Michigan’s Historic Bridges
With Emphasis On Grosse Ile and Wayne County

Presented By:
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The part of the substructure that the ends of the bridge sit on are the abutments. Any supports in between are the piers.
Grosse Ile Toll Bridge

Structure Completed in November 1913

Swing Span: 304 Feet Long

Total Bridge Length: 1030 Feet

One of the longest metal truss bridges in Michigan, and one of only a few remaining highway swing bridges in Michigan
Grosse Ile Bridge Company formed in 1912 with Edward D. Voight as President and Frank A. Schulte as Vice President
Detroit Bridge and Steel Works of River Rouge, Michigan designed the bridge and it was constructed by Whitehead and Kales Company of River Rouge, Michigan
On August 6, 1965, John T. Hutchinson lost steering control and struck and collapsed a fixed span east of the swing span, sending two cars into the river. No one was seriously hurt. Bridge closed for several months.
Grosse Ile Toll Bridge

1992 Span Collision

In September 1992, the same fixed span east of the swing span was again hit and knocked into the water, this time by the freighter H. Lee White. The span was replaced with a near replica designed based on the original plans for the 1913 span.
Bridge Company retains the original plaque for the bridge. It was originally mounted on the bridge until someone tried to steal it. The toll collector noticed someone trying to haul it away.
Grosse Ile Toll Bridge

Rendering of thief after being caught at the toll booth.
Grosse Ile Toll Bridge

Design Details

Center Pier Swing Span

Polygonal Top Chord
Repeating “V” pattern in Diagonal Members (Warren Truss Configuration)

Overhead Bracing: A Through Truss
Fixed Truss Approach Spans

A “Polygonal Warren Through Truss”
Grosse Ile Toll Bridge

Design Details

Steel from Lackawanna and Cambria mills.

Riveted connections

Some pinned connections on swing span.

Built Up Beams (Composed of smaller rolled beams)

Lattice

V-lacing
Grosse Ile Free Bridge

Today’s bridge consists of a through truss center pier swing span and fixed deck plate girder approach spans.
Grosse Ile Free Bridge

Built 1930-1932
Swing span: 340 feet long
Bridge Length: 1024 Feet
Great Lakes Dredge and Dock Company of Chicago, Illinois, a prominent contractor who worked on many bridges in Chicago built the bridge superstructure. Augustus J. Dupuis Company of Detroit, Michigan built the substructure and deck slab.
The previous bridge was a metal Double-Intersection Pratt (Whipple) through truss with a swing span and fixed approach spans.
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. Just like your arms could be holding something, sometimes these bridges hold additional “suspended” structures.
Cantilever truss bridges are a complex, continuous structure type that feature cantilevered arms that extend from a pier to normally hold a structurally independent suspended span at one end, and balance the weight out at the other end extending from the pier.
Most cantilever bridges are built of steel. However, Wayne County has concrete arch bridges that are actually cantilever bridges. They are the only such bridges in Michigan. The most well-known is the Belle Isle Bridge.
The Belle Isle Bridge has arms that extend from the piers/abutments and meet in the middle. Note the gap, indicating each half is structurally independent. Decorative keystones hide this feature to casual viewers.
There are other smaller concrete cantilever arch bridges remaining in Wayne County. Despite being smaller, most of these spans also include a suspended span.
Cantilever Arch Bridges

Parke Lane Bridge, Grosse Ile

One of the few with original railings and also with a decent span length, this is one of the most significant concrete cantilever arch bridges. Nearly 100 feet in length, it was built in 1929 by Gosner and Flynn of Dearborn, Michigan.
Swan Drive Bridge

Crossing Swan Channel, This is an 88 foot Warren pony truss with riveted connections. A pony truss bridge lacks overhead bracing.
Swan Drive Bridge

Can You Solve The Mystery?

With the National Bridge Inventory listing a 1950 construction date (late for this design), unused rivet holes found on this bridge (suggesting it originally had a sidewalk on one side), and a pier under one vertical member, this bridge appears to have been moved here from an unknown location.
Michigan designed and built a unique bridge concrete girder design called the curved chord through girder, often called simply the concrete camelback. These were built in the 1920s.
Concrete Camelback Bridges

These bridges vary in size and design, and each remaining example is rare and significant, especially on a national scale.
Concrete Camelback Bridges

These bridges were built to a “state standard” plan that was a consistent design that could be adapted for various locations.
Overview: Bascule literally means “seesaw.” A bascule bridge operates by rotating up to open the channel allowing boats to pass through. Counterweights provide the balance to make this motion possible.
In the early 1900s, Chicago city engineers including city engineer John Ericson and city engineer of bridges Thomas Pihlfeldt, developed a very reliable and cost-effective design of bascule bridge.
Later, another city engineer of bridges, Hugh E. Young decided that Chicago’s bridges were so efficient that he opened a business on the side called the Chicago Bascule Bridge Company to design these bridges for other customers.

The Wayne County Road Commission was one of those customers, and they hired Hugh. E. Young to design three bascule bridges.
Up until 2013, all three remained. However, the Fort Street Bridge is to be demolished and replaced.
A 1922 advertisement for the Chicago Bascule Bridge Company included a drawing of the Fort Street Bridge.
Hugh E. Young or the Chicago Bascule Bridge Company can be found on the River Rouge bridge plaques.
Michigan is home to three of six remaining unusual “Abt” type bascule bridges. Only eight were ever built. The design with an unusual counterweight that rotates in the opposite direction of the bridge “leaf” was invented and patented by Hugo A. F. Abt who worked for the American Bridge Company.
The Pere Marquette Railroad Bridge, crossing the Black River in Port Huron is abandoned in the raised position and at risk for demolition. It is a good example of an Abt bascule bridge.
The first Abt bascule ever built crosses the River Rouge in Detroit and remains in use today. It was built in 1921 and has a 162 foot span and its overall length is 291 feet.
Michigan built a number of t-beam bridges in the 1950s and early 1960s on its expressways that were noted for their curved beams.
Those that retain their original railings remain a rare example of an expressway bridge that has a high degree of beauty. The arches were also designed for the increase in vertical clearance.
This is a heavily skewed example. Note the longer spans and thicker beams.
Historic Bridge Park, located southeast of Battle Creek, is a unique park and open air museum whose focus is on the five historic truss bridges that have been moved to and restored within the park. Free admission.

Historic Bridge Park is the first of its kind in the country.
Portland, Michigan has a number of preserved historic metal truss bridges, several of which are part of the city’s trail system.
Players who choose to play the Sweetgrass Golf Course in Menominee County will be treated to five historic pony truss bridges that were relocated to the course.
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