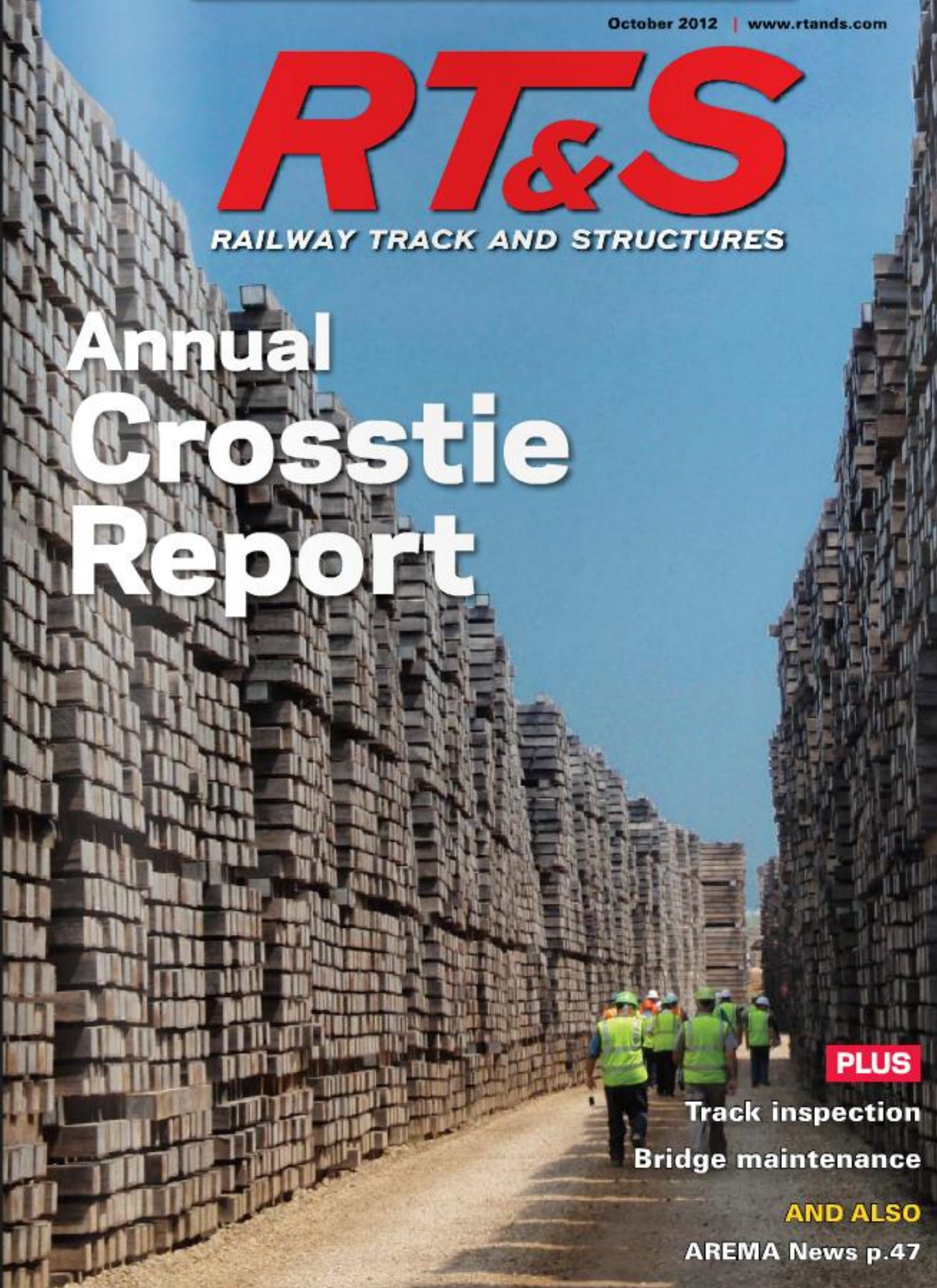
October 2012 | www.rtands.com

RT&S

RAILWAY TRACK AND STRUCTURES

Annual Crosstie Report



PLUS

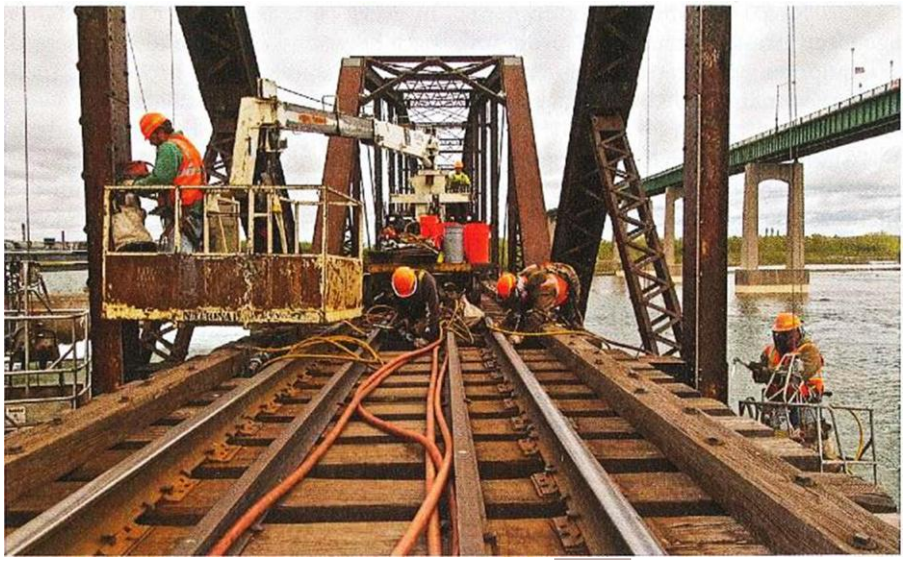
Track inspection

Bridge maintenance

AND ALSO

AREMA News p.47

UPGRADES TO THE INTERNATIONAL RAILROAD BRIDGE AT SAULT STE. MARIE

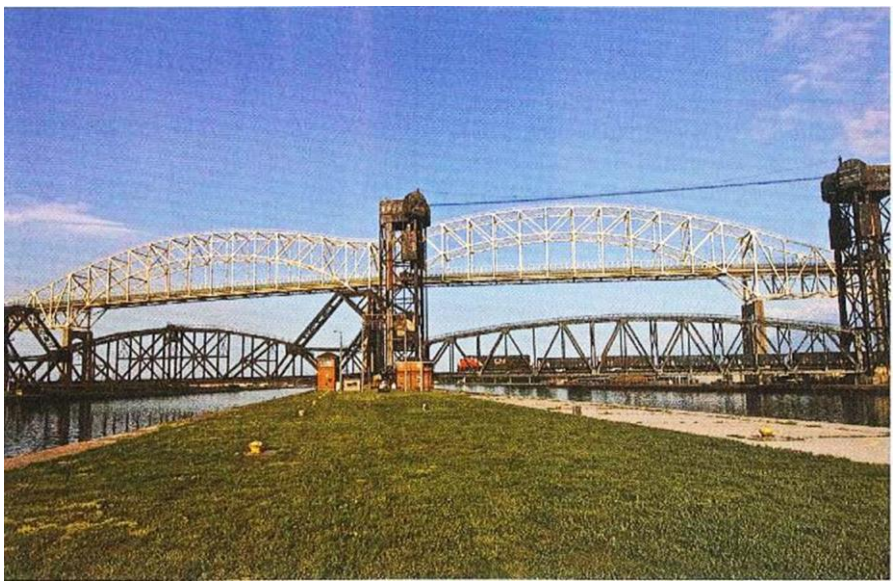


When a historic structure spanning two countries needs to be rehabilitated, contractors and railroads must work together to insure a smooth work plan.

Left, Osmose crews work on CN's international bridge separating the U.S. and Canada. Below, a CN train makes its way across the international bridge.

In an effort to bypass Chicago to transport flour from Minneapolis, Minn., to the East Coast, two countries and three railroads (Soo, CP and Duluth, South Shore & Atlantic Railway) worked together to build a railroad bridge between Canada and America over the St. Marys River at Sault Ste. Marie, Mich. Thus began the life of the Sault Ste. Marie Bridge Company. Dominion Bridge Company of Montreal was responsible for the erection of the bridge. Work began in June of 1887 and the 10, 242-foot steel pin connected thru truss spans were completed on December 31, 1887. On January 8, 1888, the first freight trains bound for the East Coast proceeded with much fanfare.

The success of this railroad venture did not go unnoticed and plans began in earnest for a lock and dam complex to help navigate the 21 feet difference between Lake Superior and Lake Huron. In addition, power canals were also designed to take advantage of the gravity fed water at the St. Marys Falls.



These enhancements further extended the International Bridge's length and complexity. The first addition in 1900 was a 410-foot swing bridge on the Canadian side to span the Great Lakes Power Canal. In 1914, on the U.S. side, a 430-foot double leaf Strauss Bascule Bridge was constructed to provide large ship access to the newly constructed Davis Lock. In 1919, the adjacent

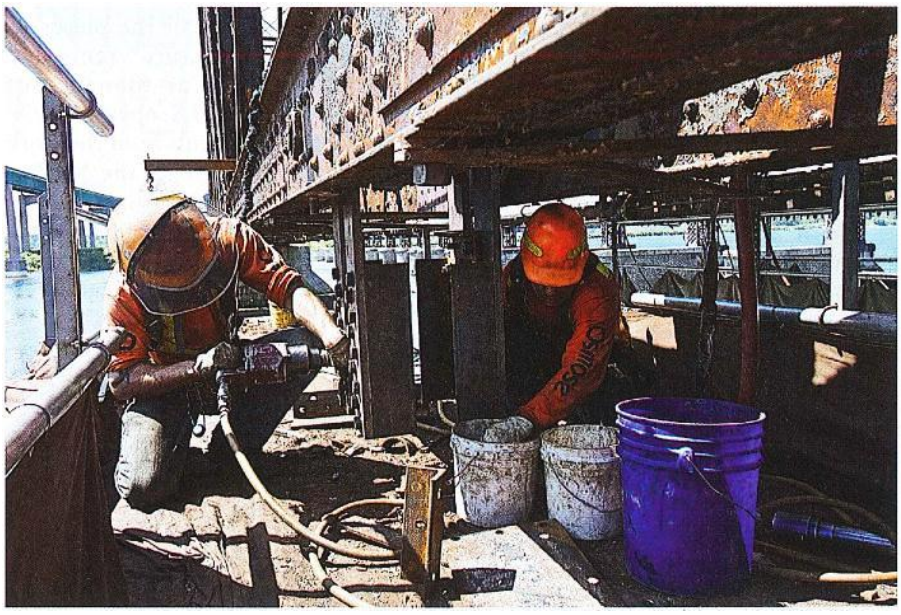
Sabin Lock entered service.

With plans for 1,000-foot ore boats on the drawing table, a 369-foot lift bridge was added in 1958 to replace a smaller swing bridge. This larger opening allowed the construction of the Poe Locks in 1968 adjacent to the 1943 MacArthur locks. Now, the International Railroad Bridge had grown to 23 spans (three movable) and 1.2 miles of track. On an average year, the locks handle 11,000 vessels and 90 million tons of cargo.

When CN acquired the Wisconsin Central in 2001, the Sault Ste. Marie Bridge Company also became CN property. Now came the tedious job of inspecting and prioritizing repairs. With increased traffic predicted, enhancements to the 120-year-plus thru truss spans also began. These plans accelerated when on February 17, 2011, some unusual cross level was noticed at the second floorbeam of span 7. CN immediately closed the bridge to traffic and investigated. A cracked pin plate in the hanger was to blame. A detailed inspection of all truss components was undertaken.

The ensuing detailed inspection was expanded to include a thorough review of all hangers. With all the remaining hangers having about the same fatigue life, CN decided to strengthen all 36 hangers with new hairpin plates before resuming operations over the bridge. In addition to the mobilization of CN bridge crews, CN also chose a contractor familiar with this unique structure for assistance. Osmose Railroad Services has a long history working on the movable and fixed portions of this structure. Mobilizing a large crew and employing designs provided by Modjeski & Masters, Osmose provided immediate fabrication and installation of replacement hair pins and splice plates. The work was further complicated by late February weather at the Soo Locks; very cold with high winds blowing off the ice from Lake Superior.

By late March of 2011, the necessary repairs were completed over all the spans where defects and possible defects were identified. But this was only the beginning. CN started longterm planning for further enhancements to upgrade Bridge 181.93 to increase component reliability with an eye towards possibly increasing the load capacity of this historic structure. Prior to ordering all the steel for the complicated repairs for the nine spans, CN chose to complete one span in the fall of 2011 to validate the accuracy of the design details.



Osmose crews at work under the CN's international bridge.

"With all the tight confines surrounding the limits of the chords and pins, we had to make sure that the contractor could fit the pieces to strengthen the structure" remarked Sandro Scola, senior manager of structures for CN - U.S. operations.

With a large percentage of the work on the Canadian side of the border, the contractor was responsible for vetting its employees. This included providing passports, work visas and background checks to satisfy Canadian and U.S. custom officials.

Mike Tweet, senior vice president - engineering for Osmose, noted, "Besides the turnkey engineering we provided, there are multiple difficulties with just trying to work across the border, even if you are not setting foot on Canadian soil. If you miss one detail, it can hold up the project until you receive a signature at all levels, government and railroad included. This is also a high security area and the bridge is monitored 24/7 by closed circuit cameras. If you step off the bridge onto one of the islands, you will be visited."

Fast forward to 2012 and CN has developed a plan to achieve their multi-year goal of enhancing the structural integrity of substandard steel members. The strengthening of the eight remaining spans currently being completed involves Ul-L2 hanger work, L0-L2 lower chord improvements and floor beam strengthening. This structure not only carries a lot of history, it is also a key logistical crossing between the U.S. and Canada.

As the long hot summer of 2012 continued, the employees for Osmose note that the cool weather at Sault Ste. Marie was a blessing versus the late winter work of a year ago. ❑