

Michigan Department of Transportation

Historic Bridge Inventory Update



NBI_Bridge_ID # 384345000070B01 **Structure #:** 4541 **County:** JACKSON
NR Recommendation: Eligible **City:** JACKSON

MDOT Region: 6- UNIVERSITY **Owner:** CITY
Location: 400 FT E OF N JACKSON ST **Milepoint:** 2
Feature On: EAST GANSON STREET
Feature Intersected: GRAND RIVER
Type: BOX BEAM **Design:** ADJACENT
Material: PRESTRESSED CONCRETE
Railing Type: MSHD R-4 RAILINGS W/METAL POSTS/APPLIED DECORATION
Spans: 1 **Overall Length (ft):** 40 **Deck Width (ft):** 65.6
Year Built: 1956 **Alteration (Date):** **Source:** CITY ENGINEER
Designer/Builder: CITY ENGINEER/LAMAR PIPE & TILE CO.

Setting/Context:

URBAN

Physical Description:

The 1-span, 40'-long, prestressed concrete, adjacent box beam bridge is supported on concrete abutments with U-shaped wingwalls. The beams are 21" deep and 3' wide. The bridge is finished with the MSHD R-4 railings, but instead of concrete posts, they have metal posts with applied strap decoration. The design appears to be a local variation on the state standard design. An industrial complex that at one time housed automotive manufacturing and a spur line of the Norfolk-Southern Railroad are beyond the east side of the bridge.

Summary of Significance:

The 1955-56 adjacent box beam bridge placed by the City of Jackson is among the eight earliest examples in the state of what would become one of the most important new bridge types from the last half of the 20th century. It is historically and technologically significant. The 1955 and 1956 examples represent not only the introduction of the significant bridge type in Michigan, but also how prestressed concrete came to challenge and then eventually overtake steel as Michigan's preferred bridge material. The East Ganson Street bridge shares a context with many other states where it was the cities and counties, not the state highway department, that initially embraced the material and demonstrated its usefulness and economy to state engineers. Credit also goes to Lamar Pipe and Tile Company of Grand Rapids, that, under the leadership of plant manager J. W. Corson, led the effort to bring precast, prestressed concrete bridges to Michigan. Lamar was established in 1923 to produce concrete and terra cotta pipe for sanitary sewer and drainage systems. It was acquired in 1954 by American-Marietta Company, the largest concrete pipe manufacturer in the country. Corson, who recognized the potential of prestressed concrete, encouraged American-Marietta to acquire Concrete Products Company of America, the company that developed the prestressed concrete box beam in 1949-50. American-Marietta now had the license for the prestressed concrete voided beam, and Lamar immediately constructed a casting yard at its Grand Rapids facility based on the layout of Concrete Products's yard in Pottstown, Pennsylvania. They also had a casting yard in Jackson (closed in 1978). As both bridge designer and salesman, Lamar worked to educate potential clients about their new product, illustrating its strength, economy, speed of erection, and ease of construction, especially in poor weather conditions when cast-in-place concrete was

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impractical. Lamar hosted a test-beam demonstration attended by 65 city and county officials, contractors, and engineering students at its Grand Rapids fabricating yard in October 1954.

Construction of the East Ganson Street was begun in the fall of 1955. An article in the December 1, 1955 issue of "Michigan Roads and Construction" recounted how placement of the novel 40'-long beams using a rubber-tired crane was witnessed by University of Michigan engineering students. The fact that a concrete bridge could be erected during winter was a tremendous advantage for the new product. The bridge is composed of the standard, 21"-deep and 3'-wide beams. No records from the Jackson plant of Lamar Pipe and Tile Company survive, but the beams are attributed to them.

The voided box beam bridge type was developed by Concrete Products Company of America in 1949-50. The company was associated with construction of America's first prestressed concrete bridge, the 1949-51 Walnut Lane bridge at Philadelphia. It was looking for a way to increase the capacity of the channel beam, a precast reinforced concrete unit that was being used with great frequency on secondary roads after World War II. By enclosing the C-shaped channel beam into a box shape and then applying the new reinforcing system of prestressing with seven-strand wire developed by John A. Roebling's Sons, they came up with the 17" and 21"-deep precast hollow box beam that is longer and stronger than the channel beam. One of the keys features of their design was using cylindrical cardboard sono-tubes to form the voids. Concrete Products worked with the Pennsylvania State Highway Department, which placed its first adjacent box beam bridges late in 1950. While other engineers also produced different prestressed beam designs, it was the voided box beam developed by Concrete Products and produced in Michigan under their license starting in 1954 that came to be one of the dominant beam designs during the last half of the 20th century. In 1986, prestressed concrete overtook steel as Michigan's preferred bridge-building material.

Reviewed By: LCE (7/07)

Notes: