

OHIO DEPARTMENT OF TRANSPORTATION  
HISTORIC BRIDGE SURVEY REPORT

6/5/2011



SFN #: 4830644

County: LUCAS

Municipality: JERUSALEM TWP

NR Rec: Not Eligible

Previous Inventory/Date:

Status:

ODOT District: 02 Owner: COUNTY

Lat/Long: 41.381992 / 83.160370

Location: 0.01 MI. N. OF JERUSALEM

UTM:

Feature On: HOWARD ROAD

Feature Intersected: WARD CANAL

Type: RIGID FRAME

Design:

Material: REINFORCED CONCRETE

Railing Type: CONCRETE BALUSTRADES

# Spans: 1

Overall Length: 49 ft.

Out to Out Width: 39.5 ft.

Roadway Width: 35.2 ft.

Year Built: 1940

Alteration (Date):

Source:

Designer/Builder LUCAS COUNTY

**Setting/Context:**

The bridge carries a 2-lane road over a drainage canal in a rural setting of active agriculture. There is a T-shaped intersection at one end of the bridge.

**Physical Description:**

The 1 span, 49'-long, reinforced-concrete rigid frame bridge has concrete balustrades that extend over the flared wingwalls.

**Integrity:**

**Summary of Significance:**

The 1940 rigid frame bridge has no unusual or distinctive features. Rigid frame bridges have an intrinsic, shallow arch profile because of the material required at the knees where the top and legs meet and where the stresses are greatest. The bridge type was introduced in the U.S. during the 1920s and was appearing in Ohio by the late 1920 and early 1930s. It was commonly used in park or park-like settings where an economical but aesthetic bridge was desired, although, as with this bridge, it wasn't always the case. This example built in 1940 by Lucas County does not have the architectural distinction or proportions of the most successful examples. There are at least 45 rigid frame bridges dated from the late 1920s to 1950s in the study (Phase 1A, 2008).

Most of Ohio's reinforced-concrete rigid frame bridges date from the late 1920s to early 1940s and were built by counties or municipalities. This is in keeping with the national context of common use in urban, park, or parkway settings where an economical but aesthetic bridge was desired. Nearly a third of the reinforced-concrete rigid frame bridges in Ohio are in Cuyahoga County.

The basic engineering principles behind the rigid frame are that the top member and the legs are integral and the legs perform useful work in supporting the loads. One of the advantages to the rigid frame type is that it reduces the mass of the abutments and thus costly work in the ground. It is an economical use of materials, and it works well in settings with limited vertical clearance, such as overpasses. Rigid frames are indeterminate structures, meaning that the stresses are difficult to predict. Accurate stress analysis relied on post-1930 advances in engineering theory. Reinforced-concrete rigid frame bridges have an intrinsic, shallow arch profile because of the material required at the knees where the top and legs meet and where the stresses (moments) are the greatest (In fact, it's not uncommon for them to be misidentified as arches by laymen).

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Reinforced-concrete rigid frame bridges were considered to have "extreme adaptability to architectural expression as compared with ordinary types of construction..." according to Arthur G. Hayden of the Westchester County (NY) Park Commission. Hayden is credited with introducing the bridge type into the United States for Westchester's pioneering parkway system, which he helped to develop starting in the early 1920s. The rigid frame technology originated in Europe during the last part of the 19th century, but it was Hayden who popularize the bridge type through technical articles, an influential 1931 textbook *The Rigid Frame Bridge*, and many handsome bridges that demonstrated the seemingly infinite variety of possibilities to accent the graceful, cast-in-place bridge type. Beginning in the early 1930s, rigid frame bridges were employed throughout the country for bridges in parks, along parkways, and even for major highways. The bridge type, however, found limited use in the development of statewide highway systems in Ohio and other states because it does not lend itself to standardization. The Ohio state highway department built a handful of rigid frame bridges from the late 1930s to early 1950s, mostly as grade separations at interchanges.

**Reviewed By/ Date:** JPH (1/08)

**Notes:**

**For Eligible Bridge:**

**Level of Significance:**

**Justification:**

**In Management Plan (2009)?** No