

COLONIAL PARKWAY,
BRACKEN POND CULVERT
crossing Bracken Pond
Yorktown vicinity
York County
Virginia

HAER No. VA-48-F

HAER
VA
100-YORK,
185-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

HAER
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BRACKENS POND CULVERT
Colonial National Historical Park
HAER No. VA-48-F

Location: Colonial Parkway, 2 miles northwest of Yorktown, York County, Virginia
Quad: Clay Bank, VA
UTM: 18/363400/4123825

Date of Construction: 1931

Type of Structure: Arch culvert

Use: Drainage

Designer/Engineer: Eastern Division, Branch of Plans and Design, National Park Service.

Builder: Nello L. Teer, Durham, North Carolina

Owner: National Park Service

Significance: The Brackens Pond culvert is one of the major drainage structures built along the Yorktown section of the Colonial Parkway. The concrete arch culvert is clad in Flemish bond brickwork, as part of the landscape division's efforts to recreate the colonial architecture of the region. Constructed in 1931, the culvert is one of the oldest structures on the Colonial Parkway.

Project Information: Documentation of the Brackens Pond culvert is part of the Colonial National Historical Park Roads and Bridges Project, conducted in summer 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 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.

BRACKENS POND CULVERT

The Brackens Pond culvert was built as part of Unit I construction of the Colonial Parkway, the first phase of the development. Unit I consisted of all grading and drainage structures (except over Indian Field, Felgates, and King Creeks) between Ballard Creek (station 74+) and Hubbard Lane (station 577), a distance of about 8 miles. Specifications for Unit I construction established the standards which guided the construction of the roadway throughout its length. Consistent with National Park Service policy, special efforts were made to preserve the landscape and avoid unnecessary scarring of the natural environment. According to construction provisions,

Any timber or other landscape features scarred or damaged by the contractor's operations shall be removed, neatly trimmed up as required by the engineer, or restored as nearly as

possible to their original condition.¹

Plans and specifications were prepared and submitted by the Bureau of Public Roads in May 1931. After bids for the work were opened in Yorktown, the contract was awarded to Nello L. Teer of Durham, North Carolina, who began work on 8 July 1931.² For all structures that would be in view of the motorist, special attempts were made to recreate a "colonial atmosphere." While reinforced concrete pipe was used for all pipe culverts, one length of vitrified clay pipe was laid at both ends of all culverts to screen the more modern concrete building material. Drainage structures which required an opening greater than 24" were constructed as reinforced concrete arches with spans of 4', 6', and 8' feet. All exposed concrete surfaces, including culvert headwalls, walls of arches, and bridges were clad with "hand-made Virginia style" clay brick manufactured by the Jamestown Brick Company of Virginia.³

To ensure an antique finish, all clay was pit-pugged for twelve hours, and mixed to produce a variety of shades. Bricks were sand struck and oversized, averaging 2-5/8" x 8'1/2" x 4". The contractor was required to hire only "expert" bricklayers, and use both Flemish and English bonds depending upon the location of the structure in relation to the specifications of the Eastern

¹U.S. Department of Agriculture, Bureau of Public Roads, "Special Provisions, Proposal and Contract Forms for Colonial National Monument Parkway," 29 May 1931, 2, file 630.C-2.4, "Planning the Parkway, 1931," collection of the Colonial National Historical Park.

²Oliver Taylor, Superintendents Monthly Narrative Reports, May-June 1931, file 207.02.3, collection of the Colonial National Historical Park.

³William H. Smith, U.S. Department of Agriculture, Bureau of Public Roads, "Final Construction Report - 1932, Colonial National Memorial Parkway, Units I and II," 3-4, collection of Colonial National Historical Park, Engineer's Office, Maintenance Division, Yorktown, Virginia.

Division of the Branch of Plans and Design. Architectural treatments for culverts along the Yorktown end of the parkway were drawn by draftsman William M. Haussman in April 1931. Beveled and half round bricks of the same color and texture were used on parapet walls along the parkway. Arch rings were pre-molded and delivered to the job site packed in sawdust. All mortar, furthermore, consisted of one part portland cement, one part lime putty, and three parts sand free of any salt that could produce a yellow shade. Upon completion, the brick was scrubbed with bristle brushes and a solution of water with 10 percent muriatic acid.⁴

Brackens Pond, like all stream crossings between Ballard Creek and King Creek, was at tidewater level providing poor bearing for foundation footings. This required that all culverts and bridges be supported by untreated timber piles of varying lengths.⁵ Culvert trenches were cut to the grade and flow specified in the plans and made wide enough to allow for adequate working space between the concrete and the earth. Once the footings were poured, Wakefield pilings between 2" and 3" were driven and anchored to the concrete by steel hook bolts. Special attention was paid to the construction of high quality form work to insure an even finish of the concrete arch. After the concrete was poured and allowed to set, the culvert trench was packed with gravel and earth and backfilled. The concrete used varied in the proportions of portland cement, fine aggregate, coarse aggregate and water. Generally, only class A and class B concrete was used for the arch culverts and footing in Unit 1 construction of the parkway.⁶

Extensive specifications were prepared to concerning the bonding

⁴"Special Provisions," 15-17.

⁵Smith, "Final Construction Reports, 1932, Colonial Parkway, Units I and II," 4.

⁶U.S. Department of Agriculture, Bureau of Public Roads, "Specifications for Concrete," supplement to FR 50 specifications for Forest Road Construction, February 1931.

of the brick to the concrete in order to insure a lasting seal. According to Unit 1 specifications,

Just before concrete is to be deposited against the masonry, the surfaces shall be thoroughly washed with a stream of water from a hose. The brick masonry shall be coated with a mixture of neat cement and water immediately ahead of the placing of the concrete. The concrete backing shall be placed in layers not more than six inches thick. All bonding pockets shall be completely filled and the concrete worked around the projecting headers and thoroughly spaded and worked until it is brought into intimate contact with every part of the back face of the brick.⁷

This adherence to detail and quality workmanship was characteristic of construction techniques for all National Park Service roads and bridges. By November 1931, all small arch culverts including Ballard Creek and Brackens Pond were completed.⁸

Brackens Pond Culvert was designed in 1931 under the direction of Charles E. Peterson and is located between the north and south piers of the Naval Weapons Station. Its arch is 13'-9" wide and is flanked by 3'-11" brick toe walls. From the top of the arch to the waterline measures 5'-7", and a 1'-5" wide brick arch ring is laid with a vertical running bond. The culvert headwall is 36'-8" from end to end and is 4'-7" from the top of the arch ring to the center point of the headwall peak. There is a differential of 1' between the peak of the headwall parapet and the wall ends. The headwall parapet extends about 2'-5" above the road grade at either end and 3'-5" at its center. At the location of the culvert, the roadway's pavement slopes toward the river from an elevation of 11'-5 5/8" to 10'-5 1/2".

A two course stringcourse extends the length of the headwall

⁷Smith, "Final Construction Report, 1932, Colonial Parkway, Units I and II," 16.

⁸William Robinson, Superintendent's Monthly Narrative Reports, November 1931.

below the half-round brick coping. Like the Ballard Creek culvert, special beveled bricks extend 8" above the string course at a slant of 4" from the vertical line of the headwall. The coping is comprised of half-round molded bricks 3" wide and 7" long. The flat area of the headwall is laid with a Flemish bond, providing variation from other bonds found on Unit I culverts. The ends of the headwalls are finished with closures comprised of a vertical line of headers spaced between every other course.

In 1931, the Navy planned to deposit dredge material from their pier facilities around the area of Brackens Pond. Park engineers and landscape architects opposed this plan due to its effects upon the parkway. Writing to Rear Admiral M. D. MacDougell on the advice of Charles Peterson, Oliver Taylor stated that, "It is hoped the natural drainage and marshes can be left in their natural condition, where they are within view of the Parkway."⁹ Instead, a suitable area was identified by Peterson between Brackens Pond and Ballard Creek for the fill to help stabilize an section of the roadway. During the landscaping of Brackens Pond, trees and underbrush were cut back to provide an open vista to the pond and the marsh vegetation.

⁹Oliver Taylor, to Rear Admiral M. D. MacDougell, September 1931, in "Unit II" file in the Collection of the Colonial National Historical Park, Engineer's office, Maintenance Division, Yorktown, Virginia.

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