

Tab K. NHDHR Individual Form for Portsmouth Approach

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POROO14

Name, Location, Ownership

1. Historic name: Portsmouth Approach to Memorial Bridge
2. District or area: N/A
3. Street and number: US Route 1
4. City or town: Portsmouth
5. County: Rockingham
6. Current owner: City of Portsmouth

Function or Use

7. Current use(s): Transportation, road-related
8. Historic use(s): Transportation, road-related

Architectural Information

9. Style: N/A
10. Architect/builder: W.A. McFarland
11. Source: Newspaper
12. Construction date: 1923
13. Source: Research, Inspection
14. Alterations, with dates: 1977 (major rehab)
15. Moved? no ☒ yes ☐ date: N/A

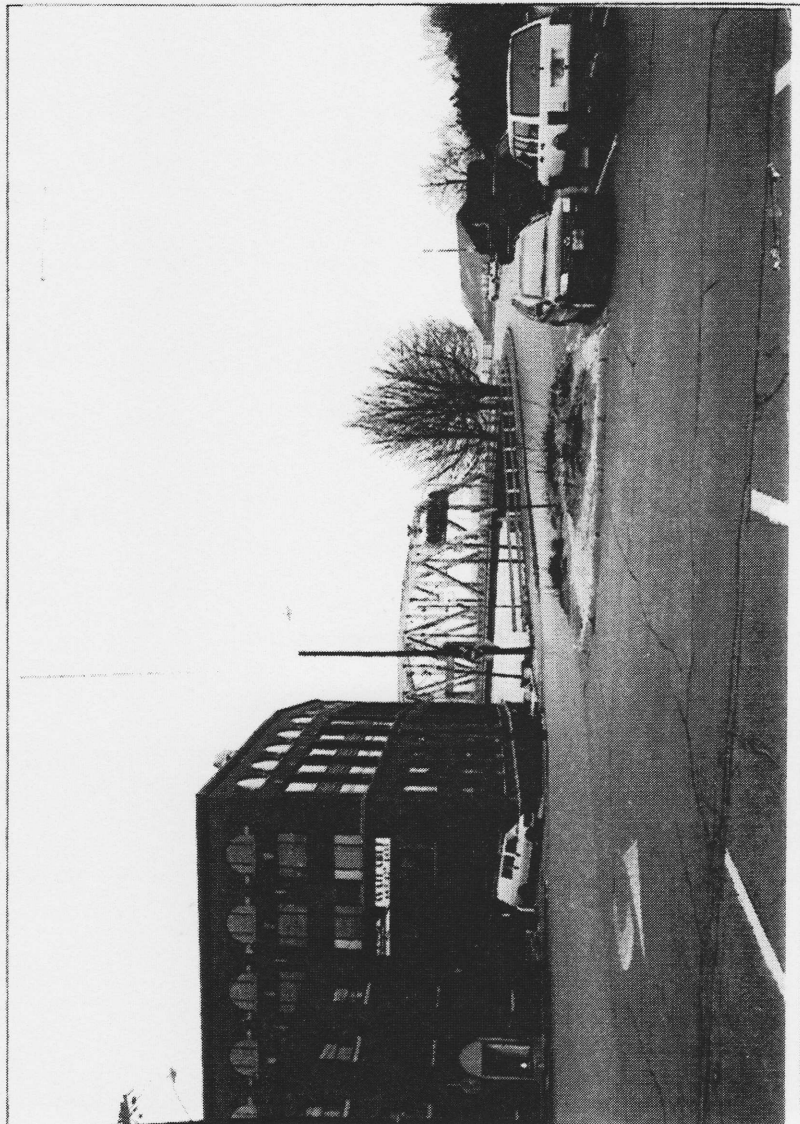
Exterior Features

16. Foundation: Concrete
17. Cladding: Concrete
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/A24. Windows: N/AReplacement? no ☒ yes ☐ date: N/A

Site Features

25. Setting: Downtown business district
26. Outbuildings: N/A
27. Landscape features: N/A
28. Acreage: less than one acre



Portsmouth Approach to Memorial Bridge

35. Photo #1

36. Date 12/200337. Roll #2Frame #30Direction: NE38. Negative stored at: NHDHR29. Tax map/parcel: N/A30 UTM reference: 19.357235.477074531. USGS quadrangle and scale: Portsmouth, 1:24000

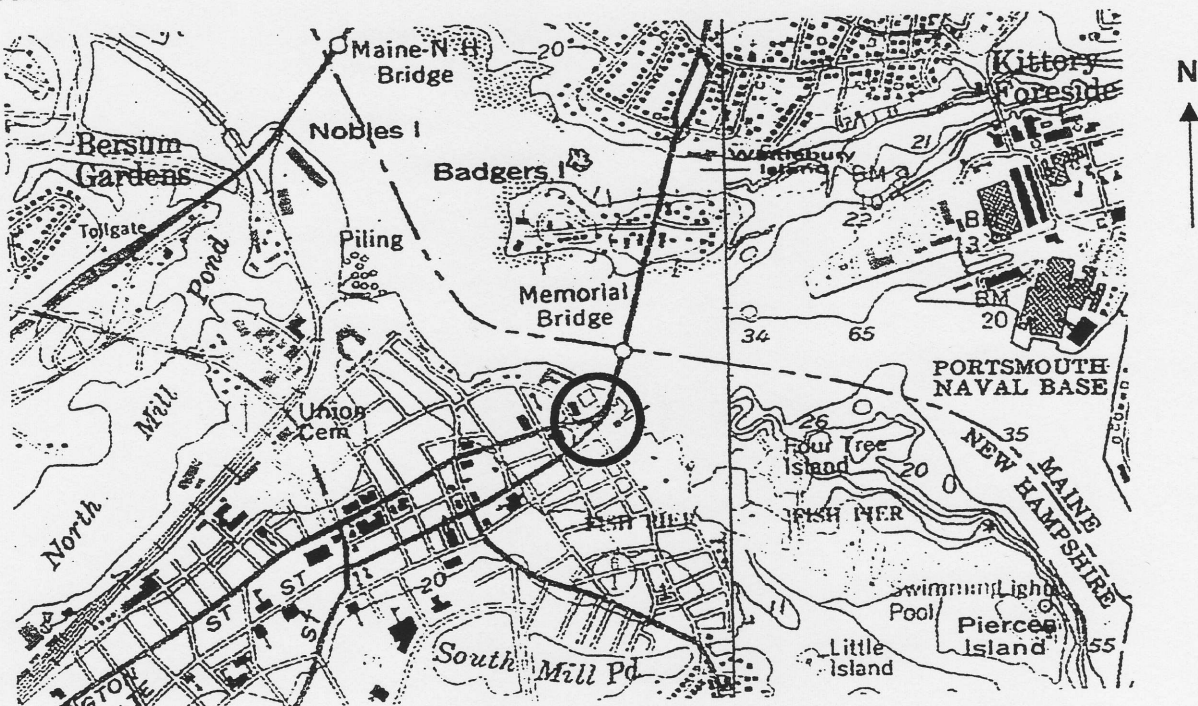
Form prepared by

32. Name: Carol Hooper; Frank Griggs33. Organization: Preservation Company34. Date of survey: December, 2003

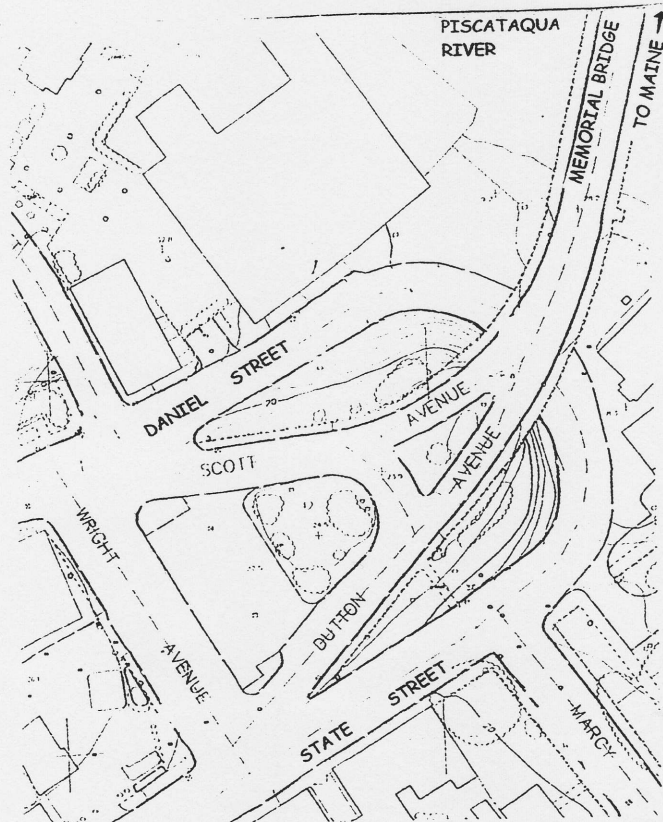
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39. LOCATION MAP:



40. PROPERTY MAP:



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

The Portsmouth Approach to Memorial Bridge is a five-span, 120'-long, reinforced concrete slab, access-span completed in 1923. Designed by Portsmouth City Engineer W.A. McFarland, it was built to provide access (via U.S. Route 1) from the south to Memorial Bridge across the Piscataqua River. The access span continues to function as the Portsmouth Approach to Memorial Bridge to the Memorial Bridge. It is owned and maintained by the City of Portsmouth.

The Portsmouth Approach to Memorial Bridge qualifies for listing on the National Register of Historic Places under Criterion C for significance in the area of engineering. As the approach span to Memorial Bridge, it is a component part of an important engineering achievement, the central portion of which was designed by eminent engineer and originator of the long span vertical lift bridge, J.A.L. Waddell. However, the Portsmouth Approach to Memorial Bridge is also significant in the area of engineering in its own right. It is one of very few access spans in the state. Compared to other bridges, it is the single longest concrete bridge built before 1925 extant in the state today. It is also the longest extant non-arched concrete bridge constructed in New Hampshire before 1935. It is the earliest identified concrete continuous slab bridge in New Hampshire and it appears to be the longest continuous span concrete bridge built before 1935 in the state. Of the over 300 pre-1930 concrete bridges in New Hampshire, it is the only five-span concrete bridge. It is also unique in its skewed design.¹

Engineering Significance - 1920s Reinforced Concrete Bridge Design

Concrete construction began to come to the forefront of American bridge design beginning around the turn of the century. With technological improvements in the concrete itself, as well as in methods of reinforcing, concrete became the material of choice because of its lower maintenance costs and its greater design flexibility (Rudge 1989: F14). Although there continued to be experimentation in methods of reinforcing up to the 1920s, by then the use of steel bars predominated. With these factors, concrete bridges came to dominate bridge construction throughout the United States. Standardized plans for concrete bridges were quickly disseminated by the many new and expanding state highway departments.

Before 1940, the most common types of concrete bridges constructed were beam and slab bridges. Concrete slab designs were popular particularly for short spans.² Consisting simply of a slab of concrete on piers/abutments, the slab operated like a continuous beam. The design was popular because it was simple to build and design, economical and it also increased overhead clearances as compared to girder construction. It, along with the beam and slab bridge designs, were used often and were well described in contemporary professional literature.³

¹ Skew refers to the fact that the substructure of the bridge is not perpendicular to the longitudinal axis of the bridge.

² The use of reinforced concrete in bridge design in the United States dates to 1871. Particularly from 1900-1920 there was significant experimentation with different methods of reinforcing. The size, spacing and arrangement of reinforcing in the Scott Avenue Approach was similar to what would be specified today with the exception that reinforcement is now deformed while that used in the Approach were square bars varying in dimension from ½" to ¾" on a side. The use of stirrups and bent up bars, was and still is, common practice.

³ Eminent early twentieth century engineer, J.A.L. Waddell, for instance, in his 1916 book *Bridge Engineering* devoted a full chapter (Chapter XXXVII) to Reinforced Concrete Bridges. The American Society of Civil Engineers (ASCE), the American Railway Engineering and Maintenance of Way Association (now AREA), The American Society for Testing Materials (ASTM) and the Association of Portland Cement Manufacturers (PCA) formed a committee in 1909 to standardize practice in the design and construction of reinforced concrete structures. Reports of the committee were made in 1909 and in 1913 with the last report published in the *Transactions of ASCE* and in summary form in *Engineering News*. Textbooks were

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The Portsmouth Approach to Memorial Bridge represents a hybrid in terms of structural systems. Although it combines elements of beam and slab, and frame design, it is best characterized as a continuous slab bridge with edge beams, with its main structural system being the slab.⁴ Little if any information exists documenting the design process for the bridge and why the particular structural system was selected, however, it seems likely that the bridge design evolved from the site conditions, the desire to have separate streets leading to and from the bridge, and a need to keep maintenance costs low. Whatever the design rationale, however, it is clear that there are many elements of the approach that are unique or rare when compared to other New Hampshire bridges of its era.

During the 1920s and 1930s in New Hampshire, although there were both many concrete bridges and many bridges this length or longer constructed, it was rare to see a non-arched bridge of this length built of concrete construction. Instead, for spans greater than 25' or 30', a variety of different types of bridge designs and materials were used, including arched concrete designs and steel, in particular steel through truss spans. Non-arched concrete designs were generally reserved for spans of less than 30'. Although it is impossible to analyze all bridges that were originally constructed, based on standing bridges and bridges recently demolished, it appears that the Portsmouth Approach is the single longest extant concrete bridge built before 1925 in the state.⁵ It is also the longest extant non-arched concrete bridge constructed in New Hampshire before 1935. Related to its length, of the over 300 pre-1930 concrete bridges in New Hampshire, the Portsmouth Approach is the only five-span concrete bridge.

The Portsmouth Approach to Memorial Bridge also appears unusual for its era because it is of continuous concrete construction, that is, the concrete slab is continuous over the piers and does not have structural breaks at the points of support. It is the earliest identified concrete continuous slab bridge in New Hampshire and it appears to be the longest continuous span concrete bridge built before 1935 in the state. This type of construction would be natural given the curvature and variable width of the bridge. Its relative rareness among New Hampshire bridges likely reflects the fact that most concrete bridges were single spans.

Another aspect of the design that was unique was the variable width and curvature of the bridge required to blend the end of the main bridge deck with the width of abutment necessary to provide for split access and egress lanes (i.e. the skew, or the angle of the bridge relative to its supports). In situations where there are not complicating features, bridges are usually aligned perpendicularly to their supports.

Historical Background

written shortly after with Waddell referring to Vol. II of Hool's *Reinforced Concrete Construction*, Taylor and Thompson's *Concrete Plain and Reinforced* and Turneure and Maurer *Principles of Reinforced Concrete Construction*.

⁴ The New Hampshire Bridge Inspection Reports for the bridge incorrectly categorize it as a "Concrete Rigid Frame" Bridge or a "Concrete Continuous Frame" Bridge.

⁵ This analysis was based on a search of the Federal Highway Administration database of bridges (supplied by the New Hampshire DOT) available at granitestatehighways.com. The fact that significant numbers of bridges from that era are no longer standing, and thus are not in the database could effect the conclusions. Concrete bridges, in particular, are subject to high rates of material failure in the North Country and thus might have been demolished in greater numbers than other types of bridges. See the Comparative Evaluation Section below for a description of contemporary approach spans.

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Portsmouth and Kittery, Maine, were united beginning in 1823 with the construction of a toll bridge over the Piscataqua River (often referred to simply as "The Portsmouth Bridge"). The 1823 bridge, which was altered to permit train traffic, was located a considerable distance north of downtown Portsmouth (at the site of the current Interstate/Long Bridge/Route 1 Bypass Bridge). The bridge was inconvenient and expensive for the large number of workers at the Portsmouth Naval Ship Yard who lived in Portsmouth. Most workers relied on ferries or boats to cross over to the Naval Shipyard. By the turn of the century the bridge was in increasingly bad condition and unsafe. As a New Hampshire state report summed up, the bridge,

is now very old and much out of repair, it has sagged or bent down in the middle, and the piles have given way in some places, on which account some accidents have happened, and it can now hardly be considered safe for the great strain of heavy trains which are constantly crossing it. Its condition of almost dilapidation now makes constant repair necessary; and it is kept up to a tolerably safe condition at a great cost. (Bridge Commissioners 1906: 39-42)

Beginning at least by 1895 there was major agitation, led by the *Portsmouth Herald*, for the replacement or "freeing" of the toll bridge. After a number of false starts, late 1916 saw the beginning of what was the final and successful effort to get a new bridge. In 1917, both Maine and New Hampshire passed legislation setting up a commission to study the possibility of a new free bridge. Immediately after the release of the Commission's report in March 1919, both Maine and New Hampshire appropriated money for the construction of a bridge. The federal government followed suit a few months later. Each of the three governments appropriated \$500,000.

It is clear that from quite early in the process, that the City of Portsmouth would assume the cost of the New Hampshire approach to the new bridge. The day before the New Hampshire legislature appropriated its share of the cost of Memorial Bridge, it authorized the City of Portsmouth "to raise money and issue bonds to aid in the construction of the Memorial Bridge." The Act authorized a sum of money not to exceed \$150,000 (Chapter 289 on March 26, 1919 NH 1919).

In May 1920, the location of the bridge, at least on the New Hampshire side, was finalized by the Bridge Commission. By late 1920, the "old Broughton wharf," adjacent to the Navy yard ferry in Portsmouth had been purchased for the bridge and the approach. By December, the John H. Broughton Company lumber sheds were being demolished in preparation for work on the south abutment (*Herald* 17 December 1920). Around this time also, the design and the designer of the central spans for Memorial Bridge itself were finally being decided. Concluding that a bascule design would be too expensive to build on the site, the Commissioners brought in eminent engineer and the originator of the long span vertical lift bridge, J.A.L. Waddell.

Meanwhile, Portsmouth's City Engineer, in coordination with the Committee on City Lands and Buildings, was working on plans for the approach. In September, plans produced by the town's engineer, W.A. McFarland, were presented before a public forum. The forum, called by the Chamber of Commerce, was aimed at exploring, "Will Portsmouth's best interest be served by a one-street approach to the Memorial Bridge?" The discussion, however, appeared largely one-sided with all present (including McFarland) favoring the slightly more expensive but more aesthetic two-way approach (*Herald* 2 September 1921).

In September, the City Council approved a bond issue of \$150,000 for the purchase of land and construction and began work on coming up with awards for property to be condemned for the

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approach. Plans and specifications were finished in October. In December, the [Memorial] Bridge Commission engineers submitted a separate set of plans to the City Council for the approach. The *Herald* reported

the plans call for a slab concrete floor construction with concrete sidewalks resting upon 278 concrete piles and the Engineers estimated that it could be built for \$50,000. The Engineers estimated that a steel structure could be built for three to four thousand dollars less but the concrete would cost less than that amount for maintenance. (*Herald* December 21, 1921)

A revised set of plans was then prepared that accommodated some recommendations of the bridge commission engineers. On December 29, 1921, the City Council approved the new set of plans for the approach. The *Herald* described the final version as follows:

The plans as submitted are practically the same as submitted by the Engineer McFarland, who months ago drew up plans for the Council. There are some slight changes, especially the section near the bridge abutment. The McFarland plan called for a single archway through, for a passageway between Daniel and State Streets but the present plans call for an overhead construction which will allow three or four passageways through along the water front. This is a part of the plans that were submitted by the Bridge Commission Engineers, and the only part that were acceptable. The plans call for the two street approach, Daniel and State Street from Mulberry Street down to the bridge ... (*Herald* December 28, 1921)

The contract for the construction of the approach was apparently awarded early in 1922. By March 1, workers from the L.H. Shattuck Construction Company were at work constructing shanties and erecting a large derrick. About a half dozen buildings on the site were advertised for sale; the buildings to be moved by April 10. Those buildings which could not be moved were demolished first. At this time also the old Broughton office building, which had been used as offices by Holbrook, Cabot and Rollins, the company constructing the substructure of Memorial Bridge, was to be moved for use of the American Bridge Company, the contractor for the superstructure of the bridge.

The construction proceeded rapidly thereafter. The *Herald* reported in early May,

So much progress being made by the contractor on the bridge approach that it is thought they will be finished by the 15th of June at the latest and possibly before that time. A good part of the concrete has been poured and the forms are being made for the overhead work over the culverts. This is a foot and a half thick and will be heavily reinforced with steel. (*Herald* May 10, 1922)

The *Herald* reported on June 1, "The concrete work on the bridge approach at the foot of Daniel street is practically finished and the work of tearing away the timber work will be started soon. It has been a remarkable quick and efficient job and credit to the Shattuck Company." (*Herald* June 1, 1922). By July the falsework was removed and railings were erected and the fill work begun. Some

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50,000 yards of gravel was hauled, first by horse and later by truck, from a pit 2 ½ miles away on Greenland Road. (*Herald* July 7, 11, 1922)

At the December 29, 1922 meeting of the City Council, after two hours of contentious testimony by various veterans groups no decision could be made as to which veterans should be included in a planned veteran's monument at the approach. It was, however, decided that the triangular space between State and Daniel Street would be known as Memorial Park and the new streets which would be created would be named to honor veterans. The section of road from Daniel Street to the bridge was named Scott Avenue after Captain J. Francis Scott who was killed in action in France. The section of road leading from State Street to the bridge was named Dutton Avenue after Corporal H.H. Dutton, also killed in action in France. The extension of Bow Street running between Daniels and State near the former location of Mulberry was renamed Wright Avenue after Lieut. J. Brandon Wright who died in "the aviation service." (*Herald* 30 December 1922).

By May of 1922 it was evident that the approach would be completed in plenty of time relative to Memorial Bridge itself which was slowed due to strikes. The finishing touches were put on the approach in the spring of 1923 when the sidewalk was poured and, in early June, the top surfaced with bithulitic.

The approach, along with Memorial Bridge itself, was officially opened on August 17, 1923. A host of dignitaries including the Governors of New Hampshire and Maine, members of the Bridge Commission and representatives of the US Navy were in attendance. After the speech making, the ribbon was cut and thousands of enthusiastic bystanders flooded across the bridge. The bridge as a whole was to prove extremely popular. It allowed the two cities to be linked conveniently, and permitted a far more expedient trip up the eastern seaboard for travelers. Within a short period the volume of traffic had skyrocketed and by late 1930s, 4,000,000 vehicles used the bridge annually and an additional bridge crossing the Piscataqua was being contemplated.

42. Applicable NHDHR Historic Contexts:

84. Automobile Highways and Culture 1900-present

43. Architectural Description and Comparative Evaluation:

The two-lane Portsmouth Approach carries Route 1 to Memorial Bridge which continues north across the Piscataqua River to Kittery, Maine. It is a reinforced concrete structure that is supported by a reinforced concrete abutment to the south, five concrete piers in the middle, and the south pier of the Memorial Bridge to the north. Because it is constructed on a curve, it varies in length from 90' on its westerly face to 134' on its easterly face; it also is variable in width, from 28' at the north end to 47' at the south end.⁶ The bridge curves on a radius of 187'-2" on the westerly face and 457'-10" on the easterly face, with both the piers and the abutment skewed relative to the road itself. A connection between State Street and Daniel Street runs between the first two piers of the approach.

The Portsmouth Approach is located in downtown Portsmouth amid a largely dense urban neighborhood. The wide, south end of the approach is located in an open area, much of which is used for public parking. Scott and Dutton Avenues, located on the rising embankment constructed as part of the approach, bring traffic onto (Dutton) and off of (Scott) Memorial Bridge. The area

⁶ The width is 45'-8" from the outside face of the side walk to the outside face of the sidewalk at the north end and 68'-0" at the south end.

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between the streets consists of one small and one larger traffic island planted with scattered bushes and small trees. The larger island includes a flagpole and plaque. The northern end of the approach is adjacent (to the northeast) to a now-abandoned wood building last occupied by the Pier II Restaurant. The old power plant, "Daniel Street Station" is located to the west.

The Approach consists of an embankment to a reinforced concrete retaining wall and abutment. The height of fill varies from 0' to 16'. From the abutment, a reinforced concrete deck on five spans extends to the first river pier. The abutment and four of the five piers are set on wood piling with a 10' thick truncated reinforced concrete footing. The piers consist of a variable number (between 6 and 2) 4' by 2'-6" columns, reinforced with 3/4" square bars. They extend to a beam below the deck. The beam spanning the columns is 4' deep and 2' wide.

The 1' 6" thick deck is reinforced continuously for its entire length with 3/4" square bars at 4" on center on the lower (tension face) and 3/4" bars in the upper tension face over the haunches on the same spacing. Every other bar was bent up from the lower tension face to the upper tension face and then back down to the next lower tension face. Additional top bars 12' long are placed between the bent up bars to provide the necessary tensile reinforcement over the haunches. Temperature reinforcing runs perpendicular to the main steel, with 1/2" square bars on spacing of 12". Edge beams 4' deep are located along both sides of the deck.

Running between the two most southern piers of the Approach, the road running between Daniel and State Streets in this area is sharply curved. The other bridge bays are used as pedestrian crossings and for parking. The height of the underpass is 12' 2".

Currently, railings on the part of the approach over the piers are aluminum and consists of three horizontal rails with posts every 6'-0" at the south end and every 7'-3" at the north end. The railing over the abutment consists of wooden posts and rails. The sidewalks on the approach consist of open metal grates supported by longitudinal I-beams and steel brackets to the north and plain concrete sidewalks to the south.

There have been significant alterations to the bridge over time particularly to the sidewalks and railings. In April 1977, the approach went through a major rehabilitation. During this repair, the sidewalks were replaced above the abutments and the abutment itself was repaired with the upper level of concrete removed and replaced. This concrete was cast monolithically with the sidewalks. At this time also, the original 8' 10" concrete sidewalks on the portion of the approach over the piers which were cantilevered off the edge beams, were replaced with the current metal grate sidewalks. In 1950 there also was significant work done replacing sidewalks and curbing as well as railings. Photos from the opening of the bridge indicate that the original railings on the approach were pipe railings that matched those of Memorial Bridge.

Comparative Evaluation

There appear to be approximately 31 bridges with approach spans in the state. Of these, only three or four other approach spans are of concrete construction. One single span concrete deck arch approach dates to 1900 in Shelburne (Bridge 075/113). A double span concrete slab bridge in Tamworth (Bridge 150/106) dates to 1955. The approach to the Stewartstown Bridge (Bridge 054/163) (Photo Page A1) over the Connecticut River, dates to 1930 and is 6 or 8 spans long (60-80 feet long). The approach span is a continuous concrete slab with steel floor beams supported by steel columns going to a concrete footing (Powelson 2004). Based on the available data, this bridge appears to be the only other pre-1998 continuous concrete construction approach span aside from the Portsmouth Approach. Although it was rehabilitated in 1971, it remains largely intact.

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There is a larger quantity of bridges (versus approach spans) with which to compare the Portsmouth Approach to Memorial Bridge. There are approximately 107, pre-1925 concrete bridges in the state. (FHWA 2001). The earliest of these bridges dates to 1890. Of these bridges, 59 are of slab construction. Their date range, by decade breaks down as follows: 1 from the 1890s, 10 from the 1900s, 11 from the 1910s and 37 from the 1920s. There are no pre-1925 concrete continuous slab bridges in the state. Seven concrete continuous slab bridges date from 1927-1930; all are relatively short two-span bridges. The longest of these are the 40 foot long bridges over Albany Brook in Barlett (Photo Page A1) and Brackett Brook in Orford. Based on a comparison of the Portsmouth Approach with other examples of concrete slab bridges of the same date around New Hampshire, the Portsmouth Approach is unique in a number of respects, including length, number of spans, continuous construction and skew. It possesses a typical level of physical integrity when compared to other examples.

44. National or State Register Criteria Statement of Significance:

Criterion A: As an individual entity, the Portsmouth Approach to Memorial Bridge is not eligible for the National Register under Criterion A. The bridge is not associated with any known event or pattern of events that was significant in Portsmouth or the State of New Hampshire.

Criterion B: As an individual entity, there are no known significant persons associated with the Portsmouth Approach that would make the structure eligible under Criterion B.

Criterion C: The Portsmouth Approach is eligible for the National Register under Criterion C. As the approach span to Memorial Bridge, it is a component part of an important engineering achievement, the central portion of which was designed by eminent engineer and originator of the long span vertical lift bridge, J.A.L. Waddell. It is also significant in the area of engineering in its own right. It is the single longest extant concrete bridge built before 1925 in the state. It is also the longest extant non-arched concrete bridge constructed in New Hampshire before 1935. It is the earliest identified concrete continuous slab bridge in New Hampshire and it appears to be the longest continuous span concrete bridge built before 1935 in the state. It is the only five-span concrete bridge built before 1930 (and potentially later) in New Hampshire. It also features a unique skewed variable curvature design.

The Portsmouth Approach has been somewhat altered. Most significantly it has lost its concrete cantilevered sidewalks, and its original rails and circa 1977 received a coating in shotcrete. These alterations, however, do not compromise the approach's integrity relative to its structural system which is the foremost element of its significance.

Criterion D: An archaeological sensitivity assessment of the Portsmouth Approach and the surrounding area has been completed by Independent Archaeological Consulting, LLC. The assessment concluded that the area is sensitive for both Native American and Euroamerican archaeological resources until it can be determined that the area was disturbed by the bridge construction. The assessment proposed controlled archaeological survey to make that determination.

45. Period of Significance:

The period of significance for the Portsmouth Approach is 1923 when the bridge was completed.

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46. Statement of Integrity:

All bridges require maintenance to preserve their structural and operational integrity and the Portsmouth Approach has seen significant work in this regard. Patching has been done throughout the structure to repair spalling, cracks, holes etc. Changes have been made at the curb line, and the deck slab has been repaved. As discussed above, the sidewalks and rails have been altered. These types of alterations are common to bridges of this era though and do not compromise the basic physical integrity of the approach. The approach retains sufficient integrity of location, design, setting, materials, workmanship, feeling and association. The open, partially landscaped area between Scott and Dutton Avenues has been altered over time and has lost design integrity. This alteration does not impact the significant character-defining elements of the Approach. More information about this area is included in a separate visual study being completed for inclusion in a Historic Structures Report on Memorial Bridge.

47. Boundary Discussion:

The boundary of the area under consideration begins at the junction between Memorial Bridge and the Approach (i.e. the beginning of the steel trusses) and runs south to include the closed U-shaped area defined by Daniel Street, State Street (and the area under the Approach where they meet) and Wright Avenue. Although it does not appear that the portions of Daniel and State Street adjacent to the Approach were altered significantly as part of its construction, they are included as they were part of the overall design scheme for the Approach.

48. Bibliography and/or References

Becker, Donald N.

1944 Transactions ASCE, Volume 109, pp 995 – 1046.

Hool, George A.

1917 Reinforced Concrete Construction, New York: McGraw-Hill Book Company, Volumes I & II.

Bridge Commissioners of the State of New Hampshire

1906 Report

Federal Highway Administration National Bridge Inventory

2001 (<http://www.granitehighways.com>)

New Hampshire State Legislature.

1919 Chapter 289, March 26, 1919 (Law Authorizing City of Portsmouth to Bond \$150,000 to Build Portsmouth Approach).

Powelson, Dave

2004 Email, phone conversation and data base search related to New Hampshire approach Spans (NH DOT Chief, Existing Bridge Section; Bureau of Bridge Design)

Portsmouth Herald (Portsmouth Athenaeum vertical files)

December 17, 1920 – Work Started on Bridge

September 2, 1921 – Chamber of Commerce Public Forum Largely Attended

December 21, 1921 – Land Damage for Bridge Approach is Awarded...

March 8, 1922 – City to Sell all Houses on Approach

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May 10, 1922 – Bridge Approach Well Ahead of Contract Time
July 7, 1922 – Big Crew of Men and Horses on Bridge Approach
July 11, 1922 – Horses too Slow for Work on the Bridge Approach
December 30, 1922 – Bridge Approach to Be a Memorial Park
April 25, 1923 – Awarded Contract for the Bridge Approach Sidewalk

Rudge, Heather

1989 Metal Truss, Masonry, and Concrete Bridges in Vermont. National Register of Historic Places Nomination Form.

Waddell, J. A. L.

1916 Bridge Engineering. New York: John Wiley & Sons. Volumes I & II.

Photographs

Athenaeum, Portsmouth, New Hampshire

Strawbery Banke, Portsmouth, New Hampshire

Surveyor's Evaluation

NR listed: individual ☐
within district ☐

Integrity: yes ☒
no ☐

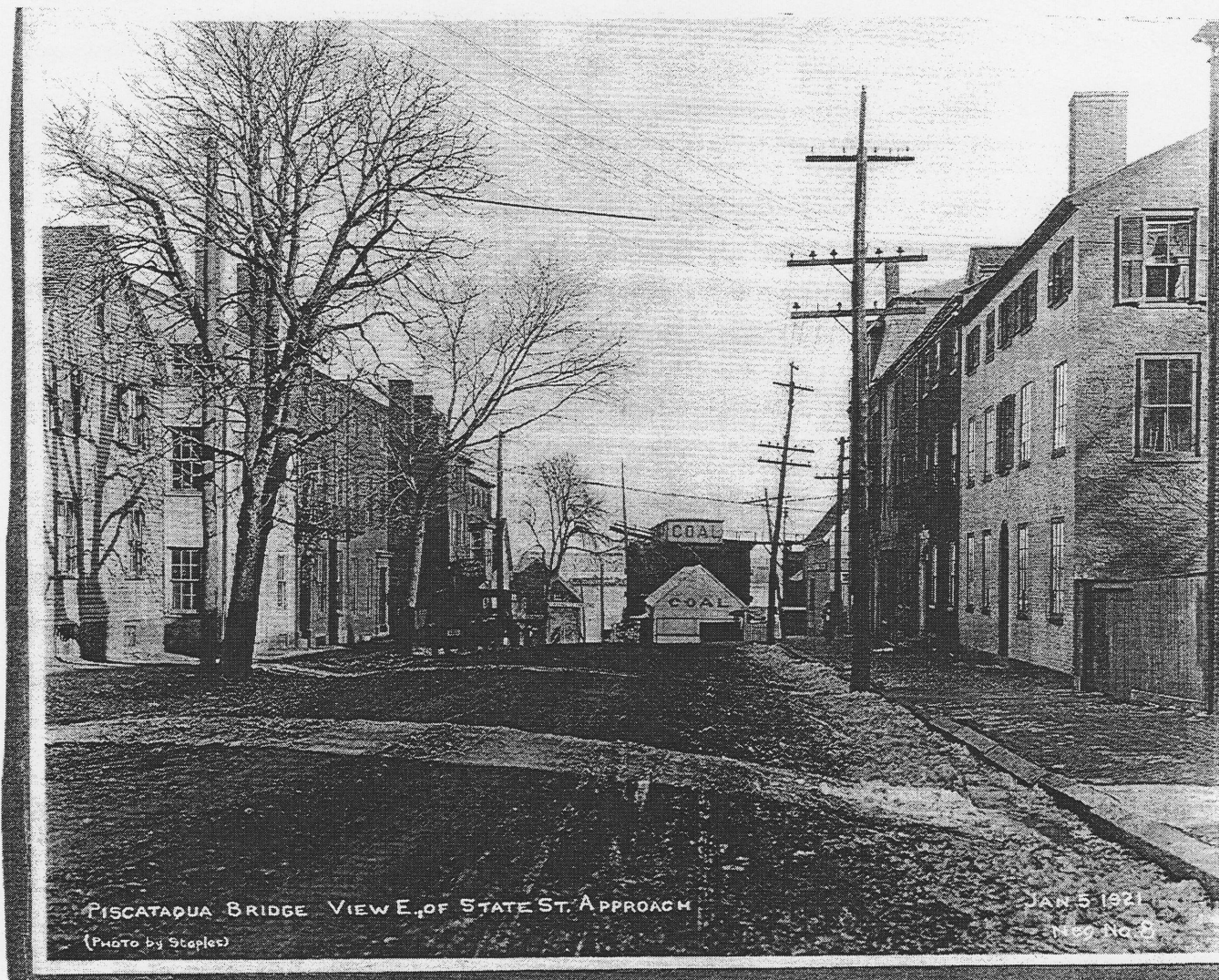
NR eligible:
individual ☒
within district ☐
not eligible ☐
more info needed ☐

NR Criteria: A ☐
B ☐
C ☒
D ☐
E ☐

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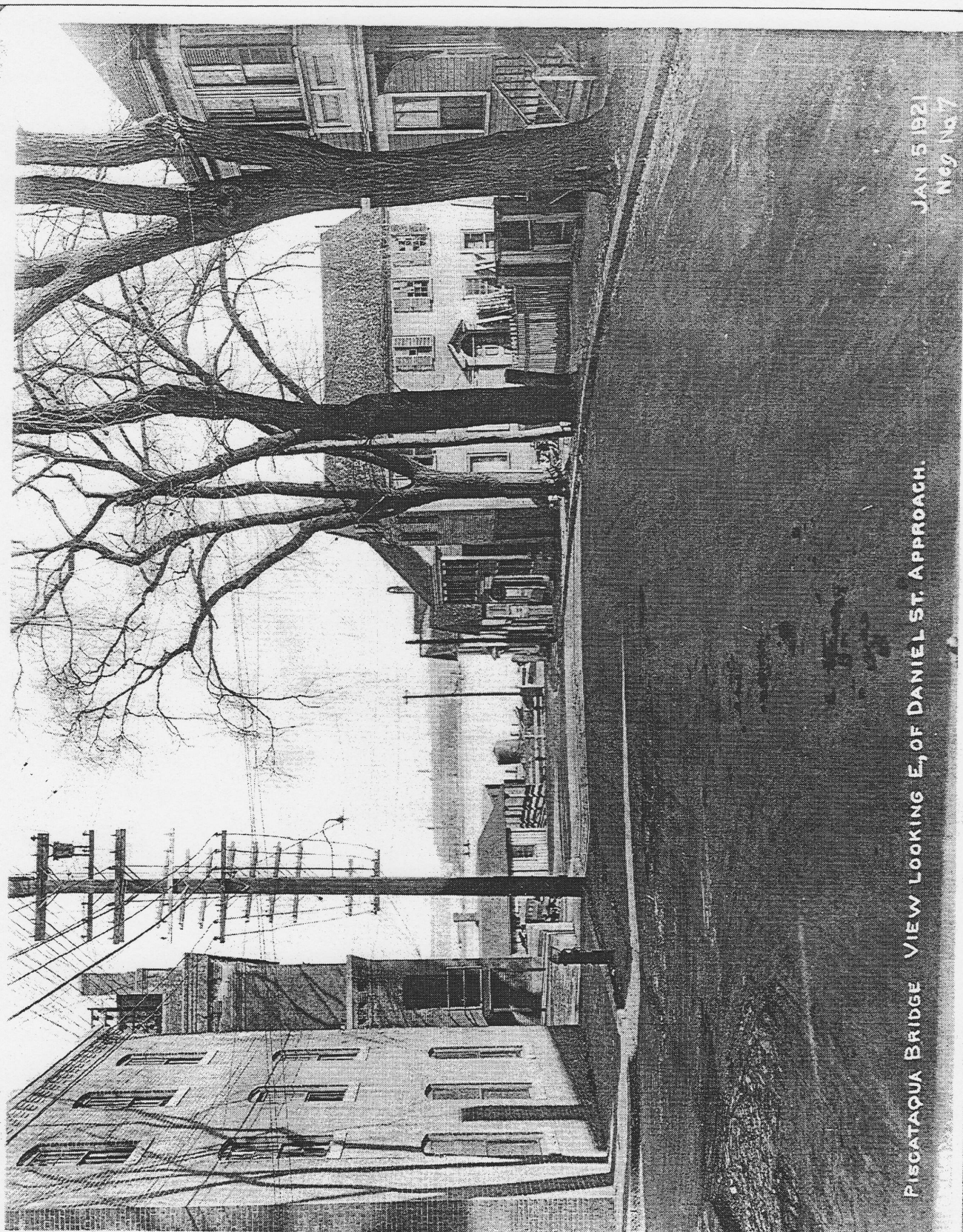
Historic Photographs



State Street, View Towards Site of Portsmouth Approach – January 5, 1921 (Portsmouth Athenaeum)

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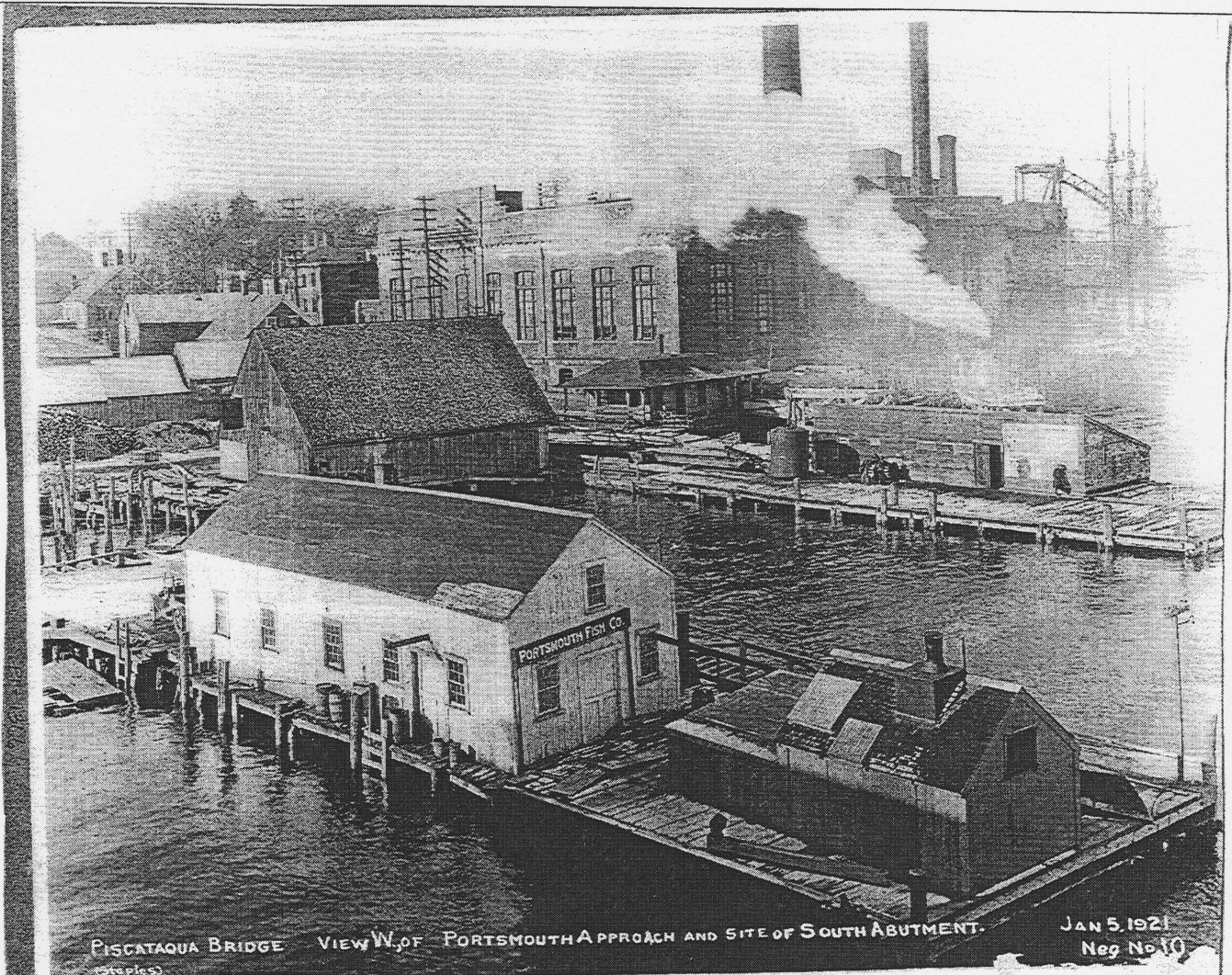
PISCATAQUA BRIDGE VIEW LOOKING E, OF DANIEL ST. APPROACH.

JAN 5 1921
Neg No 7

Daniel Street, View Toward Portsmouth Approach -January 5, 1921 (Portsmouth Athenaeum)

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View of Site of Portsmouth Approach and South Abutment January 5, 1921 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

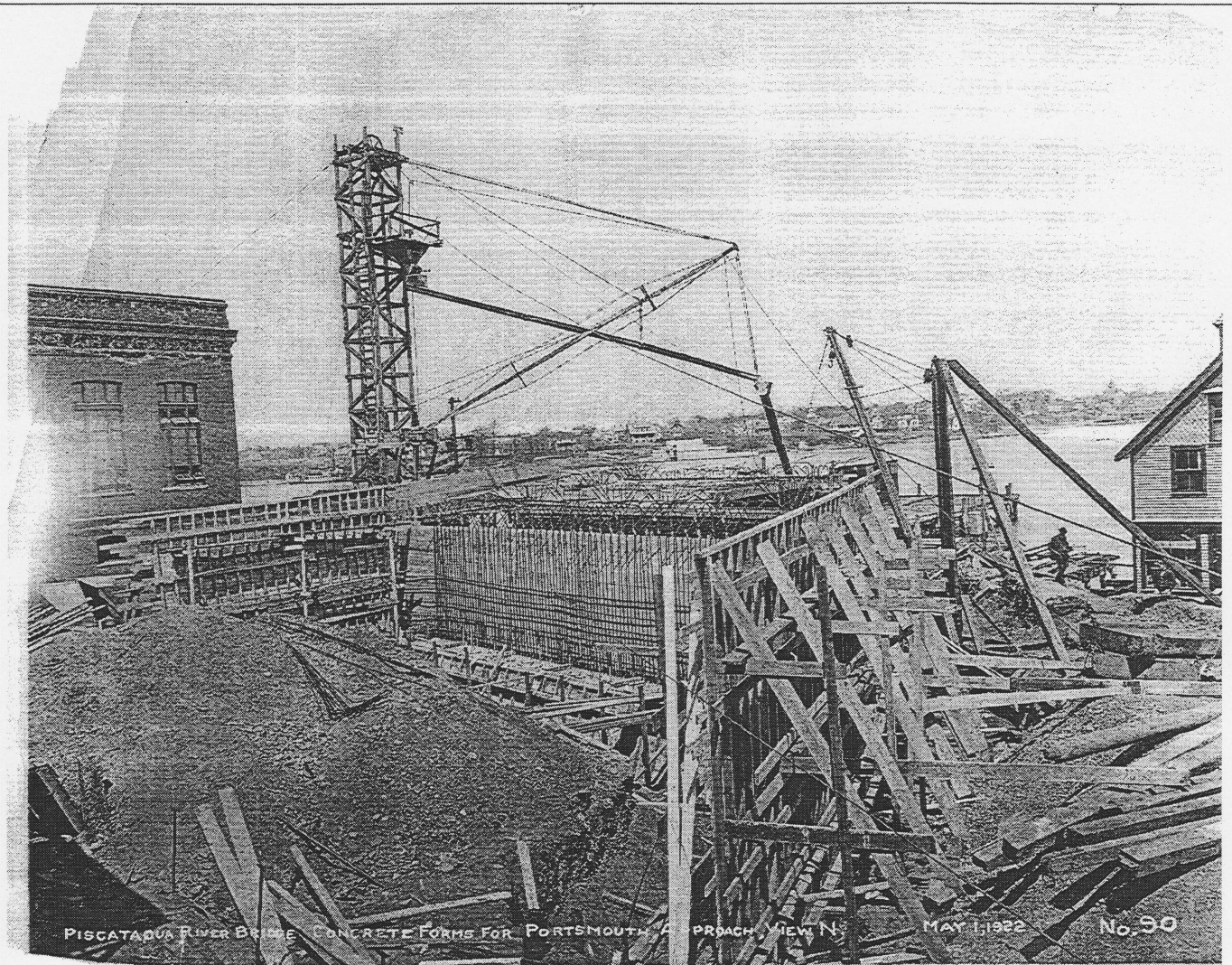
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Portsmouth Approach Site -January 3, 1922 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

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Concrete Forms for Portsmouth Approach - May 1, 1922 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

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View of Portsmouth Approach From Northeast – October 6, 1922 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

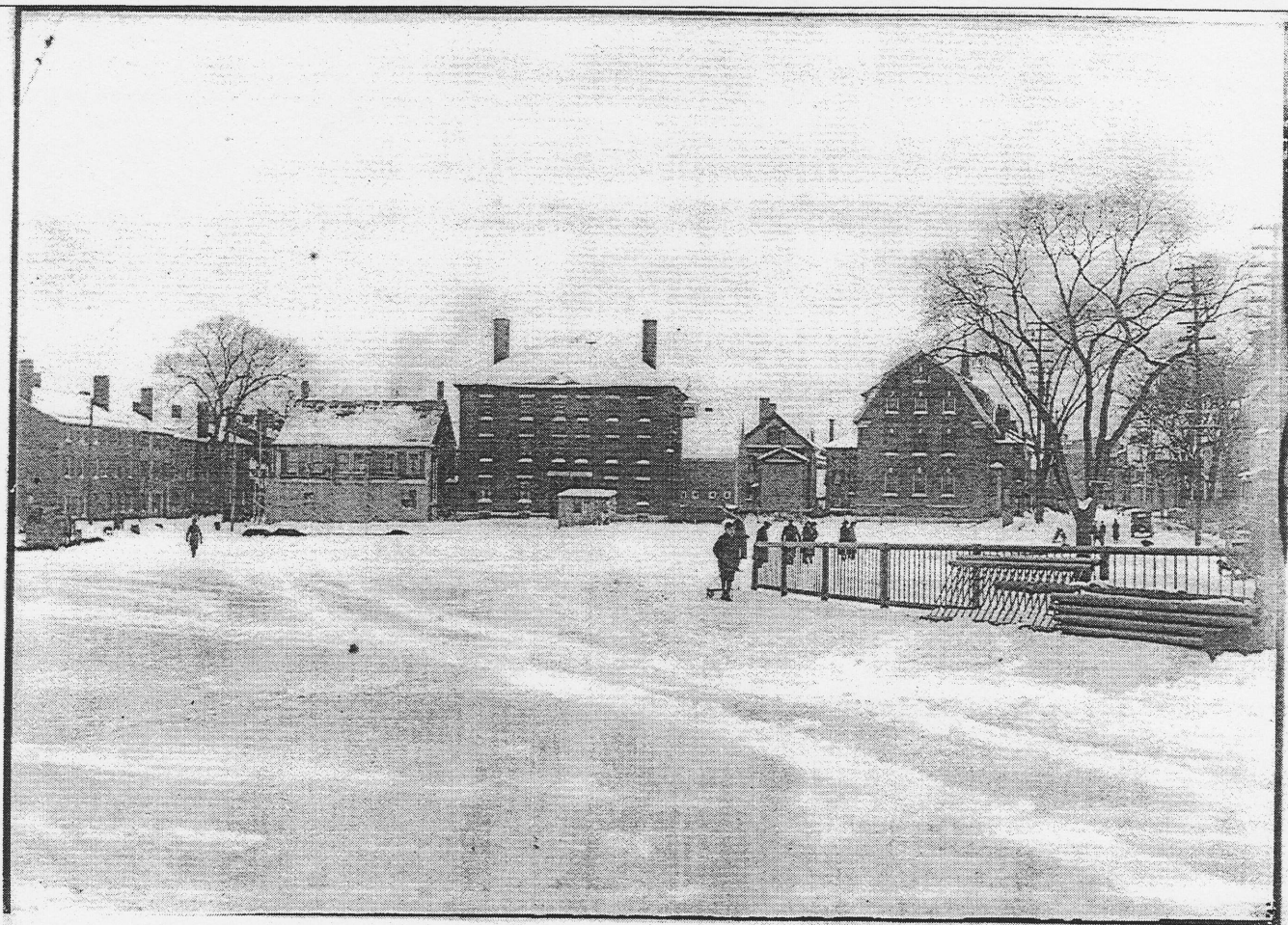
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View of Portsmouth Approach From Daniel Street – December 20, 1922 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

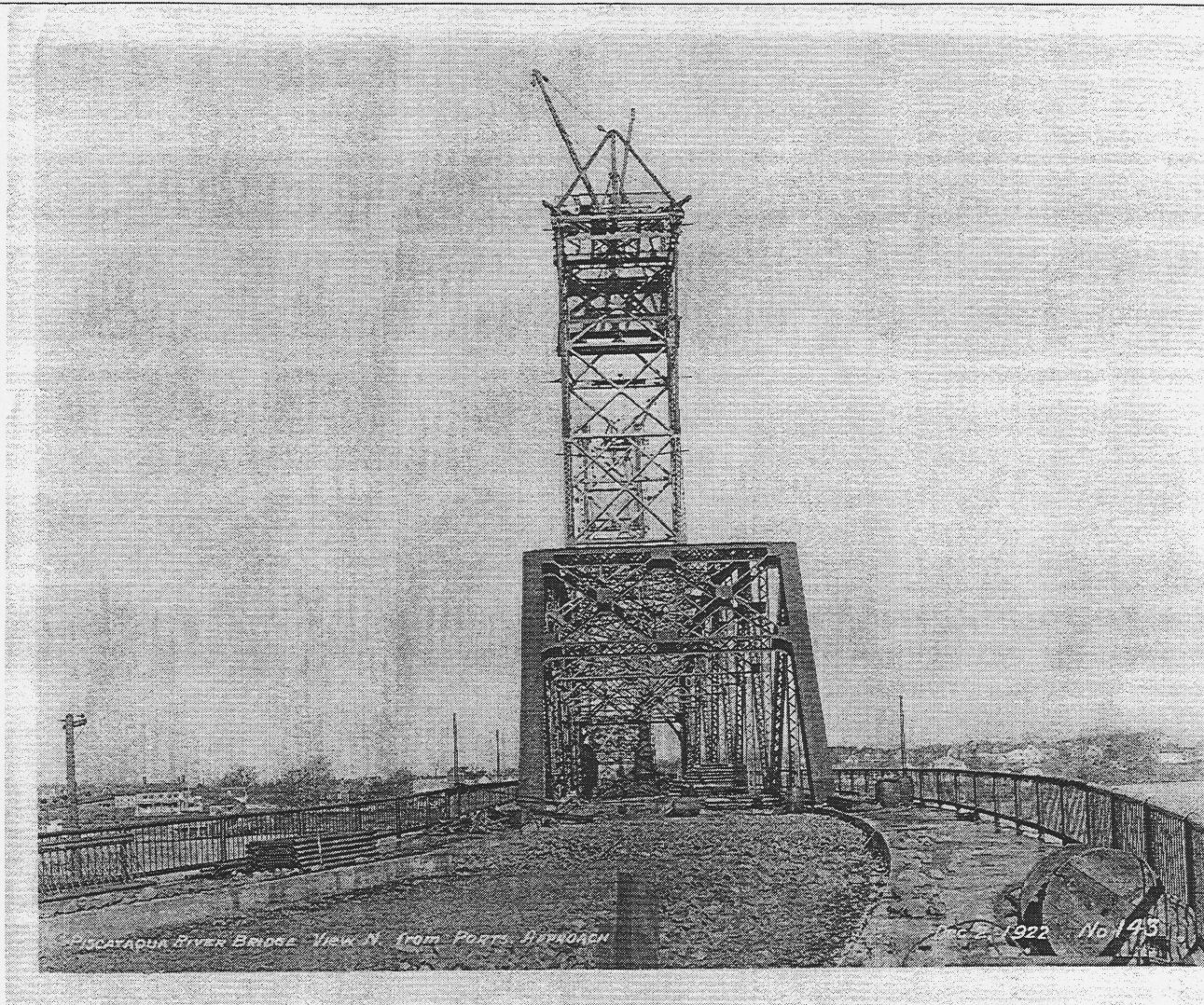
NHDHR INVENTORY NUMBER: POR0014



View of Portsmouth Approach -December 20, 1922 (Portsmouth Athenaeum)

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014



View of North Portion of Portsmouth Approach - December 20, 1922 (Portsmouth Athenaeum)

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NHDHR INVENTORY NUMBER: POR0014

Photographs

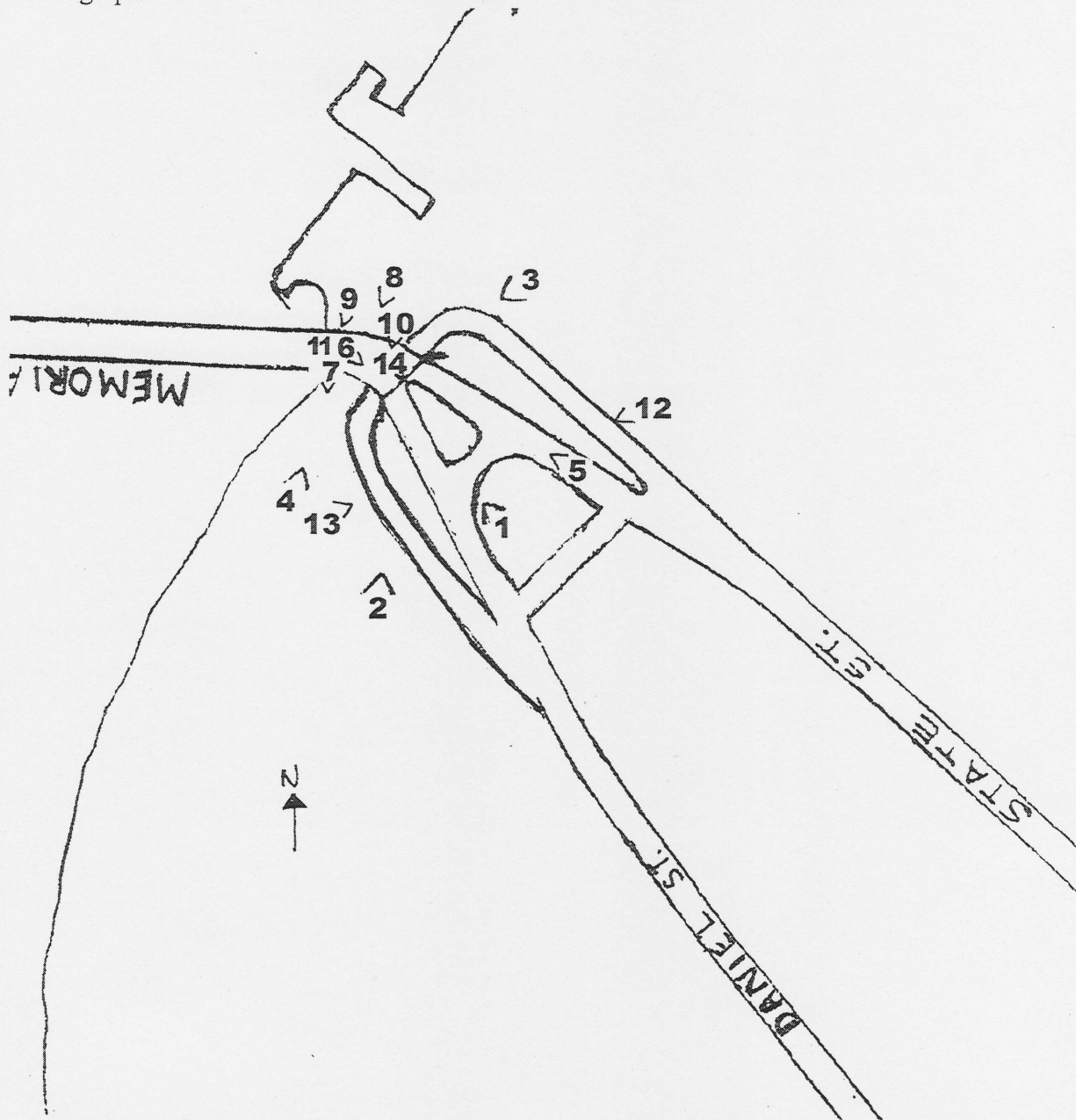


Photo Key

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POROO14

Address: US Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR



Photo 2: Portsmouth Approach Span West Elevation
Roll: 2 Frame: 24 Direction: E

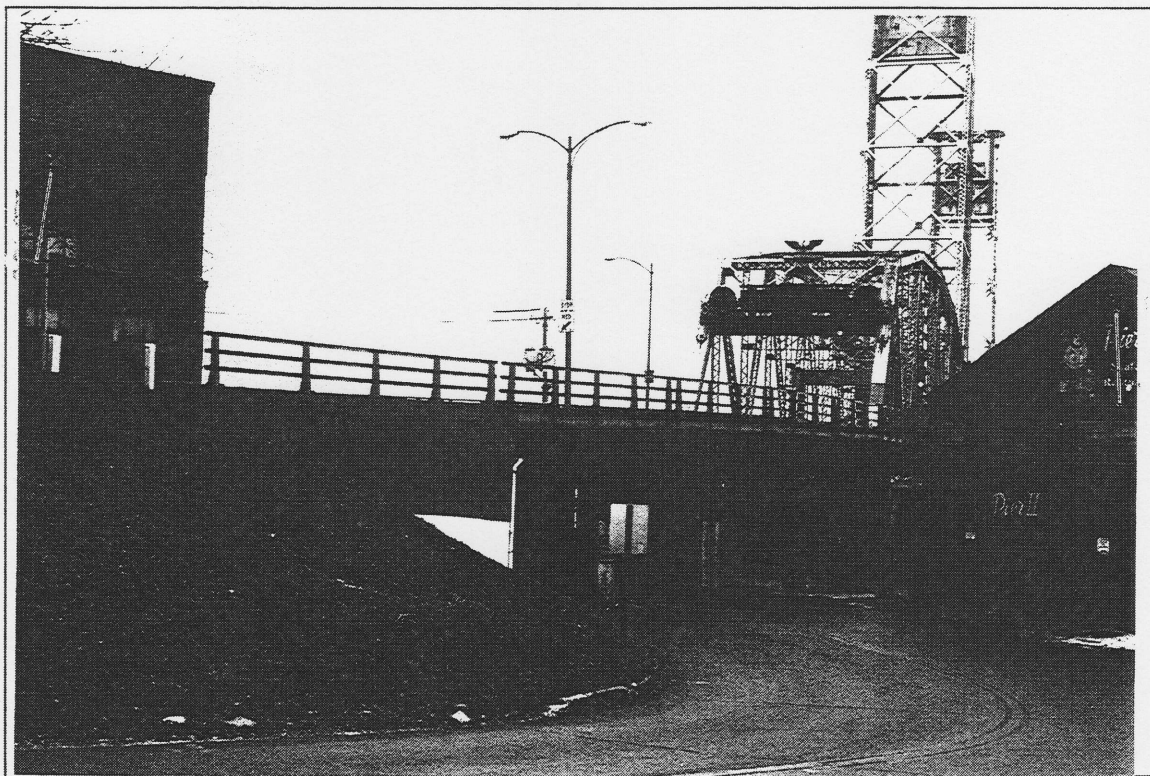


Photo 3: Portsmouth Approach East Elevation Roll: 2 Frame: 4 Direction: NW

INDIVIDUAL INVENTORY FORM

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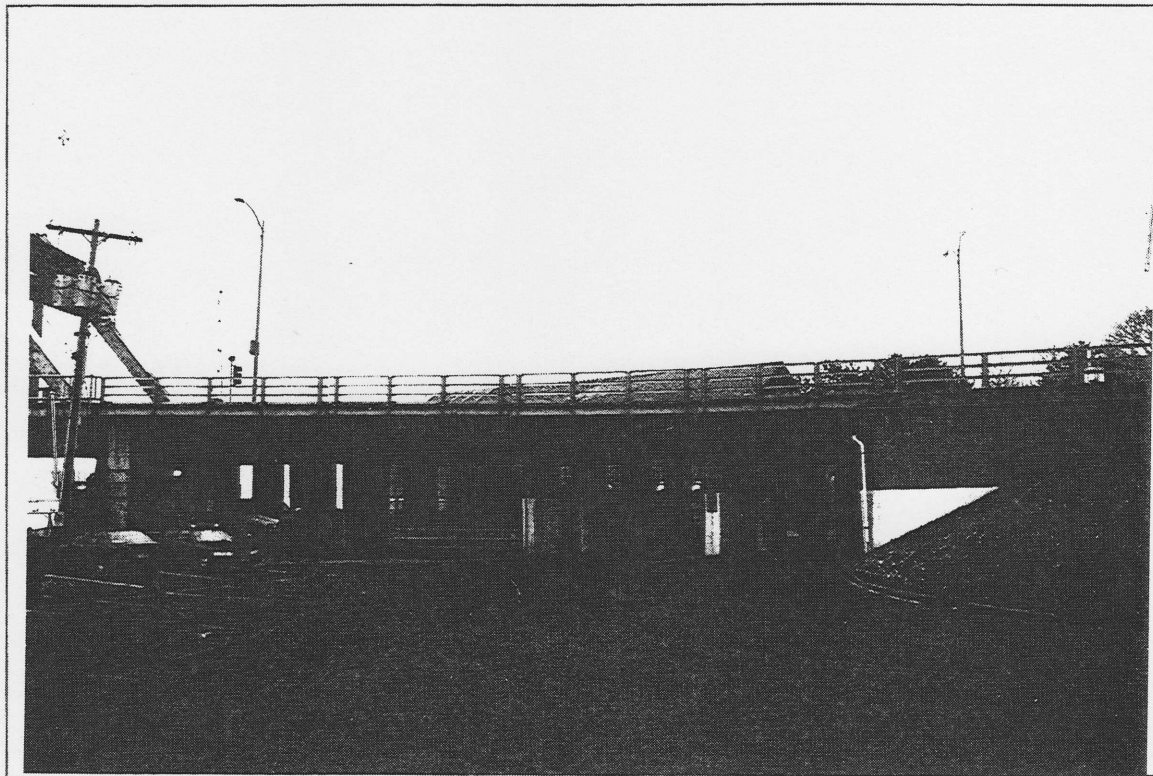


Photo 4: Portsmouth Approach Span East Elevation
Roll: 2 Frame: 17 Direction: E

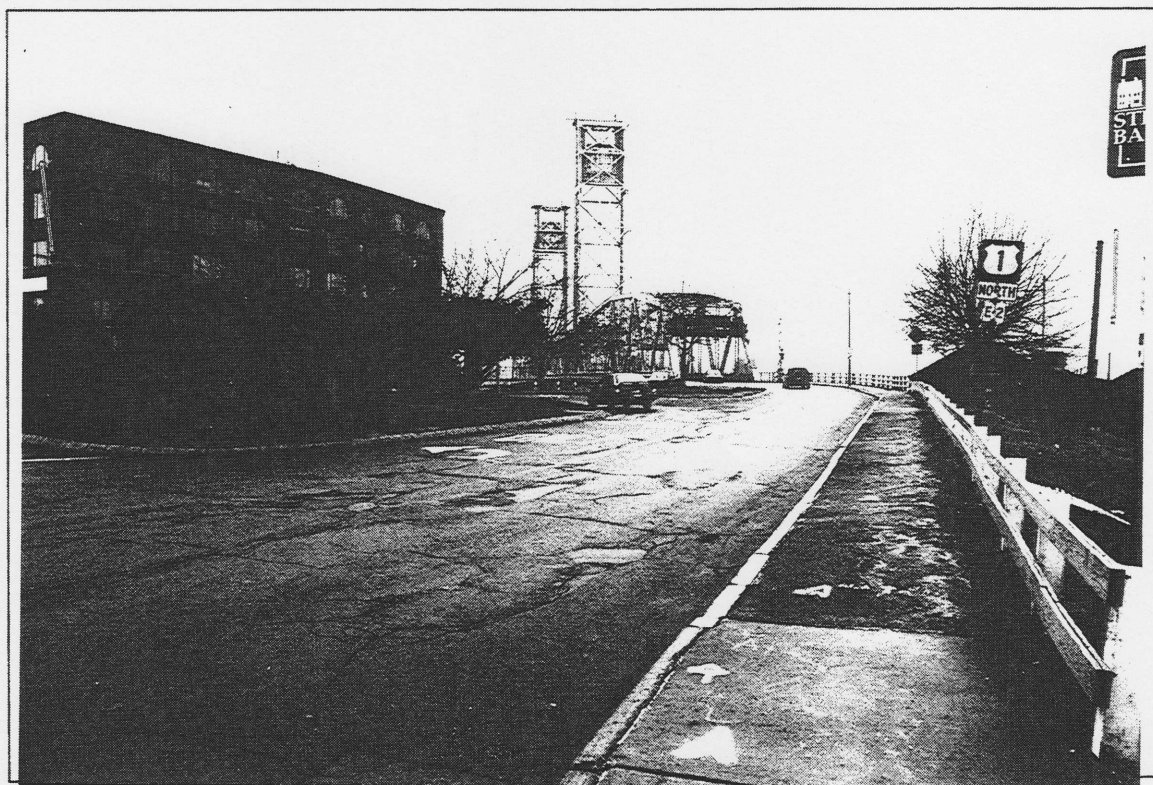


Photo 5: Portsmouth Approach View Toward Memorial Bridge
Roll: 2 Frame: 1 Direction: N

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Address: US Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR



Photo 6: Portsmouth Approach View From Memorial Bridge
Roll: 3 Frame: 6 Direction: S



Photo 7: Portsmouth Approach Showing Street Below
Roll: 3 Frame: 10 Direction: S

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Address: US Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR

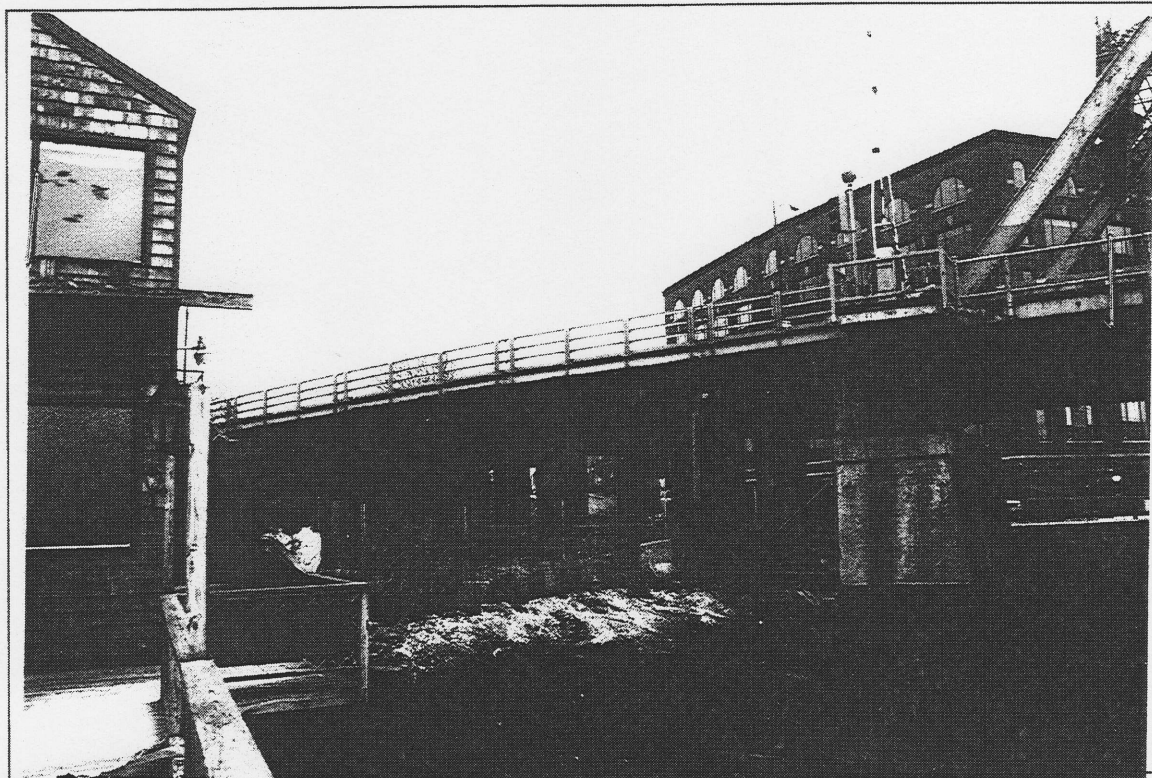


Photo 8: Portsmouth Approach , Substructure East Elevation and Memorial Bridge Abutment
Roll: 2 Frame: 11 Direction: NW

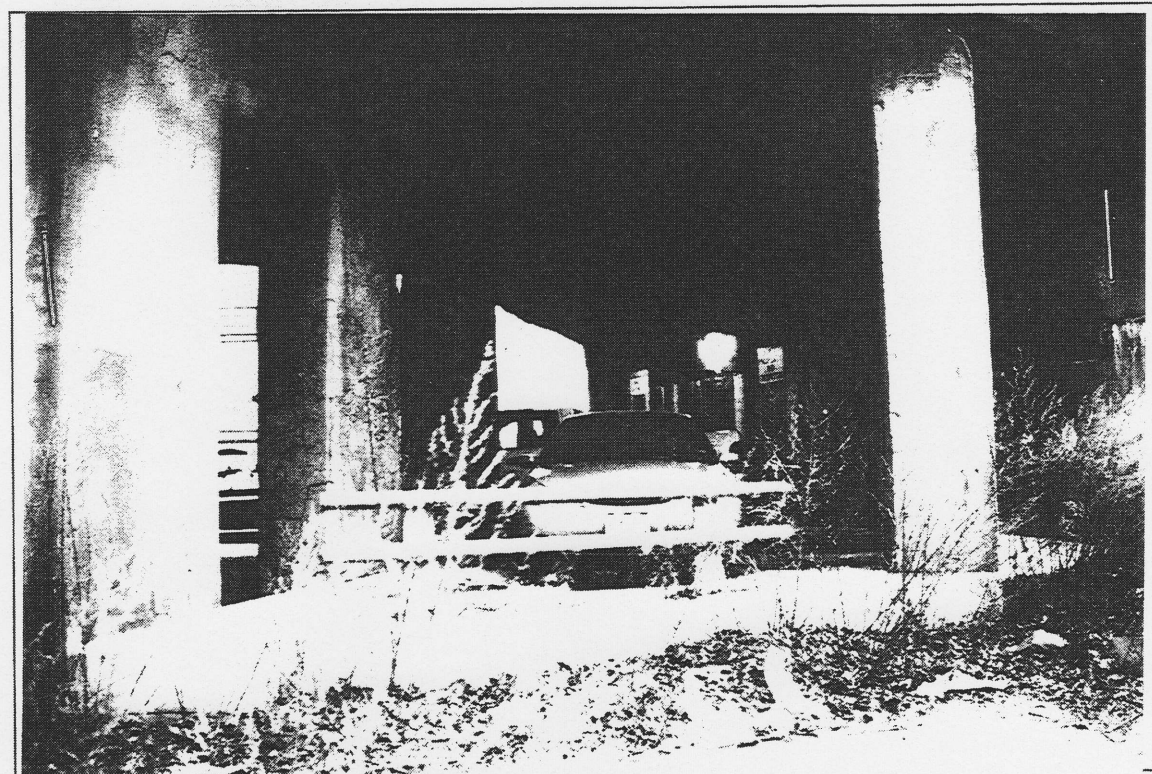


Photo 9: Portsmouth Approach Detail of Substructure
Roll: 2 Frame: 14 Direction: NW

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Address: US Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR

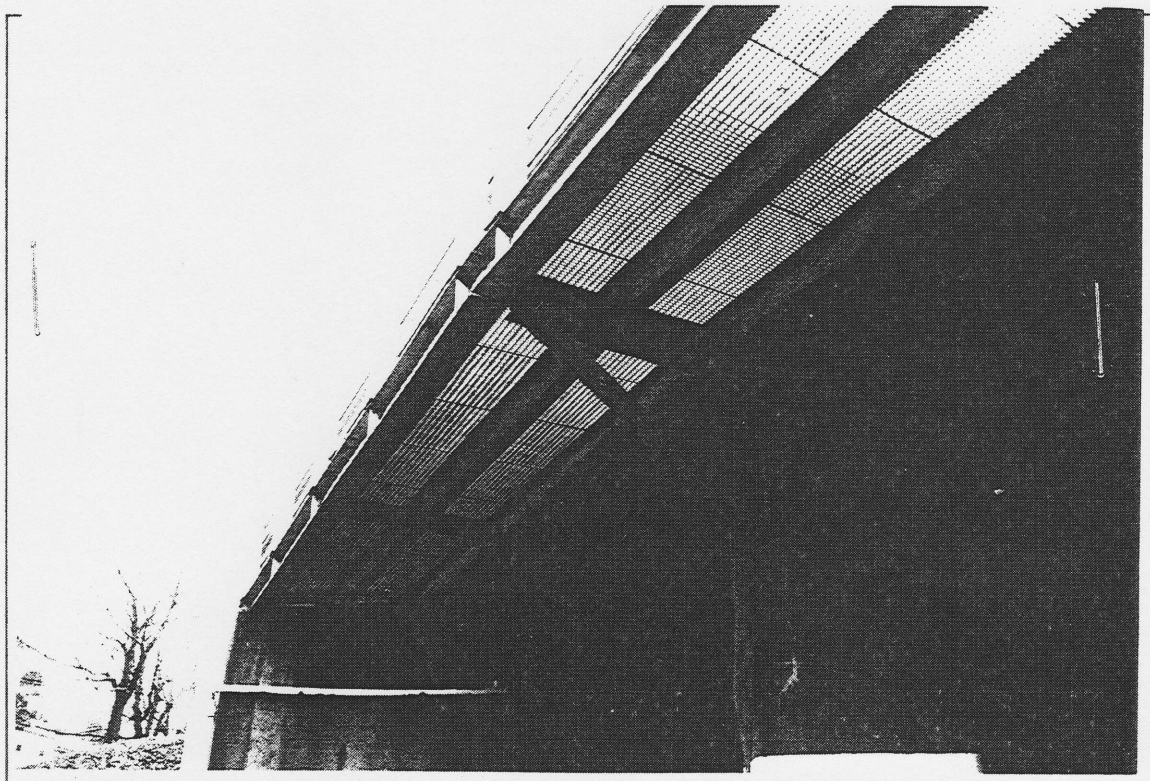


Photo 10: Portsmouth Approach Detail of Sidewalk from Below
Roll: 2 Frame: 9 Direction: W

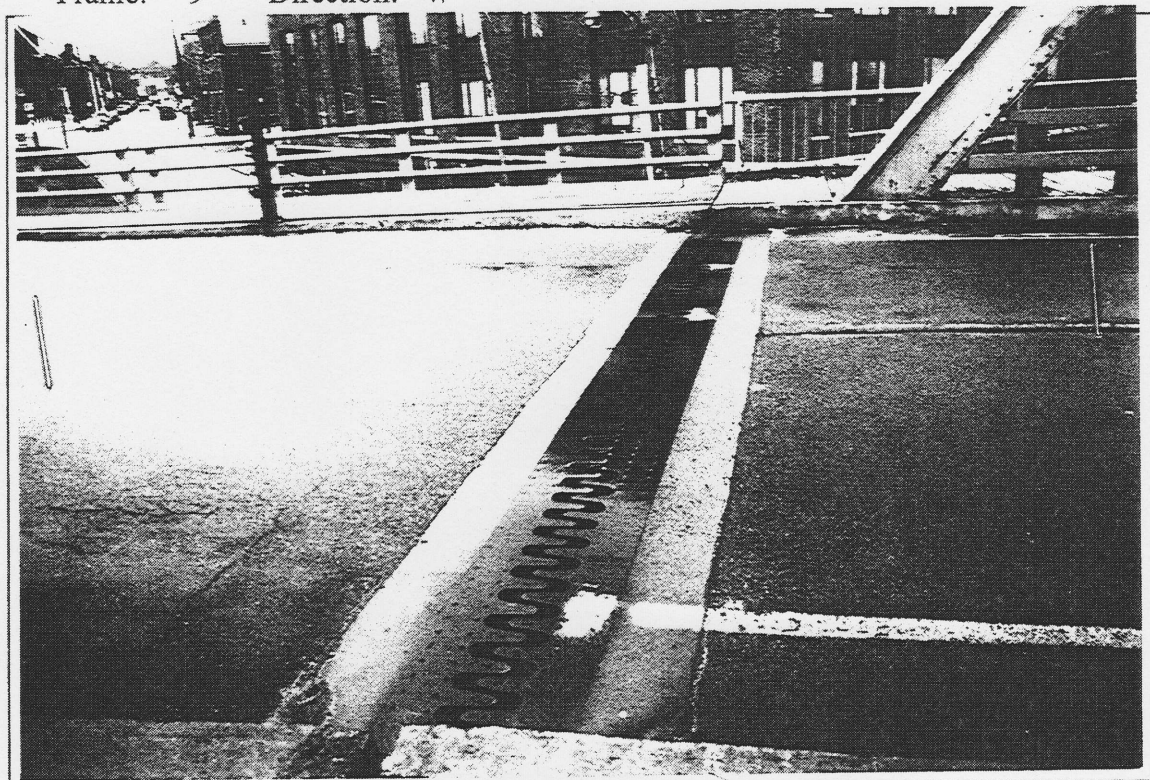


Photo 11: Portsmouth Approach Detail of Deck Connection to Memorial Bridge
Roll: 3 Frame: 4 Direction: E

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Address: US Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR

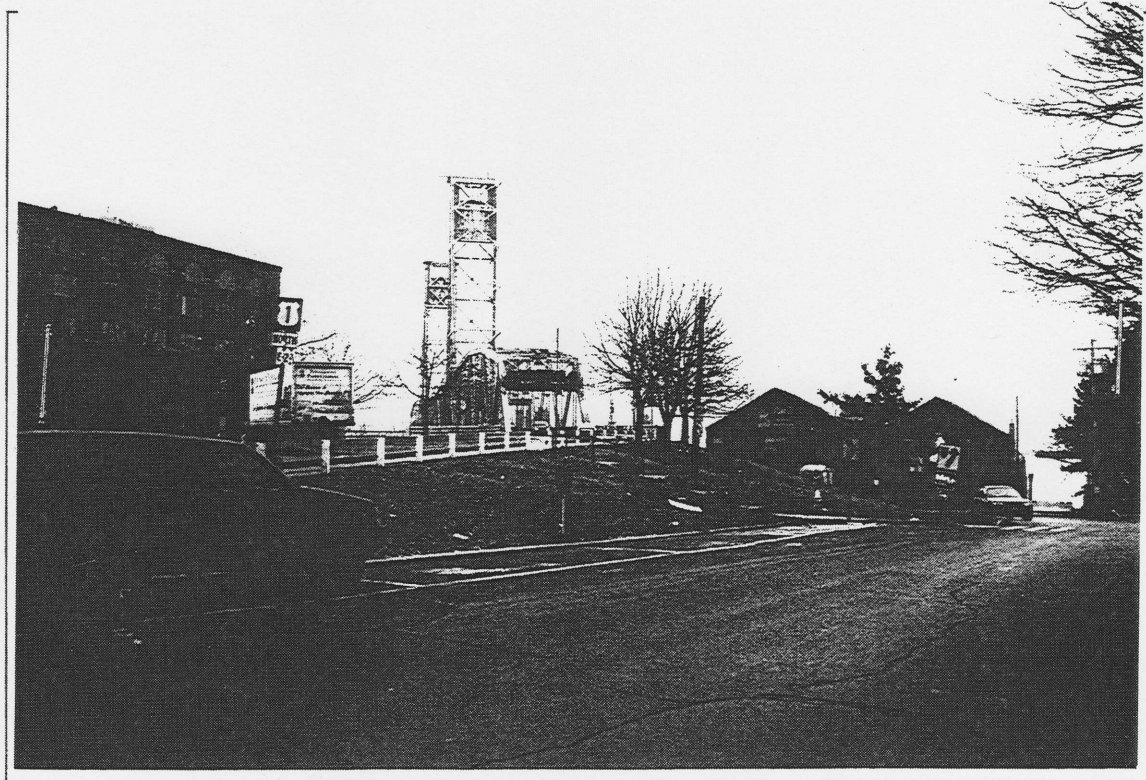


Photo 12: Portsmouth Approach East Embankment
Roll: 2 Frame: 2 Direction: NE



Photo 13: Portsmouth Approach West Embankment
Roll: 2 Frame: 19 Direction: SW

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Address: Route 1 at Piscataqua River Date taken: 12/2003 Negative stored at: NHDHR



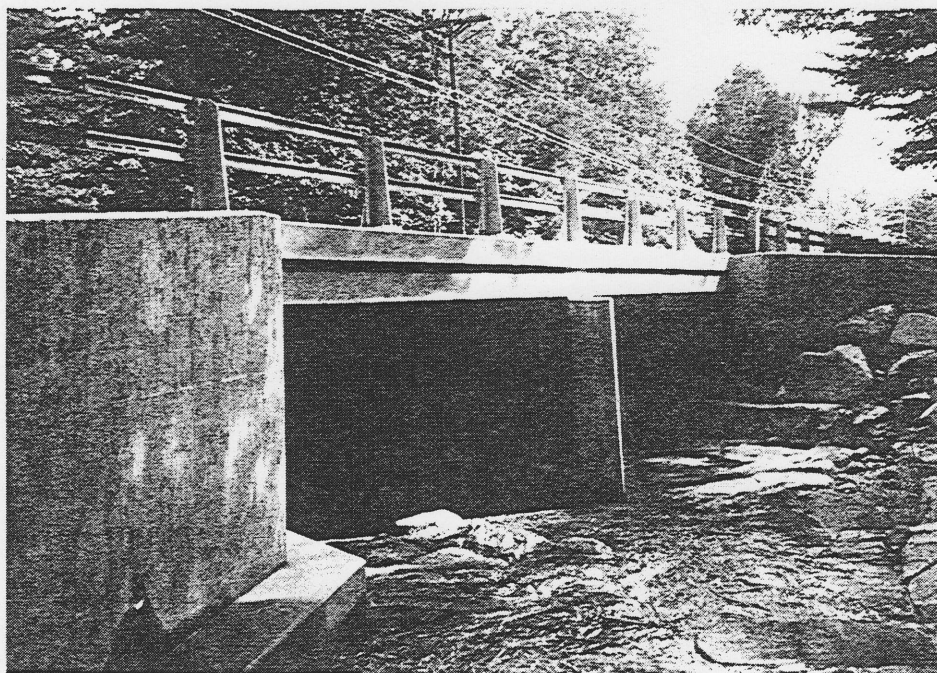
Photo 13: Portsmouth Approach - South End Openspace
Roll: 3 Frame: 11 Direction: S

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014



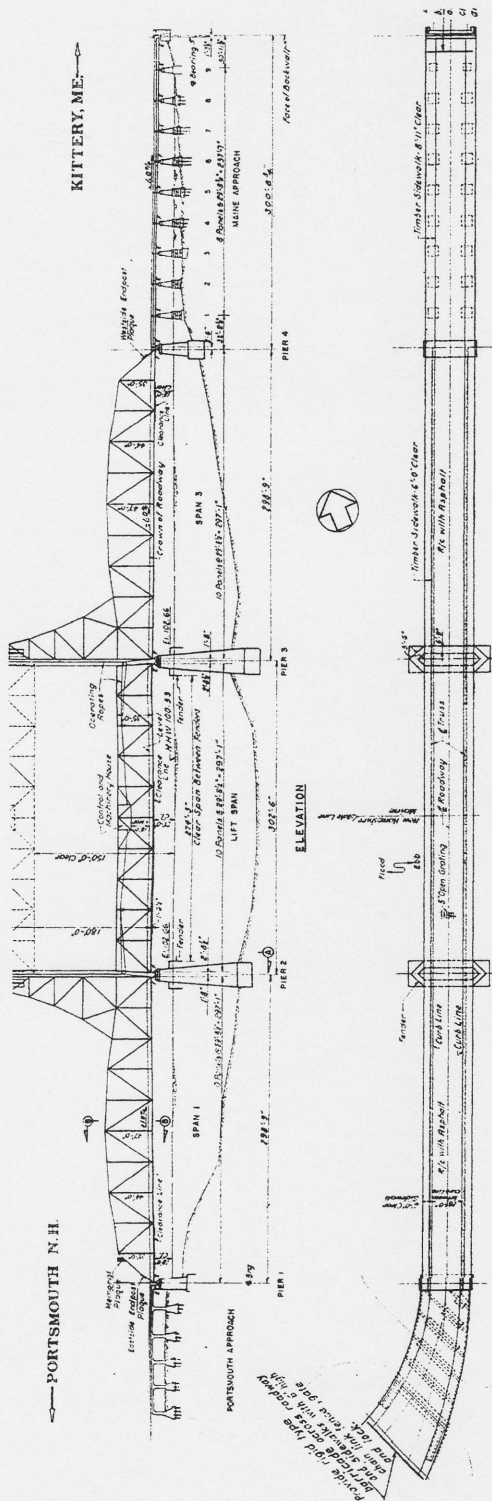
Stewartstown Bridge (Bridge 054/163) over the Connecticut River (Three spans of the NH Approach visible to the right)



Bridge over Albany Brook (Bridge 091/098), Bartlett, NH

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014



ITEM	DESCRIPTION
1	Removal of Existing Operating Equipment
2	Reconstruction of Machinery - Control House
3	Wire Ropes and Sockets
4	Machinery Improvements
5	Emergency LPG Engine
6	Lift Span Electrical Work
7	Bridge Operation

* Subassembly Items:
 Structural Steel includes Mechanical and Electrical I
 Reinforcing Steel
 Concrete Masonry (Concrete Class AXX)
 Structural Timber
 Painting of Steel and Conduits
 Structural Weldment Machinery Supports
 Emergency Portable Propane Heaters
 Maintenance of Traffic (Including Barrier Gates)
 Field Office
 Emergency Hoisting of Lift Span During Alteration P
 Balance Counterweight and Adjust Counterweight Rep
 NEW HAMPSHIRE DEPARTMENT OF PUBLIC
 STATE OF MAINE DEPARTMENT OF
 BRIDGE NO. 247/084 (MEMO)
 ROUTE US 1 OVER THE PISC
 GENERAL PLAN AND I
 HARDSETT & HANOVER SCALE: 1"=40'-0"
 OR K.A.S. APPR. E.S.

LIST OF DRAWINGS

1. GENERAL PLAN AND ELEVATION
2. OPERATING MACHINERY LAYOUT AND HOUSE DETAILS
3. FRAMING PLAN - MACHINERY - CONTROL HOUSE
4. STRUCTURAL DETAILS
5. HOUSE DETAILS
6. MACHINERY IMPROVEMENTS ASSEMBLY
7. MACHINERY IMPROVEMENTS, DETAILS - 1
8. MACHINERY IMPROVEMENTS, DETAILS - 2
9. WIRING DIAGRAM - SPAN DRIVE
10. SCHEDULE OF ELECTRICAL APPARATUS
11. WIRING DIAGRAM - AUXILIARIES
12. CONTROL DESK LAYOUT AND DETAILS
13. SCHEMATIC CONDUIT DIAGRAM AND DETAILS
14. EXISTING FACILITIES IN MACHINERY - CONTROL HOUSE

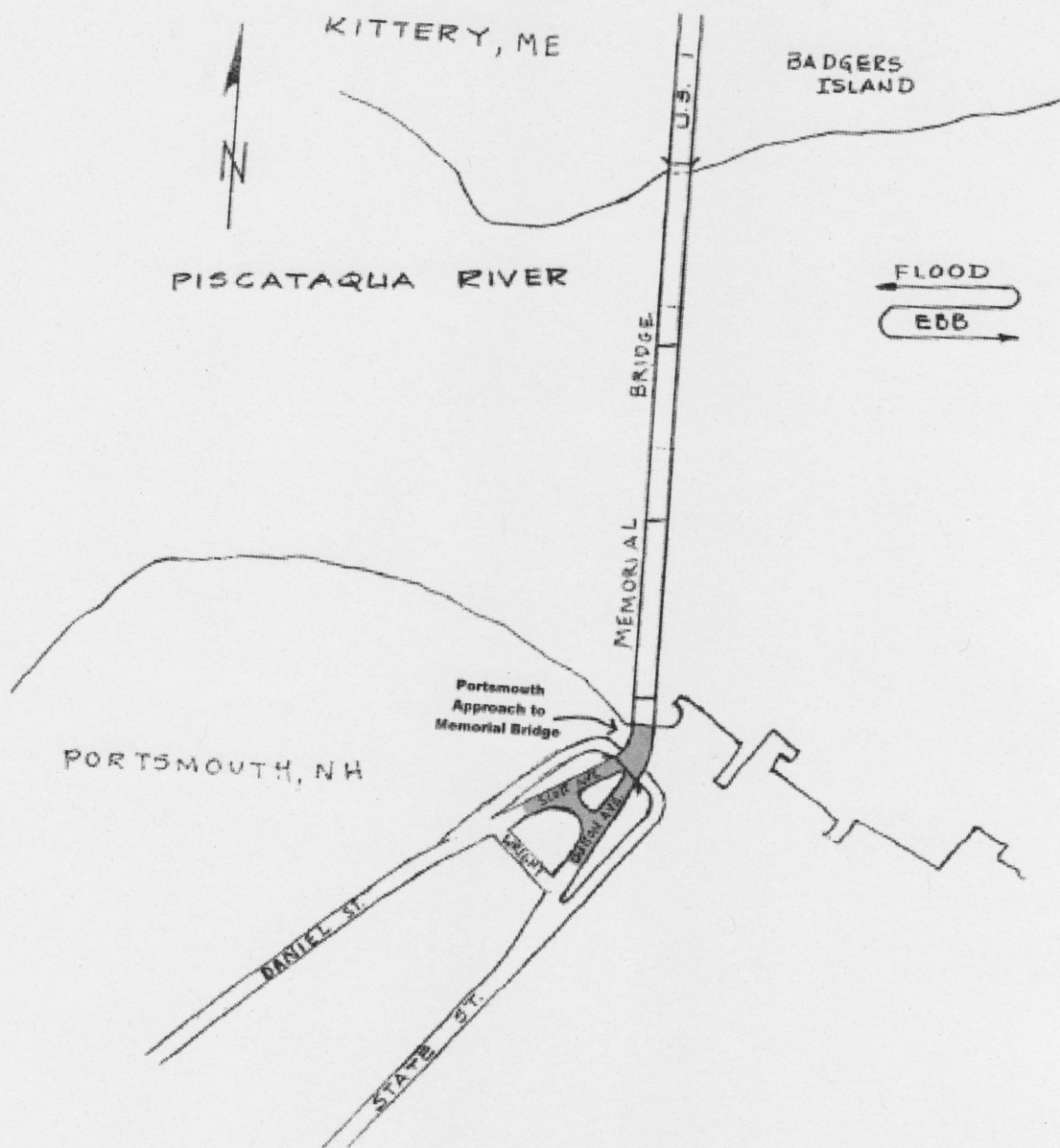
* Only some of the work or material items that are subsidiary to the project or subsidiary to or included in project pay items are listed here for informational purposes only.

Plan and Elevation Showing, Memorial Bridge, and Portsmouth and Kittery Approaches

INDIVIDUAL INVENTORY FORM

NHDHR INVENTORY NUMBER: POR0014

Revised Sketch Map to show boundaries of eligible property (shaded)



March 2009

