

## **B402**

### **Bolted Diaphragms (For Steel Beams)**

Approved, and signed, March 26, 2009. Last date revised: December 21, 2022.

#### **Revised 12-21-2022**

At FASCIA BEAM (At Pier and Intermediate Diaphragms):

- At the bolt spacing for the diaphragm to stiffener (For the beams over 36") changed the center 6" Max. Spacing to 5 ½" Max Spacing.

At FASCIA BEAM (At Abutment Diaphragms):

- A 5 ½" max. dimension for the bolt spacing between the diaphragm and the gusset plate was added.

At SECTION C-C (Skews over 30° to 60°.):

- Updated the note from "Bent Connection Plate ½" Min. Thickness and 6" Min. Straight Legs (Typ.)" to "Bent Connection Plate \_\_\_" Min. Thickness and \_\_\_" Min. Straight Legs (Typ.)". Dimensions with blank areas to be filled in based on the plate size.
- Added DESIGNER NOTE: "½" Min. Thickness and 6" Min. Straight Legs. Min. Inside Bending Radius of 2.25 x Plate Thickness"

#### **Revised 02-08-2022**

General

- Updated all the "Z" break lines to the appropriate drawing scale.

AT General Notes:

- Within the 1<sup>st</sup> note: Changed the term "per spec." to "in accordance with spec."

At SECTION C-C (Skews to 30° Max.):

- Added note to the detail: "4" Min." dimension from end of beam to centerline of stiffener
- Added note to the detail: "Skew angle"
- Added note to the detail: "⊥ Bearing and ⊥ Diaphragm"

At SECTION C-C (Skews over 30° to 60°.):

- Updated the detail: Based on input from beam fabricators and the Bridge Construction Unit, changed the method of connection between the stiffener and the end diaphragm (added a bent plate). Added additional dimensions and skew angle.

At INTERIOR BEAM (At Pier and Intermediate Diaphragms):

- Changed the thickness of the Diaphragm Plate from 5/16" to 3/8".

#### **Revised 01-05-2017**

At the DESIGNER NOTES:

- Changed the note referencing the "MN/DOT LRFD Design Manual" to reference the "Bridge Design Manual".

At SECTION A-A, SECTION B-B and INTERIOR BEAM detail:

- Removed the tail from the weld symbols.

UNDER NOTES:

- Changed all instances of "Mn/DOT SPEC." to "PER SPEC." within the notes and details.
- Updated notes to use active voice.

#### **Re-Approved 03-26-2009**

Various revisions were made to this detail including providing the designer an option in selecting the connection between the diaphragm connection stiffener and the flanges. Other changes include;

Under NOTES: Eliminated note ① "Weld size need not exceed 5/16" for intermediate diaphragm stiffeners".

Removed all existing numbered notes ① from the sheet. Renumbered note ⑥ ("Use same shear stud height as used on the beams.") to note ①. Replaced numbered note ⑥ with ① at the INTERIOR BEAM (at abutment diaphragms).

At SECTION A-A:

- Removed – "5/16" PLATE" note from the detail.

At FASCIA BEAM (At Pier and Intermediate Diaphragms):

- At the 6" and 3" dimensions between the flanges and the diaphragm, the word "(MIN)" has been replaced with a numbered note ④ in four locations.

At INTERIOR BEAM (At Pier and Intermediate Diaphragms):

- The top and bottom flange "TIGHT FIT..." notes have been replaced with a DESIGNER NOTE that gives the designer a choice of connection type.
- A 5/16" DIAPHRAGM PLATE note has been added.
- The " 3/8" x 7" PLATE FOR INTERMEDIATE DIAPHRAGMS..." note has been changed to read " 3/8" x 7" CONNECTION STIFFENER FOR INTERMEDIATE DIAPHRAGMS. SEE PLAN FOR STIFFENER SIZES OVER BEARINGS."

At FASCIA BEAM (At Abutment Diaphragms):

- At the 1.5" dimension between the top flange and the diaphragm, the word "(MIN)" has been replaced with a numbered note ④.

**Revised 09-11-2004**

Throughout detail:

- changed FACIA to FASCIA
- changed title INTERMEDIATE BEAMS to INTERIOR BEAM

At INTERIOR BEAM – AT PIER AND INTERMEDIATE DIAPHRAGMS:

- Changed 3/8" x 7" PLATE FOR INTERIOR DIAPHRAGMS. to 3/8" x 7" PLATE FOR INTERMEDIATE DIAPHRAGMS.

**Approved, and signed, November 22, 2002.**