IOWA DOT

Highway Division

H30–06 THREE SPAN

PRETENSIONED PRESTRESSED

CONCRETE BEAM BRIDGE STANDARDS

INDEX FOR H30-06 STANDARDS:

INDEX FOR H30-06 STANDARDS (CONT'D.):

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 04-13 - THE GENERAL NOTES AND SPECIFICATIONS MOVED TO STANDARD SHEET H30-01A-06. SRL NOTATION ADDED.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

INDEX SHEET | H30-01-06

GENERAL NOTES:

THE H30-06 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 30' ROADWAY PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES WITH LENGTHS OF 138'-10, 151'-4, 163'-10, 176'-4, 188'-10, 201'-4, 213'-10, 226'-4 AND 243'-0.

THESE BRIDGES MAY BE BUILT ON A 0°, 15°, 30° OR 45° SKEW. THESE PLANS SHOW THE BRIDGES SKEWED IN ONE DIRECTION, BUT ALL DIMENSIONS AND DETAILS WOULD BE THE SAME FOR THE OPPOSITE SKEW.

FOR CLARITY, MOST SECTIONS SHOWN ON THE FOLLOWING SHEETS ARE DRAWN WITH BARRIER RAIL ONLY. THESE SECTIONS WILL BE IDENTICAL FOR OPEN RAIL DESIGN WITH ANY MODIFICATIONS SHOWN ON SHEET H30-42-06 AND H30-43-06.

THESE BRIDGES ARE DESIGNED FOR HL93 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE. CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE LRFD 2005 INTERIMS.

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 FLOOR SLAB AS SHOWN INCLUDES $\frac{1}{2}$" INTEGRAL WEARING SURFACE.

THE ABUTMENTS FOR THESE BRIDGES ARE BUILT INTEGRAL WITH THE SUPERSTRUCTURE. THEREFORE, IT IS IMPORTANT THAT A PROPER JOINT FOR EXPANSION BE PROVIDED BETWEEN THE BRIDGE AND APPROACH PAVING, WHEN APPROACH PAVING IS NEEDED.

THE INTEGRAL ABUTMENT DESIGN UTILIZED ON THESE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

(1) THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE ABUTMENTS.
(2) THESE BRIDGES ARE NOT TO BE USED WHEN POINT BEARING FOR THE ABUTMENT STEEL PILING WOULD BE OBTAINED ON ROCK AT A DISTANCE LESS THAN 15 FEET FROM THE BOTTOM OF FOOTING.
(3) THE ABUTMENT PILING ARE TO BE DRIVEN THROUGH OVERSIZED HOLES PREBORED TO A MINIMUM OF 10 FEET BELOW THE BOTTOM OF FOOTING. THE PREBORED HOLES SHALL BE IN ACCORDANCE WITH SECTION 2501.03, Q OF THE STANDARD SPECIFICATIONS. THE ELEVATION OF THE BOTTOM OF THE PREBORED HOLE SHALL BE SHOWN ON THE PLANS.

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 AND PIER STEP DIMENSIONS. TO HELP IN OBTAINING THIS STEP INFORMATION SEE "EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS" ON SHEET H30-02-06 .

THE ABUTMENT FOOTING AND PIER CAP CONCRETE QUANTITIES SHOWN IN THESE PLANS ARE CALCULATED BASED ON A 0.3% GRADE. FOR HIGHER GRADES, THESE CONCRETE QUANTITIES FOR BRIDGES SKEWED AT 15°, 30°, AND 45° MAY NEED TO BE INCREASED. IN ADDITION, THE LAYOUT OF THE PIER CAP STEP REINFORCING STEEL IS GRADE DEPENDENT FOR BRIDGES SKEWED AT 15°, 30°, AND 45°. SEE SHEETS H30-17-06, H30-24-06, AND H30-31-06 TO DETERMINE THE ADDITIONAL CONCRETE QUANTITIES REQUIRED AND FOR THE LAYOUT AND QUANTITY OF THE PIER CAP STEP REINFORCING STEEL.

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

VARIOUS TYPES OF PIERS MAY BE USED WITH THESE STANDARDS. IT SHOULD BE NOTED THAT THE DETAILS FOR THE PIER DIAPHRAGM ON THE SUPERSTRUCTURE DEPEND ON THE TYPE OF PIER USED.

THE PIERS AND ABUTMENTS FOR THESE STANDARDS HAVE BEEN DESIGNED FOR THE USE OF BOTH FRICTION AND POINT BEARING PILES. IT IS NECESSARY THAT THE TYPE AND LENGTH FOR BOTH THE ABUTMENT AND PIER PILES BE DESIGNATED ON THE FRONT SHEET OF THE PLANS.

THE INTEGRAL ABUTMENTS, PILE BENTS, AND TEE PIERS FOR THESE H30 STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS OR SPREAD 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)
- PILE BENTS: STANDARD CONCRETE-FILLED STEEL PIPE PILES (PIOL), STANDARD PRESTRESSED CONCRETE PILES (PIOL), OR STANDARD H-PILES (PIOL AND SRL-1)
- TEE PIERS: HP10x57 PILES AT BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-1 OR 2 (SRL-1 OR SRL-2) OR SPREAD FOOTINGS

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

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 E17.7, E7.1.8, E7.1.9, E8.1.8, AND E8.1.9 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), CAP, AND BARRIER RAILS SHALL BE EPOXY COATED.

FOR PIERS SUBJECT TO SCOUR THE DESIGN BEARING SHALL BE OBTAINED BELOW SCOUR ELEVATION. SCOUR ELEVATION SHALL BE SHOWN ON THE FRONT SHEET.

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

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 (5a1 IS $\frac{5}{8}$ 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

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4th Ed, SERIES OF 2007.
REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 3,500 PSI.
FOR STANDARD PRESTRESSED CONCRETE BEAMS, SEE SHEETS H30-32-06 THRU H30-37-06

SPECIFICATIONS:

DESIGN:
AASHTO LRFD 4th Ed, SERIES OF 2007.

CONSTRUCTION:
IOWA DEPARTMENT OF TRANSPORTATION STANDARD 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.

04-13
LATEST REVISION DATE

Marven K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

GENERAL NOTES | H30-01A-06

REVISED 04-13 - THIS STANDARD RENAMED TO H30-01A-06. INDEX SHEET INFORMATION ON STANDARD H30-01-06.

EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS:

THE DESIGNER SHALL SHOW ON THE PLANS THE 5 ELEVATIONS AND THE 4 STEP DIMENSIONS REQUIRED FOR EACH OF THE PIER TOP AND 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 213'-10 ℄ TO ℄ OF ABUTMENT BEARINGS WITH 30° SKEW RIGHT AHEAD.

STATIONS

℄ BRIDGE STA.	=	105+85.00	
± ½ OF L2	±	38.67	
℄ PIER BRGS.	=	105+46.33	106+23.67
± LI		- 68.25	+ 68.25
℄ ABUTMENT BRGS.	=	104+78.08	106+91.92

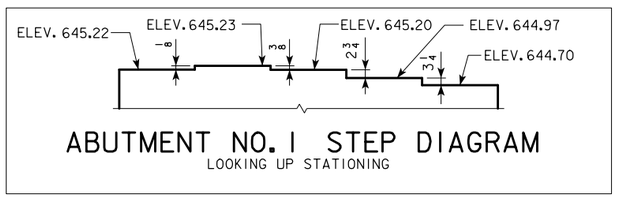
ELEVATIONS ALONG PROFILE GRADE LINE (P.G.L. ELEV.)

℄ ABUT. BRG. = 653.29-[(104+78.08)-(103+75.00)](0.0325) = 649.94
℄ PIER BRG. = 653.29-[(105+46.33)-(103+75.00)](0.0325) = 647.72
℄ PIER BRG. = 653.29-[(106+23.67)-(103+75.00)](0.0325) = 645.21
℄ ABUT. BRG. = 653.29-[(106+91.92)-(103+75.00)](0.0325) = 642.99

ELEVATIONS TOP OF SLAB FACING ALONG THE STATIONING
(BEAM SPACING)(TAN. SK.△)(GRADE) = (6.75)TAN 30°(0.0325) = 0.13'

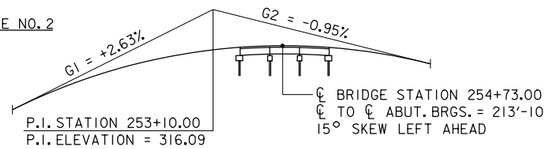
ABUTMENT NO. 1

BEAMS	EXTERIOR	INTERIOR	CENTER	INTERIOR	EXTERIOR
PGL ELEV.	649.94	649.94	649.94	649.94	649.94
SK. △CORRECT	+0.26	0.13	0.00	-0.13	-0.26
SLAB CROWN	-0.24	-0.10	0.00	-0.10	-0.24
TOP SLAB ELEV.	649.96	649.97	649.94	649.71	649.44
-"U" (4'-8⅞)	-4.74	-4.74	-4.74	-4.74	-4.74
BR. SEAT ELEV.	645.22	645.23	645.20	644.97	644.70



ABUTMENT NO. 1 STEP DIAGRAM
LOOKING UP STATIONING

EXAMPLE NO. 2



FROM SHEET H30-03-06 { LENGTH OF VERTICAL CURVE = (20000)(0.0358) = 716 FEET
M.O. = (0.0358)(716)(⅛) = 3.204 FEET

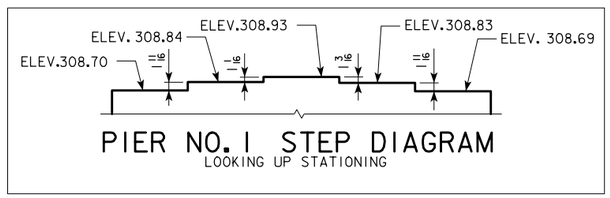
STATIONS

℄ BRIDGE STA.	=	254+73.00	
± ½ OF L2	±	38.67	
℄ PIER BRGS.	=	254+34.33	255+11.67
± LI		- 68.25	+ 68.25
℄ ABUTMENT BRGS.	=	253+66.08	255+79.92

ELEVATIONS TOP OF SLAB FACING ALONG THE STATIONING
(BEAM SPACING)(TAN. SK.△) = (6.75')TAN 15° = 1.81'

PIER NO. 1

BEAMS	EXTERIOR	INTERIOR	CENTER	INTERIOR	EXTERIOR
STATION	254+37.95	254+36.14	254+34.33	254+32.52	254+30.71
PGL ELEV.	+313.55	+313.55	313.54	313.54	313.54
SLAB CROWN	-0.24	-0.10	0.00	-0.10	-0.24
TOP SLAB ELEV.	313.31	313.45	313.54	313.44	313.30
-"U" (4'-7 5/16)	-4.61	-4.61	-4.61	-4.61	-4.61
BR. SEAT ELEV.	308.70	308.84	308.93	308.83	308.69



PIER NO. 1 STEP DIAGRAM
LOOKING UP STATIONING

TEE PIER NOTES:

THE TEE PIERS SHOWN IN THESE PLANS ARE DESIGNED FOR USE WITH THE H30-06 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE STANDARDS. THE PIER MAY BE USED FOR EITHER GRADE SEPARATION OR STREAM CROSSING STRUCTURES. THE PIERS WERE DESIGNED FOR THE FOLLOWING STREAM FORCE AND ICE LOADING CONDITIONS, AND SHOULD NOT BE USED WHERE THESE LOADING CONDITIONS ARE EXCEEDED.

ICE FORCE:
ICE FORCES WERE APPLIED AT A HEIGHT OF H/2 + 1'-6 ABOVE THE BOTTOM OF THE PIER FOOTING, WHERE H IS THE OVERALL HEIGHT OF PIER. THE EFFECTIVE ICE STRENGTH WAS 24 KSF FOR 1'-7 OF ICE DEPTH. A PRIMARY ICE FORCE (F) WAS CALCULATED ACCORDING TO THE LRFD SPECIFICATIONS AND APPLIED TO THE PIER STEM AS FOLLOWS:

CASE 1: 100% OF F APPLIED PARALLEL TO THE PIER'S LONG AXIS AND 15% OF F APPLIED PERPENDICULAR TO THE PIER'S LONG AXIS.
CASE 2: 50% OF F APPLIED PARALLEL TO THE PIER'S LONG AXIS AND 34% OF F APPLIED PERPENDICULAR TO THE PIER'S LONG AXIS.

STREAM FLOW:
THE STREAM VELOCITY USED WAS 5 FT/SEC WITH THE C_D COEFFICIENT EQUAL TO 1.4. THE RESULTING STREAM FORCE WAS ASSUMED TO ACT PARALLEL TO THE PIER'S LONG AXIS. IT WAS ASSUMED THAT SUPERSTRUCTURE ELEMENTS WILL CLEAR HIGH WATER BY APPROXIMATELY 3'-0.

FOOTING GEOMETRY:
IT WAS ASSUMED THAT THE PIER FOOTING WILL BE SET APPROXIMATELY 6'-0 BELOW THE ADJACENT STREAMBED OR GROUND SURFACE. IT WAS ALSO ASSUMED THAT THERE ARE NO SIGNIFICANT UNBALANCED EARTH PRESSURES APPLIED TO THE PIER.

ALL BRIDGES WITH TEE PIERS DETAILED ON THESE STANDARDS ARE INTENDED TO HAVE ONE FIXED PIER AND ONE EXPANSION PIER. THE PILE LAYOUT AND REINFORCEMENT SHOWN ARE THE SAME FOR EITHER FIXED OR EXPANSION PIER. THE ONLY DISTINCTION BETWEEN FIXED PIER AND EXPANSION PIER LIES IN THE SELECTION OF BEARINGS AND PRESENCE OF THE KEYWAY IN THE TOP OF THE CAP. EACH BRIDGE SHALL HAVE ONE SET OF FIXED BEARINGS AND ONE SET OF EXPANSION BEARINGS, WHICH MAY BE USED ON EITHER PIER 1 OR PIER 2. THE KEYWAY IN THE TOP OF THE CAP SHOULD BE ELIMINATED FROM THE EXPANSION PIER.

HP10x57 STEEL PILE SHALL BE USED IN THE PILE FOOTINGS OF THE PIERS FOR EITHER FRICTION OR POINT BEARING PILE CONDITIONS. FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK. NOMINAL STRUCTURAL RESISTANCE WAS TAKEN AS 243 KIPS FOR HP10x57 SRL-1 FRICTION BEARING PILES AND 365 KIPS FOR HP10x57 SRL-2 POINT BEARING PILES. A NOMINAL UPLIFT RESISTANCE OF 42 KIPS PER PILE WAS USED IN THE DESIGN OF THE PIER FOOTINGS. THE PIER SHALL NOT BE USED AT SITES WHERE THIS UPLIFT FORCE CANNOT BE ACHIEVED DUE TO SPECIFIC CONDITIONS SUCH AS SURFACE ROCK LAYERS.

WHEN PIERS ARE USED IN GRADE SEPARATION STRUCTURES, EPOXY COATED REINFORCEMENT MAY BE REQUIRED FOR PIER COLUMNS. CONSULT CURRENT POLICY FOR GUIDANCE ON THE USE OF EPOXY COATED REINFORCEMENT IN SUCH CASES. ADJUST THE dl COLUMN BAR PROJECTION INTO THE CAP AND dl/d2 LAP DISTANCE ACCORDINGLY.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

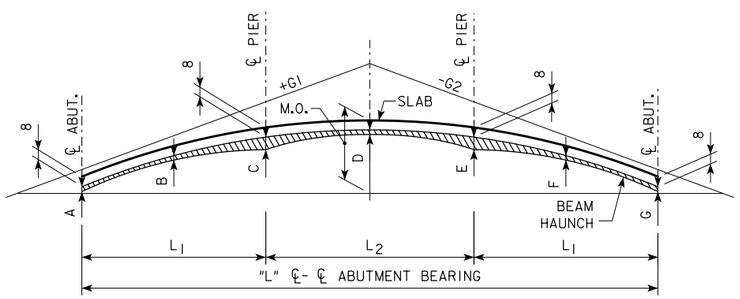
STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

GENERAL INFORMATION | H30-02-06

REVISED 04-13 - TEE PIER NOTES WERE CHANGED TO LRFD SPECS.



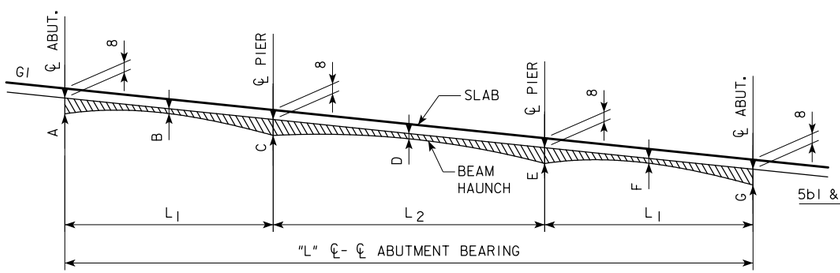
℄-℄ ABUT. BRG. "L"	A ℄ ABUT.	B	C ℄ PIER	D	E ℄ PIER	F	G ℄ ABUT.
138'-10	15/16	1/2	1 1/2	9/16	1 1/2	1/2	15/16
151'-4	3/4	9/16	1 11/16	1/2	1 11/16	9/16	3/4
163'-10	13/16	1/2	1 7/16	1/2	1 7/16	1/2	13/16
176'-4	13/16	9/16	1 11/16	9/16	1 11/16	9/16	13/16
188'-10	1	5/8	2	1/2	2	5/8	1
201'-4	1/2	5/8	1 3/8	1/2	1 3/8	5/8	1/2
213'-10	11/16	9/16	1 3/8	1/2	1 3/8	9/16	11/16
226'-4	1	1/2	1 5/8	1/2	1 5/8	1/2	1
243'-0	1 7/16	1/2	1 5/8	1/2	1 5/8	1/2	1 7/16

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.

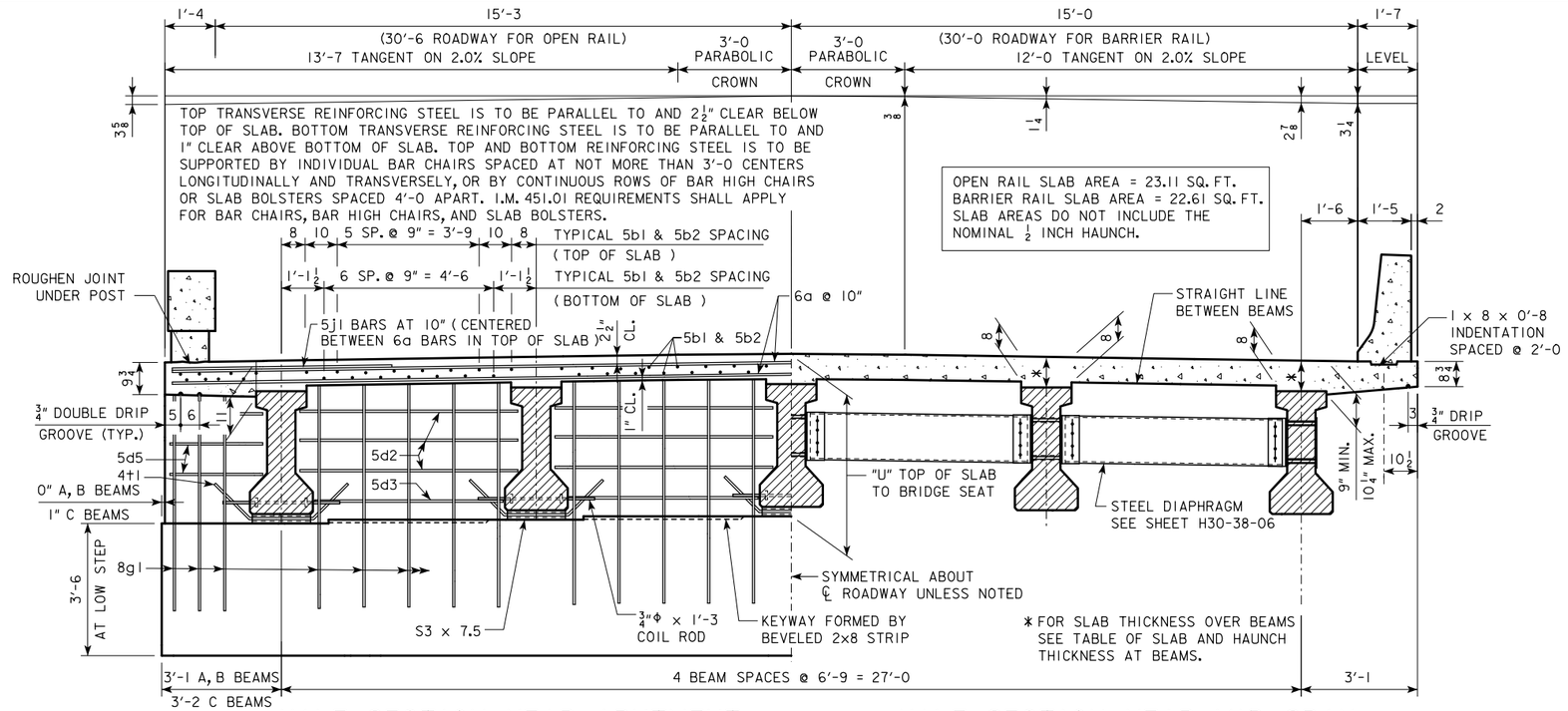
SLAB AND HAUNCH THICKNESS AT BEAMS FOR VERTICAL CURVE



℄-℄ ABUT. BRG. "L"	A ℄ ABUT.	B	C ℄ PIER	D	E ℄ PIER	F	G ℄ ABUT.
138'-10	1 1/16	1/2	1 11/16	9/16	1 11/16	1/2	1 1/16
151'-4	7/8	9/16	1 15/16	9/16	1 15/16	9/16	7/8
163'-10	15/16	1/2	1 3/4	9/16	1 3/4	1/2	15/16
176'-4	15/16	1/2	2	9/16	2	1/2	15/16
188'-10	1 1/16	9/16	2 3/8	1/2	2 3/8	9/16	1 1/16
201'-4	11/16	11/16	2	11/16	2	11/16	11/16
213'-10	15/16	1/2	1 13/16	1/2	1 13/16	1/2	15/16
226'-4	1 3/8	1/2	2 1/8	1/2	2 1/8	1/2	1 3/8
243'-0	2	1/2	2 1/8	1/2	2 1/8	1/2	2

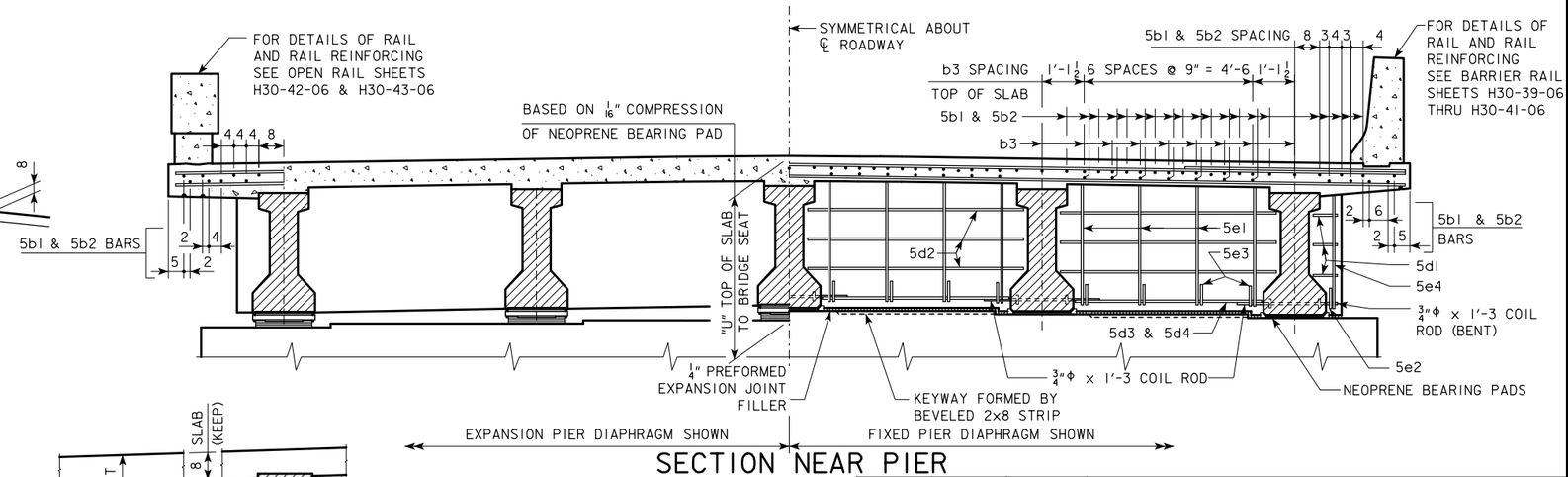
G1 MAY HAVE A + OR - SIGN. THE MINIMUM NUMERICAL VALUE OF THE GRADE IS 0.3% AND THE MAXIMUM VALUE IS 5%.

SLAB AND HAUNCH THICKNESS AT BEAMS FOR STRAIGHT GRADE

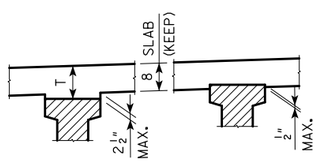


HALF SECTION NEAR ABUTMENT
(OPEN RAIL SHOWN)

HALF SECTION NEAR MID SPAN
(BARRIER RAIL SHOWN)



SECTION NEAR PIER



SLAB THICKNESS DETAILS

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 (POINTS B, D AND F). IF THE BEAM IS OVER CAMBERED DECREASE THE HAUNCH THICKNESS OVER THE BEAM AT THE MIDPOINT OF THE SPANS (POINTS B, D AND F) TO A MAXIMUM OF 1/2" EMBEDMENT IN THE SLAB. IF MORE THAN 1/2" EMBEDMENT IS REQUIRED OR IF THE HAUNCH EXCEEDS 2 1/2" THE GRADE LINE IS TO BE REVISED.

LENGTH OF S3x7.5 (ABUTMENT BEAM SEAT)	
BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1'-5	1'-3 1/2
1'-8	1'-6 1/2

06-12 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

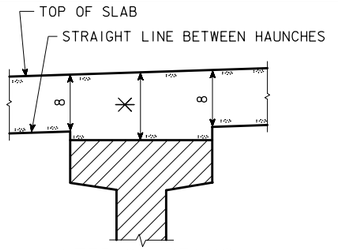
STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

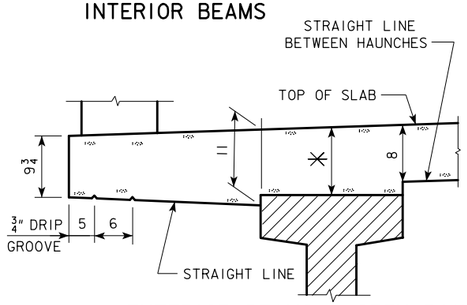
DECEMBER, 2006

SUPERSTRUCTURE DETAILS | H30-03-06

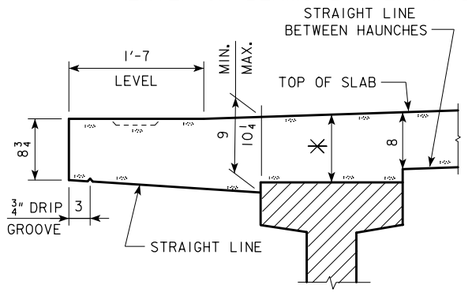
REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.



INTERIOR BEAMS



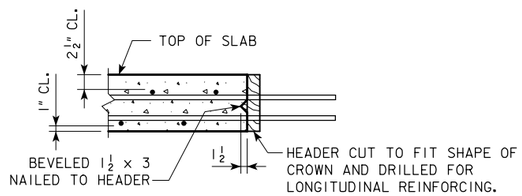
EXTERIOR BEAMS @ OPEN RAIL



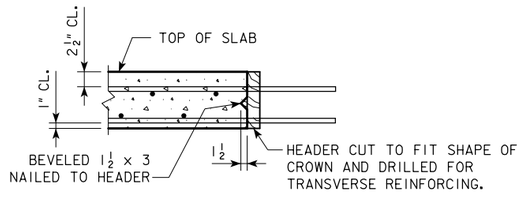
EXTERIOR BEAMS @ BARRIER RAIL

TYPICAL SLAB AND HAUNCH DETAIL

* FOR SLAB THICKNESS OVER BEAMS SEE " SLAB THICKNESS DETAILS " ON SHEET H30-03-06.

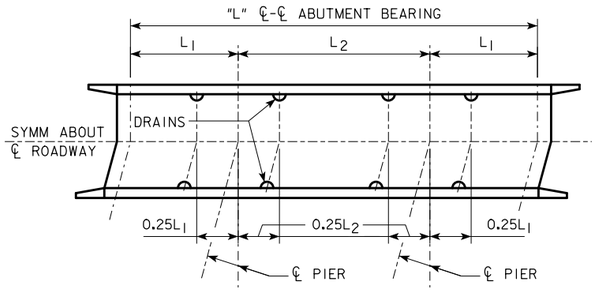


TRANSVERSE SLAB CONSTRUCTION JOINT



LONGITUDINAL SLAB CONSTRUCTION JOINT

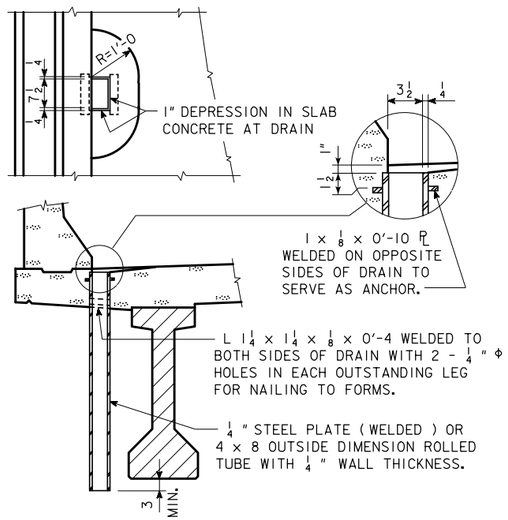
0° SKEW



15°, 30° AND 45° SKEW

SITUATION SKETCH

(SHOWING DRAIN LOCATIONS)



DRAIN DETAILS

USE FOR BARRIER RAIL ONLY.
NOT REQUIRED FOR OPEN RAIL.

NOTE :
DRAINS ARE TO BE GALVANIZED AFTER FABRICATION.
SEE " SITUATION SKETCH " FOR LOCATION OF DRAINS.
WEIGHT OF DRAINS IS INCLUDED IN THE QUANTITY FOR "STRUCTURAL STEEL".
WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN			
BEAM SIZE	A	B	C
WT. LBS.	85	96	106
LENGTH FT.	4'-4 3/4	4'-11 3/4	5'-5 3/4

GENERAL NOTES:

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 CONCRETE BEAMS ARE TO BE SET VERTICAL.

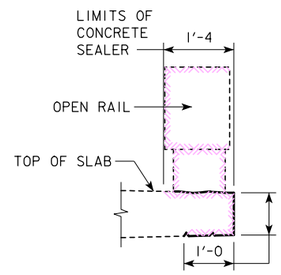
FORMS FOR THE SLAB AND RAILS ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

WEIGHT OF DRAINS IS INCLUDED IN THE STRUCTURAL STEEL QUANTITY.

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

ALL REINFORCING STEEL IS TO BE GRADE 60.

COST OF ALL PREFORMED EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".



CONCRETE SEALER LIMITS FOR OPEN RAILS

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.

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.

06-12
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

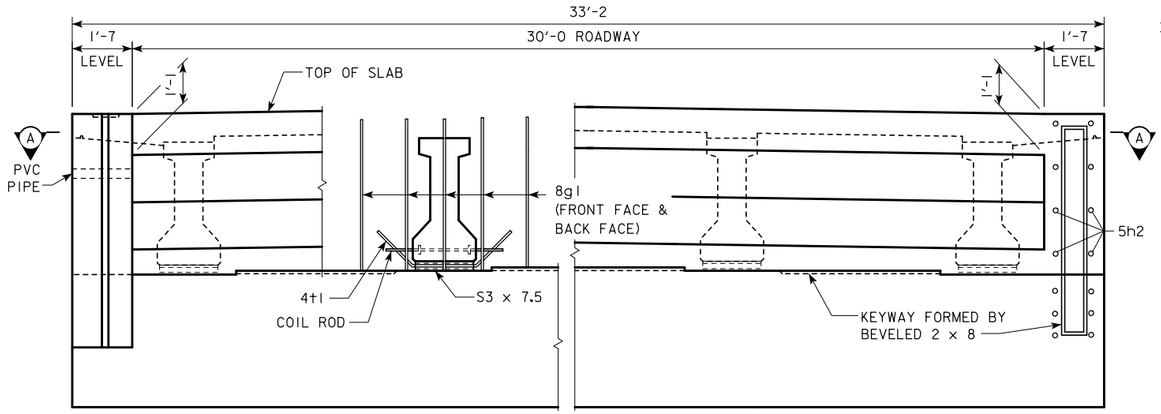
IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

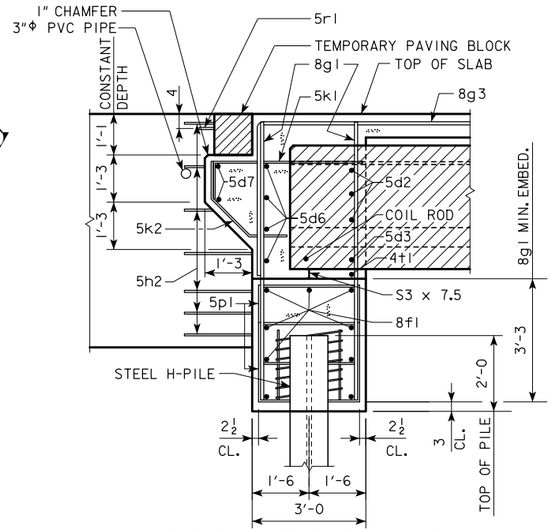
DECEMBER, 2006

SUPERSTRUCTURE DETAILS | H30-04-06



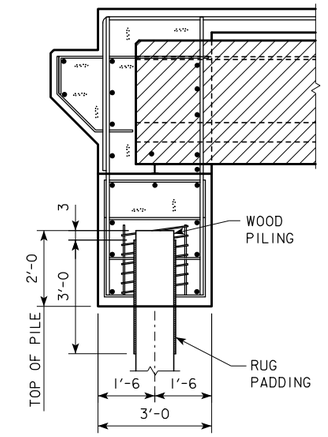
PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



PART SECTION B-B

(FOR STEEL H-PILING)



PART SECTION B-B

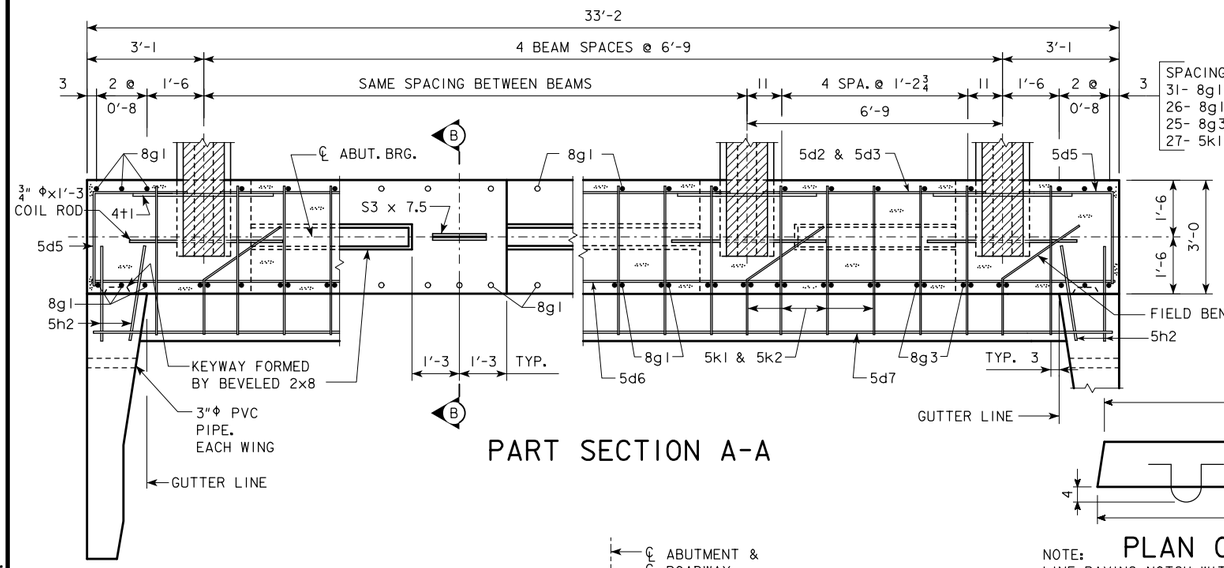
(FOR WOOD PILING)

WOOD PILING NOTE:
AFTER PILES ARE CUT OFF, THE UPPER 3', EXCEPT AS SHOWN, IS TO BE WRAPPED WITH A DOUBLE THICKNESS OF RUG PADDING HELD IN PLACE BY TACKING WITH GALVANIZED ROOFING NAILS AND WRAPPED WITH #14 GAUGE GALVANIZED WIRE AT A 4" PITCH, CARE IS TO BE TAKEN NOT TO DAMAGE PADDING WHEN PLACING CONCRETE. RUG PADDING MAY BE EITHER OF THE FOLLOWING:

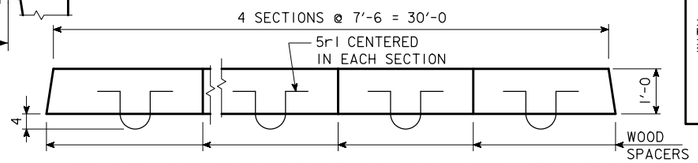
(1) HAIR AND JUTE RUG PADDING, RUBBERIZED ON BOTH SIDES, AND WEIGHING NOT LESS THAN 47 OZ. PER SQ. YD.

(2) BONDED URETHANE OR BONDED POLYFOAM WITH A MINIMUM DENSITY OF 5 LBS. PER CU. FT. AND SHALL BE AT LEAST ½ IN. THICK, (MATERIAL LESS THAN ½ IN. IN THICKNESS MAY BE USED, BUT WILL REQUIRE ADDITIONAL WRAPS FOR A TOTAL OF AT LEAST ONE INCH).

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

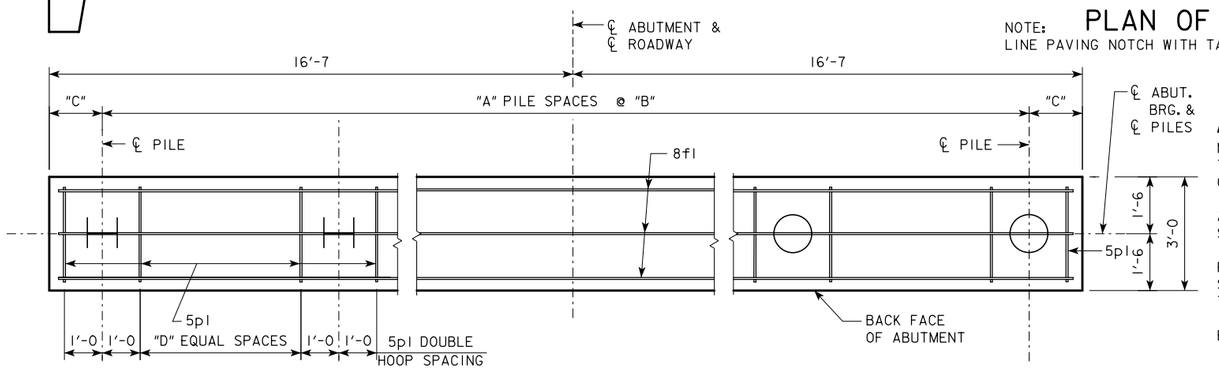


PART SECTION A-A



PLAN OF TEMPORARY PAVING BLOCK

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



ABUTMENT PILE PLAN

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES	10	11	11	12	12
	"B" (FT. - IN.)	3'-0	2'-8	2'-8	2'-6	2'-6
	"C" (FT. - IN.)	1'-7	1'-11	1'-11	1'-7	1'-7
	"D" EQUAL SPACES	1	1	1	1	1
	NO. OF PILES PER ABUT.	11	12	12	13	13
	Pu, STRENGTH I DESIGN LOAD (KIPS)	56	54	58	55	57
WITH STEEL H-PILES	"A" PILE SPACES	4	4	5	5	5
	"B" (FT. - IN.)	7'-2	7'-2	5'-8	5'-8	5'-8
	"C" (FT. - IN.)	2'-3	2'-3	2'-5	2'-5	2'-5
	"D" EQUAL SPACES	5	5	3	3	3
	NO. OF PILES PER ABUT.	5	5	6	6	6
	Pu, STRENGTH I DESIGN LOAD (KIPS)	136	141	126	131	135

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.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

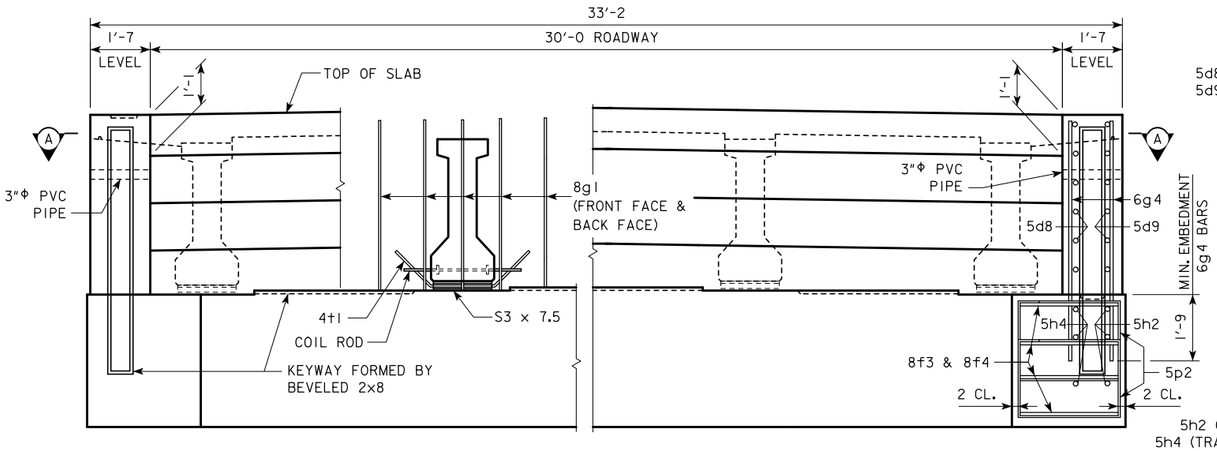
DECEMBER, 2006

ABUTMENT DETAILS

0° SKEW A & B BEAMS

H30-05-06

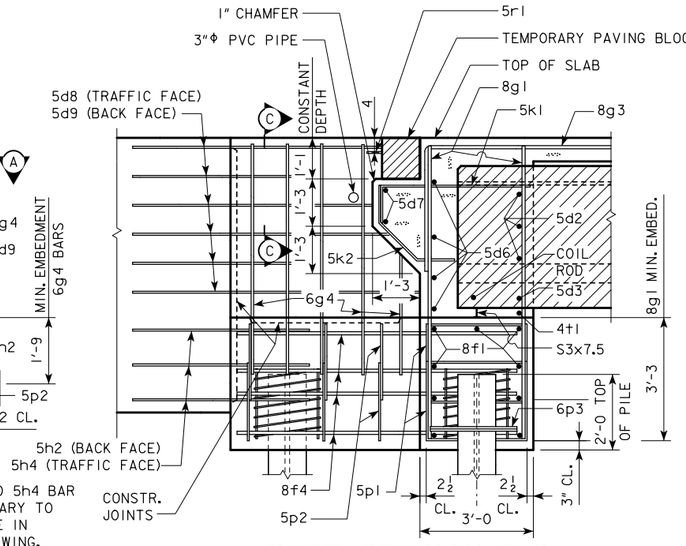
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL

FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.



PART SECTION B-B

ABUTMENT NOTES:

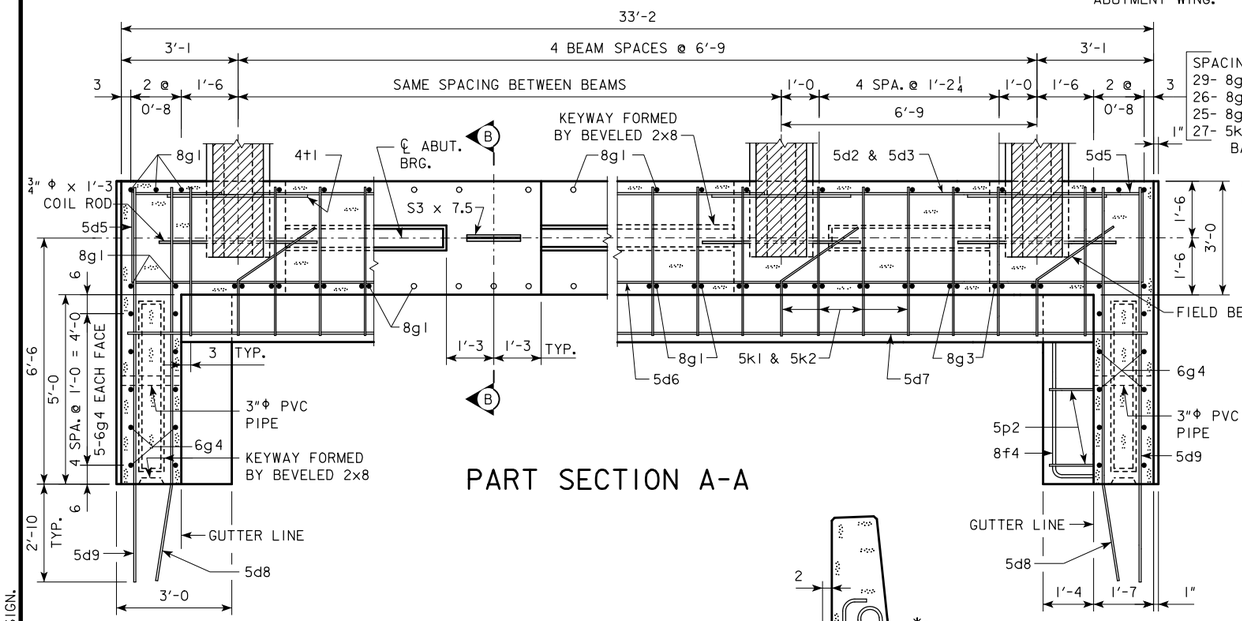
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

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

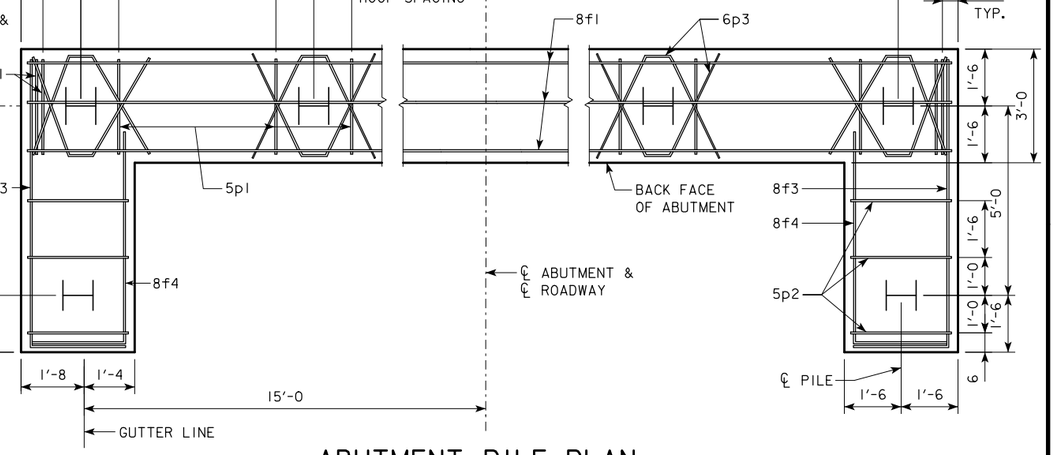
BARRIER RAIL NOT SHOWN IN DETAILS.

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

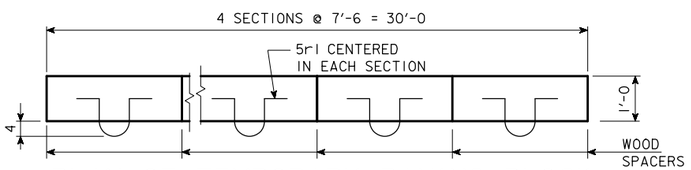
NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF NO. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - $L\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRAL.



PART SECTION A-A

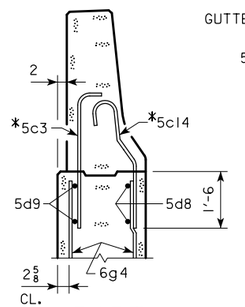


ABUTMENT PILE PLAN



PLAN OF TEMPORARY PAVING BLOCK

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



PART SECTION C-C

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

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	5	6	6	6
	"B" (FT. - IN.)	5'-9	4'-9	4'-9	4'-9
	"C" (FT. - IN.)	2'-3½	2'-5	2'-5	2'-5
	"D" EQUAL SPACES	3	3	3	3
	NO. OF PILES PER ABUT.	8	9	9	9
	Pu, STRENGTH I DESIGN LOAD (KIPS)	143	126	130	138

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

04-13
LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

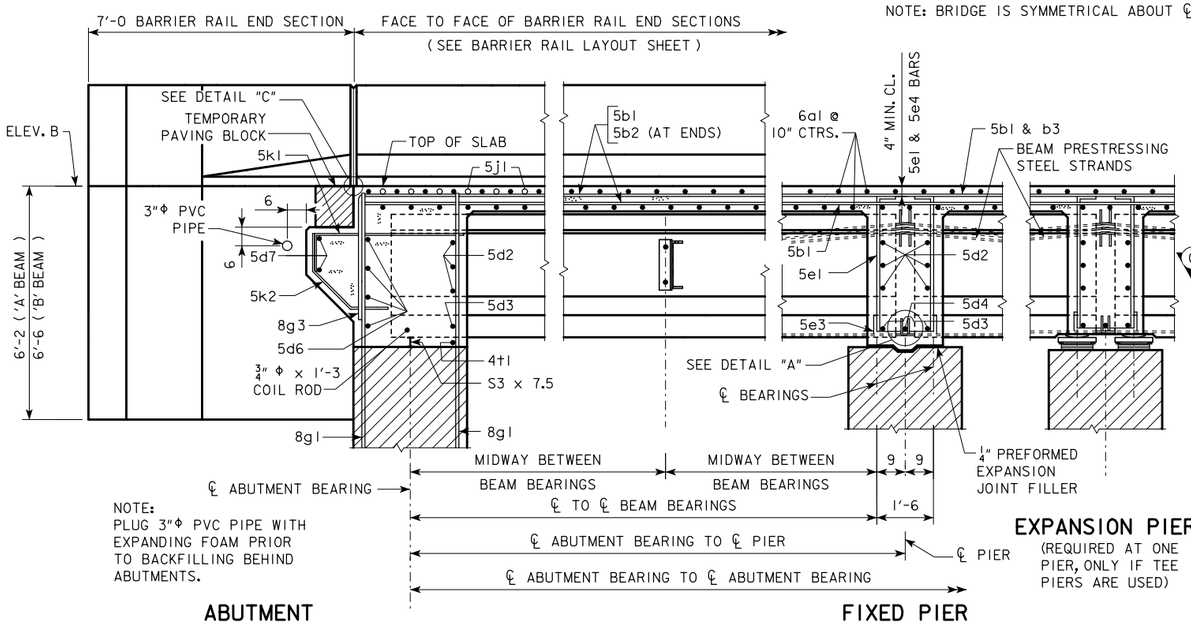
DECEMBER, 2006

ABUTMENT DETAILS

0° SKEW C BEAMS

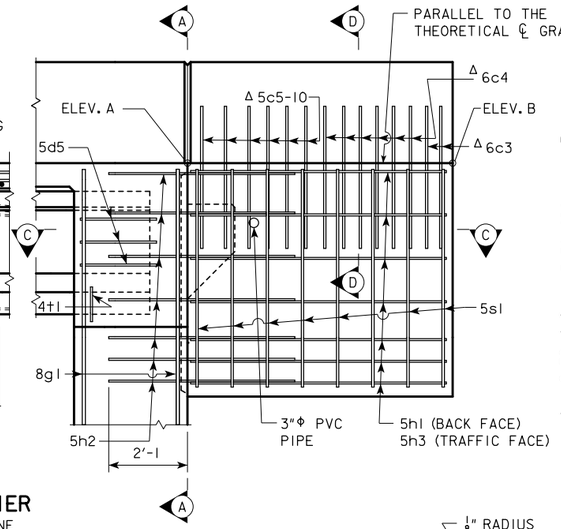
H30-06-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

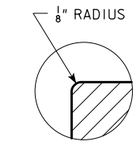


EXPANSION PIER

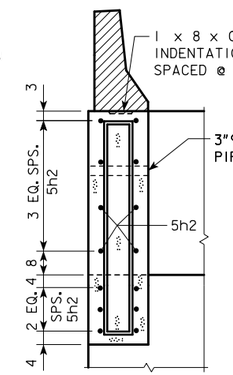
(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

PART END VIEW AT ABUTMENT

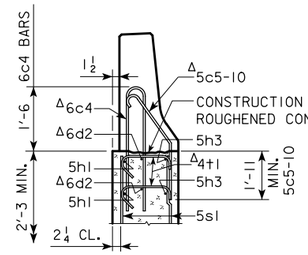
PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.



DETAIL "C"

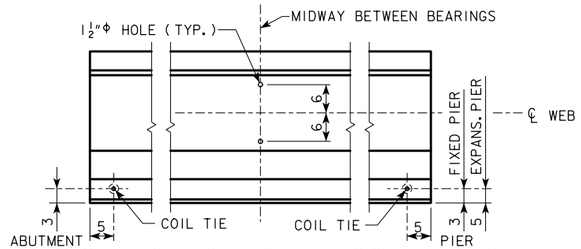


SECTION A-A

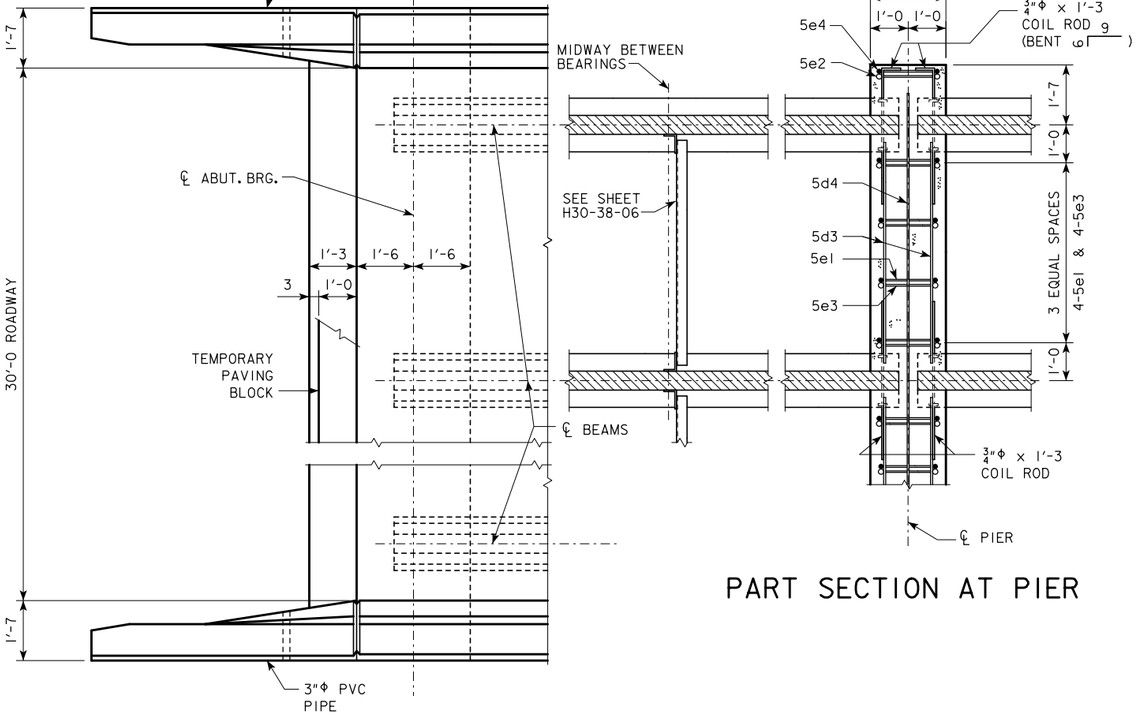


SECTION D-D

Δ NOTE:
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.

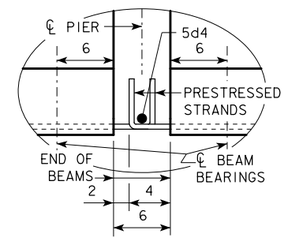


LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

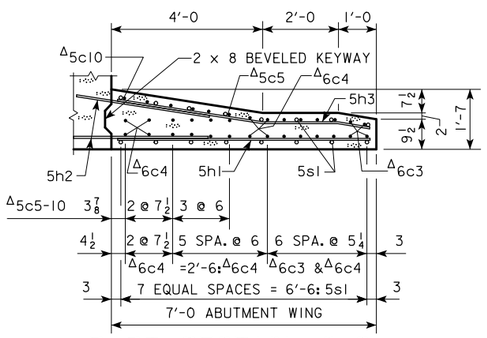


PART PLAN

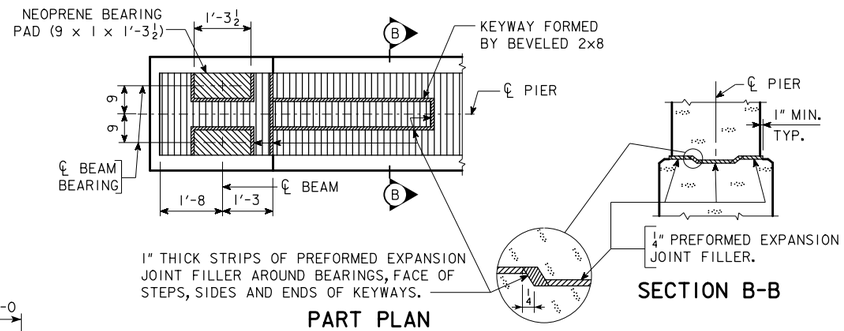
PART SECTION AT PIER



DETAIL "A"



PART SECTION C-C



SECTION B-B

PART PLAN

TOP OF FIXED PIER DETAILS

(SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS)

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

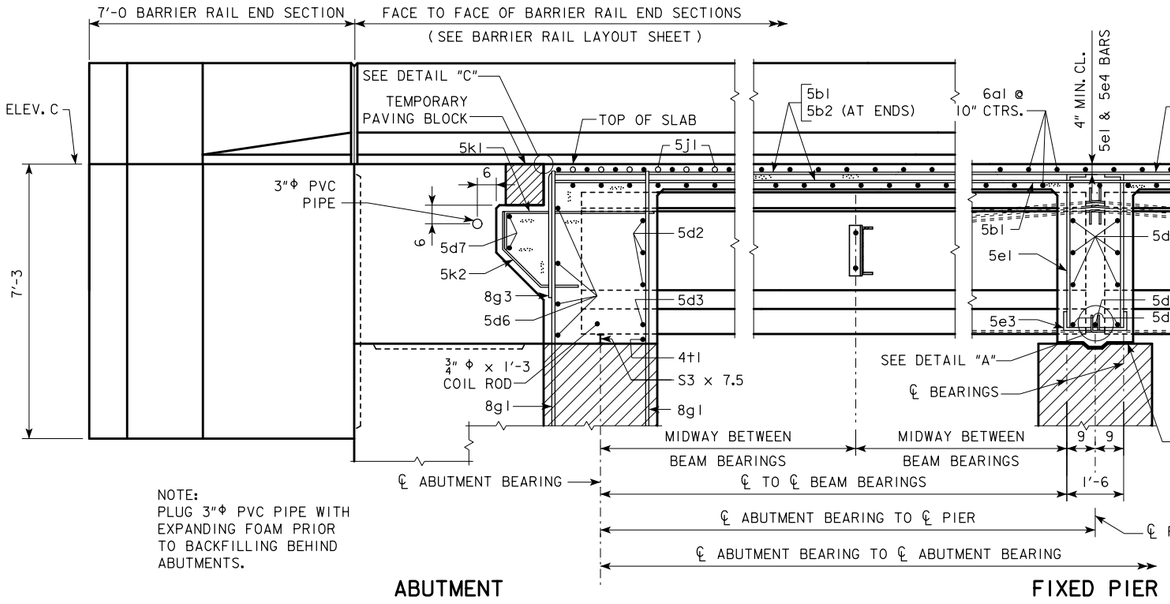
LONGITUDINAL SECTION

0° SKEW A & B BEAMS

H30-07-06

CORRECTION 09-10 - MINOR MODIFICATIONS TO PART SECTION C-C.
REVISED 07-10 - ABUT. WING SHAPE CHANGED.

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

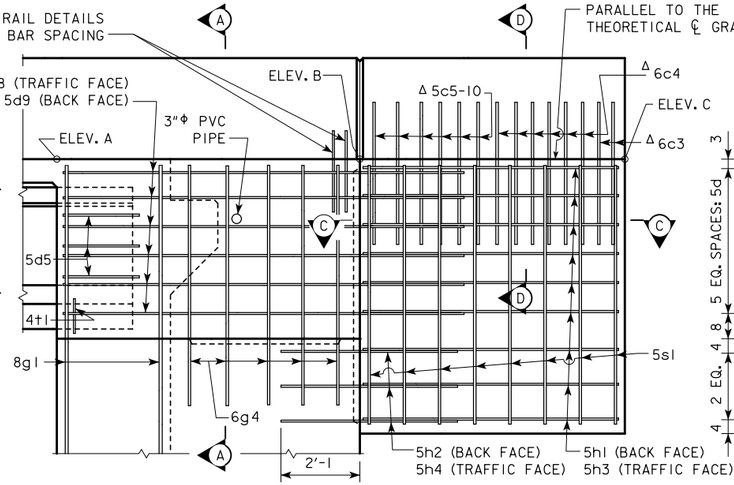


NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART LONGITUDINAL SECTION NEAR GUTTER

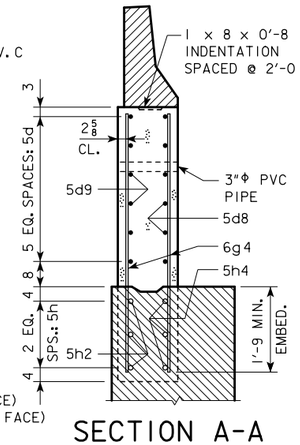
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

EXPANSION PIER
(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

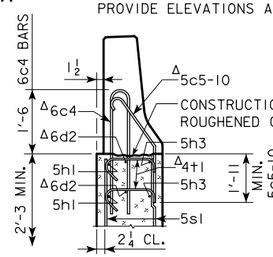


PART END VIEW AT ABUTMENT

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



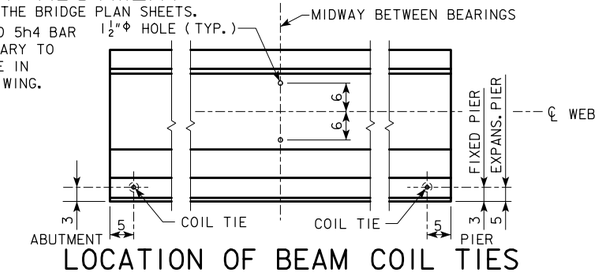
SECTION A-A



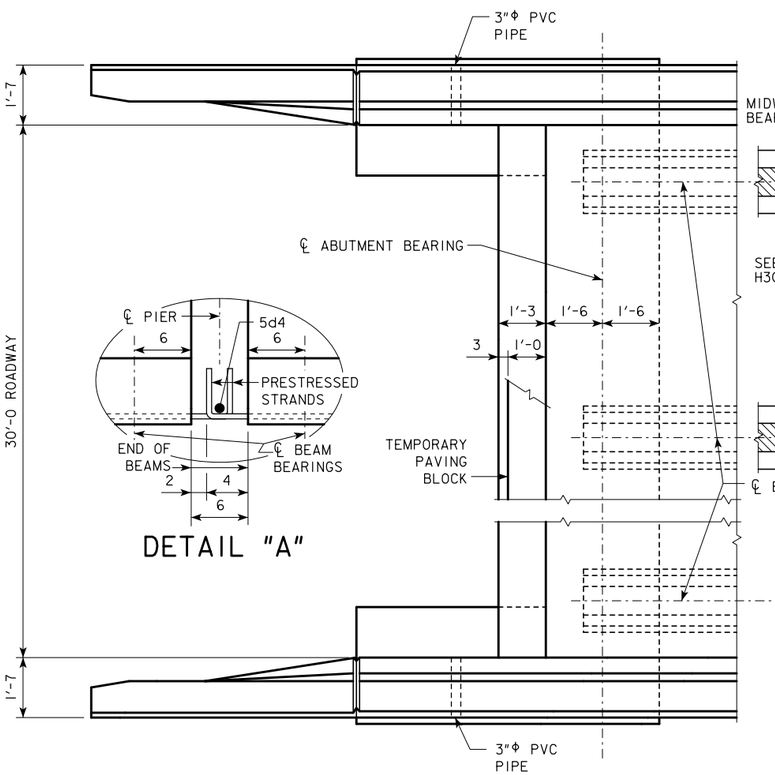
SECTION D-D

FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.

Δ NOTE:
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.

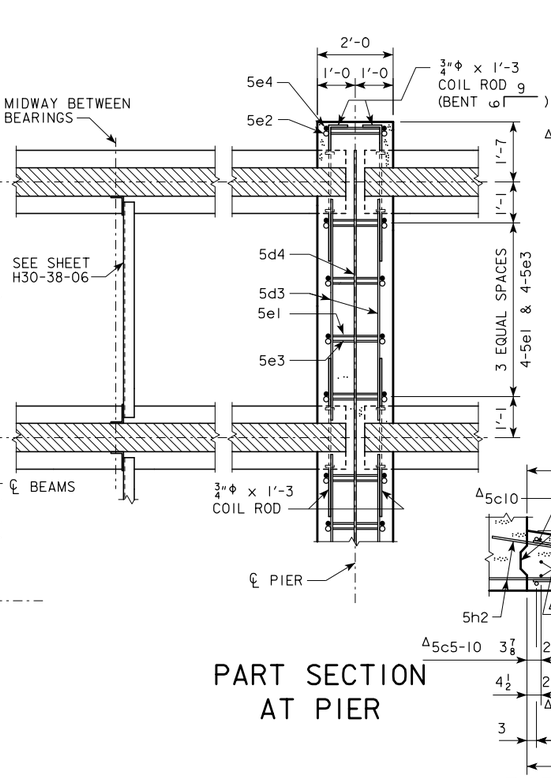


LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

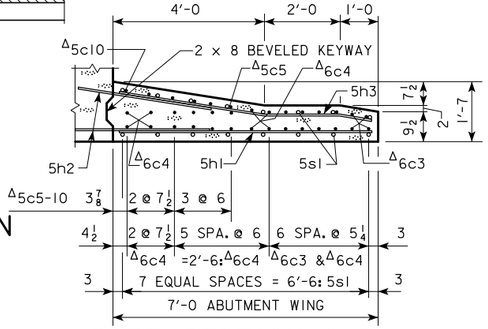


DETAIL "A"

PART PLAN

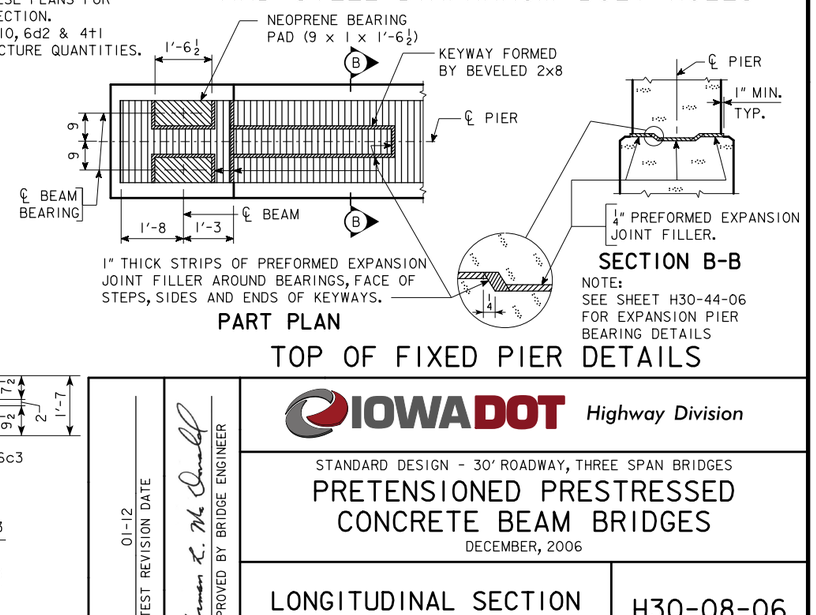


PART SECTION AT PIER



DETAIL "C"

PART SECTION C-C



PART PLAN

SECTION B-B

NOTE:
SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS

TOP OF FIXED PIER DETAILS

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.

01-12
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

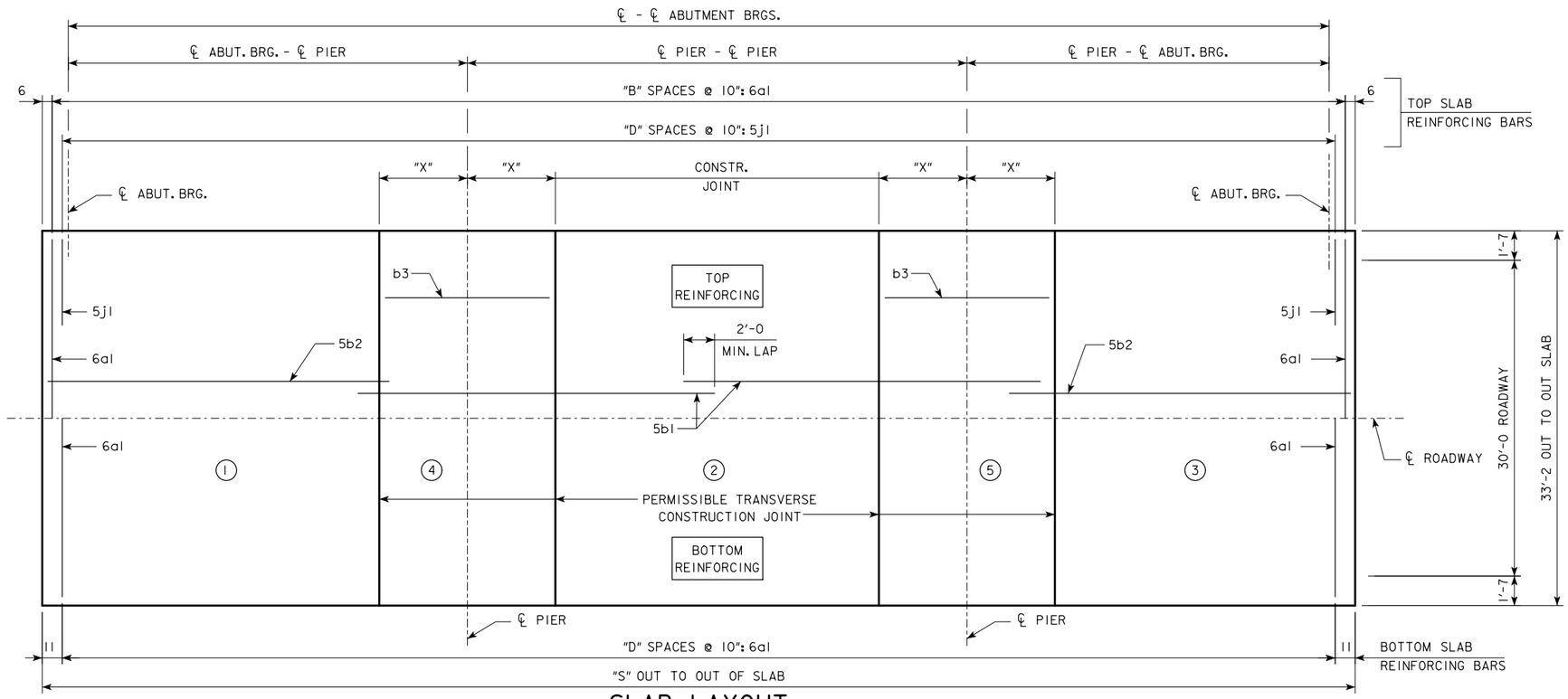
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

LONGITUDINAL SECTION

0° SKEW C BEAMS

H30-08-06



SLAB LAYOUT

ESTIMATED QUANTITIES
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STRUCTURAL CONCRETE SUPERSTRUCTURE (INCLUDES ABUTMENT WINGS, PAV. BLOCKS)	WITH BARRIER RAIL	C.Y.	168.1	178.8	196.1	206.8	217.5	239.0	249.7	261.0	275.8
	WITH OPEN RAIL	C.Y.	170.6	181.5	199.1	210.0	221.0	242.5	253.4	265.0	280.0
STRUCTURAL CONCRETE ABUTMENTS (w/ WOOD PILES)		C.Y.	25.3	25.2	25.2	25.1	25.1	-----	-----	-----	-----
STRUCTURAL CONCRETE ABUTMENTS (w/ STEEL H PILES)		C.Y.	26.6	26.6	26.6	26.6	26.6	34.4	34.4	34.4	34.4
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN		NO.	5-A50	5-A55	5-B59	5-B63	5-B67	5-C71	5-C75	5-C80	5-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN		NO.	10-A42	10-A46	10-B50	10-B55	10-B59	10-C63	10-C67	10-C71	10-C80
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	311.7	336.7	361.7	386.7	411.7	456.7	481.7	506.7	540.0
STRUCTURAL STEEL (w/ PILE BENT PIERS & DRAINS)		LB.	3829	3829	3917	3917	3917	3912	3912	3912	3912
STRUCTURAL STEEL (w/ PILE BENT PIERS & NO DRAINS)		LB.	3149	3149	3149	3149	3149	3064	3064	3064	3064
STRUCTURAL STEEL (w/ TEE PIERS & DRAINS)		LB.	4725	4725	4813	4813	4813	4970	4970	4970	4970
STRUCTURAL STEEL (w/ TEE PIERS & NO DRAINS)		LB.	4045	4045	4045	4045	4045	4122	4122	4122	4122
REINFORCING STEEL (w/ WOOD PILES & BARRIER RAIL)		LB.	50,098	53,542	57,274	61,247	64,670	-----	-----	-----	-----
REINFORCING STEEL (w/ WOOD PILES & OPEN RAIL)		LB.	50,763	54,163	58,042	62,191	65,544	-----	-----	-----	-----
REINFORCING STEEL (w/ STEEL H PILES & BARRIER RAIL)		LB.	50,150	53,487	57,064	60,928	64,351	70,789	75,170	78,589	83,064
REINFORCING STEEL (w/ STEEL H PILES & OPEN RAIL)		LB.	50,815	54,108	57,832	61,872	65,225	72,420	76,710	80,326	84,847
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS		NO.	22	24	24	26	26	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)		NO.	10	10	12	12	12	16	18	18	18
PREBORED HOLES (w/ WOOD PILES)		L.F.	220	240	240	260	260	-----	-----	-----	-----
PREBORED HOLES (w/ STEEL H-PILES)		L.F.	100	100	120	120	120	160	180	180	180

CONCRETE PLACEMENT QUANT.
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, & WINGWALLS** , SECTIONS 1 & 3	WITH BARRIER RAIL	C.Y.	90.8	97.0	107.2	113.4	119.6	134.2	140.6	147.2	162.0
	WITH OPEN RAIL	C.Y.	92.1	98.4	108.8	115.1	121.5	136.1	142.6	149.4	164.4
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	33.5	36.2	38.9	41.6	44.1	47.0	49.7	52.4	52.4
	WITH OPEN RAIL	C.Y.	34.2	37.0	39.7	42.5	45.1	48.0	50.7	53.5	53.5
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	34.2	36.0	40.0	41.8	43.8	47.0	48.6	50.6	50.6
	WITH OPEN RAIL	C.Y.	34.7	36.5	40.6	42.4	44.4	47.6	49.3	51.3	51.3
PAVING BLOCKS		C.Y.	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
ABUTMENT WINGS		C.Y.	7.2	7.2	7.6	7.6	7.6	8.4	8.4	8.4	8.4
ABUTMENT FOOTINGS (w/ WOOD PILES)		C.Y.	25.3	25.2	25.2	25.1	25.1	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES)		C.Y.	26.6	26.6	26.6	26.6	26.6	34.4	34.4	34.4	34.4

GENERAL DATA

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-7 15/16	3'-7 3/4	4'-2 13/16	4'-2 13/16	4'-3	4'-8 1/2	4'-8 11/16	4'-9	4'-9 7/16
CURVE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 7/8	3'-6 5/8	4'-1 3/8	4'-1 5/8	4'-1 15/16	4'-7 5/16	4'-7 5/16	4'-7 9/16	4'-7 9/16
STRAIGHT	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-8 1/16	3'-7 7/8	4'-2 15/16	4'-2 15/16	4'-3 1/16	4'-8 11/16	4'-8 15/16	4'-9 3/8	4'-10
GRADE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 5/8	3'-6 7/8	4'-1 11/16	4'-1 15/16	4'-2 5/16	4'-7 15/16	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	345.7	373.7	426.8	456.3	485.9	583.8	617.0	650.6	683.4
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	207.6	215.3	222.7	229.9	237.0	244.0	253.2	268.2	284.4
NO. OF SPACES FOR 6a1 BARS (TOP)		"B"	169	184	199	214	229	244	259	274	294
NO. OF SPACES FOR 6a1 BARS (BOTTOM) AND 5j1 BARS (TOP)		"D"	168	183	198	213	228	243	258	273	293
OUT TO OUT OF SLAB		"S"	141'-10	154'-4	166'-10	179'-4	191'-10	204'-4	216'-10	229'-4	246'-0
SLAB TRANSVERSE CONSTR. JT. DISTANCE FROM C.L. PIER		"X"	6'-7	7'-1	7'-7	8'-1	8'-8	9'-2	9'-8	10'-2	10'-2

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

* VALUES SHOWN ARE FOR FIXED PIERS ONLY AND ALLOW FOR 1/16 INCH DEFLECTION OF THE 1 INCH NEOPRENE BEARING PAD. AT EXPANSION PIER LOCATIONS ADD 3 1/16 INCHES TO "U" VALUES SHOWN.

** WINGWALLS APPLY ONLY TO BRIDGES USING "C" BEAMS.

07-15
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

SUPERSTRUCTURE DETAILS
0° SKEW

H30-09-06

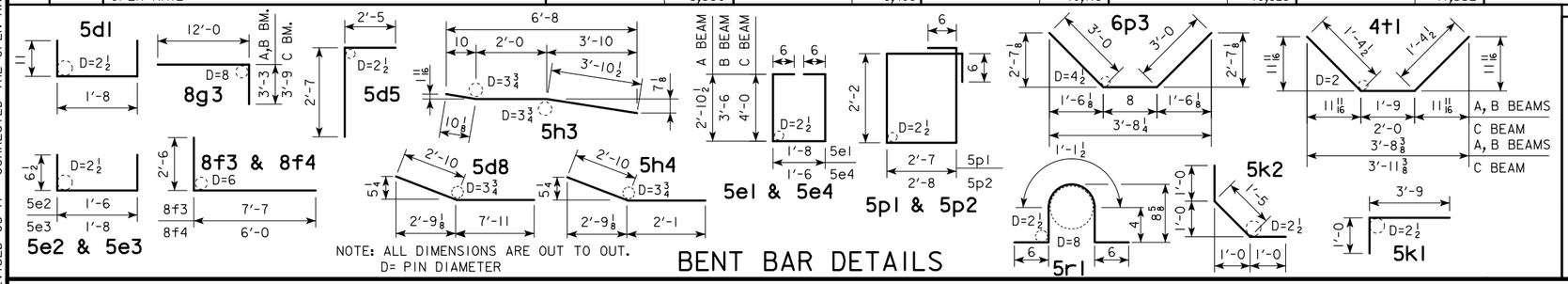
REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.

REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

			138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
		℄-℄ ABUT. BRG.	42'-6	50'-10	42'-6	46'-8	55'-0	46'-8	50'-10	59'-2	50'-10	55'-0	63'-4	55'-0	59'-2	67'-6	59'-2	63'-4	71'-8	63'-4	67'-6	75'-10	67'-6	71'-8	80'-0	71'-8	80'-0	80'-0	80'-0
		℄-℄ BEAM BRG.																											
		BEAM SERIES	A BEAM			A BEAM			B BEAM			B BEAM			B BEAM			C BEAM			C BEAM			C BEAM			C BEAM		
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.		339	32'-10	16,718	369	32'-10	18,197	399	32'-10	19,677	429	32'-10	21,156	459	32'-10	22,636	489	32'-10	24,115	519	32'-10	25,595	549	32'-10	27,074	589	32'-10	29,047
5b1	SLAB LONGITUDINAL, TOP & BOTT.		152	40'-0	6,341	152	40'-0	6,341	228	40'-0	9,512	228	40'-0	9,512	228	40'-0	9,512	304	40'-0	12,683	304	40'-0	12,683	304	40'-0	12,683	380	40'-0	15,854
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS		152	33'-9	5,351	152	40'-0	6,341	152	27'-3	4,320	152	33'-6	5,311	152	39'-9	6,302	152	27'-0	4,280	152	33'-3	5,271	152	39'-6	6,262	152	28'-10	4,571
6b3	SLAB LONGITUDINAL, TOP @ PIERS		66	12'-10	1,272	66	13'-10	1,371	66	14'-10	1,470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP @ PIERS		—	—	—	—	—	—	—	—	—	66	15'-10	2,136	66	17'-0	2,293	66	18'-0	2,428	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP @ PIERS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66	19'-0	3,348	66	20'-0	3,524	66	20'-0	3,524
5d1	PIER DIAPH. ENDS		12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44	12	3'-6	44
5d2	PIER & ABUT. DIAPH. LONGIT.		72	6'-1	457	72	6'-1	457	72	6'-1	457	72	6'-1	457	72	6'-1	457	72	5'-10	438	72	5'-10	438	72	5'-10	438	72	5'-10	438
5d3	PIER & ABUT. DIAPH. LONGIT.		24	5'-2	129	24	5'-2	129	24	5'-2	129	24	5'-2	129	24	5'-2	129	24	4'-11	123	24	4'-11	123	24	4'-11	123	24	4'-11	123
5d4	PIER DIAPH. LONGIT.		2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62	2	29'-9	62
5d5	ABUT. DIAPH. ENDS		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	12	5'-0	63	12	5'-0	63
5d6	ABUT. DIAPH. LONGIT. B.F.		8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273	8	32'-9	273
5d7	PAVING NOTCH LONGIT.		4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137	4	32'-9	137
5d8	ABUT. 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
5e1	PIER DIAPH. HOOPS		32	8'-5	281	32	8'-5	281	32	9'-8	323	32	9'-8	323	32	9'-8	323	32	10'-8	356	32	10'-8	356	32	10'-8	356	32	10'-8	356
5e2	PIER DIAPH. TIES ENDS		4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11	4	2'-7	11
5e3	PIER DIAPH. TIES		32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92	32	2'-9	92
5e4	PIER DIAPH. HOOPS ENDS		4	8'-3	34	4	8'-3	34	4	9'-6	40	4	9'-6	40	4	9'-6	40	4	10'-6	44	4	10'-6	44	4	10'-6	44	4	10'-6	44
8f1	ABUT. FOOTING LONGIT.		18	32'-10	1,578	18	32'-10	1,578	18	32'-10	1,578	18	32'-10	1,578	18	32'-10	1,578	18	33'-0	1,586	18	33'-0	1,586	18	33'-0	1,586	18	33'-0	1,586
8f3	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	10'-1	431	16	10'-1	431	16	10'-1	431	16	10'-1	431
8f4	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	8'-6	363	16	8'-6	363	16	8'-6	363	16	8'-6	363
8g1	ABUT. VERT.		114	6'-8	2,029	114	6'-8	2,029	114	7'-3	2,207	114	7'-3	2,207	114	7'-3	2,207	110	7'-9	2,276	110	7'-9	2,276	110	7'-9	2,276	110	7'-10	2,301
8g3	ABUT. DIAPH. VERT. B.F.		50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-9	2,103	50	15'-9	2,103	50	15'-9	2,103	50	15'-9	2,103
6g4	ABUT. DIAPH. WING EXT. VERT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40	6'-6	391	40	6'-6	391	40	6'-7	396	40	6'-7	396
5h1	ABUT. WING HORIZ. B.F.		28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	36	6'-8	250	36	6'-8	250	36	6'-8	250	36	6'-8	250
5h2	ABUT. TO WING ANCHOR		56	4'-11	287	56	4'-11	287	56	4'-11	287	56	4'-11	287	56	4'-11	287	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5h3	ABUT. WING HORIZ. TRAFFIC FACE		28	6'-9	197	28	6'-9	197	28	6'-9	197	28	6'-9	197	28	6'-9	197	36	6'-9	253	36	6'-9	253	36	6'-9	253	36	6'-9	253
5h4	ABUT. TO WING ANCHOR		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5j1	TOP OF SLAB TRANSV. (AT RAIL)		338	6'-3	2,203	368	6'-3	2,399	398	6'-3	2,594	428	6'-3	2,790	458	6'-3	2,986	488	6'-3	3,181	518	6'-3	3,377	548	6'-3	3,572	588	6'-3	3,833
5k1	PAVING NOTCH		54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268
5k2	PAVING NOTCH		54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192
5p1	ABUTMENT HOOPS (WOOD/STEEL)		88/104	10'-6	964/1139	96/104	10'-6	1051/1139	96/88	10'-6	1051/964	104/88	10'-6	1139/964	104/88	10'-6	1139/964	96	10'-6	1,051	112	10'-6	1,227	112	10'-6	1,227	112	10'-6	1,227
5p2	ABUTMENT HOOPS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	10'-8	267	24	10'-8	267	24	10'-8	267	24	10'-8	267
6p3	ABUT. BOTT. AT PILES		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	6'-8	240	28	6'-8	280	28	6'-8	280	28	6'-8	280
5r1	PAVING BLOCK LIFTING LOOPS		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	8	2'-10	24	8	2'-10	24
5s1	WING VERT.		64	5'-10	389	64	5'-10	389	64	6'-2	412	64	6'-2	412	64	6'-2	412	64	6'-11	462	64	6'-11	462	64	6'-11	462	64	6'-11	462
4t1	UNDER BEAMS AT ABUTMENTS		10	4'-6	30	10	4'-6	30	10	4'-6	30	10	4'-6	30	10	4'-6	30	10	4'-9	32	10	4'-9	32	10	4'-9	32	10	4'-9	32
#2	PILE SPIRAL (WOOD/STEEL)*		22/10	38'-6	141/64	24/10	38'-6	154/64	24/12	38'-6	154/77	26/12	38'-6	167/77	26/12	38'-6	167/77	16	38'-6	103	18	38'-6	116	18	38'-6	116	18	38'-6	116
	SPIRAL SPACERS, L 7/8 x 7/8 x 1/8 x 0.70 (WOOD/STL.)*		66/30	1'-10	85/39	72/30	1'-10	92/39	72/36	1'-10	92/46	78/36	1'-10	100/46	78/36	1'-10	100/46	48	1'-10	62	54	1'-10	69	54	1'-10	69	54	1'-10	69
	*EPOXY COATING NOT REQUIRED																												
	SUB TOTAL W/ WOOD PILES**				41,883			44,754			47,927			51,368			54,192			—			—			—			—
	SUB TOTAL W/ STEEL H-PILES**				41,935			44,699			47,717			51,049			53,873			59,344			63,167			66,013			69,752
	**RAIL REINFORCING NOT INCLUDED																												
	BARRIER RAIL				8,215			8,788			9,347			9,879			10,478			11,445			12,003			12,576			13,312
	OPEN RAIL				8,880			9,409			10,115			10,823			11,352			13,076			13,543			14,313			15,095

REVISED 05-11 - CORRECTED THE OPEN RAIL REBAR QUANTITIES FOR THE 201'-4, 231'-10, 226'-4, & 243'-0 BRIDGE LENGTHS.



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

BENT BAR DETAILS

05-11
LATEST REVISION DATE

Marvin K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

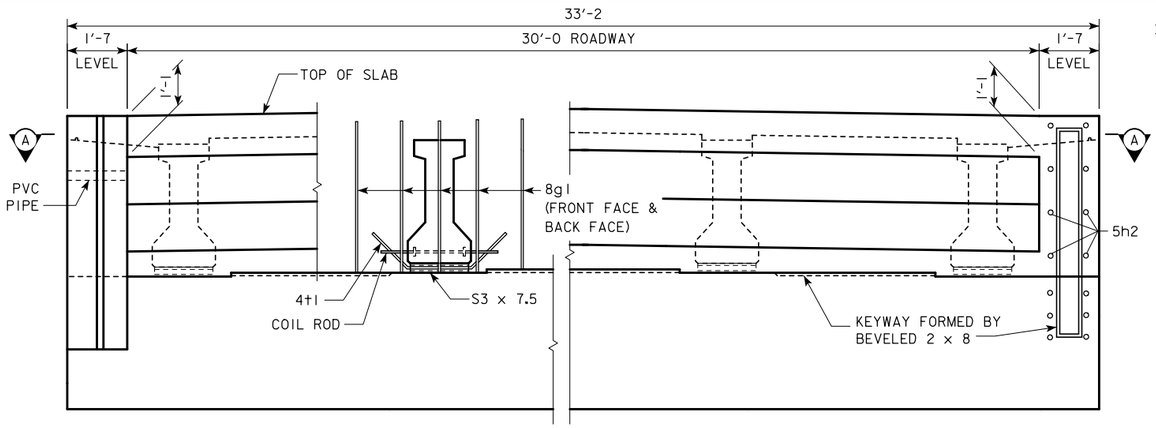
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

DECK & ABUTMENT REINF.

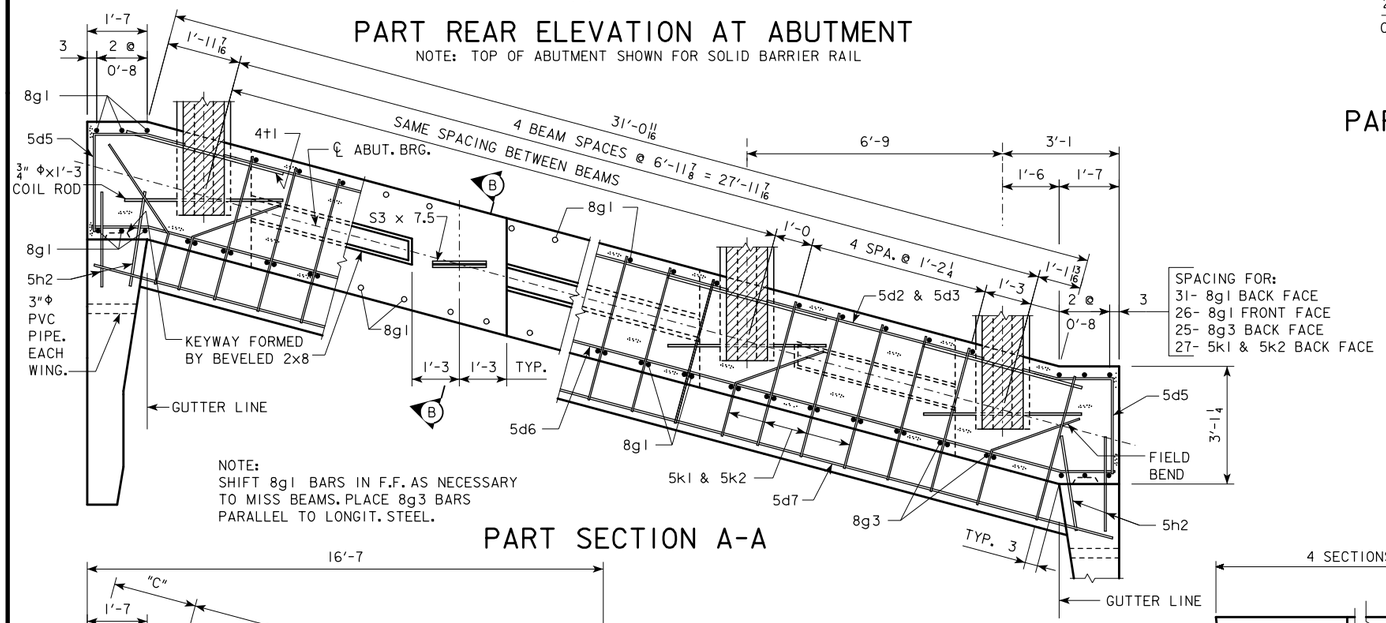
0° SKEW

H30-10-06



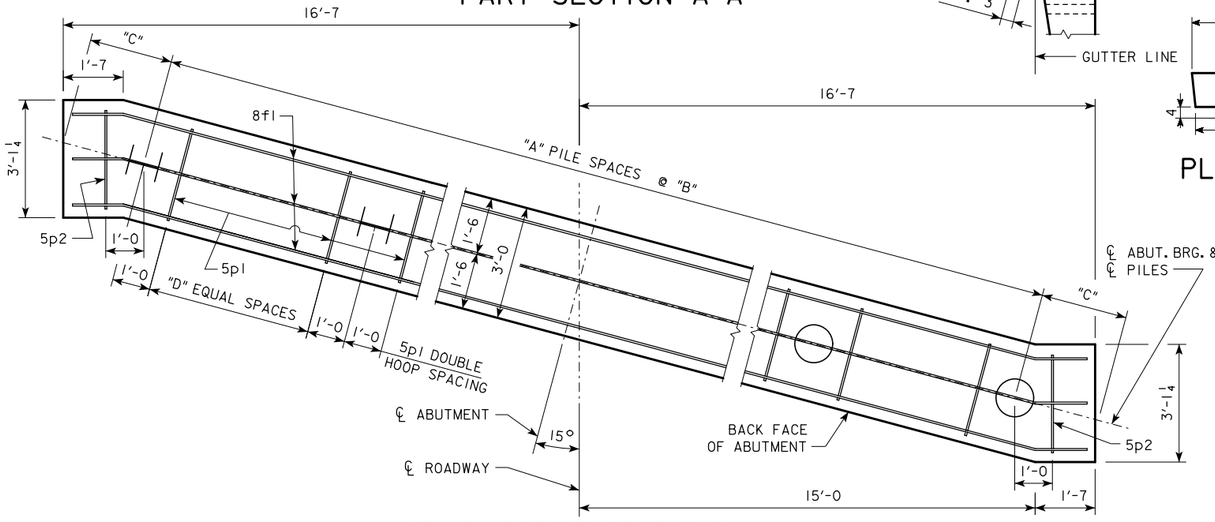
PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL

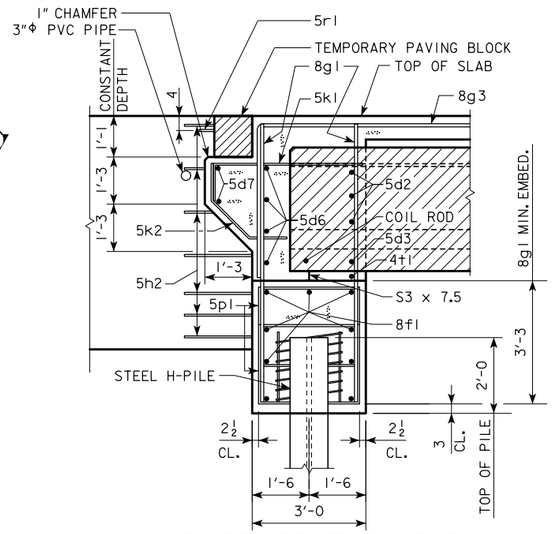


NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

PART SECTION A-A

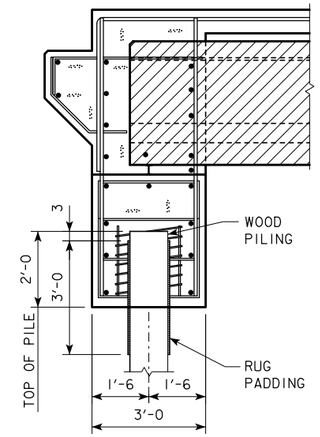


ABUTMENT PILE PLAN



PART SECTION B-B

(FOR STEEL H-PILING)



PART SECTION B-B

(FOR WOOD PILING)

WOOD PILING NOTE:
AFTER PILES ARE CUT OFF, THE UPPER 3', EXCEPT AS SHOWN, IS TO BE WRAPPED WITH A DOUBLE THICKNESS OF RUG PADDING HELD IN PLACE BY TACKING WITH GALVANIZED ROOFING NAILS AND WRAPPED WITH #14 GAUGE GALVANIZED WIRE AT A 4" PITCH, CARE IS TO BE TAKEN NOT TO DAMAGE PADDING WHEN PLACING CONCRETE. RUG PADDING MAY BE EITHER OF THE FOLLOWING:

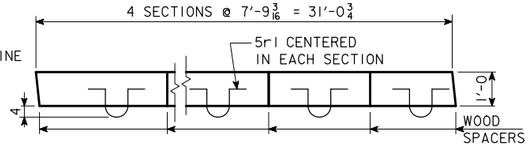
(1) HAIR AND JUTE RUG PADDING, RUBBERIZED ON BOTH SIDES, AND WEIGHING NOT LESS THAN 47 OZ. PER SQ. YD.

(2) BONDED URETHANE OR BONDED POLYFOAM WITH A MINIMUM DENSITY OF 5 LBS. PER CU. FT. AND SHALL BE AT LEAST 1/2 IN. THICK, (MATERIAL LESS THAN 1/2 IN. IN THICKNESS MAY BE USED, BUT WILL REQUIRE ADDITIONAL WRAPS FOR A TOTAL OF AT LEAST ONE INCH).

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

ABUTMENT PILE SPACING		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES		10	11	12	12	12
	"B" (FT. - IN.)		3'-1	2'-10	2'-7	2'-7	2'-7
	"C" (FT. - IN.)		1'-9	1'-7	1'-8	1'-8	1'-8
	"D" EQUAL SPACES		1	1	1	1	1
	NO. OF PILES PER ABUT.		11	12	13	13	13
	Pu, STRENGTH I DESIGN LOAD (KIPS)		57	54	54	56	58
WITH STEEL H-PILES	"A" PILE SPACES		4	4	5	5	5
	"B" (FT. - IN.)		7'-5	7'-5	5'-11	5'-11	5'-11
	"C" (FT. - IN.)		2'-4	2'-4	2'-4 1/2	2'-4 1/2	2'-4 1/2
	"D" EQUAL SPACES		5	5	4	4	4
	NO. OF PILES PER ABUT.		5	5	6	6	6
	Pu, STRENGTH I DESIGN LOAD (KIPS)		137	142	127	132	136

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



PLAN OF TEMPORARY PAVING BLOCK

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

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.

04-13
LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

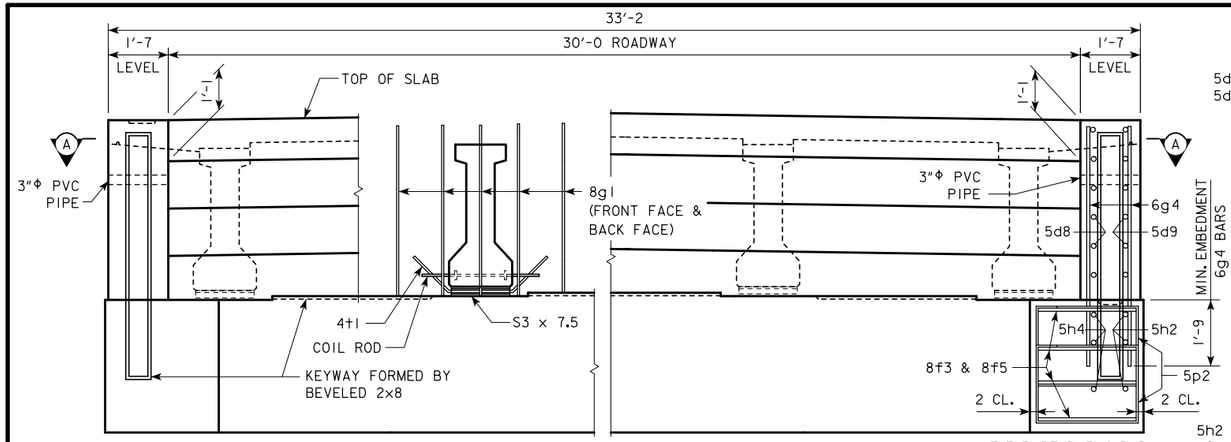
DECEMBER, 2006

ABUTMENT DETAILS

15° SKEW A & B BEAMS

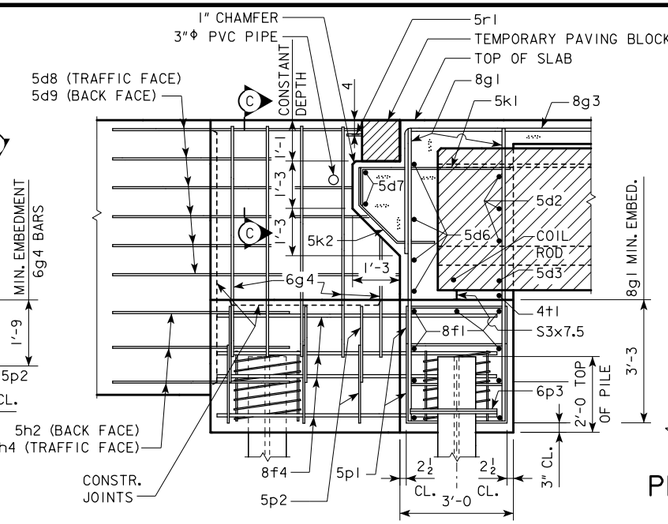
H30-11-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



PART SECTION B-B

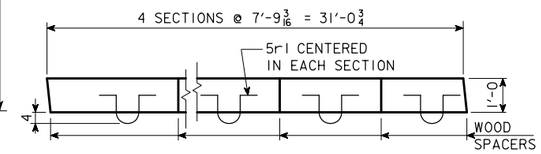
ABUTMENT NOTES:

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.

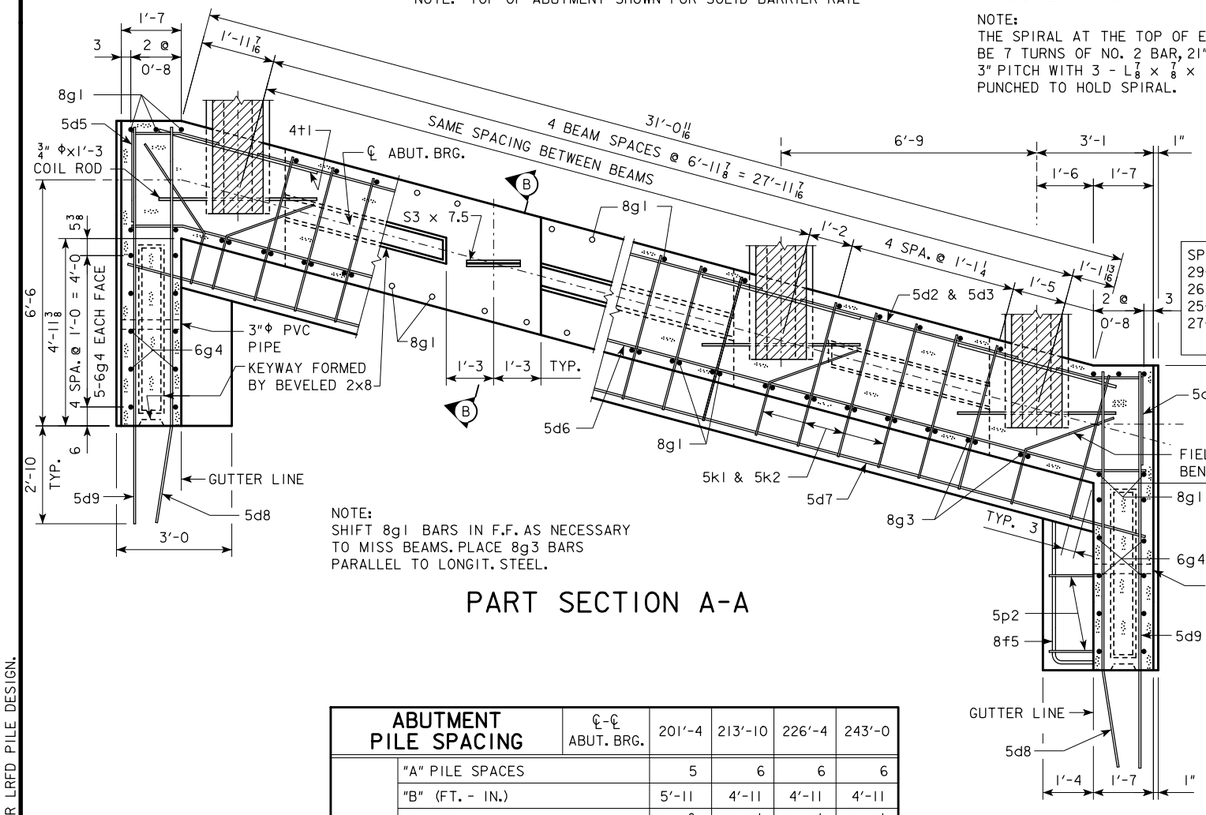
BARRIER RAIL NOT SHOWN IN DETAILS.

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



PLAN OF TEMPORARY PAVING BLOCK

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



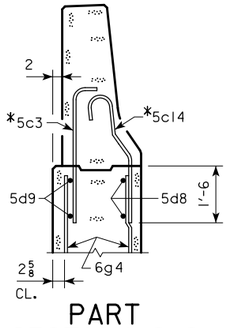
NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

PART SECTION A-A

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

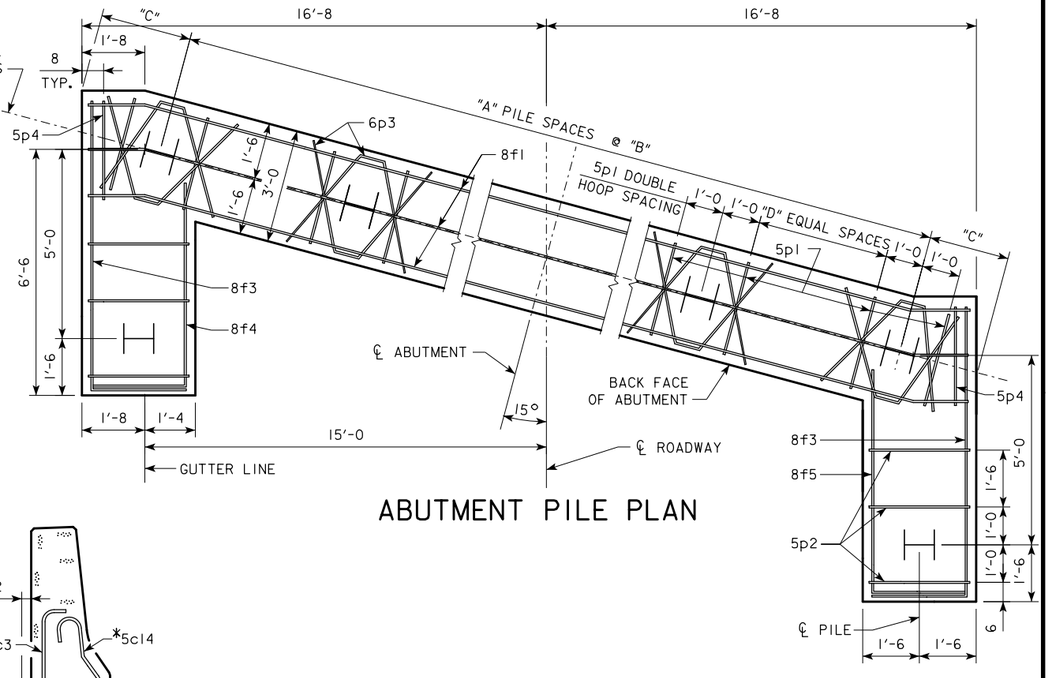
ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	5	6	6	6
	"B" (FT. - IN.)	5'-11	4'-11	4'-11	4'-11
	"C" (FT. - IN.)	2'-5 9/16	2'-6 1/16	2'-6 1/16	2'-6 1/16
	"D" EQUAL SPACES	4	3	3	3
	NO. OF PILES PER ABUT.	8	9	9	9
	Pu, STRENGTH I DESIGN LOAD (KIPS)	144	127	131	139

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



PART SECTION C-C

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

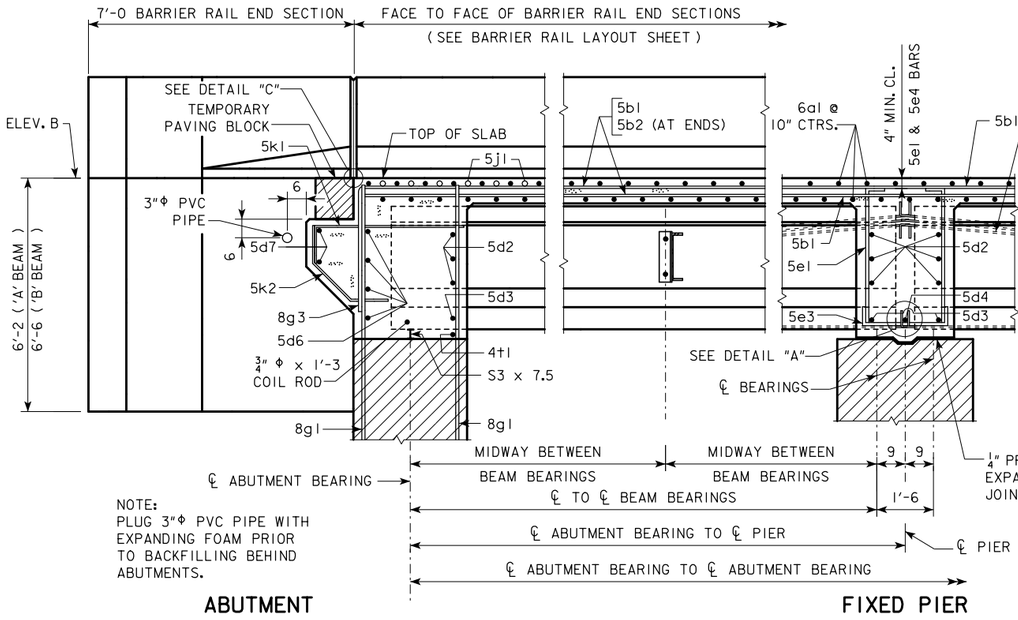


ABUTMENT PILE PLAN

04-13 LATEST REVISION DATE	Approved by Bridge Engineer	IOWA DOT Highway Division
		STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES
		PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
		DECEMBER, 2006
		ABUTMENT DETAILS — 15° SKEW C BEAMS
		H30-12-06

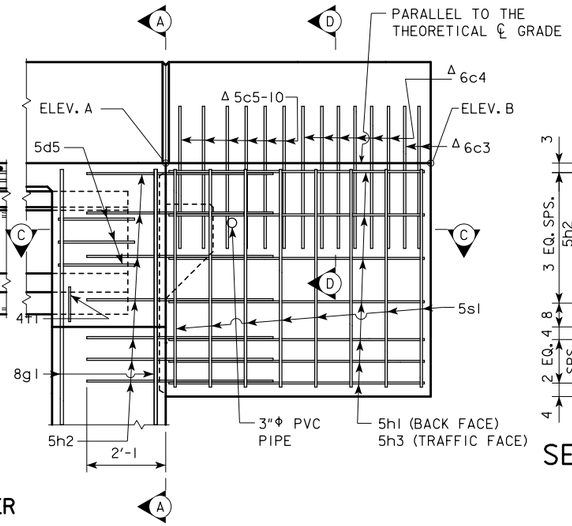
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄



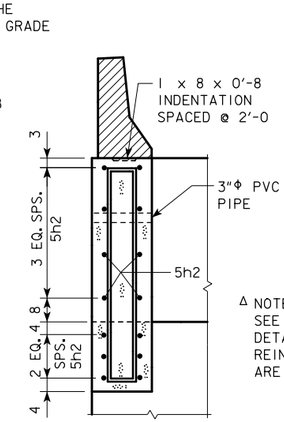
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

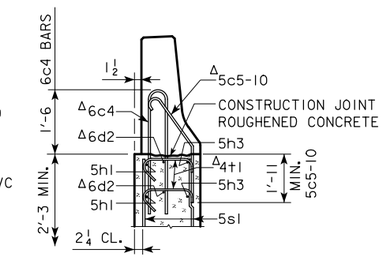


PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.

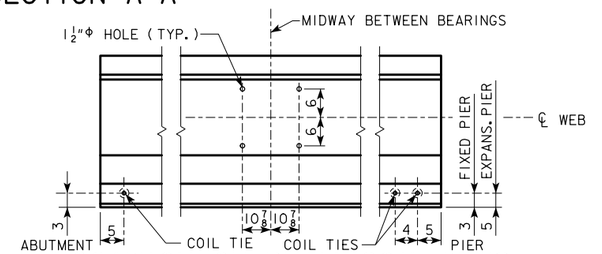


SECTION A-A

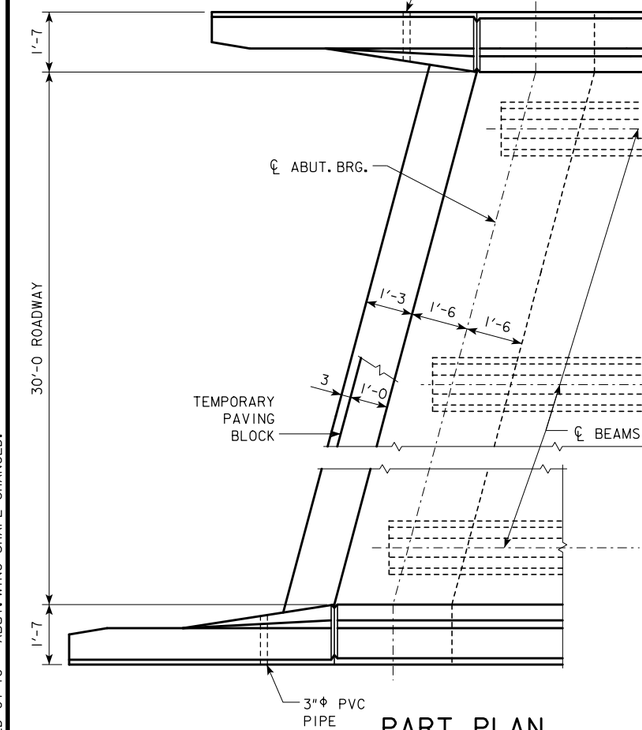


SECTION D-D

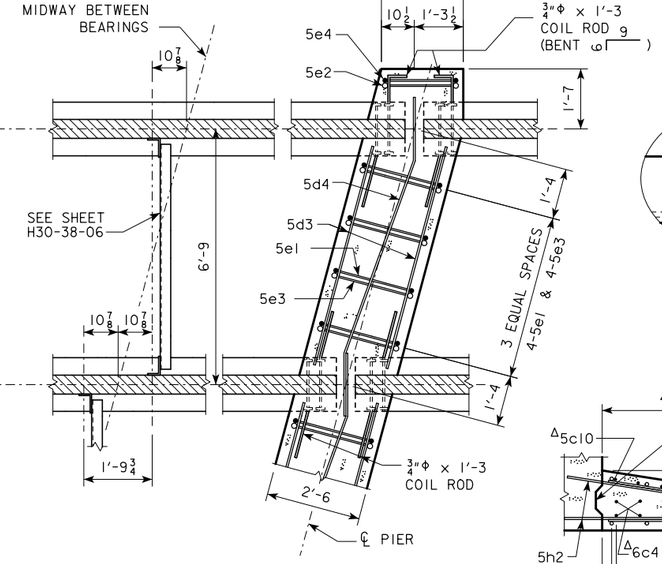
Δ NOTE:
SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION.
REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.



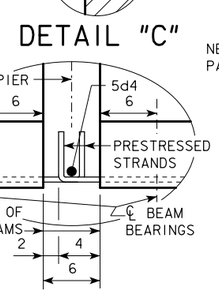
LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



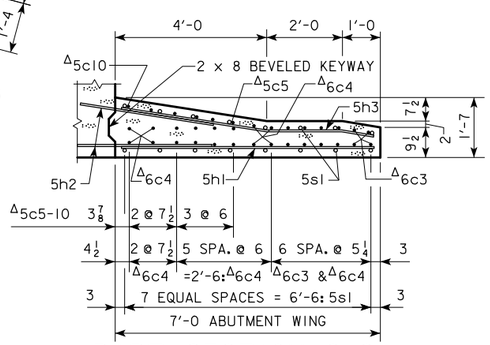
PART PLAN



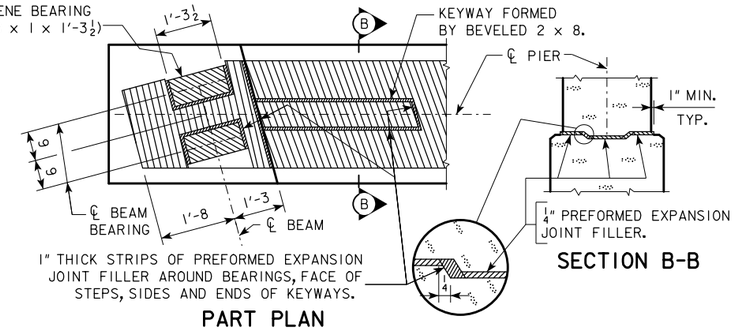
PART SECTION AT PIER



DETAIL "A"



PART SECTION C-C



SECTION B-B

PART PLAN

TOP OF FIXED PIER DETAILS

(SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS)

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

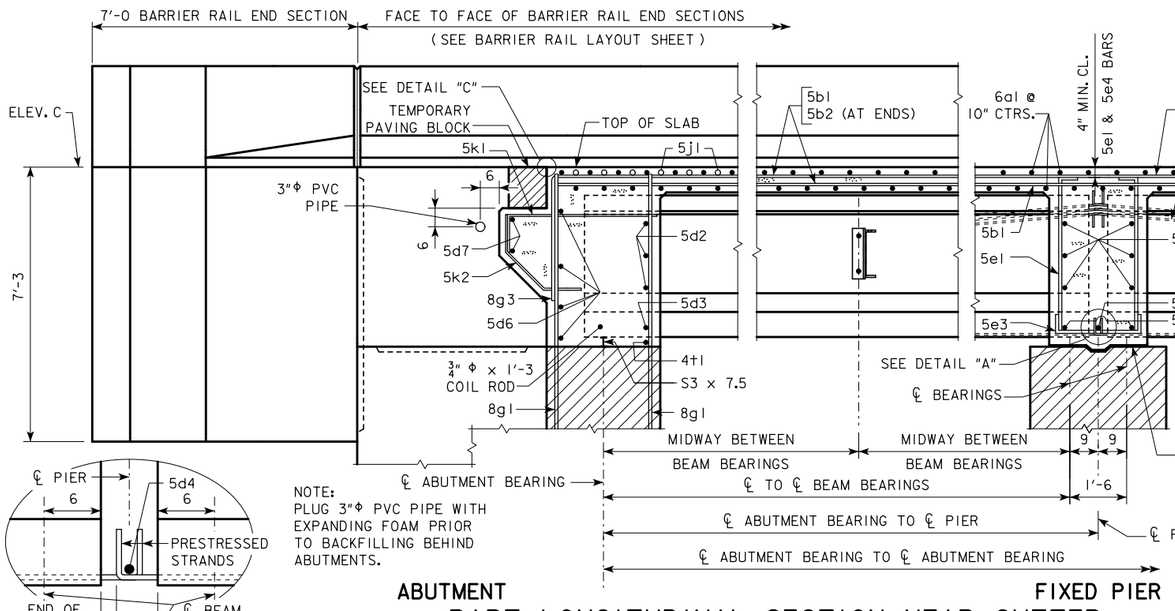
LONGITUDINAL SECTION

15° SKEW A & B BEAMS

H30-13-06

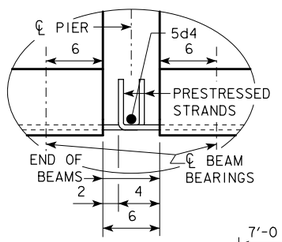
CORRECTION 09-10 - MINOR MODIFICATIONS TO PART SECTION C-C.
REVISED 07-10 - ABUT. WING SHAPE CHANGED.

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

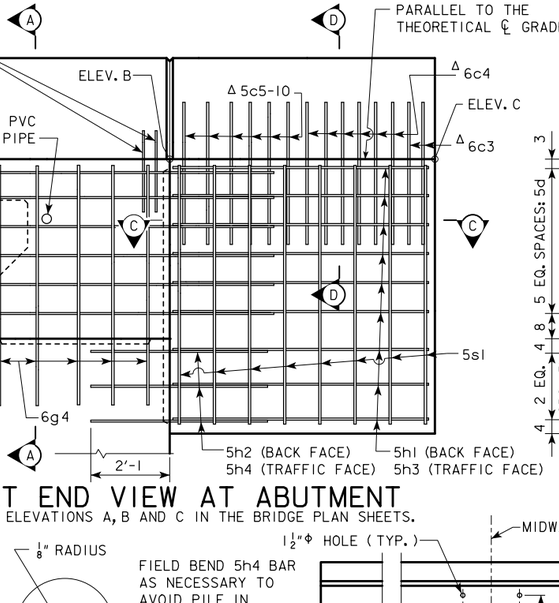


PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

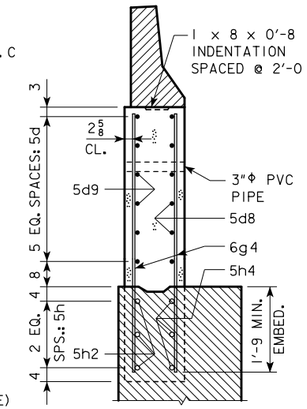


DETAIL "A"

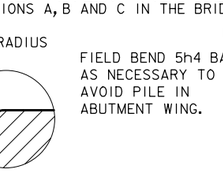


PART END VIEW AT ABUTMENT

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

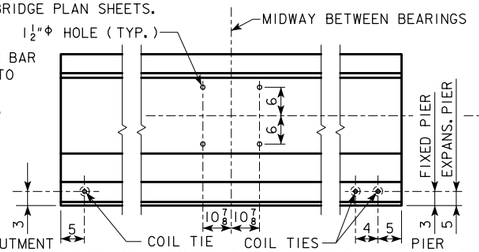


SECTION A-A

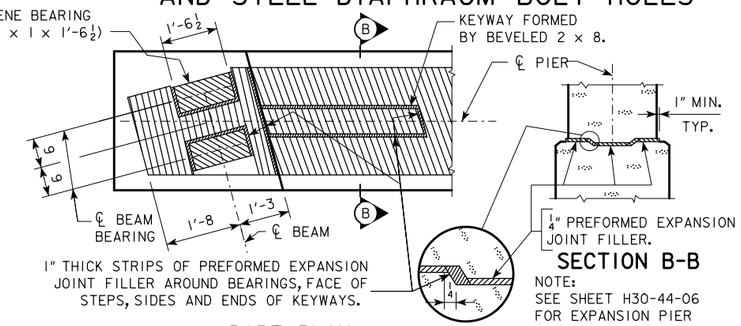


DETAIL "C"

FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.



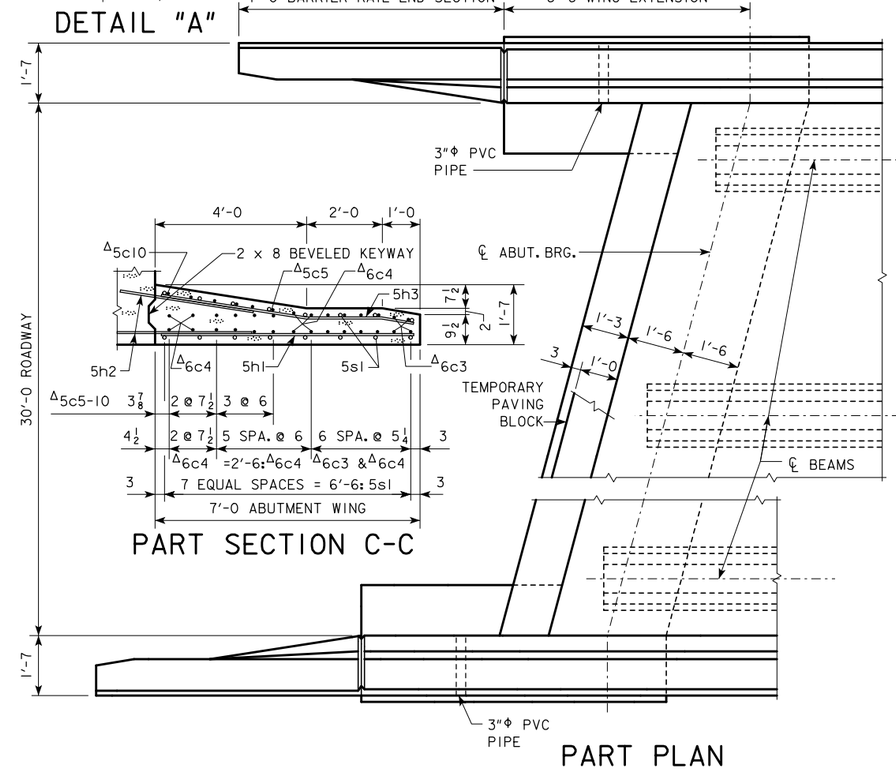
LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



SECTION B-B

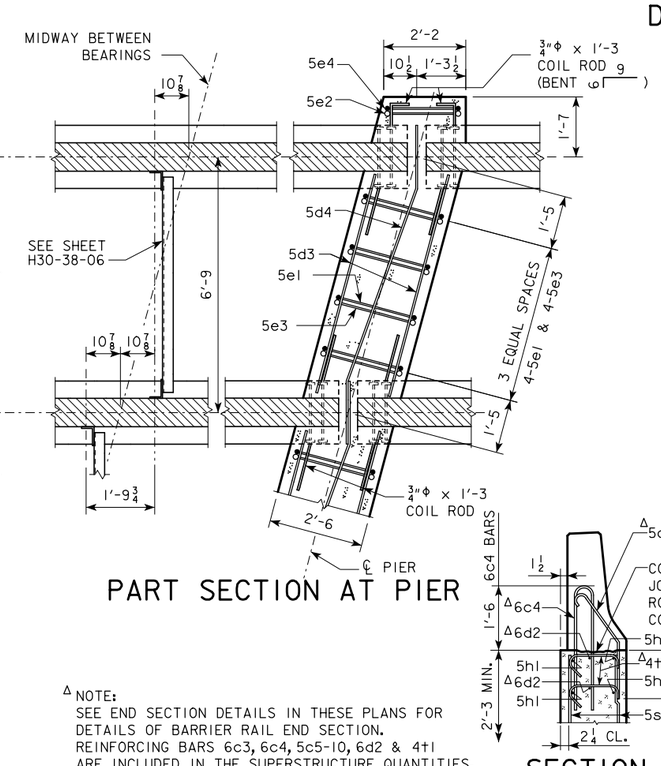
NOTE:
SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS

PART PLAN
TOP OF FIXED PIER DETAILS

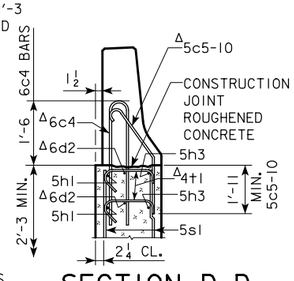


PART SECTION C-C

PART PLAN



PART SECTION AT PIER



SECTION D-D

△ NOTE:
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.

01-12 LATEST REVISION DATE	Marian K. McDonald APPROVED BY BRIDGE ENGINEER	IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

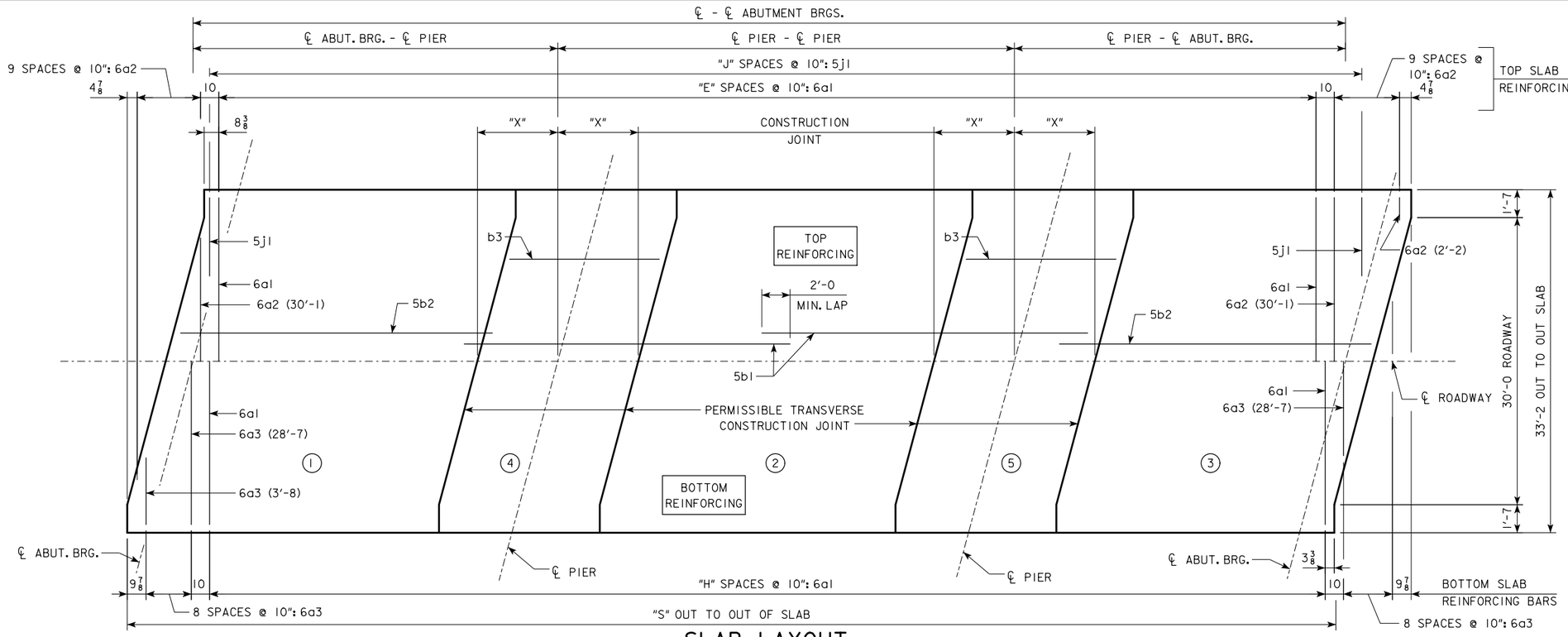
DECEMBER, 2006

LONGITUDINAL SECTION

15° SKEW C BEAMS

H30-14-06

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.



SLAB LAYOUT

(LEFT AHEAD SKEW SHOWN, RIGHT AHEAD SKEW SIMILAR)

ESTIMATED QUANTITIES
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

	℄-℄ ABUT. BRG.		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STRUCTURAL CONCRETE SUPERSTRUCTURE (INCLUDES ABUTMENT WINGS, PAV. BLOCKS)	WITH BARRIER RAIL	C.Y.	172.3	183.0	200.9	211.8	222.7	244.4	255.1	266.4	281.2
	WITH OPEN RAIL	C.Y.	174.8	185.7	203.9	215.0	226.2	247.9	258.8	270.4	285.4
STRUCTURAL CONCRETE ABUTMENTS (w/ WOOD PILES) ***		C.Y.	26.3	26.2	26.1	26.1	26.1	-----	-----	-----	-----
STRUCTURAL CONCRETE ABUTMENTS (w/ STEEL H PILES) ***		C.Y.	27.6	27.6	27.6	27.6	27.6	35.4	35.4	35.4	35.4
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN		NO.	5-A50	5-A55	5-B59	5-B63	5-B67	5-C71	5-C75	5-C80	5-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN		NO.	10-A42	10-A46	10-B50	10-B55	10-B59	10-C63	10-C67	10-C71	10-C80
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	311.9	336.9	361.9	386.9	411.9	456.7	481.7	506.7	540.0
STRUCTURAL STEEL (w/ PILE BENT PIERS & DRAINS)		LB.	3985	3985	4073	4073	4073	4077	4077	4077	4077
STRUCTURAL STEEL (w/ PILE BENT PIERS & NO DRAINS)		LB.	3305	3305	3305	3305	3305	3229	3229	3229	3229
STRUCTURAL STEEL (w/ TEE PIERS & DRAINS)		LB.	4881	4881	4969	4969	4969	5135	5135	5135	5135
STRUCTURAL STEEL (w/ TEE PIERS & NO DRAINS)		LB.	4201	4201	4201	4201	4201	4287	4287	4287	4287
REINFORCING STEEL (w/ WOOD PILES & BARRIER RAIL)		LB.	50,260	53,865	57,543	61,408	64,830	-----	-----	-----	-----
REINFORCING STEEL (w/ WOOD PILES & OPEN RAIL)		LB.	50,925	54,486	58,311	62,352	65,704	-----	-----	-----	-----
REINFORCING STEEL (w/ STEEL H PILES & BARRIER RAIL)		LB.	50,312	53,809	57,443	61,308	64,730	71,176	75,336	78,755	83,229
REINFORCING STEEL (w/ STEEL H PILES & OPEN RAIL)		LB.	50,977	54,430	58,211	62,252	65,604	72,807	76,876	80,492	85,012
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS		NO.	22	24	26	26	26	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)		NO.	10	10	12	12	12	16	18	18	18
PREBORED HOLES (w/ WOOD PILES)		L.F.	220	240	260	260	260	-----	-----	-----	-----
PREBORED HOLES (w/ STEEL H-PILES)		L.F.	100	100	120	120	120	160	180	180	180

CONCRETE PLACEMENT QUANT.
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

	℄-℄ ABUT. BRG.		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, & WINGWALLS** , SECTIONS 1 & 3	WITH BARRIER RAIL	C.Y.	91.8	98.0	108.2	114.6	120.8	135.4	141.8	148.4	163.2
	WITH OPEN RAIL	C.Y.	93.1	99.4	109.8	116.3	122.7	137.3	143.8	150.6	165.6
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	33.5	36.2	38.9	41.6	44.1	47.0	49.7	52.4	52.4
	WITH OPEN RAIL	C.Y.	34.2	37.0	39.7	42.5	45.1	48.0	50.7	53.5	53.5
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	37.4	39.2	43.8	45.6	47.8	51.2	52.8	54.8	54.8
	WITH OPEN RAIL	C.Y.	37.9	39.7	44.4	46.2	48.4	51.8	53.5	55.5	55.5
PAVING BLOCKS		C.Y.	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
ABUTMENT WINGS		C.Y.	7.2	7.2	7.6	7.6	7.6	8.4	8.4	8.4	8.4
ABUTMENT FOOTINGS (w/ WOOD PILES) ***		C.Y.	26.3	26.2	26.1	26.1	26.1	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES) ***		C.Y.	27.6	27.6	27.6	27.6	27.6	35.4	35.4	35.4	35.4

GENERAL DATA

	℄-℄ ABUT. BRG.		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-7 15/16	3'-7 3/4	4'-2 13/16	4'-2 13/16	4'-3	4'-8 1/2	4'-8 11/16	4'-9	4'-9 7/16
CURVE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 7/16	3'-6 5/8	4'-1 3/8	4'-1 5/8	4'-1 15/16	4'-7 5/8	4'-7 5/16	4'-7 5/8	4'-7 9/16
STRAIGHT	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-8 1/16	3'-7 7/8	4'-2 15/16	4'-2 15/16	4'-3 1/16	4'-8 11/16	4'-8 15/16	4'-9 3/8	4'-10
GRADE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 5/8	3'-6 7/8	4'-1 11/16	4'-1 15/16	4'-2 5/16	4'-7 15/16	4'-7 7/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	352.1	380.1	434.5	464.0	493.8	592.3	625.5	659.1	691.9
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	207.6	215.3	222.7	229.9	237.0	244.0	253.2	268.2	284.4
NO. OF SPACES FOR 6a1 BARS (TOP)		"E"	159	174	189	204	219	234	249	264	284
NO. OF SPACES FOR 6a1 BARS (BOTTOM)		"H"	160	175	190	205	220	235	250	265	285
NO. OF SPACES FOR 5j1 BARS (TOP)		"J"	167	182	197	212	227	242	257	272	292
OUT TO OUT OF SLAB		"S"	141'-11 1/4	154'-5 1/4	166'-11 1/4	179'-5 1/4	191'-11 1/4	204'-5 1/4	216'-11 1/4	229'-5 1/4	246'-1 1/4
SLAB TRANSVERSE CONSTR. JT. DISTANCE FROM C.L. PIER		"X"	6'-7	7'-1	7'-7	8'-1	8'-8	9'-2	9'-8	10'-2	10'-2

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

* VALUES SHOWN ARE FOR FIXED PIERS ONLY AND ALLOW FOR 1/16 INCH DEFLECTION OF THE 1 INCH NEOPRENE BEARING PAD. AT EXPANSION PIER LOCATIONS ADD 3/16 INCHES TO "U" VALUES SHOWN.

** WINGWALLS APPLY ONLY TO BRIDGES USING "C" BEAMS.

*** SEE SHEET H30-17-06 FOR ADDITIONAL CONCRETE REQUIRED IN ABUTMENT FOOTINGS.

07-15
LATEST REVISION DATE

Marian K. McCarthy
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

SUPERSTRUCTURE DETAILS
15° SKEW

H30-15-06

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.

REINFORCING BAR LIST

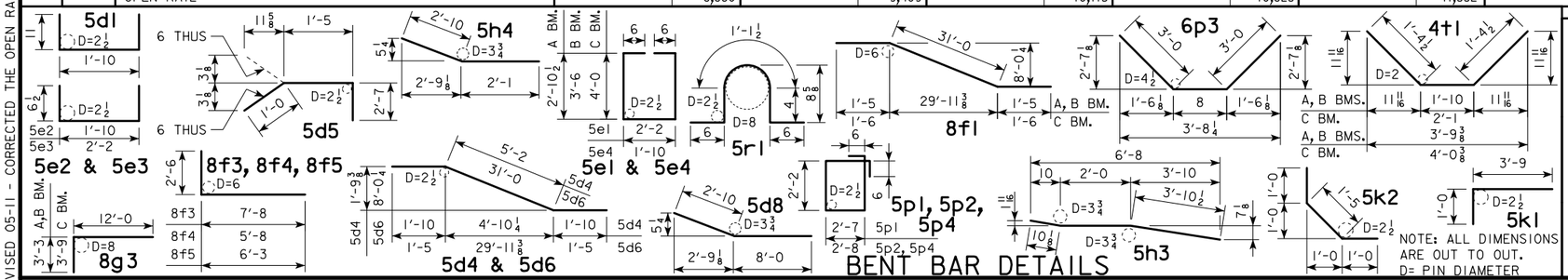
ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

REVISED 05-11 - CORRECTED THE OPEN RAIL REBAR QUANTITIES FOR THE 201'-4, 231'-10, 226'-4, & 243'-0 BRIDGE LENGTHS.

℄-℄ ABUT. BRG.	138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
℄-℄ BEAM BRG.	42'-6	50'-10	42'-6	46'-8	55'-0	46'-8	50'-10	59'-2	50'-10	55'-0	63'-4	55'-0	59'-2	67'-6	59'-2	63'-4	71'-8	63'-4	67'-6	75'-10	67'-6	71'-8	80'-0	71'-8	80'-0	80'-0	80'-0
BEAM SERIES	A BEAM			A BEAM			B BEAM			B BEAM			B BEAM			C BEAM			C BEAM			C BEAM			C BEAM		

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.		321	32'-10	15,830	351	32'-10	17,310	381	32'-10	18,789	411	32'-10	20,269	441	32'-10	21,748	471	32'-10	23,228	501	32'-10	24,707	531	32'-10	26,187	571	32'-10	28,159
6a2	SLAB TRANSV. TOP ENDS		20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484	20	VARIES	484
6a3	SLAB TRANSV. BOTT. ENDS		18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436	18	VARIES	436
5b1	SLAB LONGITUDINAL, TOP & BOTT.		152	40'-0	6,341	228	40'-0	9,512	228	40'-0	9,512	228	40'-0	9,512	228	40'-0	9,512	304	40'-0	12,683	304	40'-0	12,683	304	40'-0	12,683	380	40'-0	15,854
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS		152	33'-10	5,364	152	21'-1	3,342	152	27'-4	4,333	152	33'-7	5,324	152	39'-10	6,315	152	27'-1	4,294	152	33'-4	5,285	152	39'-7	6,275	152	28'-11	4,584
6b3	SLAB LONGITUDINAL, TOP ℄ PIERS		66	12'-10	1,272	66	13'-10	1,371	66	14'-10	1,470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP ℄ PIERS		—	—	—	—	—	—	—	—	—	66	15'-10	2,136	66	17'-0	2,293	66	18'-0	2,428	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP ℄ PIERS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66	19'-0	3,348	66	20'-0	3,524	66	20'-0	3,524
5d1	PIER DIAPH. ENDS		12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46	12	3'-8	46
5d2	PIER & ABUT. DIAPH. LONGIT.		72	6'-3	469	72	6'-3	469	72	6'-3	469	72	6'-3	469	72	6'-3	469	72	6'-0	451	72	6'-0	451	72	6'-0	451	72	6'-0	451
5d3	PIER & ABUT. DIAPH. LONGIT.		24	5'-4	134	24	5'-4	134	24	5'-4	134	24	5'-4	134	24	5'-4	134	24	5'-1	127	24	5'-1	127	24	5'-1	127	24	5'-1	127
5d4	PIER DIAPH. LONGIT.		8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74	8	8'-10	74
5d5	ABUT. DIAPH. ENDS		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	12	5'-0	63	12	5'-0	63
5d6	ABUT. DIAPH. LONGIT. B.F.		8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282	8	33'-10	282
5d7	PAVING NOTCH LONGIT.		4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141	4	33'-10	141
5d8	ABUT. DIAPH. WING EXT. LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	10'-10	271	24	10'-10	271	24	10'-10	271	24	10'-10	271
5d9	ABUT. DIAPH. WING EXT. LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	10'-9	269	24	10'-9	269	24	10'-9	269	24	10'-9	269
5e1	PIER DIAPH. HOOPS		32	8'-11	298	32	8'-11	298	32	10'-2	339	32	10'-2	339	32	10'-2	339	32	11'-2	373	32	11'-2	373	32	11'-2	373	32	11'-2	373
5e2	PIER DIAPH. TIES ENDS		4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12	4	2'-11	12
5e3	PIER DIAPH. TIES		32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108	32	3'-3	108
5e4	PIER DIAPH. HOOPS ENDS		4	8'-7	36	4	8'-7	36	4	9'-10	41	4	9'-10	41	4	9'-10	41	4	10'-10	45	4	10'-10	45	4	10'-10	45	4	10'-10	45
8f1	ABUT. FOOTING LONGIT.		18	33'-10	1,626	18	33'-10	1,626	18	33'-10	1,626	18	33'-10	1,626	18	33'-10	1,626	18	34'-0	1,634	18	34'-0	1,634	18	34'-0	1,634	18	34'-0	1,634
8f3	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	10'-2	434	16	10'-2	434	16	10'-2	434	16	10'-2	434
8f4	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8'-2	174	8	8'-2	174	8	8'-2	174	8	8'-2	174
8f5	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8'-9	187	8	8'-9	187	8	8'-9	187	8	8'-9	187
8g1	ABUT. VERT.		114	6'-8	2,029	114	6'-8	2,029	114	7'-3	2,207	114	7'-3	2,207	114	7'-3	2,207	110	7'-9	2,276	110	7'-9	2,276	110	7'-9	2,276	110	7'-10	2,301
8g3	ABUT. DIAPH. VERT. B.F.		50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-3	2,036	50	15'-9	2,103	50	15'-9	2,103	50	15'-9	2,103	50	15'-9	2,103
6g4	ABUT. DIAPH. WING EXT. VERT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40	6'-6	391	40	6'-6	391	40	6'-7	396	40	6'-7	396
5h1	ABUT. WING HORIZ. B.F.		28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	36	6'-8	250	36	6'-8	250	36	6'-8	250	36	6'-8	250
5h2	ABUT. TO WING ANCHOR		56	4'-11	287	56	4'-11	287	56	4'-11	287	56	4'-11	287	56	4'-11	287	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5h3	ABUT. WING HORIZ. TRAFFIC FACE		28	6'-9	197	28	6'-9	197	28	6'-9	197	28	6'-9	197	28	6'-9	197	36	6'-9	253	36	6'-9	253	36	6'-9	253	36	6'-9	253
5h4	ABUT. TO WING ANCHOR		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	4'-11	62	12	4'-11	62	12	4'-11	62	12	4'-11	62
5j1	TOP OF SLAB TRANSV. (AT RAIL)		336	6'-3	2,190	366	6'-3	2,386	396	6'-3	2,581	426	6'-3	2,777	456	6'-3	2,973	486	6'-3	3,168	516	6'-3	3,364	546	6'-3	3,559	586	6'-3	3,820
5k1	PAVING NOTCH		54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268	54	4'-9	268
5k2	PAVING NOTCH		54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192	54	3'-5	192
5p1	ABUTMENT HOOPS (WOOD/STEEL)		80/96	10'-6	876/1051	88/96	10'-6	964/1051	96/100	10'-6	1051/1095	96/100	10'-6	1051/1095	96/100	10'-6	1051/1095	108	10'-6	1,183	104	10'-6	1,139	104	10'-6	1,139	104	10'-6	1,139
5p2	ABUTMENT HOOPS		8	10'-8	89	8	10'-8	89	8	10'-8	89	8	10'-8	89	8	10'-8	89	24	10'-8	267	24	10'-8	267	24	10'-8	267	24	10'-8	267
6p3	ABUT. BOTT. AT PILES		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	6'-8	240	28	6'-8	280	28	6'-8	280	28	6'-8	280
5p4	ABUT. HOOPS AT ENDS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	10'-8	89	8	10'-8	89	8	10'-8	89	8	10'-8	89
5r1	PAVING BLOCK LIFTING LOOPS		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	8	2'-10	24	8	2'-10	24
5s1	WING VERT.		64	5'-10	389	64	5'-10	389	64	6'-2	412	64	6'-2	412	64	6'-2	412	64	6'-11	462	64	6'-11	462	64	6'-11	462	64	6'-11	462
4t1	UNDER BEAMS AT ABUTMENTS		10	4'-7	31	10	4'-7	31	10	4'-7	31	10	4'-7	31	10	4'-7	31	10	4'-10	32	10	4'-10	32	10	4'-10	32	10	4'-10	32
#2	PILE SPIRAL (WOOD/STEEL)*		22/10	38'-6	141/64	24/10	38'-6	154/64	26/12	38'-6	167/77	26/12	38'-6	167/77	26/12	38'-6	167/77	16	38'-6	103	18	38'-6	116	18	38'-6	116	18	38'-6	116
	SPIRAL SPACERS, L 7/8 x 7/8 x 1/8 x 0.70 (WOOD/STL.)*		66/30	1'-10	85/39	72/30	1'-10	92/39	78/36	1'-10	100/46	78/36	1'-10	100/46	78/36	1'-10	100/46	48	1'-10	62	54	1'-10	69	54	1'-10	69	54	1'-10	69
	*EPOXY COATING NOT REQUIRED																												
	SUB TOTAL W/ WOOD PILES**				42,045			45,077			48,196			51,529			54,352			—			—			—			—
	SUB TOTAL W/ STEEL H-PILES**				42,097			45,021			48,096			51,429			54,252			59,731			63,333			66,179			69,917
	**RAIL REINFORCING NOT INCLUDED																												
	BARRIER RAIL				8,215			8,788			9,347			9,879			10,478			11,445			12,003			12,576			13,312
	OPEN RAIL				8,880			9,409			10,115			10,823			11,352			13,076			13,543			14,313			15,095



05-11
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

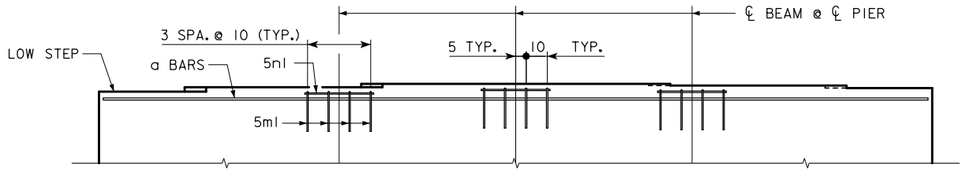
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

DECK & ABUTMENT REINF.

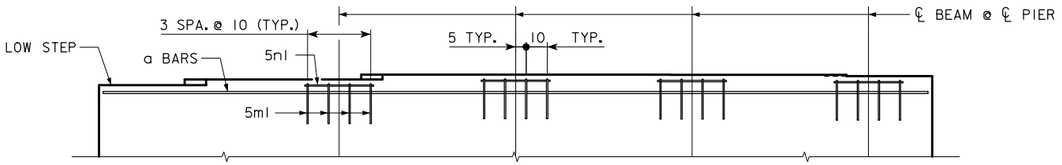
15° SKEW

H30-16-06



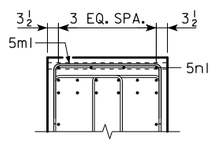
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 1.9%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.9% < G <= 5.0%



TYPICAL SECTION

STEP REINFORCING BAR LIST ONE TEE PIER

			G <= 1.9%			1.9% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5ml	6'-0	⌐¬	12	5	75	16	5	100
5nl	2'-8	——	12	5	33	16	5	45
TOTAL (LB.)					108			145

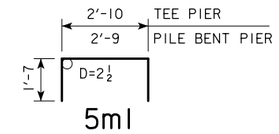
G = GRADE (%)

STEP REINFORCING BAR LIST ONE PILE BENT PIER

			G <= 1.9%			1.9% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5ml	5'-11	⌐¬	12	5	74	16	5	99
5nl	2'-8	——	12	5	33	16	5	45
TOTAL (LB.)					107			144

G = GRADE (%)

BENT BAR DETAILS



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

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES IN THE TABLE BELOW HAVE BEEN EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

ADDITIONAL CONCRETE VOLUME PER SUBSTRUCTURE UNIT (C.Y.)

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
A, B BEAMS	-----	-----	-----	0.5	0.7
C BEAMS	-----	-----	-----	0.6	0.8
EACH TEE PIER CAP - ALL BEAMS	-----	-----	-----	0.5	0.7
EACH PILE BENT PIER - ALL BEAMS	-----	-----	-----	0.5	0.6

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

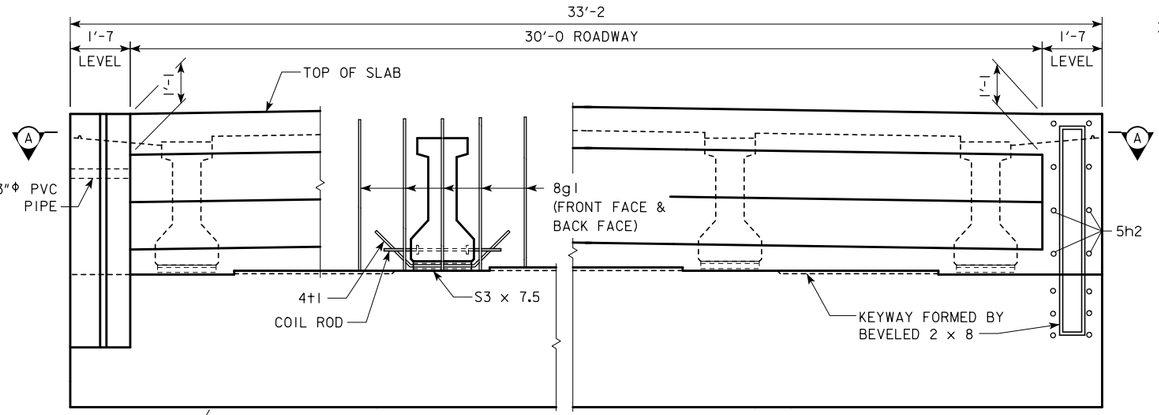
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ADDITIONAL QUANTITIES

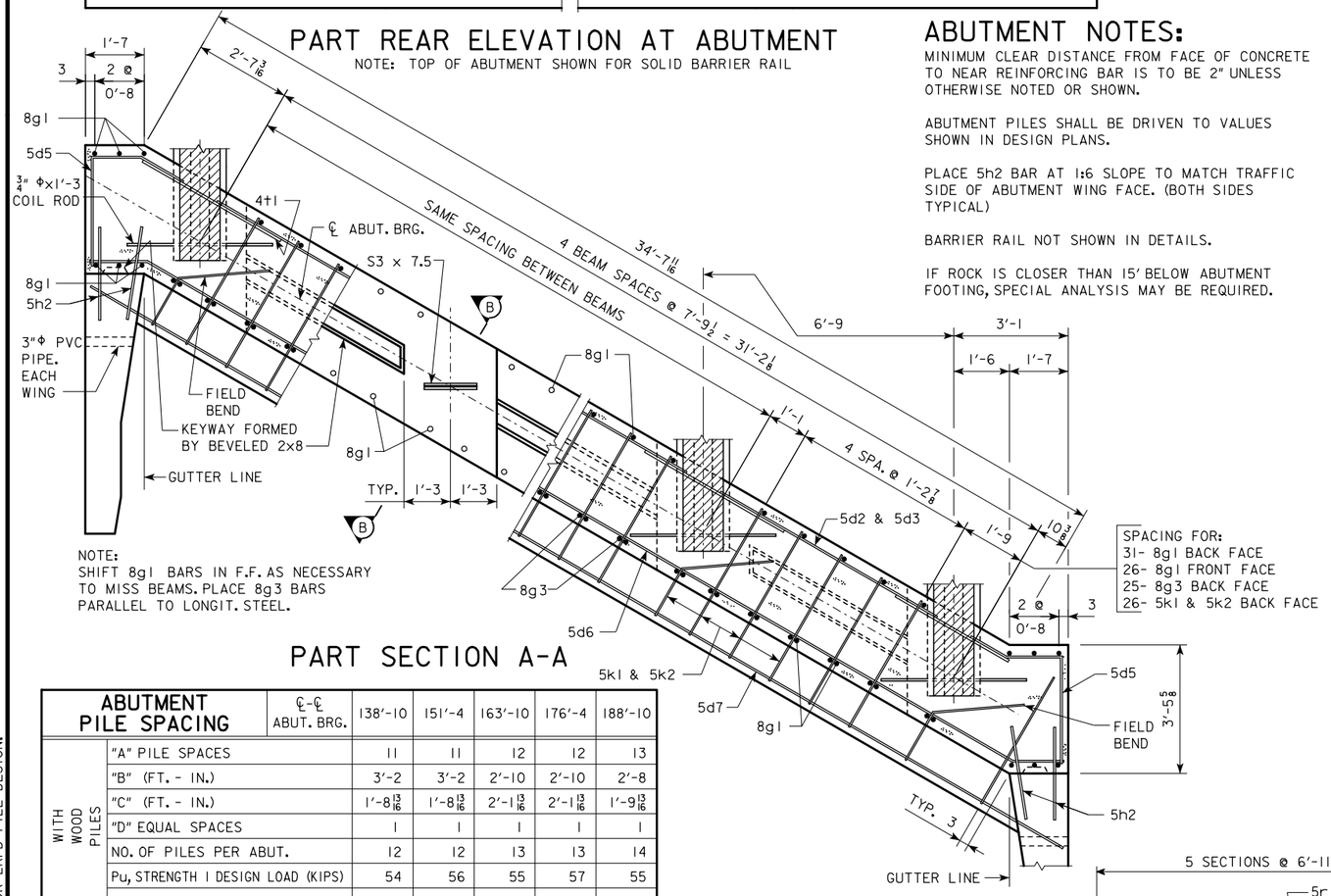
15° SKEW

H30-17-06



PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



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

SPACING FOR:
31- 8g1 BACK FACE
26- 8g1 FRONT FACE
25- 8g3 BACK FACE
26- 5k1 & 5k2 BACK FACE

PART SECTION A-A

ABUTMENT NOTES:

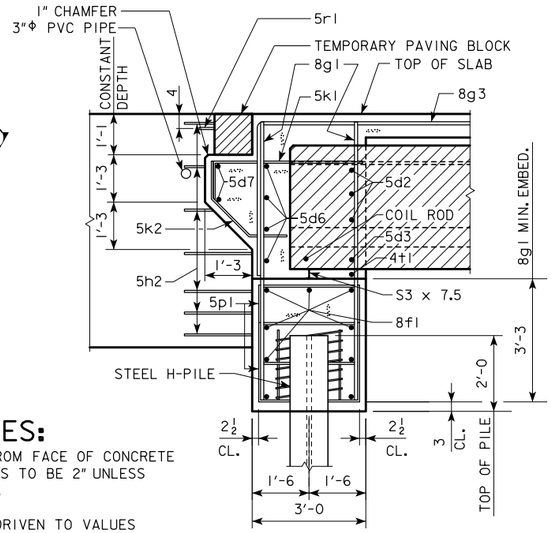
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

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

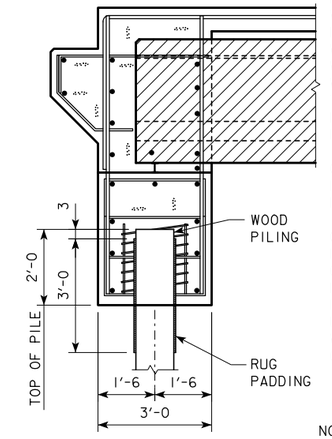
PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE. (BOTH SIDES TYPICAL)

BARRIER RAIL NOT SHOWN IN DETAILS.

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



PART SECTION B-B
(FOR STEEL H-PILING)



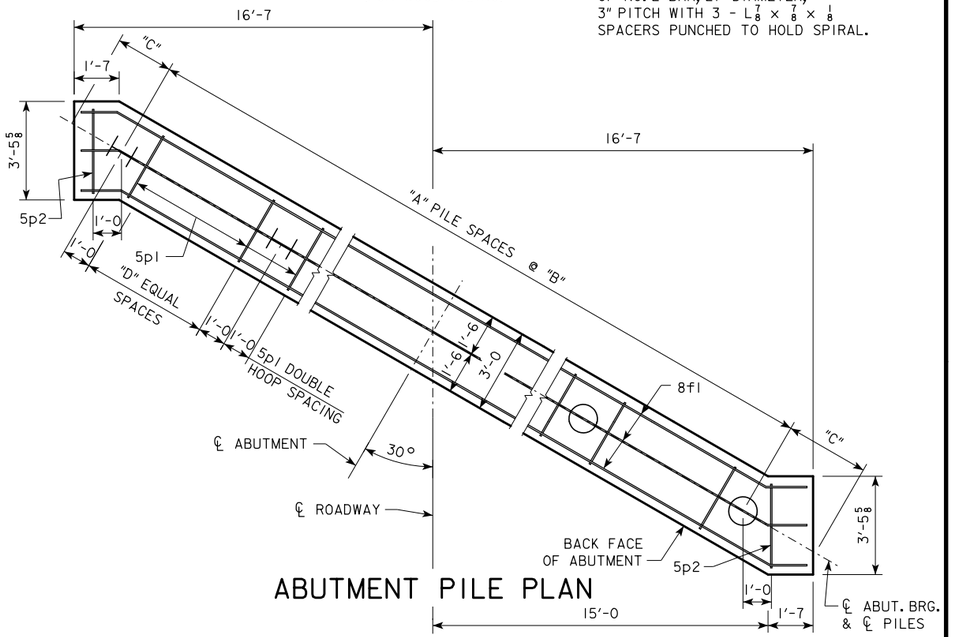
PART SECTION B-B
(FOR WOOD PILING)

WOOD PILING NOTE:
AFTER PILES ARE CUT OFF, THE UPPER 3', EXCEPT AS SHOWN, IS TO BE WRAPPED WITH A DOUBLE THICKNESS OF RUG PADDING HELD IN PLACE BY TACKING WITH GALVANIZED ROOFING NAILS AND WRAPPED WITH #14 GAUGE GALVANIZED WIRE AT A 4" PITCH, CARE IS TO BE TAKEN NOT TO DAMAGE PADDING WHEN PLACING CONCRETE. RUG PADDING MAY BE EITHER OF THE FOLLOWING:

(1) HAIR AND JUTE RUG PADDING, RUBBERIZED ON BOTH SIDES, AND WEIGHING NOT LESS THAN 47 OZ. PER SQ. YD.

(2) BONDED URETHANE OR BONDED POLYFOAM WITH A MINIMUM DENSITY OF 5 LBS. PER CU. FT. AND SHALL BE AT LEAST 1/2 IN. THICK, (MATERIAL LESS THAN 1/2 IN. IN THICKNESS MAY BE USED, BUT WILL REQUIRE ADDITIONAL WRAPS FOR A TOTAL OF AT LEAST ONE INCH).

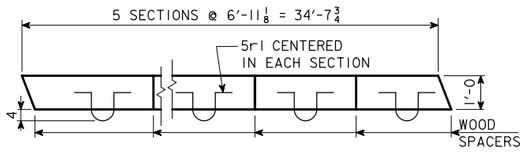
NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF NO. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



ABUTMENT PILE PLAN

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES	11	11	12	12	13
	"B" (FT. - IN.)	3'-2	3'-2	2'-10	2'-10	2'-8
	"C" (FT. - IN.)	1'-8 13/16	1'-8 13/16	2'-1 13/16	2'-1 13/16	1'-9 13/16
	"D" EQUAL SPACES	1	1	1	1	1
	NO. OF PILES PER ABUT.	12	12	13	13	14
	Pu, STRENGTH I DESIGN LOAD (KIPS)	54	56	55	57	55
WITH STEEL H-PILES	"A" PILE SPACES	5	5	5	5	5
	"B" (FT. - IN.)	6'-7	6'-7	6'-7	6'-7	6'-7
	"C" (FT. - IN.)	2'-8 5/16	2'-8 5/16	2'-8 5/16	2'-8 5/16	2'-8 5/16
	"D" EQUAL SPACES	4	4	4	4	4
	NO. OF PILES PER ABUT.	6	6	6	6	6
	Pu, STRENGTH I DESIGN LOAD (KIPS)	117	122	130	135	139

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



PLAN OF TEMPORARY PAVING BLOCK

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

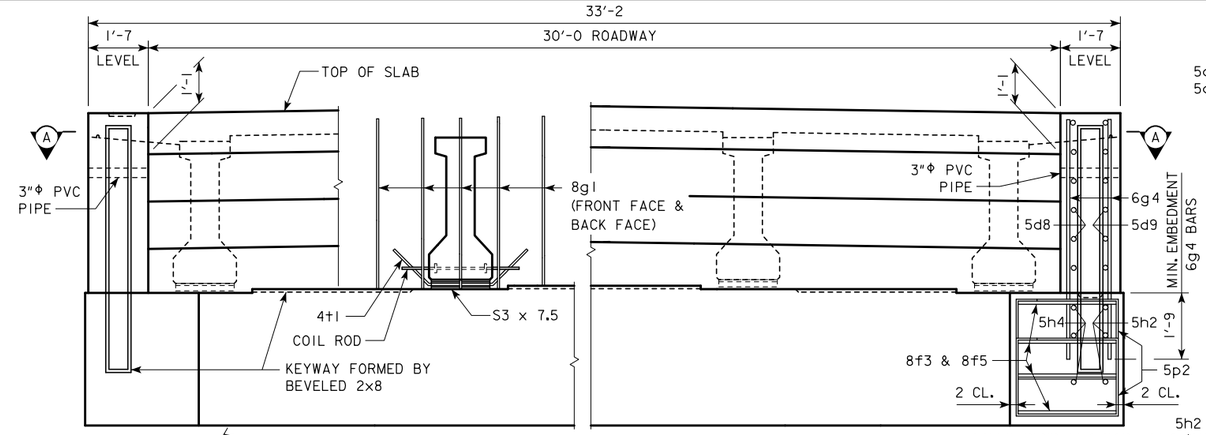
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ABUTMENT DETAILS
30° SKEW A & B BEAMS

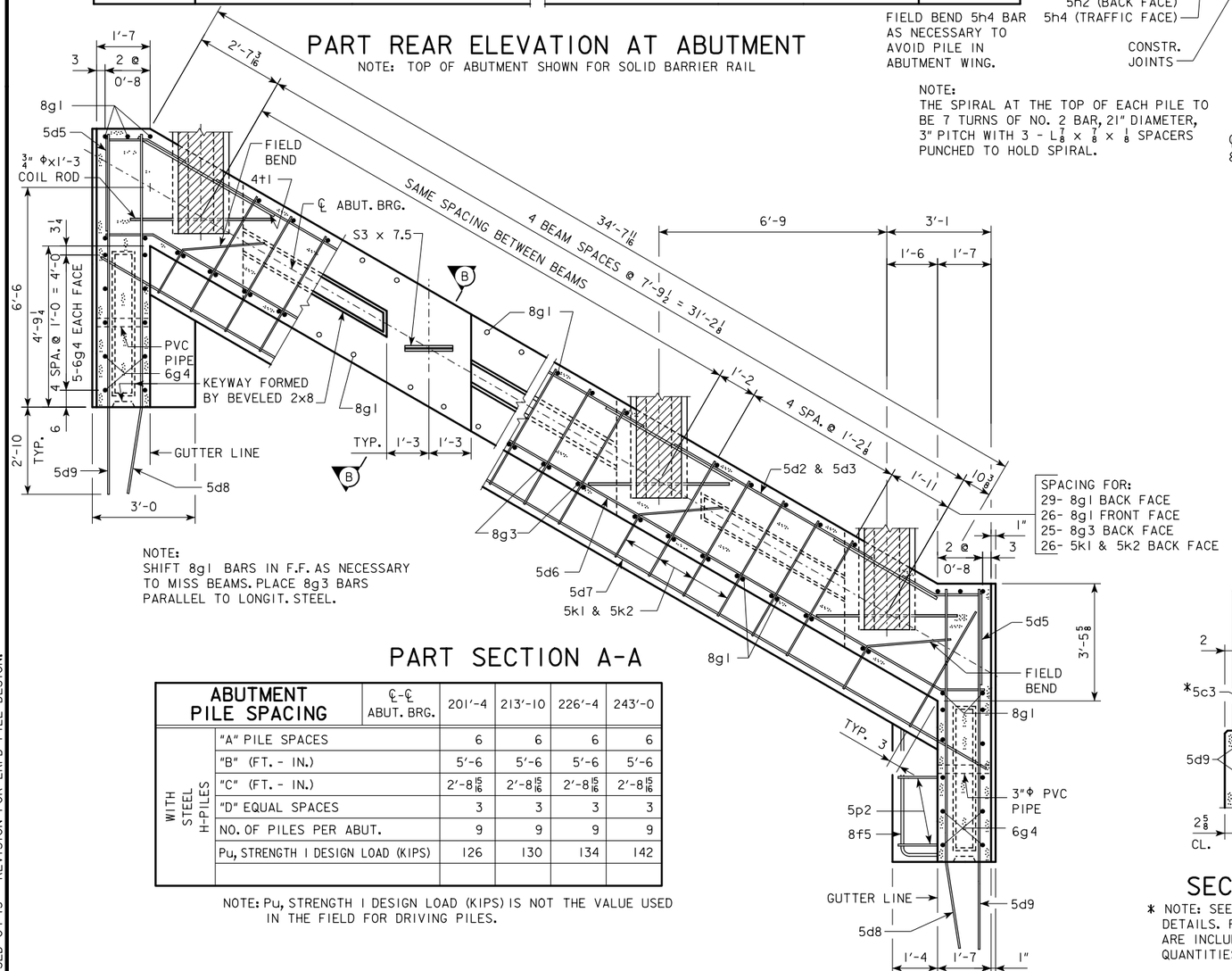
H30-18-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL

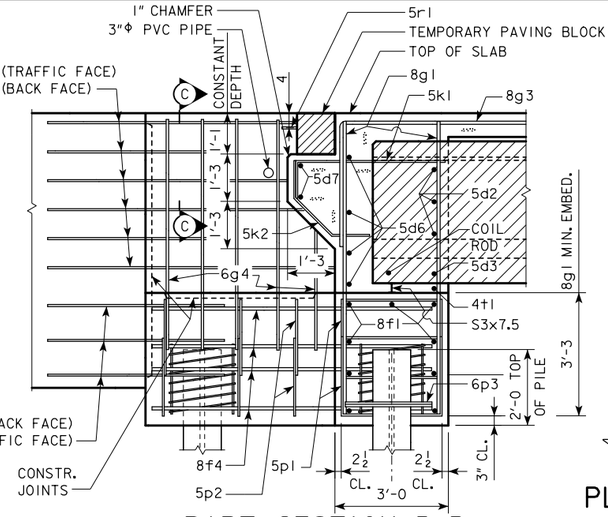


NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

PART SECTION A-A

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	6	6	6	6
	"B" (FT. - IN.)	5'-6	5'-6	5'-6	5'-6
	"C" (FT. - IN.)	2'-8 15/16	2'-8 15/16	2'-8 15/16	2'-8 15/16
	"D" EQUAL SPACES	3	3	3	3
	NO. OF PILES PER ABUT.	9	9	9	9
	Pu, STRENGTH I DESIGN LOAD (KIPS)	126	130	134	142

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



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 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.

ABUTMENT NOTES:

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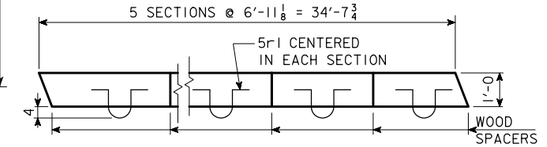
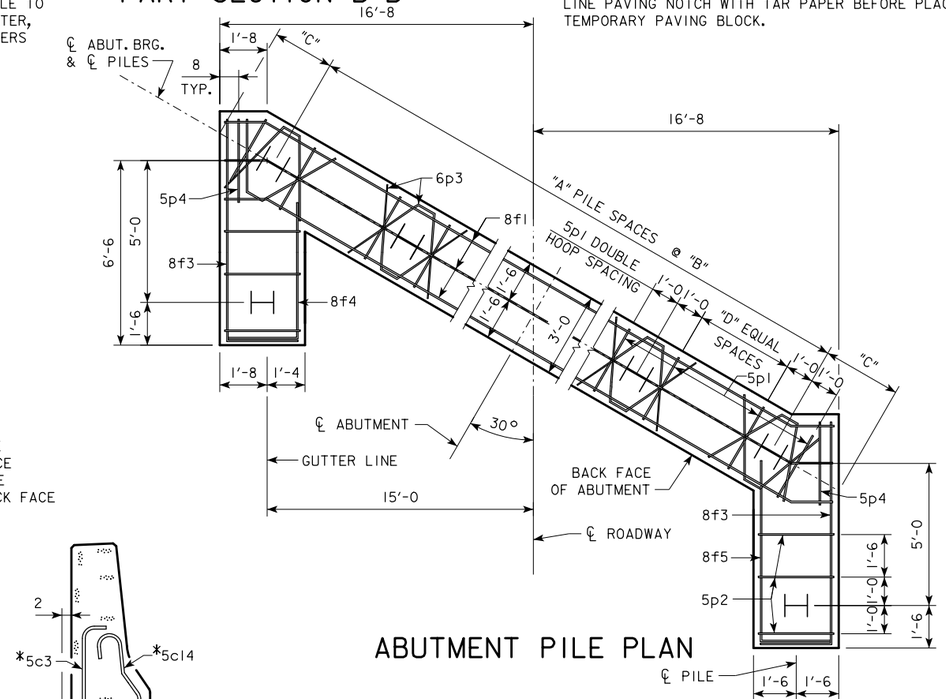
BARRIER RAIL NOT SHOWN IN DETAILS.

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

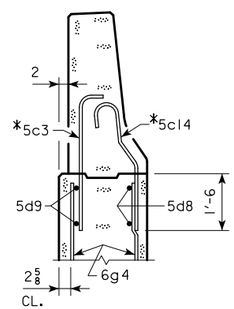


PLAN OF TEMPORARY PAVING BLOCK

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



ABUTMENT PILE PLAN



PART SECTION C-C

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

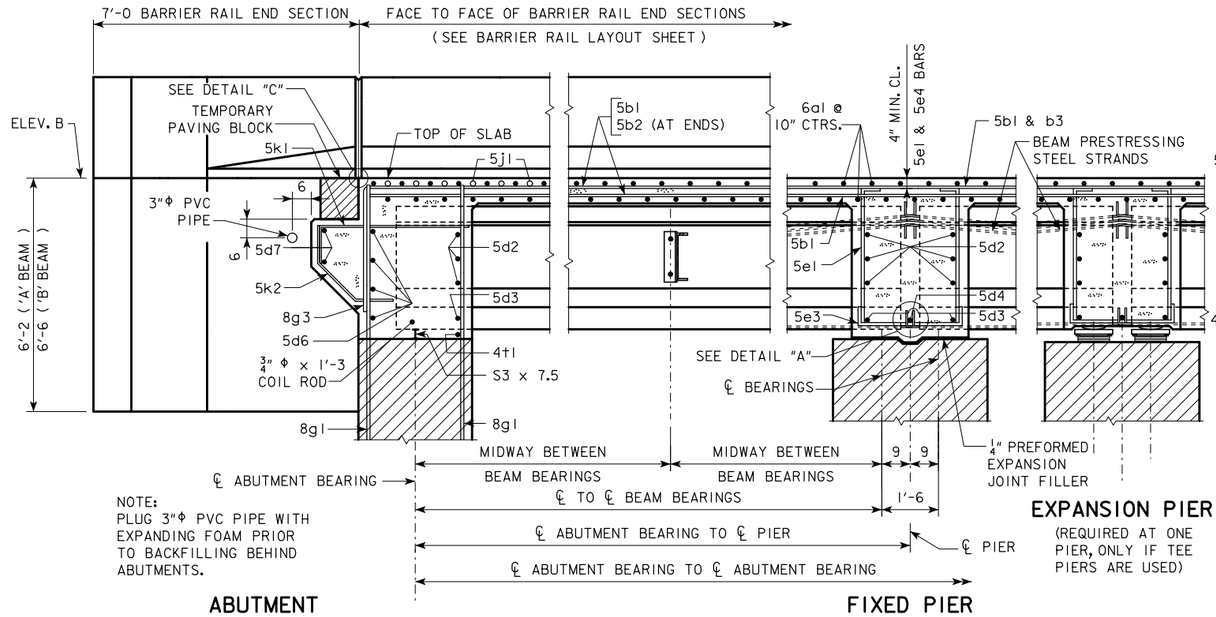
ABUTMENT DETAILS

30° SKEW C BEAMS

H30-19-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

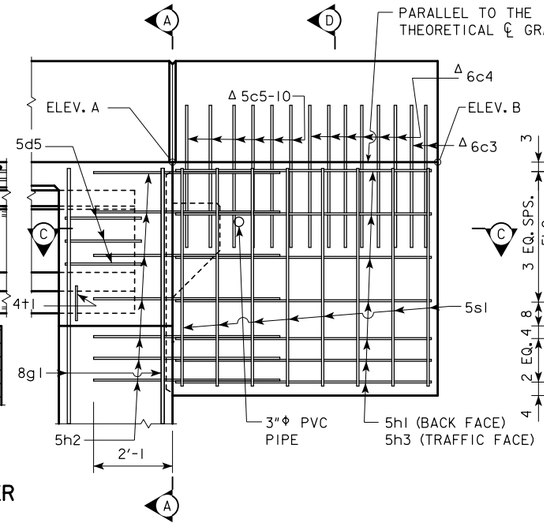


NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART LONGITUDINAL SECTION NEAR GUTTER

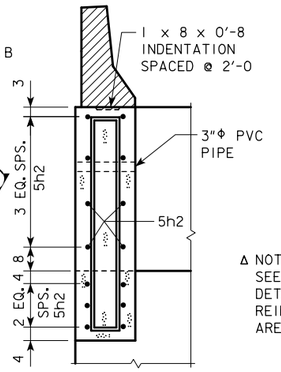
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

EXPANSION PIER
(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

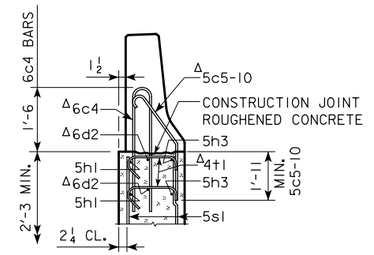


PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.

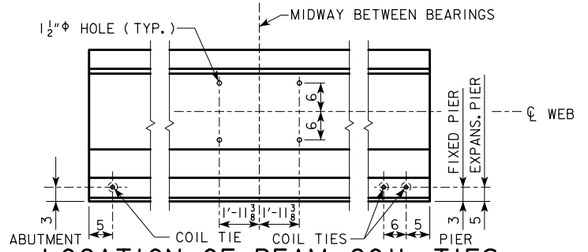


SECTION A-A

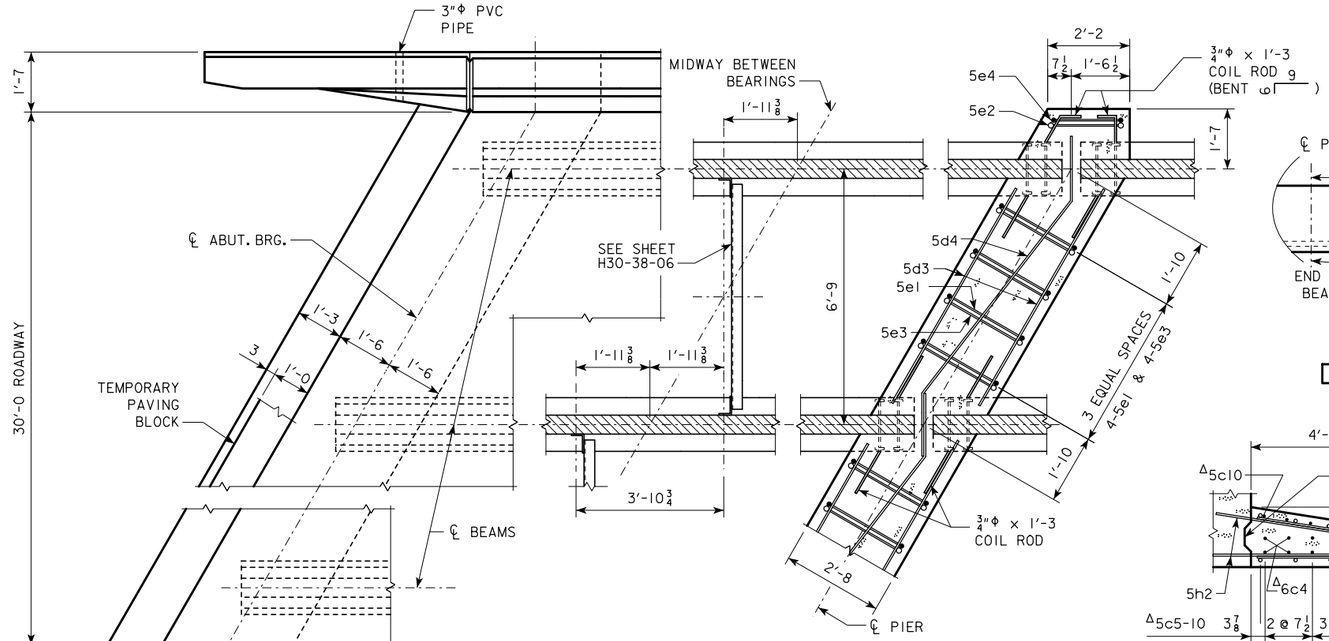


SECTION D-D

Δ NOTE:
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.

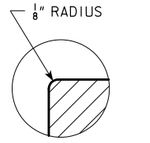


LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

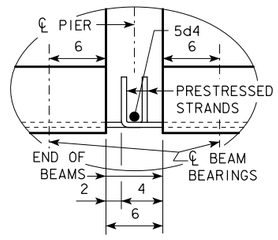


PART SECTION AT PIER

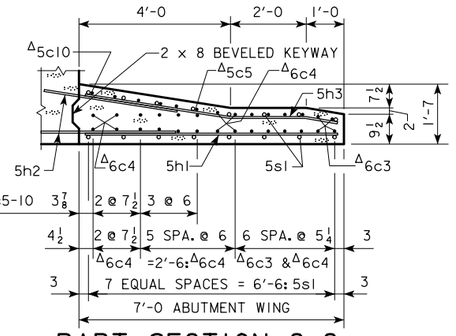
PART PLAN



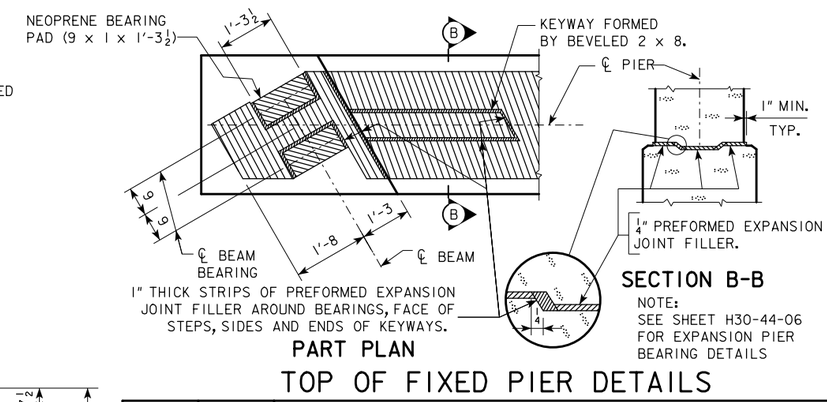
DETAIL "C"



DETAIL "A"



PART SECTION C-C



SECTION B-B

NOTE:
SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS

PART PLAN

TOP OF FIXED PIER DETAILS

CORRECTION 09-10 - MINOR MODIFICATIONS TO PART SECTION C-C.
REVISED 07-10 - ABUT. WING SHAPE CHANGED.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

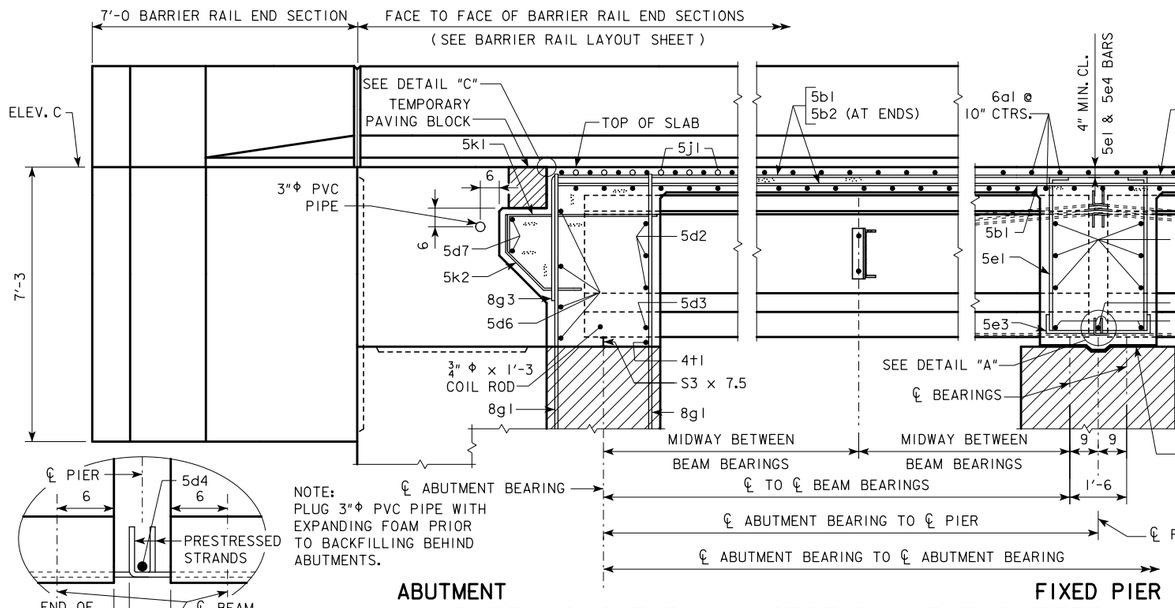
DECEMBER, 2006

LONGITUDINAL SECTION

30° SKEW A & B BEAMS

H30-20-06

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄



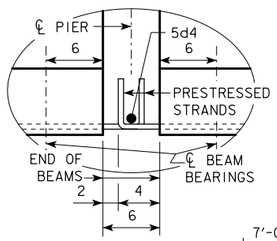
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

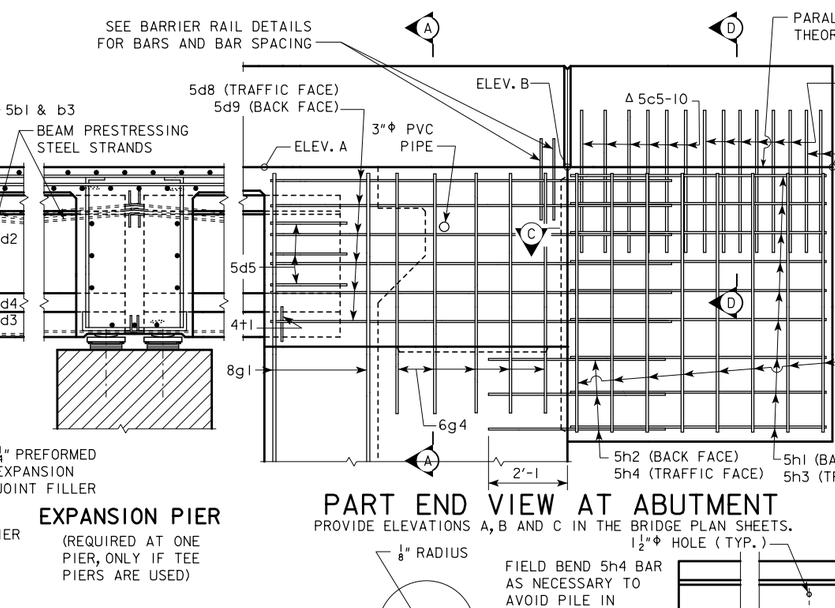
NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

EXPANSION PIER

(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

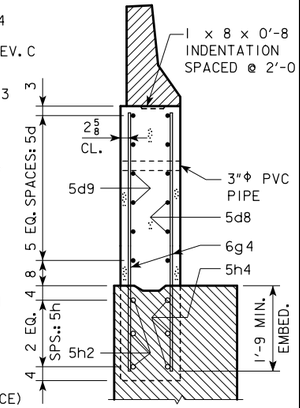


DETAIL "A"

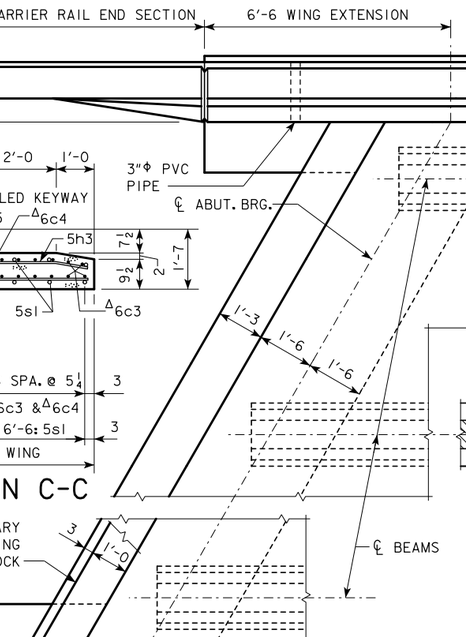


PART END VIEW AT ABUTMENT

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

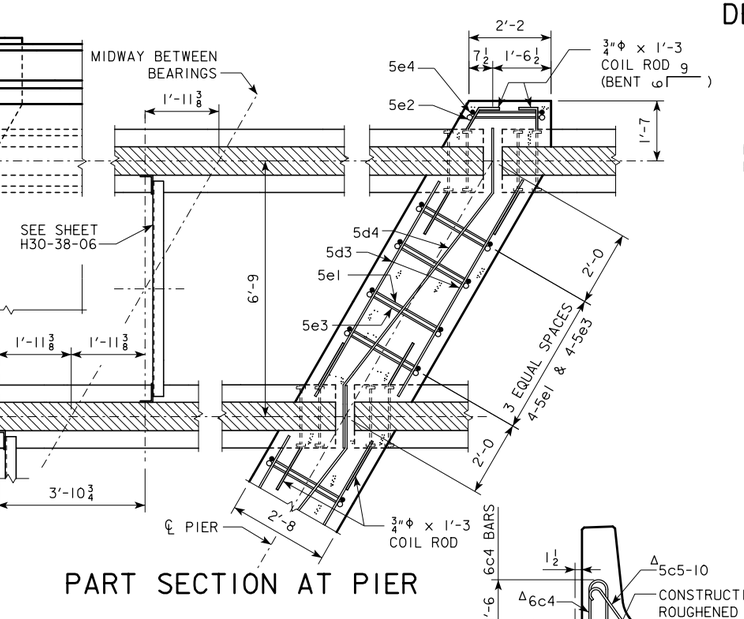


SECTION A-A

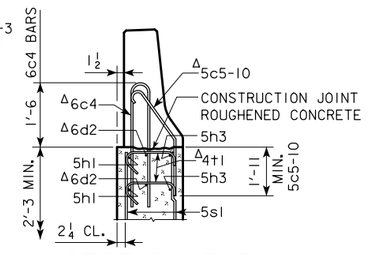


PART SECTION C-C

PART PLAN



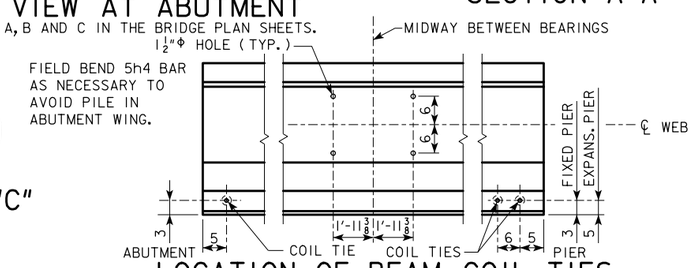
PART SECTION AT PIER



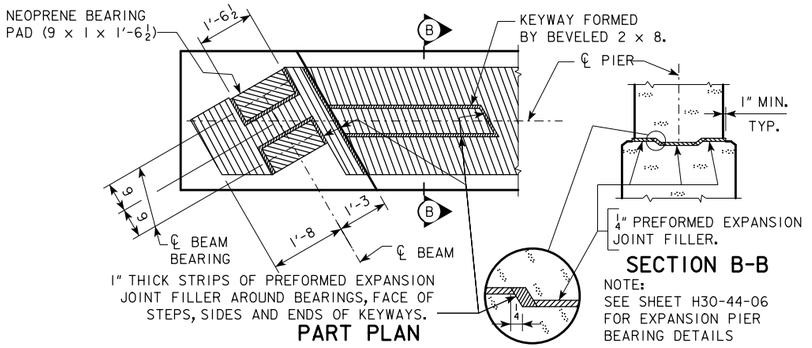
SECTION D-D

Δ NOTE:
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.

DETAIL "C"



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



SECTION B-B

NOTE:
SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS

PART PLAN

TOP OF FIXED PIER DETAILS

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.

01-12
LATEST REVISION DATE

Approved by Bridge Engineer

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

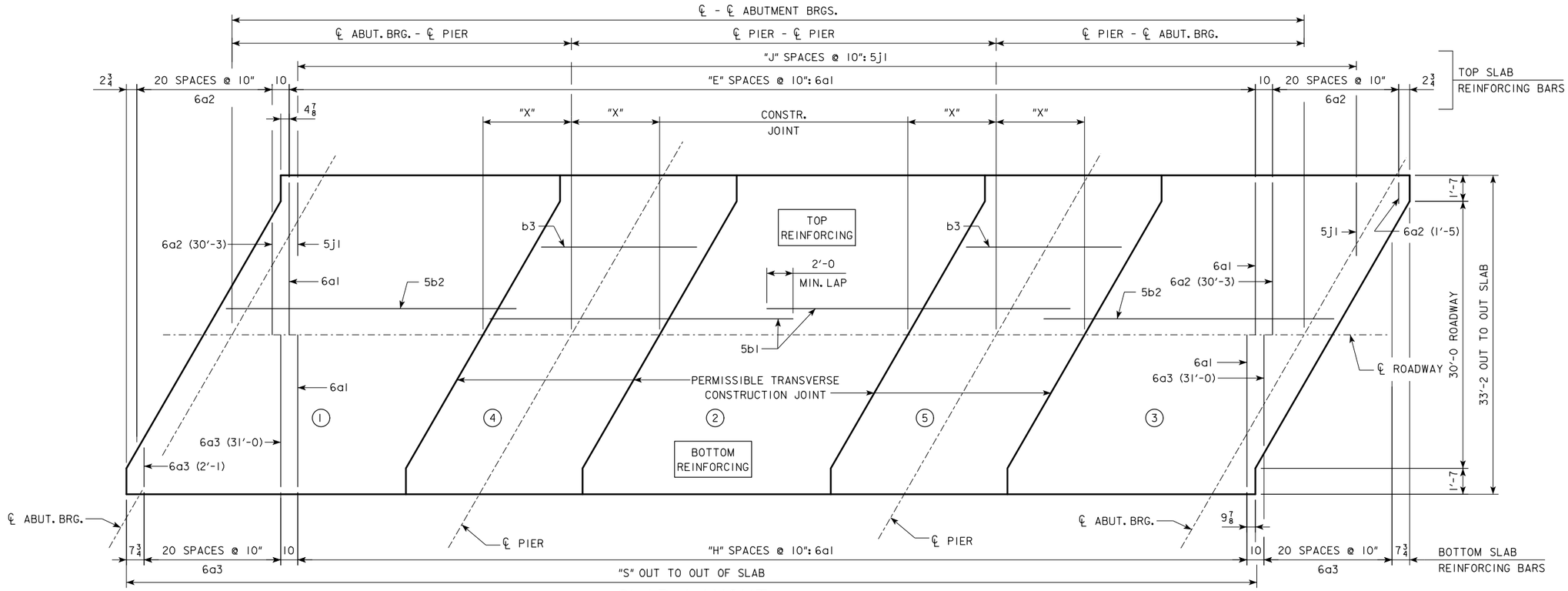
DECEMBER, 2006

LONGITUDINAL SECTION

30° SKEW C BEAMS

H30-21-06

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.



SLAB LAYOUT

(LEFT AHEAD SKEW SHOWN, RIGHT AHEAD SKEW SIMILAR)

ESTIMATED QUANTITIES
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STRUCTURAL CONCRETE SUPERSTRUCTURE	WITH BARRIER RAIL	C.Y.	178.7	189.2	208.3	219.0	229.9	252.2	262.9	274.4	289.2
(INCLUDES ABUTMENT WINGS, PAV. BLOCKS)	WITH OPEN RAIL	C.Y.	181.2	191.9	211.3	222.2	233.3	255.7	266.6	278.3	293.4
STRUCTURAL CONCRETE ABUTMENTS (w/ WOOD PILES) ***		C.Y.	29.4	29.4	29.3	29.3	29.2	-----	-----	-----	-----
STRUCTURAL CONCRETE ABUTMENTS (w/ STEEL H PILES) ***		C.Y.	30.8	30.8	30.8	30.8	30.8	38.4	38.4	38.4	38.4
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN		NO.	5-A50	5-A55	5-B59	5-B63	5-B67	5-C71	5-C75	5-C80	5-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN		NO.	10-A42	10-A46	10-B50	10-B55	10-B59	10-C63	10-C67	10-C71	10-C80
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	312.6	337.6	362.6	387.6	412.6	456.7	481.7	506.7	540.0
STRUCTURAL STEEL (w/ PILE BENT PIERS & DRAINS)		LB.	3985	3985	4073	4073	4073	4077	4077	4077	4077
STRUCTURAL STEEL (w/ PILE BENT PIERS & NO DRAINS)		LB.	3305	3305	3305	3305	3305	3229	3229	3229	3229
STRUCTURAL STEEL (w/ TEE PIERS & DRAINS)		LB.	4881	4881	4969	4969	4969	5135	5135	5135	5135
STRUCTURAL STEEL (w/ TEE PIERS & NO DRAINS)		LB.	4201	4201	4201	4201	4201	4287	4287	4287	4287
REINFORCING STEEL (w/ WOOD PILES & BARRIER RAIL)		LB.	50,727	54,225	57,905	61,770	65,300	-----	-----	-----	-----
REINFORCING STEEL (w/ WOOD PILES & OPEN RAIL)		LB.	51,392	54,846	58,673	62,714	66,174	-----	-----	-----	-----
REINFORCING STEEL (w/ STEEL H PILES & BARRIER RAIL)		LB.	50,735	54,233	57,805	61,670	65,091	71,558	75,702	79,122	83,596
REINFORCING STEEL (w/ STEEL H PILES & OPEN RAIL)		LB.	51,400	54,854	58,573	62,614	65,965	72,189	77,242	80,859	85,379
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS		NO.	24	24	26	26	28	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)		NO.	12	12	12	12	12	18	18	18	18
PREBORED HOLES (w/ WOOD PILES)		L.F.	240	240	260	260	280	-----	-----	-----	-----
PREBORED HOLES (w/ STEEL H-PILES)		L.F.	120	120	120	120	120	180	180	180	180

CONCRETE PLACEMENT QUANT.
(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM,	WITH BARRIER RAIL	C.Y.	95.2	101.2	112.2	118.4	124.6	139.4	145.8	152.6	167.4
& WINGWALLS** , SECTIONS 1 & 3	WITH OPEN RAIL	C.Y.	96.5	102.6	113.8	120.1	126.4	141.3	147.8	154.7	169.8
SLAB INCLUDING	WITH BARRIER RAIL	C.Y.	33.5	36.2	38.9	41.6	44.1	47.0	49.7	52.4	52.4
HAUNCH, SECTION 2	WITH OPEN RAIL	C.Y.	34.2	37.0	39.7	42.5	45.1	48.0	50.7	53.5	53.5
SLAB INCLUDING HAUNCH &	WITH BARRIER RAIL	C.Y.	40.0	41.8	46.8	48.6	50.8	54.6	56.2	58.2	58.2
PIER DIAPHRAGM, SECTIONS 4 & 5	WITH OPEN RAIL	C.Y.	40.5	42.3	47.4	49.2	51.4	55.2	56.9	58.9	58.9
PAVING BLOCKS		C.Y.	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
ABUTMENT WINGS		C.Y.	7.2	7.2	7.6	7.6	7.6	8.4	8.4	8.4	8.4
ABUTMENT FOOTINGS (w/ WOOD PILES) ***		C.Y.	29.4	29.4	29.3	29.3	29.2	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES) ***		C.Y.	30.8	30.8	30.8	30.8	30.8	38.4	38.4	38.4	38.4

GENERAL DATA

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-7 15/16	3'-7 3/4	4'-2 13/16	4'-2 13/16	4'-3	4'-8 1/2	4'-8 11/16	4'-9	4'-9 7/16
CURVE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 7/16	3'-6 5/8	4'-1 3/8	4'-1 5/8	4'-1 15/16	4'-7 5/16	4'-7 5/16	4'-7 9/16	4'-7 7/16
STRAIGHT	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-8 1/16	3'-7 7/8	4'-2 15/16	4'-2 15/16	4'-3 1/16	4'-8 11/16	4'-8 15/16	4'-9 3/8	4'-10
GRADE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 5/8	3'-6 7/8	4'-1 11/16	4'-1 15/16	4'-2 5/16	4'-7 15/16	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	357.3	385.4	440.8	470.4	500.2	599.2	632.4	666.1	698.8
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	207.6	215.3	222.7	229.9	237.0	244.0	253.2	268.2	284.4
NO. OF SPACES FOR 6a1 BARS (TOP)		"E"	149	164	179	194	209	224	239	254	274
NO. OF SPACES FOR 6a1 BARS (BOTTOM)		"H"	148	163	178	193	208	223	238	253	273
NO. OF SPACES FOR 5j1 BARS (TOP)		"J"	166	181	196	211	226	241	256	271	291
OUT TO OUT OF SLAB		"S"	142'-3 5/8	154'-9 5/8	167'-3 5/8	179'-9 5/8	192'-3 5/8	204'-9 5/8	217'-3 5/8	229'-9 5/8	246'-5 5/8
SLAB TRANSVERSE CONSTR. JT. DISTANCE FROM C.L. PIER		"X"	6'-7	7'-1	7'-7	8'-1	8'-8	9'-2	9'-8	10'-2	10'-2

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

* VALUES SHOWN ARE FOR FIXED PIERS ONLY AND ALLOW FOR 1/16 INCH DEFLECTION OF THE 1 INCH NEOPRENE BEARING PAD. AT EXPANSION PIER LOCATIONS ADD 3 1/16 INCHES TO "U" VALUES SHOWN.

** WINGWALLS APPLY ONLY TO BRIDGES USING "C" BEAMS.

*** SEE SHEET H30-24-06 FOR ADDITIONAL CONCRETE REQUIRED IN ABUTMENT FOOTINGS.

07-15
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

SUPERSTRUCTURE DETAILS
30° SKEW

H30-22-06

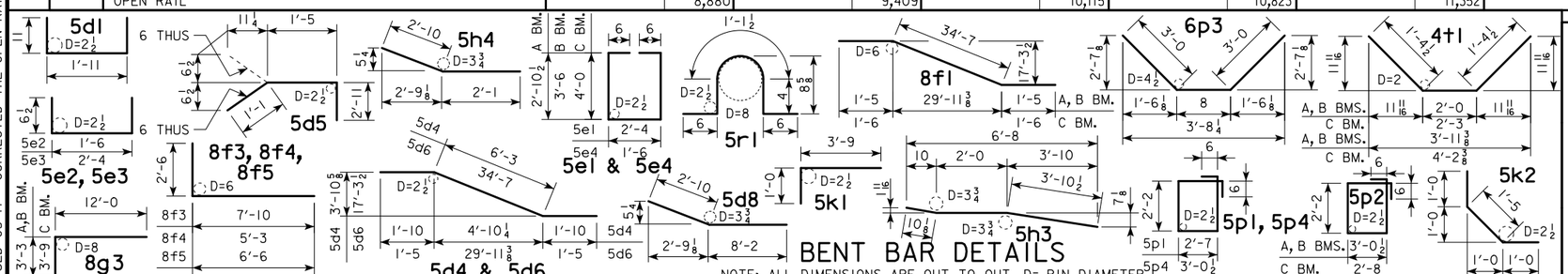
REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

			℄-℄ ABUT. BRG.	138′-10			151′-4			163′-10			176′-4			188′-10			201′-4			213′-10			226′-4			243′-0		
			℄-℄ BEAM BRG.	42′-6	50′-10	42′-6	46′-8	55′-0	46′-8	50′-10	59′-2	50′-10	55′-0	63′-4	55′-0	59′-2	67′-6	59′-2	63′-4	71′-8	63′-4	67′-6	75′-10	67′-6	71′-8	80′-0	71′-8	80′-0	80′-0	80′-0
			BEAM SERIES	A BEAM			A BEAM			B BEAM			B BEAM			B BEAM			C BEAM			C BEAM			C BEAM			C BEAM		
BAR	LOCATION	SHAPE		NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.			299	32′-10	14,745	329	32′-10	16,225	359	32′-10	17,704	389	32′-10	19,184	419	32′-10	20,663	449	32′-10	22,143	479	32′-10	23,622	509	32′-10	25,102	549	32′-10	27,074
6a2	SLAB TRANSV. TOP ENDS			42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999	42	VARIES	999
6a3	SLAB TRANSV. BOTT. ENDS			42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044	42	VARIES	1,044
5b1	SLAB LONGITUDINAL, TOP & BOTT.			152	40′-0	6,341	228	40′-0	9,512	228	40′-0	9,512	228	40′-0	9,512	228	40′-0	9,512	304	40′-0	12,683	304	40′-0	12,683	304	40′-0	12,683	380	40′-0	15,854
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS			152	34′-0	5,390	152	21′-3	3,369	152	27′-6	4,360	152	33′-9	5,351	152	40′-0	6,341	152	27′-3	4,320	152	33′-6	5,311	152	39′-9	6,302	152	29′-1	4,611
6b3	SLAB LONGITUDINAL, TOP ℄ PIERS			66	12′-10	1,272	66	13′-10	1,371	66	14′-10	1,470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP ℄ PIERS			—	—	—	—	—	—	—	—	—	66	15′-10	2,136	66	17′-0	2,293	66	18′-0	2,428	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP ℄ PIERS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66	19′-0	3,348	66	20′-0	3,524	66	20′-0	3,524
5d1	PIER DIAPH. ENDS			12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47	12	3′-9	47
5d2	PIER & ABUT. DIAPH. LONGIT.			72	7′-0	526	72	7′-0	526	72	7′-0	526	72	7′-0	526	72	7′-0	526	72	6′-8	501	72	6′-8	501	72	6′-8	501	72	6′-8	501
5d3	PIER & ABUT. DIAPH. LONGIT.			24	5′-11	148	24	5′-11	148	24	5′-11	148	24	5′-11	148	24	5′-11	148	24	5′-8	142	24	5′-8	142	24	5′-8	142	24	5′-8	142
5d4	PIER DIAPH. LONGIT.			8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83	8	9′-11	83
5d5	ABUT. DIAPH. ENDS			12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68	12	5′-5	68
5d6	ABUT. DIAPH. LONGIT. B.F.			8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312	8	37′-5	312
5d7	PAVING NOTCH LONGIT.			4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157	4	37′-9	157
5d8	ABUT. DIAPH. WING EXT. LONGIT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	11′-0	275	24	11′-0	275	24	11′-0	275	24	11′-0	275
5d9	ABUT. DIAPH. WING EXT. LONGIT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	10′-11	273	24	10′-11	273	24	10′-11	273	24	10′-11	273
5e1	PIER DIAPH. HOOPS			32	9′-1	303	32	9′-1	303	32	10′-4	345	32	10′-4	345	32	10′-4	345	32	11′-4	378	32	11′-4	378	32	11′-4	378	32	11′-4	378
5e2	PIER DIAPH. TIES ENDS			4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11	4	2′-7	11
5e3	PIER DIAPH. TIES			32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114	32	3′-5	114
5e4	PIER DIAPH. HOOPS ENDS			4	8′-3	34	4	8′-3	34	4	9′-6	40	4	9′-6	40	4	9′-6	40	4	10′-6	44	4	10′-6	44	4	10′-6	44	4	10′-6	44
8f1	ABUT. FOOTING LONGIT.			18	37′-5	1,798	18	37′-5	1,798	18	37′-5	1,798	18	37′-5	1,798	18	37′-5	1,798	18	37′-7	1,806	18	37′-7	1,806	18	37′-7	1,806	18	37′-7	1,806
8f3	ABUT. EXTENSION LONGIT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	10′-4	441	16	10′-4	441	16	10′-4	441	16	10′-4	441
8f4	ABUT. EXTENSION LONGIT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	7′-9	166	8	7′-9	166	8	7′-9	166	8	7′-9	166
8f5	ABUT. EXTENSION LONGIT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	9′-0	192	8	9′-0	192	8	9′-0	192	8	9′-0	192
8g1	ABUT. VERT.			114	6′-8	2,029	114	6′-8	2,029	114	7′-3	2,207	114	7′-3	2,207	114	7′-3	2,207	110	7′-9	2,276	110	7′-9	2,276	110	7′-9	2,276	110	7′-10	2,301
8g3	ABUT. DIAPH. VERT. B.F.			50	15′-3	2,036	50	15′-3	2,036	50	15′-3	2,036	50	15′-3	2,036	50	15′-3	2,036	50	15′-9	2,103	50	15′-9	2,103	50	15′-9	2,103	50	15′-9	2,103
6g4	ABUT. DIAPH. WING EXT. VERT.			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40	6′-6	391	40	6′-6	391	40	6′-7	396	40	6′-7	396
5h1	ABUT. WING HORIZ. B.F.			28	6′-8	195	28	6′-8	195	28	6′-8	195	28	6′-8	195	28	6′-8	195	36	6′-8	250	36	6′-8	250	36	6′-8	250	36	6′-8	250
5h2	ABUT. TO WING ANCHOR			56	4′-11	287	56	4′-11	287	56	4′-11	287	56	4′-11	287	56	4′-11	287	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5h3	ABUT. WING HORIZ. TRAFFIC FACE			28	6′-9	197	28	6′-9	197	28	6′-9	197	28	6′-9	197	28	6′-9	197	36	6′-9	253	36	6′-9	253	36	6′-9	253	36	6′-9	253
5h4	ABUT. TO WING ANCHOR			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5j1	TOP OF SLAB TRANSV. (AT RAIL)			334	6′-3	2,177	364	6′-3	2,373	394	6′-3	2,568	424	6′-3	2,764	454	6′-3	2,960	484	6′-3	3,155	514	6′-3	3,351	544	6′-3	3,546	584	6′-3	3,807
5k1	PAVING NOTCH			52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258	52	4′-9	258
5k2	PAVING NOTCH			52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185	52	3′-5	185
5p1	ABUTMENT HOOPS (WOOD/STEEL)			88/100	10′-6	964/1095	88/100	10′-6	964/1095	96/100	10′-6	1051/1095	96/100	10′-6	1051/1095	104/100	10′-6	1139/1095	104	10′-6	1,139	104	10′-6	1,139	104	10′-6	1,139	104	10′-6	1,139
5p2	ABUTMENT HOOPS			8	11′-5	95	8	11′-5	95	8	11′-5	95	8	11′-5	95	8	11′-5	95	24	10′-8	267	24	10′-8	267	24	10′-8	267	24	10′-8	267
6p3	ABUT. BOTT. AT PILES			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	6′-8	280	28	6′-8	280	28	6′-8	280	28	6′-8	280
5p4	ABUT. HOOPS AT ENDS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	11′-5	95	8	11′-5	95	8	11′-5	95	8	11′-5	95
5r1	PAVING BLOCK LIFTING LOOPS			10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30	10	2′-10	30
5s1	WING VERT.			64	5′-10	389	64	5′-10	389	64	6′-2	412	64	6′-2	412	64	6′-2	412	64	6′-11	462	64	6′-11	462	64	6′-11	462	64	6′-11	462
4t1	UNDER BEAMS AT ABUTMENTS			10	4′-9	32	10	4′-9	32	10	4′-9	32	10	4′-9	32	10	4′-9	32	10	5′-0	33	10	5′-0	33	10	5′-0	33	10	5′-0	33
#2	PILE SPIRAL (WOOD/STEEL)*			24/12	38′-6	154/77	24/12	38′-6	154/77	26/12	38′-6	167/77	26/12	38′-6	167/77	28/12	38′-6	180/77	18	38′-6	116	18	38′-6	116	18	38′-6	116	18	38′-6	116
	SPIRAL SPACERS, L 7/8 x 7/8 x 1/8 x 0.70 (WOOD/STL.)*			72/36	1′-10	92/46	72/36	1′-10	92/46	78/36	1′-10	100/46	78/36	1′-10	100/46	84/36	1′-10	108/46	54	1′-10	69	54	1′-10	69	54	1′-10	69	54	1′-10	69
	*EPOXY COATING NOT REQUIRED																												
	SUB TOTAL W/ WOOD PILES**					42,512			45,437			48,558			51,891			54,822			—			—			—			—
	SUB TOTAL W/ STEEL H-PILES**					42,520			45,445			48,458			51,791			54,613			60,113			63,699			66,546			70,284
	**RAIL REINFORCING NOT INCLUDED																												
	BARRIER RAIL					8,215			8,788			9,347			9,879			10,478			11,445			12,003			12,576			13,312
	OPEN RAIL					8,880			9,409			10,115			10,823			11,352			13,076			13,543			14,313			15,095

REVISED 05-11 - CORRECTED THE OPEN RAIL REBAR QUANTITIES FOR THE 201′-4, 231′-10, 226′-4, & 243′-0 BRIDGE LENGTHS.



05-11
LATEST REVISION DATE

Karen K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

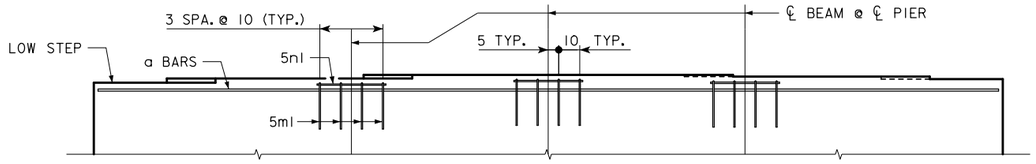
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

DECK & ABUTMENT REINF.

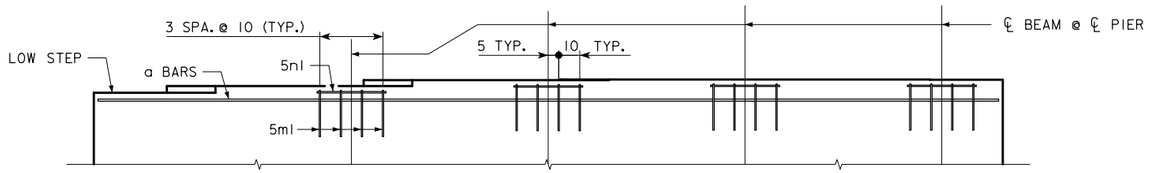
30° SKEW

H30-23-06



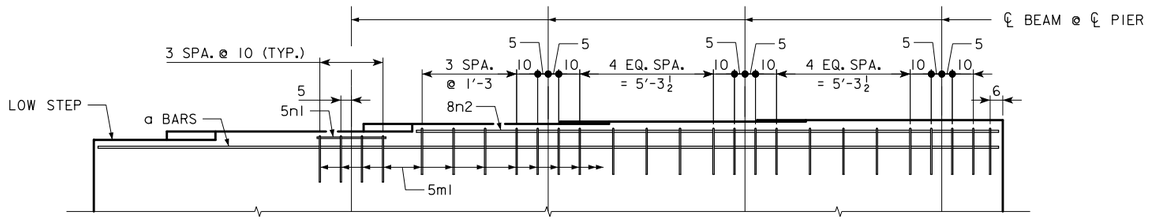
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 0.9%



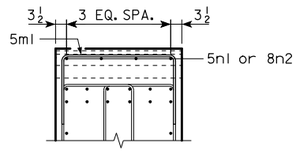
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 0.9% < G <= 3.3%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 3.3% < G <= 5.0%



TYPICAL SECTION

STEP REINFORCING BAR LIST ONE TEE PIER

			G <= 0.9%			0.9% < G <= 3.3%			3.3% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-8	⌐	12	5	83	16	5	111	26	5	181
5n1	2'-8	—	12	5	33	16	5	45	4	5	11
*8n2	VARIES	—	--	--	--	--	--	--	4	8	256
TOTAL (LB.)					116			156			448

G = GRADE (%)

*8n2 BARS VARY FROM 23'-2 TO 24'-9

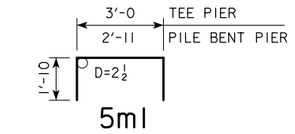
STEP REINFORCING BAR LIST ONE PILE BENT PIER

			G <= 0.9%			0.9% < G <= 3.3%			3.3% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-7	⌐	12	5	82	16	5	110	26	5	179
5n1	2'-8	—	12	5	33	16	5	45	4	5	11
*8n2	VARIES	—	--	--	--	--	--	--	4	8	256
TOTAL (LB.)					115			155			446

G = GRADE (%)

*8n2 BARS VARY FROM 23'-2 TO 24'-9

BENT BAR DETAILS



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

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES IN THE TABLE BELOW HAVE BEEN EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

ADDITIONAL CONCRETE VOLUME PER SUBSTRUCTURE UNIT (C.Y.)

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
A, B BEAMS	-----	0.6	0.9	1.3	1.6
C BEAMS	-----	0.7	1.1	1.6	2.0
EACH TEE PIER CAP - ALL BEAMS	-----	0.6	0.9	1.3	1.7
EACH PILE BENT PIER - ALL BEAMS	-----	0.6	0.9	1.3	1.7

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

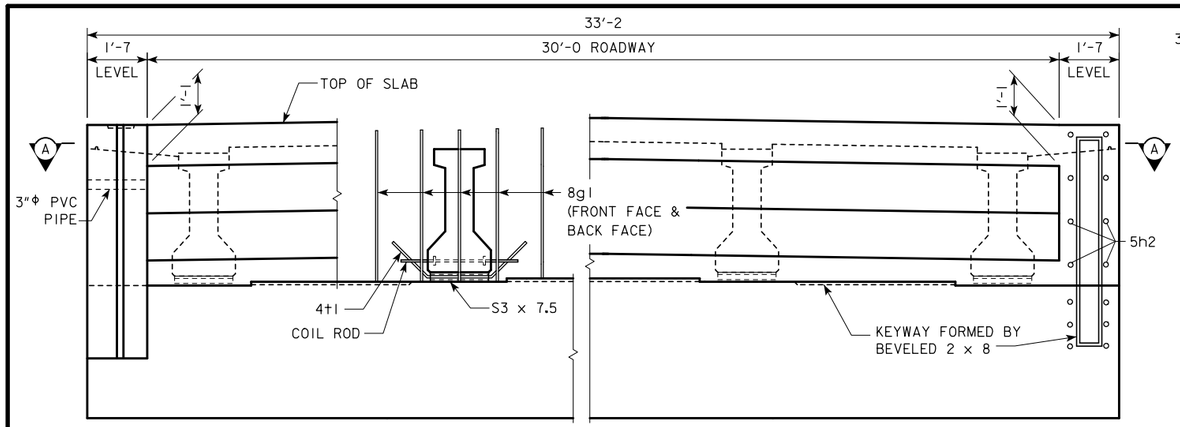
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ADDITIONAL QUANTITIES

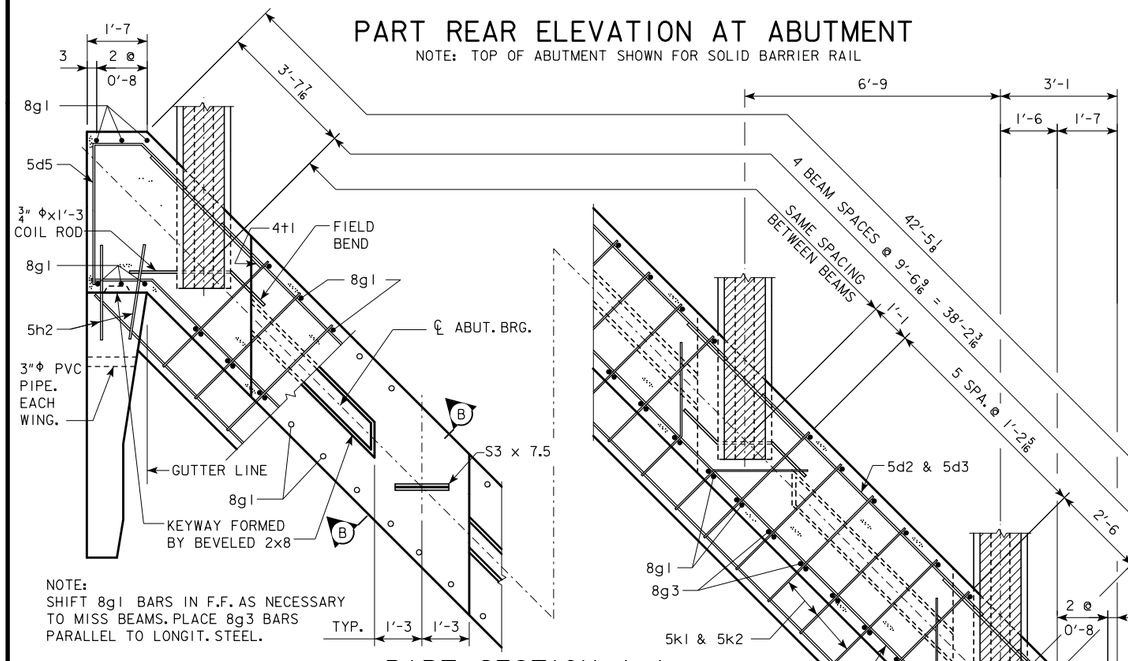
30° SKEW

H30-24-06



PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



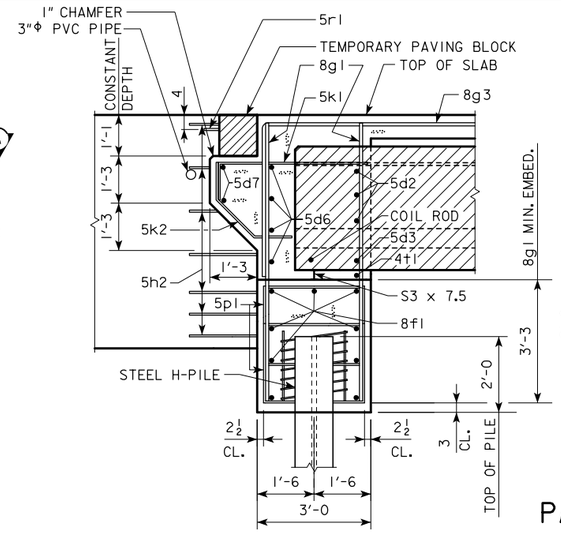
NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.

SPACING FOR:
39- 8g1 BACK FACE
30- 8g1 FRONT FACE
33- 8g3 BACK FACE
34- 5k1 & 5k2 BACK FACE

PART SECTION A-A

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES	11	12	13	13	13
	"B" (FT. - IN.)	3'-10	3'-6	3'-3	3'-3	3'-3
	"C" (FT. - IN.)	2'-4 7/16	2'-5 7/16	2'-3 15/16	2'-3 15/16	2'-3 15/16
	"D" EQUAL SPACES	2	2	1	1	1
	NO. OF PILES PER ABUT.	12	13	14	14	14
	Pu, STRENGTH I DESIGN LOAD (KIPS)	57	54	54	56	58
WITH STEEL H-PILES	"A" PILE SPACES	5	5	5	5	5
	"B" (FT. - IN.)	8'-0	8'-0	8'-0	8'-0	8'-0
	"C" (FT. - IN.)	3'-5 7/16	3'-5 7/16	3'-5 7/16	3'-5 7/16	3'-5 7/16
	"D" EQUAL SPACES	5	5	5	5	5
	NO. OF PILES PER ABUT.	6	6	6	6	6
	Pu, STRENGTH I DESIGN LOAD (KIPS)	123	128	137	141	146

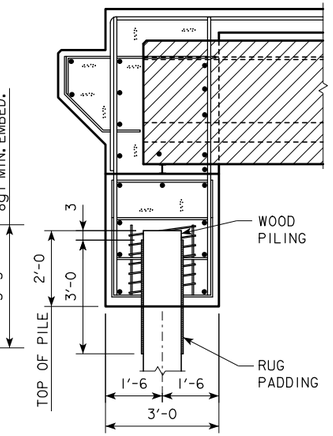
NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



PART SECTION B-B

(FOR STEEL H-PILING)

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



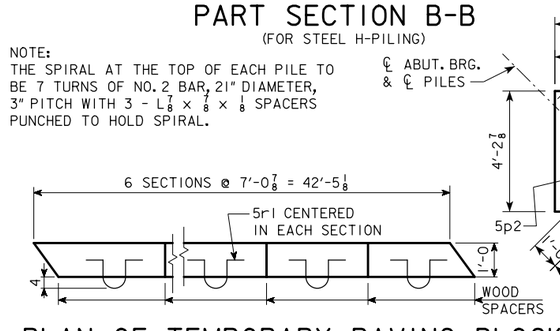
WOOD PILING NOTE:
AFTER PILES ARE CUT OFF, THE UPPER 3', EXCEPT AS SHOWN, IS TO BE WRAPPED WITH A DOUBLE THICKNESS OF RUG PADDING HELD IN PLACE BY TACKING WITH GALVANIZED ROOFING NAILS AND WRAPPED WITH #14 GAUGE GALVANIZED WIRE AT A 4" PITCH, CARE IS TO BE TAKEN NOT TO DAMAGE PADDING WHEN PLACING CONCRETE. RUG PADDING MAY BE EITHER OF THE FOLLOWING:

(1) HAIR AND JUTE RUG PADDING, RUBBERIZED ON BOTH SIDES, AND WEIGHING NOT LESS THAN 47 OZ. PER SQ. YD.

(2) BONDED URETHANE OR BONDED POLYFOAM WITH A MINIMUM DENSITY OF 5 LBS. PER CU. FT. AND SHALL BE AT LEAST 1/2 IN. THICK, (MATERIAL LESS THAN 1/2 IN. IN THICKNESS MAY BE USED, BUT WILL REQUIRE ADDITIONAL WRAPS FOR A TOTAL OF AT LEAST ONE INCH).

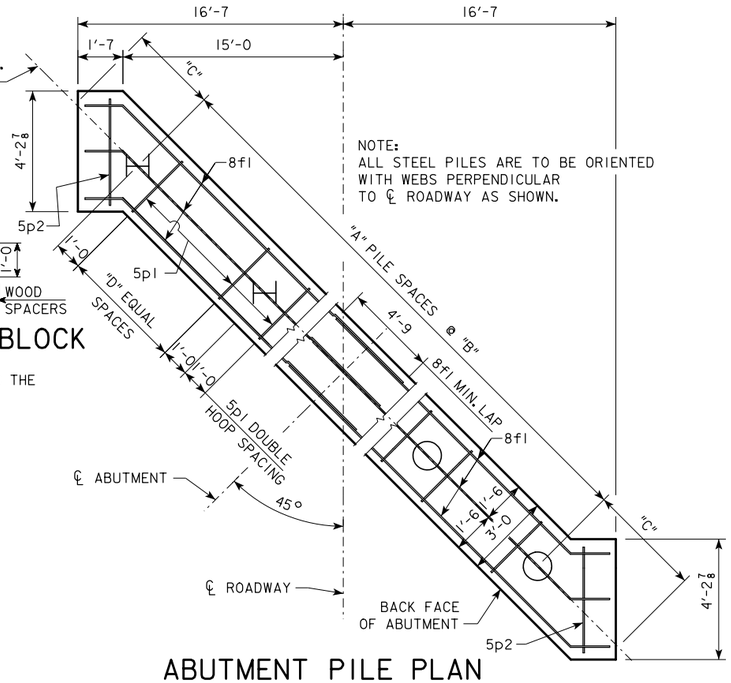
PART SECTION B-B

(FOR WOOD PILING)



PLAN OF TEMPORARY PAVING BLOCK

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



NOTE:
ALL STEEL PILES ARE TO BE ORIENTED WITH WEBS PERPENDICULAR TO ℄ ROADWAY AS SHOWN.

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.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

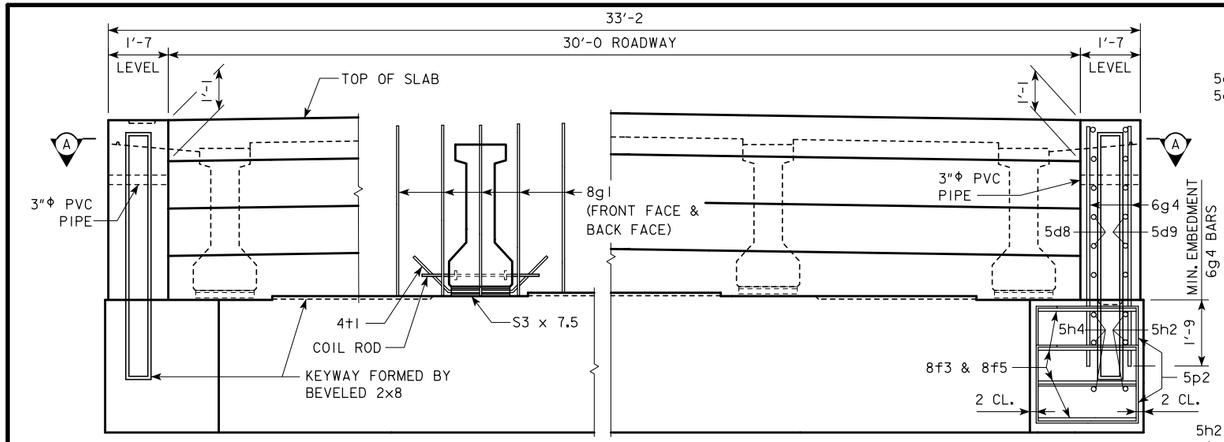
DECEMBER, 2006

ABUTMENT DETAILS

45° SKEW A & B BEAMS

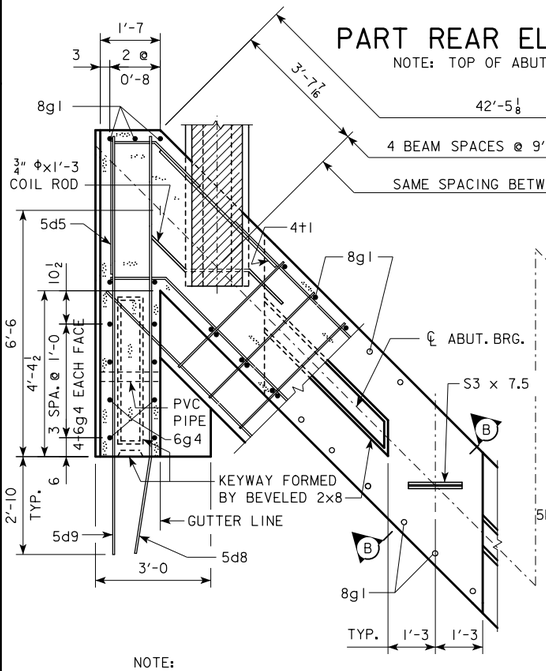
H30-25-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

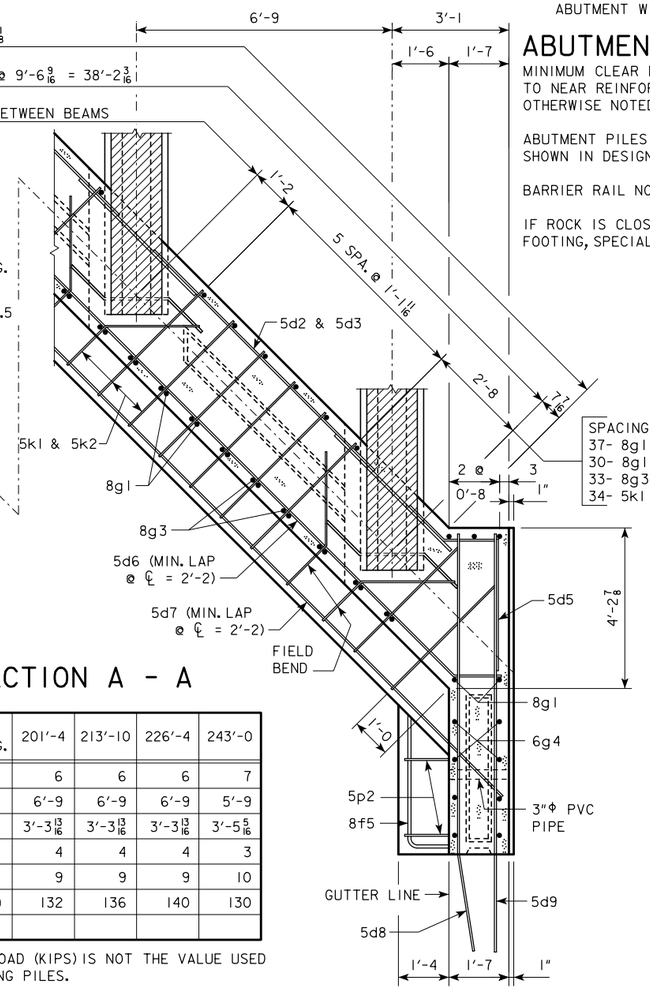


PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



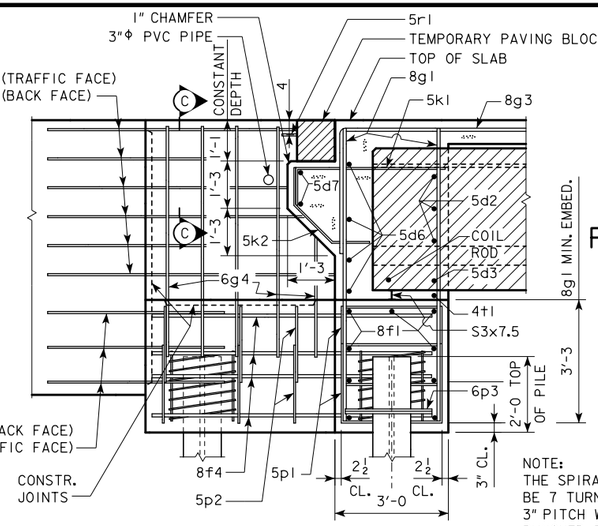
NOTE:
SHIFT 8g1 BARS IN F.F. AS NECESSARY TO MISS BEAMS. PLACE 8g3 BARS PARALLEL TO LONGIT. STEEL.



PART SECTION A - A

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	6	6	6	7
	"B" (FT. - IN.)	6'-9	6'-9	6'-9	5'-9
	"C" (FT. - IN.)	3'-3 13/16	3'-3 13/16	3'-3 13/16	3'-5 5/16
	"D" EQUAL SPACES	4	4	4	3
	NO. OF PILES PER ABUT.	9	9	9	10
	Pu, STRENGTH I DESIGN LOAD (KIPS)	132	136	140	130

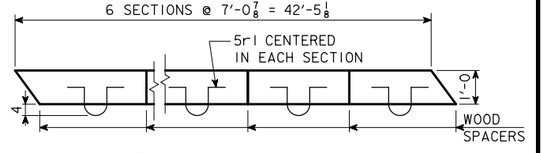
NOTE: Pu, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.

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 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



PLAN OF TEMPORARY PAVING BLOCK

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

ABUTMENT NOTES:

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

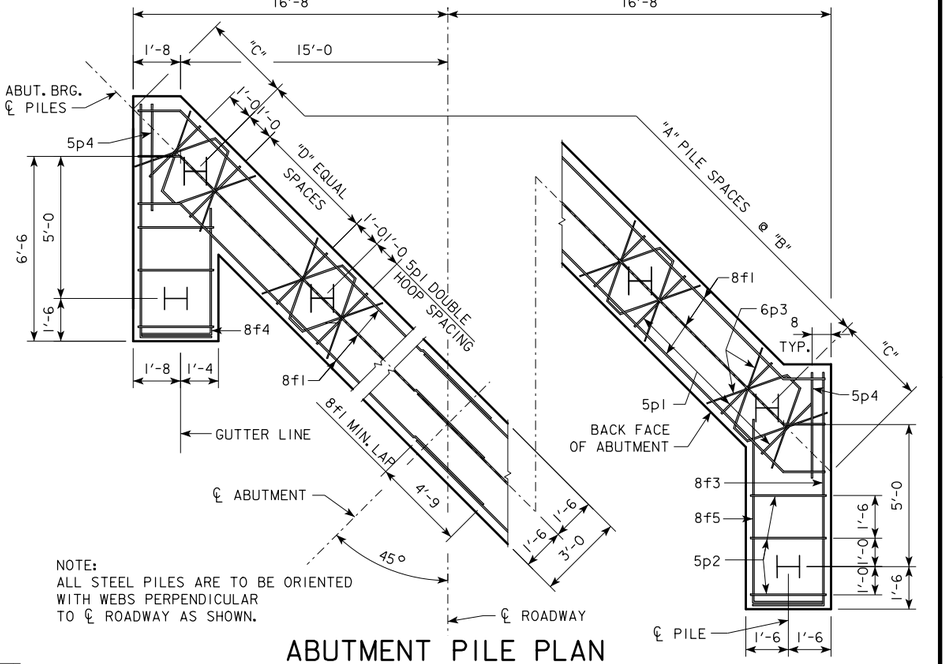
ABUTMENT PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

BARRIER RAIL NOT SHOWN IN DETAILS.

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

PART SECTION C-C

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



NOTE:
ALL STEEL PILES ARE TO BE ORIENTED WITH WEBS PERPENDICULAR TO ℄ ROADWAY AS SHOWN.

ABUTMENT PILE PLAN

04-13
LATEST REVISION DATE

Marian K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

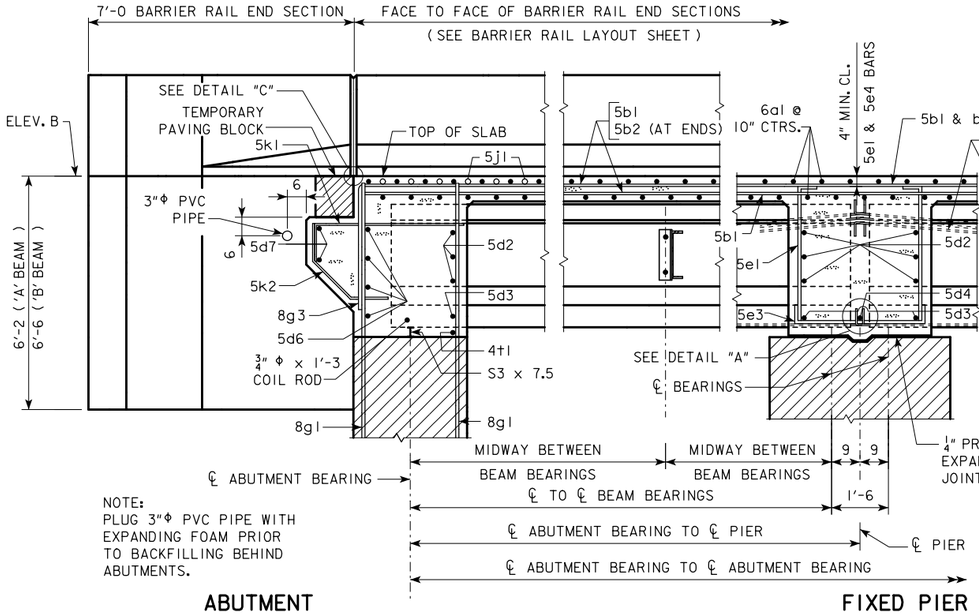
ABUTMENT DETAILS

45° SKEW C BEAMS

H30-26-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

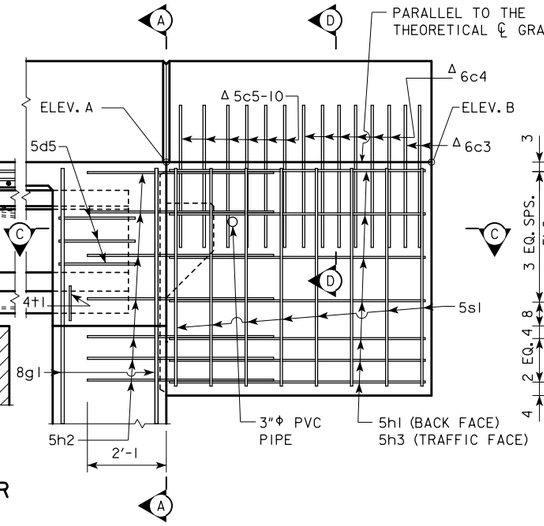


PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)

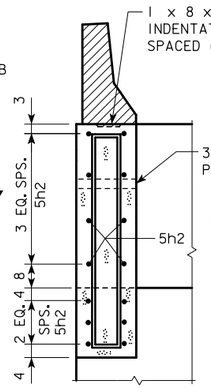
EXPANSION PIER

(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

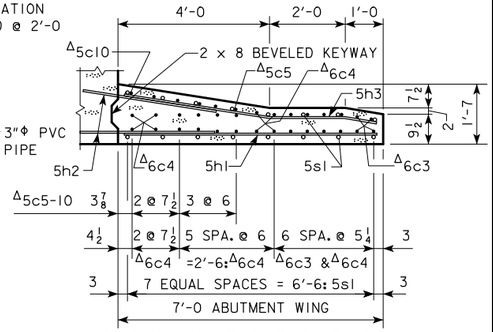


PART END VIEW AT ABUTMENT

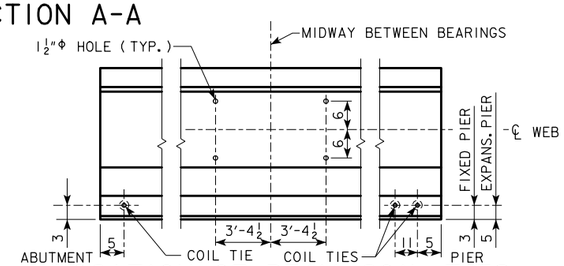
PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.



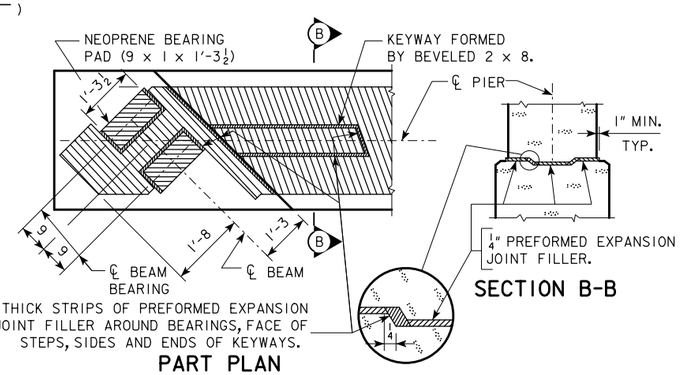
SECTION A-A



PART SECTION C-C



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

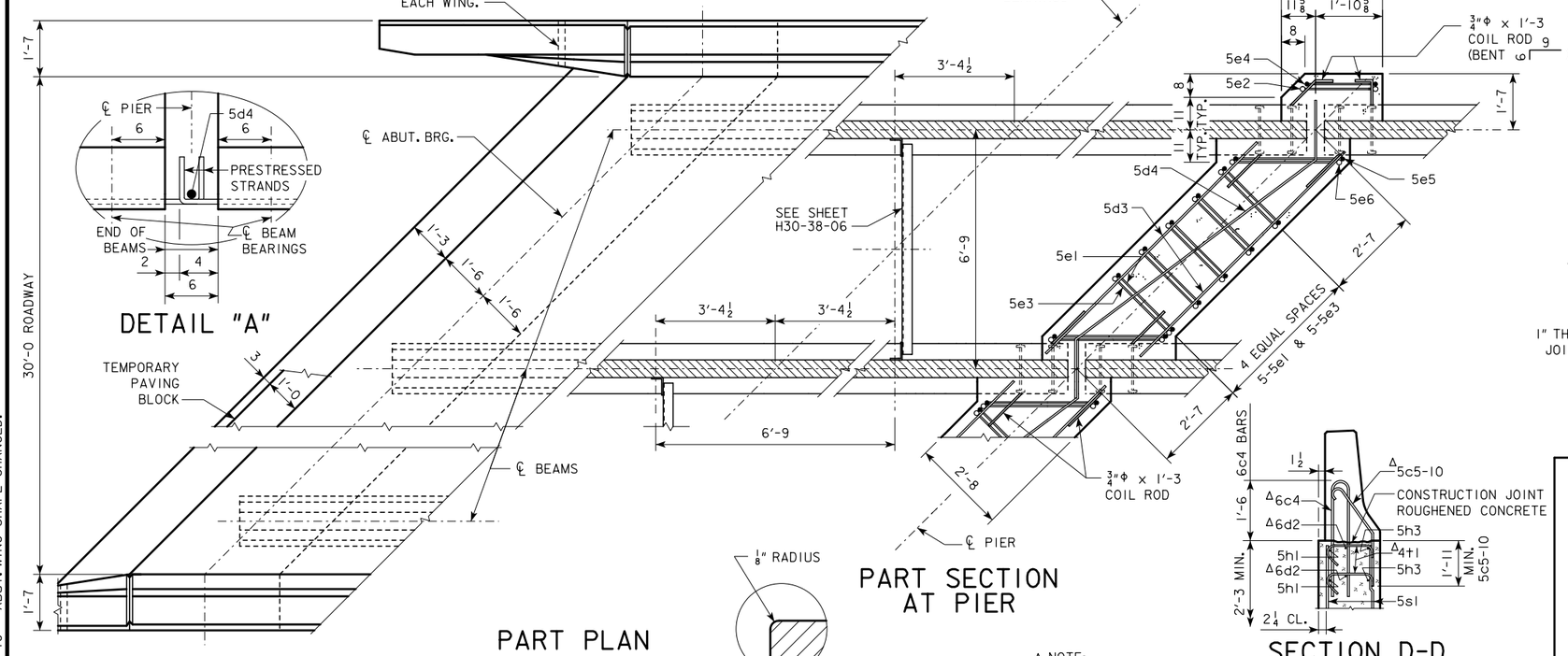


PART PLAN

SECTION B-B

TOP OF FIXED PIER DETAILS

(SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS)



SECTION D-D

Δ NOTE:
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.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

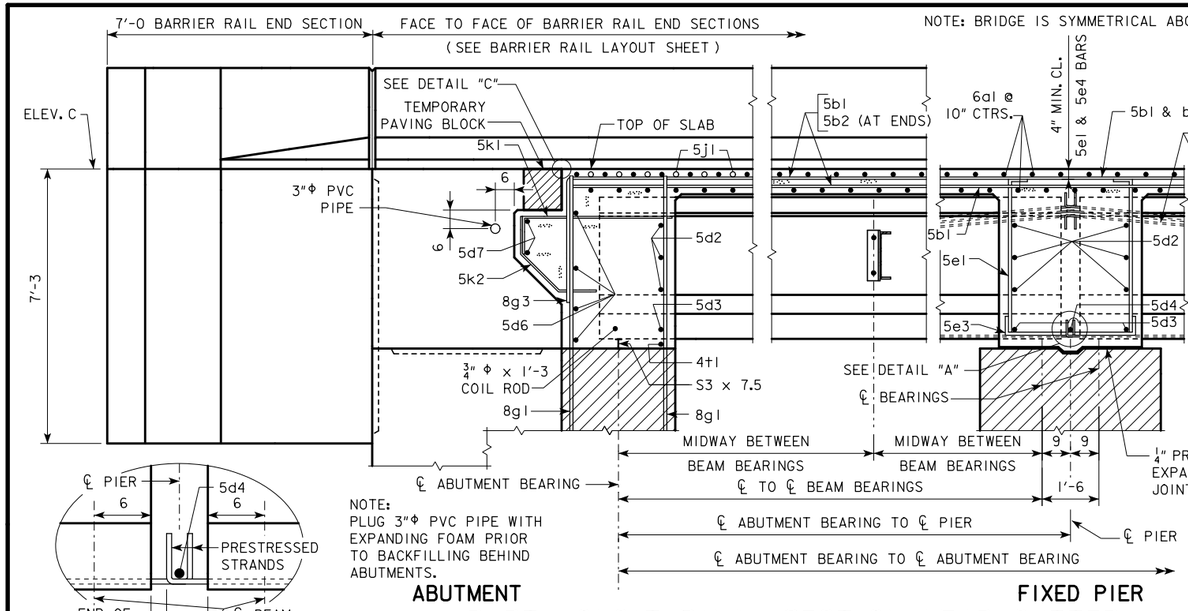
DECEMBER, 2006

LONGITUDINAL SECTION

45° SKEW A & B BEAMS

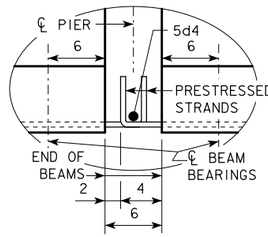
H30-27-06

CORRECTION 09-10 - MINOR MODIFICATIONS TO PART SECTION C-C.
REVISED 07-10 - ABUT. WING SHAPE CHANGED.



PART LONGITUDINAL SECTION NEAR GUTTER

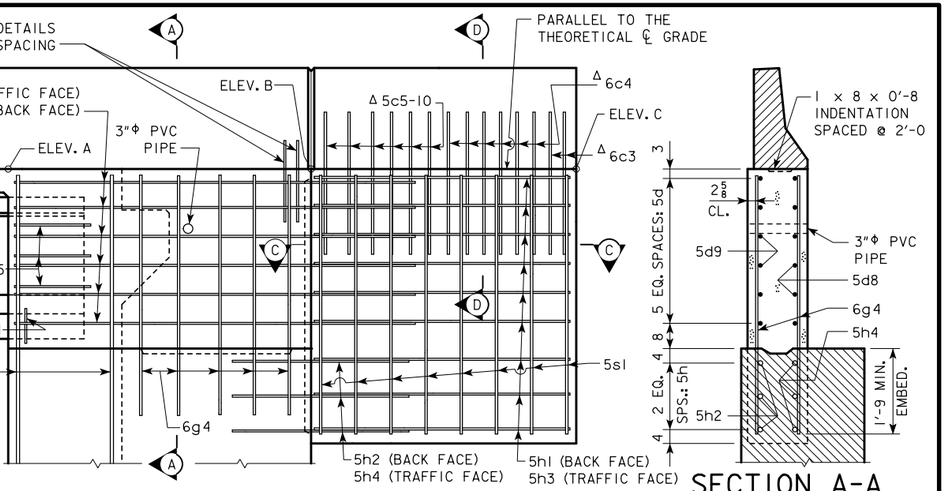
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H30-38-06)



DETAIL "A"

EXPANSION PIER

(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

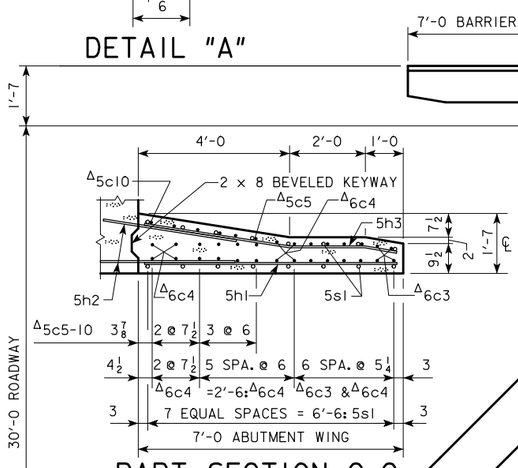


PART END VIEW AT ABUTMENT

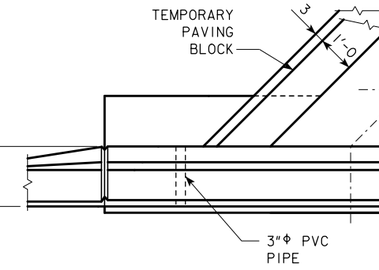
PROVIDE ELEVATIONS A, B AND C IN THE BRIDGE PLAN SHEETS.

FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.

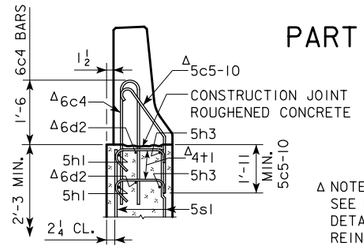
SECTION A-A



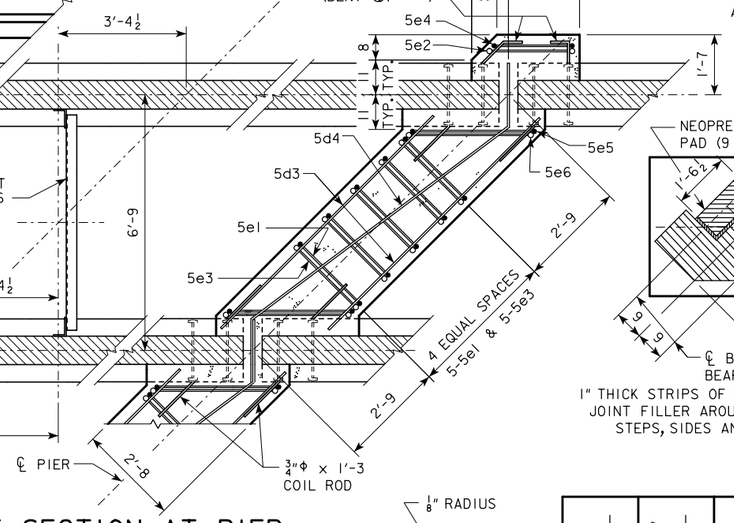
PART SECTION C-C



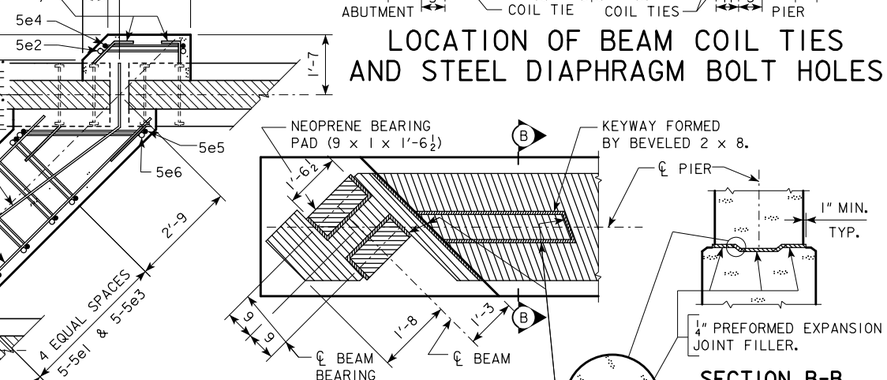
PART PLAN



SECTION D-D



PART SECTION AT PIER



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

1" THICK STRIPS OF PREFORMED EXPANSION JOINT FILLER AROUND BEARINGS, FACE OF STEPS, SIDES AND ENDS OF KEYWAYS.

PART PLAN

SECTION B-B

NOTE:
SEE SHEET H30-44-06 FOR EXPANSION PIER BEARING DETAILS

TOP OF FIXED PIER DETAILS

DETAIL "C"

Δ NOTE:
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.

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.

01-12
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

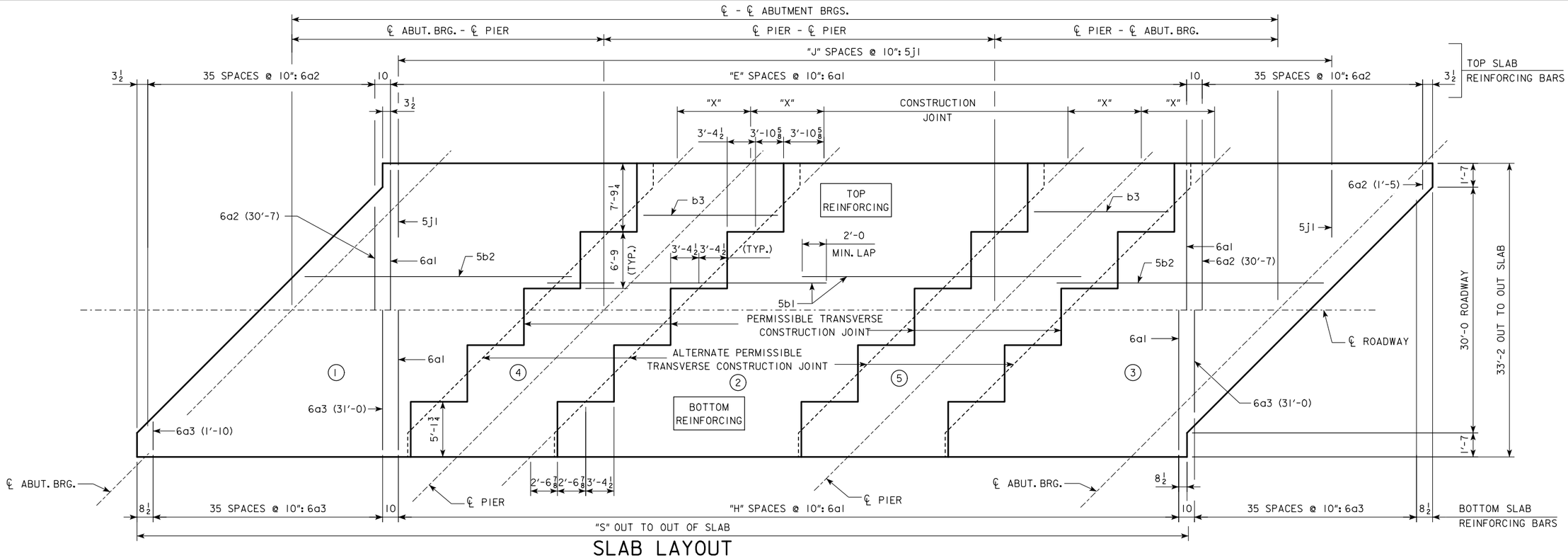
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

LONGITUDINAL SECTION

45° SKEW C BEAMS

H30-28-06



SLAB LAYOUT

(LEFT AHEAD SKEW SHOWN, RIGHT AHEAD SKEW SIMILAR)

ESTIMATED QUANTITIES

(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STRUCTURAL CONCRETE SUPERSTRUCTURE (INCLUDES ABUTMENT WINGS, PAV. BLOCKS)	WITH BARRIER RAIL	C.Y.	190.3	200.8	221.7	232.6	243.5	266.4	277.1	288.6	303.4
	WITH OPEN RAIL	C.Y.	192.8	203.5	224.7	235.8	246.9	269.9	280.8	292.5	307.6
STRUCTURAL CONCRETE ABUTMENTS (w/ WOOD PILES) ***		C.Y.	36.6	36.5	36.4	36.4	36.4	-----	-----	-----	-----
STRUCTURAL CONCRETE ABUTMENTS (w/ STEEL H PILES) ***		C.Y.	38.0	38.0	38.0	38.0	38.0	45.0	45.0	45.0	45.0
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN		NO.	5-A50	5-A55	5-B59	5-B63	5-B67	5-C71	5-C75	5-C80	5-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN		NO.	10-A42	10-A46	10-B50	10-B55	10-B59	10-C63	10-C67	10-C71	10-C80
CONCRETE RAIL (BARRIER OR OPEN)		L.F.	314.2	339.2	364.2	389.2	414.2	456.7	481.7	506.7	540.0
STRUCTURAL STEEL (w/ PILE BENT PIERS & DRAINS)		LB.	3985	3985	4073	4073	4073	4077	4077	4077	4077
STRUCTURAL STEEL (w/ PILE BENT PIERS & NO DRAINS)		LB.	3305	3305	3305	3305	3305	3229	3229	3229	3229
STRUCTURAL STEEL (w/ TEE PIERS & DRAINS)		LB.	4881	4881	4969	4969	4969	5135	5135	5135	5135
STRUCTURAL STEEL (w/ TEE PIERS & NO DRAINS)		LB.	4201	4201	4201	4201	4201	4287	4287	4287	4287
REINFORCING STEEL (w/ WOOD PILES & BARRIER RAIL)		LB.	53,802	57,451	60,673	64,538	68,117	-----	-----	-----	-----
REINFORCING STEEL (w/ WOOD PILES & OPEN RAIL)		LB.	54,467	58,072	61,441	65,482	68,991	-----	-----	-----	-----
REINFORCING STEEL (w/ STEEL H PILES & BARRIER RAIL)		LB.	53,547	57,044	60,683	64,548	68,127	74,517	78,661	82,239	86,532
REINFORCING STEEL (w/ STEEL H PILES & OPEN RAIL)		LB.	54,212	57,665	61,451	65,492	69,001	76,148	80,201	83,976	88,315
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS		NO.	24	26	28	28	28	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)		NO.	12	12	12	12	12	18	18	18	20
PREBORED HOLES (w/ WOOD PILES)		L.F.	240	260	280	280	280	-----	-----	-----	-----
PREBORED HOLES (w/ STEEL H-PILES)		L.F.	120	120	120	120	120	180	180	180	200

CONCRETE PLACEMENT QUANT.

(SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, & WINGWALLS** , SECTIONS 1 & 3	WITH BARRIER RAIL	C.Y.	102.6	108.6	120.6	126.8	133.0	148.2	154.6	161.4	176.2
	WITH OPEN RAIL	C.Y.	103.9	110.0	122.2	128.5	134.8	150.1	156.6	163.5	178.6
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	33.5	36.2	38.9	41.6	44.1	47.0	49.7	52.4	52.4
	WITH OPEN RAIL	C.Y.	34.2	37.0	39.7	42.5	45.1	48.0	50.7	53.5	53.5
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	43.6	45.4	51.2	53.2	55.4	59.4	61.0	63.0	63.0
	WITH OPEN RAIL	C.Y.	44.1	45.9	51.8	53.8	56.0	60.0	61.7	63.7	63.7
PAVING BLOCKS		C.Y.	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ABUTMENT WINGS		C.Y.	7.2	7.2	7.6	7.6	7.6	8.4	8.4	8.4	8.4
ABUTMENT FOOTINGS (w/ WOOD PILES) ***		C.Y.	36.6	36.5	36.4	36.4	36.4	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES) ***		C.Y.	38.0	38.0	38.0	38.0	38.0	45.0	45.0	45.0	45.0

GENERAL DATA

		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-7 15/16	3'-7 3/4	4'-2 13/16	4'-2 13/16	4'-3	4'-8 1/2	4'-8 11/16	4'-9	4'-9 7/16
CURVE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 7/16	3'-6 5/8	4'-1 3/8	4'-1 5/8	4'-1 15/16	4'-7 5/16	4'-7 5/16	4'-7 9/16	4'-7 9/16
STRAIGHT	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-8 1/16	3'-7 7/8	4'-2 15/16	4'-2 15/16	4'-3 1/16	4'-8 11/16	4'-8 15/16	4'-9 3/8	4'-10
GRADE	TOP OF SLAB TO PIER TOP AT C.L. PIER*	"U"	3'-6 5/8	3'-6 7/8	4'-1 11/16	4'-1 15/16	4'-2 5/16	4'-7 15/16	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	364.7	392.9	449.7	479.4	509.3	609.0	642.1	675.9	708.7
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	207.6	215.3	222.7	229.9	237.0	244.0	253.2	268.2	284.4
NO. OF SPACES FOR 6a1 BARS (TOP)		"E"	135	150	165	180	195	210	225	240	260
NO. OF SPACES FOR 6a1 BARS (BOTTOM)		"H"	134	149	164	179	194	209	224	239	259
NO. OF SPACES FOR 5j1 BARS (TOP)		"J"	164	179	194	209	224	239	254	269	289
OUT TO OUT OF SLAB		"S"	143'-0 7/8	155'-6 7/8	168'-0 7/8	180'-6 7/8	193'-0 7/8	205'-6 7/8	218'-0 7/8	230'-6 7/8	247'-2 7/8
SLAB TRANSVERSE CONSTR. JT. DISTANCE FROM C.L. PIER		"X"	6'-7	7'-1	7'-7	8'-1	8'-8	9'-2	9'-8	10'-2	10'-2

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. FOR APPROVED ALTERNATE PROCEDURES THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

* VALUES SHOWN ARE FOR FIXED PIERS ONLY AND ALLOW FOR 1/16 INCH DEFLECTION OF THE 1 INCH NEOPRENE BEARING PAD. AT EXPANSION PIER LOCATIONS ADD 3/16 INCHES TO "U" VALUES SHOWN.

** WINGWALLS APPLY ONLY TO BRIDGES USING "C" BEAMS.

*** SEE SHEET H30-31-06 FOR ADDITIONAL CONCRETE REQUIRED IN ABUTMENT FOOTINGS.

07-15 LATEST REVISION DATE

Marian K. McCandless APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

SUPERSTRUCTURE DETAILS

45° SKEW

H30-29-06

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.

REINFORCING BAR LIST

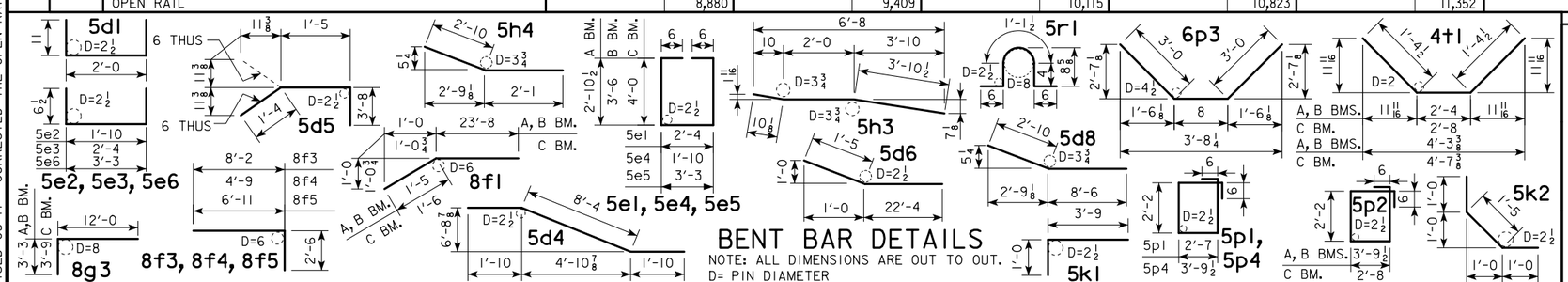
ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

℄-℄ ABUT. BRG.	138′-10			151′-4			163′-10			176′-4			188′-10			201′-4			213′-10			226′-4			243′-0		
℄-℄ BEAM BRG.	42′-6	50′-10	42′-6	46′-8	55′-0	46′-8	50′-10	59′-2	50′-10	55′-0	63′-4	55′-0	59′-2	67′-6	59′-2	63′-4	71′-8	63′-4	67′-6	75′-10	67′-6	71′-8	80′-0	71′-8	80′-0	80′-0	80′-0
BEAM SERIES	A BEAM			A BEAM			B BEAM			B BEAM			B BEAM			C BEAM			C BEAM			C BEAM			C BEAM		

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.		271	32′-10	13,365	301	32′-10	14,844	331	32′-10	16,323	361	32′-10	17,803	391	32′-10	19,282	421	32′-10	20,762	451	32′-10	22,241	481	32′-10	23,721	521	32′-10	25,693
6a2	SLAB TRANSV. TOP ENDS		72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730	72	VARIES	1,730
6a3	SLAB TRANSV. BOTT. ENDS		72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775	72	VARIES	1,775
5b1	SLAB LONGITUDINAL, TOP & BOTT.		152	40′-0	6,341	228	40′-0	9,512	228	40′-0	9,512	228	40′-0	9,512	304	40′-0	12,683	304	40′-0	12,683	304	40′-0	12,683	380	40′-0	15,854	380	40′-0	15,854
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS		152	34′-5	5,456	152	21′-8	3,435	152	27′-11	4,426	152	34′-2	5,417	152	21′-5	3,395	152	27′-8	4,386	152	33′-11	5,377	152	21′-2	3,356	152	29′-6	4,677
6b3	SLAB LONGITUDINAL, TOP ℄ PIERS		66	12′-10	1,272	66	13′-10	1,371	66	14′-10	1,470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP ℄ PIERS		—	—	—	—	—	—	—	—	—	66	15′-10	2,136	66	17′-0	2,293	66	18′-0	2,428	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP ℄ PIERS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66	19′-0	3,348	66	20′-0	3,524	66	20′-0	3,524
5d1	PIER DIAPH. ENDS		12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48	12	3′-10	48
5d2	PIER & ABUT. DIAPH. LONGIT.		72	8′-2	613	72	8′-2	613	72	8′-2	613	72	8′-2	613	72	8′-2	613	72	7′-11	595	72	7′-11	595	72	7′-11	595	72	7′-11	595
5d3	PIER & ABUT. DIAPH. LONGIT.		24	7′-3	181	24	7′-3	181	24	7′-3	181	24	7′-3	181	24	7′-3	181	24	6′-11	173	24	6′-11	173	24	6′-11	173	24	6′-11	173
5d4	PIER DIAPH. LONGIT.		8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100	8	12′-0	100
5d5	ABUT. DIAPH. ENDS		12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80	12	6′-5	80
5d6	ABUT. DIAPH. LONGIT. B.F.		16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396	16	23′-9	396
5d7	PAVING NOTCH LONGIT.		8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200	8	23′-11	200
5d8	ABUT. DIAPH. WING EXT. LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	11′-4	284	24	11′-4	284	24	11′-4	284	24	11′-4	284
5d9	ABUT. DIAPH. WING EXT. LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	11′-3	282	24	11′-3	282	24	11′-3	282	24	11′-3	282
5e1	PIER DIAPH. HOOPS		40	9′-1	379	40	9′-1	379	40	10′-4	431	40	10′-4	431	40	10′-4	431	40	11′-4	473	40	11′-4	473	40	11′-4	473	40	11′-4	473
5e2	PIER DIAPH. TIES ENDS		4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12	4	2′-11	12
5e3	PIER DIAPH. TIES		40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143	40	3′-5	143
5e4	PIER DIAPH. HOOPS ENDS		4	8′-7	36	4	8′-7	36	4	9′-10	41	4	9′-10	41	4	9′-10	41	4	10′-10	45	4	10′-10	45	4	10′-10	45	4	10′-10	45
5e5	PIER DIAPH. HOOPS		16	10′-0	167	16	10′-0	167	16	11′-3	188	16	11′-3	188	16	11′-3	188	16	12′-3	204	16	12′-3	204	16	12′-3	204	16	12′-3	204
5e6	PIER DIAPH. TIES		16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72	16	4′-4	72
8f1	ABUT. FOOTING LONGIT.		36	25′-1	2,411	36	25′-1	2,411	36	25′-1	2,411	36	25′-1	2,411	36	25′-1	2,411	36	25′-2	2,419	36	25′-2	2,419	36	25′-2	2,419	36	25′-2	2,419
8f3	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	10′-8	456	16	10′-8	456	16	10′-8	456	16	10′-8	456
8f4	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	7′-3	155	8	7′-3	155	8	7′-3	155	8	7′-3	155
8f5	ABUT. EXTENSION LONGIT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	9′-5	201	8	9′-5	201	8	9′-5	201	8	9′-5	201
8g1	ABUT. VERT.		138	6′-8	2,456	138	6′-8	2,456	138	7′-3	2,671	138	7′-3	2,671	138	7′-3	2,671	134	7′-9	2,773	134	7′-9	2,773	134	7′-9	2,773	134	7′-10	2,803
8g3	ABUT. DIAPH. VERT. B.F.		66	15′-3	2,687	66	15′-3	2,687	66	15′-3	2,687	66	15′-3	2,687	66	15′-3	2,687	66	15′-9	2,775	66	15′-9	2,775	66	15′-9	2,775	66	15′-9	2,775
6g4	ABUT. DIAPH. WING EXT. VERT.		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32	6′-6	312	32	6′-6	312	32	6′-7	316	32	6′-7	316
5h1	ABUT. WING HORIZ. B.F.		28	6′-8	195	28	6′-8	195	28	6′-8	195	28	6′-8	195	28	6′-8	195	36	6′-8	250	36	6′-8	250	36	6′-8	250	36	6′-8	250
5h2	ABUT. TO WING ANCHOR		56	4′-11	287	56	4′-11	287	56	4′-11	287	56	4′-11	287	56	4′-11	287	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5h3	ABUT. WING HORIZ. TRAFFIC FACE		28	6′-9	197	28	6′-9	197	28	6′-9	197	28	6′-9	197	28	6′-9	197	36	6′-9	253	36	6′-9	253	36	6′-9	253	36	6′-9	253
5h4	ABUT. TO WING ANCHOR		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	4′-11	62	12	4′-11	62	12	4′-11	62	12	4′-11	62
5j1	TOP OF SLAB TRANSV. (AT RAIL)		330	6′-3	2,151	360	6′-3	2,347	390	6′-3	2,542	420	6′-3	2,738	450	6′-3	2,933	480	6′-3	3,129	510	6′-3	3,325	540	6′-3	3,520	580	6′-3	3,781
5k1	PAVING NOTCH		68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337	68	4′-9	337
5k2	PAVING NOTCH		68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242	68	3′-5	242
5p1	ABUTMENT HOOPS (WOOD/STEEL)		132/120	10′-6	1446/1314	144/120	10′-6	1577/1314	104/120	10′-6	1139/1314	104/120	10′-6	1139/1314	104/120	10′-6	1139/1314	128	10′-6	1,402	128	10′-6	1,402	128	10′-6	1,402	120	10′-6	1,314
5p2	ABUTMENT HOOPS		8	12′-11	108	8	12′-11	108	8	12′-11	108	8	12′-11	108	8	12′-11	108	24	10′-8	267	24	10′-8	267	24	10′-8	267	24	10′-8	267
6p3	ABUT. BOTT. AT PILES		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	6′-8	280	28	6′-8	280	28	6′-8	280	32	6′-8	320
5p4	ABUT. HOOPS AT ENDS		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	12′-11	108	8	12′-11	108	8	12′-11	108	8	12′-11	108
5r1	PAVING BLOCK LIFTING LOOPS		12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35	12	2′-10	35
5s1	WING VERT.		64	5′-10	389	64	5′-10	389	64	6′-2	412	64	6′-2	412	64	6′-2	412	64	6′-11	462	64	6′-11	462	64	6′-11	462	64	6′-11	462
4t1	UNDER BEAMS AT ABUTMENTS		10	5′-1	34	10	5′-1	34	10	5′-1	34	10	5′-1	34	10	5′-1	34	10	5′-5	36	10	5′-5	36	10	5′-5	36	10	5′-5	36
#2	PILE SPIRAL (WOOD/STEEL)*		24/12	38′-6	154/77	26/12	38′-6	167/77	28/12	38′-6	180/77	28/12	38′-6	180/77	28/12	38′-6	180/77	18	38′-6	116	18	38′-6	116	18	38′-6	116	20	38′-6	129
	SPIRAL SPACERS, L 7/8 x 7/8 x 1/8 x 0.70 (WOOD/STL.)*		72/36	1′-10	92/46	78/36	1′-10	100/46	84/36	1′-10	108/46	84/36	1′-10	108/46	84/36	1′-10	108/46	54	1′-10	69	54	1′-10	69	54	1′-10	69	60	1′-10	77
	*EPOXY COATING NOT REQUIRED																											
	SUB TOTAL W/ WOOD PILES**				45,587			48,663			51,326			54,659			57,639			—			—			—			—
	SUB TOTAL W/ STEEL H-PILES**				45,332			48,256			51,336			54,669			57,649			63,072			66,658			69,663			73,220
	**RAIL REINFORCING NOT INCLUDED																											
	BARRIER RAIL				8,215			8,788			9,347			9,879			10,478			11,445			12,003			12,576			13,312
	OPEN RAIL				8,880			9,409			10,115			10,823			11,352			13,076			13,543			14,313			15,095

REVISED 05-11 - CORRECTED THE OPEN RAIL REBAR QUANTITIES FOR THE 201′-4, 231′-10, 226′-4, & 243′-0 BRIDGE LENGTHS.



BENT BAR DETAILS

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

05-11
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

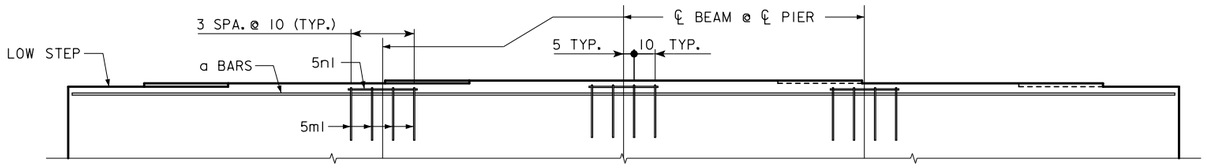
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

DECK & ABUTMENT REINF.

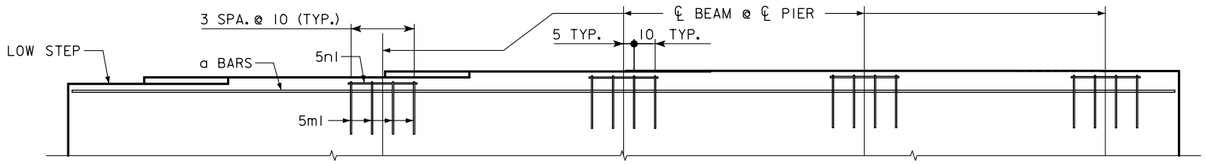
45° SKEW

H30-30-06



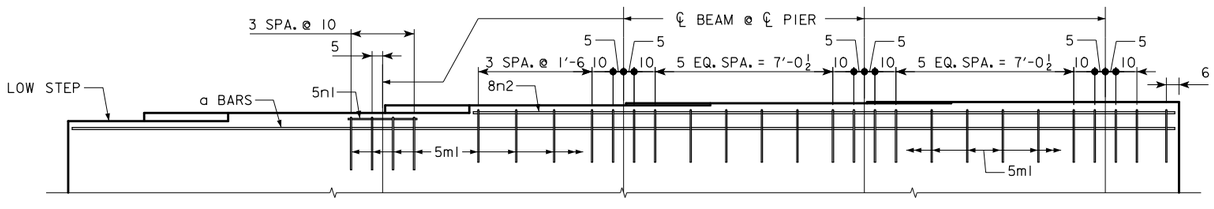
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 0.5%



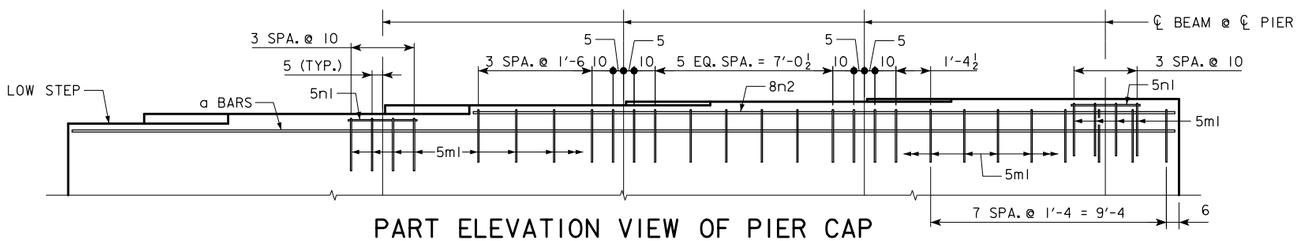
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 0.5% < G <= 1.9%



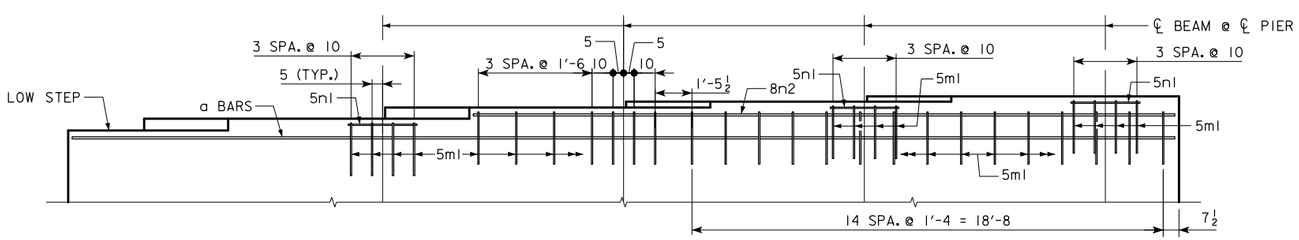
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.9% < G <= 2.8%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 2.8% < G <= 3.6%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 3.6% < G <= 5.0%

STEP REINFORCING BAR LIST - ONE TEE PIER

			G <= 0.5%			0.5% < G <= 1.9%			1.9% < G <= 2.8%			2.8% < G <= 3.6%			3.6% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	7'-2	⌐	12	5	90	16	5	120	28	5	209	31	5	232	34	5	254
5n1	2'-8	—	12	5	33	16	5	45	4	5	11	8	5	22	12	5	33
*8n2	VARIES	—	--	--	--	--	--	--	4	8	313	4	8	313	4	8	313
TOTAL (LB.)					123			165			533			567			600

G = GRADE (%)

*8n2 BARS VARY FROM 27'-11 TO 30'-8

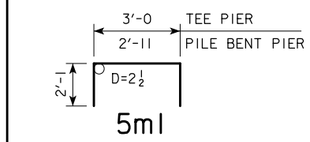
STEP REINFORCING BAR LIST - ONE PILE BENT PIER

			G <= 0.5%			0.5% < G <= 1.9%			1.9% < G <= 2.8%			2.8% < G <= 3.6%			3.6% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	7'-1	⌐	12	5	89	16	5	118	28	5	207	31	5	229	34	5	251
5n1	2'-8	—	12	5	33	16	5	45	4	5	11	8	5	22	12	5	33
*8n2	VARIES	—	--	--	--	--	--	--	4	8	313	4	8	313	4	8	313
TOTAL (LB.)					122			163			531			564			597

G = GRADE (%)

*8n2 BARS VARY FROM 27'-11 TO 30'-8

BENT BAR DETAILS



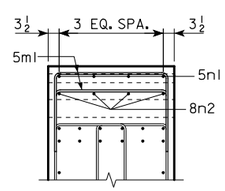
NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

NOTES:

THE TABLE BELOW LISTS THE ADDITIONAL CONCRETE VOLUME REQUIRED IN EACH ABUTMENT FOOTING/PIER CAP BASED ON THE ROADWAY GRADE AT EACH ABUTMENT FOOTING/PIER CAP. ADDITIONAL CONCRETE SHOULD BE ADDED TO THE PLANS FOR EACH ABUTMENT FOOTING/PIER CAP THAT HAS 0.5 CU. YDS. OR MORE OF ADDITIONAL CONCRETE. VALUES IN THE TABLE BELOW HAVE BEEN EXCLUDED FOR SCENARIOS THAT HAVE LESS THAN 0.5 CU. YDS. OF ADDITIONAL CONCRETE PER SUBSTRUCTURE UNIT. VALUES MAY BE INTERPOLATED FOR GRADES BETWEEN THE VALUES SHOWN IN THE TABLE.

ADDITIONAL CONCRETE VOLUME PER SUBSTRUCTURE UNIT (C.Y.)

	ROADWAY GRADE AT SUBSTRUCTURE UNIT				
	1%	2%	3%	4%	5%
EACH ABUTMENT FOOTING					
A, B BEAMS	0.5	1.2	1.9	2.6	3.2
C BEAMS	0.6	1.4	2.2	3.1	3.9
EACH TEE PIER CAP - ALL BEAMS	0.5	1.3	2.1	2.9	3.8
EACH PILE BENT PIER - ALL BEAMS	0.5	1.2	2.1	2.9	3.7



TYPICAL SECTION

LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

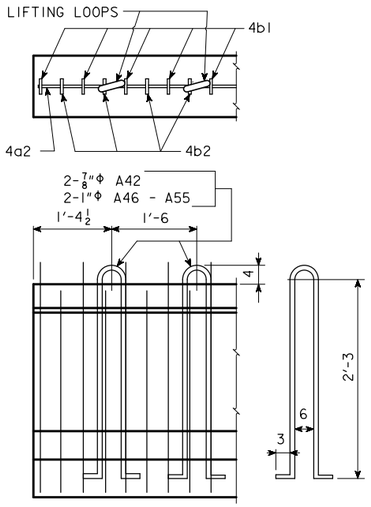
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ADDITIONAL QUANTITIES

45° SKEW

H30-31-06



LIFTING LOOP DETAIL

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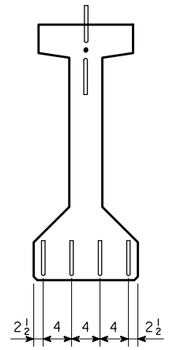
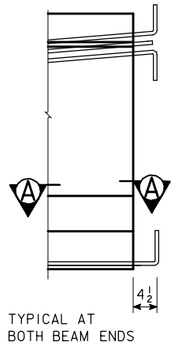
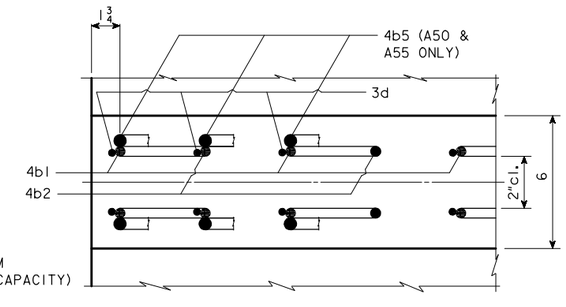


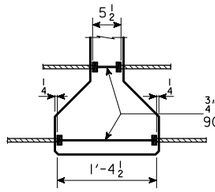
2 TOP DEFLECTED OR STRAIGHT STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN (BEND TOP AND BOTTOM ROWS). THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS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



STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



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



COIL TIE DETAIL

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

A BEAM DATA

BEAM	SPAN ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE	NO. OF STRANDS		TOTAL INITIAL PRESTRESS ③ KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)				DEFLECTION (in.) Δ_D				PERMISSIBLE SPACING				WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
				STRAIGHT	DEFLECTED			AT RELEASE		AFTER LOSSES		IMMEDIATE① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T				HL93 LOADING					
												CONC. DIAPH.	STEEL DIAPH.	CONC. DIAPH.	STEEL DIAPH.			CONC. DIAPH.	STEEL DIAPH.				
A42	42'-6	43'-6	0.6"	7	2	383	9.3	0.70		1.24		0.38	0.35	0.09	0.09			7'-6	7'-6	7.1		3.49	452
✱A46	46'-8	47'-8	0.6"	8	2	426	8.5	0.76		1.35		0.50	0.47	0.13	0.12			7'-6	7'-6	7.7		3.82	488
✱A50	50'-10	51'-10	0.6"	9	3	510.9	11.7	1.02		1.82		0.69	0.65	0.17	0.16			7'-6	7'-6	8.4		4.15	503
✱A55	55'-0	56'-0	0.6"	10	3	553.4	10.8	1.29		2.30		0.94	0.88	0.23	0.22			7'-6	7'-6	9.1		4.49	547

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 757 #/FT. (8" SLAB AND 7'-6 BEAM SPACING) AND ONE CONCRETE DIAPHRAGM (1912 #) OR ONE STEEL DIAPHRAGM (285 #) AT ℄ OF SPAN. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

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.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

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

✱ MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7,000 psi. MINIMUM f'ci AT RELEASE SHALL BE 6,000 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 2004, WITH MINOR MODIFICATIONS.

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 2004:

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 5000 psi (EXCEPT AS NOTED)

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

NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

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 FINSHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS 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 2403.14 OF THE SPECIFICATIONS.

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

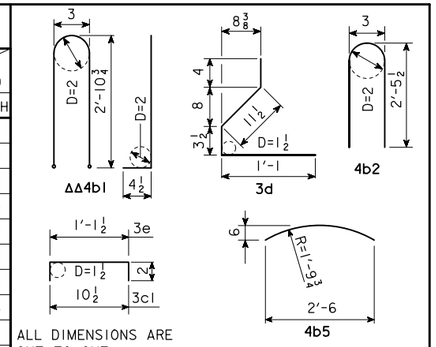
IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING 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		A42 42'-6		A46 46'-8		A50 50'-10		A55 55'-0	
BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
5a1	——	4	22'-10	4	24'-11	4	27'-0	4	29'-1
4a2	——	2	3'-3	2	3'-3	2	3'-3	2	3'-3
ΔΔ 4b1	⊂⊃	40	6'-8	44	6'-8	46	6'-8	50	6'-8
4b2	⊂⊃	12	5'-0	12	5'-0	8	5'-0	8	5'-0
4b5	⌒	—	——	—	——	8	2'-9	12	2'-9
3c1	⊓	40	1'-3	44	1'-3	46	1'-3	50	1'-3
✱✱ 3d	⊂	104	2'-8	112	2'-8	108	2'-8	116	2'-8
3e	⊓	20	1'-6	20	1'-6	18	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.

07-10
LATEST REVISION DATE

Norman K. Nicholl
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

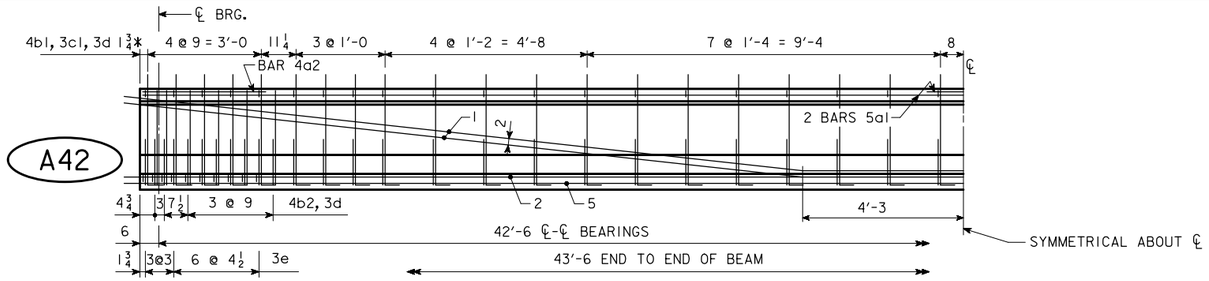
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

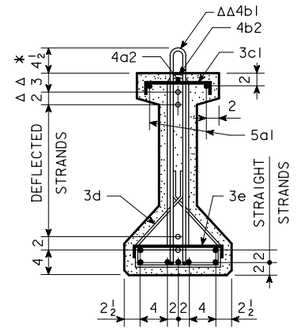
DECEMBER, 2006

A BEAM DETAILS

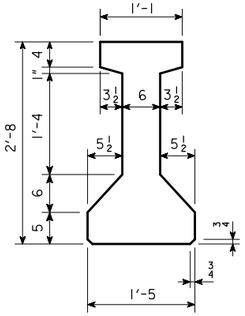
H30-32-06

REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.



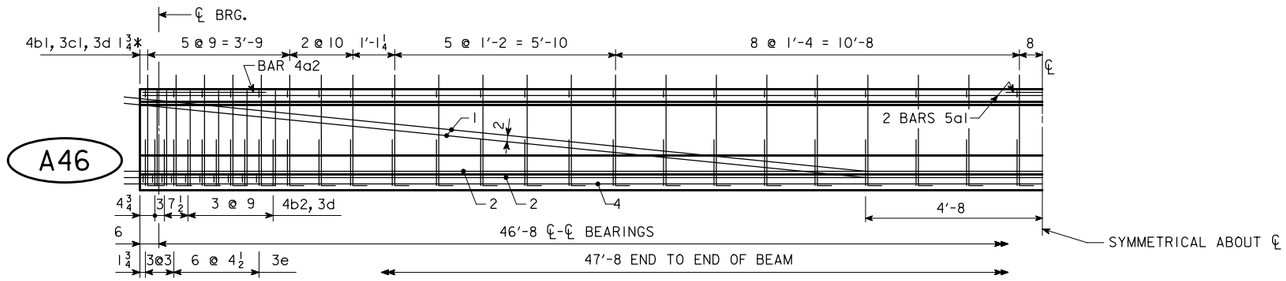


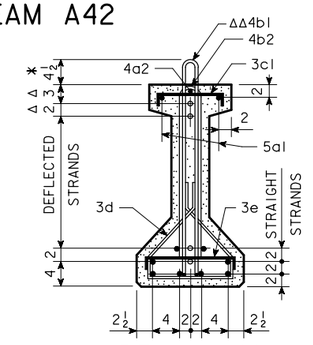
BEAM A42



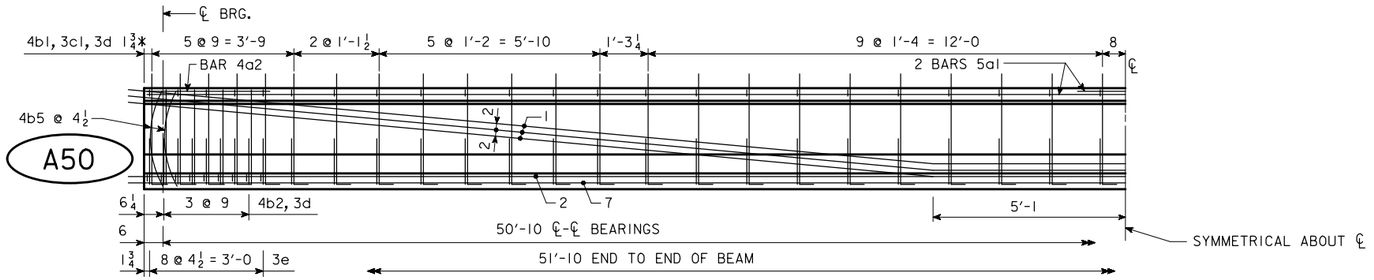
"A" BEAM
CROSS SECTION

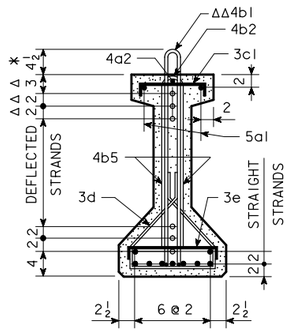
A = 311.5 in.²
Y_b = 14.05 in.
I = 34,082 in.⁴



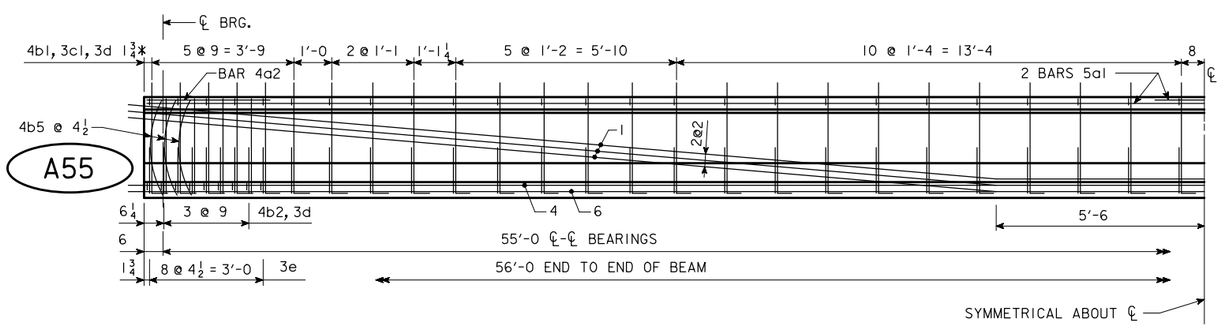


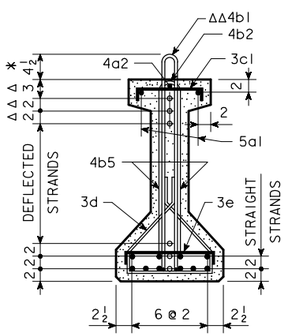
BEAM A46





BEAM A50





BEAM A55

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

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

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

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

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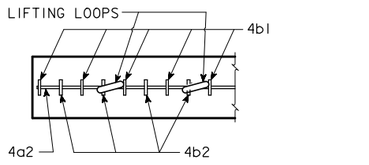
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

A BEAM DETAILS

H30-33-06

REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.



LIFTING LOOP DETAIL

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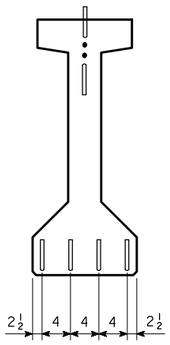

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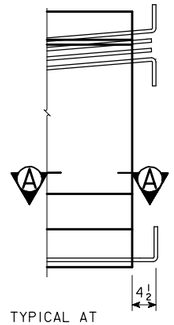
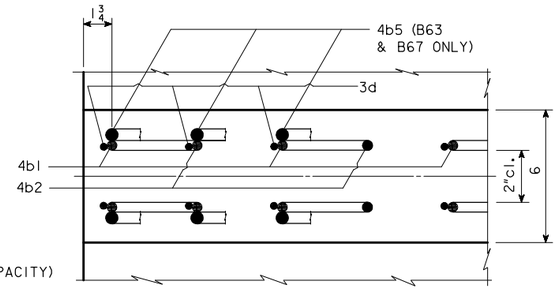
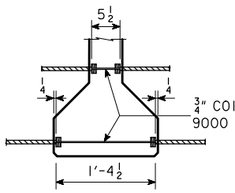


TYPICAL AT BOTH BEAM ENDS.

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS





COIL TIE DETAIL

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

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 KIPS ③	HOLD DOWN FORCE-KIPS	CAMBER (in.)				DEFLECTION (in.) Δ_D				PERMISSIBLE SPACING				WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
				STRAIGHT	DEFLECTED			AT RELEASE		AFTER LOSSES		IMMEDIATE① (ELASTIC) Δ_I		TIME ② (PLASTIC) Δ_T				HL93 LOADING					
												CONC. DIAPH.	STEEL DIAPH.	CONC. DIAPH.	STEEL DIAPH.			CONC. DIAPH.	STEEL DIAPH.				
B50	50'-10	51'-10	0.60	8	2	425	10.8	0.67		1.24		0.43	0.39	0.11	0.10			7'-6	7'-6	10.3		5.10	607
*B55	55'-0	56'-0	0.60	8	3	468	14.1	0.85		1.51		0.58	0.54	0.14	0.13			7'-6	7'-6	11.2		5.51	635
*B59	59'-2	60'-2	0.60	10	3	554	13.2	1.12		1.99		0.82	0.77	0.21	0.19			7'-6	7'-6	12.0		5.92	680
*B63	63'-4	64'-4	0.60	12	3	639	12.3	1.30		2.32		0.91	0.84	0.23	0.21			7'-6	7'-6	12.8		6.33	733
*B67	67'-6	68'-6	0.60	14	3	724	11.6	1.69		2.98		1.16	1.09	0.29	0.27			7'-6	7'-6	13.6		6.74	778

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 757 #/FT. (8" SLAB AND 7'-6 BEAM SPACING) AND ONE CONCRETE DIAPHRAGM (2270 #) OR ONE STEEL DIAPHRAGM (285 #) AT ℄ OF SPAN. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

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.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

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

* MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 7,000 psi. MINIMUM f'ci AT RELEASE SHALL BE 6,000 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 2004, WITH MINOR MODIFICATIONS.

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 2004:

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 5000 psi (EXCEPT AS NOTED)

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

NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

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 FINSHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS 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 2403.14 OF THE SPECIFICATIONS.

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

IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.

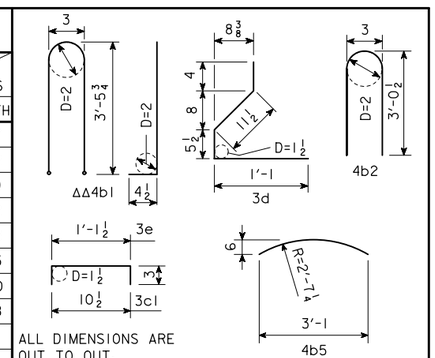
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

ΔΔ4b1 BARS TO BE EPOXY COATED.

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

REINFORCING BAR LIST

	BEAM / SPAN		B50 50'-10		B55 55'-0		B59 59'-2		B63 63'-4		B67 67'-6	
	BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	6a1	——	4	27'-3	4	29'-4	4	31'-5	4	33'-6	4	35'-7
	4a2	——	2	4'-2	2	4'-2	2	4'-2	2	4'-2	2	4'-2
ΔΔ	4b1	⊂⊃	44	7'-10	46	7'-10	50	7'-10	52	7'-10	56	7'-10
	4b2	⊂⊃	12	6'-2	12	6'-2	12	6'-2	12	6'-2	12	6'-2
	4b5	⌒	—	——	—	——	—	——	12	3'-3	12	3'-3
	3c1	⊂⊃	44	1'-5	46	1'-5	50	1'-5	52	1'-5	56	1'-5
**	3d	⊂	112	2'-10	116	2'-10	124	2'-10	128	2'-10	136	2'-10
	3e	⊂⊃	24	1'-8	24	1'-8	24	1'-8	24	1'-8	24	1'-8



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

07-10
LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

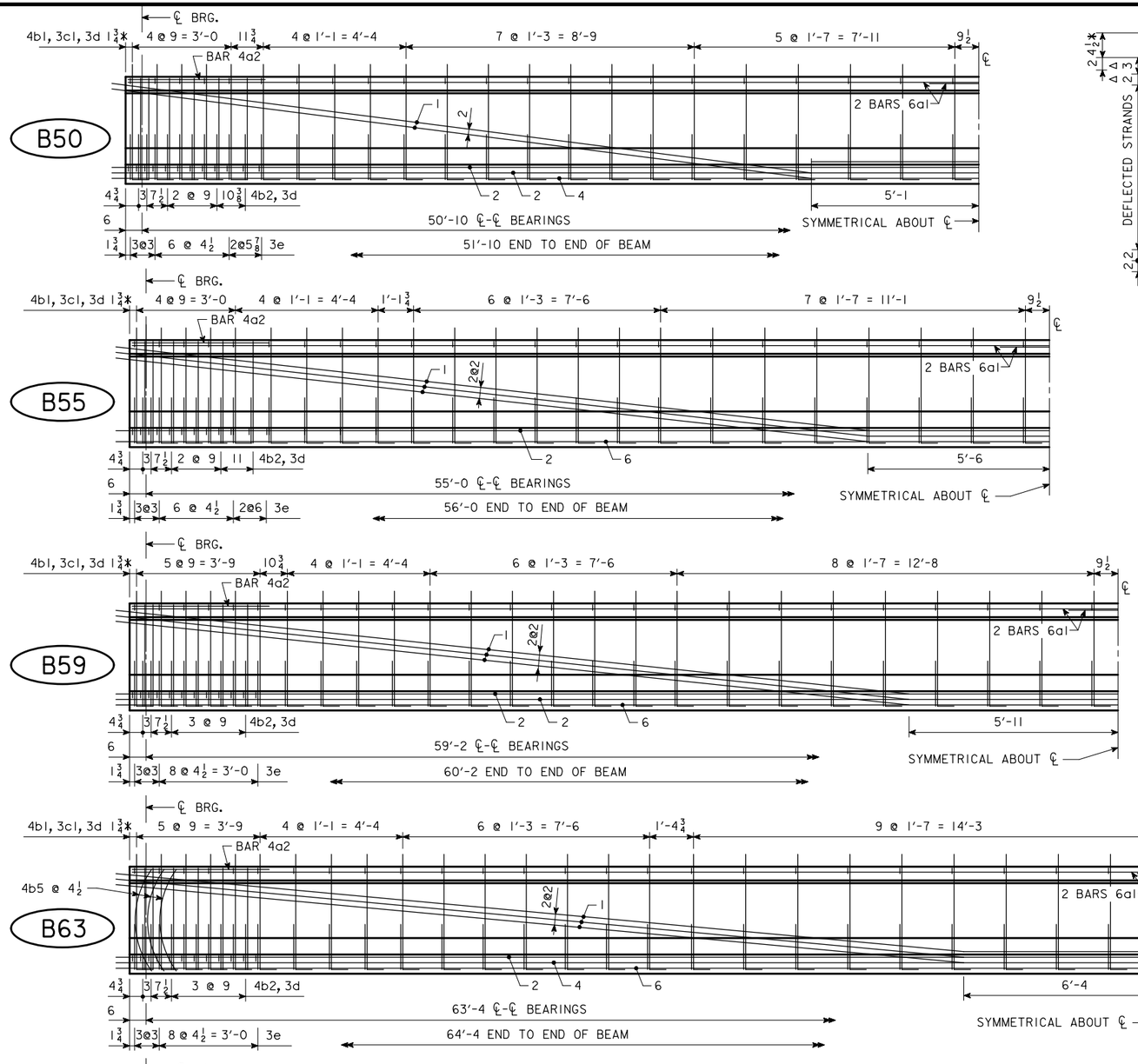
DECEMBER, 2006

B BEAM DETAILS

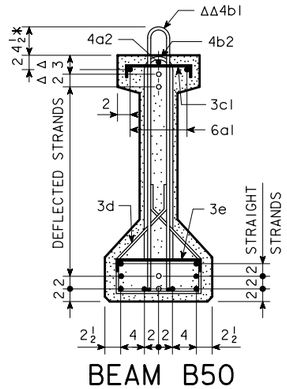
H30-34-06

REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.

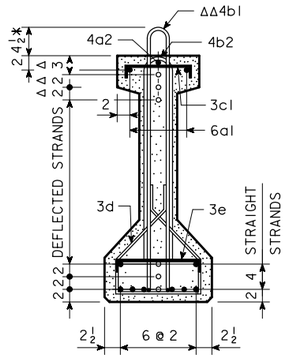
REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.



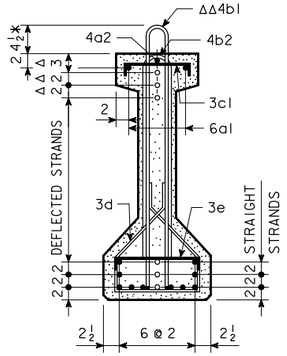
NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.



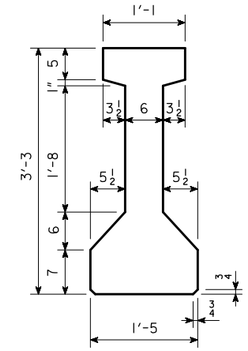
BEAM B50



BEAM B55

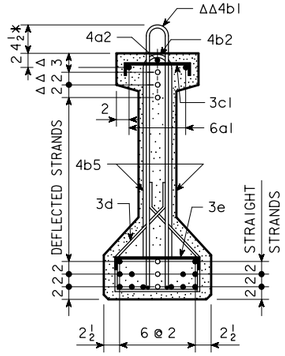


BEAM B59

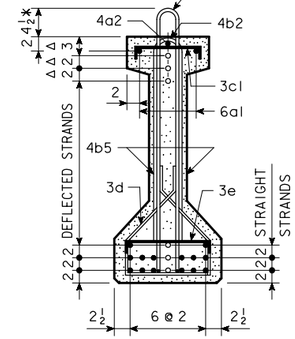


"B" BEAM CROSS SECTION

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



BEAM B63



BEAM B67

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

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

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

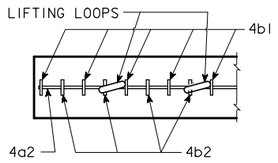
STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

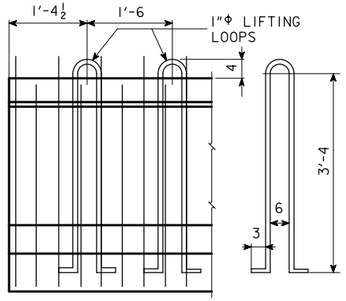
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

B BEAM DETAILS

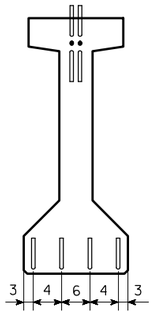
H30-35-06



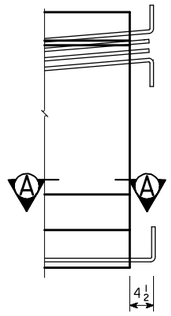


LIFTING LOOP DETAIL

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

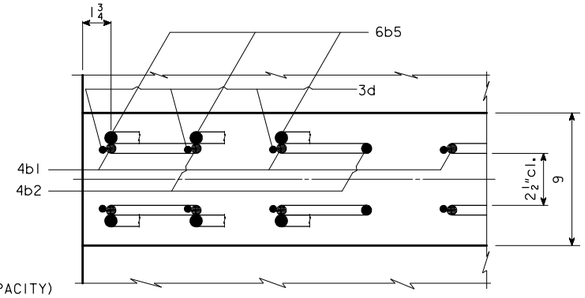


THE TOP STRAIGHT STRANDS OF BEAMS C63 AND C67 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP. THE TOP AND BOTTOM DEFLECTED STRANDS OF BEAMS C71 THROUGH C80 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN. THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR 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.

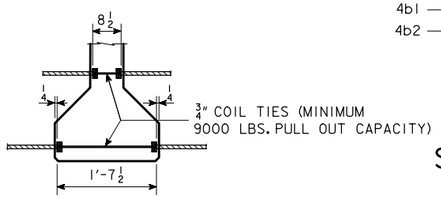


TYPICAL AT BOTH BEAM ENDS

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



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



COIL TIE DETAIL

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

C BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE DIA. (inches)	NO. OF STRANDS STRAIGHT	NO. OF STRANDS DEFLECTED	TOTAL INITIAL PRESTRESS KIPS ③	HOLD DOWN FORCE-KIPS	CAMBER (in.) AT RELEASE		CAMBER (in.) AFTER LOSSES		DEFLECTION (in.) Δ_D IMMEDIATE ① (ELASTIC) Δ_I CONC. DIAPH.	DEFLECTION (in.) Δ_D IMMEDIATE ① (ELASTIC) Δ_I STEEL DIAPH.	DEFLECTION (in.) Δ_D TIME ② (PLASTIC) Δ_T CONC. DIAPH.	DEFLECTION (in.) Δ_D TIME ② (PLASTIC) Δ_T STEEL DIAPH.	PERMISSIBLE SPACING		PERMISSIBLE SPACING HL93 LOADING CONC. DIAPH.	PERMISSIBLE SPACING HL93 LOADING STEEL DIAPH.	WEIGHT (TONS)		CONCRETE (C. Y.)	REINFORCING STEEL -(lb)
C63	63'-4	64'-4	0.60	16	—	681	——	0.70		1.24		0.59	0.54	0.15	0.14			7'-6	7'-6	18.9		9.34	536
C67	67'-6	68'-6	0.60	18	—	766	——	0.92		1.62		0.76	0.71	0.19	0.18			7'-6	7'-6	20.1		9.95	576
*C71	71'-8	72'-8	0.60	14	4	766	16	1.21		2.13		0.88	0.82	0.22	0.20			7'-6	7'-6	21.4		10.55	855
*C75	75'-10	76'-10	0.60	14	6	851	22	1.33		2.34		1.07	0.99	0.27	0.25			7'-6	7'-6	22.6		11.16	925
*C80	80'-0	81'-0	0.60	16	6	937	21	1.64		2.90		1.31	1.24	0.33	0.31			7'-6	7'-6	23.8		11.76	1191

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 757 #/FT. (8" SLAB AND 7'-6 BEAM SPACING) AND ONE CONCRETE DIAPHRAGM (2635 #) OR ONE STEEL DIAPHRAGM (285 #) AT ℄ OF SPAN. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

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.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

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

* MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 6,000 psi. MINIMUM f'ci AT RELEASE SHALL BE 5,000 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 2004, WITH MINOR MODIFICATIONS.

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 2004:

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 5000 psi (EXCEPT AS NOTED)

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

NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 lb. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

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 TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS 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 2403.14 OF THE SPECIFICATIONS.

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

IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.

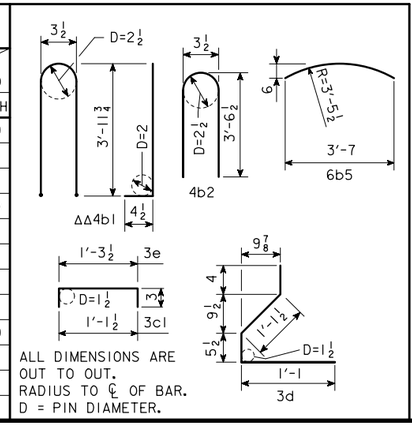
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

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

ΔΔ 4b1 BARS TO BE EPOXY COATED.

REINFORCING BAR LIST

	BAR	SHAPE	C63 63'-4 NO.	C63 63'-4 LENGTH	C67 67'-6 NO.	C67 67'-6 LENGTH	C71 71'-8 NO.	C71 71'-8 LENGTH	C75 75'-10 NO.	C75 75'-10 LENGTH	C80 80'-0 NO.	C80 80'-0 LENGTH
	6a1	——	——	——	——	——	4	37'-8	4	39'-9	4	41'-10
	4a2	——	2	5'-0	2	5'-0	2	5'-0	2	5'-0	2	5'-0
	8a3	——	——	——	——	——	——	——	——	——	2	40'-0
ΔΔ	4b1		46	8'-10	48	8'-10	54	8'-10	58	8'-10	60	8'-10
	4b2		12	7'-2	12	7'-2	12	7'-2	12	7'-2	12	7'-2
	6b5		4	3'-9	8	3'-9	8	3'-9	12	3'-9	16	3'-9
	3c1		46	1'-8	48	1'-8	54	1'-8	58	1'-8	60	1'-8
**	3d		116	3'-0	120	3'-0	132	3'-0	140	3'-0	144	3'-0
	3e		26	1'-10	26	1'-10	26	1'-10	26	1'-10	26	1'-10



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

07-10
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

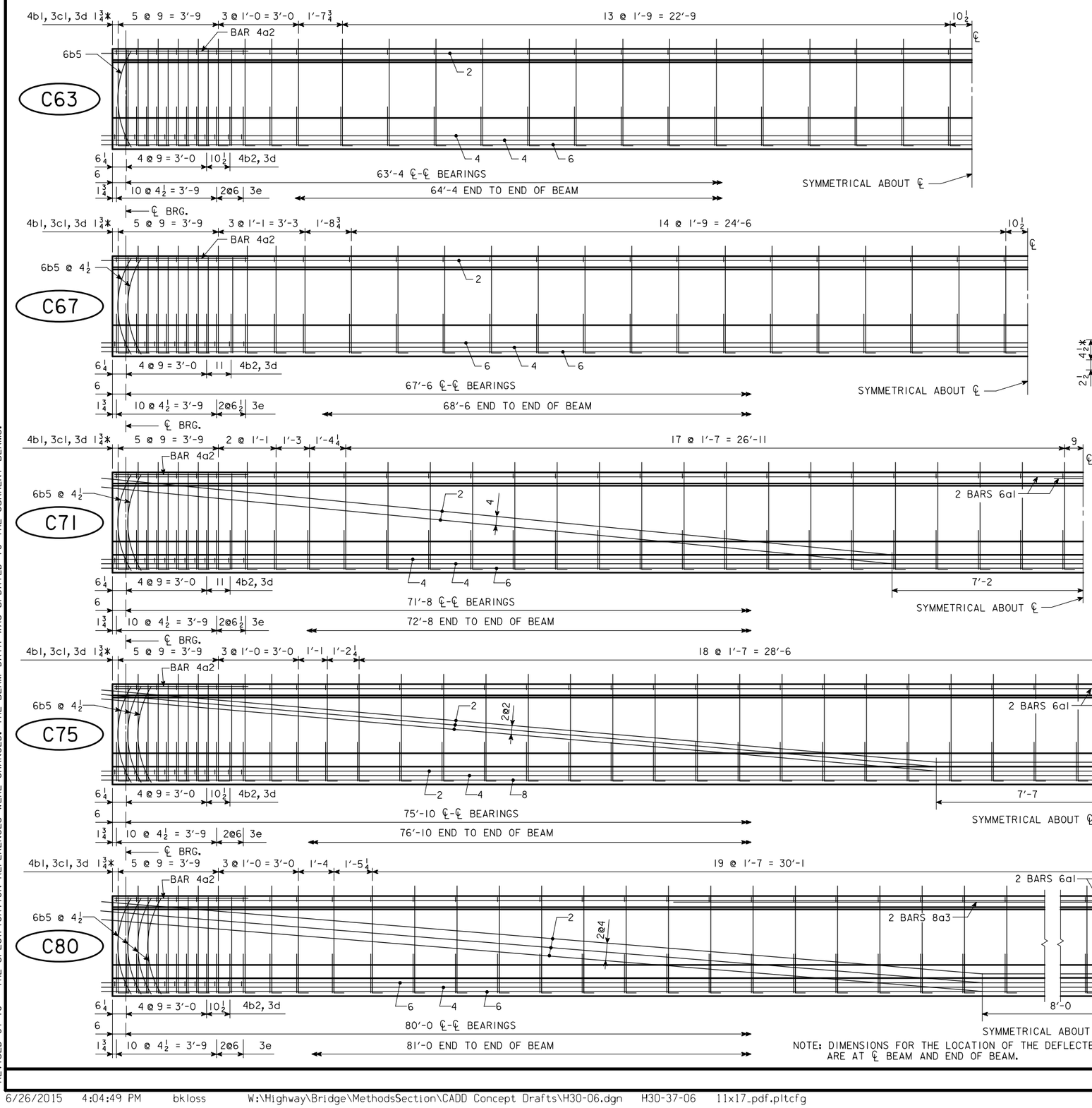
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

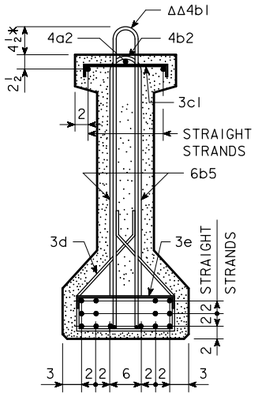
C BEAM DETAILS

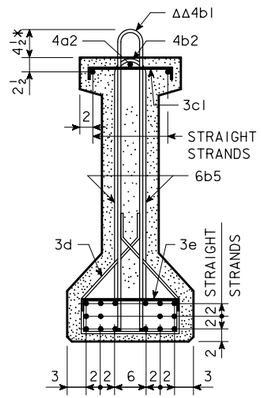
H30-36-06

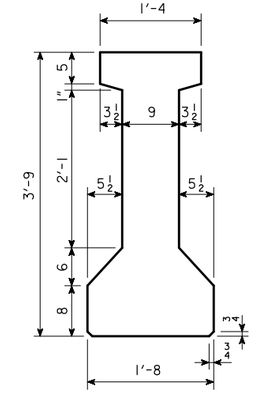
REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.



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

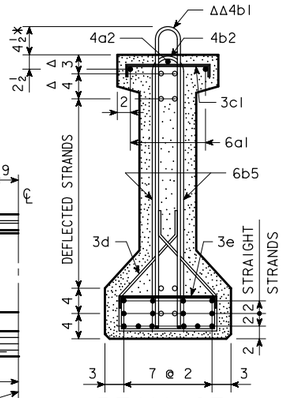


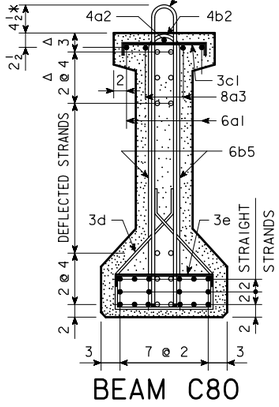


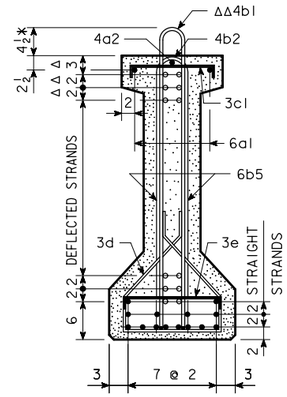


"C" BEAM CROSS SECTION

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







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

* KEEP

Δ DIMENSIONS AT END OF BEAM

ΔΔ EPOXY COATED BARS

REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DATA WAS UPDATED TO THE CURRENT BEAMS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

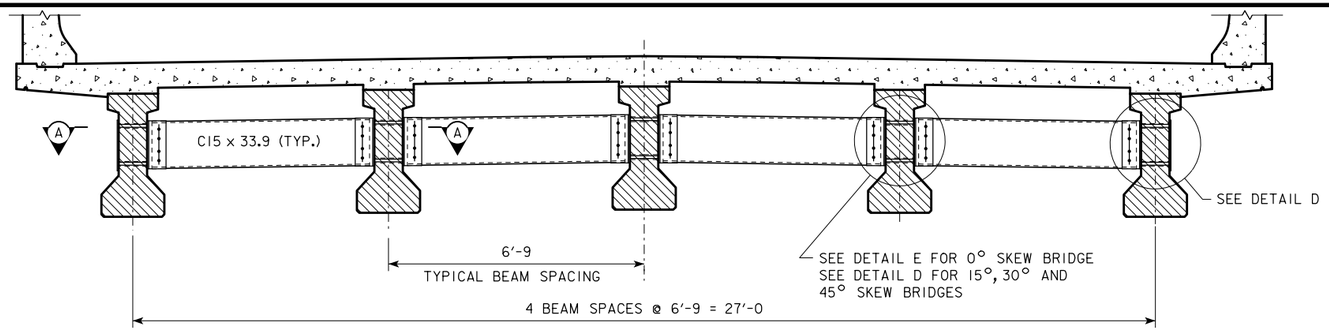
STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

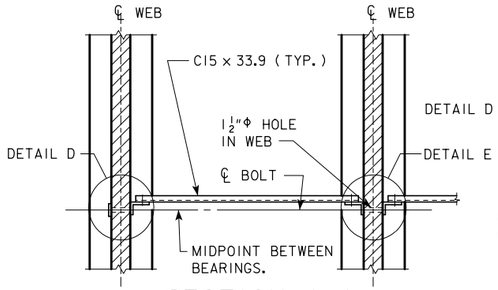
DECEMBER, 2006

C BEAM DETAILS

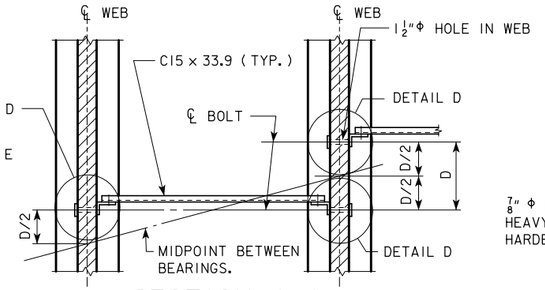
H30-37-06



SECTION SHOWING INTERMEDIATE DIAPHRAGM



SECTION A-A
FOR 0° SKEW BRIDGES



SECTION A-A
FOR 15°, 30° AND 45° SKEW BRIDGES

INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

ONE CONNECTION DETAIL "E"

2 - $\frac{7}{8}$"Φ x LENGTH H.S. BOLTS WITH NUTS AND WASHERS

WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	WEIGHT PER DETAIL "E" (LB.)	BRIDGE SKEW 0° (NUMBER OF DETAIL "E")	BRIDGE SKEW 15°, 30° & 45° (NUMBER OF DETAIL "E")	BRIDGE SKEW 0° (WEIGHT (LB.))	BRIDGE SKEW 15°, 30° & 45° (WEIGHT (LB.))
6	9	4.30	9	0	38.7	0.0
9	12	5.34	9	0	48.1	0.0
2 - L 6 x 4 x ½ x 1'-3¼ = 41.2 LB			9	0	370.8	0.0

ONE CONNECTION DETAIL "D"

2 - $\frac{7}{8}$"Φ x LENGTH H.S. BOLTS WITH NUTS AND WASHERS

WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	WEIGHT PER DETAIL "D" (LB.)	BRIDGE SKEW 0° (NUMBER OF DETAIL "D")	BRIDGE SKEW 15°, 30° & 45° (NUMBER OF DETAIL "D")	BRIDGE SKEW 0° (WEIGHT (LB.))	BRIDGE SKEW 15°, 30° & 45° (WEIGHT (LB.))
6	9	4.30	6	24	25.8	103.2
9	12	5.34	6	24	32.0	128.2
1 - BACKING PL 4 x ⅜ x 1'-3¼ = 6.5 LB			6	24	39.0	156.0
1 - L 6 x 4 x ½ x 1'-3¼ = 20.6 LB			6	24	123.6	494.4

* ONE C15 x 33.9 DIAPHRAGM

WEB THICKNESS (IN.)	BEAM SPACING	LENGTH	NO. OF DIAPH.	UNIT WEIGHT (LB.)	WEIGHT (LB.)
6	6'-9	5'-11⅝	12	202.3	2427.6
9	6'-9	5'-8⅝	12	193.9	2326.8

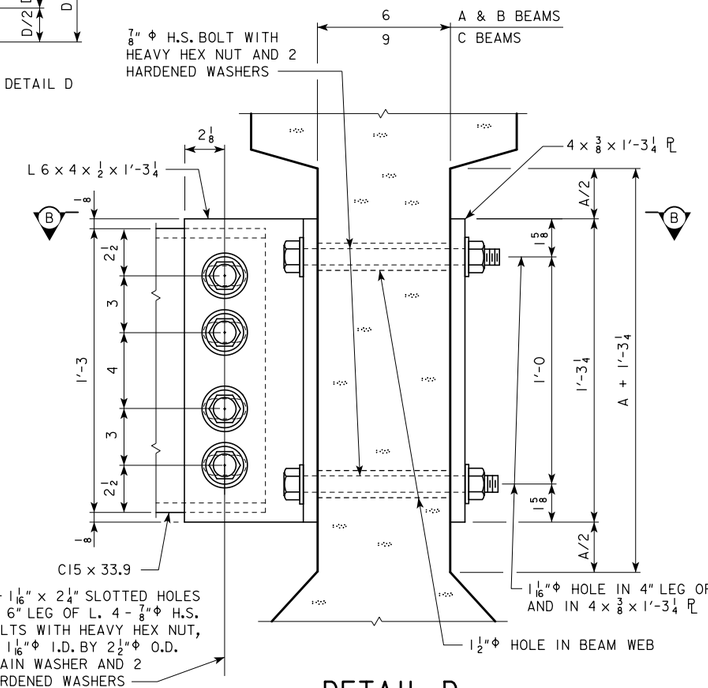
DIAPHRAGM CONNECTION BOLTS

	NO. OF DIAPH.	WEIGHT (LB.)
8-$\frac{7}{8}$"Φ x 0'-2¾ H.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM = 10.3 LB	12	123.6

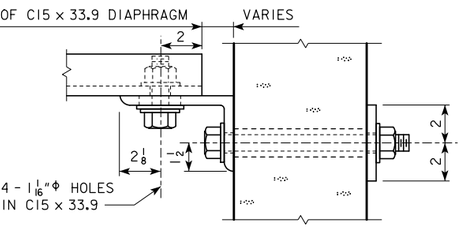
* THE LENGTH OF THE C15 x 33.9 IS BASED ON A VARIABLE CLEARANCE OF $1\frac{11}{16}$ TO $2\frac{11}{16}$ BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.

TOTAL WEIGHT

	WEB THICKNESS (IN.)	BRIDGE SKEW 0°	BRIDGE SKEW 15°, 30° & 45°
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB) =	6	3149	3305
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB) =	9	3064	3229



DETAIL D



SECTION B-B

BEAM SERIES	DIMENSIONS A + 1'-3¼	DIMENSIONS A/2
A	1'-4	3⅜
B	1'-8	2⅝
C	2'-1	4⅞

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.

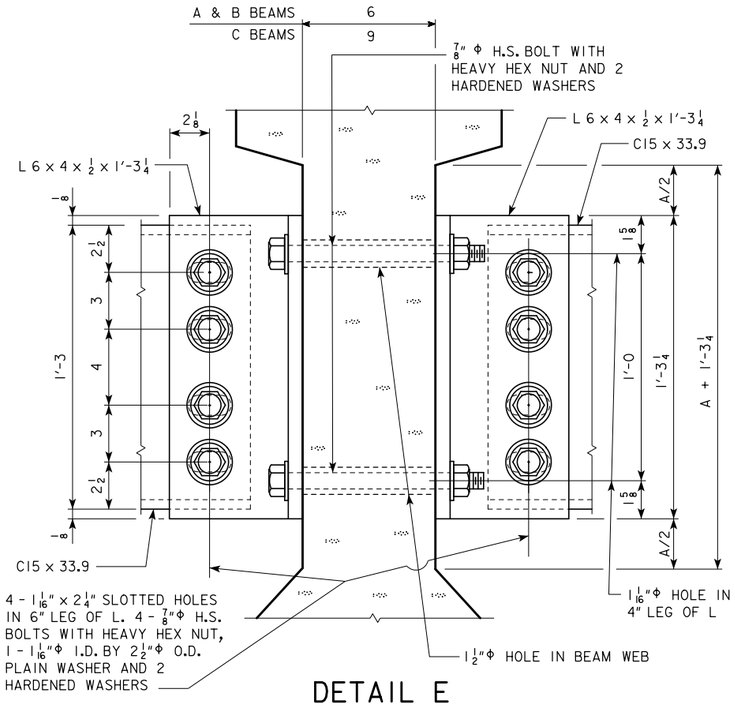
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

THE 1½"Φ HOLES FOR THE ⅞"Φ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE ⅞"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.

CONCRETE DIAPHRAGMS DETAILS SHALL BE PROVIDED IN THE BRIDGE PLANS FOR OVERHEAD BRIDGES. DESIGNER SHALL ADJUST THE CONCRETE, REINFORCING AND STRUCTURAL STEEL QUANTITIES ACCORDINGLY.



DETAIL E

REVISED 07-10 - MINOR CHANGES WERE MADE TO AGREE WITH OFFICE STANDARD.

07-10
LATEST REVISION DATE

Warren K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

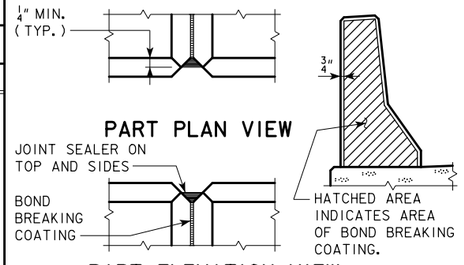
DECEMBER, 2006

INTERMEDIATE STEEL DIAPHRAGMS

H30-38-06

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG		138′-10				151′-4				163′-10				176′-4				℄-℄ ABUT. BRG
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW
DIMENSION OR NUMBER	L (FT.-IN.)	155′-10	155′-11¼	156′-3⅝	157′-0⅞	168′-4	168′-5¼	168′-9⅝	169′-6⅞	180′-10	180′-11¼	181′-3⅝	182′-0⅞	193′-4	193′-5¼	193′-9⅝	194′-6⅞	L (FT.-IN.)
	B (FT.-IN.)	141′-10	141′-11¼	142′-3⅝	143′-0⅞	154′-4	154′-5¼	154′-9⅝	155′-6⅞	166′-10	166′-11¼	167′-3⅝	168′-0⅞	179′-4	179′-5¼	179′-9⅝	180′-6⅞	B (FT.-IN.)
	S (FT.-IN.)	141′-10	141′-11¼	142′-3⅝	143′-0⅞	154′-4	154′-5¼	154′-9⅝	155′-6⅞	166′-10	166′-11¼	167′-3⅝	168′-0⅞	179′-4	179′-5¼	179′-9⅝	180′-6⅞	S (FT.-IN.)
	C	133	133	133	133	145	145	145	145	158	158	158	158	170	170	170	170	C
	D (FT.-IN.)	133′-0	133′-0	133′-0	133′-0	145′-0	145′-0	145′-0	145′-0	158′-0	158′-0	158′-0	158′-0	170′-0	170′-0	170′-0	170′-0	D (FT.-IN.)
	E	134	134	134	134	146	146	146	146	159	159	159	159	171	171	171	171	E
	F (FT.-IN.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F (FT.-IN.)
	W (FT.-IN.)	3′-11	3′-11⅝	4′-1¾	4′-6½	4′-2	4′-2⅝	4′-4¾	4′-9½	3′-11	3′-11⅝	4′-1¾	4′-6½	4′-2	4′-2⅝	4′-4¾	4′-9½	W (FT.-IN.)
	a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	a



BARRIER RAIL JOINT DETAILS

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG		188′-10				201′-4				213′-10				226′-4				243′-0				℄-℄ ABUT. BRG
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW
DIMENSION OR NUMBER	L (FT.-IN.)	205′-10	205′-11¼	206′-3⅝	207′-0⅞	228′-4	228′-4	228′-4	228′-4	240′-10	240′-10	240′-10	240′-10	253′-4	253′-4	253′-4	253′-4	270′-0	270′-0	270′-0	270′-0	L (FT.-IN.)
	B (FT.-IN.)	191′-10	191′-11¼	192′-3⅝	193′-0⅞	214′-4	214′-4	214′-4	214′-4	226′-10	226′-10	226′-10	226′-10	239′-4	239′-4	239′-4	239′-4	256′-0	256′-0	256′-0	256′-0	B (FT.-IN.)
	S (FT.-IN.)	191′-10	191′-11¼	192′-3⅝	193′-0⅞	204′-4	204′-5¼	204′-9⅝	205′-6⅞	216′-10	216′-11¼	217′-3⅝	218′-0⅞	229′-4	229′-5¼	229′-9⅝	230′-6⅞	246′-0	246′-1¼	246′-5⅝	247′-2⅞	S (FT.-IN.)
	C	183	183	183	183	195	195	195	195	208	208	208	208	220	220	220	220	237	237	237	237	C
	D (FT.-IN.)	183′-0	183′-0	183′-0	183′-0	195′-0	195′-0	195′-0	195′-0	208′-0	208′-0	208′-0	208′-0	220′-0	220′-0	220′-0	220′-0	237′-0	237′-0	237′-0	237′-0	D (FT.-IN.)
	E	184	184	184	184	196	196	196	196	209	209	209	209	221	221	221	221	238	238	238	238	E
	F (FT.-IN.)	0	0	0	0	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	F (FT.-IN.)
	W (FT.-IN.)	3′-11	3′-11⅝	4′-1¾	4′-6½	4′-2	4′-2⅝	4′-4¾	4′-9½	3′-11	3′-11⅝	4′-1¾	4′-6½	4′-2	4′-2⅝	4′-4¾	4′-9½	4′-0	4′-0⅝	4′-2¾	4′-7½	W (FT.-IN.)
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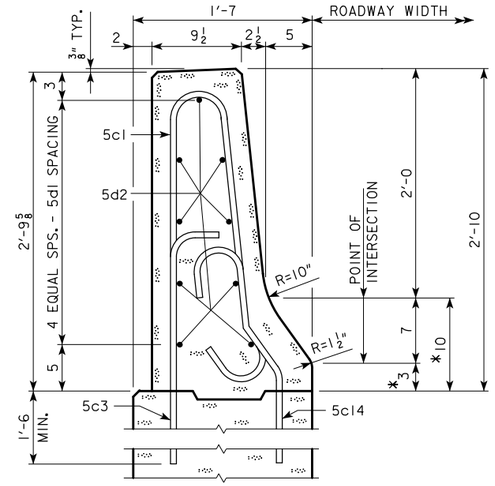
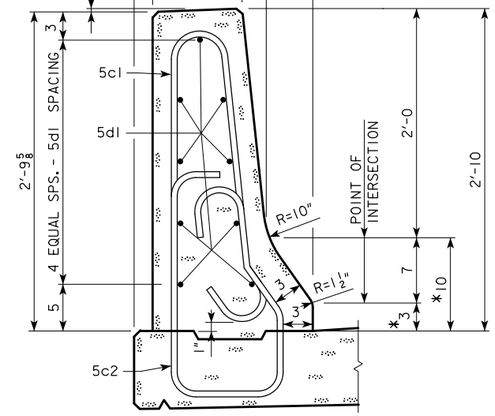
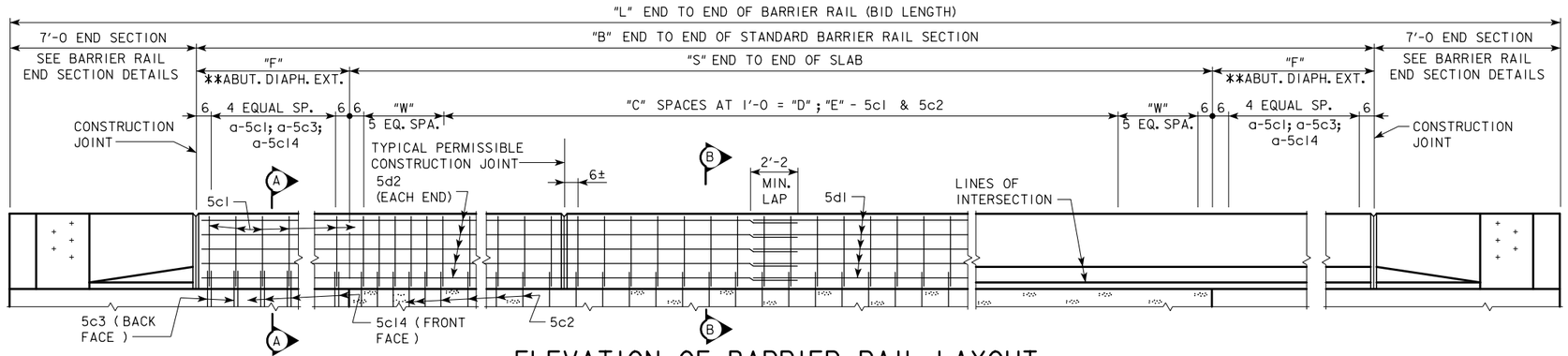


* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.





ELEVATION OF BARRIER RAIL LAYOUT

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. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

** APPLIES TO 201′-4, 213′-10, 226′-4 & 243′-0 BRIDGES ONLY.

REVISED 07-10 - THE SPECIFICATION REFERENCES WERE CHANGED.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

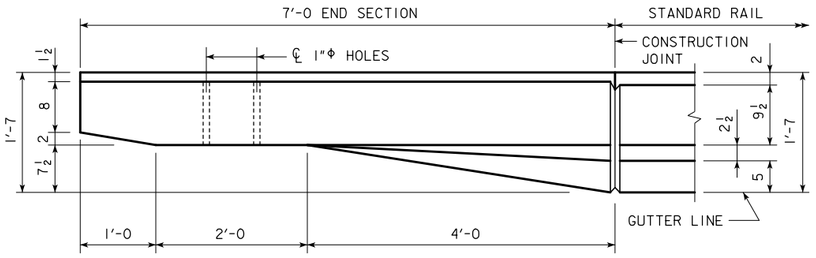
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

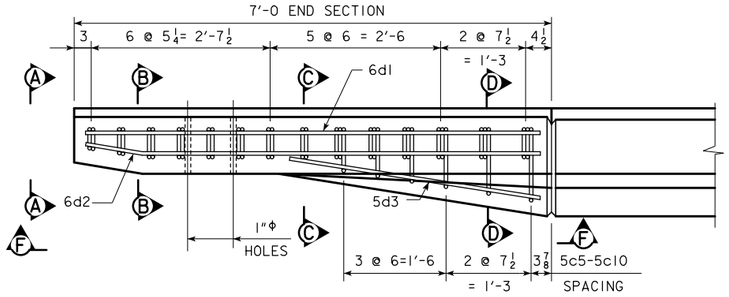
BARRIER RAIL DETAILS

SHEET 1 OF 3

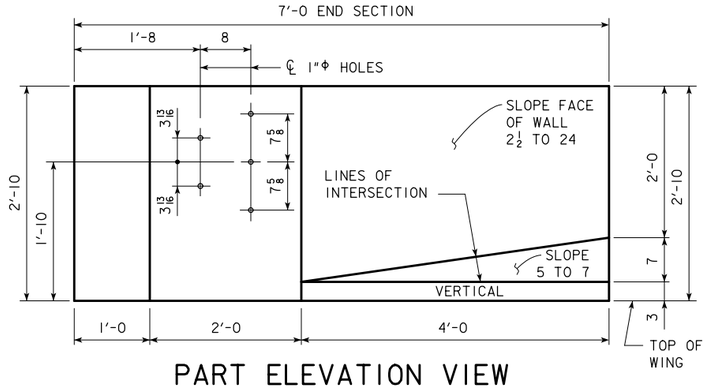
H30-39-06



PART PLAN VIEW

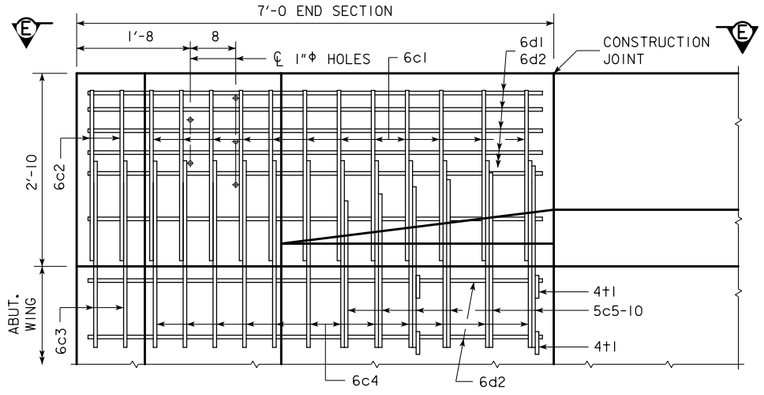


PART VIEW E-E

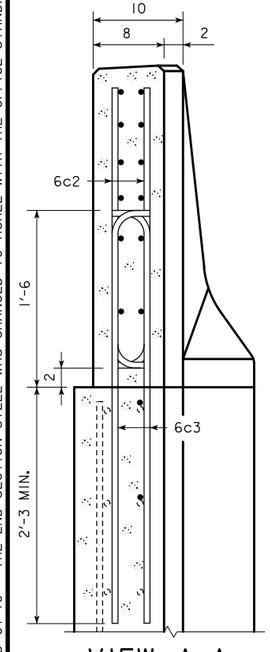


PART ELEVATION VIEW

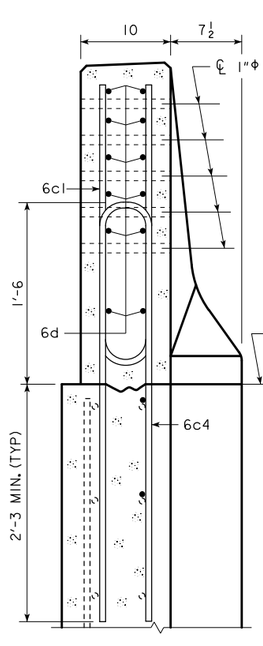
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



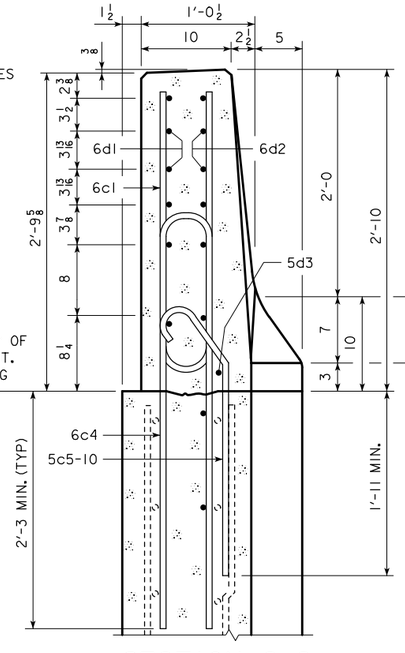
PART VIEW F-F



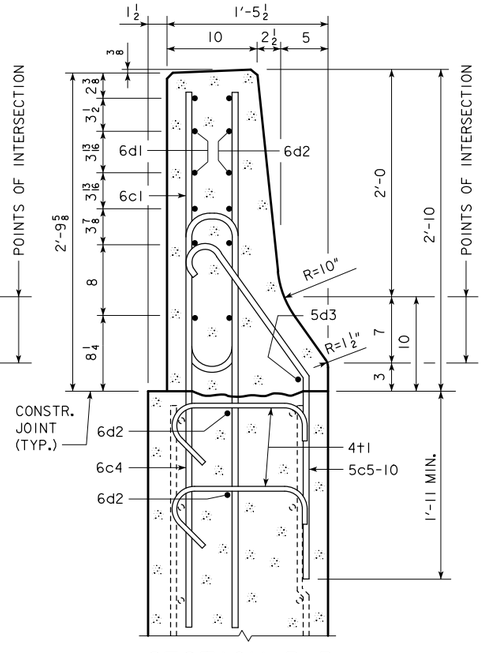
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

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.

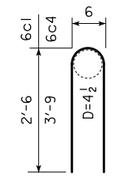
EPOXY REINFORCING STEEL - ONE END SECTION

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

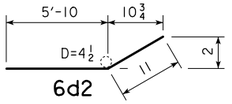
CONCRETE PLACEMENT SUMMARY

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

BENT BAR DETAILS

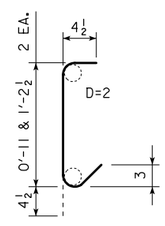


6c1 & 6c4

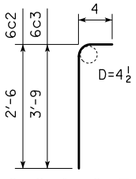


6d2

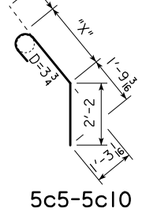
BAR	"X"
5c5	0'-6½
5c6	0'-8½
5c7	0'-10¼
5c8	1'-0¼
5c9	1'-2
5c10	1'-4



4t1



6c2 & 6c3



5c5-5c10

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

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

BARRIER RAIL DETAILS

SHEET 2 OF 3

H30-40-06

REVISED 07-10 - THE END SECTION STEEL WAS CHANGED TO AGREE WITH THE OFFICE STANDARD.

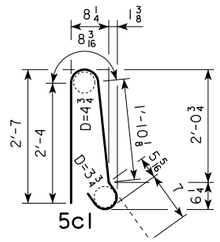
EPOXY COATED REINFORCING STEEL-TWO BARRIER RAILS

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

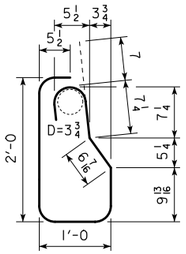
BRIDGE LENGTH				138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL		288	5'-11	1,777	312	5'-11	1,925	338	5'-11	2,086	362	5'-11	2,234	388	5'-11	2,394	432	5'-11	2,666	458	5'-11	2,826	482	5'-11	2,974	516	5'-11	3,184
	5c2	VERTICAL		288	6'-0	1,802	312	6'-0	1,952	338	6'-0	2,115	362	6'-0	2,265	388	6'-0	2,428	412	6'-0	2,578	438	6'-0	2,741	462	6'-0	2,891	496	6'-0	3,104
	5c3	VERTICAL		-----	-----	0	-----	-----	0	-----	-----	0	-----	-----	0	-----	-----	0	20	3'-3	68	20	3'-3	68	20	3'-3	68	20	3'-3	68
	5c14	VERTICAL		-----	-----	0	-----	-----	0	-----	-----	0	-----	-----	0	-----	-----	0	20	3'-10	80	20	3'-10	80	20	3'-10	80	20	3'-10	80
	5d1	LONGITUDINAL-STANDARD SECTION	——	36	40'-0	1,502	54	40'-0	2,253	54	40'-0	2,253	54	40'-0	2,253	72	40'-0	3,004	72	40'-0	3,004	72	40'-0	3,004	90	40'-0	3,755	90	40'-0	3,755
	5d2	LONGITUDINAL-STANDARD SECTION, ENDS	——	36	34'-8	1,302	36	22'-0	826	36	28'-3	1,061	36	34'-6	1,295	36	21'-10	820	36	32'-5	1,217	36	38'-8	1,452	36	26'-0	976	36	34'-4	1,289
		4 END SECTIONS @ 458 LBS.				1,832			1,832			1,832			1,832			1,832			1,832			1,832			1,832			1,832
TOTAL LBS. (INCLUDE WITH SUPERSTRUCTURE REINFORCING)						8,215			8,788			9,347			9,879			10,478			11,445			12,003			12,576			13,312

NOTE: ALL BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED IF EPOXY COATING OPTION IS USED. SEE SHEET H30-01-06.

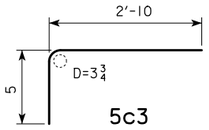
BENT BAR DETAILS



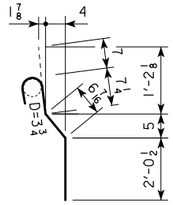
5c1



5c2



5c3



5c14

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

CONCRETE PLACEMENT SUMMARY - C.Y.

BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
STANDARD SECTION *	2 x "B" @ 0.1052 C.Y. PER FT.	30.1	32.7	35.4	38.0	40.6	45.1	47.7	50.4	53.9
BARRIER RAIL END SECTION	4 @ 0.65 C.Y.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
TOTAL C.Y.		32.7	35.3	38.0	40.6	43.2	47.7	50.3	53.0	56.5

* SEE SHEET H30-39-06 FOR DIMENSION "B". CONCRETE QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

CONCRETE BARRIER RAIL QUANTITIES - L.F.

BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
CONCRETE BARRIER RAILING	0° SKEW	311.7	336.7	361.7	386.7	411.7	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING	15° SKEW	311.9	336.9	361.9	386.9	411.9	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING	30° SKEW	312.6	337.6	362.6	387.6	412.6	456.7	481.7	506.7	540.0
CONCRETE BARRIER RAILING	45° SKEW	314.2	339.2	364.2	389.2	414.2	456.7	481.7	506.7	540.0

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

BARRIER RAIL DETAILS
SHEET 3 OF 3

H30-41-06

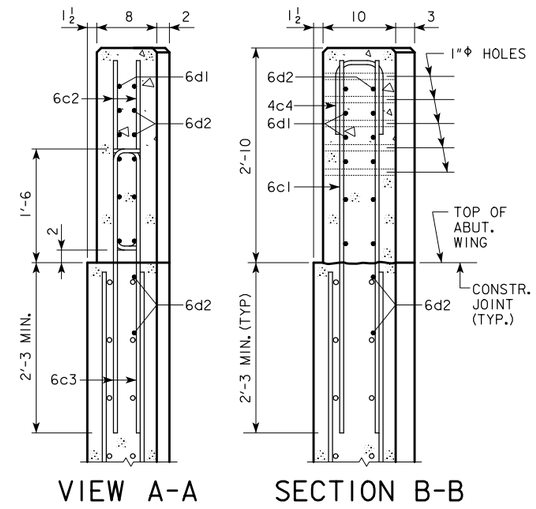
REVISED 07-10 - THE REINFORCING STEEL WAS CHANGED TO AGREE WITH H30-40-06.

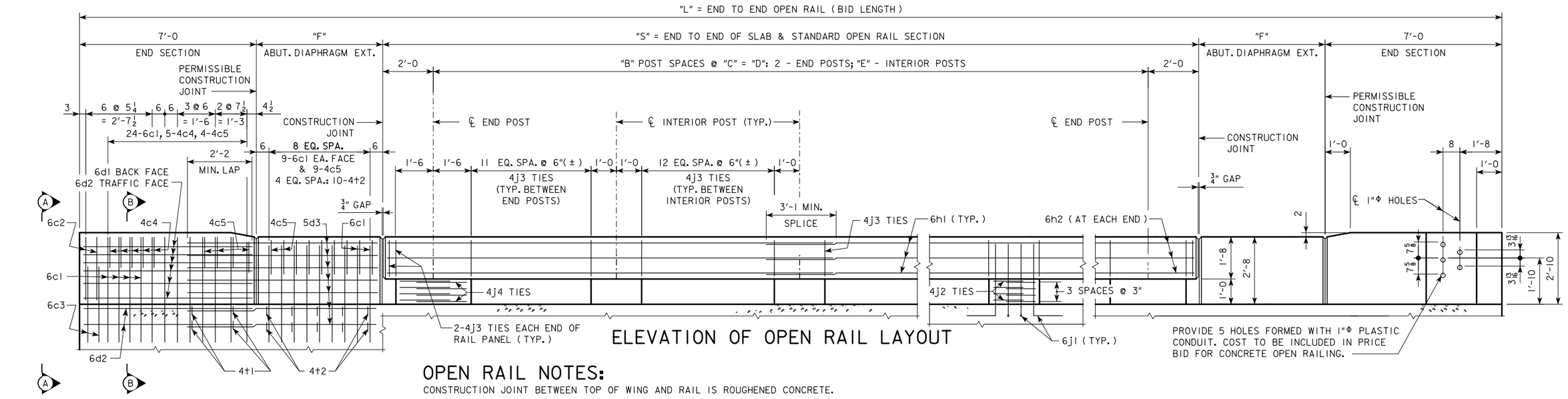
TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG		138′-10				151′-4				163′-10				176′-4				188′-10				℄-℄ ABUT. BRG	
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW	
DIMENSION OR NUMBER	L (FT.-IN.)	155′-10	155′-11¼	156′-3⅝	157′-0⅞	168′-4	168′-5¼	168′-9⅝	169′-6⅞	180′-10	180′-11¼	181′-3⅝	182′-0⅞	193′-4	193′-5¼	193′-9⅝	194′-6⅞	205′-10	205′-11¼	206′-3⅝	207′-0⅞	L (FT.-IN.)	DIMENSION OR NUMBER
	S (FT.-IN.)	141′-10	141′-11¼	142′-3⅝	143′-0⅞	154′-4	154′-5¼	154′-9⅝	155′-6⅞	166′-10	166′-11¼	167′-3⅝	168′-0⅞	179′-4	179′-5¼	179′-9⅝	180′-6⅞	191′-10	191′-11¼	192′-3⅝	193′-0⅞	S (FT.-IN.)	
	B	18	18	18	18	19	19	19	19	21	21	21	21	23	23	23	23	24	24	24	24	B	
	C (FT.-IN.)	7′-7⅞	7′-8	7′-8¼	7′-8¾	7′-11	7′-11	7′-11¼	7′-11¾	7′-9	7′-9⅛	7′-9⅜	7′-9¾	7′-7½	7′-7½	7′-7¾	7′-8⅛	7′-9⅞	7′-10	7′-10⅛	7′-10½	C (FT.-IN.)	
	D (FT.-IN.)	137′-10	137′-11¼	138′-3⅝	139′-0⅞	150′-4	150′-5¼	150′-9⅝	151′-6⅞	162′-10	162′-11¼	163′-3⅝	164′-0⅞	175′-4	175′-5¼	175′-9⅝	176′-6⅞	187′-10	187′-11¼	188′-3⅝	189′-0⅞	D (FT.-IN.)	
	E	17	17	17	17	18	18	18	18	20	20	20	20	22	22	22	22	23	23	23	23	E	
	F (FT.-IN.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F (FT.-IN.)	

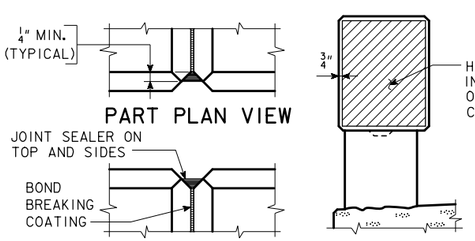
TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS

℄-℄ ABUT. BRG		201′-4				213′-10				226′-4				243′-0				℄-℄ ABUT. BRG	
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	SKEW	
DIMENSION OR NUMBER	L (FT.-IN.)	228′-4	228′-4	228′-4	228′-4	240′-10	240′-10	240′-10	240′-10	253′-4	253′-4	253′-4	253′-4	270′-0	270′-0	270′-0	270′-0	L (FT.-IN.)	DIMENSION OR NUMBER
	S (FT.-IN.)	204′-4	204′-5¼	204′-9⅝	205′-6⅞	216′-10	216′-11¼	217′-3⅝	218′-0⅞	229′-4	229′-5¼	229′-9⅝	230′-6⅞	246′-0	246′-1¼	246′-5⅝	247′-2⅞	S (FT.-IN.)	
	B	26	26	26	26	27	27	27	27	29	29	29	29	31	31	31	31	B	
	C (FT.-IN.)	7′-8½	7′-8½	7′-8⅝	7′-9	7′-10⅝	7′-10⅝	7′-10¾	7′-11⅛	7′-9¼	7′-9¼	7′-9⅜	7′-9¾	7′-9⅝	7′-9¾	7′-9⅞	7′-10⅛	C (FT.-IN.)	
	D (FT.-IN.)	200′-4	200′-5¼	200′-9⅝	201′-6⅞	212′-10	212′-11¼	213′-3⅝	214′-0⅞	225′-4	225′-5¼	225′-9⅝	226′-6⅞	242′-0	242′-1¼	242′-5⅝	243′-2⅞	D (FT.-IN.)	
	E	25	25	25	25	26	26	26	26	28	28	28	28	30	30	30	30	E	
	F (FT.-IN.)	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	5′-0	4′-11⅜	4′-9¼	4′-4½	F (FT.-IN.)	





ELEVATION OF OPEN RAIL LAYOUT



OPEN RAIL JOINT DETAILS

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.

THE CONCRETE OPEN RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF OPEN RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT. PRICE BID FOR "CONCRETE OPEN RAILING, TL-4" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO CONSTRUCT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

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.

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.

07-10
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

OPEN RAIL, TL-4 DETAILS

SHEET 1 OF 2

H30-42-06

REVISED 07-10 - END SECTIONS WERE CHANGED. VIEW A-A & SECTION B-B WERE ADDED.

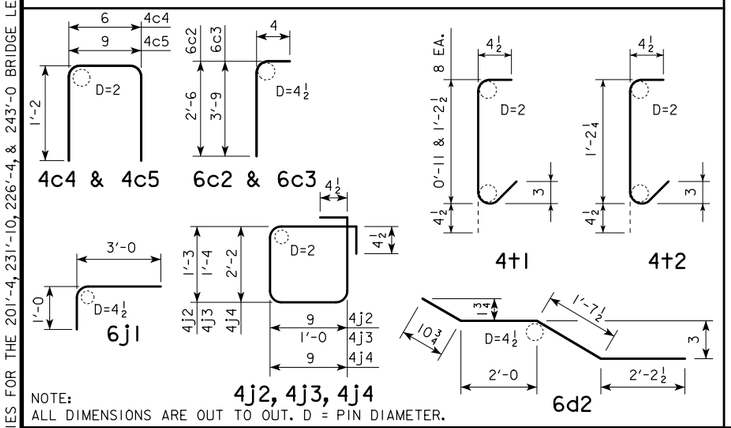
EPOXY COATED REINFORCING STEEL-TWO OPEN RAILS

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

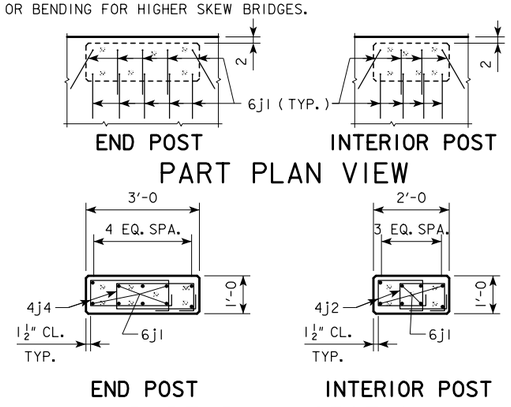
BRIDGE LENGTH			138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6c1	VERTICAL, END SECTION & ABUT. DIAPH. EXT.	—	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	168	4'-11	1,241	168	4'-11	1241	168	4'-11	1241	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	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	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	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	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	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	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	40'-0	1,442	36	40'-0	2,163	36	40'-0	2,163	36	40'-0	2,163	48	40'-0	2,884	48	40'-0	2,884	48	40'-0	2,884	60	40'-0	3,605	60	40'-0	3,605
6h2	LONGITUDINAL, OPEN RAIL, ENDS	—	24	36'-8	1,322	24	24'-8	889	24	30'-11	1,114	24	37'-2	1,340	24	25'-2	907	24	31'-5	1,133	24	37'-8	1,358	24	25'-8	925	24	34'-0	1,226
6j1	VERTICAL DOWELS, OPEN RAIL	⌐	312	4'-0	1,875	328	4'-0	1,971	360	4'-0	2,163	392	4'-0	2,355	408	4'-0	2,451	440	4'-0	2,644	456	4'-0	2,740	488	4'-0	2,932	520	4'-0	3,124
4j2	HOOP, INTERIOR POST	▭	272	4'-9	863	288	4'-9	914	320	4'-9	1,015	352	4'-9	1,117	368	4'-9	1,168	400	4'-9	1,269	416	4'-9	1,320	448	4'-9	1,422	480	4'-9	1,523
4j3	HOOP, OPEN RAIL	▭	472	5'-5	1,708	498	5'-5	1,802	550	5'-5	1,990	602	5'-5	2,178	628	5'-5	2,272	680	5'-5	2,460	706	5'-5	2,555	758	5'-5	2,743	810	5'-5	2,931
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	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	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)					8,880			9,409			10,115			10,823			11,352			13,076			13,543			14,313			15,095

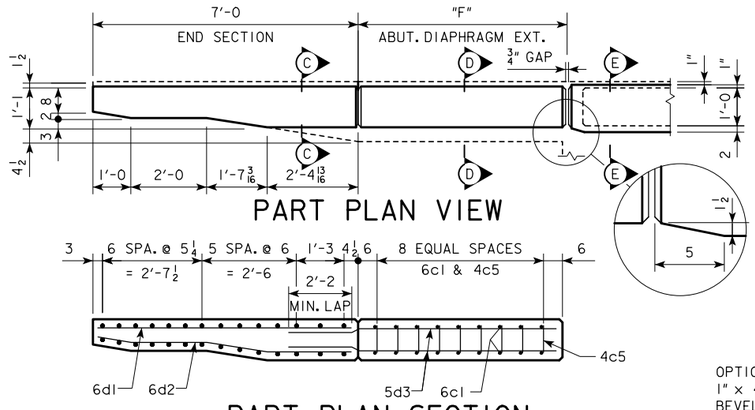
NOTE: ALL BARRIER RAIL REINFORCEMENT TO BE EPOXY COATED IF EPOXY COATING OPTION IS USED. SEE SHEET H30-01-06.

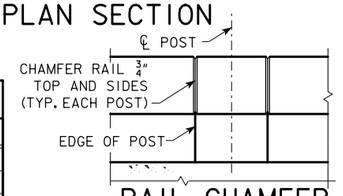
BENT BAR DETAILS

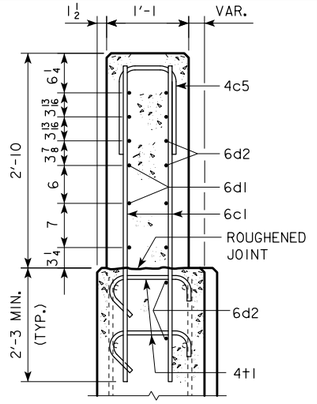


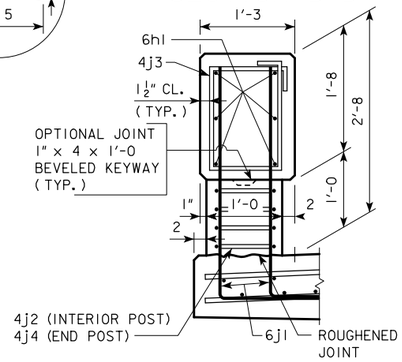
* TRAFFIC FACE 5d3 BARS MAY REQUIRE FIELD CUTTING OR BENDING FOR HIGHER SKEW BRIDGES.











CONCRETE PLACEMENT SUMMARY - C.Y.

BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
OPEN RAIL SECTION	2 @ 0.077 CU. YDS. PER FT.	22.0	24.0	25.9	27.8	29.7	31.7	33.6	35.5	38.1
OPEN RAIL-END SECTION	4 @ 0.687 CU. YDS.	2.7	2.7	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	0.4	0.4
OPEN RAIL-INTERIOR POSTS	2 x "E" @ 0.07 CU. YDS.	2.4	2.5	2.8	3.1	3.2	3.5	3.6	3.9	4.2
	TOTAL (C.Y.)	27.5	29.6	31.8	34.0	36.0	40.2	42.2	44.4	47.3

CONCRETE QUANTITIES SHOWN ARE BASED ON 45° SKEW. FOR "E" SEE SHEET H30-42-06.

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

BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
OPEN CONCRETE RAILING, TL-4	0° SKEW	311.7	336.7	361.7	386.7	411.7	456.7	481.7	506.7	540.0
OPEN CONCRETE RAILING, TL-4	15° SKEW	311.9	336.9	361.9	386.9	411.9	456.7	481.7	506.7	540.0
OPEN CONCRETE RAILING, TL-4	30° SKEW	312.6	337.6	362.6	387.6	412.6	456.7	481.7	506.7	540.0
OPEN CONCRETE RAILING, TL-4	45° SKEW	314.2	339.2	364.2	389.2	414.2	456.7	481.7	506.7	540.0

05-11 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

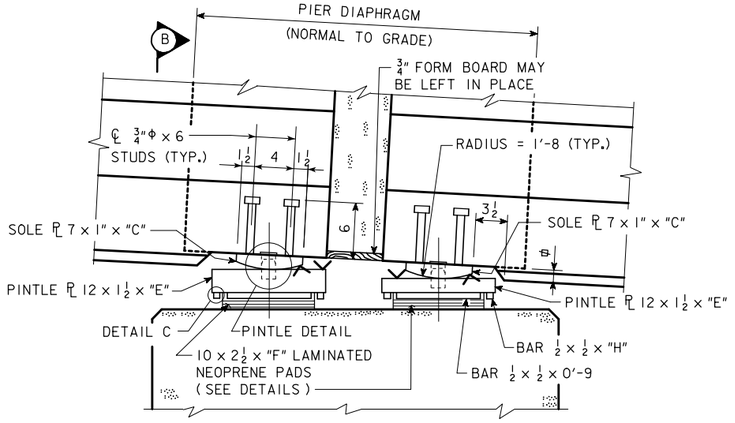
DECEMBER, 2006

OPEN RAIL, TL-4 DETAILS

SHEET 2 OF 2

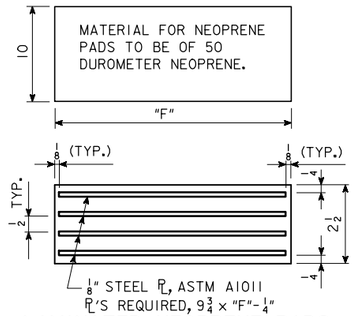
H30-43-06

REVISED 05-11 - CORRECTED THE OPEN RAIL REBAR QUANTITIES FOR THE 201'-4, 213'-10, 226'-4, & 243'-0 BRIDGE LENGTHS.

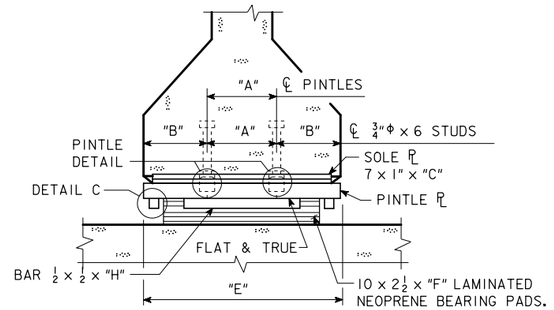


PART ELEVATION

Φ NOTCH BEAM END TO SOLE ℄ THICKNESS MAXIMUM 1"

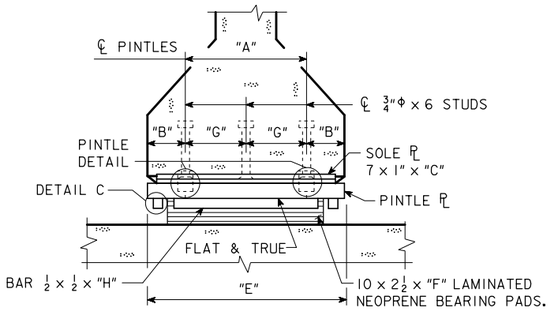


LAMINATED NEOPRENE PADS



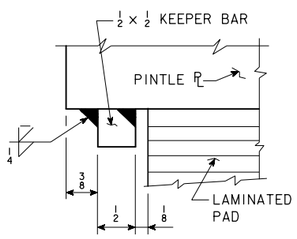
SECTION B-B FOR A & B BEAMS

(DIAPHRAGM CONCRETE NOT SHOWN)

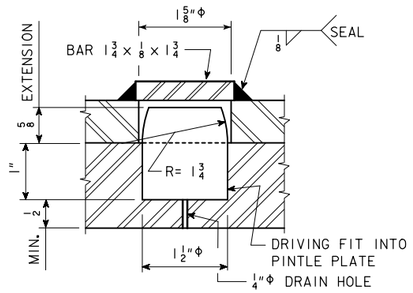


SECTION B-B FOR C BEAMS

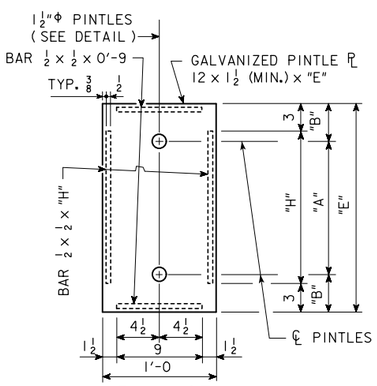
(DIAPHRAGM CONCRETE NOT SHOWN)



DETAIL C



PINTLE DETAIL



PLAN OF PINTLE PLATE

EXPANSION PIER BEARING NOTES:

SURFACES MARKED "V" SHALL BE FINISHED ANSI 250.

PINTLE PLATES ARE A PART OF THE SUPERSTRUCTURE "STRUCTURAL STEEL QUANTITY". COSTS OF ANCHORED CURVED SOLE PLATES AND NEOPRENE PADS ARE TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

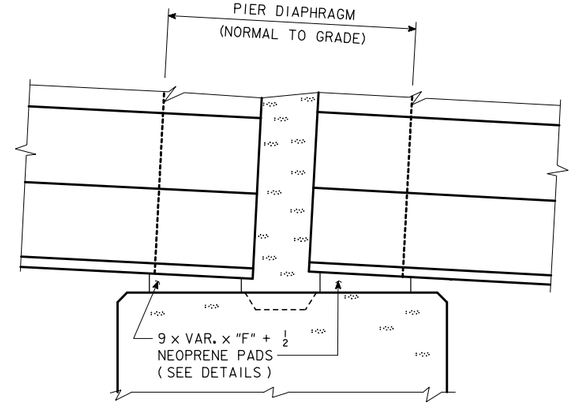
THE SOLE PLATES AND PINTLE PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.

SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.

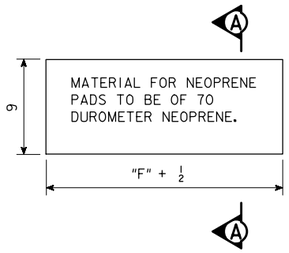
SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING :

- ASTM A 514 GRADE B
- ASTM A 709 GRADE HPS 70W

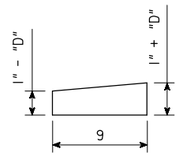
EXPANSION PIER



PART ELEVATION



PLAN OF NEOPRENE PAD



SECTION A-A

SLOPE	"D"
SLOPE ≤ 1.4%	0"
1.4% < SLOPE ≤ 4.2%	⅛"
4.2% < SLOPE ≤ 5.0%	¼"

$$SLOPE_{SPAN\ 1} = 100\% \left| \frac{\text{P/G ELEV. @ NEAR ABUT. - P/G ELEV. @ PIER 1}}{\text{SPAN 1 LENGTH}} \right|$$

$$SLOPE_{SPAN\ 2} = 100\% \left| \frac{\text{P/G ELEV. @ PIER 1 - P/G ELEV. @ PIER 2}}{\text{SPAN 2 LENGTH}} \right|$$

$$SLOPE_{SPAN\ 3} = 100\% \left| \frac{\text{P/G ELEV. @ PIER 2 - P/G ELEV. @ FAR ABUT.}}{\text{SPAN 3 LENGTH}} \right|$$

SLOPE CALCULATION FORMULA

FIXED PIER BEARING NOTES:

IF CALCULATED SLOPE FOR A GIVEN SPAN EXCEEDS 1.4%, THE NEOPRENE BEARING PADS AT THE FIXED PIER FOR THAT SPAN SHALL BE TAPERED. REFER TO TABLE FOR DIMENSIONS OF TAPERED PADS.

COST OF NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

FIXED PIER

VARIABLE DIMENSIONS

	BEAM BOTTOM FLANGE WIDTH	
	A & B BEAMS 1'-5	C BEAMS 1'-8
"A"	0'-6	1'-0
"B"	0'-5½	0'-4
"C"	1'-3½	1'-6½
"E"	1'-5	1'-8
"F"	1'-3	1'-6
"G"	———	0'-6
"H"	0'-11	1'-2

09-12 LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

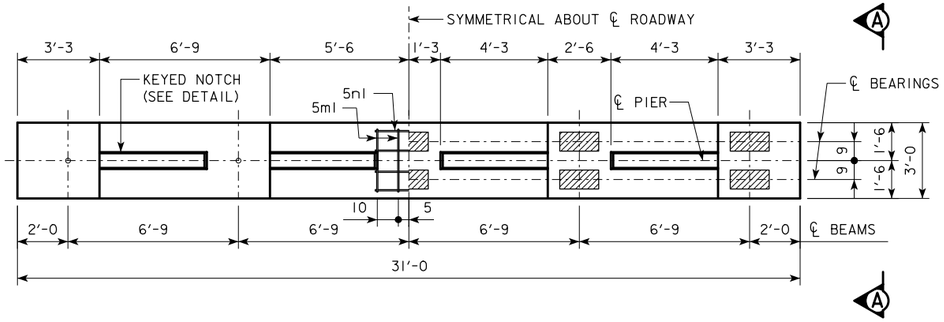
STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

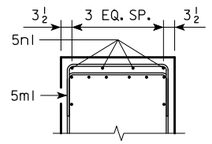
DECEMBER, 2006

PIER BEARING DETAILS | H30-44-06

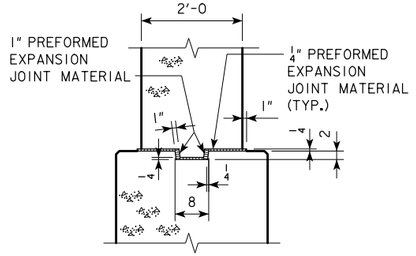
CORRECTION 09-12 - REFERENCE TO ASTM A852 WAS DELETED.



TYPICAL PLAN

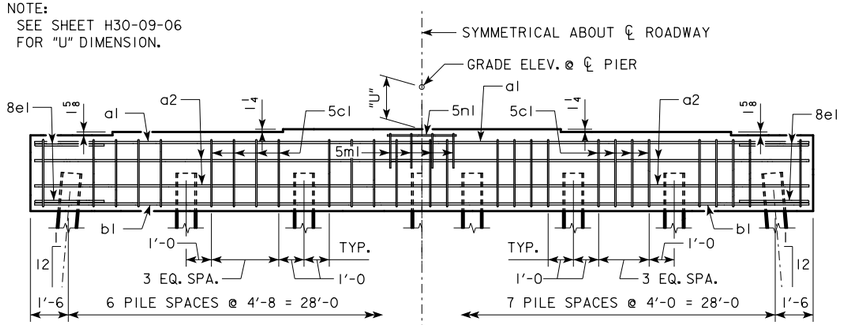


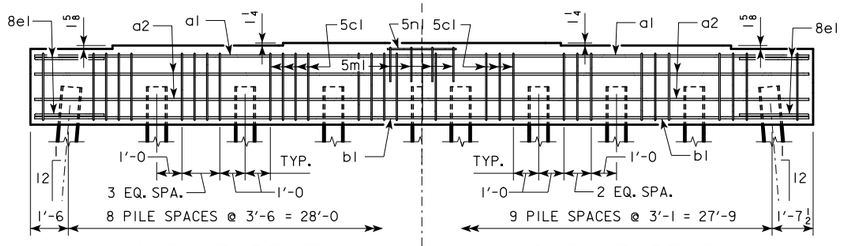
5ml & 5nl
BAR LAYOUT

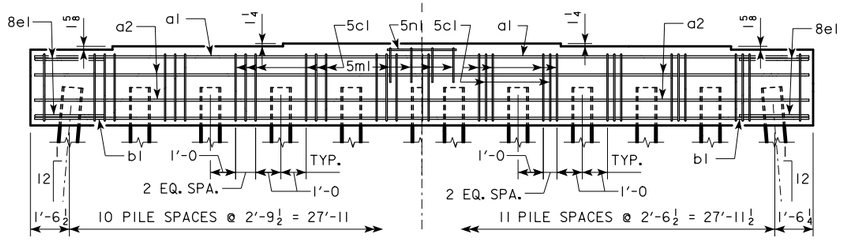


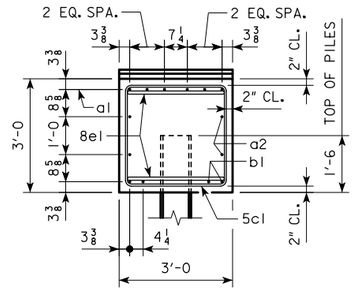
KEYED NOTCH DETAIL

NOTE:
SEE SHEET H30-09-06
FOR "U" DIMENSION.









VIEW A-A
FOR 7, 8, 9, 10, 11 & 12 PILE BENTS

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

PILE BENT PIERS

0° SKEW

H30-45-06

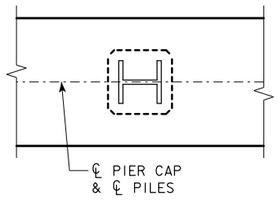
PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

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

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

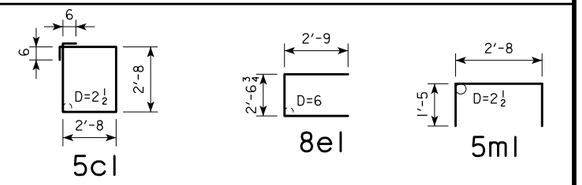


PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

			7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	30'-8	———	6	9	626	6	9	626	6	9	626	6	9	626	6	9	626	6	9	626
a2	30'-8	———	4	8	328	4	8	328	4	8	328	4	8	328	4	8	328	4	8	328
b1	30'-8	———	4	9	417	4	9	417	4	9	417	4	8	328	4	8	328	4	8	328
5c1	11'-8	⌐——¬	26	5	316	30	5	365	34	5	414	29	5	353	32	5	389	35	5	426
8e1	8'-1	⌐——¬	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
5m1	5'-6	⌐——¬	4	5	23	4	5	23	4	5	23	4	5	23	4	5	23	4	5	23
5n1	2'-8	———	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11
REINFORCING STEEL (LB.)			1807			1856			1905			1755			1791			1828		
STRUCTURAL ① CONCRETE (CY)	PILE TYPE																			
	1, 2		-----			-----			10.4			10.4			10.3			10.3		
	3		10.8			10.8			10.8			10.8			10.8			10.8		

BENT BAR DETAILS



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

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	② "K" (INCHES)	③ LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	③ LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	10	14	93	7	HP10x57	134
	9	16	104	7	HP12x53	134
151'-4	----	--	----	7	HP10x57	141
	9	16	109	8	HP12x53	123
163'-10	----	--	----	8	HP10x57	133
	----	--	----	8	HP12x53	133
176'-4	----	--	----	8	HP10x57	139
	----	--	----	9	HP12x53	124
188'-10	----	--	----	9	HP10x57	130
				9	HP12x53	130
201'-4	----	--	----	9	HP10x57	145
				10	HP12x53	130
213'-10	-----	--	----	10	HP10x57	137
				11	HP12x53	124
226'-4	-----	--	----	10	HP10x57	144
				11	HP12x53	131
243'-0	-----	--	----	11	HP10x57	138
				12	HP12x53	126

① CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT^3 PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.

② SEE STANDARD PIOL FOR "K" DIMENSION.

③ NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

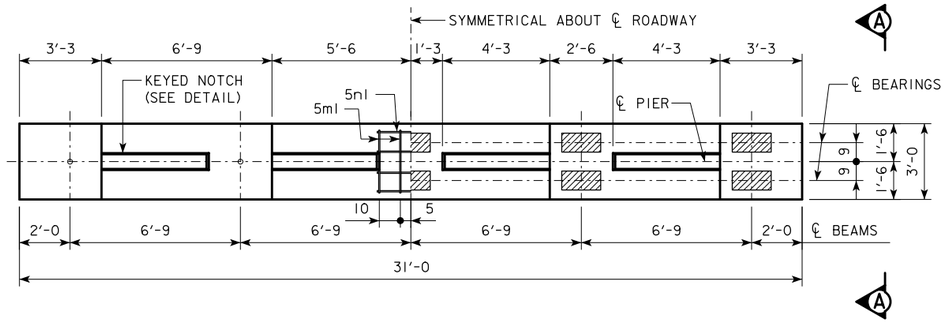
DECEMBER, 2006

PILE BENT PIERS

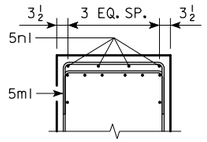
0° SKEW

H30-46-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL PLAN



5ml & 5nl
BAR LAYOUT

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

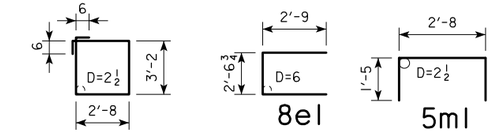
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

			6 PILE BENT			7 PILE BENT			8 PILE BENT			9 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	30'-8		8	9	834	8	9	834	6	9	626	6	9	626
a2	30'-8		4	8	328	4	8	328	4	8	328	4	8	328
b1	30'-8		4	9	417	4	9	417	4	8	328	4	8	328
5c1	12'-8		27	5	357	32	5	423	30	5	396	26	5	343
8e1	8'-1		4	8	86	4	8	86	4	8	86	4	8	86
5ml	5'-6		4	5	23	4	5	23	4	5	23	4	5	23
5nl	2'-8		4	5	11	4	5	11	4	5	11	4	5	11
REINFORCING STEEL (LB.)			2056			2122			1798			1745		
STRUCTURAL CONCRETE (CY)	PILE TYPE 3		12.6			12.6			12.6			12.6		

BENT BAR DETAILS



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

FRICTION OR POINT BEARING PILING

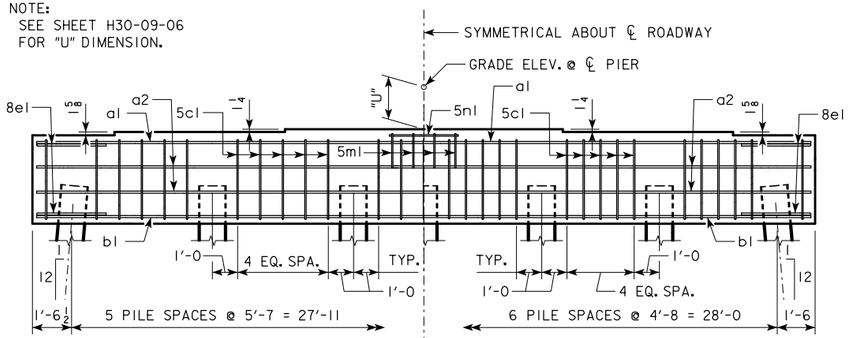
PIOL TYPE 3

℄-℄ ABUTMENT BEARING	NUMBER OF TRESTLE PILES	PILE SIZE	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	6	HP14x73	157
	6	HP14x89	157
151'-4	6	HP14x73	166
	6	HP14x89	166
163'-10	6	HP14x73	179
	6	HP14x89	179
176'-4	7	HP14x73	161
	6	HP14x89	187
188'-10	7	HP14x73	168
	6	HP14x89	196
201'-4	8	HP14x73	164
	6	HP14x89	218
213'-10	8	HP14x73	172
	7	HP14x89	197
226'-4	8	HP14x73	181
	7	HP14x89	207
243'-0	9	HP14x73	170
	7	HP14x89	218

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

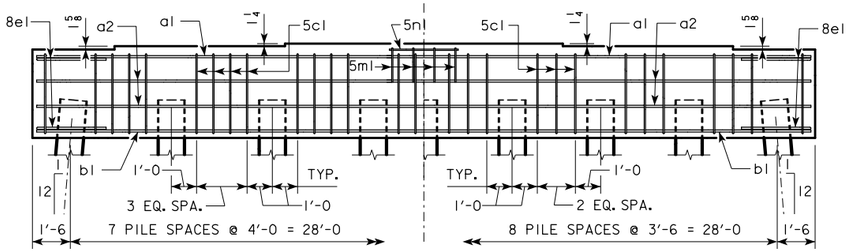
NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

NOTE:
SEE SHEET H30-09-06
FOR "U" DIMENSION.



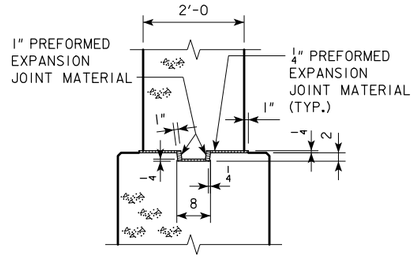
6 PILE BENT

7 PILE BENT

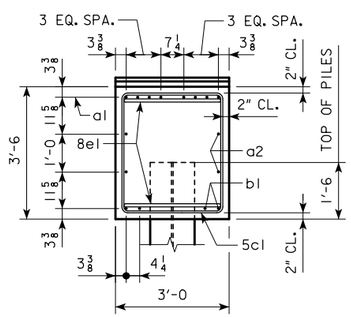


8 PILE BENT

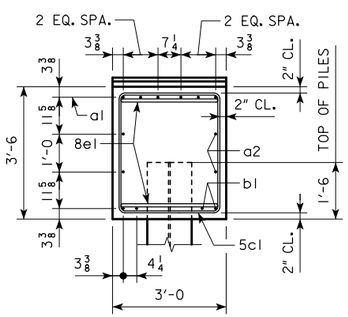
9 PILE BENT



KEYED NOTCH DETAIL



VIEW A-A
FOR 6 & 7 PILE BENTS



VIEW A-A
FOR 8 & 9 PILE BENTS

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

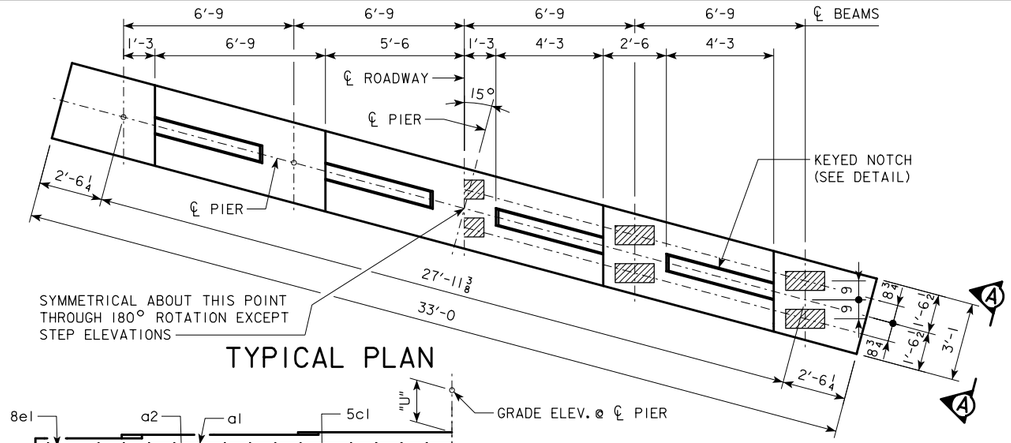
DECEMBER, 2006

PILE BENT PIERS HP14 PILES

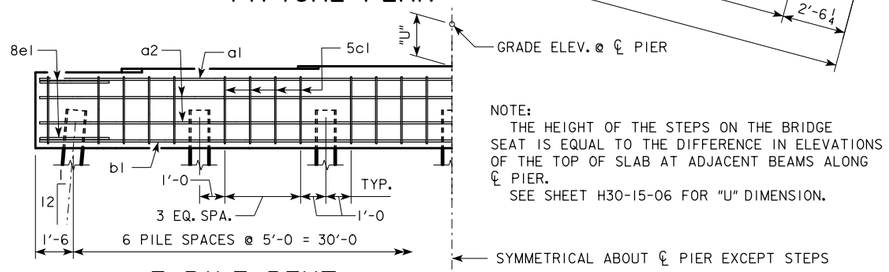
0° SKEW

H30-47-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

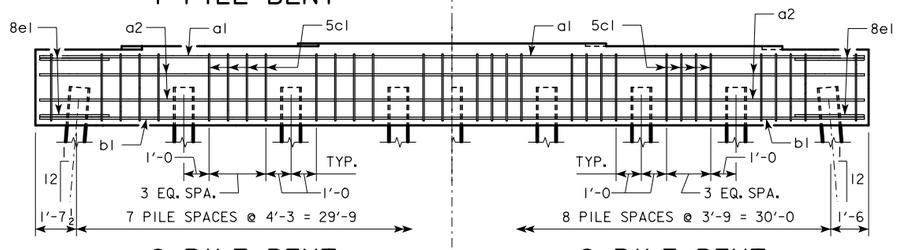


TYPICAL PLAN



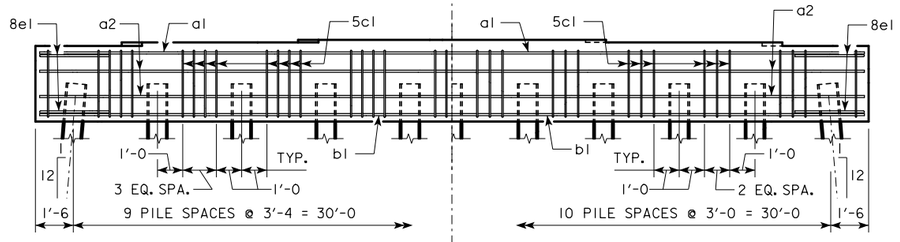
NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-15-06 FOR "U" DIMENSION.

7 PILE BENT



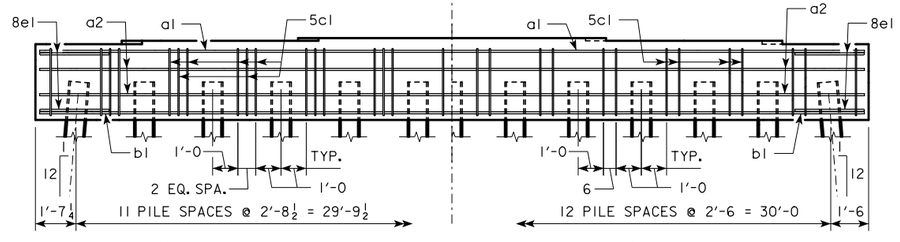
8 PILE BENT

9 PILE BENT



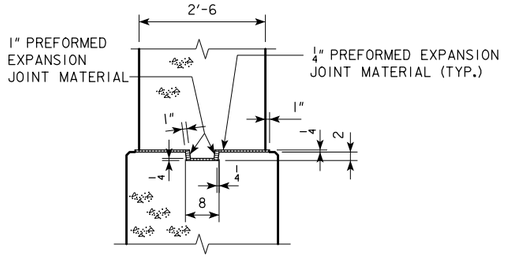
10 PILE BENT

11 PILE BENT

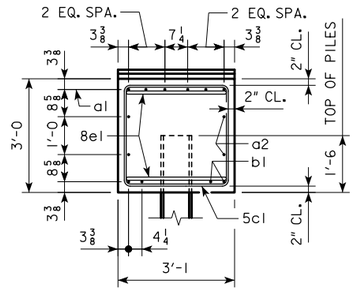


12 PILE BENT

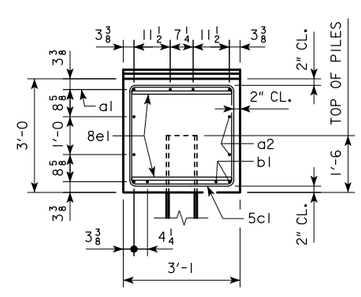
13 PILE BENT



KEYED NOTCH DETAIL



VIEW A-A
FOR 7, 8, 9, 10 & 11 PILE BENTS



VIEW A-A
FOR 12 & 13 PILE BENTS

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

PILE BENT PIERS

15° SKEW

H30-48-06

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

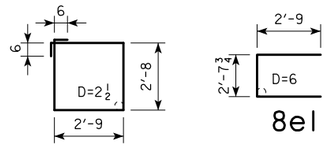
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

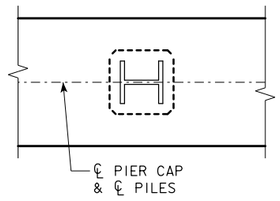
REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

				7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	32'-8	———		6	9	666	6	9	666	6	9	666	6	9	666	6	9	666	4	9	444	4	9	444
a2	32'-8	———		4	8	349	4	8	349	4	8	349	4	8	349	4	8	349	4	8	349	4	8	349
b1	32'-8	———		4	9	444	4	9	444	4	9	444	4	9	444	4	9	444	4	8	349	4	8	349
5c1	11'-10	⌐——¬		26	5	321	30	5	370	34	5	420	38	5	469	32	5	395	35	5	432	26	5	321
8e1	8'-2	⌐——¬		4	8	87	4	8	87	4	8	87	4	8	87	4	8	87	4	8	87	4	8	87
(1) REINFORCING STEEL (LB.)				1867			1916			1966			2015			1941			1661			1550		
STRUCTURAL CONCRETE (CY)			PILE TYPE																					
			1, 2	-----			-----			11.5			11.4			11.4			11.3			11.3		
			3	11.9			11.9			11.9			11.9			11.9			11.9			-----		

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING — PIOL TYPE 1 OR 2			FRICTION OR POINT BEARING PILING — PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	(3) "K" (INCHES)	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	10	14	95	7	HP10x57	135
	9	16	105	8	HP12x53	119
151'-4	11	14	91	7	HP10x57	143
	10	16	100	8	HP12x53	125
163'-10	----	--	----	8	HP10x57	135
	10	16	108	9	HP12x53	120
176'-4	----	--	----	8	HP10x57	141
	----	--	----	9	HP12x53	126
188'-10	----	--	----	9	HP10x57	131
	----	--	----	9	HP12x53	131
201'-4	----	--	----	10	HP10x57	132
				10	HP12x53	132
213'-10	----	--	----	10	HP10x57	138
				11	HP12x53	126
226'-4	-----	--	----	11	HP10x57	133
				11	HP12x53	133
243'-0	-----	--	----	11	HP10x57	139
				12	HP12x53	128

(1) SEE SHEET H30-17-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

(2) CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT^3 PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.

(3) SEE STANDARD PIOL FOR "K" DIMENSION.

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

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

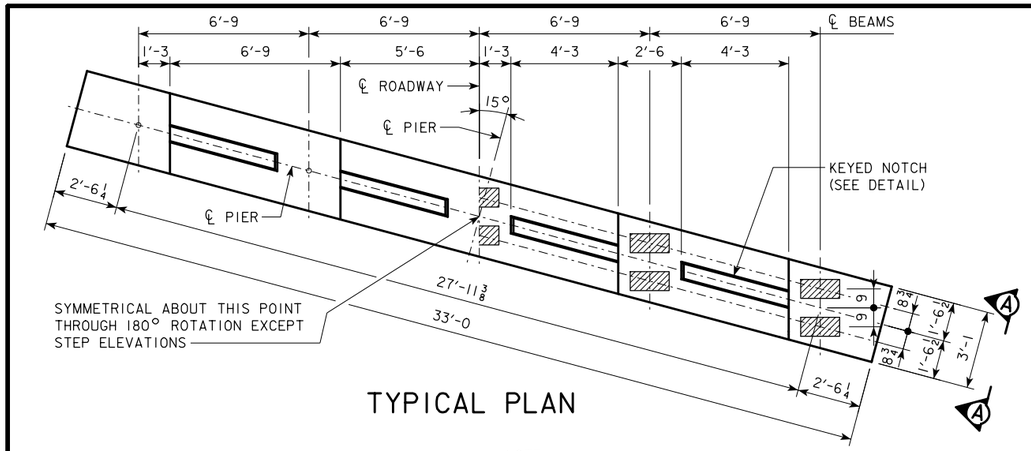
DECEMBER, 2006

PILE BENT PIERS

15° SKEW

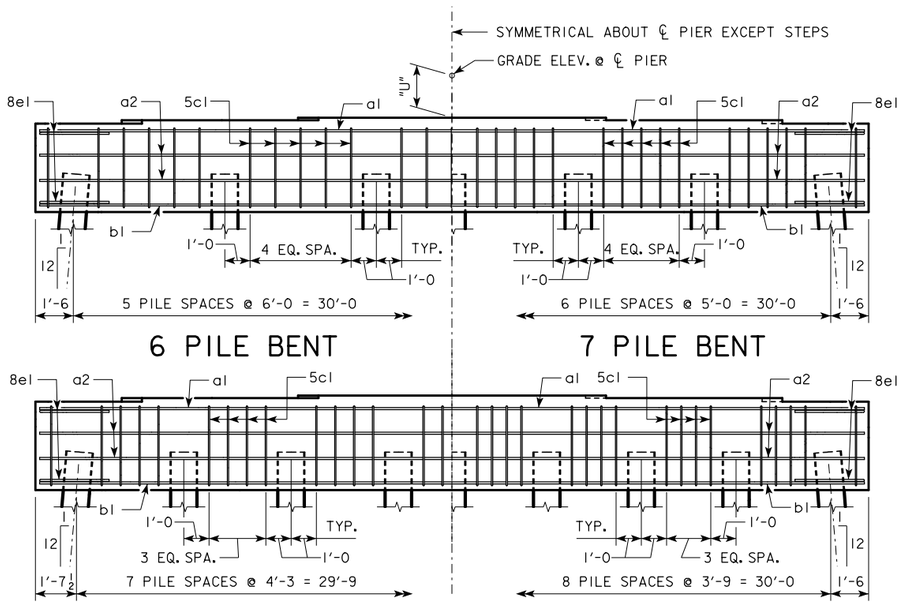
H30-49-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL PLAN

NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-15-06 FOR "U" DIMENSION.



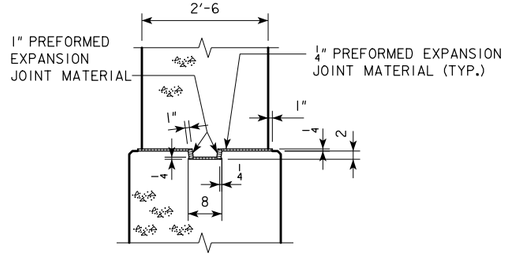
PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

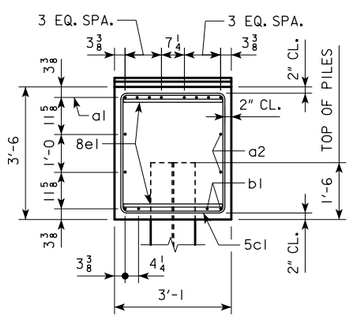
FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

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

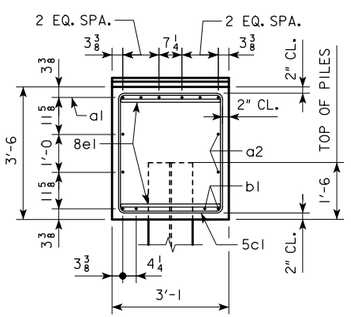
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.



KEYED NOTCH DETAIL



VIEW A-A
FOR 6 & 7 PILE BENTS

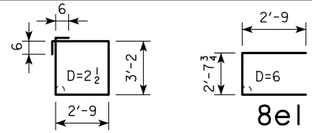


VIEW A-A
FOR 8 & 9 PILE BENTS

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

			6 PILE BENT			7 PILE BENT			8 PILE BENT			9 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	32'-8	———	8	9	889	8	9	889	6	9	666	6	9	666
a2	32'-8	———	4	8	349	4	8	349	4	8	349	4	8	349
b1	32'-8	———	4	8	349	4	9	444	4	9	444	4	8	349
5c1	12'-10	▭	27	5	361	32	5	428	30	5	402	34	5	455
8e1	8'-2	▭	4	8	87	4	8	87	4	8	87	4	8	87
① REINFORCING STEEL (LB.)			2035			2197			1948			1906		
STRUCTURAL CONCRETE (CY)	PILE TYPE 3		13.8			13.8			13.8			13.8		

BENT BAR DETAILS



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

FRICTION OR POINT BEARING PILING

℄-℄ ABUTMENT BEARING	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE	② LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	6	HP14x73	160
	6	HP14x89	160
151'-4	6	HP14x73	168
	6	HP14x89	168
163'-10	6	HP14x73	182
	6	HP14x89	182
176'-4	7	HP14x73	163
	6	HP14x89	190
188'-10	7	HP14x73	170
	6	HP14x89	198
201'-4	8	HP14x73	166
	6	HP14x89	221
213'-10	8	HP14x73	174
	7	HP14x89	199
226'-4	8	HP14x73	184
	7	HP14x89	210
243'-0	9	HP14x73	172
	7	HP14x89	221

① SEE SHEET H30-17-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

② NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

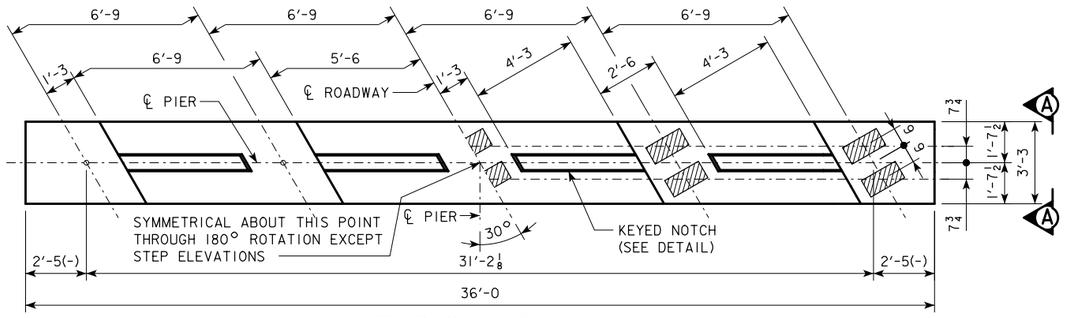
DECEMBER, 2006

PILE BENT PIERS HP14 PILES

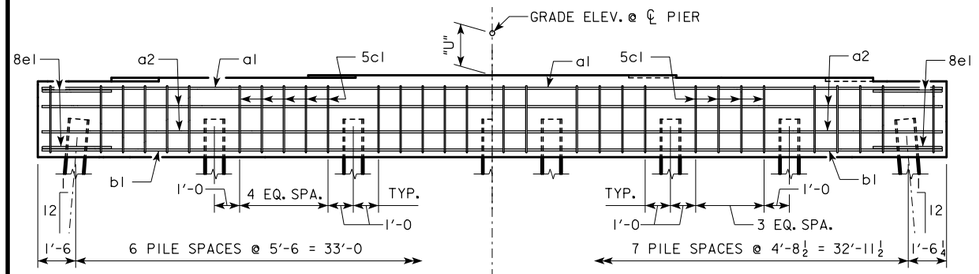
15° SKEW

H30-50-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

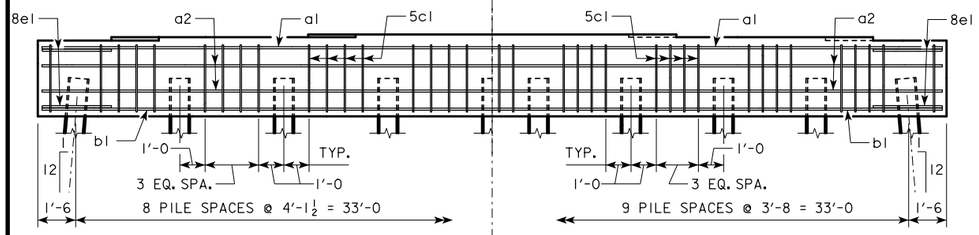


TYPICAL PLAN



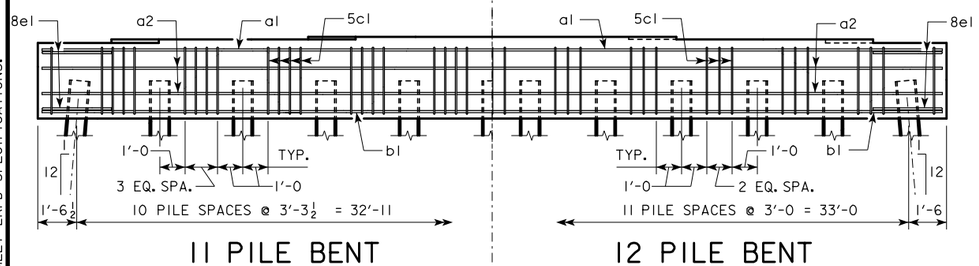
7 PILE BENT

8 PILE BENT



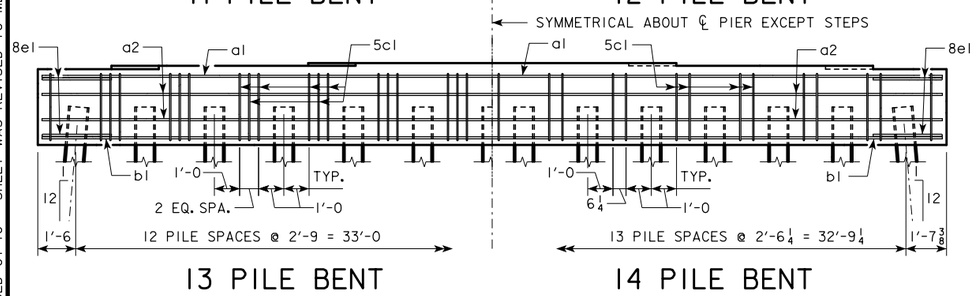
9 PILE BENT

10 PILE BENT



11 PILE BENT

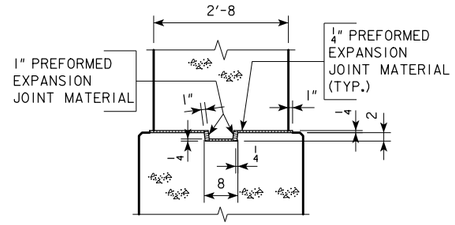
12 PILE BENT



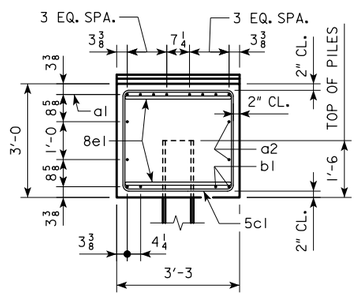
13 PILE BENT

14 PILE BENT

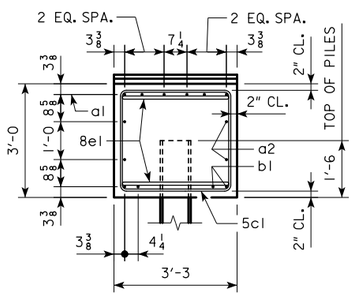
NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-22-06 FOR "U" DIMENSION.



KEYED NOTCH DETAIL



VIEW A-A
FOR 7 PILE BENT



VIEW A-A
FOR 8, 9, 10, 11, 12, 13 & 14 PILE BENTS

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

PILE BENT PIERS

30° SKEW

H30-51-06

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

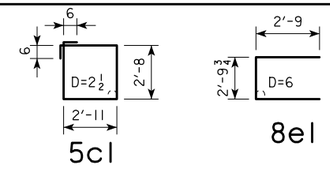
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

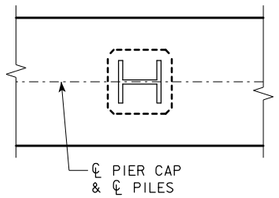
REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

				7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	35'-8	———		8	9	970	6	9	728	6	9	728	6	9	728	6	9	728	6	9	728	6	9	728	6	9	728
a2	35'-8	———		4	8	381	4	8	381	4	8	381	4	8	381	4	8	381	4	8	381	4	8	381	4	8	381
b1	35'-8	———		4	9	485	4	9	485	4	9	485	4	9	485	4	9	485	4	9	485	4	8	381	4	8	381
5c1	12'-2	⌐¬		32	5	406	30	5	381	34	5	431	38	5	482	42	5	533	35	5	444	38	5	482	28	5	355
8e1	8'-4	⌐¬		4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89
(1) REINFORCING STEEL (LB.)				2331			2064			2114			2165			2216			2127			2061			1934		
STRUCTURAL CONCRETE (CY) (2)			PILE TYPE																								
			1, 2	-----			-----			13.3			13.3			13.2			13.2			13.1			13.1		
			3	13.7			13.7			13.7			13.7			13.7			13.7			-----			-----		

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING — PIOL TYPE 1 OR 2			FRICTION OR POINT BEARING PILING — PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	(3) "K" (INCHES)	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	11	14	88	7	HP10x57	138
	9	16	107	8	HP12x53	121
151'-4	11	14	92	7	HP10x57	145
	10	16	101	8	HP12x53	127
163'-10	12	14	92	8	HP10x57	137
	----	--	----	9	HP12x53	122
176'-4	----	--	----	8	HP10x57	144
	----	--	----	9	HP12x53	128
188'-10	----	--	----	9	HP10x57	133
	----	--	----	9	HP12x53	133
201'-4	----	--	----	10	HP10x57	134
				10	HP12x53	134
213'-10	----	--	----	10	HP10x57	140
				11	HP12x53	128
226'-4	----	--	----	11	HP10x57	134
				11	HP12x53	134
243'-0	----	--	-----	11	HP10x57	141
				12	HP12x53	129

(1) SEE SHEET H30-24-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

(2) CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT^3 PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.

(3) SEE STANDARD PIOL FOR "K" DIMENSION.

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

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

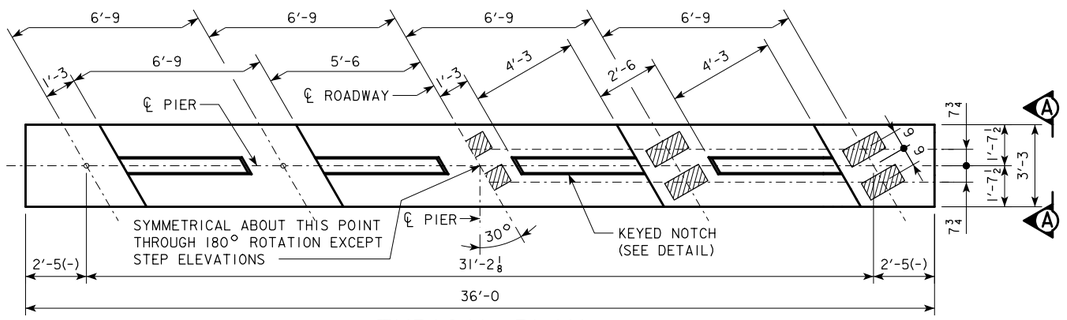
DECEMBER, 2006

PILE BENT PIERS

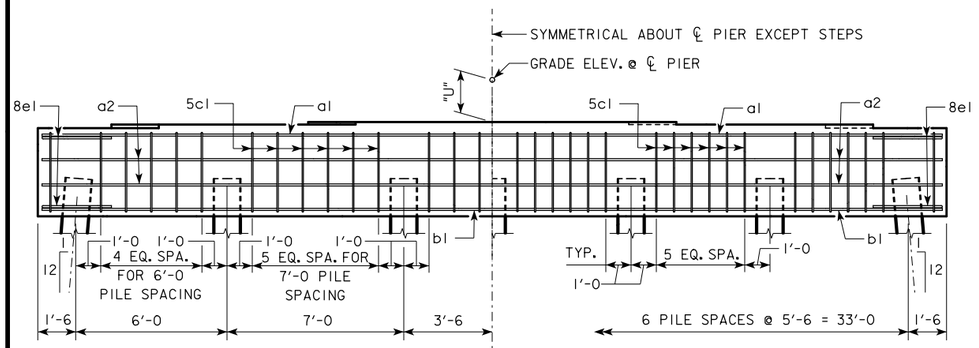
30° SKEW

H30-52-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

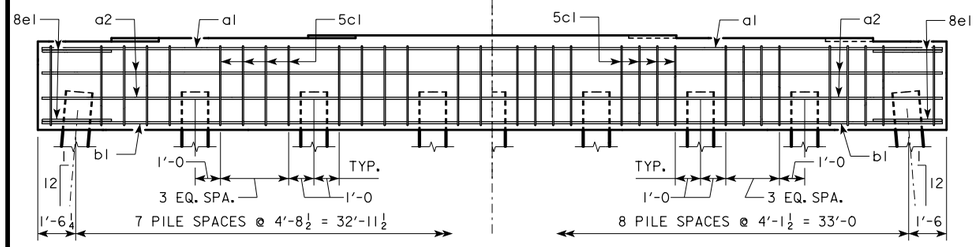


TYPICAL PLAN



6 PILE BENT

7 PILE BENT



8 PILE BENT

9 PILE BENT

PILE BENT NOTES:

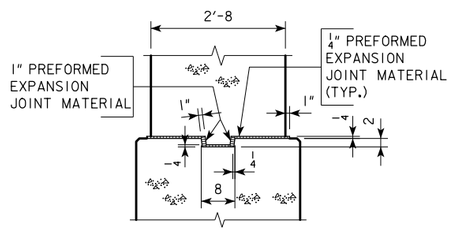
THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

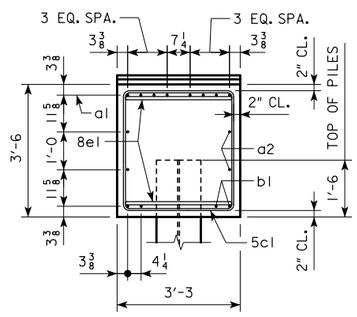
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

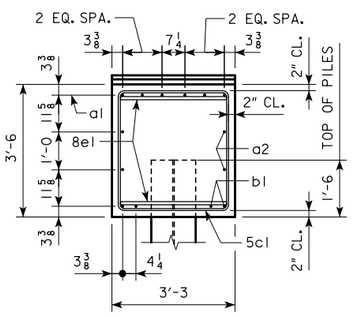
NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-22-06 FOR "U" DIMENSION.



KEYED NOTCH DETAIL



VIEW A-A
FOR 6 & 7 PILE BENTS

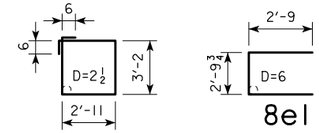


VIEW A-A
FOR 8 & 9 PILE BENTS

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	6 PILE BENT NO.	6 PILE BENT SIZE	6 PILE BENT WEIGHT	7 PILE BENT NO.	7 PILE BENT SIZE	7 PILE BENT WEIGHT	8 PILE BENT NO.	8 PILE BENT SIZE	8 PILE BENT WEIGHT	9 PILE BENT NO.	9 PILE BENT SIZE	9 PILE BENT WEIGHT
a1	35'-8		8	9	970	8	9	970	6	9	728	6	9	728
a2	35'-8		4	8	381	4	8	381	4	8	381	4	8	381
b1	35'-8		4	9	485	4	9	485	4	9	485	4	9	485
5cl	13'-2		30	5	412	38	5	522	30	5	412	34	5	467
8el	8'-4		4	8	89	4	8	89	4	8	89	4	8	89
(1) REINFORCING STEEL (LB.)			2337			2447			2095			2150		
STRUCTURAL CONCRETE (CY)		PILE TYPE 3	15.9			15.9			15.9			15.9		

BENT BAR DETAILS



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

FRICTION OR POINT BEARING PILING

℄-℄ ABUTMENT BEARING	PIOL TYPE 3 NUMBER OF TRESTLE PILES	PILE SIZE	(2) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	6	HP14x73	163
	6	HP14x89	163
151'-4	6	HP14x73	171
	6	HP14x89	171
163'-10	6	HP14x73	185
	6	HP14x89	185
176'-4	7	HP14x73	166
	6	HP14x89	193
188'-10	7	HP14x73	173
	6	HP14x89	202
201'-4	8	HP14x73	168
	6	HP14x89	225
213'-10	8	HP14x73	177
	7	HP14x89	202
226'-4	9	HP14x73	165
	7	HP14x89	213
243'-0	9	HP14x73	174
	7	HP14x89	223

(1) SEE SHEET H30-24-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

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

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

Marcia K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

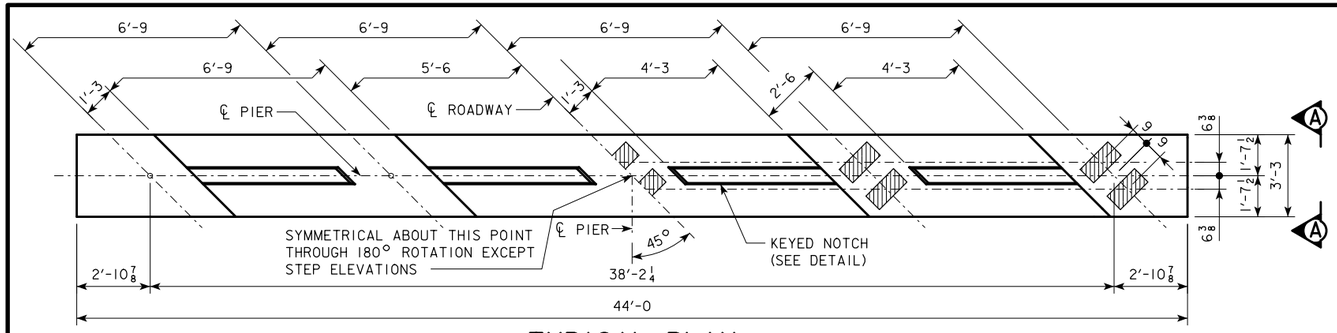
DECEMBER, 2006

PILE BENT PIERS HP14 PILES

30° SKEW

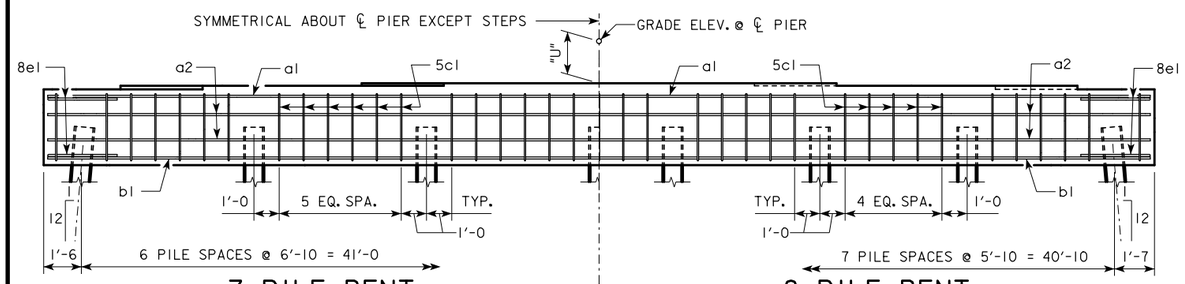
H30-53-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



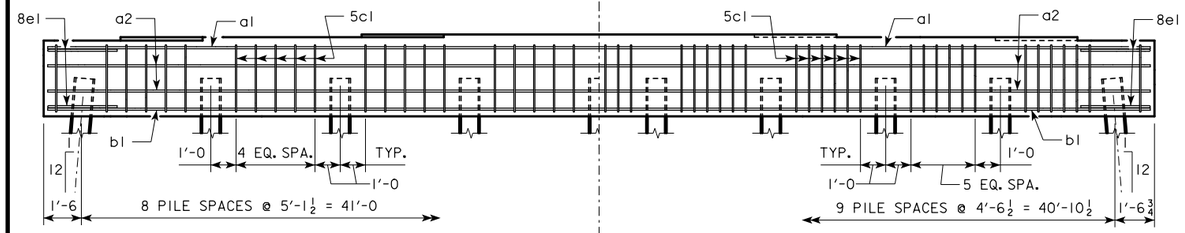
TYPICAL PLAN

NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-29-06 FOR "U" DIMENSION.



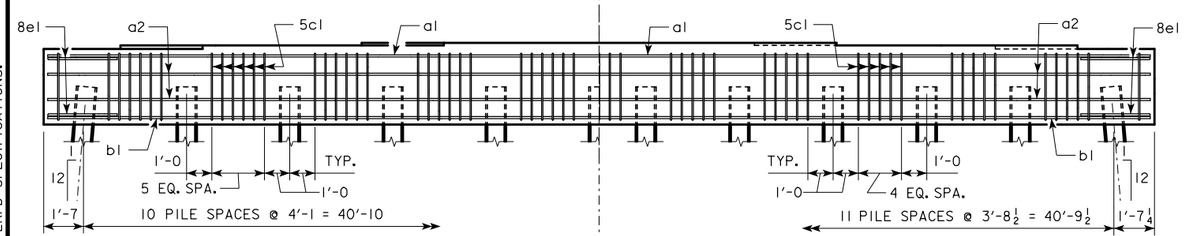
7 PILE BENT

8 PILE BENT



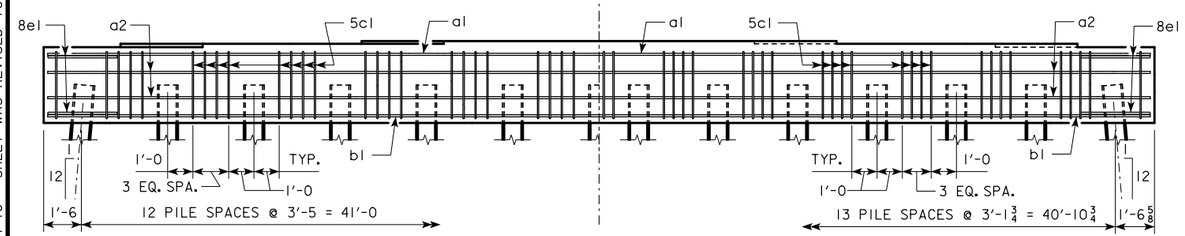
9 PILE BENT

10 PILE BENT



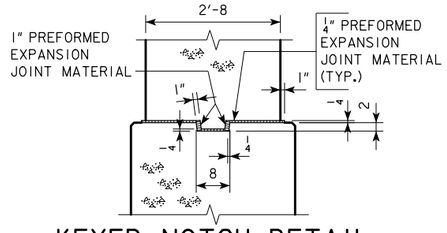
11 PILE BENT

12 PILE BENT

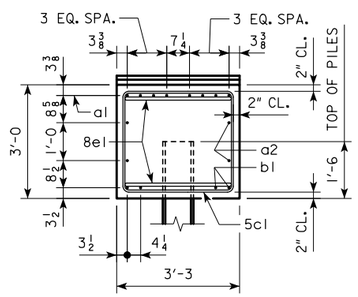


13 PILE BENT

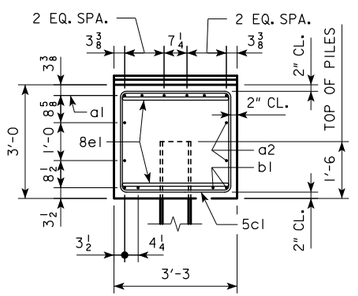
14 PILE BENT



KEYED NOTCH DETAIL



VIEW A-A
FOR 7, 8, 9 & 10 PILE BENTS



VIEW A-A
FOR 11, 12, 13 & 14 PILE BENTS

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

PILE BENT PIERS

45° SKEW

H30-54-06

PILE BENT NOTES:

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, TYPES 1, 2 AND 3, SEE STANDARD PIOL.

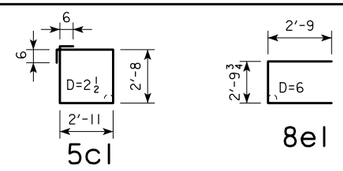
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

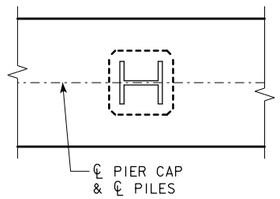
REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

				7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	43'-8	———		8	9	1188	8	9	1188	8	9	1188	8	9	1188	6	9	891	6	9	891	6	9	891	6	9	891
a2	43'-8	———		4	8	466	4	8	466	4	8	466	4	8	466	4	8	466	4	8	466	4	8	466	4	8	466
b1	43'-8	———		4	10	752	4	9	594	4	9	594	4	9	594	4	10	752	4	9	594	4	9	594	4	9	594
5c1	12'-2	▭		38	5	482	37	5	470	42	5	533	56	5	711	62	5	787	57	5	723	50	5	634	54	5	685
8e1	8'-4	▭		4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89
(1) REINFORCING STEEL (LB.)				2977			2807			2870			3048			2985			2763			2674			2725		
STRUCTURAL CONCRETE (CY) (2)		PILE TYPE																									
		1, 2		-----			-----			-----			16.4			16.4			16.3			16.3			16.2		
		3		16.9			16.9			16.9			16.9			16.9			16.9			-----			-----		

BENT BAR DETAILS



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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING — PIOL TYPE 1 OR 2			FRICTION OR POINT BEARING PILING — PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	(3) "K" (INCHES)	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	(4) LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	11	14	90	7	HP10x57	142
	10	16	99	8	HP12x53	124
151'-4	11	14	95	8	HP10x57	130
	10	16	104	8	HP12x53	130
163'-10	12	14	94	8	HP10x57	141
	11	16	102	9	HP12x53	125
176'-4	13	14	91	9	HP10x57	131
	11	16	107	9	HP12x53	131
188'-10	13	14	94	9	HP10x57	136
	12	16	102	10	HP12x53	123
201'-4	13	16	105	10	HP10x57	137
				11	HP12x53	124
213'-10	----	--	----	10	HP10x57	143
				11	HP12x53	130
226'-4	----	--	----	11	HP10x57	137
				12	HP12x53	126
243'-0	----	--	----	11	HP10x57	144
				12	HP12x53	132

(1) SEE SHEET H30-31-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

(2) CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT^3 PER FOOT OF EMBEDMENT. THE CONCRETE QUANTITIES FOR TYPE 3 PILES DO NOT REQUIRE REDUCTION FOR PILE EMBEDMENT.

(3) SEE STANDARD PIOL FOR "K" DIMENSION.

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

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

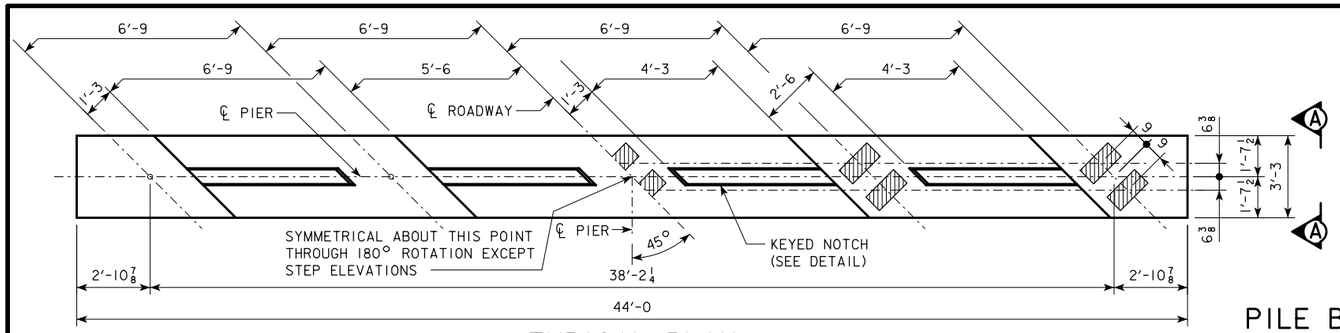
DECEMBER, 2006

PILE BENT PIERS

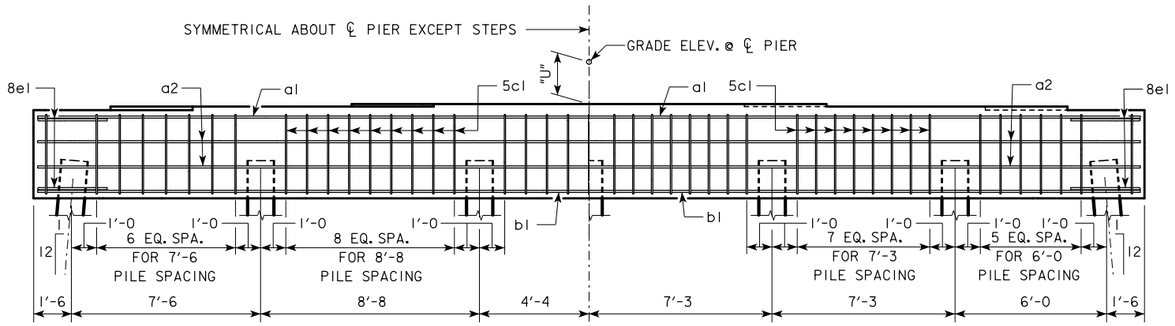
45° SKEW

H30-55-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

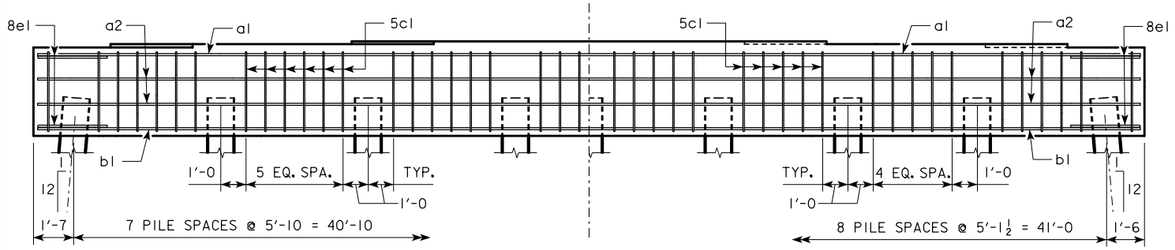


TYPICAL PLAN



6 PILE BENT

7 PILE BENT



8 PILE BENT

9 PILE BENT

PILE BENT NOTES:

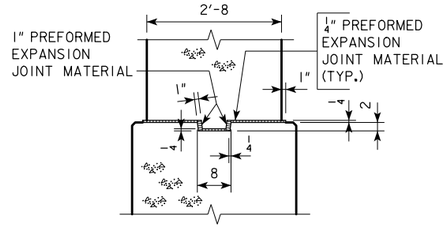
THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND DRIFT CONDITIONS ARE NOT SEVERE.

FOR DETAILS OF TRESTLE PILES, SEE STANDARD PIOL.

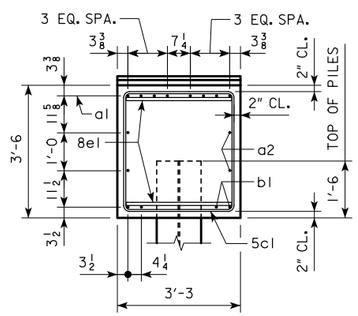
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE SEAT IS EQUAL TO THE DIFFERENCE IN ELEVATIONS OF THE TOP OF SLAB AT ADJACENT BEAMS ALONG ℄ PIER.
SEE SHEET H30-29-06 FOR "U" DIMENSION.



KEYED NOTCH DETAIL

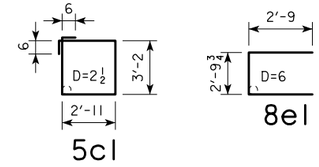


VIEW A-A
FOR 6, 7, 8 & 9 PILE BENTS

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

BAR	LENGTH	SHAPE	6 PILE BENT NO.	6 PILE BENT SIZE	6 PILE BENT WEIGHT	7 PILE BENT NO.	7 PILE BENT SIZE	7 PILE BENT WEIGHT	8 PILE BENT NO.	8 PILE BENT SIZE	8 PILE BENT WEIGHT	9 PILE BENT NO.	9 PILE BENT SIZE	9 PILE BENT WEIGHT
a1	43'-8		8	9	1188	8	9	1188	8	9	1188	8	9	1188
a2	43'-8		4	8	466	4	8	466	4	8	466	4	8	466
b1	43'-8		4	9	594	4	10	752	4	9	594	4	9	594
5c1	13'-2		43	5	591	46	5	632	44	5	604	42	5	577
8e1	8'-4		4	8	89	4	8	89	4	8	89	4	8	89
① REINFORCING STEEL (LB.)			2928			3127			2941			2914		
STRUCTURAL CONCRETE (CY)		PILE TYPE 3	19.5			19.5			19.5			19.5		

BENT BAR DETAILS



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

FRICTION OR POINT BEARING PILING

℄-℄ ABUTMENT BEARING	PIOL TYPE 3 NUMBER OF TRESTLE PILES	PILE SIZE	② LRFD Pu, STRENGTH I, DES. LOAD (KIPS)
138'-10	6	HP14x73	167
	6	HP14x89	167
151'-4	6	HP14x73	176
	6	HP14x89	176
163'-10	7	HP14x73	163
	6	HP14x89	190
176'-4	7	HP14x73	170
	6	HP14x89	198
188'-10	7	HP14x73	177
	6	HP14x89	207
201'-4	8	HP14x73	172
	7	HP14x89	197
213'-10	8	HP14x73	181
	7	HP14x89	207
226'-4	9	HP14x73	169
	7	HP14x89	217
243'-0	9	HP14x73	177
	8	HP14x89	199

① SEE SHEET H30-31-06 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

② NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

NOTE: FRICTION BEARING INCLUDES SIDE FRICTION AND END BEARING IN SOIL. POINT BEARING INCLUDES SIDE FRICTION AND POINT BEARING IN ROCK.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

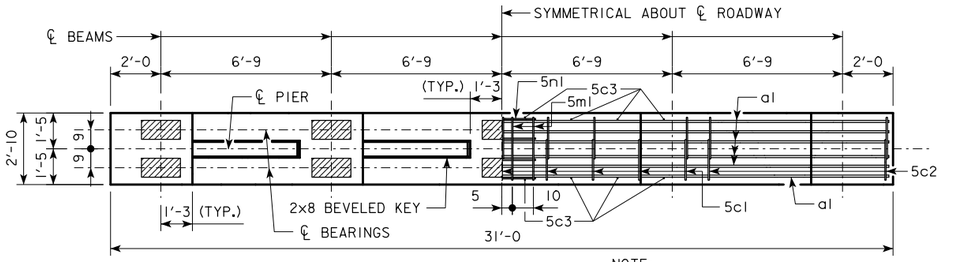
DECEMBER, 2006

PILE BENT PIERS HP14 PILES

45° SKEW

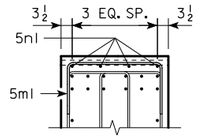
H30-56-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



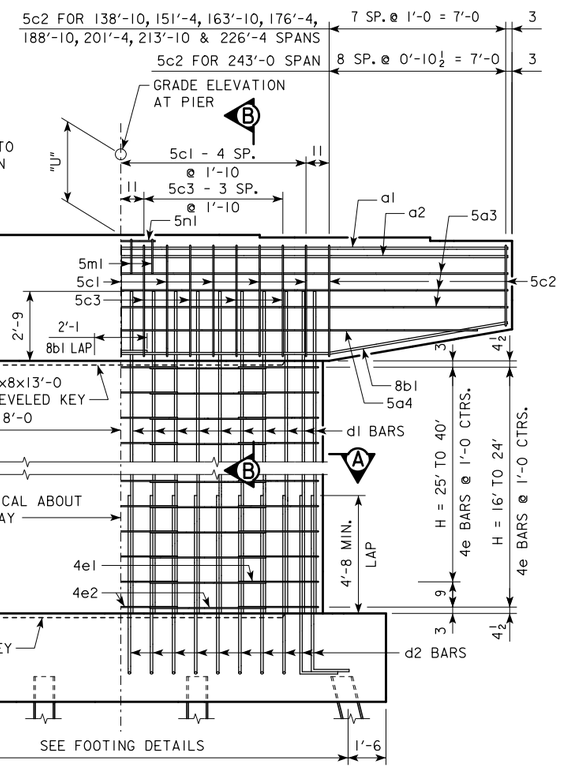
CAP PLAN

NOTE:
FOR SIZE OF BEARING PADS SEE H30-44-06.

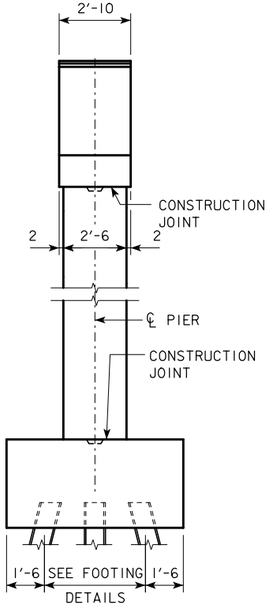


5m1 & 5n1 BAR LAYOUT

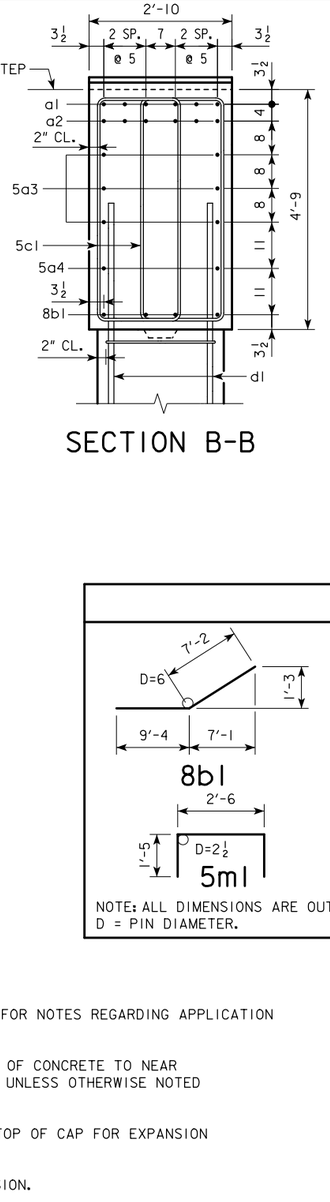
NOTE:
SHIFT 5c1 BARS TO CLEAR d1 COLUMN BARS ALL SPANS



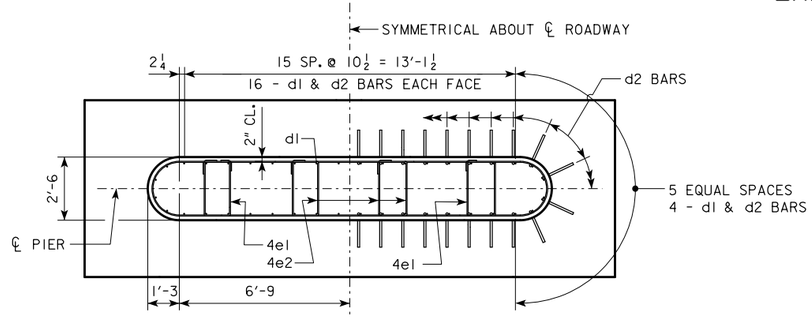
FRONT ELEVATION



END ELEVATION



SECTION B-B



SECTION A-A

PIER NOTES:

SEE "TEE PIER NOTES" ON H30-02-06 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

ELIMINATE 2x8 BEVELED KEYWAY ON TOP OF CAP FOR EXPANSION PIERS.

SEE SHEET H30-09-06 FOR "U" DIMENSION.

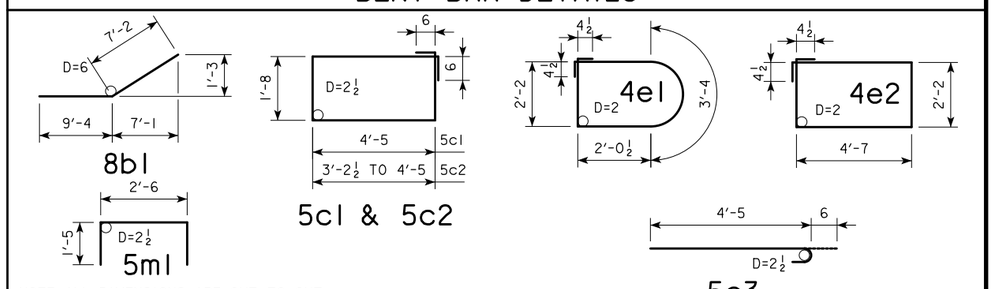
CAP

REINFORCING STEEL	℄ - ℄ ABUT. BEARINGS		138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
	BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
	a1	30'-8		6	7	376	6	7	376	6	7	376	6	8	491	6	8	491	6	8	491	6	8	491	6	8	491	6	9	626
	a2	30'-8		6	7	376	6	7	376	6	7	376	6	7	376	6	7	376	6	8	491	6	8	491	6	8	491	6	8	491
	5a3	30'-8		6	5	192	6	5	192	6	5	192	6	5	192	6	5	192	6	5	192	6	5	192	6	5	192	6	5	192
	5a4	28'-3		2	5	59	2	5	59	2	5	59	2	5	59	2	5	59	2	5	59	2	5	59	2	5	59	2	5	59
	8b1	16'-6		8	8	352	8	8	352	8	8	352	8	8	352	8	8	352	8	8	352	8	8	352	8	8	352	8	8	352
	5c1	13'-2		18	5	247	18	5	247	18	5	247	18	5	247	18	5	247	18	5	247	18	5	247	18	5	247	18	5	247
	5c2	VARIES		32	5	399	32	5	399	32	5	399	32	5	399	32	5	399	32	5	399	32	5	399	32	5	399	36	5	449
	5c3	4'-11		16	5	82	16	5	82	16	5	82	16	5	82	16	5	82	16	5	82	16	5	82	16	5	82	16	5	82
	5m1	5'-4		4	5	22	4	5	22	4	5	22	4	5	22	4	5	22	4	5	22	4	5	22	4	5	22	4	5	22
	5n1	2'-8		4	5	11	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11	4	5	11
	TOTAL (LB.)			2116			2116			2116			2231			2231			2346			2346			2481			2531		
STRUCTURAL CONCRETE (CY)				15.0			15.0			15.0			15.0			15.0			15.0			15.0			15.0					

COLUMN

H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)
			d1 BAR				4e1 BAR				4e2 BAR				
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	7'-9	11.1	40	9	10'-6	1428	16	4	10'-4	110	24	4	14'-3	228	1766
17	8'-9	12.5	40	9	11'-6	1564	18	4	10'-4	124	27	4	14'-3	257	1945
18	9'-9	14.0	40	9	12'-6	1700	20	4	10'-4	138	30	4	14'-3	286	2124
19	10'-9	15.4	40	9	13'-6	1836	22	4	10'-4	152	33	4	14'-3	314	2302
20	11'-9	16.8	40	9	14'-6	1972	24	4	10'-4	166	36	4	14'-3	343	2481
21	12'-9	18.3	40	9	15'-6	2108	26	4	10'-4	179	39	4	14'-3	371	2658
22	13'-9	19.7	40	9	16'-6	2244	28	4	10'-4	193	42	4	14'-3	400	2837
23	14'-9	21.1	40	9	17'-6	2380	30	4	10'-4	207	45	4	14'-3	428	3015
24	15'-9	22.6	40	9	18'-6	2516	32	4	10'-4	221	48	4	14'-3	457	3194
25	16'-3	23.3	40	9	19'-0	2584	34	4	10'-4	235	51	4	14'-3	485	3304
26	17'-3	24.7	40	9	20'-0	2720	36	4	10'-4	248	54	4	14'-3	514	3482
27	18'-3	26.1	40	9	21'-0	2856	38	4	10'-4	262	57	4	14'-3	543	3661
28	19'-3	27.6	40	9	22'-0	2992	40	4	10'-4	276	60	4	14'-3	571	3839
29	20'-3	29.0	40	9	23'-0	3128	42	4	10'-4	290	63	4	14'-3	600	4018
30	21'-3	30.4	40	9	24'-0	3264	44	4	10'-4	304	66	4	14'-3	628	4196
31	22'-3	31.9	40	9	25'-0	3400	46	4	10'-4	318	69	4	14'-3	657	4375
32	23'-3	33.3	40	9	26'-0	3536	48	4	10'-4	331	72	4	14'-3	685	4552
33	24'-3	34.7	40	9	27'-0	3672	50	4	10'-4	345	75	4	14'-3	714	4731
34	25'-3	36.2	40	9	28'-0	3808	52	4	10'-4	359	78	4	14'-3	742	4909
35	26'-3	37.6	40	9	29'-0	3944	54	4	10'-4	373	81	4	14'-3	771	5088
36	27'-3	39.0	40	9	30'-0	4080	56	4	10'-4	387	84	4	14'-3	800	5267
37	28'-3	40.4	40	9	31'-0	4216	58	4	10'-4	400	87	4	14'-3	828	5444
38	29'-3	41.9	40	9	32'-0	4352	60	4	10'-4	414	90	4	14'-3	857	5623
39	30'-3	43.3	40	9	33'-0	4488	62	4	10'-4	428	93	4	14'-3	885	5801
40	31'-3	44.7	40	9	34'-0	4624	64	4	10'-4	442	96	4	14'-3	914	5980

BENT BAR DETAILS



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

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

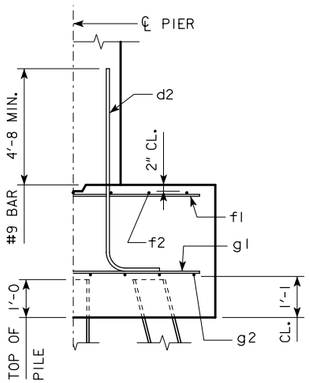
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

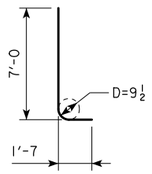
TEE PIER CAP AND COLUMN

0° SKEW

H30-57-06



TYPICAL SECTION



d2

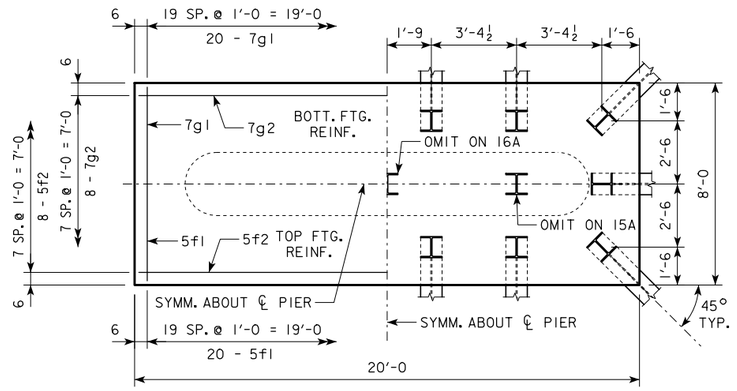
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	15A	141	3'-6 x 8' x 20'
	213'-10	16A	138	
	226'-4	16A	144	
	243'-0	17A	144	
19 TO 21	201'-4	15B	143	3'-6 x 8' x 22'
	213'-10	16B	140	
	226'-4	16B	146	
	243'-0	17B	146	
22 TO 24	201'-4	16B	139	3'-6 x 8' x 22'
	213'-10	16B	144	
	226'-4	17B	144	
	243'-0	18A	143	

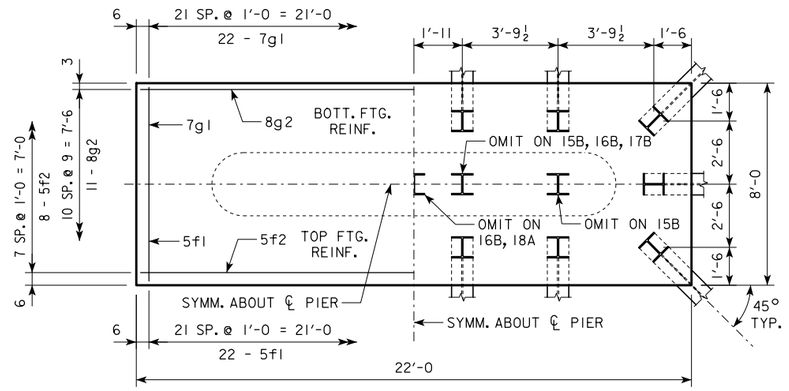
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 20'	d2	40 - #9 AS SHOWN	8'-7	1167	2126	20.7
	f1	20 - #5 @ 1'-0	7'-8	160		
	f2	8 - #5 @ 1'-0	19'-8	164		
	g1	20 - #7 1'-0	7'-8	313		
	g2	8 - #7 @ 1'-0	19'-8	322		
3'-6 x 8' x 22'	d2	40 - #9 AS SHOWN	8'-7	1167	2505	22.8
	f1	22 - #5 @ 1'-0	7'-8	176		
	f2	8 - #5 @ 1'-0	21'-8	181		
	g1	22 - #7 @ 1'-0	7'-8	345		
	g2	11 - #8 @ 0'-9	21'-8	636		

d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



3'-6 x 8'-0 x 20'-0 FOR 15A, 16A & 17A



3'-6 x 8'-0 x 22'-0 FOR 15B, 16B, 17B & 18A

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

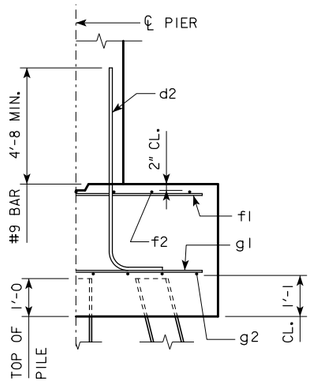
DECEMBER, 2006

TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS

0° SKEW - H=16' to 24'

H30-58-06

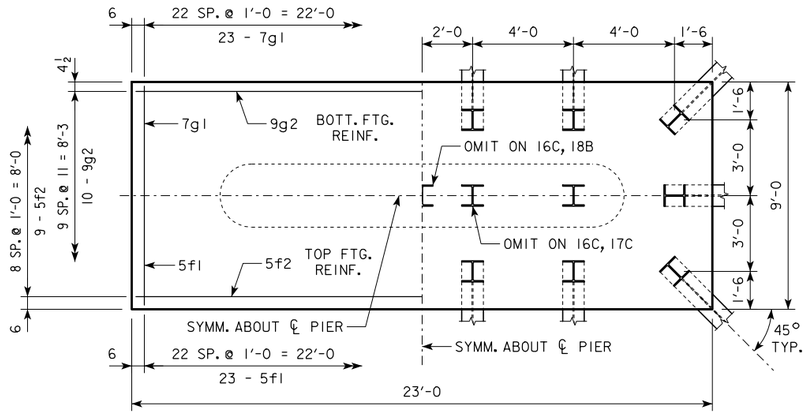
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



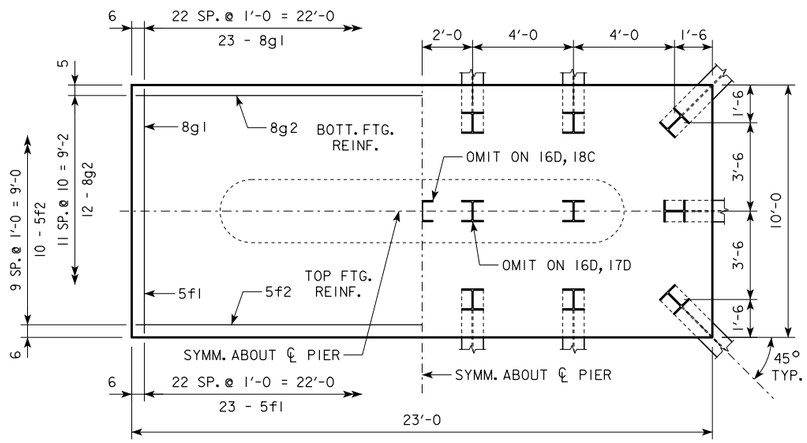
TYPICAL SECTION

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	16C	138	4' x 9' x 23'
	213'-10	16C	143	
	226'-4	17C	143	
	243'-0	18B	143	
28 TO 30	201'-4	16D	139	4' x 10' x 23'
	213'-10	16D	144	
	226'-4	17D	144	
	243'-0	18C	144	
31 TO 33	201'-4	16E	142	4' x 11' x 23'
	213'-10	16E	146	
	226'-4	17E	146	
	243'-0	18D	145	
34 TO 36	201'-4	17F	138	4' x 11' x 25'
	213'-10	17F	141	
	226'-4	17F	144	
	243'-0	18E	141	
37 TO 40	201'-4	18E	135	4' x 11' x 25'
	213'-10	18E	138	
	226'-4	18E	141	
	243'-0	18E	146	

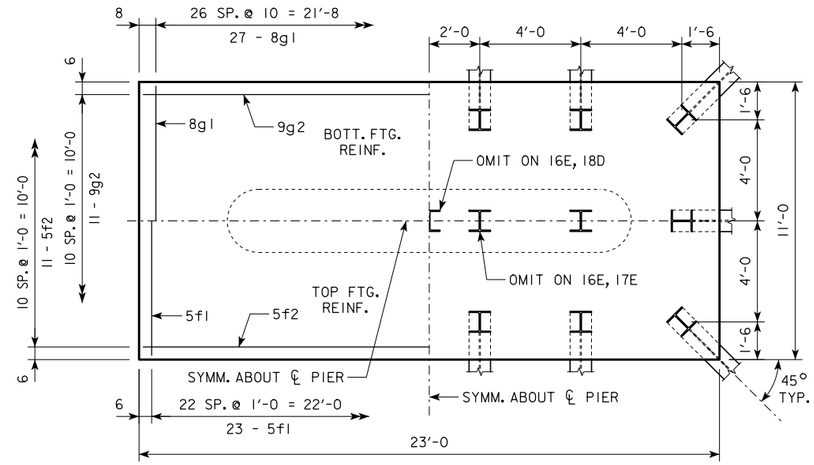
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	2834	30.7
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	23 - #7 @ 1'-0	8'-8	407		
	g2	10 - #9 @ 0'-11	22'-8	771		
4' x 10' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3023	34.1
	f1	23 - #5 @ 1'-0	9'-8	232		
	f2	10 - #5 @ 1'-0	22'-8	236		
	g1	23 - #8 @ 1'-0	9'-8	594		
	g2	12 - #8 @ 0'-10	22'-8	726		
4' x 11' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3368	37.5
	f1	23 - #5 @ 1'-0	10'-8	256		
	f2	11 - #5 @ 1'-0	22'-8	260		
	g1	27 - #8 @ 0'-10	10'-8	769		
	g2	11 - #9 @ 1'-0	22'-8	848		
4' x 11' x 25'	d2	40 - #9 AS SHOWN	9'-1	1235	3877	40.7
	f1	25 - #5 @ 1'-0	10'-8	278		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	25 - #9 @ 1'-0	10'-8	907		
	g2	14 - #9 @ 0'-9½	24'-8	1174		



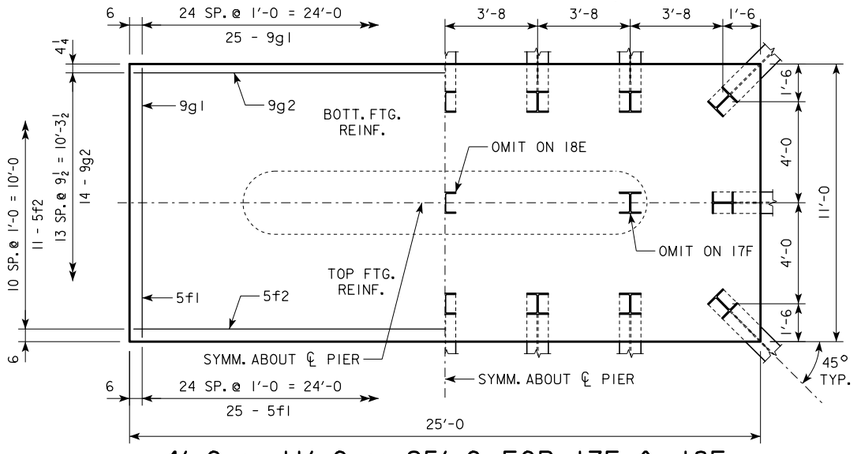
4'-0 x 9'-0 x 23'-0 FOR 16C, 17C & 18B



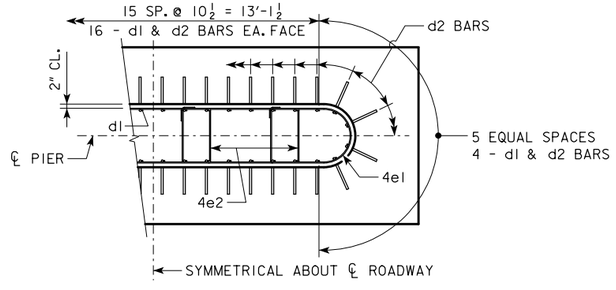
4'-0 x 10'-0 x 23'-0 FOR 16D, 17D & 18C



4'-0 x 11'-0 x 23'-0 FOR 16E, 17E & 18D

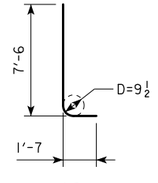


4'-0 x 11'-0 x 25'-0 FOR 17F & 18E



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

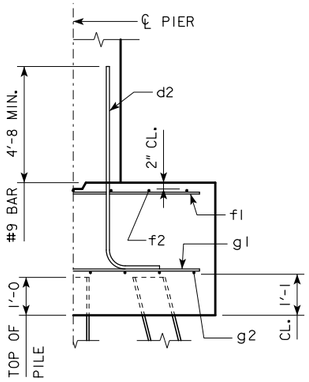
DECEMBER, 2006

TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

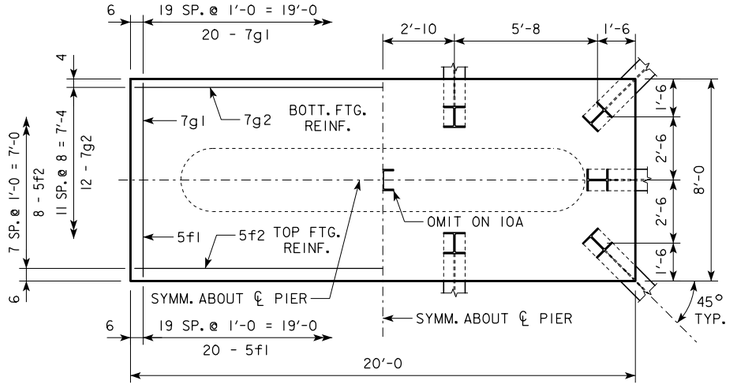
0° SKEW - H=25' to 40'

H30-59-06

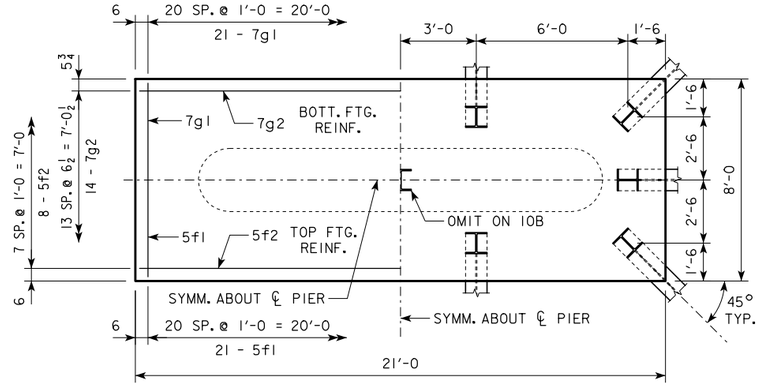
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



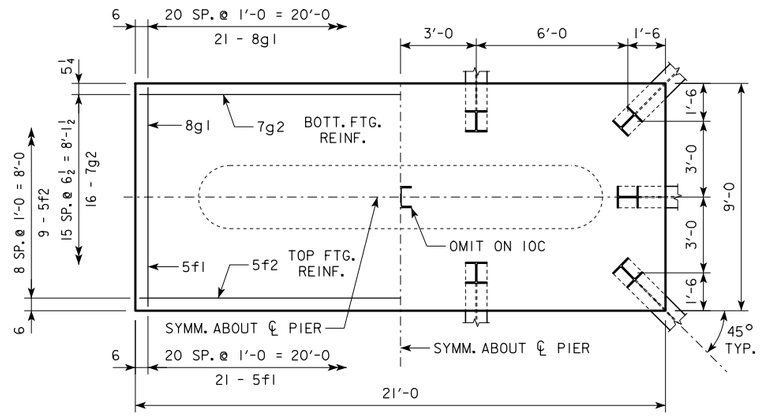
TYPICAL SECTION



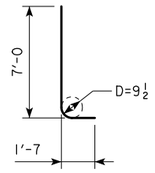
3'-6 x 8'-0 x 20'-0 FOR 10A & 11A



3'-6 x 8'-0 x 21'-0 FOR 10B & 11B



3'-6 x 9'-0 x 21'-0 FOR 10C & 11C

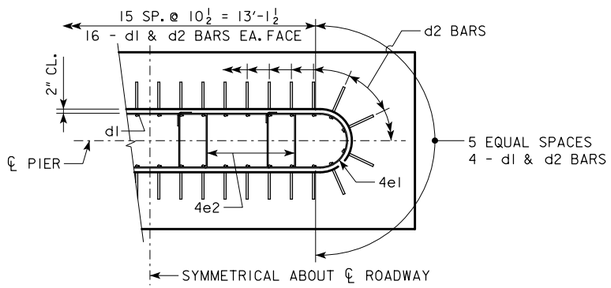


d2

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

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	10A	203	3'-6 x 8' x 20'
	213'-10	10A	211	
	226'-4	11A	206	
	243'-0	11A	214	
19 TO 21	201'-4	10B	208	3'-6 x 8' x 21'
	213'-10	10B	215	
	226'-4	11B	210	
	243'-0	11B	218	
22 TO 24	201'-4	10C	209	3'-6 x 9' x 21'
	213'-10	10C	216	
	226'-4	11C	211	
	243'-0	11C	219	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 20'	d2	40 - #9 AS SHOWN	8'-7	1167	2286	20.7
	f1	20 - #5 @ 1'-0	7'-8	160		
	f2	8 - #5 @ 1'-0	19'-8	164		
	g1	20 - #7 @ 1'-0	7'-8	313		
	g2	12 - #7 @ 0'-8	19'-8	482		
3'-6 x 8' x 21'	d2	40 - #9 AS SHOWN	8'-7	1167	2427	21.8
	f1	21 - #5 @ 1'-0	7'-8	168		
	f2	8 - #5 @ 1'-0	20'-8	172		
	g1	21 - #7 @ 1'-0	7'-8	329		
	g2	14 - #7 @ 0'-6 1/2	20'-8	591		
3'-6 x 9' x 21'	d2	40 - #9 AS SHOWN	8'-7	1167	2713	24.5
	f1	21 - #5 @ 1'-0	8'-8	190		
	f2	9 - #5 @ 1'-0	20'-8	194		
	g1	21 - #8 @ 1'-0	8'-8	486		
	g2	16 - #7 @ 0'-6 1/2	20'-8	676		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

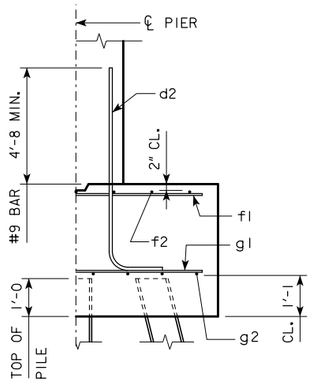
IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS
0° SKEW - H=16' to 24'

H30-60-06

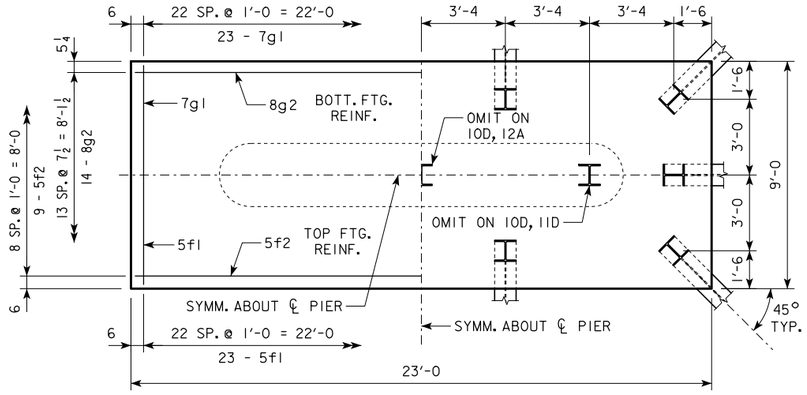
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



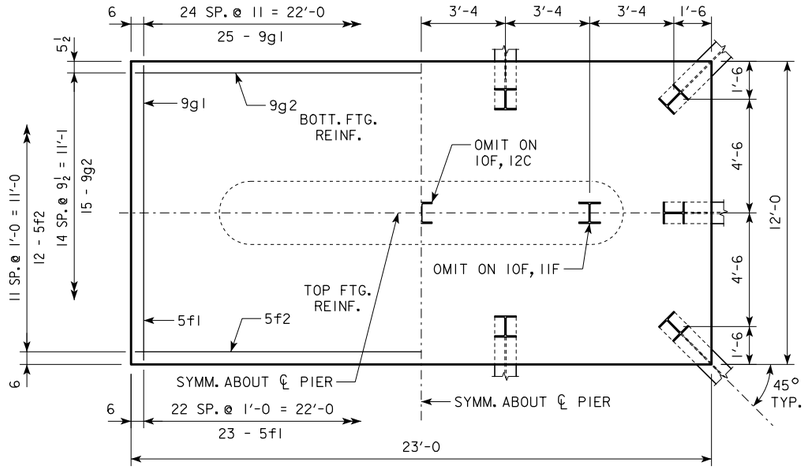
TYPICAL SECTION

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	10D	212	4' x 9' x 23'
	213'-10	10D	219	
	226'-4	11D	213	
	243'-0	12A	204	
28 TO 30	201'-4	10D	216	4' x 9' x 23'
	213'-10	11D	211	
	226'-4	11D	219	
	243'-0	12A	210	
31 TO 33	201'-4	10E	218	4' x 10' x 23'
	213'-10	11E	212	
	226'-4	12B	204	
	243'-0	12B	211	
34 TO 36	201'-4	10F	218	4' x 12' x 23'
	213'-10	11F	211	
	226'-4	11F	220	
	243'-0	12C	210	
37 TO 40	201'-4	12D	195	4' x 12' x 24'
	213'-10	12D	201	
	226'-4	12D	208	
	243'-0	12D	215	

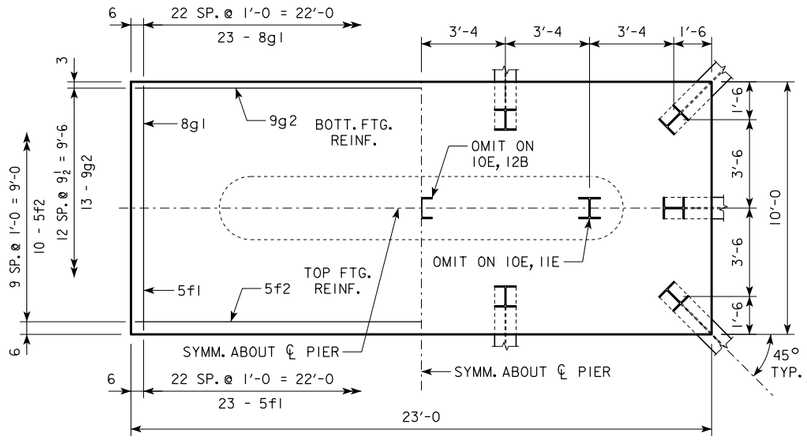
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	2910	30.7
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	23 - #7 @ 1'-0	8'-8	407		
	g2	14 - #8 @ 0'-7½	22'-8	847		
4' x 10' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3299	34.1
	f1	23 - #5 @ 1'-0	9'-8	232		
	f2	10 - #5 @ 1'-0	22'-8	236		
	g1	23 - #8 @ 1'-0	9'-8	594		
	g2	13 - #9 @ 0'-9½	22'-8	1002		
4' x 12' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3947	40.9
	f1	23 - #5 @ 1'-0	11'-8	280		
	f2	12 - #5 @ 1'-0	22'-8	284		
	g1	25 - #9 @ 0'-11	11'-8	992		
	g2	15 - #9 @ 0'-9½	22'-8	1156		
4' x 12' x 24'	d2	40 - #9 AS SHOWN	9'-1	1235	4022	42.7
	f1	24 - #5 @ 1'-0	11'-8	292		
	f2	12 - #5 @ 1'-0	23'-8	296		
	g1	25 - #9 @ 0'-11½	11'-8	992		
	g2	15 - #9 @ 0'-9½	23'-8	1207		



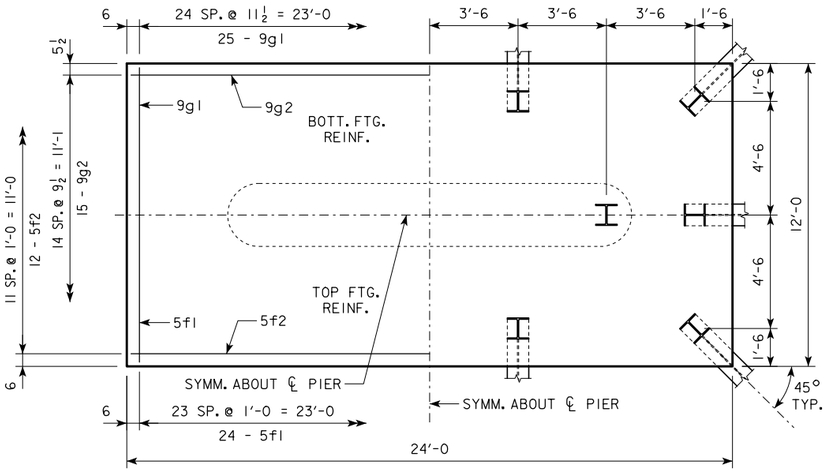
4'-0 x 9'-0 x 23'-0 FOR 10D, 11D & 12A



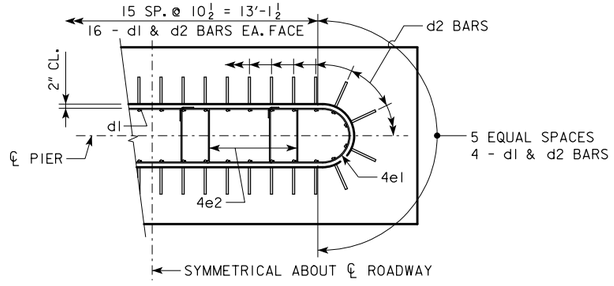
4'-0 x 12'-0 x 23'-0 FOR 10F, 11F & 12C



4'-0 x 10'-0 x 23'-0 FOR 10E, 11E & 12B

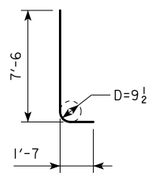


4'-0 x 12'-0 x 24'-0 FOR 12D



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

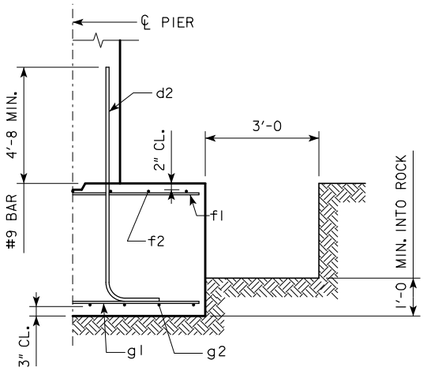
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

0° SKEW - H=25' to 40'

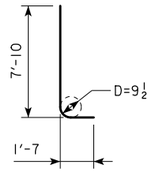
H30-61-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

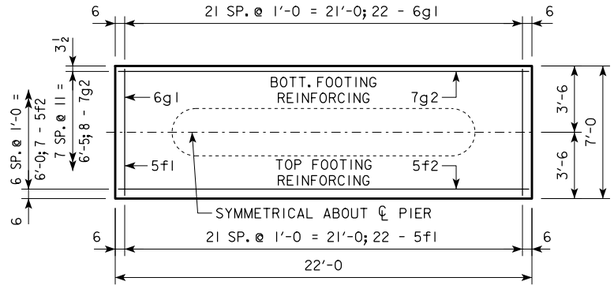
H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4	3'-6 x 7' x 22'
	163'-10 176'-4 188'-10	3'-6 x 7' x 24'
	201'-4 213'-10 226'-4	3'-6 x 8' x 24'
	243'-0	3'-6 x 9' x 24'
19 TO 21	138'-10 151'-4	3'-6 x 7' x 22'
	163'-10 176'-4	3'-6 x 7' x 24'
	188'-10 201'-4 213'-10	3'-6 x 8' x 24'
	226'-4 243'-0	3'-6 x 9' x 24'
22 TO 24	138'-10 151'-4 163'-10	3'-6 x 7' x 24'
	176'-4 188'-10 201'-4 213'-10	3'-6 x 8' x 24'
	226'-4 243'-0	3'-6 x 9' x 24'



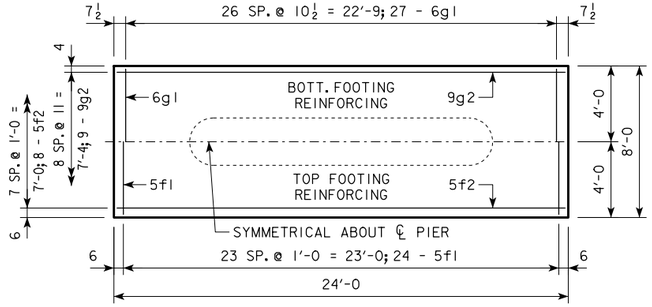
d2

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

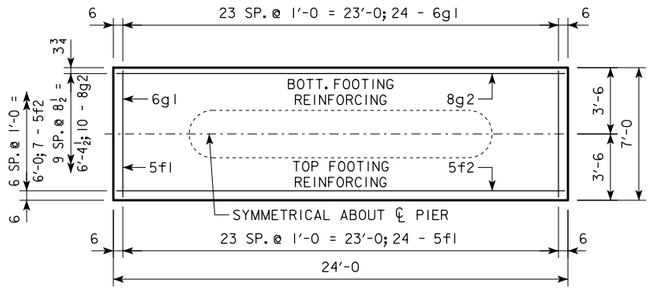
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 7' x 22'	d2	40 - #9 AS SHOWN	9'-5	1281	2166	20.0
	f1	22 - #5 @ 1'-0	6'-8	153		
	f2	7 - #5 @ 1'-0	21'-8	158		
	g1	22 - #6 @ 1'-0	6'-8	220		
	g2	8 - #7 @ 0'-11	21'-8	354		
3'-6 x 7' x 24'	d2	40 - #9 AS SHOWN	9'-5	1281	2493	21.8
	f1	24 - #5 @ 1'-0	6'-8	167		
	f2	7 - #5 @ 1'-0	23'-8	173		
	g1	24 - #6 @ 1'-0	6'-8	240		
	g2	10 - #8 @ 0'-8½	23'-8	632		
3'-6 x 8' x 24'	d2	40 - #9 AS SHOWN	9'-5	1281	2705	24.9
	f1	24 - #5 @ 1'-0	7'-8	192		
	f2	8 - #5 @ 1'-0	23'-8	197		
	g1	27 - #6 @ 0'-10½	7'-8	311		
	g2	9 - #9 @ 0'-11	23'-8	724		
3'-6 x 9' x 24'	d2	40 - #9 AS SHOWN	9'-5	1281	2986	28.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	26 - #7 @ 0'-11	8'-8	461		
	g2	10 - #9 @ 0'-11	23'-8	805		



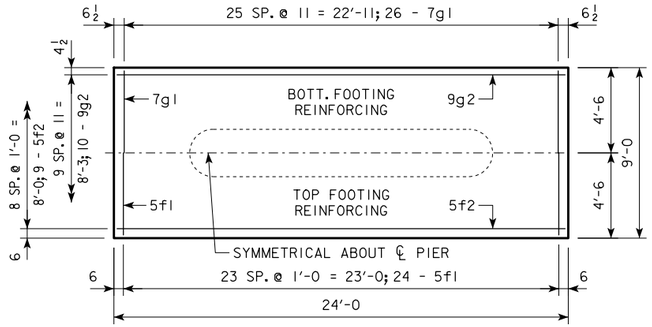
3'-6 x 7'-0 x 22'-0



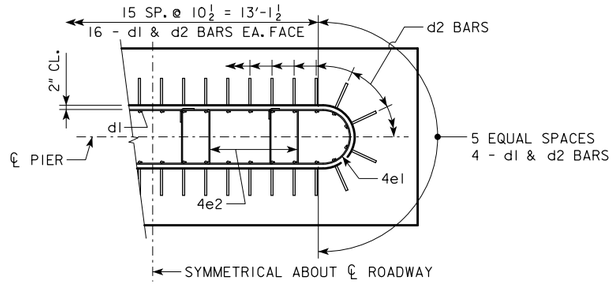
3'-6 x 8'-0 x 24'-0



3'-6 x 7'-0 x 24'-0



3'-6 x 9'-0 x 24'-0



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

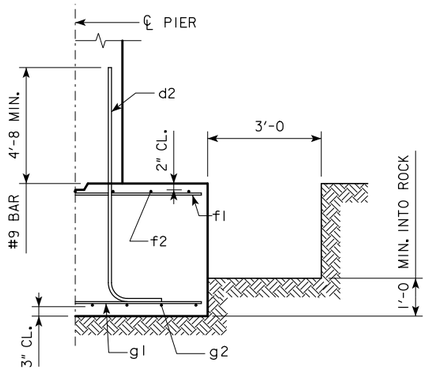
TEE PIER - SPREAD FOOTINGS

0° SKEW - H=16' to 24'

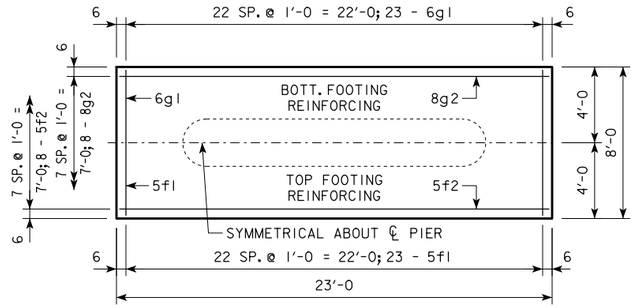
H30-62-06

REVISED 04-13 - FOOTING NOTES MODIFIED.

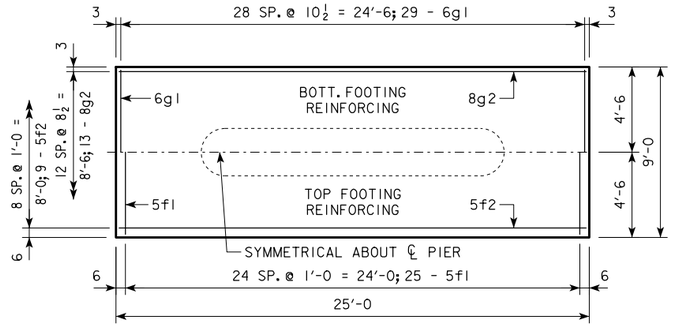
H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10 151′-4 163′-10 176′-4 188′-10	4′ x 8′ x 23′
	201′-4 213′-10	4′ x 8′ x 25′
	226′-4 243′-0	4′ x 9′ x 25′
28 TO 30	138′-10 151′-4 163′-10 176′-4 188′-10 201′-4	4′ x 8′ x 25′
	213′-10 226′-4 243′-0	4′ x 9′ x 25′
31 TO 33	138′-10 151′-4 163′-10 176′-4 188′-10	4′ x 8′ x 25′
	201′-4 213′-10 226′-4 243′-0	4′ x 9′ x 25′
34 TO 36	138′-10 151′-4 163′-10 176′-4 188′-10 201′-4 213′-10 226′-4	4′ x 9′ x 25′
	243′-0	4′ x 9′ x 27′
37 TO 40	138′-10 151′-4 163′-10 176′-4 188′-10 201′-4	4′ x 9′ x 25′
	213′-10 226′-4 243′-0	4′ x 9′ x 27′



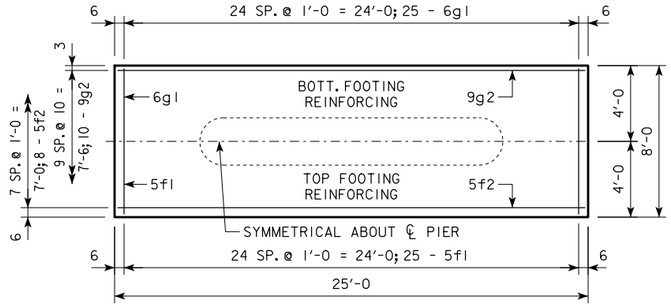
TYPICAL SECTION



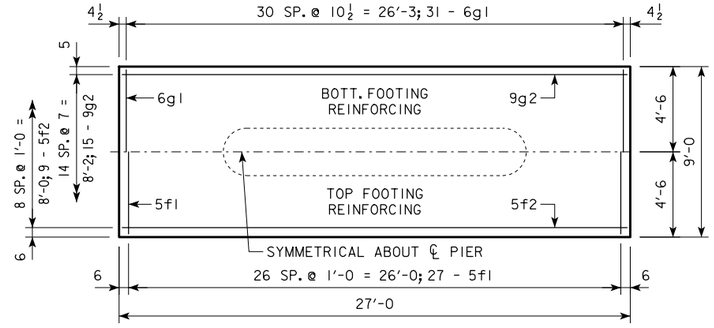
4′-0 x 8′-0 x 23′-0



4′-0 x 9′-0 x 25′-0

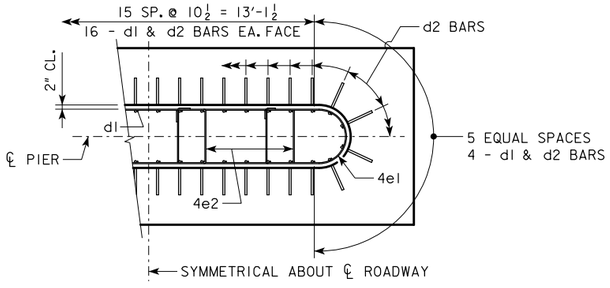


4′-0 x 8′-0 x 25′-0

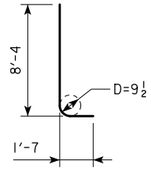


4′-0 x 9′-0 x 27′-0

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4′ x 8′ x 23′	d2	40 - #9 AS SHOWN	9′-11	1349	2471	27.3
	f1	23 - #5 @ 1′-0	7′-8	184		
	f2	8 - #5 @ 1′-0	22′-8	189		
	g1	23 - #6 @ 1′-0	7′-8	265		
	g2	8 - #8 @ 1′-0	22′-8	484		
4′ x 8′ x 25′	d2	40 - #9 AS SHOWN	9′-11	1349	2882	29.6
	f1	25 - #5 @ 1′-0	7′-8	200		
	f2	8 - #5 @ 1′-0	24′-8	206		
	g1	25 - #6 @ 1′-0	7′-8	288		
	g2	10 - #9 @ 0′-10	24′-8	839		
4′ x 9′ x 25′	d2	40 - #9 AS SHOWN	9′-11	1349	3041	33.3
	f1	25 - #5 @ 1′-0	8′-8	226		
	f2	9 - #5 @ 1′-0	24′-8	232		
	g1	29 - #6 @ 0′-10½	8′-8	378		
	g2	13 - #8 @ 0′-8½	24′-8	856		
4′ x 9′ x 27′	d2	40 - #9 AS SHOWN	9′-11	1349	3607	36.0
	f1	27 - #5 @ 1′-0	8′-8	244		
	f2	9 - #5 @ 1′-0	26′-8	250		
	g1	31 - #6 @ 0′-10½	8′-8	404		
	g2	15 - #9 @ 0′-7	26′-8	1360		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-57-06.)



d2

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

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

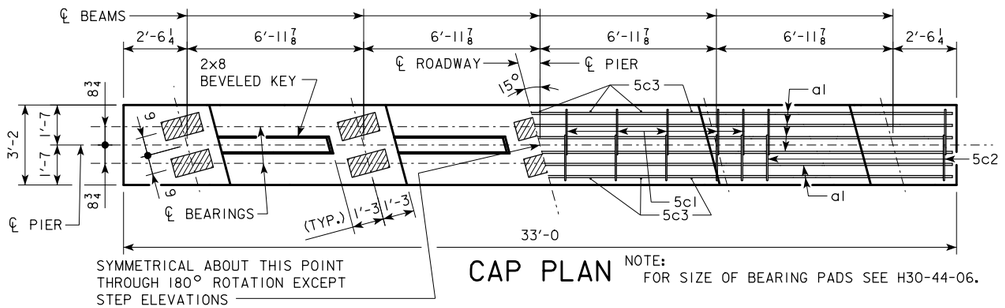
DECEMBER, 2006

TEE PIER - SPREAD FOOTINGS

0° SKEW - H=25′ to 40′

H30-63-06

REVISED 04-13 - FOOTING NOTES MODIFIED.



CAP PLAN

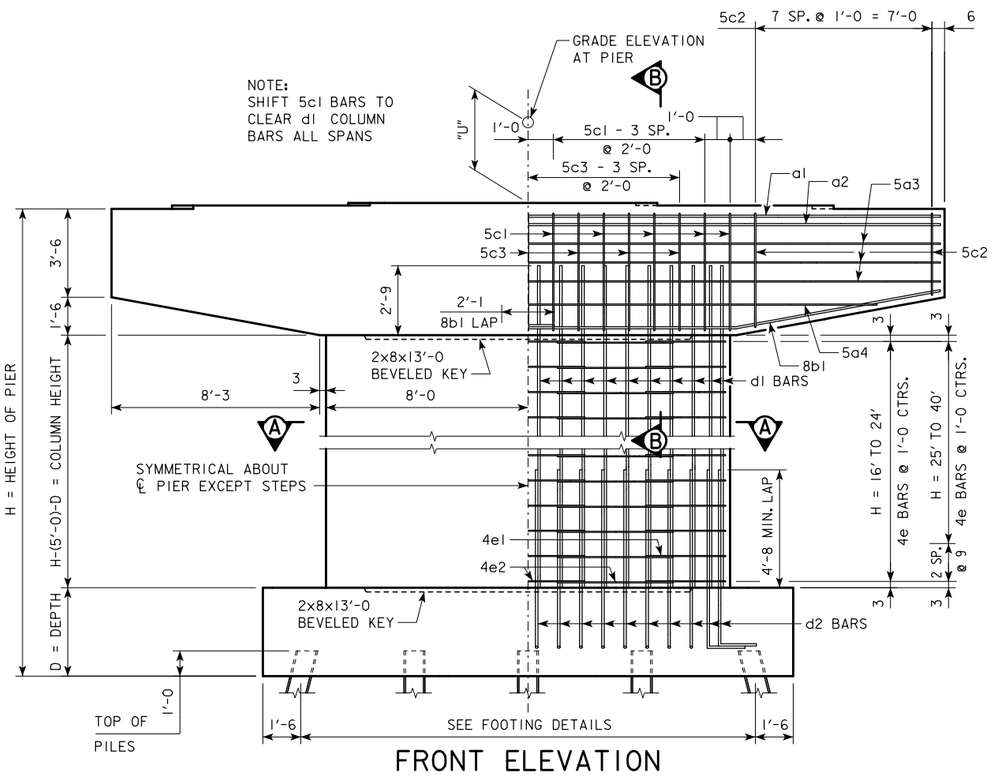
NOTE: FOR SIZE OF BEARING PADS SEE H30-44-06.

CAP

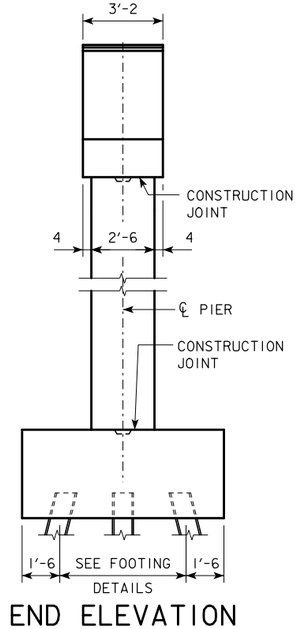
REINFORCING STEEL	℄ - ℄ ABUT. BEARINGS			138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
	BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
	a1	32'-8		6	7	401	6	7	401	6	8	523	6	8	523	6	8	523	6	8	523	6	8	523	6	9	666	6	9	666
	a2	32'-8		6	7	401	6	7	401	6	7	401	6	7	401	6	7	401	6	8	523	6	8	523	6	8	523	6	8	523
	5a3	32'-8		6	5	204	6	5	204	6	5	204	6	5	204	6	5	204	6	5	204	6	5	204	6	5	204	6	5	204
	5a4	27'-7		2	5	58	2	5	58	2	5	58	2	5	58	2	5	58	2	5	58	2	5	58	2	5	58	2	5	58
	8b1	17'-6		8	8	374	8	8	374	8	8	374	8	8	374	8	8	374	8	8	374	8	8	374	8	8	374	8	8	374
	5c1	14'-0		20	5	292	20	5	292	20	5	292	20	5	292	20	5	292	20	5	292	20	5	292	20	5	292	20	5	292
	5c2	VARIES		32	5	414	32	5	414	32	5	414	32	5	414	32	5	414	32	5	414	32	5	414	32	5	414	32	5	414
	5c3	5'-2		14	5	75	14	5	75	14	5	75	14	5	75	14	5	75	14	5	75	14	5	75	14	5	75	14	5	75
①	TOTAL (LB.)			2219			2219			2341			2341			2341			2463			2463			2606			2606		
STRUCTURAL CONCRETE (CY)				18.5			18.5			18.5			18.5			18.5			18.5			18.5			18.5			18.5		

COLUMN

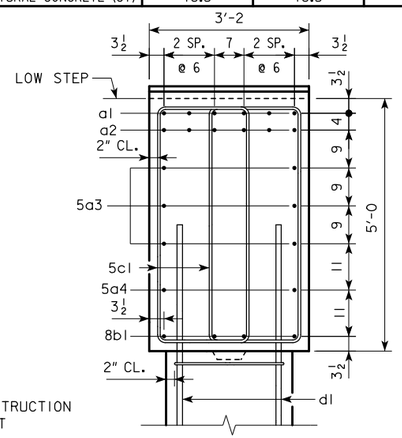
H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)
			d1 BAR				4e1 BAR				4e2 BAR				
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	7'-6	10.7	40	9	10'-3	1394	16	4	10'-4	110	24	4	14'-3	228	1732
17	8'-6	12.2	40	9	11'-3	1530	18	4	10'-4	124	27	4	14'-3	257	1911
18	9'-6	13.6	40	9	12'-3	1666	20	4	10'-4	138	30	4	14'-3	286	2090
19	10'-6	15.0	40	9	13'-3	1802	22	4	10'-4	152	33	4	14'-3	314	2268
20	11'-6	16.5	40	9	14'-3	1938	24	4	10'-4	166	36	4	14'-3	343	2447
21	12'-6	17.9	40	9	15'-3	2074	26	4	10'-4	179	39	4	14'-3	371	2624
22	13'-6	19.3	40	9	16'-3	2210	28	4	10'-4	193	42	4	14'-3	400	2803
23	14'-6	20.8	40	9	17'-3	2346	30	4	10'-4	207	45	4	14'-3	428	2981
24	15'-6	22.2	40	9	18'-3	2482	32	4	10'-4	221	48	4	14'-3	457	3160
25	16'-0	22.9	40	9	18'-9	2550	34	4	10'-4	235	51	4	14'-3	485	3270
26	17'-0	24.3	40	9	19'-9	2686	36	4	10'-4	248	54	4	14'-3	514	3448
27	18'-0	25.8	40	9	20'-9	2822	38	4	10'-4	262	57	4	14'-3	543	3627
28	19'-0	27.2	40	9	21'-9	2958	40	4	10'-4	276	60	4	14'-3	571	3805
29	20'-0	28.6	40	9	22'-9	3094	42	4	10'-4	290	63	4	14'-3	600	3984
30	21'-0	30.1	40	9	23'-9	3230	44	4	10'-4	304	66	4	14'-3	628	4162
31	22'-0	31.5	40	9	24'-9	3366	46	4	10'-4	318	69	4	14'-3	657	4341
32	23'-0	32.9	40	9	25'-9	3502	48	4	10'-4	331	72	4	14'-3	685	4518
33	24'-0	34.4	40	9	26'-9	3638	50	4	10'-4	345	75	4	14'-3	714	4697
34	25'-0	35.8	40	9	27'-9	3774	52	4	10'-4	359	78	4	14'-3	742	4875
35	26'-0	37.2	40	9	28'-9	3910	54	4	10'-4	373	81	4	14'-3	771	5054
36	27'-0	38.7	40	9	29'-9	4046	56	4	10'-4	387	84	4	14'-3	800	5233
37	28'-0	40.1	40	9	30'-9	4182	58	4	10'-4	400	87	4	14'-3	828	5410
38	29'-0	41.5	40	9	31'-9	4318	60	4	10'-4	414	90	4	14'-3	857	5589
39	30'-0	43.0	40	9	32'-9	4454	62	4	10'-4	428	93	4	14'-3	885	5767
40	31'-0	44.4	40	9	33'-9	4590	64	4	10'-4	442	96	4	14'-3	914	5946



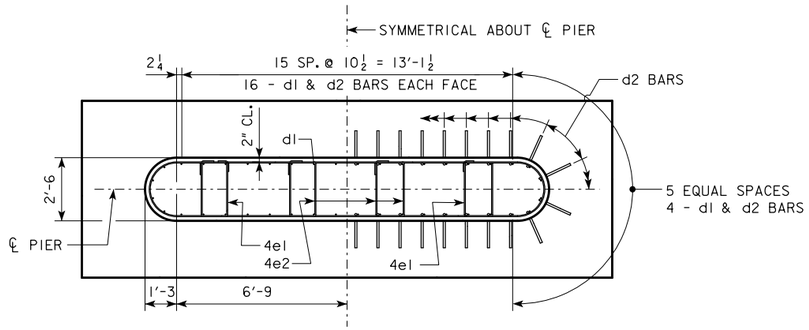
FRONT ELEVATION



END ELEVATION

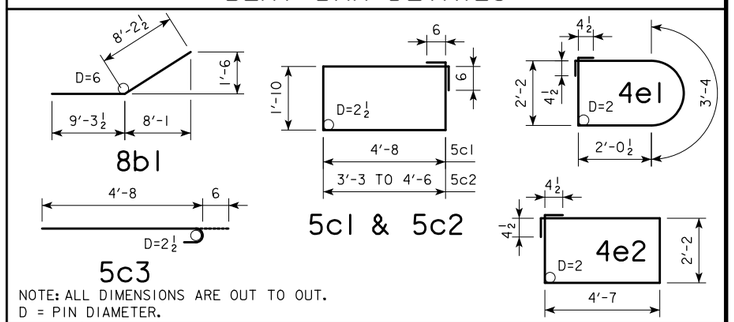


SECTION B-B



SECTION A-A

BENT BAR DETAILS



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

① SEE SHEET H30-17-06 FOR STEP REINFORCING STEEL QUANTITY AND DETAILS.

PIER NOTES:

SEE "TEE PIER NOTES" ON H30-02-06 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

ELIMINATE 2x8 BEVELED KEYWAY ON TOP OF CAP FOR EXPANSION PIERS.

SEE SHEET H30-15-06 FOR "U" DIMENSION.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

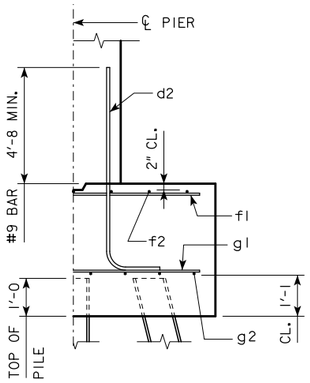
DECEMBER, 2006

TEE PIER CAP AND COLUMN

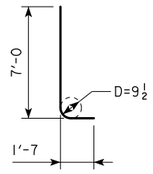
15° SKEW

H30-64-06

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.



TYPICAL SECTION

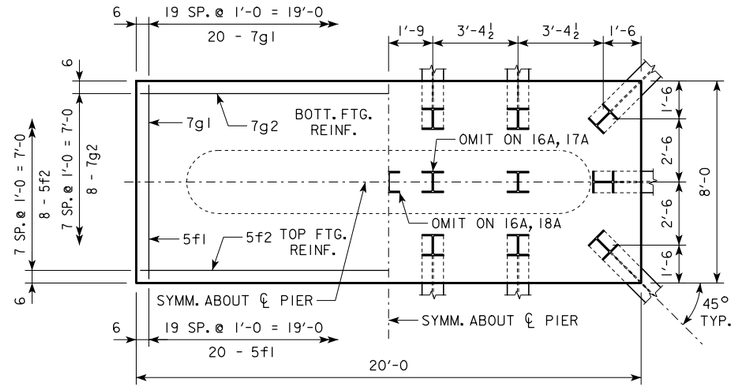


d2

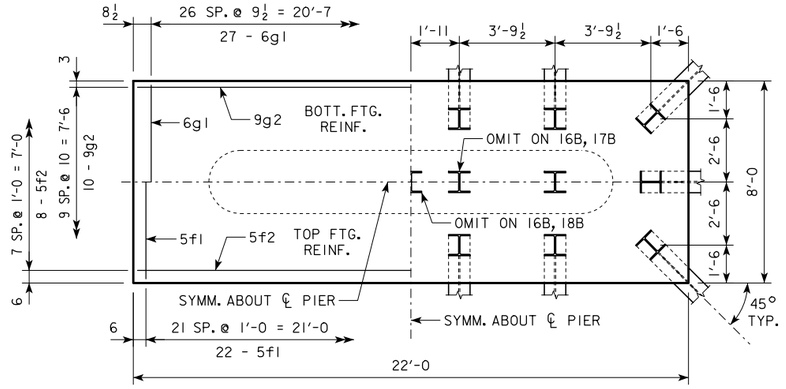
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	16A	138	3'-6 x 8' x 20'
	213'-10	16A	143	
	226'-4	17A	144	
	243'-0	18A	144	
19 TO 21	201'-4	16B	140	3'-6 x 8' x 22'
	213'-10	16B	145	
	226'-4	17B	145	
	243'-0	18B	145	
22 TO 24	201'-4	16C	141	3'-6 x 9' x 22'
	213'-10	16C	146	
	226'-4	17C	146	
	243'-0	18C	146	

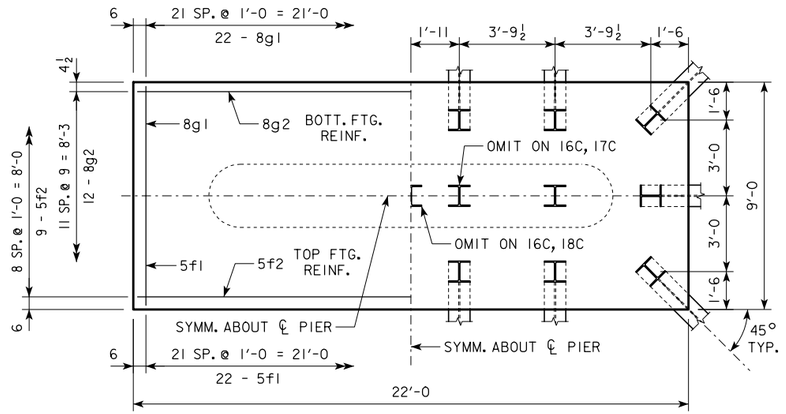
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 20'	d2	40 - #9 AS SHOWN	8'-7	1167	2126	20.7
	f1	20 - #5 @ 1'-0	7'-8	160		
	f2	8 - #5 @ 1'-0	19'-8	164		
	g1	20 - #7 @ 1'-0	7'-8	313		
	g2	8 - #7 @ 1'-0	19'-8	322		
3'-6 x 8' x 22'	d2	40 - #9 AS SHOWN	8'-7	1167	2572	22.8
	f1	22 - #5 @ 1'-0	7'-8	176		
	f2	8 - #5 @ 1'-0	21'-8	181		
	g1	27 - #6 @ 0'-9½	7'-8	311		
	g2	10 - #9 @ 0'-10	21'-8	737		
3'-6 x 9' x 22'	d2	40 - #9 AS SHOWN	8'-7	1167	2772	25.7
	f1	22 - #5 @ 1'-0	8'-8	199		
	f2	9 - #5 @ 1'-0	21'-8	203		
	g1	22 - #8 @ 1'-0	8'-8	509		
	g2	12 - #8 @ 0'-9	21'-8	694		



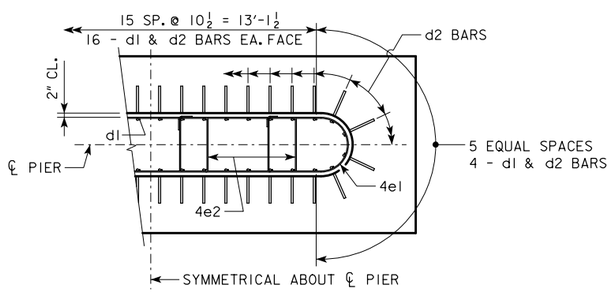
3'-6 x 8'-0 x 20'-0 FOR 16A, 17A & 18A



3'-6 x 8'-0 x 22'-0 FOR 16B, 17B & 18B



3'-6 x 9'-0 x 22'-0 FOR 16C, 17C & 18C



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Warren K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

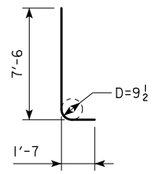
DECEMBER, 2006

TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

15° SKEW - H=16' to 24'

H30-65-06

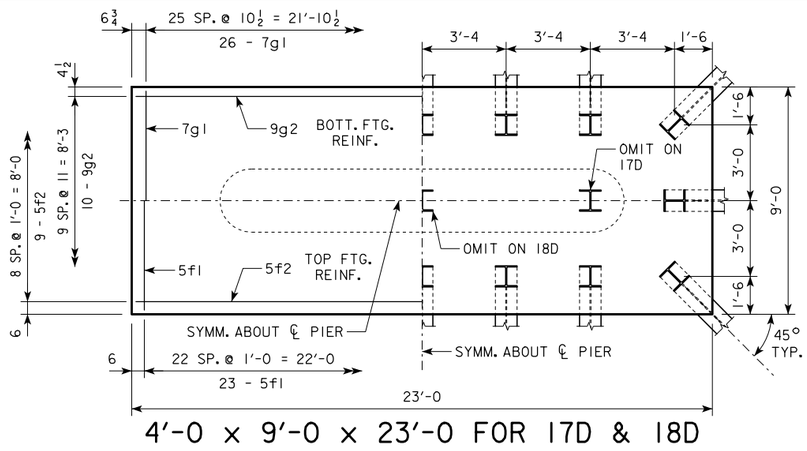
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



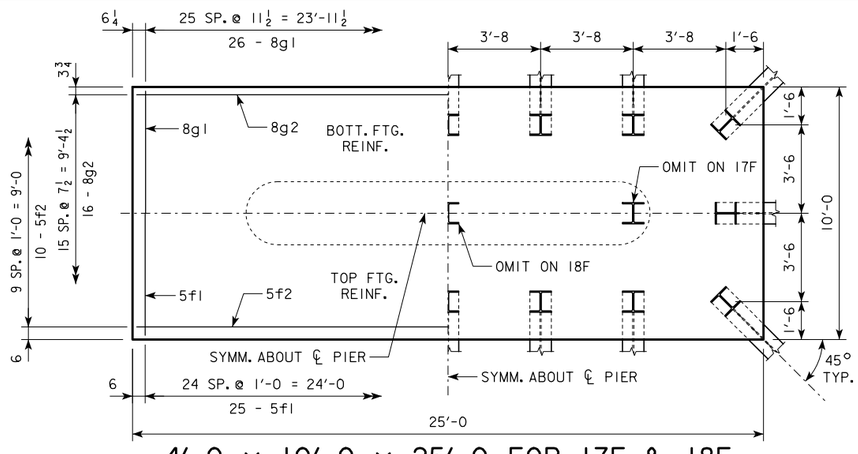
d2

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

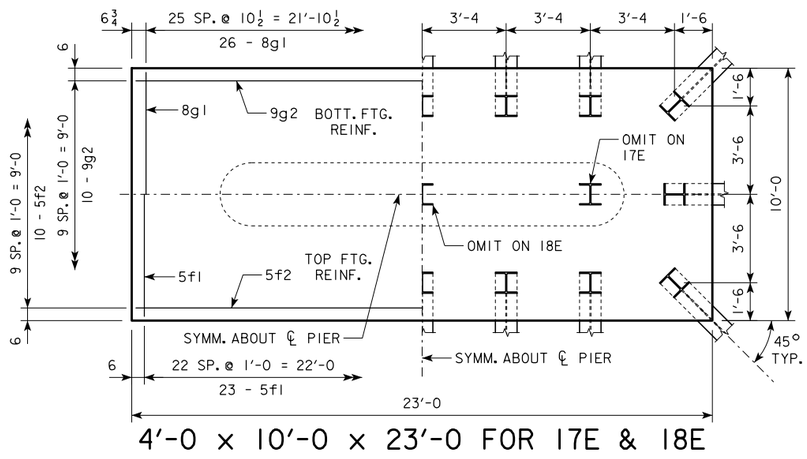
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	17D	135	4' x 9' x 23'
	213'-10	17D	140	
	226'-4	17D	146	
	243'-0	18D	142	
28 TO 30	201'-4	17D	138	4' x 9' x 23'
	213'-10	17D	143	
	226'-4	18D	140	
	243'-0	18D	145	
31 TO 33	201'-4	17E	139	4' x 10' x 23'
	213'-10	17E	143	
	226'-4	18E	141	
	243'-0	18E	145	
34 TO 36	201'-4	17F	141	4' x 10' x 25'
	213'-10	17F	144	
	226'-4	18F	141	
	243'-0	18F	146	
37 TO 40	201'-4	18G	138	4' x 11' x 25'
	213'-10	18G	141	
	226'-4	18G	144	
	243'-0	19A	143	



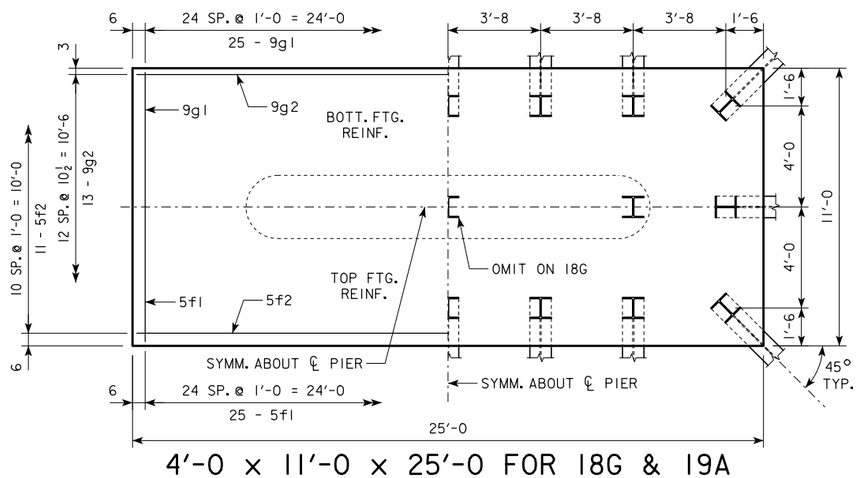
4'-0 x 9'-0 x 23'-0 FOR 17D & 18D



4'-0 x 10'-0 x 25'-0 FOR 17F & 18F

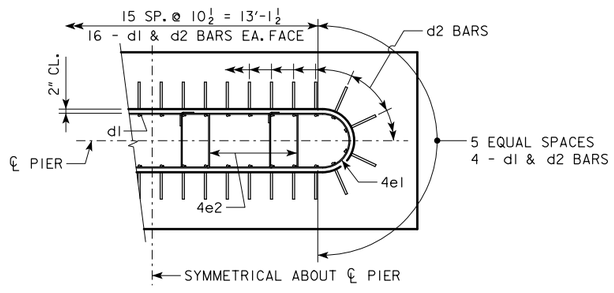


4'-0 x 10'-0 x 23'-0 FOR 17E & 18E



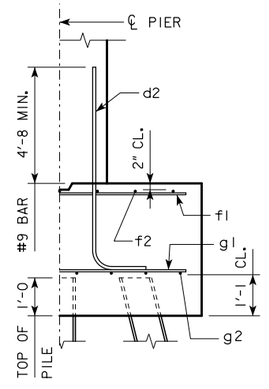
4'-0 x 11'-0 x 25'-0 FOR 18G & 19A

FOOTING SIZE	BAR	REINFORCING STEEL (ONE FOOTING) NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	2888	30.7
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	26 - #7 @ 0'-10½	8'-8	461		
	g2	10 - #9 @ 0'-11	22'-8	771		
4' x 10' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3145	34.1
	f1	23 - #5 @ 1'-0	9'-8	232		
	f2	10 - #5 @ 1'-0	22'-8	236		
	g1	26 - #8 @ 0'-10½	9'-8	671		
	g2	10 - #9 @ 1'-0	22'-8	771		
4' x 10' x 25'	d2	40 - #9 AS SHOWN	9'-1	1235	3469	37.0
	f1	25 - #5 @ 1'-0	9'-8	252		
	f2	10 - #5 @ 1'-0	24'-8	257		
	g1	26 - #8 @ 0'-11½	9'-8	671		
	g2	16 - #8 @ 0'-7½	24'-8	1054		
4' x 11' x 25'	d2	40 - #9 AS SHOWN	9'-1	1235	3793	40.7
	f1	25 - #5 @ 1'-0	10'-8	278		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	25 - #9 @ 1'-0	10'-8	907		
	g2	13 - #9 @ 0'-10½	24'-8	1090		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



TYPICAL SECTION

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

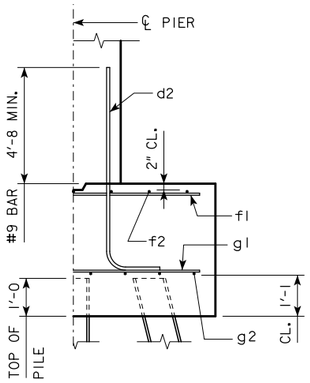
DECEMBER, 2006

TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS

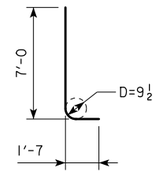
15° SKEW - H=25' to 40'

H30-66-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

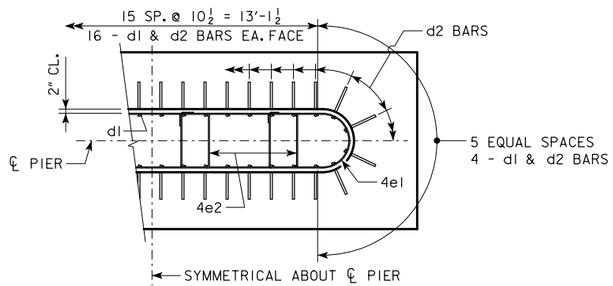


d2

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

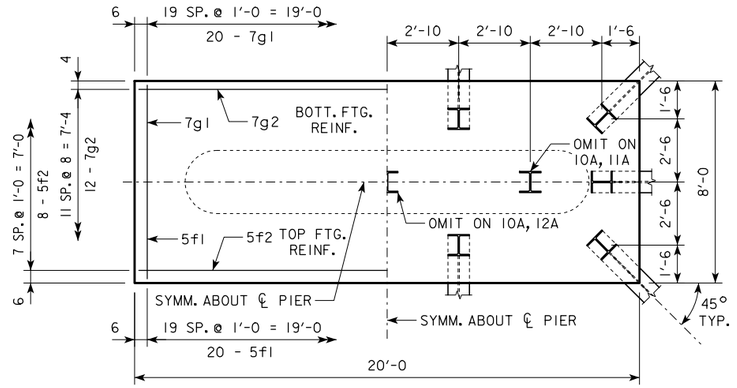
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	10A	210	3'-6 x 8' x 20'
	213'-10	10A	218	
	226'-4	11A	213	
	243'-0	12A	204	
19 TO 21	201'-4	10A	216	3'-6 x 8' x 20'
	213'-10	11A	210	
	226'-4	11A	219	
	243'-0	12A	209	
22 TO 24	201'-4	10B	218	3'-6 x 9' x 20'
	213'-10	11B	211	
	226'-4	12B	203	
	243'-0	12B	210	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 20'	d2	40 - #9 AS SHOWN	8'-7	1167	2286	20.7
	f1	20 - #5 @ 1'-0	7'-8	160		
	f2	8 - #5 @ 1'-0	19'-8	164		
	g1	20 - #7 @ 1'-0	7'-8	313		
	g2	12 - #7 @ 0'-8	19'-8	482		
3'-6 x 9' x 20'	d2	40 - #9 AS SHOWN	8'-7	1167	2501	23.3
	f1	20 - #5 @ 1'-0	8'-8	181		
	f2	9 - #5 @ 1'-0	19'-8	185		
	g1	21 - #8 @ 0'-11½	8'-8	486		
	g2	12 - #7 @ 0'-9	19'-8	482		

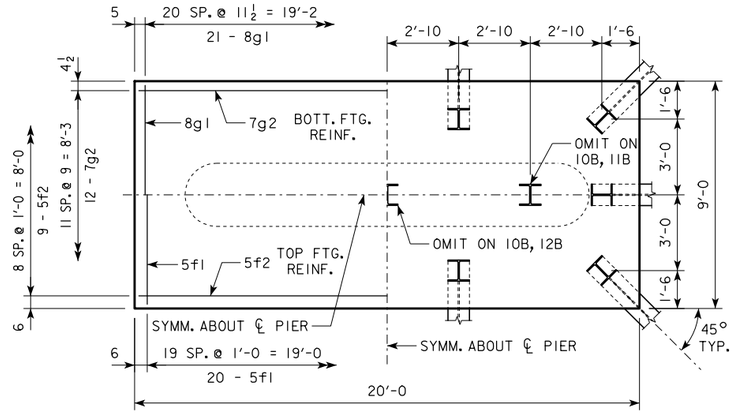


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



3'-6 x 8'-0 x 20'-0 FOR 10A, 11A & 12A



3'-6 x 9'-0 x 20'-0 FOR 10B, 11B & 12B

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

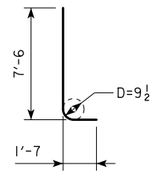
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

15° SKEW - H=16' to 24'

H30-67-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

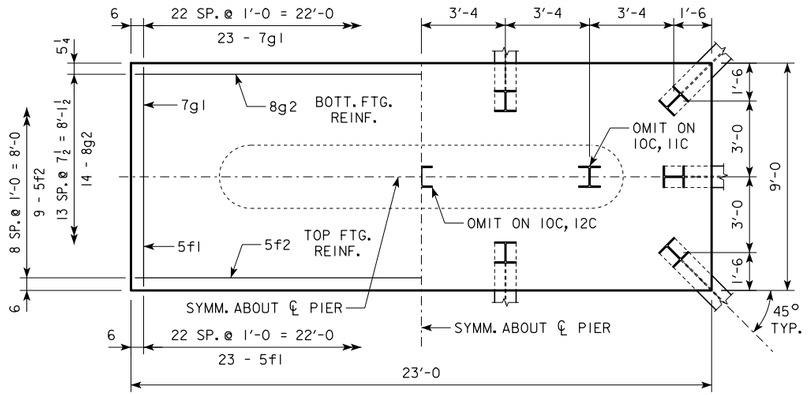


d2

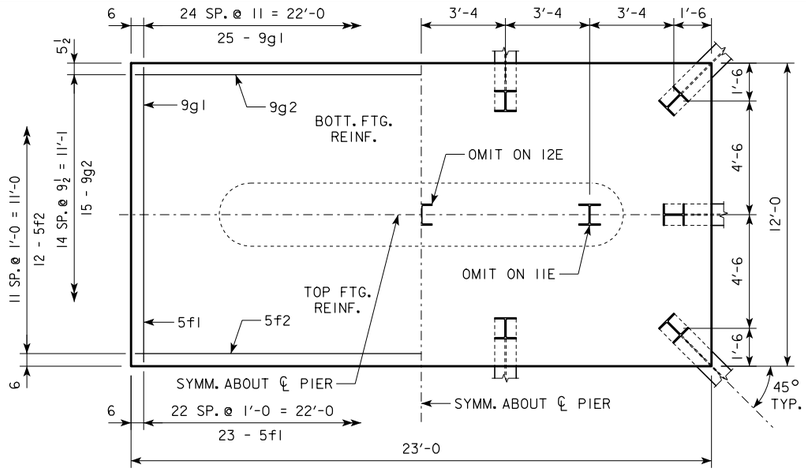
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	10C	219	4' x 9' x 23'
	213'-10	11C	212	
	226'-4	12C	204	
	243'-0	12C	211	
28 TO 30	201'-4	10D	219	4' x 11' x 23'
	213'-10	11D	211	
	226'-4	12D	202	
	243'-0	12D	209	
31 TO 33	201'-4	11D	208	4' x 11' x 23'
	213'-10	11D	215	
	226'-4	12D	206	
	243'-0	12D	213	
34 TO 36	201'-4	11E	210	4' x 12' x 23'
	213'-10	11E	217	
	226'-4	12E	208	
	243'-0	12E	215	
37 TO 40	201'-4	12F	199	4' x 12' x 24'
	213'-10	12F	204	
	226'-4	12F	211	
	243'-0	12F	218	

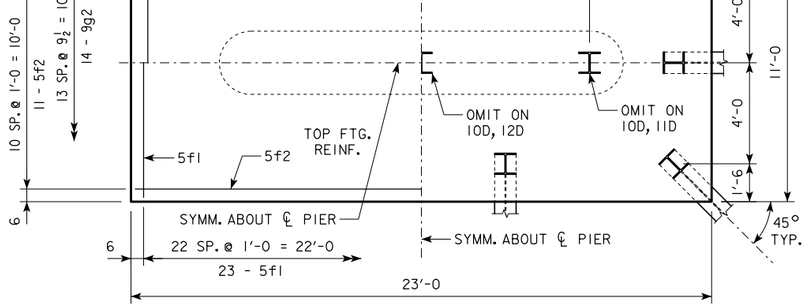
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	2910	30.7
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	23 - #7 @ 1'-0	8'-8	407		
	g2	14 - #8 @ 0'-7½	22'-8	847		
4' x 11' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3599	37.5
	f1	23 - #5 @ 1'-0	10'-8	256		
	f2	11 - #5 @ 1'-0	22'-8	260		
	g1	27 - #8 @ 0'-10	10'-8	769		
	g2	14 - #9 @ 0'-9½	22'-8	1079		
4' x 12' x 23'	d2	40 - #9 AS SHOWN	9'-1	1235	3947	40.9
	f1	23 - #5 @ 1'-0	11'-8	280		
	f2	12 - #5 @ 1'-0	22'-8	284		
	g1	25 - #9 @ 0'-11	11'-8	992		
	g2	15 - #9 @ 0'-9½	22'-8	1156		
4' x 12' x 24'	d2	40 - #9 AS SHOWN	9'-1	1235	4022	42.7
	f1	24 - #5 @ 1'-0	11'-8	292		
	f2	12 - #5 @ 1'-0	23'-8	296		
	g1	25 - #9 @ 0'-11½	11'-8	992		
	g2	15 - #9 @ 0'-9½	23'-8	1207		



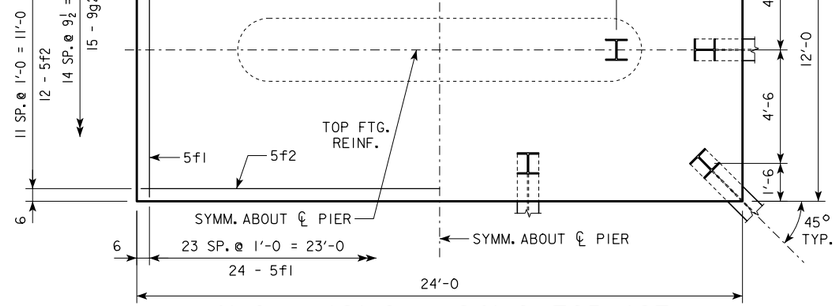
4'-0 x 9'-0 x 23'-0 FOR 10C, 11C & 12C



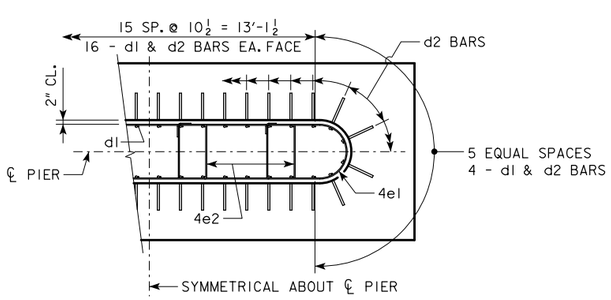
4'-0 x 12'-0 x 23'-0 FOR 11E & 12E



4'-0 x 11'-0 x 23'-0 FOR 10D, 11D & 12D

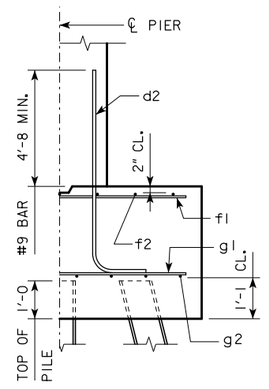


4'-0 x 12'-0 x 24'-0 FOR 12F



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



TYPICAL SECTION

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

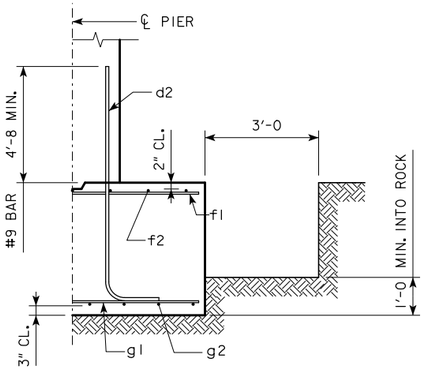
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

15° SKEW - H=25' to 40'

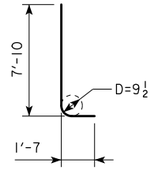
H30-68-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

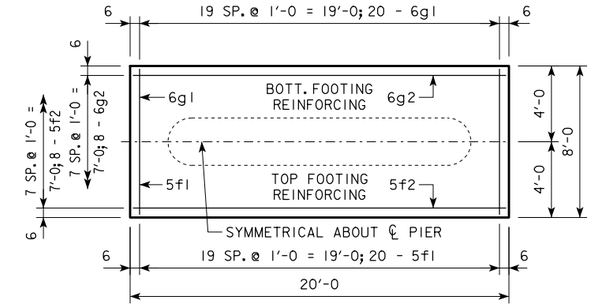
H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4 163'-10	3'-6 x 8' x 20'
	176'-4 188'-10	3'-6 x 8' x 22'
	201'-4 213'-10	3'-6 x 8' x 24'
	226'-4 243'-0	3'-6 x 9' x 24'
19 TO 21	138'-10 151'-4	3'-6 x 8' x 20'
	163'-10 176'-4 188'-10	3'-6 x 8' x 22'
	201'-4	3'-6 x 8' x 24'
	213'-10 226'-4 243'-0	3'-6 x 9' x 24'
22 TO 24	138'-10 151'-4 163'-10 176'-4	3'-6 x 8' x 22'
	188'-10 201'-4	3'-6 x 8' x 24'
	213'-10 226'-4 243'-0	3'-6 x 9' x 24'



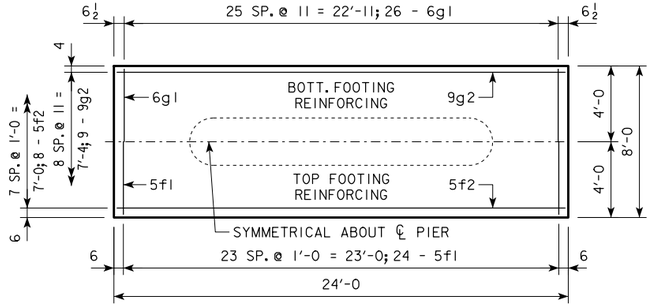
d2

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

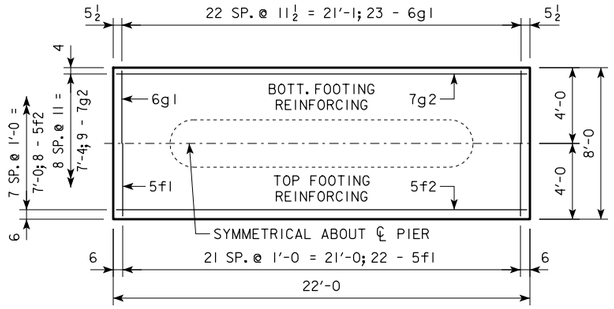
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 8' x 20'	d2	40 - #9 AS SHOWN	9'-5	1281	2071	20.7
	f1	20 - #5 @ 1'-0	7'-8	160		
	f2	8 - #5 @ 1'-0	19'-8	164		
	g1	20 - #6 @ 1'-0	7'-8	230		
	g2	8 - #6 @ 1'-0	19'-8	236		
3'-6 x 8' x 22'	d2	40 - #9 AS SHOWN	9'-5	1281	2302	22.8
	f1	22 - #5 @ 1'-0	7'-8	176		
	f2	8 - #5 @ 1'-0	21'-8	181		
	g1	23 - #6 @ 0'-11½	7'-8	265		
	g2	9 - #7 @ 0'-11	21'-8	399		
3'-6 x 8' x 24'	d2	40 - #9 AS SHOWN	9'-5	1281	2693	24.9
	f1	24 - #5 @ 1'-0	7'-8	192		
	f2	8 - #5 @ 1'-0	23'-8	197		
	g1	26 - #6 @ 0'-11	7'-8	299		
	g2	9 - #9 @ 0'-11	23'-8	724		
3'-6 x 9' x 24'	d2	40 - #9 AS SHOWN	9'-5	1281	2986	28.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	26 - #7 @ 0'-11	8'-8	461		
	g2	10 - #9 @ 0'-11	23'-8	805		



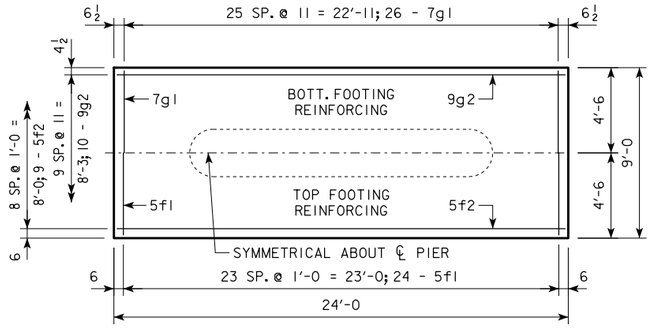
3'-6 x 8'-0 x 20'-0



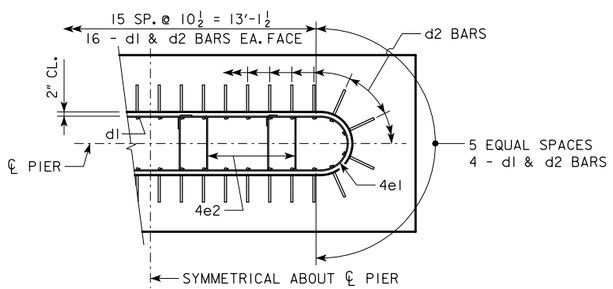
3'-6 x 8'-0 x 24'-0



3'-6 x 8'-0 x 22'-0



3'-6 x 9'-0 x 24'-0



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

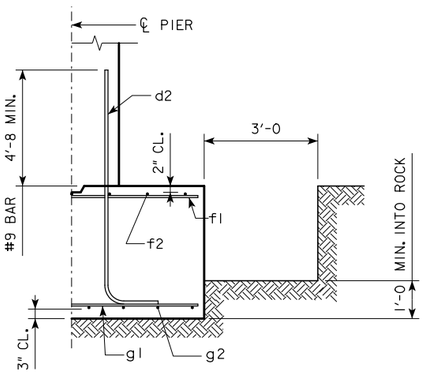
TEE PIER - SPREAD FOOTINGS

15° SKEW - H=16' to 24'

H30-69-06

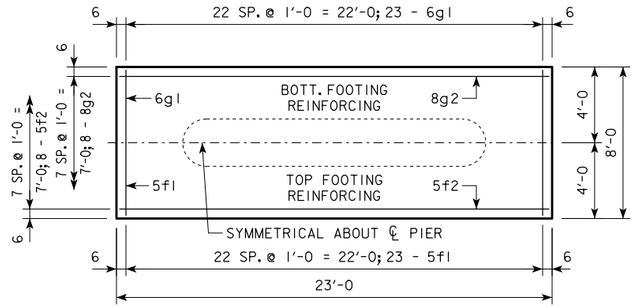
REVISED 04-13 - FOOTING NOTES MODIFIED.

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10 151′-4 163′-10 176′-4	4′ x 8′ x 23′
	188′-10 201′-4	4′ x 8′ x 25′
	213′-10 226′-4 243′-0	4′ x 9′ x 25′
28 TO 30	138′-10	4′ x 8′ x 23′
	151′-4 163′-10 176′-4 188′-10	4′ x 8′ x 25′
	201′-4 213′-10 226′-4 243′-0	4′ x 9′ x 25′
31 TO 33	138′-10 151′-4 163′-10 176′-4	4′ x 8′ x 25′
	188′-10 201′-4 213′-10 226′-4 243′-0	4′ x 9′ x 25′
34 TO 36	138′-10 151′-4 163′-10 176′-4 188′-10 201′-4 213′-10 226′-4	4′ x 9′ x 25′
	243′-0	4′ x 9′ x 27′
37 TO 40	138′-10 151′-4 163′-10 176′-4 188′-10	4′ x 9′ x 25′
	201′-4 213′-10 226′-4 243′-0	4′ x 9′ x 27′

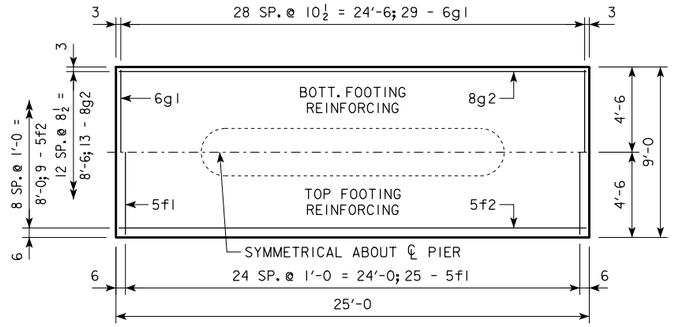


TYPICAL SECTION

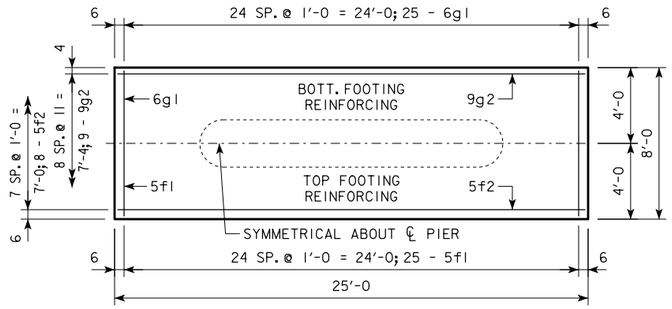
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4′ x 8′ x 23′	d2	40 - #9 AS SHOWN	9′-11	1349	2471	27.3
	f1	23 - #5 @ 1′-0	7′-8	184		
	f2	8 - #5 @ 1′-0	22′-8	189		
	g1	23 - #6 @ 1′-0	7′-8	265		
	g2	8 - #8 @ 1′-0	22′-8	484		
4′ x 8′ x 25′	d2	40 - #9 AS SHOWN	9′-11	1349	2798	29.6
	f1	25 - #5 @ 1′-0	7′-8	200		
	f2	8 - #5 @ 1′-0	24′-8	206		
	g1	25 - #6 @ 1′-0	7′-8	288		
	g2	9 - #9 @ 0′-11	24′-8	755		
4′ x 9′ x 25′	d2	40 - #9 AS SHOWN	9′-11	1349	3041	33.3
	f1	25 - #5 @ 1′-0	8′-8	226		
	f2	9 - #5 @ 1′-0	24′-8	232		
	g1	29 - #6 @ 0′-10½	8′-8	378		
	g2	13 - #8 @ 0′-8½	24′-8	856		
4′ x 9′ x 27′	d2	40 - #9 AS SHOWN	9′-11	1349	3607	36.0
	f1	27 - #5 @ 1′-0	8′-8	244		
	f2	9 - #5 @ 1′-0	26′-8	250		
	g1	31 - #6 @ 0′-10½	8′-8	404		
	g2	15 - #9 @ 0′-7	26′-8	1360		



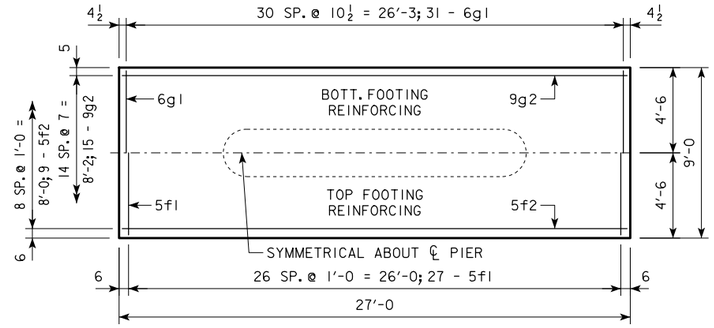
4′-0 x 8′-0 x 23′-0



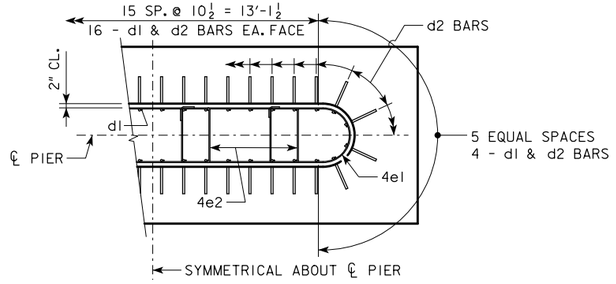
4′-0 x 9′-0 x 25′-0



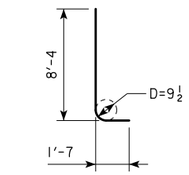
4′-0 x 8′-0 x 25′-0



4′-0 x 9′-0 x 27′-0



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H30-64-06.)



d2

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

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

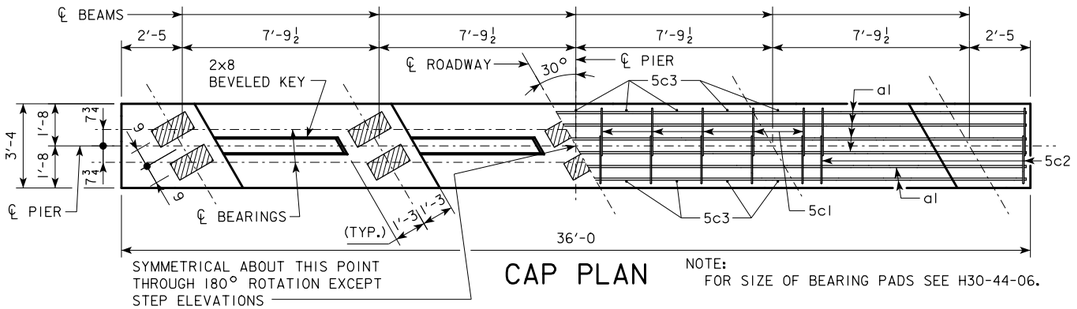
DECEMBER, 2006

TEE PIER - SPREAD FOOTINGS

15° SKEW - H=25′ to 40′

H30-70-06

REVISED 04-13 - FOOTING NOTES MODIFIED.

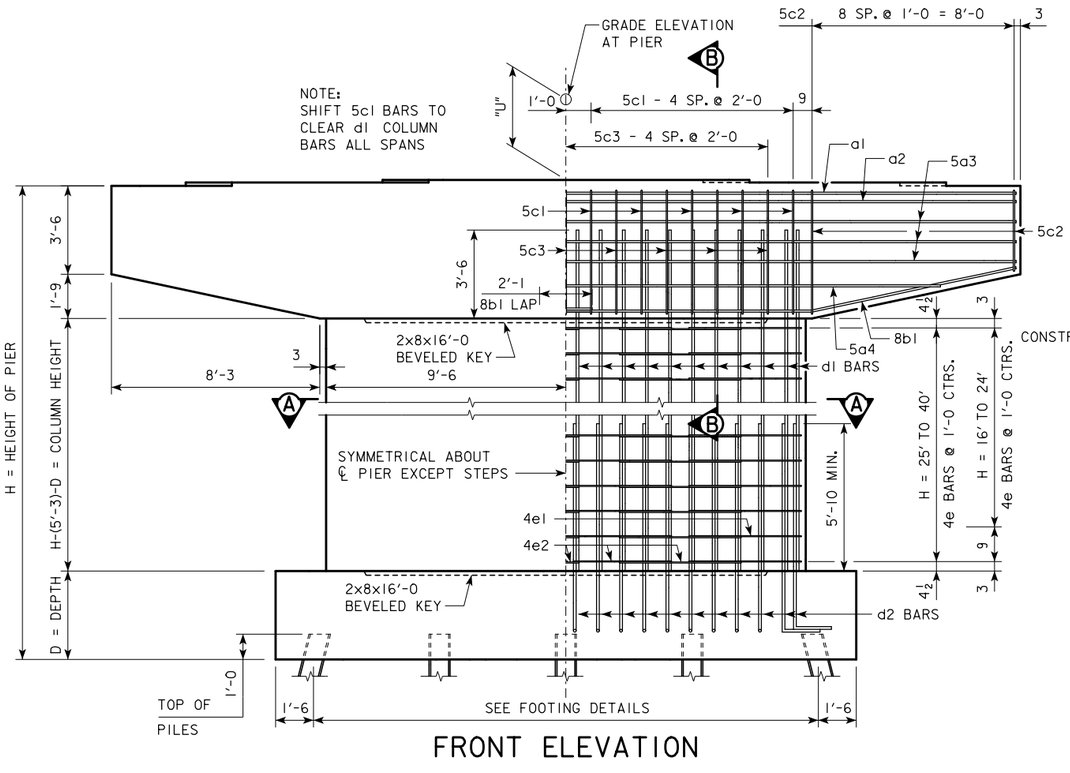


CAP PLAN

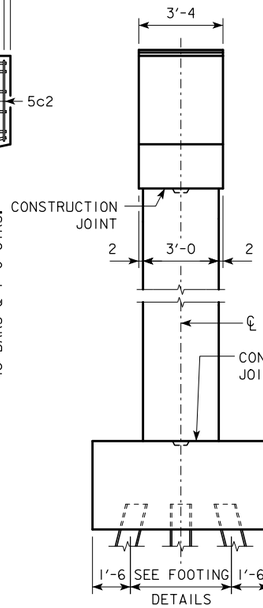
NOTE:
FOR SIZE OF BEARING PADS SEE H30-44-06.

CAP

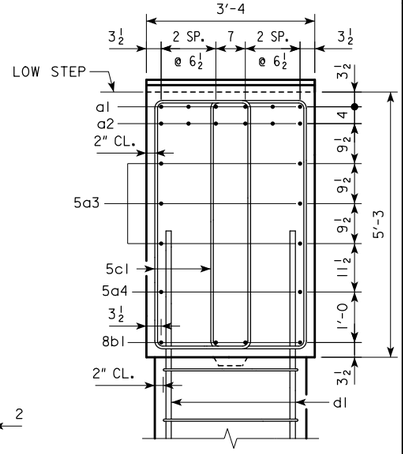
	℄ - ℄ ABUT. BEARINGS			138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
	BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
REINFORCING STEEL	a1	35'-8		6	8	571	6	8	571	6	8	571	6	8	571	6	8	571	6	8	571	6	8	571	6	9	728	6	9	728
	a2	35'-8		6	7	437	6	7	437	6	7	437	6	7	437	6	7	437	6	8	571	6	8	571	6	8	571	6	8	571
	5a3	35'-8		6	5	223	6	5	223	6	5	223	6	5	223	6	5	223	6	5	223	6	5	223	6	5	223	6	5	223
	5a4	29'-10		2	5	62	2	5	62	2	5	62	2	5	62	2	5	62	2	5	62	2	5	62	2	5	62	2	5	62
	8b1	19'-1		8	8	408	8	8	408	8	8	408	8	8	408	8	8	408	8	8	408	8	8	408	8	8	408	8	8	408
	5c1	14'-8		20	5	306	20	5	306	20	5	306	20	5	306	20	5	306	20	5	306	20	5	306	20	5	306	20	5	306
	5c2	VARIES		36	5	487	36	5	487	36	5	487	36	5	487	36	5	487	36	5	487	36	5	487	36	5	487	36	5	487
	5c3	5'-5		18	5	102	18	5	102	18	5	102	18	5	102	18	5	102	18	5	102	18	5	102	18	5	102	18	5	102
①	TOTAL (LB.)			2596			2596			2596			2596			2596			2730			2730			2887			2887		
STRUCTURAL CONCRETE (CY)				22.3			22.3			22.3			22.3			22.3			22.3			22.3			22.3			22.3		



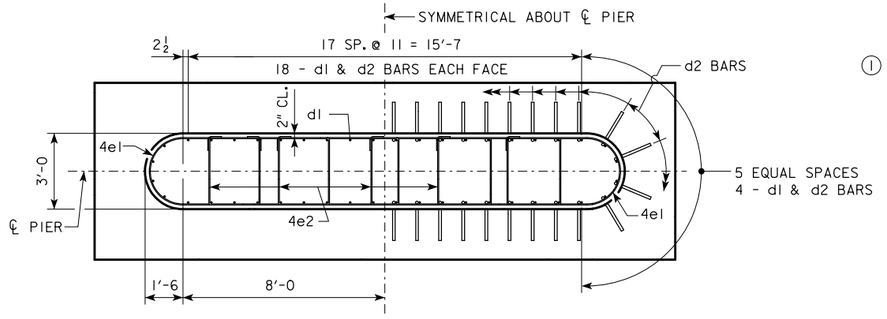
FRONT ELEVATION



END ELEVATION



SECTION B-B



SECTION A-A

① SEE SHEET H30-24-06 FOR STEP REINFORCING STEEL QUANTITY AND DETAILS.

PIER NOTES:

SEE "TEE PIER NOTES" ON H30-02-06 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

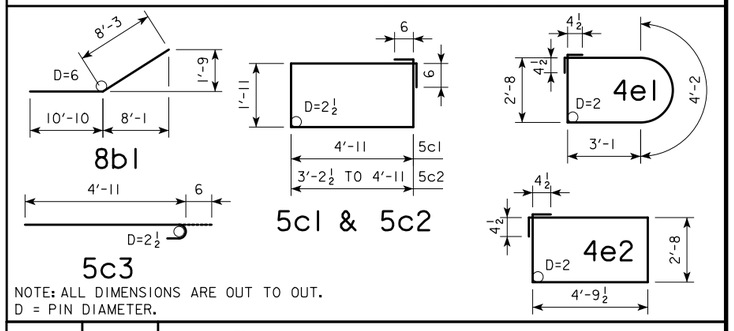
ELIMINATE 2x8 BEVELED KEYWAY ON TOP OF CAP FOR EXPANSION PIERS.

SEE SHEET H30-22-06 FOR "U" DIMENSION.

COLUMN

H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL												TOTAL WEIGHT (LB.)
			d1 BAR ———				4e1 BAR ▭				4e2 BAR ▭				
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	7'-3	14.8	44	10	10'-9	2035	16	4	13'-9	147	32	4	15'-8	335	2517
17	8'-3	16.8	44	10	11'-9	2225	18	4	13'-9	165	36	4	15'-8	377	2767
18	9'-3	18.9	44	10	12'-9	2414	20	4	13'-9	184	40	4	15'-8	419	3017
19	10'-3	20.9	44	10	13'-9	2603	22	4	13'-9	202	44	4	15'-8	460	3265
20	11'-3	22.9	44	10	14'-9	2793	24	4	13'-9	220	48	4	15'-8	502	3515
21	12'-3	25.0	44	10	15'-9	2982	26	4	13'-9	239	52	4	15'-8	544	3765
22	13'-3	27.0	44	10	16'-9	3171	28	4	13'-9	257	56	4	15'-8	586	4014
23	14'-3	29.1	44	10	17'-9	3361	30	4	13'-9	276	60	4	15'-8	628	4265
24	15'-3	31.1	44	10	18'-9	3550	32	4	13'-9	294	64	4	15'-8	670	4514
25	15'-9	32.1	44	10	19'-3	3645	32	4	13'-9	294	64	4	15'-8	670	4609
26	16'-9	34.2	44	10	20'-3	3834	34	4	13'-9	312	68	4	15'-8	712	4858
27	17'-9	36.2	44	10	21'-3	4023	36	4	13'-9	331	72	4	15'-8	754	5108
28	18'-9	38.2	44	10	22'-3	4213	38	4	13'-9	349	76	4	15'-8	795	5357
29	19'-9	40.3	44	10	23'-3	4402	40	4	13'-9	367	80	4	15'-8	837	5606
30	20'-9	42.3	44	10	24'-3	4591	42	4	13'-9	386	84	4	15'-8	879	5856
31	21'-9	44.4	44	10	25'-3	4781	44	4	13'-9	404	88	4	15'-8	921	6106
32	22'-9	46.4	44	10	26'-3	4970	46	4	13'-9	423	92	4	15'-8	963	6356
33	23'-9	48.4	44	10	27'-3	5159	48	4	13'-9	441	96	4	15'-8	1005	6605
34	24'-9	50.5	44	10	28'-3	5349	50	4	13'-9	459	100	4	15'-8	1047	6855
35	25'-9	52.5	44	10	29'-3	5538	52	4	13'-9	478	104	4	15'-8	1088	7104
36	26'-9	54.6	44	10	30'-3	5727	54	4	13'-9	496	108	4	15'-8	1130	7353
37	27'-9	56.6	44	10	31'-3	5917	56	4	13'-9	514	112	4	15'-8	1172	7603
38	28'-9	58.6	44	10	32'-3	6106	58	4	13'-9	533	116	4	15'-8	1214	7853
39	29'-9	60.7	44	10	33'-3	6295	60	4	13'-9	551	120	4	15'-8	1256	8102
40	30'-9	62.7	44	10	34'-3	6485	62	4	13'-9	569	124	4	15'-8	1298	8352

BENT BAR DETAILS



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

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

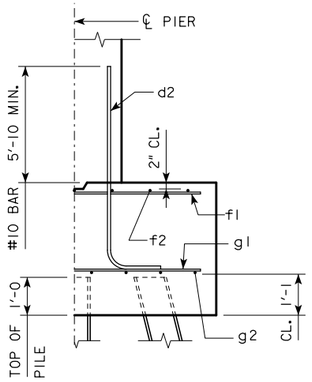
DECEMBER, 2006

TEE PIER CAP AND COLUMN

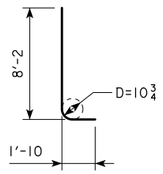
30° SKEW

H30-71-06

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

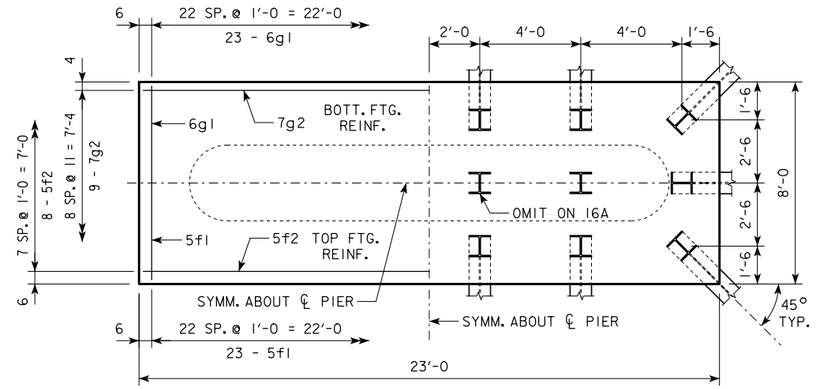


TYPICAL SECTION

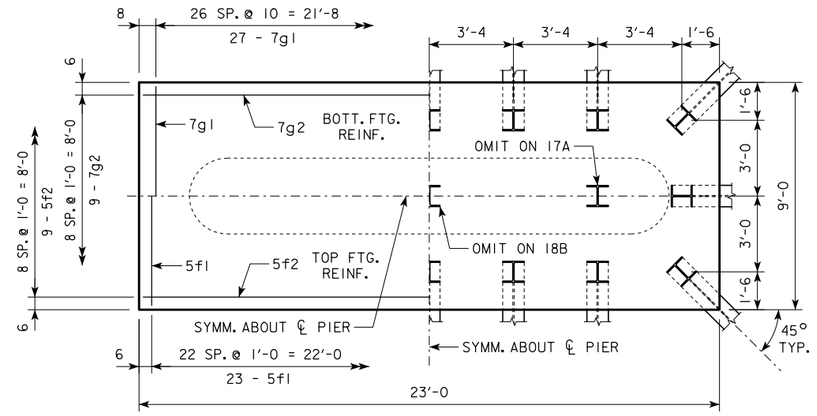


d2

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



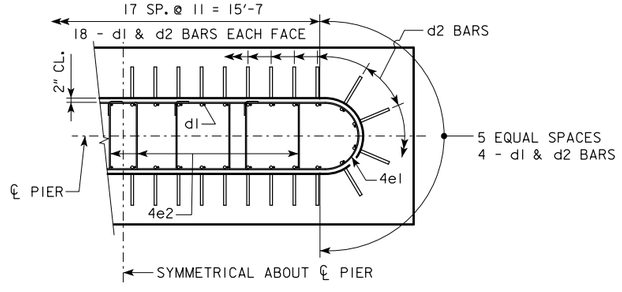
3'-6 x 8'-0 x 23'-0 FOR 16A & 18A



3'-6 x 9'-0 x 23'-0 FOR 17A, 18B & 19A

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	16A	142	3'-6 x 8' x 23'
	213'-10	16A	147	
	226'-4	18A	141	
	243'-0	18A	146	
19 TO 21	201'-4	17A	136	3'-6 x 9' x 23'
	213'-10	17A	141	
	226'-4	18B	139	
	243'-0	18B	144	
22 TO 24	201'-4	17A	141	3'-6 x 9' x 23'
	213'-10	17A	145	
	226'-4	18B	143	
	243'-0	19A	142	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	2948	23.9
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	23 - #6 @ 1'-0	7'-8	265		
	g2	9 - #7 @ 0'-11	22'-8	417		
3'-6 x 9' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	3209	26.8
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	27 - #7 @ 0'-10	8'-8	478		
	g2	9 - #7 @ 1'-0	22'-8	417		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-71-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

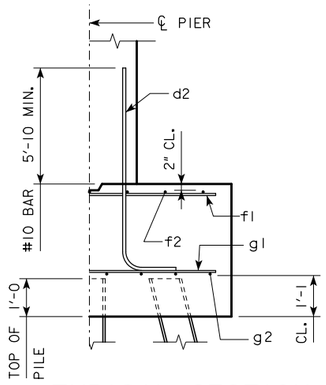
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

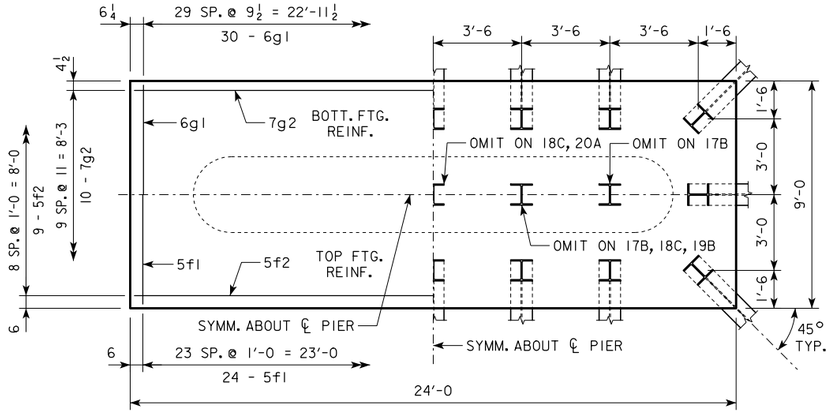
TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

30° SKEW - H=16' to 24'

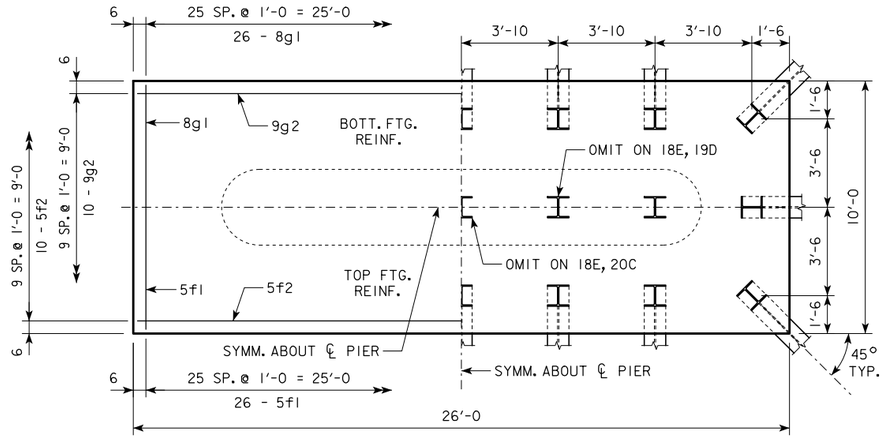
H30-72-06



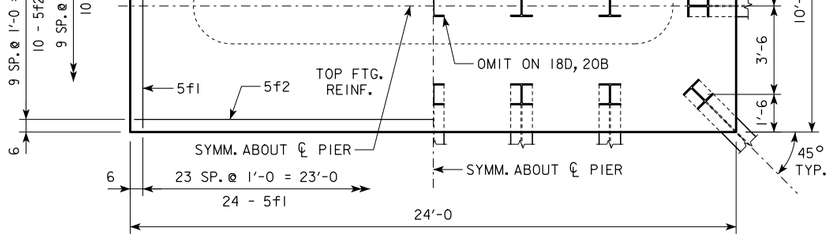
TYPICAL SECTION



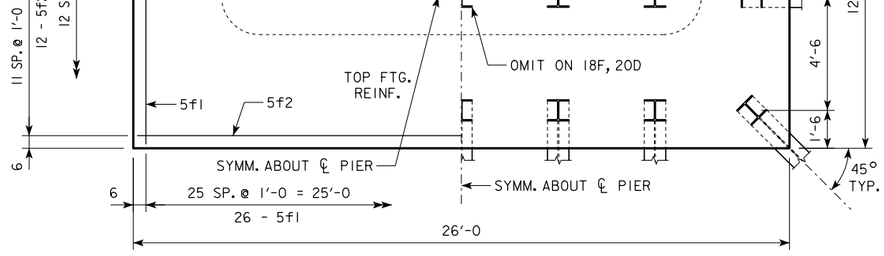
4'-0 x 9'-0 x 24'-0 FOR 17B, 18C, 19B & 20A



4'-0 x 10'-0 x 26'-0 FOR 18E, 19D & 20C



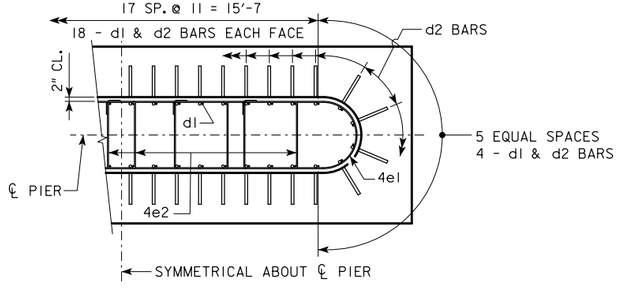
4'-0 x 10'-0 x 24'-0 FOR 18D, 19C & 20B



4'-0 x 12'-0 x 26'-0 FOR 18F, 19E & 20D

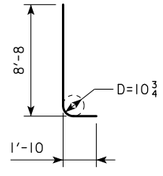
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	17B	144	4' x 9' x 24'
	213'-10	18C	140	
	226'-4	18C	145	
	243'-0	19B	145	
28 TO 30	201'-4	18C	139	4' x 9' x 24'
	213'-10	18C	143	
	226'-4	19B	144	
	243'-0	20A	143	
31 TO 33	201'-4	18D	141	4' x 10' x 24'
	213'-10	18D	145	
	226'-4	19C	145	
	243'-0	20B	144	
34 TO 36	201'-4	18E	142	4' x 10' x 26'
	213'-10	18E	146	
	226'-4	19D	146	
	243'-0	20C	145	
37 TO 40	201'-4	18F	145	4' x 12' x 26'
	213'-10	19E	145	
	226'-4	20D	143	
	243'-0	20D	147	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	3302	32.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	30 - #6 @ 0'-9½	8'-8	391		
	g2	10 - #7 @ 0'-11	23'-8	484		
4' x 10' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	3580	35.6
	f1	24 - #5 @ 1'-0	9'-8	242		
	f2	10 - #5 @ 1'-0	23'-8	247		
	g1	24 - #8 @ 1'-0	9'-8	619		
	g2	10 - #7 @ 1'-0	23'-8	484		
4' x 10' x 26'	d2	44 - #10 AS SHOWN	10'-6	1988	4062	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	26 - #8 @ 1'-0	9'-8	671		
	g2	10 - #9 @ 1'-0	25'-8	873		
4' x 12' x 26'	d2	44 - #10 AS SHOWN	10'-6	1988	4587	46.2
	f1	26 - #5 @ 1'-0	11'-8	316		
	f2	12 - #5 @ 1'-0	25'-8	321		
	g1	27 - #9 @ 0'-11½	11'-8	1071		
	g2	13 - #8 @ 0'-11½	25'-8	891		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-71-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.

04-13
LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

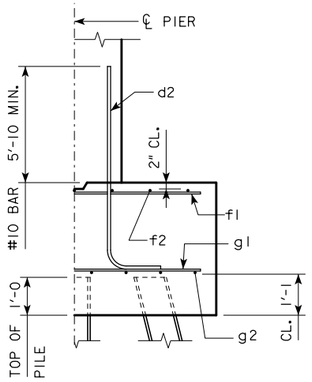
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

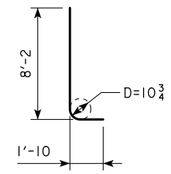
TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

30° SKEW - H=25' to 40'

H30-73-06

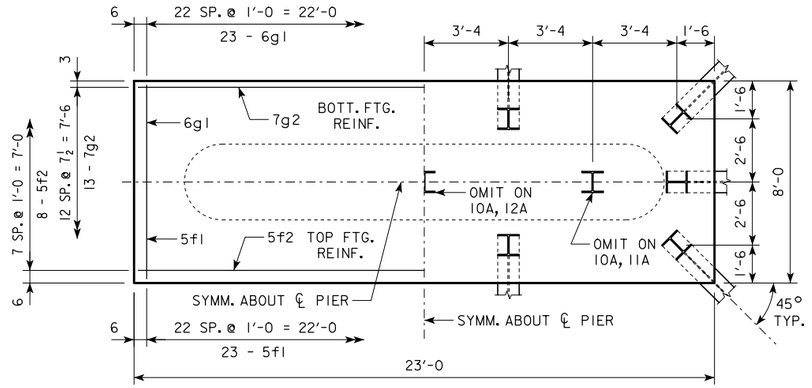


TYPICAL SECTION

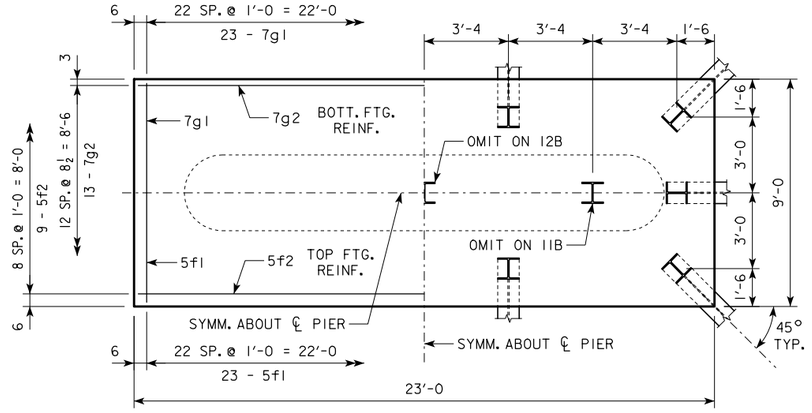


d2

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



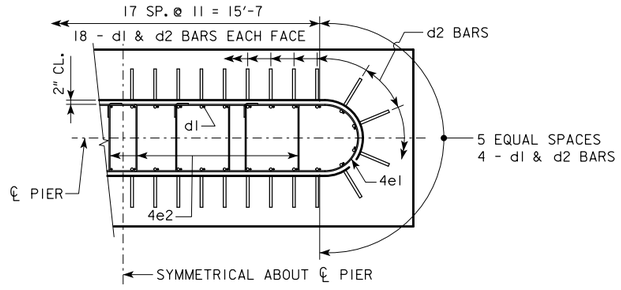
3'-6 x 8'-0 x 23'-0 FOR 10A, 11A & 12A



3'-6 x 9'-0 x 23'-0 FOR 11B & 12B

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	10A	215	3'-6 x 8' x 23'
	213'-10	11A	209	
	226'-4	11A	217	
	243'-0	12A	207	
19 TO 21	201'-4	11A	208	3'-6 x 8' x 23'
	213'-10	11A	216	
	226'-4	12A	207	
	243'-0	12A	214	
22 TO 24	201'-4	11B	212	3'-6 x 9' x 23'
	213'-10	11B	219	
	226'-4	12B	210	
	243'-0	12B	217	

FOOTING SIZE	BAR	REINFORCING STEEL (ONE FOOTING) NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	3133	23.9
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	23 - #6 @ 1'-0	7'-8	265		
	g2	13 - #7 @ 0'-7½	22'-8	602		
3'-6 x 9' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	3323	26.8
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	23 - #7 @ 1'-0	8'-8	407		
	g2	13 - #7 @ 0'-8½	22'-8	602		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-71-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

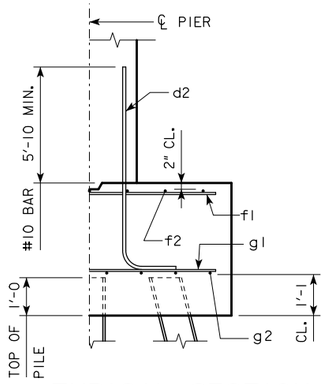
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

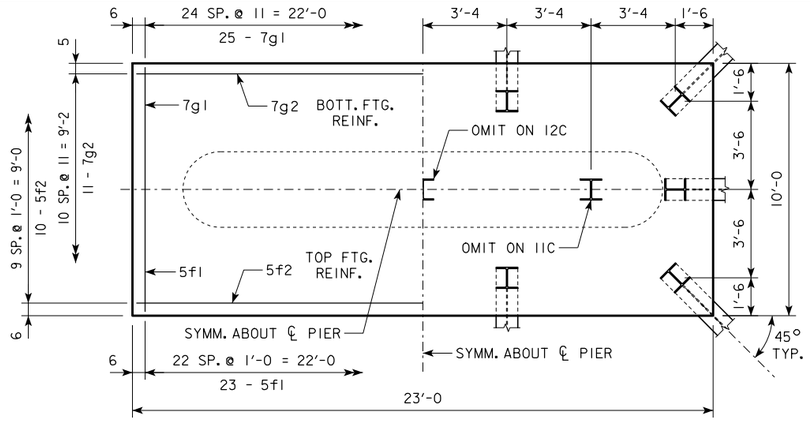
30° SKEW - H=16' to 24'

H30-74-06

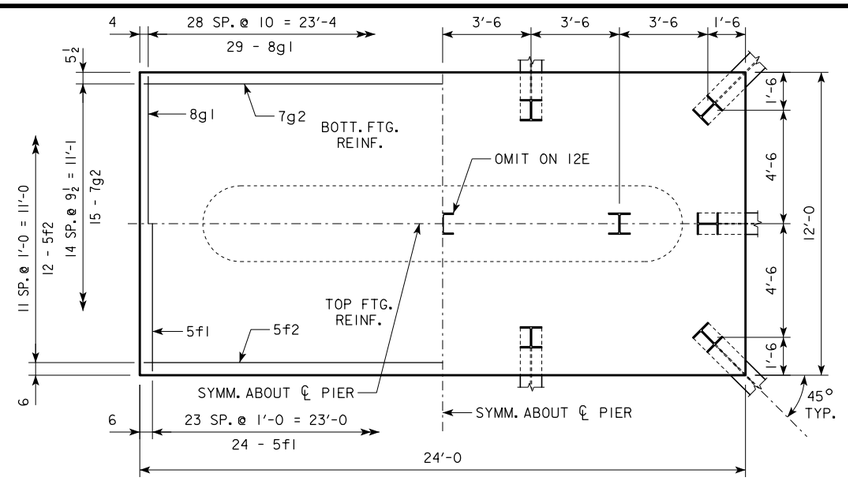
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



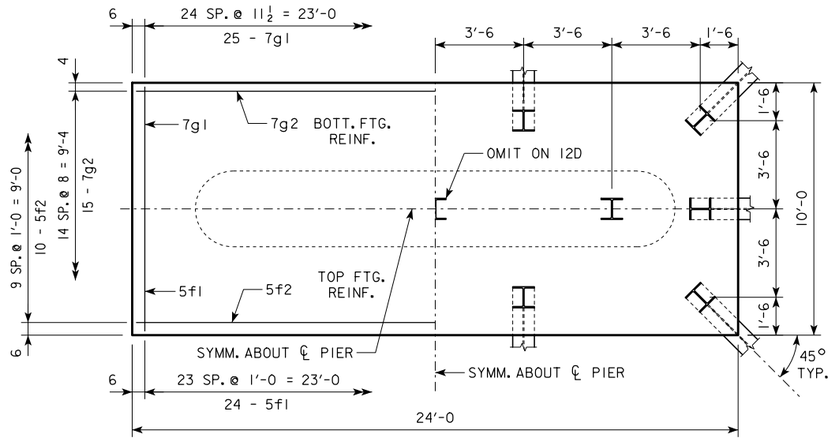
TYPICAL SECTION



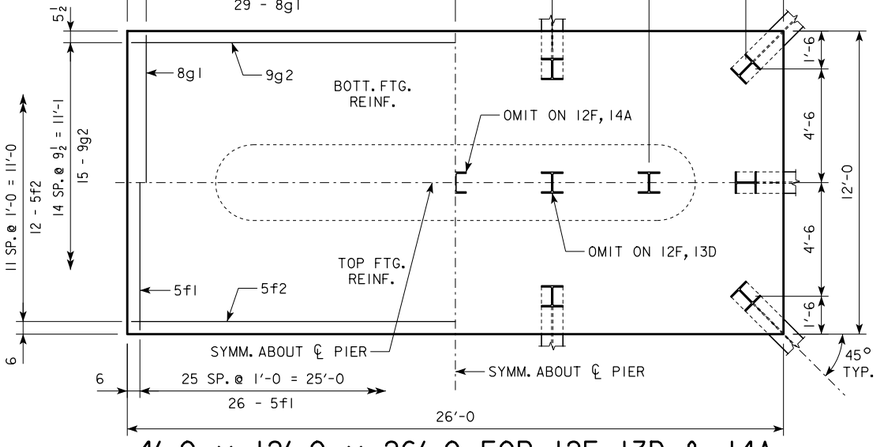
4'-0 x 10'-0 x 23'-0 FOR 11C, 12C & 13A



4'-0 x 12'-0 x 24'-0 FOR 12E & 13C



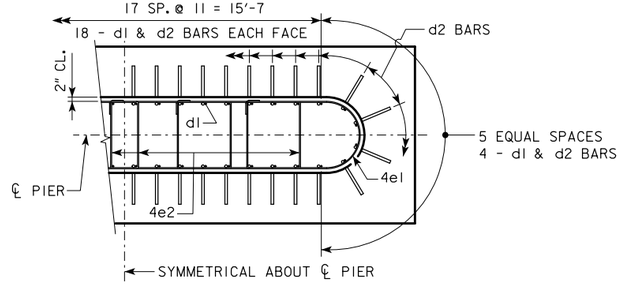
4'-0 x 10'-0 x 24'-0 FOR 12D & 13B



4'-0 x 12'-0 x 26'-0 FOR 12F, 13D & 14A

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	11C	215	4' x 10' x 23'
	213'-10	12C	205	
	226'-4	12C	213	
	243'-0	13A	208	
28 TO 30	201'-4	12C	203	4' x 10' x 23'
	213'-10	12C	210	
	226'-4	12C	218	
	243'-0	13A	213	
31 TO 33	201'-4	12D	207	4' x 10' x 24'
	213'-10	12D	214	
	226'-4	13B	210	
	243'-0	13B	217	
34 TO 36	201'-4	12E	208	4' x 12' x 24'
	213'-10	12E	215	
	226'-4	13C	210	
	243'-0	13C	217	
37 TO 40	201'-4	12F	213	4' x 12' x 26'
	213'-10	12F	219	
	226'-4	13D	214	
	243'-0	14A	208	

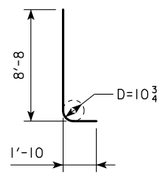
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 10' x 23'	d2	44 - #10 AS SHOWN	10'-6	1988	3460	34.1
	f1	23 - #5 @ 1'-0	9'-8	232		
	f2	10 - #5 @ 1'-0	22'-8	236		
	g1	25 - #7 @ 0'-11	9'-8	494		
	g2	11 - #7 @ 0'-11	22'-8	510		
4' x 10' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	3697	35.6
	f1	24 - #5 @ 1'-0	9'-8	242		
	f2	10 - #5 @ 1'-0	23'-8	247		
	g1	25 - #7 @ 0'-11½	9'-8	494		
	g2	15 - #7 @ 0'-8	23'-8	726		
4' x 12' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	4205	42.7
	f1	24 - #5 @ 1'-0	11'-8	292		
	f2	12 - #5 @ 1'-0	23'-8	296		
	g1	29 - #8 @ 0'-10	11'-8	903		
	g2	15 - #7 @ 0'-9½	23'-8	726		
4' x 12' x 26'	d2	44 - #10 AS SHOWN	10'-6	1988	4837	46.2
	f1	26 - #5 @ 1'-0	11'-8	316		
	f2	12 - #5 @ 1'-0	25'-8	321		
	g1	29 - #8 @ 0'-10½	11'-8	903		
	g2	15 - #9 @ 0'-9½	25'-8	1309		



d2 LAYOUT

(SEE SECTION A-A ON SHEET H30-71-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

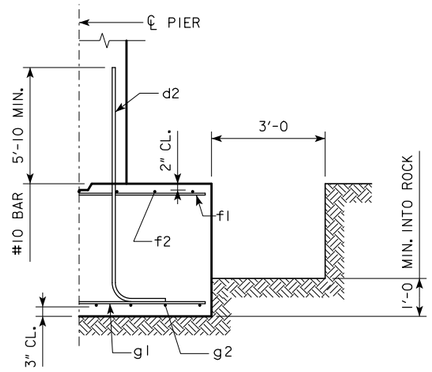
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

30° SKEW - H=25' to 40'

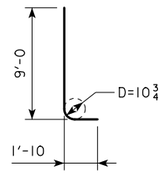
H30-75-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

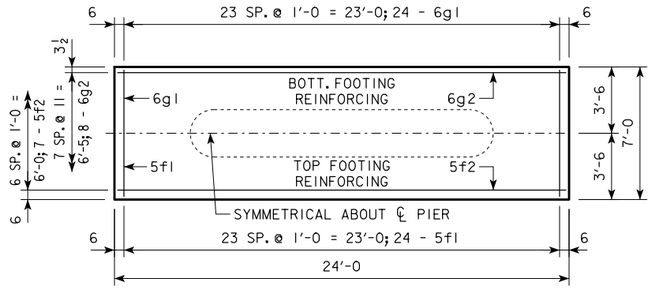
H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4 163'-10	3'-6 x 7' x 24'
	176'-4 188'-10 201'-4	3'-6 x 8' x 24'
	213'-10 226'-4 243'-0	3'-6 x 8' x 26'
19 TO 21	138'-10 151'-4	3'-6 x 7' x 24'
	163'-10 176'-4 188'-10	3'-6 x 8' x 24'
	201'-4 213'-10 226'-4	3'-6 x 8' x 26'
	243'-0	3'-6 x 9' x 26'
22 TO 24	138'-10	3'-6 x 7' x 24'
	151'-4 163'-10 176'-4 188'-10	3'-6 x 8' x 24'
	201'-4 213'-10	3'-6 x 8' x 26'
	226'-4 243'-0	3'-6 x 9' x 26'



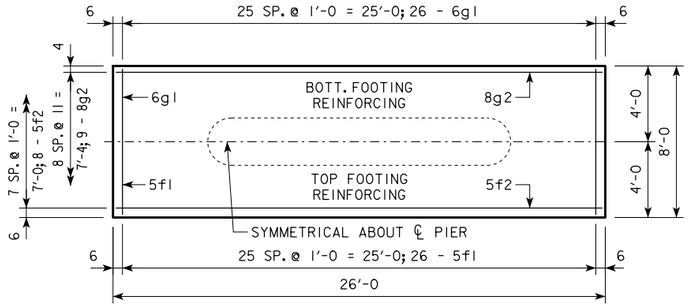
d2

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

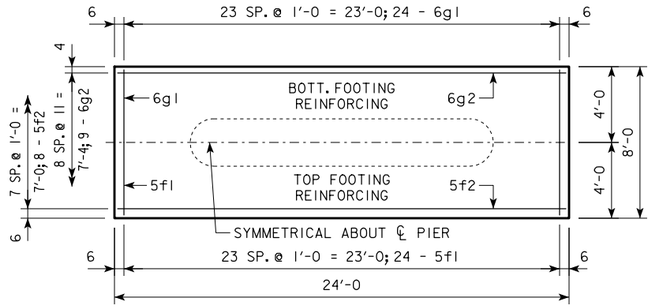
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 7' x 24'	d2	44 - #10 AS SHOWN	10'-10	2051	2915	21.8
	f1	24 - #5 @ 1'-0	6'-8	167		
	f2	7 - #5 @ 1'-0	23'-8	173		
	g1	24 - #6 @ 1'-0	6'-8	240		
	g2	8 - #6 @ 0'-11	23'-8	284		
3'-6 x 8' x 24'	d2	44 - #10 AS SHOWN	10'-10	2051	3036	24.9
	f1	24 - #5 @ 1'-0	7'-8	192		
	f2	8 - #5 @ 1'-0	23'-8	197		
	g1	24 - #6 @ 1'-0	7'-8	276		
	g2	9 - #6 @ 0'-11	23'-8	320		
3'-6 x 8' x 26'	d2	44 - #10 AS SHOWN	10'-10	2051	3389	27.0
	f1	26 - #5 @ 1'-0	7'-8	208		
	f2	8 - #5 @ 1'-0	25'-8	214		
	g1	26 - #6 @ 1'-0	7'-8	299		
	g2	9 - #8 @ 0'-11	25'-8	617		
3'-6 x 9' x 26'	d2	44 - #10 AS SHOWN	10'-10	2051	3603	30.3
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	30 - #6 @ 0'-10½	8'-8	391		
	g2	10 - #8 @ 0'-11	25'-8	685		



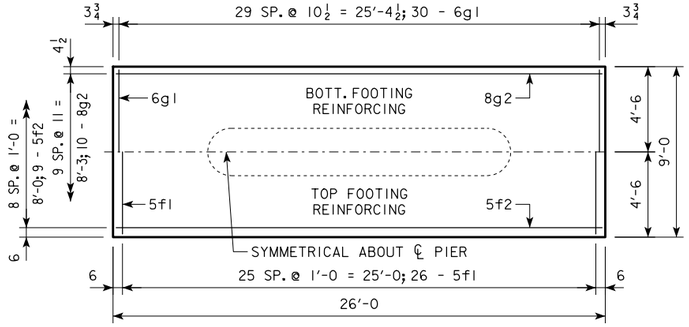
3'-6 x 7'-0 x 24'-0



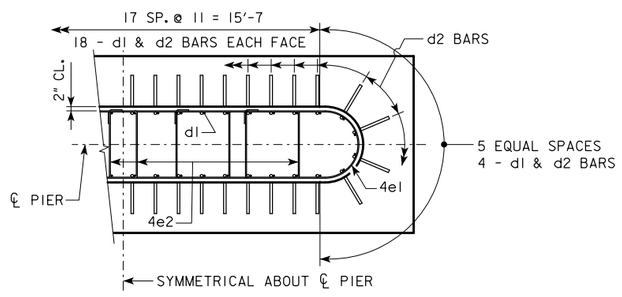
3'-6 x 8'-0 x 26'-0



3'-6 x 8'-0 x 24'-0



3'-6 x 9'-0 x 26'-0



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-71-06.)

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

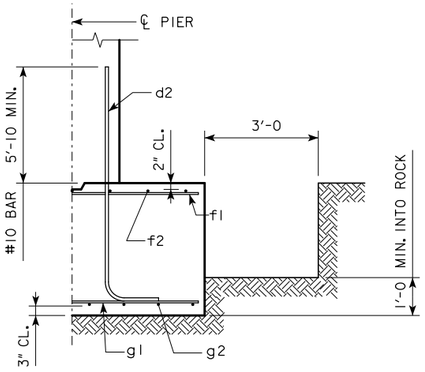
TEE PIER - SPREAD FOOTINGS

30° SKEW - H=16' to 24'

H30-76-06

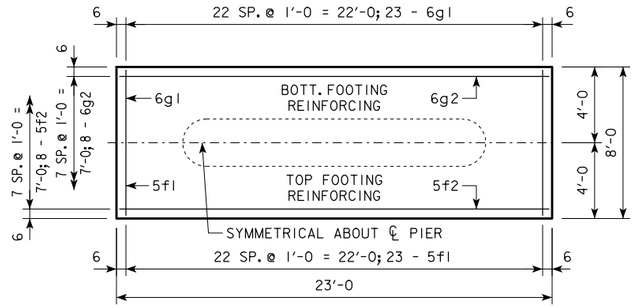
REVISED 04-13 - FOOTING NOTES MODIFIED.

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138'-10 151'-4	4' x 8' x 23'
	163'-10 176'-4 188'-10	4' x 8' x 25'
	201'-4 213'-10 226'-4	4' x 9' x 25'
	243'-0	4' x 9' x 27'
28 TO 30	138'-10	4' x 8' x 23'
	151'-4 163'-10 176'-4	4' x 8' x 25'
	188'-10 201'-4 213'-10	4' x 9' x 25'
	226'-4 243'-0	4' x 9' x 27'
31 TO 33	138'-10 151'-4	4' x 8' x 25'
	163'-10 176'-4 188'-10 201'-4 213'-10	4' x 9' x 25'
	226'-4 243'-0	4' x 9' x 27'
34 TO 36	138'-10 151'-4 163'-10 176'-4 188'-10	4' x 9' x 25'
	201'-4 213'-10 226'-4	4' x 9' x 27'
	243'-0	4' x 10' x 27'
37 TO 40	138'-10 151'-4	4' x 9' x 25'
	163'-10 176'-4 188'-10 201'-4	4' x 9' x 27'
	213'-10 226'-4 243'-0	4' x 10' x 27'

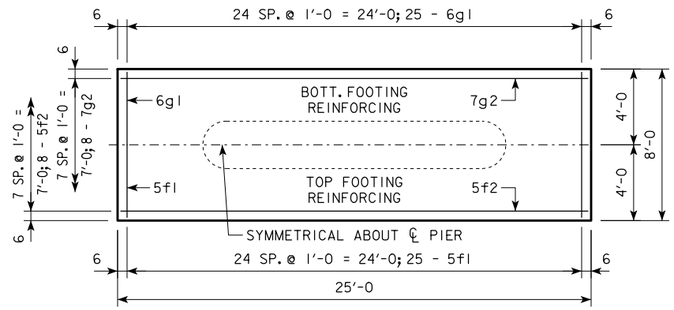


TYPICAL SECTION

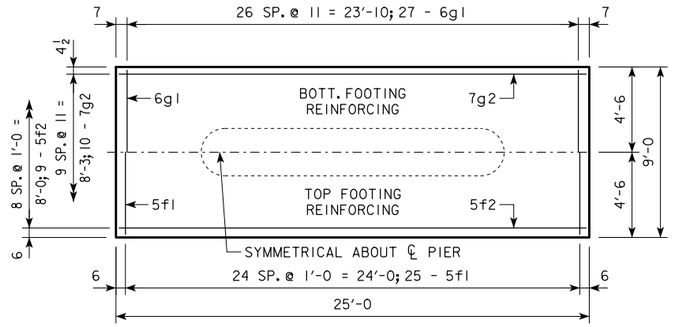
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4' x 8' x 23'	d2	44 - #10 AS SHOWN	11'-4	2146	3056	27.3
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	23 - #6 @ 1'-0	7'-8	265		
	g2	8 - #6 @ 1'-0	22'-8	272		
4' x 8' x 25'	d2	44 - #10 AS SHOWN	11'-4	2146	3243	29.6
	f1	25 - #5 @ 1'-0	7'-8	200		
	f2	8 - #5 @ 1'-0	24'-8	206		
	g1	25 - #6 @ 1'-0	7'-8	288		
	g2	8 - #7 @ 1'-0	24'-8	403		
4' x 9' x 25'	d2	44 - #10 AS SHOWN	11'-4	2146	3459	33.3
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	27 - #6 @ 0'-11	8'-8	351		
	g2	10 - #7 @ 0'-11	24'-8	504		
4' x 9' x 27'	d2	44 - #10 AS SHOWN	11'-4	2146	3925	36.0
	f1	27 - #5 @ 1'-0	8'-8	244		
	f2	9 - #5 @ 1'-0	26'-8	250		
	g1	29 - #6 @ 0'-11	8'-8	378		
	g2	10 - #9 @ 0'-11	26'-8	907		
4' x 10' x 27'	d2	44 - #10 AS SHOWN	11'-4	2146	4156	40.0
	f1	27 - #5 @ 1'-0	9'-8	272		
	f2	10 - #5 @ 1'-0	26'-8	278		
	g1	28 - #7 @ 0'-11½	9'-8	553		
	g2	10 - #9 @ 1'-0	26'-8	907		



4'-0 x 8'-0 x 23'-0

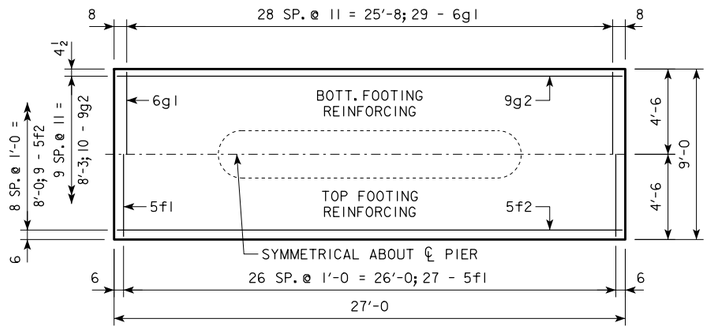


4'-0 x 8'-0 x 25'-0

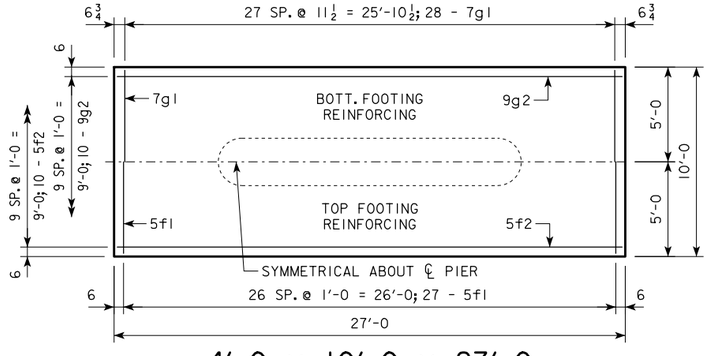


4'-0 x 9'-0 x 25'-0

4'-0 x 8'-0 x 25'-0



4'-0 x 9'-0 x 27'-0

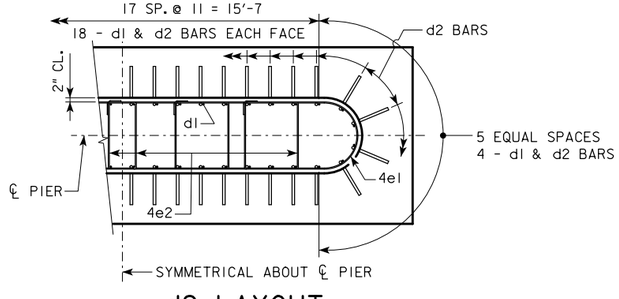


4'-0 x 10'-0 x 27'-0

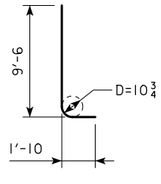
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-71-06.)



d2

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

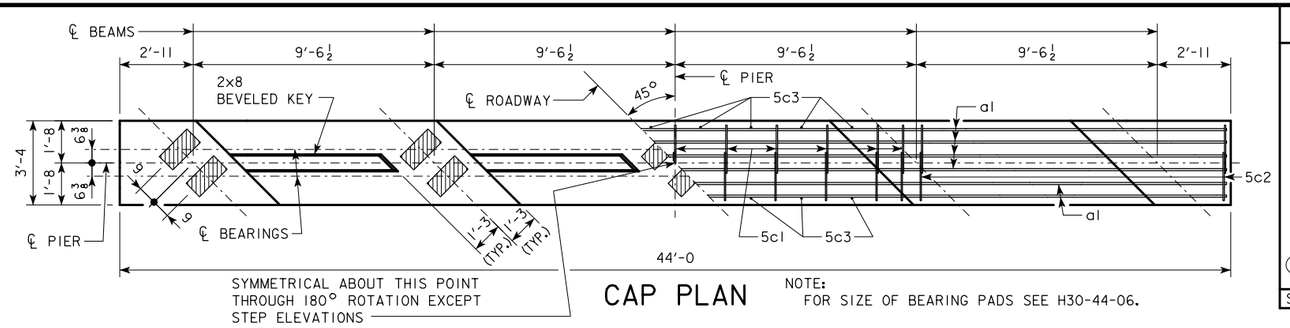
DECEMBER, 2006

TEE PIER - SPREAD FOOTINGS

30° SKEW - H=25' to 40'

H30-77-06

REVISED 04-13 - FOOTING NOTES MODIFIED.



CAP PLAN

NOTE:
FOR SIZE OF BEARING PADS SEE H30-44-06.

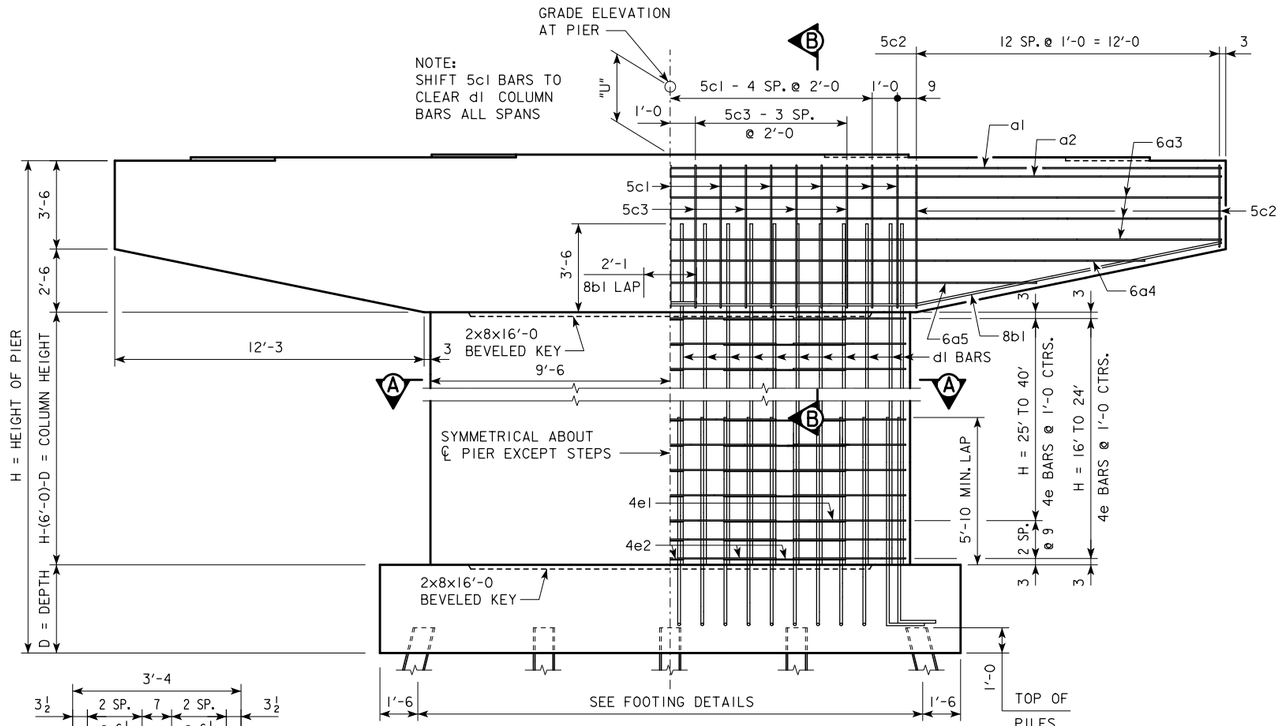
CAP

REINFORCING STEEL	℄ - ℄ ABUT. BEARINGS		138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	43'-8		6	8	700	6	9	891	6	9	891	6	9	891	6	9	891	6	10	1127	6	10	1127	6	10	1127
a2	43'-8		6	8	700	6	8	700	6	8	700	6	9	891	6	9	891	6	9	891	6	9	891	6	10	1127
6a3	43'-8		6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394	6	6	394
6a4	37'-6		2	6	113	2	6	113	2	6	113	2	6	113	2	6	113	2	6	113	2	6	113	2	6	113
6a5	28'-11		2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87	2	6	87
8b1	23'-2		8	8	495	8	8	495	8	8	495	8	8	495	8	8	495	8	8	495	8	8	495	8	8	495
5c1	16'-2		22	5	371	22	5	371	22	5	371	22	5	371	22	5	371	22	5	371	22	5	371	22	5	371
5c2	VARIES		52	5	744	52	5	744	52	5	744	52	5	744	52	5	744	52	5	744	52	5	744	52	5	744
5c3	6'-2		16	5	103	16	5	103	16	5	103	16	5	103	16	5	103	16	5	103	16	5	103	16	5	103
① TOTAL (LB.)			3707			3898			3898			4089			4089			4325			4325			4561		
STRUCTURAL CONCRETE (CY)			29.8			29.8			29.8			29.8			29.8			29.8			29.8			29.8		

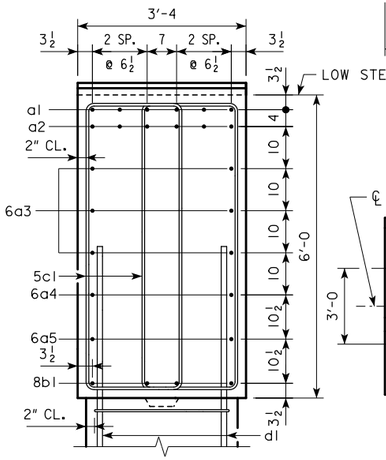
COLUMN

REINFORCING STEEL	℄ - ℄ ABUT. BEARINGS		243'-0		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT
a1	43'-8		6	10	1127
a2	43'-8		6	10	1127
6a3	43'-8		6	6	394
6a4	37'-6		2	6	113
6a5	28'-11		2	6	87
8b1	23'-2		8	8	495
5c1	16'-2		22	5	371
5c2	VARIES		52	5	744
5c3	6'-2		16	5	103
① TOTAL (LB.)			4561		
STRUCTURAL CONCRETE (CY)			29.8		

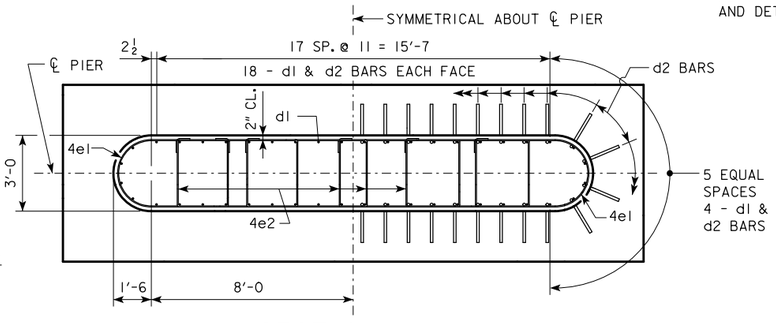
H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL: d1 BAR				4e1 BAR				4e2 BAR				TOTAL WEIGHT (LB.)
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	6'-6	13.3	44	10	10'-0	1893	14	4	13'-9	129	28	4	15'-8	293	2315
17	7'-6	15.3	44	10	11'-0	2083	16	4	13'-9	147	32	4	15'-8	335	2565
18	8'-6	17.3	44	10	12'-0	2272	18	4	13'-9	165	36	4	15'-8	377	2814
19	9'-6	19.4	44	10	13'-0	2461	20	4	13'-9	184	40	4	15'-8	419	3064
20	10'-6	21.4	44	10	14'-0	2651	22	4	13'-9	202	44	4	15'-8	460	3313
21	11'-6	23.5	44	10	15'-0	2840	24	4	13'-9	220	48	4	15'-8	502	3562
22	12'-6	25.5	44	10	16'-0	3029	26	4	13'-9	239	52	4	15'-8	544	3812
23	13'-6	27.5	44	10	17'-0	3219	28	4	13'-9	257	56	4	15'-8	586	4062
24	14'-6	29.6	44	10	18'-0	3408	30	4	13'-9	276	60	4	15'-8	628	4312
25	15'-0	30.6	44	10	18'-6	3503	32	4	13'-9	294	64	4	15'-8	670	4467
26	16'-0	32.6	44	10	19'-6	3692	34	4	13'-9	312	68	4	15'-8	712	4716
27	17'-0	34.7	44	10	20'-6	3881	36	4	13'-9	331	72	4	15'-8	754	4966
28	18'-0	36.7	44	10	21'-6	4071	38	4	13'-9	349	76	4	15'-8	795	5215
29	19'-0	38.8	44	10	22'-6	4260	40	4	13'-9	367	80	4	15'-8	837	5464
30	20'-0	40.8	44	10	23'-6	4449	42	4	13'-9	386	84	4	15'-8	879	5714
31	21'-0	42.8	44	10	24'-6	4639	44	4	13'-9	404	88	4	15'-8	921	5964
32	22'-0	44.9	44	10	25'-6	4828	46	4	13'-9	423	92	4	15'-8	963	6214
33	23'-0	46.9	44	10	26'-6	5017	48	4	13'-9	441	96	4	15'-8	1005	6463
34	24'-0	48.9	44	10	27'-6	5207	50	4	13'-9	459	100	4	15'-8	1047	6713
35	25'-0	51.0	44	10	28'-6	5396	52	4	13'-9	478	104	4	15'-8	1088	6962
36	26'-0	53.0	44	10	29'-6	5585	54	4	13'-9	496	108	4	15'-8	1130	7211
37	27'-0	55.1	44	10	30'-6	5775	56	4	13'-9	514	112	4	15'-8	1172	7461
38	28'-0	57.1	44	10	31'-6	5964	58	4	13'-9	533	116	4	15'-8	1214	7711
39	29'-0	59.1	44	10	32'-6	6153	60	4	13'-9	551	120	4	15'-8	1256	7960
40	30'-0	61.2	44	10	33'-6	6343	62	4	13'-9	569	124	4	15'-8	1298	8210



FRONT ELEVATION

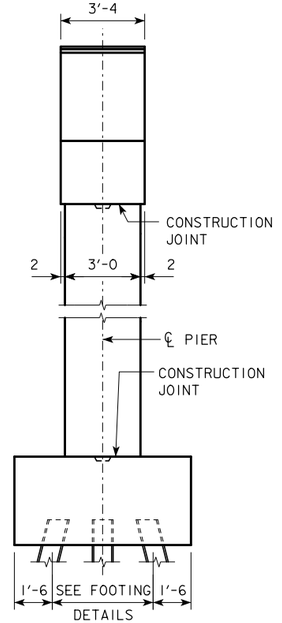


SECTION B-B



SECTION A-A

① SEE SHEET H30-31-06 FOR STEP REINFORCING STEEL QUANTITY AND DETAILS.



END ELEVATION

PIER NOTES:

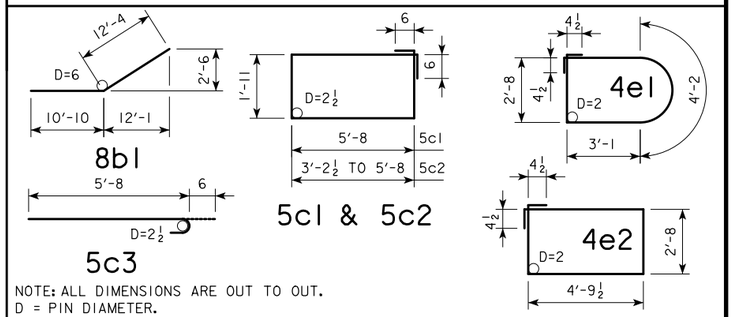
SEE "TEE PIER NOTES" ON H30-02-06 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

ELIMINATE 2x8 BEVELED KEYWAY ON TOP OF CAP FOR EXPANSION PIERS.

SEE SHEET H30-29-06 FOR "U" DIMENSION.

BENT BAR DETAILS



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

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

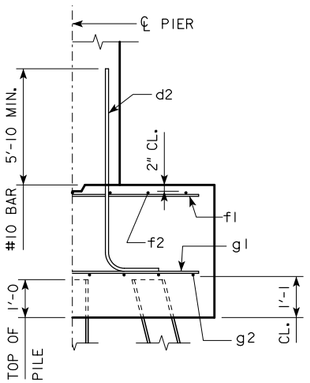
DECEMBER, 2006

TEE PIER CAP AND COLUMN

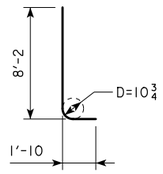
45° SKEW

H30-78-06

REVISED 07-10 - SHEET WAS REVISED TO MEET LRFD SPECIFICATIONS.

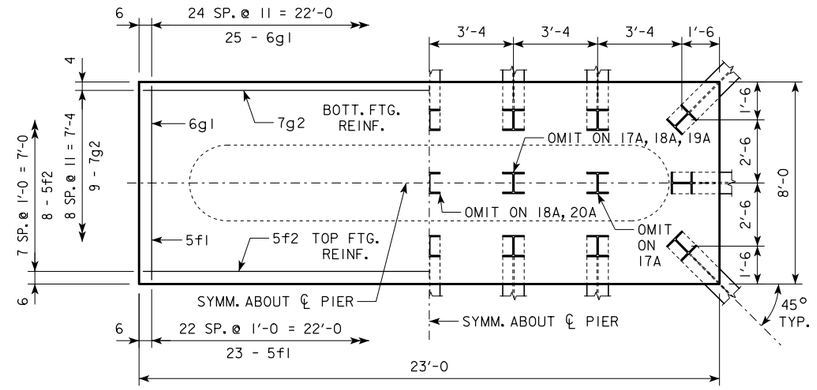


TYPICAL SECTION

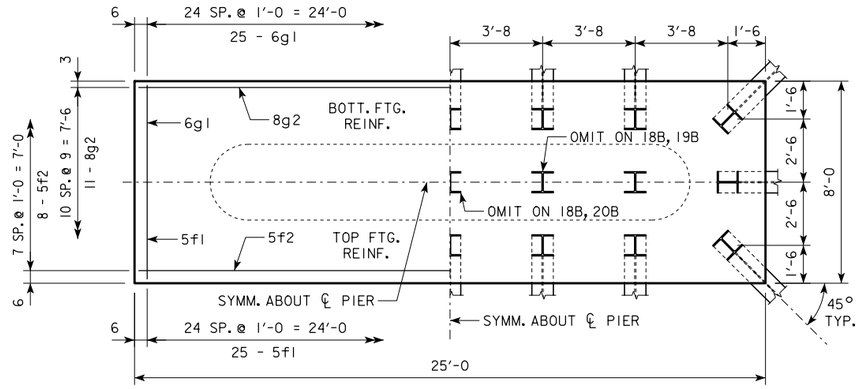


d2

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



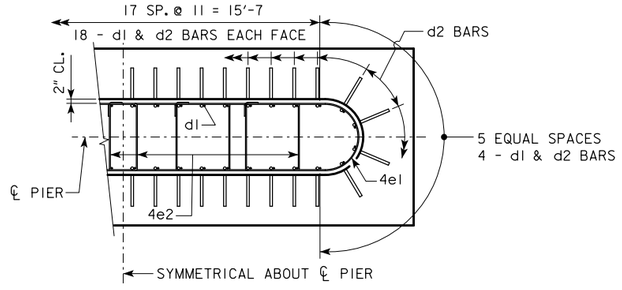
3'-6 x 8'-0 x 23'-0 FOR 17A, 18A, 19A & 20A



3'-6 x 8'-0 x 25'-0 FOR 18B, 19B & 20B

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	17A	141	3'-6 x 8' x 23'
	213'-10	17A	146	
	226'-4	18A	143	
	243'-0	19A	143	
19 TO 21	201'-4	17A	145	3'-6 x 8' x 23'
	213'-10	18A	141	
	226'-4	19A	142	
	243'-0	20A	142	
22 TO 24	201'-4	18B	138	3'-6 x 8' x 25'
	213'-10	18B	143	
	226'-4	19B	143	
	243'-0	20B	143	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	2971	23.9
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	25 - #6 @ 0'-11	7'-8	288		
	g2	9 - #7 @ 0'-11	22'-8	417		
3'-6 x 8' x 25'	d2	44 - #10 AS SHOWN	10'-0	1893	3311	25.9
	f1	25 - #5 @ 1'-0	7'-8	200		
	f2	8 - #5 @ 1'-0	24'-8	206		
	g1	25 - #6 @ 1'-0	7'-8	288		
	g2	11 - #8 @ 0'-9	24'-8	724		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

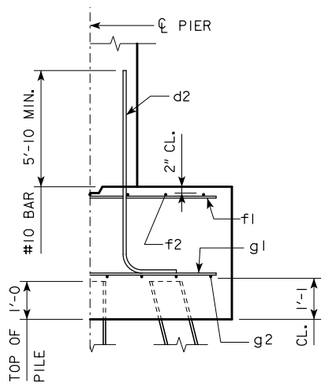
DECEMBER, 2006

TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

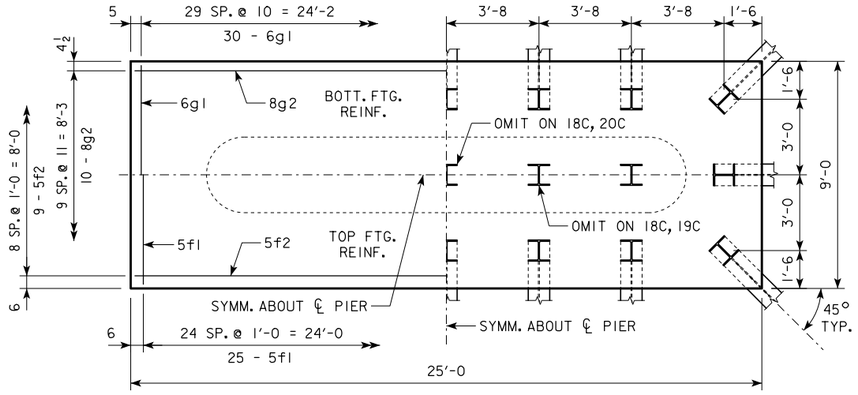
45° SKEW - H=16' to 24'

H30-79-06

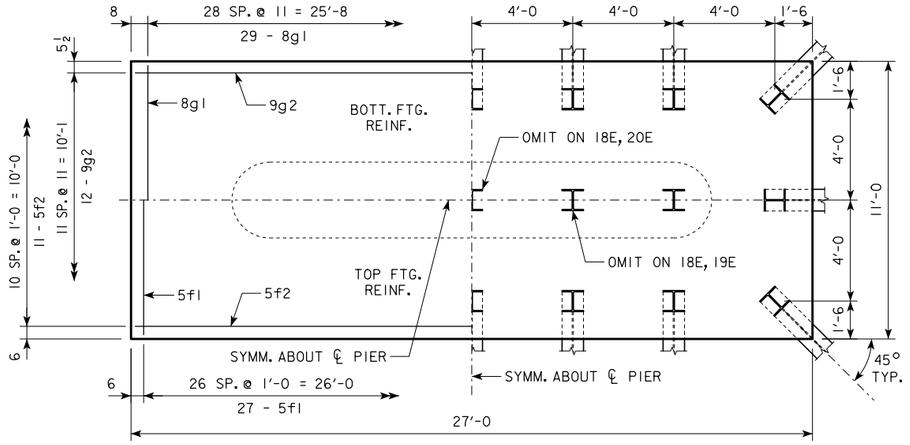
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



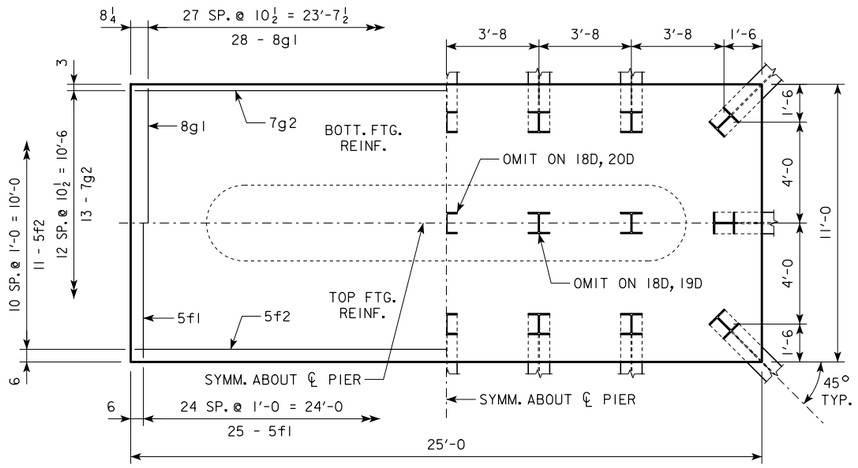
TYPICAL SECTION



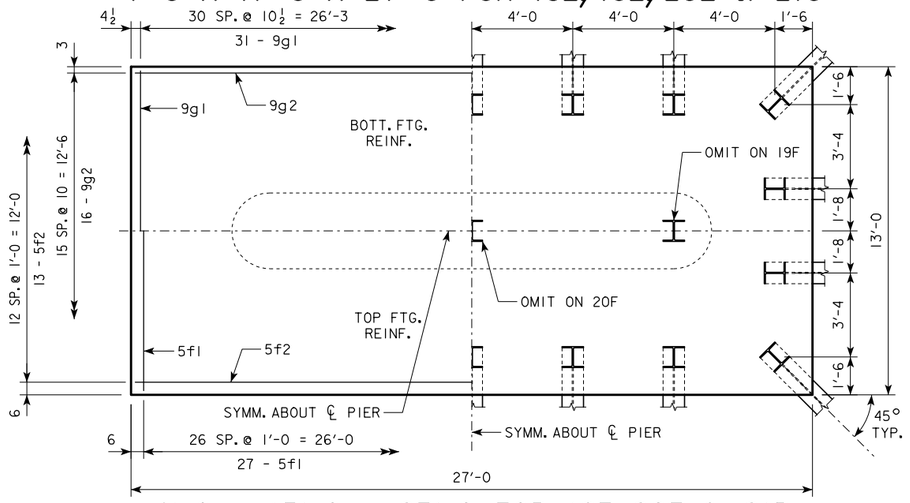
4'-0 x 9'-0 x 25'-0 FOR 18C, 19C, 20C & 21A



4'-0 x 11'-0 x 27'-0 FOR 18E, 19E, 20E & 21C



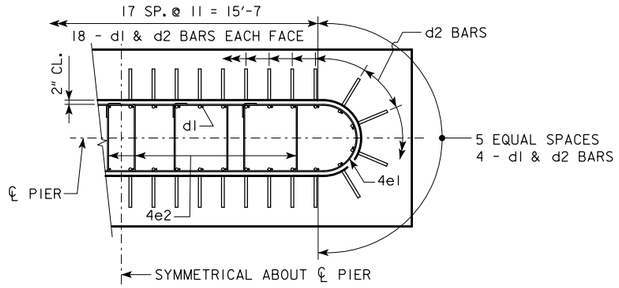
4'-0 x 11'-0 x 25'-0 FOR 18D, 19D, 20D & 21B



4'-0 x 13'-0 x 27'-0 FOR 19F, 20F & 21D

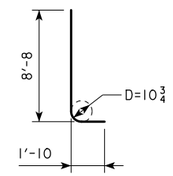
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	18C	140	4' x 9' x 25'
	213'-10	18C	145	
	226'-4	19C	146	
	243'-0	20C	145	
28 TO 30	201'-4	18C	144	4' x 9' x 25'
	213'-10	19C	143	
	226'-4	20C	143	
	243'-0	21A	144	
31 TO 33	201'-4	18D	145	4' x 11' x 25'
	213'-10	19D	145	
	226'-4	20D	144	
	243'-0	21B	144	
34 TO 36	201'-4	18E	147	4' x 11' x 27'
	213'-10	19E	146	
	226'-4	20E	145	
	243'-0	21C	145	
37 TO 40	201'-4	19F	140	4' x 13' x 27'
	213'-10	19F	145	
	226'-4	20F	142	
	243'-0	21D	141	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 25'	d2	44 - #10 AS SHOWN	10'-6	1988	3496	33.3
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	30 - #6 @ 0'-10	8'-8	391		
	g2	10 - #8 @ 0'-11	24'-8	659		
4' x 11' x 25'	d2	44 - #10 AS SHOWN	10'-6	1988	4001	40.7
	f1	25 - #5 @ 1'-0	10'-8	278		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	28 - #8 @ 0'-10½	10'-8	797		
	g2	13 - #7 @ 0'-10½	24'-8	655		
4' x 11' x 27'	d2	44 - #10 AS SHOWN	10'-6	1988	4508	44.0
	f1	27 - #5 @ 1'-0	10'-8	300		
	f2	11 - #5 @ 1'-0	26'-8	306		
	g1	29 - #8 @ 0'-11	10'-8	826		
	g2	12 - #9 @ 0'-11	26'-8	1088		
4' x 13' x 27'	d2	44 - #10 AS SHOWN	10'-6	1988	5493	52.0
	f1	27 - #5 @ 1'-0	12'-8	357		
	f2	13 - #5 @ 1'-0	26'-8	362		
	g1	31 - #9 @ 0'-10½	12'-8	1335		
	g2	16 - #9 @ 0'-10	26'-8	1451		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

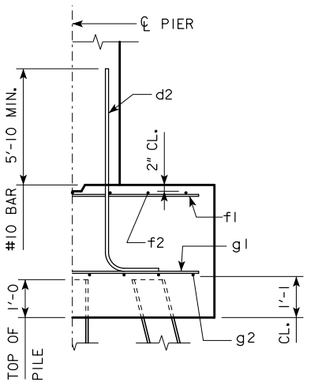
DECEMBER, 2006

TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

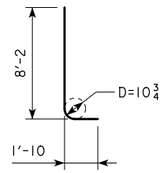
45° SKEW - H=25' to 40'

H30-80-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

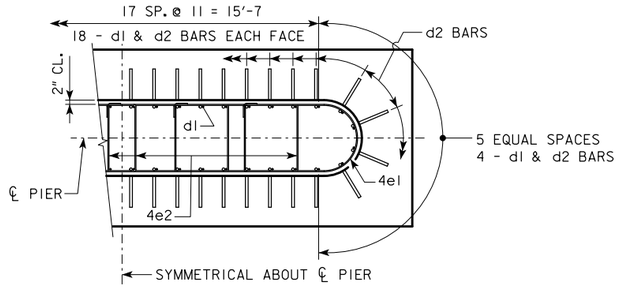


d2

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

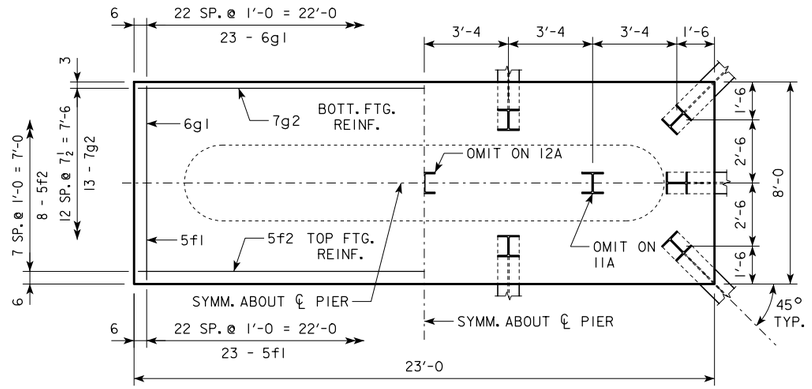
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
16 TO 18	201'-4	11A	210	3'-6 x 8' x 23'
	213'-10	11A	217	
	226'-4	12A	208	
	243'-0	12A	215	
19 TO 21	201'-4	11B	214	3'-6 x 9' x 23'
	213'-10	12B	203	
	226'-4	12B	212	
	243'-0	12B	219	
22 TO 24	201'-4	12B	202	3'-6 x 9' x 23'
	213'-10	12B	209	
	226'-4	12B	217	
	243'-0	13A	213	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	3133	23.9
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	23 - #6 1'-0	7'-8	265		
	g2	13 - #7 @ 0'-7½	22'-8	602		
3'-6 x 9' x 23'	d2	44 - #10 AS SHOWN	10'-0	1893	3323	26.8
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	23 - #7 @ 1'-0	8'-8	407		
	g2	13 - #7 @ 0'-8½	22'-8	602		

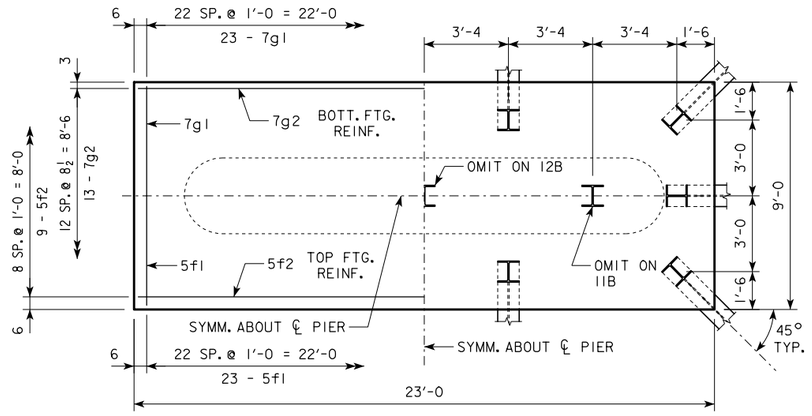


d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



3'-6 x 8'-0 x 23'-0 FOR 11A & 12A



3'-6 x 9'-0 x 23'-0 FOR 11B, 12B & 13A

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

04-13
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

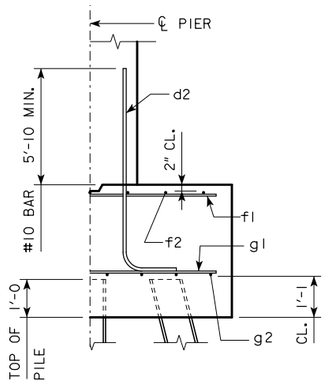
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

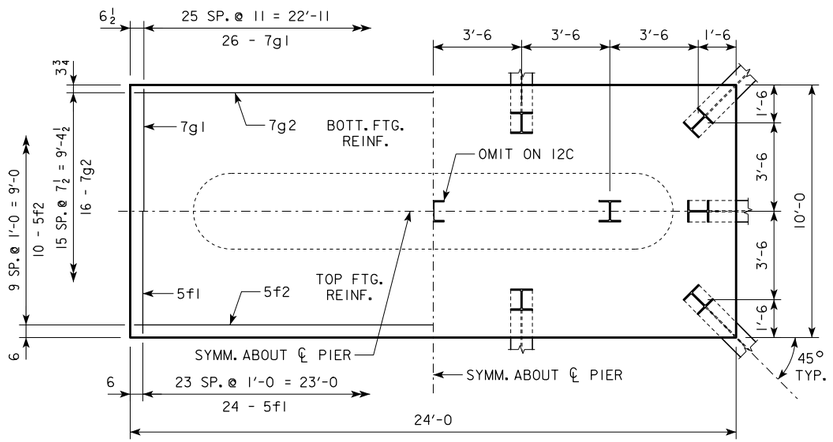
45° SKEW - H=16' to 24'

H30-81-06

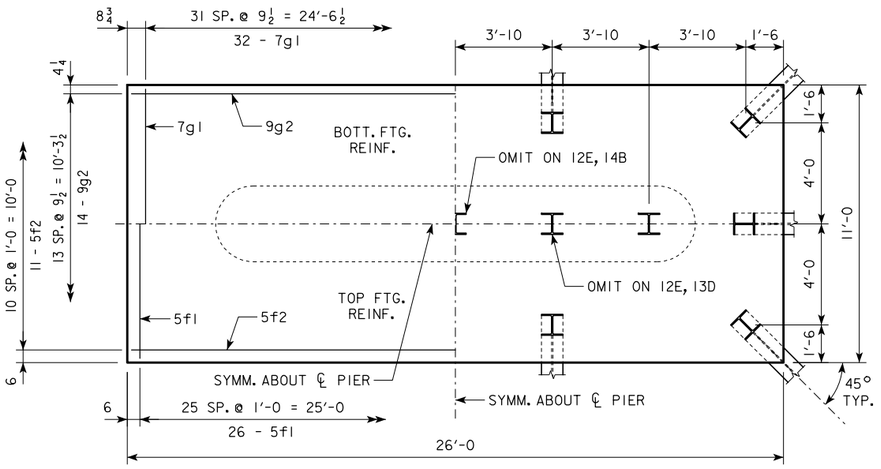
REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



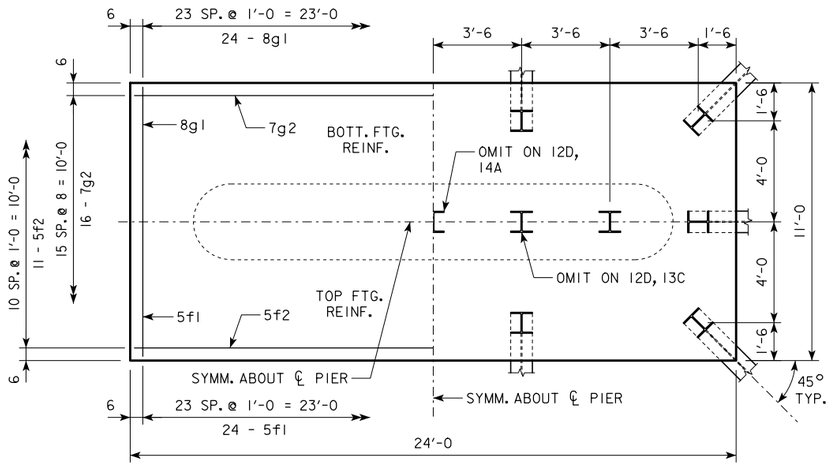
TYPICAL SECTION



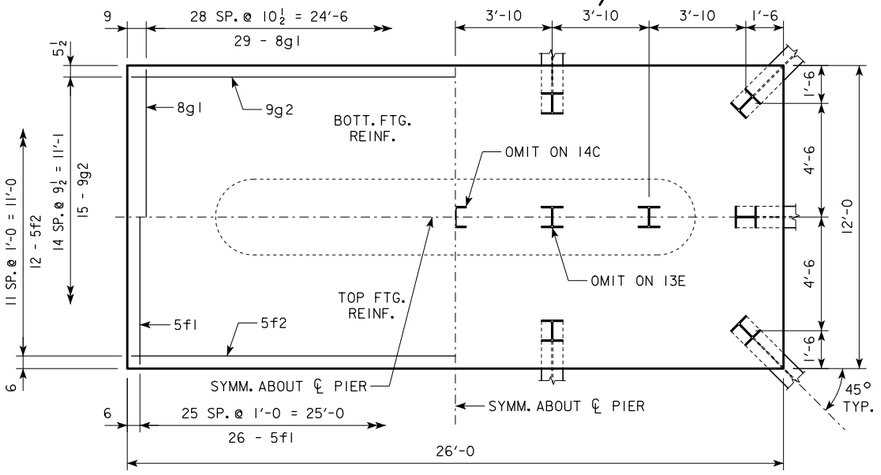
4'-0 x 10'-0 x 24'-0 FOR 12C & 13B



4'-0 x 11'-0 x 26'-0 FOR 12E, 13D & 14B



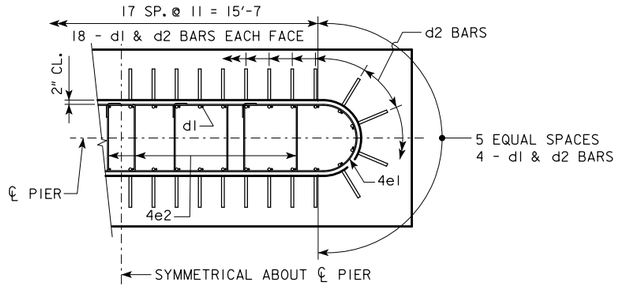
4'-0 x 11'-0 x 24'-0 FOR 12D, 13C & 14A



4'-0 x 12'-0 x 26'-0 FOR 13E & 14C

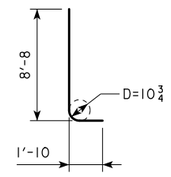
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD Pu, STRENGTH I, DES. LOAD (KIPS)	FOOTING SIZE
25 TO 27	201'-4	12C	205	4' x 10' x 24'
	213'-10	12C	211	
	226'-4	12C	220	
	243'-0	13B	215	
28 TO 30	201'-4	12D	208	4' x 11' x 24'
	213'-10	12D	215	
	226'-4	13C	211	
	243'-0	13C	219	
31 TO 33	201'-4	12D	213	4' x 11' x 24'
	213'-10	13C	208	
	226'-4	13C	216	
	243'-0	14A	211	
34 TO 36	201'-4	12E	217	4' x 11' x 26'
	213'-10	13D	212	
	226'-4	14B	209	
	243'-0	14B	215	
37 TO 40	201'-4	13E	210	4' x 12' x 26'
	213'-10	13E	217	
	226'-4	14C	213	
	243'-0	14C	219	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 10' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	3765	35.6
	f1	24 - #5 @ 1'-0	9'-8	242		
	f2	10 - #5 @ 1'-0	23'-8	247		
	g1	26 - #7 @ 0'-11	9'-8	514		
	g2	16 - #7 @ 0'-7½	23'-8	774		
4' x 11' x 24'	d2	44 - #10 AS SHOWN	10'-6	1988	3985	39.1
	f1	24 - #5 @ 1'-0	10'-8	267		
	f2	11 - #5 @ 1'-0	23'-8	272		
	g1	24 - #8 @ 1'-0	10'-8	684		
	g2	16 - #7 @ 0'-8	23'-8	774		
4' x 11' x 26'	d2	44 - #10 AS SHOWN	10'-6	1988	4491	42.4
	f1	26 - #5 @ 1'-0	10'-8	289		
	f2	11 - #5 @ 1'-0	25'-8	294		
	g1	32 - #7 @ 0'-9½	10'-8	698		
	g2	14 - #9 @ 0'-9½	25'-8	1222		
4' x 12' x 26'	d2	44 - #10 AS SHOWN	10'-6	1988	4837	46.2
	f1	26 - #5 @ 1'-0	11'-8	316		
	f2	12 - #5 @ 1'-0	25'-8	321		
	g1	29 - #8 @ 0'-10½	11'-8	903		
	g2	15 - #9 @ 0'-9½	25'-8	1309		



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)

① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



d2

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

FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

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

04-13
LATEST REVISION DATE

Marcus K. McGrail
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

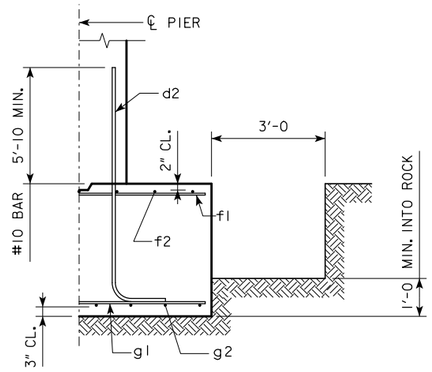
DECEMBER, 2006

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

45° SKEW - H=25' to 40'

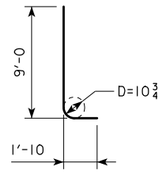
H30-82-06

REVISED 04-13 - REVISION FOR LRFD PILE DESIGN.



TYPICAL SECTION

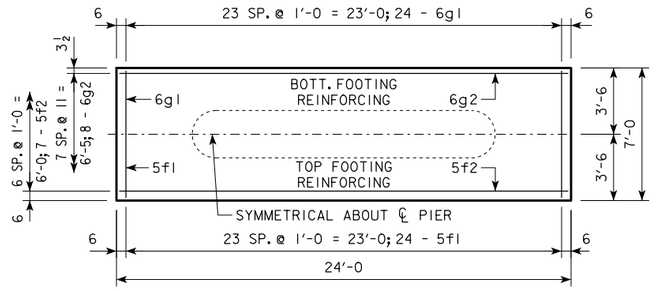
H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4	3'-6 x 7' x 24'
	163'-10 176'-4 188'-10	3'-6 x 8' x 24'
	201'-4 213'-10 226'-4	3'-6 x 9' x 24'
	243'-0	3'-6 x 9' x 26'
19 TO 21	138'-10	3'-6 x 7' x 24'
	151'-4 163'-10 176'-4 188'-10	3'-6 x 8' x 24'
	201'-4 213'-10	3'-6 x 9' x 24'
	226'-4 243'-0	3'-6 x 9' x 26'
22 TO 24	138'-10 151'-4 163'-10 176'-4	3'-6 x 8' x 24'
	188'-10 201'-4 213'-10	3'-6 x 9' x 24'
	226'-4 243'-0	3'-6 x 9' x 26'



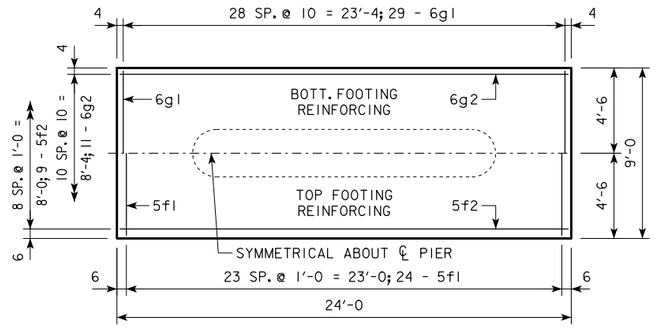
d2

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

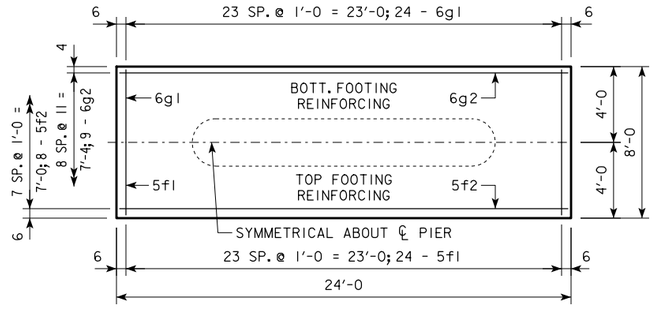
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 7' x 24'	d2	44 - #10 AS SHOWN	10'-10	2051	2915	21.8
	f1	24 - #5 @ 1'-0	6'-8	167		
	f2	7 - #5 @ 1'-0	23'-8	173		
	g1	24 - #6 @ 1'-0	6'-8	240		
	g2	8 - #6 @ 0'-11	23'-8	284		
3'-6 x 8' x 24'	d2	44 - #10 AS SHOWN	10'-10	2051	3036	24.9
	f1	24 - #5 @ 1'-0	7'-8	192		
	f2	8 - #5 @ 1'-0	23'-8	197		
	g1	24 - #6 @ 1'-0	7'-8	276		
	g2	9 - #6 @ 0'-11	23'-8	320		
3'-6 x 9' x 24'	d2	44 - #10 AS SHOWN	10'-10	2051	3259	28.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	29 - #6 @ 0'-10	8'-8	378		
	g2	11 - #6 @ 0'-10	23'-8	391		
3'-6 x 9' x 26'	d2	44 - #10 AS SHOWN	10'-10	2051	3616	30.3
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	31 - #6 @ 0'-10	8'-8	404		
	g2	10 - #8 @ 0'-11	25'-8	685		



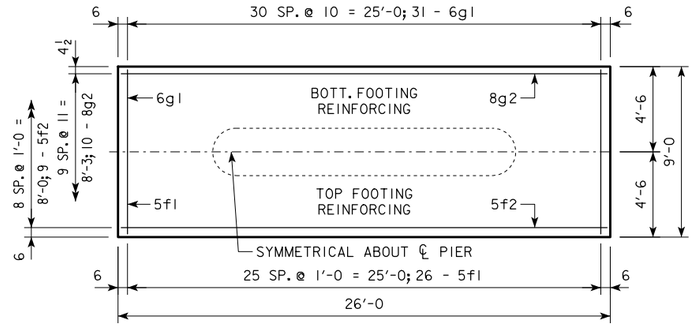
3'-6 x 7'-0 x 24'-0



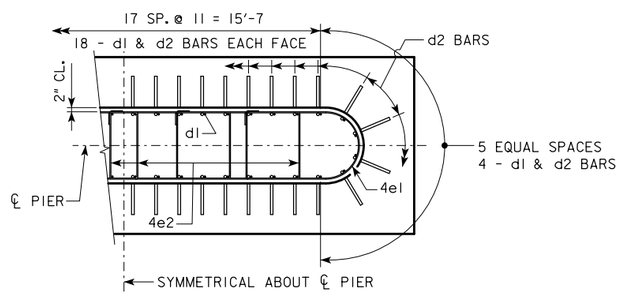
3'-6 x 9'-0 x 24'-0



3'-6 x 8'-0 x 24'-0



3'-6 x 9'-0 x 26'-0



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

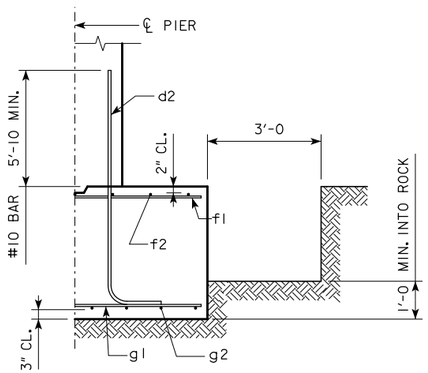
TEE PIER - SPREAD FOOTINGS

45° SKEW - H=16' to 24'

H30-83-06

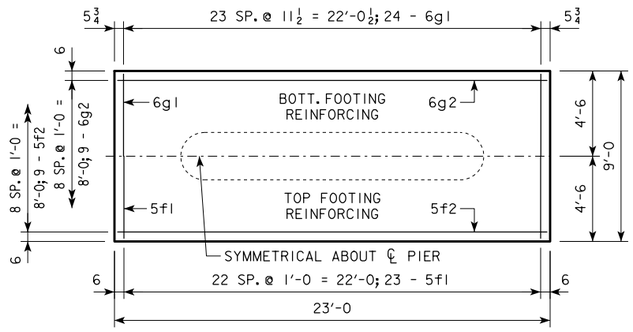
REVISED 04-13 - FOOTING NOTES MODIFIED.

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10 151′-4 163′-10 176′-4 188′-10	4′ x 9′ x 23′
	201′-4 213′-10	4′ x 9′ x 25′
	226′-4 243′-0	4′ x 10′ x 25′
28 TO 30	138′-10 151′-4 163′-10 176′-4	4′ x 9′ x 23′
	188′-10 201′-4	4′ x 9′ x 25′
	213′-10 226′-4 243′-0	4′ x 10′ x 25′
31 TO 33	138′-10 151′-4	4′ x 9′ x 23′
	163′-10 176′-4 188′-10	4′ x 9′ x 25′
	201′-4 213′-10 226′-4 243′-0	4′ x 10′ x 25′
34 TO 36	138′-10 151′-4 163′-10 176′-4 188′-10	4′ x 9′ x 25′
	201′-4 213′-10 226′-4	4′ x 10′ x 25′
	243′-0	4′ x 10′ x 27′
37 TO 40	138′-10	4′ x 9′ x 25′
	151′-4 163′-10 176′-4 188′-10 201′-4	4′ x 10′ x 25′
	213′-10 226′-4 243′-0	4′ x 10′ x 27′

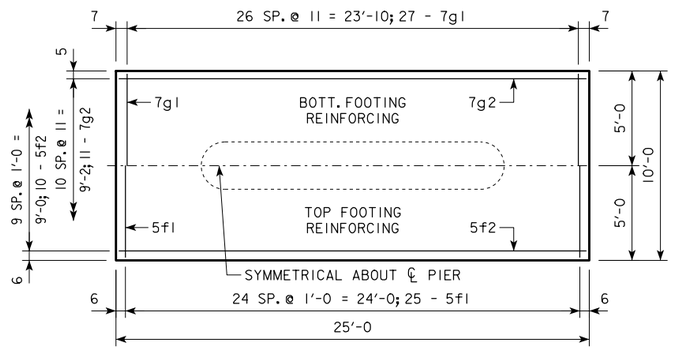


TYPICAL SECTION

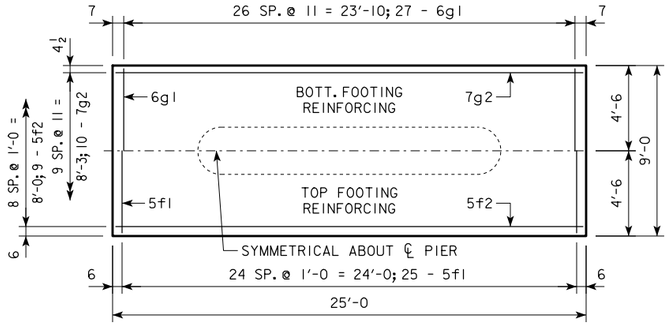
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4′ x 9′ x 23′	d2	44 - #10 AS SHOWN	11′-4	2146	3185	30.7
	f1	23 - #5 @ 1′-0	8′-8	208		
	f2	9 - #5 @ 1′-0	22′-8	213		
	g1	24 - #6 @ 0′-11½	8′-8	312		
	g2	9 - #6 @ 1′-0	22′-8	306		
4′ x 9′ x 25′	d2	44 - #10 AS SHOWN	11′-4	2146	3459	33.3
	f1	25 - #5 @ 1′-0	8′-8	226		
	f2	9 - #5 @ 1′-0	24′-8	232		
	g1	27 - #6 @ 0′-11	8′-8	351		
	g2	10 - #7 @ 0′-11	24′-8	504		
4′ x 10′ x 25′	d2	44 - #10 AS SHOWN	11′-4	2146	3743	37.0
	f1	25 - #5 @ 1′-0	9′-8	252		
	f2	10 - #5 @ 1′-0	24′-8	257		
	g1	27 - #7 @ 0′-11	9′-8	533		
	g2	11 - #7 @ 0′-11	24′-8	555		
4′ x 10′ x 27′	d2	44 - #10 AS SHOWN	11′-4	2146	4143	40.0
	f1	27 - #5 @ 1′-0	9′-8	272		
	f2	10 - #5 @ 1′-0	26′-8	278		
	g1	30 - #7 0′-10½	9′-8	593		
	g2	12 - #8 @ 0′-10	26′-8	854		



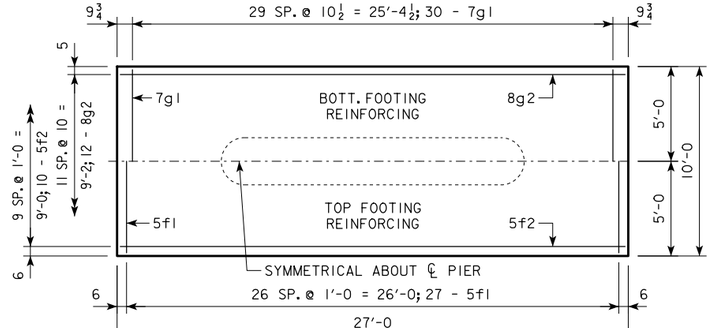
4′-0 x 9′-0 x 23′-0



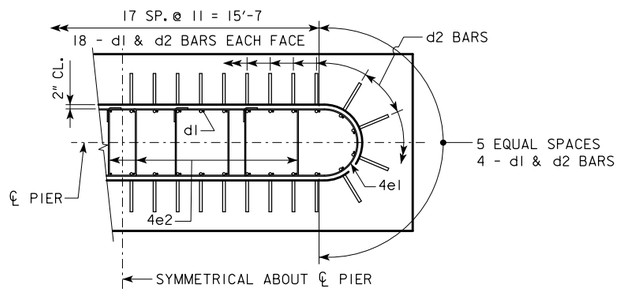
4′-0 x 10′-0 x 25′-0



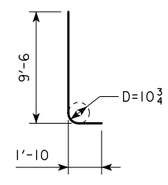
4′-0 x 9′-0 x 25′-0



4′-0 x 10′-0 x 27′-0



d2 LAYOUT
(SEE SECTION A-A ON SHEET H30-78-06.)



d2

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

FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H30-57-06.

THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF AT LEAST 10 KIPS PER SQUARE FOOT).

04-13
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30′ ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

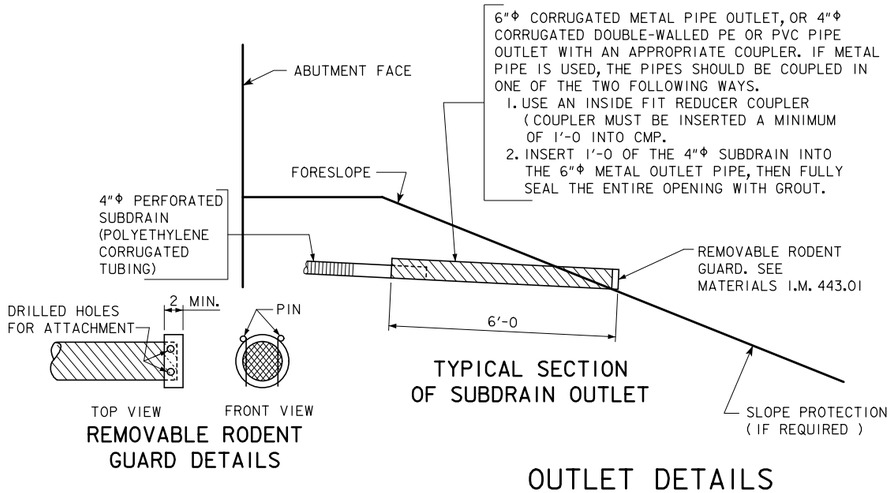
DECEMBER, 2006

TEE PIER - SPREAD FOOTINGS

45° SKEW - H=25′ to 40′

H30-84-06

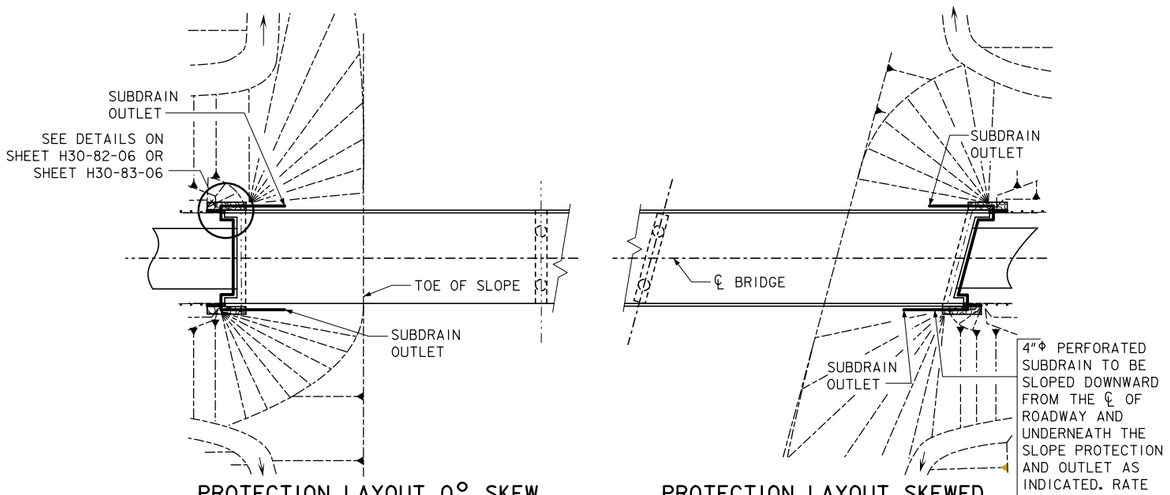
REVISED 04-13 - FOOTING NOTES MODIFIED.



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.

07-10
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

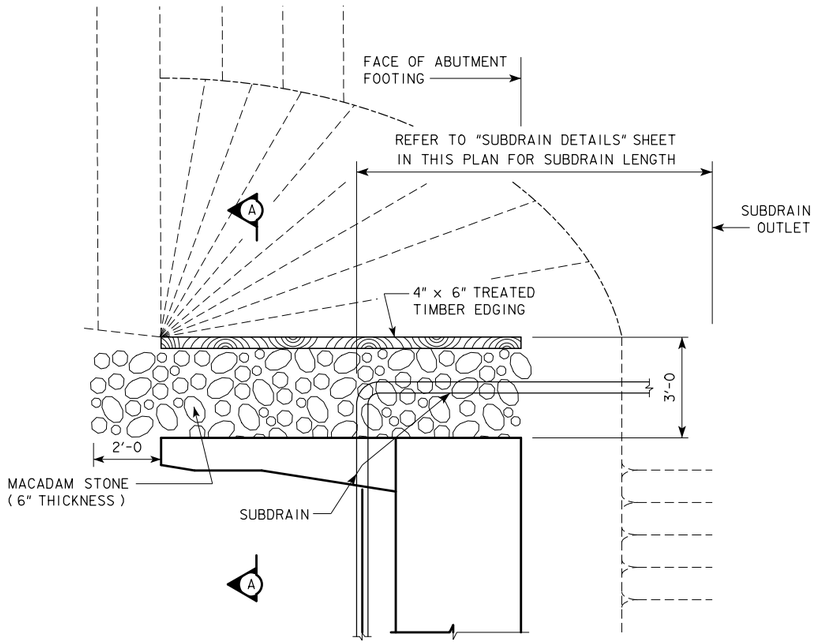
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

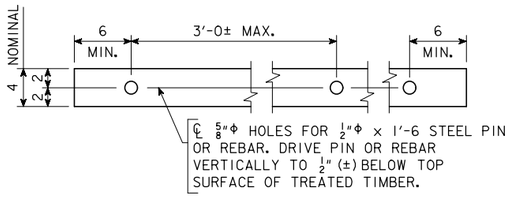
SUBDRAIN DETAILS

H30-85-06

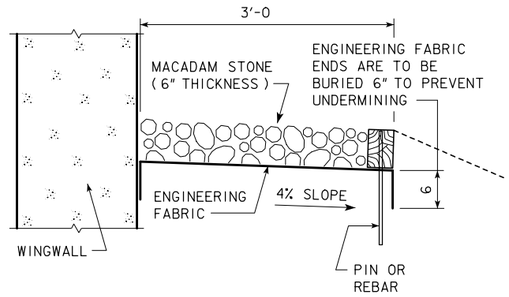
REVISED 07-10 - REMOVED THE GRANULAR BACKFILL DETAIL.



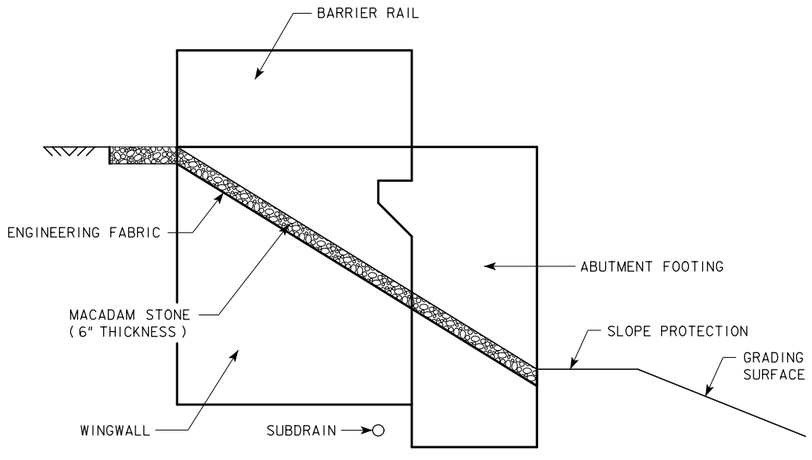
TOP VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A



PROFILE VIEW OF WING ARMORING

(SHOWN FOR INTEGRAL ABUTMENT)

SUBDRAIN NOTES:

SEE H30-85-06 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.

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MACADAM STONE WING ARMORING NOTES:

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

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09-14
LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

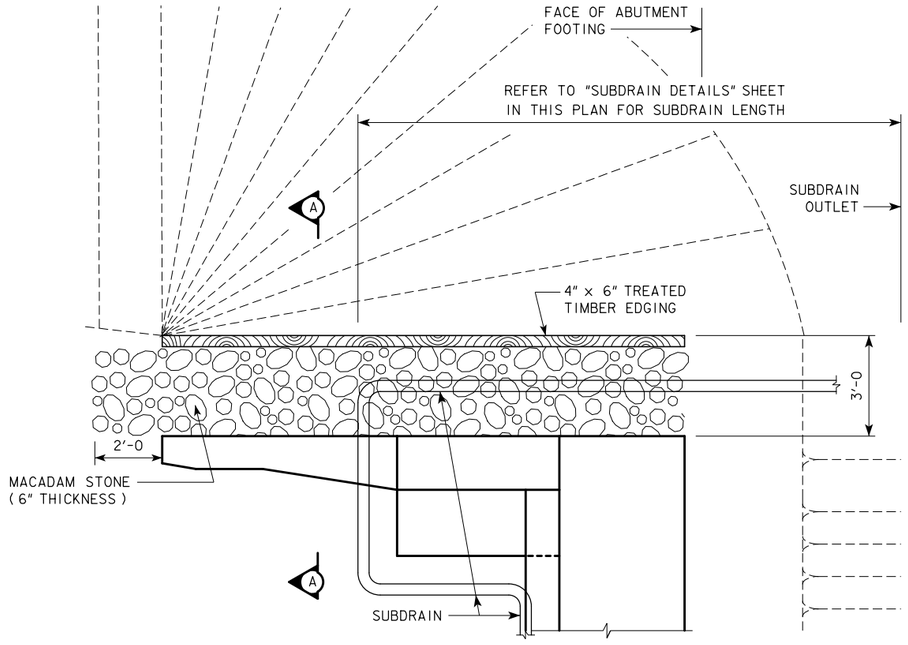
DECEMBER, 2006

WING ARMORING DETAILS

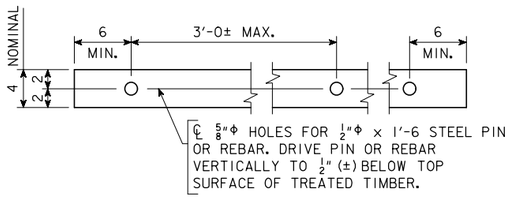
A & B BEAMS

H30-86-06

REVISED 09-14 - CHANGED THE AREA OF THE MACADAM STONE AREA TO 2'-0 IN FRONT OF THE BRIDGE WING.



TOP VIEW OF WING ARMORING WITH WING EXTENSION



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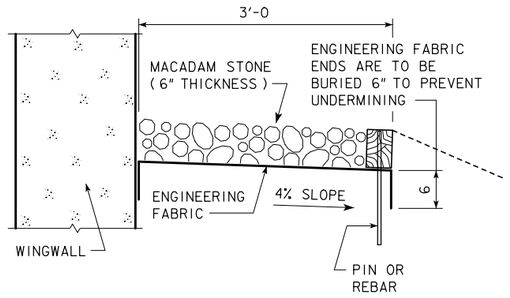
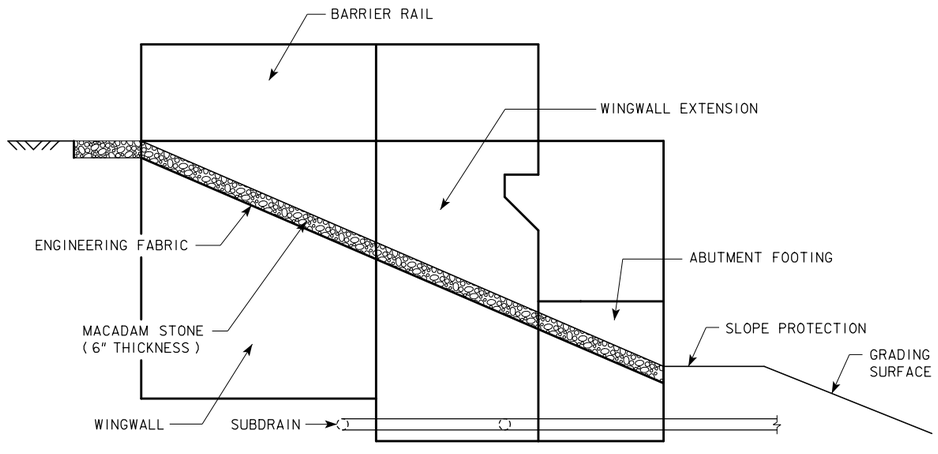


SECTION A-A



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APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

WING ARMORING DETAILS

C BEAMS

H30-87-06

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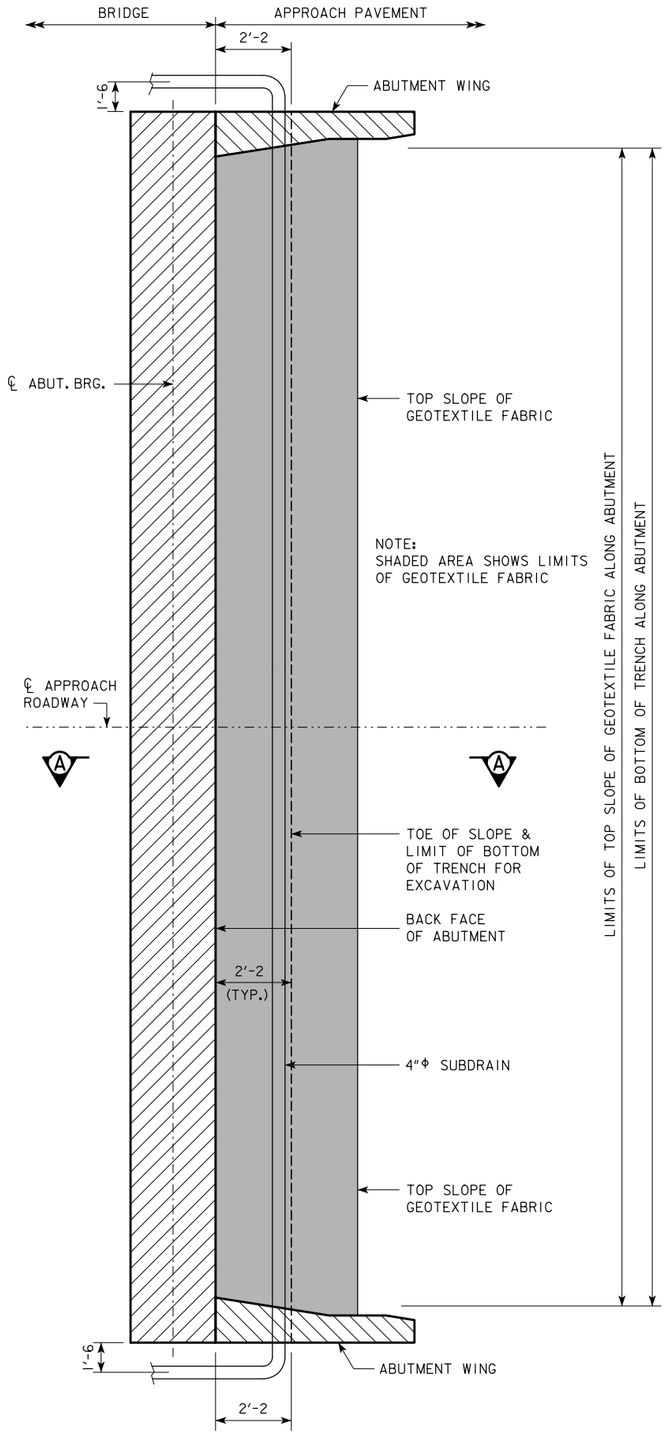

ABUTMENT PLAN WITHOUT WING EXTENSIONS

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 "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 FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE 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.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

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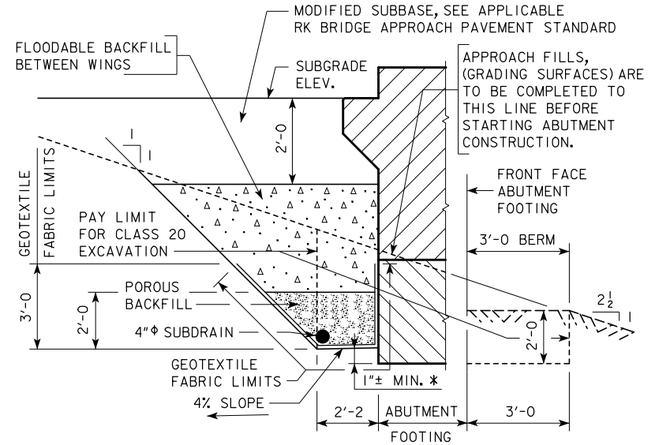
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

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

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE 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.



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, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ABUTMENT BACKFILL DETAILS

A & B BEAMS - 0° SKEW

H30-88-06

REVISED 09-14 - THE TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND A NOTE ADDED TO REFER TO THE STANDARDS SPECIFICATIONS FOR THIS INFORMATION.

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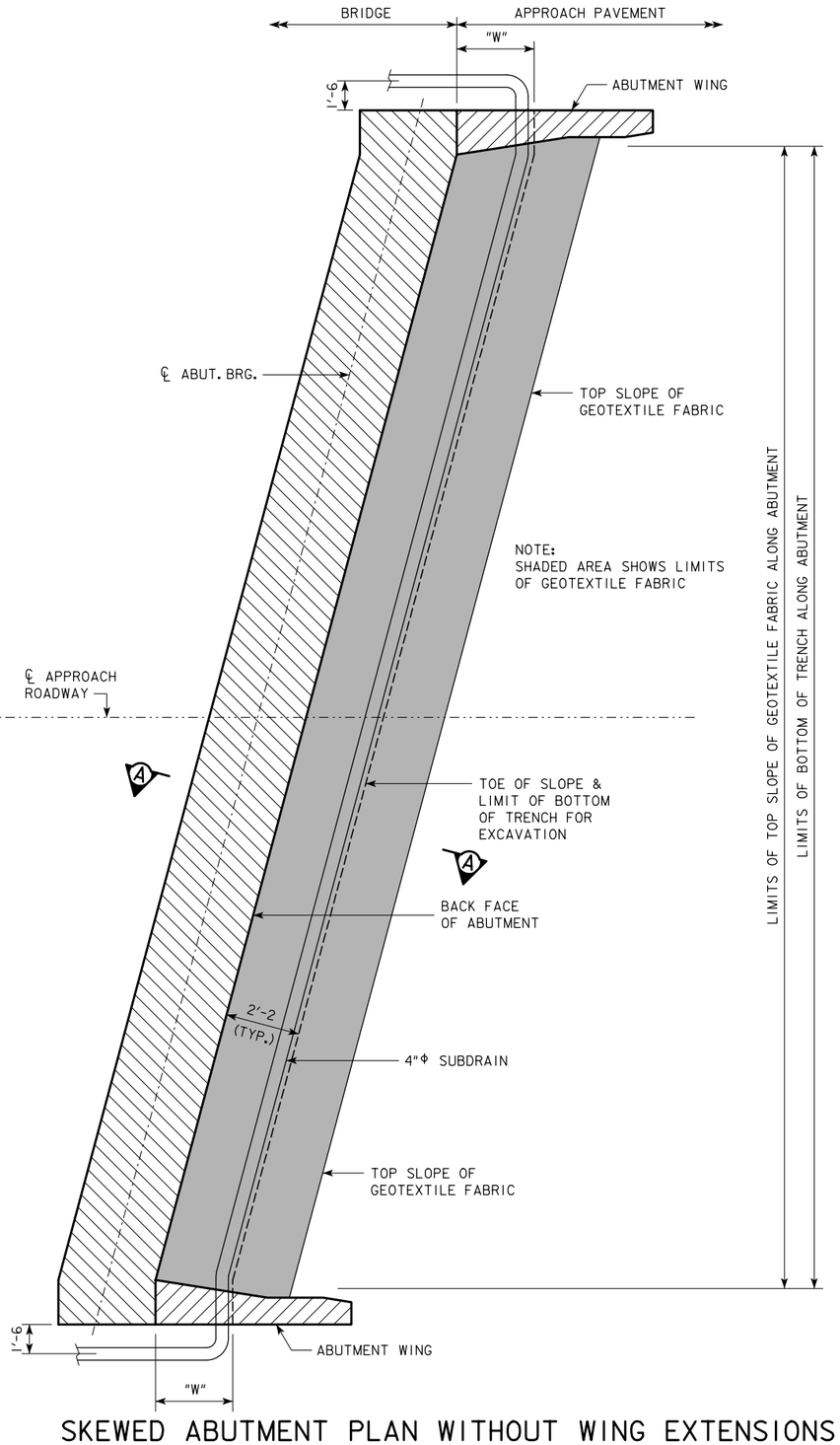

SKEWED ABUTMENT PLAN WITHOUT WING EXTENSIONS

(SKEWED LEFT AHEAD SHOWN, SKEWED RIGHT AHEAD SIMILIAR)

"W" DIMENSION	
SKEW	DIMENSION
15°	$2'-2\frac{7}{8}$
30°	2'-6
45°	$3'-0\frac{3}{4}$

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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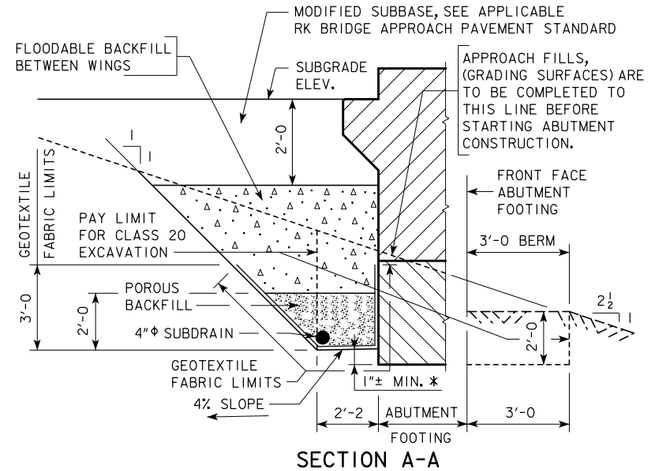

SECTION A-A

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PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

DECEMBER, 2006

ABUTMENT BACKFILL DETAILS

A & B BEAMS - SKEWED

H30-89-06

6/26/2015 4:06:36 PM bkloss W:\Highway\Bridge\MethodsSection\CADD Concept Drafts\H30-06.dgn H30-89-06 11x17_pdf.pltcfg

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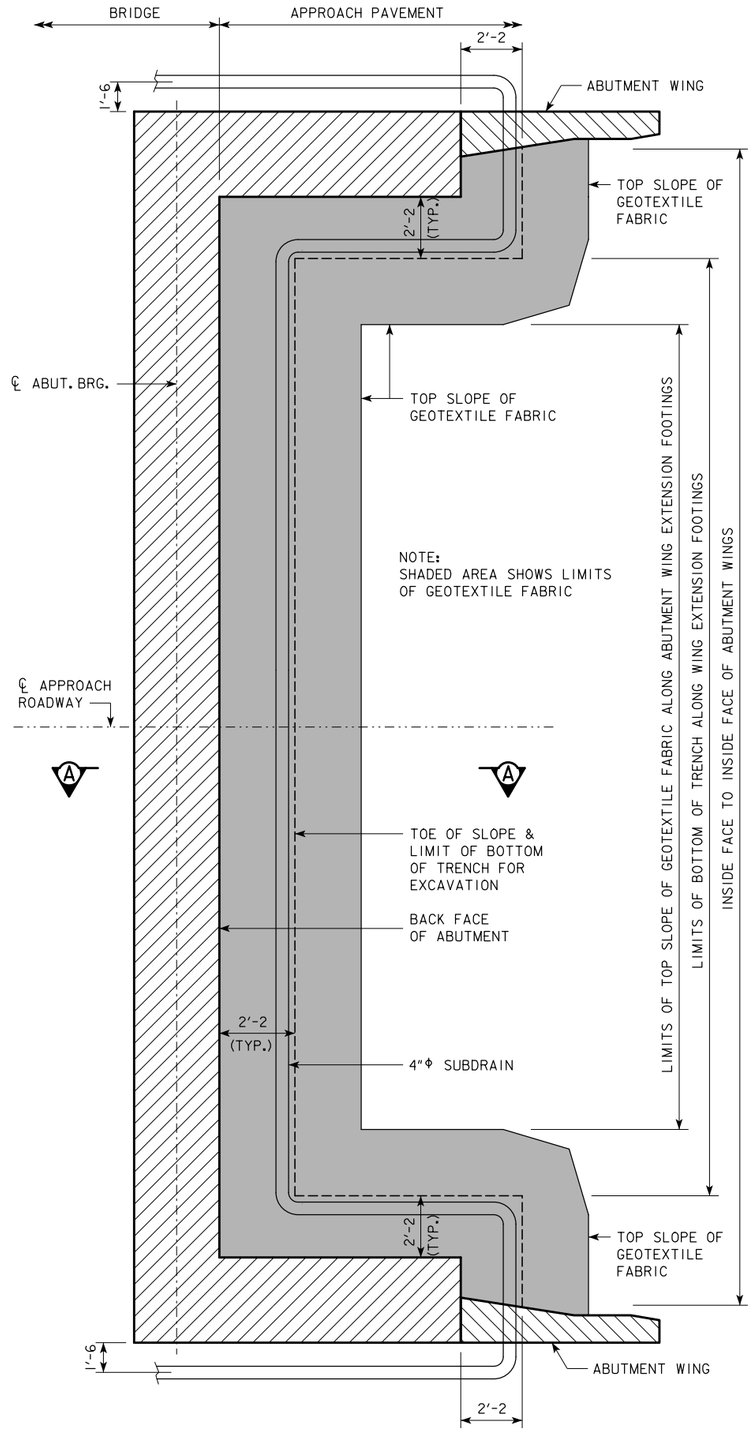

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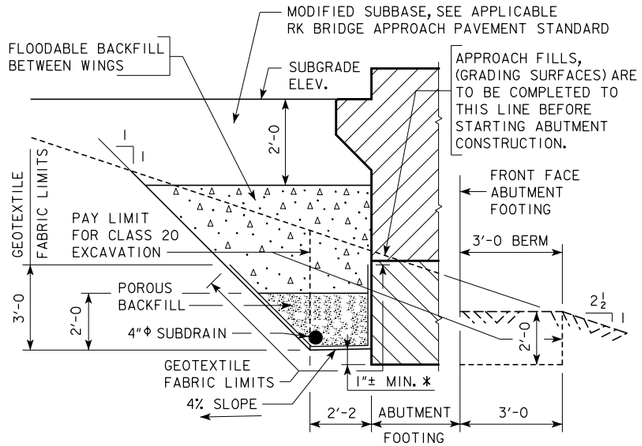


SECTION A-A

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

Marian K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, THREE SPAN BRIDGES

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

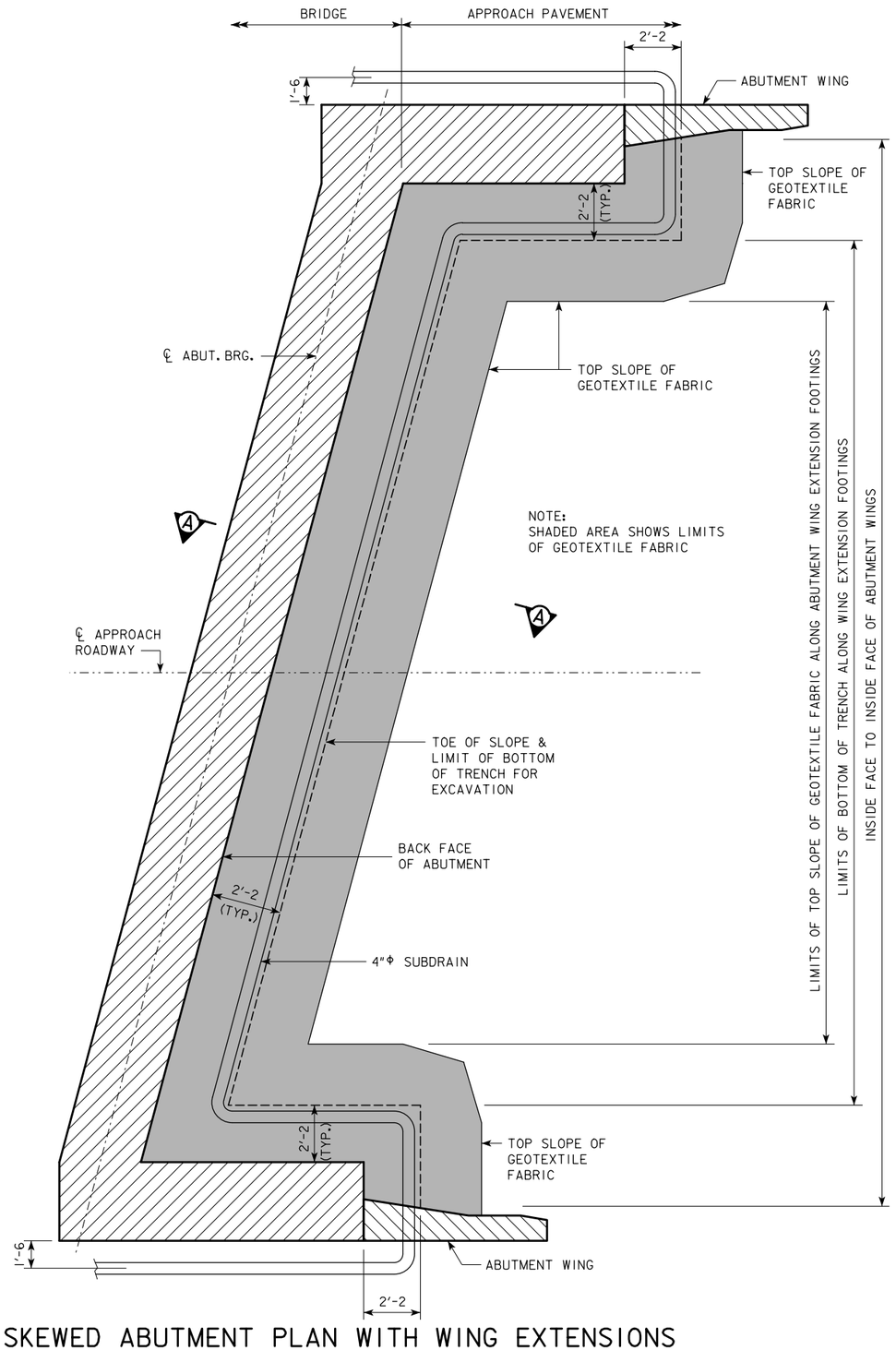
DECEMBER, 2006

ABUTMENT BACKFILL DETAILS

C BEAMS - 0° SKEW

H30-90-06

REVISED 09-14 - THE TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND A NOTE ADDED TO REFER TO THE STANDARDS SPECIFICATIONS FOR THIS INFORMATION.



SKEWED ABUTMENT PLAN WITH 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.

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 "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 FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE 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.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL 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, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

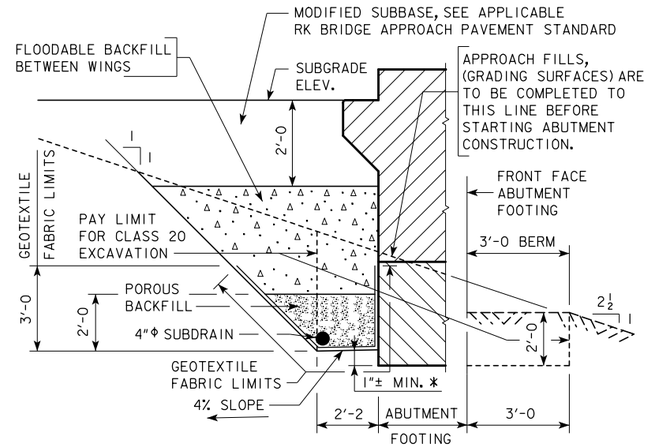
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

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

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE 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.



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