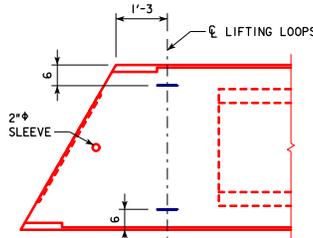
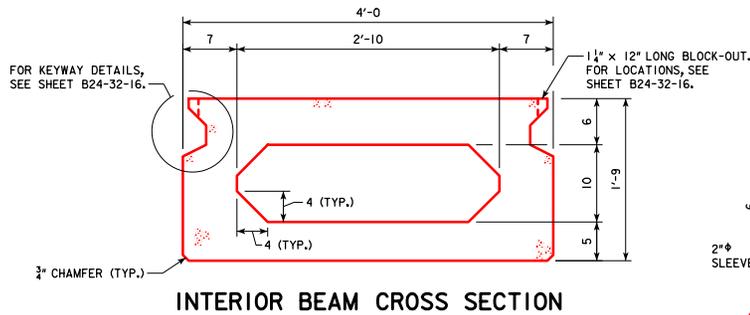


21" x 48" PRETENSIONED PRESTRESSED CONCRETE BOX BEAM DATA

BEAM	SKEW (DEGREES)	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH	CONCRETE STRENGTH		STRAND SIZE DIA. (IN.)	NO. OF STRANDS	TOTAL INITIAL PRESTRESS (KIPS)	CAMBER (IN.)		WEIGHT (TONS)	CONCRETE (C.Y.)	REINFORCING STEEL (LBS.)
				f'c _i (KSI)	f'c (KSI)				AT RELEASE	AFTER LOSSES			
PPCBB 21" x 48" x 30'-0"	0	30'-0"	31'-2"	4.5	5.0	0.6	12	510	0.2	0.4	11.7	5.8	SEE SHEET B24-37-16
	15		31'-2 1/2"										
	30		31'-4 1/4"										
PCBB 21" x 48" x 40'-0"	0	40'-0"	41'-2"	4.5	5.0	0.6	16	681	0.5	1.0	15.2	7.5	SEE SHEET B24-40-16
	15		41'-2 1/2"										
	30		41'-4 1/4"										



A = 670 in²
 Y_b = 10.4 in
 I = 33,302 in⁴

BEAM SECTION PROPERTIES (INTERIOR BEAM)

SPECIFICATIONS:

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED., SERIES OF 2014, EXCEPT AS NOTED IN "LIVE LOAD DISTRIBUTION FACTOR NOTES".

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

LIVE LOAD DISTRIBUTION FACTOR NOTES:

LIVE LOAD DISTRIBUTION FACTORS USED FOR THE FLEXURAL DESIGN OF THE BEAMS WAS BASED ON PAST STUDIES CONDUCTED BY IADOT. HOWEVER, AASHTO EQUATIONS INCLUDING SKEW EFFECTS WERE USED FOR DETERMINING THE LIVE LOAD DISTRIBUTION FACTOR FOR SHEAR. CONTROLLING LIVE LOAD DISTRIBUTION FACTORS ARE:

30'-0" SPAN
 MOMENT = 0.50 LANES / BEAM
 SHEAR = 0.69 LANES / BEAM

40'-0" SPAN
 MOMENT = 0.50 LANES / BEAM
 SHEAR = 0.67 LANES / BEAM

DESIGN STRESSES:

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

- REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
- CONCRETE IN ACCORDANCE WITH SECTION 5.
- PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 270.

NOTES:

THESE BEAMS ARE DESIGNED FOR HL93 LOADING WITH AN ALLOWANCE OF 50 LB. PER SQUARE FOOT OF ROADWAY FOR GRAVEL OR FUTURE WEARING SURFACE.
 ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

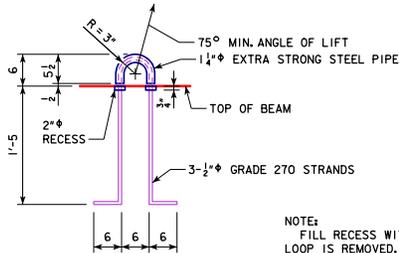
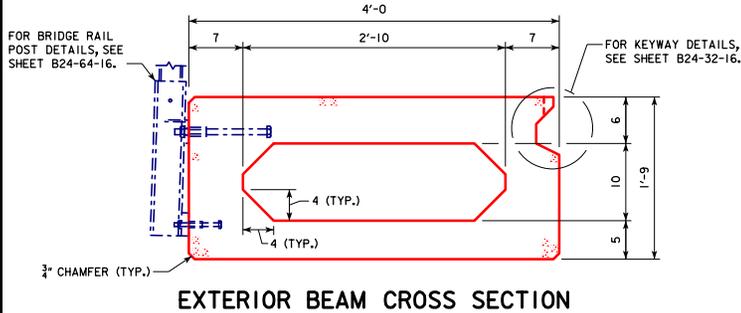
TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND LONGITUDINALLY TINED IN ACCORDANCE WITH ARTICLE 2301.03, H, 3 OF THE STANDARD SPECIFICATIONS.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.
 BEAMS ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FUTURE WEARING SURFACE, IF USED, IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.
 ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

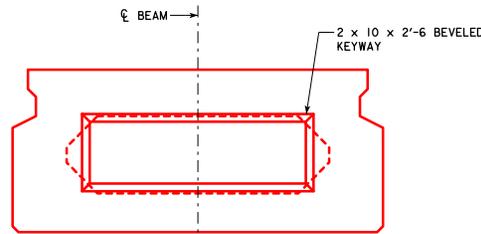
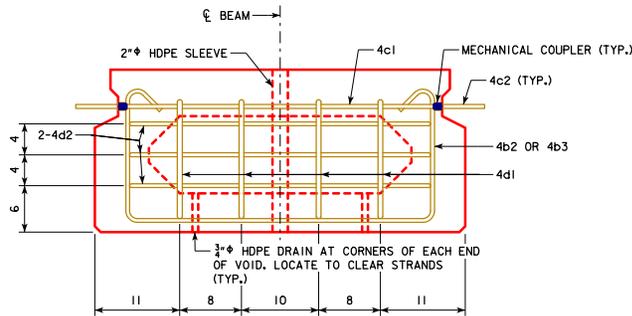
0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE ⌀ BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP SLAB.
 TOTAL INITIAL PRESTRESS IS BASED ON 72.6K f'_s, f'_s = 270 ksi AND A_s = 0.217 sq. in.
 LIFTING OPERATIONS SHALL BE PERFORMED IN A MANNER THAT LIFTING LOOPS CARRY LOADS EQUALLY.

NOTES:

FOR VIEW B-B LOCATION, SEE SHEETS B24-35-16 & B24-36-16.
 FOR BEAM CHAMFER DETAILS, SEE SHEET B24-33-16.



ALTERNATE TYPES OF LIFTING LOOPS MAY BE SUBMITTED FOR APPROVAL.



LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



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

DECEMBER, 2016

21" x 48" PPCBB DETAILS

B24-34-16