

Retired Railcar Flats Find New Purpose as County Bridges

By Joel Buxton



Keirerleber has been implementing an outside-the-box solution by re-purposing discontinued flatcar railway cars to become the superstructure foundation of new bridges.

Brian P. Keirerleber is a man on a mission, and that mission began in Buchanan County, Iowa. Many of the town's bridges were past their prime and needed replacement. The problem was made worse by the fact that advancements in farming and transport technology has increased the size of trucks and loads that use the bridges, leading to more wear-and-tear. Sometimes the bridges' strict load limits were exceeded on a regular basis because there was not enough manpower to enforce the laws. This added to the urgency of the need to replace bridges in Buchanan County.

To replace a bridge is a serious undertaking, requiring the loss of the bridge's use during construction. Costs can rise to as high as \$175 per square foot, meaning the total cost can often reach totals of \$525,000. This high cost can be prohibitive to smaller counties with lower budgets than replacement costs. Over time, the situation can become a ticking time bomb of potential bridge failure and danger to motorists. It seems like an insurmountable problem, but Keirerleber was interested in looking for solutions.

Keirerleber has been implementing an outside-the-box solution by re-purposing discontinued flatcar railway cars to become the superstructure foundation of new bridges. It may sound like an odd solution, but these railway cars are designed to meet and exceed the stress requirements

that are expected from bridges in the county. Another positive upside of re-purposing flatcars as bridges is that installation is quicker, and can often take advantage of existing bridge abutments. In addition, the natural length of flatcars is often long enough to span the required bridge length without the need for additional flatcars.

For this solution to become feasible, a substantial number of retired flatcars would need to be available for projects. Fortunately, there is a substantial turnover of these flatcars, as they are constantly retired for various reasons having nothing to do with performance. For example, railway flatcars may be retired because of derailments, routine replacement with newer, more efficient railcars, and for tax purposes. None of these reasons is related to the structural integrity of the flatcars, making them perfect candidates for use as bridges.

In terms of the flatcars used, 30 bridges have already been created in the Buchanan County area. There is flexibility as to the type of train cars used, including pulp cars, military cars, and 89 foot flatcars. Total costs for these bridges have ranged from approximately \$75,000 to \$130,000 per bridge, a major reduction in traditional costs.

In terms of safety, all bridges are rated to carry legal loads, and were tested by Iowa State University. A full load

RRFC (Railroad Flatcar) was constructed in Bowen Laboratory and was tested for adequate load redundancy after fracturing a primary member. The bridge was loaded to 190 kips, and was found to be not fracture critical as evaluated using National Bridge Inspection Standards.

This is an exciting new approach to bridge replacement that is cost effective, safe, and environmentally conscious, finding innovative use of existing materials.

For more information, please refer to the following link: http://www.operationsresearch.dot.state.ia.us/reports/ihrb_by_number/tr400plus.html

75K

Total costs for these bridges have ranged from approximately \$75,000 to \$130,000 per bridge.

