

Historic Metal Truss Bridges: Restoration and Reuse

Presented By Nels Raynor,
Bach Steel





Bridge Restoration Experience



Bach Steel specializes in the relocation and restoration of historic metal truss bridges, but also has many years of experience in general structural steel fabrication and erection work.



Case Study: State Street Bridge, Bridgeport , Michigan



Bridge before restoration. Due to failing pier, the spans were twisted slightly and at risk for eventual collapse.

Site Visit: Inspect Bridge and Identify Problems



Widespread areas of deterioration can be replicated.



Isolated or minor deterioration can be repaired.



Site Visit:

The Value of Experienced Engineers and Fabricators



- Know where hidden deterioration is located (reduce surprise restoration costs)
- Make accurate cost estimates (not too high, not too low)
- Propose creative repair procedures (can something be repaired for less cost than replacing it?)



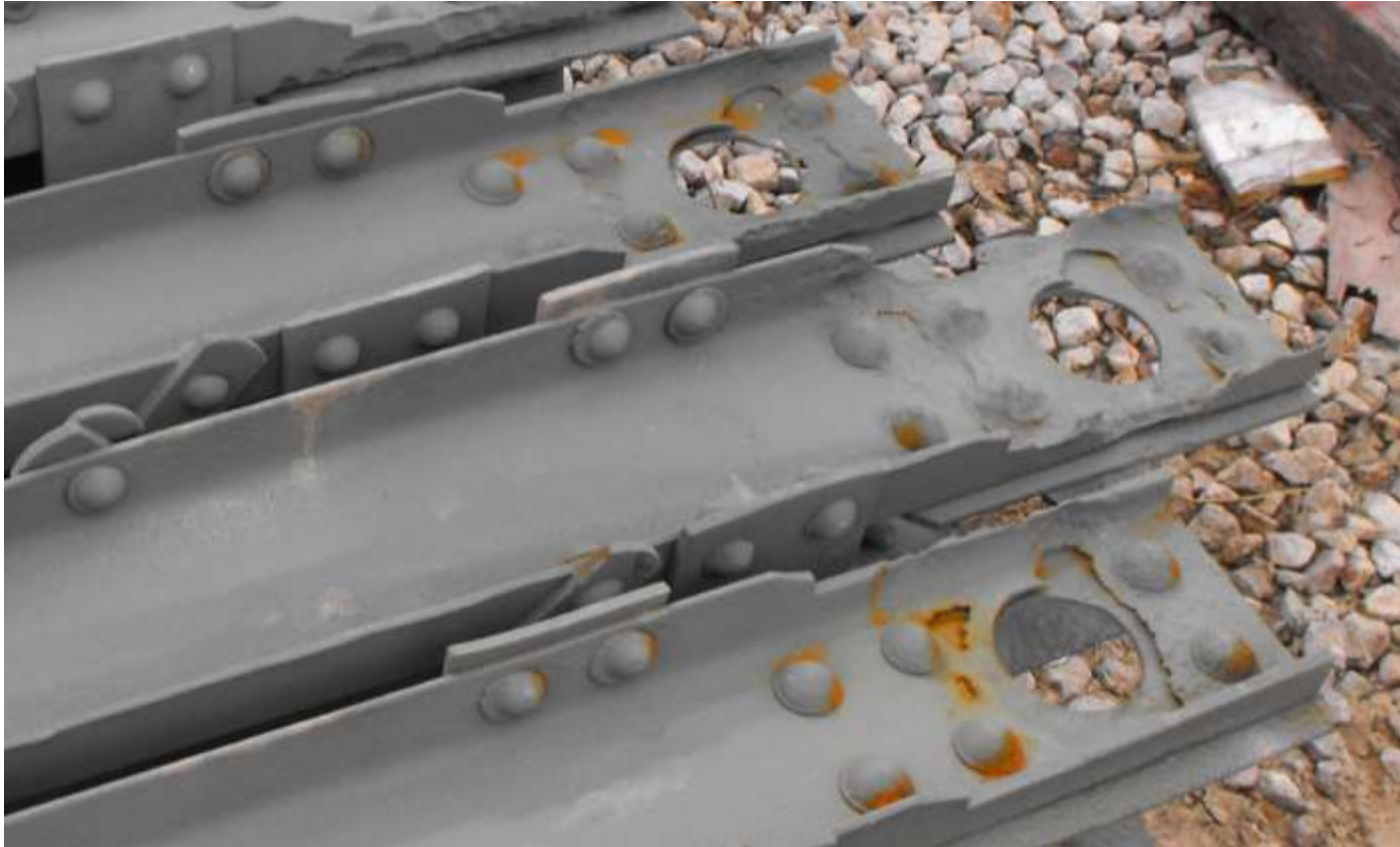
Case Study: State Street Bridge, Bridgeport , Michigan



After deck removal, truss was removed from the substructure with cranes, and rolled to a nearby site to be dismantled and shipped to Bach Steel.



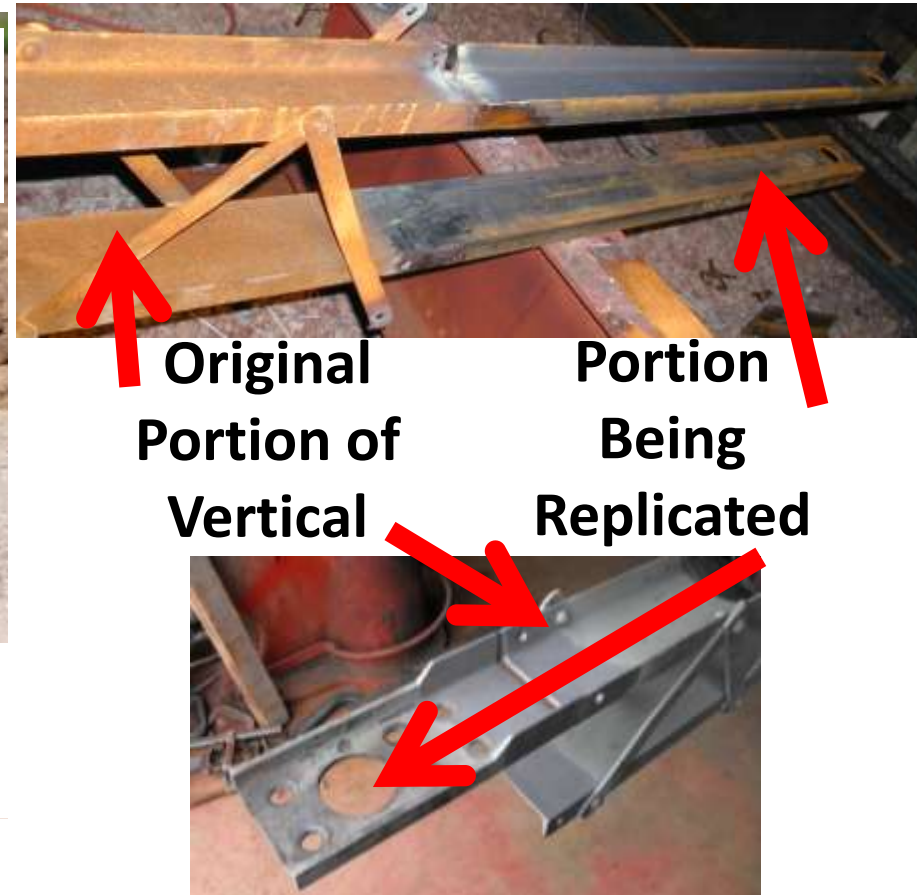
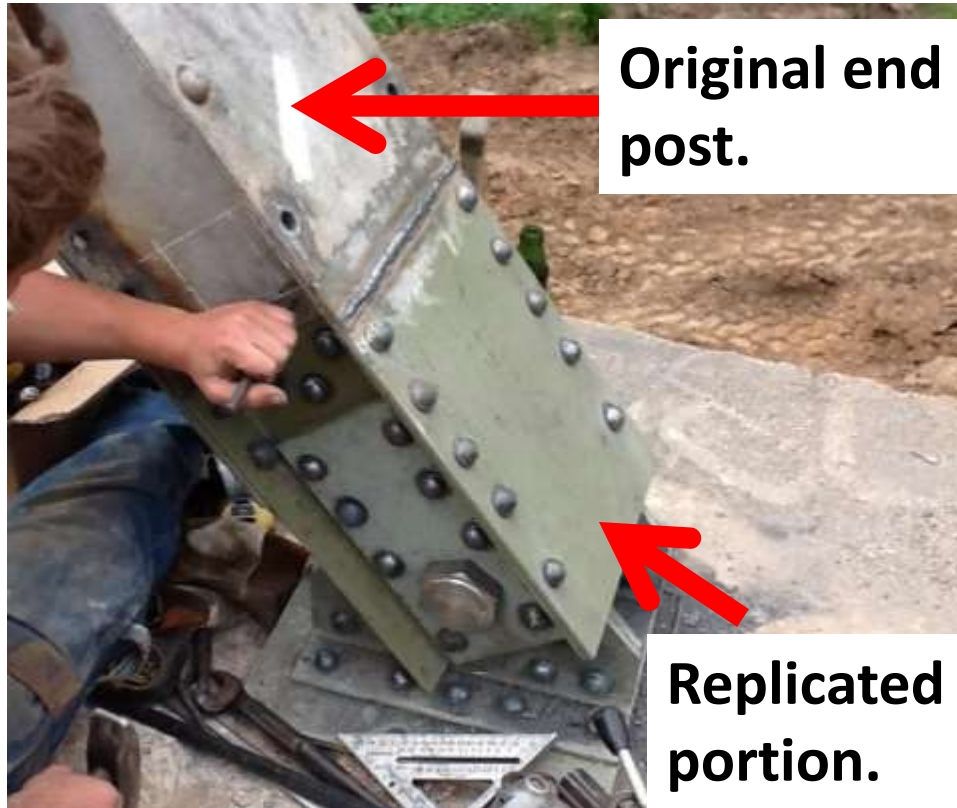
Case Study: State Street Bridge, Bridgeport , Michigan



Disassembled bridge at the shop. Deteriorated ends of vertical members and associated pin plates to be replaced with replicas.



The Restoration: Replicating Portions of Beams



A very common truss repair: Replicate and replace only the bottom portion of vertical members and end posts.



Case Study: State Street Bridge, Bridgeport , Michigan



Restoration of bridge parts at shop. Examples of work completed shown above. Replacing rivets with rivets during restoration is economical, reliable, and historically correct.



The Restoration: Welding and Wrought Iron



There are a lot of misconceptions about welding wrought iron. The reality is that wrought iron can be reliably welded.



The Restoration: Heat Straightening



Heat straightening can be done on historic truss bridges in a manner similar to that done for modern steel bridges.



The Restoration: Pad Welding

**Pad
welding in
progress.**



**Areas of section
loss cleaned
before repair**



**Pad welding
completed.**



Isolated and moderate section loss can be repaired by pad welding. This applies to a variety of bridge parts including plates, beams, and eyebars.



The Restoration: The Value of Experience



A restoration done by an experienced fabricator will be longer-lasting, look nicer, and reduce cost by getting it done right the first time.



Case Study: State Street Bridge, Bridgeport , Michigan



**Reassembly of the bridge on the ground a short distance
away.**



Case Study: State Street Bridge, Bridgeport , Michigan



**Placing the assembled truss on new abutment and pier
followed by deck installation.**



Case Study: State Street Bridge, Bridgeport , Michigan



A restored, functional historic bridge the community can be proud of!



Case Study: State Street Bridge, Bridgeport , Michigan



Before and After



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



**M-72 Ausable River, Grayling, MI
Rehabilitation of small riveted steel rigid-frame bridge on
Business Loop 75 (M-72).**



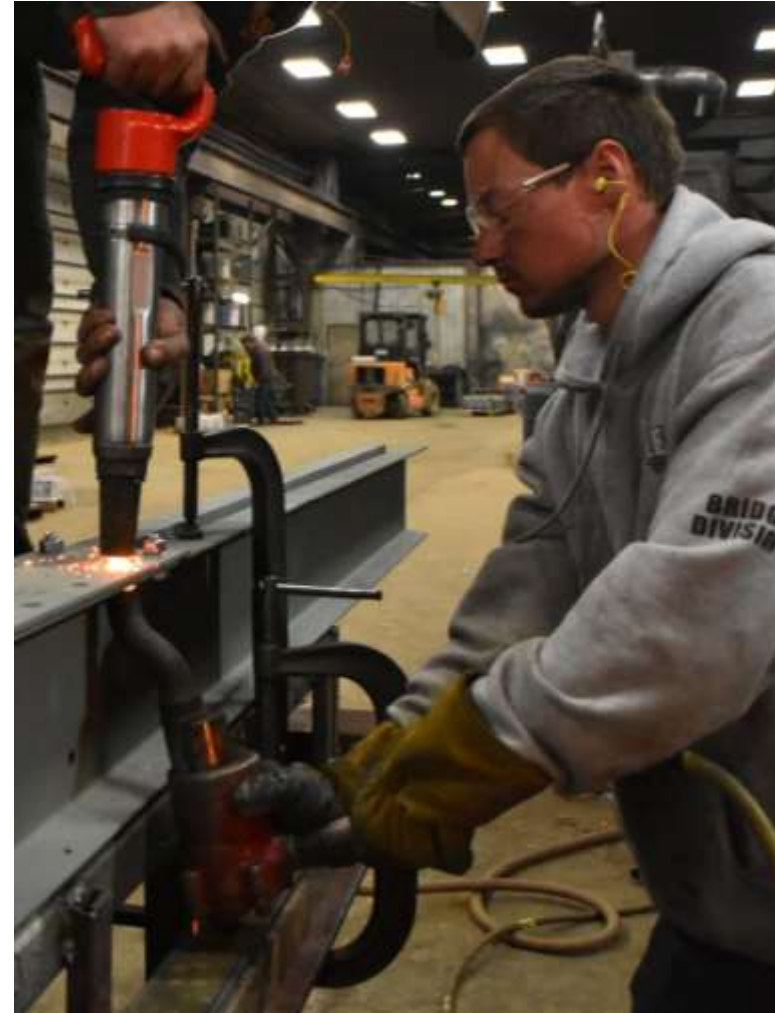
2016: Notable Bridge Projects: 3 MDOT Riveting Projects



M-72 Ausable River, Grayling, MI
First known riveting in historic bridge project for active highway use in Michigan.



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



M-72 Bridge Hot Riveting In The Shop



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



M-72 Bridge Hot Riveting In The Field (Tight Locations)



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



Restoration/Relocation M-86 Prairie River



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



Restoration/Relocation M-86 Prairie River
Moving from busy State Trunkline Highway to quiet county road.



2016: Notable Bridge Projects: 3 MDOT Riveting Projects



**US-23 Cheboygan River Bascule Bridge
Rehabilitation of historic riveted bascule bridge on major US
Highway.**



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