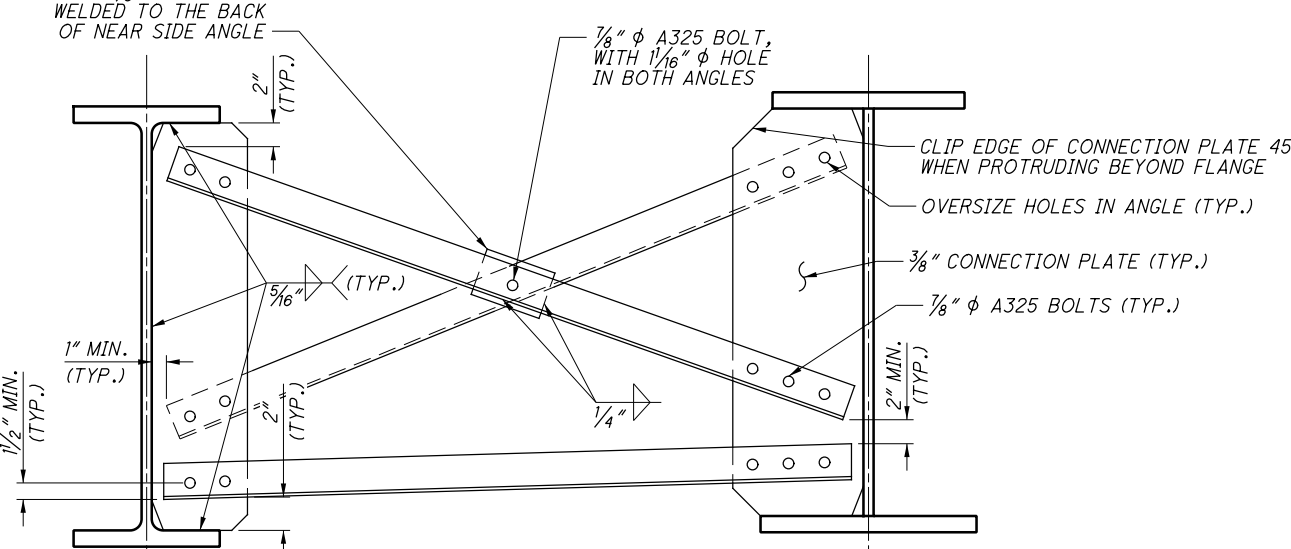


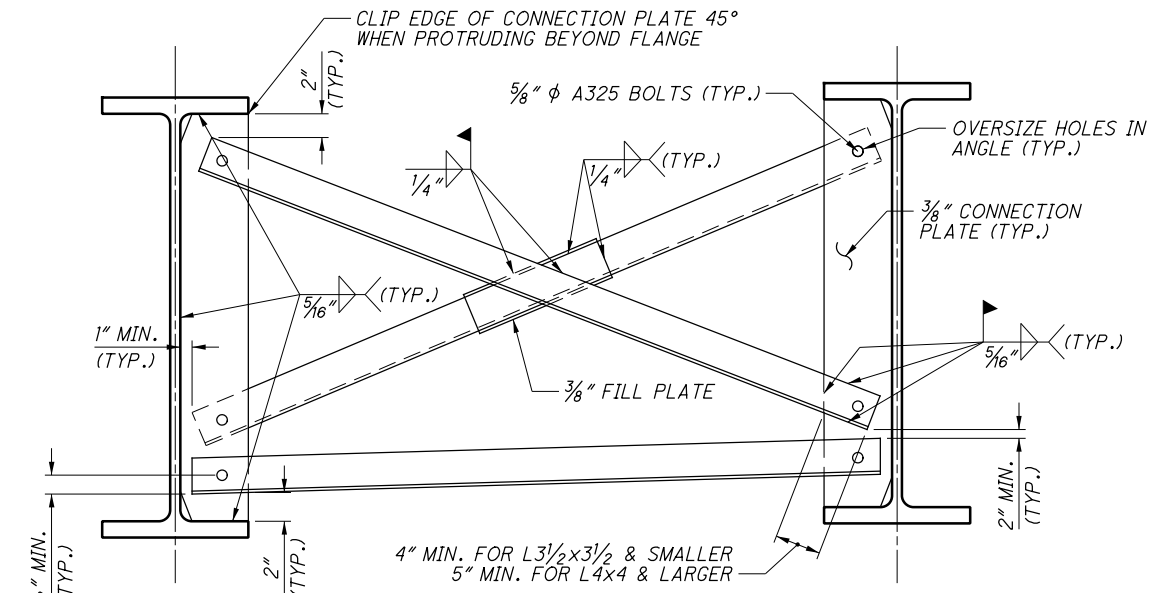
TYPE A INTERMEDIATE CROSSFRAME

STANDARD CONNECTION PLATE ON LEFT
ALTERNATE CONNECTION PLATE ON RIGHT



TYPE C INTERMEDIATE CROSSFRAME

STANDARD CONNECTION PLATE ON LEFT
ALTERNATE CONNECTION PLATE ON RIGHT



TYPE B INTERMEDIATE CROSSFRAME

INTERMEDIATE CROSSFRAME ANGLE SIZE				
OVERHANG	DEPTH OF ROLLED BEAM OR GIRDER WEB (D)	BEAM OR GIRDER SPACING (S)		
		S ≤ 6.5'	6.5' < S ≤ 8.5'	8.5' < S ≤ 10.5'
2' OVERHANG	3' ≤ D < 4'	L3x3x5/16	L3 1/2 x 3 1/2 x 3/8	L4x4x1/16
	4' ≤ D ≤ 5'	L3x3x5/16	L3 1/2 x 3 1/2 x 3/8	L4x4x3/8
	5' < D ≤ 6'	L3 1/2 x 3 1/2 x 3/8	L4x4x3/8	L4x4x1/2
3' OVERHANG	3' ≤ D < 4'	L3 1/2 x 3 1/2 x 3/8	L4x4x1/16	L5x5x1/2
	4' ≤ D ≤ 5'	L3x3x3/8	L3 1/2 x 3 1/2 x 3/8	L4x4x1/16
	5' < D ≤ 6'	L4x4x3/8	L4x4x1/16	L5x5x1/2
4' OVERHANG	3' ≤ D < 4'	L4x4x1/16	L5x5x1/2	L5x5x1/2
	4' ≤ D ≤ 5'	L3x3x5/16	L4x4x3/8	L5x5x1/2
	5' < D ≤ 6'	L3 1/2 x 3 1/2 x 3/8	L4x4x1/2	L5x5x1/2

INTERMEDIATE CROSSFRAME NOTES

GENERAL:

STANDARD CROSSFRAMES ARE LIMITED TO TANGENT STEEL MEMBERS. CROSSFRAMES TYPE A, TYPE B, AND TYPE C ARE CONSIDERED TO BE SIMILAR AND INTERCHANGEABLE FROM A DESIGN PERSPECTIVE. EXCEPT WHERE OTHERWISE SPECIFIED IN THE CONTRACT PLANS, THE CONTRACTOR MAY CHOOSE THE CROSSFRAME TYPE IN ACCORDANCE WITH THIS STANDARD. PROVIDE THE UNIT COST FOR STRUCTURAL STEEL USING THE TOTAL WEIGHT PROVIDED IN THE ESTIMATED QUANTITIES, REGARDLESS OF ANY CHANGE TO THE TOTAL WEIGHT RESULTING FROM THE SELECTION OF CROSSFRAME TYPE.

THE FABRICATOR SHALL CHECK LONGITUDINAL CROSSFRAME SPACING SO THAT INTERFERENCE WITH BOLTED SPLICES, ANCHOR BOLTS, COMPLETE PENETRATION WEB OR FLANGE WELDED SPLICES AND BEARING STIFFENERS IS AVOIDED. SPACING SHALL BE ADJUSTED TO PROVIDE AT LEAST SIX (6) INCHES OF LONGITUDINAL CLEARANCE.

FOR COMPLETELY SHOP PAINTED, METALIZED OR GALVANIZED SYSTEMS, A TYPE A OR TYPE C CROSSFRAME SHALL BE USED.

MATERIAL:
ALL INTERMEDIATE CROSSFRAME MATERIAL SHALL BE A709 GRADE 36, 50 OR 50W. THE TYPE AND GRADE SHALL BE THE SAME AS THAT SPECIFIED FOR THE SUPER-STRUCTURE MAIN STEEL.

FASTENERS:
ALL BOLTS SHALL BE ASTM F3125, GRADE A325, WITH THREADS EXCLUDED FROM THE SHEAR PLANE.

FASTENERS (CONT.):

FOR GALVANIZED, METALIZED AND PAINTED STEEL, TYPE 1 GALVANIZED BOLTS SHALL BE USED. FOR BARE A709 GRADE 50W STEEL, TYPE 3 BOLTS SHALL BE USED. EACH ANCHOR ASSEMBLY SHALL INCLUDE A BOLT, NUT AND TWO (2) WASHERS, TIGHTENED ACCORDING TO CMS 513 PRIOR TO DECK PLACEMENT.

MINIMUM EDGE DISTANCES FOR BOLTS SHALL BE 1 1/2".

LIMITATIONS FOR TYPE A INTERMEDIATE CROSSFRAMES:

FOR L3x3 AND L3 1/2 x 3 1/2 CROSSFRAME ANGLES, USE 1 COLUMN OF 3 BOLTS FOR TOP GUSSET PLATES AND 1 COLUMN OF 4 BOLTS FOR LOWER GUSSET PLATES WITH STANDARD CONNECTION PLATES. FOR L4x4 AND L5x5 CROSSFRAME ANGLES, USE 2 COLUMNS OF 3 BOLTS FOR TOP GUSSET PLATES AND 2 COLUMNS OF 4 BOLTS FOR LOWER GUSSET PLATES WITH ALTERNATE CONNECTION PLATES.

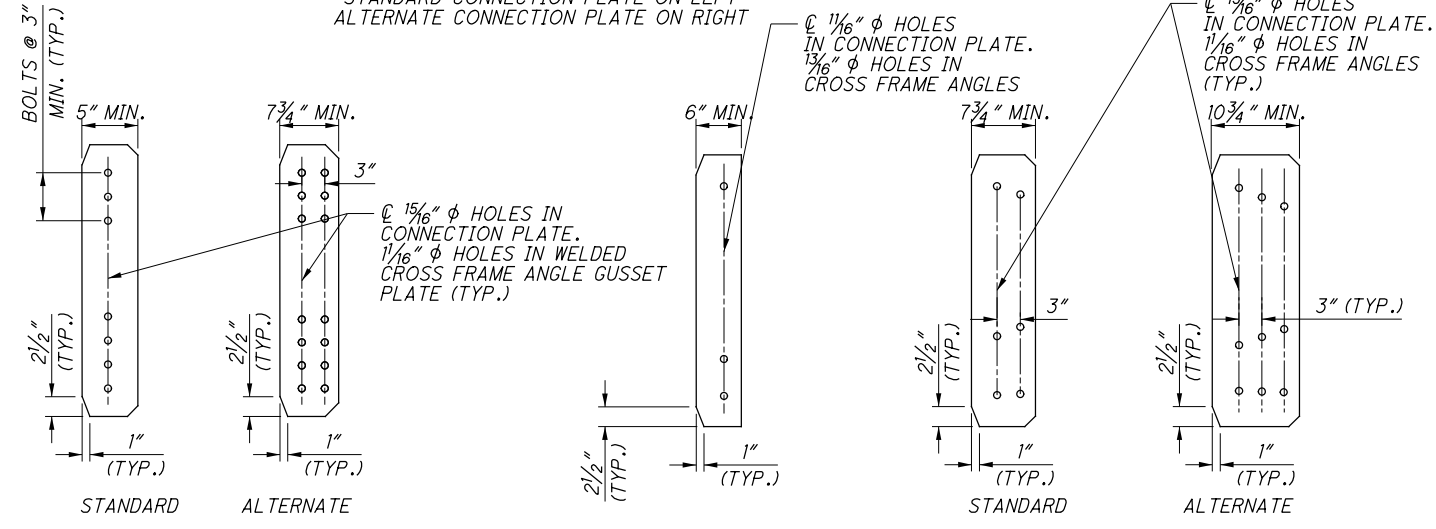
LIMITATIONS FOR TYPE C INTERMEDIATE CROSSFRAMES:

TYPE C INTERMEDIATE CROSSFRAMES ARE NOT PERMITTED FOR BEAMS/GIRDERS < 4' DEEP IF EITHER THE DECK OVERHANG EXCEEDS 2' OR BEAM/GIRDER SPACING EXCEEDS 8.5'.

FOR DECK OVERHANGS > 2' AND ≤ 3' AND GIRDERS ≤ 5' DEEP, USE 2 BOLTS PER CROSSFRAME MEMBER WITH STANDARD CONNECTION PLATE.

FOR DECK OVERHANGS > 2' AND ≤ 3' AND GIRDERS > 5' DEEP, USE 3 BOLTS PER CROSSFRAME MEMBER WITH ALTERNATE CONNECTION PLATES.

FOR DECK OVERHANGS > 3', USE 3 BOLTS PER CROSSFRAME MEMBER WITH ALTERNATE CONNECTION PLATES.



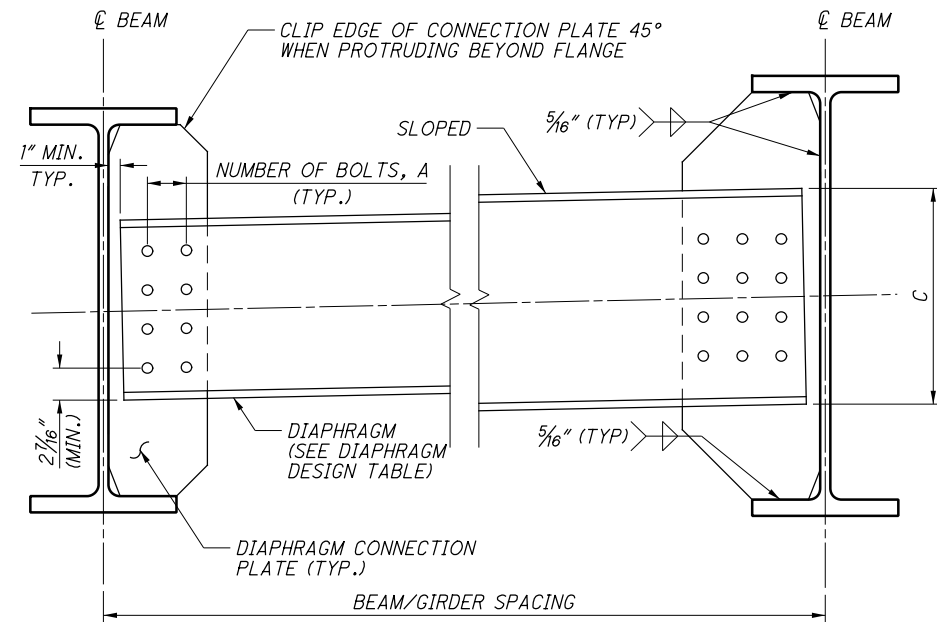
TYPE A CROSSFRAME CONNECTION PLATE

TYPE B CROSSFRAME CONNECTION PLATE

TYPE C CROSSFRAME CONNECTION PLATE

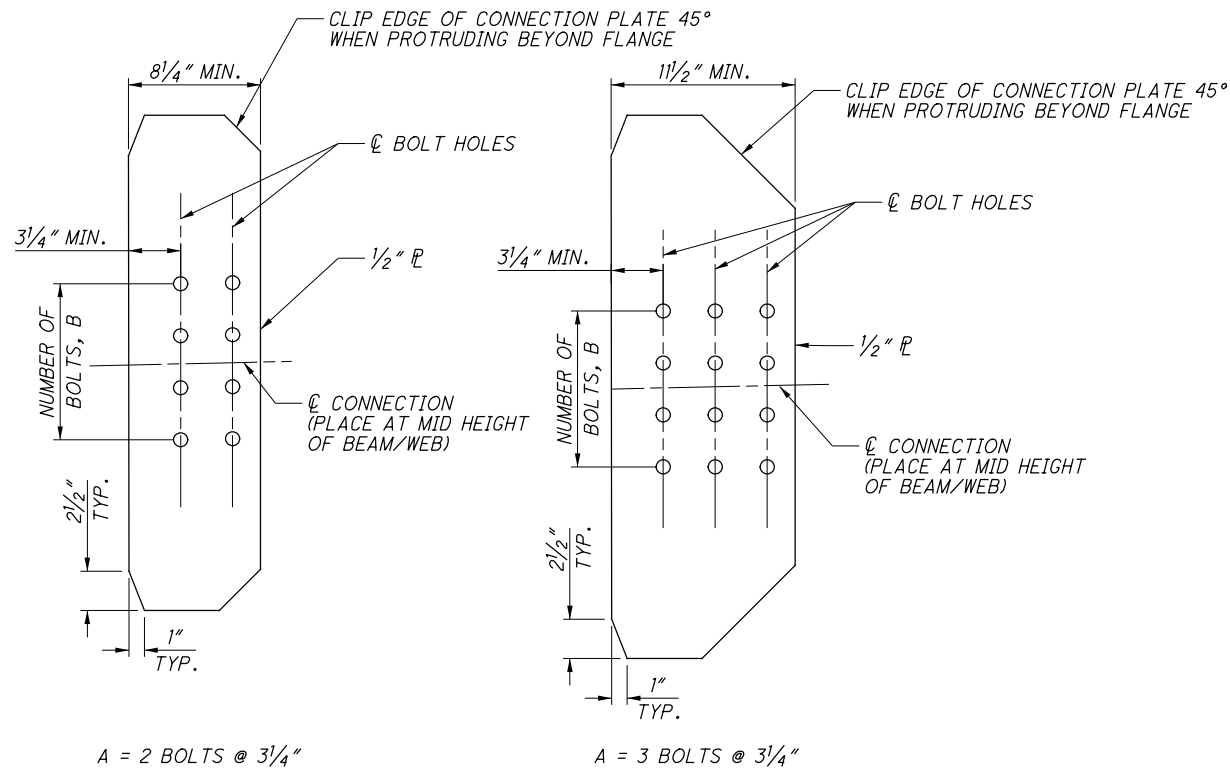
REFER TO LIMITATIONS FOR TYPE A INTERMEDIATE CROSSFRAMES FOR CONNECTION PLATE SELECTION.

REFER TO LIMITATIONS FOR TYPE C INTERMEDIATE CROSSFRAMES FOR CONNECTION PLATE SELECTION.



INTERMEDIATE DIAPHRAGM

2 COLUMNS OF BOLTS WITH C15x33.9 SHOWN ON LEFT
 3 COLUMNS OF BOLTS WITH MC18x42.7 SHOWN ON RIGHT
 SEE DIAPHRAGM DESIGN TABLE FOR DIAPHRAGM AND
 BOLT REQUIREMENTS



DIAPHRAGM CONNECTION PLATE

ALL COLUMNS OF BOLTS ARE VERTICAL.
 ROWS OF BOLTS MAY BE HORIZONTAL OR
 SLOPED, WHERE NECESSARY TO MAINTAIN
 TIGHTENING CLEARANCES TO CHANNEL FLANGES.

DIAPHRAGM DESIGN TABLE					
OVERHANG	DEPTH OF ROLLED BEAM	DIAPHRAGM SIZE	DIMENSIONS		
			A	B	C
2' OVERHANG	≤ 30"	C15x33.9	2 BOLTS @ 3/4"	4 BOLTS @ 3/4"	15"
	30" < D ≤ 36"	MC18x42.7	2 BOLTS @ 3/4"	4 BOLTS @ 3/4"	18"
> 2' AND ≤ 3' OVERHANG	≤ 30"	C15x33.9	3 BOLTS @ 3/4"	4 BOLTS @ 3/4"	15"
	30" < D ≤ 36"	MC18x42.7	3 BOLTS @ 3/4"	4 BOLTS @ 3/4"	18"
> 3' AND ≤ 4' OVERHANG	≤ 30"	MC18x42.7	3 BOLTS @ 3/4"	5 BOLTS @ 3/4"	18"
	30" < D ≤ 36"	MC18x42.7	3 BOLTS @ 3/4"	5 BOLTS @ 3/4"	18"

INTERMEDIATE DIAPHRAGM NOTES

GENERAL:

THESE STANDARD DIAPHRAGMS ARE LIMITED TO TANGENT ROLLED BEAM MEMBERS WITH BEAM SPACINGS ≤ 10.5 FT.

THE FABRICATOR SHALL CHECK LONGITUDINAL DIAPHRAGM SPACING SO THAT INTERFERENCE WITH BOLTED SPLICES, ANCHOR BOLTS, COMPLETE PENETRATION WEB OR FLANGE WELDED SPLICES AND BEARING STIFFENERS IS AVOIDED. SPACING SHALL BE ADJUSTED TO PROVIDE AT LEAST SIX (6) INCHES OF LONGITUDINAL CLEARANCE.

MATERIAL:

ALL INTERMEDIATE DIAPHRAGM MATERIAL SHALL BE A709 GRADE 36, 50 OR 50W. THE TYPE AND GRADE SHALL BE THE SAME AS THAT SPECIFIED FOR THE SUPER-STRUCTURE MAIN STEEL.

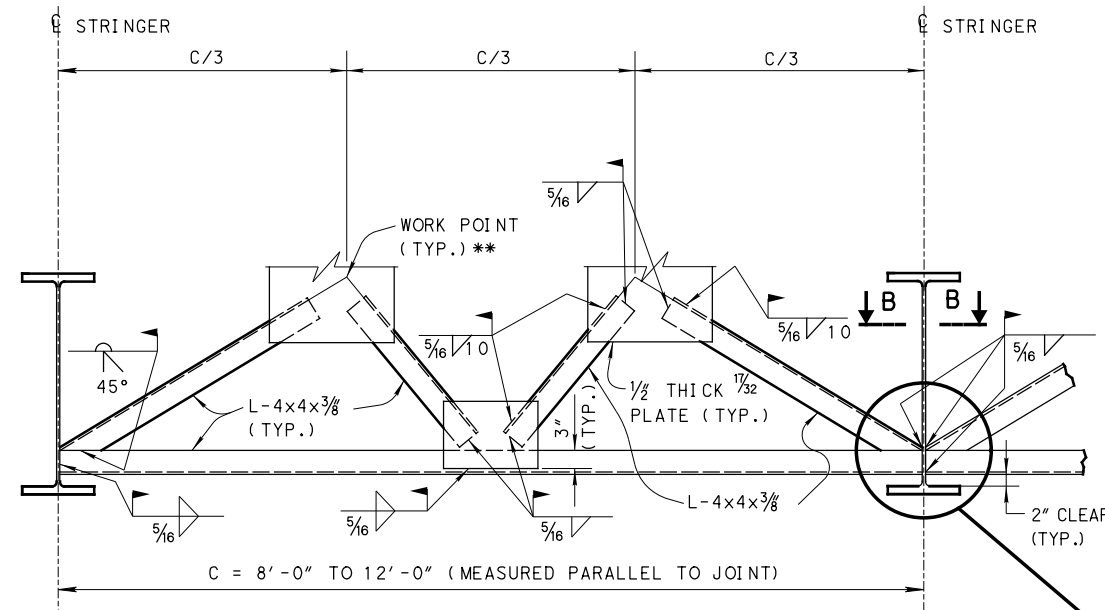
FASTENERS:

ALL BOLTS SHALL BE 1" φ. ASTM F3125, GRADE A325, WITH THREADS EXCLUDED FROM THE SHEAR PLANE.

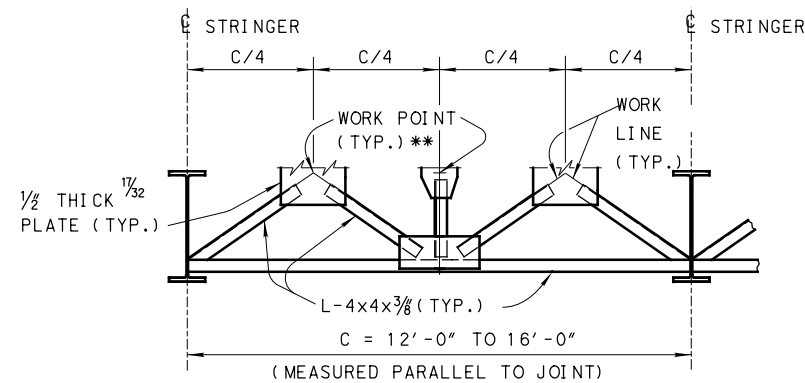
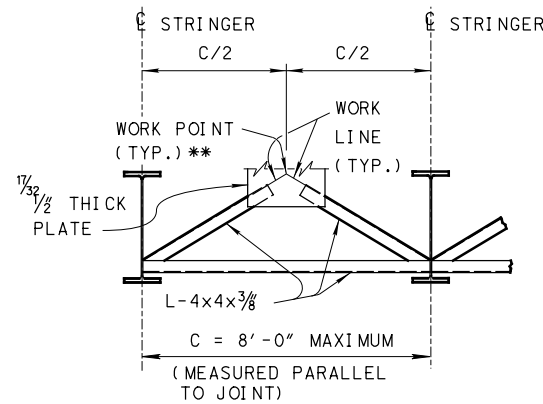
FOR GALVANIZED, METALIZED AND PAINTED STEEL, TYPE 1 GALVANIZED BOLTS SHALL BE USED. FOR BARE A709 GRADE 50W STEEL, TYPE 3 BOLTS SHALL BE USED. EACH ANCHOR ASSEMBLY SHALL INCLUDE A BOLT, NUT AND TWO (2) WASHERS, TIGHTENED ACCORDING TO CMS 513 PRIOR TO DECK PLACEMENT.

MINIMUM EDGE DISTANCES FOR BOLTS SHALL BE 1 3/4".

ALL HOLES TO BE 1/8" DIA. IN CONNECTION PLATES AND 1/4" DIA. IN DIAPHRAGM.



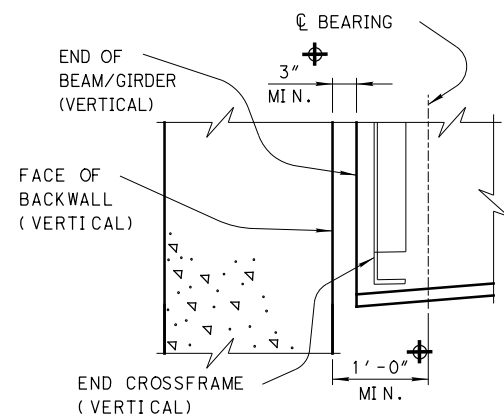
NOTE: THE WELDING SYMBOLS SHOWN ABOVE ARE TYPICAL FOR ALL SIMILAR LOCATIONS OF THIS END CROSSFRAME. THE WELDED ATTACHMENT DETAILS AND TYPICAL DIMENSIONS SHOWN ARE TYPICAL FOR THE CROSSFRAMES DETAILED BELOW.



END CROSSFRAME DETAILS

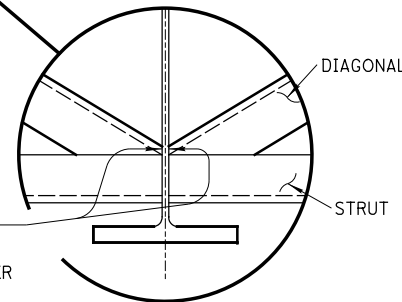
* - THE 1/2" THICK PLATE IS PART OF THE EXPANSION JOINT SYSTEM. SEE THE APPROPRIATE EXPANSION JOINT STANDARD BRIDGE DRAWING FOR DETAILS INCLUDING MATERIAL AND COATING REQUIREMENTS.

** - THE WORK LINE SHALL BE THE INSIDE FACE OF THE PROTRUDING ANGLE LEG EXTENDED AS SHOWN. THE WORK POINT SHALL BE AT THE INTERSECTION OF THESE LINES

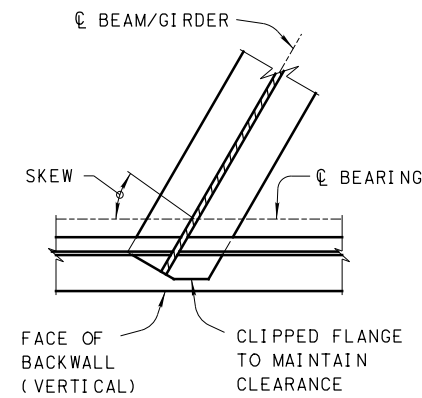


ELEVATION OF BEAM/GIRDER

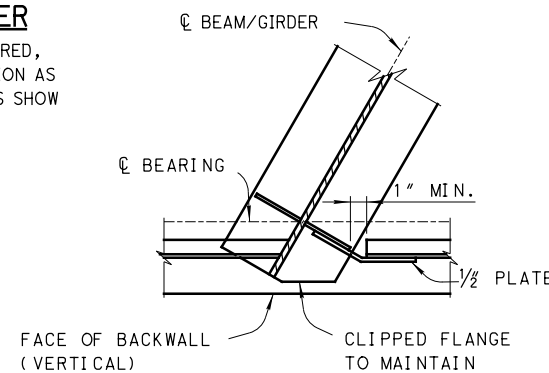
DESIGNER TO ESTABLISH DIMENSION REQUIRED, MEASURED NORMAL TO BACKWALL. DIMENSION AS ABOVE UNLESS CONTRACT CRITERIA/PLANS SHOW OTHERWISE.



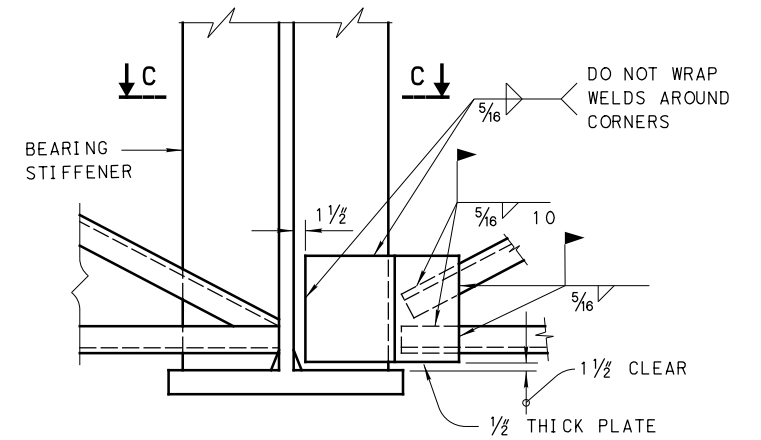
BEVEL HORIZONTAL LEG OF DIAGONAL TO INTERSECT BEAM/GIRDER WEB AS SHOWN



SECTION B-B



SECTION C-C



BEAM/GIRDER END

END CROSSFRAME FOR SKEWED BRIDGES WHERE BEARING STIFFENERS INTERFERE WITH END CROSSFRAMES.

END CROSSFRAME NOTES:

MATERIAL: ALL END CROSSFRAME MATERIAL SHALL BE A709 GRADE 50 EXCEPT WHEN THE SUPERSTRUCTURE MAIN STEEL IS A709 GRADE 50W, THEN THE END CROSSFRAME MATERIAL SHALL ALSO BE A709 GRADE 50W.

BEAM/GIRDER ENDS: FOR STRUCTURES ON GRADE, THE BEAM/GIRDER ENDS SHALL BE FABRICATED TO BE VERTICAL AFTER ERECTION. A THREE (3) INCH MINIMUM CLEARANCE AT 60° F SHALL BE MAINTAINED BETWEEN THE VERTICAL ENDS OF THE BEAMS/GIRDERS AND THE VERTICAL FACE OF THE BACKWALL UNLESS THE CONTRACT CRITERIA/PLANS SHOW OTHERWISE.

WORK POINTS: WORK POINTS SHALL BE COORDINATED BETWEEN EXPANSION JOINT AND STRUCTURAL STEEL SUPPLIERS TO ASSURE FIT UP AT ALL DESIGN LOCATIONS.

STIFFENER NOTES:

NOTES FOR STIFFENER DETAILS: INSTALL STIFFENERS ACCORDING TO 513. UNLESS THE CONTRACT DOCUMENTS REQUIRE LARGER WELDS, PROVIDE A 1/4" WELD WHEN THE THICKER PLATE IS 3/4" OR LESS AND A 5/16" WELD WHEN THE THICKER PLATE IS GREATER THAN 3/4".

SCUPPER NOTES:

GENERAL: THE DESIGNER SHALL SHOW THE LOCATION OF THE SCUPPERS IN A PLAN VIEW OF THE BRIDGE DECK ON THE CONTRACT DOCUMENTS.

SUPPLEMENTAL REINFORCEMENT: REINFORCE THE CONCRETE DECK AT THE TWO SCUPPER CORNERS OPPOSITE THE CURB LINE WITH ONE #4 BAR, 3'-0" LONG ORIENTED AT 45° TO THE LONG AXIS OF THE SCUPPER AND LOCATED JUST BELOW THE TRANSVERSE BARS IN THE TOP MAT OF STEEL.

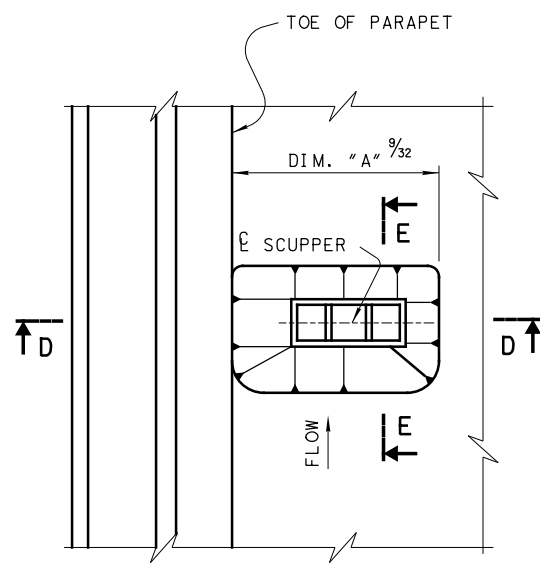
MATERIAL: FURNISH STRUCTURAL STEEL TUBING ACCORDING TO 707.10. TOUGHNESS TESTING IN ACCORDANCE WITH ASTM E436 IS NOT REQUIRED. ALL OTHER MATERIAL SHALL BE ASTM A709 GRADE 36, 50 OR 50W. GALVANIZE SUPPORT ANGLES, BARS, BOLTS, NUTS AND WASHERS IN ACCORDANCE WITH 711.02

DECK CROWN/SUPERELEVATION: CUT THE TOP OF THE STEEL TUBING SQUARE FOR CROSS SLOPES $\frac{1}{2}$ " PER FOOT AND LESS. CUT THE TOP OF THE TUBING PARALLEL TO THE DECK SURFACE FOR CROSS SLOPES GREATER THAN $\frac{1}{2}$ " PER FOOT.

FASTENER NOTES:

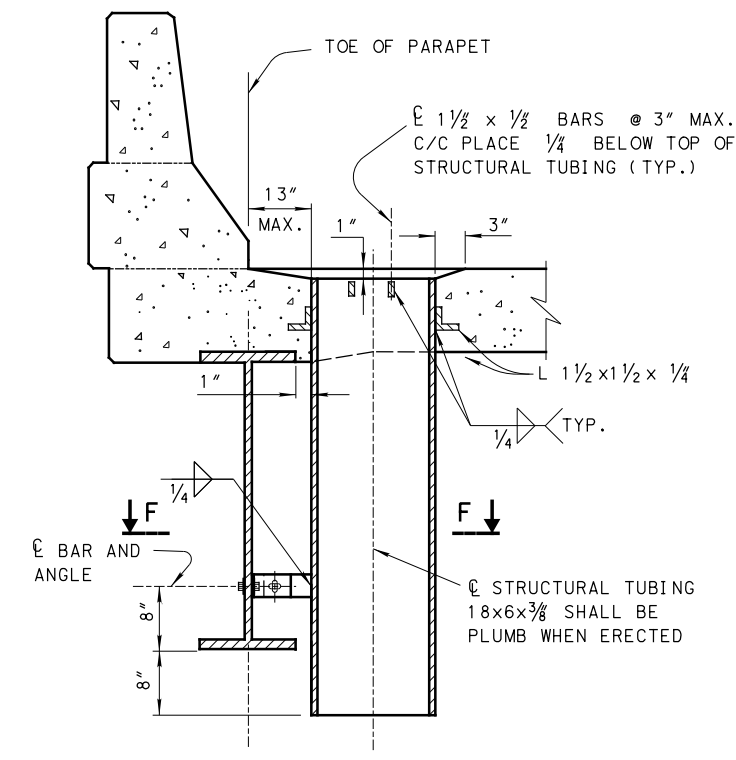
1. THE SIZE OF THE SLOTTED HOLES SHALL BE $\frac{1}{16}$ " x $1\frac{1}{16}$ ". THE SLOT SHALL BE HORIZONTAL IN THE $3" \times \frac{3}{8}$ " BAR AND VERTICAL IN THE ANGLE. BOLTS SHALL BE $\frac{5}{8}$ " DIAMETER A325 TYPE 1, GALVANIZED, WITH HEX NUT AND TWO WASHERS. TIGHTEN ACCORDING TO 513.
2. THE BOLTS SHALL BE $\frac{5}{8}$ " DIAMETER A325 TYPE 1 GALVANIZED FOR GALVANIZED, METALIZED OR PAINTED STRUCTURES OR A325 TYPE 3 FOR BARE WEATHERING STEEL STRUCTURES. EACH ASSEMBLY SHALL INCLUDE A BOLT, NUT AND TWO WASHERS. TIGHTEN ACCORDING TO 513. FOR WEATHERING STEEL STRUCTURES, PROVIDE A $3\frac{1}{2}" \times 3\frac{1}{2}" \times \frac{1}{8}"$ PREFORMED BEARING PAD, 711.21, WITH A $\frac{1}{16}$ " DIAMETER HOLE, BETWEEN THE BEAM WEB AND THE ANGLE. AFTER THE DECK CONCRETE HAS BEEN POURED, FIELD DRILL THE $\frac{1}{16}$ " DIAMETER HOLE IN THE WEB.

BASIS OF PAYMENT: THE DEPARTMENT WILL PAY FOR THE SUPPLEMENTAL REINFORCEMENT DESCRIBED ABOVE SEPARATELY UNDER ITEM 509.

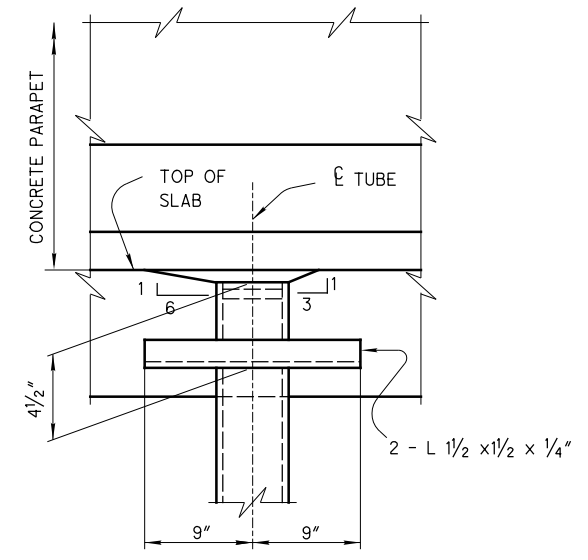


PLAN

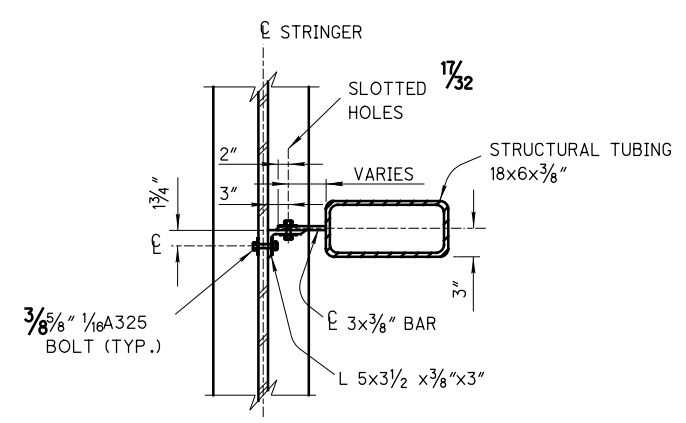
* - DIMENSION "A" SHALL NOT EXTEND BEYOND THE LIMITS OF THE SHOULDER (SHALL NOT FALL IN THE TRAFFIC LANE)



SECTION D-D



SECTION E-E



SECTION F-F

$\frac{1}{32}$ - SEE FASTENER NOTE 1.
 $\frac{3}{8}$ - SEE FASTENER NOTE 2.