

COLONIAL PARKWAY,
INDIAN FIELD CREEK BRIDGE
spanning Indian Field Creek
Yorktown vicinity
York County
Virginia

HAER No. VA-48-H

HAER
VA
100-YORK,
18H-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Department of the Interior
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HISTORIC AMERICAN ENGINEERING RECORD

INDIAN FIELD CREEK BRIDGE
Colonial National Historical Park
HAER No. VA-48-H

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Location: Colonial Parkway at confluence of Indian Field Creek and the York River, four miles northwest of Yorktown, York County, Virginia.
Quad: Clay Bank, VA
UTM: 18/361900/4125600

Date of Construction: 1932-1933, 1980

Structure Type: Reinforced concrete deck slab on steel I-beams set on concrete bents.

FHWA Structure No.: 4290-010P

Designer/Engineer: Bridge Division of the Bureau of Public Roads, Department of Agriculture; and the Eastern Division, Branch of Plans and Design, National Park Service.

Builder: Sanford & Brooks Co., Baltimore, Maryland, rebuilt in 1980 by J. Lawson Jones Construction Co., Clarksville, Virginia

Owner: National Park Service

Use: Vehicular traffic

Significance: Indian Field Creek Bridge was built at the confluence of Indian Field Creek and the York River as part of Unit IV construction. At this section the roadway extends out over the York River on hydraulic fill. The low-level concrete slab bridge was designed to blend into the environment and provide maximum views of the river and tidal marshes.

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Project Information: Documentation of Indian Field Creek Bridge is part of the Colonial National Historical Park Roads and Bridges project conducted by the Historic American Engineering Record in the summer 1995.

Historian: Michael G. Bennett, HAER Historian, 1995

INTRODUCTION

Along with photographs, measured drawings, and an overview history of the Colonial National Historical Park roads and bridges (HAER No. VA-115), individual reports on certain bridges, park tour roads (Jamestown Island Tour Road HAER No. VA-116, and the Yorktown Battlefield Roads HAER No. VA-117), and other structural features of the Colonial Parkway are part of this documentation. These reports provide a more detailed history of a structure's design and construction. Similar documentation for Colonial National Historical Park was completed by HAER in 1988 for the Colonial Parkway (HAER No. VA-48), the Navy Mine Depot Overpass (HAER No. VA-48-A), Capitol Landing Underpass (HAER No. VA-48-B), the C & O Railroad Underpass (HAER No. VA-48-C), and the Williamsburg Tunnel (HAER No. VA-48-D).

CONTEXT

Constructed between 1931 and 1957, the Colonial Parkway is the key transportation feature of Colonial National Historical Park. Crossing the Tidewater peninsula, the road is a scenic link between the "historic triangle" of Jamestown, Williamsburg, and Yorktown--a distance of about 23 miles--designed to provide continuity in the transition from one historical era to another. The Colonial Parkway represents one of the first attempts of the National Park Service to integrate parkway design principles standardized in Westchester County, New York during the 1920s with its own traditions of landscape architecture. Under the initial direction of Charles E. Peterson, chief landscape architect for the Eastern Division of the Branch of Plans and Design, the parkway was constructed to harmonize the scenic qualities of the Tidewater environment with the region's colonial material culture.

Modern highway design and engineering practices were utilized in the construction of the parkway. The alignment of the road is comprised of a variation of spiral and single-centered curves with limited tangents, set in a right-of-way averaging 500' with broad landscaped slopes. Commercial development is prohibited, and access to the road is limited to provide motorists an

uninterrupted flow through the landscape thought to be essential to the historic experience of the park. Extensive "cut and fill" operations were used to create a road with maximum curves of 5° and grades no greater than 5 percent.

The decision to align the parkway along both the York and the James Rivers required the use of hydraulic fill to create a road embankment. Low level concrete slab bridges blend with the sandy areas of fill, providing open views of the rivers and marshes. In the vicinity of Williamsburg, filled spandrel concrete arch bridges with colonial style brick veneer provide separated grade underpasses for federal, state, and county roads. To simulate the character of a "country road," the parkway's pavement was limited to a width of 30' and specially treated to expose the extra large aggregate in the concrete. All of these features, along with interpretive markers, create a roadscape with unity, variety, and character, three common elements of NPS landscape design tradition.

INDIAN FIELD CREEK BRIDGE

Indian Field Creek Bridge is located at the confluence of Indian Field Creek and the York River. Its construction was part of the Unit IV bridge contract for structures over King, Felgate, and Indian Field creeks. The contract was awarded to the Stanford & Brooks Company of Baltimore, Maryland, on 30 September 1932. The construction of these structures followed the placement of nearly a mile of hydraulic fill along the mouth of Felgate Creek and between Indian Field Creek and the north pier of the Naval Weapons Station (Unit II contract). In order to align the parkway between the York River and the officer's quarters of the Navy Mine Depot, a section of the roadway had to extend out over the river. The use of hydraulic fill for road-building was not new for the Park Service since similar work was done to complete the Mount Vernon Parkway. All work along the York River was subject to review by the Secretary of the Navy.¹

¹Oliver Taylor, Superintendent's Monthly Narrative Reports, July-August, 1931, file 207.03.2, collection of Colonial National

The contract for hydraulic fill was awarded to the Arundel Corporation of Baltimore, Maryland on 3 June 1931; work began a month later under the supervision of the Army Corps of Engineers. Specifications called for a roadway width of 60' at a minimum elevation of 11' above sea level. Slopes were to be no steeper than 1:25 or flatter than 1:30. The embankments were formed by the bleeding process of hydraulic fill. Dredged material from the river bed was pumped through a discharge pipe to the center-line of the embankment and allowed to settle naturally. Due to the fine quality of the material, considerable difficulty was had in confining the slopes within the range specified in the plans.²

The filling operations caused numerous landscaping problems along the right-of-way. Many trees that were covered with sand were threatened, and others were being drowned when closed stream channels resulted in rise of inland water levels. The Arundel Corporation was required to dig out buried trees and open new channels for proper drainage. At Indian Field Creek, a new channel was cut for the bridge just north of the original mouth through an established sand spit. It was thought that the location would provide a more stable foundation for the bridge and better drainage of the creek. Cutting a new channel in fresh fill would have required extensive maintenance to keep the channel clear.³ The fill across Indian Field Creek was completed in November 1931.

Construction of the bridge over Indian Field Creek began in

Historical Park.

²William H. Smith, U.S. Department of Agriculture, Bureau of Public Roads, "Final Construction Report - 1932, Colonial National Monument Parkway, Units I and II," 6-7, collection of the Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia.

³William Robinson, letters between director of the Park Service A. E. Demaray, and BPR engineer H. J. Spelman, in "Unit II" file, collection of the Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia.

October of 1932. Originally, bridge engineers for the Bureau of Public Roads designed two alternative proposals for Unit IV bridges. Alternative one called for a reinforced concrete deck slab on steel I-Beams and concrete bents and piers, wide enough for a 30' road with 2' sidewalks on both sides. Alternative two, however, utilized a reinforced concrete deck slab on steel I-beams on a timber trestle to support a 24' roadway.⁴ There was an ongoing debate within the landscape division as to the final treatment of the concrete finish to match the character of the parkway. Plans to sand-blast the handrails and stain the entire substructure brown to simulate a wood finish were dropped after undesirable results were attained during field tests. It was later decided to leave the natural color of the concrete exposed to blend with the surrounding hydraulic fill.⁵

The contract for the three bridges was awarded to the Stanford & Brooks Company of Baltimore, Maryland on 30 September 1932. Following alternative one, the company began to drive piles in October utilizing one pile driver with 90' leads and a steam hoisting engine, along with a No. 2 Vulcan steam hammer and No. 9 McTerry steam hammer. The untreated timber piles were cut below the mud line after the specified bearing value was attained. Other equipment included a floating concrete mixing plant consisting of a Blaw Knox 5-bag mixer, two derrick scows, four light scows, a steam crane and a land plant with two Rex half-yard concrete mixers. By December 1932, the piles had been driven and concrete poured for both abutments, but the piles had yet to be driven for the piers due to heavy winds and strong surf.⁶

⁴Robinson, Superintendent's Monthly Narrative Report, September 1932.

⁵Robinson, Superintendent's Monthly Narrative Reports, August-October 1932; and Smith, "Final Construction Report."

⁶U.S. Department of Agriculture, Bureau of Public Roads, "Final Construction Report, Project No. 1, Colonial Parkway, Unit IV Bridges," 13 December 1933, collection of the Colonial National Historical Park, Engineer's office, Maintenance

By April 1933, Indian Field Creek Bridge was opened to "restricted traffic."⁷ The three-span bridge was set on two concrete bents, each supported by three granite piers. The bridge span measured 134' from abutment face to abutment face, and was 36' wide (out-to-out). The structure was built on a 3 degree-0" horizontal curve, at an elevation of 11' above sea level.⁸ On 26 September 1933, NPS landscape architects Charles E. Peterson and Edward Zimmer made a final inspection of the Unit IV bridges and issued their approval. In a letter Peterson wrote NPS Director Horace Albright he quoted an observation of resident landscape architect Edward Zimmer who stated,

These bridges built under the contract are extremely well executed and I believe the best examples of concrete construction to be seen in this part of the country."⁹

In 1977, a Federal Highway Administration bridge inspection survey determined that extensive reconstruction of Felgate, Indian Field, and King creeks bridges, and the Navy Mine Depot Underpass was necessary for safety improvements and rehabilitation. Extensive deterioration of the deck slab and corrosion of the steel support beams were identified at the Indian Field structure. Underwater investigations also uncovered spalled and cracked areas in the bridge's substructure, although the original timber piles were considered stable. As a result of this investigation, it was decided to completely replace the

Division, Yorktown, Virginia; and Robinson, Superintendent's Monthly Narrative Reports, December 1932, 9.

⁷Robinson, Superintendent's Monthly Narrative Report, April 1933.

⁸U.S. Department of Agriculture, Bureau of Public Roads, Drawing No. G-640, "Bridge Over Indian Field Creek: General Plan and Foundation Layout," revised October 1932.

⁹Charles E. Peterson, letter to H. J. Spelman, 26 September 1933, "Unit IV" file, collection of the Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia.

bridge deck, clean and coat the steel beams with a non-corrosive epoxy, replace the abutment wingwalls, and encase the original granite piers with reinforced concrete. The contract was awarded to the J. Lawson Jones Construction Company of Clarksville, Virginia, and work began on 12 January 1980. The parkway was closed between State Route 641 and the Naval Weapons Station entrance for the duration of the contract. An incentive clause was included, providing a \$3,000 a day bonus for early completion in an attempt to reopen the road for the upcoming bicentennial celebration of the siege of Yorktown, scheduled for 1981.¹⁰

Between March and June of 1980 the deck slab and abutment wingwalls of Indian Field Creek Bridge were removed, and parallel work bridges were constructed to provide access to all the sites. Steel 12HP53 foundation piles manufactured by Bethlehem Steel and provided through Stanhope Steel, Inc., of Darien, Connecticut, were used under the reconstructed wingwalls. From curb to curb, the new deck slab is 8" thick and 38' wide, providing a 30' roadway and two 4' shoulders. The curb is a uniform 8" above the level of the shoulder, and a 1'-10 1/2" post and rail guardrail extends from the top of the curb on both sides of the bridge. All work was completed in September 1980.¹¹

¹⁰J. B. Curd, "Final Construction Report, Project 1B27, Colonial Parkway," collection of the Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia. At the completion of the project, the contractor was awarded \$ 90,000 in bonus pay for early completion.

¹¹U.S. Department of Agriculture. Bureau of Public Roads. Drawings No. G-7390 and G-7392, "Bridge Over Indian Field Creek, General Repair Details & Notes," part of the "Final Construction Report, Project 1B27."

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