

## **JOHNSON ROAD COVERED BRIDGE**

### **DESCRIPTION**

The Johnson Road Bridge was built in 1869 and is possibly the oldest Smith Truss in existence. This structure was built using Smith's 1869 patent. This bridge carries Scioto Township Road 291 over the Little Scioto River. During the inspection the structure was posted at 5 tons. This structure is listed on the state inventory as Bridge No. SCI-T0291-0113, Structure File Number (SFN) 4032977.

The trusses are 72'-0" in overall length. The clearance between the two trusses is 14'-0'. The trusses are constructed of oak and are protected by vertical wood siding on the outside of the members, and by a sheet metal roof.

The top and bottom chords are built up of three members each. The top consists of three 5"x11" members which are spliced at various locations along the length of the structure. The bottom chord is built up of three 5"x8" members also spliced at various locations. Both chords have about 1" gaps between their members. At the splices the members are notched around splice blocks and the entire chord is through bolted. The chord members are also notched to accept the tension diagonals. The diagonals are all about 7"x8" timbers and they in turn are also notched where they pass through the chords. At the centerline of the trusses the diagonal members form an open "V". The two members forming the V are reinforced with 7/8" diameter metal rods. The end posts are composed of two 7"x6" members and these are also reinforced with 7/8" rods.

The upper and lower bracing systems are connected directly to their respective chords. Both bracing systems consist of transverse members which are perpendicular to the trusses and diagonal members crossing between the transverse members.

The floor system consists of a single layer of timber planks laid diagonally on timber floorbeams. The width of the planks varies from board to board and the thickness is approximately 2-1/2". The floorbeams are supported directly on the bottom chord. There are approximately two 2-3/4" x 10-1/2" members every 14 inches on center acting as the floorbeams.

The abutments are constructed of stone. The north abutment has been faced with concrete to help stem the effects of poor channel alignment. Both abutment seats have been repaired with concrete.

## Statement of Significance

The Johnson Road Covered Bridge is significant as an example of a distinctive wooden truss type developed by an important and prolific Ohio bridge builder, Robert W. Smith. Smith invented and patented two "Smith trusses" in the late 1860s and built these bridges throughout the state and the Midwest in the 1870s. He continually adapted and improved his truss design as he built them, and four different variations have been identified. The Johnson Bridge was built upon Smith's 1869 patent (#97,714), and is the only structure of this type known to currently exist in the state, and is thus a comparatively rare example of 19th century wooden bridge technology.

Robert Smith was born in Miami County in 1833, the son of a cabinet maker. As a teenager he worked as a carpenter for a contractor and began his first efforts at structural design, devising a roof truss for large barns. In 1867 he patented his first wooden bridge truss and established the Smith Bridge Company at Tippecanoe City (now, Tipp City) "for the purpose of manufacturing, constructing and erecting bridges" based on his patents. Shortly thereafter, he moved his business to Toledo to take advantage of its better transportation facilities. By the 1870s the firm began the construction of metal truss bridges, to complement the wooden designs. The Smith Bridge Company was one of the "prolific bridge builders" identified in the recent survey of Ohio highway bridges conducted by the Ohio Department of Transportation. It was combined with the Toledo Bridge Company in the 1890s.

Smith's 1867 (#66,900) and 1869 patents were intended to provide the maximum strength with the minimum of material. They were designed so that connections could be made without cutting down the dimensions of the ends of the timbers, and thus avoid reducing the amount of material and thereby the strength of each member, a major concern of 19th century wooden bridge builders. The Smith truss was also distinctive for its angled arrangement of braces and counterbraces aimed at increasing the rigidity of the structure. Advertising by the company identified the brace as "the perfect cross-brace" intended "to prevent careening."

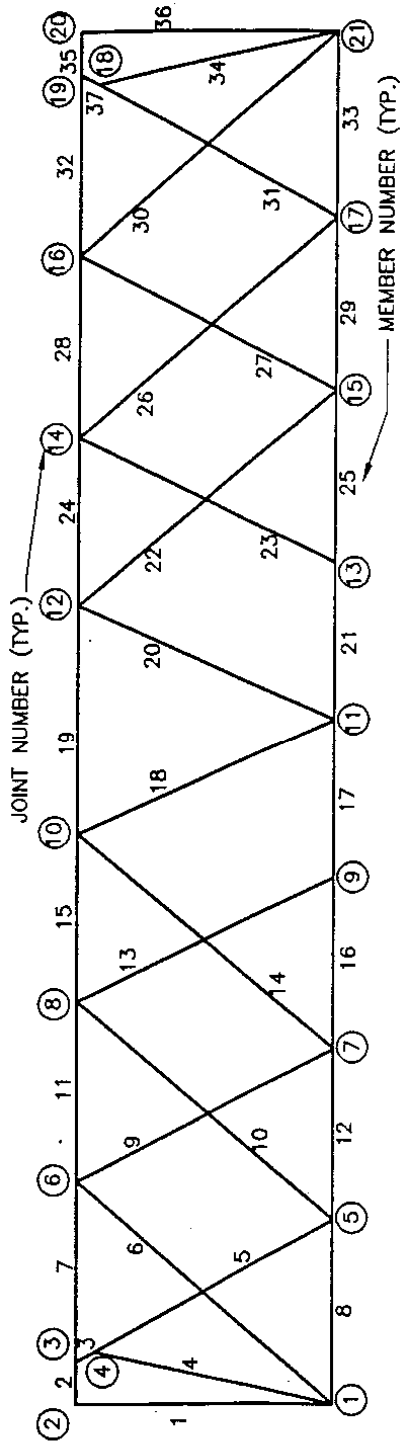
Smith built a large number of both wooden and iron highway and railroad bridges throughout southern Ohio, and all but one of the known examples of his Smith truss today are south of the old National Road. Virtually all of the covered bridges built in Jackson County during the 19th century were for example, Smith trusses, indicative of the quality of the firm's agent and reputation in this area.

## **Physical Appearance**

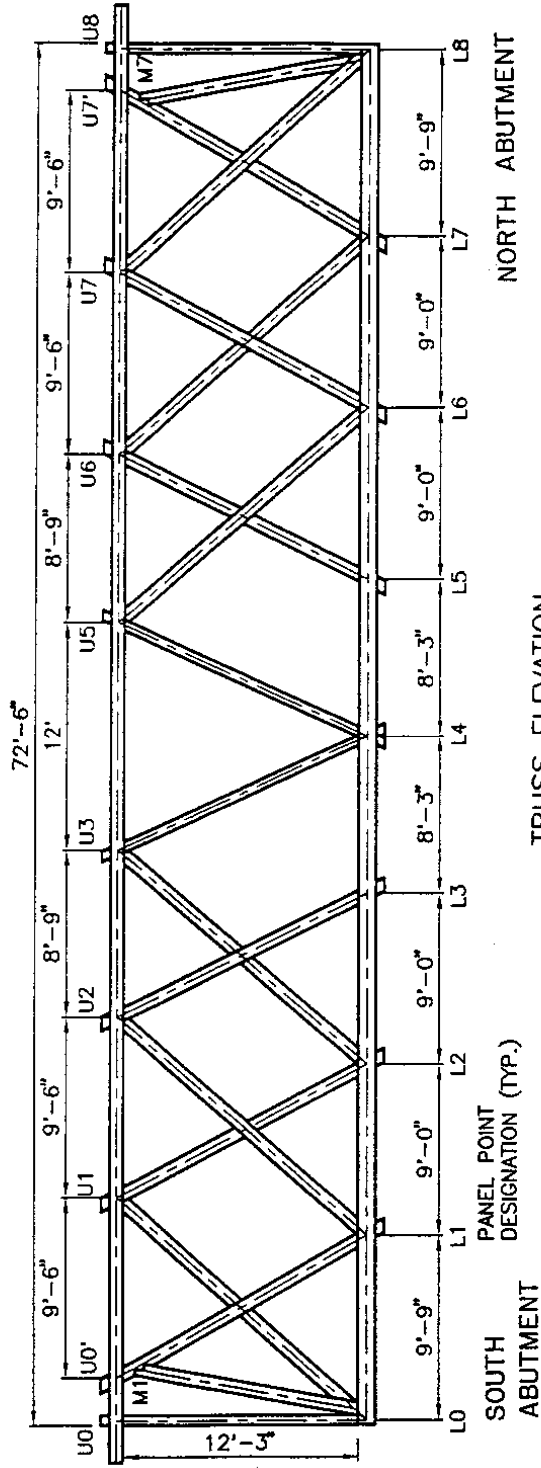
The Johnson Road Covered Bridge is a single span wooden truss covered bridge spanning the Little Scioto River in an isolated rural section of southwest Jackson County. It is a six panel Smith truss measuring 70'11" overall and 68'3" clear span. The roadway is approximately 14' wide and the structure is 17'4" wide overall with a 12' overhead clearance.

The bridge has vertical siding, a gabled metal roof, projecting portals and a single layer of floor planks laid diagonally. It sets on the original cut stone abutments. The trusses of the bridge are Robert Smith's 1869 patent. The braces are inclined towards the center at a 45° angle and the counter braces inclined towards the abutments at a 60° angle. The center panel is a V formed by two counterbraces. A "rigidly fastened" lateral bracing connects the bottom and top chords of the two trusses.





COMPUTER MODEL  
 SCI-T0291-0113 SFN 4032977



TRUSS ELEVATION  
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