

Colonial National Monument Parkway,
C & O Railroad Underpass (L. B. Smith Bridge)
Milepost 12.54 of the Colonial Parkway
Williamsburg City
Virginia

HAER No. VA-48-C

HAER
VA,
100-YDRK,
18-C-

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

HISTORIC AMERICAN ENGINEERING RECORD

COLONIAL NATIONAL MONUMENT PARKWAY:
C & O RAILROAD UNDERPASS

HAER No. VA-48-C

HAER
VA,
100-YORK,
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Location: Milepost 12.54 of the Colonial Parkway (0.8 miles north of the intersection of the parkway and Newport Avenue), Williamsburg City, Virginia.

UTM: 18.349340.4126560
Quad: Williamsburg

Architect: Charles E. Peterson

Date of Construction: December, 1935-June, 1937

Builder: C.Y. Thomason
Greenwood, South Carolina

Present Owner: Mid-Atlantic Region
National Park Service
U.S. Department of the Interior
Customs House
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

Present Use: Bridge carrying both vehicular traffic on Lafayette Street (Virginia State Routes 5, 31, and 162) and rail traffic on three tracks of the Chesapeake and Ohio (C & O) Railroad over the Colonial Parkway.

Significance: The C & O Railroad Underpass represents a typical 1930s brick-faced arch reinforced concrete bridge constructed on the Colonial Parkway. Charles Peterson based his design of this bridge on the 1860 brick arch viaduct of the Central of Georgia Railway in Savannah, Georgia. While using stylistic elements of colonial architecture such as arches and Flemish and English bond brickwork, this bridge also reflects the effort on the part of the designers to have the underpass complement the natural environment of the Tidewater area through its subdued exterior decorations and color as well as its relatively short physical dimensions.

Historian: Joseph P. Meko, 1988

Although often regarded as two separate bridges connected by overhead brickwork,¹ the C & O Railroad Underpass constituted a single structural entity in both design and construction. Engineers in the Bureau of Public Roads made their first preliminary studies for this Colonial Parkway project in late 1932.² On July 12, 1934, a conference of National Park Service, Bureau of Public Roads, and Williamsburg Restoration officials met to discuss the extension of the parkway into Williamsburg. Two alternatives, an underpass and an overpass, had been suggested for the intersection of the parkway and the railroad. After discussion that afternoon, the underpass option received backing from personnel in both the Branch of Plans and Design of the National Park Service and the Bureau of Public Roads because an underpass would handle traffic better, not cause the parkway route to be shifted north as with an overpass, and offer "a natural and pleasant relationship of the Parkway to existing topographic conditions."³

At the close of 1934, Charles Peterson, chief of the Eastern Division of the National Park Service's Branch of Plans and Design, sketched the proposed underpass at the C & O Railroad.⁴ The drawing showed a double-span structure; each span had three arches and a parapet. The large center arch over the parkway had a large arch ring as well as a brick-faced keystone that rose to the bottom of the parapet. One of the smaller side arches spanned a smaller road.⁵ A rondelle appeared above the arches' springing points on each of the piers which separated the central arch from the side arches. The sketch emphasized how the structure complemented the natural environment--the drawing contained a stream, numerous trees, and lush vegetation. A horse-drawn carriage travelled along the side road while the vault of the center arch concealed an automobile in its shadow.

¹ The Federal Highway Administration 1983 regards the C & O Underpass as two separate bridges, one for Lafayette Street and the other for the Chesapeake and Ohio Railroad.

² Robinson "Superintendent's Monthly Narrative Report" (November, 1932), 8. The park superintendent filed his monthly report (hereafter abbreviated "SMNR") during the month following the month stated in the title.

Although the Bureau of Public Roads exercised immediate project supervision, the National Park Service nevertheless had to approve all plans and accept completed work. For more information on the construction of the Colonial Parkway, see the Historic American Engineering Record documentation report HAER No. VA-48, especially 3-5, 9, 10.

³ Peterson 1934a.

⁴ Peterson 1934b. See Supplemental Information 1.

⁵ Today, this smaller arch spans a wooden railed walkway next to a stream; the other side arch spans only rubble and crushed stone.

Peterson based his conception of the center arch of the C & O Railroad Underpass on the 1860 brick arch viaduct of the Central of Georgia Railway that spanned West Boundary Street and the Savannah and Ogeechee Canal in Savannah, Georgia.⁶ Both the underpass and the viaduct had wide arches, parapets, and rondelles. Significant differences between the two structures, however, testified to the originality of the underpass' design. The Savannah viaduct contained only large arches with highlighted top arch ring courses and no keystones. The piers on the common bond faced exterior had decorative pediments located below the arches' springing points in addition to the rondelles on the spandrels. In contrast, the underpass did not have a highlighted top arch ring course. Piers on which the rondelles appeared flared out at their bases. These underpass piers separated a large central arch with a brick-faced keystone from smaller side arches.

Peterson's conception of the C & O Railroad Underpass formed the basis for the bridge's construction plans drawn by the Bureau of Public Roads in April, 1935. The northern and larger portion of the underpass carried three tracks of the C & O Railroad while the smaller southern section carried "Railroad Avenue" (now Lafayette Street). This reinforced concrete structure had stepped footings hidden behind sloped soil. The large center arch spanned fifty feet six inches and had an arch ring two feet ten inches wide. The large brick-faced keystone went from the arch ring to the bottom of the parapet and received further accentuation from the parapet's highlighted eight foot seven inch center section. The piers measured eight feet seven inches wide and flared out at their base in a 4:1 slope. The side arches each had a two-foot wide arch ring that spanned fourteen and one-half feet. The one-foot seven and one-half inch thick parapets had flared ends. Structurally symmetric about its vertical center line, the bridge had a parabolic curve for its center 117 1/2 feet. Straight grades of forty-nine feet three inches and forty-one feet three inches flanked either end of the parabolic center on the north and south facades respectively.⁷ Flemish bond covered the bridge's exterior while English bond decorated the interior of the arch vaults. The rondelles or "bullseyes" had diameters of seven feet two inches and contained sections that extended three inches beyond its nine and one-fourth inch highlighted outer ring every ninety degrees. The brickwork that joined the two sections of the underpass to form light wells measured fifteen and one-half feet in length and eight feet seven inches in width. Corresponding to the locations of the facade piers that divide the three arches, these

⁶ For information on the viaduct, see the Historic American Engineering Record documentation report HAER No. GA-1, Central of Georgia Railway: Savannah Repair Shops, 124-25, and HAER No. GA-4, Central of Georgia Railway: 1860 Brick Arch Viaduct.

⁷ Bureau of Public Roads 1935a, Sheets G-107 ("General Plan & [North] Elevation) and G-108 ("[South] Elevations and Details"). The underpass' north facade thus has a total length of 216 feet while the south facade has a total length of 200 feet. At its top, the C & O Railroad Underpass measures a total of 106 1/4 feet in width.

crossings have sloped interiors to facilitate drainage from the rail tracks and the roadway.⁸

The April, 1935 plans also specified the underpass' interior reinforcing. The larger northern section which carried the railroad measured forty-seven feet three inches wide at its top and rested on a buried foundation fifty-two feet four and one-half inches wide. The track closest to the north facade handled westbound rail traffic and had its center line eight feet from the parapet. Carrying eastbound rail traffic, the middle track found its center line twenty-two feet from the parapets. Freight siding constituted the function of the third and southernmost track which, like the westbound track, had its center line eight feet from the side of the structure.⁹ The smaller southern portion that carried "Railroad Avenue" allowed twenty feet for the roadway and ten feet for two curbs and two sidewalks. At its top, this section had a width of thirty-three feet three inches resting on an underground base thirty-eight feet four and one-half inches wide. Both the railway and the road sections of the underpass used one-inch steel bars in counterforts as reinforcing; the size and composition of each section's foundation, however, epitomized the structural difference between the two portions of the underpass. Although both parts had bottom reinforced concrete bases measuring three and one-half feet in height, the railroad section topped its base with twelve feet of reinforced concrete while the road section contained three two-foot wide interior reinforced concrete diaphragm walls approximately fourteen feet in height surrounded by gravel sheathing. Heavier design loads from trains necessitated the larger size and amount of reinforcing in the railroad's part of the underpass.¹⁰

Even before the final plans had been completed, the National Park Service began to consider how to contract the construction work for the C & O Railroad Underpass. Although the argument had been advanced for separate contracts for the Capitol Landing and C & O Railroad underpasses,¹¹ the Bureau

⁸ Bureau of Public Roads 1935b. In order to insure that all exterior sections of the underpass, including the relatively shielded surfaces of the light wells, would weather uniformly, Peterson 1935b acknowledged that an attempt would be made, "during construction, to find some way of diverting some water down the brick trough of the light wells to make them look more convincing as the weathering of years goes on."

⁹ Peterson 1935a unsuccessfully argued to have this third track eliminated on the grounds that its inclusion would add \$50,000 to the price of the entire underpass.

¹⁰ Bureau of Public Roads 1935a, Sheet G-110 ("Cross Sections").

¹¹ Spelman 1935. In his letter, this Bureau of Public Roads' district engineer believed that both underpasses would each "be of sufficient size to attract good bids from bridge contractors." For more information on the Capitol Landing Underpass, see the Historic American Engineering Record documentation

of Public Roads nevertheless eventually decided to combine the two projects into a single venture. Offered on September 23, 1935, the contract for Colonial Parkway Project 1-C-2--1-D-2 went to C.Y. Thomason of Greenwood, South Carolina, who submitted the low bid of \$175,389.30.¹² The original schedule called for only 365 days to complete both structures at an original allotment of \$236,000 for construction and \$24,000 for engineering. The Bureau of Public Roads gave Thomason its approval to begin construction on December 20, 1935, but heavy snows and cold weather prevented any significant work from being accomplished. After halting construction on Christmas Eve, Thomason resumed work on January 13, 1936, and started the excavation for the Capitol Landing Underpass. Despite the first delay, Bureau of Public Roads associate highway engineer William H. Smith reported that Thomason would likely finish his contract before the close of 1936.¹³

Cold weather continued to hamper the construction of the parkway underpasses, resulting in the loss of most of February and pushing the probable completion date well into 1937. Nevertheless, the C & O Railroad continued working on the construction of detour tracks around the underpass site.¹⁴ March brought more favorable weather and the completion of the temporary wooden by-pass trestle.¹⁵ Having completed the excavation and grading for the underpass, the contractor next constructed the forms for the footings in June and began pouring concrete in July. While the Capitol Landing Underpass required additional pilings to compensate for unexpectedly soft soil, the C & O Railroad Underpass needed no strengthening of its foundation because its firm soil could support the structure's weight without settling.¹⁶ The next four months witnessed the pouring of the concrete piers and arches, the northern railroad section of the bridge finishing with its concrete in November and the southern roadway portion completed in December. By the end of 1936, brickwork had been in progress for several months and "only the pouring of the south spandrel walls, cross members, and reinforcing

report HAER No. VA-48-B.

¹² Bureau of Public Roads 1935d; Flickinger "SMNR" (October, 1935), 8. In July, 1933, B. Floyd Flickinger replaced William M. Robinson, Jr. as park superintendent. Flickinger remained in office until January, 1939.

"Project 1-C-2" refers to the planning and construction of the Capitol Landing Underpass. "Project 1-D-2" indicates the planning and construction of the C & O Railroad Underpass.

¹³ Flickinger, "SMNR" (December, 1935), 7; "SMNR" (January, 1936), 10-11.

¹⁴ Flickinger "SMNR" (February, 1936), 12. See Bureau of Public Roads 1935c, Sheet G-202 ("Track Changes") for the route of the C & O Railroad's temporary tracks.

¹⁵ Flickinger "SMNR" (March, 1936), 11.

¹⁶ Flickinger "SMNR" (June, 1936), 11; "SMNR" (July, 1936), 13.

members to complete the main structure" remained.¹⁷ As 1937 began, inclement weather hindered backfilling the arches, waterproofing the structure, and laying additional brick facing. Even though masonry work had to be temporarily halted in February, the underpass' brick facing had already attained the belt course on the bottom section of the parapet.¹⁸ The backfilling of the two center arches as well as the drainage system reached completion in April; May saw finishing of the parapet walls and the resumption of rail traffic on the three new lines of track across the northern section of the bridge.¹⁹ Thomason finished his contract on June 19, 1937 at an estimated final cost of \$225,000. The total building time required had increased from an initial 365 to 471 days, thirty-three of those days coming from allowed extra time and seventy-three days lost to four stop work orders.²⁰

The C & O Railroad and the Capitol Landing Underpasses, "two of the largest highway projects to be done in the State in recent years," fulfilled the goal of Colonial Parkway planners in limiting traffic because these bridges brought the parkway "into Williamsburg without touching existing highways [or railways] at any point."²¹ Like the other brick-faced Colonial Parkway bridges, the C & O Railroad Underpass reflected the decision on the part of the designers to have the structure complement the surroundings. This bridge neither added to nor detracted from the environment. The structure contained no "sophisticated engineering" such as an open spandrel or dramatic exterior decorations that would draw attention to the bridge. The sizeable parapet decreased the amount of train and automobile traffic crossing the underpass seen by a motorist on the Colonial Parkway. While using an arch with subdued brick facing as "colonial" motifs, the brickwork and the bridge's relatively small dimensions did not give the underpass a massive appearance. The C & O Railroad Underpass also reflected the ability of Charles E. Peterson to synthesize a new three-arched underpass that carried both rail and road traffic from his own ideas and existing elements found on the Savannah brick viaduct. The Underpass thus embodied not only a structure done in the colonial architectural style but also a successful example in the effort to integrate the Colonial Parkway into the Tidewater natural environment.²²

¹⁷ Flickinger "SMNR" (November, 1936), 9; "SMNR" (December, 1936), 7.

¹⁸ Flickinger "SMNR" (February, 1937), 6.

¹⁹ Flickinger "SMNR" (April, 1937), 7; "SMNR" (May, 1937), 6.

²⁰ Monthly Narrative Reports of Bureau of Public Roads Engineers: Colonial National Monument Parkway. April and June, 1937.

²¹ "Motorists Anxious for Completion of Parkway Pavement" 1937.

²² For additional information on the relationship between the Colonial Parkway's bridges and the environment, see the documentation report HAER No. VA-48, 7-8.

Supplemental Information

1. Underpass at C & O Railroad Near the Governor's Palace: 1934.²³



UNDERPASS AT C & O RAILROAD
NEAR THE GOVERNOR'S PALACE
WILLIAMSBURG · VIRGINIA · IN · THE · COLONIAL · NATIONAL · MON.

DRAWN BY THE EASTERN DIVISION · BRANCH OF PLANS AND DESIGN · NATIONAL PARK SERVICE

Bibliography

Colonial National Historical Park is abbreviated CNHP. Entries labelled "Parkway: HLW" can be found in File No. 630-Parkway: Hubbard's Lane to Williamsburg, Colonial Parkway Original Construction Specification files, Engineer's Office, CNHP Maintenance Division, Yorktown.

Bureau of Public Roads, U.S. Department of Agriculture. Drawings for "Colonial National Monument Parkway: Underpass at C & O Railway Near Governor's Palace." 14 sheets (G-105 to G-11, G-141, G-202, and 5 sheets from Eastern Division, Branch of Plans & Design, National Park Service), reference number 256-74. [Located at U.S. Department of Transportation, Federal Highway Administration, Arlington, Virginia.]

The document numbers, their dates, and citation dates in the narrative are as follows:

<u>DOCUMENT NUMBER</u>	<u>DATE</u>	<u>CITATION DATE</u>
G-105 to G-111	4-35	1935a
G-141	6-35	-----
Sheets from Eastern Division	8-15-35	1935b
G-202	9-35	1935c

_____. 1935d. Typed transcript of the bid notice for Colonial Parkway Project 1C2-1D2. September 23, 1935. [Located in Parkway: HLW]

Federal Highway Administration, U.S. Department of Transportation. 1983. "Bridge Safety Inspection Report: C & O Railroad over Colonial Parkway, Colonial National Historical Park, Structure No. 4290-034P." June 28, 1983. Also "Bridge Safety Inspection Report: Lafayette Street over Colonial Parkway, Colonial National Historical Park, Structure No. 4290-019P." June 29, 1983. [Located at U.S. Department of Transportation, Federal Highway Administration, Arlington, Virginia.]

Flickinger, B. Floyd. "Superintendent's Monthly Narrative Reports, Colonial National Historical Park." File No. 207-002.3 or 207-02.3. [Located in Historian's Office, CNHP Headquarters, Yorktown.]

The park superintendent filed these reports during the month following the month stated in the title. Flickinger held the position of park superintendent from July, 1933, to January, 1939. Information on the parkway bridges can be found under the headings "170-Plans, Maps, and Surveys: Bureau of Public Roads" and "230-

New Construction: Parkway." Citations in the narrative use the abbreviation "SMNR" and give the month being reviewed.

Monthly Narrative Reports of Bureau of Public Roads Engineers: Colonial National Monument Parkway. April and June 1937. Record Group 79 (National Park Service), Entry 28, National Archives, Washington, D.C.

"Motorists Anxious for Completion of Parkway Pavement." 1937. Newport News Daily Press, February 7, 1937. [Located in Parkway: HLW.]

Peterson, Charles E. 1934a. Memorandum from Peterson, Chief of the Eastern Division of the National Park Service's Branch of Plans and Design, to A.E. Demaray, Senior Assistant Director of the National Park Service. July 18, 1934. [Located in Parkway: HLW.]

_____. 1934b. Letter and sketch of "Underpass at C & O Railroad near the Governor's Palace, Williamsburg, Virginia, in the Colonial National Monument" to B. Floyd Flickinger, Colonial National Monument park superintendent. December 15, 1934. (The drawing is also referenced as COL 1212.) [Located in Parkway: HLW.]

_____. 1935a. Memorandum to A.E. Demaray, Senior Assistant Director of the National Park Service. February 7, 1935. [Located in Parkway: HLW.]

_____. 1935b. Letter to H.J. Spelman, District Engineer for the Bureau of Public Roads. September 6, 1935. [Located in Parkway: HLW.]

Robinson, William M., Jr. 1932. "Superintendent's Monthly Narrative Reports, Colonial National Historical Park." November, 1932. File No. 207-002.3 or 207-02.3. [Located in Historian's Office, CNHP Headquarters, Yorktown.]

Robinson held the position of park superintendent from October, 1931, to June, 1933. See Flickinger for more information about these monthly reports.

Spelman, H.J. 1935. Letter from Spelman, the Bureau of Public Roads' district engineer, to A.E. Demaray, Associate Director of the National Park Service. February 18, 1935. (Letter signed by "District Engineer.") [Located in Parkway: HLW.]

COLONIAL PARKWAY, C&O RAILROAD UNDERPASS
(Colonial National Monument Parkway, C&O Railroad Underpass)
(Colonial National Monument Parkway, Lafayette Street Bridge)
Milepost 12.54 of the Colonial Parkway
Yorktown Vicinity
York County
Virginia

HAER No. VA-48-C

HAER
VA
100-YORK,
18-C-

ADDENDUM TO
COLONIAL NATIONAL MONUMENT PARKWAY, C&O RAILROAD UNDERPASS
(Colonial National Monument Parkway, Lafayette Street Bridge)
(Colonial Parkway, C&O Railroad Underpass)
Milepost 12.54 of the Colonial Parkway
Yorktown Vicinity
York County
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REDUCED COPIES OF MEASURED DRAWINGS

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HISTORIC AMERICAN ENGINEERING RECORD

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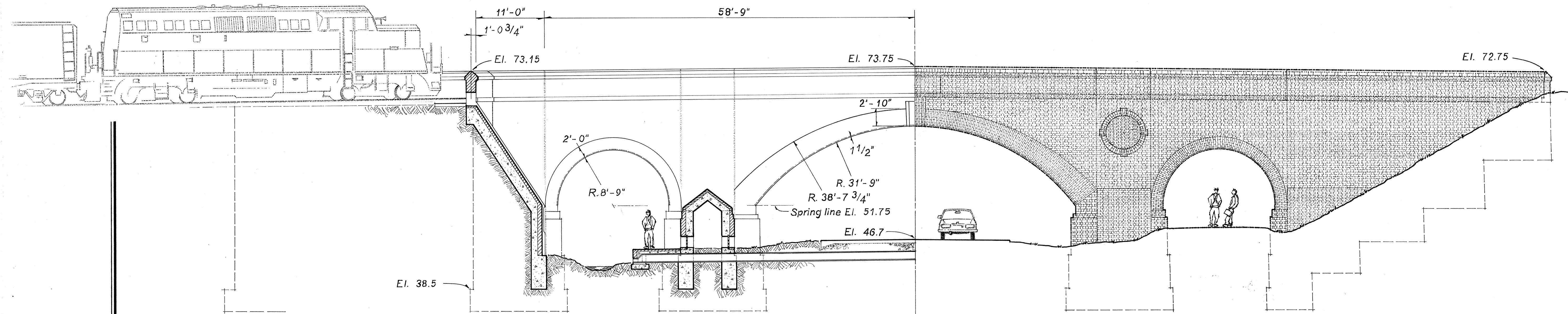
Colonial National Monument Parkway,
C & O Railroad Underpass (Lafayette St. Bridge)
Milepost 12.54 of the Colonial Parkway
Williamsburg
Williamsburg City
Virginia

HAER No. VA-48-C

Photographer: Jet T. Lowe, October 1938

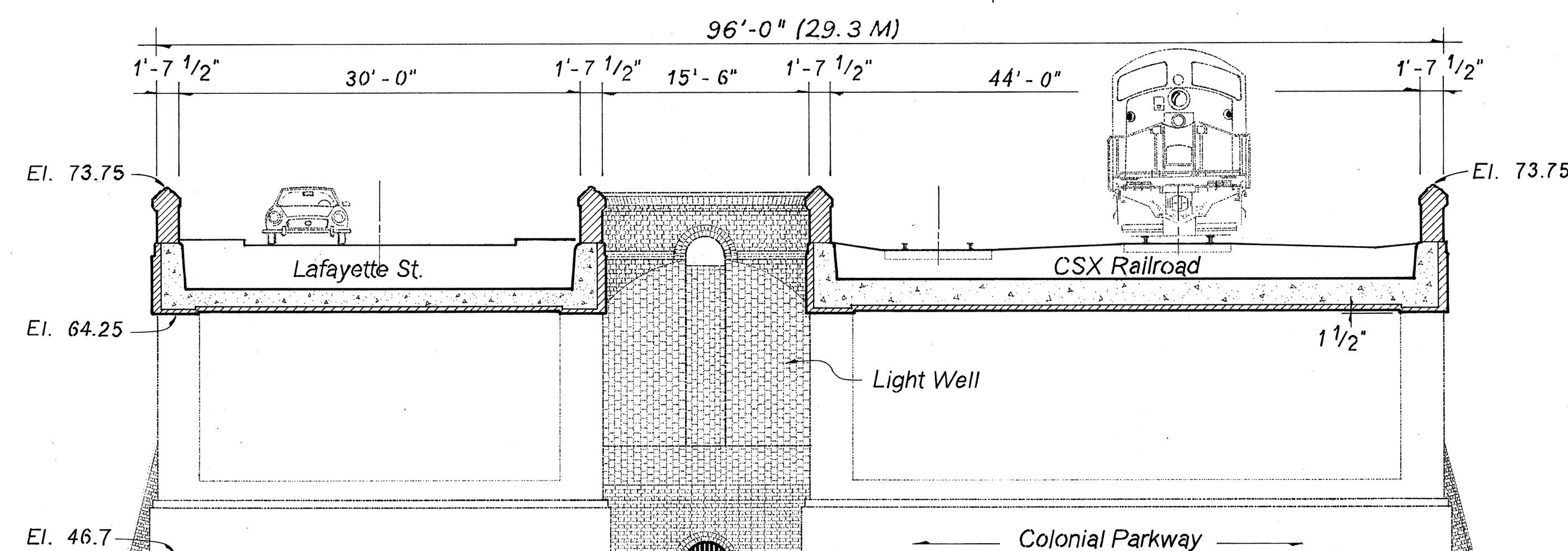
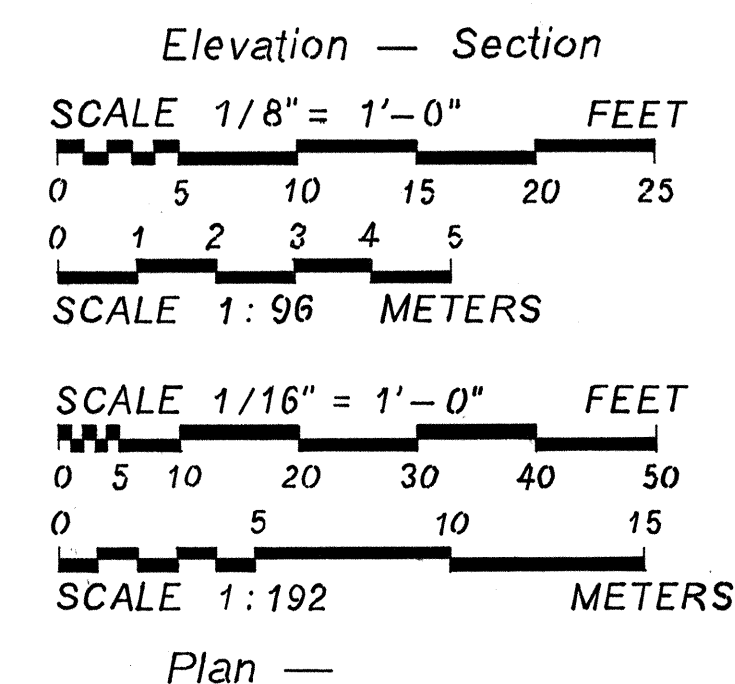
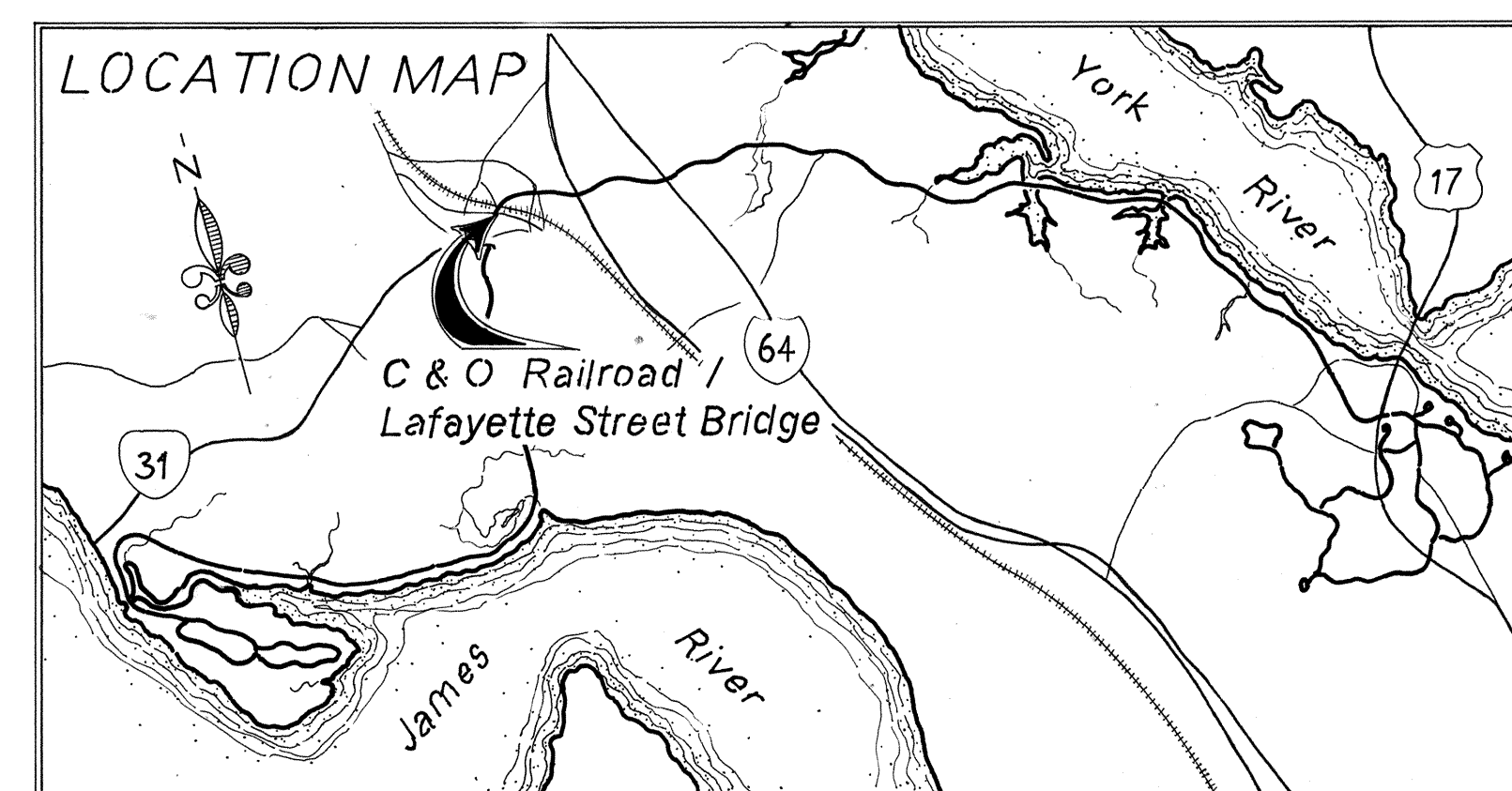
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VA-48-C-5	DECK VIEW, LOOKING WEST, SHOWING RAILROAD TRACKS.
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C&O RR / LAFAYETTE STREET BRIDGE 1937

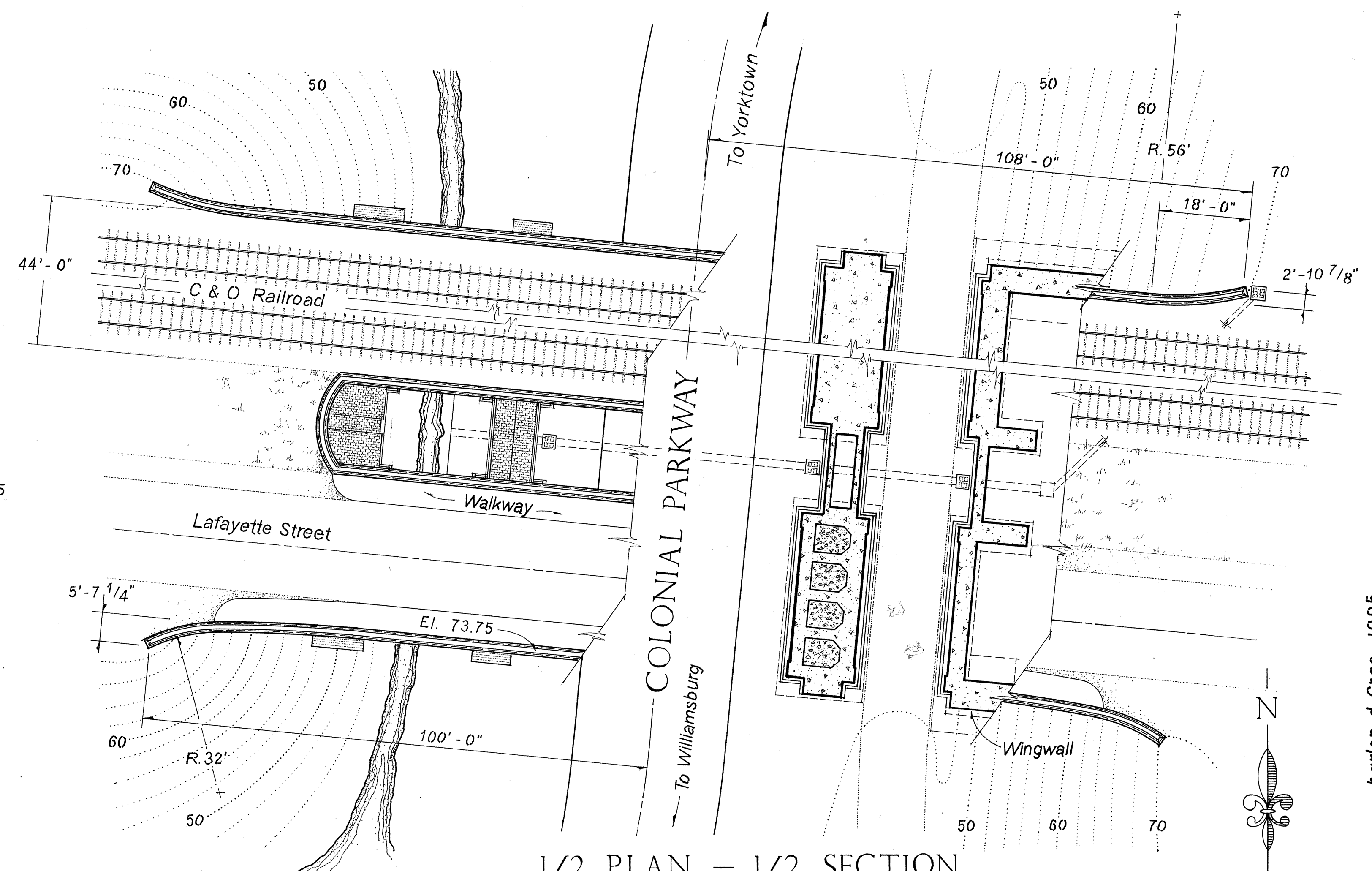


1/2 INTERIOR ELEVATION

LAFAYETTE ST. ELEVATION 1/2 EXTERIOR



CROSS SECTION ON CL



1/2 PLAN — 1/2 SECTION
 UTM No (see HAER No VA-48-C)

DELINATED BY: harlen d. Grae, 1995

COLONIAL NHP
 ROADS & BRIDGES RECORDING PROJECT
 UNITED STATES DEPARTMENT OF THE INTERIOR

YORKTOWN VICINITY

COLONIAL PARKWAY, C&O RR / LAFAYETTE ST. BRIDGE
 MILEPOST 12.54 OF THE COLONIAL PARKWAY
 YORK COUNTY

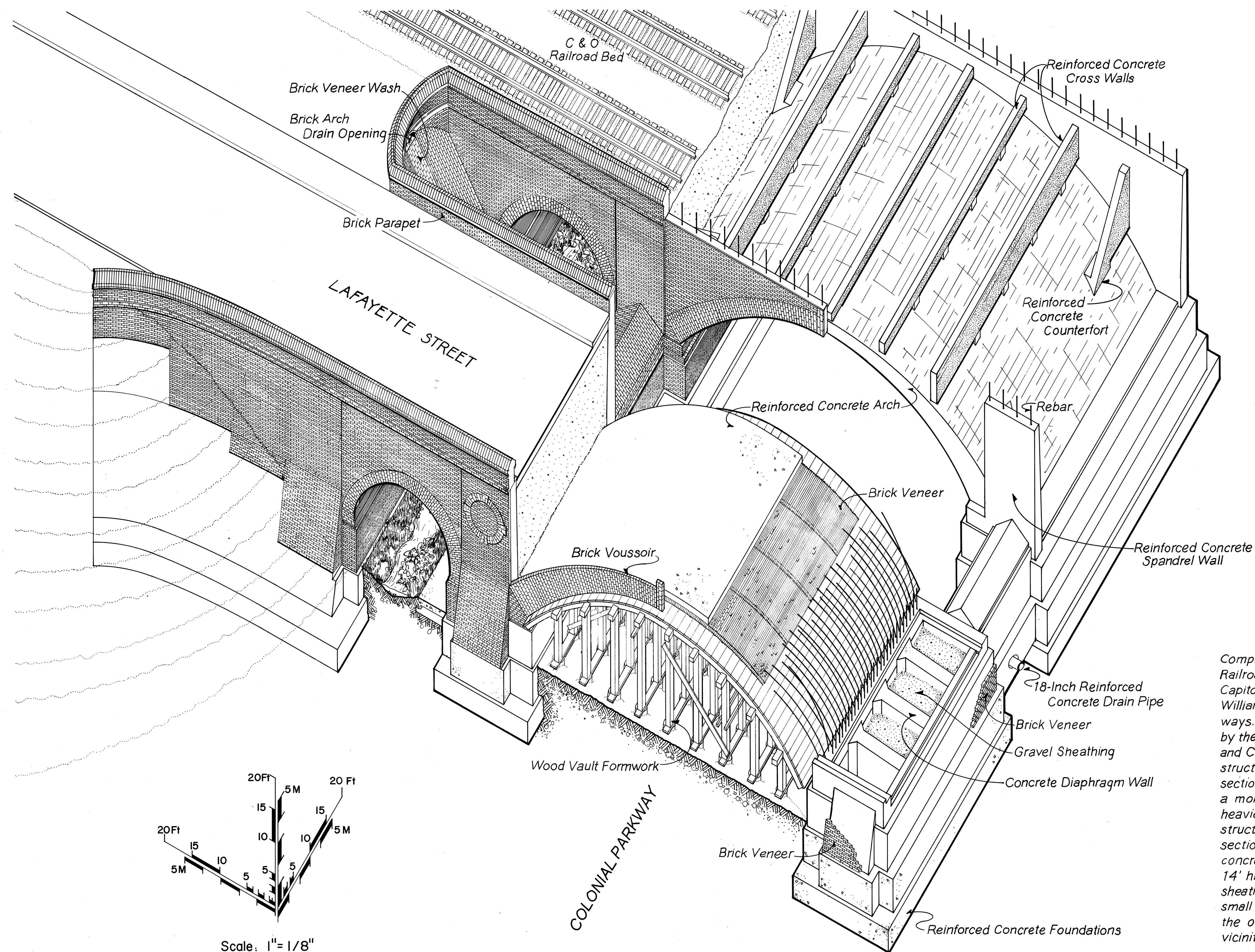
VIRGINIA

SHEET 1 OF 2

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 VA-48-C

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CONSTRUCTION ISOMETRIC



Completed in 1937, the Lafayette Street and C & O Railroad underpass was constructed along with the Capitol Landing underpass to provide an approach to Williamsburg without intersecting existing right-of-ways. Although considered two separate structures by the Federal Highway Administration, the Lafayette and C & O bridge is a single structure with different structural elements for the street and railroad sections. The northern section carrying the railroad is a more substantial structure to accommodate the heavier loads of railroad traffic. While the entire structure was built upon a 3'-6" base, the railroad section has an additional 12' of solid reinforced concrete to form its foundation, compared with the 14' high, 2' wide diaphragm walls filled with gravel sheathing for the road section. The bridge's relatively small dimensions and brick veneer harmonize with the overall design of the Colonial Parkway in the vicinity of Williamsburg. (See HAER No. VA-48-C)

DELINATED BY: Catherine Lee Dear, 1993 & Edward J. Lippak, 1997

COLONIAL NHP
ROADS & BRIDGES RECORDING PROJECT
UNITED STATES DEPARTMENT OF THE INTERIOR

YORKTOWN VICINITY

COLONIAL PARKWAY, C&O RR / LAFAYETTE ST. BRIDGE
MILEPOST 12.54 OF THE COLONIAL PARKWAY
YORK COUNTY

VIRGINIA

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