EAGLE LAKE BRIDGE
(Eagle Lake Road Bridge)
Acadia National Park Roads & Bridges
Spanning carriage road on Eagle Lake Road (Route 233)
Bar Harbor Vicinity
Hancock County
[redacted] Maine

HAER NO. ME-55

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

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

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HISTORIC AMERICAN ENGINEERING RECORD

EAGLE LAKE ROAD BRIDGE

HAER No. ME-55

LOCATION: Maine Route 233 (Eagle Lake Road), spanning carriage road connecting Eagle Lake and Witch Hole Pond carriage road loops at carriage post 6, 2 miles west of Bar Harbor, Acadia National Park, Mount Desert Island, Maine

Quad: Salisbury Cove, ME
UTM: 19/559460/4913850

DATE OF CONSTRUCTION: 1928

ARCHITECT: William Welles Bosworth, New York

ENGINEER: Paul D. Simpson, Seal Harbor, ME

CONTRACTOR: B. W. Candage & Sons, Seal Harbor, ME

STRUCTURE TYPE: Stone-faced reinforced concrete filled arch grade separation structure.

FHwA STRUCTURE NO.: 1700-012S

SIGNIFICANCE: The Eagle Lake Road Bridge provides a grade separation between its namesake road (now Maine Route 3) and a carriage road connector. Such structures help ensure traffic efficiency while eliminating the dangers of a grade level crossing. The Gothic or pointed arch bridge is one of only two such structures on the system. The widening of the bridge in 1974-75 won two national awards for the marvel technological feat which preserved the historic appearance of the bridge. The bridge is one of the most visible of the eighteen stone-faced bridges on the Rockefeller carriage road system, and is probably viewed by more Acadia park visitors than any other structure, due to its location just off the popular Eagle Lake Loop carriage road.

PROJECT INFORMATION: Documentation of the Eagle Lake Road Bridge is part of the Acadia National Park Roads and Bridges Recording Project, conducted in 1994-95 by the Historic American Engineering Record.

Richard H. Quin, Historian, 1996

This is one in a series of reports prepared for the Acadia National Park Roads and Bridges Recording Project. HAER No. ME-11, ACADIA NATIONAL PARK ROADS AND BRIDGES, is an overview history of the park motor road system.

HISTORY OF THE EAGLE LAKE ROAD BRIDGE

The Eagle Lake Road Bridge provides a grade separation between the Maine Route 233, the Eagle Lake Road connecting Bar Harbor and Somes Sound, and the Breakneck Ponds carriage road connector between the Eagle Lake and Witch Hole Pond loop carriage roads. The large stone-faced reinforced concrete structure was built for John D. Rockefeller, Jr. in order to restrict automobile traffic from accessing his extensive carriage road system. The bridge is one of two Gothic arched bridges on the carriage road system. (The other is Hemlock Bridge on the West Sargent Mountain Road.)

Rockefeller engaged New York architect William Welles Bosworth to design the structure. Bosworth, a graduate of the École des Beaux Arts in Paris, had designed the earlier bridges on the Rockefeller carriage road system, dating back to Cobblestone Bridge [HAER No. ME-31], built in 1915. Bosworth also designed the interior of the Rockefeller townhouse on New York City's West 54th Street, and the gardens for the family's country home at Pocantico Hills, New York.

For his contractor, Rockefeller selected the Seal Harbor firm of B. W. Candage & Sons. The Candages had worked on the Rockefeller carriage roads since 1910 and had built most of the earlier bridges. Their work was well-known to Rockefeller, though he disturbed that they routinely failed to complete their projects at their projected cost.

Construction of the bridge was necessary to carry the carriage road system to the north end of Mount Desert Island. The small connecting carriage road beside Breakneck Stream and Breakneck Ponds would link the Eagle Lake Loop carriage road, which circled the largest pond on the eastern half of the island, and the Witch Hole Pond Loop carriage road, a smaller circuit in wild terrain just west of Bar Harbor. The connecting road would have to cross the Eagle Lake Road, the principal cross-island route, and in order to eliminate a grade crossing, a bridge would be required. Rockefeller and his carriage road engineer, Paul Simpson, chose to have the county road (now a state route) borne across the carriage road on an impressive stone-faced bridge.

Planning for the bridge began in 1924. As Bosworth was in France, Rockefeller instructed Simpson to oversee a careful topographic survey of the site, including all levels, the width of the arch required, and the exact location of both roads.

Simpson was to ask Walters Hill, another local engineer who did extensive work for Rockefeller, to carry out the work, and to forward him the drawings, along with notes and suggestions. Rockefeller would then send the materials to Bosworth so that the design could be completed.[1]

Bosworth submitted plans for the bridge in 1926. The structure would feature a pointed or Gothic arch, a treatment previously employed on the 1924 Hemlock Bridge [HAER No. ME-34]. Pointed arches were considerably more difficult to construct than the semicircular arches employed on most of the other carriage road bridges, but the appearance would be especially dignified. The structure would feature parapet walls with openings or "reveals" to lighten the appearance of the heavy stone mass, and viewing platforms or "turrets" to enable pedestrians to look down on the carriage roads and Eagle Lake. Sam Candage estimated the cost of the structure at $48,000.[2]

On 26 October 1926, Welles Bosworth wrote Rockefeller, stating that he had studied his plans and thought it would be an improvement to provide more space around the arch. He was preparing new drawings for the revisions. As for the terminal points of the bridge, he proposed for the parapet walls to be carried, without openings, to points beyond the bridge. Simple rectangular posts or "curtails" would form the ends of the parapets; these, he suggested, would look "perfectly well." The viewing platforms would follow the slope of the bridge, as Rockefeller had suggested. Ashlar cut stone would "of course look finer" than boulder construction.[3]

On 1 November, Paul Simpson told Rockefeller that Bar Harbor town officials asked, through their engineer, Crockett, that the road be constructed to a 27' width, rather than 21' as originally planned. This would allow for the future widening of the road, as the officials intended for the road to become the chief artery

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[1]John D. Rockefeller, Jr., New York, to Paul D. Simpson, Seal Harbor, ME, 24 December 1924. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1217.

[2]"Bridges Built by B. W. Candage," MSS, 19 August 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1217.

[3]Welles Bosworth to John D. Rockefeller, Jr., 26 October 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1.

to the west side of Mount Desert Island. Although Simpson noted that the state bridge leading to the island (Trenton Bridge) was only 20' wide, he felt it might be well to plan for a wider bridge in order to meet future contingencies. Widening the bridge would not affect the design in any way, he stated, but it would add about $4,000 to the cost of construction. Because of the steep grade and high approaches, the widening would "add to safety and appearance."[4]

A week later, Rockefeller wrote back, stating that he was "not enthusiastic" about widening the bridge to 27'. He stated that "if the Bar Harbor people were paying for this bridge themselves, I do not for a moment believe they would suggest widening it at the additional cost of several thousand dollars." Since the bridge leading to the island was only 20' wide, he thought there was no need to build the new bridge wider than 21'. However, he left the decision to Simpson, Bosworth and Crockett to work out. He did indicate his concern about the height of the arch in the proposed plan. If the proposed 13' 6" height might not give adequate headroom for people on a coach, he would prefer raising the height to 16', which Simpson had indicated would be adequate for all carriages except possibly tallyhos.[5]

Work on the bridge was underway by 1927, and Rockefeller's estate superintendent at Seal Harbor, S. F. Ralston, who was supervising the project, indicated the structure was 40 percent complete in a June memorandum. Ralston warned Rockefeller's personal secretary, Charles O. Heydt, that Candage was, as usual, running over his cost estimates. Ralston had estimated that another $7,200 would carry the work to completion, but now thought at least $10,000 more would be required. He attributed the problems to poor management, stating "Mr. Candage does not get over 60¢ worth of labor for every dollar paid for labor." He urged Heydt to come to the island before the bridge was completed so that he could review the situation, stating that he (Ralston) was

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[4]Paul D. Simpson, Seal Harbor, ME, to Rockefeller, 11 November 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1.

[5]Rockefeller to Simpson, 8 November 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1. Tallyhos are large four-in-hand coaches, the name coming from *Tally-Ho*, a coach formerly plying between London and Birmingham.

"powerless" to get better results from Candage.[6]

On 6 August, Heydt presented the problem of the cost overruns to Mr. Rockefeller. Candage's estimate of $48,000 included 1,000 yards of excavation, 75 yards of blasting, and about 2,100 yards of fill material, most of which came from the bridge site. Rockefeller had replied stating that he assumed the figure included all of the masonry work in the bridge, all of the excavation, and all of the fill. He had also indicated the estimate was higher than had been expected, and suggested that Candage would be able to carry out the work for somewhat less. However, by 4 June, with the bridge less than half complete, Candage had already spent $48,439, a figure higher than the complete estimate. A. H. Lyman, a Bar Harbor attorney and chairman of a rump "road committee" set up by Rockefeller to ostensibly oversee the carriage road work, inspected the project in mid-June and reported to Heydt that he estimated another $12,900 would be required; however, this figure did not include any planting or landscape work. At the end of the month, Lyman advised Candage was still having problems, and another $3,700 would be required to finish the project. By now, the project was more than $16,000 over the cost of the original estimate.[7]

The bridge was completed in August, but the cost had risen again. On 24 August, Rockefeller wrote Candage, expressing his "unqualified satisfaction" with the structure. Not surprisingly, though, he chided Candage for the significant cost overrun.

> In all fairness, however, I must also register my disappointment at the cost, which I find is $67,500, with three or five thousand additional dollars of bills still to be paid, as compared with your estimate of January 18, 1927, of $48,000.[8]

On 10 December, Heydt reported the final cost of the structure

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[6]S. F. Ralston, Seal Harbor, ME, to Charles O. Heydt, New York, 23 June 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

[7]Heydt to Rockefeller, 6 August 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

[8]Rockefeller to Sam Candage, Seal Harbor, ME, 24 August 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

was $70,627.30, more than $22,000 over the original estimate.[9]

Following the completion of the bridge, Mr. Rockefeller enlisted noted landscape gardener Beatrix Farrand to offer some planting suggestions for the bridge site. In a 21 April 1928 letter to Rockefeller, then at Seal Harbor, she indicated she had not been asked to investigate the landscape work there, but merely offered some possible suggestions "in an unofficial capacity as an onlooker from the sidelines."

> It occurred to me the other day that the abutments of the bridge might look very well if framed, on the east side especially, by some rather large trees which might be set out approximately half or two-thirds of the way up the bank. It seems as though the effect would be attractive seen either from the upper or lower road. With my mind's eye I rather imagine maples and other deciduous trees would look nicely and possibly a few spruce mixed in on the lower slopes.[10]

Rockefeller wrote back on 11 May, thanking Farrand for her "gracious letter." Her suggestions, he told her, had led to several conferences at Seal Harbor. He asked her to consider allowing him to engage her professionally in consultation on the Eagle Lake and Bubble Pond bridge sites. He noted that he had repeatedly tried to engage her on contract before in connection with the landscape work, but that she had responded by undertaking the work while deferring any compensation. As this work was so important, he again asked her to provide a bill for services when she desired. However, he assured her, he would forget any "monetary obligation you are putting me under, and think only and always with pleasure and real appreciation of the friendly cooperation which you are giving on your own terms."[11]

Mrs. Farrand never submitted any bills for her work in connection with the carriage road system, though she had worked on the

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[9]Heydt to Rockefeller, 10 December 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

[10]Beatrix Farrand, New York, to JDR, Jr., 21 April 1928. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 Folder 738.

[11]Rockefeller to Farrand, 11 May 1928. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 Folder 738.

Rockefeller gardens under a standard contract. Her work with the carriage road work was a personal contribution to the project. Only some of Mrs. Farrand's advice in conjunction with the bridge plantings was apparently adopted, as the only mature trees framing the abutments on the south side are all evergreens. In July 1931, she suggested extra plantings in the triangle just south of the bridge (post 6).[12] Plantings on the north side of the bridge would have been disturbed in a subsequent widening project.

Mr. Rockefeller's refusal to adopt the wider width for the bridge as originally requested by the Town of Bar Harbor had predictable results. As motor traffic increased and larger trucks became common, the bridge's narrow width proved problematic. In the 1970s, the National Park Service and the Maine Department of Transportation [MDOT] agreed the bridge would have to be widened. Park Service officials and MDOT Commissioner Roger L. Maller determined the bridge was a significant historic feature and its appearance should be preserved. Working with the division office of the Federal highway Administration, engineers planned a widening project that would entail moving one of the side walls out, then filling in the gap with matching granite and fill. This would result in a widening of the deck from 22' to 34'.[13]

In August 1974, the MDOT awarded the widening contract to the Harold MacQuinn Construction Company of Hulls Cove, just west of Bar Harbor. MDOT required that the granite side wall of the bridge would have to be preserved or restored, but left the method of reconstruction up to the contractor. MacQuinn originally planned to dismantle the wall and re-erect it, piece by piece. However, as excavation proceeded, he determined the solidity of the construction would allow for a one-piece move. After consulting with Brackett Hill, a New Hampshire expert on moving stone buildings, and engineer Howard Fleming of South Portland, Maine, he decided to lift the wall from its foundation and move it outward on ball bearings resting on a steel track. This work was successfully carried out in 1974 and 1975. Massachusetts subcontractor Ed Monti was hired to burn through the granite with a torch, then crews drilled through the deck, allowing the wall to be separated from arch. Metal tracks were

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[12]Farrand, "John D. Rockefeller, Jr., Esquire - Road Notes, July 31, 1931." Rockefeller Archives Center, Offices of the Messrs Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 File 738.

[13]"Bridge Reconstruction Work Takes Top Prize in U.S. DOT Competition," *Bar Harbor* [ME] *Times*, 15 November 1977.

then laid on newly poured concrete forms, and the wall was lifted by jacks. It was then lowered onto bearings resting on the tracks and pushed 12' to its new position. Closely matching granite was then used to construct the intervening section of the arch underside or intrados, new fill was placed, and the deck was repaved.[14]

The bridge widening and reconstruction project won a first place prize in the U.S. Department of Transportation's annual contest, "The Highway and the Environment," in 1975. DOT recognized the project as an "outstanding example of sympathetic treatment of historic, cultural, or natural environment." Contractor MacQuinn subsequently won a top national award in the Build America competition sponsored by the Associated General Contractors of America and the Motorola Corporation.[15]

A June 1990 bridge safety inspection by the Federal Highway Administration indicated the structure was in good overall condition. Moderate amounts of efflorescence was detected on the stone arch wall faces, and transverse cracks were located at the abutments and the center line of the arch. In several places, the mortar joints were separated from the stone, and silt and gravel had accumulated along the edges of the parapet. However, no immediate rehabilitation work was recommended, except for sealing some cracks in the asphalt wearing surface.[16]

DESCRIPTION
The Eagle Lake Road Bridge is a stone-faced reinforced concrete filled arch grade separation structure. It measures 116' long and 34' wide, and is constructed on a 5 percent grade rising from

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[14]Ibid.; Associated General Contractors of Maine, "Widening Eagle Lake Bridge, Acadia National Park, Bar Harbor, Me," nomination for "Build America" award, 8 January 1976; Bob Morrison, Harold MacQuinn, Inc., Bar Harbor, ME to Bill Wadman, Associated General Contractors of Maine, Augusta, ME, 30 December 1975. Acadia National Park Library, vertical files, "Carriage Roads" file.

[15]"Bridge Reconstruction Work Takes Top Prize. . ."

[16]U.S. Department of Transportation, Federal Highway Administration. "Bridge Safety Inspection Report, Maine Rte. 233 Over Carriage Road, Acadia National Park, Str. No. 1700-012S, Inspected Jun 21 1990," (Sterling, VA: Federal Highway Administration, Eastern Direct Federal Division, 1990), 2, 5-6.

east to west. The bridge bears Maine Route 3, the Eagle Lake Road, over the Breakneck Ponds carriage road connector on a single Gothic or pointed arch. The arch is 26' wide and 17' high, and is defined by cut arch ring stones or voussoirs. The spandrel and wing walls of the bridge are constructed of ashlar cut granite coursed to follow the grade of the structure. To either side of the central arch are projecting viewing platforms or "turrets" on battered bases. The stone parapet or guard wall features regularly defined openings or reveals which lighten the heavy massed appearance of the bridge. Old evergreen trees on the south or Eagle Lake side of the bridge may be original plantings specified by Beatrix Farrand; the landscaping on the north side of the structure would have been disturbed by the 1974-75 widening.

BIBLIOGRAPHY

Federal Highway Administration Reports

U.S. Department of Transportation, Federal Highway Administration. "Bridge Safety Inspection Report, Maine Rte. 233 Over Carriage Road, Acadia National Park, Str. No. 1700-012S, Inspected June 21 1990." Sterling, VA: Federal Highway Administration, Eastern Direct Federal Division, 1990.

Correspondence

Bosworth, Welles, New York, to John D. Rockefeller, Jr., New York, 26 October 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1.

Farrand, Beatrix, New York, to John D. Rockefeller, Jr., New York, 21 April 1928. Rockefeller Archives Center, Offices of the Messrs Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 Folder 738.

Heydt, Charles O., New York, to John D. Rockefeller, Jr., New York, 6 August 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

--to Rockefeller, 10 December 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

Lynam, A. H., Bar Harbor, ME, to Charles O. Heydt, New York, 3 March 1928. Rockefeller Archives Center, Offices of the Messrs Rockefeller, Record Group 2, Homes (Seal Harbor), Box 74 Folder 763.

Morrison, Bob, Harold MacQuinn, Inc., Bar Harbor, ME to Bill Wadman, Associated General Contractors of Maine, Augusta, ME, 30 December 1975. Acadia National Park Library, vertical files, "Carriage Roads" file.

Ralston, S. F., Seal Harbor, ME, to Charles O. Heydt, New York, 23 June 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

Rockefeller, John D., Jr., to Sam Candage, Seal Harbor, ME, 24 August 1927. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1224.

--to Beatrix Farrand, New York, 11 May 1928. RAC, Offices of the Messrs Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 Folder 738.

--to Paul D. Simpson, Seal Harbor, ME, 24 December 1924. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121, Folder 1217.

--to Simpson, 8 November 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1.

Simpson, Paul D., to John D. Rockefeller, Jr., 11 November 1926. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 1.

Manuscripts

Farrand, Beatrix. "John D. Rockefeller, Jr., Esquire - Road Notes, July 31, 1931." Rockefeller Archives Center, Offices of the Messrs Rockefeller, Record Group 2, Homes (Seal Harbor), Box 72 File 738.

Ephemera

Associated General Contractors of Maine. "Widening Eagle Lake Bridge, Acadia National Park, Bar Harbor, Me," nomination for "Build America" award, 8 January 1976. Acadia National Park Library, vertical files, "Carriage Roads" file.

SECONDARY SOURCE MATERIALS

"Bridge Reconstruction Work Takes Top Prize in U.S. DOT Competition," *Bar Harbor* [ME] *Times*, 15 November 1977.

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Maine

JET LOWE, PHOTOGRAPHER, SEPTEMBER 1994

ME-55-1	SOUTH ELEVATION, FACING N
ME-55-2	ARCH DETAIL FACING N
ME-55-3	3/4 VIEW OF N FACADE, FACING SW
ME-55-4	VIEW OF PARAPET/DECK, FACING NW

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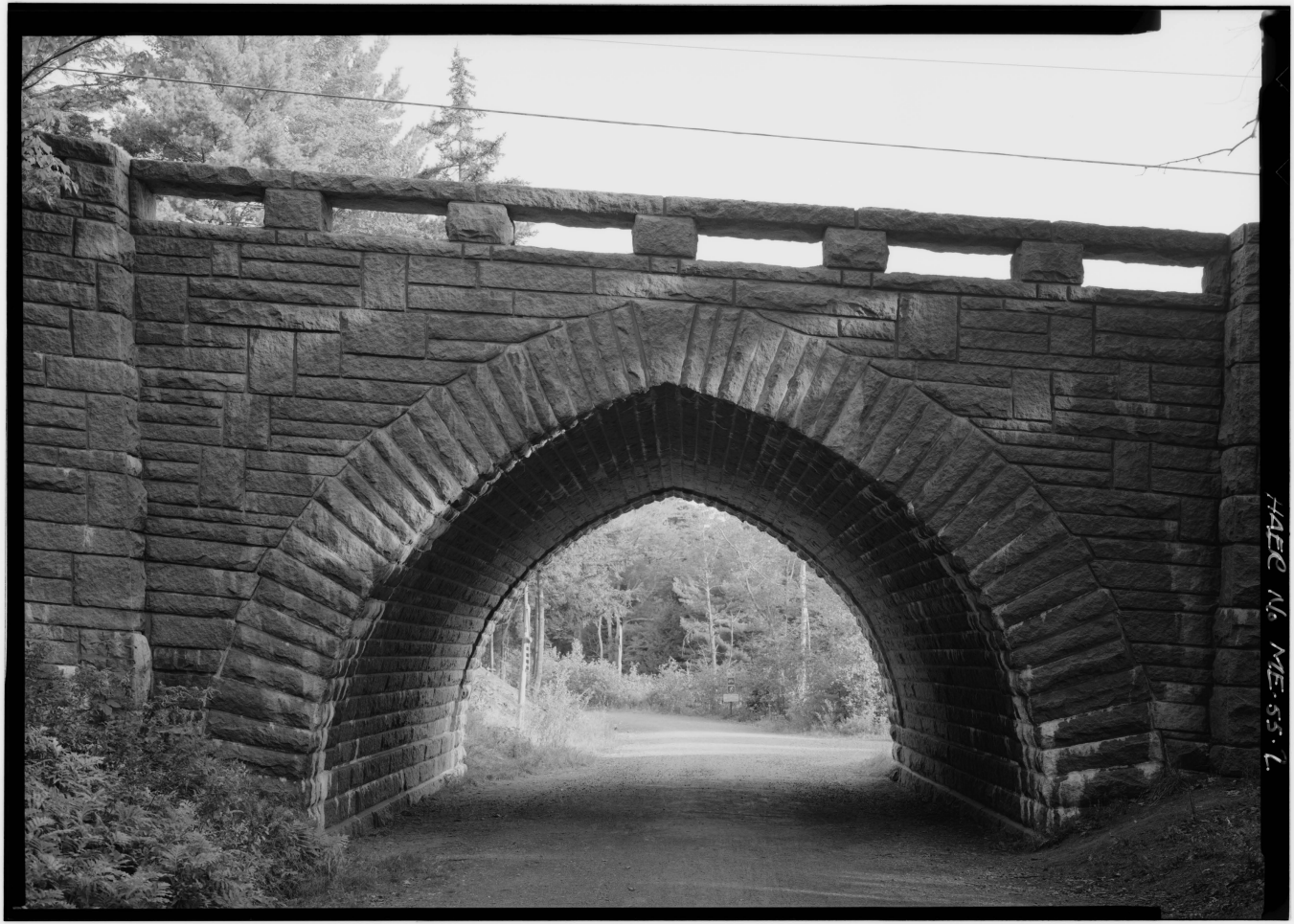
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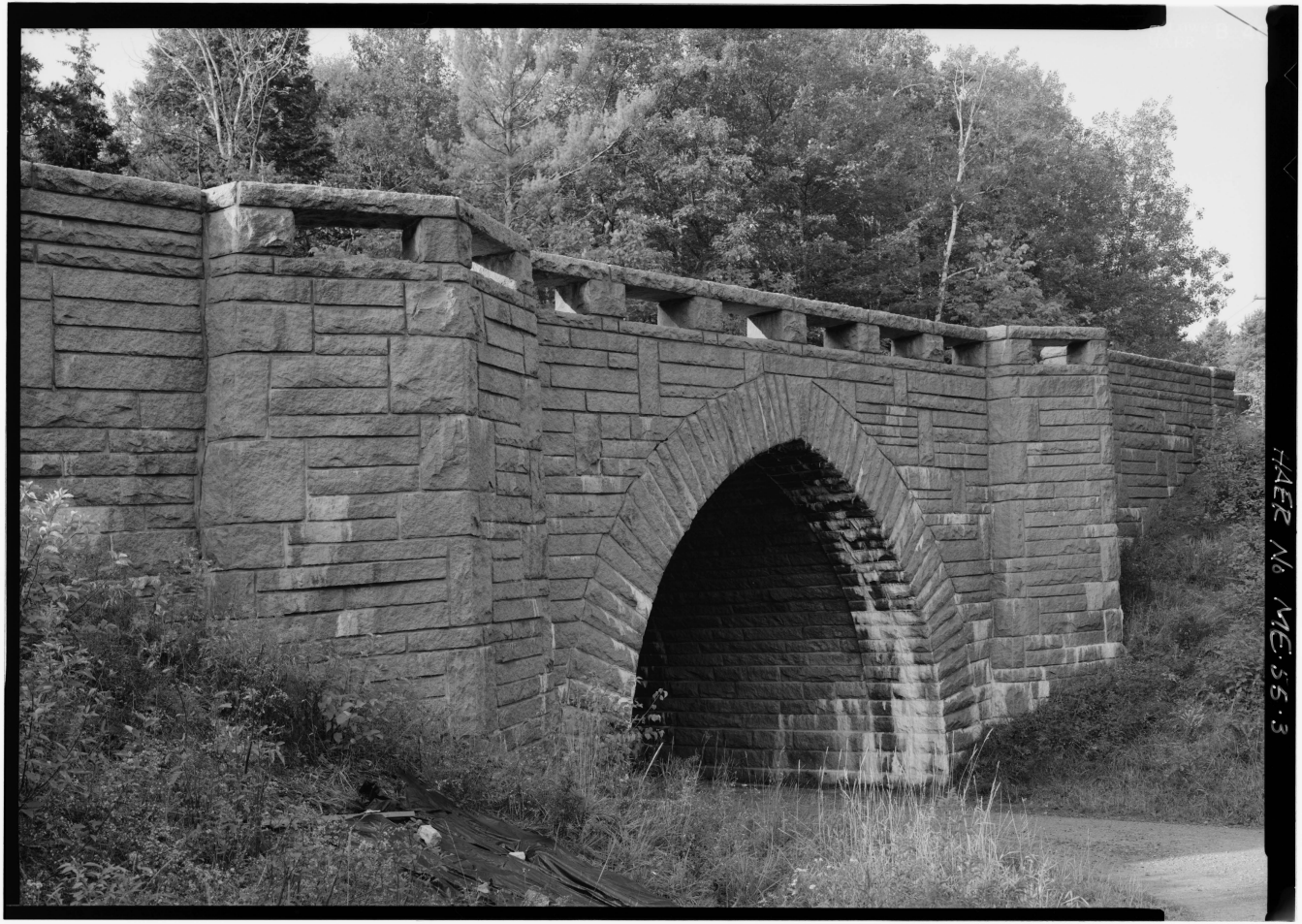
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