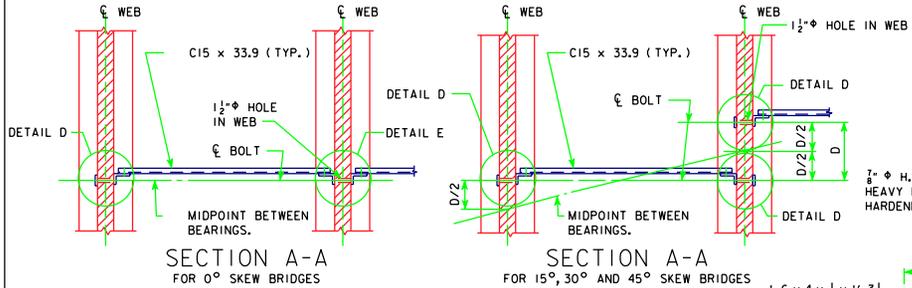


SECTION SHOWING INTERMEDIATE DIAPHRAGM



**NOTES:**

- ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
- SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.
- ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.
- THE 1 1/2" HOLES FOR THE 7/8" H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.
- THE 7/8" H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.
- ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.

CONCRETE DIAPHRAGMS DETAILS SHALL BE PROVIDED IN THE BRIDGE PLANS FOR OVERHEAD BRIDGES. DESIGNER SHALL ADJUST THE CONCRETE, REINFORCING AND STRUCTURAL STEEL QUANTITIES ACCORDINGLY.

**INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL**

**ONE CONNECTION DETAIL "E"**

2 - 7/8" x LENGTH H.S. BOLTS WITH NUTS AND WASHERS		BRIDGE SKEW	
WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	0°	15°, 30° & 45°
6	9	4.30	25.8
9	12	5.34	32.0
2-L6x4x1/2x1'-3 1/4" = 41.2 LB		6	0
		6	0
		6	0

**ONE CONNECTION DETAIL "D"**

2 - 7/8" x LENGTH H.S. BOLTS WITH NUTS AND WASHERS		BRIDGE SKEW	
WEB THICKNESS (IN.)	LENGTH OF H.S. BOLTS (IN.)	0°	15°, 30° & 45°
6	9	4.30	25.8
9	12	5.34	32.0
1-BACKING PL 4x3/8x1'-3 1/4" = 6.5 LB		6	18
1-L6x4x1/2x1'-3 1/4" = 20.6 LB		6	18
		6	18
		6	18

**\* ONE C15 x 33.9 DIAPHRAGM**

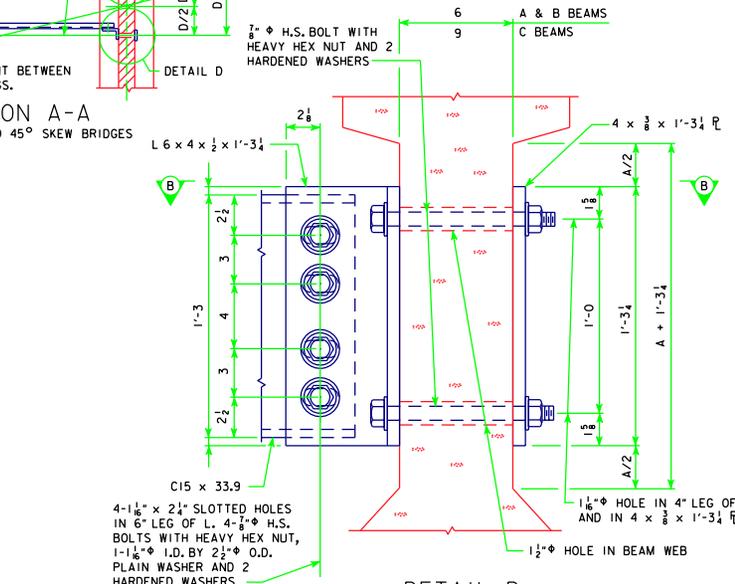
WEB THICKNESS (IN.)	BEAM SPACING	LENGTH	NO. OF DIAPH.	UNIT WEIGHT (LB.)	WEIGHT (LB.)
6	7'-0"	6'-2 1/8"	9	210.8	1897.3
9	7'-0"	5'-11 1/8"	9	202.3	1821.1

**DIAPHRAGM CONNECTION BOLTS**

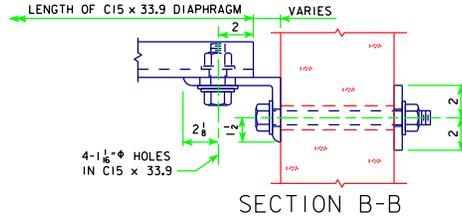
8-7/8" x 0'-2 1/4" H.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM = 10.3 LB	NO. OF DIAPH.	WEIGHT (LB.)
	9	92.7

**TOTAL WEIGHT**

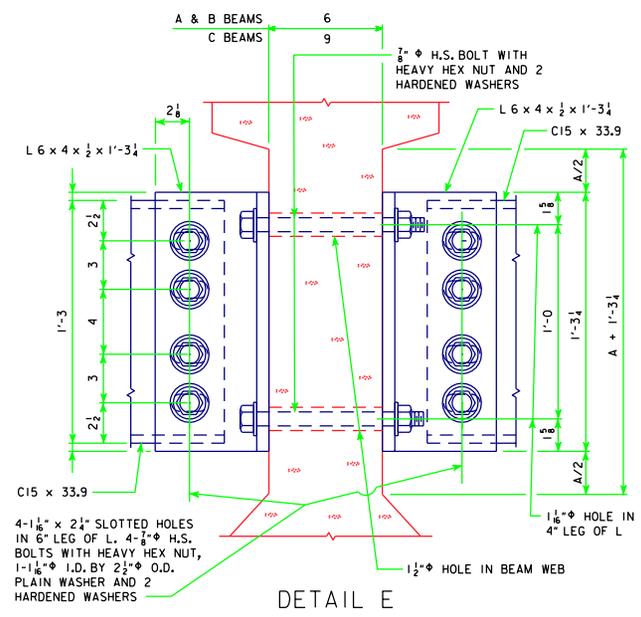
* THE LENGTH OF THE C15 x 33.9 IS BASED ON A VARIABLE CLEARANCE OF 1 1/8" TO 2 1/8" BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.	WEB THICKNESS (IN.)	BRIDGE SKEW
	0°	15°, 30° & 45°
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB.) =	6	2451
INTERMEDIATE DIAPHR. STRUCT. STEEL - TOTAL (LB.) =	9	2388



DETAIL D



SECTION B-B



DETAIL E

BEAM SERIES	DIMENSIONS	
	A + 1'-3 1/4"	A/2
A	1'-4"	3 3/4"
B	1'-8"	2 3/4"
C	2'-1"	4 3/4"

LATEST REVISION DATE  
01-10  
APPROVED BY BRIDGE ENGINEER  
*Norman C. McQuinn*

**Iowa Department of Transportation Highway Division**  
STANDARD DESIGN - 24' ROADWAY, THREE SPAN BRIDGE  
**PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES**  
DECEMBER, 2006

INTERMEDIATE STEEL DIAPHRAGMS  
H24-38-06

REVISED 01-10 - MINOR CHANGES WERE MADE TO AGREE WITH OFFICE STANDARD.