INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY # MAN0487

Name, Location, Ownership

1. Historic name: B&MRR Goffstown Branch Bridge No. 1.89 over Piscataquog River a.k.a. Kelly's Falls Bridge
2. District or area: NHDHR RR Area Form Goffstown Branch Railroad, 1995. Not Eligible
3. Street & number:
4. City or town: Manchester
5. County: Hillsborough
6. Current owner: City of Manchester

Function or Use

7. Current use(s): Closed, unsafe and barricaded bridge on recreational trail
8. Historic use(s): Railroad bridge

Architectural Information

9. Style: steel stringers on wood pile bents
10. Architect/builder: Boston & Maine Railroad
11. Source: Drawings
12. Construction date: 1941
13. Source: Structure list and drawings
14. Alterations, with dates: tracks removed, date unknown; ties removed & steel lateral bracing added, date unknown.
15. Moved? no ☒ yes ☐ date:

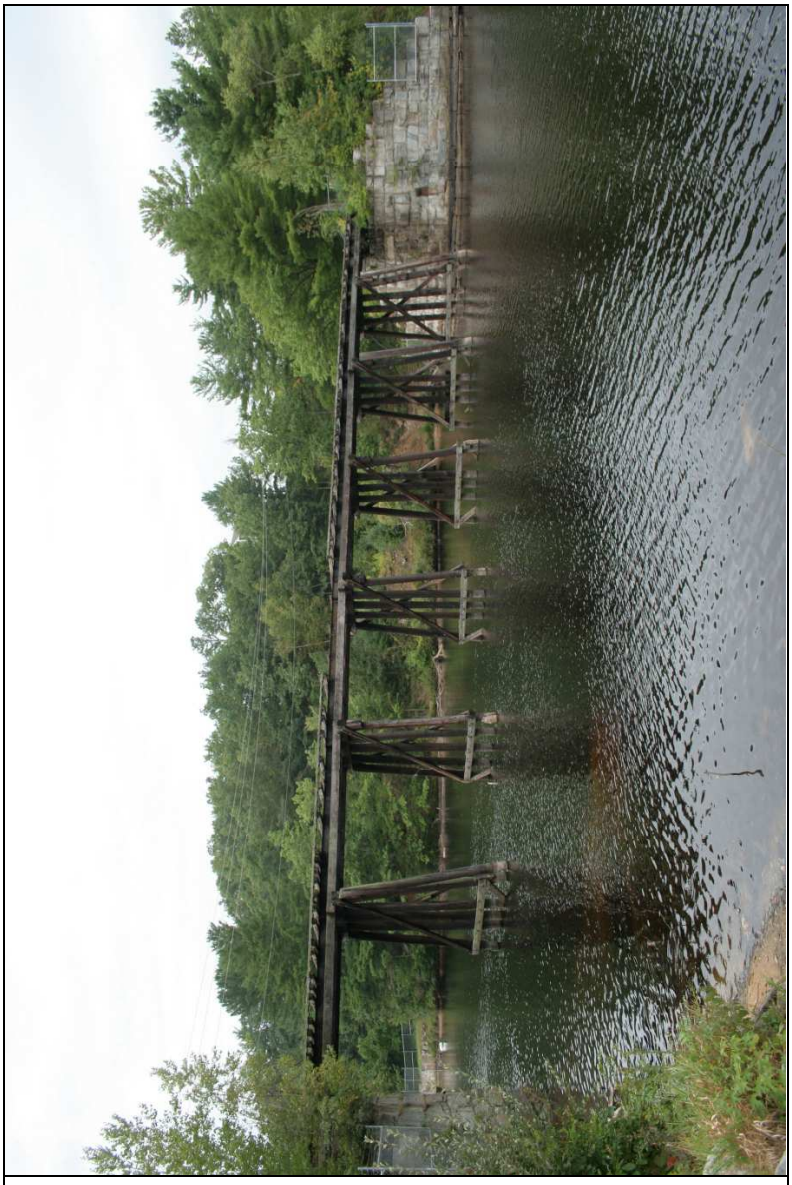
Exterior Features

16. Foundation: stone abutments
17. Cladding: n/a
18. Roof material: n/a
19. Chimney material: n/a
20. Type of roof: n/a
21. Chimney location: n/a
22. Number of stories: n/a
23. Entry location: n/a
24. Windows: n/a

Replacement? no ☐ yes ☐ date:

Site Features

25. Setting: mixed use, residential and recreational trail and boat launch, mostly wooded
26. Outbuildings: n/a



35. Photo # 1 36. Date: 09/15/ 2011
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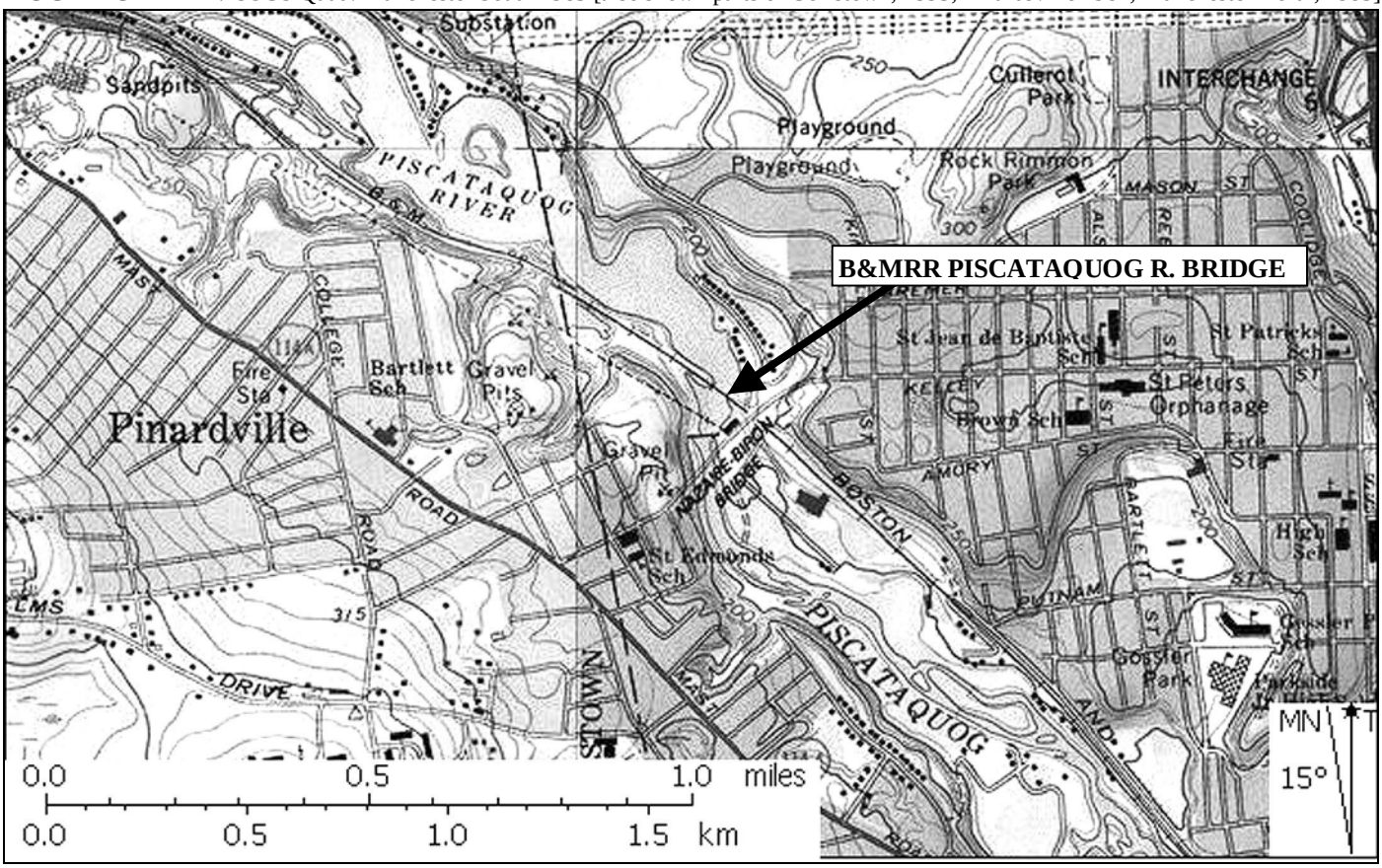
38. Image stored at: digital file at: Historic Documentation Co. Portsmouth, RI 401-683-3483

27. Landscape features: n/a
28. Acreage: less than 1
29. Tax map/parcel #: 702-3
30. UTM reference: 19.296598.4763249
31. USGS quad and scale: Manchester South, NH 1985, 7.5 min

Form prepared by

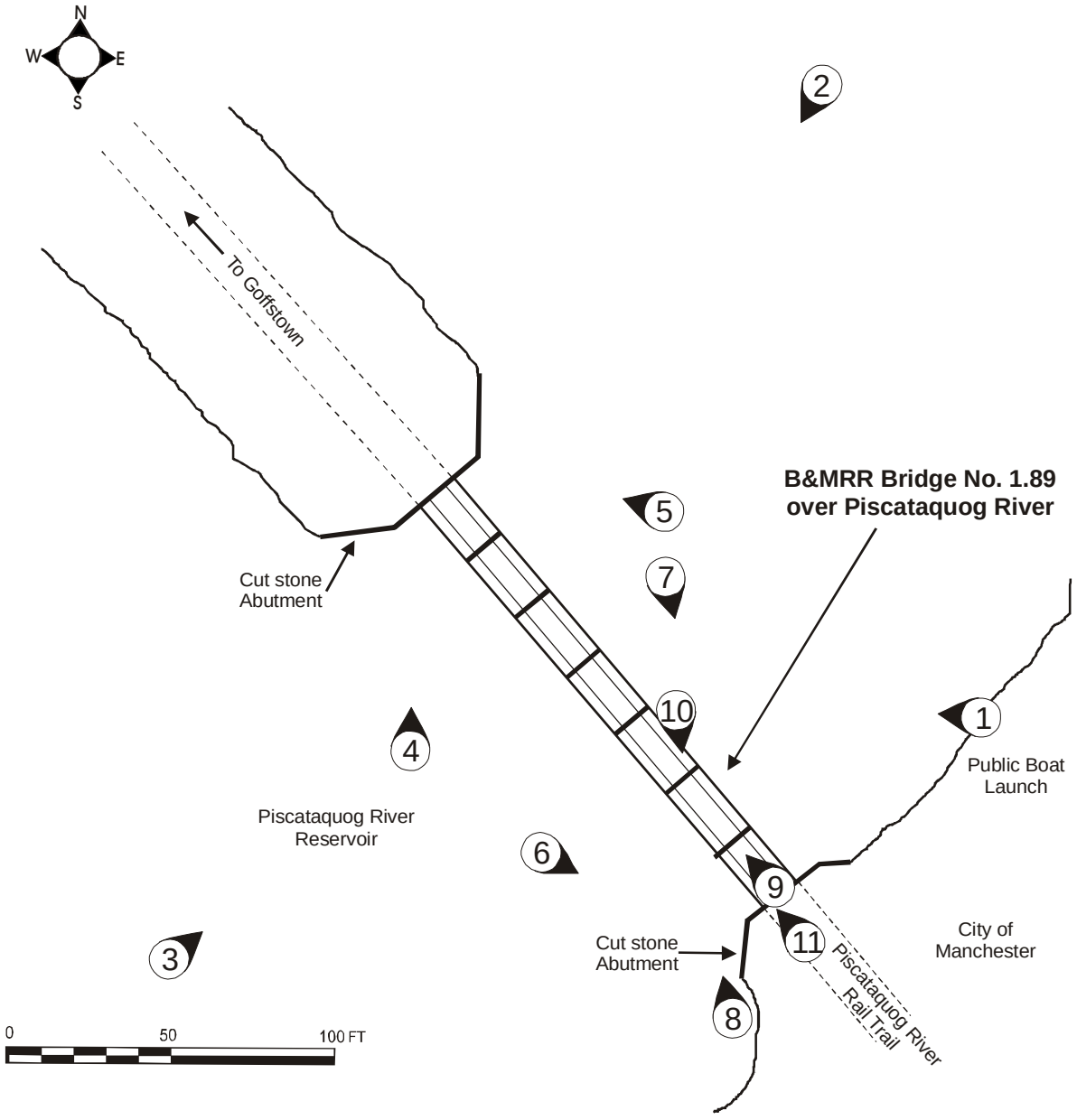
32. Name: Richard M. Casella
33. Organization: Historic Documentation Company, Inc.
34. Date of Survey: September 2011

39. LOCATION MAP: USGS Quad: Manchester South 1985 [also shown parts of Goffstown, 1995; Pinardsville 1982; Manchester North, 1985]



Aerial view of Property looking north-northeast (Source: Microsoft Bing Maps, copyright 2010; actual date of photo unknown)

40. PROPERTY SKETCH PLAN AND KEY TO PHOTOS



41. Historical Background and Role in the Town or City's Development:

B&MRR Bridge No. 1.89 (Kelly's Falls Bridge) is located just above the Kelly's Falls dam on the Piscataquog River on the west edge of the City of Manchester. It is on the route of the former New Hampshire Central Railroad, chartered in 1848 to build between Manchester and Claremont, through the towns of Bedford, Goffstown, Weare, Henniker, Bradford, Newbury, Sunapee and Newport. By 1850 the line was opened between Manchester and Henniker but due to financial hardship it was not continued any further. In 1858 the tracks from North Weare to Henniker were taken up and the line was rechartered as the Manchester and North Weare Railroad under the ownership of the Concord Railroad.[1] (see Figures 1-2).

The history and role of the Goffstown line and the bridge in the development of Manchester and other towns along the route has been discussed in the NHDHR Area Form prepared in 1995, and will not be repeated here. Like nearly all rail lines, it played a very important role in the economy and development of each of the towns it served.

The 1995 Area Form evaluated the Manchester section of the Goffstown branch line for the presence of historical resources. The overall resource was found lacking the necessary integrity to be eligible for the National Register as a linear historic district and the remaining individual resources, including the subject wood trestle bridge, were found lacking sufficient historical and/or architectural importance to be individually eligible. This Individual Form re-examines the bridge as a potentially eligible individual resource since over fifteen years has passed since the Area Form was prepared, and because it is perceived to be an uncommon bridge type in the state with few surviving examples.

The existing Kelly's Falls Bridge was built in late 1941 in response to the destruction of the preceding bridge by fire September 1, 1941 (see Figures 5,6). The preceding bridge was a 150'-span covered wood truss railroad bridge. It was not determined conclusively if an earlier bridge preceded the covered span but the 1941 newspaper article on the fire states that the bridge was only 50 years old at the time. The covered bridge depicted in an undated post card image (Figure 3), shows a bridge with a gable roof and plank siding; the newspaper photos of the fire show a wood truss bridge without siding or roof. This discrepancy was not resolved. The existing granite abutment of the trestle exhibit workmanship typical of mid and late 19th century railroad masonry in NH and there is no reason to believe they are not the same abutments that carried the previous wood truss bridge. It is known that the truss bridge was strengthened by the Concord Railroad Company in 1883 with the addition of supplemental wood arches, but no other documentary information on its history was located.[2]

By 1890 the line had come under the control of the rapidly expanding Boston & Maine Railroad system. That year (1890) the Union Electric Company erected the dam and powerhouse at Kelly's Falls, about 500 feet downstream of the railroad bridge (see Figure 3). The following history of the line in the early 20th century is taken from the NHDHR Area Form for the Goffstown Branch Railroad:

> The Boston & Maine first proposed to discontinue service on the Goffstown Branch in the 1920s, due to increasing competition from automobiles and trucks. Several hundred grain dealers, store owners, stock and milk farmers, apple growers, lumber mill operators and poultrymen opposed the B&M's petition. At the time, four passenger trains ran between Hillsborough and Manchester daily (Dearborn 1959:177). Due to the outcry, the B&M continued to run two daily passenger trains and freight service. The 1936 flood washed out the railroad bridge over the Piscataquog River for several months and passenger bus service was initiated. Profits continued to decline, and the line was officially abandoned between Goffstown and Henniker in 1936. The Piscataquog River trestle was rebuilt, and freight service continued to Goffstown (Dearborn 1959:178). The Goffstown and Manchester sections were officially abandoned in 1981.

The Piscataquog bridge referred to above by Dearborn is not the trestle over the Piscataquog River in Manchester; perhaps she was referring to another bridge upstream either at Goffstown Falls or in Weare. The effects of the 1936 flood on the railroad were described and documented with photographs in the *Boston and Maine Railroad Employees Magazine*.[3] The

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[1] See Hostutler, Elizabeth and Worthern Muzzey. *Goffstown Branch Railroad, Manchester Area Form*, September 1995. Filed at New Hampshire Division of Historic Resources, Concord.

[2] New Hampshire. *Annual Report of the Railroad Commissioners*. 1883, p. 10.

[3] There are multiple articles regarding the flood in the January-February-March 1936 issue (vol. 9, no. 8) of the *Boston and Maine Railroad Employees Magazine.*

North Weare Branch bridge (later known as the Goffstown Branch) over the Merrimack River in Manchester was washed out in the 1936 flood, but no damage to the covered bridge over the Piscataquog River at Kelly's Falls or other bridges along the branch was mentioned in the B&MRR magazine.

The covered bridge burned September 1, 1941 in a spectacular fire believed to been started accidently or intentionally by youths observed on the bridge shortly before Alarm Box 339 at the corner of Kelly and Morgan streets was pulled.[4] The fire was fueled by strong winds that showered burning embers on the neighboring community, igniting brush fires and one house at 56 Messier Avenue. "Thousands of spectators watched the bridge fire from 'grandstand' seats atop the Kelly's Falls highway bridge but were driven to cover from time to time as shifting winds sent sparks and embers flying in their direction"[5] (see Figures 5, 6).

The record drawings of the bridge are dated 3/10/42 but do not mention when the bridge was completed and put in service (see Figures 7,8,9) The B&MRR Track Structures list of 1953 lists the bridge as the Kelly's Falls Bridge, Bridge Number 1.89 on the Goffstown Branch with a construction date of 1941. A search of the *Manchester Leader* microfilm through the remainder of 1941 did not locate any further articles on completion of the trestle bridge or reopening of the line.

42. Applicable NHDHR Historic Contexts: 82 – Railroads in New Hampshire 1842-1960.

43. Architectural Description and Comparative Evaluation:

B&MRR Bridge No. 1.89 (Kelly's Falls Bridge) is a seven-span steel stringer bridge on wood pile bents. The bridge type is a pile bent trestle, often called simply a trestle which can be generally considered a bridge with numerous short spans on pile bents or frames. There is no bracing between the bents which is a characteristic of framed trestles.[6] The ends of the bridge rest on stone abutments that previously carried a single-span covered wood truss railroad bridge that was destroyed by fire in 1941. The practicality of replacing a single span bridge with a seven span bridge was due to the construction of the Kelly Falls Dam in 1890. The dam greatly stilled the waters under the bridge allowing simple pile bents, to be placed in the channel without much risk of them being swept away by flood debris or ice floes. The design of Bridge 1.89 utilized four steel I beam stringers paired close together under each track to achieve spans of 22', roughly twice the span of typical pile bent railroad bridges with wood stringers (see Figure 7). The fewer number and therefore wider spacing of the pile bents made the structure less vulnerable to debris and ice loads. The cost of piers or bents versus the cost of the superstructure is always weighed by the engineer; in this case the use of more expensive steel beams to achieve longer spans was offset by the fewer bents required and the added benefit of less vulnerability.

The four stringers are 20" American Standard Beams with 6-1/4" flanges weighing 65.4 pounds per foot. The stringer pairs are spaced with 12" wood blocking and tied together with four steel stringer clamps per span. The stingers are carried on timber pile caps measuring 12" x 14" x 14 feet long. The stringers are not end-butted and joined with splice plates over the bents typical of highway spans, but instead are offset just enough to bypass one another and overhang the caps by about 8 inches. At some later time (not shown on the plans) the stringers were laterally braced with steel angles welded to the stringers, both diagonally and perpendicular (see Photo 9). The 6"x8" ties are spaced 14" apart but several were removed at intervals to allow the installation and welding of the later-added lateral bracing.

Each of the six bents consist of five 12" piles with 3x10" horizontal and diagonal wood bracing as shown in Figure 8. The longest piles at the middle of the channel are about 50 feet with 20 feet extending above the waterline to carry the tracks. The plans show the hitting ledge just below the riverbed and therefore rock-filled timber cribs roughly 5' high were constructed around the bottom of each bent to provide lateral stability. Additional stone (rip rap) was piled around the outside to the cribs in a continuous bed across the river. The bents are interconnected with 8"x12" longitudinal timbers attached to the top of the pile caps above the outside piles. A single fender pile was originally installed on the upstream side of each bent; they are missing from Bents 2, 3, and 4, counting from the Manchester end. The stone abutments have beveled wings and are built of

[4] *Manchester Leader.* "Kelly's Falls Bridge is Destroyed by Fire." *Manchester Leader,* September 2, 1941.
[5] *Ibid.*
[6] Trestles with bracing between the bents to form an interconnected structural frames, often running the entire length of the structure, are known as frame, braced frame, or pile and frame trestles.

quarry split and squared granite blocks with mortared joints. Courses average 2 feet high and are roughly parallel. The wings are stepped down to the shoreline elevation.

Comparative Evaluation

Wood pile bent trestle railroad bridges were uncommon in New Hampshire relative to the middle and western states due to several factors. The topography and climate afforded less occasion to build pile trestles because the great number of fast narrow valley streams dictated longer spans carried on flood and ice resistant stone piers. The ever-increasing importance of New England rail lines in the late 19th century and the resulting need for heavier track and locomotives justified the building of heavier and more permanent structures, replacing wood bridges with fireproof steel girder and truss bridges.[7]

According to the Newington Branch/Portsmouth & Dover Railroad Area Form (Mausolf, 2010), as of 1999 twenty-six pile bent trestles were listed in the NHDOT database of which ten were known to be extant. The low survival rate of 19th and early 20th century wood bridges as a whole is due to the forces of decay which even for heavily creosoted timber generally limits the useful life to well under 50 years. And railroad bridges as a whole in New Hampshire have received little or no maintenance due to abandonment in the late 20th century by the B&MRR. Therefore the Kelly's Falls Bridge belongs to a small group of surviving pile bent trestle bridges.

A review of Area Forms prepared for other rail line in New Hampshire identified four other surviving pile bent trestles with more than two spans that share similar characteristics with the Kelly's Falls Bridge.

1). Manchester-Lawrence RR Trestle 4.65 over Spickett River, Salem is a six span solid-deck pile-bent trestle 65' long built in 1929 (see Figure 10). It is differs from the Kelly's Falls Bridge with its solid concrete deck and lower height with only one set of bracing instead of two (the second set of bracing on the Kelly Falls Bridge is below the water surface).

2) Manchester-Lawrence RR Trestle 24.17 over Cohas Brook, Manchester is an eight span, 154' long, braced-frame pile bent trestle built 1932 by B&MRR (see Figure 11). Although not mentioned in the Area Form description, the spans appear to be steel I-beams like those found on the Kelly's Falls Bridge; it is also a high structure with two sets of bracing on each bent. It differs in that it is a braced frame trestle with alternating upper and lower cross bracing between each bent.

3) Portsmouth-Dover RR Trestle MP 0.19 over Piscatqua Inlet, Portsmouth is a nine span pile bent trestle with both timber and I-beam spans, circa 1910 (see Figure 12). It is lower in height with only one set of bent bracing and less impressive in scale, but otherwise similar in design.

4) B&MRR Trestle over Winnipeasaukee River, Franklin is a framed timber bent trestle for which the structural details were not obtained (see Figure 13). It is an impressive and prominent fixture of the landscape, features shared with the Kelly's Falls Bridge, but as a bridge type it varies significantly in that the bents are frames that rest on masonry piers or footings. The spans are wood stringers supported mid-span by diagonal braces to each bent.

Based on this comparative study the Kelly's Falls Bridge possesses a unique set of features that does not seem to be fully represented by another railroad bridge in New Hampshire.

44. National or State Register Criteria Statement of Significance:

B&MRR Goffstown Branch Bridge No. 1.89 over Piscataquog River (Kelly's Falls Bridge) is not eligible for the National Register under Criteria A. Its association with events important to the broad patterns of our history, specifically the establishment New Hampshire Central Railroad and the development of the towns of Bedford, Goffstown, and Weare is not significant due to the fact that the bridge was built in 1941, shortly before the end of rail service on the line. The small amount of traffic travelling over the line in the following decades cannot be considered instrumental in the development of

[7] The B&MRR was one of the few railroads that continued to use heavy timber bridges including covered wood trusses and trestles into the early 20th century, see, J. Parker Snow. "Wooden Bridge Construction on the Boston and Maine Railroad, 1895.

the towns along the route. The 1995 Area Form study of the Goffstown line found the resource as a whole to be lacking in the necessary integrity to be NR eligible as a historic district.

Under Criteria C, the bridge is significant as a well-preserved and rare-surviving example of a specialized property type in New Hampshire. The trestle is not important or distinguished for its engineering characteristics; it is of a standardized design widely used by American railroads since the mid-to-late 19th century. This nearly mid-20th century example differs only in the use of I-beam instead of wood stringers and galvanized-steel hardware instead of wrought iron. The design and construction of the structure could be considered of interest as a late example of a timber trestle railroad bridge built during the decline of railroads in New England. The choice of the most economical bridge type was undoubtedly the result of dwindling construction and maintenance budgets and knowledge that its use by the B&MRR would be short. The stone abutments should also be mentioned as a well-preserved and visually accessible example of 19th century railroad masonry. The bridge can therefore be considered eligible for the National Register under Criteria C.

45. Period of Significance: 1941, date of construction, to 1961, fifty-year cutoff.

46. Statement of Integrity: The property retains integrity of location, setting, workmanship, feeling and association. The removal of the tracks and railings, deterioration of structural components, and welded-brace reinforcement have somewhat diminished the integrity of design and materials but not to such a degree as to destroy the integrity of the primary character defining features.

47. Boundary Discussion: The boundary of the property is defined by the physical limits of the bridge and its abutments.

Surveyor's Evaluation:

NR listed:	individual	_____	NR eligible:			NR Criteria:	A _____
	within district	_____		individual	__x___		B _____
				within district	_____		C __x___
Integrity:	yes	__X__		not eligible	____		D _____
	no	____		more info needed	_____		E _____

Photography Statement: I, the undersigned, confirm that the photos in this inventory form have not been digitally manipulated and that they conform to the standards set forth in the NHDHR Digital Photo Policy. These photos were printed with HP Photosmart 7850 Printer, HP Vivera 100 Gray Photo Ink, HP Premium-Plus Photopaper. The digital files are housed at Historic Documentation Co., Portsmouth, RI

Richard M. Candee

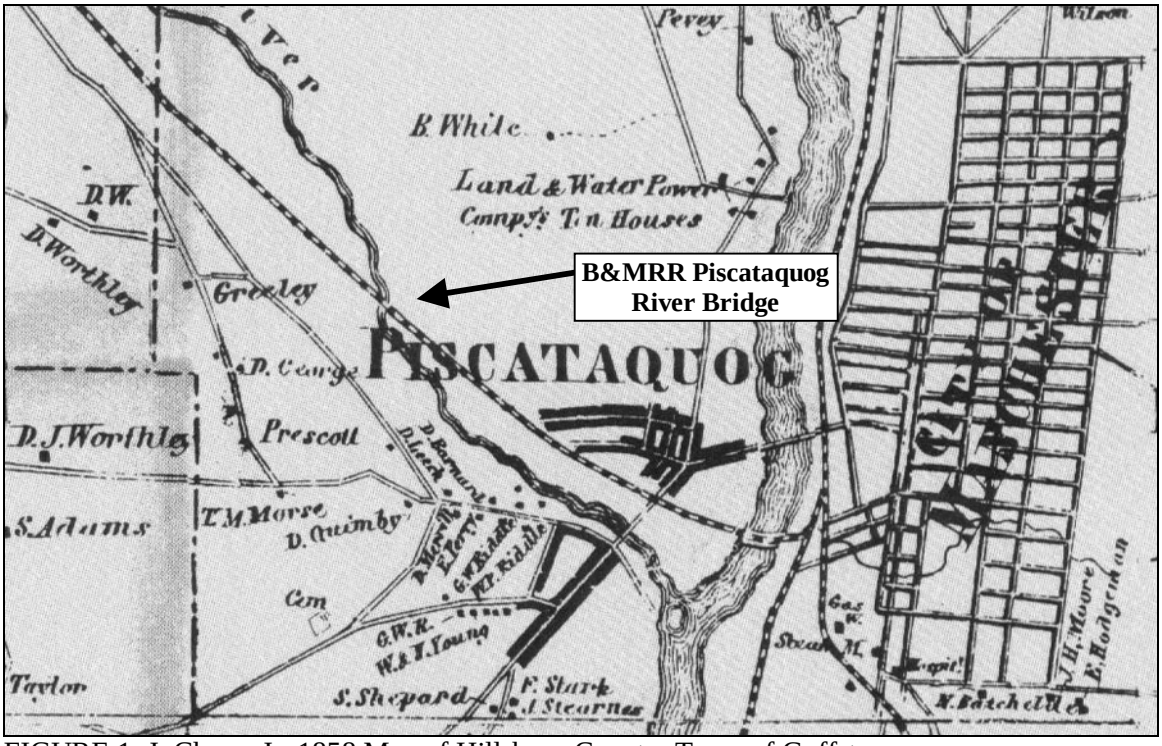

FIGURE 1: J. Chace, Jr. 1858 Map of Hillsboro County, Town of Goffstown.

FIGURE 2: NH Railroad Commissioners Railroad Map of 1894.

FIGURE 3: Kelly's Falls Dam and Hydroelectric Plant ca. 1890. B&MRR Piscataquog River Covered wood truss railroad bridge seen in background was destroyed by fire in 1941. Current trestle replaced it. (Source: Pinardsville History website)

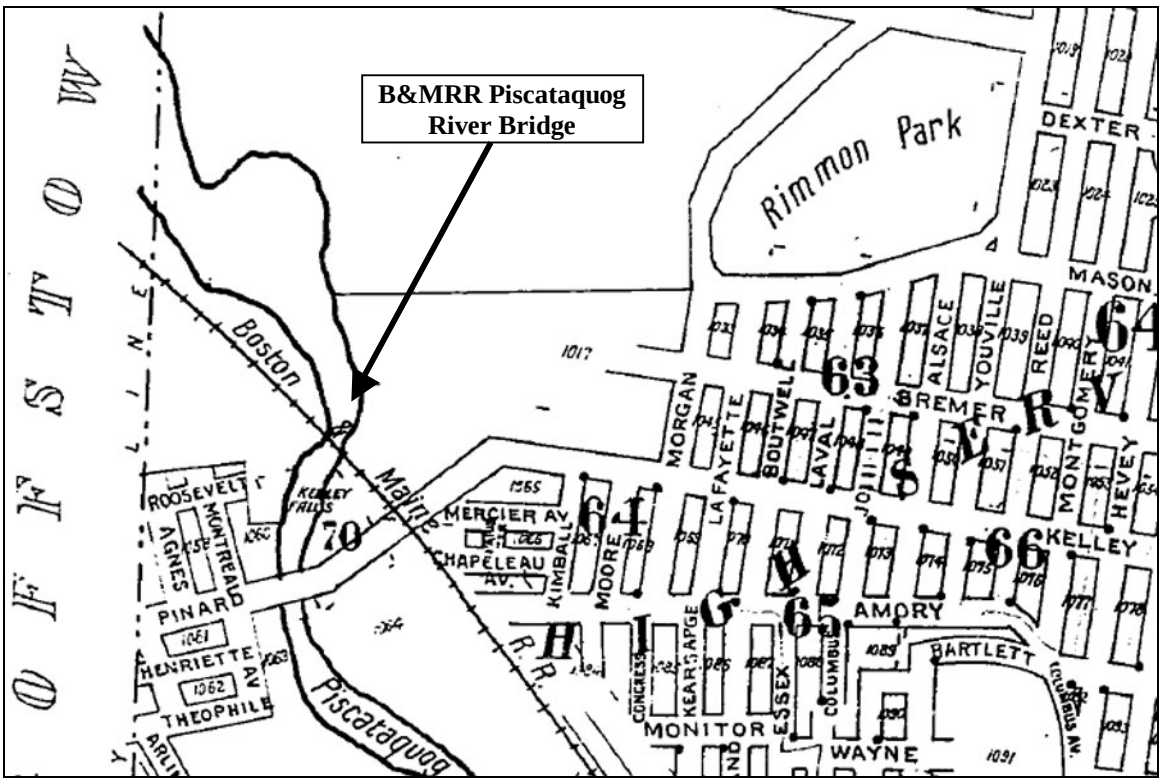

FIGURE 4: 1915 Sanborn Map.

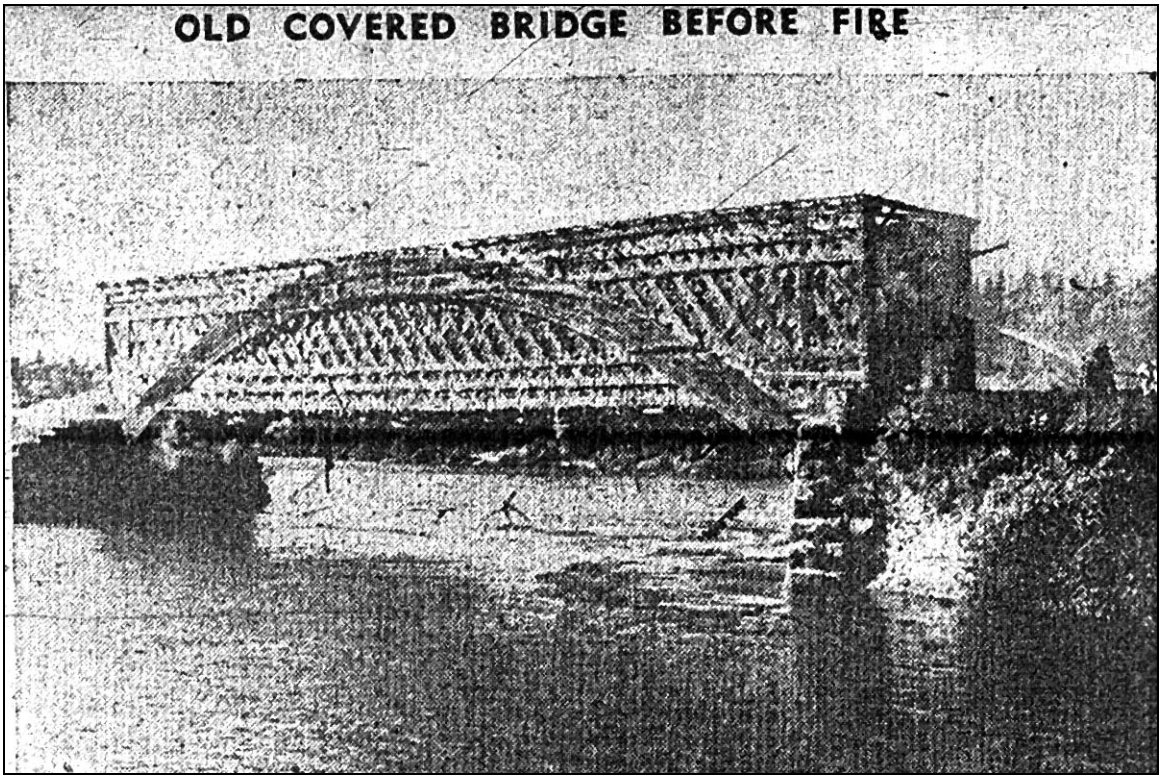

FIGURE 5: SB&MRR Piscataquog River Covered railroad bridge prior to fire. (Source: *Manchester Leader*, September 2, 1941.

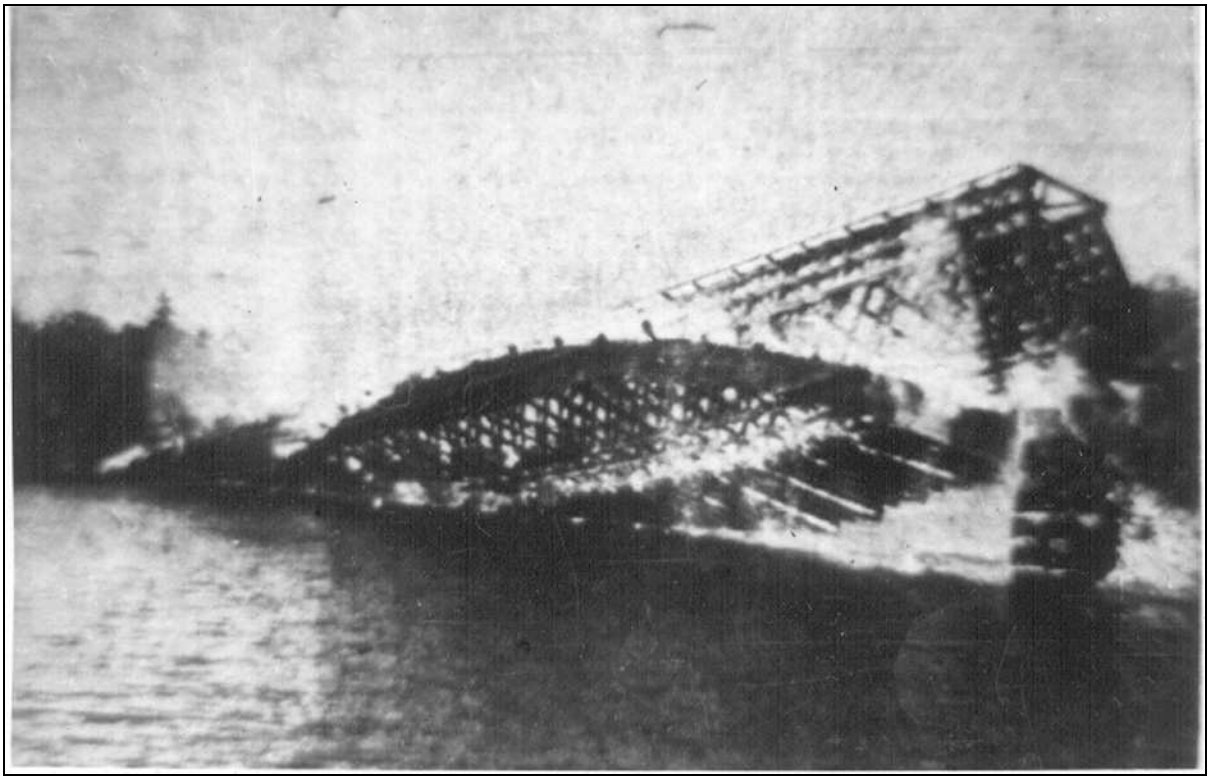

FIGURE 6: B&MRR Piscataquog River Covered railroad bridge destroyed by fire and collapsing into the river September 1, 1941 (Source: Pinardsville History website).

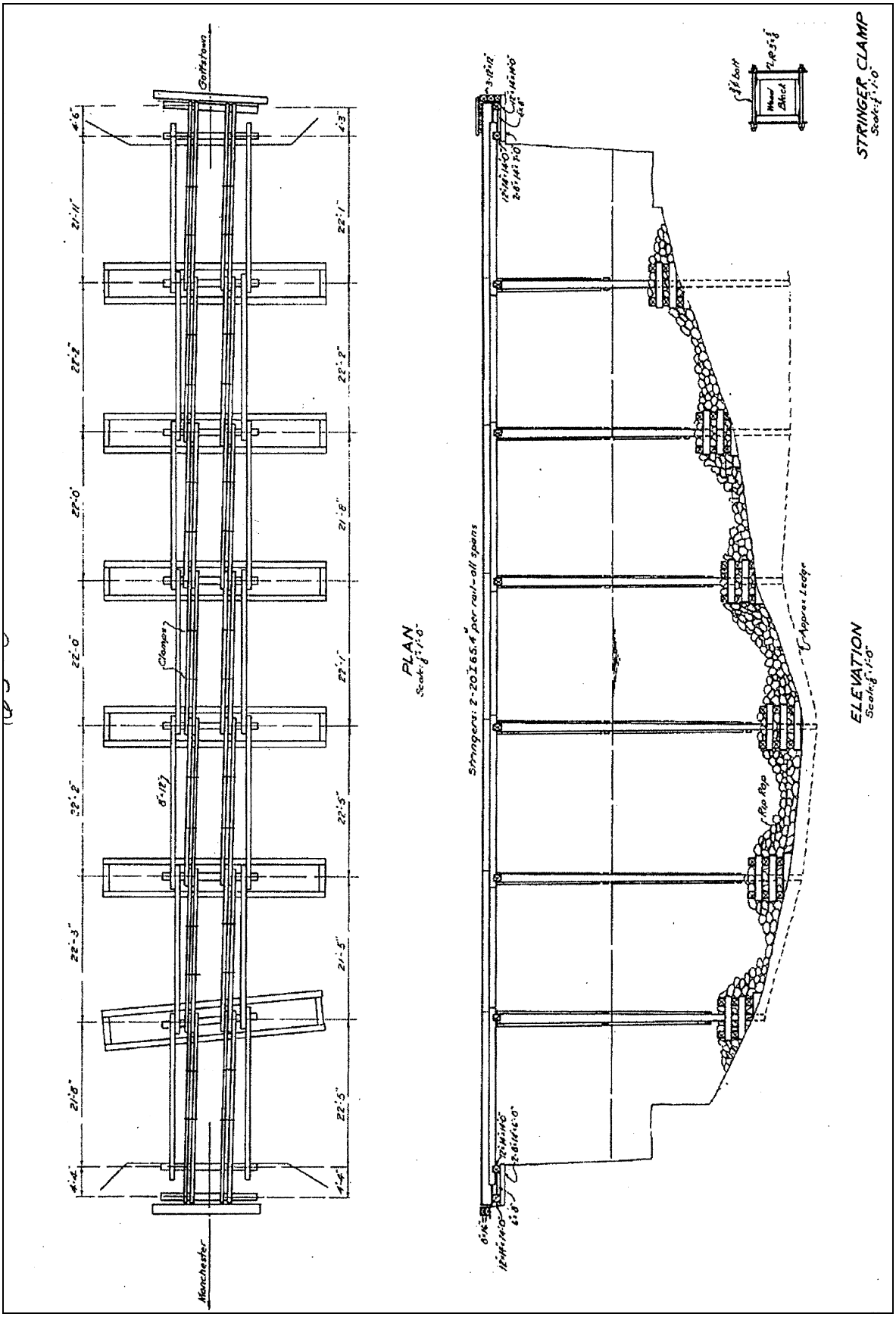

FIGURE 7: B&MRR Bridge No. 1.89 over Piscataquog River, West Manchester, NH. Plan and Elevation. [Source: "Record Plan, B&MRR Bridge No. 1.89 (404) West Manchester." Dated 3/10/42]

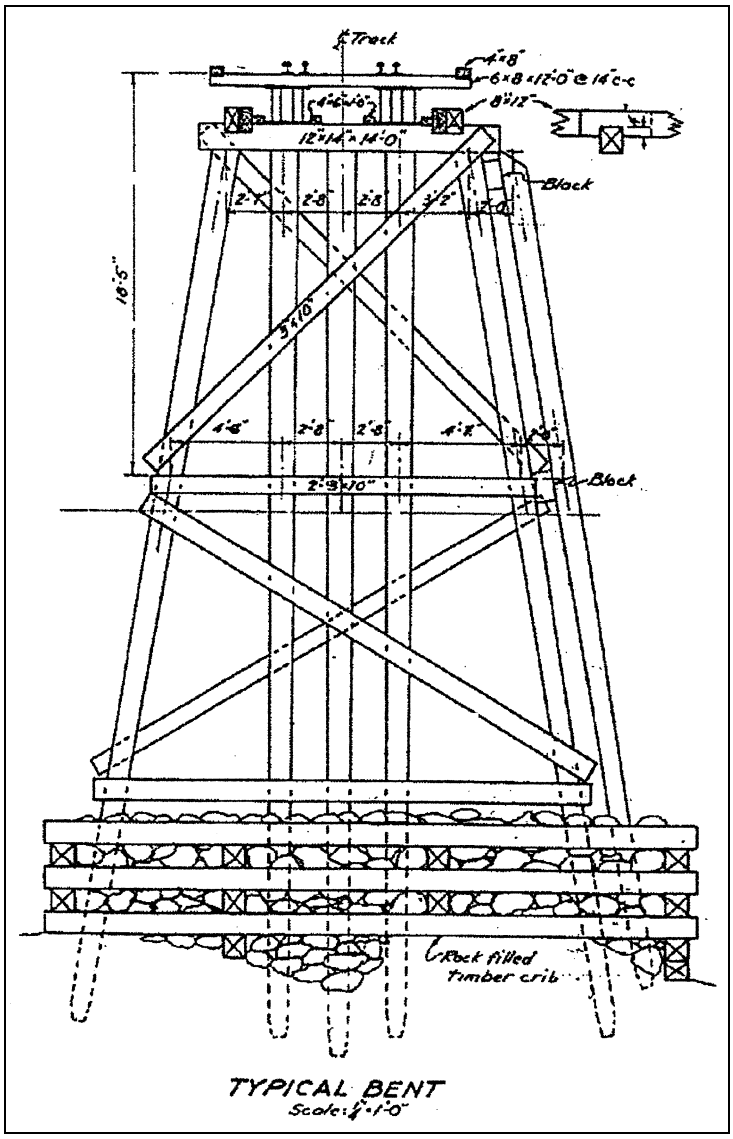

FIGURE 8: B&MRR Bridge No. 1.89 over Piscataquog River, West Manchester, NH. Section of typical bent. [Source: "Record Plan, B&MRR Bridge No. 1.89 (404) West Manchester." Dated 3/10/42]

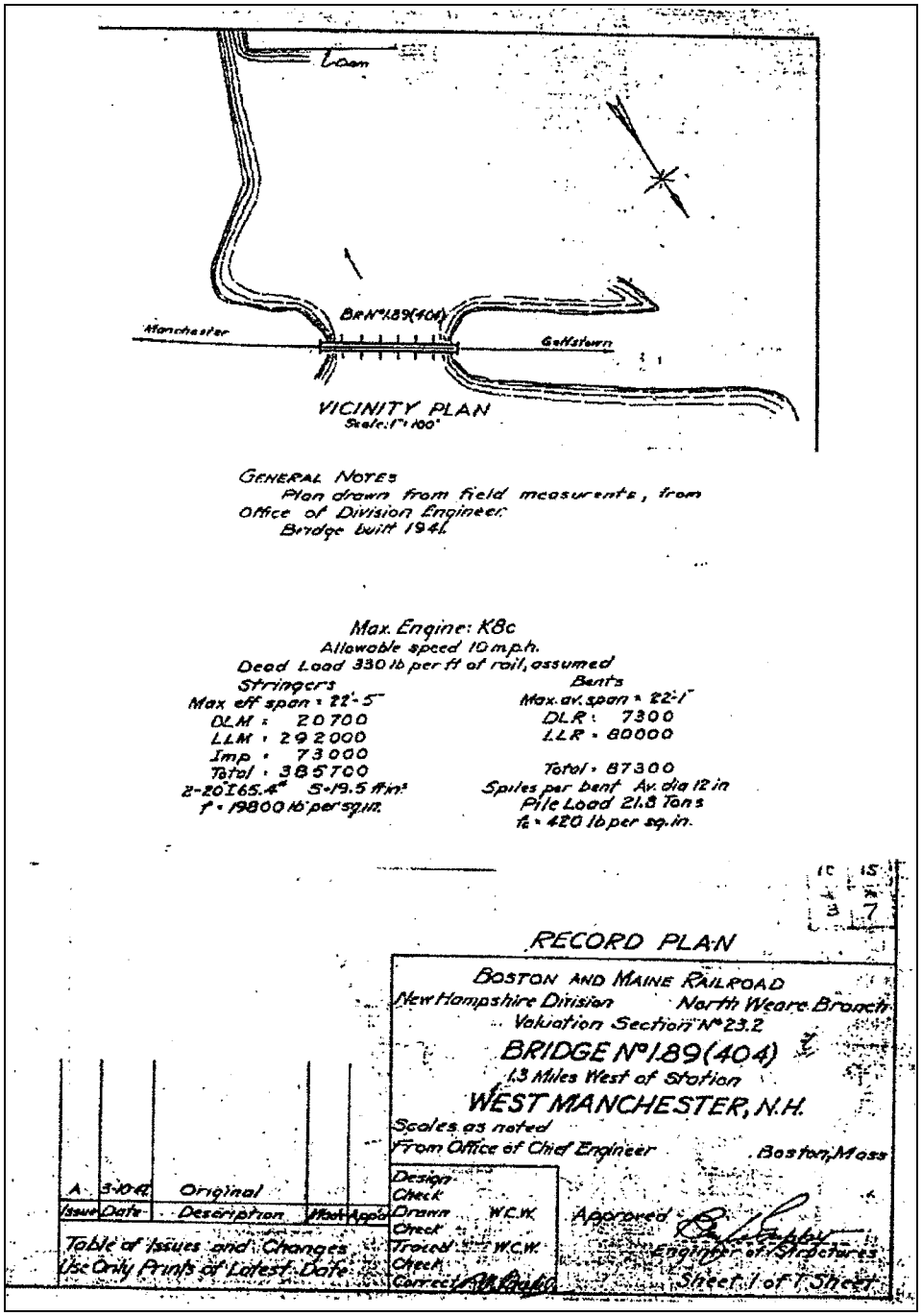

FIGURE 9: B&MRR Bridge No. 1.89 over Piscataquog River, West Manchester, NH. Title block, location plan and notes from plans. [Source: "Record Plan, B&MRR Bridge No. 1.89 (404) West Manchester." Dated 3/10/42]

FIGURE 10: Comparative Bridge: Manchester-Lawrence RR Trestle 4.65 over Spickett River, Salem. Six span, with solid concrete deck, 65' long, built 1929. (Source: Manchester and Lawrence Railroad Area Form, Lisa Mausolf, 2009).

FIGURE 11: Comparative Bridge: Manchester-Lawrence RR Trestle 24.17 over Cohas brook, Manchester. Eight span, 154' long, built 1932 by B&MRR. Although not mentioned, spans appear to be steel I-beams. (Source: Manchester and Lawrence Railroad Area Form, Lisa Mausolf, 2009).

FIGURE 12: Comparative Bridge: Portsmouth-Dover RR Trestle MP 0.19 over Piscatqua Inlet, Portsmouth. Nine span, timber and I-beam spans, circa 1910 with later reconstruction. (Source: Newington Branch/Portsmouth & Dover Railroad Area Form, Lisa Mausolf, 2010).

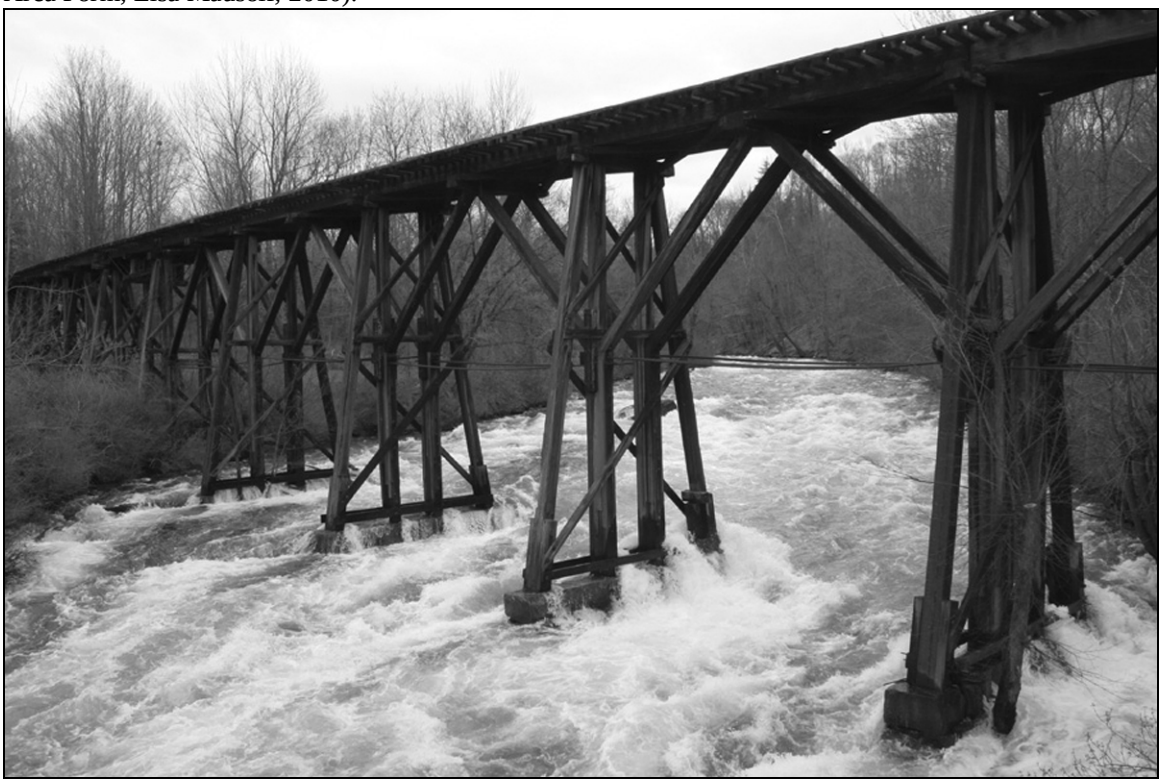

FIGURE 13: Comparative Bridge: B&MRR Trestle over Winnipeasaukee River, Franklin. (structure details not acquired).

48. Bibliography and/or References:

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Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 2 description: View of north (upstream) side of bridge with Kelly St. bridge in background.

Digital Photo File Name: MAN0487_02 Direction: SW

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 3 description: Overall view of south (downstream side of bridge.

Digital Photo File Name: MAN0487_03 Direction: NE

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 4 description: South side of Goffstown abutment.

Digital Photo File Name: MAN0487_04 Direction: N

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 5 description: North side of Goffstown abutment.

Digital Photo File Name: MAN0487_05 Direction: NW

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 11/11/2010 Image stored at: HDC INC.

Photo # 6 description: South side of Manchester abutment.

Digital Photo File Name: MAN0487_06 Direction: SE

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 7 description: Pile bents and north side of Manchester abutment.

Digital Photo File Name: MAN0487_07 Direction: S

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 11/11/2010 Image stored at: HDC INC.

Photo # 8 description: Oblique view of pile bents .

Digital Photo File Name: MAN0487_08 Direction: NW

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 9 description: Deck view: rotted or missing wood ties; steel angle welded to I-beam stringers.

Digital Photo File Name: MAN0487_09 Direction: NW

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 10 description: Detail of pile bent, cap, bracing and steel I-beam stringers.

Digital Photo File Name: MAN0487_10 Direction: S (looking up)

Address: B&MRR Bridge 1.89 over Piscataquog R. Date: 09/15/2011 Image stored at: HDC INC.

Photo # 11 description: Detail of double steel I-beam stringers supporting wood ties.

Digital Photo File Name: MAN0487_11 Direction: NW