

Robertson Martin Architects Inc.
216 Pretoria Avenue
Ottawa ON K1S 1X2

September 29, 2017
Project No. 18021

Attn: Mr. James Maddigan

Re: Maison de L'Ile, Hawkesbury, Ontario
Masonry Walls Condition – Summary Letter

1.0 INTRODUCTION

John G. Cooke & Associates Ltd. (JCAL) was retained by Robertson Martin Architects Incorporated in September 2017 to complete a non-destructive visual inspection of the building's heritage masonry walls, as well as to confirm the capacity of an existing wall to support a new roof load. The objective of the inspection was as follows:

- To carry out a visual non-destructive investigation of the building's exterior masonry walls and masonry walls within the basement, gaining access to all parts of the masonry walls, where possible. To record all visible deficiencies noted and take photographs as necessary.
- To prepare a summary letter for the owner. The report would outline the findings of the inspection and include recommendations for repair and priorities.

1.2 METHODOLOGY

The church was surveyed on September 26, 2017 by Lisa Nicol, P. Eng. from John G. Cooke & Associates Ltd, along with James Maddigan, MscA, CAHP from Robertson Martin Architects Inc, and the building owner representative, Mr. Guillaume Boudrais. The masonry walls were reviewed from the exterior and from the basement of the building. The interior of the building, on the main floor levels, was entirely covered in finishes. Observations noted during the investigation are summarized in this letter.

Drawings of the building were given to us, for a current renovation project, drawings were dated 2017-06-20 and produced by Lacelles Engineering & Associates and J.L. Richards & Associates Ltd.

1.3 DESCRIPTION

Maison de l'Ile was constructed around 1810, with a further addition on the south west end of the building constructed around 1850 or later. It is located at 2 John Street, Hawkesbury and is currently home of Le Chenail – Centre Culturel. This building was originally the administrative building of the Hamilton Sawmill complex.

The building consists of stone masonry load bearing walls around the perimeter; these walls support the roof and the upper floor structure. These walls extend down into a nearly full basement or a crawlspace in some areas. There is a sloped roof. The masonry walls are constructed with a variety of local stone comprising of sandstones and limestones.

1.4 ASSESSMENT CLASSIFICATION

Deficient items were noted during our visual inspection and the condition of each item was rated based on its physical component. The classifications used are as follows:

Good: Is defined as: the component is mainly intact and is at minor risk of damage or deterioration due to natural conditions.

Fair: Is defined as: the component is compromised and is at considerable risk of damage or deterioration due to natural conditions.

Poor: Is defined as: the component is lost or is at considerable risk of loss due to natural conditions.

2.0 OBSERVATIONS



The north wall is in poor condition. There is visible bowing in the wall – a concave bow on the east half of the wall, with a convex bow on the west half of the wall. At the west end of the wall, where a door frame and window frame have been removed, there is visible separation of the inner wythe and exterior wythe, with the inner core reduced to essentially sand, with literally a pile of sand coming out of the wall from the mortar joints. This means the structural integrity of the wall is reduced, as the wall no longer acts as one massive wall, but two separate, more slender walls. Both these openings have been temporarily shored.

Photograph No. 1: North wall – looking west [JCAL 2017]



Photograph No. 2: North wall gable (original building)
[JCAL 2017]

The north gable wall has no obvious signs of failure, like the south gable wall does (see photo No.9 for comments on the south gable). However it is considered to be in the same condition as the rest of the walls around the perimeter, and may be worse.



Photograph No. 3: North Wall, Existing Door Opening – looking up at the lintel [JCAL 2017]

At the existing door opening, a large timber lintel and a stone lintel create the opening. It was noted that the stone lintel has very little bearing at the end west end. The original door frame, like the three window frames along this wall, was likely a large timber frame which provided some support to the lintels. To the right of the photo, the exterior wythe of stone (behind the 2x4 shoring post) has separated from the inner wythe of stone.



This photo is a close up of the west side of the door opening, the gap between wythes is to the left of the 2x4 wood shoring post. Very little to no bond is present between the core of the wall and the inner and outer wythes. This means the wall no longer acts as one massive masonry wall, it is effectively two separate, more slender walls, which reduces its strength capacity and causing the wall to bow as noted above.

Photograph No. 4: North wall, door opening – west side of opening [JCAL 2017]



The east side of the door opening has not separated. The mortar in the joints continues to be sand, for the most part.

Photograph No. 5: North wall, door opening – east side of opening. [JCAL 2017]



The renovation project, calls for a new roof over this existing patio area. Part of this report scope is to define whether the sloped masonry wall is capable of supporting the new roof load. This sloped wall appears to sit on top of an existing masonry foundation wall. The masonry walls surrounding this patio are covered in plaster on metal lath, which has cracked in several different directions. This cracking may be an indication of movement of the masonry wall behind. The masonry exposed above the plaster is in fair to poor condition with many cracked or opening joints.

The brick wall (where the new door opening will be made) along the ground floor level is spalled and has deteriorated mortar.

Photograph No. 6: North East corner of building
[JCAL 2017]



For the sloped patio wall, on the exterior face (the side of the wall facing the bridge), there is typically a thin layer of finishpointing mortar, over some small crushed stones – almost like mini pea stone – and then very soft mortar/sand behind. There is moisture in the wall behind the finishpointing. All finishpointing is in various stages of cracking and debonding from the wall. Some of the stones are fractured.

On the interior face of the wall, the mortar is an extremely hard cementitious mortar however, it is debonded entirely from the surrounding stones.

Photograph No. 7: Exterior side of the sloped patio

wall [JCAL 2017]



This elevation is pretty typical of the exterior masonry walls for the original building, with larger stones creating the window and door jambs and medium to small stone making up the rubble coursing on the sections of main walls. Finishpointing is very thin and feathered over very thin (approximately 10mm) mortar joints and stone edges to create the illusion of thicker mortar joints. Along this wall, mortar behind the first 12mm of mortar had deteriorated to sand.

On the entrance facades, typically larger stones were used than on the gable walls.

Photograph No. 8: Partial East Elevation
[JCAL 2017]



The walls of the South East addition have a core that has reduced to sand. On the East wall of the original building, the gable portion of the wall has a significant bulge between the upper storey windows, with stones fractured and mortar joints open. This is a dangerous condition, as the wall between the windows isn't a solid masonry wall – as the flue for the chimney is likely built into the wall thickness, making this section of wall weaker structurally speaking. The section of wall at the ground floor level, is in poor to fair condition, some mortar joints had firm mortar in them but most had soft mortar or sand, behind the thin finishpointing layer that had been feather over the thin mortar joints.

Photograph No. 9: South Elevation, original building
and S.E. addition are evident in this photo [JCAL 2017]



Photograph No. 10: South West side of the building
[JCAL 2017]

Vines covered portions of the west elevation. North elevation is currently used as the main entrance to the building.

Both chimneys appear capped with no ventilation, causing moist air to accumulate in the flues and migrate into the stone promoting deterioration.



Photograph No. 11: Typical stones at corner of building
and around windows and doors [JCAL 2017]

This is an example of extremely weathered stone at a corner of the building on the north elevation. The stone is delaminating and/or cleaving typically around the building. Any replacement stone should be of higher quality than this existing stone and naturally bedded. The bed seams in this stone are oriented vertically, they should be oriented horizontally.



This joint is located on the west elevation, however this is a typical scenario around the entire building.

Once the thin layer of finishpointing is removed, the mortar behind is sand. This photo was taken after the sand had fallen out of the wall – as evident by the completely void joint.

With the core of the wall reduced to sand, as stated earlier, this reduces the structural integrity of the wall, as it is no longer working as one whole massive masonry wall but two separate walls (ie. the inner wythe and the exterior wythe act separately).

Photograph No. 12: Typical mortar joint (part 1)

[JCAL 2017]



My screwdriver extends easily into the wall, for it's full depth. If I had a longer screwdriver it would have gone in deeper.

Photograph No. 13: Typical mortar joint (part 2)

[JCAL 2017]



The sill stone has an upward bulge to it, with the section of wall below the window bulging outward. The bulge upward has been there since the windows were installed, as the grout around the windows was installed to suit the slope.

Photograph No. 14: West Elevation, window at far north end. [JCAL 2017]



The stone is generally in fair to poor condition. There are a lot of fractures or weathered veins in the stones, in multi directions. So, any rehabilitation of the walls will inevitably lead to a high amount of stone replacement, where raking out of the mortar joints is done.

Photograph No. 15: Typical stone and mortar condition. [JCAL 2017]



The existing timber lintel has split and dropped vertically by approximately 12mm. My screw driver could penetrate through the lintel without effort. This window lintel has not been shored. There is also a bulge in the masonry wall below this window, with open joints. Typically below basement windows, there is moisture in the mortar joints and the mortar is deteriorating, in fair to poor condition.

Photograph No. 16: Basement, east wall, southern window – north of basement entrance [JCAL 2017]



The existing timber lintel is rotten, and has been shored. There is a gap between the concrete block masonry infill at this window and the surrounding stone masonry.

Further south along this wall, the wood sill plate is in poor condition as well.

Photograph No. 17: Basement, east wall, northern window [JCAL 2017]

3.0 RECOMMENDATIONS / ACTION REQUIRED

Generally, the finishpointing and even some deeper repointing (in the case of the sloped patio wall) were done with hard cementitious mortar, this mortar traps moisture in the wall and does not allow the wall the flexibility it needs to resist freeze thaw cycles that are inherent in Canada. Using a weaker cementitious lime mortar such as a 1:2.5:8 (cement: Type SA lime: sand) is more highly advisable. This mortar has been tested over the past twenty years, and is considered to be as near to compatible with historic mortars as is possible in the Canadian climate. The cement provides the initial set and durability. The lime provides the relative flexibility and vapour transmission. The air entrainment in the type SA lime provides the frost resistance.

The existing stone is a poor quality and likely will not hold up to a repointing program. Therefore, any budgeting for repointing that is done in the future, should include as much as 50% stone replacement. For stone sourcing, perhaps a granite from the Rock of Ages would be a good match for the window and door surround stones; for the main wall rubble stone, perhaps St-Canut sandstone (from St-Canut, Quebec) for the rubble stone with the red/brown colouring through the stone, and a Kingston Limestone (from Inverary, Ontario) or Champlain Limestone (from Havelock, Quebec) for the more solid grey rubble stone.

With the very small mortar joints, it is doubtful that the joints can even effectively be raked out and repointed. However, we'll see how the two pilot projects go on the north wall (see below for more information on that).

The following are recommendations on how to move forward from here, based on the site investigation:

- Cordon off the area below the south wall gable, so that no one can access this area of the grass. The exterior wythe of this gable wall is unstable and may collapse.
- North wall scope of work, to be done this fall/winter, in conjunction with on-going renovation project. Heating will be required in these Pilot Project areas, once the average ambient temperature is below 5 degrees Celsius, all materials are required to stay about 10 degrees Celsius.
 - Remove plaster finish on the back of this wall (for the portion of wall, where the patio is located)
 - Pilot Project #1a: Take down and rebuild exterior wythe for portion of wall to west of existing door opening, under the direction of a trained professional engineer and experienced mason.
 - Pilot Project #1b: Hydrovac sand and loose mortar out of wall. Once clear, grout wall for portion of wall to east of existing door opening. Monitor if grout leaks out onto patio area – as this may be an issue if grouting is to be considered for walls around the building where one side is finished with plaster. This should also be done under the direction of a trained professional and an experienced mason.

These two pilot projects will be considered mock-ups to determine how feasible each idea is for other parts of the building.

- Sloped patio wall, two stones will to be removed (one on each side) for further inspection/investigation.
- A long term rehabilitation plan should be developed based on the results of the north wall pilot project. All of the exterior walls of the building should be restored within the next 10 years, in order of priority: north wall, south wall, west wall, and east wall. Any budgeting or costing could be done after the pilot project is complete, as then we'll have a better idea how the restoration work will be complete and the full scope of the work.
- All vines should be removed from the masonry walls; they promote deterioration by holding moisture near the wall.

4.0 DISCLAIMER AND LIMITATIONS

This report is based on and limited to verbal information supplied to John G. Cooke & Associates Ltd. by the visual observations made during a walk-around inspection of Maison de L'Ile in Hawkesbury, Ontario. Only those items that are capable of being observed and are reasonably obvious to John G. Cooke & Associates Ltd. or have been otherwise identified by other parties and detailed during this investigation can be reported.

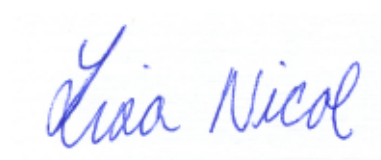
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This report has been produced for the sole use of Maison de L'Ile, and cannot be reproduced or otherwise used by any third party unless approval is obtained from John G. Cooke & Associates Ltd.

We trust that this report covers the scope of work as outlined in our Terms of Reference. Should there be any questions regarding this report, or if we can be of any further assistance to you, please contact us.

Yours sincerely,

JOHN G. COOKE & ASSOCIATES LTD.



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