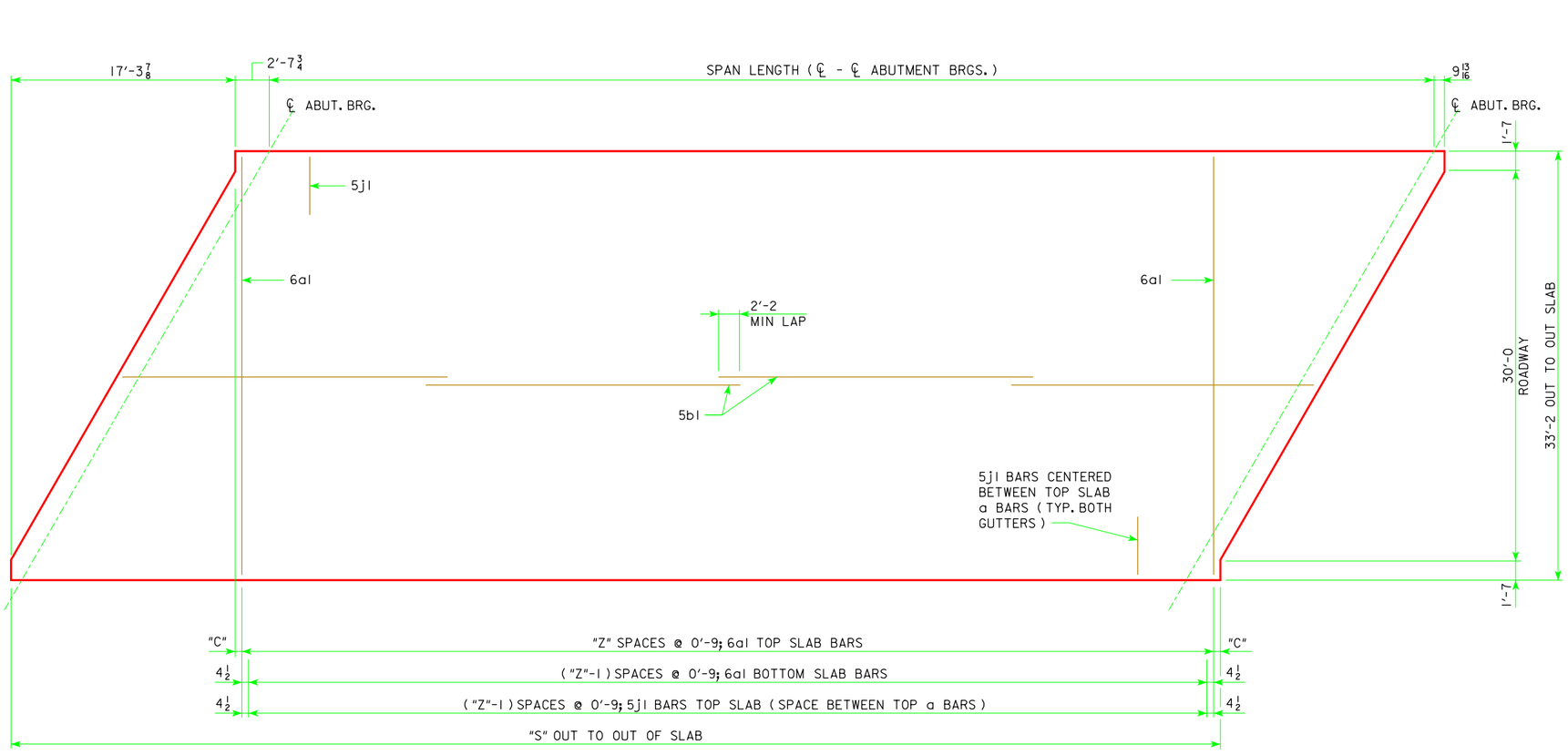
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

LONGITUDINAL SECTION

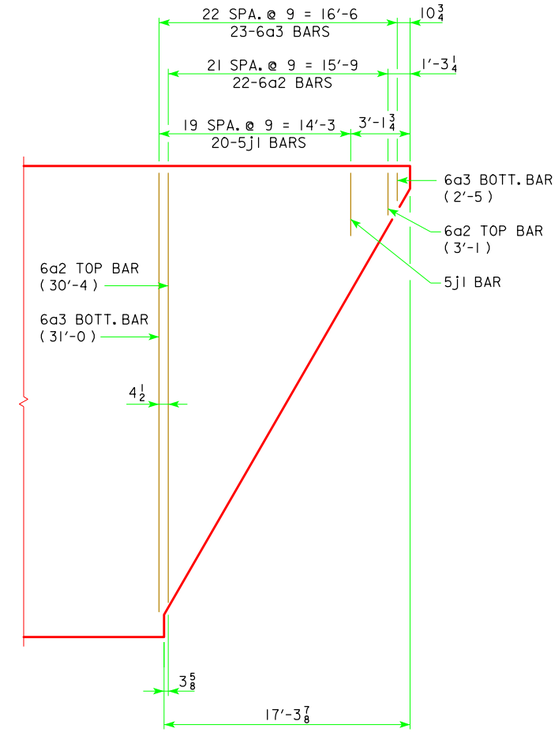
30° SKEW C & D BEAMS

H30SI-18-12



SLAB LAYOUT

(LEFT AHEAD SKEW SHOWN, RIGHT AHEAD SKEW SIMILAR)



END OF SLAB REINFORCING

(TYPICAL EACH END OF DECK)

GENERAL DATA

SPAN LENGTH (℄ - ℄ ABUTMENT BRGS.)		46'-8	55'-0	67'-6	80'-0	90'-0	100'-0	110'-0
LOCATION OF EXTREME 6a1 TOP BAR FROM END OF SLAB	"C"	3 3/8	3 7/8	2 3/8	5 5/8	2 3/8	3 7/8	5 3/8
NO. OF SPACES FOR 6a1 TOP BARS	"Z"	43	54	71	87	101	114	127
OUT TO OUT OF SLAB	"S"	50'-1 9/16	58'-5 9/16	70'-11 9/16	83'-5 9/16	93'-5 9/16	103'-5 9/16	113'-5 9/16
VERTICAL CURVE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3'-8 1/8	3'-8 1/2	4'-3 7/8	4'-9 7/16	5'-6 3/16	5'-6 11/16	5'-7 5/16
STRAIGHT GRADE TOP OF SLAB TO ABUTMENT TOP AT ℄ ABUTMENT BEARING	"U"	3'-8 5/16	3'-8 3/4	4'-4 3/16	4'-9 15/16	5'-6 13/16	5'-7 7/16	5'-8 1/4
SERVICE D.L. ABUTMENT REACTION (D.L. + F.W.S.) SERVICE LOADS	KIPS	314.7	341.8	406.9	521.6	595.9	637.0	678.1
SERVICE L.L. ABUTMENT REACTION (HL-93) NO IMPACT SERVICE LOADS	KIPS	152.8	162.4	175.0	186.0	194.4	202.2	209.8

05-13
LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

SUPERSTRUCTURE

30° SKEW

H30S1-19-12

REVISED 05-13 - REVISION FOR LRFD PILE DESIGN.

REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

BRIDGE LENGTH

BAR	LOCATION	SHAPE	46′-8 A NO.	46′-8 A LENGTH	46′-8 A WEIGHT	55′-0 A NO.	55′-0 A LENGTH	55′-0 A WEIGHT	67′-6 B NO.	67′-6 B LENGTH	67′-6 B WEIGHT	80′-0 C NO.	80′-0 C LENGTH	80′-0 C WEIGHT	90′-0 D NO.	90′-0 D LENGTH	90′-0 D WEIGHT	100′-0 D NO.	100′-0 D LENGTH	100′-0 D WEIGHT	110′-0 D NO.	110′-0 D LENGTH	110′-0 D WEIGHT
6a1	SLAB TRANSVERSE, TOP & BOTTOM		87	32′-10	4291	109	32′-10	5376	143	32′-10	7053	175	32′-10	8631	203	32′-10	10,012	229	32′-10	11,294	255	32′-10	12,576
6a2	SLAB TRANSVERSE END, TOP		44	*	1105	44	*	1105	44	*	1105	44	*	1105	44	*	1105	44	*	1105	44	*	1105
6a3	SLAB TRANSVERSE END, BOTTOM		46	**	1155	46	**	1155	46	**	1155	46	**	1155	46	**	1155	46	**	1155	46	**	1155
5b1	SLAB LONGITUDINAL TOP & BOTTOM		168	26′-0	4556	168	30′-2	5286	168	36′-5	6381	252	29′-2	7666	252	32′-6	8542	252	35′-10	9418	252	39′-2	10,294
5d2	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F.		24	7′-2	180	24	7′-2	180	24	7′-2	180	24	6′-11	174	24	7′-1	178	24	7′-1	178	24	7′-1	178
5d3	ABUTMENT DIAPHRAGM, LONGITUDINAL - F.F.		8	6′-3	53	8	6′-3	53	8	6′-3	53	8	6′-0	51	8	5′-10	49	8	5′-10	49	8	5′-10	49
5d5	ABUTMENT DIAPHRAGM, LONGITUDINAL - END		12	5′-0	63	12	5′-0	63	12	5′-0	63	12	5′-0	63	12	5′-0	63	12	5′-0	63	12	5′-0	63
5d6	ABUTMENT DIAPHRAGM LONGITUDINAL - B.F.		8	37′-5	313	8	37′-5	313	8	37′-5	313	8	37′-5	313	8	37′-5	313	8	37′-5	313	8	37′-5	313
5d7	PAVING NOTCH, LONGITUDINAL		4	37′-10	158	4	37′-10	158	4	37′-10	158	4	37′-10	158	4	37′-10	158	4	37′-10	158	4	37′-10	158
5d8	ABUTMENT DIAPH. WING EXT. LONGIT.		-	-	-	-	-	-	-	-	-	24	10′-9	269	24	10′-9	269	24	10′-9	269	24	10′-9	269
5d9	ABUT. DIAPH. WING EXT. LONGIT.											24	10′-8	267	24	10′-8	267	24	10′-8	267	24	10′-8	267
8f1	ABUTMENT FOOTING LONGITUDINAL		18	37′-5	1798	18	37′-5	1798	18	37′-5	1798	18	37′-5	1798	18	37′-5	1798	18	37′-5	1798	18	37′-5	1798
8f3	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	10′-7	453	16	10′-7	453	16	10′-7	453	16	10′-7	453
8f4	ABUTMENT EXTENSION LONGITUDINAL		-	-	-	-	-	-	-	-	-	16	9′-6	406	16	9′-6	406	16	9′-6	406	16	9′-6	406
8g1	ABUTMENT VERTICAL		114	6′-7	2004	114	6′-7	2004	114	7′-2	2181	110	7′-8	2252	110	8′-5	2472	110	8′-5	2472	110	8′-5	2472
8g3	ABUTMENT DIAPHRAGM VERTICAL - B.F.		50	15′-3	2036	50	15′-3	2036	50	15′-3	2036	50	15′-9	2103	50	15′-9	2103	50	15′-9	2103	50	15′-9	2103
6g4	ABUT. DIAPH. WING EXT. VERT.		-	-	-	-	-	-	-	-	-	40	5′-8	341	40	6′-5	386	40	6′-5	386	40	6′-5	386
5h1	ABUTMENT TO WING ANCHOR		28	6′-8	196	28	6′-8	196	28	6′-8	196	36	6′-8	252	36	6′-8	252	36	6′-8	252	36	6′-8	252
5h2	ABUTMENT TO WING ANCHOR		56	4′-11	288	56	4′-11	288	56	4′-11	288	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5h3	ABUTMENT TO WING ANCHOR		28	6′-9	198	28	6′-9	198	28	6′-9	198	36	6′-9	256	36	6′-9	256	36	6′-9	256	36	6′-9	256
5h4	ABUTMENT TO WING ANCHOR		-	-	-	-	-	-	-	-	-	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5j1	SLAB TRANSV. TOP AT RAIL		126	6′-3	822	148	6′-3	965	182	6′-3	1187	214	6′-3	1396	242	6′-3	1578	268	6′-3	1748	294	6′-3	1917
5k1	PAVING NOTCH, TRANSVERSE		52	4′-11	267	52	4′-11	267	52	4′-11	267	52	4′-11	267	52	4′-11	267	52	4′-11	267	52	4′-11	267
5k2	PAVING NOTCH, TRANSVERSE		52	3′-5	186	52	3′-5	186	52	3′-5	186	52	3′-5	186	52	3′-5	186	52	3′-5	186	52	3′-5	186
5p1	ABUTMENT HOOPS		120	10′-6	1315	120	10′-6	1315	120	10′-6	1315	120	10′-6	1315	112	10′-6	1227	128	10′-6	1402	128	10′-6	1402
5p2	ABUTMENT EXT.HOOPS		-	-	-	-	-	-	-	-	-	24	10′-8	268	24	10′-8	268	24	10′-8	268	24	10′-8	268
6p3	ABUT. BOTT. AT PILES		-	-	-	-	-	-	-	-	-	28	6′-8	281	32	6′-8	321	36	6′-8	361	36	6′-8	361
5p4	ABUTMENT HOOPS AT ENDS		8	11′-6	96	8	11′-6	96	8	11′-6	96	8	11′-6	96	8	11′-6	96	8	11′-6	96	8	11′-6	96
5r1	PAVING BLOCK LIFTING HOOPS		8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24	8	2′-10	24
5s1	WING, VERTICAL		64	5′-10	390	64	5′-10	390	64	6′-2	412	64	6′-11	462	64	7′-8	512	64	7′-8	512	64	7′-8	512
4t1	UNDER BEAMS AT ABUTMENTS		10	4′-11	33	10	4′-11	33	10	4′-11	33	10	4′-11	33	10	5′-1	34	10	5′-1	34	10	5′-1	34
#2	PILE SPIRAL - NO. 2 BAR		12	38′-6	77	12	38′-6	77	12	38′-6	77	18	38′-6	115	20	38′-6	128	22	38′-6	141	22	38′-6	141
	SPIRAL SPACER $L\frac{7}{8}\times\frac{7}{8}\times\frac{1}{8}\times$ 0.70		24	1′-10	32	24	1′-10	32	24	1′-10	32	36	1′-10	47	40	1′-10	53	44	1′-10	59	44	1′-10	59
	REINFORCING STEEL (LBS.)				21636			23594			26678			32327			35055			37617			39944
	SEE BARRIER RAIL DETAILS (LBS.)				4054			4410			4968			6002			6438			6875			7353
	SEE OPEN RAIL DETAILS (LBS.)				4179			4572			5277			6816			7478			7900			8322

* VARIES FROM 3′-1 TO 30′-4 ** VARIES FROM 2′-5 TO 31′-0

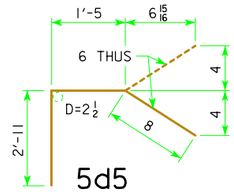
CONCRETE PLACEMENT QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

			46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
SLAB, AND ABUT. DIAPHRAGM	WITH BARRIER RAIL	CU.YD.	73.8	81.0	96.4	117.0	133.6	142.9	152.0
	WITH OPEN RAIL	CU.YD.	75.2	82.7	98.5	119.5	136.4	146.0	155.4
PAVING BLOCKS		CU.YD.	2.8	2.8	2.8	2.8	2.8	2.8	2.8
ABUTMENT WINGS		CU.YD.	7.2	7.2	7.6	8.4	9.2	9.2	9.2
ABUTMENT FOOTINGS		CU.YD.	30.7	30.7	30.7	38.5	38.5	38.5	38.5

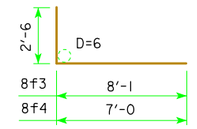
ESTIMATED QUANTITIES (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

			46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
NO. OF STEEL H-PILES FOR TWO ABUTS. (HP10X57)		NO.	12	12	12	18	20	20	20
STRUCTURAL CONCRETE, (BRIDGE)	WITH BARRIER RAIL	CU.YD.	113.4	120.6	136.4	165.6	183	192.3	201.4
	WITH OPEN RAIL	CU.YD.	114.8	122.3	138.5	168.1	185.8	195.4	204.8
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	128.3	144.9	169.9	214.9	234.9	254.9	274.9
REINFORCING STEEL	WITH BARRIER RAIL	LBS.	25,490	27,804	31,446	38,120	41,284	44,283	47,088
	WITH OPEN RAIL	LBS.	25,815	28,166	32,064	39,143	42,533	45,517	48,266
STRUCTURAL STEEL	WITH BARRIER RAIL	LBS.	1532	1526	1570	1610	1695	1695	1695
	WITH OPEN RAIL	LBS.	1242	1235	1235	1235	1265	1265	1265

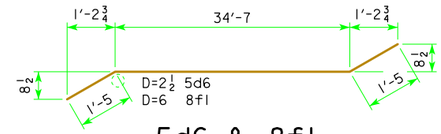
BENT BAR DETAILS



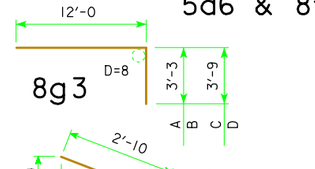
5d5



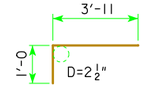
8f3 & 8f4



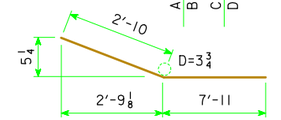
5d6 & 8f1



8g3



5k1



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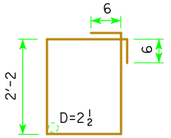
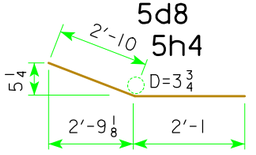
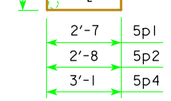
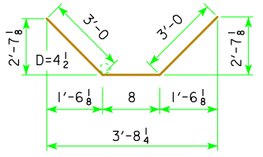


5h4

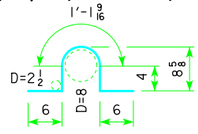




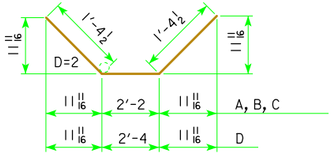
5p1, 5p2 & 5p4



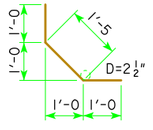
6p3



5r1



4t1



5k2

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D= PIN DIAMETER

REVISED 09-14 - CORRECTED THE BARRIER RAIL REINFORCING STEEL QUANTITIES FOR ALL THE BRIDGE LENGTHS.
REVISED 05-15 - CORRECTED THE CONCRETE QUANTITIES OF THE PAVING BLOCKS FOR ALL THE BRIDGE LENGTHS. (WAS 1.7 CU.YD.)

05-15 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

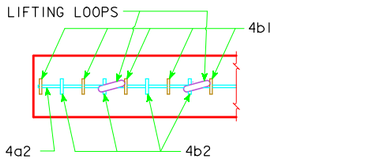
STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

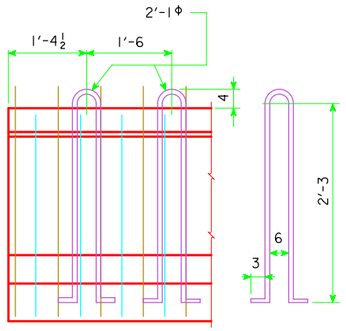
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

DECK & ABUTMENT REINF.
30 SKEW

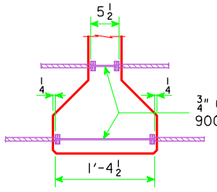
H30SI-20-12





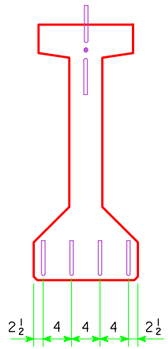
LIFTING LOOP DETAIL

ALTERNATE TYPES MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ARE TO BE STRUCTURAL GRADE.

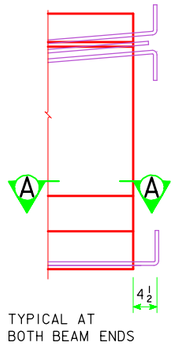


COIL TIE DETAIL

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.

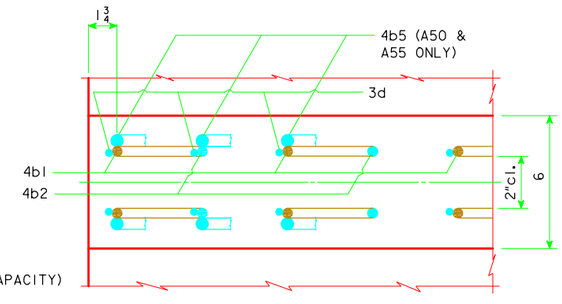


2 TOP DEFLECTED OR STRAIGHT STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN (BEND TOP AND BOTTOM ROWS). THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.



TYPICAL AT BOTH BEAM ENDS

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

A BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS ③ KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)				DEFLECTION (in.) Δ_D						WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
				STRAIGHT	DEFLECTED			AT RELEASE		AFTER LOSSES		IMMEDIATE① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T							
													STEEL DIAPH.		STEEL DIAPH.						
A46	46'-8	47'-8	0.60	8	2	426	8.5	0.76		1.35			0.44		0.11				7.7		3.82	488
A55	55'-0	56'-0	0.60	10	3	553	10.8	1.29		2.30			0.82		0.21				9.1		4.49	547

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, Δ_D, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's = 270 ksi AND As = 0.217 sq. in.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5.
MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7,000 psi.
MINIMUM f'ci AT RELEASE SHALL BE 6,000 psi.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, f's = 270,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO HL-93 LIVE LOADS AS WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE SLAB IS PLACED EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.

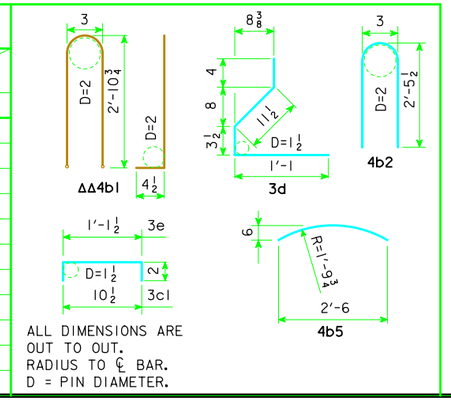
ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

REINFORCING BAR LIST

BEAM / SPAN		A46 46'-8		A55 55'-0	
BAR	SHAPE	NO.	LENGTH	NO.	LENGTH
5a1		4	24'-11	4	29'-1
4a2		2	3'-3	2	3'-3
ΔΔ 4b1		44	6'-8	50	6'-8
4b2		12	5'-0	8	5'-0
4b5		—	—	12	2'-9
3c1		44	1'-3	50	1'-3
** 3d		112	2'-8	116	2'-8
3e		20	1'-6	18	1'-6



ALL DIMENSIONS ARE OUT TO OUT.
RADIUS TO ℄ BAR.
D = PIN DIAMETER.

ΔΔ 4b1 BARS TO BE EPOXY COATED.

** WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

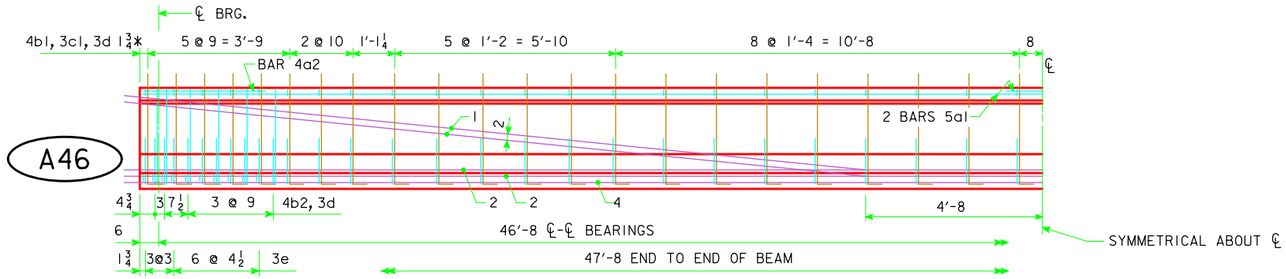
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

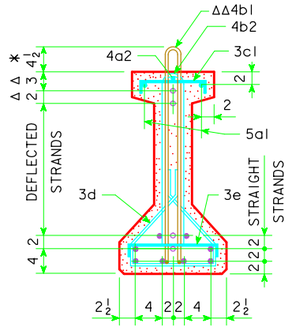
APRIL, 2012

A BEAM DETAILS

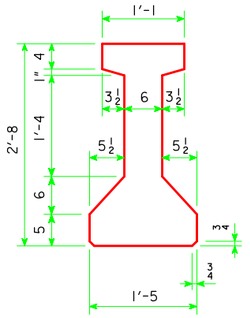
H30SI-21-12

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.



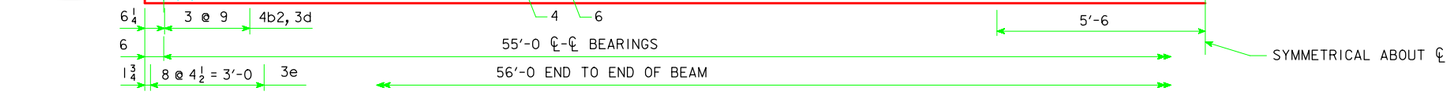


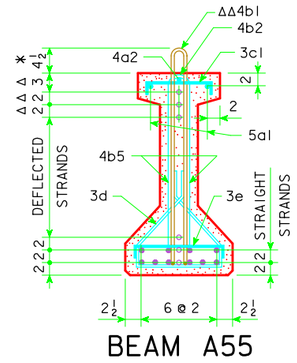
BEAM A46



"A" BEAM
CROSS SECTION

A = 311.5 in.²
Y_b = 14.05 in.
I = 34,082 in.⁴





BEAM A55

NOTE: BARS 3d ARE TO BE PLACED IN PAIRS.

○ DEFLECTED STRANDS
* KEEP
Δ DIMENSIONS AT END OF BEAM
ΔΔ EPOXY COATED BARS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

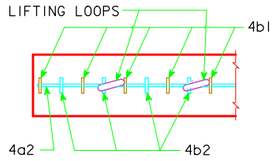
STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

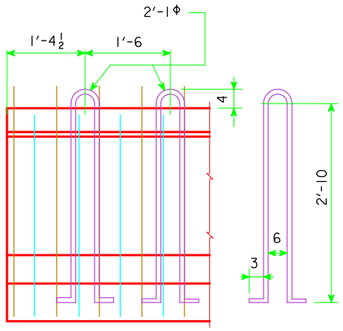
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

A46-A55 BEAM DETAILS

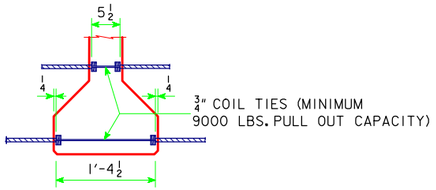
H30SI-22-12





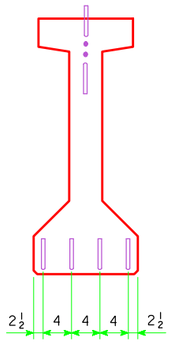
LIFTING LOOP DETAIL

ALTERNATE TYPES MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ARE TO BE STRUCTURAL GRADE.

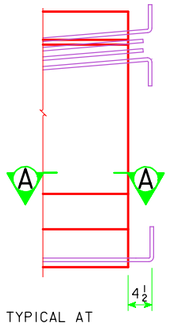


COIL TIE DETAIL

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.

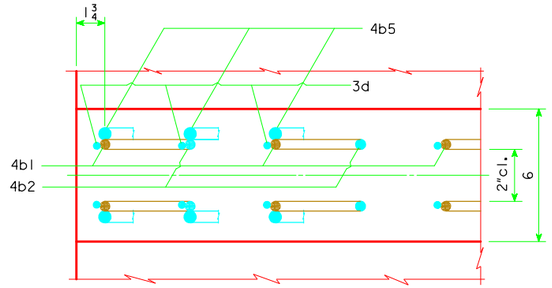


2 TOP DEFLECTED OR STRAIGHT STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN (BEND TOP AND BOTTOM ROWS). THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.



TYPICAL AT BOTH BEAM ENDS.

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

B BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS ③ KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)		DEFLECTION (in.) Δ_D				WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
				STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES	IMMEDIATE① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T					
											STEEL DIAPH.		STEEL DIAPH.				
B67	67'-6	68'-6	0.60	14	3	723	11.6	1.69	2.98		1.02		0.25		13.6	6.74	778

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, Δ_D, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's = 270 ksi AND As = 0.217 sq. in.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5.
MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7,000 psi.
MINIMUM f'ci AT RELEASE SHALL BE 6,000 psi.

PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, f's = 270,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO HL-93 LIVE LOADS AS WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE SLAB IS PLACED EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.

ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

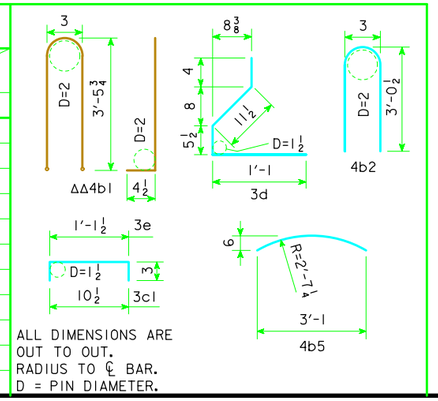
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

ΔΔ4b1 BARS TO BE EPOXY COATED.

** WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.

REINFORCING BAR LIST

	BEAM / SPAN		B67 / 67'-6				
	BAR	SHAPE	NO.	LENGTH			
	6a1		4	35'-7			
	4a2		2	4'-2			
ΔΔ	4b1		56	7'-10			
	4b2		12	6'-2			
	4b5		12	3'-3			
	3c1		56	1'-5			
**	3d		136	2'-10			
	3e		24	1'-8			



ALL DIMENSIONS ARE OUT TO OUT.
RADIUS TO ℄ BAR.
D = PIN DIAMETER.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

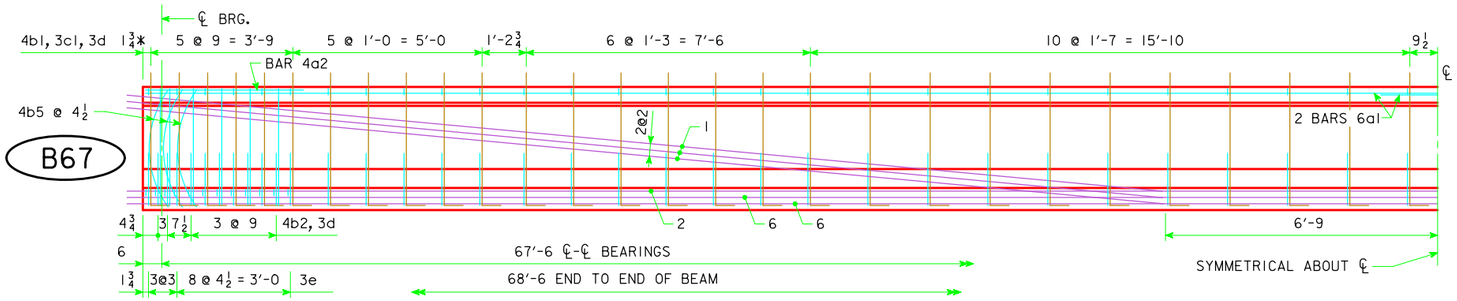
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

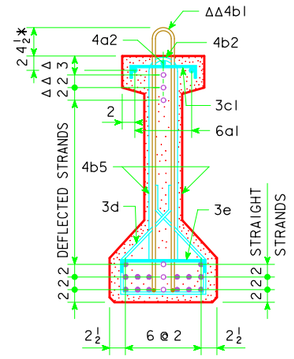
APRIL, 2012

B BEAM DETAILS

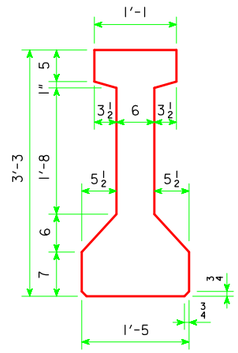
H30SI-23-12

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.





BEAM B67



"B" BEAM CROSS SECTION

A = 382.5 in.²
Yb = 17.06 in.
I = 62,000 in.⁴

NOTE: BARS 3d AND 4b5 ARE TO BE PLACED IN PAIRS.

○ DEFLECTED STRANDS
* KEEP
Δ DIMENSIONS AT END OF BEAM
ΔΔ EPOXY COATED BARS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

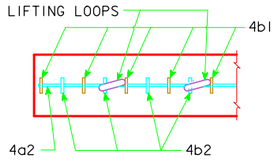
STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

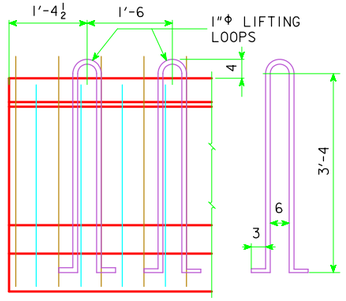
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

B67 BEAM DETAILS

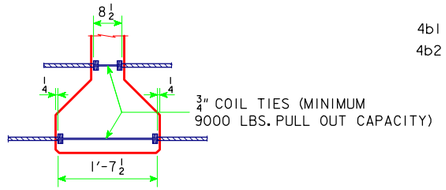
H30SI-24-12





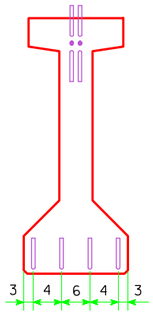
LIFTING LOOP DETAIL

ALTERNATE TYPES MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ARE TO BE STRUCTURAL GRADE.

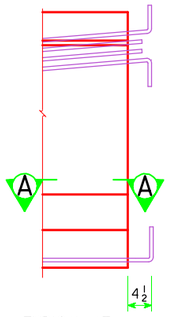


COIL TIE DETAIL

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.

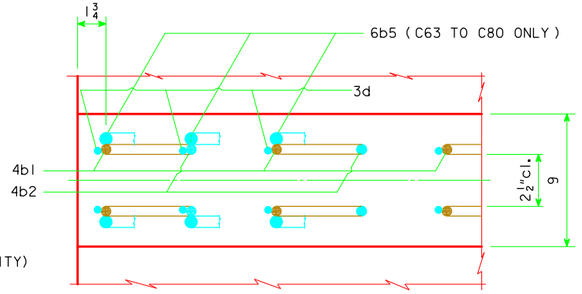


THE TOP STRAIGHT STRANDS OF BEAMS C30 THROUGH C67 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP. THE TOP AND BOTTOM DEFLECTED STRANDS OF BEAMS C71 THROUGH C80 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN. THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.



TYPICAL AT BOTH BEAM ENDS

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

C BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS ③ KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)				DEFLECTION (in.) Δ_D								WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
				STRAIGHT	DEFLECTED			AT RELEASE		AFTER LOSSES		IMMEDIATE① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T									
													STEEL DIAPH.		STEEL DIAPH.								
C80	80'-0	81'-0	0.60	16	6	936	21	1.64		2.90			1.16		0.29					23.8		11.76	1191

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, Δ_D, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
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③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's = 270 ksi AND As = 0.217 sq. in.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5.
MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 6,000 psi.
MINIMUM f'ci AT RELEASE SHALL BE 5,000 psi.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, f's = 270,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

BEAM NOTES:

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HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE SLAB IS PLACED EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.

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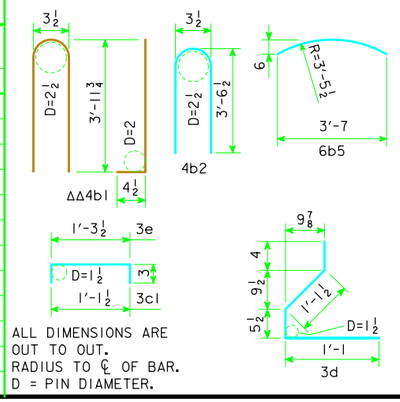
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

** WHERE DEFLECTING STRANDS INTERFERE WITH PLACEMENT, SOME IN-PLACE BENDING MAY BE NECESSARY.
ΔΔ 4b1 BARS TO BE EPOXY COATED.

REINFORCING BAR LIST

	BEAM / SPAN	C80 / 80'-0	
	BAR	SHAPE	NO.	LENGTH
	6a1		4	41'-10
	4a2		2	5'-0
	8a3		2	40'-0
ΔΔ	4b1		60	8'-10
	4b2		12	7'-2
	6b5		16	3'-9
	3c1		60	1'-8
**	3d		144	3'-0
	3e		26	1'-10



ALL DIMENSIONS ARE OUT TO OUT.
RADIUS TO ℄ OF BAR.
D = PIN DIAMETER.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

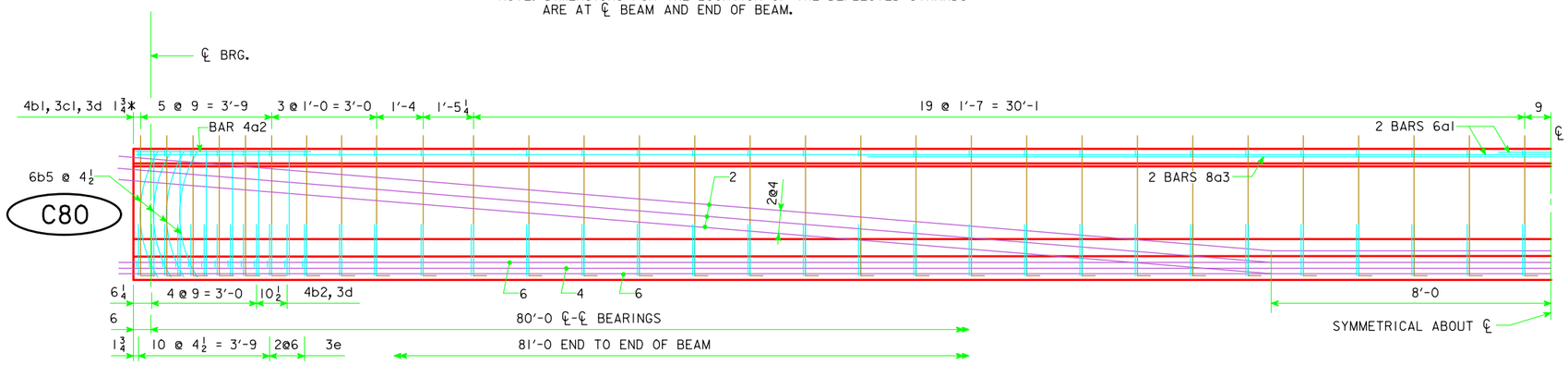
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

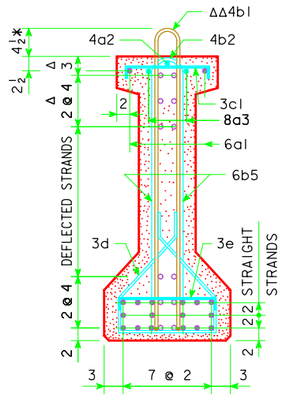
APRIL, 2012

C BEAM DETAILS

H30SI-25-12

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.





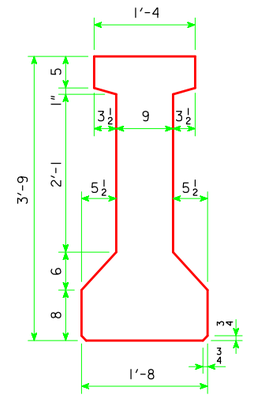
NOTE: BARS 6b5 AND 3d ARE TO BE PLACED IN PAIRS.

○ DEFLECTED STRANDS

* KEEP

Δ DIMENSIONS AT END OF BEAM

ΔΔ EPOXY COATED BARS



"C" BEAM CROSS SECTION

A = 564.5 in²
Yb = 20.23 in
I = 116,354 in⁴

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

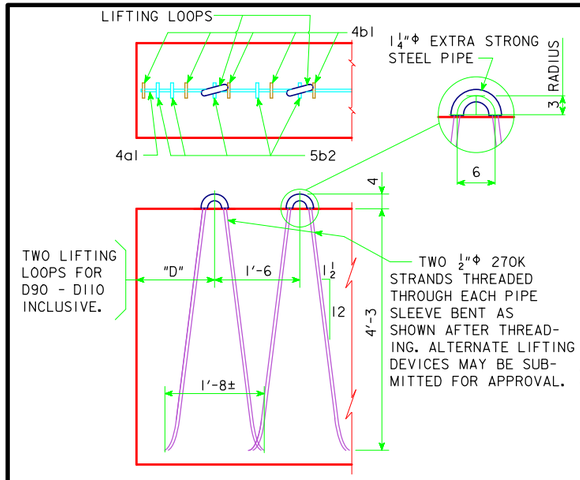
IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

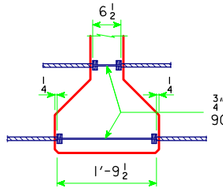
C80 BEAM DETAILS | H30SI-26-12



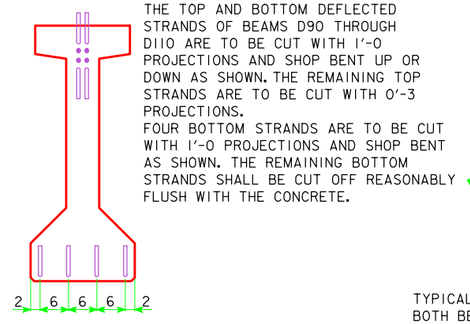
LIFTING LOOP DETAIL

"D" = 1'-3 FOR D90
"D" = 3'-9 FOR D100
"D" = 8'-2 FOR D110

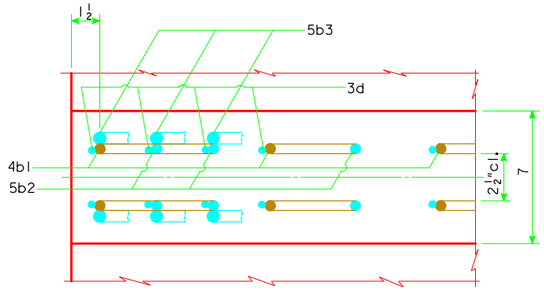
NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.



COIL TIE DETAIL



STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

D BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS ③ KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)		DEFLECTION (in.) Δ_D				WEIGHT (TONS)		CONCRETE (C.Y.)	REINFORCING STEEL - (lbs.)
				STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES	IMMEDIATE ① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T					
											STEEL DIAPH.		STEEL DIAPH.				
D90	90'-0	91'-0	0.60	16	6	936	25.8	1.40	2.46	0.93		0.23		30.4		15.0	1310
*D100	100'-0	101'-0	0.60	22	6	1192	22.3	2.08	3.67	1.41		0.35		33.6		16.6	1521
ΔD110	110'-0	111'-0	0.60	28	6	1446	21.2	2.83	4.83	1.69		0.42		36.9		18.2	1664

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, Δ_D, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's = 270 ksi AND As = 0.217 sq. in.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 5000 psi (EXCEPT AS NOTED)

* MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7500 psi. MINIMUM f'ci AT RELEASE SHALL BE 6000 psi.

Δ MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7500 psi. MINIMUM f'ci AT RELEASE SHALL BE 6500 psi.

PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, f's = 270,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO HL-93 LIVE LOADS AS WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE SLAB IS PLACED EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.

ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

FOR TRANSPORTING, THE OVERHANG SHALL BE IN ACCORDANCE WITH ARTICLE 2407.03, K, OF THE STANDARD SPECIFICATIONS, EXCEPT THE OVERHANG MAY BE INCREASED TO A MAXIMUM OF 9 FEET FOR THE D90 BEAM, 12 FEET FOR THE D100 BEAM, AND 14 FEET FOR THE D110 BEAM.

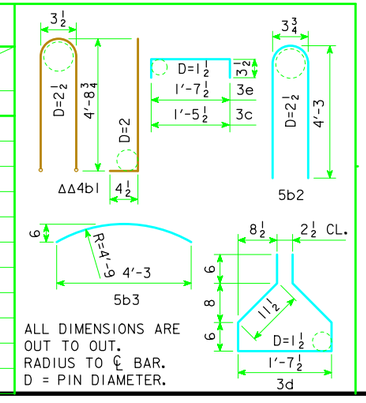
THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE D100 AND D110 BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

A=SIZE
B=NO.

ΔΔ 4b1 BARS TO BE EPOXY COATED

REINFORCING BAR LIST

BEAM / SPAN		D90 90'-0		D100 100'-0		D110 110'-0	
BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
4a1	—	2	18'-0	2	22'-0	2	26'-6
a2	—	5/4	30'-10	6/4	35'-4	6/4	38'-4
a3	—	7/2	34'-0	8/2	36'-0	8/2	40'-0
ΔΔ4b1		74	10'-4	81	10'-4	91	10'-4
5b2		16	8'-8	16	8'-8	16	8'-8
5b3		20	4'-4	20	4'-4	20	4'-4
3c		74	2'-1	81	2'-1	91	2'-1
3d		90	5'-7	97	5'-7	107	5'-7
3e		30	2'-3	30	2'-3	30	2'-3



LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

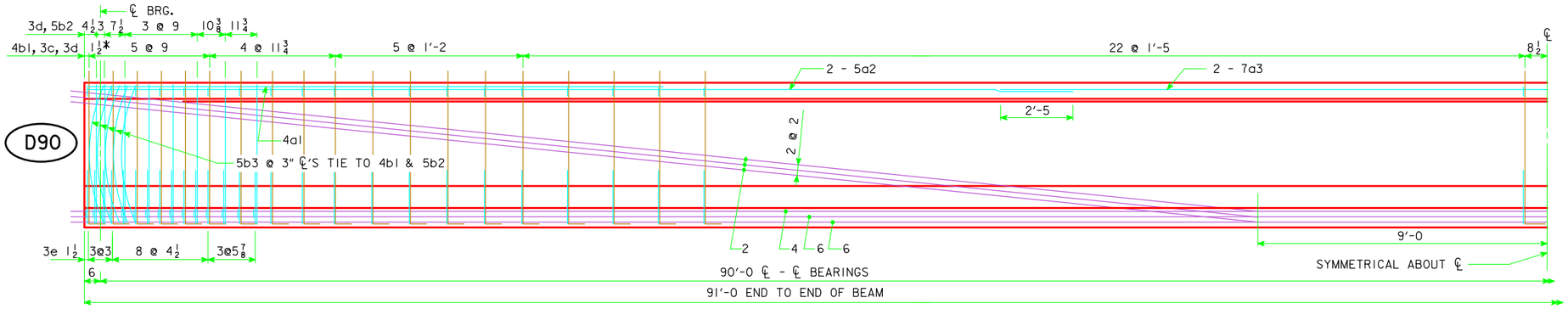
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

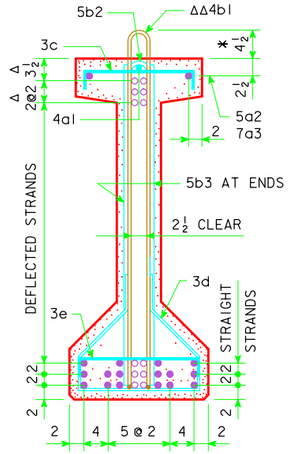
APRIL, 2012

D BEAM DETAILS

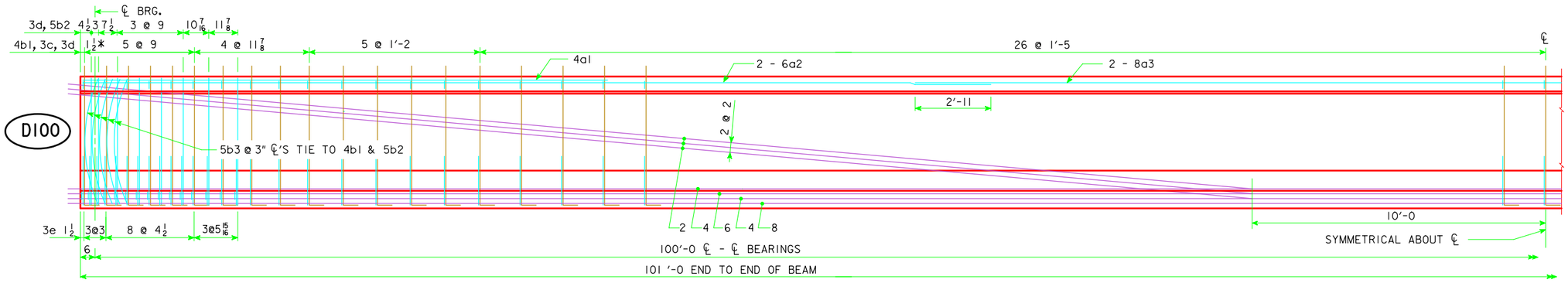
H30SI-27-12

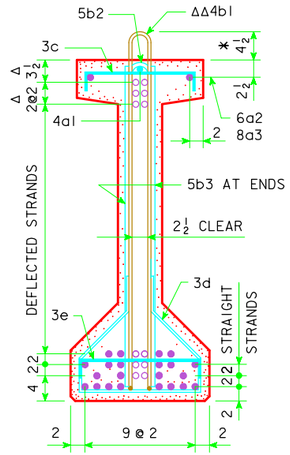
NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.





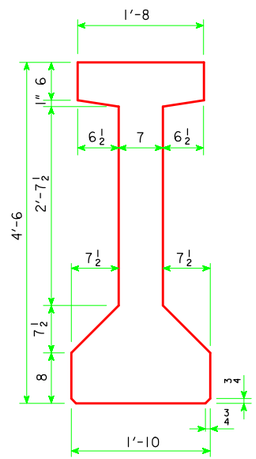
BEAM D90





BEAM D100

- ○ DEFLECTED STRANDS
- * KEEP
- ΔΔ EPOXY COATED BARS
- Δ DIMENSIONS AT END OF BEAM



"D" BEAM CROSS SECTION

AREA = 638.75 in²
Y_b = 24.37 in
I = 214,974 in⁴

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

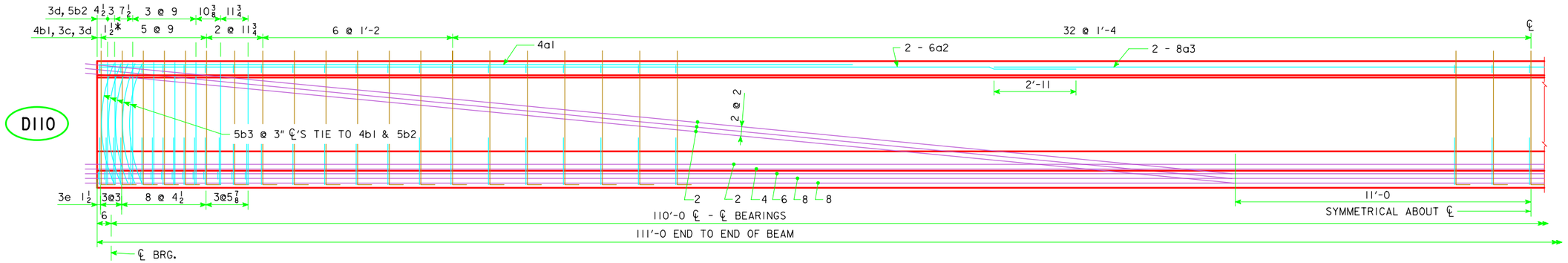
IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

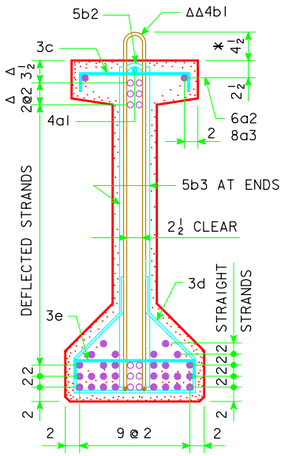
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

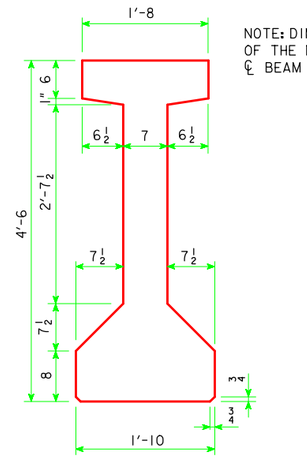
D90-D100 BEAM DETAILS | H30SI-28-12



ELEVATION VIEW



BEAM D110



D110 CROSS SECTION

AREA = 638.75 in²
Y_b = 24.37 in
I = 214,974 in⁴

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.

○ DEFLECTED STRANDS
✱ KEEP
ΔΔ EPOXY COATED BARS
Δ DIMENSIONS AT END OF BEAM

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

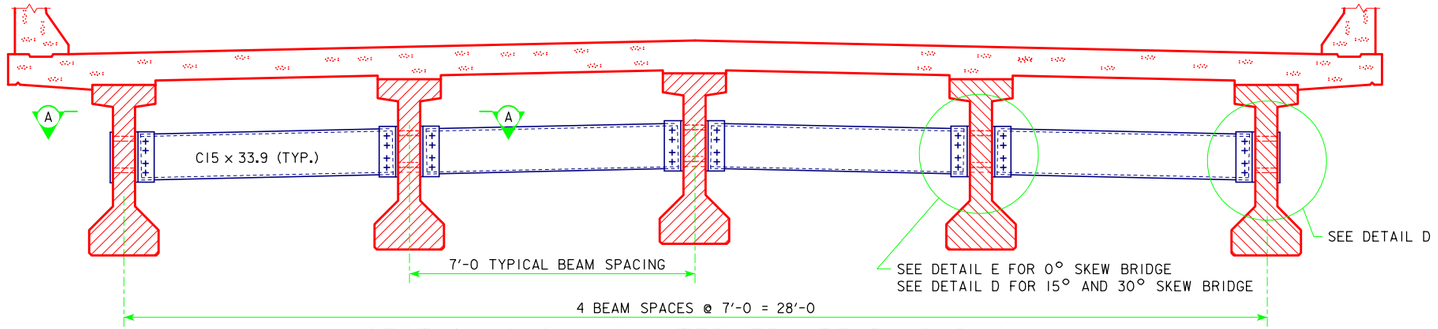
STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

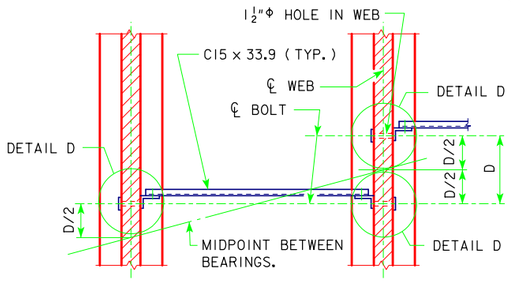
APRIL, 2012

D110 BEAM DETAILS

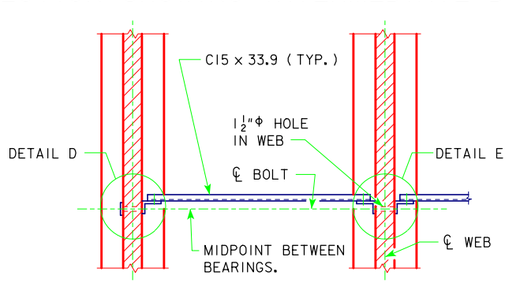
H30SI-29-12



SECTION SHOWING INTERMEDIATE DIAPHRAGM



SECTION A-A
FOR 15° AND 30° SKEW BRIDGES



SECTION A-A
FOR 0° SKEW BRIDGES

INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

ONE CONNECTION DETAIL "E"

2 - 7/8"Φ x LENGTH H.S. BOLTS WITH NUTS AND WASHERS

WEB THICKNESS	LENGTH OF H.S. BOLTS	WEIGHT PER DETAIL "E"
6"	9"	4.30 LBS.
7"	10"	4.66 LBS.
9"	12"	5.34 LBS.

2 - L 6 x 4 x 1/2 x 1'-3 1/4 = 41.2 LBS.

ONE CONNECTION DETAIL "D"

2 - 7/8"Φx LENGTH H.T.S. BOLTS WITH NUTS AND WASHERS

WEB THICKNESS	LENGTH OF H.S. BOLTS	WEIGHT PER DETAIL "D"
6"	9"	4.30 LBS.
7"	10"	4.66 LBS.
9"	12"	5.34 LBS.

1 - BACKING PL 4 x 3/8 x 1'-3 1/4 = 6.5 LBS.

1 - L 6 x 4 x 1/2 x 1'-3 1/4 = 20.6 LBS.

ONE C15 x 33.9 DIAPHRAGM

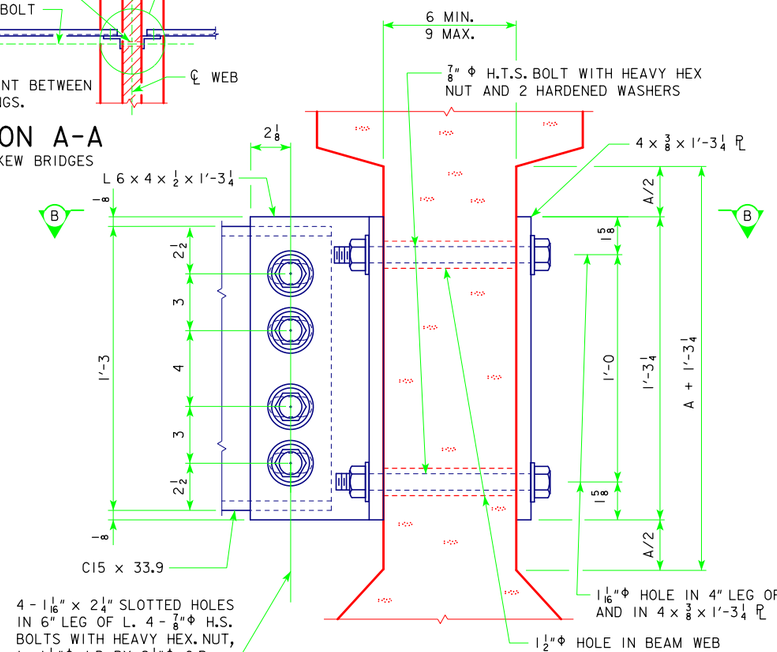
WEB THICKNESS \ BEAM SPACING	7'-0	
	* LENGTH	UNIT WEIGHT (LBS.)
6"	6'-2 5/8	210.8
7"	6'-1 5/8	208.0
9"	5'-11 5/8	202.4

DIAPHRAGM CONNECTION BOLTS

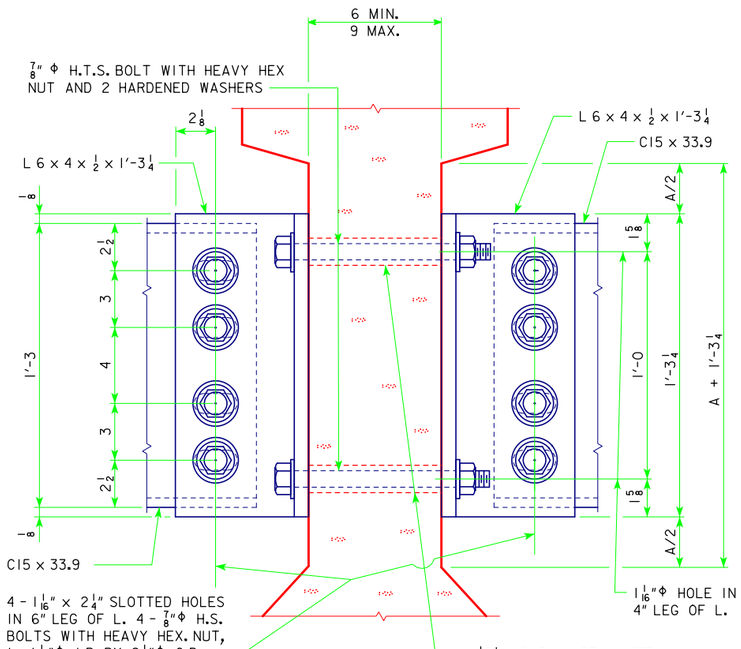
8 - 7/8"Φ x 0'-2 3/4 H.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM

10.3 LBS.

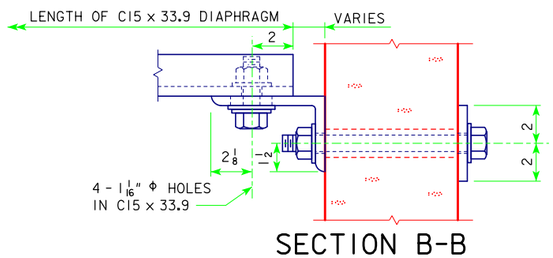
* THE LENGTH OF THE C15 x 33.9 SHOWN IN THE TABLE IS BASED ON A VARIABLE CLEARANCE OF 1 1/16 TO 2 1/16 BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.



DETAIL D



DETAIL E



SECTION B-B

BEAM SERIES	DIMENSIONS	
	A + 1'-3 1/4	A/2
A	1'-4	3/8
B	1'-8	2 3/8
C	2'-1	4 7/8
D	2'-7 1/2	8 1/8

NOTES:

ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

THE 1 1/2"Φ HOLES FOR THE 7/8"Φ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE 7/8"Φ H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.

ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

INTERMEDIATE STEEL DIAPHRAGMS

H30SI-30-12

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG		46′-8			55′-0			67′-6			80′-0			90′-0			100′-0			110′-0		
SKEW		0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
DIMENSION OR NUMBER	L (FT.-IN.)	63′-8	63′-9 1/4	64′-1 9/16	72′-0	72′-1 1/4	72′-5 9/16	84′-6	84′-7 1/4	84′-11 9/16	107′-0	107′-1 1/4	107′-5 9/16	117′-0	117′-1 1/4	117′-5 9/16	127′-0	127′-1 1/4	127′-5 9/16	137′-0	137′-1 1/4	137′-5 9/16
	B (FT.-IN.)	49′-8	49′-9 1/4	50′-1 9/16	58′-0	58′-1 1/4	58′-5 9/16	70′-6	70′-7 1/4	70′-11 9/16	93′-0	93′-1 1/4	93′-5 9/16	103′-0	103′-1 1/4	103′-5 9/16	113′-0	113′-1 1/4	113′-5 9/16	123′-0	123′-1 1/4	123′-5 9/16
	S (FT.-IN.)	49′-8	49′-9 1/4	50′-1 9/16	58′-0	58′-1 1/4	58′-5 9/16	70′-6	70′-7 1/4	70′-11 9/16	83′-0	83′-1 1/4	83′-5 9/16	93′-0	93′-1 1/4	93′-5 9/16	103′-0	103′-1 1/4	103′-5 9/16	113′-0	113′-1 1/4	113′-5 9/16
	C	39	39	39	47	47	47	60	60	60	72	72	72	82	82	82	92	92	92	102	102	102
	D (FT.-IN.)	39′-0	39′-0	39′-0	47′-0	47′-0	47′-0	60′-0	60′-0	60′-0	72′-0	72′-0	72′-0	82′-0	82′-0	82′-0	92′-0	92′-0	92′-0	102′-0	102′-0	102′-0
	E	40	40	40	48	48	48	61	61	61	73	73	73	83	83	83	93	93	93	103	103	103
	F (FT.-IN.)	0′-0	0′-0	0′-0	0′-0	0′-0	0′-0	0′-0	0′-0	0′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0
	W (FT.-IN.)	4′-10	4′-10 5/8	5′-0 13/16	5′-0	5′-0 5/8	5′-2 13/16	4′-9	4′-9 5/8	4′-11 13/16	5′-0	5′-0 5/8	5′-2 13/16	5′-0	5′-0 5/8	5′-2 13/16	5′-0	5′-0 5/8	5′-2 13/16	5′-0	5′-0 5/8	5′-2 13/16
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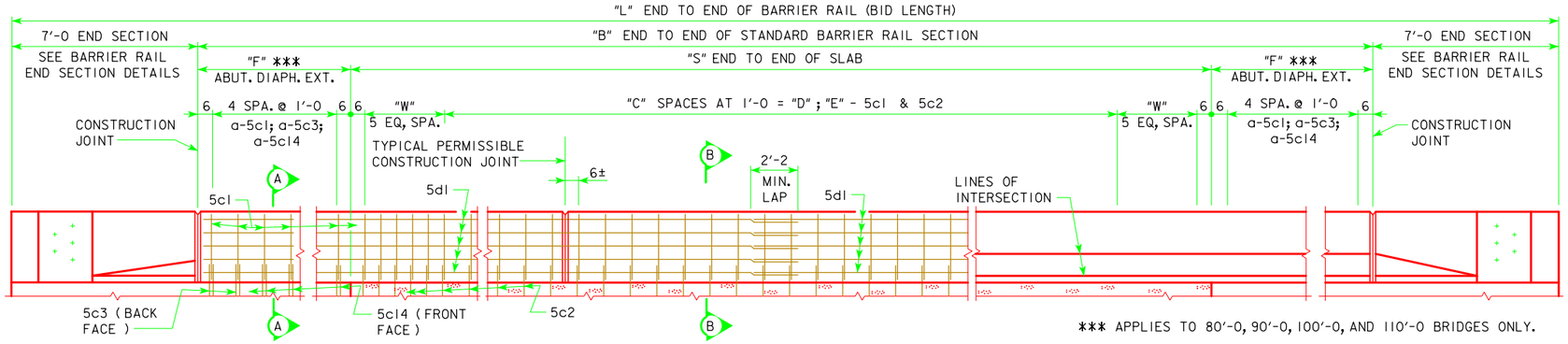
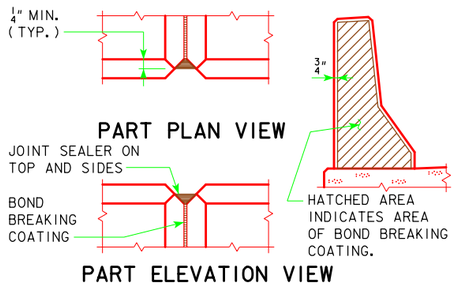
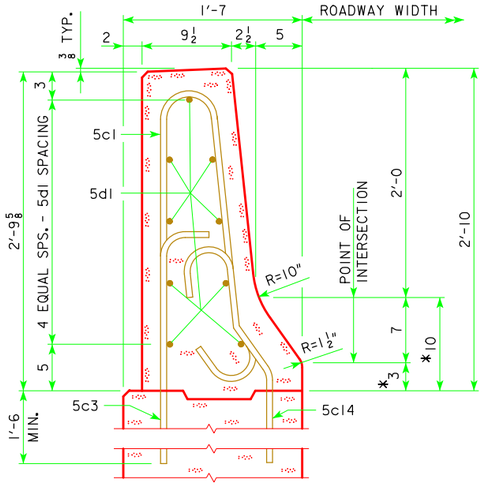


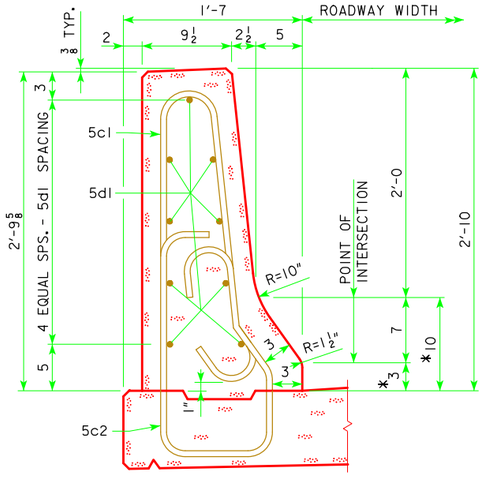
ELEVATION OF BARRIER RAIL LAYOUT



BARRIER RAIL JOINT DETAILS



PART SECTION A-A



PART SECTION B-B

*DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

BARRIER RAIL NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03B OF THE STANDARD SPECIFICATION. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

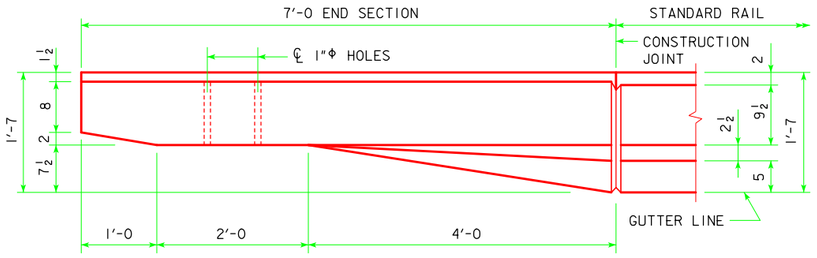
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

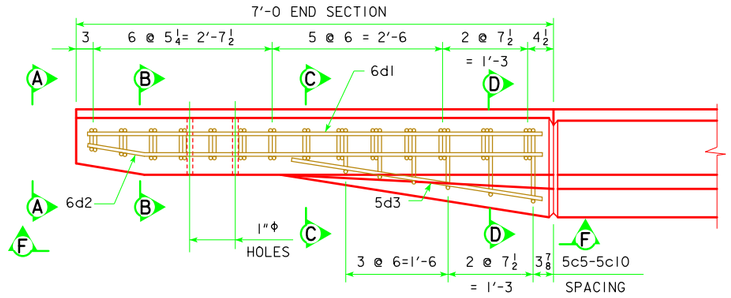
BARRIER RAIL DETAILS

SHEET 1 OF 3

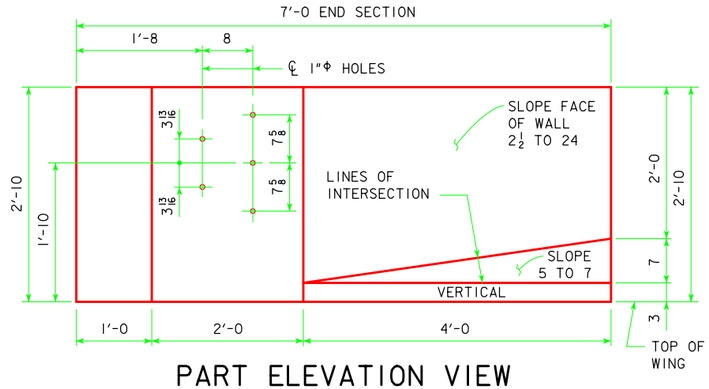
H30SI-31-12



PART PLAN VIEW

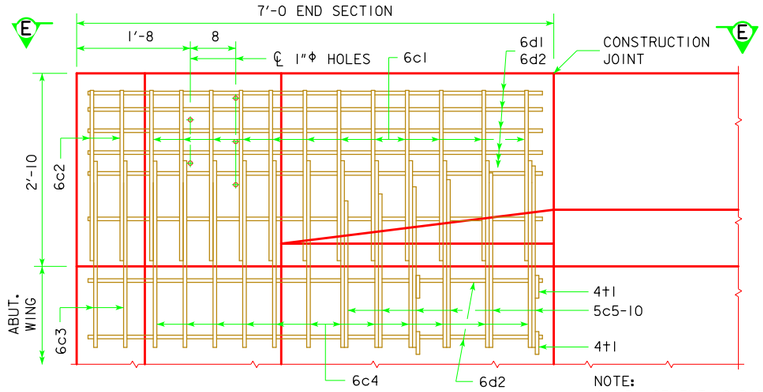


PART VIEW E-E



PART ELEVATION VIEW

PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



PART VIEW F-F

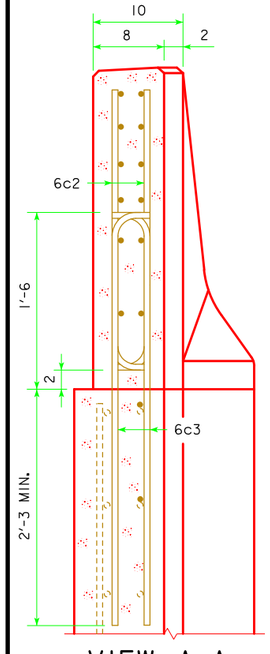
NOTE:
4t1 PLACEMENT- 2 BARS EACH LEVEL OF 6d2 IN WING FOOTING.

NOTE:
CONSTRUCTION JOINT BETWEEN TOP OF WING AND BARRIER RAIL IS ROUGHENED CONCRETE.

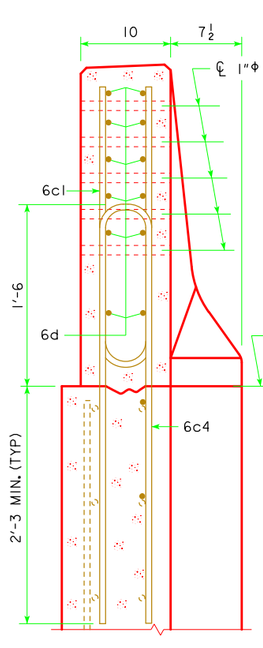
NOTE:
THE 10" RADIUS AND 1½" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

NOTE:
THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND 4t1 BARS ARE TO BE PLACED WITH THE ABUTMENT WING. THE DETAILS FOR PLACEMENT ARE SHOWN ON THE WING ABUTMENT SHEET.

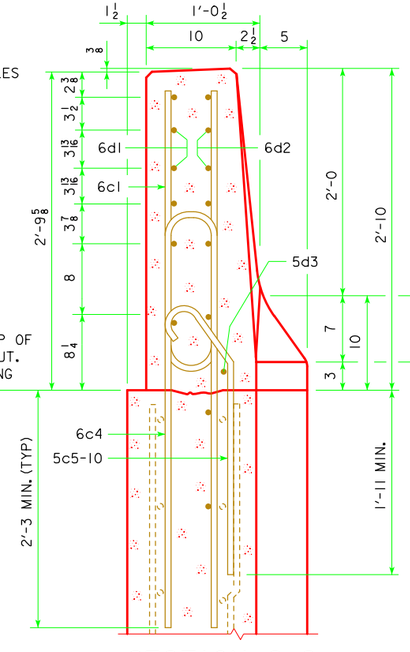
NOTE:
DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE WING ABUTMENT SHEET FOR PLACEMENT.



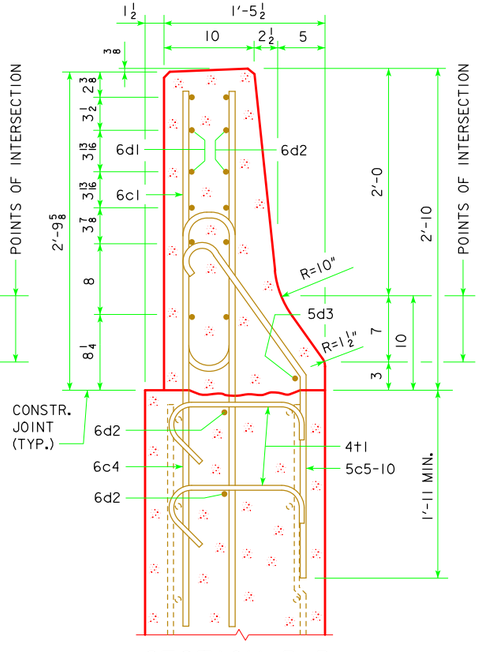
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

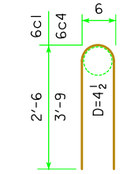
REINFORCING STEEL - ONE END SECTION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	VERTICAL		12	5'-6	99
6c2	VERTICAL		4	2'-10	17
6c3	VERTICAL		4	4'-1	25
6c4	VERTICAL		12	8'-0	144
5c5-10	VERTICAL		6	VARIES	23
6d1	HORIZONTAL		6	6'-8	60
6d2	HORIZONTAL		8	6'-9	81
5d3	HORIZONTAL		1	3'-9	4
4t1	ABUTMENT WING TIE BARS		4	VARIES	5
(INCLUDE WITH BARRIER RAIL REINFORCING)		TOTAL WEIGHT (LBS.)			458

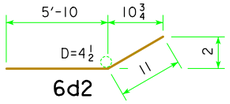
CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS

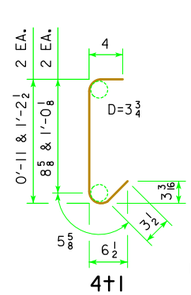


6c1 & 6c4

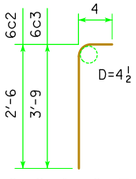


6d2

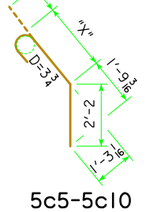
BAR	"X"
5c5	0'-6½
5c6	0'-8½
5c7	0'-10¼
5c8	1'-0¼
5c9	1'-2
5c10	1'-4



4t1



6c2 & 6c3



5c5-5c10

NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

BARRIER RAIL DETAILS

SHEET 2 OF 3

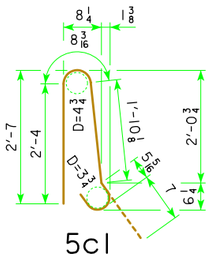
H20SI-32-12

REINFORCING STEEL-TWO BARRIER RAILS

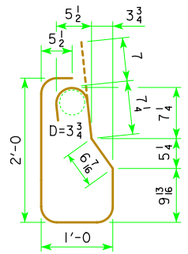
(NOTE: THESE REINFORCING BARS TO BE USED ON ALL SKEWS)

BRIDGE LENGTH				46′-8			55′-0			67′-6			80′-0			90′-0			100′-0			110′-0		
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL		100	5′-11	617	116	5′-11	716	142	5′-11	876	186	5′-11	1148	206	5′-11	1271	226	5′-11	1395	246	5′-11	1518
	5c2	VERTICAL		100	6′-0	626	116	6′-0	726	142	6′-0	889	166	6′-0	1039	186	6′-0	1164	206	6′-0	1289	226	6′-0	1414
	5c3	VERTICAL		-	-	-	-	-	-	-	-	-	20	3′-3	65	20	3′-3	65	20	3′-3	65	20	3′-3	65
	5c14	VERTICAL		-	-	-	-	-	-	-	-	-	20	3′-10	80	20	3′-10	80	20	3′-10	80	20	3′-10	80
	5d1	LONGITUDINAL		36	26′-1	979	36	30′-3	1136	36	36′-6	1371	54	32′-7	1835	54	35′-11	2023	54	39′-3	2211	72	32′-6	2441
		4 END SECTIONS @ 458 LBS.				1832			1832			1832			1832			1832			1832			1832
TOTAL LBS. (INCLUDE WITH SUPERSTRUCTURE REINFORCING)						4054			4410			4968			6002			6438			6875			7353

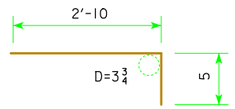
BENT BAR DETAILS



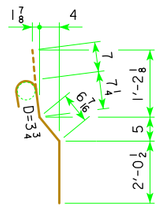
5c1



5c2



5c3



5c14

NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

CONCRETE PLACEMENT SUMMARY

BRIDGE LENGTH		46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
STANDARD SECTION *	2 X B @ 0.1052 CU.YD. PER FT.	10.5	12.3	14.9	19.7	21.8	23.9	26.0
END SECTION	4 @ 0.65 CU.YD.	2.6	2.6	2.6	2.6	2.6	2.6	2.6
	TOTAL (CU. YD.)	13.1	14.9	17.5	22.3	24.4	26.5	28.6

* SEE SHEET H30SI-34-12 FOR DIMENSION "B".
CONCRETE QUANTITIES SHOWN ARE BASED
ON 30° SKEW BID LENGTHS.

CONCRETE BARRIER RAIL QUANTITIES

BRIDGE LENGTH		UNIT	46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
CONCRETE BARRIER RAILING	0° SKEW	L.F.	127.3	144.0	169.0	214.0	234.0	254.0	274.0
CONCRETE BARRIER RAILING	15° SKEW	L.F.	127.5	144.2	169.2	214.2	234.2	254.2	274.2
CONCRETE BARRIER RAILING	30° SKEW	L.F.	128.3	144.9	169.9	214.9	234.9	254.9	274.9

LATEST REVISION DATE

Karen K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

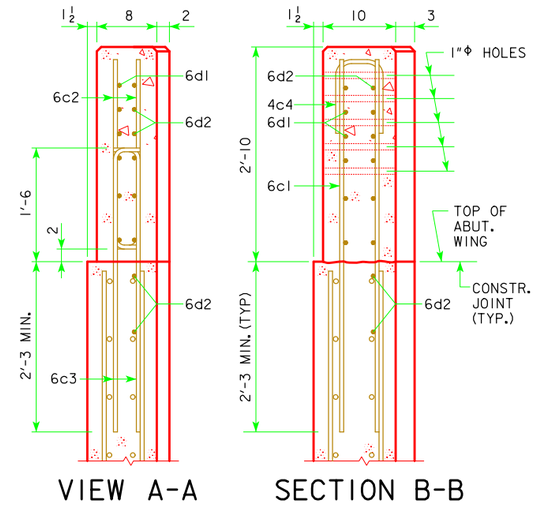
APRIL, 2012

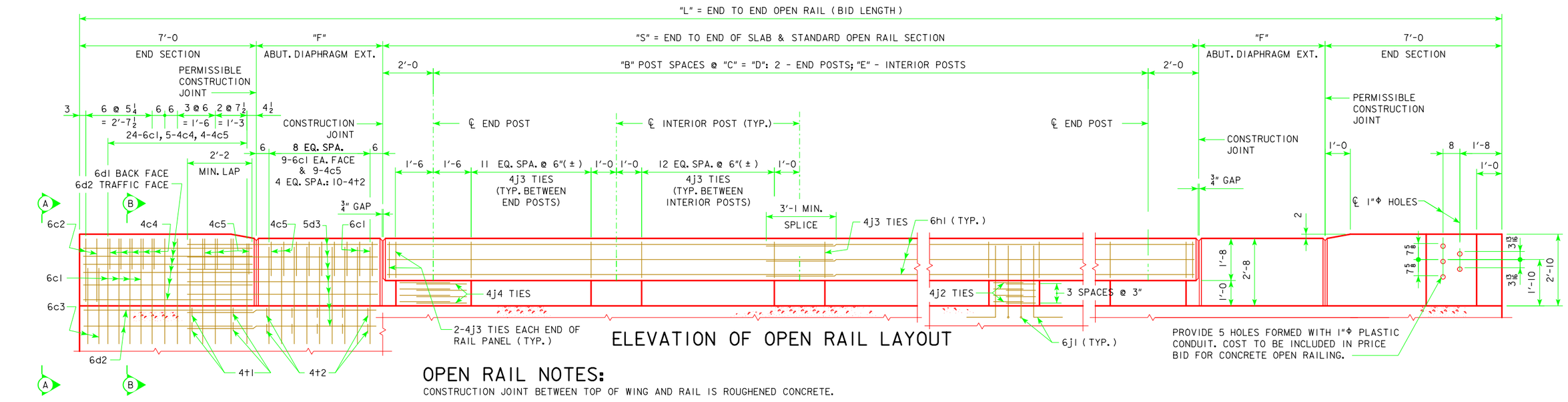
BARRIER RAIL DETAILS
SHEET 3 OF 3

H30SI-33-12

TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG.		46′-8			55′-0			67′-6			80′-0			90′-0			100′-0			110′-0			℄-℄ ABUT. BRG.	
SKEW		0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	SKEW	
DIMENSION OR NUMBER	L (FT.-IN.)	63′-8	63′-9 1/4	64′-1 5/8	72′-0	72′-1 1/4	72′-5 5/8	84′-6	84′-7 1/4	84′-11 5/8	107′-0	107′-1 1/4	107′-5 5/8	117′-0	117′-1 1/4	117′-5 5/8	127′-0	127′-1 1/4	127′-5 5/8	137′-0	137′-1 1/4	137′-5 5/8	L (FT.-IN.)	DIMENSION OR NUMBER
	S (FT.-IN.)	49′-8	49′-9 1/4	50′-1 5/8	58′-0	58′-1 1/4	58′-5 5/8	70′-6	70′-7 1/4	70′-11 5/8	83′-0	83′-1 1/4	83′-5 5/8	93′-0	93′-1 1/4	93′-5 5/8	103′-0	103′-1 1/4	103′-5 5/8	113′-0	113′-1 1/4	113′-5 5/8	S (FT.-IN.)	
	B	6	6	6	7	7	7	9	9	9	10	10	10	12	12	12	13	13	13	14	14	14	B	
	C (FT.-IN.)	7′-7 3/8	7′-7 1/2	7′-8 1/4	7′-8 5/8	7′-8 3/4	7′-9 3/8	7′-4 5/8	7′-4 3/4	7′-5 1/4	7′-10 3/4	7′-10 7/8	7′-11 3/8	7′-5	7′-5 1/8	7′-5 1/2	7′-7 3/8	7′-7 1/2	7′-7 3/4	7′-9 3/8	7′-9 1/2	7′-9 7/8	C (FT.-IN.)	
	D (FT.-IN.)	45′-8	45′-9 1/4	46′-1 5/8	54′-0	54′-1 1/4	54′-5 5/8	66′-6	66′-7 1/4	66′-11 5/8	79′-0	79′-1 1/4	79′-5 5/8	89′-0	89′-1 1/4	89′-5 5/8	99′-0	99′-1 1/4	99′-5 5/8	109′-0	109′-1 1/4	109′-5 5/8	D (FT.-IN.)	
	E	5	5	5	6	6	6	8	8	8	9	9	9	11	11	11	12	12	12	13	13	13	E	
	F (FT.-IN.)	0	0	0	0	0	0	0	0	0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	5′-0	F (FT.-IN.)	





ELEVATION OF OPEN RAIL LAYOUT

OPEN RAIL NOTES:

CONSTRUCTION JOINT BETWEEN TOP OF WING AND RAIL IS ROUGHENED CONCRETE.

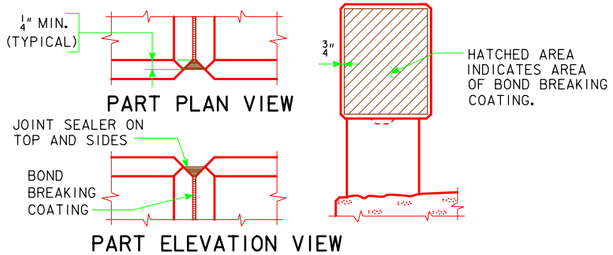
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

THE CAST-IN-PLACE OPEN RAIL SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED.

TOP OF THE OPEN RAIL IS TO BE PARALLEL TO THEORETICAL ℄ GRADE.



OPEN RAIL JOINT DETAILS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

OPEN RAIL, TL-4 DETAILS

SHEET 1 OF 2

H30SI-34-12

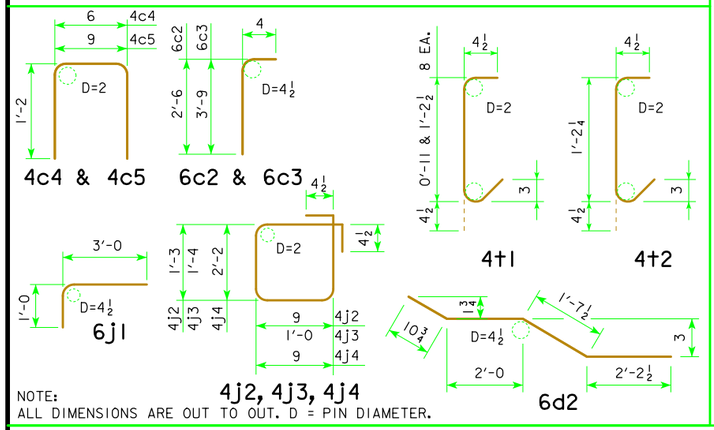
REINFORCING STEEL-TWO OPEN RAILS

(NOTE: THESE REINFORCING BARS TO BE USED ON ALL SKEWS)

BRIDGE LENGTH			46′-8			55′-0			67′-6			80′-0			90′-0			100′-0			110′-0		
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6c1	VERTICAL, END SECTION & ABUT. DIAPH. EXT.	—	96	4′-11	709	96	4′-11	709	96	4′-11	709	168	4′-11	1,241	168	4′-11	1,241	168	4′-11	1,241	168	4′-11	1241
6c2	VERTICAL, END SECTION	—	16	2′-10	68	16	2′-10	68	16	2′-10	68	16	2′-10	68	16	2′-10	68	16	2′-10	68	16	2′-10	68
6c3	VERTICAL, END SECTION	—	16	4′-1	98	16	4′-1	98	16	4′-1	98	16	4′-1	98	16	4′-1	98	16	4′-1	98	16	4′-1	98
4c4	VERTICAL HOOPS, END SECTION	⊓	20	2′-10	38	20	2′-10	38	20	2′-10	38	20	2′-10	38	20	2′-10	38	20	2′-10	38	20	2′-10	38
4c5	VERT. HOOPS, END SEC. & ABUT. DIAPH. EXT.	⊓	16	3′-1	33	16	3′-1	33	16	3′-1	33	52	3′-1	107	52	3′-1	107	52	3′-1	107	52	3′-1	107
6d1	HORIZONTAL, END SECTION-BACK FACE	—	24	6′-8	240	24	6′-8	240	24	6′-8	240	24	6′-8	240	24	6′-8	240	24	6′-8	240	24	6′-8	240
6d2	HORIZONTAL, END SECTION-TRAFFIC FACE	⌒	32	6′-9	324	32	6′-9	324	32	6′-9	324	32	6′-9	324	32	6′-9	324	32	6′-9	324	32	6′-9	324
5d3 *	HORIZONTAL, ABUT. DIAPH. EXT.-BOTH FACES	—	——	——	——	——	——	——	——	——	——	48	7′-2	359	48	7′-2	359	48	7′-2	359	48	7′-2	359
6h1	LONGITUDINAL, OPEN RAIL	—	24	26′-6	955	24	30′-8	1,106	24	36′-11	1,331	36	29′-10	1,613	36	33′-2	1,793	36	36′-6	1,974	36	39′-10	2,154
6j1	VERTICAL DOWELS, OPEN RAIL	⌐	120	4′-0	721	136	4′-0	818	168	4′-0	1009	184	4′-0	1105	216	4′-0	1298	232	4′-0	1394	248	4′-0	1490
4j2	HOOP, INTERIOR POST	▭	80	4′-9	254	96	4′-9	305	128	4′-9	406	144	4′-9	457	176	4′-9	558	192	4′-9	609	208	4′-9	660
4j3	HOOP, OPEN RAIL	▭	160	5′-5	579	186	5′-5	673	238	5′-5	861	264	5′-5	955	316	5′-5	1143	342	5′-5	1237	368	5′-5	1332
4j4	HOOP, END POST	▭	32	6′-7	141	32	6′-7	141	32	6′-7	141	32	6′-7	141	32	6′-7	141	32	6′-7	141	32	6′-7	141
4t1	WING FOOTING TIE BARS	⌐	16	VARIES	19	16	VARIES	19	16	VARIES	19	16	VARIES	19	16	VARIES	19	16	VARIES	19	16	VARIES	19
4t2	WING FOOTING TIE BARS	⌐	——	——	——	——	——	——	——	——	——	40	1′-11	51	40	1′-11	51	40	1′-11	51	40	1′-11	51
TOTAL LBS. (INCLUDE WITH SUPERSTRUCTURE REINFORCING)					4179			4572			5277			6816			7478			7900			8322

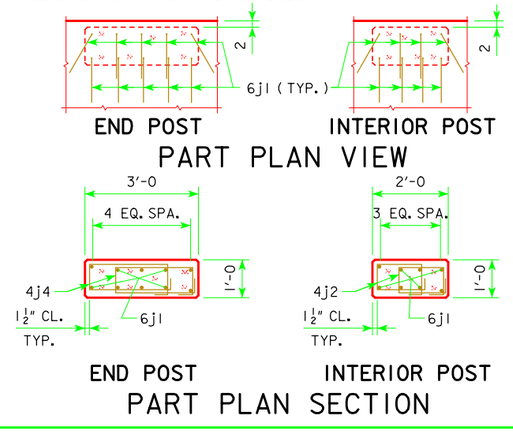
NOTE: ALL BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED IF EPOXY COATING OPTION IS USED.

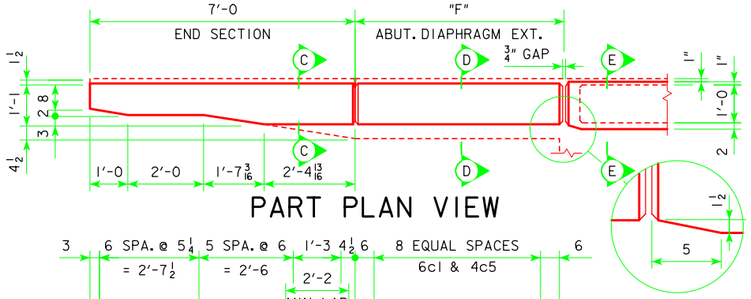
BENT BAR DETAILS

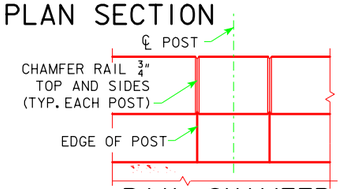


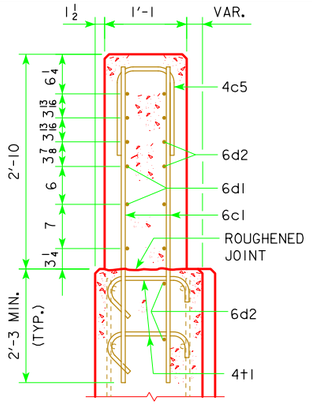
NOTE:
ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

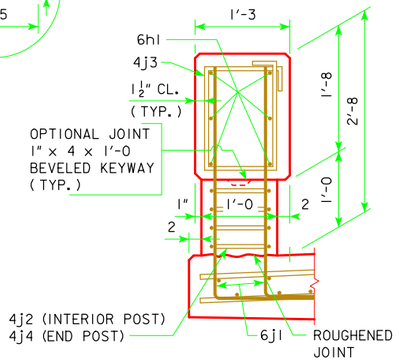
* TRAFFIC FACE 5d3 BARS MAY REQUIRE FIELD CUTTING OR BENDING FOR HIGHER SKEW BRIDGES.











CONCRETE PLACEMENT SUMMARY - C.Y.

BRIDGE LENGTH		46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
OPEN RAIL SECTION	2 @ 0.077 CU. YDS. PER FT.	7.8	9.0	10.9	12.9	14.4	15.9	17.5
OPEN RAIL-END SECTION	4 @ 0.687 CU. YDS.	2.7	2.7	2.7	2.7	2.7	2.7	2.7
OPEN RAIL-ABUT. DIAPH. SECTION	4 @ 0.107 CU. YDS. PER FT.	——	——	——	1.9	1.9	1.9	1.9
OPEN RAIL-END POSTS	4 @ 0.11 CU. YDS.	0.4	0.4	0.4	0.4	0.4	0.4	0.4
OPEN RAIL-INTERIOR POSTS	2 x "E" @ 0.07 CU. YDS.	0.7	0.8	1.1	1.3	1.5	1.7	1.8
	TOTAL (C.Y.)	11.6	12.9	15.1	19.2	20.9	22.6	24.3

CONCRETE QUANTITIES SHOWN ARE BASED ON 30° SKEW.

OPEN CONCRETE RAIL, TL-4 QUANTITIES - L.F.

BRIDGE LENGTH		46′-8	55′-0	67′-6	80′-0	90′-0	100′-0	110′-0
OPEN CONCRETE RAILING, TL-4	0° SKEW	127.3	144.0	169.0	214.0	234.0	254.0	274.0
OPEN CONCRETE RAILING, TL-4	15° SKEW	127.5	144.2	169.2	214.2	234.2	254.2	274.2
OPEN CONCRETE RAILING, TL-4	30° SKEW	128.3	144.9	169.9	214.9	234.9	254.9	274.9

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, SINGLE SPAN BRIDGE

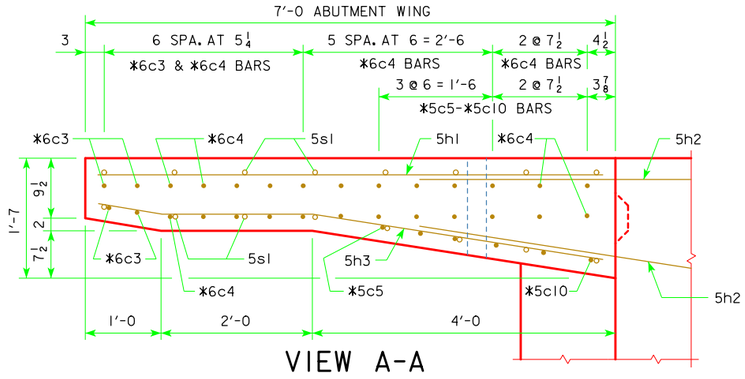
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

OPEN RAIL, TL-4 DETAILS

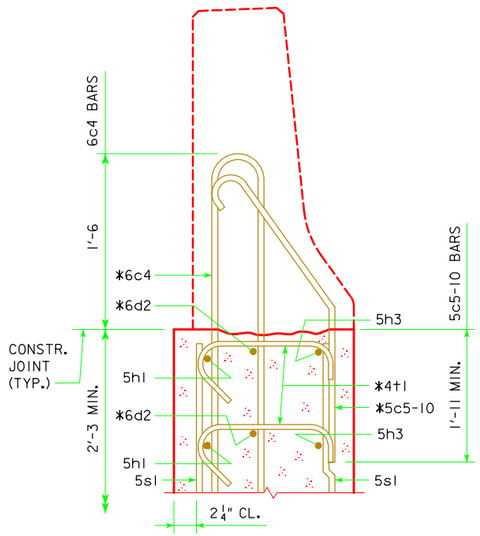
SHEET 2 OF 2

H30SI-35-12



VIEW A-A

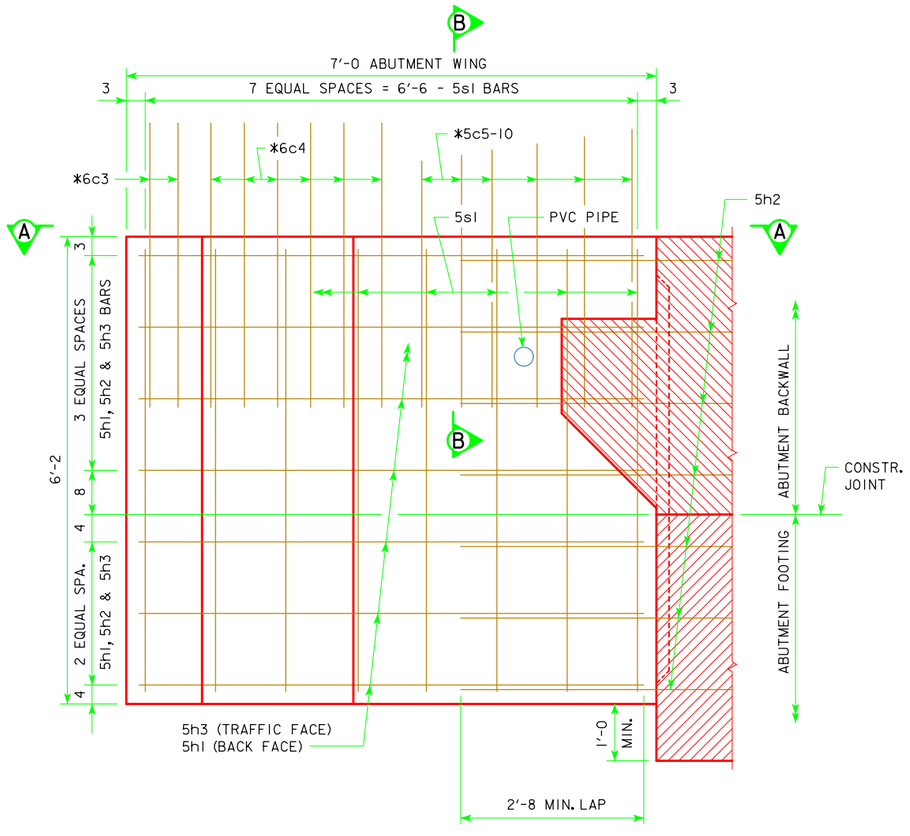
NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.



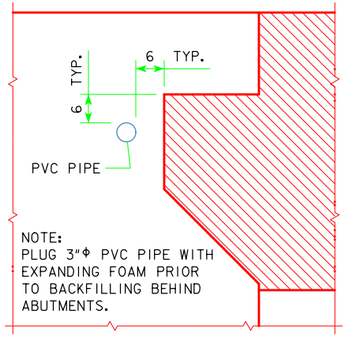
SECTION B-B

* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.



ABUTMENT WING - ELEVATION VIEW

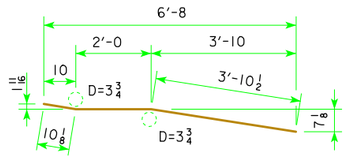


NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PVC PIPE LOCATION

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE		7	6'-8	49
5h3	HORIZONTAL TRAFFIC FACE		7	6'-9	49
5s1	VERTICAL BOTH FACES		16	5'-10	97
			TOTAL (LBS.)		195



5h3

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	1.8
TOTAL (CU. YDS.)	1.8

NOTE:

REINFORCING STEEL QUANTITY AND CONCRETE QUANTITY ARE TO BE ADDED TO THE SUPERSTRUCTURE QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

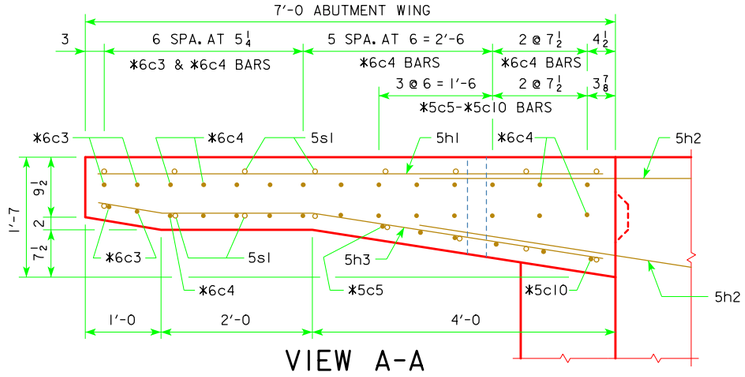
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

WING DETAILS

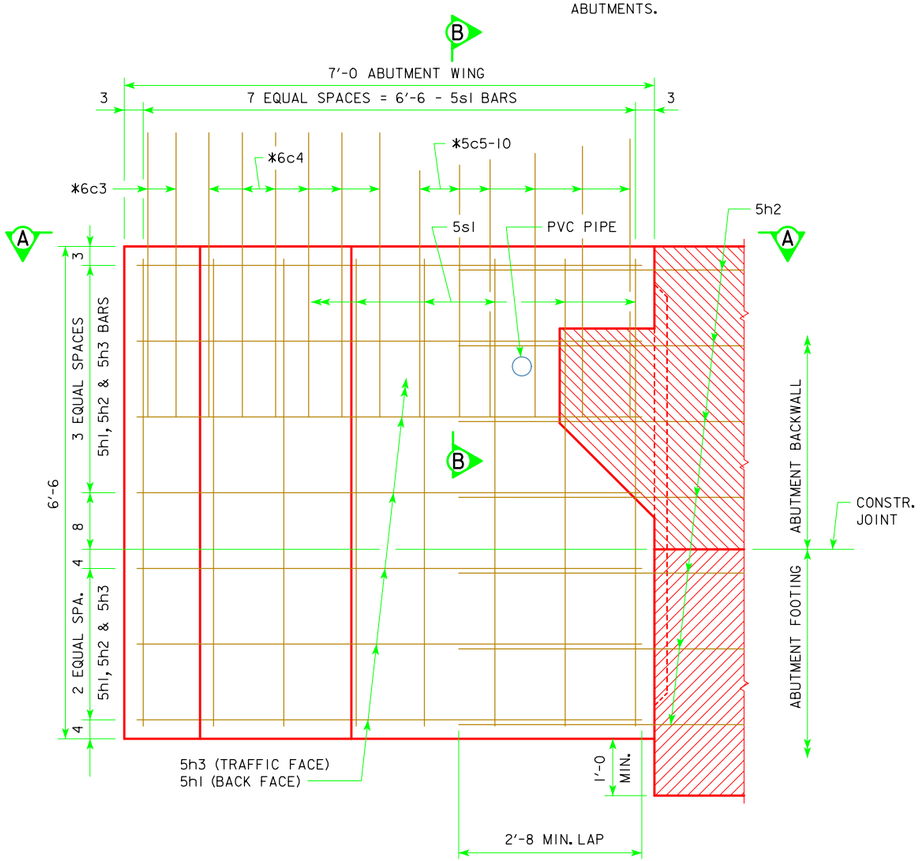
H30SI-36-12

'A' BEAM INTEGRAL ABUTMENT WING DETAILS

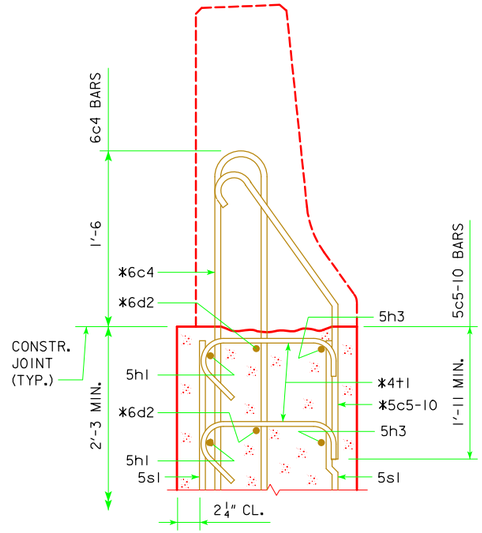


VIEW A-A

NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.



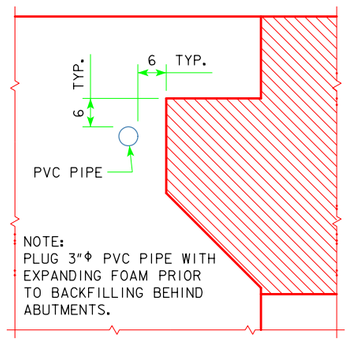
ABUTMENT WING - ELEVATION VIEW



SECTION B-B

* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

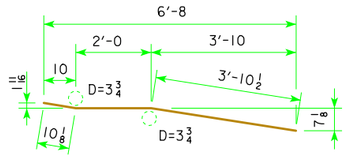
SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.



PVC PIPE LOCATION

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE		7	6'-8	49
5h3	HORIZONTAL TRAFFIC FACE		7	6'-9	49
5s1	VERTICAL BOTH FACES		16	6'-2	103
			TOTAL (LBS.)		201



5h3

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	1.9
TOTAL (CU. YDS.)	1.9

NOTE:

REINFORCING STEEL QUANTITY AND CONCRETE QUANTITY ARE TO BE ADDED TO THE SUPERSTRUCTURE QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

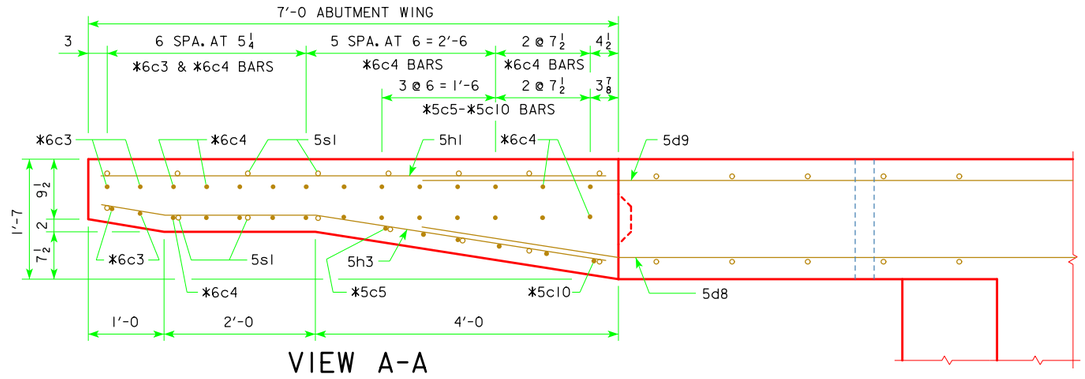
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

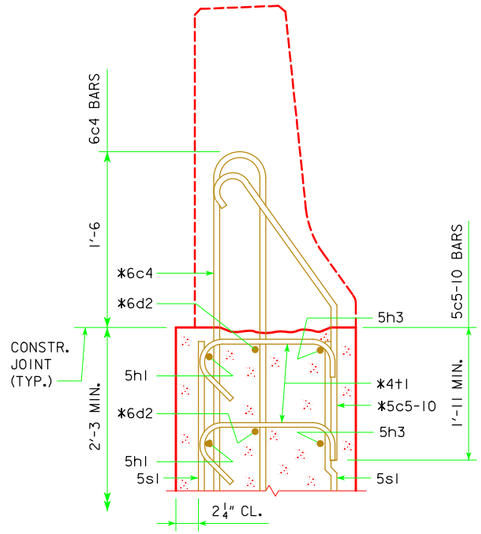
WING DETAILS

H30SI-37-12

'B' BEAM INTEGRAL ABUTMENT WING DETAILS



VIEW A-A



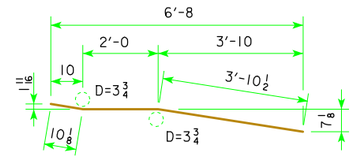
SECTION B-B

* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE	——	9	6'-8	63
5h3	HORIZONTAL TRAFFIC FACE	⌒	9	6'-9	63
5s1	VERTICAL BOTH FACES	——	16	6'-11	115
			TOTAL (LBS.)		241



5h3

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

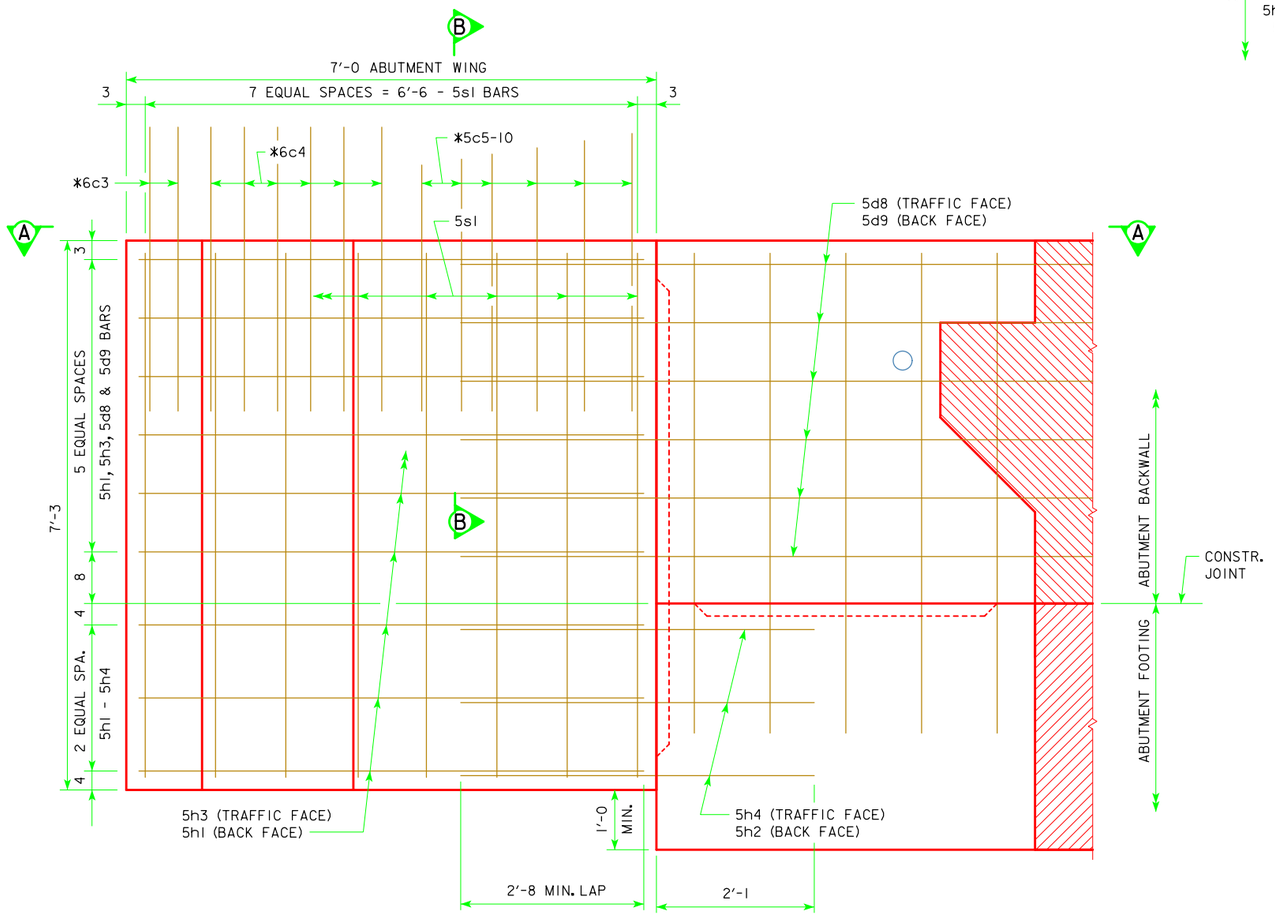
BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	2.1
TOTAL (CU. YDS.)	2.1

NOTE:

REINFORCING STEEL QUANTITY AND CONCRETE QUANTITY ARE TO BE ADDED TO THE SUPERSTRUCTURE QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.



ABUTMENT WING - ELEVATION VIEW

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

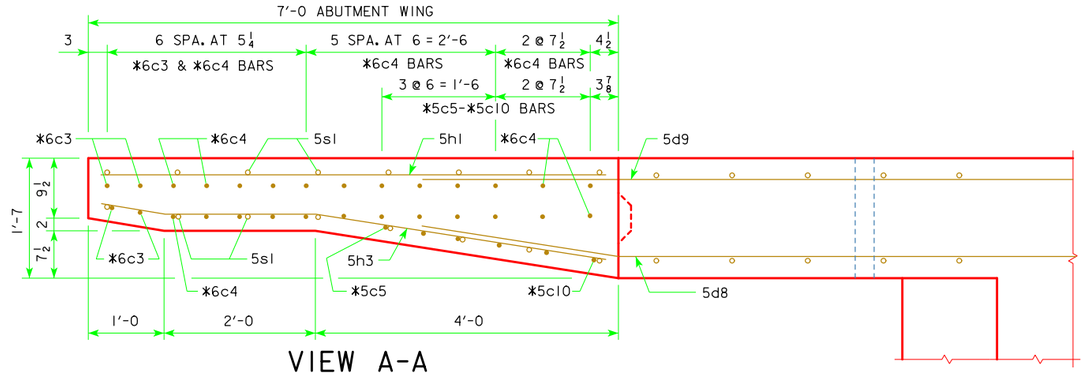
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

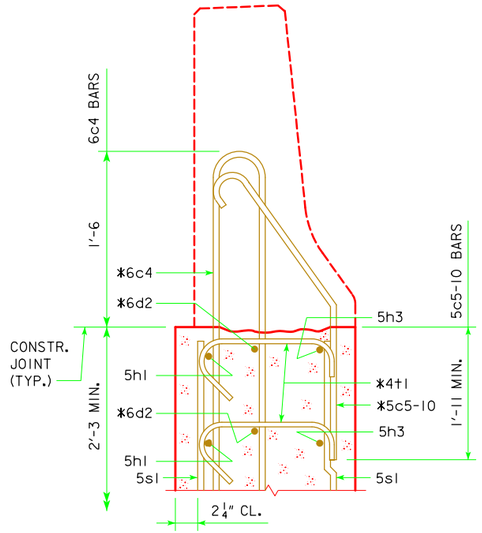
WING DETAILS

H30SI-38-12

10/14/2015 1:41:14 PM bkloss W:\Highway\Bridge\Standards\Bridges\H30SI-12.dgn H30SI-38-12 11x17_pdf.pltcfg



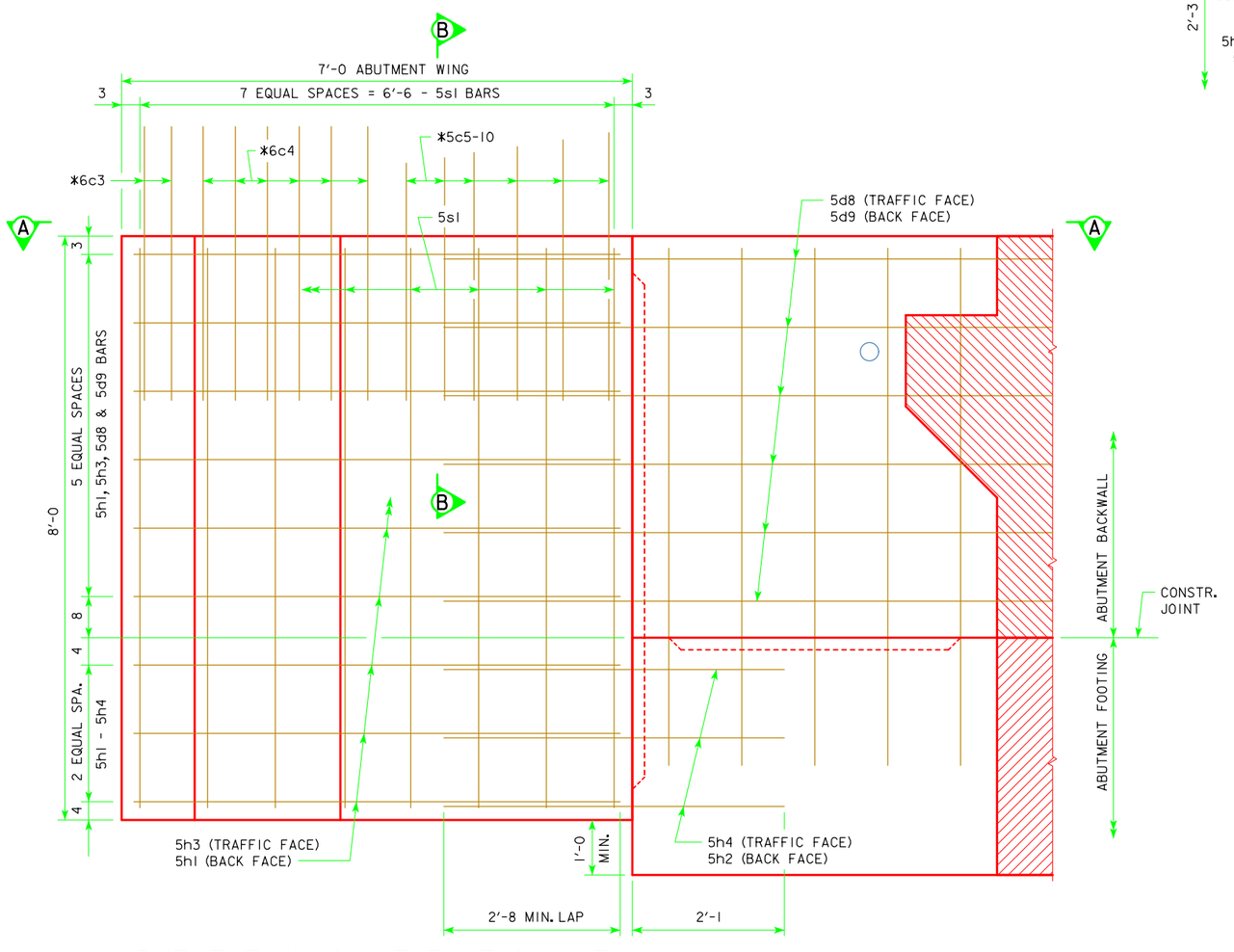
VIEW A-A



SECTION B-B

* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

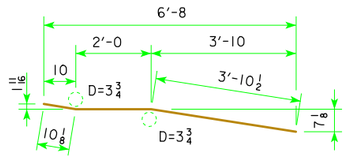
SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.



ABUTMENT WING - ELEVATION VIEW

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE	——	9	6'-8	63
5h3	HORIZONTAL TRAFFIC FACE	~~	9	6'-9	63
5s1	VERTICAL BOTH FACES	——	16	7'-8	128
			TOTAL (LBS.)		254



5h3

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	2.3
TOTAL (CU. YDS.)	2.3

NOTE:

REINFORCING STEEL QUANTITY AND CONCRETE QUANTITY ARE TO BE ADDED TO THE SUPERSTRUCTURE QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

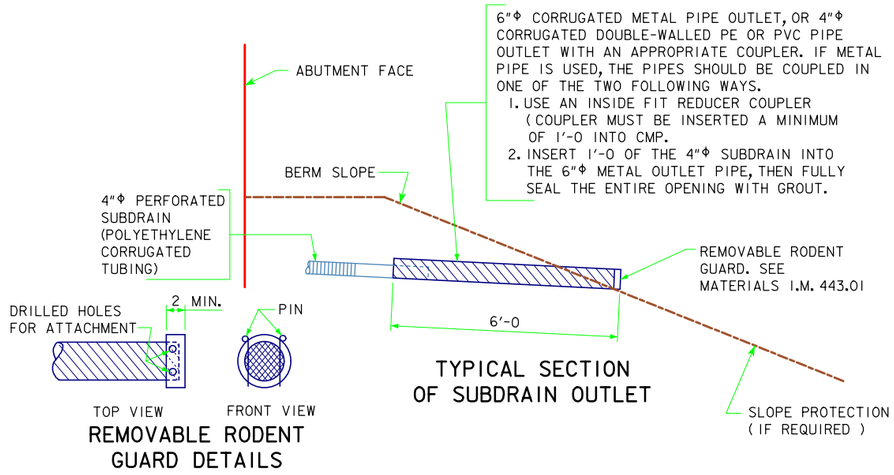
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

WING DETAILS

H30SI-39-12

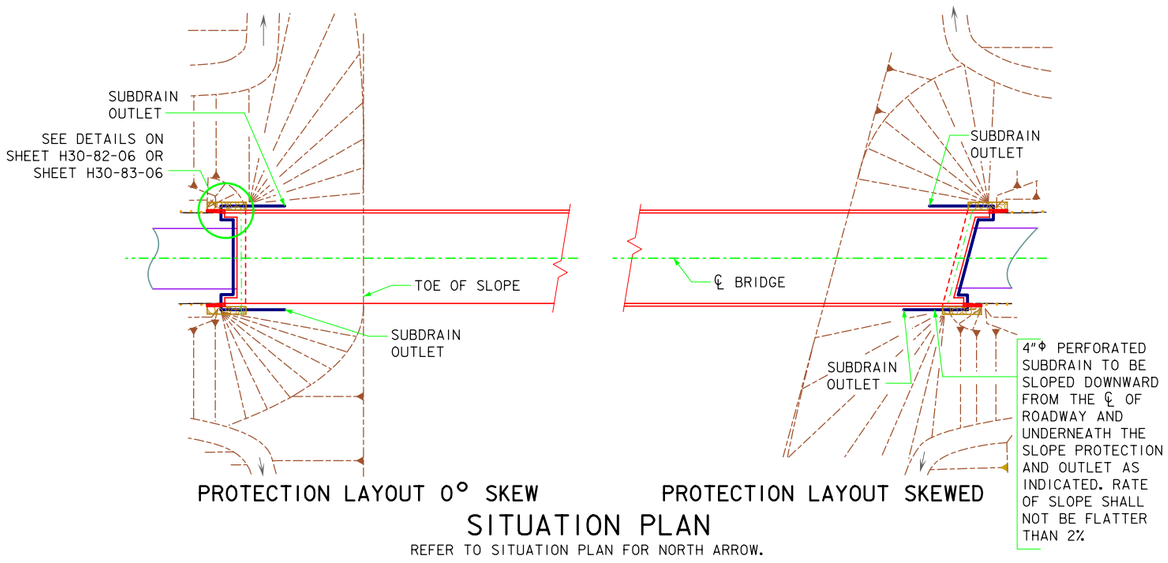
'D' BEAM INTEGRAL ABUTMENT WING DETAILS



REMOVABLE RODENT GUARD DETAILS

TYPICAL SECTION OF SUBDRAIN OUTLET

OUTLET DETAILS



PROTECTION LAYOUT 0° SKEW

PROTECTION LAYOUT SKEWED

SITUATION PLAN

REFER TO SITUATION PLAN FOR NORTH ARROW.

NOTE:
SEE ABUTMENT BACKFILL DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

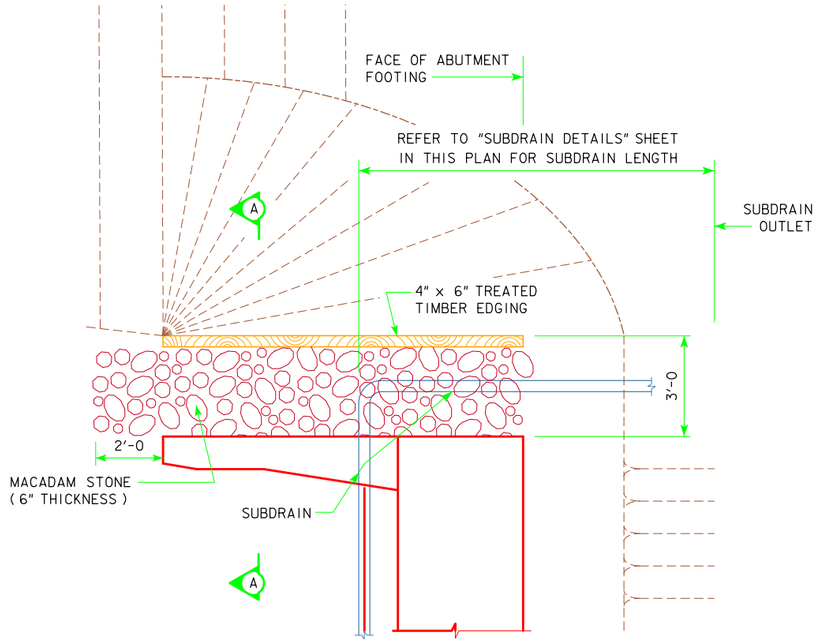
IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

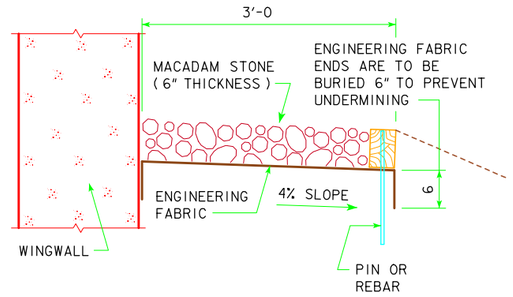
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

SUBDRAIN DETAILS | H30SI-40-12



TOP VIEW OF WING ARMORING



SECTION A-A

SUBDRAIN NOTES:

SEE H30SI-40-12 AND "GENERAL ELEVATION DATA" SHEETS FOR DETAILS OF PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENT. THE SUBDRAINS SHALL BE 4" IN DIAMETER AND MEET THE REQUIREMENTS OF SECTION 4143.01 B OF THE CURRENT I.D.O.T. STANDARD SPECIFICATION. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

MACADAM STONE WING ARMORING NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC.

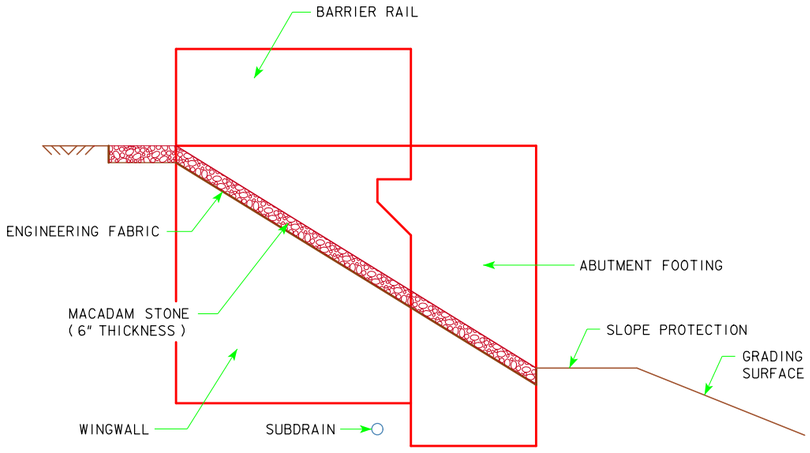
THE BRIDGE BERM SLOPE SHALL BE COMPACTED AND SHAPED AS SHOWN ON THESE PLANS, THE SITUATION PLAN, AND AS DIRECTED BY THE ENGINEER. THE BERM SLOPE SHALL BE FIRM WHEN THE ENGINEERING FABRIC AND MACADAM STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

THE MACADAM STONE SHALL MEET THE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, MACADAM STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - MACADAM STONE".



PROFILE VIEW OF WING ARMORING
(SHOWN FOR INTEGRAL ABUTMENT)

REVISED 09-14 - THE MACADAM STONE AREA WAS MODIFIED TO EXTEND 2 FEET IN FRONT OF THE BRIDGE WING.

09-14
LATEST REVISION DATE

Warren K. McAndrew
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

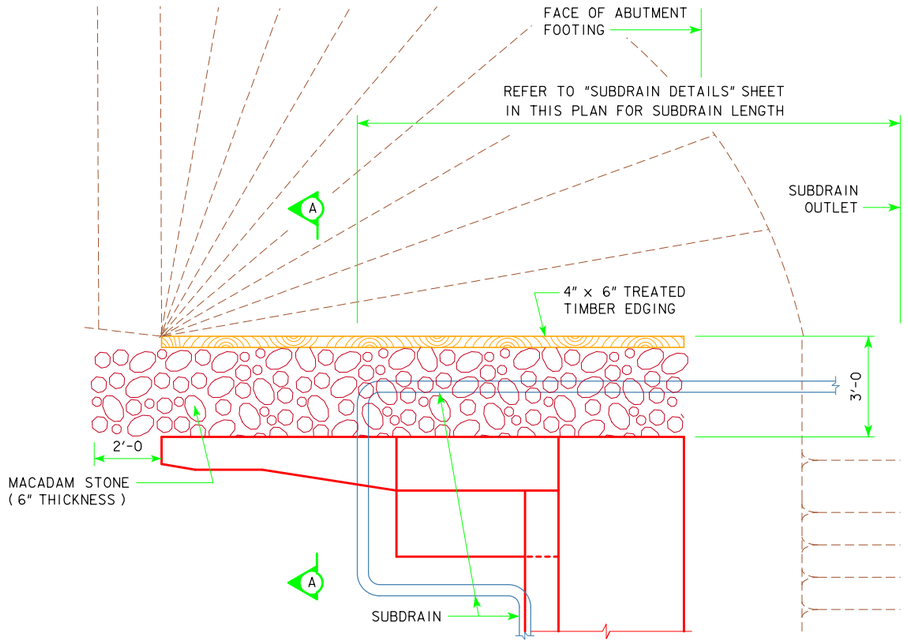
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

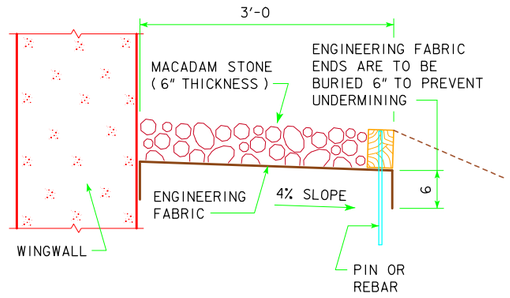
WING ARMORING DETAILS

A & B BEAMS

H30SI-41-12



TOP VIEW OF WING ARMORING WITH WING EXTENSION



SECTION A-A

SUBDRAIN NOTES:

SEE H30SI-40-12 AND "GENERAL ELEVATION DATA" SHEETS FOR DETAILS OF PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENT. THE SUBDRAINS SHALL BE 4" IN DIAMETER AND MEET THE REQUIREMENTS OF SECTION 4143.01 B OF THE CURRENT I.D.O.T. STANDARD SPECIFICATION. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

MACADAM STONE WING ARMORING NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC.

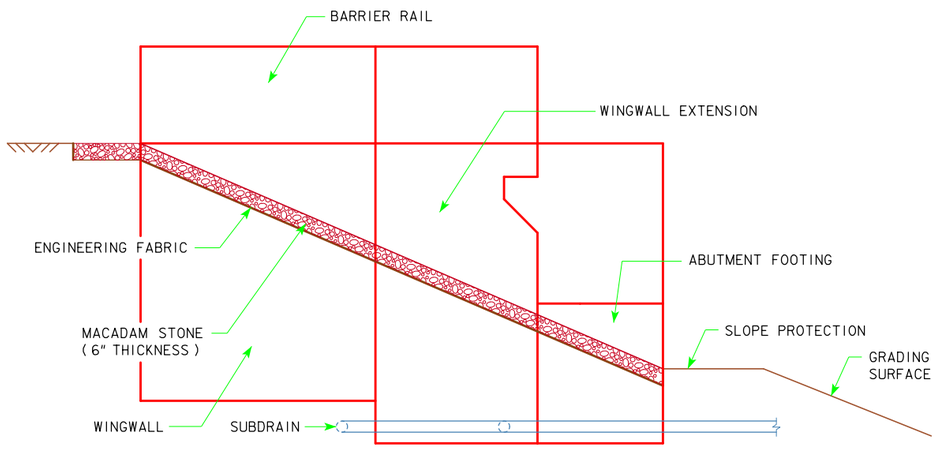
THE BRIDGE BERM SLOPE SHALL BE COMPACTED AND SHAPED AS SHOWN ON THESE PLANS, THE SITUATION PLAN, AND AS DIRECTED BY THE ENGINEER. THE BERM SLOPE SHALL BE FIRM WHEN THE ENGINEERING FABRIC AND MACADAM STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

THE MACADAM STONE SHALL MEET THE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, MACADAM STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - MACADAM STONE".



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

(SHOWN FOR INTEGRAL ABUTMENT WITH WING EXTENSIONS)

REVISED 09-14 - THE MACADAM STONE AREA WAS MODIFIED TO EXTEND 2 FEET IN FRONT OF THE BRIDGE WING.

09-14
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

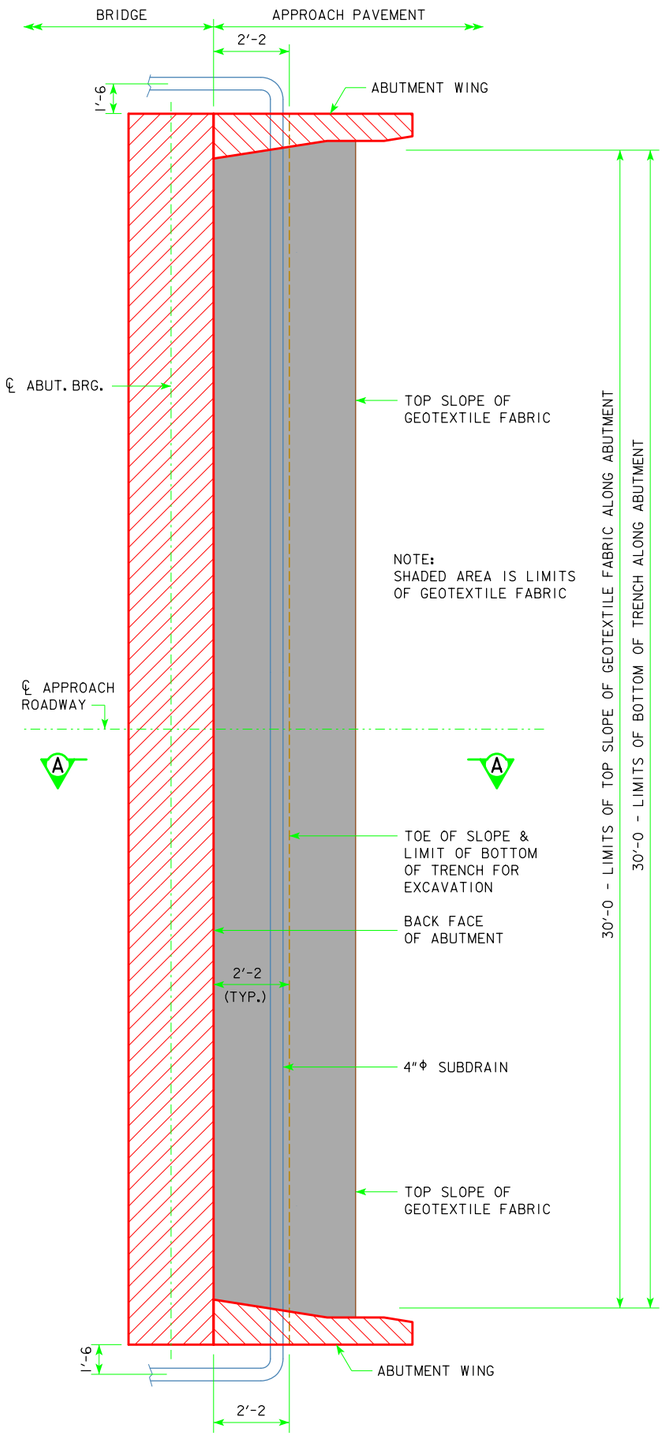
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

WING ARMORING DETAILS

C & D BEAMS

H30SI-42-12



ABUTMENT PLAN WITHOUT WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "GRANULAR BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

THE REMAINING WORK INVOLVES BACKFILLING WITH GRANULAR BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE GRANULAR BACKFILL MATERIAL SHALL HAVE 4% OR LESS PASSING THE #200 SIEVE (I.E. WASHED CONCRETE SAND). THE GRANULAR BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

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LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, GRANULAR BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

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NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM ℄ APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

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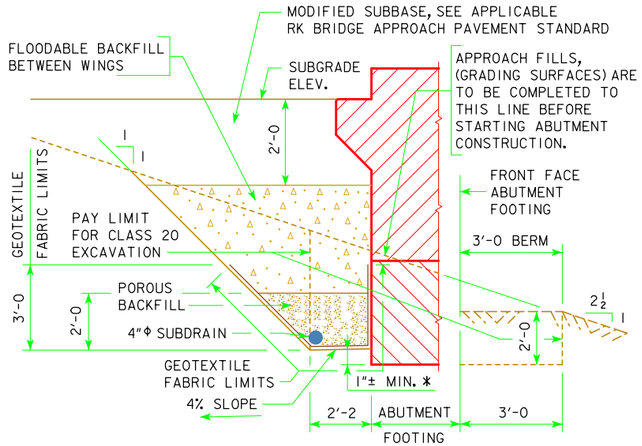


SECTION A-A

BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

09-14
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

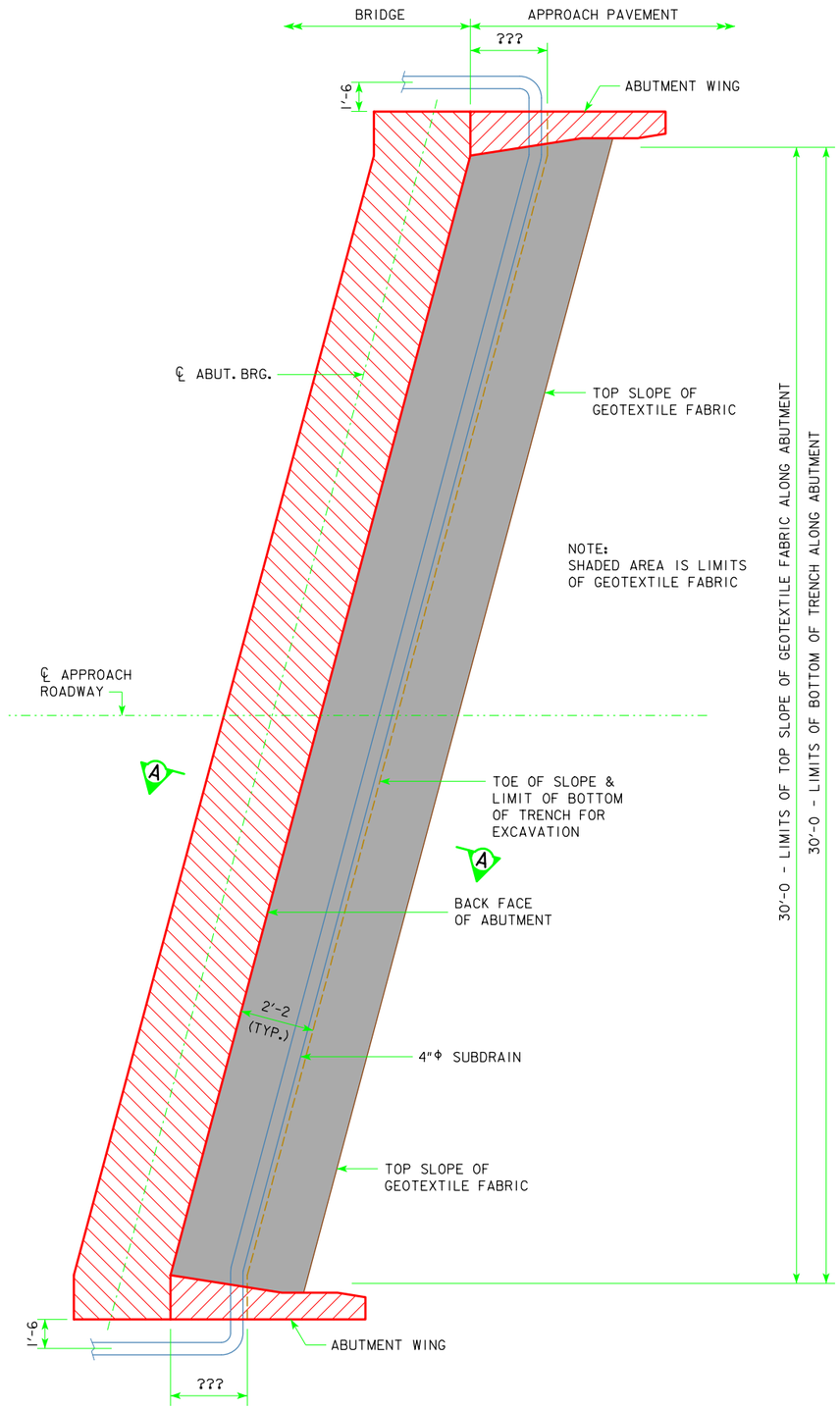
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT BACKFILL DETAILS
AT BACKFACE OF ABUTMENTS

H30SI-43-12

REVISED 09-14 - TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND IS LOCATED IN THE STANDARD SPECIFICATIONS.



SKEWED ABUTMENT PLAN WITHOUT WING EXTENSIONS

(SKEWED LEFT AHEAD SHOWN, SKEWED RIGHT AHEAD SIMILIAR)

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

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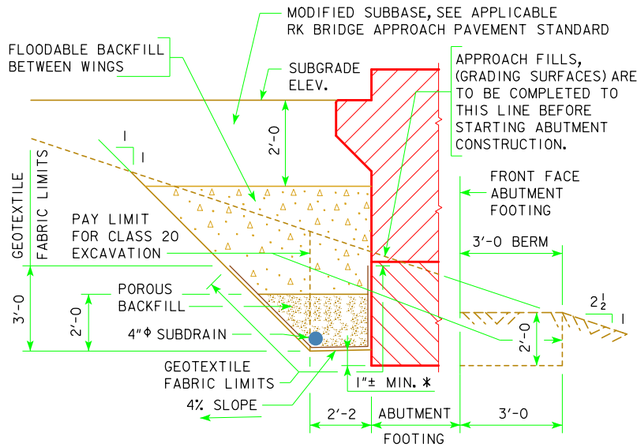

SECTION A-A

BACKFILL DETAILS

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09-14
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

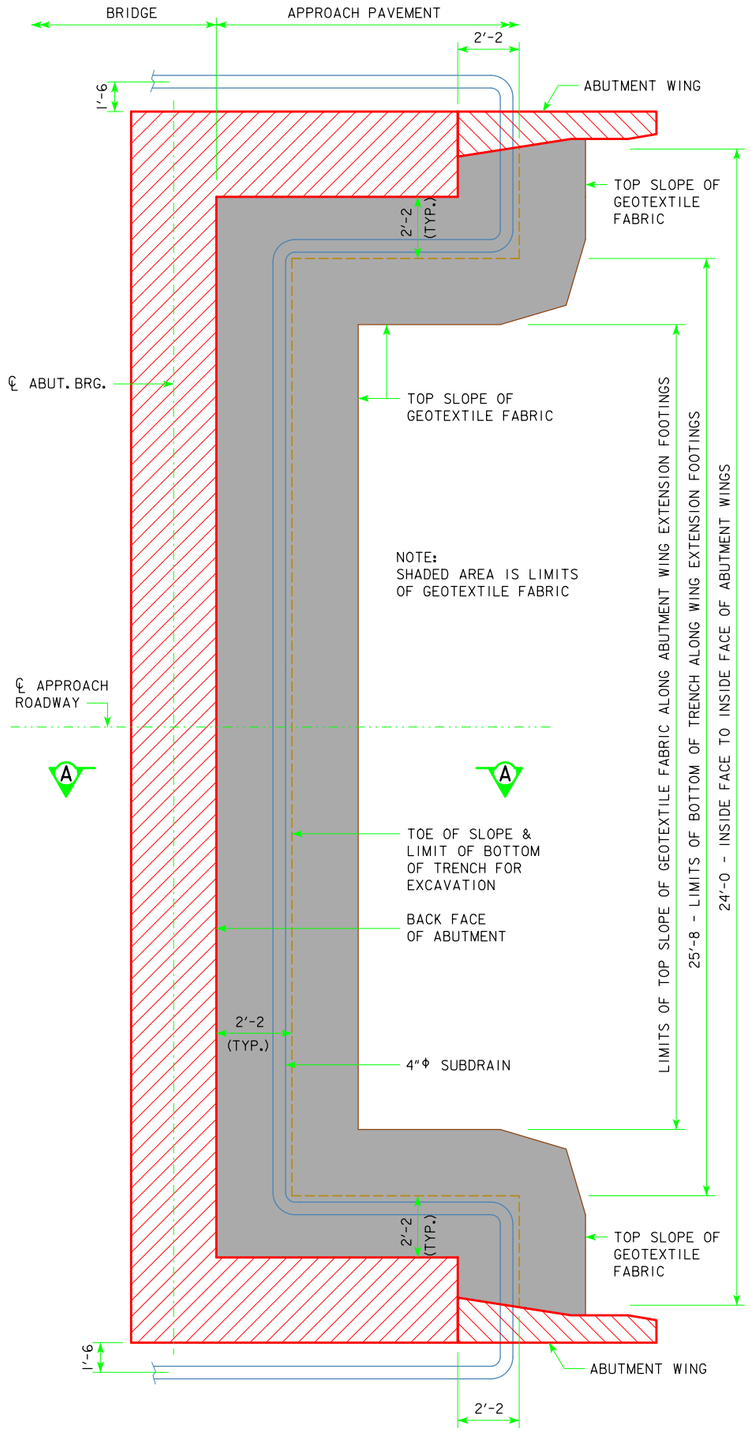
APRIL, 2012

ABUTMENT BACKFILL DETAILS

AT BACKFACE OF ABUTMENTS

H30SI-44-12

REVISED 09-14 - TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND IS LOCATED IN THE STANDARD SPECIFICATIONS.



ABUTMENT PLAN WITH WING EXTENSIONS

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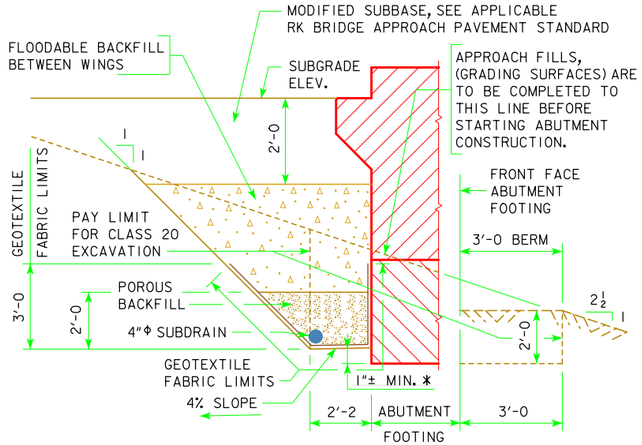

SECTION A-A

BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

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09-14
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

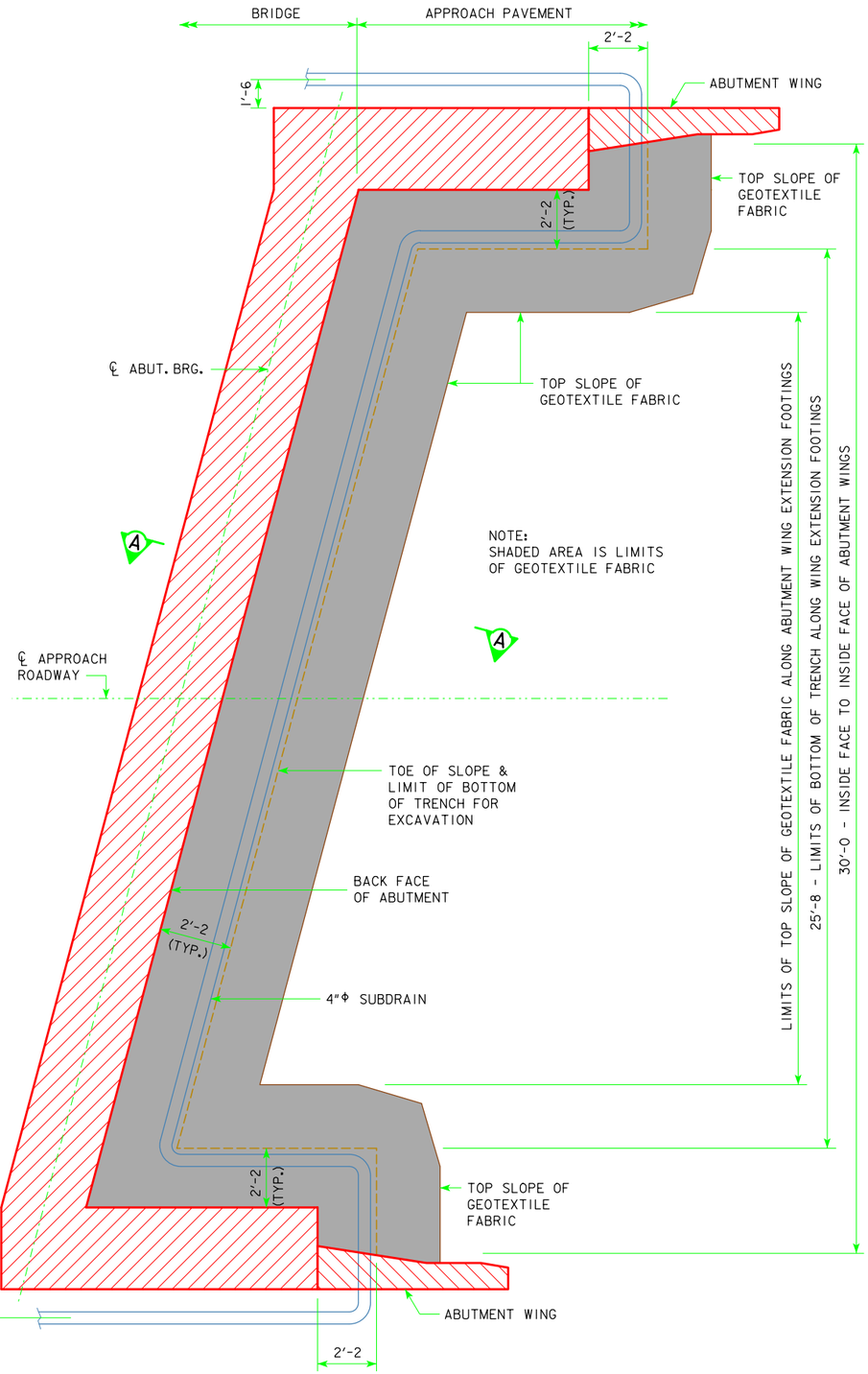
STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT BACKFILL DETAILS
AT BACKFACE OF ABUTMENTS

H30SI-45-12



SKEWED ABUTMENT PLAN WITH WING EXTENSIONS

(SKEWED LEFT AHEAD SHOWN, SKEWED RIGHT AHEAD SIMILIAR)

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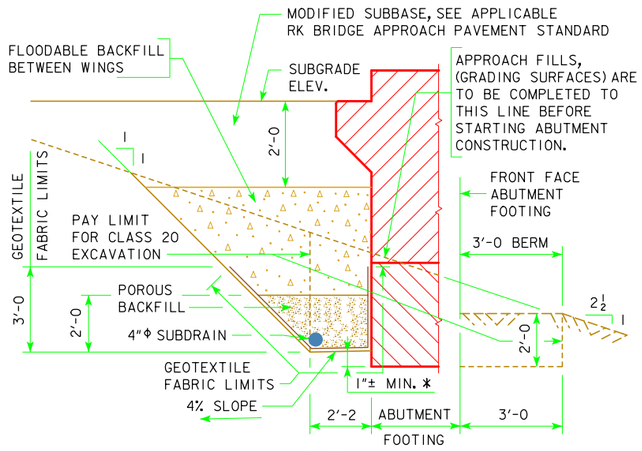

SECTION A-A

BACKFILL DETAILS

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APPROVED BY BRIDGE ENGINEER

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STANDARD DESIGN - 30' ROADWAY, SINGLE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

APRIL, 2012

ABUTMENT BACKFILL DETAILS

AT BACKFACE OF ABUTMENTS

H30SI-46-12

REVISED 09-14 - TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND IS LOCATED IN THE STANDARD SPECIFICATIONS.