



**Feasibility Study & Schematic Design  
Phase 2  
Arcove Architects  
ReArch Company, Inc.**

**Mont Vernon Town Hall  
Mont Vernon, NH**

**December 30, 2023**

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## Introduction

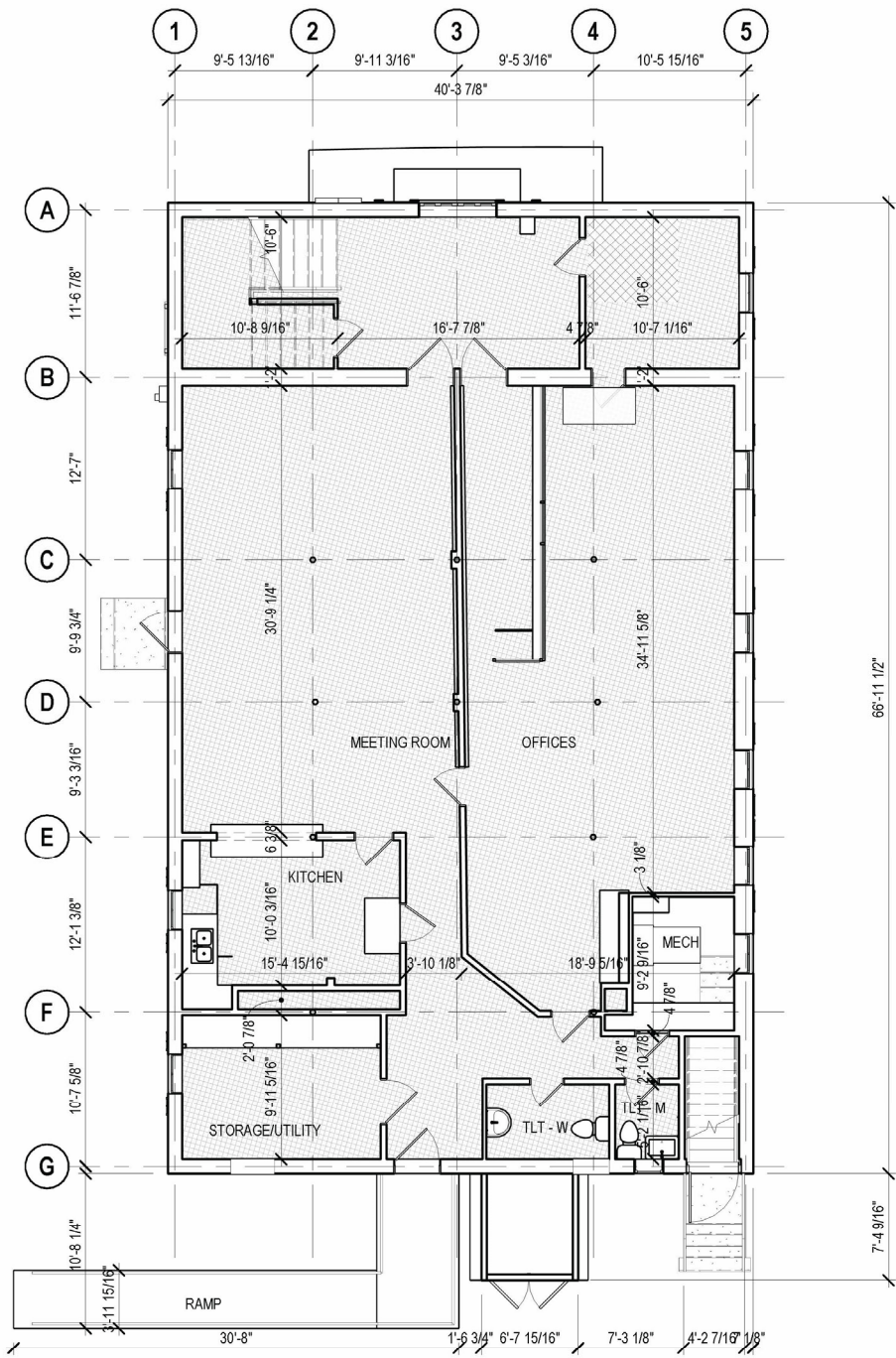
This *Phase 2, Feasibility Study and Schematic Design* report pertains to the Town Hall building in Mont Vernon, New Hampshire. This building is historically significant for its distinctive design typology, for its uses over time, and as a central defining feature of the town. The purpose and intent of this report is to investigate and recommend a viable path forward for using the building to serve the Town’s future needs. This report provides design direction for capital improvements and building maintenance to address the town’s anticipated future space needs, with budgetary cost and scheduling recommendations.

The following recommendations are corollary to ARCOve Architects’ *Phase 1 Historic Building Condition Assessment* dated March 14, 2023. The Phase 1 report evaluated the current existing conditions and provided recommendations to ensure the character defining historic fabric of the building endures for future generations. Phase 1 findings focused on stabilizing the structure, protecting it from further deterioration, making it safe for occupants, and providing handicapped accessibility for its current use and configuration.

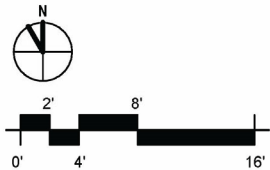
The project team is headed by principal architect Tracy S. Kozak, AIA of Arcove Architects, and includes construction management input from ReArch Companies for cost budgeting, construction phasing scheduling and logistics.

## Part 1 – Existing Conditions, measured drawings & 3d model

The existing building was surveyed on site using 3d laser point cloud technology, by Sitrine360, an Archimedia Solutions Group Company. Leica TruView software was used to create LGS files of interior spaces and the building exterior, with a 200 level of detail. This data was then translated into a 3d CAD/BIM model in REVIT 2022 format. Existing condition floorplans are as follows.



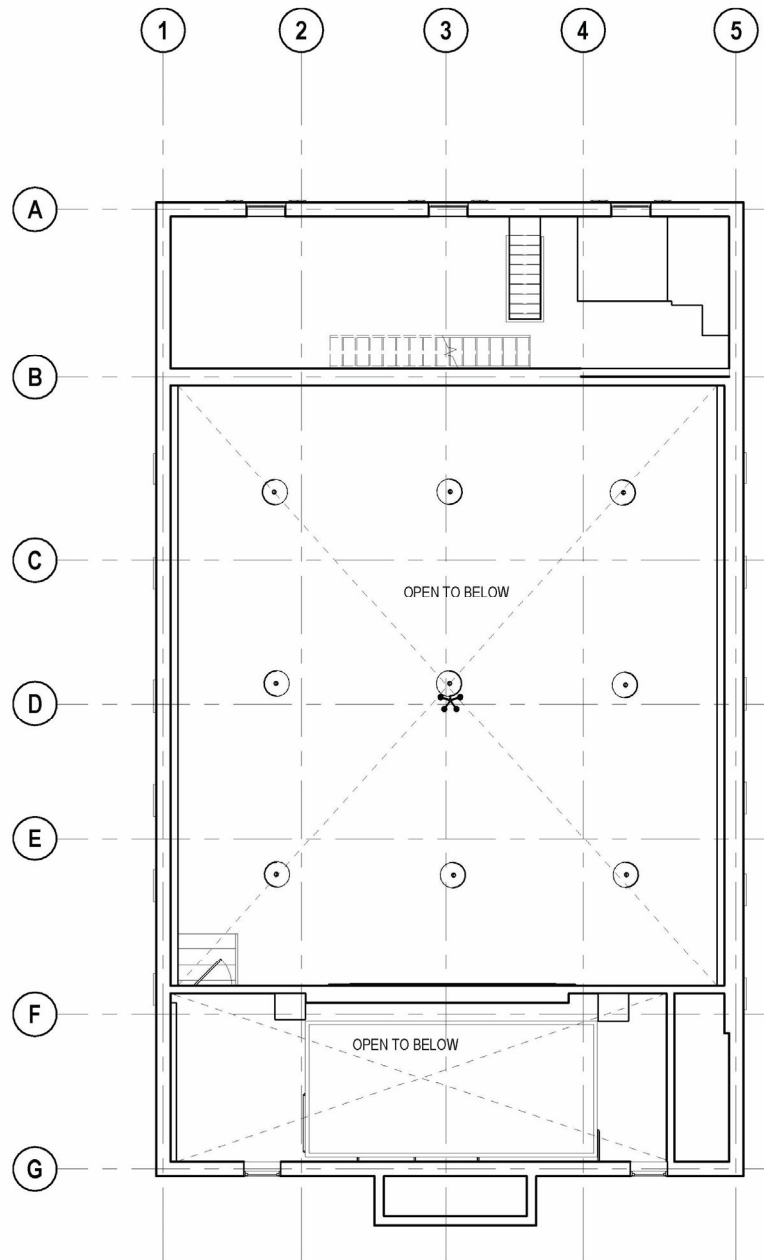
1 Level 1 - Existing  
1/8" = 1'-0"



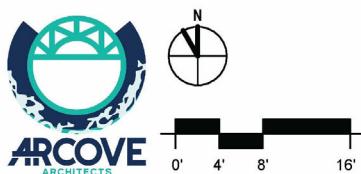
FIRST FLOOR PLAN - EXISTING  
MONT VERNON TOWN HALL

P0.01

4/28/2023  
PROJECT NO: 1006



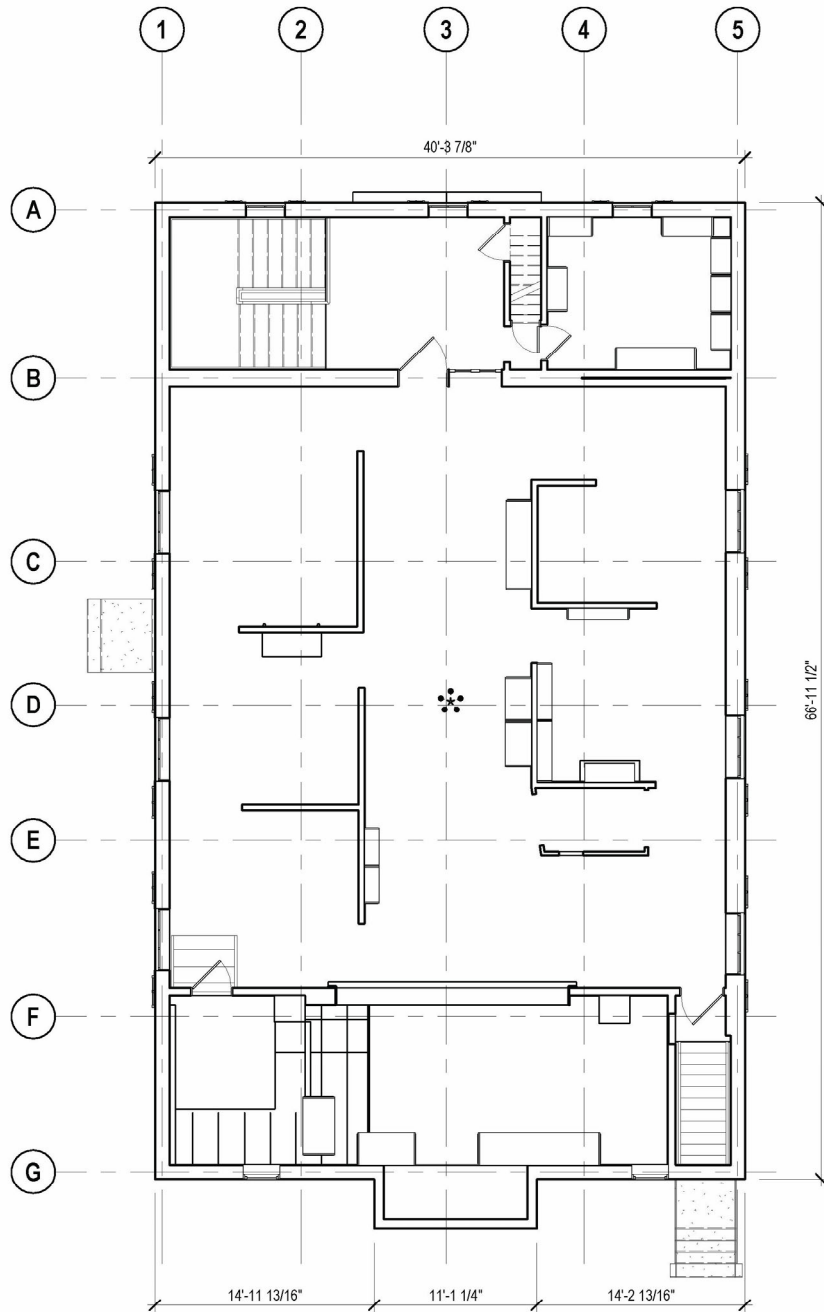
1 LEVEL 2.5 Attic Mezzanine - Existing  
1/8" = 1'-0"



ATTIC MEZZANINE PLAN - EXISTING  
MONT VERNON TOWN HALL

P0.02.5  
4/28/2023  
PROJECT NO:1006



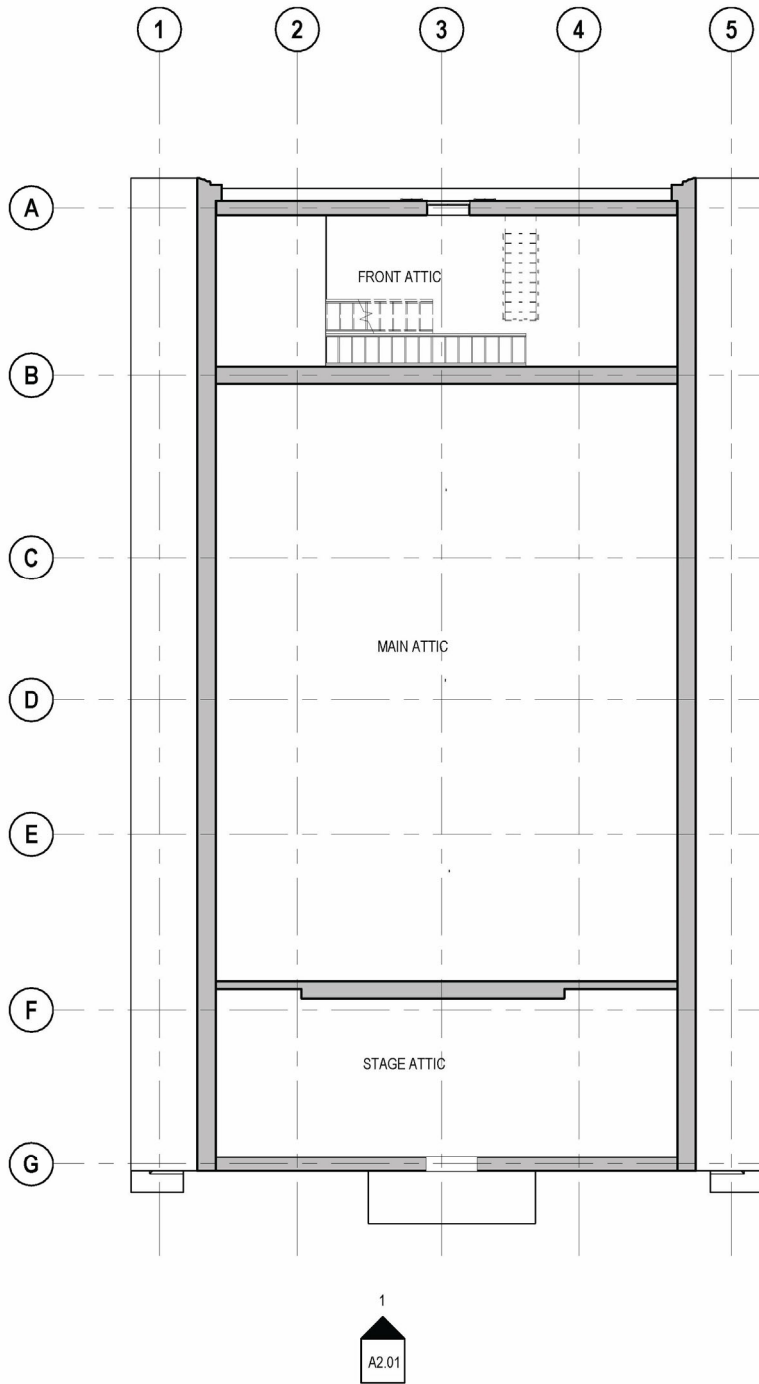


1 LEVEL 2 - existing  
1/8" = 1'-0"



SECOND FLOOR PLAN - EXISTING  
MONT VERNON TOWN HALL

P0.02  
4/28/2023  
PROJECT NO: 1006



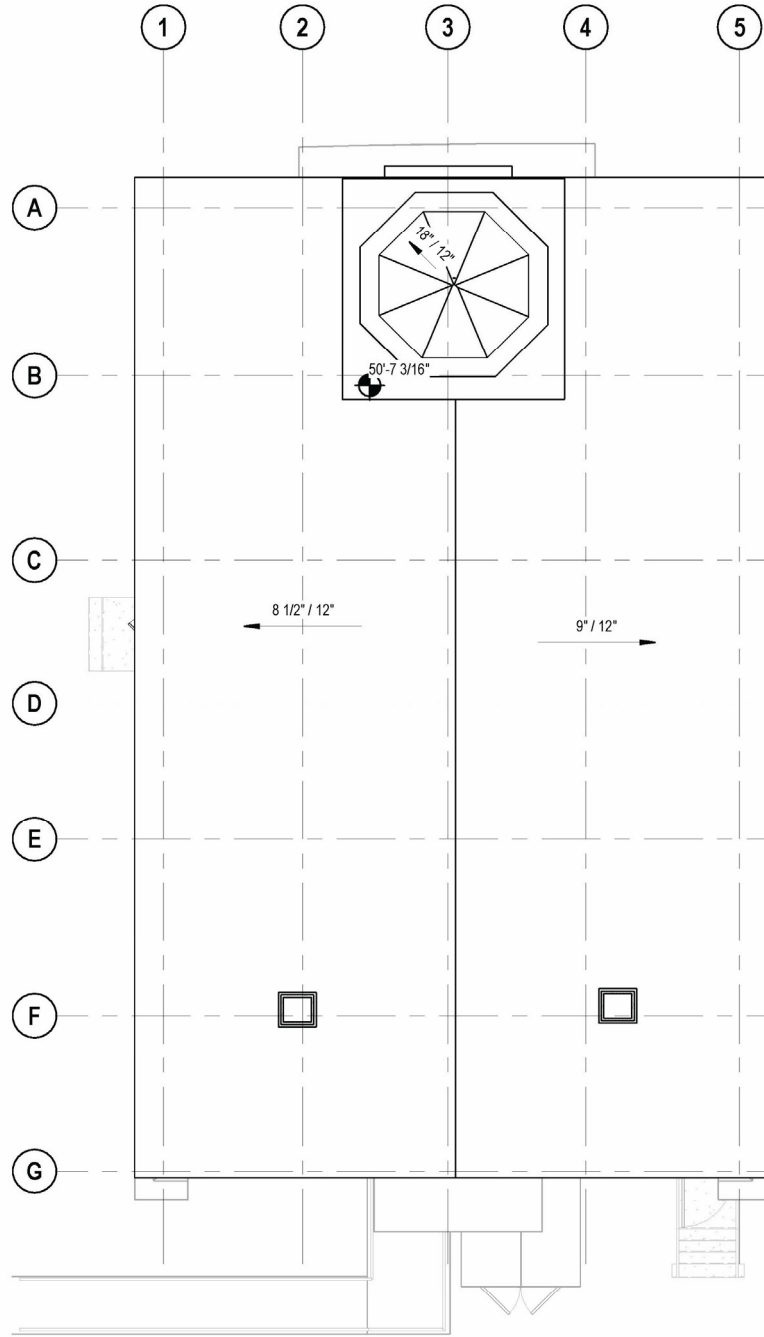
1 LEVEL 3 - Existing  
1/8" = 1'-0"



ATTIC FLOOR PLAN - EXISTING  
MONT VERNON TOWN HALL

P0.03

4/28/2023  
PROJECT NO:1006



1 ROOF - EXISTING  
1/8" = 1'-0"

ROOF PLAN - EXISTING  
MONT VERNON TOWN HALL

P0.04  
4/28/2023  
PROJECT NO: 1006

## Part 2 – Space Needs Area Program

A proposed area program of spaces as needed to serve Town functions going forward, was developed after the design team met with Town stakeholders on April 13 and July 6 of 2023. The general programming consensus was to keep Town Hall services at the first floor, flexible community event space at the second floor auditorium, and make all spaces handicapped accessible. Current meeting functions at the lower level could happen in the upper auditorium in the future.



Mont Vernon Town Hall  
Preliminary Area Program  
May 1, 2023

Department	Role	Quantity	area	total area	notes
<b>First Floor</b>					
Selectman	Selectman/customer service	1	64	64	
Selectman	Executive Assistant	1	64	64	
Selectman	Administrative Assistant	1	64	64	
Selectman	Town administrator	1	64	64	Part time
Tax Office	Chief Assessor/customer Service	1	64	64	
Tax Office	Deputy Assessor	1	64	64	
Tax Office	Chief Collector	1	64	64	
Tax Office	Deputy collector	1	64	64	storage
Town Clerk	Clerk/customer service	1	64	64	Dedicated Space
Town Clerk	Deputy clerk	1	64	64	
Town Clerk	checklist supervisor	1	64	64	
Town Clerk	secure storage/vault	1	64	64	
Planning & Inspections	customer service	1	64	64	
Planning & Inspections	administrative assistant	1	64	64	
Planning & Inspections	town planner	1	64	64	future
Planning & Inspections	building inspector	1	64	64	storage
<b>subtotal</b>		<b>16</b>	<b>1,024</b>	<b>1,024</b>	
Support & Circulation	Lobby	1	175	175	
Support & Circulation	Customer Service	1	600	600	
Support & Circulation	Kitchenette	1	100	100	
Support & Circulation	Storage	1	100	100	
Support & Circulation	Sprinkler	1	50	50	
Support & Circulation	Toilet room	3	50	150	
<b>subtotal</b>			<b>1,075</b>	<b>1,175</b>	
net total 1st floor				2,099	
support, 1st floor (stairs, elevator, structure)		28.6%		601	
<b>gross total first floor</b>				<b>2,700</b>	
<b>Second floor</b>					
Assembly	Auditorium	1	1,561	1,561	
Assembly	Stage	1	195	195	
<b>subtotal</b>				<b>1,756</b>	
Support & Circulation	Foyer	1	175	175	
Support & Circulation	Toilet room	1	56	56	
Support & Circulation	Backstage / storage	1	187	187	accessible lift to stage
<b>subtotal</b>			<b>418</b>	<b>418</b>	
net total 2nd floor				2,174	
support, 2nd floor (stairs, elevator, structure)		25.7%		558	
<b>gross total second floor</b>				<b>2,732</b>	
<b>Not included</b>					
Welfare Office		0	0		
<b>GROSS TOTAL WHOLE BUILDING</b>				<b>5,432</b>	

# Part 3 – Code Analysis

## 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 achieving 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) , 2018 Edition with NH Amendments  
 International Energy Conservation Code, 2018 Edition with NH Amendments  
 International Existing Building Code (IEBC) 2018 Edition with NH Amendments, Chapter 12 Historic Building  
 NH State Fire Code Saf-C 6000, NFPA-1, 2018 Edition  
 NFPA 101, Life Safety Code - 2018 Edition: Chapters 13 Existing Assembly; 39 Existing Business, Chapter 43 Building Rehabilitation  
 NFPA 914, Code for Fire Protection of Historic Structures - 2010 Edition  
 NFPA 909 - Code for the Protection of Historic Resources - Museums Libraries and Places of Worship  
 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 (2009)  
 Town of Mont Vernon, Zoning Ordinance

### 1 General - Applicable Scope

IEBC Chapter 12 Historic Buildings

1201.2 For Alterations or Change of Use - Evaluation and written report prepared 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)	<b>A2 - Existing Assembly</b> , community hall
IBC (311.2) & NFPA (Chapters 39 & 43)	Accessory Nonseparated <b>B - BUSINESS existing</b> Office, Professional, or service type transactions, including storage of records and accounts

### 3 Minimum Occupancy Separations

NFPA - 6.1.14.4.1a

Table IBC 508.4 Required Separation of Occupancies in hours

OCCUPANCY	B Business, Office
A3 - Assembly, community hall	<b>non-separated; all spaces shall conform to A3</b>

### IBC Table 508.2.5 Incidental Use Areas

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

### Separation Continuity IBC 711.2.3.1

horizontal assemblies - supporting construction	Shall be protected as is the Fire resistance rating of horizontal assembly supported
NFPA - 7.1.3.2.1 - not required when separation is existing	Continuous fire rating for supporting construction of horiz separation assemblies is required; except at separation of incidental uses

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

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

Construction Type	Occupancy	sprinklered	sprinklered	sprinklered	sprinklered
5B*	A3	4001	6002	6,000	18,000

*non-compliant as existing*

As Designed	
Stories above grade	2
Height (Feet)	34 +/-
Footprint Area	2,764
Gross Floor Area (sf)	

### 5

Level	Occupancy	Zoning & IBC - Building Area Footprint	IBC - Occupancy Floor Area
		to outside face of exterior walls	to inside face of exterior walls
2nd floor - Footprint	A3	2,764	2,530
1st floor	B	2,717	2,480
<b>gross area above grade</b>		<b>5,481</b>	<b>5,010</b>



6 Fire-resistance 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	
<b>Primary Structural Frame</b>		
<b>Columns</b>	0	1 / HT
supporting more than one floor, columns, other bearing walls		
supporting one floor only		
supporting roofs only		
<b>Beams, Girders, Trusses</b>	0	1 / HT
supporting more than one floor, columns, other bearing walls		
supporting one floor only		
supporting roofs only		
<b>Bearing Walls - Exterior</b>	0	
<b>Bearing Walls - Interior</b>	0	
<b>Exterior</b>	0	
<b>Secondary Members</b>	0	1 / HT
<b>Secondary Members</b>	0	

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

IBC - Table 602

Occupancy	A3	B
Construction Type	5B	4
<b>Fire Separation Distance</b>		
<5'	1	1
≥5' <10'	1	1
≥10' <30'	1	1
≥30'	0	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 & B business		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
boiler room > 200k btu when 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

IBC / NFPA	not sprinklered		with auto sprinkler system per Section	
	A3	B	A3	B
Common Path Limit 1006.2.1	75	100	75	100
Dead End Limit 1020.4	20	50	20	50
Travel Distance Limit 1017.2 / 13.2.6.2	200	300	250	300

11 Occupant Load

Level / total area per level	Occupancy	Net Occupied Floor Area (sf)	sf/occupant	#occupants	Total Maximum Occupants
2	A3 - stage & backstage	466	15	31.07	
1,421	A3 - tables, or movable seating (not standing*)	955	7	136.43	167.50
1					
2,480	B business, office	2,480	100	24.80	24.80
<b>TOTAL maximum occupancy</b>		<b>3,901</b>			<b>192.30</b>

\*Note: Per NFPA 13.3.5.1, if "festive seating" (audience standing only, no chairs) is used at auditorium, then a fire sprinkler suppression system is required. If building is not sprinklered, auditorium is limited to 136 occupants at audience area, and 31 occupants at stage/backstage area.

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 IBC 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 pass.

**13 Egress Width per Occupant Served**

\* with automatic sprinkler system in accordance with Section 903.3.1.1

	IBC 1005.1	NFPA 7.3.3.1	exit(inches)	Provided
Stairways	1005.3.1	3 inches/occpt.	25.12	50"
Other egress components	1005.3.2	.2 inches/occpt.	16.75	34" min. clear door openings

**14 Minimum Required Width of Egress**

	Min. Width (in/occ)	Min. Width Prescriptive	Min. Width Provided
Stairways	25.12	<b>44.00</b>	50"
Passageways, Aisles and Corrid	16.75	<b>A:44 &amp; B:36</b>	44"

**15 Energy Code: IECC 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, at
- 305.8.14 threshold height = 3/4"
- 305.8.5 1:8:1:10 for max rise 3"

**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.

- required in both fire rated stairwells, unless elevator/lift is on
- NFPA/IBC/ADA Tactile (braille) exits signs are required at each exit and stairway door.
- ANSI/ADA

**17 Fire Alarm System**

NFPA 13.3.4.1.1 Assembly occupancy

**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

	No. occupants	Water Closets (MF 50-50)		Lavatories (MF 50-50)		Tubs/Showers required	IPC) * not required for occ<15 ** not required for restaurants providing free		Service Sink
		no. required per use	total required	no. required per use	total required		required	total required	
A3 - community hall	167.5	1:125 Male & 1:65 Female	1.96	1 per 200	0.84	None	1 per 500	0.3	1
B - office	24.8	1 per 25(@<51)	1.00	1 per 40(@<81)	1.00	None	1 per 100	0.2	1
<b>Total Required</b>			<b>3.0</b>		<b>2.0</b>	<b>0</b>		<b>1.0</b>	
<b>Total Provided</b>			<b>13.0</b>		<b>12.0</b>	<b>4</b>		<b>0.0</b>	

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

IEBC Alterations 908.1: Alterations to existing buildings 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.

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.

Chapter 5 - Existing 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.

	Prescriptive Table C402.1.3 ci = continuous insulation	Performance Table C402.1.4	SHGC - sew	SHGC - n
<b>Building Envelope Requirements</b>				
Roof insulation entirely above roof	R-30 or R-38	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 4 – Proposed Use Conceptual Design**






The following proposed demolition and new construction plans portray the programmatic space goals described in Part 2. In summary:

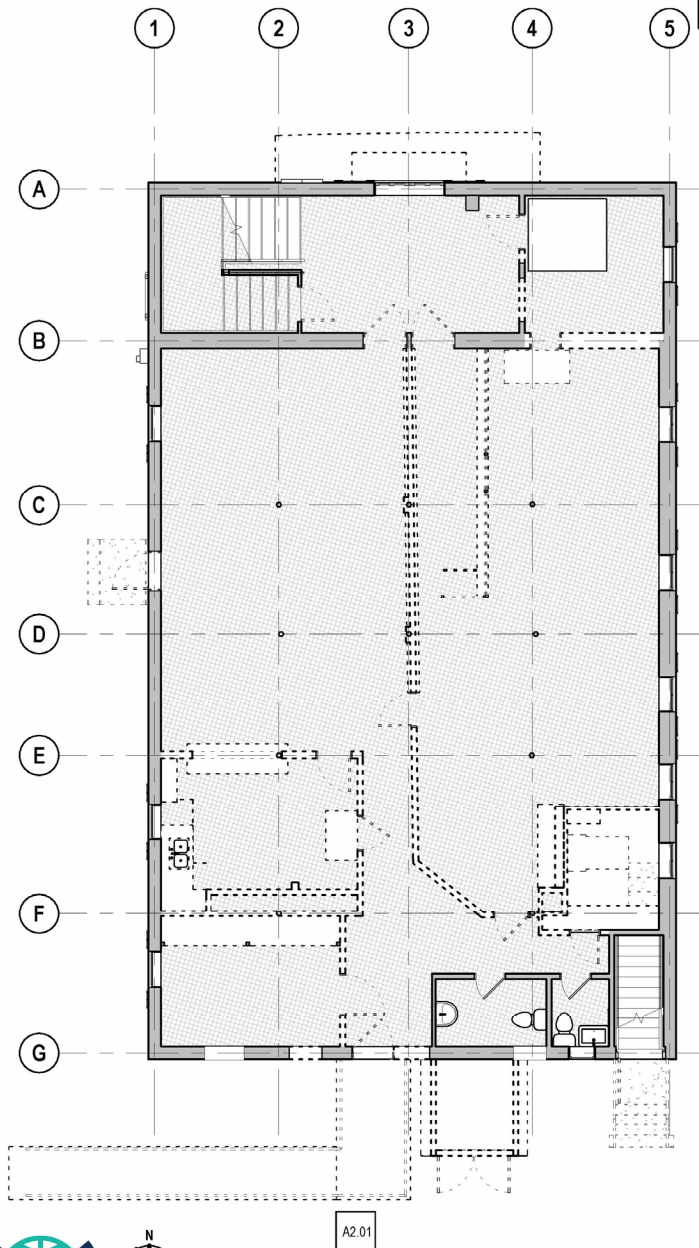
The building envelope would be repaired, painted and made sound; the first floor structure replaced and repaired as required. Note that selective areas of finishes demolition for concealed conditions at first floor structure and at second floor rim joists will be needed to fully assess scope of repairs.

The first floor layout would be revised to more efficiently accommodate town offices space needs, while allowing for securable office spaces with accessible public access. Utility spaces for new HVAC and sprinkler systems are shown. A new, gender neutral handicapped toilet room is proposed at the front entrance off of the main lobby. This would be available for use by both town office occupants and auditorium visitors. The existing rear first floor toilet rooms would remain available for town office occupants and visitors.

The front entrance would be made accessible via a low-slope ramp (no handrails required when slope is less than 1:20). Resetting of the existing granite steps would be required, with a new granite landing at door threshold level. A new LULA lift (limited use limited application elevator) would be installed off of the main entrance lobby, behind existing historic walls; serving the first and second floors. A new rear deck and enclosed egress vestibule will provide safe and code compliance access to first floor and egress from second floor.






At the second floor, a new platform lift is proposed at the side of stage, for accessibility to the stage. A new and safer stair is proposed to the attic level, along with a new single user, non-handicapped toilet room off of the front upper level lobby.

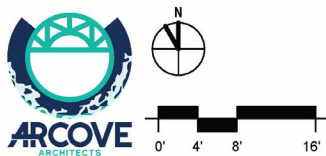
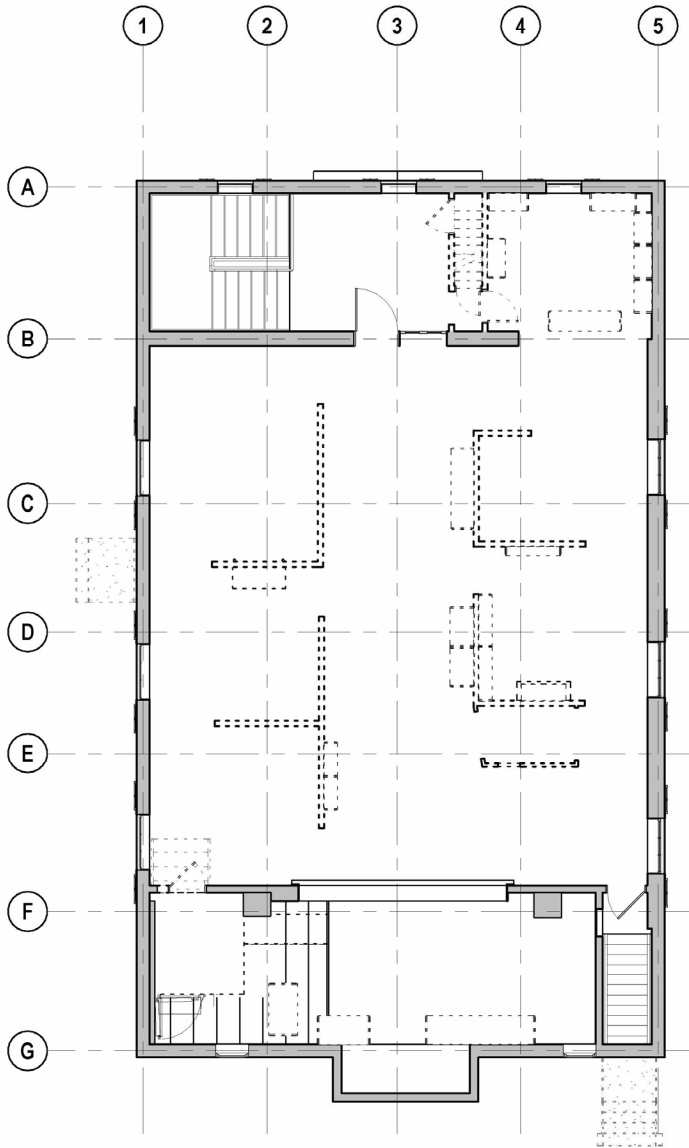
DEMOLITION LEGEND	
	EXISTING WALL TO BE REMOVED
	EXISTING WALL TO REMAIN
	EXISTING WINDOW & FRAME TO BE REMOVED
	EXISTING DOOR TO REMAIN
	EXISTING DOOR AND FRAME TO BE REMOVED



1ST FLOOR DEMOLITION PLAN  
MONT VERNON TOWN HALL

PD1.01  
6/01/2023  
PROJECT NO: 1006






DEMOLITION LEGEND	
	EXISTING WALL TO BE REMOVED
	EXISTING WALL TO REMAIN
	EXISTING WINDOW & FRAME TO BE REMOVED
	EXISTING DOOR TO REMAIN
	EXISTING DOOR AND FRAME TO BE REMOVED

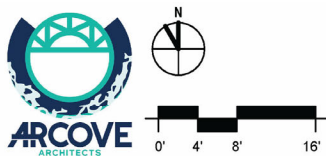
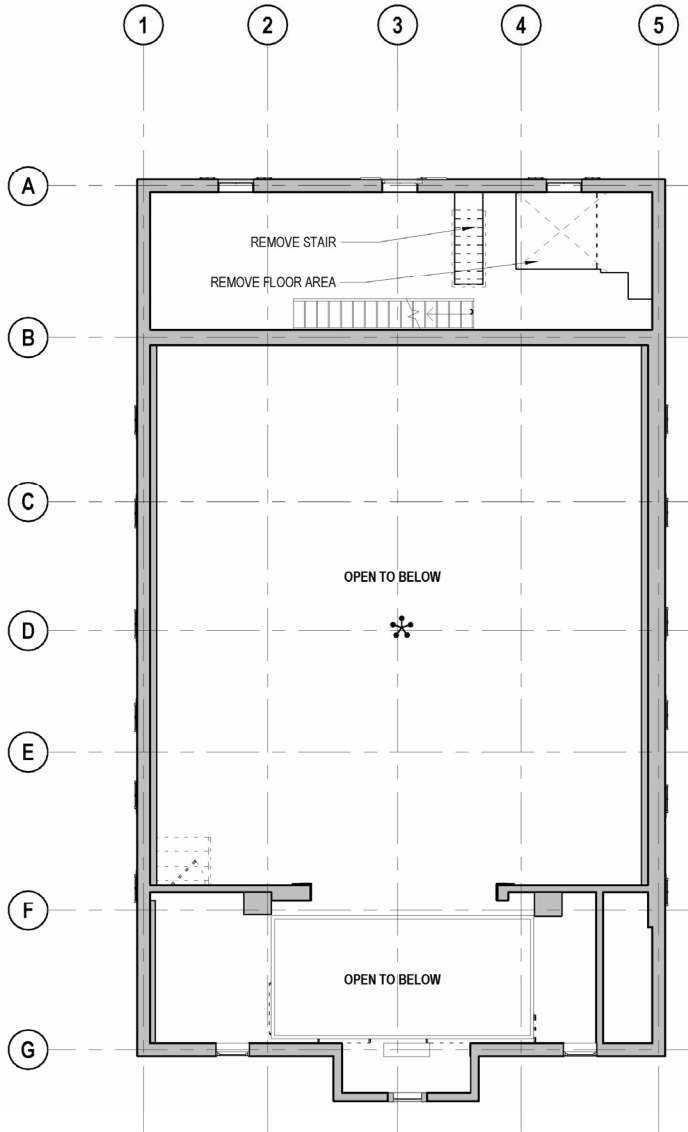


2ND FLOOR DEMOLITION PLAN  
MONT VERNON TOWN HALL

PD1.02  
6/9/2023  
PROJECT NO: 1006








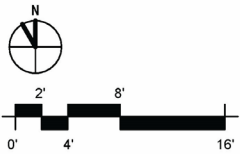
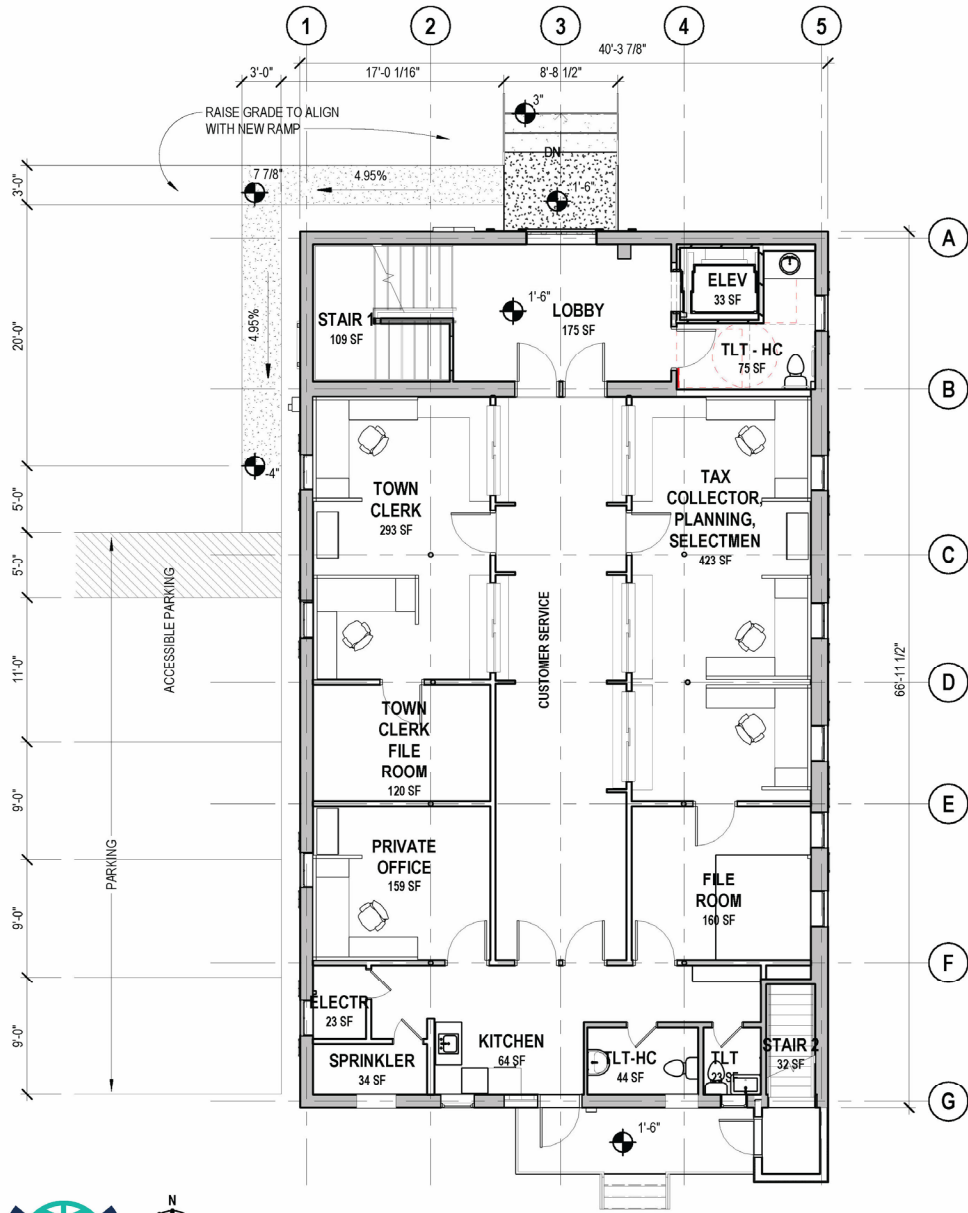
DEMOLITION LEGEND	
	EXISTING WALL TO BE REMOVED
	EXISTING WALL TO REMAIN
	EXISTING WINDOW & FRAME TO BE REMOVED
	EXISTING DOOR TO REMAIN
	EXISTING DOOR AND FRAME TO BE REMOVED



ATTIC MEZZANINE DEMOLITION PLAN  
MONT VERNON TOWN HALL

PD1.02.5  
6/01/2023  
PROJECT NO: 1006

PLAN LEGEND	
	NEW WALL
	EXISTING WALL TO REMAIN
	NEW DOOR
	EXISTING DOOR TO REMAIN
	AREA NOT IN SCOPE








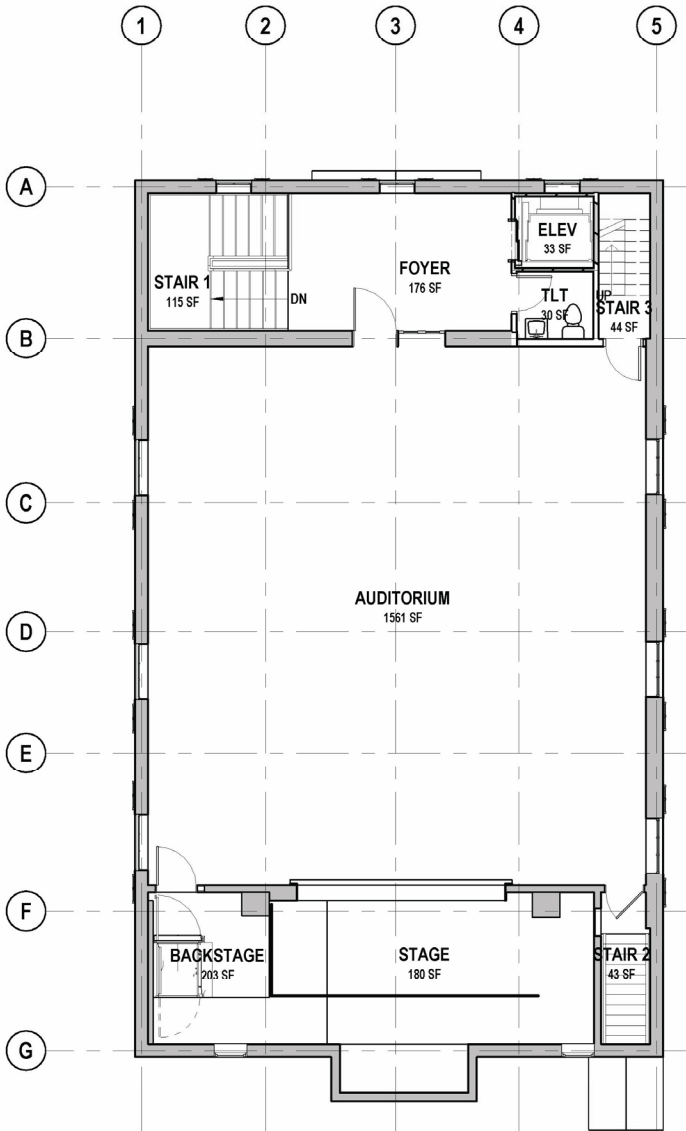
1ST FLOOR PLAN

MONT VERNON TOWN HALL

P1.01

4/28/2023  
PROJECT NO:1006






PLAN LEGEND	
	NEW WALL
	EXISTING WALL TO REMAIN
	NEW DOOR
	EXISTING DOOR TO REMAIN
	AREA NOT IN SCOPE

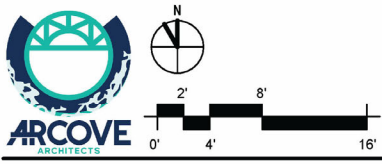
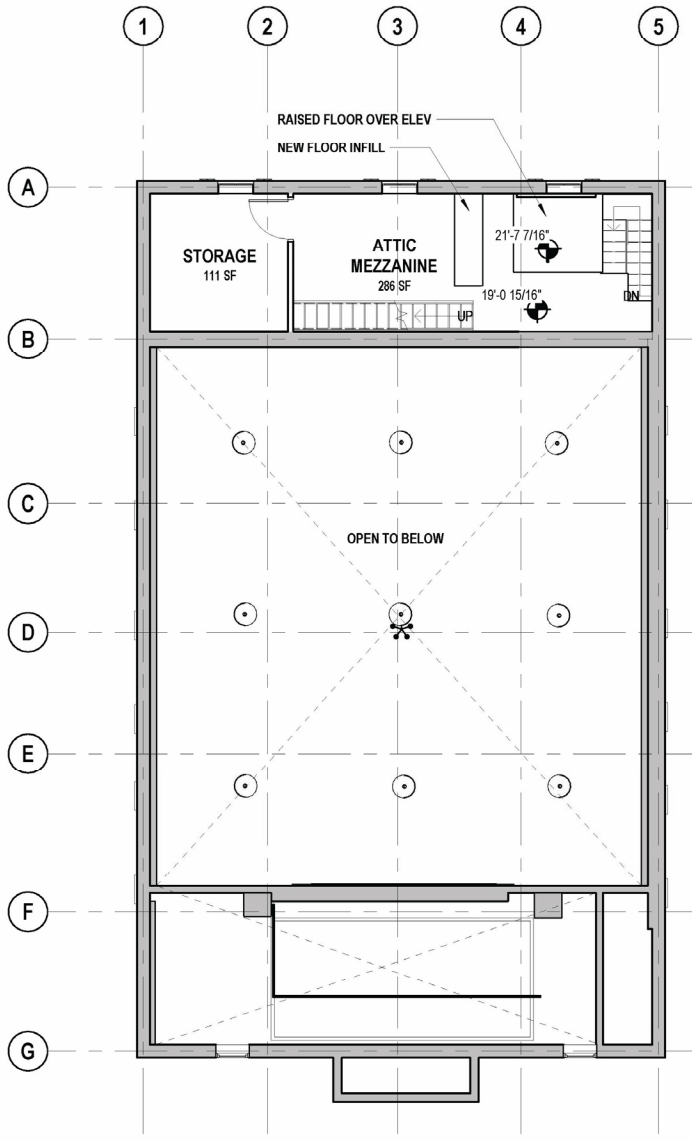


ARCOVE ARCHITECTS logo is located at the bottom left. To its right is a north arrow pointing upwards. Below the north arrow is a graphic scale bar with markings at 0', 4', 8', and 16'. To the right of the scale bar is a section marker symbol consisting of a triangle with the number '1' above it and a box containing 'A2.01' below it.

2ND FLOOR PLAN  
MONT VERNON TOWN HALL






P1.02  
6/01/2023  
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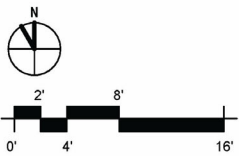
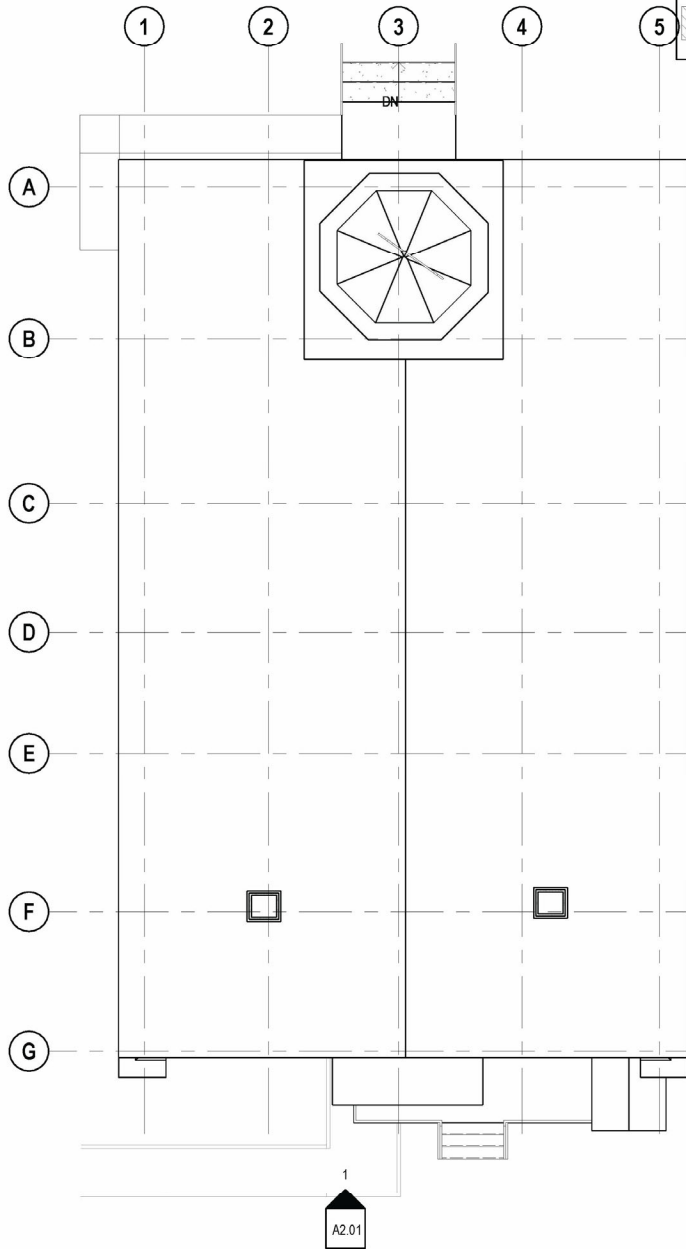
PLAN LEGEND	
	NEW WALL
	EXISTING WALL TO REMAIN
	NEW DOOR
	EXISTING DOOR TO REMAIN
	AREA NOT IN SCOPE



ATTIC MEZZANINE PLAN  
MONT VERNON TOWN HALL

P1.02.5  
6/01/2023  
PROJECT NO: 1006

PLAN LEGEND	
	NEW WALL
	EXISTING WALL TO REMAIN
	NEW DOOR
	EXISTING DOOR TO REMAIN
	AREA NOT IN SCOPE



ROOF PLAN  
MONT VERNON TOWN HALL

P1.03  
6/01/2023  
PROJECT NO: 1006



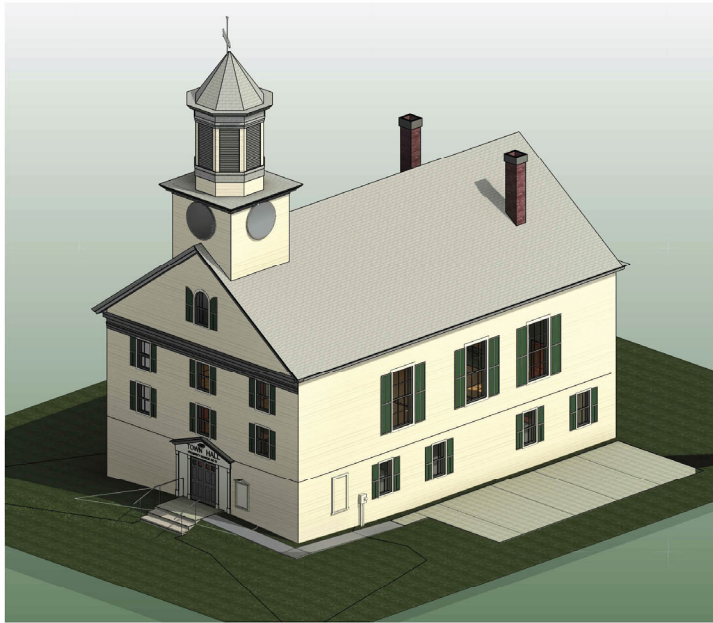


PROPOSED SERVICE CORRIDOR, FIRST FLOOR TOWN OFFICES

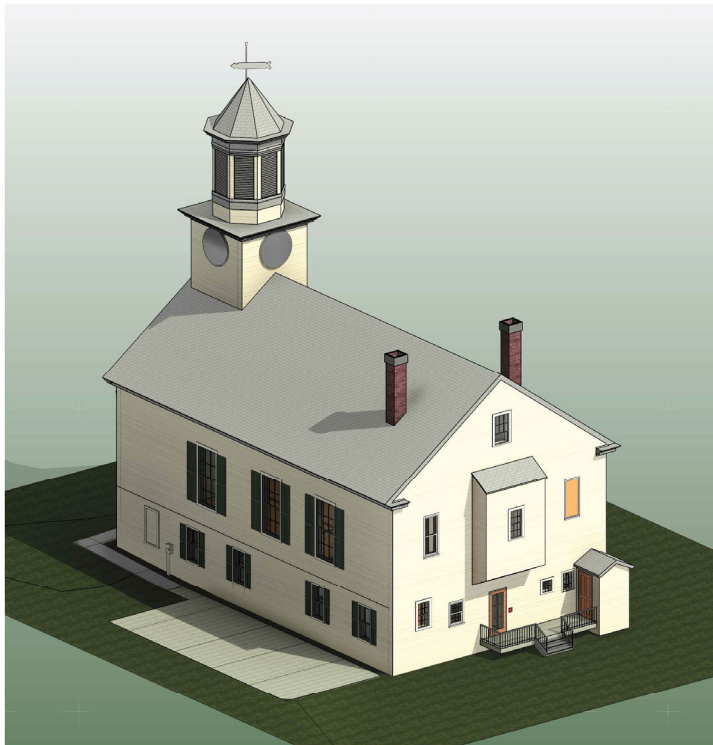


PROPOSED TOWN OFFICES WORK AREA, FIRST FLOOR





1 FRONT AXONOMETRIC

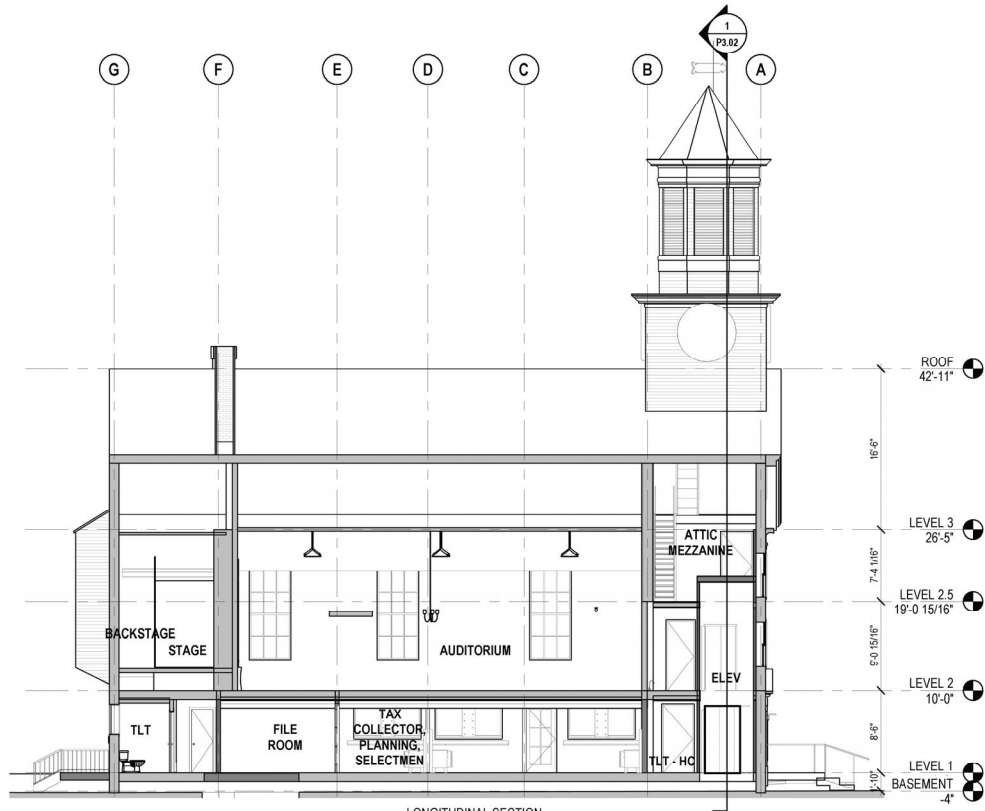


2 REAR AXONOMETRIC



VIGNETTES - EXTERIOR  
MONT VERNON TOWN HALL

P2.02  
12/30/2023  
PROJECT NO.:1006

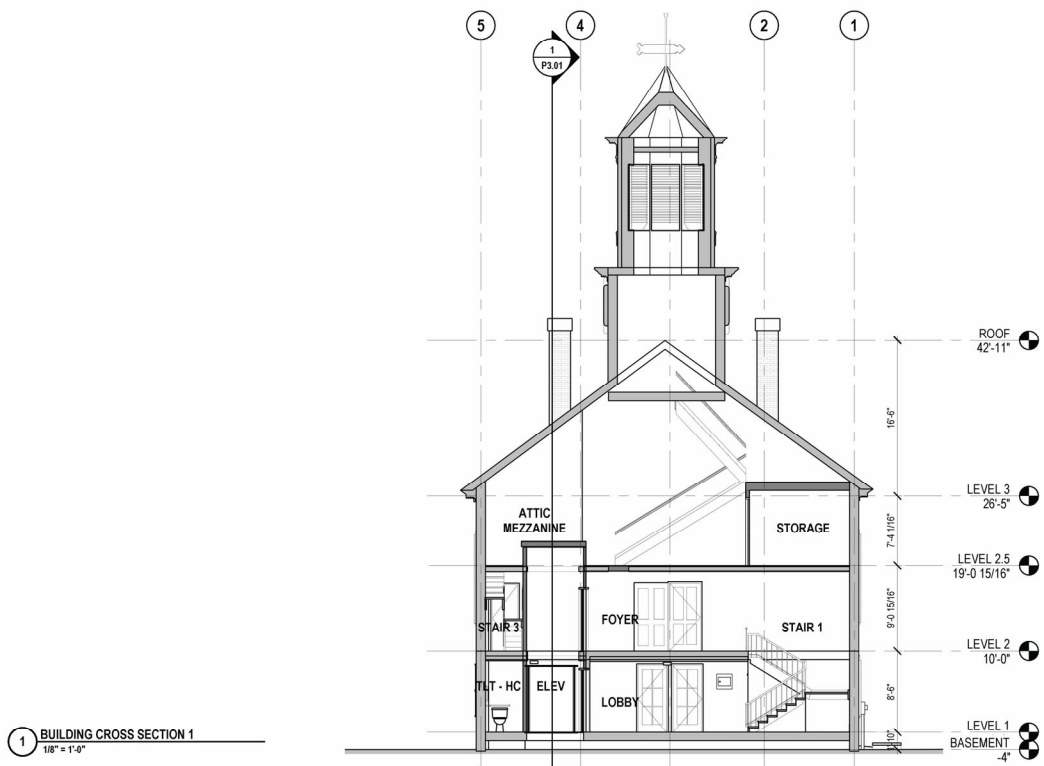


1 BUILDING LONGITUDINAL SECTION 2  
1/8" = 1'-0"

LONGITUDINAL SECTION  
MONT VERNON TOWN HALL

P3.01

12/2022  
PROJECT NO.1006



1 BUILDING CROSS SECTION 1  
1/8" = 1'-0"

CROSS SECTION  
MONT VERNON TOWN HALL

P3.02

12/2022  
PROJECT NO.1006

## Part 5 – Energy Modelling

# ENERGY ANALYSIS

### Mont Vernon Town Hall Mont Vernon, NH

December 30, 2023

The Town Hall building was analyzed for energy efficiency improvement options, using CoveTool Energy Modelling software. The results of our analysis compare the existing conditions with select building improvement option scenarios including mechanical heating & cooling; roof insulation; and wall insulation.

#### Summary

The existing Town Hall building is highly inefficient for energy usage, with an EUI (energy use intensity) rate of **76**. EUI measures energy a building uses per square foot, per year, in KBTU's. The Department of Energy's national average for similar buildings in this area is nearly half, at **46**. To achieve global climate goals, new buildings need to be EUI **9**. With historic buildings such as this, it is expected to have lower efficiency rates, however an EUI of 76 leaves much opportunity for improvement. We understand there is a need to balance first costs with operational costs. The following comparisons show the energy usages, cost to install, and the payback periods for three energy improvement approaches.

#### Option A: Existing Conditions.

Baseline condition, no changes. Oil fired furnace for heat. No air conditioning, no mechanical ventilation. Existing R-20 attic insulation, and no wall insulation for an effective value of R-3.6.

December 30, 2023

Mont Vernon Town Hall – Energy Analysis

Page 1 of 2



**Option B: HVAC.**

Replace the existing heating system with new electric, air-source heat pump system for heating, ventilation, and air conditioning (HVAC). The cost per ReARCH’s 8/11/23 budget is roughly \$342,000. The building’s energy usage would be **34** EUI, which is 45% of current energy use and better than national average. The building insulation would not be improved in this scenario. The electricity cost to run this HVAC system would be approximately \$8,353 per year. This is an increase of approximately \$1,077 per year over the current heating system, due in part to changing energy source from oil to electric within a poorly insulated building. However this approach has the advantage of providing air conditioning and fresh air, as well as heat, while reducing carbon emissions by more than half.

**Option C: HVAC & Wall Insulation**

In addition to a new HVAC system, this option adds blown cellulose fiber insulation to exterior walls. In this scenario, the building’s energy usage drops to an EUI of **23**, which is 30% of current energy use. The electricity cost each year to run the new HVAC system with added wall insulation would be approximately \$5,572 per year. This is a savings of approximately \$1,704 per year over the current heating system. These savings would cover the cost of wall insulation in about 7 years. This approach offers the highest investment-to-performance value, and is our recommended approach for this project.

**Option D: HVAC, Wall & Roof Insulation**

This option adds more roof insulation to the attic, where there is already some insulation; a new HVAC system; and wall insulation. This scenario would provide an EUI of **22**, only slightly better than option C. The cost of the roof insulation would be approximately 31,694. The electricity cost each year to run the new HVAC system with added wall and roof insulation would be approximately \$5,383 per year -- not much different than Option C – with a savings of approximately \$1,893 per year over the current heating system. These savings would cover the cost of wall insulation in about 7 years, and the cost of roof insulation in an additional 3 years.

Option	A	B	C	D
<b>operating cost analysis</b>	<b>existing</b> (r20 roof, r3.6 walls)	<b>HVAC</b> (r20 roof, r3.6 walls)	<b>HVAC &amp; walls</b> (r20 roof, r20 walls)	<b>HVAC, roof &amp; walls</b> (r50 roof, r20 walls)
Installation Cost	\$ -	\$ 342,000	\$ 20,606	\$ 31,694
Annual energy usage (EUI)	76	34	23	22
Annual energy cost	\$ 7,276	\$ 8,353	\$ 5,572	\$ 5,383
Payback period (years)	0.00	0.00	7.41	10.67

# Part 6 – Budget & Schedule

Project: **Mont Vernon Town Hall**

Date: **November 29, 2023**

Overall Budget per Historic Building Condition Assessment Dated 3/14/23		
1st Floor	2,730	sf
2nd Floor	2,772	sf
Attic Mezzanine	401	sf
		sf
<b>Total Finished SF =</b>	<b>5,903</b>	<b>sf</b>



Const. Start date =	4/14/2025
Const. Finish date =	1/30/2026
Project durations wks =	41.6
Project durations mos =	9.6

Div. #	Description	Quantity	Unit	Detail Total	Div. Total
<b>Div-1a</b>	<b>Pre-Construction</b>				<b>\$ 4,600</b>
	Proposed precon fee - Part 1	1	ls	\$ 4,500	
<b>Div-1b</b>	<b>General Requirements</b>				<b>\$ 344,439</b>
	PM - 12 hours per week	499	hrs	\$ 58,865	
	Estimator - 2 hours per week	83	hrs	\$ 8,730	
	Superintendent - Full Time	41.6	wks	\$ 179,589	
	Project Vehicles (Super)	41.6	wks	\$ 20,446	
	Supers - Lodging and Meals	41.6	wks	\$ 36,354	
	Safety Officer	41.6	wks	\$ 4,210	
	Safety Requirements	1	ls	\$ 1,330	
	Safety Supplies (Signage, Hardhats, Fire Extinguishers)	1	ls	\$ 530	
	Construction Blueprints/mailings/printing cost	1	ls	\$ 477	
	Tools & Equipment	1	ls	\$ 1,060	
	Set up Field Offices in space	1	ls	\$ 1,472	
	Field Office supplies	10	mos	\$ 2,542	
	Sanitary Facilities & Temporary Toilets	10	mos	\$ 3,051	
	Move Materials	10	mos	\$ 7,675	
	Rubbish, Recycling & Cleanup	10	mos	\$ 12,204	
	Final Cleaning	5,903	sf	\$ 5,903	
<b>Div-2</b>	<b>Selective Demolition</b>				<b>\$ 36,700</b>
	<b>Demolition:</b>				
	Walls and doors	3,610	sf	Included Above	
	Millwork	225	sf	Included Above	
	Concrete	615	sf	Included Above	
	Demo display cases/storage	1	ls	Included Above	
	Demo stair	1	ls	Included Above	
	Demolition - Labor	10	days	\$ 16,000	
	Equipment Rental	10	days	\$ 1,800	
	Investigative demo before work commences	40	hr	\$ 3,000	
	Demolition Dumpster	500	cy	\$ 15,900	

Div. #	Description	Quantity	Unit	Detail Total	Div. Total
<b>Div-31</b>	<b>Site Work</b>				<b>\$ 31,633</b>
	1C - Install gutters and downspout, and gravel drip strip along foundation perimeter				
	Gravel drip strip excavation	11	cy	\$ 567	
	Gravel drip strip with perforated perimeter drain system	11	cy	\$ 5,667	
	1M - Replace first floor framing with insulated assembly				
	1M - Assume excavating 18" deep	154	cy	\$ 15,400	
	1M - Assume adding piers	1	ls	\$ 10,000	
<b>Div-3</b>	<b>Concrete</b>				<b>\$ 8,281</b>
	2A - Concrete steps at rear exit should be structurally reinforced or replaced. Replace guardrail - deleted, will be part of deck				
	2A - demo concrete	-	cy	\$ -	
	2A - new concrete steps	-	cy	\$ -	
	3B - Provide accessible front (main) entrance - assume new ramp only from door to existing asphalt	5.9	cy	\$ 4,148	
	3B - excavation	5.9	cy	\$ 593	
	3C - Rear handicapped ramp - provide landings - removed, not needed, only new front entry	-	cy	\$ -	
	3C - excavation	-	cy	\$ -	
	3H - LULA lift for second floor assembly space and at stage if programmable space				
	3H - elevator pit footings	4.4	cy	\$ 3,090	
	3H - excavation	4.4	cy	\$ 450	
<b>Div-4</b>	<b>Masonry</b>				<b>\$ 5,400</b>
	1E - Repoint chimney; or remove if not needed for mechanical ventilation - assumes repoint	3	cd	\$ 5,400	
<b>Div-5</b>	<b>Metals</b>				<b>\$ 800</b>
	3B - Provide accessible front (main) entrance - assume new ramp only from door to existing asphalt			\$ -	
	3B - handrail	20	lf	\$ 800	
	3C - Rear handicapped ramp - provide landings - removed			\$ -	
	3C - handrail	-	lf	\$ -	
<b>Div-6a</b>	<b>Rough Carpentry</b>				<b>\$ 206,753</b>
	<b>1st Floor Framing Plan</b>				
	1I - First floor framing should be replaced according to structural report (Appendix D)				
	1I - Demo existing floor and framing supports	2,730	sf	\$ 5,460	
	1I - Replace existing floor framing and decking - no change in number, need to do investigative demo to figure out extent of replacement	2,730	sf	\$ 49,004	
	1I - fasteners	1	ls	\$ 1,085	
	1I - shoring allowance	215	ls	\$ 32,250	
	1L - Structure Repair (Appendix A)				
	1L - repairs at leaning clock tower	1	ls	\$ 7,500	
	1L - selective replacement of second floor rim joists - no change in number, need to do investigative demo to figure out extent of replacement	136	lf	\$ 61,200	
	1N - Repair and reinforce split braces and unreinforced beams under front wall of bell	1	ls	\$ 10,000	
	1O - Inspect exterior wall conditions at second floor rim joists, at side walls for further review	1	ls	\$ 5,000	

Div. #	Description	Quantity	Unit	Detail Total	Div. Total
	2E - Reconfigure rear exit stair for clearance at landings - removed	-	ls	\$ -	
	Fitout - deck allowance	1	ls	\$ 10,000	
	Fitout - Stair 3 allowance added	1	ls	\$ 10,000	
	Dumpster for trades	10	mos	\$ 15,255	
<b>Div-6b</b>	<b>Architectural Wood Casework, Countertops</b>				<b>\$ 28,271</b>
	<b>Kitchen Millwork</b>				
	Fitout - Base cabinets	10	lf	\$ 3,983	
	Fitout - Wall cabinets	10	lf	\$ 3,188	
	Fitout - Counter	10	lf	\$ 1,100	
	Fitout - Office transaction window wood paneling allowance	1	ls	\$ 20,000	
<b>Div-7a</b>	<b>Siding &amp; Trim</b>				<b>\$ 4,800</b>
	1D - Repair decayed wood at shutters and louvers at bell tower - reduced, just pain and scrape	8	ea	\$ 4,800	
<b>Div-7b</b>	<b>Insulation &amp; Waterproofing</b>				<b>\$ 53,507</b>
	<b>Insulation:</b>				
	1M - Replace first floor framing with insulated assembly				
	1M - Vapor barrier	4,095	sf	\$ 20,475	
	1M - Vertical insulation at interior face of foundation walls	430	sf	\$ 1,720	
	1M - insulation at interior face of rim boards	430	sf	\$ 1,720	
	1M - drainage mat	2,730	sf	\$ 5,460	
	<b>Joint Sealant</b>				
	Joint sealant allowance at doors, window, etc.	1	ls	\$ 2,500	
	2F - If alterations or change of use. Fire-protection steel tube columns - deleted	-	ea	\$ -	
	3L - Air Sealing allowance	1	ls	\$ 5,000	
	3M - Exterior wall - insulation assembly - assume Level 1, repair of existing siding, trim, flashing, sheathing boards pending full investigation - see AIt #1	-	sf	\$ -	
	3M - Exterior wall - insulation assembly - Level 2, add blown cellulose fiber insulation - see AIt #2	-	sf	\$ -	
	3N - Attic insulation assembly and louvers at attic gable windows or roof ventilators				
	3N - attic insulation - blown-in mineralwool (R-30, fire resistant)	2,772	sf	\$ 5,544	
	3N - air/vapor barrier	2,772	sf	\$ 11,088	
<b>Div-7c</b>	<b>Roofing</b>				<b>\$ 14,510</b>
	1B - Reflash roofing and roof to wall connections where compromised	238	lf	\$ 7,140	
	1C - Install gutters and downspout, and gravel drip strip along foundation perimeter				
	1C - Aluminum gutter	222	lf	\$ 3,330	
	1C - Aluminum downspout	104	lf	\$ 1,040	
	3O - New attic hatch and access ladder, or extend stair if LULA installed at current attic stair - deleted, now new stair	-	ls	\$ -	
	3N - Attic insulation assembly and louvers at attic gable windows or roof ventilators				
	3N - Attic gable louvers	2	ea	\$ 3,000	

Div. #	Description	Quantity	Unit	Detail Total	Div. Total
<b>Div-8a</b>	<b>Windows and Glass</b>				<b>\$ 12,500</b>
	1F - Repair double hung wood windows. Repair existing aluminum storm windows at first floor - allowance - deleted, will be in owner scope	-	ea	\$ -	
	Fitout - Transaction window allowance	5	ea	\$ 12,500	
<b>Div-8b</b>	<b>Doors, Frames &amp; Hardware</b>				<b>\$ 59,849</b>
	2B - Provide door panic hardware at exit and stairwell doors - reduced quantity from 6 to 5	5	ea	\$ 9,450	
	3B - accessible front entrance hardware with operators on each side	1	ls	\$ 2,950	
	3D - Exterior doors - weather stripping, accessible latch sets	6	ea	\$ 8,160	
	3E - Plane and bevel door thresholds for maximum 3/4" height, or provide ramped accessory	6	ea	\$ 1,350	
	3F - Provide accessible lever latch-sets at doors to bathrooms and along primary routes	11	ea	\$ 10,296	
	3J - Replace/relocate the door latch-set at first floor meeting room to front stair hall	1	ls	\$ 883	
	Fitout - Interior doors	15	ea	\$ 26,760	
<b>Div-9a</b>	<b>Gypsum Board Assemblies</b>				<b>\$ 69,263</b>
	1H - Repair water damaged ceilings behind stage. Inspect adjacent concealed areas.	481	sf	\$ 4,810	
	1K - cutting and patching allowance for new mechanical work	1	ls	\$ 5,000	
	2Cii - Provide 2 hour fire rating at 2nd floor assembly (reduced to 1 hour if sprinklered) - assume 2nd floor lobby area - reduced by half for 1 hour	477	sf	\$ 1,193	
	2Ciii - Provide 2 hour fire rating at exit stair interior walls and doors (1 hour if sprinklered) - reduced by half	1,320	sf	\$ 3,300	
	2D - Electrical - upgrades are recommended per CW-2018 report				
	2D - cutting and patching allowance to access wiring throughout building	1	ls	\$ 10,000	
	3H - LULA lift for second floor assembly space and at stage if program mable space				
	3H - fire rated shaft wall	500	sf	\$ 5,000	
	Fitout - General wall patch allowance	40	hr	\$ 3,000	
	Fitout - Gypsum partitions, assume 2x4 studs, insulation, drywall both sides	3,696	sf	\$ 36,960	
<b>Div-9b</b>	<b>Finish Flooring</b>				<b>\$ 58,047</b>
	Fitout - Floor prep	5,502	sf	\$ 5,502	
	Fitout - Wood flooring throughout 1st floor open area	1,903	sf	\$ 28,545	
	Fitout - Carpet at 1st floor offices	101	sy	\$ 4,549	
	Fitout - Refinish wood floor at 2nd floor	3,490	sf	\$ 17,452	
	Fitout - Vinyl wall base	800	lf	\$ 2,000	
<b>Div-9c</b>	<b>Painting</b>				<b>\$ 55,925</b>
	1A - Scrape peeling paint, selectively repair/replace rotted wood, repaint siding and trim				
	Scrape peeling paint, repaint siding - includes primer and 2 coats exterior latex	6,043	sf	\$ 18,129	
	Repaint trim	1,792	lf	\$ 5,376	
	Boom lift for 2 months	2	mos	\$ 6,254	
	Excludes replacement of rotted wood				
	3N - Attic insulation assembly and louvers at attic gable windows or roof ventilators				
	3N - (2) coats latex paint 2nd floor ceiling	2,772	sf	\$ 4,158	
	Fitout - Paint partitions, ceilings, doors, trim throughout	5,502	sf	\$ 22,008	



Div. #	Description	Quantity	Unit	Detail Total	Div. Total
Div-9d	<b>Ceilings</b>				\$ 28,526
	Fitout - Assume ACT throughout 1st floor	3,003	sf	\$ 25,526	
	Fitout - Patch existing plaster ceiling at 2nd floor	40	hr	\$ 3,000	
Div-11	<b>Equipment</b>				\$ -
	Refrigerator - by owner, removed	1	ls	\$ -	
Div-12	<b>Furnishings</b>				\$ -
	Assumes all furniture by owner	-	ls	\$ -	
Div-14	<b>Conveying</b>				\$ 85,000
	3H - LULA lift for second floor assembly space only, not at stage	1	ls	\$ 85,000	
Div-21	<b>Fire Suppression</b>				\$ -
	2Ci - Automatic fire suppression sprinkler system - removed, see Alt #3	-	sf	\$ -	
	2Ci - Sprinkler tank, in crawlspace? Underground? Location TBD	-	ls	\$ -	
Div-23	<b>Mechanical</b>				\$ 243,070
	<b>HVAC</b>				
	1J - Relocate/replace mechanical system. Insulate and weatherize new first floor assembly. Assume demo only and new system costs in 1K	1	ls	\$ 5,000	
	1K - Mechanical - upgrades as recommended per CW-2018 assessment report. Includes square foot allowance pricing for low temp air source heat pump system - removed attic mezzanine area from sf calculation cost - added back in	5,502	sf	\$ 192,570	
	1N - Install dehumidifier within crawlspace, with drain connected to sump pump	1	ls	\$ 3,000	
	<b>Plumbing</b>				
	3G - Update bathroom signage and plumbing fixtures. Add one new accessible Toilet Room	1	ls	\$ 15,000	
	3I - Accessible unisex family/assisted toilet room with access from second floor assembly space	1	ls	\$ 20,000	
	Fitout - Kitchen sink	1	ls	\$ 7,500	
Div-26	<b>Electrical</b>				\$ 209,145
	1K - Mechanical - upgrades as recommended per CW-2018 assessment report. Power for heat pump system - added back in	5,502	sf	\$ 16,506	
	2D - Electrical - upgrades are recommended per CW-2018 report				
	2D - upgraded service to building	1	ea	\$ 20,000	
	2D - upgrade wiring	5,903	sf	\$ 88,545	
	2D - upgrade lighting	5,903	sf	\$ 59,030	
	3A - Lightning protection system - per sf roof area	2,774	sf	\$ 4,855	
		-	sf	\$ -	
	<b>Fitout</b>				
	Demo	5,903	sf	\$ 5,903	
	Power at new partitions	5,903	sf	\$ 11,806	
	Relocate panel if required	1	ls	\$ 2,500	
	Fire alarm	By owner		\$ -	
	Telecom allowance	By owner		\$ -	

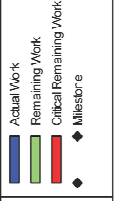
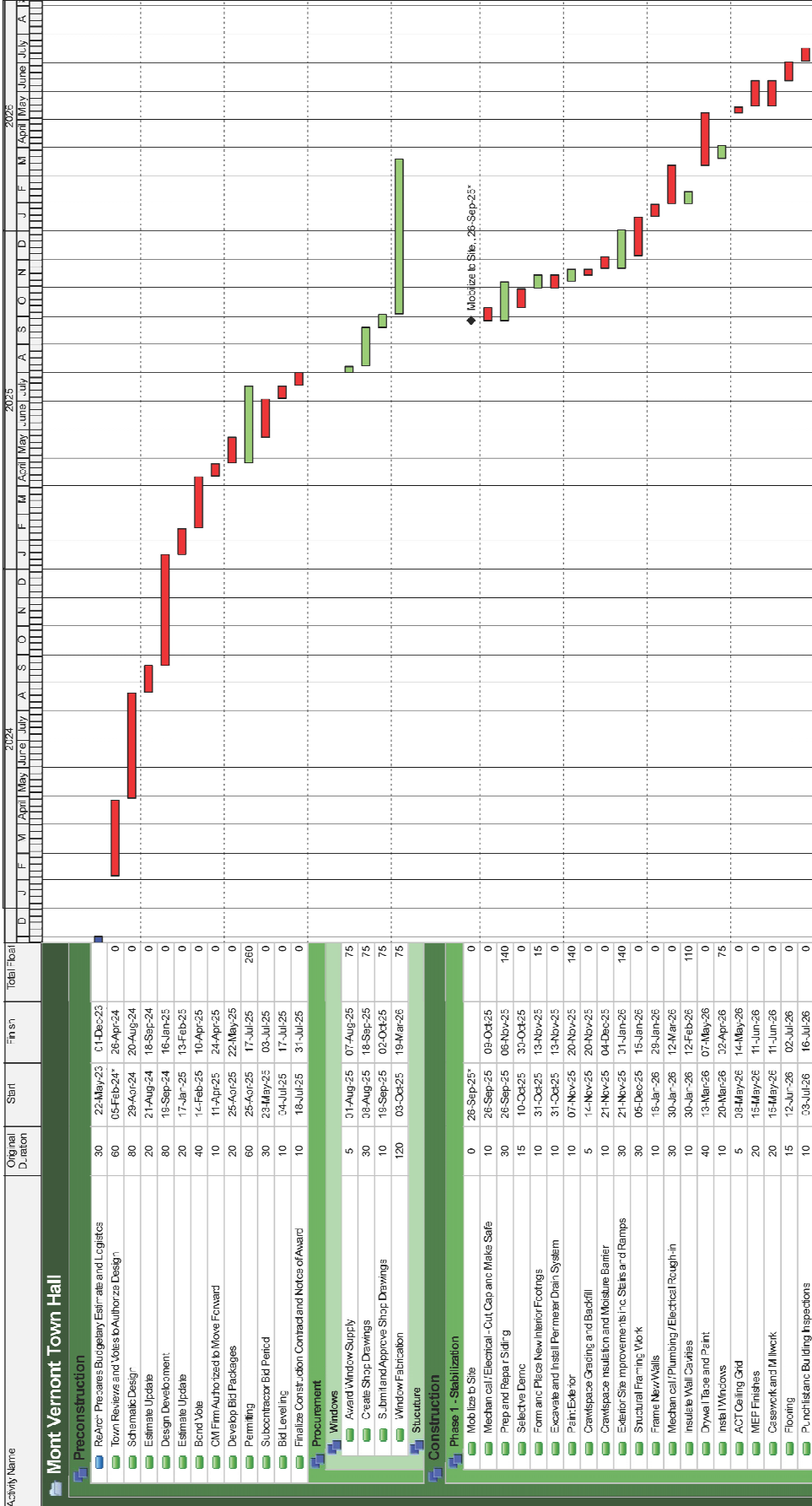
Div. #	Description	Quantity	Unit	Detail Total	Div. Total
Div-00	<b>Miscellaneous</b>				\$ 5,000
	1G - Restore and repair exterior clockfaces where required	1	ls	\$ 5,000	
Div-00	<b>Permits &amp; Insurance:</b>				\$ -
	Permits	By owner			
	Builders Risk Insurance	By owner			
Div-00	<b>Design Fees</b>				\$ -
	A/E Fee	By owner			
	<b>Sub Total</b>			\$ 1,565,918	\$ 1,565,918
	Escalation - assume 5% for 1 year	5.00%		\$ 78,296	\$ 78,296
	General Liability Insurance	1.0%		\$ 16,442	\$ 16,442
	CM Fee	8.0%		\$ 132,852	\$ 132,852
	ReArch Conceptual Contingency (SDs 10%, DDs 7.5%, CDs 5%)	12.5%		\$ 224,189	\$ 224,189
	<b>Total Estimate -----</b>			\$ 2,017,697	\$ 2,017,697

Alternates				
#	Description	Value (Including markups)	Accepted? Y/N	Accepted Value
1	3M - Exterior wall - insulation assembly - assume Level 1, repair of existing siding, trim, flashing, sheathing boards pending full investigation	\$ 62,292		\$ -
2	3M - Exterior wall - insulation assembly - Level 2, add blown cellulose fiber insulation	\$ 23,359		\$ -
3	2Ci - Automatic fire suppression sprinkler system	\$ 67,291		\$ -
4				\$ -
5		\$ -		\$ -
6		\$ -		\$ -

### Budgetary Next Steps:

This estimate includes allowances for structural repairs that is limited by the knowledge gathered to date in the assessment report and through our field observations (see line items 1I, 1L, and 3M). For the construction cost to be further developed and refined, we recommend hiring a local contractor to conduct the following investigative demo:

- Selective removal of the first-floor & subfloor to investigate the condition of the first-floor beams and purlins and define the extent of replacement required
- Selective removal of exterior siding/sheathing to investigate second-floor rim joists for integrity, and define extent of repair/replacement (per structural report).
- Removal of the first-floor ceiling to investigate the second-floor framing to accommodate an assembly use (per the recommendation of the structural engineer on page 15 of the historic building assessment)



Mont Vernon Town Hall  
 CONCEPT SCHEDULE  
 Data Date: 24-May-23 | Page 1 of 1

