

**B412**

**Steel Intermediate Bolted Diaphragm (All MW Prestressed Concrete Beams)**

Approved, and signed, April 21, 2021. Last date revised: December 21, 2022.

**Approved 12-21-2022**

At DIAPHRAGM SUPPORT detail:

- (bend in diaphragm) Changed note from "3/4" Min. Radius" to "1 1/8" Min. Inside Radius".
- (beam face side of support) Changed the "6" ±" dimension to "6" Min."

**Re-Approved 04-21-2021**

THROUGHOUT the DETAIL:

- Changed all instances of “PER SPEC.” to “IN ACCORDANCE WITH SPEC.”

At INTERMEDIATE DIAPHRAGM DETAIL:

Changed the note pointing to the bolt through the web *from* “7/8" dia. A307 bolts, per spec. 3391.2.A, with two hex nuts, or equal, and two hardened 3" sq. x 5/16" plate washers each at all interior beam diaphragm connections” *to* “7/8" dia. A307 bolts, in accordance with spec. 3391.2.A, with two hex nuts, and two hardened 3" sq. x 5/16" plate washers each at all interior beam diaphragm connections”

**Revised 10-22-2019**

At INTERMEDIATE DIAPHRAGM DETAIL:

- Changed the 4" dimension to 6" at the cross member for correct representation of the L shape.

**Revised 01-05-2017**

Added to the Detail:

- DETAIL “D” showing the bolt hole pattern for 6 bolt or 4 bolt connections

At PART TRANSVERSE SECTION:

- Removed the minimum distance note.
- Added note, “See Detail “D”” with leader line pointing to the 6 bolt connection.

**Revised 11-03-2015**

At Section B-B and Section C-C:

- Removed from the common note for the two details “Torque anchor bolts to 80 ft.-lbs.”.

Under NOTES:

- Changed all notes to “Active Voice” if needed.
- Added a 4<sup>th</sup> note: Torque all bolts, including anchor bolts to 80 ft.-lbs.

**Revised 09-11-2014**

REMOVED: the term “Mn/DOT” from all locations referencing MnDOT Spec. throughout the detail.

At PART TRANSVERSE SECTION:

- Changed the term *From*: “SHALL BE” *To*: “IS” in two locations within the Minimum Distance note.
- Added “PER SPEC. 3391.2.B” to the bolt description in the note pointing to the diaphragm bolts.

At INTERMEDIATE DIAPHRAGM DETAIL:

- Changed the spec number *From*: 3391.2A *To*: 3391.2.A within the note pointing to the bolts going through the beam web.

At Section B-B and Section C-C:

- Added “PER SPEC. 3391.2.B” to the H.S. Bolt description within the note pointing to the anchorage.

Under NOTES:

- Changed the 2<sup>nd</sup> note to read: Include all structural steel shown on this detail, including bolts and washers, in the payment for diaphragms for prestressed beams.
- Changed the spec. number in the 3<sup>rd</sup> note: *From*: 2405.3M *To*: 2405.3.K.
- Changed the 4<sup>th</sup> note to read: Galvanize steel plates and shapes in accordance with spec. 3394.

- Changed numbered note ② to read: Space bolt holes so as to miss prestressed strands in concrete beams. See prestressed concrete beam sheets for more information.

**APPROVED 09-22-2011**

New B-DETAIL for the MW shape prestressed concrete beams. The basis of the B412 was the recently archived detail B406, “Steel Intermediate Bolted Diaphragm (For 63M – 81M Prestressed Concrete Beams)”

Revision to the detail included modifying the diaphragm height, bolt spacing and steel angle sizes to accommodate the MW shape for beam spacing up to 13'-0”.

Approved, and signed, September 22, 2011.

NEW B-DETAIL