

Timber, Concrete, and Steel

Bridging Peaslee Road over the Piscataquog River

Credits

“Timber, Concrete, and Steel” fulfills mitigation measures for the adverse effects resulting from the replacement of the National Register-eligible Peaslee Road Bridge, and was produced in coordination with the Army Corps of Engineers, New Hampshire Department of Transportation, New Hampshire Division of Historical Resources, Town of Weare, Weare Heritage Commission, and Weare Historical Society.

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The circa 1940 Peaslee Road Bridge spanned the Piscataquog River in northeast Weare, New Hampshire. The Peaslee Road Bridge was a Beam Girder, single span bridge measuring 63 feet long and 17 feet wide. In 2014 the Peaslee Road Bridge was one of five Beam Girder bridges remaining in New Hampshire.

The Beam Girder bridge type consists of two rolled steel girders supporting I-beam floor beams with a concrete deck. The cover photo illustrates the Peaslee Road Bridge's design: the girders were exterior steel members running parallel with the roadway, while the I-beam floor beams ran under and perpendicular to the roadway. The bridge was further distinguished by the use of rolled girders with wide flanges.

The Peaslees of Peaslee Road

The history of the Piscataquog River crossing at Peaslee Road begins with the settlement of Weare. The crossing's development was spurred by the construction of early mills and the endeavors of the Peaslee family.

Under the 1749 grant that established Weare, the area around the future location of the Peaslee Road Bridge was reserved for a saw mill in order to provide the settlement with the necessary cut lumber for building purposes. The mill was built in 1752 and located on the north side of the Piscataquog River. The mill proved short-lived when a substantial flood swept it away a few years later.

Ebenezer Peaslee, Peaslee Road's namesake, purchased the original mill's privilege and constructed a grist and saw mill on the south side of the Piscataquog River in 1779. He operated the mills until his death in 1817. The mills remained in the Peaslee family for subsequent generations, including Ebenezer's son, Moses, and grandson, Robert Peaslee.

Peaslee Road was laid out by the Town of Weare in 1782. It was two rods (approximately 33 feet) wide and ran to Peaslee's mill from the northeast. By the 1850s the road extended further north than it does today and reached the approximate present day location of Cross Road. By 1892 it connected River Road to Concord

This design constituted an efficient use of materials and provided a cost effective way to cross a relatively long distance with a single span.

Interestingly, the Peaslee Road Bridge is the only documented bridge built as a result of the 1938 flood to utilize the Beam Girder design. Other bridges constructed at that time utilized more common contemporary concrete and steel truss designs, suggesting that the Peaslee Road Bridge design was directly tied to site specific needs. The Peaslee Road Bridge demonstrates the evolution of an early twentieth-century bridge type and its modification to produce a unique solution to efficiently cross the Piscataquog River.

A Rare Resource

In 2014 the Peaslee Road Bridge was one of only five Beam Girder bridges remaining in New Hampshire. All five of these bridges deviated from the 1914 design and included advancements in bridge engineering and materials. The other known Beam Girder bridges in New Hampshire include:

- Charlestown Bridge No. 71/115 was built in 1935 on Chestnut Flat Road and is closed to traffic.
- Jefferson Bridge No. 166/058 was built in 1939 on Carter's Cut Bridge Road and is also closed to traffic.
- Pittsburg Bridge No. 99/134 was built in 1938 on Murphy Dam Road and is only 31 feet long.
- Lebanon Bridge No. 121/127 was built in 1966 and is a pedestrian walkway over I-89.

Over its lifespan, the Peaslee Road Bridge routinely faced flooding risks due to its low clearance. In 2006 the bridge was inundated by flood waters and could no longer carry emergency vehicles. The Peaslee Road Bridge was replaced in 2015.

Suggested Reading

Dearborn, Helen. *Town History of Weare, New Hampshire from 1888.*

Weare, NH: Town of Weare, 1959.

Little, William. *The History of Weare, New Hampshire.* Weare, NH:

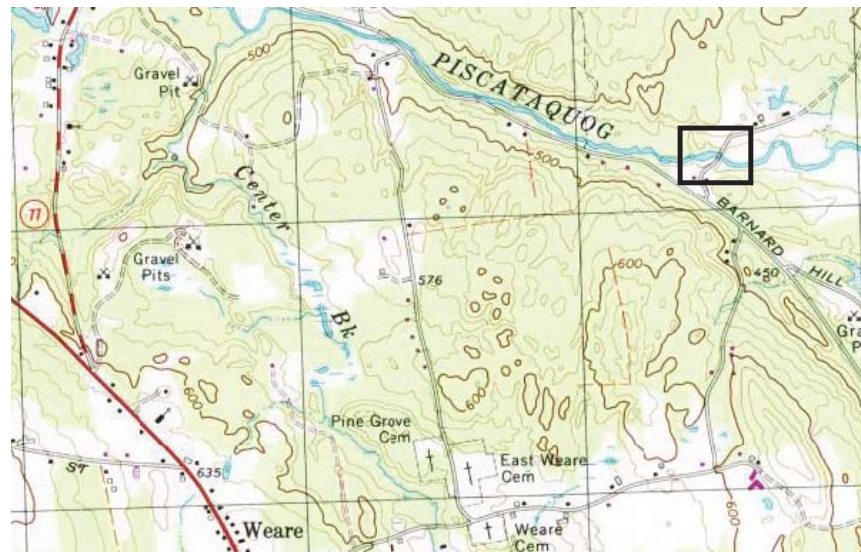
Town of Weare, 1888.

Weare Junior Historical Society. *The Flood and Hurricane of 1938 Weare,*

New Hampshire. Weare, NH: Weare Junior Historical Society, 1972.

The 1914 Beam Girder design was the result of improved early twentieth-century steel production methods. The wide flange girders found in the design were an advancement in steel production, and specifically, in rolled girder technology. Wider flanges made steel beams stronger. Thus, wide flange girders became popular for constructing longer bridges and taller skyscrapers. Henry Grey of the U.S. Steel Corporation developed this girder around 1900. When Charles M. Schwab quit as president of U.S. Steel in 1904, he bought controlling interest at Bethlehem Steel, a rival competitor. Schwab also bought Grey's patents for wide flange rolled girders and started producing them in 1907. Despite a legal battle with U.S. Steel, Bethlehem Steel retained the patent on the wide flange girders and controlled the technology. In the 1920s Bethlehem Steel finally granted U.S. Steel a license for wide-flange girder production.

With the advancement of steel production, New Hampshire bridge engineers combined the use of wider flange rolled girders with the 1914 design to increase the total span length. The Peaslee Road Bridge was designed with 33 inch rolled girders with 11 inch wide flanges to span 63 feet. In comparison, the United Construction Company's 1914 Beam Girder design only crossed a 35-foot span.



The c.1940 Peaslee Road Bridge was located northeast of Weare Village and spanned across the Piscataquog River. *USGS Topographical Map*



An artistic rendering of Ebenezer Peaslee's original mill on the Piscataquog River. *The History of Weare, New Hampshire, 1888*

Stage Road (current day Route 77). The only two residences located north of the Peaslee Road Bridge are houses built by Ebenezer and Moses Peaslee. Ebenezer's house dates to circa 1790 and Moses's dates to 1825.

Peaslee Road's Early Bridges

The 1782 description of Peaslee Road suggests the need for a bridge across the Piscataquog River, noting that the road ran east to west before dropping south across the Piscataquog River to River Road. The first documented mention of a bridge at this location was in 1799. The town paid Eleazer Greeley in rum for his work "repairing the bridge by Peaslee's mill." The bridge either stood for several years prior to 1799 or experienced damage shortly after construction if repairs were in order.

A late eighteenth-century bridge could have been either timber or stone. The Peaslee Road crossing was not heavily traveled, but needed to cross the Piscataquog River at around 50 feet wide. Timber was plentiful in the area, and timber bridges were easier to construct over a long span when compared to stone bridges. A stone arch bridge, which could have spanned this length, would have required more resources (significant amounts of quarried



A pre-1907 postcard shows a wooden bridge carrying Peaslee Road over the Piscataquog River. *Courtesy of the Weare Historical Society*

stone or fieldstone) and effort (manpower and time) than necessary for this rural crossing. A stone slab bridge, consisting of a large stone laid over vertical stone posts, were typically limited to small narrow crossings. Most likely, the original Peaslee Road Bridge was constructed of timber and composed of hand hewn planks laid over logs to create a smooth riding surface.

As the nineteenth century progressed, Peaslee Road continued to receive only light traffic related to the Peaslee's mills and farms and the crossing may have retained a wooden bridge. The earliest photographic evidence of a bridge at this location dates from around the turn of the twentieth century and shows a wooden bridge.

The immediate predecessor to the circa 1940 Peaslee Road Bridge dates to 1924. It was the first concrete bridge constructed in Weare. It cost \$6,000, but only stood for a little more than a decade. On September 21, 1938 a devastating hurricane soaked much of New Hampshire causing widespread flooding. The torrential downpours that ultimately continued for several days caused the dam at the Deering Reservoir to crest, setting off a chain reaction of flooding that also caused Lake Horace to breach and send a wave of water down the Piscataquog towards the concrete bridge.

The bridge did not survive the flood waters; it cracked and collapsed into the river. A total of 17 bridges and numerous mills and dams in Weare were lost as a result of the 1938 hurricane.

Town reports do not provide details about post-hurricane bridge building activities. Local history suggests that a temporary bridge was placed at the Peaslee Road crossing shortly after the flood, but the State of New Hampshire soon constructed a new, more permanent, steel bridge.

Engineering the Peaslee Road Bridge

After the 1938 flood, the Peaslee Road crossing posed a unique challenge for bridge engineers. They needed a bridge that would receive only limited use from moderately heavy vehicles, but would span over 60 feet. Typically, a bridge of this length would require multiple spans or more complex engineering and use of materials, increasing costs.

The solution was found in a previously popular bridge design: the Beam Girder bridge designed by the United Construction Company of Albany, New York. The State of New Hampshire began using this design in May 1914 and many Beam Girder bridges were constructed around the state in the following years.

Rolled Girder Diagram

