

**NOTES**

- ALL STRUCTURAL STEEL ELEMENTS IN THIS DETAIL SHALL BE COMPOSED OF WEATHERING STEEL CONFORMING TO AASHTO M270, GRADE 50W, OR HOT-DIPPED GALVANIZED STEEL CONFORMING TO AASHTO M270, GRADE 36. IF WEATHERING STEEL IS USED, ALL ELEMENTS SHALL BE SAND BLASTED TO SSPC SP-6 AND WET PRIOR TO SHIPPING. PAINTING OF THESE ELEMENTS IS NOT REQUIRED.
- BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F3125, GRADE A325. IF WEATHERING STEEL IS USED FOR THIS DETAIL, TYPE 3 WEATHERING STEEL BOLTS SHALL BE USED. IF GALVANIZED STEEL ELEMENTS ARE USED, BOLTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232.
- THE VERTICAL DISTANCE BETWEEN ANY TWO HOLES OR INSERTS SHALL NOT VARY FROM THE SPECIFIED DISTANCE BY MORE THAN 1/16". ALSO, THE TOTAL LENGTH OF THE GROUP OF HOLES OR INSERTS SHALL NOT VARY FROM THE DESIGN LENGTH BY MORE THAN 1/16". THE PRESTRESSED GIRDER FABRICATOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE PROPER PLACEMENT OF INSERTS DURING THE GIRDER FABRICATION PROCESS.
- CLIP ANGLES AND BACK PLATES SHALL BE ATTACHED TO THE PRESTRESSED GIRDER AT THE GIRDER FABRICATION SITE PRIOR TO TRANSPORT. DIAPHRAGM INSTALLATION SHALL BE COMPLETED PRIOR TO DECK PLACEMENT.
- THREADED INSERTS AND PIPE INSERTS ARE INCIDENTAL TO THE PRESTRESSED CONCRETE BEAMS.
- AT LOCATIONS WHERE STEEL IS BEING FASTENED TO CONCRETE, THE MAXIMUM INSTALLATION TENSION FOR THE BOLTS SHALL NOT EXCEED 5 KIPS. TESTS SHALL BE PERFORMED TO DETERMINE THE TORQUE NECESSARY TO ACHIEVE THE SPECIFIED INSTALLATION TENSION.
- ALL STEEL DIAPHRAGMS SHALL BE STAMPED OR MARKED WITH PAINT ON THE UPSTATION FACE OF DIAPHRAGM INDICATING PLACEMENT OF DIAPHRAGM LEFT OR RIGHT OF THE CENTERLINE OF CONSTRUCTION.

**NOTE TO DESIGNER**

PICK GIRDER SIZE(S) AND DELETE REST.

PRESTRESSED CONCRETE BEAM TYPE	H (in.)	A (in.)	B (in.)	C (in.)	D (in.)	L (in.)	N	S1 (in.)	DIAPHRAGM UNIT WEIGHT (lb/ft)*	CLIP ANGLE WEIGHT (lb.)
TYPE 36	15	9	4 1/2	12	3 1/2	13	3	3	28	16
TYPE 45	15	10	4 1/2	16 1/2	3 1/2	13	3	3	28	16
TYPE 54	21	11	6 1/2	19 1/2	4	16	3	4	36	20
TYPE 63	33	11	7 1/2	16 1/2	5	28	4	6	51	35
TYPE 72	33	11	7 1/2	21	5	28	4	6	51	35
TYPE BT-54	33	9	7 1/2	13 1/2	5	28	4	6	51	35
TYPE BT-63	33	9	7 1/2	18	5	28	4	6	51	35
TYPE BT-72	33	9	7 1/2	22 1/2	5	28	4	6	51	35
TYPE 63-MODIFIED	33	9	7 1/2	16 1/2	5	28	4	6	51	35
TYPE 72-MODIFIED	33	9	7 1/2	21	5	28	4	6	51	35

\* MULTIPLY BY DIAPHRAGM LENGTH (S-A) TO OBTAIN TOTAL DIAPHRAGM WEIGHT.  
cos θ

m = SLOPE OF BENT PLATE DIAPHRAGM (SEE BRIDGE PLANS FOR ELEVATIONS AT CONNECTION POINTS).

A = THICKNESS OF GIRDER WEB PLUS 3" (SEE TABLE).

B = DISTANCE FROM TOP OF STEEL DIAPHRAGM TO CENTER OF FIRST HOLE.

C = DISTANCE FROM TOP OF BEAM TO C OF FIRST INSERT.

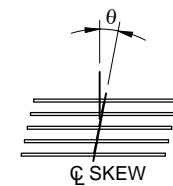
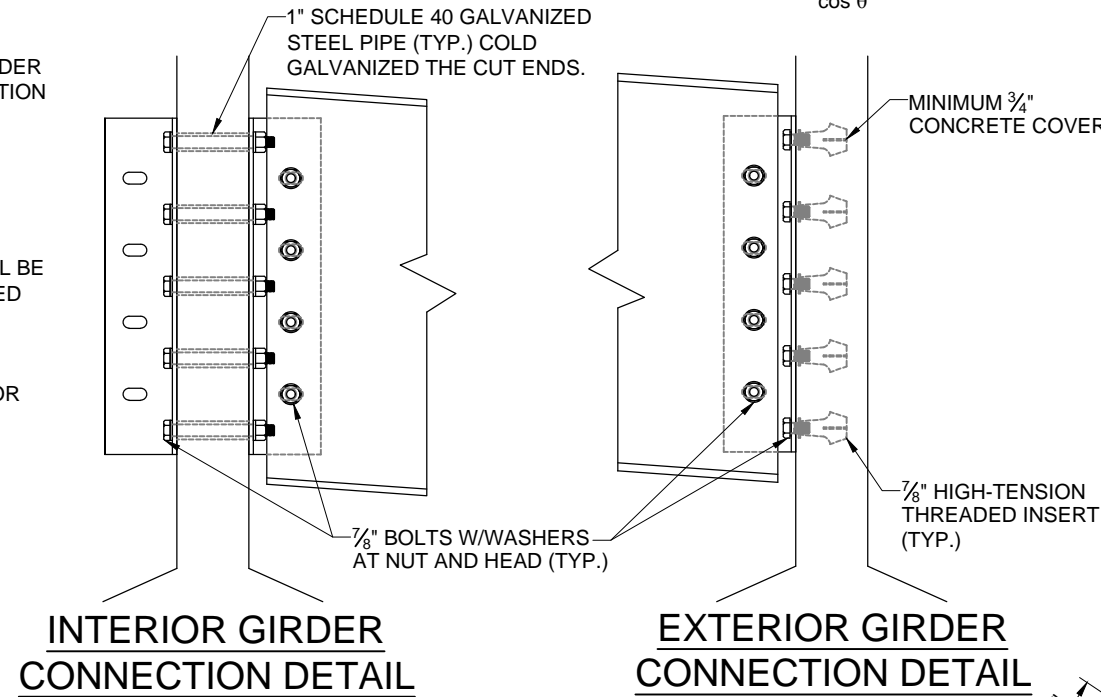
D = DISTANCE FROM CLIP ANGLE EDGE TO CENTER OF FIRST HOLE (CLIP ANGLE/DIAPHRAGM CONNECTION).

H = DEPTH OF BENT PLATE DIAPHRAGM.

L = LENGTH OF BACK PLATES AND CLIP ANGLES.

N = NUMBER OF BOLT SPACES IN GIRDER/CLIP ANGLE CONNECTION.

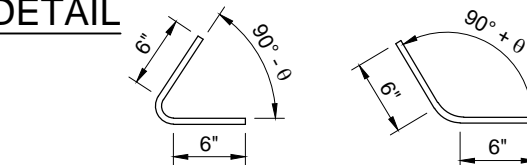
S1 = HOLE SPACING.



SKEW 0° TO 10°

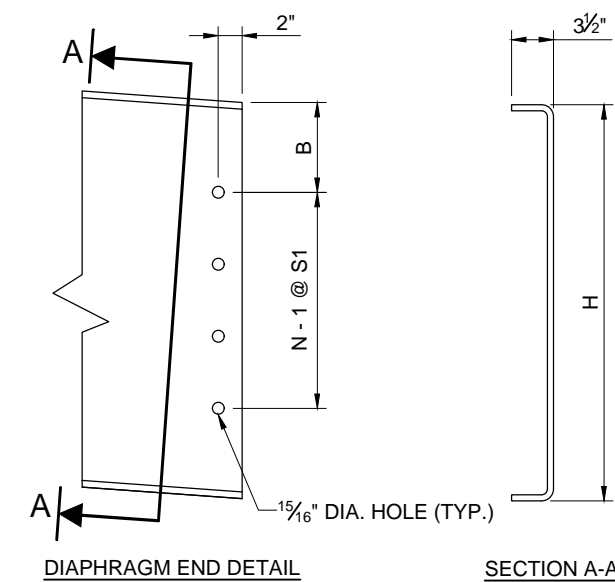
**DIAPHRAGM PLACEMENT PATTERN**

DO NOT USE FOR SKEWS EXCEEDING 10°

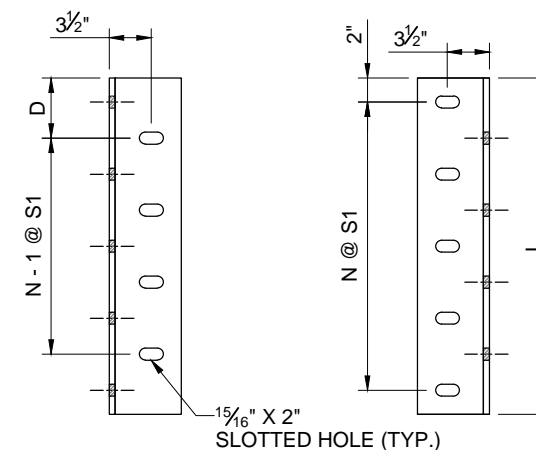


**3/8" CLIP ANGLE CROSS SECTIONS**

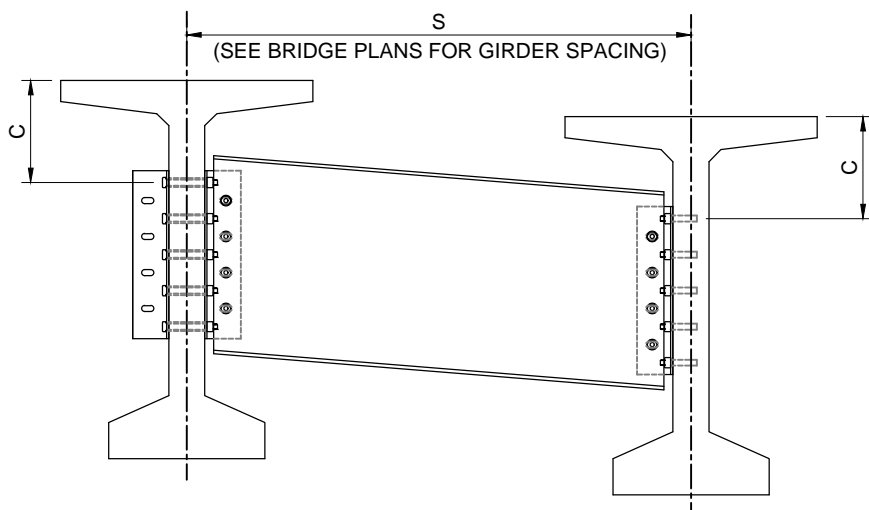
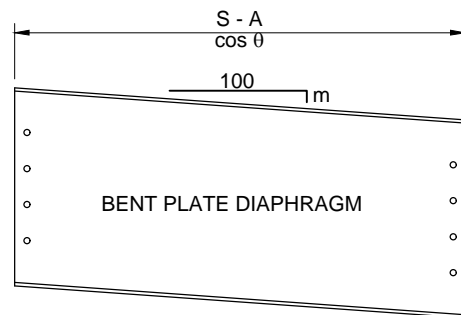
USE 1 OF EACH FOR DIAPHRAGM



**3/8" BENT PLATE DIAPHRAGM**  
SEE TABLE FOR HEIGHT "H"



**3/8" CLIP ANGLE DETAILS**



DRAWING PATH: M:\20 - ENGINEERING TOOLS\03 - DESIGN TEMPLATES\ENGLISH\BOLTED DIAPHRAGM\ENGLISH\BOLTED DIAPHRAGM\ENGLISH\BOLTED DIAPHRAGM\ENGLISH\BOLTED DIAPHRAGM.DWG

REVISIONS			
NO.	DESCRIPTION	DATE	BY

NEW MEXICO DEPARTMENT OF TRANSPORTATION

ROUTE OVER FEATURE INTERSECTED

BOLTED STEEL DIAPHRAGMS  
SKEWED 0° TO 10°  
BENT PLATE CLIP ANGLE DETAIL