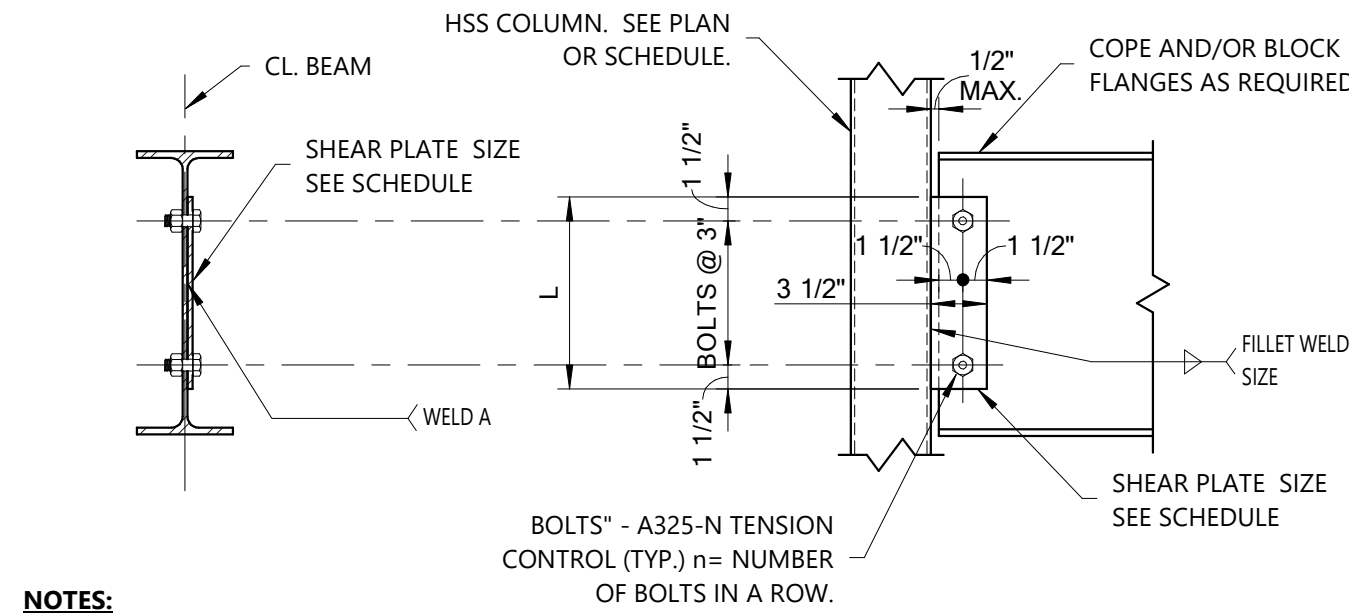


- NOTES:**
- WHERE BEAMS AND GIRDERS FRAME INTO A W8 COLUMN OR THE WEB OF A W10 COLUMN, ANGLE SIZE 3x3 1/2xSAME THICKNESS SHALL BE USED AND g1 SHALL BE DECREASED BY 2" TYPICALLY.
 - FOR CHANNEL CONNECTIONS, USE ANGLE AND BOLTS FOR SIMILAR DEPTH BEAM SHOWN BELOW.
 - FOR ANGLES 0 DEGREES TO 5 DEGREES FROM PERPENDICULAR, ANGLES SHALL BE BENT.
 - FOR ANGLES 5 DEGREES TO 33.7 DEGREES FROM PERPENDICULAR, PROVIDE (2) BENT PLATES 3/8"x4-1/2"x-1/2" X "L" AS SHOWN BELOW (OPTION 1 SHALL BE USED WITH WELD A = 1/4"). PLACE LONG LEG OF BENT PLATE ON SUPPORTING BEAM OR COLUMN.
 - FOR ANGLES 33.7 DEGREES TO 71.6 DEGREES FROM PERPENDICULAR, PROVIDE (1) BENT PLATE 3/8"x4-1/2"x4-1/2" X "L" AS SHOWN BELOW (OPTION 1 SHALL BE USED WITH WELD A = 1/4").
 - LEG SHALL BE ADJUSTED WHERE REQUIRED BY GEOMETRY.
 - AT ALL BEAM CONNECTIONS TO DIAGONAL BRACED FRAME COLUMNS IN WHICH BEAM IS PARALLEL TO THE DIAGONAL BRACED FRAME, THE CONNECTION ANGLE THICKNESS SHALL BE INCREASED TO 1/2" AND "WELD A" SHALL BE 1/4".
 - AT DOUBLE BEAM CONNECTIONS AT COLUMNS, INCREASE ANGLE LEG AND ADD BOLTS AS REQUIRED TO MEET OSHA STANDARDS.
 - FOR BEAM TO BEAM CONNECTIONS, PROVIDE CONNECTION PER THE SHALLOWER MEMBER AND COPE SUPPORTED BEAM AS REQUIRED.
 - CONNECTION TO WEB OF SUPPORTED BEAM MAY BE WELDED OR BOLTED, UNLESS NOTED OTHERWISE ABOVE.

BEAM SIZE	ANGLE SIZE	L (inches)	n	g1	WELD A	BOLTS
W8's & W10's	L4x3 1/2x5/16	5 1/2	2	5 1/2	1/4	3/4"
W12's	L4x3 1/2x5/16	8 1/2	3	5 1/2	1/4	3/4"
W14's	L4x3 1/2x5/16	8 1/2	3	5 1/2	1/4	3/4"
W16's	L4x3 1/2x5/16	11 1/2	4	5 1/2	1/4	3/4"
W18's	L4x3 1/2x5/16	14 1/2	5	5 1/2	1/4	3/4"
W21's	L4x3 1/2x5/16	17 1/2	6	5 1/2	1/4	3/4"
W24's	L4x3 1/2x5/16	20 1/2	7	5 1/2	1/4	3/4"
W27's	L4x3 1/2x5/16	23 1/2	8	5 1/2	1/4	3/4"
W30's	L4x3 1/2x5/16	26 1/2	9	5 1/2	1/4	3/4"
W36's	L4x3 1/2x5/16	32 1/2	10	5 1/2	1/4	3/4"
W40's	L4x3 1/2x5/16	35 1/2	11	5 1/2	1/4	3/4"

1 Typical Beam Connection Schedule And Detail

1" = 1'-0"



- NOTES:**
- WHERE BEAM FRAMES INTO FLAT FACE OF HSS COLUMN ON A SKEW 10 DEGREES OR LESS FROM PERPENDICULAR, PLATE SHALL BE WELDED TO COLUMN WITH FILLET WELD AS INDICATED IN TABLE BELOW.
 - WHERE BEAM FRAMES INTO FLAT FACE OF HSS COLUMN ON A SKEW GREATER THAN 10 DEGREES FROM PERPENDICULAR, PLATE SHALL BE FULL PEN WELDED TO COLUMN.
 - FOR PLATES ATTACHING TO THE RADIUSUED CORNER OF AN HSS COLUMN USE COMPLETE JOINT PENETRATION WELD.
 - SLOTTED BOLT HOLES SHALL NOT BE USED, UNLESS NOTED OTHERWISE, EXCEPT AT LOCATIONS APPROVED BY ENGINEER VIA THE RFI PROCESS.

BEAM SIZE	PLATE SIZE (inches)	L (inches)	n	WELD (TYP.) EA. SIDE (inches)	BOLTS (TYP.)
W8's	5/16	6	2	1/4	3/4"
W10's	5/16	6	2	1/4	3/4"
W12's	5/16	9	3	1/4	3/4"
W14's	5/16	9	3	1/4	3/4"
W16's	5/16	12	4	1/4	3/4"
W18's	5/16	15	5	1/4	3/4"
W21's	5/16	18	6	1/4	3/4"
W24's	5/16	18	6	1/4	3/4"
W27's	5/16	21	7	1/4	3/4"
W30's	5/16	24	8	1/4	3/4"
W36's	5/16	27	9	1/4	3/4"

2 Typical Beam To HSS Column Connection Schedule And Detail

1" = 1'-0"

SHEAR STUD PLACEMENT FOR COMPOSITE STEEL BEAMS

DECK PERPENDICULAR TO SUPPORTS

CASE 1 - FEWER STUDS THAN VALLEYS

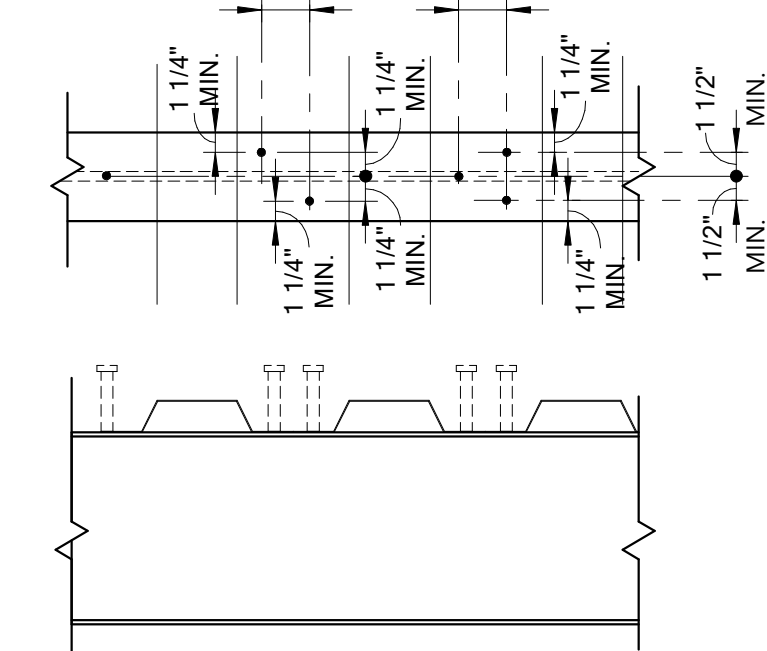
EXAMPLE: W14x22 (20) -- (20) INDICATES NUMBER OF STUDS

PROCEDURE: PLACE A STUD IN ALTERNATING FLUTES FOR ENTIRE LENGTH OF BEAM. PLACE REMAINING STUDS IN FLUTES NOT ALREADY HAVING A STUD, STARTING NEAR BEAM ENDS AND CONTINUING TOWARD BEAM CENTER. MAXIMUM SPACING ALLOWED IS 12" O.C. SEE DETAIL BELOW FOR APPROXIMATE LOCATION OF SINGLE STUDS IN FLUTES.

CASE 2 - MORE STUDS THAN VALLEYS

EXAMPLE: W14x22 (20) -- (20) INDICATES NUMBER OF STUDS

PROCEDURE: PLACE A STUD IN AVAILABLE FLUTES, IF STUDS ENDS REMAIN, PLACE A SECOND STUD IN FLUTES NEAR BEAM ENDS AND CONTINUE PLACING A SECOND STUD IN EACH FLUTE TOWARD BEAM CENTER. IF STUDS REMAIN, PLACE A THIRD STUD IN FLUTES NEAR BEAM ENDS AND CONTINUE PLACING A THIRD STUD IN EACH FLUTE TOWARD BEAM CENTER. SEE DETAIL BELOW FOR APPROXIMATE LOCATION FOR TWO OR THREE STUDS IN FLUTES. MAXIMUM SPACING ALLOWED IS 12" O.C.



DECK PARALLEL TO SUPPORTS

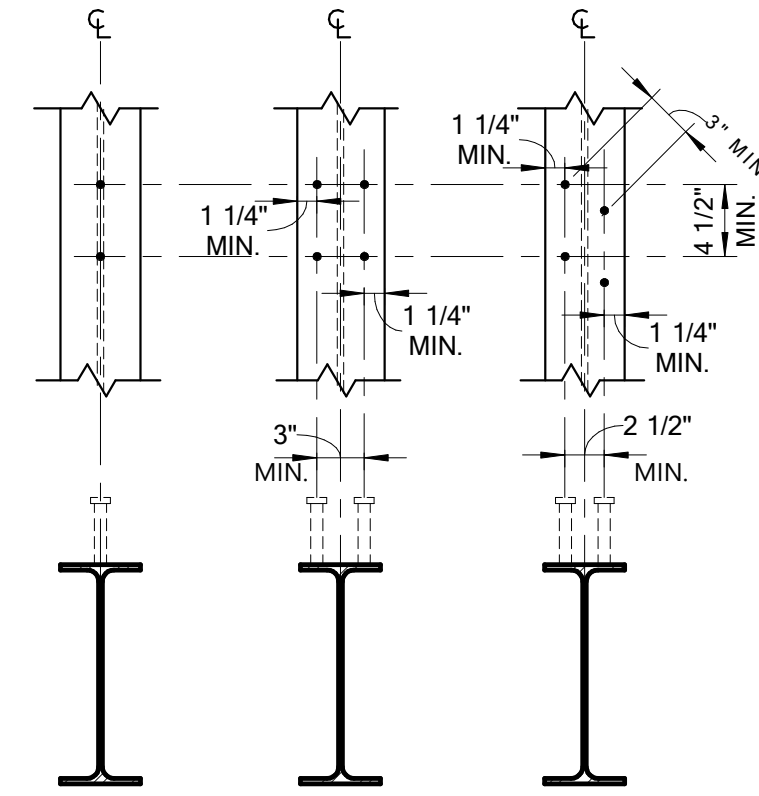
CASE 3 - ALL DECK PARALLEL TO SUPPORTS

EXAMPLE: W21x44 (45) -- (45) INDICATES NUMBER OF STUDS ON BEAM TO BE EQUALLY SPACED ALONG BEAM LENGTH

PROCEDURE: PLACE A SINGLE ROW OF STUDS ALONG GIRDER AT EQUAL SPACING. IF SPACING IS LESS THAN 4 1/2", USE DOUBLE ROW AS REQUIRED. STUD SPACING NOT TO EXCEED 12" O.C.

NOTE:

GENERALLY, THE FIRST STUD IS PLACED 12" +/- FROM THE COLUMN LINE.



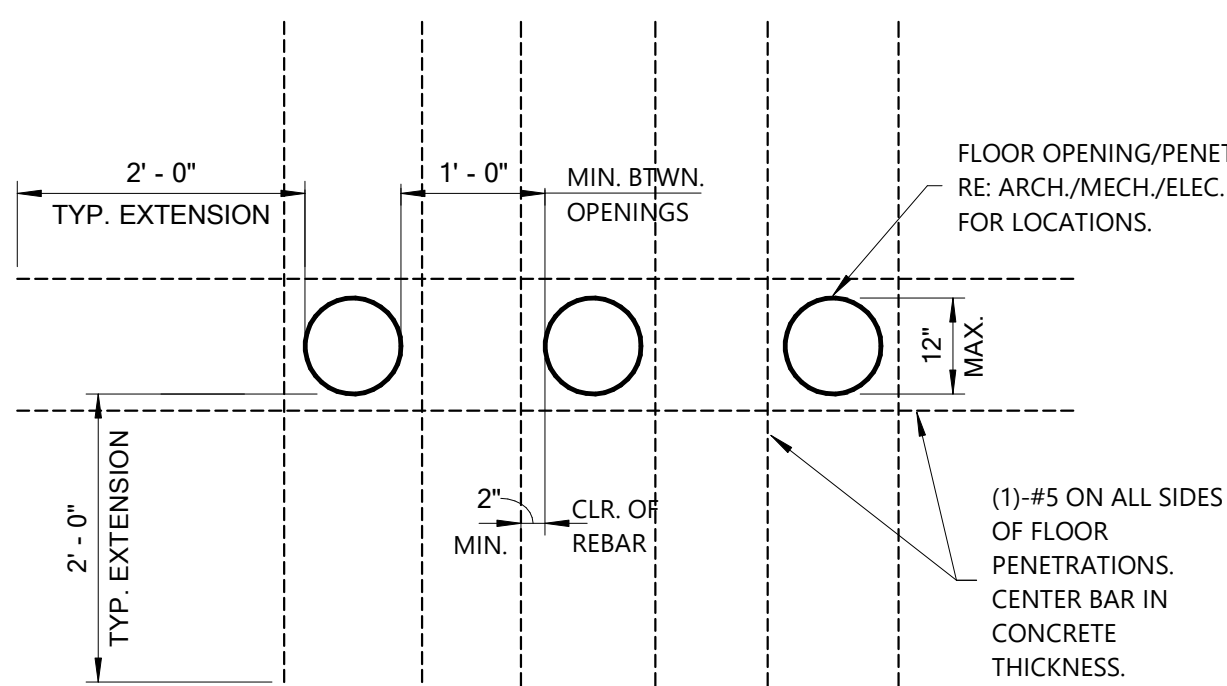
EDGE BEAM NOTE:

STAGGERED OR DOUBLE ROW LAYOUT IS REQUIRED AT ALL COMPOSITE EDGE BEAMS. SEE "TYPICAL SLAB EDGE DETAIL WITH COMPOSITE BEAMS".

3 Shear Stud Placement Detail

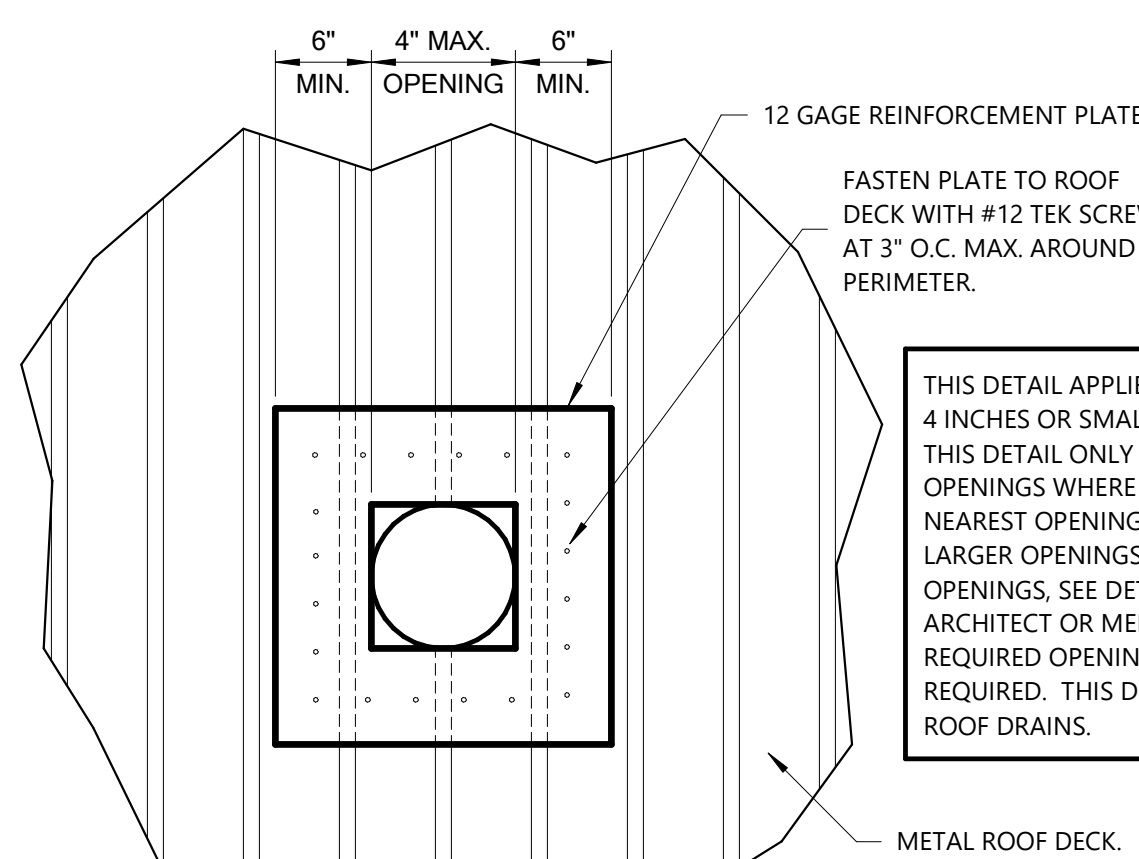
1" = 1'-0"

NOTE:
THIS DETAIL IS APPLICABLE FOR ALL FLOOR PENETRATIONS (INCLUDING ELEC. AND MECH.) GREATER THAN 2" IN DIA. IF 12" SPACING CANNOT BE OBTAINED, FRAME AROUND PENETRATIONS AS A SINGLE OPENING PER DETAIL "LARGE FLOOR OPENINGS".



4 Small Openings In Elevated Floor

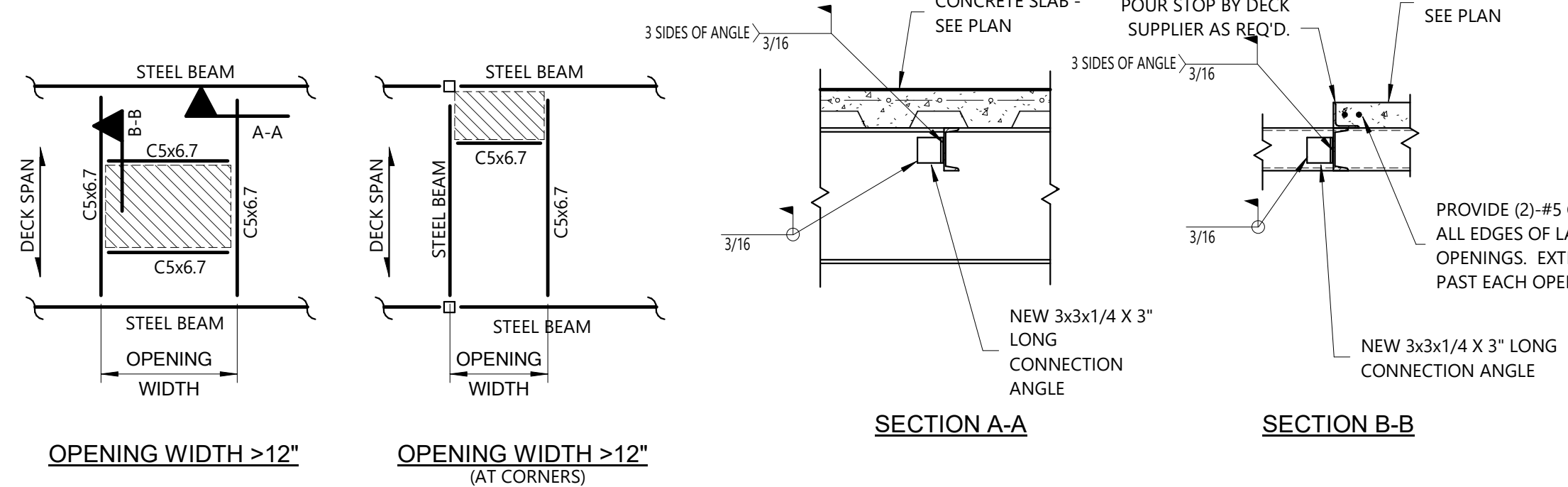
3/4" = 1'-0"



5 Small Reinforced Roof Deck Opening

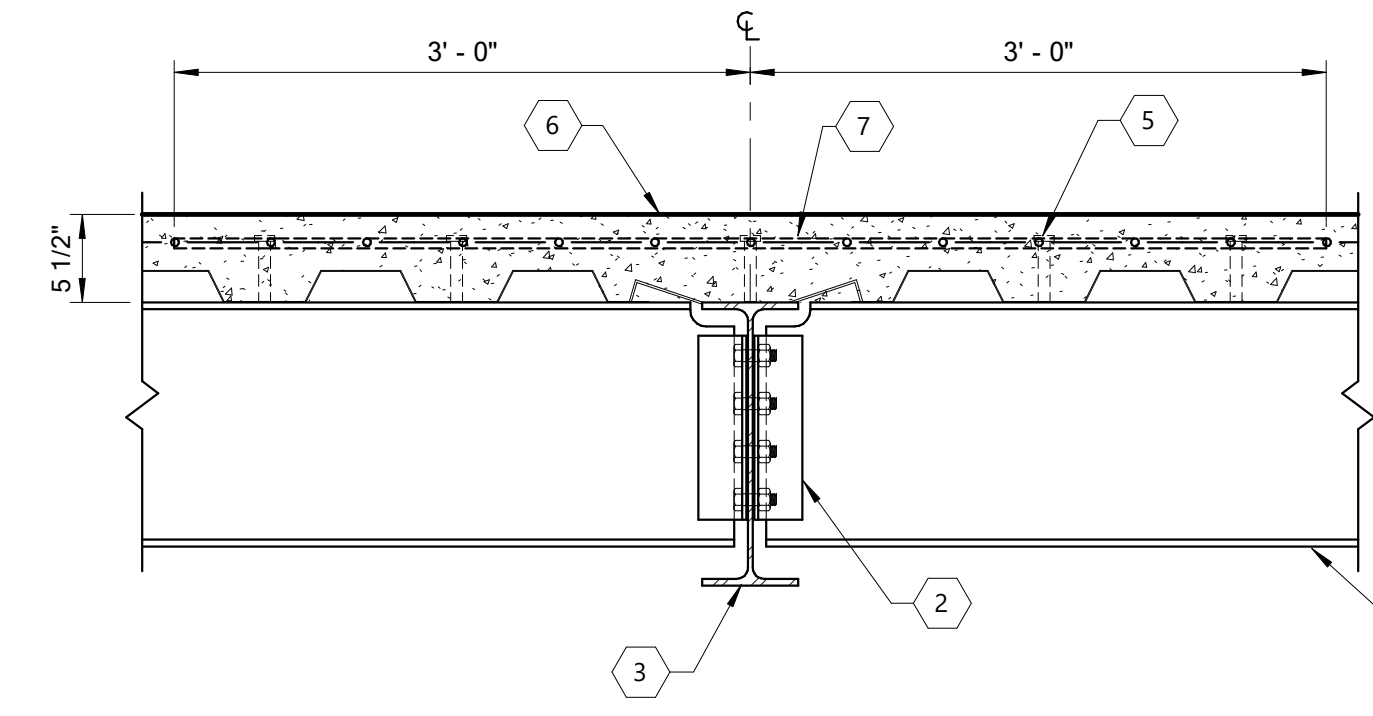
1" = 1'-0"

NOTE:
THIS DETAIL APPLIES AT ALL REQUIRED OPENINGS GREATER THAN 12" IN WIDTH, BUT LESS THAN 60" IN WIDTH. GENERAL CONTRACTOR SHALL COORDINATE SIZE, LOCATION, AND NUMBER OF REQUIRED OPENINGS. CONTACT ENGINEER FOR OPENINGS LARGER THAN 60" IN WIDTH.
GENERAL CONTRACTOR SHALL PROVIDE SUBMITTAL WITH LAYOUT OF ALL LARGE FLOOR OPENINGS TO ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.



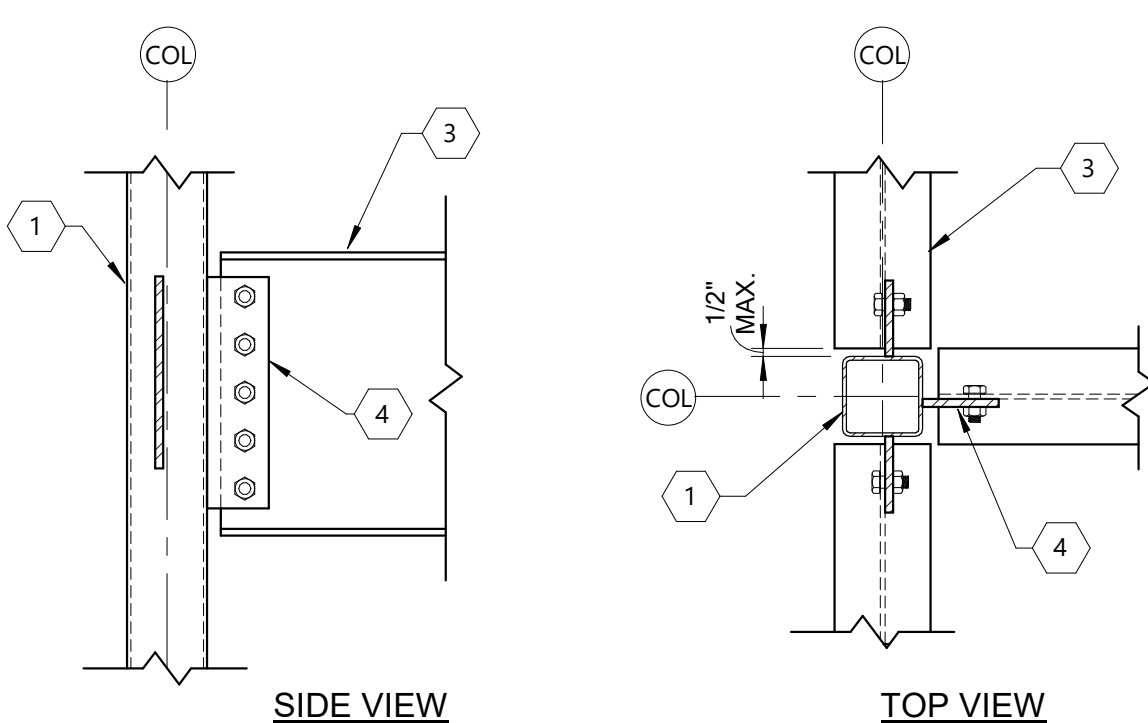
6 Large Floor Openings

3/4" = 1'-0"



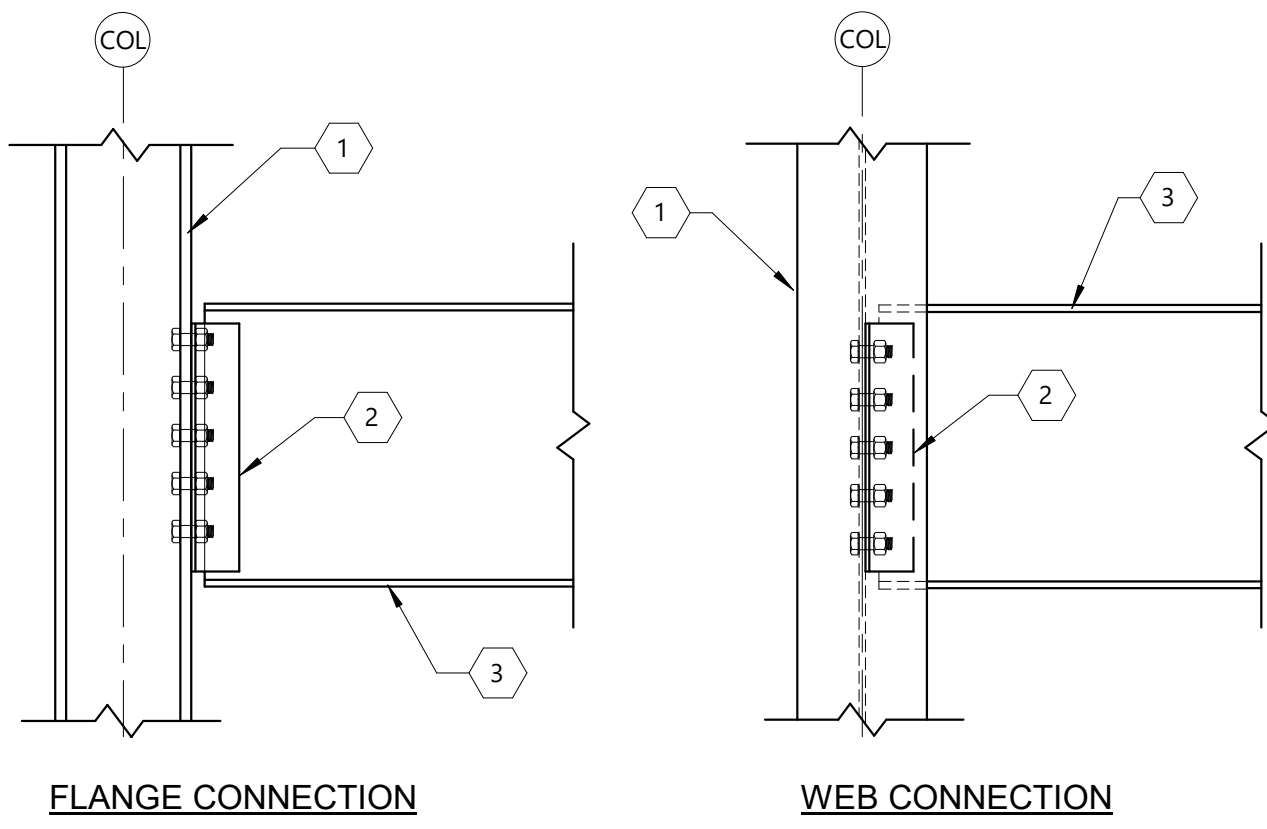
7 Typical Beam To Beam - Composite Slab

1" = 1'-0"



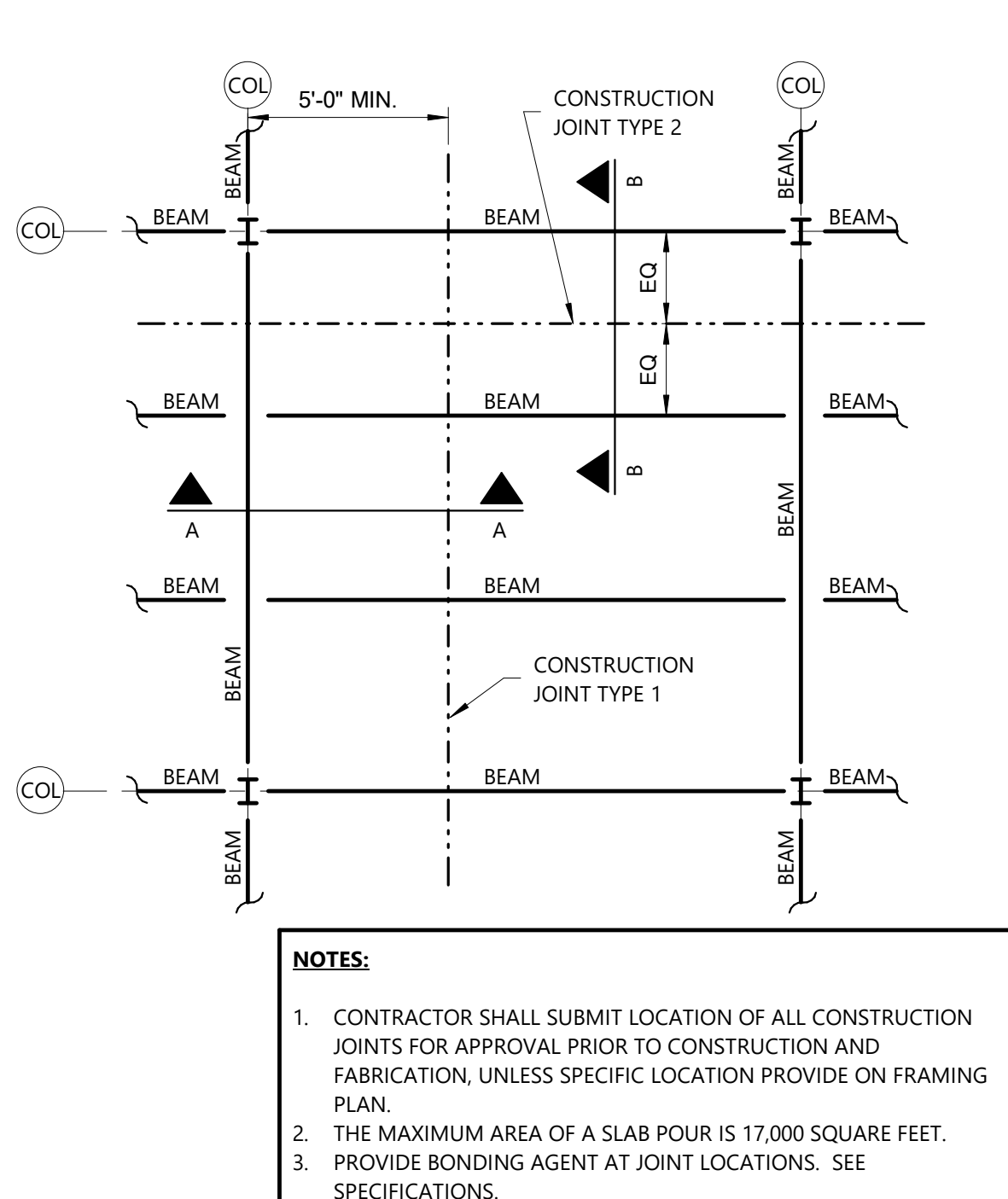
8 Beam To HSS Column

1" = 1'-0"



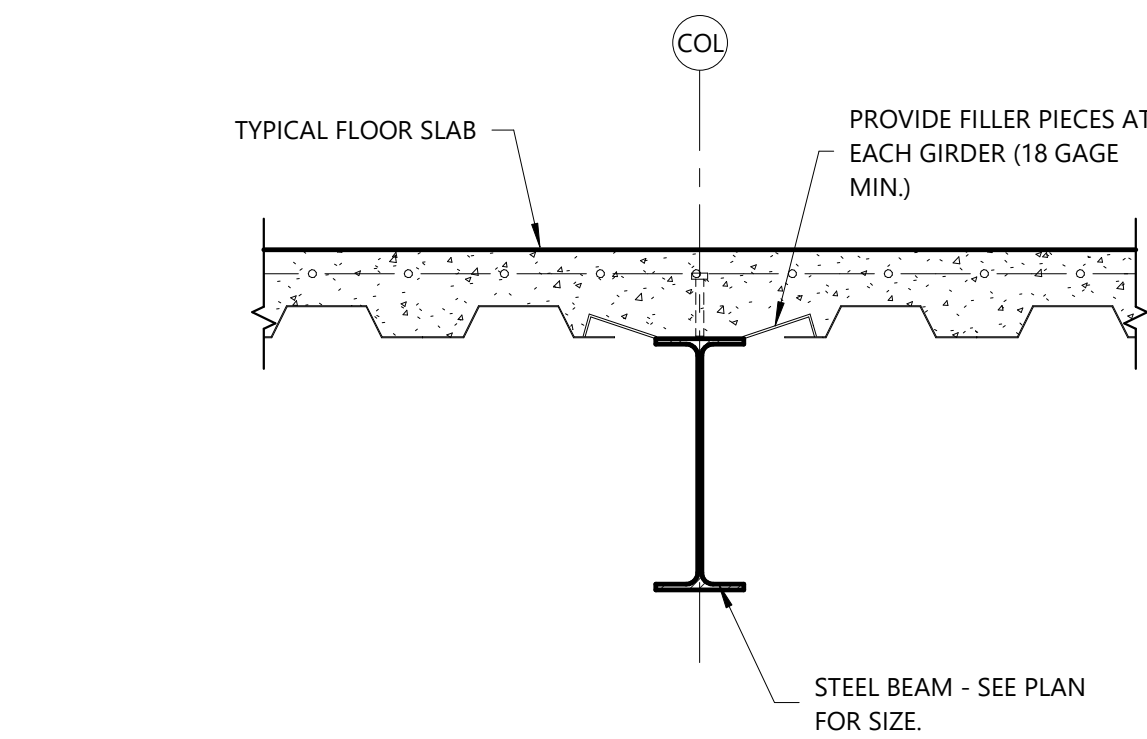
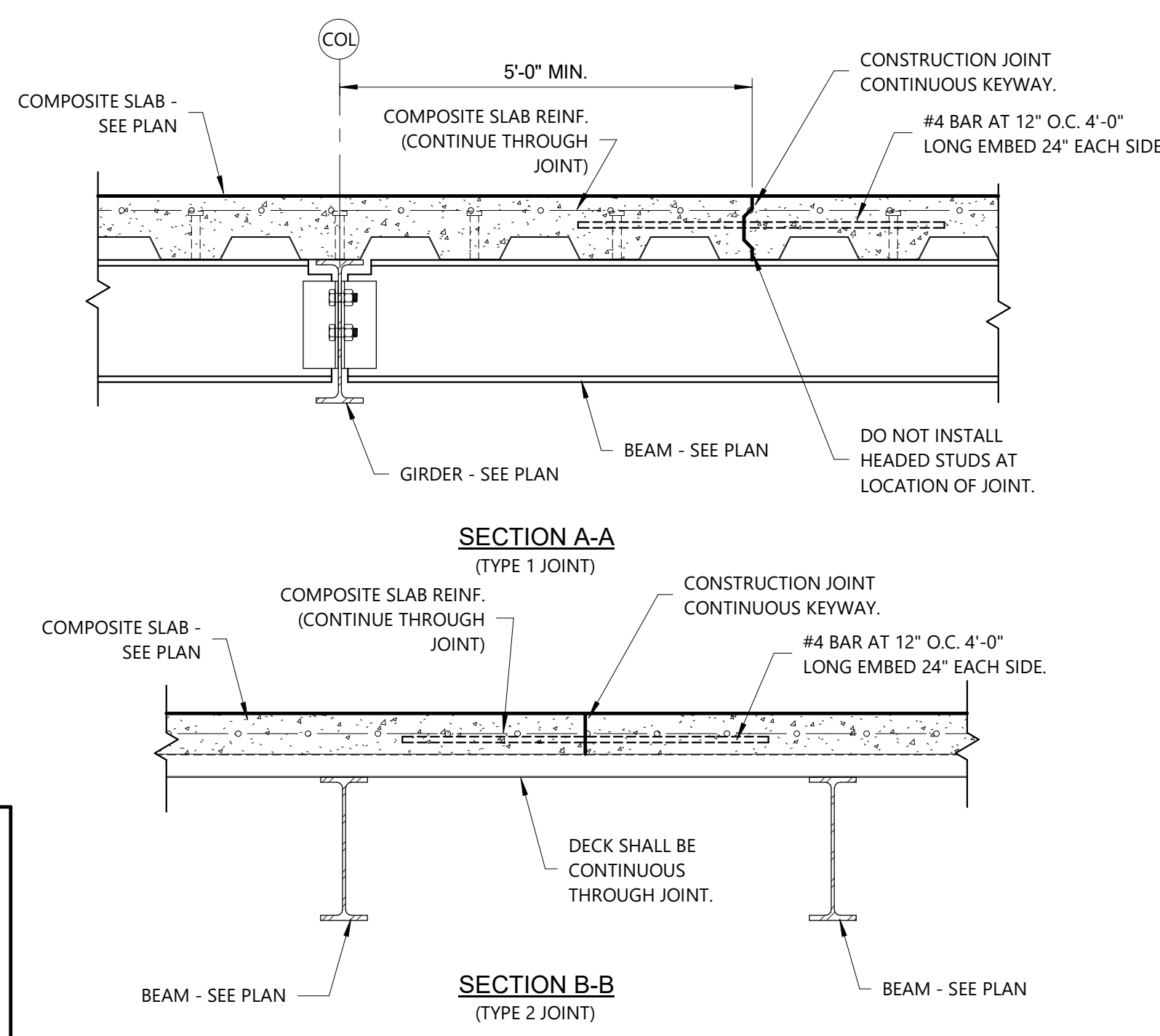
9 Beam To Wide Flange Column

1" = 1'-0"



10 Construction Joints In Composite Slabs

1" = 1'-0"



11 Girder Filler Deck Parallel To Beam

1" = 1'-0"

Keynote Legend

- STEEL COLUMN - SEE PLAN FOR SIZE.
- STANDARD DOUBLE ANGLE BEAM CONNECTION. RE: BEAM CONNECTION SCHEDULE AND DETAIL FOR INFORMATION.
- STEEL BEAM - SEE PLAN FOR SIZE.
- STANDARD SINGLE PLATE BEAM CONNECTION. RE: TYPICAL BEAM TO HSS COLUMN CONNECTION SCHEDULE AND DETAIL.
- 3/4" DIA. X 4" LONG HEADED SHEAR STUDS. SEE PLANS FOR NUMBER REQUIRED.
- 5 1/2" LIGHTWEIGHT CONCRETE ON 2VL18 GAGE METAL DECK. REINFORCE WITH WWF 4x4 W4.0/W4.0 CENTERED IN SLAB.
- AT EACH BEAM TO GIRDER LOCATION, ADD (3)-#5 TRANSVERSE BARS X 6'-0" LONG 1" CLR. FROM TOP OF SLAB. CENTER BARS ABOUT GIRDER AND PROVIDE 12" SPACING BETWEEN BARS. WHERE BEAMS ALONG EACH SIDE OF GIRDER ALIGN OR ARE LOCATED WITHIN 1'-0" OF EACH OTHER, A SINGLE GROUP OF BARS MAY BE PROVIDED.