

**NEW HAMPSHIRE HISTORIC PROPERTY DOCUMENTATION
NASHUA RIVER STONE RETAINING WALL,
NASHUA MANUFACTURING COMPANY, NASHUA, NH**

NH State No. 538-F

LOCATION: South bank of the Nashua River, situated approximately 400 to 670 feet to the north from the west end of Factory Street, Nashua, Hillsborough County, New Hampshire

USGS Nashua North NH Quadrangle
UTM Coordinates: 19.297596.4737292

BUILDER: Nashua Manufacturing Company

DATE: Ca. 1892

PRESENT OWNER: City of Nashua

PRESENT USE: Retaining wall

SIGNIFICANCE: The Nashua River Stone Retaining Wall is a contributing resource to the National Register-listed Nashua Manufacturing Company Historic District. The district is significant due to the company's role as Nashua's first major industry and largest textile mill, and is illustrative of the importance of the textile industry to the economic development of southern New Hampshire in the nineteenth and early twentieth centuries. The Nashua Manufacturing Company significantly contributed to the history of the City of Nashua as its largest industry and employer for 125 years. The stone retaining wall is a representative example of the stone masonry construction used throughout the complex.

**PROJECT
INFORMATION:**

This structure will receive impacts from the Broad Street Parkway Project, which will include the building of a road that will cross the Nashua River via a new bridge, passing over the subject stone wall and through portions of the former Nashua Manufacturing Company mill yard. This recordation was undertaken in accordance with a Memorandum of Agreement between the Federal Highway Administration, the New Hampshire Division of Historical Resources and the City of Nashua. The historical documentation was completed in July 2013 by Historic Documentation Company, Inc. architectural historians Richard Casella and Philip Pendleton. The large format photographs were taken by Robert Tucher. The measured isometric drawing was prepared by Dennis Howe.

DESCRIPTION

The Nashua River Stone Retaining Wall is located on the west bank of the Nashua River, about 300 feet north east of the landmark Nashua Manufacturing Company brick smokestack. The granite wall runs in a roughly north-south direction for a distance of 335 feet, abutting the four-story concrete frame Bleachery and Dye House building at its north end and the four-story brick Picker House No. 1 building at its south end. The wall ranges in height from 13' at the south end to a maximum of 25' along its mid-section. The raised land area west of the wall is cleared of the industrial buildings that once occupied the site and most of the area is now utilized for parking for tenants of the former Bleachery & Dye House building. A strip of land along the top of the wall; roughly 20 to 50 feet wide, is overgrown with vines, underbrush and small to medium size trees. The Nashua River flows west to east into the Merrimack River, 1.5 miles east of the site. The river curves its way through Nashua and follows a sharp horseshoe bend through the Nashua Manufacturing Company property (see Figures 1 and 2; figures are located at the end of the narrative section after the bibliography).

The wall is at the very edge of the river, with toe of the wall either in the water or standing on a narrow strip of riverbank, typically one to three feet in width that submerges when the river rises in response to heavy rainfall or snow melt. This fringe of shoreline appears in a ca. 1940 aerial photograph and is likely to represent a continuation of the original condition from when the wall was built ca. 1892, as opposed to merely being deposited silt. The nature of the foundation of the wall below grade could not be determined from field inspection.

The character of the stonework and masonry is of such a uniform nature throughout the wall that it suggests the wall was built in its entirety at one time, without alteration. But variations in the height of the wall, and a sudden 5' drop in its height at one point, cannot be explained with certainty and raises the possibility that the wall was raised in height. No plans or descriptions for its construction have been found and historical mapping does not depict the wall with definitive detail.

For purposes of identification and discussion the wall can be considered to have four sections based on its height, beginning with the lowest section at the south end and proceeding northward: south section, 100' long, 13' high; inclined section, 60' long, 13' high, increasing to 25' in height; high section, 100' long, 25' high; and north section, 75' long, 20' high.

The south section has two structures resting on the wall. Approximately ten feet from the Picker House is a small one-story brick pump house building that overhangs the wall about 2 feet. Two iron pipes extend through the overhanging floor down into the water. A concrete wall, approximately 42" high by 40' long sits on the wall as well, the purpose of which is unknown.

The inclined section of wall is simply that, rising from 13' to 25' over a distance of 60'. The top of the wall is an inclined plane with the coping stones laid on a slant, as opposed to walls that are vertically stepped. The high section of wall runs for 100 feet where it drops vertically in height 5' to meet the north section of wall. It has been suggested that this upper 5 feet of wall was added at

a later time to increase the height of the wall for some purpose, however, there is not sufficient evidence to support that conclusion. It is more likely that the wall was built in this manner originally to conform in part to the existing land contours thereby saving wall labor and materials.

Masonry Characteristics

The masonry is typical of late 19th century stone retaining wall construction found in industrial, transportation, civil and other applications where high earth fills or cuts must be retained behind a vertical or nearly vertical wall. The backside of stone retaining walls of this type were typically battered at 60 degrees or perhaps a bit steeper, making the base of the Nashua River wall 12-14 feet deep under its highest point.

The stones vary in size and shape depending on the thickness and uniformity of the natural bedding planes of the granite and the dimensions to which they were split at the quarry. They mostly range from 3' to 7' in length with cross section dimensions from 12" to 30". The variety of sizes and shapes can be seen in the accompanying drawing and photographs. The best grade of stone in the wall, representing perhaps half of the total, is composed of very nearly square or rectangular blocks. The lesser quality stones lack one or more perpendicular sides and are tapered, trapezoidal or otherwise irregular. This irregular or "quarry run" stone is more difficult to lay in level courses of even thickness and requires considerably more labor to fit smaller angular stones into the many gaps between irregular shaped stones. The resulting masonry work, of which the Nashua River wall is a good example, is called rough range-work, in which a roughly equal percentage of level and uniform coursing to insure structural stability is mixed with runs of irregular coursing and pockets of random rubble. The wall is topped with a coping course composed of flat stones, typically about 5 to 7 feet in length, 12 to 20 inches in height and 24 to 40 inches in width that extends for the full length of the wall.

The faces of the stones are unfinished and exhibit the natural rough surface resulting from splitting at the quarry, known as rough-faced, split-faced or quarry-faced. The stone was split along a line of shallow regularly spaced machine drilled holes of uniform diameter (3/4") and depth (2-1/2" to 3") using the plug and feather method, the typical practice of late 19th century New Hampshire granite quarries. The source of the stone is not known, but it is a fine-grained gray granite believed to be Concord Granite, which is classified as a two-mica (biotite and muscovite) granite from the Late Devonian geologic period. Concord granite was quarried at many locations in New Hampshire for its uniform bedding planes and clean splitting.

The wall stone was almost entirely laid in a full mortar bed and flush pointed, meaning the excess mortar squeezed from the joint when setting the stone was scraped even with the surface of the stone and back smoothed with the trowel. This is crude but effective workmanship done to insure strong, full and watertight joints that would not be subject to damage from water penetration and ice-jacking. The exception is the upper part of the high section of wall, where the mortar was used sparingly and is recessed in the joints giving the wall the appearance of being dry laid. This difference, it has been suggested, may be attributed to this portion of the wall being added at a

later time, or to being built by different masons. More likely is that it was done for economy, reflects the less need for expensive mortar at the top of walls where wall pressure, earth pressure and risks of damage from water and ice are less.

HISTORICAL BACKGROUND

The Nashua River Stone Retaining Wall was constructed ca. 1892 in association with expansion of the Nashua Manufacturing Company mill complex into the horseshoe bend area of the river, judging from the available evidence.

The history of the retaining wall must be written via interpretation of buildings that are apparently related to the retaining wall, i.e., it was necessary to build the retaining wall on the riverbank as an element in creating a landscaped site for the relevant buildings and related structures. Record in secondary sources has not been found for the construction of this retaining wall. Earlier chroniclers of the Nashua Manufacturing Company complex concentrated on buildings and the Power Canal in treating the physical development of the property; the preparation and construction of the overall site landscape did not attract attention as a process requiring historical documentation. Graphic sources such as maps, plans, and isometric views from the mid-nineteenth century through the early twentieth century yield very little in the way of direct detail enabling interpretation of the history of this retaining wall. In general, these sources either omit the location of the wall from their coverage or they do depict the location but fail to provide detail or perspective at a level that is adequate for interpretation.

The map of Nashua drafted by Hoar and Mead in 1842 clearly depicted the irregular course of the shoreline in this area (see Figure 3). The 1883 Birdseye view map is extremely detailed, and clearly depicts the subject section of river bank in its unimproved state with what appears to be a slope at its natural angle of repose and a gently curving shoreline (see Figure 4). The companies that prepared fire insurance survey plans did not fully feature this portion of the riverbank until 1906 and onward. None of these insurance maps from the first half of the twentieth century actually depict the wall as a discrete landscape feature. The Associated Mutual Insurance Company (AMIC) plans for 1906 (see Figure 5) indicate a nearly straight shoreline in the wall's location, suggesting that the wall had been built by 1906 and that this had resulted in a linear configuration for the riverbank edge. The 1912 and 1949 Sanborn maps (see Figures 6 and 7), however, show a gently curving shoreline. The wall does have a slight bend in it as shown in the site plan (Figure 2) that was traced from the survey-based site plan for the new Nashua River Bridge project. An aerial photograph from around 1940 documents the wall as in existence at that date (see Figure 8). In the photograph, the wall is set back by just a few feet from the slightly irregular shoreline. It may be that the waterline edge depicted on the AMIC plans represents the wall but on the Sanborn maps it represents the actual shoreline. Regardless, the business of the fire insurance maps was buildings, not natural or manmade landscape features, and therefore cannot be relied upon for concise interpretation of those features.

As indicated above, the buildings on the bluff above the retaining wall offer the best evidence for the approximate date of its construction. The ca. 1940 aerial photo shows a large, relatively level area to the west of the retaining wall and to the north and northwest of the boiler house that had apparently been built up with fill and then landscaped to provide building sites. The Bleachery and Dye House, still extant today, was constructed in this area in three stages: the west end of the building during 1892-1894, a central section in 1910-1913, and the east end in 1919.¹ The eventual enlargement of this building was probably anticipated from the first, i.e., by 1892, thereby necessitating construction of the wall around that date. In addition, the fire insurance maps from 1906 and 1912 indicate that frame storehouse buildings were erected in this area around 1900, although these structures were later taken down.

It has been suggested that a horizontal seam in the high section of the wall, 5 feet down from the top at the level of the adjoining north section, can be discerned, suggesting that at some date the central portion of the wall was raised in height five feet. If that is true, the alteration may have been made to accommodate additional fill for landscaping deposited for some modification of the bluff-top site.

It is also possible that a relatively small segment of the retaining wall at the south end adjacent to the Picker Building was built in 1881 or 1882 when the Picker Building and Boiler House were erected. The granite foundation of the Picker Building extends out about 6 feet from the face of the retaining wall and it is possible that the retaining wall was built perpendicular to it for some distance north of the building to protect it, but there is no map or physical evidence to support that suggestion. The section of Picker Building foundation visible in the photographs and depicted on the elevation drawing, undoubtedly extends west the full length of the building and would have been sufficient to resist any force put on it by the river.

¹ Dayl Cohen and Rita Walsh, National Register Nomination Form Update: *Nashua Manufacturing Form Historic District*, 2010, p. 8.

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- Sanborn Fire Insurance Map Company. *Nashua, New Hampshire*. Sheets 29 and 35. 1912. On file at Nashua Historical Society, Nashua.
- Sanborn Fire Insurance Map Company. *Nashua, New Hampshire*. Sheets 29 and 35. 1949; depicts architecture as modified since 1912. On file at Nashua Historical Society, Nashua.



FIGURE 1: Location Map. USGS Nashua North, NH 7.5 min. quadrangle, 1985.

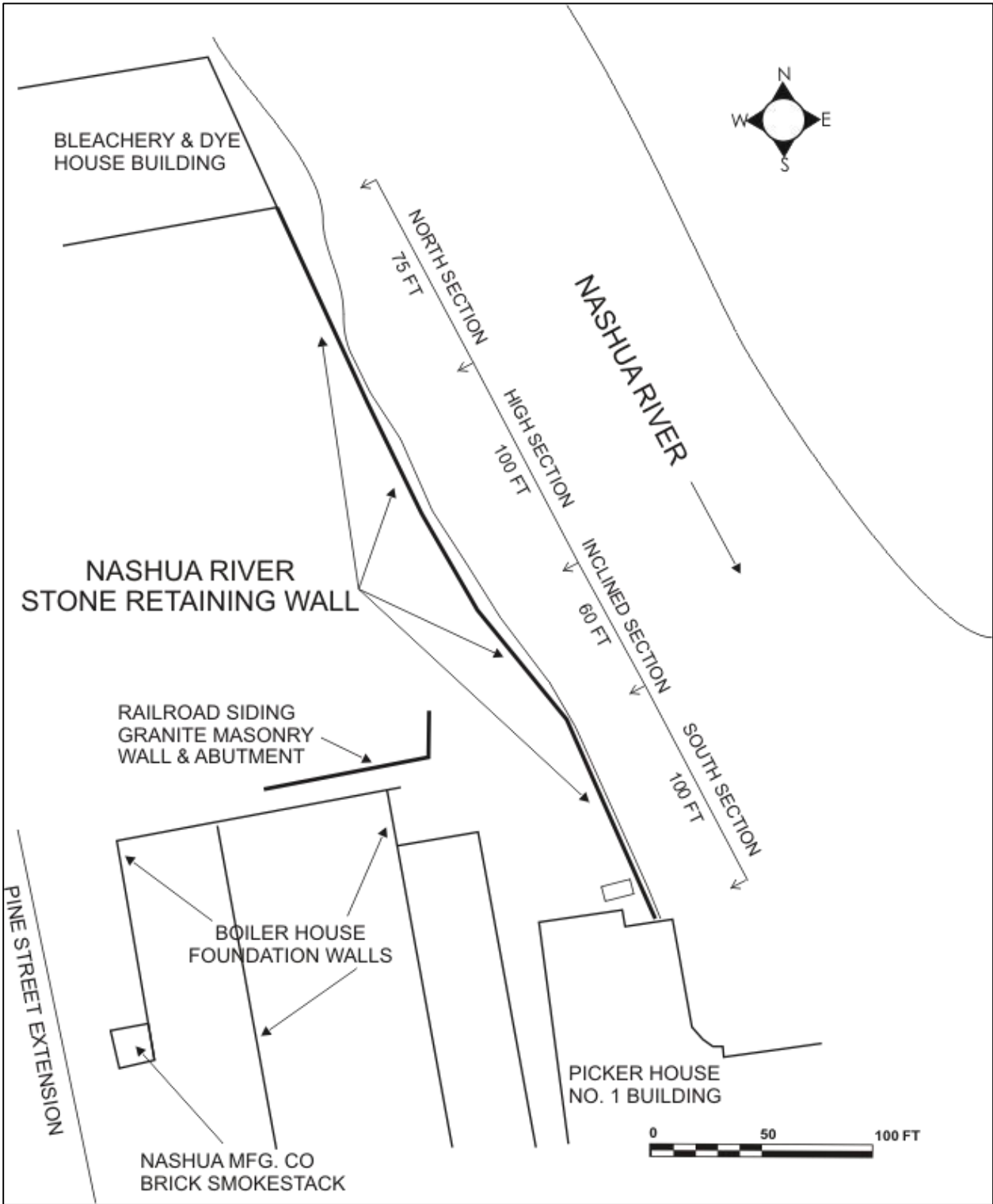


FIGURE 2: Site Sketch

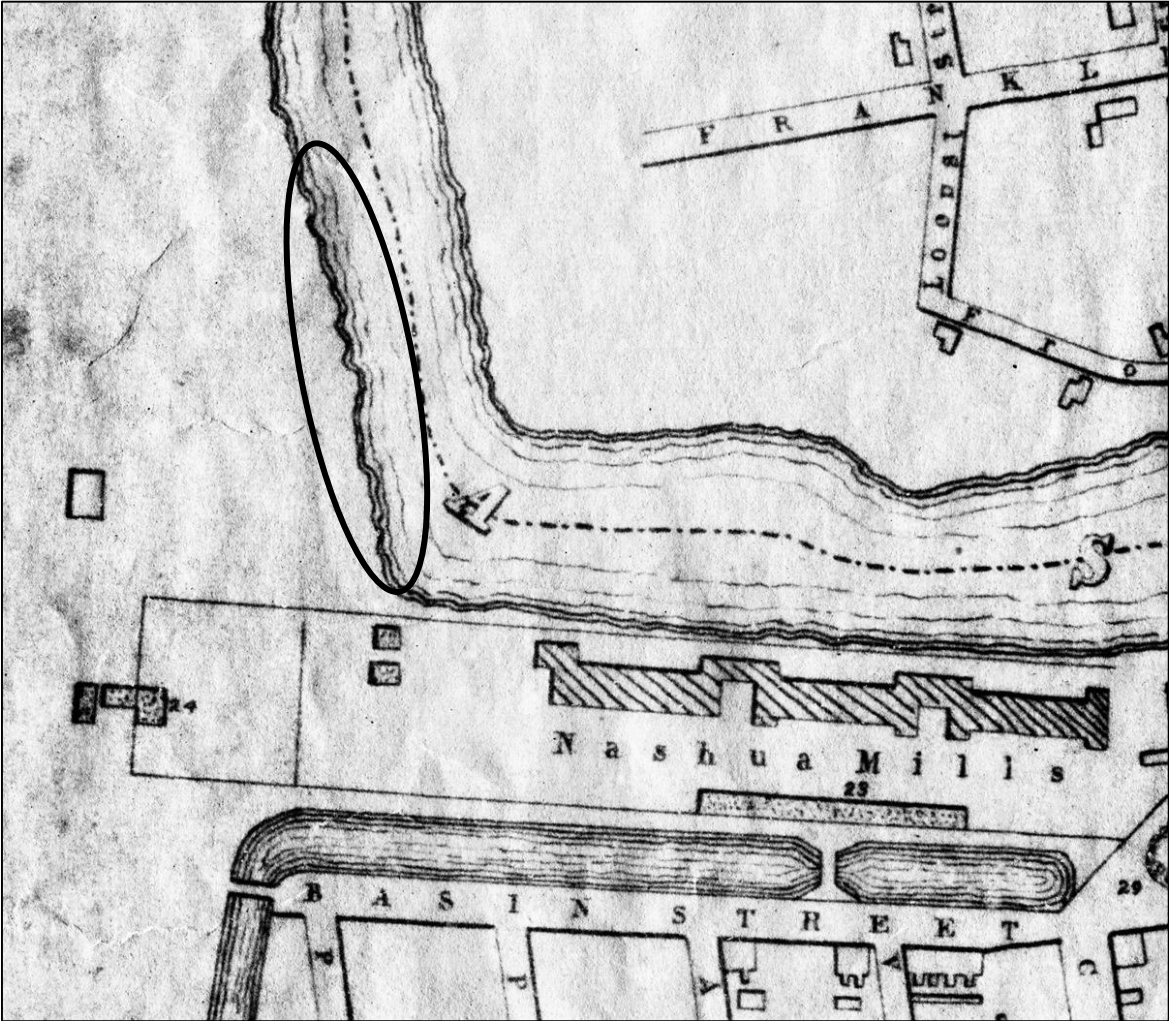


FIGURE 3: Map of Nashua Manufacturing Co. in 1842, showing approximate location of stone retaining wall, not yet present (Source: Hoar & Mead).

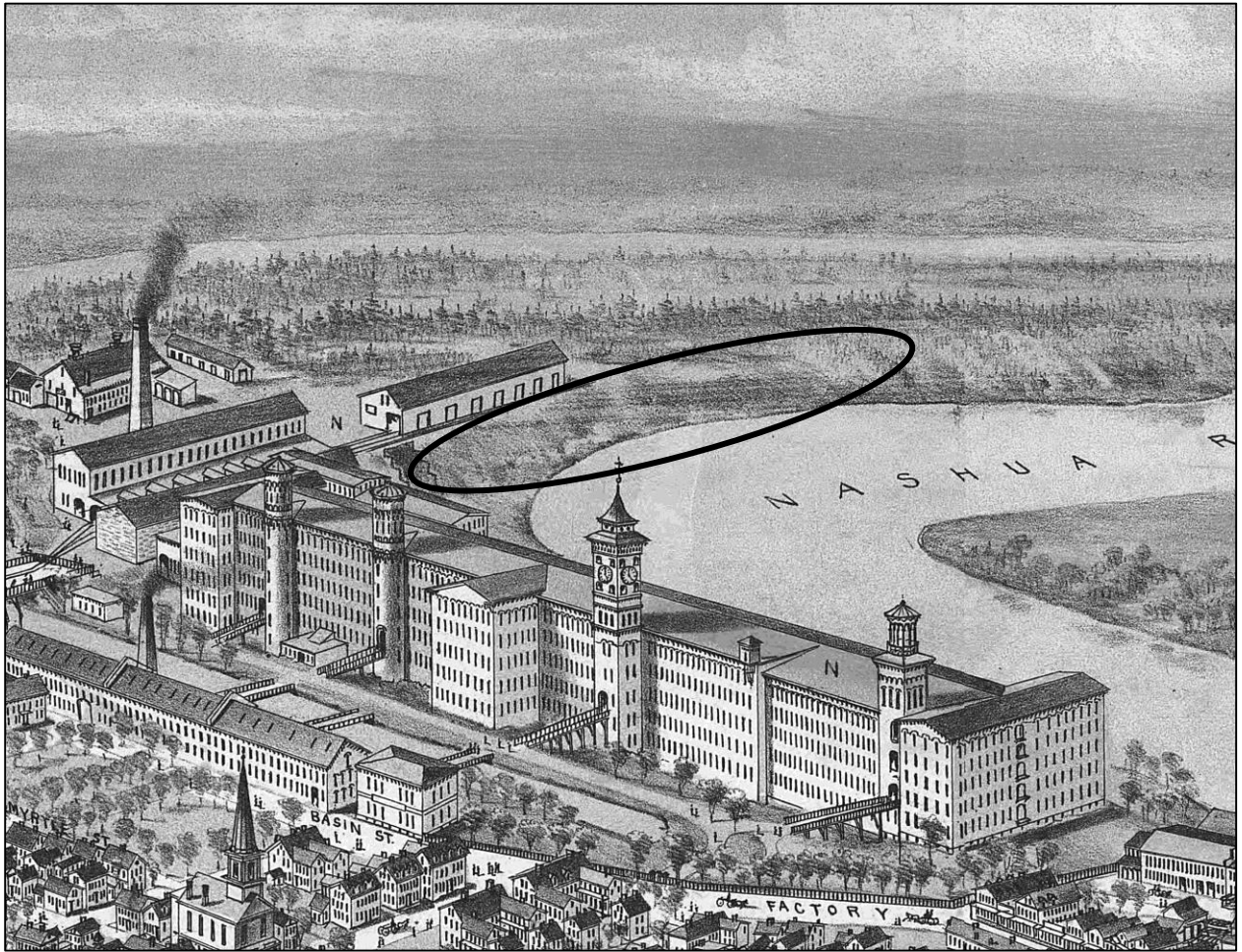


FIGURE 4: A portion of 1883 Birdseye view map of Nashua Manufacturing Co. showing approximate location of stone retaining wall along Nashua River, not yet present (Source: O. H. Bailey 1883).

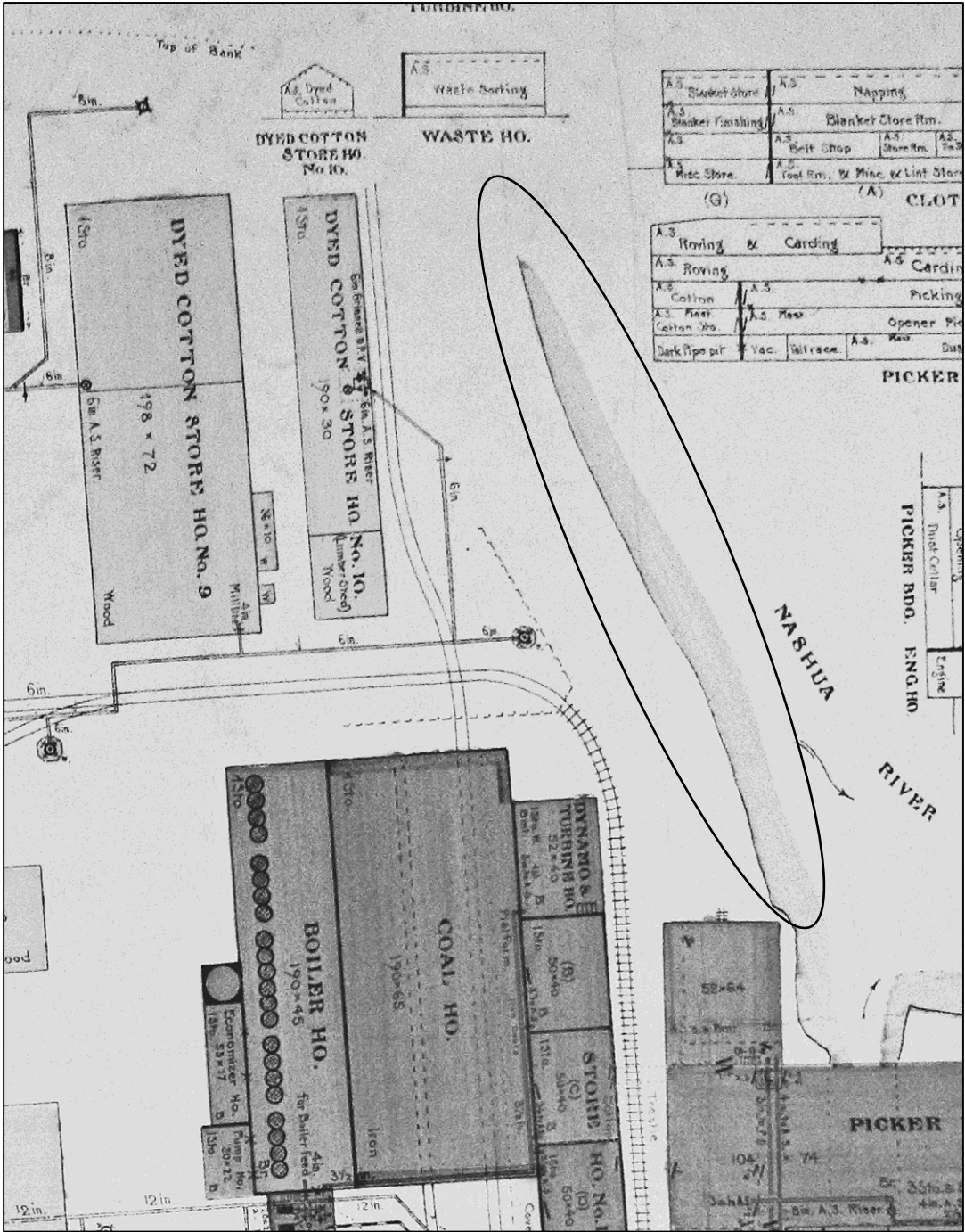


FIGURE 5: Portion of American Manufacturing Insurance Co. map of Nashua Manufacturing Company, 1906, showing location of stone wall (Source: American Manufacturing Insurance Co.).

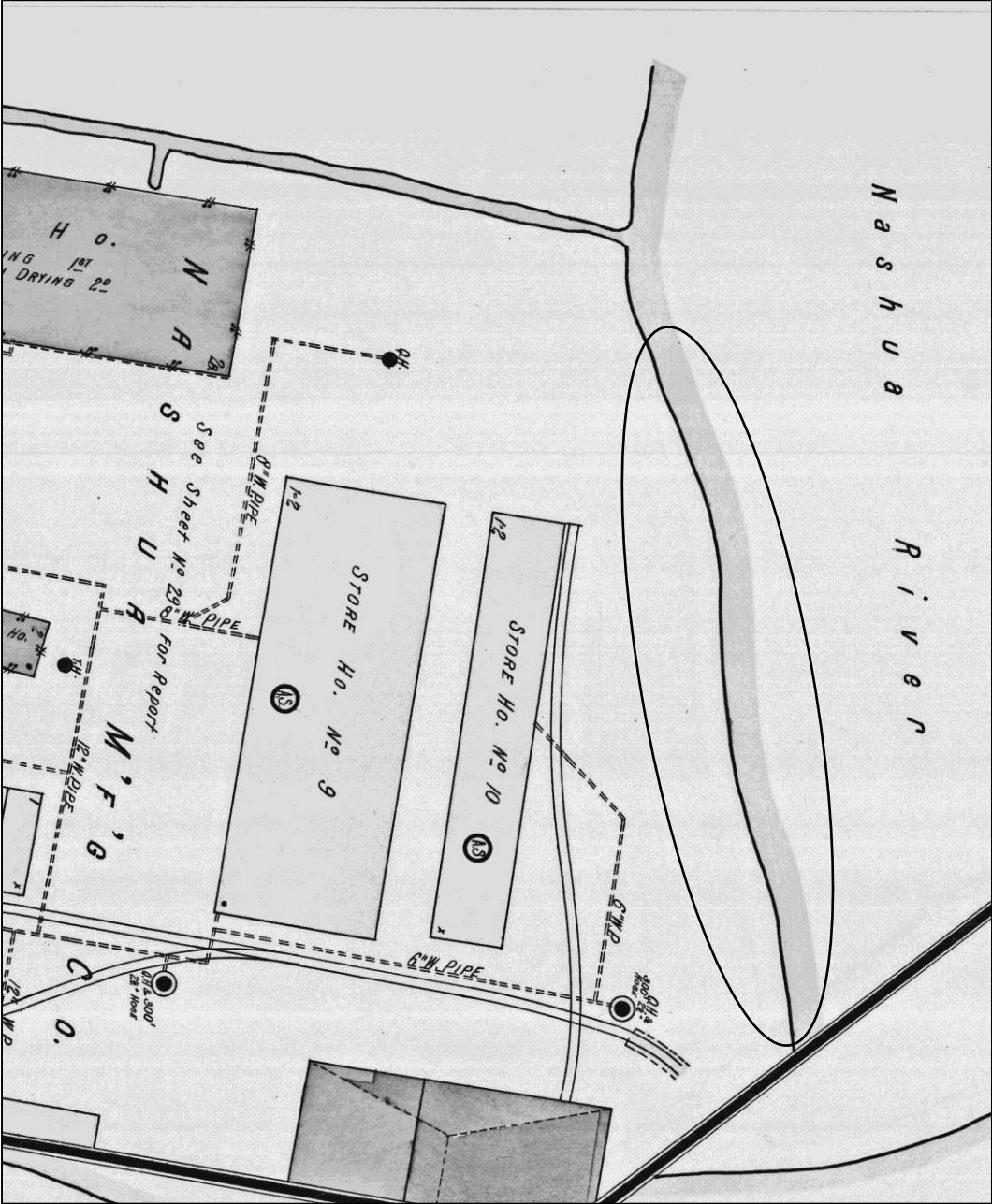


FIGURE 6: Portion of Sanborn Map Co. insurance map of Nashua Manufacturing Company, 1912, showing location of stone wall (Source: Sanborn Map Company).



FIGURE 7: Portion of Sanborn Map Co. insurance map of Nashua Manufacturing Company, 1949, showing location of stone wall (Source: Sanborn Map Company).

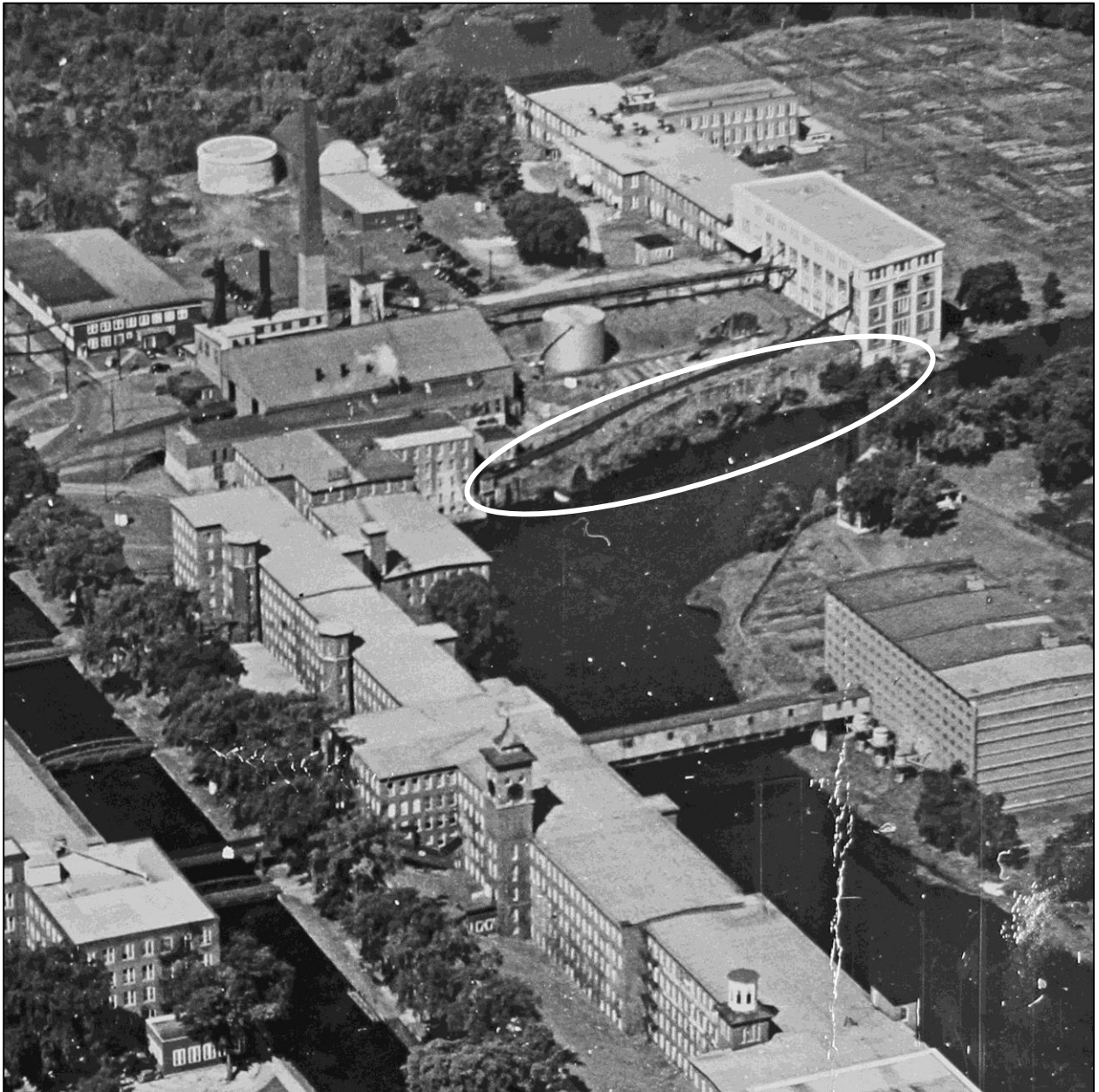
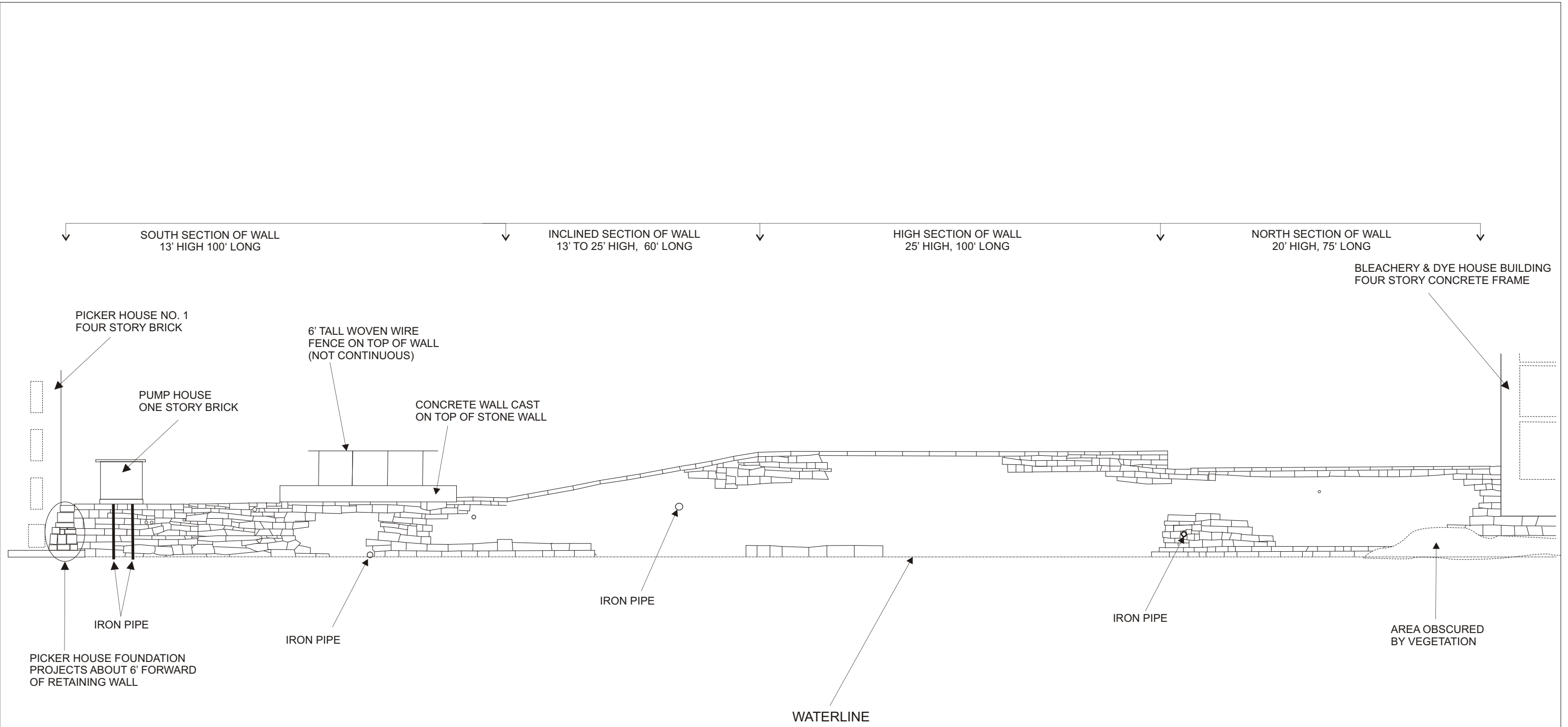


FIGURE 8: Aerial photograph of Nashua Manufacturing Co., ca. 1940, showing location of stone retaining wall along Nashua River (Source: Nashua Manufacturing Company Photograph collection, Nashua Historical Society).



STONE MASONRY RETAINING WALL ON NASHUA RIVER NASHUA MANUFACTURING COMPANY, NASHUA, NH NH STATE NO. 538-F		
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DRAWN BY: R. CASELLA	JULY 2013	SHEET 1 OF 1

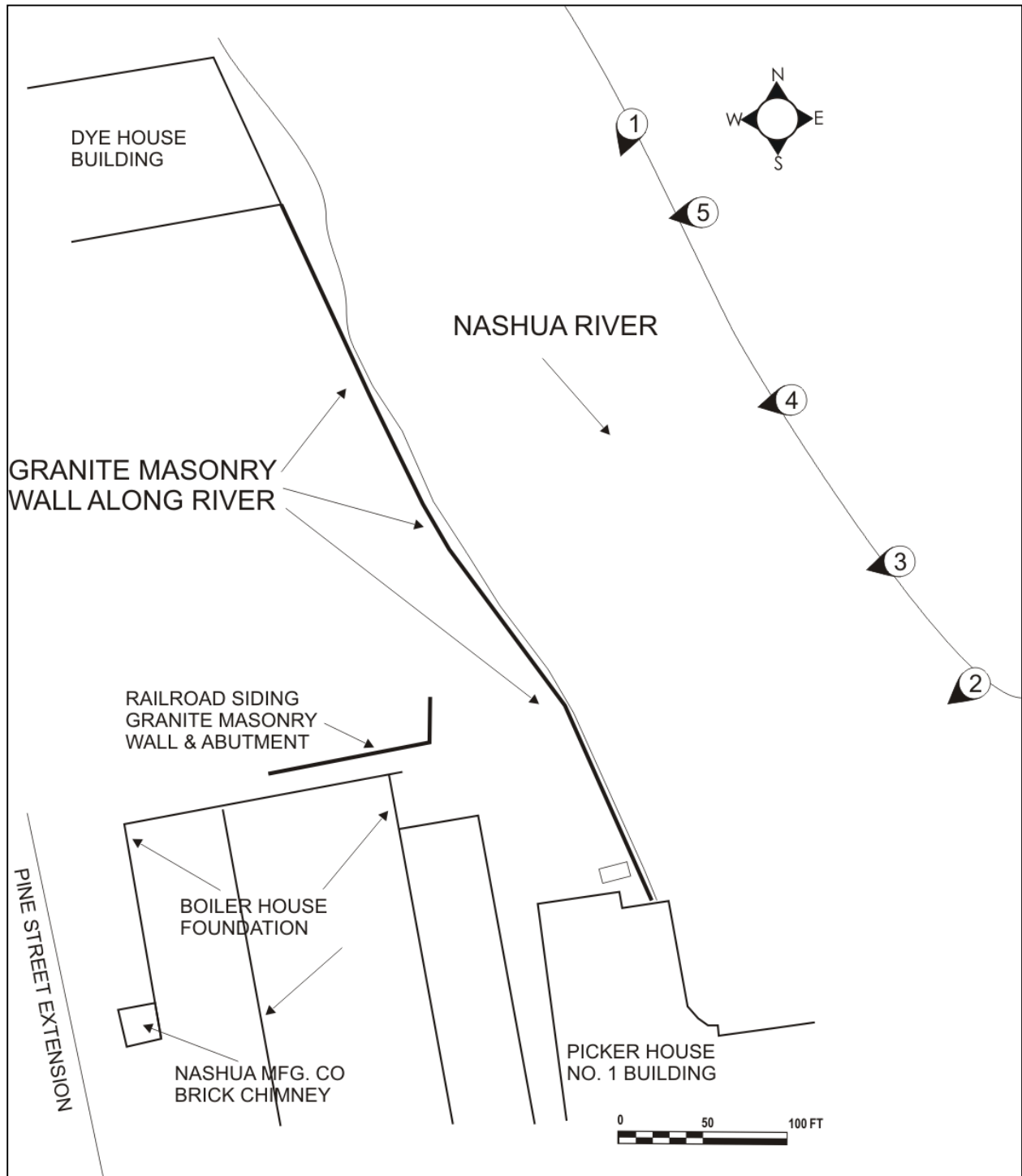
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NASHUA
HILLSBOROUGH COUNTY,
NEW HAMPSHIRE.

NEW HAMPSHIRE STATE NO. 538-F
Photographer: Rob Tucher
April 2013

- NH-538-F-1 Oblique view of wall in overall context from east bank of Nashua River, showing corner of Dye House building at right, Picker House No. 1 building in distance at left and brick Boiler House Chimney at center. Looking south southwest.
- NH-538-F-2 Partial oblique view of south end of wall in context with adjoining Picker Building No.1 at left, small Pump House structure atop wall and Boiler House Chimney. Looking west southwest.
- NH-538-F-3 Elevation of south section of wall adjoining Picker Building No. 1. Looking west.
- NH-538-F-4 Elevation of middle section of wall. Looking west.
- NH-538-F-5 Elevation of north section of wall adjoining Dye House building. Looking west.

STONE MASONRY RETAINING WALL ON NASHUA RIVER
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STONE MASONRY RETAINING WALL ON NASHUA RIVER
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NH-538-F-1: Oblique view of wall in overall context from east bank of Nashua River, showing corner of Dye House building at right, Picker House No. 1 building in distance at left and brick Boiler House Chimney at center. Looking south southwest.

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NH-538-F-2: Partial oblique view of south end of wall in context with adjoining Picker Building No.1 at left, small pump house structure atop wall and Boiler House Chimney. Looking west southwest.

STONE MASONRY RETAINING WALL ON NASHUA RIVER
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NH-538-F-3: Elevation of south section of wall. Looking west.

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NH-538-F-4: Elevation of middle section of wall. Looking west.

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NH-538-F-5: Elevation of north section of wall adjoining Dye House building. Looking west.