Historic Building Conditions Assessment

Reverend William Morrison Meeting House
Londonderry, NH

May 31,2025

Table of Contents

Part I: Executive Summary/Introduction

Figure 1: Location of Morrison Meeting House

Purpose and Intent

The purpose and intent of this study is to guide the **Town of Londonderry** on building rehabilitation needs of **The Morrison Meeting House**. This study documents the history, evolution, character-defining features, and existing conditions of the building. Significant historic features are evaluated to determine how best to protect those features. Recommendations offer solutions for updating life safety, improving accessibility and energy performance. To be made fully usable, the historic **Morrison Meeting House** must be brought up to current safety standards including egress and fire protection. Occupied spaces used by the public should be made accessible in an equitable manner. Providing fresh air ventilation will make the spaces healthier and more comfortable for occupants. Optional energy efficiency improvements aligning with Town goals can offset operational costs with sustainable impacts. These recommendations provide implications for budgetary planning to create an approach that will address the community's needs.

Process - Information Gathering

The project team includes Arcove Architects and Structures North. The team is headed by principal architect Tracy S. Kozak, AIA of Arcove Architects.

Field investigations were conducted of the existing meeting house building to assess rehabilitation needs of the architectural envelope, MEP systems, & structural systems.

The history of the building was evaluated on site and researched to document the design & evolution of the existing structure and to document the roles it has played within the community. Sources consulted for historic documentation include town and county histories, architectural histories, historical society records, books, periodicals, photographs and reports.

To determine the programmatic needs of the meeting house, the team conducted collaborative meetings and site visits. This input process resulted in a list of recommendations to restore the existing building to code and preserve its architectural history for the town.

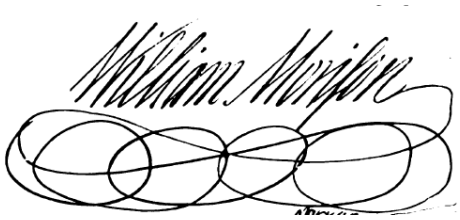
Findings & Recommendations

The Morison Meeting House has significant historic significance to the Town of Londonderry, NH. Over the years, this building has undergone several alterations to modify spaces in response to evolving programmatic needs of the town. These recommendations address structural stability, maintenance and rehabilitation of the existing building envelope and systems, means of egress, accessibility, and energy efficiency with an approach that will respect and maintain the historic character of the existing building.

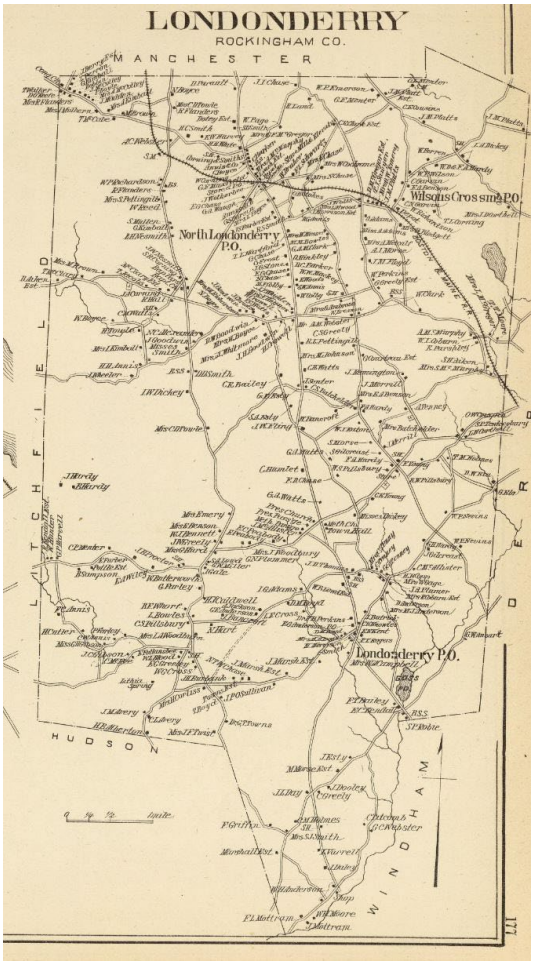
Part II: Historic & Development of the Property

History & Development

The Morrison Meeting house is Pre-Revolutionary War architecture and is the oldest public building standing in Londonderry, NH. The discussion for a new meeting house in the center of town started in 1793 until finally, in 1798 the building was erected. Henry Cambell donated 1 acre in good faith for the new meeting house. It was the third of its kind serving the West Parish and ran longer than its predecessors. Reverend William Morison gave the first sermon May 18th, 1880. The Morison or Morrison Family originated from the western islands of Scotland and the family records indicate they were descendants of Mores, one of the original 3 kings of Norovay that founded Scotland. They were one of the original 16 settlers that founded Londonderry, NH in c. 1719 in order to escape religious persecution in their homeland. Charter Robert Morison was the first and many more followed suit. The Morison family had many influential members in the Londonderry community consisting of a member of congress, judges, lawyers, and religious scholars. Rev. William Morrison, who the meetinghouse was named after, immigrated from Scotland after Charter Robert Morison and became the pastor of the second parish in 1783. He married Jean Fullerton from Pennsylvania and had no children. He was the most respected and influential Minister to serve the Londonderry West Parish, and his ministry lasted from 1783 until his death in 1818.



Timeline of Repairs & Changes



Over the years, the Morison Meeting House has undergone several alterations to modify spaces in response to evolving programmatic needs of the town. Over time interior changes included a back shed addition, finish changes, & and interior ceiling soffits under the original historic ceilings. Exterior alterations included replacement windows, composite siding, & back shed addition. These design recommendations address egress, accessibility, energy efficiency, and programmatic requirements that will be in keeping with the historic character of the existing building.

Treatments, repairs or changes between 1798 and today include:

- Building Addition, mid-20th century
- Original windows replaced, mid-20th century
- Wood siding & trim covered with composite siding, late 20th century
- The Meeting House was used for both religious and civil purposes from its construction in 1770 until 1837 when the congregation removed to the present Presbyterian Church. In 1845 the old Meeting House was moved to its present location by the Common where it became the Town Hall.
- Town Meetings were held here until 1968.
- The tall front attachment was added in the Victorian period and housed the Selectmen's offices, the library and, for a short while, a school.
- Under threat of demolition, it was leased by the Lions Club in 1976 and used by them until recently.

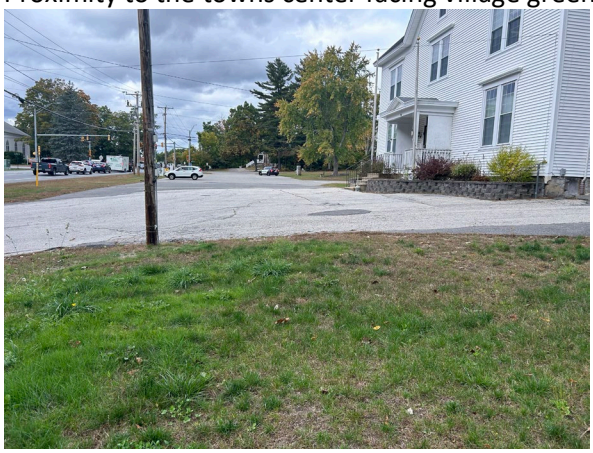
Character Defining Features

The following is a list of Character Defining Features related to the c.1798 Morison Meeting House as it exists today after its c.1980's renovations. The determination of Character-Defining Features is covered in Preservation Brief #17 published by the National Park Service. The priority given is the author's opinion and is delineated at the request of the Town of Londonderry. Each feature listed is important to preserve and/or repair as part of any future work on the Morison Meeting House.

1. Site

Very Important

Dominant presence on shoulder of the main road
Proximity to the towns center facing village green



Important

Low to grade with stone foundation

2. Exterior Character Defining Features

Very Important

Original clapboard siding *(underneath the vinyl composite)*
Federal Style architecture
Victorian era front center gable form
3 bay facade
Front entry Portico on the long side
Window dentils, roof rakes, eaves, corner trim

Important

Rear additions Shed & Ell

Not Important

Vinyl Siding
9 over 9 replacement windows

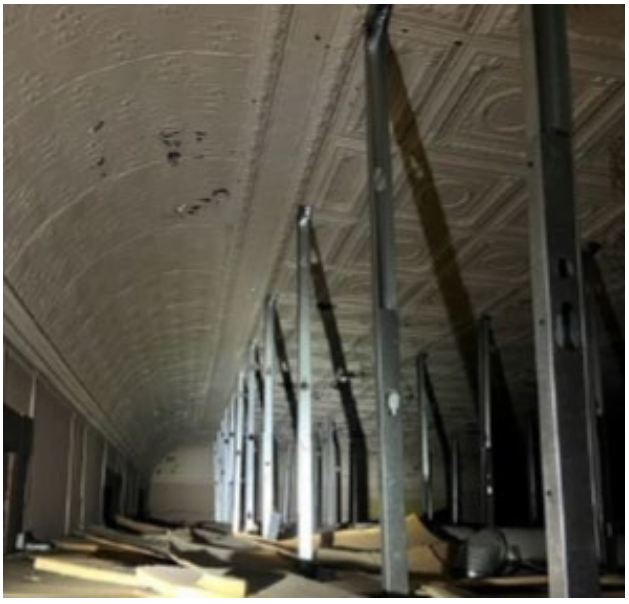
3. Interior Character Defining Features

Very Important

Front entry hall into grand stair with ornate railings

Stage (*not materials*)

Original tin ceiling in open auditorium



Important

Historic vault

Not Important

Lions Den relics

Part III: Existing Conditions Assessment

Architectural and structural assessments of the existing conditions of the Morison Meeting House were conducted to determine the historic significance and condition of the architectural elements, life safety, accessibility, energy usage, programmatic needs, and structural, mechanical, and electrical systems. Overall, the building has been mostly adequately maintained and updated as changing uses have merited over time. Current shortfalls, common to many building of this age, include lack of handicapped accessibility, inadequate ventilation, lack of fire separation at second egress stair, lack of fire suppression sprinkler system, some outdated electrical components, a moisture laden crawlspace, and compromised structural first floor framing and localized areas of framing throughout.

Existing Conditions Drawings

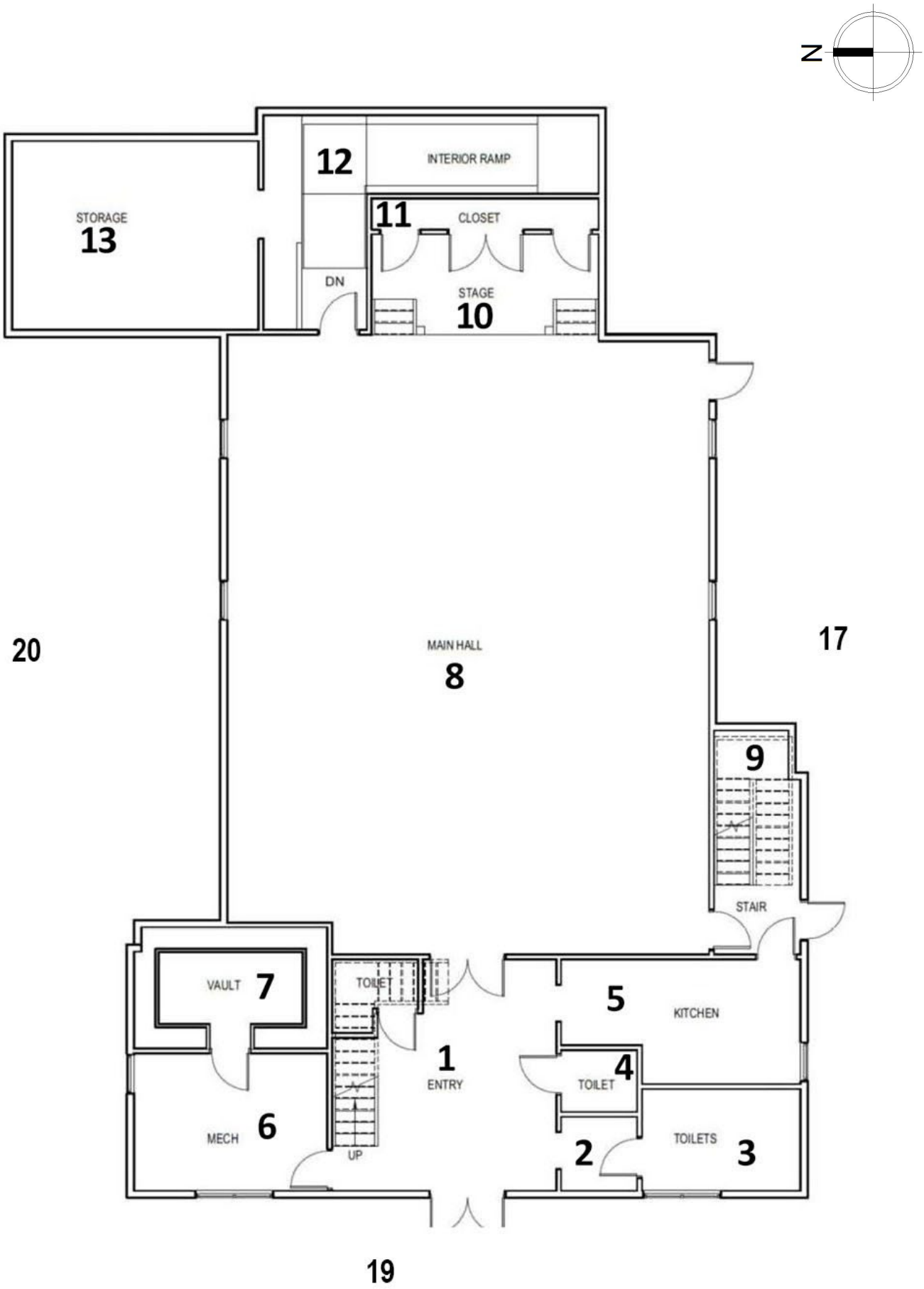


Figure 1: Floor Plans from Weston Sampson Report 2022

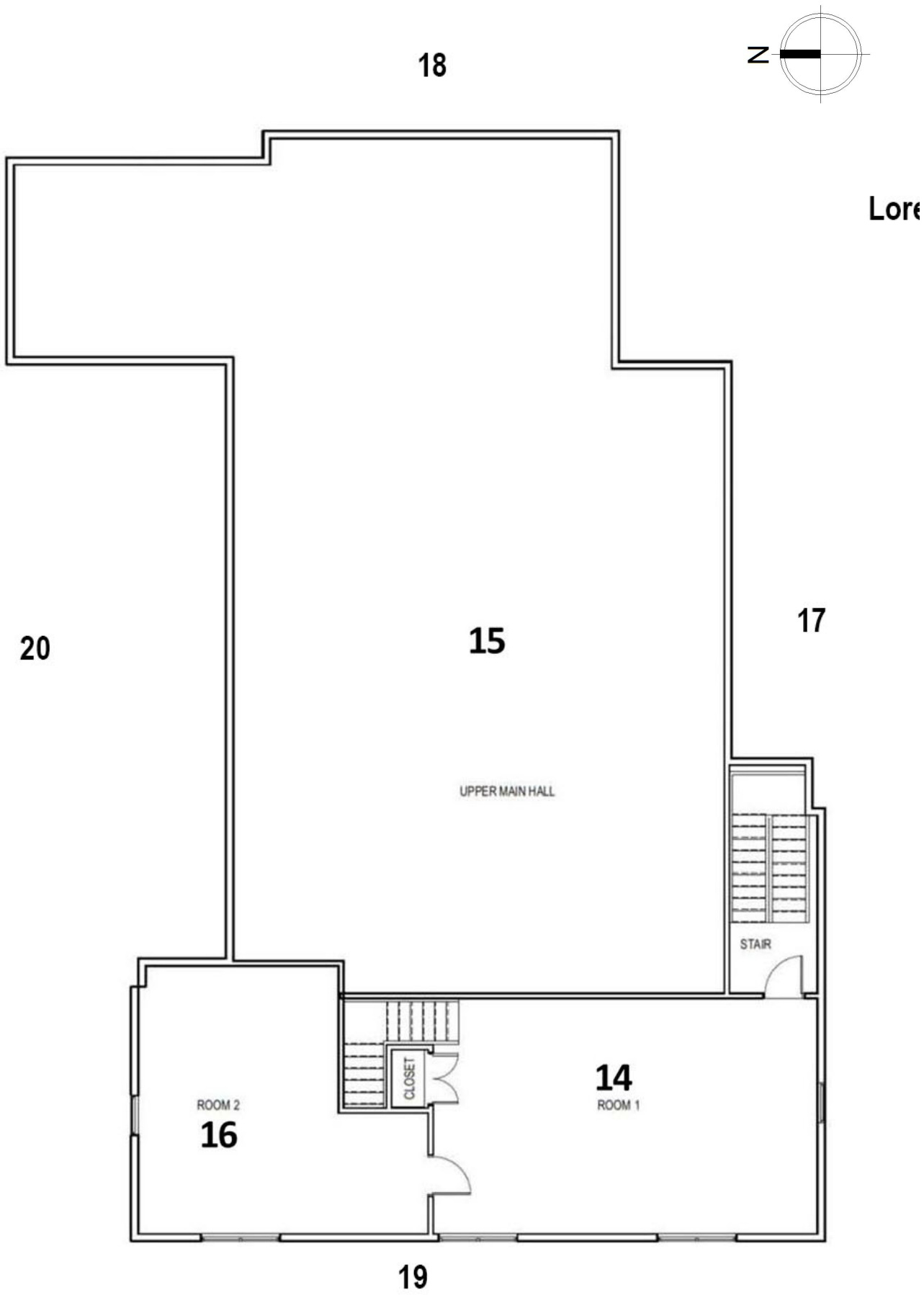
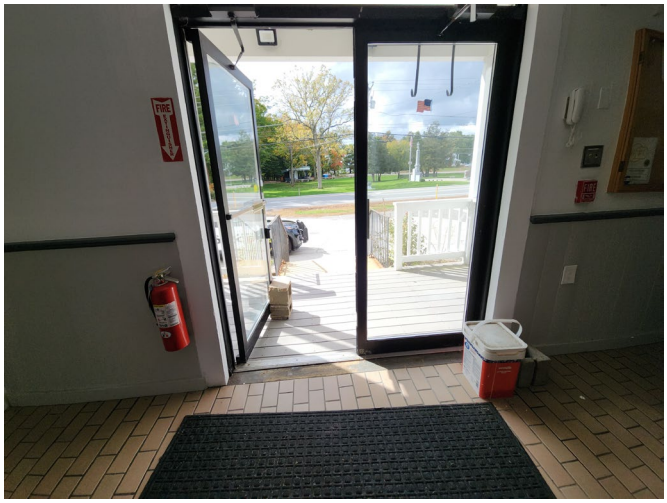


Figure 2: Floor Plans from Weston Sampson Report 2022

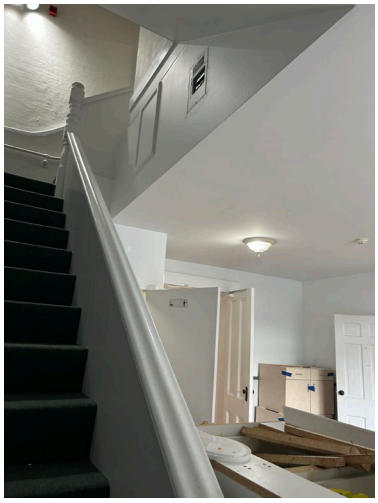
Existing Conditions Assessment: Building materials and systems functional integrities*

**Reference floor plans above for paragraph numbers.*

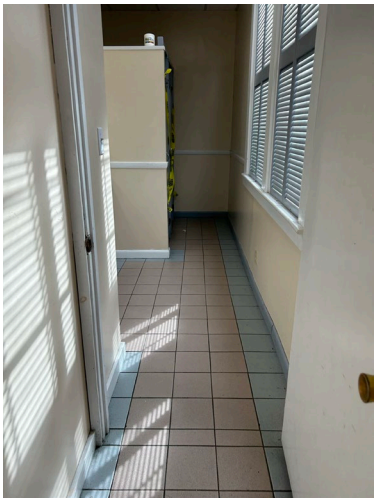


1: All entry finishes have been replaced in recent decades. Flooring has been replaced with modern tile and is not historic. The front doors are aluminum storefront replacement doors with no emergency exit hardware, and they're not properly weather sealed. The front entry threshold is level with the deck addition, which is modern, but the deck addition is not handicapped accessible because of the steps down to grade.

The ceiling is contemporary drywall with c. 1980s light fixtures, and smoke detectors. Similarly the walls are drywall with 1x6 flat stock door casings. The wainscot is painted bead board with chair rail, which might be original but the definition of the profile and beading is obscured by thick paint layered on over the years. The electrical outlets and switches are a mix of old and new. There is a fire alarm pull, telephone, and some emergency lighting on a shelf plugged into an outlet on the ceiling. There is forced air ventilation via ceiling and upper wall grills as well as a vent under the stair that is slightly damp and damaged.

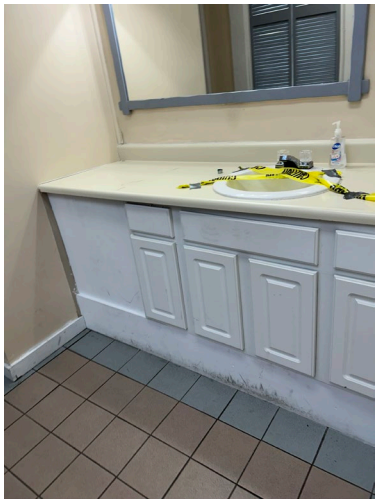


The open staircase to the second floor has an original, heavily turned newel post at the bottom of the banister, which has been painted. It attaches to a beadboard guardrail which is solid. There are no balusters. The handrail mounted to the wall is made out of contemporary iron pipe fittings, and there is beadboard and a chair rail along this wall as well. There is no fire separation or enclosure. Above the second floor, original horsehair plaster appears above the chair rail. On the stair to the right there is a very old circuit board electrical panel without a cover plate, a 100 amp panel, circuits labeled one through six. The guardrail height at stairwell is 25” (code requires 42”); while the handrail mounted to the wall is 27” (where 36” is required). There is a chair rail behind the handrail that is 36” high.

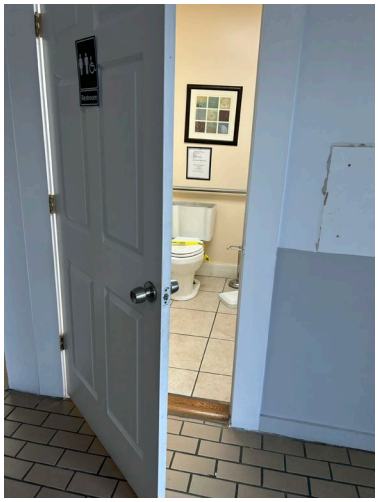


2: The vestibule into the women's room has 8x8 ceramic tile circa 1980s. The hollow core door into the women's room has a residential doorknob, not handicap accessible.

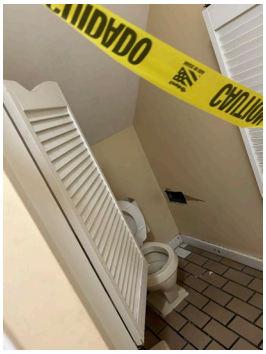


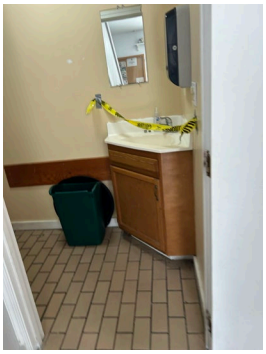


3: In the Women's bathroom, there are shutters on the windows, the walls are modern drywall, bathrooms are not handicap accessible. There is one sink and a solid counter below. The counter height is 37". There are two toilet stalls, not handicapped accessible, and all the plumbing is taped off with caution tape for winter. The millwork under the sink counter, is all circa 1980s and it's contoured plastic laminate countertop with the MDF prefab door panels, which are mounted crooked. In poor condition, there is a CT ceiling emergency lighting, ceiling vents, and large 2x4 fluorescent light fixture, the painted wood shutters on the windows don't open as they are screwed shut.

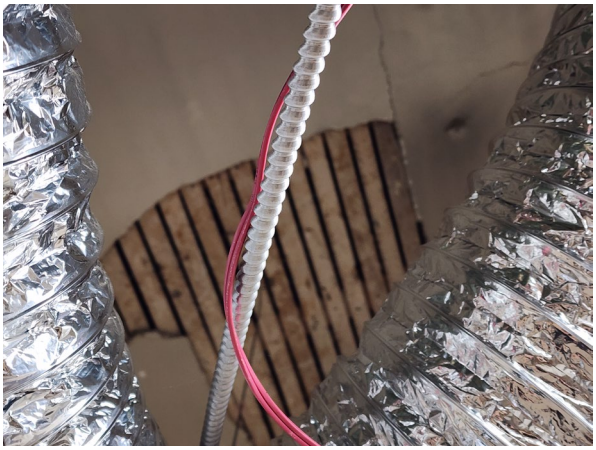



4: The handicapped bathroom is spacious though a little worn out, there is a possibly c. 1980s pedestal sink with lever faucet, and the toilet has appropriate grab bars however is missing the vertical bar. The door hardware is not handicapped accessible and is a 6 panel style replacement door. The door threshold is also not handicapped accessible due to the trim at the floor transition.



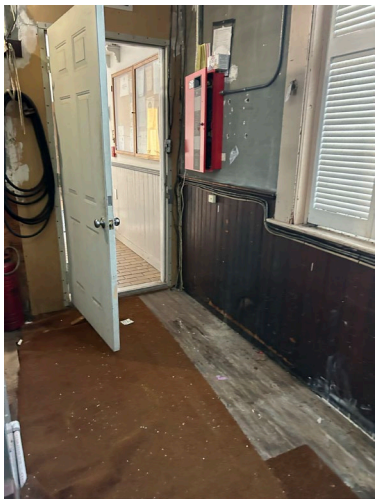


4.5: The men's bathroom under the stair is not ADA accessible, and has a saloon style stall.

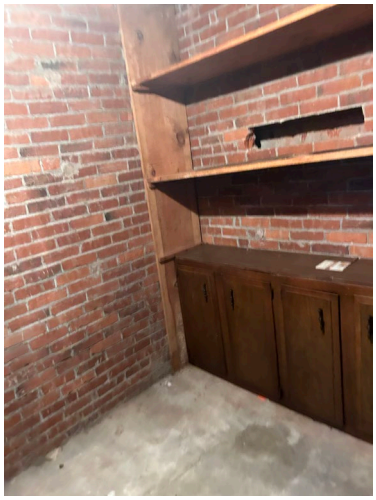



5: The kitchen is VCT 12x12 flooring, possibly c. 1980s plastic laminate. The countertops are chipped, warped, and crooked. The ceiling tiles are not in poor condition however, there is approx. 4-5' above the ACT ceiling, up to the original ceiling, which is lath on plaster. Some of the plaster is missing, and the lath on plaster that remains is terribly cracked. ACT ceiling has 2x4 lights. There is a small hot water tank underneath the microwave next to the window that is roughly 10 gallons.


There is a refrigerator, fire extinguisher, surface mounted conduits, two quadruplex receptacle outlets, 70's era wood paneling, which has been painted on the walls. On the wall next to the door is a Dayton seven day dial, time switch, four pole, two normally open, two normally closed, and model number 2E21.The paneling seems original before paint.



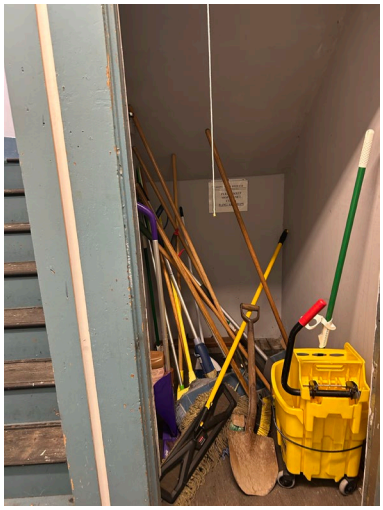
6: The boiler room has period beaded wood paneling below the chair rail and plaster on lath above, which are in worn condition. There are modern, bi-fold, wood interior shutters. The windows are Harvey vinyl, double hung, double glazed with grills between the glass, with no screen or storm windows, installed in 2005. There is a vault behind the furnace powered by gas. Behind the furnace is a pressurized expansion tank installed in 2006 that feeds the furnace.



7: The Vault is a MacNeil with an urban steel door. It's secured into a very thick, 2’ thick wall of brick and or concrete covered in brick. The wall between the vault and the auditorium is a cavity wall with two layers of brick and a 4” gap in the middle, which is unusual for this type of construction. The ceiling is wood with plaster and possibly brick above as well for safe keeping of whatever used to be in here. There's a very small vent in one corner.

8: Auditorium the main entry doors into the entry hall do appear to be original, four panel doors that are not equipped with handicapped hardware. There is a very tiny residential grade closer on each leaf with what used to be a closing rod in the middle which has been removed. The bottom corners are eroded and chipped away. The perimeter walls are modern painted drywall, set in from the original exterior walls and the windows are double hung, Harvey vinyl replacement windows. The ceiling is a dropped drywall soffit and the original tin ceiling and structure is hidden above, in poor condition but could be restored.

The cavity behind the modern walls near the vault shows the original walls had wood horizontal boards below a chair rail with plaster. We cannot see the original walls along the side, exterior walls without selective demolition, which will occur at a later time. The base board hovers above the floor by a couple of inches. The settlement is one inch at the rear wall. There are rodent droppings everywhere, especially at the back wall of the auditorium, kitchen, and in the vault. They probably live in the cavities of all the walls around the building. We do have some grounded outlets here and light switching, two thermostats and a timer. Transaction window to the kitchen, the oak hardwood floor looks like it has been recently refinished and is not level.


9: The front stair hall has very worn paint, painted flat wood trim, and drywall in very poor condition. There is broom storage underneath the stair and rubber treads at the mid landing, as well as another small closet with some shelves and a painted beadboard interior. There is only one handrail at each side of the stairwell landing. The door at the bottom of the stair goes outside to the south parking lot and has a narrow, 30", c. 1950's panic bar. The frame is worn, rotted, poorly insulated, and in overall poor condition. The door to the kitchen is an old hollow core door, in poor condition, with a broken door knob. The door into the main auditorium does appear of an older vintage, with partially missing late 19th century door hardware and flat stock trim.



10 & 11: The exit door from the stage to the outside has very old panic hardware and closer, and is in need of refurbishment. There's an exit sign above, emergency lighting, fire alarm, station, fire extinguisher. There is a stage platform with steps on either side, which has c. 1980s paneling, textured plaster, ceiling on drywall. There is some circa 1980's track lighting, and worn green carpeting in poor condition. There is another 100 amp electrical panel, stage left, which is not labeled.

There does appear to be some water damage at the ceiling above the stage that worsens when inside of the closet behind the stage. The height of the stage platform is 32" above the auditorium and there are no proper handrails.

12: The storage behind the auditorium is the current ADA access to the building as the floor is ramped however there is storage obstructing the pathway. It ramps from the auditorium to the back hallway in an ell, until you reach the door to the parking lot.

13: The storage shed addition is framed with 2x6 lumber. There's no ridge plate or ridge beam and appears to be approximately 100 years old or more, but not post and beam. The floor has carpet and is not level. There's a sliding track barn door on one side, the wall sheathing shows quite a bit of moisture intrusion, as does the roofing boards, which have been splintered and there are gaps, but it appears to have been covered with new roofing to keep the water out currently. The old siding is evident in the attic, above the connector, behind the stage in the shed.

14: The upstairs meeting room has narrow hard oak flooring. The floor is not level and is warped. There's a high point in the middle, and then it dips down to either side. There's modern wallpaper, drywall, and trim that has been redone over the years. There's a hatch in the upper wall providing access to the attic. The ceiling is 2x2 ACT and has evidence of moisture damage especially in the area around the chimney. Above the ACT is the original ceilings in relatively poor condition.

15: The attic above the main hall has blown in insulation at the attic floor, and cellulose. There is old knob and tube wiring throughout, and no sprinkler system. RE: Structural report

16: The side upstairs meeting room appears to be the Lions Club bar with c. 1970s and 1980s wood paneling, carpeting, ACT ceiling. There is nothing original to the building and it all appears in poor condition. In the attic there was access further up to the attic over the front entry space however there were no floorboards, though it was insulated. Not accessible due to dangerous conditions.

17. Southern Façade:

There is an access panel to the crawlspace of the basement and a pipe that goes all the way down. The metal side door to the stairwell is rusted, not plumb, and there is evidence of rot within the door frame. There is cracking in the foundation throughout the façade. There are no downspouts or gutters however, there is a large overhang from the fascia and soffit with a drip edge. The windows are Harvey replacement windows. There is minimal damage to some of the siding, with the original siding hidden underneath that appears to be pretty cracked. The back side door to the stage is also metal and the wood trim is slightly worn but in better condition then the other door. There is some minor damage to the bottom, left corner with some of the wood exposed, the paint is chipped, but the wood itself is in decent condition other than a small portion that has rotted. There are major holes and gaps in the foundation of the back addition's foundation and [art of the siding is in poor condition towards the bottom of that foundation. The back side door that provides ADA access to the building is metal and is in better condition than the other two, however the metal has split from the wood. The trim is slightly damaged at the bottom right.

18. Eastern Façade:

The eastern façade has siding is in very poor. The foundation is less exposed and in areas where it is exposed it looks in decent condition. The back corner of the building connection to the shed has some severe runoff and warping that may need some selective demo in order to investigate if there is moisture damage underneath, and the underside of the roof is also worn. The siding to the shed addition needs to be cleaned and has some minor cracks, the wood underneath appears not too bad.

19. Western Façade:

The front porch's paint is chipped the underside of the roof eaves look in good condition, though there is some minor damage on the front roof eve but not too severe. Some of the siding is cracked and the foundation's mortar looks like it's in need of some repair. The wood appears to be mostly sound, there is minor damage and it's in need of cleaning. Some of the siding at the front door siding is also chipped and peeling. The wood itself at the bottom of the door frame is very worn, and there is some cracking to the wood, but not too severe. There is some cracking at the wood on the left side of the porch floor support, the front left column. The mortar on the front left side also needs to be repaired. The windows are in good condition. 39" height to front entry

20. Northern Façade:

There is minor damage to the left corner roof eave. The windowsill on the corner towards the back that first one of three, the frame is in very poor condition. There is some rot and a lot of damage to the siding on this facade there should be investigation to determine moisture damage underneath a lot of this vinyl siding. The foundation is lower to the ground on this side so I'm not seeing much cracking and siding in the corner appears to have some moisture issues pretty much at connections of the buildings from runoff, gutters & downspouts at these locations would be ideal.

21) Heating, ventilation and air conditioning (HVAC):

(a) The building is served by two gas powered forced air direct vent furnaces for heating.
(b) A two-stage non-ducted air conditioning unit serves the auditorium.
(c) No fresh air ventilation is provided. Small exhaust fans at restrooms and upstairs meetings room vent into the attic. Some of the vent grille covers are in need of repair.

22) Electrical:

(a) Power: 200 amp service with several subpanels; with exposed wires and variously dated components observed, including some abandoned knob and tube.
(b) Lighting: Functional light fixtures may remain, although replacement with period appropriate fixtures is recommended for the entry and auditorium spaces.

23) **Fire alarm, smoke detectors**: A central fire alarm panel with smoke detectors exist throughout, with emergency lighting and exterior alarm pull boxes.

24) **Low voltage data & security systems:** None were observed.

25) **Fire suppression sprinkler system:** This building does not have a sprinkler system.

26) **Plumbing**: Domestic water service to restrooms and kitchen are compromised by lack of thermal building envelope. Restrooms do not meet ADA for accessibility.

27) **Hazardous materials:** Asbestos and PCB's are common in buildings this age. An abatement assessment survey would help determine scope of remediation required.

Code Analysis

Summary

The Morison Meeting House is a wood stick framed building with two stories and a shallow crawl space. The building is used for assembly purposes. Although grandfathered for some conditions, the building does not comply with current codes in the following categories:

1. Means of egress – The open stair at front entry is allowed to remain open to first and second floor lobbies if the second floor is limited to business/office use. If the two upstairs rooms are used for assembly, meetings then the front stairway will need to be enclosed with fire resistant construction. Existing exit doors are too narrow and have non-compliant hardware.
2. Accessibility - The building is not handicapped accessible from the main entrance, nor to the stage or second floor levels. A ramped hallway provides some degree of accessibility through the back storage space. To be fully compliant with accessibility regulations, an improved ramp and doorways are required. A lift to access the stage, and an elevator for the second floor if functions are held there for public use. Upgrades for accessibility are not required when cost exceeds 20% the cost of other alterations. Bathroom facilities have inadequate accessibility.
3. Fire doors - Exceptions for historic buildings such as this, not undergoing changes to occupancy or to more than 50% of floor plan layouts, allow for solid wood historic doors to remain in fire separation assemblies (between stairs, utility rooms, and auditorium spaces) if they have smoke seals, closers, and positive latching; plaster on lath walls are also allowed as historic conditions. The front stair hall has various openings into adjacent rooms which should be made more smoke and fire resistant, and with solid wood or plaster components. Visible gaps are seen around some of the doors currently, smoke seals should be added to all doors at exit stairs.
4. Fire suppression - The building is not currently fire sprinklered. If area of work exceeds 50% of the building, a sprinkler system is required. The existing wood building (construction type 5B) is limited to one story of assembly use. If the building remains sprinklered, the second floor would need to be not used for assembly purposes (storage or Business/office use would be allowed).

Code Analysis - Detail

Morison Meeting House, Londonderry NH
May 31, 2025

LIFE SAFETY, ACCESSIBILITY & BUILDING CODE ANALYSIS

Summary: Applicable codes and regulations allow "grand-fathered" non-compliant existing conditions to remain as they are only if there is no change of use; no change of ownership; and no change of interior layout, subject to review and approval of local building officials. The following summary lists existing conditions which are non-compliant, and minimum action required to bring building into compliance. Where compliance modifications are deemed damaging to historic character defining features, a report compiled by a registered design professional may be submitted to the local building official, demonstrating alternative methods for acheiving comparable level of safety; this report is subject to the review and approval of the local building officials.

Applicable Codes & Regulations

International Building Code (IBC) , 2021 Edition with NH Ammendments
International Energy Conservation Code, 2021 Edition with NH Ammendments
International Existing Building Code (IEBC) 2021 Edition with NH Ammendments, Chapter 12 Historic Building
NH State Fire Code Saf-C 6000, NFPA-1, 2021 Edition
NFPA 101, Life Safety Code - 2021 Edition: Chapters 13 Existing Assembly; Chapter 43 Building Rehabilitation
NFPA 914, Code for Fire Protection of Historic Structures - 2010 Edition
NH Code for Barrier Free Design
Americans with Disabilities Act Standards for Accessible Design 2010
American National Standard for Accessible and Usable Buildings and Facilities - ICC/ANSI A117.1 (2017)
Town of Londonderry, Zoning Ordinance

1 General - Applicable Scope

IEBC Chapter 12 Historic Buildings

1201.2 For Alterations or Change of Use - Evaluation and written report perpared by registered design professions is required for review and approval by code official. Report shall identify required safety features of Chapter 12 that are in compliance; and demonstrate equivalent methods of safety where compliance with other chapters would damage character defining features.

2 Occupancy- Non-separated

IBC (303.1) & NFPA (Chapters 13 & 43)	**A2 - Existing Assembly**, community hall

3 Minimum Occupancy Separations NFPA - 6.1.14.4.1a

Table IBC 508.4 Required Separation of Occupancies in hours

OCCUPANCY	incidental accessory use (storage, utility)
A3 - Assembly, community hall	**non-separated; all spaces shall conform to A3**

IBC Table 508.2.5 Incidental Use Areas

Furnace Room > 400k BTU/hour	automatic fire
Boiler Room > 15psi & 10 hp	automatic fire
Refrigerant machinary room	automatic sprinkler
Laundry Rooms over 100 sf	automatic fire
waste & linen collection rooms over 100 sf	automatic fire

4 Construction Type 5B - Allowed Tabular Height and Area Limitations

IBC 2015 Tables 504.3 & 506.2 type is 5B due to

Construction Type	Occupancy	Height/Stories not sprinklered	Height/Stories sprinklered	Allowed Area (sf) not sprinklered	Allowed Area (sf) Sprinklered
5B	A3	40/1	60/2	6,000	18,000

non-compliant as existing

As Designed	
Stories above grade	2
Height (Feet)	35 +/-
Footprint Area	3,906
Gross Floor Area (sf)	5,085

5

Level	**Occupancy**	**Zoning & IBC - Building Area Footprint** to outside face of exterior walls	**IBC - Occupancy Floor Area** to inside face of exterior walls (est)
2nd floor	A3	1,179	1,061
1st floor	A3	3,906	3,515
gross area above grade		**5,085**	**4,577**

6 **Fireresistance Ratings of Building Elements - IBC Table 601**

NFPA Table A.8.2.1.2

	IBC	
Construction Type	**5B**	supporting construction of 1-HR rated floors
Building Element	**Rating in hours**	
Primary Structural Frame		
Columns	0	1 / HT
supporting more than one floor, columns, other bearing walls		
supporting one floor only		
supporting roofs only		
Beams, Girders, Trusses	0	1 / HT
supporting more than one floor, columns, other bearing walls		
supporting one floor only		
supporting roofs only		
Bearing Walls -Exterior	0	
Bearing Walls - Interior	0	
Nonbearing Walls - Interior &	0	
Floor Construction &	0	1 / HT
Roof Construction &	0	

7 **Fire-resistance Ratings for Exterior Walls - Fire rating (hours)**

IBC - Table 602

Occupancy	A3
Construction Type	5B
Fire Separation Distance	
<5'	1
≥5' <10'	1
≥10' <30'	1
>30'	0

8 **Fire Resistance Rated Construction**

* with automatic sprinkler system in accordance with Section 903.3.1.1

Component	reference IBC / NFPA	IBC rating	NFPA rating	Table 8.3.4.2
Shaft and Vertical Exits *(connecting <3 stories)	708.4, 715 / 8.6.5 (2)	1 hour (fire barrier)	1	.75 doors only
*exit stair can be open between 2 floors max if occ load <10, and not more than 1 story from grade				
Exit Passageway	1023.3, 715 / 7.1.3.1	0 (1 hr if not sprinklered)	0 (1 hr if not sprinklered)	3/4
Corridor Walls, A3 assembly		0 (1 hr if not sprinklered)	0 (1 hr if not sprinklered)	

9 **Separated Incidental Accessory Occupancies IBC Table 508.2.5 / NFPA 101**

fire separation rating (hours) w	**IBC**
furnace room >400k Btu/Hr	1 hour or sprinkler system
Boiler room > 15psi & 10hp	1 hour or sprinkler system
waste rooms > 100sf	1 hour
room is not also used for storage	
Laundry rooms >100 sf	1 hour or sprinkler system
linen collection	1 hour or sprinkler system
storage rooms >100sf	1 HOUR

10 **Maximum Length of Exit Access Travel**

	not sprinklered	system per Section
IBC / NFPA	A3	A3
Common Path Limit 1006.2.1	75	75
Dead End Limit 1020.4	20	20
Travel Distance Limit 1017.2 / 13.2.6.2	200	250

11 **Occupant Load**

Level / total area per level	**Occupancy**	**Net Occupied Floor Area (sf)**	**sf/occupant**	**#occupants**
2 - meeting rooms	A3, tables & chairs	1,000	15	66.67
1 - stage	A3	184	15	12.27
1 - auditorium	A3 - tables, or movable seating (not standing*)	1,784	7	254.86
1 - storage & utility	accessory	1,070	300	3.57
1 - kitchen	accessory	228	50	4.56
TOTAL maximum occupancy		**3,266**		**341.92**

*Note: Per NFPA-101, 13.3.51., if "festival seating"or "standing room" (audience standing only, no chairs) is used at auditorium, or if occupancy exceeds 100 when area of work exceeds 50%, then a fire sprinkler suppression system is required.

12 **Minimum Number of Exits per story** (IBC 1021.1 / NFPA 7.4.1)

Max Occupants Per Floor	Exits required per level
500	2

Note: Per IEBC 1203.3 - Where specifically approved by local building official, egress door at main entrance need not swing in direction of travel; and non-conforming egress stair dimensions may be approved by local building official if in their opinion the width and height are sufficient for occupants to

14 **Minimum Required Width of Egress**

	Min. Width (in/occ)	Min. Width Prescriptive	Min. Width Provided
Stairways	20.00	44.00	36.00
Passageways, Aisles and Corri	27.53	A:44 & B:36	44"

15 **Energy Code: IIECC 305.4 & 305.6**

Change of use or alterations affecting an area of primary function requires accessibility compliance to the 'maximum extent technically feasible". EXCEPTIONS: 1) unless it would threaten or destroy historic significance; and 2) unless the cost of compliance exceeds 20% of cost of the alterations.

Accessibility requirements do not pertain to alterations that are solely MEP and windows.

305.8.11	bathrooms are added,
305.8.14	threshold height = 3/4"
305.8.5	1:8-1:10 for max rise

16 **Accessibility: Historic Building**

IEBC B101.4	With designation as "qualified historic building", accessibility improvements that would destroy historic elements are not required.
IEBC 305.7.1	Costs of accessibility not required to exceed 20% of costs of alterations
IEBC 305.9	One accessible route is required to a building entrance
IEBC 305.9	One accessible main entrance is required
IEBC 305.9	Minimum one accessible user-assisted (family/unisex) bathroom
IEBC 305.9	Elevator or platform lift is required for change of use or alterations to the second floor.
NFPA/IBC/ADA	required in both fire rated stairwells, unless elevator/lift is on
ANSI/ADA	Tactile (braille) exits signs are required at each exit and stairway door.

17 **Fire Alarm System**

NFPA 13.3.4.1.1	current Assembly

18 **Kitchen cooking equipment**

NFPA 13.3.2.2	Non-fire protected cooking equipment is limited to food-warming devices, not connected to exhaust flues.

19 **Minimum Number of Plumbing Facilities** IBC Table 2902.1

		Water Closets (M/F 50-50)		Lavatories (M/F 50-50)		Tubs/Showers	Drinking Fountains (410.1 IPC) * not required for occ<15 ** not required for		Service Sink
	No. occupants	no. required per use	total required	no. required per use	total required	required	required	total required	
A3 - auditorium & stage	275.3	1:125 Male & 1:65 Female	3.22	1 per 200	1.38	None	1 per 500	0.6	1
A3, meeting rooms	66.7	1 per 25(@<51)	1.00	1 per 40(@<81)	1.00	None	1 per 100	0.7	1
Total Required			**5.0**		**3.0**	**0**		**2.0**	**1**
Total Existing			**5.0**		**3.0**	**4**		**0.0**	

20 **Energy Requirements -** IECC Energy Conservation Cod Climate Zone 5

IEBC Alternations 908.1: Alterations to existing buidlings are **permitted without requiring the entire building to comply** with the energy requirements of the IECC. Alterations shall conform to energy requirements of IECC as they relate to new construction only.

Chapter 5 - Existing Building

C501.6: Historic Buildings: **Compliance is not mandatory** with report signed by registered design professional, to building officials demonstrating that compliance would threaten or destroy historic form fabric or function of building.
C503.1 Alterations to any building or structure **shall comply** with the requirements of the code for new construction.
C505.1 Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy **shall comply** with this code.

Building Envelope Requiremer	Prescriptive Table C402.1.3 ci = continuous insulation	Performance Table C402.1.4	SHGC - sew	SHGC - n
Roof insulation entirely above ro	r-30 ci	u-0.032		
Roof insulation - attic	r-38	u-0.037		
wood framed walls	R-13 + 3.8 ci; or R-20	u-0.064		
windows - operable		u-0.45		
windows - pf<.2			0.4	0.53
windows - .2<=pf<.5			0.48	0.58
windows - pf>=.5			0.64	0.64
glazed entrance doors		u-0.077		
Swinging solid opaque Doors	u-0.37	u-0.37		

Part IV: Recommendations

Recommendations for capital improvements to Morison Meeting House have been developed using findings from the team's research, information gathering, and stakeholder collaboration. These recommendations address life safety egress, accessibility, energy efficiency, and programmatic needs of town and community users. Proposed design solutions give careful consideration to protecting the historic character defining features of the building.

Recommended Building Improvements

The proposed building improvements are needed to restore the integrity of existing historic conditions by repairing deteriorating features and making the building weather-tight, and to bring the existing building into further compliance with current building and life safety codes. Recommendations include the following:
**Reference floor plans above for item numbers.*

1: Entrance Foyer

a. Aluminum storefront entry doors: These contemporary doors are functional and may remain, although replacement with period appropriate doors is recommended. Minimum work needed includes:
   - Provide emergency exit hardware
   - Provide weather stripping.

b. For handicapped accessibility, install ramped concrete walkway with handrails connecting from front entry with landing turning along south side, adjust grading/curbing as required.

c. For fire separation between open stair and auditorium, repair any cracks or gaps in ceiling and wall drywall or plaster in the stairway and entry foyer. Doors between auditorium and foyer require functioning closers and panic hardware, and smoke seals; repair damaged and missing bottom corners of historic door panels.

d. Open staircase to the second floor:
   - The wood paneled guardrail height at stairwell is 25" without a handrail, whereas code requires 42" high with a 36" high handrail. For code compliance, install a compliant guardrail and handrail behind the existing paneled guardrail, without damaging or replacing the existing guardrail. A minimal profile steel and glass, or traditional wood picket style is recommended.
   - Replace the existing wall mounted pipe handrail (it is too low) with a code compliant handrail immediately above the 36" existing beadboard wainscot.

3 & 4: Men's and Women's bathrooms:

a. New layout, fixtures, and door hardware/thresholds are required for handicap accessibility. Expansion into the kitchen area may be required. The kitchen could be relocated to the Storage space north of stage (#13 on plan) if that area was to be insulated and weatherproofed. The remaining remnants of historic wood wainscot should be repaired and preserved where possible.

b. A custodial closet and a high/low drinking fountain is also required by code at this floor, both could be worked into this area to consolidate plumbing runs.
c. See section 20 for below-floor insulation for protection of plumbing piping.

5: Kitchen: Finishes are worn throughout, some in poor condition – especially the ceiling. See #3 above for Kitchen relocation suggestion.

6: Boiler room - See item #24 below for HVAC system. Wall finishes are worn but historic and would benefit from some repair and repainting.

7: Vault: This space is historic, no work other than general cleaning and maintenance is recommended.

8: Auditorium: For historic rehabilitation purposes (not code required):

a. Remove the contemporary interior perimeter furring walls. Repair or replace in kind the revealed historic wood wainscot and plaster walls.
b. Remove the contemporary dropped ceiling and soffits, to reveal the original tin ceiling above. Repair in kind where required. Strip any flaking paint and repaint.
c. The oak hardwood flooring appears recently refinished however may need refinishing, repair or replacement upon process of repairing and releveling the floor framing (reference attached structural report).

9: Front fire stair:

a. Replace or repair the very worn finishes at walls, ceiling and treads.
b. Install handrail on the side without a handrail.
c. Replace the worn door at the bottom of the stair exiting to exterior with a wider (36”) code compliant door and hardware.
d. Replace door between fire stair and auditorium with a wider (36”) 45 minute fire rated door and code compliant exit hardware.
e. Closets and storage within a fire exit stair are prohibited and should be removed.

10 & 11: Stage and backstage:

a. The exit door from the stage to the exterior requires weatherstripping and new code compliant exit hardware.
b. Stage finishes and lighting are not historically significant, they are functional but worn, and would benefit from updates.
c. Repair ceiling and roof flashing at location of visible water damage above the stage and backstage
d. Handrails should be installed at the side stage steps.

12: The storage behind the auditorium is the current ADA access to the building as the floor is ramped however there is storage obstructing the pathway and lacks handrails. It ramps from the auditorium to the back hallway in the ell, to the door at the parking lot.

13: Storage, shed addition:

a. The tops of walls and roof framing show some sagging, reference attached *Structural Assessment report.*
b. Wall and roof sheathing shows signs of past moisture damage. Inspect and repair roofing and flashing in this area.
c. If this area is to be occupied for programmed space (such as a relocated kitchen), insulation, interior finishes, doors, and MEP will be required.

14: Upstairs meeting room:

a. Reference structural report for sagging floor areas above first floor windows.
b. Inspect and repair roofing and flashing at chimney above areas of ceiling moisture damage.

15: Attic: Existing fiberglass batt and blown-in vermiculate insulation is providing some energy efficiency. To improve this efficiency, an air barrier could be installed below the insulation; weather-seal any gaps between attic floor framing/air-barrier and top of wall framing.

16: North side upstairs meeting room: Repair or replace worn, non-historic finishes.

17. Southern (side) Façade:

a. Reference structural report for foundations.
b. The back side door frame and trim needs repair.

18. Eastern (rear) Façade:

a. The back corner of the main building at connection to shed shows signs of moisture damage at wall and soffits from roof water runoff. Localized removal of siding and trim is recommended to determine extent of damage and repair needed in this area.
b. The siding at shed addition needs to be cleaned, minor cracks should be repaired.

19. Western (front) Façade:

a. Portico needs repainting.
b. Repair minor damage on front roof eave
c. Repair minor cracks in siding and wood trim, clean and repaint as required.
d. The wood at the bottom of the door frame needs repair.
e. Repair cracked wood on front left portico post.
f. Reference *Structural Assessment Report* for foundations.

20. Northern (side) Façade:

a. Repair minor damage to the left corner roof eave.
b. Repair window sill and frame, for window at back corner.
c. Deteriorated areas of vinyl siding should be investigated to determine potential moisture damage underneath.

21) Exteriors, general:

a. Windows are Harvey vinyl replacement windows, double hung, double glazed with grills between the glass, with no screen or storm windows, installed in 2005.
b. Vinyl siding is generally intact and is protecting the building. For a full historic rehabilitation the vinyl siding should be removed. Wood siding and trim revealed should be inspected for condition, and repaired or replaced in kind as needed.
c. Install downspouts and gutters to help protect foundation and floor framing from moisture damage.
d. Foundation wall cracks – reference structural report.
e. Rodent control is needed throughout. Inspect exterior envelope throughout for any holes, cracks or gaps, fill and repair as needed.

22) Structural, framing & foundations: See attached *"Structural Analysis"* by Structures North Engineers.

23) Crawlspace: For both the interior sides of foundation walls and at the ground below floor framing, provide insulation and moisture proof membrane with integrated drainage system. A thermally protected crawlspace will prolong the lifespan of wood floor framing, protect plumbing from winter conditions, and improve HVAC energy efficiency.

24) Heating, ventilation and air conditioning (HVAC):
   a) Install an ERV energy recovery ducted ventilation system throughout building.
   b) Repair damaged or loose vent grille covers.
   c) For greater efficiency, consider replacing current gas fired furnace and AC units as they age out with heat pump system.
   d) Consider installing window screens, to allow for natural ventilation during mild weather.

25) Electrical:
   (a) Power: Outdated devices and wiring should be replaced throughout, concealed conditions to be verified for compliance.
   (b) Lighting: Functional light fixtures may remain, although replacement with period appropriate fixtures is recommended for the entry and auditorium spaces.

26) Fire alarm, smoke detectors:
   a) Central fire alarm panel and smoke detectors, emergency lighting and exterior alarm pull boxes should have continued maintenance; install additional devices for coverage as required by current codes.
   b) Carbon monoxide detectors are required by current codes and should be installed if gas fired appliances (furnace, hot water heaters) continue in use.

27) Low voltage data & security systems: Not required.

28) Fire suppression sprinkler system: A sprinkler system is required by current codes for assembly occupancies and should be installed throughout. New water service from street will be required; a flow test will be required to determine whether a fire pump is also needed.

29) Plumbing:
   a) Domestic water service to restrooms and kitchen are compromised by lack of thermal building envelope.
   b) Restrooms do not meet ADA for accessibility.

30) Hazardous Materials: Scope of required abatement to be determined according to future abatement assessment.

Conceptual Budgetary Opinion

The probable cost for scope of work described above is dependent on several factors.
In general, the scope of work aligns with much of *"Scenario 2 – Limited repairs and Alterations"* as detailed in the Weston Sampson Existing Conditions and Redevelopment Options Report, 10/2022. Variations and adjustments for current cost escalations are as follows:

1. Reduced scope for entry ramp, omit elevator (change 2nd floor use to office).
2. Expanded scope for structural repairs
3. Budgetary owner 'soft costs'

ARCOVE
ARCHITECTS

Morison Meeting House, Londonderry NH
Budgetary Opinion of Cost
May 31, 2025

Description of allowances		year 2025
Haz Mat abatement		57,881
Site improvements		54,987
Foundations & crawlspace improvements*		92,610
Wood framing repairs and replacement*		289,406
Exterior Envelope		131,969
Interior Fitout and Finishes		104,186
Fire Protection		88,280
Plumbing		43,411
Mechanical		73,567
Electrical		36,784
subtotal		973,082
Contingency	20.0%	194,616
General Conditions & Insurance	18.0%	175,155
Testing, Design & Engineering Fees	12.0%	116,770
GC overhead & profit	8.0%	77,847
TOTAL		**1,537,470**

* Structural repairs scope are estimated at certain concealed conditions, further selective demolition will inform this budget item.
** Bond, by owner (if required)

Part V: Supplemental Information

Referenced Reports and Surveys

- Weston & Sampson, Existing Conditions and Redevelopment Options Report, October 2022
- Weston & Sampson, Redevelopment Opportunities Presentation; October 2023
- David J. Ellis, History of the Reverend Morrison Meeting House, September 2023

Meetings & Site visits

Two on-site meetings with architect and Town's project representatives

Two on-site inspections with structural engineers

Technical Resources

The following *National Park Service Preservation Briefs* further informs the IV-Recommendations section of this report. To find these reports in full, please refer to the website links below:

Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings, by Robert C. Mack, FAIA and John P. Speweik, 1998: https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf

Preservation Brief 3: Improving Energy Efficiency in Historic Buildings, by Jo Ellen Hensley and Antonia Aguilar, 2011: https://www.nps.gov/orgs/1739/upload/preservation-brief-03-energy- efficiency.pdf

Preservation Brief 10: Exterior Paint Problems on Historic Woodwork, by Kay D. Weeks and David W. Look, AIA, 1982: https://www.nps.gov/orgs/1739/upload/preservation-brief-10-paint-problems- exterior-woodwork.pdf

Preservation Brief 21: Repairing Historic Flat Plaster-Walls and Ceilings, by Marylee MacDonald,1989: https://www.nps.gov/orgs/1739/upload/preservation-brief-21-flat-plaster.pdf

Preservation Brief 24: Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches, by Sharon C. Park, AIA, 1991: https://www.nps.gov/orgs/1739/upload/preservation-brief-24-heating-cooling.pdf

Preservation Brief 28: Painting Historic Interiors, by Sara B. Chase, 1992: https://www.nps.gov/orgs/1739/upload/preservation-brief-28-painting- interiors.pdf

Preservation Brief 32: Making Historic Properties Accessible, by Thomas C. Jester and Sharon C. Park, AIA, 1993: https://www.nps.gov/orgs/1739/upload/preservation-brief-32-accessibility.pdf

Preservation Brief 39: Holding the Line: Controlling Unwanted Moisture in Historic Buildings, Sharon C. Park, AIA, 1996: https://www.nps.gov/orgs/1739/upload/preservation-brief-39-controlling- moisture.pdf

Building Science Corporation Insight 041: Rubble Foundations
Joseph W. Lstiburek, Phd, P.Eng, Fellow ASHRAE, 2010: https://www.buildingscience.com/documents/insights/bsi-041-rubble-foundations

Structures North
CONSULTING ENGINEERS, INC.

60 Washington St, Suite 401
Salem, Massachusetts 01970-3517
P.O. Box 01971-8560
T 978.745.6817 | F 978.745.6067
www.structures-north.com

25 April, 2025

Tracy Kozak
ARCove Architects
3 Congress Street
Portsmouth, NH 03801

Dear Tracy:

On February 10th, 2025, we visited the Reverend Morrison Meeting House, also known as the Londonderry Lions Club, to perform a structural analysis of the building as it is unusable in its current state.

STRUCTURAL DESCRIPTION

The old meetinghouse consists of the original meetinghouse, a Victorian addition at the front, and an lean-two addition and an attached ell at the rear.

The property was leased to the Lions Club in 1976 and expanded with an large addition to the rear and was still open to the public until recently. For the purpose of this report, the front of the structure will be considered to face the west.

Center Section

This original, meetinghouse portion was built in 1770 and served both religious and civil purposes as the "Presbyterian Meetinghouse", within the community. This structure is apparently captured in a rendering dating from the period; however, it is shown with two vertically stacked sets of windows. This was sometimes done in structures with tall interior spaces and wraparound balconies; however, the small size and unadorned nature of these openings would be more suggestive of a first and second floor.

Presently there is only a single-story finished space in this structure below a suspended acoustical ceiling that is even with the tops of windows. A half story remains between the suspended ceiling and the hard ceiling under the attic floor, which occurs half-level above the front section's second floor. Because of this, we

question whether the structure is actually the same one depicted in the rendering, since by proportion, the depicted structure is clearly two-stories up to the eaves.

This center section is constructed with sawn lumber framed walls between timber posts supporting a roof structure consisting of four heavy timber trusses that span the short direction across the structure. These trusses support timber purlins that run across the trusses between the front and back walls and support the wood sheathing or the roof. The attic floor is basically the furred, hard plaster ceiling over the meetinghouse, supported by joists that run from truss-to-truss and the front and back walls.

The perimeter walls land on a timber sill resting on a stone foundation.

The first floor was originally constructed with sawn lumber joists spanning between pier supported timber beams that ran between the long side walls of the structure over an inaccessible crawlspace. The joists have since been replaced by modern I-joists in a presumed effort to increase the overall load capacity.

There is a two-story stairwell added to the north side of the center section, at the corner with the front section.

Front Section

The Front Section is a two-story Victorian sawn lumber "stick-framed" structure on a stone foundation over an accessible crawlspace. The roof structure is a compound tied gable, ascending from the eaves above the second floor.

Rear Section

The back section consists of a dimensional lumber rafters running from the back wall of the center section onto a wood-framed bearing wall at the back edge. There is also a single story, gable roofed ell projecting off of the north side of the lean-to constructed with dimensional lumber. The side walls have large door openings in them that have been filled in.

NOTED CONDITIONS AND RECOMMENDATIONS

We noted the following conditions for which we have the following *recommendations*.

Center Section

Interior/ First Floor Structure and Crawlspace-

- In the large hall there is noticeable deflection and undulation in the floor. Some of this is due to normal deflection of the joists between the supporting timber beams, however in the center of the space there is a concentrated depression of several inches (See Photos 5 & 6).

  While inspecting within the crawlspace below, the height of the space began at 18" and significantly decreased the further we went, so we could not reach the depressed area from below. Due to this lack of access from underneath, it was necessary to create an exploratory opening from above. The placement of the opening allowed us to witness why some of the installed I-joists were allowing the floor to abruptly sag.

  The I-joists below the depression were supported at one end with hangers that only had one nail per flange and were fastened to an LSL (laminated strand lumber) nailer that had been lightly nailed to the original supporting timber. The joist hanger sheared off of the LSL, causing the joist end to drop by more than an inch (See Photo 7). In addition, the LSL nailer appeared to have slipped vertically downward on the face of the original timber, mostly due to the fact that there were too few nails connection the nailer and the surface of the timber was too rounded and uneven to effectively nail onto. As a result, the I-joist floor framing, which we confirmed to be sufficiently sized for the load and span, are not are not sufficiently connected at their ends to reach the full design loading without the ends shearing off. Given the noted undulation of the floor, if is quite possible that this insufficient connection condition exists throughout the main hall's floor.

  Because of the extreme tightness of the crawlspace, we recommend that additional viewing ports be opened at at least four other locations to determine whether this condition exists throughout.

  If this is found to be an isolated condition, we recommend that the LSL nailers be lifted up to the be at least flush with the tops of the carrying timbers, and then the gaps between the nailers and the timbers be filled with glued-in shims and the nailers be properly screwed into place. The fallen joists should then be lifted up and the hangers fully nailed onto the LSLs.

If this is found to be a pervasive condition, then given the shallow depth of the crawlspace, it might be better to remove the entire wood floor structure, build a small concrete block wall along the front edge of the middle section, and then fill in the volume with compacted structural fill or flow fill and cap it with a new concrete slab on grade. The fill and the slab would need to be held back from the perimeter sills so as not to entrap moisture against the sill that would promote decay. The slab could be recessed to allow for a furred wood or carpet on plywood to be constructed at the same level as the adjoining front and back sections.

- There is a gap below the north side of the main hall's north wall that is likely from floor deflection and should be corrected with the repair or replacement of the floor.

- The north, south and west perimeter sills could not be inspected from the interior other than at the extreme east end of the north and south walls, due to the shallowness of the crawlspace, where they were found to be OK. We noted a moderate amount of up-and-down undulation in the north and south walls, which could be a sign of sill compression. We recommend that the sills on the north and south walls and the small, south section of the east wall be exposed by temporary removal of the siding and sheathing along the very bottoms of these walls to expose the sills.

  If rotten conditions are encountered, the rotted wood can be simply removed in an incremental manner and replaced with new, naturally rot-resistant white oak. Some temporary shoring of the posts will be needed while working below them, however, sill replacement is a common and routine repair that is done on structures like this every day.

  The sill at the west end is an interior condition and not as likely to be rotted since not close to the weather, however, it should still be inspected if the if the floor is removed for replacement.

<u>Interior/ Attic and Roof Structure</u>-

- We noted several notches and mortises and unused mortices in the truss timbers in the attic, suggesting that some of the framing members were either salvaged and repurposed, modified or mis-cut (Photo 13). In addition, several of

the top cord notches that receive purlins are wider than the purlins going into them. *The unused and oversized notches and mortises are not large enough to be an issue, structurally*.

- A proportion of the oak pins that connect the truss timbers are either missing, broken or partially consumed by soft rot. *The broken, missing and reduced pins should be replaced by new white oak pins of the same size*. *This must be done with care so that the connected members don't slip during the process, and some temporary bracing or restraint may be needed during this operation*.

- The bottom chords of the three interior trusses starting from the west have deflected by between ½" and 1" by slipping downward from the bottoms of the King Posts due to mis-detailed wedged mortise connections which are supposed to suspend the chords from the posts, leaving gaps between the connected members (See Photo 14). *To prevent further separation, we recommend adding a steel gusset hangers to suspend the chords*. The bottom chord of the first interior truss from the east has dropped by 3", *meaning that it will need to be pulled back upward by this amount when the gusset connections are installed*.

- We also noticed a cross-brace is missing between the second and third truss' king posts (as shown in Photos 15 and 16). *Adding a brace will assist in preventing lateral movement within the trusswork*.

- Additionally, portions of the trusswork have been damaged by powderpost beetles (See Photo 17). Typically, this most affects the sapwood on softwood timbers while leaving the heartwood cores of the timbers undamaged. *We recommend treating the trusswork with Boric acid to prevent further damage from occurring*.

- The roof purlins are sagging in the east and west bays of the roof, which have a longer clear span than the interior bays, which are not sagging. This is especially concerning in the easternmost bay, which can pick up sliding snow from the west roof slope from the front section. *The sagging rafters should be sistered with new LVL (laminated veneer lumber) members of similar depth*.

- Some partial length 2x4 sisters have been added to the original purlins to in the northwest corner of the roof however, they are likely more for nailing the sheathing than assisting the span, given that they don't run the entire span length.

- In at least three areas there has been plywood installed to replace damage sheathing boards. The plywood face grain runs parallel to the purlins, rather than transversely with the span, making it weaker than the wood it replaced. *We recommend that additional purlins be inserted midway between the existing under these areas in order to cut the plywood spans in half*.

- Ventillators have been added through the main hall ceiling, which has required cutting some of the ceiling joists, weakening the system. *The cut off joist ends should be supported by adding headers and trimmers, between and along, respectively, the remaining joists*.

We noticed an outward bowing of the eaves on the SW face of the Side Room. *We suggest adding collar ties to restrict any further movement* (See Photo 1). Within the Side Room, the wall plate is deflecting across its Northwest face,. *Adding studs in addition to investigating the foundation will assist in structurally resisting further deflection*.

Front Section

Interior/ First Floor Structure and Crawlspace-

- From what we could access, the visible timber and sill conditions looked satisfactory, however, there is a lot of insulation blocking our view.

- There are several animal burrows in the crawlspace, one of which has been dug directly underneath a brick pier that may want to settle as a result (See Photos 8 and 9). *We recommend that a rodent control inspection and abatement program gets set in place, which may include flushing with water evacuate the rodents or dry ice. The borrow beneath the structural pier should be filled with grout. Afterwards, a Hardware Cloth should be installed over or just below the crawlspace ground surface.*

- Approximately underneath the entrance to the mechanical room on the ground floor, there is a poorly constructed un-mortared CMU (concrete block) foundation that is contorted and sinking into the ground. This appears to have, in part, replaced what may have been a stone pier that once supported the end of a beam that now rests on the CMU (See Photo 10). *We recommend fully rebuilding the CMU on a proper concrete footing and re-laying the same block units with mortar, along with adding a pilaster or pier to support the end of the beam*.

- There is a timber beam running under the center of the first floor in the north south direction, supported by stone piers and intermediate added steel pipes on shallow pads. *Two of the pipes have rusted and fallen over and, along with the ones that have not yet fallen over, should be replaced with proper supports on permanent footings*.

- Above, in the kitchen, there is some deflection in the ceiling. *We recommend checking the hangers and supports above the ceiling grid system to ensure they are not pulling out* (See Photos 11 & 12).

- There is a crack in the concrete floor slab of the vault that is likely due to past settlement or curing shrinkage, or on-going corrosion of embedded iron or steel. The crack should be monitored to see if it gets worse.

Interior/ Second Floor-

- There are several dips in "room 1" of the second floor that occur directly over window openings at the first floor. *The headers and/or brace-jacks over the windows should be investigated*.

Exterior-

- The front eaves dip a bit at the ends of the front gable. This could be due to roof spread or downward bending of the eave cantilevers due to the concentrated weights of the descending rake ends. *Nailed gussets should be added to the sides of the stacked rafter-to-attic joist end connections in this area and support confirmed at the ends of the valley rafters in these areas*.

Rear Section

Interior-

- The stage floor and ceiling slope backwards (as shown in Photo 4) *and should be investigated as to why*. Some of this may be due to foundation settlement.

- The east and west walls of the small ell consist of closed off door openings that are spanned by a top eave level wall plates, at least one of which sags (shown in Photos 2 and 3). *All of the spanning plates should be sistered with ripped LVLs*.

- The roof eaves are held in place by only one single 2x6 collar tie to keep them from spreading apart (See Photo 1). *At least two additional collar ties should be added and the end-nailing on the existing tie should be increased*.

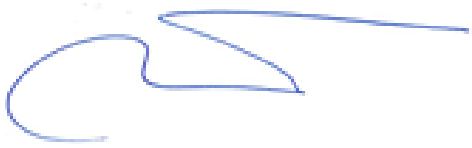
Exterior-

- The roof eaves of the ell bow outward due to the lack of sufficient collar tying at the interior. Along with the outward bow is a gentle depression of the ridge line. *Additional collar ties should be installed as noted above*.

These are our findings as of 04/16/2025. Please reach our office if you have any questions or concerns.

Respectfully,

Structures North Consulting Engineers, Inc.



John M. Wathne, PE (MA), President Macy Paquin, Preservation Designer

Photo 1: Outward bow in gutter of Side Room

Photo 2: Deflection in Wall Plate of Side Room

Photo 3: Deflection in Wall Plate of Side Room

Photo 4: Deflection in Stage Ceiling

Photo 5: Floor deflection

Photo 6: Deflection in Main Room Floor

Photo 7: Disconnected I-Joist

Photo 8: Burrow below pier

Photo 9: Burrow below pier

Photo 10: Beam bearing on CMU

Photo 11: Deflection in Kitchen Ceiling

Photo 12: Deflection in Kitchen Ceiling

Photo 13: Multiple open notches throughout Main Truss chords

Photo 14: Deflection in Main Truss bottom chord

Photo 15: Missing brace in Main Truss

Photo 16: Missing brace in Main Truss

Photo 17: Powderpost beetle damage to trusswork