McKENZIE ENGINEERING COMPANY, INC.

August 30, 2021

Board of Selectmen
Town Of Warren
48 High Street
Warren MA 01083

Re: Old Town Hall Building – Structural Assessment
1 Milton O Fountain Way
Warren MA 01083

Attn: David Dufresne, Chairman

Dear David,

This letter is a structural assessment of the Old Town Hall building located at 1 Milton O Fountain Way and addresses the Foundation, Masonry Walls, Floors, Roof and the Clock Tower. Attached to this letter are captioned photos, cost estimates for the building renovation per current code to the former use group of each floor, being Business use on the first floor and Assembly use for the public on the second floor, as requested an estimate for the demolition of the building is included on the last page.

Structural Assessment:

1. Building Foundation: The building foundation which measures 115' x 56' outside is constructed of stone rubble and/or brick mortared in place, interior structural piers are also of stone rubble and/or brick. No failure of the foundation system was observed however the bottom 24 " +/- of brick above the basement floor needs re-pointing and some brick replacement, most likely due to continual historical flooding of the basement during high flow conditions of the Powder Mill Brook that flows against the foundation on the South side of the building. There is evidence of multiple areas where the foundation leaks water currently causing high humidity and mold issues. One dehumidifier was observed but cannot keep up with the water entering the basement due to the permeability of the foundation. Except for the above issues the foundation is in good condition but needs reinforcement for seismic upgrades. Recommended seismic upgrades to include the replacement of the deteriorated brick columns with concrete filled steel columns, a reinforced concrete floor and buttress walls for the exterior rubble stone and brick foundation walls.

305 WHITNEY STREET
LEOMINSTER, MA 01453
www.MCKENZIEINC.com
(978) 537-8210

2. Masonry Walls: The exterior walls of the building on the East. North and West sides are faced with a yellow beige hard burned face brick with narrow joints that was added to the building after the 1900 fire. The South (rear) side of the original building is faced with a softer red brick. The majority of the brick surface on the building is in good condition with the following deficiencies noted:
    a. The brick on the North (Main Street) side from the Northeast corner at the Clock Tower is cracked/broken in many places and in need of repair. Refer to attached photo's #2811 thru 2814 showing various types of damage to the existing brick work requiring reconstruction. Additionally, the three facades with the yellow beige hard burned brick are stained/soiled and in need of cleaning and re-pointing as required.
    b. On the South (Powder Mill Brook) side there are deteriorated original red brick joints that need repointing. The Southwest area beyond the chimney also needs repointing work. The brick joint between the original building and the Memorial Hall addition requires new caulking. Access to this side of the building is difficult and trees, brush and vines growing up the brick would need to be cut to allow this proposed work.
    c. The limestone columns at the main entrance Portico are in reasonably good shape with some joints requiring repointing. The Portico limestone should be cleaned as should all the face brick on the building. It was noted that the wood roof deck of the portico is rotted and should be replaced.
3. Floors: From the basement the first-floor joist measurements and clear unsupported spans varied however in general they were measured as 1 ¾"x11 1/4" wood joists at 16" o.c. spanning 23', using a bending stress of 1400 psi with a 1.15 repetitive member factor and a dead load of 15 psf gives a live load rating of 60 psf which is sufficient for normal business use. The second-floor joist sizes per a Nov. 23, 2010 letter by Engineering Design Associates, Inc. were measured as 1 ¾" x 13" at 12" o.c. and as 2 ¾" x 13 ½" at 16" o.c., both spanning 24'-4" between bearing walls, using again 1400 psi allowable bending stress, a 1.15 repetitive member factor and a 15 psf dead load gives a live load rating of 74 psf and 99 psf respectively. Note that the minimum live load rating for assembly use is 100 psf. Per these live load calculations some reinforcement of the second-floor framing would need to be done for a proposed assembly use. The first floor level of the west addition was constructed 42" below the level of the original building first floor level, and an additional "mezzanine level" floor was constructed between the first and second floors. Headroom clearance does not meet code in this mezzanine level and this level is nonfunctional. I would recommend that the west addition first floor be brought level with the original building floor and the mezzanine level floor be eliminated.

4. Roof: The roof is conventionally framed with onsite constructed trusses to clear span over the auditorium. The top chord of the truss cantilevers approximately 4' from the bearing points on the North and South exterior walls to the bottom chord connection point. This cantilever creates and overstressed condition with a code snow load in the top chord and requires the trusses to be reinforced. The balcony and stairs to the balcony are also hung from what appears to be a 5-gang truss which cannot support a code required live load for the balcony of 100 pounds per square foot (psf). Truss reinforcement for the proper loads from the balcony support rods is required in my opinion. The upper low slope/flat roof area appears to have a relatively new TPO or PVC membrane and is in good condition. This upper low slope roof drains to a higher slope slate shingled roof that was observed to need some maintenance and repair of damaged/dislodged slates. The roof eaves have built in copper gutters which discharge to copper downspouts that drain to cast iron piping in the basement that drains to the powder mill brook on the South side. The gutters, fascia and soffit could only be observed from the ground but appear to be in good condition with the exception of some wood trim replacement and scraping and painting. There most likely is some copper replacement that will be required also which is typical for buildings of this age.
5. Clock Tower: The clock tower which measures 14' +/- square is constructed of unreinforced red brick with an exterior wythe of the yellow beige hard burned brick. The upper open level where the bell is located is wood framed with a copper roof and a copper floor at the bell level. It was observed that the bell level copper floor is leaking and that some wood trim and potentially framing at that level is rotting due to lack of maintenance and age. The copper upper roof could not be accessed but visually appears to be in good condition. Access to the bell level is difficult at best and extremely constricted. As previously mentioned under masonry, repairs to cracked and broken bricks in the clock tower will be required. The clock tower may make a good location for an elevator shaft.

Attached to this report as requested is a cost estimate to bring the first and second floors up to current code so that the entire building can be used with the second-floor auditorium being returned to an assembly use group. Costs included in the estimate to accomplish this upgrade include the foundation upgrades described, gutting the building, removal of the chimney, retrofitting of the west addition first-floor level, elimination of the mezzanine level, new stairs and windows in the west addition, upgrades on both levels and roof to meet current energy code, retrofitting for accessibility including an elevator retrofit in the clock tower shaft, new electrical, bathrooms, plumbing and HVAC. Structural upgrades and repairs to the foundation, exterior brick including seismic upgrades, windows, fascia, soffit, second floor framing and roof are also included as are a fire alarm and sprinkler system.

Please call if you have any questions.

Very Truly Yours,

Peter M. Reynolds, P.E.
President

ME-4317\Str Assessment Old Town Hall 08-30-21
Email: Jim Dusty <maintenance@warren-ma.gov>, David Dufresne <dufresne@warren-ma.gov>

Old Town Hall - Warren MA, 1 Milton O Fountain Way

Fire Escape From Balcony - Poor Condition
IMG_2723

Powder Mill Brook Against Building- South Side
IMG_2719

IMG_2724

Red Soft Brick Facade - South Side
IMG_2722

Clock Tower
IMG_2727

South East Corner
IMG_2725

Portico - Rotted Wood Deck - East Side
IMG_2728

South East Corner
IMG_2726

Clock Tower
IMG_2731

Portico - East Side
IMG_2729

Base - Clock Tower North Side
IMG_2732

Base - Clock Tower East Side
IMG_2730

North (Main St - Rte 67)
IMG_2735

2 Electric Services - top one abandoned North (Main St - Rte 67) Side
IMG_2733

Rusted Architectural Columns - North (Main St - Rte 67)
IMG_2736

North (Main St - Rte 67)
IMG_2734

Police Entrance - North (Main St - Rte 67) Side
IMG_2739

North (Main St - Rte 67)
IMG_2737

Police Entrance - North (Main St - Rte 67) Side
IMG_2740

North (Main St - Rte 67)
IMG_2738

Settlement of Steps - West Side
IMG_2743

Bulkhead - Generator - West Side
IMG_2741

Typical Replacement Window -
Wood Head, Jambs and Sill

West Side
IMG_2742

Dehumidifier - Rubble Stone and Brick Piers
IMG_2748

Rubble Stone and Brick Foundation
IMG_2746

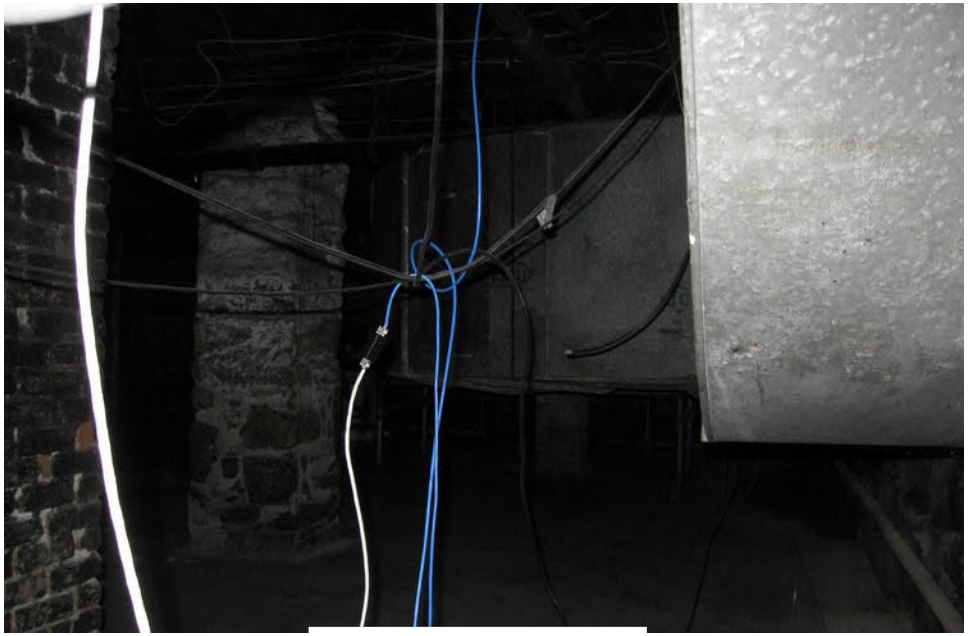
Historical Fire Damage
IMG_2749

Rubble Stone and Brick Foundation - Basement Door South Side
IMG_2747

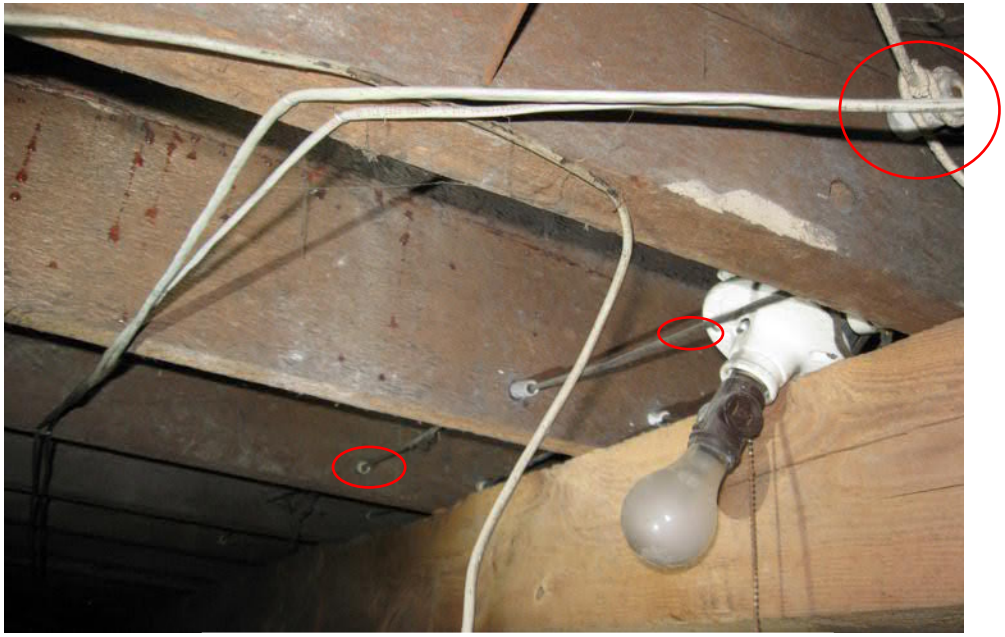
Basement - Brick Arch - Unknown Use
IMG_2752

Brick Deterioration
IMG_2750

Brick Deterioration
IMG_2753



Poor Wiring Methods
IMG_2751



Knob & Tube Wiring - Typical Throughout
IMG_2756

Current Gas Boiler for 1st Floor
IMG_2754

First Floor Joist Additional Support Beams
IMG_2757

Brick Deterioration
IMG_2755

IMG_2760

IMG_2758

IMG_2761

IMG_2759

Basement - Joist Attachment - Moisture/Mold Many Areas

IMG_2764

Basement - Heat Pump Condenser

IMG_2762

Basement - Variety of Wiring Methods
None would meet a proposed Assembly Use

IMG_2765

Basement - Beam Deflection

IMG_2763

Basement - Water Infiltration Through Walls and SLab

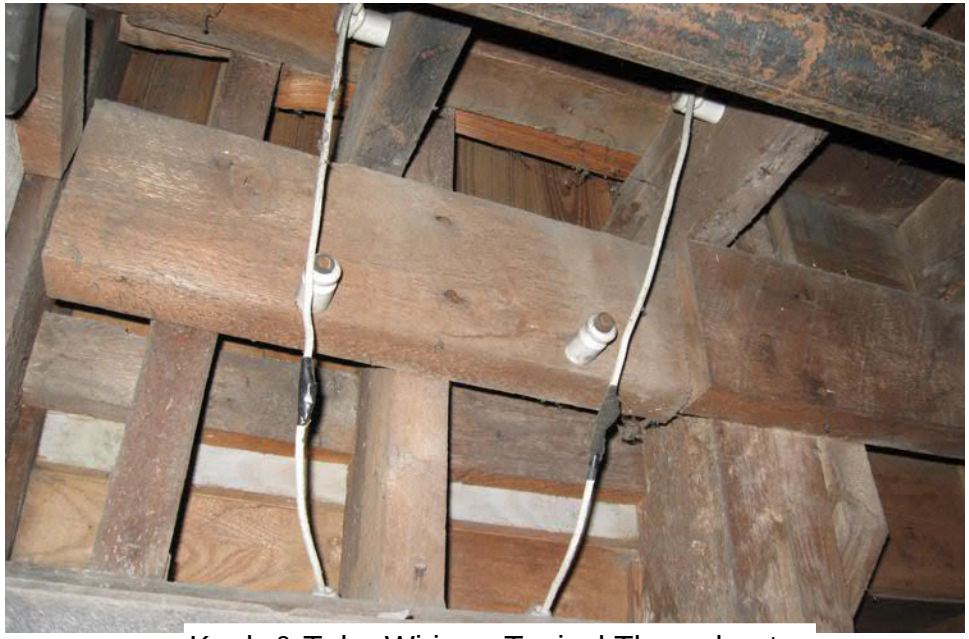
IMG_2768

Basement - Moisture Damage to Framing

IMG_2766

Abandoned Air Handler

IMG_2769



Knob & Tube Wiring - Typical Throughout

IMG_2767

Steam Piping System - Basement - Damage to Fireproofing of Framing

IMG_2772

Misc Piping

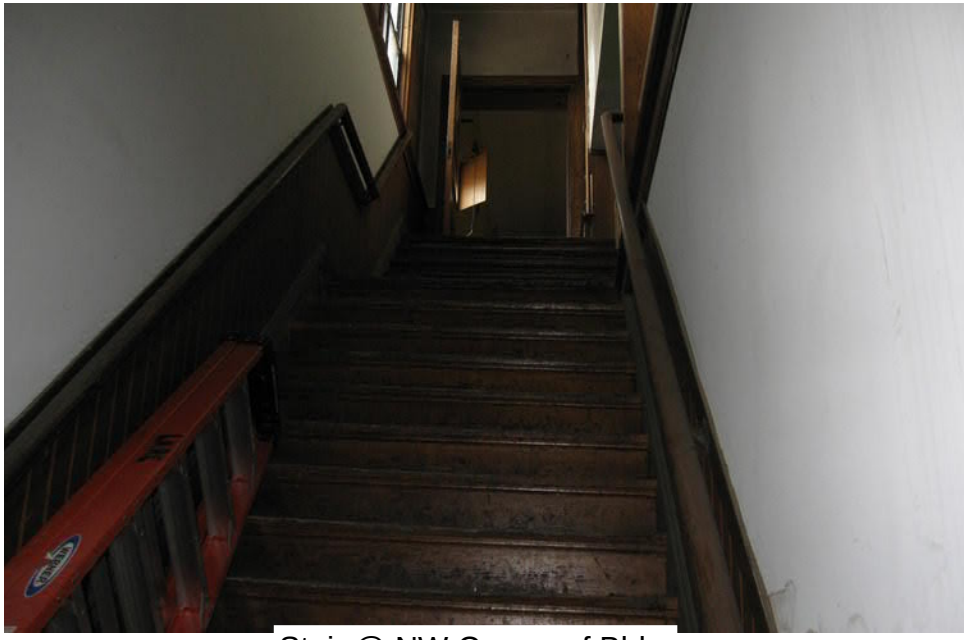
IMG_2770

First Floor Ceiling Detailing

IMG_2773

Wiring - Typical Brick Piers

IMG_2771

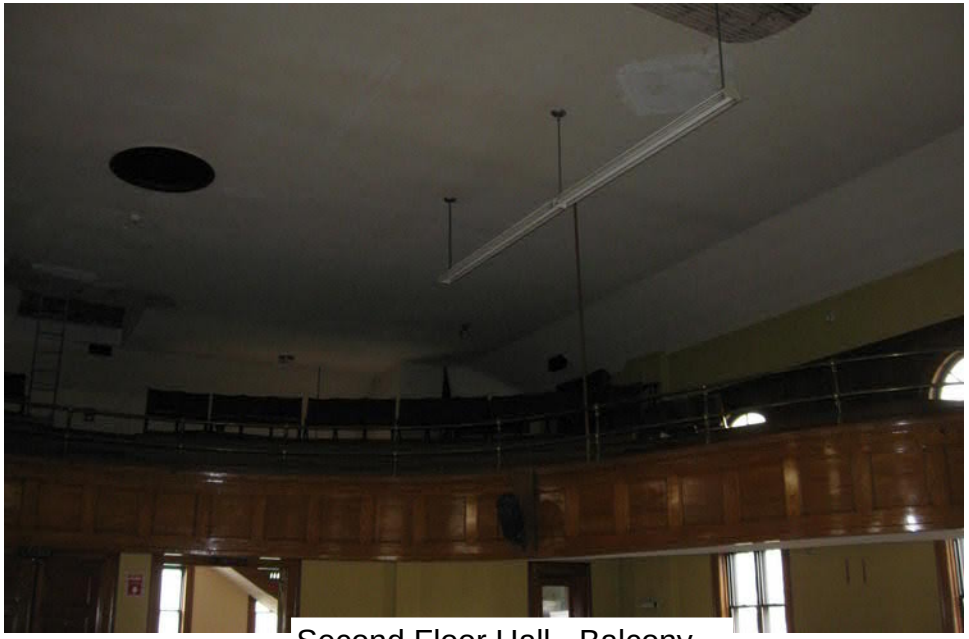


Stair @ NW Corner of Bldg

IMG_2776

West Wall - Memorial Hall -Weight Room

IMG_2774



Second Floor Hall - Balcony

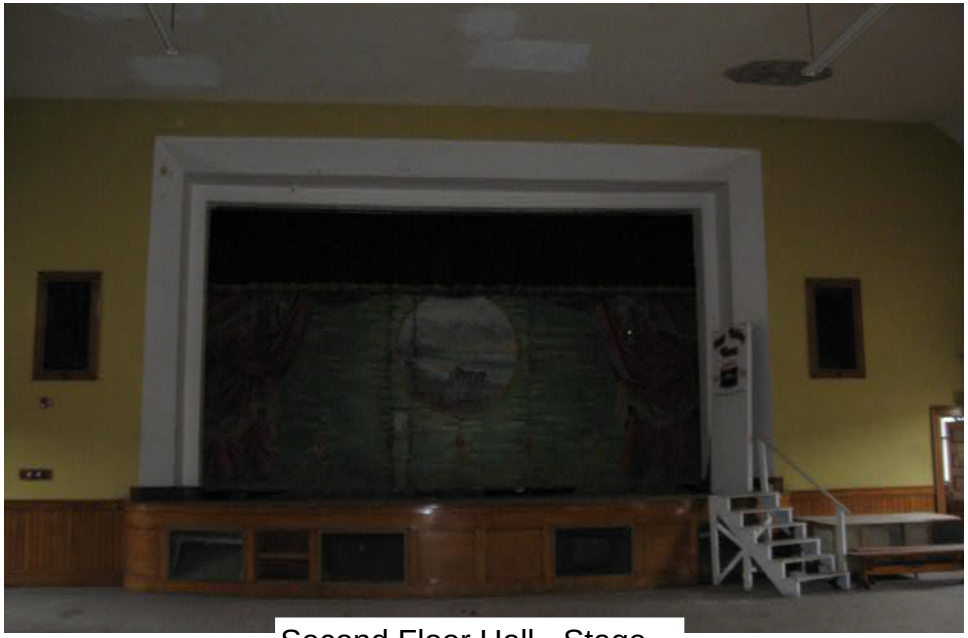
IMG_2777

First Floor - Memorial Hall - Weight Room

IMG_2775

Second Floor Hall - Ceiling @ Balcony - Ladder to Attic

IMG_2780

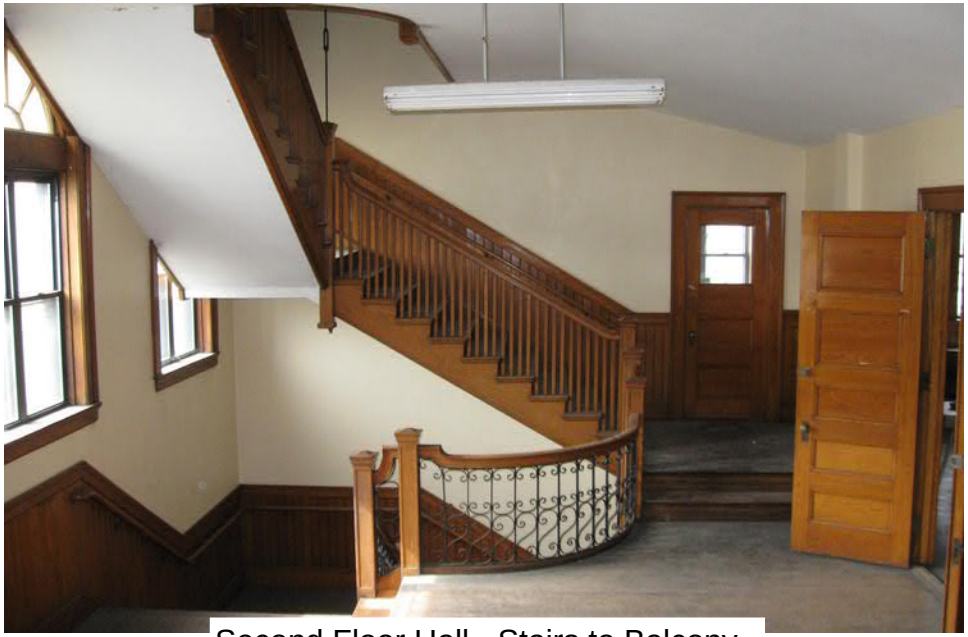


Second Floor Hall - Stage

IMG_2778

Second Floor Hall - Balcony

IMG_2781

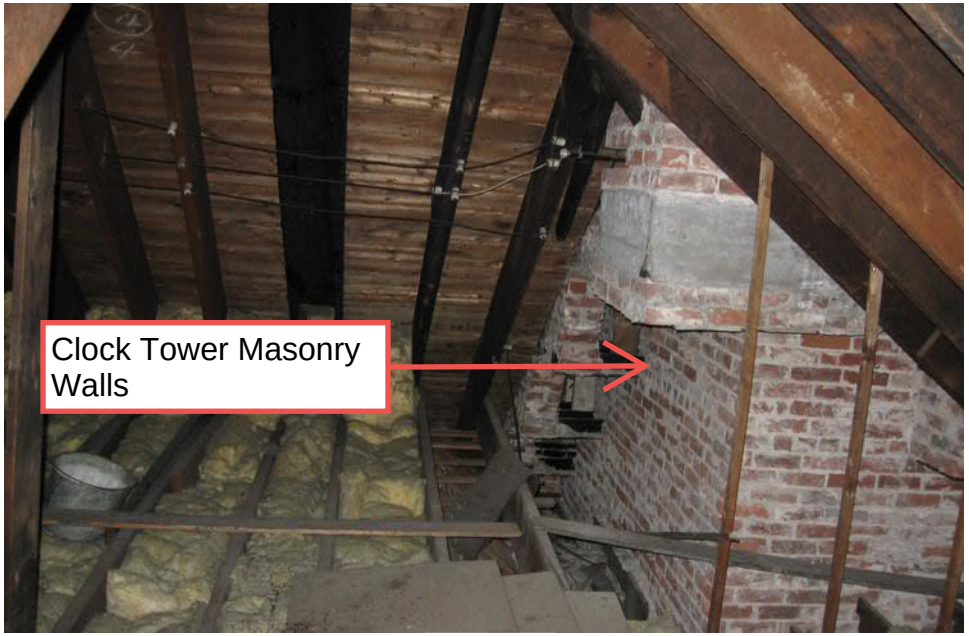


Second Floor Hall - Stairs to Balcony

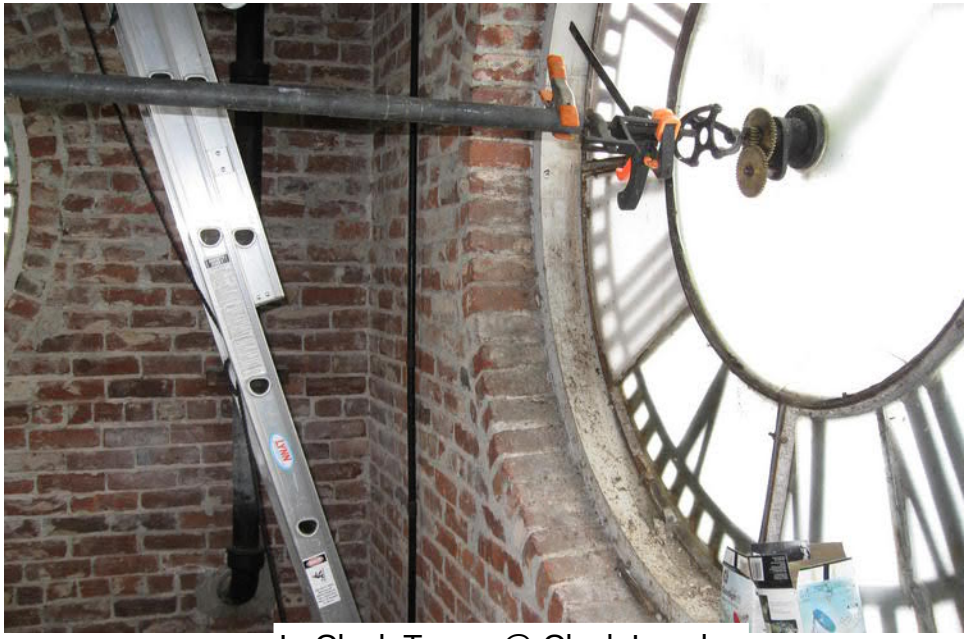
IMG_2779

In Clock Tower - Bell Level Deck Above
IMG_2785

In Clock Tower
IMG_2782



In Attic
IMG_2786



In Clock Tower @ Clock Level
IMG_2784

Center Flat Roof Area

IMG_2789

Ventilation Ductwork in Attic

IMG_2787

Clock Tower - Bell Level

IMG_2790

Typical Attic Framing - No Fire Protection

IMG_2788

Ventilating Cupola

IMG_2793

Clock Tower - Bell Level

IMG_2791

IMG_2794

IMG_2792

NW Corner of Roof
IMG_2797

IMG_2795

Slate Shingle Damage

NE Corner of Roof
IMG_2798

SE Corner of Roof
IMG_2796

IMG_2801

Ventilation Cover - Obsolete

IMG_2799

IMG_2802

Clock Tower Flashing

IMG_2800

Roof Framing Over Rear of Stage

IMG_2805

IMG_2803

Rotted Deck - Portico

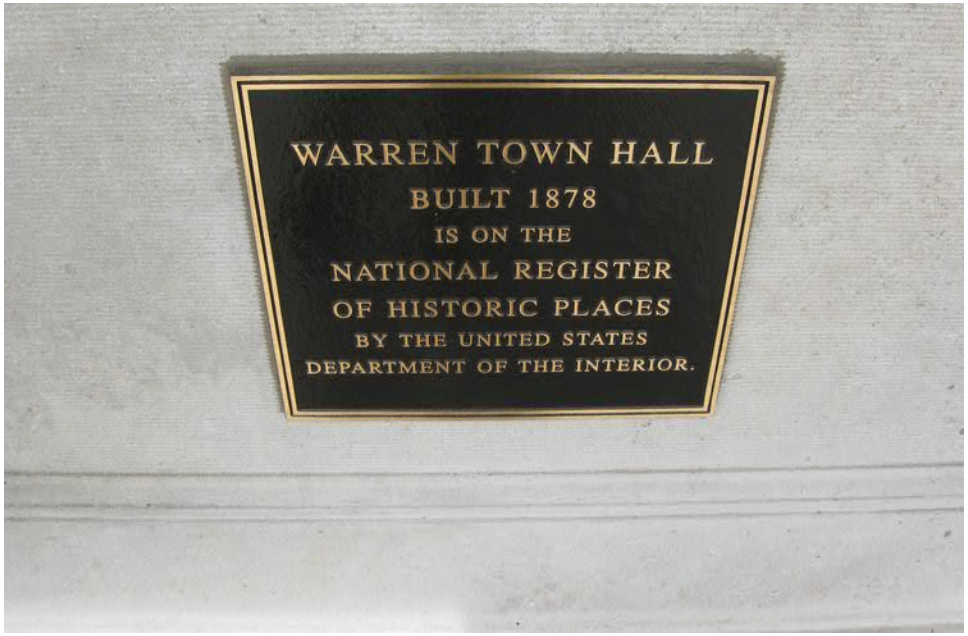
IMG_2806

2nd Floor - Balcony Looking Toward Stage - Front Wall

IMG_2804

Brick Damage - East Side Entrance

IMG_2809



IMG_2807

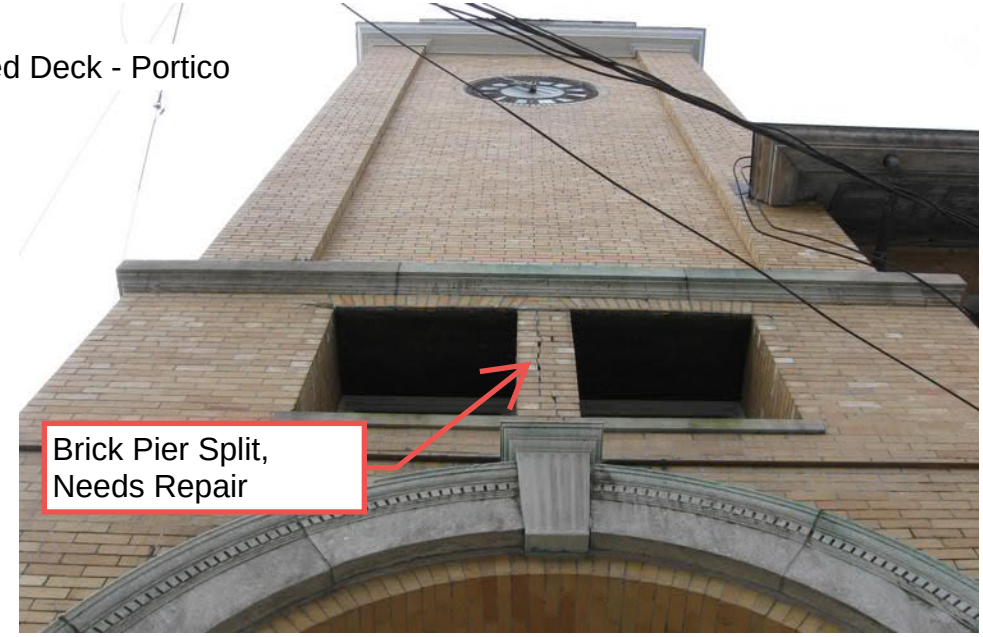
IMG_2810

Rotted Deck - Portico

IMG_2808

IMG_2813

Rotted Deck - Portico



IMG_2811

IMG_2814

IMG_2812

McKENZIE **ENGINEERING** CO., INC.
305 WHITNEY STREET, LEOMINSTER MA 01453
(978) 537-8210

DATE: 08/30/2021

WORK DESCRIPTION: **RENOVATION TO CURRENT CODE**
1ST FLOOR BUSINESS USE GROUP
SECOND FLOOR ASSEMBLY USE GROUP

JOB: TOWN OF WARREN
OLD TOWN HALL

BLDG = 115x56 = 6500 S.F./ FLOOR

#	WORK DESCRIPTION	# UNITS	UNIT COST	COST		
	DESIGN COST - SEE TOTAL COST AT END OF ESTIMATE					
	CONSTRUCTION					
1	**DIV 01 — GENERAL CONDITIONS**					
	MOBILIZATION & DEMOBILIZATION	1	35,000.00	35,000.00		
	G.C. 16 MO. @ 28,000/MO	16.0	28,000.00	448,000.00		
	BUILDING PERMIT	1.0	42,000.00	42,000.00		
	TEMP SERVICES FOR CONTR	1.0	10,000.00	10,000.00	Total 01	$535,000.00
2	**DIV 02 - DEMOLITION & SITE CONSTRUCTION**					
	DEMOLITION & DEMO PREP					
	GUT INTERIOR OF BUILDING INCL ELEC AND PLUMBING 14500 S.F.	14,500.0	9.00	130,500.00		
	DEMO WEST ADDN FIRST AND MEZZ LEVEL FLOORS	3,200.0	6.00	19,200.00		
	CLOCK TOWER DEMO FOR ELEV SHAFT	1.0	9,500.00	9,500.00		
	BASEMENT FLOOR DEMO FOR NEW REINF CONC FLOOR	6,500.0	5.00	32,500.00		
	BASEMENT PIER DEMO	1.0	7,600.00	7,600.00		
	DEMO PORTICO ROOF AND WOOD ROOF DECK FOR REPLACEMENT	1.0	6,000.00	6,000.00		
	DEMO EXISTING VENT DUCTS AND ROOF VENTING STRUCTURES	1.0	15,000.00	15,000.00		
	DEMO PIT & OPENINGS IN CLOCK TOWER SHAFT FOR NEW ELEVATOR	1.0	35,000.00	35,000.00		
2B	**SITEWORK**					
	EXCAVATION AND INSTALL NEW PERIMETER BASEMENT DRAIN AND SUMP W/PUMP	1.0	35,000.00	35,000.00		
	EXCAVATION FOR NEW REINF CONC BASEMENT FLOOR	1.0	35,000.00	35,000.00		
	HC PARKING SPACE COSTS	1.0	1,500.00	1,500.00		
	MISC TEMP FENCING	1.0	7,500.00	7,500.00		
	EXCAV FOR ACCESIBLE RAMPS	1.0	6,500.00	6,500.00		
	SPR & WATER TAPPING FEE (NOT INCLUDED)	1.0	0.00	0.00		
	SPRINKLER AND WATER SERVICES INTO BUILDING	1.0	45,000.00	45,000.00		
	PIPE BOLLARDS (10)	1.0	24,000.00	24,000.00		
		10.0	1,500.00	15,000.00	Total 02 & 2I	$424,800.00
3	**DIV 03 - CONCRETE**					
	FOOTINGS FOR NEW CONCRETE COLUMNS AT EXISTING BRICK PIERS	1.0	38,000.00	38,000.00		
	4" REINF CONCRETE FLOOR BASEMENT	6,500.0	14.00	91,000.00		
	4" REINF CONC FLOOR FIRST AND SECOND FLOORS	3,000.0	14.00	42,000.00		
	BUTTRESS WALLS TO FNDN (6)	6.0	5,200.00	31,200.00		
	ELEVATOR PIT FLOOR & WALLS @ EXISTING CLOCK TOWER	1.0	25,000.00	25,000.00		
	ACCESSIBLE RAMPS EAST AND WEST SIDES	2.0	88,000.00	176,000.00		
		1.0	72,000.00	72,000.00	Total 03	$475,200.00
4	**DIV 04 - MASONRY**					
	BRICK CLEANING , SOAP SCUB AND PRESSURE WASH 10000 S.F.	10,000.0	5.00	50,000.00		
	BRICK REPLACEMENT, 100	100.0	150.00	15,000.00		
	BRICK RE-POINTING, 4,000 L.F.	4,000.0	7.00	28,000.00		
	SEISMIC REINFORCING WITH STEEL FROM INTERIOR	10,000.0	35.00	350,000.00	Total 04	$443,000.00
5	**DIV 05 - METALS**					
	STR STEEL, JOISTS & METAL DECK - NEW FLOORS WEST ADDN - 10 TON	10.0	9,500.00	95,000.00		
	MISC METALS - INTERIOR STAIRS AND RAILINGS	1.0	48,000.00	48,000.00		
	RAILINGS FOR 2 RAMPS	180.0	110.00	19,800.00		
	ROOF STRUCTURE FOR RAMPS	2.0	150,000.00	300,000.00	Total 05	$462,800.00
6	**DIV 06 - CARPENTRY**					
	STRUCRURAL UPGRADES TO ROOF, BALCONY SUPPORT	1.0	45,000.00	45,000.00		
	INT WALLS FRAMED - WOOD 17000 S.F.	17,000.0	12.00	204,000.00		
	GYP BD, WALLS AND CEILINGS	28,000.0	5.50	154,000.00		
	WOOD TRIM	3,500.0	10.00	35,000.00		
	MISC MODIFICATIONS TO ELEV SHAFT, OPENINGS, METAL STUD, GWB, DRYWALL	1.0	20,000.00	20,000.00	Total 06	$458,000.00
7	**DIV 07 - THERMAL & MOISTURE PROTECTION**					
	INSUL	13,000.0	4.00	52,000.00		
	ROOFING - MEMBRANE PATCHING	500.0	17.00	8,500.00		
	PORTICO ROOF	400.0	17.00	6,800.00	Total 07	$67,300.00
8	**DIV 08 - DOORS & WINDOWS**					
	EXT DOORS	6.0	6,500.00	39,000.00		
	NEW WINDOWS, EXISTING WOOD FRAMES REMOVED, NEW P.T. FRAMING, CAULKED	52.0	1,800.00	93,600.00		
	INT DOORS	32.0	2,100.00	67,200.00		
	INT WINDOWS	8.0	800.00	6,400.00		
	SECURITY SYSTEM AND DOOR COMPONENTS	1.0	27,000.00	27,000.00	Total 08	$233,200.00
9	**DIV 09 - FINISHES**					
	ACOUSTICAL SUSPENDED CEILINGS	7,000.0	6.00	42,000.00		
	FRP WALLS IN BATHROOMS	3,500.0	6.00	21,000.00		
	FLOORING 1ST FLOOR	6,500.0	12.00	78,000.00		
	FLOORING 2ND FLOOR - HARDWOOD FINISHED, SEALED	5,000.0	18.00	90,000.00		
	PAINTING	42,000.0	2.30	96,600.00	Total 09	$327,600.00
10	**DIV 10 - SPECIALTIES**					
	FIRE EXTINGUISHERS	7.0	80.00	560.00	Total 10	$560.00
12	**DIV 12 - FURNISHINGS**					
	MISC CABINETRY & BATHROOM FURNISHINGS	6	6,500.00	39,000.00	Total 12	$39,000.00
14	**DIV 14 - CONVEYING SYSTEMS**					
	ELEVATOR INSTALLED	1	195,000.00	195,000.00	Total 14	$195,000.00

15	**DIV 15 - MECHANICAL**					
	PLUMBING FOR BATHROOMS, SINKS, 20 Fixtures	20	6,500.00	130,000.00		
	GAS PIPING	1	6,500.00	6,500.00		
	ROOFTOP GAS HEAT ELEC COOL, 4 UNITS 10 TON EACH WITH DUCTWOR TO 1ST & 2ND FLOORS	40	7,800.00	312,000.00		
	HRV SYSTEM	1	38,000.00	38,000.00		
	ROOF DRAINANGE SYSTEM REPAIR	1	4,000.00	4,000.00		
	SPRINKLER SYSTEM INSTALL, BSMT, 1ST, 2ND, ATTIC	26,000	4.75	123,500.00	Total 15	$614,000.00
16	**DIV 16 - ELECTRICAL**					
	FIRE ALARM SYSTEM - NOTIFIER	1	21,000.00	21,000.00		
	NEW 400 A 3 PHASE SERVICE, MAIN PANEL	1	22,000.00	22,000.00		
	4 SUB PANELS, 200A EACH	4	6,200.00	24,800.00		
	LIGHTING INCL EMERG & EXITS	15,000	4.50	67,500.00		
	EXT LIGHTING	1	4,800.00	4,800.00		
	SECURITY WIRING FOR ACCESS DOOR CONTROLS	1	15,000.00	15,000.00		
	MISC DATA/TEL LINES	1	6,500.00	6,500.00		
	POWER & ELEVATOR WIRING	1	8,000.00	8,000.00	Total 15	$169,600.00
17	ONGOING AND FINAL CLEAN UP	14	6,000.00	84,000.00		
	DISPOSAL - (15) 40 YD DUMPSTERS @ 2000	15	2,000.00	30,000.00	Total 17	$114,000.00
	Total:			$4,559,060.00		$4,559,060.00

TRADE TOTALS		$	4,559,060.00
Overhead & Profit %	15%	$	683,859.00
Safety (meetings, etc.)		$	39,000.00
Contingency	20%	$	911,812.00
TOTAL CONSTRUCTION COST:			**$6,193,731.00**
ARCHITECTURAL & ENGINEERING FEES	12%	$	743,248.00
TOTAL PROJECT COST:			**$7,887,791.00**

McKENZIE ENGINEERING COMPANY, INC.

August 30, 2021

Board of Selectmen
Town Of Warren
48 High Street
Warren MA 01083

Re: Building Demolition Cost
Old Town Hall Building

Attn: David Dufresne, Chairman

Dear David,

To provide the town with an accurate cost of demolition for the Old Town Hall building I contacted Ray Bourgeois of Bourgeois Wrecking in Westminster MA. Ray inspected the site and gave me a price of $250,000.00 assuming all asbestos related abatement had already been completed. I recommend you carry a price of $300,000 for any price increases and for the filling of the basement with gravel and a stone/rip-rap finish.

Please call if you have any questions.

Very Truly Yours,

Peter M. Reynolds, P.E.
President

ME-4317\Building Demolition Cost - Old Town Hall 08-30-21
Email: Jim Dusty <maintenance@warren-ma.gov>, David Dufresne <dufresne@warren-ma.gov>

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