

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.
- FOR BRIDGES WITHOUT SKEW, THE INTERIOR GIRDER CONNECTION DETAIL SHALL BE USED AS SHOWN. FOR SKEWED BRIDGES, THE OPPOSING CLIP ANGLE SHALL BE REPLACED WITH THE BACK PLATE SHOWN ON THIS SHEET. DIAPHRAGMS SHALL BE OFFSET ON ALL SKEWED BRIDGES TO FACILITATE THE INSTALLATION OF THE BACK PLATES.
- 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.)	BACK PLATE WEIGHT (lb.)
TYPE 36	15	9	4 1/2	12	3 1/2	13	3	3	28	16	7
TYPE 45	15	10	4 1/2	16 1/2	3 1/2	13	3	3	28	16	7
TYPE 54	21	11	6 1/2	19 1/2	4	16	3	4	36	20	9
TYPE 63	33	11	7 1/2	16 1/2	5	28	4	6	51	35	15
TYPE 72	33	11	7 1/2	21	5	28	4	6	51	35	15
TYPE BT-54	33	9	7 1/2	13 1/2	5	28	4	6	51	35	15
TYPE BT-63	33	9	7 1/2	18	5	28	4	6	51	35	15
TYPE BT-72	33	9	7 1/2	22 1/2	5	28	4	6	51	35	15
TYPE 63-MODIFIED	33	9	7 1/2	16 1/2	5	28	4	6	51	35	15
TYPE 72-MODIFIED	33	9	7 1/2	21	5	28	4	6	51	35	15

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

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 ϕ OF FIRST INSERT.

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

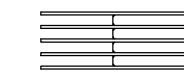
H = DEPTH OF BENT PLATE DIAPHRAGM.

L = LENGTH OF BACK PLATES AND CLIP ANGLES.

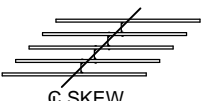
N = NUMBER OF BOLT SPACES IN GIRDER/CLIP ANGLE CONNECTION.

S1 = HOLE SPACING.

NOTE TO DESIGNER
PICK ONE AND DELETE OTHER



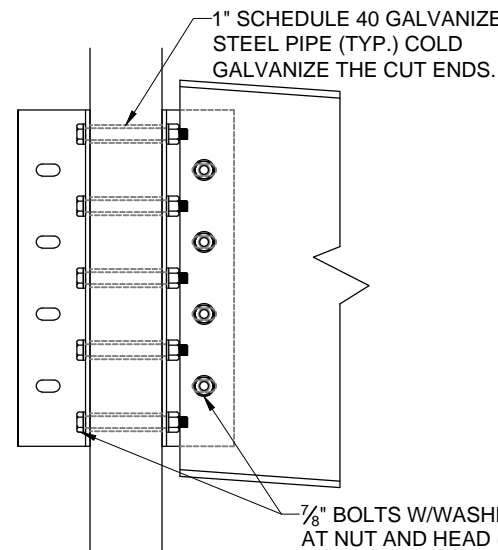
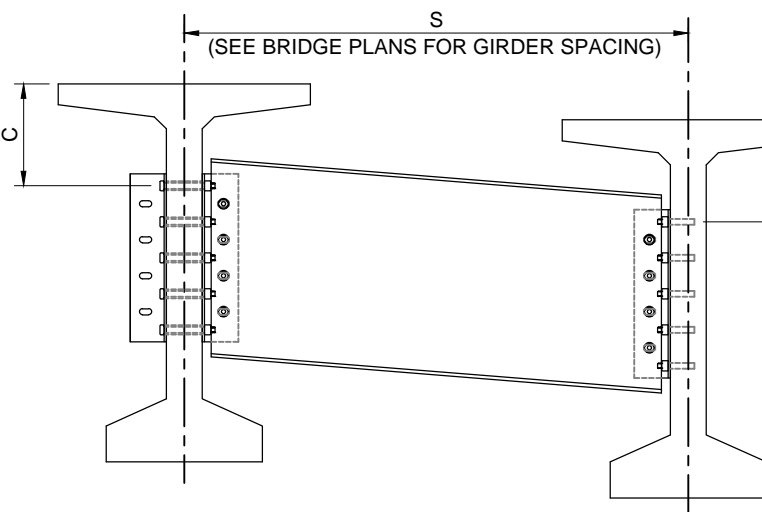
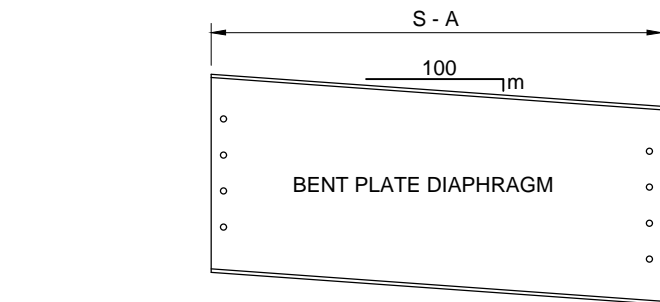
NORMAL (NO SKEW)



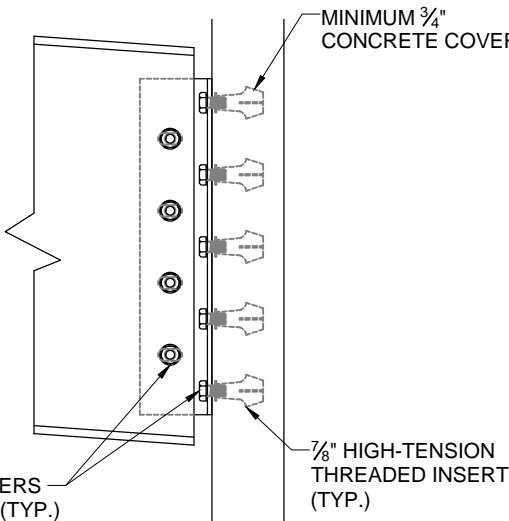
ϕ SKEW
SKEW GREATER THAN 10°

DIAPHRAGM PLACEMENT PATTERN

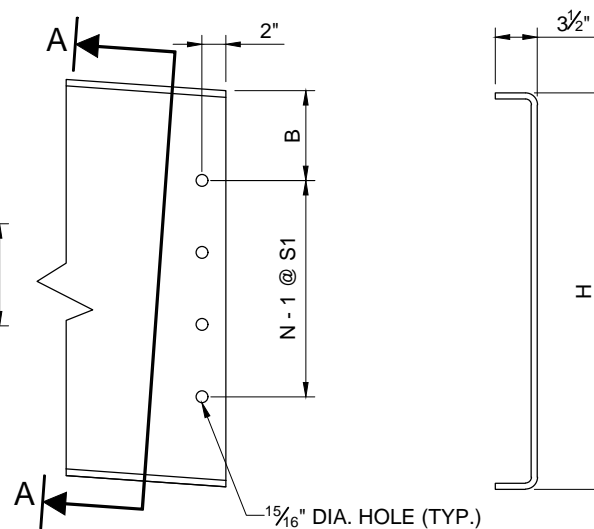
FOR SKEWS BETWEEN 0° AND 10°
USE BENT PLATE CLIP ANGLE DETAIL



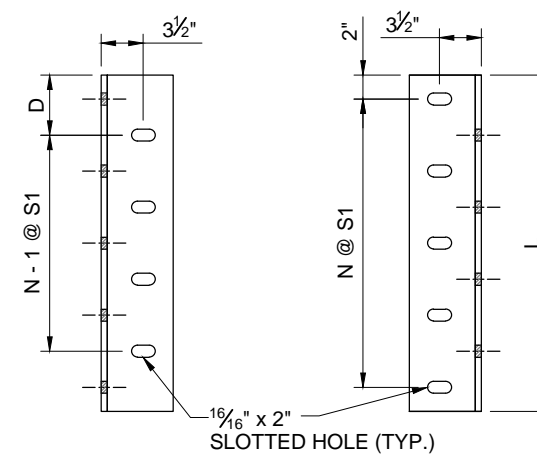
INTERIOR GIRDER CONNECTION DETAIL



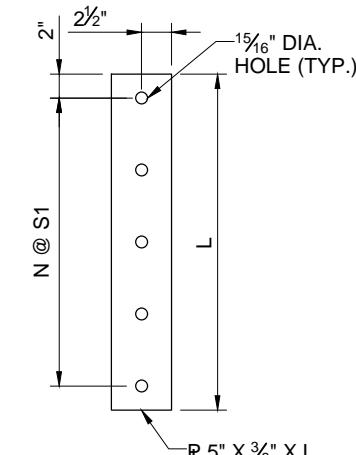
EXTERIOR GIRDER CONNECTION DETAIL



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



CLIP ANGLE DETAILS
L6 X 6 X 3/8"



BACK PLATE DETAIL
(SEE NOTE 3)

REVISIONS			
NO.	DESCRIPTION	DATE	BY

NEW MEXICO DEPARTMENT OF TRANSPORTATION

ROUTE OVER FEATURE INTERSECTED

BOLTED STEEL DIAPHRAGMS
NORMAL AND SKEWED 10°+
ROLLED CLIP ANGLE DETAIL

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