JOHN G. COOKE & ASSOCIATES LTD.
CONSULTING ENGINEERS

Lisa Nicol, P.Eng. Principal
Jonathan Dee, P. Eng., ing. Principal
Chris Vopni, P.Eng. Principal
John Cooke, P.Eng., RSW Principal Emeritus

Architecttura Inc.
180 Eugenie St. W
Windsor, ON N8X 2X6

December 9, 2024

Project No. 25029

Attn: Dan Soleski
(dsoleski@architecttura.com)

RE: Amherstburg Town Centre
South Elevation Facade

Dear Mr. Soleski,

As requested, and further to our proposal no. P25034, Jonathan Dee, P.Eng., ing., CAHP, of John G. Cooke & Associates Ltd. (JCAL) visited the site of the former General Amherst High School, located at 130 Sandwich St S, in Amherstburg, Ontario. JCAL visited on Wednesday, November 6, 2024, accompanied by yourself, Peter Valante of Valente Development who are the current Owners of the building, along with two other representatives with Valente Development.

The purpose of the visit was to review the historic façade central to the South Elevation of the General Amherst High School (marked with an "A" on Figure 1), in order to provide options and recommendations with respect to its conservation and incorporation into a proposed new development on the site (see Figure 2). This façade was constructed ca. 1922 as part of the initial school building of what ultimately became a much larger complex. The building is <u>not</u> designated under Part IV of the Ontario Heritage Act.

An addition was constructed abutting the west side of the original school building ca. 1950 and is marked with a "B" on Figure 1. This addition was constructed to mimic the style and materials of the original façade, but it is understood that its retention is not being contemplated as part of the redevelopment, and it was therefore not reviewed in any detail.

A set of mural panels painted on more contemporary parts of the building along the West Elevation were also reviewed (marked with a "C" on Figure 1). It is understood that six of the panels are on the former gymnasium building, which is planned to be retained (and is visible in Figure 2). However, three of the panels are on a separate building to the north which is planned to be demolished.

Fig. 1: Existing buildings, isometric view looking NE.


Fig. 2: Proposed development, also looking NE.

Together, we visually reviewed conditions from grade level at the base of the façade and from roof level, visually reviewed interior conditions at floor levels, and made an investigatory opening at the interior side of the ground floor level to confirm the wall assembly. Original ca. 1921 drawings of the historic façade and ca. 1950 drawings of the west addition were provided to JCAL prior to our visit, and these were reviewed.

Observations

Historic Facade

Per the original drawings, the historic South Elevation façade is 105’-8” long and extends 36’-10” from grade to the tops of the parapets on either side of the slightly taller central bay with the main entrance. There are two interior floor levels, plus a basement level. A projecting ground floor entrance central to the elevation has been modified to remove the original circular arched doorway and place a window opening similar in size to the adjacent original windows.

The original school building is constructed with a cast-in-place concrete foundation wall, which is exposed at both the interior and exterior sides. The floors are framed primarily with wood floor joists which could be seen in several places from the interior. Reinforced concrete lintels are indicated on the drawings to support both floor framing and masonry at window openings. Reinforced concrete columns are also indicated on the drawings, but these appear to be only located at the relatively slender piers indicated by arrows in Figure 3. An important consideration for potential retention in-situ is that the wood joists run perpendicular to the façade and the walls are thus load bearing. The joists are indicated to have occasional wrought iron straps to the wall and to be pocketed into it, bearing directly on the concrete window lintels where these are present.

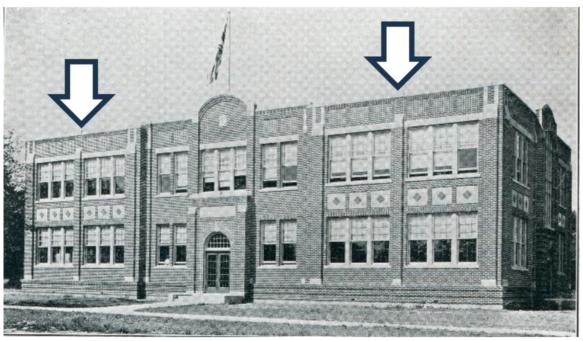

Fig. 3: Historic façade soon after original construction.

Fig. 4: Historic façade and 1950’s addition, today.

Fig 5: Closer view of façade, showing brick bond patterns, stone details, piers.

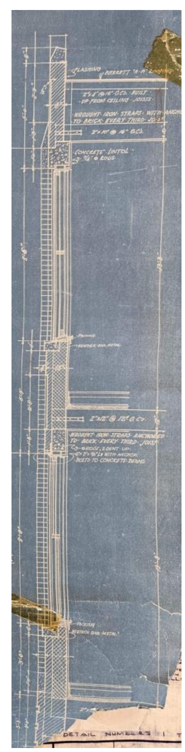

Fig 6: Section

Wall Construction

The wall construction consists of a single exterior wythe of red brick which has a rugg texture (vertically combed) that is relatively coarse. The brick is laid primarily in a running bond pattern of stretchers, with no regularly spaced header courses in the field. There are soldier courses above windows and below the coping stones, several rowlock courses to form a circular arched parapet above the former central doorway, and panels of stack-bond headers (likely false headers) between the uppermost windows and the roof. The brick bond patterns can be seen in Figure 5, above.

Limestone details are present as sills below windows, at the tops and bottoms of piers, and as coping stones along the top of parapet. This appears to be Indiana Limestone which remains an actively quarried and available material. There are also rectangular panels along the second-floor level of the east and west wings of the façade. These appear to consist of a cementitious parging with a terra cotta tile rhombus set in their center. The backup for these panels is not known and would likely be brick or terra cotta tile. See Figure 5, showing the general arrangement of these details.

The overall wall thickness at a typical location in the brick field is approximately 13”, and the interior side backup for the outer brick consists of hollow terra cotta tile. This thickness includes approximately 4” for the exterior brick, ½” for a mortar collar joint, 8” for the terra cotta tile backup, and ½” for the interior plaster finish, applied to the tile. One interior investigatory opening made at the ground floor, though limited in size, was sufficient to confirm the presence of a plaster finish, the terra cotta tile, and the 8” thickness of the tile. See Figure 6 for a section at a typical wall elevation, from the 1921 drawings. Note that this drawing also shows the above-noted perpendicular joists and concrete lintel beams.

The façade includes many little piers and returns. The drawings suggest that the assembly simply turns the corner at the larger returns, and that a brick wythe is added at the exterior at the shallower pier projections, with the terra cotta remaining a consistent thickness.

General Condition

In general, the brick façade is in relatively good condition and better than expected for its age. Though no material testing was completed to date, the brick was laid in what appears to be a Portland cement mortar with a significant proportion of lime. This mortar appears to be quite compatible with the brick, acting as the route for moisture evaporation from the wall and being softer than the brick. Indeed, most of the mortar appears to be original and has required only localized maintenance, and repointing.

Other previous maintenance efforts included the placement of prefinished flashing atop the coping stones. This would have benefited the parapet considerably by mitigating water ingress the part of the wall that is most exposed to the elements and remains relatively cold and wet, and thus more prone to freeze-thaw cycles and deterioration. Despite this, most of the issues observed are indeed up at the parapet. The stone units themselves are in generally good condition, and no rust staining or significant bulging was observed throughout the wall. However, we did identify some potential issues and note some conditions that would require repairs as part of incorporating the existing façade into a new development, as discussed below.

Attachment of Exterior Brick Wythe and Composite Action

As previously noted, there is a distinct absence of header bricks. While headers do appear to be present at the sides of piers to key them into the regular plane of the wall, and aside from the decorative panels of stack bond headers (which I suspect are false headers), no headers exist in the regular field of the wall. Figure 7 below, extracted from the Principles of Tile Engineering Handbook of Design, published in 1946, shows a typical construction of a composite brick-tile wall, with headers to key the wythes. The alternative means of securing the exterior brick to the tile backup would be to incorporate masonry ties, similar to common veneer applications constructed today.

We recently reviewed the Strathroy Town Hall building, which was built ca. 1928 and with a similar exterior brick, Indiana limestone details, and concrete foundation walls to this building. The brick along its concrete foundation wall is a single-wythe veneer and was outwardly displaced in many areas. Exploratory openings revealed that within a 7'x4' panel there was just a single plain steel wire loop cast into the concrete and set in the bed joint of the brick, possibly having been intended as a veneer tie. However, as illustrated in Figure 8 below, indicating the location of the tie and with a closeup of the tie itself, this sole tie was not resistant to corrosion, nor was it sufficient to adequately restrain the brick in the first place.

While no systematic brick bulging or displacement was evident during the review of the General Amherst High School's facade, veneer construction at the time of its construction was often not to the standards of today, and the possibility remains that anchorage is insufficient in spacing. It is also very likely that any anchorage that is present may consist of plain steel or thin sections that are prone to corrosion. Another possibility, though we have not seen it in composite brick-tile construction such as this, is the use of concealed diagonal headers (also called clipped headers), which are often ineffective and prone to separation.

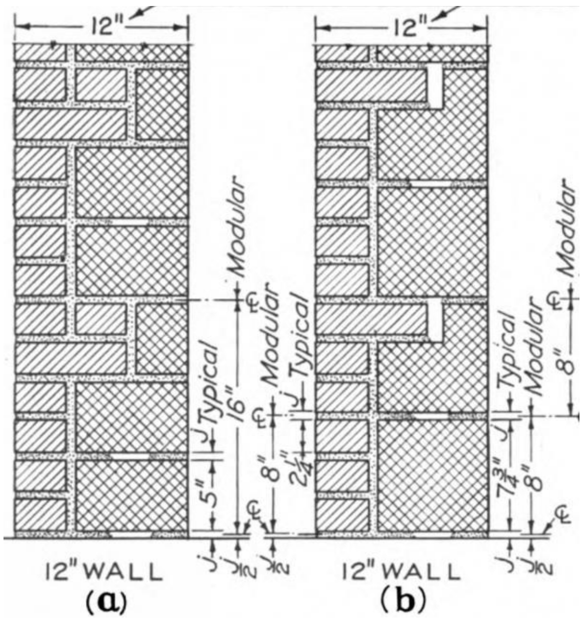

Fig. 7: Typical historic brick-tile wall detail.


Fig. 8: Brick veneer and tie at Strathroy Town Hall.

Assuming the brick is not acting in composite with the terra cotta tile, the unsupported wall height (from t/o joist floor below to u/s of joist above) of 13'3" for the ground and second floors would result in a slenderness ratio of 159"/8" = 19.9. This is within slenderness limits per Clause 7.7.5.2. of CSA S304, which is $kh/t < 30$. It also (just barely) meets the requirements in Table F.2 of Appendix F - Empirical Design for Unreinforced Masonry, which stipulates $h/t < 20$ and minimum 190 mm (7½") thick. As such, any potential correction here would be limited to ensuring the proper lateral attachment of the brick to the terra cotta backup wall.

<u>Water Table (Projection) at Base of Wall</u>

Several brick courses at the base of the wall project beyond the wall above, to form a water table or plinth course along the base of wall. Unfortunately, this projection consists only of brick masonry and parging and does not effectively shed water, providing a skyward facing surface upon which it can collect and be absorbed into the wall below. The deterioration here is relatively limited, overall, however, there are signs of corrosion of steel lintels above openings and resulting cracking (see Fig. 9), and there are eroded joints and spalled bricks due to moisture-related deterioration (see Fig. 10). A strip of metal flashing set into a reglet and with a drip edge beyond the wall below would have better protected this area.


Fig. 9: Cracks, repairs to water table at base of wall


Fig. 10: Spalling brick at water table

Parapet and Upper Level Masonry

For the most part, the masonry at the upper areas of the wall is in relatively good condition, and fair-to-good condition along the parapet. As expected, there are some areas of eroded or debonded mortar joints. The previously mentioned placement of metal flashing to discretely protect most of the skyward facing masonry has performed well and is likely a key factor in the good condition of the masonry (see Figure 11).


Fig. 11: Cap flashing atop parapet coping stones.

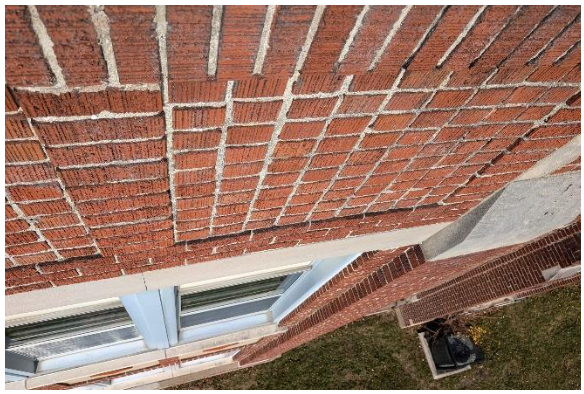
Fig. 12: Mortar joints at parapet.

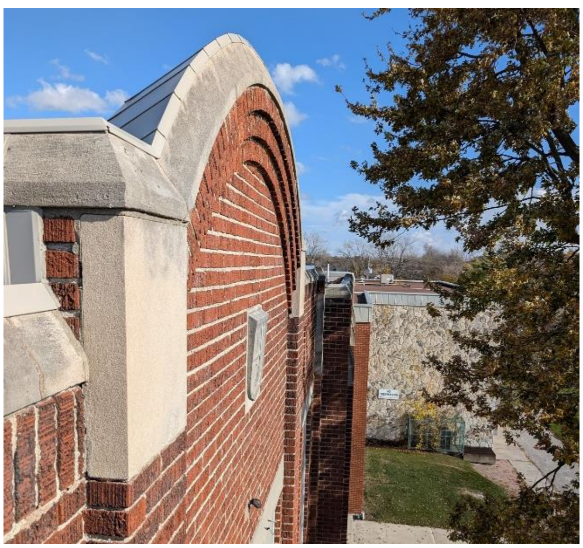
Fig. 13: Arched central bay of parapet.


Fig. 14: Typical condition along parapet.

Several of the stone units at the upper levels of the building were noted to be displaced. See Figures 15 and 16 for examples. The stone at Figure 15 abuts the 1950's addition, and may be impacted by differential movement between the two structures. The movement in the example at Figure 16, a relatively slender stone, is likely due to the failure of its anchorage or a lack of anchorage when it was constructed.

Fig. 15: Displaced stone at SW corner of facade.

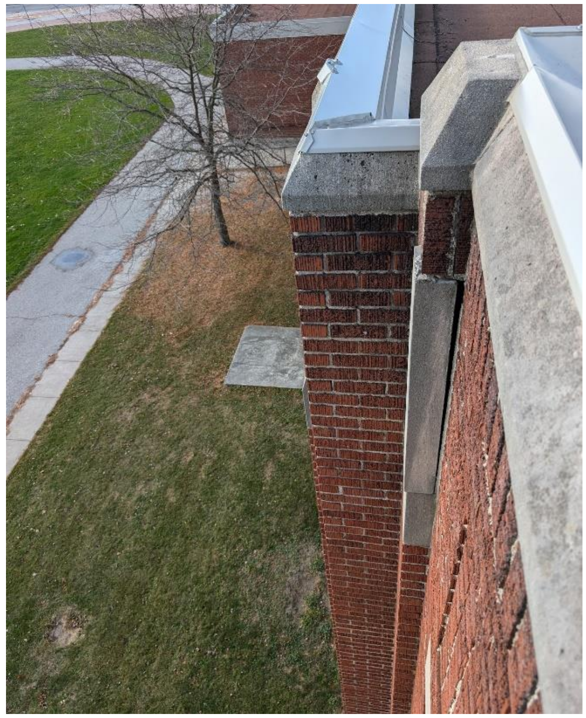

Fig. 16: Displaced stone at return at west wing.

Mural Panels

The murals on the West Elevation of the gymnasium building were also reviewed (see Figure 17). It is understood that the gymnasium structure upon which the six southern panels are located will remain in-situ as part of the new development, but that the three remaining panels to the north are on a structure that will be demolished and that options to preserve these murals are sought.

Fig. 17: West Elevation mural panels.

Fig. 18: Plaque regarding 2012 mural restoration.

The murals appear to be painted onto cementitious parging applied to concrete block construction, and they are in good condition. They were restored in 2012 according to a plaque to the north of them (see Fig. 18). The murals are recessed from the adjacent brick and do not extend all the way to grade, with approximately 18” of wall tile having been installed below them. The murals are painted with relatively few colours and in fairly simplistic shapes, and he profile of the coloured areas appears to be noticeably raised from the adjacent field.

Options regarding the conservation of these murals are provided following discussion on options to preserve the historic façade, in the next section.

Options and Recommendations

Historic Facade

The potential options that were initially discussed for the incorporate this façade into the new development are for it to either be retained in-situ and attached to the new building, or for it to be dismantled, the exterior stone and brick masonry to be salvaged, and for it to be rebuilt as a veneer for the new structure.

We believe that either approach is achievable. The cost for retention in-situ is greater than that for salvaging and reconstruction. However, the end product of reconstruction will be quite dependent on the workmanship of the masonry contractor retained to do this work and, though it is understood that this building does not hold a heritage designation, such an approach is less consistent with The Standards & Guidelines for the Conservation of Historic Places in Canada. Though not the case for the building overall, retention in-situ would entail the *Preservation* of the primary façade, which is the preferred conservation treatment in the Standards & Guidelines. Additionally, this approach would be more compatible with several of *The Standards* described in that document, namely:

- *Standard No. 1. – Conserve the heritage value of an historic place. Do not remove, replace or substantially alter its intact or repairable character-defining elements. Do not move a part of an historic place if its current location is a character-defining element.*
- *Standard No. 3. – Conserve heritage value by adopting an approach calling for minimal intervention.*
- *Standard No. 7. – Evaluate the existing condition of character-defining elements to determine the appropriate intervention needed. Use the gentlest means possible for any intervention. Respect heritage value when undertaking an intervention*

In light of the fact that the building is not designated under the Ontario Heritage Act or any other legislation (at least to our knowledge), a third option was subsequently also discussed, in which only the stone elements in the façade are retained and the façade is rebuilt using new brick selected to resemble the original. While this option would stray further from the Standards & Guidelines, it provides other advantages and opportunities.

Ultimately, it is expected that a decision on which approach to pursue will be made by the project stakeholders by balancing considerations with respect to the desired project outcomes, risks, and costs, associated with each approach, and we hope that this is helpful in coming to a decision.

Option 1 – Retention In-Situ

There are two common ways of retaining a façade in-situ, which are to either construct a temporary frame to laterally brace the wall while the existing building is separated from it and demolished, or to leave and brace a bay of the existing structure along the façade to serve as bracing. The latter has the benefit of minimizing the extent of the temporary construction needed to brace the wall, at the expense of a more complicated environment in which to construct the new building and is generally more advantageous in taller buildings. Given the relative size and height of the façade, the more typical approach of constructing a structural steel braced frame on the exterior side of the façade is considered for this facade (see Figure 19 for an example).

The braced frame would include horizontal steel members placed on the interior and exterior faces of the façade, primarily along the tops and bottoms of window openings, to sandwich the wall. The frame could be placed on footings, with ballast (large concrete blocks) to resist overturning moments induced by wind loads, or, it could be founded on helical piles which may act in both vertical directions and serve as hold-down anchors. It is necessary to carefully separate the façade, by making vertical cuts along connecting masonry walls and by cutting or removing connecting floor structures (joists and beams), prior to demolishing the remainder of the building. Joists and beams must be shored before any cutting to avoid prying on the wall as they fail. In general, the retention must also be carefully coordinated with the demolition plan, and the latter should be reviewed as a shop drawing submittal.

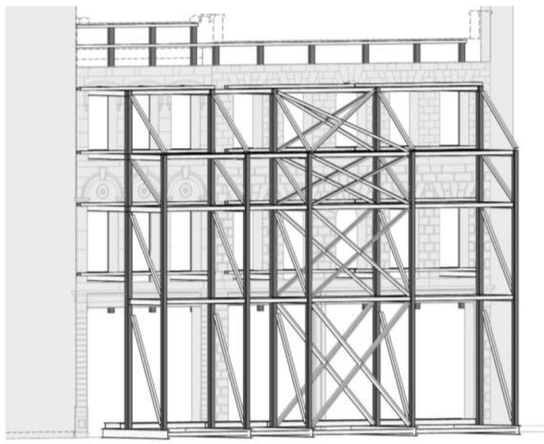

Fig. 19: Example 3D model of façade retention frame.

The sequence and scope of work for in-situ retention would generally go as follows:

- Complete initial masonry stabilization work.
- Erect structural steel retention frame, including temporary foundations or ballast.
- Shim tight between temporary horizontal steel bracing elements and the façade, on both sides of the wall.
- Cut façade free from adjoining walls.
- Shore and cut/remove adjoining floor structures.
- Provide temporary weather protection at interior face of wall which is not suitable for exterior exposure, and at cut ends of masonry.
- Construct the new building.
- Make permanent lateral attachments between the new building and the façade, which is typically a vertically slotted angle anchored to the interior face of the façade and secured to the new floor structure.
- Dismantle and remove the temporary steel framing.

Masonry conservation work of the existing masonry would be required as part of this approach, with at least stabilization work being carried out before the start of demolition, to ensure no damage occurs during that phase. Overall, the masonry conservation work would include the following scope items, with at least part of those marked with an asterisk to be completed as part of an initial stabilization phase and the balance to be completed at a later time, if preferred.

- Cut façade at corner return walls and consolidate cut ends of masonry. *
- Infill joist pockets at interior side of façade. *
- Locally repoint along the parapet. *
- Reset displaced stone units. *
- Repoint, locally rebuild, and locally replace brick along water table at base of wall. *
- Local repointing throughout. *
- Repoint all coping stone joints.
- Add metal flashing to protect masonry projection above main entrance projection.
- Add metal flashing to protect masonry projection at water table.

In order to proceed with this approach, additional information must be determined, as follows:

- Confirm the presence and condition of anchors/ties between exterior brick wythe and backup. This could likely be done with a metal detector and an interior-side opening.
- Complete a geotechnical study to determine soil conditions, and properties for footing design.
- Determine design of new building's foundations and depth below grade and design underpinning or other measures to ensure façade foundation is not compromised.
- Complete utility locates along façade, to avoid interference during foundation design for retention system.

A final consideration as part of this approach concerns the placement of new insulation and vapour barriers, which will likely be needed to achieve the desired envelope performance of the new building. Historic brick, and certainly terra cotta backup tile, are not as resistant to moisture and freeze-thaw damage as modern brick. The masonry in this facade has benefited from being part of an uninsulated wall assembly that is able to breathe in both the exterior and interior directions. Insulation will reduce the waste heat coming through the wall generally making the masonry elements in the wall colder, and therefore wetter (warm things tend to dry faster). The placement of vapour barriers will inhibit drying to the interior, increasing the potential for moisture to accumulate.

As the brick in this façade has generally performed very well, including along corners and parapets where it is most exposed to moisture and cold, one would expect that it could tolerate additional insulation. However, JCAL are not building scientists or materials testers, and if there is a desire to confirm future performance, hygrothermal modeling and brick testing would be the way to do so. We are aware of several firms that do this work. They could also review future wall assembly details and advise on insulation thickness and type, and materials such as smart vapour barriers that are now on the market and often used in similar applications.

Estimate of probable cost (order of magnitude):

Item	Cost
Stabilization masonry work	$ 75,000.00
Retention frame foundations	$ 125,000.00
Structural steel retention frame installation	$ 775,000.00
Wall cutting	$ 50,000.00
Temporary shoring, cutting, and removal of framing	$ 25,000.00
Temporary protection of backup	$ 50,000.00
Structural steel retention frame dismantling	$ 100,000.00
Total to Retain In-Situ	**$ 1,200,000.00**

The above assumes a custom-built retention frame for this application. However, there are several contractors in the Toronto area that have prefabricated modular towers for use in retention applications. Depending on the timing of the work and the availability of one of these towers, there is the potential for significant cost savings, perhaps on the order of $200,000.00 (very approximate), if a contractor has such towers available for use. This could potentially bring the cost to retain in-situ on par with reconstruction, or at least close to it.

Option 2 – Salvage and Reconstruct

The discussed alternative to incorporating this façade in the new development is to dismantle it, salvage the brick and stone material, and reconstruct it, discarding the terra cotta backup. Reconstruction would be as a veneer, tied to a new backup wall. Flashing would still be incorporated at horizontal projections, as noted for the previous option.

Salvaging is complicated somewhat by the rugged brick, which is more difficult to clean. Should the brick be re-used, testing of the existing brick and mortar is recommended in order to select a compatible mortar for the reconstruction. Also, as noted for the previous option, consideration should again be given to the future performance of the existing brick should it be re-used, as the brick would again be part of an assembly that is likely to include insulation and a vapour barrier.

Prior to any dismantling, a 3D laser scan should be completed of the façade, to fully document all existing geometry. Additionally, each stone should be given a unique identification number on the elevation drawings.

The sequence and scope of work for dismantling and reconstruction would generally go as follows:

- Erect scaffolding across façade.
- Carefully dismantle the exterior wythe of brick and stone.
- Mark each stone with unique identification number.
- Clean existing mortar from brick and stone.
- Place brick and stone on pallets and place into weather-protected storage.
- Dismantle scaffolding.
- Erect new building, including new foundations and new backup wall.
- Reinstall scaffolding across façade.
- Reconstruct façade, complete with new veneer anchorage.
- Dismantle scaffolding.

Estimate of probable cost (order of magnitude):

Item	Cost
Mobilization and scaffolding	$ 50,000.00
Dismantle and salvage brick and stone	$ 150,000.00
Storage	$ 50,000.00
Re-mobilization and scaffolding	$ 50,000.00
Reconstruct brick and stone	$ 450,000.00
Total to Dismantle, Salvage, and Reconstruct	**$ 750,000.00 ** **

Option 3 – Selective Salvage and Reconstruct

A third option, which would be less costly though less desirable again from a heritage and environmental perspective is to salvage only the stone and reconstruct the façade using a modern brick that is similar in appearance to the existing. The stone could likely be salvaged from roof and floor levels, and via a lift, just prior to demolition.

Aside from hopefully limiting scaffolding costs and not cleaning and salvaging the brick, this item would proceed be as for Option 2, including the laser scanning in advance of any work.

The costs for this option are further reduced from the former two, despite the cost of purchasing new brick. There is some risk of damage to the stone units in either approach but this is increased in this option by having to pull them from the wall assembly or during the course demolition. However, it should be noted that replacement Indiana limestone can still be readily supplied, if necessary.

This option has the benefit of being able to select a new exterior brick that is manufactured to current material standards and that will be fully appropriate for use in a new cavity wall construction. Red rugg bricks that appear to be quite similar to the brick used in this façade are available from several manufacturers.

Finally, this option offers the interesting possibility of seamlessly integrating a rebuilt East Elevation into the development. The original East Elevation of the school was previously removed to accommodate an addition. It is understood that while the design will be further developed, this addition may no longer be included in the development and the developer is considering the possibility of reconstructing the East Elevation along with the South. This would be along the lines of a *Restoration* approach, as defined in the Standards & Guidelines, and there are drawings, photos, and existing geometry from the remaining South Elevation that may be used to create a well informed reconstruction. Given that the reconstruction of the East is somewhat speculative, and for comparison purposes with the other options, costing of this option only includes the work on the South Elevation.

Estimate of probable cost (order of magnitude):

Item	Cost
Mobilization and access/scaffolding	$ 25,000.00
Salvage stone and storage	$ 65,000.00
New brick	$ 35,000.00
Mobilization and scaffolding	$ 50,000.00
Reconstruct brick and stone	$ 450,000.00
Total to Dismantle and Reconstruct /w New Brick	**$ 625,000.00** **

****** Note that the above costs do not include the demolition of the existing foundation, construction of a new foundation, and construction of a new backup wall that are required as part of this option. This should be considered in the difference between these costs and that of in-situ retention. Window costs are not included in any option, whether new or removal and reinstatement of existing.

Glass Enclosure

It is understood that a glass enclosure proud of the façade is being contemplated as part of either option. Glass interfacing with heritage masonry does tend to showcase the heritage fabric, and its lightness and transparency can give a certain deference to solid masonry as the primary feature of a space. Having a former exterior wall in a new interior space can also add a lot of interest and appeal. An example that the undersigned worked on extensively, and which won a CAHP award of excellence for adaptive re-use is the Sir John A. MacDonald building at 144 Wellington St. in Ottawa, ON (see Figure 21).

Based on the information at hand, the decision to build an enclosure should be made primarily at an architectural level. While the enclosure would provide full protection from the elements, and therefore mitigate any further deterioration, the façade has performed quite well to date, and this level of protection is not required to assure additional lifespan in its new use. Protection would eliminate the need to analyze brick properties, envelope performance, and the installation of new flashings.

Fig. 20: Potential glass enclosure along facade.

Fig. 21: Glass façade and atrium at SJAM Bldg.

Mural Panels

Finally, with respect to the three mural panels that would be lost with the demolition of the building to the north of the gymnasium, we can offer a couple options for their conservation. Before any work is undertaken on these murals, we recommend that they be documented using 3D laser scanning, or at least with rectified photography.

One approach is to detach and relocate the murals, and apply them to whatever new structure is constructed in place of the current building. This would require steel framing to sandwich the block wall panels, steel needle beams placed perpendicularly under the panel, disconnection from the adjoining walls, and lifting of the panels by crane to and from a temporary storage location that would presumably be on the site.

Another option may be to recreate the murals by repainting them onto a surface of the new building. This could even be in some other form if that building's wall is not suitable for painting, such as etchings on panels of a glass façade, or free-standing panels or if there is no building in that place.

Any masonry painting should be done with appropriate paints, ideally sol silicate paint, and should be done by artists with appropriate experience. The plaque at Figure 18 includes the name of the artist involved in the 2012 mural restoration who would no doubt be very well-suited to such work, but there are other artists with similar experience. For example, we recently completed a project at the Elgin and Winter Garden Theatre in Toronto that included an artist to re-paint a historic sign on the side of the theatre and which went very well.

Disclaimer and Limitations

This report is based on and limited to information supplied to John G. Cooke & Associates Ltd. by Architecttura and Valente Development, and by observations made during a walk-through inspection of the subject property. 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.

The work reflects the Consultant's best judgment in light of the information reviewed by them at the time of preparation. There is no warranty expressed or implied by John G. Cooke & Associates Ltd. that this investigation will uncover all potential deficiencies and risks of liabilities associated with the subject property. John G. Cooke & Associates Ltd. believes, however, that the level of detail carried out in this investigation is appropriate to meet the objectives as outlined in the request for our services. We cannot guarantee the completeness or accuracy of information supplied by any third party.

John G. Cooke & Associates Ltd. is not investigating or providing advice about pollutants, contaminates or hazardous materials.

This report has been produced for the sole use of Architecttura, and their client, and cannot be reproduced or otherwise used by any third party unless approval is obtained from John G. Cooke & Associates Ltd. No portion of this report may be used as a separate entity; it is written to be read in its entirety.

Closing

We trust that the above is helpful in advancing this project. Please do not hesitate to contact the undersigned if we can be of any further assistance, or should you have any questions or require clarifications.

Sincerely,

JOHN G. COOKE & ASSOCIATES LTD.

Jonathan Dee, P.Eng., ing., CAHP
Principal

25029/ltr_1

LICENSED PROFESSIONAL ENGINEER
J. K. DEE
100162005
Dec-09-24
PROVINCE OF ONTARIO