

**INDIVIDUAL INVENTORY FORM**

**NHDHR INVENTORY # AND0025**

**Name, Location, Ownership**

- 1. Historic name Bridge No. 206/137 (B & M RR 95.79)
- 2. District or area East Andover
- 3. Street and number Rt. 11 over Northern Railroad
- 4. City or town Andover
- 5. County Merrimack
- 6. Current owner State of NH

**Function or Use**

- 7. Current use Transportation: Road related
- 8. Historic use Transportation: Road related

**Architectural Information**

- 9. Style I Beam with Concrete Deck
- 10. Architect/builder B & M RR/Boston Bridge Works
- 11. Source drawings
- 12. Construction date 1929
- 13. Source NH State Highway Department Card
- 14. Alterations, with dates 1996 – new two bar aluminum rails
- 15. Moved? no  yes  date: \_\_\_\_\_

**Exterior Features**

- 16. Foundation concrete, steel
- 17. Cladding \_\_\_\_\_
- 18. Roof material ---
- 19. Chimney material ---
- 20. Type of roof ---
- 21. Chimney location ---
- 22. Number of stories ---
- 23. Entry location ---
- 24. Windows ---
- Replacement? no  yes  date: \_\_\_\_\_

**Site Features**

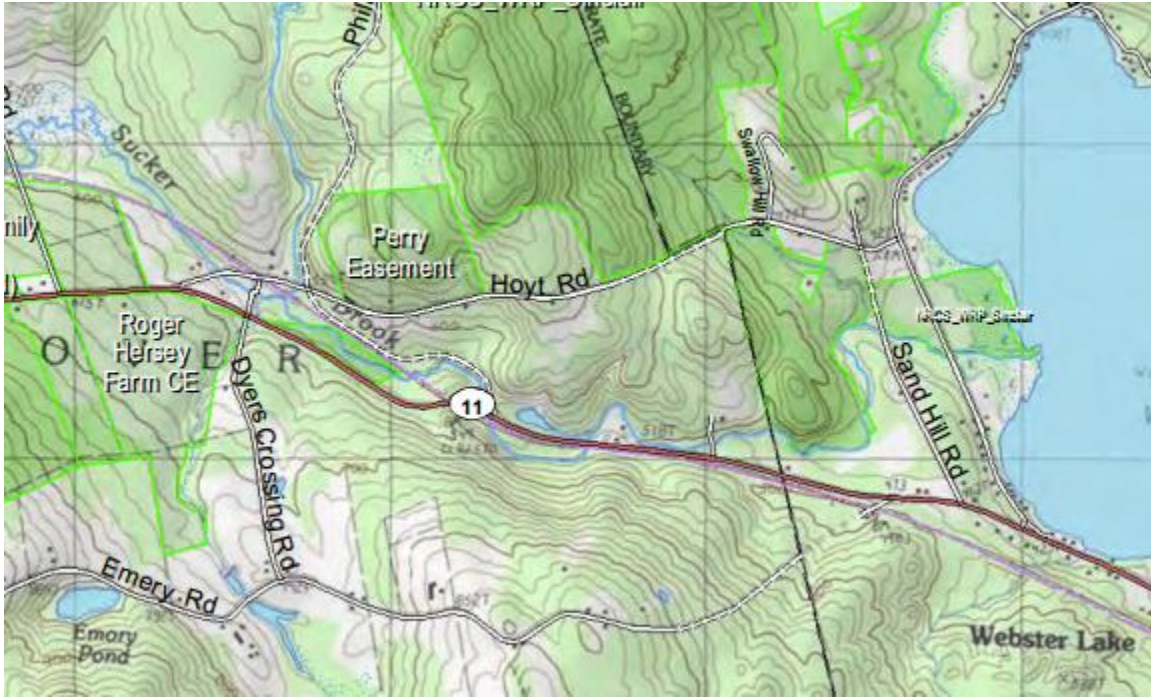
- 25. Setting rural
- 26. Outbuildings NA
- 27. Landscape features concrete crib retaining walls



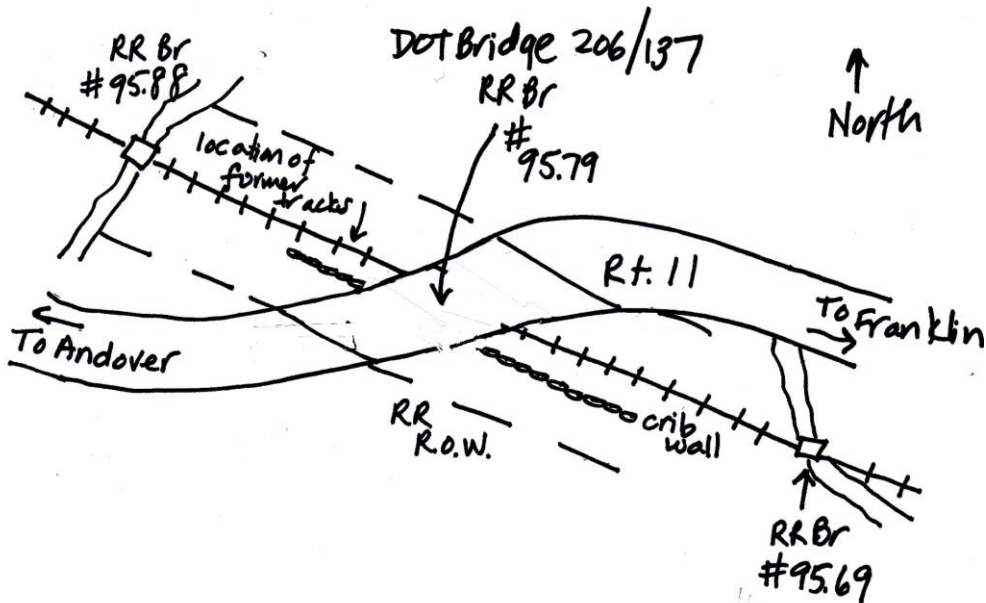
- 35. Photo #1 Direction: west
- 36. Date January 3, 2015
- 37. Reference 5455

- 28. Acreage NA
- 29. Tax map/parcel # NA
- 30. Map reference Z19 280245E 4816366N
- 31. USGS quadrangle and scale Franklin 1:24000
- Form prepared by**
- 32. Name Lisa Mausolf
- 33. Organization NHDOT
- 34. Date of survey January 3, 2015

39. LOCATION MAP:



40. PROPERTY MAP:



#### **41. Historical Background and Role in the Town's Development:**

Bridge No. 206/137 is located on NH Route 11, which occupies the approximate location of the historic east-west roadway through Andover which was laid out in 1762 and was originally known as "Centre Road". The road was initially constructed about 2 ½ miles in what is now Franklin, from the Pemigewasset River to Chance Pond and then extended to the mill privilege near the "hog-back" (a sharp ridge with steeply sloping sides) in what is now Andover. The so-called "hog-back" was located in the vicinity of the present bridge. The crossroad (Dyers Crossing Road) was laid out from the Centre Road to what is now Emery Road in 1769 (Eastman 1910: 200).

The eastern section of Andover was settled several years before the western section of town and there were several early mills near what was called "hog-back". Mill Brook, the outlet of Highland Lake, furnished water power for the first sawmill and the first gristmill and several other later mills. The brook is known as Sucker Brook further east and flows into Webster Lake in Franklin. In 1839 a severe freshet destroyed the bridges at Dyer's Crossing and below the "hog-back" but these were rebuilt (Eastman 1910).

Construction of the Northern Railroad to connect Concord and Lebanon was begun in 1846 and the rails reached Andover in July 1847. The route the railroad took in Andover generally followed the Centre Road and Sucker Brook. One of the largest physical impediments to extend the railroad to Lebanon was going through Hogback Hill in Andover. In order to cut through the hill a group of Irishmen with a one-horse dump cart were employed to haul dirt down to the hollow. It is estimated that over 5,000 carts of gravel were used (Shepard 1996). The construction of overhead bridges, bridges that carried vehicular roads over the train tracks, was also undertaken by the railroad. The town of Andover gave the railroad the right to cross the highway slightly east of the present overpass in 1846 but it is not clear if this was for a grade crossing or overpass. It is known that a bridge carried this road over the railroad by 1887. An appraisal of the Northern Railroad that year includes a Hogback Town Overpass consisting of a wood stringer bridge 21' long that carried the town road over the railroad and was located roughly between mileposts 95.50 and 95.69. It appears that it was located a short distance from the present bridge, indicating a later adjustment in the alignment of the town road. The railroad was taken over by the Boston and Maine Railroad in 1888 and the Railroad Commissioners Report of that year reports that extensive repairs and renewals were made along the line in 1887. In Andover these repairs included extensive repairs to the Hogback overpass, the predecessor of the present bridge (RR Commissioners' Report, 1888, p. 40).

There were likely no substantial changes to the so-called Hogback overpass until the late 1920s. However, on November 3 and 4, 1927 torrential rains fell over much of New England, causing severe floods and considerable damage to infrastructure including miles of highway and railroad throughout New England. Following the flood the B & M began a four-year effort of replacing bridges. On the Northern Railroad this resulted in the reconstruction of over thirty-five bridges during this period (Mausolf 2014: 23). The present bridge was constructed in 1929 by the Boston & Maine Railroad as part of this effort. The alignment of Rt. 11/Franklin Highway was also altered slightly in this area at the time, relocating a section of Rt. 11 to south of the brook and relocating the crossing over the railroad to the present location (Trunk Line Construction Project #1451). Also reconstructed at about the same time were three nearby railroad bridges: resulting in a new concrete slab bridge at Lower Hogback (MP 95.50, 1929), a thru plate girder at Upper Hogback (MP95.69, 1930) at MP 95.50 and a concrete slab bridge at Emory's (MP95.88, 1930).

Bridge No. 206/137 was fabricated by the Boston Bridge Works of Cambridge, Massachusetts. The company was established in 1876 by David H. Andrews. From a small shop in the 1870s the business grew into one of the most successful bridge building companies in New England by the turn of the century. Notable spans included the 1892 Harvard Bridge on Massachusetts Avenue between Cambridge and Boston. The Boston Bridge Works built bridges for many New England railroads including the Boston & Maine, Providence, Old Colony, New Haven, and Connecticut River. The company also built a number of highway bridges in New Hampshire including bridges at Piermont and Bath after the 1927 floods. The company experienced hard times during the Depression and went out of business in 1938.

In the early 1980s Guilford Transportation absorbed the former B & M lines including the Northern. In 1991 Guilford Transportation filed papers to abandon the 59 miles of the line between Boscawen and Lebanon; this process was completed in 1992. Development of a rail trail in the Merrimack County section began in 2000.

**42. Applicable NHDHR Historic Contexts:**

Commerce, industry and trade in New Hampshire village and town centers, 1630-present  
Railroads in NH, 1842-1960  
Automobiles, Highways and Culture, 1900-present

**43. Architectural Description and Comparative Evaluation:**

Built in 1929, Bridge No. 206/137 carries NH Route 11 over the Northern Rail Trail at railroad mile marker 95.79. It is located east of East Andover village, east of Dyers Crossing Road and 0.7 miles west of the Franklin-Andover town line.

The five span I-Beam with concrete deck bridge measures 178'11" long. The roadway is 26' wide without sidewalks and is flanked by uncoated two bar aluminum railings which were installed in 1996. The bridge is located on a curve in the road and has a 51 degree skew. The concrete deck is covered with asphalt pavement. The deck is supported by seven concrete-encased I-beams.

As constructed, the railroad right-of-way was a single track wide at this location with a provision for a future track that was never built. The rails were removed c.2000 and the right-of-way is currently a rail trail. The bridge offers about 19' 10" of clearance above the former track. The substructure of the bridge consists of concrete abutments and four steel bents set on concrete bases. The four steel bents are each constructed of four steel H columns with box girder caps and smaller members used for cross frame braces with another steel subvertical descending from the center of the brace. The two center bents are the tallest and in each case the four H columns are set on a single, elongated concrete pad. The two outer (uphill) bents are shorter with each column resting on an individual concrete pad. The slope in front of the westernmost bent is shored up by an iron retaining wall. The bridge typifies early 20<sup>th</sup> construction in that by the time this bridge was constructed steel had superceded wrought iron and riveted connections had replaced pins.

The bridge is relatively unchanged from its original appearance but the substructure of the bridge in particular displays serious deterioration. There is significant section loss, girders are rusted and there is rebar exposed on the abutments. Holding back the slope to the south of the bridge there is a distinctive concrete crib retaining wall that was also built by the railroad. It stands a maximum of six feet high and is constructed of interlocking concrete members. The crib wall extends over fifty feet east of the bridge and about 25' on the west approach.

The I-Beam with concrete deck span (IB-C) was a common highway bridge erected throughout the state in the early to mid 20<sup>th</sup> century. The bridge first became popular in the late 19<sup>th</sup> to early century after the Bessemer process made steel inexpensive.<sup>1</sup> In terms of highway bridges, the IB-C was widely used by the State Highway Department. As of 2011 there were at least 183 known I-Beam highway bridges with concrete decks built in New Hampshire prior to 1936 (Garvin 2011). Most of the bridges were a single span although there were also double spans and spans with 3 to 9 sections. What sets this bridge apart from other similar IB-C highway bridges is its substructure which displays the latest in early 20<sup>th</sup> century design, material, and method of construction. The substructure exceeds what would have been normal for a highway bridge and this is evident in the large size of the members and the use of subverticals. The bridge was overdesigned compared to typical highway bridges because it was a product of B & M design. Railroads typically designed for much higher loads than highway engineers and they also required greater rigidity. The design was also guided by the priority the railroad engineers placed on protecting the right-of-way from accidents (Clouette 1991:5).

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<sup>1</sup> In the Bessemer process a blast of air was forced through the molten metal in order to remove impurities from the iron. It was the first inexpensive industrial process for the mass production of steel from molten pig iron. The Bessemer process was named for its inventor, British engineer Henry Bessemer, who took out a patent in 1855. The Bessemer process was eventually superceded by the open hearth process.

**44. National or State Register Criteria Statement of Significance:**

Constructed by the Boston & Maine Railroad in 1929, Bridge No. 206/137 contributes to the Northern Railroad Historic District which was determined eligible for the National Register in 1999 and reconfirmed in 2014. The Railroad is significant under Criterion A and C as a linear transportation district that illustrates one of the most significant historical contexts in the state – railroading from the mid 19<sup>th</sup> to the mid 20<sup>th</sup> century. All rail related structures, objects and buildings that are more than fifty years old and maintain sufficient integrity to demonstrate their historic associations, contribute to the district. As a railroad-related resource on the line, Bridge No. 206/137 may lack individual distinction but contributes to the overall significance of the district. The 2014 inventory form for the Northern Railroad erroneously concluded that this bridge was not a contributing resource because it was not rail-related. Subsequent research indicates that the bridge was indeed designed by and constructed for the Boston & Maine Railroad highlighting the fact that the construction and maintenance of overhead bridges was the responsibility of the railroad. It is known that a bridge carried the road over the railroad on or near this location since at least the late 19<sup>th</sup> century. The present bridge was built during an early 20<sup>th</sup> century orchestrated effort of the B & M to replace bridges on the line and throughout New England after the 1927 flood. The present bridge is an excellent example of the type of sturdy steel construction favored by the railroad to protect the right-of-way and was constructed by the Boston Bridge Works, a major 20<sup>th</sup> century bridge contractor.

A bridge of similar construction is located further up the line in Danbury at milepost 111.18.

**45. Period of Significance** (for Northern Railroad district): 1929 to late 1970s (end of railroad service)

**46. Statement of Integrity:**

Bridge No. 206/137 retains integrity for the period since its construction in 1929. It retains its design, materials, workmanship, and feeling from that date. Integrity of setting and association are affected by the removal of the railroad tracks but the relationship to the railroad bed remains intact.

**47. Boundary Discussion:** railroad right-of-way

**48. Bibliography and/or References:**

Appraisal of Northern Railroad, 1887, Book 3 [NH Historical Society, Concord]

Boston & Maine (B&M) Railroad. List of bridges and structures, New Hampshire Division, Main line Concord to White River Junction, 1945.

Boston & Maine (B&M) Railroad. Right-of-Way and Track Map for the Northern Railroad. Boston: 1914.

Chaffee, Ralph G. *History of Andover, New Hampshire, 1900-1965*. Orford, NH: Equity Publishing Corp., 1966.

Clouette, Bruce. Historic American Engineering Record for Ferry Street Railroad Bridge, New Haven, Connecticut, HAER No. CT-54, 1991.

Eastman, John R. *History of the Town of Andover, New Hampshire, 1751-1906*. Concord: Rumford Printing Co., 1910.

Garvin, James. "High Water: Rebuilding bridges after the floods of 1927 and 1936", *New Hampshire Highways*, March/April 2004.

Garvin, James. "I-Beam Bridges with Concrete Decks (IB-C) in New Hampshire, 1935 or earlier". March 15, 2011.

Hersey, Miss M. F. "Andover", *The Granite Monthly*, Vol. XXI, No. 4, October 1896.

Mausolf, Lisa. Area Form for the Northern Railroad, May-Dec. 2013. [On file at the NH Division of Historical Resources, Concord, NH]

New Hampshire Department of Transportation. Bridge Design, Inspection Card, Drawings and reports for Bridge No. 206/137 and other comparable bridges.

New Hampshire Department of Transportation. Drawings for T.L.C. 1451, Franklin-Andover, 1929.

Preservation Company. Valley Road Rural Historic Areas, Andover #12806 Project Area Form, 2000. [On file at the NH Division of Historical Resources].

Seventh Annual Report of the State Highway Department of New Hampshire for the Period from Feb. 1, 1929 to January 31, 1930.

Shepard, Alice M. *The History of Franklin*. Franklin: Sant Bani Press, 1996.

Story, Kenneth. Historic American Engineering Record for Andover Town Bridge (097/096). Prepared by Preservation Company for the NH Department of Transportation, 2001. [On file at the NH Division of Historical Resources]

**Surveyor's Evaluation:**

NR listed: individual \_\_\_\_\_  
within district \_\_\_\_\_

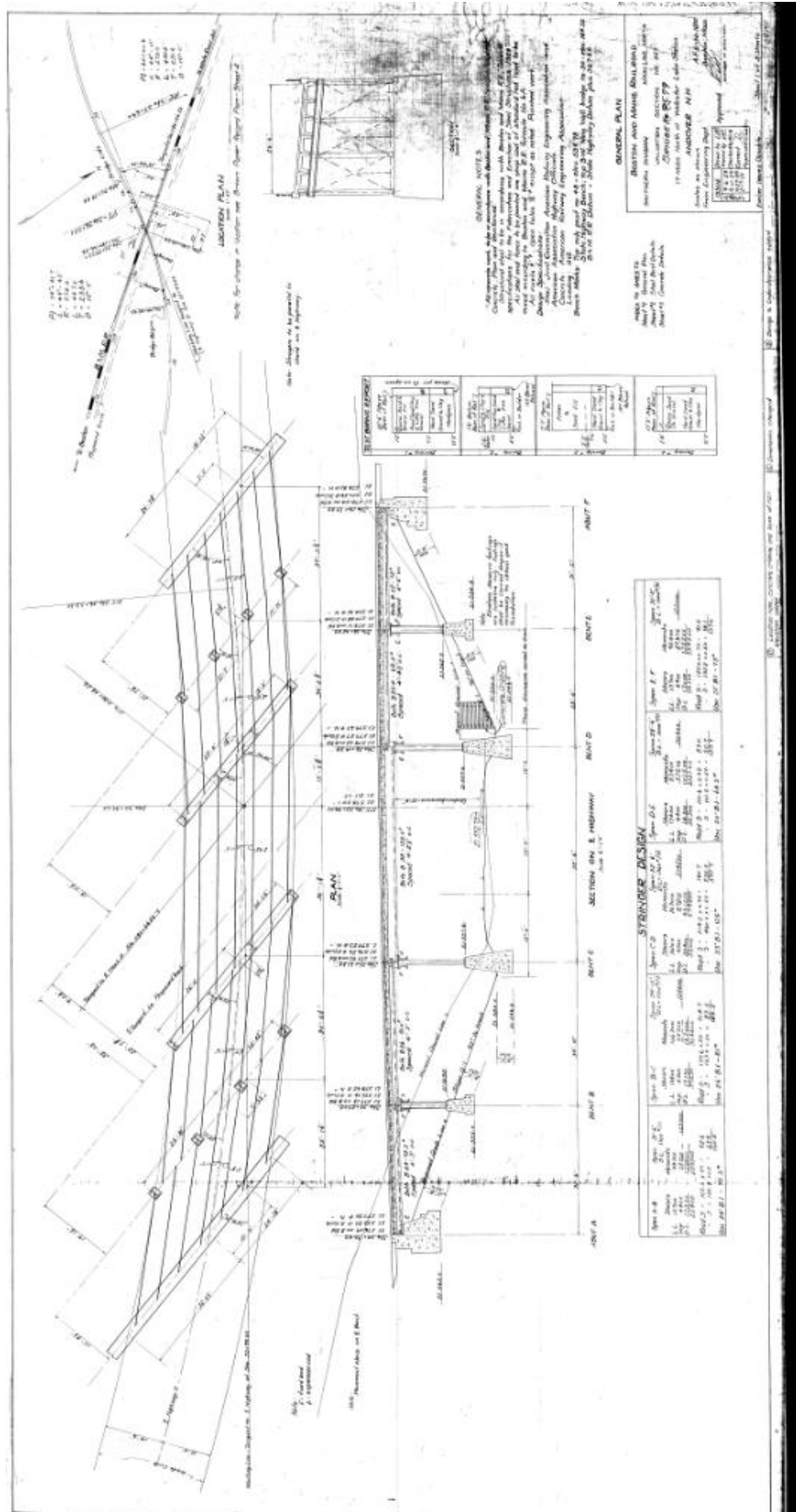
Integrity: yes \_\_\_\_\_  
no \_\_\_\_\_

NR eligible: individual \_\_\_\_\_  
within district   x    
not eligible \_\_\_\_\_  
more info needed \_\_\_\_\_

NR Criteria: A   x    
B \_\_\_\_\_  
C   x    
D \_\_\_\_\_  
E \_\_\_\_\_

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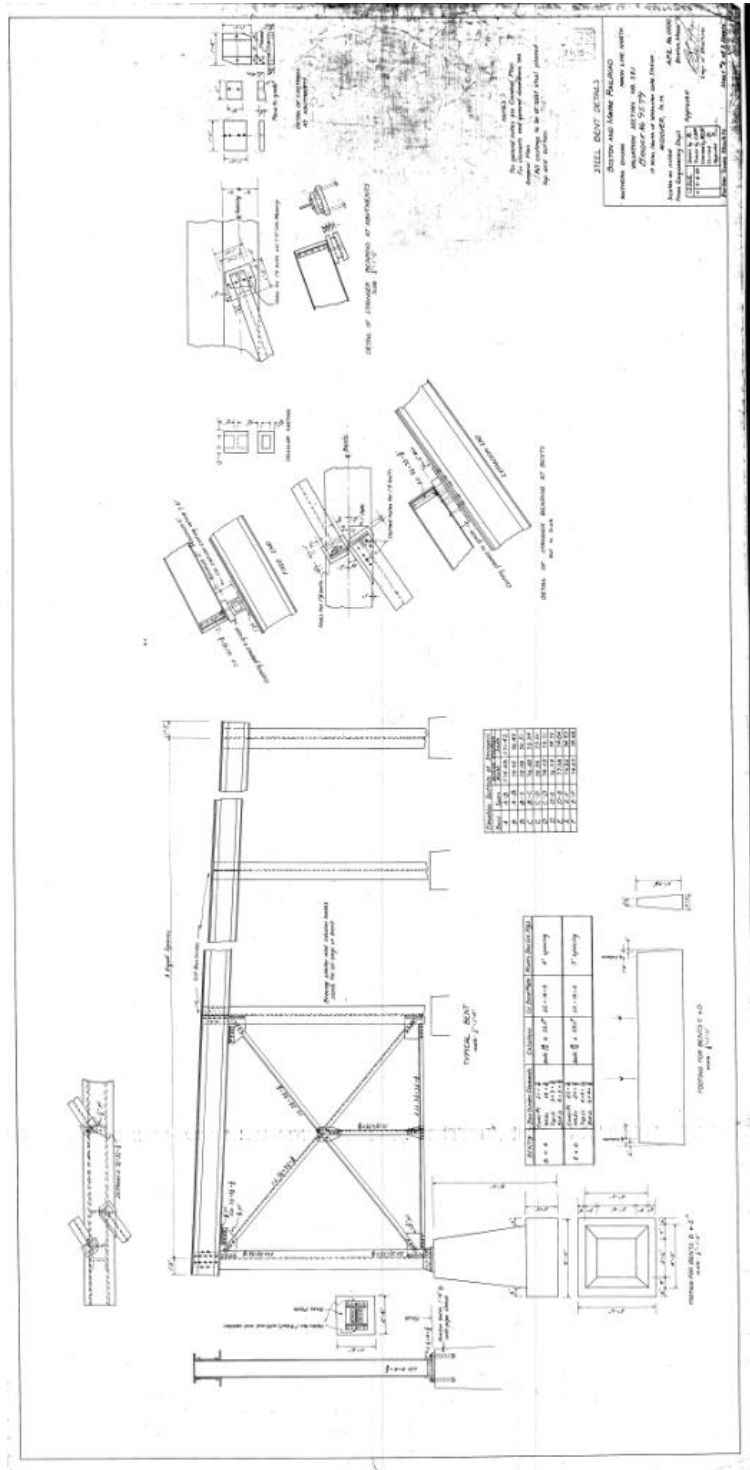


Original drawing

Source: NHDOT Bridge Design

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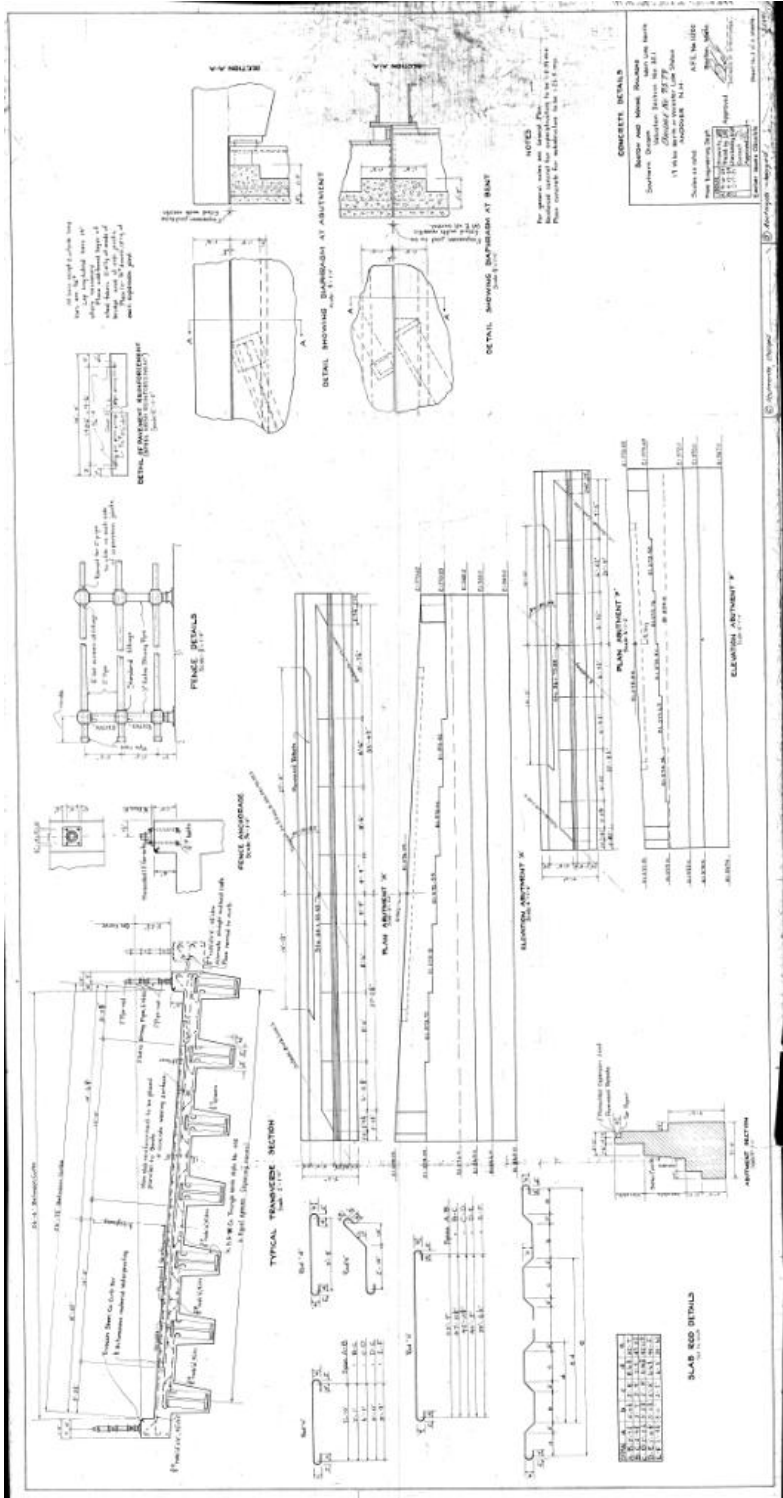
Original drawing

Source: NHDOT Bridge Design



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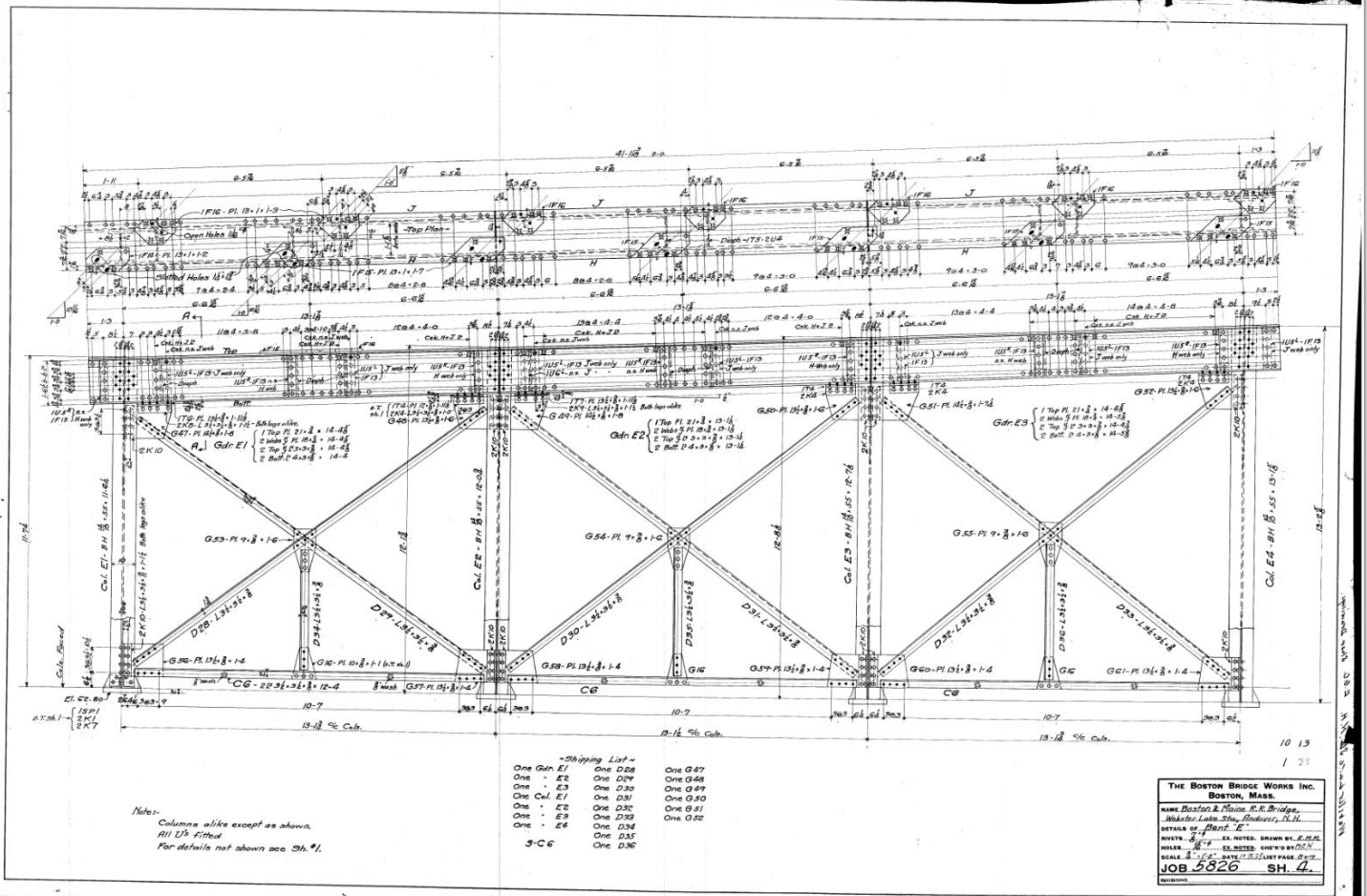


Original drawing

Source: NHDOT Bridge Design

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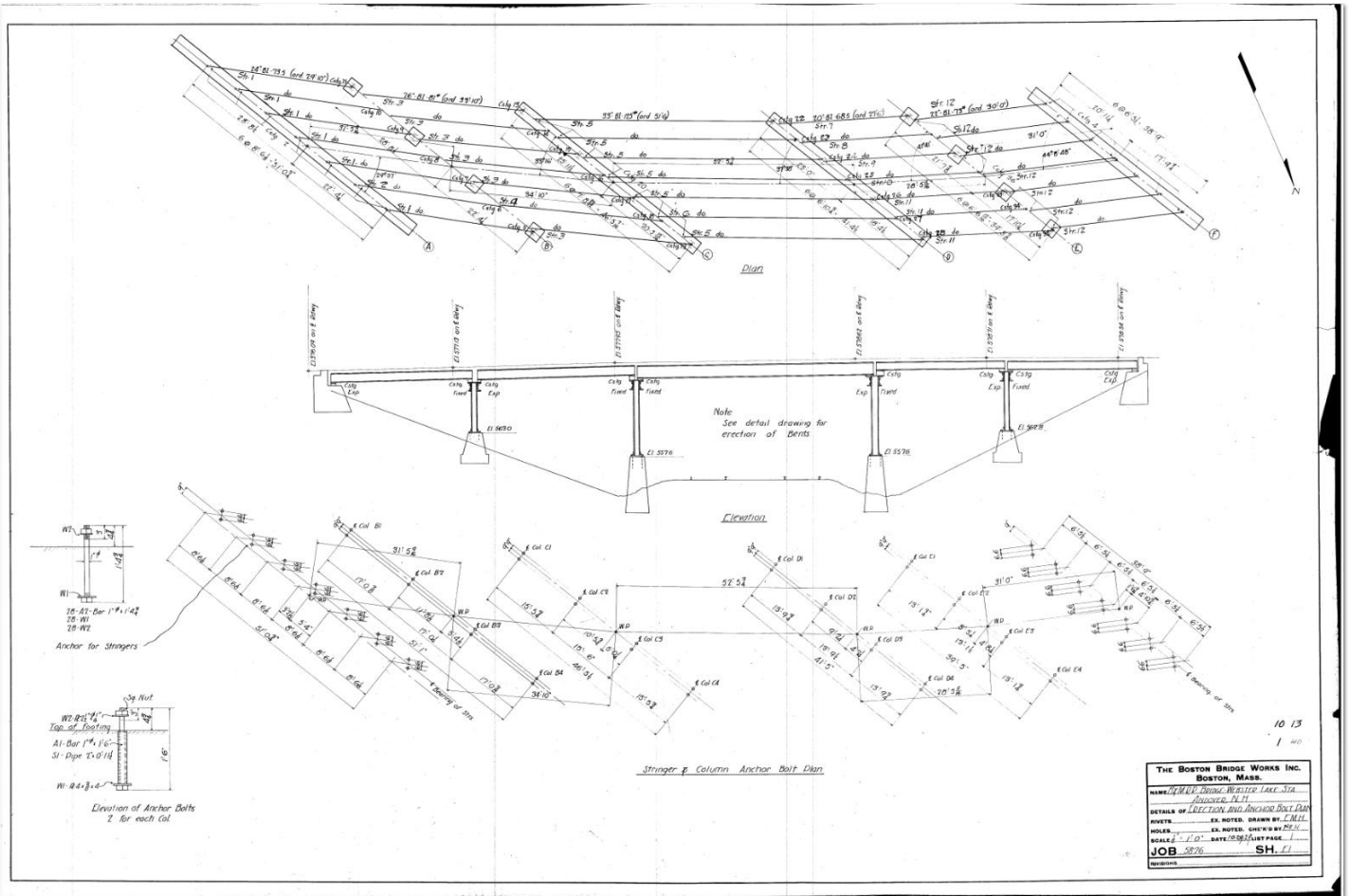


Original drawing

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Original drawing

Source: NHDOT Bridge Design

**INDIVIDUAL INVENTORY FORM**

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Date photos taken: January 3, 2015



Photo # 2 Description: View down trail at north side of bridge with concrete tie crib wall at right  
Reference: 5479 Direction: SE



Photo # 3 Description: View from rail trail of south side of bridge with concrete tie crib wall at left  
Reference: 5502 Direction: NW

**INDIVIDUAL INVENTORY FORM**

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Date photos taken: January 3, 2015



Photo # 4 Description: View of east bents and abutment from trail  
Reference: 5488 Direction: east



Photo # 5 Description: View of east bents and east abutment  
Reference: 5462 Direction: north

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Date photos taken: January 3, 2015



Photo # 6 Description: Detail of corrosion on east center bent  
Reference: 5461 Direction: west



Photo # 7 Description: Detail of corrosion on east box girder cap  
Reference: 5472 Direction: east

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Date photos taken: January 3, 2015



Photo # 8 Description: View from trail of westernmost bent with iron retaining wall behind  
Reference: 5482 Direction: south



Photo # 9 Description: View from trail of west bents and abutment  
Reference: 5472 Direction: west

**INDIVIDUAL INVENTORY FORM**

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Date photos taken: January 3, 2015



Photo # 10 Description: Easternmost bent and abutment  
Reference: 5465 Direction: east



Photo # 11 Description: Concrete tie crib retaining wall on south side of trail  
Reference: 5480 Direction: south



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Date photos taken: January 3, 2015

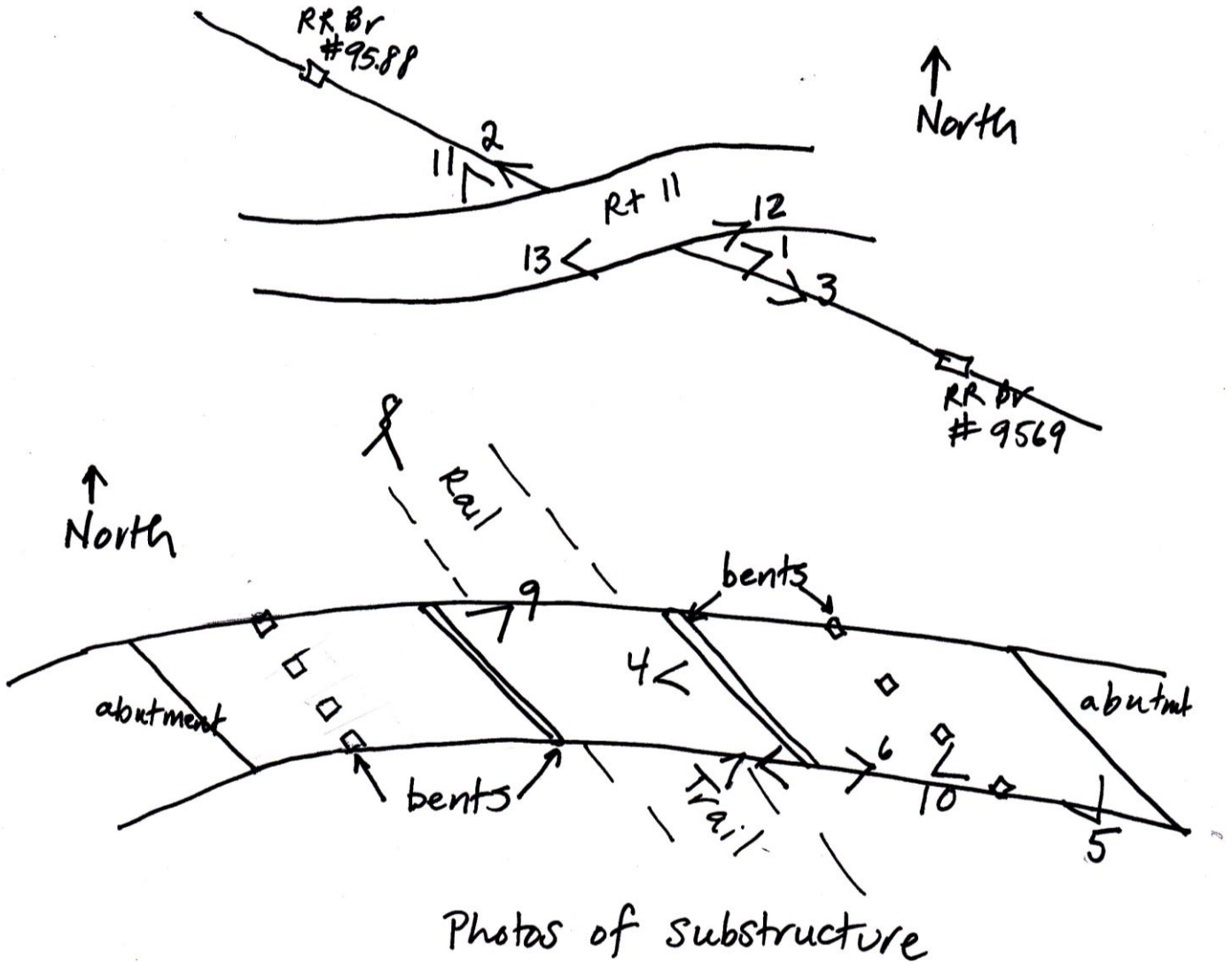


Photo # 12 Description: View of roadway with rail visible below at left  
Reference: 5511 Direction: west



Photo # 13 Description: Roadway view  
Reference: 5514 Direction: east

PHOTO KEYS



Photos of substructure

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 Photo Policy. These photos were printed at Concord Camera. The digital files are housed at my office in Reading, Massachusetts.

SIGNED: