

Demolition of Steel Truss Bridge

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OVER-VIEW OF THE PROJECT

This contract is for the replacement of a bridge on S.R. 37 and U.S. 50, southbound over the East Fork of White River awarded to Traylor Bros., Inc. of Evansville, Indiana on August 1, 1983.

A major item of the contract was the removal of the existing southbound structure which was a four-span camel back truss, built in 1923 with span lengths of 198 ft each. (Shown in Figure 1)

The removal item included the entire superstructure, portions of the abutments and portions of the piers. The removal of the existing structure was necessary to make way for the new structure which is to be built at the same location.



Figure 1. Existing Four Span Bridge

THE REMOVAL OPERATON

The method of removing the old steel trusses was optional with the salvage material being the property of the contractor. The contractor decided it would be to his advantage to drop thte trusses to the ground by use of explosive charges. He felt that he could do the job quicker and safer, using this method.

The contractor sublet the blasting and the planning preparation

for blasting to Jet Research Center of Arlington, Texas. It was decided that the old bridge deck and stringer beams would be removed prior to blasting (Figure 2).

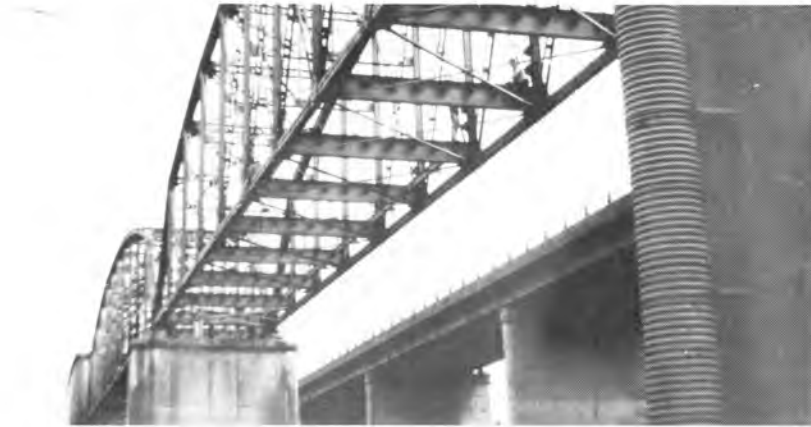


Figure 2. Existing bridge with concrete deck and stringer beams removed.

It was planned to cut each truss into five sections as shown in the sketch (Figure 3). In the bays where these cuts were to be made, each steel member had to be cut—top chords, bottom chords, top laterals, bottom laterals and diagonals.

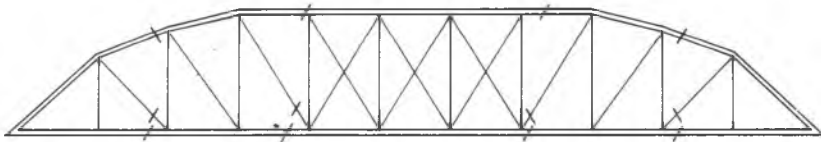


Figure 3. Explosive cuts were made at locations indicated.

Prior to placing the charges each structural member, to be cut, was prepared by cutting with a torch. One leg of each angle member and the flanges of beams were cut. This left the minimum amount of steel to be cut with explosives. This concluded the preparation for blasting. The prime contractor performed all of the preparation work.

THE BLASTING OPERATON

The first step in the blasting operation was to make the explosive charges, which consisted of powder being placed in lead tubes. The use of copper tubes would have resulted in hotter charges but were not used because copper fragments would fly, which could cause damage to the northbound structure. The lead tubing disintegrates with no flying pieces. A total of 37 lbs of powder was used on the bridge.

Early in the morning, on the day of the blast, two men from Jet Research Center started setting the charges. The charges were strapped to the structural members with rubber straps. After all the charges were set, four runs of primer chord were placed to connect the charges. These operations took approximately eight hours.

After a double check of all the wiring connections, a blasting cap was placed in each run of primer chord. At this time traffic on the roadway and the river was stopped. Then the blast was set off (Figure 4). The successful result is shown in Figure 5.



Figure 4. Photo of blast—smoke from primer chord and explosive charges.



Figure 5. Final result of explosion.

The next process was to cut up the steel members into pieces that could be loaded and hauled from the job site. At this time, this work has been completed and the contractor is in the process of building the new bridge piers.

