



Spencer, Sullivan & Vogt
ARCHITECTURE • PRESERVATION

Conditions Assessment & Feasibility Study for the
LANSING MILLIS MEMORIAL BUILDING

64 EXCHANGE STREET, MILLIS, MASSACHUSETTS • 1 FEBRUARY 2021

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Acknowledgements	3
Executive Summary	5
Methodology	9
Elevation Photos	11
Measured Drawings (Plans)	13
Measured Drawings (Elevations)	19
 PART 1: HISTORY AND SIGNIFICANCE	
History and Significance	27
Character Defining Features	31
Preservation Guidelines	37
 PART 2: CONCEPTUAL DESIGN	
Overview	41
Landscape Design Option	43
Design Options	47
 PART 3: EXISTING CONDITIONS & TREATMENT RECOMMENDATIONS	
Overview	59
Conditions Assessment	60
Hazardous Materials	71
Structural Assessment	73
Mechanical, Electrical, Plumbing & Fire Protection Assessment	87
Regulatory Analysis	93
 PART 4: SCOPE & COST ESTIMATES	
Overview	101
Restoration Scope Drawings	103
Outline Specifications	111
Cost Estimates	115
 PART 5: MANAGEMENT PLAN	
Management Plan	119



THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGEMENTS

Prepared for:

**Permanent Building Committee**

Town of Millis
900 Main Street
Millis, MA 02054

Prepared by:

Spencer, Sullivan & Vogt

1 Thompson Square, Suite 504
Boston, MA 02129
(617) 227-2765
www.ssvarchitects.com

Lynne Spencer	Principal, Historic Preservation
Douglas L. Manley	Senior Associate, Architecture
Joseph M. Metrano	Architectural Designer, Report Coordinator
Matthew Wolfson	Architectural Designer

Greg Nowak, PE, *Structural Engineer*
Structures North Consulting Engineers
60 Washington St. #401
Salem, MA 01970
(978) 745-6817

Jeff White, PE, *HVAC Engineer*
Northeast Engineering & Commissioning
20 Meadowbrook Rd.
Westwood, MA 02090
(978) 857-0305



With special thanks to the following for their invaluable assistance in preparing this report:

Wayne Klocko, *Chairman*
Millis Permanent Building Committee

Charles Vecchi, *Associate*
Millis Historical Commission

And all other members of the Millis Permanent Building Committee:

Kimberly Borst, *Department Assistant*
Diane Jurmain
Craig Schultze
Patrick Sheehan
John Larkin
James J. McCaffrey

EXECUTIVE SUMMARY

It has been a privilege to prepare this conditions assessment and feasibility study for the Town of Millis. Among the town's most notable historic landmarks, the Lansing Millis Memorial Building is a critical resource that is treasured by locals and visitors alike — not to mention its *particular* appreciation by local railroad aficionados, some of whom have shared information online that has proven incredibly useful in our preparation of the 'History & Significance' portion of this report. We also appreciate the Town's willingness — and in fact, enthusiasm — to revitalize this building, especially given its current state of disrepair. We see, just as the members of the Permanent Building Committee do, that there is far more to the Lansing Millis Memorial Building than its warped shingles and broken gutters (and the squirrels and raccoons living in its walls might agree!). Here is a structure designed and built to house *three* distinct functions and did so, quite successfully, for many decades. Beyond that, the stories of Millis's earliest citizens and storied founder are built into its walls. To revitalize this valuable resource is to revitalize its legacy, bringing it back into the forefront of Millis's rich cultural landscape and ensuring its protection for decades to come.

Faced with the challenge of rehabilitating this 134 year-old structure, the Town of Millis, acting through the Permanent Building Committee, commissioned this conditions assessment and master plan to kickstart a campaign of long overdue building improvements. The stated goals of the study, as listed in the Request for Qualifications, were as follows:

- Prepare measured drawings (plans and elevations) of the building's existing conditions (*p. 13-25*;
- Identify and document significant architectural features at the interior and exterior (*p. 31-38*) and assess their conditions (*p. 58-69*);
- Identify the potential locations of any hazardous materials in the building, especially asbestos and lead (*p. 71-72*);
- Evaluate the existing building systems (including HVAC, electrical, plumbing, and fire protection) and structure, providing recommendations for improvements required to bring them up to code compliance (*p. 73-85 and 87-91*);
- Prepare preliminary regulatory analyses, identifying relevant requirements for bringing the building into full compliance with Town of Millis zoning bylaws and Commonwealth of Massachusetts building codes (*p. 93-99*);
- Prepare alternative use plans for the rehabilitated structure, including assessments of the relevant code considerations and solutions for accessibility (*p. 43-57*);
- Prepare a cost estimate for the necessary restoration scope as well as one for each reuse option (*p. 115-117*); and
- Compile all work of the study into a final report with recommendations for next steps.

The study independently addressed each of the above goals, and the resulting findings, recommendations, and designs have been compiled herein. The section of

this executive summary titled “The Report” gives a more detailed summary of the way in which this document is organized.

A significant portion of this report is devoted to identifying the building’s current deficiencies, many of which relate to its age and recent neglect. Many of these preservation concerns are shared by other historic buildings similar in age and construction to the Lansing Millis Memorial Building. Of particular concern are deficiencies at the building envelope: failing and otherwise missing gutters and flashings, damaged shingles and siding, and openings improperly protected from infiltration by pests. The provided recommendations are prioritized according to urgency and cost.

Though no official historical designations (*National and Mass. Registers of Historic Places*, local historic districts, preservation restrictions, etc.) exist for the building, careful attention has been given to its historical integrity, given its importance to the community (and charming design). Several recommended treatments are primarily intended to restore the building’s historical integrity, a goal that is more pressing at the exterior by virtue of its visibility.

A cost has been estimated for each of the recommended treatments, all of which are included in the first cost estimate provided in *Part Four*. The scope has also been phased according to priority which provides the Town with an opportunity to ease the burden of a serious up-front expense and instead carry out succeeding projects as funds become available. We have projected a budget of **\$493,577** for the first phase (roof replacement) and \$1,022,081 for the third (all other scope items), adding up to a **total restoration budget of \$1,515,658**.

We have engaged two consultants for the assessment of the Lansing Millis Memorial Building, each addressing separate goals. Consultant reports assessing the building’s structural condition and mechanical systems have been included alongside our conditions assessment in *Part Three* of this report. Included before each consultant report is a summary of the findings and treatment recommendations detailed therein. Options have been provided for implementing new heating, cooling, and fire protection systems within the building, the projected costs of which have been included in the cost estimates. The role of each consultant is explained in the ‘Methodology’ narrative directly following this executive summary on p. 9. During this phase of the assessment, we also performed a regulatory analysis of the building to identify any local and/or state restrictions (zoning, building, historical etc.) that would require attention in moving forward with any improvements or renovations; of particular concern at this property are municipal zoning bylaws.

The restoration measures outlined in *Part Three* comprise a crucial first step (or steps) in any planned reuse of the building. It follows that all the proposed reuse schemes are hinged on the Town’s ability to support the proper comprehensive rehabilitation of the building envelope. A significant portion of this report does respond to the Town’s stated goal of renovating the building for reuse. Five options were developed, ranging from commercial to residential uses. A commitment to creative stewardship on the part of the Town has allowed for the exploration of various models, which have been outlined in detail in the ‘Management Plan’ narrative in *Part Five* of this report.

Further, much attention was given to the development of a conceptual landscape plan that would effectively serve most of the proposed reuse schemes (with the exception of the private residence option, which was vetoed during a virtual meeting). A table comparing projected costs for each of the five reuse schemes (excluding the restoration scope items identified in Part Two) has also been prepared and is the final item included in *Part Four* of this report. The projected budgets for each reuse scheme are as follows: **\$729,731** for Option 2 and **\$830,167** for Option 4.

Discussion with the Permanent Building Committee has informed the development of two finalized conceptual schemes, which are detailed in the outline specifications included in Part Three. In effect, the preferred schemes were those that were most readily permitted by town zoning bylaws: full commercial use and a live/work space, both of which would involve maintaining municipal ownership of the building and leasing it to a tenant. The result of careful attention to detail, the modifications necessitated by these schemes minimally disrupt the building exterior and will allow for retainment of all interior and exterior character-defining features identified in Part One. The historic character of the building will not only be maintained, but revitalized. As explained in various places throughout this report, historical photographs have been compiled (and are included in *Part One*), which will in turn provide models for the replacement of non-original, missing, and otherwise deficient features.

The Report

Part One of the report, ‘History & Significance,’ begins with a brief history of the building. This is followed by a list of character defining features, the physical elements that define the building’s architectural significance that should be retained in any restoration scheme. The ‘Preservation Guidelines’ section describes how alterations to the building should be approached to retain and celebrate its architectural significance.

Part Two, ‘Conceptual Design,’ begins with an exploration of possible models for the building’s stewardship upon its rehabilitation and renovation. This narrative is followed by a landscape design option intended to improve circulation and increase parking at the site as well as five distinct schemes for reuse of the building. Each drawing is annotated to explain the benefits and drawbacks of the scheme.

Part Two, ‘Existing Conditions & Treatment Recommendations,’ includes an examination of current conditions at the building – both exterior and interior, from the roof to framing to the foundation – and recommendations for the repair of deficiencies. Structural and mechanical assessments, as well as a building code (or ‘regulatory’) analysis, are provided for the existing structure.

Part Four, ‘Scope and Cost Estimates,’ includes elevations identifying restoration scope items followed by a specification comprehensively outlining the restoration scope. Two cost estimates are included at the end of the report, the first for the building’s restoration and the second for its reuse. Estimates for all scope items are informed by the cost of similar work that we have carried out as part of recent projects.

Part Five, ‘Management Plan,’ is a brief narrative discussing four options for stewardship of the building, including management by the Town, a public-private partnership, outright lease, and outright sale.



METHODOLOGY

This Conditions Assessment and Feasibility Study reflects a collaborative effort between Spencer, Sullivan & Vogt and the Town of Millis, who owns and manages the Lansing Millis Memorial Building at 64 Exchange Street. The Town was represented by Wayne Klocko, chairman of the Permanent Building Committee, who was the design team's primary point of contact in preparing this report. Mr. Klocko provided important guidance, helping SSV understand and appreciate the history of this building and the challenges it presents.

The project team was assembled and coordinated by Lynne Spencer, partner and preservationist at SSV. Lynne directed on-site investigations with the assistance of architectural designers Joe Metrano and Matt Wolfson. Using field measurements taken during visits to the site on April 1st, June 8th, and August 3rd, Joe and Matt prepared existing conditions drawings in AutoCAD. These drawings, included on pages 13-25 of this report, served as the basis for later conceptual design work. Informed by detailed discussions with Lynne and Joe about the scope of the project, history of the building, and aims of the Town, preservation architect Doug Manley prepared conceptual sketches in which five distinct uses for the building were proposed. These were submitted to Mr. Klocko for review by the Permanent Building Committee and other relevant stakeholders and have been included in *Part Two* of this report. These options were discussed in detail at a virtual (Zoom) meeting on August 26th, during which the Committee selected two preferred uses for the building: **business** and **live/work**.

On September 15th, Joe Metrano joined structural engineer Greg Nowack of *Structures North* and mechanical engineer Jeff White of *Northeast Engineering* at the site to assess the building's structure and HVAC system(s), respectively. Both consultants also provided recommendations for renovating the building according to each of the two proposed uses and their reports have been included in *Part Three* of this report.

Lynne, Doug, and Joe subsequently worked together to finalize a phased restoration scope, for which Joe prepared the drawings and Doug prepared the outline specifications. The group subsequently developed a cost estimate for each phase of the restoration scope as well as a matrix comparing the projected cost of the two selected reuse schemes. Scope drawings, outline specifications, and cost estimates are all included in *Part Four* of this report.

Joe also led research into the building's history, synthesizing findings into *Part One* of this report: 'History and Significance.' These historical findings partially informed recommendations provided for the proper treatment of the building, which have been included as part of the conditions assessment comprising *Part Three*. All recommended treatments and proposed renovations included in this report are closely guided by the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.



THIS PAGE INTENTIONALLY LEFT BLANK

ELEVATION PHOTOS



EAST



NORTH

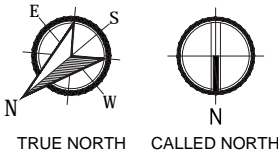
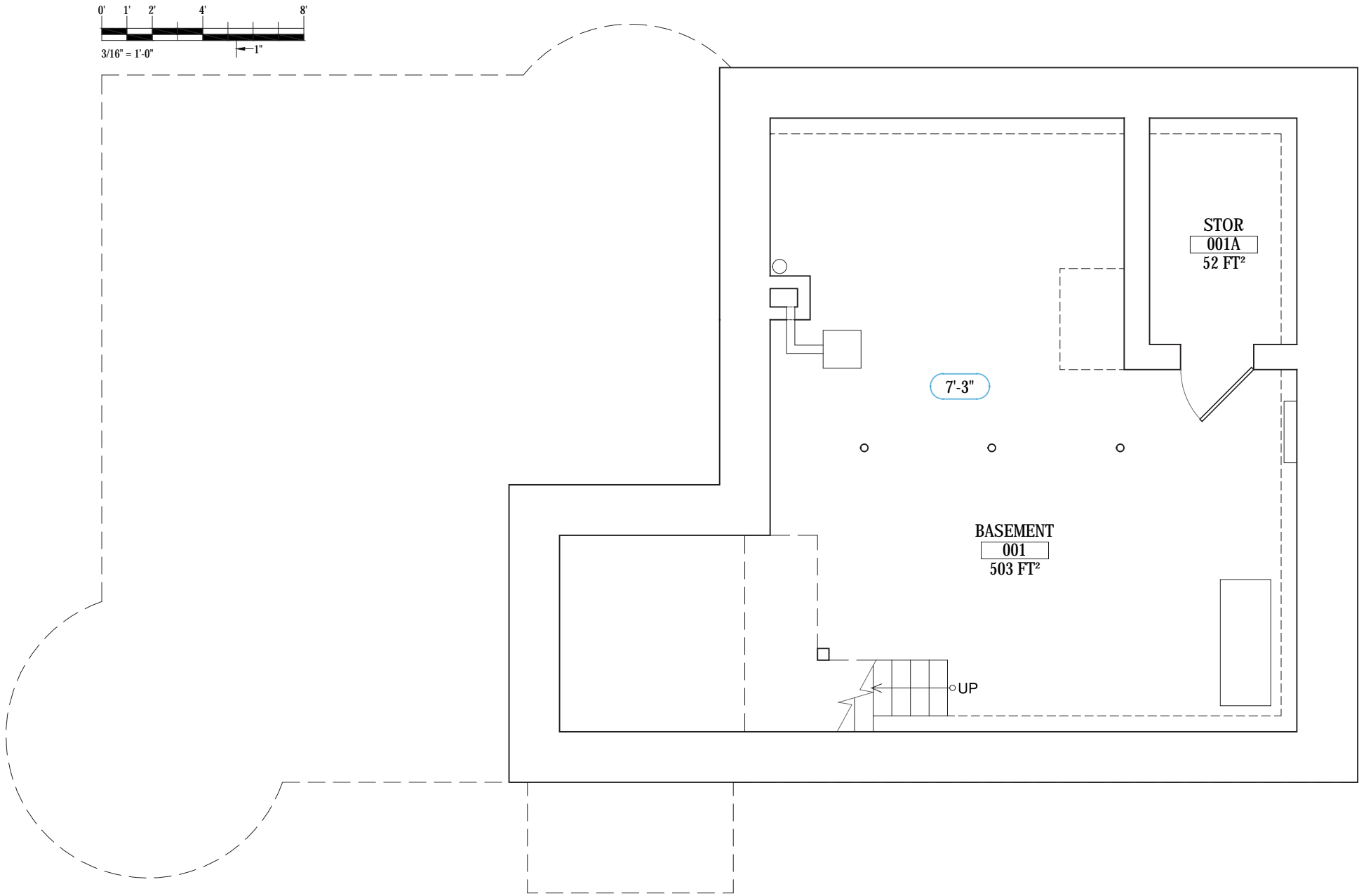
WEST



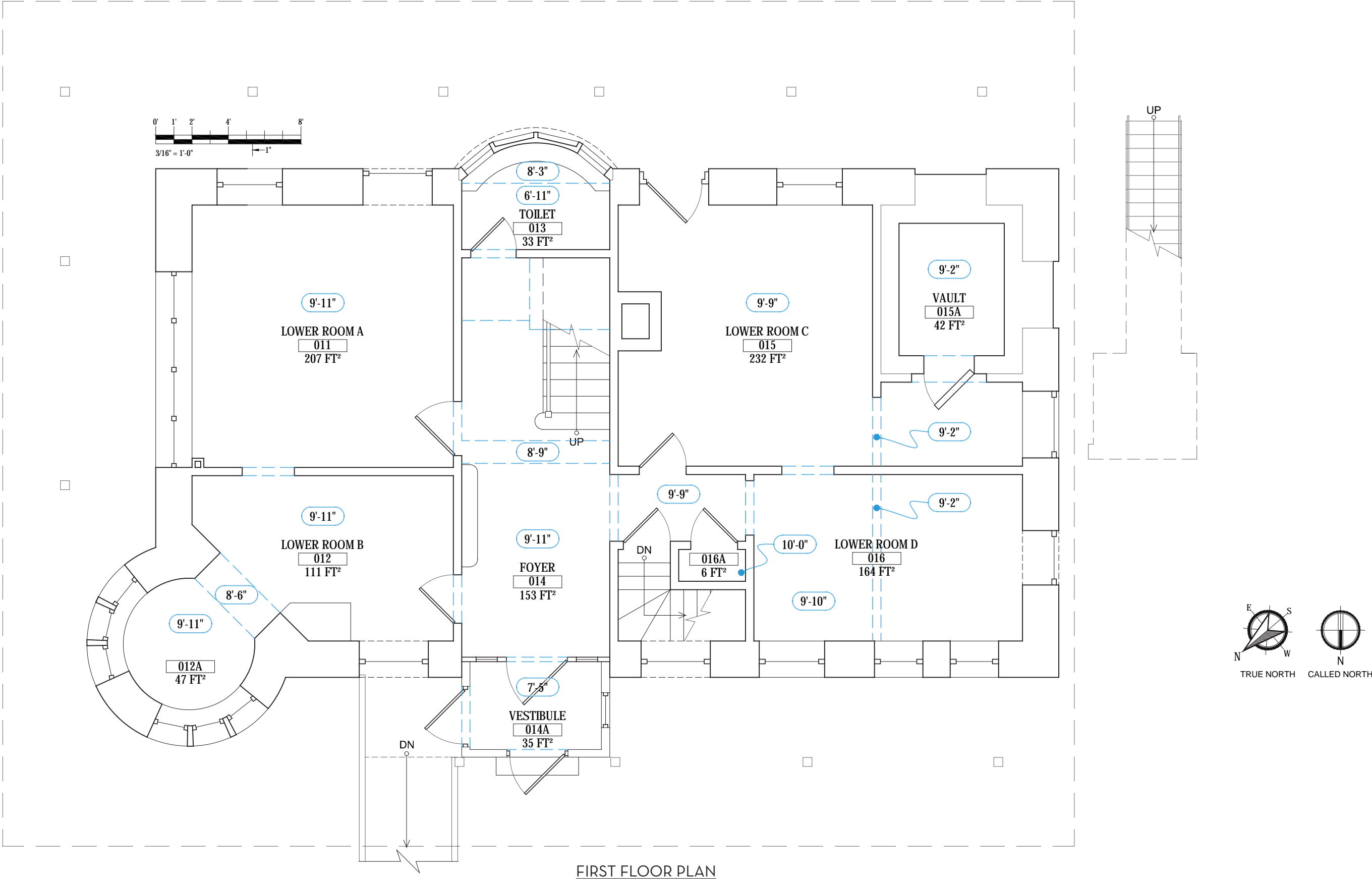
SOUTH

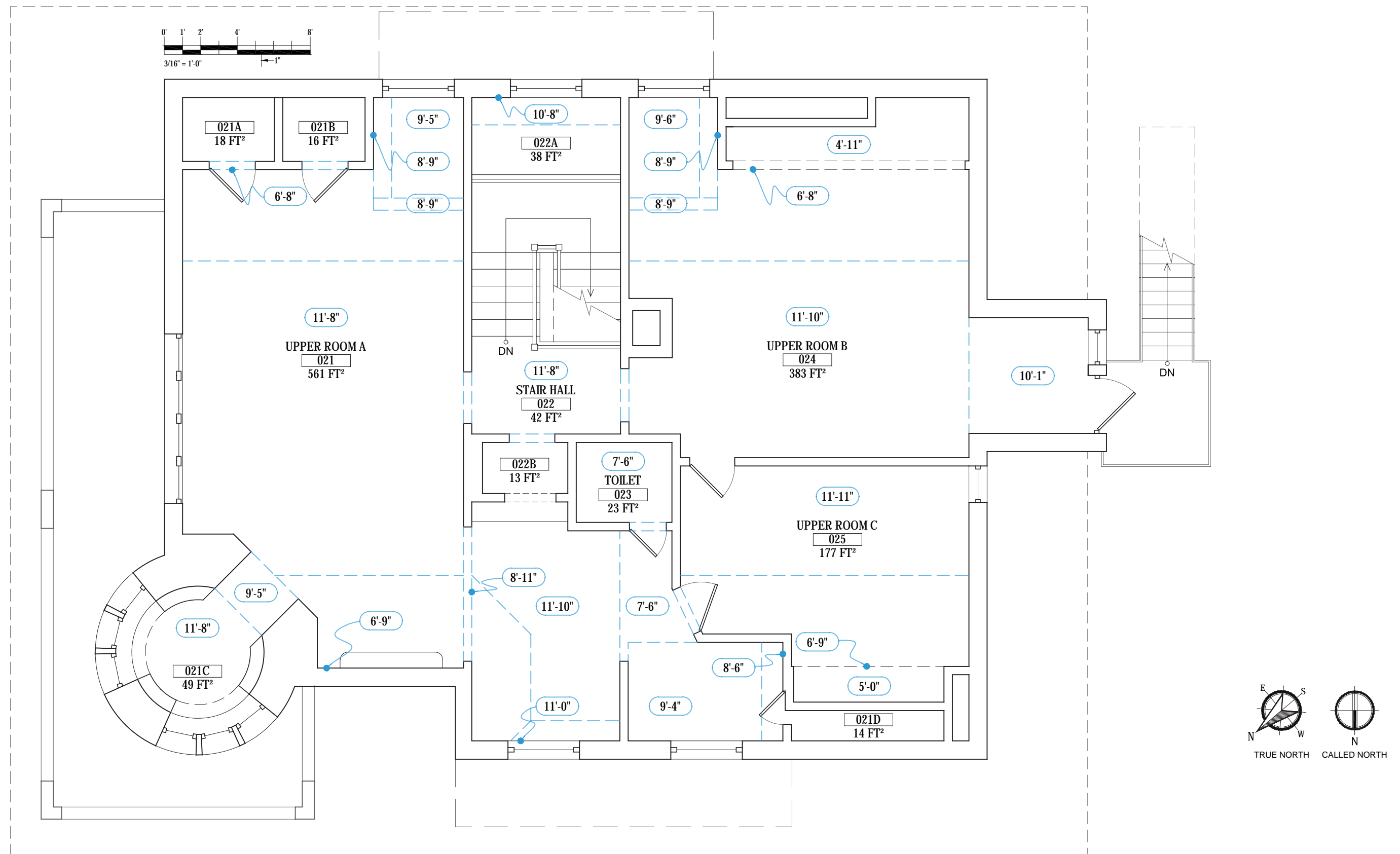


MEASURED DRAWINGS (PLANS)



BASEMENT PLAN





SECOND FLOOR PLAN

MEASURED DRAWINGS (ELEVATIONS)



EAST ELEVATION



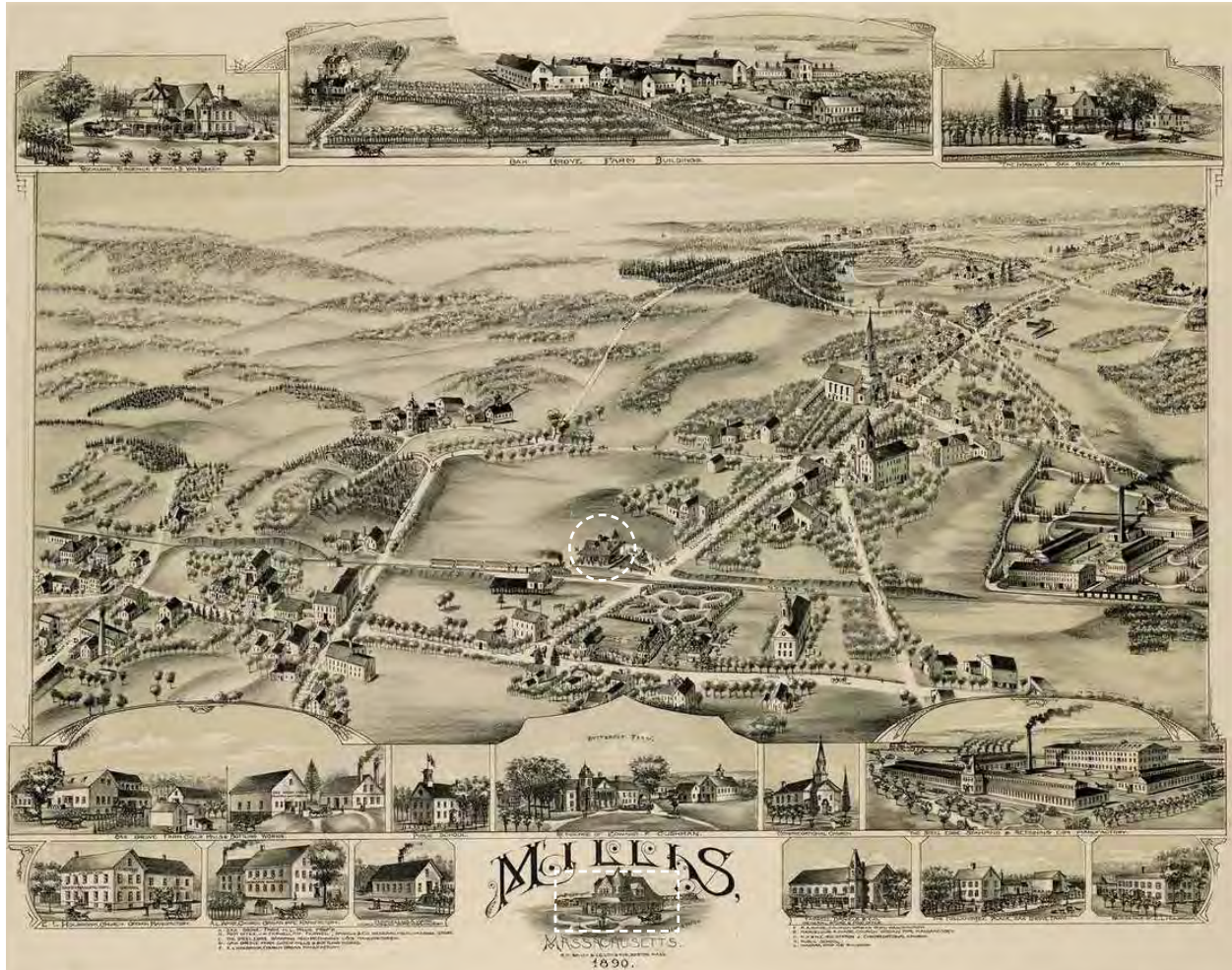
NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION



A map of Millis, Massachusetts, published in 1890 by *O.H. Bailey & Company*, who prepared similar maps for many communities across the American Northeast and Midwest. Note the central location of both depictions of the Lansing Millis Memorial Building.

PART 1: HISTORY & SIGNIFICANCE

It was common practice in the late nineteenth century for municipal governments across the Northeast to commission maps of their respective towns or cities. Intended perhaps more as decoration than practical guides, copies of these stylized maps – rendered in a perspective view, with close attention to architectural and geographical detail – can still be seen gracing the walls of town halls and banks across Massachusetts. The map of Millis was published by *O.H. Bailey & Co.* in 1890, only five years after its incorporation as an independent town. Here, Millis appears somewhat sparse, with a few tall steeples and smokestacks penetrating long stretches of empty farmland. As today, two major roads converge on the town center. What is more striking though, is the presence of the railroad, shown – as was typical in maps by *O.H. Bailey & Co.* – with an engine actively pulling passenger cars into the station. The artists here make no mistake in communicating the importance of the train: here, north does not face the top of the page, as would be expected. Instead, the map is turned about 30°, so as to show the railroad cutting across the middle of the page and the railroad station at the very center of the composition (at the expense, it should be noted, of any building at the southwestern portion of the town). What is more: among the sixteen properties featured in the margins, a depiction of the train station has the unique distinction of accompanying the town's name, situated prominently between the words 'Millis' and 'Massachusetts' at the bottom edge of the page.

Commercial prints aside, the Lansing Millis Memorial Building has a long and distinguished history in the Town of Millis, having served many purposes throughout its 134-year lifespan. As its name suggests, the station was built in memory of Lansing Millis – widely considered the town's founding father – during the year following his death. A self-made business executive, Mr. Millis spent much of his career climbing ranks in the railroad industry, beginning with a position as the Boston soliciting agent for the *Michigan Southern and Northern Indiana Railroads* and (in typical Gilded age fashion) ultimately resulting in distinct offices at four companies, including presidency at the *National Dispatch Line*, *Chicago, Boston & Liverpool Refrigerator Company*, and the *Ogdensburg & Lake Champlain Railroad*.

Having lived in Boston for almost four decades during a time in which pollution and filth were the norm in cities, Mr. Millis's health began to suffer. At a doctor's advice to get more outdoor exercise, he purchased a farm in East Medway, which he would greatly expand in the following years through extensive land acquisition. His presence in the town – and, more specifically, his philanthropy thereto – ultimately encouraged the people of the village to separate from Medway and incorporate an independent town, which they named in his honor. Among the last public events that Mr. Millis attended before his death in April 1885 was the celebration of the town's founding.



A portrait of Lansing Millis, courtesy of Millis Historical Society



A lithograph showing Oak Grove Farm, the East Medway estate to which Mr. Millis moved before founding Millis

The incorporation of Millis alone did not allow for its independent success. Though several churches and businesses had been established here during its time as East Medway, the town was still without three key institutions: a town hall, a public library, and a railroad station. For a community of its size, the solution was simple: build one structure housing all three. Continuing the family's legacy of philanthropy in the community that now bore their name, Charles Millis, son of Lansing, requested permission to privately fund construction of the new building at a special town meeting in October of 1885. Cleverly designed to incorporate elements of the Queen Anne, Shingle, and Romanesque Revival styles (all of which were exceedingly fashionable at the time), the building would be situated at a vacant site along the Woonsocket Division of the *New York & New England Railroad*, which ran between Medway and Woonsocket. Perhaps in a nod to his integral role in establishing the *New York & New England Railroad*, the building would be named for Lansing Millis.

Construction of the Lansing Millis Memorial Building received unanimous approval at town meeting and began shortly thereafter. The town's citizens were asked to contribute any unusual stones that they could gather for construction of the outer walls and many other were donated as memorials by business acquaintances of Mr. Millis (each of which was then marked with the initials of the corporation that donated it). Rumor has it that, between donations from the townspeople and Mr. Millis's acquaintances, the building contains at least one stone from each state, of which there were 38 at the time. After only a few months of construction, the building opened its doors in 1886. On the first floor were railroad functions: a ticketing booth, waiting rooms, and offices; and on the second were town offices and a library that held the town's small collection of books. Whether to pay their taxes, check out a book, or travel to Boston, most citizens of Millis visited this place with relative frequency, solidifying its place as an administrative center – and by extension, cultural landmark – of the town.



The building in 1899. Courtesy of Millis Historical Society.



The interior of the building around the turn of the 20th century. Courtesy of the Town of Millis.



The building under lease by the New Haven Railroad, ca. 1960s. Courtesy of Millis Historical Society.

After the turn of the 20th century, the Lansing Millis Memorial Building's central role in the administration and commerce of the town declined along with the importance of local rail service. The flexibility offered by automobile travel was an appealing prospect for many, and investors shifted their attention from the construction of rail lines to the construction of roads. Having outgrown the limited space offered by the station, town offices and the library expanded into Millis High School (now known as the Veterans Memorial Building) in 1933. Notwithstanding, a small group of municipal employees continued to work at the Lansing Millis Building, sharing the space with the *New York, New Haven and Hartford Railroad*, which had been leasing the Woonsocket Division line since 1898. The line was used by the New Haven until 1967, at which point they discontinued passenger service, leaving the town as the sole occupant of the building for over three decades. In 1999, the municipal offices housed in the building were relocated

to the high school, effectively making that building the main ‘town hall’ and leaving the station as a historic relic. For the next twenty years, the building was leased for commercial uses and its most recent tenant – a Montessori school – relocated to a newer facility in 2018.

Despite its seeming decline in commercial importance, the Lansing Millis Memorial Building stands testament to Millis’s storied past: one in which the business know-how and philanthropy of a single man transformed a sparsely-populated corner of an agrarian town into a business hub, connected by rail to the region’s most important cities. Worn and weathered as it may be, the walls of this building quite literally hold the stories of those earliest citizens of Millis, to whom this railroad brought a new way of life and ushered in the modern era.



A postcard showing the Lansing Millis Memorial Building, or ‘R.R. Station, Millis, Mass.’ as it appeared sometime before 1912.

Bibliography

- Millis Historical Commission. “Lansing Millis Memorial Railroad Station.” Accessed November 16, 2020.
<http://www.millishistory.org/railroad-station.html>.
- Waskiewicz, Fred. “Millis Railroad History.” Accessed November 16, 2020.
<http://www.millishistory.org/railroad-station.html>.
- Millis Historical Commission. “Lansing Millis.” Accessed November 18, 2020.
<http://www.millishistory.org/lansing-millis.html>.
- “Millis, Massachusetts.” Boston: O.H. Bailey & Co., 1890. Digital Commonwealth.
<https://ark.digitalcommonwealth.org/ark:/50959/x633ff64j>.
- Millis Historical Commission. “Millis Historical Commission Master Plan 2014.” April 28, 2014.
http://www.millishistory.org/uploads/1/4/2/3/14238504/mhc_masterplan2014_a1.pdf.
- McLoughlin, Marianne and Joan A. Hernon. “Lansing Millis Memorial Building (MLS.72).”
Massachusetts Cultural Resource System. Submitted 1978/rev. 1988.



THIS PAGE INTENTIONALLY LEFT BLANK

CHARACTER DEFINING FEATURES

Every old building has a distinctive identity and character. Character-defining features are the significant, observable, and experiential aspects of a building that define its architectural power and personality. These are the features that should be retained in any restoration or rehabilitation scheme in order to protect the building's historic integrity and maintain its eligibility for preservation grant funding and rehabilitation tax credits.

Character defining elements include the overall shape of the building along with its materials, craftsmanship, decorative details, and interior spaces and features. In many cases the site and environment also play a key role in defining a historic building's character. These are critically important considerations in planning any modification to an old building, as inappropriate changes can undermine its historical and architectural significance, sometimes irreparably.

This survey of the Lansing Millis Memorial Building identifies the elements that contribute to the unique exterior character of the building. Bulleted items in this section should be considered important aspects of the building's historic nature, and any changes to them should be made only after careful consideration.

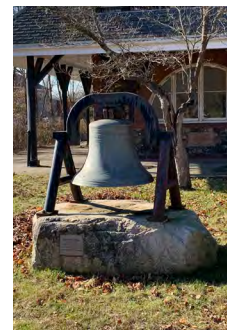
Exterior

Setting: *The topography, population density, and other influences that are noteworthy to the property.*

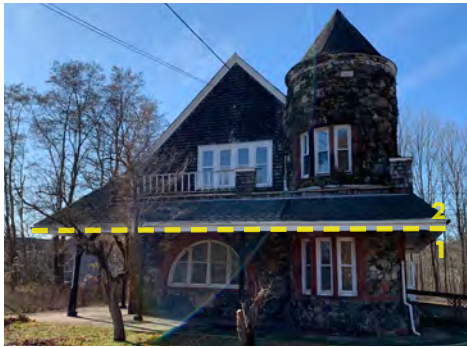
- Located on Exchange Street, just north of its intersection with Main Street, the Lansing Millis Memorial Building is situated on the fringes of Millis's downtown. It is one of several municipally-owned structures in this area, including the Public Library, Town Hall, and Police and Fire Departments. The building's proximity to this civic/commercial corridor is sensible, given its historic use as a train station.
- The building is situated at the center of a mostly level lot, directly adjacent at the south to overgrown train tracks running southwest to northeast. The lot is bordered to the east by Exchange Street, to the north by the grounds of St. Thomas the Apostle Catholic Church, and to the west by wooded wetlands. Much of it is paved for parking, with access from the east and north.
- The little green space on the site is occupied by monuments. A cobblestone well is situated at the center of the roundabout near Exchange Street and a Holbrook bell dating to the 1830s was installed near the building's southeast corner in the 1976.



Location



A well (left) and a historic bell (right) share the site



The building's roof line clearly delineates its two levels



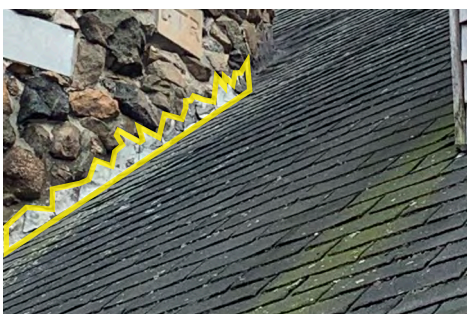
The east and west gable ends match the pitch of the hip roof



Balcony wrapping northeast corner of the building



Smaller overhang at west end, compared to other three sides



Lead flashings at intersection of roof and turret

Shape: The form of the building. The massing that gives the initial visual impression of the structure.

- Typical of the Romanesque Revival style in which it was designed, the building has a weighty massing with a clear exterior delineation between its two levels.
- A round masonry turret penetrates the roof at the building's northeast corner. The peak of its conical roof is only slightly higher than that of the primary roof.
- At the east and west elevations, the hip roof gives way to gables, which are recessed from the outer edge of the masonry walls below. First-floor masonry walls extend just above the soffits, whereas the second-floor walls are made of wood.
- A balcony wraps the southeast northeast corner of the building, from intersection of the east gable with the hip roof, around the turret to the intersection of the turret with the roof at the north side. Only the east side of the balcony is wide enough for walking.
- Roughly centered on the south elevation is a curved bay window protruding about three feet from the masonry wall. The lower quarter is masonry, providing a sill for the windows occupying the center half. The uppermost quarter, from the upper edge of the windows to the soffit, is wood construction.

Roof and Roof Features: Typically the most dominant element of a building. Often the element that most informs the shape of a building.

- Train stations from this period often integrated roofs with dramatic overhangs. Though integral to the structure's outward character, this was largely utilitarian, providing sheltered outdoor space for commuters and other travelers.
- Asphalt shingles cover all portions of the roof, including the dormers and turret roof. These shingles are not original to the building, having replaced earlier wood shingle roof covering.
- While the building's hip roof overhangs its masonry walls at all four sides, the overhang is far smaller at the west elevation, possibly because it was a back-of-house space and there is no practical need for shelter here. The roof is supported at the other three sides by wood columns.
- Large hipped dormers at the north and south walls extend beyond the edges of the masonry walls, signifying that the second floor overhangs the first along this axis.
- Lead flashings are visible where walls penetrate the roof, specifically at the dormers and turret.

Foundations: *Base of the building, openings for entries, and other features such as steps and ramps.*

- The building's foundation is made of red sandstone, matching decorative elements around masonry openings and at quoins. Sandstone at the foundation appears to be deteriorating significantly.
- At door openings, the foundation is flush with the floor, serving as a threshold between interior and exterior spaces.

Openings: *Windows and doors. These often reflect the hallmark features of specific architectural styles.*

- Unless otherwise noted, the following observations hold true: (1) all masonry openings are framed in red sandstone, matching the foundation discussed above, (2) all non-original windows are white vinyl, and (3) the casings of all windows and doors are painted (or fabricated in) white.
- The monumental half-round window at the east wall is wood and has three mullions, dividing it into four portions. Each of the four sash has a horizontal muntin, which are aligned to the center point of the middle mullion. Historic photos provide evidence that these four sash were originally subdivided into multiple (square) lites, a design feature typical at buildings of the Romanesque Revival and Shingle styles.
- At the east gable end (second floor) four narrow double-hung windows are framed within a single opening in the timber-framed wall.
- The original entrance to the building's north wall, though obscured from the exterior by a later, poorly designed vestibule, is situated within a large masonry opening. Here, the door is framed by two sidelights and a transom. The transom is horizontally divided into three portions, with the two mullions aligned to the door frame below.
- The main entrance is abutted on either side by matching full-height masonry openings. Six-over-one windows occupy the upper portion of each opening; the one to the left of the door is a vinyl replacement while the one to the right is wood with an aluminum storm panel, suggesting that it is original to the structure. Both windows are framed-in by wood walls painted deep red.
- The three vinyl windows at the rightmost portion of north wall of the first floor are all double hung, framed by sandstone. While the lintels of these openings are aligned, the sill of the larger, left-most window is lower. The smaller four-over-one windows to the right are matching.



Red sandstone foundations are spalling throughout



Monumental half-round window at east wall



Interior view of primary entrance with transom and sidelights



Right-most windows at north wall



Masonry openings at the west wall



Bay window at south wall, abutted by twin masonry openings



South dormer



Masonry openings at turret are vertically-aligned

- There are two squat double-hung replacement windows in the north dormer.
- There are three masonry openings at the west wall of the first floor, the left-most of which is full-height. Similar to the openings at either side of the main entrance, this opening has a vinyl double-hung window framed-in by wood construction, which is painted white.
- The central opening at west wall is occupied by a vinyl eight-over-one window, whereas the right-most opening is bricked in, a consequence of the vault introduced during the building's tenure as town offices.
- The south wall is organized similarly to the north wall, with a full-height masonry opening at either side of the bay window. The bay window is situated in a masonry opening through the upper three-quarters of the wall. It is likely that there were originally four windows here, but the middle two have since been blocked with plywood, leaving one double-hung window at either side.
- In the opening to the right of the bay window is a six-over-one double-hung window framed-in by a wood wall below (a replica of the full-height openings at the north wall, but painted white instead of red).
- In the opening to the left of the bay window is a wood door painted deep red, with a six-pane light, the frame and glazing bars of which are painted golden yellow.
- The left-most masonry opening on the south wall is full-height. Much like the window directly around the corner, it is bricked in to prevent access to the vault.
- Between the south wall's bricked opening and door is a masonry opening housing an eight-over-one double-hung window, the sill of which roughly aligns with that of the bay window. There is a copy of this window on the other side of the bay window, the right-most opening on this wall.
- There are three equally-spaced eight-over-one double-hung windows in the south dormer.
- There are four masonry openings at the turret, each pair vertically aligned and roughly parallel with the nearest wall. Each opening houses three narrow double-hung windows, with both upper sets being notably squatter than the lower ones.

Trim and Secondary Features: *Casings at windows and doors, moldings, cornices, watertables, and other additive features.*

- Where they still exist, fascia boards at the primary roof are fairly

simple, likely because gutters were mounted to them. Wood trim at the dormers, turret, and gable ends however, is slightly more intricate.

- All soffits are enclosed by tongue-and-groove ceiling boards. Intersections of the soffit with masonry walls are otherwise concealed by crown moldings, except at the turret, where they are scribed to the stone's jagged edge.
- The distances to Woonsocket and Boston ('W. 14.8 M.' and 'B. 22.7 M.') are carved into the sandstone sill at the south bay window. Directly below is a large sandstone block into which 'MILLIS' is carved. '1885,' the year of the station's construction, is carved into the sandstone lintel over the upper east window opening at the turret.

Materials: *The visible kit of parts that comprise the exterior envelope of buildings.*

- Fieldstone construction was often used during this time period for its picturesque qualities, particularly for buildings designed in the Romanesque Revival style. A notable quality sets this building apart: while the walls are primarily constructed with local fieldstones (many of which are granite), a wide variety of other stones have been integrated into the masonry. Some of these stones are quite eccentric, ranging from pre-cut and polished blocks bearing carved initials to pieces of a millstone. Most of these 'special' stones are concentrated near the eastern end of the building, particularly at the tower where they enjoy high visibility.
- As previously discussed, openings and quoins are accented with red sandstone, as is the building foundation.
- The roof is surfaced with asphalt shingles. Careful examination of historic photographs indicates that the roof was originally covered with wood shingles.
- Wood casings around windows and doors are generally painted white, along with most other exposed exterior wood elements, like balcony railings, fascias, etc. Wood columns supporting the roof overhangs are painted black. Paint analysis can indicate the original color scheme of these elements.
- The upper levels of the building, including the gable ends, dormers, balcony, and egress addition, are covered in unpainted wood shingles.



Soffits are carefully cut at turret, with moldings elsewhere



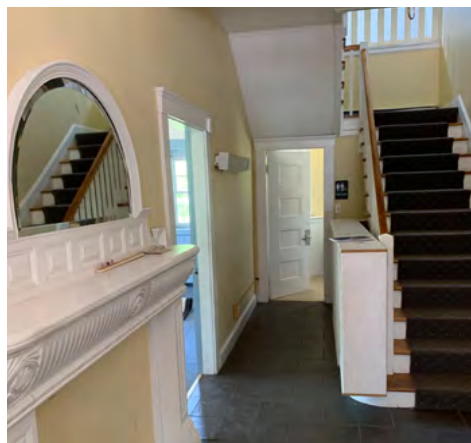
Inscriptions in sandstone at bay window sill



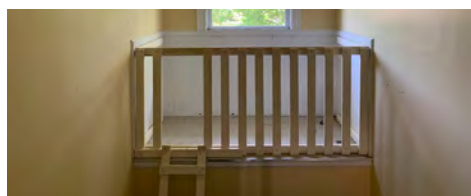
Close-up of inscribed tones embedded in fieldstone masonry



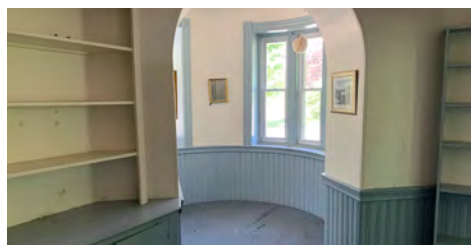
An inscribed millstone embedded in the masonry at the turret



The main foyer



The 'lookout platform' at the second floor



A photo of the turret at the first floor showing window casings, wainscoting, and a base cabinet



Intricately-carved mantelpieces at the first (left) and second (right) floors

Interior

Layout and Plan: The interior organization of the building. This often has the largest impact on the user's experience of a building.

- There is a non-original vestibule at the north elevation, to which there is an accessible ramp. The inner door, while itself not original is surrounded by a transom and two sidelites, which are not original to the building.
- Level with the second floor, but only accessible via a ladder on the stair landing, is a platform occupying the middle window bay of the south dormer. This detail should be retained as it likely served as a lookout for the station manager when the building functioned as a train station.

Furnishings and Millwork: Those remaining elements that were not necessarily designed for the building, but nonetheless accentuate its interior.

- No historic furniture remains. A historic photograph taken sometime around the turn of the 20th century suggests that this building used to enjoy a wealth of fine furniture, which complemented its highly fashionable design.
- Some historic millwork remains, including some of the door frames and window casings at both floors, as well as wainscoting throughout. Though all remaining wood trim has been crudely painted over, its preservation is important in restoring the historic character of the building.
- It is unclear whether the cabinet at the intersection of the turret and north wall is original, though evidence suggests that it is nonetheless historic. While it does not necessarily define the building's historic character in any great capacity, it could be salvaged if so desired. The same goes for the bookshelves at the turret on the second floor, which could be repurposed depending on the reuse scheme chosen by the Town.
- Two matching mantelpieces remain, which historic photos suggest are original. They are not situated adjacent to the existing or original chimneys (the latter ran through the center of the building via the current attic hatch), suggesting that they have been moved. These are among the most important historic features remaining and should be retained at all costs. Historic photos also suggest that interior woodwork had a clear finish.

PRESERVATION GUIDELINES

The consideration of repairs, maintenance, and interior space planning at the Lansing Millis Memorial Building should be guided by the significance of the building and site as framed by the National Register of Historic Places and the character-defining features identified in this report. *The Secretary of the Interior's Standards for the Treatment of Historic Properties* should be used to inform all work at the building. The Standards provide advice on the preservation and protection of cultural resources and recognize four treatments: Preservation, Rehabilitation, Restoration and Reconstruction. The first three are relevant to this project.

Preservation is defined “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 rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.”

Rehabilitation is defined “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.”

Restoration is defined “as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.”

General Application of the Standards

Additions

- Additions to a historic structure should be respectful and subordinate to the original building. Although the addition should possess similar mass, proportions and materials and can feature complementary stylistic details, it should not replicate the original building and should be readily distinguished as new construction.
- *No additions have been proposed as part of this rehabilitation. However, the existing additions (the vestibule, ramp, and fire escape) **do not** adhere to this guideline and as such their removal would not disrupt the building's historic character.*

Materials

- When repairs are required, original building materials should be replaced in kind – brick for brick, wood for wood, slate for slate. When traditional replacement materials are not available or are economically unfeasible, substitute materials that mimic the look, feel, and workability of original materials may be considered. Care should be taken when deciding on a synthetic material, and close attention should be given to matching its color, texture, cut, and durability with those of

the original(s). *As always, work is guided by the Secretary of the Interior's Standards for the Treatment of Historic Properties.*

- *Unfortunately, many of the original materials at the Lansing Millis Memorial building have been lost to time, and have since been improperly replaced. The historic elements that **do** remain vary in condition, some requiring replacement and others, restoration. In both cases, bid documents should require that all bidders be DCAMM certified in historic building. Specialists are often engaged for the restoration and/or replacement of historic windows, masonry, and roofing.*

Masonry

- Stone and brick elements should be replaced with matching material. Well-crafted cast stone can be strikingly similar to natural stone in appearance, texture, density, and workability. It generally provides the additional benefit of being more durable than natural material, and can serve as an appropriate substitute. Cast stone's increasing popularity in historic restoration can largely be attributed to the difficulty of finding stone to match the original cuts, which in many cases were purchased from now-defunct quarries; *this is particularly true of the red sandstone used at the Lansing Millis Memorial Building. However, other stones – such as those inscribed with the initials of donors and others taken from all corners of the country – are character-defining and should be retained at all costs.*
- An appropriate mortar formula should be established and adopted for all repointing campaigns. Clear records of the mortar mix, proportions of tinting pigments, and the application technique, including the final strike, should be documented in the building owner's maintenance records. Actual mortar samples should be retained with the records along with a sample panel on the building.
- *A skilled mason should be engaged for masonry repairs at the Lansing Millis Memorial Building. Masons specializing in historic building are preferred as they are typically familiar with the construction methods, stones, and mortars used in 19th-century buildings and could assist in the selection of matching cast stone and mortar mixes.*

Wood Windows and Doors

- Wood windows and doors are character defining features and essential elements in a historic building's distinctive architectural design. Repairing and weatherizing existing wood doors and windows is always the preferred approach for historic buildings and provides energy efficiency comparable to new elements.
- When windows have exceeded their useful lives and retention is not practical or economically feasible, an approach that combines repairing old windows where possible and introducing new windows that match all existing details and materials where necessary is recommended.
- *Given the fair condition of the remaining original wood windows at the station, restoration is the most appropriate approach. Non-original windows (most of which are vinyl replacements) disrupt the building's historic character and offer limited energy efficiency compared to their wood counterparts. For these, in addition to all exterior doors, replacement with wood alternatives modelled on historical photographs is most appropriate.*

Paint Finishes

- Original paint formulations and colors are character-defining elements that are often lost over time because the paint materials themselves are relatively short-lived. When repainting is necessary to preserve the integrity of the envelope, the colors chosen should be appropriate to the style and setting of the building. If the intent is to reproduce the original colors or those from a significant period in the building's history, they should be based on the results of a scientific paint analysis.
- Traditional lead-based paints, which offer excellent longevity, durability and color stability, are no longer available in the United States. The highest quality latex-based paints available should be employed instead, after thorough surface preparation and priming. The application of a permanent vinyl or ceramic liquid coating system is damaging to wood, irreversible, and historically inappropriate.
- *A comprehensive paint analysis should be carried out as part of this rehabilitation. Sampling from areas of original woodwork such as historic windows and interior trim would enable the most detailed analysis, allowing for the identification of paint colors to match the originals. Restoring a building's historic color scheme is often among the most visible measures in any restoration or rehabilitation project, helping to bring new life to an otherwise forgotten landmark.*



THIS PAGE INTENTIONALLY LEFT BLANK

PART 2: CONCEPTUAL DESIGN

As discussed in the earlier ‘History and Significance’ narrative in *Part One* of this report, the Lansing Millis Memorial Building has seen some modifications over time. The Town of Millis, through its Permanent Building Committee, is seeking ways to preserve the station, being fully aware that a building with no active purpose is not only as burden to the Town, but also an attractive nuisance on its way to complete decline. This section explores several ways to reactivate the building, potentially generating tax revenue and restoring the structure to a place of community pride.

Though the building envelope is marred by numerous deficiencies, much of its historic character is largely intact. The same cannot be said for the building’s interior, where many – if not most – of the historic finishes have been lost to time. In the interest of preserving what remains of the building’s historic character, the schemes proposed in this section adapt its existing spaces with minimal disruption of those character-defining features discussed in *Part One*.

Each scheme offers a distinct solution for the building’s reuse, as determined by zoning and building codes. Considerations like these are often integral in developing solutions for the adaptive reuse of historic buildings, due to the inherent limitations of the existing fabric. The reuse options proposed for this building range from commercial to residential, each designed according to the requirements of the applicable codes, which in this case include the 2015 edition of the *International Existing Building Code* (IEBC) and *Massachusetts Architectural Access Board* (MAAB) regulations.

The preliminary sketches presented here illustrate the first stage in the conceptual design process. Included with each scheme is a brief description and an outline of its advantages and disadvantages. Also included is a preliminary landscape design option intended to improve circulation and parking at the site, which is compatible with any of the conceptual designs for the building.

Following review by the Permanent Building Committee, two reuse schemes were designated as the most feasible options: **Option 2 – *Business Use*** and **Option 4 – *Live/Work Space***.



LANDSCAPE DESIGN OPTION

The drawing presented on the following spread illustrates a preliminary design for the site at 64 Exchange Street. Adaptive reuse of the building necessitates a redesign of the site, which, in its current state, offers a number of challenges regarding circulation and parking. The proposed scheme reconfigures the existing parking area to:

1. Increase the parking capacity of the site (as necessary for commercial use),
2. Regulate the flow of traffic into and out of the parking area for visitor safety, and
3. Offer a clear, minimally disruptive handicapped-accessible route into and out of the building.

In addition to offering logistical improvements, this scheme also improves the overall aesthetic quality of the site by recovering green space around the building and adjacent to the street. It is our hope that, when paired with the much-needed preservation measures addressed in Part Two, these site enhancements will assist in forging a new legacy for the building — first generating appeal among potential tenants and later attracting members of the local public to support any businesses that may operate here. The attached plan is annotated to identify those areas of the site most impacted by the proposed alterations.

NOTE: The attached site plan was designed to be paired with the commercial/business use schemes discussed later in this section of the report. In the event that the Permanent Building Committee decides on the third option for reuse — that is, as a single-family residence — a corresponding landscape scheme limiting the amount of paved area around the building and integrating more green space would be appropriate.



This proposed scheme will expand on-site parking, allowing up to 13 cars to be parked here at any given time. The expanded parking is designed to allow ample space for circulation, with a designated turn-around area behind the building.

NOTE: We have also proposed changing the existing overhead electrical service to *underground* as part of the comprehensive improvements to the building site. Doing so would not only contribute to the site and building's overall aesthetic appeal, but would also prevent power outages caused by downed lines.

LANDSCAPE DESIGN OPTION
 Not to Scale

PLAN BOOK 112, PLAN 723 of 1930

All the building schemes outlined in the following section involve deletion of the existing vestibule. This allows for reconfiguration of the handicapped access solution at the building's primary entrance. Proposed in this scheme is a curved ramp to the entry from the parking area, which does not require handrails per MAAB, by virtue of its gradual (less than 1:20) slope

Access to
Curve Street

Reconfiguring the curb-cut at the Exchange Street entrance is intended to control traffic into the site. The narrower entrance oriented at a 90-degree angle with the street forces drivers to slow down when entering the site, ensuring the safety of pedestrians crossing the parking area.

This intervention also recovers green space, which formally separates the building from the surrounding parking areas and improves the overall aesthetic quality of the site.



THIS PAGE INTENTIONALLY LEFT BLANK

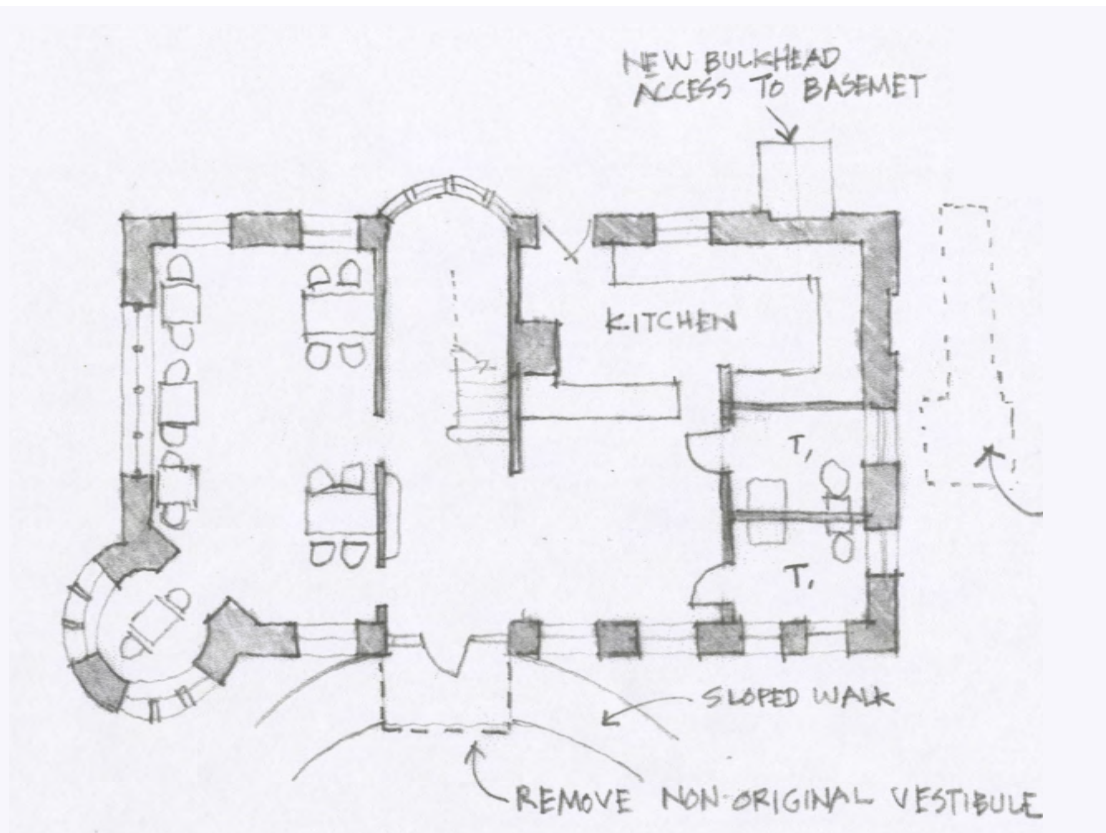
DESIGN OPTIONS

The drawings presented on the following pages illustrate the first step in developing a scheme for renovations to 64 Exchange Street, according to potential uses developed by the design team. Each scheme is designed to meet the needs of a particular building function, summarized as follows:

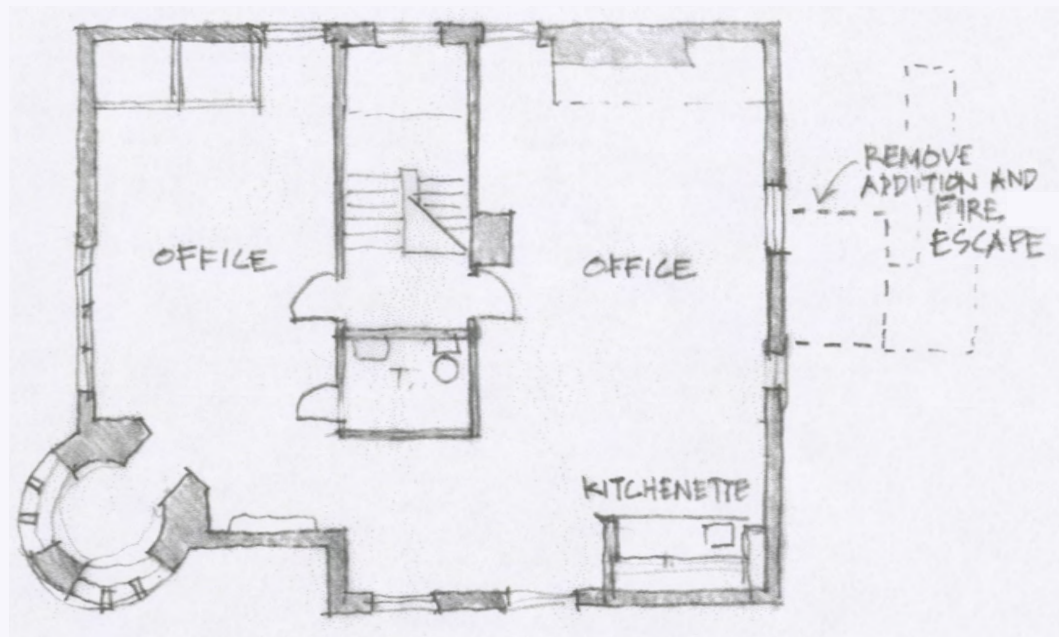
1. Casual dining at the first floor, with a second floor office space inaccessible for physically-handicapped individuals;
2. Retail or office space at the first floor, with a universally-accessible office at the second;
3. A single family residence;
4. A live/work space with a studio and gallery at the first floor and an apartment at the second; and
5. A three-classroom school with an occupancy of up to 56 students.

Each scheme reorganizes the existing spaces within the building to create an environment that is conducive to the day-to-day needs of its proposed functions and compliant with the applicable code regulations. Attention has been given to retaining character-defining elements, including the mantels and wood trim at both levels, as well as the remaining historic windows. All exterior character-defining features previously defined as such in *Part One* will be retained, and preserved where necessary (see *Part Two*). All schemes propose the removal of the existing fire escape, its accompanying addition, and the entrance vestibule, none of which appears to be original to the structure. Universal access is provided to the first floor with a gently inclined walkway, in lieu of the existing wood ramp.

Each scheme is presented with two floors plan sketches (first and second), and a brief description of each floor.



FIRST FLOOR PLAN - OPTION 1
Not to Scale



SECOND FLOOR PLAN - OPTION 1
Not to Scale

OPTION 1 – CASUAL DINING WITH OFFICES

*This scheme proposes commercial use for the building, with the first floor rehabilitated to serve as a café and the second floor serving as an office space that **does not** require regular access by patrons or other members of the general public. **Fully permitted in Town of Millis Zoning District C-V.***

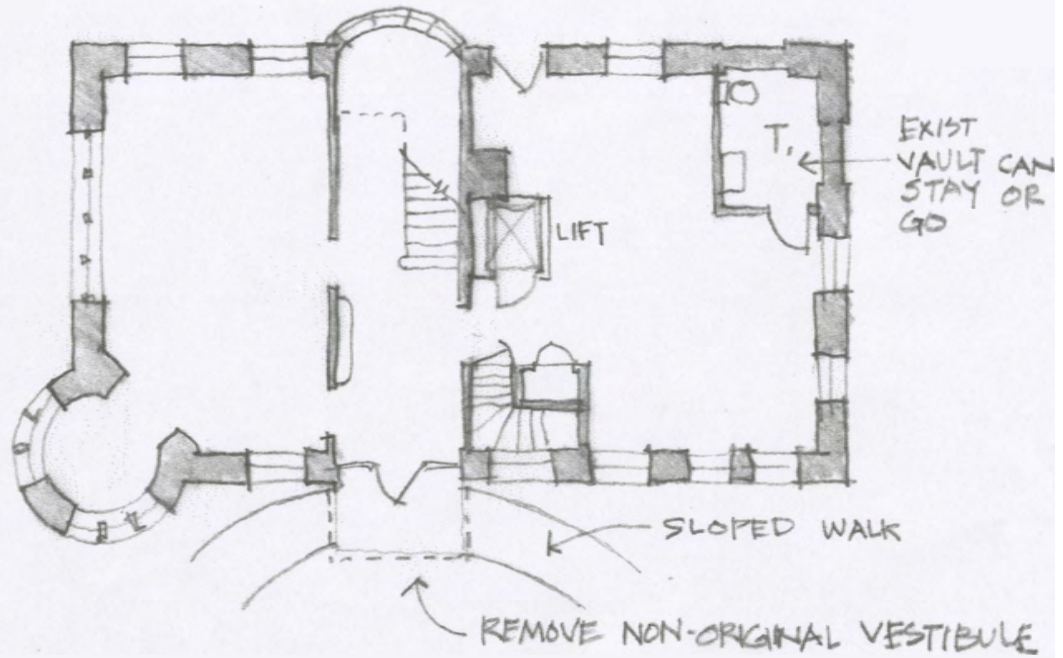
First Floor:

- The existing layout of the first floor – when considered with the scale of the building’s footprint – is conducive to use as a café. With the foyer clearly defining two separate ‘halves’ of the building, the plan lends itself to separate spaces for food preparation/ordering and dining. Because the kitchen is small, food preparation is likely to be limited.
- The vault has been removed to increase usable space within the building, and the rear door facing the tracks provides back-of-house access for delivery.
- The stairway accessing the basement has been removed to make room for a waiting area, and a new bulkhead has been added at the building’s south wall for access to the basement.
- Removal of the partition at the existing toilet room allows more natural light to enter the foyer, improving the overall light quality within the space. New restrooms are situated at the northwest corner of the building, near the existing kitchenette, for proximity to existing plumbing.
- The eastern portion of the building offers the most picturesque features, including the monumental arch window, turret, and ample natural light, making it well-suited for use as a dining area (following the removal of the partition between the two existing rooms).

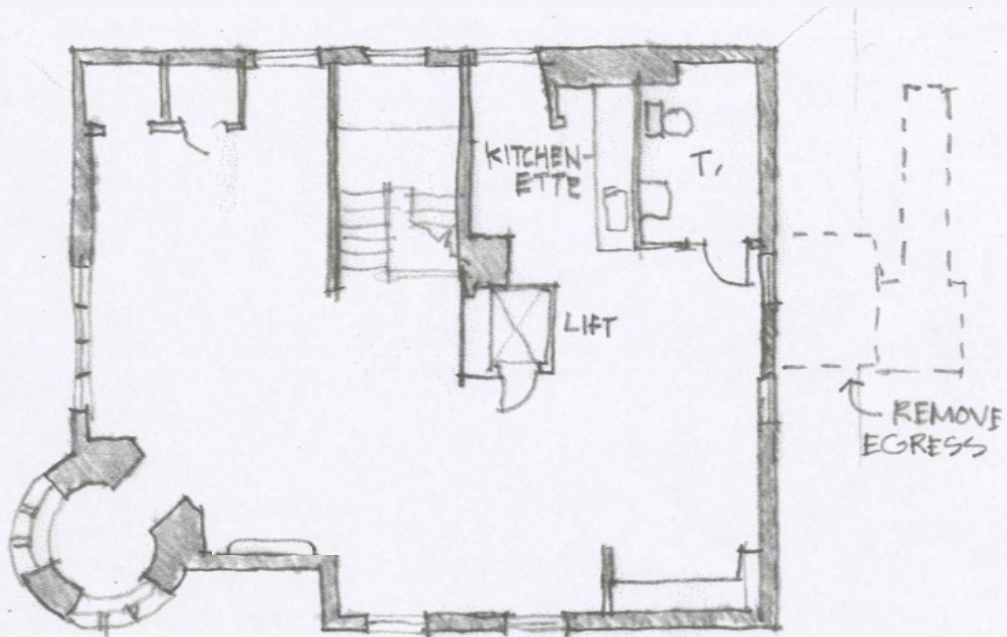
Second Floor:

- As it exists currently, the layout of the second floor is awkwardly arranged, evidently having seen numerous modifications since its construction. In this scheme, most of the existing partitions are removed and the space is opened up for use as an office.
- The existing toilet room (which is quite small and more conducive for use by children than working professionals) has been expanded into the adjacent closet space.
- A kitchenette is situated in the northeast corner of the building, and storage has been retained where possible.
- Doors between the stair hall and the rest of the floor provide security and prevent patrons of the business downstairs from wandering into the office.

NOTE: *The International Building Code (2015) with Massachusetts Amendments* permits a single means of egress for business, mercantile, storage, and factory uses with occupancies of less than 50, in turn allowing for the removal of the fire escape and its accompanying addition.



FIRST FLOOR PLAN - OPTION 2
Not to Scale



SECOND FLOOR PLAN - OPTION 2
Not to Scale

OPTION 2 - RETAIL OR OFFICE, UNIVERSALLY ACCESSIBLE

*This scheme also proposes commercial use for the building, with both floors serving as business or retail spaces. Installation of a vertical lift accessing both levels makes for more flexibility at the second level, as public access will be permitted (in contrast to the previous option). **Fully permitted in Town of Millis Zoning District C-V.***

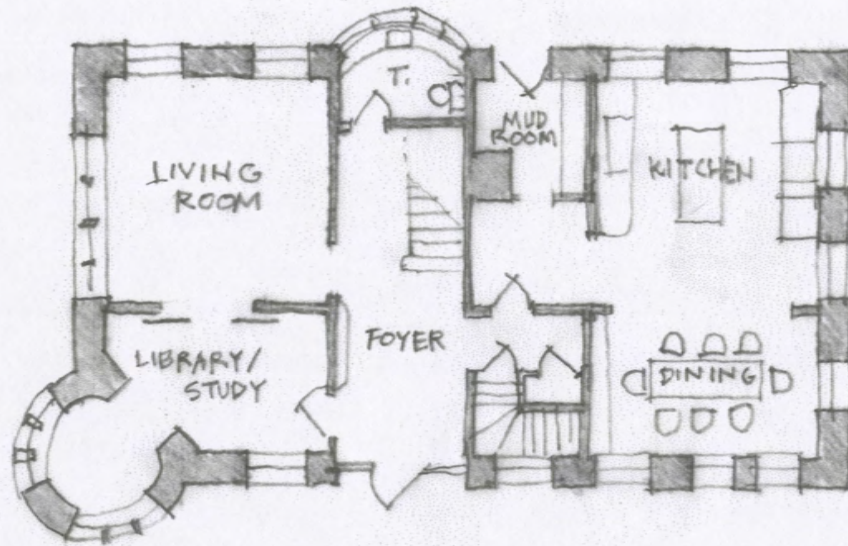
First Floor:

- Some partitions have been removed, effectively leaving two primary spaces on either side of the entry foyer.
- The closet and basement stair have been retained, but the toilet room has been relocated. As with the previous option, removal of the partition at the existing toilet room improves the light quality at the foyer.
- The shaft for the vertical lift is situated adjacent to the chimney, as this location is centrally located and provides ample 'head space' at the second floor (due to its proximity to the roof ridge).

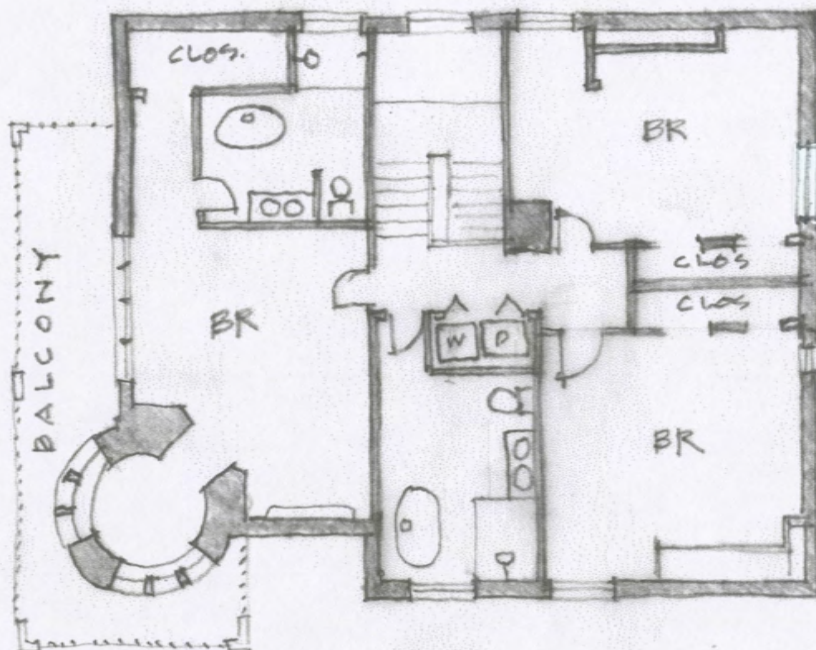
Second Floor:

- Due to its publicly-accessible nature, the second floor has here been opened to a greater extent than in the first option. There are no doors securing the space, assuming that the entire building would be rented by a single business.
- The toilet room has been relocated to the southwest corner of the building, aligning with the one below and allowing for the consolidation of plumbing infrastructure.
- A small kitchenette is situated adjacent to the toilet room (also to consolidate plumbing).
- Storage closets at the southeast corner have been retained, but other storage has been lost.

NOTE: *The International Building Code (2015) with Massachusetts Amendments* permits a single means of egress for business, mercantile, storage, and factory uses with occupancies of less than 50, in turn allowing for the removal of the fire escape and its accompanying addition.



FIRST FLOOR PLAN - OPTION 3
Not to Scale



SECOND FLOOR PLAN - OPTION 3
Not to Scale

OPTION 3 – SINGLE-FAMILY RESIDENCE

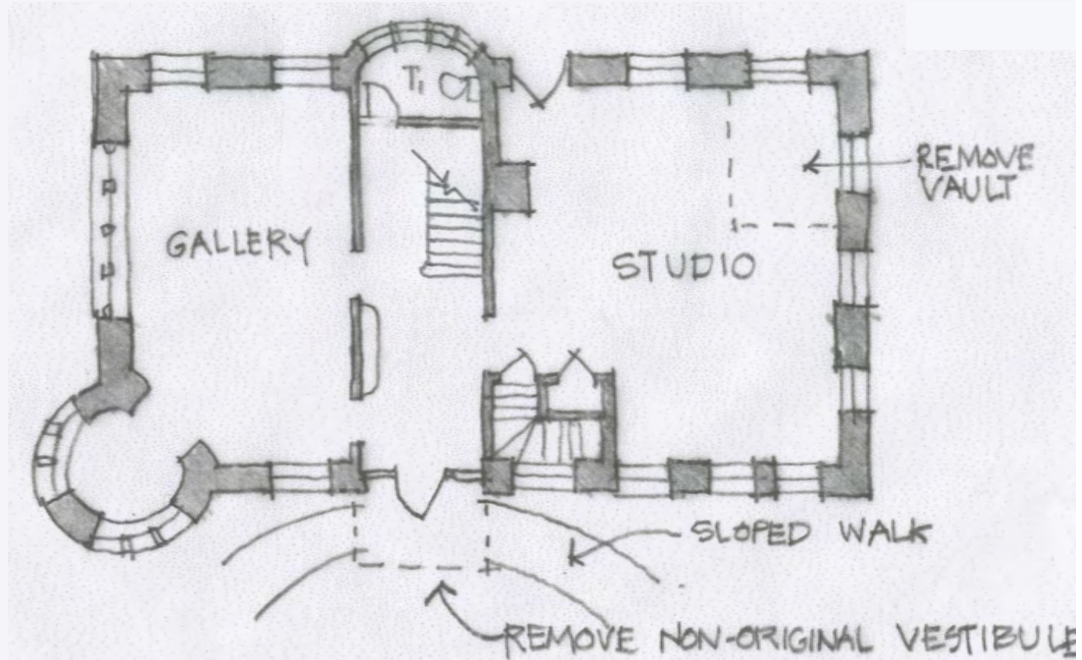
*This scheme proposes repurposing the building as a single-family residence with three bedroom and two and a half bathrooms. Despite requiring the most modifications to the existing spaces (for user comfort), this scheme has the least limitations per applicable building codes. The overall scale of the structure is conducive to residential use, as is its location within a predominately residential neighborhood. Of course, many options would be possible in laying out a single-family home; we have here presented a sample, test-fit option. **Not permitted in Town of Millis Zoning District C-V; a zoning variance would be required.***

First Floor:

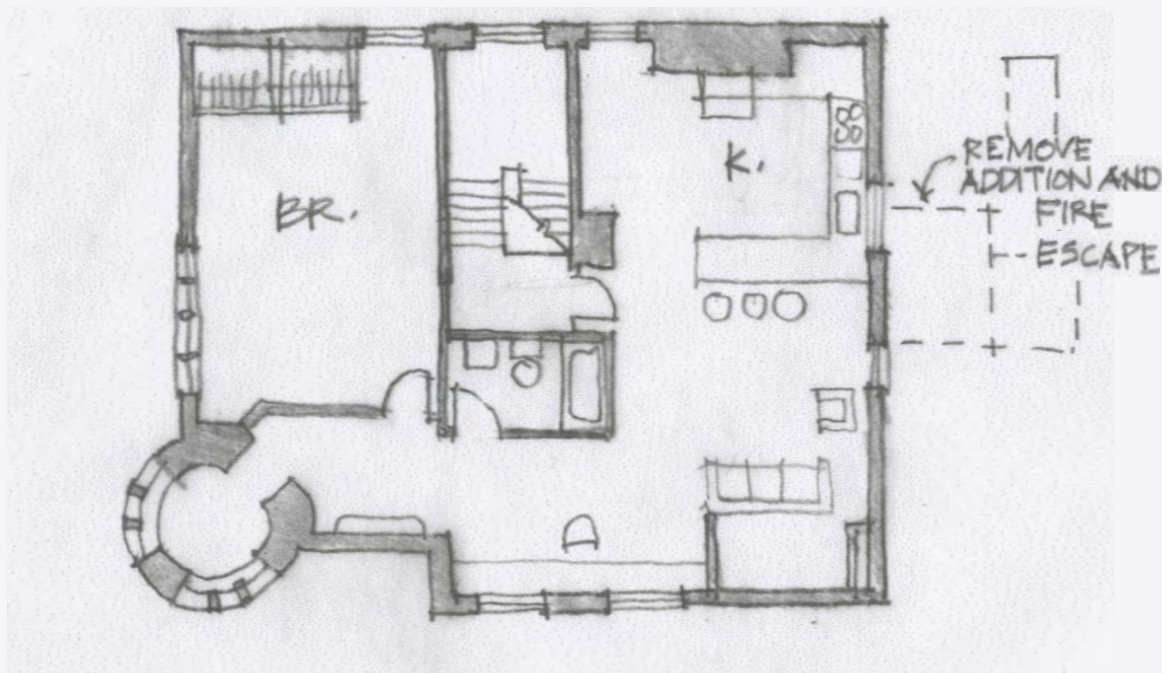
- The existing partition separating the two rooms at the eastern portion of the first floor has been retained, with a two-leaf sliding door separating the larger living rooms from the smaller library (with a reading nook in the turret, as was typical for buildings of this era).
- There are two entrances to the building, the primary at the north wall and the secondary at the south wall. The existing entry foyer space is retained, including the toilet room (‘half-bath’) under the stair.
- By virtue of the south entrance’s more private nature, a mud room has been added. This offers residents a back-of-house entrance and storage for shoes, coats, umbrellas, etc.
- The existing partition separating the two rooms at the western portion of the building has been opened, with only a large doorway between the kitchen and dining room.
- The existing basement stair and broom closet have been retained. The opening to the existing kitchenette at the end of the hallway has been blocked, effectively managing foot traffic and separating the ‘public’ and ‘private’ areas of the first floor.

Second Floor:

- The large, open room that currently occupies the eastern portion of the second floor has been adapted for use as a *en suite* bedroom, with a bathroom and closet occupying the side adjacent to the stair. This space was ideal for use as the *en suite* bedroom by virtue of the turret space, which is picturesque. Access to the balcony could also be integrated, if desired.
- The shared bathroom is directly across from the stair, separating the master bedroom from the smaller bedrooms at the western portion of the building. One corner of the space is reserved as a closet, in which a washer and dryer would be housed. The bathroom and closet are both accessible via the hallway.
- The remainder of the second floor (the western portion) is divided between two bedrooms, approximately equal in size.



FIRST FLOOR PLAN - OPTION 4
Not to Scale



SECOND FLOOR PLAN - OPTION 4
Not to Scale

OPTION 4 - LIVE/WORK

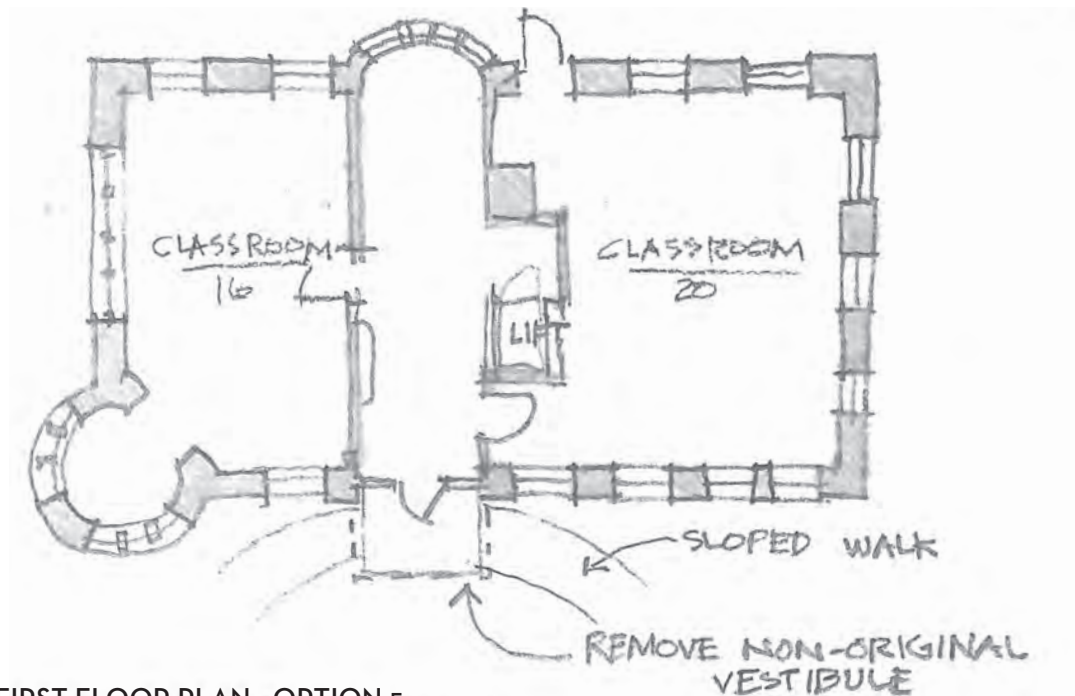
*This scheme combines the previously-discussed reuse options by adapting the building for use as a 'live/work' space. Here, work (and otherwise public) functions are confined to the first floor, while the tenant's private living space occupies the entirety of the second floor. Minimal modification to the building is required: both existing toilet rooms will be retained (just expanded at the second floor) and no lift is required. **Permitted in Zoning District C-V only with issuance of a special permit.***

First Floor:

- The existing partitions separating rooms at the eastern and western portions of the building have been removed, effectively leaving two primary spaces. The more picturesque space to the east of the foyer is occupied by a 'gallery,' intended for public reception and/or events. To the west of the foyer is the 'studio,' which is intended to serve as the tenant's primary work space.
- The two existing doors have been retained. As with all other options, the north door is intended to serve as the primary entrance, by virtue of its proximity to the parking areas. The south door provides a 'back-of-house' entrance for the tenant, with direct access to the studio space.
- The existing vault has been removed to increase workspace and allow for installation of an additional window at the west wall, ideal for bringing more natural light into the studio.
- The existing basement stair and broom closet have been retained, as have the existing doorways at the two north-south partitions (on either side of the foyer).

Second Floor:

- Much of the second floor's existing organization has been modified. Three major partitions have been removed and one has been added, effectively opening up the western portion of the floor and separating it from the proposed bedroom.
- The northern and western portions of the floor are occupied by an open-plan kitchen and living/dining room. The kitchen at the southwest corner is separated by a counter, while the remaining space can be flexibly arranged for living and/or dining.
- The existing toilet room has been expanded into the adjacent storage space, allowing for a full bathtub. The entrance to the bathroom has been shifted eastward and here occupies the place of the existing opening in the back wall of the storage space.
- The southwest corner of this floor is here occupied by a bedroom, which has been closed off by a partition extending from the corner of the bathroom to that of the turret. The existing closets have been retained and the door immediately east of the stair has been removed.
- A door between the stair hall and the living area prevents visitors from wandering upstairs into the tenant's private living space.



FIRST FLOOR PLAN - OPTION 5
Not to Scale



SECOND FLOOR PLAN - OPTION 5
Not to Scale

OPTION 5 - SCHOOL

*This scheme developed in response to a specific request in the initial RFQ for this study, proposes restoring the building to its earlier use as a school. Designed for a maximum capacity of 56 students, the school is comprised of three classrooms, a small library, a staff lounge, and three single-occupant toilet rooms. As required by code, an accessible lift has been integrated. **Fully permitted in Town of Millis Zoning District C-V.***

First Floor:

- Similar to three of the other options, the two primary east-west partitions have here been removed, leaving two spaces at the first floor, each serving as a classroom. The room to the east has space for up to 16 students and the one to the west has space for 20.
- The *International Building Code (2015) with Massachusetts Amendments* requires handicapped access to the upper level(s) of any school building. A LULA lift has been proposed in the main hallway/foyer, adjacent to the door accessing the west classroom.
- For **this scheme alone**, the *IEBC* requires two means of egress from the second floor and the existing egress stair and accompanying addition are to remain.
- Both existing entrances have been retained. All visitors will be welcomed at the north entrance, while the south door will serve exclusively as egress.
- The existing first floor toilet room has been removed, as have the existing basement stair and broom closet. The basement is here accessed via a bulkhead at the south elevation, similar to that proposed in Option #1.

Second Floor:

- The large existing space at the east side of the second floor has been repurposed as a third classroom, with an occupancy of 20 students. The existing storage closets at the southeast corner of the room have been retained.
- The existing toilet room and storage area have been deleted and the partitions separating the stair hall from the adjacent rooms have been extended to the north wall, separating a small room to be used as a library/work room.
- The remainder of the floor is comprised of a staff lounge at the northwest corner and three single-occupant toilet rooms wrapping the southwest corner. All rooms at this floor are individually accessible from a central hallway connecting to the existing stair hall, with the exception of the staff toilet room, which opens to the lounge.
- The LULA lift accesses the second floor via the southeast corner of the staff lounge, opening to the hallway.

NOTE: As required by *The International Building Code (2015) with Massachusetts Amendments*, occupancy is here calculated at 20 square feet per student. An occupancy of 60 or more students would necessitate additional toilets, per the plumbing code.



THIS PAGE INTENTIONALLY LEFT BLANK

PART 3: EXISTING CONDITIONS & TREATMENT RECOMMENDATIONS

While *Part One* explored the history and character of 64 Exchange Street, *Part Three* will instead assess the building's *current* condition. As should be expected of any historic structure, the Lansing Memorial Building has endured over a century of weathering and change of use resulting in various alterations. Once a proud icon of the Town of Millis, it is now in a state of disrepair, exacerbated by several years of vacancy and neglect. In its current state, the building offers an ideal home for a wide array of pests and vermin; extensive improvements will be required to instead make it suitable for *human* occupation.

This section of the report includes a detailed conditions assessment and recommendations for the treatment of the identified deficiencies. Also included are reports from two consultants: Structures North, who assessed the existing structure and provided recommendations for its treatment, and Northeast Engineering, who provided recommendations for modifications to the existing HVAC, plumbing, and fire protection systems.

The final section of *Part Three*, the regulatory analysis, identifies and summarizes all relevant code and zoning regulations applicable to the rehabilitation, renovation, and/or reuse of the building. All applicable codes are listed on p. 91.

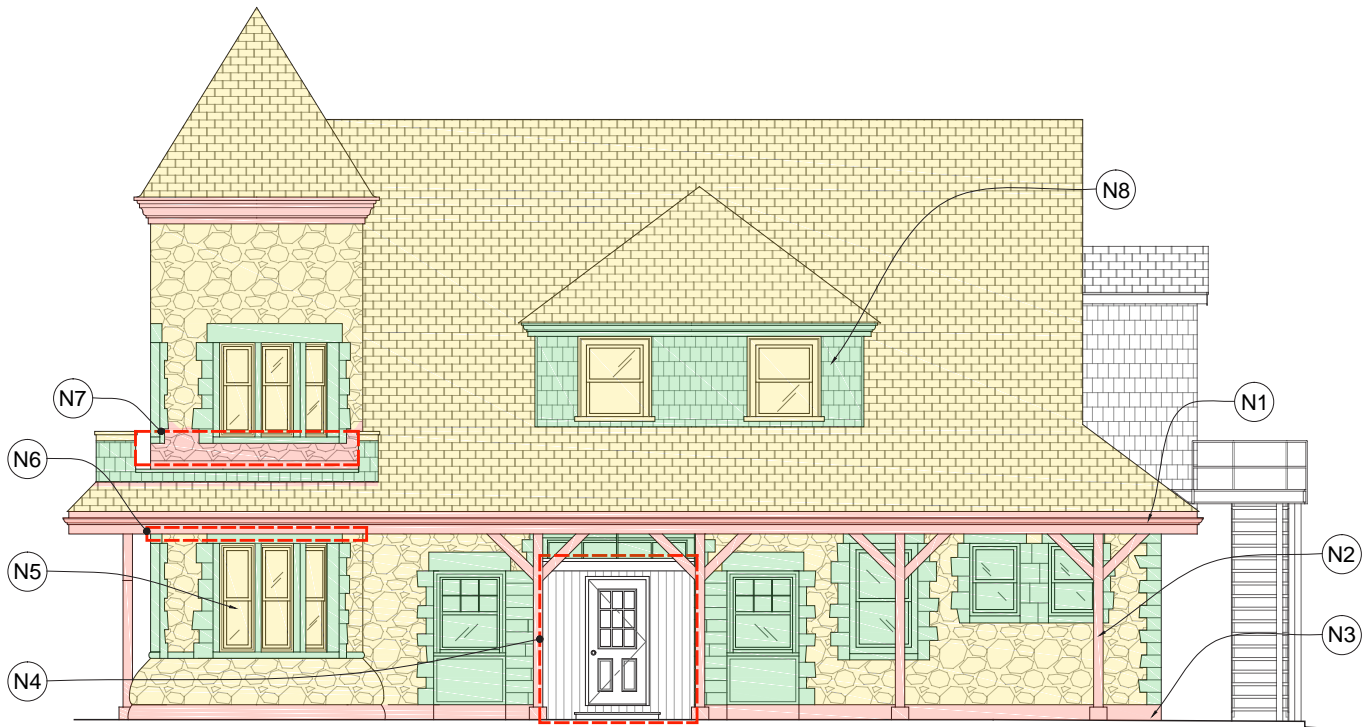
All treatment recommendations outlined herein are intended not only to preserve the Lansing Millis Memorial Building, but also to allow for its renovation and reuse. Conceptual schemes for the building's reuse are outlined in Part Three of the report.

KEY

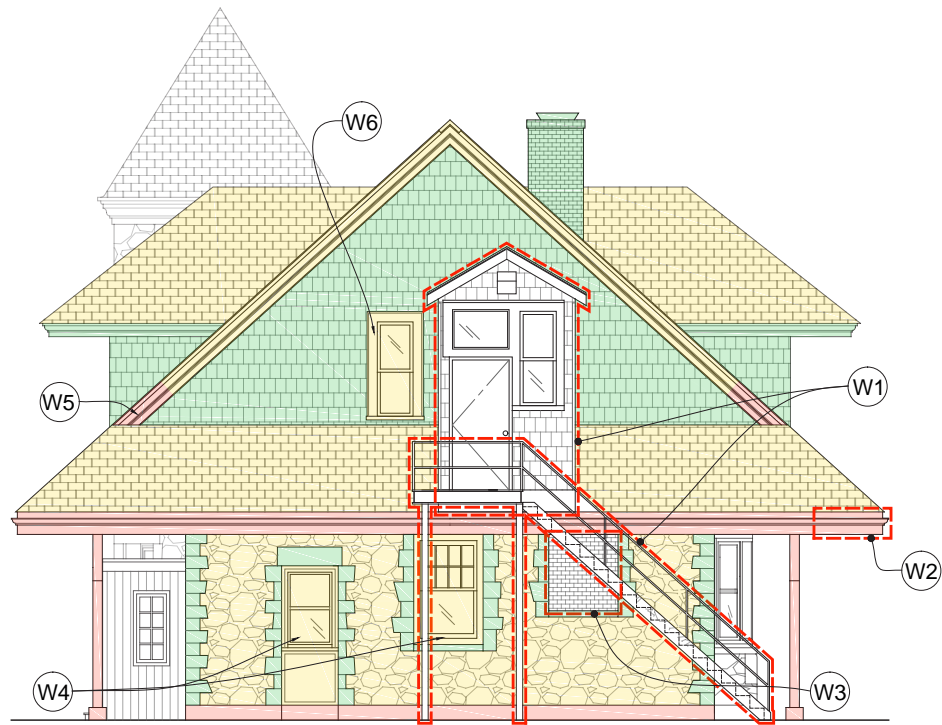
- Urgent (1-2 years)
- Short-term (3-5 years)
- Long-term (6-10 years)



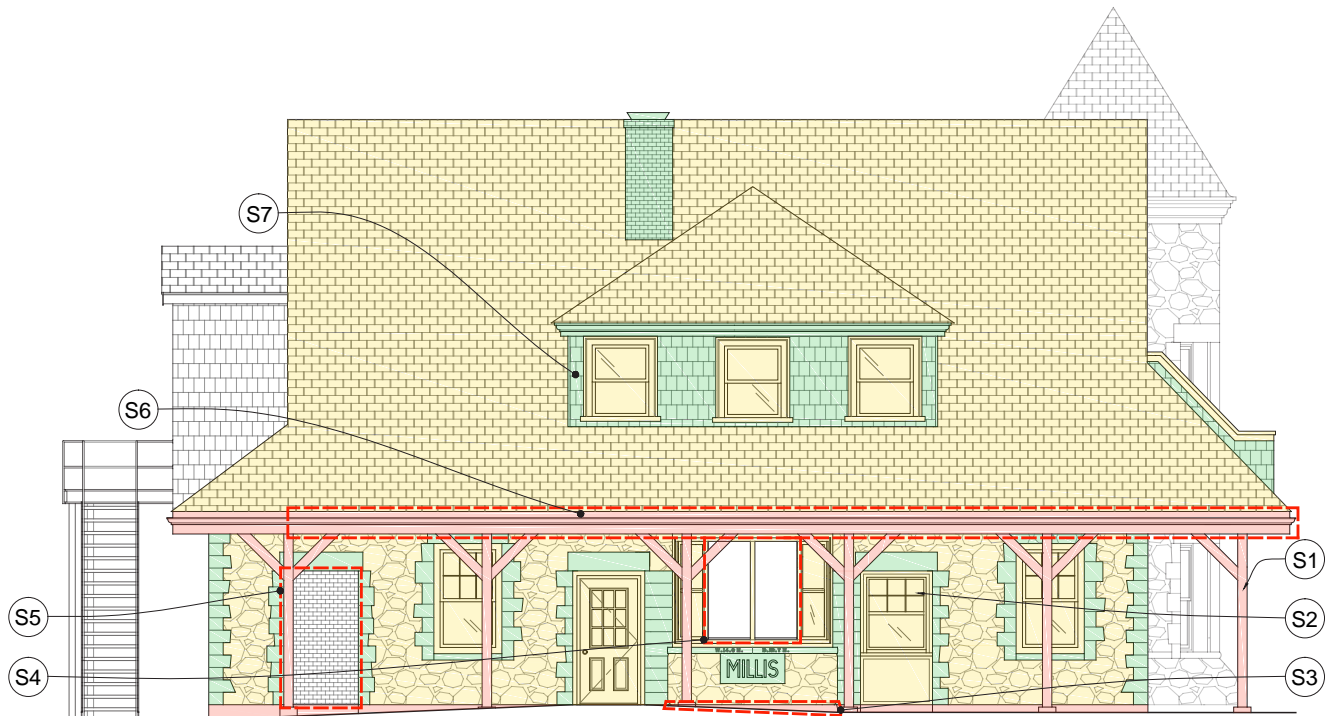
East Elevation



North Elevation



West Elevation



South Elevation



- The railings surrounding the balcony are significantly deteriorated. Two sections are completely missing. The former location of the missing east-facing element is outlined in red in Img. E1. The railings shown in historical photographs differ from these as they had significantly more balusters, suggesting that they are non-original. *The existing railing should be removed along with any remnants of the two missing ones. Missing railings should be replaced with wood replicas, closely modeled after those seen in historic photographs, p. 28.*
- Small trees have taken root in the reglet cut for the lead counterflashing at the intersection of the tower and the balcony's flat roof (see yellow arrow in Img. E1). Further observation suggests that all lead flashings and counterflashings around the building are beyond their usable lives. *All flashings and counterflashings should be comprehensively replaced while other roof work is ongoing.*
- Wood gutters are failing at all elevations. Though well-sized for the roof, neglect (including failure to periodically oil them for waterproofing and clean out organic debris) have deteriorated the wood. The failure of gutters has allowed for significant water damage to the fascia boards below (note the makeshift repair performed at the northeast corner as shown in Img. E2). *All elements of the wood cornice, including the gutter, fascia, and molding, should be replaced with durable decay-resistant wood and painted in the color determined through paint analysis.*
- The structure's original builders scribed the tongue-and-groove boards at the soffit to fit tightly against the masonry's irregular face. This, however, is only seen at the soffit's intersection with the tower (the intersection is concealed by moldings elsewhere). Small gaps between the wood and masonry appear to have allowed wildlife to enter the building envelope, despite efforts to patch the openings with screen. Pest activity is strongest at the northeast corner of the building, as evidenced by regular noise inside the tower – particularly at the second floor. *A vermin or pest specialist should be engaged for removal and any residual feces or debris should be thoroughly removed.*
- The east-facing half-round window is one of only a few wood windows that have been maintained

around the building. Because it is well-sheltered from wind, rain, and ice, it appears to have faced little degradation aside from some peeling paint (see Imgs. E4 and E5). Historic documentation suggests that the original sash have been altered and/or replaced: photos taken around the turn of the 20th century (Img. E6 is a close-up of a ca. 1910 photo) show a complex glazing bar grid at this window, whereas a 1978 photo shows the window in its current configuration. The likely modification of this window during the early- to mid-20th century suggests that wood windows are likely locations of asbestos-containing caulk, though only sampling and testing can determine this. *The existing sash should be removed (with proper attention to the potential presence of asbestos therein) and replaced with new wood sash replicating the appearance of the original window. The new sash and existing casings should be painted to match other wood elements around the building.*

- Asphalt shingles were installed probably within the last fifty years. The discovery of a tile in the attic suggests that asbestos roofing preceded the asphalt and was likely installed to fireproof the roof. Notwithstanding, the existing asphalt roofing is beyond its usable life, as suggested by the prevalence of moss and lichens (see the yellow arrow in Img. E7), as well as torn and worn shingles throughout. *Asphalt shingles should be comprehensively replaced with wood shingles.*
- Lead flashings and counterflashings around the building are deficient. The red arrow in Img. E7 identifies an area at the southeast corner of the balcony in which a counterflashing has come loose. *New base and counter flashing should be installed as part of the roof replacement recommended above.*
- While wood shingle siding is generally in fair condition, it will remain useful for no more than a decade. Weathering is evidenced by some loose shingles (see red arrows in Img. E8) and extensive ‘cupping.’ Historic photos suggest that shingles were coated, likely to protect them from the elements. *A comprehensive restoration of the building should involve replacement of all wood shingle siding. Though optional, staining the siding is recommended, as it would emulate the building’s historical appearance and slow damage.*

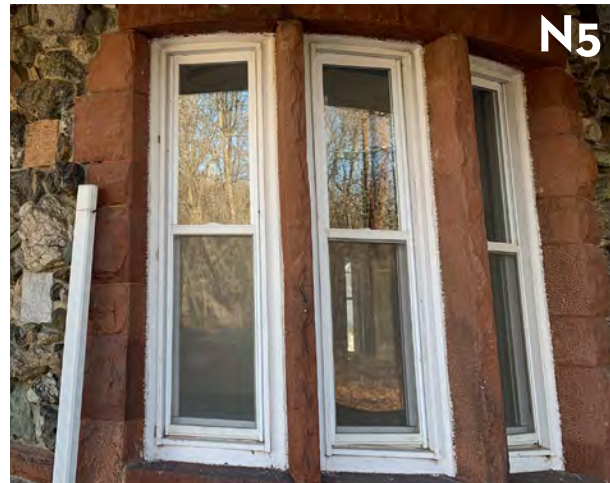




- Image N1 further illustrates the severe degradation of wood gutters around the building. In this case, sediment build-up within the gutter has allowed grasses to take root, in addition to the more typical mosses and lichens. *As discussed earlier, all elements of the cornice should be removed and replaced at all four elevations.*
- Black painted posts supporting the overhanging roof have experienced significant rot over time. Though they appear to be in sound condition upon first glance, closer investigation shows that most of the columns' lower portions have been wrapped in a thin sheet metal (see areas outlined in red in Img. N2). Knocking on the metal coverings reveals that they are mostly hollow underneath. This is a typical pattern of decay; lower portions of wood columns often wick water upwards from the ground (especially if it is paved, as in this case). Rot is visible below the metal coverings (as identified by yellow arrows in Img. N2). *Closer investigation of the condition of the columns necessitates removal of the sheet metal, at which point a better-informed approach for their repair can be determined. It appears as though most columns will only need some additional structural support via metal stand-off bases and new concrete masonry piers, though some may require replacement.*
- Red sandstone – particularly around openings and at quoins – has remained in relatively good condition since the building was constructed in 1885. One exception to this assessment is at the foundations, with more notable degradation throughout. There are three primary areas at which the sandstone foundation has weathered most dramatically, one of which is shown in Img. N3. Here (below the third north-facing window from the right), sandstone decay is seen in the red powder at the foot of the wall. Holes at the foundation's intersection with the pavement suggest the presence of pests, which have evidently burrowed into the basement in various locations (see the yellow arrow in Img. N3). *Damaged pieces of sandstone should be removed and replaced with matching natural or cast stone. All reuse schemes discussed in Part Three of this report necessitate re-paving the entire perimeter of the building.*
- The wood vestibule and handicapped ramp (see Img. N4) are not original to the building and *should be removed in any reuse scheme. Exterior grade near the*

entry should be adjusted so that access can be provided without the need for an unsightly ramp. The existing door casing, with sidelights and transoms, should remain, but should be properly restored to ensure weathertightness and durability, and the door should be replaced with a historically-appropriate alternative, matching those fabricated for the south elevation.

- All twelve windows at the tower are vinyl replacements of the original wood windows (see Img. N5). The typical lifespan of vinyl windows is around twenty years. *Though these windows are currently in working order, replacement will be necessary in the near future. The same applies to all vinyl windows throughout the building. Any replacements should be fabricated in wood, which would last longer in addition to being more historically appropriate. In the previously mentioned historic photographs from the late 19th or early 20th century, all windows appear to be a dark color. Paint analysis of wood trim elsewhere (which appeared to match) would help to determine what color replacement windows should be painted. It is also recommended that replacement windows be designed with muntin patterns based on historic photographs.*
- Many window screens (particularly at the east wall, second floor) are torn. *New screens should be installed at all replacement windows. If windows are not replaced immediately, damaged screens should be repaired or replaced to prevent further infestation by insects.*
- Unlike at the east-facing side, there are no large openings at this side of the soffit's intersection with the tower. The soffit's paint, however, is peeling. *It should be scraped and repainted to match all other wood trim.*
- The area outlined in red in Image N7 identifies the location of the second of two missing railings (*where, as previously discussed, a wood replica should be installed*).
- Most elements of the north dormer, including the asphalt roofing, flashings, wood shingle siding, and windows have been previously discussed in earlier observations. *The remaining elements, the cornice and soffit are somewhat degraded. Wood replacements should be fabricated to match the profile of the existing installed in their place, and painted to match other exterior wood trim (see Img. N8).*

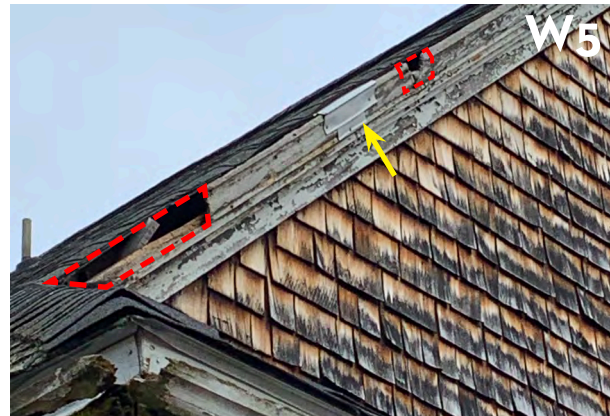


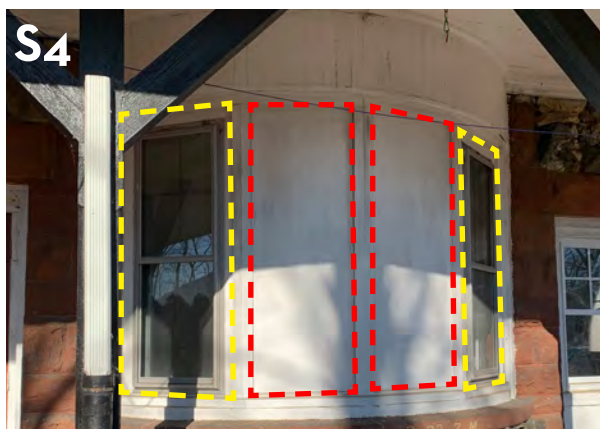


- The egress addition and fire escape are not original to the building and were likely added to meet code requirements sometime in the latter half of the 20th century. *All reuse schemes discussed in Part Three of this report call for the removal of these elements, as the additional means of egress would not be code-required for the proposed occupancy uses. The resulting holes in the west wall and roof should be patched to match their surroundings, which, in the case of the latter, will involve installation of new roofing and flashing infill. The existing window on the west face of the addition should be salvaged for re-installation at the right side of the new wall.*
- As discussed in earlier observations in this section, the building's cornice and gutters are in irreparable condition; corners have faced the most severe damage. Image W2 shows the southwest corner of the roof, which has rotted away almost entirely. One or more repairs has evidently been attempted with sheet metal and there appears to be a nest inside the gap (see the red arrow). Deficient gutters have also allowed the angled, outermost portions of the soffit to rot. *The only appropriate way to repair damage to the gutters and cornice is to comprehensively replace them (as discussed on page 42). Any damaged soffit boards should also be removed, replaced, and painted to match the surrounding wood trim.*
- Two window openings were bricked in upon installation of the vault at the southwest corner of the first floor: the rightmost window at the west elevation and the leftmost door at the south elevation. *The re-use schemes presented in Part Three of this report offer options to retain or remove the vault. In the event that the vault is retained, it is most sensible to leave these openings blocked. If the vault is removed, however, the bricks should also be removed and a historically-appropriate wood window should be fabricated, installed at the west-facing opening, and painted to match the other wood trim. This wood window should be installed here even if the existing vinyl windows are temporarily retained, as it will negate the need for later replacement.*
- The two other masonry openings at the building's west elevation are occupied by vinyl windows, though the leftmost opening was evidently intended for a door. There are four such instances around the building, and in all cases the bottom portion of the opening is occupied by a wood panel that is concealed on the interior (outlined in red in Img.

W4). *Vinyl windows should be replaced according to earlier recommendations and the condition of wood panels should be more closely assessed. If it is determined that the panels are also in need of replacement, historically appropriate replicas should be fabricated and installed.*

- Though the gable cornice is in sound condition at the east elevation (perhaps due to better maintenance resulting from higher visibility), the cornice at the west-facing gable is severely damaged. Some portions of the molding are missing altogether (see areas outlined in red in Img. W5), allowing water to enter the building envelope. Repairs with sheet metal have also been attempted (as identified with the yellow arrow). *Because damage is largely confined to the lower portions (near the wall's intersection with the hip roof), a cost-effective treatment would involve replacing deteriorated portions with matching wood infills.*
- The existing second-floor window at this elevation, like most of the other windows, is a vinyl replacement. *Upon re-installation, the window salvaged from the addition should mirror this one about a vertical axis from the roof peak. Though both are in working order, they should eventually be replaced with a more historically-appropriate wood windows, painted with the color identified by paint analysis.*





- Wood posts supporting the overhanging roof at the south elevation are in similar condition to those at the north. On some, rot has been covered with sheet metal which was subsequently painted over. *Wood posts at this elevation should be assessed and replaced as discussed for those at the north elevation, with additional structural support provided via metal stand-off bases. Some may require complete replacement.*
- Image S2 shows another masonry opening which was evidently designed and built for a door, but was later repurposed as a window. Similar to the north elevation, this opening is mirrored on the other side of the protruding bay window. However, the building's secondary entrance/exit door is situated in that opening, where the presence of a lever handle here suggests that it was installed to provide accessibility to the first floor. Historical photographs suggest that both of these openings previously served as doors. *Two historically-appropriate doors (with frames) should be fabricated for installation in these openings.*
- The second area of notable sandstone disintegration is at the foundation below the protruding bay window. Damage here is much more severe than at the north elevation, as suggested by the sheer amount of dust at the foot of the foundation, (identified with red arrows in Img. S3). This disintegration can likely be attributed to the stone's exposure to wet/dry and freeze/thaw cycles, as well as frequent contact with de-icing salts. *Damaged pieces of sandstone should be removed and replaced with matching natural or cast stone.*
- The protruding bay window is actually comprised of four double-hung wood windows over a rounded quarter-height wall. Historic photos suggest that all four of the windows were once occupied by sash. What is more: at least the two central windows appear to have had a complex glazing bar grid like the half-round at the east elevation. Here, two (possibly original) wood windows remain and are protected by storm panels (outlined in yellow in Img. S4). The central two windows, however, have been blocked with wood panels (red outlines). These panels are completely concealed by plaster at the interior. *All reuse schemes explored in Part Three of this report propose installation of wood windows at the two central openings, which would allow more natural light*

into the main foyer following demolition of the existing toilet room partition. Fortunately, the existing wood windows could serve as precedents in fabricating wood replacements.

- Image S5 shows the second of two masonry openings that were bricked in upon installation of the vault. This opening, unlike the other, appears to have originally served as a door. *Pending removal of the vault, bricks infilling both openings should be removed. At the south elevation, installation of a historically-appropriate 'blind' (or, non-functional) door to match the other doors at this elevation would indicate the builders' original intent. While the original use of the south opening is more ambiguous, installing a window to match the replacements discussed elsewhere in this assessment would provide symmetry with respect to the neighboring opening.*
- About 90% of the gutter at this elevation has either fallen off or been removed completely. It fortunately appears as though the gutter was lost fairly recently, judging by the mild level of decay of the remaining fascia. *Gutter and cornice replacement, as discussed in several earlier recommendations, will remediate this problem.*
- As with its counterpart at the north elevation, most of the south dormer's exterior elements have been previously discussed in earlier observations. *The cornice should be replaced as part of a comprehensive roof replacement project and painted to match other exterior wood trim (see Img. S7).*





THIS PAGE INTENTIONALLY LEFT BLANK

HAZARDOUS MATERIALS

Of the hazardous materials typically encountered in buildings, lead and asbestos are the most frequent. Both were historically valued for their versatility and longevity, and as such were incorporated into many construction materials. It was not until the last quarter of the 20th century that the materials' negative health effects were understood, resulting in widespread legislation restricting their use in new construction. As a building that was heavily modified throughout the 20th century, it is likely that the Lansing Millis Memorial Building contains lead and asbestos in various locations.

Asbestos

- At the exterior, asbestos is typically found in adhesives, glazing putties, caulking (see Img. H1), and roofing cement dating to the 20th century. As such, all windows should be tested for asbestos before their removal. Any mastics appearing red or black in color should also be tested. In the event that asbestos is detected, it should be properly abated by trained professionals as part of the construction process.
- At the interior, asbestos was often used for fireproofing and insulation, but could also be found in caulking. Heating pipes in the basement crawl space are wrapped in material in which asbestos is frequently found (see Img. H2). Given the presence of non-original partitions within the structure, it should also be noted that asbestos-containing skim coats and joint compounds were used in wallboard construction. To test both would be good practice, and any incidence of the material should be similarly abated.
- As noted earlier, an asbestos tile, frequently used for fire proofing roofs, was found in the attic. While it appears that these have been comprehensively replaced with asphalt singles, the attic and roof should be assessed to determine if any remain.

Lead

- While asbestos is only hazardous when disrupted, lead poses a more consistent threat: the metal oxidizes into a fine, toxic dust that can be inhaled or otherwise ingested, causing various health





problems over time. Lead paint was builders' paint of choice for centuries, valued for its durability and vibrancy. It is therefore very likely that the Lansing Millis Memorial Building contains the material (see Img. H3). All interior and exterior paints should be tested for lead. If lead is present, regulated lead management practices should be followed in handling and disposing of painted materials, and in preparations for recoating. For some potential occupancies where young children will be the present, the lead must be abated.

STRUCTURAL ASSESSMENT

Prepared by **Structures North Consulting Engineers**

Floor Framing Observations and Recommendations

- The floor and roof framing consists of lumber joists spanning north-south, supported at the exterior ends by masonry perimeter walls. An interior beam at the mid-point of the first floor spans east-west and the wall above is likely load-bearing. Floor and roof framing has performed well since the building's construction.
- Though none of the anticipated changes would *increase* the current loading, some conditions require further investigation.
- Several flush-framed conditions at the first floor require additional support, which can be provided through installation of new metal face-mount hangers.
- The existing basement columns are moderately corroded. Base plates generally lack positive connection to the column base and cap plates similarly lack positive connection with the supported beam. The condition of these columns may have contributed to the floor's evident slope toward the building's center.
 - All the existing columns in the basement should be replaced with more durable supports – like standard steel pipe or tube section – with welded cap and base plates, coated for protection against corrosion.
 - If footings are found to be in poor condition or are insufficiently sized, they should also be replaced.
- The wood post supporting the corner of the basement stair (where the header and trimmer intersect) should be replaced with a similar column to those discussed above.
- The basement crawl space is shallow and does not provide sufficient space for systems needs (as discussed in the MEP/Fp assessment in the following section). Framing that is visible is not well supported.
 - The flooring over this area should be removed for minimal excavation of the soil below and evaluation/repair of the floor framing as required.

Masonry Observations and Recommendations

- Mortar joints have eroded at the brick masonry (lower) portion of the foundation wall, as observed from the basement. These foundation walls should be comprehensively repointed with a historically-appropriate mortar.
 - Mortar joints in the stone portion of the foundation walls have similarly faced degradation, which is much more severe due to the size of the

joints. The likely subsidence of soil behind the stones has caused large voids in the wall. These portions of the walls require a deep cutting and repointing operation **or** grout injection.

- A large stone has dislodged from the south side of the turret, signifying a need for reconstruction of this portion of the tower's stonework. Further, the presence of vegetation at the tower exterior suggests the need for local repairs and masonry cleaning.
- Many of the red sandstone units comprising the exterior base of the walls are severely deteriorated and require replacement with matching cast stone or natural stone replicas.

Lift Installation and Code Implications

- Per the *International Existing Building Code with Massachusetts Amendments*, adding a lift within the building footprint would qualify as a "limited structural alteration" in it would adjust under 30% of the building's total floor and roof area. None of the proposed alterations increase the demand or decrease the capacity of the building's existing structure.
 - Any existing framing cut to accommodate the lift would need to be re-supported according to the requirements of the *International Building Code with Massachusetts Amendments*.

Report Limitations

- This report is a summary of **readily visible observations** conducted during a single visit to the property. No finishes were removed to expose hidden structure, not have any calculations been performed.



Doug Manley, AIA, LEED AP, Senior Associate
Spencer, Sullivan & Vogt
1 Thompson Square, Suite 504
Charlestown, MA 02129

Reference: Lansing Millis Memorial Railroad Station
64 Exchange Street
Millis, Massachusetts
Structural Conditions Survey

Dear Doug:

Last September we visited the site at 64 Exchange Street in Millis, Massachusetts to observe the readily visible existing structural conditions, specifically regarding the proposed renovation of the building. For the purposes of this report the main entry at the parking area Avenue faces north.

General Description

The building is a 2-story building that was originally built in 1886 to serve multiple purposes for the Town of Millis. The first floor served as a train station while town offices and a public library were housed on the second floor. Most recently the building was used a school

Approximately two-thirds of the building has a full basement at its west end, and a crawlspace is located at the east portion (see Photo #1 on Page 1 of the Appendix). The floor and roof framing consists of lumber joists that generally span north-south and are supported at their exterior ends by stone masonry perimeter walls. There is an interior beam at the approximate middle of the first floor that spans east-west, and the first floor wall above is likely a bearing wall for the second floor framing.

Noted Conditions, Floor Framing Capacity and Recommendations

For present loading conditions, the floor and roof framing has served satisfactorily for decades, which is commonly referred to as “historic performance.” While no changes are anticipated that would increase the loading on the floors of the structure, there are a few conditions that require repair or further investigation.

- F1** Several flush-framed conditions at the first floor either have no hangers or have hangers that are improperly installed (see Photos #2 through #4 and #6 on Pages 1-3 of the Appendix). Several of these locations have separated or are susceptible to splitting.

All flush-framed conditions should be supported with new metal face-mount hangers.

- F2** Interior columns at the full basement section are moderately corroded, particularly at their bases; these are susceptible to further damage due to corrosion since the column walls are relatively thin and lack any additional corrosion protection, such as epoxy paint or cold-galvanizing. The typical base plates of these columns, when present, are generally scant and lack any positive connection to the column base. The cap plates do not provide much bearing and lack positive connection between the column and supported beam.

These columns should be removed and replaced with a more durable vertical support, such as a standard steel pipe or tube section with welded cap and base plates. As there is an apparent slope towards the center of the building, the footing conditions should be verified during the column replacement and the footings replaced if not found to be in good condition or insufficiently sized. Any replacement footings should be a minimum of 36" square and a minimum of 15" thick, reinforced with #4 rebar spaced at 6" on-center each way, located at the bottom of the footing with 3" of clear cover. Exposed surfaces of the base plates and anchors (prior to slab patching), as well as column bases and should be coated with a protective marine-grade epoxy or cold-galvanizing coating. Protective coatings should extend a minimum of 12" above the slab, however the entire height and all surfaces may be coated prior to installation, which will provide additional corrosion resistance and extend the life of the column.

- F3** A wood post was used to support the corner of the basement stair where the header and trimmers intersect.

Wood posts in basements should be avoided and this should be replaced in a similar manner to the columns described above in Item F2 with an L-shaped cap plate to support both the header and trimmer.

- F4** The crawlspace is extremely shallow and does not appear to provide sufficient access for any plumbing, electrical or mechanical maintenance needs. Much of the framing in this area is concealed from view, however the framing that is visible is not well supported (see Item F1 above).

The flooring in this area should be removed so that the soil can be minimally excavated, and the floor framing fully evaluated and repaired as required. Excavations should be minimal to avoid increasing the unbalanced fill on foundation walls that have historically seen a balanced condition, yet also be sufficiently deep to provide proper access. Repair of the foundation walls will likely be required as described below.

While the exterior masonry has performed relatively well for a building of this age, several areas are deteriorated and require attention:

- M1** The bottom portion of the foundation wall that consists of brick masonry where the joints have eroded (see Photo #7 on Page 4 of the Appendix).

The foundation walls should be re-pointed with a compatible mortar. If complete re-pointing is not performed as part of the upcoming rehabilitation, the walls should be monitored for changes in condition. For a historic brick wall such as this, we recommend a 1:1:6 (cement: lime: sand) mortar proportion by volume as per ASTM C1713. It is important to note that this mortar should be proportioned and-mixed by hand as pre-packaged mortars rarely state the mortar mix proportions in the bag. If

pre-bagged mortars are used, they should be specifically intended for historic masonry with the proportions clearly listed with product information readily available for submittal and approval prior to ordering material.

- M2** Similar to the brick portion, the stone portion above the brick has mortar joints that have eroded below grade. This damage is more severe as the joints in the stone are much larger and the soil behind the stones has likely begun to subside, resulting in large voids in the wall (see Photo #7 on Page 4 of the Appendix).

The foundation walls will require a deep cut & pointing operation at the stone portions. A “deep” cutting and pointing operation is recommended for the stone portions of the foundation walls due to the thickness of the stone units and the likelihood that the original soil backfill has settled and/or eroded and caused voids on the soil-side of the wall. For this process a bonding agent should replace 1/3 of the mix water in order to improve the bond with the relatively low porosity rubble stones. Grout-injection may also be considered in lieu of a deep cut & pointing operation, which would involve shallow repointing followed by followed grout-injection and be performed in lifts.

- M3** A large stone has dislodged from the south side of the turret (see Photo #9 on Page 5 of the Appendix).

The stonework in this area will need to be re-built.

- M4** Vegetation can be seen growing out of the east face of the turret masonry (see Photo #10 on Page 5 of the Appendix).

The stonework in this area will need to be locally repaired. A full exterior cleaning of the masonry should be considered.

- M5** Most of the brownstone units at the base of the wall are deteriorated.

All deteriorated brownstone will need to be replaced, likely with cast stone. Complete replacement around the base should be considered in order to maintain consistency and provide a more durable product at this susceptible location.

There are several exterior wood posts on the north elevation that are wrapped in sheet metal. This appears to be a peculiar repair that may be concealing damage to the wood posts, such as rot, behind the metal wrapping.

Additional investigation should be performed on these posts, including selective, exploratory demolition to determine the reason for this repair and the extent of damage behind it. While damaged posts often undergo “Dutchman” style repairs, if the height and extent of the damage is too severe, such a repair may introduce a hinge point at the maximum height of the post, resulting in an instability. If the damage is only concentrated at the bottom of the post, the rotted portions should be removed, and the posts re-supported with metal stand-off bases and new or reconstructed concrete or masonry piers. If the damage extends beyond the post base as described above, full replacement will need to be performed.

Lift Installation, IEBC Implications and Code-Compliance

Alterations and additions to existing structures are governed by the Massachusetts State Building Code, which in its current edition has adopted the 2015 International Existing Building Code (IEBC) with Massachusetts Amendments for work on existing structures

such as this. Adding a lift within the building footprint as proposed would likely fall under a Level 2 or 3 per the Work Area Method provided in the IEBC, however even under a Level 3 scope it would likely not qualify for a “Substantial structural alteration” as defined in Section 907.4.2., “where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a 5-year period...”. If this threshold is not met the work would qualify for “Limited structural alteration” as noted in Section 907.4.4, which refers back to Section 807.5 (Level 2) for lateral load-resisting system. None of the proposed modifications increase the demand or decrease the capacity of the existing lateral force resisting system.

Existing elements carrying gravity loads fall under Section 907.3, which also refers back to Level 2 Section 807.4. Section 807.4 allows existing elements to remain unaltered so long as their stresses are not increased more than 5 percent as outlined in the first exception of this section. This exception would be met as any existing framing that is cut to accommodate the lift would be re-supported with new structure meeting the requirements of the International Building Code (IBC) with Massachusetts Amendments as noted below, and no changes of use are proposed that would increase the demand.

Any new elements would need to meet the requirements of the IBC with Massachusetts Amendments, which would include the column and footing replacement, re-support of any existing framing that is cut back for the lift installation, any new beams required to remove load-bearing partitions, and exterior post replacement.

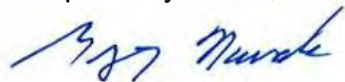
The Prescriptive Compliance Method may also be considered if beneficial for other building systems, as this approach would be the same as the Work Area Method given the above noted implications.

Report Limitations

This report is a summary of readily visible observations conducted during a single visit to the property. No finishes were removed to expose hidden structure and no calculations have been performed to determine if the overall building complies with past or present building codes. This report is strictly limited to structural considerations noted. Other building systems were not reviewed, and they are beyond the scope of this report.

Thank you for the opportunity to investigate this historic structure. We trust this information will help in developing scope for the next phase of design work, and we look forward to working with you on the subsequent phases of work for this project. Please contact us if you have any questions or if we can be of further assistance

Respectfully Yours,



Greg Nowak, P.E.
Associate

Attachments: Appendix, 7-pages, including cover

APPENDIX, 6-pages

Page 1

Photo 1: Basement facing crawlspace to the east

Photo 2: Visible portions of the first floor framing at crawlspace (facing east)

Page 2

Photo 3: East edge of first floor stair header (facing west)

Photo 4: First floor stair framing at stair header, showing notched cog (facing south)

Page 3

Photo 5: Wood post at corner of basement stair

Photo 6: Improperly installed hanger at stair header-trimmer connection

Page 4

Photo 7: Interior face of stone foundation wall

Photo 8: Concrete base of vault

Page 5

Photo 9: Dislodged stone at south edge of turret at roof level

Photo 10: East elevation showing vegetation at north edge of turret

Page 6

Photo 11: Deteriorated brownstone sills at base of walls at south elevation

Photo 12: Deteriorated brownstone sills at base of walls at north elevation



Photo 1
Basement facing crawlspace to the east



Photo 2
Visible portions of the first floor framing at crawlspace (facing east)



Photo 3
East edge of first floor stair header (facing west)

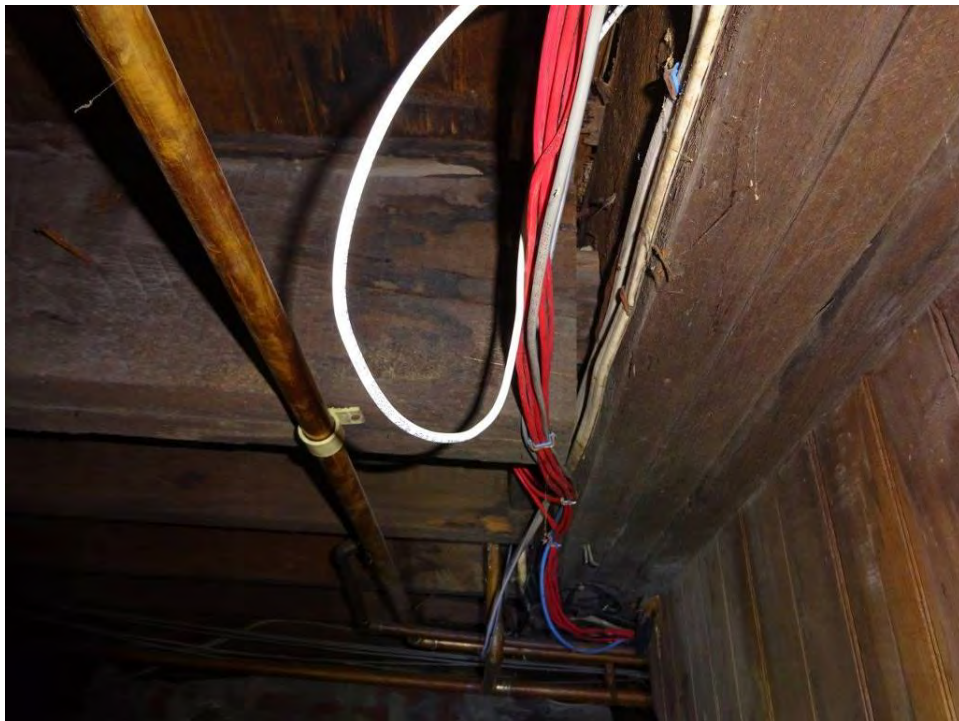


Photo 4
First floor stair framing at stair header, showing notched cog (facing south)



Photo 5
Wood post at corner of basement stair



Photo 6
Improperly installed hanger at stair header-trimmer connection



Photo 7
Interior face of stone foundation wall



Photo 8
Concrete base of vault



Photo 9
Dislodged stone at south edge of turret at roof level



Photo 10
East elevation showing vegetation at north edge of turret



Photo 11
Deteriorated brownstone sills at base of walls at south elevation



Photo 12
Deteriorated brownstone sills at base of walls at north elevation



THIS PAGE INTENTIONALLY LEFT BLANK

MECHANICAL, ELECTRICAL, PLUMBING & FIRE PROTECTION ASSESSMENT

Prepared by ***Northeast Engineering & Commissioning***

HVAC

- The existing 17 year-old oil fired, cast iron hot water boiler is currently offline. The boiler has a realistic lifespan of about another decade but should be replaced as part of a renovation.
- The 13 year-old 220-gallon oil tank has been offline for an undetermined amount of time. Per Massachusetts law, this tank should have been removed after two years of disuse.
- Heating is distributed to finned-tube radiators in six zones, each controlled by a thermostat and zone valve. The first floor bathroom instead has a hydronic convector and the second floor's north dormer has electric finned tube with an undetermined output.
- There is no mechanical ventilation anywhere in the building and the attic is un-insulated.
- For both proposed architectural schemes, the heating load is estimated at 150 MBH and the cooling load is estimated at 8.5 tons. There are two options for heating and cooling:
 - **Option #1** involves keeping the same type of finned tube heating with an oil-fired boiler. The existing components could be maintained or replaced, but will require re-zoning. Cooling would be provided by mini-split systems, requiring five to six outdoor condensing units. This option would be more expensive up-front but would provide more comfort and lower utility bills.
 - **Option #2** involves providing an air source VRF heat pump system powered by electricity for both heating and cooling, which would require only one or two outdoor units. Toilet exhaust fans would need to be provided and the oil tank in the basement would need to be removed.
- Installation of a lift in the proposed location may require relocation of some piping and equipment, particularly hot water, domestic water, and the boiler. **Installation of a new boiler is recommended as relocation of an existing one is not prudent.**

Plumbing

- Sanitary piping appears to be in good condition but should be video scoped to determine if it could be re-used in a renovation.

- There is 3/4" cold water service from the street, but the meter is disconnected. At the first floor, water is heated by an electric, 20 gal. 2.5 kW heater in the basement, which appears to be in good condition after five to six years of use. A 2.5 gal., 1.44 kW point-of-use electric heater warms water at the second floor.
 - The existing 2.5 kW water heater would be sufficient for the retail design scheme (Option #2), but would not be large enough to support the shower required for the live/work scheme (Option #4).
 - An oil-fired boiler (as discussed above for Option #1) would allow for a larger indirect water heater or a larger electric water heater could be installed.
- Installation of new systems will require removing sections of the floor as the crawl space is inaccessible.
- Both proposed architectural schemes require removal of the existing plumbing fixtures.

Fire Protection

- There is no sprinkler system. **Installation of one would be a prudent investment regardless of the design option chosen by the Town.**
 - Sprinklers would not be required for retail use (Option #2), but would be required for live/work use (Option #4). The latter would require proper sprinkling in all areas, including a dry system for the exterior canopy and attic.

Cost estimates for each of the solutions described herein are listed in Section IV of the MEP/Fp assessment (p. xx).



I. INTRODUCTION

Northeast Engineering & Commissioning was retained by Spencer, Sullivan & Vogt, to evaluate the existing HVAC & Plumbing systems at the Lansing Millis Memorial Building, and to develop options and recommendations for moving forward. Our primary objectives are:

1. Evaluate the existing system
2. Determine modifications required to renovate the building to:
 - a. Live/work artist studio (Option #4)
 - b. Retail space (Option #2)

II. EXISTING CONDITIONS

A. HVAC

The existing HVAC system consists of an oil fired, cast iron, hot water boiler, Weil McLain model P-WGO-5 rated at 175,000 BTU/hr gross, 152,000 BTU/hr net output which was installed in 2003. The boiler is currently off-line, with the cold water make-up and expansion tank removed. The boiler appears to be in decent condition, but is 17 years old. The boiler could last another ten years if maintained, but a significant renovation would warrant it's replacement.

The fuel oil is stored in a 220 gallon tank in the basement, which was installed in 2007. Per 527 CMR 9.02, any above ground fuel oil storage tank unused for more than 24 months must be removed. It is unknown how long the existing boiler has been disconnected.

The heating hot water is distributed to finned tube radiation in six different zones throughout the building. Each zone controlled by a wall mounted thermostat and a zone valve.

The majority of the building is provided with residential style finned tube radiation. While the exact model could not be determined, similar products have rated outputs of around 500 BTU/hr FT. The first floor bathroom is provided with a hydronic convector.

There is some electric finned tube on the second floor, the output of which could not be determined.

There is currently no mechanical ventilation.

The existing chimney could not be accessed, but appears to be lined.

The existing crawl space under the North half of the building is not accessible and will make installation of new systems difficult without removal of sections of the floor.

The attic is currently un-insulated and un-ventilated.

B. Plumbing

The Plumbing system serves one bathroom on each floor, and a two-bay sink on the first floor.

The sanitary piping appears to be in good condition, but should be scoped from the building to the street to properly determine it's condition.

The domestic water is supplied by a ¾" cold water service from the street. The meter is currently disconnected.

The domestic hot water on the first floor is heated by an electric 20 gallon, 2.5



KW water heater AO Smith model EJCS-20-200, located in the basement. The heater was installed in 2015-2016 and appears to be in good condition.

The domestic water to the second floor lavatory is heated by a small electric point-of-use 2.5gal, 1.44KW water heater, Eemax model EMT2.5.

The Plumbing fixtures in general are aged and in disrepair.

The existing crawl space under the North half of the building is not accessible and will make installation of new systems difficult without removal of sections of the floor.

C. Fire Protection

There is no existing sprinkler system in the building

III. DESIGN CONSIDERATIONS

A. HVAC

The building heating and cooling loads are estimated to be about 8-1/2 tons of cooling and 150 MBH heating. The loads are similar for both proposed scenarios. Heating and cooling could be accomplished multiple ways. One option would be to keep the same type of finned tube heating with an oil fired boiler. The existing boiler and finned tube could either be kept or replaced, but would be re-zoned to fit the new layout. Cooling would be provided by mini split systems. Cooling only mini-splits require an outdoor condensing unit for each fan coil, or in this case about five or six units.

Another option would be to provide an air source VRF heat pump system to provide both heating and cooling. This would only require one or two units, installed outside.

The first option would be more expensive up front and require more equipment, but provide for a more comfortable space and have lower utility bills. The oil fired boiler would also allow for an indirect fired domestic water heater to replace the existing electric water heater.

The second option would allow for a single electrically-powered system to provide heating and cooling. Toilet exhaust fans must be added to ventilate the bathrooms. The existing oil tank will need to be removed if it is not used.

Location of the lift may require piping and equipment modifications to allow for the installation. As it is currently shown in option #2, some of the hot water, domestic water, and the boiler itself would need to be re-located. Note that re-locating the existing boiler is not recommended, and that installing a new boiler would be more prudent.

B. Plumbing

The sanitary system should first be scoped to determine if it could be re-used in any major renovation.

Either architectural design scenario requires the existing plumbing fixtures be removed. The existing 2.5 KW water heater would be sufficient for the retail design option #2 since it only serves two bathroom sinks and a kitchenette. The water heater would not be large enough to support the shower required for the live/work option #4. An oil fired boiler would allow for a larger indirect water heater, or a new larger electric water heater could be installed.

C. Fire Protection

A sprinkler system may, or may not be required depending on the design option chosen, but would be a prudent investment regardless.

Per 780 CMR, Massachusetts amendments table 903.2, use groups B & M (the likely use group for design option #2, only requires sprinklers in buildings greater than 12,000 SF. This is modified by MGL 26G requiring sprinklers in buildings larger than 7500 SF. Regardless, sprinklers would not be required for design option #2.

Design option #4 however, would be a mixed use residential building requiring sprinklers regardless of building size per 780 CMR, Massachusetts amendments table 903.2. This sprinkler system would need to be designed and installed in accordance with NFPA-13, 2013. Sprinklers would be required in all areas, including a dry system for the exterior canopy and the attic.

IV. COST CONSIDERATIONS

Below are preliminary budget figures for the design considerations listed above:

- A. New boiler, flue, pumps, piping & heaters: \$80K
- B. Indirect Water Heater: \$4K
- C. Electric Water Heater:\$2.5K
- D. Two 5-ton mini-split heat pumps: \$20K
- E. Five 2-ton mini-split A/C only: \$35K
- F. Bathroom Exhaust Fans: \$5K
- G. New Plumbing Fixtures & Piping: \$25K-\$40K
- H. Sprinkler system: \$80K



THIS PAGE INTENTIONALLY LEFT BLANK

REGULATORY ANALYSIS

This section of the report briefly describes the applicability of the 9th edition of the Massachusetts State Building Code (2015 International Existing Building Code – with Massachusetts Amendments) and architectural access regulations (521 CMR Regulations of the Massachusetts Architectural Access Board, or MAAB).

The Commonwealth adopted the 9th Edition of the *Massachusetts State Building Code* (2015 *International Existing Building Code* – with Massachusetts Amendments in this case for an existing building), on October 20, 2017. The new code went into effect, as of January 1, 2018.

The purpose of the building code is to:

- Establish minimum requirements to safeguard public health, safety and welfare
- Provide life safety from fire and other hazards to building occupants
- Protect the building from loss or damage due to fire or other environmental events
- Provide safety to fire fighters and emergency responders during emergency operations

In general, existing buildings are not required to retroactively conform to the current building code, except where existing health and safety conditions are considered hazardous by the local building official.

The *International Building Code* for new construction (IBC) would be referenced for any substantial renovation of the existing building, or if a new addition is contemplated. In the case with the Lansing Millis Memorial Building, any proposed Change of Occupancy Classification will require that much of the new work will reference the IBC. Otherwise, existing buildings are governed by the *International Building Code for Existing Construction* (IBCEC).

The IBCEC divides work on existing buildings into “Repairs” and “Alterations.” “Repairs” are considered in-kind replacements of existing materials and systems, and would be considered as guidelines for building maintenance. “Alterations” are categorized into three (3) levels depending upon the amount and scale of work involved.

Most recommendations for work to be undertaken at the Lansing Millis would be considered a blend of **Repairs and Alterations**. Generally speaking, the Code requires any **Repair** work to maintain or improve the life safety of the building. Basically, no condition should be made less code compliant than before work started. An example of a Repair item would be the patching or partial replacement of a damaged wood cornice and gutter assembly.

The proposed interior work scope would largely fall under the category **Alterations – Level 1 and Alterations Level 2**.



Level 1 Alterations cover the replacement of existing materials and systems with new ones. An example would be the replacement of an existing roof with a new roof. Work on historic buildings generally conform to the requirements for **Level 1 Alterations**. The recommended interior **Level 1** work scope at the Lansing Millis Building would include the removal of any plaster wall or ceilings and the installation of new gypsum drywall finishes.

A very important aspect of any proposed **Level 1 Alteration** work occurs if the building is located in a flood hazard area. If the scope of the proposed work constitutes *substantial improvements* (construction costs exceeding 50% or more of the market value of the building), then the building must be brought into compliance with the flood-resistant provisions of the *IBC Code* for new construction (*IEBC* Section 701.3). Fortunately, the Lansing Millis Building is not located within the Special Flood Hazard District so there is no requirement to bring the building to full compliance.

Level 2 Alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any building system, and the installation of any additional equipment. Proposed work at the Lansing Millis will therefore be classified as **Level 2 Alterations**. Within the work area, there are a number of requirements that will need to be addressed, such as:

- 30 minute fire enclosure is required for stairs
- Fire alarm system is required
- Existing electrical wiring must be upgraded if it does not comply with NFPA 70
- Natural or mechanical ventilation must be provided in accordance with the International Mechanical Code
- Means of Egress and Accessibility elements must be provided within the work area.

Change of Occupancy: The current Use and Occupancy of the Lansing Millis Building is classified as Use Group B– Business. A proposed use of the building to accommodate professional offices would be a continuation of the current use. While a proposed use as a café or small restaurant would normally classify as an Assembly use, the small size of the building would result in an occupancy of under 50, and therefore be allowed by code to be classified as a Business use, a continuation of the existing Use Group. A residential use of the building would be a Change and Occupancy, and require that changes be made to bring the building in conformance with the Residential Building Code.

Fire Protection: A fire protection system (i.e. sprinkler) is not proposed or required. In making that determination, we are guided by the advisory memo from the Fire Safety Commission from 2009 that requires sprinklers for buildings with a gross area exceeding 7,500 square feet. For this calculation all areas, including attics and basements are counted. In the case of the Lansing Millis Building, the gross area equals 2,905, well under the requirement for sprinkler.

On the other hand, sprinkling **will** be required if the building is adapted as a live/work space (Option 4), per the report from *Northeast Engineering*, p. 87.

APPLICABLE CODES & STANDARDS (MODEL CODE BASIS)

- International Existing Building Code (IEBC)
- Base Volume (2015 International Building Code with Massachusetts Amendments)
- Massachusetts State Building code (780 CMR), Ninth Edition, Base Volume (2015 International Building Code with Massachusetts Amendments)
- Energy Conservation (780 CMR 13.00)
- Massachusetts Board of State Examiners of Plumbers and Gas Fitters Regulations (248 CMR)
- Massachusetts Comprehensive Fire Safety Code (527 CMR 1.00 – 2012 NFPA 1: Fire Code with amendments)
- Massachusetts Electrical Code (527 CMR 12.00 – 2014 NFPA 70: National Electrical Code with amendments)
- Massachusetts Architectural Access Board Regulations – MAAB - (521 CMR)
- Americans with Disabilities Act (ADA)

RULES AND REGULATIONS OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB)

Architectural access regulation in Massachusetts (521 CMR) are written to encourage making buildings and spaces barrier free to persons with physical or mental disabilities.

Note that the Lansing Millis Building is not required to retroactively outfit its facility for Universal Access. However, there are several “triggers” where work done will need to incorporate accessibility. Note that the guidelines below describe a minimum standard. Exceeding these requirements is at the discretion of the Town.

Generally speaking, all new work including construction, reconstruction, alterations, re-modeling, additions, and changes in use should conform to the access regulations. This means all additions, reconstruction, remodeling, and alterations or repairs to existing public buildings or facilities which require a building permit.

If the building permit value of the work being performed amounts to less than 30% of the assessed building value and less than \$100,000, only new work or renovated spaces would be required to comply. The Town of Millis tax assessment for fiscal year 2019 is \$295,000 (building only), so the 30% threshold would be \$88,500.

If the work value is under 30% of the assessed building value, but over \$100,000, the work must be made accessible and both an accessible entrance and rest room are required.

If the value of the work to be done is determined to be greater than 30% of the “full and fair cash value” of the building, which is \$295,000, then the entire facility would have to be made fully accessible. If spaces cannot be made accessible, a variance may be sought to allow their continued use by the public, or for exemption for certain uses.

Whether performed alone or in combination with each other, the following types of alterations are not subject to 521 CMR 3.3.1 and do not count towards the 30% trigger. When performing exempted work, a memo stating the exempted work and its



costs must be filed with the permit application or a separate building permit must be obtained. Exceptions not counting towards the 30% trigger are:

- Alteration work which is limited solely to electrical, mechanical, or plumbing systems, to abatement of hazardous materials, or
- To retrofit of automatic sprinklers, and does not involve the alteration of any elements or spaces required to be accessible under 521 CMR.
- Roof replacement or repair, window repair or replacement, repointing and masonry repair work.
- Work relating to septic system repairs, site utilities and landscaping.

However, if the above work alone or in concert with additional work exceeds the 30% trigger, then it is as if the work is not exempted. Note that the cost of work is tracked over a three year span, so phased projects may be cumulative.

The scope of the proposed work would trigger **full compliance with the applicable MAAB regulations**. The 2nd floor area is not currently accessible. The second floor would have to be designated as unavailable for use by the public, or an elevator would be required. Per 521 CMR, a wheelchair lift would be permitted for second floor access in lieu of a full elevator, because the building is less than 3 stories, and has less than 3,000 square feet per floor.

The summary below identifies some basic information about the Lansing Millis Building and how it relates to current building code requirements. The review should be used as a guide when contemplating building renovations.

CODE SUMMARY

A. Work Area and Classification of Work

1. Existing building to be repaired or altered: 2 stories

- a. 1st Floor = 1,030 SF
- b. 2nd Floor = 1,320 SF
- c. Basement = 550 SF
- d. TOTAL SF = 2,905 SF

2. It is important to note that while the Lansing Millis is identified as a contributing structure to a National Register Historic District, the building is not individually listed. As such, exceptions to the building code, described in IEBC, 2015 Edition, Chapter 12, "Historic Buildings," do not apply to the present uses and characteristics of the building.

For Historic Buildings, the IEBC provides the opportunity for the Architect to prepare a report for review by the code official, wherein alternative compliance options that provide an equivalent level of safety can be presented when compliance with provisions of the code would be damaging to contributing historic features of the building. Some of the features that typically come under review in these reports are the effect of door sizes and swings, placement of exit signs,

fire enclosures, and stairs. Section 1206 provides the option for conforming to structural floor loading by limiting occupancy rather than requiring reinforcement of existing framing.

B. Occupancy Classification

1. Most Recent Occupancy – Business, B
 2. Proposed Occupancy – Business, B; live/work unit, R-2; or possibly single family residential, R-3.
- Note that while a proposed restaurant or café use would usually be classified as an Assembly, Group A use, 303.1.1 allows small buildings of Assembly use to be classified as Business use when the occupancy is less than 50.

C. Minimum Construction Type - Classification VB

1. The Lansing Millis Building most closely resembles Construction Classification VB, with exterior and interior wood stud bearing walls, and dimension lumber floor framing.

D. Fire Resistance Ratings:

1. The building is not currently protected throughout with an automatic fire suppression (sprinkler) system.

E. Means of Egress:

1. The occupancy load for the building is quite limited due to its size, that is, the building's maximum occupancy will be less than 49. Therefore a single means of egress would be permitted from each floor for Business, Assembly, or Residential use. For any of those uses, it is recommended that the non-original fire escape be removed, as it represents a maintenance problem and detracts from the historic character of the building.

F. Structural

- 807.1 – Proposed alterations cause NO increase in design dead, live or snow loads.
807.3 – Proposed alterations cause NO increase in design lateral loads.
807.4 – No alterations are proposed that will reduce the gravity load carrying capacity of this structure.
807.5 – No alterations are proposed that will increase the design lateral load.
807.6 – The capacity of the existing structural elements to resist forces will not be reduced.

G. Electrical

- 808.1 – New work shall conform to NFPA 70
808.2 – Existing wiring is NOT required to be upgraded as the building is in Use Group B.

H. Mechanical

- 809.1 – New work shall conform to the International Mechanical Code.

809.2 and 809.3 – New work is designed to conform to Indoor Air Quality Procedure of ASHRAE 62.1.

I. Energy Conservation

811.1 – Entire building is not required to comply with the provisions of the International Energy Conservation Code. Alterations are required to comply.

J. Massachusetts Plumbing Code (248 CMR)

1. Proposed Occupancy Count (Table 1004.1.1 Max. Floor Area Allowances):

Plumbing Fixture Counts

OPTION 1 CAFÉ/BUSINESS

Proposed Occupants: First floor

16 diners plus 4 employees =	20 persons
	10 Female
	10 Male

Fixture Calculations:

Toilets Required, Female @ 1 per 50:	1 required
Toilets Provided, Female:	1 <i>provided</i>
Toilets Required, Male @ 1 per 100:	1 required
Toilets/Urinals Provided, Male:	1 <i>provided</i>
Lavatories Required, M / F @ 1 per 50:	1 req. /gender
Lavatories Provided, Female:	1 <i>provided</i>
Lavatories Provided, Male:	1 <i>provided</i>

Proposed Occupants: Second floor

Business use: 1 person per 100sf =	14 persons
	7 Female
	7 Male

Fixture Calculations:

Toilets Required	1 required
Toilets Provided	1 <i>provided</i>
Lavatories Required	1 required
Lavatories Provided	1 <i>provided</i>

OPTION 2 BUSINESS

Proposed Occupants:

1 per 100 GSF =	
2350 / 100 =	24 persons
	12 Female

12 Male

Fixture Calculations:

Toilets Required, Female @ 1 per 25:	1 required
Toilets Provided, Female:	1 <i>provided</i>
Toilets Required, Male @ 1 per 20:	1 required
Lavatories Required, M/F @ 1 per 40:	1 req. / gender
Lavatories Provided, Female:	1 <i>provided</i>
Lavatories Provided, Male:	1 <i>provided</i>

ZONING ANALYSIS

Zoning District: C-V Commercial Village

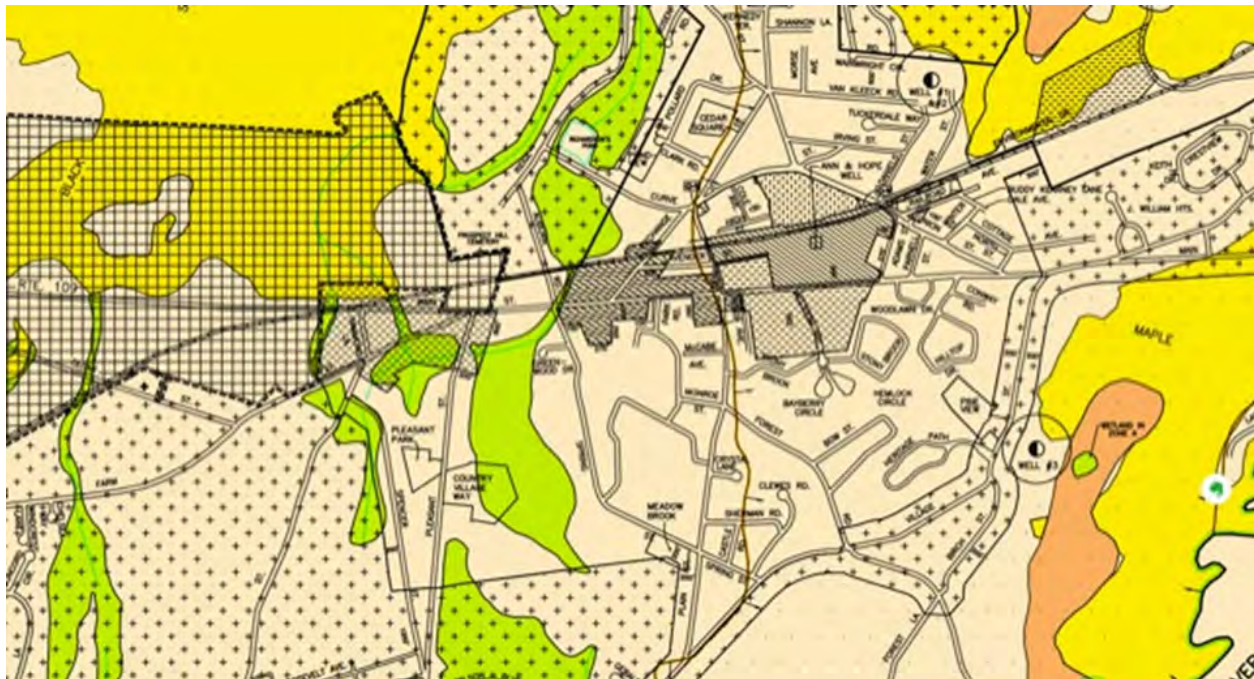
Property is NOT in a Watershed Protection District, Groundwater Protection District, or Special Flood Hazard District

Permitted uses:

Restaurant: yes
 Professional Offices: yes
 Retail: yes
 Single Family Residence: no
 Live/work: yes, with special permit

Parking requirements:

Restaurant: 1 space per 4 seats
 Retail or Business use: 1 space per 250 GSF





THIS PAGE INTENTIONALLY LEFT BLANK

PART 4: SCOPE & COST ESTIMATES

A budget of costs for the recommended scope of needs and repairs has been established, along with costs for the interior fit outs for the two preferred use options (*Option 1 – Business Use*, and *Option 4 – Live/Work Space*).

The initial exterior restoration budget was divided into three phases, the scope of each determined by the priority of the necessary work. In that estimate, the first phase included all exterior envelope repairs (roofing, gutters and downspouts, siding, and masonry), the second phase included window replacement, and the third phase included site improvements like paving, planting, and lighting.

Following discussion with the Permanent Building Committee during a January 19th meeting the exterior restoration estimate was reorganized to have only two phases, the first including all work required to stabilize the building and the second including the remaining scope items. The reworked estimate is included on pp. 111-112.

The first priority is to address urgent deficiencies at the envelope, which are allowing water to penetrate the building at an accelerating rate. Of those deficiencies noted in the conditions assessment, roofing issues are by far the most pressing. In **Phase I**, failing or otherwise missing elements at the building's roof will be comprehensively replaced, including asphalt shingles, sheet metal flashings, gutters, and downspouts, and wood cornices, fascia boards, and soffits. **The estimated cost for these *Phase I* priorities is \$493,577.**

With roofing problems corrected and the building effectively stabilized, **Phase II** will remediate all other exterior deficiencies identified in the conditions assessment. As part of this campaign, the non-original vestibule and fire egress addition will be removed, wood shingle siding will be comprehensively replaced, masonry will be repaired (and rebuilt where necessary) and all non-original windows and doors will be replaced with historically appropriate alternatives. Most structural measures recommended in Greg Nowak's report on pp. 71-8, including replacement of columns in the basement and wood pillars at the exterior, and selective rebuilding at the turret, are not high priority and will also be addressed during this phase. Similarly, Jeff White's recommendation to insulate the attic will be executed as part of Phase II, along with the installation of a vapor barrier at the basement crawl space. It is our recommendation that all site plan revisions, including paving, lighting, and planting, also be carried out as part of this phase. **The estimated cost for *Phase II* is \$1,022,081.**

Dollar amounts for the removal/abatement of hazardous materials such as lead paint and asbestos have been included in the estimate for *both phases*. **A 20% construction contingency and 15% design contingency have also been factored in, as well as architectural and engineering fees at 15%.**

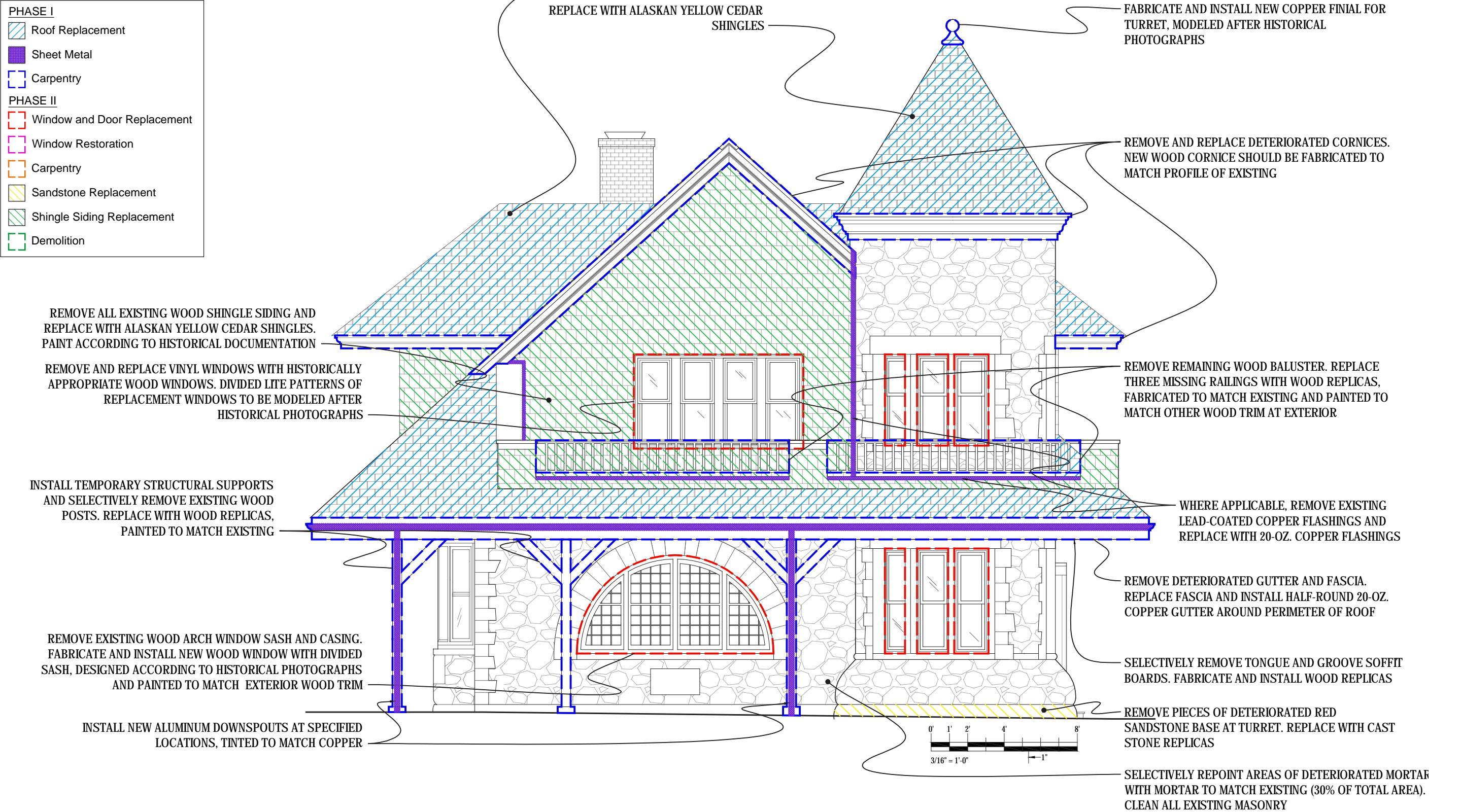
The interior renovation costs will vary depending on the preferred development option. Design *Option 2*, the proposed business use option, has a lower square foot cost, but does feature a new vertical lift to provide access to both floors. Design *Option 4*, the proposed live/work space, has a higher square foot cost normally expected



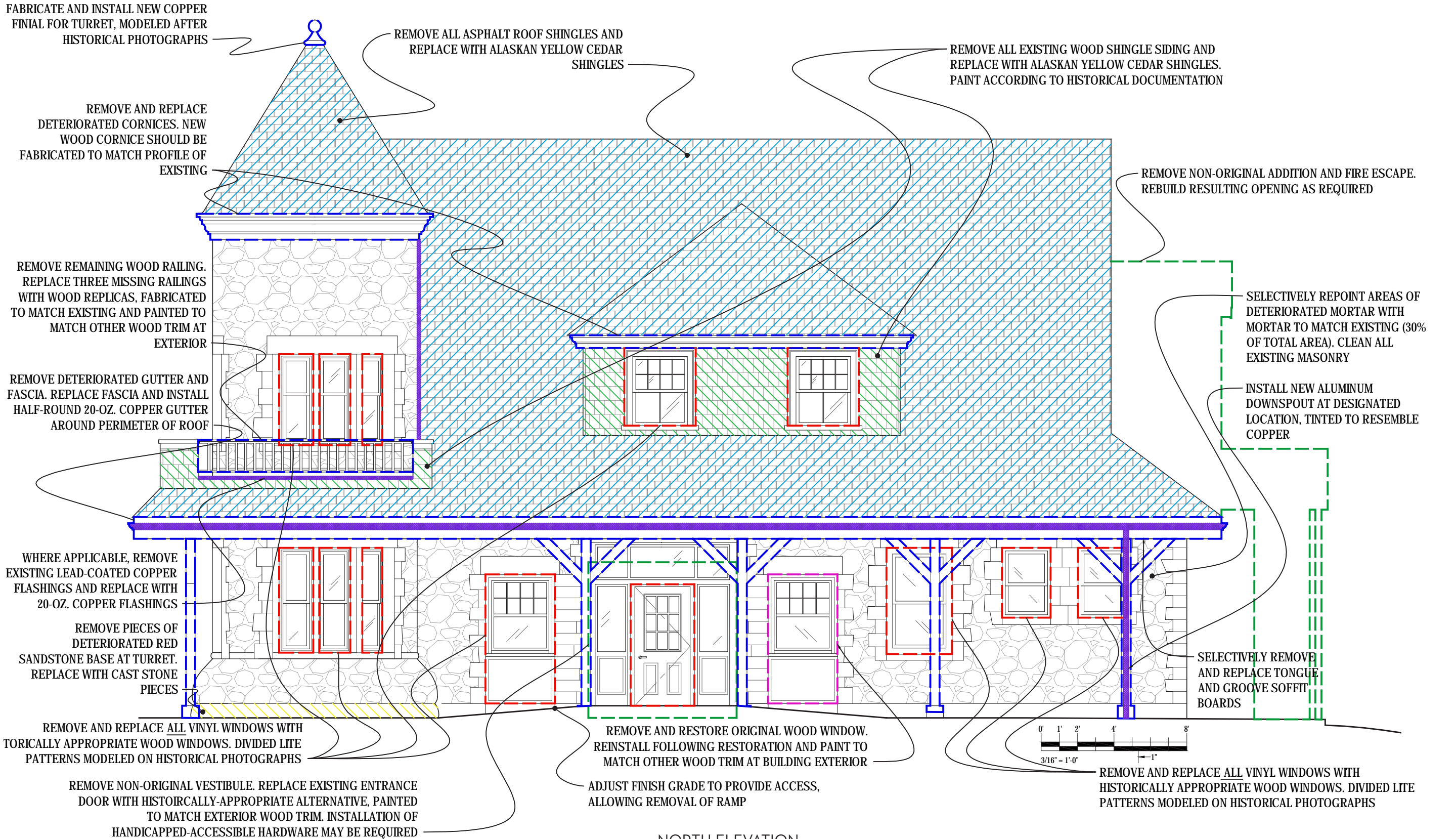
when kitchens and bathrooms are included in the scope. The fitout costs include the new plumbing, electrical, and mechanical improvements associated with the selected use program. Fitout estimates have also changed since submission of the draft report, but less substantially than the restoration costs.

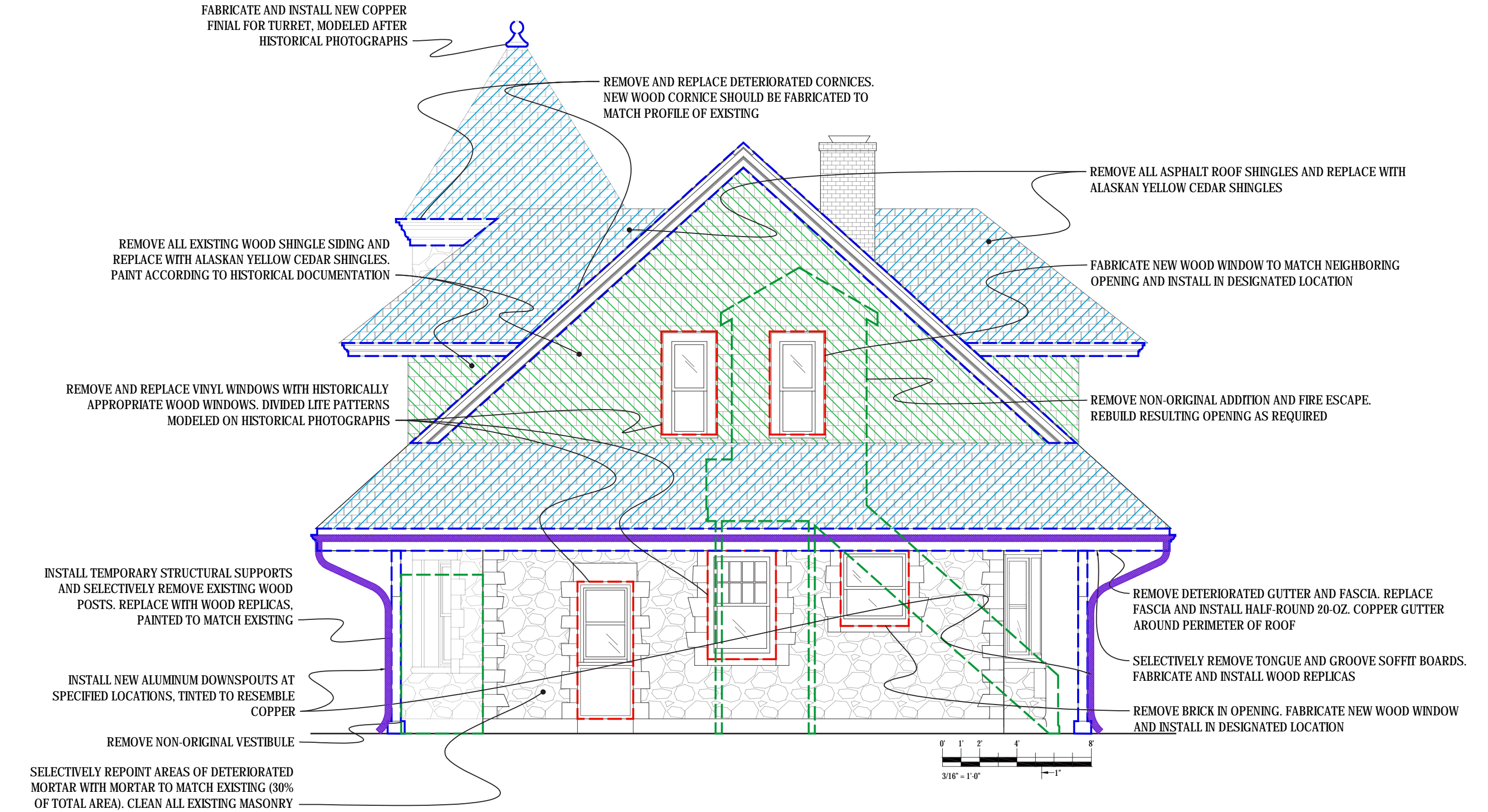
The budget cost for the *Option 2* fit out is \$729,731 and the cost for the *Option 4* fit out is \$830,167. The budget numbers given include contingencies and architectural/engineering fees, and assume that the work would be publicly bid under the requirements of M.G.L. Chapter 149.

RESTORATION SCOPE DRAWINGS

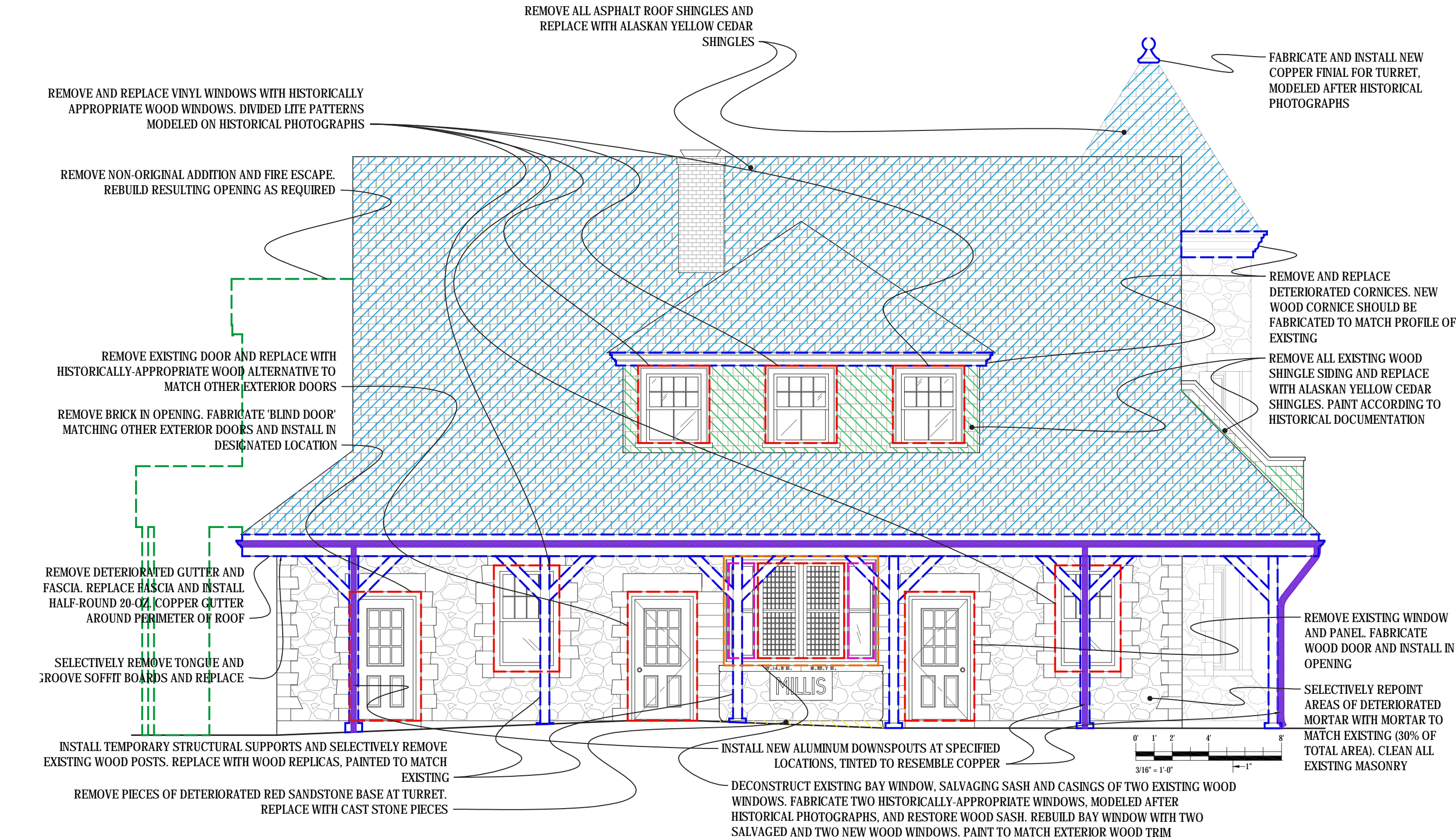


EAST ELEVATION





WEST ELEVATION



SOUTH ELEVATION

OUTLINE SPECIFICATIONS

The following outline specifications are developed based on schemated design

01 00 00 GENERAL REQUIREMENTS

01 10 00 Summary

Restoration of building exterior, interior structural repairs, systems upgrades, and interior renovation specific to preferred future use options.

01 40 00 Quality Requirements

Build to requirements of the 9th Edition Massachusetts Building Code, including the 2015 International Existing Building Code, and CMR 521 Regulations of the Architectural Access Board.

01 50 00 Temporary Facilities and Controls

Temporary power and heat

Temporary sanitary facilities

Temporary fencing

Barricades, direction signage, general public safety controls

Access to Work, lifts, staging, hoisting

02 00 00 EXISTING CONDITIONS AND SITE

02 40 00 Demolition

Remove non-original entry vestibule and 2nd floor egress structure

Note: "Replacement" items to follow assume removal of existing

02 80 00 Remediation

Asbestos abatement

Lead-based paint management

03 00 00 CONCRETE

New cast-in-place concrete footings for columns

04 00 00 MASONRY

Selective cleaning to remove biological growth at exterior

Selective repointing of exterior masonry

Selective rebuilding of masonry

Replacement of deteriorated sandstone at grade



05 00 00	METALS
	Structural and Miscellaneous Metals
	Replacement of corroded steel columns at basement
06 00 00	WOODS, PLASTICS AND COMPOSITES
06 10 00	Rough Carpentry
	Install joist hangers at first floor framing
06 40 00	Architectural Woodwork
	Repair/Replace exterior wood columns
	Replace deteriorated soffit and fascia
	Selective rebuilding as required by the removal of vestibule & exit enclosure
	Replace wood shingle siding
07 00 00	THERMAL AND MOISTURE PROTECTION
07 21 00	Insulation
	Insulate attic
07 50 00	Roofing
	Replace asphalt shingles with new wood shingle roof
	Replace sheet metal flashings.
	Replace wood gutters with new copper gutters and downspouts
08 00 00	OPENINGS
08 10 00	Doors and Frames
	Replace exterior doors with new historically appropriate doors
	At interior, reuse any original doors
	New doors and frames as required for interior schemes
08 50 00	Windows
	Replace existing vinyl windows and wood arch window
	Restore original wood windows
08 70 00	Hardware
	New hardware where required, including auto operator accessible entry door
08 90 00	Louvers and vents
	As required for new mechanical systems.

09 00 00 FINISHES**09 30 00 Tiling**

Walls and wainscots at bathrooms

09 60 00 Flooring

Refinish wood floors

New resilient flooring in bathrooms, food prep areas

09 90 00 Painting and Coatings

Exterior - Paint siding and trim

Interior – Paint ceilings, walls, trim, doors, and windows

14 00 00 CONVEYING SYSTEMS**14 20 00 Lift**

New Limited Use / Limited Access lift (Option 2)

22 00 00 PLUMBING

Replace fixture and associated piping

23 00 00 HVAC

Replace Boiler

New air conditioning units

26 00 00 ELECTRICAL

New lighting, switching, and power outlets per selected use Option

32 00 00 SITE IMPROVEMENTS

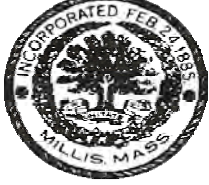

Site Plan revision including parking, paving, landscaping

- End of Outline Specifications -



THIS PAGE INTENTIONALLY LEFT BLANK

COST ESTIMATE - RESTORATION

		Town of Millis Lansing Millis Memorial Building Assessment Report				
					1 Thompson Square, Suite 504 • Charlestown, MA 02129	
DIV. 01 - GENERAL REQUIREMENTS and GENERAL CONDITIONS		UNIT	QUAN	COST	PHASE I	PHASE II
Staging, disposal, etc.					\$40,000	\$75,000
Lead paint management and hazardous materials removals					\$20,000	\$40,000
SUBTOTAL					\$60,000	\$115,000
DIV. 02 - SITE CONSTRUCTION		UNIT	QUAN	COST		
Demolition: Remove non-original vestibule, fire escape structure, and vault		LS	1	35000		\$35,000
Asbestos Abatement		LS	1	20000		\$20,000
Site plan revision for parking (incl. preparation, paving, lighting, and planting)		LS	1	100000		\$100,000
SUBTOTAL						\$155,000
DIV. 04 - MASONRY		UNIT	QUAN	COST		
Selective masonry repointing (30% of 1,500 SF)		SF	450	20		\$9,000
Selective masonry rebuilding		SF	15	150		\$2,250
Comprehensively remove vegetative growth; clean masonry		LS	1	8000		\$8,000
Selective replacement of sandstone base (at turret and south bay window)		LF	38	450		\$17,100
SUBTOTAL						\$36,350
DIV. 05 - METALS		UNIT	QUAN	COST		
Column replacements in basement		EA	3	7,000		\$21,000
SUBTOTAL						\$21,000
DIV. 06 - CARPENTRY		UNIT	QUAN	COST		
Install joist hangers at first floor framing		LS	1	2000		\$2,000
Repair/replace exterior wood columns		EA	6	800		\$4,800
Replace missing second floor balustrades		LF	40	100		\$4,000
Replace deteriorated fascia and cornices (100%)		LF	322	100	\$32,200	
Replace deteriorated soffit (40%)		LS	1	20000	\$20,000	
Replace shingle siding (incl. 'patching' at west wall)		SF	718	30		\$21,540
Selective rebuilding at removed vestibule and fire escape		LS	1	8000		\$8,000
SUBTOTAL					\$52,200	\$40,340

DIV. 07 - THERMAL AND MOISTURE PROTECTION		UNIT	QUAN	COST		
	Install vapor barrier at crawl space	SF	590	2		\$1,180
	Replace roof with new shingles (~4182 SF)	SF	4182	30	\$125,460	
	Replace sheet metal flashings, gutters, and downspouts	LF	485	100	\$48,500	
	Insulate attic	SF	920	10		\$9,200
SUBTOTAL					\$173,960	\$10,380
DIV. 08 - DOORS AND WINDOWS		UNIT	QUAN	COST		
	Replacement of existing windows w/ new wood windows	EA	33	4500		\$148,500
	Fabrication and installation of replacement exterior doors	EA	3	2500		\$7,500
	Installation of door hardware (incl. lever handles and automatic openers as req'd for universal accessibility)	LS	1	2000		\$2,000
	Fabrication and installation of blind door at south wall	LS	1	1500		\$1,500
	Fabrication and installation of replacement arch window at east wall	LS	1	15000		\$15,000
	Reconstruction of south bay window	LS	1	20000		\$20,000
SUBTOTAL						\$194,500
DIV. 09 - FINISHES		UNIT	QUAN	COST		
	Paint exterior siding and trim	LS	1	20000		\$20,000
	Note: Other interior finishes included in overall fit-up costs					
SUBTOTAL						\$20,000
DIV. 14, 15 & 16 - PLUMBING, MECHANICAL, ELECTRICAL		UNIT	QUAN	COST		
	Note: Costs for plumbing, mechanical, electrical are identified in design option estimates					
SUBTOTAL						
SUBTOTAL					\$286,160	\$592,570
Overhead + Profit: @ 10% +					\$28,616	\$59,257
SUBTOTAL					\$314,776	\$651,827
Payment + Performance Bonds: @ 1% +					\$3,148	\$6,518
CONSTRUCTION COST SUBTOTAL					\$317,924	\$658,345
Construction Contingency: @ 20% +					\$63,585	\$131,669
Design Contingency: @ 15%					\$47,689	\$98,751.79
Architecture/Engineering Fees 15% +					\$64,380	\$133,315
PROJECT COST TOTAL					\$493,577	\$1,022,081
					\$1,515,658	

COST ESTIMATE - INTERIOR FIT-OUTS

COST ESTIMATE – LANSING MILLIS MEMORIAL BUILDING – FITOUT SCHEMES						
DIVISION						
01 - General Requirements						
(See Below)						
	UNIT	COST	QTY OPT. 2	OPTION 2	QTY OPT. 4	OPTION 4
02 - Existing Conditions						
Selective demolition	SF	\$4	3,166	\$12,664	\$3,166	\$12,664
Subtotal				\$12,664		\$12,664
Unit Costs						
Business space \$100/sf	SF	100	3,166	\$316,600	\$1,445	\$144,500
Vertical Lift				\$60,000		
Residential space \$750/sf	SF	175			\$1,721	\$301,175
Subtotal				\$376,600		\$445,675
SCOPE OF WORK COST				\$389,264		\$458,339
01 - General Conditions & Requirements (15%)				\$58,390		\$68,751
				\$447,654		\$527,090
Overhead and Profit (5%)				\$22,383		\$26,354
				\$470,036		\$553,444
CONSTRUCTION TOTAL				\$470,036		\$553,444
Contingency (35%) - design & construction				\$164,513		\$193,706
Architectural Fees (15%)				\$95,182		\$83,017
PROJECT COST TOTAL				\$729,731		\$830,167



THIS PAGE INTENTIONALLY LEFT BLANK

PART 5: MANAGEMENT PLAN

The success of the repurposing of an historic structure requires a multi-tiered approach based on a deep understanding of the historic integrity of the building; a practical plan for the physical rehabilitation of the building and site; a level-headed financing strategy; and finally, an ownership management plan. In the case of the Lansing Millis Memorial Building, this is conditioned by the municipal ownership of the property and the commitment to long term stewardship expressed by the Town of Millis. The question is how to make all this happen in a rational framework.

There are several scenarios for this:

1. Management by the Town.
2. Public-private partnership with a long-term ground lease and preservation restrictions.
3. Outright lease.
4. Outright sale with preservation restrictions.

1. Management by the Town

This assumes the following:

- a. Investment of \$1.5 m in the exterior envelope to stabilize and preserve the building.
- b. Decision on the use of the building and site. Preferred options by the planning committee are (1) commercial use on both floors – which can be multiple tenants; and (2) live/workspace with first floor as workspace and second as residential – assuming one tenant.
- c. Investment for Option 2 is \$648,000. Option 4 \$747,000.
- d. Financing can be achieved with either municipal financing, CPA-funded financing, or a combination thereof, mostly likely bonding for a 20-year period.
- e. The Town would need to issue Request for Proposals for tenants in either scenario or be prepared to manage those leasing/tenant relationships through the public procurement process (Central Register).
- f. It is likely that annual maintenance and care would continue to be the Town's responsibility. While some amount of that may be assigned to the tenants, it is necessary to make sure that the building is well maintained to ensure the investment made in its rehabilitation.
- g. Real estate taxes would be assessed for commercial tenants but that may not apply to a non-profit tenant.

2. Public-private partnership with a long-term ground lease and preservation restrictions:

This assumes the following:

- a. The Town prepares a Request for Proposals (RFP) for the long-term leasing (minimum 20 years) through the public procurement process (Central Register).
- b. The terms of the RFP would describe requirements for investment in preservation and rehabilitation by the applicant.
- c. However, given the magnitude of preservation, it is likely that some amount of investment by the Town will be necessary to make this work financially.
- d. The lease should include specific preservation requirements and the associated time frame.
- e. Annual inspections will be required by the Town to ensure that the lease requirements and regular maintenance standards are being observed.
- f. Real estate taxes would be assessed for commercial tenants but that may not apply to a non-profit tenant.

This method of continued public ownership with a private lessee has been used in several situations known to Spencer, Sullivan & Vogt, ranging from the Buckman Tavern, owned by the Town of Lexington, now in its second 100-year lease arrangement with the Lexington Historical Society, to the Nahant Lifesaving Station, owned by the Town of Nahant, leased to the Nahant Preservation Trust. Another example is the Hull Lifesaving Station leased to the Hull Lifesaving Station Museum. The case of the Nahant Community Center, the former Valley Road School which is under the aegis of the Nahant Historical Commission, Town of Nahant, is a good comparable example for the Lansing Millis Station. Now about to begin its second 20-year lease period, this building is leased to the Nahant Preservation Trust, which began its life to save this building from demolition. The Trust succeeded in raised funds to rehabilitate the 15,000 SF building which had been unoccupied for over 20 years, and leases 50% of the space to non-profit tenants, with the balance leased to commercial tenants.

Another example of such a leasing structure is the Commonwealth of Massachusetts, Department of Conservation and Recreation's Historic Stewardship Program.

Subsequent to having been awarded the lease through the RFP public procurement process, the advantage to this leasing scenario is the ability of private entities to

raised funds and invest in rehabilitation independent of the public procurement process.

3. Outright lease:

- a. To make this building attractive to potential tenants, the steps outlined in option 1 would likely be necessary.
- b. The Town would then prepare a Request for Proposals for the leasing through the public procurement process (Central Register). Lease terms would be in the 1 – 5-year range.
- c. The Town would be serving as a landlord with the associated management and costs of operation and maintenance.
- d. Real estate taxes would be assessed for commercial tenants but that may not apply to non-profits.

4. Outright sale with preservation restrictions:

This option assumes the following:

- a. The town of Millis would declare the Lansing Millis Memorial building as a surplus property.
- b. A preservation restriction is prepared that describes in detail the requirements for the physical preservation of the building, exterior and interior.
- c. The responsibility of ensuring that the terms of the preservation restrictions are achieved needs to be assigned to an experienced entity which will make annual inspections and the ability to enforce the restrictions.
- d. The offering for sale would be a *public* process.
- e. Depending on the buyer, the sale would increase the Town's tax base.
- f. Conversely, sale to a non-profit would not add to the tax base.



THIS PAGE INTENTIONALLY LEFT BLANK