

IOWA DEPARTMENT OF TRANSPORTATION

To Office: Bridges and Structures

Date: January 7, 2002

Attention: All Employees

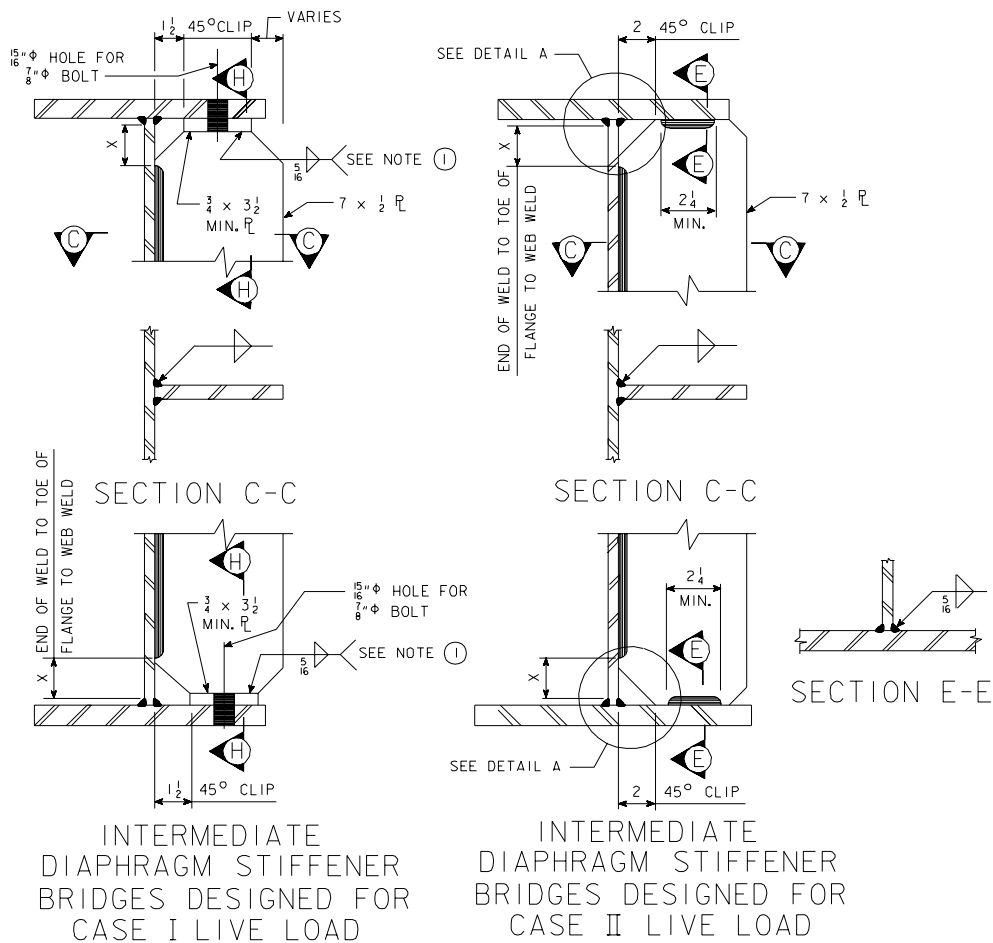
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From: Gary Novey

Office: Bridges and Structures

Subject: Bridge Superstructure Design- MM No. 37 Diaphragm Stiffener Connections for Case I

The Office of Bridges and Structures CADD standard 1021 shows the use of bolted tabs for the connection of the intermediate diaphragm stiffener to the flanges (See details below). This detail is used for the Case I live load because of the lower allowable fatigue stress (13 ksi compared to 21 ksi for the Category C weld). The current office policy is to use the bolted tab detail for all intermediate diaphragm stiffener connections when Case I stress cycles are used for fatigue (AASHTO 10.3.2A).



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In recent discussions that we have had with the steel fabricators, they have mentioned that this connection is extremely expensive because of the amount of labor it takes to complete. Because of the high cost, we would like to minimize the use of the bolted tab connection by revising our current office policy as follows:

1. During design, check the fatigue stresses at the diaphragm connections to see if the stress range would allow the use of the welded connection (Case II details).
2. If the stress range exceeds the allowable for the Category C welded connection, then consider increasing the flange thickness to decrease the stress range. By designing the flange thickness for the lower fatigue stresses, the standard welded connection that is shown in the Case II live load can then be used.

Note: This will generally be in the positive bending regions where the diaphragm welded stiffener connection controls the fatigue stress for the bottom tension flange. In the negative regions where tension stresses are on the top flange, the shear connectors along with the welded diaphragm connections may control the fatigue stresses.

3. A cost comparison should be made between the cost of bolted tabs and the additional cost of steel material. If the additional cost of steel for the larger flange thickness become excessive, then the Case I detail shall be used. The locations for the Case I details will need to be shown in the framing diagram. For estimating costs, assume \$350.00 per stiffener to provided the bolted tab detail and \$.30 per pound of steel.

Using a thicker flange plate rather than the connection should reduce the overall cost of the bridge because of the savings in labor. This policy change is for straight girders only. If you have any questions check with your section leader.

DGB/jw