November 27, 2024

Alissa Golden, MCIP RPP
Program Lead, Cultural Heritage
Planning and Economic Development
City of Hamilton

RE CHIA Addendum for Heritage Committee

Dear Alissa,

In preparation for the Heritage Committee meeting to be held on December 13th, 2024, we provide this addendum for the Cultural Heritage Impact Assessment. The purpose is to:

1. Provide more detail around the building conditions and processes required to repair the building, and
2. Outline the key principles in the design approach of the new development.

1. Engineering Reports on Building Conditions & Recommendations

1.1. Access Environmental Solutions provided a designated substances and hazardous building materials assessment. Designated substances and hazardous building materials were identified to be present, including areas of cultural heritage value as summarized below.

FEATURE	HAZARDOUS MATERIALS
Plaster on Walls, Ceilings, Ornamental Mouldings	CONFIRMED: Asbestos is found in plaster on walls, ceilings, ornamental mouldings throughout subject building. COMMENTS: The condition of the asbestos-containing plaster throughout the building is extremely poor, evidenced by widespread damage to plaster walls and ceilings. Debris from this asbestos plaster can be found throughout the premises. Consequently, it is recommended to treat all building surfaces as contaminated with asbestos fibres due to the extent of plaster damage and debris present.

1.2. Kalos Engineering provided findings of the conditions of the structure found to be in poor condition, with recommended replacement, additional reinforcing and rebuilding of the structural components as summarized below.

STRUCTURAL ELEMENT	STRUCTURAL ASSESSMENT
Roof Structural System	The roof structure consists of gypsum-based roof deck panels. This material loses structural integrity when it becomes wet. Heavy moisture from failing roofing materials is evident throughout the roof structure; portions of the roof have collapsed. Shoring installation is in place to prevent collapse. Entire roof deck must be removed and replaced Steel Roof Framing Steel roof trusses span the width of the auditorium. Areas of wood infill show evidence of significant water damage. Steel columns support steel roof trusses and extend down to bear on the top of the reinforced concrete wall at the base of the auditorium chamber along the perimeter. Steel structure requires full seismic upgrades and reinforcing, including the addition of new lateral bracing and shear walls to meet current codes and standards. (Existing plaster Ceiling Sub-structure is suspended from steel roof structure, In order to undertake any upgrades ceiling must be removed)
Brick and Clay Tile Walls	<u>EXTERIOR WALLS</u> The exterior of existing building is brick masonry. The brick and mortar are failing in several locations. Considerable cracking and spalling were observed. Rowlock bricks in certain areas indicate that the exterior masonry wall is part of the buildings structural system. Removal or repair of the exterior brick façade would impact the building structure and interior walls. <u>INTERIOR WALLS</u> Interior of walls (in main hall) are constructed of a combination of clay tile, commonly known as speed tile. The clay tile has been compromised due to moisture damage and is no longer viable. Brick and clay tile interior walls covered with plaster finish in most areas. Plaster is in poor condition; where visible, clay tiles and bricks are in poor condition. To access clay tile elements for demolition and removal all interior plaster wall finish requires remediation and removal. Brick and clay tile walls are significantly deteriorating at both the exterior and interior of the walls. In places exterior facades are integral to the building structure and cannot simply be removed and replaced. Interior clay tile can only be accessed after the removal and remediation of the asbestos containing plaster that covers it.

Floor Framing	Additional reinforcing is required to remove damaged members and reinforce the floors to meet current structural codes and standards. Additional foundations and members are required to meet current day loading requirements. All floor leveling compound found through out the theater is asbestos containing and will require removal and remediation.
Paint and Plaster	Peeling paint and plaster is indicative of moisture and water infiltration in the walls. Plaster and paint will require removal remediation to access structural elements
Basement	Water ingress to basement has caused some flooding of rooms in the basement.
Foundations	It is assumed that the building is founded on strip and spread footing, founded on clay tile. New structural elements will need to be instated on native soils to provide adequate structural upgrades to meet current codes and standards

1.3. John G. Cooke & Associates Ltd. Consulting Engineers were retained to provide an additional current review on the building's conditions and processes required for repairing the building. Structural Engineer Jonathan Dee, P.Eng (CAHP) reported the following:

STRUCTURAL ELEMENT	STRUCTURAL CONDITIONS/ REMEDIATION PROCESS REQUIRED
Roof Deck	OBSERVED: Gypsum-based panels have absorptive properties that make it a poor choice for a roof deck which is deteriorating due to water infiltration, and unsafe to walk on. Continued service of the deck is not recommended. REMEDIATION: A new roof deck is required including additional insulation which should include analysis of the existing trusses to confirm their ability to resist the full design snow load, and any necessary reinforcement identified and installed.
Steel Columns	OBSERVED: Water infiltration at column locations which have damaged the masonry. The columns appear to have a flange of only ¼" which means there is little spare material that can be lost before the column loses capacity. REMEDIATION: It is not possible to know the true extent of corrosion until it is exposed by removing the surrounding masonry. Any rehabilitation of the Tivoli should include the careful investigation of the embedded steel columns, which will likely require removal of exterior and interior finishes in order to repair.
Walls	OBSERVED: There is great concern over the performance of the exterior brick wall in saturated conditions and exposed to freeze-thaw cycles in many locations. The balance of the wall assembly consists of asbestos-containing plaster applied to metal lath, which is secured to wood nailing strips set into the terra cotta tile. The nailing strips have fully deteriorated in several locations, leaving a void in the bed joints for the terra cotta and causing the plaster to fail. The metal lath is also corroding. These conditions are undoubtedly present across many other locations where the plaster has not yet fully failed. REMEDIATION: Any rehabilitation of the Tivoli should include a comprehensive investigation of the condition of the terra cotta backup wythe for the exterior wall, and the

	condition of wall ties where there is a cavity between terra cotta wythes. Any rehabilitation should also consider how the exterior wall might perform as part of a modern insulated wall assembly, especially the terra cotta. Hygrothermal modelling of any new wall assembly should consider the fact that much of this wall is quite saturated and will take years to fully dry. If salvage and reinstating asbestos-containing materials such as the plaster interior finishes were possible, removal of the plaster to avoid damage during the investigations and repairs does not seem practical.

1.4. Summary

Based on our review of these reports, we find that the building conditions allow no opportunity to retain the remaining historic interior building fabric as summarized below.

Abatement of Designated Substances Impact on Plaster Heritage Features

Plaster finishes of the walls, ceilings and ornamental mouldings are asbestos containing. Damaged plaster is in a friable condition and requires abatement. Because of the debris and plaster damage present, the report recommends that all building surfaces be treated as contaminated with asbestos fibres. The report recommends Type 3 abatement operations, recommending full removal of the contaminated plaster as noted in the report costing.

The statuary are isolated elements and could be encapsulated and relocated elsewhere and potentially integrated into the proposed interpretive centre.

Asbestos is a group of class I (WHO) carcinogenic fibers, and the main cause of mesothelioma. The role of asbestos in inducing lung cancer is well established and estimated to be six times larger than the mesothelioma incidence. https://www.lungcancerjournal.info/article/S0169-5002(24)00395-7/fulltext

Structural Remediation Impact to Heritage Features

Remediation required for the building exterior, roof and framing system requires major construction – replacement, reinforcement or rebuilding.

The interior plaster fabric is integral to these structural components. Plaster is installed on metal lath suspended from the existing roof structure. Plaster on the interior side of the exterior walls is also installed on metal lath which has corroded due to moisture and can't be reused. Interior clay tile walls where lath and plaster are attached have moisture damage.

As noted in the structural remediation notes, wall and roof structures that are supporting the existing plaster finishes require demolition, reinforcement and/or instatement of new structural elements. To undertake work to building structure, asbestos containing plaster will need to be complete removed and remediated to allow access to base building structural elements that require upgrading or replacement. These interventions listed in the Cooke report include:

- Investigations of column conditions,
- Repair of steel columns,
- Replacement of all gypsum roof deck panels,
- Reinforcement of roof trusses if required,
- Complete localized rebuilding and repairs of masonry walls from exterior,
- Investigate and locally replace failed terra cotta tile along the interior,
- Investigate and reinforce wall ties as required.

Guidance on Conservation

With replacement of the structural elements and interior finishes of the building required, the work would be described more as renovation instead of conservation. Guiding principles for the conservation of historical properties are provided in the Ontario Heritage Toolkit. The goal of conservation is to:

- repair rather than replace building materials,
- use minimal intervention to maintain the historic content of the resources,
- keep new work legible so it can be distinguished from the original.

Since conservation of the physical building and heritage attributes is not feasible as defined, there is loss of building integrity and heritage value. Conservation must rely on a high level of historical documentation – historical photographs, drawings and physical evidence. Design guidelines for the new development should include reference to or dialogue with the unique features of the Tivoli Theatre such as the James St main entrance, the marquee, the building prominence such as massing, materiality and fenestration, and the grandeur of the theatre space.

2. Key Principles of the Design in the New Development

The rich history of the Tivoli Theatre began as a Carriage Factory constructed in 1875. Over the years it adaptive to various uses such as a storefront nickelodeon, a combination vaudeville and movie house, and a venue for live state shows. Along the way it became one of Hamilton's largest theatres and a part of the collective memory of its citizens. Capturing the history, the excitement and experience of the Tivoli Theatre is important to maintaining its presence in the future which can be achieved through interpretation planning and design.

Heritage interpretation is the communication of the meaning of a place through a variety of media.

The proposed new residential development will honour the legacy of the Tivoli Theatre through multiple measures architectural and interpretive material:

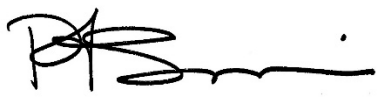
- Reinstatement of the lobby and new marquee in the same location as the original Tivoli theatre along James St N, introducing a reinterpretation and commemoration of the original carriage factory building in the heritage streetscape.

- A new public interpretive center and theater lobby, accessible from James Street North, will feature a commemorative gallery. The commemorative elements and interpretive materials will chronologically document the detailed history of the Tivoli Theatre, from its origins as a carriage factory to its eventual closing. This rich history will be showcased through various multimedia exhibits, including print and electronic publications, interactive installations, and a virtual reality tour. The VR experience will incorporate point cloud building scans undertaken by the owner, allowing visitors to immerse themselves in the grandeur of the theatre space and explore it as though they were physically present.

- A new event space will feature a design that pays homage to the heritage fabric of the original Tivoli Theatre. Through contemporary design elements, the space will embody the spirit and character-defining features of the historic venue, creating a thoughtful commemoration of its legacy. These features will engage users by blending modern aesthetics with the timeless charm of the original design, fostering a meaningful connection to the theater's storied past.

I trust that this provides sufficient additional detail, but look forward to your comments.

Best regards,
+VG Architects



Paul John Sapounzi
BES BARCH OAA NSA MAA FRAIC CAHP AIA
Chief Executive Officer

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

Aventus Development Corp.
1418 Ontario St
Burlington, ON L7S 1G4

November 27, 2024

Project No. 24059

Attn: Mitch Gold (mgold@aventusdevelopments.com)
Jason Smith (jsmith@riserealestate.ca)

RE: Tivoli Theatre
Update to Condition Assessment

Dear Messrs. Gold and Smith,

We understand that an application was made to demolish the property, which was discussed at the most recent Heritage Permit Review Sub-Committee. We further understand that the Sub-Committee requested some additional information be provided in advance of consideration of this application at the Hamilton Municipal Heritage Committee, among this:

> *2. Clarity on the severity of the structural issues and what it would take to make the building sound. What steps would be needed to repair the envelope and replicate the interior heritage features, and what would the approximate cost be? The Councillor has indicated he is specifically interested in understanding cost, though I recognize that cost was not necessarily the deciding factor for the applicant in this case.*

This letter is intended to provide additional requested information with respect to the building's structure and envelope, and to otherwise provide an update to the report on the condition of the Tivoli Theatre prepared by John G. Cooke & Associates Ltd. (JCAL) in January 2024 (our report). Our report was written in anticipation that it would form part of a broader document package that would include architectural considerations and discussion on the outcome for the building. As it ultimately did not, and as it is clear that there are differing views on what should happen with the building, this letter therefore seeks to highlight some of the findings of our report and otherwise provide some further observations and opinions that we believe should be considered as part of that debate.

Given the span of time between our report and this latest request, Jonathan Dee, P.Eng., ing., CAHP, and Sarah Francisca, EIT, CAHP Intern, of John G. Cooke & Associates Ltd. visited the site in the afternoon on Friday, November 22, 2024, accompanied by yourselves and Paul Sapounzi of +VG Architects, to review current conditions.

In very brief summary, as it is relevant to understanding this letter, the theatre's auditorium is constructed with

- gypsum-based roofing panels supported by steel roof framing, and steel trusses spanning the width of the auditorium,
- steel columns embedded in the exterior walls, and
- exterior masonry walls that consist of a brick exterior wythe keyed into a terra cotta tile backup, to which the interior finishes are applied.

<u>Structure</u>

Foremost is to update regarding the risk posed by conditions at the re-entrant corner along the south wall of the auditorium (location marked in Fig. 1). In our report we identified concerns with movement of the pier at this corner, which at the top is displaced by approximately 3-4" towards the north, separating from the wall to its south (see Figs. 2, 3, and 4). The roof has failed adjacent to this pier and we identified the potential for corrosion of the steel column that we believe is embedded within it. In February 2024, we designed

shoring for the truss that bears on this pier/column, including lateral attachment where the return wall meets the column pier. While we were advised that the shoring had been installed, our most recent review confirms this is not the case, and we understand that there was a miscommunication from employees previously with Aventus. You have confirmed that this shoring will be given utmost priority, and will be installed by Thursday November 28, 2024.

While no failure to the column or truss has occurred since our January review, it is very important to install this shoring immediately and for it to be in place before any significant snowfall would add load to the roof. Actively leaking in January, a roof repair above this pier has now fully failed and daylight is visible in the attic.


Fig 1: Aerial view, with area of concern identified.

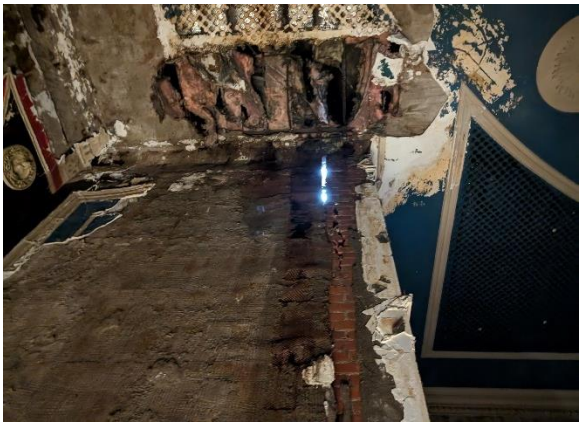


Fig 2: Pier separating from wall, from interior.


Fig 3: Pier separation, from attic, in Jan 2024.


Fig 4: As Fig. 3, in Nov 2024, with failed roof.

There are signs of water infiltration at other column locations, as well as signs of previous corrosion-jacking having damaged the masonry, such as cracking at columns and a control joint that appears to have been cut into the wall in one location along the alleyway to the north. As they must only support a single level, the columns themselves are not very large, and appear to have a flange thickness of only around 1/4”. As opposed to larger historic buildings with larger columns, there is not much spare material that can be lost before the column loses capacity. Typically we have found in buildings of this era that no anchors are provided between columns and the adjacent masonry, which can also result in issues.

Corrosion of steel embedded in masonry is a very common problem for buildings constructed before modern rain screen wall systems. It is not possible to know the true extent of corrosion until it is exposed by removing the surrounding masonry. An example can be seen at Fig. 5, where after removing some cracked masonry and concrete around a column supporting eight levels below the wing of a historic hotel in Quebec City, we found the column to have completely failed. Given the roof leaks and the lack of heat in

the building to assist drying, we are concerned with the risk that corrosion of steel columns embedded in the walls of the Tivoli's auditorium is present and ongoing.

Any rehabilitation of the Tivoli should include the careful investigation of the embedded steel columns, which will likely require removal of exterior and interior finishes in order to repair.

Fig 5: Example of severe concealed corrosion.

Fig. 6: Roof deck, inset w/ panel composition

The other key issue with the building's structure is the roof deck, which consists of gypsum panels. Leaks throughout the auditorium roof have resulted in deterioration of this deck (see Fig. 6). Gypsum roof deck panels were a relatively common cost-effective option in early 20th century construction, and consist essentially of plaster of Paris mixed with wood shavings (see inset on Fig. 6), cast into panels with integral steel reinforcing. The panels were fire resistant, lightweight, insulative, and minimized the potential for condensation at the underside of the deck. This latter absorptive quality is also the reason the material is very susceptible to moisture damage, making it a terrible choice as a durable roof deck, especially for a flat roof. We do not believe it is safe to walk on the roof of this building without fall protection, nor would we recommend the continued service of the roof deck.

An insulated roof deck is often desired as part of rehabilitation work. While the existing roof trusses have a history of adequate performance, the marginal insulation offered by the gypsum panels has likely effectively reduced snow loading. The addition of any insulation should include the analysis of the existing trusses to confirm their ability to resist the full design snow load, and any necessary reinforcement identified and installed.

Walls

The walls of the auditorium consist of exterior brick built integrally with backup terra cotta tile. This is not a poor performing wall when in good condition and in a typical heated and weather protected application, but we are very concerned with its performance in a saturated condition exposed to freeze-thaw cycles, a combination which exists in many locations. Moisture transmission through the wall will also transport and deposit soluble salts, which is also detrimental.

The balance of the wall assembly consists of asbestos-containing plaster applied to metal lath, which is secured to wood nailing strips set into the terra cotta tile. In several locations the nailing strips have fully deteriorated, leaving a void in the bed joints for the terra cotta and causing the plaster to fail. The metal lath is also corroding. Many curtains hung up against the interior walls of the auditorium are wet and retaining moisture against the wall. We are not environmental consultants but it seems very likely that mold is present. t Rotted nailing strips and corroding lath are undoubtedly present across many other locations where the

plaster has not yet fully failed. Closer to the auditorium the plaster is applied to a separate interior wythe of terra cotta that curves inward towards the stage, and here the plaster is in better condition. Unfortunately, the condition of the underlying terra cotta in the exterior wall is obscured, and there exists the risk that concealed corrosion of wall ties has been occurring.

Any rehabilitation of the Tivoli should include a comprehensive investigation of the condition of the plaster attachment, the condition of the terra cotta backup wythe for the exterior wall, and the condition of wall ties where there is a cavity between terra cotta wythes.

Any rehabilitation of the Tivoli should consider how the exterior wall might perform as part of a modern insulated wall assembly, especially the terra cotta. Notwithstanding how insulation might be installed, the significant energy loss through uninsulated walls is typically attempted to be addressed in rehabilitation projects. Analysis of both the brick and the terra cotta substrate to confirm freeze-thaw resistance and dimensional stability should inform hygrothermal modeling of any new wall assembly, including the amount of allowable insulation (if any) and the application of air and moisture barriers. Modeling should consider the fact that much of this wall is quite saturated and will take years to fully dry.

It is understood that the heritage fabric to be conserved at this building consists of the plaster interior finishes. Assuming it would be allowable to salvage and reinstate asbestos-containing material, removing the plaster from the substrate to avoid damage during the above-noted investigations and repairs does not seem practical, and any such work would be made more difficult still as it contains friable asbestos.

Interventions Required

At minimum, the following scope of work is required to conserve the building shell:

- Investigate the condition of columns.
  - This may be required at all columns.
  - Scope could potentially be reduced if one can confidently correlate the condition of exposed masonry with that of the underlying steel.
- Repair steel columns as required.
  - The scope here is fully unknown at this point but could be substantial.
  - Confirm existing steel is weldable.
  - Repairs typically involve reinforcing columns by adding welded plates/angles, but can range to wholesale replacement where severe corrosion exists.
  - Exposed columns should also be protected from future corrosion with at least a marine epoxy paint.
- Replace all gypsum roof deck panels.
  - This would presumably be done with steel deck.
- Reinforce roof trusses, if required.
  - This is unknown but as the benchmark national building code edition for snow loading is 1960, and 1965 for snow drifts, this is a potential issue, especially around roof obstructions (RTUs, doghouses, etc.). Must assess trusses and secondary roof framing.
- Complete localized rebuilding and repairs of masonry walls, from exterior.
  - Repoint failed cracks, rebuild parapets, etc.
  - Add masonry anchors along steel columns.
- Investigate and locally replace failed terra cotta tile along the interior.
  - This scope is fully unknown and would be very challenging to determine without at least localized removals of the plaster, throughout.
  - Deteriorated sections of terra cotta tile would be replaced, with a compatible material.
- Investigate and reinforce wall ties, as required.
  - This scope is fully unknown at this time pending a substantial amount of exploratory openings.
  - Install supplementary wall ties, as required where existing ties are ineffective or have failed/corroded.
  - New ties could potentially consist of helical ties driven through the interior plaster, and across the wythes of tile.

The above should be considered a minimum, based on existing information. Other issues and concerns regarding the structure and envelope would likely come up when the building is considered by a team of consultants for the various disciplines required for a full rehabilitation project. The above does not consider any foundation, slab on grade, or basement-level work which is required. Any excavation below the slab on grade should also consider the potential for contaminated soil, which we occasionally find in historic fill below these slabs.

Potential rough costs for the superstructure and building shell are as follows:

Column investigation and wall/finish repairs*	$	250,000.00
Column repairs (placeholder) *	$	500,000.00
Roof deck removal and replacement *	$	1,500,000.00
Roof truss repairs (placeholder) *	$	200,000.00
Asbestos, shoring, scaffolding.	$	1,000,000.00
Exterior wall repairs and rebuilding	$	750,000.00
Interior wall investigation, repair (placeholder**)	$	250,000.00
Wall tie investigation, repair (placeholder**)	$	250,000.00
	$	**4,700,000.00**

* Roofing replacement is required to prevent further water ingress. To do this, the roof deck must be replaced, and therefore columns must also be investigated and repaired. Trusses must be assessed and reinforced as well, if insulation is to be added.

** Repairs across 20% of terra cotta wall area is assumed.

It is almost impossible to come up with a budget without far more investigation and determination of the true scope of work required to rehabilitate the building shell. We would recommend that any budgeting for this project include a large contingency of at least 25%. Effectively addressing the ongoing water ingress requires the completion of most of the above-noted work.

Closing

It is understood that this letter, and presumably the associated report, may be provided to the Heritage Committee where I hope it can better inform the discussion on the fate of the Tivoli theatre.

While the Tivoli clearly has an important place in the City's history this building is nonetheless in an advanced state of deterioration. This building presents very significant challenges, not only to a potential rehabilitation but even to mitigating the ongoing water ingress in the interim, and addressing either of these would require significant funding and the acceptance of a high risk of scope, schedule, and cost increases due to investigation findings and site conditions.

As a structural engineer I am less equipped to comment on the social and community aspect of the ongoing discussion, but my experience in the preservation and adaptive re-use of many buildings would suggest that this building is at least pushing very hard on the limits of what can reasonably and realistically be achieved as part of a redevelopment project.

It is important to bear in mind that deterioration of this building will continue to progress at an increasing rate. There is a high likelihood that dangerous conditions will develop in the near term and, more concerningly, that others may currently exist that we cannot see.

By now the building has sat as the object of debate for many years while its condition deteriorates. The Owner wishes to demolish it and does not have a business case wherein they are willing to accept the significant costs and risks associated with retaining it. Heritage advocates, who's cause I support, do not wish to lose what was once a vibrant space in the community. I am concerned about the risks to the public posed by the building right now, let alone in the coming years. The liability of leaving this building to deteriorate further is unacceptable. Unless there is a realistic prospect of immediately undertaking a project in line with what is described above, then I must regrettably recommend that this building be demolished without further delay.

Disclaimer and Limitations

This report is based on and limited to information supplied to John G. Cooke & Associates Ltd. by Aventus Developments personnel, and by observations made during walk-through inspections of the Tivoli Theatre Building. 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 of our requested 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 Aventus Developments Corp. 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.

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

Sincerely,

JOHN G. COOKE & ASSOCIATES LTD.

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

JD/jd
24059/ltr_02

November 23, 2024 Access File: 10113.003

Aventus Development Corp.
1418 Ontario Street
Burlington, Ontario L7S 1G4

Attention: Mitch Gold, Planning Analyst

Re: High-Level Opinion on Probable Costs for Abatement
Former Tivoli Theatre - 108 James Street North, Hamilton, Ontario

Access Environmental Solutions (Access) is pleased to provide Aventus Development Corp. (Aventus/ Client) with a high-level Opinion on the Probable Costs (OPC) associated with the abatement of designated substances (including asbestos) and hazardous building materials identified to be present in the former Tivoli Theater building located at 108 James Street North, Hamilton, Ontario.

This OPC review was conducted at the request of Aventus to aid in making informed decisions regarding the redevelopment of the site.

An assessment was completed by Access as documented in the report titled “Designated Substances and Hazardous Building Materials Assessment, Final Report, Former Tivoli Theatre, 108 James Street North, Hamilton”, dated April 9, 2024, Access File No. 100113.002 which revealed the following:

Asbestos-Containing Materials (ACM)

- parging insulation (Alabastine®) applied to the brick chimney wall (likely extending from the main level to the roof)
- floor tiles, mastic and levelling compounds at various locations within the building
- pipe and fitting insulation (in poor condition) located in the crawl space below the front lobby area (similar insulation may be concealed in other areas of the building)
- textured finish on walls and ceiling of a storage room
- cementitious coating on boiler room walls
- plaster on walls, ceilings, and possibly ornamental mouldings present throughout the building

The asbestos-containing plaster is in poor condition, with debris observed throughout the premises. As a result, all building surfaces are considered contaminated with asbestos fibres.

In addition to the ACMs listed above, the following building materials, suspected to be present but inaccessible for sampling, are presumed to contain asbestos until further testing confirms otherwise:

- flexible fabric connectors on ductwork
- sheathing on electrical wiring throughout subject building
- electrical components within electrical panels, switches, breakers, fuse holders, light fixtures etc.
- cast iron pipe connections
- gaskets
- buried cement-based pipes / conduits
- roofing materials including felts, flashing, underlayment, roofing paper, vapour retardants, adhesives, caulking, sealants etc.

Lead

- Lead is present in previously tested paint and surface coatings, with concentrations ranging from <0.0005% (5 ppm) to 3.67% (36,700 ppm).
- Untested paint and surface coatings are presumed to contain lead.
- Paint and surface coatings are in deteriorating condition, with extensive peeling, flaking, and debris observed throughout the premises.
- Lead is also presumed to be present in the following materials: batteries (e.g., emergency lighting, exit signs), cable and wire sheathing, cast iron pipe gaskets and connections, pipes, solder (used in domestic water lines, bell fittings for cast iron pipes, and electrical equipment), and structural steel primers.

Mercury

- compact fluorescent lights
- paints and adhesives

Silica

- concrete and cement
- masonry and mortar
- block walls
- drywall
- paints
- plaster and stucco

Polychlorinated Biphenyls (PCB)

- electrical equipment including transformers, capacitors, pot heads, cables

Ozone-Depleting Substances (ODS)

- Rooftop HVAC units

Mould

- Mould growth is prevalent on various surfaces throughout the building due to ongoing water damage and leaks.

Biological Contaminants

- Animal waste observed in several parts of the catwalk space / ceiling plenum, particularly beneath the fibreglass batt insulation. Given the state of the building, it is likely that similar waste is present in other areas of the building.

Based on the assessment, the following cost elements and corresponding activities have been identified for the building's redevelopment to support either building demolition or renovation.

1. **Removal of Asbestos-Containing Materials**
   - The project will be completed in compliance with the requirements of the Ontario Occupational Health and Safety Act (OHSA) including O. Reg. 278/05 (asbestos regulation) and O. Reg. 490/09 (designated substances regulation).
   - Due to the significant damage to asbestos-containing materials, all work must adhere to the highest level of precautions as outlined in O. Reg. 278/05 for Type 3 operations.
   - The scope of work includes the removal of all confirmed and presumed asbestos-containing materials identified above.
   - The work will require setting up the entire building as a Type 3 asbestos abatement area, including sealing any voids in the building envelope, such as the roof, to maintain the negative pressure necessary for abatement activities.
   - The project will involve supplying and installing a sufficient number of negative air machines to sustain adequate negative air pressure for the duration of the work. This is a requirement for Type 3 abatement work areas unless the building is to be demolished and will not be entered by any person except workers involved in the operation and workers involved in the demolition of the building.
   - A worker decontamination facility, including separate clean-side and dirty-side change rooms as well as an integrated showering area, will be established.
   - All workers involved in abatement activities will wear personal protective equipment, including disposable coveralls, gloves, appropriate full-face respirators, and additional safety gear such as hard hats, safety footwear, and harnesses for those working at heights.
   - Non-fixed materials to be salvaged (i.e., ornaments, statues etc.), will require cleaning using HEPA vacuuming and wet wiping methods prior to removal from the building.

- Fixed building components, such as theatre seating, will need to be removed and either cleaned using HEPA vacuuming and wet wiping methods prior to disposal as clean waste or not cleaned and disposed of as asbestos waste. This is due to the potential contamination from damaged asbestos plaster and settled asbestos fibers.
- Due to the height of the theatre's plaster ceiling, it may be necessary to remove the theatre stage to facilitate the entry of man-lifts through a bay door off Hughson Street North. Alternatively, scaffolding could be erected; however, the associated costs may not be the most cost-effective solution for accessing and removing the plaster ceiling.
- All generated asbestos waste will be double-bagged in labeled waste bags and disposed of at an approved facility in accordance with regulatory requirements.
- Clearance air monitoring by a qualified asbestos consultant is a regulated requirement for Type 3 operations unless the building will be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition.
- Unless measures are implemented to expose the asbestos-containing pipe and fitting insulation located in the crawl space beneath the concrete floor slab of the lobby (the preferred approach), confined space procedures will need to be followed to safely access the area for abatement activities.
- Water, electricity, and potentially heating (depending on the season) will need to be provided to support abatement work.
- Given the roof's condition (water-damaged), a detailed plan must be developed to implement special measures ensuring the safe removal of roofing materials.
- Due to damage to building components caused by water leaks, which has led to structural deterioration, the abatement of asbestos-containing materials should be planned out alongside a comprehensive review and planning of structural engineering considerations.

2. **Management of Lead-Containing Materials**
   - Lead remediation work will be undertaken in conjunction with the Type 3 asbestos abatement operations listed above.
   - Loose and flaking paint, as well as extensive paint debris present throughout the interior, confirmed and presumed to contain lead, will require removal and disposal in compliance with the requirements of Ontario Waste Management Regulation O. Reg. 347/90.
   - Building materials containing lead will require testing for leachable lead prior to disposal as they may be subject to classification as hazardous waste.
   - Lead-containing batteries should be recycled when taken out of service.

3. **Management of Mercury-Containing Materials**
   - Complete removal and proper disposal of mercury-containing equipment is required when the equipment is taken out of service, prior to renovation or demolition work.
   - Mercury is a hazardous waste and should be disposed of in accordance with the requirements of O. Reg. 347/90. As a preferred alternative, mercury-containing equipment can be sent for recycling.

4. **Management of Silica-Containing Materials**
   - The safe work practices in accordance with the requirements of the OHSA are to be followed for the disturbance of silica-containing materials.

5. **Management of PCB-Containing Materials**
   - Prior to decommissioning, the PCB content of electrical equipment will need to be reviewed.
   - Equipment confirmed to contain PCBs should be handled, stored, and disposed of in compliance with all applicable federal and provincial regulations.

6. **Management of ODS-Containing Materials**
   - Prior to decommissioning, equipment containing or suspected to contain ODS refrigerants will require decommissioning by a licenced refrigeration technician.

7. **Management of Mould and Biological Contaminants**
   - If the building is not demolished, mould remediation work should be undertaken where mould-impacted and water-damaged building materials are identified. The work should be completed by specialized mould abatement contractors following the safe work practices and precautions provided in the EACC publication entitled “EACC Mould Abatement Guideline”, Edition 3, (2015).
   - Mould clearance air monitoring will be required after the removal of mould-impacted building materials and before protective measures are lifted if the building is not being demolished and renovations are planned.
   - EACC Level 3 operations should be implemented in conjunction with O. Reg. 278/05 Type 3 operations listed above for the remediation of mould-impacted building materials.
   - In areas where extensive or significant amounts of mould or animal waste-contaminated materials are present or suspected, manual or hand-demolition activities should be avoided; instead, heavy equipment should be utilized.

- Dust suppression measures should be employed throughout the demolition process.
- Heavy equipment operators and nearby workers should implement appropriate health and safety protocols and use adequate personal protective equipment (PPE), such as respirators and protective suits, to safeguard against airborne dust generated during demolition activities.

1.0 ASSUMPTIONS AND LIMITATIONS

The OPC provided is based on the following assumptions/limitations:

- Asbestos has been identified in the plaster finish coat but not in the base coat consistently throughout the building, based on sampling conducted to date. Further extensive sampling is recommended to confirm this initial finding.
- The effort required to remove the asbestos-containing plaster remains uncertain and may impact abatement costs. Conducting a trial removal would provide valuable insight into the level of effort needed, enabling a more accurate cost estimate.
- Roofing materials are presumed to contain asbestos. Due to the potential costs associated with removing the roofing as asbestos-containing material, it is recommended to conduct sampling and testing to confirm asbestos content and determine the extent of abatement work required.
- OPC is provided based on rough estimates of the building size and layout.
- If the building is to be salvaged and renovated, the extent to which hidden mould-impacted building materials are present is uncertain. Full costs may not be known without a more intrusive inspection to uncover hidden issues such as the extent of water damage and mould growth.
- Structural instability, water damage, or degradation of building materials and components can complicate abatement activities and increase costs.
- The OPC excludes costs related to the management and disposal of large-format equipment such as transformers that may contain PCBs, which were not observed during the initial assessment. The costs outlined below pertain to the removal and disposal of lighting ballasts, contingent on PCB presence being confirmed during removal.
- The OPC is based on current prices for labour, equipment, materials and waste management. An increase in these costs due to market changes, seasonal variations, weather conditions etc. could affect the final abatement and remediation costs.
- The costs for professional consulting services, including additional assessments (e.g., roofing), preparation of abatement specifications, support during construction including oversight inspections, clearance air testing etc., should be considered and are estimated below.

2.0 HIGH-LEVEL OPINION ON PROBABLE COSTS (OPC)

Cost Element	Opinion of Probable Costs (OPC)
O. Reg. 278/05 Type 3 operations for the abatement and disposal of identified asbestos-containing materials within the theatre	$965,000*
Abatement and disposal of roofing materials	$150,000*
Management of lead-containing materials (undertaken in conjunction with asbestos abatement operations)	-
Management of mercury-containing materials (undertaken in conjunction with asbestos abatement operations)	-
Management of silica-containing materials (measures implemented during building renovation or demolition work)	-
Management of PCB-containing materials	$5,000*
Management of ODS-containing materials	$5,000*
Management of mould-impacted building materials and other biological contaminants in conjunction with Type 3 asbestos abatement operations (assumes building demolition)	-
Professional consulting support services	$15,000*
Total	$1,140,000*

* plus / minus 30% to 50%
OPC excludes all taxes

The high-level Opinion of Probable Costs provided above has been developed based on currently available information and general assumptions about the scope and complexity of the project. The OPC was prepared in collaboration with a contractor specializing in the abatement of asbestos and other hazardous building materials. It is important to note that the OPC is intended as a preliminary estimate and may not fully account for all variables, such as unforeseen site conditions, hidden/concealed materials or changes in the project scope. Additional detailed assessments and planning may be required to refine the cost estimate.

3.0 GENERAL LIMITATIONS

The work performed by Access is conducted by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time and geographic location the work is performed.

The findings of the assessment represent the best technical judgment of Access based on the information made available by the Client and on the site conditions encountered by Access at the date and time the work was performed. The findings are limited to the areas assessed based on the mutually agreed to scope of work. The extent of the area that was assessed may be limited by various factors including

building construction and conditions, subsurface conditions, concealed or obscured areas, weather, building usage, occupancy and other factors. Due to the nature of the investigation and the limited data available, Access cannot warrant against undiscovered environmental liabilities. Conclusions presented in the report or other information provided should not be construed as legal advice.

No warranty is either expressed or implied, or intended by this agreement or by furnishing oral or written reports or findings. Access's liability will be limited to the lesser of the fees paid or actual damages incurred by the Client. Access will not be responsible for any consequential or indirect damages and can only be liable for damages resulting from the negligence of Access.

4.0 CLOSURE

We trust this report is in accordance with your requirements. Should you have any questions or require clarification on any aspect of this submission please feel free to contact the undersigned.

Sincerely,

ACCESS ENVIRONMENTAL SOLUTIONS

Andy Andriotis, P.Eng.
Principal Consultant, Author
226-989-8082
andy@accessenvironmental.ca

Rita Nabbe, BSc (Chem)
Quality Reviewer
226-929-9528
rita@accessenvironmental.ca

https://accessenv-my.sharepoint.com/personal/andy_accessenvironmental_ca/Documents/AccessES/Projects/10113 RiseRealEstateInc/003 AbtConslting108JamesStNHamilton/Report/10113.003 OPC for Abatement at Former Tivoli Theatre Aventus Nov 23 2024.docx