HB-2199

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OCTOBER 1916

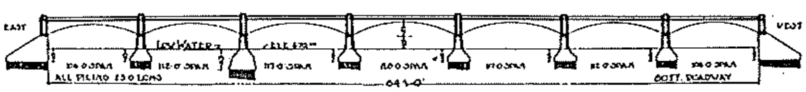
The National Concrete Company

of Indianapolis

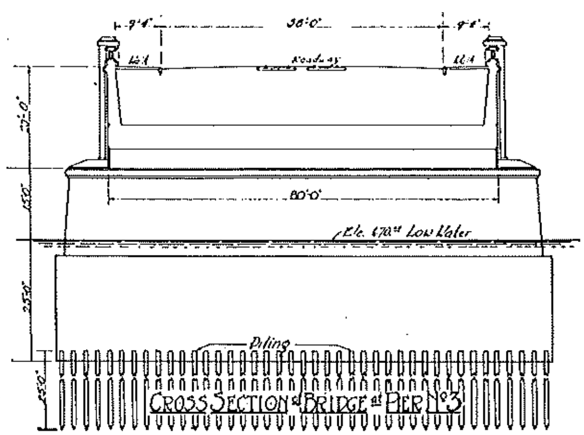
BUILDERS OF THE

West Washington Street Bridge over White River

Indianapolis, Ind.



Seven-Span Reinforced Concrete Bridge. Spans 106 ft. to 120 ft.

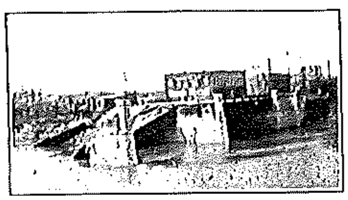


THE first bridge across White River at Indianapolis was built in 1833 to carry the National Road over the river. The road was diverted from an east and west line into what is now known as Washington Avenue in order that the bridge might cross the river at right angles. The location of the bridge was somewhat north of the bridges later built on the line of Washington Street. This first structure was a two-span covered wooden bridge resting on stone abutments. Stone for the sub-structure was hauled by ox teams from a quarry one mile north of Waverly to Indianapolis. Timber for the bridge was obtained locally.

After fifty years' service this bridge was finally condemned because of decay of the timber. The superstructure and the pier were removed.

The first bridge on the line of Washington Street was a three-span bow-string iron truss, built in 1872. This bridge collapsed in 1900 under the load of a street car.

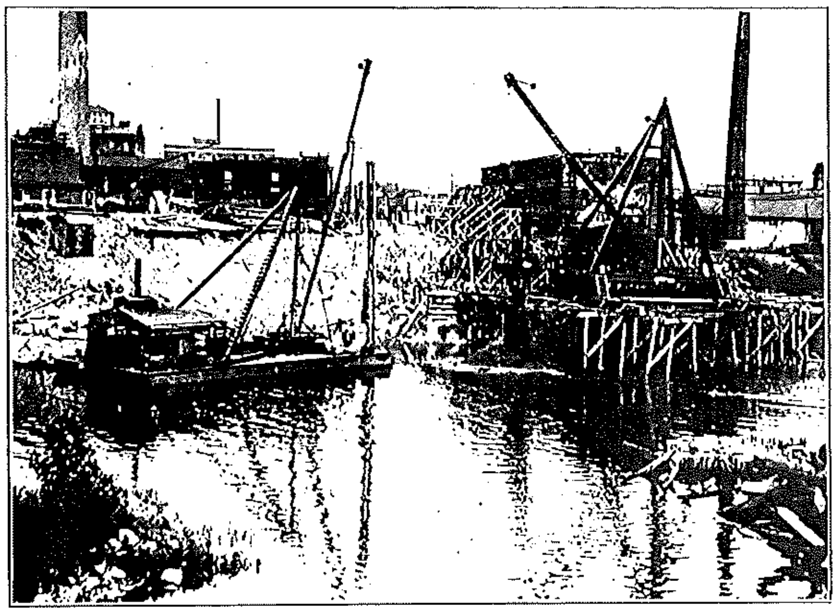
The collapsed bridge was replaced by five steel deck-plate girder spans completed in 1903. At the time this bridge was building, the depth of foundation was criticised but as no greater appropriation could be obtained the depth was limited by the money available.



The Easter flood of 1913 undermined the piers and the east abutment of the bridge. All but the west span collapsed. The illustrations show the condition of the structure after this flood.

On July 10th, 1914, the Marion County Commissioners awarded the contract for the east five spans of a new bridge to the National Concrete Company, of Indianapolis, on a plan submitted by Mr. Daniel B. Luten, of Indianapolis, filed ten days before the date of letting under the Indiana Acts of 1907. The design was for a seven-span reinforced concrete arch bridge. The design was so made and the work was to be so executed that if the City of Indianapolis proceeded with the then contemplated flood prevention work, two spans at the West could be added. The contract for these two spans, as designed by Mr. Luten, was awarded to the National Concrete Company August 6th, 1915, by the City of Indianapolis.

The piers and abutments of the two other bridges at this location were at right angles to Washington Street. The piers and abutments of the new bridge are parallel to the river current which places them at an angle of sixty degrees with Washington Street. The foundations of the two wrecked bridges were still intact below low water and there was considerable wrecked superstructure in the river when work on the new bridge started in 1914. On account of the new bridge being on a skew all new piers and abutments, except those on the extreme west end, crossed old foundation work. The removal of this old work and the removal of the debris was extremely tedious

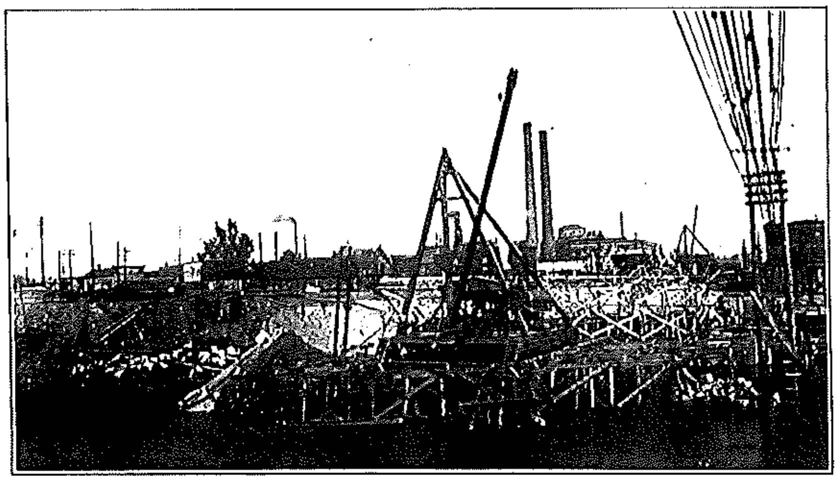


Barge and traveller excavating for pier

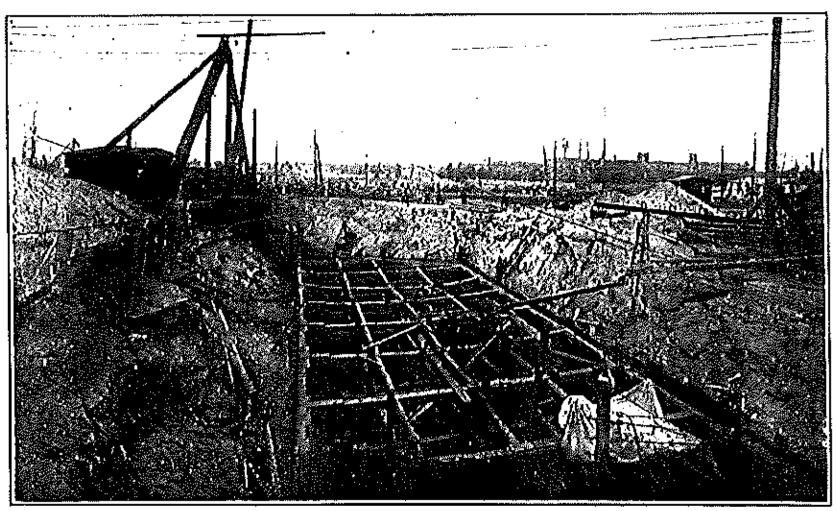
and difficult. Two heavy travellers shown in the illustrations were built especially for this work. A diver was constantly used to locate old wreckage and direct the work below the surface of the water. All wreckage was removed from the site of a new pier before a cofferdam was built. The cofferdam was then sunk to place. The pier cofferdams were 30 feet by 115 feet. The abutment cofferdams were somewhat larger and were the largest that have ever been built in Indianapolis.

All concrete foundations were carried 15 feet below low water with the exception of one channel pier which went to a depth of 25 feet. The concrete at these depths rests on 25-foot piling. A total of 3,431 piles was used to support the foundations.

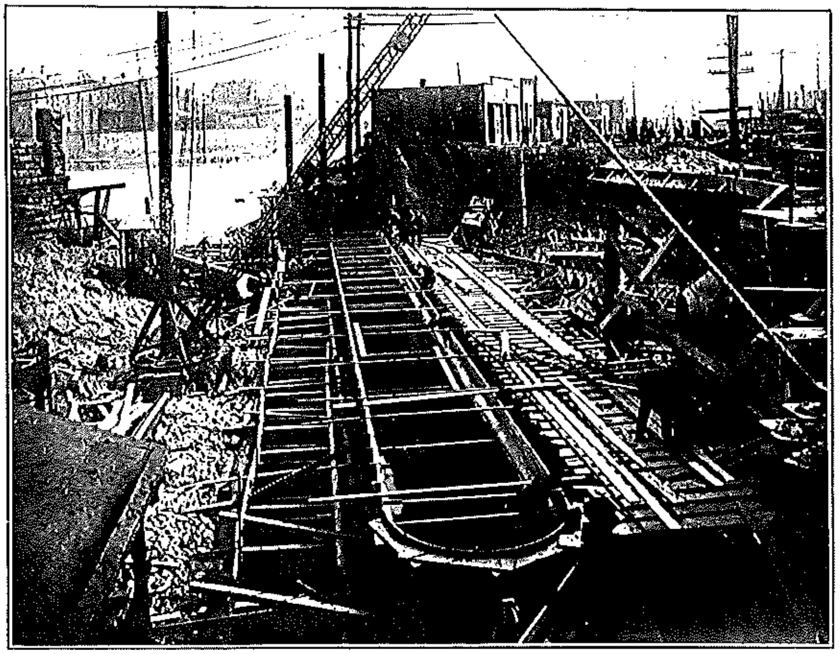
The construction of this bridge sets a record for rapid work in Indianapolis. It has always required two years to build bridges over White River. This bridge, which contains more than twice as much material as any of the bridges built previously, and which on account of the wreckage involved five times the difficulty in foundation work, has been completed in two years and three months.



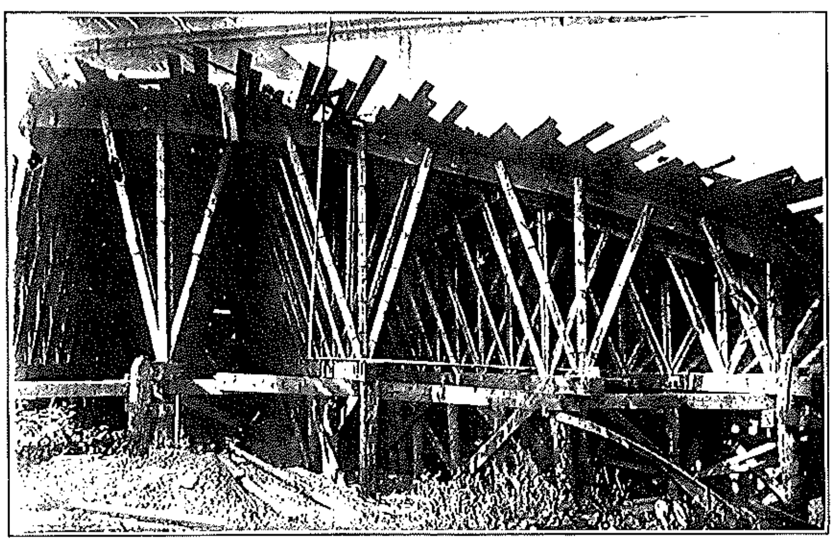
Traveller built especially for removing old wreckage



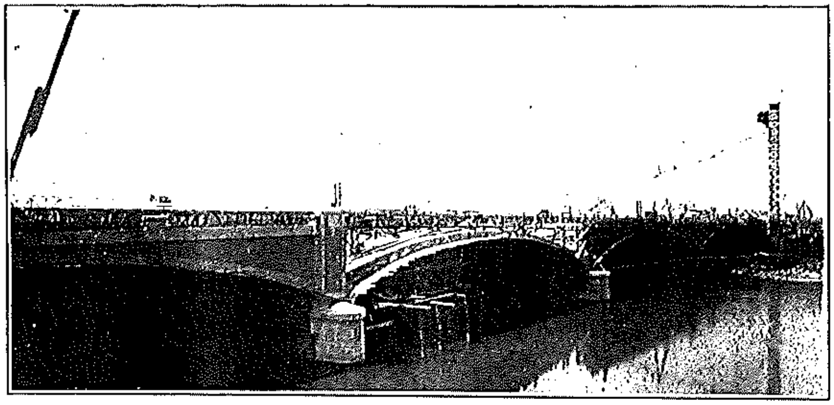
Coffer dam ready for concrete



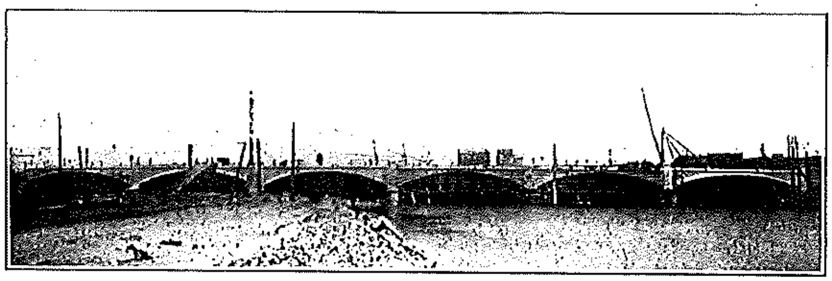
Pier form ready for concrete



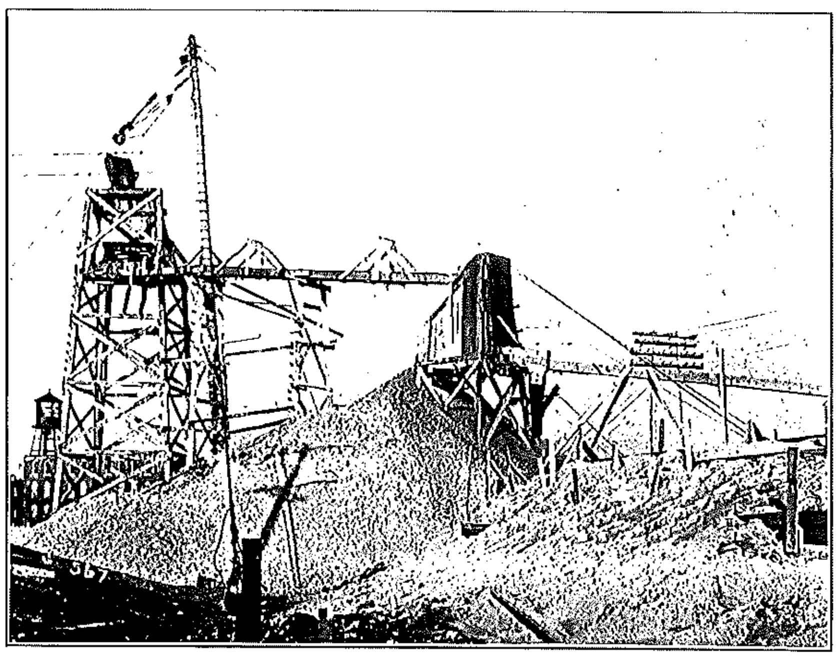
Arch centering showing method of supporting concrete rings



Construction view showing concrete-spouting tower, hight 125 ft.



Construction view



Gravel plant of Company employed for two years exclusively on the bridge

The total length of the bridge between abutments is 844 feet. Concrete construction required 36,097 barrels of cement. The area of waterway is about 75 per cent. greater than in the bridge washed out in 1913.

An arch properly designed is in equilibrium under the fixed loading and subject only to compression stresses, and hence the use of concrete, which every one knows to be strong in compression, in such a structure appeals to the eye as aesthetically appropriate.

In the West Washington Street Bridge the exposed portions have been finished by polishing or by bush-hammering so that pleasing color contrasts are produced without detracting from the dignity of appearance incident to the mass treatment of the material. In the railing the desired color contrast was secured by making the spindles of a mixture richer in concrete.