BROAD STREET BRIDGE
Spanning the Scioto River at U.S. 40
Columbus
Franklin County
Ohio

HAER No. OH-72

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

THE BROAD STREET BRIDGE HAER No. OH-72

HAER
OHIO
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Location: Spanning the Scioto River on U.S. 40, also known as Broad Street, in the City of Columbus, Franklin County, Ohio.

UTM: 17.328840.4425200
Quad: Southwest, Franklin County, Columbus, Ohio

Construction Dates: May 1918 to October 1921

Original and Present Owners: Franklin County Commissioners and The Ohio Department of Transportation

Present Use: Vehicular Bridge

Significance: The Broad Street Bridge is significant because it is one of three integral parts of the riverfront reconstruction after the 1913 flood, the Town Street Bridge and flood wall are the other two parts. The flood destroyed many bridges and buildings along the riverfront in Columbus. Although the design and materials used for construction were common place, dating back as early as 14 A.D. with the Romans. The concrete arch that typifies the Broad Street Bridge was introduced in France by Jean Rudolph Perronet in the 1650's. The bridges and floodwall were the first step in a major restructuring of government agency locations in Columbus and a partial realization of the 1908 master plan. The district was determined eligible for the National Register of Historic Places in November of 1986.

Project Information:

This document was undertaken in 1988 as part of a Memorandum of Agreement between the State Historic Preservation Office and the Federal Highway Administration as a mitigative measure prior to the replacement of the bridge.

Franklin County selected Burgess and Niple Ltd. of Columbus, Harbeson, Hough, Livingston & Larson (H2L2) of Philadelphia and Leonhardt, Andra and Partner of Stuttgart, West Germany, as the design team.

The present bridge is slated for demolition in February of 1990 with construction of a new five-span concrete plate arch structure to be built immediately after this.

This document was prepared by Mark Sherman of the Franklin County Engineer's office, 970 Dublin Road, Columbus, Ohio 43215.

II. HISTORY OF BRIDGE
A) History of Crossing

In 1779 Franklinton laid out west of the Scioto River by Lucas Sullivant.

In 1812 Columbus named and plotted along the left bank of the river. Increasing traffic; Scioto not always fordable; ferry service established.

In 1815 The Ohio General Assembly passed an act authorizing Lucas Sullivant to build a bridge across the Scioto River at Broad Street and authorized the collection of tolls. This bridge was intended to mitigate the traffic problems with the ford and ferry service.

In 1816 Sullivant's toll bridge across river constructed; a roofless, wooden bridge of unknown span. As its direction formed a right angle with the course of the river, it touched the west bank at a point several rods below the ford, making necessary the opening of a new road across the fields to Franklinton.

In 1826 a second similar bridge replaced the first. This toll bridge had its western terminus at the original landing, initiating a straight connection across the river. It was carried away by "the great flood of 1832."

In 1832 Sullivant franchise was purchased for $10,000. ($2000 of county money and $8,000 by private subscription), to make way for a new free bridge to be constructed at the site as part of the National Road. During construction of the permanent structure, a temporary bridge carried traffic, but it too was washed out by a freshet in 1834 shortly before the highway bridge was completed.

In 1834 The National Road Bridge was a substantial two-span covered bridge with two separated tracks for vehicles and an outside walk on each side for foot passengers. Entirely wooden except for the shingle rails in the roof when new iron rod bracing was added in later years. This bridge withstood many floods until replaced in 1883.

In 1883 a two-span iron through-truss four lanes wide. At least at a later date included two sets of street car tracks. Cantilevered pedestrian walks on each side. Stone masonry abutments and center pier.
Cost: $148,000. Heavily damaged during 1913 flood but restored to use for a few more years during the City's recovery from the destruction.

The current Broad Street Bridge was built in the years between 1918 and 1921. The seven-span, earth-filled concrete arch structure carries six lanes of traffic, two of which were trolley car tracks, and two pedestrian sidewalks. The bridge was constructed in conjunction with the Master Plan for the rebuilding and redevelopment of the City along the Scioto River corridor. This area extended from Broad Street to Town Street and included widening of the river's cross section, construction of flood levees and tall concrete retaining walls. A strong effort was made to provide bridges, walls, and balustrades with similar architectural treatment throughout.

B) Selection of Design and Description

As mentioned in Section A, the present bridge is a seven span, earthfilled concrete arch structure that carries 6 lanes of traffic and two pedestrian sidewalks. The spans are as follows: 78', 88', 97', 105', 97', 88', 78'; all cast in place reinforced concrete supporting earth fill. The earth fill is retained between two inner spandral walls and distributes the trolley track loads and vehicle loads evenly across the arches. The sidewalk and railings are supported by the outer spandral walls. The railing is a classical ballustrade made from Indiana limestone.

The piers and abutments are composed of cyclopean concrete founded on timber piling, which was later modified and not used. The span proportions and stone detail are Renaissance Revival. The deck consists of 62 feet of asphalt pavement on brick pavers with 12 foot sidewalks on each side for a total width of 86 feet. The highest clearance of the main arch over the water is 24 feet. The total length of the bridge is 679 feet from abutment to abutment.

Several factors affected the design of the Broad Street bridge. One of the primary factors was the desire not to have a repeat of the 1913 flood, so the new structure needed to be longer, higher and massive enough to withstand future floods. Another factor was the desire and opportunity to initiate development of the capital area around the 1908 master plan which centered on the riverfront. The third major factor affecting the overall design was WWI. During the design and construction of the Broad Street bridge, the Federal government was in need of structural steel to support the war effort and promoted the use of concrete for local civic projects as a substitute material wherever possible. The bridge was designed to carry two tracks of trolley cars, 4 lanes of vehicular traffic with sidewalks on each side. The earth filled concrete arch was the most efficient means of supporting the types of loads required without the use of structural steel. The use of concrete in an arched structure enabled the designers Braun, Fleming, Knollman and Prior of Columbus to give Columbus a civic center not unlike many in Europe. The design compliments the classical architecture of the Ohio Capital Building and established the framework for the implementation of the 1908 master plan. Little is known about the design firm of Braun, Fleming and Knollman, other than their work on the Broad Street and Town Street bridges and the floodwall.

C) Selection of Contractor and the Construction

The contractor who constructed the Broad Street Bridge was Carmichael-Cryder of St. Louis, Missouri. The cost of construction was $628,093.24. The Engineer's Estimate was $679,440.00. Bids were opened in April of 1918 and work was completed October 31, 1921. Construction did not go well. There were three successive floods in 1919 and the design of the foundations for the piers had to be revised. This revision was partially due to the flooding and partially due to the subsurface conditions. They were unable to drive the timber piling called for under the piers due to the density of the substrate and the number of cobbles encountered. The plans were revised to provide deeper concrete foundations. Material shortages were also a problem due to WWI. The railing subcontract had to be relet at an amount $15,000 higher which caused a delay in the completion. The following is a comparison of the contractor's bid with the engineer's estimate.

Material	Qty.	Contract Prices	Eng's. Est.
Removing old bridge		$2,000.00	$1,000.00
Removing old substructure		24,600.00	8,000.00
Class "A" Exc.	56,000 C.Y.	56,000.00	64,400.00
Cofferdams		99,600.00	100,000.00
Class "B" Exc.	29,112 C.Y.	26,200.80	72,780.00
Piling in Foundation		15,107.40	30,214.80
Class "A" concrete	14,497 C.Y.	164,106.04	144,970.00
Class "B" concrete	9,560 C.Y.	143,520.00	143,520.00
Re-Steel	895,000 Lbs.	44,750.00	60,412.50
Tooled Finish	29,500 S.F.	2,655.00	3,540.00
Sidewalk Finish	16,514 S.F.	825.70	1,155.98
Steel Curbing	1,376 L.F.	1,238.40	2,270.40
Stone Coping	1,700 L.F.	11,900.00	7,650.00
Stone Railing	1,605 L.F.	11,556.00	17,655.00
Waterproofing	1,400 S.Y.	1,540.00	1,610.00
Spandrel Wall Exp. Joints	1,650 S.F.	577.50	825.00
Scuppers and drains		300.00	1,000.00
Conduits, wiring, poles, M.H.		4,000.00	5,000.00
Angle Spacers		1,380.00	1,380.00
Arch Fill	10,150 C.Y.	15,225.00	11,165.00
Waterproofing Coping	4,114 S.F.	411.40	246.84
Engineers Office		300.00	200.00
Lettering on Railing		200.00	200.00
River Gauge		100.00	244.48
TOTALS		$628,093.24	$679,440.00

H.M. Cryder of Carmichael-Cryder, the prime contractor, was personally in charge of construction. He was born in Chillicothe and a 1900 graduate of Ohio State University in Engineering.

In 1921 a lawsuit was filed by taxpayers to stop the project citing the exorbitant cost. The suit was dismissed since the bridge was complete except for the railing.

Upon completion in 1921, the bridge was named in memorial to the veterans of World War I and a plaque was mounted.

In 1927, the Daughters of the American Colonists erected a plaque commemorating the National Road. Other plaques include two stone engraved posts at the east end of the bridge honoring the County officials, the contractor and designers.

The Franklin County Engineer estimated the cost of replacing the bridge in kind, in 1984, at 13 million dollars.

III. Decline and Recent History
A) Alterations and Repairs

The Broad Street Bridge has had many changes and repairs performed on it from the time it was completed. As early as 1924, a new pavement of paving bricks was added. In 1929 new wingwalls were constructed at the east abutment to connect with the new flood wall and Civic Center Drive alignment. Lightning from an electrical storm in 1947 destroyed a large portion of the south railing and sidewalk. After World War II, the trolley cars were removed and an asphalt wearing surface was placed on the roadway.

In 1963, Ohio Bell Telephone Company cables, along with Columbus and Southern Power lines, were incorporated under the sidewalks and new sidewalk slabs were poured on top of the existing sidewalks.

More recent repairs were to the railing as a number of cars have veered off the bridge through the balustrade and into the river. Several sections of the stone railing had to be replaced with concrete replicas.

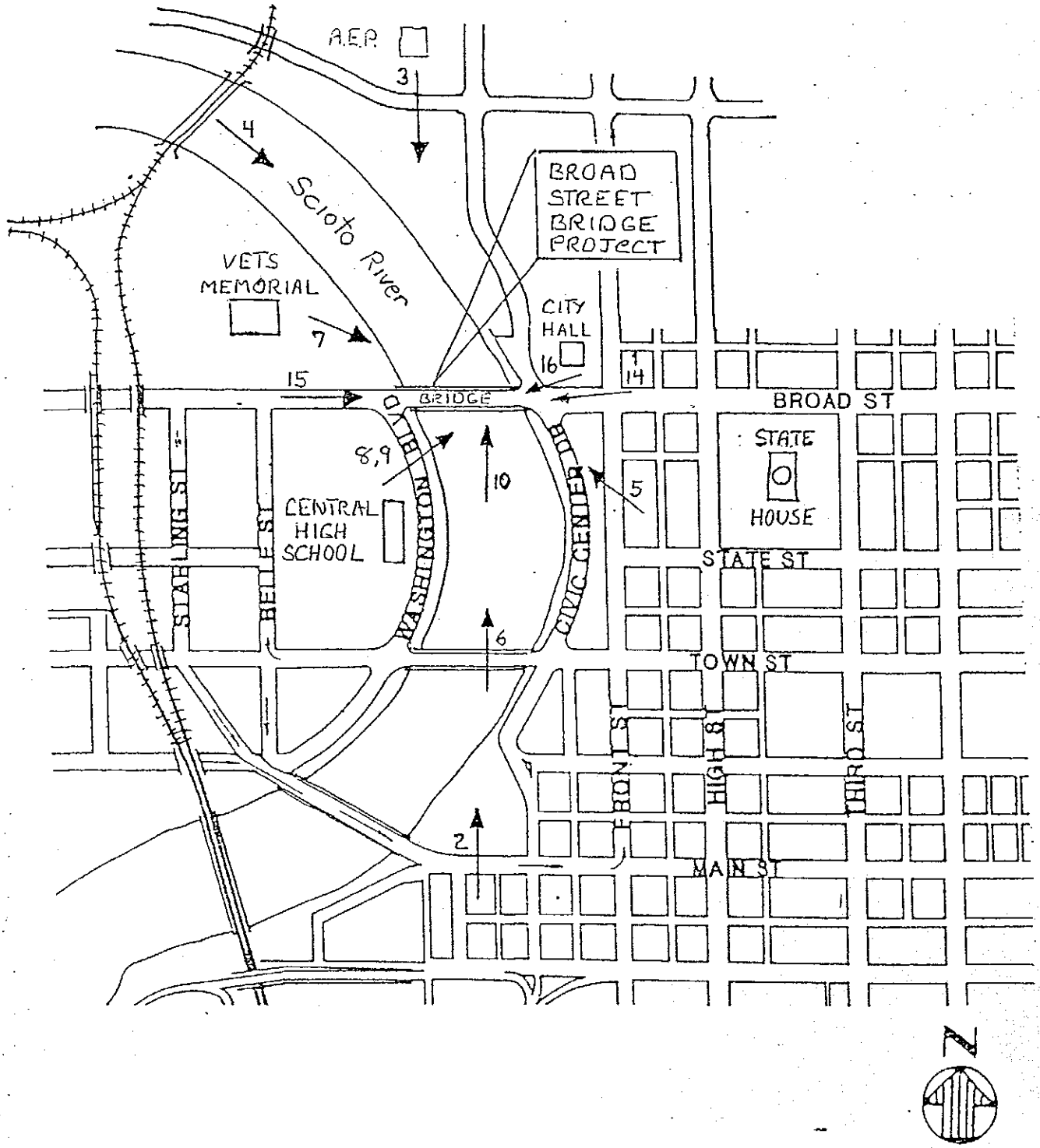
B) Recent Inspections and Testing

By 1982 significant deterioration had taken place. Franklin County retained the engineering consulting firm of Jones & Stuckey Ltd. of Columbus to perform a detailed visual inspection of the bridge. As a result of that inspection, Franklin County programmed the bridge for a preliminary evaluation with the Ohio Department of Transportation and the Federal Highway Administration. Alden E. Stilson and Associates of Columbus was contracted to perform the evaluation. Even though the bridge was designed to carry 60 ton trolley cars in the middle of the structure, the outer portions of the bridge from the inner spandral wall out were visibly distressed and deteriorated. In 1984, 1986 and 1988, many concrete corings were taken and tested to determine the extent of deterioration and determine whether the bridge could be rehabilitated. Analysis of the cores revealed that rehabilitation would not be feasible and replacement was the only alternative.

C) Historic District

The Civic Center Historic District was determined eligible for the National Register of Historic Places. This historic district is bounded by Front Street to the east, Bell Street on the west, Main Street on the south, and Long Street on the north. To help execute the Memorandum of Agreement, a Community Interest Task Force (CITF) was created and a design team selected.

SITE PLAN



Downtown Columbus

ADDENDUM TO:
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FIELD RECORDS

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