IOWA DOT

Highway Division

H44–14 THREE SPAN PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE STANDARDS

INDEX FOR H44-14 STANDARDS:

INDEX FOR H44-14 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, WEB SITE.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

INDEX SHEET

H44-01-14

GENERAL NOTES:

THE H44-14 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 44' 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° OR 30° SKEW. THESE PLANS SHOW THE BRIDGES SKEWED IN ONE DIRECTION, BUT ALL DIMENSIONS AND DETAILS WOULD BE THE SAME FOR THE OPPOSITE SKEW.

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 H44-35-14 AND H44-36-14.

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.

THE FLOOR SLAB AS SHOWN INCLUDES ½" 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 ARTICLE 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 H44-02-14.

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°, AND 30° MAY NEED TO BE INCREASED. IN ADDITION, THE LAYOUT OF THE PIER CAP STEP REINFORCING STEEL IS GRADE DEPENDENT FOR BRIDGES SKEWED AT 15° AND 30°. SEE SHEETS H44-17-14 AND H44-24-14 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 H44 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.

THESE STANDARDS ARE USING NON-COATED, EPOXY COATED AND STAINLESS STEEL REINFORCING BARS. THE DESIGNER SHOULD NOTE WHERE THESE DIFFERENT TYPES OF BARS ARE USED THOUGHOUT THESE STANDARDS.

3" WING PVC PIPE IS INCIDENTAL TO STRUCTURAL CONCRETE.

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

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.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

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 H44-32-14 THRU H44-37-14

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.

THESE STANDARDS GIVE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES. HOWEVER, THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED FOR USE ON PRIMARY ROUTES. FOR SECONDARY ROUTES THE ENGINEER MAY NOT REQUIRE ALL SHEETS TO BE PROVIDED:

1. TITLE SHEET WITH ENGINEERS SEAL
2. ESTIMATED QUANTITIES TOTALS INCLUDING CLASS 20 EXCAVATION FOR BRIDGE
3. SUMMARY QUANTITIES SHEET
4. SITUATION PLAN LAYOUT OF BRIDGE
5. TOP OF SLAB ELEVATIONS LAYOUT
6. BOTTOM OF ABUTMENT FOOTING ELEVATIONS
7. BOTTOM OF PIER CAP ELEVATIONS
8. PILING DESIGN INFORMATION
9. SLOPE PROTECTION LAYOUT IF NEEDED
10. CONDUIT LAYOUT
11. LIGHTING LAYOUT IF NEEDED

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

GENERAL NOTES | H44-01A-14

EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS:

THE DESIGNER SHALL SHOW ON THE PLANS THE 7 ELEVATIONS AND THE 6 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

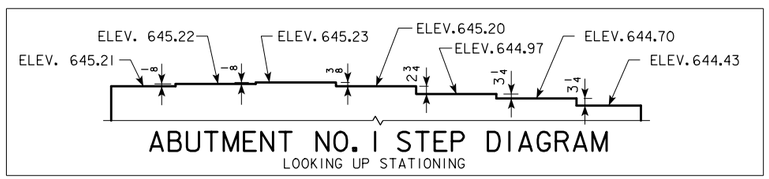
ELEVATIONS ALONG PROFILE GRADE LINE (P.G.L. ELEV.)

℄ 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.Δ)(GRADE) = (6.84)TAN 30°(0.0325) = 0.13'

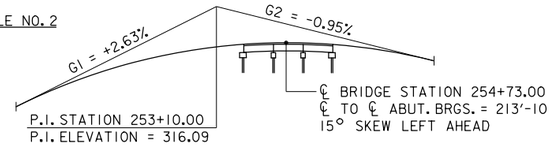
ABUTMENT NO. 1

BEAMS	EXTERIOR	INTERIOR	INTERIOR	CENTER	INTERIOR	INTERIOR	EXTERIOR
PGL ELEV.	649.94	649.94	649.94	649.94	649.94	649.94	649.94
SK. ΔCORRECT	+0.39	+0.26	+0.13	0.00	-0.13	-0.26	-0.39
SLAB CROWN	-0.38	-0.24	-0.10	0.00	-0.10	-0.24	-0.38
TOP SLAB ELEV.	649.95	649.96	649.97	649.94	649.71	649.44	649.17
-"U" (4'-8 7/8)	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74
BR. SEAT ELEV.	645.21	645.22	645.23	645.20	644.97	644.70	644.43



ABUTMENT NO. 1 STEP DIAGRAM
LOOKING UP STATIONING

EXAMPLE NO. 2



FROM SHEET H44-04-14 { LENGTH OF VERTICAL CURVE = (20000)(0.0358) = 716 FEET
M.O. = (0.0358)(716)(1/8) = 3.204 FEET

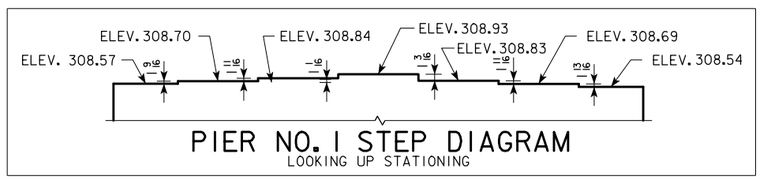
STATIONS

℄ BRIDGE STA.	=	254+73.00	
± 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.Δ) = (6.84')TAN 15° = 1.83'

PIER NO. 1

BEAMS	EXTERIOR	INTERIOR	INTERIOR	CENTER	INTERIOR	INTERIOR	EXTERIOR
STATION	254+39.82	254+37.99	254+36.16	254+34.33	254+32.50	254+30.67	254+28.84
PGL ELEV.	+313.56	+313.55	+313.55	313.54	313.54	313.54	313.53
SLAB CROWN	-0.38	-0.24	-0.10	0.00	-0.10	-0.24	-0.38
TOP SLAB ELEV.	313.18	313.31	313.45	313.54	313.44	313.30	313.15
-"U" (4'-7 5/16)	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61
BR. SEAT ELEV.	308.57	308.70	308.84	308.93	308.83	308.69	308.54



PIER NO. 1 STEP DIAGRAM
LOOKING UP STATIONING

TEE PIER NOTES:

THE TEE PIERS SHOWN IN THESE PLANS ARE DESIGNED FOR USE WITH THE H44-14 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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

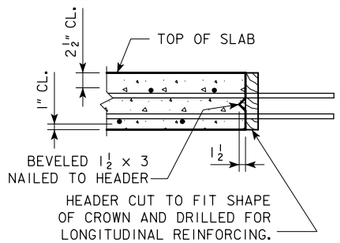
IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

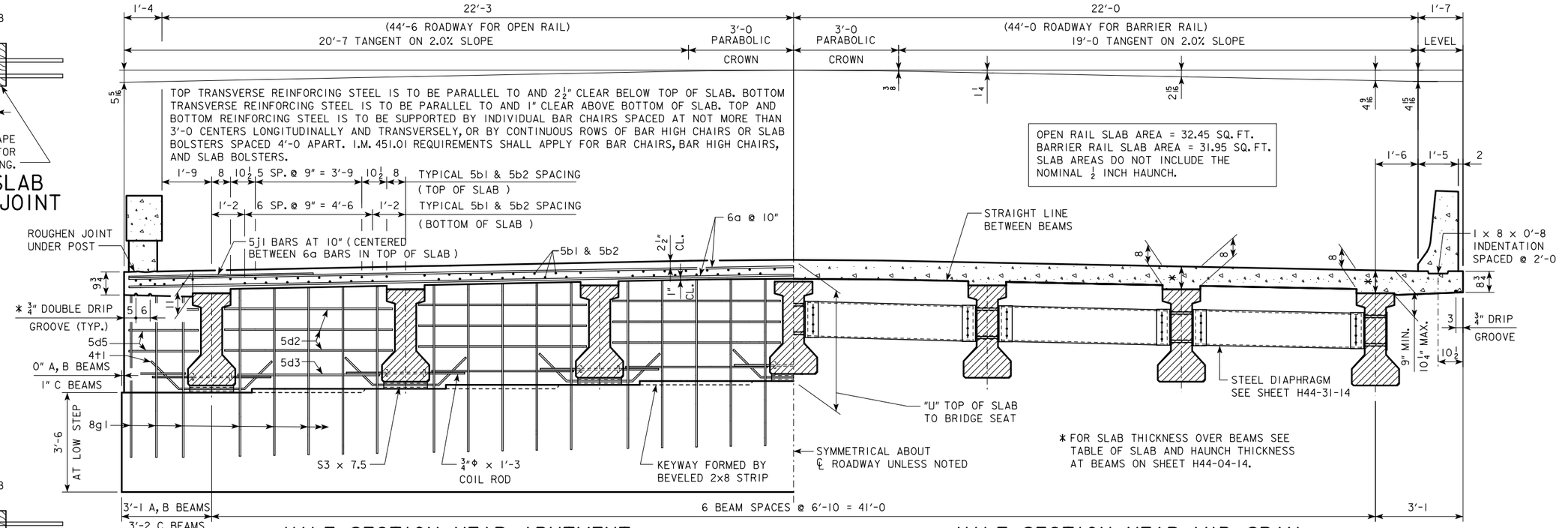
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

GENERAL INFORMATION | H44-02-14



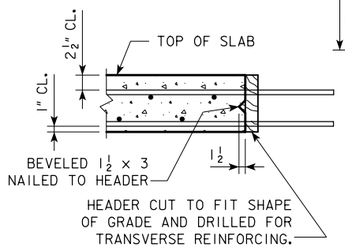
TRANSVERSE SLAB CONSTRUCTION JOINT



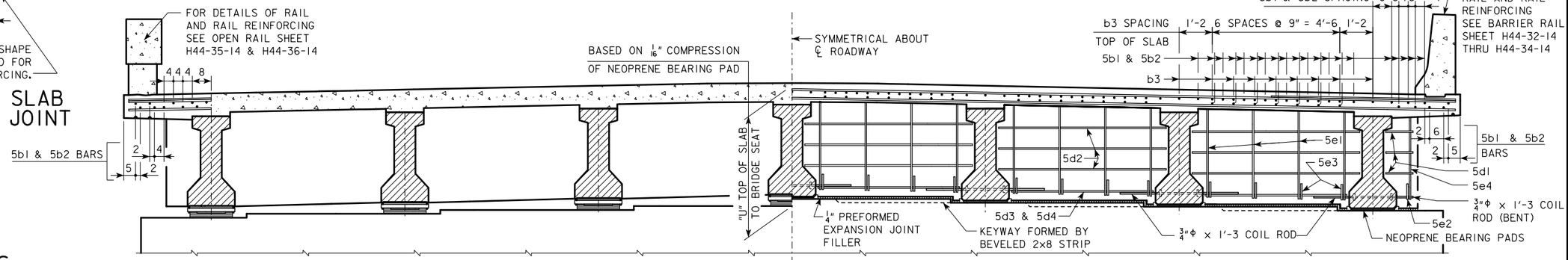
* NOTE: DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

HALF SECTION NEAR ABUTMENT
(OPEN RAIL SHOWN)

HALF SECTION NEAR MID SPAN
(BARRIER RAIL SHOWN)



LONGITUDINAL SLAB CONSTRUCTION JOINT



SECTION NEAR PIER

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)".

TRANSVERSE SLAB REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS:
TOP BARS - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10).
BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10).
PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

LENGTH OF S3 x 7.5
(ABUTMENT BEAM SEAT)

BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1'-5	1'-3½
1'-8	1'-6½

LATEST REVISION DATE

Warren K. McAnulty
APPROVED BY BRIDGE ENGINEER

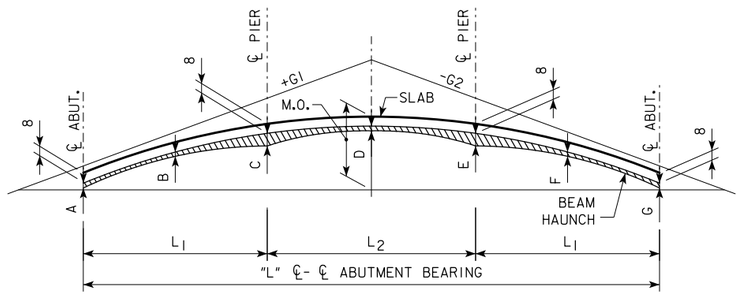
IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

SUPERSTRUCTURE DETAILS | H44-03-14

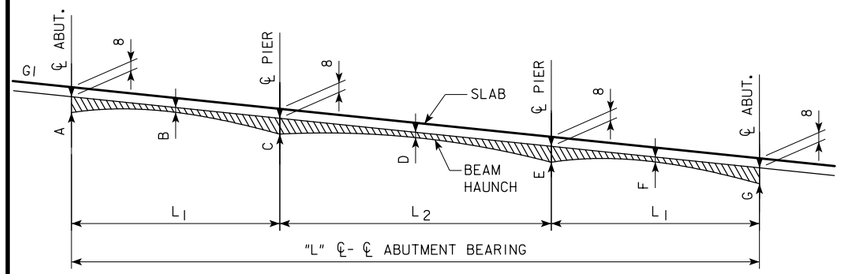


℄-℄ ABUT. BRG. "L"	A ℄ ABUT.	B	C ℄ PIER	D	E ℄ PIER	F	G ℄ ABUT.
138'-10	1 1/16	9/16	1 1/2	9/16	1 1/2	9/16	1 1/16
151'-4	13/16	5/8	1 11/16	9/16	1 11/16	5/8	13/16
163'-10	15/16	5/8	1 7/16	1/2	1 7/16	5/8	15/16
176'-4	7/8	5/8	1 11/16	9/16	1 11/16	5/8	7/8
188'-10	15/16	5/8	2	1/2	2	5/8	15/16
201'-4	5/8	11/16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

LENGTH OF VERTICAL CURVE REQUIRED = (20,000)(G1-G2)
M.O. = (G1-G2)(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.

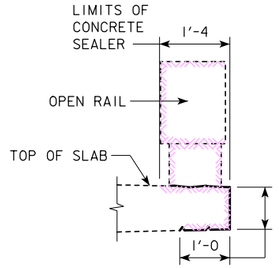
SLAB AND HAUNCH THICKNESS AT BEAMS FOR VERTICAL CURVE



℄-℄ 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	9/16	2	9/16	2	9/16	15/16
188'-10	1 1/16	9/16	2 3/8	1/2	2 3/8	9/16	1 1/16
201'-4	3/4	5/8	1 13/16	9/16	1 13/16	5/8	3/4
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%.

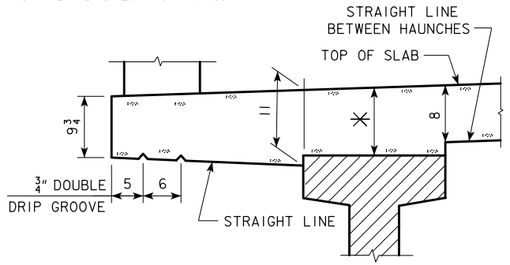
SLAB AND HAUNCH THICKNESS AT BEAMS FOR STRAIGHT GRADE



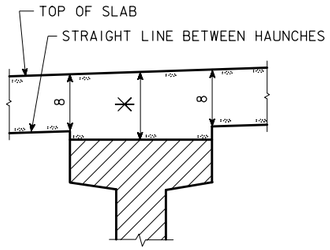
CONCRETE SEALER LIMITS FOR OPEN RAILS

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.

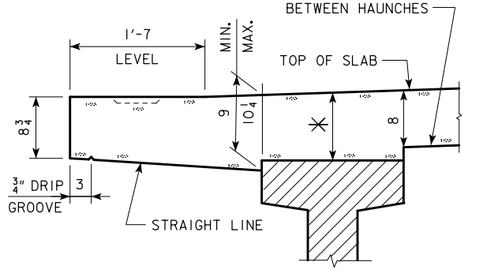
THE CONCRETE SEALER LIMITS ARE SHOWN IN THE DETAIL AND SHALL APPLY TO THE FULL LENGTH OF BRIDGE. CONCRETE SEALER SHALL BE APPLIED IN ACCORDANCE WITH ARTICLE 2403.03, P, 3, OF THE STANDARD SPECIFICATIONS.



EXTERIOR BEAMS @ OPEN RAIL



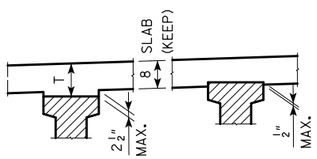
INTERIOR BEAMS



EXTERIOR BEAMS @ BARRIER RAIL

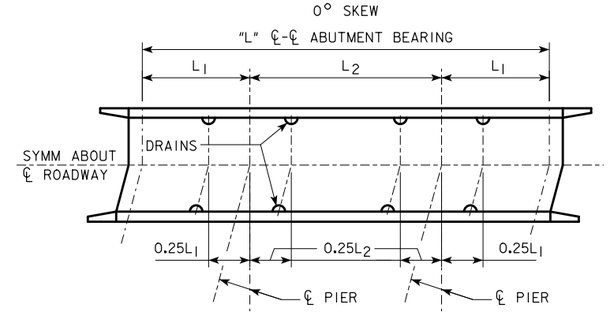
TYPICAL SLAB AND HAUNCH DETAIL

* FOR SLAB THICKNESS OVER BEAMS SEE " SLAB THICKNESS DETAILS " ON THIS SHEET.



SLAB THICKNESS DETAILS

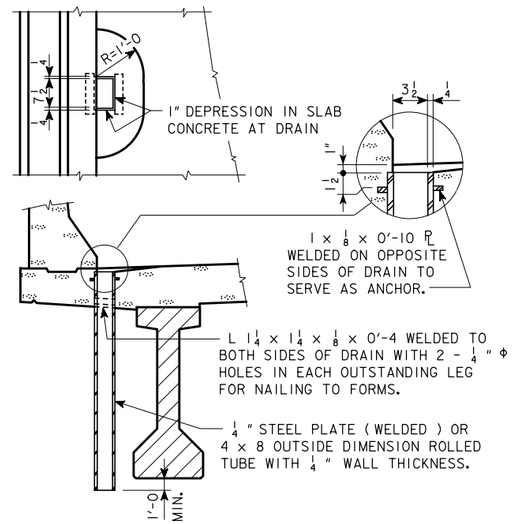
NOTE: THE SLAB THICKNESS (T) AT THE BEAMS, (8" SLAB PLUS HAUNCH) IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED INCREASE THE HAUNCH THICKNESS OVER THE BEAM AT THE MIDPOINT OF THE SPANS (POINTS B, D AND F). IF 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.



15° AND 30° 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" ON THE SUMMARY QUANTITIES SHEET IN THE PLAN. 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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

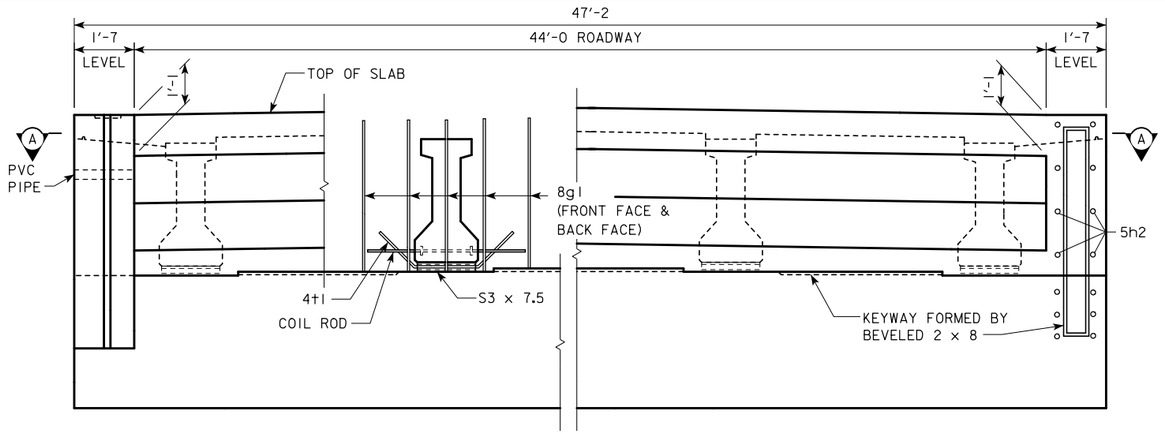
IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

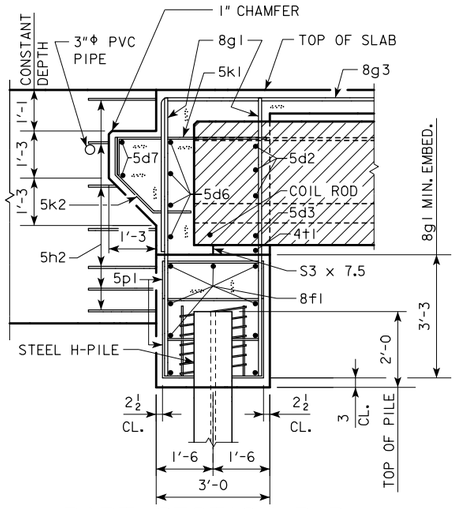
SEPTEMBER, 2014

SUPERSTRUCTURE DETAILS | H44-04-14



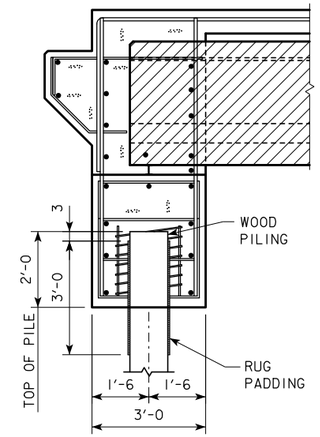
PART REAR ELEVATION AT ABUTMENT

NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



PART SECTION B-B

(FOR STEEL H-PILING)



PART SECTION B-B

(FOR WOOD PILING)

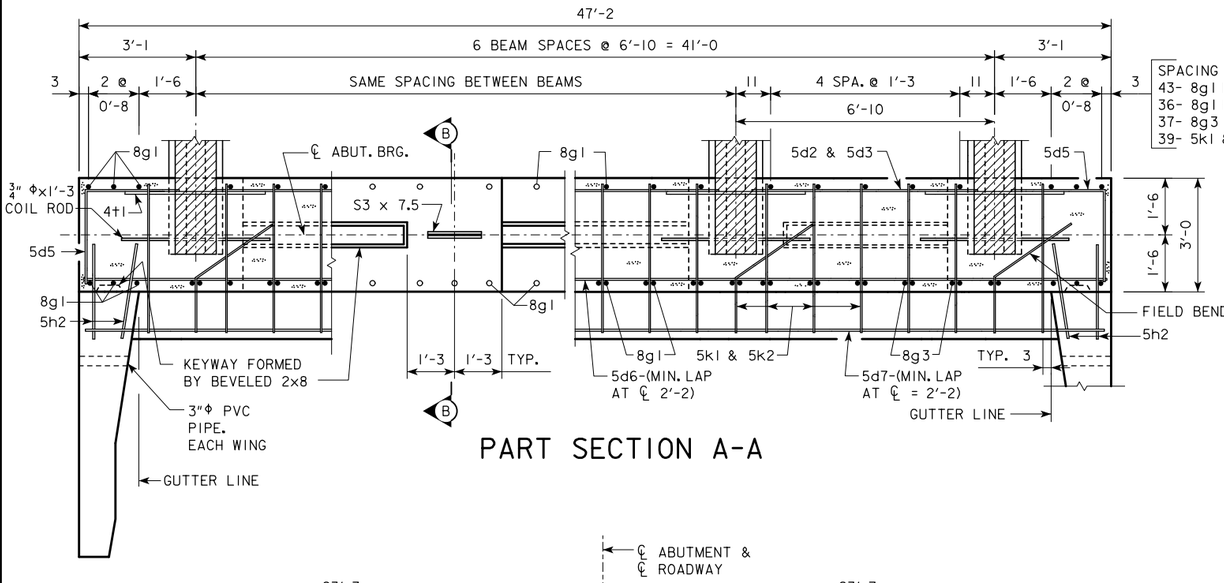
WOOD PILING NOTE:

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:

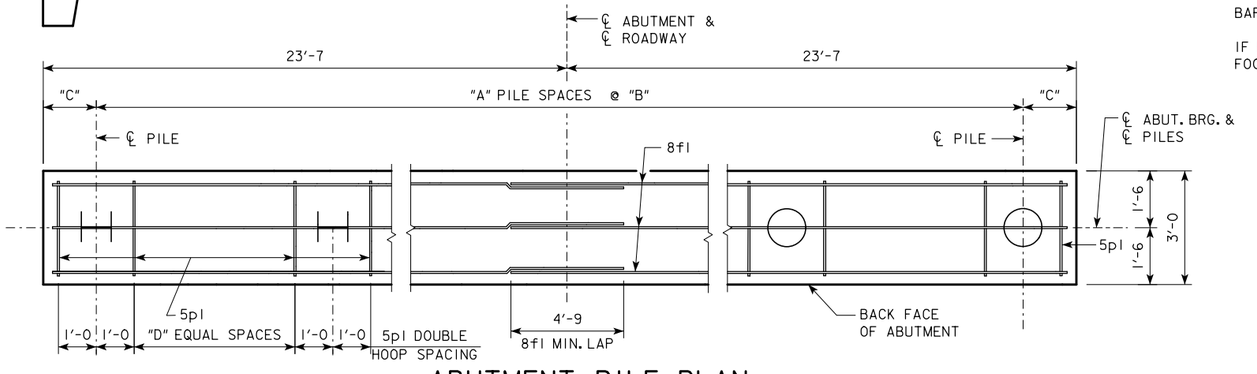
(1) HAIR AND JUTE RUG PADDING, RUBBERIZED ON BOTH SIDES, AND WEIGHING NOT LESS THAN 47 OZ. PER SQ. YD.

(2) BONDED URETHANE OR BONDED POLYFOAM WITH A MINIMUM DENSITY OF 5 LBS. PER CU. FT. AND SHALL BE AT LEAST $\frac{1}{2}$ IN. THICK, (MATERIAL LESS THAN $\frac{1}{2}$ 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 $\frac{7}{8}$ x $\frac{7}{8}$ x $\frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRAL.



PART SECTION A-A



ABUTMENT PILE PLAN

ABUTMENT NOTES:

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

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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

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

BARRIER RAIL NOT SHOWN IN DETAILS.

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

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES	14	14	16	16	17
	"B" (FT. - IN.)	3'-0	3'-0	2'-8	2'-8	2'-6
	"C" (FT. - IN.)	2'-7	2'-7	2'-3	2'-3	2'-4
	"D" EQUAL SPACES	1	1	1	1	1
	NO. OF PILES PER ABUT.	15	15	17	17	18
	PU, STRENGTH I DESIGN LOAD (KIPS)	55	58	55	57	56
WITH STEEL H-PILES	"A" PILE SPACES	6	6	6	7	7
	"B" (FT. - IN.)	7'-1	7'-1	7'-1	6'-1	6'-1
	"C" (FT. - IN.)	2'-4	2'-4	2'-4	2'-3½	2'-3½
	"D" EQUAL SPACES	5	5	5	4	4
	NO. OF PILES PER ABUT.	7	7	7	8	8
	PU, STRENGTH I DESIGN LOAD (KIPS)	129	134	144	131	135

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

NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

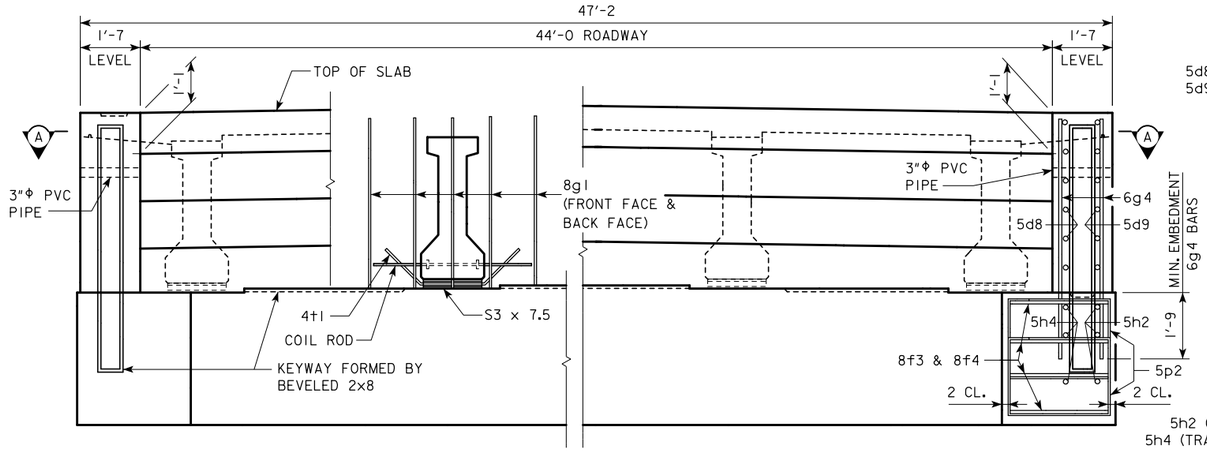
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT DETAILS

0° SKEW A & B BEAMS

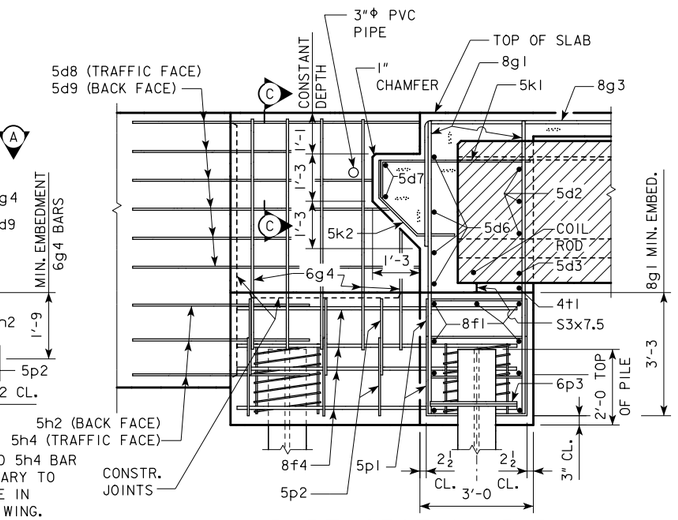
H44-05-14



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.

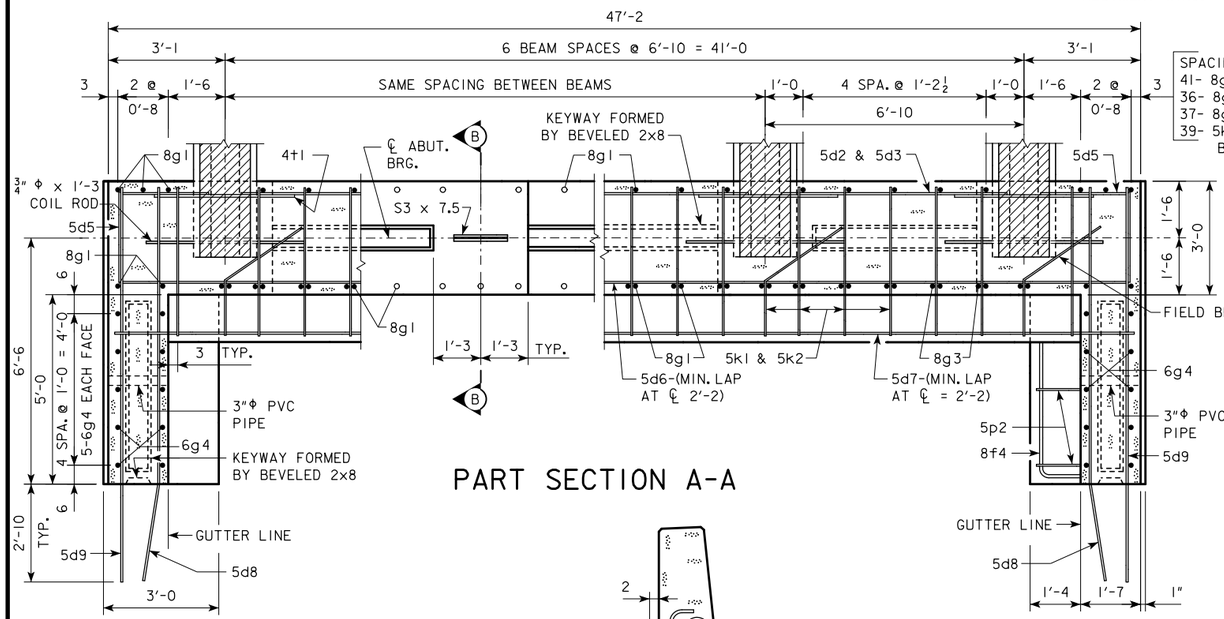
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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

BARRIER RAIL NOT SHOWN IN DETAILS.

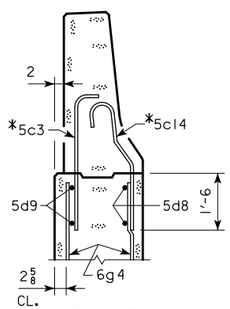
IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

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.



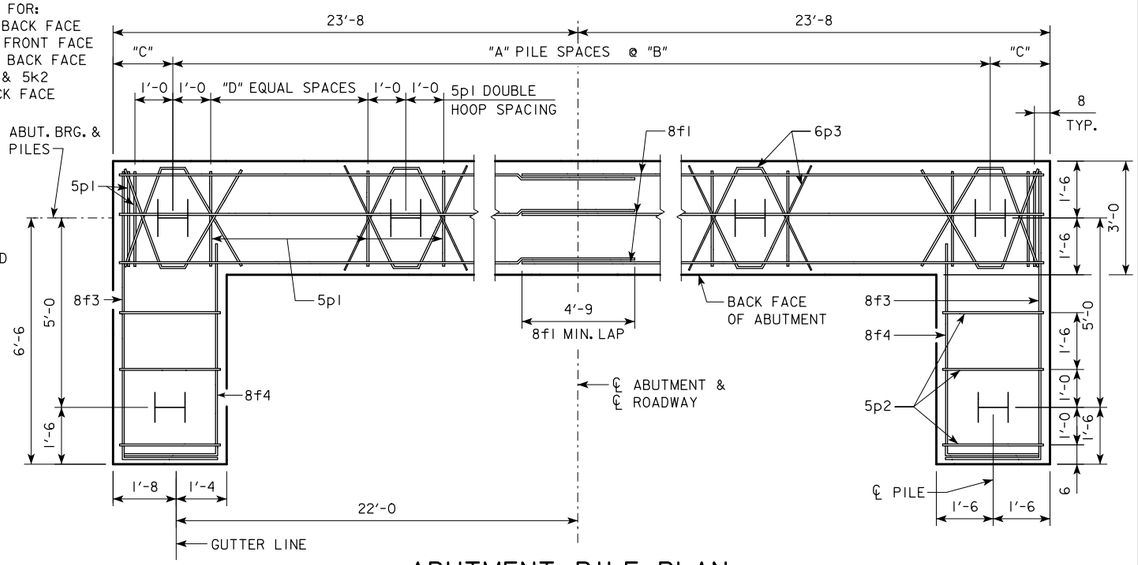
PART SECTION A-A

SPACING FOR:
41- 8g1 BACK FACE
36- 8g1 FRONT FACE
37- 8g3 BACK FACE
39- 5k1 & 5k2 BACK FACE



PART SECTION C-C

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



ABUTMENT PILE PLAN

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	7	8	8	8
	"B" (FT. - IN.)	6'-1	5'-4	5'-4	5'-4
	"C" (FT. - IN.)	2'-4½	2'-4	2'-4	2'-4
	"D" EQUAL SPACES	4	3	3	3
	NO. OF PILES PER ABUT.	10	11	11	11
	PU, STRENGTH I DESIGN LOAD (KIPS)	144	132	137	145

NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.
NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

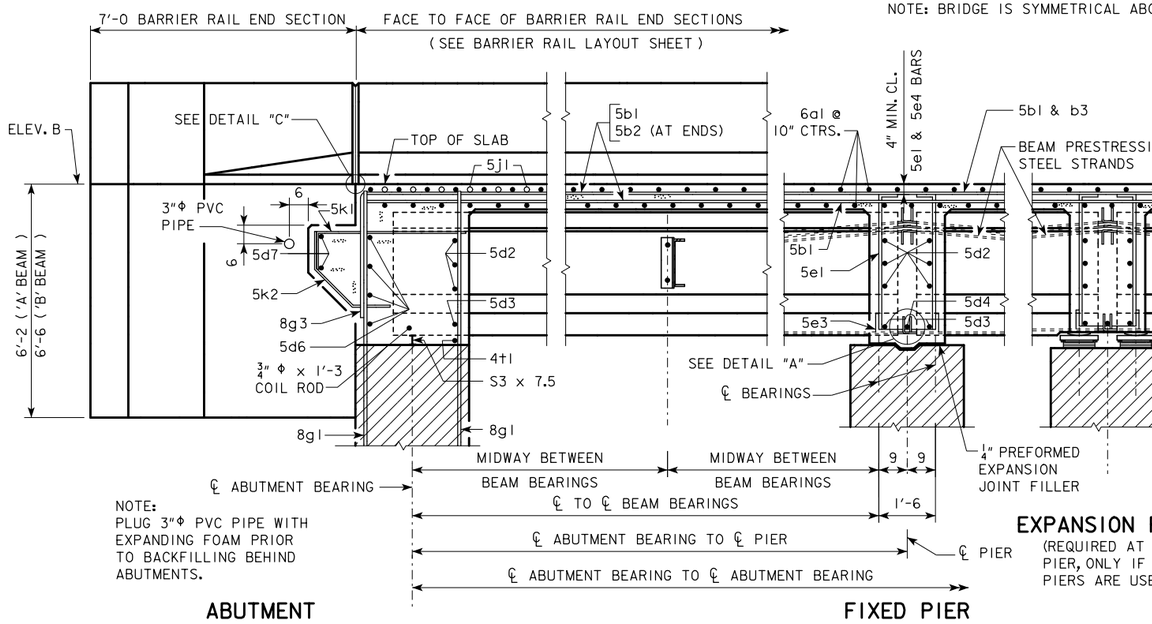
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT DETAILS

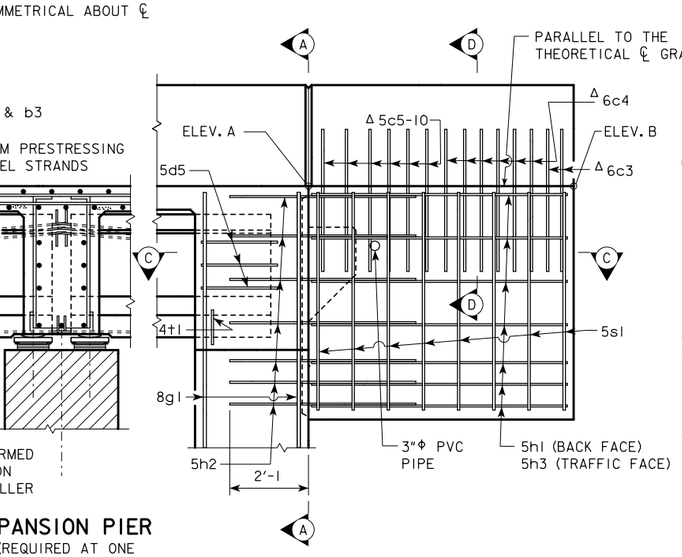
0° SKEW C BEAMS

H44-06-14



PART LONGITUDINAL SECTION NEAR GUTTER

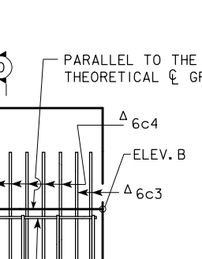
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)



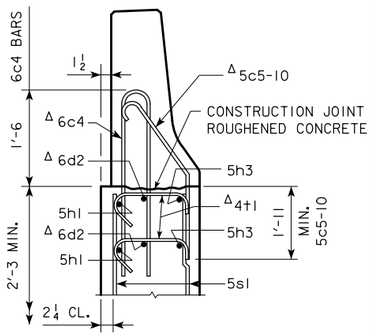
EXPANSION PIER
(REQUIRED AT ONE PIER, ONLY IF TEE PIERS ARE USED)

PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.

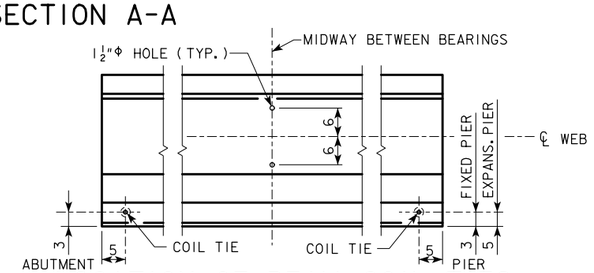


SECTION A-A



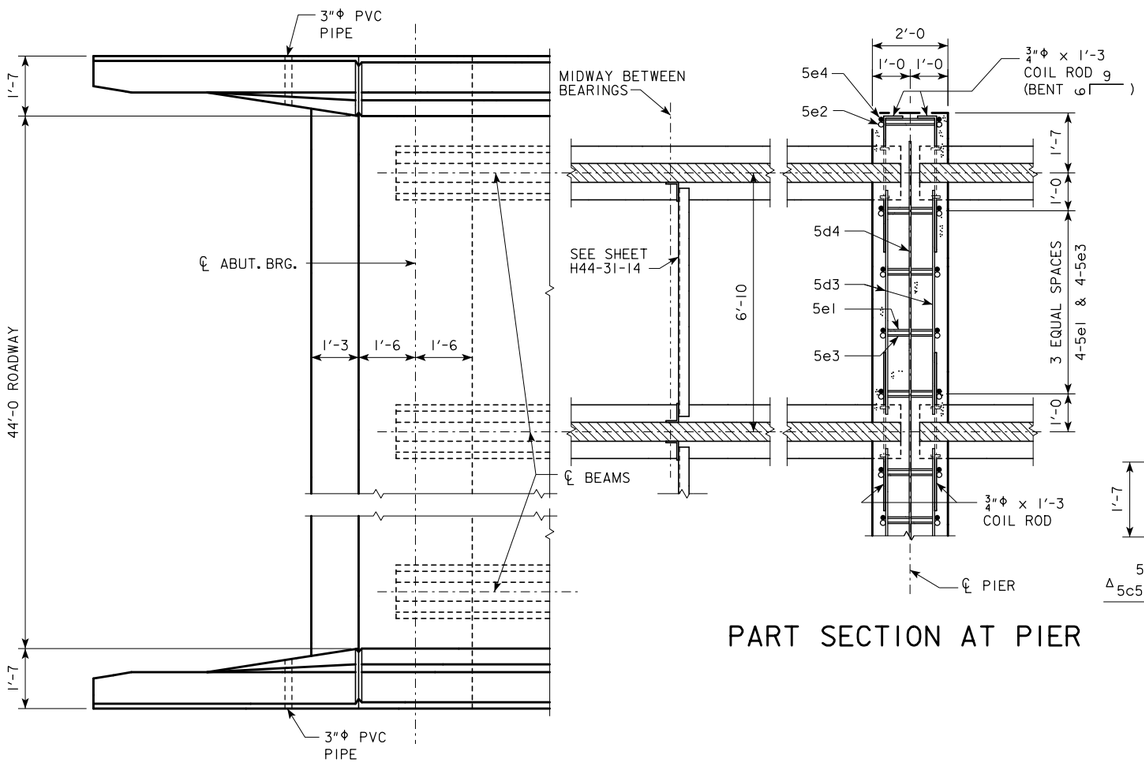
SECTION D-D

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 BARRIER RAIL QUANTITIES.



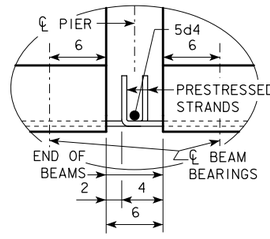
DETAIL "C"

LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

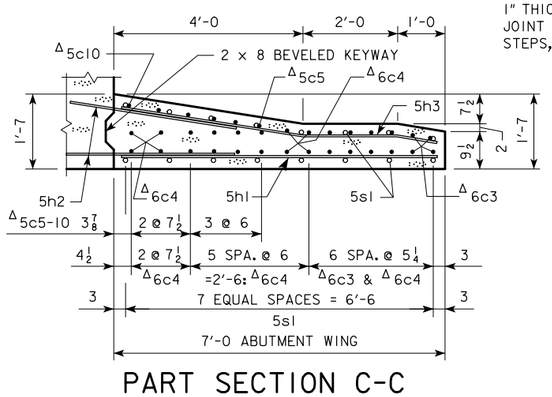


PART PLAN

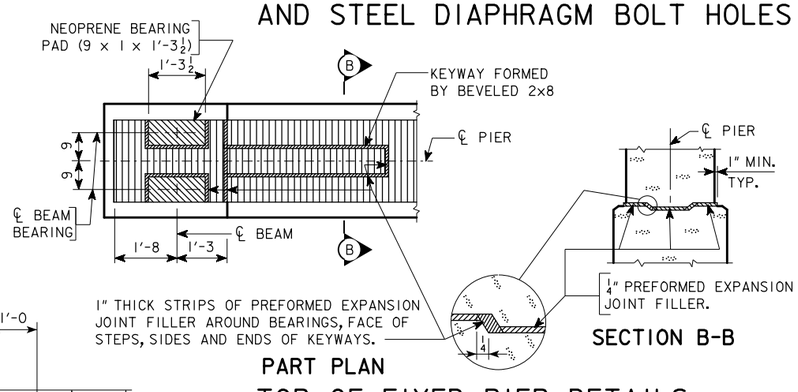
PART SECTION AT PIER



DETAIL "A"



PART SECTION C-C



PART PLAN

SECTION B-B

TOP OF FIXED PIER DETAILS

(SEE SHEET H44-37-14 FOR EXPANSION PIER BEARING DETAILS)

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

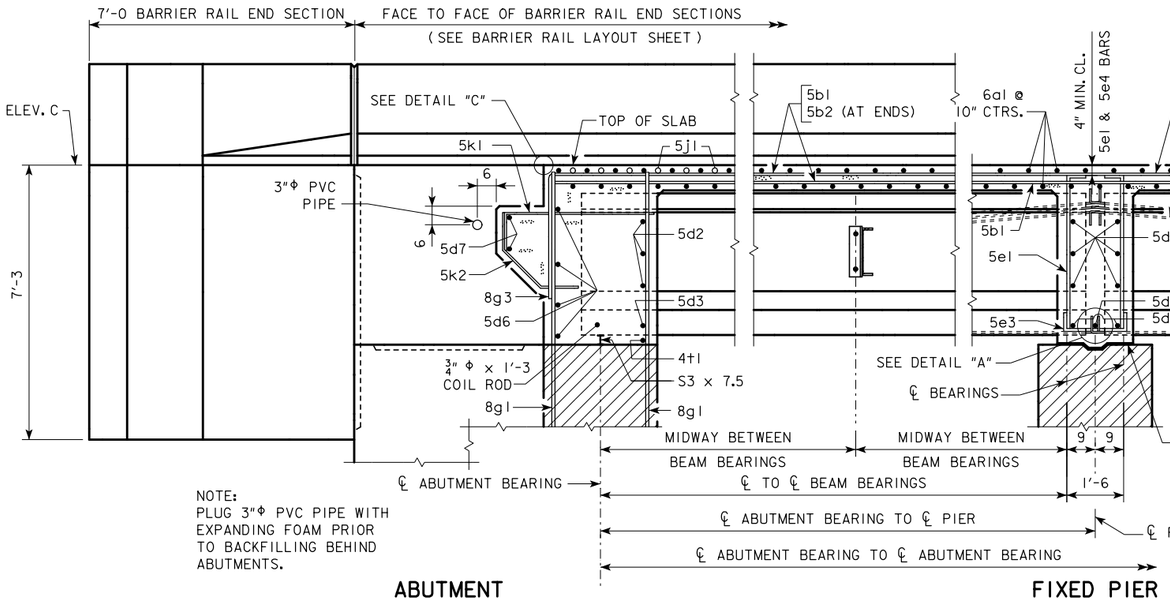
SEPTEMBER, 2014

LONGITUDINAL SECTION

0° SKEW A & B BEAMS

H44-07-14

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

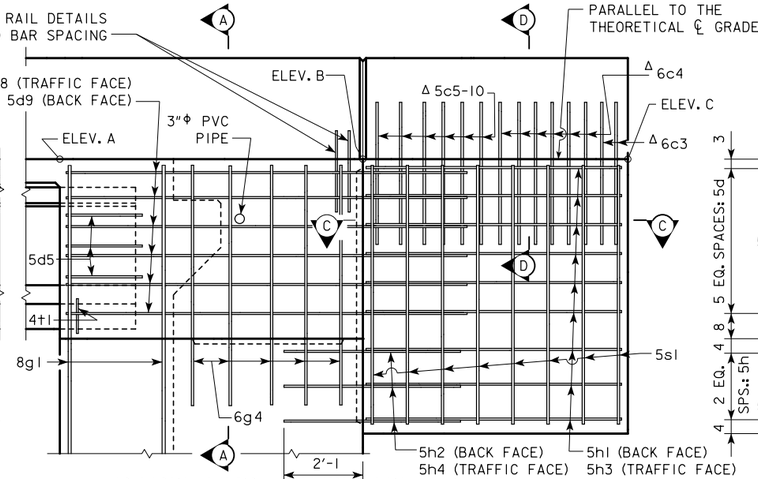


NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART LONGITUDINAL SECTION NEAR GUTTER

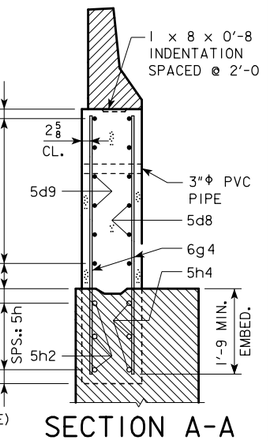
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)

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

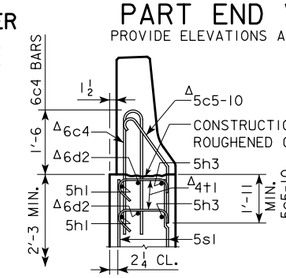


PART END VIEW AT ABUTMENT

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



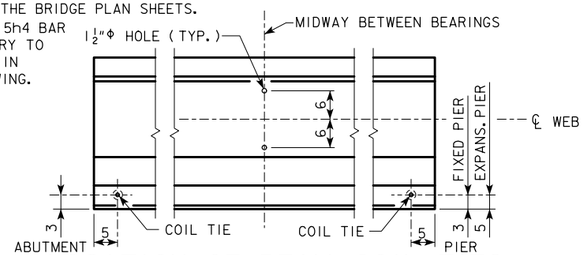
SECTION A-A



SECTION D-D

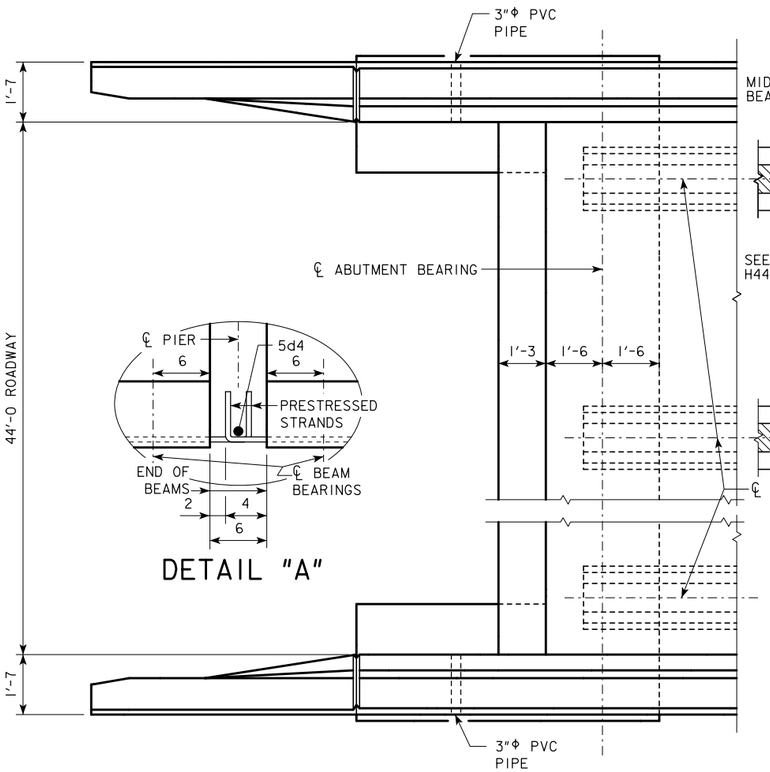
Δ NOTE:
SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION.
REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE BARRIER RAIL QUANTITIES.

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

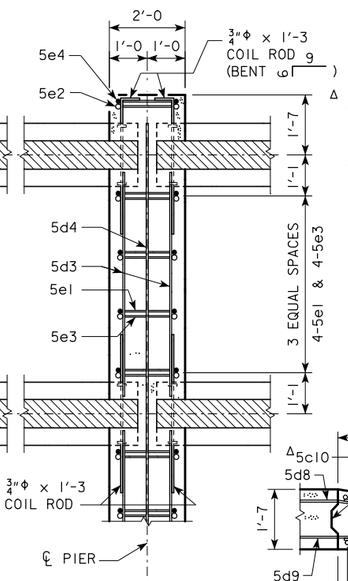


LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

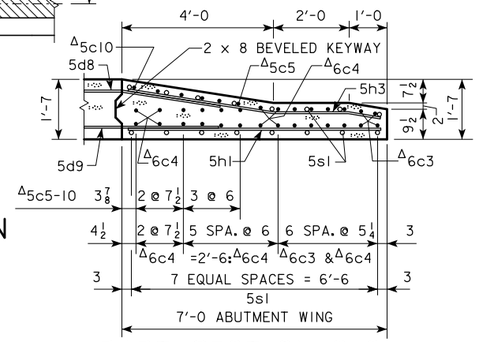
DETAIL "A"



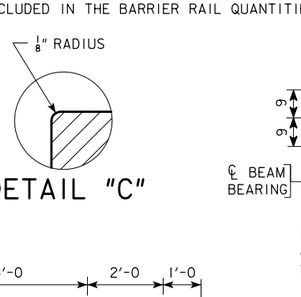
PART PLAN



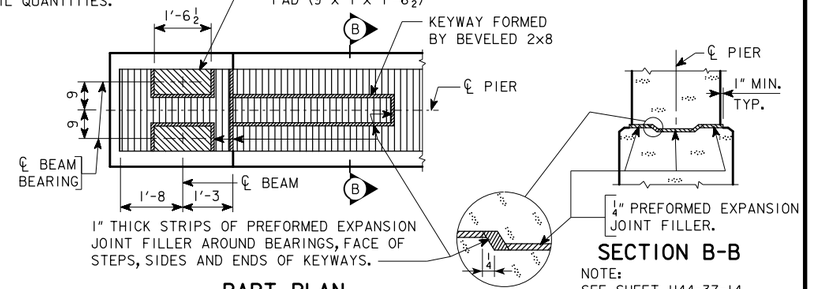
PART SECTION AT PIER



PART SECTION C-C



DETAIL "C"



PART PLAN

SECTION B-B

NOTE:
SEE SHEET H44-37-14 FOR EXPANSION PIER BEARING DETAILS

TOP OF FIXED PIER DETAILS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

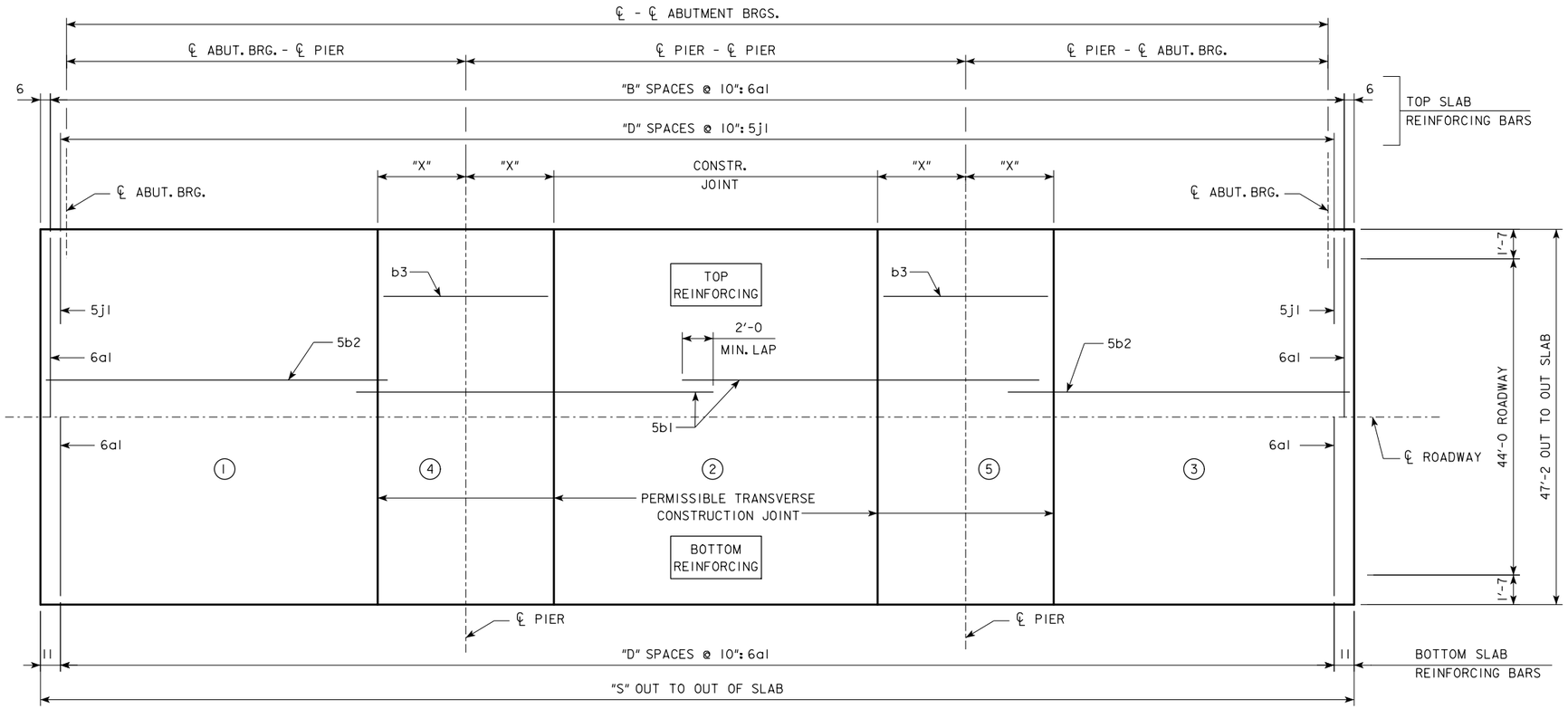
SEPTEMBER, 2014

LONGITUDINAL SECTION

0° SKEW C BEAMS

H44-08-14

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



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
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN	NO.	7-A50	7-A55	7-B59	7-B63	7-B67	7-C71	7-C75	7-C80	7-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN	NO.	14-A42	14-A46	14-B50	14-B55	14-B59	14-C63	14-C67	14-C71	14-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
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS	NO.	30	30	34	34	36	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)	NO.	14	14	14	16	16	20	22	22	22
PREBORED HOLES (W/WOOD PILES)	L.F.	300	300	340	340	360	-----	-----	-----	-----
PREBORED HOLES (W/STEEL H-PILES)	L.F.	140	140	140	160	160	200	220	220	220
WING ARMORING	S.Y.	3.5	3.5	3.5	3.5	3.5	5.7	5.7	5.7	5.7

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL, REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ 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.	128.8	137.4	152.0	160.8	169.6	188.0	197.0	206.4	227.2
	WITH OPEN RAIL	C.Y.	130.1	138.8	153.6	162.5	171.5	189.9	199.0	208.6	229.6
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	47.3	51.1	54.9	58.7	62.3	66.4	70.2	74.1	74.1
	WITH OPEN RAIL	C.Y.	48.0	51.9	55.7	59.6	63.3	67.4	71.2	75.2	75.2
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	49.0	51.4	57.2	59.8	62.8	67.4	69.8	72.4	72.4
	WITH OPEN RAIL	C.Y.	49.5	51.9	57.8	60.4	63.4	68.0	70.5	73.1	73.1
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.	36.7	36.7	36.4	36.4	36.3	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES)		C.Y.	38.4	38.4	38.4	38.4	38.4	46.4	46.4	46.4	46.4

GENERAL DATA

			℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL CURVE	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"		3'-8 1/16	3'-7 13/16	4'-2 15/16	4'-2 7/8	4'-2 15/16	4'-8 5/8	4'-8 3/4	4'-9 7/16	4'-9 5/8
	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 1/2	4'-1 5/16	4'-7 5/16	4'-7 5/16	4'-7 9/16	4'-7 9/16
STRAIGHT GRADE	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 3/4	4'-8 15/16	4'-9 3/8	4'-10
	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 3/4	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS		471.8	509.8	583.3	623.5	663.8	799.8	845.3	891.2	936.0
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS		264.7	274.5	283.9	293.1	302.2	311.0	322.9	341.9	362.6
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

Marcus K. McQuillen
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

SUPERSTRUCTURE DETAILS
0° SKEW

H44-09-14

REINFORCING BAR LIST

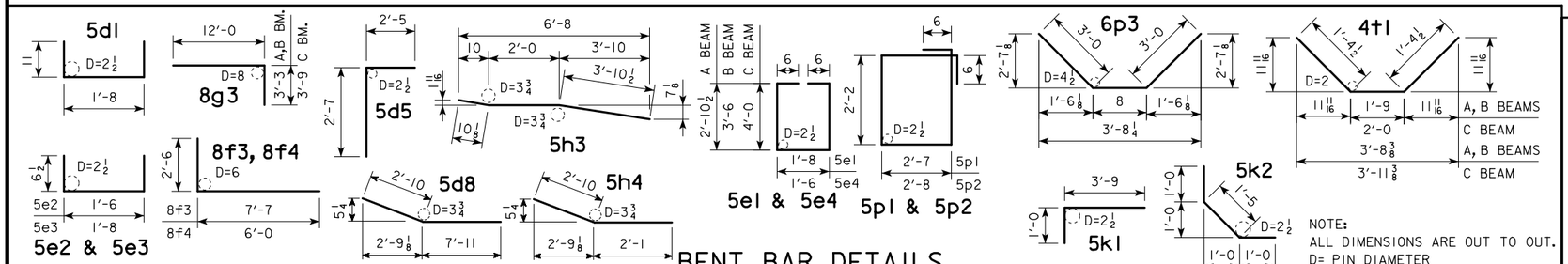
ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	℄-℄ 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		
				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	46′-10	23,847	369	46′-10	25,957	399	46′-10	28,067	429	46′-10	30,177	459	46′-10	32,288	489	46′-10	34,398	519	46′-10	36,508	549	46′-10	38,619	589	46′-10	41,432
5b1	SLAB LONGITUDINAL, TOP & BOTT.	———		212	40′-0	8,845	212	40′-0	8,845	318	40′-0	13,267	318	40′-0	13,267	318	40′-0	13,267	424	40′-0	17,689	424	40′-0	17,689	424	40′-0	17,689	530	40′-0	22,112
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS	———		212	33′-9	7,463	212	40′-0	8,845	212	27′-3	6,025	212	33′-6	7,407	212	39′-9	8,789	212	27′-0	5,970	212	33′-3	7,352	212	39′-6	8,734	212	28′-10	6,376
6b3	SLAB LONGITUDINAL, TOP @ PIERS	———		98	12′-10	1,889	98	13′-10	2,036	98	14′-10	2,183	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———
7b3	SLAB LONGITUDINAL, TOP @ PIERS	———		———	———	———	———	———	———	———	———	———	98	15′-10	3,172	98	17′-0	3,405	98	18′-0	3,606	———	———	———	———	———	———	———	———	———
8b3	SLAB LONGITUDINAL, TOP @ PIERS	———		———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	98	19′-0	4,972	98	20′-0	5,233	98	20′-0	5,233
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.	———		108	6′-2	695	108	6′-2	695	108	6′-2	695	108	6′-2	695	108	6′-2	695	108	5′-11	666	108	5′-11	666	108	5′-11	666	108	5′-11	666
5d3	PIER & ABUT. DIAPH. LONGIT.	———		36	5′-3	197	36	5′-3	197	36	5′-3	197	36	5′-3	197	36	5′-3	197	36	5′-0	188	36	5′-0	188	36	5′-0	188	36	5′-0	188
5d4	PIER DIAPH. LONGIT.	———		4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95	4	22′-10	95
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.	———		16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409	16	24′-6	409
5d7	PAVING NOTCH LONGIT.	———		8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202	8	24′-2	202
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	⊏⊐		48	8′-5	421	48	8′-5	421	48	9′-8	484	48	9′-8	484	48	9′-8	484	48	10′-8	534	48	10′-8	534	48	10′-8	534	48	10′-8	534
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	⌐——⌐		48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138	48	2′-9	138
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.	———		36	25′-10	2,483	36	25′-10	2,483	36	25′-10	2,483	36	25′-10	2,483	36	25′-10	2,483	36	25′-11	2,491	36	25′-11	2,491	36	25′-11	2,491	36	25′-11	2,491
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.	———		158	6′-8	2,812	158	6′-8	2,812	158	7′-3	3,058	158	7′-3	3,058	158	7′-3	3,058	154	7′-9	3,187	154	7′-9	3,187	154	7′-9	3,187	154	7′-10	3,221
8g3	ABUT. DIAPH. VERT. B.F.	⌐———		74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112
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	⌐——		78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386
5k2	PAVING NOTCH	⌐		78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278
5p1	ABUTMENT HOOPS (WOOD/STEEL)	▢		120/152	10′-6	1314/1665	120/152	10′-6	1314/1665	136/152	10′-6	1489/1665	136/148	10′-6	1489/1621	144/148	10′-6	1577/1621	156	10′-6	1,708	144	10′-6	1,577	144	10′-6	1,577	144	10′-6	1,577
5p2	ABUTMENT HOOPS	▢		———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	24	10′-8	267	24	10′-8	267	24	10′-8	267	24	10′-8	267
6p3	ABUT. BOTT. AT PILES	◡		———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	32	6′-8	320	36	6′-8	360	36	6′-8	360	36	6′-8	360
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	◡		14	4′-6	42	14	4′-6	42	14	4′-6	42	14	4′-6	42	14	4′-6	42	14	4′-9	44	14	4′-9	44	14	4′-9	44	14	4′-9	44
#2	PILE SPIRAL (WOOD/STEEL)*	▥		30/14	38′-6	193/90	30/14	38′-6	193/90	34/14	38′-6	219/90	34/16	38′-6	219/103	36/16	38′-6	231/103	20	38′-6	129	22	38′-6	141	22	38′-6	141	22	38′-6	141
	SPIRAL SPACERS, L $\frac{1}{8}$×$\frac{7}{8}$×$\frac{1}{8}$× 0.70 (WOOD/STL.)*			90/42	1′-10	116/54	90/42	1′-10	116/54	102/42	1′-10	131/54	102/48	1′-10	131/62	108/48	1′-10	139/62	60	1′-10	77	66	1′-10	85	66	1′-10	85	66	1′-10	85
	*EPOXY COATING NOT REQUIRED																													
	SUB TOTAL W/ WOOD PILES**					58,261			62,096			66,704			71,381			75,411		———			———			———			———	
	SUB TOTAL W/ STEEL H-PILES**					58,447			62,282			66,674			71,328			75,250			82,047			87,030			90,984			96,157
	**RAIL REINFORCING NOT INCLUDED																													

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

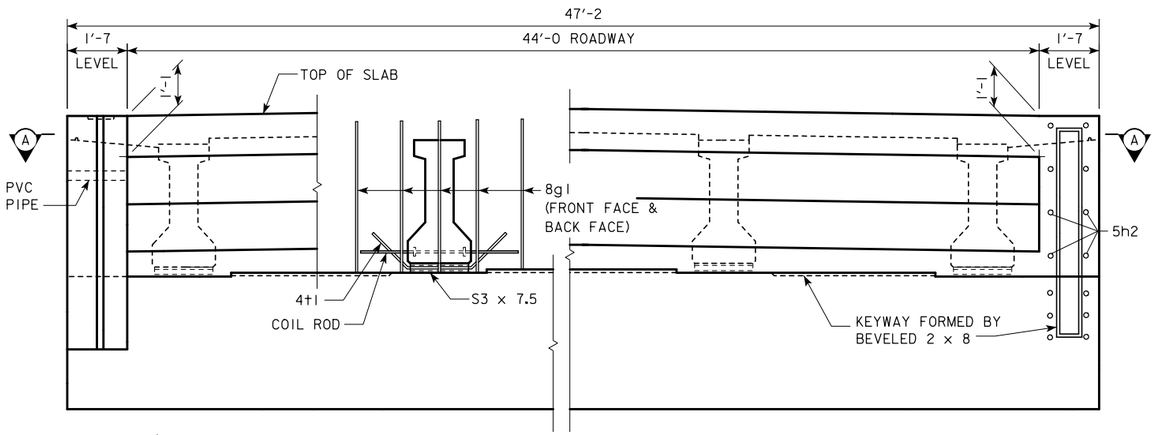
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

DECK & ABUTMENT REINF.

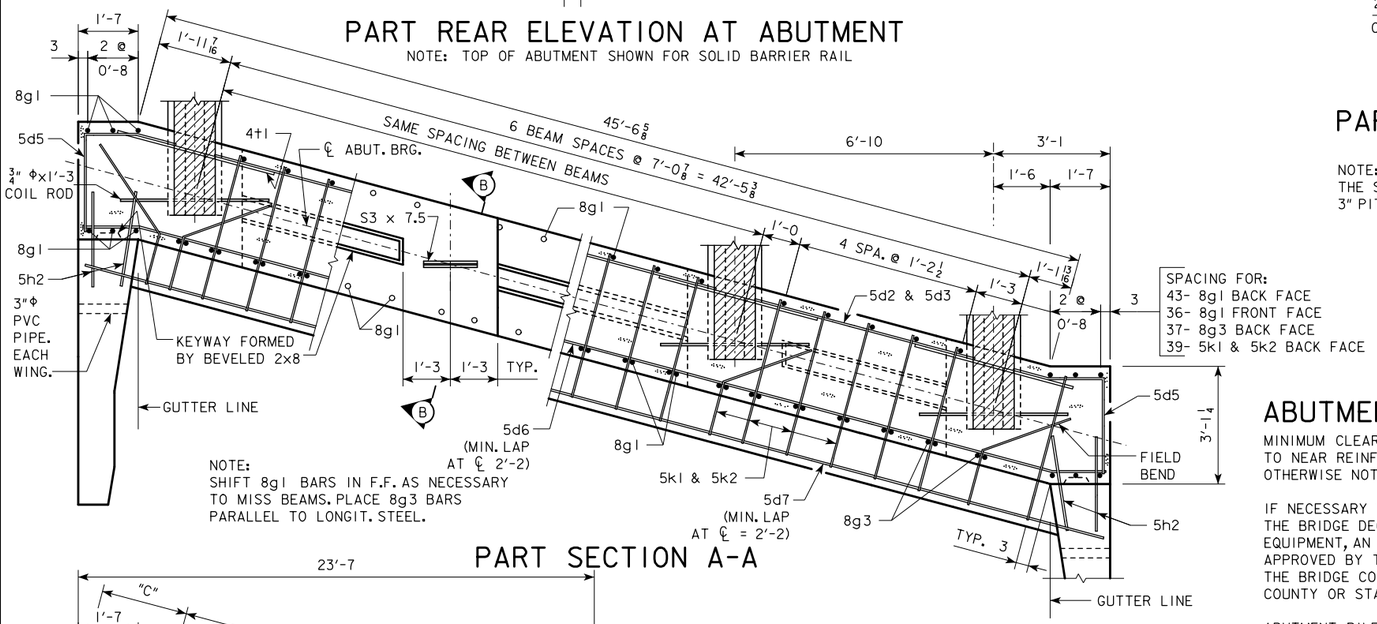
0° SKEW

H44-10-14

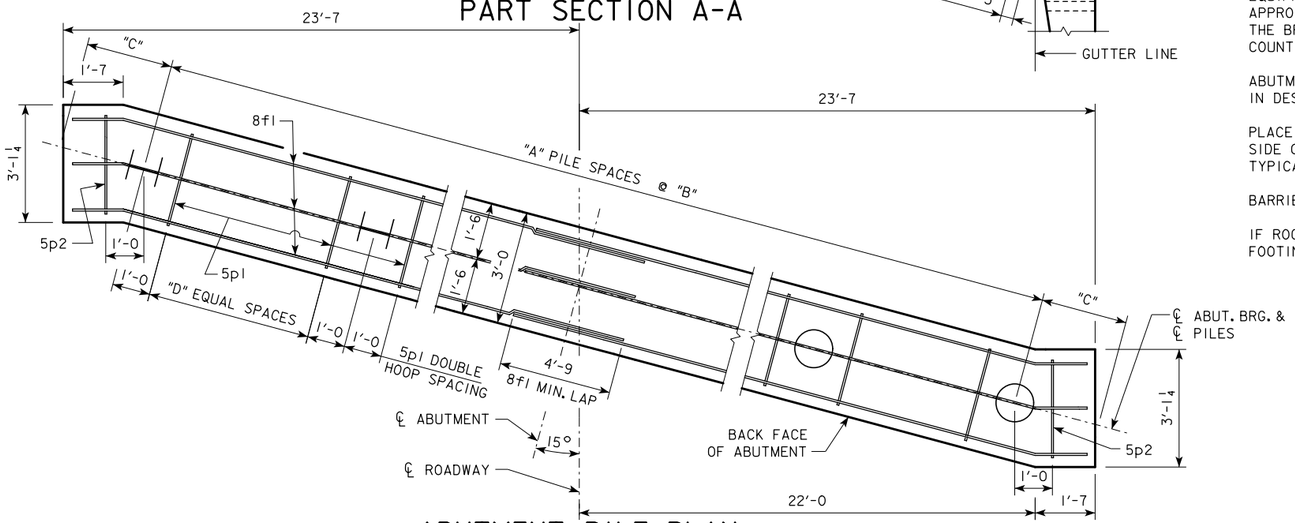


PART REAR ELEVATION AT ABUTMENT

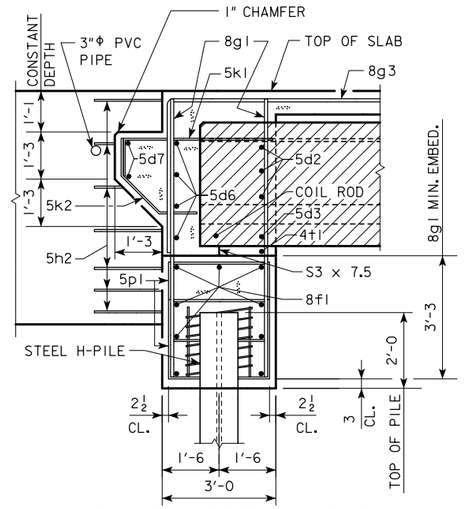
NOTE: TOP OF ABUTMENT SHOWN FOR SOLID BARRIER RAIL



PART SECTION A-A

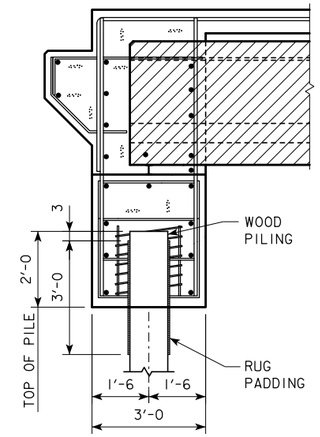


ABUTMENT PILE PLAN



PART SECTION B-B

(FOR STEEL H-PILING)



PART SECTION B-B

(FOR WOOD 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).

ABUTMENT NOTES:

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

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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

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

BARRIER RAIL NOT SHOWN IN DETAILS.

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

ABUTMENT PILE SPACING		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES		14	15	16	16	17
	"B" (FT. - IN.)		3'-1	2'-11	2'-9	2'-9	2'-7
	"C" (FT. - IN.)		2'-10	2'-6 1/2	2'-5	2'-5	2'-5 1/2
	"D" EQUAL SPACES		1	1	1	1	1
	NO. OF PILES PER ABUT.		15	16	17	17	18
	PU, STRENGTH I DESIGN LOAD (KIPS)		56	55	55	57	56
WITH STEEL H-PILES	"A" PILE SPACES		6	6	6	7	7
	"B" (FT. - IN.)		7'-4	7'-4	7'-4	6'-3	6'-3
	"C" (FT. - IN.)		2'-5	2'-5	2'-5	2'-6 1/2	2'-6 1/2
	"D" EQUAL SPACES		5	5	5	4	4
	NO. OF PILES PER ABUT.		7	7	7	8	8
	PU, STRENGTH I DESIGN LOAD (KIPS)		130	136	145	132	136

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

NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

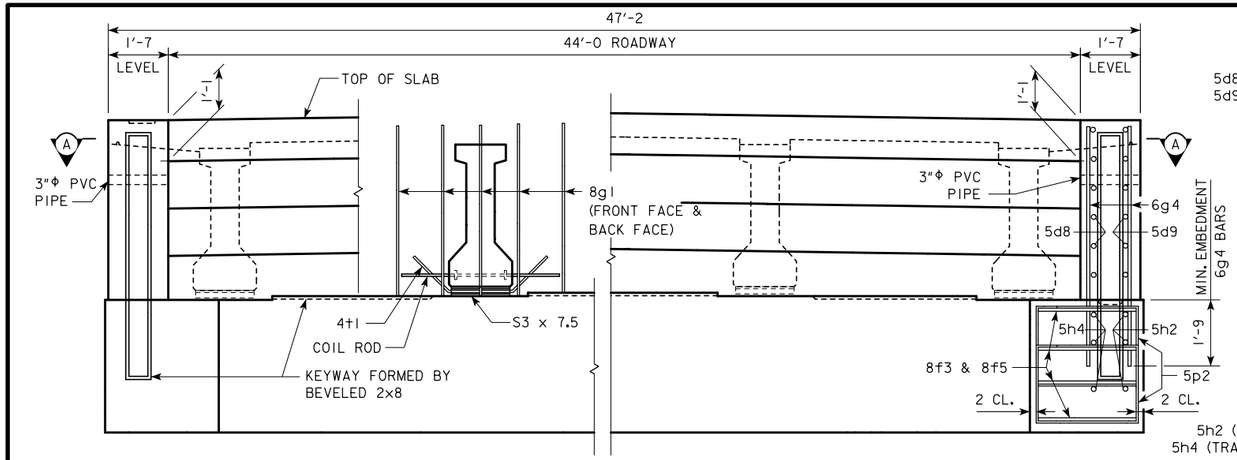
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT DETAILS

15° SKEW A & B BEAMS

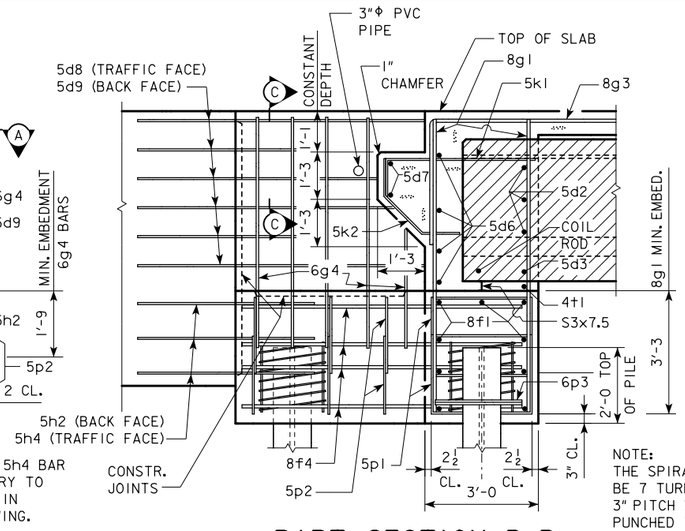
H44-11-14



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.



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 B-B

ABUTMENT NOTES:

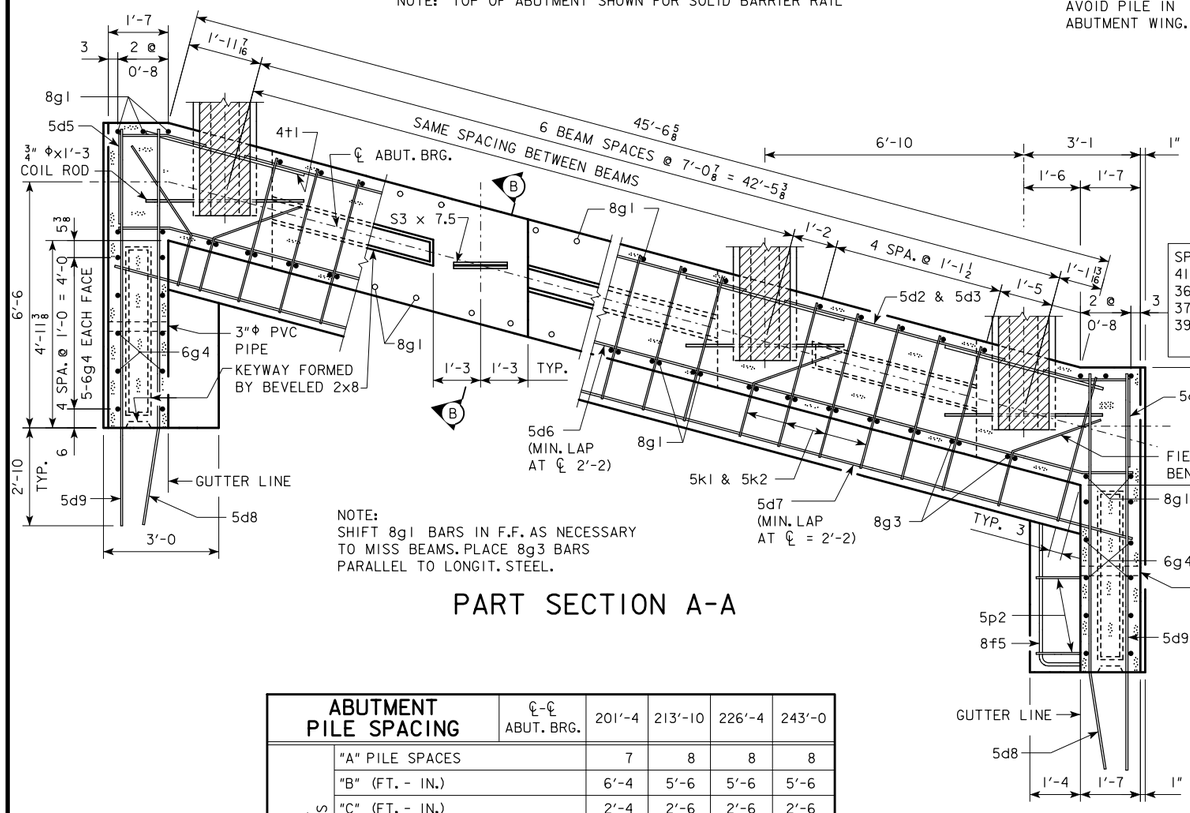
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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

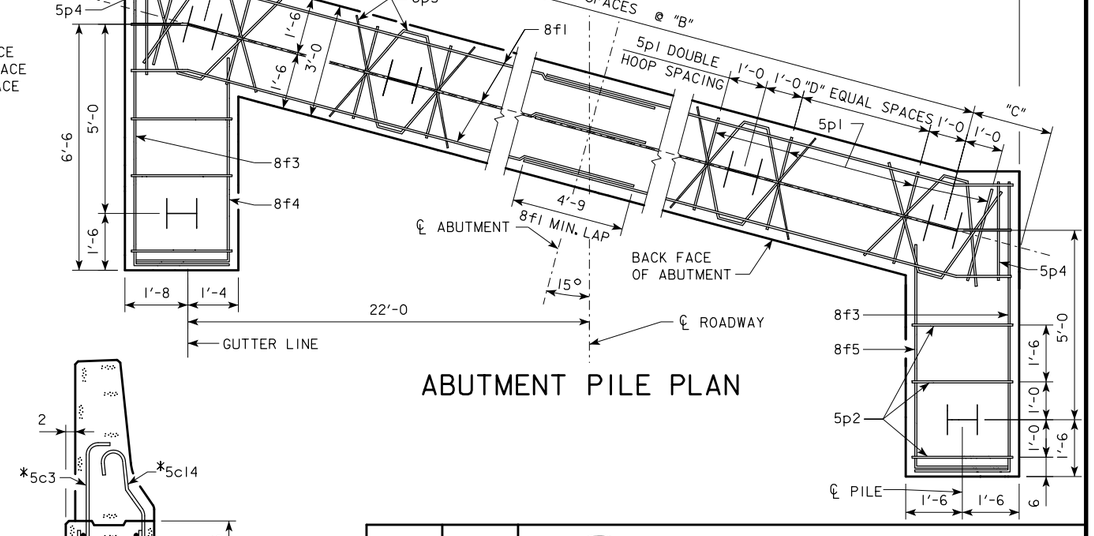
BARRIER RAIL NOT SHOWN IN DETAILS.

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



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

PART SECTION A-A

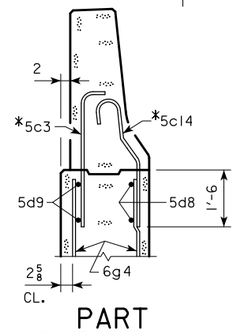


ABUTMENT PILE PLAN

ABUTMENT PILE SPACING	℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES	7	8	8	8
	"B" (FT. - IN.)	6'-4	5'-6	5'-6	5'-6
	"C" (FT. - IN.)	2'-4	2'-6	2'-6	2'-6
	"D" EQUAL SPACES	4	3	3	3
	NO. OF PILES PER ABUT.	10	11	11	11
	PU, STRENGTH I DESIGN LOAD (KIPS)	145	133	138	146

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

NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



PART SECTION C-C

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

LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

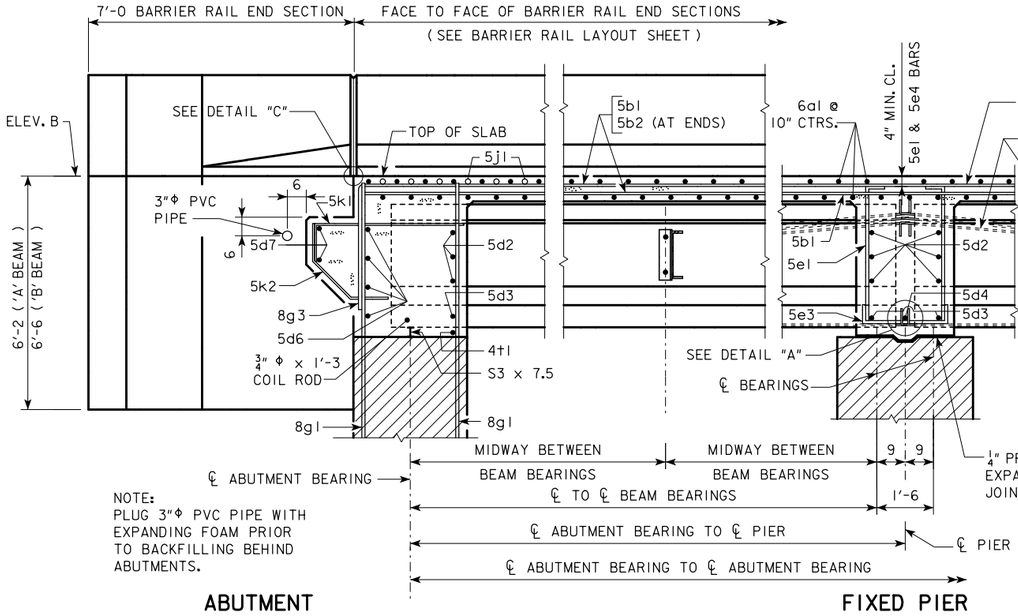
SEPTEMBER, 2014

ABUTMENT DETAILS

15° SKEW C BEAMS

H44-12-14

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄



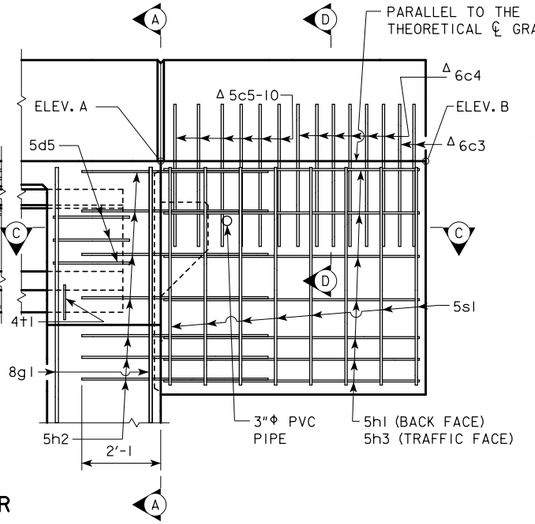
NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)

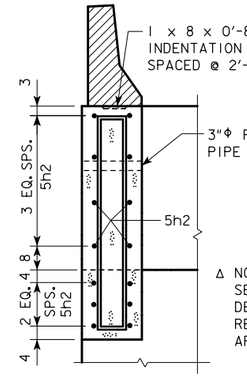
EXPANSION PIER

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

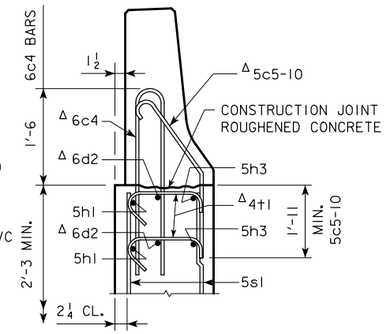


PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.

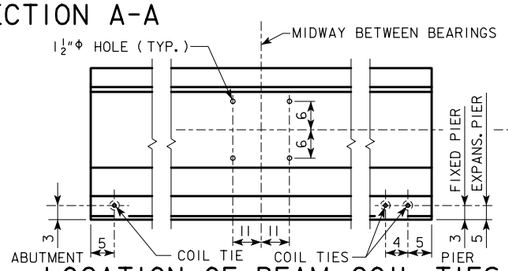


SECTION A-A

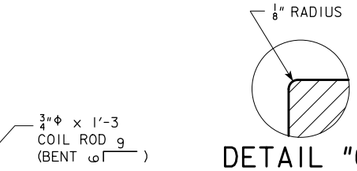


SECTION D-D

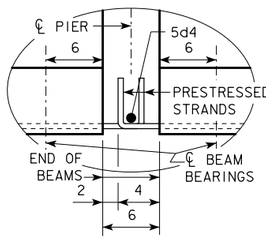
Δ NOTE:
SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1 ARE INCLUDED IN THE BARRIER RAIL QUANTITIES.



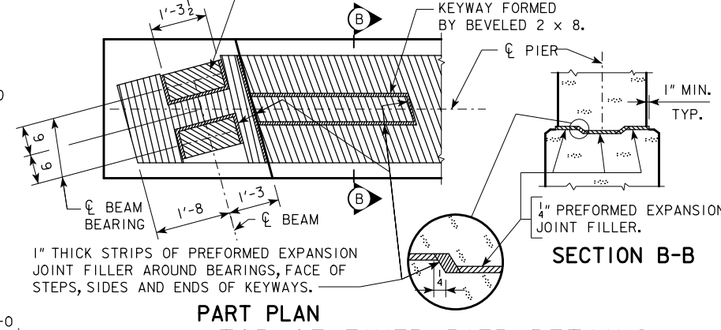
LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



DETAIL "C"



DETAIL "A"



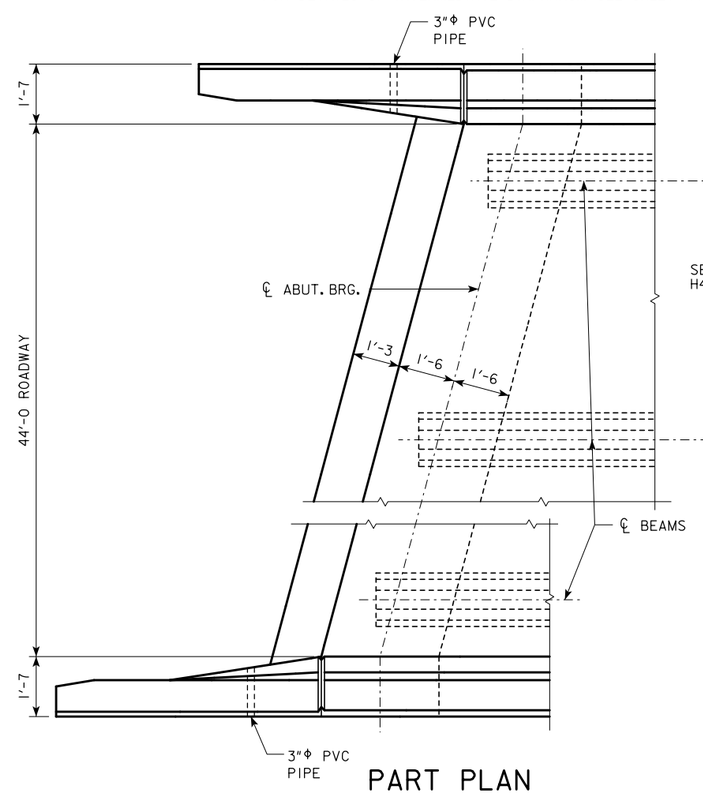
1" THICK STRIPS OF PREFORMED EXPANSION JOINT FILLER AROUND BEARINGS, FACE OF STEPS, SIDES AND ENDS OF KEYWAYS.

PART PLAN

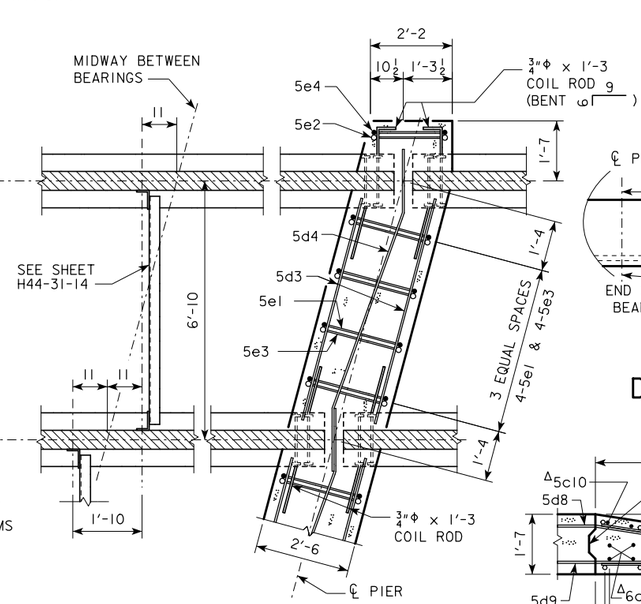
SECTION B-B

TOP OF FIXED PIER DETAILS

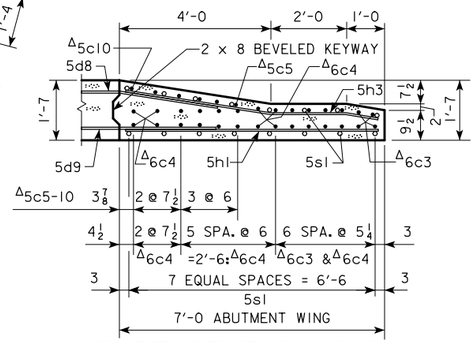
(SEE SHEET H44-37-14 FOR EXPANSION PIER BEARING DETAILS)



PART PLAN



PART SECTION AT PIER



PART SECTION C-C

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT *Highway Division*

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

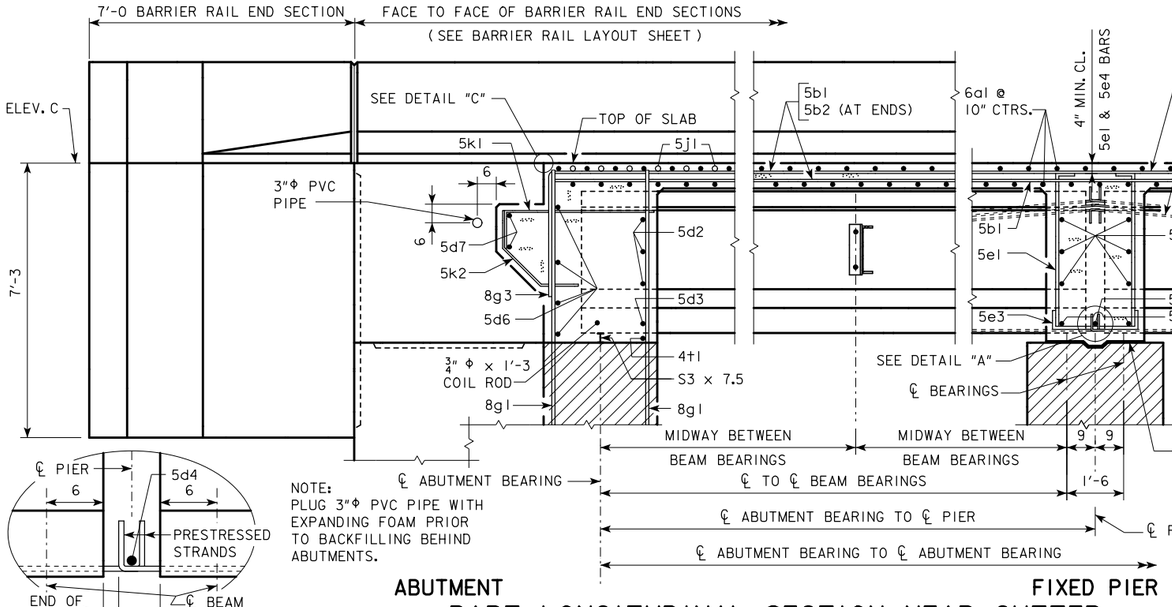
SEPTEMBER, 2014

LONGITUDINAL SECTION

15° SKEW A & B BEAMS

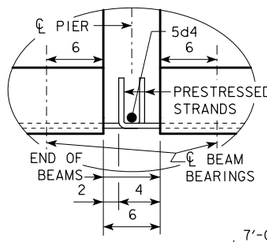
H44-13-14

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄



PART LONGITUDINAL SECTION NEAR GUTTER

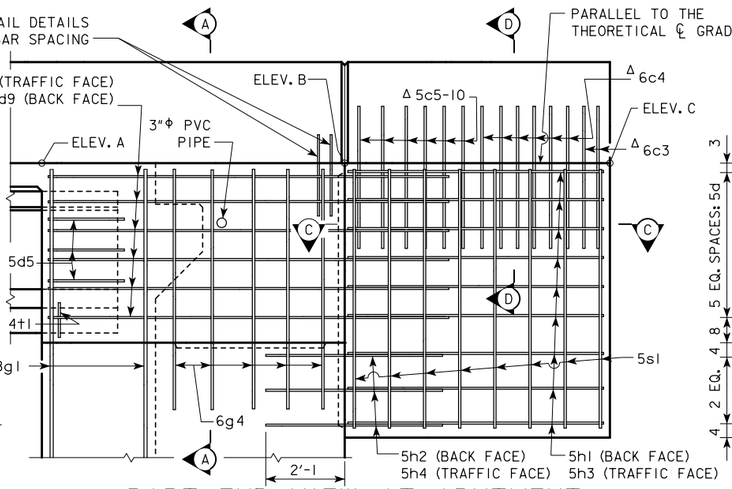
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)



DETAIL "A"

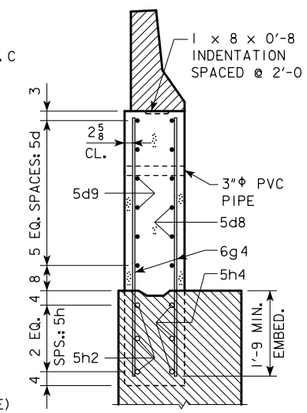
EXPANSION PIER

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

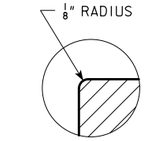


PART END VIEW AT ABUTMENT

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

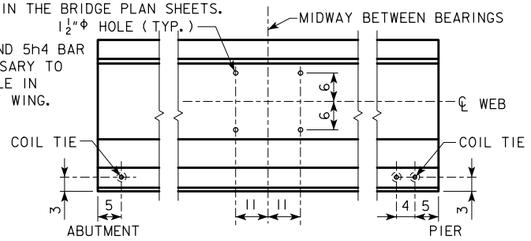


SECTION A-A

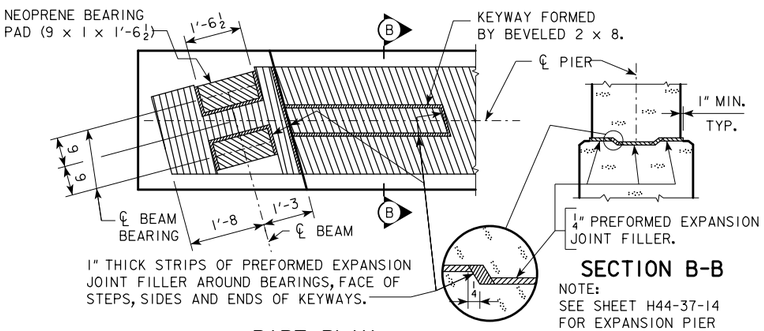


DETAIL "C"

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



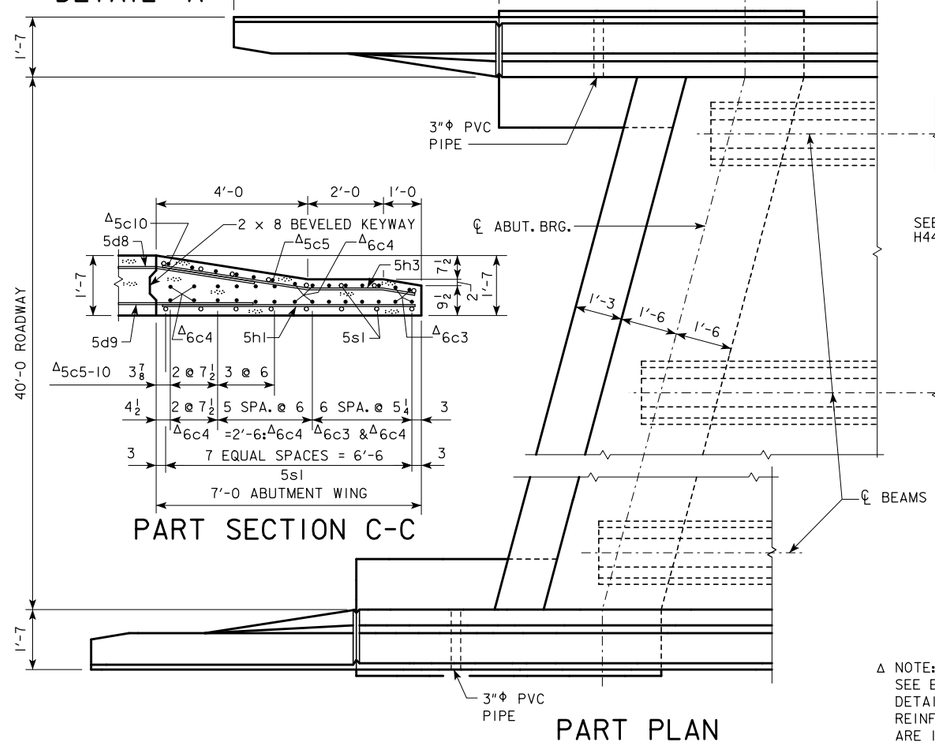
LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES



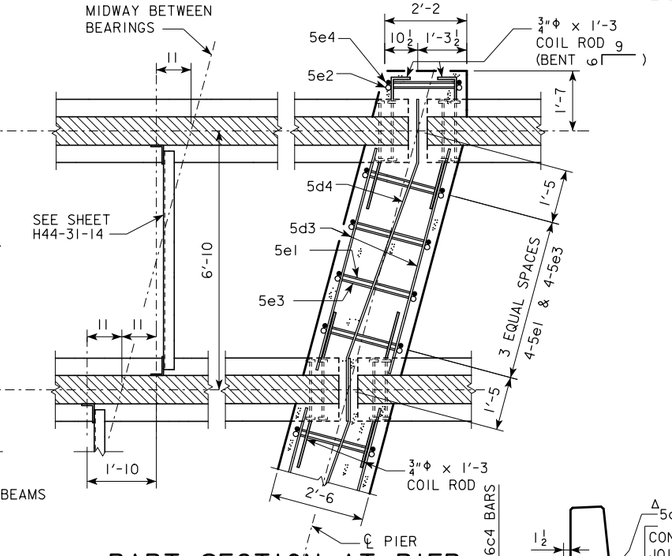
SECTION B-B

NOTE:
SEE SHEET H44-37-14 FOR EXPANSION PIER BEARING DETAILS

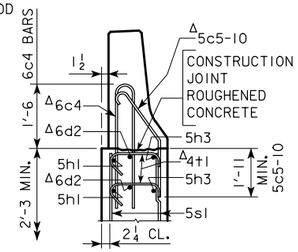
PART PLAN
TOP OF FIXED PIER DETAILS



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 BARRIER RAIL QUANTITIES.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

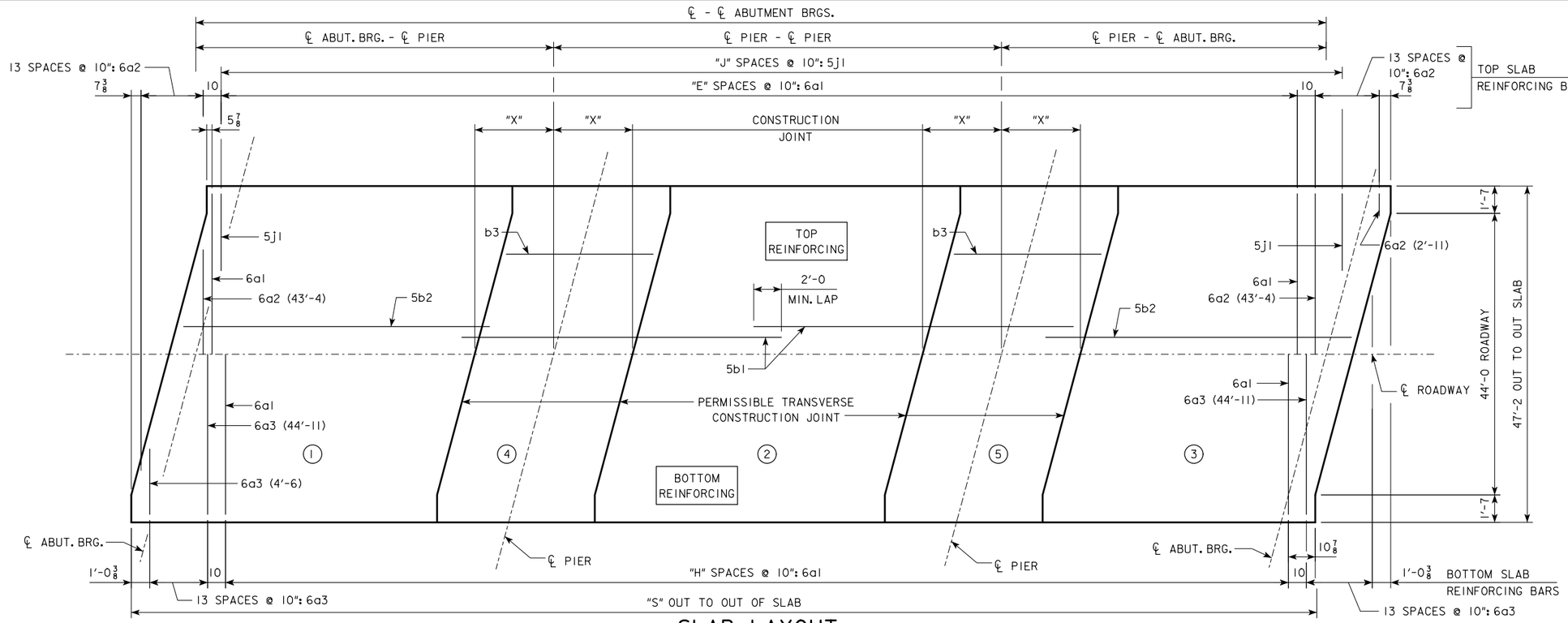
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

LONGITUDINAL SECTION

15° SKEW C BEAMS

H44-14-14



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
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN		NO.	7-A50	7-A55	7-B59	7-B63	7-B67	7-C71	7-C75	7-C80	7-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN		NO.	14-A42	14-A46	14-B50	14-B55	14-B59	14-C63	14-C67	14-C71	14-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
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS		NO.	30	32	34	34	36	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)		NO.	14	14	14	16	16	20	22	22	22
PREBORED HOLES (W/WOOD PILES)		L.F.	300	320	340	340	360	-----	-----	-----	-----
PREBORED HOLES (W/STEEL H-PILES)		L.F.	140	140	140	160	160	200	220	220	220
WING ARMORING		S.Y.	3.5	3.5	3.5	3.5	3.5	5.7	5.7	5.7	5.7

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL, REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ 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.	130.2	138.8	153.6	162.4	171.2	189.8	198.8	208.2	229.0
	WITH OPEN RAIL	C.Y.	131.5	140.2	155.2	164.1	173.1	191.7	200.8	210.4	231.4
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	47.3	51.1	54.9	58.7	62.3	66.4	70.2	74.1	74.1
	WITH OPEN RAIL	C.Y.	48.0	51.9	55.7	59.6	63.3	67.4	71.2	75.2	75.2
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	53.6	56.2	62.8	65.4	68.6	73.6	76.0	78.6	78.6
	WITH OPEN RAIL	C.Y.	54.1	56.7	63.4	66.0	69.2	74.2	76.7	79.3	79.3
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.	38.3	38.1	38.0	38.0	37.9	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES) ***		C.Y.	40.0	40.0	40.0	40.0	40.0	47.8	47.8	47.8	47.8

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'-8 1/16	3'-7 13/16	4'-2 15/16	4'-2 7/8	4'-2 15/16	4'-8 5/8	4'-8 3/4	4'-9 3/16	4'-9 5/8
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 3/4	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 3/4	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	481.4	519.5	594.8	635.1	675.5	812.5	858.0	903.9	948.7
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	264.7	274.5	283.9	293.1	302.2	311.0	322.9	341.9	362.6
NO. OF SPACES FOR 6a1 BARS (TOP)		"E"	155	170	185	200	215	230	245	260	280
NO. OF SPACES FOR 6a1 BARS (BOTTOM)		"H"	154	169	184	199	214	229	244	259	279
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.

07-15
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

SUPERSTRUCTURE DETAILS

15° SKEW

H44-15-14

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

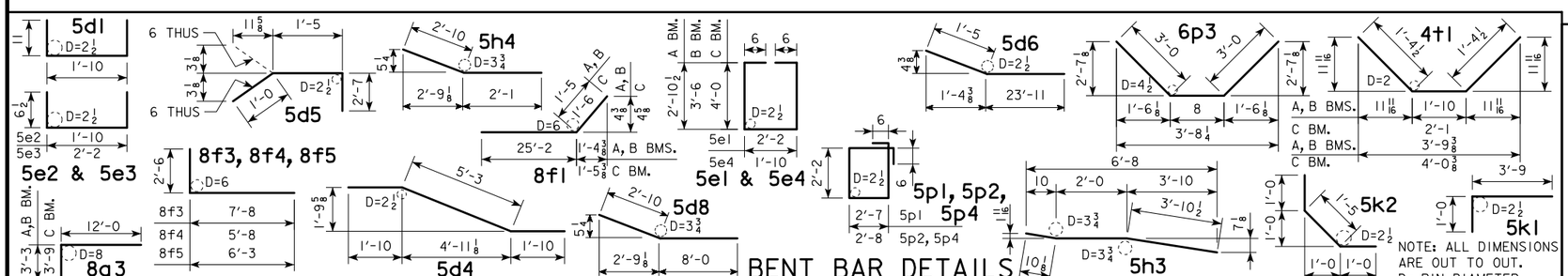
REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	℄-℄ 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		
				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.			311	46′-10	21,877	341	46′-10	23,987	371	46′-10	26,098	401	46′-10	28,208	431	46′-10	30,318	461	46′-10	32,428	491	46′-10	34,539	521	46′-10	36,649	561	46′-10	39,463
6a2	SLAB TRANSV. TOP ENDS			28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973	28	VARIES	973
6a3	SLAB TRANSV. BOTT. ENDS			28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039	28	VARIES	1,039
5b1	SLAB LONGITUDINAL, TOP & BOTT.			212	40′-0	8,845	318	40′-0	13,267	318	40′-0	13,267	318	40′-0	13,267	318	40′-0	13,267	424	40′-0	17,689	424	40′-0	17,689	424	40′-0	17,689	530	40′-0	22,112
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS			212	33′-10	7,481	212	21′-1	4,662	212	27′-4	6,044	212	33′-7	7,426	212	39′-10	8,808	212	27′-1	5,989	212	33′-4	7,371	212	39′-7	8,753	212	28′-11	6,394
6b3	SLAB LONGITUDINAL, TOP ℄ PIERS			98	12′-10	1,889	98	13′-10	2,036	98	14′-10	2,183	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP ℄ PIERS			—	—	—	—	—	—	—	—	—	98	15′-10	3,172	98	17′-0	3,405	98	18′-0	3,606	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP ℄ PIERS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	98	19′-0	4,972	98	20′-0	5,233	98	20′-0	5,233
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.			108	6′-4	713	108	6′-4	713	108	6′-4	713	108	6′-4	713	108	6′-4	713	108	6′-1	685	108	6′-1	685	108	6′-1	685	108	6′-1	685
5d3	PIER & ABUT. DIAPH. LONGIT.			36	5′-5	203	36	5′-5	203	36	5′-5	203	36	5′-5	203	36	5′-5	203	36	5′-2	194	36	5′-2	194	36	5′-2	194	36	5′-2	194
5d4	PIER DIAPH. LONGIT.			12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112	12	8′-11	112
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.			16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423	16	25′-4	423
5d7	PAVING NOTCH LONGIT.			8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209	8	25′-0	209
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			48	8′-11	446	48	8′-11	446	48	10′-2	509	48	10′-2	509	48	10′-2	509	48	11′-2	559	48	11′-2	559	48	11′-2	559	48	11′-2	559
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			48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163	48	3′-3	163
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.			36	26′-7	2,555	36	26′-7	2,555	36	26′-7	2,555	36	26′-7	2,555	36	26′-7	2,555	36	26′-8	2,563	36	26′-8	2,563	36	26′-8	2,563	36	26′-8	2,563
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.			158	6′-8	2,812	158	6′-8	2,812	158	7′-3	3,058	158	7′-3	3,058	158	7′-3	3,058	154	7′-9	3,187	154	7′-9	3,187	154	7′-9	3,187	154	7′-10	3,221
8g3	ABUT. DIAPH. VERT. B.F.			74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112
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			78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386	78	4′-9	386
5k2	PAVING NOTCH			78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278	78	3′-5	278
5p1	ABUTMENT HOOPS (WOOD/STEEL)			112/144	10′-6	1227/1577	120/144	10′-6	1314/1577	128/144	10′-6	1402/1577	128/140	10′-6	1402/1533	136/140	10′-6	1489/1533	148	10′-6	1,621	136	10′-6	1,489	136	10′-6	1,489	136	10′-6	1,489
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			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32	6′-8	320	36	6′-8	360	36	6′-8	360	36	6′-8	360
5p4	ABUT. HOOPS AT ENDS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	10′-8	89	8	10′-8	89	8	10′-8	89	8	10′-8	89
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			14	4′-7	43	14	4′-7	43	14	4′-7	43	14	4′-7	43	14	4′-7	43	14	4′-10	45	14	4′-10	45	14	4′-10	45	14	4′-10	45
#2	PILE SPIRAL (WOOD/STEEL)*			30/14	38′-6	193/90	32/14	38′-6	206/90	34/14	38′-6	219/90	34/16	38′-6	219/103	36/16	38′-6	231/103	20	38′-6	129	22	38′-6	141	22	38′-6	141	22	38′-6	141
	SPIRAL SPACERS, L $\frac{7}{8}$×$\frac{1}{8}$×$\frac{1}{8}$× 0.70 (WOOD/STL.)*			90/42	1′-10	116/54	96/42	1′-10	123/54	102/42	1′-10	131/54	102/48	1′-10	131/62	108/48	1′-10	139/62	60	1′-10	77	66	1′-10	85	66	1′-10	85	66	1′-10	85
	*EPOXY COATING NOT REQUIRED																												
	SUB TOTAL W/ WOOD PILES**					58,500			62,663			66,944			71,621			75,649											
	SUB TOTAL W/ STEEL H-PILES**					58,685			62,741			66,913			71,567			75,488			82,292			87,275			91,228			96,401
	**RAIL REINFORCING NOT INCLUDED																												

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



BENT BAR DETAILS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

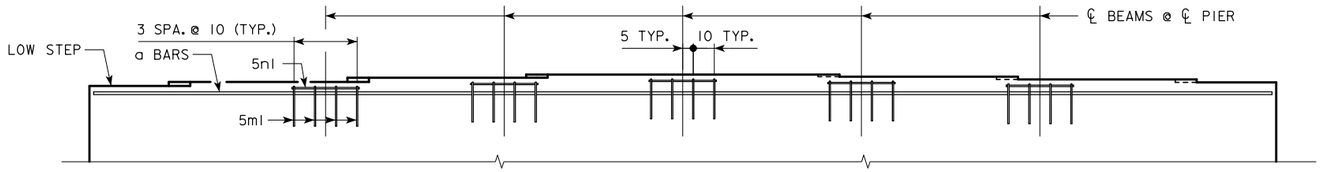
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

DECK & ABUTMENT REINF.

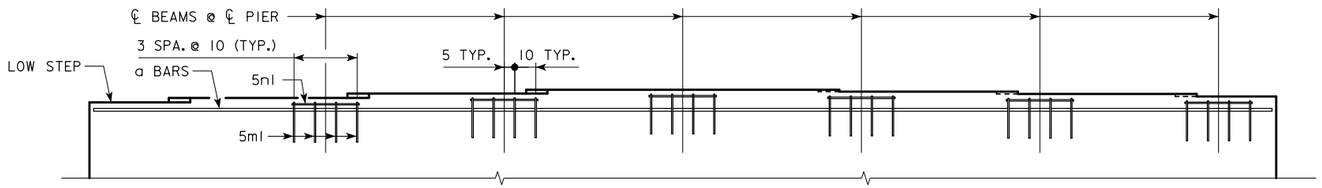
15° SKEW

H44-16-14



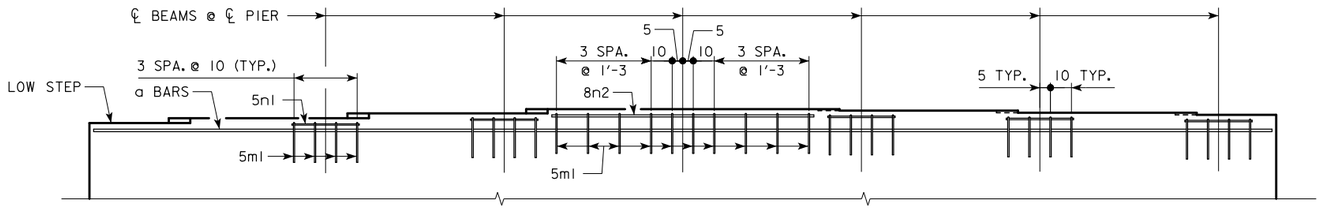
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 1.3%



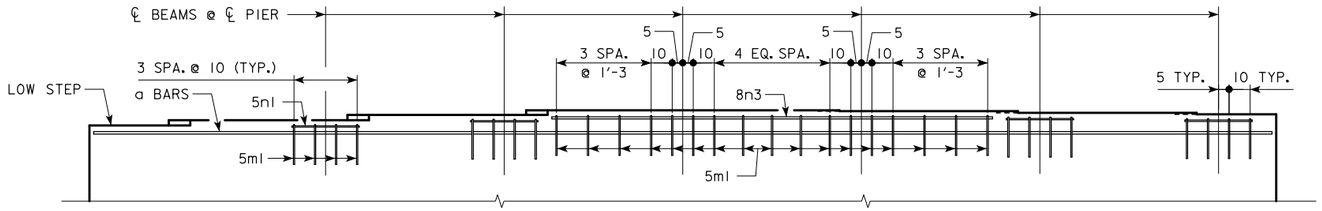
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.3% < G <= 2.1%



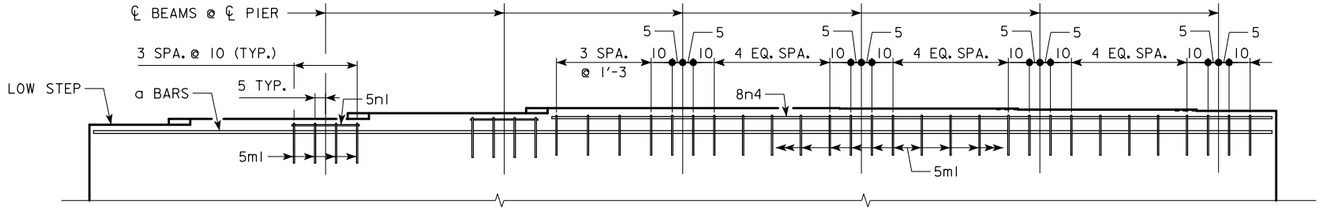
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 2.1% < G <= 3.0%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 3.0% < G <= 4.0%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 4.0% < G <= 5.0%

STEP REINFORCING BAR LIST
ONE TEE PIER

			G <= 1.3%			1.3% < G <= 2.1%			2.1% < G <= 3.0%			3.0% < G <= 4.0%			4.0% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-4	⌐	20	5	132	24	5	159	30	5	198	33	5	218	36	5	238
5n1	2'-8	—	20	5	56	24	5	67	20	5	56	16	5	45	8	5	22
8n2	11'-2	—	--	--	--	--	--	--	4	8	119	--	--	--	--	--	--
8n3	18'-3	—	--	--	--	--	--	--	--	--	--	4	8	195	--	--	--
*8n4	VARIES	—	--	--	--	--	--	--	--	--	--	--	--	--	4	8	309
TOTAL (LB.)					188			226			373			458			569

G = GRADE (%)

*8n4 BARS VARY FROM 28'-7 TO 29'-3

STEP REINFORCING BAR LIST
ONE PILE BENT PIER

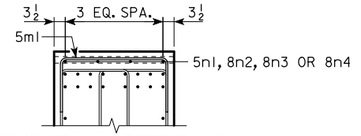
			G <= 1.3%			1.3% < G <= 2.1%			2.1% < G <= 3.0%			3.0% < G <= 4.0%			4.0% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-3	⌐	20	5	130	24	5	156	30	5	196	33	5	215	36	5	235
5n1	2'-8	—	20	5	56	24	5	67	20	5	56	16	5	45	8	5	22
8n2	11'-2	—	--	--	--	--	--	--	4	8	119	--	--	--	--	--	--
8n3	18'-3	—	--	--	--	--	--	--	--	--	--	4	8	195	--	--	--
*8n4	VARIES	—	--	--	--	--	--	--	--	--	--	--	--	--	4	8	309
TOTAL (LB.)					186			223			371			455			566

G = GRADE (%)

*8n4 BARS VARY FROM 28'-7 TO 29'-3

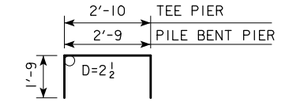
NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



TYPICAL SECTION

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 SHOULD BE 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	0.8	1.1	1.4
C BEAMS	--	0.6	1.0	1.3	1.7
EACH TEE PIER CAP - ALL BEAMS	--	0.5	0.8	1.1	1.4
EACH PILE BENT PIER - ALL BEAMS	--	0.5	0.8	1.1	1.4

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

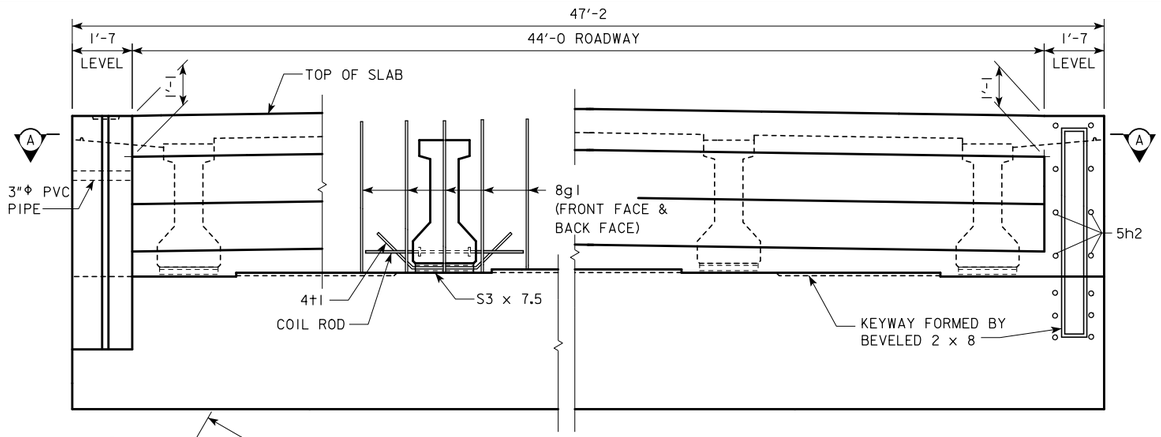
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ADDITIONAL QUANTITIES

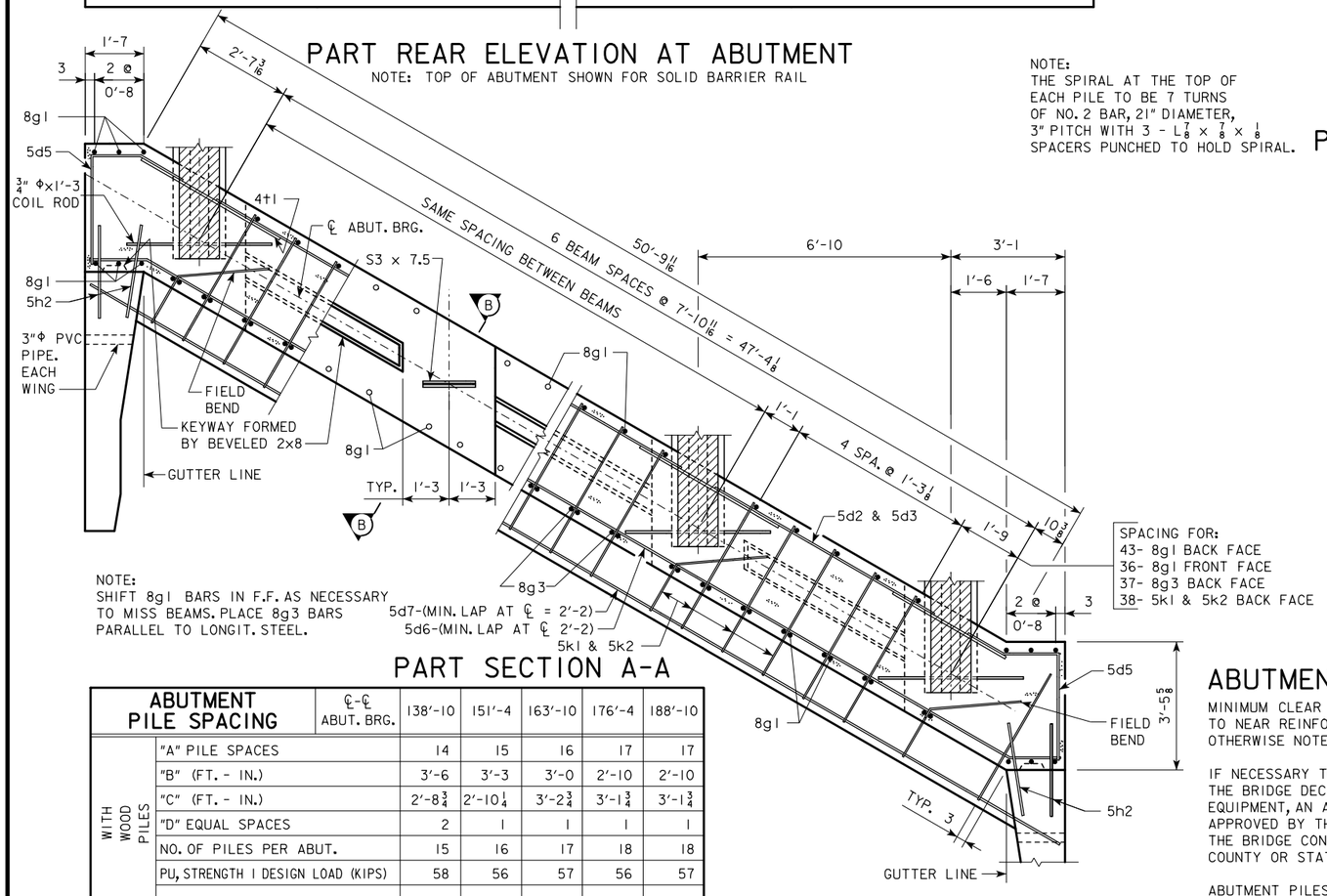
15° SKEW

H44-17-14



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.

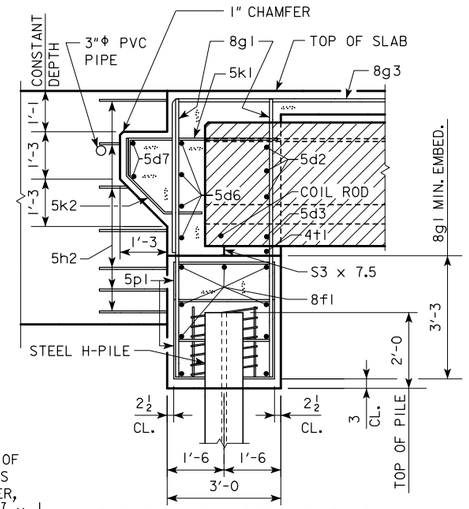
PART SECTION A-A

ABUTMENT PILE SPACING		℄-℄ ABUT. BRG.	138'-10	151'-4	163'-10	176'-4	188'-10
WITH WOOD PILES	"A" PILE SPACES		14	15	16	17	17
	"B" (FT. - IN.)		3'-6	3'-3	3'-0	2'-10	2'-10
	"C" (FT. - IN.)		2'-8 3/4	2'-10 1/4	3'-2 3/4	3'-1 3/4	3'-1 3/4
	"D" EQUAL SPACES		2	1	1	1	1
	NO. OF PILES PER ABUT.		15	16	17	18	18
	PU, STRENGTH I DESIGN LOAD (KIPS)		58	56	57	56	57
WITH STEEL H-PILES	"A" PILE SPACES		7	7	7	7	7
	"B" (FT. - IN.)		7'-0	7'-0	7'-0	7'-0	7'-0
	"C" (FT. - IN.)		2'-8 3/4	2'-8 3/4	2'-8 3/4	2'-8 3/4	2'-8 3/4
	"D" EQUAL SPACES		4	4	4	4	4
	NO. OF PILES PER ABUT.		8	8	8	8	8
	PU, STRENGTH I DESIGN LOAD (KIPS)		117	122	131	135	139

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

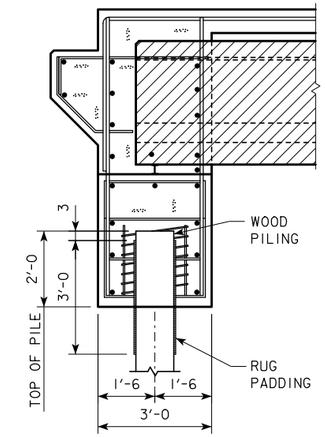
NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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



PART SECTION B-B

(FOR STEEL H-PILING)



PART SECTION B-B

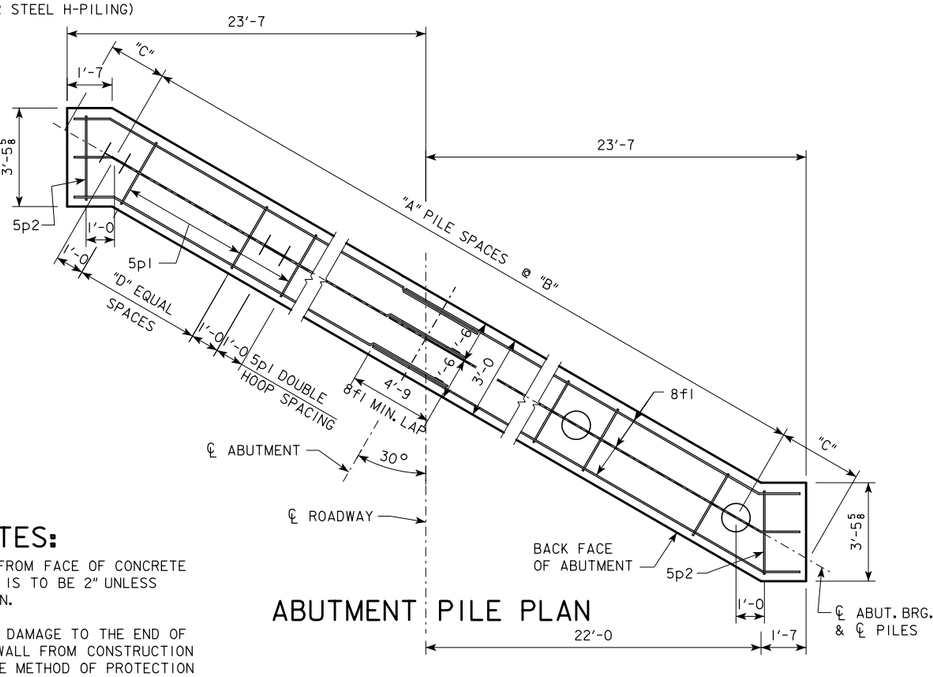
(FOR WOOD PILING)

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).



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.

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

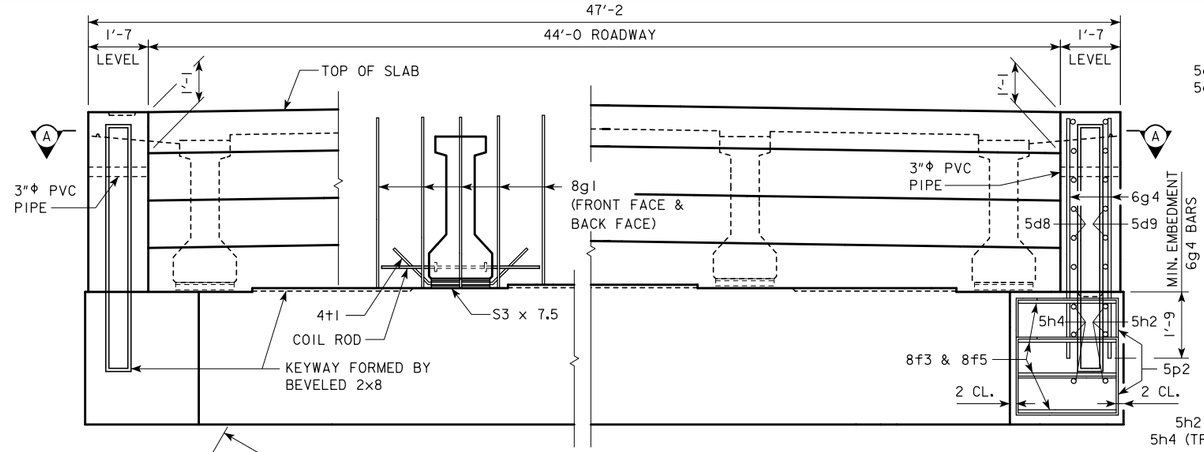
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT DETAILS

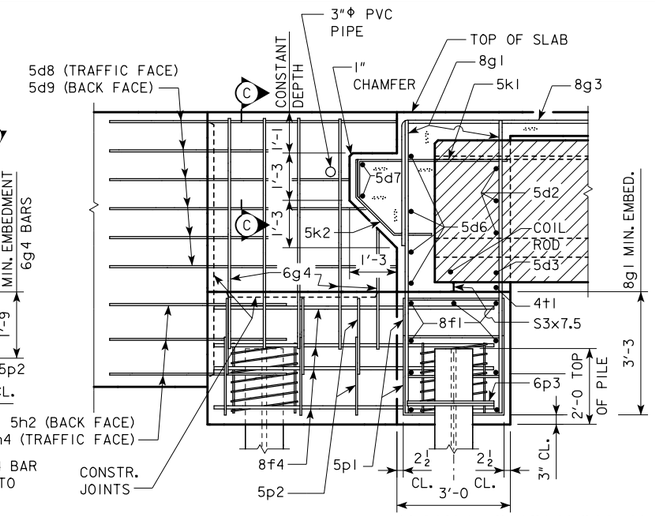
30° SKEW A & B BEAMS

H44-18-14



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.

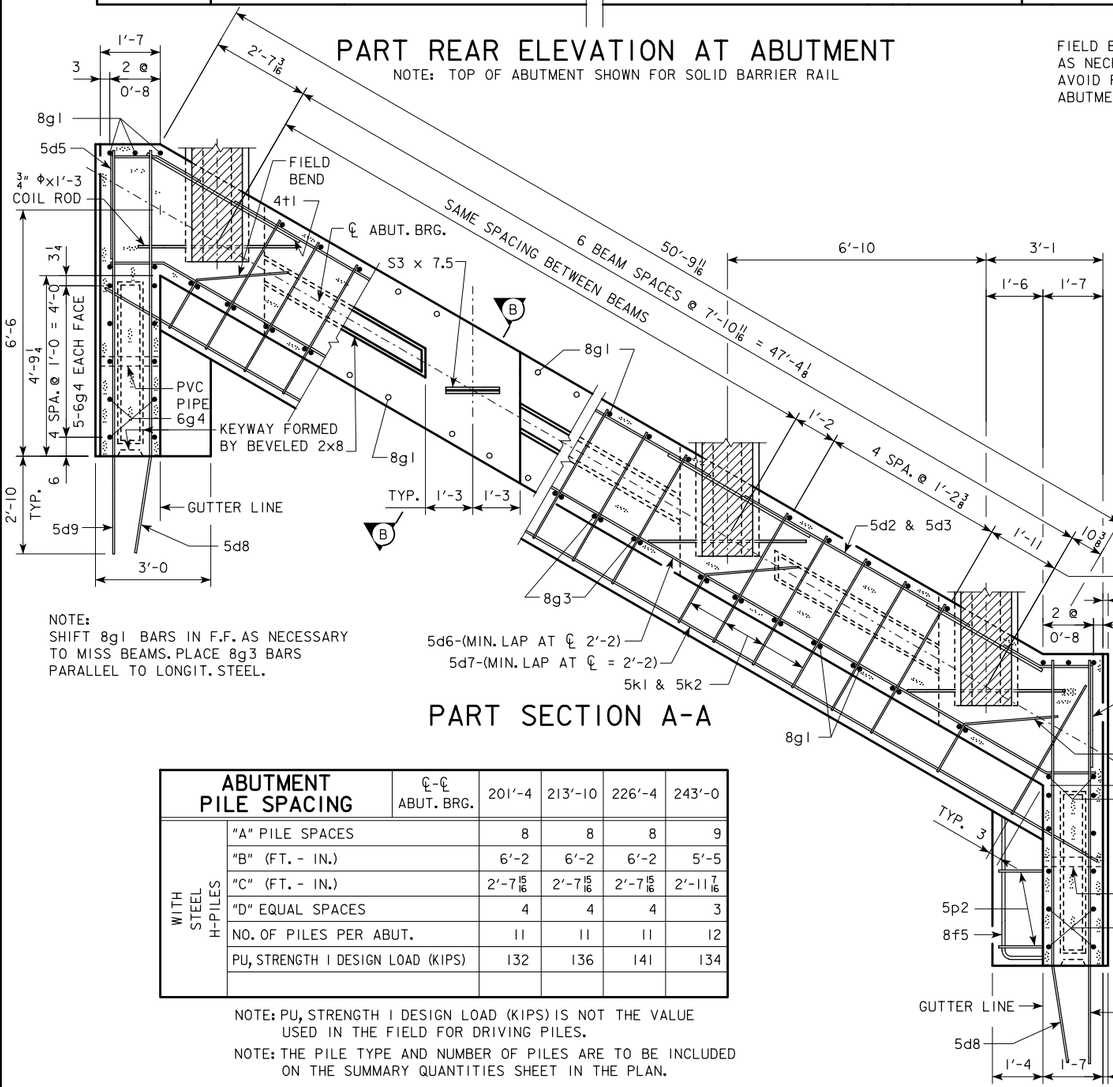
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY OR STATE.

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

BARRIER RAIL NOT SHOWN IN DETAILS.

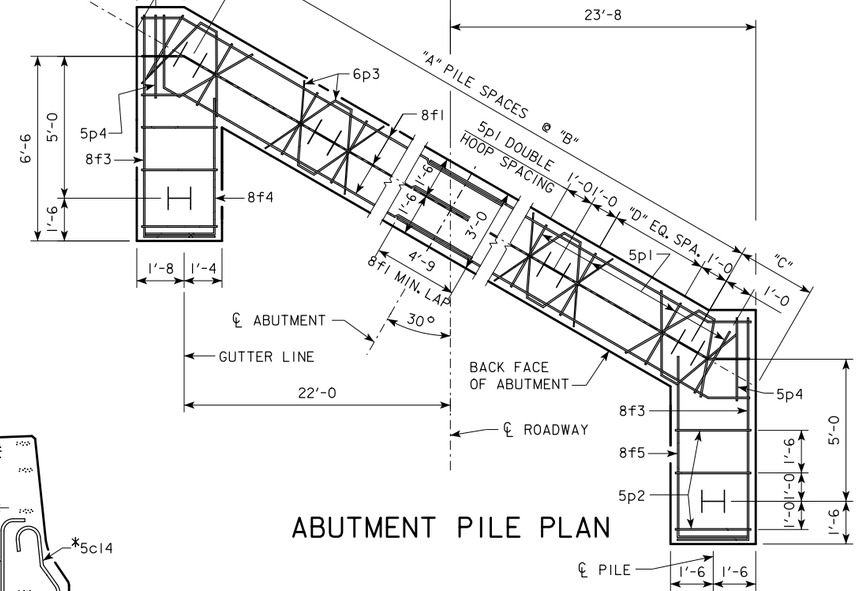
IF ROCK IS CLOSER THAN 15' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

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.



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

PART SECTION A-A

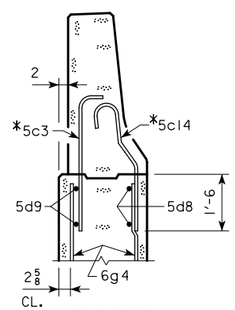


ABUTMENT PILE PLAN

ABUTMENT PILE SPACING		℄-℄ ABUT. BRG.	201'-4	213'-10	226'-4	243'-0
WITH STEEL H-PILES	"A" PILE SPACES		8	8	8	9
	"B" (FT. - IN.)		6'-2	6'-2	6'-2	5'-5
	"C" (FT. - IN.)		2'-7 15/16	2'-7 15/16	2'-7 15/16	2'-11 7/16
	"D" EQUAL SPACES		4	4	4	3
	NO. OF PILES PER ABUT.		11	11	11	12
	PU, STRENGTH I DESIGN LOAD (KIPS)		132	136	141	134

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

NOTE: THE PILE TYPE AND NUMBER OF PILES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



PART SECTION C-C

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

LATEST REVISION DATE

Warren K. McCaulley
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

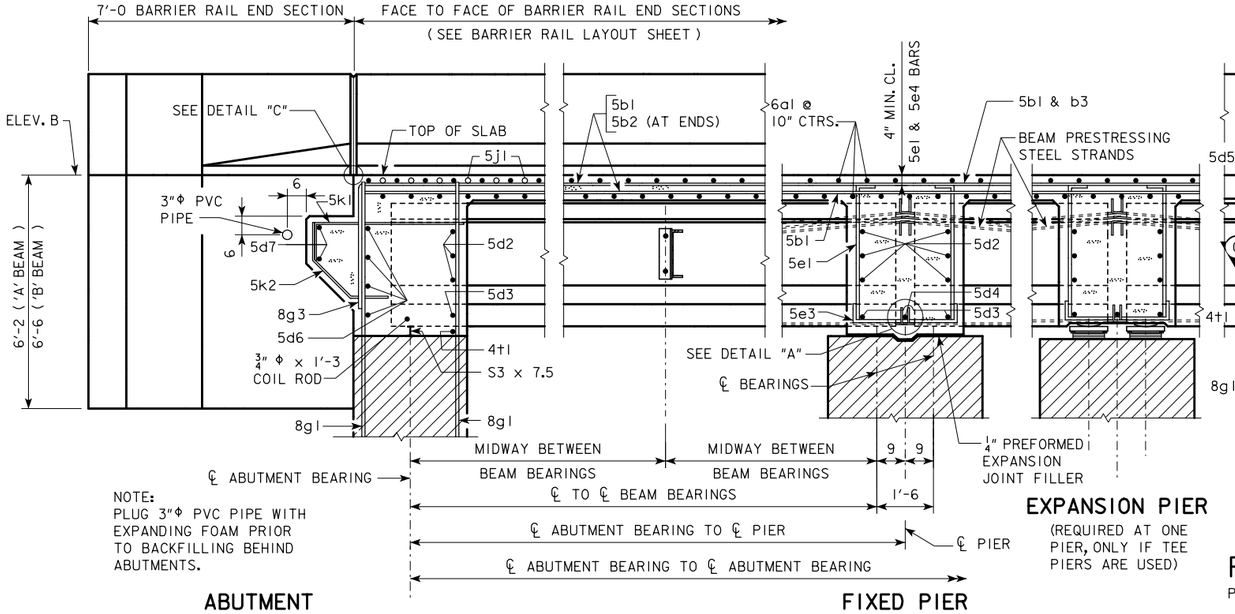
SEPTEMBER, 2014

ABUTMENT DETAILS

30° SKEW C BEAMS

H44-19-14

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄

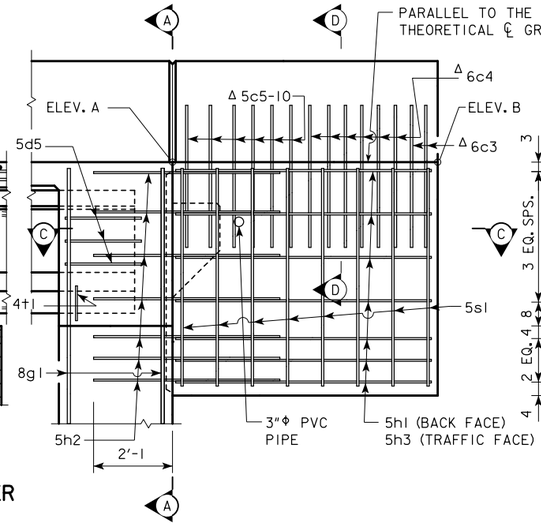


NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.

PART LONGITUDINAL SECTION NEAR GUTTER

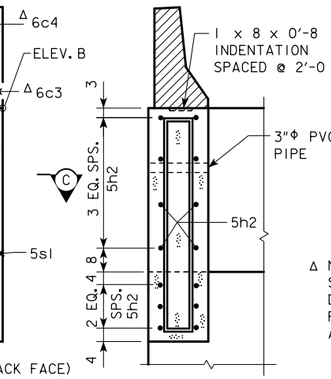
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)

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

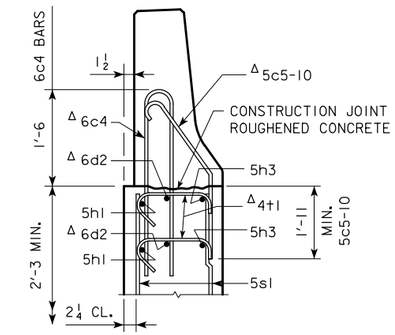


PART END VIEW AT ABUTMENT

PROVIDE ELEVATIONS A AND B IN THE BRIDGE PLAN SHEETS.

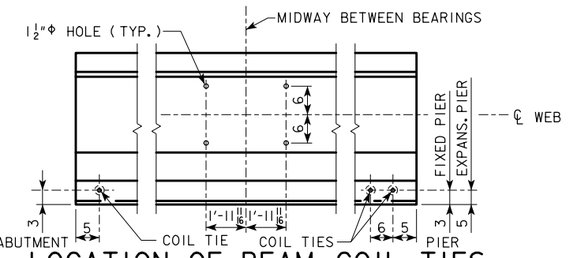


SECTION A-A

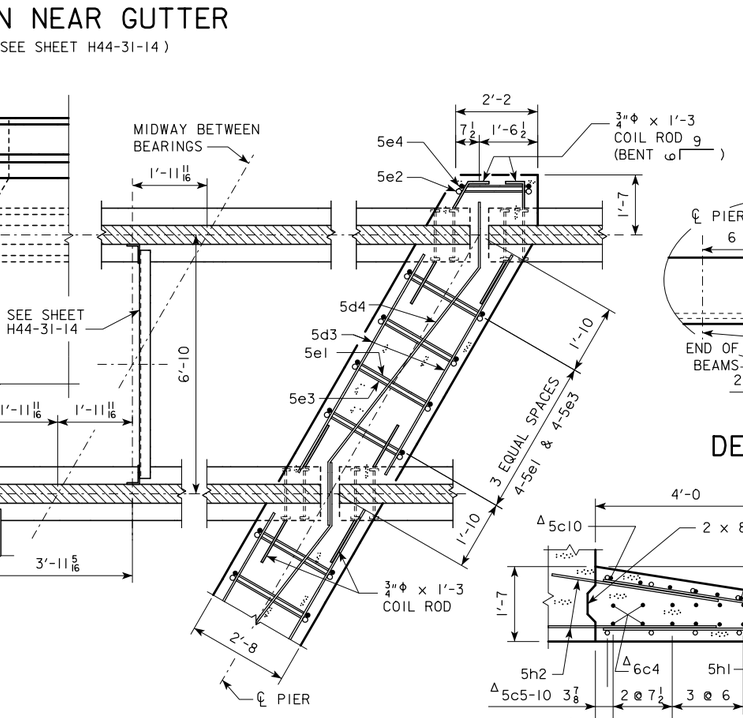


SECTION D-D

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 BARRIER RAIL QUANTITIES.

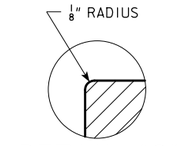


LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

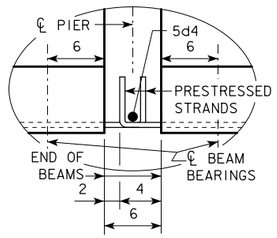


PART PLAN

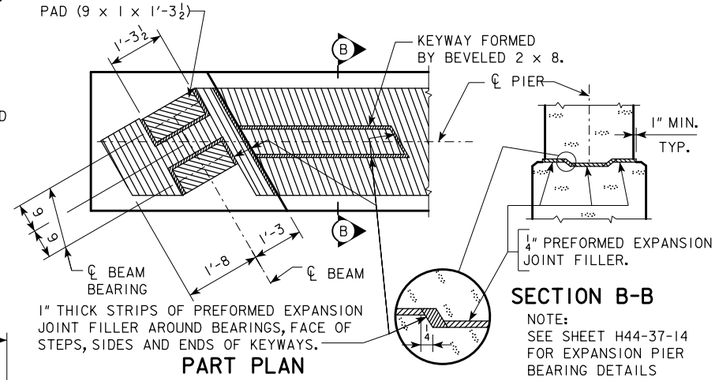
PART SECTION AT PIER



DETAIL "C"



DETAIL "A"



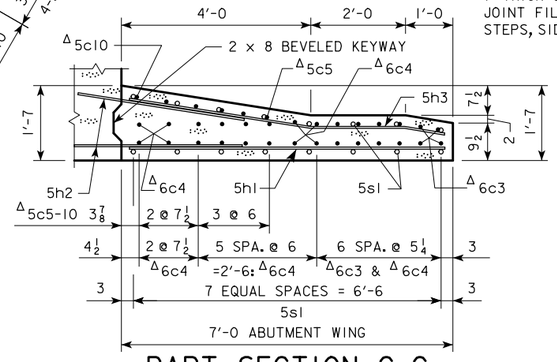
1" THICK STRIPS OF PREFORMED EXPANSION JOINT FILLER AROUND BEARINGS, FACE OF STEPS, SIDES AND ENDS OF KEYWAYS.

PART PLAN

SECTION B-B

NOTE:
SEE SHEET H44-37-14 FOR EXPANSION PIER BEARING DETAILS

TOP OF FIXED PIER DETAILS



PART SECTION C-C

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

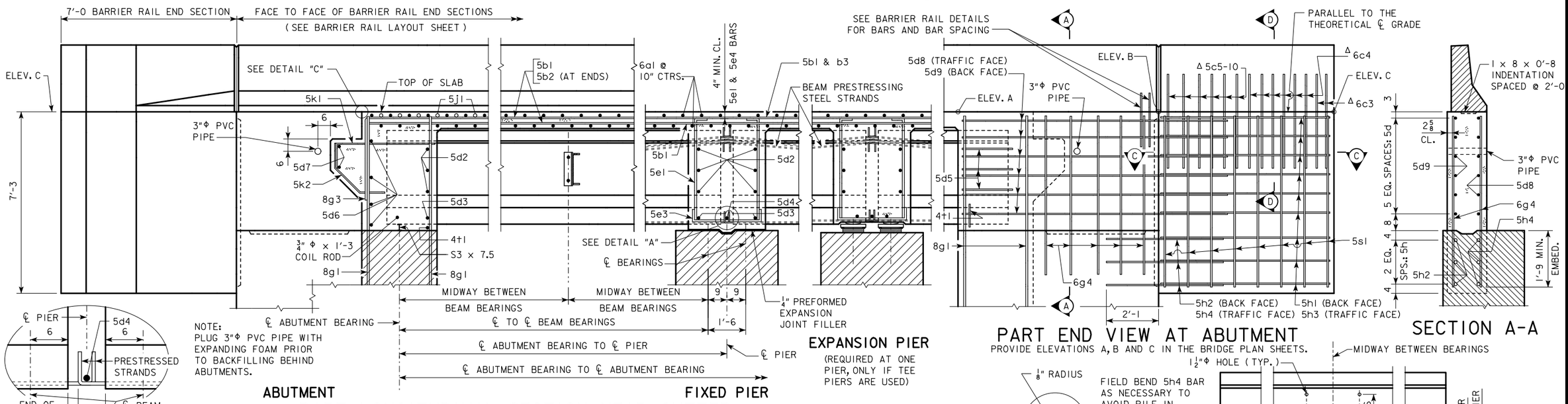
SEPTEMBER, 2014

LONGITUDINAL SECTION

30° SKEW A & B BEAMS

H44-20-14

NOTE: BRIDGE IS SYMMETRICAL ABOUT ℄



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STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

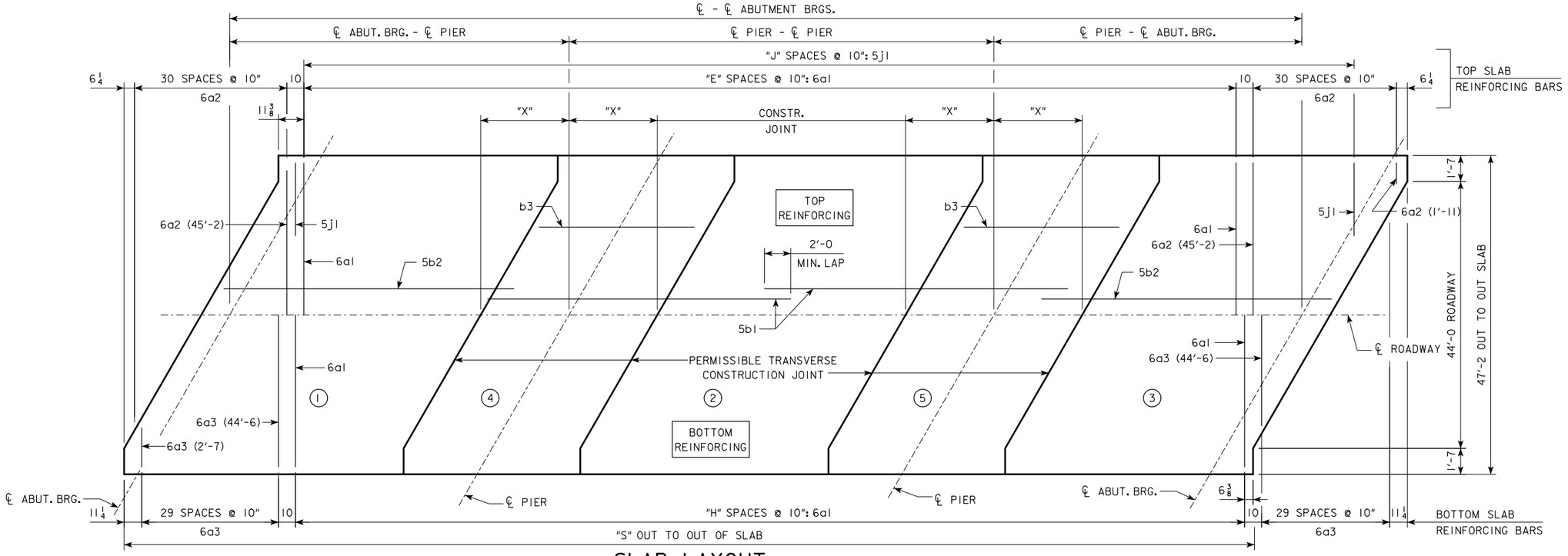
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

LONGITUDINAL SECTION

30° SKEW C BEAMS

H44-21-14



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
PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN	NO.	7-A50	7-A55	7-B59	7-B63	7-B67	7-C71	7-C75	7-C80	7-C80
PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN	NO.	14-A42	14-A46	14-B50	14-B55	14-B59	14-C63	14-C67	14-C71	14-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
NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS	NO.	30	32	34	36	36	-----	-----	-----	-----
NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)	NO.	16	16	16	16	16	22	22	22	24
PREBORED HOLES (W/WOOD PILES)	L.F.	300	320	340	360	360	-----	-----	-----	-----
PREBORED HOLES (W/STEEL H-PILES)	L.F.	160	160	160	160	160	220	220	220	240
WING ARMORING	S.Y.	3.7	3.7	3.7	3.7	3.7	5.9	5.9	5.9	5.9

NOTE:
FOR QUANTITIES OF STRUCTURAL CONCRETE, REINFORCING STEEL AND STRUCTURAL STEEL, REFER TO THE SUMMARY QUANTITIES SHEET IN THE BRIDGE PLANS.

GENERAL DATA

℄-℄ ABUT. BRG.			138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
VERTICAL CURVE	TOP OF SLAB TO ABUT. CONSTR. JT. AT C.L. ABUT. BRG.	"U"	3'-8 1/16	3'-7 13/16	4'-2 15/16	4'-2 7/8	4'-2 15/16	4'-8 5/8	4'-8 3/4	4'-9 3/16	4'-9 5/8
	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 GRADE	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 3/4	4'-8 15/16	4'-9 3/8	4'-10
	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 3/4	4'-7 3/4	4'-8 1/16	4'-8 1/16
D.L. PIER REACTION (D.L. + F.W.S.) SERVICE LOADS		KIPS	489.3	527.5	604.3	644.6	685.2	822.9	868.4	914.4	959.2
L.L. PIER REACTION (HL93) NO IMPACT SERVICE LOADS		KIPS	264.7	274.5	283.9	293.1	302.2	311.0	322.9	341.9	362.6
NO. OF SPACES FOR 6a1 BARS (TOP)		"E"	138	153	168	183	198	213	228	243	263
NO. OF SPACES FOR 6a1 BARS (BOTTOM)		"H"	139	154	169	184	199	214	229	244	264
NO. OF SPACES FOR 5j1 BARS (TOP)		"J"	165	180	195	210	225	240	255	270	290
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.

Δ NOTE:
CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

Δ 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.	135.0	143.8	159.2	168.0	176.8	195.6	204.6	214.0	235.0
	WITH OPEN RAIL	C.Y.	136.3	145.2	160.8	169.7	178.6	197.5	206.6	216.1	237.4
SLAB INCLUDING HAUNCH, SECTION 2	WITH BARRIER RAIL	C.Y.	47.3	51.1	54.9	58.7	62.3	66.4	70.2	74.1	74.1
	WITH OPEN RAIL	C.Y.	48.0	51.9	55.7	59.6	63.3	67.4	71.2	75.2	75.2
SLAB INCLUDING HAUNCH & PIER DIAPHRAGM, SECTIONS 4 & 5	WITH BARRIER RAIL	C.Y.	57.6	60.2	67.6	70.2	73.4	78.6	81.2	83.8	83.8
	WITH OPEN RAIL	C.Y.	58.1	60.7	68.2	70.8	74.0	79.2	81.9	84.5	84.5
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.	43.1	42.9	42.8	42.7	42.7	-----	-----	-----	-----
ABUTMENT FOOTINGS (w/ STEEL H PILES) ***		C.Y.	44.8	44.8	44.8	44.8	44.8	52.6	52.6	52.6	52.6

* 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.

07-15
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

SUPERSTRUCTURE DETAILS
30° SKEW

H44-22-14

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
CHANGED SHEET NUMBER FROM H44-22-07 TO H44-22-14.

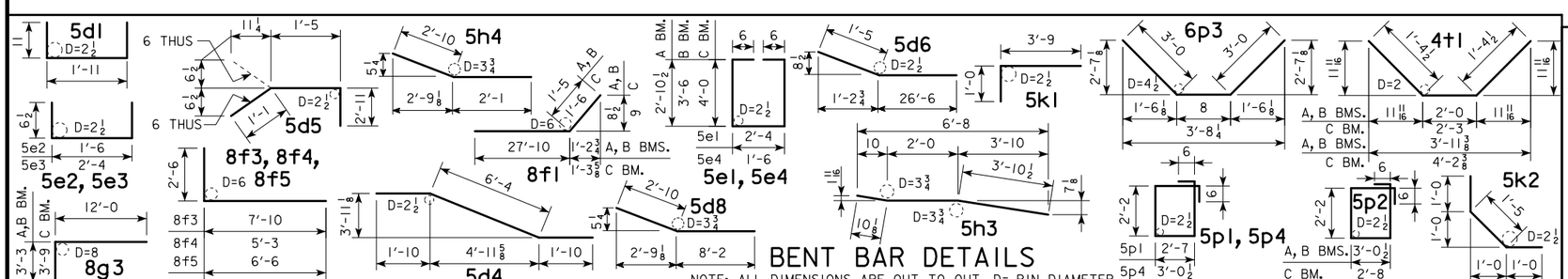
REINFORCING BAR LIST

ONE SUPERSTRUCTURE AND TWO ABUTMENTS

EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	℄-℄ 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		
				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.			279	46′-10	19,626	309	46′-10	21,736	339	46′-10	23,847	369	46′-10	25,957	399	46′-10	28,067	429	46′-10	30,177	459	46′-10	32,288	489	46′-10	34,398	529	46′-10	37,212
6a2	SLAB TRANSV. TOP ENDS			62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192	62	VARIES	2,192
6a3	SLAB TRANSV. BOTT. ENDS			60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122	60	VARIES	2,122
5b1	SLAB LONGITUDINAL, TOP & BOTT.			212	40′-0	8,845	318	40′-0	13,267	318	40′-0	13,267	318	40′-0	13,267	318	40′-0	13,267	424	40′-0	17,689	424	40′-0	17,689	424	40′-0	17,689	530	40′-0	22,112
5b2	SLAB LONGITUDINAL, TOP & BOTT., ENDS			212	34′-0	7,518	212	21′-3	4,699	212	27′-6	6,081	212	33′-9	7,463	212	40′-0	8,845	212	27′-3	6,025	212	33′-6	7,407	212	39′-9	8,789	212	29′-1	6,431
6b3	SLAB LONGITUDINAL, TOP @ PIERS			98	12′-10	1,889	98	13′-10	2,036	98	14′-10	2,183	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7b3	SLAB LONGITUDINAL, TOP @ PIERS			—	—	—	—	—	—	—	—	—	98	15′-10	3,172	98	17′-0	3,405	98	18′-0	3,606	—	—	—	—	—	—	—	—	—
8b3	SLAB LONGITUDINAL, TOP @ PIERS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	98	19′-0	4,972	98	20′-0	5,233	98	20′-0	5,233
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.			108	7′-1	798	108	7′-1	798	108	7′-1	798	108	7′-1	798	108	7′-1	798	108	6′-9	760	108	6′-9	760	108	6′-9	760	108	6′-9	760
5d3	PIER & ABUT. DIAPH. LONGIT.			36	6′-0	225	36	6′-0	225	36	6′-0	225	36	6′-0	225	36	6′-0	225	36	5′-9	216	36	5′-9	216	36	5′-9	216	36	5′-9	216
5d4	PIER DIAPH. LONGIT.			12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125	12	10′-0	125
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.			16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466	16	27′-11	466
5d7	PAVING NOTCH LONGIT.			8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232	8	27′-9	232
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			48	9′-1	455	48	9′-1	455	48	10′-4	517	48	10′-4	517	48	10′-4	517	48	11′-4	567	48	11′-4	567	48	11′-4	567	48	11′-4	567
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			48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171	48	3′-5	171
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.			36	29′-3	2,812	36	29′-3	2,812	36	29′-3	2,812	36	29′-3	2,812	36	29′-3	2,812	36	29′-4	2,820	36	29′-4	2,820	36	29′-4	2,820	36	29′-4	2,820
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.			158	6′-8	2,812	158	6′-8	2,812	158	7′-3	3,058	158	7′-3	3,058	158	7′-3	3,058	154	7′-9	3,187	154	7′-9	3,187	154	7′-9	3,187	154	7′-10	3,221
8g3	ABUT. DIAPH. VERT. B.F.			74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-3	3,013	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112	74	15′-9	3,112
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)			332	6′-3	2,164	362	6′-3	2,360	392	6′-3	2,555	422	6′-3	2,751	452	6′-3	2,946	482	6′-3	3,142	512	6′-3	3,338	542	6′-3	3,533	582	6′-3	3,794
5k1	PAVING NOTCH			76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377	76	4′-9	377
5k2	PAVING NOTCH			76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271	76	3′-5	271
5p1	ABUTMENT HOOPS (WOOD/STEEL)			168/140	10′-6	1840/1533	120/140	10′-6	1314/1533	128/140	10′-6	1402/1533	136/140	10′-6	1489/1533	136/140	10′-6	1489/1533	168	10′-6	1,840	168	10′-6	1,840	168	10′-6	1,840	152	10′-6	1,665
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			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36	6′-8	360	36	6′-8	360	36	6′-8	360	40	6′-8	401
5p4	ABUT. HOOPS AT ENDS			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	11′-5	95	8	11′-5	95	8	11′-5	95	8	11′-5	95
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			14	4′-9	44	14	4′-9	44	14	4′-9	44	14	4′-9	44	14	4′-9	44	14	5′-0	47	14	5′-0	47	14	5′-0	47	14	5′-0	47
#2	PILE SPIRAL (WOOD/STEEL)*			30/16	38′-6	193/103	32/16	38′-6	206/103	34/16	38′-6	219/103	36/16	38′-6	231/103	36/16	38′-6	231/103	22	38′-6	141	22	38′-6	141	22	38′-6	141	24	38′-6	154
	SPIRAL SPACERS, L $\frac{7}{8}\times\frac{7}{8}\times$ 0.70 (WOOD/STL.)*			90/48	1′-10	116/62	96/48	1′-10	123/62	102/48	1′-10	131/62	108/48	1′-10	139/62	108/48	1′-10	139/62	66	1′-10	85	66	1′-10	85	66	1′-10	85	72	1′-10	92
	*EPOXY COATING NOT REQUIRED																												
	SUB TOTAL W/ WOOD PILES**					59,629			63,179			67,460			72,244			76,164			—			—			—			—
	SUB TOTAL W/ STEEL H-PILES**					59,178			63,234			67,406			72,083			76,003			83,089			88,144			92,097			97,157
	**RAIL REINFORCING NOT INCLUDED																												

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

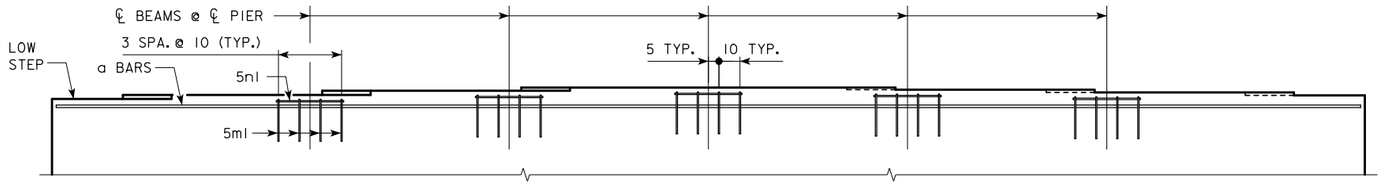
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

DECK & ABUTMENT REINF.

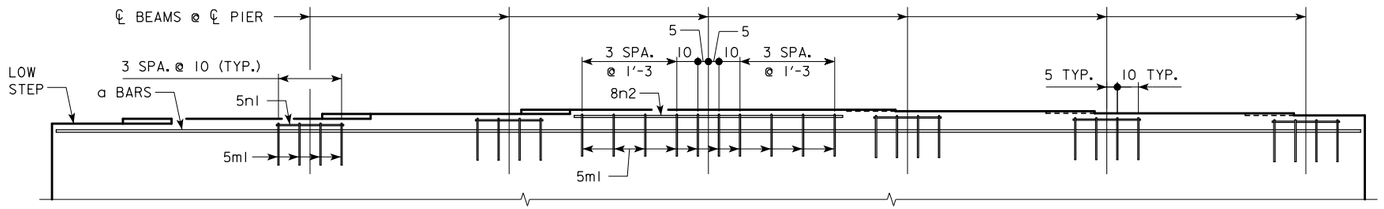
30° SKEW

H44-23-14



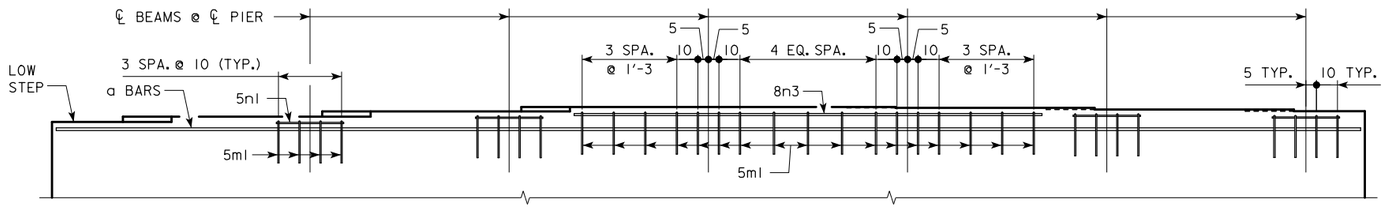
PART ELEVATION VIEW OF PIER CAP

GRADE (G): G <= 0.6%



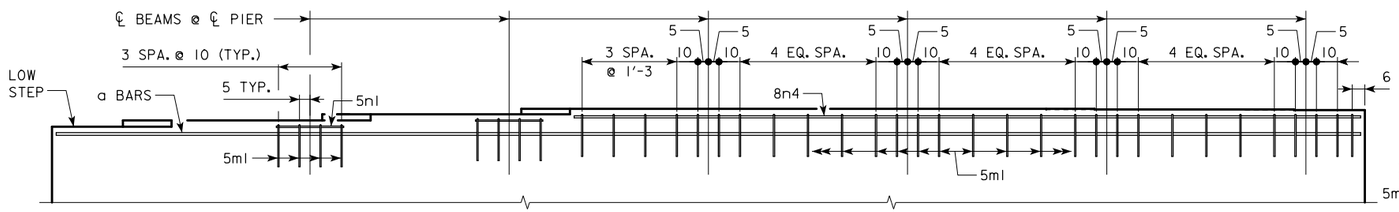
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 0.6% < G <= 1.4%



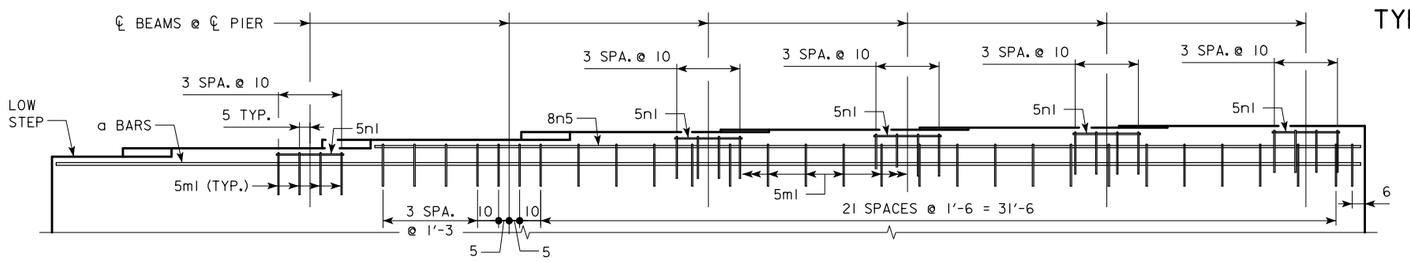
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.4% < G <= 1.8%



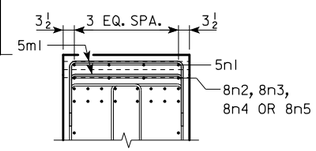
PART ELEVATION VIEW OF PIER CAP

GRADE (G): 1.8% < G <= 2.8%



PART ELEVATION VIEW OF PIER CAP

GRADE (G): 2.8% < G <= 5.0%



TYPICAL SECTION

STEP REINFORCING BAR LIST ONE TEE PIER

			G <= 0.6%			0.6% < G <= 1.4%			1.4% < G <= 1.8%			1.8% < G <= 2.8%			2.8% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-8	⌐	20	5	139	30	5	209	33	5	229	37	5	257	49	5	341
5n1	2'-8	—	20	5	56	20	5	56	16	5	45	8	5	22	20	5	56
8n2	12'-5	—	--	--	--	4	8	133	--	--	--	--	--	--	--	--	--
8n3	20'-4	—	--	--	--	--	--	--	4	8	217	--	--	--	--	--	--
*8n4	VARIES	—	--	--	--	--	--	--	--	--	--	4	8	342	--	--	--
*8n5	VARIES	—	--	--	--	--	--	--	--	--	--	--	--	--	4	8	426
TOTAL (LB.)					195			398			491			621			823

G = GRADE (%)

*8n4 BARS VARY FROM 31'-3 TO 32'-10
8n5 BARS VARY FROM 39'-2 TO 40'-8

STEP REINFORCING BAR LIST ONE PILE BENT PIER

			G <= 0.6%			0.6% < G <= 1.4%			1.4% < G <= 1.8%			1.8% < G <= 2.8%			2.8% < G <= 5.0%		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
5m1	6'-7	⌐	20	5	137	30	5	206	33	5	227	37	5	254	49	5	336
5n1	2'-8	—	20	5	56	20	5	56	16	5	45	8	5	22	20	5	56
8n2	12'-5	—	--	--	--	4	8	133	--	--	--	--	--	--	--	--	--
8n3	20'-4	—	--	--	--	--	--	--	4	8	217	--	--	--	--	--	--
*8n4	VARIES	—	--	--	--	--	--	--	--	--	--	4	8	342	--	--	--
*8n5	VARIES	—	--	--	--	--	--	--	--	--	--	--	--	--	4	8	426
TOTAL (LB.)					193			395			489			618			818

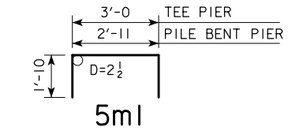
G = GRADE (%)

*8n4 BARS VARY FROM 31'-3 TO 32'-10
8n5 BARS VARY FROM 39'-2 TO 40'-8

NOTE: THE REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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 SHOULD BE 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	2.7	3.4
C BEAMS	0.6	1.4	2.3	3.1	4.0
EACH TEE PIER CAP - ALL BEAMS	0.5	1.3	2.1	2.9	3.7
EACH PILE BENT PIER - ALL BEAMS	0.5	1.3	2.0	2.8	3.6

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

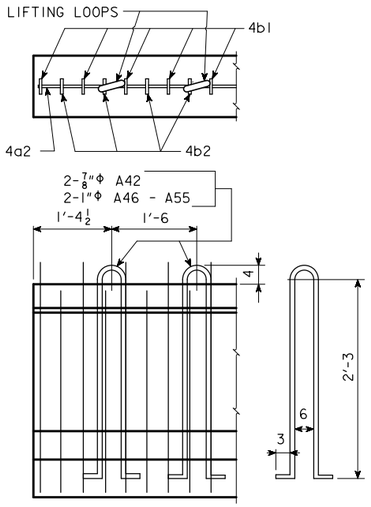
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ADDITIONAL QUANTITIES

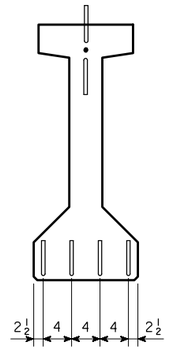
30° SKEW

H44-24-14

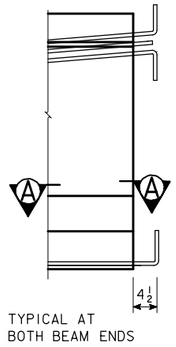


LIFTING LOOP DETAIL

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

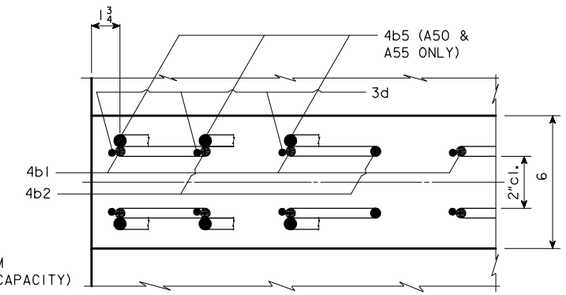


2 TOP DEFLECTED OR STRAIGHT STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN (BEND TOP AND BOTTOM ROWS). THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS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

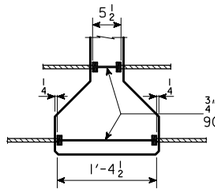


TYPICAL AT BOTH BEAM ENDS

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



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



COIL TIE DETAIL

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

A BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE	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.				
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 2007, WITH MINOR MODIFICATIONS.

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DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:

REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.

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

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 2403.03, I, OF THE STANDARD SPECIFICATIONS.

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

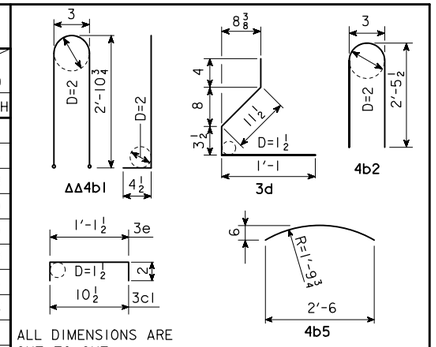
IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

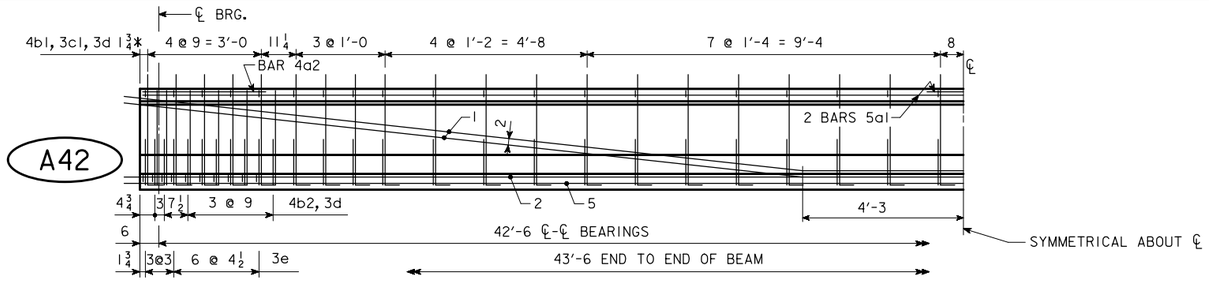
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

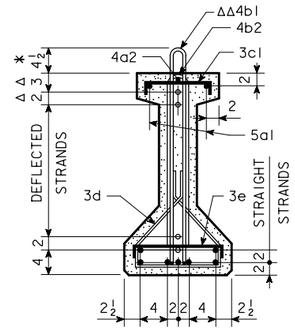
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

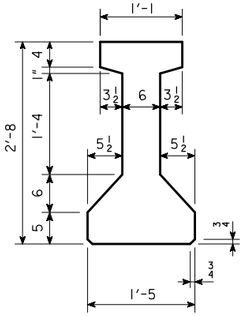
A BEAM DETAILS

H44-25-14



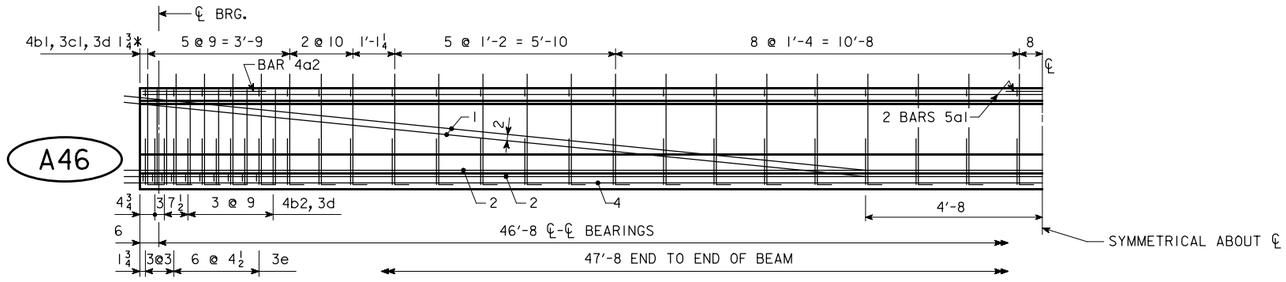


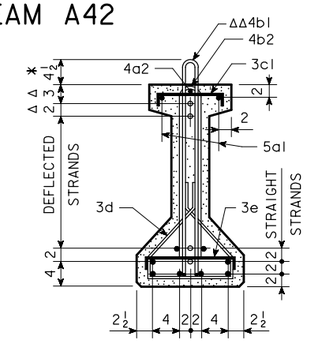
BEAM A42



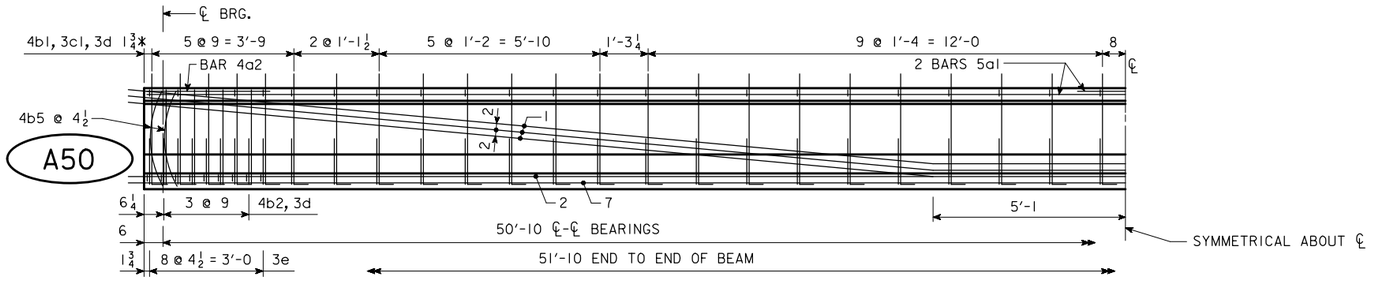
"A" BEAM
CROSS SECTION

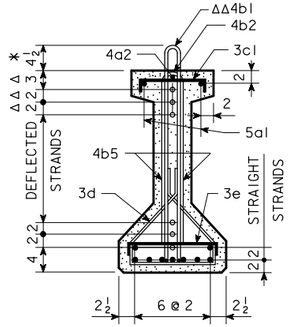
A = 311.5 in.²
Y_b = 14.05 in.
I = 34,082 in.⁴



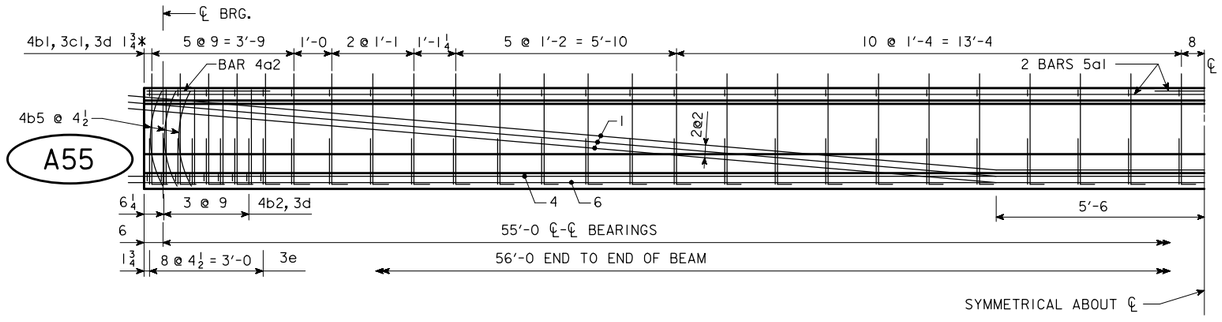


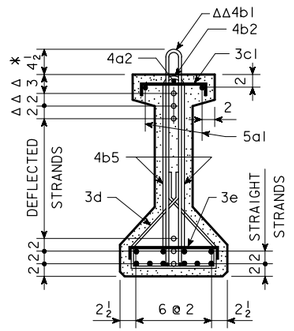
BEAM A46





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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

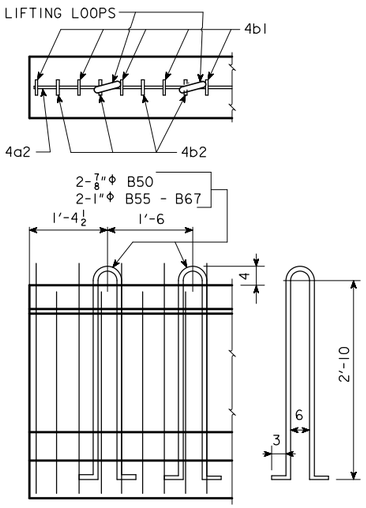
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

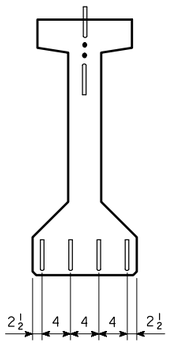
A BEAM DETAILS

H44-26-14

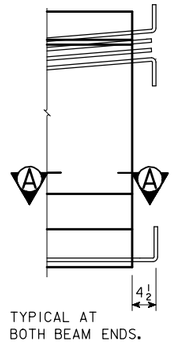


LIFTING LOOP DETAIL

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

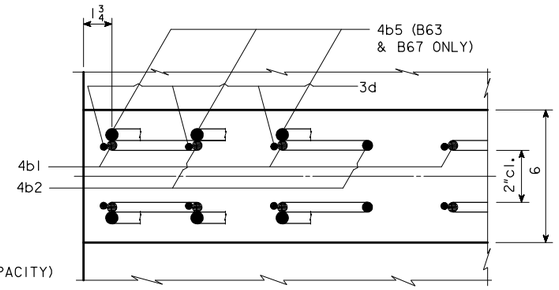


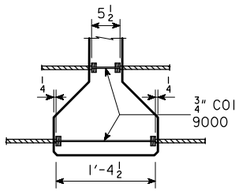
2 TOP DEFLECTED OR STRAIGHT STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN (BEND TOP AND BOTTOM ROWS). THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS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



TYPICAL AT BOTH BEAM ENDS.

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS





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 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.				
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.

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NOTES:

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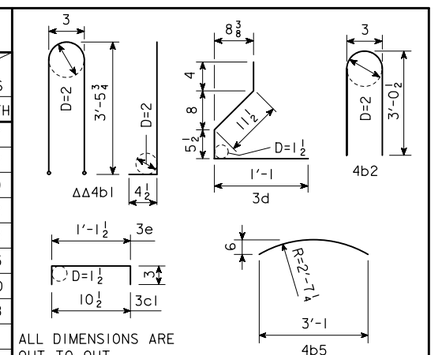
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

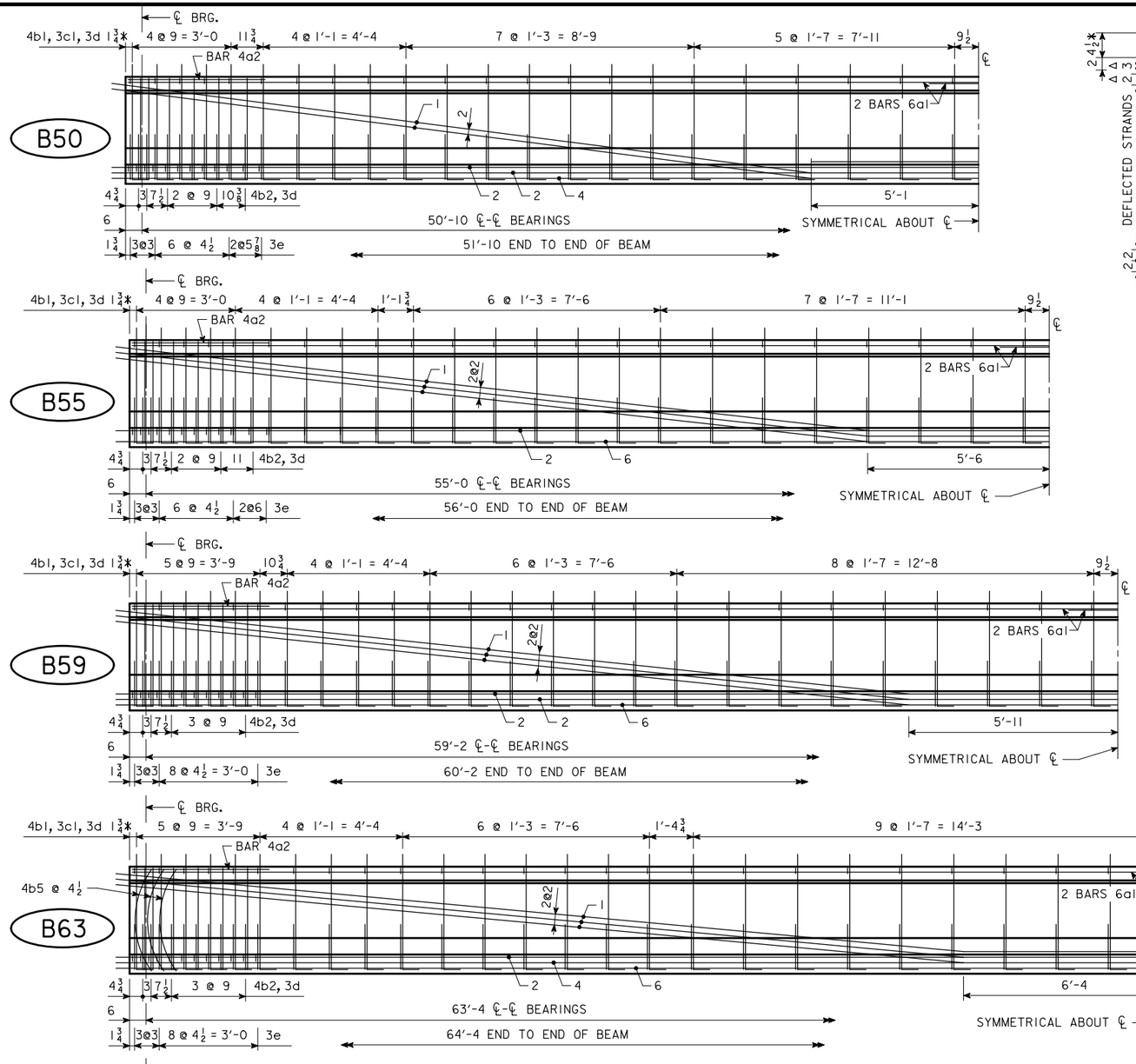
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

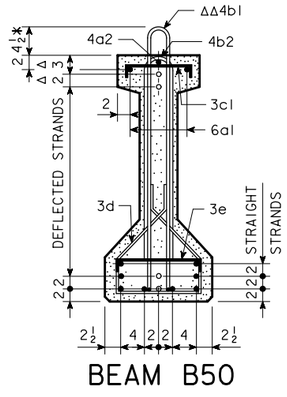
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

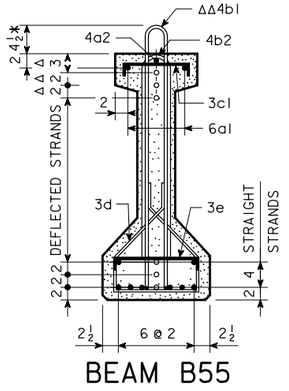
SEPTEMBER, 2014

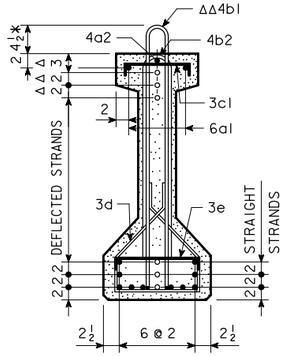
B BEAM DETAILS

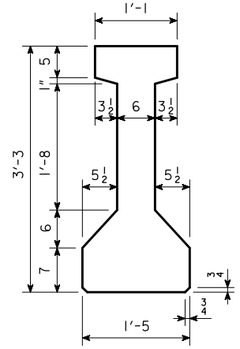
H44-27-14



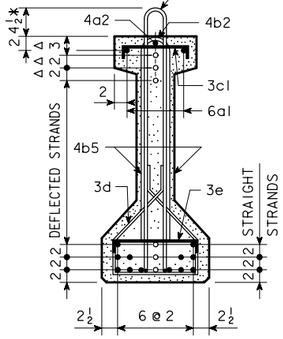


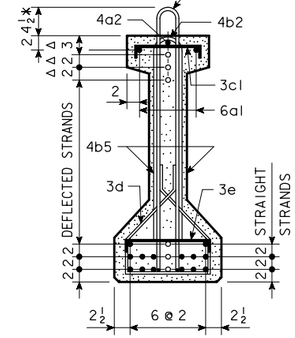






"B" BEAM
CROSS SECTION
A = 382.5 in.²
Yb = 17.06 in.
I = 62,000 in.⁴





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

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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

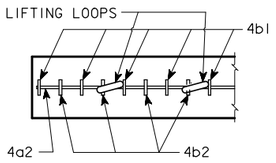
STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

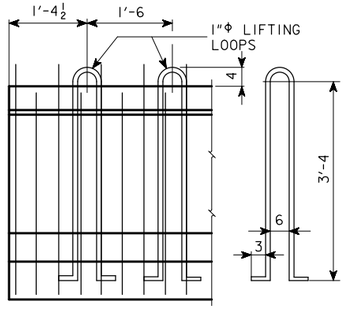
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

B BEAM DETAILS

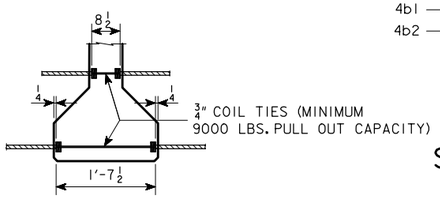
H44-28-14





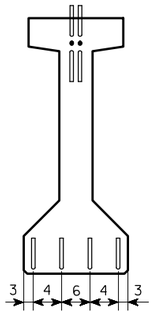
LIFTING LOOP DETAIL

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

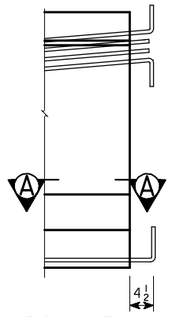


COIL TIE DETAIL

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

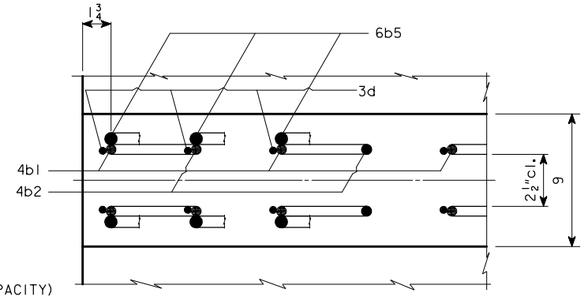


THE TOP STRAIGHT STRANDS OF BEAMS C63 AND C67 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP. THE TOP AND BOTTOM DEFLECTED STRANDS OF BEAMS C71 THROUGH C80 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN. THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-3 PROJECTIONS.
FOUR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

C BEAM DATA

BEAM	SPAN ℄-℄ 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 2007, 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 2007:

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 2403.03, I, OF THE STANDARD 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.

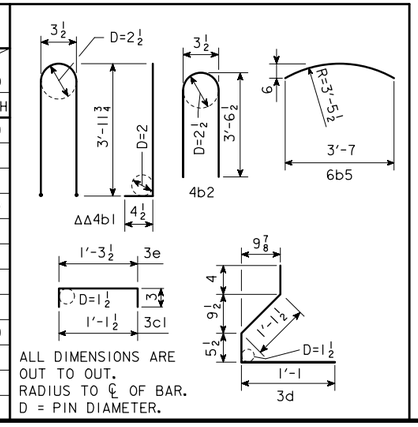
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

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

ΔΔ 4b1 BARS TO BE EPOXY COATED.

REINFORCING BAR LIST

	BEAM / SPAN		C63 63'-4		C67 67'-6		C71 71'-8		C75 75'-10		C80 80'-0	
	BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	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.

REVISED 11-09 - THE SPECIFICATION REFERENCES WERE CHANGED. THE BEAM DETAILS WERE UPDATED TO THE CURRENT BEAM DETAILS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

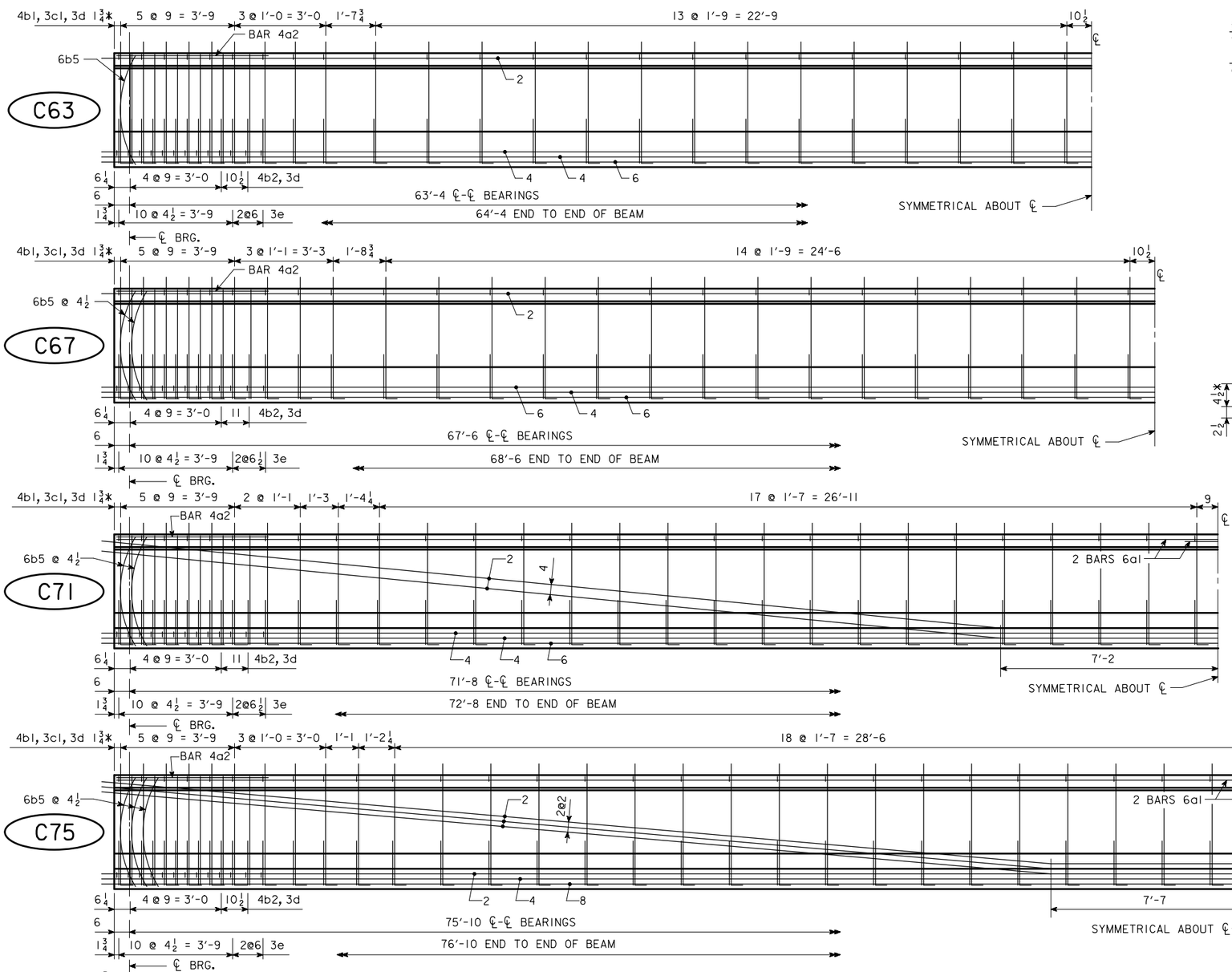
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

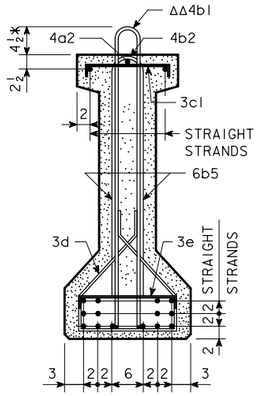
SEPTEMBER, 2014

C BEAM DETAILS

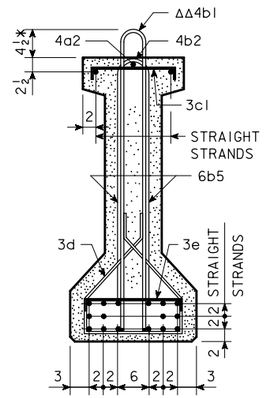
H44-29-14



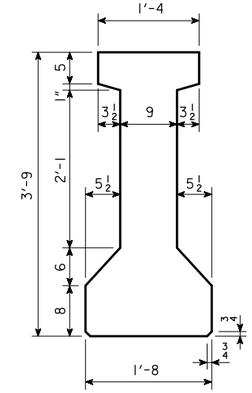
NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.



BEAM C63

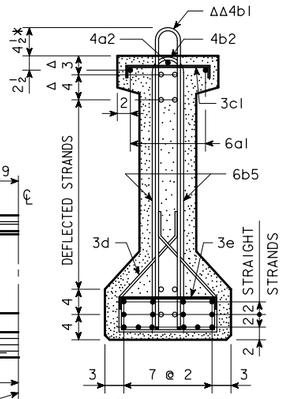


BEAM C67

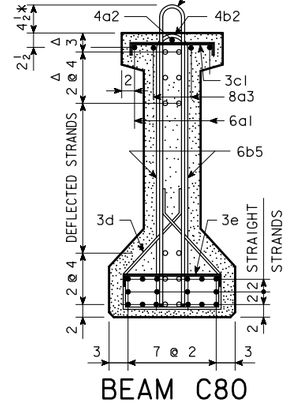


"C" BEAM CROSS SECTION

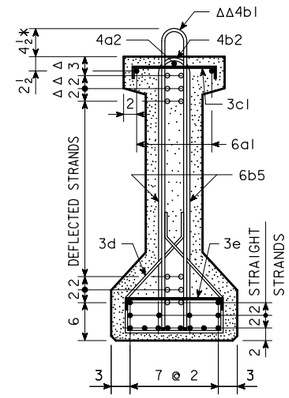
A = 564.5 in²
Yb = 20.23 in
I = 116,354 in⁴



BEAM C71



BEAM C80



BEAM C75

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

* KEEP

Δ DIMENSIONS AT END OF BEAM

ΔΔ EPOXY COATED BARS

LATEST REVISION DATE

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IOWADOT Highway Division

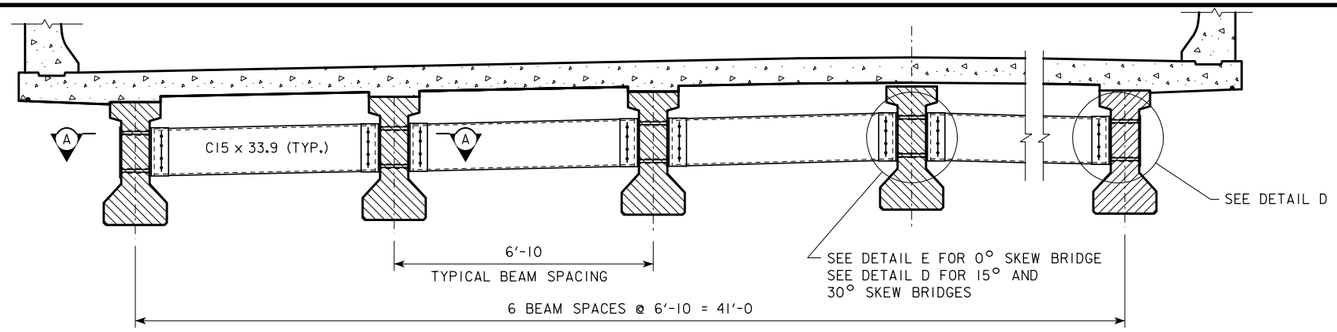
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

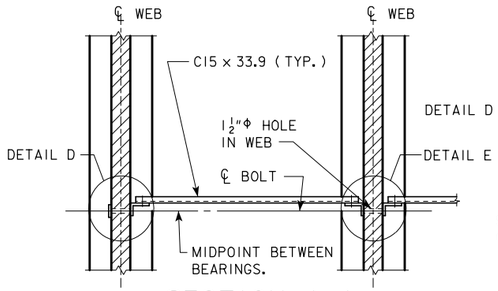
SEPTEMBER, 2014

C BEAM DETAILS

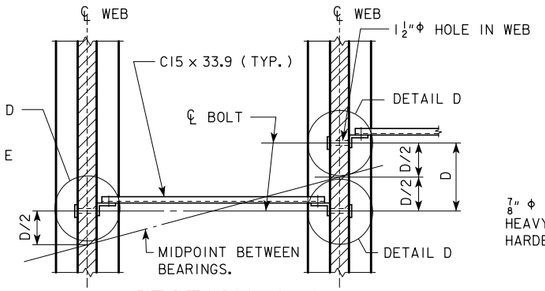
H44-30-14



SECTION SHOWING INTERMEDIATE DIAPHRAGM



SECTION A-A
FOR 0° SKEW BRIDGES



SECTION A-A
FOR 15° AND 30° 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 NUMBER OF DETAIL "E" 0°	BRIDGE SKEW NUMBER OF DETAIL "E" 15° & 30°	BRIDGE SKEW WEIGHT (LB.) 0°	BRIDGE SKEW WEIGHT (LB.) 15° & 30°
6	9	4.30	15	0	64.5	0.0
9	12	5.34	15	0	80.1	0.0
2 - L 6 x 4 x ½ x 1'-3¼ = 41.2 LB			15	0	618.0	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 NUMBER OF DETAIL "D" 0°	BRIDGE SKEW NUMBER OF DETAIL "D" 15° & 30°	BRIDGE SKEW WEIGHT (LB.) 0°	BRIDGE SKEW WEIGHT (LB.) 15° & 30°
6	9	4.30	6	36	25.8	154.8
9	12	5.34	6	36	32.0	192.2
1 - BACKING PL 4 x ⅜ x 1'-3¼ = 6.5 LB			6	36	39.0	234.0
1 - L 6 x 4 x ½ x 1'-3¼ = 20.6 LB			6	36	123.6	741.6

* ONE C15 x 33.9 DIAPHRAGM

WEB THICKNESS (IN.)	BEAM SPACING	LENGTH	NO. OF DIAPH.	UNIT WEIGHT (LB.)	WEIGHT (LB.)
6	6'-10	6'-0⅝	18	205.2	3693.0
9	6'-10	5'-9⅝	18	196.7	3540.4

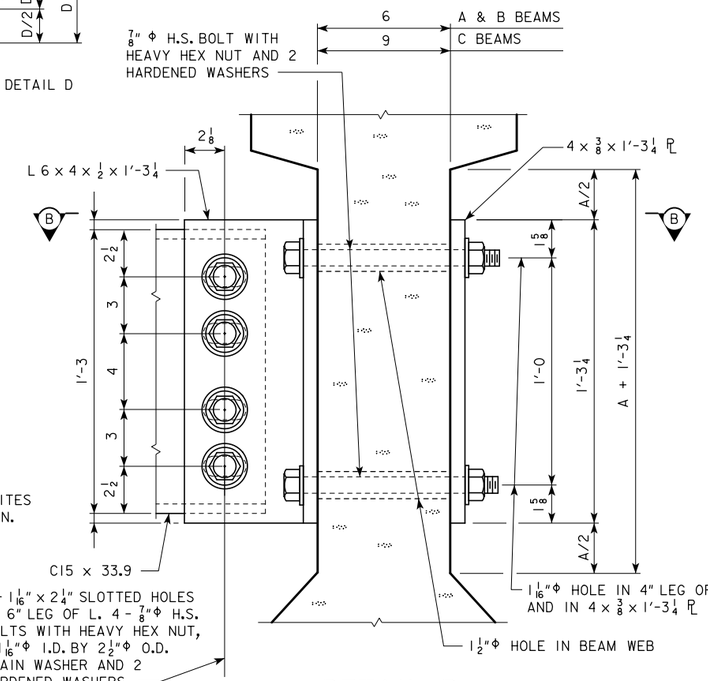
DIAPHRAGM CONNECTION BOLTS

	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	18	185.4

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

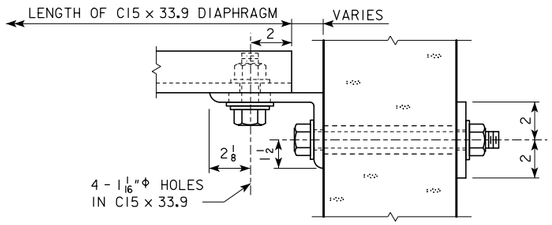
TOTAL WEIGHT

	WEB THICKNESS (IN.)	BRIDGE SKEW 0°	BRIDGE SKEW 15° & 30°
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB) =	6	4749	5009
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB) =	9	4619	4894



NOTE:
THE STRUCTURAL STEEL DIAPHRAGM WEIGHTS TO BE INCLUDED ON THE SUMMARY QUANTITITES SHEET IN THE PLAN.

DETAIL D



SECTION B-B

BEAM SERIES	DIMENSIONS A + 1'-3¼	DIMENSIONS A/2
A	1'-4	⅜
B	1'-8	2⅜
C	2'-1	4⅜

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.

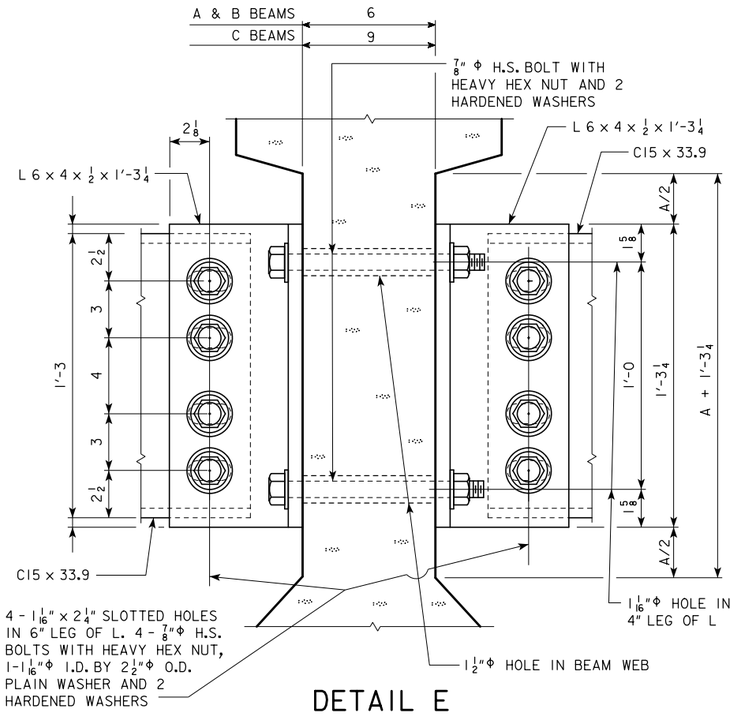
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

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



DETAIL E

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

INTERMEDIATE STEEL DIAPHRAGMS

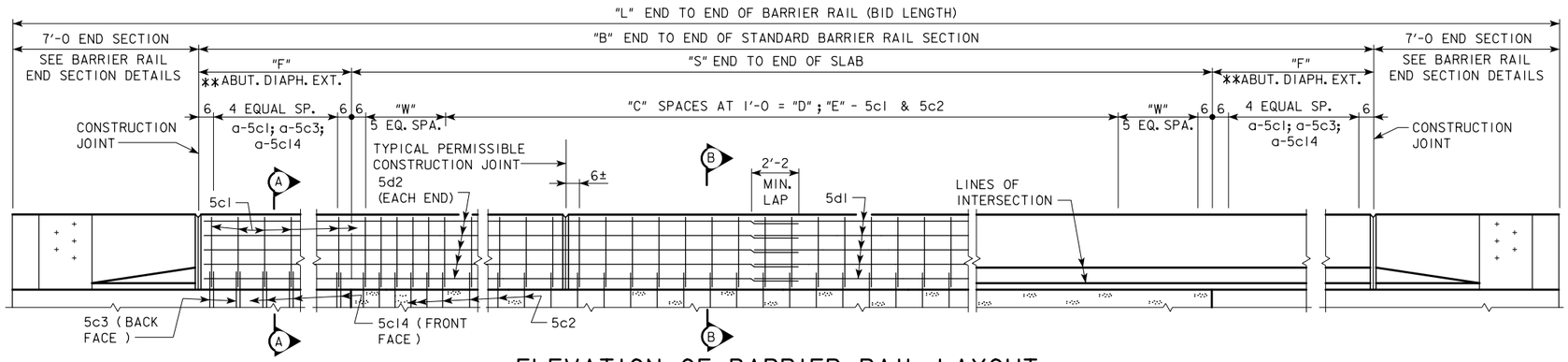
H44-31-14

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

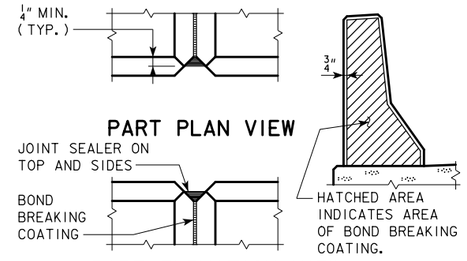
℄-℄ ABUT. BRG		138′-10			151′-4			163′-10			176′-4			℄-℄ ABUT. BRG
SKEW		0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	SKEW
DIMENSION OR NUMBER	L (FT.-IN.)	155′-10	155′-11¼	156′-3⅝	168′-4	168′-5¼	168′-9⅝	180′-10	180′-11¼	181′-3⅝	193′-4	193′-5¼	193′-9⅝	L (FT.-IN.)
	B (FT.-IN.)	141′-10	141′-11¼	142′-3⅝	154′-4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

TABLE OF BARRIER RAIL DIMENSIONS AND NUMBERS

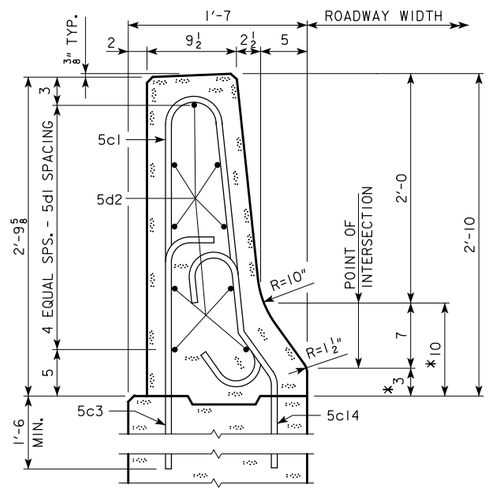
℄-℄ ABUT. BRG		188′-10			201′-4			213′-10			226′-4			243′-0			℄-℄ ABUT. BRG
SKEW		0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°	SKEW
DIMENSION OR NUMBER	L (FT.-IN.)	205′-10	205′-11¼	206′-3⅝	228′-4	228′-4	228′-4	240′-10	240′-10	240′-10	253′-4	253′-4	253′-4	270′-0	270′-0	270′-0	L (FT.-IN.)
	B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



ELEVATION OF BARRIER RAIL LAYOUT

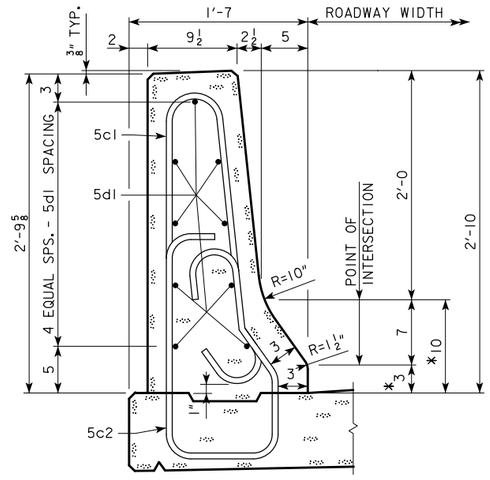


BARRIER RAIL JOINT DETAILS



PART SECTION A-A

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



PART SECTION B-B

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 ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN OR NOTED. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M.452.

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 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. 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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

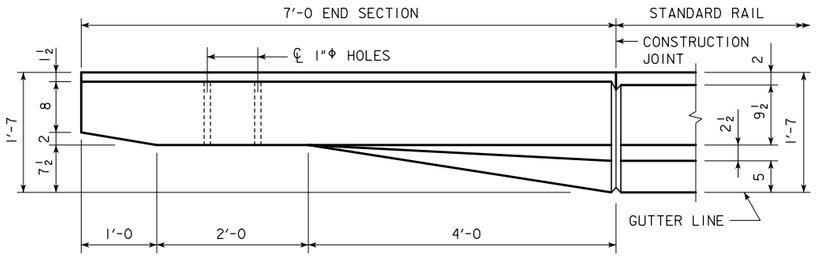
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

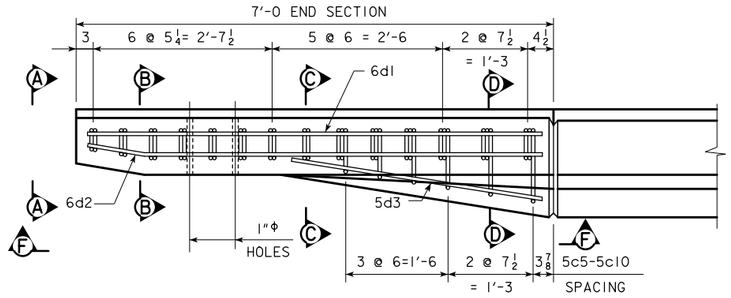
BARRIER RAIL DETAILS

SHEET 1 OF 3

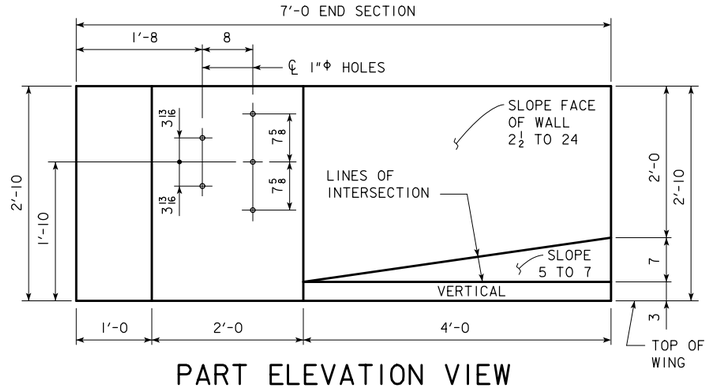
H44-32-14



PART PLAN VIEW

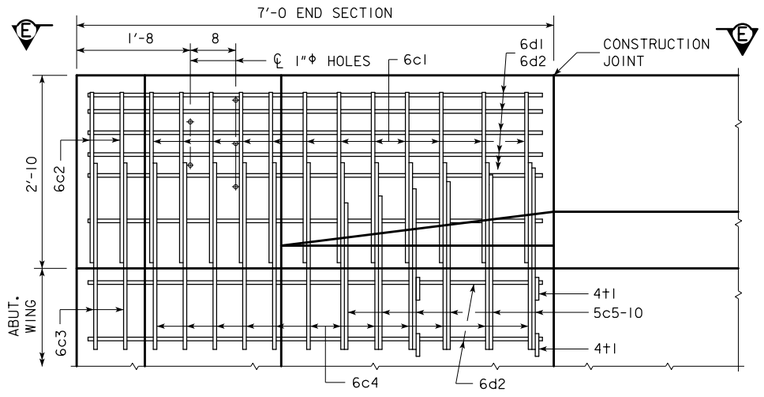


PART VIEW E-E

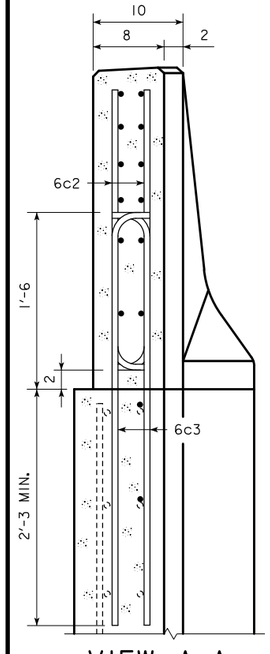


PART ELEVATION VIEW

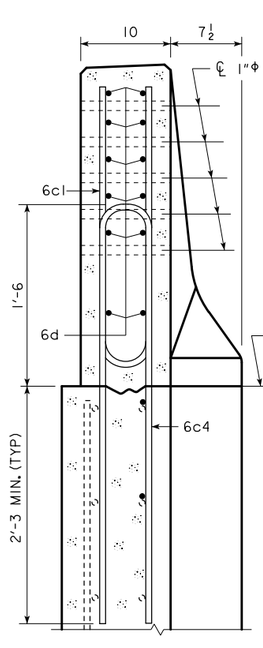
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



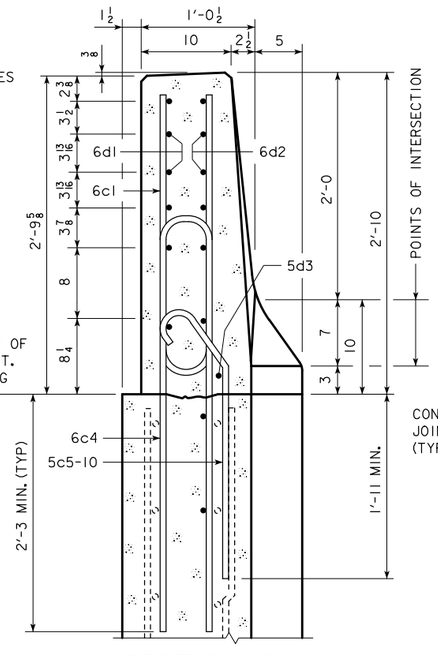
PART VIEW F-F



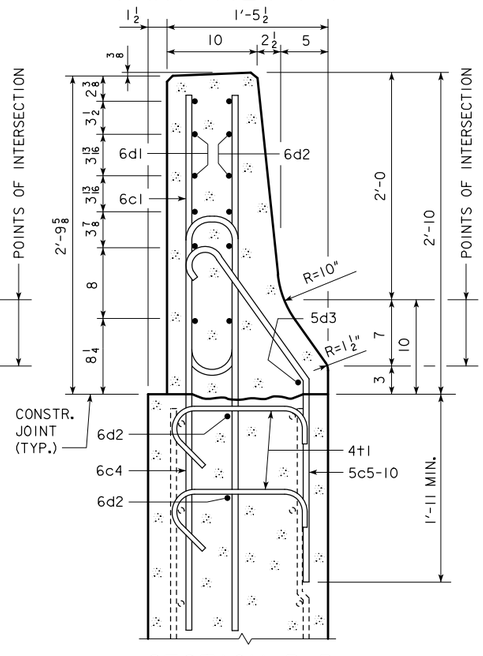
VIEW A-A



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 & 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
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
			EPOXY COATED TOTAL WEIGHT (LBS.)		266

STAINLESS REINFORCING STEEL - ONE END SECTION

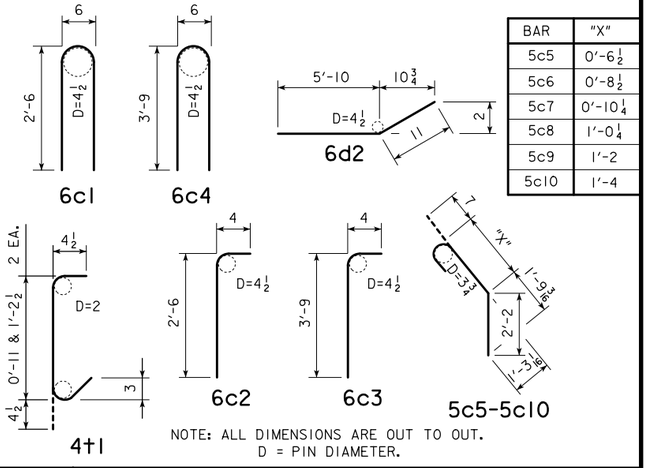
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	VERTICAL	⌐	4	4'-1	25
6c4	VERTICAL	⊓	12	8'-0	144
5c5-10	VERTICAL	⌐	6	VARIES	23
			STAINLESS STEEL TOTAL WEIGHT (LBS.)		192

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE PLACEMENT SUMMARY

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

BENT BAR DETAILS



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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

BARRIER RAIL DETAILS

SHEET 2 OF 3

H44-33-14

EPOXY COATED REINFORCING STEEL-TWO BARRIER RAILS

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

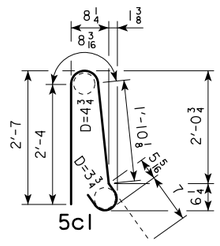
BRIDGE LENGTH				138'-10			151'-4			163'-10			176'-4			188'-10			201'-4			213'-10			226'-4			243'-0		
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
STANDARD SECTION	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
	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
EPOXY COATED REINFORCING STEEL TOTAL LBS.						4,581			5,004			5,400			5,782			6,218			6,887			7,282			7,705			8,228

STAINLESS STEEL REINFORCING STEEL-TWO BARRIER RAILS

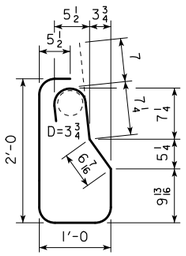
(NOTE: THESE REINFORCING BARS TO BE USED ON ALL SKEWS)

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	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	-----	-----	0	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
STAINLESS STEEL REINFORCING STEEL TOTAL LBS.						1,802			1,952			2,115			2,265			2,428			2,726			2,889			3,039			3,252

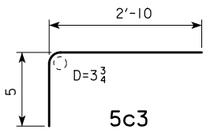
BENT BAR DETAILS



5c1



5c2



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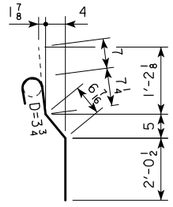


5c14

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

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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 H40-39-14 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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

BARRIER RAIL DETAILS

SHEET 3 OF 3

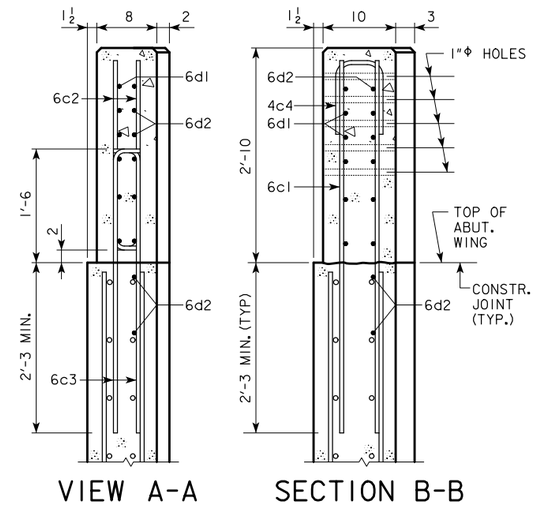
H44-34-14

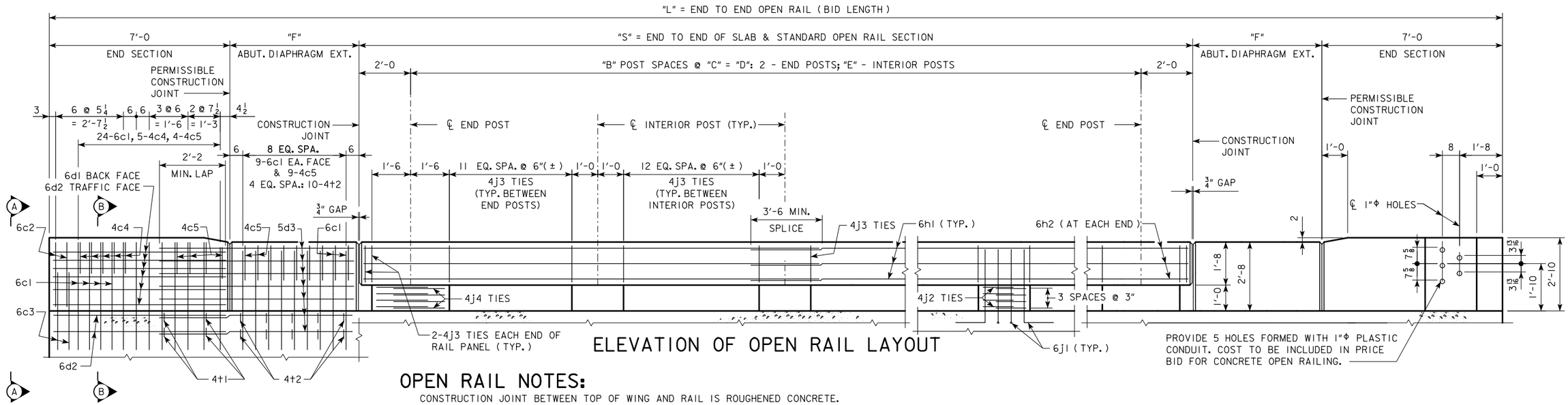
TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS

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

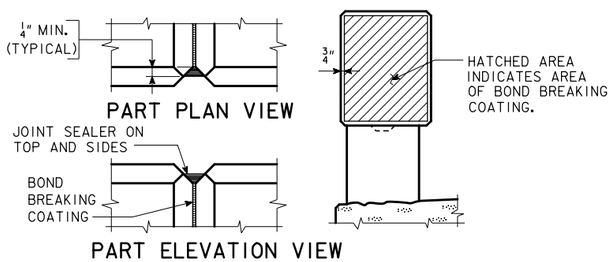
TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS

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





ELEVATION OF OPEN RAIL LAYOUT



JOINT DETAILS AT END SECTION

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 ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

ALL OPEN RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN OR NOTED. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M.452.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

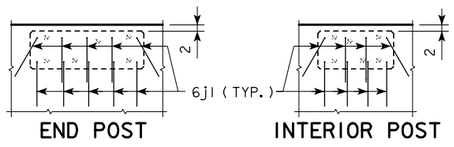
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

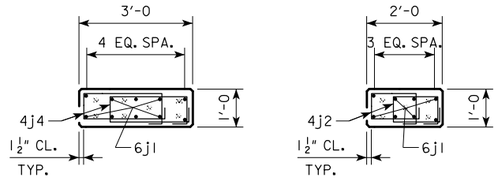
OPEN RAIL, TL-4 DETAILS

SHEET 1 OF 2

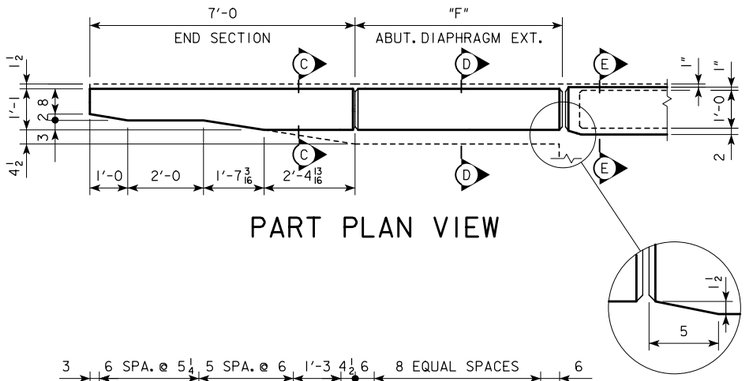
H44-35-14



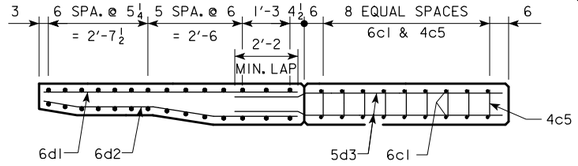
PART PLAN VIEW



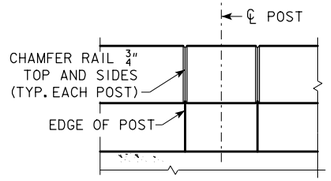
PART PLAN SECTION



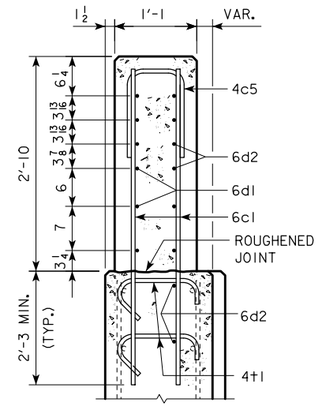
PART PLAN VIEW



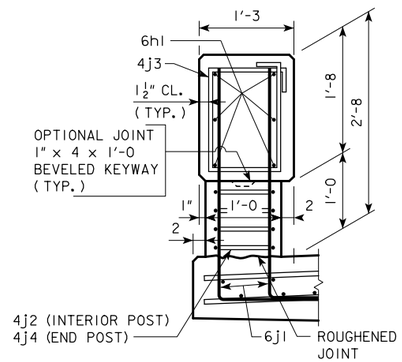
PART PLAN SECTION



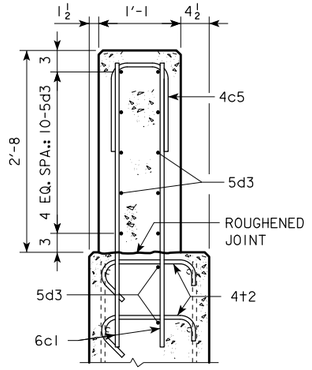
RAIL CHAMFER DETAIL



SECTION C-C



PART SECTION E-E



SECTION D-D

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

OPEN RAIL, TL-4 DETAILS

SHEET 2 OF 2

H44-36-14

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
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
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	11'-2	537	32	11'-2	537	32	11'-2	537	32	11'-2	537
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
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
	EPOXY COATED REINFORCING STEEL TOTAL LBS.				6,198			6,631			7,145			7,661			8,094			9,306			9,677			10,255			10,845

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

STAINLESS STEEL 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
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
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
	STAINLESS STEEL REINFORCING STEEL TOTAL LBS.				2,682			2,778			2,970			3,162			3,258			3,983			4,079			4,271			4,463

NOTE: REINFORCING STEEL QUANTITIES ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE PLACEMENT SUMMARY - C.Y.

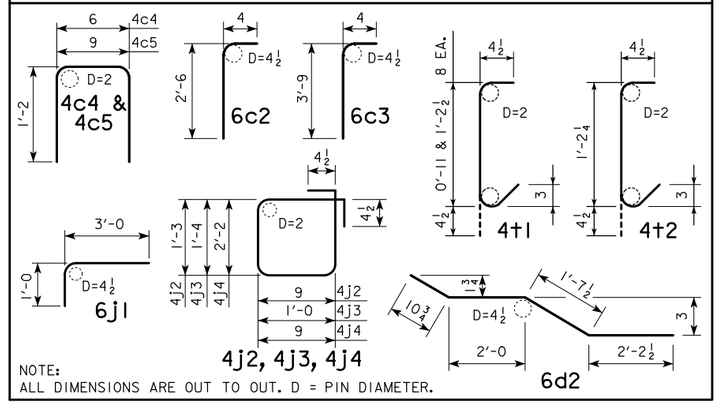
BRIDGE LENGTH		138'-10	151'-4	163'-10	176'-4	188'-10	201'-4	213'-10	226'-4	243'-0
OPEN RAIL SECTION	2 @ 0.077 CU. YDS. PER FT.	21.9	23.8	25.8	27.7	29.6	31.5	33.5	35.4	38.0
OPEN RAIL-END SECTION	4 @ 0.687 CU. YDS.	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
OPEN RAIL-ABUT. DIAPH. SECTION	4 @ 0.107 CU. YDS. PER FT.	—	—	—	—	—	2.0	2.0	2.0	2.0
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.)	27.4	29.4	31.7	33.9	35.9	40.1	42.2	44.4	47.3

CONCRETE QUANTITIES SHOWN ARE BASED ON 30° SKEW. FOR "E" SEE SHEET H44-35-14.

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

BENT BAR DETAILS



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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

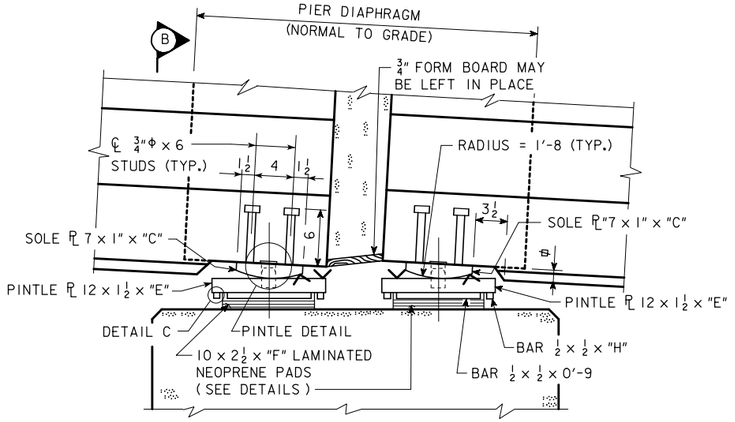
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

OPEN RAIL, TL-4 DETAILS

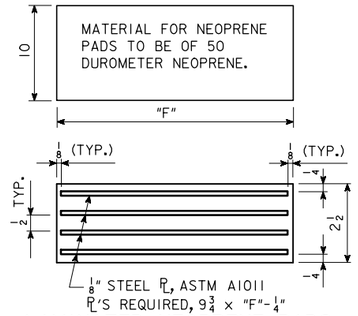
SHEET 2A OF 2

H44-36A-14

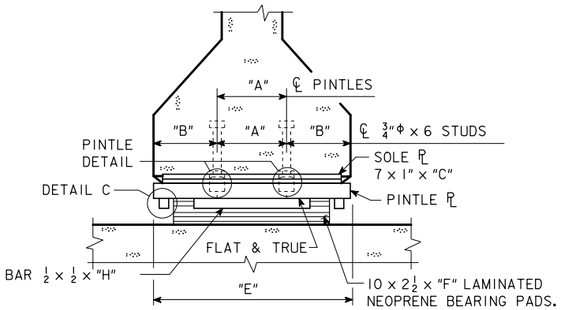


PART ELEVATION

Φ NOTCH BEAM END TO SOLE PL THICKNESS MAXIMUM 1"

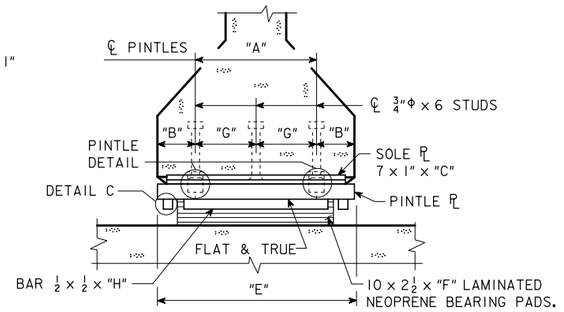


LAMINATED NEOPRENE PADS



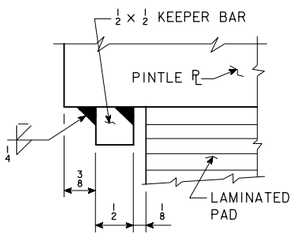
SECTION B-B FOR A & B BEAMS

(DIAPHRAGM CONCRETE NOT SHOWN)

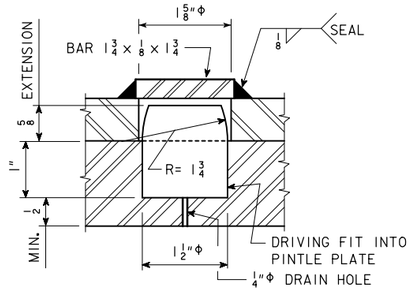


SECTION B-B FOR C BEAMS

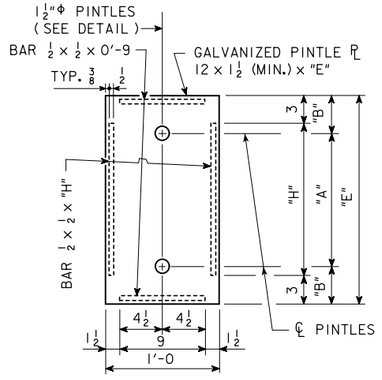
(DIAPHRAGM CONCRETE NOT SHOWN)



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

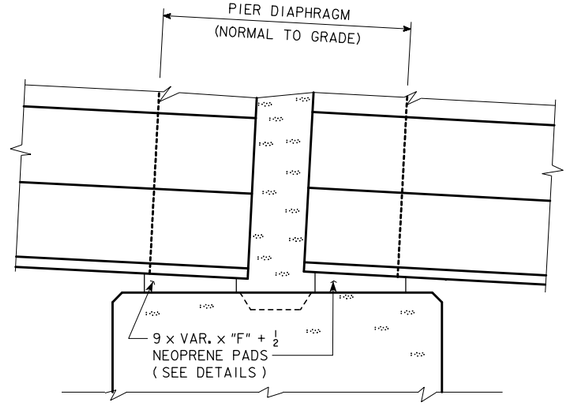
STRUCTURAL STEEL			
DATA FOR ONE BEARING			
BEAM SIZE	A	B	C
WEIGHT (LBS.)	89	89	106

DOES NOT INCLUDE CURVED SOLE PL

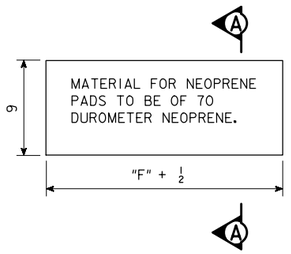
NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.

EXPANSION PIER

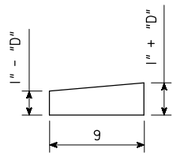
LAMINATED NEOPRENE PAD / CURVED SOLE PL ASSEMBLY



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

LATEST REVISION DATE

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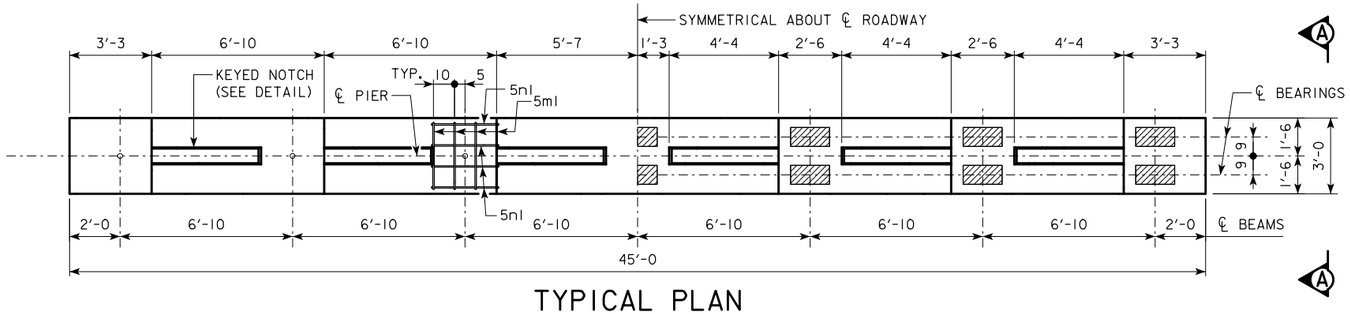
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

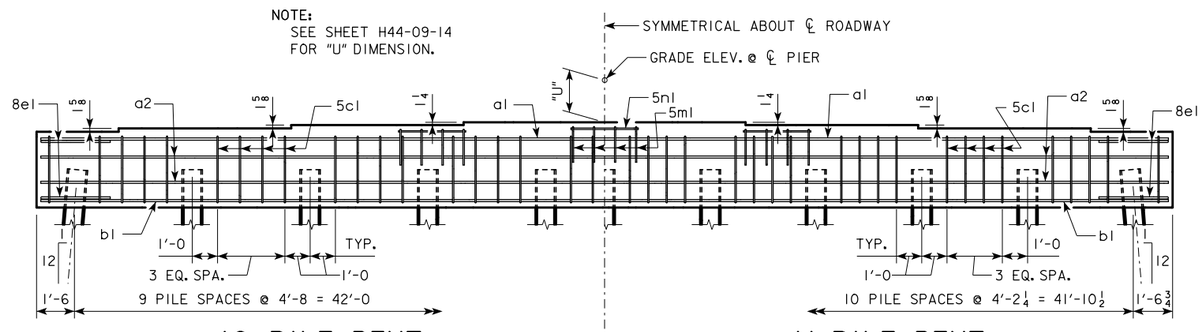
SEPTEMBER, 2014

PIER BEARING DETAILS | H44-37-14



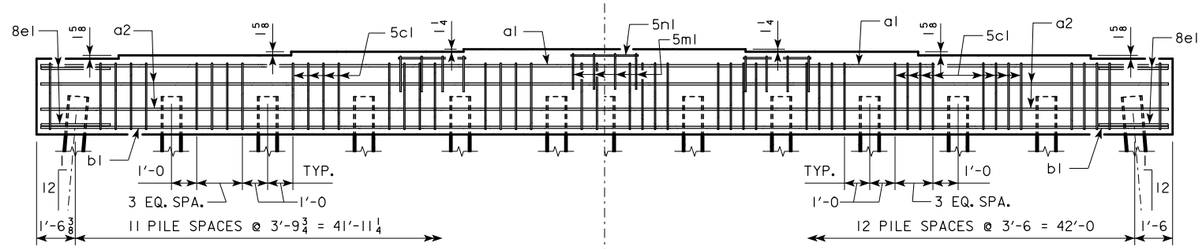
TYPICAL PLAN

NOTE:
SEE SHEET H44-09-14
FOR "U" DIMENSION.



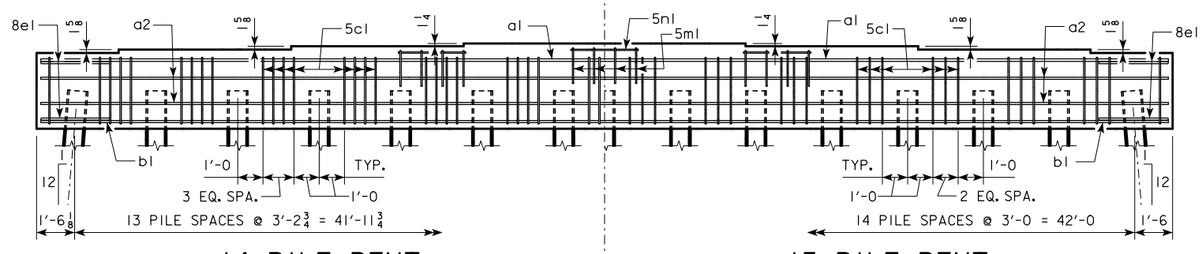
10 PILE BENT

11 PILE BENT



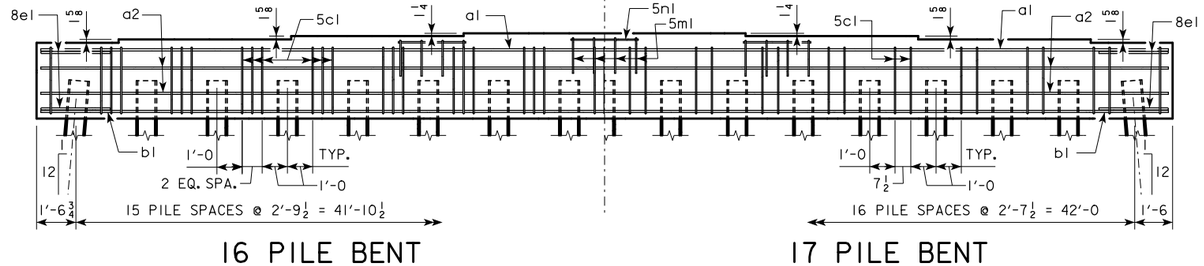
12 PILE BENT

13 PILE BENT



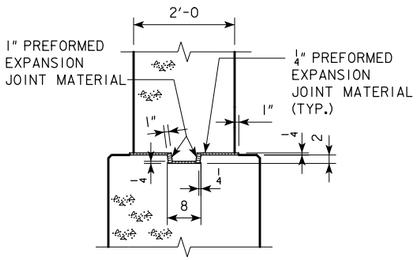
14 PILE BENT

15 PILE BENT

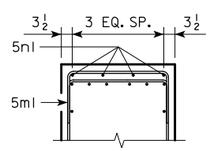


16 PILE BENT

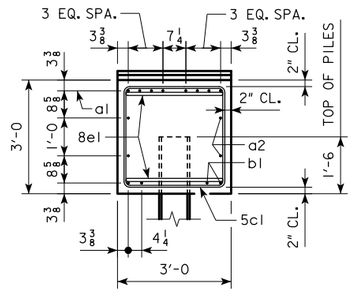
17 PILE BENT



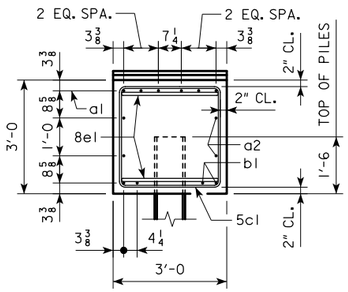
KEYED NOTCH DETAIL



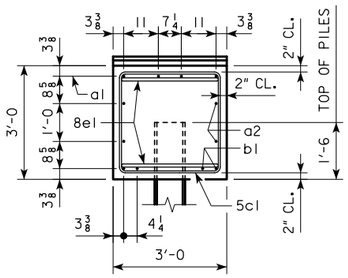
5m1 & 5n1 BAR LAYOUT



VIEW A-A
FOR 10 PILE BENT



VIEW A-A
FOR 11, 12, 13, 14, 15 & 16 PILE BENTS



VIEW A-A
FOR 17 PILE BENT

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

0° SKEW

H44-38-14

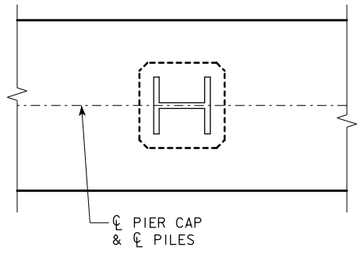
PILE BENT NOTES:

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

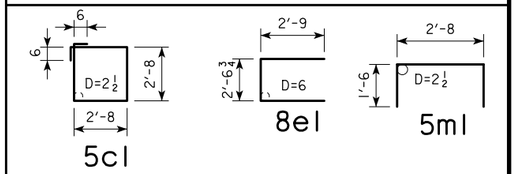
			10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT			15 PILE BENT			16 PILE BENT			17 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	44'-8	———	8	9	1215	6	9	911	6	9	911	6	9	911	6	9	911	6	9	911	6	9	911	4	9	607
a2	44'-8	———	4	8	477	4	8	477	4	8	477	4	8	477	4	8	477	4	8	477	4	8	477	4	8	477
b1	44'-8	———	4	9	607	4	9	607	4	9	607	4	9	607	4	9	607	4	8	477	4	8	477	4	8	477
5c1	11'-8	⌐——¬	38	5	462	42	5	511	46	5	560	50	5	608	54	5	657	44	5	535	47	5	572	34	5	414
8e1	8'-1	⌐——¬	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
5m1	5'-8	⌐——¬	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71
5n1	2'-8	———	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33
REINFORCING STEEL (LB.)			2951			2696			2745			2793			2842			2590			2627			2165		
STRUCTURAL (1) CONCRETE (CY)	PILE TYPE																									
	1, 2		-----			-----			15.5			15.5			15.5			15.4			15.4			15.3		
	3		16.1			16.1			16.1			16.1			16.1			16.1			16.1			-----		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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. BRG. (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	(3) LRFD PU, STRENGTH I DES. BRG. (KIPS)
138'-10	14	14	89	10	HP10x57	124
	12	16	104	10	HP12x53	124
151'-4	14	14	94	10	HP10x57	131
	12	16	109	10	HP12x53	131
163'-10	15	14	95	10	HP10x57	142
	13	16	109	11	HP12x53	129
176'-4	-----	--	--	11	HP10x57	135
	-----	--	--	12	HP12x53	124
188'-10	-----	--	--	11	HP10x57	141
	-----	--	--	12	HP12x53	130
201'-4	-----	--	--	12	HP10x57	145
				13	HP12x53	134
213'-10	-----	--	--	13	HP10x57	141
				14	HP12x53	131
226'-4	-----	--	--	14	HP10x57	138
				15	HP12x53	129
243'-0	-----	--	--	14	HP10x57	145
				16	HP12x53	127

(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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

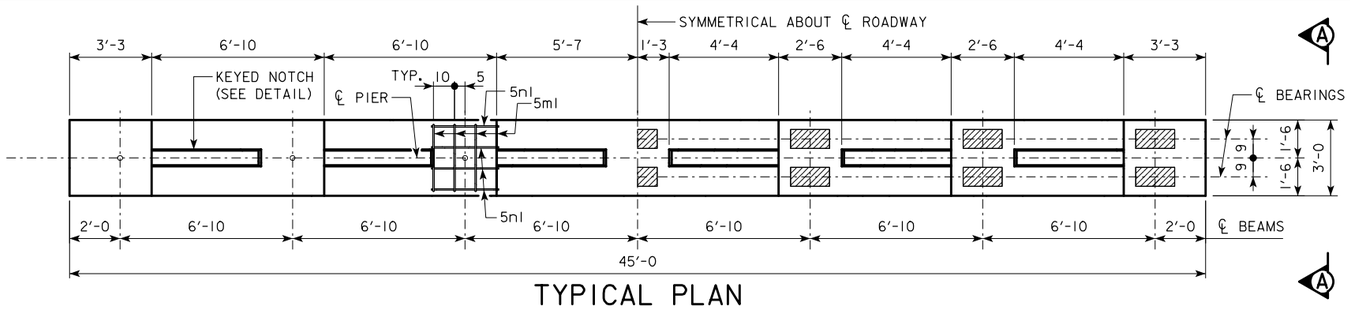
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

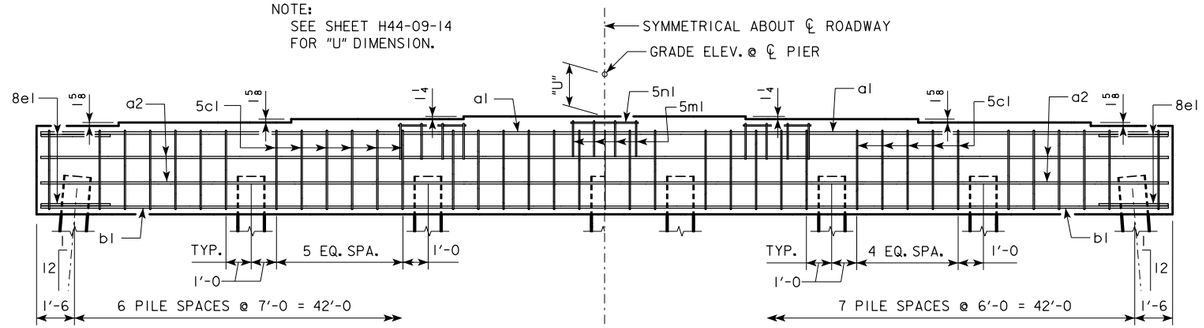
0° SKEW

H44-39-14



TYPICAL PLAN

NOTE:
SEE SHEET H44-09-14
FOR "U" DIMENSION.

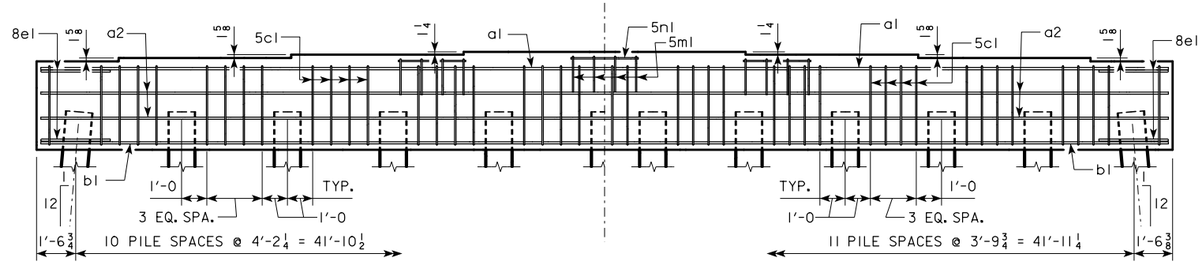


7 PILE BENT

8 PILE BENT

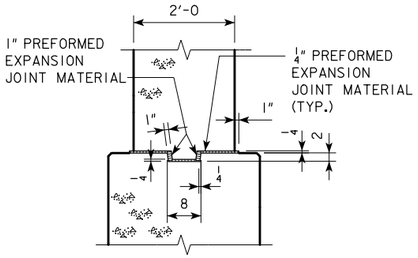
9 PILE BENT

10 PILE BENT

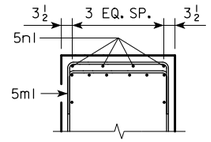


11 PILE BENT

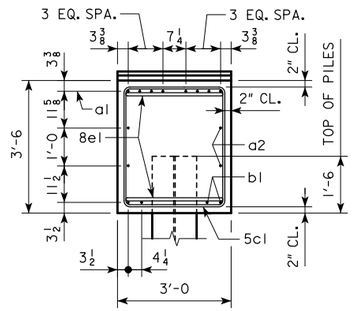
12 PILE BENT



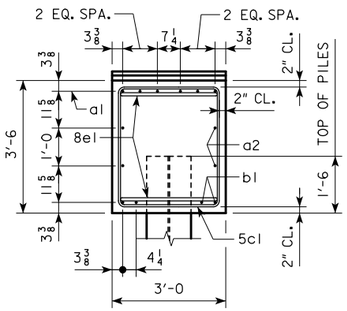
KEYED NOTCH DETAIL



5m1 & 5n1 BAR LAYOUT



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



VIEW A-A
FOR 11 & 12 PILE BENTS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS HP14 PILES

0° SKEW

H44-40-14

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

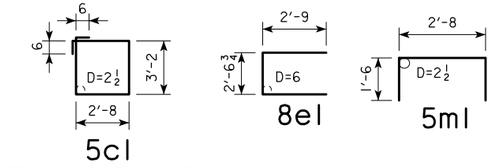
			7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	44'-8		8	9	1215	8	9	1215	8	9	1215	8	9	1215	6	9	911	6	9	911
a2	44'-8		4	8	477	4	8	477	4	8	477	4	8	477	4	8	477	4	8	477
b1	44'-8		4	10	769	4	9	607	4	9	607	4	9	607	4	8	477	4	8	477
5c1	12'-8		38	5	502	37	5	489	42	5	555	47	5	621	42	5	555	46	5	608
8e1	8'-1		4	8	86	4	8	86	4	8	86	4	8	86	4	8	86	4	8	86
5m1	5'-8		12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71
5n1	2'-8		12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33
REINFORCING STEEL (LB.)			3153			2978			3044			3110			2610			2663		
STRUCTURAL CONCRETE (CY)	PILE TYPE 3		18.6			18.6			18.6			18.6			18.6			18.6		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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. BRG. (KIPS)
138'-10	7	HP14x73	179
	7	HP14x89	179
151'-4	8	HP14x73	165
	7	HP14x89	189
163'-10	8	HP14x73	179
	7	HP14x89	205
176'-4	9	HP14x73	167
	7	HP14x89	214
188'-10	9	HP14x73	174
	8	HP14x89	196
201'-4	10	HP14x73	175
	8	HP14x89	219
213'-10	10	HP14x73	184
	9	HP14x89	205
226'-4	11	HP14x73	176
	9	HP14x89	216
243'-0	12	HP14x73	170
	10	HP14x89	204

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

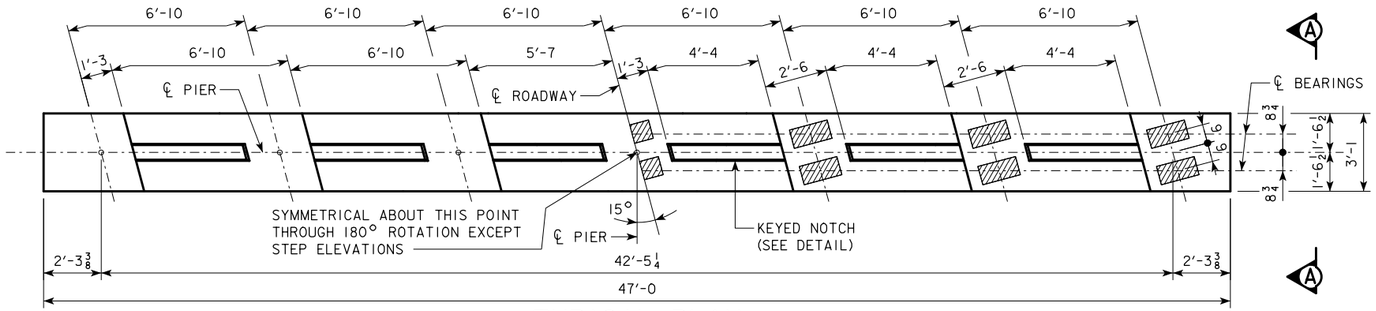
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS HP14 PIERS

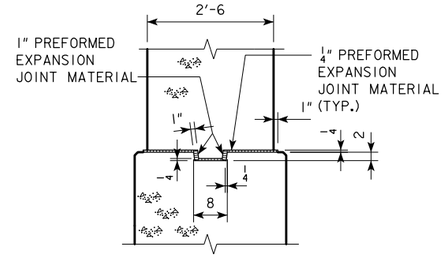
0° SKEW

H44-41-14

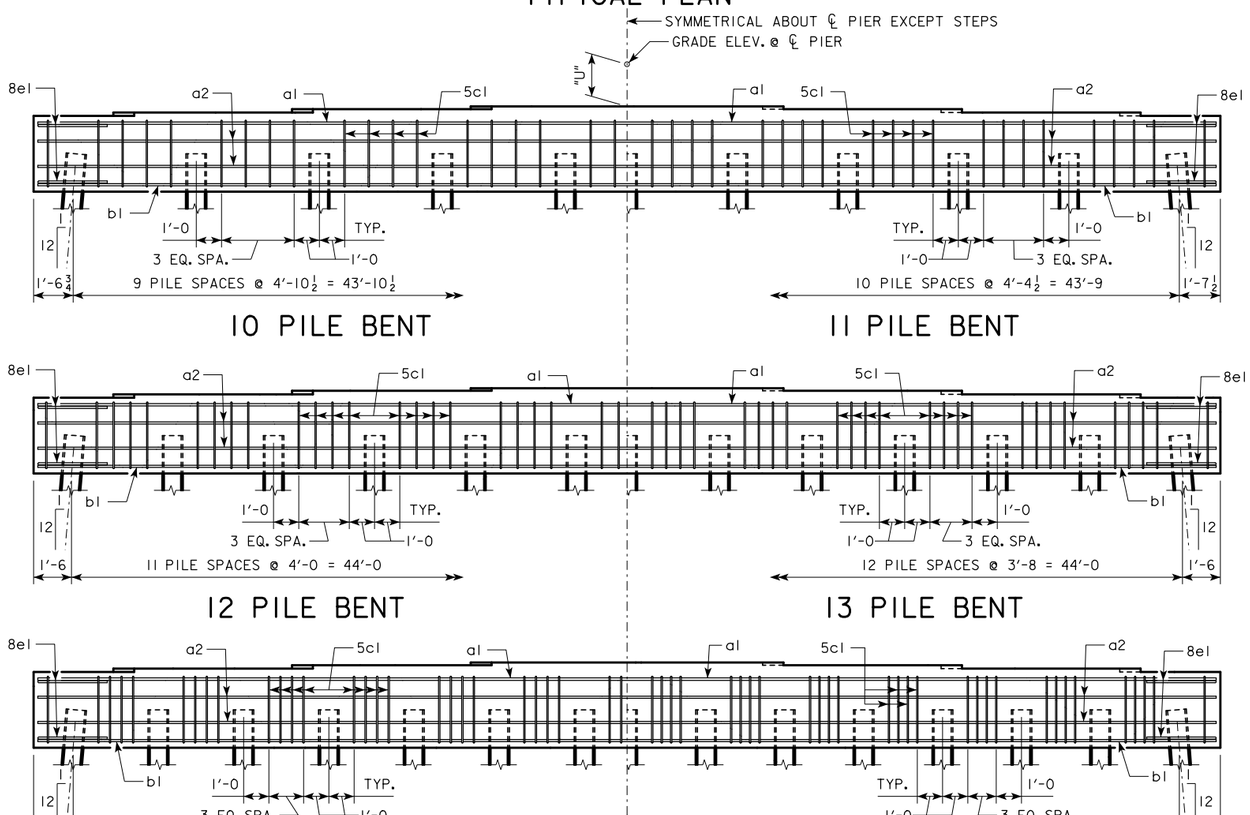


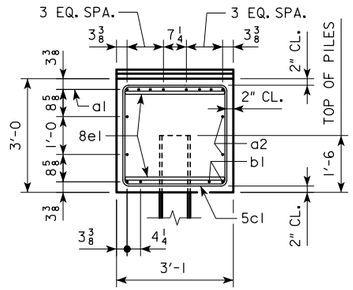
TYPICAL PLAN

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 H44-15-14 FOR "U" DIMENSION.

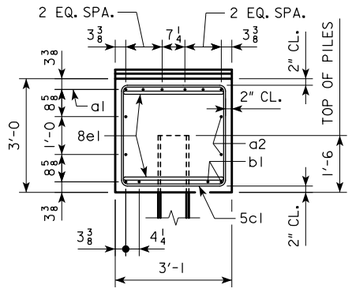


KEYED NOTCH DETAIL

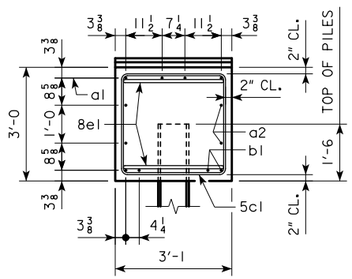




VIEW A-A
FOR 10 PILE BENT



VIEW A-A
FOR 11, 12, 13, 14, 15 & 16 PILE BENTS



VIEW A-A
FOR 17 PILE BENT

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

15° SKEW

H44-42-14

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

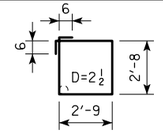
				10 PILE BENT			11 PILE BENT			12 PILE BENT			13 PILE BENT			14 PILE BENT			15 PILE BENT			16 PILE BENT			17 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	46'-8	———		8	9	1269	6	9	952	6	9	952	6	9	952	6	9	952	6	9	952	6	9	952	4	9	635
a2	46'-8	———		4	8	498	4	8	498	4	8	498	4	8	498	4	8	498	4	8	498	4	8	498	4	8	498
b1	46'-8	———		4	9	635	4	9	635	4	9	635	4	9	635	4	9	635	4	9	635	4	8	498	4	8	498
5c1	11'-10			38	5	489	42	5	518	46	5	568	50	5	617	54	5	666	58	5	716	47	5	580	50	5	617
8e1	8'-2			4	8	87	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.)				2958			2690			2740			2789			2838			2888			2615			2335		
STRUCTURAL (2) CONCRETE (CY)		PILE TYPE																									
		1, 2		-----			-----			16.8			16.8			16.7			16.7			16.6			16.6		
		3		17.4			17.4			17.4			17.4			17.4			17.4			17.4			-----		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

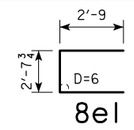
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS

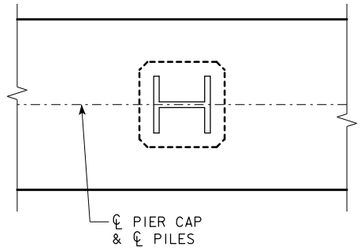


5c1



8e1

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



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

℄-℄ ABUTMENT BEARING	FRICTION BEARING PILING			FRICTION OR POINT BEARING PILING		
	PIOL TYPE 1 OR 2			PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	(3) "K" (INCHES)	(4) LRFD PU, STRENGTH I DES. BRG. (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	(4) LRFD PU, STRENGTH I DES. BRG. (KIPS)
138'-10	14	14	90	10	HP10x57	126
	12	16	105	10	HP12x53	126
151'-4	14	14	95	10	HP10x57	133
	13	16	102	10	HP12x53	133
163'-10	16	14	90	10	HP10x57	144
	14	16	103	11	HP12x53	131
176'-4	16	14	94	11	HP10x57	137
	14	16	108	12	HP12x53	126
188'-10	-----	--	--	11	HP10x57	143
	-----	--	--	12	HP12x53	131
201'-4	-----	--	--	13	HP10x57	136
				14	HP12x53	126
213'-10	-----	--	--	13	HP10x57	143
				14	HP12x53	132
226'-4	-----	--	--	14	HP10x57	139
				15	HP12x53	130
243'-0	-----	--	--	15	HP10x57	137
				16	HP12x53	128

(1) SEE SHEET H44-17-14 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, STENGTH 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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

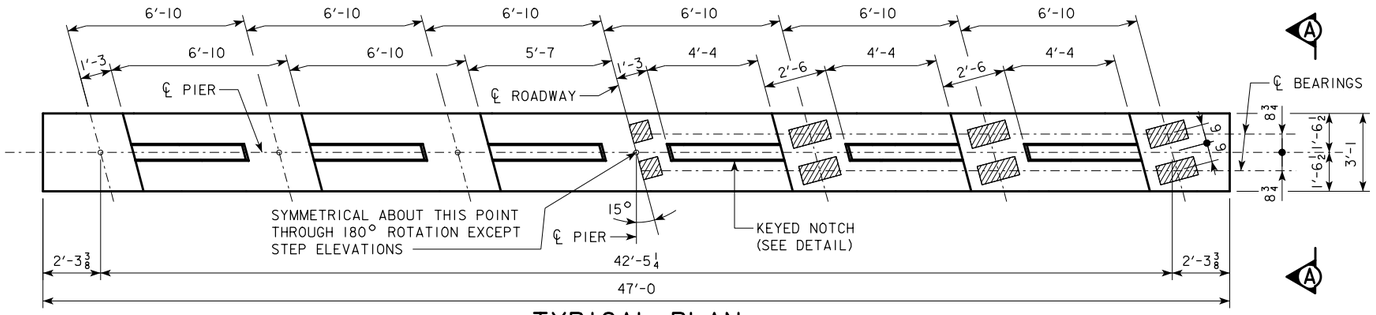
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

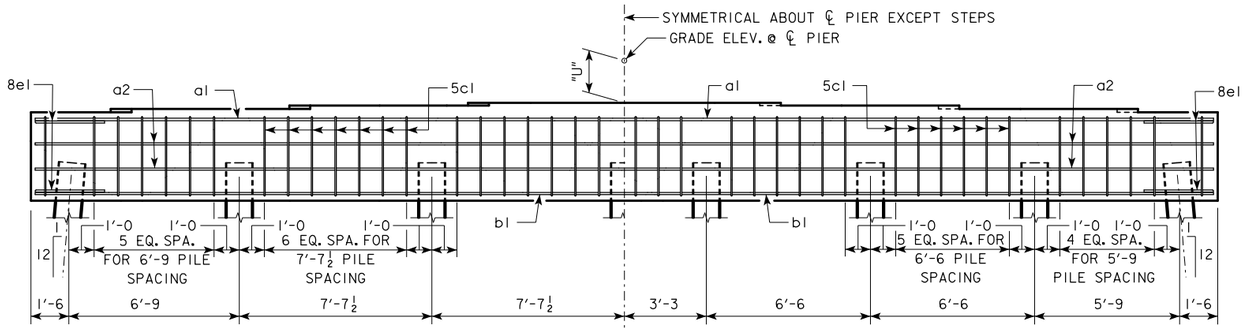
15° SKEW

H44-43-14



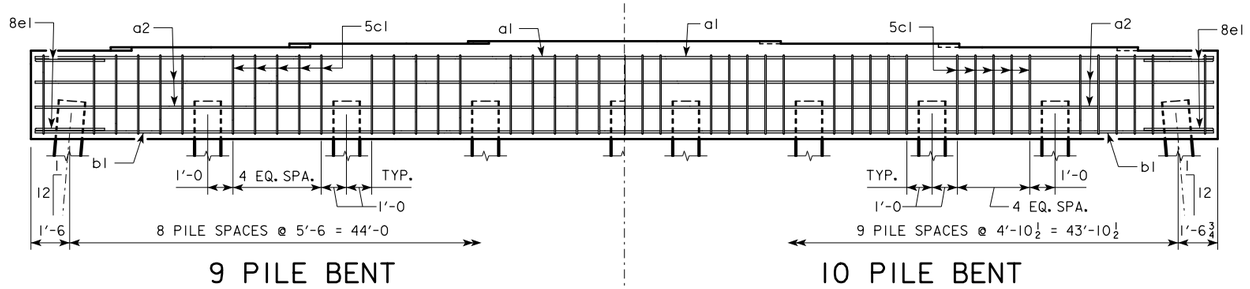
TYPICAL PLAN

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 H44-15-14 FOR "U" DIMENSION.



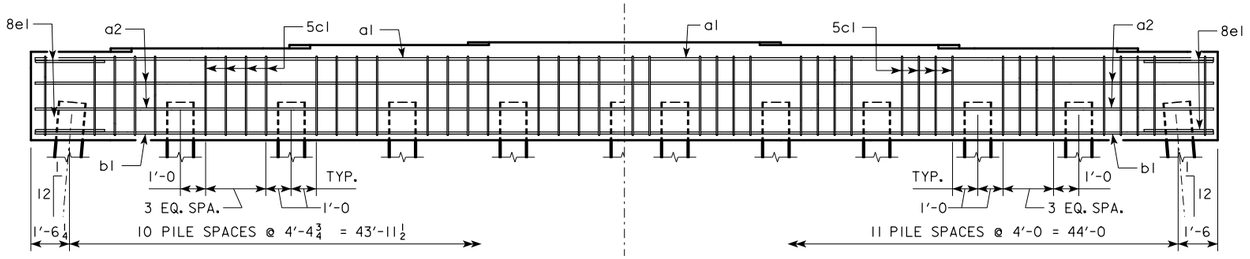
7 PILE BENT

8 PILE BENT



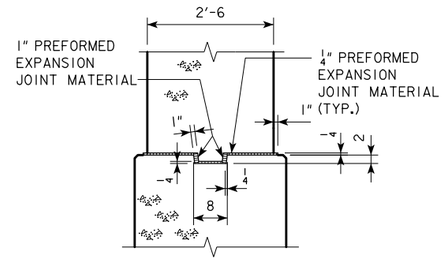
9 PILE BENT

10 PILE BENT

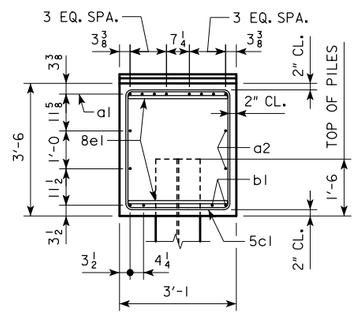


11 PILE BENT

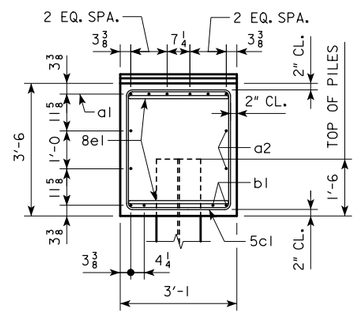
12 PILE BENT



KEYED NOTCH DETAIL



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



VIEW A-A
FOR 11 & 12 PILE BENTS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS HP14 PILES

15° SKEW

H44-44-14

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

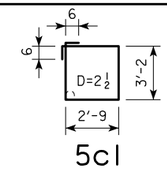
				7 PILE BENT			8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT		
BAR	LENGTH	SHAPE	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	46'-8	———	8	9	1269	8	9	1269	8	9	1269	8	9	1269	6	9	952	6	9	952
a2	46'-8	———	4	8	498	4	8	498	4	8	498	4	8	498	4	8	498	4	8	498
b1	46'-8	———	4	10	803	4	9	635	4	9	635	4	9	635	4	9	635	4	9	635
(1) 5c1	12'-10	⌐——¬	42	5	562	42	5	562	42	5	562	47	5	629	42	5	562	46	5	616
8e1	8'-2	⌐——¬	4	8	87	4	8	87	4	8	87	4	8	87	4	8	87	4	8	87
REINFORCING STEEL (LB.)			3219			3051			3051			3118			2734			2788		
STRUCTURAL CONCRETE (CY)	PILE TYPE	3	20.0			20.0			20.0			20.0			20.0			20.0		

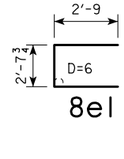
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS





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

℄-℄ ABUTMENT BEARING	FRICTION OR POINT BEARING PILING — PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE	(3) LRFD PU, STRENGTH I DES. BRG. (KIPS)
138'-10	7	HP14x73	182
	7	HP14x89	182
151'-4	8	HP14x73	168
	7	HP14x89	192
163'-10	8	HP14x73	182
	7	HP14x89	208
176'-4	9	HP14x73	169
	7	HP14x89	217
188'-10	9	HP14x73	177
	8	HP14x89	199
201'-4	10	HP14x73	178
	8	HP14x89	222
213'-10	11	HP14x73	170
	9	HP14x89	207
226'-4	11	HP14x73	179
	9	HP14x89	218
243'-0	12	HP14x73	172
	10	HP14x89	206

(1) SEE SHEET H44-17-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

(2) FOR DETERMINING ACTUAL PILE LENGTHS IN FIELD.

(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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

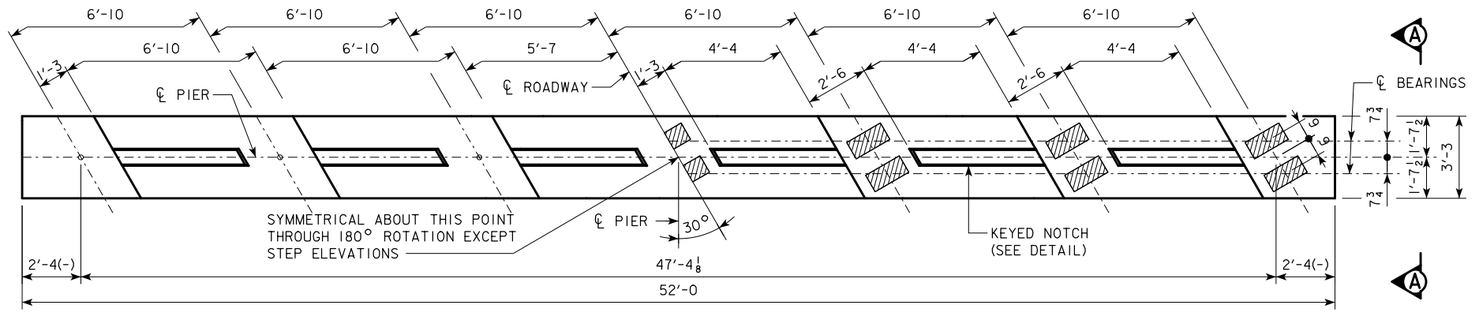
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS HP14 PILES

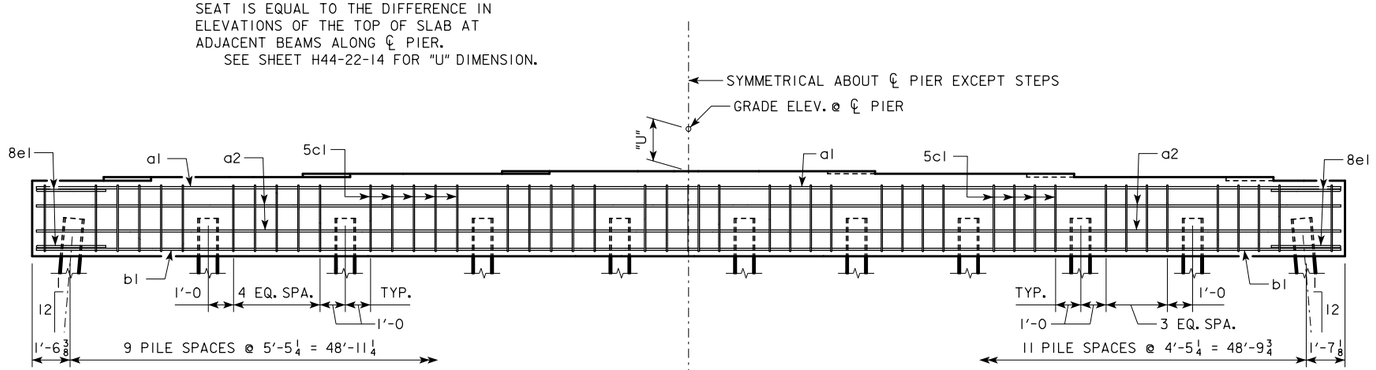
15° SKEW

H44-45-14



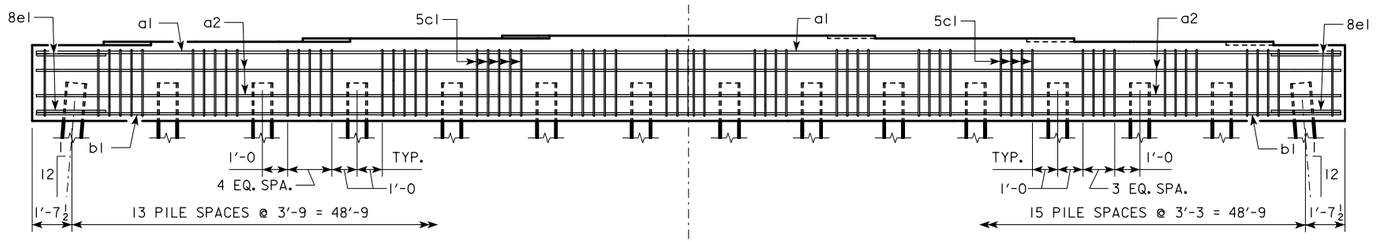
TYPICAL PLAN

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 H44-22-14 FOR "U" DIMENSION.



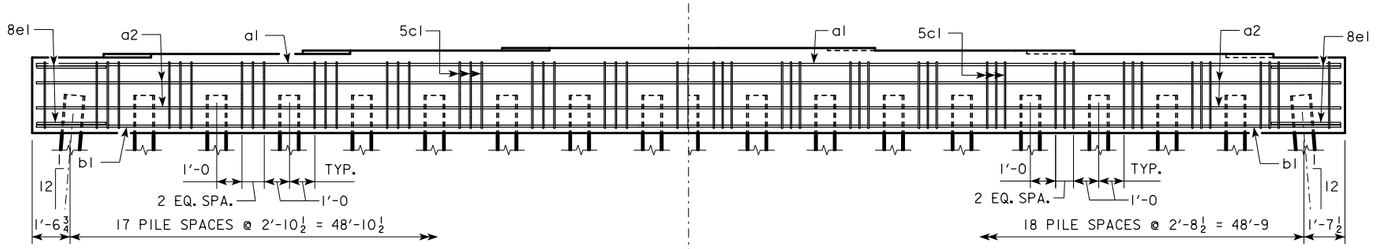
10 PILE BENT

12 PILE BENT



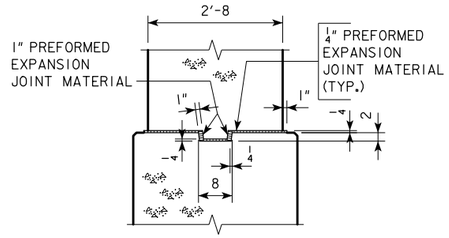
14 PILE BENT

16 PILE BENT

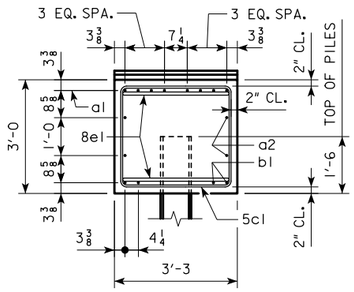


18 PILE BENT

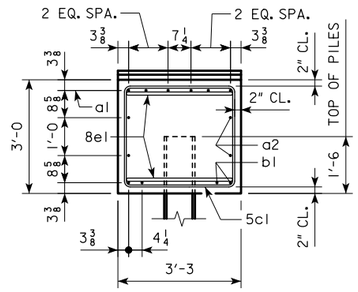
19 PILE BENT



KEYED NOTCH DETAIL



VIEW A-A
FOR 10, 12 & 14 PILE BENTS



VIEW A-A
FOR 16, 18 & 19 PILE BENTS

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

30° SKEW

H44-46-14

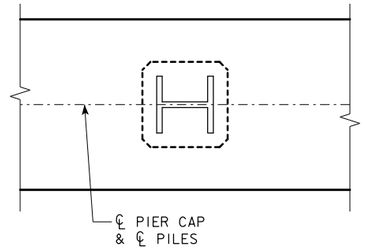
PILE BENT NOTES:

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

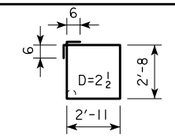
				10 PILE BENT			12 PILE BENT			14 PILE BENT			16 PILE BENT			18 PILE BENT			19 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	51'-8	———		8	9	1405	8	9	1405	8	9	1405	6	9	1054	6	9	1054	6	9	1054
a2	51'-8	———		4	8	552	4	8	552	4	8	552	4	8	552	4	8	552	4	8	552
b1	51'-8	———		4	9	703	4	9	703	4	9	703	4	9	703	4	8	552	4	8	552
5c1	12'-2	⌐——¬		47	5	596	46	5	584	67	5	850	62	5	787	53	5	673	56	5	711
8e1	8'-4	⌐——¬		4	8	89	4	8	89	4	8	89	4	8	89	4	8	89	4	8	89
① REINFORCING STEEL (LB.)				3345			3333			3599			3185			2920			2958		
STRUCTURAL CONCRETE (CY) ②			PILE TYPE																		
			1, 2	-----			19.8			19.7			19.7			19.6			19.5		
			3	20.4			20.4			20.4			20.4			-----			-----		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

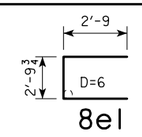
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



5c1



8e1

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	③ "K" (INCHES)	④ LRFD PU, STRENGTH I DES. BRG. (KIPS)	NUMBER OF TRESTLE PILES	PILE SIZE	④ LRFD PU, STRENGTH I DES. BRG. (KIPS)
138'-10	14	14	92	10	HP10x57	129
	12	16	107	10	HP12x53	129
151'-4	16	14	85	10	HP10x57	135
	14	16	97	12	HP12x53	113
163'-10	16	14	92	12	HP10x57	122
	14	16	105	12	HP12x53	122
176'-4	-----	--	--	12	HP10x57	128
	-----	--	--	12	HP12x53	128
188'-10	-----	--	--	12	HP10x57	134
	-----	--	--	12	HP12x53	134
201'-4	-----	--	--	14	HP10x57	128
	-----	--	--	14	HP12x53	128
213'-10	-----	--	--	14	HP10x57	134
				16	HP12x53	118
226'-4	-----	--	--	14	HP10x57	141
				16	HP12x53	124
243'-0	-----	--	--	16	HP10x57	130
				16	HP12x53	130

① SEE SHEET H44-24-14 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, STENGTH 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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

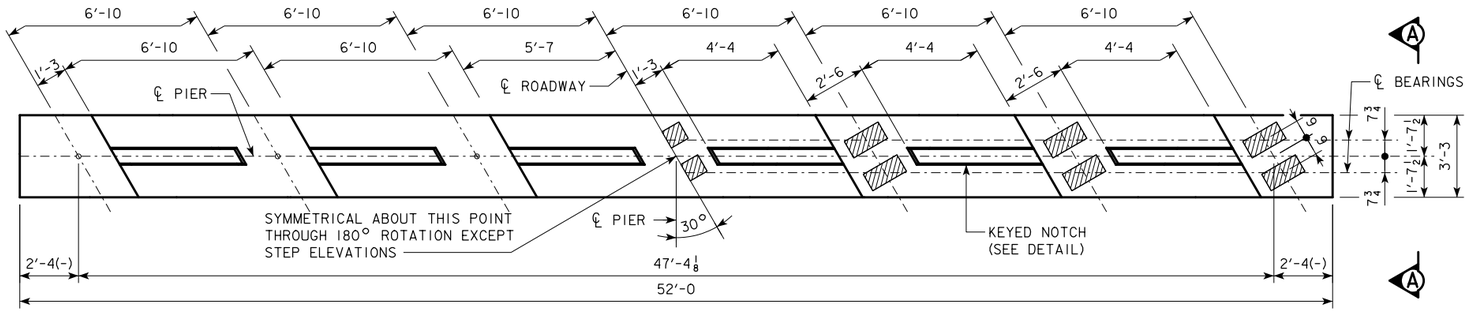
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS

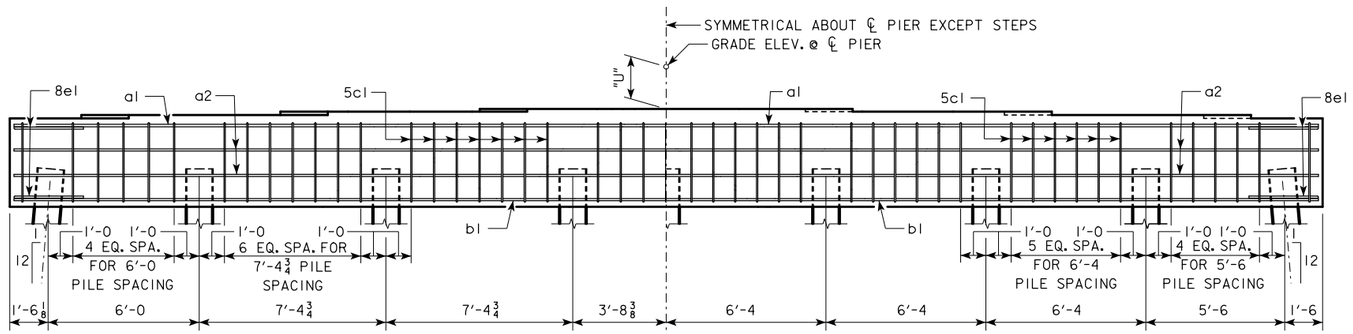
30° SKEW

H44-47-14



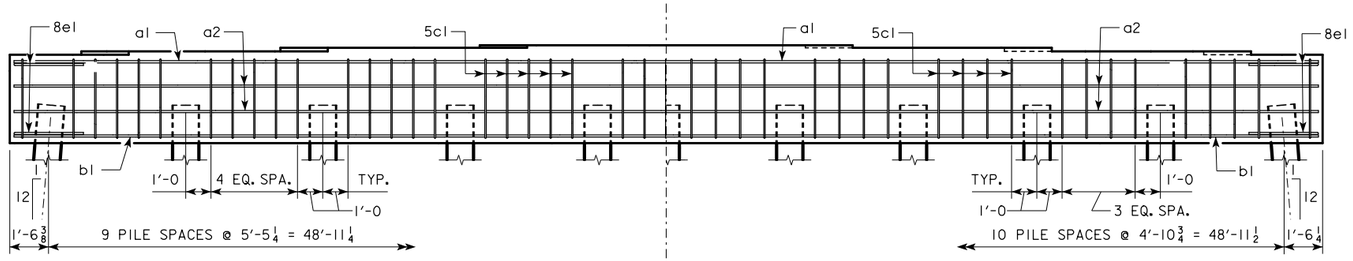
TYPICAL PLAN

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 H44-22-14 FOR "U" DIMENSION.



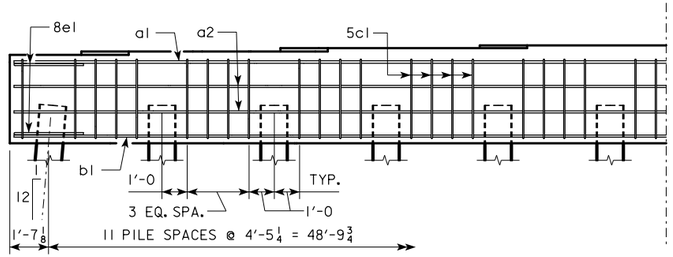
8 PILE BENT

9 PILE BENT

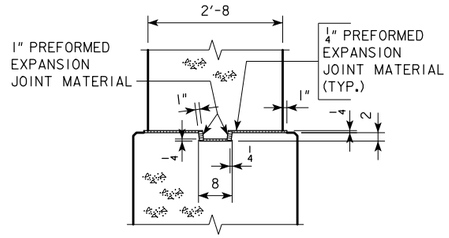


10 PILE BENT

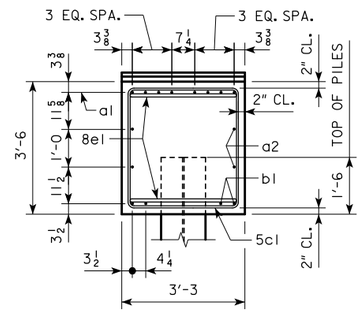
11 PILE BENT



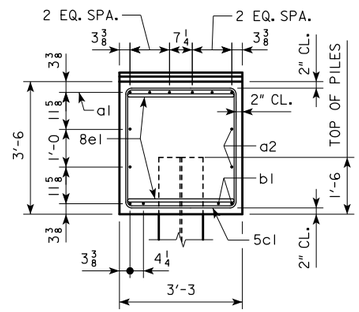
12 PILE BENT



KEYED NOTCH DETAIL



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



VIEW A-A
FOR 12 PILE BENT

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

PILE BENT PIERS HP14 PILES

30° SKEW

H44-48-14

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

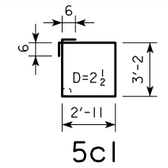
				8 PILE BENT			9 PILE BENT			10 PILE BENT			11 PILE BENT			12 PILE BENT		
BAR	LENGTH	SHAPE		NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT	NO.	SIZE	WEIGHT
a1	51'-8	———		8	9	1405	8	9	1405	8	9	1405	8	9	1405	6	9	1054
a2	51'-8	———		4	8	552	4	8	552	4	8	552	4	8	552	4	8	552
b1	51'-8	———		4	9	703	4	10	889	4	9	703	4	9	703	4	9	703
5c1	13'-2	▭		47	5	645	48	5	659	47	5	645	42	5	577	46	5	632
8e1	8'-4	▭		4	8	89	4	8	89	4	8	89	4	8	89	4	8	89
(1) REINFORCING STEEL (LB.)				3394			3594			3394			3326			3030		
STRUCTURAL CONCRETE (CY)			PILE TYPE 3	23.5			23.5			23.5			23.5			23.5		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

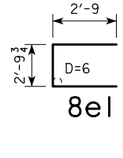
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

BENT BAR DETAILS



5c1



8e1

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

℄-℄ ABUTMENT BEARING	FRICTION OR POINT BEARING PILING		
	PIOL TYPE 3		
	NUMBER OF TRESTLE PILES	PILE SIZE	(3) LRFD PU, STRENGTH I DES. BRG. (KIPS)
138'-10	8	HP14x73	163
	8	HP14x89	163
151'-4	8	HP14x73	171
	8	HP14x89	171
163'-10	8	HP14x73	185
	8	HP14x89	185
176'-4	9	HP14x73	172
	8	HP14x89	194
188'-10	9	HP14x73	180
	8	HP14x89	202
201'-4	10	HP14x73	181
	8	HP14x89	226
213'-10	11	HP14x73	173
	9	HP14x89	211
226'-4	11	HP14x73	181
	9	HP14x89	222
243'-0	12	HP14x73	175
	10	HP14x89	210

(1) SEE SHEET H44-24-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

(2) FOR DETERMINING ACTUAL PILE LENGTHS IN FIELD.

(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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

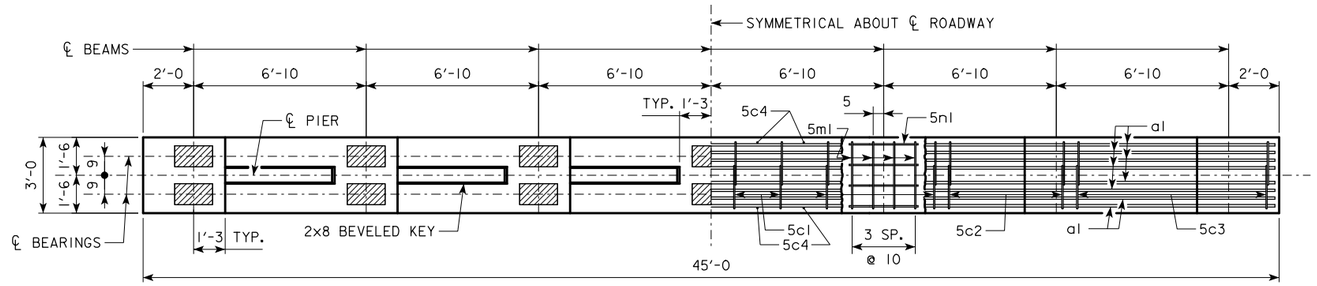
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

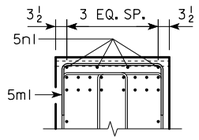
PILE BENT PIERS HP14 PILES

30° SKEW

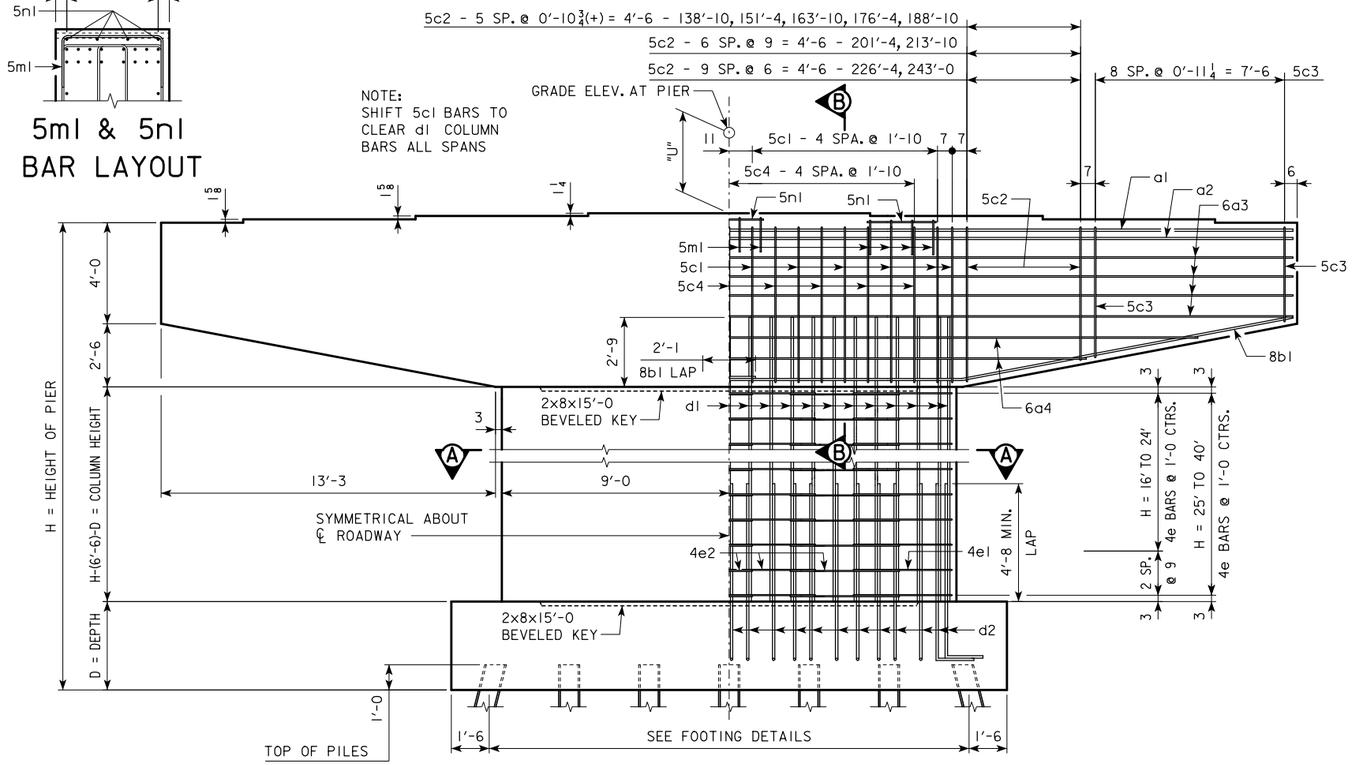
H44-49-14



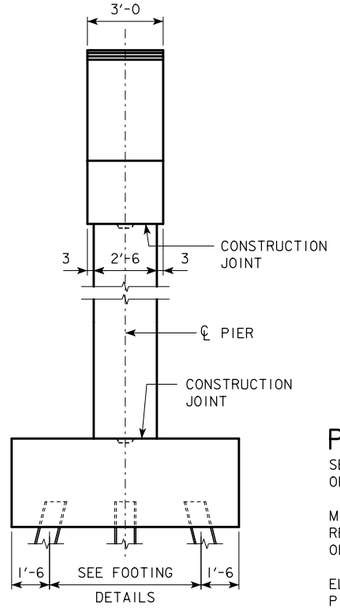
CAP PLAN



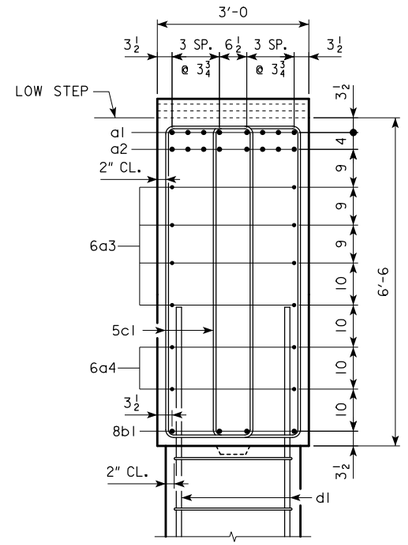
5m1 & 5n1
BAR LAYOUT



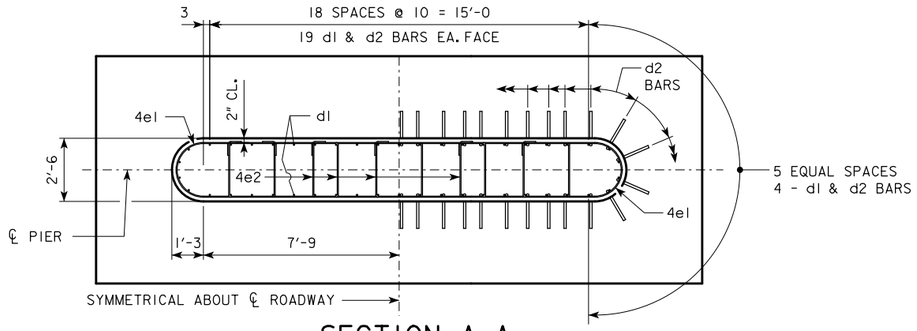
FRONT ELEVATION



END ELEVATION



SECTION B-B



SECTION A-A

PIER NOTES:

SEE "TEE PIER NOTES" ON H44-02-14 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.

FOR SIZE OF BEARING PADS, SEE H44-37-14.

SEE SHEET H44-09-14 FOR "U" DIMENSION.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

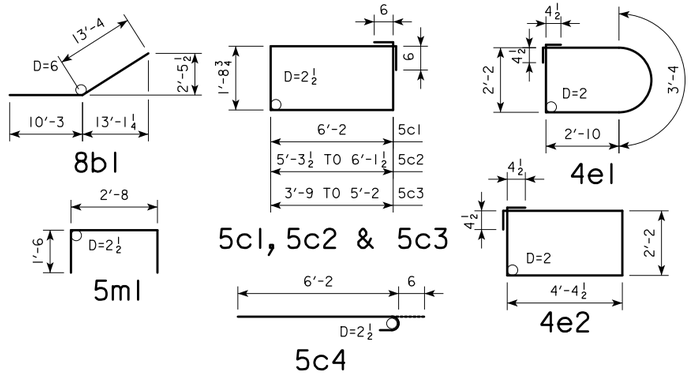
SEPTEMBER, 2014

TEE PIER CAP AND COLUMN

0° SKEW

H44-50-14

BENT BAR DETAILS



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

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	44'-8		8	9	1215	8	9	1215	8	9	1215	8	9	1215	8	10	1538	8	10	1538	8	10	1538	8	11	1899	8	11	1899
a2	44'-8		8	8	954	8	8	954	8	9	1215	8	9	1215	8	9	1215	8	10	1538	8	10	1538	8	10	1538	8	10	1538
6a3	44'-8		8	6	537	8	6	537	8	6	537	8	6	537	8	6	537	8	6	537	8	6	537	8	6	537	8	6	537
6a4	VARIES		4	6	199	4	6	199	4	6	199	4	6	199	4	6	199	4	6	199	4	6	199	4	6	199	4	6	199
8b1	23'-7		8	8	504	8	8	504	8	8	504	8	8	504	8	8	504	8	8	504	8	8	504	8	8	504	8	8	504
5c1	16'-10		24	5	421	24	5	421	24	5	421	24	5	421	24	5	421	24	5	421	24	5	421	24	5	421	24	5	421
5c2	VARIES		24	5	397	24	5	397	24	5	397	24	5	397	24	5	397	28	5	464	28	5	464	40	5	662	40	5	662
5c3	VARIES		36	5	502	36	5	502	36	5	502	36	5	502	36	5	502	36	5	502	36	5	502	36	5	502	36	5	502
5c4	6'-8		18	5	125	18	5	125	18	5	125	18	5	125	18	5	125	18	5	125	18	5	125	18	5	125	18	5	125
5m1	5'-8		12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71	12	5	71
5n1	2'-8		12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33	12	5	33
TOTAL (LB.)			4958			4958			5219			5219			5542			5932			5932			6491			6491		
STRUCTURAL CONCRETE (CY)			29.9			29.9			29.9			29.9			29.9			29.9			29.9			29.9			29.9		

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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	6'-0	9.7	46	9	8'-9	1369	14	4	11'-11	111	28	4	13'-10	259	1739
17	7'-0	11.3	46	9	9'-9	1525	16	4	11'-11	127	32	4	13'-10	296	1948
18	8'-0	12.9	46	9	10'-9	1681	18	4	11'-11	143	36	4	13'-10	333	2157
19	9'-0	14.6	46	9	11'-9	1838	20	4	11'-11	159	40	4	13'-10	370	2367
20	10'-0	16.2	46	9	12'-9	1994	22	4	11'-11	175	44	4	13'-10	407	2576
21	11'-0	17.8	46	9	13'-9	2151	24	4	11'-11	191	48	4	13'-10	444	2786
22	12'-0	19.4	46	9	14'-9	2307	26	4	11'-11	207	52	4	13'-10	481	2995
23	13'-0	21.0	46	9	15'-9	2463	28	4	11'-11	223	56	4	13'-10	517	3203
24	14'-0	22.6	46	9	16'-9	2620	30	4	11'-11	239	60	4	13'-10	554	3413
25	14'-6	23.4	46	9	17'-3	2698	30	4	11'-11	239	60	4	13'-10	554	3491
26	15'-6	25.1	46	9	18'-3	2854	32	4	11'-11	255	64	4	13'-10	591	3700
27	16'-6	26.7	46	9	19'-3	3011	34	4	11'-11	271	68	4	13'-10	628	3910
28	17'-6	28.3	46	9	20'-3	3167	36	4	11'-11	287	72	4	13'-10	665	4119
29	18'-6	29.9	46	9	21'-3	3324	38	4	11'-11	302	76	4	13'-10	702	4328
30	19'-6	31.5	46	9	22'-3	3480	40	4	11'-11	318	80	4	13'-10	739	4537
31	20'-6	33.1	46	9	23'-3	3636	42	4	11'-11	334	84	4	13'-10	776	4746
32	21'-6	34.8	46	9	24'-3	3793	44	4	11'-11	350	88	4	13'-10	813	4956
33	22'-6	36.4	46	9	25'-3	3949	46	4	11'-11	366	92	4	13'-10	850	5165
34	23'-6	38.0	46	9	26'-3	4106	48	4	11'-11	382	96	4	13'-10	887	5375
35	24'-6	39.6	46	9	27'-3	4262	50	4	11'-11	398	100	4	13'-10	924	5584
36	25'-6	41.2	46	9	28'-3	4418	52	4	11'-11	414	104	4	13'-10	961	5793
37	26'-6	42.9	46	9	29'-3	4575	54	4	11'-11	430	108	4	13'-10	998	6003
38	27'-6	44.5	46	9	30'-3	4731	56	4	11'-11	446	112	4	13'-10	1035	6212
39	28'-6	46.1	46	9	31'-3	4888	58	4	11'-11	462	116	4	13'-10	1072	6422
40	29'-6	47.7	46	9	32'-3	5044	60	4	11'-11	478	120	4	13'-10	1109	6631

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

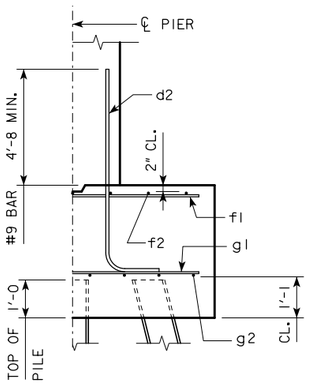
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

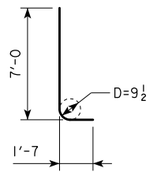
SEPTEMBER, 2014

TEE PIER
CAP AND COLUMN
0° SKEW

H44-51-14



TYPICAL SECTION



d2

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

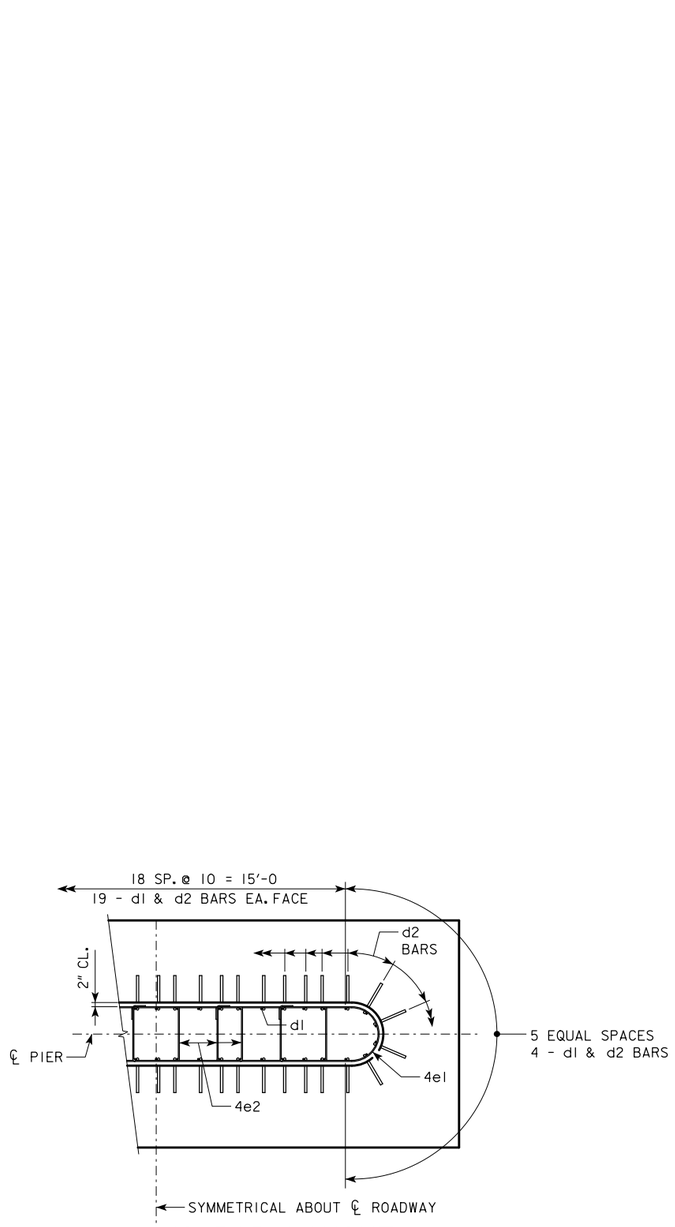
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

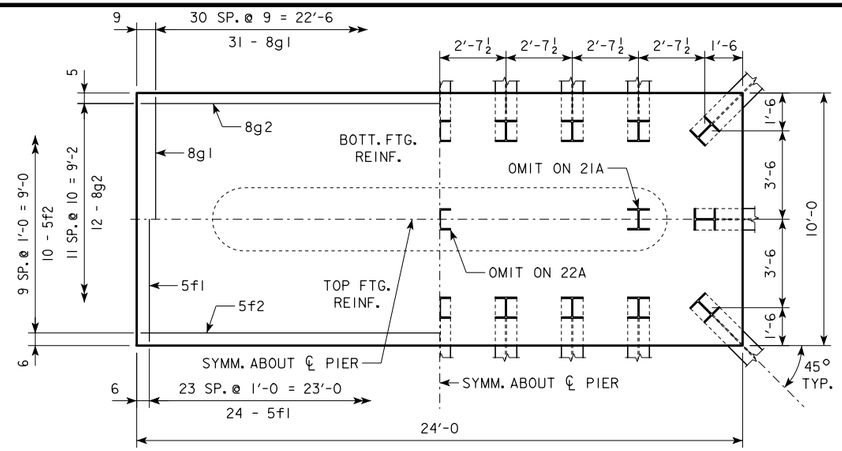
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	21A	145	3'-6 x 10' x 24'
	213'-10	22A	141	
	226'-4	23A	144	
	243'-0	24A	145	
19 TO 21	201'-4	22A	138	3'-6 x 10' x 24'
	213'-10	22A	144	
	226'-4	23A	146	
	243'-0	25A	143	
22 TO 24	201'-4	22A	140	3'-6 x 10' x 24'
	213'-10	22A	146	
	226'-4	24A	143	
	243'-0	25A	145	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 10' x 24'	d2	46 - #9 AS SHOWN	8'-7	1342	3389	31.1
	f1	24 - #5 @ 1'-0	9'-8	242		
	f2	10 - #5 @ 1'-0	23'-8	247		
	g1	31 - #8 @ 0'-9	9'-8	800		
	g2	12 - #8 @ 0'-10	23'-8	758		

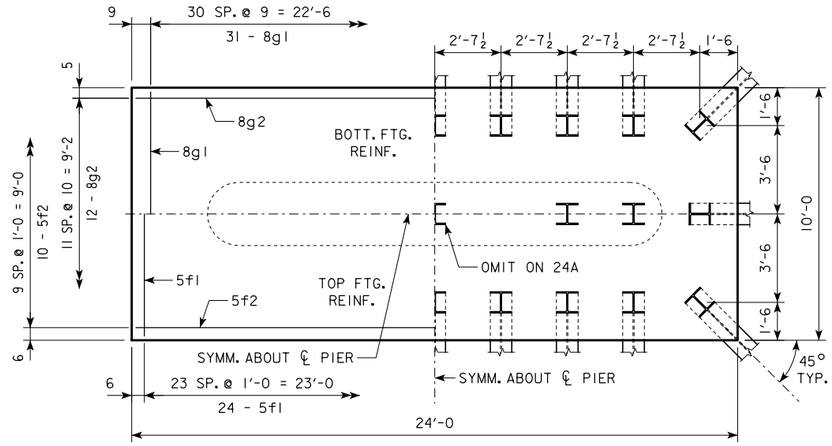


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-50-14.)

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



3'-6 x 10'-0 x 24'-0 FOR 21A, 22A & 23A



3'-6 x 10'-0 x 24'-0 FOR 24A & 25A

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 H44-50-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

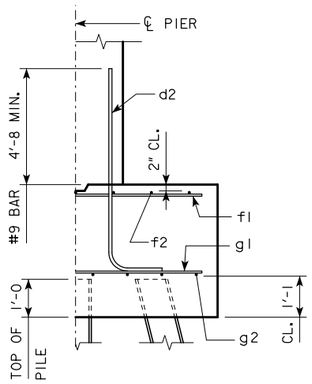
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

0° SKEW - H=16' TO 24'

H44-52-14



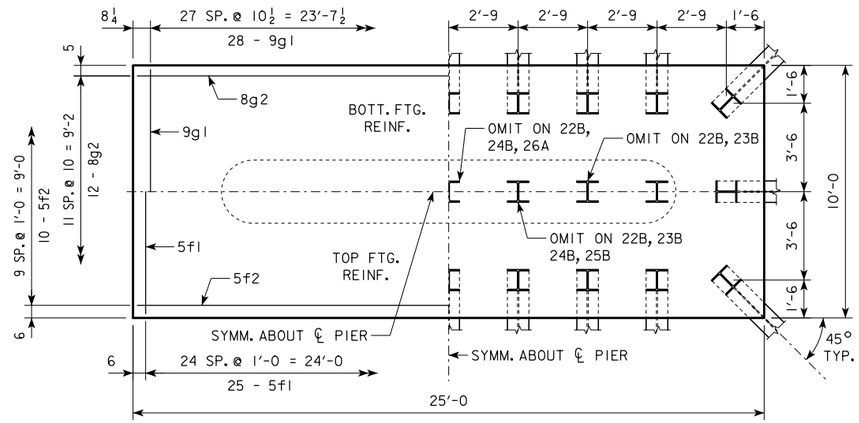
TYPICAL SECTION

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

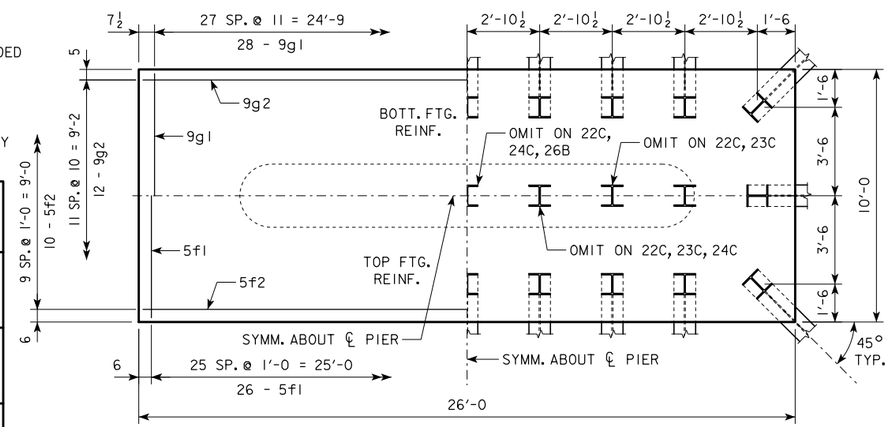
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	22B	141	4' x 10' x 25'
	213'-10	22B	146	
	226'-4	24B	143	
	243'-0	25B	145	
28 TO 30	201'-4	22B	143	4' x 10' x 25'
	213'-10	23B	144	
	226'-4	24B	144	
	243'-0	26A	143	
31 TO 33	201'-4	22C	143	4' x 10' x 26'
	213'-10	23C	144	
	226'-4	24C	145	
	243'-0	26B	143	
34 TO 36	201'-4	22D	144	4' x 11' x 26'
	213'-10	23D	144	
	226'-4	24D	145	
	243'-0	26C	143	
37 TO 40	201'-4	22D	146	4' x 11' x 26'
	213'-10	23D	147	
	226'-4	25C	143	
	243'-0	26C	145	

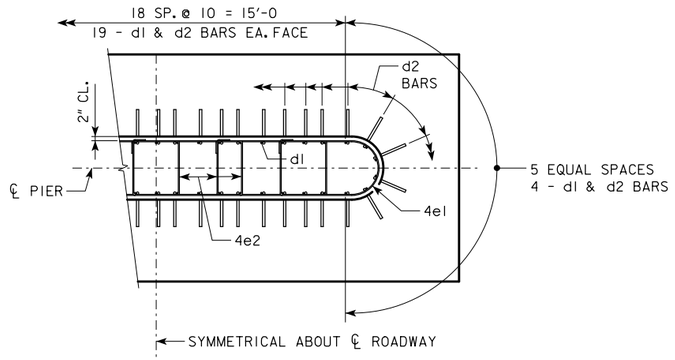


4'-0 x 10'-0 x 25'-0 FOR 22B, 23B, 24B, 25B & 26A



4'-0 x 10'-0 x 26'-0 FOR 22C, 23C, 24C & 26B

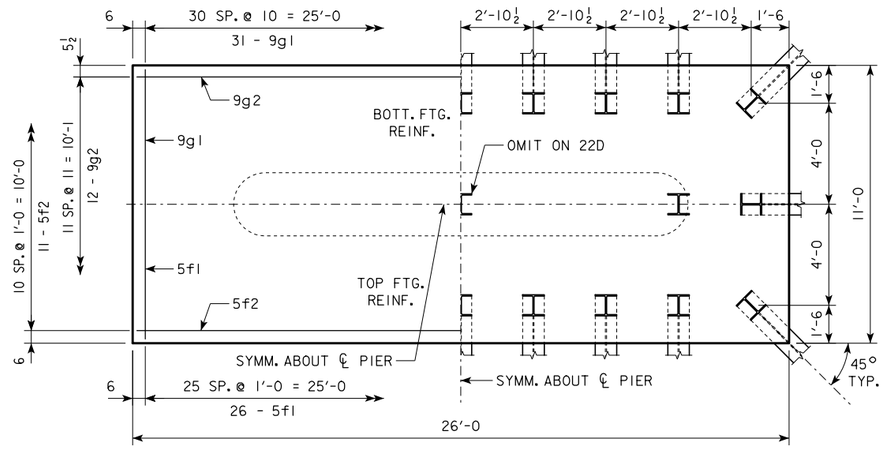
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 10' x 25'	d2	46 - #9 AS SHOWN	9'-1	1421	3640	37.0
	f1	25 - #5 @ 1'-0	9'-8	252		
	f2	10 - #5 @ 1'-0	24'-8	257		
	g1	28 - #9 @ 0'-10½	9'-8	920		
	g2	12 - #8 @ 0'-10	24'-8	790		
4' x 10' x 26'	d2	46 - #9 AS SHOWN	9'-1	1421	3918	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	28 - #9 @ 0'-11	9'-8	920		
	g2	12 - #9 @ 0'-10	25'-8	1047		
4' x 11' x 26'	d2	46 - #9 AS SHOWN	9'-1	1421	4175	42.4
	f1	26 - #5 @ 1'-0	10'-8	289		
	f2	11 - #5 @ 1'-0	25'-8	294		
	g1	31 - #9 @ 0'-10	10'-8	1124		
	g2	12 - #9 @ 0'-11	25'-8	1047		



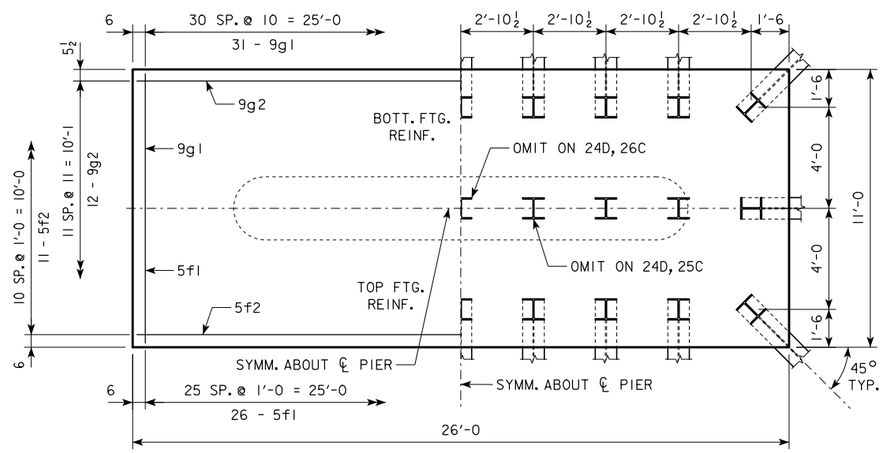
d2 BAR LAYOUT

(SEE SECTION A-A ON SHEET H44-50-14.)

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



4'-0 x 11'-0 x 26'-0 FOR 22D & 23D



4'-0 x 11'-0 x 26'-0 FOR 24D, 25C & 26C

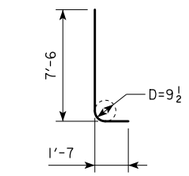
FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H44-50-14.

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.



d2

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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

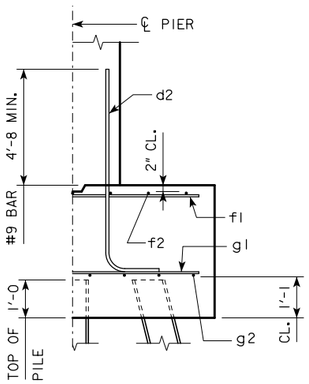
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

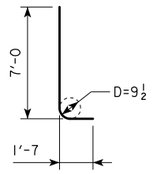
TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS

0° SKEW - H=25' TO 40'

H44-53-14



TYPICAL SECTION



d2

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

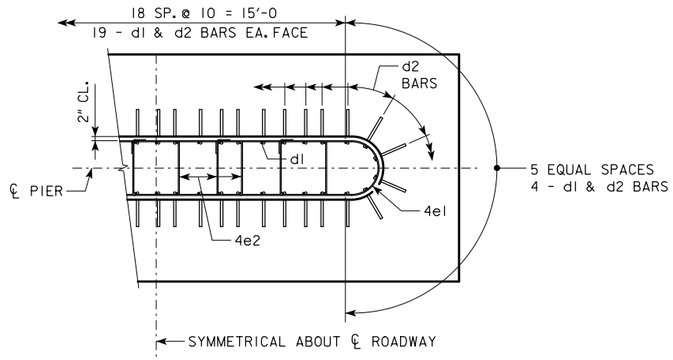
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

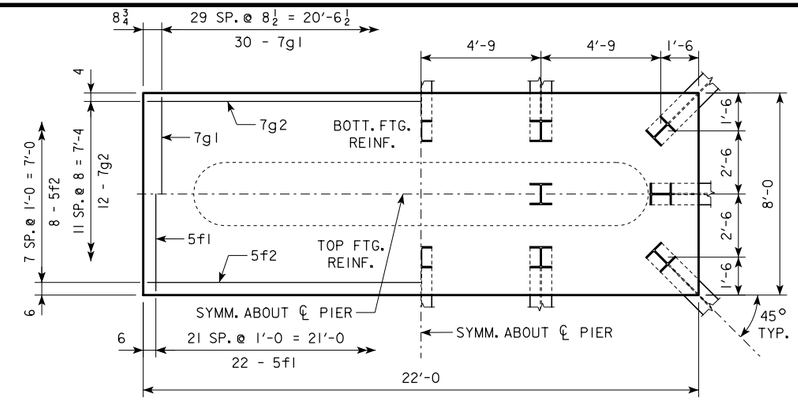
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	14A	220	3'-6 x 8' x 22'
	213'-10	15A	214	
	226'-4	16A	210	
	243'-0	16A	219	
19 TO 21	201'-4	15A	210	3'-6 x 8' x 22'
	213'-10	15A	218	
	226'-4	16A	214	
	243'-0	17A	215	
22 TO 24	201'-4	15A	213	3'-6 x 8' x 22'
	213'-10	16A	208	
	226'-4	16A	217	
	243'-0	17A	218	

FOOTING SIZE	BAR	REINFORCING STEEL (ONE FOOTING) NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 22'	d2	46 - #9 AS SHOWN	8'-7	1342	2700	22.8
	f1	22 - #5 @ 1'-0	7'-8	176		
	f2	8 - #5 @ 1'-0	21'-8	181		
	g1	30 - #7 @ 0'-8½	7'-8	470		
	g2	12 - #7 @ 0'-8	21'-8	531		

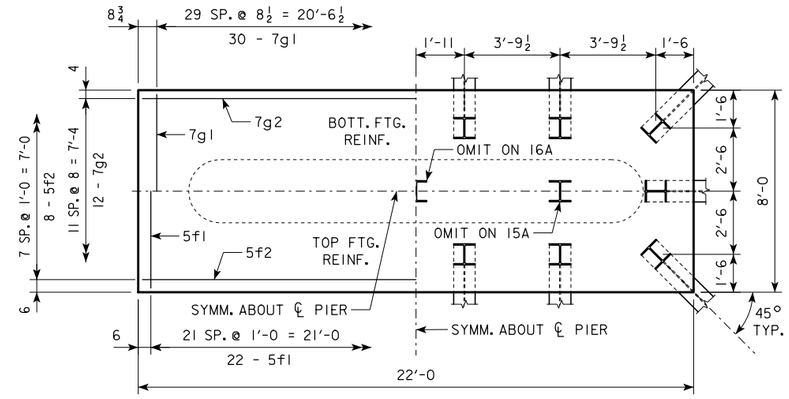


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-50-14.)

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 22'-0 FOR 14A



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

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 H44-50-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

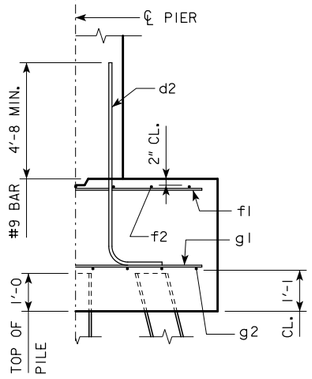
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

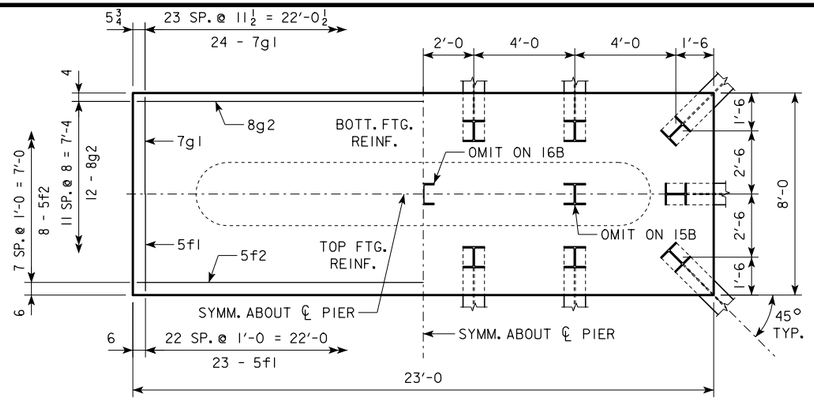
TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

0° SKEW - H=16' TO 24'

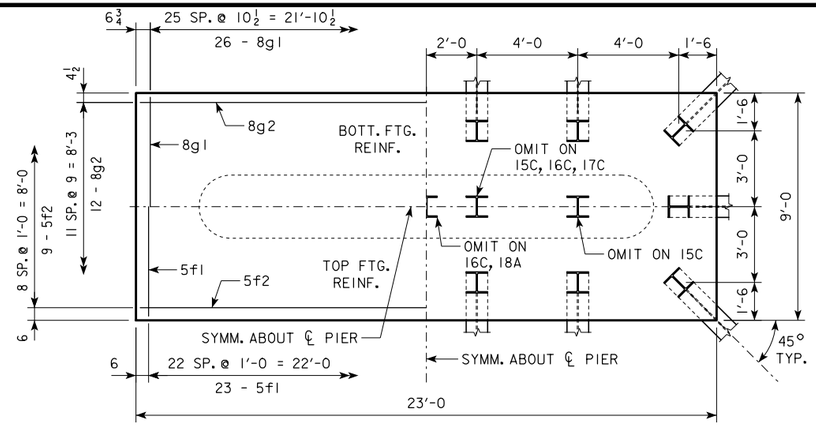
H44-54-14



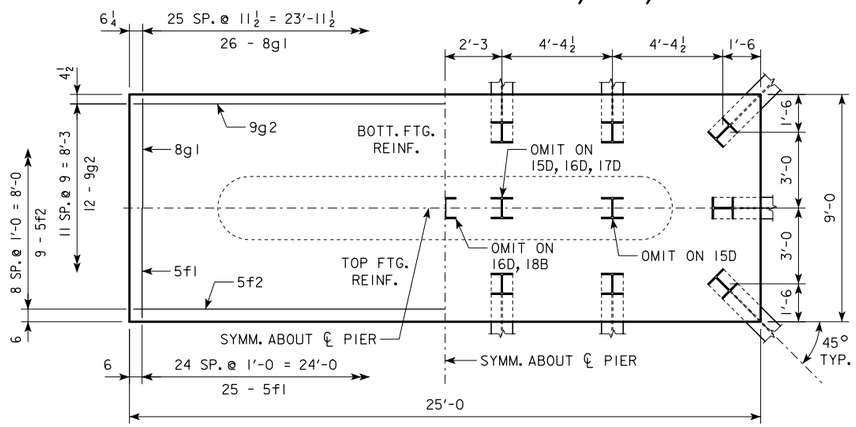
TYPICAL SECTION



4'-0 x 8'-0 x 23'-0 FOR 15B, 16B & 17B



4'-0 x 9'-0 x 23'-0 FOR 15C, 16C, 17C & 18A



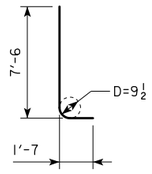
4'-0 x 9'-0 x 25'-0 FOR 15D, 16D, 17D & 18B

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

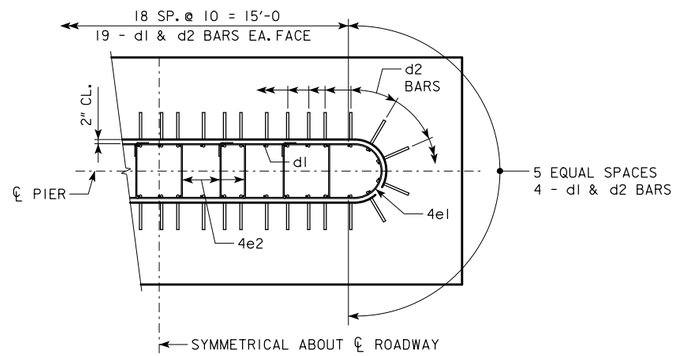
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	15B	214	4' x 8' x 23'
	213'-10	16B	208	
	226'-4	16B	218	
	243'-0	17B	219	
28 TO 30	201'-4	15C	213	4' x 9' x 23'
	213'-10	16C	207	
	226'-4	16C	217	
	243'-0	17C	218	
31 TO 33	201'-4	15C	216	4' x 9' x 23'
	213'-10	16C	210	
	226'-4	16C	219	
	243'-0	18A	212	
34 TO 36	201'-4	15D	214	4' x 9' x 25'
	213'-10	16D	208	
	226'-4	16D	217	
	243'-0	18B	209	
37 TO 40	201'-4	15D	218	4' x 9' x 25'
	213'-10	16D	212	
	226'-4	17D	213	
	243'-0	18B	213	



d2

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

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	46 - #9 AS SHOWN	9'-1	1421	2896	27.3
	f1	23 - #5 @ 1'-0	7'-8	184		
	f2	8 - #5 @ 1'-0	22'-8	189		
	g1	24 - #7 @ 0'-11½	7'-8	376		
	g2	12 - #8 @ 0'-8	22'-8	726		
4' x 9' x 23'	d2	46 - #9 AS SHOWN	9'-1	1421	3170	30.7
	f1	23 - #5 @ 1'-0	8'-8	208		
	f2	9 - #5 @ 1'-0	22'-8	213		
	g1	26 - #8 @ 0'-10½	8'-8	602		
	g2	12 - #8 @ 0'-9	22'-8	726		
4' x 9' x 25'	d2	46 - #9 AS SHOWN	9'-1	1421	3487	33.3
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	26 - #8 @ 0'-11½	8'-8	602		
	g2	12 - #9 @ 0'-9	24'-8	1006		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-50-14.)

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 H44-50-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

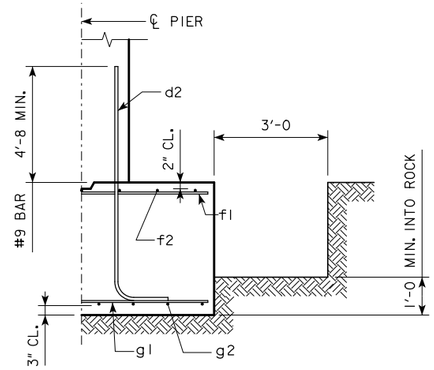
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

0° SKEW - H=25' TO 40'

H44-55-14

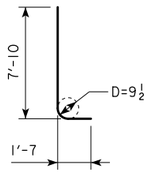


TYPICAL SECTION

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4 163'-10	3'-6 x 9' x 25'
	176'-4 188'-10	3'-6 x 9' x 27'
	201'-4 213'-10	3'-6 x 9' x 29'
	226'-4 243'-0	3'-6 x 10' x 29'
19 TO 21	138'-10 151'-4 163'-10	3'-6 x 9' x 25'
	176'-4 188'-10	3'-6 x 9' x 27'
	201'-4 213'-10	3'-6 x 9' x 29'
	226'-4 243'-0	3'-6 x 10' x 29'
22 TO 24	138'-10 151'-4	3'-6 x 9' x 25'
	163'-10 176'-4 188'-10	3'-6 x 9' x 27'
	201'-4	3'-6 x 9' x 29'
	213'-10 226'-4 243'-0	3'-6 x 10' x 29'

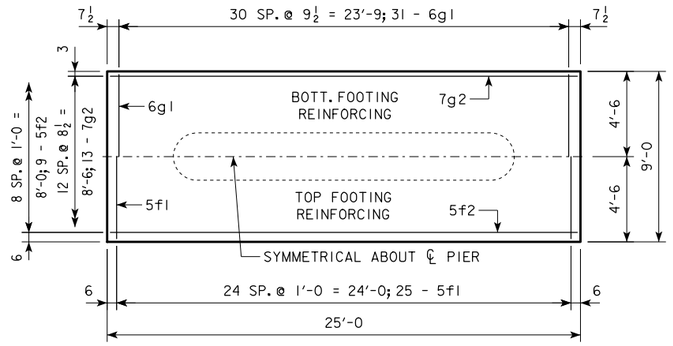
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

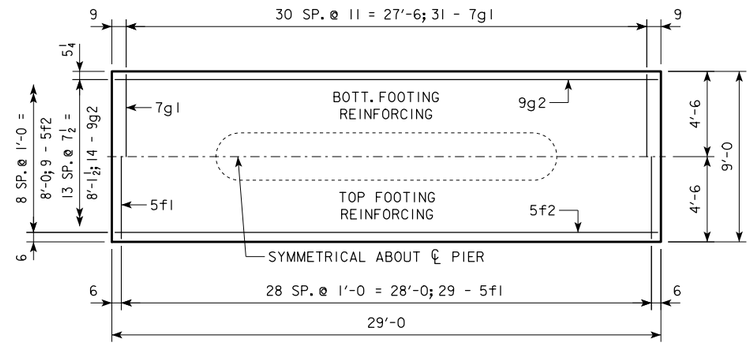


d2

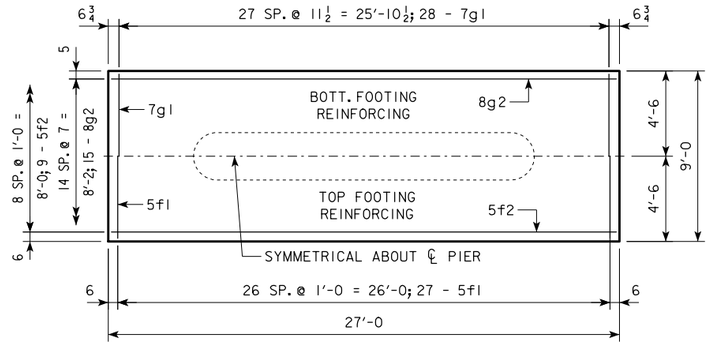
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.



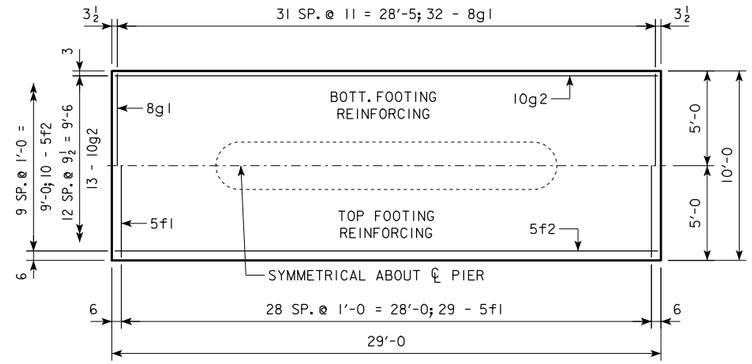
3'-6 x 9'-0 x 25'-0



3'-6 x 9'-0 x 29'-0

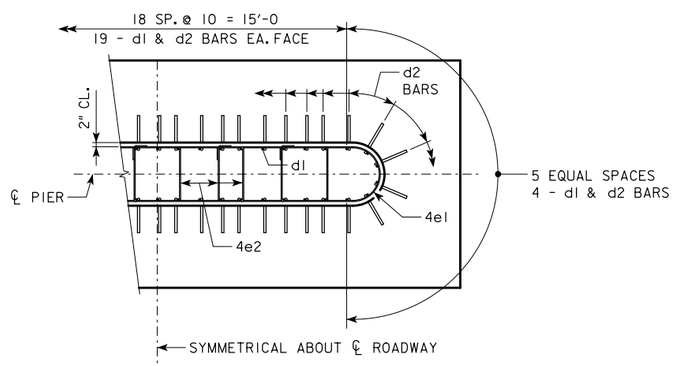


3'-6 x 9'-0 x 27'-0



3'-6 x 10'-0 x 29'-0

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 9' x 25'	d2	46 - #9 AS SHOWN	9'-5	1473	2990	29.2
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	31 - #6 @ 0'-9½	8'-8	404		
	g2	13 - #7 @ 0'-8½	24'-8	655		
3'-6 x 9' x 27'	d2	46 - #9 AS SHOWN	9'-5	1473	3531	31.5
	f1	27 - #5 @ 1'-0	8'-8	244		
	f2	9 - #5 @ 1'-0	26'-8	250		
	g1	28 - #7 @ 0'-11½	8'-8	496		
	g2	15 - #8 @ 0'-7	26'-8	1068		
3'-6 x 9' x 29'	d2	46 - #9 AS SHOWN	9'-5	1473	3918	33.8
	f1	29 - #5 @ 1'-0	8'-8	262		
	f2	9 - #5 @ 1'-0	28'-8	269		
	g1	31 - #7 @ 0'-11	8'-8	549		
	g2	14 - #9 @ 0'-7½	28'-8	1365		
3'-6 x 10' x 29'	d2	46 - #9 AS SHOWN	9'-5	1473	4494	37.6
	f1	29 - #5 @ 1'-0	9'-8	292		
	f2	10 - #5 @ 1'-0	28'-8	299		
	g1	32 - #8 @ 0'-11	9'-8	826		
	g2	13 - #10 @ 0'-9½	28'-8	1604		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-50-14.)

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 H44-50-14.

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).

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER - SPREAD FOOTINGS

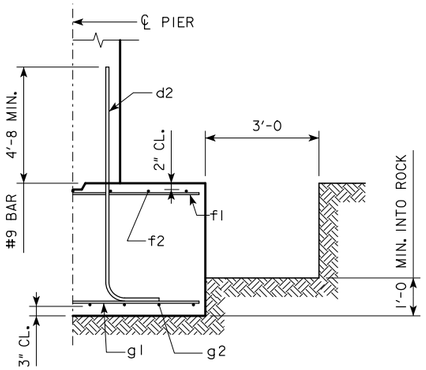
0° SKEW - H=16' TO 24'

H44-56-14

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10 151′-4	4′ x 9′ x 25′
	163′-10 176′-4	4′ x 9′ x 27′
	188′-10 201′-4	4′ x 9′ x 29′
	213′-10 226′-4	4′ x 9′ x 31′
	243′-0	4′ x 10′ x 31′
28 TO 30	138′-10	4′ x 9′ x 25′
	151′-4 163′-10 176′-4	4′ x 9′ x 27′
	188′-10	4′ x 9′ x 29′
	201′-4 213′-10 226′-4	4′ x 9′ x 31′
	243′-0	4′ x 10′ x 31′
31 TO 33	138′-10	4′ x 9′ x 25′
	151′-4 163′-10	4′ x 9′ x 27′
	176′-4 188′-10	4′ x 9′ x 29′
	201′-4 213′-10	4′ x 9′ x 31′
	226′-4 243′-0	4′ x 10′ x 31′
34 TO 36	138′-10 151′-4 163′-10	4′ x 9′ x 27′
	176′-4 188′-10	4′ x 9′ x 29′
	201′-4 213′-10	4′ x 9′ x 31′
	226′-4 243′-0	4′ x 10′ x 31′
37 TO 40	138′-10 151′-4	4′ x 9′ x 27′
	163′-10 176′-4 188′-10	4′ x 9′ x 29′
	201′-4	4′ x 9′ x 31′
	213′-10 226′-4 243′-0	4′ x 10′ x 31′

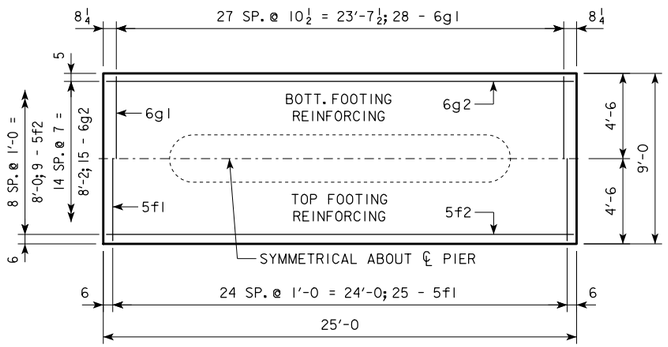
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

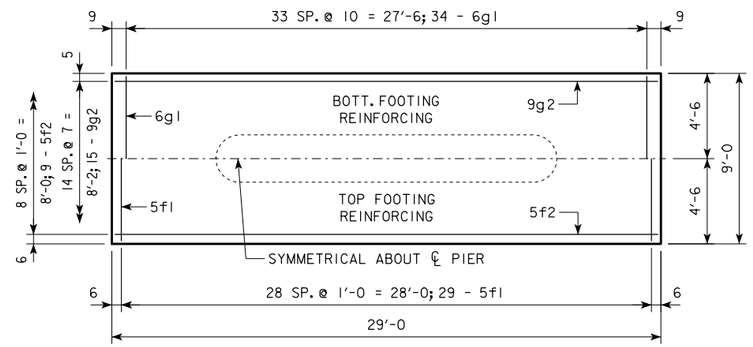


TYPICAL SECTION

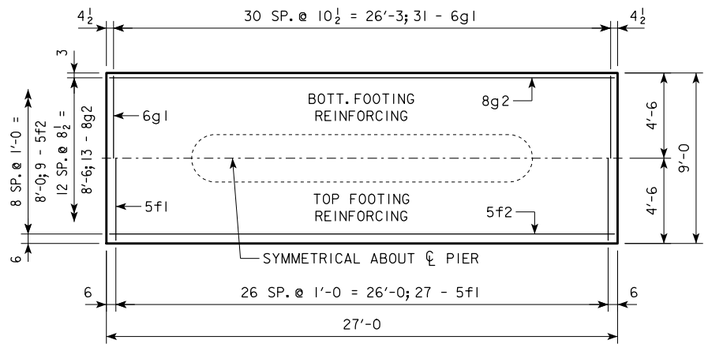
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4′ x 9′ x 25′	d2	46 - #9 AS SHOWN	9′-11	1551	2929	33.3
	f1	25 - #5 @ 1′-0	8′-8	226		
	f2	9 - #5 @ 1′-0	24′-8	232		
	g1	28 - #6 @ 0′-10½	8′-8	364		
	g2	15 - #6 @ 0′-7	24′-8	556		
4′ x 9′ x 27′	d2	46 - #9 AS SHOWN	9′-11	1551	3375	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	13 - #8 @ 0′-8½	26′-8	926		
4′ x 9′ x 29′	d2	46 - #9 AS SHOWN	9′-11	1551	3987	38.7
	f1	29 - #5 @ 1′-0	8′-8	262		
	f2	9 - #5 @ 1′-0	28′-8	269		
	g1	34 - #6 @ 0′-10	8′-8	443		
	g2	15 - #9 @ 0′-7	28′-8	1462		
4′ x 9′ x 31′	d2	46 - #9 AS SHOWN	9′-11	1551	4269	41.3
	f1	31 - #5 @ 1′-0	8′-8	280		
	f2	9 - #5 @ 1′-0	30′-8	288		
	g1	37 - #6 @ 0′-10	8′-8	482		
	g2	16 - #9 @ 0′-6½	30′-8	1668		
4′ x 10′ x 31′	d2	46 - #9 AS SHOWN	9′-11	1551	4963	45.9
	f1	31 - #5 @ 1′-0	9′-8	313		
	f2	10 - #5 @ 1′-0	30′-8	320		
	g1	31 - #8 @ 1′-0	9′-8	800		
	g2	15 - #10 @ 0′-8	30′-8	1979		



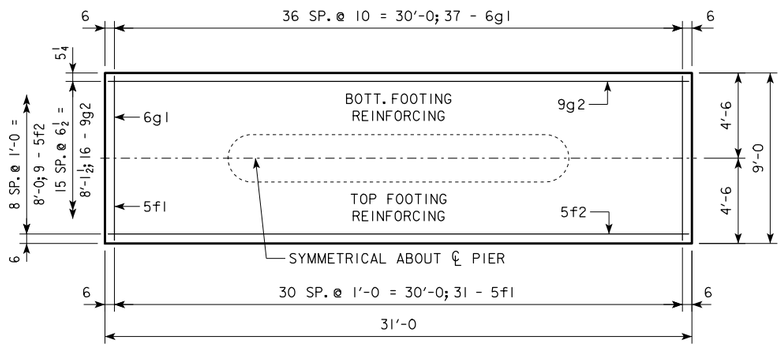
4′-0 x 9′-0 x 25′-0



4′-0 x 9′-0 x 29′-0



4′-0 x 9′-0 x 27′-0

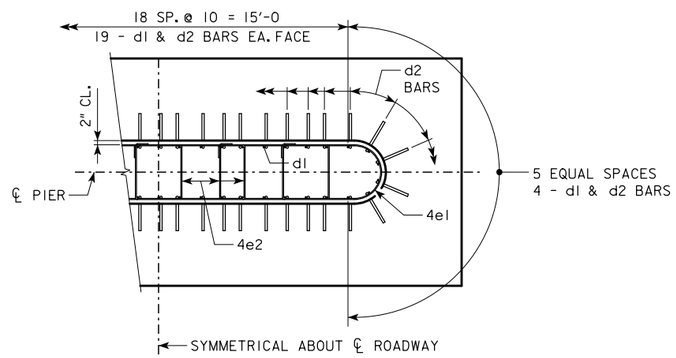


4′-0 x 9′-0 x 31′-0

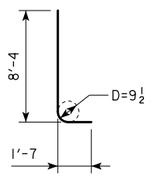
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H44-50-14.

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).

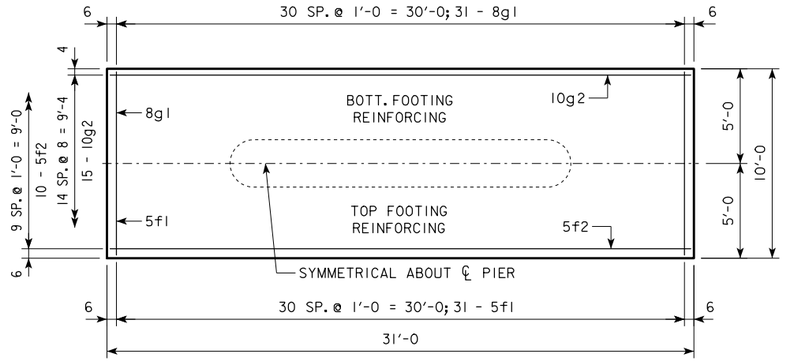


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-50-14.)



d2

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



4′-0 x 10′-0 x 31′-0

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

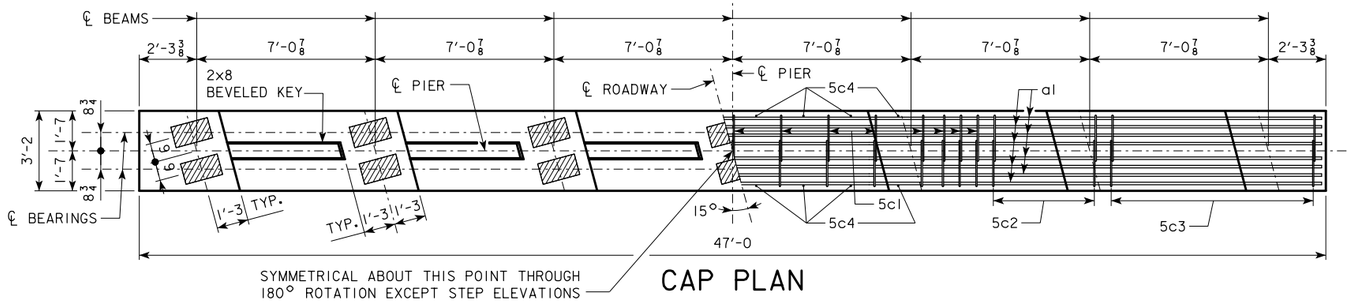
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

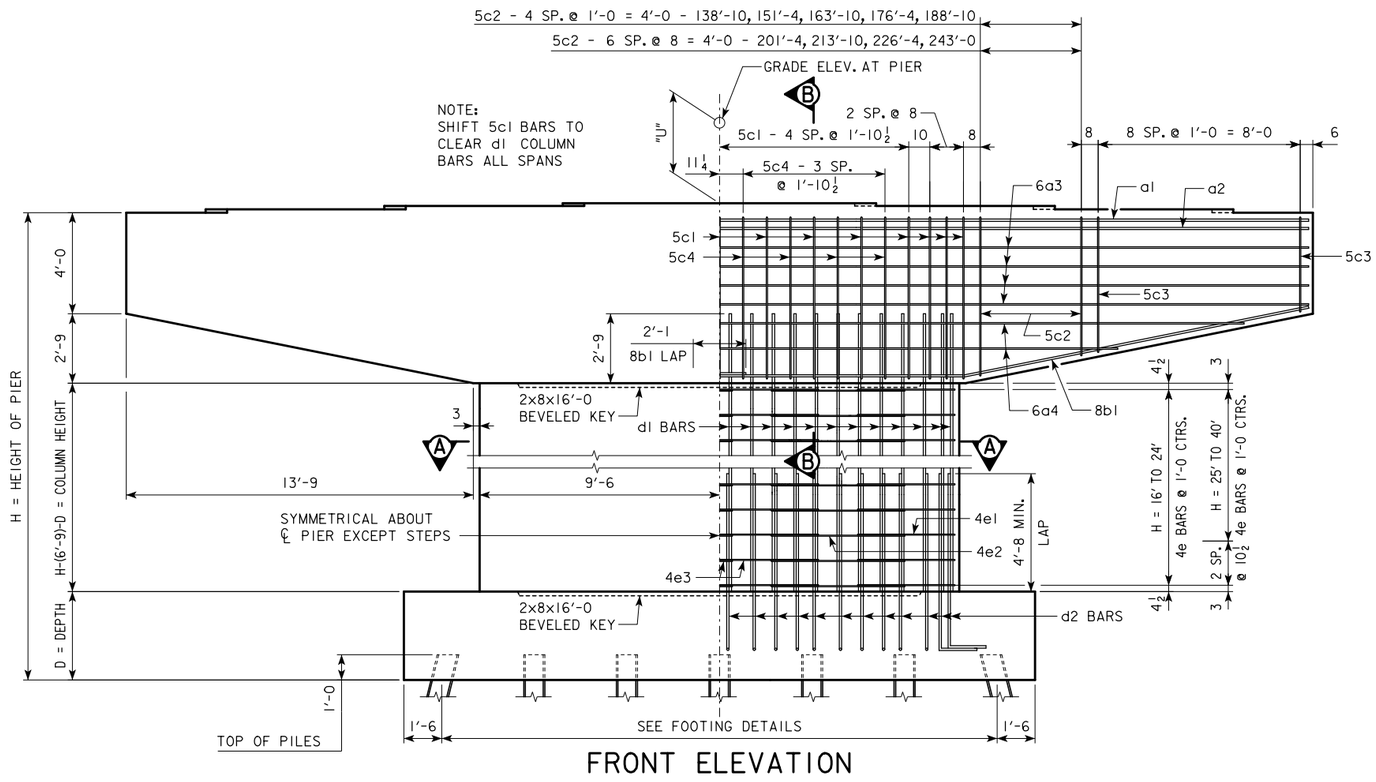
TEE PIER - SPREAD FOOTINGS

0° SKEW - H=25′ TO 40′

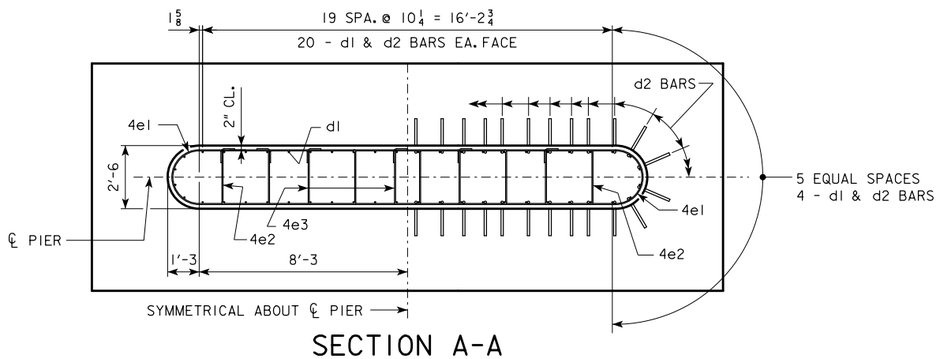
H44-57-14



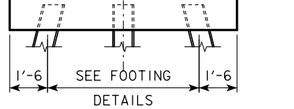
CAP PLAN



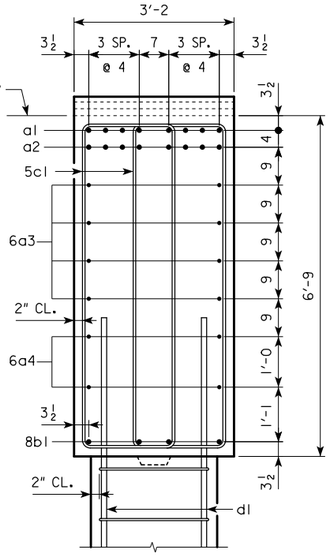
FRONT ELEVATION



SECTION A-A



END ELEVATION



SECTION B-B

PIER NOTES:

SEE "TEE PIER NOTES" ON H44-02-14 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.

FOR SIZE OF BEARING PADS, SEE H44-37-14.

SEE SHEET H44-15-14 FOR "U" DIMENSION.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

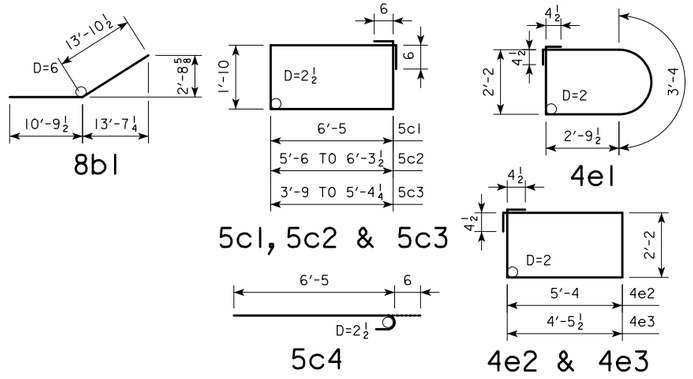
SEPTEMBER, 2014

TEE PIER CAP AND COLUMN

15° SKEW

H44-58-14

BENT BAR DETAILS



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

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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	46'-8	———	8	9	1269	8	9	1269	8	9	1269	8	9	1269	8	10	1606	8	10	1606	8	10	1606	8	10	1606	8	11	1984
a2	46'-8	———	8	8	997	8	8	997	8	9	1269	8	9	1269	8	9	1269	8	9	1269	8	10	1606	8	10	1606	8	10	1606
6a3	46'-8	———	8	6	561	8	6	561	8	6	561	8	6	561	8	6	561	8	6	561	8	6	561	8	6	561	8	6	561
6a4	VARIES	———	4	6	220	4	6	220	4	6	220	4	6	220	4	6	220	4	6	220	4	6	220	4	6	220	4	6	220
8b1	24'-8		8	8	527	8	8	527	8	8	527	8	8	527	8	8	527	8	8	527	8	8	527	8	8	527	8	8	527
5c1	17'-6	□	30	5	548	30	5	548	30	5	548	30	5	548	30	5	548	30	5	548	30	5	548	30	5	548	30	5	548
5c2	VARIES	□	20	5	343	20	5	343	20	5	343	20	5	343	20	5	343	28	5	481	28	5	481	28	5	481	28	5	481
5c3	VARIES	□	36	5	517	36	5	517	36	5	517	36	5	517	36	5	517	36	5	517	36	5	517	36	5	517	36	5	517
5c4	6'-11	⌐	16	5	115	16	5	115	16	5	115	16	5	115	16	5	115	16	5	115	16	5	115	16	5	115	16	5	115
① TOTAL (LB.)			5097			5097			5369			5369			5706			5844			6181			6181			6559		
STRUCTURAL CONCRETE (CY)			34.1			34.1			34.1			34.1			34.1			34.1			34.1			34.1			34.1		

COLUMN

H IN FEET	COLUMN HEIGHT	STRUCTURAL CONCRETE (CY)	REINFORCING STEEL																TOTAL WEIGHT (LB.)
			d1 BAR ———				4e1 BAR ⌐				4e2 BAR □				4e3 BAR □				
			NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	
16	5'-9	9.8	48	9	8'-6	1387	12	4	11'-10	95	12	4	15'-9	126	12	4	14'-0	112	1720
17	6'-9	11.5	48	9	9'-6	1550	14	4	11'-10	111	14	4	15'-9	147	14	4	14'-0	131	1939
18	7'-9	13.2	48	9	10'-6	1714	16	4	11'-10	126	16	4	15'-9	168	16	4	14'-0	150	2158
19	8'-9	15.0	48	9	11'-6	1877	18	4	11'-10	142	18	4	15'-9	189	18	4	14'-0	168	2376
20	9'-9	16.7	48	9	12'-6	2040	20	4	11'-10	158	20	4	15'-9	210	20	4	14'-0	187	2595
21	10'-9	18.4	48	9	13'-6	2203	22	4	11'-10	174	22	4	15'-9	231	22	4	14'-0	206	2814
22	11'-9	20.1	48	9	14'-6	2366	24	4	11'-10	190	24	4	15'-9	253	24	4	14'-0	224	3033
23	12'-9	21.8	48	9	15'-6	2530	26	4	11'-10	206	26	4	15'-9	274	26	4	14'-0	243	3253
24	13'-9	23.5	48	9	16'-6	2693	28	4	11'-10	221	28	4	15'-9	295	28	4	14'-0	262	3471
25	14'-3	24.4	48	9	17'-0	2774	30	4	11'-10	237	30	4	15'-9	316	30	4	14'-0	281	3608
26	15'-3	26.1	48	9	18'-0	2938	32	4	11'-10	253	32	4	15'-9	337	32	4	14'-0	299	3827
27	16'-3	27.8	48	9	19'-0	3101	34	4	11'-10	269	34	4	15'-9	358	34	4	14'-0	318	4046
28	17'-3	29.5	48	9	20'-0	3264	36	4	11'-10	285	36	4	15'-9	379	36	4	14'-0	337	4265
29	18'-3	31.2	48	9	21'-0	3427	38	4	11'-10	300	38	4	15'-9	400	38	4	14'-0	355	4482
30	19'-3	32.9	48	9	22'-0	3590	40	4	11'-10	316	40	4	15'-9	421	40	4	14'-0	374	4701
31	20'-3	34.6	48	9	23'-0	3754	42	4	11'-10	332	42	4	15'-9	442	42	4	14'-0	393	4921
32	21'-3	36.3	48	9	24'-0	3917	44	4	11'-10	348	44	4	15'-9	463	44	4	14'-0	411	5139
33	22'-3	38.0	48	9	25'-0	4080	46	4	11'-10	364	46	4	15'-9	484	46	4	14'-0	430	5358
34	23'-3	39.7	48	9	26'-0	4243	48	4	11'-10	379	48	4	15'-9	505	48	4	14'-0	449	5576
35	24'-3	41.5	48	9	27'-0	4406	50	4	11'-10	395	50	4	15'-9	526	50	4	14'-0	468	5795
36	25'-3	43.2	48	9	28'-0	4570	52	4	11'-10	411	52	4	15'-9	547	52	4	14'-0	486	6014
37	26'-3	44.9	48	9	29'-0	4733	54	4	11'-10	427	54	4	15'-9	568	54	4	14'-0	505	6233
38	27'-3	46.6	48	9	30'-0	4896	56	4	11'-10	443	56	4	15'-9	589	56	4	14'-0	524	6452
39	28'-3	48.3	48	9	31'-0	5059	58	4	11'-10	458	58	4	15'-9	610	58	4	14'-0	542	6669
40	29'-3	50.0	48	9	32'-0	5222	60	4	11'-10	474	60	4	15'-9	631	60	4	14'-0	561	6888

① SEE SHEET H44-17-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

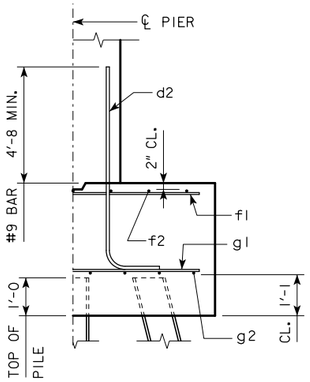
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

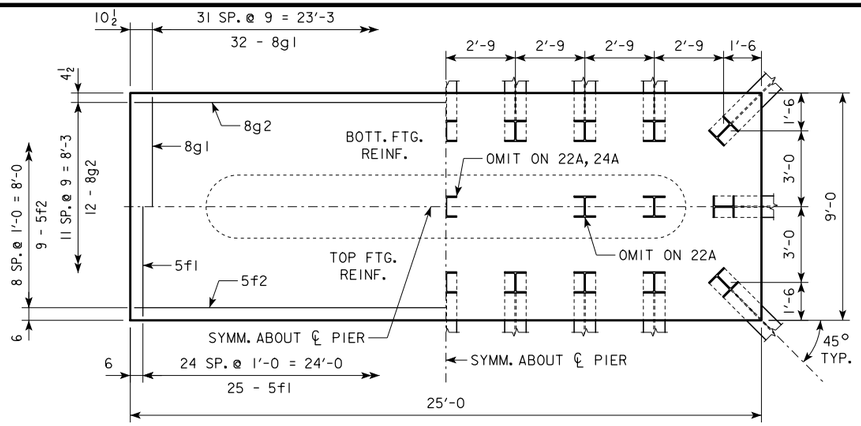
TEE PIER CAP AND COLUMN

15° SKEW

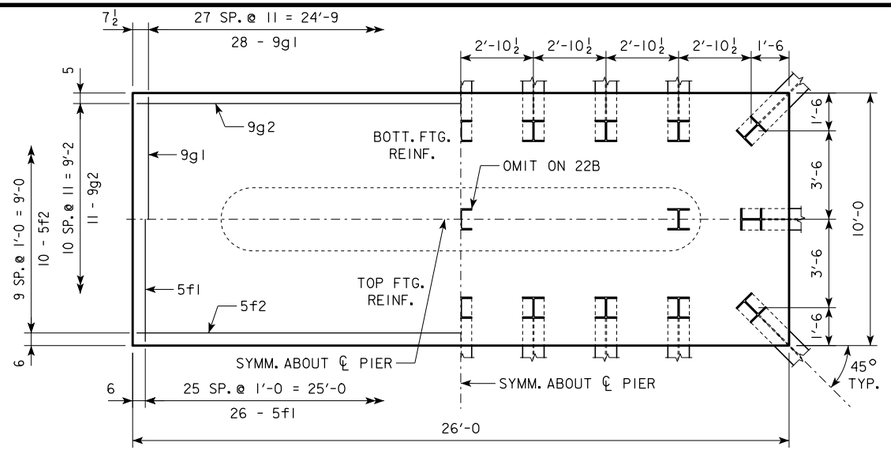
H44-59-14



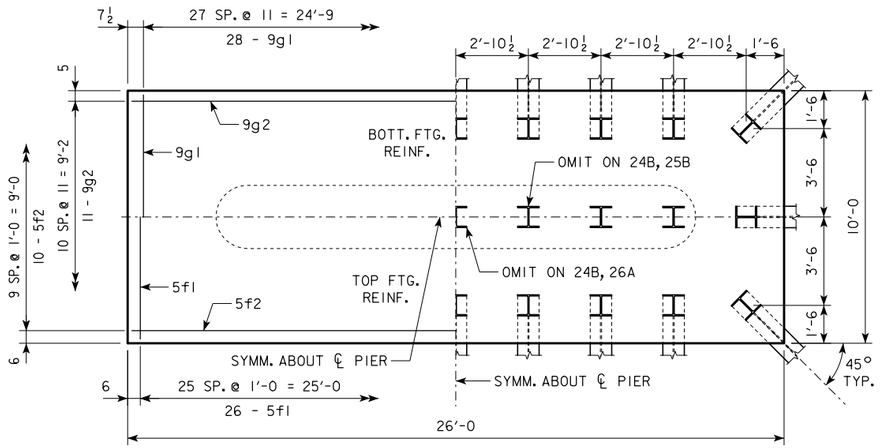
TYPICAL SECTION



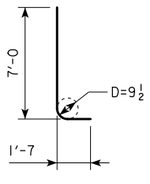
3'-6 x 9'-0 x 25'-0 FOR 22A, 24A & 25A



3'-6 x 10'-0 x 26'-0 FOR 22B & 23A



3'-6 x 10'-0 x 26'-0 FOR 24B, 25B & 26A



d2

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

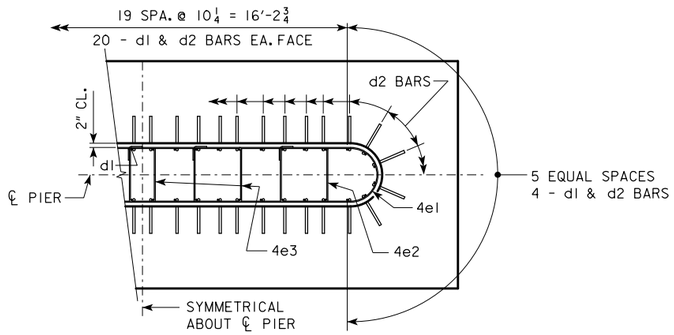
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	22A	140	3'-6 x 9' x 25'
	213'-10	22A	146	
	226'-4	24A	143	
	243'-0	25A	145	
19 TO 21	201'-4	22B	140	3'-6 x 10' x 26'
	213'-10	22B	146	
	226'-4	24B	142	
	243'-0	25B	145	
22 TO 24	201'-4	22B	143	3'-6 x 10' x 26'
	213'-10	23A	144	
	226'-4	24B	145	
	243'-0	26A	143	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 9' x 25'	d2	48 - #9 AS SHOWN	8'-7	1401	3389	29.2
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	32 - #8 @ 0'-9	8'-8	740		
	g2	12 - #8 @ 0'-9	24'-8	790		
3'-6 x 10' x 26'	d2	48 - #9 AS SHOWN	8'-7	1401	3811	33.7
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	28 - #9 @ 0'-11	9'-8	920		
	g2	11 - #9 @ 0'-11	25'-8	960		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)

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 H44-58-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

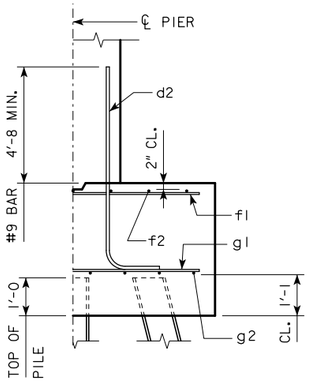
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

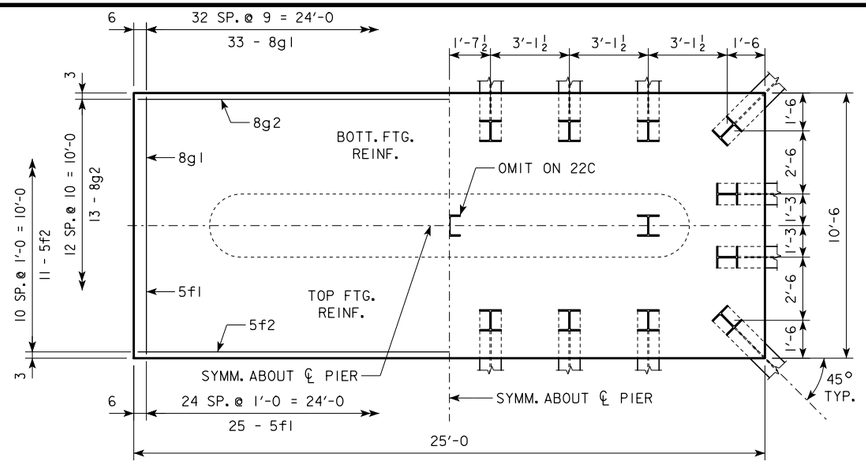
TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

15° SKEW - H=16' TO 24'

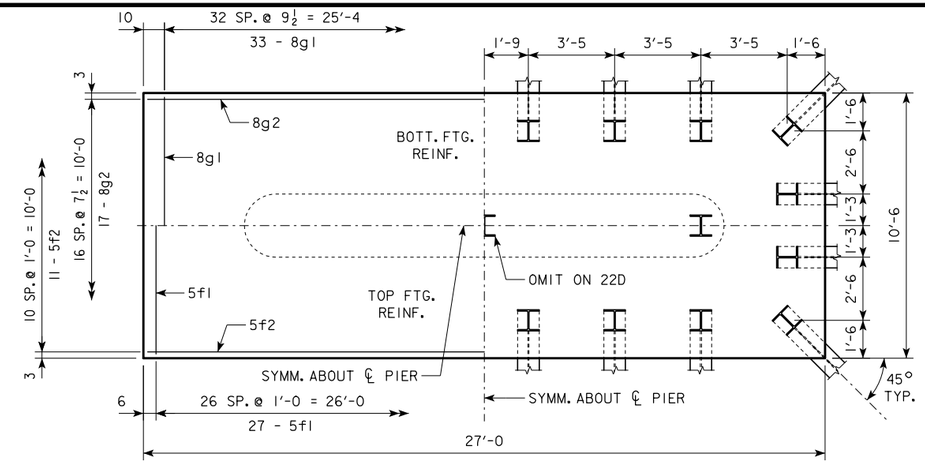
H44-60-14



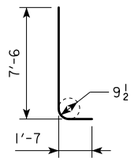
TYPICAL SECTION



4'-0 x 10'-6 x 25'-0 FOR 22C & 23B



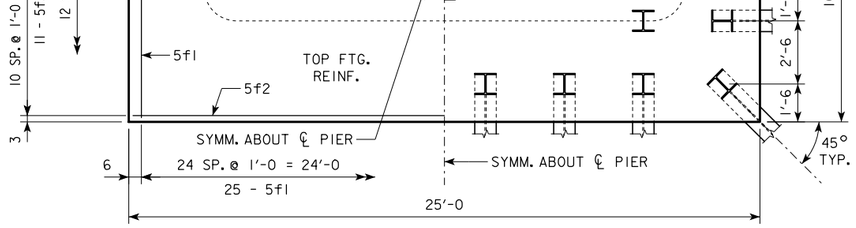
4'-0 x 10'-6 x 27'-0 FOR 22D & 23C



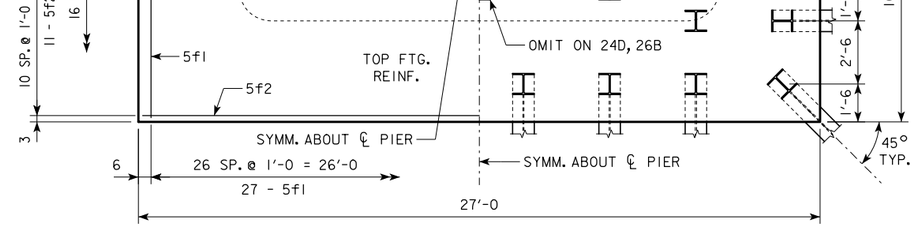
d2

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. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	22C	143	4' x 10'-6 x 25'
	213'-10	23B	144	
	226'-4	24C	142	
	243'-0	25C	144	
28 TO 30	201'-4	22D	142	4' x 10'-6 x 27'
	213'-10	23C	143	
	226'-4	24D	142	
	243'-0	25D	143	
31 TO 33	201'-4	22D	144	4' x 10'-6 x 27'
	213'-10	23C	145	
	226'-4	24D	144	
	243'-0	25D	145	
34 TO 36	201'-4	22D	146	4' x 10'-6 x 27'
	213'-10	24D	140	
	226'-4	24D	145	
	243'-0	26B	142	
37 TO 40	201'-4	23C	145	4' x 10'-6 x 27'
	213'-10	24D	142	
	226'-4	25D	144	
	243'-0	26B	145	



4'-0 x 10'-6 x 25'-0 FOR 24C & 25C



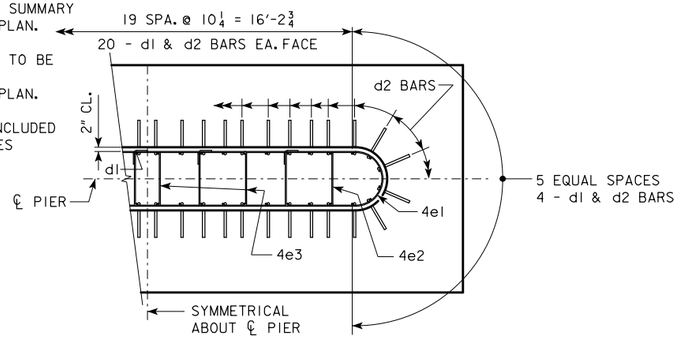
4'-0 x 10'-6 x 27'-0 FOR 24D, 25D & 26B

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 10'-6 x 25'	d2	48 - #9 AS SHOWN	9'-1	1482	3782	38.9
	f1	25 - #5 @ 1'-0	10'-2	265		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	33 - #8 @ 0'-9	10'-2	896		
	g2	13 - #8 @ 0'-10	24'-8	856		
4' x 10'-6 x 27'	d2	48 - #9 AS SHOWN	9'-1	1482	4180	42.0
	f1	27 - #5 @ 1'-0	10'-2	286		
	f2	11 - #5 @ 1'-0	26'-8	306		
	g1	33 - #8 @ 0'-9½	10'-2	896		
	g2	17 - #8 @ 0'-7½	26'-8	1210		

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)

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 H44-58-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

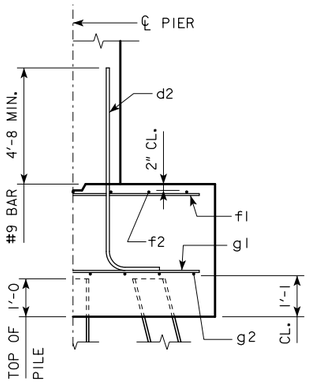
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

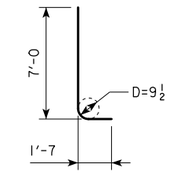
TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS

15° SKEW - H=25' TO 40'

H44-61-14



TYPICAL SECTION



d2

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

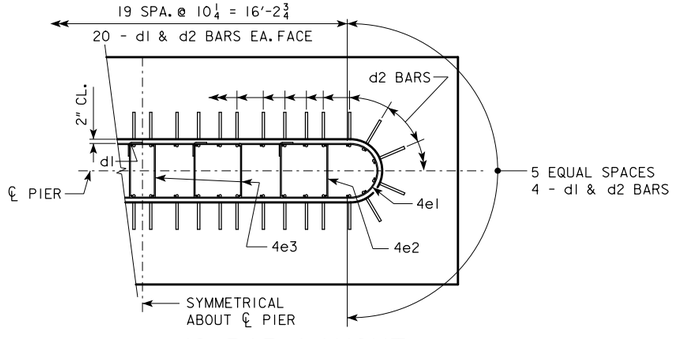
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

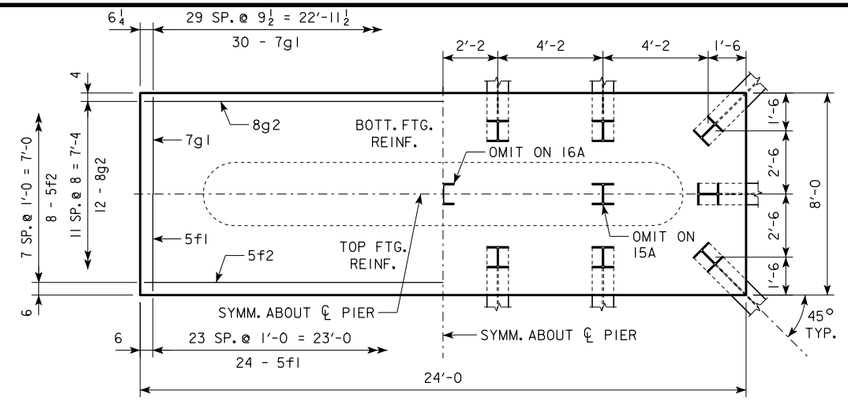
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	15A	207	3'-6 x 8' x 24'
	213'-10	15A	215	
	226'-4	16A	211	
	243'-0	16A	220	
19 TO 21	201'-4	15A	212	3'-6 x 8' x 24'
	213'-10	15A	220	
	226'-4	16A	215	
	243'-0	17A	216	
22 TO 24	201'-4	15A	216	3'-6 x 8' x 24'
	213'-10	16A	210	
	226'-4	16A	219	
	243'-0	18A	212	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 8' x 24'	d2	48 - #9 AS SHOWN	8'-7	1401	3018	24.9
	f1	24 - #5 @ 1'-0	7'-8	192		
	f2	8 - #5 @ 1'-0	23'-8	197		
	g1	30 - #7 @ 0'-9½	7'-8	470		
	g2	12 - #8 @ 0'-8	23'-8	758		

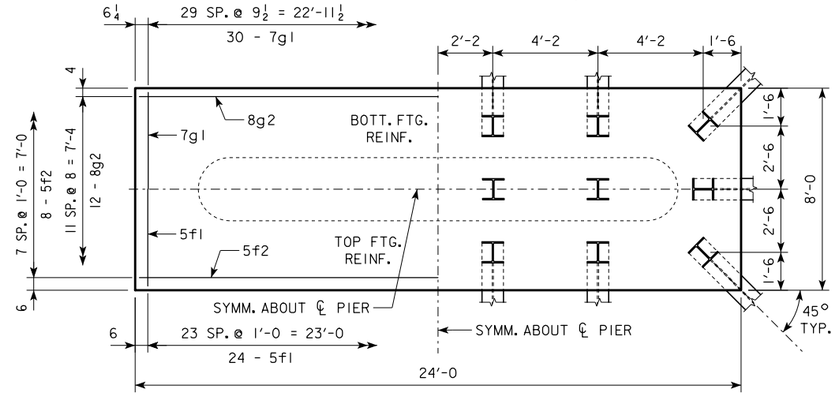


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)

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 24'-0 FOR 15A, 16A & 17A



3'-6 x 8'-0 x 24'-0 FOR 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 H44-58-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

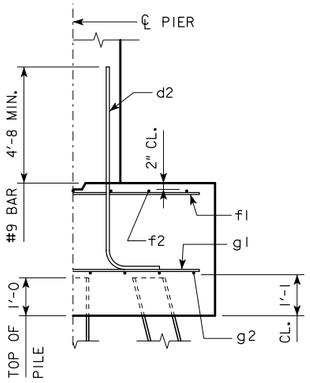
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

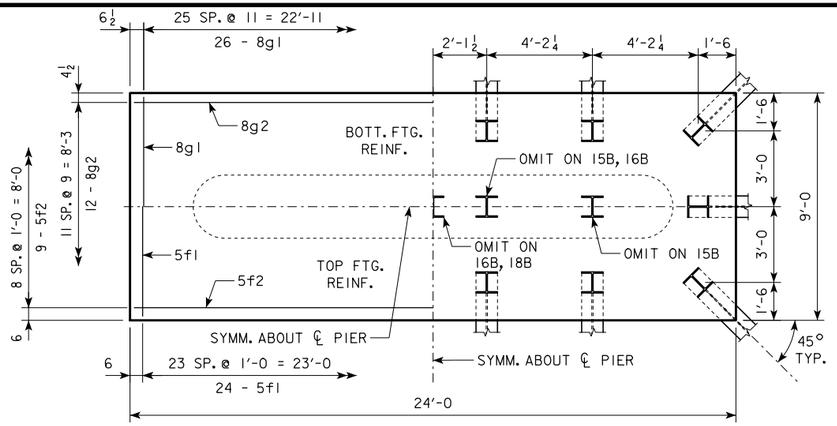
TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

15° SKEW - H=16' TO 24'

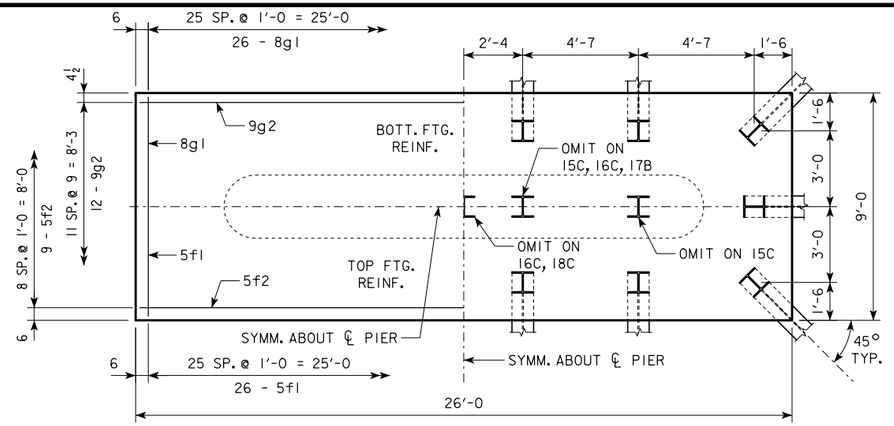
H44-62-14



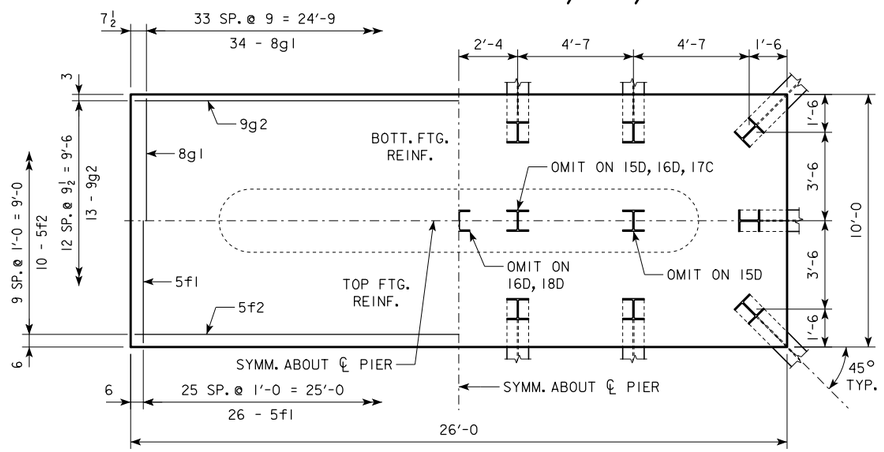
TYPICAL SECTION



4'-0 x 9'-0 x 24'-0 FOR 15B, 16B & 18B



4'-0 x 9'-0 x 26'-0 FOR 15C, 16C, 17B & 18C



4'-0 x 10'-0 x 26'-0 FOR 15D, 16D, 17C & 18D

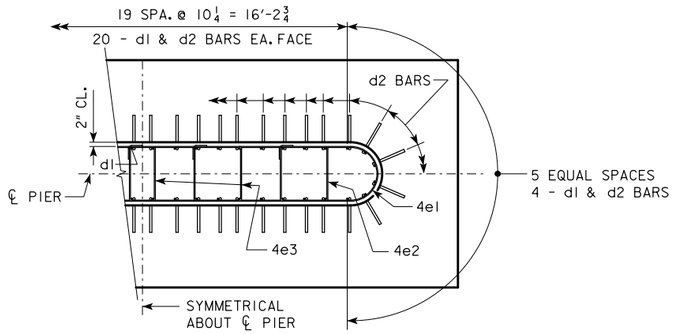
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

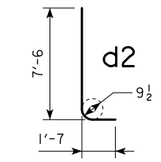
H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	15B	217	4' x 9' x 24'
	213'-10	16B	210	
	226'-4	16B	220	
	243'-0	18B	213	
28 TO 30	201'-4	15C	215	4' x 9' x 26'
	213'-10	16C	209	
	226'-4	16C	218	
	243'-0	18C	210	
31 TO 33	201'-4	15C	218	4' x 9' x 26'
	213'-10	16C	212	
	226'-4	17B	213	
	243'-0	18C	213	
34 TO 36	201'-4	15D	219	4' x 10' x 26'
	213'-10	16D	212	
	226'-4	17C	213	
	243'-0	18D	213	
37 TO 40	201'-4	16D	209	4' x 10' x 26'
	213'-10	16D	216	
	226'-4	17C	217	
	243'-0	18D	217	

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	48 - #9 AS SHOWN	9'-1	1482	3281	32.0
	f1	24 - #5 @ 1'-0	8'-8	217		
	f2	9 - #5 @ 1'-0	23'-8	222		
	g1	26 - #8 @ 0'-11	8'-8	602		
	g2	12 - #9 @ 0'-9	23'-8	758		
4' x 9' x 26'	d2	48 - #9 AS SHOWN	9'-1	1482	3607	34.7
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	26 - #8 @ 1'-0	8'-8	602		
	g2	12 - #9 @ 0'-9	25'-8	1047		
4' x 10' x 26'	d2	48 - #9 AS SHOWN	9'-1	1482	4024	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	34 - #8 @ 0'-9	9'-8	878		
	g2	13 - #9 @ 0'-9½	25'-8	1134		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)

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



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 H44-58-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

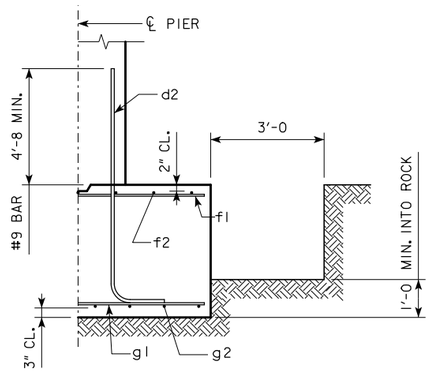
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

15° SKEW - H=25' TO 40'

H44-63-14

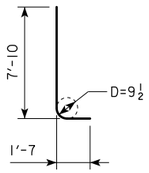


TYPICAL SECTION

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4 163'-10 176'-4	3'-6 x 9' x 26'
	188'-10	3'-6 x 9' x 28'
	201'-4 213'-10 226'-4	3'-6 x 9' x 30'
	243'-0	3'-6 x 10' x 30'
19 TO 21	138'-10 151'-4 163'-10	3'-6 x 9' x 26'
	176'-4 188'-10	3'-6 x 9' x 28'
	201'-4 213'-10	3'-6 x 9' x 30'
	226'-4 243'-0	3'-6 x 10' x 30'
22 TO 24	138'-10 151'-4	3'-6 x 9' x 26'
	163'-10 176'-4 188'-10	3'-6 x 9' x 28'
	201'-4 213'-10	3'-6 x 9' x 30'
	226'-4 243'-0	3'-6 x 10' x 30'

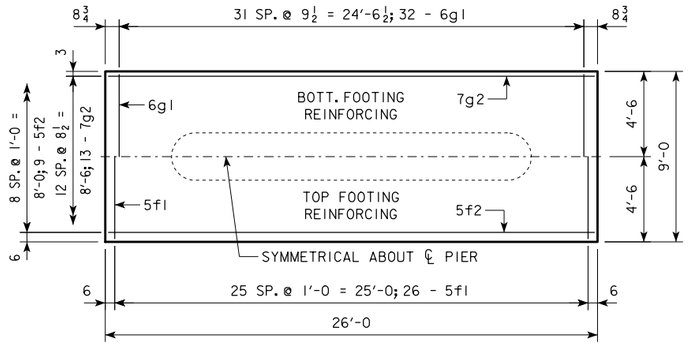
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

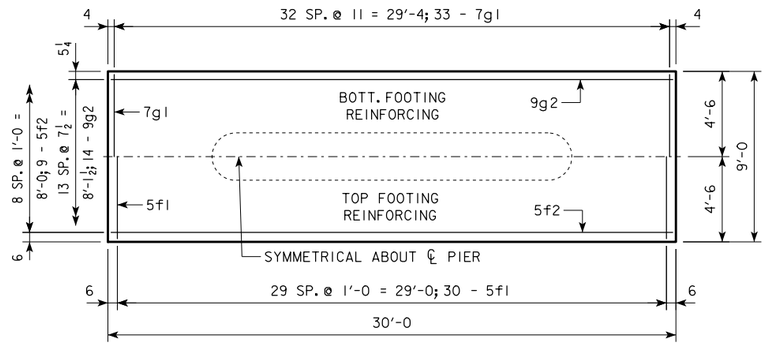


d2

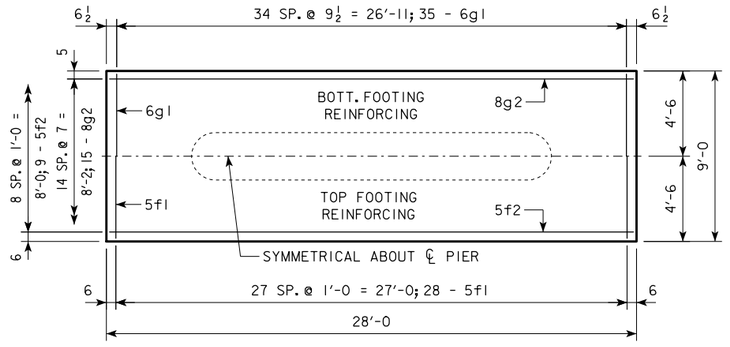
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.



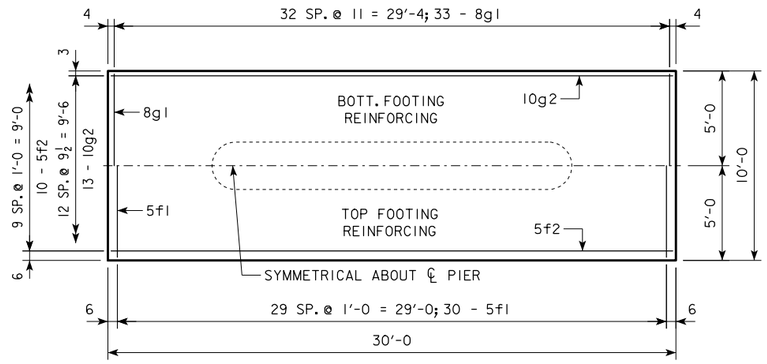
3'-6 x 9'-0 x 26'-0



3'-6 x 9'-0 x 30'-0

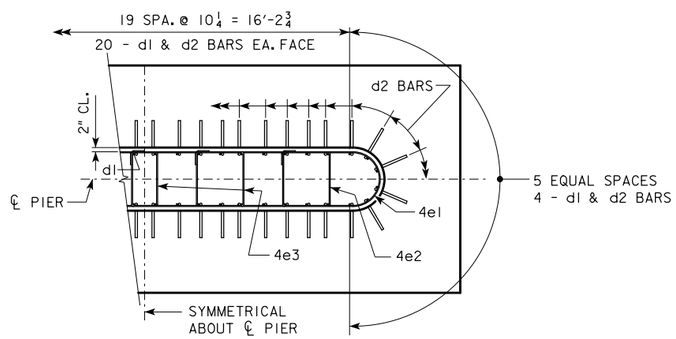


3'-6 x 9'-0 x 28'-0



3'-6 x 10'-0 x 30'-0

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 9' x 26'	d2	48 - #9 AS SHOWN	9'-5	1537	3112	30.3
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	32 - #6 @ 0'-9½	8'-8	417		
	g2	13 - #7 @ 0'-8½	25'-8	682		
3'-6 x 9' x 28'	d2	48 - #9 AS SHOWN	9'-5	1537	3614	32.7
	f1	28 - #5 @ 1'-0	8'-8	253		
	f2	9 - #5 @ 1'-0	27'-8	260		
	g1	35 - #6 @ 0'-9½	8'-8	456		
	g2	15 - #8 @ 0'-7	27'-8	1108		
3'-6 x 9' x 30'	d2	48 - #9 AS SHOWN	9'-5	1537	4083	35.0
	f1	30 - #5 @ 1'-0	8'-8	271		
	f2	9 - #5 @ 1'-0	29'-8	278		
	g1	33 - #7 @ 0'-11	8'-8	585		
	g2	14 - #9 @ 0'-7½	29'-8	1412		
3'-6 x 10' x 30'	d2	48 - #9 AS SHOWN	9'-5	1537	4660	38.9
	f1	30 - #5 @ 1'-0	9'-8	302		
	f2	10 - #5 @ 1'-0	29'-8	309		
	g1	33 - #8 @ 0'-11	9'-8	852		
	g2	13 - #10 @ 0'-9½	29'-8	1660		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)

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 H44-58-14.

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).

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER - SPREAD FOOTINGS

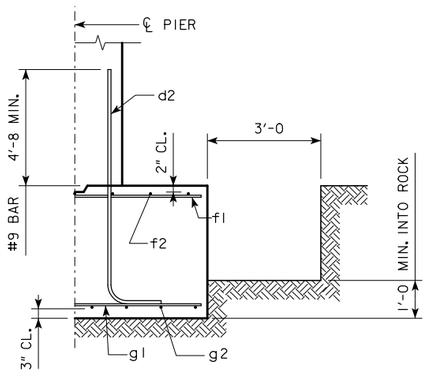
15° SKEW - H=16' TO 24'

H44-64-14

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10	4′ x 9′ x 25′
	151′-4 163′-10	4′ x 9′ x 27′
	176′-4 188′-10	4′ x 9′ x 29′
	201′-4 213′-10	4′ x 9′ x 31′
	226′-4 243′-0	4′ x 10′ x 31′
28 TO 30	138′-10 151′-4 163′-10	4′ x 9′ x 27′
	176′-4 188′-10	4′ x 9′ x 29′
	201′-4 213′-10	4′ x 9′ x 31′
	226′-4 243′-0	4′ x 10′ x 31′
31 TO 33	138′-10 151′-4	4′ x 9′ x 27′
	163′-10 176′-4 188′-10	4′ x 9′ x 29′
	201′-4	4′ x 9′ x 31′
	213′-10 226′-4 243′-0	4′ x 10′ x 31′
34 TO 36	138′-10 151′-4	4′ x 9′ x 27′
	163′-10 176′-4	4′ x 9′ x 29′
	188′-10 201′-4	4′ x 9′ x 31′
	213′-10 226′-4 243′-0	4′ x 10′ x 31′
37 TO 40	138′-10	4′ x 9′ x 27′
	151′-4 163′-10	4′ x 9′ x 29′
	176′-4 188′-10	4′ x 9′ x 31′
	201′-4 213′-10 226′-4 243′-0	4′ x 10′ x 31′

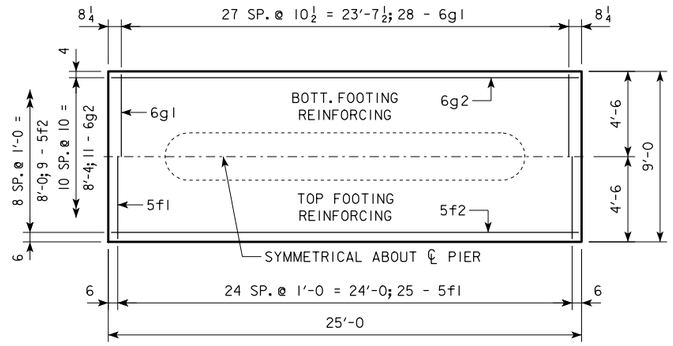
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

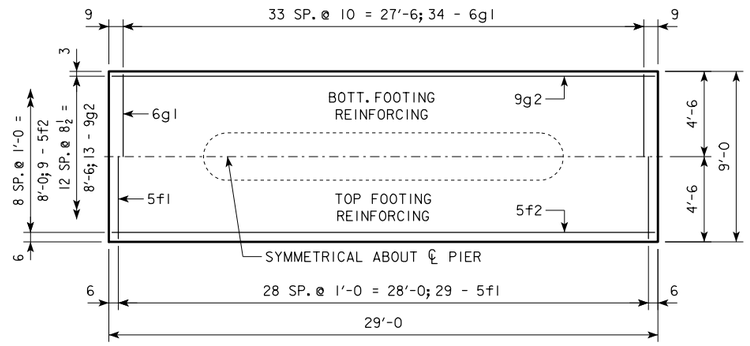


TYPICAL SECTION

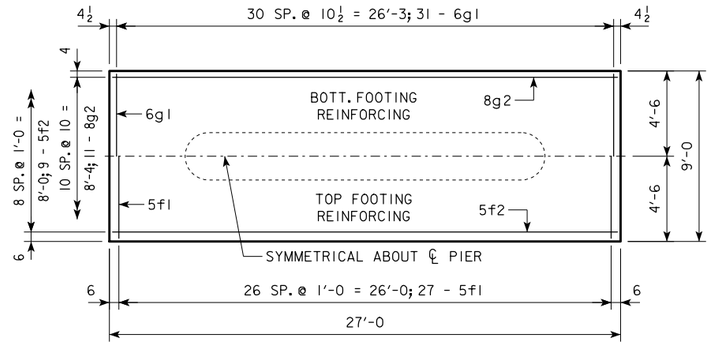
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4′ x 9′ x 25′	d2	48 - #9 AS SHOWN	9′-11	1618	2848	33.3
	f1	25 - #5 @ 1′-0	8′-8	226		
	f2	9 - #5 @ 1′-0	24′-8	232		
	g1	28 - #6 @ 0′-10½	8′-8	364		
	g2	11 - #6 @ 0′-10	24′-8	408		
4′ x 9′ x 27′	d2	48 - #9 AS SHOWN	9′-11	1618	3299	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	11 - #8 @ 0′-10	26′-8	783		
4′ x 9′ x 29′	d2	48 - #9 AS SHOWN	9′-11	1618	3859	38.7
	f1	29 - #5 @ 1′-0	8′-8	262		
	f2	9 - #5 @ 1′-0	28′-8	269		
	g1	34 - #6 @ 0′-10	8′-8	443		
	g2	13 - #9 @ 0′-8½	28′-8	1267		
4′ x 9′ x 31′	d2	48 - #9 AS SHOWN	9′-11	1618	4252	41.3
	f1	31 - #5 @ 1′-0	8′-8	280		
	f2	9 - #5 @ 1′-0	30′-8	288		
	g1	37 - #6 @ 0′-10	8′-8	482		
	g2	12 - #10 @ 0′-9	30′-8	1584		
4′ x 10′ x 31′	d2	48 - #9 AS SHOWN	9′-11	1618	4898	45.9
	f1	31 - #5 @ 1′-0	9′-8	313		
	f2	10 - #5 @ 1′-0	30′-8	320		
	g1	31 - #8 @ 1′-0	9′-8	800		
	g2	14 - #10 @ 0′-8½	30′-8	1847		



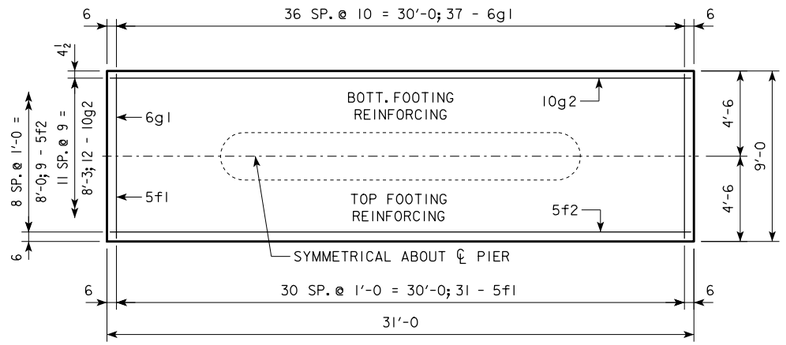
4′-0 x 9′-0 x 25′-0



4′-0 x 9′-0 x 29′-0



4′-0 x 9′-0 x 27′-0



4′-0 x 9′-0 x 31′-0

FOOTING NOTES:

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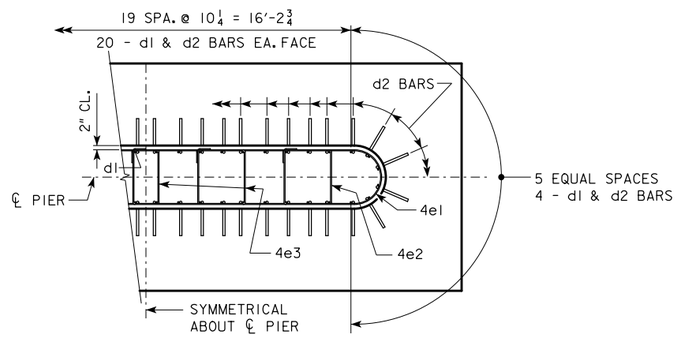
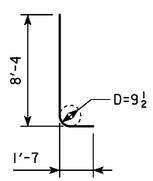
THESE SPREAD FOOTINGS SHALL EXTEND AT LEAST 12 INCHES INTO SUITABLE FOUNDATION ROCK AND THE LAST 12 INCHES OF ROCK EXCAVATION SHALL BE TO NEAT LINES OF MASONRY. THE FOUNDATION ROCK SHALL HAVE A MINIMUM LRFD NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE SERVICE LOAD BEARING VALUE OF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

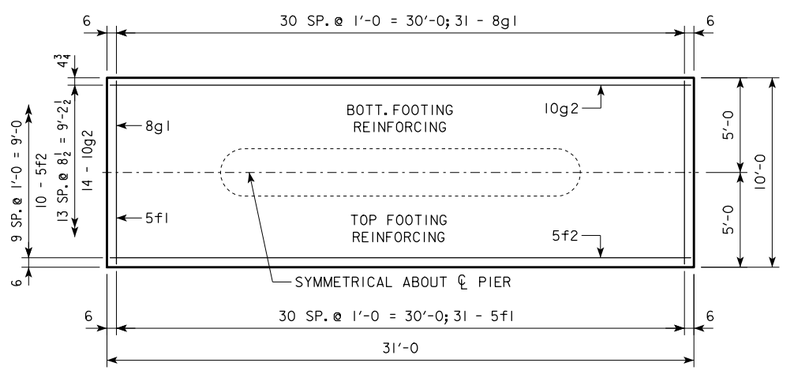


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-58-14.)



d2

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



4′-0 x 10′-0 x 31′-0

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

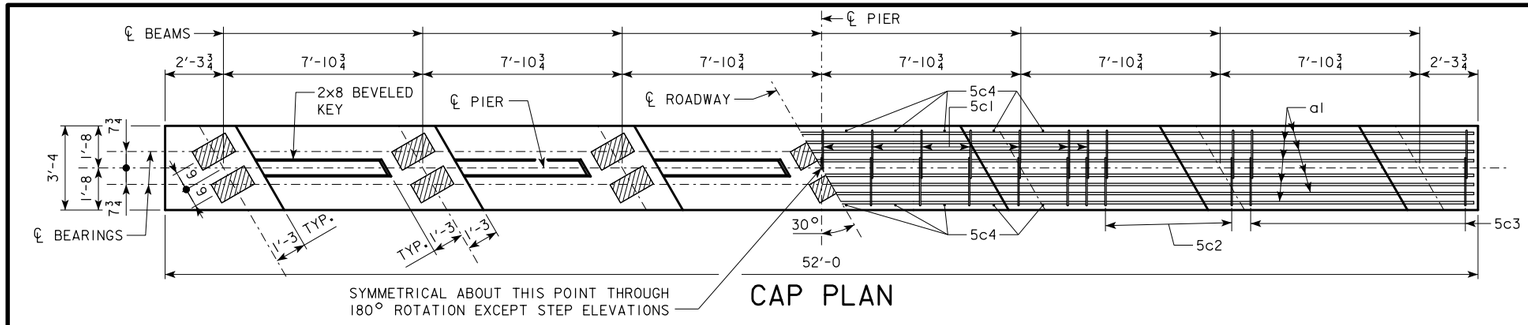
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

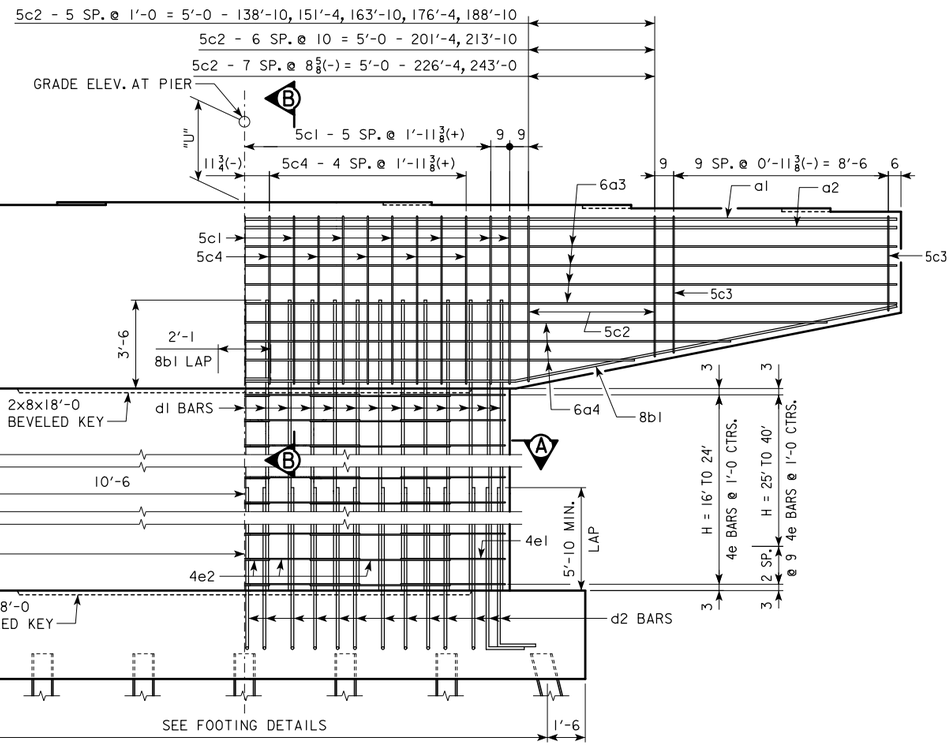
TEE PIER - SPREAD FOOTINGS

15° SKEW - H=25′ TO 40′

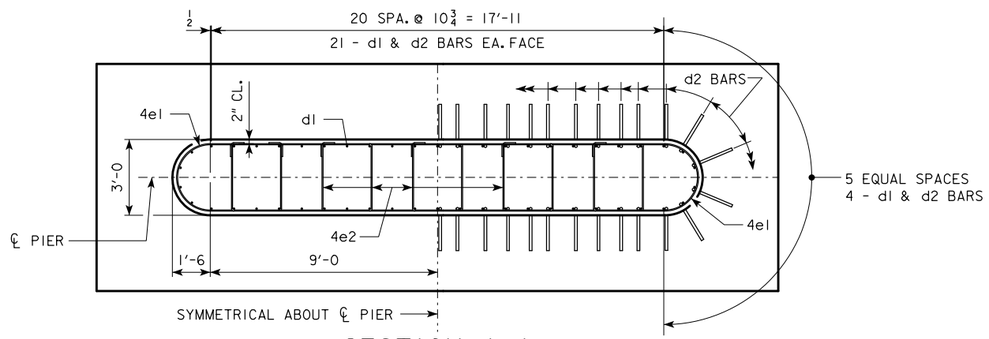
H44-65-14



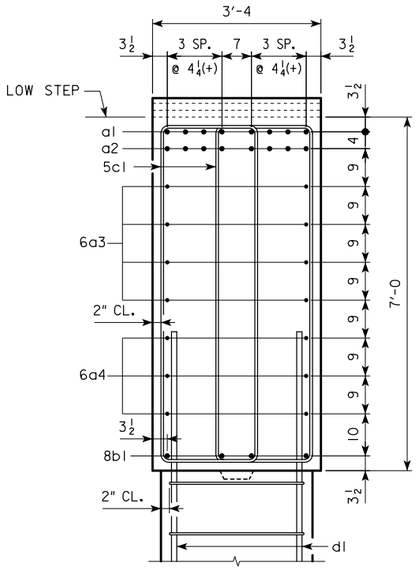
CAP PLAN



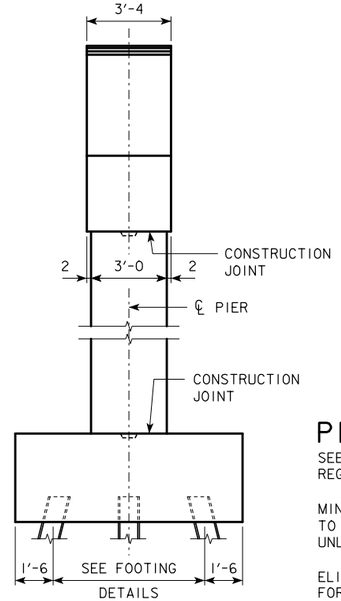
FRONT ELEVATION



SECTION A-A



SECTION B-B



END ELEVATION

PIER NOTES:

SEE "TEE PIER NOTES" ON H44-02-14 FOR NOTES REGARDING APPLICATION OF THESE PIER STANDARDS.

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

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

FOR SIZE OF BEARING PADS, SEE H44-37-14.

SEE SHEET H44-22-14 FOR "U" DIMENSION.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

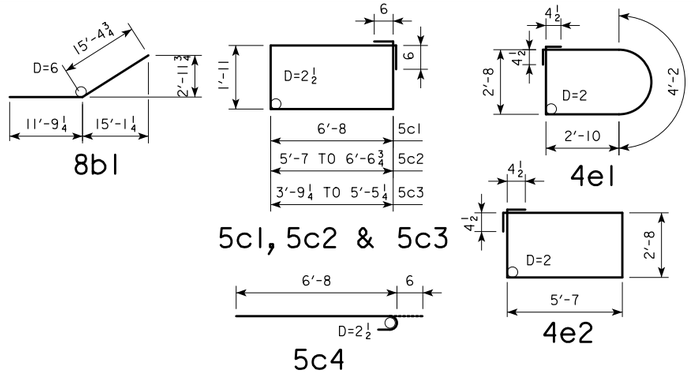
SEPTEMBER, 2014

TEE PIER CAP AND COLUMN

30° SKEW

H44-66-14

BENT BAR DETAILS



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

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	51'-8		8	9	1405	8	9	1405	8	10	1779	8	10	1779	8	10	1779	8	10	1779	8	10	1779	8	11	2196	8	11	2196
	a2	51'-8		8	8	1104	8	9	1405	8	9	1405	8	9	1405	8	9	1405	8	10	1779	8	10	1779	8	10	1779	8	11	2196
	6a3	51'-8		8	6	621	8	6	621	8	6	621	8	6	621	8	6	621	8	6	621	8	6	621	8	6	621	8	6	621
	6a4	VARIES		6	6	350	6	6	350	6	6	350	6	6	350	6	6	350	6	6	350	6	6	350	6	6	350	6	6	350
	8b1	27'-2		8	8	580	8	8	580	8	8	580	8	8	580	8	8	580	8	8	580	8	8	580	8	8	580	8	8	580
	5c1	18'-2		26	5	493	26	5	493	26	5	493	26	5	493	26	5	493	26	5	493	26	5	493	26	5	493	26	5	493
	5c2	VARIES		24	5	425	24	5	425	24	5	425	24	5	425	24	5	425	28	5	496	28	5	496	32	5	567	32	5	567
	5c3	VARIES		40	5	586	40	5	586	40	5	586	40	5	586	40	5	586	40	5	586	40	5	586	40	5	586	40	5	586
	5c4	7'-2		20	5	149	20	5	149	20	5	149	20	5	149	20	5	149	20	5	149	20	5	149	20	5	149	20	5	149
①	TOTAL (LB.)		5713			6014			6388			6388			6388			6833			7250			7321			7738		
STRUCTURAL CONCRETE (CY)			40.9			40.9			40.9			40.9			40.9			40.9			40.9			40.9			40.9		

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

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	5'-6	12.4	50	10	9'-0	1936	12	4	13'-3	106	24	4	17'-3	277	2319
17	6'-6	14.7	50	10	10'-0	2152	14	4	13'-3	124	28	4	17'-3	323	2599
18	7'-6	17.0	50	10	11'-0	2367	16	4	13'-3	142	32	4	17'-3	369	2878
19	8'-6	19.2	50	10	12'-0	2582	18	4	13'-3	159	36	4	17'-3	415	3156
20	9'-6	21.5	50	10	13'-0	2797	20	4	13'-3	177	40	4	17'-3	461	3435
21	10'-6	23.7	50	10	14'-0	3012	22	4	13'-3	195	44	4	17'-3	507	3714
22	11'-6	26.0	50	10	15'-0	3227	24	4	13'-3	212	48	4	17'-3	553	3992
23	12'-6	28.3	50	10	16'-0	3442	26	4	13'-3	230	52	4	17'-3	599	4271
24	13'-6	30.5	50	10	17'-0	3658	28	4	13'-3	248	56	4	17'-3	645	4551
25	14'-0	31.7	50	10	17'-6	3765	30	4	13'-3	266	60	4	17'-3	691	4722
26	15'-0	33.9	50	10	18'-6	3980	32	4	13'-3	283	64	4	17'-3	737	5000
27	16'-0	36.2	50	10	19'-6	4195	34	4	13'-3	301	68	4	17'-3	784	5280
28	17'-0	38.5	50	10	20'-6	4411	36	4	13'-3	319	72	4	17'-3	830	5560
29	18'-0	40.7	50	10	21'-6	4626	38	4	13'-3	336	76	4	17'-3	876	5838
30	19'-0	43.0	50	10	22'-6	4841	40	4	13'-3	354	80	4	17'-3	922	6117
31	20'-0	45.2	50	10	23'-6	5056	42	4	13'-3	372	84	4	17'-3	968	6396
32	21'-0	47.5	50	10	24'-6	5271	44	4	13'-3	389	88	4	17'-3	1014	6674
33	22'-0	49.8	50	10	25'-6	5486	46	4	13'-3	407	92	4	17'-3	1060	6953
34	23'-0	52.0	50	10	26'-6	5701	48	4	13'-3	425	96	4	17'-3	1106	7232
35	24'-0	54.3	50	10	27'-6	5917	50	4	13'-3	443	100	4	17'-3	1152	7512
36	25'-0	56.5	50	10	28'-6	6132	52	4	13'-3	460	104	4	17'-3	1198	7790
37	26'-0	58.8	50	10	29'-6	6347	54	4	13'-3	478	108	4	17'-3	1244	8069
38	27'-0	61.1	50	10	30'-6	6562	56	4	13'-3	496	112	4	17'-3	1291	8349
39	28'-0	63.3	50	10	31'-6	6777	58	4	13'-3	513	116	4	17'-3	1337	8627
40	29'-0	65.6	50	10	32'-6	6992	60	4	13'-3	531	120	4	17'-3	1383	8906

① SEE SHEET H44-24-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

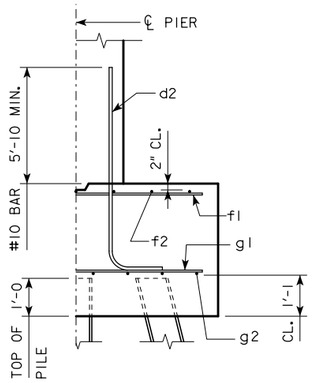
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

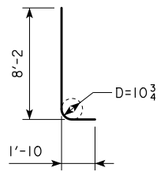
TEE PIER CAP AND COLUMN

30° SKEW

H44-67-14



TYPICAL SECTION



d2

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

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	22A	143	3'-6 x 10'-6 x 25'
	213'-10	23A	145	
	226'-4	24A	143	
	243'-0	25A	146	
19 TO 21	201'-4	22A	147	3'-6 x 10'-6 x 25'
	213'-10	24A	140	
	226'-4	24A	146	
	243'-0	26A	144	
22 TO 24	201'-4	23A	146	3'-6 x 10'-6 x 25'
	213'-10	24A	143	
	226'-4	25A	146	
	243'-0	27A	144	

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 10'-6 x 25'	d2	50 - #10 AS SHOWN	10'-0	2152	4174	34.0
	f1	25 - #5 @ 1'-0	10'-2	265		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	32 - #8 @ 0'-9	10'-2	869		
	g2	12 - #7 @ 0'-10½	24'-8	605		

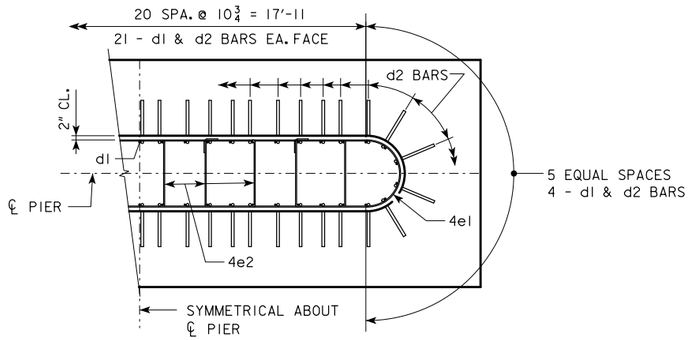
FOOTING NOTES:

THESE FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H44-66-14.

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

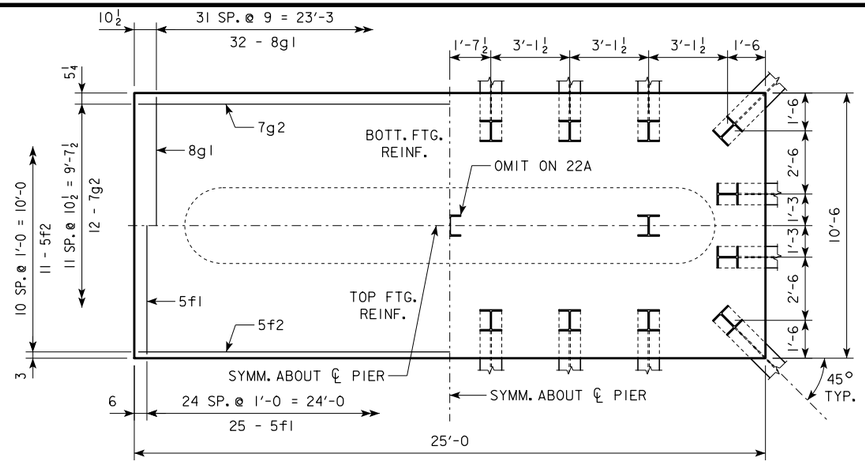
STEEL PILING USED AS POINT BEARING SHALL HAVE A MINIMUM DISTANCE OF APPROXIMATELY 10 FEET FROM BOTTOM OF FOOTING TO TOP OF BEARING ROCK. THE PILE LAYOUTS ARE SUCH THAT THE DISTANCE CENTER TO CENTER OF ADJACENT PILING SHALL NOT EXCEED 8'-0.

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

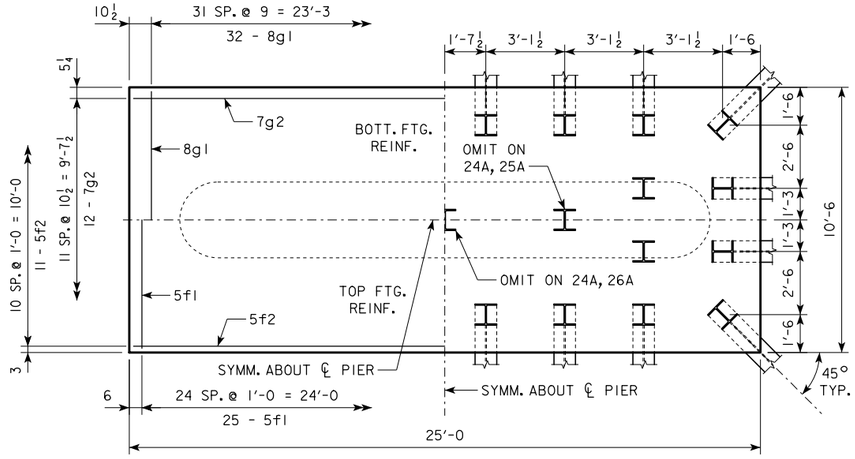


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)

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



3'-6 x 10'-6 x 25'-0 FOR 22A & 23A



3'-6 x 10'-6 x 25'-0 FOR 24A, 25A, 26A & 27A

LATEST REVISION DATE

Marcus K. McCandless
APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

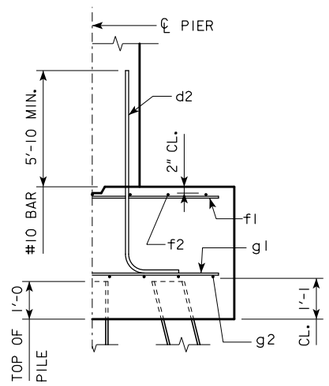
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

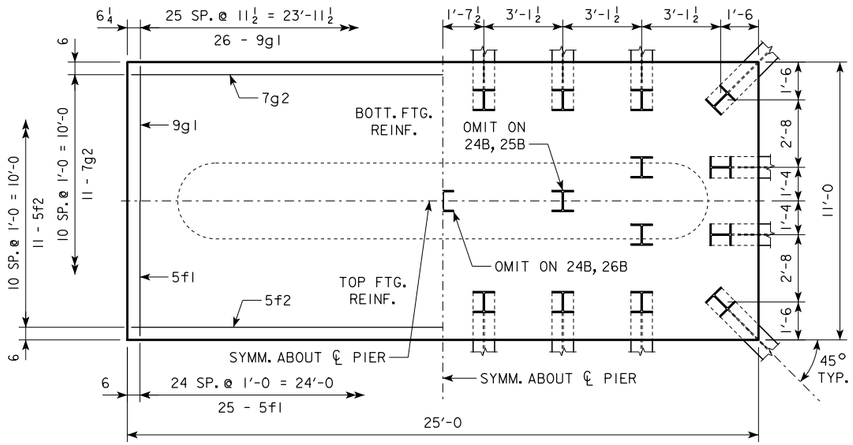
TEE PIER-HP10x57 SRL-1 STEEL PILE FOOTINGS

30° SKEW - H=16' TO 24'

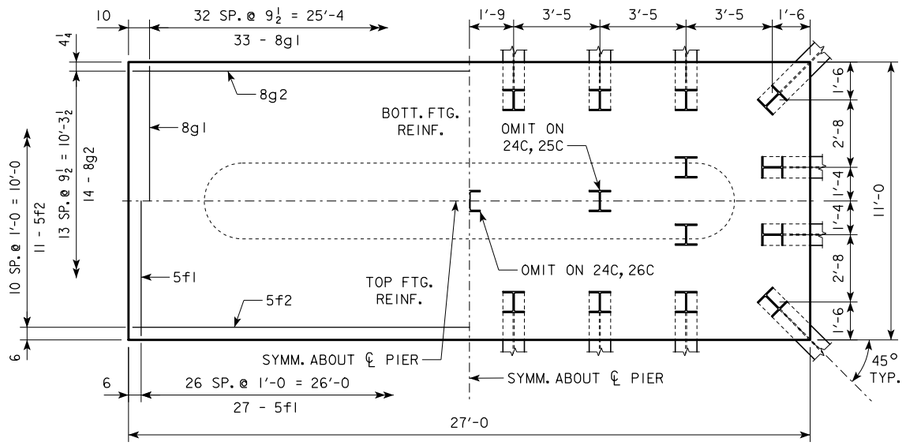
H44-68-14



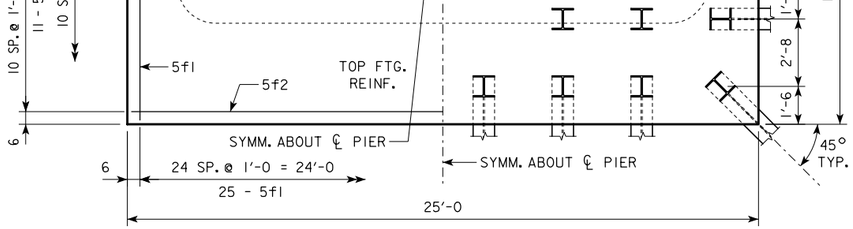
TYPICAL SECTION



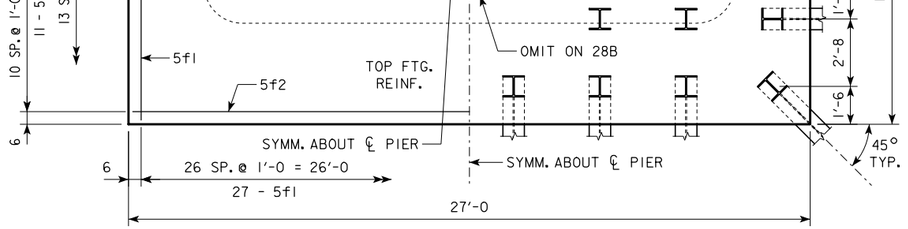
4'-0 x 11'-0 x 25'-0 FOR 24B, 25B, 26B & 27B



4'-0 x 11'-0 x 27'-0 FOR 24C, 25C, 26C & 27C



4'-0 x 11'-0 x 25'-0 FOR 28A



4'-0 x 11'-0 x 27'-0 FOR 28B & 29A

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

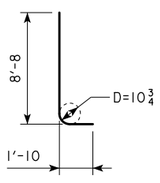
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	24B	141	4' x 11' x 25'
	213'-10	24B	146	
	226'-4	26B	144	
	243'-0	27B	146	
28 TO 30	201'-4	24B	143	4' x 11' x 25'
	213'-10	25B	145	
	226'-4	26B	146	
	243'-0	28A	144	
31 TO 33	201'-4	24C	143	4' x 11' x 27'
	213'-10	25C	144	
	226'-4	26C	145	
	243'-0	28B	143	
34 TO 36	201'-4	24C	145	4' x 11' x 27'
	213'-10	25C	146	
	226'-4	27C	144	
	243'-0	28B	145	
37 TO 40	201'-4	25C	145	4' x 11' x 27'
	213'-10	26C	145	
	226'-4	28B	142	
	243'-0	29A	144	

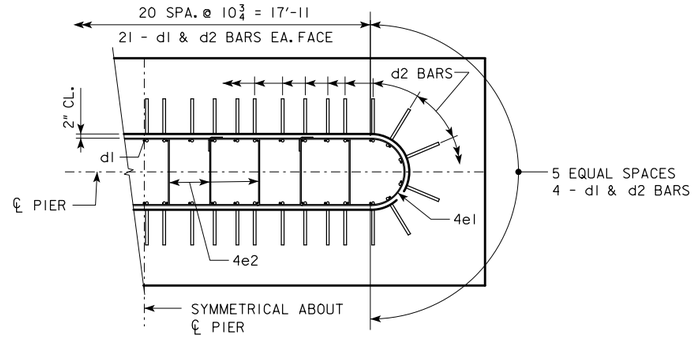
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 11' x 25'	d2	50 - #10 AS SHOWN	10'-6	2259	4318	40.7
	f1	25 - #5 @ 1'-0	10'-8	278		
	f2	11 - #5 @ 1'-0	24'-8	283		
	g1	26 - #9 @ 0'-11½	10'-8	943		
	g2	11 - #7 @ 1'-0	24'-8	555		
4' x 11' x 27'	d2	50 - #10 AS SHOWN	10'-6	2259	4802	44.0
	f1	27 - #5 @ 1'-0	10'-8	300		
	f2	11 - #5 @ 1'-0	26'-8	306		
	g1	33 - #8 @ 0'-9½	10'-8	940		
	g2	14 - #8 @ 0'-9½	26'-8	997		



d2

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



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)

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 H44-66-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

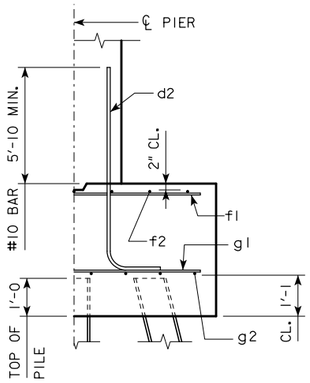
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

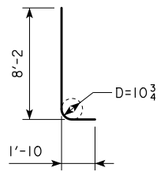
TEE PIER-HP10x57 SRL-I STEEL PILE FOOTINGS

30° SKEW - H=25' TO 40'

H44-69-14



TYPICAL SECTION



d2

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

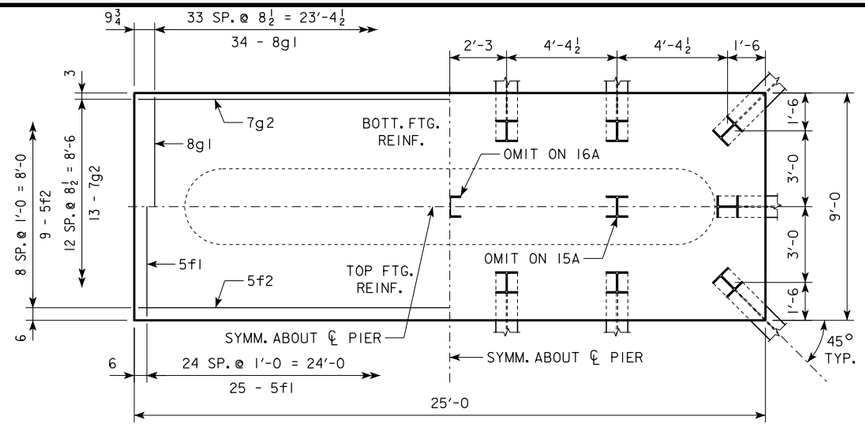
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

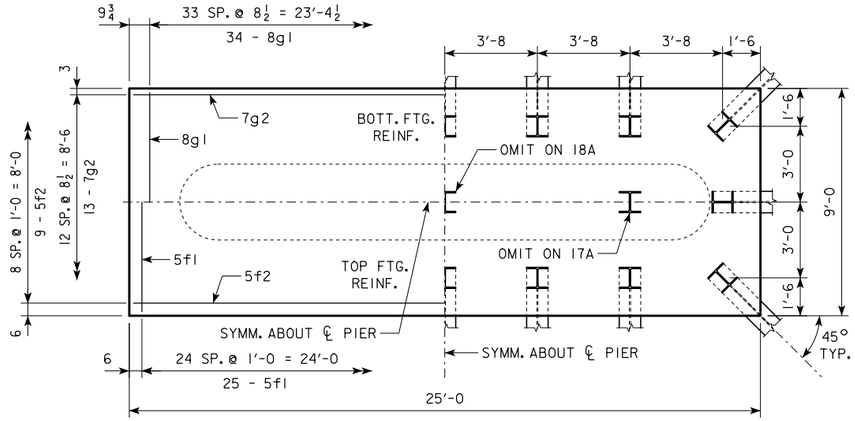
NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
16 TO 18	201'-4	15A	215	3'-6 x 9' x 25'
	213'-10	16A	208	
	226'-4	16A	217	
	243'-0	17A	217	
19 TO 21	201'-4	15A	220	3'-6 x 9' x 25'
	213'-10	16A	213	
	226'-4	17A	213	
	243'-0	18A	207	
22 TO 24	201'-4	16A	210	3'-6 x 9' x 25'
	213'-10	16A	218	
	226'-4	17A	217	
	243'-0	18A	211	

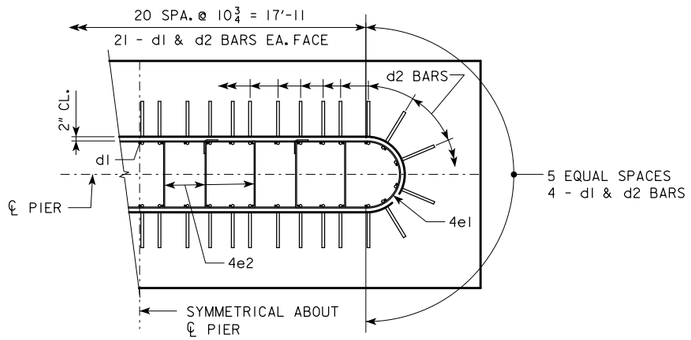
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
3'-6 x 9' x 25'	d2	50 - #10 AS SHOWN	10'-0	2152	4052	29.2
	f1	25 - #5 @ 1'-0	8'-8	226		
	f2	9 - #5 @ 1'-0	24'-8	232		
	g1	34 - #8 @ 0'-8½	8'-8	787		
	g2	13 - #7 @ 0'-8½	24'-8	655		



3'-6 x 9'-0 x 25'-0 FOR 15A & 16A



3'-6 x 9'-0 x 25'-0 FOR 17A & 18A



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)

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 H44-66-14.

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.

LATEST REVISION DATE

Marcus K. McDonald
APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

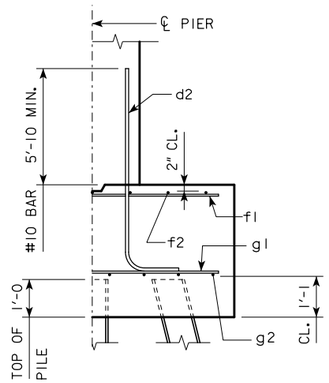
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

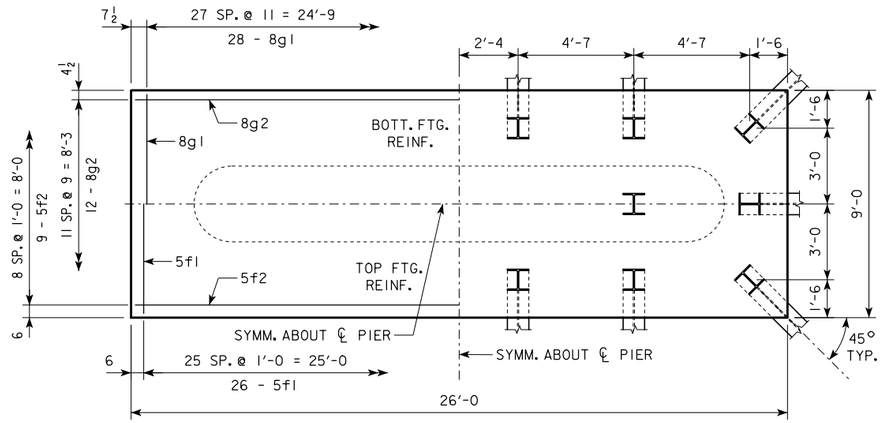
TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

30° SKEW - H=16' TO 24'

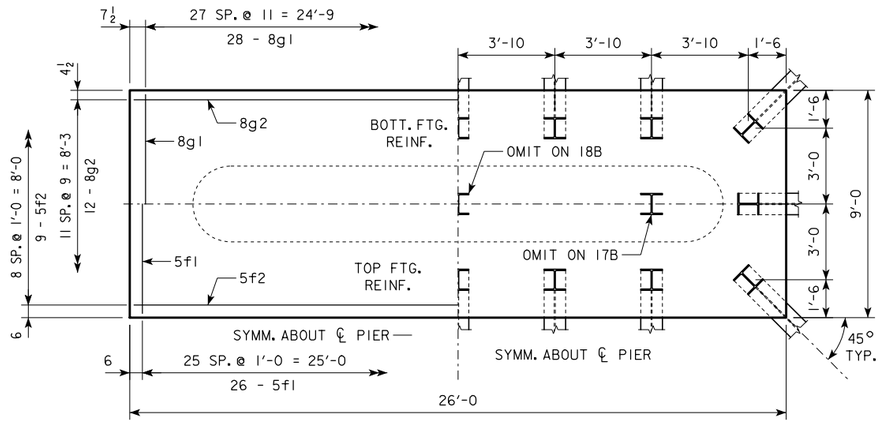
H44-70-14



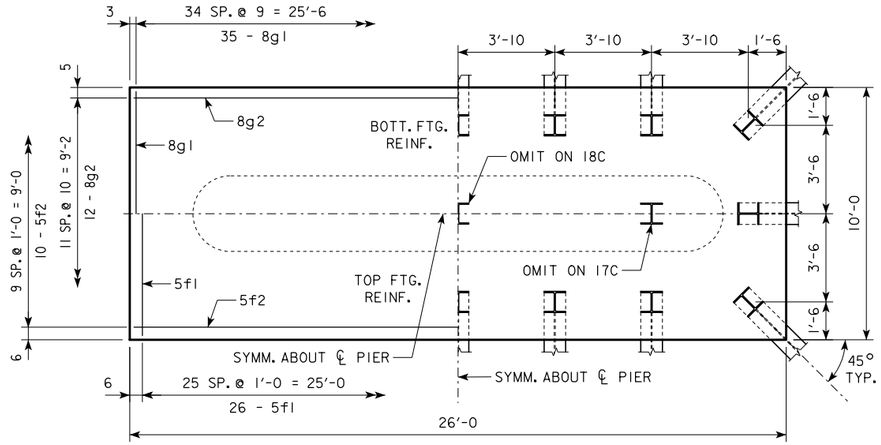
TYPICAL SECTION



4'-0 x 9'-0 x 26'-0 FOR 16B



4'-0 x 9'-0 x 26'-0 FOR 17B, 18B & 19A



4'-0 x 10'-0 x 26'-0 FOR 17C, 18C & 19B

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

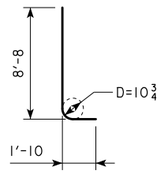
NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

H IN FT.	℄ - ℄ ABUT. BRG.	PILING (HP10x57) NO. & LAYOUT	PILING (HP10x57) ① LRFD PU, STRENGTH I DES. BRG. (KIPS)	FOOTING SIZE
25 TO 27	201'-4	16B	212	4' x 9' x 26'
	213'-10	17B	210	
	226'-4	17B	219	
	243'-0	18B	213	
28 TO 30	201'-4	16B	216	4' x 9' x 26'
	213'-10	17B	214	
	226'-4	18B	209	
	243'-0	18B	216	
31 TO 33	201'-4	17B	210	4' x 9' x 26'
	213'-10	17B	217	
	226'-4	18B	212	
	243'-0	19A	213	
34 TO 36	201'-4	17C	212	4' x 10' x 26'
	213'-10	17C	219	
	226'-4	18C	213	
	243'-0	19B	214	
37 TO 40	201'-4	17C	216	4' x 10' x 26'
	213'-10	18C	209	
	226'-4	18C	218	
	243'-0	19B	218	

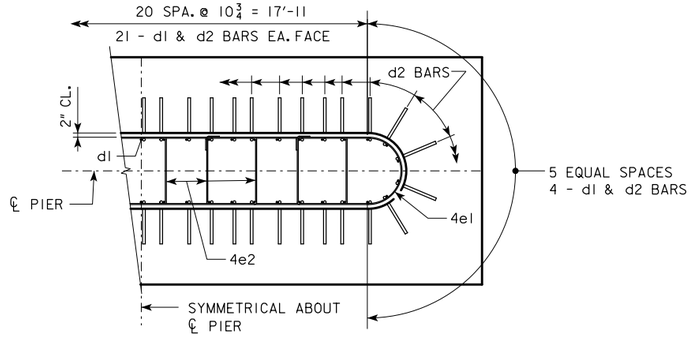
① NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING) BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	STRUCTURAL CONCRETE (CY)
4' x 9' x 26'	d2	50 - #10 AS SHOWN	10'-6	2259	4205	34.7
	f1	26 - #5 @ 1'-0	8'-8	235		
	f2	9 - #5 @ 1'-0	25'-8	241		
	g1	28 - #8 @ 0'-11	8'-8	648		
	g2	12 - #8 @ 0'-9	25'-8	822		
4' x 10' x 26'	d2	50 - #10 AS SHOWN	10'-6	2259	4514	38.5
	f1	26 - #5 @ 1'-0	9'-8	262		
	f2	10 - #5 @ 1'-0	25'-8	268		
	g1	35 - #8 @ 0'-9	9'-8	903		
	g2	12 - #8 @ 0'-10	25'-8	822		



d2

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



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)

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 H44-66-14.

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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

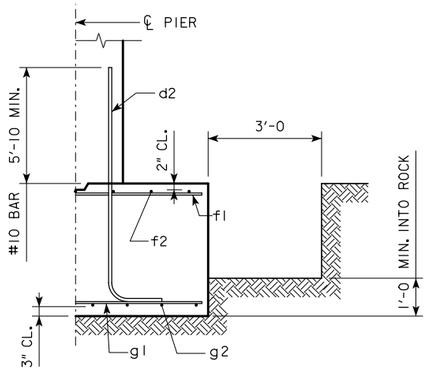
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER-HP10x57 SRL-2 STEEL PILE FOOTINGS

30° SKEW - H=25' TO 40'

H44-71-14

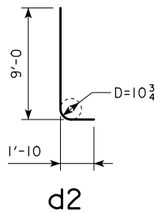


TYPICAL SECTION

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
16 TO 18	138'-10 151'-4 163'-10 176'-4	3'-6 x 9' x 27'
	188'-10	3'-6 x 9' x 29'
	201'-4 213'-10	3'-6 x 9' x 31'
	226'-4 243'-0	3'-6 x 10' x 31'
19 TO 21	138'-10 151'-4 163'-10	3'-6 x 9' x 27'
	176'-4 188'-10	3'-6 x 9' x 29'
	201'-4 213'-10	3'-6 x 9' x 31'
	226'-4 243'-0	3'-6 x 10' x 31'
22 TO 24	138'-10 151'-4	3'-6 x 9' x 27'
	163'-10 176'-4 188'-10	3'-6 x 9' x 29'
	201'-4	3'-6 x 9' x 31'
	213'-10 226'-4 243'-0	3'-6 x 10' x 31'

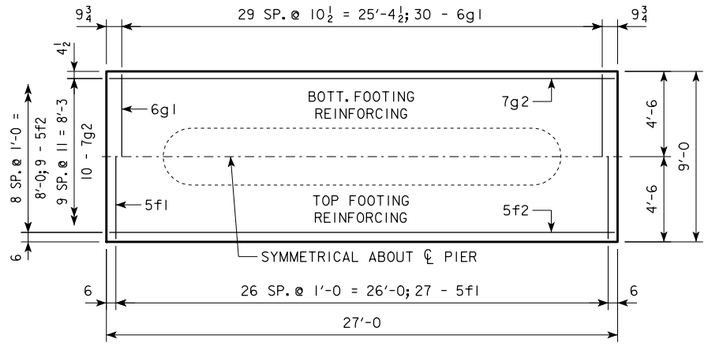
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

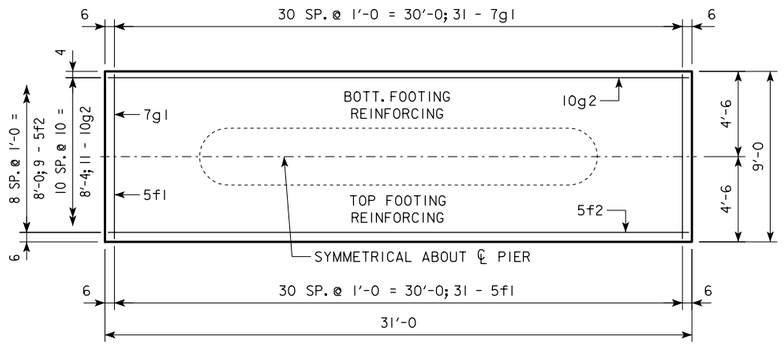


d2

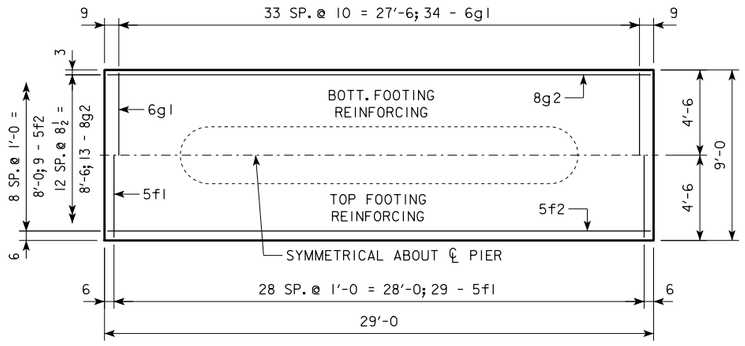
NOTE: D = PIN DIAMETER.
DIMENSIONS ARE OUT TO OUT.



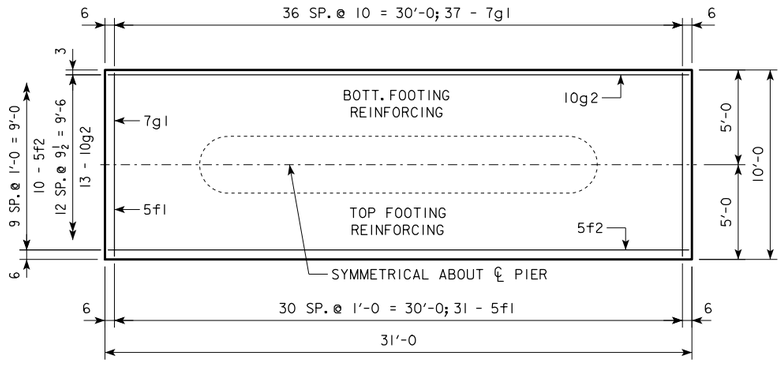
3'-6 x 9'-0 x 27'-0



3'-6 x 9'-0 x 31'-0

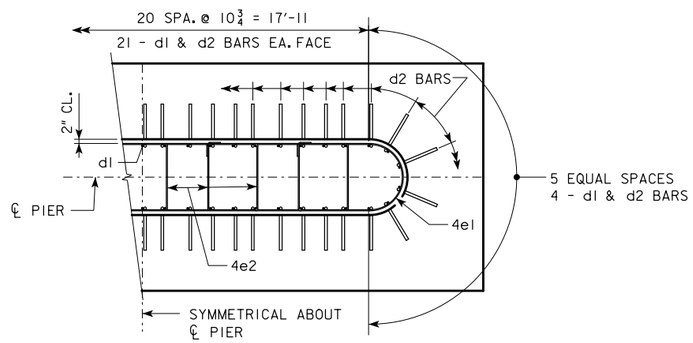


3'-6 x 9'-0 x 29'-0



3'-6 x 10'-0 x 31'-0

FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
3'-6 x 9' x 27'	d2	50 - #10 AS SHOWN	10'-10	2331	3761	31.5
	f1	27 - #5 @ 1'-0	8'-8	244		
	f2	9 - #5 @ 1'-0	26'-8	250		
	g1	30 - #6 @ 0'-10½	8'-8	391		
	g2	10 - #7 @ 0'-11	26'-8	545		
3'-6 x 9' x 29'	d2	50 - #10 AS SHOWN	10'-10	2331	4300	33.8
	f1	29 - #5 @ 1'-0	8'-8	262		
	f2	9 - #5 @ 1'-0	28'-8	269		
	g1	34 - #6 @ 0'-10	8'-8	443		
	g2	13 - #8 @ 0'-8½	28'-8	995		
3'-6 x 9' x 31'	d2	50 - #10 AS SHOWN	10'-10	2331	4900	36.2
	f1	31 - #5 @ 1'-0	8'-8	280		
	f2	9 - #5 @ 1'-0	30'-8	288		
	g1	31 - #7 @ 1'-0	8'-8	549		
	g2	11 - #10 @ 0'-10	30'-8	1452		
3'-6 x 10' x 31'	d2	50 - #10 AS SHOWN	10'-10	2331	5410	40.2
	f1	31 - #5 @ 1'-0	9'-8	313		
	f2	10 - #5 @ 1'-0	30'-8	320		
	g1	37 - #7 @ 0'-10	9'-8	731		
	g2	13 - #10 @ 0'-9½	30'-8	1715		



d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)

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 H44-66-14.

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).

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER - SPREAD FOOTINGS

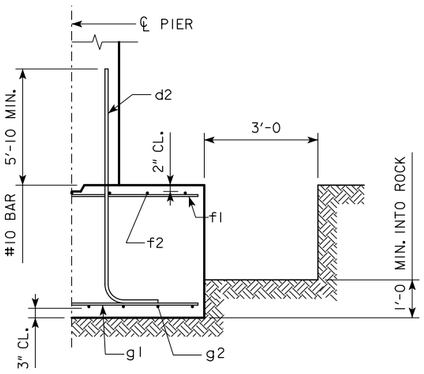
30° SKEW - H=16' TO 24'

H44-72-14

H IN FT.	℄ - ℄ ABUT. BRG.	FOOTING SIZE
25 TO 27	138′-10	4′ x 8′ x 30′
	151′-4	
	163′-10	4′ x 9′ x 30′
	176′-4	
	188′-10	
	201′-4	4′ x 9′ x 32′
	213′-10	4′ x 10′ x 32′
	226′-4	
	243′-0	
28 TO 30	138′-10	4′ x 8′ x 30′
	151′-4	4′ x 9′ x 30′
	163′-10	
	176′-4	
	188′-10	4′ x 9′ x 32′
	201′-4	
	213′-10	4′ x 10′ x 32′
	226′-4	
	243′-0	
31 TO 33	138′-10	4′ x 9′ x 30′
	151′-4	
	163′-10	
	176′-4	
	188′-10	4′ x 9′ x 32′
	201′-4	4′ x 10′ x 32′
	213′-10	
	226′-4	
	243′-0	4′ x 10′ x 34′
34 TO 36	138′-10	4′ x 9′ x 30′
	151′-4	
	163′-10	
	176′-4	4′ x 9′ x 32′
	188′-10	
	201′-4	4′ x 10′ x 32′
	213′-10	
	226′-4	
	243′-0	4′ x 10′ x 34′
37 TO 40	138′-10	4′ x 9′ x 30′
	151′-4	
	163′-10	4′ x 9′ x 32′
	176′-4	
	188′-10	
	201′-4	4′ x 10′ x 32′
	213′-10	
	226′-4	4′ x 10′ x 34′
	243′-0	

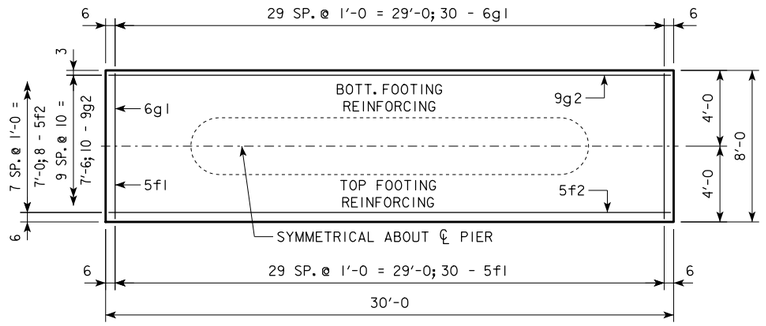
NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

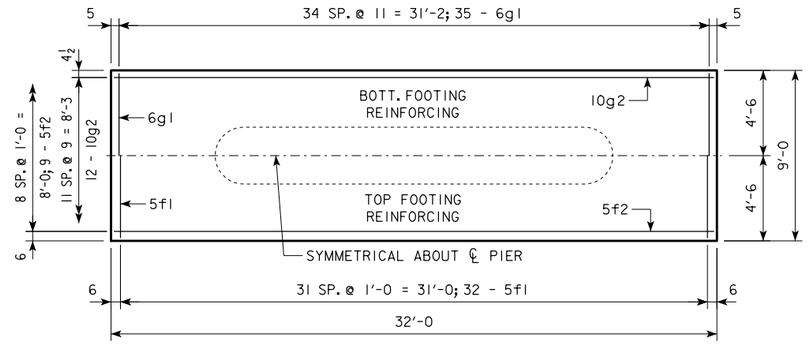


TYPICAL SECTION

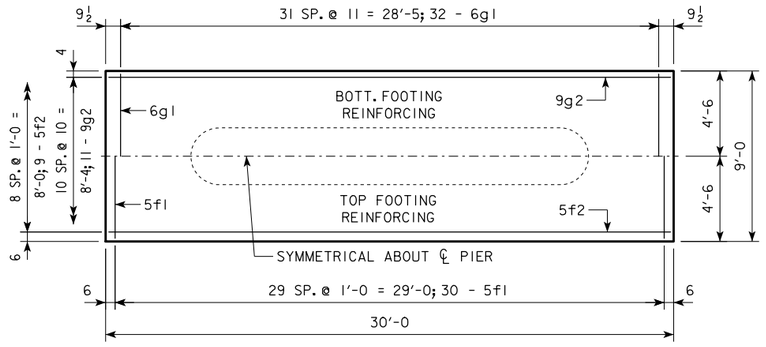
FOOTING SIZE	REINFORCING STEEL (ONE FOOTING)					STRUCTURAL CONCRETE (CY)
	BAR	NO., SIZE & SPACING	LENGTH	WEIGHT (LB.)	TOTAL WEIGHT (LB.)	
4′ x 8′ x 30′	d2	50 - #10 AS SHOWN	11′-4	2438	4280	35.6
	f1	30 - #5 @ 1′-0	7′-8	240		
	f2	8 - #5 @ 1′-0	29′-8	248		
	g1	30 - #6 @ 1′-0	7′-8	345		
	g2	10 - #9 @ 0′-10	29′-8	1009		
4′ x 9′ x 30′	d2	50 - #10 AS SHOWN	11′-4	2438	4514	40.0
	f1	30 - #5 @ 1′-0	8′-8	271		
	f2	9 - #5 @ 1′-0	29′-8	278		
	g1	32 - #6 @ 0′-11	8′-8	417		
	g2	11 - #9 @ 0′-10	29′-8	1110		
4′ x 9′ x 32′	d2	50 - #10 AS SHOWN	11′-4	2438	5115	42.7
	f1	32 - #5 @ 1′-0	8′-8	289		
	f2	9 - #5 @ 1′-0	31′-8	297		
	g1	35 - #6 @ 0′-11	8′-8	456		
	g2	12 - #10 @ 0′-9	31′-8	1635		
4′ x 10′ x 32′	d2	50 - #10 AS SHOWN	11′-4	2438	5554	47.4
	f1	32 - #5 @ 1′-0	9′-8	323		
	f2	10 - #5 @ 1′-0	31′-8	330		
	g1	35 - #7 @ 0′-11	9′-8	692		
	g2	13 - #10 @ 0′-9½	31′-8	1771		
4′ x 10′ x 34′	d2	50 - #10 AS SHOWN	11′-4	2438	6036	50.4
	f1	34 - #5 @ 1′-0	9′-8	343		
	f2	10 - #5 @ 1′-0	33′-8	351		
	g1	37 - #7 @ 0′-11	9′-8	731		
	g2	15 - #10 @ 0′-8	33′-8	2173		



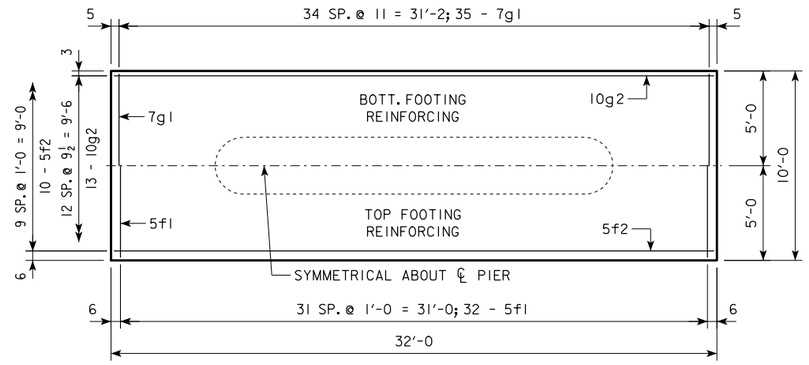
4′-0 x 8′-0 x 30′-0



4′-0 x 9′-0 x 32′-0



4′-0 x 9′-0 x 30′-0

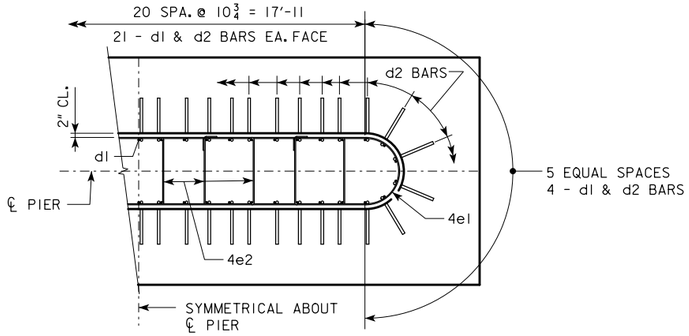


4′-0 x 10′-0 x 32′-0

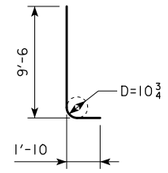
FOOTING NOTES:

THESE SPREAD FOOTINGS ARE DESIGNED AND DETAILED TO BE USED WITH THE CAP AND COLUMN DETAILS OF THE TEE PIERS AS SHOWN ON SHEET H44-66-14.

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).

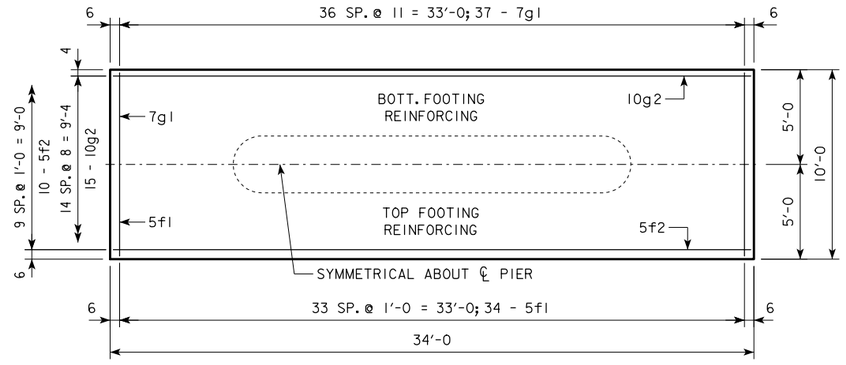


d2 BAR LAYOUT
(SEE SECTION A-A ON SHEET H44-66-14.)



d2

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



4′-0 x 10′-0 x 34′-0

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44′ ROADWAY, THREE SPAN BRIDGE

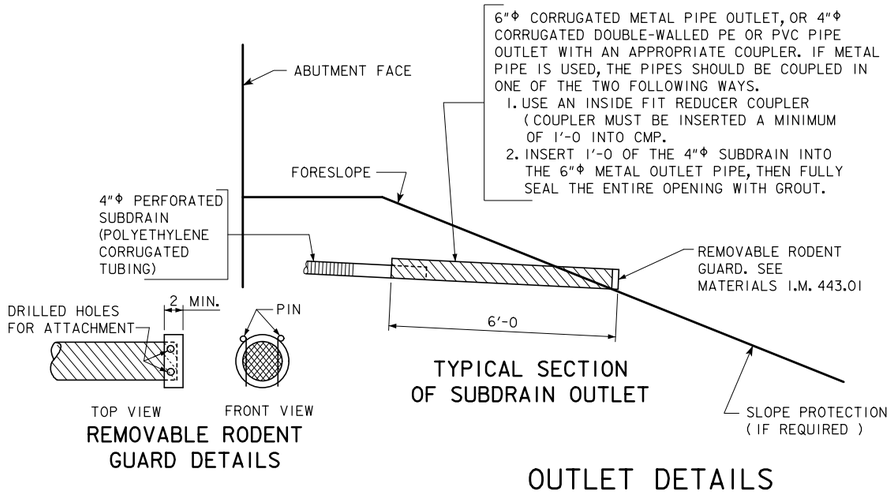
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

TEE PIER - SPREAD FOOTINGS

30° SKEW - H=25′ TO 40′

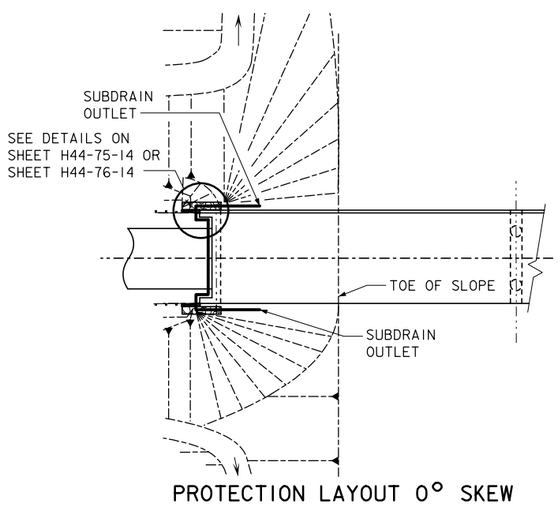
H44-73-14



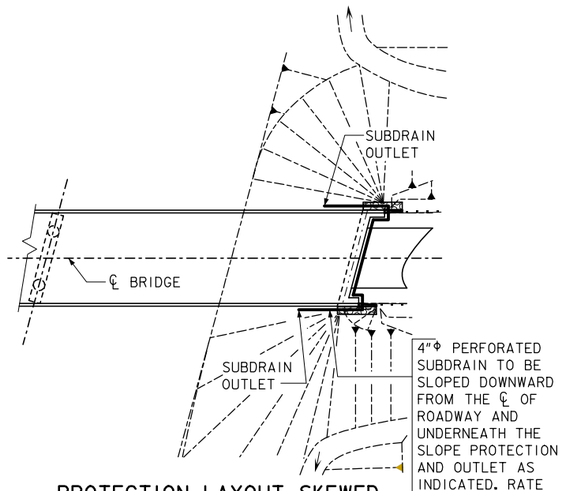
REMOVABLE RODENT GUARD DETAILS

TYPICAL SECTION OF SUBDRAIN OUTLET

OUTLET DETAILS



PROTECTION LAYOUT 0° SKEW



PROTECTION LAYOUT SKEWED

SITUATION PLAN

REFER TO SITUATION PLAN FOR NORTH ARROW.

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

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

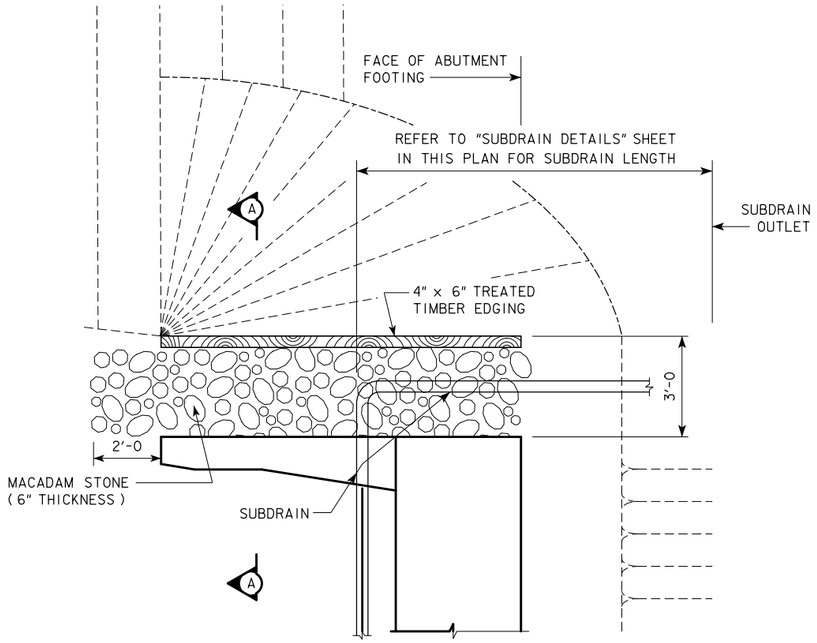
STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

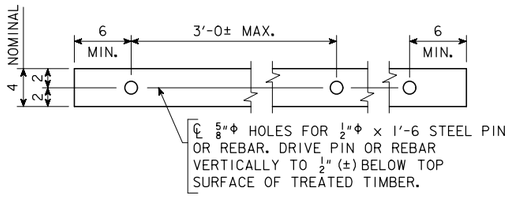
SEPTEMBER, 2014

SUBDRAIN DETAILS

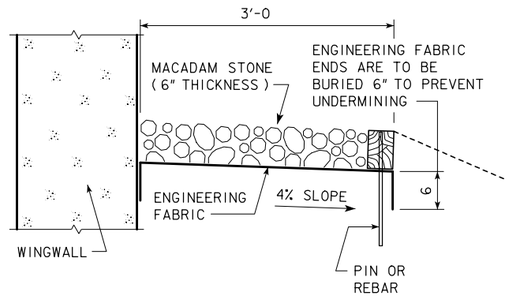
H44-74-14



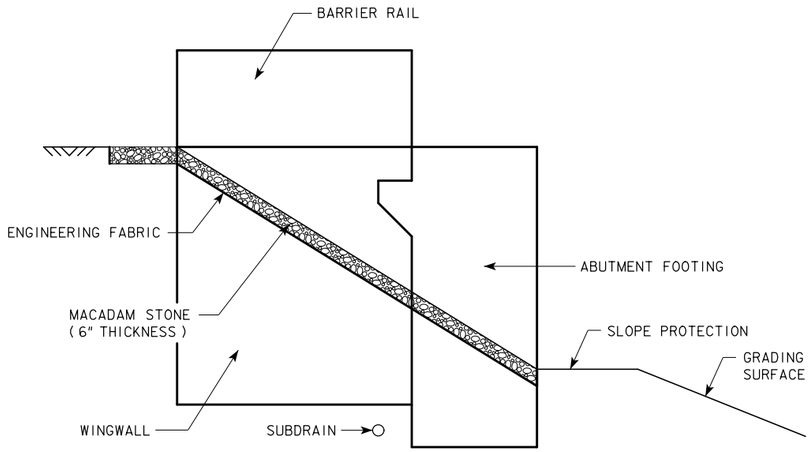
TOP VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A



PROFILE VIEW OF WING ARMORING

(SHOWN FOR INTEGRAL ABUTMENT)

SUBDRAIN NOTES:

SEE H44-74-14 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 BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD.

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

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

MACADAM STONE WING ARMORING NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC AND BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

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.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, 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.

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH ARTICLE 4122.02, OF THE STANDARD SPECIFICATIONS FOR COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, AND BE IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

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

THE BRIDGE WING ARMORING SHALL BE BID AS "BRIDGE WING ARMORING - MACADAM STONE" IN SQUARE YARDS AND SHALL INCLUDE COSTS OF ALL MATERIAL AND LABOR TO CONSTRUCT THE WING ARMORING AS SHOWN ON THESE PLANS.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

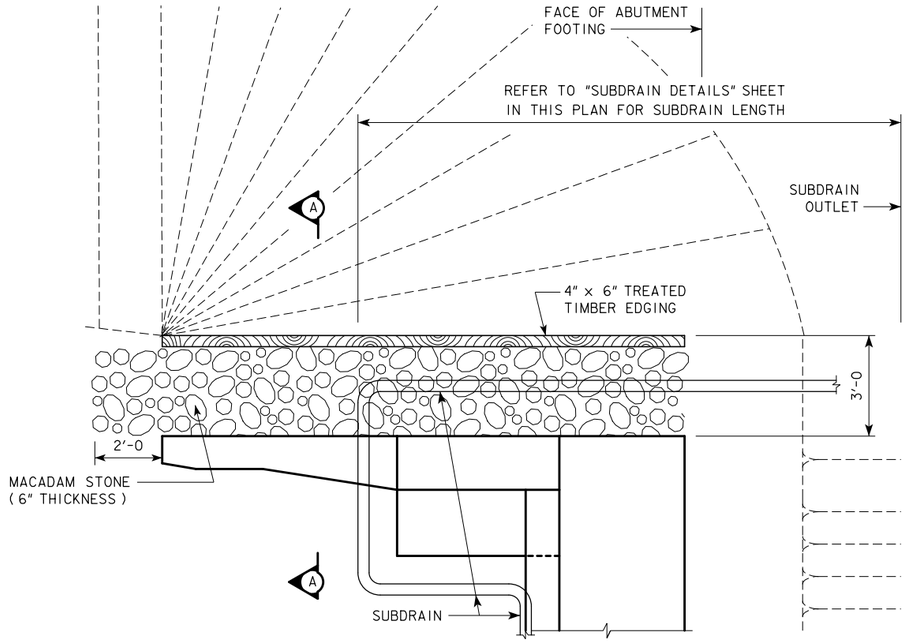
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

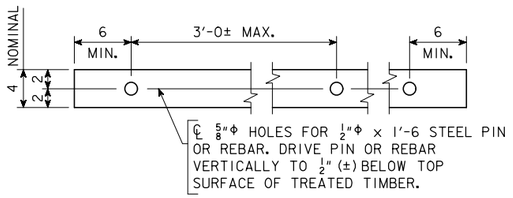
WING ARMORING DETAILS

A & B BEAMS

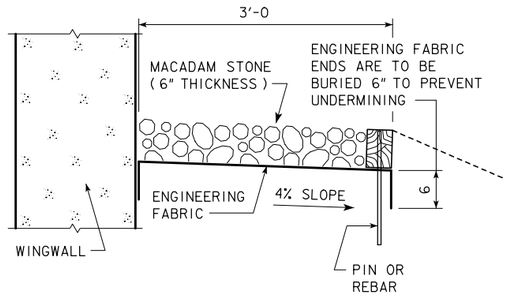
H44-75-14



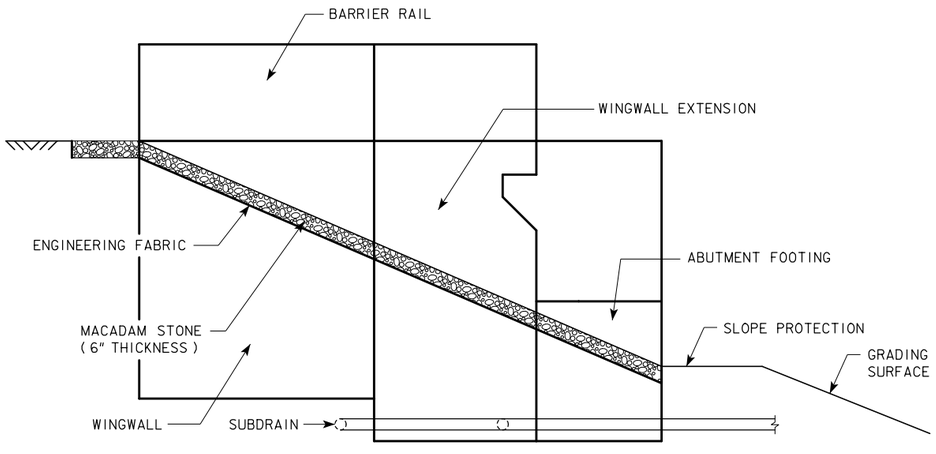
TOP VIEW OF WING ARMORING WITH WING EXTENSION



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

(SHOWN FOR INTEGRAL ABUTMENT WITH WING EXTENSIONS)

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LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWADOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

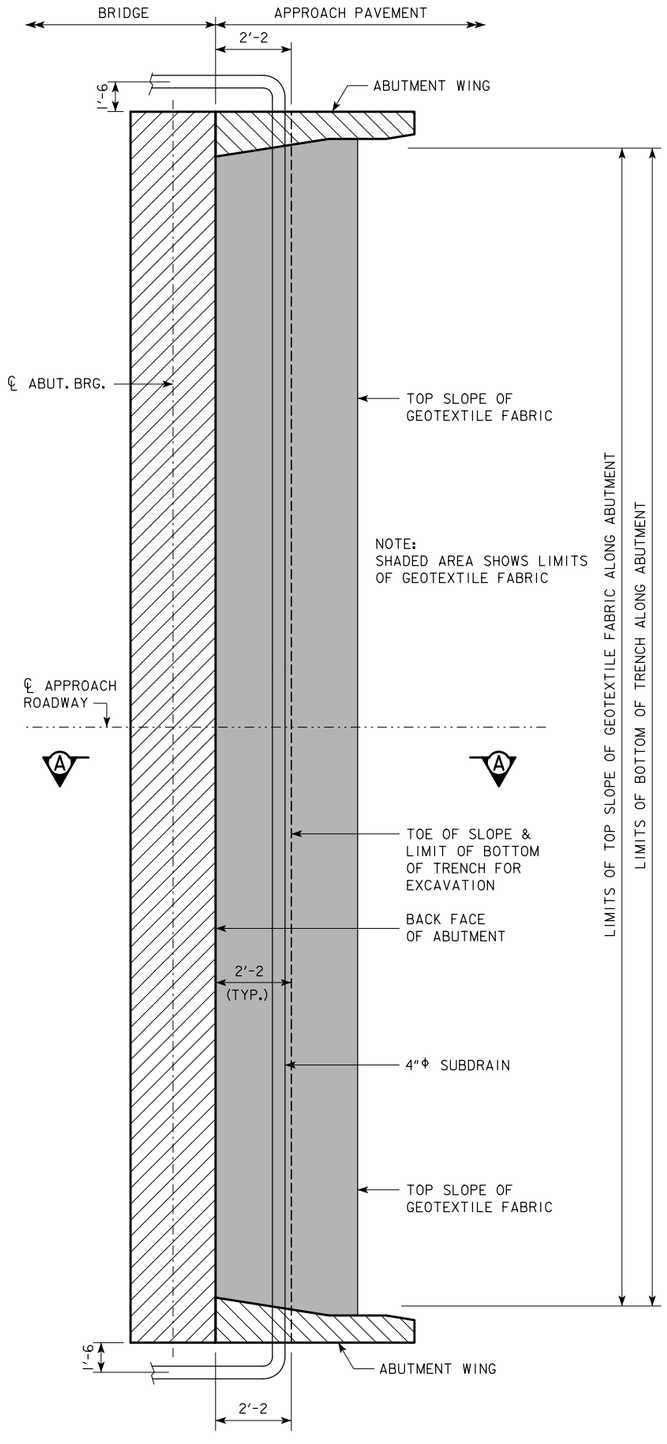
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

WING ARMORING DETAILS

C BEAMS

H44-76-14



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.

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.

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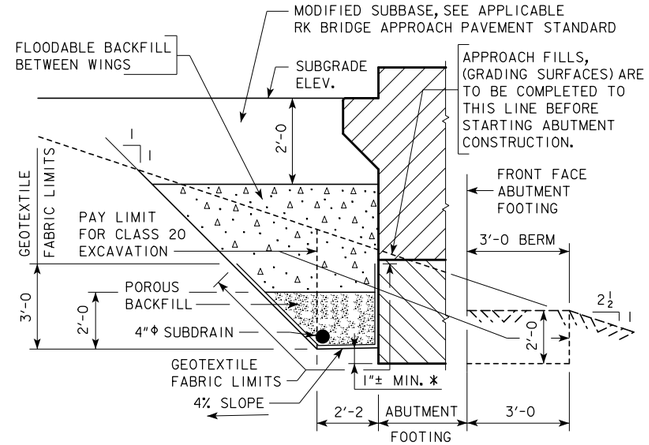


SECTION A-A

BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

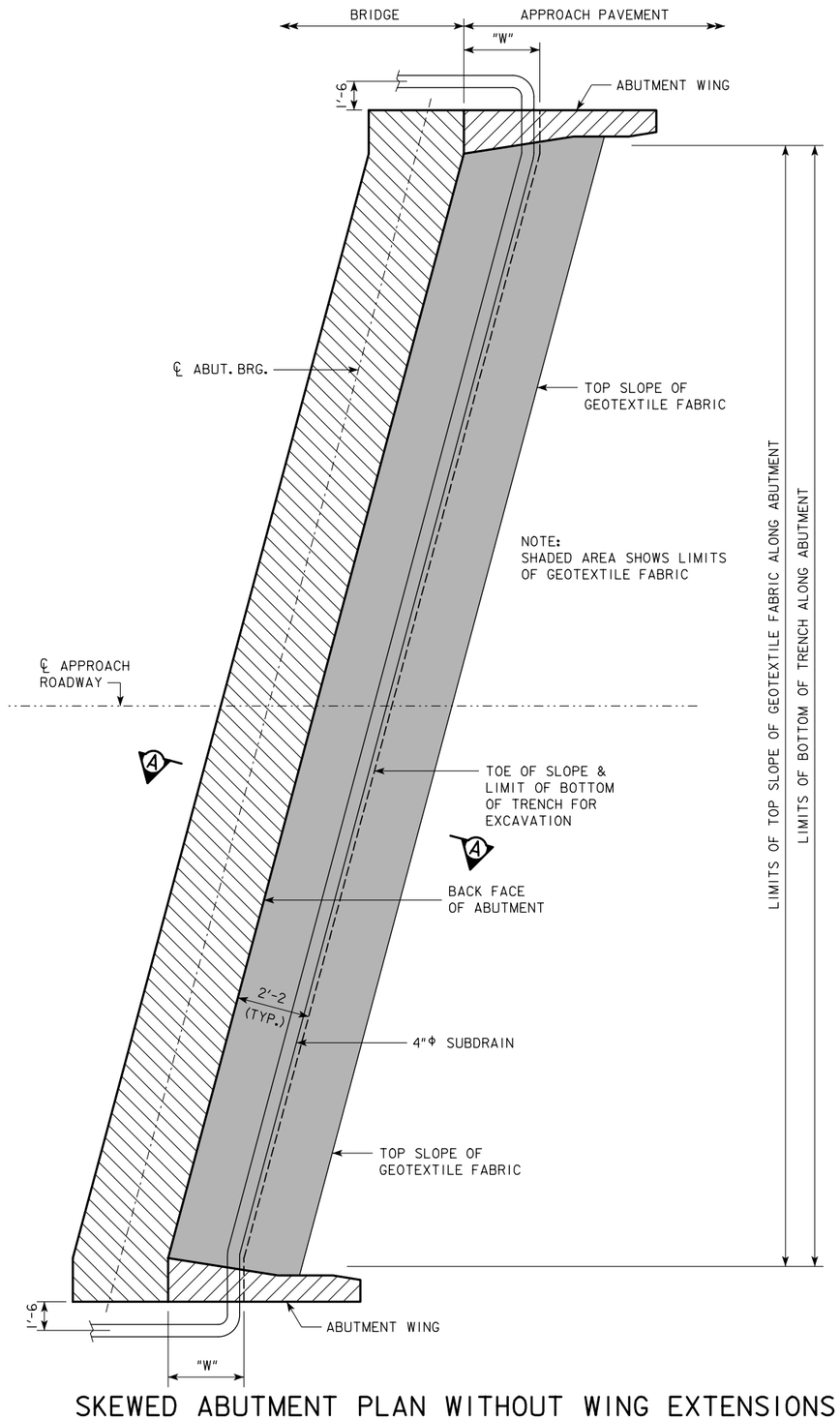
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT BACKFILL DETAILS

A & B BEAMS - 0° SKEW

H44-77-14



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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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.

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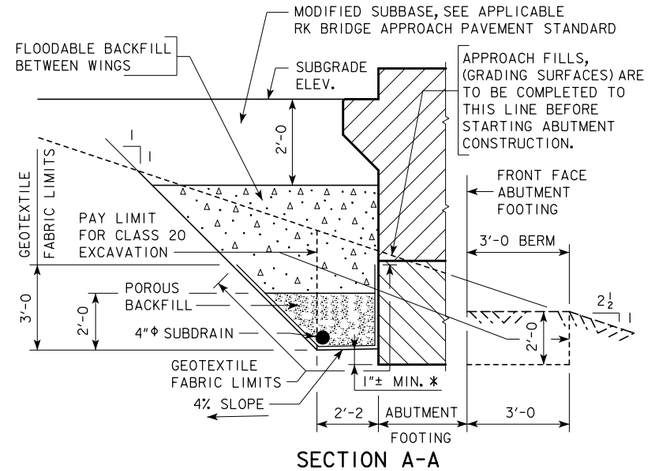

SECTION A-A

BACKFILL DETAILS

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

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LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

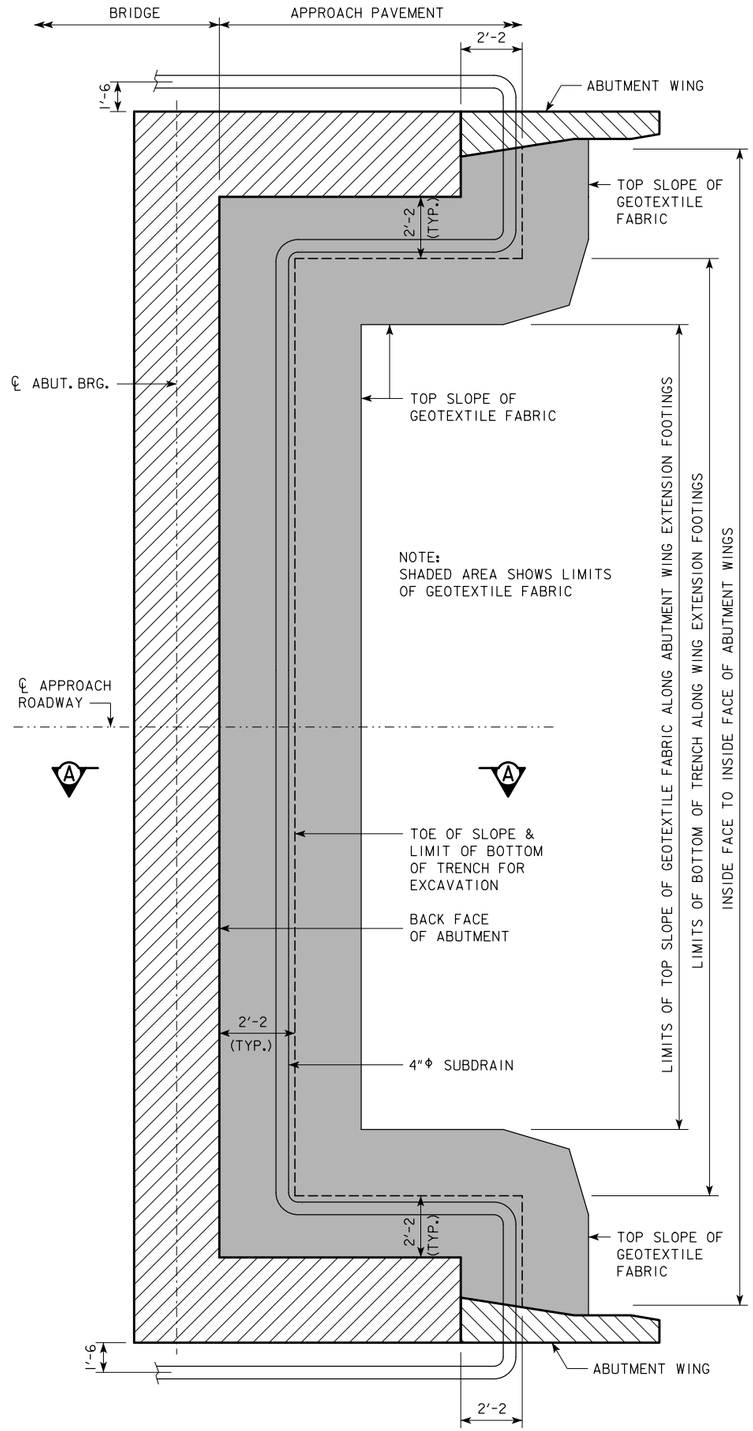
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT BACKFILL DETAILS

A & B BEAMS - SKEWED

H44-78-14



ABUTMENT PLAN WITH WING EXTENSIONS

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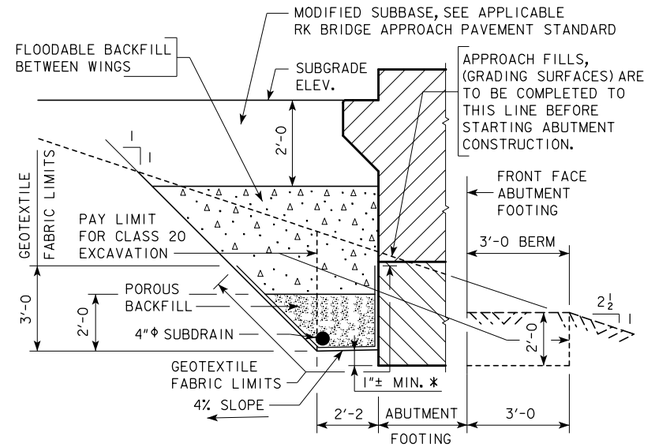

SECTION A-A

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LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

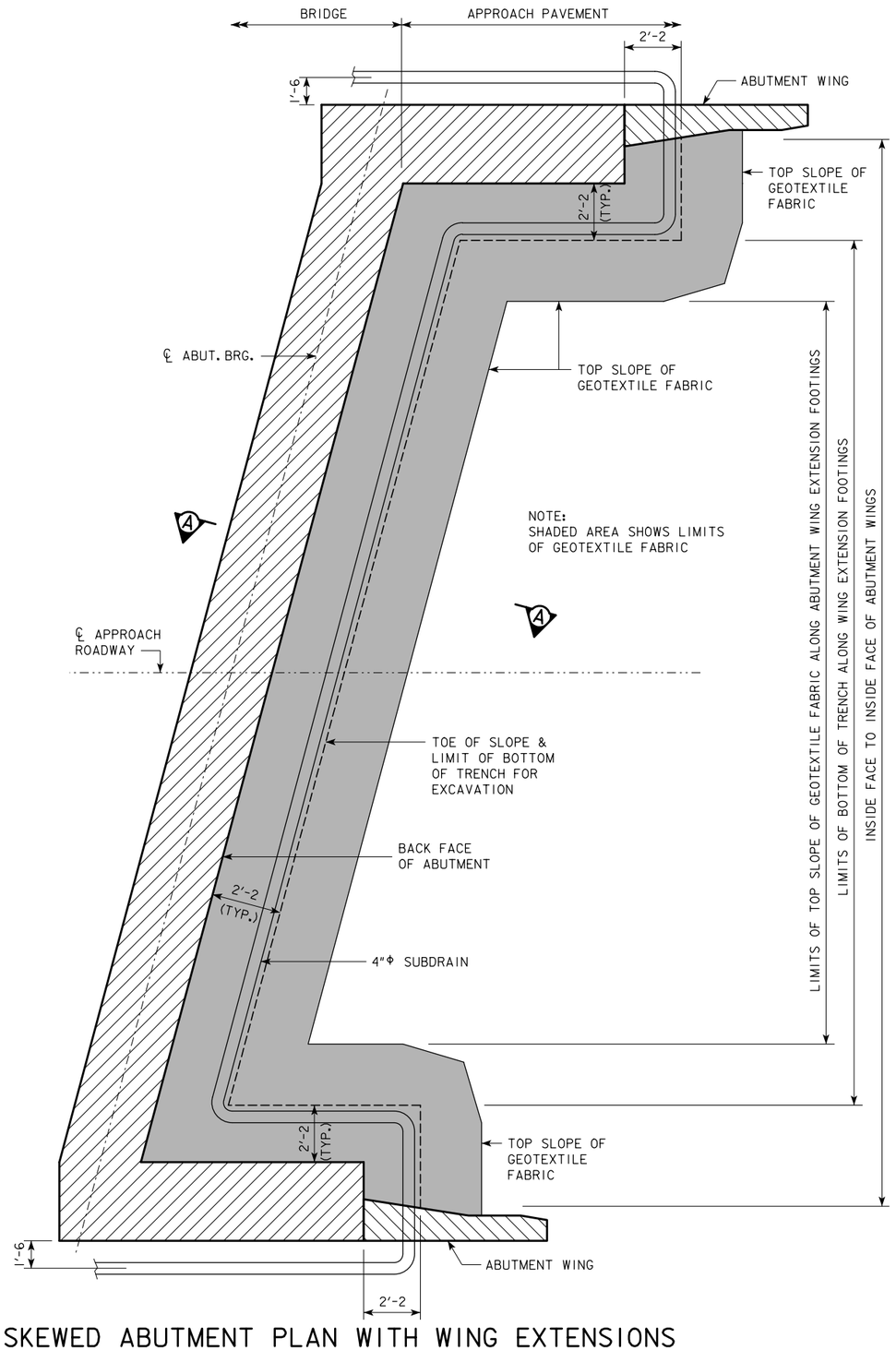
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT BACKFILL DETAILS

C BEAMS - 0° SKEW

H44-79-14



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.

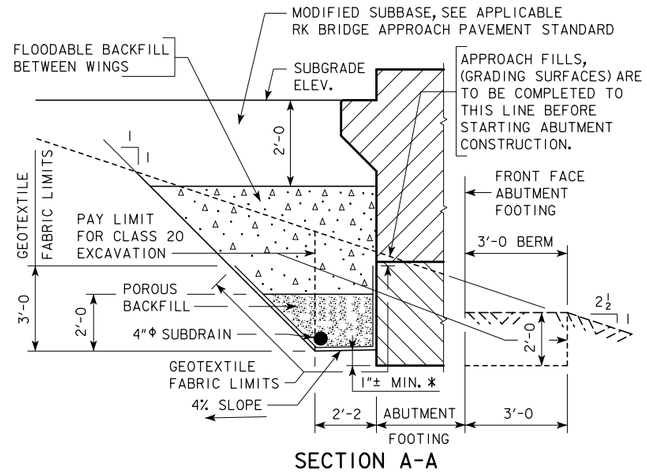
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

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.



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.

LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

ABUTMENT BACKFILL DETAILS

C BEAMS - SKEWED

H44-80-14