

OHIO DEPARTMENT OF TRANSPORTATION
HISTORIC BRIDGE SURVEY REPORT

2/17/2011



SFN #: 0701599 County: BELMONT Municipality: BLAINE
NR Rec: Eligible Previous Inventory/Date: ARCH SUPPLEMENT, 1994 Status: Select

ODOT District: 11 Owner: STATE Lat/Long: 40.06677 / 80.82006
Location: 0.9 MI.E.OF CR 214, BLAINE HILL VIADUCT UTM: 17.515280.4434980
Feature On: US 40 (BLAINE HILL VIADUCT)
Feature Intersected: WHEELING CK/CR 10/B&O RR
Type: OPEN SPANDREL ARCH Design: RIBBED
Material: REINFORCED CONCRETE
Railing Type: CONCRETE PARAPETS (1982)
Spans: 11 Overall Length: 754 ft. Out to Out Width: 44.3 ft. Roadway Width: 38 ft.
Year Built: 1932 Alteration (Date): 1982 Source: Plaque
Designer/Builder OHIO STATE HWY DEPT (D. H. OVERMAN)

Setting/Context:

The bridge a highway and sidewalk over a stream in a setting with a scattered mix of early- to late-20th century residential and commercial development at the base of Blaine Hill. The highway transitions from 2 lanes at the bridge's east end to 3 lanes on the bridge to provide an up-hill passing lane. The NR-listed Blaine "S" Bridge, part of the old National Road, is to the north side of the viaduct's main span over the stream.

Physical Description:

The 11 span, 754'-long bridge built on a vertical profile has four open-spandrel-arch main spans and seven prestressed-concrete box beam spans (1982), which replaced the original T-beam approach spans. The bridge is supported on reinforced-concrete abutments and 2-column bents with arched cap beams. The 2-ribbed open-spandrel arch spans have spandrel columns with capitals that now carry a prestressed-concrete box beam deck. The original concrete balustrades have been replaced with concrete parapets/safety shape barrier textured on the exterior faces to appear like the original balustrades. The bridge's eastern approach roadway is carried on earth fill with concrete retaining walls. A reinforced-concrete staircase is located on the northeast corner of the easternmost arch span.

Integrity:

Rehabilitation replaced arch spans from the deck up. Approach spans (originally T beams) replaced with box beams. Repaired spandrel columns and arch ribs (1982). Spalling and cracking of concrete noted in select locations including deck and spandrel columns (2009).

Summary of Significance:

The 1932 open-spandrel arch bridge is one of Ohio's signature bridges designed by D. H. Overman and the state bridge bureau (Criterion C). Overman was the bridge bureau's "arch specialist" who was noted for his aesthetic designs. The bridge was rehabilitated in 1982 without adverse effect. There are 25 open spandrel arch bridges dating from 1907 to 1957 in the inventory (Phase 1A, 2008).

"The reinforced concrete open spandrel arch was first constructed around 1906. It was the dominant form for concrete bridges in the 1920s and 1930s. By eliminating the walls and fill material of the closed spandrel, dead loads were reduced and cost savings were seen in materials with the open spandrel. Aesthetics was another factor with the open spandrel. They had a lightness and visual appeal and were used in prominent or scenic locations. Open spandrel construction marked engineering prowess during the 1930s and 1940s. By the 1940s, the open spandrel concrete structure began to be supplanted by the more pre-stressed beam and reinforced concrete girder structures. Open

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spandrel arch bridges have pierced spandrel wall with no fill material, and the spandrel columns transmit dead and live load from the deck to the arch. The arch ring may be either solid (barrel) or ribbed. Open spandrel arch bridges require more formwork to construct than filled spandrel bridges. Open spandrel concrete arches, while not uncommon, are not as common as many other bridge types built during this same era. They are significant because they represent the evolution of concrete technology. To be considered significant, open spandrel arches should have integrity through the retention of their character-defining features, which include arch ribs, ring or barrel; spandrel; spandrel columns; railing or parapet; and piers, abutments, and wingwalls." [From: A Context for Common Historic Bridge Types by Parsons Brinckerhoff, October 2005]

Reviewed By/ Date: JPH (12/07)

Notes:

Blaine Viaduct; Field Checked 8/4/99, 4/17/01. No previous ODOT inventory form located. Good Condition. Minor chipping and rebar exposure. Field Checked 7/5/06. ODOT rehabilitation project is in planning phase (2009).

For Eligible Bridge:

Level of Significance: High

Justification:

Because of the early emphasis on aesthetics at the local and state levels, Ohio has an impressive assemblage of long and shorter open spandrel arch bridges dating from 1907 through World War II. Twenty-three of the 25 predate World War II. This one is evaluated as having high significance because of its aesthetics and historic contexts including the crossing and the Ohio State Highway Department.

In Management Plan (2009)? No