

ROGERS RANGERS MEMORIAL BRIDGE
Carries Route 2 over the Connecticut River between
Lancaster (New Hampshire) and Guildhall (Vermont).
Lancaster
Coos County
New Hampshire

HAER No. NH-56

PHOTOGRAPHS

WRITTEN AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
1234 Market Street, 20th floor
Philadelphia, PA 19107

HISTORIC AMERICAN ENGINEERING RECORD

ROGERS RANGERS MEMORIAL BRIDGE

HAER No. NH - 56

Location: Spanning the Connecticut River between Lancaster, Coos County, New Hampshire and Guildhall, Essex County, Vermont.

Latitude: 44.49616 N, Longitude: 71.5944W (NAD83). Datum at approximate center of bridge, obtained 31 January 2019, using USGS TopoView online mapping with +/- 12 meters accuracy. Bridge location has no restriction on its release to the public.

**Present Owner/
Occupant:** New Hampshire Department of Transportation.

Present Use: Highway bridge.

Significance: Constructed in 1950, the Rogers Rangers Memorial Bridge is one of four remaining riveted polygonal Pratt truss bridges, sometimes called a Parker Truss, spanning the Connecticut River between Vermont and New Hampshire. One other Parker Truss bridge survives in New Hampshire, along with ten others in Vermont. Only one other two-span Parker Truss survives in the two states, spanning the Connecticut River between Lyme, New Hampshire, and Thetford, Vermont.

Rogers Rangers Memorial Bridge continues the use of an important river crossing established in 1790 along a route that became the country's northernmost east-west federal highway. The bridge is importantly associated with the history of local transportation and community development. In 2013 the property was determined eligible for listing in the National Register by the New Hampshire State Historic Preservation Officer under Criteria A and C.

Historian: Richard M. Casella, Historic Documentation Company, Inc., June 2018.

**Project
Information:** This documentation was prepared by Historic Documentation Company Inc. (HDC), Portsmouth, RI, for the New Hampshire Department of Transportation (NHDOT). The documentation fulfills a requirement of a Memorandum of Agreement among the Federal Highway Administration, the NHDOT, the Vermont Agency of Transportation, and the New Hampshire State Historic Preservation Officer dated 24 May 2017. The report was written and compiled by Richard M. Casella, Engineering Historian, Historic Documentation Company, Portsmouth Rhode Island. The large format black and white film photography was completed by Rob Tucher Photographic Documentation, High Bridge, New Jersey.

Part I. Historical Information

A. Physical History:

1. Date(s) of construction: 1950.

2. Engineer: New Hampshire Highway Department (NHHD), Ralph R. Kenney and Alfred M. Whittemore. Kenney started employment with the NHHD in the 1920s, Whittemore started in the 1930s. The men were staff engineers in the department which grew from approximately twelve engineers in the 1920s to over thirty-five in the 1930s. No additional biographical or career information pertaining to Kenney and Whittemore was obtained.

3. Contractor/Fabricator: W. H. Hinman Co. of North Anson, Maine, won the contract for construction of the bridge in January 1950 with a low bid of \$261,000. Hinman contracted the fabrication of the bridge's steel truss superstructure to American Bridge Company of New York. American Bridge prepared shop drawings in March 1950 in their Trenton, New Jersey, plant; fabrication was done at their Elmira, New York, plant.

4. Original plans and construction: Ten sheets of engineering drawings (NHDOT File No. 2-10-1-1) were drawn by NHHD draftsman Lester W. Holt between 1944 and 1946. The project was approved for Federal Aid funding and assigned Federal Aid Project number F-297(1) and State Project number P-2038. The original plans are in archival storage accessible by arrangement at NHDOT Bridge Design, Concord, New Hampshire. The plans are described as follows:

Sheet 1 of 10, "General Plan & Elevation," January 1946.

Sheet 2 of 10, "Survey Plan & Profile," January 1946.

Sheet 3 of 10, "Borings," November 1945.

Sheet 4 of 10, "Borings," November 1945.

Sheet 5 of 10, "Borings," November 1945.

Sheet 6 of 10, "Abutments," December 1945.

Sheet 7 of 10, "Concrete Pier," November 1945.

Sheet 8 of 10, "Plan & Elevation of Truss," April 1944.

Sheet 9 of 10, "Superstructure Sections & End Dams at Abut's," April 1944.

Sheet 10 of 10, "Slab Reinforcement, Pier End Dam, Shoes," April 1944.

In addition there are twenty-one American Bridge Company drawings for the bridge stored at NHDOT with the original NHHD drawings.¹

The original overall appearance of the bridge and its appearance today are essentially the same. The most visible change has been the addition of a sidewalk cantilevered off the north side of the bridge outside of the trusses designed with a wood deck for use by snowmobilers. Originally a 30" wide section of steel open grid floor ran along each side of the roadway next to the curbs to facilitate drainage; the grids sections have been removed and replaced with concrete slabs.

¹ American Bridge Co. Shop Drawings, NHDOT File No. 2-10-1-1. There are twenty shop drawings that provide exact dimensions including rivet hole layout for all the truss members. An additional sheet entitled "Erection Diagram" provides member layout and truss assembly instructions.

Rogers Rangers Bridge is a two span riveted steel through truss highway bridge on reinforced concrete substructures. The bridge is 404' long by 34.8' wide overall, with a maximum truss height of 36'. The trusses are of the polygonal Pratt type with straight bottom chord and a segmentally arched top chord, sometimes referred to as a Parker truss. The two truss spans are identical, each 198' in length between bearing pins, with a total of nine panels 22' wide. A more detailed description is provided below in Part II, B.

5. Alterations and additions: In 1956 the bridge was repainted by New Hampshire Highway Department forces with 154 gallons of zinc primer, 280 gallons of sage green top coat paint and four gallons of white paint for the guardrail, at a total cost of \$6,779.91.

Plans show a 30" wide section of steel open grid floor along each side of the slab next to the curbing to facilitate drainage; these grids sections have been removed and replaced with concrete slabs; the date of this alteration was not determined.

In 1995 a steel-framed sidewalk with a laminated wood floor was attached to the north side of the bridge, cantilevered on steel wide-flange (WF) beams resting on the lower chord member and bolted to the outside stringer. Timber retaining walls were constructed adjacent to the abutments to accommodate the sidewalk approaches.²

No information regarding Vermont's involvement in the alterations and additions, if any, was located.

B. Historical Context: Lancaster was chartered in 1763 and settled in 1764. About 1790 the first bridge in Lancaster was built over Israel River, just north of the Town Common where a meeting house was erected at roughly the same time. Also in 1790, charters for three ferries across the Connecticut River were granted by the legislature, including one to Major Jonas Wilder who established a crossing on his farm in approximately the location of the present Rogers Rangers Bridge. In 1804 Wilder transferred his rights to the Lancaster Bridge Company who built a toll bridge across the river in the same location. The nature of this first bridge is not known, but sometime prior to 1844 a covered toll bridge of continuous Howe Truss design was built on the site. The toll was removed in 1895 and the bridge stood until 1901 when it was so damaged by log jams that it had to be replaced. The replacement bridge erected in 1902 was also a covered wood truss similar in design to its predecessor. It stood until 1950 when it was demolished to make way for the Rogers Rangers Bridge. The original plans for the bridge and photos of the construction of Rogers Rangers Bridge in 1950 show that the covered bridge was located less than twenty feet downstream of the new bridge.

The area of Guildhall, Vermont was first documented by Captain Peter Powers in 1754 evidently in the course of investigating established travel and crossing routes along the upper Connecticut River. Five years later Major Robert Rogers and his Rangers crossed the river near the bridge while fleeing Abernaki warriors during their retreat from their raid on St. Francis, Quebec.

² See NHDOT Plan File 63-3-2: Federal Aid Transportation Enhancement Program – Bridge Enhancement Project – Sidewalk Attachment. Federal Project No. STP-TE-X-000S(164); NH Project No. 12280.

Guildhall was chartered in 1761 and settled by proprietors of the grant from New Haven County, Connecticut, by 1764. A small village grew around Guildhall Falls where a grist and saw mill were established in 1786 and an assortment of other industries including a carding mill, distillery and brick yard by 1800. Lancaster, however, grew at a much faster pace than Guildhall, becoming the seat of Coos County, created in 1803.

The route over the Connecticut River between Lancaster and Guildhall, first by ferry and then bridge, became an important link in a trail and road system that extended from Maine into New Hampshire through Gorham, along sections of the Androscoggin River north of the White Mountains, through Jefferson to Lancaster. In Vermont the trail continued to St. Johnsbury, Montpelier, Burlington and north to the Canadian border where it crossed into New York at Rouses Point. By the early nineteenth century sections of this important series of paths that joined coastal Maine to Montreal, Canada, were being improved, in some cases as private turnpikes. In 1805, for example, the Winooski Turnpike opened between Montpelier and Burlington, along what is now US Route 2.

Planning for the Rogers Rangers Bridge began in 1940 with a survey made by New Hampshire Highway Department (NHHD) surveyor N. Cricenti. Located on US Route 2, the bridge was eligible for Federal Aid funding, but with the onset of World War II nearly all bridge projects were put on hold. Designing the bridge was postponed during the war until February 1944 when NHHD engineers Ralph R. Kenney and Alfred M. Whittemore were assigned the project and began design work as noted above. Original plans and records of calculations and material estimates do not indicate that the Vermont Highway Department participated in the design of the bridge.

The project was further delayed apparently due to the structural steel shortage following World War II; this shortage hampered many New Hampshire bridge projects requiring large quantities of war-critical materials including steel and concrete.

In January 1950, W. H. Hinman Company of North Anson, Maine, was awarded the construction contract for their low bid of \$261,000. This amount was roughly seven percent more than the estimate prepared for the project by the New Hampshire Highway Department. Based on the estimated project cost of \$242,560.97, the Federal Aid contribution was to cover roughly 50 percent of the total and with New Hampshire and Vermont paying 78.5 percent and 21.5 percent of the remainder, respectively.³ It was not determined how the additional costs were split.

Fabrication of the superstructure by American Bridge Company was done at their Elmira, New York, plant in the spring of 1950. The contractor began construction of the bridge in May 1950 under the supervision of W. H. Hinman, Jr. New Hampshire Highway Department engineer Rolland McMurphy served as Resident Engineer.

The August 1950 issue of *New Hampshire Highways* reported on the progress of the bridge's construction, noting that the contractor had "licked the worst of their problems... with the pouring of the concrete pier. The presence of large boulders in the sandy river bed presented difficult problems in unwatering the cofferdam. An underwater seal was finally poured and the pier

³ "Revised Estimate for Project Agreement, FA Project No. F297(1)." Typed document located in New Hampshire Department of Transportation Archives Box 150152. New Hampshire Department of Transportation, Concord.

completed."⁴ The base of the pier was set 13 feet below river level and carried on 48 end-bearing steel H-piles. The wooden form for the pier was roughly 60' wide, 12' deep and 20' high. The form was constructed in one piece on the Vermont shore and then lifted by a crane mounted on a floating barged and lowered into the steel cofferdam.

The bridge was opened to traffic November 27, 1950. In December, NHHD Division Engineer Harford Nay of Lancaster announced that the Department was seeking public opinion for a name for the new bridge to be assigned at a formal dedication in 1951.

Dedication ceremonies officially opening the new bridge were held at the bridge on August 18, 1951. In attendance were New Hampshire Governor Sherman Adams, the principal speaker, and Vermont Highway Commissioner Paul Gates representing Governor Lee Emerson.⁵ The bridge was named the Rogers Rangers Memorial Bridge, in honor of Major Robert Rogers who led 200 Rangers on the famous campaign in 1759 to destroy the Abernaki Indian settlement at St. Francis Quebec. The raid was punishment for the Abernaki's continual raids into the Connecticut River Valley to kill and kidnap English settlers. Rogers' destruction of St. Francis is regarded as the pivotal event in bringing security to the Connecticut River Valley and enabling the settlement of the towns along it.⁶ A plaque was erected on the New Hampshire side dedicating the bridge as the Rogers Rangers Memorial Bridge with a brief history; unfortunately the plaque was stolen some years ago.⁷

Part II. Structural/Design Information

A. General Statement:

1. Character: A Pratt truss with a polygonal top chord was chosen as the most cost-effective bridge type for the site. The Pratt is a quadrilateral truss (four-sided panels) with vertical posts in compression and diagonals in tension. The type was invented and patented by Thomas Pratt in 1844 and is generally referred to by engineers as a Pratt truss with a polygonal top chord or as a polygonal Pratt truss. The polygonal top chord is composed of all straight structural members. The Parker truss, as bridge historians often refer to the polygonal Pratt, is named after Charles H. Parker who re-introduced the type in the 1870s after Pratt's patent expired. Parker added some patentable features and popularized its use. The term Parker Truss best suits the several patent trusses actually built by Parker, a few of which survive today. However, the name Parker Truss is commonly used among historians for the polygonal Pratt truss.

The Pratt design and its variations proved well-suited to all-metal bridge trusses. The truss was easily structurally analyzed by either the graphic or the mathematical methods that were developed by 1850. Structural analysis permitted the stresses in each member to be calculated under various conditions of loading and led to the development of the polygonal form in which the height of the panels increased toward the center of the span where the stresses are highest.

⁴ *New Hampshire Highways*, August 1950, p. 6.

⁵ For more details on the opening ceremony see *New Hampshire Highways*, September 1951, p. 8.

⁶ For a history of Rogers Rangers St Francis Raid see Parkman, 1922, pp. 263-269.

⁷ According to Barbara Robarts, Director, Weeks Memorial Library, Lancaster, NH, personal communication, January 9, 2013.

The increased use of Bessemer steel for bridge building in the United States in the 1890s increased the use of the Pratt truss, which was well adapted both to pin-connected and riveted spans.

The polygonal Pratt truss (Parker Truss) proved to be an economical design, and after the expiration of Parker's patents 1887 they were "widely built for both highway and railroad service."⁸ The Parker truss was economical for spans exceeding 200 or 250 feet and by 1904 had been built with a span that exceeded 400 feet.

By 1900, truss bridges with all-riveted connections, a superior design in widespread use in Europe at the time, were finding increasing acceptance with American railroad engineers. Riveted connections provided a stiffer bridge and allowed for greater distribution of stresses at the joints and a subsequent savings in metal costs. The introduction of the portable air-powered riveting gun in the early part of the century allowed for the field assembly of riveted connections, eliminating the expensive and high maintenance pin-connected joints. By the 1920s riveted connections had replaced pin connections as the primary method of metal truss bridge construction in the U.S.

Of the ten Parker Truss bridges that have been built in New Hampshire, five survive. The first was a 170' span truss over the Merrimack River between Boscawen and Canterbury built 1907, demolished 2013. In 1926 a single 200' span Parker Truss was built over a branch of the Connecticut River, wholly located in Hinsdale and still in service. Following the severe floods in November 1927 that affected Vermont and northwestern New Hampshire, three Parker Trusses of single 220' and 240' spans replaced bridges destroyed over the Connecticut and Ammonoosuc Rivers; all have been replaced. The longest span built in the state was the 305' McIndoes Road Bridge built 1930 over the Connecticut River from Monroe to Barnet, Vermont, rehabilitated in 2000 and presently in service. Two more Parker Trusses were built over the Connecticut River following the Great Flood of 1936: Barnet Road Bridge, a 264' span from Monroe to Barnet, Vermont, and Thetford Road Bridge, a 232' span from Lyme to Thetford, Vermont. Both bridges remain in service.

In Vermont, many examples of the Parker Truss bridge type were built following the devastating 1927 flood.⁹ Of the thirteen that could be identified as dating from 1928, 1929 or 1930, ten survive of which at least four have been rehabilitated: Bridge 9 in Sheldon over Missisquoi River; Bridge 29 between Berlin and Middlesex, Bridge 5 in Montpelier, and Bridge 31 between Waterbury and Duxbury, all over the Winooski River. The other surviving bridges are Bridge 12 in Enosburg over Missisquoi River, Bridge 27 in Fairfax over Lamoille River, Bridge 3 between Richford and Canada over Missisquoi River, Bridge 15 in Bethel, Bridge 31 in Royalton and Bridge 15 in Sharon, all over the White River.

The final Parker Truss built in either Vermont or New Hampshire was the subject Rogers Rangers Memorial Bridge built 1950. Technologically, the bridge is significant in that it marks

⁸ Mansfield Merriman and Henry S. Jacoby, *A Text-Book on Roofs and Bridges. Part I. Stresses in Simple Trusses*, sixth ed. (New York: John Wiley and Sons, 1908):212.

⁹ Robert McCullough, *Crossings, A History of Vermont Bridges*. (Barre, Vermont: Vermont Historical Society, 2005): 117.

the end of the period of practical use of the riveted Parker Truss type. After World War II deck girder spans of continuous and welded design achieved span lengths in the 200-400 foot range more economically than trusses which were labor intensive to erect and more costly to maintain.

2. Condition of fabric: In 2011 a comprehensive structural inspection of the bridge was performed and revealed advanced deterioration of the truss bottom chord and the floor system members, cracking and spalling of the concrete bridge deck, and several other deficiencies. The bridge is currently on the NHDOT's Red List of bridges, with the deck, superstructure and substructure all rated in poor condition. Overall the bridge has a Federal Sufficiency Rating of 33.1 as of April 2018.

B. Description: The bridge is 404' long by 34.8' wide overall, with a maximum truss height of 36'. The trusses are of the polygonal Pratt type with straight bottom chord and a segmentally arched top chord, sometimes referred to as a Parker Truss. The two truss spans are identical, each 198' in length between bearing pins, with a total of nine panels 22' wide. Truss members are both built-up riveted members and single rolled members. Top chords and inclined end-posts are built-up members consisting of 15" x 40 pounds per lineal foot (p.l.f.) channels joined back-to-back with 21" wide cover plates on top and tie plates on the bottom. Bottom chords are built-up members also consisting of 15" x 40 p.l.f. channels, joined back-to-back with 14" wide top and bottom tie plates. The bottom chord channels in the center panel increase in weight to 50 p.l.f. The channels are reinforced with 14" x 7/16" supplemental side plates. Posts consist of rolled 12" x 8" x 40 p.l.f. wide-flange (WF) beams except posts 3 and 8 which are 65 p.l.f. Diagonals in panels 2, 3, 8, & 9, are 12" x 10" x 53 p.l.f. WF beams, and in panels 4, 5, & 6 are 12-1/8" x 6-1/2" x 31 p.l.f. WF beams. A horizontal tie beam consisting of two 5" x 3-1/2" angles connects posts 4 and 5 in panel 4, and posts 6 and 7 in panel 6. Upper and lower lateral braces, sway braces and portal bracing all consist of angle members.

The bridge retains its original floor system consisting of 36" x 194 p.l.f. WF floor beams except the end beams which are 160 p.l.f. Stringers are 18" x 50 p.l.f. WF beams spaced 3'-10" on center. The floor is a 7-1/2" thick reinforced concrete slab with bituminous overlay. An original 30" wide section of steel open grid floor along each side of the floor slab next to the curbing has been removed and replaced with reinforced concrete. The curbs are rolled steel with built in scuppers for drainage. On each side of the roadway inside the trusses are narrow 30" wide sidewalks with original steel grid floors. Railings consist of two lines of channel members, the lower is built-up with angles and plate, the upper is a rolled section. A builder's plate is located on the endpost at the New Hampshire end and reads: AMERICAN BRIDGE COMPANY 1950.

The superstructure rests on straight concrete abutments and a single solid concrete pier, all of which are carried on steel H-pilings according to the original drawings. The concrete base of the pier was poured in a steel sheet pile cofferdam, the lower portion of which was left in place. The upstream and downstream faces of the pier are rounded; the upstream faces is also battered.

A steel-framed sidewalk with a laminated wood floor is attached to the north side of the bridge, cantilevered on steel wide-flange beams resting on the lower chord member and bolted to the outside stringer. Timber retaining walls extend from the north side of the abutments to accommodate the sidewalk approaches.

C. Mechanicals/Operation: Not applicable.

D. Site Information: The bridge carries two lanes of US Route 2 in an east-west direction over the Connecticut River between the towns of Lancaster, New Hampshire, and Guildhall, Vermont. The Connecticut River is roughly 250' wide where the bridge spans it at a height of 20'. The area immediately surrounding the bridge is flat with open fields with trees along the edges of the river and fields. The area is lightly developed with residential and commercial uses widely spaced on both sides of the river. Two farm properties on the Vermont side in the vicinity of the bridge date prior to 1900.

Part III. Sources of Information

A. Primary Sources:

Coos County Democrat [Lancaster N.H.] Microfilm. In Weeks Memorial Library, Lancaster.

———. "Start Work Soon for Bridge and Pipeline." April 26, 1950.

———. "Progress on Construction Projects." May 10, 1950.

———. "Old Covered Bridge Sold For One Dollar." June 11, 1950.

———. "The Old Covered Bridge is Going." August 16, 1950.

———. "New Bridge Over Connecticut River Opened to Traffic Monday." November 29, 1950.

———. "Have You a Name for the New Bridge?" December 20, 1950.

———. "Invite Governors to Attend Bridge Dedication." August 8, 1951.

———. "Rogers Rangers Bridge is Dedicated." August 22, 1951.

New Hampshire. *Sixth Biennial Report of the State Department of Highways*. Concord: 1917, pp. 3, 4, 121-123. In New Hampshire State Library (NHSL), Concord.

New Hampshire Bridge Commissioners. *Report of the Bridge Commissioners of the State of New Hampshire to the Legislature, Dec. 31, 1906*. Manchester [N.H.]: John B. Clarke Co., 1906.

New Hampshire Department of Transportation. Bridge Card and Inspection Files: Lancaster 111/129. In NH Department of Transportation (NHDOT), Bridge Design, Concord.

———. Original plans. File No. 2-10-1-1. In NHDOT, Bridge Design, Concord.

New Hampshire Department of Public Works and Highways. *Annual Report*. 1958, pp. 49, 53. In NHSL, Concord.

New Hampshire Highways. "Bridge Program – 1950." February 1950, p. 4. In NHSL, Concord.

———. "Review of Highway Construction Progress." August 1950, p. 4.

———. "New Bridge." June, 1951, p. 9.

———. "Rogers Rangers Memorial Bridge." September 1951, p. 8.

Storrs Historic Photograph Collection. In New Hampshire Division of Historical Resources, Concord.

B. Secondary Sources:

Hurd, D. Hamilton, Ed. *The History of Cheshire and Sullivan Counties, New Hampshire*. Philadelphia: J. W. Lewis & Co., 1886.

Lancaster Bicentennial Committee. *Two Hundred Years, A Bicentennial Sketch Book, Lancaster, New Hampshire 1764-1964*. Lancaster: Democrat Free Press, 1964.

McCullough, Robert. *Crossings, A History of Vermont Bridges*. Barre, Vermont: Vermont Historical Society, 2005.

Merrill, G. D. *History of Coos County, New Hampshire*. Syracuse [NY]: W. A. Fergusson, 1888.

Parkman, Francis. *Montcalm and Wolfe. France and England in North America*. Vol. 2. Boston: Little, Brown, and Co., 1922.

Somers, Rev. A. N. *History of the Town of Lancaster, N.H.* Concord: Rumford Press, 1899.

C. Likely Sources Not Yet Investigated: None known.

APPENDIX A: SUPPLEMENTAL GRAPHICS

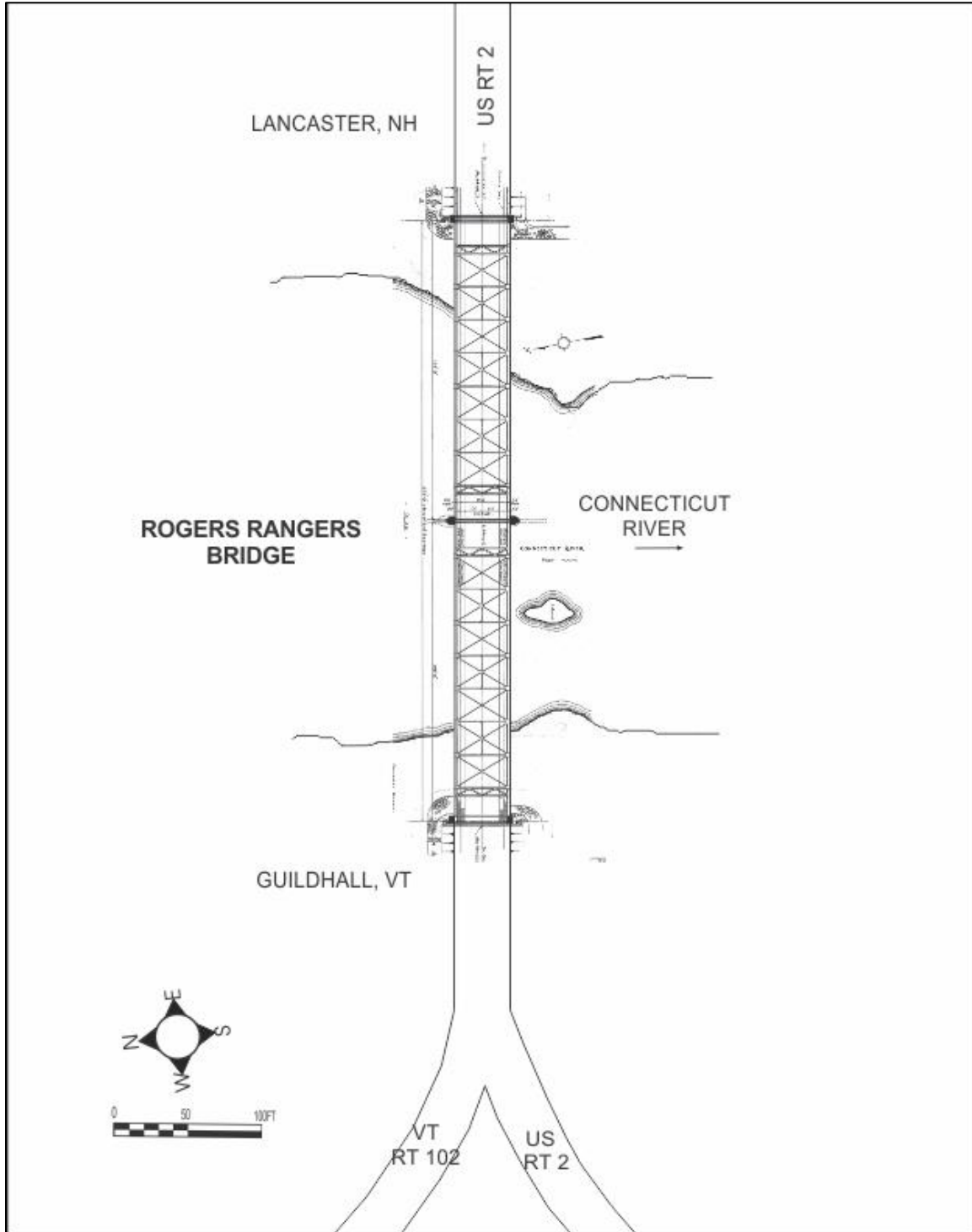


FIGURE 1: Site Sketch. Source: NHDOT, Original Plans.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)



FIGURE 2: Covered bridge, built before 1844, replaced in 1901-1902 (photo circa 1890-1900). Caption reads "The combination of high water and log drives in the spring was hard on the Connecticut River bridges. Jams like this one damaged this bridge so badly in the 1890s that it was replaced in 1901 by another." Source: Lancaster Bicentennial Committee, 1964.



FIGURE 3: Photograph dated October 2, 1922, of covered bridge, built 1901-1902, demolished and replaced in 1950 with Rogers Rangers Bridge. Source: Storrs Photograph Collection, New Hampshire Division of Historical Resources.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)



FIGURE 4: Photograph, July 1950, from Vermont side, showing construction of steel sheet-pile cofferdam for concrete pier, and existing covered bridge on downstream side. Note pier formwork prebuilt on New Hampshire side and white stake in foreground marking south corner of west abutment. Source: *New Hampshire Highways*, August 1950.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)

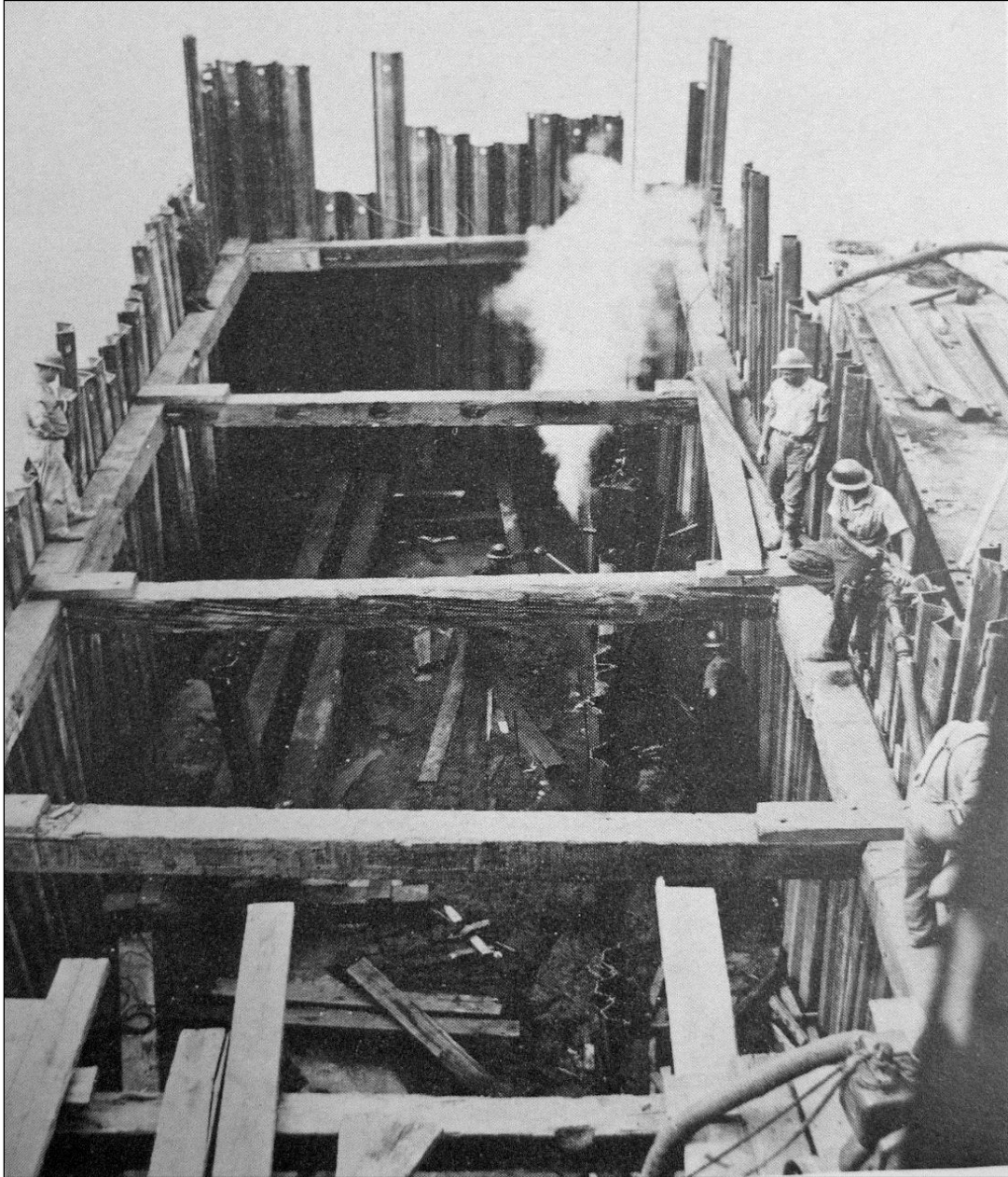


FIGURE 5: Photograph, ca. July 1950, showing construction and dewatering of steel sheet-pile cofferdam for concrete pier. Source: *New Hampshire Highways*, June 1951.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)

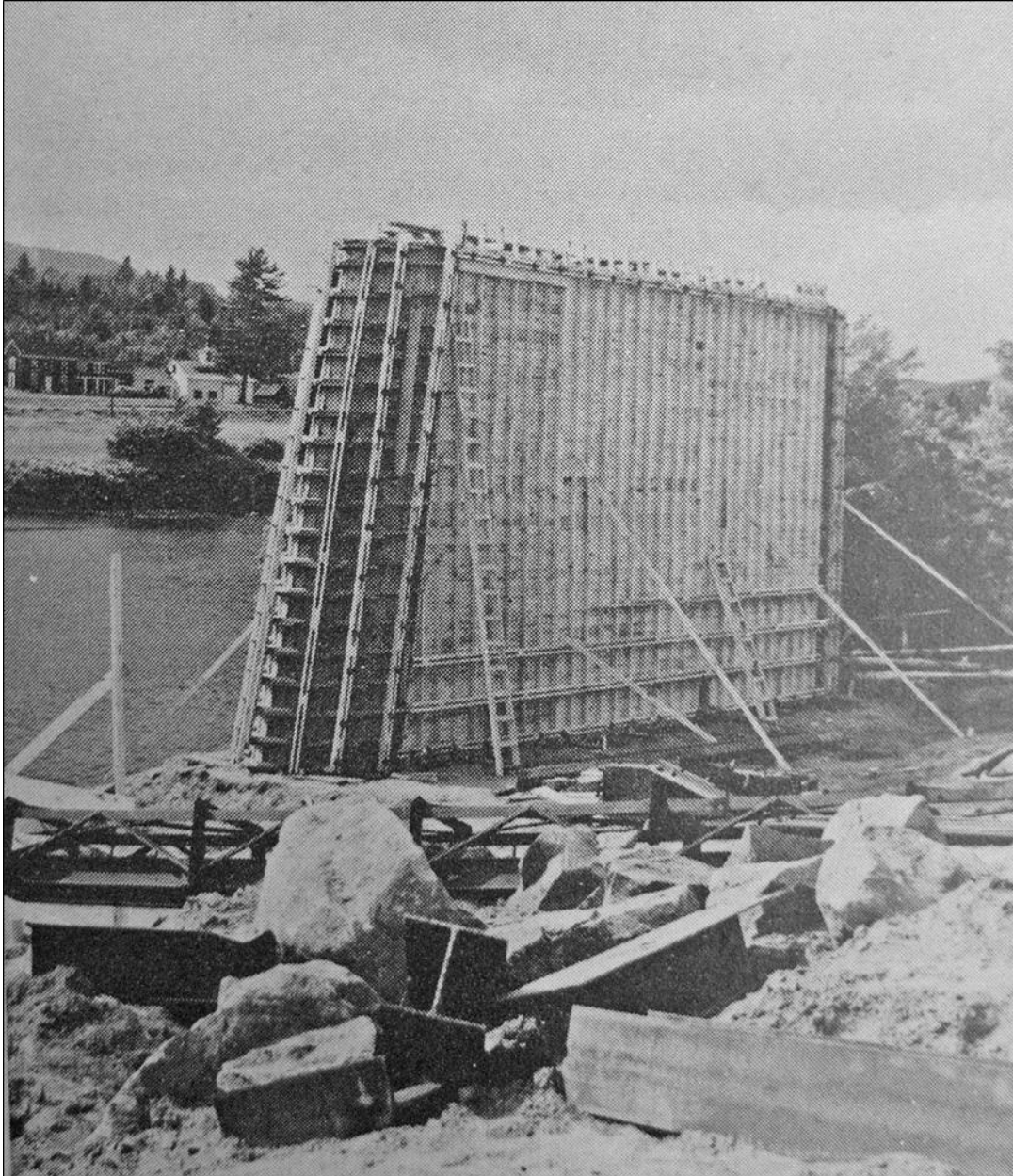


FIGURE 6: Photograph, July 1950, showing formwork for concrete pier prebuilt on New Hampshire side. The completed form was lifted by a floating crane and lowered into the excavated cofferdam. Source: *New Hampshire Highways*, August 1950.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)

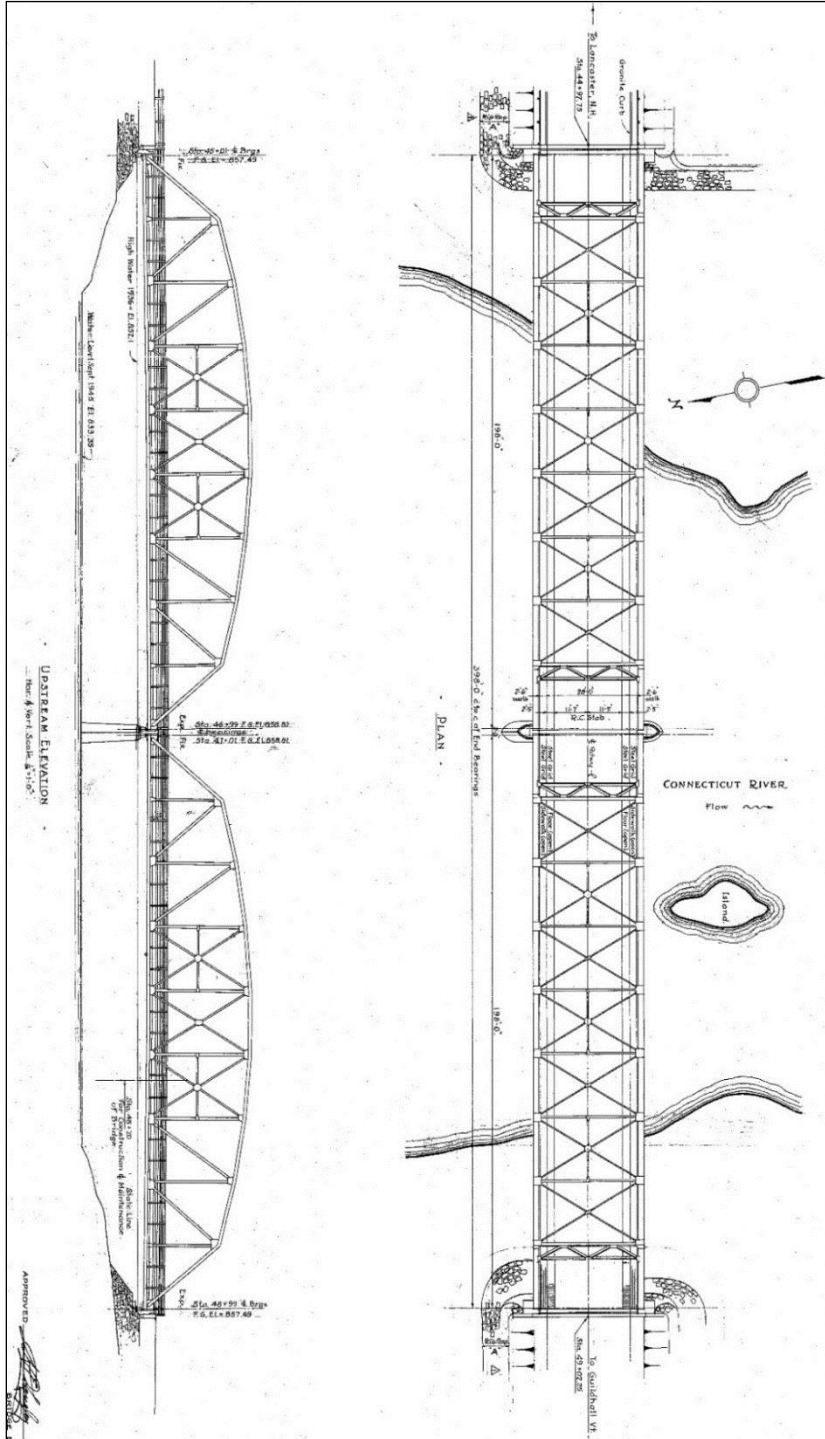


FIGURE 7: General Plan and Elevation. From original NHHD plans (File 2-10-1-1) Sheet 1 of 10, dated March 1946. Source: NHDOT, Original Plans.

APPENDIX A: SUPPLEMENTAL GRAPHICS (continued)

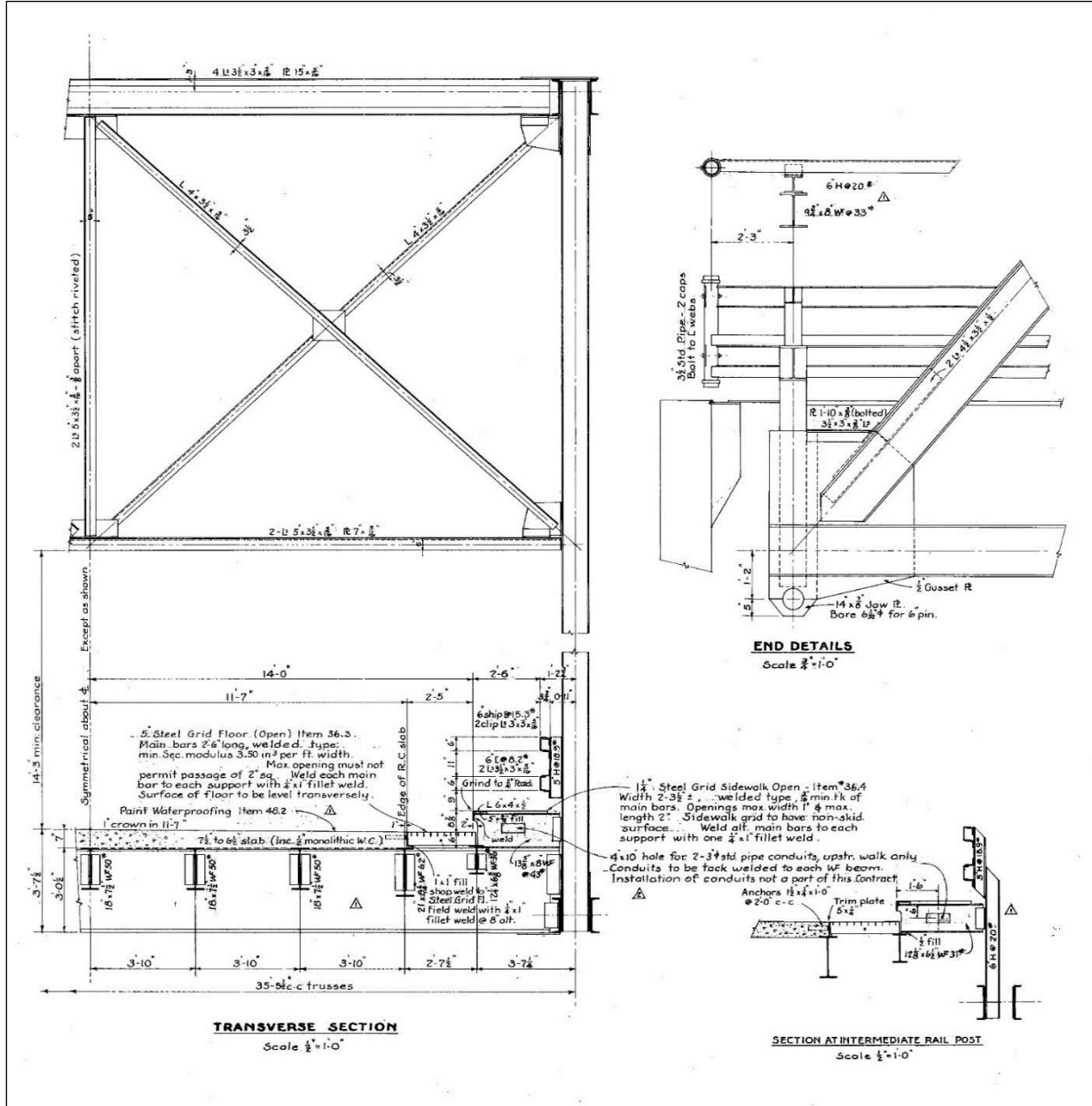


FIGURE 8: Sections and details. From original NHHD plans (File 2-10-1-1). Sheet 9 of 10, dated March 1946. Source: NHDOT, Original Plans.

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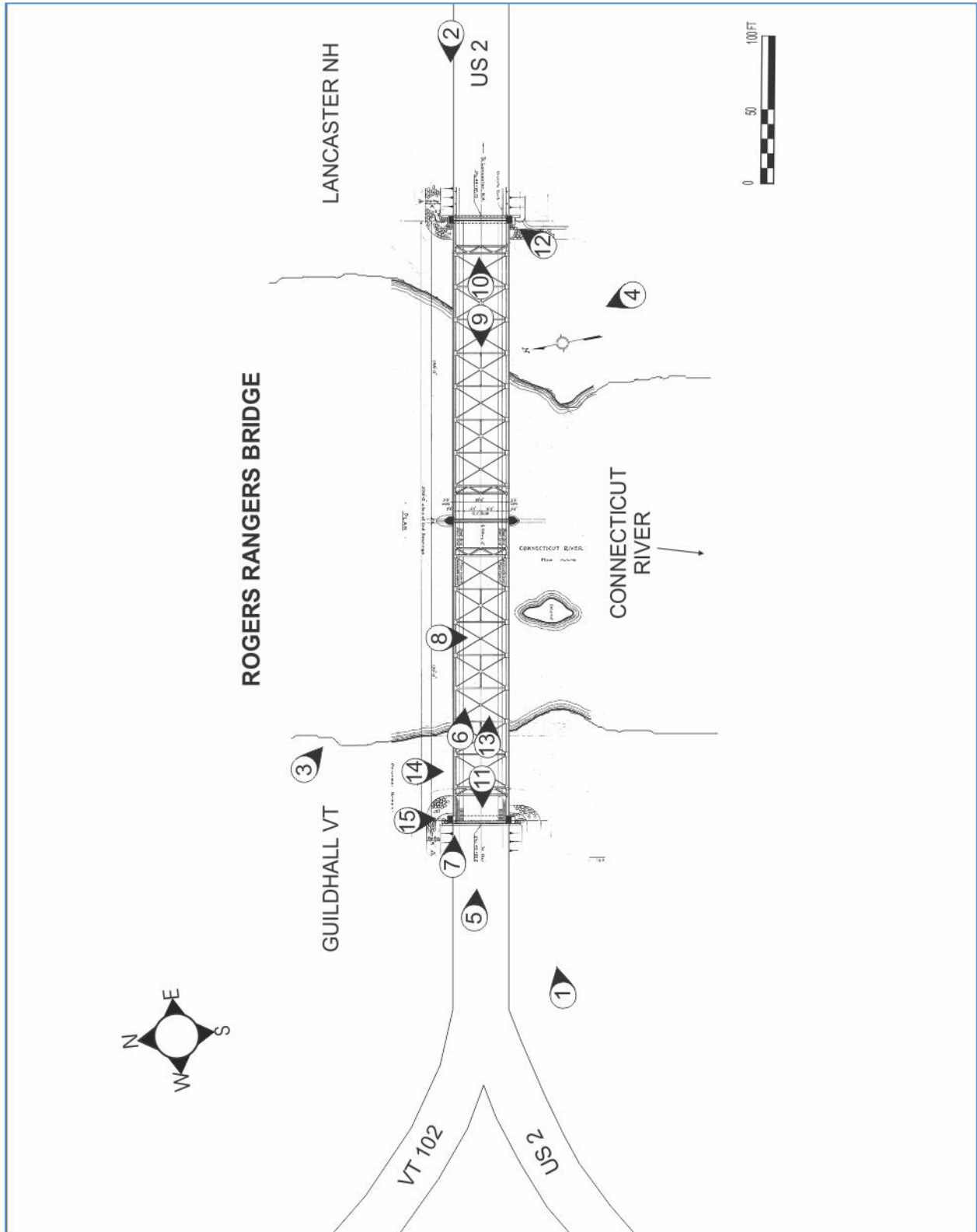
HAER No. NH-56

Carries Route 2 over the Connecticut River between
Lancaster (New Hampshire) and Guildhall (Vermont).
Lancaster
Coos County
New Hampshire

Photographer: Rob Tucher, April 2018

- NH-56-1 APPROACH TO BRIDGE FROM WEST. LOOKING EAST.
- NH-56-2 APPROACH TO BRIDGE FROM EAST. LOOKING WEST.
- NH-56-3 NORTH (UPSTREAM) SIDE. LOOKING SOUTHEAST.
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- NH-56-5 WEST PORTAL. LOOKING EAST.
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- NH-56-8 WEST SPAN, DETAIL OF THREE TYPES OF TRUSS PANEL BRACING.
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- NH-56-10 EAST ABUTMENT WITH DETAIL OF STRINGER TO FLOOR BEAM
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- NH-56-11 WEST ABUTMENT. LOOKING WEST.
- NH-56-12 EAST SPAN, FIXED BEARING. LOOKING NORTHEAST.
- NH-56-13 PIER, WEST SIDE. LOOKING EAST.
- NH-56-14 WEST SPAN, DETAIL LOWER CHORD AND SIDEWALK FRAMING. LOOKING
SOUTH.
- NH-56-15 WEST SPAN, EXPANSION (ROCKER) BEARING. LOOKING SOUTH.

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