

SPECIFICATIONS:

DESIGN: AASHTO LRFD 7th Ed, SERIES OF 2014, EXCEPT AS NOTED ON THE PRESTRESSED CONCRETE BEAM SHEETS,
 CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7th ED, SERIES OF 2014.

- REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
- CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, $f'_c = 4.0$ KSI.
- STANDARD CONCRETE BOX BEAMS, SEE SHEETS B24-34-16 THRU B24-62-16.
- PRECAST ABUTMENT FOOTING CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, $f'_c = 5.0$ KSI.
- ULTRA HIGH PERFORMANCE CONCRETE IN ACCORDANCE WITH THE REQUIREMENTS ON SHEET B24-25-16 THRU B24-26-16.
- STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6, ASTM A709 GRADE 36, GRADE 50 AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50 AND GRADE 50W), UNLESS OTHERWISE SHOWN OR NOTED.
- SELF-CONSOLIDATING STRUCTURAL CONCRETE (HIGH EARLY STRENGTH) IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON SHEET B24-03-16.

GENERAL NOTES:

THE B24-16 BRIDGE STANDARDS PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT SINGLE SPAN 24'-0" ROADWAY CONCRETE BOX BEAM BRIDGES WITH LENGTHS OF 30'-0", 40'-0", 50'-0", 60'-0" AND 70'-0" MEASURED CENTER OF BEARING TO CENTER OF BEARING.

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

THESE BRIDGES ARE DESIGNED FOR HL93 LOADING PLUS 50 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE OR GRAVEL.

THESE PLANS PROVIDE DETAILS FOR PRECAST OR CAST-IN-PLACE ABUTMENTS.

THE DECK, AS SHOWN, INCLUDES A $\frac{1}{2}$ " INTEGRAL WEARING SURFACE.

THE ABUTMENTS FOR THESE STANDARDS HAVE BEEN DESIGNED FOR THE USE OF HP10x57 PILES AS PER BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.1, STRUCTURAL RESISTANCE LEVEL-1 (SRL-1). STRUCTURAL RESISTANCE LEVEL-1 (SRL-1) REPLACES THE 50 TON STEEL PILE DESIGNATION. FOR MORE INFORMATION ON SRL-1, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATION, OFFICE OF BRIDGES AND STRUCTURES WEB SITE.

ALL REINFORCING STEEL AND MECHANICAL COUPLERS SHALL BE EPOXY COATED, UNLESS NOTED OTHERWISE.

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

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5#1 IS $\frac{5}{16}$ 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

SHOP DRAWING SUBMITTALS

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

1	SHEET PILING, TIES, WALERS, AS PER STEEL SHEET PILING NOTES
2	BRIDGE RAIL POSTS

OTHER SUBMITTALS

THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW.

REQUIREMENTS FOR THE FOLLOWING SUBMITTALS SHALL BE IN ACCORDANCE WITH THE DESIGN PLANS.

1	PRECAST CONCRETE MIX DESIGNS.
2	SELF-CONSOLIDATING (HIGH EARLY STRENGTH) CONCRETE MIX DESIGNS.
3	UHP MIX DESIGN, PLACEMENT PLAN AND LIST OF SIMILAR PROJECTS.
4	QUALITY CONTROL PLAN (ALTERNATE SITE CASTING)
5	LIFTING LOOP PATCH AND STRUCTURAL REPAIR PROCEDURES.
6	MATERIAL PROPERTY CERTIFICATION FOR HIGH MOLECULAR WEIGHT METHACRYLATE (FOR REPAIR OF LEAKING BEAM JOINTS).

TOLERANCES

BOX BEAM DIMENSIONAL TOLERANCES

LENGTH OF BEAM	$\pm \frac{1}{8}$ " PER 10' AND $\pm \frac{3}{4}$ " MAX.
DEPTH OF BEAM	$\pm \frac{1}{4}$ "
FLANGE WIDTH	$\pm \frac{1}{4}$ "
FLANGE THICKNESS EXCLUDING FILLETS:	
TOP	$+\frac{1}{8}$ "
BOTTOM	$+\frac{1}{2}$ " OR $-\frac{1}{8}$ "
WIDTH OF BEAM WALLS	$+\frac{3}{8}$ " OR $-\frac{1}{4}$ "
WIDTH OF VOID	$\pm \frac{1}{2}$ "
HEIGHT OF VOID	$\pm \frac{1}{2}$ "
DEVIATION FROM VERTICAL	$\pm \frac{1}{8}$ "
DEVIATION FROM SKEW ANGLE	$\pm 0.5^\circ$

BOX BEAM ACCESSORY TOLERANCES

POSITION OF RAIL POST ANCHORS	$\pm \frac{1}{4}$ "
POSITION OF LIFTING DEVICES	$\pm 3"$
POSITION OF SLEEVES	$\pm \frac{1}{2}$ "

BOX BEAM SWEEP AND CAMBER TOLERANCES

HORIZONTAL SWEEP	$\frac{1}{8}$ " PER 10'-0"
MAXIMUM GAP BETWEEN BEAMS	1"
CAMBER DEVIATION FROM DESIGN CAMBER	$\pm 30\%$ OF PLAN CAMBER

PRECAST SUBSTRUCTURE ELEMENT TOLERANCES

LENGTH	$\pm \frac{1}{4}$ " PER 25'-0"
DEPTH	$+\frac{1}{2}$ " OR $-\frac{1}{4}$ "
WIDTH	$+\frac{3}{8}$ " OR $-\frac{1}{4}$ "

NOTES TO DESIGNER:

THESE STANDARDS GIVE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES ON A STRAIGHT GRADE. BECAUSE OF THE INFINITE NUMBER OF GRADE POSSIBILITIES, IT WILL BE NECESSARY TO SHOW ON THE PLANS THE ABUTMENT CONTROL ELEVATIONS. TO AID IN OBTAINING THE INFORMATION, SEE "EXAMPLES OF BRIDGE ELEVATION CALCULATIONS" ON SHEET B24-05-16.

THE ABUTMENT FOOTING CONCRETE QUANTITIES SHOWN IN THESE PLANS ARE CALCULATED BASED ON 0% GRADE. FOR HIGHER GRADES, THESE CONCRETE QUANTITIES FOR BRIDGES SKEWED AT 15° AND 30° NEED TO BE INCREASED AS SHOWN IN "ADDITIONAL CONCRETE" TABLES ON SHEETS B24-15-16 AND B24-16-16.

FOR 0° SKEW BRIDGES, THE DESIGNER WILL NEED TO PROVIDE WING ELEVATIONS "A" AND "B" AS NOTED ON THE STANDARD SHEET B24-08-16.

FOR STEEL PILES, 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 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](http://www.iowadot.gov/BRIDGE/INDEX.HTM).

THESE STANDARDS CONTAIN OPTIONS FOR:

1) BOX BEAM BRIDGES WITH CAST-IN-PLACE CONCRETE ABUTMENTS (SHEETPILE WINGS (0° SKEW ONLY) OR CONCRETE WINGS (0°, 15°, 30° SKEWS))

2) BOX BEAM BRIDGES WITH PRECAST CONCRETE ABUTMENTS (SHEETPILE WINGS (0° SKEW ONLY) OR CONCRETE WINGS (0°, 15°, 30° SKEWS))

3) PRESTRESSED AND NON-PRESTRESSED CONCRETE BOX BEAMS.

REFER TO QUANTITY SUMMARY SHEETS B24-28-16 TO B24-31-16 FOR APPROPRIATE BID ITEMS TO USE IN PLAN DEVELOPMENT.

LATEST REVISION DATE

Thomas E. McQuill
 APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 24'-0" ROADWAY, SINGLE SPAN
CONCRETE BOX BEAM BRIDGES

DECEMBER, 2016

**GENERAL NOTES
 (SHEET 1 OF 3)**

B24-02-16