

COLONIAL PARKWAY,  
MILL CREEK BRIDGE  
spanning Mill Creek  
Yorktown vicinity  
York County  
Virginia

HAER No. VA-48-N

HAER  
VA  
100-YORK,  
18N-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
Department of the Interior  
P. O. Box 37127  
Washington, D.C. 20013-7127

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MILL CREEK BRIDGE

Colonial National Historical Park

HAER No. VA-48-N

Location: Spanning Mill Creek on Colonial Parkway three miles east of Jamestown Island, Williamsburg vicinity, James City county, Virginia.  
Quad: Hog Island, VA  
UTM: 18/345200/4119900

Date of Construction: 1955-1956

Type of Structure: Steel I-Beam bridge with reinforced concrete substructure on timber pilings.

FHWA Structure No: 4290-024P

Use: Vehicular crossing

Designer/Engineer: Eastern Office of the Division of Design and Construction, National Park Service, and Bridge Division, Region Fifteen, Bureau of Public Roads.

Builder: Rea Construction Company, Charlotte, North Carolina

Owner: National Park Service

Significance: Constructed on hydraulic fill along the mouth of Mill Creek, the bridge was part of the efforts to complete the Colonial Parkway to Jamestown island in preparation for the 350th anniversary of the settlement of Jamestown. The instability of the fill necessitated the use of deep foundation pilings, and rip rap shore protection around the bridge abutments. Remedial dredging was found to be necessary by the Army Corps of Engineers to keep the channel open for fishermen.

Project History:

The documentation of the Mill Creek Bridge is part of the Colonial National Historical Park Roads and Bridges Project, conducted in the summer of 1995 by the Historic American Engineering Record, National Park Service.

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 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.

#### PLANNING FOR THE PARKWAY'S COMPLETION

Day to day operations at Colonial National Historical Park began to return to normal after the end of World War II. Maintenance of the park and the parkway was a major priority for park staff, who no longer had available the manpower of Civilian Conservation Corps, which was disbanded in the park in 1942. The reopening of the parkway, closed for national defense through Navy lands, required the removal of access roads built by the military for wartime training and transport on the parkway. Slopes and trees destroyed from excessive use required extensive restoration. New construction on the parkway was limited to minor work on the tunnel under Williamsburg, and a separated grade crossing for State Route 168 (now Route 143). Between 1947, when the final tracts of land to Jamestown island were acquired, and 1953 there was increased planning activity connected to the completion of the parkway for the 350th anniversary of the founding of Jamestown. Much of this work was coordinated by regional landscape architect

Stanley Abbott, who became superintendent of Colonial in 1953.<sup>1</sup>

The Korean War continued to delay new roadway construction until the armistice was signed in 1953. In the interim, meetings were held between officials of the Park Service, the Colonial Williamsburg Foundation, the Army Corps of Engineers, and the Association for the Preservation of Virginia Antiquities concerning the alignment of the road, the location of bridges, and the use of hydraulic fill between Jamestown and Williamsburg. Conferences were also held with the Virginia Department of Highways on the possible relocation of Route 31 and the Scotland Ferry north and west of the parkway's terminus with Glasshouse Point.<sup>2</sup>

The greatest impetus for the completion of the parkway came in the form of Mission 66. In response to the overstressed facilities of the National Park Service by the 1950s, Director Conrad L. Wirth devised a 10-year program to develop park lands, and create a more systematic management plan for the Service's 50th anniversary in 1966.<sup>3</sup> Colonial became one of the first parks to benefit from Mission 66 funding as planning for the Jamestown celebration was well underway by 1954-1955. Beginning in fiscal year 1955, Colonial was allocated over \$7.5 million as part of the "President's Budget for Parkways, Roads and Trails, and Buildings and Utilities." A field conference attended by Thomas Vint, Edward Zimmer, H. J. Spelman, and William H. Smith

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<sup>1</sup>Edward Hummel, Superintendent's Monthly Narrative Reports, January-May 1949, file 207.02.3, Colonial National Historical Park.

<sup>2</sup>U.S. Jamestown-Williamsburg-Yorcktown Celebration Commission, *The 350th Anniversary of Jamestown: 1607-1957*, Final Report to the President and Congress, (Washington, DC: Government Printing Office, 1958), 40-45; Lon Dill, "Colonial Parkway Extension to Jamestown," *The Commonwealth Magazine of Virginia* 22 (September 1955): 19-21.

<sup>3</sup>Barry MackIntosh, *The National Parks: Shaping the System* (Washington, DC: Department of the Interior, Government Printing Office, 1991), 62-65.

was held in Yorktown between January 13 and 16 to review park construction projects proposed for 1955 and 1956.<sup>4</sup> This conference set the stage for a two year program of construction and rehabilitation that led to the completion of the Colonial Parkway, and a reshaping of the entire park landscape.

#### MILL CREEK BRIDGE

Like the bridges at Felgate and Indian Field creeks along the York River, the construction of Mill Creek bridge followed the creation of a roadway embankment by hydraulic fill. Numerous surveys in the early 1950s between Park Service landscape architects, engineers from the Bureau of Public Roads, and the Army Corps of Engineers established the location of fill at College Creek, Mill Creek and between Glasshouse Point and Jamestown island to restore the original land approach to the island. Meetings were held with local fishermen to hear their concerns about access through the bridge channels. Although a permit for the fill and bridges was not received from the Army Corps of Engineers until January 1955, as early as March 1954, a sub-contractor working on other projects on the parkway constructed a timber bulkhead for the Mill Creek Bridge in the center of the existing channel in preparation for the fill.<sup>5</sup>

The Nello L. Teer Company of Durham, North Carolina, was awarded the contract for hydraulic fill on 14 January 1955, and work began on 20 March 1955. Completed in November 1955, the embankment at Mill Creek had a 50' crest for the roadway and shoulders, and a standard slope elevation between 25:1 and 30:1. Because of high grade fill material located between College Creek and Glebe Gut, a mile-long discharge pipe was constructed along

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<sup>4</sup>Stanley Abbott, Superintendent's Monthly Narrative Report, January 1955.

<sup>5</sup>Abbott, Superintendent's Monthly Narrative Report, January 1954.

the shoreline to the mouth of Mill Creek.<sup>6</sup> The design for both the Isthmus Bridge and Mill Creek Bridge were prepared by the Eastern Office of Design and Construction under supervision Edward Zimmer (a resident landscape architect at CNHP in the 1930s) in September 1954. In June 1955, bids were opened for the construction contract for the Mill Creek Bridge. The three individual contracts for the Mill Creek, College Creek, and Isthmus bridges were awarded to the Rea Construction Company of Charlotte, North Carolina.<sup>7</sup>

Although the operations were to begin in August 1955, the Rea Construction Company delayed work until February 1956 due to their involvement in other projects on the parkway. Structural steel for the bridge was delivered in February and stored on the nearby fill. Excavations for the abutment foundations proceeded slowly. The contractor experienced considerable difficulty in stabilizing the area for the footings. A timber work trestle was constructed to the west abutment, and a cofferdam was erected prior to excavations. Because of unstable soil conditions, excavations of -20' were required instead of the proposed -12 1/2'. Despite this adjustment, foundation piles driven to 70' did not produce the necessary bearing value of twenty-five tons. Consultation with BPR engineer H. J. Spelman resulted in a plan to create a "sand blanket" between 8' and 10' through which longer piles were driven. In addition, extra piles were used for the footings of both the west and east abutments.<sup>8</sup> This plan must have proved successful since no other mention of the problem appears in the record.

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<sup>6</sup>Sam Marsh, U.S. Department of Commerce, Bureau of Public Roads, "Final Construction Report, Project 1D5-1E1, Colonial Parkway, Hydraulic Embankments," Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia.

<sup>7</sup>Abbott, Superintendent's Monthly Narrative Reports, April-August 1955.

<sup>8</sup>Abbott, Superintendent's Monthly Narrative Reports, April 1956, 9; "Final Construction Report, Project 1D6," 6.



Progress continued to be slow through the summer, prompting a meeting between superintendent Abbott and the field representative of Rea Construction. Despite assurances that additional equipment and labor would be moved to the site, it was not until mid-October that both abutments had been constructed. The remaining structural elements of the bridge, however, were constructed quickly. The five structural steel girders were set in place and anchored to the abutments with high tensile strength steel bolts rather than rivets. Forms for the deck slab and guardrails were put in place and the subcontractor C. P. Buckner Steel Erection Service of Chapel Hill, North Carolina, mounted the reinforcing steel and expansion joints. The concrete was poured for the deck in November and an exposed aggregate finish was produced on the surface of the guardrails and shoulders. Finishing work, including the painting of the steel, the grading of the approach fills, the construction of a riprap wall around the abutments, and clean up were completed, and final inspection was made on 4 December 1956.<sup>9</sup>

Characteristic of small highway crossings, the bridge is a simple reinforced concrete open span deck structure supported by steel I-beams on a concrete substructure set on untreated timber pilings. It is 137'-8 6/8" long, with a 50' open span. The bridge carries a 30' roadway, but at the approach slabs, the bridge flares to 44'-9 1/2" on the east end and 44' on the west. A parabolic curve extend the final 31' of the bridges guardrail, and slopes 10" below the horizontal line of the top of the rail. A 1'-10" high, 11 5/8" wide post-and-rail guardrail is located on both sides of the structure. The parapet is parallel to the tangent except for 31' at the ends where they flare 4'-3/4" for the bridge approach section.<sup>10</sup>

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<sup>9</sup>"Final Construction Report, Project 1D6," 6-7.

<sup>10</sup>U.S. Department of the Interior, National Park Service, Eastern Office of the Division of Designs and Construction, Drawing PKY-COL 3002-A, "Bridge over Mill Creek," Colonial National Historical Park, Engineer's office, Maintenance Division.

In 1988, reconstruction work was completed on Mill Creek Bridge as part of Phase II of the reconstruction of the Colonial Parkway. Phase II included the rehabilitation of the reinforced concrete between Miller's Crossing and Jamestown island, along with basic reconstructive work on Halfway, College, Mill and Powhatan creek bridges. As with all bridges along the parkway, the parapet of Mill Creek Bridge was modified to accept a new timber guardrail. All deteriorated concrete was removed and replaced with additional reinforcement. Expansion joints were inspected and replaced as needed and all joints were cleaned and resealed. Minor repair to curbs, guardrail and other bridge members was made, and the structural steel was cleaned and repainted.<sup>11</sup>

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<sup>11</sup>U.S. Department of Transportation, Federal Highway Administration, "Plans for Proposed Project PRA COLO 1D39, E12, Colonial Parkway," 1 August 1988, Colonial National Historical Park, Engineer's office, Maintenance Division.

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