

**ATTACHMENT 41 – LETTER TO THE NATIONAL TRANSPORTATION
SAFETY BOARD FROM THE MINNESOTA DEPARTMENT OF
TRANSPORTATION DATED MARCH 24, 2008**

(3 pages)



Minnesota Department of Transportation

Office of Bridges & Structures

MS 610, 3485 Hadley Ave. No.
Oakdale, MN 55128

March 24, 2008

Office Tel: 651/366-4501
Fax: 651/366-4497

Daniel Walsh
National Transportation Safety Board
Office of Highway Safety
624 Six Flags Drive
Suite 150
Arlington, TX 76011

Subject: Inquiry Regarding the Wakota Bridge Issues

Dear Mr. Walsh:

During the course of our meeting of February 21, 2008, you noted Mn/DOT encountered problems during construction of the Wakota Bridge and you had several questions. As a follow-up, you asked for a description of the situation, problems encountered, and specifically the peer review process conducted of the original consultant design. The purpose of this letter is to provide you with that information.

The Wakota Bridges are segmental cast-in-place box girder structures spanning the Mississippi River. Each bridge is a two cell box girder, with a center web and two inclined exterior webs. Our website contains schematics that may be useful to picture the design.

Mn/DOT retained a consultant firm to design the bridges in early 2001. The river bridges are twin structures but vary slightly since the westbound bridge includes extra width for a bike trail. The design consultant completed the design in 2002 and the bidding took place in December of 2002. Lunda Construction was the contractor and began work in early 2003. The two bridges together accounted for \$59 million of a larger contract that included roadway and interchange bridges. Of the bridges, the westbound bridge cost was approximately \$34 million and the eastbound bridge was about \$25 million.

In September of 2004, hairline cracks were discovered in the webs of the box girders. The westbound bridge was about 40% complete at the time. Construction inspection was being conducted by Mn/DOT construction staff and Parsons Transportation retained by Mn/DOT to assist. Parsons Transportation was not the bridge designer. Construction continued through the fall of 2004 as we investigated materials, methods and other issues to determine the cause of the cracking. In December of 2004, we began adding vertical post tensioning to the webs of the remaining segments being cast to prevent additional cracking. Early in 2005 we directed Parsons Transportation to conduct a peer review of the box girder superstructure design. Parsons determined the original designer assumed a

simplified distribution of load to the exterior and interior webs whereby each web carried 1/3 of the load. In reality, the center web carries over 40% of the load.

We further directed Parson Transportation to undertake a complete review of the design plans for both the westbound bridge under construction and the eastbound bridge which had not yet begun. This included foundations, piers and superstructure. That peer review was completed in the summer of 2005 and detailed the design deficiencies.

During the spring and summer of 2005, the original designer was also preparing retrofit plans to add external post-tensioning to the westbound bridge to relieve the overstresses in the portion of the bridge built prior to the discovery of the cracks. Parsons Transportation conducted an over the shoulder peer review of the retrofit design as it progressed.

Finally, the original designer modified the design and plans to the eastbound bridge to add vertical postensioning to the webs of that bridge. The eastbound bridge construction had not yet begun. Parson Transportation also performed over the shoulder peer reviews of that redesign effort for Mn/DOT. I should note that throughout the retrofit and redesign process, and the concurrent peer review by Parsons Transportation, the original designer and Parsons staff performed professionally under very stressful circumstances to correct the issue and keep the project moving forward.

You also asked about the cost of the design modifications. The retrofit and construction delays of the westbound bridge added approximately \$19 million to the construction cost and it was completed one year behind schedule. Mn/DOT eventually eliminated the eastbound bridge from Lunda Construction's contract when we were unable to agree upon the increased costs with the contractor. We subsequently advertised the eastbound bridge for competitive bidding in February of 2008 and the bridge portion of the project cost was approximately \$56 million. Lunda Construction was the low bidder among four bidders. The eastbound bridge is now scheduled for completion in 2010, three years after the original planned date of 2007.

I believe I covered the aspects you requested, please call if there is any more information desired.

Sincerely,



Daniel L. Dorgan
State Bridge Engineer