Building Condition Assessment

Lunenburg Townhall
119 Cumberland Street
Lunenburg, Nova Scotia

Prepared for:

Town of Lunenburg
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Lunenburg NS B0J 2C0

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EXECUTIVE SUMMARY

Pursuant to the request of the Town of Lunenburg, Fishburn Sheridan Atlantic (FSA) was commissioned to perform a Building Condition Assessment (BCA) of the Lunenburg Town Hall located at 119 Cumberland Street in the Town of Lunenburg, Nova Scotia. The visual, non-intrusive investigation was conducted on Thursday May 19, 2022. A LiDar scan of the building was also performed on this date. A subsequent return visit was made on July 12, 2022.

The subject building is located at 119 Cumberland Street in Lunenburg, Nova Scotia. A distinguishing element of its design is the inclusion of two separate entrances reflecting the building's dual-purpose use. The south facing entrance features an arched sign which reads "Town Hall" whereas the north facing entrance located on Townsend Street features a similar, yet smaller arched sign reading "Court House". The building, constructed between 1891 – 1893 is of red, solid brick construction with a faced granite foundation and granite coursing. The edifice stands out in an area where wood construction and cladding are most common.

The building is designed in notable Second Empire fashion with defining elements such as the mansard roof with embellished roofline, elaborate projecting dormer windows, a central pavilion, and tall round headed windows across all elevations. The exterior of the building is clad almost entirely with clay brick masonry including masonry arches, especially above windows and granite keystones. The majority of windows are single-hung, single-glazed, wood frame construction some featuring decorative wood and glazed arches. Each elevation features unique fixed, arched, or rounded, single-glazed, wood frame windows as well. Most windows include aluminum framed storm windows.

The main roof at the north is of wood framed hip construction with an asphalt composite shingle roof, while the neighbouring lower, south roof area is of relatively flat, wood frame construction with a modified bitumen (mod. bit.) roof membrane. A prominent mansard roof surrounds the upper elevations which is clad in asphalt composite shingle. Dormers are featured at all elevations within the mansard roof. The sidewalls of dormers are typically clad in copper while their roofs are clad in copper while some have mod. bit. membranes. Original gutters were likely of copper as suggested by some copper downspouts still visible at the exterior of the building. The existing gutter is of galvanized metal, painted to suit the style of the building. Copper is used as flashing material at masonry and around the perimeter of the main roof areas. Two prominent copper roofs are featured at the north and east facades, respectively. The north tower features a domed copper roof while the east tower features a pyramid shaped copper roof.

Exterior property elements include granite slab steps at the south facing, Town Hall entrance. At the north facing Townsend Street, Court House entrance, a newer steel ramp and stairway have been installed to provide accessibility access to the building as well as fire egress from upper floors. The building is surrounding by green space, including a heritage bandstand located east of the Town Hall.

The Lunenburg Town Hall is a registered heritage property within the Province of Nova Scotia and is situated within the Town of Lunenburg, a designated UNESCO World Heritage Site since 1995. Luneburg is further considered a National Historic Site of Canada.

Overall, most property elements are in good to fair condition. However, readers are advised to examine the full content of the report herein. Some property elements vary from fair to satisfactory condition and will require repairs or replacement work to ensure that they continue to perform as designed and intended. Some exterior building elements have exceeded their life expectancy and require major repairs or replacement within the near future.

This report covers commentary concerning the condition of all major components of the building envelope, including observations in respect to heritage elements and architectural details with particular focus on items that exhibit distress or deficient circumstances. Although the surrounding exterior grounds and interior finish elements are not included within the scope of this assessment, comments and observations have been made where these elements may affect the overall design, aesthetic or proposed building envelope repairs.

Upon completion of this assessment and interpretation of the collected data, a series of prescriptive recommendations were generated for consideration by the Town of Lunenburg. The main goal of this report, as set out by the Town of Lunenburg, is to restore the building envelope and provide an approximate 25-year life expectancy for all major components, while recognizing the need for ongoing maintenance. The estimated improvement costs associated with the recommended repair selections are as follows:

Masonry Repairs	$ 2,483,560
South Entrance Steps	$ 74,000
Window Renewal	$ 258,200
Roof Replacement	$ 477,510
Gutters and Downspouts (Cu)	$ 34,800
Staging Allowance	$ 90,000
Total	**$ 3,418,070**

1.0 INTRODUCTION

Pursuant to the request of the Town of Lunenburg, Fishburn Sheridan Atlantic (FSA) was commissioned to perform a Building Condition Assessment (BCA) of the Town Hall building located at 119 Cumberland Street, in the town of Lunenburg, Nova Scotia.

This report has been prepared specifically and solely for the Town of Lunenburg and contains a summary of our findings. The predominant purpose of this BCA is to establish a conditional evaluation of the building to be used by the Town in the development of a complete exterior restoration of the building envelope. Areas of focus include all roof areas, dormers, windows, exterior wood trim, soffits, gutters, and downspouts as well as all exterior masonry and stonework. Based on the findings of this report, a repair recommendations and Class C construction budget have been developed so as to restore or rejuvenate all elements of the building envelope to provide a 25-year life expectancy with appropriate, ongoing maintenance.

To meet this objective, FSA observed and reported on the current physical condition of the main elements of the subject property supplemented by a LiDar scan to provide accurate measurements and facilitate the creation of detailed CAD drawings. Although the use of LiDar was not part of the original deliverables, FSA determined that the use of this technology would collect the most accurate data to be used in the development of CAD drawings and details. Of further yet unanticipated benefit, LiDar scanning provided an overall degree of detail which cannot be captured by the human eye during visual inspection. We have provided an opinion of the existing overall condition and have supplied opinions of probable Class “C” costs required to reach the capital and maintenance goals of the Town of Lunenburg. Recommendations have been made to remedy physical deficiencies and performance concerns by undertaking a major repair and renewal of building components and property elements to be completed between 2023 and 2025. This property is presently and regularly used as the Town’s administrative offices and houses the Town’s Corporate Service Department; therefore, recommendations have been made with the aim of balancing current and ongoing operational needs while implementing all necessary improvements.

2.0 TERMS OF REFERENCE

This reporting provides documentation of the present condition of existing property elements with respect to capital repairs, renewal and maintenance planned for 2023 - 2025. The property components assessed were categorized as: Structural Systems, Masonry, Windows and Doors, Roofing, Copper Elements.

This review was visual in nature only with no destructive investigation performed, and was conducted from grade and opportunistic vantage points, where they were available. The visual investigation was supplemented by LiDar scan performed by a third-party contractor under the direct supervision of FSA. The data collected was used to provide a detailed examination of the existing structure and elements and to aide in the creation of accurate CAD drawings for planned capital and maintenance work. This study is not intended to identify all specific deficiencies, but rather to obtain an understanding of the current condition and function of existing systems, so as to create a tender-ready construction specifications and detailed drawings to bring all elements of the building envelope to a serviceable state with an anticipated life expectancy of 25 years providing that ongoing maintenance is carried out.

3.0 SCOPE OF WORK

The scope of work for this assignment included:

3.1 Review of Existing Documents

- Existing as-built drawings were not available for review.
- Review of document and drawings entitled *Lunenburg Town Hall & Courthouse – Conservation Program* by G.F. Duffus and Company Limited dated April 2008.
- Review of report by EXP. entitled *Lunenburg Town Hall – Snow Load Report* dated 2020-03-30.

3.2 Visual Review of Building and Site

This detailed visual review of the building envelope and its associated systems allowed a reasonably accurate assessment of their current condition. The site review was broken down into the following main categories:

- Roof system: including condition of roof covering, insulation level, drainage and waterproofing condition of rooftop elements.
- Masonry: including granite coursing, keystones, architectural masonry elements.
- Granite slab entrance steps.
- Windows and doors.
- Gutters and downspouts.
- Copper elements: including flashings, roof vents, dormer claddings and copper roof at top the stairwell tower.

3.3 Reporting

A comprehensive engineering report was prepared summarizing the salient aspects of the assessment and the findings of the site review, including related photographs, financial/quantitative information and other pertinent information obtained during the assessment.

The major exclusions, relative to the cited ASTM standard include:

- mechanical and electrical systems,
- utilities,
- security systems,
- verification of the property's compliance with barrier-free accessibility requirements,
- investigation of whether or not the property resides in a flood plain,
- reviews of municipal/public records for zoning, building, and/or fire & life safety code/regulatory compliance,
- vertical transportation,
- verification of number of parking spaces,
- verification of gross and net usable areas of the site buildings
- a complete structural assessment and

- interior elements are not included in the scope of work for this assessment.

It should be noted that compliance with the ASTM standard does not warrant or guarantee code compliance with any governmental entity, trade standard, or the insurance industry and this effort should not be considered an in-depth code compliance review.

ASTM defines a physical deficiency as a conspicuous defect or significant deferred maintenance of a site's material systems, components or equipment as observed during the site assessor's walk-through site visit. Included within this definition are material systems, components or equipment that are approaching, have reached or have exceeded their typical expected useful life or whose remaining useful life should not be relied upon in view of actual or effective age, abuse, excessive wear and tear, exposure to the elements, lack of proper or routine maintenance, etc. This definition specifically excludes deficiencies that may be remedied with routine maintenance, miscellaneous minor repairs, normal operating maintenance, etc., and excludes conditions that generally do not constitute a material physical deficiency of the site.

The review of the site was based on a visual walk-through review of the visible and accessible components of the building. The roof surfaces, exterior wall finishes, and the exterior and interior of windows and doors along with their frames, were visually assessed to check their condition and to identify physical deficiencies where observed. The assessment did not include an intrusive investigation of roof assemblies, wall assemblies, ceiling cavities or any other enclosures/assemblies. No physical tests were conducted, and no samples of building materials were collected to substantiate observations made, or for any other reason. No physical tests were conducted on any system. The mansard roof space was entered along with the basement. Images were taken for reference only and are not included in the scope of this investigation.

4.0 BUILDING CONDITION ASSESSMENT METHODOLOGY

4.1 Phases of Work

This BCA was carried out in four main phases, including: the document review, the walk-through survey, the development of findings and costs, and the building condition report.

Document review was utilized to gather information regarding historical repairs and replacement and their costs, the level of preventive maintenance exercised, and pending repairs and improvements. The document review served to augment the walk-through survey and to assist in the overall understanding of the property. As such, much of the document review was carried out prior to the walk-through survey, so that any specific issues raised could be reviewed during the walk-through survey.

Next, a walk-through survey of the subject property was performed to assess the condition of property elements, including identification of physical deficiencies. In general, the walkthrough survey included a review of site elements, structural and building envelope elements. These items were reviewed to the extent that they were easily visible and readily accessible. Observations were made without intrusion, relocation or removal of materials, exploratory probing, or use of any specialized equipment or instruments. As a result, the review of the structural frame was typically very limited due to the concealed nature of such elements and finding that the structural frame appears satisfactory was typically based on the lack of evidence of structural related distress on building envelope elements. It should be noted, that a brief interior walkthrough revealed conditions associated with water ingress and deterioration due to ongoing thermal cycling within the mass masonry wall. Intrusive investigation is therefore recommended as noted in this report.

A Lidar scan of the building was also performed to supplement the visual investigation. From the data collected we are able to better visualize and analysis specific anomalies and generate accurate CAD drawings and details.

Following the walk-through survey and LiDar scan, the information gathered was analyzed to develop findings regarding rejuvenation recommendations. Budget costs were estimated for all repair and replacement work recommended to address deficiencies and to renew building elements which have reached the end of their service life. For repair items, budget costs involved an estimate of the material and labour requirements for each specific item. For major renewal items, budget estimates were determined by multiplying the total quantity of the element in question by the expected unit price for the work of concern, based on a database of pricing for similar work. However, if an item was too complex to develop a cost using the quantity and unit price method, a lump sum opinion of probable cost was included for such an item. In certain situations, contractor input was used to assist with budget estimates.

The budget estimates were intended to provide a general understanding of the physical condition of the property by associating a cost to deficiencies. With this in mind, it is important to note that cost estimates in this report are preliminary of Class C magnitude and are exclusive of contract general requirements, contractor mark-ups, engineering fees and applicable taxes. These are the minimum repairs, beyond standard maintenance, that should be budgeted to allow the property's systems to attain the stipulated project goals. The costs are in 2022 dollars and assume favourable working conditions (i.e., spring or summer work during regular hours) phased over two (2) years.

Once information was analyzed and findings and cost estimates were developed, an engineering report was prepared, providing written and photographic documentation of observed deficiencies. A remedial action plan was prepared for repair and replacement work required with the given construction timelines in mind.

Estimates of replacement costs were based on the assumption that quality materials will be used. In the case of older construction, newer materials may be required to adhere to the current building code regulations. Installation costs were assumed to be at contractors' prices, using union labour and current construction techniques, including contractors' overhead and profit. Cost for access, removal and disposal were also factored in.

4.2 Summary of Document Review

The following is a list of key information sources reviewed:

<u>Engineering Drawings</u>

- FSA was informed by the project representatives for the Town of Lunenburg that no as-builts or other drawings exist for the subject building. As such, no original drawings were reviewed.

<u>Engineering Reports</u>

- Drawings and markup by G.F. Duffus & Company LTD. entitled Lunenburg Town Hall & Courthouse Conservation Program dated April 2008
- Report by EXP entitled *Lunenburg Town Hall – Snow Load Report* dated 2020-03-30

5.0 DESCRIPTION OF PROPERTY

5.1 Brief History and Description

The subject building is located at 119 Cumberland Street in Lunenburg, Nova Scotia. A distinguishing element of its design is the inclusion of two separate entrances reflecting the building's dual-purpose use. The south facing entrance features an arched sign which reads "Town Hall" whereas the north facing entrance located on Townsend Street features a similar, yet smaller arched sign reading "Court House". The building, constructed between 1891 – 1893 is of red, solid brick construction with a faced granite foundation and granite coursing. The edifice stands out in an area where wood construction and cladding are most common.

The building is designed in notable Second Empire fashion with defining elements such as the mansard roof with embellished roofline, elaborate projecting dormer windows, a central pavilion, and tall round headed windows across all elevations. The exterior of the building is clad almost entirely with clay brick masonry including masonry arches, especially above windows and granite keystones. The majority of windows are single-hung, single-glazed, wood frame construction some featuring decorative wood and glazed arches. Each elevation features unique fixed, arched, or rounded, single-glazed, wood frame windows as well. Most windows include aluminum framed storm windows.

The main roof at the north is of wood framed hip construction with an asphalt composite shingle roof, while the neighbouring lower, south roof area is of relatively flat, wood frame construction with a modified bitumen (mod. bit.) roof membrane. A prominent mansard roof surrounds the upper elevations which is clad in asphalt composite shingle. Dormers are featured at all elevations within the mansard roof. The sidewalls of dormers are typically clad in copper while their roofs are clad in copper while some have mod. bit. membranes. Original gutters were likely of copper as suggested by some copper downspouts still visible at the exterior of the building. The existing gutter is of galvanized metal, painted to suit the style of the building. Copper is used as flashing material at masonry and around the perimeter of the main roof areas. Two prominent copper roofs are featured at the north and east facades, respectively. The north tower features a domed copper roof while the east tower features a pyramid shaped copper roof.

Exterior property elements include granite slab steps at the south facing, Town Hall entrance. At the north facing Townsend Street, Court House entrance, a newer steel ramp and stairway have been installed to provide accessibility access to the building as well as fire egress from upper floors. The building is surrounding by green space, including a heritage bandstand located east of the Town Hall.

The Lunenburg Town Hall is a registered heritage property within the Province of Nova Scotia and is situated within the Town of Lunenburg, a designated UNESCO World Heritage Site since 1995. Luneburg is further considered a National Historic Site of Canada.

The building proper is believed to be generally of vintage construction, with some known rehabilitation and modernization programs being implemented. These include but are not limited to:

- a newer steel ramp and stairway installed to provide accessibility access to the building as well as fire egress from upper floors located at the north elevation of the building,
- aluminium entrance door systems,
- aluminum framed storm windows,
- steel window security bars,
- galvanized gutters and plastic downspouts,

- architectural asphalt composite shingles and modified bitumen (mod. bit.) membrane roofing.

GPS Location (DMS):	44.37798757261384, -64.30986434632179
Age:	±130 years
Architectural Style:	Second Empire
Heritage Designation:	Yes
Designing Architect:	Henry Busch
Height:	3.5 Stories
Levels Below Grade:	1
Roofs:	Mansard, Dome, Flat, Dormer
Floors:	Wood
Cladding:	Mass Clay Brick Masonry
Foundations:	Faced Stone Masonry
Defining Characteristics:	Mansard roof with embellished roofline, projecting dormers, central pavilion, tall round-headed windows, defining pilasters.

6.0 FINDINGS OF BUILDING CONDITION ASSESSMENT

The scope of work for this building condition assessment included a visual review of the clay brick masonry walls and granite elements, windows and doors, wooden trim, soffits, gutters, downspouts, and all roof areas including the mansard roof and dormers. The following sections illustrate typical items of concern and the deficiencies noted in respective elements.

6.1 Structural Systems

The following commentary represents an assumed structural configuration of the building, based on visual observations made during the walk-through survey. No structural or architectural drawings were available for our review.

The basic primary construction of the building is of faced, stone foundation with exterior faced granite where the foundation is visible above grade supplemented with wood timber framing. Below grade, the building is supported by a faced stone foundation partly visible at the interior. The basement floor consists of a concrete slab-on-grade construction. Above grade, the building is supported by a mass clay brick masonry wall with decorative granite elements extending to the roof line. Timber frame elements bear on the exterior masonry walls to support the mansard roof. A solid masonry wall was observed to separate the building between north and south given the building's original dual purpose.

FSA has not been provided with a seismic analysis of the structure and it is therefore assumed that no such analysis has been performed for this structure.

The following observations were made:

South Elevation • Visible faced granite at foundation level. • Mass clay brick masonry walls. • Granite slab entrance stairs. • Mansard roof with prominent dormers.	
Basement • Typical stone foundation visible throughout basement.	
Roof Space • Typical wood construction is visible within the mansard roof.	

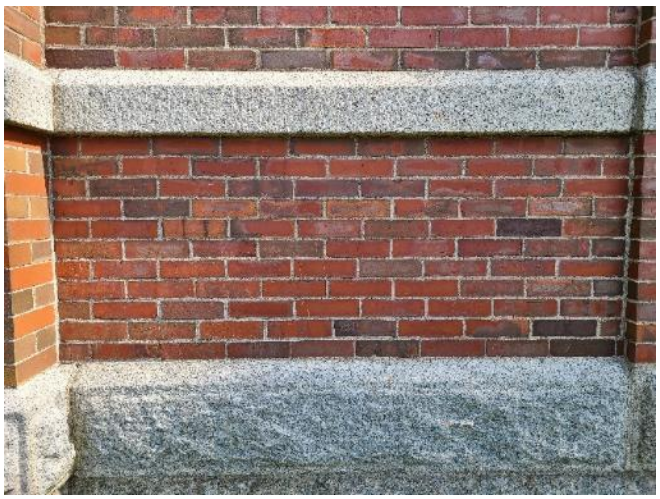
Roof Space • Typical wood construction is visible within the mansard roof.	
Roof Space • Typical example of mass masonry wall at the top of the exterior wall at the base of the mansard.	
Roof Space • Masonry wall separating building north to south is visible at the interior of the mansard roof area.	

6.2 Building Envelope

The building envelope consists of a mass clay brick masonry wall comprised of multiple wythes with integral granite keystones and ribbons. Windows are of wood frame construction with rounded heads comprising of single glazed units. Exterior doors consist of aluminium entry systems and steel doors and frames. The roof structure consists of various areas including mansard, dormer, dome and flat roof sections. Eaves-trough is of galvanized construction and some original copper downspouts have been replaced with newer materials. The following commentaries summarize the condition of each element.

.1 Walls

The exterior walls are predominantly clad with clay brick masonry with granite accents and ribbons. The foundation visible that is visible above grade is of faced granite. Prominent masonry pilasters are featured at exterior corners of the building and at both the north and south entrances. Various masonry arch designs incorporating granite key stones are featured around windows at all elevations. with rough-faced stone throughout most masonry fields and dressed masonry accent stones surrounding wall openings at windows and doors, and along water tables. It was reported that some masonry repointing work has been occurring over the last few years to address highly deteriorated mortar jointing. An exterior insulation finish system was installed over the wall surfaces of the Fairmont Avenue entrance to the administrative offices.

South Elevation • General image of south elevation.	
South Elevation • Substantial crazing of masonry units was observed at all elevations.	

South Elevation

- Substantial crazing was observed at masonry units.
- Previous masonry repairs were observed at the pilaster as seen at the left of the image. New masonry units differ from the older, possibly original, masonry units.

South Elevation

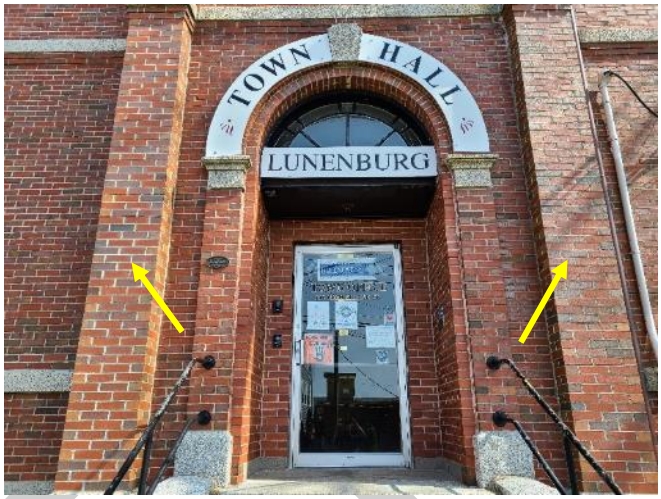
- Substantial crazing was observed at masonry units.
- Cracking was observed at mortar joints of masonry and granite (yellow arrow).

South Elevation

- Typical example of the masonry arches observed at windows at south elevation.

South Elevation

- The pilasters on either side of the main south entrance have been rebuilt.
- The inset entranceway appears to be of relatively new construction as the masonry varies from the original.



South Elevation

- Organic growth and staining were observed at the pilaster to the right of the main entrance. This may be caused by water run-off overshooting the eavestrough above. Continued wetting may result in premature deterioration of the clay brick masonry units and/or the mortar.

East Elevation

- General view of east elevation featuring a copper roof at the top of the stairway tower.

East Elevation • Significant crazing of masonry was observed. See following image.	
East Elevation • Significant crazing of masonry was observed across the east elevation. See following image.	
East Elevation • Significant crazing of masonry was observed across the east elevation.	

East Elevation

- Typical example of masonry arches at the first floor to the south of the stair tower.
- This detail is duplicated at the second-floor windows above; however, second floor windows feature a taller archway (see following observation), whereas the first-floor arch is shallower.

East Elevation

- Typical example of masonry arches at the first floor to the south of the stair tower.
- This detail is duplicated at the second-floor windows above; however, second floor windows feature a taller archway (see following observation), whereas the first-floor arch is shallower.

East Elevation

- Typical example of masonry arches above windows at the east elevation. Note, the lack of granite keystones at the third floor.
- Organic growth was observed to the right of the stair tower. See following observation.

East Elevation

- Organic growth and staining were observed at various locations across the east elevation. This is likely exacerbated by substantial shading by large trees surrounding the property limiting the drying potential of the masonry.

North Elevation – behind retaining wall

- General image of the north elevation behind the retaining wall.
- Notice, the original copper downspout has been replaced with plastic (yellow arrow).
- Staining of the masonry was observed at the interior corner. This is likely caused by water run-off from the roof passing between the gutter and the exterior wall (red arrow). The gutter end may also be damaged.
- Staining and discoloration of the granite ribbon was observed.

North Elevation – behind retaining wall

- Missing downspout support brackets were observed leaving openings in masonry.
- See following observation.

North Elevation – behind retaining wall • Unsecured downspout support brackets were observed.	
North Elevation – behind retaining wall • Holes in masonry were observed to be plugged with wood. • Notice the staining at the masonry.	
North Elevation – behind retaining wall • General image of the north elevation behind the retaining wall. • Organic growth was observed at the north elevation. This is likely exacerbated by this area being a mainly shaded throughout the day limiting the drying potential of the masonry.	

North Elevation – behind retaining wall

- Staining of the masonry was observed at the interior corner. This is likely caused by water run-off from the roof passing between the gutter and the exterior wall (red arrow). The gutter end may also be damaged.
- A crack was observed through the masonry at the upper right corner of the window (yellow arrow).
- See following observation.

North Elevation – behind retaining wall

- The crack observed travels diagonally through masonry and terminates at the pilaster.
- The pilaster to the right of the window appears to have been rebuilt likely following the report provided by GF Duffus dated April 2008.
- See following observation.

North Elevation – behind retaining wall

- The crack was observed to travel directly through the back of the granite coining.
- The pilaster to the right of the window appears to have been rebuilt likely following the report provided by G.F. Duffus dated April 2008.

North Elevation • General image of north elevation. • Substantial crazing of masonry units was observed at multiple locations.	
North Elevation • General image of north elevation. • Deteriorated mortar was observed below the first granite ribbon. • Staining was observed at the granite keystone above the entrance and a granite ribbons.	
North Elevation • Deteriorated mortar was observed below the granite ribbon. • A crack was observed through the masonry originating above the granite keystone, traveling vertically towards the horizontal granite ribbon. • Staining of the granite was observed in multiple locations.	

North Elevation

- Cracking of the mortar between the newer masonry and older, likely original, pilasters to the right and left of the entrance was observed.
- The inset entranceway, similar to that observed at the south elevation appears to be of relatively new construction as the masonry varies from the original.
- Significant crazing of masonry units was observed to both the right and left of the entrance. See following observation.

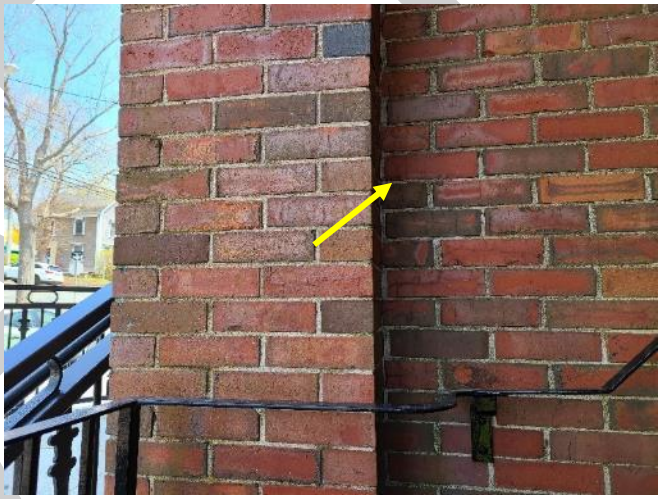
North Elevation

- Cracking of the mortar between the newer masonry and older pilasters to the right and left of the entrance was observed.
- Significant crazing of masonry units was observed to both the right and left of the entrance. See following observation.

North Elevation

- Significant crazing of masonry units was observed to both the right and left of the entrance. See following observation.

North Elevation • Staining of masonry was observed at the elevation right of the main entrance. • Cracking and crazing of masonry were observed at multiple locations. • See following images.	
North Elevation • Cracking through the masonry was observed at the base of the pilaster (yellow arrow). • The original copper downspout has been replaced with plastic and is observed to drain beneath grade level.	
North Elevation • Cracking of the masonry was observed (yellow arrow). See following image.	

North Elevation • Same as above.	
North Elevation • The cracking shown in the previous observation was observed to travel vertically along the edge of the pilaster (yellow arrow). • Significant crazing of masonry units was observed.	
North Elevation • Same as above.	

North Elevation • Masonry making up the corbel below the granite ribbon was observed to be slightly bowed as indicated by the yellow marker. • Staining of the granite was observed.	
North Elevation • No masonry lintel was observed above the exterior steel exit doors. See following image. • Staining of the masonry was observed. • Some organic growth was observed, particularly above the exit door. See following observation.	
North Elevation • No masonry lintel was observed above the exterior steel exit doors. See following image. • Staining of the masonry was observed. • Some organic growth was observed, particularly above the exit door.	

West Elevation

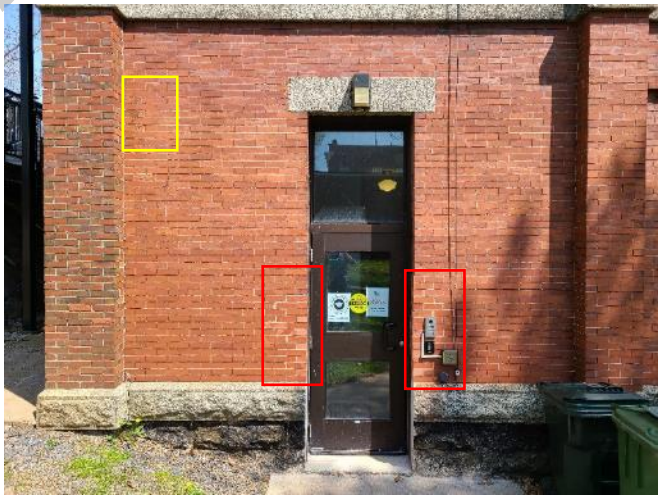
- General image of west elevation.
- The west elevation features two styles of masonry arches unique to the elevation pictured here.
- Crazing of masonry was observed at multiple locations.
- Cracking of masonry was observed at multiple locations.
- Deteriorated mortar joints were observed at multiple locations.

West Elevation

- General image of west elevation.
- Crazing of masonry was observed at multiple locations.
- Cracking of masonry was observed at multiple locations.
- Deteriorated mortar joints were observed at multiple locations.
- See following observations.

West Elevation

- Spalling of masonry faces was observed (yellow box).
- Previous repointing and masonry repairs were observed (red boxes).



West Elevation

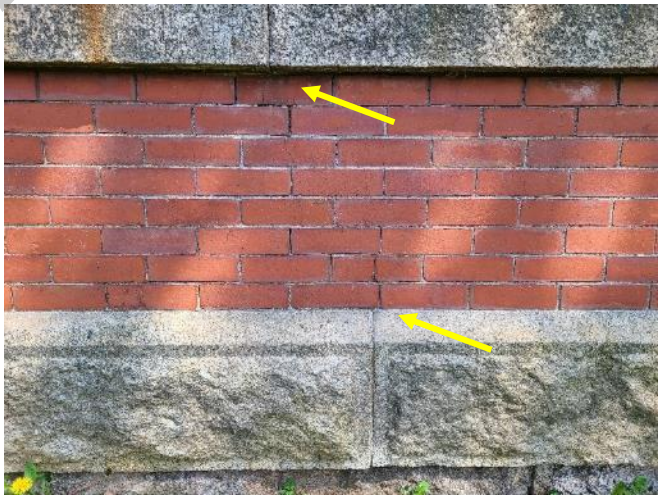
- An abandoned electrical insulator was observed along with an unsealed penetration approximately 50 mm in diameter (yellow box).
- Significant efflorescence was observed at the masonry between the second and third floors (red box).

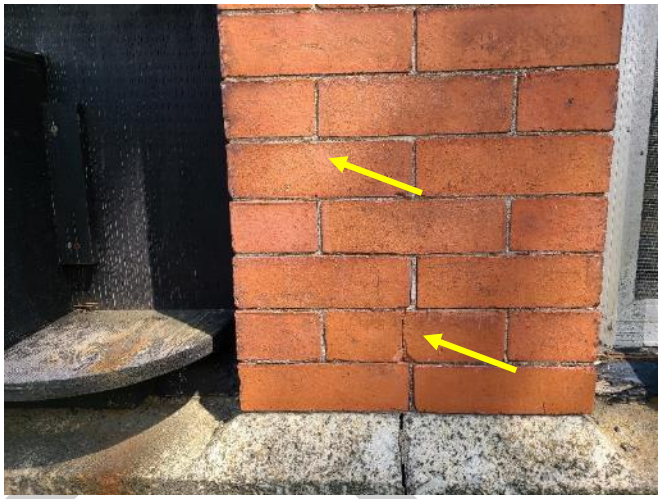
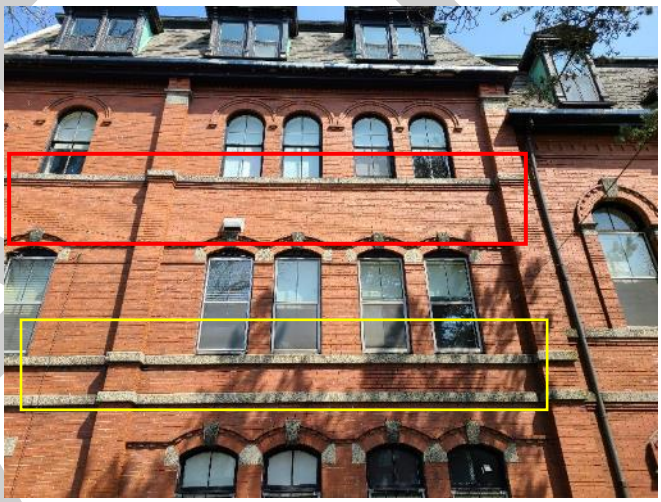
West Elevation

- Typical masonry detailing above first floor windows at the northern most side of the west elevation.
- Masonry cracking was observed at multiple locations (yellow arrow).
- The cracks observed originated at the granite foundation and travel vertically above the first-floor windows.
- See following observations.

West Elevation

- Masonry cracking was observed at multiple locations.
- The crack, pictured here, originated at the granite foundation and travels vertically above the first-floor windows.



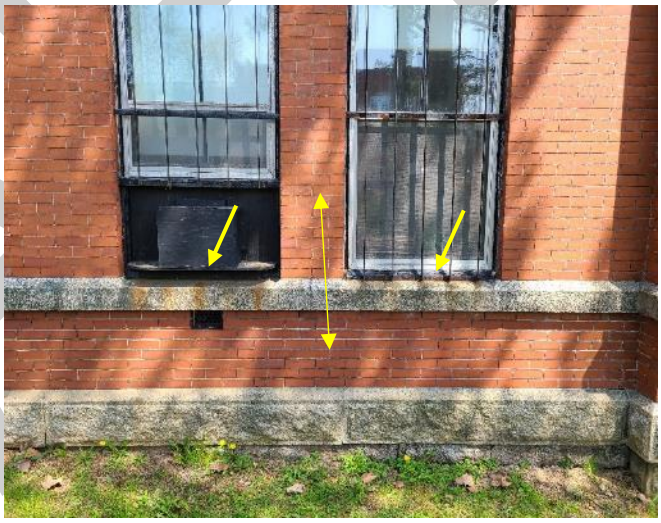
West Elevation • Same as above.	
West Elevation • Typical masonry detailing above third floor windows. • Significant efflorescence was observed at the masonry between the second and third floors (red box). • Deteriorated masonry was observed between the first and second floor windows. See following image.	
West Elevation • Deteriorated masonry was observed between the first and second floor windows.	

West Elevation

- Typical masonry arch detail above first floor windows.
- Deterioration of mortar joints between the cap bricks of the masonry eyebrow was observed (yellow arrows).
- Spalled masonry faces were observed at this location.
- Previous repairs were observed at the head of windows.
- Deteriorated sealant was observed.
- Staining of the granite keystones was observed.

West Elevation

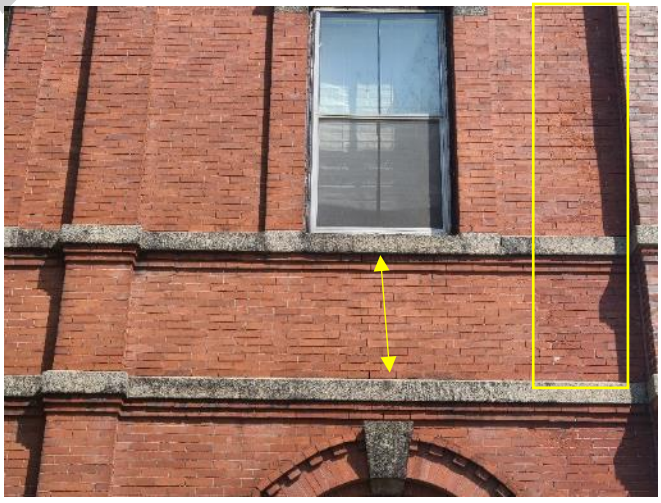
- Staining was observed at the granite ribbon below the first-floor windows. This is likely caused by the deteriorated, metal security bars at windows.
- Deteriorated mortar joints were observed below the granite ribbon.
- A masonry crack originating at the foundation was observed to travel vertically between windows.
- Efflorescence and crazing of the masonry units was observed at window level.



West Elevation

- Typical example of masonry arches common to the west and east elevation.
- A previous repair and repointing effort was observed (yellow arrow). Repair work does not blend with the surrounding masonry.
- Spalling masonry was observed near the downspout (see following observation).

West Elevation • Spalling masonry was observed near the downspout (yellow box). • Deteriorated mortar joints were observed at the pilasters supporting the window arch (yellow arrow). • Deteriorated sealant was observed at the pilaster to the left of the downspout (red arrow). Sealant was also used to repair masonry and joints. • Previous repairs were also observed at the masory arch which does not blend with the original masonry.	
West Elevation • A previous repair and repointing effort was observed (yellow arrow). Repair work does not blend with the surrounding masonry. • Staining of granite keystones and springers were observed at most windows.	
West Elevation • Spalling of masonry was observed two the left of the pilaster (yellow box). • A masonry crack was observed above the window (yellow arrow). • Staining of granite ribbons was observed.	

West Elevation • Spalling of masonry was observed two the left of the pilaster. • Staining of granite ribbons was observed.	
West Elevation • Spalling of masonry was observed two the left of the pilaster (yellow box). • A masonry crack was observed (yellow arrow). • See following observation.	
West Elevation • Same as above.	

Southwest Corner • Significant deflection was observed in the masonry forming the outermost pilaster. This was especially visible at the top of the pilaster.	
Southwest Corner • Same as above.	

.2 Windows

The windows throughout most of the building are non-thermally broken, custom-fitted wood frame sashed windows set in a punched configuration. The majority of windows display vertical slider or operating vents, and most windows display exterior aluminum storm window frames. Alterations to the original windows was observed at all elevations. This includes boxing-out sections of windows with plywood to accept various mechanical penetrations. Although considered to be thermally inefficient, the windows are suiting their intended purpose.

South Elevation • Window frames were generally observed to be sound; however, paint was observed to be deteriorated. • Sealant was observed to be deteriorated. • The basement window is infilled with painted plywood. An oil fill and vent pipe were observed to penetrate the window area. Paint was observed to be deteriorated.	
South Elevation • Window frames were generally observed to be sound; however, paint was observed to be deteriorated. • Sealant was observed to be deteriorated. • A crack glazing unit was observed in the upper left arched window (yellow arrow).	
South Elevation • In many instances, sealant has been replaced between window frames and masonry; however, the sealant used and it's application is inconsistent and was often observed to be deteriorated. • Paint/stain was generally observed to be deteriorated at wooded window frames and sills.	

South Elevation • Paint/stain at the upper arched window was observed to be deteriorated. • The brickmould for the arch appears to be constructed of multiple pieces of quarter round. This does not appear to be of original construction.	
South Elevation • Same as above.	
South Elevation • Upper arched window is infilled with painted plywood to accept a mechanical exhaust vent. • Paint/stain was observed to be deteriorated.	

South Elevation • Windows at the first floor of the east elevation were observed to be boxed out or sealed with varying plywood structures.	
East Elevation • Typical first floor windows at the east elevation, left of the stairwell tower.	

East Elevation

- Windows at the second and third floor of the stairwell tower are unique to all other windows. These feature decorative circular mullions.
- The exterior door at the base of the stairwell tower has been replaced; however, still features an arched window above.
- Paint and sealant were observed to be deteriorated.
- See following observation.

East Elevation – Interior of stairwell tower, 2nd floor landing

- General image at interior
- Decorative, unique millwork is used stairwell windows.

East Elevation – Interior of stairwell tower, 3rd floor landing • General image at interior. • Decorative, unique millwork is used at stairwell windows.	
East Elevation – Interior of stairwell tower, 3rd floor landing • In general, wood sashes and window frames were observed to be in deteriorating condition and in need of rejuvenation.	

East Elevation – Interior of stairwell tower, 3rd floor landing • In general, wood sashes and window frames were observed to be in deteriorating condition and in need of rejuvenation. • Crazing can be seen at the masonry.	
East Elevation • First floor windows to the right of the stair tower are protected with metal security bars. • The end window is infilled with masonry. • Organic growth and staining was observed at the granite ribbon below second floor windows.	

East Elevation • In general, metal security bars were observed to be in fair condition. Corrosion was observed at multiple locations and translated to staining of the masonry walls below.	
East Elevation • Basement windows were observed to be infilled with painted plywood. • A hose bibb (yellow arrow) penetration and hood vent were observed at this window penetration. • A mechanical vent was observed to be corroded.	
East Elevation • Windows at the first floor of the east elevation were observed to be boxed out or sealed with varying plywood structures.	

North Elevation – Left of entrance • General image of windows at the north elevation. • Windows located at the ground floor are infilled with masonry. • Aluminum storm windows are observed at the first-floor windows. The infill appears to be of a vintage similar to the adjacent exterior walls.	
• Paint/stain at the upper arched window was observed to be deteriorated. • The brickmould for the arch appears to be constructed of multiple pieces of quarter round. This does not appear to be of original construction. See following observation.	
North Elevation – Ground level • Same as above. • Deteriorated paint/stain and sealant were observed at the wood frame and sash.	

North Elevation – at entrance • An arched window is observed over the north entrance. This appears to match the arched window over the south entrance. • Deteriorated paint/stain and sealant was observed.	
North Elevation – at entrance • An arched window is observed at the second floor, over the north entrance. • Deteriorated paint/stain and sealant was observed.	
North Elevation – right of entrance • First floor windows were observed to be square with a shallow, decorative wooden arch above. See following observation.	

North Elevation – right of entrance • The head of the first-floor windows was observed to be square with a shallow, decorative wooden arch above. • Sealant was observed to be deteriorated.	
North Elevation – right of entrance • The second-floor features arched, vertical sliding windows. • Deteriorated paint/stain was observed as well as deteriorated sealant. • The window visible at the left of the image was observed to be replaced with a Georgia-wire glass, likely as an increased security measure See following image.	
North Elevation – right of entrance • The window pictured here was observed to be replaced with a Georgia-wire glass, likely as an increased security measure given the potential access provided by the exterior stairs.	

North Elevation – right of entrance • In general, the design of dormer windows appears continuous around the building, although, single windows as opposed to the double window pictured here are also used. • The wood framed dormers are generally in fair but deteriorating conditions. • Paint/stain was observed to be deteriorated. • Dormer windows were observed to be wood framed, vertical sliders. Some lites have been replaced with more efficient IGU's or the addition of aluminum storm windows.	
North Elevation – right of entrance • The installation suggets there are no step flashings at the vertical sides of dormers.	

North Elevation – right of entrance • Deteriorated wood sill and window frame was observed. • The leaf guard at the gutter was observed to be damaged and poorly secure.	
Dormers at the Interior • Some dormers windows have been replaced with newer, double hung vinyl replacements. • Significant water damage was observed at the interior at the dormer. See following observation.	
Dormers at the Interior • Some dormers windows have been replaced with newer, double hung vinyl replacements. • Significant water damage was observed at the interior at the dormer which appears to be aligned with the interface between the dormer and the adjacent mansard roof.	

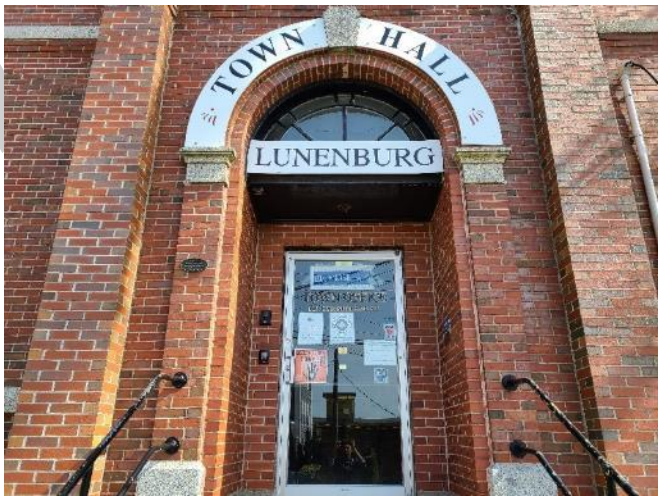
West Elevation – General images • First floor windows across the west elevation feature arched heads. Multiple windows at this level are boxed out with plywood to accommodate various mechanical elements. • Second floor windows are square with a decorative wood arch at the head of the window. These feature aluminum storm windows. • Third floor windows are typically arched. • All windows were generally found to be in fair but deteriorating conditions with paint/stain and sealant maintenance being required.	
West Elevation – General images • Same as above.	
West Elevation • Typical first floor windows feature metal security bars and aluminum storm windows. • Corrosion was generally observed at metal security bars which in turn is staining the granite sill/ribbon below. • Paint/stain at window frames and sashes was generally observed to be deteriorated and in need of maintenance. See following images.	

West Elevation • Corrosion was generally observed at metal security bars which in turn is staining the granite sill/ribbon below.	
West Elevation • Typical first floor windows feature metal security bars and aluminum storm windows.	
West Elevation • Various alterations were observed to windows at all elevations.	

West Elevation • First floor windows across the west elevation feature arched heads. The window pictured here features a squared arch. Multiple windows at this level are boxed out with plywood to accommodate various mechanical elements. • Paint/stain was observed to be deteriorated at window frames, sashes and plywood components.	

.3 Exterior Doors

Exterior doors are of various styles and construction. The main entrance doors at both the north and south elevations are of aluminum construction. Egress doors are typically composed of fire-rated, hollow metal door slabs with comparable framing, set into the wall opening. These doors are relatively new additions to the exterior wall at the second and third floors of the north elevation. Some entrance assemblies displayed Georgia wired glass lites. A fully accessible aluminum entrance system with overhead lite is newly installed at the west elevation at ground level. All associated hardware appeared to be functioning and operating to expectation. The following observations were made:

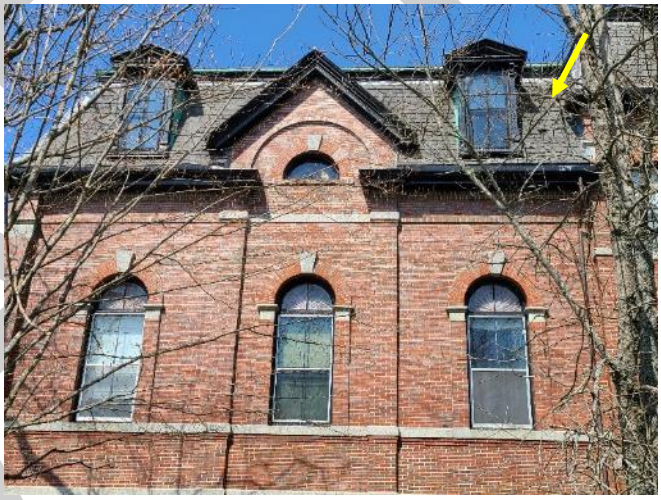
South Elevation • The main entrance was likely remodelled to accommodate the existing aluminum entrance door. Note, the arched lite was preserved.	

East Elevation • A newer metal slab door has been installed. The arched lite above was preserved.	
North Elevation • The main entrance was likely remodelled to accommodate the existing aluminum entrance door. Note, the arched lite was preserved.	
North Elevation – second floor • Newly installed metal slab door for emergency egress at the second floor. This does not appear to be part of the original construction. Note, a lintel was not installed above the head of the door to effectively distribute the weight of the overhead masonry.	

North Elevation – third floor • Newly installed metal slab door for emergency egress at the third floor. This does not appear to be part of the original construction. • FSA could not confirm if an adequate header/lintel was installed above the door.	
West Elevation • An accessible aluminum entrance system with overhead lite was observed.	

.4 Roofs

South Elevation • Prominent mansard roof and dormers typical around the building. • The roof of the left dormer was observed to be temporarily repaired; however, the pressure sensative material applied is now damaged, missing and no longer providing protection.	

East Elevation • Prominent mansard roof and dormers typical around the building. • The east elevation also features a copper roof above the stairway tower and a unique gable roof towards the south elevation (yellow arrows). • The style of the mansard roof at the hip changes to a rounded profile at this elevation. The hips, capped with lead are common around the building.	
East Elevation • General image of the hip roof and dormers at the east elevation. • Deterioration of shingles was observed (yellow arrow). Shingles were torn, curled and in some areas missing. See following observation.	
East Elevation • Deterioration of shingles was observed (yellow arrow). Shingles were torn, curled and in some areas missing. See following observation. • Paint/stain of the woodwork around the dormers was observed to be deteriorated and in need of repair/maintenance. This was typical of all elevations. • Paint was observed to be flaking at the gutter to the right of the dormer. This was typical off all elevations.	

East Elevation • Some deterioration was observed at soffits in isolated areas including deteriorated wood and flaking paint/stain. This was typical of all elevations.	
North Elevation • General image of the roof at the north elevation. • Prominent copper near-domed roof and dormers are visible.	
North Elevation • Staining and organic growth was observed at the mansard. This elevation remains relatively shaded throughout the day due to its orientation and large trees. • Mesh gutter guards were observed to be damaged and providing little protection. See following observation.	

North Elevation • Mesh gutter guards were observed to be damaged and providing little protection against debris accumulation in the gutters. • Paint at the gutters was observed to be deteriorating. • Organic growth was observed along the gutter. • Sealant at joints in the gutter were observed to be deteriorated (yellow arrow).	
North Elevation • Step flashing transitioning from lead to copper was observed at the intersection to masonry. Flashing is set into a reglet. See following observation. • No interlapping with the orignal step – flashing. This creates a vulnerable flashing detail reliant on sealant.	
North Elevation • General image of lead reglet step flashing. Sealant has been applied at the head of the joint and is beginning to deteriorate. • No interlapping with the orignal step – flashing. This creates a vulnerable flashing detail reliant on sealant.	

North Elevation • Previous repairs were observed at the gutter. • Dissimilar metals and corroded fasteners were observed. • Untreated wood trim was observed beneath the gutter.	
General Image – facing north • Shingled roof area. • Copper elements were observed to be deteriorating. Various repairs have been made and sealants applied likely in an effort to mitigate water ingress being experienced at the interior.	
Copper Roof (Dome) – North tower • In general, copper roofs were observed to have reached the end of their useful life. • Deteriorated paint/stain was observed beneath the flat top of the copper roof. • Corroded fasteners and dissimilar metals were observed especially at the foot of the copper roof. See following observations. • There was no idication of step flashing between the shingle roof detail and the copper roof creating a transition vulnerable to water ingress.	

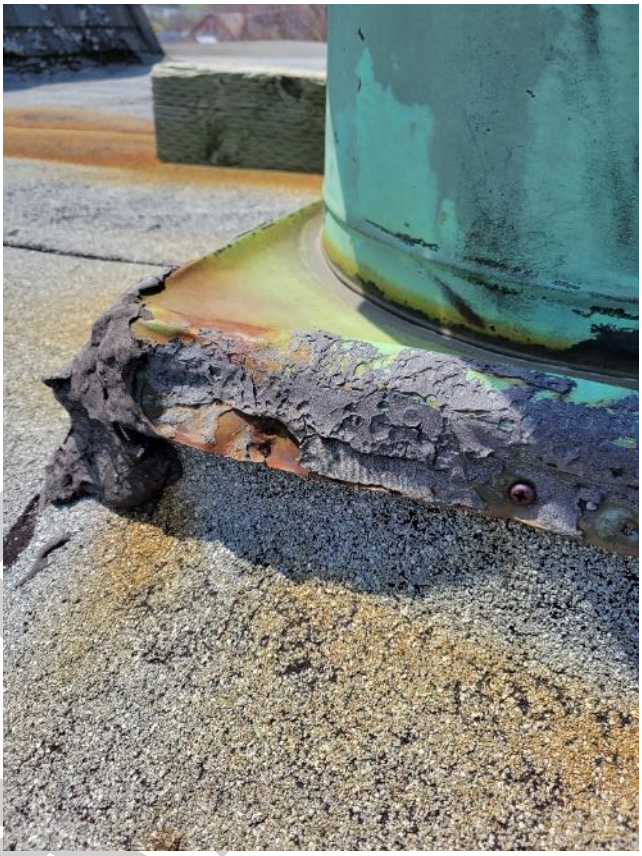
Copper Roof (Dome) – North tower • Corroded fasteners and dissimilar metals were observed especially at the foot of the copper roof.	
Copper Roof (Dome) – North tower • Deteriorated paint/stain was observed at the wood and metal elements beneath the flat top of the copper roof. • Missing fasteners were observed at the metal flashing.	
Copper Roof (Pyramid) – East Tower • In general, copper roofs were observed to have reached the end of their useful life. • Deteriorated sealant was observed at the foot of the copper roof. Furthermore, the use of mastics suggest no step flashing was used to transition the flashing upstand. See following image.	
Copper Roof (Pyramid) – East Tower • Roof valley results in water flow being directed under the shingles that are sloped to the eaves.	

Copper Roof – facing east • Detailing sealant, missing and ineffective fasteners were observed. • No evidence of required step flashing resulting in a detail vulnerable to water intruison.	
General Image – low slope/mod. bit. membrane roof area • Low slope roof area is of modified bitumen (mod. bit.) membrane construction. In general, the roof area has reached the end of its useful life and needs replacement. • The rooftop unit was observed to be severely corroded and placed on wooden sleepers which appeared to be loose-laid on the roof. • See following observations.	
General Image – low slope/mod. bit. membrane roof area • Low slope roof area is of mod. bit. membrane construction. In general, the roof area has reached the end of its useful life and needs replacement. • Staining and organic growth were observed at various locations. • Various open seams were observed in the MB membrane at the roof area.	

General Image – low slope/mod. bit. membrane roof area • Multiple fasteners were observed penetrating the mod. bit. membrane in the field of the roof. Corroded fasteners and deteriorated sealant were observed. • Note the deterioration of the mod. bit. cap sheet. • Note the organic growth visible at the mod. bit. cap sheet. • See following observation.	
General Image – low slope/mod. bit. membrane roof area • Same as above.	

General Image – low slope/mod. bit. membrane roof area, facing north • In general, the mod. bit. membrane cap sheet was observed to have reached the end of its serviceable life and replacement is recommended. • Organic growth and loss of granules was observed across the field of the roof area. • Deteriorated wood trim along with paint/stain were observed (yellow box). See following observation.	
General Image – low slope/mod. bit. membrane roof area, facing north • Deteriorated wood trim along with paint/stain were observed. • Dissimilar metals and poorly detailed flashing components New pre-painted roof edge flashings have been installed over older copper cornice components, lead flashings have been installed under existing wood and metal components and overlapped over newer mod. bit. membrane roof flashings • Copper was observed to be oxidized with various sealants applied. •	

General Image – low slope/mod. bit. membrane roof area • Low slope roof area is of mod. bit. membrane construction. In general, the roof area has reached the end of its useful, serviceable life and needs replacement. • The rooftop unit (RTU) was observed to be severely corroded and placed on wooden sleepers which appeared to be loose laid on the roof resulting in potential for roof membrane damage and inadequate securement of the RTU	
General Image – low slope/mod. bit. membrane roof area • Copper roof vents were observed to have reached the end of their serviceable life. Many were observed to be damaged with various repairs made. • Waterproofing and sealant at the foot of copper roof vents was observed to be deteriorated. See following observations. • No separate membrane flashing ply was observed suggesting a weak transition that relies on mastics.	

General Image – low slope/mod. bit. membrane roof area • Waterproofing and sealant at the foot of copper roof vents was observed to be deteriorated. • Fasteners were observed to be of non-compatible material. • Note the deterioration of the mod. bit. membrane cap sheet flashing. • No separate interlapping membrane flashing and unlikely any reinforcing gussets at corner details.	

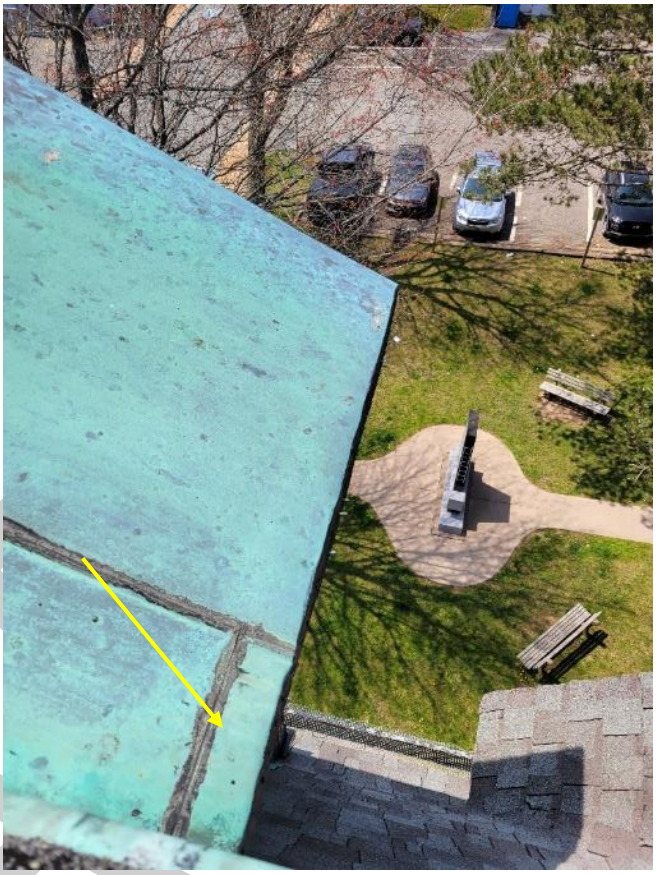
<u>General Image – low slope/mod. bit. membrane roof area</u> • The roof hatch was observed to uninsulated and poorly sealed. • Mod. bit. membrane was observed to be substantially deteriorated. • No use of interlapping flashing applications was observed which is recommended by all mod. bit. membrane manufacturers.	
<u>Shingled roof – south elevation</u> • Mod. bit. membrane was observed on the flat top of the roof area (yellow arrow) and has reached the end of its serviceable life. • Deteriorated paint/stain was observed on the cornice elements beneath the flat top of the copper roof.	

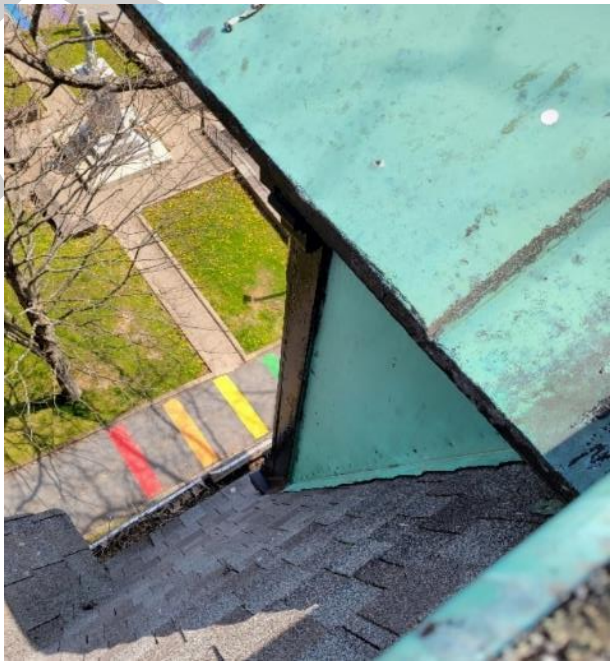
Shingled roof – south elevation • Mod. bit. membrane roof covering was observed on the flat top of the roof area (yellow arrow) and has reached the end of its serviceable life. • Significant organic growth on the surface of the membrane was observed.	
Shingled roof – south elevation • Pulled fasteners securing the edge of the mod. bit. membrane were observed. Pulled fasteners no longer provide the intended securement. • Note the substantial organic growth.	

Dormer roof – south elevation • The roof of the left dormer was observed to be temporarily repaired; however, the pressure sensative material applied is now deteriorated, missing and no longer providing protection. • Note the deterioration of the mod. bit. membrane cap sheet at the edge of the main roof visible in the foreground of the image.	
East Stair Tower Roof – facing east • Shingles were observed to be poorly fastened at roof edge leaving gaps beneath the drip/starter flashing. • Dissimilar metals were observed. • Holes and missing fasteners were observed at the copper. • Deteriorated paint/stain was observed at wood working.	

Dormers – facing east

- In general, copper roofs were observed to be pitted.
- Various repairs were observed including the use of sealant at copper seams. Sealant was observed to be deteriorated.
- Fasteners were observed to be pulled. Pulled fasteners no longer provide the intended securement. See following observation.
- An absence of solder at seams and poor sizing of copper sheets – see yellow arrow, suggest an inexperienced copper installer.



Dormers – facing east • Fasteners were observed to be pulled. Pulled fasteners no longer provide the intended securement. • The use of nails further indicates an absence of clips and cleats to secure copper and inexperienced workmanship.	
Dormers – facing east • Damaged shingles were observed at the mansard roof along with debris in the gutters. See following image.	

Dormers – facing east

- Damaged shingles were observed at the mansard roof along with debris in the gutters.

Copper downspouts were reviewed. Note, downspouts at the north and west elevations were observed to have been replaced with plastic. The following summarizes our findings:

South Elevation

- Copper downspout to the west of the entrance stairs is assumed to tie-into a drainage system below grade. This was not confirmed.
- Uncontrolled roof drainage below grade may be contributing to the deteriorated condition of the support for the granite steps at the south elevation.

South Elevation • Copper downspout to the east of the entrance stairs is assumed to tie-into a drainage system below grade. This was not confirmed. • Uncontrolled roof drainage below grade may be contributing to the deteriorated condition of the support for the granite steps at the south elevation.	
East Elevation • Copper downspout to the north and south of the tower appear to tie-into a drainage system below grade. This was not confirmed. • The downspout to the north of the tower was observed to be disconnected. See following observation. • Uncontrolled roof drainage below grade may be contributing to the deteriorated condition of the support for the granite steps at the south elevation.	
East Elevation • The downspout to the north of the tower was observed to be disconnected. See following observation.	

.5 Granite Slab Repairs

The exterior stairs were observed to be off level. These observations focus on the main south entrance stairs. The following observations were made:

South Elevation • The granite slab steps at the south entrance were observed to have settled. the right side riser appears to have shifted to the right and a significant crack has developed in the bottom tread. • A large gap between the riser and treads was observed. See following image.	
South Elevation • A large gap between the riser and tread was observed.	

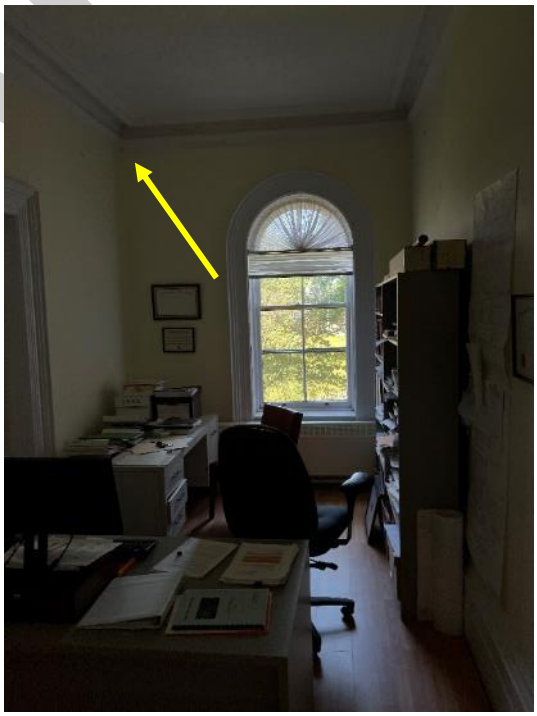
South Elevation • Downspouts were observed to drain below grade at both the right and left of the south entrance steps. If the drainage is uncontrolled below grade, this could be contributing to the settling observed.	
South Elevation • Downspouts were observed to drain below grade at both the right and left of the south entrance steps. If the drainage is uncontrolled below grade, this could be contributing to the settling observed. • Deteriorated mortar joints were observed at the right of the south entrance steps, especially at grade level (yellow arrow).	

6.3 Interior

Although interior building components were not included in the scope of this assessment, the following observations were made as they may have impact on the work being recommended at the exterior building envelope. Indications of deterioration of the mass masonry wall seen at the interior requires that further investigation be undertaken to better understand the impact of the conditions observed. Windows were observed to be in various conditions from good – fair with signs of water ingress being observed at multiple locations. The following observations were made:

• Various diagonal cracks were observed in the plaster wall covering at the exterior walls throughout the building typical for the age and type of construction.	
• Notice the diagonal crack traveling from the window casing towards the ceiling.	
• Various window sills, frames and sashes throughout the building show signs of deterioration • Indications of water intrusion and/or water damage due to condensation forming on the single glazing as these windows provide a limited thermal break. • Signs of water intrusions may also be caused by deteriorated sealants and masonry at the exterior.	

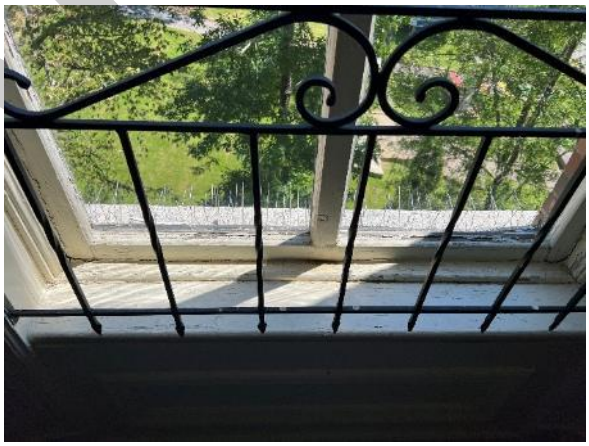
• At the interior, windows were observed to be in various stages of repair and operation. Aging and poorly functioning window locks are visible here.	
• New cordage was observed at multiple windows and these windows were observed to be operation.	

• New cordage was observed at the interior of multiple windows.	
• Various diagonal cracks were observed in the plaster wall covering at the exterior walls throughout the building typical for the age and type of construction.	

• Notice the diagonal crack traveling from the window casing towards the ceiling. • This crack suggests significant movement of the exterior wall. Further intrusive investigation is recommended to determine the overall degree and implications of any deterioration within the mass masonry wall.	
• Many window frames were observed to be in good condition, with only minor repairs needed.	

• In general, single-glazing was observed to be in good condition; however, some cracked and damaged panes were observed requiring replacement.	
• At the courthouse room, missing and damaged window stops were observed requiring repair.	

• At the interior of the courthouse, the single-hung windows were observed to be operational.	
• The window interior windowsill was observed to be in fair condition requiring rejuvenation. • This is typical of many windowsills. In general, sanding, minor repairs and paint/stain would address the deficiencies observed at the interior.	

• At the interior of the east stairwell, unique decorative windows were observed to be in fair condition. • Some deterioration was observed at the interior sill.	
• Signs of water ingress and/or damaged caused by condensation were observed at the sill. See following image.	

• Signs of water ingress were observed. These may also be caused by deteriorated exterior sealants, paint or deteriorated masonry.	
• Many individually glazed units require removal, sanding of frames and reglazing to improve their performance and ensure performance equal to their design.	

• At the exterior, some deterioration of the window frame was observed requiring the removal of all sealants, stripping and sanding of the window frame, sash, mullions and sill followed by refinishing.	
• Within the mansard at the south of the building, windows were observed to be in good to fair condition. • Bird nests and droppings were observed around window frames and at windowsills requiring maintenance. • Newer spray polyurethane foam (SPF) was observed around multiple windows, likely in an effort to mitigate water ingress and drafts.	

• Newer vinyl windows were observed to be installed at the north upper floor. • At the north interior, substantial water ingress was observed around dormer windows. • Deteriorated, crumbling and stained drywall and/or plaster was observed. Water stains were further observed around windows.	
• Significant water ingress was observed possibly due to roofing and/or flashing deficiencies at the exterior. These areas of water ingress will be addressed in the overall rejuvenation effort. • Ongoing water intrusion has the potential to create indoor air quality issues and the growth or harmful organics. Mold may be present in these areas. Further evaluation is recommended.	

• A newer vinyl window was observed to have a broken seal between glazing causing condensation and fogging.	
• Newer vinyl windows were observed to be date stamped 2002.	

• Significant water ingress was observed possibly due to roofing and/or flashing deficiencies at the exterior. These areas of water ingress will be addressed in the overall rejuvenation effort. • Ongoing water intrusion has the potential to create indoor air quality issues and the growth or harmful organics. Mold may be present in these areas. Further evaluation is recommended.	
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• Significant water ingress was observed possibly due to roofing and/or flashing deficiencies at the exterior. These areas of water ingress will be addressed in the overall rejuvenation effort. • Ongoing water intrusion has the potential to create indoor air quality issues and the growth or harmful organics. Mold may be present in these areas. Further evaluation is recommended.	

7.0 SUMMARY OF FINDINGS

The building envelope assessment allowed FSA to evaluate the building with respect to key performance indicators of both the wall and roof systems and to document architectural features. The following summarizes the findings from our assessment:

7.1 Masonry Walls

In general, masonry walls were found to be in good to fair condition. Many positive elements were observed including original or near-original architectural detailing being preserved through various masonry repairs carried out over previous years. Unique characteristics including the prominent stair tower, dormers, masonry arches, pilasters, granite ribbons and keystones continue to exhibit the distinctive characteristics of this building.

The brick used is a clay fired, solid masonry unit typical for the age of construction. These masonry units have limited resilience to thermal cycling which translates to localized deterioration in the form of spalling, crazing, diagonal, vertical and step cracking. Cracks were observed to propagate through both mortar joints and masonry units and was observed at all elevations. Cracking at all locations was typically hairline in width.

Areas of previous repairs were observed and include localized brick replacement, repointing and the addition of sealants. Some structural elements were observed to be reconstructed such as various pilasters.

Masonry deterioration was observed at all elevations and includes:

- Deteriorated mortar
- Spalling
- Crazing of masonry units
- Cracking
- Organic growth and staining
- Efflorescence

Masonry pilasters which have recently been repaired or rebuilt were observed to be, in some cases, significantly out of level. These observations were corroborated through LiDar scanning which allowed us to verify that at specific locations masonry elements are out of plumb by upwards of 50 mm posing a potential structural risk.

Metal slab doors were installed at the second and third floors. Openings were made in the masonry walls to accommodate these doors; however, the installation of steel lintels above the doors to support masonry was not included. Although this is a mass wall which may provide initial self-support of masonry at the face of the wall, overtime, unsupported masonry units may begin to shift and impede the proper function of doors meant for egress.

7.2 Windows and Doors

The majority of windows observed are wood framed with single glazed lites which provide minimal thermal resistance; however, they are performing as originally intended. Wood window frames, sills and sashes were observed to be in good condition, although deteriorated finishes, paint and sealant were observed at all elevations. In general, windows would benefit from rejuvenation efforts to restore and protect wood frames and components. Although most windows are single hung, many appear non-operational as they have been sealed shut whether intentionally of otherwise, with paint and/or sealant. In more recent years, aluminium storm windows have been installed, likely in an effort to reduce drafts and increase occupant comfort. Storm windows will provide some improved energy efficiency; however, these energy and cost savings are likely minimal.

Some windows have been replaced with newer, vinyl framed inserts some of which were date stamped '2002'. Vinyl windows may increase occupant comfort by reducing drafts and providing greater thermal resistance; however, these inserts are typically installed within the original wood window frames.

Metal security bars were observed to be installed at first floor windows. These were typically observed to be secured to the wood window frames. In general, corrosion was observed at the metal bars, often staining the granite sill and masonry below.

Across all elevations, many window openings have been retrofit to accept various mechanical equipment such as window mounted air conditioners or penetrations for vents. These retrofits are typically completed with plywood, installed, and then painted.

The main entrances at both the north and south elevations have been redesigned to accommodate aluminium framed entrance systems. Wood trim and sealant surrounding these openings was observed to be deteriorated and in need of maintenance. At the north elevation, egress from upper elevations is accomplished through a more recent installation of a metal access ramp and stairs. Metal slab doors were installed at the second and third floors. Openings were made in the masonry walls to accommodate these doors; however, the installation of steel lintels above the doors to support masonry was not included. Although this is a mass wall which may provide initial self-support of masonry at the face of the wall, overtime, unsupported masonry units may begin to shift impeding the doors' proper function.

7.3 Gutters and Downspouts

Painted galvanized steel gutters were observed around the building. It is assumed that the gutters were originally of copper construction and have been replaced with galvanized metal and painted in recent years. In general, gutters appear to be performing as intended, although organic debris was observed in some areas requiring cleaning to ensure sufficient drainage. Galvanized wire mesh gutter guards were observed at multiple locations; however, these were generally in poor condition requiring repair or replacement. Paint was observed to be deteriorated and flaking at all elevations and will require maintenance to return to an acceptable, aesthetic condition. Fasteners and original rivets were observed to be corroded.

The original downspouts are of copper; however, some have been replaced with PVC, or ABS material. Downspouts were observed to drain below the foundation and are assumed to tie into the foundation drainage; however, this was not confirmed.

7.4 Roof System

The roof consists of various roof areas and elements including a mansard roof at all elevations clad in asphalt composite shingle with a mixture of copper and lead flashings. Asphalt shingles continue above the mansard to a shingled hip roof with the flat roof of mod. bit. construction below. The mansard was observed to be in good condition and is estimated to have a remaining life expectancy of approximately 7 – 10 years; however, missing, and damaged shingles were observed at various locations, most notable at the east elevation.

The modified bitumen (mod. bit.) membrane roof was observed to have reached the end of its useful life. Organic growth, a severely deteriorated cap sheet and open seams were observed throughout. Little to no insulation was observed at the interior of the roof and it appears that the mod. bit. membrane is applied directly to the wood deck.

Prominent dormers with copper roofs are featured at all elevations. The copper was observed to be in fair to poor condition and was generally observed to have reached the end of its useful life. Seams were observed to be failing and multiple repairs with various sealants and incompatible fasteners were noted throughout the copper dormer roofs. Temporary repairs were observed at the dormer at the south elevation, to the left of the main entrance. These repairs were observed to be deteriorated and no longer providing any protection from water ingress.

In general, lack of appropriate step flashings, weak valleys, poor sheet metal detailing as well as poor membrane flashing detailing has created many areas vulnerable to water ingress. In many areas, water resistance was reliant on mastics and sealants which must be inspected, reapplied and are, by nature, more vulnerable to the elements.

At the interior, water ingress and damages consistent with water ingress were observed within the mansard roof and at the interior of dormers. Staining, crumbling plaster and drywall and potential mold and/or mildew was observed at the interior due to ongoing water intrusion.

7.5 Copper and Metal Flashings

Copper was widely used as flashing material and has performed as originally intended. Copper detailing was observed at dormers and as step flashing at the roof level. Copper gutters and downspouts were likely original to the building. As previously noted, copper gutters have been replaced with painted galvanized steel gutters and some downspouts have been replaced with pre-painted metal, ABS, or PVC material.

Cooper counter flashing used at the sides of dormers was observed. There was indication of lead step flashing incorporated beneath the shingles; however, its effectiveness and continuity could not be verified. This may be a contributing factor to the water ingress observed at the interior of the mansard roof area. Incompatible metal fasteners were observed at various locations leading to the oxidization of metal flashings.

Lead roof flashing was observed at various roof areas including at the hips of the mansard roof, at the transition between the horizontal and vertical of the mansard roof, as step flashings at the sides of dormers, as step flashing between roof and walls. Lead flashings were observed to be performing as intended.

Copper roof vents were also observed. These were found to be in fair to poor condition and replacement is recommended to ensure continued, long-term performance. These are considered part of the heritage aesthetic of the building.

8.0 DISCUSSION

This building envelope assessment was initiated to determine the overall condition of the various elements contributing to the roof and wall systems and to prepare tender ready documents to address the observable conditions as found in this report. Restoration work is planned to begin in early 2023 and be completed in 2025 with the goal of providing a 25-year life expectancy for all major building envelope elements recognizing that ongoing maintenance will be necessary. The scope of this assessment includes all roof areas, dormers, windows, wooden trim, soffits, gutters, downspouts, and masonry. The building has undergone various repairs and changes throughout its history; however, the majority of original architectural elements and detailing have been maintained. The building has suffered various leaks at both roof and exterior walls in previous years. Water intrusion has typically been observed at various roof penetrations and at the roof/wall intersection. The following discussion provides further detail:

8.1 Roof System

The mansard roof is a prominent and notable characteristic of the building which is visible from all faces. The mansard roof features slightly bell-cast eaves and a deep, galvanized eaves trough at the foot of the roof. In recent years, the mansard has been shingled with glass-matt reinforced, architectural asphalt composite shingles; however, some deterioration of the shingles was observed including missing and torn material especially at the east elevation. Staining from water-run off and organic growth was also observed. Deterioration and organic growth at shingles is likely exacerbated by the shade provided by the surrounding large trees. In general, shingles are estimated to have a remaining 7 - 10 years of serviceable life if the recommended maintenance is undertaken.

At the upper level of the main roofs, the structure is separated into two roof areas; the north roof area is of hip construction with glass-matt, architectural shingles whereas the south, flat roof area is of modified bitumen (mod. bit.) membrane construction. The shingles of the north roof area were observed to be in good condition with an estimated remaining life of 5 – 7 years; however, some maintenance is required. The south roof area of mod. bit. membrane construction has reached the end of its serviceable life and requires replacement. The mod. bit. membrane cap sheet was observed to be severely deteriorated with various repairs being undertaken likely in an effort to mitigate various areas of water intrusion. Rooftop equipment was observed to be corroded and should be evaluated to ensure its functionality. The RTU was observed to sit directly on wood sleepers which have not be incorporated into the roof system.

The entire roof system contains only trace amounts of insulation, predominantly at the north elevation at the third floor, within the mansard roof. Various leaks and indications of water intrusion at the roof level suggests that any insulation present may have reduced performance due to wetting. Based on the age and style of construction, improving the thermal performance of the building envelope at the third floor will be challenging. The roof, walls, and fenestration openings would have to be addressed for each third floor/attic area to provide a satisfactory result.

If a mod. bit. membrane is specified as part of the rejuvenation effort, the introduction of gypsum coverboard or similar is recommended. A properly installed coverboard will provide a surface less prone to thermal movement resulting in a more durable installation.

Copper roof areas including the large copper dome and pyramid at the north and east towers, respectively, as well as dormers were observed to be nearing the end of their useful life. Copper was generally observed to be pitted and numerous repairs reflected ongoing maintenance and/or water mitigation efforts. Repairs to copper roofing were observed to be made with various sealants and often incompatible fasteners providing only short-term solutions.

8.2 Wall Systems

The walls are of solid masonry or mass wall construction. Exterior masonry walls were observed to be multiple withes deep. The clay brick at the exterior walls are solid masonry units, typically vulnerable to expansion and contraction due to thermal cycling as well as increases and decreases in moisture content. Due to clay brick's ability to absorb moisture, they undergo irreversible expansion which decreases over time. Conversely, the stone elements such as the granite ribbons, keystones and foundation stones are less effected by thermal cycling and the absorption of moisture and typically undergo long-term drying resulting ultimately in shrinkage. These opposing forces can lead to various masonry cracking and contribute to the deterioration of mortar joints and masonry units.

Previous masonry repairs and substantial reconstruction of significant masonry elements was observed; however, limited repairs were noted at the west elevation resulting in ongoing deterioration and worsening of masonry condition. Repointing and the replacement of individual masonry units was easily discernible as matching the original masonry and mortar is challenging and repairs are often obvious to a trained eye. The following describes the typical masonry repairs observed:

- Significant reconstruction of masonry pilasters at the south and north elevation
- Localized replacement of spalled, cracked or severely crazed masonry units
- Localized repointing of mortar joints
- Localized repairs to decorative masonry arches
- Infill of previous windows or door penetrations with masonry

The report generated by G. F. Duffus & Company LTD. recommended substantial masonry repairs were needed at all elevations. Although a considerable masonry repair was undertaken, many of the original areas of noted deterioration remain unchanged or poorly repaired. These conditions were further observed by FSA and include but are not limited to the following:

- Poor corbelling – too wide and/or inconsistent with original masonry
- Pilasters out of plumb and bowed
- Cracked masonry
- Open joints
- Continuous control joints were not created as recommended
- Rebuilding of deteriorated pilasters was not completed as recommended
- Pin and grouting do not appear to have been completed as recommended

The conditions observed at exterior walls continues to propagate deterioration. Open and deteriorated mortar joints and cracks left unrepaired will continue to allow water ingress. In turn, ongoing deterioration of the masonry is exacerbated by thermal cycling year after year. This leads to the worsening of the observed masonry conditions and can ultimately result in loss of structural integrity often resulting in poorly secured masonry, spalling masonry and generally worsening conditions. Annual inspection and timely repairs are necessary to continue to preserve the integrity and ensure the resilience of masonry walls even though restoration work may be completed.

At the interior, although the majority of walls are enclosed with lath and plaster or drywall, observations were made which suggest localized deterioration of the mass masonry wall beyond the outer most wythe. Masonry and mortar dust and debris were observed at the foot of exterior walls throughout the interior. This is often caused by ongoing movement due to thermal cycling and/or water ingress over many years.

Further target intrusive investigation is recommended to determine the overall condition of the inner wythes of the masonry wall. Substantial deterioration may require a more extensive reconstruction.

It should be noted that original, built-in thermal deficiencies and the absence of a vapour/ air barrier, as was common when this building was originally constructed, limit, if not prohibit this asset from meeting current building codes. Furthermore, any exterior remediation must balance cost and overall performance alongside heritage preservation recognizing that any improvements will not likely improve overall building efficiency without substantial and likely unrealistic engineering, design construction and overall investment costs.

8.3 Windows and Doors

Windows at all elevations play an integral role in the overall aesthetic design of the building envelope. The majority of windows are of wood construction and are typically single hung with arched or round heads. Single glazing was observed at the majority of windows; however, some individual lites have been replaced with double-glazed units. Aluminium storm windows were observed at most elevations. A variety of alterations have been made to numerous windows at all elevations, most of which were observed at the first floor. These typically include infilling or boxing out the heads or lower third of a window to accommodate HVAC vents, window mounted air conditioning units or other equipment. Windows located at ground level also feature metal security bars which were observed to be corroded, staining the masonry sills and walls below.

A summary of the style of windows at each elevation is provided below:

South Elevation	The south elevation features a stand alone round headed window above the main entrance, arched windows at the first floor, round headed windows at the second floor and round headed windows at the dormers within the mansard.
East Elevation	Arched windows are featured at the first floor while the second floor includes a mixture of rounded headed windows to the south and arched windows towards the north, respectively. Round headed windows are repeated at the north end. The stair tower which divides the elevation between north and south features a large arched window at the second landing with decorative, rounded muntin or sash details. Above, at the third-floor landing a round headed window with decorative 'flowered' muntin completes this elevation. Round headed windows are observed at the two dormers to towards the south while typical single-hung dormer with decorative wood dentils at the lintel above.
North Elevation	The north elevation features a stand alone rounded headed window above the main entrance similar to that of the south entrance. Arched windows are observed at the second floor, round headed windows at the third floor and single hung windows at the dormers within the mansard featuring decorative wood dentils at the height of the lintel. The central 'tower' features a large, round headed window at the second floor and proportionately smaller rounded headed window above at the height of the mansard.

West Elevation

The west elevation is divided between north and south sections. To the north, the first-floor features tall arched windows while the second floor features windows with a shallow arch. The third floor contains round headed windows while the dormers feature square single hung windows with decorative wood dentils at the height of the lintel.

At the south end, the same tall arched windows were observed at the first floor while windows with rounded heads are featured at the second floor. Two round headed dormer windows differ from those to the south.

In general, exterior windows were observed to be performing as originally intended and remain in fair to good condition. Wooden components such as window frames, sills and sashes were observed to sound with some deterioration requiring more extensive repairs; however, the original architectural styling has been preserved over the years.

Deteriorated conditions typical of single-glazed, wood windows were observed at the interior including signs of water ingress and deteriorated paint and finishes. This is often caused by the accumulation of condensation at the interior during the heating season as the single glazing provides little thermal separation between interior and exterior temperatures. Although requiring a greater level of maintenance to ensure their continued performance, the majority of wood windows can be rejuvenated and remain in place. Future maintenance should include routine inspection of glazing during the coldest days, wiping down and drying frames and glazing where condensation is readily apparent. The utilization of storm windows likely provides an improved thermal separation resulting in less condensation and related damages at the interior while also protecting the wooden frames, sashes and sills from exterior weather.

8.4 Gutters and Downspouts

The gutters, located at the foot of the mansard roof are of galvanized construction and have been painted to blend in with the mansard. Although original drawings were not made available, it is assumed that gutters were originally of copper construction and were replaced in more recent years. The painted finish of the galvanized metal was observed to be deteriorating at all elevations requiring the need for full surface preparation and repainting. The sectional profile of the gutters varies around the building and may not match the original profile, likely similar to the ogee profile still apparent at the isolated remaining copper gutter sections.

Likely, the downspouts original to the building were of copper construction and some copper downspouts remain; however, approximately 50 % have been replaced with pre-painted PVC or ABS material. All downspouts, excluding those which were observed to be broken or incomplete, were observed to terminate below grade and may be tied into a perimeter drainage tile system at or near the footing. This was not confirmed during our site visit and further imaging and possible excavation of these areas may be required to confirm their effectiveness. Uncontrolled water being directed to towards the footings can cause soil erosion and lead to structural instability if left uncontrolled and/or unmaintained.

8.5 Copper Elements

Various copper elements were incorporated during the building's original construction. Many of the copper elements have been removed or replaced over the years; however, key features still remain. Copper is used widely at both the sidewalls and roofs of the dormers and as step flashing; however, in some locations, a transition to lead flashings was used.

There are indications that the eaves trough and downspouts were originally all copper; however, these elements have been repaired or replaced in recent years with galvanized materials for the gutters and pre-painted metal or plastic ABS or PVC for some of the downspouts. This may have been due to the

high expense associated with copper work, the availability of skilled labour experienced in working with copper and the potential for theft given the lucrative recycling costs of various metals.

At the level of the flat roof, copper roof vents were incorporated as part of the original construction. These were observed to be in fair to poor condition and have reached the end of their useful life. Some repairs were observed to these elements; however, their replacement will be necessary.

8.6 South Entrance Steps

The south entrance steps were observed to have settled or shifted, dropping off towards the east. Repair of the granite steps may not be possible without removing and resetting them; however, further intrusive investigation is recommended to determine the cause of the settling. There is some indication that soil erosion due to uncontrolled drainage from the roof may be a contributing factor. Downspouts appear to be tied into a perimeter drainage tile system; however, the existence of and performance cannot be verified without excavation or the use of scope camera.

9.0 RECOMMENDED OPTIONS

FSA concludes that the building envelope has been well maintain over the structure's life; however, substantial repair and rejuvenation work is required to achieve the Town of Lunenburg's overall goal of a 25-year building envelope performance life. FSA proposes the following recommendations with Class C costing:

9.1 Roof System

FSA recognizes the high expense associated with a complete roof replacement; however, both mod. bit. membrane and copper roof areas have reached the end of their life and will require replacement. We further acknowledge the remaining service life of the existing, shingled mansard roof. Taking into consideration the cost and challenges associated with accessing the upper elevations to complete window and masonry repairs, it would be prudent to include the replacement of the shingles at the mansard roof at the same time to take advantage of the access that would be provided by the staging required for the window and masonry repairs. This will further ensure that all roof areas have a comparable performance life.

FSA recommends the following replacement options along with Class C costing for your consideration:

9.2 Roof Replacement Options

Three roof replacement options have been provided for performance, warranty, and costing comparison. FSA recommends the following replacement options and Class C costing for the roof system:

Option 1 – Complete Replacement with Asphalt Shingles and Colour Matched Aluminium Flashings

Description:

Option 1, a targeted replacement includes general repairs to asphalt shingles at the mansard roof and hip roof area above. Replacement of copper roof elements, including the pyramid shaped roof above the east tower and flashings will be made with colour matched aluminium to reduce replacement costs. Dormer roofs will be replaced with colour matched aluminium. The low-slope roof area will be replaced with a 2-ply mod. bit. membrane system incorporating a coverboard. Existing copper roof vents will be replaced with new, custom, colour matched aluminium roof vents. The domed roof above the north tower will be replaced in copper due to its shape. The existing galvanized gutter to remain in place and be repaired and repainted. All downspouts to be replaced with colour matched metal.

Total Class C Estimate of Option 1:

All Roof Areas $ 272,880 (Excluding HST).

Gutter and Downspout Repair $ 22,000 (Excluding HST).

Advantages:

- Replacement of the existing copper elements with colour and period matched aluminium will reduce the overall replacement cost.
- Aluminium roof and flashings will perform well, if properly maintained for 30 – 40 years.
- Repairing the existing shingle roof at the mansard will reduce overall construction costs.
- Salvaging and repairing the existing gutter will reduce overall construction costs.
- Replacing downspouts with colour matched aluminium will reduce overall construction costs.
- 25 - year performance life is attainable for the low-slope roof area; however, mod. bit. membrane roof will likely requiring re-capping or coating at or near 15 years.
- Lowest initial cost of all options.

Disadvantages:

- Original construction materials used such as copper and lead will not be incorporated into this option thus sacrificing some of the original heritage elements; however, the overall aesthetic of the various building elements will not be substantially altered from the existing.
- Proper phasing of masonry repairs will be required as aluminium flashing materials can be damaged by alkali solutions contained in wet mortar.
- Protection of aluminium flashings may be required while masonry repair work is being carried out due to potential damaged caused by alkali solutions.
- The shingles at the mansard roof will likely requiring replacement in 10 – 15 years, adding substantial future cost outside the project scope.
- Additional construction costs for mobilizations, staging, disposal etc. will be incurred when the shingle roof needs to be replaced, thus ultimately increasing the overall capital investment.

Option 2 – Complete Replacement with Synthetic Slate Shingles and Copper Flashings

Description:

Option 2, a complete roof replacement includes the replacement of the shingles at the mansard roof with engineer synthetic shake or slate shingles, replacement of all copper roof elements with new copper, including dormer roofs, domes and pyramid roofs above the east and north tower, respectively as well as flashings. Installation of a new 2-ply mod. bit. membrane system at the low slope roof area and the hip roof area. Existing copper roof vents will be replaced with new, custom, copper roof vents. The existing galvanized gutter and associated downspouts will be replaced with a new copper gutter configuration similar to the original.

Total Class D Estimate of Option 2:

All Roof Areas and Flashings $ 479,640 (Excluding HST).

Gutters and Downspouts – Copper	$ 73,200 (Excluding HST).
Roof Vents – Copper	$ 15,600 (Excluding HST).

Advantages:

- An overall 25-year life expectancy for major roof elements can be achieved with copper elements having a 100 + year expected service life, thus reducing some annual maintenance costs.
- 25 - year performance life is attainable for all roof areas; however, mod. bit. membrane roofs will likely requiring re-capping or coating at or near 15 years.
- Option 2 maintains the overall aesthetic while preserving the original design intent and materials used increasing the heritage value of the building.
- Copper is resistant to alkali solutions contained in wet mortar thus reducing the need to protect or phase work accordingly.

Disadvantages:

- Most costly replacement option.
- Copper is often the target of illegal metal recyclers and may become a target, especially where copper elements are accessible such as copper downspouts.
- There are limited manufacturers or skilled contractors able to undertake this type of work, which could limit competitive pricing.
- Ongoing maintenance will require trade-persons skilled in copper work which may be challenging to find.
- Quality assurance of ongoing maintenance may be required to ensure that compatible materials and practices are being used, thus potentially increasing annual maintenance costs.
- Asphaltic shingles used at the mansard roof have a typical life expectancy of 15 – 20 years thus falling short of this project's overall goal of a 25-year life expectancy for the building envelope as a whole.

Option 3 – Complete Replacement – Hybrid

Description:

A complete replacement incorporating a hybrid approach which makes use of modern and traditional materials providing a heritage aesthetic while balancing cost, performance, and longevity. This option includes the replacement of the asphalt shingles at the mansard with an engineered synthetic shake or composite synthetic slate tile. Colour match aluminium which replicates the patinaed copper is used at dormer sidewalls and as flashing material. Copper will be used at the cupolas in order to accurately replicate the existing shape. Replacement of the existing gutters and downspouts with compatible, colour matched aluminium is specified. A 2-ply mod. bit. roof incorporating a coverboard will be used for the low-slope roof area as well as the dormer roofs and the greater hip roof area.

Total Class D Estimate of Option 3:

All Roof Areas	$ 432,110 (Excluding HST).
Gutters and Downspouts - Aluminium	$ 29,800 (Excluding HST).
Roof Vents – Copper	$ 15,600 (Excluding HST).

Advantages:

- 25 - year performance life is attainable for all roof areas; however, mod. bit. membrane roofs will likely requiring re-capping or coating at or near 15 years.
- The use of engineered synthetic shake or composite synthetic slate would increase overall performance and life expectancy of the mansard roof area while providing an aesthetic which is nearer the original design intent and appearance.
- Reduced maintenance costs due to use of synthetic or engineered roofing products.
- The use of aluminium as opposed to copper will reduce the overall construction and material costs.
- Increased performance life of all roofing elements and the ability to meet the 25-year performance goal of building envelope elements.
- Competitive pricing with several manufacturers and contractors able to complete the project.
- Option 3 maintains a uniform look and average life expectancy with appropriate maintenance across all roof areas.
- Standardization of roofing materials and systems across all roof areas without sacrificing the original aesthetic of the building.
- mod. bit. membrane provide a granulated surface providing greater protection against sliding snow and ice as well as improving safety for maintenance workers at the roof level.
- Grey and green mod. bit. membrane cap sheets are available. A grey membrane may decrease thermal loading during the day, while a green cap sheet may provide a more uniformed look at visible transitions to flashings. Colour sampling and testing would be required.

Disadvantages:

- Engineered synthetic shake and composite synthetic slate can be 25% - 50% more costly than asphalt shingles; however, if properly installed they have a performance life of 25 – 50 years
- Original construction materials used such as copper and lead will not be incorporated into this option thus sacrificing some of the original heritage elements; however, the overall aesthetic of the various building elements will not be sacrificed.
- Proper phasing of masonry repairs will be required as aluminium flashing materials can be damaged by alkali solutions contained in wet mortar.
- Protection of aluminium flashings may be required while masonry repair work is being carried out due to potential damaged caused by alkali solution.

9.3 Wall Systems

FSA recognizes the high expense associated with building envelope repairs related to heritage masonry and windows and has sought to provide options which balance cost, performance, and longevity. These options provide a continuous, phased approach over two years to complete the initial rejuvenation of the building envelope and its associated components. The following maintenance and repair recommendations seek the overall goal of a 25-year performance life of the building envelope. This result will not be achieved by solely performing one-time repairs due to the nature of heritage masonry and wood framed windows. Ongoing, well planned and executed annual maintenance will be required even if a complete rejuvenation of all building envelope components is undertaken. The following recommendations have been made:

9.4 Masonry

Although various repairs and rebuilding efforts have been carried out, a substantial amount of masonry repair work is still needed. In some cases, previous repairs now require demolition and rebuilding to ensure their structural integrity and to allow a more uniform and effective tie-in of various masonry elements. Matching original clay bricks and masonry details is often challenging. All efforts will be made to provide a near-match to the existing elements. If preservation is possible by way of repair or rejuvenation of masonry components, all efforts will be made to do provided that no immediate or future performance or structural integrity risk exists. Detailed elevations providing a general overview of the recommended masonry repair work is found in Appendix B. In general, the scope of masonry repairs includes the following:

- All masonry elevations require repair.
- All masonry work to be completed by skilled masons with experience in heritage masonry repair and reconstruction.
- The removal and replacement of all damaged or significantly deteriorated masonry units with an accepted, near matching clay brick.
- Removal and reconstruction of clay brick corbels and window arches.
- Dismantling and reconstruction of pilasters, pilaster capitals (head) and plinths (base) where needed to make true and structurally sound by pinning and grouting to structurally sound backer material.
- The addition of continuous control joints where pilasters intersect with elevation plane.
- Raking back deteriorated and failing mortar joints at masonry clay bricks, granite stone detailing bands, corbels and cornices. Repointed and tooled.
- The removal and replacement of damaged and unsound granite window arch key stones, bands or cornice stones, if rejuvenation is not possible.
- Where necessary, the removal and replacement of partial stones may be restored with a dutchman type repair, secured with appropriate techniques to make sound, invisible repairs.
- Where needed, the removal and replacement of sealants with colour matched or another appropriate sealant.
- Removal of all organic growth, staining from wildlife and efflorescence from masonry with appropriate, safe, and environmentally friendly product.
- Consideration for using a silicate type spray to protect masonry and facilitate the escape of any trapped moisture.

A Class C summary of maintenance costing includes labour, materials and access but does not include appropriate taxes.

SUMMARY OF MASONRY REPAIR COSTS

Elevation	Estimated Cost
North Elevation	$ 513,797
East Elevation	$ 682,277
South Elevation	$ 519,417
West Elevation	$ 768,069
South Entrance Stairs	$ 74,000
TOTAL	**$ 2,557,560**

Prior to undertaking any masonry repairs, intrusive investigation at masonry walls is strongly recommended. Various indications of structural movement and deterioration were observed during our visual inspection and a complete understanding of implications is essential in preparing accurate construction tender documents. Intrusive investigation is not included as part of the initial building envelope assessment.

9.5 Windows

In general, windows were observed to be in good condition. Although the existing windows do not meet current fenestration performance standards, they are performing as originally intended. Various repairs have been undertaken which have aided in the preservation of the existing wood framed windows. Painting and re-glazing efforts have protected wooden components such as window frames, sash and sills; however, some deterioration was observed at all elevations and rejuvenation is recommended. The following rejuvenation options have been provided:

9.6 Window Options

Description:

In-place rejuvenation of all existing windows will take place without the removal of individual window frames and will incorporate the following:

- Removal of all existing paint, stain, sealant and glazing from windows
- Removal of all alterations at the exterior
- Preparing and priming of wooden components
- Repair of deteriorated wooden components using ‘Dutchman’ repairs and acrylic fillers where needed
- Replacement of damaged glazing
- Reglazing of all exterior panes

Total Class D Estimate excluding engineering fees and HST:

Option 1 Window Rejuvenation $ 258,200

Advantages:

- Rejuvenation of windows and frames will ensure their continued performance.
- Improved window performance and resistance to water intrusion and rot.
- Replacement of cracked or unsealed glazed units improving water control and occupant comfort.
- Reduction in drafts occurring at window penetrations.
- Provide a more uniform wear of wooden components such as frames, sashes etc. at all elevations, thus standardizing ongoing maintenance needs reducing overall maintenance planning and costs.
- Reduction in maintenance issues.
- Competitive pricing with several manufacturers and contractors able to complete the project.
- Improved building envelope performance.
- Increased occupant comfort.
- Reduced risk of indoor air quality issues.
- Least expansive option.

Disadvantages:

- A complete restoration to original-like construction and operation is not possible without fully removing most windows.
- Visual review of window openings and potential repairs or thermal improvements are limited without completely removing windows.
- Option 1 may still require complete removal of various windows to facilitate specific masonry repairs.
- Window operation will vary from unit to unit.

Option 2 – Complete Window Restoration – Single Glazed

Description:

A complete window restoration approach will involve the removal of approximately 75% of windows to facilitate restoration. Windows will be taken to an offsite workshop (controlled environment) for restoration. This will ensure an elevated repair increasing the heritage value of the asset. Windows will be returned to their original operational state through restoration and/or replacement of damaged or inoperable hardware. Furthermore, removal of the majority of windows will facilitate necessary masonry repairs and reduce protective measures required when working around windows. Option 2 consists of the following:

- Documentation and numbering of all windows along with their specific locations, descriptions, and individual chattels.
- Removal and protection of each window.
- Temporary protection of the exposed window opening.
- Localized repairs to window opening, including necessary masonry repairs and preparation of the opening for reinstallation.
- Replacement or repair of hardware (optional).
- In workshop: Glazing will be removed, and wood components stripped of paint or stain finishes. Framed will be sanded, primed and finished and single pane glazing replaced with new.

- Reinstallation of all windows to their original locations and appropriately sealed.

Total Class D Estimate excluding engineering fees and HST:

Window Rejuvenation	$ 309,840
Hardware Repairs (optional)	$ 31,200
Total	$ 341,040

Advantages:

- Complete restoration of all windows is possible.
- Hoarding and protection of existing windows will be reduced providing some savings to masonry repair budget.
- Improved repair of masonry as typically concealed deterioration may be more easily accessible, and repairs more readily made.
- Increased project scope and timeline compared to Option 1.
- Rejuvenation of windows and frames will ensure their continued performance as originally designed.
- Improved window performance and resistance to water intrusion and rot over Option 1.
- Replacement of all glazed units improving water control and occupant comfort while increasing life expectancy and reducing maintenance needs at individual panes.
- Reduction in drafts occurring at window penetrations due to increased preparation and the ability to make necessary repairs and improvements to individual window openings.
- Provide a uniform wear of wooden components such as frames, sashes etc. at all elevations, thus standardizing ongoing maintenance needs reducing overall maintenance planning and costs.
- Improved building envelope performance.
- Increased occupant comfort.
- Reduced risk of indoor air quality issues.
- Opportunity to return all windows to their original operational state.
- Project sequencing becomes less of an issue if windows removal and masonry repairs are carried out in tandem at individual elevations.

Disadvantages:

- Limited number of contractors with the specialized skills and/or workshops to perform
- Increased cost and timeline over Option 1.
- Increased occupant disruption; however, over the long-term will reduce overall occupant disruption due to reduced maintenance needs.
- Depending on project sequencing, tying into existing entrance systems, windows and roof system may slightly complicate the installation.

Option 3 – Complete Window Rejuvenation – IGU Upgrade

Description:

Option 3 follows the same process as Option 2; however, increases overall window performance through the addition of insulated glazed units (IGU) in place of the original, single-glazed units. The advantages and disadvantages also remain the same as Option 2 with an increased cost.

Total Class D Estimate excluding engineering fees and HST:

Window Rejuvenation	$ 347,020
Hardware Repairs	$ 45,700
Upgrade to IGUs	$ 32,450
Total	$ 425,170

Advantages of IGUs

- Increased occupant comfort by reducing drafts.
- Possible reduction in heating and cooling costs due to improved thermal performance.
- Reduced issues involving condensation and 'sweating' at glazed units.
- Reduced staining and or mold/mildew potentially reducing cleaning requirements.

Disadvantages:

- Increased cost over Option 1 and 2.
- Increased scope.
- The installation of IGU's may not be possible at all existing windows.
- Minor improvements to thermal efficiency as there will be no improvement to the existing wood frames which do not incorporate a thermal break.
- Minor improvements to thermal efficiency as the thermal values of the existing mass walls and roof systems are anticipated to remain the same.

Option 4 – Custom Window Replacement

Description:

A complete window replacement is undertaken. Windows are custom ordered to emulate the original units. Replacement windows may be of wood or aluminium construction and meet current fenestrations guidelines, thus improving thermal performance and operation at all elevations.

Total Class D Estimate excluding engineering fees and HST:

Window Replacement (aluminium framed) $ 434,950

Advantages:

- Complete replacement of all windows creating a uniform fit and finish.

- Hoarding and protection of existing windows will be reduced providing some savings to masonry repair budget.
- Improved repair of masonry as typically concealed deterioration may be more easily accessible, and repairs more readily made.
- All windows will operate as new which may increase occupant comfort especially during summer months.
- Increased project scope and timeline compared to Option 1.
- A uniform life expectancy of 30 – 40 years for all windows replaced.
- Improved window performance and resistance to water intrusion and rot over Option 1 and 2.
- Improved water control and occupant comfort.
- Reduction in drafts occurring at window penetrations due to increased preparation and the ability to make necessary repairs and improvements to individual window openings.
- Improved building envelope performance.
- Reduced risk of indoor air quality issues.
- Project sequencing becomes less of an issue if windows removal and masonry repairs are carried out in tandem at individual elevations.

Disadvantages:

- Necessary interior repairs and preparation of openings will greatly increase the time and cost of the installation.
- Increased cost and timeline over Option 1.
- Increased occupant disruption: however, over the long-term will reduce overall occupant disruption due to reduced maintenance needs.

10.0 RECOMMENDATIONS

Although various repairs and maintenance have been completed throughout the life of the building, major components making up the building envelope are now approaching the end of their serviceable life. Furthermore, previous repairs and rebuilding of masonry walls has resulted in various conditions requiring reconstruction. Based on our visual investigation and data gathered via Lidar scan the following recommendations have been made:

10.1 Roof Recommendations

FSA recommends that all roof areas be replaced in order to achieve the project goal of an overall 25-year building envelope performance life. FSA recommends Option 3 – Complete Roof Replacement – Hybrid as this approach seeks to balance cost, performance while maintaining the building's unique heritage aesthetic. Option 3 makes use of composite engineered slate or shake style shingles at the mansard roof area which provide a typical life expectancy of 50 + years thus reducing future maintenance and replacement costs. As access to the mansard roof area is extremely challenging, a composite engineered shingle will out-perform a typical asphalt shingle and provide a system more closely resembling the original aesthetic.

At the flat roof area, the hip roof and all dormers, Option 3 proposes the use of a 2-ply mod. bit. membrane with the inclusion of a coverboard. Although mod. bit. membrane is a relatively newer roofing system in

comparison to materials used as part of the original construction, the areas suggested for this covering will remain mostly out of sight, therefore will not interfere with the buildings overall heritage appearance. The use of patinaed aluminum flashings will provide a heritage 'copper' look where metal flashings are visible and provide cost savings in comparison to all copper flashings.

The use of copper material will be limited to the prominent towers which feature existing dome and pyramid roofs. Replacement in copper is recommended for these roof areas as copper remains a mailable material ideally suited to this type of installation. Copper will also achieve a 70 + year performance life and maintain the building's current look.

Option 3 seeks to use patinaed aluminum for all gutters and downspouts as it will provide a uniformed finish which requires little maintenance. The use of aluminum for all downspouts is further recommended as it will discourage theft often associated with copper. It is necessary to note that there will be a visually apparent difference between a patinaed green aluminum and copper finishes as copper may take 50 – 75 years to oxidize and change to a greenish-blue colour. Even then, there may still be a difference in appearance between the two metal finishes. If a uniform finish is desired across all elevations and components, copper can be specified for gutters, downspouts, flashing and the roof areas above the two prominent towers. It is prudent to note the cost difference between aluminum and copper materials.

10.2 Masonry Recommendations

The condition of the existing masonry requires a complete rejuvenation of all elevations. This work will involve not only repair but replacement of various masonry elements. FSA recommends that rejuvenation work be completed at all elevations within 2 years, likely completing two elevations per year. Due to the nature of heritage masonry, once a full rejuvenation has been completed, ongoing, annual maintenance will be required for the life of the asset.

Prior to commencing any masonry work, FSA recommends a series of intrusive test openings be made in order to verify the condition of the mass walls. FSA's initial investigation revealed serious concerns regarding various elements of the building's structure. Significant lean was observed at multiple pilasters and substantial step and vertical cracking through masonry units indicates potential underlying issues with the foundation. The level of detail provided by the LiDar scan further verified these out-of-plumb areas and allowed us to examine these walls in greater detail. At the south elevation, the granite slab steps are out of plumb and a question regarding adequate fill and/or soil conditions has been raised. At the interior, masonry dust, cracking or separating of interior wall or window finishes and signs of water intrusion indicate the presence of significant moisture within the mass wall being affected by ongoing thermal cycling.

Intrusive investigation will provide crucial information influencing future construction documents while narrowing down the necessary scope.

10.3 Window Recommendations

In general, the majority of windows appear to be original to the building and remain in good to fair condition and therefore are prime candidates for rejuvenation. FSA recommends that Option 1 – Window Rejuvenation be undertaken. This option seeks to balance cost while preserving the original heritage value of the existing windows. Although, Options 2 – 4 provide some thermal improvement, these gains come at an increased cost and may sacrifice some existing heritage elements. Option 1 seeks to rejuvenate the majority of windows 'in-place' following the completion of masonry work at each elevation, thus taking advantage of the staging used for masonry and roof work. The installation of metal security bars and various alterations at all elevations, some of which conceal sills, glazing, portions of frames and mullions will present some challenges and may increase the cost of returning windows to near-original condition; however, this is considered minor compared to the other options provided.

10.4 Costing

Based on the above recommendations, the following Class C costing has been provided:

Masonry Repairs	$ 2,483,560
South Entrance Steps	$ 74,000
Window Renewal	$ 258,200
Roof Replacement	$ 477,510
Gutters and Downspouts	$ 34,800
Staging Allowance	$ 90,000
TOTAL	$ 3,418,070

10.5 Economies of Scale

The overall goals put forward by the Town of Lunenburg require appropriate planning and phasing of this project in order for success. To take advantage of economies of scale, sound scheduling and overlapping of trades will be crucial and ultimately affect overall budgets and timelines. If this project is appropriately managed cost savings may be achieved in following areas:

- Mobilization and demobilization
- Equipment rentals
- Staging
- Disposal
- Hoarding
- Quality assurance observation
- Site Safety
- Material Discounts
- Landscaping
- Contract admin

11.0 CONCLUSION

While this is an older building of traditional construction, the major components of the exterior envelope appear to be relatively sound; however, maintenance and repairs need to be undertaken in the near-future to ensure this asset remains so. If maintenance and repairs are carried out in a timely manner, this building should remain serviceable for the long-term. However, if the building is left in the current condition and the major components continue to deteriorate, there is risk of creating conditions that would adversely affect the construction and the health and safety of the building and its occupants.

FSA recommends that the Town of Lunenburg proceed with planned building envelope repairs, as described in this report. Necessary work should begin no later than 2023. Appropriate phasing of the various elements of this project will ensure the work is completed in a cost-effective manner, minimizing site traffic, unnecessary labour, mobilization and demobilization fees.

Staging will likely be required to complete the necessary masonry repair work as well as provide access to replace the roof system, especially at the mansard roof area but would also allow safe roof access to complete reroofing and metal work at the low-slope, hip roof and dormer roof areas. Following completion of masonry and roof replacements the rejuvenation of windows can be undertaken making use of the same staging.

FSA recommends that the necessary work, if possible, be completed by 2025 thus providing a potential 25-year service life for all major building envelope components. Although the above-described work will renew the major components of the building envelope, ongoing, annual maintenance will still be necessary. Masonry elements require ongoing maintenance; however, this should be limited in scope to primarily repointing, cleaning and inspection of sealants. Wood components will require annual inspection for deteriorated finishes and rot especially at vulnerable areas where water ingress is likely to occur. Sealants should be inspected on an annual basis, especially at windows and doors and repaired/replaced as required. Glazing at individual windows should also be inspected annually and repaired as necessary to reduce the risk of water intrusion along with the deterioration often associated with it. All efforts should be made to preserve the heritage value of the asset and its components, using techniques and materials which will not detract from the overall aesthetic, and which will provide long-term protection and performance.

12.0 STATEMENT OF LIMITATIONS

This BCA has been carried out in general accordance with the agreed scope of work and with ASTM E2018. The conclusions presented herein are based on information gathered from the visual assessment. The historical research relies on limited information supplied by others and was limited within the scope of work, time and budget of the project herein.

This report was prepared for the sole use of the Town of Lunenburg. Permission and notification from the aforementioned and this firm will be required to release this report to any other party for review or reliance purposes.

Any comments or conclusions within this report represent our opinion, which is based upon the documents provided to FSA, our field review of physical conditions, specifically identified testing and our past experience. This review is limited to the exterior building envelope in chorus with technical, construction and performance related items. Some of the findings herein may be based on a random sampling, and others are based on a visual review of the surface conditions. Deficiencies, which may exist, but were not recorded in this report, including out-of-scope issues, were not apparent given the level of study undertaken.

No legal survey, soils analysis, environmental assessment, detailed engineering computations or quantity compilation have been performed. Therefore, FSA assumes no responsibility concerning these matters. FSA did not design or construct the subject building and will not be held liable for impact of any design or construction defects, whether described within this report or not. Owners, prospective purchasers, tenants or others who use or rely on the contents of this report do so with the understanding as to the limitations of the documents reviewed, the general visual inspection undertaken and understand that FSA cannot be held liable for damages which may be suffered with respect to the purchase, ownership or use of the subject property. No guarantee or warranty expressed or implied, with respect to the subject property has been made. Should any conditions be encountered at the subject site and/or historical information differ from the findings presented, FSA should be notified immediately in order to allow for reassessment if necessary.

Furthermore, changes in the use of the property, renovations or modifications made to the property may affect the findings and conclusions stated in the report. Therefore, it is important that the Client periodically re-evaluate the facility and review developments or operations that may potentially impact the facility.

We trust this report satisfies your immediate requirements. If you have any questions, or if we may be of further assistance, please do not hesitate to contact the undersigned.

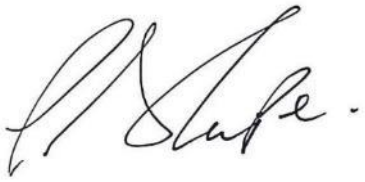
Yours truly,

Fishburn Sheridan Atlantic Inc.

Prepared by:

Ryan Beecroft
Project Leader

Reviewed by:



Paul Shupe, RRO
Atlantic Branch Manager

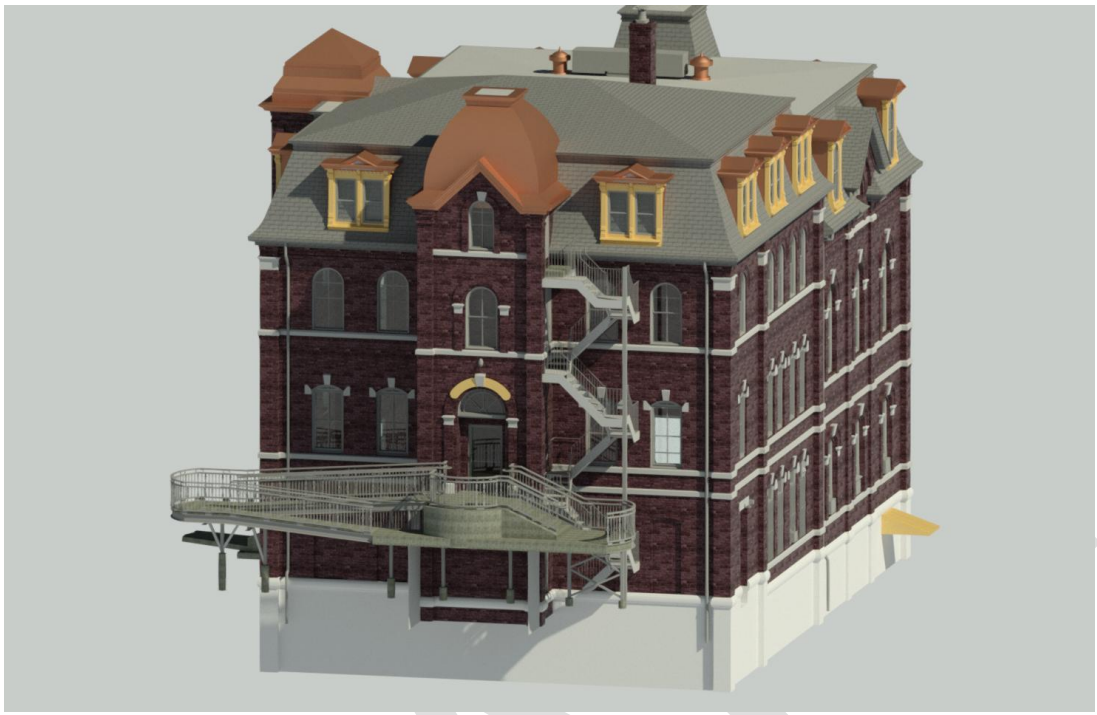
John B. McIntyre, A.Sc.T., CAHP
Senior Project Manager

APPENDIX A

Reference Elevations

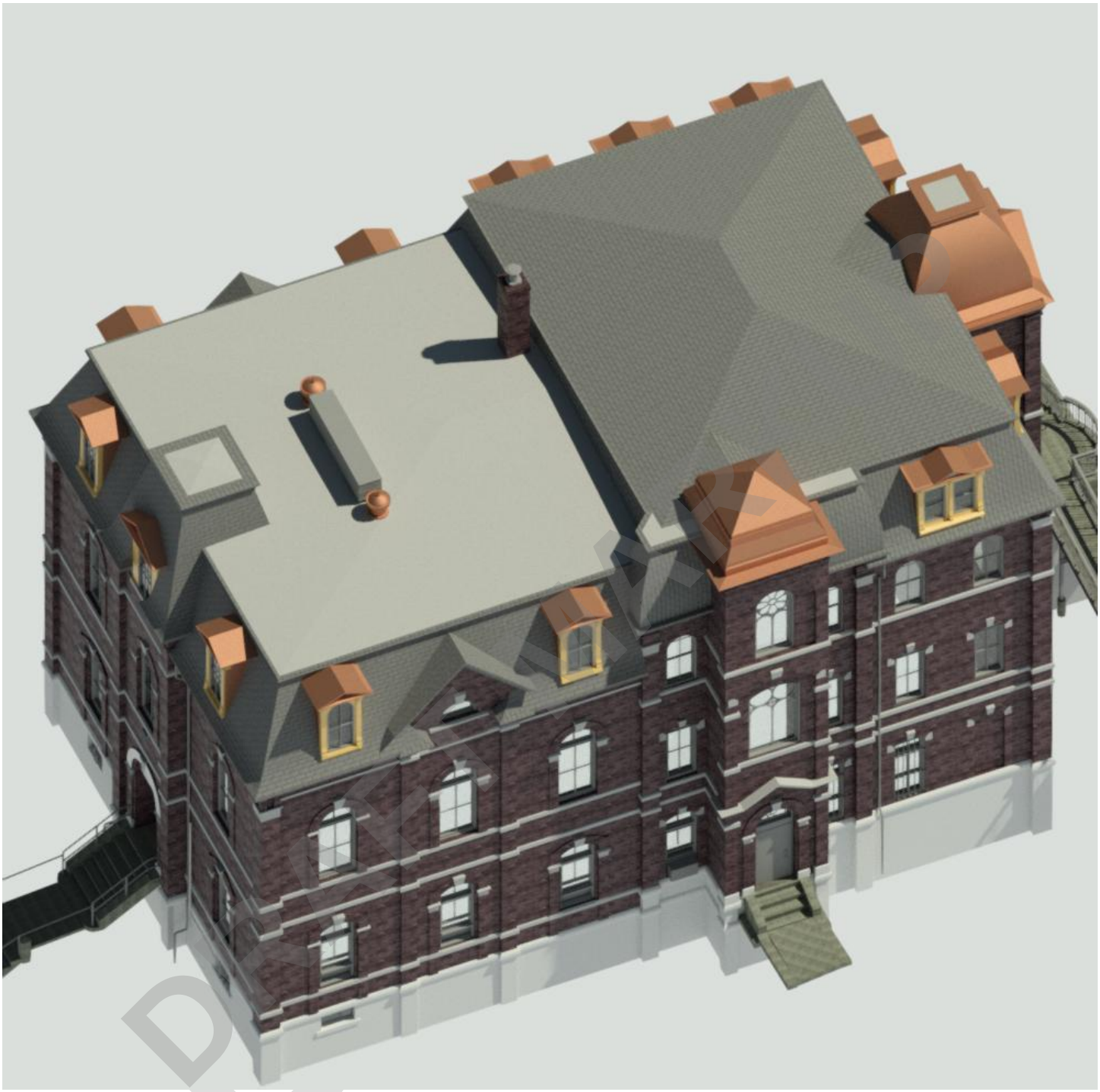
East Elevation

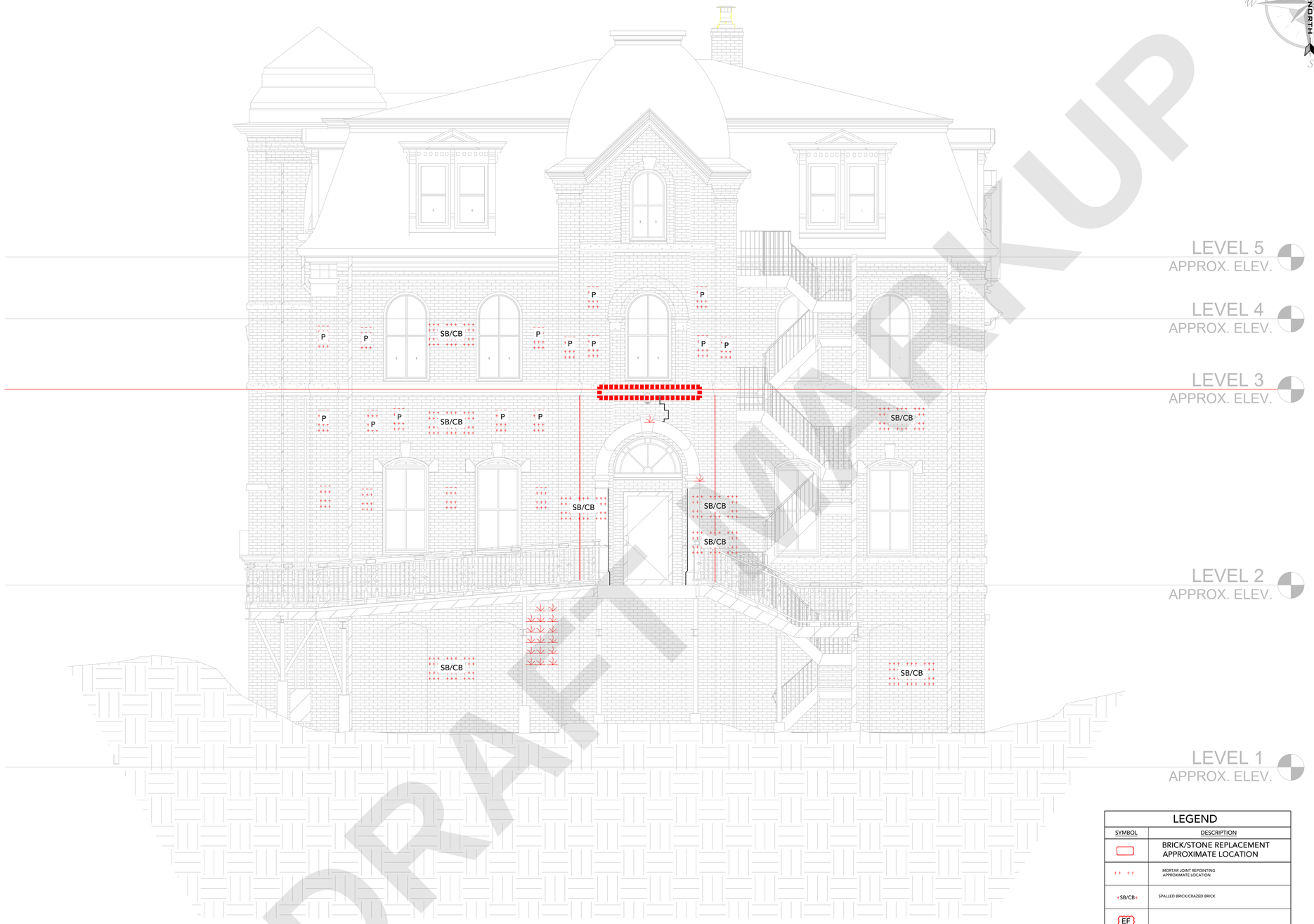
North Elevation



West Elevation

Roof





LEGEND	
SYMBOL	DESCRIPTION
	BRICK/STONE REPLACEMENT APPROXIMATE LOCATION
	MORTAR JOINT REPOINTING APPROXIMATE LOCATION
+SB/CB+	SPALLED BRICK/CRAZED BRICK
EF	
	ORGANIC GROWTH
	STEP CRACK/WIDE JOINTS

0 50 100 150 200 250 300 mm

Key Plan:

Notes:

Fishburn Sheridan Atlantic Inc.
48 Ogden Mill Road, Sackville, New Brunswick E4L 3H8
T: 506-651-9159 | www.fsaeng.com

REV #	DATE	DESCRIPTION
1	2022-09-23	FOR REVIEW

Client: TOWN OF LUNENBURG

Project: LUNENBURG TOWN HALL BUILDING CONDITION ASSESSMENT

Project #: CLIENT PROJECT # FSA Project #: 22057DA

Title:

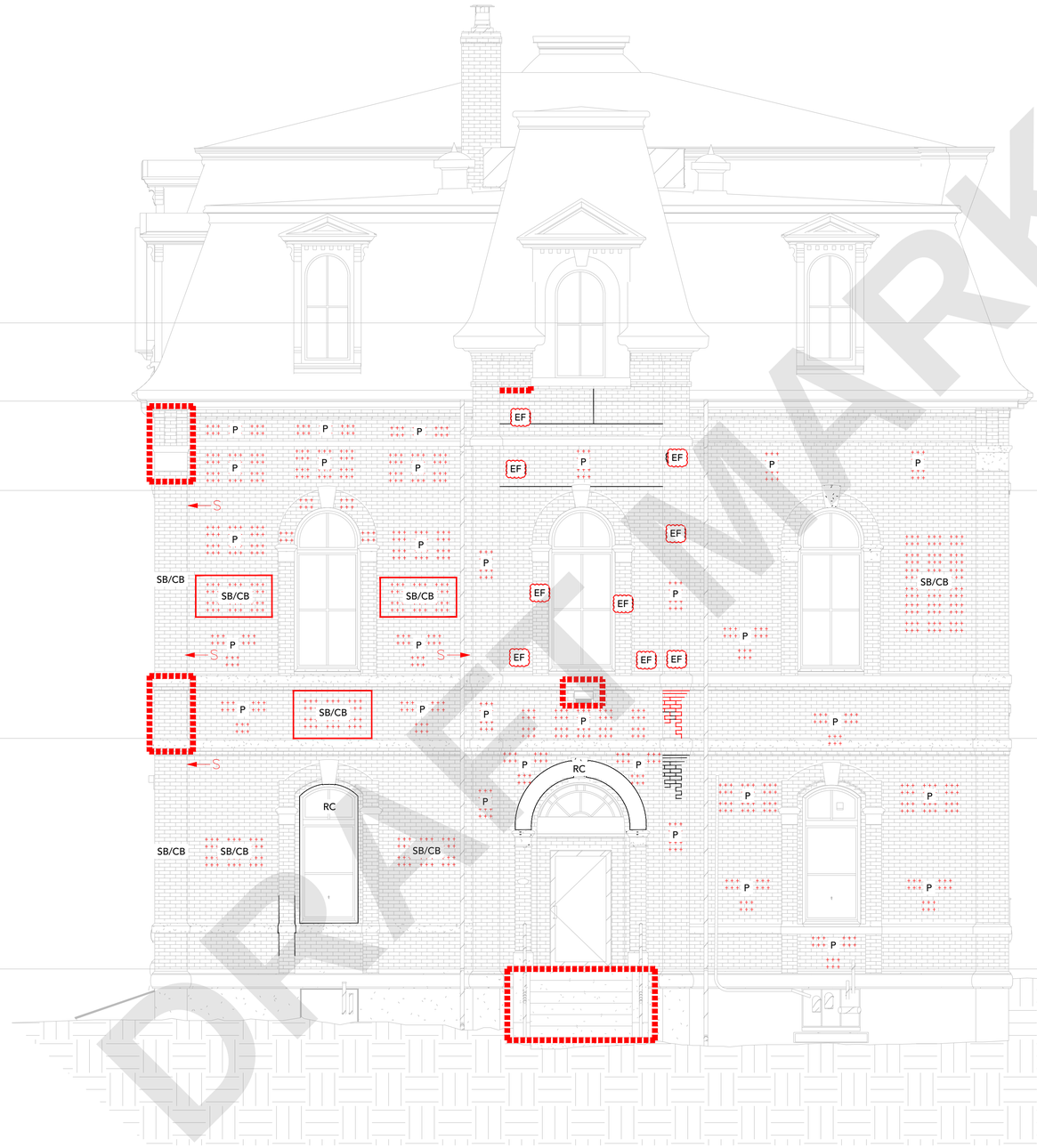
NORTH ELEVATION

Address of Project:
119 CUMBERLAND ST.
LUNENBURG, N.S.
B0J 2C0

Scale: (1:50)
Drw.: MN
Dgn.:
Chk.: RPB

Page Number: 2

Date: 2022-06-13 22057DA-MN.dwg



LEVEL 5
APPROX. ELEV.

LEVEL 4
APPROX. ELEV.

LEVEL 3
APPROX. ELEV.

LEVEL 2
APPROX. ELEV.

LEVEL 1
APPROX. ELEV.

LEGEND	
SYMBOL	DESCRIPTION
	BRICK/STONE REPLACEMENT APPROXIMATE LOCATION
	MORTAR JOINT DETERIORATION APPROXIMATE LOCATION
SB/CB	SPALLED BRICK/CRAZED BRICK
EF	EFLORESENCE
	ORGANIC GROWTH
	STEP CRACK/WIDE JOINTS

0 50 100 150 200 250 300 mm

Key Plan:

Notes:

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REV #	DATE	DESCRIPTION
1	2022-09-23	FOR REVIEW

Client: TOWN OF LUNENBURG

Project: LUNENBURG TOWN HALL BUILDING CONDITION ASSESSMENT

Project #: CLIENT PROJECT # FSA Project #: 22057DA

Title: SOUTH ELEVATION

Address of Project:
119 CUMBERLAND ST.
LUNENBURG, N.S.
B0J 2C0

Scale: (1:50)
Drw.: MN
Dgn.:
Chk.: RPB

Page Number: 3

Date: 2017-01-26 | 22057DA-MN.dwg

Key Plan:

Notes:

LEGEND

SYMBOL	DESCRIPTION
+ + + +	MORTAR JOINT DETERIORATION APPROXIMATE LOCATION
+SB/CB+	SPALLED BRICK/CRAZED BRICK
EF	EFLORESENCE
	ORGANIC GROWTH
	STEP CRACK/WIDE JOINTS

0 50 100 150 200 250 300 mm

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REV #	DATE	DESCRIPTION
1	2022-09-23	FOR REVIEW

Client: TOWN OF LUNENBURG

Project: LUNENBURG TOWN HALL BUILDING CONDITION ASSESSMENT

Project #: CLIENT PROJECT # FSA Project #: 22057DA

Title:

EAST ELEVATION

Address of Project:
119 CUMBERLAND ST.
LUNENBURG, N.S.
B0J 2C0

Scale: (1:50)
Drw.: MN
Dgn.:
Chk.: RPB

Page Number: 4

Date: 2017-01-26 22057DA-MN.dwg

LEGEND

SYMBOL	DESCRIPTION
++ ++	MORTAR JOINT REPOINTING APPROXIMATE LOCATION
+SB/CB+	SPALLED BRICK/CRAZED BRICK
EF	EFLORESENCE
(organic growth symbol)	ORGANIC GROWTH
(step crack symbol)	STEP CRACK/WIDE JOINTS

0 50 100 150 200 250 300 mm

Key Plan:

Notes:

Fishburn Sheridan Atlantic Inc.
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REV #	DATE	DESCRIPTION
1	2022-09-23	FOR REVIEW

Client: TOWN OF LUNENBURG

Project: LUNENBURG TOWN HALL BUILDING CONDITION ASSESSMENT

Project #: CLIENT PROJECT # FSA Project #: 22057DA

Title:

WEST ELEVATION

Address of Project:
119 CUMBERLAND ST.
LUNENBURG, N.S.
B0J 2C0

Scale: (1:50)
Drw.: MN
Dgn.:
Chk.: RPB

Page Number: 5

Date: 2017-01-26 22057DA-MN.dwg