2023-03-30

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HAVILAND CLUB ASSESSMENT

HSI Project No. 22359 **Revision 0**

Dear Greg,

Heritage Standing Inc. (HSI) was engaged by Greg Munn to conduct a conservation-based condition assessment of Haviland Club located on 2 Haviland St., PE. The building is undergoing a restoration and rehabilitation project and protecting the building's historic significance and architectural beauty is a priority.

This report will summarize the findings of the condition assessment and provide recommendations for long term planning and future projects.

Figure 1: Haviland Club

1. OBJECTIVE AND SCOPE

The project objectives were:

Objective 1. Preliminary structural condition assessment

The scope of services carried out for the preliminary condition assessment of Haviland Club were as follows:

1. Pre-Site Tasks
   a. Review background information from architect
2. Site Visit
   a. Visual inspection of structure and building envelope aspects that impact the structure
   b. Documentation of deficiencies and structural curiosities

    c. Borescope investigation on front foundation
3. Evaluation
    a. Holistic evaluation of information gathered on site to determine probable causes
    b. Evaluation of needs for further investigation where causes remain unclear
4. Letter Report

Not included in the scope was any detailed assessment (such as Non-Destructive Testing or specialized material testing) or any design of interventions.

All services completed by HSI were guided by the following charters, standards, and codes:

- ICOMOS Charter and the ISCARSAH Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage[1]
- Standards and Guidelines for the Conservation of Historic Places in Canada, 2nd Edition, Parks Canada[2]
- 2015 National Building Code, National Research Council Canada[3]

1.1 LIMITATIONS

Evaluations and recommendations concerning previous work are limited by the background information provided to HSI as well as by the extent of investigation and evaluation that is possible under the prescribed scope.

2. SITE BACKGROUND

It is important to understand the evolution of a building over time, as well as any interventions to the structure. Many historic buildings are adapted for new purposes over time, and sometimes this results in changes to the structure. In some instances past interventions to the structure or building envelope

[1] ICOMOS (the International Council on Monuments and Sites) is a non-governmental international organization dedicated to conservation, noted for advising UNESCO on World Heritage Sites. ISCARSAH (the International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage) was founded by ICOMOS in 1996 as a forum for engineers involved in the restoration and care of heritage buildings. The ISCARSAH Principles are a ratified international standard which outlines appropriate analysis and repair methods for heritage structures that respect their cultural context. They are available for free download at:
https://iscarsah.org/documents/

[2] Based upon international best practices and lessons but with a focus on Canada, this document was developed to aid all groups involved with Conservation projects, including owners, consultants, and contractors. They outline the conservation decision-making process and provide guidance for maintaining the authenticity of historic places in Canada. They are available for free download at: https://www.historicplaces.ca/en/pages/standards-normes.aspx

[3] The 2015 National Building Code of Canada has been adopted by PEI as the governing document for the construction industry. The document is predominately designed for new construction, although it applies to construction on existing buildings as well. The Code defines the objectives that must be met to ensure acceptable levels of safety and includes the most commonly referenced acceptable solutions.

can cause later problems, understanding what has changed helps bring clarity to what could be happening.

In addition, it is important to understand what gives the building its unique value. Canadian conservation practices define this unique value as the Heritage Value. Any work to be done on a building should carefully consider and prevent potential impacts to the building's Heritage Value. For recognized historic sites, the Heritage Value is communicated through its Character-Defining Elements, which are the physical aspects of a building or place that contribute to the Heritage Value. Character-Defining Elements should be preserved to protect the value of a historic site, and any impacts carefully considered.

2.1 Site History

Haviland House was built as a distinguished Italianate residence in the fashionable area of Dundas Esplanade from 1868 to 1869. It was probably constructed by the Lowe Company following designs by architect David Stirling.[4]

Figure 2: Historic Haviland Club, retrieved from: https://havilandclub.com/history/

The house was built for successful local businesswoman Esther Lowden after the death of her husband (George Fish Crow Lowden) in 1864, the birth of her third daughter three months after his death, and the loss of her home in the Great Halifax fire of 1866.[5] Esther lived in the house until her death in 1896, and since then Haviland House has housed tenants including the American consulate and a military club. It currently operates as the Haviland Club.[6]

2.2 Historic Site Designation

The City of Charlottetown formally recognized the building exterior and land parcel in 1979 because of the grand architecture and due to its association first with the Lowden family and then with the American Consulate. The designation does not include the interior of the building. The Heritage Value of the buildings comes from its association with the Lowden family and the American Consulate as well its grand Italianate architecture.[7]

[4] Lynne Thiele, 2020. *Esther of Farringford,* Over the Bridge Club.
[5] Lynne Thiele, 2020. *Esther of Farringford,* Over the Bridge Club.
[6] https://www.historicplaces.ca/en/rep-reg/place-lieu.aspx?id=2454, sourced 2022-12-05
[7] https://www.historicplaces.ca/en/rep-reg/place-lieu.aspx?id=2454, sourced 2022-12-05

Canada's historic places has identified the following Character-Defining Elements that contribute to the buildings Heritage Value:[8]

- the symmetrical façade with twin bay windows on the first floor
- the placement and style of other windows in the building, including: round-headed windows on the second floor, two over two windows with lunettes, a roundel window, and small horizontal "eyebrow" windows in the frieze
- the prominent porch doorway
- the style of the door with transom light above and sidelights
- the pitch of the roof, capped by a belvedere, with roof level pediments on the front and sides, and decorative brackets under the eaves
- the four chimneys - two on each side

2.3 Past Interventions

Limited records were available on the past interventions to the buildings. HSI was informed that the building's roofs were replaced approximately 3 years prior to our visit.

2.4 Past Reports

Background reports and information that document conditions, where and why previous changes occurred, or other details, can reveal inherent strengths and weaknesses of the site. This background is important context in understanding the history of a building, similar to how a doctor uses a case history to better understand a patient.

No past reports were available for this report.

2.5 Site Visits

HSI conducted one site visit with time spent on site over two days, as shown in Table 1.

Table 1: Site visit record

Date	Staff Present	Visit Focus
2022-11-28	T. Morrison (Principal) E. Meek (EIT)	Condition Assessment
2022-11-29	T. Morrison (Principal) E. Meek (EIT)	Condition Assessment

Investigations used during site visits included: Drone footage, photographic, textual, and video documentation.

[8] https://www.historicplaces.ca/en/rep-reg/place-lieu.aspx?id=2454, sourced 2022-12-05

2.6 Evaluation Measures

A general evaluation and documentation of building conditions was done through visual inspection. Conditions are described as good, fair, poor, or failed (Figure 3). Levels of priority for recommended actions are described as urgent, high, medium, and low (**Error! Reference source not found.**). Monitoring of conditions is essential to help address problems early so they can be more easily controlled at a lower cost.

Figure 3: Building conditions

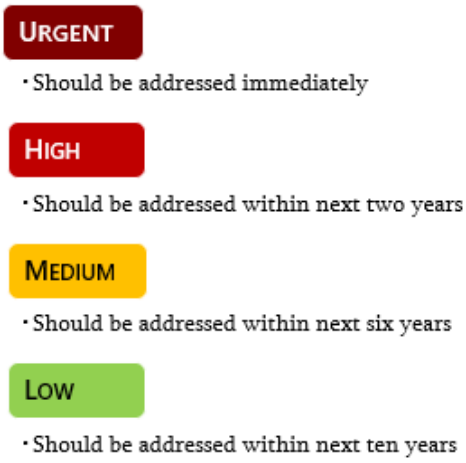

Figure 4: Building priorities

3. Observations and Evaluation

The building is oriented west-east with its west face fronting Haviland Street and its east facing Union Street (Figure 5, Figure 6, Figure 7, Figure 8, Figure 9). Building directions will be referenced according to those provided in Figure 5 for this report.

Observations have been broken down and provided based upon major structural groups: building site, exterior, roof and associated features, interior, and foundation/basement. Please note that all observations listed in this report were documented at the time of the site visits on 2022-11-28 and 2022-11-29; HSI understands that conditions may change at any time after the site visits were conducted.

Figure 5: Building orientation, taken from Google Maps

Figure 6: West facade

Figure 7: North facade

Figure 8: East facade

Figure 9: South facade

3.1 Building Site

HSI found that the building site was in **good** condition overall with some minor deficiencies:

A. The ground had a minor slope towards the building on a portion of the east façade (Figure 10). The landscaping was also growing directly adjacent to the building here.

B. The ground beneath the downspout on the south façade was directing water towards the building (Figure 11).

C. The front façade window wells were too close to the ground and surrounding landscaping, making them vulnerable to moisture infiltration (Figure 12).

D. The paved walkway to the front entrance of the building was uneven (Figure 13).

Figure 10: Ground immediately adjacent does not slope away from building

Figure 11: Ground underneath downspout sunk around building

Figure 12: Window wells set too close to ground

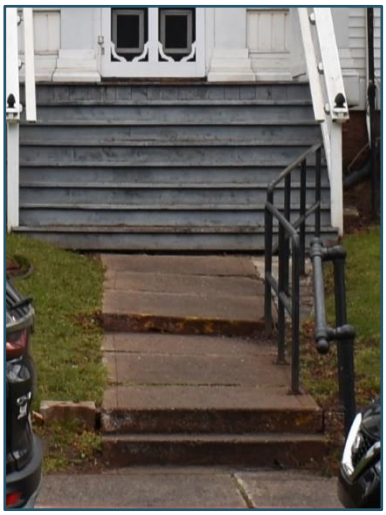

Figure 13: Uneven walkway

3.2 EXTERIOR WALLS

HSI found that the building exterior was in **good** condition overall with some minor deficiencies:

A. The vinyl siding typically had poor details around joints and junctions; openings to the building envelope were common (Figure 14 and Figure 15).

B. The exterior wood elements typically were coated in multiple layers of paint (Figure 16).

C. Paint was typically crazing, cracking and failing on the wooden elements (Figure 17 and Figure 18). This is likely related to moisture being trapped in the wood by the paint.

D. The roof above the main entrance was directing moisture towards the siding and was causing moisture staining (Figure 19).

E. The wooden windows were typically deteriorating. particularly between at the base of the frame and in the sashes (Figure 20 and Figure 21).

F. The ramp railing on the north side of the building was trapping debris against the siding (Figure 22).

G. The siding at the southwest corner had surface staining (Figure 23).

H. A small portion of vinyl siding was opened on the east wall of the building to investigate wall conditions underneath. The vinyl siding appeared to have been installed on top of wood clapboard siding. The wood clapboard siding was found to be extensively damaged (Figure 24).

Figure 14: Opening in junction between siding

Figure 15: Worn joint between siding and wooden windowsill

Figure 16: Paint buildup

Figure 17: Crazing paint

Figure 18: Failed paint at the decorative brackets

Figure 19: Siding staining

Figure 20: Deterioration of wooden window frame

Figure 21: Deteriorating window sash

Figure 22: Ramp railing trapped debris towards the building

Figure 23: Surface staining at southwest corner

Figure 24: Damaged clapboard siding covered by vinyl siding, photo provided by Greg Munn on 2022-12-20

3.3 Roof Structure and Associated Features

The roof structure and associated features comprises of the different roofs of the building, the chimneys, the attic structure, and the belvedere. HSI found the roof structure and associated features to be in **fair** condition. However, structural members in the attic were **failing/had failed** and will require urgent action to stabilize. Interpretation of the findings in the attic will be discussed in greater detail in the discussion section of this report. Documented deficiencies and observations included the following:

A. The ceiling boards in the belvedere were uneven (Figure 25). One of the boards was broken (Figure 26).

B. The belvedere windows had significant condensation (Figure 27). Moisture appeared to be infiltrating and was causing movement in the walls and ceiling boards.

C. Paint was typically failing on the exterior of the belvedere (Figure 28).

D. The roof underneath the belvedere had varying slopes (Figure 29). The north and south slopes were under 1 degree which is typically seen as insufficient slope for drainage. It is suspected that moisture is not being adequately drained from the roof.

E. The chimneys did not appear to be capped based upon initial drone investigation; discussions with the project architecture indicated that the chimneys are still in use, but this was not confirmed. The brick did not appear historic suggesting that the chimneys were rebuilt in recent years. The parging on top of the chimneys had failed and pieces were falling onto the roof below (Figure 30). The upper portion of the chimney brick masonry has deteriorated.

Figure 25: Uneven ceiling boards in belvedere

Figure 26: Broken ceiling board

Figure 27: Condensation on windows and high moisture content in walls

Figure 28: Failing paint

Figure 29: Low-sloped roof

Figure 30: Failed parge

F. The chimney masonry was in fair to poor condition where it could be viewed in the attic (Figure 31). Deterioration of various joints and potential incompatible past repairs was typical.

G. The roof framing members had minor moisture staining (Figure 32).

H. Three support posts were installed recently (Figure 33). The reason for their installation is unknown. They do not appear to transfer any load to the load bearing walls on the floor beneath.

I. Several structural wood members in the attic were significantly damaged. A major beam running parallel to the entrance into the belvedere had failed and requires urgent action (Figure 34). A major beam running perpendicular to the entrance into the belvedere was failing in torsion (Figure 35). Eight of the posts were splitting and the majority of these were the historic posts (Figure 36). Visual inspection looked for patterns to better understand the damages. Damages that occurred in the past will typically darken with age, so the colour of the openings in a wood member is an initial indication of when the problem may have occurred. Of the significantly damaged members, the cracking revealed bright new wood, which suggests there was recent change to the structure.

J. The cellulose insulation seen in the attic, located above the second storey ceiling, appeared to have settled (Figure 37).

K. The lower roof above the southmost bay window on the west façade has had a history of moisture issues (Figure 38). Upon visual inspection, the roof did not have an adequate slope to divert moisture away from the building (Figure 39). It is further suspected that there are open/worn joints between the roof and vinyl siding where moisture is infiltrating into the building.

Figure 31: Chimney brick from attic

Figure 32: Moisture staining

Figure 33: New support post

Figure 34: Failed beam

Figure 35: Failing beam

Figure 36: Splitting post

Figure 37: Settled insulation

Figure 38: Lower roof on southmost bay window circled in red, viewed from Haviland St.

Figure 39: Moisture accumulation on lower roof

3.4 Building Interior

The building interior comprises of the interior walls, ceilings, and floors. HSI found the building interior to be in **good** condition overall with some minor deficiencies:

First Floor

The following observations were made on the first (main) floor:

A. Two windows in the vestibule had an open joint in the framing around the arch (Figure 40).

B. Plaster cracking was typical throughout the first-floor walls and ceilings (Figure 41, Figure 42, and Figure 43). Vulnerable areas like doorway openings typically had diagonal plaster cracking (Figure 44).

C. The interior window paint was typically failing (Figure 45).

D. One of glass screens in the sitting room bay windows was not properly installed (Figure 46).

E. The portion of ceiling underneath the lower roof was damaged from moisture accumulation. The decorative cornices had been rebuilt in recent years (Figure 47 and Figure 48).

F. Windows were typically poorly sealed from the interior (Figure 49).

G. A corner cornice detail in the main room was cracked (Figure 50).

H. There was a large gap at the joint between the westmost mantel and the wall in the main room (Figure 51).

Figure 40: Horizontal cracking in window frame at vestibule

Figure 41: Plaster crack in main room

Figure 42: Plaster crack in main room

Figure 43: Plaster cracking underneath main staircase

Figure 44: Diagonal crack at doorway to sitting room

Figure 45: Failing window paint

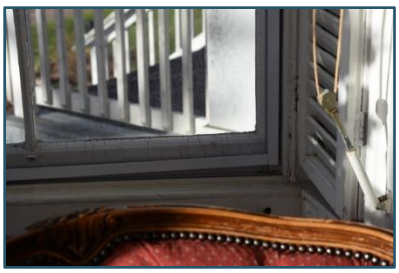

Figure 46: Glass window screen improperly installed

Figure 47: Damaged and repaired cornices

Figure 48: Change in detail where cornice was damaged

Figure 49: Poor seal around window in sitting room

Figure 50: Crack in corner cornice detail

Figure 51 Gap between chimney mantel and wall

Second Floor

The following observations were made on the second floor.

I. The plaster in the staircase up to the second floor was cracked (Figure 52).

J. The paint on the window shutters in the Esther Full Lowden room had failed (Figure 53) and the front façade window frame was cracking around the rounded arch (Figure 54). There was an opening into the wall that corresponded to the area with a history of moisture damage (Figure 55). There was evidence of moisture in the opening.

K. In the sitting room on the northern end of the second floor, the front façade windows were cracking (Figure 56). The paint had failed on a portion of the ceiling above the windows (Figure 57).

L. A piece of the wooden window frame in the dressing room was detached (Figure 58).

M. The floor in the Captain Nicola Goddard room was not level throughout the room. A small part of the floor towards the fireplace was broken (Figure 59). The frame around the northmost window was not flush to the window unit in some places, causing openings that encourage air infiltration (Figure 60).

N. Both bathrooms on the second floor had poor seals at joints between the walls and ceilings as well as the walls and the baseboards (Figure 61).

O. A small portion of wood panelling pieces in the president meeting room were becoming detached (Figure 62).

P. The storage area south of the attic stairs had a large horizontal crack in the ceiling that spanned the entire length (Figure 63). There was some staining that indicated moisture was entering through the crack (Figure 64). The window paint on the window was failing (Figure 65).

Q. Plaster cracking was typical throughout the second floor and varied in age and severity (Figure 66, Figure 67, Figure 68, Figure 69, Figure 70, Figure 71, and Figure 72). Some of the plaster cracking towards the small storage area south of the bathrooms looked recent, while other areas like the cracking in the Esther Full Lowden room appeared older as it was painted over.

R. The walls typically tilted 1.2 degrees inwards. The tilt carried down to the first floor.

Figure 52: Plaster cracking in staircase

Figure 53: Failing paint on window shutters

Figure 54: Opening into wall

Figure 55: Cracking in window framing

Figure 56: Cracking in window framing

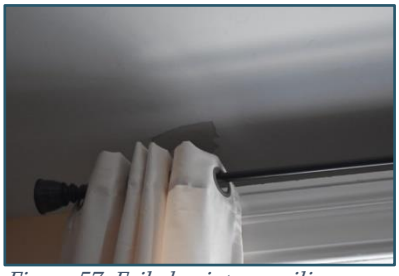

Figure 57: Failed paint on ceiling

Figure 58: Detached framing piece

Figure 59: Broken floor

Figure 60: Poor seal

Figure 61: Poor seals at joint between walls and ceiling in bathrooms

Figure 62: Wood panelling becoming detached

Figure 63: Horizontal crack in ceiling

Figure 64: Staining around crack in ceiling

Figure 65: Paint failing around window

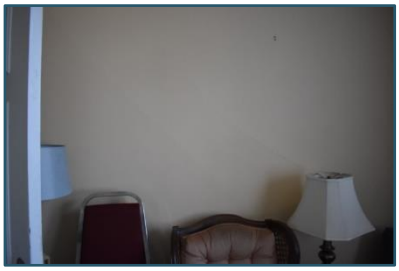

Figure 66: Cracking in northwest room

Figure 67: Plaster cracking in Club Manager's Office

Figure 68: Plaster cracking in dressing room

Figure 69: Plaster cracking in dressing room

Figure 70: Plaster cracking in Captain's room

Figure 71: Plaster cracking at storage area south of bathrooms

Figure 72: Horizontal cracking in hallway

3.5 FOUNDATION/BASEMENT

HSI found the foundation to be in **fair** condition, and the more severe deterioration was concentrated to specific areas. Documented deficiencies and general observations made on site were as follows:

Exterior

A. The foundation was composed of brick and stone masonry. The foundation from the exterior was painted red with what appeared to be latex paint. The paint was failing throughout the foundation (Figure 73).

B. About 10% of the foundation joints were open or washed out, but this was difficult to confirm due to the paint (Figure 74 and Figure 75).

C. Deterioration of the lower courses of brick and stone was common. The condition was the worst on the east and south facades (Figure 76 and Figure 77).

D. Different types of bricks and mortar had been used for repairs in the past (Figure 78). It was difficult to determine the extent of past repairs due to the painted foundation.

E. The northeast and southeast corners had large vertical cracks that traveled through brick and mortar (Figure 79, Figure 80, Figure 81, and Figure 82).

F. Repair mortar on the east façade was applied very thick (Figure 83).

G. The glass in a window well on the north foundation was broken (Figure 84).

Figure 73: Failed paint

Figure 74: Open joints in brick at base of wall on south facade

Figure 75: Open joints in masonry on front facade

Figure 76: Deteriorating stone on east facade

Figure 77: Deteriorating stone on south facade

Figure 78: Repair brick and mortar visible

Figure 79: Cracking in east foundation

Figure 80: Cracking in foundation at southeast corner

Figure 81: Cracking in foundation on south facade

Figure 82: Cracking in foundation at southwest corner

Figure 83: Thick joints in repair mortar

Figure 84: Broken window well

Interior

H. The moisture levels in the areas surrounding the front façade window wells were high (Figure 85).

I. A portion of wall was opened on the front façade (Figure 86). The opening showed stone and brick masonry that had been painted over and had concrete underpinning (Figure 87). The concrete underpinning would not be original. The foundation showed symptoms of high moisture in the past.

J. There was an opening in the wall in the large room towards the south façade (Figure 88 and Figure 89).

K. A portion of the foundation in the storage room towards the north façade was newly poured concrete (Figure 90). Building managers explained this was originally intended to be a separate entrance into the basement from the exterior. Another portion of foundation in this room was painted brick and stone (Figure 91). The masonry appeared to have had a lime wash applied in the past that was since painted over. The masonry had evidence of moisture accumulation and it is suspected that the paint is trapping moisture against the foundation (Figure 92). Some of the ceiling framing had moisture staining (Figure 93).

L. The ceiling tiles were deflecting (Figure 94). A portion of the ceiling framing was revealed towards the front façade (Figure 95).

M. The foundation towards the east façade did not appear to have any underpinning. The ground appeared to be lowered and a concrete slab was poured (Figure 96 and Figure 97).

N. The brick and stone masonry in the eastern foundation was in fair to poor condition (Figure 98). About 10% of the brickwork had deteriorated, with crumbling bricks and open mortar joints being common conditions (Figure 99). There was evidence of rising damp in the masonry, likely due to the concrete slab that absorbs moisture and transfers it up through the surrounding masonry.

O. Stone was deteriorating around a utility opening in the eastern foundation (Figure 100).

P. A pipe was leaking onto the concrete slab below in the eastern foundation (Figure 101). Areas surrounding the pipe had high moisture content.

Q. The eastern foundation masonry appeared to have had a lime wash applied in the past and had since been painted over (Figure 102). The paint likely was trapping moisture in the wall.

R. Repair mortar in the eastern foundation had been applied in some locations but did not appear to be properly bonded to the masonry. A piece of mortar was easily removed, and it revealed sound historic mortar underneath (Figure 103).

S. Mortar was typically failing in the eastern foundation (Figure 104).

T. The foundation at the southeast corner had parging applied overtop of the masonry (Figure 105).

Figure 85: High moisture content around front facade window wells

Figure 86: Revealed foundation at front facade

Figure 87: Concrete underpinning on front facade foundation

Figure 88: Opening in wall in large southern room

Figure 89: Opening in wall in large southern room

Figure 90: New concrete foundation

Figure 91: Painted masonry foundation

Figure 92: Failing paint from high moisture content in walls

Figure 93: Moisture staining in ceiling framing

Figure 94: Deflecting ceiling tiles

Figure 95: Revealed ceiling framing

Figure 96: Poured concrete slab

Figure 97: Framing shows where ground was before being lowered

Figure 98: Damaged foundation masonry

Figure 99: Deteriorated brick

Figure 100: Masonry damaged around utility opening

Figure 101: Moisture around leaking pipe

Figure 102: Failing paint on masonry

Figure 103: Mortar removed to reveal strong historic mortar underneath

Figure 104: Failing mortar

Figure 105: Parging over masonry

4. Discussion

4.1 Roof Structure & Belvedere

During the condition assessment, HSI found that two major members in the attic had failed/were failing, and seven to eight of the posts were splitting. The cracking revealed brighter wood underneath that suggests the failure had occurred recently as the exposed wood had not yet darkened with age. The question was raised regarding if cracking was related to tropical storm Hurricane Fiona that brought gale force winds to Charlottetown in September of 2022. Building Managers indicated that Haviland Street was hit particularly bad by the storm, with little protection from the extreme winds. According to a report by the Weather Network, the winds brought by the hurricane reached as high as 135 km/hr.[9] This could have resulted in approximately 40% higher wind loads than the current 1/50-year wind levels the National Building Code requires new construction designs to resist.

Following the site visit further review was undertaken, and results support the initial opinion that Hurricane Fiona was the likely cause of the beam damages. While one of the beams has a more visually significant failure, both urgently require repair. The damage in this region of the attic appears related to an uplift gust.

Other damage patterns are more complex and will require further evaluation outside of this report scope to provide conclusive findings. Because of the damage caused by Hurricane Fiona and the building construction type, it is presumed that other recent damage is also related to the storm. Based upon the preliminary information collected, it appears possible that the belvedere has dropped. The roof immediately neighboring the belvedere was recorded as having less than 1 degree slope. This creates a location where moisture is unable to drain adequately and pooling of water will increase loads around the belvedere, contributing to worsening conditions in the roof structure.

The damages to the interior posts, and the fact that three of the posts are not original and could be impacting the load paths, will require some intervention. This needs to align with both lower floor structural layouts as well as plans for the future use of the building.

Intervention into the attic is required and must be completed. HSI recommends that immediate work is done in the coming weeks, for which HSI has already provided some concepts. This should be followed by larger interventions in the coming months. Further evaluation will allow designs to be tailored to the unique nature of space and minimized in the extent of construction work required. While the problems are serious, the available space will provide greater flexibility. For the best results the larger structural intervention should be designed with an understanding of the future use plans.

[9] Data retrieved 2022-12-21 from https://www.theweathernetwork.com/ca/monthly/prince-edward-island/charlottetown?year=2022&month=9&dispt=calendar-container-monthly

The roofs over the bay windows on the front façade do not have adequate slope on the flat portion to drain water (Figure 106, Figure 107, and Figure 108). This would have contributed to the past damage as it creates a more vulnerable design detail. This slope should be increased in the future to achieved better drainage without impacting the visual aesthetic of the building.

Figure 106: Roof over southmost bay window on front facade

Figure 107: Roof over northmost bay window on front facade

Figure 108: Roof staining indicating an area prone to water accumulation

4.2 Borescope Investigation

Two openings were created in the eastern foundation to investigate the wall contents with a borescope. The first opening was in the center wall in the eastern foundation (Figure 109). A 250mm deep hole was drilled into a joint underneath a course of pinning stones about 1m above the concrete floor slab. The drilling was generally soft. Borescope investigation found:

- The hole was initially solid with no apparent openings or voids.
- There was a small void about 17 mm into the hole.
- The hole had no openings or voids for the next 118mm.
- There was a larger void 135 mm into the hole.
- The mortar about 200 mm into the hole was a different, stiffer type.
- Little dust came out of the hole when drilling which suggests there are more significant voids in the wall.

A second hole was drilled in the southeast foundation about 1.2-1.3 m from the floor (Figure 110). The drill was inserted into the parging. The drilling varied from soft to hard. Borescope investigation found:

- The parge was very hard to drill through. It is suspected initial drilling was through brick.
- There was a larger void about 100 mm into the hole.
- Afterwards the drilling became softer with no significant voids encountered, and the hole was solid older mortar.
- A lot of dust came out of the hole while drilling which suggests there are less voids in the wall here.

Figure 109: Borescope opening 1

Figure 110: Borescope opening 2

Findings of the borescope investigation indicated that in areas with greater deterioration of the masonry it should be assumed that there are greater wall voids. The worst of these appeared in areas that past interventions did not use compatible materials or techniques, such as around the hard concrete parge.

Based upon the borescope investigation and the visual assessment, there will be a need for future masonry work, including some grouting of the wall core; this is not an immediate priority, but will need to be taken into account in future planning.

4.3 Wall Siding

Based upon the visual inspection, the current vinyl siding was installed over existing damaged wood clapboard, with a thin layer of insulation added in between (Figure 111). The vinyl siding has been detailed to try to preserve the character and unique architectural features of the building.

Figure 111: Wood siding under vinyl, photo provided by Greg Munn 2022-12-21

While it appears that the vinyl siding has provided a weather resistant barrier to the building envelope since it was installed, our concerns are that there are a number of vulnerabilities in its design and installation that may become sources of damage in the future. The detailing of the siding requires many joints and junctions that create weak points, as the vinyl becomes more brittle overtime from the UV exposure. The application of vinyl siding for a historic building like Haviland Club is typically discouraged as it changes the traditional moisture mitigation details and is more likely to rely on products like silicone caulking, which have limited lifespans.

Vulnerabilities in the existing building envelope can cause significant structural impacts that will need further architectural consideration when making any changes to the building. HSI recommends returning to wood siding to improve the building envelope's ability to manage and divert moisture and to avoid further damages to the structure. This would also benefit the building's authenticity and public perception as it would return to its historic appearance. The first steps could be removal of larger siding areas to better understand the state of the existing clapboard, and the extent of work that would be required. Depending upon the scope of repairs, some consideration could be given regarding how to improve the performance of the envelope to lower operational carbon costs while limiting the use of new materials.

4.3.1 Painting Exterior Wood Elements

If Haviland Club proceeds with restoring the wood siding on the building, HSI recommends using a traditional linseed oil paint. A linseed oil would also be appropriate for any exterior wooden architectural elements.

Wood is an organic material that will naturally absorb and release moisture. Modern latex paints are sealing and will often trap moisture against the wood elements. In new construction, measures are taken to control any moisture entering the wall assembly, but with historic buildings the philosophy tends to emphasize control of moisture as opposed to complete removal, and design details typically allow some moisture to move into the wood frame. Because of the seal created by a latex paint, the wood cannot easily release any of the moisture it absorbs, and issues like premature paint failure and deterioration of the wood may present themselves. The issue can be worsened if there are multiple layers of latex paint that have been applied overtime.

Providing a compatible paint is an important step in prolonging the life of exterior wood elements. A type of paint that has shown to be effective with wood elements historically is a traditional linseed oil paint (note there are also linseed oil paints that are not traditional and have more harmful chemicals). This is a natural paint finish that ensures drying of the wood elements. A regular exterior linseed oil paint should be used on most of the exterior walls. Two sources for traditional linseed oil paints in Canada are Broun's and Company[10] and Sage Restoration.[11] While good on exterior walls, the paint will stain more quickly and is less suited to horizontal surfaces.

4.4 Surrounding Site Considerations

The potential for an addition to the north side of Haviland Club was discussed on site. In consideration of the building's Heritage Value, Character-Defining Elements, and the surrounding site, it appears that this could be done in a sympathetic manner. The architect will aid in the design to ensure that the

[10] https://linseedpaint.com/, retrieved 2022-12-13
[11] https://sagerestoration.com/, retrieved 2022-12-13

addition is distinct from and compatible with the historic building in order to minimize any significant visual impact on the site.

4.5 Global Movements

Visual inspection of the building found evidence of some global structural movements. While, with the exception of the attic and roof structure, it was not possible to gauge when movements occurred, there were no indications that they were recent. A brief consideration to cracking, and movement in floors and walls is provided here.

The cracking throughout the building was relatively minimal. The most pronounced cracking was that seen in the ceiling of the central southern room on the second floor. This location corresponds to one of the newer columns supporting the roof structure in the attic above and appears linked to movements and failures to that structure. Other locations, such as walls near doorways, and in the ceiling of the large northern room on the first floor, appeared to be old cracks and it is assumed that these locations that have not yet been repaired. Based upon this assumption these cracks appear to be stable and are not a major cause for concern.

The floor levels in some areas, particularly the Captain's room on the second floor, suggest movement over time. Based upon the understanding that they have not changed, they are within acceptable tolerances for structural stability, and not seen as a structural problem. However, their potential to pose accessibility challenges was not assessed. Monitoring in some form should continue.

The slight out of plumb of multiple walls was presumed to be stable and are within acceptable structural tolerances. Monitoring should continue, and the situation must be reassessed if the wall plumbs are changing.

4.6 Moisture Levels

Most common forms of deterioration in historic buildings like Haviland Club are related to moisture. While not always a primary cause, it is often a contributing factor. Moisture levels in Haviland Club were acceptable when on site, although slightly high in the basement and there was evidence of past high moisture in the attic.

Basements tend to have higher moisture than other spaces in a building. There is typically insufficient air movement, and the moisture in the surrounding soils can often enter through the foundation walls. Controlling moisture around the foundations will have significant impacts on the basement moisture levels. Other measures such as maintaining adequate site grading, functioning gutter systems, and an effective envelope (wood and masonry) will help manage moisture. Once those are in place the following additional considerations are suggested:

- Determine if the basement is to be occupied or will remain as storage space. This may change decisions on details and indoor environment requirements.
- Improve air flow through the basement. This can be done passively in some instances, or use of a heat exchange recovery ventilator.
- Avoid use of dehumidifiers as primary means of moisture control. Where the basement foundation walls are historic unreinforced masonry, they are more porous than contemporary concrete. Dehumidifiers dry the air to a level that encourages moisture to be drawn in through the masonry foundation walls creating potential moisture problems in masonry and structure. This can be mitigated through use of air flow and exchange instead of forced dehumidification.
- Avoid use of materials that are vulnerable to damage from moisture. This includes avoiding insulation or finishes that are not moisture resistant.
- If any exterior excavation is done, consider adding additional design to control moisture access. Waterproof membranes should be avoided, as they trap moisture, however other systems can be designed to control and keep water away from the walls.

The water staining of timbers in the attic is indicative of past high moisture. However, as it appeared that leaking had stopped and good ventilation was being maintained, the staining was cosmetic only. Moisture levels should continue to be monitored, and further evaluation is possible with deep probing for wood moisture.

4.7 Past Repairs

Limited information was available on what past repairs had been undertaken and at what point in the building's life, as well as their purpose. Background information on interventions facilitates HSI's understanding on changes made to the building and can improve our ability to diagnose conditions and provide recommendations that bring the most value to the building.

Visual inspection found some incompatibilities in past repairs, both in systems and in materials. The following are a few items to consider:

- Masonry repairs must be done with compatible mortars, masonry units, and techniques. Some past repairs used harder mortars or incompatible bricks that have caused failure in the areas surrounding them. These types of incompatibilities can result in damages that require more costly and substantial repairs than if the masonry was regularly maintained. These issues were not extensive at Haviland Club, however, future repairs must ensure compatibility to avoid problems. This will require testing and design.
- Some of the newer posts added in the attic create more complex load paths and are stiffer than the existing flexible system. The incompatibility impacts the structural dynamic of the building and is causing damage at the second floor.

- The paint applied over the limewash in the basement masonry is incompatible with the existing system. It has been causing the lower layers of limewash and the coating to fail and inhibits the lime's ability to wick away moisture.
- The paint over the brick masonry is incompatible, trapping moisture and shorting the life of the bricks and the mortar joints.
- The previously mentioned vinyl siding.
- The previously mentioned additional attic posts.

4.7.1 Foundation Paint

The foundation at Haviland Club is painted on the exterior (Figure 112), and in some locations on the interior (Figure 113). Similar to wood, masonry performs the best when it is able to absorb and release moisture; but the types of coatings suggested for masonry are different than wood. Most contemporary sealing latex paints can weaken masonry's ability to release moisture and will trap moisture against the masonry. This can cause failure. Restoration plans should include removing the paint from the foundation, as this can facilitate long term maintenance of the building.

For interior foundation walls a traditional approach is to use a hot lime wash. This lime wash, also referred to as white washing, provides a white coating that will help brighten the wall and water absorption properties that help control moisture in the wall. Done properly it should be relatively stable and should not flake off. Loss will occur in high moisture areas, but reapplication can be easily done.

For exterior foundation walls limewash is occasionally done but has a much shorter life span than interior application. Typically, the exterior masonry is left exposed, but if coatings are required use of either a coating designed for historic brick masonry, or mineral paints are initial considerations. Selection of the coating should be done by a professional.

Figure 112: Incompatible paint on brick

Figure 113: Incompatible paint on interior foundation masonry

4.8 Minor Damages

Most minor damages can be addressed on a case by case basis. Those not elaborated upon in the discussion should not require special considerations. But these deficiencies should be addressed, as some are able to gradually worsen to the point more intensive interventions are necessary.

5. RECOMMENDATIONS

The following summary outlines what interventions should be undertaken for each area of the building. Each intervention has been identified as either urgent, high, medium, or low. Additionally, discussed are approaches to be avoided. Based upon the findings of the Condition Assessment, HSI recommends the following:

5.1 URGENT PRIORITY RECOMMENDATIONS

Recommendation 1. URGENT Temporarily stabilize the beams and posts in attic as instructed by an Engineer[12].

5.2 HIGH PRIORITY RECOMMENDATIONS

Recommendation 2. HIGH Evaluate roof structure and design long term repair strategies that complement future use plans for the space. Solutions should maintain the existing structural dynamic and remove incompatible new posts.

Recommendation 3. HIGH Adjust the low slopes of the roofs to adequately deflection moisture. This will require design by an architect or engineer.

Recommendation 4. HIGH Monitor the building with regular inspections. Specific items to monitor should include:

- Any changes in the cracks in the foundation.
- Ceiling cracking in room south of attic stairs for any changes.
- Cracking in plaster for any changes. Document any new cracks. Plan for future repairs to the plaster.
- Moisture levels in the attic for any changes.

5.3 MEDIUM PRIORITY RECOMMENDATIONS

Recommendation 5. MEDIUM Establish ground slope away from building on east façade and portions of south façade. This is a simple and effective means to control moisture ingress.

Recommendation 6. MEDIUM Undertake repairs to foundation masonry. When undertaking repairs, remove incompatible paint to prevent moisture from being trapped against the masonry. Ensure repair mortar, brick, and stone are compatible to the existing system to prevent further issues from developing.

Recommendation 7. MEDIUM Lower ground around window wells to prevent moisture infiltration and lower moisture levels from the basement interior.

[12] The initial work for stabilization has been undertaken since this report was drafted. A summary of what was done and how was provided in a 2023-01-30 Memo from HSI to Greg Munn.

Recommendation 8. MEDIUM Maintain the deck additions so that they do not create locations where moisture is held against the building. That includes ensuring good airflow below the decks, not piling snow against wood elements, and ensuring no debris is trapped between decks and the structure.

Recommendation 9. MEDIUM Maintain landscaping away from building as there are multiple ways the plants can contribute to local high moisture levels.

Recommendation 10. MEDIUM Seal open joints and junctions from the exterior and interior to prevent moisture from entering the building envelope.

Recommendation 11. MEDIUM Improve air flow in the basement to control moisture levels.

Recommendation 12. MEDIUM Remove existing parge on top of the chimney and replace with a solution that deflects moisture away from the brick.

5.4 Low Priority Recommendations

Recommendation 13. LOW Improve seals at windows from interior and exterior to prevent air infiltration.

Recommendation 14. LOW Establish future use plans for basement to guide design decisions and determine indoor environment requirements.

Recommendation 15. LOW Replace broken wood ceiling board in the belvedere.

Recommendation 16. LOW Seal windows in the belvedere to prevent moisture infiltration and reduce condensation. Plan for complete restoration of windows in the future.

Recommendation 17. LOW Clean siding of staining.

Recommendation 18. LOW The front walkway is not level and could be improved for greater user comfort.

Recommendation 19. LOW Undertake paint repairs with a compatible wood paint.

Recommendation 20. LOW Restore historic wood clapboard siding to improve moisture management of the building envelope and the building's heritage character. Siding should be painted with a compatible wood paint.

Recommendation 21. LOW Undertake window restoration of wooden windows. Many of the seals have worn in the historic windows. To improve thermal performance of the building in the long term, the wood windows should be repaired and restored. An alternative to this approach would be installing storm windows (either interior or exterior) that improve thermal performance while maintaining the historic windows.

6. Conclusions

Haviland Club has unique character and charm that could not be matched by any new construction. With its long-standing history in Charlottetown, the planned rehabilitation and restoration of the building would provide a future use that brings vitality to the site as well as a welcomed gathering place for the local community and its visitors.

Figure 114: Haviland Club entrance

HSI recommends that immediate action is taken to stabilize the failed structural members in the attic to prevent further loss and risk to safety. The remaining interventions required to address current structural deficiencies can be done practically, with the result to be of greater value than the cost of work.

Sincerely,

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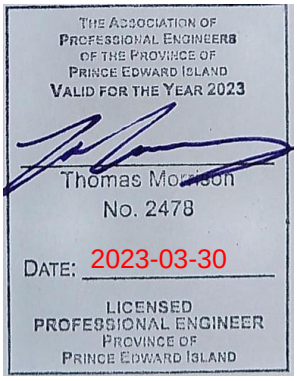

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