



## Historic Bridge Foundation Facebook Archives

### Bad Repairs

December 2015

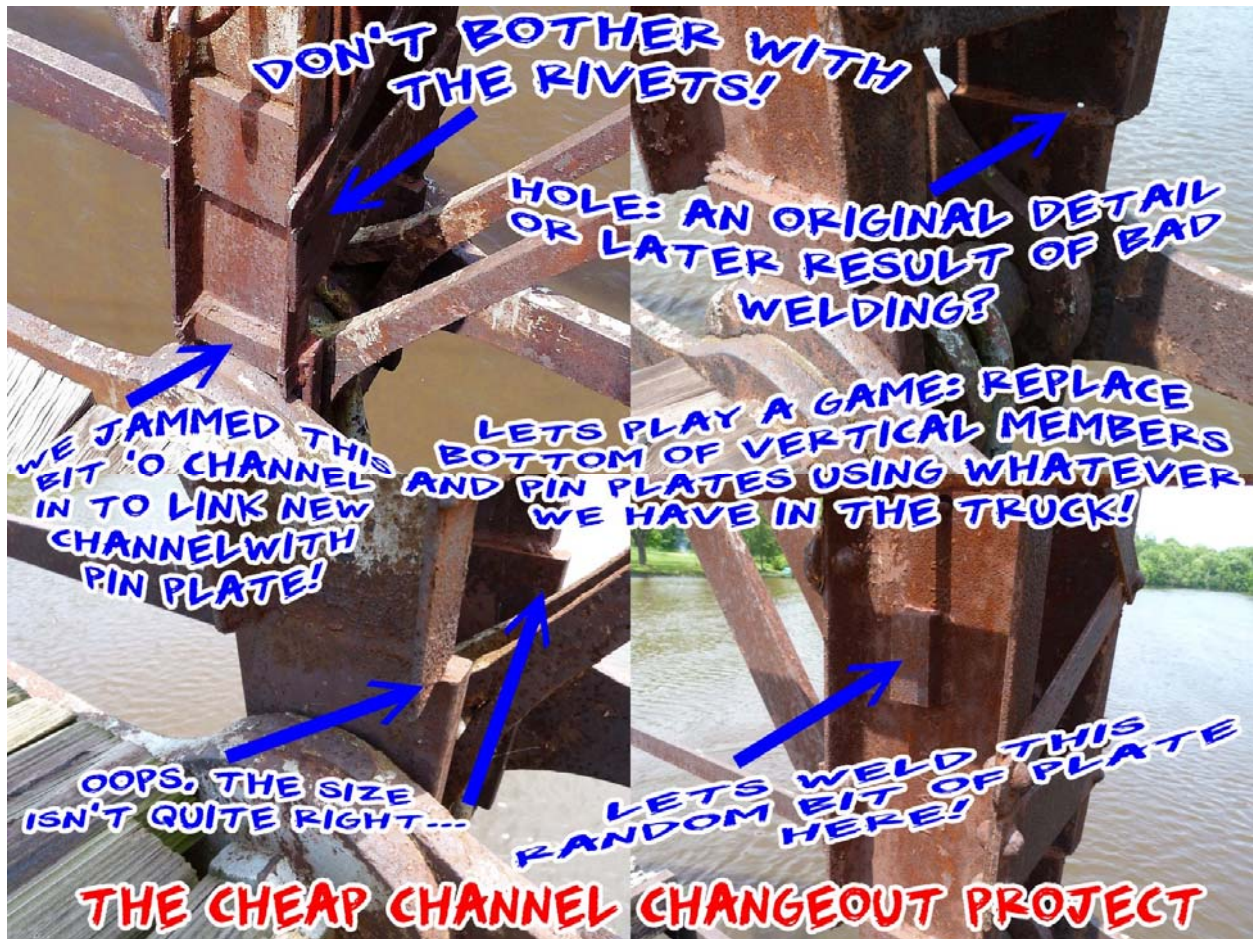
Maintenance and repairs are an important aspect of historic bridge preservation, and sadly it does not happen as often as it should. Worse, sometimes when historic bridges are repaired, the repairs are not the most skillfully executed repairs. These “bad repairs” might have a variety of results. In some cases they might still manage to accomplish their goal of extending the service life of the bridge. In some cases a bad repair is better than no repair. In other cases however, a bad repair might not properly address the problem, or it might address the problem in the short term, but create worse problems down the road. Bad repairs might also be structurally beneficial, but harm the historic integrity of a bridge, when a better repair might have been better for the bridge in terms of maintaining historic integrity. Alterations are often considered when evaluating a bridge for National Register eligibility.

Consider the following repairs. While these may have been important to extend the service life of these historic bridges, one cannot help but wonder if it might have been possible to carry the repairs out in a more tasteful and skillful manner.

The identities of these bridges and their owners have been left anonymous to protect the owners’ dignity!

We offer this sample photo gallery of “bad repairs.” We labeled the photos in a somewhat humorous manner with the goal of making this an enjoyable view, but have also offered text captions in the photo gallery for a more serious discussion of what you are looking at in each repair.

We may expand this gallery in the future as we find more “bad repairs.”

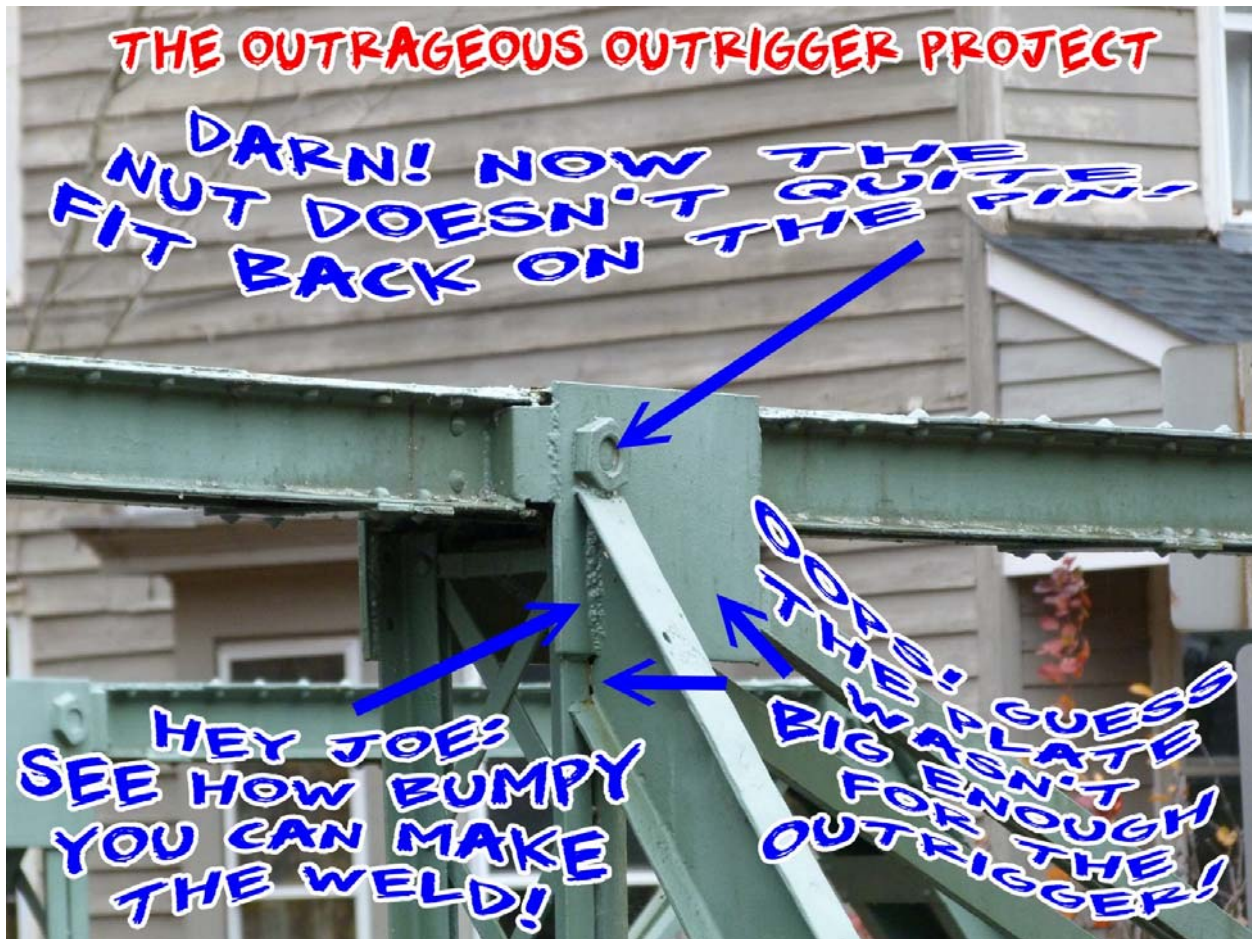


This repair was never a good one to begin with, but time and continued deterioration of this now-abandoned bridge have made the repair even less reliable. Here, pieces of channel were used to replace sections of some verticals. More noteworthy, all pin plates were replaced with new welded plates. Pin plates are structurally important since they link the vertical member to the connection. Here, the weld quality does not appear to have been very good, failing to offer much coverage between the two plates. As a result, section loss holes have developed in several areas along the welds, assuming they were not there to begin with when the repair was completed.

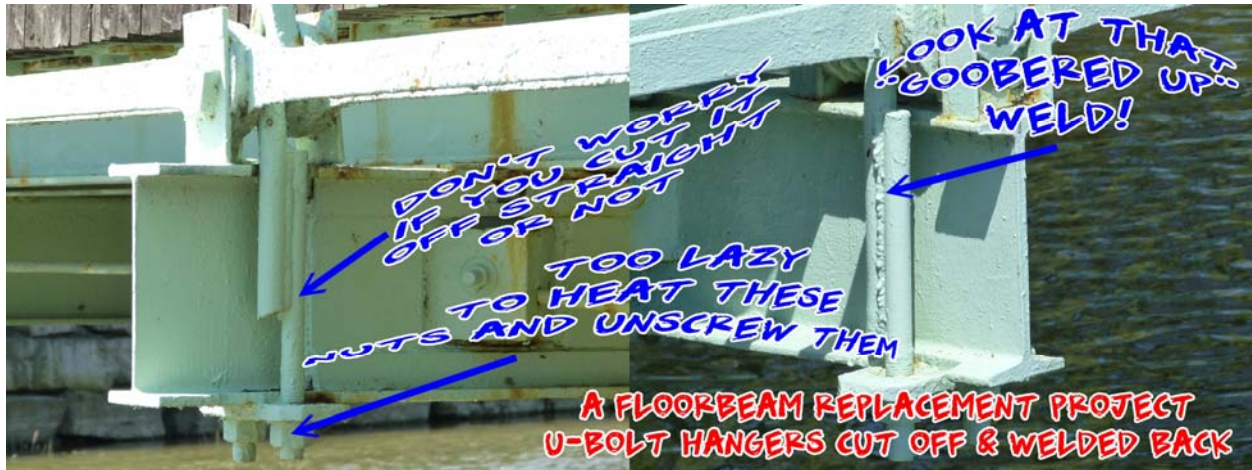


This repair sought to supplement an original cast iron connection plate and diagonal members at this truss pin connection location with welded bar and plate. The visual presentation of this repair as well as the actual workmanship is poor. The supplemental gusset plate that is welded on has messy cuts, uneven shape, and appears to be oversized. There is a big hole in the middle, which might have been the result of trying to make it fit, but regardless the visual presentation is that of a “mystery hole.” In terms of actual workmanship and quality the most striking aspect of this repair is the welding of the supplemental diagonal bar to the new gusset plate where at least three gaps (holes) in the weld are visible.





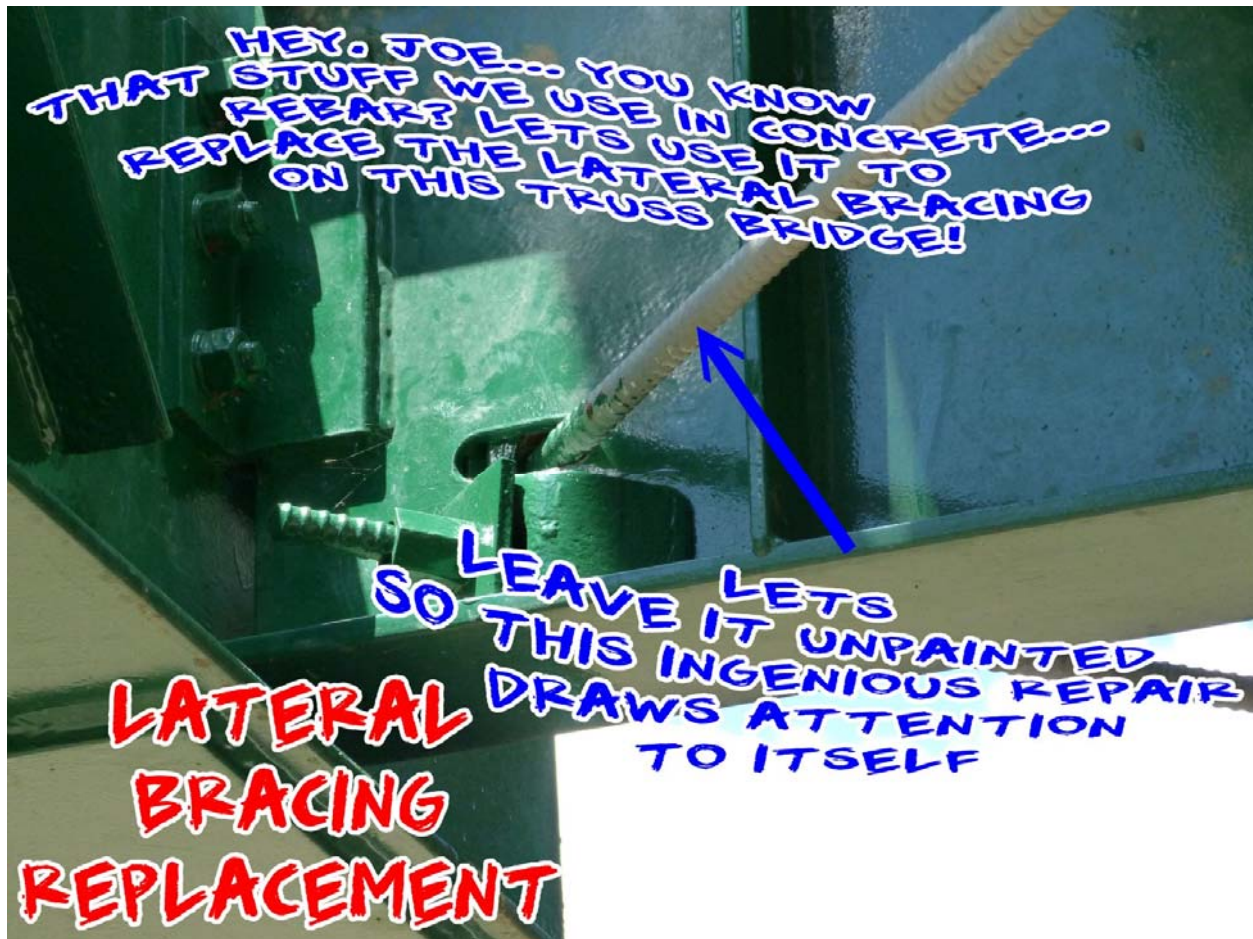
This repair does not appear to be thought out very well and also shows poor workmanship. The main features of the repair are that a gusset plate was added to an existing truss pin connection, and outrigger beams were added to this bridge. The intent appears to have been to weld the new outrigger to the new gusset plate. However, the gusset plate turned out not to be tall enough, so only the top two thirds of the outrigger are actually welded to the plate, with the remainder not welded to anything. Worse, the part that was welded shows very poor weld quality. The very random and bumpy looking weld does not display the even pattern of ridges that are characteristic of a good weld. Another problem with this repair occurred when it turned out adding the plate made it impossible to fully screw the nut back onto the pin, such that the nut is only about halfway on the pin.



With this truss bridge, potentially as part of an effort to replace floor beams, the u-bolt hangers were cut, and rather than be replaced with new u-bolts, it appears some of the original u-bolts were welded onto new pieces of rod. The end result of this repair is that the u-bolts, which are tension members holding the floor beams onto the truss, rely on these welds for their function. Many engineers frown on repairs that require a tension member to rely on a weld for their function, even though a high quality weld may perform very well in tension. However, what about a bad weld? Certainly any engineer would frown at a tension member relying on a bad weld. Yet that is what is seen in this repair. The very random and bumpy looking weld does not display the even pattern of ridges that are characteristic of a good weld.

Its also worth noting that in some cases, u-bolts can be removed, and later reinstalled in a non-destructive manner by heating and unscrewing the nuts at the bottom. This approach would be a way to replace floor beams without requiring an unusual repair like this.





This is a good example of a repair of a metal truss bridge that from a structural standpoint probably performs just fine, but visually just doesn't look very nice or historically accurate. Here, the original lateral bracing under the deck was replaced with new rods. The rods used are the ribbed design found in concrete rebar. Seeing rebar on a historic truss bridge being used for lateral bracing just doesn't look very nice. Also these rods, which appear to be galvanized, were not painted green like the rest of the truss; therefore they stand out and call attention to themselves.



This is a repair for which its hard to tell how much structural value it provided. The intent appears to have been to replace one panel's worth of bottom chord in a pin-connected truss. It is a repair that has the appearance of being put together using spare parts. It includes galvanized turnbuckles, but these were the only things that were galvanized. The rest of the parts appear to have been painted steel, as they had rusted to varying degree in the years after the repair, unless rusty pieces were used to begin with. At the pin connection, a series of steel plates were stacked and bolted together. However, some of the plates were either not cut straight, or were not the right size, as they do not all line up.