



Bridge No. 134



Bridge No. 13



Bridge No. 93



Bridge No. 117

All of the bridges featured in this brochure have been determined to be eligible for listing in the National Register of Historic Places.

Most of the text for this brochure was adapted from the *Indiana Bridges Historic Context Study, 1830s-1965*, prepared by M&H Architecture, Inc. for INDOT.

The full document and more information about Indiana's Historic Bridges can be found here: www.in.gov/indot/2531.htm

HISTORIC BRIDGES



OF SHELBY COUNTY INDIANA



Shelby County, Indiana

Historic bridges are an important part of the heritage, development and transportation system of Indiana. As our state has grown, many historic bridges have been replaced with modern bridges to accommodate today's higher traffic volumes and larger vehicles.

Projects utilizing federal funds and involving a historic bridge are analyzed to see if the existing bridge will meet future traffic and safety needs. If the historic structure does not meet the traffic and safety needs of the roadway, other alternatives are considered.

When planning begins to replace a historic bridge with federal funds, consultation is undertaken by the Federal Highway Administration (FHWA) to resolve the adverse effects that the project has on the historic bridge. While resolution of adverse effects is now handled through a programmatic approach for most historic bridges in Indiana,

in the past, consultation usually resulted in a Memorandum of Agreement (MOA), which outlined agreed-upon measures that the FHWA would take to avoid, minimize, or mitigate the adverse effects upon historic properties.



Mitigation refers to actions that reduce or compensate for the adverse effect a project may have on a historic bridge. Per an MOA between the

FHWA, the Indiana State Historic Preservation Officer (SHPO) and the Indiana Department of Transportation (INDOT), this brochure was created to help mitigate the adverse effect of the replacement of the historic concrete arch bridge that once carried State Road 9 over Lewis Creek in Shelby County (pictured above).



Bridge No. 128



Bridge No. 147



Bridge No. 31



Bridge No. 129

Concrete Slab

These structures include a rigid horizontal monolithic slab that serves both as the deck and the structural member that carries stresses to the abutments and/or piers. For shorter spans, they were the simplest and most economical of concrete bridge designs. The concrete slab was used extensively in Indiana in the 1920s. However, by the 1930s, their usage had dropped significantly. Bridge No. 183 was built around 1917 and is a long example: 6 spans for a total of 124 feet.



Concrete Girder/Beam

The basic form of the concrete girder, which was constructed in both reinforced and prestressed concrete, was developed by the first decade of the 20th century. It resembles a steel beam encased in concrete.

During the 1920s and 1930s, its economical value led to its popularity, and this type represented one-third of all bridges constructed in Indiana. Bridge No. 23 was built around 1920. This type was often less durable and more limited in span length than reinforced concrete arches, slabs, and steel beams. In the 1930s, use of this style notably diminished.



Bridge No. 129, has the deepest reinforced girders found on any Indiana example with a span of 54 feet.

Metal Truss

Metal was first used in American bridges in the late 18th century, but its use was not seen in Indiana until the 1870s. The choice of metal used – iron or steel – changed over time, as did the method for connecting the members. Wrought iron was preferred until the 1890s. Far from reliable, numerous bridge failures occurred because of iron's impurities. New manufacturing processes in the late 19th century made strong and versatile steel available for use. By 1895, steel surpassed iron as the metal of choice.



Three basic arrangements – pony, through, and deck – and a wide variety of trusses were used. A pony (or low) truss carries the deck near the top chord but does not provide enough height to allow cross-bracing between the parallel top chords. The through (or overhead) truss features lateral bracing between parallel top chords over the deck. The deck truss carries the roadway on the top chord.

Bridge Nos. 13, 31, and 147, are examples of the through Pratt type, which was introduced in 1844 by Thomas and Caleb Pratt. It was originally designed to use timber and wrought iron. However, by 1852 the first all-iron Pratt bridge was produced.

The use of pins, introduced in the 1840s, allowed for easier erection of bridges, much of which could be completed off-site. Pin connections feature removable pins or pegs inserted into holes aligned in adjoining structural members. They were popular until the end of the 19th century. Bridge Nos. 13 and 31 have pin connections.

Bridge No. 13 was built around 1890 and retains its latticed portals and decorated portal bracing. Bridge No. 31, also known as the Frank Mull Bridge, was built around 1895. Mull and others had petitioned the County Commissioners for a bridge at this location on the Rush County line.

Bridge No. 41, also known as the McConnell Ford Bridge, is a camelback truss type. It was built in 1915 by the Central States Bridge Company and Craig Construction Company.

Introduced in the late 1800s, the camelback is a Parker truss with a polygonal top chord of exactly five slopes. Bridge No. 41 has bolted connections. Bolting represents an intermediate connection method during the early 20th century. Bolts replaced pins, but were quickly superseded by rivets.



Riveted construction uses a gun-like mechanism to drive heated steel rivets into pre-drilled holes to connect structural members using plates. Factory riveting emerged in the 1880s, and field riveting was introduced in the early 1900s. Shelby County Bridge No. 147, also known as the St. Paul Bridge, has rivets. It has a main Pratt truss and Warren pony truss approach span and was constructed in 1910 by the Lafayette Engineering Company.

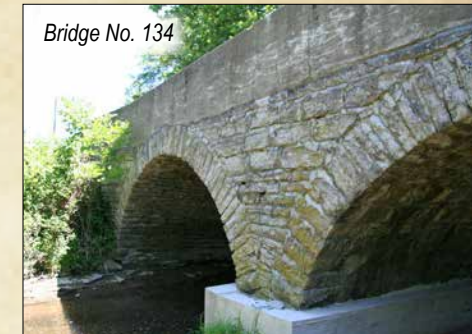
Arc-welding slowly replaced riveting, and became readily accepted by the 1940s as an economical method for fastening metal structural members.

The most common truss type of the 20th century was the Warren truss, patented in 1848 by two British engineers. It uses diagonals to withstand both tensile and compressive forces. Warren trusses can include verticals that serve more as bracing units than load-bearing systems. They were frequently used in a pony configuration in Indiana, and became popular once bolts and rivets supplanted pins. Two such examples in Shelby County are Bridge Nos. 117 and 128.



Stone Arch

Stone is a strong building material that requires little maintenance, but stone bridges were costly and time-consuming due to the need for skilled labor and suitable, accessible material. Construction of stone bridges was often limited to areas with a stone supply or to railroad companies that could afford to transport the materials.



An established bridge type in the United States by the 1700s, the stone arch continued to be used into the 20th century. The stones that comprise the arch are called voussoirs; a keystone at the center locks them into place. In 1892, the county contracted William Avery and Joseph R. Eck to construct Bridge No. 134 for \$540.

Concrete Arch

These structures came into widespread use following Josef Melan and Fritz von Emperger's introduction of reinforcing systems in the late 1890s. Daniel B. Luten also played an important role in their development in both Indiana and the United States.



Closed spandrel arches were mainly used for short lengths. The spandrel is the area between the arch ring and deck that retains earth or rubble fill. This type constituted one-fifth of the bridges designed and constructed by the Indiana State Highway Commission (ISHC) before World War II.

Two closed spandrel arches cross Conns Creek: Bridge No. 36 and Bridge No. 93. Bridge No. 36 is a 1917 single-span structure. When the ISHC took over a section of the Michigan Road, Bridge No. 93 replaced an inherited bridge with a three-span concrete arch. It was built in 1929 and turned over to the county decades later when I-74 was built.