

Bell, Tammi [DOT]

From: Bell, Tammi [DOT]**Sent:** Tuesday, December 09, 2008 3:23 PM**To:** Bell, Tammi [DOT]**Subject:** Recommended Action Plan for Compliance with Technical Advisory T5140.29 by Local Jurisdictions

TO: County Engineers, City Representatives, and Consultants
Tammi Bell Iowa DOT - Local Systems tammi.bell@dot.iowa.gov

CC: District Local Systems Engineers, Service Bureau,
Mitch Dillavou, Kevin Mahoney, Ahmad Abu-Hawash,
Scott Neubauer, Bruce Brakke, Mike Todsén, Eric
Souhrada, Norman McDonald, and Office of Local Systems

FROM: Office of Local Systems

SUBJECT: Recommended Action Plan for Compliance with Technical
Advisory T5140.29 by Local Jurisdictions

DATE: December 9, 2008

Federal Highway Administration (FHWA) Technical Advisory T5140.29 (TA) dated January 15, 2008, gave recommendations for bridge owners as a result of the National Transportation Safety Board (NTSB) investigation of the collapse of the I-35W Bridge in Minneapolis. It was sent to you on January 22, 2008. The recommendations relate to the gusset plates of truss bridges and are listed below. The recommendations are as follows:

- 1) New or replaced non-load-path-redundant steel truss bridges. Bridge owners are strongly encouraged to check the capacity of gusset plates as part of the initial load ratings.
- 2) Future recalculations of load capacity on existing non-load-path-redundant steel truss bridges. Bridge owners are strongly encouraged to check the capacity of gusset plates as part of the load rating calculations conducted to reflect changes in condition or dead load, to make permit or posting decisions, or to account for structural modifications or other alterations that result in significant changes in stress levels.
- 3) Previous load ratings for non-load-path-redundant steel truss bridges. Bridge owners are recommended to review past load rating calculations of bridges which have been subjected to significant changes in stress levels, either temporary or permanent, to ensure that the capacities of gusset plates were adequately considered.

In Iowa, there are nearly 1200 truss bridges of which 948 are pony trusses. Most

of these bridges are owned by local agencies and were constructed following Iowa DOT (formerly Iowa Highway Commission) standard plans. These bridges have provided many years of reliable service with no known problems concerning the design of the gusset plates. Load ratings of the standard truss designs were performed thru Iowa Highway Research Board funding and have been made available to the local agencies. The ratings were performed in 1982 and trusses over 100 feet were updated in 1998.

To follow the recommendations of the TA, the Iowa DOT recommends that bridge owners in Iowa do the following:

- 1) If a new truss bridge is constructed, an analysis of the gusset plates should be included in the initial load rating.
- 2a) When bridges are inspected per the National Bridge Inspection Standards (NBIS), the condition of the gusset plates should be observed. If significant section loss, distortion, damage, or other deterioration is observed in the gusset plates or other members, the deteriorated members should be analyzed for load capacity.
- 2b) If work is performed that significantly changes the dead load of the structure, the bridge, including gusset plates, should be analyzed for load capacity. An example of this would be the addition of concrete barrier rails to a bridge that was not originally designed for them.
- 2c) If work is done to the truss that would result in a change or redistribution of stresses, the bridge, including gusset plates, should be analyzed for load capacity. An example of this would be the addition or rearrangement of truss members to strengthen the structure.
- 2d) For bridges that are posted, the gusset plates only need to be evaluated when a main truss member is controlling the posting. Most standard trusses are controlled by the stringer or floor beam rating. Standard truss's controlling members can be identified from the documentation on file at the Iowa D.O.T.
- 2e) For bridges that require new posting, the gusset plates only need to be rated when there is significant deterioration of the gusset plate, deterioration of connecting rivets/bolts, or a main truss member controls the rating.
- 2f) For permitting a heavy load over a truss, the gusset plates need to be evaluated only if stresses in the main truss members are greater than inventory levels. Stringers and floor beams are normally the controlling members.
- 2g) Gusset plates in a truss type floor beam will also need to be evaluated when the floor beam controls the rating or the member meets one of the governing criteria listed above.
- 3) Existing bridges should be reviewed to determine if work as described in items 2b and 2c have been made on a bridge in the past. If this type of work was performed and the gusset plates were not analyzed subsequent to the work, the gusset plates should be analyzed for load capacity.

In summary, a generic re-evaluation of the secondary road standards for truss bridges to produce gusset plate rating is not warranted. Bridge owners need to identify truss bridges in their inventory meeting the criteria discussed above and calculate the gusset plate capacity. Iowa DOT will provide guidance and assistance as needed.

If you have questions, please contact Scott Neubauer in the Iowa DOT Office of Bridges and Structures at 515-239-1290 or Scott.Neubauer@dot.iowa.gov.

Please do not hit the reply option in your e-mail note.

Thanks

Tammi Bell
Office of Local Systems
515-239-1529
tammi.bell@dot.iowa.gov

Mailings are available at the Local Systems Weekly Mailing web address
http://www.iowadot.gov/local_systems/mailing/main_mailing.htm