Minute Man National Historical Park
John Nelson House & Barn

Historic Structure Assessment Report

November 2008

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MINUTE MAN NATIONAL HISTORICAL PARK

JOHN NELSON HOUSE AND BARN

HISTORIC STRUCTURE ASSESSMENT REPORT
MIMA 94148

November 28, 2008

Project Management/Structural/Site:
HDR Engineering, Inc.
Boston, MA

Architecture:
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Chadds Ford, PA

HVAC/Electrical/Plumbing:
Fitzemeyer & Tocci Associates
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Page

PART 2.0-B JOHN NELSON BARN: RECOMMENDATIONS FOR TREATMENT

EXECUTIVE SUMMARY

The National Park Service proposes to implement stabilization and preservation actions to correct critical deferred maintenance needs for health and safety and resource protection for two historic structures located in Minute Man National Historical Park, the John Nelson House and Barn. Prior to conducting this work, the NPS commissioned the completion of historic structure research and documentation. The goal of this Historic Structure Assessment Report is to provide informed preservation recommendations, to enable appropriate treatments, and to correct critical deferred maintenance needs for health, safety, and resource protection. This report provides recommendations for specific actions that are intended to maintain the existing integrity and character of the two historic structures.

The following primary tasks were carried out in preparing the HSAR:

1. Archival research to retrieve information related to the significance and developmental history of the buildings and site, and to assist in identifying the character-defining features and evaluating their integrity.

2. Architectural, structural, HVAC, plumbing, electrical, and safety investigations to retrieve and document physical evidence in order to assess existing conditions and to formulate recommendations for the proposed preservation work.

2. Statement of recommended treatment philosophy consistent with the evaluation of significance and proposed use for the buildings.

3. Statement of recommended treatment of the properties.

Architectural investigations revealed extensive physical evidence in support of the construction chronology and character-defining features. This evidence is presented in the form of detailed descriptions and annotated photographs. An assessment is made of the building's architectural features and recommendations were made for appropriate treatments to maintain the existing integrity and character of the historic structure.

An assessment of the building's structural, HVAC, plumbing, electrical, and safety components was conducted to identify national and local code deficiencies at the buildings, and evaluate overall operational performance of the systems for reuse. The HVAC, plumbing, electrical and safety sections of the report are organized by building system, with operational problems and major code deficiencies identified for each. Code issues are presented are based on current day, State of Massachusetts requirements. Recommendations are designed to improve the facility's infrastructure conditions, energy performance, code compliance, and maintainability.

The architectural investigations, assessments, and recommendations were prepared by John Milner Architects, Inc., Chadds Ford, PA. The structural and site investigations, assessments, and recommendations were prepared by HDR Engineering, Inc., Boston, MA. The HVAC, plumbing, electrical and safety investigations, assessments, and recommendations were prepared by Fitzemeyer & Tocci Associates, Inc., Stoneham, MA.

PROJECT DATA

RESOURCE: The John Nelson House and John Nelson Barn

LOCATION: 200 N. Great Road
Lincoln, Middlesex County, Massachusetts
(located within the boundary of Minute Man National Historical Park)

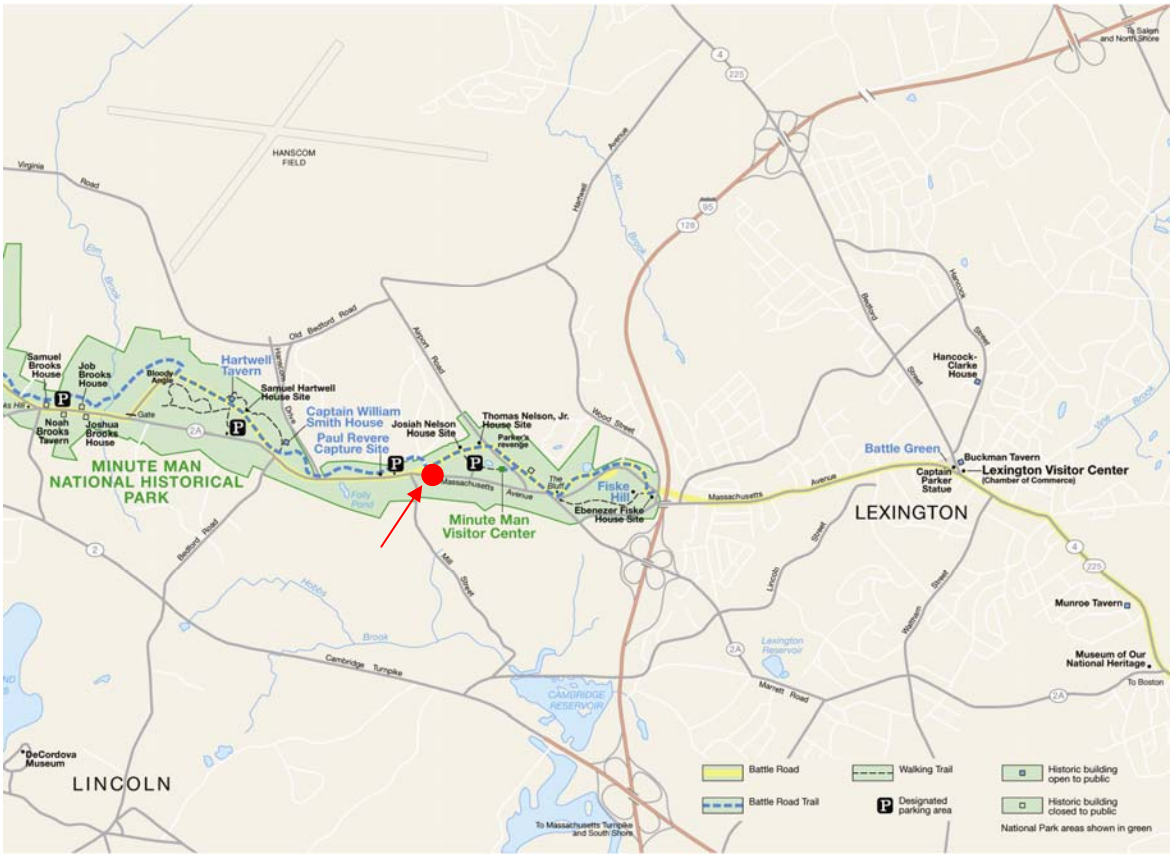


Figure a. Detail map of Minute Man National Historical Park in Lincoln, Massachusetts as provided by the National Park Service (not to scale). Approximate location of the John Nelson House and Barn is indicated in red.

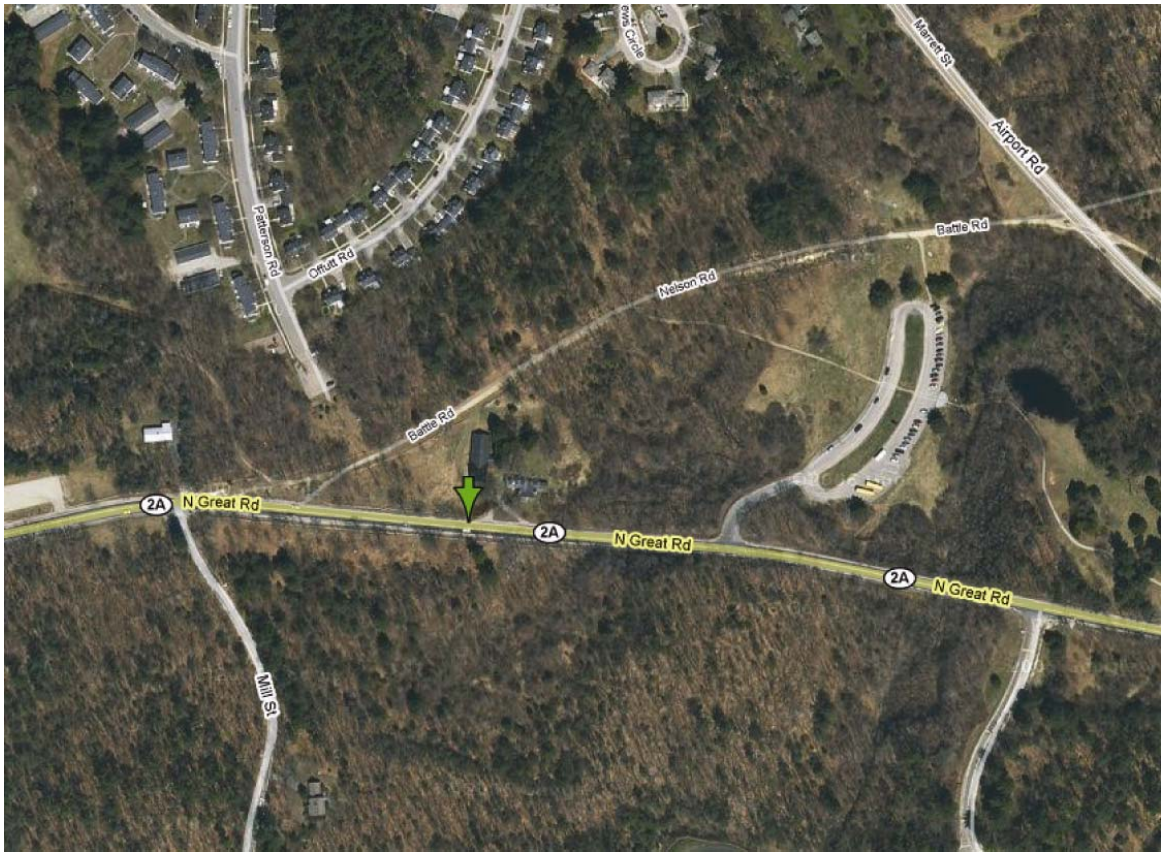


Figure b. Aerial photograph of site (not to scale). Adapted from Google Maps.

NATIONAL REGISTER OF HISTORIC PLACES STATUS:

Status: The John Nelson House and Barn are listed as contributing properties within the Minute Man National Historical Park Historic District.

Date Listed: 2002

PART 1.0 - A

JOHN NELSON HOUSE:
PHYSICAL DESCRIPTION, CONDITIONS ASSESSMENT,
AND CHARACTER-DEFINING FEATURES

PART 1.0-A. JOHN NELSON HOUSE: PHYSICAL DESCRIPTION, CONDITIONS ASSESSMENT AND CHARACTER-DEFINING FEATURES

1.1-A HISTORICAL BACKGROUND, CONTEXT, AND CHRONOLOGY OF DEVELOPMENT AND USE

The John Nelson House, as the property is currently known, is named for one of the house's early occupants and a key contributor to the main house's design and construction. The house is situated on a parcel of land south of Nelson Road and north of North Great Road (Route 2-A). The current John Nelson House, Barn and property are located on part of a parcel purchased in 1772 by John Nelson's father Josiah Nelson, Sr. (1726-1810) from Daniel Brown. Prior to the purchase of this parcel, Josiah Nelson, Sr. owned property to the east of Daniel Brown.[1]

Josiah Nelson, Sr. was one of three children born to Thomas Nelson, whose great-grandfather Thomas Nelson came to Massachusetts from Rowley, England in 1636.[2] Josiah Nelson, Sr. and his wife Elizabeth had six children which included Josiah, Jr. (1778-1835), John (1789-1859), and Joshua. During the late eighteenth century, Josiah Nelson, Sr. and his family occupied a wood frame house built on a 21-acre lot north of Nelson Road known as the Josiah Nelson, Sr. house. The house burned down in 1908 and the remaining foundation underwent archeological investigation and stabilization by the National Park Service from 1964-66.[3]

Figure 1.0A-1. Photographic print of the John Nelson House from the manuscript of "Houses in Lincoln 100 Years Old and Older with some of their Owners" by Edward R. and Samuel Farrar, 1935. Lincoln Public Library, Lincoln, MA. Date of photograph unknown (possibly late 19th or early 20th century).

[1] Holland, Martha. "Archeological Investigations of Minute Man National Historical Park. Volume I: Farmers and Artisans of the Historical Period." Cultural Resources Management Study No. 22, NPS, p. 327.
[2] Carroll, William F. "Nelson Family Papers – Historical/Biographical Notes" (2002.006). Archives/Special Collections, Lincoln Public Library, Lincoln, Massachusetts: December 2002.
[3] Abel, Leland J. "Completion Report: Stabilization of the Cellar and Foundation Walls of the Josiah Nelson House, including Historical, Archeological, and Architectural Research." NPS: 1966, p.1-2.

Josiah Nelson, Jr. began construction on the structure known as the John Nelson House, located on his father's land south of Nelson Road, in 1808. Evidence of this construction date is provided by an itemized bill from Jacob Robinson, a stone mason, to Josiah Nelson, Jr. for work completed from March to November 1808 [*fig. 1.0A-2*]. The bill charges Josiah Nelson, Jr. for tasks on various dates including, "stoning the cellar and splitting and hammering stones", "stoning the cellar and hammering and laying the underpinning", "building the brick ends", and "altering the chimneys in the old house."[4] The description of "brick ends" almost certainly points to the construction of the John Nelson House main block. Additionally, the "old house" mentioned in the bill must be the original eighteenth-century structure that was standing prior to the construction of the main block. No evidence of construction date or description of the eighteenth-century structure was found during research investigations, but it can be assumed that it was standing for a period of time prior to 1808 since Jacob Robinson worked to underpin the cellar and alter the chimney during the main block construction. What currently remains of this original structure are the foundation walls, a single first floor room with brick cooking fireplace and some original finishes, first and second floor framing, and second floor deck with a partial frame wall sheathed with horizontal boards. Physical evidence, which will be discussed further in this report, clearly points to this section of the house as pre-dating the main block construction.

Josiah Nelson, Jr. married Anna Hoar in November 1809 and the impending marriage may have been impetus for the new construction during the prior year. In 1810, Josiah Nelson, Jr. was assessed $15 for his house. From the years 1810 to 1818 there was no increase in Josiah Nelson's real estate assessment. During this same eight years Josiah's brother, John, was not assessed for any real estate.[5] In 1818, eight years after Josiah Nelson, Sr.'s death, the Nelson property was divided among his heirs, according to Middlesex County deed records. The three brothers Josiah, Jr., John, and Joshua inherited their father's property. Joshua received the

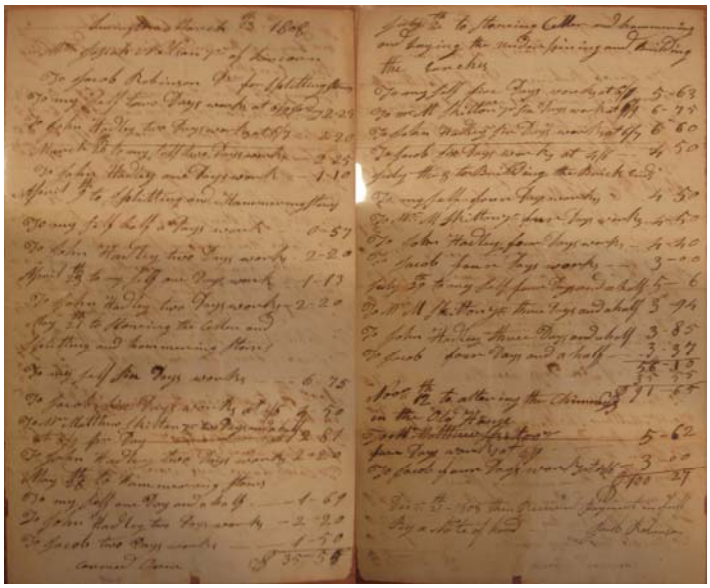


Figure 1.0A-2. Itemized bill from Jacob Robinson to Josiah Nelson, Jr. for work completed from March to November, 1808. Nelson Family Papers, Lincoln Public Library, Lincoln, MA.

[4] Jacob Robinson to Josiah Nelson, Jr., March-November, 1808. Nelson Family Papers, Archives/Special Collections, Lincoln Public Library, Lincoln, MA.
[5] "Notes on the Relative Value of the Nelson's and Hastings' Houses, Barns and Total RE, 1810-1831," File: *Tax Records – Nelson Family*, Historical Files, MIMA NHP.

property on the north side of Nelson Road containing his father's house. John received 5 acres of pasture land in Lincoln on the south side of Nelson Road along with the west end of the John Nelson House. Josiah, Jr. received 19 acres of land and the east end of the John Nelson House.[6]

John Nelson married Lucy Viles in May 1820.[7] In 1821, John was assessed $12 for his half of the house and Josiah, Jr. was assessed $9 for his half.[8] The larger assessment for John in 1821 indicates that during the time between the 1818 and 1821 assessments he may have made significant improvements to his half of the house. The improvements most likely included the first phase of the two-story northwest wing located to the north and west of the main block [*see fig. 1.0A-6 for a diagram of the 2 phases of the northwest wing*]. John's addition probably contained two rooms on the first floor and two rooms on the second floor (since altered) which would suitably house his new wife and future family. Since John and Josiah shared joint ownership of the house, most likely the two brothers and their families occupied the house together. Physical evidence, such as stair and door configurations, suggests that the house may have been used for some time as two dwellings. The extent to which the residences were separated is unknown since the back stair and central-rear spaces in the northwest wing were significantly altered during the late 19th and early 20th century. The presence of two main entrance doors on the south elevation, one at the main block and one at the northwest wing, suggest two separate dwelling entrances but this premise is not confirmed by the physical evidence that exists.

It appears that the northwest wing was not built concurrently with the main block [*see fig. 1.0A-5 for a diagram of the various building sections*]. Physical evidence found in the basement and attic/roof areas of the house corroborates the premise that the northwest wing was added after the construction of the two-story main block was completed. Evidence includes the partially intact north section of the original wood-shingled main block roof that is found in the attic. This roof was later framed over when the northwest wing was constructed. Additionally, visual analysis of the main block north elevation foundation wall, as viewed from the basement crawl space under the northwest wing, reveals a foundation wall that would have originally been exposed above grade. Large dressed granite slabs similar to those found on the main block front exterior were installed on the north elevation of the main block, which were concealed when the northwest wing was added.

The next recorded tax assessment was in 1824, in which John and Josiah, Jr. were each assessed for half of the house. Soon after, in 1826, Josiah Nelson, Jr. was declared insane which precipitated some significant changes in his property holdings. Large areas of Josiah, Jr.'s land were sold in 1827 in order to pay off his mounting debts, although he continued to maintain ownership of his half of the house. In 1831, Josiah, Jr. mortgaged 4 acres and his part of the house lot to Mrs. Joan Locke of Lexington. The home lot was

[6] Ronsheim, Robert. "Land in the Park." *Historic Grounds Report.* MIMA NHP: 1968, p. 35-37.
[7] *Vital Records of Lincoln Massachusetts to the Year 1850.* Boston: New England Historic Genealogical Society, 1908.
[8] Ronsheim, p. 35-36.

described in the deed as being "bounded on the west by John Nelson 20 rods through the front entry of my dwelling house"[9] The 1834 and 1835 tax assessment records note that John and Josiah, Jr. were each assessed for half of the house. Josiah, Jr. died in 1835, and in 1840 his heirs were assessed for one-third of the house (John was assessed for two-thirds of the house). It is possible that during the time between 1835 and 1840 John Nelson constructed the second phase of the northwest wing, increasing the size of his "half" of the house. Physical evidence suggests that the "phase 2" rooms, first and second floors, were added to the northwest wing, however the actual date of construction is unknown [*fig. 1.0A-6*]. Conjecture that the addition was constructed during this time provides a feasible explanation for why John was assessed for two-thirds of the house in 1840. In 1846, John's only child George purchased the eastern part of the John Nelson House lot from the heirs of Josiah Nelson, Jr. In the 1850 tax assessment, George was assessed for half a house and John was assessed for the other half. Upon John's death in 1859, George inherited all of his father's property and real estate holdings (which is reflected in the 1860 tax assessment).[10] After purchasing the eastern part of the John Nelson House from Josiah, Jr.'s heirs in 1846 and inheriting the western part of the house from his father in 1859, George Nelson attained ownership of the entire house.[11]

According to census records George Nelson, his wife Abigail, and children George, Jr., Charles, J. Walter, and Charlotte occupied the house throughout the late nineteenth and early twentieth centuries.[12] Alterations to the first and second floor central-rear spaces of the northwest wing were most likely made during this time period, since the house was then occupied by a single family. Any accommodations for two-family dwelling needs while John and Josiah, Jr. occupied the house were obsolete. It is possible that the conjectured original rear stair was removed and a new secondary stair was installed in its current configuration, as physical evidence suggests, but further investigations are required to determine the exact changes made to the house during this time period. The northeast wing may have been constructed in the early twentieth century, as physical evidence discussed later in this report suggests, but it is not possible to provide an affirmative period of construction for this addition. Other likely twentieth-century alterations include the introduction of a modern kitchen on the first floor and a full bathroom on the second floor.

J. Walter Nelson, the son of George Nelson, occupied the house during the early twentieth century along with his wife, Nellie, and their son, Walter Newton.[13] W. Newton Nelson owned and occupied the house through the third quarter of the twentieth century until he sold the House, Barn and property to Minute Man National Historical Park in the 1970's. Effectively, the John Nelson House property remained in the same family for over two hundred years.

[9] Ibid, p. 39.
[10] "Notes on the Relative Value of the Nelson's and Hastings' Houses, Barns and Total RE, 1810-1831," p. 10-11, 15-17.
[11] Ronsheim, p. 38.
[12] Census of Lincoln, Massachusetts: 1850, 1860, 1870, and 1880.
[13] Census of Lincoln, Massachusetts: 1920.

Figure 1.0A-3: Table of Significant Nelson Family and Property Events

Date	Event
1636	Thomas Nelson (great-great grandfather of Josiah Nelson, Sr.) from Rowley, England settled in Massachusetts.
1720	Thomas Nelson (great-grandfather of Josiah Nelson, Sr.) located to the Lexington, MA area.
1726	Josiah Nelson, Sr. was born (d. 1810).
1772	Josiah Nelson, Sr. purchased a parcel of land in Lincoln, MA from Daniel Brown. This large parcel of land included the property that currently contains the John Nelson House and Barn. Josiah Nelson, Sr. constructed a wood frame house on a 21-acre lot north of Nelson Road.
1775	April 19, 1775 the Battle Road events took place as the British returned from Concord.
1778	Josiah Nelson, Jr. born (d. 1835).
1789	John Nelson born (d. 1859).
1808	Josiah Nelson, Jr. began construction of the John Nelson House on a parcel of his father's land south of Nelson Road, adding a brick-ended wood frame structure (the Main Block) to the southwest of an existing 18th century wood frame structure.
1818	Josiah Nelson, Sr.'s property was divided among his heirs, after his death in 1810. John Nelson received 5 acres of pasture land on the south side of Nelson Road, along with the west end of the John Nelson House. Josiah Nelson, Jr. received 19 acres of land and the east end of the John Nelson House.
1821	Increased tax assessment indicates that the John Nelson House may have been expanded by John Nelson between 1818 and 1821 (the Northwest Wing).
1822	John Nelson's only son George was born.
1824	Tax assessment lists John and Josiah, Jr. as each assessed for half of the John Nelson House.
1826-7	Josiah Nelson, Jr. was declared insane and portions of his land were sold to pay off his debts. He maintained ownership of his half of the house.
1835	Josiah Nelson, Jr. died and his property was passed on to his heirs.
1840	Tax assessment lists Josiah Nelson, Jr.'s heirs as assessed for one-third of the John Nelson House. John Nelson was assessed for two-thirds of the house.
1846	John's only son George Nelson purchased the eastern section of the John Nelson House from Josiah, Jr.'s heirs.
1859	John Nelson died and his son George inherited his father's property and house, retaining ownership of the entire John Nelson House.
1863	George's son J. Walter Nelson was born, who owned and occupied the John Nelson House from the late 19th century into the early 20th century.
1905	J. Walter Nelson's son W. Newton Nelson was born. He owned and occupied the John Nelson House from the early through the third quarter of the 20th century.
1970's	W. Newton Nelson sold the property, including the house and barn, to Minute Man National Historical Park.

1.2-A PHYSICAL DESCRIPTION AND CONDITIONS ASSESSMENT

1.2.1-A SITE

The property containing the John Nelson House is located in Lincoln, Middlesex County, Massachusetts within the boundaries of Minute Man National Historical Park. The John Nelson House and Barn are located next to each other along the north side of North Great Road (Route 2-A), also known as Massachusetts Avenue in Lexington. The site is also bordered by Battle Road to the north. The house is situated facing south on the north side of North Great Road. A rubble stone wall borders the southern property line along North Great Road from the western edge of the driveway to the intersection with Battle Road. The wall also borders an open meadow on the site that separates North Great Road from Battle Road. The eastern edge of the site appears to border a wetland area.

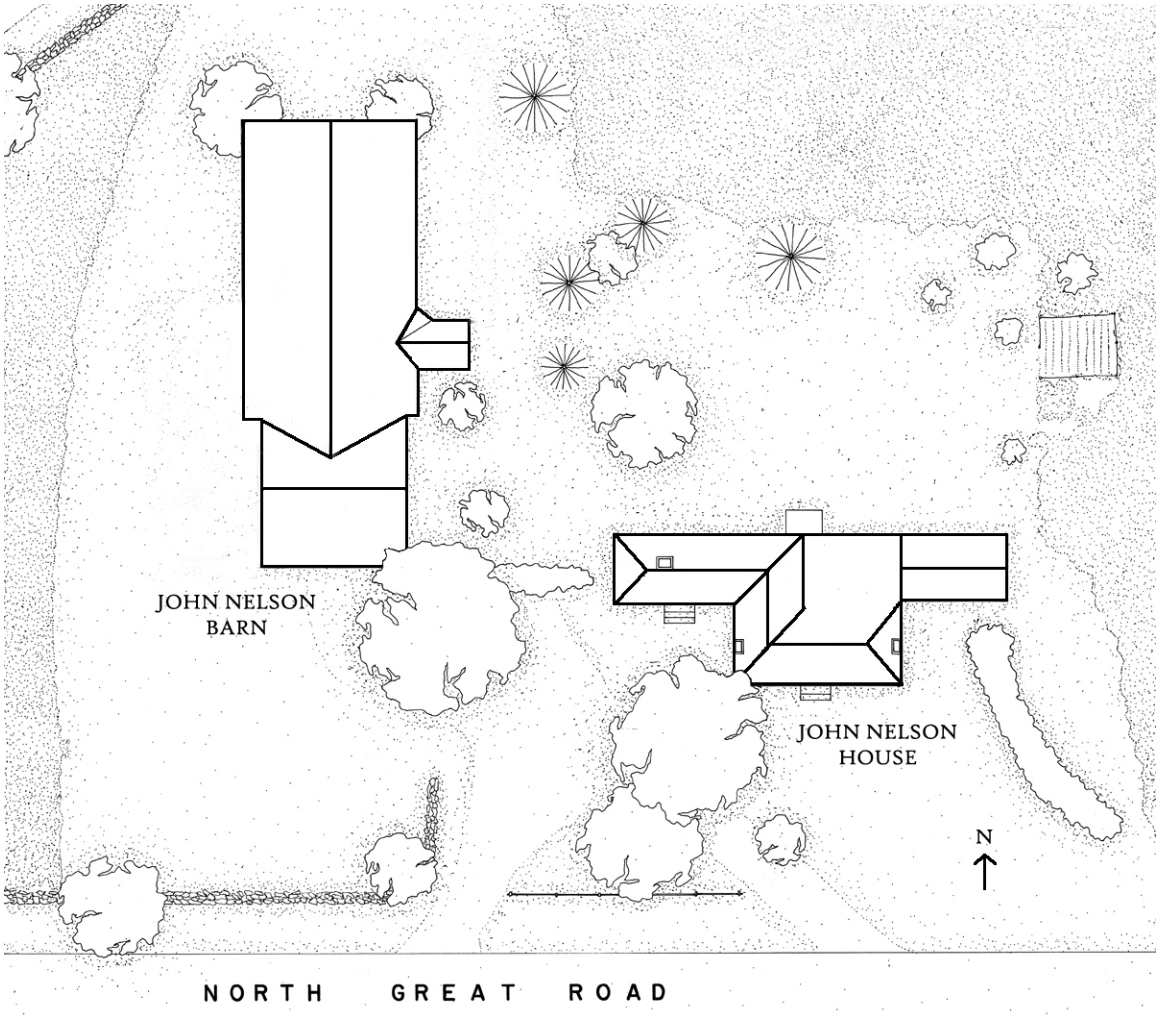


Figure 1.0A-4. Site plan (not to scale). Adapted from HABS drawings.

Battle Road and North Great Road

According to the "Cultural Landscape Report for Battle Road Unit," Battle Road appears to have been originally laid out c. 1666. North Great Road was constructed between c. 1802-1806 to straighten out the "very crooked and circuitous" Battle Road.[14] The construction of the main block of the house c. 1808-11 and the main block of the barn c. 1824 appear to have occurred specifically with the intent of facing the then newly constructed North Great Road.

Adjacent to the site, Battle Road is currently used as a pedestrian walkway and for park staff vehicles. North Great Road is also designated as Massachusetts State Highway Route 2-A and carries traffic between Interstate Highway 95 to the east and Interstate 495 to the west. Route 2-A also serves as the primary access route to the public aviation facilities at Hanscom Field located to the west. There are accommodations for pedestrian access along North Great Road.

Accessibility

There are neither organized parking spaces nor designated "accessible" parking spaces at the site. The House has three entryway doors on the south elevation and two on the north elevation; all doorways have one or more external steps into the house and are not considered accessible by the current Architectural Barriers Act Accessibility Standards (ABAAS). Access to the front door of the main block is gained via a 34-inch wide, wooden walkway. Access to the south door of the northwest wing is provided via a brick-paved walkway. Neither walkway provides the 48-inch minimum width required by the ABAAS. A garage door located on the south side of the eastern-most block of the house does allow direct at-grade access into the building. However, there is no accessible route leading to the garage and stairs must be negotiated from the garage to gain access into the actual habitable space. The two doorways on the north elevation do not have an accessible route from the parking area and the rear porch is one step above grade.

If the house is to be used for non-residential purposes, universal access must be provided to at least one of the doors. Access could be provided via an ABAAS compliant ramp. Although a mechanical lift could be considered, such a device would not likely be cost effective when compared to a ramp and is sometimes more visually intrusive.

Circulation

Existing vehicular and pedestrian circulation through the site is limited to the horseshoe-shaped, gravel driveway to/from North Great Road. A secondary driveway provides access to the north side of the barn for Park Service vehicles from Battle Road.

[14] Dietrich-Smith, Deborah, et al., "Cultural Landscape Report for Battle Road Unit, Minute Man National Historical Park, Volume I." U.S. Department of the Interior, National Park Service and the Olmsted Center for Landscape Preservation, September, 2005, p. 24, 48.

There are no sidewalks on North Great Road. Pedestrian visitors to the site may use Battle Road to gain access from the Minute Man National Historical Park Visitor Center. However, there is no ABAAS compliant accessible route from Battle Road to either of the buildings.

The existing driveway can accommodate approximately five vehicles. The Battle Road Structure Survey recommended that visitor parking be provided on site because of limited space to maneuver vehicles. However, a grassed area located south and west of the barn could be utilized for additional parking if required for programmatic purposes. Modifications to the existing driveway entrances will be required to provide on-site parking for public use and safe site lines for existing onto North Great Road. An assessment of traffic impacts and associated parking improvements needs to be based on a proposed use. Once the NPS has determined what the site will be used for, a detailed traffic analysis will be required in order to recommend site improvements related to traffic. Since a proposed re-use has not been made at this time and a detailed traffic analysis is not included in the scope of this report, no traffic related site improvements are included herein.

Site Comments

- Neither the house nor the barn is currently accessible. Three steps up to each doorway preclude access to the house.

- The existing landscaping is relatively well maintained. However a sugar maple located in front of the house appears to be in poor condition.

- There are no foundation plantings around the buildings and the lawn area is well maintained.

- There is a single downspout and gutter on the north face of the original eighteenth century block. The house has a wooden-shingle drip edge around the perimeter. The lack of downspouts and gutters is a historical feature.

- Parking area in the driveway appears to provide a less than 1.8% maximum grade. The gravel driveway surface is not considered "accessible" under the ABAAS requirements.

- The grade around the house generally slopes away from the building to provide positive drainage.

Utility Services

- Domestic water service enters the basement of the house from the south face of the main block and is connected to an 8-inch municipal water line in North Great Road that is owned by the town of Lincoln, Massachusetts.

- Fire service is provided at the site by a municipal fire hydrant located across the street from the barn. The hydrant is connected to the same 8-inch

municipal water main that provides the domestic service. The town of Lincoln Water Department has stated that the system maintains a water pressure of 65 psi. The Water Department also believes that the existing 8-inch main is transite/asbestos; however, they also stated that they have no records to confirm the material type. The Water Department representative stated that no extraordinary precautions are generally required to tap into the transite pipe. A detailed assessment of tapping requirements should be made by the design engineer if such a connection is required. However, no asbestos abatement permits are anticipated at this time.

- Wastewater disposal discharges via a pipe from north face of the building to a sub-surface lift system located to the northeast of the house. The septic tank includes a F.A.S.T. system that discharges to a leaching field consisting of three trenches located further to the north of the house. The septic system was installed in 2004 and a copy of the record drawing is included in Appendix Section 3.7 of this report.

- Electrical service is provided from an overhead cable located at the southeast corner of the main block.

- Telephone service is provided from an overhead cable located at the southeast corner of the main block.

- Cable television service is provided from an overhead cable located on the south face of the northwest wing.

- No gas service was found.

- Additional discussion of the utility services is included in the mechanical, electrical, and plumbing sections.

Fixed Activated Sludge Treatment

The Fixed Activated Sludge Treatment (FAST) process is a two zone design which consists of a primary anaerobic settling zone and an aerobic biological treatment zone. Solids are trapped in the primary settling zone. The aerobic biological zone consists of a submerged media bed which is colonized by nitrifying bacteria naturally present in sewage. Wastewater is re-circulated between these two zones allowing both nitrification and dentrification to occur. Regenerative blowers are used to introduce high volumes of oxygen into the system. Each FAST system is equipped with an inlet filter assembly and near-permanent, washable filter element. Every FAST system has similar functionality and operation, keeping Operation and Maintenance (O&M) fairly simple and straightforward. Annual maintenance of a FAST system involves a system check of the aboveground components to assure continuous problem-free operation. The air filter element located at the remote blower should be checked for washing or possible replacement. The septic tank should be inspected annually to determine if pump-out is necessary.

The NPS installed a FAST system at the John Nelson House and Barn in 2004. FAST systems are installed for several reasons. In the case of the John Nelson House and Barn the system was installed because the alternative was a sand mound. A sand mound is very intrusive in its physical appearance to an historic scene. Capacity of the FAST system in use at the John Nelson House is 660 gallons per day. Please refer to the construction drawing in Appendix 3.3 for additional information specific to this system. The system serves both the John Nelson House and Barn.

1.2.2-A ARCHITECTURAL

1.2.2.1-A General Description

The 2-story wood frame and brick Federal-style farmhouse that occupies the property is essentially a symmetrical T-shape plan [*fig. 1.0A-5*]. The house is comprised of a central rectangular section (main block) noted for its unique brick end walls at the east and west elevations, flanked on the northwest and northeast by wood frame wings. The main block was constructed around 1808-11 as a southwest addition to an existing eighteenth-century wood frame structure (original 18th century block). Construction campaigns during the early-to-mid nineteenth century added the northwest wing (which contains two formal rooms and a kitchen on the first floor and two bedrooms and a bathroom on the second floor) in two separate building phases [*fig. 1.0A-6*], added the northeast wing (which contains an unfinished workroom and carriage house), and incorporated the original eighteenth-century structure into the body of the main house. The northwest wing is two stories while both the 18th century block and the northeast wing are 1-1/2 stories with unfinished attic space above the first floor.

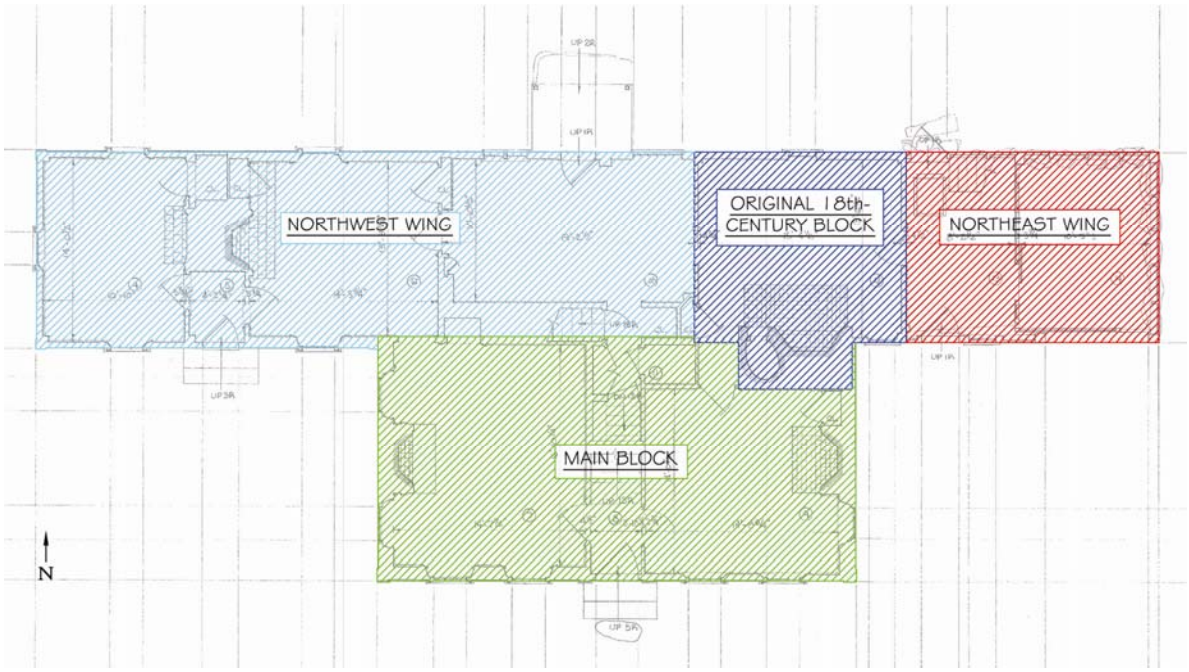


Figure 1.0A-5. House Sections Key Plan, overlaid on HABS drawings (not to scale).

The main block of the house measures approximately 36′-3″ wide (east to west) by 17′-6″ deep (north to south). The footprint of the original eighteenth-century frame block measures roughly 16′-2″ wide by 14′-4″ deep with an approximately 8′-6″ x 3′-6″ masonry mass (for the large cooking fireplace and bake oven) projecting from the center of its south wall, which has been incorporated into the northeast corner of the main house block mass. The northwest wing projects approximately 26′-0″ west from the

northwest corner of the main block and measures 15′-0″ deep at the west elevation. The northeast wing projects approximately 23′-2″ east from the northeast corner of the main block and measures 14′-4″ deep at the east elevation. The north wall measures approximately 85′-4″ long from the far northeast corner to the far northwest corner.

The exterior walls of the entire house are primarily wood frame construction, with the exception of the east and west end walls of the main block which are wood frame with a brick masonry face. The foundation walls of the entire house perimeter are rubble fieldstone with ashlar granite blocks on the exterior face (with brick behind) above grade along the west, south, and east elevations. The exposed north elevation foundation wall is rubble fieldstone. The wood frame walls on the west, south, and east elevations are clad with horizontal wood clapboard siding with a 2-1/2″ to 3″ exposure. The north elevation wall is clad with wood shingles.

The main block roof is a single hip. The two-story northwest wing roof eave and ridge heights are aligned with the main block roof. When the northwest wing was added to the main block, the main block west roof was overframed and extended north to intersect with the northwest wing roof. The original 18th century block roof continues the slope from the north side of the main block hip roof. The roof above the 1-1/2 story northeast wing is a gable roof with a slightly steeper pitch than the original 18th century block roof. The entire house roof is clad with asphalt shingles on solid plywood sheathing with a wood shingle drip course.

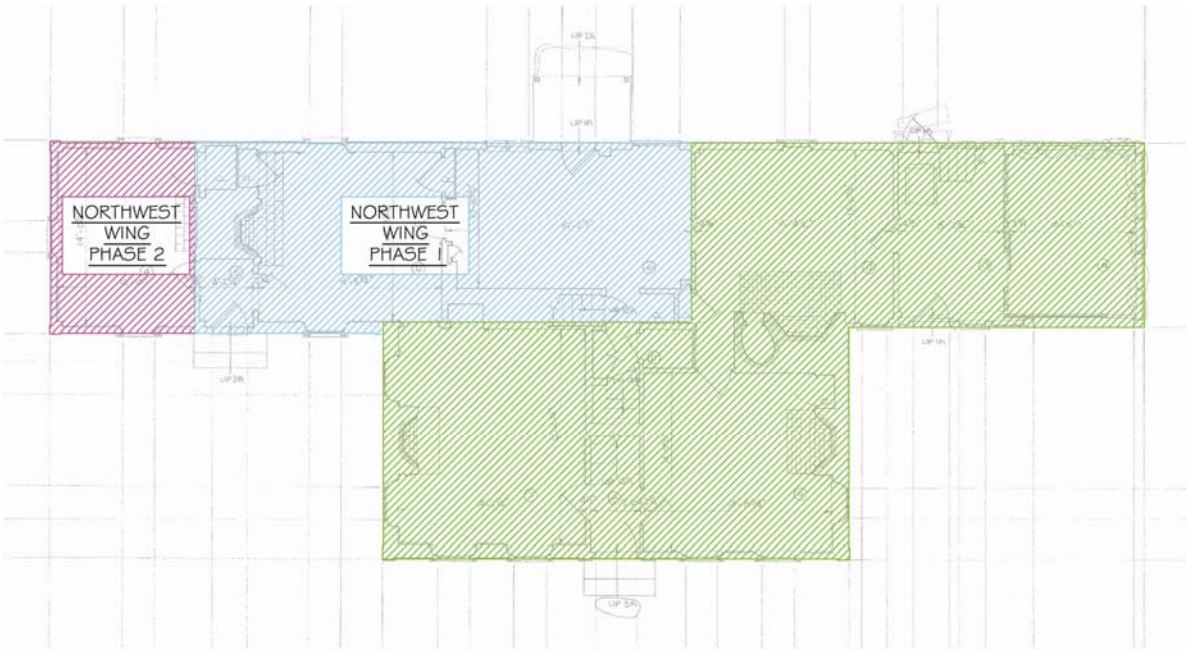


Figure 1.0A-6. Northwest Wing Phases 1 & 2 conjectural plan, overlaid on HABS drawings (not to scale).

Windows

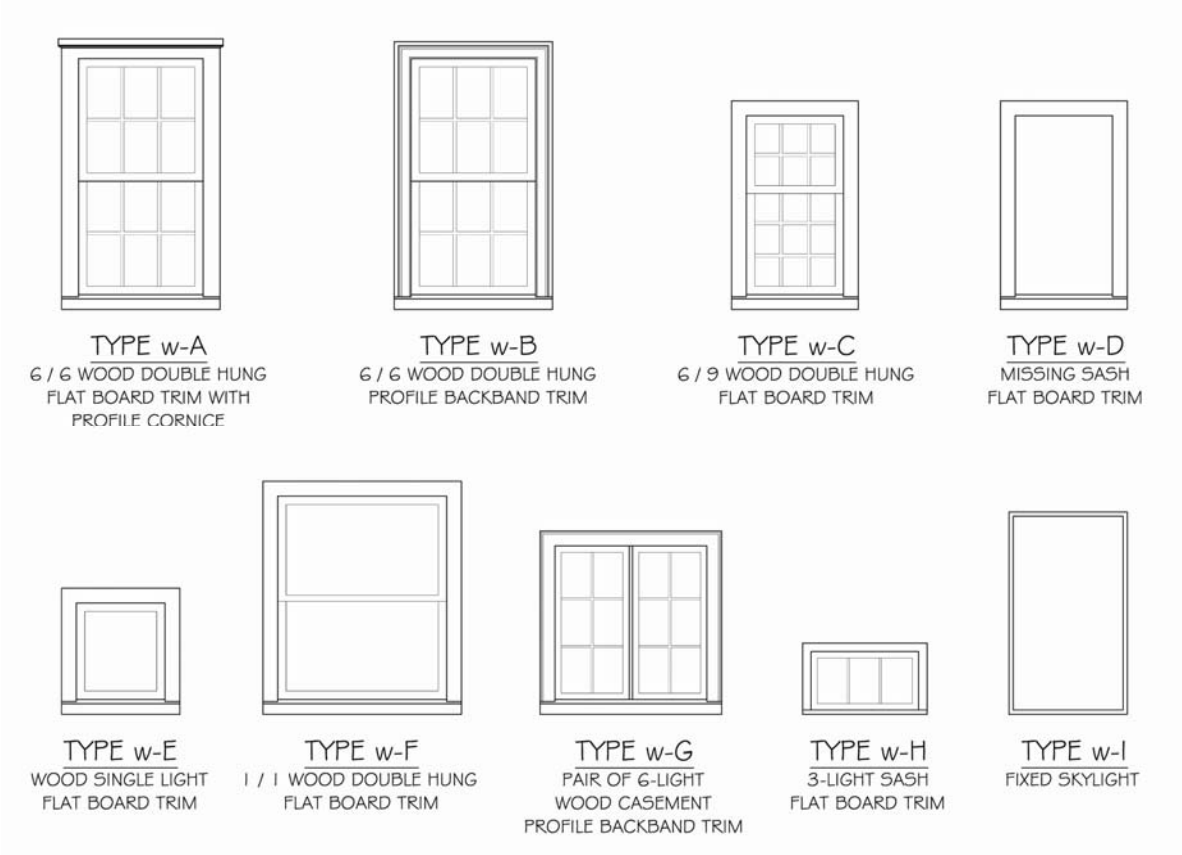


Figure 1.0A-7. John Nelson House Existing Window Types (not to scale).

Type w-A: 6-over-6 light double hung wood sash with 8-3/4″ x 12-1/2″ visible glass lights. The flat board trim projects approximately 2-1/2″ from clapboard siding. The window frame is mortise-and-tenon with a profile cornice. Overall window dimensions approximately 37-1/2″ x 63-1/2″.

Type w-B: 6-over-6 light double hung wood sash with 8-3/4″ x 12-1/2″ visible glass lights. Wood backband brick mold projects approximately 2″ from clapboard siding. The window frame is mortise-and-tenon. Overall window dimensions approximately 38″ x 63″.

Type w-C: 6-over-9 light single hung wood sash with 6-3/4″ x 8-3/4″ visible glass lights. The flat board trim projects approximately 1″ from clapboard siding. Overall window dimensions approximately 30″ x 55-1/2″.

Type w-D: Sash is missing, however original sash most likely matched 6-over-9 configuration of Type C. The flat board trim projects approximately 1″ from clapboard siding. Overall window dimensions approximately 30″ x 55-1/2″.

Type w-E: Single light replacement sash. Photographs documented by HABS in 1961 show a 6-light casement sash. Overall window frame dimensions approximately 30″ x 30″.

Type w-F: 1-over-1 single hung wood sash with insulated glass and vinyl jambs. The trim is a flat board. Overall window dimensions approximately 47″ x 55″.

Type w-G: Pair of 6-light wood casement windows with 8″ x 12″ visible glass lights. Overall window dimensions approximately 43″ x 43-1/2″.

Type w-H: 3-light fixed basement window. Overall window dimensions approximately 30″ x 12″.

Type w-I: Single light modern skylight. Dimensions not documented.

Doors

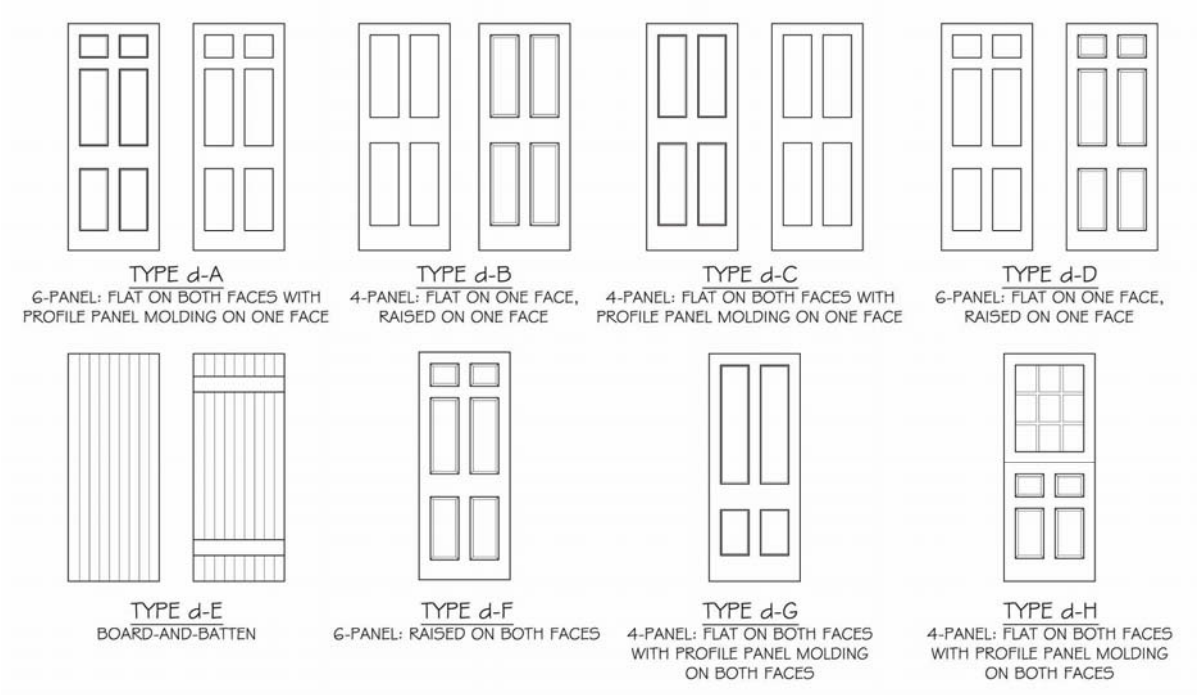


Figure 1.0A-8. John Nelson House Existing Door Types (not to scale).

Type d-A: 6-panel wood door with flat panels on both faces. The door has profile panel moldings on one face only.

Type d-B: 4-panel wood door with flat panels on one face and raised panels on one face.

Type d-C: 4-panel wood door with flat panels on both faces. The door has profile panel moldings on one face only.

Type d-D: 6-panel wood door with flat panels on one face and raised panels on one face.

Type d-E: Wood board-and-batten door.

Type d-F: 6-panel wood door with raised panels on both faces.

Type d-G: 4-panel wood door with flat panels and profile panel moldings on both faces.

Type d-H: Dutch-style wood door with 9-light glass at the top door and 4 panels at the bottom door.

1.2.2.2-A Exterior Elevations

The architectural details and construction materials that compose the exterior elevations of the John Nelson House are typical for a Federal-style New England farmhouse, yet also unique for the level of craftsmanship and the incorporation of multiple materials. The Federal style became influential in the Boston area beginning around 1780, as a movement in the early years of the new nation to define an American architectural style. This marked a shift in architectural expression from the heavy Georgian proportion and ornament to a more refined and elegant design, a style that earlier in the century was popularized by Robert Adam in London.[15]

One American builder's guide, Asher Benjamin's *The American Builder's Companion: or a New System of Architecture Particularly Adapted to the Present Style of Building in the United States of America*, was published in Boston in 1806 and presented an architectural style for America, unique from Europe. Benjamin's book purportedly was a strong influence for John Nelson as a carpenter and housewright. John Nelson owned a copy of *The American Builder's Companion*, which is currently in the collection of the Museum of National Heritage located in Lexington, Massachusetts, and he most likely adapted some of Asher Benjamin's details in his own house design. The John Nelson House exterior typifies the Federal style with its narrow clapboard siding, large 6-over-6-light double hung windows, window trim capped with a cornice, hipped roof, end wall brick chimneys, refined and shallow roof cornice moldings, and decorative door porticos with Federal architectural motifs. Unique, but not necessarily an anomaly, are the brick end walls at the main block. The following discussion presents a description of the exterior elements and their current conditions. Further discussion of the significant architectural elements and the other character-defining features of the John Nelson House will be found in section 1.3-A.

[15] Rifkind, Carole. "A Field Guide to American Architecture." New York: New American Library, 1980. pp. 29-30.

South Elevation –

Masonry Foundation Walls

- The exposed portions of the south elevation foundation walls at the northwest wing and main block are composed of dressed ashlar granite blocks [*fig. SE-6*]. The south elevation of the northeast wing foundation wall is granite block for approximately 3'-0" from the west corner and is formed concrete for the remainder of the south elevation [*fig. SE-13*]. The foundation walls below grade, where observable, are random rubble fieldstone [*fig. SE-6*].
- Pointing mortar at the granite block joints is hard (cement-based) and is chipped, shrunken and missing in areas.

Wood Clapboard Siding

- The exterior walls of the south elevation are clad with painted wood horizontal clapboard siding. The siding boards have a vertical exposure of approximately 2-1/2" to 3".
- Generally, the wood clapboards are in fair condition with localized areas of severe wood rot, warped and split boards. Areas closest to the foundation wall and surrounding the windows and doors appear to have the most deterioration. The paint finish is poor with extensive cracking and peeling [*figs. SE-6 & SE-8*].
- Between the clapboard siding and the masonry foundation wall is a 4-1/4" wide horizontal wood apron board, which is thicker in dimension than the siding and projects out further from the wall. There is metal flashing installed behind the clapboard siding that projects below the bottom clapboard and over the top ¼" of the apron board. The metal flashing is attached to the apron board face with exposed nails. There is also exposed metal flashing between the apron board and the masonry foundation wall. The apron board is generally deteriorated with wood rot.
- Vertical wood corner boards are found at the inside and outside corners of each block. The boards are butt-jointed at the corners and appear to be somewhat deteriorated (some have dutchman repair boards at approximately the bottom 2'-0"). Paint is cracked and peeling.
- Along the northwest block, multiple wires run across the face of the apron board and the bottom clapboard attached with screws, nails and cleats. The east side of the main block has an electrical service meter attached to the face of the corner board and conduit attached to the apron board.

Roofs

- The entire house roof is covered with asphalt shingles on solid ¾" plywood sheathing with a wood shingle drip course. The main block hip roof was replaced in 2004 and the remainder of the house roof was replaced in 2005, according to Minute Man NHP employee Don Morel who oversaw the roofing project.
- The extant main block hip roof appears to have been constructed prior to the northwest wing roof as evidenced in the attic where the original framing, sheathing boards, and wood shingles are still intact. The north section of the main block was overframed when the northwest wing hip roof was constructed.

Doors

Door 1/101: The front door and entrance to the main block is located at the center of the main block south elevation [*fig. SE-10*].

- The decorative wood portico appears to be original to the construction of the main block. The surround is designed with pilasters flanking the door, a fanlight (now a single light), flat arched frieze board, and a projecting cornice. The pilaster bases and sill were recently replaced (October, 2007) by the NPS due to severe deterioration. The surround is in fair condition with areas of rot and peeling paint. Small sections of the decorative trim at the pilaster caps and cornice are missing [*fig. SE-12*].
- A modern aluminum screen door is installed on the exterior.
- The wood door leaf is 6-panel.
- Two large granite slabs serve as risers and treads. Cement-based mortar has been applied to patch and fill large gaps between the slabs [*fig. SE-11*].

Door 1/105: The entrance to the northwest wing is located at the center of the northwest wing, south elevation [*fig. SE-9*]. This door most likely was added during the construction of the northwest wing second phase. Prior to this time, the house was occupied by the brothers John Nelson and Josiah Nelson, Jr. and their families. Adding Door 1/105 would have provided a second entrance for John Nelson's family who possibly occupied the west half of the house, based upon information found in the tax assessment records.

- The decorative wood door surround appears to be original to the northwest wing. The surround is designed with simple pilasters flanking each side with a flat frieze board and a projecting cornice. The surround is in fair condition with some areas of rot and decay near the base. The lower portion of the surround appears to have been repaired with replacement boards along the bottom 1'-6". The wood sill is extremely deteriorated from rot and insect infestation. The painted finish is generally cracked and peeling [*fig. SE-8*].
- A modern aluminum screen door is installed on the exterior.
- The wood door leaf is 6-panel with lights in place of panels at the top, and it appears to be original.
- Two granite slabs serve as stair risers and treads. There are no railings.

Door 1/109: The entrance to the northeast wing is located in the western half of the northeast wing south elevation [*fig. SE-13*]. The door provides exterior access to an unfinished storage room.

- The door frame and trim is comprised of a simple flat board. The door trim is deteriorated and warped, especially on the west side of the door where a replacement board has started to detach from the frame. The door sill is extremely deteriorated with rot and insect infestation; it has detached from the door frame and a large hole is open to the interior [*fig. SE-14*].
- The door leaf is 6-panel and is rotted, warped and has a large amount of peeling paint.

Door 1/110: The large carriage door to the carriage house is located in the eastern half of the northeast wing, south elevation [*fig. SE-15*]. The door provides exterior access to an unfinished carriage house.

- The door trim is a simple flat board and is in poor condition with areas of rot and peeling paint. The east trim board also serves as the southeast corner board of the northeast wing. The corner board is rotted and gouged. There is no door sill at the carriage house door.
- The single carriage house door leaf is composed of diagonal flat boards. The door is deteriorated near the bottom and has warped boards and peeling paint throughout.

Windows

All of the south façade windows are weathered and deteriorated to some degree. The wood frames and sills exhibit moderate deterioration, rot and worn paint. The wood sash are in fair condition with areas of deteriorated glazing putty and worn paint.

- **Window 001**: Type w-H.
- **Window 002**: Type w-H. The west light was removed for a former dryer vent.
- **Window 101**: Type w-A. The cornice and metal flashing cap exhibit significant deterioration. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 102**: Type w-A. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 105**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 106**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 107**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 108**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 110**: Type w-C. The wood sash is deteriorated and the glazing putty has failed.
- **Window 111**: Type w-D. The frame opening is infilled with a single piece of Plexiglas. The frame and sill are integral with Door 1/109 frame. The window sill exhibits severe rot and is projecting away from the frame wall.
- **Window 201**: Type w-A. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 202**: Type w-A. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 203**: Type w-A. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 206**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 207**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.

- **Window 208**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 209**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 210**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.

Millwork

- The wood cornice along the northwest wing is a typical profile crown molding and bed molding. The west corner of the south elevation is rotted and paint is worn [*fig. SE-7*].
- The wood cornice at the main block is a profile crown molding with a rope bed molding. The crown molding and cornice are significantly deteriorated in the center of the south elevation above Window 208 and also at the east corner [*fig. SE-20*].
- The wood cornice at the northeast wing is a simple flat board fascia with a small profile bed molding. The general condition of the cornice is poor [*fig. SE-21 & 22*].

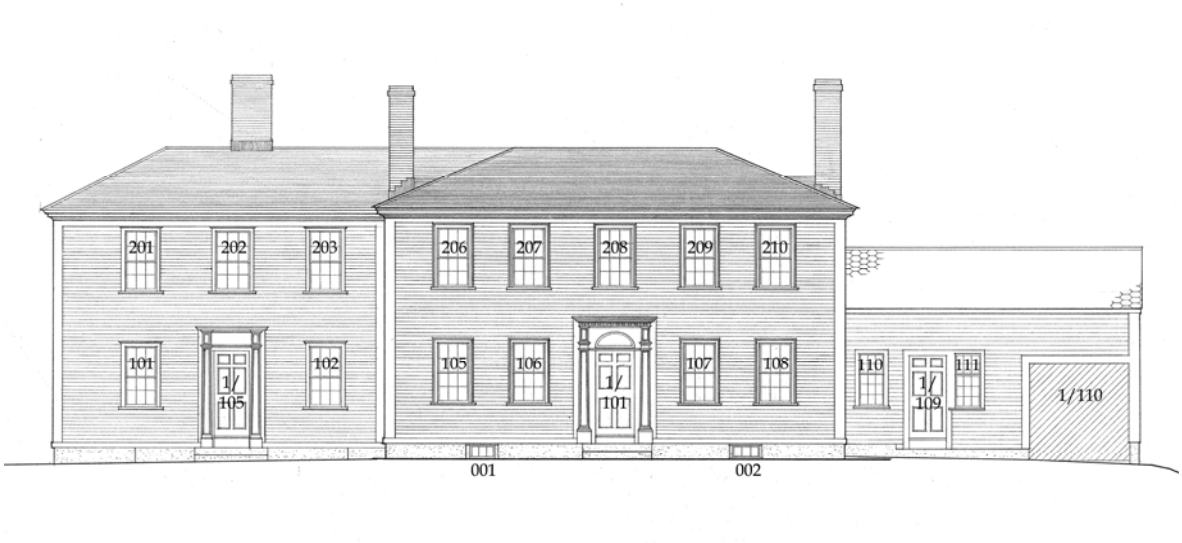


Figure SE-1. South Elevation with keyed window and door numbers (adapted from HABS drawings).

Figure SE-2. South Elevation.

Figure SE-3. South Elevation of northwest wing.

Figure SE-4. South Elevation of main block.

Figure SE-5. South Elevation of northeast wing.

Figure SE-6. South Elevation foundation wall at northwest wing where it meets the main block, showing condition of granite foundation wall, mortar, apron board, siding and corner board.

Figure SE-7. Roof cornice condition at southwest corner of northwest wing. Also note wood shingle drip course.

Figure SE-8. Condition of sill, pilaster, wood siding and apron board at Door 1/105.

Figure SE-9. Door 1/105 – entrance to the northwest wing.

Figure SE-10. Door 1/101 – entrance to the main block. The rotted sill and pilaster bases were replaced by the NPS in October, 2007.

Figure SE-11. Detail of Door 1/101 showing new aluminum flashing at the sill and replaced pilaster bases. The granite slab steps were previously repaired with incompatible cement-based mortar.

Figure SE-12. Door 1/101: detail of door surround cornice showing condition. Note unique decorative spiral rope molding, also found along the main block roof cornice.

Figure SE-13. Door 1/109 and Window #111, Type w-D. The door sill is extremely deteriorated. The window sash is missing and has been replaced with a single piece of Plexiglas. The foundation wall is granite block on the left of the door, at the 18th century block, and formed concrete to the east of this point.

Figure SE-14. Door 1/109: detail of rotted and warped sill.

Figure SE-15. Door 1/110: detail showing deterioration at the lower edge of the diagonal-board carriage house door. The foundation at south elevation of carriage house is formed concrete.

Figure SE-16. Window Type w-A: 6-over-6 double hung window with flat board trim and cornice. An aluminum triple-track storm window is attached to the wood frame. This window type is found at the south, west and north elevations of the northwest wing. On the south elevation Type w-A is found at #101, 102, 201, 202, & 203.

Figure SE-17. Window Type w-B: 6-over-6 double hung window with profile backband trim, found only at the main block. An aluminum triple-track storm window is attached to the wood frame. On the south elevation Type w-B is found at #105, 106, 107, 108, 206, 207, 208, 209, & 210.

Figure SE-18. Window Type w-C: 6-over-9 single hung with flat board trim. On the south elevation Type w-C is found at Window #110.

Figure SE-19. Window Type w-H: 3-light fixed basement window. On the south elevation this window is found at locations #001 and 002.

Figure SE-20. Deteriorated roof cornice at the center of main block, above window # 208.

Figure SE-21. Deteriorated roof cornice at northeast wing.

Figure SE-22. Deteriorated roof cornice at east side of northeast wing.

East Elevation –

Masonry Foundation Walls

- The exposed portion of the east elevation foundation walls at the main block is comprised of large ashlar granite blocks. The east elevation of the northeast wing foundation wall is comprised of large irregular-shaped granite blocks. The south corner of the northeast wing is formed concrete. The foundation walls below grade are random rubble fieldstone [*fig. EE-3*].
- The pointing mortar at the granite block joints is hard (cement-based) and is chipped, shrunken and missing in areas [*fig. EE-4*].

Masonry Walls

- The east elevation of the main block is comprised of brick laid in common bond [*fig. EE-2*]. The brick surface is stained in the areas directly below the window sills and along the base above the stone foundation. It appears as if the brick surface had been painted for a time and then later removed, as evidenced by small areas of paint remaining in brick and mortar crevices.
- The brick pointing mortar appears to be original, however further investigation is required to determine its age and composition. In the section of wall between the first and second floor windows (#109 and #211) there is water damage that has resulted in areas of deteriorated and missing mortar.
- There are large open joints between the brick wall and the wood window frames, which allow water to infiltrate the wall.

Wood Clapboard Siding

- The east elevation of the 1-1/2 story northeast wing is clad with painted wood horizontal clapboard siding. The exposed area of the northeast wing section is also clad with wood clapboard siding. The siding boards have a vertical exposure of approximately 2-1/2" to 3" [*fig. EE-3*].
- Generally, the clapboards are in fair condition with localized areas of wood rot. The paint finish is poor with general cracking and peeling.
- The vertical wood corner boards are found at the inside and outside corners of each block, including the brick end wall. The boards are butt-jointed at the corners and appear to be somewhat deteriorated. The paint is cracked and peeling.

Wood Shingle Siding

- The portion of the 2-story northwest wing that is exposed to the east elevation is clad with painted wood shingle siding. Shingles are deteriorated along the roof line of the 1-1/2 story northeast wing. The paint is cracked and peeling [*fig. EE-7*].

Roofs

- The entire house roof is covered with asphalt shingles on solid ¾" plywood sheathing with a wood shingle drip course.

Chimneys

- There is one brick chimney on the east elevation, centered on the main block brick end wall [*fig. EE-8*].
- This chimney most likely contains three separate flues: one for the large fireplace and bake oven in Room 108, one for the fireplace in Room 103, and one for the fireplace in Room 204. The Room 108 fireplace and bake oven flue was reworked and incorporated into this chimney when the main block was constructed, as noted in the mason's bill of work to Josiah Nelson, Jr. in 1808.
- The brick and mortar appear to be in good condition.
- The chimney is capped with sheet lead.

Windows

All of the east façade windows are weathered and deteriorated to some degree. The wood frames and sills exhibit moderate deterioration, rot and worn paint. The wood sash are in fair condition with areas of deteriorated glazing putty and worn paint.

- **Window 109**: Type w-B. The wood backband trim sits flush with the brick wall. The sill appears to be a replacement since it projects from the brick wall (all other windows in the brick wall are flush). The mortise-and-tenon frame is deteriorated near the bottom left. The sill is missing large areas of paint and is exposed to the weather. A modern metal triple-track storm window is installed on the face of the wood frame.
- **Window 211**: Type w-B. The wood backband brick mold and sill sit flush with the brick wall. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 212**: Type w-E. The paint is peeling.
- **Window 213**: Type w-E. The paint is peeling.
- **Window 218**: Type w-I. Fixed skylight in poor condition.

Millwork

- The wood cornice at the east elevation of the main block is a profile crown molding with a rope bed molding, which miters at the corner and returns to the wall where it meets the 1-1/2 story roof. The cornice is significantly deteriorated in the center of the east elevation.
- The wood raking board at the east elevation of the central section of the 1-1/2 story northeast wing, where it continues to slope from the main block hipped roof, is a crown molding. The crown molding is deteriorated and has partially detached from the wall, exposing the sheathing behind [*fig. EE-6*].
- The wood raking board at the east elevation of the northeast block is a flat board.

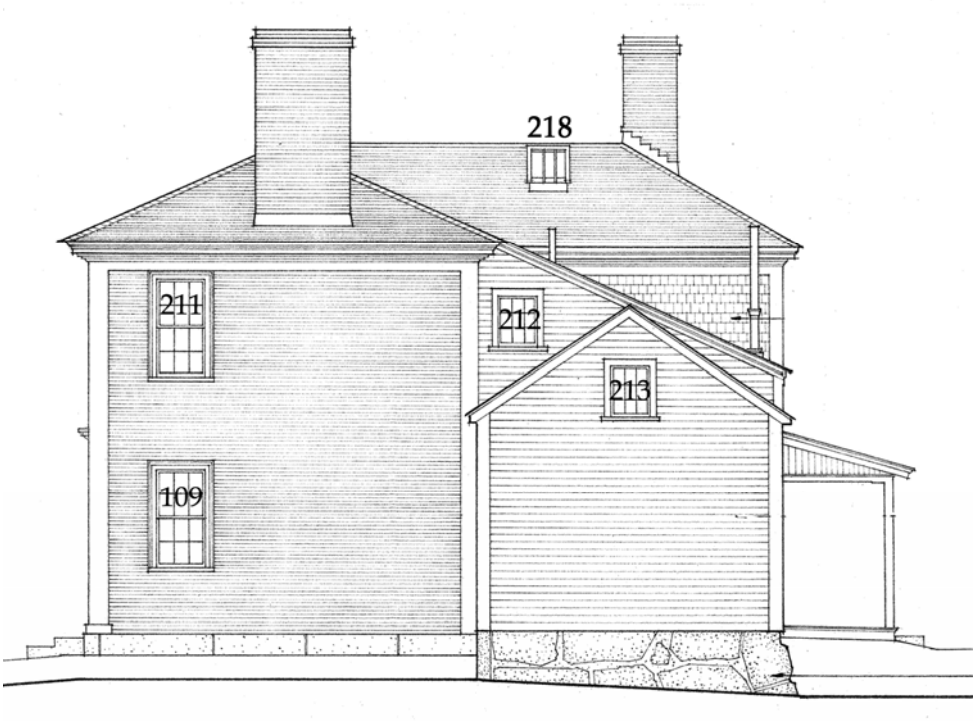


Figure EE-1. East Elevation with keyed window numbers (adapted from HABS drawings).

Figure EE-2. East Elevation of main block.

Figure EE-3. East Elevation of northeast wing.

Figure EE-4. Foundation wall at east elevation of main block, with deteriorated corner board and chipped and cracked concrete mortar at foundation wall.

Figure EE-5. East elevation of main block and rear addition. Window #212, Type w-E. The original sash was a 3-light casement as documented in HABS photographs.

Figure EE-6. East rear addition gable end wall above northeast wing. The raking board is deteriorated and has detached from wall.

Figure EE-7. The exposed portion of the northwest wing at the east elevation. The skylight (window # 218) can be seen above the roof eave, below the chimney.

Figure EE-8. East main block chimney.

North Elevation –

Masonry Foundation Walls

- The exposed portion of the north elevation foundation wall is comprised of random rubble granite [*fig. NE-5*]. The east corner stones are splayed. The west corner of the foundation wall is configured with small retaining walls projecting to the north and west to allow access to the crawlspace under the northwest wing.
- Pointing mortar is hard (cement-based) and is chipped, shrunken and missing in areas.
- There are areas of the stone foundation wall where stones are missing [*fig. NE-6*].

Wood Shingle Siding

- The north elevation is clad with painted wood shingle siding. The wood shingles are in fair condition, with some areas of deterioration and dislodged shingles. There are also areas of newer shingles installed to replace previously deteriorated or missing shingles. The paint is cracked and peeling [*fig. NE-7*].
- There are corner boards at the far northeast and northeast corners.
- There are multiple penetrations and wires along the wood shingle surface. Electrical conduit for the first and second floors of the northwest wing is surface mounted on the exterior wall. A large wire penetrates the northwest corner board and runs up to the cornice where an alarm speaker is installed.

Roofs

- The entire house roof is covered with asphalt shingles on solid ¾" plywood sheathing with a wood shingle drip course.
- There is a single aluminum gutter and downspout at the middle of the north elevation [*fig. NE-3*].

Chimneys

- There is one brick chimney on the north elevation, located in the northwest wing [*fig. NE-9*].
- This chimney most likely contains three separate flues: one for the fireplace in Room 106, one for the fireplace in Room 104, and one for the fireplace in Room 208.
- The brick and mortar appear to be in fair condition, with a few spalled or missing bricks.
- The chimney is capped with sheet lead.

Doors

Door 1/003: Located at the far west end of the north elevation, this half-height board door is the entrance to the shallow basement under the east room of the northwest wing [*fig. NE-12*].

Door 2/109: Located right of center at the north elevation of the 1-1/2 story block of the northeast wing, this door is the rear entrance to the unfinished workroom [*fig. NE-10*].

- The door leaf is 1x6 vertical double-beaded boards. The door trim is a flat board with a metal drip along the head. Both the left and right trim jambs have Dutchman repairs. The bottom of the door is severely rotted and exhibits peeling paint.
- The door hardware includes a reproduction thumblatch and small strap hinges.
- There is a large granite slab step which has become dislodged.

Door 1/107: Located in approximately the center of the north elevation, this modern door is the entrance to Room 107, the kitchen [*fig. NE-11*].

- The door leaf is a wood dutch door with 9 lights in the top leaf and 4 raised panels in the bottom leaf. The door trim is comprised of flat wood boards.
- The hardware is reproduction antique.
- There is a wood screen door.
- The door appears to date to the mid-twentieth century, and possibly was installed when the kitchen was modernized.

Windows

All of the north elevation windows are weathered and deteriorated to some degree. Wood frames and sills exhibit moderate deterioration, rot and worn paint. Wood sash are in fair condition with areas of deteriorated glazing putty and worn paint.

- **Window 112**: Type w-C. The wood sash is deteriorated and the glazing putty has failed. The upper sash meeting rail is rotted and is separating from the muntins. One light is cracked. There is a painted metal drip along the window head [*fig. NE-13 & 14*].
- **Window 113**: Type w-F [*fig. NE-16*].
- **Window 114**: Type w-G [*fig. NE-15*].
- **Window 115**: Type w-A. The top left of the sill and bottom of the left jamb has rotted and was Dutchman repaired. An aluminum triple-track storm window is installed on the face of the wood frame [*fig. NE-17*].
- **Window 116**: Type w-A. The left jamb and sill are rotted. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 214**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 215**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 216**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.

Millwork

- The wood cornice at the farthest east section of the 1-1/2 story northeast wing, along the north elevation, is a flat board.
- The wood cornice at the west center of the north elevation is a flat board installed on a 45-degree angle toward the roof eave. A white aluminum gutter runs along the north eave of this center section, along the exterior of the original 18th-century block.

- The wood cornice at the northwest wing is a profile crown molding and profile bed molding. A large percentage of the north elevation cornice is rotted and paint is worn. The northwest corner of the cornice is rotted and covered with sheet metal.
- There is a covered rear porch at the center of the north elevation and Door 1/107. The porch deck is comprised of 5/4 x 4″ boards and 3-3/4″ square posts supporting a simple shed roof. The porch roof is comprised of asphalt shingles over wood shingles [*fig. NE-18*].

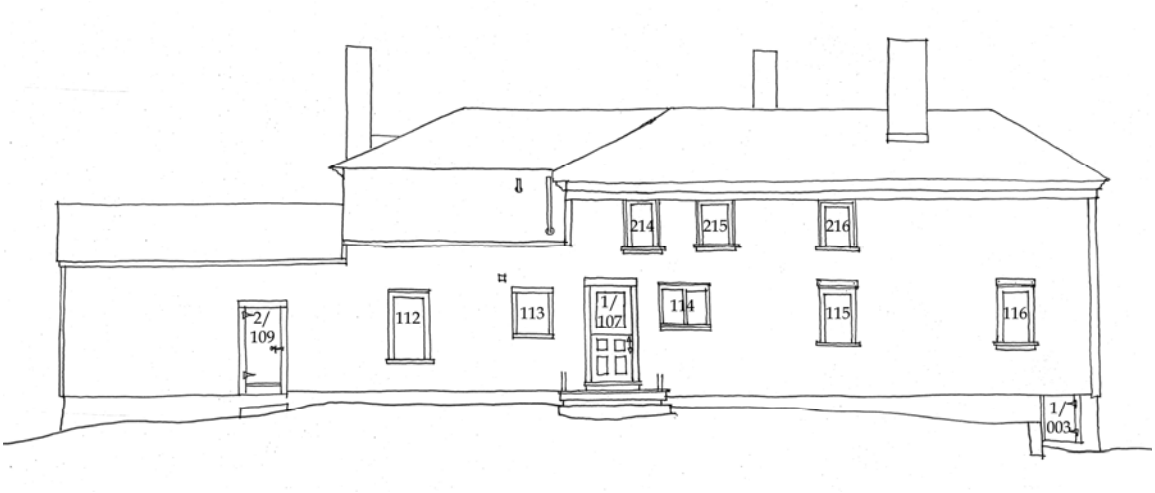


Figure NE-1. North Elevation with keyed window and door numbers.

Figure NE-2. North Elevation of northeast wing.

Figure NE-3. North Elevation of original 18th-century block. This section is the only location that has a gutter and downspout.

Figure NE-4. North Elevation of northwest wing.

Figure NE-5. Random rubble stone foundation wall and painted shingle siding at north elevation.

Figure NE-6. Foundation wall near rear porch with areas of missing foundation stones.

Figure NE-7. Deteriorated and missing areas of shingle siding at the north elevation.

Figure NE-8. Wall under rear porch where shingles and sheathing were removed to expose deteriorated framing behind.

Figure NE-9. Brick chimney on the north elevation at the northwest wing.

Figure NE-10. Door 2/109: board-and-batten door with deterioration along the bottom and the sill.

Figure NE-11. Door 1/107, Windows 113, 114, and rear porch.

Figure NE-12. Door 1/003: exterior entrance to basement Room 003.

Figure NE-13. Window #112, Type w-C. Wood sash and sill are deteriorated.

Figure NE-14. Detail of deteriorated wood sash at Window #112.

Figure NE-15. Window 114, Type w-G.

Figure NE-16. Window #113, Type w-F.

Figure NE-17. Window #115, Type w-A. Lower left portions of frame and sill are rotted and flashed with metal.

Figure NE-18. Side view of rear porch, looking east.

West Elevation –

Masonry Foundation Walls

- The exposed portion of the west elevation foundation wall at the northwest wing and main block is comprised of dressed ashlar granite blocks. The foundation walls below grade are random rubble fieldstone [*fig. WE-4*].
- Pointing mortar at the granite block joints is hard (cement-based) and is chipped, shrunken and missing in areas [*fig. WE-5*].

Masonry Walls

- The west elevation of the main block is comprised of brick laid in common bond. The brick surface is stained in the areas directly below the window sills and along the base above the stone foundation [*fig. WE-6*]. It appears as if the brick surface had been painted for a time and then later removed, evidenced by small areas of paint remaining in brick and mortar crevices.
- The brick pointing mortar appears to be original, however further investigation is required to determine its age and composition. In the section of wall between the two second floor windows (204 and 205) and above window 103 there is water damage that has resulted in areas of deteriorated and missing mortar.
- There are open joints between the brick wall and the wood window frames.

Wood Clapboard Siding

- The exterior walls of the west elevation at the northwest wing are clad with painted wood horizontal clapboard siding. The siding boards have a vertical exposure of approximately 2-1/2" to 3".
- Generally, the wood clapboards are in fair condition with select areas of severe wood rot, warped and split boards. Areas closest to the foundation wall and surrounding the windows and doors appear to have the most deterioration. The paint finish is poor with overall cracking and peeling.
- Between the clapboard siding and the masonry foundation wall is a 4-1/4" wide horizontal wood apron board, which is thicker in dimension than the siding and projects out further from the wall. There is metal flashing installed behind the clapboard siding that projects below the bottom clapboard and over the top ¼" of the apron board. The metal flashing is attached to the apron board face with exposed nails. There is also exposed metal flashing between the apron board and the masonry foundation wall. The apron board is generally deteriorated with wood rot [*Fig. WE-8*].
- Vertical wood corner boards are found at the inside and outside corners of each block. The boards are butt-jointed at the corners and appear to be somewhat deteriorated (some have Dutchman repair boards at approximately the bottom 2'-0"). Paint is cracked and peeling.
- A few wires are running across the face of the clapboards and apron board and are attached with screws, nails and cleats. A hosebib is installed in the apron board.

Chimneys

- There is one brick chimney on the east elevation, centered on the main block brick end wall [*fig. WE-10*].
- This chimney most likely originally contained two separate flues: one for the fireplace in Room 102, one for the fireplace in Room 202. The chimney currently is used as the flue for the boiler located in the basement. The boiler flue consists of a metal flue liner, which from a visual observation appears to be in good condition.
- The brick and mortar appear to be in good condition.

Roofs

- The entire house roof is covered with asphalt shingles on solid ¾" plywood sheathing with a wood shingle drip course.
- The extant main block hip roof appears to have been constructed prior to the northwest wing roof as evidenced in the attic where the original framing, sheathing boards, and wood shingles are still intact. The north section of the main block was overframed when the northwest wing hip roof was constructed.

Windows

All of the west façade windows are weathered and deteriorated to some degree. Wood frames and sills exhibit moderate deterioration, rot and worn paint. Wood sash are in fair condition with areas of deteriorated glazing putty and worn paint.

- **Window 117**: Type w-A. Sash muntins are damaged. The wood cornice and metal flashing cap exhibit significant deterioration. The left side of the sill is rotted and paint has chipped off. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 103**: Type w-B. Sash muntins are damaged and attempts to repair are unsuccessful. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 104**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 217**: Type w-A. The cornice and metal flashing cap exhibit significant deterioration. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 204**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.
- **Window 205**: Type w-B. An aluminum triple-track storm window is installed on the face of the wood frame.

Millwork

- The wood cornice at the northwest wing is a profile crown molding and profile bed molding. The northwest corner of the cornice is rotted and covered with sheet metal [*fig. WE-9*]. The southwest corner of the cornice also exhibits deterioration and worn paint.
- The wood cornice at the main block is a profile crown molding with a rope bed molding.

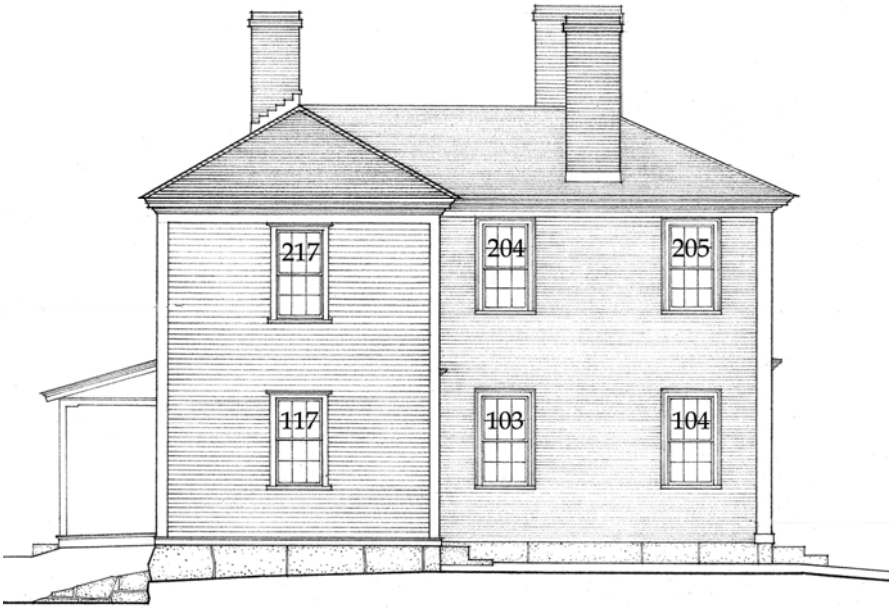


Figure WE-1. West Elevation with keyed window and door numbers (adapted from HABS drawings).

Figure WE-2. West Elevation of northwest wing with windows #117 & 217, both Type w-A.

Figure WE-3. West Elevation of the main block with windows#103, 104, 204, & 205 all Type w-B.

Figure WE-4. Foundation wall at west elevation of northwest wing.

Figure WE-5. Detail of west elevation foundation wall showing condition of shrunken and cracked mortar.

Figure WE-6. Granite slab foundation and brick wall at west elevation of main block. Brick wall and stone foundation wall exhibit significant water staining.

Figure WE-7. Detail of foundation wall at west elevation of main block, showing condition of shrunken and missing mortar.

Figure WE-8. Corner board and apron at the west elevation of the northwest wing, exhibiting cracked and peeling paint.

Figure WE-9. Roof cornice at west elevation, with deteriorated crown molding covered with metal. An alarm speaker is attached to the adjacent wall.

Figure WE-10. Brick chimney at the west elevation of the main block.

1.2.2.3-A Interior Spaces

The floor plan of the John Nelson House is T-shaped in configuration, comprised of a rectangular main block in front, facing south, with rectangular wings to the northwest and northeast. The main block contains a central stair flanked on either side by a single room. The northwest wing contains three rooms with a secondary front entrance hall on the first floor, a back stair to the second floor, and two bedrooms and a bathroom on the second floor. North of the east end of the main block is the 1-1/2 story original 18th century block, which is the oldest section of the house. The attic space above this block is unfinished. East of the 18th century block is the northeast wing which contains two rooms on the first floor and unfinished attic space above. There is a full basement under the main block and a half-height basement under the far west room of the northwest wing. All other basement space is unexcavated.

The following discussion presents a description of the interior elements and their current conditions. Further discussion of the significant architectural elements and the other character-defining features of the John Nelson House is found in section 1.3-A.

BASEMENT

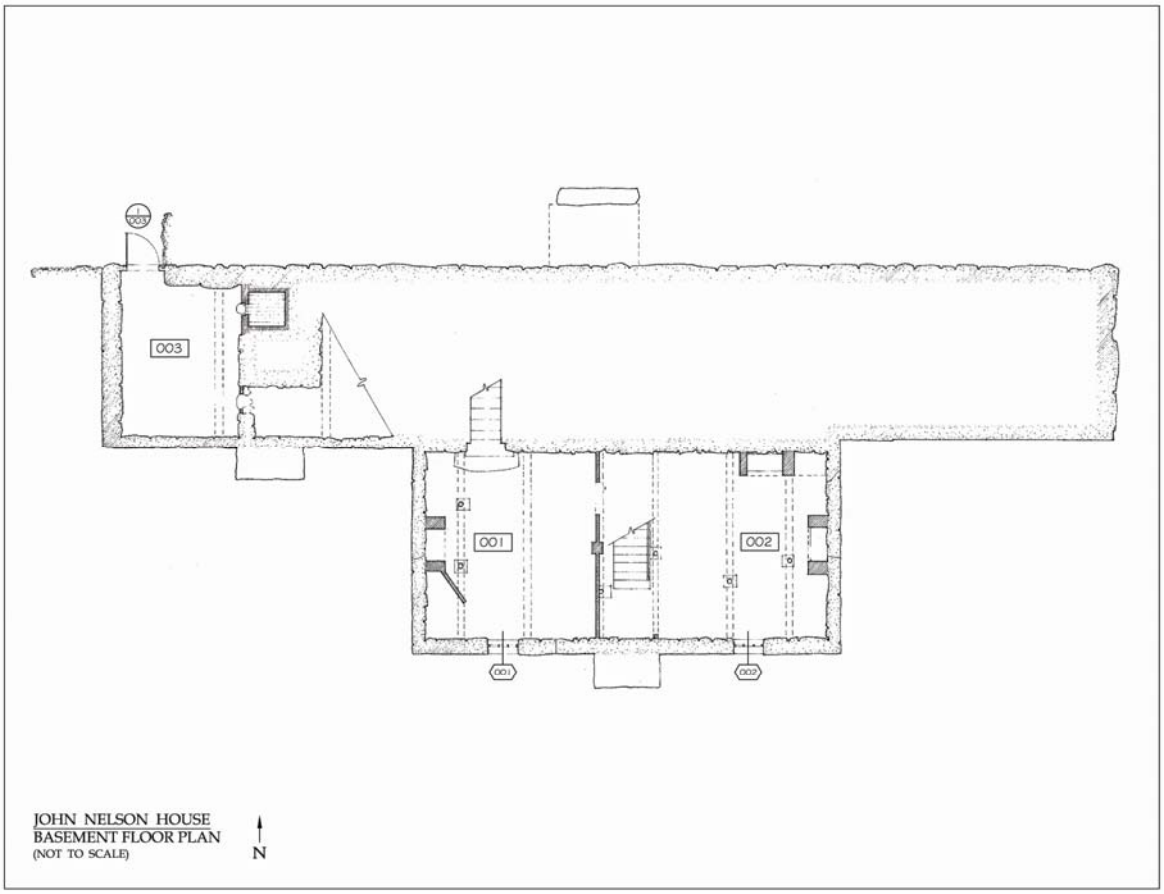


Figure BF-1. Basement key plan (adapted from HABS drawings).

Room 001 –
Room 001 is the west room of the main block basement which is believed to have been constructed by Josiah Nelson, Jr. circa 1808.

Floor

- Poured concrete slab floor, most likely added in the twentieth century.

South Wall [*fig. 001-2*]

- The south wall is exposed random rubble stone to grade level, with brick on the inside face of the exterior ashlar granite slabs, above grade. There is one exterior basement window (#001) in the south wall.

East Wall

- The east wall is painted brick wall and it separates the east and west sections of the main block basement. The wall is not bearing; however, there is a bearing brick pier centered in the wall. There are openings and penetrations in the brick wall and the paint has peeled off in many areas.

North Wall [*fig. 001-1*]

- The north wall is exposed random rubble stone to grade level, with brick above grade on the west half of the wall. There is a full-height opening in the wall to a wood staircase (now cut off at the first floor level), with two large stone treads at the basement interior side of the opening. The stair may have originally been an exterior bulkhead stair prior to the construction of the northwest wing. More likely, though, is the conjecture that the stair was added as a second interior basement stair when the northwest wing was constructed. There is finished plaster on the inside walls of the stair, which most likely would not be present if it was an exterior bulkhead stair. If the stair was originally a bulkhead, a portion of the north basement masonry wall would have been removed for the insertion of the interior stair when the northwest wing was constructed, but physical evidence does not reveal that the wall was disturbed. Running parallel above this basement stair was most likely a stair from Room 102 to the second floor. As viewed from the opening in the north basement wall, the basement staircase ran along the west wall of Room 107 (currently, the kitchen) and most likely landed through the door opening 4/106 to Room 106.

West Wall

- The west wall is exposed random rubble stone to grade level with brick above grade on the west half of the wall, behind the exterior ashlar granite slabs. There are two brick piers that support the fireplace and hearth above.

Figure 001-1. North wall of Room 001 with opening in foundation wall for former staircase, now cut off at the first floor level.

Figure 001-2. South wall of Room 001 with Window #001.

Room 002 –
Room 002 is the east room of the main block basement, which is believed to have been constructed by Josiah Nelson, Jr. circa 1808.

Floor

- Poured concrete slab floor, most likely added in the twentieth century.

South Wall [*figs. 002-1 & 4*]

- The south wall is exposed random rubble stone to grade level, with brick above grade facing the exterior ashlar granite slabs. There is one exterior basement window (#002) in the south wall.

East Wall [*fig. 002-1*]

- The east wall is exposed random rubble stone to grade level, with brick above grade on the west half of the wall on the inside face of the exterior ashlar granite slabs, above grade. There are two brick piers and a wood lintel that support the fireplace and hearth above.

North Wall [*fig. 002-2*]

- The north wall is exposed random rubble stone to grade level, with brick above grade. There are two brick piers on the northeast section of the wall that support the large cooking fireplace and bake oven above. Most likely, this is the existing fireplace foundation that was underpinned during the main block construction, as listed in the 1808 bill to Josiah Nelson, Jr. from Jacob Robinson. The wood fireplace lintel was later reinforced with concrete.

West Wall [*fig. 002-3*]

- The east wall is a painted brick wall that separates the east and west sections of the main block basement. The wall is not bearing, however there is a bearing brick pier centered in the wall. There are openings and penetrations in the brick wall and the paint has peeled off in many areas. A wood staircase runs along the west wall and lands in Room 107.

Figure 002-1. East and south walls at Room 002, with the brick fireplace support on the east wall and Window #002 on the south wall.

Figure 002-2. North and east walls of Room 002, with the brick supports under the Room 108 fireplace that were underpinned and reworked when the main block was constructed.

Figure 002-3. West wall of Room 002, looking toward basement stair and to Room 001.

Figure 002-4. South wall of Room 002, with Window #002. The beam on the right is severely deteriorated.

Room 003 –
Room 003 is the shallow basement under the far west room of the northwest wing. This section may have been constructed as the phase 2 addition to the northwest wing [*fig. 1.0A-6*]. Physical evidence at the first and second floor supports this conjectural construction sequence.

Floor
- Earth floor.

South Wall [*fig. 003-1*]
- The south wall is exposed random rubble stone.

East Wall
- The east wall is exposed random rubble stone with brick at the northernmost section. The brick supports what appears to originally have been a bake oven in Room 106. There is an ash cleanout in the brick [*fig. 003-3*]. The center section of the east foundation wall, which is the support for the back-to-back fireplaces and hearths above in Rooms 104 and 106, is rubble stone. The south section of the east wall is also stone and contains an opening to the crawl space under the unexcavated section of the northwest wing [*fig. 003-2*].
- The east wall would have been the exposed exterior west foundation wall of the northwest wing prior to the construction of the second phase. It appears that the east wall masonry has a clearly defined southwest corner. The south wall appears to have been added since the second phase masonry is not keyed in. It is not possible to observe the joint between the first and second phases of the northwest wing on the exterior south elevation because the stone slab steps to Door 1/105 are situated in front of this area.

North Wall [*fig. 003-4*]
- The north wall is exposed random rubble stone. There is a framed access door opening in the west side of the north wall leading to the exterior, with a formed concrete sill.

West Wall
- The west wall is exposed random rubble stone.

Figure 003-1. Room 003, south wall.

Figure 003-2. Room 003, east wall. This may have been the exterior foundation wall prior to the construction of the northwest wing second phase. The wall appears to have been significantly reworked at some point, with the brick infill at the fireplace and bake oven foundations.

Figure 003-3. Room 003, northern section of the east wall showing the brick foundation wall of the earlier first floor bake oven, now removed.

Figure 003-4. Room 003, north wall showing exterior access door.

FIRST FLOOR

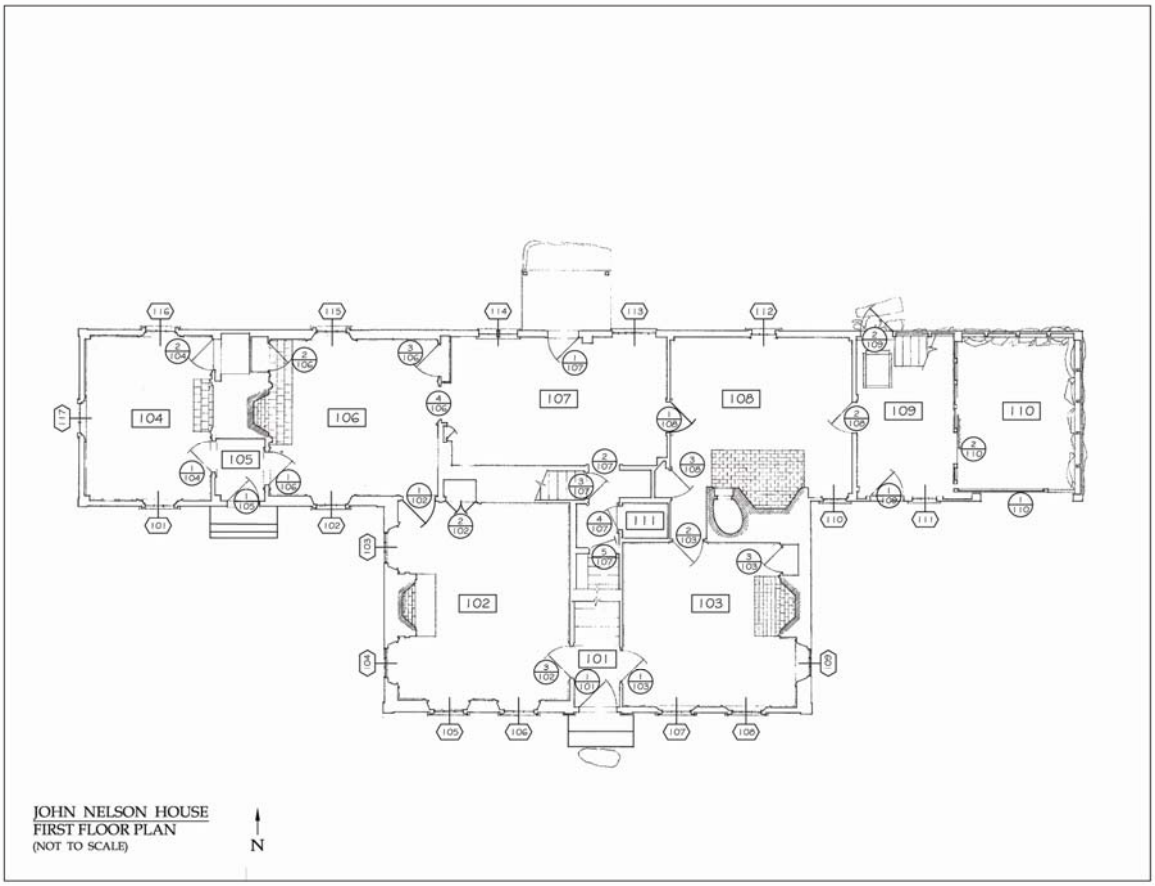


Figure FF-1. First Floor key plan (adapted from HABS drawings).

Room 101 –
Room 101 is located in the center of the main block, which is believed to have been to have been constructed by Josiah Nelson, Jr. circa 1808. The room is the front entry hall of the main block and contains the central staircase leading up to the second floor.

Floor

- The wood floor appears to be long-leaf yellow pine, random-width (5"-11") with the boards running north-to-south. The floor boards are installed on paper on a subfloor (9/16" thick boards running east-to-west). The presence of paper between the subfloor boards and the finish floor indicates that the original floor boards were removed at some point in time and the current floor (along with the paper underlayment) was added.
- The wood floor is in good condition with some scratches and worn areas.

Walls & Baseboards

- The walls are plaster with a wallpaper finish.
- There is a flat horizontal board wainscot on the east and west walls with a chair rail and baseboard.
- The chair rail profile does not match any other chair rail profile found in the house.

Ceiling

- The ceiling is painted plaster. The ceiling plaster is cracked and stained, with areas of peeling paint.
- There is a small 1-1/2" wood crown molding.

Doors

- **Door 1/101**: [*fig. 101-2*] Type d-A. Located on the south wall, this is the front entry door. 6-panel painted wood door leaf with an arched fanlight with a single glass pane (cracked).
- **Door 3/102**: Type d-A. Located on the west wall, this door leads to Room 102. 6-panel painted wood door leaf. Door panels are recessed flat on both faces, with profile panel moldings on the Room 102 face. The paint finish on the door casing is chipped and gouged. The door hardware consists of a wood knob on the Room 101 side and a cut glass knob on the Room 102 side.
- **Door 1/103**: Type d-B. Located on the east wall, this door leads to Room 103. 4-panel painted wood door leaf. Door panels are recessed flat on the Room 101 face and raised on the Room 103 face. The paint finish on the door casing is chipped and gouged. The door hardware consists of wood knobs on both sides

Stair [*fig. 101-1*]

- The stair is the full width of the hall and has stained treads with a bullnose edge and painted risers.
- The handrail and brackets are not original.

Figure 101-1. Room 101, looking north at stair.

Figure 101-2. South elevation of Room 101 with Door 1/101.

Room 102 –
Room 102 is the front room located in the west section of the main block, which is believed to have been to have been constructed by Josiah Nelson, Jr. circa 1808.

Floor

- The wood floor appears to be long-leaf yellow pine, random-width (5"-11"), installed with cut nails and running lengthwise north-to-south. The floorboards are installed on paper on top of subfloor boards (11/16" - 3/4" thick by 18-1/2" – 18-3/4" wide). The existence of paper between the subfloor boards and finish floor indicates that the original floor boards were removed at some point and the current floor (along with the paper underlayment) was added. The floor is flush with the threshold of door 3/102.
- The wood floor is in good condition with some scratches and worn areas.
- Radiators are installed below windows 103 and 104, with holes in the floor for the pipes to the basement.

Walls & Baseboards

- The walls are plaster with wallpaper finish and painted top layer.
- There is a flat horizontal board wainscot on all four walls with a chair rail and a 2-piece baseboard [*fig. 102-4*].
- The window jambs are splayed and paneled above and below the sill [*fig. 102-1*].
- Electrical outlets are installed in the baseboard.
- A single modern wall sconce is installed on the east wall.

Ceiling

- The ceiling is painted plaster. The plaster is cracked with areas of peeling paint. There is staining on the ceiling over the fireplace.
- There is a small 1-1/2" wood crown molding.
- There is a painted metal ceiling vent installed over the northwest window.

Doors

- **Door 1/102**: [*fig. 102-3*] Type d-A. Located on the north wall, this door leads to Room 106. The frame and casing abut Door 2/102, and the two doors share the same wood threshold. 6-panel painted wood door leaf. The door panels are recessed flat on both sides, with profile panel moldings on the Room 102 face. The door hardware consists of cut glass knobs.
- **Door 2/102**: [*fig. 102-3*] Located on the north wall, this door opening contains a cabinet with two half-doors at the base and open shelves above. The door frame and casing abut Door 1/102, and the two doors share the same wood threshold. It appears that the opening may have originally been the door to a staircase that led to the second floor, which would have run above the former staircase found in the basement. The bottom riser and tread still exist in the base cabinet and are observed from the basement stair below. The door was infilled with shelves, most likely when the original stair was reconfigured and the modern kitchen was installed.

- **Door 3/102**: Type d-A. Located on the east wall, this door leads to Room 101. 6-panel painted wood door leaf. The door panels are recessed flat on both faces, with profile panel moldings on the Room 102 face. The paint finish on the door casing is chipped and gouged. The door hardware consists of a wood knob on the Room 101 side and a cut glass knob on the Room 102 side.

Windows

- **Windows 103, 104, 105 & 106:** 6/6 double hung, ¾" muntin wood sash. The windows have splayed paneled jambs from the floor to the window head and paneled interior shutters. There is paneled wood wainscot in place of a typical interior sill and 3-piece casing that sits on plinth blocks. The shutters are painted shut and the sash and muntins have thick layers of paint [*fig. 102-1*].

Fireplace [*fig. 102-2*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The fireplace is original to the circa 1808 main block. The firebox is brick with a painted plaster face.
- The decorative painted wood mantel appears to be original to the room.
- The stone hearth is cracked and the firebox pointing mortar is chipped and failing.

Figure 102-1. South elevation of Room 102, showing the splayed and paneled window jambs with recessed sills.

Figure 102-2. West elevation of Room 102, decorative fireplace mantel.

Figure 102-3. North elevation of Room 102. Door 1/102 is on the left and Door 2/102 is on the right. The doors share an integral casing and threshold. Door 2/102 may have originally opened to a stair that led to the second floor.

Figure 102-4. Room 102, detail of wood wainscot, chair rail, 2-piece baseboard, and door casing as found at Door 3/102.

Room 103 –
Room 103 is the front room located in the east section of the main block, which is believed to have been constructed by Josiah Nelson, Jr. circa 1808.

Floor

- The wood floor appears to be yellow pine, installed by blind nailing. The floor boards run east-to-west. There is a perimeter band at the east and west walls where the floor boards end. The current floor boards are a uniform 3-1/4" width and they appear to have been installed on top of the original floorboards, which are intact on top of subfloor boards (9/16" thick by 11" – 15-1/2" wide, running north-to-south). The original floor boards were not observed because they are concealed between the current floor and the sheathing boards, however they are presumed intact because of the thickness of the floor and the difference in height between the adjacent Room 101 finish floor level.
- The wood floor is in good condition with some scratches and worn areas.
- Radiator pipes penetrate the floor in the southeast corner of the room.

Walls & Baseboards

- The walls are painted plaster.
- There is a flat horizontal board wainscot on all four walls with a chair rail and baseboard [*fig. 103-5*]. There is a quarter-round shoe mold, which was most likely added after the current floor was installed. The chair rail continues around the room perimeter and aligns with the window sills [*fig. 103-1*].
- Electrical outlets are installed in the baseboard.
- A wall cabinet with shelves and glass-paned doors with diamond-patterned muntins is in the upper part of the north wall, above the masonry mass of the original bake oven from Room 108 [*fig. 103-3*].

Ceiling

- The ceiling is painted plaster. The plaster ceiling has a few small cracks.
- There is a small 1-1/2" wood crown molding.

Doors

- **Door 1/103**: [*fig. 103-4*] Type d-B. Located on the west wall, this door leads to Room 101. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 101 face and raised on the Room 103 face. The door hardware consists of wood knobs.
- **Door 2/103**: [*fig. 103-3*] Type d-B. Located on the north wall, this door leads to Room 108. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 108 side and raised on the Room 103 side. The door hardware consists of wood knobs.
- **Door 3/103**: [*fig. 103-2*] Type d-B. Located on the east wall, this door leads to built-in shelves that are as deep as the adjacent fireplace masonry mass. The door panels are recessed flat on the inside and raised on the Room 103 side. The door was originally a single door, later cut into two pieces to create a dutch door,

which was then later repaired back to its current configuration as a single door leaf. The door hardware consists of a wood pull and metal latch.

Windows

- **Windows 107 & 108:** 6/6 double hung with ¾" muntin wood sash and shallow splayed jambs. Both windows, bottom sash are rotted and poorly repaired. Window 107 glass lights are cracked.
- **Window 109:** 6/6 double hung with ¾" muntin wood sash and deep splayed jambs.

Fireplace [*fig. 103-2*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The fireplace location and size appear to be original to the circa 1808 main block.
- The firebox is brick with a square tile surround and hearth. The tile is 4-1/2" square, machine-made and stamped with "A.E. Tile Co.", a company based in Zanesville, Ohio that operated from 1876-1930's.
- The square tile hearth is recessed ½" below the finish floor level, appearing to be flush with the original floor level.
- The decorative painted wood mantel appears to be a manufactured mantel dating from the late 19th or early 20th century. Most likely the mantel, tile hearth and firebox surround were installed to replace an earlier mantel. Additionally, the south side of the fireplace masonry mass appears to have been increased in width by 1-1/4" to accommodate the width of the current mantel, with a vertical joint visible in the face of the plaster.

Figure 103-1. South elevation of Room 103 with Windows 108 and 107.

Figure 103-2. North elevation of Room 102 with fireplace and Door 3/103 leading to a wall cabinet.

Figure 103-3. North elevation of Room 103 with Door 2/103 leading to Room 108. The wall cabinet with diagonal-patterned glass doors is above the masonry mass of the bake oven and fireplace in Room 108.

Figure 103-4. West elevation of Room 103 with Door 1/103 leading to Room 101.

Figure 103-5. Room 103, detail of wood wainscot, chair rail, baseboard, and door casing. The chair rail and baseboard are thicker than the door casing backband and they have been cut at an angle to resolve the difference in depth.

Room 104 –
Room 104 is the rear west room located in the northwest wing, which was constructed as an addition to the main block. Room 104 may have been added in a second construction phase to the west end of the northwest wing.

Floor

- The wood floor appears to be white pine and is painted gray. The floor boards are random width (4-1/2″-5-3/8″) and run north-to-south. The painted floor surface is scraped in northwest corner.
- Radiators are installed under the windows on the north and south walls, with pipes that penetrate the floor.

Walls & Baseboards

- The walls are painted plaster.
- There is a flat horizontal board wainscot on all four walls with a chair rail and baseboard. There is a quarter-round shoe mold on the north wall only.
- Electrical outlets, conduit, cable outlet and telephone jacks are installed on the face of the wainscot and baseboard along the north, south and east walls.
- There are painted, boxed wood corner posts that project from the northeast and southeast corners of the room [*fig. 104-3*].
- The profiles of all the architectural trim including the door and window casing, baseboard, and chair rail are unique to this room.
- There is a closet on the east wall, north of the fireplace.

Ceiling

- The ceiling is painted plaster. The plaster ceiling has a few small cracks.
- There is a small 1-1/2″ wood crown molding.

Doors

- **Door 1/104**: [*fig. 104-2*] Type d-A. Located on the east wall, this door leads to Room 105. 6-panel painted wood door leaf. The door panels are recessed flat on both faces, with panel profile moldings on the Room 105 face. The door hardware consists of brown porcelain door knobs.
- **Door 2/104**: [*fig. 104-1*] Type d-B. Located on the east wall, this door leads to a closet with a hanging rod. The base of the closet is built up with the masonry remains of the original bake oven from Room 106, currently removed. The remains of shallow shelves are found behind the right door jamb, which were present when the bake oven was in use. The shelves were since cut off and the closet enlarged in depth using space originally part of the removed bake oven [*fig. 104-5*]. The door panels are recessed flat on both faces, with panel profile moldings on the Room 104 face. The door hardware consists of brown porcelain door knobs, with the closet interior knob broken off.

Windows [*fig. 104-6*].

- **Windows 101, 116 & 117:** 6/6 double hung, ¾″ muntin wood sash. Shallow splayed jambs.

Fireplace [*fig. 104-4*]. (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The brick fireplace appears to be original to this room, which was most likely constructed as an addition to the northwest wing. The firebox is brick with a painted plaster face.
- The square brick hearth appears to be original.
- The brick firebox is stained and brick surface is damaged.
- The decorative painted wood mantel is possibly original to the room, but further investigation is required to determine its age. The mantel is centered on the firebox and hearth.

Figure 104-1. North and east elevations of Room 104. Doors 2/104 and 1/104 are on the east wall, with the fireplace centered between. Door 2/104 leads to a closet and Door 1/104 leads to Room 105.

Figure 104-2. East and South elevations of Room 104, showing the fireplace and Door 1/104 on the east elevation.

Figure 104-3. South and west elevations of Room 104.

Figure 104-4. Room 104, detail of fireplace.

Figure 104-5. Room 104, detail of closet interior showing the remaining masonry base of the original removed bake oven in Room 106. The bottom riser and tread are wood and the top riser is the painted face of the masonry with wood boards applied to the top. The remnants of cut-off shallow shelves are visible behind the right door jamb.

Figure 104-6. Room 104, window detail.

Room 105 –
Room 105 is the entry hall located in the northwest wing, which was constructed by as an addition to the main block.

Floor
- The wood floor is uniform width (6-3/4″) with cut nails. The floorboards run east-to-west. The two northernmost boards are possibly infill and measure 5-1/2″ wide. The floor surface is significantly worn in front of exterior doorway.
- Radiator pipes penetrate the northeast corner.

Walls & Baseboards
- The walls are painted plaster.
- The lower half of the north wall projects into the room approximately 1′-0″ which is part of the masonry mass of the back-to-back fireplaces in Rooms 104 and 106. The masonry forms a shelf that is approximately 3′-6″ above the floor [*fig. 104-1*] .
- There is a flat horizontal board wainscot on all four walls with a chair rail and baseboard that match the millwork profiles found in Room 106. The door casing profile also matches the door casing profile in Room 106.
- A single corner post projects from the southwest corner.

Ceiling
- The ceiling is painted plaster.
- There is a small 1-1/2″ wood crown molding.

Doors
- **Door 1/104**: Type d-A. Located on the west wall, this door leads to Room 104. 6-panel painted wood door leaf. The door panels are recessed flat on both faces, with profile panel moldings on the Room 105 face. The hardware consists of brown porcelain knobs.
- **Door 1/105**: [*fig. 105-1*] Type d-A. Located on the south wall, this door leads to the exterior. 6-panel painted wood door leaf with top 2 panels consisting of glass. The hardware consists of brown porcelain knobs, cylinder rim lock and metal interlocking threshold. The original covered escutcheon for the exterior key is painted shut and the interior escutcheon is missing.
- **Door 1/106**: Type d-A. Located on the east wall, this door leads to Room 106. 6-panel painted wood door leaf. The door panels are recessed flat on both faces, with profile panel molding on the Room 105 face. The hardware consists of brown porcelain knobs.

Figure 105-1. Room 105, looking west. Door 1/105 is open to the exterior face.

Room 106 –
Room 106 is located in the northwest wing, which was constructed as an addition to the main block.

Floor

- The wood floor appears to be long-leaf yellow pine, random width (5" – 11"), with cut nails (similar to Room 102). The floorboards run north-to-south. The floor is scratched and worn.
- Radiators are installed in front of the window on the north wall and in the southwest corner, with pipes that penetrate the floor.

Walls & Baseboards

- The walls are painted plaster.
- There is a flat horizontal board wainscot on all four walls with a chair rail and a 2-piece baseboard. The architectural trim profiles in Rooms 106 match Room 102, and so it appears that both rooms were finished at the same time.
- The chair rail and baseboard at the west elevation, between the fireplace and Door 2/106 is clearly different than the rest of the room, indicating that it was added when the fireplace was altered and decreased in size.
- Electrical outlets are installed in the baseboard.
- Three contemporary wall sconces are installed on the north and south walls. A doorbell is installed on the east wall over Door 1/106. A thermostat is installed on the east wall next to door 4/106.

Ceiling

- The ceiling is painted plaster with a rough texture finish.
- There is a small 1-1/2" wood crown molding.

Doors

- **Door 1/106**: [*fig. 106-2 & 3*] Type d-A. Located on the west wall, this door leads to Room 105. 6-panel painted wood door leaf. The door panels are recessed flat on both faces, with profile panel moldings on the Room 105 face. The hardware consists of brown porcelain door knobs.
- **Door 2/106**: [*fig. 106-3*] Type d-D. Located on the west wall, this door conceals built-in shelves. The bottom section of the cabinet is painted brick with a metal clean-out, painted closed. Evidence in this room and in the basement space below suggests that this was originally a brick bake oven, later altered along with the adjacent fireplace. The painted door leaf is 6-panel with recessed flat panels on the Room 106 face and raised panels on the inside. The hardware consists of a cut glass knob on the Room 106 face and a metal thumb turn on the inside.
- **Door 3/106**: [*fig. 106-4*] Type d-A. Located on the east wall, this door conceals built-in shelves. The frame and casing abut Door 4/106, and the two doors share the same wood threshold. The door opening may have originally been a passage to Room 107. The interior right jamb of the closet door stop is notched to receive a rim box lock from the Room 107 side [*fig. 106-8*]. The door panels are recessed

flat on both sides, with profile panel moldings on the Room 106 face. The hardware consists of cut glass door knobs.

- **Door 4/106**: [*fig. 106-4*] Located on the east wall, this cased opening opens to Room 107. The frame and casing abut Door 3/106, and the two doors share the same wood threshold. The opening may have originally led to a basement staircase, which would have run parallel to the east wall. Pintel hinges and a latch receiver from the previous door leaf are still intact on the door jambs.

Windows [*fig. 106-9*]

- **Windows 102 & 115:** 6/6 double hung, ¾" muntin wood sash. The jambs are splayed with panels above the sill. The window casing sits on plinth blocks, similar to Room 102 but without paneling below the window sill.

Fireplace [*fig. 106-5*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The fireplace hearth is composed of square brick and extends from the south fireplace edge to the north wall, continuing from the firebox to the face of the adjacent cabinet (Door 2/106). The hearth appears to be original and its width suggests that it was originally a much larger cooking fireplace. There is evidence of a former brick bake oven, of which the brick base still remains in the adjacent closet [*fig. 106-6*].
- The firebox is brick with a painted plaster face. A cast iron lintel was inserted later, most likely when the original cooking fireplace was altered and reduced in size. The firebox is stained and the brick surface is damaged [*fig. 106-7*].
- The decorative painted wood mantel appears to have been added in the late 19th or early 20th century, after the original fireplace was altered. Further investigation, including paint analysis, may provide more specific information about the date of the fireplace alterations.

Figure 106-1. East and south elevations of Room 106. Door 4/106 leading to Room 107 is on the left and Door 1/102 leading to Room 102 is on the right.

Figure 106-2. South and west elevations of Room 106. Door 1/106 and the fireplace are on the west elevation

Figure 106-3. West and north elevations of Room 106 with Doors 1/106 and 2/106 and the fireplace. Door 1/106 leads to Room 105 and Door 2/106 opens to shelves.

Figure 106-4. North and east elevations of Room 106. Door 3/106 is on the left and Door 4/106 is on the right. Door 4/106 leads to Room 107 and is missing a door leaf (the pintel hinges and latch receiver are still intact).

Figure 106-5. Room 106, fireplace and closet detail.

Figure 106-6. Room 106, detail of continuous hearth at closet and brick base of original bake oven in the bottom section of the closet. The small section of chair rail and baseboard between the fireplace and the closet is different than the rest of the room.

Figure 106-7. Room 106, detail of firebox condition with damaged and stained surface, typical of fireplaces throughout the house.

Figure 106-8. Room 106, detail of right jamb at Door 3/106 showing indentation in door stop for the original box rim lock.

Figure 106-9. Room 106, window elevation with paneled jambs above the sill and horizontal board wainscot below.

Room 107 –
Room 107 is located directly north of the main block, within the northwest wing. The room was significantly altered in the twentieth century to its current use as a modern kitchen. Initial investigations did not reveal evidence pointing to an original configuration nor the construction date of the room. Most likely, the room was constructed at the same time as Room 106 but further investigation is necessary to verify this.

Floor
- Vinyl sheet floor on plywood subfloor.

Walls & Baseboards
- The walls are painted plaster and gypsum board.
- There is a flat horizontal board wainscot on the east and north walls with a chair rail and baseboard.
- There is a post on north wall, enclosed in wood boards, to the right of Door 1/107. The structural post is visible from the exterior where the shingles and sheathing have been removed [*fig. 107-2*]. The southeast corner is boxed out, however this was not investigated [*fig. 107-3*].
- Floor and wall cabinets are installed along the south and north walls, dating from the mid-twentieth century.
- There are built-in wall cabinets on the west elevation that share space with the closet in Room 106.

Ceiling
- The ceiling is painted plaster with a rough texture finish.
- A portion of the ceiling at the north wall structural post has been removed, exposing the failed structural members [*fig. 107-4*].
- There is a small 1-1/2" profile wood crown molding.
- Two contemporary ceiling lights are installed in the ceiling in the kitchen area and one in the ceiling at the hall to the basement stair.

Doors
- **Door 4/106**: [*fig. 107-1*] Located on the west wall, this cased opening opens to Room 106.
- **Door 1/107:** [*fig. 107-2*] Type d-H. Located on the north wall, this door leads to the exterior. The door is a dutch door with a 9-light upper leaf and 4-panel bottom leaf. The hardware consists of reproduction H-hinges, dutch door quadrant, thumblatch, and a modern cylinder lock.
- **Door 1/108:** [*fig. 107-2*] Type d-C. Located on the east wall, this door leads to Room 108. 4-panel painted wood door leaf. The hardware consists of a reproduction thumblatch.
- **Door 2/107:** [*fig. 107-3*] Located on the south wall, this cased opening leads to the basement stair hall.
- **Door 3/107:** Type d-B. Located on the west wall of the basement stair hall, this door leads to the second floor stair. 4-panel painted wood door leaf. The

hardware consists of reproduction H-hinges and a thumblatch with "Stanley" marked on the face.

- **Door 4/107:** Type d-F. Located on the east wall of the basement stair hall, this door leads to Room 111, a powder room. 6-panel painted wood door leaf. The hardware consists of reproduction H-hinges and a thumblatch with "Stanley" marked on the face.
- **Door 5/107:** Type d-F. Located on the south wall of the basement stair hall, this door leads to the basement stair. 6-panel painted wood door leaf. The hardware consists of reproduction H-hinges and a thumblatch with "Stanley" marked on the face.

Windows

- **Windows 113:** 1/1 single hung wood window with vinyl jambs and insulated glass.
- **Window 114:** Pair of 6-light modern wood casement windows with 8" x 12" glass lights.

Figure 107-1. Room 107, looking west with Door 4/106 that leads to Room 106.

Figure 107-2. Room 107, looking east with Door 1/108 that leads to Room 108. A concealed post is on the north wall, left, to the right of exterior Door 1/107.

Figure 107-3. Room 107, looking south through cased opening 2/107 towards Door 5/107 and the basement stair. The boxed-out area in the southeast corner was not investigated.

Figure 107-4. Room 107, ceiling view with plaster removed to expose failed structural members.

Room 108 –
Room 108 is located north east of the main block. The room is the only remaining finished space of the original 18th century frame structure and existed prior to the construction of the main block, northwest, and northeast wings.

Floor

- The wood floor appears to be long-leaf yellow pine, random width (6-1/2" - 12", and 7-3/4" – 9-1/2"), installed with wrought nails. The north 4'-0" of the room was at one point infilled with newer random-width boards (7-3/4" – 9-1/2"), which are installed with cut nails and are visibly different than the rest of the room. The floorboards run east-to-west. The condition of the floorboards is generally scratched and worn. There is some settlement in the floor structure which has created a sagging, uneven surface, especially at the hearth and along the north wall.
- The wood floor does not appear to be original to the construction of the 18th-century block. Physical evidence suggests that the floorboards were installed after the main block was constructed. Reasoning for this conjecture is found in the passage area at the southwest corner of the room leading to Room 103, west of the fireplace masonry mass [*fig. 108-8*]. The 18th-century structure was most likely rectangular in its original configuration. Therefore, the passage area would not have existed prior to the addition of the main block because it would have been outside of the building footprint. This and the observation that the wood floor in this passage area is identical in size, finish, and nailing pattern as the rest of the room, indicates that the majority of the floor was installed at the same time, most likely after the main block was added in 1808-11.

Walls & Baseboards

- The walls are painted plaster. There is a flat horizontal board wainscot on all four walls with a bullnose chair rail and baseboard. The conditions differ per wall.
- East Wall: The plaster surface is generally cracked and uneven. There is a vertical scar in the plaster wall, north of Door 2/108, which indicates that an original partition wall (possibly enclosing a staircase) was removed. The scar continues at the chair rail, wainscot, and baseboard [*fig. 108-2 & 3*]. The two adjoining sections of baseboard have different profiles, suggesting that one section was added at a later time. The north section appears to be newer since the baseboard on the south matches the baseboard profile on the south side of Door 2/108. In addition, the north section of infill floorboards is attached with concealed nailing under the infill baseboard, a technique not found in the older sections of the room.
- North Wall: The plaster surface is cracked above Window 112 and the paint is peeling and chipping [*fig. 108-4*]. There is a vertical scar in the plaster, east of the window, which appears to correspond with the possible partition and enclosed stair mentioned in the discussion of the East wall.
- West Wall: the north section of the West wall, north of Door 1/108, does not contain the horizontal board wainscot found throughout the room. There is a chair rail at this section of the wall, however it is installed higher than the north

wall, and so the chair rails do not align at the northwest corner of the room [*fig. 108-5*]. There is an applied profile shoe molding along the baseboard north of Door 1/108, possibly to conceal a gap between the sagging floor and the baseboard.

- South Wall: [*fig. 108-6*] The large brick cooking fireplace and bake oven are found on the South wall. The plaster surface exhibits cracking above the fireplace.
- Electrical outlets are installed in the wainscot on the east wall and in the baseboard on the north wall.
- The west side of the fireplace mass contains a high cupboard with shelves and sliding wood board doors, accessible from the east side.
- Exposed painted corner posts project out from the northwest, northeast and southeast corners of the room.

Ceiling

- The ceiling is painted plaster. Plaster surface is cracked and uneven, with bowing in certain areas.
- There are scar lines in the plaster at the northeast corner that correspond with the vertical scars on the east and north walls (see discussion of East and North walls) [*fig. 108-3*].
- There is a single outlet for a light fixture in the middle of the ceiling.

Doors

- **Door 1/108**: Type d-C. Located on the west wall, this door leads to Room 107. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 108 face and raised on the Room 107 face. The hardware consists of a reproduction thumb latch.
- **Door 2/108**: [*fig. 108-1*] Type d-C. Located on the east wall, this door leads to Room 109. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 109 face and raised on the Room 108 face. The hardware consists of a reproduction thumb latch (different from 1/108). There is a scar on the door face that indicates that there was originally a box rim lock on the Room 108 side.
- **Door 3/108**: [*fig. 108-7*] Type d-B. Located on the west wall, this door opens to a closet with shelves. The closet appears to have originally been a passage, as evidenced by wood door threshold typical to the rest of the house and the walls and shelves that were clearly added to the inside of the door frame. Further investigation is needed to determine this. 4-panel painted wood door leaf. The door panels are recessed flat on the inside and raised on the Room 108 side. The hardware consists of a large wood pull knob and metal latch.
- **Door 2/103**: [*fig. 108-8*] Type d-B. Located on the south wall, this door opens to Room 103. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 108 side and raised on the Room 103 side. The hardware consists of wood door knobs.

Windows

- Both windows in Room 108 are most likely original window locations from the 18th-century structure, however the wood sash appear to be twentieth-century

replacements. The 6/9 sash configuration with small lights is most likely the same as the original window configuration.

- **Window 110:** [*fig. 108-6*] 6/9 single hung wood sash with 6-3/4" x 8-3/4" visible glass lights. The top sash is deteriorated. The jambs are splayed and there are wood curtain rod brackets added to the top jamb corners. The window sill aligns with the chair rail.
- **Window 112:** [*fig. 108-4*] 6/9 single hung wood sash with 6-3/4" x 8-3/4" visible glass lights. The jambs are splayed and there are wood curtain rod brackets added to the top jamb corners. The window sill aligns with the chair rail.

Fireplace [*fig. 108-6*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The brick fireplace appears to be original to the original 18th-century frame structure. The flues and chimney were reworked when the main block was added to the south west of the 18th-century block, as mentioned in the 1808 itemized bill to Josiah Nelson, Jr. The flues were possibly reworked a second time in the nineteenth century when the bake oven was no longer in use.
- The large cooking fireplace has a brick firebox, bake oven, and brick hearth.
- The brick firebox is stained and the brick surface is damaged.
- The brick hearth is uneven and has partially settled.
- The fireplace surround is a flat board with a bead at the firebox opening. Above the firebox there is a simple wood mantel with brackets and a flat plaster panel. The wood mantel and other wood trim around the fireplace appear to not be original to the 18th-century structure, as evidenced by the use of cut nails in construction.
- A wrought iron cooking crane is attached to the left side of the firebox.

Figure 108-1. East elevation of Room 108 with Door 2/108 that leads to Room 109.

Figure 108-2. North section of the East elevation of Room 108, showing the joint in the chair rail, wainscot and baseboard indicating that the north section was infilled (see arrows in the photo).

Figure 108-3. Room 108, northeast corner showing scars on north wall, ceiling and floor where the conjectured partition walls and staircase were located.

Figure 108-4. North elevation of Room 108 with Window 112.

Figure 108-5. Room 108, detail of northwest corner with exposed corner post. The west wall (on the left) is plaster below the chair rail while the north wall (on the right) is horizontal board wainscot. The chair rails do not align and the west wall has a different baseboard and an added shoe molding.

Figure 108-6. Room 108, south elevation with Window 110 and Door 2/103.

Figure 108-7. Room 108, Door 3/108 closet. The closet interior walls and shelves appear to have been added, indicating that this door may have previously been used as a passage door.

Figure 108-8. Room 108, southwest corner of room looking at passage to Door 2/103, leading to Room 103.

Rooms 109 - Room 109 is located to the east of Room 108 and comprises the west half of the northeast wing. The room contains an unfinished workroom. Rooms 109 and 110 appear to have been constructed at the same time, however they do not appear to be contemporary with the 18th-century block. Both Room 109 and 110 were constructed with salvaged antique materials, most likely in the early 20th century.

Floor

- The wood floor is random width (5" – 17-1/2"), installed with cut nails. The floorboards run north-to-south. The floor is significantly worn and is severely deteriorated in front of Door 1/109.

Walls

- The west wall is comprised of horizontal wood boards [*fig. 109-1*]. The horizontal boards appear to have possibly been exterior sheathing boards for the 18th-century block. Both wrought and cut nails were found in the boards. The boards were investigated for possible nailing patterns that would indicate wood siding or shingles as the exterior material, but nothing conclusive was found. Further studies are necessary to determine the age of the boards and their possible function as exterior sheathing boards. The north and south walls are wood framing exposing the back side of the horizontal exterior sheathing boards [*fig. 109-2*]. A partition of horizontal wood boards on the east wall separates the workroom from Room 110, the carriage house [*fig. 109-3*].

Ceiling

- The ceiling is exposed rough log joists open to the wood board floor of the attic above.

Doors

- **Door 1/109**: [*fig. 109-2*] Type d-A. Located on the south wall, this door leads to the exterior. Door frame is integral with the frame and sill of Window 111. 6-panel painted wood door leaf. The paint is peeling and the door surface is worn. The hardware consists of brown porcelain door knobs and a metal slide bolt.
- **Door 2/109**: [*fig. 109-4*] Type d-E. Located on the north wall, this door leads to the exterior. Board-and-batten painted wood door leaf. The bottom of the door is rotted and a reinforcing board has been applied to the interior surface. The hardware consists of a reproduction thumblatch (matches Door 2/108) and a hook-and-eye latch.
- **Door 2/110**: [*fig. 109-3*] Type d-E. Located on the east wall, this door leads to the carriage house. Comprised of two unfinished wide boards, the door slides on head-mounted hardware.

Windows

- **Window 111:** [*fig. 109-2*] The sash is missing and the opening is infilled with a single piece of Plexiglas. The sash opening size is similar to Window 110. The frame and sill are integral with the frame of Door 1/109.

Figure 109-1. West elevation of Room 109. The horizontal wall boards are possibly the original exterior sheathing boards of the 18th-century block.

Figure 109-2. Room 109, south elevation with Door 1/109 and Window 111 (sash missing).

Figure 109-3. Room 109, east elevation with Door 2/110. The room was constructed of what appears to be antique materials salvaged from another building.

Figure 109-4. West and north elevations of Room 109, with Door 2/109 leading to the exterior.

Room 110 –
Room 110 is located to the east of Room 109 in the eastern section of the northeast wing. The space contains an unfinished workroom and carriage house.

Floor
- Earth floor.

Walls
- The walls are comprised of exposed framing materials, which appear to be salvaged from another building. There are unused beam pockets and pegs that do not correspond with the current framing.

Ceiling
- The ceiling is exposed rough log joists open to the wood board floor of the attic above.

Doors
- **Door 2/110**: Located on the west wall, this door leads to Room 109. Comprised of two unfinished wide boards, the door slides on head-mounted hardware.
- **Door 1/110**: Located on the south wall, this door is the exterior carriage house door. The single door leaf is comprised of diagonal flat boards and the door slides on head-mounted hardware.

Figure 110-1. West and north elevations of Room 110. The room was constructed of what appears to be salvaged antique materials.

Figure 110-2. Ceiling view of Room 110, including damaged joist in background.

Figure 110-3. South west corner of Room 110. Carriage house Door 1/110 is on the left, and Door 2/110 leading to Room 109 is on the right. The floor is earth.

Room 111 –
Room 111 located off of the Room 107 hall leading to the basement stair.

Floor
- The floor is vinyl tile on plywood subfloor.

Walls
- The walls are gypsum wall board with ceramic tile wainscot. All materials appear to be in good condition.

Ceiling
- The ceiling is gypsum wall board.

Doors
- **Door 4/107**: Type d-F. Located on the west wall of Room 111, this door leads to the basement stair hall. 6-panel painted wood door leaf. The hardware consists of reproduction H-hinges and a thumblatch with "Stanley" marked on the face.

Fixtures
- There is a toilet and a wall-mounted lavatory sink.

Figure 111-1. Powder Room 111.

SECOND FLOOR

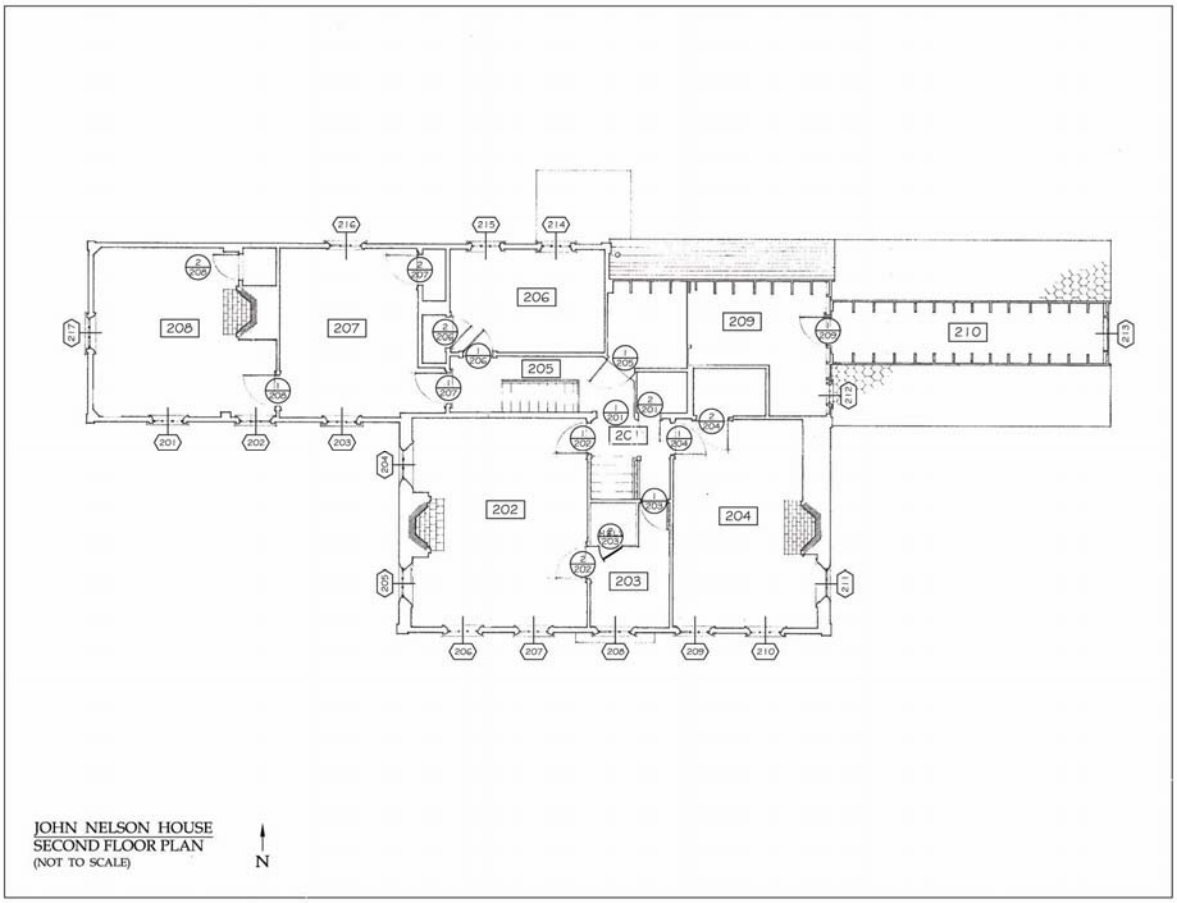


Figure SF-1. Second Floor key plan (adapted from HABS drawings).

Room 201 –
Room 201 is located in the north center section of the main block second floor. The room serves as the second floor stair hall.

Floor

- The wood floor appears to be white pine, random width (9-1/2" – 10-1/2"). At the top landing of the staircase the floorboards run east-to-west, while the remainder of the stair hall floor boards run north-to-south. The floor exhibits some cupping and is worn with scratches and a few gouges.

Walls & Baseboards

- The walls are plaster with wallpaper finish, which is peeling in a few areas.
- There is a wood baseboard with a profile cap.
- A single modern wall sconce is installed on the west wall.

Ceiling

- The ceiling is painted plaster with cracks, stains, and peeling paint.
- Three modern smoke detectors are installed in the ceiling.
- There is a small 1-1/2" wood crown molding.

Doors

- **Door 1/201**: [*fig. 201-2*] Located on the north wall, this cased opening leads to Room 205. The door leaf is missing and the latch receiver for a thumblatch remains intact on the jamb.
- **Door 2/201**: [*fig. 201-2*] Type d-B, modified. Located on the north wall, this door leads to the closet 201A. The door is not typical full height and the door leaf is a single raised panel with wood knob pull. There is a door-activated light switch on the inside of the door jamb.
- **Door 1/204**: [*fig. 201-3*] Type d-B. Located on the east wall, this door leads to Room 204. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 201 side and raised on the Room 204 side. The hardware consists of a thumblatch, also found at 1/203 and 2/204. Further investigation is needed to determine if the hardware is reproduction or antique. There is a scar on the door from and earlier mortise rim lock.
- **Door 1/203**: [*fig. 201-4*] Type d-B. Located on the south wall, this door leads to Room 203. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 203 side and raised on the Room 201 side. The hardware consists of a thumblatch, similar to 1/204 and 2/204.
- **Door 1/202**: [*fig. 201-1*] Type d-D. Located on the west wall, this door leads to room 202. 6-panel painted wood door leaf. The door panels are recessed flat on the Room 202 side and raised on the Room 201 side. The hardware consists of brown porcelain door knobs.

Room 201A –
Room 201A is located in the second floor of the main block. The room serves as a walk-in closet [*fig. 201-2*].

Floor
- Painted wood floor, uniform width boards.

Walls & Baseboards
- Painted vertical wood board walls with hooks and hanging rods. The paint finish is peeling.

Ceiling
- Painted plaster ceiling, which is severely cracked. There is a single ceiling-mounted light fixture.

Figure 201-1. West elevation of Room 201, with Door 1/202 leading to Room 202.

Figure 201-2. North elevation of Room 201 with Door 1/201 leading to Room 205 and Door 2/101 leading to 201A.

Figure 201-3. East elevation of Room 201 with Door 1/204 leading to Room 204.

Figure 201-4. South elevation of Room 201 with Door 1/203 leading to Room 203 and view down stair case to the first floor entry hall, Room 101.

Room 202 –
Room 201 is located on the second floor in the western half of the main block.

Floor

- Painted wood floor, random width (5-1/2" – 10") with cut nails. The species of the floor was not determined because of the painted finish. The floorboards run north-to-south. The floor boards are cupped and uneven, with some split boards. There are gaps between some of the floor boards, which were filled with wood strips. The floor slopes down toward the northwest corner of the room.

Walls & Baseboards

- The walls are painted plaster. The north and south walls have a few cracks.
- The painted wood baseboard has a cap profile.
- The casing profiles in Room 202 appear to match the profiles of Room 201.
- Electrical outlets and conduit run along the surface of the south and east walls [*fig. 202-7*].

Ceiling

- The ceiling is painted plaster with multiple cracks. The ceiling has stains and peeling paint above the fireplace.
- There is a small 1-1/2" wood crown molding.
- A single contemporary flush mount light fixture is installed in the south area of the ceiling with surface-mounted conduit.

Doors

- **Door 1/202**: [*fig. 202-3*] Type d-D. Located on the east wall, this door leads to room 201. 6-panel painted wood door leaf. The door panels are recessed flat on the Room 202 side and raised on the Room 201 side. The hardware consists of brown porcelain door knobs.
- **Door 2/202**: [*fig. 202-3*] Type d-D. Located on the east wall, this door leads to room 203. 6-panel painted wood door leaf. The door panels are recessed flat on the Room 202 side and raised on the Room 203 side. The hardware consists of a thumb latch that matches 1/203 and 2/204 [*fig. 202-4 & 5*].

Windows

- **Windows 204 & 205:** [*fig. 202-2*] 6/6 double hung, ¾" muntin wood sash, on the west wall. The sash have metal tracks. The jambs are comprised of deep splayed flat boards. Window casing dies into a simple bullnose sill, without a sill apron. The sash muntins have multiple layers of paint. There is roller shade hardware installed on face of the sash stop.
- **Windows 206 & 207:** [*fig. 202-1*] 6/6 double hung, ¾" muntin wood sash, on the south wall. The sash have metal tracks. The jambs are comprised of shallow splayed flat boards [*fig. 202-6*]. Window casing dies into a simple bullnose sill, without a sill apron. The sash muntins have multiple layers of paint. There is roller shade hardware installed on face of the sash stop.

Fireplace [*fig. 202-2*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The firebox is brick with a painted plaster face and the hearth is square brick. The firebox and hearth appear to be original to the circa 1808 main block. The firebox is stained and the brick surface is damaged.
- The decorative painted wood mantel is not centered on the firebox and the fireplace is not centered on the masonry mass that projects into the room. It is possible that the mantel is original, dating from the early 19th-century construction date of the main block, based upon similar stylistic features found in typical mantel designs from the Federal time period. Further investigation is needed to determine the age of the fireplace mantel.

Figure 202-1. South elevation of Room 202 with Windows 207 & 206.

Figure 202-2. West elevation of Room 202 with Windows 205 & 204.

Figure 202-3. East elevation of Room 202 with Door 1/202 on the left that leads to Room 201 and Door 2/202 on the right that leads to Room 203. Both doors are identical in size and panel configuration, although the hardware is different.

Figures 202-4 & 5. Thumb latch door hardware found at Doors 2/202, 1/203 and 2/204.

Figure 202-6. Room 202, window jamb and sill detail on south wall.

Figure 202-7. Room 202, detail of baseboard with surface mounted outlets and wires.

Room 203 –
Room 203 is located on the second floor in the south center section of the main block.

Floor

- The wood floor is painted, random width (3-1/2"– 11-1/2") with cut nails. The floorboards run north-to-south. The floorboards are cupped and uneven, with some split boards.

Walls & Baseboards

- The walls are painted wallpaper on plaster.
- There is a flat baseboard with a bead. A quarter-round shoe mold was installed along the east wall only.
- Telephone wires are mounted to the top of the baseboard.

Ceiling

- The ceiling is painted plaster with multiple cracks.
- There is a small 1-1/2" wood crown molding with a gap between the molding and the ceiling.
- A single contemporary pendant light fixture is installed in the center of the ceiling with surface-mounted conduit.

Doors

- **Door 1/203**: Type d-B. Located on the north wall, this door leads to Room 201. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 203 side and raised on the Room 201 side. The hardware consists of a thumb latch.
- **Door 2/202**: Type d-D. Located on the west wall, this door leads to Room 202. 6-panel painted wood door leaf. The door panels are recessed flat on the Room 202 side and raised on the Room 203 side. The hardware consists of a thumb latch.
- **Door 2/203**: [*fig. 203-2*] Type d-E. Located on the north wall, this door leads to a closet with shelves. The painted door leaf is board-and-batten.

Windows

- **Window 208:** [*fig. 203-1*] 6/6 double hung, ¾" muntin wood sash. The sash have metal tracks. The jambs are comprised of shallow splayed flat boards. Muntins have multiple layers of paint. There is roller shade hardware installed on face of sash stop.

Figure 203-1. South elevation of Room 203.

Figure 203-2. North elevation of Room 203 with Door 2/203 that leads to a closet.

Room 204 –
Room 204 is located on the second floor in the east section of the main block.

Floor

- The painted wood floor is random width (8-1/2" – 12"). The floor appears to be white pine. The floorboards run north-to-south and, from visual observation only, appear to be installed on top of another finish wood floor. Further investigation is needed to determine this. The floor boards have a few scratches and gouges and they slope down toward the north end of the room.
- A section of the northeast corner of room (6'-7" x 3'-0") is infilled with floor boards in the area above original first floor fireplace. This may have occurred after the flue and chimney were reworked for a second time, most likely after the bake oven was deemed obsolete.
- A small section of the masonry flue from the original first floor fireplace projects out from the floor to the baseboard near the northeast corner of the room [*fig. 204-5*].
- There is a radiator in the southeast corner with pipes that penetrate the floor.

Walls & Baseboards

- The walls are plaster with painted wallpaper. The west wall surface is rough and uneven, as is the east wall above the fireplace.
- Paint and wallpaper are peeling above the fireplace.
- The architectural trim profiles match those found in Room 103.
- There is a small cabinet installed on the south wall of the fireplace mass, in the space above the firebox.
- The flat board baseboard has an added profile board with a quarter-round shoe mold.
- Electrical outlets are installed in the baseboard and wires run along the face of the south and west walls.

Ceiling

- The ceiling is painted plaster, smooth and even.
- There is a small area of water damage above the fireplace.
- There is a small 1-1/2" wood crown molding.

Doors

- **Door 1/204**: [*fig. 204-3*] Type d-B. Located on the west wall, this door leads to Room 201. 4-panel painted wood door leaf. The door panels are recessed flat on the Room 201 side and raised on the Room 204 side. The hardware consists of a thumb latch.
- **Door 2/204**: [*fig. 204-3*] Type d-B. Located on the north wall, this door leads to the closet. 4-panel painted wood door leaf. The door panels are recessed flat on the inside of the closet and raised on the Room 204 side. The hardware consists of a thumb latch.

Windows

- **Windows 209 & 210:** 6/6 double hung, ¾" muntin wood sash, on the south wall. The sash have metal tracks. The jambs are comprised of shallow splayed flat boards. The muntins have multiple layers of paint. There is roller shade hardware installed on the face of the sash stops. There is a cracked light at window 209.
- **Window 211:** [*fig. 204-2*] 6/6 double hung, ¾" muntin wood sash. The sash have metal tracks. The jambs are comprised of deep splayed flat boards. The muntins have multiple layers of paint. There is roller shade hardware installed on the face of the sash stops.

Fireplace [*fig. 204-4*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The firebox is brick with a painted plaster face and the hearth is brick. The firebox and hearth appear to be original to the circa 1808 main block. The firebox is stained and the brick surface is damaged.
- There is a decorative painted wood surround with a simple bolection molding and mantel shelf with brackets. The backband profile of the bolection appears to be the same as the window casing backband profile. Further investigation is needed in order to determine the age of the fireplace surround.

Room 204A –

Room 204A is located in the second floor of the main block. The room serves as a walk-in closet. Located north of Room 204, Room 204 A is within the space that was formerly the second floor or attic space of the original 18th-century block.

Floor

- Vinyl sheet floor surface.

Walls & Baseboards

- The walls are painted wood boards.

Ceiling

- The ceiling is painted wood boards.

Figure 204-1. South elevation of Room 204, with Windows 209 & 210.

Figure 204-2. East elevation of Room 204.

Figure 204-3. North and west elevations of Room 204. Door 1/204 on the left leads to Room 201. Door 2/204 leads to the closet, Room 204A.

Figure 204-4. Room 204, fireplace and hearth.

Figure 204-5. Room 204, exposed portion of masonry flue at northeast corner of room.

Room 205 –
Room 205 is the rear stair hall located in the second floor of the northwest wing.

Floor

- The painted wood floor is random width (8-1/2" – 10"). The floorboards run north-to-south. The floor boards have a few scratches and chipped paint. The floor slopes down severely toward the north end of the room due to structural failure.
- The current floor is installed on top of the original floor boards, as observed in an area where the current floor was removed. The original floor boards are continuous under the north wall to Room 206.
- The stair treads and risers that lead down to first floor are painted wood.

Walls & Baseboards

- The north, west, and south walls are painted plaster. The plaster surface is rippled and uneven, revealing ghost lines of the wood lath strips behind. There are cracks in the plaster finish.
- The east wall is painted vertical beaded board.
- The painted flat baseboard has a chamfered edge. There is a large quarter-round shoe mold installed along the north wall only. The baseboard along the west wall appears to have been installed after the floor sag, since it is level and does not follow the slope of the floor.
- The staircase walls are vertical beaded board on the north and horizontal beaded board on the south wall below the second floor level, with plaster above the beaded board.

Ceiling

- The ceiling is painted plaster.
- There is an access panel to the attic (2'-0" x 2'-0") in the west end of the room.
- There is a fixed skylight in the center of the ceiling [*fig. 205-4*].
- A pendant light fixture and smoke detector are installed in the ceiling.

Doors

- **Door 1/201**: Located on the south wall, this cased opening leads to Room 201. The door leaf is missing. There is a latch receiver for a thumb latch remaining on the jamb.
- **Door 1/205**: [*fig. 205-5*] Type d-F, modified. Located on a 45 degree angle at the intersection of the north and east walls, this door leads to the attic space above the kitchen and the original 18th century structure. 6-panel painted wood door leaf, which has been modified to accommodate the floor sag. The hardware consists of brown porcelain door knobs.
- **Door 1/206**: [*fig. 205-3*] Type d-G. Located on the north wall, this door leads to Room 206. 4-panel painted wood door leaf. The door panels are recessed flat on both faces, with profile panel moldings. The hardware consists of brown porcelain door knobs.

- **Door 1/207**: [*fig. 205-1*] Type d-G. Located on the west wall, this door leads to Room 207. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with profile panel moldings. The hardware consists of brown porcelain door knobs.

Figure 205-1. Room 205, looking west with Door 1/207 that leads to Room 207. The staircase to the first floor is in the foreground.

Figure 205-2. Room 205, looking east. Door 1/205 leads to the attic, Room 209. There is a skylight in the ceiling.

Figure 205-3. North elevation of Room 205. Door 1/207 is on the left and Door 1/206 is on the right.

Figure 205-4. Skylight in Room 205.

Figure 205-5. North and east elevations of Room 205 with Door 1/205 that leads to the attic, Room 209. The door leaf has been modified to accommodate the sloping floor.

Figure 205-6. Room 205, staircase and railing.

Room 206 –
Room 206 is the rear center room located on the second floor of the northwest wing. The room was modified from its original unknown use to a full modern bathroom, which included the addition of a center partition wall, bath and shower surround, and modern fixtures.

Floor
- Asbestos composite tile (9" square) on plywood subfloor, on the original wood floor boards (8-1/2" – 10") that are continuous north-to-south from Room 205. The original floor structure sagged significantly from structural failure and sleepers were installed to level the floor for the tile installation.
- The tile and subfloor had been previously removed from around the toilet and bath area, exposing the sleepers and original wood floor boards [*fig. 206-2 & 3*].

Walls & Baseboards
- The north wall, east wall at toilet, south, and west walls are painted plaster with many cracks.
- The walls enclosing the bath and shower and the partition dividing the center of the room are painted gypsum wall board.
- The painted flat baseboard has a chamfer.

Ceiling
- The ceiling is skim coated plaster with minor cracks.

Doors
- **Door 1/206**: [*fig. 206-1*] Type d-G. Located on the south wall, this door leads to Room 205. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with profile panel moldings. The hardware consists of brown porcelain door knobs.
- **Door 2/206**: [*fig. 206-1*] Type d-G. Located on the west wall, this door leads to a closet. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with profile panel moldings. The hardware consists of brown porcelain door knobs.

Windows
- **Windows 214 & 215:** [*fig. 206-4*] 6/6 double hung sash with a narrow muntin profile. Windows 214 and 215 are unique to the other windows in the house, indicating that they may have been installed more recently.

Figure 206-1. Room 206, looking southwest. Door 1/206 is on the left and leads to Room 205. Door 2/206 is on the right and leads to a closet. The modern sink vanity and lighting fixtures are in the foreground.

Figure 206-2. Room 206, looking east. A portion of the floor and subfloor was previously removed. Sleepers were installed to correct the sagging floor prior to the installation of the partition wall on the right, the bathtub and surround, and the tile floor.

Figure 206-3. Room 206, looking southeast showing removed finish floor and leveling sleepers on top of the original floorboards, which run continuous under the south wall that separates Room 206 from Room 205.

Figure 206-4. Room 206, Window 215 (Window 214 is similar). The window casings and sills at windows 214 and 215 are unique to the house.

Room 207 –
Room 207 is a rear west room located in the second floor of the northwest wing.

Floor

- The wood floor appears to be yellow pine and is installed on top of an earlier finish floor. The floorboards are uniform width (5-1/4"), blind nailed and run east-to-west. The floorboards have a varnish finish with some scratches.
- The floor sags along the middle of the west wall, at the location where a stove heater may have been installed, as evidenced by the former flue plate on the west wall.

Walls & Baseboards

- The walls are plaster with painted wallpaper. The plaster surface has a few cracks and is stained below Window 203.
- The southeast corner of the room is boxed out in the vicinity of where the northwest corner of the main block meets the room, on the other side of the wall [*fig. 207-2*].
- The west wall has an extra layer of paper or thin gypsum board, which is flush with the casing around Door 1/208 [*fig. 207-4*].
- Painted wood baseboard with cap profile. Electrical outlets and conduit, along with other wires, are installed on the baseboard surface.
- On the west wall is a decorative metal plate meant to receive a stove flue, now painted closed [*fig. 207-4*].
- A radiator is installed on the north wall to the right of Window 216, with pipes that penetrate the floor [*fig. 207-5*].

Ceiling

- The ceiling is painted plaster with minor cracks and stains.
- A contemporary light fixture is installed at the center of the ceiling.

Doors

- **Door 1/207**: [*fig. 207-2*] Type d-G. Located on the east wall, this door leads to Room 205. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with panel profile moldings. The hardware consists of brown porcelain door knobs.
- **Door 2/207:** [*fig. 207-2*] Type d-G. Located on the east wall, this door leads to a closet. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with panel profile moldings. The hardware consists of brown porcelain door knobs, key and escutcheon.
- **Door 1/208:** [*fig. 207-4*] Type d-G. Located on the west wall, this door leads to Room 208. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with panel profile moldings. The hardware consists of brown porcelain door knobs.

Windows

- **Window 203:** [*fig. 207-3*] 6/6 double hung, ¾" muntin wood sash. The jambs are shallow splayed flat boards. The muntins have multiple layers of paint. Roller shade hardware is installed on the face of the sash stops. There is one cracked sash light.
- **Window 216:** [*fig. 207-6*] 6/6 double hung, ¾" muntin wood sash, on the north wall. The jambs are square, unlike the splayed jambs of Window 203. The muntins have multiple layers of paint. Roller shade hardware is installed on the face of the sash stops.

Figure 207-1. Room 207, looking northeast. Door 2/207 on the north wall leads to a closet.

Figure 207-2. Room 207, looking southeast. Door 2/207 on the left leads to a closet and Door 1/207 on the right leads to Room 205. The wall in the southeast corner is boxed out in the vicinity of where the northwest corner of the main block meets the northwest wing, on the other side of the wall.

Figure 207-3. South elevation of Room 207, with Window 203.

Figure 207-4. West elevation of Room 207 with Door 1/208 that leads to Room 208. The floor sags in the middle, at the possible location of a stove heater. The former stove vent plate is found on the wall above this area, now painted over (see arrow).

Figure 207-5. North elevation of Room 207, with Window 216.

Figure 207-6. Window 216 on the north wall of Room 207.

Room 208 –
Room 208 is the rear west room located in the second floor of the northwest wing. This room may have been added to the west of the northwest wing in a second phase of construction [*see fig. 1.0A-6*].

Floor

- The painted wood floor is random width (8"-13") with wood infill strips at the gaps between the boards. The floorboards run north-to-south and exhibit minor cupping and scratches. There is heavy surface damage to the wood floor in the northwest region of the room [*fig. 208-4*].
- The floorboards near Door 1/208 are uneven.
- A radiator is installed on the south wall on the side of the fireplace, with pipes that penetrate the floor.

Walls & Baseboards

- The walls are painted plaster.
- The painted wood baseboard has a profile cap. Electrical outlets and conduit are installed on the baseboard surface.
- A boxed-out corner post is found on the south wall, to the west of Window 202 [*fig. 208-2*]. The same condition is found at the northeast corner, and aligns with the post on the south wall [*fig. 208-1*]. The existence of these posts, along with the posts below, suggests that this may have been an exterior frame wall (phase 1 of the northwest wing). In this supposed construction sequence, Rooms 208 and 104, below, would have been the phase 2 addition [*fig. 1.0A-6*].
- The northwest and southwest corners are finished with 45 degree walls that most likely conceal corner posts. Room 104 below contains exposed corner posts in the same locations [*fig. 208-3 & 4*].
- The closet interior walls are painted plaster with cracks. There is a peg rail and shelves inside the closet.

Ceiling

- The ceiling is painted plaster, with cracks showing through the top skim coat.
- There are areas of water damage to the right of the fireplace and in the northeast corner.
- There is a small 1-1/2" wood crown molding.
- There is a contemporary surface-mounted light fixture at the center of the ceiling.

Doors

- **Door 1/208:** [*fig. 208-2*] Type d-G. Located on the east wall, this door leads to Room 207. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with profile panel moldings. The hardware consists of brown porcelain door knobs.
- **Door 2/208:** [*fig. 208-1*] Type d-G. Located on the east wall, this door leads to a closet. 4-panel painted wood door leaf. The door panels are recessed flat on both sides, with panel profile moldings. The hardware consists of brown porcelain door knobs.

Windows

- **Windows 201, 202 & 217:** [*fig. 208-3 7 4*] 6/6 double hung, ¾" muntin wood sash. Shallow splayed flat board jambs. Window casing is a backband that dies into a simple bullnose sill, no sill apron. Muntins have multiple layers of paint. Roller shade hardware installed on face of sash stop. There are three cracked lights at Window 202. The muntins at the lower sash of Window 201 are worn. Storm window weeps have been sealed.

Fireplace [*fig. 208-5*] (See Section 1.3A, Character-Defining Features, for a more detailed description of the fireplace mantels).

- The firebox and hearth are brick and appear to be original to the northwest wing. The firebox is stained and the brick surface has spalled. The plaster face at the firebox has been removed, as evidenced by the small amount of plaster that remains on the face.
- The decorative painted wood mantel appears to have possibly been added in the late 19th or early 20th century.

Figure 208-1. Northeast corner of Room 208 with Door 2/208 leading to a closet. The northeast corner is boxed out, possibly concealing a post.

Figure 208-2. Southeast corner of Room 208. Door 1/208 leads to Room 207. The boxed-out area to the right of Window 202 most likely conceals a frame post. This post aligns with the post located directly below in Room 105. The posts in the northeast and southeast corners may have been part of an earlier exterior frame wall.

Figure 208-3. Room 208, looking southwest with an angled corner finish, most likely enclosing a corner post.

Figure 208-4. Room 208, looking northwest with an angled corner finish, most likely enclosing a corner post. An area of heavily damaged floor boards is near the corner.

Figure 208-5. Room 208, detail of fireplace.

Room 209 –

Room 209 is the unfinished attic space that contains part of the original 18th century structure. The footprint of the original structure does not match the current room configuration. The floor level of the western portion of Room 209, above Room 107, is level with the finished second floor areas. The floor level steps down approximately one foot where the west side of the 18th century structure footprint begins. The east side of the 18th century block footprint extends into Room 210. The second floor space above the 18th century block was originally at least half-height, if not a full second floor. The space was significantly altered, probably in the nineteenth century, as original wall studs were removed (the original stud pockets in the sill plate remain) and the corner posts were modified for the current attic configuration. The northwest corner post was observed intact and appears to have been cut down to a lower height to accommodate the current shed roof [*fig. 209-3*]. The south west corner post is not visible, but if it is intact it would be enclosed in a partition wall. The north east and south east corner posts have rotted and are missing; however, the tenons from the connecting sill plates remain intact.

Floor

- The floorboards are wide random-width floor boards (15-1/2" – 16-1/2"), which run east-to-west. The presence of small wrought nails indicates that this may be the original 18th century floor.

Walls

- The unfinished walls are exposed wood framing with the back side of the exterior sheathing boards visible.
- The knee wall framing is not original, as evidenced by the empty stud pockets in the sill plate. The current knee wall framing does not correspond with the pockets. This indicates that the original roof configuration was changed [*fig. 209-1*].
- A small section of the original 18th century west frame wall is intact, with horizontal sheathing boards, installed with wrought nails [*fig. 209-4 & 5*].
- Room 109 and Room 110 are separated by a partition wall of horizontal wood boards.
- The closet from Room 204 projects into the southwest corner of the room. The board closet wall is sheathed with insulation and cardboard.
- The south wall is opened to reveal the north wall framing of the main block. Any evidence of possible exterior sheathing on the main block wall was not found, and so it appears that this wall was never an exterior wall. According to this evidence, the 18th century block existed prior to the construction of the main block.

Ceiling

- The ceiling consists of exposed rafter framing.
- There was a roof leak observed at the time of survey.

Doors

- **Door 1/205**: Type d-F. Located on a 45 degree angle at the intersection of the south and west walls, this door leads to Room 205. 6-panel painted wood door leaf, significantly modified to accommodate floor sag.
- **Door 1/209**: [*fig. 209-4*] Type d-H. Located on the east wall, this is a simple board door that separates the two attic spaces.

Windows

- **Windows 212:** Framed window opening, sash is missing and replaced with a sheet of Plexiglas.

Figure 209-1. Room 209, knee wall along north wall. The wall stud members appear to have been added, as the original sill plate below has empty pockets that would have contained the original wall studs.

Figure 209-2. Room 209, looking north. The single existing 18th century structure corner post, since cut down in height, is visible in the center of the wall. The area left of the post is the northwest wing above Room 107 and the area right of the post is the 18th century block above Room 108.

Figure 209-3. Room 209, detail of cut-off 18th century structure corner post on north wall, as well as later roof plate, rafter, and knee wall framing.

Figure 209-4. Room 209, looking east. The attic space is above the original 18th century block. The partition wall in the right foreground with horizontal sheathing boards and wrought nails is possibly 18th century, however further investigation is needed to determine this. The frame partition wall in the background was added later and divides the original 18th century attic space.

Figure 209-5. Room 209, looking west at the possible 18th century frame wall, in center. The floor steps up at this point where the 18th century block meets the northwest wing.

Room 210 –
Room 210 is the unfinished attic space that contains part of the original 18th century structure and the entire northeast wing. The footprint of the original 18th century structure continues from Room 209 into the west section of this roorm. The northeast and southeast corner posts are missing; however, the tenons from the connecting sill plates are intact [*fig. 210-4*]. The sill plate along the north, east and south walls of the 18th century block contains the original stud pockets.

Floor

- The floorboards are wide random-width (8" – 13") plank boards, which run north-to-south. The nails in the 18th century block section are wrought while those in the northeast wing section are cut nails. There is an opening in the northwest corner of the room, directly above Room 108 where a scar is seen on the ceiling plaster surface. The opening in the floor may have been for an original staircase [*fig. 210-3*].

Walls

- The walls are exposed wood framing with the rear of the exterior sheathing boards visible.
- The partition wall between Room 109 and Room 110 is not original.

Ceiling

- Exposed rafter framing.

Doors

- **Door 1/209**: Located on the west wall, this is a simple board door that separates the two attic spaces.

Windows

- **Window 213:** Framed window opening, sash is missing and replaced with a sheet of Plexiglas.

Figure 210-1. Room 210, looking east. The attic space is above the work room and carriage house of the northeast wing.

Figure 210-2. Room 210, looking south at southwest corner. The original east wall plate of the 18th century block, running north-to-south is seen at the middle-left. The attic floor to the left of this is in the northeast wing. The horizontal board partition on the right that divides the attic space above the 18th century block was added later.

Figure 210-3. Room 210, looking north above the 18th century block. There is a board and batten door over an opening in the floor, shown moved in this image. It is possible that this opening was for a former staircase, as the opening aligns with the scars on the walls and ceilings below in Room 108.

Figure 210-4. Room 210, showing the original tenon plates at the northeast corner of the 18th century block (the corner post is missing).

ATTIC

Room 301 –

Room 301 is the unfinished attic space above the main block and the northwest wing and is accessed through a small ceiling hatch in Room 205. The structural systems of the attic and roof are discussed elsewhere in this report. The most significant feature of the attic is that the roof of the northwest wing was framed over the main block roof. The main block roof was, originally, a 4-sided hip roof and the original hip, sheathing boards, and shingles are still intact in the attic [*fig. 301-1*]. A portion of this original roof sheathing and shingles has been cut out to provide access into the main block attic.

The original portion of the roof has 1-inch thick solid sheathing boards that vary in width from 12-1/2" to 13-1/2". The shingles are white cedar, 3-1/2" to 7-1/2" in width, and installed with a 7" exposure. The shingles are spaced at approximately 4-1/2" – 5" with and attached with one row of cut nails.

Water damage to the roof sheathing boards is evident in the valleys of the roof. In general, these areas were repaired during the recent re-roofing. In some areas the deteriorated sheathing boards were cut out and left in the attic. Cellulose insulation has been blown in between all the attic floor joists. It has been compacted in some areas due to roof leaks and human contact. There are no floor boards for maintenance access and movement in the attic is very difficult. Visually the framing in the northwest wing attic is similar to the main block attic but because of the over framing it is evident that the northwest wing and the main block were not constructed concurrently.

The attic area above the northwest wing was investigated for possible evidence of the northwest wing being constructed in two phases. The attic area above Room 208 would be considered part of the phase two addition to the northwest wing, however from visual observation the hip roof framing of the northwest wing appears to be consistent. The chimney that extends through to the roof, in the area above and between Rooms 208 and 207, is not centered on the roof ridge. The ridge beam continues uninterrupted across the entire length of the northwest wing. There are also the remains of a metal stove pipe flue above Room 207, in the area where it was presumed a heating stove was previously located. Since the physical evidence is inconclusive, further investigation is needed to determine if the entire northwest wing was built in a single construction campaign or in two phases.

Figure 301-1. Room 301, looking west above the north side of the main block. The partial north main block hip roof, with sheathing boards and shingles intact, is visible with the northwest wing roof overframing above.

Figure 301-2. Room 301, the attic space in the west section of the main block showing the log ceiling joist, typical above Room 202, and cellulose insulation.

Figure 301-3. Room 301, looking east in the attic above the main block. The chimney mass and king post are in the right background. The roof rafters and board sheathing (now overframed by the northwest wing) are in the right foreground.

Figure 301-4. Room 301, view of the 5-sided ridge beam in the main block with pegged rafters and king post in the background.

1.2.3-A STRUCTURAL

An evaluation of the building's structural systems (floor framing, roof framing, etc.) was conducted by Qun Wu, P.E. of HDR Engineering, Inc. to determine the condition of the component structural members and to identify remedial work required to ensure continued structural stability. The structural evaluation consisted primarily of visual observations combined with selective, non-destructive probing of various portions of the building's structural framework which were safely accessible without the use of either staging or uncovering. These observations were performed on November 5 and 9, 2007. The findings of this structural engineering assessment are presented here in this report.

A structural engineering assessment was also performed by B. B. Diwadkar, P.E. of the National Park Service. The assessment prepared by the NPS engineer was presented in a memo from B. B. Diwadkar to the Chief Engineering, Northeast Region Boston Office, dated September 26, 2007. A copy of this memo is included in the Appendix of this report; excerpts of the memo are referenced in this section.

General Description

The building was originally designed and constructed as a residential structure. It is comprised of four distinct blocks: the main block located on the south-side and containing the first floor parlor and dining rooms is a 2-story, braced-frame, post and beam structure that was likely constructed circa 1810. The second block, the northwest wing, is of similar construction and likely constructed about the same time as the main block. The third block, the original 18th century block, is located north and east of the main block and includes dimensional lumber that appears to have been used to replace the original timber framing members. Although much of the framing appears newer, the third block likely predates both the first and second. The fourth block, the northeast wing, is located east of the original 18th century block. This post and beam structure also appears to include a replacement roof framed with dimensional lumber.

Allowable Live Load Capacity

In the process of rehabilitation, the building must be made structurally sound and the strength of the floor framing must be adequate to support at least the minimum live load requirements imposed by good practice and the building code for the intended use. The following table provides a summary of the minimum uniformly distributed floor loading for various uses recommended by the Building Code (ASCE/SIE 7-05, Table 4-1):

Occupancy or Use	Live Load (PSF)
Residences	
Uninhabitable attics	20
Habitable attics and sleeping spaces	30
All other areas	40
Offices	50

Additionally, the building is located in a zone 3 snow load area; the Massachusetts State Building Code requires that roof structures in zone 3 have a minimum uniformly distributed snow load capacity of 35 PSF.

Although the actual wood species has not been determined, the engineer assumed Northern Red Oak framing members for the first and second blocks. For strength, the engineer assumed that the original building material meets the current requirements "structural no. 2" for 2"-4" thick members and "structural no. 3" for members 5" x 5" and greater. The allowable extreme fiber bending stress and elastic modulus are 975 PSI and 1,200,000 PSI, for "structural no. 2" timbers and 875 PSI and 1,300,000 for "structural no. 3." For the reframed roofs, the material is assumed to be hem-fir No. 2 lumber with an allowable bending stress of approximately 875 PSI. By standard practice, the building code limits the allowable live load deflection to 1/360 of the span length.

Assessment of Live Load Capacity

This report includes an assessment of the live load capacities for floor areas where the structure could be seen; that is, the first floors of the main block and the northwest wing. The reader should also note that the scope of work associated with this Historic Structure Assessment Report (HSAR) was limited to an assessment of the structure rather than a full structural analysis. As a result, the engineer based the assessments on the structural members that appear to limit the floor's capacity. Additionally, the full extent of deterioration found in many of the members could not be definitively determined and therefore the effective dimensions of the remaining solid wood could not be accurately calculated. Because of these significant unknowns, the engineer assumed that these issues will be addressed during a future design phase and therefore based the assessment on fully-intact, non-deteriorated, and repaired members. Consequently, the reader should note that the actual live load capacities of the floors under existing conditions are likely to be much less that those presented in this report.

Given these qualifications, the engineer estimates that the original, fully-intact floor framing and posts would have provided the following Live Load capacities:

	First Floor	Second Floor
Main Block	19 psf	N/A
Northwest Wing	40 psf	N/A
Original 18th Century Wing	N/A	N/A
Northeast Wing	N/A	N/A

(N/A – Floor framing was not accessible)

Although this report includes suggestions for increasing the live load capacities, the engineer did not perform calculations for sizing these new structural elements. Such suggestions are included to provide an approximation for scope and cost estimating purposes only. Additional investigations and detailed design calculations will be required to address these issues fully.

Compliance with State Board of Building Regulations and Standards

Because the structure is listed in the National Register of Historic Places, the house is considered to be an "Historic Building" as defined by the State Board of Building Regulations and Standards, 780 CMR 3409.0. This section of the code specifically "preempt(s) all other regulations of 780 CMR governing the reconstruction alterations change of use and occupancy, repairs maintenance and additions for conformity of historic buildings and structures to 780 CMR". This section allows for repairs such as "patching, splicing, piecing-in, consolidating or reinforcing" of historic materials. When such repairs are not possible, "compatible materials may be substituted which closely convey the form and design as well as the visual appearance of the existing feature." (780 CMR 3409.3.1.2) As a result, there does not appear to be any regulatory requirements under the State Building Code to upgrade the structural systems for compliance with the current standards.

The reader should note that although full compliance is not required, the Code does state that the maximum "occupancy shall be limited by the actual structural load capacity." (780 CMR 3409.2.2.3)

For purposes of convention within this report, all descriptions of member sizes are full-dimension unless noted otherwise as nominal.

MAIN BLOCK

The main block measures 36′ east-west by 17′-11″ north-south and is built over a full basement. The foundation consists of mortared, rubble stone walls that are capped with brick masonry, dressed with cut granite blocks. While the structure is of braced-framed, post and beam construction, the exterior end walls are brick masonry. The southern and northern walls are assumed to be wood sheathing, however, no sheathing was visible during the observations.

The *first floor* is framed with 3x4 wood joists set at 24″ on center in some areas and 3x3 joists set at 24″ centers, spanning east-west, and bearing on 8x8 beams [*fig. S-1*]. Several of the joists have been replaced with 2x6 (nominal) lumber and a beam set along the east side of the basement stairs has been replaced with a 6x8 (nominal) beam.

Figure S-1. Typical first floor framing.

The beams are set at variable spacing from 4'-9.5" to 6'-3" on-center, span north-south, and bear on timber sill beams. The southern ends of the interior beams have been replaced with 6x8 dimensional timbers. These horizontal lap joints are supported by 2x6 (nominal) lumber blocking set on 6-inch diameter cedar posts. The locations of these posts are shown in the sketch. Where original joists connect to the replaced beams, 2x4 (nominal) lumber blocking has been scabbed onto the beam to support the joist tenons. Much of the remaining, original beam material is in poor condition from rot and insect infestation. The poor condition of the beams and unknown extent of the deterioration makes a load rating for the first floor problematic. The engineer estimates that if the members were fully intact and in good condition the original floor structure would have safely support a uniformly distributed live load of approximately 19 PSF. However, if the rotted material is fully removed, repaired, and additional post supports installed as described below, the framing should safely support a uniformly distributed live load of approximately 50 PSF.

The sill beams rest along the top of the foundation walls. Tom Nieves, the Acting Park Facility Manager, reported that repairs were recently made to the front door threshold and timber sill to address an infestation of carpenter ants. Portions of the south sill appear to be missing; where the sill appears to be intact, the structural soundness could not be fully determined by a visual inspection from the exterior. However, the southern end of the interior beam that connected to the sill under the front door is currently being supported by a steel post. Based on the need to support the beam end, the extensive replacement work that has been previously done, and the reported carpenter ant infestation, there is reason to believe that the deterioration of the southern sill is very extensive and on-going; further investigation is recommended.

The *second floor* structural members were not exposed and therefore no comments can be provided for these members.

Access to this *attic space* is extremely limited and can be gained only from the attic of the second block. Observations were limited to what could be seen from the western end of the attic. There is no flooring in the attic to support any live load. The attic floor framing consists of 8x7 timber beams set at 9'centers that span north-south. These north-south beams are assumed to be tie beams of five bents used to frame the structure. The tie beams of the second and fourth bents each support an 8x8 king post at mid-span [*fig. S-2*]. There is no king post at bent three. An 8x7 summer beam spans east-west just south of the king post and joins the tie beams of bents one and two. The eastern end of the attic was inaccessible and the presence of a similar beam between bents four and five could not be visually verified; however, the observed structural symmetry suggests that an eastern summer beam does exist. No summer beams were observed within bays two and three.

Figure S-2. King post framing in background.

Figure S-3. Half-round joists for ceiling support.

Two half-round joists, also spanning north-south, are spaced 37" on center within each bay to support the second floor plaster ceiling and wooden lath [*fig. S-3*]. No connections were observed between the ends of the joists and the top plates. The only means of support for the joists appears to be single, 1-inch thick boards of variable width that are attached near each end of the half round joists and suspended from the roof rafters. Although the boards do no appear to be original, no historic connection points for the rafters were observed on the top plate faces.

The hipped *roof* framing appears to be in generally good condition. The previously mentioned king posts at bents two and four are connected by and support a continuous, five-sided ridge beam. The side faces have been taper-cut perpendicular to the rafters. All roof structural members are connected with pegged, mortise and tenon joints. 8x8 principal rafters, spanning north-south, are located at bents two, three, and four. Additional 7x7 principal rafters, oriented east-west, span from the mid-spans of the tie beams of bents one and five to the ridge beam/king post connections at bents two and four, respectively. 6x6 hip rafters span diagonally from the ridge beam at the king posts to the principal posts of bents one and five. The corner end of each hip rafter bears on a 6x4 hammer beam aligned with the hip rafter. The hammer beam is supported by the principal post and a 4x4 horizontal, diagonal brace; this brace bears on the intersecting tie beam and top plate at each corner. 3x4 common rafters, oriented east-west, span from the tie beam of bent one to the hip rafters. Similarly within the first and fourth bays, 3x4 common rafters span from the northern and southern top plates to the hip rafters. Within bays two and three, 3x4 common rafters, set approximately 3' on-center, span north-south between the top plates and the ridge beam. A common rafter located on the north side of bay two is cracked in half and should be repaired with a sister rafter. Assuming repair of the cracked rafter, the roof should continue to perform satisfactorily to support a uniformly distributed snow load as it has in the past.

NORTHWEST WING

The northwest wing measures 49′ east-west by 14′-6″ north-south and is built primarily over a shallow, dirt floor, crawl space. The western most section of this block has a low-clearance, dirt floor basement. The foundation consists of mortared, rubble stone walls that are capped with cut granite blocks on the south and west sides. The northern side is constructed of mortared, uncoursed, stone rubble. There is no foundation on the east side that remains open to the third block. The structure is of braced-framed, post and beam construction sheathed in wood boards.

The *first floor* is framed with 3x5 wood joists set at variable centers of 18, 23, and 27 inches. The joists span east-west and bearing on 8x9 beams. The joists are connected to the beams with 3x3, bottom-shouldered tenons. The floor beams are set at 12′ centers, span north-south, and bear on timber sill beams. The floor beams have been intermittently shored with various stone and brick piles and wood piers. Some of these intermittent supports have deteriorated beyond their utility [*figs. S4 & S5*]. The floor beam located west of the back door is in poor condition from rot and insect infestation; this beam has been double-sistered with 2x8 (nominal) lumber that bears on a stone rubble pier. The joists in this area are similarly rotted and have also been sistered with 2x4 (nominal) lumber. Assuming that the rotted material is fully removed and repaired and the existing rubble posts replaced with masonry posts, the repaired framing should support a uniformly distributed live load of approximately 40 PSF.

Figure S-4. Shoring of first floor beam.

Figure S-5. Shoring of first floor beam.

Figure S-6. Replaced section of south sill beam below door.

The sill beams rest along the top of the foundation walls. There are signs of rot at various points along the sill, primarily below the south side door and below the north-side window located east of the chimney. A section of the sill below the south door appears to have been replaced with no visible ties to the original sill [*fig. S-6*]. The shallow crawl space is crisscrossed with various heating, and plumbing pipes such that access could not be gained to the eastern end of the block. An exterior probing of the sill found it to be intact. However, the locations of the observed rot in the basement side may be indicative of water damage from above; further investigation is recommended.

Some evidence of insect damage was observed in various joists and beams throughout the frame. Some of the beam are checked longitudinally and should be repaired.

Figure S-7. Sister beam and cut beam at northeast corner.

There is evidence of extensive damage at the northeast corner of this block. The floor of the second-floor bathroom has been extensively shimmed to compensate for significant settlement at the post. The eastern-most, second-floor beam was cut straight through and sistered with a 4x6 (nominal) timber bolted to the east side to make room for a cast iron plumbing vent stack [*fig. S-7*]. The northern end of the sister beam is enclosed with sheathing and other wall materials, therefore, the engineer could not determine how this sister beam is supported on its northern end. The beam did not exhibit active movement, appeared to be stable, and not in imminent danger of collapse. However, a definitive determination cannot be made without removal of the historic fabric.

Some of the exterior sheathing had been removed at this post by park staff and the post appears severely deteriorated from water and insect damage [*fig. S-8*]. Probing under the sheathing at the base of the post did not provide any evidence of either an intact sill or other means of support for the post at this location. Variations in the alignment of the shingle siding and the roof soffit provide circumstantial evidence that there has been significant settlement of the post. Such settlement would appear to explain the significant pitch in the second floor bathroom and hallway. A structural engineering assessment performed by B. B. Diwadkar, P.E. of the National Park Service questions the integrity of the structure and recommends further investigation. The structural engineer for this report agrees with Mr. Diwadkar that the floor in this area should be considered unsafe for any use.

Figure S-8. Deteriorated post with exposed end of sister beam located to the left.

The flooring that had been removed by park staff in the second-floor bathroom allowed a limited observation of the *second floor* framing [*fig. S-9*]. The 3x5 joists, spanning east-west, are set on 28" centers and bear on 6x6 floor beams set on 48" centers. The remaining second floor structural members were not exposed and therefore no comments can be provided for these members. As a result, a uniformly distributed live load rating cannot be determined for the second floor at this time. A severe cross slope in the second floor hallway around the stairs indicates that the floor framing may have been compromised.

Figure S-9. Shimmed floor at northeast corner.

There is no flooring in the attic to support any live load. Observations were limited to what could be seen from the eastern end of the attic. The attic floor framing appears to be in good condition and consists of 7x7 timber beams set at 9'-4" centers, spanning north-south, bearing on posts that are connected by 7x7 header beams. The north-south beams are assumed to be tie beams of six bents used to frame the structure.

Joists spanning east-west connect the mid-spans of the tie-beam. However, they appear to serve only to support the wood lath and plaster ceiling.

The hipped *roof* framing appears to be in good condition with a five-sided, east-west ridge beam is supported by principal and common rafters that bear on the posts and top plates of both the north and south walls [*fig. S-10*]. The side faces of the ridge beam have been taper-cut perpendicular to the rafters.

Figure S-10. Hipped roof framing.

All roof structural members are connected with pegged, mortise and tenon joints. 6x6 principal rafters, spanning north-south, are located at bents two through five. Additional principal rafters, oriented east-west, span from the mid-spans of the tie beams of bents one and six to the ridge beam at bents two and five, respectively. 6x6 hip rafters span diagonally from the ridge beam to the principal posts of bents one and six. The corner end of each hip rafter bears on a 6x4 hammer beam aligned with the hip rafter. The hammer beam is supported by the principal post and a 4x4 horizontal, diagonal brace; this brace bears on the intersecting tie beam and top plate at each corner [*fig. S-11*].

East-west, 3x5 common rafters are set approximately 36" on center within the first and fifth bays span from the tie beams of bents one and six to the hip rafters. Similarly, north-south common rafters span from the northern and southern top plates to the hip rafters. From bent two to five, 6x6 common rafters, set approximately 36"on-center, span north-south between the top plates and the ridge beam. A second ridge beam extends from the eastern end of the main ridge beam south to the roof of the main block. The means of connection with the main block roof is unclear. The common rafters in this section bear on the roof sheathing of the main block [*fig. S-12*]. The roof framing appears to be in good condition and should continue to perform satisfactorily to support a uniformly distributed snow load as it has in the past.

Figure S-11. Hip rafter connection to hammer beam support.

Figure S-12. Typical roof framing.

ORIGINAL 18TH CENTURY BLOCK

The original eighteenth century block measures 18'-6" east-west by 14'-6" north-south and is built over a shallow, dirt floor, crawl space. The foundation consists of mortared, rubble stone walls. There is no foundation on the west side that remains open to the northwest block and the south foundation could not be accessed for a visual inspection. The crawl space is inaccessible in this area and a visual inspection of the first floor members was precluded by the presence of fiberglass insulation. Intermittent piers similar to those in the northwest block were observed below this section. Further inspections might be made if the flooring is removed as discussed in the discussion of the northwest wing.

The first floor shows signs of differential settlement towards the north wall. The brick kitchen hearth shows significant deterioration that may be related to this settlement. Additional investigation is recommended to determine the condition of the first floor structural members.

The second floor framing has been stressed by the settlement in the northwest corner located adjacent to the deteriorated post in the northwest wing.

The roof rafters have been replaced with 2x8 (nominal) lumber set 19" and 24" on-center in the eastern and western portions, respectively. The rafters span north-south and bear on a double top plate constructed of 2x4 (nominal) lumber on the north side. The top plate bears on 2x4 (nominal) wall studs set approximately 16" on-center [*fig. S-13*]. However, additional framing details cannot be confirmed since the wall studs are not accessible at the first floor level. The southern end of the rafters bear on the top plate of the main block southern wall.

Figure S-13. Framing at north wall of the original 18th century block.

NORTHEAST WING

The northeast wing of the house is a braced-frame, post and beam structure that measures 23′-0″ east-west by 14′-6″ north-south. The first floor consists of a storage room and a garage. The second floor attic may have been used for storage. The crawl space below the storage room was inaccessible. From the exterior, the foundation appears to be dressed granite blocks on the south and east sides with uncoursed, mortared stone on the north side. The granite blocks at the northeast corner appear to have settled inward towards the rubble wall [*fig. S-14*]. Although this condition causes the sill and structure to project unsupported, a few inches from the foundation, the structure appears to be in good condition and does not appear to be in danger of collapse.

Figure S-14. Foundation at northeast corner.

The sills in the western half of this wing could not be inspected because of lack of access.

The attic floor joists are unfinished, rounded logs of variable diameter that span north-south. The second floor is supported by round joists of variable diameters set on approximately 30" centers and span 8'-2" and 10-5" in the western and eastern portions, respectively. A broken joist in the northeast corner should be replaced. The joists tie into the floor beams that span east-west along the southern and northern exterior walls. The south wall shows evidence of movement in the frame with tenon pull-out in the southern, second-floor tie-beam [*fig. S-15*].

Figure S-15. Tenon pullout on tie-beam at south wall.

Figure S-16. Second floor joists.

The roof structure was replaced in the 1930's with dimensional 2x6 (nominal) rafters set 20″ on-center. There are 1x7 wood collar ties installed at every third rafter. The rafter ends bear on a single 2x4 (nominal) top plate that is supported by 2x4 (nominal) wall studs set 20″ on-center. The studs bear on a 2x4 (nominal) base plate that bears on the original timber top plate. Although this connection is unconventional, the structure does not show signs of failure at this point.

Figures S-17 & 18. Roof framing in the northeast wing.

1.2.4-A HVAC

Primary Heating

Primary heating for the building is provided from a single hot water heating boiler (located in the basement) and a section of electric baseboard located in a first floor room adjacent to the kitchen (east side).

The primary heating boiler supports terminal hot water heating equipment that includes cast iron convectors and fin-tube baseboard mounted radiation. The boiler is an H.B. Smith Company Series 8 model, cast-iron sectional style device rated for 169 MBH. The boiler is fitted with a forced-draft oil burner, fed with 120V, single-phase, electrical service [*fig. H-1*].

Figure H-1. Hot water boiler.

The heating boiler was installed in the last 10 years and is in good condition. The latest boiler service was conducted on the 19th of February, 2008. During the service, the boiler fuel supply train was cleaned, and burner settings tuned. Preliminary load estimates for the building indicate the boiler has adequate capacity to provide heating hot water for the building.

Combustion air intake/relief for the boiler is provided by local room air only; no intake ductwork systems are installed. The volume of the basement is approximately 4500 cubic feet. This volume does not meet the State mechanical code required volume for local room air combustion air supply (for the installed boiler).

The boiler's breeching and stack system consists of a steel flue vent connecting to a masonry chimney that discharges above the roof. The masonry portion of the stack is lined and fitted with a vent cap. The metal breeching connecting to the masonry chimney is in good condition, as is the barometric draft damper system and the vent cap.

Heating fuel for the boiler is stored in a horizontal steel tank located in the basement. The tank holds approximately 275 gallons and is in marginal condition with signs of corrosion at the seams and connection points [*fig. H-2*].

Figure H-2. Heating Oil Tank.

A single piece of electric baseboard heating is also installed in a small corridor area of the room adjacent to the kitchen (on the east side) [*fig. H-3*]. This baseboard unit is in marginal physical condition (bent enclosure) but is operable.

Figure H-3. Electric Baseboard.

Primary Cooling

The house has no mechanical cooling systems installed.

Hydronic Distribution Systems

The building hydronic distribution systems consist of two hot water heating loops providing hot water from the boiler and pumped to cast iron radiators [*fig. H-4*]. The pumps are identical Taco Company in-line centrifugal circulators; both are in good condition. The two hydronic loops are controlled via independent, wall mounted electronic thermostats. Zoning is split between the east and west sides of the building (both floors).

The overall physical condition of the hydronic systems above is fair to poor. The original building heating system appears to have been fireplaces, replaced with a steam system, and subsequently replaced with hydronic heating equipment. When converted to hot water service, several of the existing heating pipes were reused in many places (particularly the risers). The physical condition of the piping, particularly in the basement, is in poor condition. There are multiple areas exhibiting signs of corrosion and deterioration. The terminal heating equipment (radiators) are in marginal condition [*fig. H-5*]. Isolation valves, air vents, and enclosures are in many cases inoperable, and/or damaged.

Figure H-4. Hydronic circulator pumps.

Figure H-5. Typical cast iron radiator.

Air Distribution Systems

There is no mechanical ventilation or supply air distribution systems installed in the building. Building code required outdoor air ventilation is provided by operable windows. The window size and quantity exceeds that required by State mechanical codes for natural style ventilation.

Exhaust systems throughout the building consist of toilet and kitchen hood exhausts. These systems include ceiling or hood mounted fans (kitchen only) ducted above the ceiling to wall mounted exhaust vents with backdraft dampers. The fans operate from local switching and were all operational at the time of inspection.

HVAC Code Issues

Boiler combustion air intake system is not compliant with State Mechanical code; high and low intake/relief system not provided.

1.2.5-A PLUMBING

Domestic Water Service

The municipal domestic water service for the building enters basement. The 3/4" service is fitted with a positive displacement style, utility grade water meter. An exterior remote reader device is installed to allow utility monitoring. The service also includes a 3/4" connection that is routed to a buried plastic pipe serving a hose bibb located in the ground within the adjacent barn.

The water service is in fair physical condition with minor corrosion around the basement level fittings. The water supply is adequate for support of the existing plumbing fixtures throughout the facility.

Figure P-1. Domestic water service

Domestic Distribution

Plumbing systems consist of cold and hot water piped throughout the building. The system serves sinks, lavatories, showers, a washing machine connection, and exterior hose bibbs. Hot water is generated by a 66 gallon electric water heater located in the basement. The heater is in good physical condition [*fig. P-2*]. Domestic water supply piping is primary copper material, un-insulated, and in fair condition [*fig. P-1*].

Figure P-2. Domestic Hot Water Heater

Floor mounted, tank type water closets, and wall or counter-mounted lavatories are the standard configuration for the bathrooms. There is a single half-bath on the first floor and a single full-bath on the upper level. The upper level tub/shower assembly is a built-up style with tile walls [*fig. P-3 & 4*]. The kitchen sink is stainless style with single handle faucet. The lower level plumbing fixtures (kitchen and half-bath) are in fair condition; the tailpiece on the lavatory has some corrosion [*fig. P-5*]. The upper level bathroom fixtures are in poor condition; the water closet is currently not installed due to some plumbing repairs made at the fixture connections.

Figure P-3 & 4. Upper Level Plumbing Fixtures.

Figure P-5. Lower Level (half bath) Plumbing Fixtures.

Sanitary and Venting

The building has gravity sanitary services within that exit the building to a site lift station [*fig. P-6*]. The lift station is provided with duplex pumping, controlled by an electronic pump control package located in the basement. System venting is connected to all fixture drains and exits the roof at several locations. Sanitary and vent piping is a combination of cast iron with PVC repair in some locations.

At the time of inspection system leak at the upper level water closet was under repair. With respect to physical condition the piping system varies; some sections in the basement exhibit significant corrosion.

Internal piping condition and the physical and operational condition of the sewage lift station were not observable at the time of inspection. It is recommended the piping and lift station be internally evaluated as well.

Figure P-6. Sewage Lift Station

Storm Water

The building roof systems drain to exterior gutter and downspouts; no internal storm drainage systems are installed. The addition of roof gutters and downspouts would help direct water away from the building. It should be noted that the introduction of gutter and downspout elements have architectural considerations that are discussed in further detail in the architectural section of this report.

Fuel Supply

The building has only a No. 2 fuel oil supply; see the mechanical section for further details on the fuel oil storage tank.

Plumbing Code Issues

None noted.

1.2.6-A FIRE SUPPRESSION

Fire Water Service

The building has no fire protection water service. Portable fire extinguishers are currently located in the basement near the base of the stairs, in the kitchen near the sink, and at the top of the stairs on the upper floor.

Pressure Pumps

The building has no fire protection pumps.

Sprinklers and Standpipes

The building has no sprinkler or standpipe systems.

Fire Protection Code Issues

None noted. The current State of MA buildings codes do not require sprinkler systems in the house. It should be noted, however, that NPS Director's Order #58 (implementing Reference Manual #58), may require sprinkler systems in the house pending case-by case review by NPS regional fire safety official, as the authority having jurisdiction (AHJ).

1.2.7-A ELECTRICAL

Main Electric Service

a. Description:

The ensuing descriptions are based on visual assessment at the site. The electric service is supplied to the main building via a 240/120 Volt, 1-phase, 3-wire feeder. This feeder originates from a pole-mounted transformer, then, it is run overhead to the building and connects to a weatherhead [*fig. E-1*]. From the weatherhead the service is run in a surface mounted conduit down following the corner of the building to a utility company meter #3795723-1871145 [*fig. E-2*]. From the meter the service is run into the basement feeding the Main panelboard.

b. Assessment:

The existing 200Amp service lateral is adequate for the present residential type use. The conductors appear to be in good condition and are sized by the utility company for a 200Amp service. The conductors from the load side of the meter #3/0, which is appropriate for a 200Amp service.

Figure E-1. Main incoming service feeder.

Figure E-2. Utility meter.

Power Distribution

a. Description

Power is distributed from a panelboard (15-20 years in service) [*fig. E-3*] which contains the following:

- Main circuit breaker: 200A, 4-pole circuit breaker. The incoming phase conductors land on two poles each. This arrangement effectively creates a condition where each phase leg is connected to two circuit breakers in parallel. There is no technical reason for this type of circuit breaker.
- The panel contains (40) branch circuit breakers with a mix of 15A and 20A single pole breakers in addition to (1) 20A-2P, (2) 30A-2P and (1) 50A-2P.
- The 20A-2P circuit breaker feeds the barn.

Branch circuiting for both structures is distributed throughout the buildings using a multitude of wiring methods, i.e. cloth sheathed, metal sheathed (type AC), and non-metallic sheathed cable (romex) wiring. The wire sizes used for the branch circuits consist of #14, #12, #10 & #8 based on the circuit breaker to which the conductors are attached.

Figure E-3. Main panelboard.

Figure E-4. Typical wiring methods.

Wiring devices in both structures consist of a variety of types. The majority of the devices are 15A, 2-prong, non-grounded devices; grounded devices are sporadically used throughout the property - primarily in the barn. There are no ground fault protected devices in use on the property.

a. Assessment:

In summary, the existing electrical distribution system is the result of many years of additions, modifications and re-configurations. The level of quality runs the gamut of home-owner level to professional electrician. From a safety perspective, it would be very difficult to trace the wiring in case of a failure. As a whole, the system has reached the end of useful life. The lack of grounding, ground fault protective devices and arc-fault protective devices is a major safety issue. The site personnel were not aware of any problems with the system. The 200Amp, 4-pole main circuit breaker is a serious safety concern and should be replaced whether or not any renovation takes place.

Refer to attached floor plans for additional information [*fig. MEP-1 - 3*].

Lighting System

a. Description:

The existing lighting throughout the main building consists of surface mounted, wall and ceiling fixtures with incandescent sources. In general, the lighting systems are old, but in a fair state of repair. The existing interior lighting fixtures throughout the house are generic fixtures inconsistent with the historic nature of the facility.

Exterior lighting consists of wall-mounted fixtures with incandescent sources. The lights are in fair condition.

Exit signs are not in use.

b. Assessment:

The lighting fixtures are at the end of useful life using inefficient sources. Based on the balance of the electrical system it would be reasonable to say that most of the fixtures are not grounded.

Refer to attached floor plans for additional information [*fig. MEP-1 - 3*].

Fire Alarm System

a. Description:

The building is equipped with a non-addressable fire alarm system with a head end dialer as manufactured by Ademco. The control panel appears to be at least 10 years old. The system consists of a mix of hard wired and battery powered smoke detectors and combination smoke/carbon monoxide detectors, located on each level and system horn/strobes located in the stairwell at the top and bottom. The quantity of devices is minimal, but protects the building based on residential requirements.

b. Assessment:

The fire alarm control panel appears to be in serviceable condition but must be functionally evaluated by the Ademco vendor.

Refer to attached floor plans for additional information.

Security system

a. Description:

The security system consists of a touch pad at the main entry with door and window sensors throughout the first floor [*fig. E-5*]. Also, there are motion sensors at the first floor. Functionality was not determined or part of this scope. The security system only protects the main building.

b. Assessment:

The security system appears to be functional and in fair condition.

Refer to attached floor plans for additional information [*fig. MEP-1 - 3*].

Figure E-5. Security key pad.

Telephone and cable television (CATV) services and wiring

a. Description:

The telephone and CATV services come overhead from the utility pole across the street and attach to the building in the same location as the electric service [*fig. E-1*]. The interior wiring [*fig. E-6*] was accomplished with a mix of surface mounted wiring and terminal connection boxes and concealed wiring and surface mounted terminal connection boxes. The telephone wiring in the basement is a combination of telephone company wiring and homeowner type wiring. There is a large quantity of telephone cables that are disconnected and abandoned in place.

b. Assessment:

The combination of active and abandoned telephone cables present a confusing starting point for any potential renovation.
The CATV distribution and outlet locations can be re-configured for residential applications.

Refer to attached floor plans for additional information [*fig. MEP-1 - 3*].

Figure E-6. Typical telephone and CATV wiring.

Electrical Code Issues

- Both structures require updating to current Electrical code.
- Commercial occupancies require all receptacles to be mounted at a minimum 15″above finished floor due to ADA requirements.
- Residential occupancies require receptacles to be installed on 12′ spacing throughout the building with special requirements for kitchen counters.
- Commercial occupancy requires exit signs and emergency battery-powered egress lighting. This lighting must illuminate the means of egress both interior and exterior.
- Most of the receptacles within both structures are not grounded, or ground fault protected.
- Bedrooms do not have arc-flash protected receptacles.

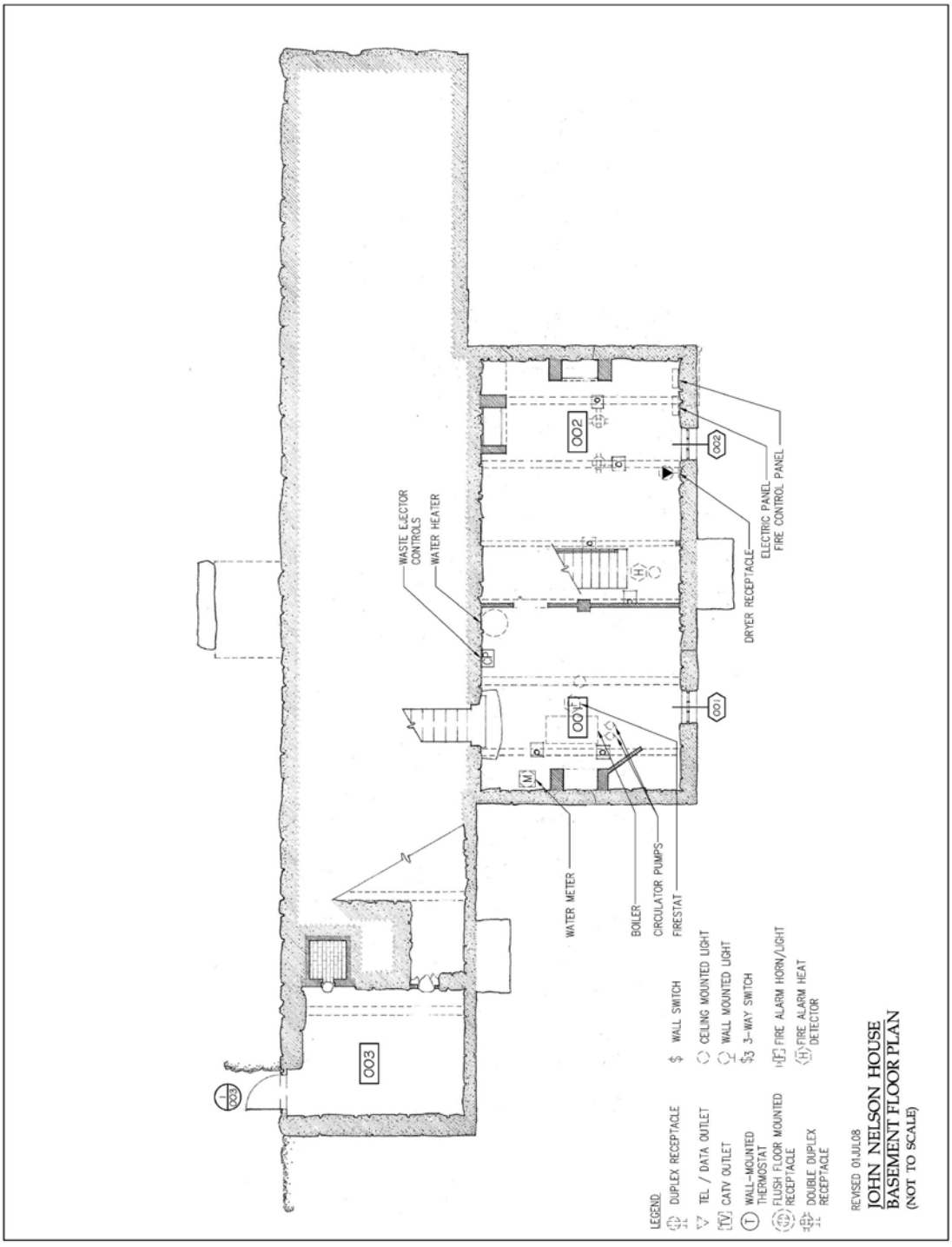


Figure MEP-1. Mechanical, Electrical, and Plumbing key plan, Basement.

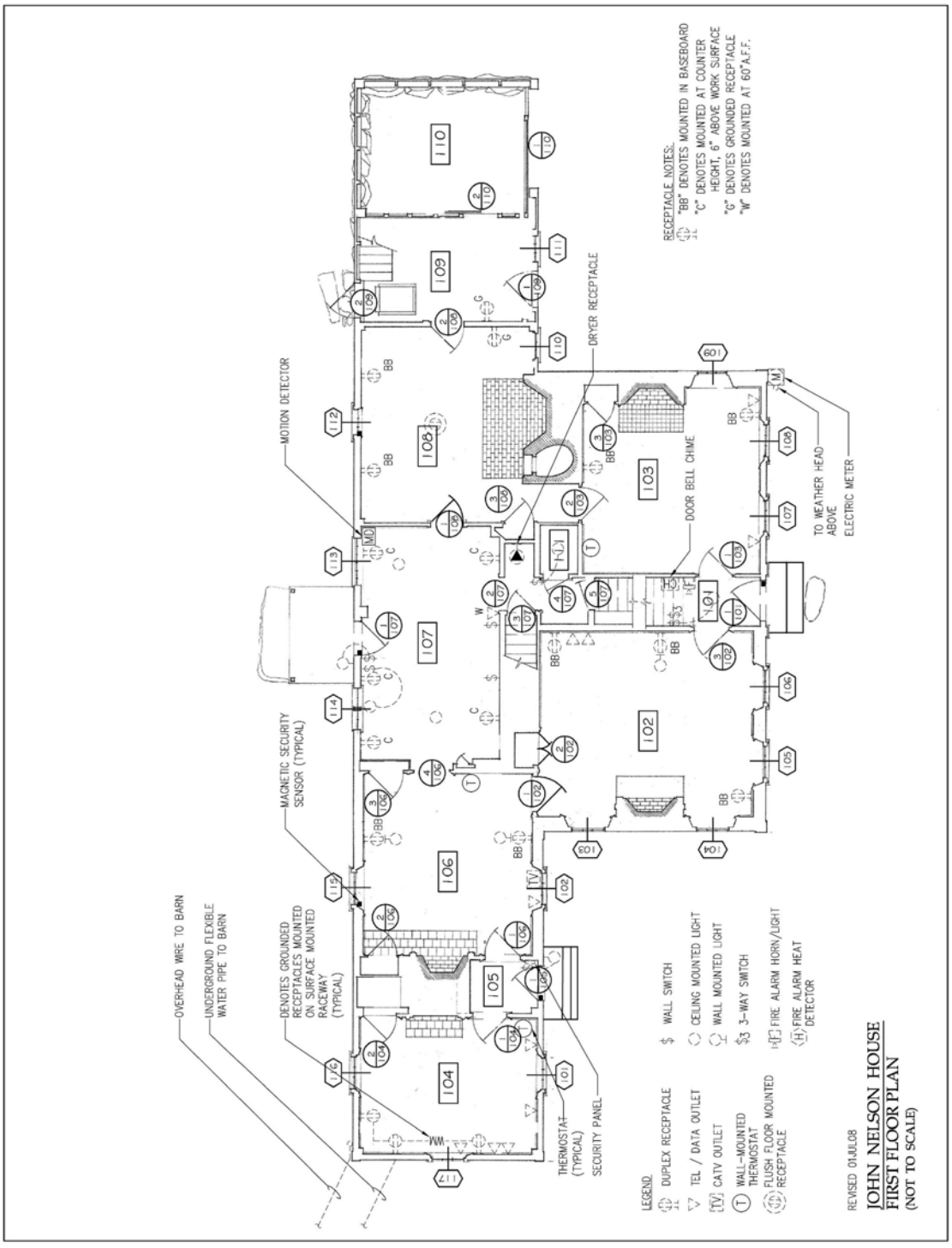


Figure MEP-2. Mechanical, Electrical, and Plumbing key plan, First Floor.

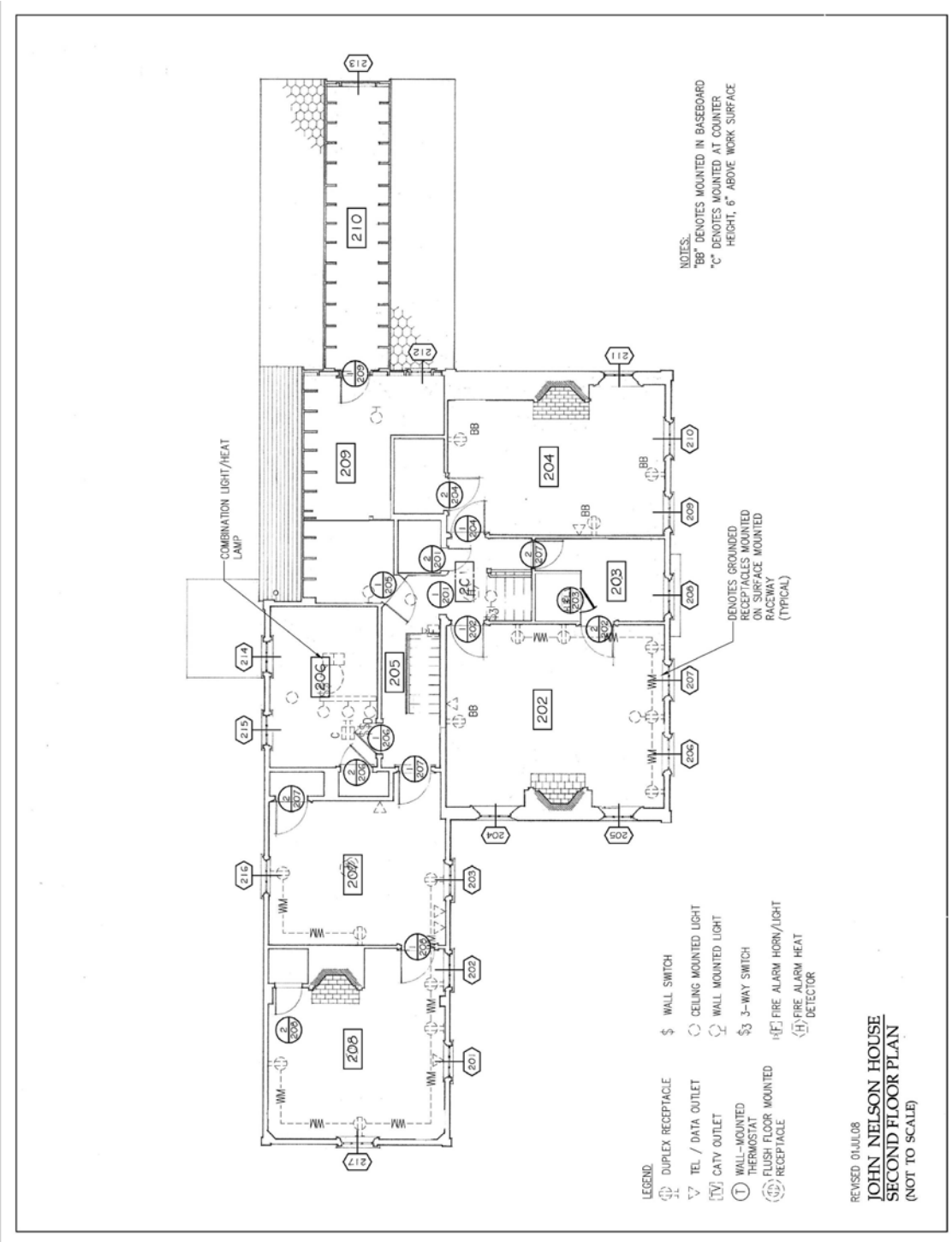


Figure MEP-3. Mechanical, Electrical, and Plumbing key plan, Second Floor.

1.3-A CHARACTER-DEFINING FEATURES

To aid in the process of planning for the preservation, treatment and potential reuse of the John Nelson House, a general summary of the character-defining features is provided below including a list of extant exterior and interior elements which contribute to the architectural and visual character of the property. Missing features that would be considered character-defining are also listed where archival or physical evidence indicates that they were once present.[16] Included are references to the defined periods of significance for the John Nelson House and Barn, which are discussed further in section 2.1-A, Treatment Philosophy.

EXTERIOR FEATURES –

Orientation to the south facing North Great Road (Route 2-A).

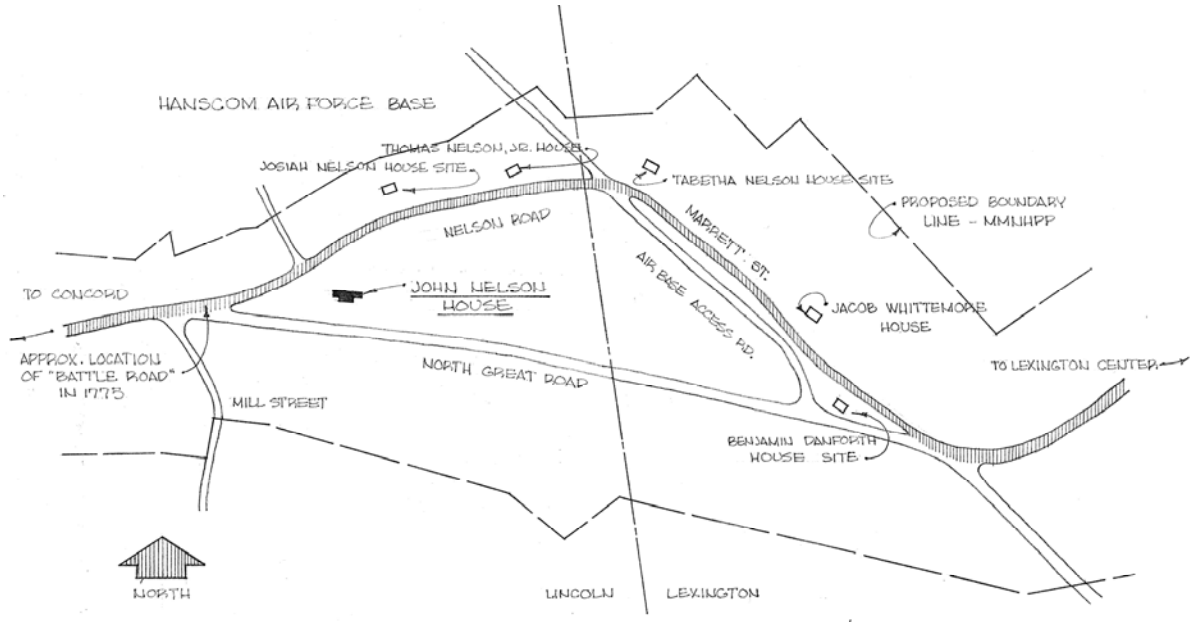


Figure 1.3A-1. Site plan, not to scale. (adapted from HABS drawings).

When the main block of the John Nelson House was constructed in the time period of 1808-11, the immediate surrounding landscape consisted mainly of forest with some open field farmland. Nelson Road, the major thoroughfare of that time, lay just a few hundred feet to the northwest of the house site. Nelson Road is also called Battle Road in commemoration of the events that took place along the road on April 19, 1775 between the Colonial militia and the British forces. Running west-to-east and turning northeast before reaching the Nelson properties, Nelson Road was the main road between Concord and Lexington. A new road called North Great Road (now Route 2-A)

[16] For additional information regarding period building materials that survive in situ and evidence for missing and removed features, see Sections 1.1-A through 1.6-A.

was developed to the south of the house site around 1802-06.[17] This was concurrent with the construction of the main block addition to the existing eighteenth century frame structure that existed on the John Nelson property. Rather than construct the main block oriented to the north or northeast, facing Nelson Road and the other Nelson family properties, the addition was intentionally oriented south facing the new road. Subsequently, North Great Road became the major road between Concord and Lexington during the nineteenth century, while Nelson Road became a secondary road.

[17] Dietrich-Smith, Foulds, Selvek, Laham, and Harris, "Cultural Landscape Report for Battle Road Unit, Minute Man National Historical Park, pp. 7, 48.

Wood shingle roofs (replaced with asphalt shingles).

The original main block roofing material was white cedar shingles on horizontal sheathing boards, as evidenced by the existing section of the main block roof that remains intact in the attic. As described in Section 1.2.2.3-A, the white cedar shingles are approximately 15″ long by 12-1/2″ to 13-1/2″ wide. The butt thickness is 3/16″ and tapers to less than 1/16″. The shingles are installed using early machine-cut nails with an exposure of 7″. The roofing material installed after the construction of the northwest wing in the early 19th century and northeast wing in the early 20th century is unknown, since no record or physical evidence exists, but most likely the roof was wood shingles. The roofing material is an important visual element of the house, critical to its historic character.

Figure 1.3A-2. Portion of original wood shingle and machine-cut nail, as found in Attic 301.

Form and massing of the building as indicative of 19th century Federal New England country residence.

The Federal style building expression became popular in the Boston area during the last decade of the eighteenth and the early nineteenth centuries. The refined, delicate style was a reaction to the heavy Georgian style that permeated the eighteenth century, as well as a movement to define an American architectural identity (see section 1.2.2.2-A for a more detailed discussion of the Federal style). Asher Benjamin published a number of builder's guides in the early 1800s that succeeded in introducing Federal details and forms to the common carpenter. John Nelson was one of the many New England carpenters and housewrights to be inspired and directed by Benjamin's works. The John Nelson house clearly presents this influence in its form, massing and expression of detail.

In his book *The American Builder's Companion: or a New System of Architecture Particularly Adapted to the Present Style of Building in the United States of America*, first published in Boston in 1806, Benjamin presented the elevations and plans for a house "Intended for a Country Situation." [*fig. 1.3A-3*] The house consists of a 2-story center block with flanking 1-story wings on each side. Notable as key features of the Federal style in this house design are the symmetrical facades, the raised foundation wall of cut stone, the hipped roofs, and end wall chimneys. John Nelson owned a copy of the 1806 edition, which is currently in the collection of the Museum of National Heritage in Lexington, and he must have referred to his copy when he and his brother Josiah planned and built the house c. 1808-11.

Granted, the John Nelson House is not an exact replica of Benjamin's Country House design, especially with regard to the floor plan. In elevation the Nelson House main block is five bays wide instead of four, it has an entrance door in the middle of the center block, and one of the wings is two stories instead of one. If the conjecture that the northeast wing was not constructed until the early twentieth century is accurate, then admittedly the John Nelson House form was not symmetrical for the duration of the nineteenth century. It is possible, though, that the symmetrical form was John Nelson's original design intention, not fully realized until the early twentieth century. The Nelson House does possess design elements that feasibly could have been influenced by Benjamin. The symmetrical main block is central, sitting proud of the flanking wings. The foundation walls of the primary south elevation are faced with ashlar granite slabs. The tall brick chimneys are located at the end walls of the main block. The architectural detailing and millwork are found to be heavily influenced by details found in Asher Benjamin's builder's guides, as will be discussed further in this section. The John Nelson House is a significant example of rural Federal style residential architecture.

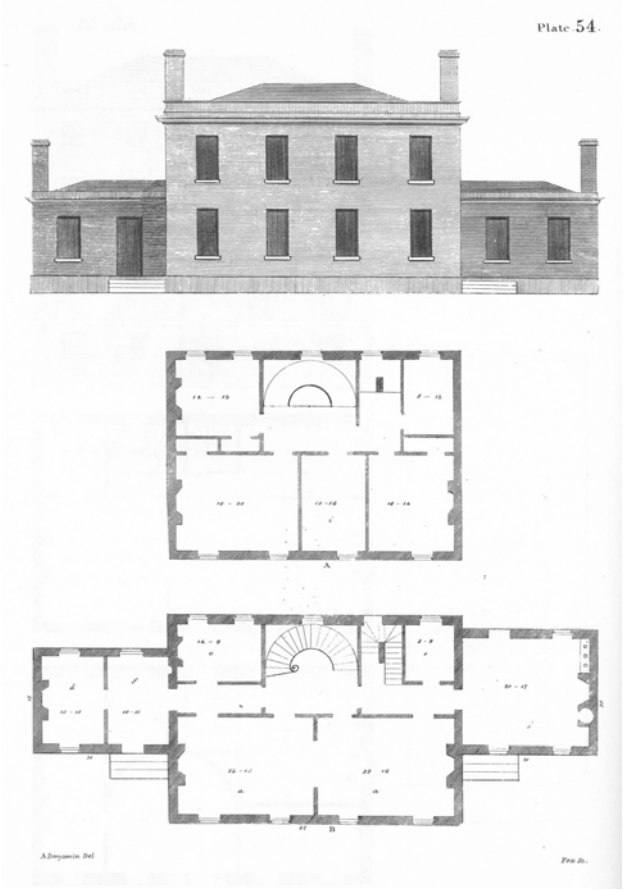


Figure 1.3A-3. Plate 54: "Plan and Elevation for a House which is Intended for a Country Situation" from *The American Builder's Companion* by Asher Benjamin. Image from 1969 Dover Books reprint of the sixth edition, 1827.

Figure 1.3A-4. South elevation of the John Nelson House.

Existing fenestration.

There are two historic window types found at the John Nelson House: single-hung wood sash with 6-over-9 lights at the 18th century block and the 6-over-6 double-hung sash found throughout the remainder of the 19th century structure. Types A and B are both 6-over-6 double-hung with similar sized sash and visible glass. The windows differ in the details of their exterior and interior trim. Both types appear to have original wood sash from the early 19th century intact with some original glass lights [*fig. 1.3A-5*]. Type C is the 6 over 9 single-hung window. This is most likely the original sash light configuration dating from the construction of the 18th century block, but the current sash appear to be replacements [*fig. 1.3A-7*].

The 6-over-6 configuration of the Types A and B windows, along with the narrow muntins and large glass size, is characteristic of Federal style windows. Asher Benjamin detailed a similar window in *The American Builder's Companion*, first published in 1806 [*fig. 1.3A-6*]. Josiah and John Nelson may have referred to this book when designing the windows for the house.

The 6-over-9 configuration and smaller light size of the Type C windows, found only in the 18th century block, are characteristic of windows earlier than the Federal period. The two windows that fall into this category, windows 110 and 112, appear to be in their original locations. The fact that the window locations and configurations remain intact despite the major changes made to the house during the 19th century is important because the windows retain the character of the 1775 period of significance.

Figure 1.3A-5. Windows Type A on the left and B on the right.

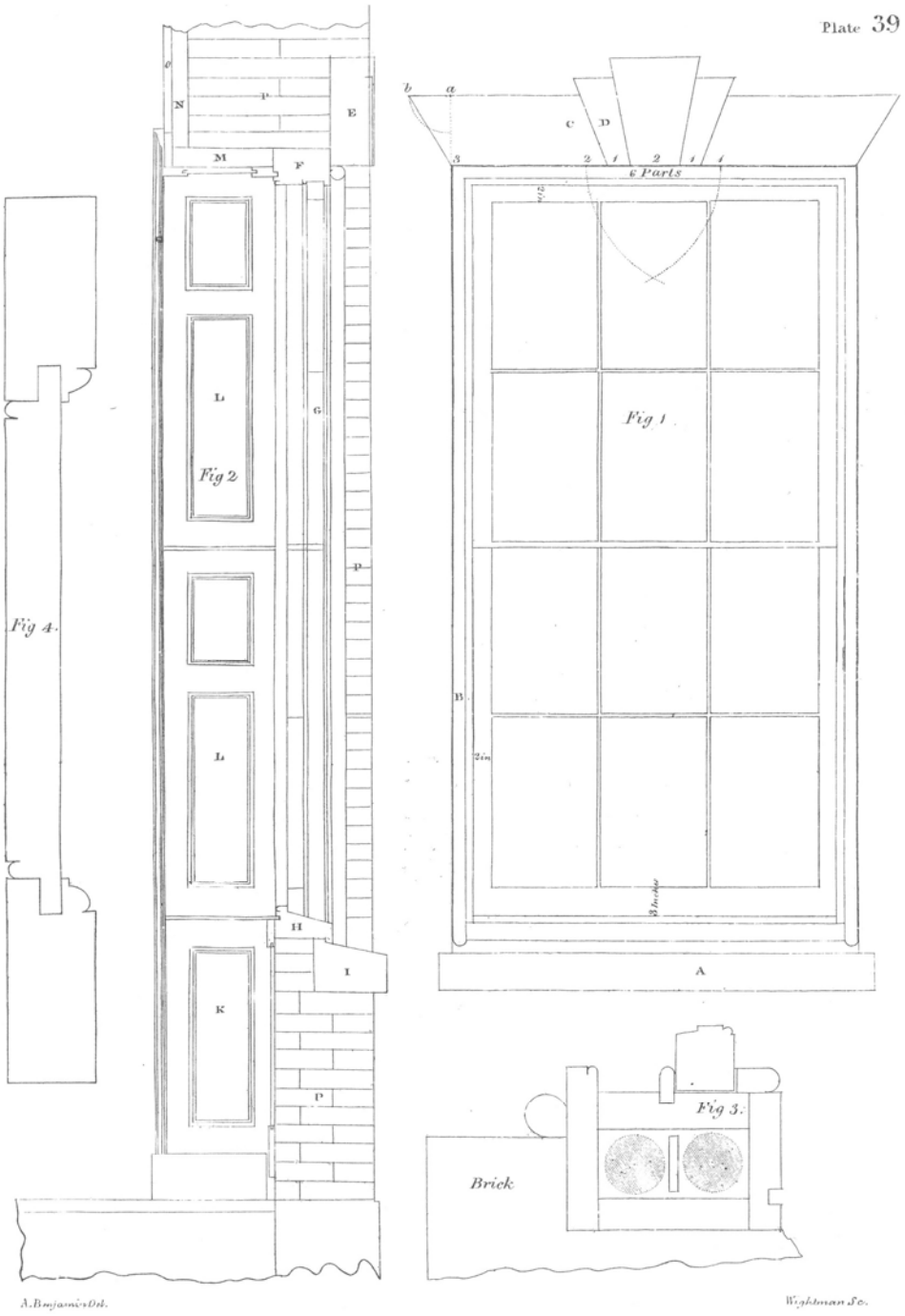


Figure 1.3A-6. Window details from Asher Benjamin, *The American Builder's Companion*, 1806 (1969 Dover reprint of the sixth edition, 1827), p. 78.

Figure 1.3A-7. Window Type C.

Exterior wood clapboard siding and trim.

The wood clapboard siding, along with the associated corner boards and apron boards, are exterior features indicative of the house's Federal style dating from the early 19th century. Most areas of replacement siding and trim appear to be consistent with the original design intent. The horizontal clapboards contribute to the formal, refined appearance of the house.

Figure 1.3A-8. Horizontal clapboard siding and corner board.

Existing roof eave cornices.

There are two significant eave cornice profiles found at the John Nelson House. The cornice at the main block contains ogee profiles and a rope bed mold [*fig. 1.3A-9*] and dates to the c. 1808-11 period of signficance. The cornice at the northwest wing is secondary, with a smaller-scaled ogee profile and bed mold and dates from the early to mid-19th century [*fig. 1.3A-11*]. The cornice at the northeast wing consists of simple flat boards representative of less formal structures.

The main block cornice appears to be very similar in profile to a cornice detailed in Asher Benjamin's book *The Country Builder's Assistant*, first published in 1797 [*fig. 1.3A-10*]. It was not possible to reach the height of the cornices during the building survey to measure and document the full-size profiles, and so this comparison is based solely upon visual observation.

Figure 1.3A-9. John Nelson House eave cornice at the main block.

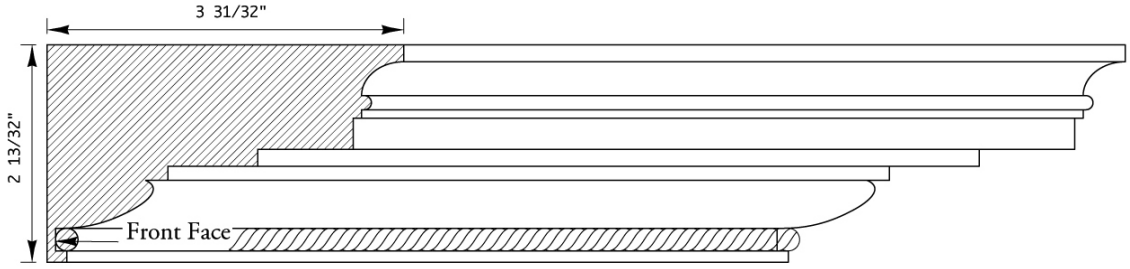


Figure 1.3A-10. Cornice profile, pl. XIII from *The American Builder's Companion* by Asher Benjamin, 1806 (drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 43). Not to scale.

It is very possible that John Nelson referred to his personal copy of the 1806 edition of Benjamin's book when he designed and milled the main block cornice. Nelson's cornice does not match Benjamin's cornice exactly, but it is very similar in form and profile. The rope bed molding is an especially important detail, inspired by Asher Benjamin's designs and representative of Federal ornamental detail.

The eave cornice at the northwest wing is a much more simplified profile than the main block, with ogees at the cornice and the bed molding [*fig. 1.3A-11*]. The ninety-degree intersection between the northwest corner of the main block and the south elevation of the northwest wing is awkward [*fig. 1.3A-12*]. The two cornices do no align and it appears that the northwest wing cornice was installed around the existing main block cornice.

Figure 1.3A-11. John Nelson House eave cornice at the northwest wing.

Figure 1.3A-12. Awkward intersection between roof eave cornices, northwest wing on the left and main block on the right.

Existing door openings and two decorative wood front door surrounds.

There are two entrance doors on the front elevation of the John Nelson House. Door 1/101 is the front entrance and leads to the main block entry hall. The door is located in the center bay of the main block south elevation. Door 1/105 is the entrance to the northwest wing, and is located in the center bay of the south elevation. Both doors were designed with formal entry surrounds, each with similar millwork details that appear to date stylistically from the c. 1808-11 period of significance. Most likely Door 1/101 dates from this period while Door 1/105 was added in the early to mid-19th century, when the northwest wing was constructed, in a form that complements Door 1/101.

The main house entrance, Door 1/101, has paneled pilasters with square bases and capitals, frieze board, and a decorative projecting cornice with a rope bed molding. There is an arched opening above the door, presumably for a fanlight, although the light is now a single piece of glass [*fig. 1.3A-13*]. The original pilaster bases and wood sill were replaced in the fall of 2007 because of severe deterioration from rot and insect infestation. The secondary front entrance, Door 1/105, also has paneled pilasters with square bases and capitals, frieze board, and a decorative projecting cornice. Both door surround designs appear to be prototypical for the Federal style, especially when compared with other examples of door surrounds such as the one documented from an 1806 house in Salem, Massachusetts [*fig. 1.3A-14*]. The addition of aluminum screen doors, dating from the mid-to-late twentieth century, at both doors detracts from the historic appearance.

Figure 1.3A-13. Door 1/101 on the left and Door 1/105 on the right.

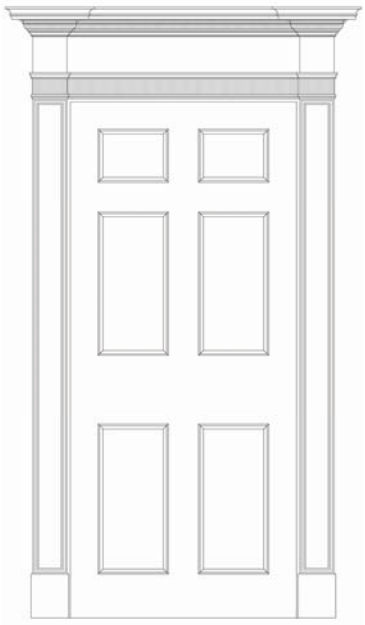


Figure 1.3A-14. Typical Federal style door surround. Gideon Tucker House, Salem, MA, 1806. (drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 43). Not to scale.

Exterior common bond brick masonry end walls.

The use of brick for the east and west end walls of the main block, with siding and shingles on the other elevations, is unique yet it is not a complete anomaly for typical New England Federal style buildings. One such example is found nearby in the town of Concord, and there are other examples in the region [*fig. 1.3A-16*].

Figure 1.3A-15. West and East elevations of the John Nelson House with brick end walls.

Figure 1.3A-16. House in Concord, MA with brick end walls.

Figure 1.3A-17. Detail of one of the John Nelson House brick end walls, with remains of the painted surface in the mortar and brick crevices.

A close inspection of the end wall surfaces revealed remains of paint in the mortar and brick crevices. Microscopic analysis of the paint samples was performed, and it was revealed that there are approximately nine layers of paint. The time period when the brick surface was painted is unknown. The end walls appear to be painted in an undated photograph that is most likely from the late-nineteenth to early-twentieth century (the estimated age of the photograph is based upon a comparison of the historic and current size of the sugar maple in front of the house.) [*fig. 1.0A-1*]. All other photographs observed, from the mid-to-late twentieth century mostly, show the end walls as exposed brick. It is also unknown if the brick end walls were originally painted, or if the paint was added later. Further investigation is needed in order to determine the date and composition of the painted layers [*fig. 1.3A-8*].

Granite slab foundation walls and front door steps.

The granite foundation walls, found on the south and west elevations, are characteristic of the Federal style and appear to date from the c. 1808-11 period. Typically, exposed stone foundations constructed in the 18th and 19th centuries were comprised of rubble stone masonry. Using dressed stone as found at the John Nelson House required more time and expense to install, but provided a desired formal and refined appearance. When the main block was constructed in 1808, the Nelson brothers opted to use large dressed granite blocks to face the exposed areas of the main foundation walls. The builders went to the extent of replacing the exposed portion of the 18th century block south foundation wall with a granite slab. The northwest wing addition was also constructed with the same granite slab detail which served to seamlessly tie the northwest wing to the main block. The granite slab steps found on the south elevation at Doors 1/101 and 1/105 are another key feature of the front elevation.

Figure 1.3A-18. Granite slab foundation walls and steps at Door 1/101.

INTERIOR FEATURES –

Floor plan and general arrangement of interior spaces.

The main block of the John Nelson House was constructed c. 1808-11 as a southwest addition to the 18th century block. The arrangement of the main block is a basic center-hall plan, with a room flanking each side. The addition of the northwest wing in the early 19th century, and later the northeast wing in the early 20th century, served to form a T-shaped plan and enhanced the formality of the building arrangement.

Wood floors (some replacement or painted).

The wood floors vary in size and arrangement throughout the house. Generally, the older floors are random-width while the newer floors are narrow and uniform-width. The wood floors are painted in some of the rooms.

The floors in Rooms 101 and 102 appear to be replacements due to the presence of paper between the subfloor and the finish floor. Most likely, paper would not have been installed in 1808 and so it appears that the original floor was replaced and the current floor was installed with the paper during the late 19th century period of significance. The paper is fibrous with wood pulp. Further investigation into the historical use of floor paper, along with microscopic analysis, may reveal more information about the date of the current floor installation in these rooms.

Throughout the house, all of the wood floors appear to be early-20th century or older, with the exception of Room 104. Microscopic paint analysis in this room revealed that there are five layers of paint and a bottom layer of varnish, all appearing in composition to be modern (later 20th century). There was no evidence of dirt between the wood floor and the varnish finish, indicating that the floor is late 20th century as well. Since this room is above an unconditioned half-height basement space, it is possible that moisture or insects deteriorated the original floor, necessitating its replacement.

Nails were pulled from a few floor locations in an effort to date the floor installation. A nail taken from the floor in Room 106 appears to be an early machine-cut nail, although it is difficult to determine if the head is hand or machine formed. Nonetheless, it is apparent that the floor in Room 106 most likely dates from the c. 1808-11 period.

Many of the wood floors, mostly on the second floor, are painted. In some cases the paint layers are thick with multiple layers. It was not determined if any of the floors were painted originally or if the floors were natural with the paint added later. Further investigation may reveal more information about the original floor finishes and conditions where the wood floors are painted, as well as the approximate date of installation.

Fireplaces and decorative fireplace surrounds/mantels.

Room 108:
The original 18th century fireplace with bake oven is found intact. The wood and plaster surround appears to be added later, as evidenced by the presence of cut nails in the wood trim installation. The brick hearth and firebox appear to be original and are a fine example of an 18th century cooking fireplace with adjoining bake oven. Prior to the main block construction, the 18th century block was a free-standing structure. The fireplace chimney most likely extended straight up from the fireplace and through the south side of the original roof. When the main block was constructed c. 1808-11, the original chimney was removed and the flues were significantly reworked so that they tied into the new main block chimney for the fireplaces in Rooms 103 and 204.

Figure 1.3A-19. Fireplace in Room 108.

Room 102:
This fireplace mantel appears to be original to the main block construction of c. 1808-11. Microscopic analysis of paint samples suggests that the paint layers on the mantel are consistent with the door and window trim found in the same room, meaning that these architectural elements were installed at the same time. Finish nails were taken from the baseboard area on the left side of the mantel. These nails appear to early machine-cut brads, dating from the early 1800s.

The decorative mantel is significant in its Federal stylistic details including thin columns with fluted capitals, a flat frieze board, and a deep profile shelf. A similar decorative mantel is found in the 1808 Hyde-Lincoln House, located in Charlestown, Massachusetts [*fig. 1.3A-21*]. A similar mantel design with thin columns is also detailed in Asher Benjamin's book *The American Builder's Companion.*

Figure 1.3A-20. Fireplace in Room 102.

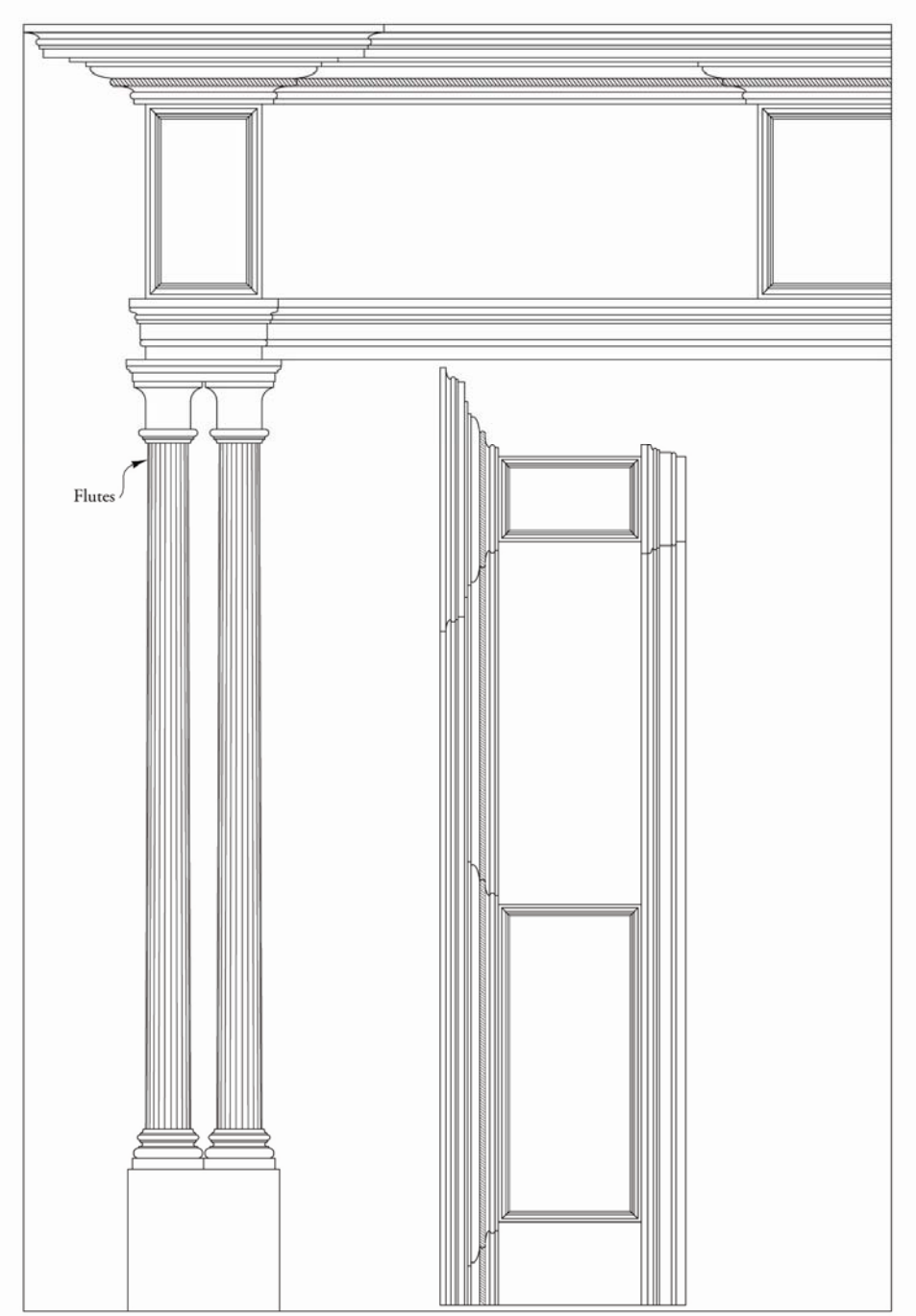


Figure 1.3A-21. Federal style fireplace mantel. Hyde-Lincoln House, Charlestown, MA, 1801. (drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 155). Not to scale.

Room 103:
This fireplace mantel appears to have been added in the early 20th century. Microscopic analysis of paint samples suggests that the paint layers on the mantel are not consistent with the door and window trim. There are fewer layers on the mantel, suggesting that it was added later. Added to this evidence is the presence of early 20th century manufactured tiles applied to the firebox face and the hearth. The brick firebox appears consistent with the c. 1808-11 fireboxes found elsewhere in the house. Most likely, the firebox is original to the main block construction while the fireplace surround was refaced sometime in the early 20th century.

Figure 1.3A-22. Fireplace in Room 103.

Room 106:
This fireplace mantel, located on the west wall of Room 106, does not appear to be original to the northwest wing construction. Typically a fireplace hearth will extend in front of the general firebox opening only. In this case, the brick hearth extends from the left side of the firebox past the right side until it ends at the north wall. There is a closet to the right of the fireplace that contains a brick base with an ash cleanout. The presence of a brick base in the closet, most likely part of an original bake oven, coupled with the extended hearth suggests that this fireplace was reconfigured. Most likely, the original fireplace (early to mid-19th century) was similar to Room 108 with a large cooking fireplace and a brick bake oven. It appears that at some point the cooking oven was no longer needed and so the fireplace was reworked with a smaller firebox, the bake oven was partially removed, the closet with shelves was added, and a decorative fireplace mantel was installed. Physical evidence that further supports this premise includes the cast iron lintel added to the firebox opening to support the masonry above and the infill wainscot, chair rail, and baseboard between the fireplace and the closet that fail to match the rest of the room. The decorative mantel, although not original to the room, is important to the late 19th century period of significance in its stylistic details including flat paneled pilasters, frieze board, and projecting profile shelf.

Figure 1.3A-23. Fireplace in Room 106.

Room 104:
This fireplace and mantel appear to be original to the northwest wing construction (early to mid-19th century). As discussed in Section 1.1-A, it is conjectured that Room 104 is a western addition to the northwest wing. If this is the case, then this fireplace was added to the back end of the existing fireplace in Room 106 and the chimney was reworked. The firebox is brick with a square brick hearth and a painted plaster face. The decorative mantel is significant in its 19th century stylistic details including reeded columns with flat panel capitals, a flat frieze board, and a shallow profile shelf.

Figure 1.3A-24. Fireplace in Room 104.

Room 202:
This fireplace and mantel appear to be original to the main block, c. 1808-11. The firebox is brick with a square brick hearth and a painted plaster face. The decorative mantel is significant in its 19th century stylistic details including fluted pilasters, capitals with carved flower, flat frieze board with carved swag motif, and profile shelf with a deep projection.

Figure 1.3A-25. Fireplace in Room 202.

Room 204:
This firebox appears to be original to the main block, c. 1808-11. The firebox is brick with a brick hearth (square and rectangular) and a painted plaster face. The decorative surround consists of a bolection molding and a simple board shelf with ogee brackets. The bolection profile appears to be similar to the window casing backband profile. More investigation is needed to determine if the fireplace surround is contemporary with the main block construction.

Figure 1.3A-26. Fireplace in Room 204.

Room 208:
The firebox and hearth are brick and appear to be original to the northwest wing, dating from the early to mid-19th century. Stylistically the decorative wood mantel appears to be later than the others in the house, possibly dating from the late 19th or early 20th century. The mantel may be a salvaged piece that was installed in this existing firebox opening. Reasoning for this conjecture is that the mantel opening does not proportionately fit the brick firebox opening, suggesting that the mantel was not originally designed for this fireplace. On the right side of the fireplace where the finish wall returns along the side of the chimney mass, the mantel extends beyond the wall corner. On the opposite side, the mantel shelf awkwardly projects onto the trim of Door 2/208. Further investigation is necessary to determine the age of the mantel and whether it is original to the room.

Figure 1.3A-27. Fireplace in Room 208.

Wood trim including existing period chair rails, wainscot, baseboard, crown molding, door casing, and window trim.

The interior millwork was surveyed in an effort to provide relative dates of the room finishes and understand the house's sequence of construction. It was discovered that the architectural trim profiles varied throughout the house. Evaluations between rooms were made, as well as comparisons with typical Federal style profiles including those designed by Asher Benjamin.

Rooms 102 and 106 (c. 1808-11):
The door and window trim profiles in Rooms 102 and 106 appear to match. Microscopic analysis of paint samples in Room 102 reveals that the paint layers on the door trim, window trim, wood board wainscot, and baseboard are consistent, suggesting that these architectural elements were installed at the same time [*fig. 1.3A-28*]. Behind the baseboard on the wainscot are paint markings that project lower than the current height of the baseboard [*fig. 1.3A-29*]. This leads to the conclusion that the baseboard was originally installed slightly lower than its current height. Further investigation should be performed to explore this conjecture.

Figure 1.3A-28. Door casing, Room 102. The window casing in this room is similar.

Figure 1.3A-29. Paint markings on the wainscot behind the baseboard in Room 102, below the height of the current paint markings, suggest that the baseboard was originally installed slightly lower. The baseboard may have been removed for the current floor installation and then reinstalled.

The windows in Room 102 have paneled interior shutters, a unique detail that indicates that Room 102 was intended to be the most formal room in the house [*fig. 1.3A-30*]. Asher Benjamin detailed splayed jambs with interior paneled shutters in his 1806 book *The American Builder's Companion* [*fig. 1.3A-31*], which may have served as a guide for John and Josiah Nelson when this room was designed.

Figure 1.3A-30. Paneled interior window shutters in Room 102.

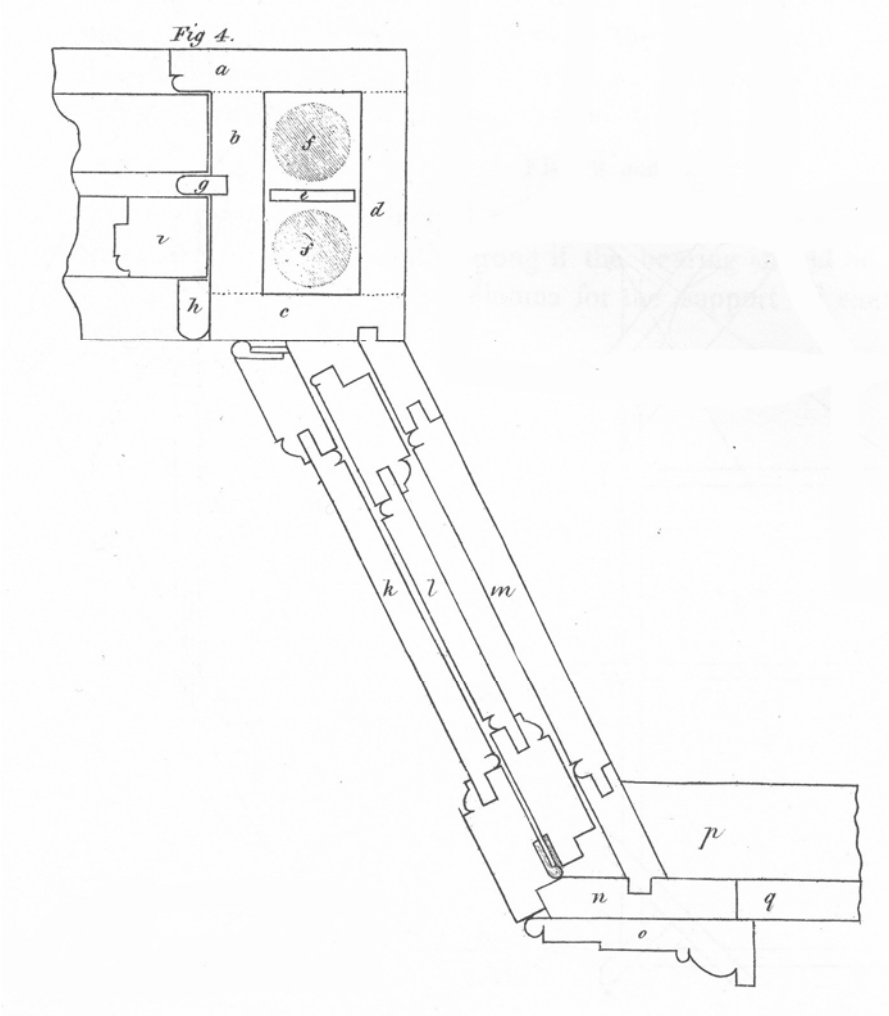


Figure 1.3A-31. Paneled interior window shutter details from Asher Benjamin, *The American Builder's Companion*, 1806 (1969 Dover reprint of the sixth edition, 1827), p. 83.

The windows in Room 106 have splayed paneled jambs, similar in detail to the paneled shutters of Room 102 [*fig. 1.3A-32*]. The door and window casing profiles in Rooms 102 and 106 are identical, suggesting that both rooms were finished at the same time. The door and window casing is one of many characteristic profiles from the Federal period. A similar example is found at the 1801 Hyde-Lincoln House in Charlestown, Massachusetts [*fig. 1.3A-33*].

Figure 1.3A-32. Window casing detail with paneled splayed jambs, Room 106.

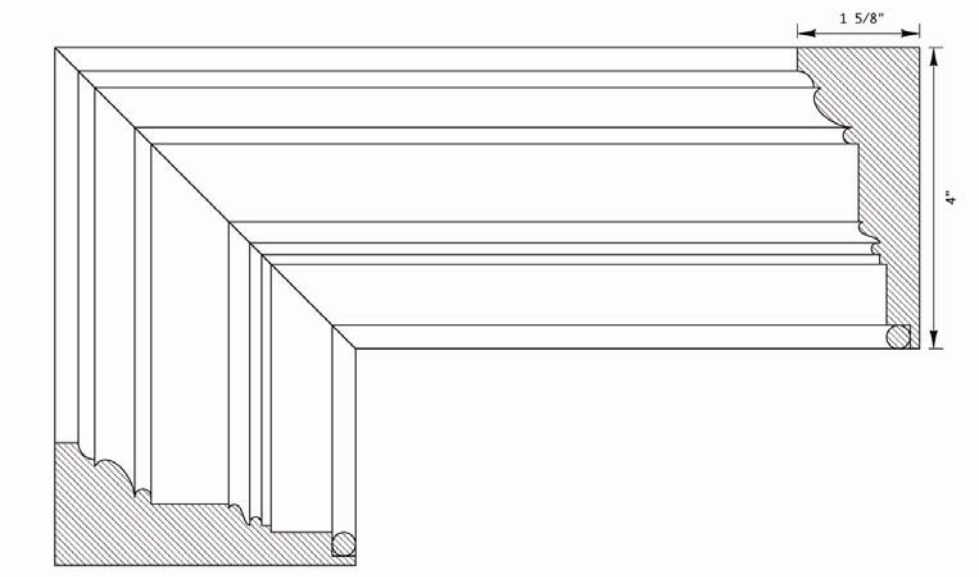


Figure 1.3A-33. Door & window profile from the Hyde-Lincoln House, Charlestown, MA, 1801. (Drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 83). Not to scale.

Rooms 104 and 204 (early to mid-19th century):

The windows in Rooms 104 and 204 have splayed flat board jambs. The door and window casing profiles in both rooms appear to be identical. This profile is very similar to one found in *The American Builder's Companion* by Asher Benjamin written in 1806.

Figure 1.3A-34. Window casing, Room 104. The door casing in this room is similar, as well as in Room 204.

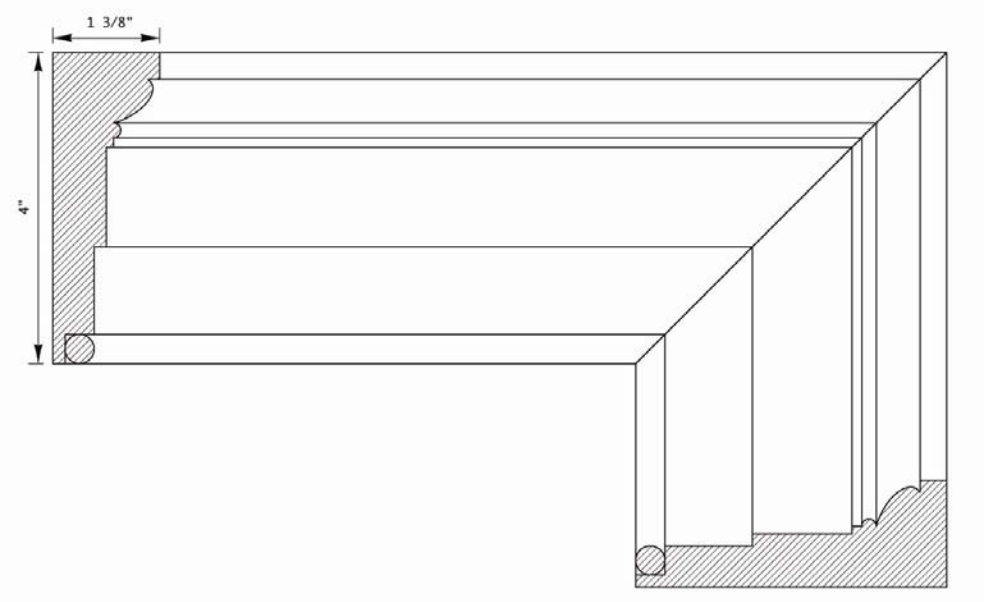


Figure 1.3A-35. Door & window profile, pl. XI from *The American Builder's Companion* by Asher Benjamin, 1806 (drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 77). Not to scale.

Rooms 201 and 202 (c. 1808-11):

The windows in Room 201 have splayed flat board jambs. The door and window casing profiles in both Room 201 and 202 appear to be identical. This profile is very similar to one found in Asher Benjamin's 1797 book *The Country Builder's Assistant*.

Figure 1.3A-36. Splayed window jamb at Room 201.

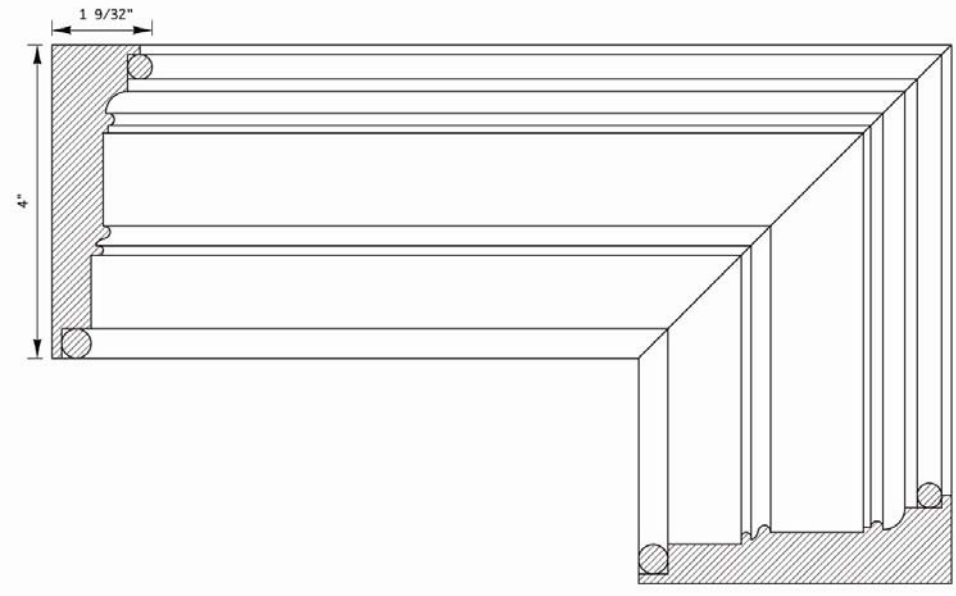


Figure 1.3A-37. Door & window trim profile, pl. I from *The Country Builder's Assistant* by Asher Benjamin, 1797 (drawing from Smith and Mudrick, *Federal Style Patterns: 1780-1820*, p. 74). Not to scale.

Interior wood panel doors, frames and thresholds.

A majority of the historic doors found in the John Nelson House are paneled. The panel configurations vary throughout the house [*see Door Types, fig. 1.0A-8*]. The lack of consistency detracts from a unified appearance. However, the doors reflect the varied stylistic time periods in which they were installed and they hint at the sequence of construction. The modern added and replacement doors in Room 107 are paneled in an attempt to reflect the existing door styles. Overall, the interior and exterior doors are all significant to the house's character.

Interior period hardware.

There does not appear to be any original hardware remaining in the house. There are, however, a few different examples of later 19th and early 20th century hardware including porcelain door knobs [*fig. 1.3A-37*], wood door knobs [*fig. 1.32A-38*], cut glass door knobs, and reproduction metal thumb latches [*figs. 1.3A-39, 202-4 & 5*].

Figure 1.3A-37. Porcelain door knobs, typical.

Figure 1.3A-38. Wood door knob, typical.

Figure 1.3A-39. Reproduction thumb latch, Room 108. There is a scar on the door from a former rim box lock.

Built-in cabinets and shelves.

There are a number of built-in cabinets and shelves found in the John Nelson House. Some are carved out of spaces previously used for passages, while others were installed to take advantage of open space provided by the reworking of fireplace flues. Generally, the built-in cabinets and shelves remain as evidence of the individuals who occupied the house throughout its history, and their need for storage and the efforts they made to adapt the existing space to meet their needs.

Possible elements of the original 18th century structure.

There are a few remaining walls, floors, and other finish materials that appear to be original to the frame 18th century structure. These elements existed prior to the 19th century additions made by the Nelsons. Most notable is the supposed original horizontal board sheathing found on the west interior wall of Room 109, or what would have been the east exterior elevation of the 18th century structure. A similar wall situation exists in the western area of the attic in Room 209, where a partial horizontal board wall is found. Although the boards appear to be from the 18th century, the original exterior finish material was not determined. There do not appear to be any nailing patterns on the boards that would indicate shingles, siding, or lath for stucco. There are both hand-wrought and machine-cut nails found in the board wall, used to attach the boards to the wood stud [*fig. 1.3A-40 & 41*]. The presence of hand-wrought nails suggests, but does not confirm, that the boards were installed prior to the emergence of machine-cut nails in the early 19th century. Hand-wrought nails are not reliable for dating based solely on their presence. Wrought nails were used several decades following the introduction of cut nails, even into the late 19th century.[18] Given this fact, along with the presence of machine-cut nails, it is critical to find other evidence that supports the conjecture linking the board walls to the 18th century structure.

[18] Nelson, Lee H., "Nail Chronology as an Aid to Dating Old Buildings," American Association for State and Local History Technical Leaflet 48, *History News*, 1968, p. 3.

Figure 1.3A-40. Horizontal board wall with hand-wrought and machine-cut nails.

Figure 1.3A-41. Hand-wrought nails found in the horizontal board wall.

PART 1.0 - B

JOHN NELSON BARN:
PHYSICAL DESCRIPTION, CONDITIONS ASSESSMENT,
AND CHARACTER-DEFINING FEATURES

PART 1.0-B. JOHN NELSON BARN: PHYICAL DESCRIPTION, CONDITIONS ASSESSMENT AND CHARACTER-DEFINING FEATURES

1.1-B HISTORICAL BACKGROUND, CONTEXT, AND CHRONOLOGY OF DEVELOPMENT AND USE

The original section of the John Nelson Barn was most likely constructed between 1821 and 1824. In the 1810 tax assessment discussed in section 1.1A, John Nelson and Josiah Nelson, Jr. were each assessed for half of a barn. Most likely, this barn is not the John Nelson barn, but instead is the barn belonging to the property that was owned by their father, Josiah Nelson, Sr. In 1821, John Nelson's brother Joshua was assessed for one barn.[19] The 1818 division of Josiah, Sr.'s property had occurred by this time, and thus Joshua was assessed for the barn that he inherited along with his father's house and property north of Nelson Road. Neither John nor Josiah, Jr. (by this time occupants of the house and property south of Nelson Road) were assessed for a barn in 1821. However, in 1824 John was assessed for a barn as part of his property and half-house holdings.[20] This evidence suggests that the original 3-bay barn structure was constructed in the time between the 1821 and 1824 tax assessments. A comparison of the 1835 and 1836 tax assessments for John's real estate suggests that the barn was improved upon during this period. In 1835, John was assessed $240 for his half of the house and $120 for his barn. In 1836, the house assessment remained the same but the barn assessment was increased to $175.[21] This data points to the possible construction of the first addition, a 3-bay wide cross gable on the north elevation of the main block, as having been constructed between the 1835 and 1836 tax assessments. The original materials of this first phase of the north block were observed and noted by Orville W. Carroll (NPS project supervisor who oversaw the 1979 documentation and repair work) as dating to the 1830's.[22]

Later improvements to the Barn included a lean-to added to the west elevation, possibly around 1870. A cross-gable wing was added to the west elevation, a small gable wing was added to the east elevation, and the 1830's north barn addition was extended even further to the north around 1900.[23] The barn then remained in essentially the same configuration through the middle of the twentieth century. In 1963, the Historic American Buildings Survey documented the barn with measured drawings of the floor plan, south and east elevations, and an isometric framing diagram.[24] The barn was severely damaged in 1978 by a heavy snowfall which, in addition to already present wood rot, caused the collapse of the 1870's lean-to [*fig. 1.1B-1*]. The lean-to was removed

[19] "Notes on the Relative Value of the Nelson's and Hastings' Houses, Barns and Total RE, 1810-1831," Minute Man National Historical Park Archives Historical Files, p. 6-7.
[20] Ibid, p. 7.
[21] Ibid, p. 15.
[22] Carroll, Orville W to Regional Historical Architect, P & RP, NARO. *Repairs to the John Nelson Barn, MIMA*. May 10, 1978.
[23] Ibid.
[24] Historic American Buildings Survey. *John Nelson Barn, MIMA*. HABS MA-831, 1963.

and the NPS started maintenance work to repair the west end wall. It became apparent that extensive repair work would be required on the ca. 1900 west wing due to its deteriorated structural condition. The decision was made to remove this newer wing [*fig. 1.1B-2*] and expose more of the original barn structure. The west walls of the original barn and 1830's north addition were repaired in 1979 and new wall shingles were installed on top of the original barn boards, in the locations where they still existed [*fig. 1B-3*].[25]

Figure 1.1B-1. West elevation of the Barn after the ca. 1870's lean-to collapse in 1978. Minute Man National Historical Park Archives, 1979.

[25] Carroll, Orville W, "Completion Report: Repairs to the John Nelson Barn," MIMA NHP, 1979.

Figure 1.1B-2. West elevation of the Barn prior to the 1979 removal of the c.1900 west wing. Minute Man National Historical Park Archives, 1979.

Figure 1.1B-3. John Nelson Barn after the work was completed. Minute Man National Historical Park Archives, 1979.

1.2-B PHYSICAL DESCRIPTION AND CONDITIONS ASSESSMENT

1.2.1-B SITE

The property containing the John Nelson Barn is located in Lincoln, Middlesex County, Massachusetts within the boundaries of Minute Man National Historical Park. The barn is situated facing south on the north side of North Great Road (Route 2-A), also known as Massachusetts Avenue in Lexington.

SITE PLAN:

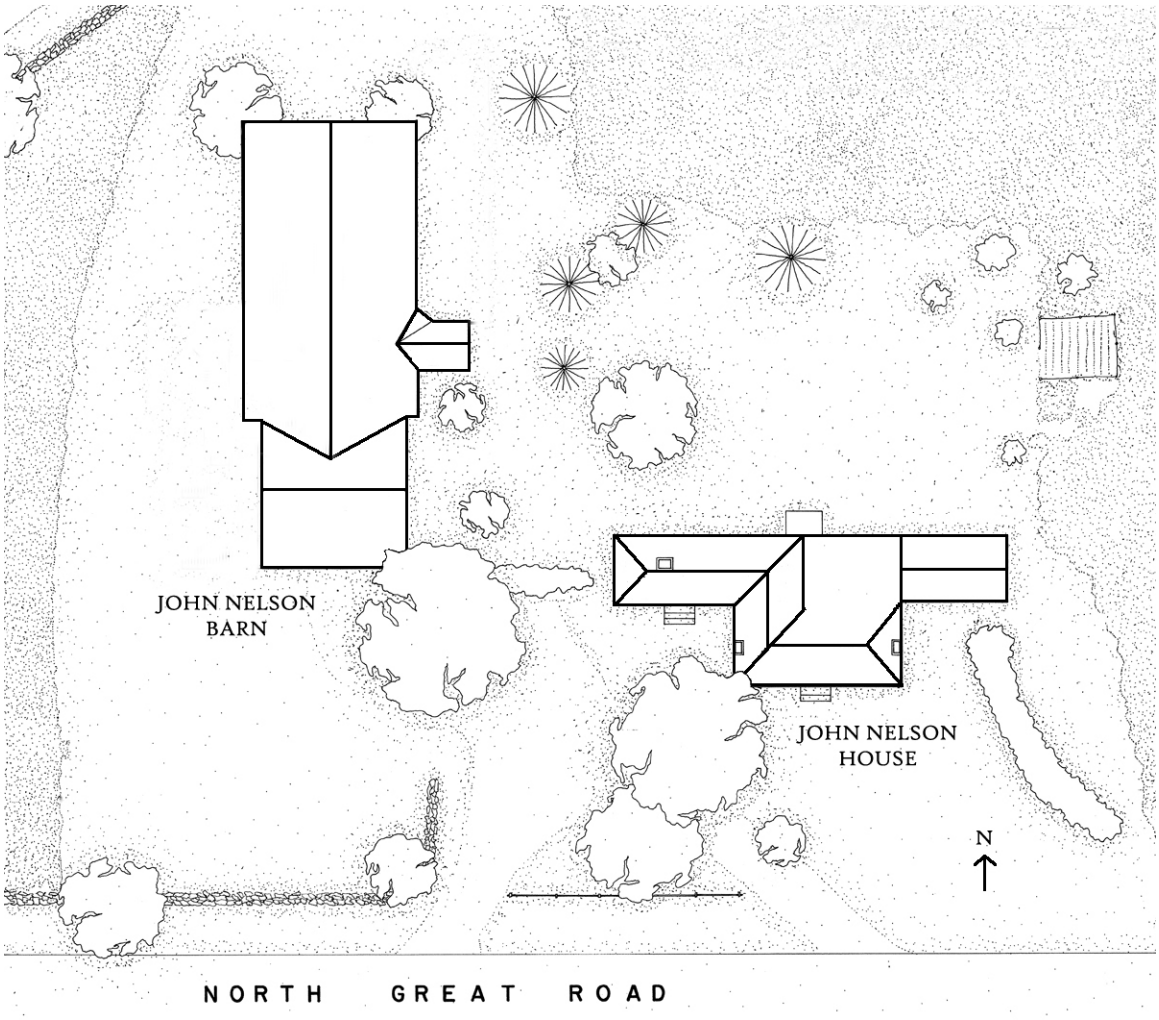


Figure 1.1B-4. Site plan (not to scale). Adapted from HABS drawings.

Accessibility

There are neither organized parking spaces nor designated "accessible" parking spaces at the site. Access to the John Nelson Barn is provided by large doors on the south and north walls. However, access to the doors is gained over a non-ABAAS compliant grass surface. The north side door has a short, non-compliant wooden ramp.

Circulation

Existing vehicular and pedestrian circulation through the site is limited to the horseshoe-shaped, gravel driveway to/from North Great Road. A secondary driveway provides access to the north side of the barn for Park Service vehicles from Battle Road. There are no sidewalks on North Great Road. Pedestrian visitors to the site may use Battle Road to gain access from the main Park Headquarters. However, there is no ABA & UFAS compliant accessible route from Battle Road to either the House or the Barn.

The existing driveway can accommodate approximately five vehicles. However, a grassed area in front of the barn could be utilized for additional parking if required for programmatic purposes.

Site Comments

- Neither the house nor the barn is currently accessible. Three steps up to each doorway preclude access to the house.

- The existing landscaping is relatively well maintained. However a sugar maple located in front of the house appears to be in poor condition.

- Parking area in the driveway appears to provide a less than 5% maximum grade. The gravel driveway is not considered "accessible" under the ABAAS requirements.

- The grade around the barn provides positive drainage along the western and northern side. The southwestern corner appears to drain back towards the barn. The concentration of water at the base of the barn and may be contributing to the structural problems associated with the deteriorated / missing sill beams.

1.2.1-B ARCHITECTURAL

1.2.1.1-B General Description

The John Nelson Barn is a wood frame structure located to the west of the John Nelson House, facing south. The main section of the barn ("main block") was constructed in the early nineteenth century and is a traditional 3-bay English barn with a single gable running east to west. A cross-gable addition ("north block") was constructed on the north elevation during the mid-to-late nineteenth century and was extended further north in the early twentieth century. The north addition is also three bays wide. There is a small 1-room early-twentieth century addition on the east elevation ("east wing"). Mid-and-late nineteenth century additions to the west elevation were removed by the National Park Service in 1978 due to structural deterioration and collapse.

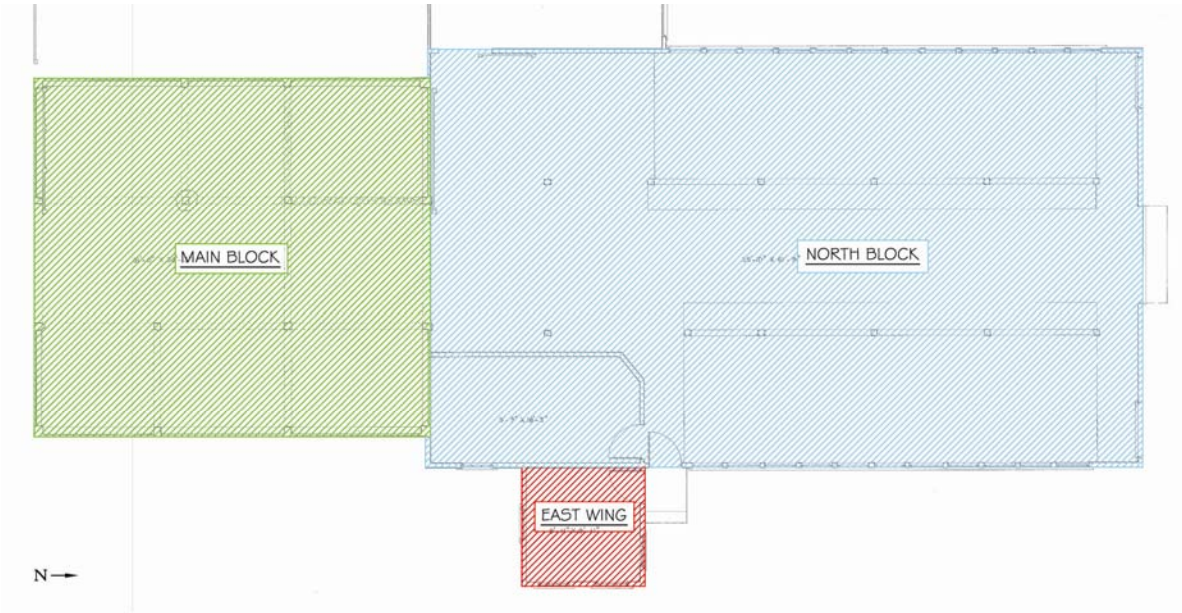


Figure 1.1B-5. Barn Sections Key Plan, overlaid on HABS drawings (not to scale).

The main block footprint measures approximately 31′-3″ wide (east-to-west) by 34′-2 1/2″ feet deep (north-to-south). The north block measures approximately 36′-0″ wide by 62′-6″ deep and is essentially centered on the north elevation of the main block. The east wing is approximately 13′-2″ wide by 10′-11″ deep.

The exterior walls of the John Nelson Barn are wood frame on rubble fieldstone foundation laid on level grade. The main block is constructed of hand-hewn mortise-and-tenon framing members. The floor in the main block is dirt. The north block is constructed of sawn framing members. The floor in the center bay is concrete and the flanking bays are dirt with areas of wood board flooring. The entire Barn is clad with wood shingles on vertical board sheathing at the main block and horizontal board sheathing at the additions.

The main block roof is a single gable running east to west. The north block is a cross gable with a lower eave and ridge that overframes the north side of the main block. The east wing addition has extended eaves with exposed rafter tails. The main block roof is rolled asphalt roofing on plywood sheathing, installed on top of older horizontal board sheathing. The north block and east wing roofs are asphalt shingle on horizontal board and conventional plywood sheathing.

Windows

Figure 1.1B-6. John Nelson Barn Existing Window Types (not to scale).

Type w-J: 6-over-6 light double hung wood sash with flat board trim.

Type w-K: 6-light wood awning sash with flat board trim.

Type w-L: Sash is missing; flat board trim.

Doors

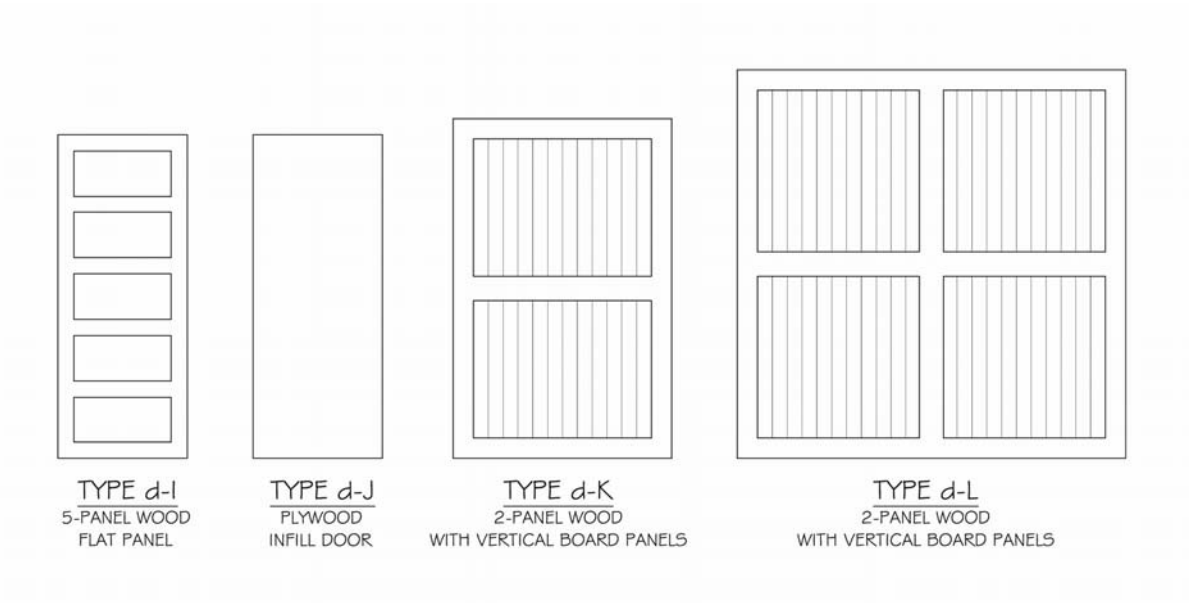


Figure 1.1B-7. John Nelson Barn Existing Door Types (not to scale).

Type d-I: 5-panel wood door with flat panels on both faces.

Type d-J: Plywood infill door.

Type d-K: Large 2-panel wood door with vertical board panels.

Type d-L: 2-panel wood barn door with vertical board panels.

1.2.2.2-B Exterior Elevations

South Elevation –

Masonry Foundation Walls

- The exposed portion of the south elevation foundation walls, at both the main block and the east wing, is comprised of random rubble fieldstone. Very little of the masonry foundation is exposed due to high grade and vegetation growth.
- The pointing mortar at the rubble stone joints is chipped, shrunken and missing in areas.

Wood Shingle Siding

- The entire south elevation is clad with red cedar shingle siding. The wood shingles are in poor condition, with large areas of deterioration and dislodged shingles. The shingles and wall sheathing along the entire foundation wall are rotted and missing, exposing the sill plate which is also rotted [*fig. SE-2*].
- At the main block, structural deterioration has caused the east side of the wall to project out approximately 2'-0" at the right door jamb [*fig. SE-3*].

Roofs

- The south elevation roof at the main block is comprised of rolled asphalt roofing on ¾" plywood sheathing, installed on existing horizontal wood sheathing boards.
- The south elevation roof sags significantly towards the center, a result of structural failure and added weight from the modern plywood sheathing [*fig. SE-1*].
- The south elevation roof at the east wing is comprised of asphalt shingles on an unknown sheathing material. The shingles are deteriorated and missing in areas.

Doors

- **Door B-1/101**: [*fig. SE-1*] Type d-J. Located in the center of the south elevation of the main block, the original door is missing and has been replaced with plywood infill. The door frame is a painted flat board, deteriorated and warped with rot at the base of both jambs.

Windows

- **Window B-102**: Type w-K. 6-light wood awning sash with partially deteriorated muntins and sash. The wood trim is a painted flat board. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.

Millwork

- The wood cornice at the main block is a simple flat board fascia in fair condition. The cornice is unpainted and subject to further weathering.
- The wood cornice at the east wing is a 2-step flat fascia board with exposed rafter tails.

Figure SE-1. South elevation of Barn at the main block.

Figure SE-2. Deteriorated shingles, wall sheathing and sill plate at west corner of the south elevation, main block.

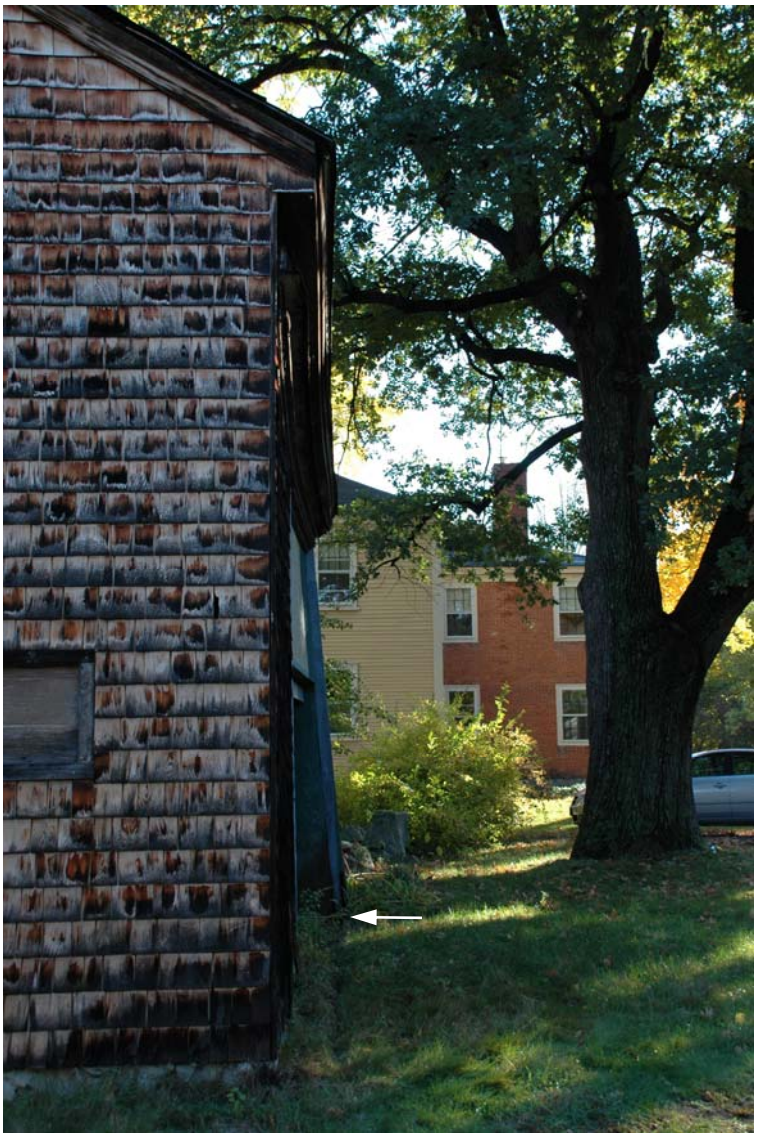


Figure SE-3. View looking east, showing the extent of movement of the south elevation due to structural deterioration.

East Elevation –

Masonry Foundation Walls

- The exposed portion of the east elevation foundation walls at the main block, the east wing, and the north block is comprised of random rubble fieldstone. The stone is covered with vegetation and mossy growth [*fig. SE-4*].
- The pointing mortar at the rubble stone joints is hard (cement-based) and is chipped, shrunken and missing in areas.

Wood Shingle Siding

- The entire east elevation is clad with red cedar shingle siding. The wood shingles are in poor condition with large areas of weathering, deterioration and mossy growth [*fig. EE-6*]. The shingles directly above the foundation wall exhibit the largest amount of weathering and rot [*fig. EE-4*].
- The east elevation exhibits areas where entire shingles are missing, exposing the board wall sheathing behind or open holes to the barn interior.

Roofs

- The east elevation roof at the main block is comprised of rolled asphalt roofing on ¾" plywood sheathing, installed on existing horizontal wood sheathing boards.
- The east elevation roof at the north wing is comprised of asphalt shingles on horizontal wood sheathing boards with a wood shingle drip course. The shingles are deteriorated and missing in areas.
- The area where the north block gable intersects the higher main block roof displays the most deterioration, caused by the water runoff [*fig. EE-5*]. The intersection between the north block roof and east wing gable is also a problem area.
- There is a raised portion of the north block roof for a roof vent, which appears to be closed off.

Doors

- **Door B-1/102**: Type d-I. Located just to the north of the east wing, this door is a painted 5-panel wood door. The door leaf is severely rotted at the base and starting to fall apart.

Windows

- **Window B-101**: Type w-L. Wood sash is missing (originally 6-light). The wood trim is a painted flat board. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.
- **Window B-103:** Type w-K. 6-light wood awning sash with partially deteriorated muntins and sash. Wood trim is a painted flat board. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.
- **Window B-104:** Type w-K. 6-light wood awning sash with partially deteriorated muntins and sash. Wood trim is a painted flat board. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.

- **Window B-106:** [*fig. EE-6*] Type w-L. Bank of 11 framed window openings with wood sash missing. The wood trim is a painted flat board. The windows are covered with sheets of Plexiglas that are screwed onto the face of the trim.
- **Window B-201**: [*fig. EE-2*] Type w-J. 6/6 wood double hung sash with flat board trim. The painted sash and unpainted trim are extremely weathered.

Millwork

- The east elevation wood cornice at the main barn is an unpainted two-step flat raking board, which is severely weathered.
- The east elevation wood cornice at the east wing is a painted two-step flat raking board with exposed rafter tails at the eaves. There is a deep roof overhang at the east elevation, with a vertical board ceiling on the underside of the overhang.
- The east elevation wood cornice at the north wing is a painted flat board.

Figure EE-1. East elevation of Barn with the gable end of the main block and the north block on the right.

Figure EE-2. Detail of east gable end at main block with window #B-201.

Figure EE-3. East elevation of c. 1830's north block addition on the left and the c. 1900 east wing addition on the right.

Figure EE-4. Wall condition at east elevation, with mossy and vegetative growth on the wood shingles and masonry foundation.

Figure EE-5. Roof condition at east elevation where the north block roof, right, intersects with the main block roof, left.

Figure EE-6. Windows #B-106 at the east elevation of the north block. The deteriorated condition of the shingles is typical along the east elevation.

North Elevation –

Masonry Foundation Walls

- The exposed portion of the north elevation foundation wall at the east and north wings is comprised of random rubble fieldstone. The stone is covered with vegetation and mossy growth.
- The pointing mortar at the rubble stone joints is hard (cement-based) and is chipped, shrunken and missing in areas.
- There are sloped concrete stoops in front of each of the north elevation doors.

Wood Shingle Siding

- The entire north elevation is clad with red cedar shingle siding. The wood shingles are in poor condition with large areas of weathering and rot.
- There is a pent roof over the sliding barn door (B-3/102) which exhibits an area where entire shingles are missing, exposing the horizontal board wall sheathing behind.

Roofs

- The north elevation roofs of the north block and west wing are comprised of asphalt shingles on horizontal wood sheathing boards with a wood shingle drip course. The shingles are deteriorated.
- The north elevation roof at the main barn is comprised of rolled asphalt roofing on ¾" plywood sheathing, installed on existing horizontal wood sheathing boards.

Doors [*fig. NE-1*]

- **Door B-2/102**: Type d-K. Located on the east side of the north elevation, this is an original 2-panel vertical board door. The painted door is weathered.
- **Door B-3/102:** Type d-L. Located in the middle of the north elevation, this is an original large barn door with 4 vertical board panels. Nearly half of the vertical boards have been replaced with modern boards or plywood infill. The painted door is weathered. The original sliding door hardware is intact and door still operates.
- **Door B-4/102:** Type d-K. Located on the west side of the north elevation, this is an original 2-panel vertical board door. The painted door is weathered.

Windows [*fig. NE-1*]

- **Window B-105:** Type w-K. 6-light wood awning sash with partially deteriorated muntins and sash. Wood trim is a painted flat board. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.
- **Window B-202:** Type w-K. Pair of 6-light wood sash. The wood trim is unpainted flat boards. The window is covered with a sheet of Plexiglas that is screwed onto the face of the trim.

Millwork

- The north elevation wood cornice at the east wing is an unpainted 2-step flat raking board with exposed rafter tails at the eaves. There is a deep roof overhang at the north elevation, with a vertical board ceiling on the underside of the overhang.

Figure NE-1. North elevation of the barn, north block.

Figure NE-2. East side of north elevation, north block, with Door B-2/102 in the foreground. The north elevation of the east wing is in the background.

West Elevation –

Masonry Foundation Walls

- The exposed portion of the west elevation foundation walls at the north block and the main block is comprised of random rubble fieldstone. The stone is covered with vegetation and mossy growth.
- There is a clear joint in the foundation wall indicating where the now-demolished west wing extended from the west elevation. The foundation wall at this location does not have finished pointing [*fig. WE-4*].
- The pointing mortar at the rubble stone joints is hard (cement-based) and is chipped, shrunken and missing in areas.

Wood Shingle Siding

- The west elevation is clad with a mixture of red and white cedar shingle siding. The northern portion of the north block is red cedar. White cedar shingles cover the area where the now-demolished west wing extended from the west elevation. The west elevation of the main block is also white cedar shingles, installed at the same time as the work on the north block took place. The wood shingles are in poor condition with large areas of weathering and rot [*fig. WE-5*]. The shingles directly above the foundation wall exhibit the largest amount of deterioration.

Roofs

- The west elevation roof at the north block is comprised of asphalt shingles on horizontal wood sheathing boards with a wood shingle drip course. The shingles are deteriorated and missing in areas.
- The area where the north block gable intersects the higher main block roof displays the most deterioration, caused by the water runoff.
- There is a raised portion of the north block roof for a roof vent, which appears to be closed off.

Windows

- **Window B-107**: [*fig. WE-2*] Type w-L. Bank of 12 framed window openings with wood sash missing. Wood trim is unpainted flat boards. The window openings are covered with sheets of Plexiglas that are screwed onto the face of the trim.
- **Window B-108**: Type w-L. Framed window opening with plywood infill.
- **Window B-109**: Type w-L. Framed window opening with plywood infill.
- **Window B-203**: Type w-J. 6/6 wood double hung sash with flat board trim. The painted sash and unpainted trim are extremely weathered. One glass light is missing.

Millwork

- The west elevation wood cornice at the north wing is an unpainted 2-step flat fascia board.
- The west elevation wood cornice at the main barn is an unpainted 2-step flat raking board.

Figure WE-1. West elevation of the barn. The main block is on the right and the north block is on the left.

Figure WE-2. West elevation of the north block, looking towards the southeast.

Figure WE-3. West elevation of the main block.

Figure WE-4. Foundation wall at west elevation, where the now-demolished west wing extended from the west wing on the right half of the foundation wall.

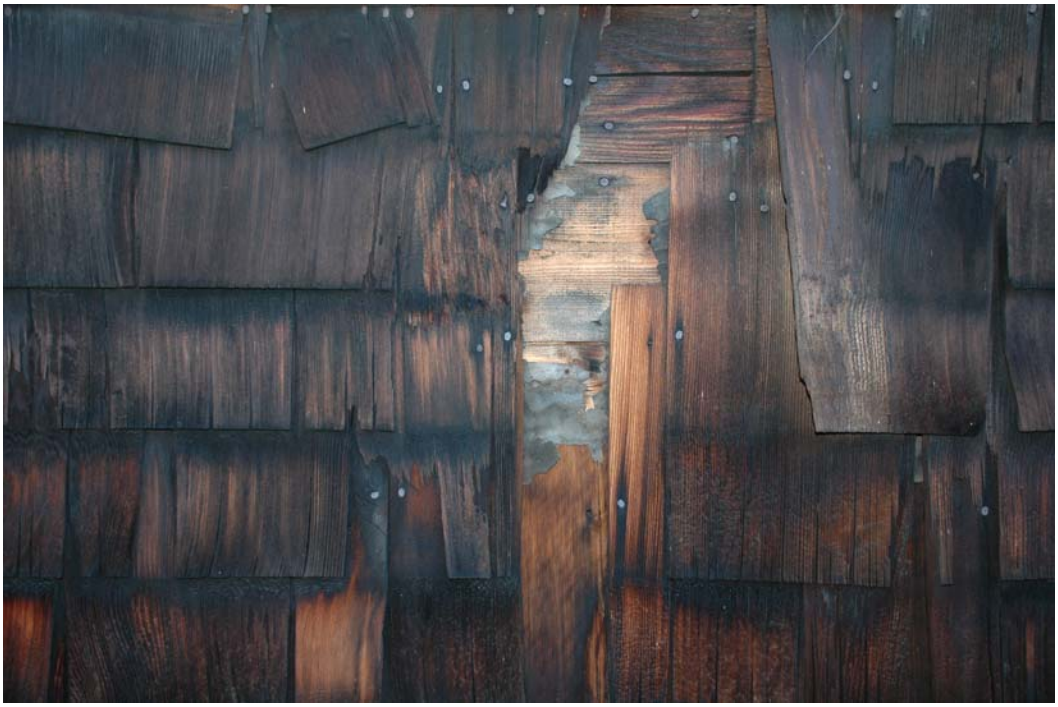


Figure WE-5. Condition of deteriorated areas of west elevation, main block.

1.2.2.3-B Interior Spaces

FIRST FLOOR

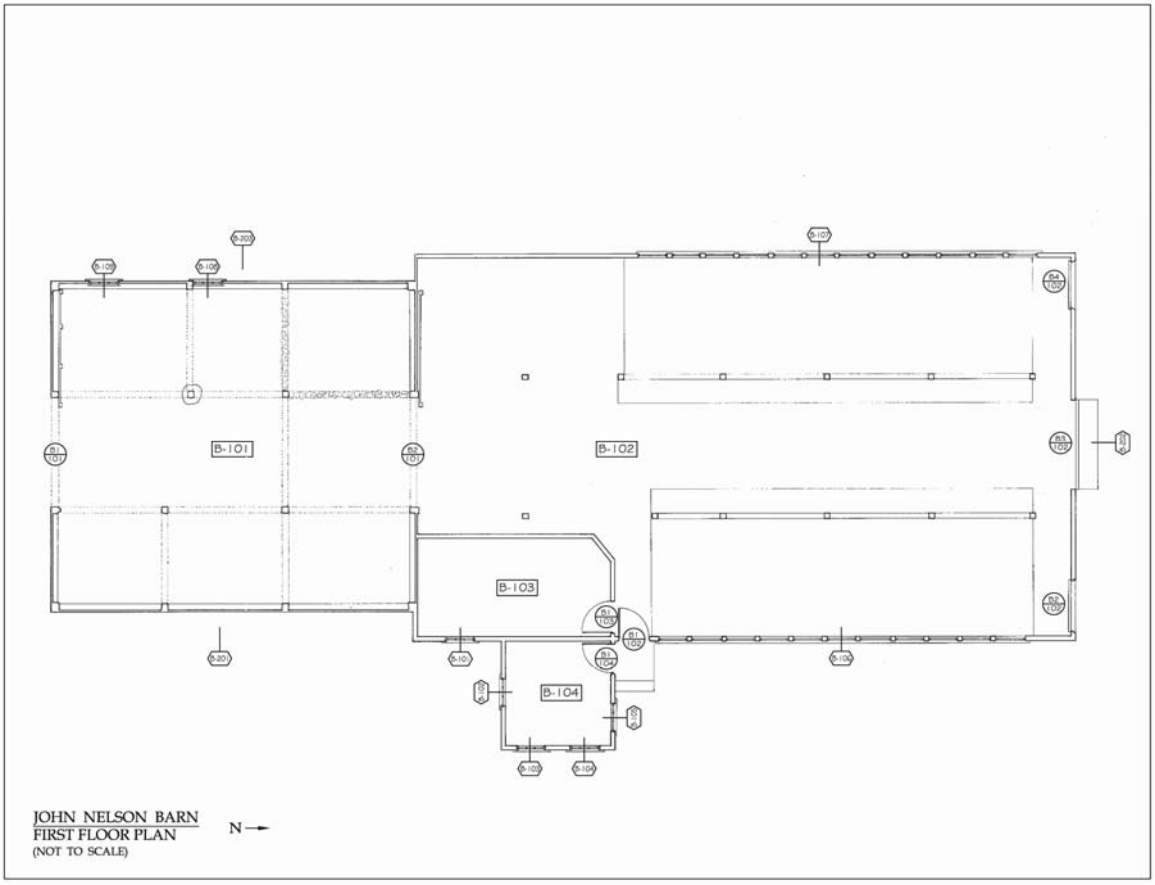


Figure FF-1. First Floor key plan (adapted from HABS drawings).

Room B-101 –
Room B-101 is the single interior room of the original barn main block section that was built in the time between 1821 and 1824, most likely by John Nelson.

Floor
- The floor is compacted earth.

Walls
- The walls are wood framing with the backside of the exterior vertical sheathing boards exposed. Areas of the wall sheathing are deteriorated and are open to the exterior. The original posts, joists, plates and other framing members are deteriorated.
- The exposed sill plates are extremely rotted.
- The southeast wall has bowed significantly toward the south with the failure of adjacent structural framing members [*figs. B101-5 & 6*].

Ceiling
- The ceiling is original rafter framing with the underside of the roof sheathing exposed. Most sheathing boards appear to be original, except for areas with plywood patching, and are deteriorated with rot and water staining. A full layer of modern plywood sheathing is installed on top of the original sheathing boards, which can be seen through the deteriorated sheathing boards [*fig. B101-2*].
- The rafters are deteriorated. The previously failed rafters in the northwest section were repaired and reinforced by the National Park Service in 1979.

Doors
- **Door B-1/101**: [*fig. B101-1*] Type d-J. Located on the south wall, the original sliding barn door is missing. The large framed door opening is infilled with plywood and corrugated fiberglass.
- **Door B-2/101**: Type d-L. Located on the north wall, the original large board-and-batten sliding barn door is intact along with the original sliding door hardware and track.

Windows
- **Window B-108**: Framed window opening with plywood infill.
- **Window B-109**: Framed window opening with plywood infill.
- **Window B-203**: 6/6 wood double hung sash with flat board trim. The painted sash and unpainted trim are extremely weathered. One light is missing.

Figure B101-1. Room B-101, looking south. The original barn door opening is infilled with plywood and a corrugated fiberglass panel.

Figure B101-2. Room B-101, showing repairs to the rafters and roof sheathing.

Figure B101-3. Room B-101, looking southeast.

Figure B101-4. Room B-101, looking southwest.

Figure B101-5. Room B-101, interior view of south wall that has projected out due to structural deterioration. The rotted sill plate at the left arrow is the original wall line.

Figure B101-6. Room B-101, jamb at Door B-1/101 where the south wall has projected out due to structural deterioration. The arrows show the extent of movement.

Room B-102–
Room B-102 is the north block interior room that encompasses most of both the circa 1836 north addition and the circa 1900 north extension.

Floor
- The floor is poured concrete at the north-to-south center bay. The flanking east and west bay floors are poured concrete in the 2 furthest south bays and wood boards on earth in the remaining side bays.

Walls
- The walls are wood framing with the backside of the exterior sheathing boards exposed.

Ceiling
- The ceiling is original rafter framing with the underside of the roof sheathing boards exposed. The southwest roof area was infilled with new rafters and sheathing in 1979 when the deteriorated west cross-gable addition was removed [*fig. B102-3*].

Doors
- **Door B-2/101**: Type d-L. Located on the north wall, the original large board-and-batten sliding barn door is intact along with the original sliding door hardware and track.
- **Door B-1/102:** Type d-I. Located on the east wall, this door leads to the exterior. The door leaf is a painted 5-panel wood door. The door is severely rotted at the base and starting to fall apart.
- **Door B-2/102**: Type d-K. Located on the east side of the north wall, this is an original 2-panel vertical board door.
- **Door B-3/102:** Type d-L. Located in the middle of the north wall, this is an original large barn door with 4 vertical board panels. Nearly half of the vertical boards have been replaced with modern boards or plywood infill. The original sliding door hardware is intact and door still operates.
- **Door B-4/102:** Type d-K. Located on the west side of the north façade, this is an original 2-panel vertical board door. The painted door is weathered.
- **Door B-1/103:** Located on the southeast wall, this opening leads to Room B-103.

Windows
- **Window B-106:** This consists of a bank of 11 framed window openings with missing wood sash. The wood trim is painted flat boards. The windows are covered with sheets of Plexiglas that are screwed onto the face of the exterior trim.
- **Window B-202:** Pair of 6-light wood sash. The wood trim is unpainted flat boards. The window is covered with a sheet of Plexiglas that is screwed onto the face of the exterior trim.
- **Window B-107**: This consists of a bank of 12 framed window openings with missing wood sash. The wood trim is painted flat boards. The window

openings are covered with sheets of Plexiglas that are screwed onto the face of the exterior trim.

Figure B102-1. Room B-102, looking north toward Door B-3/102 in the center and Doors B-4/102 and B-2/102 on the left and right.

Figure B102-2. Room B-102, looking south toward Door B-2/101 and Room B-101.

Figure B102-3. Room B-102, looking west at the ceiling. The plywood roof sheathing and sistered rafters were installed in 1979.

Room B-103–
Room B-103 is the small storage room that is found in the southeast corner of the circa 1836 north addition. The room was not surveyed due to its inaccessibility caused by the storage of machinery and other objects in its vicinity.

Room B-104–
Room B-104 is the small storage room wing that is found to the west of the circa 1836 north addition. The room is accessed only by the exterior through Door 1/104. The room was not surveyed due to its inaccessibility.

1.2.3-B STRUCTURAL

An evaluation of the barn's structural systems was conducted by Qun Wu, P.E. of HDR Engineering, Inc. to determine the condition of the component structural members and to identify remedial work required to ensure continued structural stability. The structural evaluation consisted primarily of visual observations combined with selective, non-destructive probing of various portions of the building's structural framework which were safely accessible without the use of either staging or uncovering. These observations were performed on November 5, 2007. The findings of this structural engineering assessment are presented here in this report.

General Description

The building was originally designed and constructed as an agricultural structure. It is currently comprised of two distinct blocks: the main block located on the south-side is a single-story, braced-frame, post and beam structure. The north block, located north of the main block, is a single-story structure consisting of load bearing walls with post and beam bents and appears to be of relatively recent construction using standard, dimensional lumber and modern joinery techniques. A small east wing is located along the eastern wall of the north block.

Allowable Live Load Capacity

In the process of rehabilitation, the building must be made structurally sound and the strength of the framing must be adequate to support at least the minimum wind and snow load requirements imposed by good practice and the building code. The building is located in a zone 3 snow load area; the Massachusetts State Building Code requires that roof structures in zone 3 have a minimum uniformly distributed snow load capacity of 35 PSF.

According to the Historic American Building Survey of the barn, the upper tie-beams are set at a height of approximately 14 feet. These drawings also indicate that the ridge beam is set at a height of approximately 25 feet above finished grade. Because of the visible deterioration in the roof framing and other structural members, the engineer questioned the structural integrity of most of the members for use as a bearing surface for a ladder. A close-up inspection of these members was not performed out of concern for both personal safety and possible damage to the historic fabric. The lack of direct access to many of the roof structural members precluded the engineer from making accurate measurements. As a result of both the limited access and the significant amount of deterioration observed, the snow load capacity of the main block roof could not be estimated.

Compliance with State Board of Building Regulations and Standards

Because the structure is listed in the National Register of Historic Places, the barn is considered to be an "Historic Building" as defined by the State Board of Building Regulations and Standards, 780 CMR 3409.0. This section of the code specifically "preempt(s) all other regulations of 780 CMR governing the reconstruction alterations change of use and occupancy, repairs maintenance and additions for conformity of historic buildings and structures to 780 CMR". This section allows for repairs such as "patching, splicing, piecing-in, consolidating or reinforcing" of historic materials. When such repairs are not possible, "compatible materials may be substituted which closely convey the form and design as well as the visual appearance of the existing feature." (780 CMR 3409.3.1.2). As a result, there does not appear to be any regulatory requirements under the State Building Code to upgrade the structural systems for compliance with the current standards.

The reader should note that although full compliance with the current building code is not required, in some cases, such as where the north block cantilevers over and bears on the roof of the main block, upgrades to increase the structural capacity of certain members may be desirable to avoid any overstressing of the main block structure. In this particular example, the increased dead load imparted by the north block may actually require full compliance with current building code under 780 CMR 3409.3.2.1. This issue will be discussed further in the treatment alternatives section of this report.

MAIN BLOCK

The main block measures 31'-0" east-west by 34'-3" north-south and is built on-grade with a dirt floor. The foundation consists of rubble stone walls of unknown depth. The structure is of braced-framed, post and beam construction, sheathed in vertical 1-inch boards of variable width. For purposes convention, the dimensions of all timber members in this section are described as full-dimension inches. Replacement and shoring member dimensions are nominal unless otherwise noted.

The structure rests on 8x8 timber sills along the exterior walls. The frame consists of four structural bents oriented north-south and spaced approximately 10 ft, 10 ft, and 11 ft on-center, east-west. A sketch of the bents and column lines is included. Each bent consists of two external (principal) posts and two internal posts. The posts are connected by 8x8 timber sills at bents one and four. No sills were found connecting the internal posts of the internal bents.

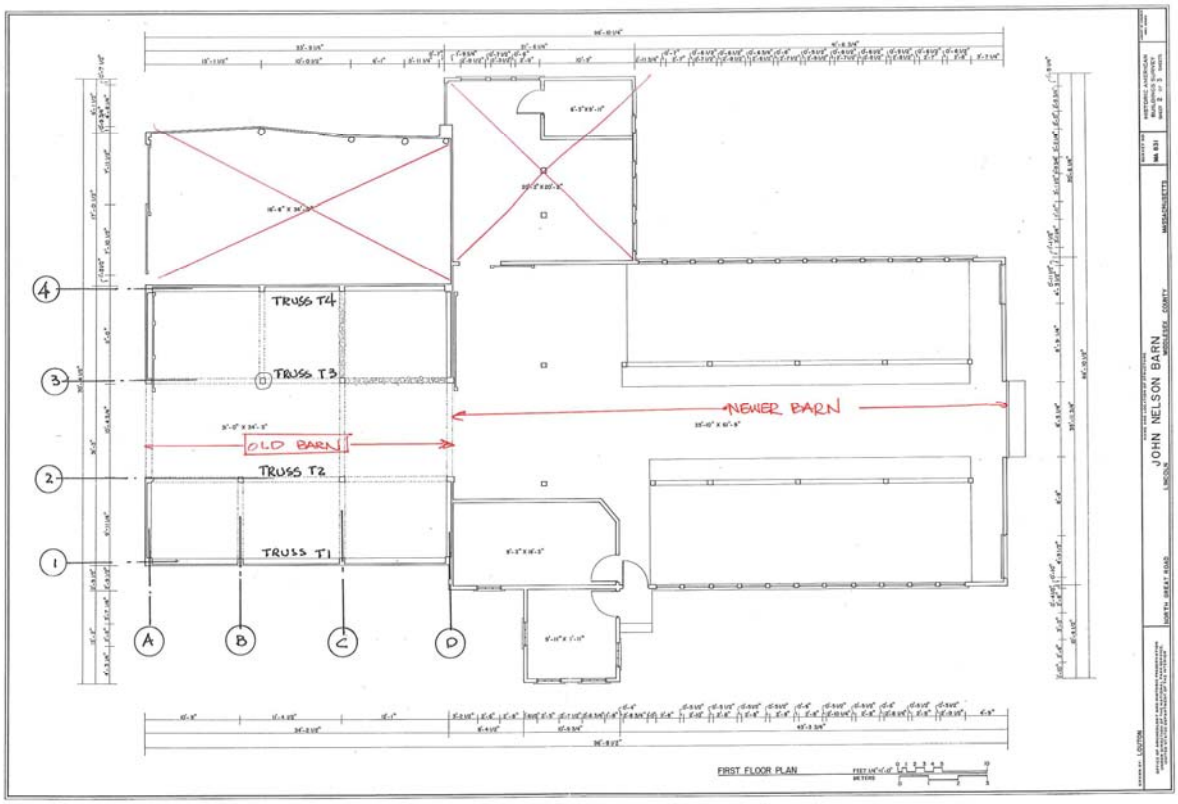


Figure BS-1. Sketch diagram showing the bents and column lines.

Figure BS-2. Typical barn post.

Each bent post is connected by an 8x8 upper tie-beam at the top and an 8x8 lower tie-beam at about mid-height. Each bent also includes a pair of principal rafters bearing on the principal posts [*fig. BS-2*], connected to each other at the ridgeline, and braced near the upper one-third points by queen posts. The queen posts bean on the upper tie-beam of each bent, just inside from the internal posts. The bottom of each internal post has been replaced with new timbers spliced with lap joints of variable lengths. In addition to the lack of sill beams at the internal bents, there are no observed mechanical means of connection between the internal posts and their concrete bases. The posts exhibit evidence of significant insect infestation; no active insects were observed.

Adjacent bents are connected by sill beams, running east-west, between the first and second bents along the north wall. Although evidence of corresponding sill beams was found along the southern wall, these beams have greatly deteriorated and in some cases are missing altogether [*fig. BS-3*].

Figure BS-3. Missing sill beams at southeast corner.

Figure BS-4. Buckled secondary rafters.

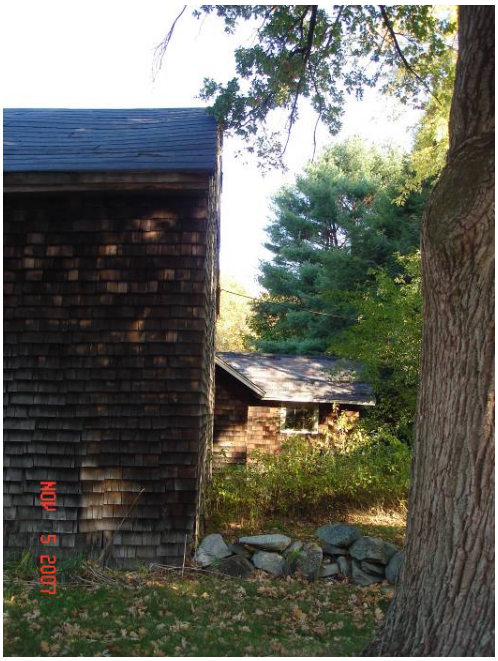
The bents are also connected by 8x8 timber top plates that span east-west at the top of the posts at column lines A, C, and D. Lower tie-beams, located within the first and third bays, span east-west at about mid-height the posts of column lines A, B, and D between bents 3 and 4 as well as column lines A, C, & D between bents 1 and 2. In the south-west corner bay, these second floor beams support a loft of solid wood boards. The boards should not be considered sufficient to safely support any live load.

In addition to the ridge beam, the principal rafters of each bent are tied together by timber purlins of variable dimensions, spanning east-west, that are located at about the top, one-third point of the principal rafters, just above the tops of the queen posts. Additional rafters span from the purlins up to the ridge beam and from the purlins down to the northern and southern top plates. Several of the secondary rafters on the south side appear to be bent [*fig. BS-4*]. Based on the size of the secondary rafters and the nature of the loading, the engineer suspects that the bending could have occurred as a result of excessive bending loading. However, because of the unfinished character and variable dimensions of the members, further analysis should consider if the apparent bending might actually be the original shape of the member at the time of construction.

The deterioration found throughout the structure appears to continue up into the roof framing. The deterioration in the roof framing is clearly visible and evidenced by the fact that shoring has been installed throughout the barn. On the north side, many of the rafters have been sistered with dimensional lumber. Additionally, the secondary rafters have been retrofitted with struts, constructed of dimensional lumber, that bear on the top plate of the northern, internal posts and support the upper end of the sistered rafters [*fig. BS-5*]. On the south side, the rafters have been braced by a secondary beam, spanning east-west, located at about the mid-span of the bottom, secondary rafters. This shoring beam is supported by struts posts that bear on the upper tie-beams of the second and third bents.

The structure has lost most of its structural integrity and is in need of significant repairs. The roof line has a clearly, discernable sag from east to west; the structure appears to have a slight lean to the east; and the south wall exhibits signs of movement at the base of about 12 to 15 inches [*figs. BS-6 & 7*]. The sill along the south wall has severely deteriorated and in some areas is missing completely.

Figure BS-5. Shoring struts supporting the north roof.



Figures BS-6 & 7. Roof line and soffit line sag – the structure is out of plumb.

This missing sill appears to have caused much of the damage visible in the roof line in that the southern, principal post of bent three may have settled approximately 8-inches. This settlement appears to have resulted in a severely distressed (possibly broken) tie-beam in bent three and a ruptured mortise on the knee brace between the post and the tie-beam [*fig. BS-8*]. The lack of a sill beam below the south door appears to have allowed the base of the south wall at bent two to move outward by approximately 12 to 15 inches. Additional trim work has been installed around the south door in an apparent attempt to compensate for this movement.

Figure BS-8. Broken tie-beam and ruptured tenon at knee brace

Figure BS-9. Sagging and deteriorated framing under north block roof projection.

The roof the north block, oriented perpendicular to the main block, was constructed directly on top of the main block. As a result, the north roof of the main block carries loads from the north block. This additional load appears to have overstressed the roof of the main block as evidenced by the additional shoring installed under the north roof [*fig. BS-9*].

The structural capacity of the roof framing should be further investigated to determine if additional and/or larger structural members are required to support the required snow and wind loads. The additional dead load introduced by the north block roof should also be considered in this analysis.

Much of the remaining, original structural material is in poor condition from rot and insect infestation [*figs. BS-10 & 11*]. Significant differential post settlement has overstressed some of the members to the point of breaking. Some joints display evidence of movement with tenon pull out of up to 1.5 inches and some of the internal columns exhibit signs of movement at their bases [*figs. BS-12 & 13*]. The poor condition of the beams and unknown extent of the deterioration makes a load rating for the roof problematic. During the site visit, the engineer was informed by park staff that the asphalt shingle roof was overlain with ½" plywood and rolled roofing material.

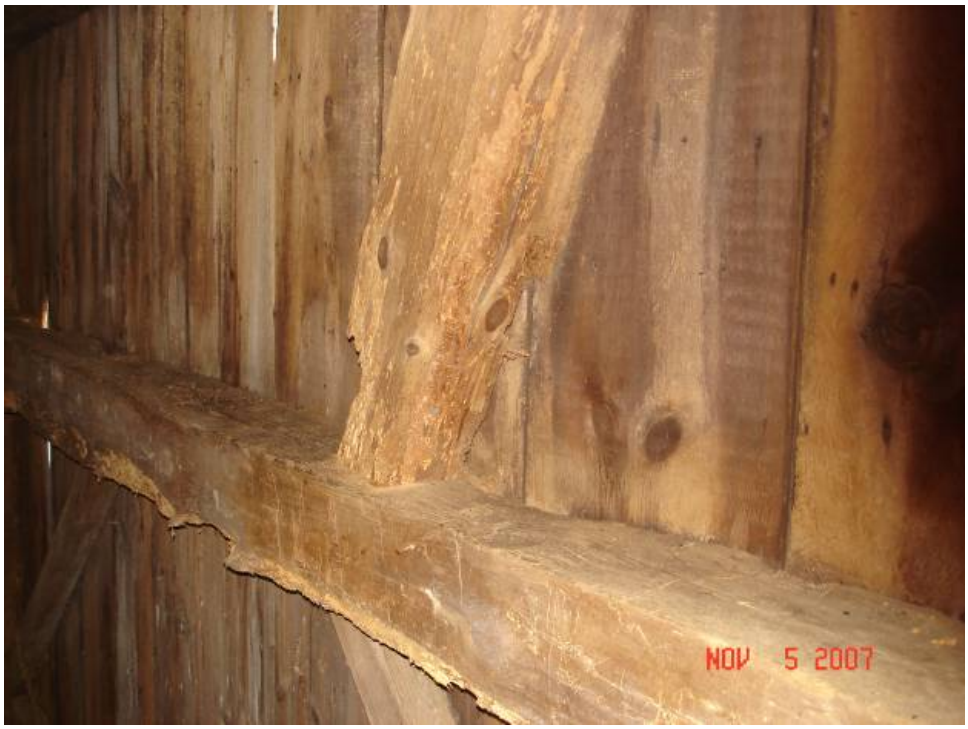


Figure BS-10 & 11. Deteriorated/missing structural members.

Figure BS-12 & 13. Tenon pull-out at upper tie-beam.

NORTH BLOCK

The north block measures 34'-10" east-west by 61'-9" north-south. The foundation consists of mortared, rubble stone walls of unknown depth and a slab-on-grade floor throughout. No mechanical means of connection were found at the bases of the internal posts. Additionally, no bracing was found at the top of the internal posts. Although this type of framing can be found in pole and beam construction, the actual details of the internal post foundations are unknown. The roof is sheathed in solid boards. For purposes of convention, all member dimensions discussed in this section are nominal unless otherwise noted.

Figure BS-14. North end of north block

The structural system of the north block consists of two exterior load bearing walls and two interior post and beam bents, oriented north-south. The structure is symmetrical to the roof ridge board. The internal bents consist of 6x6 posts set approximately 9'-7" on-center. The posts are connected by a 6x8 (estimated) tie beam, spanning north-south. The 2x8 rafters span east-west between the ridge board and the exterior walls. The tie beams support the rafters at about the upper one-third point of the rafters.

Figure BS-15. North block framing.

The post and beam bents divide the block into three bays of approximately equal width. 2x6 tie beam joists span east-west between the exterior walls and the interior post and beam bents. These joists bear on the top plate of the exterior wall and the mid-height beam of the interior bents. The park staff reported that the 2x6 joists were continuous across the entire building width but that the staff had removed the joists through the middle bay to provide additional clearance for park vehicles. The central joists were replaced with 2x6 joists set above the originals, spanning between matching posts of the two bents.

The roof is sheathed in solid wood boards (likely tongue and grooved). A portion of the roofing in the southwest corner was installed in 1979 when the western wing was removed. The replacement roofing is framed with 2x8 rafters that are “fish-plate” spliced to the original rafters. Plywood sheathing was installed in this repaired area [*fig. BS-16*].

The structure appears to be in excellent structural condition. The framing should be able to continue supporting a minimum uniformly distributed snow load of 35 PSF.

Figure BS-16. Roof framing at southeast corner.

Figure BS-17. North block roof extension over south block roof.

1.2.4-B HVAC

The barn has no mechanical heating or cooling systems installed.

1.2.5-B PLUMBING

Domestic Water Service

The municipal domestic water service includes a 3/4″ connection that is routed to a buried plastic pipe serving a hose bibb located in the ground within the adjacent barn [*fig. BP-1*].

Figure BP-1. Hose Bibb in Barn

1.2.6-B FIRE SUPPRESSION

Fire Water Service

The building has no fire protection water service.

Pressure Pumps

The building has no fire protection pumps.

Sprinklers and Standpipes

The building has no sprinkler or standpipe systems.

Fire Protection Code Issues

None noted. The current State of MA buildings codes do not require sprinkler systems in the barn. It should be noted, however, that NPS Director's Order #58 (implementing Reference Manual #58), may require sprinkler systems in the barn building pending case-by-case review by NPS regional fire safety official, as the authority having jurisdiction (AHJ).

1.2.7-B ELECTRICAL

Power Distribution

a. Description

The detached barn is fed via a 3-wire branch circuit run overhead on a messenger wire to a 240/120V, 2-circuit, main lug only sub-panel. This sub-panel contains (2) 20A-1P circuit breakers for lighting and power respectively [*fig. BE-1 & 2*]. The branch circuit wiring consists of a combination of non-metallic sheathed cable and armored cable. The conductor size is #12AWG, which has a current carrying capacity of 20Amps.

Branch circuiting for both structures is distributed throughout the buildings using a multitude of wiring methods, i.e. cloth sheathed, metal sheathed (type AC), and non-metallic sheathed cable (romex) wiring. The wire sizes used for the branch circuits consist of #14, #12, #10 & #8 based on the circuit breaker to which the conductors are attached.

GFCI protection is not provided for any circuits.

Wiring methods used for service to distribution equipment are not compliant with NEC requirements (i.e. non-metallic sheathed cable is run exposed and unprotected).

The existing overhead service cable is comprised of 3#12AWG+G conductors.

b. Assessment:

The existing 2-circuit electrical service panel, which contains the only disconnecting means, is in poor condition and should be replaced. The condition of the service conductors is poor. The interior distribution and devices are also in poor condition. The existing 2-circuit electrical service panel/disconnect serves lighting and receptacle throughout the barn. The existing service conductor (overhead), service panel, interior wiring, and light fixtures are in poor condition and require replacement for any type of re-use scenario.

Refer to attached floor plans for additional information [*fig. BMEP-1*].

Figure BE-1 . Barn overhead feeder.

Figure BE-2. Barn service.

Lighting System

a. Description

The barn lighting consists of surface mounted porcelain keyless fixtures with incandescent sources. These fixtures are in a good state of repair.

Exit signs are not in use.

b. Assessment:

The lighting fixtures are at the end of useful life using inefficient sources. Based on the balance of the electrical system it would be reasonable to say that most of the fixtures are not grounded.

Refer to attached floor plans for additional information [*fig. BMEP-1*].

Fire Alarm System

The barn does not have a fire alarm system.

Security System

The barn does not have a security system.

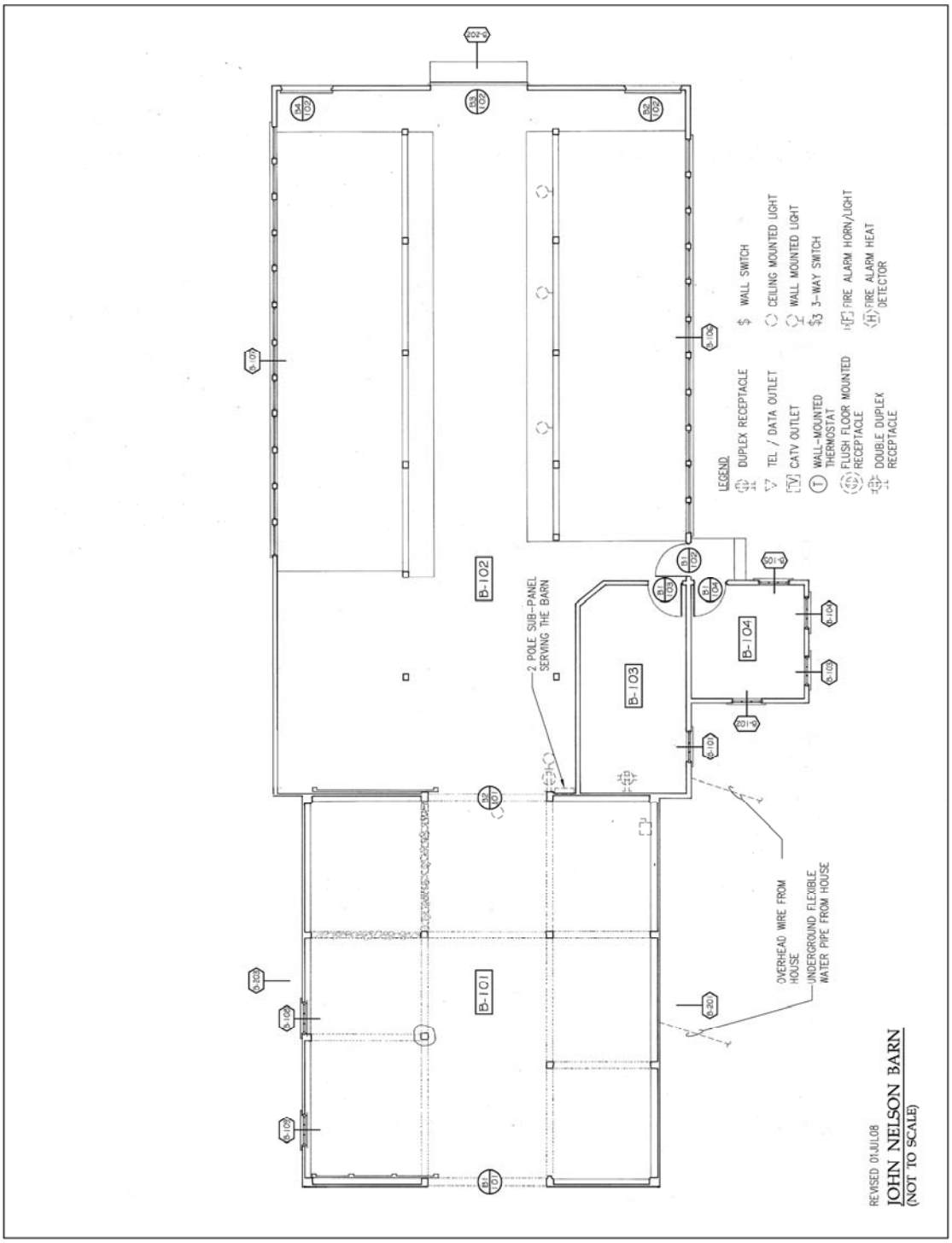


Figure BMEP-1. Mechanical, Electrical, and Plumbing key plan, Barn.

1.3-B CHARACTER-DEFINING FEATURES

To aid in the process of planning for the preservation, treatment and potential reuse of the John Nelson Barn, a general summary of the character-defining features is provided below including a list of extant exterior and interior elements which contribute to the architectural and visual character of the property. Missing features that would be considered character-defining are also listed where archival or physical evidence indicates that they were once present.

Orientation to the south facing North Great Road and the relationship with the adjacent John Nelson House.

The John Nelson Barn was constructed c. 1821-24 and is oriented facing south as the adjacent John Nelson House. The close proximity of the barn to the house indicates that it was a vital aspect of the historic agricultural operations of the Nelson farmstead. The barn is historically significant on its own merit, and coupled with the John Nelson House it continues to be a significant contributing element of the Nelson property.

Form and massing of the building as indicative of 19th century New England 3-bay English Barn.

The John Nelson Barn is a 19th century English Barn form, typified by its three bays established by four bents (vertical posts joined with tie beams and braces, separating the bays). Typically, the central bay of an English barn was the threshing floor, with the side bays functioning as grain storage and seasonal animal shelter.[26]

Building evolution and massing, directed by various uses.

The original section of the John Nelson Barn, the main block, appears to have been constructed for the purpose of agricultural storage and possibly a few farm animals. The expansion of the north block in the mid-19th century was most likely to provide housing for additional animals, as evidenced by the animal bays flanking the central north-south bay. The agricultural functions of the barn appear to have changed through the nineteenth and early twentieth centuries, corresponding with the additions and alterations to suit those functions. By the mid-to late 20th century, when agriculture ceased to be the main occupation of the residing Nelson family, the barn became most useful for storage.

Gable roofs associated with distinct blocks and building evolution.

The first section of the barn to be constructed was the main block, which was built with a gable roof running east-to-west. The north block was built as an addition to the main block, as evidenced by the cross-gable roof that overframes the north elevation of the main block roof. The roof configuration expresses the evolution of the building form.

[26] Endersby, Elric, Alexander Greenwood, and David Larkin, *Barn: The Art of a Working Building*, New York: Houghton Mifflin Co., 1992, p. 60.

Wood shingle roofs (replaced with asphalt rolled and shingle roof) and wood board roof sheathing.

The current barn roofs, comprised of rolled asphalt material on the main block and asphalt shingles on the north block and east wing, are not historically accurate. Evidence of the original roofing material does not remain, although many of the original wood sheathing boards are intact. Most likely, cedar shingles were the original roofing material.

Period millwork including roof eave cornices, rake boards and exposed rafter tails.

The exterior architectural trim details of the barn are simplified as compared to the John Nelson House, which is typical for an agricultural building. Mainly, the cornices are formed with flat boards and shallow overhangs. Adding interest to this basic architectural detailing are the exposed rafter tails of the north block and the east wing.

Period barn door openings, doors and hardware.

The original barn doors that exist on the north elevation are characteristic of typical sliding board-and-batten barn doors. The large door on the south elevation is missing, but since the door on the north elevation is still intact, the south elevation door could be reproduced to match.

Earth floor.

The earth floor found in the main block is an original feature of the barn.

Wood shingle siding and wood board sheathing.

The wood shingle siding is a common, but characteristic, exterior material used for New England barns.

Rubble masonry foundation walls.

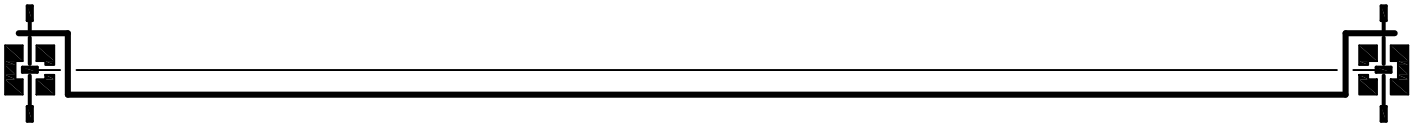
The rubble masonry foundation walls are typical for utilitarian building such as a barn. There is a distinct difference between the barn foundation walls and the John Nelson House foundation walls, which are dressed granite slabs on the north and west elevations.

Original hand-hewn framing posts, beams and rafters.

The fact that so many of the original hand-hewn bents, posts, beams and rafters are intact is significant, even though many are deteriorated. The hand-hewn framing members contribute to the overall significance of the building.

PART 2.0 - A

JOHN NELSON HOUSE:
RECOMMENDATIONS FOR TREATMENT



PART 2.0-A JOHN NELSON HOUSE: RECOMMENDATIONS FOR TREATMENT

2.1-A TREATMENT PHILOSOPHY

The *Secretary of the Interior's Standards for the Treatment of Historic Properties* provides four distinct, but interrelated approaches to the treatment of historic properties: Preservation, Rehabilitation, Restoration, and Reconstruction.

The general treatment approach recommended for the John Nelson House is Rehabilitation. Rehabilitation is defined by the Secretary of the Interior as "…the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."[27] Rehabilitation acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic value.

Change in property use is addressed specifically in the Standards for Rehabilitation. Standard number one states that, "A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships."[28] This is especially relevant to the John Nelson House since the building is being considered not only for its historical residential use, but also for possible business or assembly uses.

The remaining Standards for Rehabilitation address the retention and preservation of historic character, materials, features, finishes, construction techniques, and craftsmanship. This report provides a summary of these specific character-defining features, their conditions, and recommended treatments. Once the use of the John Nelson House is determined, the Standards for Rehabilitation shall be followed throughout the planning, design and implementation phases.

In addition to the proposed usage of the structure, a period of significance should be established in order to determine certain recommended treatments. Given the different construction periods of the John Nelson House, the rehabilitation could potentially focus on several time periods. The John Nelson Barn should also be considered jointly with the house, since the barn's significance is directly tied to its use as an agricultural building for the Nelson farmstead.

[27] "The Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for preserving, rehabilitating, restoring and reconstructing historic buildings," U.S. Department of the Interior, National Park Service, Heritage Preservation Services, 2001, http://www.nps.gov/history/hps/tps/standguide/rehab/rehab_index.htm (accessed December 2007).
[28] Ibid, http://www.nps.gov/history/hps/tps/standguide/rehab/rehab_standards.htm.

Periods of Significance:

1. April 19, 1775 - While it appears that there was a structure on the site in the 18th century, there is no documentary evidence that the house was present on this significant date and thus a "witness" structure to the British return from Concord along Nelson Road, or Battle Road. The barn had not yet been constructed.

2. c. 1808-11 – The main sections of the existing house were constructed by this date. However, this date would not include some of the later additions and changes that are believed to have been made when converting the structure from a two-family to single family residence. The evidence of these changes is present but not conclusive enough to allow for physical restoration to this period. The barn had not yet been constructed.

3. Late 19th century – This period incorporates the majority of the additions to the house and the changes that occurred when it was converted back to a single-family residence. The northeast wing would not be included in this period of significance. The appearance of the current kitchen and bathroom spaces is not fully known during this period. The barn was constructed by this time and was as it is found currently, with most of the early 20th century sheds and lean-to additions removed.

4. Early to mid-20th century (prior to c. 1975) – This time period could be considered significant because the Nelson family continued to occupy the house prior to transferring it to the National Park Service in 1975. It also includes most of the house and barn as it is found intact today, including the northeast addition, although the kitchen and bathroom spaces are thought to have been updated since then.

In consideration of these options, and the requirements of the Park for reuse, it appears that the period of the early to mid-20th century would allow for the most adaptive re-use options (residential and non-residential) as well as the least destruction of historic fabric. This period of significance allows for full interpretation of both the house and barn structures' complex evolutions, without suggesting the removal of later modifications for the sake of historical accuracy. The early to mid-20th century period includes an accumulation of the various features from all three previous periods of significance, since the features were incorporated into and absorbed by the house as it evolved over time.

2.2-A REQUIREMENTS FOR TREATMENT

2.2.1-A USE AND INTERPRETATION OF THE RESOURCE

Given the existing physical condition of the House, any future occupancy will require moderate rehabilitation and restoration of the interior and exterior finishes as well as the repairs to or upgrading of basic support utilities such as electrical service, heating and cooling, and plumbing. In addition, the impact of a proposed use on the historic resource must be considered in an effort to preserve the maximum amount of historic fabric.

The Park has projected that the most feasible immediate re-use scenario for the John Nelson House is single-family residential. The house was most recently occupied for residential use, having been under lease (not affiliated with Park housing) during the time after being acquired by the Park until its current vacancy. The Park acknowledges that residential rental income will help support cyclical maintenance of the house and barn and will underwrite deferred restoration work. Appendix 3.1 contains a detailed list of the primary rehabilitation work and associated cost estimates for the repair and stabilization of the John Nelson House for residential use, including improvements to satisfy building code requirements. The cost to install an automatic fire suppression system is also part of Appendix 3.1. However, this estimate is separate from the cost to rehabilitate for single-family residential.

- Single-Family Residential –

The building's size is very suitable for residential use and given that the John Nelson House was constructed as a one-, then two-family residence, any type of residential occupancy would be relatively low impact. Many of the amenities necessary for residential use, such as a kitchen and bathrooms, were already introduced and any new kitchens and bathrooms could be located in the areas already disturbed by the earlier work.

As a residence, the John Nelson House could be rented to a Park employee or to a private tenant. Residential occupants often provide a deterrent to vandalism and unwanted trespassing, particularly at night.

Building code compliance issues are relatively minor. Residential uses generally require two means of egress, one primary and one secondary. The central stairway could serve as the primary means of egress, if granted a variance for riser dimensions. The secondary means of egress would be provided through the north stair if granted a variance for width and tread/riser dimensions. Another option would be to exit through existing windows although they do not meet the current code requirement of 5.7 square feet of area and would also require a variance. Variances such as these are often granted for existing historic structures.

The installation of a 13R automatic fire suppression system would compensate for the noncompliant stair and would eliminate the requirement for a secondary means of egress.

Other noncompliant features, such as door widths, ceiling heights, and hallway widths which do not meet code are generally permitted based on the existing and historic status of the structure.

Two other possible uses have been considered for the John Nelson House:

- Visitor Center/House Museum –

The John Nelson House and Barn are located near the east entrance of Minute Man National Historical Park on North Great Road (Route 2-A), near the historic Battle Road route, and the House could be adapted to serve as a satellite visitor and interpretation center. The main Minute Man Visitor Center is located a short distance to the east of the John Nelson House. Since parking at the John Nelson House is not feasible, visitors could park at the Visitor Center parking lot and travel to the House by foot via the Battle Road Trail.

The use of the John Nelson House as a visitor center and museum is discussed in the October 2005 report entitled, *Minute Man National Historical Park Battle Road Structure Survey*, prepared by the National Park Service and the Olmsted Center for Landscape Preservation. The study analyzed potential uses for the House including a center for artists in residence, youth hostel, tea room, director's residence, office, bed and breakfast inn, environmental education staging center, and living history/working farm. The visitor center/house museum use is listed in the report as the preferred use by the MIMA NHP and is categorized as "low impact" (the effect on the landscape is described as "medium impact"). Benefits listed for using the House as a museum include a unique interpretive experience for visitors, contribution to the local significant architecture, and close location to Battle Road Trail and Visitor Center parking lot. Disadvantages to the museum use include the necessity for a full Historic Structure Report to understand the structure (much of which is accomplished in this HSAR) and the potentially destructive impact on the structure during architectural investigations necessary for museum exhibits.[29]

Rehabilitating the John Nelson House as a museum and visitor destination along the Battle Road Trail can be accomplished by focusing the reinterpretation upon the Nelson family historical landscape. The route along the Battle Road Trail from the Visitor Center to the John Nelson House and Barn passes through property historically owned by various members of the Nelson family. As early landowners and farmers, the Nelson family is extremely significant to the area's agricultural history. As well, a few of the Nelson family members were participants in the events of April 19, 1775. The preserved remains of the Thomas Nelson and Josiah Nelson, Sr. house are located on the Trail, northeast of the John Nelson House. Although the

[29] Laham, Lauren and Macej Konieczny. "Battle Road Structure Survey, Phase II. Minute Man National Historical Park, Concord, Massachusetts." Lowell, MA: U.S. Department of the Interior, National Park Service, Historic Architecture Program and Olmsted Center for Landscape Preservation, October 2005, p. 8.

John Nelson House and Barn were constructed after the end of the Revolutionary War and thus are not significant to the historical focus of Minute Man Historical Park, the structures stand as significant representations of both regional family heritage and early 19th century New England vernacular architecture.

- Offices or Business –

The John Nelson House could accommodate a variety of commercial functions including Park or tenant office space. The house could also be adapted for dual-occupancy use, such as a Museum on the first floor and NPS offices on the second floor.

The office or business reuse scenario is also relatively low impact. It is generally adaptable to existing room and spatial configurations, requires little reorganization of the existing layout, and in most cases would involve no special added amenities.

The site impact of car traffic in and out of the small parking area would also need to be addressed.

2.2.2-A CODE REVIEW

The following code review section addresses the three re-use scenarios discussed in the previous section: residential, office/business, and visitor center/assembly. Although residential use is planned, the information relative to all three uses is included for future Park reference. In order to re-occupy the John Nelson House, the building will have to meet minimum life safety and fire safety criteria.

Applicable codes include the following:

- International Building Code, 2006 for construction and building (IBC)
- International Existing Building Code, 2006 for construction and building (IEBC)
- Architectural Barriers Act Accessibility Standards (ABAAS)

All of the above-listed codes or regulations acknowledge that there are challenges in meeting all of the requirements in historic buildings without damaging or losing significant historic fabric. In most cases, alternative methods of compliance or variances must be reviewed and agreed upon by the authorities having jurisdiction. The following is a summary of the most significant code elements associated with the existing physical design of the John Nelson House and a general discussion of the new requirements relative to the various possible uses.

IBC & IEBC

The IBC and the IEBC provide guidelines for the building height and area limitations depending on the occupancy. All of the above-listed codes or regulations acknowledge that there are challenges in meeting all of the requirements in historic buildings without damaging or losing significant historic fabric. In most cases, alternative methods of compliance or variances must be reviewed and agreed upon by a design process team.

Existing Building Components

The most significant existing physical components of The John Nelson House are summarized below followed by a general discussion of the code requirements relative to possible future uses.

Existing Occupancy Group: Residential (unoccupied for approx. 1 year)

Proposed Occupancy Groups: Small Assembly (visitor center); Business (house museum, park offices); mixed.

Business is a relatively lenient usage classification whereas Assembly is a relatively restrictive usage classification.

Construction Type: The majority of the house is Type V B (common construction). Protection type is "B" (unprotected). However, the codes allow for some fire rating qualities to be applied to historic materials such as plaster on walls.

Total Gross Square Footage:

Condition: Floor area is 4,526 and includes the basement. The attic is not accessible and is not included in the gross square footage calculation.

Total Occupiable Space: 3,880 (first and second floors only)

Height and Number of Stories: The height limitation for Type V B the limit is 2 stories.

Condition: Existing 24'-0" and two stories.

Stairs: Two (2) existing stairs.

Number of Exits: In general, two (2) exits are required from each floor. A single means of egress is allowed if (a) the single exit serves only one floor and the total travel distance is less than 100' or (b) there is only one (1) tenant, the building has automatic fire suppression and the total travel distance is less than 100'.

Conditions: The first floor has four (4) doors that exit the building. The second floor has two stairs (see below) which would require waivers to retain. Until a use is selected, it is difficult to determine if the building meets the criteria for a single means of egress.

Exit Enclosures (stairs): 1-hr. rated if three stories or less including fire-rated door with closer.

Conditions: Current stairs are either not enclosed or the enclosure is not 1-hr. rated. Adding automatic fire suppression to the building may be an alternative to this requirement. The straight run stairs are not enclosed at the second floor and only the north stair is enclosed at the first floor.

Headroom in existing buildings: 84", ceiling projections 80".

Conditions:

Doors: Exit enclosure doors must swing in the direction of egress.

Conditions: All existing exterior doors swing inward against the direction of egress.

Stairs: Existing building maximum riser 7½", minimum tread 10".

Conditions: Existing north stair does not meet code for existing stairs for any possible use. They are too narrow (27" wide), too steep (9-7/8" riser, 8-3/4" tread) and do not have 80" of headroom at the bottom. Existing central stair run is too narrow; however, the riser height and stair width is compliant (8-1/4" riser, 9-1/2" tread, 46-1/2" wide).

ABAAS

Any new use for the house will require compliance with ABAAS. Historic structures are expected to comply with the accessibility guidelines for building alterations except where the required work would threaten or destroy the historic significance of the building. The determination of whether or not an alteration would threaten or destroy historic significance will come from the NPS with concurrence from the State Historic Preservation Office of Massachusetts.

Minimum ABAAS requirements for historic structures are:

- At least one accessible route from a site access point to an accessible entrance shall be provided.
- At least one accessible entrance which is used by the public shall be provided.
- If toilets are provided, then at least one toilet facility along an accessible route (may be unisex) shall be provided.
- Accessible routes from accessible entrance to all publicly used spaces on at least the level of the accessible entrance (includes 32" clear doorways) shall be provided. Access should be provided to all levels of a building or facility whenever practical.
- Displays and written information, documents, etc. should be located where they can be seen by a seated person.

The John Nelson House presents several existing conditions that are in conflict with even the minimum requirements.

Site Access: As noted in the Site section, the existing loose gravel parking lot is not accessible. In addition the existing raised porches and stoops are not accessible. The brick paths do appear to meet the criteria of an accessible walkway.

Accessible Entrance: There are four first floor entrance doors and a garage door. All of the doors are elevated above grade and not accessible. A ramp or grade modification, along with a new sidewalk to the accessible entrance, could provide access to one of the north doors. Once inside, the first floor is one level with only minor thresholds.

Toilet Facilities: Only one ground-floor powder room exists and it is not accessible. Any new toilet facilities would need to be accessible.

Accessible Route: Once inside the building, the first floor is one level with only minor thresholds. The code allows for up to ¾" thresholds in historic buildings provided they are beveled on each side. The doors are typically 31 1/2 inches to 32 inches wide which gives about 31 inches of clear width between the door stops. This does not meet the minimum code required clear width of 32 inches yet widening of any of the doors would cause significant loss of historic fabric. A variance for the non-compliant doorways should be requested. The physical layout of the house limits access to the entire second floor. Introducing an elevator to provide access is a consideration, however the amount of alteration and physical invasion that would be required may to be greater than the benefit of gaining access to the second floor. A recommendation for providing an accessible route to the second floor cannot be made until the new use for the building is established.

2.3-A RECOMMENDATIONS FOR TREATMENT

The following in-depth studies and documentation are recommended prior to any work or repairs, but they are not considered to be necessary for the priority rehabilitation work as discussed in Appendix 3.1:

Hazardous material survey and analysis

- Removal and/or mitigation of hazardous materials are often an important component of historic building preservation or rehabilitation. A comprehensive survey and analysis of hazardous materials would identify finishes that may require removal or other mitigating treatment. The treatments may include removal of historic finishes, such as layers of lead paint.

Paint and finish sampling and analysis

- As noted in the report, there are a number of questions about the building chronology that might be answered by comparative paint analysis. In addition, a comprehensive paint and finish study would document all finishes in case original layering of paint is lost due to surface preparation or removal of built-up paint layers. This study should also include the exterior surfaces of the building even though many of the wood surfaces have previously weathered to bare wood and many of the original paint layers may be missing.

Mortar sampling and analysis

- Any recommended repointing or masonry repairs can only be undertaken in conjunction with full analysis of the exiting mortar composition in order to properly match the formula, color and texture. A full study of many samples would document the variety of mortars that may be present and may also provide information about previous, undocumented repairs, and the construction chronology of the various building sections.

The recommended treatments outlined below fall into two categories: preservation and rehabilitation. Preservation recommendations include those that should be addressed to avoid further deterioration of the building or that will lead to loss of the historic fabric if left untreated. These are recommendations regardless of the occupancy of the building. Rehabilitation recommendations include those that support the intended use of the building. Some of the recommendations that are listed will only be implemented if certain building uses are determined. In all cases, the recommended treatment would attempt to minimize the removal of earlier fabric and, if removal was necessary, full documentation would be recommended before treatment occurred.

2.3.1-A SITE

- Prepare a topographic site survey including front and back yard to center of North Great Road.

- For business/assembly use, provide a designated accessible parking space.

- Provide a compatibly-designed, accessible ramp to either the south-facing door of the north facing door of the northwest block.

- Provide a gravel trench with drainpipe along the roof drip line to minimize water splashing onto building (see discussion of roof drainage recommendations in architectural exterior recommendations, section 2.3.2.1-A).

- Consult an arborist for recommendations on the disposition of the sugar maple in the front yard.

- The town of Lincoln recommends the installation of a minimum 4-inch ductile iron water service from the existing 8-inch main to serve any new sprinkler system that may be installed in either the house or the barn. Recommend that the final size of the fire protection service be determined by a plumbing engineer.

2.3.2-A ARCHITECTURAL

2.3.2.1-A Exterior

Stone foundation wall: selective repointing to fill in gaps at masonry joints:

- South and west elevations (main block and northwest wing): slab stone wall with (18) vertical joints by approx. 1'-6" high.
- East elevation (northeast wing): large stone random rubble, 14'-6" long by 2'-0" high.
- North elevation: small stone random rubble, 81'-0" by approx. 1'-0" high.

Wood clapboard siding (east, south and west elevations): scrape peeling paint, prime and apply 2 new coats of paint; replacement of deteriorated boards.

- Selective scraping and painting: 80% of approx. 1,440 square feet.
- Selective replacement of deteriorated boards: 10% of approx. 1,440 square feet.

Wood shingle siding (north elevation): scrape peeling paint, prime and apply 2 new coats of paint; replacement of deteriorated shingles.

- Selective scraping and painting: 80% of approx. 1,329 square feet.
- Selective replacement of deteriorated shingles: 10% of approx. 1,329 square feet.

Wood Trim: Selective repair and/or replacement of wood apron boards, corner boards, roof cornice and trim.

- Replace deteriorated wood apron board: approx. 78 linear feet (3/4" x 4-1/4" board).
- Repair deteriorated ogee profile cornice at 5 corner intersections and approx. 6 linear feet at south elevation of main block and 20 linear feet on north elevation.
- Replace flat fascia board at northeast wing: approx. 23 linear feet on south elevation (1" x 4" board).
- Replace rotted soffit at northeast wing: approx. 3 linear feet on north elevation.
- Replace rotted and detached ogee profile rake board on east elevation of 1-1/2 story block at northeast wing: approx. 15 linear feet.

Brick Walls (east and west walls of main block): cleaning and repointing.

- Cleaning of water stains, vegetative growth and dirt: 100% of approx. 582 square feet.
- Selective repointing at areas of missing mortar (mostly at gaps between brick and window frames) and areas of incompatible mortar infill: 10% of approx. 582 square feet.
- [Alternative: repointing of 100% of approx. 582 square feet.]

Windows

- Repair 2 basement windows, including deteriorated wood frames and sash. Replace missing light in window 002.
- Repair deteriorated sills of wood frame and sash double hung 6/6 windows: 10% of 30 total windows.

- Repair projecting wood cornice and metal flashing: 9 windows.
- Repair deteriorated sash muntins: 75% of 30 total windows.
- Replace 7 broken panes of glass (approx. 9″ x 13″).
- Replace missing wood window sash: (2) 9-light casement and (1) 6/9 double hung.
- [Alternative: remove 2 modern windows on north elevation and replace with new wood 6/6 double-hung divided light windows.]
- [Alternative: remove aluminum storm windows and install 30 removable exterior wood storm sash (approx. 30″ x 56″ panel size)]
- [Alternative: remove aluminum storm windows and install 30 magnetic interior storm panels (approx. 30″ x 56″ panel size)].

Doors

- Replace deteriorated sills and thresholds: 3 doors on south elevation.
- Replace cracked fanlight glass at Door 1/101.
- Repair deteriorated decorative wood door surrounds including pilasters, cornices and other millwork details: (2) approx. 5′-0″ x 8′-0″ door surrounds with 25% area rotted or missing.
- Repair rotted areas of diagonal board-and-batten carriage house door on south elevation: bottom 1′-0″ high x 7′-9″ wide area deteriorated. Repaint entire door (approx. 62 square feet).
- Remove aluminum storm doors at 2 south elevation doors and replace with wood storm doors.

Roof

- Remove asphalt shingle roof and sheathing. Replace with new plywood sheathing, ice and water shield and approx. 1915 square feet red cedar shingles.
- [Alternative: replace roof with white cedar shingles].
- [Alternative: replace roof with pine shingles]

Roof Drainage

- The installation of gutters is not recommended because they are not historically compatible with the house. In order to minimize water splashing onto the building, provide a gravel trench with drainpipe along the roof drip line.

Exterior Lighting

- Replace 3 surface-mounted porch/entry lights.

Porch (north elevation): shed roof porch with 2 posts and wood board deck.

- Remove existing porch and replace deck, deck framing, 2 posts, sheathing, trim, roof framing and wood shingle roof (retain existing foundation with 7′-7-3/4″ x 5′-1-1/2″ footprint).

2.3.2.2-A Interiors

The following list includes recommendations for the removal of specific architectural features including, but not limited to, cabinetry, appliances, light fixtures, stairs, railings, floor materials, and partition walls. These specific items shall not be removed and/or replaced until the new use of the house structure and site has been determined.

Floors

- Clean existing wood floor (approx. 1,057 square feet).
- Remove paint from wood floor and refinish (approx. 865 square feet).
- Remove sheet vinyl or composite tile floor and replace with new wood floor (approx. 300 square feet).

Walls

- Repair parging at brick bearing wall in basement Rooms 001 and 002 (approx. 50 square feet).
- Investigate source of water infiltration at south basement wall and correct any deficiencies.
- Remove wallpaper from walls and prepare plaster wall for paint (approx. 1,156 square feet).
- Repair cracks in plaster walls (approx. 23 linear feet).
- Prepare plaster wall surfaces and repaint (approx. 6,054 square feet).
- Prepare wood baseboard, wainscot and cap surfaces and repaint (approx. 416 square feet).
- Remove wood stud wall and gypsum wall board partition that divides Room 206 (approx. 5′-0″ x 8′-0″).

Ceilings

- Remove textured plaster ceiling in Room 106 and replace with smooth plaster ceiling to match other plaster ceilings in the house (approx. 186 square feet).
- Remove skylight at Room 205 and patch plaster ceiling.

Doors

- Prepare all interior doors and repaint (35 interior doors).
- Prepare all interior casing and repaint (34 windows and 37 doors/cased openings).

Interior lighting

- All existing lighting fixtures in the house appear to be contemporary and do not merit salvage or restoration. Remove 8 ceiling fixtures and 6 wall sconces and replace.

Cabinetry & Appliances

- Remove kitchen cabinets and appliances.

Stairs

- If the second floor has business or assembly occupancy, remove stair railings and handrails and install new code-compliant railings and handrails at 2 locations.

Fireplaces

- Clean brick fireboxes and repoint (8 fireplaces).
- Prepare decorative wood fireplace surrounds and repaint (8 fireplaces).

2.3.3-A STRUCTURAL

MAIN BLOCK

Regarding the southern sill beam, carefully remove the exterior apron board and siding along the south side to determine the full extent of the sill deterioration. Remove the rotted portion and replace with 8x8 pressure treated timbers; connect the new sill beam to the sound material with a 4-ft lap joint secured with lag screws. Jacking of the structure will likely be necessary if the sill must be replaced below a post. Carefully remove additional siding and sheathing if the rot is found to continue up into the posts and wall studs. Replace or repair the posts and studs as required. The full scope of work cannot be determined without removing the exterior materials for a visual inspection.

The 8x8 beam located in the basement, 9' from the western wall is limited by deflection to 15 PSF. Occupancy will be limited by this relatively low Live Load rating and therefore limit the potential for reuse of the building for either residential or business/assembly purposes. To provide a Live Load capacity that is compliant with the current Building Code standards, install a post at the mid-span of this beam. The engineer estimates that the post will increase the Live Load rating for this floor to 50 PSF; this rating is fully compatible with both residential and business/assembly uses.

Note: if increases in the Live Load rating are desired, the recommended treatments contained in this section will generally increase the rating to about 50 PSF. These treatments should be considered optional as discussed in the structural evaluation section of this report.

Replace the deteriorated first floor beams as required with pressure treated, select structural lumber or timbers. Connect the repaired beams to the sill beams with metal joist hangers. Where the new materials meet the original beam, connect the two members with a lap joint supported on adjustable steel columns supported by new concrete footings.

A more desirable alternative may be to replace the entire length of the rotted beams in kind. However, if full beam replacement is chosen, the building occupancy and Live Load rating will be limited by deflection to only 15 PSF. Install new posts at the mid-point of each beam to provide a Live Load rating of 50 PSF.

Sister the first floor 3x3 joists to provide a Live Load rating of 50 PSF.

Replace rotted joists either in kind or with 2x6 pressure treated, select structural lumber supported by the beams with metal joist hangers.

In the attic, jack the broken rafter back into position and sister with select structural lumber. Inspect all rafters for damage and sister with select structural lumber, as required.

Although the second floor framing was not visible for observation, the framing is not likely to exceed the capacity of the first floor framing. As a result, significant structural modifications will likely be necessary to provide minimum floor load requirements per the current building code. Such improvements might include the insertion of steel beams to support the main floor beams. Sistering the floor joists may be required for additional support.

NORTHWEST WING

Regarding the northeast principal post, carefully remove the exterior siding and sheathing in the vicinity of the post to determine the full extent of the sill and post deterioration. Determine if shoring is required and provide as necessary. Remove any rotted portions and replace members in kind. Given the extensive deterioration observed in the post, it may be necessary to jack the corner at the top of the post for a full replacement. To repair the second floor beam, the vent stack should be reconfigured so that the beam can be reconnected to the post. The tie-beam should be jacked back into alignment and can either be fully replaced in-kind or partially replaced in-kind with a tension scarf joint to avoid the need for an interior post in the kitchen area. Steel reinforcement may be required with a tension scarf joint.

Regarding the second floor hallway, carefully remove the hallway flooring and the kitchen ceiling below to inspect the structure and determine the source of failure in the framing. Repair or replace materials as required.

For the first floor, carefully remove the floor and sub-floor in the kitchen to expose the deteriorated beam west of the north door. Replace deteriorated portions of the beam and joists with pressure treated, select structural timbers and metal joist hangers.

In the crawl space, replace the intermittent brick and wood piers with concrete masonry piers set on concrete footings.

Regarding the sill beams, carefully remove the exterior apron board and siding to determine the full extent of the sill deterioration. Remove the rotted portions and replace with 8x8 pressure treated timbers; connect the new sill beam to the sound material with a 4-ft lap joint secured with lag screws. Jacking of the structure will likely be necessary if the sill must be replaced below a post. Carefully remove additional siding and sheathing if the rot is found to continue up into the posts and wall studs. Replace or repair the posts and studs as required. The full scope of work cannot be determined without removing the exterior materials for a visual inspection.

Although moisture was not observed in the crawl space, this may have been related to the time of year that the observations were made. A dehumidifier located in the basement of the main block indicates that excess moisture is a problem in the basement. Provide ventilation of the entire basement and crawl space. Install a vapor barrier throughout the crawl space and within the low height basement located in the western end. The vapor barrier should be protected with a layer of stone. Some excavation of the

crawl space may be necessary to allow for continued access within this space after the stone is placed.

Since observations of the second floor framing was very limited no rating analysis could be performed. However, the framing is not likely to exceed the capacity of the first floor framing. As a result, significant structural modifications will likely be necessary to provide minimum floor load requirements per the current building code. Such improvements might include the insertion of steel beams to support the main floor beams. Sistering the floor joists may be required for additional support.

ORIGINAL EIGHTEENTH CENTURY BLOCK

Repair the second floor beam as discussed in the northwest block discussion. Sister and reconnect the second floor joists to this beam.

The hearth bricks have a significant pitch to the north and additional investigation is recommended to determine the live load capacity of the floor. Carefully remove the floor boards to expose the floor framing and make repairs as required. Install a vapor barrier over any exposed soil and cover with pea stone. Inspect the hearth support structure and install masonry piers if required; replace deteriorated members with pressure treated, select structural timbers.

NORTHEAST WING

Regarding the sill beams, carefully remove the first floor boards and possibly the exterior siding to inspect for sill deterioration. Remove the rotted portions and replace with similarly sized, pressure treated timbers; connect the new sill beam to the sound material with a 4-ft lap joint secured with lag screws. Jacking of the structure will likely be necessary if the sill must be replaced below a post. Carefully remove additional siding and sheathing if the rot is found to continue up into the posts and wall studs. Replace or repair the posts and studs as required. The full scope of work cannot be determined without removing the exterior materials for a visual inspection.

Realign the frame with jacks and cables to restore structural integrity. Reinforce the joints with metal straps.

Sister the joists with 2x6 select structural lumber connected to the beams with joist hangers. Additional joists will likely be required to provide minimum live-load ratings.

Reconsolidate the checked beams with epoxy and lag screws.

2.3.4-A HVAC

Following are recommendations regarding repair, modifications, and/or upgrades for the HVAC infrastructure systems. The upgrades are listed separately for residential or business/assembly re-use scenarios.

Residential re-use:

The intent of the recommendations below is to repair and upgrade the existing systems to provide reliable heating and appropriate level of temperature control zoning. Consistent with typical residential HVAC systems in the Northeast part of the country, ventilation shall be provided by operable windows only, and mechanical cooling is not required.

- Replace all heating water piping and repair terminal heating radiator connections and controls. The existing radiators should be cleaned and refinished, new controls valves (for zoning) isolation valves, vents, and balancing valves should be provided. The new piping configuration should be designed to provide independent zoning of the first and second floors, along with the current east/west zoning split (for a total of four control zones). Programmable electronic thermostats are the recommended controls. The existing boiler, heating water pumps, and first floor thermostats can be re-used. All new piping in the basement should be insulated with a minimum R-5 pipe covering system. Piping in crawl space should also be jacketed with and provided with a vapor barrier system.

- Replace fuel oil storage tank with new 275 gallon tank.

- Provide combustion air intake/relief ductwork system in basement to comply with State Mechanical Code requirements.

Business/Assembly re-use:

The intent of the recommendations below is to repair and upgrade the existing systems to provide reliable heating, air conditioning, ventilation, and appropriate level of temperature control zoning. These requirements are consistent with typical HVAC systems in the Northeast part of the country.

- Replace all hydronic water piping and replace existing radiators with fan-coil style heating/cooling units (floor mounted). Architecturally compatible enclosures should also be provided or constructed to maintain the existing building's historic nature. Because the building is primarily ambient environment driven (with regard to HVAC system loads), the option to provide a two-pipe style hydronic heating cooling system is an appropriate cost option. In this arrangement, the entire system would be provided with heating water (from re-use of the existing boiler), or cooling water from a small package chiller. The estimated preliminary chiller capacity required is 10 tons. An alternate to

the chiller scenario would be to provide a water-to-water style heat pump system supported from a geothermal ground well. This alternate would reduce the energy required for cooling by utilizing ground temperatures for condensing in lieu of ambient air temperatures.

- With regard to ventilation, the final occupancy requirements will dictate whether natural ventilation or mechanical introduction is required. To provide mechanical ventilation, the recommended approach is to locate make-up air units in the basement and closet/attic spaces of the upper floor. Ductwork can then be provided to discrete floor and ceiling registers for delivery of conditioned ventilation air to each occupied space. For energy reductions purposed, the make-up air units should be provided with energy recovery wheels that transfer heat from outgoing exhaust air (required to maintain proper building pressurization) to incoming ventilation air. Final tempering can then be provided via a hydronic heating coil supported by the boiler water system.

- The recommended new piping configuration should be designed to provide independent zoning for each of the fan-coil units. Programmable electronic thermostats are the recommended controls. The existing boiler can be re-used; new pumps will be required to support the increased flow requirements of the system during cooling operations. All new piping should be insulated with a minimum R-5 pipe covering system. Piping in crawl space should also be jacketed with and provided with a vapor barrier system.

- Replace fuel oil storage tank with new 275 gallon tank.

- Provide combustion air intake/relief ductwork system in basement to comply with State Mechanical Code requirements.

2.3.5-A PLUMBING

Following are recommendations regarding repair, modifications, and/or upgrades for the plumbing infrastructure systems. The upgrades are listed separately for residential or business/assembly re-use scenarios.

Residential re-use:

- Replace all plumbing fixtures in upper level bathroom.
- Inspect internals site lift station and test underground sanitary piping.
- Immediate drain waste and vent system repairs include replacement of the tail-piece on lavatory at lower level bathroom and repair/replace corroded sanitary piping at basement level.
- Over the longer term, replace all drain, waste, and vent piping at throughout the facility. The majority of this piping is past its typical service life and shows signs of corrosion and deterioration.

Business/Assembly re-use:

- Replace all plumbing fixtures in upper level bathroom.
- Inspect internals site lift station and test underground sanitary piping.
- Immediate drain waste and vent system repairs include replacement of the tail-piece on lavatory at lower level bathroom and repair/replace corroded sanitary piping at basement level.
- Over the longer term, replace all drain, waste, and vent piping at throughout the facility. The majority of this piping is past its typical service life and shows signs of corrosion and deterioration.
- Provide drinking fountains on first and second levels.
- Provide accessible bathrooms with ABAAS compliant water closets, lavatories, and metered faucet fixtures. It should be noted, the existing water service is adequate to support tank style water closet fixtures only. If flush valve water closets are desired, a new larger water service (from the municipal street system) will be required.

2.3.6-A FIRE SUPPRESSION

Following are recommendations regarding repair, modifications, and/or upgrades for the fire suppression infrastructure systems. All upgrades are recommended for both the residential or business/assembly re-use scenarios unless noted otherwise.

- Ensure fire extinguishers are provided in conspicuous location at the upper and lower level.
- Current State of MA building codes do not require installation of sprinkler systems in the house facility. If upon further review by NPS regional fire safety official as the authority having jurisdiction (AHJ) the building is deemed to require sprinkler protection under NPS Director's Order #58, it is recommended that a new sprinkler water service (from existing municipal water systems) and fully automatic sprinkler systems throughout the house facility be provided. A wet-pipe style system is recommended for all heated areas with a dry-pipe or glycol system incorporated for unheated (attic/crawl space) areas. The system design and coverage should be consistent with NFPA code requirements. Current site engineer evaluations of the local municipal water supply indicate adequate services are available to support installation of a new fire protection water service. For further details regarding the site water utility infrastructure see the site section of this report.
- If a commercial sprinkler system (NFPA-13, designed to protect the building and permit occupant egress) is considered, the NPS should understand that this installation would require a more robust, invasive, and expensive system than otherwise required for a residential system (NFPA-13R/13D, designed primarily to permit occupant egress). The commercial system would also include installation of a dry-pipe system in the attic and crawl space areas – generally not required in a residential system. The NPS should also understand that the AHJ will have the ultimate authority to determine all requirements for any sprinkler system, including both the need and the level of protection to be provided.

2.3.7-A ELECTRICAL

Following are recommendations regarding repair, modifications, and/or upgrades for the Electrical infrastructure systems. All upgrades are recommended for both the residential or business/assembly re-use scenarios unless noted otherwise.

- Maintain the existing incoming service for the existing residential use. The 200Amp service is adequate provided no additional air conditioning load is added. At this point a service calculation and design would be required. A change from residential usage to business/assembly would require a service upgrade to accommodate higher power density requirements and the addition of air conditioning. Business/assembly use will required a change of incoming service to a three-phase service and an increased ampacity. A full service calculation and design would be required in order to size the new service.

- The existing main panel should be replaced no matter what the future use.

- Re-wire the building based on the type of use with a single, consistent, code legal wiring method. This would establish safe, solid, reliable grounding throughout the facility. Provide ground fault protected devices where required by code, i.e. exterior devices, adjacent to sinks in the bathrooms and kitchen, etc. Re-circuit bedrooms via new arc fault protected breakers as required by N.E.C. 210.12, provide new wiring sized per N.E.C. requirements.

- Replace existing lighting with energy-efficient compact fluorescent lighting wherever possible.

- Replace all fire alarm detection devices with system hard wired devices. Residential applications require smoke and carbon monoxide detection on each level and outside of each sleeping area. Expand existing system as required for additional devices, resize existing battery also to accommodate expansion.

- The security system appears adequate for this building. It is recommended that a vendor evaluate the system functions based on continued use.

- Replace the existing telephone and cable television (CATV) wiring. Existing devices are haphazardly placed and in poor locations. Coordinate new locations depending on use applications.

2.4-A ALTERNATIVES FOR TREATMENT

2.4.1-A SITE

There are no recommended alternatives for treatment for the site. Refer to Recommended Treatments under section 2.3.1-A.

2.4.2-A ARCHITECTURAL

	Alternative Treatment	Advantages (Beneficial Effects)	Disadvantages (Adverse Effects)
1a	Selective repointing of brick end walls	Lower cost. Retains maximum original mortar.	New mortar must precisely match color, texture and pointing technique which can require specialized mortar materials and installation techniques.
1b	100% repointing of brick end walls	Uniform pointing color and texture.	Higher cost. Loss of original mortar that is still in sound condition.
2a	Retain 2 modern window sash on north elevation	Lower cost.	Incompatible with historic divided light windows.
2b	Replace 2 modern window sash with new wood divided light sash	Uniform windows with traditional appearance. New windows more energy efficient.	Higher cost. Location and configuration of original windows unknown.
3a	Retain aluminum storm window sash	Low cost. Protects existing windows. Low maintenance. Screens are easy to use for ventilation.	Visually alters the exterior appearance of the house. Weep holes require maintenance to keep clear (to avoid water damage to the sill).
3b	Replace aluminum storm sash with removable exterior wood storm sash with interchangeable screen panel	Physical evidence indicates that exterior storms were on the house at one time. Appropriate design for period of the house. Storm panel protects wood windows from direct weather.	Alter the exterior appearance of the house. No evidence that the 1808 house had storm windows.
3c	Replace aluminum storm sash with magnetic interior sash	No impact to exterior appearance.	Two-step process to open for ventilation and use of screen.

4a	Replace asphalt shingle roof with white cedar shingles	Replicates original shingles based on extant shingles in the attic.	Thin shingles will not have a long life span in a roof application (25-30 years).
4b	Replace asphalt shingle roof with red cedar shingles	Thick-butt shingles have 40 year material warranty. Fire-treatment available.	Not the original material. To get the warranty the shingles are thicker than original shingles and will have different appearance.
4c	Replace asphalt shingle roof with pine shingles	Pressure-treated shingles have a 40-50 year warranty. Can also be fire-treated.	Not the original material. Pressure-treating gives a green hue that takes about a year to weather down.

2.4.3-A STRUCTURAL

	Alternative Treatment	**Advantages (Beneficial Effects)**	**Disadvantages (Adverse Effects)**
1a	Replace deteriorated and previously repair beams in full with pressure-treated timbers of similar size.	Restores original structural configuration. Posts can be removed by increasing the size of the members. Reduced risk of moisture and insect damage.	Not the original material. Limited live load unless either member size is increased or new posts are added.
1b	Replace deteriorated and repaired beams in full with timbers of similar size and matching wood species.	Restores original structural configuration and construction materials.	Greater material cost. Little protection from future insect and moisture damage.
2a	Replace deteriorated and repaired beams without mid-span posts	Cost. Restores original structural configuration.	Occupancy limited by Live Load capacity to only 15 PSF.
2b	Replace deteriorated and repaired beams with mid-span posts.	Provides Live Load capacity of 50 PSF and allows full occupancy for both residential and business/assembly uses.	Introduces additional non-original materials and structural elements.
3a	Jack broken beams and rafters into original position and install a sister member.	Minimal cost and maintains historic fabric.	Adds new structural members.
3b	Remove broken beam and rafters and replace with new material.	Retains original structural configuration.	Cost and loss of historic materials.

4a	Replace sill beams with pressure treated timbers.	Greater resistance to insects and rot.	Does not match historic wood species.
4b	Replace sill beams with wood species that matches the existing frame.	Matches historic materials.	Less resistance to future deterioration from moisture and insects. Greater material costs.

2.4.4-A HVAC

	Alternative Treatment	**Advantages (Beneficial Effects)**	**Disadvantages (Adverse Effects)**
1a	Electric chiller for commercial fan-coil system cooling system option	Lower first cost option.	Higher operational cost and less sustainable option.
1b	Geothermal cooling system with water-cooled heat pump option.	Higher first costs. Site impact from geothermal heat exchanger(s).	Lower operational cost and more sustainable option.
2a	Standard gas-fired ventilation air heating	Lower first cost option.	Higher operational cost and less sustainable option.
2b	Heat recovery style (air-to-air exchanger) ventilation air pre-heating	Higher first costs and more space required for equipment.	Lower operational cost and more sustainable option.

2.4.5-A PLUMBING

There are no recommended alternatives for treatment for the plumbing systems. Refer to Recommended Treatments under section 2.3.5-A.

2.4.6-A FIRE SUPPRESSION

There are no recommended alternatives for treatment for the fire suppression system. Refer to Recommended Treatments under section 2.3.6-A. Consult with NPS regional AHJ for concurrence on adding sprinkler system to protect this historic resource against loss.

2.4.7-A ELECTRICAL

There are no recommended alternatives for treatment for the electrical system. Refer to Recommended Treatments under section 2.3.7-A.

2.5-A ASSESSMENT OF EFFECT FOR RECOMMENDED TREATMENTS

In the following section each recommended treatment is assessed along with its effect on the character-defining features using the Advisory Council's criteria of effect:

2.5.1-A SITE

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Prepare a topographic site survey including front and back yard to center of North Great Road.	None	None	Creates a plan for the basis of design.
For business/assembly use, provide a designated accessible parking space.	Changes to the existing/historic landscape and elimination of gravel driveway.	Compatible design for historic setting.	Provides universal access for all drivers.
Provide a compatibly designed accessible route from Battle Road to the south side of the site.	Changes to the existing/historical landscape.	Compatible design for historic setting.	Provides universal access from Battle Road.
Provide accessible ramp into houses	Changes to historical appearance.	Provide a compatible design in low visibility area.	Provides universal access for all visitors.
Consult an arborist for recommendations on the disposition of the sugar maple in the front yard.	Removal of large tree.	Selective pruning, if possible.	Promote long-term health of tree.
Size fire service connection by plumbing engineer.	None	None	Provides property sized fire service connection.

2.5.2-A ARCHITECTURAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
EXTERIOR			
Stone foundation walls: selective repointing	Uneven appearance from non-matching patching mortar.	Utilize mortar analysis to identify the aggregates, lime and cement contents of the original pointing.	Prevents water, cold air, and animal intrusion. Maintains structural integrity of foundation.
Wood clapboard siding: selective scraping and painting	Possible loss of original or early paint layers.	Document finishes with a comprehensive paint analysis.	Prevents further deterioration of the clapboard siding.
Wood clapboard siding: selective replacement of deteriorated boards	Damage to existing finishes adjacent to work area. Altering of appearance.	Protect adjacent work surfaces and use appropriate techniques for selective board replacement. Use custom made boards to precisely match the original.	Prevents further deterioration of the building envelope. Retains the maximum amount of original siding.
Wood shingle siding: selective scraping and painting	Possible loss of original or early paint layers.	Document finishes with a comprehensive paint analysis.	Prevents further deterioration of the shingle siding.
Wood shingle siding: selective replacement of shingles	Damage to existing finishes adjacent to work area. Altering of appearance.	Protect adjacent work surfaces and use appropriate techniques for selective board replacement. Use custom made boards to precisely match the original.	Prevents further deterioration of the building envelope Retains the maximum amount of original siding.
Wood Trim: selective repair and/or replacement	Damage to existing finishes adjacent to work area. Altering of appearance.	Protect adjacent work surfaces and use appropriate techniques for selective board replacement. Use custom made boards to precisely match the original.	Prevents further deterioration of the building envelope Retains the maximum amount of original trim.

Brick end walls: cleaning and selective repointing	Uneven appearance from non-matching patching mortar.	Utilize mortar analysis to identify the aggregates, lime and cement contents of the original pointing.	Restores deteriorated mortar joints which prevents entry of water and accelerated deterioration.
Basement windows: repair and replace missing lights	Loss of original fabric.	Thoroughly document existing windows, profiles, etc. with photographs and drawings.	Restores the windows both in appearance and operation.
Wood windows: repair deteriorated sills, cornice, sash muntins, and broken glass	Loss of original fabric.	Thoroughly document existing windows, profiles, etc. with photos and drawings.	Restores the windows both in appearance and operation.
Windows: replace 3 missing wood sash	None	None	Restores building envelope and prevents additional heat loss.
Doors: replace deteriorated sills and thresholds	Loss of original fabric.	Remove the minimum amount of rotted wood necessary to make the repair.	Preserves the maximum amount of the existing sills.
Doors: repair decorative wood surrounds	Loss of original fabric.	Remove the minimum amount of rotted wood necessary to make the repair.	Preserves the maximum amount of the existing door.
Doors: repair carriage house door	Loss of original fabric.	Remove the minimum amount of rotted wood necessary to make the repair.	Preserves the maximum amount of the existing door.
Doors: remove aluminum storm doors and replace with wood	None	None	Enhances the exterior appearance of the house.
Roof: remove asphalt roof and rotted sheathing and replace with new sheathing and wood shingle roof	None	None	Restores the exterior appearance of the house.
Decorative lighting: replace entry light fixtures	None	None	Enhances the exterior appearance of the house.

Rear porch: replace porch deck, framing, and roof	Removal of existing fabric.	Thoroughly document existing porch with measured drawings and photographs.	Provides a safe porch for entry into, and exit from, the house.
INTERIOR			
Floors: clean	Damage to wood surface.	Utilize cleaning materials and methods appropriate for the wood species.	
Floors: remove paint and refinish (if determined by period of significance)	Damage to original floor surface.	Utilize paint removal materials and methods appropriate for the wood species.	Possible lead paint removal, return floor to original appearance.
Floors: remove sheet vinyl or composite tile and replace with wood			Return floor to original appearance.
Walls: repair parging at basement wall	None	None	Minimize water infiltration and efflorescence of wall surface.
Walls: remove wallpaper	Possible loss of original or early paint or wallpaper layers.	Document finishes with a comprehensive paint and finish analysis. Utilize materials and methods to remove wallpaper to minimize damage to finishes below.	Restores this space to an earlier appearance.
Walls: repair cracks in plaster	Possible loss of additional plaster materials.	Remove plaster only as needed to properly repair cracks.	Reduces further deterioration of historic finishes.
Walls: repaint plaster walls and wood trim	Possible loss of original or early paint layers.		Potential lead paint removal, highlight molding profile.
Walls: remove wood stud partition that divides Room 206			
Basement: investigate water infiltration and remediate	Possible disturbance of soil and archeological resources.	Limit soil invasion and/or perform archeological investigations in area to be disturbed.	Decrease water infiltration and resulting damage to structure.

Ceilings: replace textured ceiling at Room 106	Potential loss of original plaster ceiling below.	None	New ceiling will replicate the original plaster ceiling.
Ceilings: remove skylight at Room 205 and patch ceiling	Loss of natural daylight in the stair hall.	Add additional artifical light fixtures or increase wattage in existing fixtures.	Restores this space to an earlier appearance.
Doors: repaint doors and casing	Possible loss of original or early paint layers.	Document finishes with a comprehensive paint analysis.	Potential lead paint removal, highlight molding profile.
Decorative lighting: replace fixtures with energy-efficient fixtures	None	None	
Cabinetry & Appliances: remove	None	None	
Stairs: replace stair railings and handrail			
Fireplaces: clean and repoint fireboxes	Loss of visual character of a used firebox.	Perform mortar analysis and minimize mortar removal.	Prevent further deterioration of masonry.
Fireplaces: repaint decorative wood surrounds	Damage to decorative woodwork. Loss of original paint layers.	Use paint preparation techniques that will not damage the detailing. Document finishes with a comprehensive paint analysis.	Decorative woodwork may be more visible after removal of built-up paint layers.

2.5.3-A STRUCTURAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Repair sill beams	Potential loss of historic fabric required to connect new members to the existing. Damage to historic fabric from removal and resetting of materials.	Determine the full extent and limits of the deterioration. Careful removal and preservation of historic fabric.	Prevents further deterioration of the structure from the spread of the existing rot and restores the structural integrity of the frame.
Installation of posts.	Introduces a non-original structural member.	Increase size of members to either minimize or delete post.	Provides increased live load capacity.
Repair structural floor members.	Some loss of historic fabric required to connect new members to the existing.	Determine the full extent and limits of the deterioration. Careful removal and preservation of historic fabric.	Prevents further deterioration of the structure from the spread of the existing rot and restores the structural integrity of the frame.
Sister joists, rafters, and other structural members.	Introduces a non-original structural member.		Provides increased live load capacity.
Replace rotted floor joists.	Pressure treated lumber and metal joist hangers do not match the historical details.		Prevents further deterioration of the structure from the spread of the existing rot and provides increased live load capacity.
Jack broken rafter back into position and sister with select structural lumber.	Introduces a non-original structural member.		Restores the structural integrity of the roof.

Install new structural members within the second floor framing.	Introduces a non-original structural member. Damage to and loss of historic fabric from removal of materials.	Replacement of either damaged or lost materials with similar materials.	Provides required live load rating for the use of the second floor.
Repair/replace post and beam at the northeast corner of the northwest wing.	Damage to and loss of existing fabric from removal of materials.	Careful identification of historic materials with new member splicing as allowable.	Prevents further deterioration of the structure from the spread of the existing rot in the post. Prevents further damage to existing members that are currently over-stressed. Restores the structural integrity of the frame.
Repair structural support of second floor hallway.	Damage to and loss of existing fabric from removal of materials.	Careful identification and removal of historic materials.	Prevents further damage to existing members that are currently over-stressed. Restores the structural integrity of frame. Removes excessive cross-slope in hallway.
Repair first floor structural members below kitchen and original 18th century block.	Damage to and loss of existing fabric from removal of materials.	Careful identification and removal of historic materials.	Prevents further deterioration of the structure from the spread of any existing rot and provides increased live load capacity.
Replace brick and wood piers in crawl space with concrete masonry piers.	Removal of historic repairs.		Prevents further deterioration of the structure and increased live load capacity.
Install vapor barrier throughout the dirt floor crawl space.	Introduces non-historic materials. Stone overlay decreased height of the crawl space.		Reduces source of moisture that contributes to structural deterioration from rot.

Realign frame of the northeast block.	Possible damage to historic materials.	Careful and selective removal of historic fabric. Use of blocking and other materials to protect existing materials.	Restores the structural integrity of the frame.
Reconsolidate checked beams with epoxy and lag screws.	Introduction of non-historic materials.	Careful planning and selective use as appropriate.	Restores integrity of member and maximizes preservation of historic materials.

2.5.4-A HVAC

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Replace heating water piping and repair terminal equipment	Floor damage from running new piping.	Remove existing piping and re-use cores as much as possible. Provide floor escutcheons.	Improved temperature control, system reliability, and less potential for system leaks.
Replace fuel oil storage tank	None	NA	Less potential for damaging fuel leaks and better heating system reliability.
Provide new combustion air intake and relief for boiler	None	NA	Code compliance and better protection from CO issues caused by improper burner operations.
Replace existing heating system with heating and cooling 2-pipe fan coil system. Provide ventilation air systems.	Floor damage from running new piping. Aesthetics of new fan coils different than existing radiators.	Remove existing piping and re-use cores as much as possible. Provide floor escutcheons. Provide architecturally acceptable fan coil enclosures.	Improved temperature control, system reliability, and less potential for system leaks.

2.5.5-A PLUMBING

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Replace upper level bathroom plumbing fixtures	None	NA	Restoration of fixture operations. Less potential for leaks.
Repair ground level bathroom lavatory fixture and repair lower level piping.	None	NA	Restoration of fixture operations. Less potential piping leaks.
Replace all drain, waste, and vent piping.	Floor and wall damage associated with piping replacement in walls.	Careful restoration of floor and wall surfaces.	Improved system performance, less potential for leaks and system clogs.
Provide drinking fountains	Non-original aesthetics.	Provide architecturally compatible fixtures.	Code compliance.
Provide ADA accessible bathrooms.	Non-original aesthetics. Modifications to existing structural layout.	Provide architecturally compatible fixtures and carefully incorporate structural changes.	Code compliance.

2.5.6-A FIRE SUPPRESSION

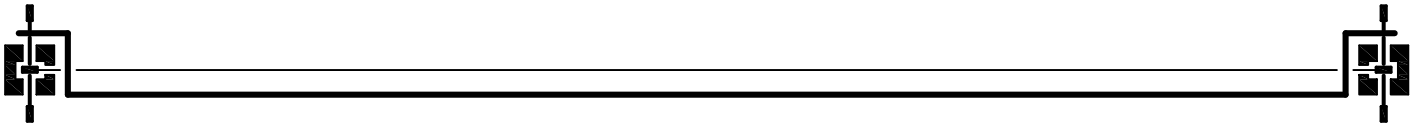
Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Provide fire extinguishers at upper level	None	NA	Code compliance and improved protection from fire.
Provide new sprinkler system for House.	Ceiling and wall damage associated with piping and head installations.	Careful restoration of ceiling and wall surfaces.	Code compliance and improved protection from fire.

2.5.7-A ELECTRICAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Re-wiring of power distribution	Ceiling and wall damage associated with running new wiring.	Careful restoration of ceiling and wall surfaces.	Code compliance, improved system reliability and safety.
Replace lighting with energy efficient fixtures.	Ceiling and wall damage associated with installing new fixtures.	Careful restoration of ceiling and wall surfaces.	Improved system performance and energy efficiency.
Upgrade and replace fire alarm system.	Ceiling and wall damage associated with running new wiring and installing new devices.	Careful restoration of ceiling and wall surfaces.	Code compliance, improved system reliability and safety.
Replace existing telephone and CATV wiring and devices.	Ceiling and wall damage associated with running new wiring and installing new devices.	Careful restoration of ceiling and wall surfaces.	Improved system performance and reliability.
Upgrade emergency lighting	Ceiling and wall damage associated with running new wiring and installing new fixtures.	Careful restoration of ceiling and wall surfaces.	Improved system performance, reliability, and safety.

PART 2.0 - B

JOHN NELSON BARN:
RECOMMENDATIONS FOR TREATMENT



PART 2.0-B JOHN NELSON BARN: RECOMMENDATIONS FOR TREATMENT

2.1-B TREATMENT PHILOSOPHY

The *Secretary of the Interior's Standards for the Treatment of Historic Properties* provides four distinct, but interrelated approaches to the treatment of historic properties: Preservation, Rehabilitation, Restoration, and Reconstruction.

The general treatment approach recommended for the John Nelson Barn, with regards to immediate action needed, is Preservation. Preservation is defined by the Secretary of the Interior as "…the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction."[30] Preservation emphasizes the importance of retention, protection, and maintenance of a property's historic character and features over alteration or replacement.

According to the Standards for Preservation, a new use may be introduced to the building. However, the new use must not be invasive and should maximize the retention of distinctive materials features, spaces and spatial relationships. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate in a preservation project.[31]

In order to preserve the John Nelson Barn, the existing building will require significant structural stabilization and repair of the exterior finishes and materials.

In addition to the proposed usage of the structure, a period of significance is established in order to determine certain recommended treatments. This is discussed further with regards to both the John Nelson House and Barn, in the Treatment Philosophy section for the house, Section 2.1-A.

[30] "The Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for preserving, rehabilitating, restoring and reconstructing historic buildings," U.S. Department of the Interior, National Park Service, Heritage Preservation Services, 2001, http://www.nps.gov/history/hps/tps/standguide/preserve/preserve_index.htm (accessed December 2007).
[31] Ibid, http://www.nps.gov/history/hps/tps/standguide/preserve/preserve_standards.htm

2.2-B REQUIREMENTS FOR TREATMENT

2.2.1-B USE AND INTERPRETATION OF THE RESOURCE

The impact of a proposed use on the historic resource must be considered in an effort to preserve the maximum amount of historic fabric. Given the existing physical condition of the Barn, any future occupancy besides storage will require significant rehabilitation as well as the installation of life safety components, upgraded electrical service, heating system, and possibly plumbing. A new use would also require the implementation of upgrades to meet building and accessibility codes.

The Park has projected that the most feasible immediate re-use scenario for the John Nelson Barn is for education interpretation as a historic out-building along with continued use as storage for facility maintenance. The Barn structure would be stabilized and repaired, however new or upgraded mechanical systems would not be introduced until future phases of work. Appendix 3.1 contains a detailed list of the primary rehabilitation work and associated cost estimates for the repair and stabilization of the John Nelson Barn for storage use.

- Storage – The barn is presently used for miscellaneous Park storage of building materials and seasonal equipment and supplies. Building code compliance issues are relatively minor and the usage has little impact on the historic structure. Mechanical systems and toilet facilities are not required which further limits the impact of the usage as well as rehabilitation costs.

Two other possible uses have been considered for the John Nelson Barn:

- Assembly – The barn is a fairly open space and could be used as a Visitor Center, an Educational Center for school groups, a small Community Center with a meeting space, etc. For year-round occupation, the barn will require at least heat and a toilet facility as well as insulation in the exterior walls and roof. The barn could also be used only in the summer for seasonal visitor support which would require less invasion of a mechanical system. Valley Forge National Historical Park, for example, uses an unheated stable for school groups only in the spring and summer when their visitation is greatest.

- Business – The barn could accommodate a retail business or tenant office space. Unless it was a seasonal business, such as an antique dealer, a mechanical system would be required as well as toilet facilities. If used year-round the exterior walls would likely require insulation and interior finishing as well as a finished floor in the original barn section if it is used.

2.2.2-B CODE REVIEW

The following code review section addresses the three re-use scenarios discussed in the previous section: storage, assembly, and business. Although storage use is planned, the information relative to all three uses is included for future Park reference. In order to re-occupy the John Nelson Barn, the building will have to meet minimum life safety and fire safety criteria:

- International Building Code, 2006 for construction and building (IBC)
- International Existing Building Code, 2003 for construction and building (IEBC)
- Architectural Barriers Act Accessibility Standards (ABAAS)

All of the above-listed codes or regulations acknowledge that there are challenges in meeting all of the requirements in historic buildings without damaging or losing significant historic fabric. In most cases, alternative methods of compliance or variances must be reviewed and agreed upon by the authorities having jurisdiction. The following is a summary of the most significant code elements associated with the existing physical design of the John Nelson Barn and a general discussion of the new requirements relative to the possible re-use.

IBC & IEBC

The IBC and the IEBC provide guidelines for the building height and area limitations depending on the occupancy. All of the above-listed codes or regulations acknowledge that there are challenges in meeting all of the requirements in historic buildings without damaging or losing significant historic fabric. In most cases, alternative methods of compliance or variances must be reviewed and agreed upon by a design process team.

Existing Building Components

Existing Occupancy Group: Agricultural buildings and barns Utility – U.

Proposed Occupancy Groups: Non-hazardous Storage – S1 or S2, Business – B, or Assembly - A3.

Construction Type: Type V (common construction) and Type VI (heavy timber). Protection type is "B" (unprotected). The more restrictive Type V is used for assessment proposed occupancies.

Total Gross Square Footage: The existing floor area is 3,450 square feet.

Height and Number of Stories: The existing building is 1-story.

Number of Exits: There are five (5) doors that exit the building. Three of the doors, however, are sliding type doors which cannot be used for egress.

Doors: All existing exterior doors swing inward against the direction of egress.

Code Requirements for Proposed Uses

Height and Area Limitations:

Storage (S) – One (1) exit is allowed if there are no more than 30 occupants and the maximum travel is less than 100 feet. The barn meets this criteria if the east side door is modified to swing outward.

Business (B) - One (1) exit is allowed if there are no more than 50 occupants and the maximum travel is less than 75 feet (100 feet if sprinklered). The occupant load is estimated at 35 occupants (3,450 SF ÷ 100 SF/person). The barn meets this criterion if the east side door is modified to swing outward.

Assembly (A3) - One (1) exit is allowed if there are no more than 50 occupants and the maximum travel is less than 75 feet (100 feet if sprinklered). The occupant load is estimated at 230 occupants (3,450 SF ÷ 15 SF/person). The barn does not meet the criteria for one exit. Two exits are required. The east and north doors could be modified to swing outward and provide the required egress.

ABAAS

Even a storage use requires compliance with ABAAS. Historic structures are expected to comply with the accessibility guidelines for building alterations except where the required work would threaten or destroy the historic significance of the building. The determination of whether or not an alteration would threaten or destroy historic significance is made by the Advisory Council on Historic Preservation if the NPS and SHPO cannot concur on preservation approaches.

Minimum ABAAS requirements for historic structures are:

- At least one accessible route from a site access point to an accessible entrance shall be provided.
- At least one accessible entrance which is used by the public shall be provided.
- If toilets are provided, then at least one toilet facility along an accessible route (may be unisex) shall be provided.
- Accessible routes from accessible entrance to all primary function areas on at least the level of the accessible entrance (includes 32" clear doorways) shall be provided. Access should be provided to all levels of a building or facility whenever practical.
- Displays and written information, documents, etc. should be located where they can be seen by a seated person.

There are several existing conditions at the John Nelson Barn that are in conflict with even the minimum accessibility requirements.

Site Access: As noted in the Site section, the existing loose gravel parking lot is not accessible. In addition there are no paved paths to any of the entrance/exit doors.

Accessible Entrance: None of the sliding doors are accessible. The east door is not accessible because of the raised landing and the landing size.

Toilet Facilities: There is currently no plumbing in the Barn, necessitating an accessible path to a nearby alternate facility, such as a portable toilet/modular restroom or to the House.

Accessible Route: Once inside the building, the first floor is one level but the concrete and wood floors only exist in the rear portion of the barn. The original front section has a dirt floor which is not accessible. Introducing a floor in this section would diminish the barn's existing character and features.

2.3-B RECOMMENDATIONS FOR TREATMENT

A majority of the recommended treatments outlined below fall into the category of preservation, which is the short-term, immediate treatment. Preservation recommendations include those that should be addressed to avoid further deterioration of the building or that will lead to loss of the historic fabric if left untreated. These are recommendations regardless of the occupancy of the building. Discussion of alternative uses, part of future rehabilitation work, on the structure may be found in Appendix 3.1. Storage may be retained under re-use scenarios and the structure could acquire multiple functions. Any recommendations listed below that support the intended use of the building for either a business or assembly use are general in nature. In all re-use scenarios, the recommended treatment would attempt to minimize the removal of earlier fabric and, if removal was necessary, full documentation would be recommended before treatment occurred. Replacement materials would be either compatible substitutes or in-kind matching fabric.

2.3.1-B SITE

- Prepare a topographic site survey including front and back yard to center of North Great Road.

- Provide a compatibly-designed accessible route from Battle Road to the south-side of the site.

- Re-grade the ground around the barn to provide positive drainage. A French-drain may be needed to move the water toward the open meadow located to the west of the barn.

- The town of Lincoln recommends the installation of a minimum 4-inch ductile iron water service from the existing 8-inch main to serve any new sprinkler system that may be installed in either the house or the barn. Recommend that the final size of the fire protection service be determined by a plumbing engineer.

Rehabilitated New Use:

- For non-storage use, provide a designated accessible parking space.

- For non-storage use, provide accessible site circulation connecting accessible parking and loading zones to facility entry. Provide orientation signage for mobility challenged visitors.

- For non-storage use, provide amenities required by ABAAS, to include drinking fountains, public telephones, assistive devices for special populations (eg; listening devices, visual aids, etc.)

2.3.2-B ARCHITECTURAL

2.3.2.1-B Exterior

Stone foundation walls:

- Repoint to replace deteriorated masonry joint mortar at all elevations - small stone random rubble, 100% of approx. 350 linear feet x 1′-0″ high.

Wood shingle siding:

- Removal of existing deteriorated shingles and sheathing boards.
- Replacement of sheathing and white cedar shingles: 100% of 5481 square feet.

Wall Repairs:

- Repair rotted sill plate (see structural recommendations).
- Repair bowed section of wall, east of Door B-1/101 after structural stabilization and interior framing repairs have been completed.

Doors:

- Replace missing Door B-1/101 with new barn door to match Door B-3/102 and retrofit door in opening to swing outward.
- Repair Door B-3/102: replace 50% of missing vertical boards on 120 square foot door and paint.
- Paint Doors B-2/102 and B-4-102.
- Replace existing wood stoop with accessible-compliant stoop and ramp or sloped walk-way as required by the existing grade.

Windows:

- Replace missing 6-light wood window sash at 26 locations (approx. 2′-6″ x 2′-0″ sash size).
- Paint all window sills and casing at 32 windows.

Roof:

- Remove all asphalt roofing material and sheathing. Replace with new plywood sheathing, ice and water shield and approx. 3467 square feet red cedar shingles.
- [Alternative: replace roof with white cedar shingles].
- [Alternative: replace roof with pine shingles].

2.3.2.2-B Interiors – recommended treatments for the interior are based on rehabilitated new uses, not including storage use.

Floors:
Install a concrete floor slab in B-101 to align with existing concrete floor in B-102.
Remove rotted wood flooring in B-102 and install concrete floor slab to align with existing concrete floor in B-102. Note: this treatment would only be needed in an A3 or B occupancy.

Walls:
Install insulation in all exterior walls and finish walls with boards or gypsum drywall. Note: this treatment would be needed only in certain re-use applications.

Provide at least one unisex accessible toilet room. Room B-104 or B-103 are possible places for this use.

Ceilings:
Install insulation in all ceilings and finish ceilings with boards or gypsum drywall. Note: this treatment would be needed only in certain re-use applications.

2.3.3-B STRUCTURAL

MAIN BLOCK

Overall, the main block is in very poor condition. Although the structure does not appear to be in danger of imminent collapse, significant repairs must be undertaken to restore its structural integrity. Based on our field investigation and evaluation, the recommended repairs include the following:

- The mortise and tenon joinery of the frame will require significant manipulation of the structure to repair the framing in-kind. Repairs involving the exterior members such as posts and sills will also require full access to all sides of the members during installation. Carefully remove roofing and siding materials as required.

- Carefully jack the frame back into proper alignment.

- Selectively repair the broken beams with epoxy and fiberglass reinforcement and steel plates as required.

- Selectively replace rotted, deteriorated, and missing timbers with new, select-structural timbers.

- Replace missing knee braces.

- Reinforce weakened joints with steel bracing and strapping secured with lag screws.

- Carefully replace original sheathing and supplement with new boards, in-kind, as required.

- In order to facilitate the repairs to the north roof, it may be necessary to temporarily remove the portion of the north block roof that extends over and onto the main block.

- Remove the rolled roofing, plywood overlay, and asphalt shingles. Remove rotted roof sheathing and replace with new boards, in-kind, as required.

NORTH BLOCK

The north block appears to be in good condition. However, a portion of the roof projects over the southern block and may be overloading the older structure. Repair and restoration of the southern block will need to account for this condition. Additionally, the projecting portion of the roof may need to be removed in order facilitate the repairs required on the southern block. The roof will need to be properly flashed to prevent water infiltration in the valley.

2.3.4-B HVAC

There are no recommendations for the HVAC system.

2.3.5-B PLUMBING

Replace the flexible pipe hose-bibb style water feed to the barn (from the house), with a new wall mounted hose-bibb. This piping should also be provided with a new shut-off and drain connection at the house end of the system to allow for close-off and draining during winter months.

2.3.6-B FIRE SUPRRESSION

Following are recommendations regarding repair, modifications, and/or upgrades for the fire suppression infrastructure systems. All upgrades are recommended for all re-use scenarios unless noted otherwise.

- Ensure fire extinguishers are provided in conspicuous location.
- The current State of MA building codes do not require installation of sprinkler systems in the barn facility. If upon further review by NPS regional fire safety official as the authority having jurisdiction (AHJ) the building is deemed to require sprinkler protection under NPS Director's Order #58, it is recommended that a new sprinkler water service (from existing municipal water systems) and fully automatic sprinkler systems throughout the barn facility be provided. A dry-pipe style system is recommended due to the unheated nature of the barn. The system design and coverage should be consistent with the requirements of NFPA 13. A new heated water service entrance room will need to be constructed to house the riser assembly. Electric unit heaters are the recommended heating means. Current site engineer evaluations of the local municipal water supply also indicate adequate services are available to support installation of a new fire protection water service. For further details regarding the site water utility infrastructure see the site section of this report.

2.3.7-B ELECTRICAL

Following are recommendations regarding repair, modifications, and/or upgrades for the Electrical infrastructure systems.

- Replace existing non-grounded devices and provide proper grounding at each device location.

- Business/assembly application requires the installation of fire alarm system into the barn. Provide initiation and notification devices, wiring, zone card, battery and connection to existing system. Replace existing wiring devices with ground fault protected devices with in the open barn area. Provide exit signs, emergency battery units and remote exterior lighting along with associated wiring and conduits for life safety requirements, designed per NFPA 70 and NFPA 101

requirements; each connected to a dedicated breaker within the main panel board, emergency source (emergency generator) not required.

- Upgrade ambient lighting to increase general illumination level and task lighting.

2.4-B ALTERNATIVES FOR TREATMENT

2.4.1-B SITE

There are no recommended alternatives for treatment for the site. Refer to Recommended Treatments found in Section 2.3.1-B.

2.4.2-B ARCHITECTURAL

	Alternative Treatment	Advantages (Beneficial Effects)	Disadvantages (Adverse Effects)
1a	Replace rolled asphalt roof with white cedar shingles.	Replicates the original shingles.	Thin shingles will not have a long life span in a roof application (25-30 years).
1b	Replace rolled asphalt roof with red cedar shingles.	Thick-butt shingles have 40 year material warranty. Fire-treatment available.	Not the original material. To get the warranty the shingles are thicker than original shingles and will have different appearance.
1c	Replace rolled asphalt roof with pine shingles.	Pressure-treated shingles have a 40-50 year warranty. Can also be fire-treated.	Not the original material. Pressure-treating gives a green hue that takes about a year to weather down.

2.4.3-A STRUCTURAL

	Alternative Treatment	Advantages (Beneficial Effects)	Disadvantages (Adverse Effects)
1a	Replace deteriorated portions of structural members with timbers of similar size.	Minimizes the amount of material removal. Retains previous repair work and maximizes the retention of historic fabric. Restores structural integrity.	Greater cost. Requires significant amount of splicing. Risk of not removing all rotted materials.
1b	Replace deteriorated and previously repaired beams in full with timbers of similar size.	Restores structural integrity. Avoids need for member splicing. Replicates original framing. Less cost.	Loss of original framing material.
2a	Jack broken beams and rafters into original position and reinforce with sisters and/or metal strapping.	Maintains historic fabric.	Loss of original configuration by adding new structural members. Exposed metal connections.
2b	Remove broken beam and rafters and replace with new material.	Retains original structural configuration.	Greater cost and loss of historic materials.

3a	Replace deteriorated structural members with full mortise and tenon joinery.	Replicates original joinery techniques and materials. Tenon "replacement" may be possible on many members without significant structural manipulation.	Greater cost. Requires manipulation of structural framing to install mortises.
3b	Replace deteriorated structural members using metal connections.	Simplifies installation. Reduced cost.	Exposed metal connections. Does not replicate original joinery techniques.
4a	Strengthen the framing of the north roof of the main block to support the cantilevered portion of the north block roof.	Maintains framing of the north block.	Does not replicate original structural framing. Will require structural modifications within the older, main block. Will likely require full compliance with current building codes throughout structure, including the foundation.
4b	Strengthen/reframe cantilevered portion of the north block to eliminate dead load transfer to the main block roof.	Allows full restoration of main block structural framing, in-kind. Reframing of cantilevered portion may be very similar in appearance to the existing framing.	Requires modification to framing of north block.

2.4.4-B HVAC

There are no recommended alternatives for treatment for the HVAC systems. Refer to Recommended Treatments found in Section 2.3.4-B.

2.4.5-B PLUMBING

There are no recommended alternatives for treatment for the plumbing systems. Refer to Recommended Treatments found in Section 2.3.5-B.

2.4.6-B FIRE SUPPRESSION

There are no recommended alternatives for treatment for the fire suppression system. Refer to Recommended Treatments found in Section 2.3.6-B.

2.4.7-B ELECTRICAL

There are no recommended alternatives for treatment for the electrical system. Refer to Recommended Treatments found in Section 2.3.7-B.

2.5-B ASSESSMENT OF EFFECT FOR RECOMMENDED TREATMENTS

In the following section each recommended treatment is assessed along with its effect on the character-defining features.

2.5.1-B SITE

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Prepare a topographic site survey including front and back yard to center of North Great Road	None	None	Creates a plan for the basis of design.
For business/assembly use, provide a designated accessible parking space.	Changes to the existing/historic landscape and elimination of gravel driveway.	Compatible design for historic setting.	Provides universal access for all drivers.
Provide a compatibly-designed accessible route from Battle Road to the south side of the site.	Changes to existing/historical landscape.	Compatible design for historic setting.	Provides universal access from Battle Road.
Provide an accessible entrance to the barn.	Changes to the historical appearance.	Provide a compatible design in a low visibility area.	Provides universal access for all visitors.
Re-grade the ground around the barn to provide positive drainage.	Changes to the historic landscape.	Design with minimal impact on existing plantings.	Removes water from the base of the building. Reduced risk of future structural deterioration.

2.5.2-B ARCHITECTURAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Stone foundation walls: selective repointing.	Uneven appearance from non-matching patching mortar.	Utilize mortar analysis to identify the aggregates, lime and cement contents of the original pointing.	Prevents water, cold air, and animal intrusion. Maintains structural integrity of foundation.

Replace deteriorated shingles siding and sheathing boards.	Loss of original building fabric.	Save a sample of each removed material and document areas of replacement.	Weathertight building envelope.
Replace missing doors	None	Utilize appropriate detailing from photographic evidence.	Weathertight building envelope.
Repair doors	None	None	Weathertight building envelope.
Replace existing stoop	None	None	Accessible building for multiple occupancies.
Replace missing windows	None	None	Weathertight building envelope.
Replace roof with wood shingles	None	None	Weathertight building envelope.
Install concrete floors	Loss of dirt and wood floors.	None	Accessible building for multiple occupancies.
Install insulation and interior wall finish at exterior walls	Covering up of interior barn framing; change in interior character.	Expose parts of heavy timber where feasible.	Weathertight building envelope and use of building year-round.
Install accessible toilet room	Modification of agricultural barn floor plan.	Use existing space such as which are already partitioned off.	Accessible building for multiple occupancies.
Install insulation and interior ceiling finish at roofs	Covering up of interior barn framing; change in interior character.	Expose parts of heavy timber where feasible.	Weathertight building envelope and use of building year-round.

2.5.3-B STRUCTURAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Repair sill beams.	Potential loss of historic fabric required to connect new members to the existing. Damage to historic fabric from removal and resetting of materials.	Careful removal and preservation of historic fabric.	Prevents further deterioration of the structure from the spread of the existing rot and restores the structural integrity of frame. Provides solid bearing surface and base connection for posts and prevents continued structural failure from differential settlement and lateral movement.
Selectively repair the broken beams with epoxy and fiberglass reinforcement and steel plates as required.	Introduces non-original building materials.	Determine full extent of rot in each member and retain as much solid material as practicable.	Restores structural integrity. Maximizes preservation of historic fabric.
Selectively replace rotted and missing timbers with new, in-kind, select structural timbers.	Pressure treated timbers would not match the historical details. Loss of historic fabric.	Careful removal and preservation of historic fabric. Use replacement timbers of matching species.	Prevents further deterioration of the structure from the spread of the existing rot and restores structural integrity.
Replace missing knee braces.	Potential damage to historic fabric to connect new members to the existing.	Use replacement timbers of matching species.	Restores structural integrity.
Reinforce weakened joints with steel bracing and strapping secured with lag screws.	Introduces non-original building materials.	Design connections to minimize visual impact.	Restores structural integrity.
Removal of building sheathing.	Potential damage to historic fabric.	Careful removal of materials.	Full access to members to be replaced/ repaired.

Remove roof and replace rotted roof sheathing with boards, in-kind.	Potential damage to and loss of historic fabric.	Careful removal of materials.	Prevents rot form spreading further and restores structural integrity.

2.5.4-B HVAC

There are no recommended treatments for the HVAC system.

2.5.5-B PLUMBING

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Replace hose-bibb and provide shut-off provisions	None	NA	Improved operability.

2.5.3-B FIRE SUPPRESSION

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Provide fire extinguishers	None	NA	Code compliance and improved protection from fire.
Provide new sprinkler system	Ceiling and wall damage associated with piping and head installations	Careful restoration of ceiling and wall surfaces.	Improved protection from fire.

2.5.3-B ELECTRICAL

Recommended Treatment	Potential Effects	Mitigating Measures	Beneficial Effects
Replace lighting	Ceiling and wall damage associated with installing new fixtures.	Careful restoration of ceiling and wall surfaces.	Improved system performance and energy efficiency.
Upgrade and replace fire alarm system.	Ceiling and wall damage associated with running new wiring & installing new devices.	Careful restoration of ceiling and wall surfaces.	Code compliance, improved system reliability and safety.

Upgrade emergency lighting	Ceiling and wall damage associated with running new wiring and installing new fixtures.	Careful restoration of ceiling and wall surfaces.	Improved system performance, reliability and safety.

PART 3.0

APPENDIXES

APPENDIX 3.1

JOHN NELSON HOUSE AND BARN: PRIMARY REHABILITATION WORK

The following is a prioritized list of treatment recommendations and associated cost estimates that are directed at the proposed building re-use options identified by the Park: residential occupancy of the John Nelson House and storage use of the John Nelson Barn. The primary rehabilitation work list provides recommendations in order to stabilize and/or repair items exhibiting severe deterioration or failure, which threaten a potential loss of historic fabric or a safety risk. The list also addresses improvements necessary to satisfy building code requirements for the proposed new building uses. The listed costs include all markups. A full detailed breakdown of each item is found in the itemized Class C cost estimate provided as the end of this section.

A. John Nelson House:

ARCHITECTURAL

EXTERIORS --

Site: Trench and install French drain to daylight: • Perimeter of building, approx 236 linear feet.	$ 11,177
Stone foundation wall: selective repointing to fill in gaps at masonry joints: • South and west elevations (main block and northwest wing): slab stone wall with (18) vertical joints by approx. 1'-6" high. • East elevation (northeast wing): large stone random rubble, 14'-6" long by 2'-0" high. • North elevation: small stone random rubble, 81'-0" by approx. 1'-0" high.	$ 8,111
Wood clapboard siding (east, south and west elevations): • Selective scraping and painting: 80% of approx. 1,440 square feet.	$ 12,308
• Selective replacement of deteriorated boards: 10% of approx. 1,440 square feet.	$ 10,301
Wood shingle siding (north elevation): • Selective scraping and painting: 80% of approx. 1,329 square feet.	$ 11,349
• Selective replacement of deteriorated shingles: 10% of approx. 1,329 square feet.	$ 7,992

Wood Trim: Selective repair and/or replacement of wood apron boards, corner boards, roof cornice and trim. • Replace deteriorated wood apron board: approx. 78 linear feet (3/4" x 4-1/4" board). • Repair deteriorated ogee profile cornice at 5 corner intersections and approx. 6 linear feet at south elevation of main block and 20 linear feet on north elevation. • Replace flat fascia board at northeast wing: approx. 23 linear feet on south elevation (1 x 4 board). • Replace rotted soffit at northeast wing: approx. 3 linear feet on north elevation. • Replace rotted and detached ogee profile rake board on east elevation of 1-1/2 story block: approx. 15 linear feet.	$ 13,676
All Wood Components (siding, shingles & trim): inspect and treat against insect damage. Treatment method depends upon material and extent of damage.	$ 10,656
Brick Walls (east and west walls of main block): • Cleaning of water stains, vegetative growth and dirt: 100% of approx. 582 square feet.	$ 2,756
• Repointing of 100% of approx. 582 square feet.	$ 41, 347
Windows • Repair 2 basement windows, including deteriorated wood frames and sash. Replace missing light in window 002. • Repair deteriorated sills of wood frame and sash double hung 6/6 windows: 10% of 30 total windows. • Repair projecting wood cornice and metal flashing: 9 windows. • Repair deteriorated sash muntins: 75% of 30 total windows.	$ 41,619
• Replace 7 broken panes of glass (approx. 9" x 13").	$2,901
• Replace missing wood window sash: (2) 9-light casement and (1) 6/9 double hung.	$ 8,525
• Inspect and seal windows against air and water leaks: 36 windows.	$ 21,313
Doors • Replace deteriorated sills and thresholds: 3 doors on south elevation.	$ 3,197
• Replace cracked fanlight glass at Door 1/101.	$ 474
• Repair deteriorated decorative wood door surrounds including pilasters, cornices and other millwork details: (2) approx. 5'-0" x 8'-0" door surrounds with 25% area rotted or missing.	$ 2,368

• Repair rotted areas of diagonal board-and-batten carriage house door on south elevation: bottom 1′-0″ high x 7′-9″ wide area deteriorated. Repaint entire door (approx. 62 square feet).	$ 1,776
Roof • Remove asphalt shingle roof and sheathing. Replace with new plywood sheathing, ice and water shield and red cedar shingles, approx. 1915 square feet for house roof and 40 square feet for porch roof.	$ 113,425
• Patch roof at replaced skylight (8 square feet).	$464
Exterior Lighting • Replace 3 surface-mounted porch/entry lights.	$ 5,238

INTERIORS –

Floors • Clean existing wood floors utilizing Murphy soap and steel wool buffing where required. (approx. 1,057 square feet).	$ 3,129
Floors • Remove paint from wood floors and refinish (865 square feet).	$ 10,242
Walls • Investigate source of water infiltration at south basement wall and seal interior areas of deficiency.	$ 8,288
• Remove wallpaper from walls and prepare plaster wall for paint (approx. 1,156 square feet).	$ 6,844
• Repair cracks in plaster walls (approx. 23 linear feet).	$ 1,362
• Paint plaster wall surfaces (approx. 6,054 square feet).	$ 17,920
• Paint wood baseboard, wainscot and cap surfaces (approx. 416 square feet).	$ 1,970
• Insulate ceilings, walls, floors & foundations.	$ 29,838
Ceilings • Remove skylight at Room 205 and patch plaster ceiling.	$ 3,552
Doors • Repaint all interior doors (35 interior doors).	$ 16,577
Doors • Paint all interior casing (34 windows and 37 doors/cased openings).	$ 21,017

Fireplaces	
• Clean brick fireboxes and repoint (8 fireplaces).	
• Repaint decorative wood fireplace surrounds (8 fireplaces).	$ 12,314

STRUCTURAL

Main Block	
• Replace sill beam at south side.	$ 31,969
• Add post to existing 8x8 beam, located 9' from western wall.	$ 4,381
• Sister first floor joists.	$ 30,690
• Replace deteriorated first floor beams & joists.	$ 38,363
• Jack roof rafter and sister as required.	$ 2,250
• Sister second floor joists.	$ 30,690
Northwest Wing	
• Repair corner post and sill.	$ 13,024
• Repair second floor hallway framing.	$ 10,656
• Repair first floor framing and piers.	$ 33,627
• Replace sill beams as required.	$ 44,402
• Ventilate and provide a vapor barrier at crawl space.	$ 10,929
Original 18th Century Block	
• Repair second floor framing.	$ 10,656
• Repair first floor framing, ventilate crawl space.	$ 12,788
Northeast Block	
• Replace sill beams as required.	$26,641
• Double sister floor framing.	$ 19,833
• Realign framing, evaluate beam checks and consolidate as required.	$ 13,616

HVAC

• Replace piping and fin tube radiation.	$ 83,356
• Replace fuel oil tank.	$ 2,842

PLUMBING

• Replace fixtures at second floor bathroom.	$ 13,143
• Inspect, repair sanitary systems.	$ 4,736

• Repair lavatory piping at basement.	$ 3,552
• Hose bibb for water to barn.	$ 3,552

ELECTRICAL

• Replace main electrical panel.	$ 10,656
• Rewire building, replace devices.	$ 70,853
• Replace lighting.	$ 41,678
• Upgrade fire alarm (including basement).	$ 20,602
• Upgrade security system.	$ 12,503
• Replace telephone and CATV	$ 10,420
• Emergency battery lights & existing lights (including basement).	$ 15,452

FIRE SUPPRESSION

• Provide fire extinguishers	$ 2,368
• Install fire suppression system, service and combination wet-pipe/dry-pipe sprinklers throughout (including attic and basement) meeting NFPA 13R guidelines.	$ 178,867

B. John Nelson Barn

ARCHITECTURAL

EXTERIORS –

Site: • Trench and install French drain to daylight: perimeter of building, approx 312 linear feet.	$ 14,777
• Re-grade the ground around the barn for positive site drainage.	$ 14,208
• Trench and install minimum 4" ductile iron pipe from municipal water main to building for future use, approx. 150 linear feet.	$ 23,089
Stone Foundation Walls: Repoint to replace deteriorated masonry joint mortar. • All elevations: small stone random rubble, 100% of approx. 350 linear feet x 1'-0" high.	$ 20,721
Wood shingle siding: • Removal of existing deteriorated shingles and sheathing boards. • Replacement of sheathing and white cedar shingles: 100% of 5,481 square feet.	$ 259,589
Wall repairs: • Repair bowed section of wall, east of Door B-1/101 after structural stabilization and interior framing repairs have been completed.	$ 5,920
Doors: • Replace missing Door B-1/101 with new barn door to match Door B-3/102.	$ 20,129
• Repair Door B-3/102: replace 50% of missing vertical boards on 120 square foot door and paint.	$ 7,104
• Paint Doors B-2/102 and B-4/102.	$ 4,499
Windows: • Replace missing 6-light wood window sash at 26 locations (approx. 2'-6" x 2'-0" sash size).	$ 38,481
• Paint all window sills and casing at 32 windows.	$9,472
• Sheath fenestration for temporary closure and weather tightness, 32 windows.	$ 13,261
Roof: • Remove all asphalt roofing material and sheathing at the Main Block. Replace with in-kind horizontal wood board sheathing and approx. 1069 square feet of red cedar shingles.	$ 75,944

• Remove all asphalt roofing material and sheathing at the North Block and East Wing. Replace with new plywood sheathing, ice & water shield and approx. 2380 square feet of red cedar shingles.	$ 138,083
• Install valley flashing at wall intersection with main block, approx. 44 linear feet.	$ 3,647

STRUCTURAL

<u>Main Block</u> • Jack frame back into alignment.	$ 25,149
• Repair/replace framing as required. This work is non-restorative and performed with modern material for a contemporary but compatible final effect. Replacement in kind materials will be reserved for selective installations where historical appearance must be precisely replicated.	$ 125,745
<u>North Block</u> • Structural repairs as required: remove projecting portion of main block roof to perform repairs affecting north block; install valley flashing to protect structural members.	$ 38,185

HVAC

- There are no recommendations for the HVAC system.

PLUMBING

• Install new hose bibb.	$ 1,776
• Install shut-off valve and drain connection at the house.	$ 3,552

ELECTRICAL

• Rewire building, replace devices.	$ 45,538
• Replace lighting.	$ 11,385
• Extend fire alarm.	$ 15,179

FIRE SUPRRESSION

• Provide fire extinguisher	$ 1,776

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JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount
John Nelson House - Residential Use				
Exteriors				$ 139,607
Interiors				91,386
Structural				141,260
Mechanical, Electrical Plumbing				124,875
Subtotal				$ 497,127
Contingency	30%			149,138
Subtotal				$ 646,265
General Conditions	20%			129,253
Protecting & Preserving Historic Fabric	10%			77,552
Overhead & Profit	20%			170,614
Contracting Method Adjustment (Negotiated Contract)	15%			153,553
TOTAL ESTIMATED COST				**$ 1,177,237**
John Nelson House - Fire Suppression System				
Fire Suppression System				$ 75,533
Subtotal				$ 75,533
Contingency	30%			22,660
Subtotal				$ 98,192
General Conditions	20%			19,638
Protecting & Preserving Historic Fabric	10%			11,783
Overhead & Profit	20%			25,923
Contracting Method Adjustment (Negotiated Contract)	15%			23,330
TOTAL ESTIMATED COST				**$ 178,867**
John Nelson House - Commercial Use				
Exteriors				$ 134,887
Interiors				101,386
Structural				141,260
Mechanical, Electrical Plumbing				250,445
Subtotal				$ 627,977
Contingency	30%			188,393
Subtotal				$ 816,370
General Conditions	20%			163,274
Protecting & Preserving Historic Fabric	10%			97,964
Overhead & Profit	20%			215,522
Contracting Method Adjustment (Negotiated Contract)	15%			193,970
TOTAL ESTIMATED COST				**$ 1,487,100**

Notes: All unit prices are adjusted for Lincoln, Massachusetts area
Prices are based on Federal Wage rates
All State & Local Taxes are included in General Conditions
Costs prepared October, 2008

For purposes of updating estimates for future construction contracting, costs need to be escalated at the prevailing market rate with reported and reliable percentage increases that are current.

The fire suppression cost estimate is based on a system designed to NFPA-13 (commercial building) standards.

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JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount
John Nelson Barn				
Exteriors				$ 274,030
Interiors				-
Structural				79,845
Mechanical, Electrical Plumbing				33,448
Subtotal				$ 387,323
Contingency	30%			116,197
Subtotal				$ 503,519
General Conditions	20%			100,704
Protecting & Preserving Historic Fabric	10%			60,422
Overhead & Profit	20%			132,929
Contracting Method Adjustment (Negotiated Contract)	15%			119,636
TOTAL ESTIMATED COST				**$ 917,211**
TOTAL - House (Residential) & Barn				**$ 2,273,315**
TOTAL - House (Commercial) & Barn				**$ 2,583,178**

Notes: All unit prices are adjusted for Lincoln, Massachusetts area
Prices are based on Federal Wage rates
All State & Local Taxes are included in General Conditions
Costs preparerd October, 2008

For purposes of updating estimates for future construction contracting, costs need to be escalated at the prevailing market rate with reported and reliable percentage increases that are current.

The fire suppression cost estimate is based on a system designed to NFPA-13 (commercial building) standards.

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Prep: mcf
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Revised: 11/20/2008

DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups 2.368081489
ARCHITECTURAL ASSESSMENT					
John Nelson House					
Exteriors					
Site - Trench & Install French Drain	236	LF	$ 20.00	$ 4,720	$ 11,177
Stone Foundation Walls - Selective Pointing	137	SF	25.00	3,425	8,111
Wood Clapboard Siding (E, S, W) - Prep, Paint	1,155	SF	4.50	5,198	12,308
- Selective Replacement	145	SF	30.00	4,350	10,301
Wood Shingle Siding - Repair, Prep, Paint	1,065	SF	4.50	4,793	11,349
- Selective Replacement	135	SF	25.00	3,375	7,992
Wood Trim - Repair/Replace as Required	165	LF	35.00	5,775	13,676
All Wood - Inspect & Treat Against Insect Damage	1	LS	4,500.00	4,500	10,656
Brick Walls - Clean	582	SF	2.00	1,164	2,756
- Repoint 100%	582	SF	30.00	17,460	41,347
Windows - Frame, Sash, Component Repairs	37	EA	475.00	17,575	41,619
- Glass Replacement	7	EA	175.00	1,225	2,901
- Sash Replacement	3	EA	1,200.00	3,600	8,525
- Inspect & Seal Sash Against Air/Water Leaks	36	EA	250.00	9,000	21,313
Doors - Sill, Threshold Repairs	3	EA	450.00	1,350	3,197
- Replace Broken Glass	1	EA	200.00	200	474
- Repair Door Surround	2	EA	500.00	1,000	2,368
- Repair Carriage House Doors, Repaint	1	EA	750.00	750	1,776
Roof - Replace Roof & Sheathing w/Red Cedar, Incl Porch	1,955	SF	24.50	47,898	113,425
Exterior Lighting - Replace Lights	3	EA	750.00	2,250	5,328
Total - Exterior				$ 139,607	$ 330,600
Interiors					
Floors - Clean Wood	1,057	SF	1.25	$ 1,321	$ 3,129
- Remove Paint & Refinish Wood	865	SF	5.00	4,325	10,242
Walls - Repair Water Infiltration	1	LS	3,500.00	3,500	8,288
- Remove Wallpaper & Paint Wall	1,156	SF	2.50	2,890	6,844
- Repair Plaster Cracks	23	LF	25.00	575	1,362
- Paint Plaster	6,054	SF	1.25	7,568	17,920
- Paint Base, Wainscot, Cap	416	SF	2.00	832	1,970
- Insulate Ceilings, Walls, Floors & Foundations	8,400	SF	1.50	12,600	29,838
Ceiling - Remove Skylight & Patch Plaster	1	EA	1,500.00	1,500	3,552
Doors - Repaint Doors	35	EA	200.00	7,000	16,577
- Repaint Door, Window Casing	71	EA	125.00	8,875	21,017
Fireplaces - Clean Firebox, Paint Surrounds	8	EA	650.00	5,200	12,314
Cut/Patch For MEP Work	3,520	SF	10.00	35,200	83,356
Total - Interiors				$ 91,386	216,409

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups
STRUCTURAL ASSESSMENT					
John Nelson House					
Main Block - Replace Sill Beam @ S Side	36	LF	375.00	$ 13,500	$ 31,969
- Add Post to Beam	1	EA	1,850.00	1,850	4,381
- Sister 1st Floor Joist	648	SF	20.00	12,960	30,690
- Replace Deteriorated 1st Floor Beams, Joists	648	SF	25.00	16,200	38,363
- Jack Roof Rafter & Sister as Required	1	EA	950.00	950	2,250
- Sister 2nd Floor Joist	648	SF	20.00	12,960	30,690
Northwest Wing - Repair Corner Post, Sill	1	LS	5,500.00	5,500	13,024
- Repair Second Floor Hallway Framing	1	LS	4,500.00	4,500	10,656
- Repair First Floor Framing, Piers	710	SF	20.00	14,200	33,627
- Replace Sill Beams as Required	50	LF	375.00	18,750	44,402
- Ventilate @ Provide Vapor Barrier @ Crawl Space	710	SF	6.50	4,615	10,929
Original 18th Century Block - Repair Second Floor Framing	1	LS	4,500.00	4,500	10,656
- Repair 1st Floor Framing, Ventilate Crawl Space	270	SF	20.00	5,400	12,788
Northeast Block - Replace Sill Beams as Required	30	LF	375.00	11,250	26,641
- Double Sister Floor Framing	335	SF	25.00	8,375	19,833
- Realign Framing, Consolidate Checks	1	LS	5,750.00	5,750	13,616
Total - Structural				$ 141,260	$ 334,515
MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT					
John Nelson House					
HVAC - Replace Piping, Fin Tube Radiation	3,520	SF	10.00	$ 35,200	$ 83,356
- Replace Fuel Oil Tank	1	EA	1,200.00	1,200	2,842
Plumbing Systems - Replace Fixtures @ 2nd Floor	3	EA	1,850.00	5,550	13,143
- Inspect, Repair Sanitary Systems	1	LS	2,000.00	2,000	4,736
- Repair Lavatory, Piping @ Basement	1	LS	1,500.00	1,500	3,552
- Hose Bib for Water to Barn	1	LS	1,500.00	1,500	3,552
Fire Suppression Systems - Provide Fire Extinguishers	1	LS	1,000.00	1,000	2,368
Electrical Systems - Replace Main Electrical Panel	1	EA	4,500.00	4,500	10,656
- Rewire Building, Replace Devices	3,520	SF	8.50	29,920	70,853
- Replace Lighting	3,520	SF	5.00	17,600	41,678
- Upgrade Fire Alarm (Incl. Bsmt)	4,350	SF	2.00	8,700	20,602
- Upgrade Security as Required	3,520	SF	1.50	5,280	12,503
- Replace Telephone & CATV	3,520	SF	1.25	4,400	10,420
- Emergency Battery Lights & Exist Lights (Incl. Bsmt)	4,350	SF	1.50	6,525	15,452
Total - Mechanical, Electrical, Plumbing				$ 124,875	$ 295,714
Subtotal				$ 497,127	
Contingency	30%			149,138	
Subtotal				$ 646,265	
General Conditions	20%			129,253	
Protecting & Preserving Historic Fabric	10%			77,552	
Overhead & Profit	20%			170,614	
Contracting Method Adjustment (Negotiated Contract)	15%			153,553	
TOTAL ESTIMATED COST				**$ 1,177,237**	**$ 1,177,238**

JOHN MILNER ARCHITECTS
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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups
Fire Suppression Systems					
- New Service	1	LS	15,000.00	15,000	35,521
- Wet Sprinklers (1st, 2nd Floors)	3,520	SF	8.00	28,160	66,685
- Dry Sprinklers (Bsmt & Attic)	2,815	SF	11.50	32,373	76,661
Subtotal				$ 75,533	
Contingency	30%			22,660	
Subtotal				$ 98,192	
General Conditions	20%			19,638	
Protecting & Preserving Historic Fabric	10%			11,783	
Overhead & Profit	20%			25,923	
Contracting Method Adjustment (Negotiated Contract)	15%			23,330	
TOTAL ESTIMATED COST				**$ 178,867**	**$ 178,867**

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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups 2.368081489
ARCHITECTURAL ASSESSMENT					
John Nelson House					
Exteriors					
Site - Trench & Install French Drain	236	LF	$ 20.00	$ 4,720	$ 11,177
Stone Foundation Walls - Selective Pointing	137	SF	25.00	3,425	8,111
Wood Clapboard Siding (E, S, W) - Prep, Paint	1,155	SF	4.50	5,198	12,308
- Selective Replacement	145	SF	30.00	4,350	10,301
Wood Shingle Siding - Repair, Prep, Paint	1,065	SF	4.50	4,793	11,349
- Selective Replacement	135	SF	25.00	3,375	7,992
Wood Trim - Repair/Replace as Required	165	LF	35.00	5,775	13,676
All Wood - Inspect & Treat Against Insect Damage	1	LS	4,500.00	4,500	10,656
Brick Walls - Clean	582	SF	2.00	1,164	2,756
- Repoint	582	SF	30.00	17,460	41,347
Windows - Frame, Sash, Component Repairs	37	EA	475.00	17,575	41,619
- Glass Replacement	7	EA	175.00	1,225	2,901
- Sash Replacement	3	EA	1,200.00	3,600	8,525
- Inspect & Seal Sash Against Air/Water Leaks	36	EA	250.00	9,000	21,313
Doors - Sill, Threshold Repairs	3	EA	450.00	1,350	3,197
- Replace Broken Glass	1	EA	200.00	200	474
- Repair Door Surround	2	EA	500.00	1,000	2,368
- Repair Carriage House Doors, Repaint	1	EA	750.00	750	1,776
Roof - Replace Roof & Sheathing w/Red Cedar	1,955	SF	24.50	47,898	113,425
Exterior Lighting - Replace Lights	3	EA	750.00	2,250	5,328
Total - Exterior				$ 134,887	$ 330,600
Interiors					
Floors - Clean Wood	1,057	SF	1.25	$ 1,321	$ 3,129
- Remove Paint & Refinish Wood	865	SF	5.00	4,325	10,242
Walls - Repair Water Infiltration	1	LS	3,500.00	3,500	8,288
- Remove Wallpaper & Paint Wall	1,156	SF	2.50	2,890	6,844
- Repair Plaster Cracks	23	LF	25.00	575	1,362
- Paint Plaster	6,054	SF	1.25	7,568	17,920
- Paint Base, Wainscot, Cap	416	SF	2.00	832	1,970
- Insulate Ceilings, Walls, Floors & Foundations	8,400	SF	1.50	12,600	29,838
Ceiling - Remove Skylight & Patch Plaster	1	EA	1,500.00	1,500	3,552
Doors - Repaint Doors	35	EA	200.00	7,000	16,577
- Repaint Door, Window Casing	71	EA	125.00	8,875	21,017
Fireplaces - Clean Firebox, Paint Surrounds	8	EA	650.00	5,200	12,314
Install Wood ADA Ramp	1	EA	10,000.00	10,000	23,681
Cut/Patch For MEP Work	3,520	SF	10.00	35,200	83,356
Total - Interiors				$ 101,386	$ 240,090

JOHN MILNER ARCHITECTS
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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups
STRUCTURAL ASSESSMENT					
John Nelson House					
Main Block - Replace Sill Beam @ S Side	36	LF	375.00	$ 13,500	$ 31,969
- Add Post to Beam	1	EA	1,850.00	1,850	4,381
- Sister 1st Floor Joist	648	SF	20.00	12,960	30,690
- Replace Deteriorated 1st Floor Beams, Joists	648	SF	25.00	16,200	38,363
- Jack Roof Rafter & Sister as Required	1	EA	950.00	950	2,250
- Sister 2nd Floor Joist	648	SF	20.00	12,960	30,690
Northwest Wing - Repair Corner Post, Sill	1	LS	5,500.00	5,500	13,024
- Repair Second Floor Hallway Framing	1	LS	4,500.00	4,500	10,656
- Repair First Floor Framing, Piers	710	SF	20.00	14,200	33,627
- Replace Sill Beams as Required	50	LF	375.00	18,750	44,402
- Ventilate @ Provide Vapor Barrier @ Crawl Space	710	SF	6.50	4,615	10,929
Original 18th Century Block - Repair Second Floor Framing	1	LS	4,500.00	4,500	10,656
- Repair 1st Floor Framing, Ventilate Crawl Space	270	SF	20.00	5,400	12,788
Northeast Block - Replace Sill Beams as Required	30	LF	375.00	11,250	26,641
- Double Sister Floor Framing	335	SF	25.00	8,375	19,833
- Realign Framing, Consolidate Checks	1	LS	5,750.00	5,750	13,616
Total - Structural				$ 141,260	$ 334,515
MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT					
John Nelson House					
HVAC - Replace Piping, Radiators w/FCU & Piping	3,520	SF	28.50	$ 100,320	$ 237,566
- Provide Mechanical Ventilation	3,520	SF	12.50	44,000	104,196
- Replace Fuel Oil Tank	1	EA	1,200.00	1,200	2,842
Plumbing Systems - Provide 2 Bathroom @ 2nd Floor	4	Fixt	3,500.00	14,000	33,153
- Inspect, Repair Sanitary Systems	1	LS	2,000.00	2,000	4,736
- Repair Lavatory, Piping @ Basement	1	LS	1,500.00	1,500	3,552
- Hose Bib for Water to Barn	1	LS	1,500.00	1,500	3,552
Fire Suppression Systems - Provide Fire Extinguishers	1	LS	1,000.00	1,000	2,368
Electrical Systems - Enlarge Service & Main Panel	1	EA	12,500.00	12,500	29,601
- Rewire Building, Replace Devices	3,520	SF	8.50	29,920	70,853
- Replace Lighting	3,520	SF	5.00	17,600	41,678
- Upgrade Fire Alarm (Incl. Bsmt)	4,350	SF	2.00	8,700	20,602
- Upgrade Security as Required	3,520	SF	1.50	5,280	12,503
- Replace Telephone & CATV	3,520	SF	1.25	4,400	10,420
- Emergency Battery Lights & Exist Lights (Incl. Bsmt)	4,350	SF	1.50	6,525	15,452
Total - Mechanical, Electrical, Plumbing				$ 250,445	$ 593,074
Subtotal				$ 627,977	
Contingency	30%			188,393	
Subtotal				$ 816,370	
General Conditions	20%			163,274	
Protecting & Preserving Historic Fabric	10%			97,964	
Overhead & Profit	20%			215,522	
Contracting Method Adjustment (Negotiated Contract)	15%			193,970	
TOTAL ESTIMATED COST				**$ 1,487,100**	$ 1,498,279

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
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DETAILS - PRIMARY REHABILITATION WORK CLASS C COST ESTIMATE

Description	Quantity	Unit	Unit Cost	Amount	Total Including All Mark Ups 2.368081489
ARCHITECTURAL ASSESSMENT					
John Nelson Barn					
Exteriors					
Site - Trench & Install French Drain	312	LF	$ 20.00	$ 6,240	$ 14,777
- Regrade for Positive Drainage	1	LS	6,000.00	6,000	14,208
- Trench & Install 4" Water Main	150	LF	65.00	9,750	23,089
Stone Foundation Walls - Selective Pointing	350	SF	25.00	8,750	20,721
Wood Shingle Siding - Replace Shingles, Sheathing	5,481	SF	20.00	109,620	259,589
Wall Repairs - Repair Bowed Wall	1	LS	2,500.00	2,500	5,920
Doors - Replace Missing Door	1	EA	8,500.00	8,500	20,129
- Repair Door	1	EA	3,000.00	3,000	7,104
- Paint Doors	2	EA	950.00	1,900	4,499
Windows - Replace Missing Sash	26	EA	625.00	16,250	38,481
- Paint Sills, Casing	32	EA	125.00	4,000	9,472
- Sheath Fenestrations for Temporary Closure	32	EA	175.00	5,600	13,261
Roof - Replace Roof & Sheath. w/Board & Cedar Main Block	1,069	SF	30.00	32,070	75,944
- Replace Roof & Sheath. w/Ply Wd, Cedar N & E	2,380	SF	24.50	58,310	138,083
- Install Valley Flashing	44	LF	35.00	1,540	3,647
Total - Exterior				$ 274,030	$ 648,925
Interiors					
See Structural Assessment				-	
Total - Interiors				**$ -**	
STRUCTURAL ASSESSMENT					
John Nelson Barn					
South (Main) Block - Remove Roofing & Siding				Included Above	
- Jack Frame Back Into Alignment	1,062	SF	$ 10.00	$ 10,620	$ 25,149
- Repair/Replace Framing as Required	1,062	SF	50.00	53,100	125,745
- Replace Roofing, Siding				Included Above	
North Block - Minor Repairs as Required	2,150	SF	7.50	16,125	38,185
Total - Structural				$ 79,845	$ 189,079
MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT					
John Nelson Barn					
Fire Suppression Systems - Provide Fire Extinguishers	1	LS	$ 750.00	$ 750	$ 1,776
Plumbing - New Hose Bib	1	EA	750.00	750	1,776
- Shut Off Valve & Drain Connection @ House	1	LS	1,500.00	1,500	3,552
Electrical Systems - Rewire Building, Replace Devices	3,205	SF	6.00	19,230	45,538
- Replace Lighting	3,205	SF	1.50	4,808	11,385
- Extend Fire Alarm	3,205	SF	2.00	6,410	15,179
Total - Mechanical, Electrical, Plumbing				$ 33,448	$ 79,206
Subtotal				$ 387,323	
Contingency	30%			116,197	
Subtotal				$ 503,519	
General Conditions	20%			100,704	
Protecting & Preserving Historic Fabric	10%			60,422	
Overhead & Profit	20%			132,929	
Contracting Method Adjustment (Negotiated Contract)	15%			119,636	
TOTAL ESTIMATED COST				**$ 917,211**	$ 917,211

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- Photographs and Negatives
- Architectural Conservator's Research Notes
- Miscellaneous Land Files
- Miscellaneous Historical Files

Massachusetts State Archives, Boston, MA

- Miscellaneous Maps
- Lincoln, MA Tax and Evaluation Records

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MINUTE MAN NATIONSL HISTORIC PARK
JOHN NELSON HOUSE & BARN
HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUETTS
100% CLASS C SUBMISSION COST ESTIMATE

The following information must be considered and used in conjunction with the Construction Cost Estimate.

1. Information used in the preparation of this Estimate includes.

   A. John Milner Architects, Inc. Evaluation and Recommendations, dated April 8, 2008 received by ICI April 8, 2008.

2. This Estimate is based on the following gross building areas:

House Area	4,350 SF
Barn Area	3,212 SF

3. This Estimate is developed and documented according to the Recommendation Reports.

4. This Estimate is based on second, 2008 construction unit prices. No escalation has been included. Once a construction period has been established, the appropriate. escalation factor, based on eight percent (8%) per year must be added

5. The general contractor's overhead and profit are included in General Requirements, which is added following the Estimate Details.

6. No architectural, engineering, or project management fees are included in this Estimate.

7. The purpose of this Estimate is to establish a Schematic budget for the described work. Once more detailed investigations and design have been completed, this Estimate should be revised and updated.

JOHN MILNER ARCHITECTS
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DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	John Nelson House - Residential Use				
	Exteriors				$ 114,947
	Interiors				101,327
	Structural				141,260
	Mechanical, Electrical Plumbing				168,375
	Subtotal				$ 525,908
	Contingency	30%			157,772
	Subtotal				$ 683,681
	General Conditions	20%			136,736
	Protecting & Preserving Historic Fabric	10%			82,042
	Overhead & Profit	20%			180,492
	Contracting Method Adjustment (Negotiated Contract)	15%			162,443
	TOTAL ESTIMATED COST				**$ 1,245,393**
	John Nelson House - Commercial Use				
	Exteriors				$ 114,947
	Interiors				118,327
	Structural				141,260
	Mechanical, Electrical Plumbing				293,945
	Subtotal				$ 668,478
	Contingency	30%			200,543
	Subtotal				$ 869,022
	General Conditions	20%			173,804
	Protecting & Preserving Historic Fabric	10%			104,283
	Overhead & Profit	20%			229,422
	Contracting Method Adjustment (Negotiated Contract)	15%			206,480
	TOTAL ESTIMATED COST				**$ 1,583,010**
	John Nelson Barn				
	Exteriors				$ 239,462
	Interiors				-
	Structural				79,845
	Mechanical, Electrical Plumbing				68,908
	Subtotal				$ 388,214
	Contingency	30%			116,464
	Subtotal				$ 504,678
	General Conditions	20%			100,936
	Protecting & Preserving Historic Fabric	10%			60,561
	Overhead & Profit	20%			133,235
	Contracting Method Adjustment (Negotiated Contract)	15%			119,912
	TOTAL ESTIMATED COST				**$ 919,322**
	TOTAL - House (Residential) & Barn				**$ 2,164,715**
	TOTAL - House (Commercial) & Barn				**$ 2,502,332**

Notes: All unit prices are adjusted for Lincoln, Massachusetts area
Prices are based on Federal Wage rates
All State & Local Taxes are include in General Conditions

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

ICI #: 207740-1
Prep: mcf
Date: 4/15/2008
Page: 2
Revised:

DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	ARCHITECTURAL ASSESSMENT				
	John Nelson House				
	Exteriors				
	Stone Foundation Walls - Selective Pointing	137	SF	$ 25.00	$ 3,425
	Wood Clapboard Siding (E, S, W) - Prep, Paint	1,155	SF	4.50	5,198
	- Selective Replacement	145	SF	30.00	4,350
	Wood Shingle Siding - Repair, Prep, Paint	1,065	SF	4.50	4,793
	- Selective Replacement	135	SF	25.00	3,375
	Wood Trim - Repair/Replace as Required	165	LF	35.00	5,775
	Brick Walls - Clean	582	SF	2.00	1,164
	- Repoint	60	SF	30.00	1,800
	Windows - Frame, Sash, Component Repairs	37	EA	475.00	17,575
	- Glass Replacement	7	EA	175.00	1,225
	- Sash Replacement	3	EA	1,200.00	3,600
	Doors - Sill, Threshold Repairs	3	EA	450.00	1,350
	- Replace Broken Glass	1	EA	200.00	200
	- Repair Door Surround	2	EA	500.00	1,000
	- Repair Carriage House Doors, Repaint	1	EA	750.00	750
	- Replace Aluminum Storm Doors w/Wood	2	EA	1,600.00	3,200
	Roof - Replace Roof & Sheathing w/Red Cedar	1,915	SF	24.50	46,918
	Exterior Lighting - Replace Lights	3	EA	750.00	2,250
	Porch - Rebuild Porch & Roof @ N Elevation	40	SF	175.00	7,000
	Total - Exterior				$ 114,947
	Interiors				
	Floors - Clean Wood	1,057	SF	1.25	$ 1,321
	- Remove Paint & Refinish Wood	865	SF	5.00	4,325
	- Remove Vinyl/Comp & Replace w/Wood Floor	300	SF	25.00	7,500
	Walls - Repair Parging	50	SF	15.00	750
	- Repair Water Infiltration	1	LS	3,500.00	3,500
	- Remove Wallpaper & Paint Wall	1,156	SF	2.50	2,890
	- Repair Plaster Cracks	23	LF	25.00	575
	- Paint Plaster	6,054	SF	1.25	7,568
	- Paint Base, Wainscot, Cap	416	SF	2.00	832
	- Remove Modern Wall	40	SF	5.00	200
	Ceilings - Replace Plaster Ceiling	186	SF	18.50	3,441
	- Remove Skylight & Patch Plaster	1	EA	1,500.00	1,500
	Doors - Repaint Doors	35	EA	200.00	7,000
	- Repaint Door, Window Casing	71	EA	125.00	8,875
	Interior Lighting - Replace Lights	14	EA	600.00	8,400
	Cabinetry & Appliances - Remove Kitchen Cab/Appliance	1	LS	2,250.00	2,250
	Fireplaces - Clean Firebox, Paint Surrounds	8	EA	650.00	5,200
	Cut/Patch For MEP Work	3,520	SF	10.00	35,200
	Total - Interiors				$ 101,327

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

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DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	STRUCTURAL ASSESSMENT				
	John Nelson House				
	Main Block - Replace Sill Beam @ S Side	36	LF	375.00	$ 13,500
	- Add Post to Beam	1	EA	1,850.00	1,850
	- Sister 1st Floor Joist	648	SF	20.00	12,960
	- Replace Deteriorated 1st Floor Beams, Joists	648	SF	25.00	16,200
	- Jack Roof Rafter & Sister as Required	1	EA	950.00	950
	- Sister 2nd Floor Joist	648	SF	20.00	12,960
	Northwest Wing - Repair Corner Post, Sill	1	LS	5,500.00	5,500
	- Repair Second Floor Hallway Framing	1	LS	4,500.00	4,500
	- Repair First Floor Framing, Piers	710	SF	20.00	14,200
	- Replace Sill Beams as Required	50	LF	375.00	18,750
	- Ventilate @ Provide Vapor Barrier @ Crawl Space	710	SF	6.50	4,615
	Original 18th Century Block - Repair Second Floor Framing	1	LS	4,500.00	4,500
	- Repair 1st Floor Framing, Ventilate Crawl Space	270	SF	20.00	5,400
	Northeast Block - Replace Sill Beams as Required	30	LF	375.00	11,250
	- Double Sister Floor Framing	335	SF	25.00	8,375
	- Realign Framing, Consolidate Checks	1	LS	5,750.00	5,750
	Total - Structural				$ 141,260
	MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT				
	John Nelson House				
	HVAC - Replace Piping, Fin Tube Radiation	3,520	SF	10.00	$ 35,200
	- Replace Fuel Oil Tank	1	EA	1,200.00	1,200
	Plumbing Systems - Replace Fixtures @ 2nd Floor	3	EA	1,850.00	5,550
	- Inspect, Repair Sanitary Systems	1	LS	2,000.00	2,000
	- Repair Lavatory, Piping @ Basement	1	LS	1,500.00	1,500
	- Hose Bib for Water to Barn	1	LS	1,500.00	1,500
	Fire Suppression Systems - Provide Fire Extinguishers	1	LS	1,000.00	1,000
	- Water Service & Sprinklers Through Out (Incl. Bsmt)	4,350	SF	10.00	43,500
	Electrical Systems - Replace Main Electrical Panel	1	EA	4,500.00	4,500
	- Rewire Building, Replace Devices	3,520	SF	8.50	29,920
	- Replace Lighting	3,520	SF	5.00	17,600
	- Upgrade Fire Alarm (Incl. Bsmt)	4,350	SF	2.00	8,700
	- Upgrade Security as Required	3,520	SF	1.50	5,280
	- Replace Telephone & CATV	3,520	SF	1.25	4,400
	- Emergency Battery Lights & Exist Lights (Incl. Bsmt)	4,350	SF	1.50	6,525
	Total - Mechanical, Electrical, Plumbing				$ 168,375
	Subtotal				$ 525,908
	Contingency	30%			157,772
	Subtotal				$ 683,681
	General Conditions	20%			136,736
	Protecting & Preserving Historic Fabric	10%			82,042
	Overhead & Profit	20%			180,492
	Contracting Method Adjustment (Negotiated Contract)	15%			162,443
	TOTAL ESTIMATED COST				**$ 1,245,393**

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

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DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	ALTERNATES				
	Repoint 100% of Brick Walls - Add	522	SF	30.00	$ 15,660
	Mark Ups	136.8%			21,423
	TOTAL - NET ADD				**$ 37,083**
	Replace Modern Windows w/Divided Light	2	EA	1,350.00	$ 2,700
	Mark Ups	136.8%			3,694
	TOTAL - NET ADD				**$ 6,394**
	Replace Aluminum Storm Panel w/ Exterior Wood	30	EA	600.00	$ 18,000
	Mark Ups	136.8%			24,624
	TOTAL - NET ADD				**$ 42,624**
	Replace Aluminum Storm Panel w/ Interior Magnetic	30	EA	375.00	$ 11,250
	Mark Ups	136.8%			15,390
	TOTAL - NET ADD				**$ 26,640**
	Substitute White for Red Cedar Roofing (House/Barn)	5,382	SF	1.25	$ 6,728
	Mark Ups	136.8%			9,203
	TOTAL - NET ADD				**$ 15,931**
	Substitute Pine for Red Cedar Roofing (House/Barn)	5,382	SF	2.00	$ 10,764
	Mark Ups	136.8%			14,725
	TOTAL - NET ADD				**$ 25,489**

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
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LINCOLN, MASSACHUSETTS

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DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	ARCHITECTURAL ASSESSMENT				
	John Nelson House				
	Exteriors				
	Stone Foundation Walls - Selective Pointing	137	SF	$ 25.00	$ 3,425
	Wood Clapboard Siding (E, S, W) - Prep, Paint	1,155	SF	4.50	5,198
	- Selective Replacement	145	SF	30.00	4,350
	Wood Shingle Siding - Repair, Prep, Paint	1,065	SF	4.50	4,793
	- Selective Replacement	135	SF	25.00	3,375
	Wood Trim - Repair/Replace as Required	165	LF	35.00	5,775
	Brick Walls - Clean	582	SF	2.00	1,164
	- Repoint	60	SF	30.00	1,800
	Windows - Frame, Sash, Component Repairs	37	EA	475.00	17,575
	- Glass Replacement	7	EA	175.00	1,225
	- Sash Replacement	3	EA	1,200.00	3,600
	Doors - Sill, Threshold Repairs	3	EA	450.00	1,350
	- Replace Broken Glass	1	EA	200.00	200
	- Repair Door Surround	2	EA	500.00	1,000
	- Repair Carriage House Doors, Repaint	1	EA	750.00	750
	- Replace Aluminum Storm Doors w/Wood	2	EA	1,600.00	3,200
	Roof - Replace Roof & Sheathing w/Red Cedar	1,915	SF	24.50	46,918
	Exterior Lighting - Replace Lights	3	EA	750.00	2,250
	Porch - Rebuild Porch & Roof @ N Elevation	40	SF	175.00	7,000
	Total - Exterior				$ 114,947
	Interiors				
	Floors - Clean Wood	1,057	SF	1.25	$ 1,321
	- Remove Paint & Refinish Wood	865	SF	5.00	4,325
	- Remove Vinyl/Comp & Replace w/Wood Floor	300	SF	25.00	7,500
	Walls - Repair Parging	50	SF	15.00	750
	- Repair Water Infiltration	1	LS	3,500.00	3,500
	- Remove Wallpaper & Paint Wall	1,156	SF	2.50	2,890
	- Repair Plaster Cracks	23	LF	25.00	575
	- Paint Plaster	6,054	SF	1.25	7,568
	- Paint Base, Wainscot, Cap	416	SF	2.00	832
	- Remove Modern Wall	40	SF	5.00	200
	Ceilings - Replace Plaster Ceiling	186	SF	18.50	3,441
	- Remove Skylight & Patch Plaster	1	EA	1,500.00	1,500
	Doors - Repaint Doors	35	EA	200.00	7,000
	- Repaint Door, Window Casing	71	EA	125.00	8,875
	Interior Lighting - Replace Lights	14	EA	600.00	8,400
	Cabinetry & Appliances - Remove Kitchen Cab/Appliance	1	LS	2,250.00	2,250
	Fireplaces - Clean Firebox, Paint Surrounds	8	EA	650.00	5,200
	Stairs - Replace Stair Railings, Handrails	2	EA	3,500.00	7,000
	Install Wood ADA Ramp	1	EA	10,000.00	10,000
	Cut/Patch For MEP Work	3,520	SF	10.00	35,200
	Total - Interiors				$ 118,327

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
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LINCOLN, MASSACHUSETTS

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DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	STRUCTURAL ASSESSMENT				
	John Nelson House				
	Main Block - Replace Sill Beam @ S Side	36	LF	375.00	$ 13,500
	- Add Post to Beam	1	EA	1,850.00	1,850
	- Sister 1st Floor Joist	648	SF	20.00	12,960
	- Replace Deteriorated 1st Floor Beams, Joists	648	SF	25.00	16,200
	- Jack Roof Rafter & Sister as Required	1	EA	950.00	950
	- Sister 2nd Floor Joist	648	SF	20.00	12,960
	Northwest Wing - Repair Corner Post, Sill	1	LS	5,500.00	5,500
	- Repair Second Floor Hallway Framing	1	LS	4,500.00	4,500
	- Repair First Floor Framing, Piers	710	SF	20.00	14,200
	- Replace Sill Beams as Required	50	LF	375.00	18,750
	- Ventilate @ Provide Vapor Barrier @ Crawl Space	710	SF	6.50	4,615
	Original 18th Century Block - Repair Second Floor Framing	1	LS	4,500.00	4,500
	- Repair 1st Floor Framing, Ventilate Crawl Space	270	SF	20.00	5,400
	Northeast Block - Replace Sill Beams as Required	30	LF	375.00	11,250
	- Double Sister Floor Framing	335	SF	25.00	8,375
	- Realign Framing, Consolidate Checks	1	LS	5,750.00	5,750
	Total - Structural				$ 141,260
	MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT				
	John Nelson House				
	HVAC - Replace Piping, Radiators w/FCU & Piping	3,520	SF	28.50	$ 100,320
	- Provide Mechanical Ventilation	3,520	SF	12.50	44,000
	- Replace Fuel Oil Tank	1	EA	1,200.00	1,200
	Plumbing Systems - Provide 2 Bathroom @ 2nd Floor	4	Fixt	3,500.00	14,000
	- Inspect, Repair Sanitary Systems	1	LS	2,000.00	2,000
	- Repair Lavatory, Piping @ Basement	1	LS	1,500.00	1,500
	- Hose Bib for Water to Barn	1	LS	1,500.00	1,500
	Fire Suppression Systems - Provide Fire Extinguishers	1	LS	1,000.00	1,000
	- Water Service & Sprinklers Through Out (Incl. Bsmt)	4,350	SF	10.00	43,500
	Electrical Systems - Enlarge Service & Main Panel	1	EA	12,500.00	12,500
	- Rewire Building, Replace Devices	3,520	SF	8.50	29,920
	- Replace Lighting	3,520	SF	5.00	17,600
	- Upgrade Fire Alarm (Incl. Bsmt)	4,350	SF	2.00	8,700
	- Upgrade Security as Required	3,520	SF	1.50	5,280
	- Replace Telephone & CATV	3,520	SF	1.25	4,400
	- Emergency Battery Lights & Exist Lights (Incl. Bsmt)	4,350	SF	1.50	6,525
	Total - Mechanical, Electrical, Plumbing				$ 293,945
	Subtotal				$ 668,478
	Contingency	30%			200,543
	Subtotal				$ 869,022
	General Conditions	20%			173,804
	Protecting & Preserving Historic Fabric	10%			104,283
	Overhead & Profit	20%			229,422
	Contracting Method Adjustment (Negotiated Contract)	15%			206,480
	TOTAL ESTIMATED COST				**$ 1,583,010**

JOHN MILNER ARCHITECTS
MINUTE MAN NATIONAL HISTORIC PARK
JOHN NELSON HOUSE AND BARN HISTORIC STRUCTURE ASSESSMENT
LINCOLN, MASSACHUSETTS

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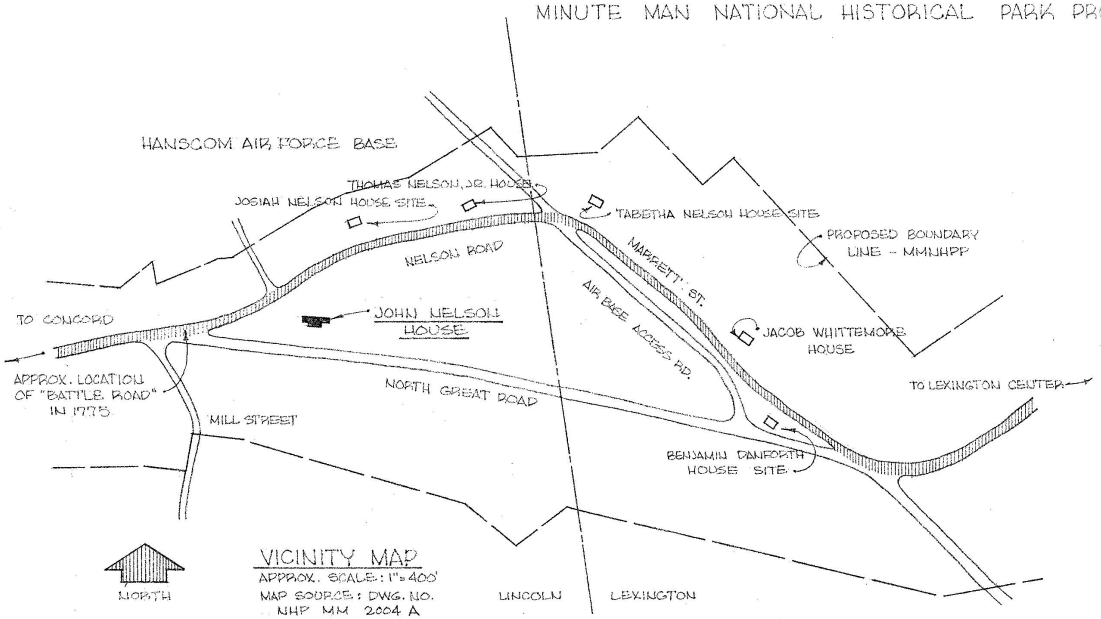
DETAILS - 100% CLASS C SUBMISSION COST ESTIMATE

Account	Description	Quantity	Unit	Unit Cost	Amount
	ARCHITECTURAL ASSESSMENT				
	John Nelson Barn				
	Exteriors				
	Stone Foundation Walls - Selective Pointing	350	SF	$ 25.00	$ 8,750
	Wood Shingle Siding - Replace Shingles, Sheathing	5,481	SF	20.00	109,620
	Wall Repairs - Repair Bowed Wall	1	LS	2,500.00	2,500
	Doors - Replace Missing Door	1	EA	8,500.00	8,500
	- Repair Door	1	EA	3,000.00	3,000
	- Paint Doors	2	EA	950.00	1,900
	Windows - Replace Missing Sash	26	EA	625.00	16,250
	- Paint Sills, Casing	32	EA	125.00	4,000
	Roof - Replace Roof & Sheathing w/Red Cedar	3,467	SF	24.50	84,942
	Total - Exterior				$ 239,462
	Interiors				
	See Structural Assessment				-
	Total - Interiors				**$ -**
	STRUCTURAL ASSESSMENT				
	John Nelson Barn				
	South (Main) Block - Remove Roofing & Siding				Included Above
	- Jack Frame Back Into Alignment	1,062	SF	$ 10.00	$ 10,620
	- Repair/Replace Framing as Required	1,062	SF	50.00	53,100
	- Replace Roofing, Siding				Included Above
	North Block - Minor Repairs as Required	2,150	SF	7.50	16,125
	Total - Structural				$ 79,845
	MECHANICAL, ELECTRICAL, PLUMBING ASSESSMENT				
	John Nelson Barn				
	Fire Suppression Systems - Provide Fire Extinguishers	1	LS	$ 750.00	$ 750
	- Water Service & Dry Sprinklers Through Out	3,205	SF	12.00	38,460
	Electrical Systems - Rewire Building, Replace Devices	3,205	SF	6.00	19,230
	- Replace Lighting	3,205	SF	1.50	4,808
	- Extend Fire Alarm	3,205	SF	2.00	6,410
	Total - Mechanical, Electrical, Plumbing				$ 68,908
	Subtotal				$ 388,214
	Contingency	30%			116,464
	Subtotal				$ 504,678
	General Conditions	20%			100,936
	Protecting & Preserving Historic Fabric	10%			60,561
	Overhead & Profit	20%			133,235
	Contracting Method Adjustment (Negotiated Contract)	15%			119,912
	TOTAL ESTIMATED COST				**$ 919,322**

THE · JOHN · NELSON · HOUSE

NORTH GREAT ROAD – LINCOLN – MIDDLESEX COUNTY – MASSACHUSETTS

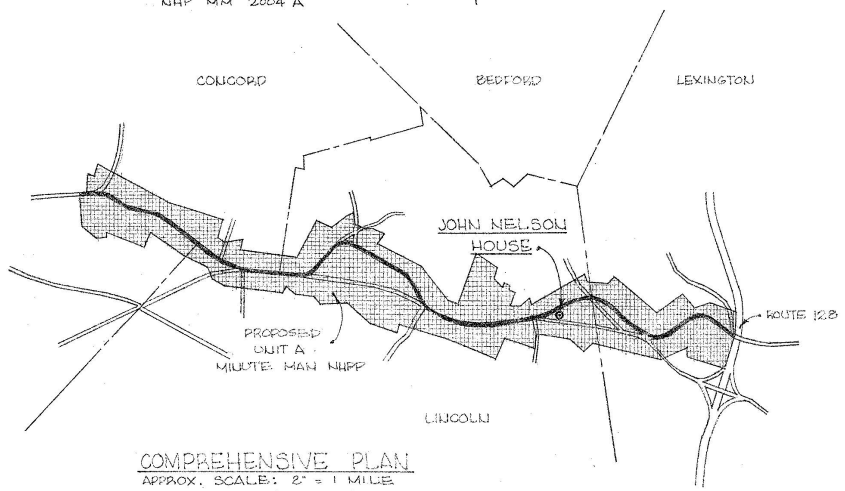
MINUTE MAN NATIONAL HISTORICAL PARK PROJECT



VICINITY MAP

APPROX. SCALE: 1" = 400'

MAP SOURCE: DWG. NO. NHP MM 2004 A



COMPREHENSIVE PLAN

APPROX. SCALE: 2" = 1 MILE

MAP SOURCE: INTERIM REPORT OF THE BOSTON NATIONAL HISTORIC SITES, 1959.

R. V. KEUNE DEC., 1962

THE EARLIEST PORTION OF THIS STRUCTURE, THE KITCHEN, APPEARS TO DATE FROM THE EIGHTEENTH CENTURY; ITS LOCATION ON THIS SITE AT THAT PERIOD IS QUESTIONABLE. THE MAIN PORTION OF THE HOUSE WAS STARTED IN 1811 AND HAD ADDITIONS OVER A PERIOD OF YEARS. JOHN NELSON, THE BUILDER, WAS A LOCAL CARPENTER AND MANY OF THE DETAILS INCORPORATED INTO THE MAIN PORTION OF THE HOUSE WERE INFLUENCED BY PATTERNS IN ASHER BENJAMIN'S "THE COUNTRY BUILDER'S ASSISTANT." NELSON'S ORIGINAL COPY OF THE BOOK IS IN THE POSSESSION OF THE PRESENT OCCUPANT'S, MR. AND MRS. W. NEWTON NELSON. THE HOUSE IS PRESENTLY USED AS A PRIVATE RESIDENCE AND IS WITHIN THE APPROVED BOUNDARIES OF THE MINUTE MAN NATIONAL HISTORICAL PARK.

THIS PROJECT WAS FINANCED BY FUNDS OF THE "MISSION 66" PROJECT OF THE NATIONAL PARK SERVICE. MEASURED AND DRAWN AUGUST, 1963, UNDER THE DIRECTION OF CHARLES E. PETERSON, SUPERVISING ARCHITECT, HISTORIC STRUCTURES; ARCHITECT RUSSELL V. KEUNE, MINUTE MAN NATIONAL HISTORICAL PARK; AND STUDENT ASSISTANT ARCHITECTS CHARLES H. BRITTAIN, GEORGIA INSTITUTE OF TECHNOLOGY; ROBERT LANCHESTER, MASSACHUSETTS INSTITUTE OF TECHNOLOGY; ALAN R. McDONALD, OHIO STATE UNIVERSITY.

MINUTE MAN N.H.P.M. SURVEY – 1962
LEXINGTON, LINCOLN, CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

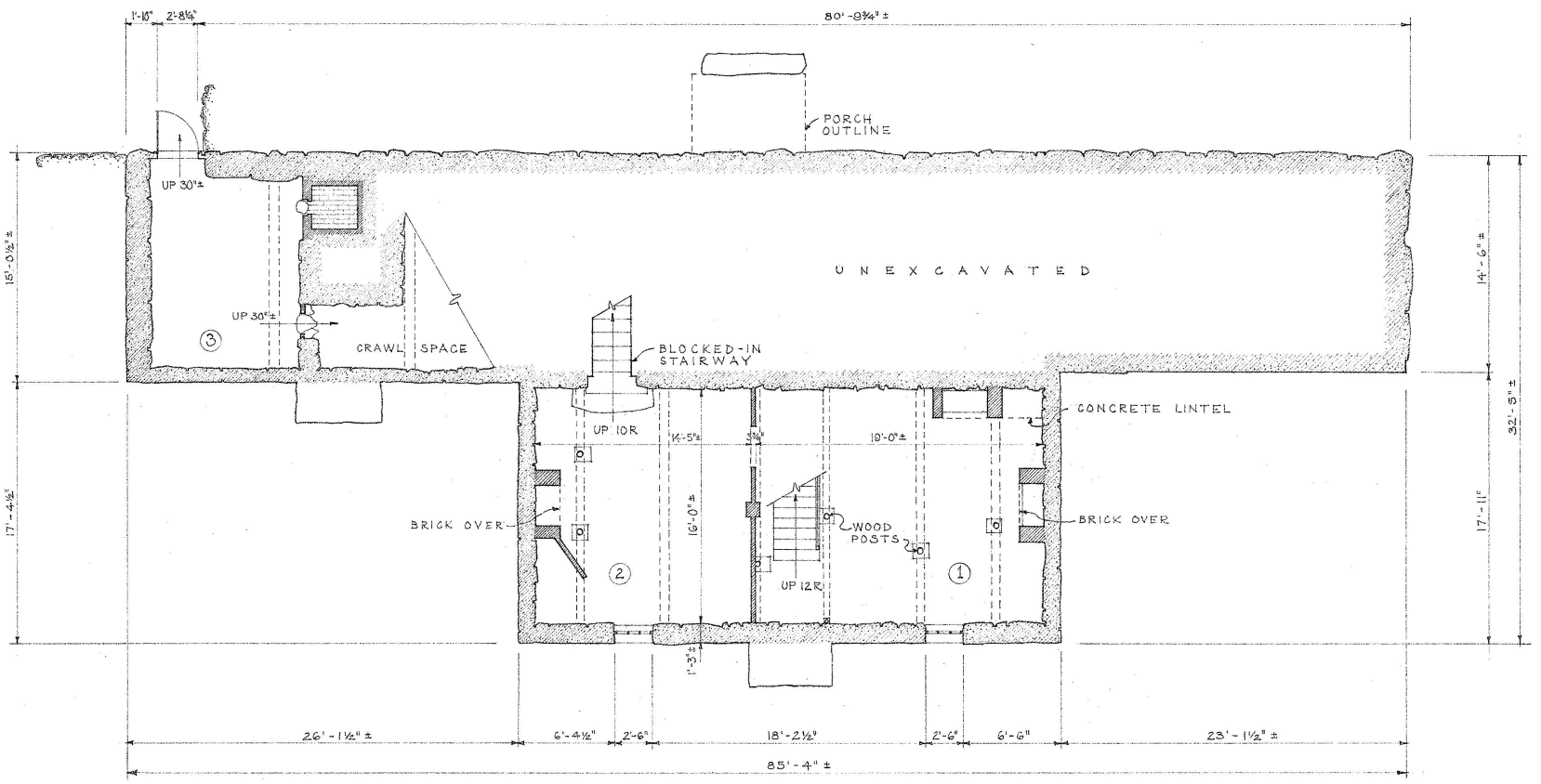
NAME OF STRUCTURE
THE JOHN NELSON HOUSE
NORTH GREAT ROAD – LINCOLN – MIDDLESEX COUNTY – MASSACHUSETTS

SURVEY NO. MA-830

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 6 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

TRIM LINE



BASEMENT PLAN

SCALE 3/16" = 1'-0"

NOTE: DOTTED LINES INDICATE BEAMS OVERHEAD

ROBERT LANCHESTER, DEL. 1962

3/16" = 1'-0" 0 5 10 15

MINUTEMAN N.H.P.P. SURVEY, 1962
LEXINGTON • LINCOLN • CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE JOHN NELSON HOUSE
NORTH GREAT ROAD — LINCOLN — MIDDLESEX COUNTY — MASSACHUSETTS

SURVEY NO. MA-830

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 2 OF 6 SHEETS

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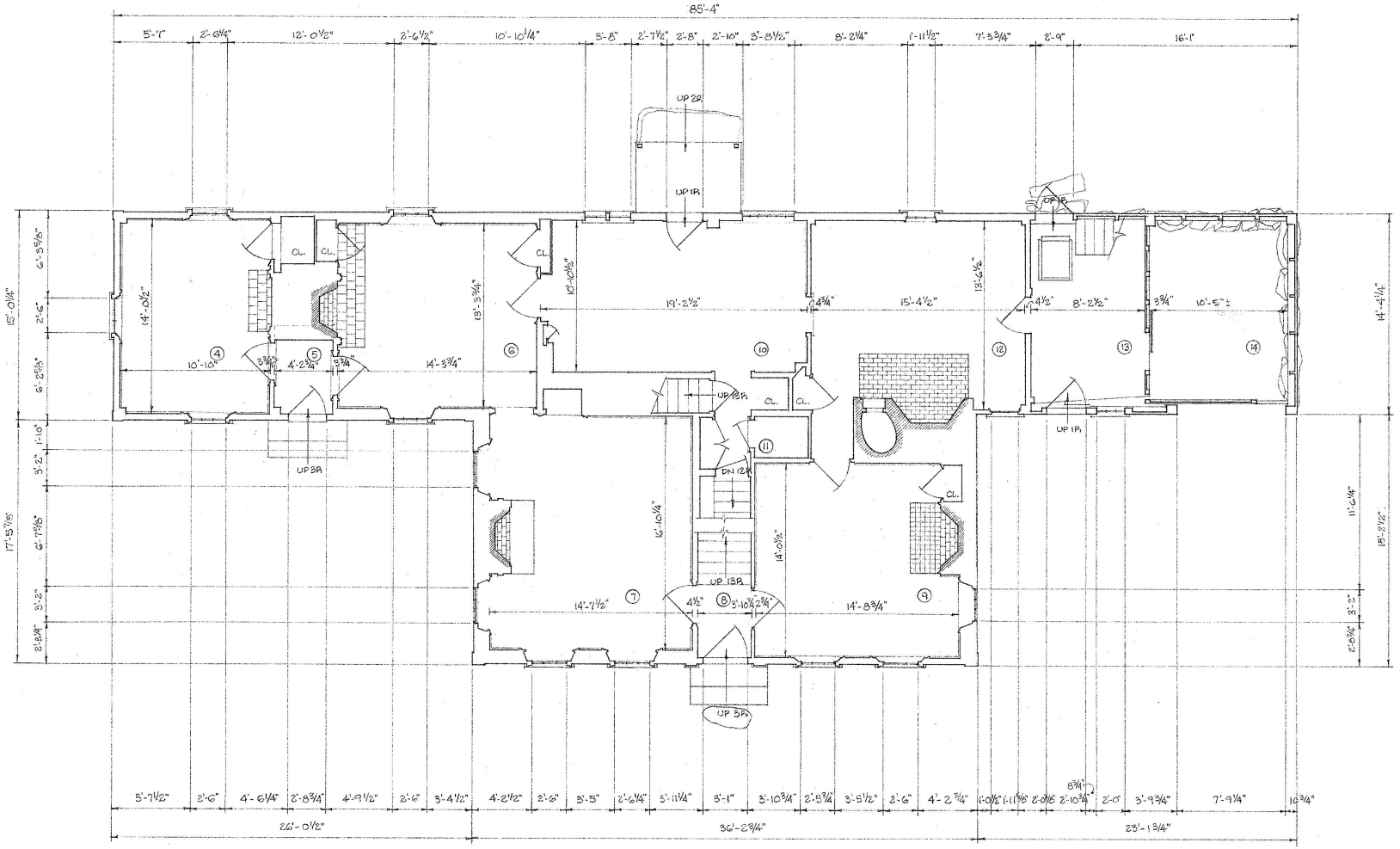

FIRST FLOOR PLAN

SCALE 3/16" = 1'-0"

NORTH

C.H. BRITTAIN DEL., 1962.

3/16" = 1'-0" 0 5' 10' 15'

MINUTE MAN N.H.P.P. SURVEY - 1962
LEXINGTON, LINCOLN, CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE JOHN NELSON HOUSE
NORTH GREAT ROAD – LINCOLN – MIDDLESEX COUNTY – MASSACHUSETTS

SURVEY NO. MA-830

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 3 OF 6 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

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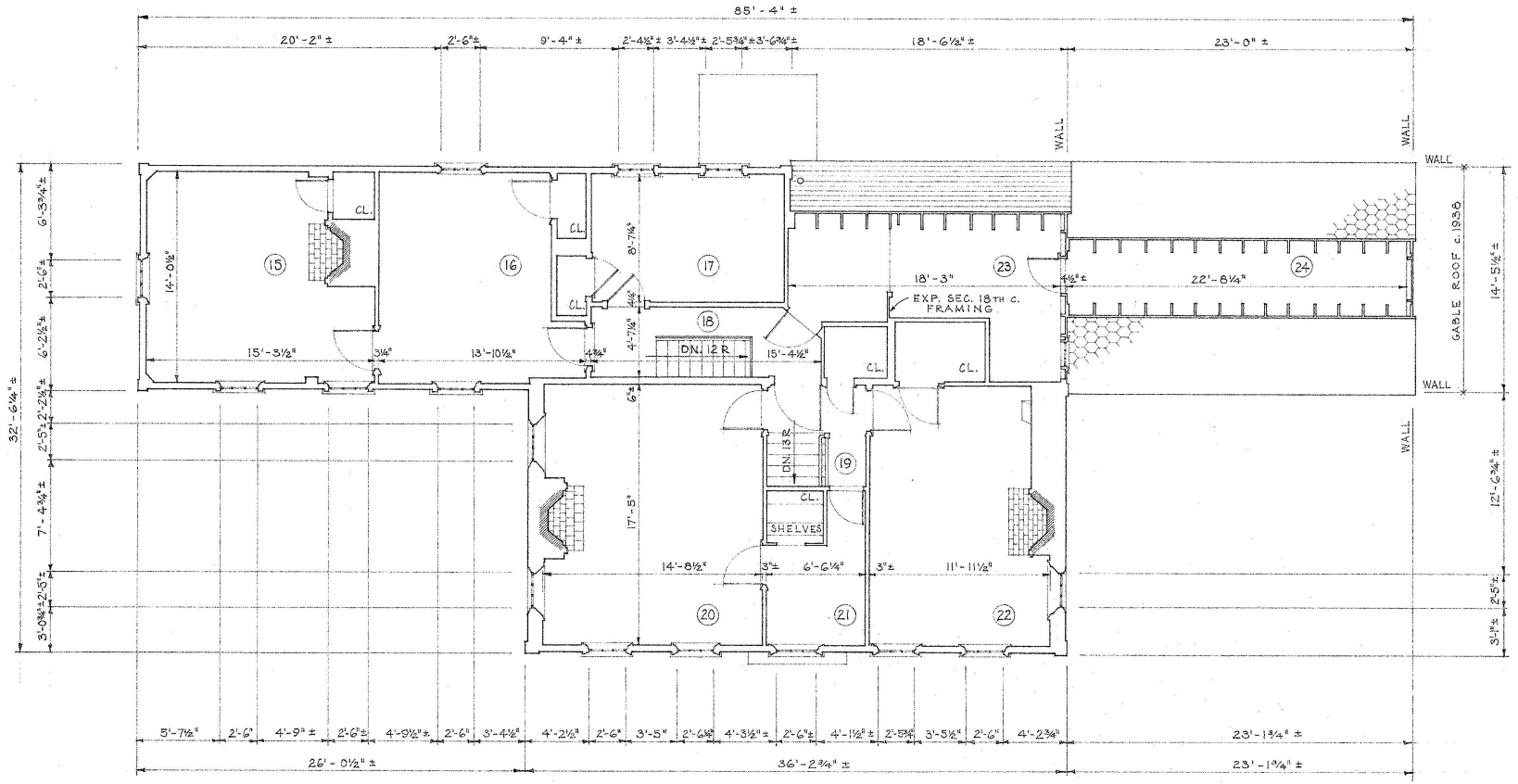
TRIM LINE

TRIM LINE



SECOND FLOOR PLAN

SCALE: 3/16" = 1'-0"

NORTH

ROBERT LANCHESTER, DEL. 1962

3/16" = 1'-0" 0 5 10 15

MINUTE MAN N.H.P.P. SURVEY, 1962
LEXINGTON - LINCOLN - CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE JOHN NELSON HOUSE
NORTH GREAT ROAD — LINCOLN — MIDDLESEX COUNTY — MASSACHUSETTS

SURVEY NO.
MA-830

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 4 OF 6 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

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TRIM LINE

TRIM LINE

NOTE: BRICK CHIMNEYS
ASPHALT SHINGLES
PAINTED CLAPBOARDS
GRANITE FOUNDATIONS

NOTE: SEE SHEET 6 OF 6 FOR ADDITIONAL VERTICAL DIMENSIONS.

SOUTH ELEVATION

SCALE: 3/16"=1'-0"

CHARLES H. BRITTAIN, DEL., 1962

3/16"=1'-0" 0 5 10 15

MINUTEMAN N.H.P.P. SURVEY, 1962
LEXINGTON • LINCOLN • CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE JOHN NELSON HOUSE
NORTH GREAT ROAD — LINCOLN — MIDDLESEX COUNTY — MASSACHUSETTS

SURVEY NO. MA-850

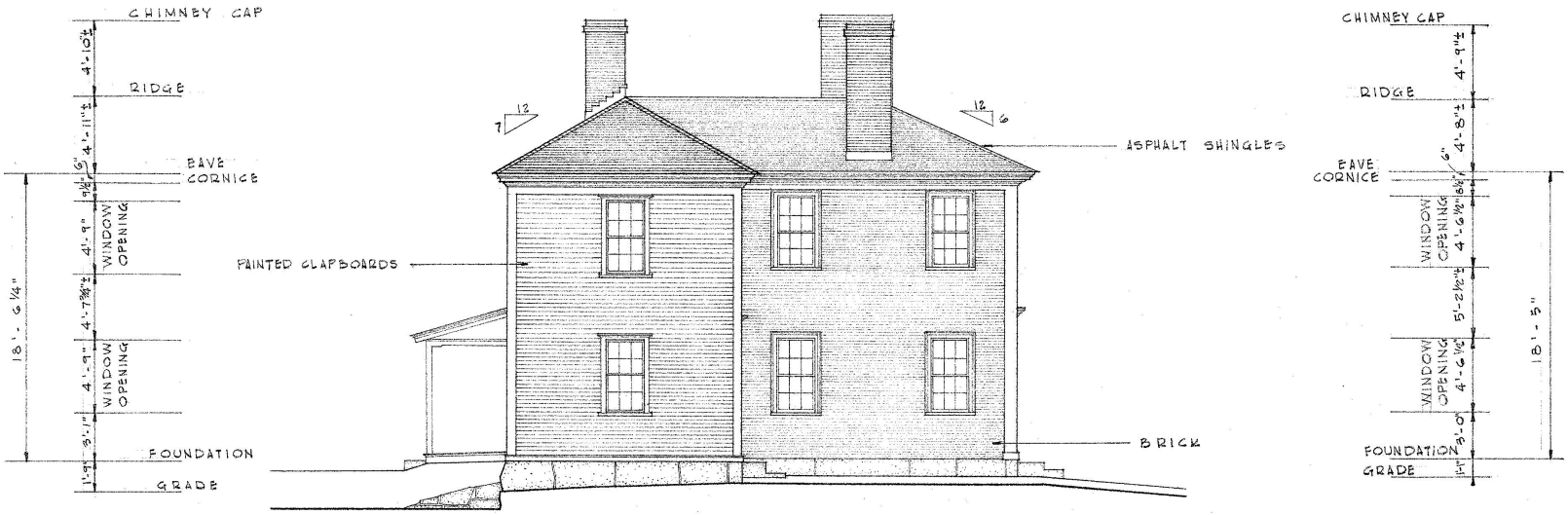
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 5 OF 6 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

U.S. GOVERNMENT PRINTING OFFICE 10—5539

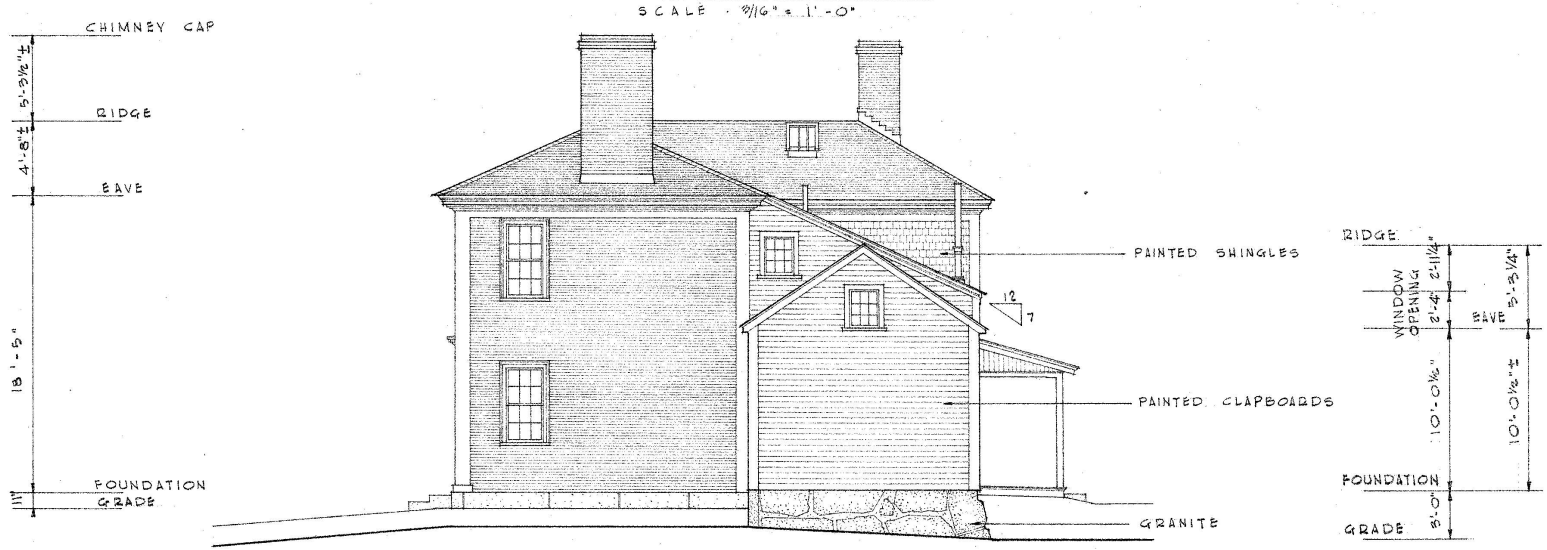
TRIM LINE

TRIM LINE



WEST ELEVATION

SCALE · 3/16" = 1'-0"



EAST ELEVATION

SCALE · 3/16" = 1'-0"

ALAN R. McDONALD, DEL. 1962

SCALE · 3/16" = 1'-0"

0 5 10 15

MINUTEMAN N.H.P.P. SURVEY, 1962
LEXINGTON • LINCOLN • CONCORD, MASS.
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE

THE JOHN NELSON HOUSE

NORTH GREAT ROAD — LINCOLN — MIDDLESEX COUNTY — MASSACHUSETTS

SURVEY NO. MA-830

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 6 OF 6 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

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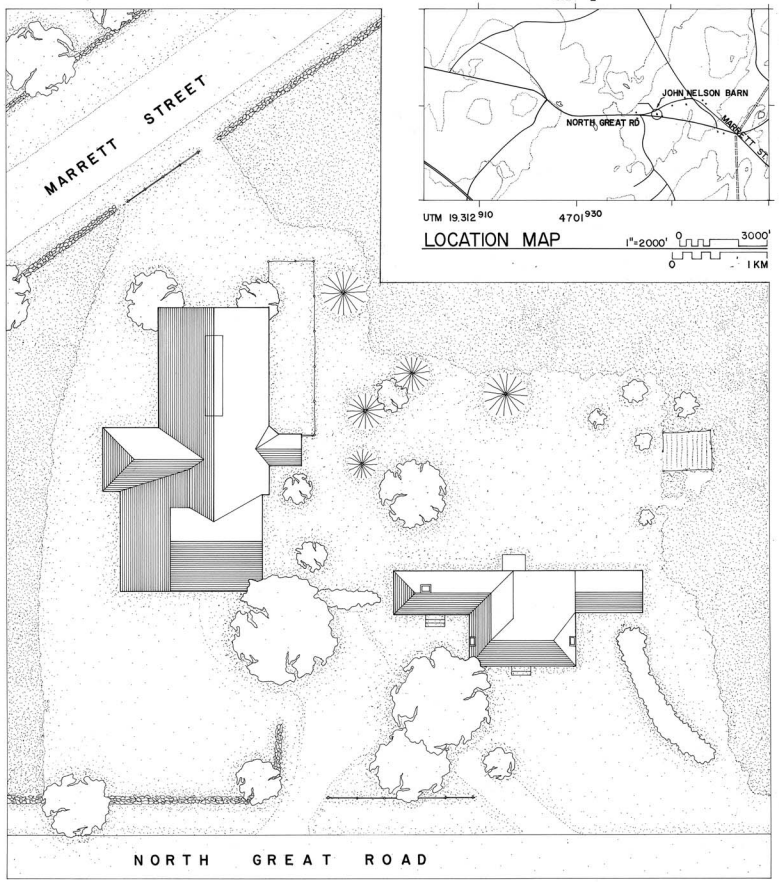
TRIM LINE

TRIM LINE

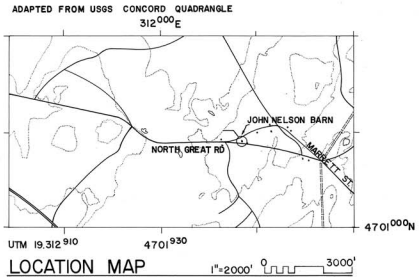
NELSON BARN



SITE PLAN

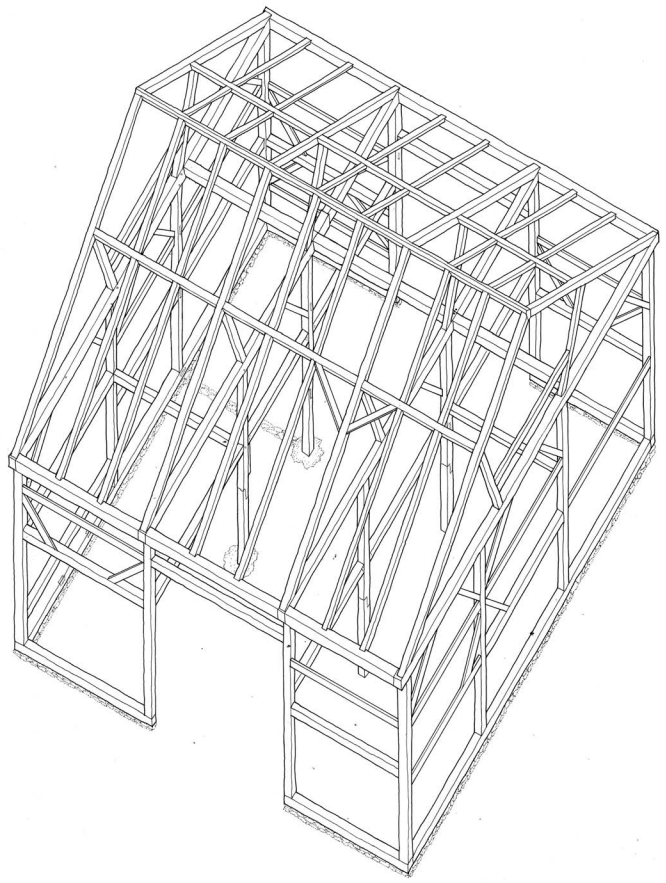
FEET 1"=20' 0 10 50

METERS 1:20 0 5 20



LOCATION MAP 1"=2000' 0 3000'

0 1 KM



FRAMING ISOMETRIC FEET 1/4"=1'-0" 0 1 2 3 4 5 10

METERS 1:48 0 1 2 3

DRAWN BY: HALL

OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
UNDER DIRECTION OF THE NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NAME AND LOCATION OF STRUCTURE

JOHN NELSON BARN
NORTH GREAT ROAD LINCOLN MIDDLESEX COUNTY MASSACHUSETTS

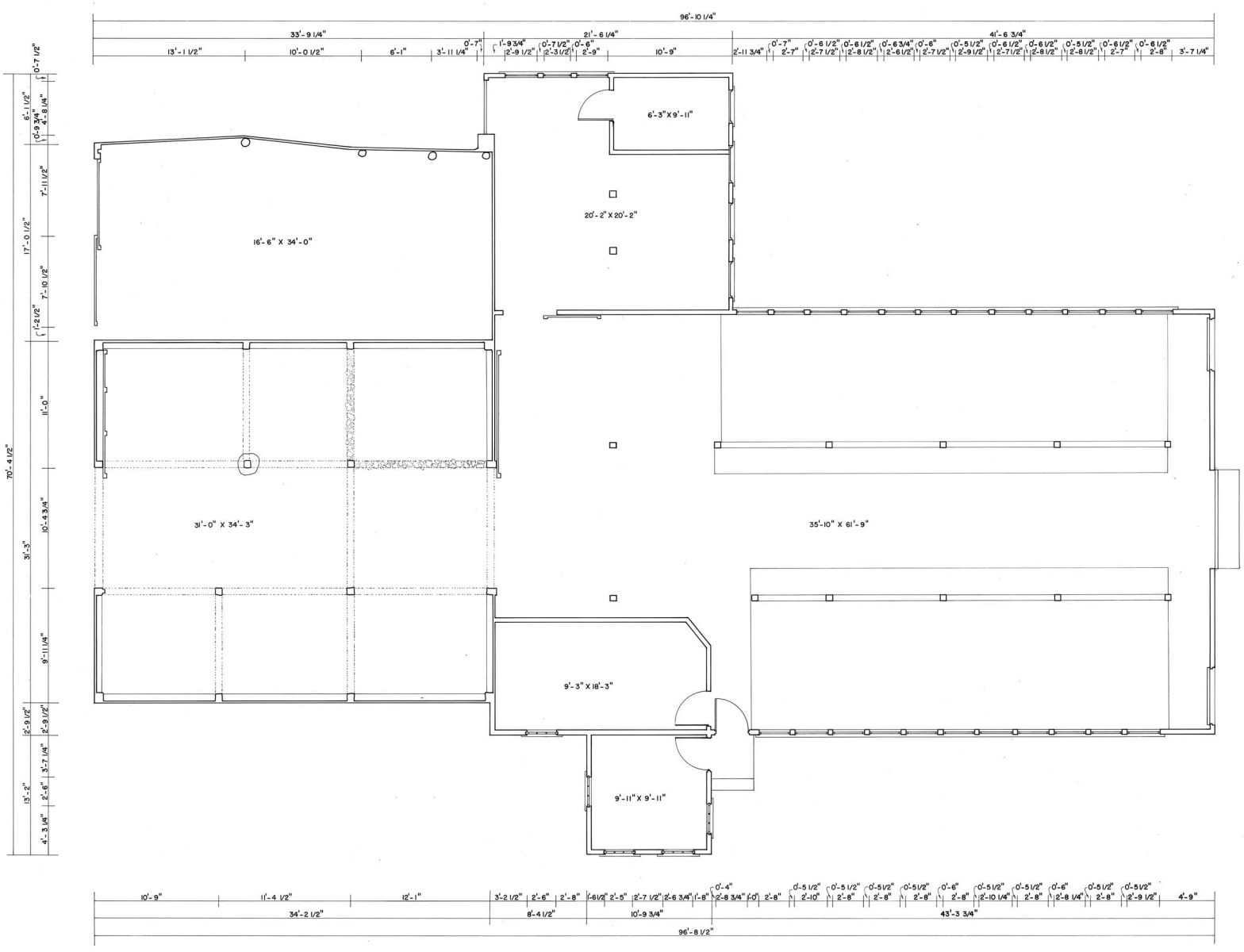
SURVEY NO. MA 831

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 3 SHEETS

TRIM LINE

K&E C-T 19 1259 3-73 MC80+

TRIM LINE



NAME AND LOCATION OF STRUCTURE

JOHN NELSON BARN

NORTH GREAT ROAD LINCOLN MIDDLESEX COUNTY MASSACHUSETTS

SURVEY NO. MA 831

HISTORIC AMERICAN BUILDINGS SURVEY

SHEET 2 OF 3 SHEETS

DRAWN BY: LOUTON

OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
UNDER DIRECTION OF THE NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

K&E C-T 19 1233 2-73 MC302-

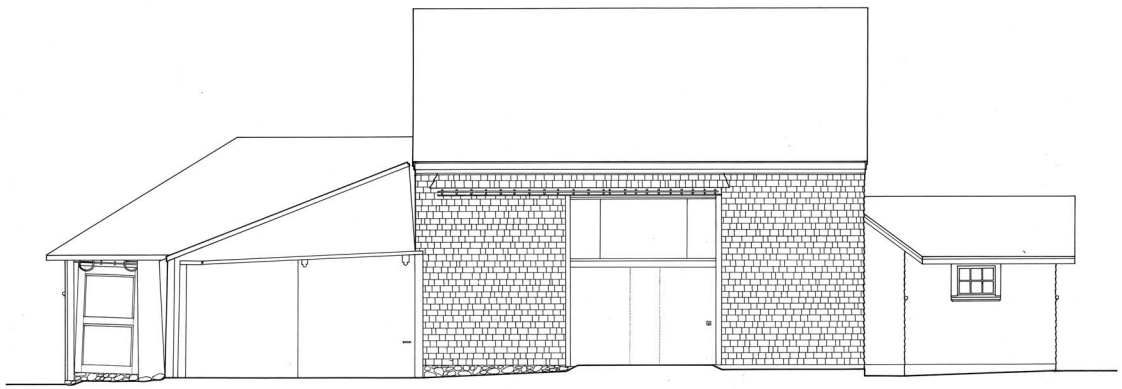
TRIM LINE

TRIM LINE

EAST ELEVATION

FEET 1/4"= 1'-0"
METERS 1:48

0 5 10
0 1 2 3



SOUTH ELEVATION

FEET 1/4"= 1'-0"
METERS 1:48

0 5 10
0 1 2 3

NAME AND LOCATION OF STRUCTURE

JOHN NELSON BARN
MIDDLESEX COUNTY MASSACHUSETTS
LINCOLN
NORTH GREAT ROAD

SURVEY NO. MA 831

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 3 OF 3 SHEETS

DRAWN BY: OLSCHLAGER

OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
HISTORIC AMERICAN BUILDINGS SURVEY
UNITED STATES DEPARTMENT OF THE INTERIOR

K&E C-T 19 1233 2-73 MC202-

TRIM LINE

APPENDIX 3.5: LIST OF FIGURES

Page	Figure	Caption
24	SE-7	Roof cornice condition at southwest corner of northwest wing. Also note wood shingle drip course
24	SE-8	Condition of sill, pilaster, wood siding and apron board at Door 1/105.
25	SE-9	Door 1/105 – entrance to the northwest wing.
26	SE-10	Door 1/101 – entrance to the main block. The rotted sill and pilaster bases were replaced by the NPS in October, 2007.
27	SE-11	Detail of Door 1/101 showing new aluminum flashing at the sill and replaced pilaster bases. The granite slab steps were previously repaired with incompatible cement-based mortar.
27	SE-12	Door 1/101: detail of door surround cornice showing condition. Note unique decorative spiral rope molding, also found along the main block roof cornice.
28	SE-13	Door 1/109 and Window #111, Type w-D. The door sill is extremely deteriorated. The window sash is missing and has been replaced with a single piece of Plexiglas. The foundation wall is granite block on the left of the door, at the 18th century block, and formed concrete to the east of this point.
29	SE-14	Door 1/109: detail of rotted and warped sill.
29	SE-15	Door 1/110: detail showing deterioration at the lower edge of the diagonal-board carriage house door. The foundation at the south elevation of the carriage house is formed concrete.
30	SE-16	Window Type w-A: 6-over-6 double hung window with flat board trim and cornice. An aluminum triple-track storm window is attached to the wood frame. This window type is found at the south, west, and north elevations of the northwest wing. On the south elevation Type w-A is found at #101, 102, 201, 202 & 203.
31	SE-17	Window Type w-B: 6-over-6 double hung window with profile backband trim, found only at the main block. An aluminum triple-track storm window is attached to the wood frame. On the south elevation Type w-B is found at #105, 106, 107, 108, 206, 207, 208, 209 & 210.
32	SE-18	Window Type w-C: 6-over-9 single hung with flat board trim. On the south elevation Type w-C is found at Window # 110.

Page	Figure	Caption
126	202-3	East elevation of Room 202 with Door 1/202 on the left that leads to Room 201 and Door 2/202 on the right that leads to Room 203. Both doors are identical in size and panel configuration, although the hardware is different.
127	202-4 & 5	Thumb latch door hardware found at Doors 2/202, 1/203 and 2/204.
128	202-6	Room 202, window jamb and sill detail on south wall.
128	202-7	Room 202, detail of baseboard with surface mounted outlets and wires.
130	203-1	South elevation of Room 203.
130	203-2	North elevation of Room 203 with Door 2/203 that leads to a closet.
133	204-1	South elevation of Room 204, with Windows 209 & 210.
133	204-2	East elevation of Room 204.
134	204-3	North and west elevations of Room 204. Door 1/204 on the left leads to Room 201. Door 2/204 leads to the closet, Room 204A.
134	204-4	Room 204, fireplace and hearth.
135	204-5	Room 204, exposed portion of masonry flue at northeast corner of room.
137	205-1	Room 205, looking west with Door 1/207 that leads to Room 207. The staircase to the first floor is in the foreground.
138	205-2	Room 205, looking east. Door 1/205 leads to the attic, Room 209. There is a skylight in the ceiling.
138	205-3	North elevation of Room 205. Door 1/207 is on the left and Door 1/206 is on the right.
139	205-4	Skylight in Room 205.
139	205-5	North and east elevations of Room 205 with Door 1/205 that leads to the attic, Room 209. The door leaf has been modified to accommodate the sloping floor.

Page	Figure	Caption
140	205-6	Room 205, staircase and railing.
142	206-1	Room 206, looking southwest. Door 1/206 is on the left and leads to Room 205. Door 2/206 is on the right and leads to a closet. The modern sink vanity and lighting fixtures are in the foreground.
143	206-2	Room 206, looking east. A portion of the floor and subfloor was previously removed. Sleepers were installed to correct the sagging floor prior to the installation of the partition wall on the right, the bathtub and surround, and the tile floor.
144	206-3	Room 206, looking southeast showing removed finish floor and leveling sleepers on top of the original floorboards, which run continuous under the south wall that separates Room 206 from Room 205.
145	206-4	Room 206, Window 215 (Window 214 is similar). The window casings and sills at Windows 214 and 215 are unique to the house.
147	207-1	Room 207, looking northeast. Door 2/207 on the north wall leads to a closet.
148	207-2	Room 207, looking southeast. Door 2/207 on the left leads to a closet and Door 1/207 on the right leads to Room 205. The wall in the southeast corner is boxed out in the vicinity of where the northwest corner of the main block meets the northwest wing, on the other side of the wall.
148	207-3	South elevation of Room 207, with Window 203.
149	207-4	West elevation of Room 207 with Door 1/208 that leads to Room 208. The floor sags in the middle, at the possible location of a stove heater. The former stove vent plate is found on the wall above this area, now painted over (see arrow).
149	207-5	North elevation of Room 207, with window 216.
150	207-6	Window 216 on the north wall of Room 207.
152	208-1	Northeast corner of Room 208 with Door 2/208 leading to a closet. The northeast corner is boxed out, possibly concealing a post.

Page	Figure	Caption
153	208-2	Southeast corner of Room 208. Door 1/208 leads to Room 207. The boxed-out area to the right of Window 202 most likely conceals a frame post. This post aligns with the post located directly below in Room 105. The posts in the northeast and southeast corners may have been part of an earlier exterior frame wall.
153	208-3	Room 208, looking southwest with an angled corner finish, most likely enclosing a corner post.
154	208-4	Room 208, looking northwest with an angled corner finish, most likely enclosing a corner post. An area of heavily damaged floor boards is near the corner.
154	208-5	Room 208, detail of fireplace.
156	209-1	Room 209, knee wall along north wall. The wall stud members appear to have been added, as the original sill plate below has empty pockets that would have contained the original wall studs.
157	209-2	Room 209, looking north. The single existing 18th century structure corner post, since cut down in height, is visible in the center of the wall. The area left of the post is the northwest wing above Room 107 and the area right of the post is the 18th century block above Room 108.
157	209-3	Room 209, detail of cut-off 18th century structure corner post on north wall, as well as later roof plate, rafter, and knee wall framing.
158	209-4	Room 209, looking east. The attic space is above the original 18th century block. The partition wall in the right foreground with horizontal sheathing boards and wrought nails is possibly 18th century, however further investigation is needed to determine this. The frame partition wall in the background was added later and divides the original 18th century attic space.
159	209-5	Room 209, looking west at the possible 18th century frame wall, in center. The floor steps up at this point where the 18th century block meets the northwest wing.
161	210-1	Room 210, looking east. The attic space is above the work room and carriage house of the northeast wing.

September 26, 2007

Memorandum

To: Chief Engineering, Northeast Region Boston Office

From: Environmental Engineer, B. B. Diwadkar

Subject: Trip Report September 14, 2007, Minute Man National Historical Park, Concord, MA

Purpose: The purpose of the visit was to review structural conditions of the John Nelson House.

Discussion & Findings:

On September 14, 2007 I visited Minuteman National Historical Park and met with Management Analyst Dianna Shiba, Administrative Officer Mike McCarthy, Wood Crafter Don Morel, Acting Facility Manager Tom Nieves, and General Engineer Peter Woodbury of NERO Boston. Purpose of the visit was to perform visual structural inspection of John Nelson House located at 200 North Great Road, Lincoln, MA. Visual inspection was done jointly with Mr. Woodbury in the readily accessible areas.

OBSERVATIONS:

This is an early 19th century wooden frame farm house with load bearing wood frame walls, basement and two floors. Structure is supported on random rubble stone wall foundation. House has extensive damage from water and rotted wood. Structure has lost structural rigidity. Sometime in the past bathroom was added on the second floor on the rear side behind the stairs. In order to make room for drain pipes floor support beam was cut all the way without any modifications to the structural framing. Overstressing other end of the beam with excessive load at the connection. This partial floor load distribution has caused severe floor sagging. Stress cracks developed from deflection. In addition water leakage from drain lines and moisture built up caused rotting of the floor joist. Vulnerable warped, sagging, sloping and springing floors indicates serious structural problems. Structure does not maintain its integrity. There are also other deficiencies in other areas such as:

Water leak and deteriorated framing members problem.
Musty odor from decay, may be from Moss growing on floors and or decay of building materials.
There is a possibility of potential health risk in the structure from environmental hazards from Lead, Asbestos etc.
Differential foundation settlement has reflected damages on random rubble stone foundation wall. On the rear side foundation wall has openings allowing access to rodents, and water. In the basement random timber post added under floor beams, without any proper connection.

In the utility room 4inch thick brick wall was added under main support beam. However due to excessive load on the wall mortar deteriorated, flaking and spalling of bricks.

RECOMMENDATIONS:

1. Due to potential health risk in the structure. In depth environmental inspection by a certified environmental professional is necessary for testing, diagnosis of the followings for safety:

Lead in paint from damaged walls, paint peeling, and chipping.
Asbestos-bearing products, in ceiling panels, walls plaster boards, flooring tiles.
Indoor air quality hazards from toxic mold (fungi) and other allergens,

2. Add roof drainage. Continuous presence of ground water around wall foundation and water wicking up from the ground. Provide exterior perimeter drainage system and re-grade area around house so water flows away from the structure.

3. Park has to come to the conclusion for use of the structure such as residential or commercial or for class rooms. As floor live load vary with functional use.

4. Based on the use of the structure, A/E shall determine existing floor load capacity of each area based on wood species, grade, size and condition of the lumber used.

5. Determination of the species may require the expertise of a wood technologist.

6. A licensed lumber grader may be desired to officially classify the materials grades.

7. A professional Pathologist may be required to determine the extent of various types of deterioration from decay as decay causes significant reduction in strength.

8. Depending on the use of the structure concrete foundation walls, all other structural components and connections shall be designed to meet code requirements as well structural integrity.

9. Placing new concrete foundation walls for correcting the settlement.

10. Remove all rotted wood and replace with structural grade lumber.

CONCLUSION:

The structure is unsafe for any type of use and poses threat to safety, since structural elements are not structurally sound, moreover weakness in structural load distribution. Severe deteriorations from rot and wood decay in structural members. Extensive repairs are required based on investigation requested in recommendations.

TW

ESTIMATED COST:

Building use for any type of occupancy, following technical reports are needed for consideration of total cost of repairs:

A. Park has to define the use. (residential or commercial or school)

B. Park shall have to engage following A/E services:

1. Wood Technologist for determination of the wood species.

2. Licensed lumber grader to officially classify the materials grades.

3. Professional Pathologist to determine the extent of various types of deterioration from decay in floor joists, Beams, post and other areas.

4. Engineering services to determine actual floor load capacity, based on wood species, grade, size and condition of the lumber. Depending on the use of the structure, necessary modifications necessary.

5. Geotechnical engineering services for:
   a. Report on soil properties, soil bearing capacity based on soil boring logs.
   b. Under pinning method for correcting differential foundation settlement or constructing additional footing on inner side of rubble stone foundation wall.

6. Land surveyors topography map for designing French Drain around house to collect run-off and divert it away from structure.

After hearing from you, we shall write the scope of work for individual service.

Cost for the above services shall be in the range of $ 50,000.00 to $ 100,000.00

Approved for distribution

Frederick W. Bentley, P.E. Peter Woodbury B. B. Diwadkar, P. E.

CC: Superintendent, MIMA
Mike McCarthy Administrative Officer, MIMA
Tom Nieves Acting Facility Manager, MIMA
Diana Shiba Management Analyst, MIMA
Don Morel Wood Crafter, MIMA
Terrie Wallace Museum Curator, MIMA

SOIL TEST PIT DATA

Perc. Test — Observed Groundwater

Date: Aug. 27, 2002

TP	1		2
EL.	99.3		99.8
GW.	95.0		95.6

TP 1: 10" Ap Topsoil; 20" Bw 10YR4/3 gravelly loam; C1 5Y4/6 5% gravel compact in place; 50" C2 2.5Y5/6 med. sand 15% gravel; Mottles: 10YR4/8 @ 42"; 138 Bottom Not Refusal

TP 2: Ap Topsoil; Bw 10YR4/6 sandy loam few boulders; C 5Y7/6 sandy loam, firm in place 15% gravel; Color changes to 5Y5/6 @ 60"; Mottles: faint 2.5Y5/1 @ 50" 10YR5/8; Bottom 114 Not Refusal

Class I / II — II

Tests P. Saulnier — P. Saulnier

Witness S. Sosnicki

SCS Class II

PERCOLATION TEST DATA

Hole	P-1	P-2
Depth (in.)	12-84	32-50
Time @ 12"	10:54	10:52
11"		
10"		
9"	11:11	11:08
8"		
7"		
6"	11:34	11:39
Time (9-6")	23	31
Rate (Min/")	8	10

General Notes:

This plan is for the construction of the sewage disposal facility ONLY.

All pipes shall be SCH 40 PVC or equivalent, unless otherwise noted.

Contractor shall call for inspections and approvals from the Board of Health and the engineer after:
- a.) excavation
- b.) installation of system components
- c.) backfilling and final grading

Engineer shall certify installation and final grades on "As-built" plan. Contractor shall certify that installation conforms to approved As-built plan.

Prior to final backfill inspection, the contractor shall submit to B.O.H. a sketch with dimensions to system components from building corners and depth to access covers.

Contractor shall keep vehicles and materials off of the S.A.S. at all times.

No industrial wastes or categories are applicable.

Fill shall not be placed during rain or snow.

Excavation to be dry and scarified. Dewatering is required if fill is to be placed below groundwater.

No existing or proposed wells are within 200' of S.A.S., except as shown.

There are no known public wells or surface water supplies within 400 feet; private wells within 200 feet; bordering vegetated wetlands or inland banks within 150 feet; no surface or subsurface drains of any kind, and no foundation drains. The work area is outside the regulatory floodway and the 100 year floodplain.

Construction Notes:

Within limit of excavation, remove all topsoil, subsoil and other impervious material.

All construction materials and methods shall conform to D.E.P., Title 5 and local Board of Health Regulations.

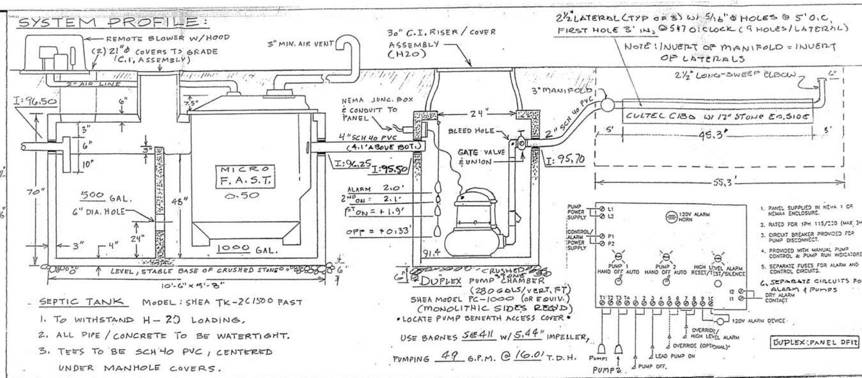
Contractor shall be responsible for locating any and all underground utilities within the limits of construction. This includes securing and paying for the services of the local utility and private companies to mark all underground utilities on the property. The engineer does not guarantee that ALL utilities and subsurface structures are shown.

Cesspool to be abandoned by pumping dry and filling with sand.

Sand shall be stockpiled at edge and pushed/cast inward over excavated area.

Contractor shall install and maintain flagging around the system until the Certificate of Compliance is issued.

SYSTEM PROFILE:



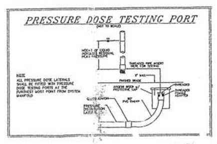
Septic tank — Model: Shea TK-2C1500 FAST
1. To withstand H-20 loading.
2. All pipe / concrete to be watertight.
3. Tees to be SCH 40 PVC, centered under manhole covers.

Buoyancy Check

Septic Tank:
- Wgt. of Tank + Soil = 14,500 lbs + (10.5×5.8)(0.5)(100) = 17,545 lbs
- Wgt. of Water Displaced = (10.5×5.8)(2)(62.4) = 7,600 lbs ✓

Pump Chamber:
- Wgt. of Tank + Soil = 14,500 lbs × (9.5)(5.7)(1)(100) = 20,215 lbs
- Wgt. of Water Displaced = (9.5×5.7)(2.5)(62.4) = 3,447 lbs ✓

PRESSURE DOSE TESTING PORT



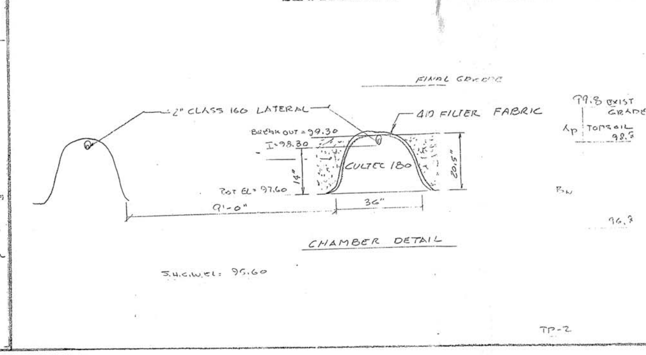
Specifications For MicroFAST 0.5 Wastewater Treatment System

Date 7-11-00 — BIO-MICROBICS — MicroFAST 0.5 Specifications

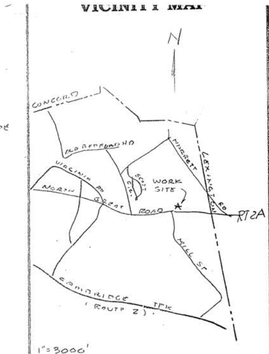
Fill material shall be comprised of clean granular sand, free from organic matter and deleterious substances. Mixtures and layers of different classes of soils shall not be used. The fill shall not contain ant material larger than two inches. A sieve analysis, using a #4 sieve, shall be performed on a representative sample of the fill delivered to the site. Up to 45% by weight of the fill sample may be retained on the #4 sieve. Sieve analyses also shall be performed on the fraction of the fill sample passing the #4 sieve, such analysis must demonstrate that the material meets each of the following specifications:

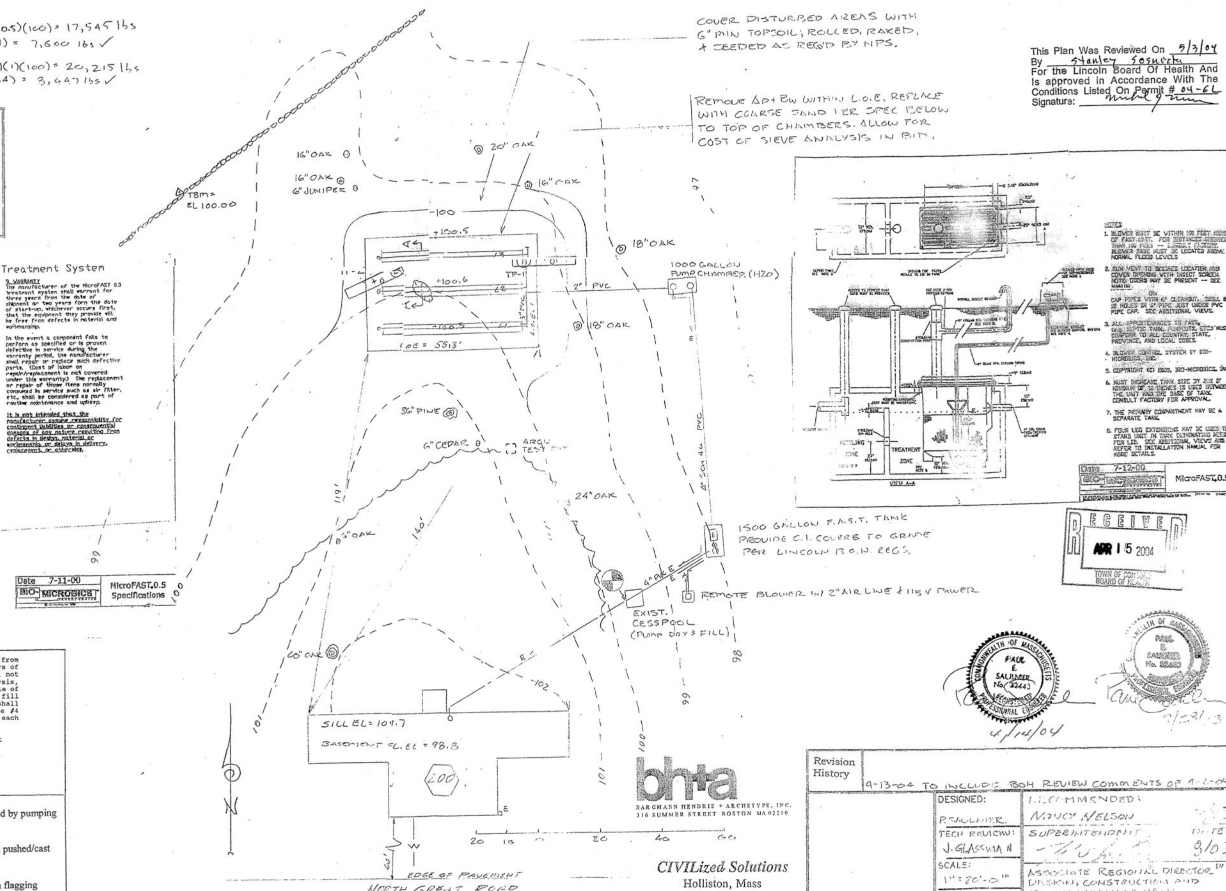
sieve size	effective particle size	% that must pass sieve
# 4	4.75 mm	100%
# 50	0.30 mm	10% - 100%
# 100	0.15 mm	0% - 20%
# 200	0.075mm	0% - 5%

SECTION A-A



VICINITY MAP





This Plan Was Reviewed On 9/3/04 By Stanley Sosnicki For the Lincoln Board Of Health And Is approved in Accordance With The Conditions Listed On Permit # 04-6L Signature:

RECEIVED APR 15 2004 TOWN OF LINCOLN BOARD OF HEALTH

Commonwealth of Massachusetts — Paul E. Saulnier — No. 32442 — Registered Professional Engineer — 4/14/04

Paul E. Saulnier No. 2840 — Registered Sanitarian — 9/21/03

LEGEND

- New Meets Existing (N.M.E.)
- L.O.E. — Limit of Excavation
- N.I.C. — Not In Contract
- Test Pit
- Perc Hole
- Section A-A
- ---100--- Existing Contour Elevation
- —100— Proposed Contour Elevation
- Groundwater
- S.H.GW — Seasonal High Groundwater

DESIGN CRITERIA

DESIGN FLOW: 9-Room, SF Residence

4 Bedrooms @ 165 GPD/Br = 660 GPD

SEPTIC TANK:
- Required 2 x 660 = 1320 Gal
- Provided: 2 ... 1500 Gal

LEACHING FACILITY:
- Design Perc Rate 10 Min./Inch
- Soil Class II
- Loading Rate 0.56 Gal/Day/SF
- Assume: Cultec 180 chambers @ 8.9 SF/LF
- REQUIRED: 660 GPD / 0.56 GPD/SF = 1179 SF; 1179 SF / 8.9 SF/LF = 132 LF
- PROVIDED: 3 rows of 45.3' each
- 3 × 45.3 × 8.9 = 1209.5 SF ✓

SCHEDULE OF INVERT ELEVATIONS:

4" @ Building	Thru slab
4" @ Septic Tank (IN)	96.50
4" @ Septic Tank (OUT)	96.25
4" @ Pump Chamber (IN)	95.50
2" @ Pump Chamber (OUT)	95.70
2" @ Distribution Box (IN)	N/A
4" @ Distribution Box (OUT)	N/A
" @ Leaching Pipe	98.80
Elev. at Bottom of Chambers	97.60
Elev. at Bottom of Excavation	20"-36" B.G.

Observed Groundwater Elev.	95.0 - 95.6
High Groundwater Elev.	95.6
Determination Method	Soil Morphology
B.O.H. Correction Factor	N/A

Revision History	
	9-13-04 To include BOH review comments of 9-1-04

bh+a — Bargmann Hendrie + Archetype, Inc. 316 Summer Street Boston MA 02210

CIVILized Solutions — Holliston, Mass — (508) 429 - 7192

DESIGNED:	RECOMMENDED:	
P. Saulnier	Nancy Nelson, Superintendent	3/03
TECH REVIEW:		
J. Glasscha N		
SCALE: 1"=20'-0"	Associate Regional Director, Design, Construction and Facility Management	
DATE: July 13, 2003		

SEPTIC SYSTEM REPLACEMENT

NELSON HOUSE

200 N. GREAT Rd, LINCOLN, MASS

OWNER(S):	ASSESSOR'S:
National Park Service, Minute Man NHP, 174 Liberty Street, Concord, MA 01742	Map 9
	Block 6
	Lot 0

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration. [D-106]