ROLLINS FARM BRIDGE
(Boston & Maine Railroad: Western Route, Portland Division, Bridge No. 69.19)
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National Covered Bridges Recording Project
Spanning Boston & Maine Railroad at Ham Road
Rollinsford
Strafford County
New Hampshire

HAER NH-44
NH-44

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
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Location:	Spanning Boston & Maine Railroad at Ham Road, Rollinsford, Strafford County, New Hampshire. UTM: 19.349310E.4786798N, Dover East, NH-ME Quad.
Date of Construction:	Rebuilt 1929
Fabricator:	Boston & Maine Railroad
Present Owner:	Guilford Transportation Industries, Iron Horse Park, North Billerica, MA 01862
Present Use:	Farm lane, foot, and domestic animal bridge
Significance:	Rollins Farm Bridge is one of possibly seven standing boxed pony timber bridges in North America, and one of four in New Hampshire. It is the only example of the numerous overhead roadway bridges built by the Boston & Maine Railroad surviving in *situ*. It is also the only example with three trusses and two lanes.
Historian:	Dr. Mark M. Brown, August 2003, based on a National Register nomination completed by Dr. Nelson H. Lawry and Christine E. Fonda, 1995, and field measurements from June 2003
Project Information:	The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Historic American Buildings Survey/Historic American Engineering Record, a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

Description[1]

Rollins Farm Bridge is an overhead timber boxed pony truss bridge spanning 35'-8". It crosses Guilford Transportation's Portland Division main line, on a northwest-southeast axis, with a clearance of 21-1/2' and a slight skew. Its load-bearing elements consist of three parallel modified-Howe trusses, each of four panels. The middle two panels are each about 9'-8-1/2" long, thereby leaving about 8' for each of the outermost panels. The truss form can also be described as a queenrod truss subdivided by a kingrod truss in the middle panel. Allowing for dimensional variation from the sawmill, queenrod braces, or inclined end posts, are about 8-1/2" wide and 8" deep. Interestingly, the top chord is 10" wide by 8" deep and the difference in widths between it and the end braces is noticeable at U1 and U3. Shear blocks and bolts, located at the panel points, ensure proper spacing and tension transfer between the two 12" x 6" timbers of the bottom chords. The struts are 7-3/4" wide and 5-3/4" deep, the vertical rods at U1-L1 and U3-L3 are 1-3/4" in diameter, and the rod at the center of the truss is 1-3/8" in diameter. Eight 10" wide and 12" high deck beams spaced an average of 4'-10" apart are hung under the bottom cords and parallel to the tracks. The three trusses form two lanes of unequal width: about 15' on the south for vehicles and farm machinery and 6'-3" on the north for domestic animals and, perhaps, pedestrians.

The timber queenrod braces, tenoned into the top and bottom cords by means of complex joints of three faces, resist compressive stresses; the vertical, wrought iron rods, threaded and fitted on each end with a large nut, resist tensile stresses.[2] Unlike most railroad-built Howe trusses, there are no castings or junction boxes at the panel points. Above and perpendicular to the floor beams are wooden stringers (two for the north lane, and seven for the south), which in turn support, at a right angle, the floor planks of the bridge decks. Covering each truss is a sloped-end truss box (a.k.a. truss housing), originally built of tongue-and-groove matched boards to protect the trusses against harsh weather and smoke blast in the cut between the embankments and to increase substantially their useful lives. The load-bearing wooden members are made of creosoted hard pine or fir; the floor planks and truss boxes are not creosoted. Because of the infrequent, irregular, and light traffic anticipated on this bridge, additions seen on more heavily traveled examples, such as stay braces -which would help keep the trusses vertical - and wheel guards, are absent. The maximum depth of the trusses, from the top face of the top chord, to the bottom face of the bottom chord is 6'-11".

The underlying granite masonry abutments differ. The southeast abutment is a stepped planar wing wall of ashlar composition; the three-faced northwest abutment is somewhat more finely crafted of broken range ashlar, quoined, with its flanking faces returned into the embankment.

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[1] This report is based a National Register of Historic Places Nomination completed by Dr. Nelson H. Lawry and Christine E. Fonda in 1995. The corporate owner of the bridge exercised its right and declined listing. Most of the dimensions were taken in June 2003. The cladding and safety considerations make it difficult to measure the bridge completely.

[2] The rods are probably wrought iron because 1.) wrought-iron rods were part of the Boston & Maine's standard pony truss construction, and 2.) visual inspection shows the mild oxidation of wrought iron and not the heavier, more pervasive, and unsightly orange rust associated with steel. On the Boston & Maine's standard pony truss construction see, J. Parker Snow, "Wooden Bridge Construction on the Boston and Maine Railroad," *Journal of the Association of Engineering Societies* 15 (July 1895): 35.

The Rollins Farm Bridge is in superb shape for a structure of its design and years, but the siding is in need of replacement, and gaps in the deck planking of the smaller lane have speeded the deterioration of the stringers.

Significance

The Rollins Farm Bridge is eligible for the National Register under Criterion C for significance in engineering. It retains integrity of location, design, setting, materials, workmanship, feeling, and association for its date of last construction, 1929. A modified Howe truss type, it survives as the sole overhead boxed pony truss bridge in New Hampshire.

The wooden pony truss bridge, with its trusses either exposed or housed, saw widespread use during the nineteenth century, from eastern Canada to the American Midwest.[3] Its most common application in New England and Canada was over natural watercourses, but in New York, it was used in an increasingly standardized form over the extensive upstate canal system, due in part to the efforts of renowned bridge designer and builder Squire Whipple.[4] Sadly, none of those ponies survive in the Empire State; elsewhere, no more than seven boxed ponies stand: four in New Hampshire and one each in Connecticut, Pennsylvania and in western Québec. The pony truss bridge represents an inexpensive solution to bridging water barriers, particularly when boxes were erected over the trusses since they increased the lifespan of these crucial, complicated, and costly (relative to the rest of the bridge) load-bearing members.

The low cost was something the Boston & Maine Railroad (B&M) was not unaware of when it adopted this bridge type to eliminate the dangerous grade crossings on its rights-of-way.[5] The railroad's financial condition was not good and it opted to construct the needed bridges inexpensively, using timber in lieu of iron or steel. Such boxed pony truss bridges constructed by the B&M, probably beginning during the 1870s or 1880s, can be considered to be the third and final generation of wooden pony truss bridges erected in the United States.[6] These last boxed ponies were built in three New England states served by that railroad: Massachusetts (up

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[3] For HAER documentation of two other Boston & Maine Railroad overhead boxed pony trusses, see Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, "Boston & Maine Railroad, Essex Street Bridge," HAER No. MA-166, and "Meeting House Bridge," HAER No. ME-51. For an example of a half-through pony Town lattice truss, see "Livermore Bridge," HAER No. NH-8. For a contrasting approach to the timber pony truss, see Donald Fraser, "Evolution of Timber Truss Road Bridges In New South Wales, Australia," in *Proceedings of and International Conference on Historic Bridges to Celebrate the 150th Anniversary of the Wheeling Suspension Bridge*, ed. Emory Kemp (Morgantown, West Virginia: West Virginia University Press, 1999), 157-170.

[4] Squire Whipple, *An Elementary and Practical Treatise on Bridge Building* (New York: Van Nostrand, 1883).

[5] For a broader contextual view of the boxed pony trusses built by the Boston & Maine, see Nelson H. Lawry, "Boston & Maine's Boxed Ponies: Galloping Into Oblivion?" *Trains* (February 1994), 44-47, and "Boston & Maine's Boxed Ponies: Losing the Race," *Railpace* (April 1998), 39. On the business and engineering philosophy and technical standards of the Boston & Maine's timber bridges, see Snow, "Wooden Bridge Construction on the Boston and Maine Railroad," 31-43.

[6] The three generations of timber pony trusses are First Generation: early North American generic; Second Generation: upgraded, improved, and more standardized ca. civil War; and Third Generation: timber anachronism built by the B&M.

to three overhead bridges in storage), New Hampshire (one overhead and two track survivors), and Maine (up to two overhead bridges in storage).[7]

Historical Background[8]

In January 1842, property owner William Rollins granted the right-of-way to the Boston & Maine Railroad (subsequently the main line of the railroad's Western Route, Portland Division). The Rollins farm straddles Ham Road, a crude public thoroughfare that connected Rollins Road with the Dover-South Berwick Turnpike, now State Route 4. Where Ham Road intersected the B&M's right-of-way, it required a bridge to obviate a potentially dangerous crossing at grade. At some unknown point, the bridge became one of the boxed pony truss type, in line with B&M practice to build such bridges as a cost-saving measure, despite all other Class 1 railroads switching to the more durable iron, and later, to the even stronger steel. Rollins Farm Bridge, then number 77, was rebuilt and lengthened in 1891 to accommodate the double tracking of that stretch of the main line.

Between December 1916 and March 1917, after correspondence between Benjamin W. Guppy, Superintendent of Bridges and Buildings, and B. F. Pickering, supervisor of bridges and buildings at Salem, Massachusetts, Rollins Farm Bridge was again rebuilt, at a cost of $869 for materials and labor. [9]

Fred A. Dodge purchased the farm from the Rollins estate in 1919. Within a decade, the public road had become in practice a farm lane used almost exclusively by Dodge, for the town no longer repaired the road or kept it open during the winter. In December 1928, Guppy, then B&M's engineer of structures, instructed that the load capacity of Rollins Farm Bridge be reduced from 10 tons to 4 tons pending repairs. The railroad attempted during the following summer to persuade farmer Dodge to allow it to rebuild the bridge as a narrower, two-truss structure, but Dodge refused, arguing that he needed the third-truss cattle run in order not to foul the road for his agricultural equipment use. In an internal memo, Guppy acknowledged that the bridge was a legitimate farm crossing that the railroad had no choice but to maintain. General Solicitor Mackinnon concurred with that view, pointing out that B&M could make no substantive changes without the agreement of the property owner.

Begun on November 11, 1929 the construction of the new three-truss bridge, now number 69.19 to reflect the mileage from Boston, made use of creosote-treated timber, except for the floor planks and truss boxes sheathing. The job was completed on December 16, for an estimated cost of $1376. Repairs to the truss boxes were made in 1949, and two years later new boards replaced the old ones. For the last five and a half decades, only random repairs have been made

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[7] There are two track survivors, although the rails have been taken up and the line is no longer in service.
[8] All quotations and information drawing on primary documents in this section are based on records in the *B&MRR Bridge Files*, Iron Horse Park , Guilford Transportation Company, North Billerica, Massachusetts and the *B&MRR Bridges Lists*, Boston & Maine Railroad Historical Society Archives, Center for Lowell History, University of Lowell, Lowell, Massachusetts.
[9] Or perhaps Salem, New Hampshire. Each Salem was in the Portland Division of the Boston & Maine Railroad.

to the structure. Vandals damaged much of the northeastern (cattle run) truss box and some of the adjacent truss box in recent years. The load limit is presently 4 tons, and hikers, hunters, and landowners used the remote bridge for access to the fields and woods beyond the track. Its other substantial value to the town of Rollinsford is as a bridge site in use for more than 150 years.

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