Thamesville Bridge

A Unique Heritage Truss Bridge

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Metal truss bridges feature a network of metal beams arranged in a pattern based on triangles that work to support the bridge.

Through Truss

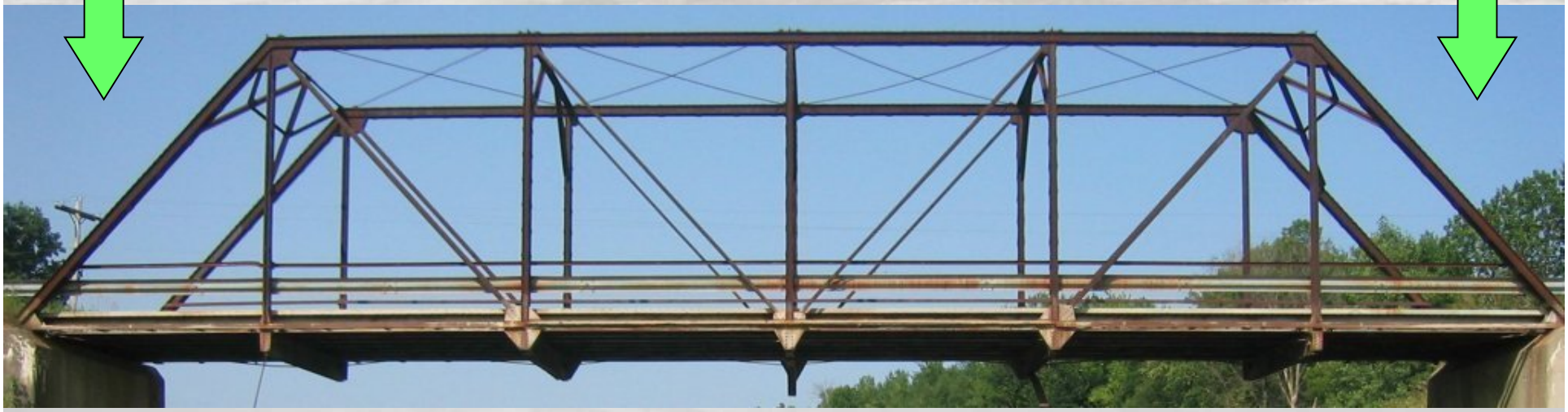
Pony Truss

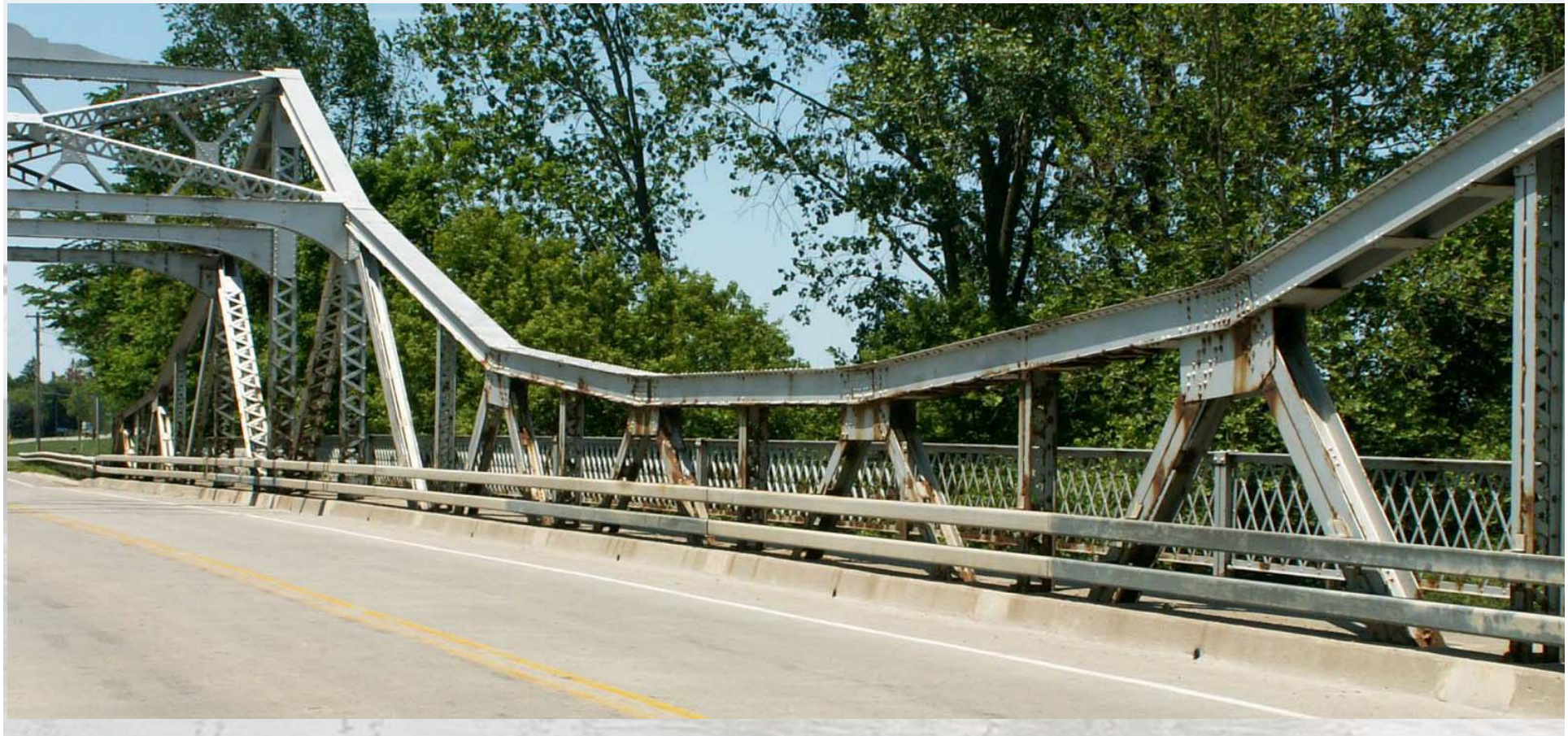
Longer truss bridges need overhead bracing to stabilize them and are called through trusses. Shorter spans without overhead bracing are pony truss bridges.

Warren truss (repeating “V’s”)

Truss designs are classified by how the “diagonal members” are positioned. The two most basic types are shown.

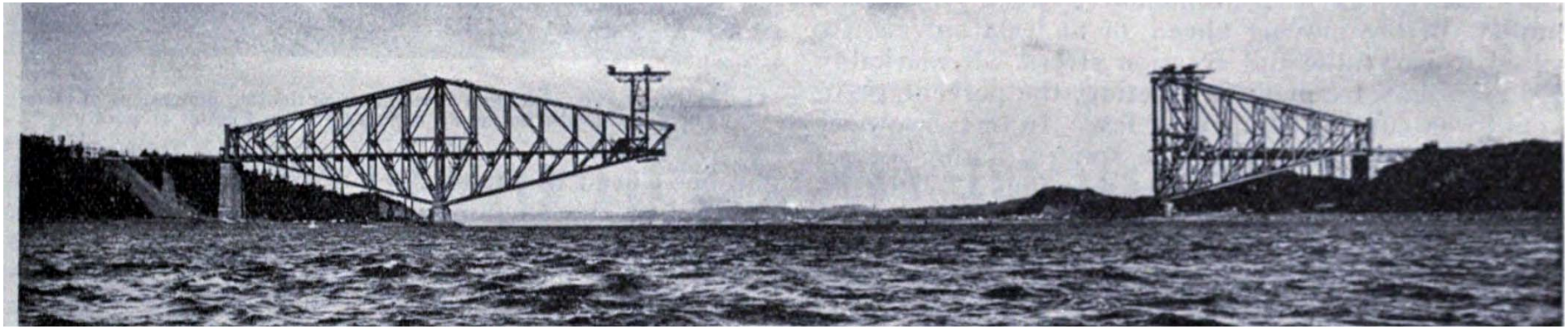
Pratt truss (pointing bottom, center)





The Thamesville Bridge's trusses follow a Warren through truss design.

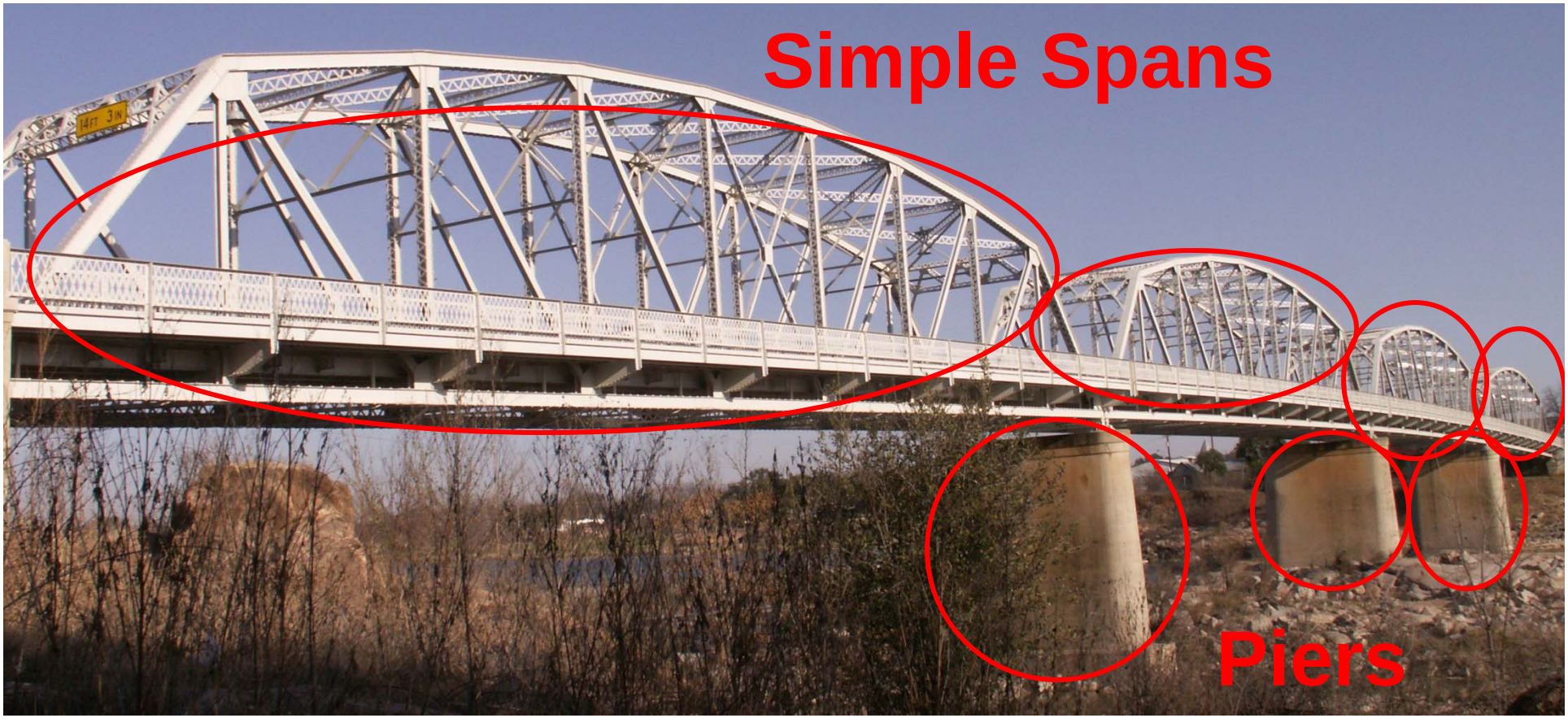
What is a cantilever?



Cantilevers are like holding your arms outstretched. Your arms are cantilevered from your body. Similarly, cantilever bridges have structures like arms that extend from the abutments or piers of a bridge and do not need the other end of the bridge to support them.

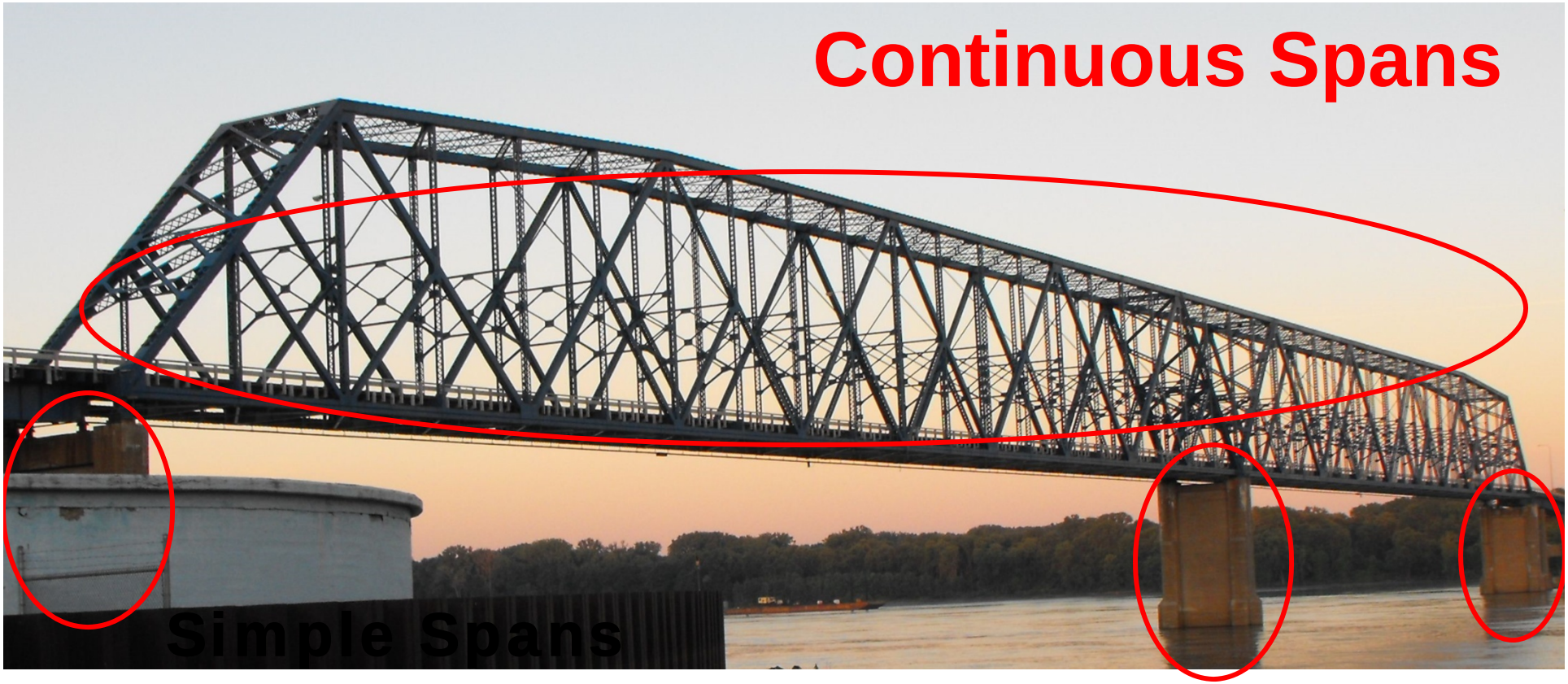
Portions of bridges could often be constructed without the aid of falsework using a cantilevered design.

Simple Spans



Simple spans are structurally independent, each physically capable of being its own separate bridge and functioning as such.

Continuous Spans



Continuous spans are interconnected with their surrounding spans and require the presence of the surrounding spans to function correctly

Thamesville Bridge

Bridge is a continuous through truss constructed using the cantilever method.

Thamesville Bridge

- Built in 1937
- Builder: Canadian Bridge Company of Walkerville, Ontario
- Designer: Ontario Department of Highways under Arthur Sedgwick. (Sedgwick is credited with introducing the rigid-frame bridge to Ontario.)
- 320 Feet (97.5 Meters) in length.

Heritage Significance: Engineering

Bridge in Corning, New York, 1937. Main Span: 223 Feet (67.9 Meters)

- Bridges of this design were usually reserved for very large river crossings.
- This is one of the smallest examples of this design I have encountered. The Thamesville main span is 160 Feet (48.8 Meters).

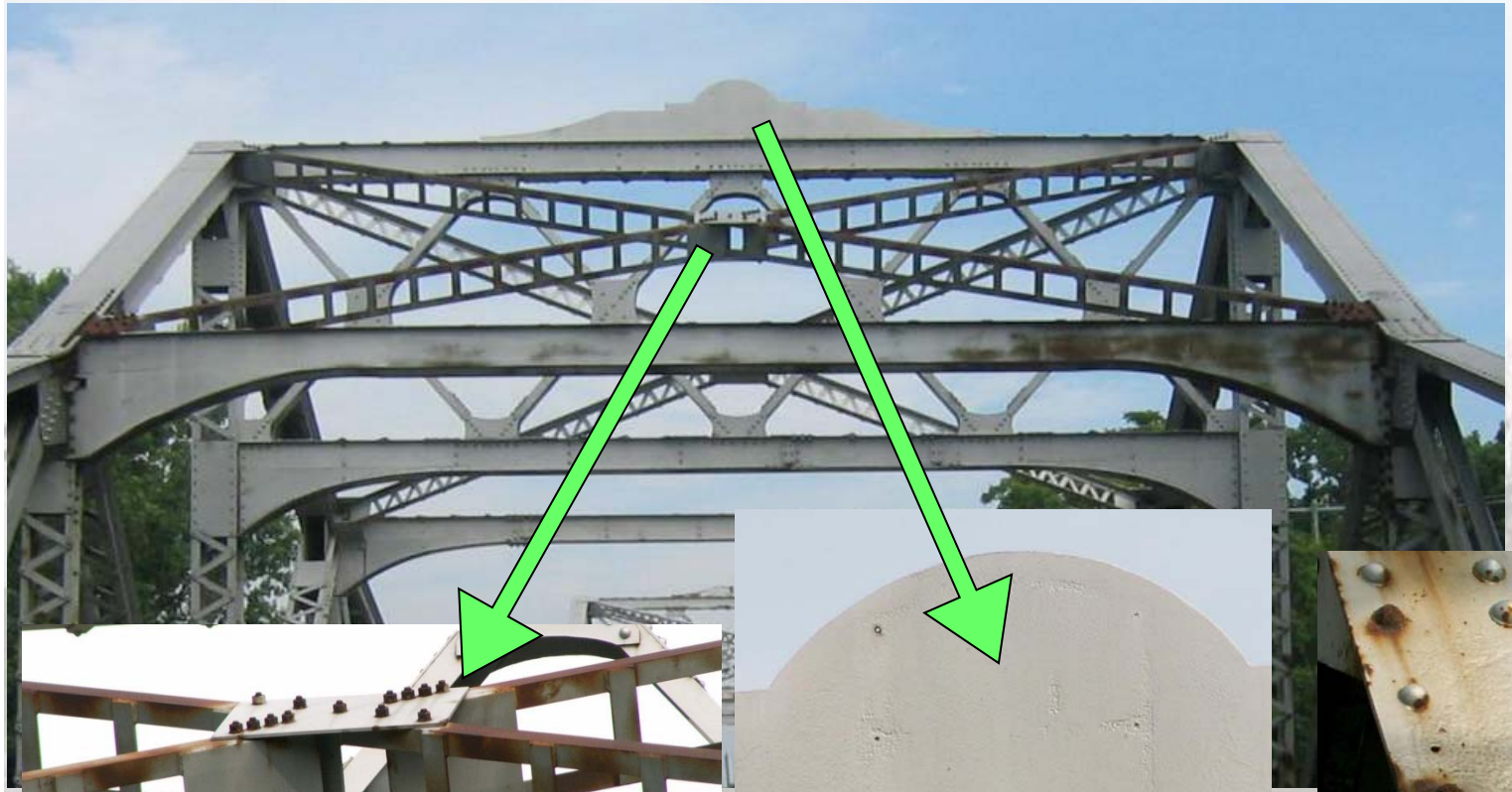
Heritage Significance: Engineering

- **Large or small, the Thamesville Bridge is the only bridge of this type in Chatham-Kent.**
- **No known similar bridges in terms of size and design in Ontario.**

Heritage Significance: Integrity

The Thamesville Bridge's trusses appear to be largely unaltered, retaining original design and materials. This adds to the heritage significance of the bridge.

Heritage Significance: Integrity



The only noteworthy alterations are the replacement of one of the portal braces and the loss of the builder plaques.

Heritage Significance: Integrity

An intact end post plaque on another bridge built by the Canadian Bridge Company suggests what the Thamesville Bridge end post plaque might have looked like.

Heritage Significance: Craftsmanship and Beauty

Modern Bridge

Thamesville Bridge

Thamesville Bridge has a more intricate and detailed design than modern bridges. These details both reveal the work of craftsmen and offer aesthetic qualities as well.

Heritage Significance: Craftsmanship and Beauty

Unlike modern bridges, this bridge's trusses are carefully "built up" from smaller parts like angles, channels, and v-lacing. All are held together by many rivets.

Thamesville Bridge: Built of Canadian Steel

Steel mill “brands” on the bridge indicate that at least some of the steel came from Algoma, a Canadian steel company.

Heritage Significance: An All-Canadian Bridge

This period advertisement states that the bridge was built by a Canadian Company with Canadian Steel by Canadian workers.

Possible Rehabilitation Overview

- Repairs to abutments and piers.
- Repairs and selective replacement of truss members and rivets.
- New deck (floor beams / deck stringers too?)
- Blast clean and repaint trusses

Possible Rehabilitation Work

Upper

Lower

Like the majority of heritage truss bridges, deterioration is worse in areas that are exposed to water and salt. Lower portions of the truss are far more deteriorated than the upper parts.

Possible Rehabilitation Work

It may not be necessary to replace an entire beam that has deterioration. Here, some lacing bars and plates are deteriorated and may need replacement, but the other parts of the beam might be possible to retain.

Possible Rehabilitation Work

- If one section of a truss beam is deteriorated, that section can be replaced with a new section which is welded on.
- Plates or even welds can be applied to “patch” deteriorated areas.

Possible Rehabilitation Work

Original deck stringers and floor beams, typical trouble areas, are in surprisingly decent condition.

Its not uncommon to replace these elements in rehabilitation, but is it really needed here?

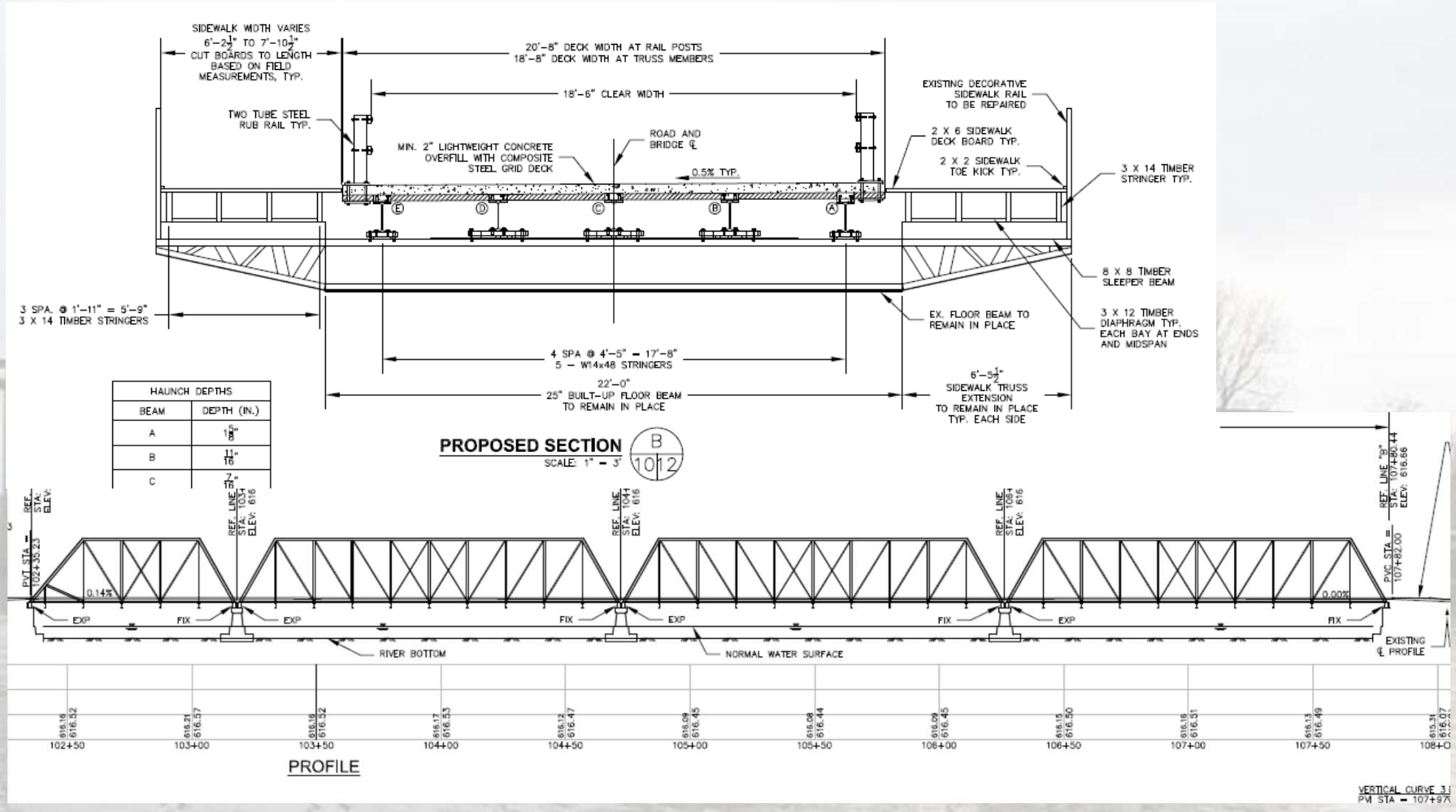
Possible Rehabilitation Challenges

Is any of the paint on the bridge lead based? If rehabilitated over the river, containment may be needed.

If rehabilitated over the river what falsework might be needed?

Alternatively, is bridge feasible to dismantle, and rehabilitate in a shop despite its size and design?

Typical Rehabilitation Experiences



Rehabilitation costs are often similar or less than the cost of replacement. Each bridge's situation is unique however.

Case Study: 6th Street Bridge

The 6th Street Bridge in Grand Rapids, Michigan is a bridge that has been well maintained. It is much older and more lightweight than the Thamesville Bridge.

Built: 1886

Length: 544.7 Feet (166 Meters)

Roadway Width: 18 Feet (5.5 Meters)

Case Study: 6th Street Bridge

1979 Rehabilitation To Repair Substructure and Superstructure, and Blast Clean and Repaint: $585,570.

2002 Repainting Project: Full Blast Clean and Paint: $823,000

2012 Rehabilitation To Replace Deck, Spot Paint, and Repair Superstructure and Substructure: $2.2 Million

Case Study: Maple Road Bridge

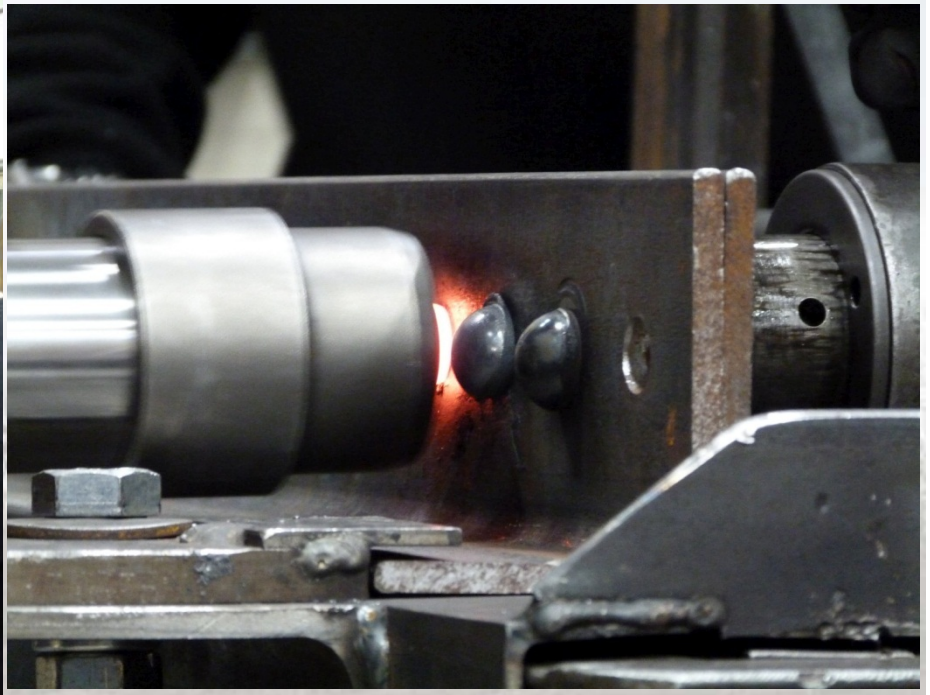
Maple Road Bridge, Ann Arbor, Michigan

2003 Rehabilitation: Cost: $525,000

Weight limit increased from 6 tons to 20 tons.

Demolition and Replacement cost estimates started at $1 Million and went up to $4 Million.

You Can Use Rivets In Rehabilitation!



Many engineers think that failed rivets must be replaced with modern bolts. This is not true. Riveting is not a “lost art.” It is not costly or time consuming to do, and replacing rivets with rivets maintains the original design of the bridge.

Experience Counts!

Bach Ornamental and Structural Steel is a Michigan firm that has restored many truss bridges.

bachornamental.com

VJM Metal Craftsman is a resource to contact for information and training on restoration techniques like riveting.

historicbridgerestoration.com

Save money and increase project quality: Seek engineers and contractors with extensive experience in heritage truss rehabilitation.

They will understand what needs to be fixed and what doesn't, and how to get the job done right.

Typical Benefits of Experienced Engineers

- Provide a clear estimate… no surprise costs down the road.
- Design a rehabilitation with a service life of 50+ years, and minimize interim maintenance costs.
- Design a rehabilitation that is competitive with the cost of a replacement.
- Repair existing materials whenever possible to avoid costly, widespread replacement of original material.

Preservation Alternatives: Retrofit

An independent load-bearing system could be installed under the bridge.

Preservation Alternatives: Bypass/Couplet

Build a new bridge beside the heritage bridge to either form a one-way couplet, or leave heritage bridge in place for pedestrians only.

Concluding Thoughts…

The key features of this heritage bridge are its rare design and its eye-catching appearance.

Concluding Thoughts…

It was built only a year before the Blue Water Bridge was completed.

The Blue Water Bridge was rehabilitated and preserved.

Concluding Thoughts…

The fate of the vast majority of heritage metal truss bridges is demolition and replacement with a modern bridge.

Concluding Thoughts…

The only other heritage metal truss bridge on public roads in Chatham-Kent, the Mint Line Bridge over Babtiste Creek, is to be demolished and replaced. This increases the local rarity and significance of the Thamesville Bridge as a truss bridge.

The Thamesville Bridge is Worth Preserving!