



## Regular Council Meeting

<b>To:</b>	Mayor and Council
<b>Date:</b>	December 16, 2024
<b>From:</b>	Chris Allison, Parks and Facilities Manager
<b>Report Number:</b>	Parks and Facilities 2024-05
<b>Subject:</b>	Mould Assessment Results and Required Remediation at Millbrook Arena

### Recommendation:

Information report to advise Council on the results from a recent Mould Assessment conducted at the Millbrook Arena.

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### Overview:

On September 13, 2024, Cambium Inc. (“**Cambium**”) provided a report (the “**Cambium Report**”) (Attachment No.1) setting out the results of air sampling conducted at the Millbrook Arena (the “**Arena**”) as part of the Township’s annual inspections to test for the presence of mould and evaluate airborne mould levels to ensure the facility can be safely used by the public and Township employees. The results revealed an increase in airborne mould levels within the lobby and second floor hallway areas of the Arena, when compared to the April 2023 testing results.

Upon seeking legal advice, the Township was advised to take a precautionary approach and requested that Cambium undertake additional sampling at multiple locations frequently used.

With the presence of mould being identified in previous facility reviews and the results of recent air quality testing conducted by Cambium and the advice of legal counsel the Arena was closed to the public on October 18, 2024, as a precautionary approach to protect the health and safety of the Arena patrons and Township employees. Township staff retained Cambium to perform a Mould Assessment including additional air and bulk sampling throughout the facility, and the Mould Assessment report was finalized on December 6, 2024 (the “**Cambium Mould Assessment**”). Barry Bryan Associates (“**BBA**”) was requested to provide a review of the Cambium Mould Assessment and provide an order of magnitude budget to address and remediate the mould as per Cambium’s recommendations.

Key findings that are outlined in the Cambium Mould Assessment include extensive mould growth across building materials and surfaces and high airborne mould spore concentrations, posing potential health risks. Recommendations include Level 3 mould removal of impacted materials gypsum finishes, acoustic ceiling tiles, wood trim, fibreglass insulation and vapour barrier. Cleaning and disinfecting mould impacted concrete, removable rubber flooring, and all stored items throughout the building. Cleaning and disinfecting non-porous materials and HVAC systems is required and moisture intrusion sources must be repaired before reinstating finishes. Additional air quality testing post-remediation is recommended to verify that effective remediation has occurred and that health and safety is protected.

Based on the findings in the Cambium Mould Assessment, BBA was retained to complete an “order of magnitude” budget for the work required for the mould remediation which includes associated general construction costs and contingencies. (Attachment No.3).

The total Construction Budget would be approximately \$1.91M of hard construction costs, and \$2.63M with modest contingencies to proceed with the remediation to restore the Arena’s functionality status quo.

It is recommended that the Arena be closed to the public based on the findings of the Cambium Mould Assessment. Staff is requesting Council’s direction pertaining to the future of the Millbrook Arena as per this report.

The last direction was in June R-2023-168

Moved by: Graham

Seconded by: Huntley

That Staff be directed to commence planning for the creation of a community park on the Millbrook Arena lands; and

That the existing users of the Millbrook Arena be permitted to use the existing facility in its current state until the final plans for the community park are approved by Council or that the facility becomes a health and safety concern; and

That Council’s direction be carried forward in Phase Two of the Parks and Recreation Plan – Vision 2035.

## **Background**

The Township conducted a Designated Substance Survey for the Arena in April 2023, which included mould testing and associated air sampling. While mould was detected during this survey, the results of air quality testing conducted by Cambium and laboratory analysis by EMC Scientific Incorporated in April of 2023 did not indicate significant risk in the indoor air quality at that time, and Cambium recommended annual testing to monitor the issue.

On September 13, 2024, Cambium provided the Township with the Cambium Report, setting out the results of air sampling conducted at the Arena as part of the Township's annual inspections to determine if mould spores are present to ensure the facility can be safely used by the public and Township employees.

The September 2024 Cambium Report and sampling results revealed an increase in mould spore levels at two sampling locations, within the lobby area of the Arena as well as a location on the second floor, when compared to the April 2023 testing results. The September 2024 Report did not include testing in the main Arena area, washrooms and dressing rooms which are rented by sports teams. The Township sought legal advice, from Aird & Berlis, LLP to review and provide advice on the Cambium Report as it relates to the Arena. The Arena is typically rented in the fall, winter and spring to soccer and lacrosse teams and the facility users are comprised of a predominately sensitive sector, including child and youth soccer players.

On the advice of legal counsel, the Arena was closed to all members of the public on the morning of Friday, October 18, 2024. The Township was advised to take a precautionary approach to protect the health and safety of the Arena patrons and employees and: (i) request that Cambium conduct additional air and bulk sampling throughout the areas of the Arena frequently used by the public, in light of the increase in mould spores between 2023 and 2024, and (ii) close the facility until the results from the sampling were received. The Township was advised to ensure that the main arena space was tested because this space is used by sensitive populations for sport. Previous testing was limited to two locations and did not include the main arena space. As a result, the extent of potential mould impacts and exposure risks were unknown. Additional testing was required to enable the Township to understand the nature and scope of the risk.

All arena users were notified that rentals of the main Arena space to sporting teams would be suspended until further testing, sampling and implementation of any necessary corrective actions to ensure a safe and healthy environment for all staff and users.

Cambium conducted additional testing, as soon as possible after the October 18<sup>th</sup> closure, on October 21, 2024 and October 31, 2024. Cambium did extensive testing collecting 21 air samples and 17 bulk samples.

### **Legal Framework and Recommendation**

From a legal standpoint, the Township is obligated under both common law, the *Municipal Act, 2001* and the *Occupiers' Liability Act* to ensure that municipally owned facilities are reasonably safe for users and employees and to take appropriate actions to ensure the health and safety of municipally owned and operated facilities. Allowing continued access to the Arena without addressing the mould issue could breach this duty of care. Failure to close the Arena and investigate the risk, harm the health of facility users and employees and could also result in the Township facing claims of

negligence and breach of the *Occupiers' Liability Act*, potentially resulting in costly litigation and reputational damage.

Employers, including municipal employers, are required by section 25(2)(h) of the *Occupational Health and Safety Act* to take every precaution reasonable in the circumstances for the protection of workers. The *Occupational Health and Safety Act* places a responsibility on constructors (section 23), employers (section 25), and supervisors (section 27) to ensure the health and safety of workers. This includes protecting workers from mould in workplace buildings.

The legal recommendation was to temporarily close the facility until further mould sampling and testing was completed by Cambium, given the rising airborne spore counts seen between the 2023 and 2024 testing. It was understood that should Cambium find evidence of mould or elevated spore levels in other locations within the facility, that Cambium would likely recommend mould remediation procedures. Aird & Berlis advised against any interim use until the testing was undertaken, any recommended remediation of mould was completed and post-remediation air testing was done to ensure the safety of all occupants and users of the space. This approach reflects the Township's commitment to public health and safety while reducing the risk of legal liability.

### **Cambium Report, September 13, 2024 (the “Cambium Report”)**

The Cambium Report was carried out as per the annual testing recommended to the Township in the Designated Substances Survey. Testing was carried out in two locations, the main floor lobby and the second floor bar area. Testing was conducted on August 27, 2024.

The results of the air sampling revealed that mould spore levels were increasing as compared to the 2023 sampling year. Furthermore, the testing did not include the areas of the Arena used as part of its sports rentals. Legal advice was obtained, which recommended more extensive testing to determine if the areas used as part of the Township's sports rental programs were impacted by mould. This work was conducted through Cambium's October 2024 mould testing and reported in the Cambium Mould Assessment.

### **Cambium Mould Assessment, December 6, 2024 (the “Cambium Mould Assessment”)**

Cambium was retained to perform a mould assessment as suggested by the Township's legal counsel to determine if the areas of the Arena rented for sporting use were impacted by mould or airborne mould spores (Attachment No.2). If mould impacts were found, Cambium was asked to identify the probable source and make recommendations for remediating the mould and ensuring the Arena was safe for use.

The Cambium Assessment provides a summary of the results and findings of the mould assessment and outlines the locations, quantities of mould growth and bulk mould



sampling. Impacted materials are identified along with quantity of visible mould (Square Feet).

The Mould Assessment consisted of:

1. Visual assessment of mould growth, water damage, and/or water intrusion;
2. Collection of moisture measurements of building materials;
3. Collection and analysis of 21 mould air samples (includes outdoor benchmark air samples); and
4. Collection and analysis of 17 bulk mould samples.

The Mould Assessment commenced on October 21, 2024. Air samples were collected throughout the facility to determine the types and relative concentrations of fungal spores.

On October 31, 2024, Cambium returned to collect an additional 10 bulk samples. 17 bulk samples were collected in total to confirm the presence or absence of mould where suspected mould growth was observed. Bulk samples were collected from wood, concrete, gypsum, fibreglass insulation, vapour barrier and acoustic ceiling tiles in various locations throughout the building. Where mould growth is confirmed, results identify the types of fungal spores in Appendix B of the report.

*Stachybotrys* fungal spore air sample concentrations were determined to be elevated in eight locations throughout the building. *Stachybotrys* is known to be hazardous to human health and typically encountered in areas with water damaged materials. *Stachybotrys* spores were identified in the men's washroom first floor, spare change room, referees room, change rooms 3 and 4, second floor hall and both second floor washrooms.

*Aspergillus/Penicillium* fungal spore concentrations were determined to be elevated throughout the building in comparison to the exterior reference samples. Although commonly found in indoor environments, some species of *Aspergillus/Penicillium* are known to be toxigenic or allergenic.

Cambium concluded that in comparing the indoor air concentrations to the outdoor reference samples, it is likely that the observed quantity of *Stachybotrys* and *Aspergillus/Penicillium* spores within the building would have an adverse effect on occupants, especially those considered at great risk of experiencing adverse health effects such as infants, children, seniors, pregnant people and those with respiratory conditions such as asthma. Cambium noted that more recently, there is increased recognition that indoor mould and dampness may contribute to the development of asthma, bronchitis and other respiratory infections, as well as eczema.

Cambium recommended implementation of risk management actions to prevent potential exposure and adverse health effects to individuals accessing the facility. Cambium concluded that based on laboratory findings of potentially allergenic, toxigenic or pathogenic mould, risk to general occupants and workers is high. Cambium states

that risk management can include isolating the building from occupants (general public and staff) until successful remedial measures can occur. The use of respiratory protection (suitable for mould) should be considered for at risk individuals who must enter the facility.

Cambium recommended conducting the following mould remediation procedures as outlined in the Environmental Abatement Council of Canada (EACC) guidelines using EACC Level 3 mould abatement procedures:


- a. Remove mould impacted gypsum (drywall) finishes, in conjunction with Type 2 asbestos abatement procedures as outlined in O. Reg 278/05;
- b. Remove mould impacted acoustic ceiling tiles;
- c. Remove mould impacted wood trim;
- d. Remove mould impacted fibreglass insulation;
- e. Remove mould impacted vapour barrier;
- f. Clean and disinfect mould impacted concrete;
- g. Clean and disinfect removable rubber flooring;
- h. Clean and disinfect all stored items and surfaces throughout the building;
- i. Clean and disinfect all other non-porous surfaces (to the extent practical) throughout all other areas of the building utilizing HEPA sandwich cleaning techniques;
- j. Clean and disinfect all supply and return ductwork (including all air handling equipment) throughout the building as outlined in the National Air Duct Cleaners Association (NADCA) standard, 2021 Edition; and
- k. Following all mould abatement work (as well as cleaning and disinfecting), Cambium recommends completing additional air sampling to gauge effectiveness of remedial efforts and ensure safe levels are archived prior to re-occupancy.

Cambium recommended that, prior to any reinstatement activities, all finishes should be verified dry, and all sources of moisture intrusion rectified. Cambium recommends retaining a building envelope specialist to evaluate the cause and source of water infiltration issues associated with the roof of the building.

Barry Bryan Associates Architects, Engineers, Project Managers (“**BBA**”), were retained with the purpose of reviewing the Cambium Mould Assessment, past Cambium reports and past BBA reports including the current site conditions to provide recommendations and a high-level order of magnitude budget relating to the remediation actions required to address current mould issues within the municipal public facility. The Total Construction Budget presented is approximately \$1.9M of hard construction costs, and \$2.63M with modest contingencies (Figure 1.)

Please note BBA did not undertake a full inspection, nor did they request mechanical or electrical engineers to visit the site to review any specific equipment. Its important to note these are high-level estimates based on the remediation plan. Should Council wish to consider remediation the Township will follow its Purchasing By-law and a Request for Proposal or Tender will be required.

**Figure 1.**

<b>Order of Magnitude Budget</b> <b>Millbrook Arena - Moisture Infiltration Repairs and Mould Remediation</b> December 5, 2024				 Barry Bryan Associates Architects, Engineers, Project Managers	
<b>Gross Floor Area:</b>				<b>25000 SF</b>	
				<b>Unit Cost</b>	
<b>Building Shell</b>				<b>\$ 1,250,000.00</b>	<b>\$ 50.00</b>
Roofing	\$	450,000.00			\$ 18.00
Exterior Enclosure	\$	800,000.00			\$ 32.00
<b>Building Interiors</b>				<b>\$ 200,000.00</b>	<b>\$ 8.00</b>
Interior Repairs	\$	200,000.00			\$ 8.00
<b>Ancillary Work</b>				<b>\$ 300,000.00</b>	<b>\$ 12.00</b>
Demolition	\$	50,000.00			\$ 2.00
Mould Remediation	\$	250,000.00			\$ 10.00
<b>Subtotal</b>				<b>\$ 1,750,000.00</b>	<b>\$ 70.00</b>
<b>General Requirements</b>				<b>\$ 157,500.00</b>	<b>\$ 6.30</b>
Contractor's General Requirements	6%	\$ 105,000.00			\$ 4.20
Contractor's Fees	3%	\$ 52,500.00			\$ 2.10
<b>Subtotal (Hard Construction)</b>				<b>\$ 1,907,500.00</b>	<b>\$ 76.30</b>
<b>Construction Allowances</b>				<b>\$ 724,850.00</b>	<b>\$ 28.99</b>
Escalation	8.0%	\$ 152,600.00			\$ 6.10
Design Contingency	15.0%	\$ 286,125.00			\$ 11.45
Construction Contingency	15.0%	\$ 286,125.00			\$ 11.45
<b>Total Construction Cost Incl. Allowances</b>				<b>\$ 2,632,350.00</b>	<b>\$ 105.29</b>


Beyond immediate remediation requirements, the facility also requires modifications, renewal and repairs to ensure that the community facility is in a reasonable state of good repair and meets required community standards. For example, accessibility modifications are required as the building currently does not meet accessibility standards of the Province of Ontario for community buildings.

A total construction Order of Magnitude Budget to bring the Millbrook Arena into a state of good repair was provided to the Township on September 15, 2022. This work is required, in addition, to the work noted in Figure 1 above, and would involve approximately \$4.45M of hard construction costs, and \$5.25M with modest contingencies. The developed budgets recommend a life cycle replacement for a service life of an additional 25 years for the facility to act as a Public Community building. Due to the age and conditions of the existing facility, the upgrades would be considered major and would require substantial funding to achieve. Additional funding may also be required to convert the building to a different use depending on the alternate uses considered. Again, these suggested costs are high-level as of 2022 pricing.

Township staff reached out to BBA and asked for an update report based on the recent findings and today's costs to remediate and renovate the Millbrook Arena based on the Ontario Building Code standards. The Order of Magnitude Budget for the Millbrook Arena Moisture Infiltration Repairs, Mould Remediation and Accessibility Upgrades dated December 11, 2024 is provided in (Figure 2.) The total construction budget

presented is approximately \$4.9M of hard construction costs and \$6.6M with modest contingencies.

**Figure 2.**

Order of Magnitude Budget - R1			
<b>Millbrook Arena - Moisture Infiltration Repairs, Mould Remediation and Accessibility Upgrades</b> December 11, 2024		 <b>Barry Bryan Associates</b> Architects, Engineers, Project Managers	
Gross Floor Area:		25000 SF	
			Unit Cost
<b>Building Shell</b>		<b>\$ 1,250,000.00</b>	<b>\$ 50.00</b>
Roofing	\$ 450,000.00		\$ 18.00
Exterior Enclosure	\$ 800,000.00		\$ 32.00
<b>Building Interiors</b>		<b>\$ 1,000,000.00</b>	<b>\$ 40.00</b>
Interior Repairs	\$ 200,000.00		\$ 8.00
Assessability Upgrades	\$ 800,000.00		\$ 32.00
<b>Mechanical</b>		<b>\$ 1,225,000.00</b>	<b>\$ 49.00</b>
Plumbing and Fixtures	\$ 275,000.00		\$ 11.00
HVAC and Controls	\$ 850,000.00		\$ 34.00
Life Safety	\$ 100,000.00		\$ 4.00
<b>Electrical</b>		<b>\$ 525,000.00</b>	<b>\$ 21.00</b>
Lighting, Devices and Fire Alarm	\$ 525,000.00		\$ 21.00
<b>Site Work Allowance</b>		<b>\$ 225,000.00</b>	<b>\$ 9.00</b>
<b>Ancillary Work</b>		<b>\$ 300,000.00</b>	<b>\$ 12.00</b>
Demolition	\$ 50,000.00		\$ 2.00
Mould Remediation	\$ 250,000.00		\$ 10.00
<b>Subtotal</b>		<b>\$ 4,525,000.00</b>	<b>\$ 181.00</b>
<b>General Requirements</b>		<b>\$ 407,250.00</b>	<b>\$ 16.29</b>
Contractor's General Requirements	6% \$ 271,500.00		\$ 10.86
Contractor's Fees	3% \$ 135,750.00		\$ 5.43
<b>Subtotal (Hard Construction)</b>		<b>\$ 4,932,250.00</b>	<b>\$ 197.29</b>
<b>Construction Allowances</b>		<b>\$ 1,676,965.00</b>	<b>\$ 67.08</b>
Escalation	4.0% \$ 197,290.00		\$ 7.89
Design Contingency	15.0% \$ 739,837.50		\$ 29.59
Construction Contingency	15.0% \$ 739,837.50		\$ 29.59
<b>Total Construction Cost Incl. Allowances</b>		<b>\$ 6,609,215.00</b>	<b>\$ 264.37</b>

In addition, Cambium Inc. provided a proposal to complete mould consulting services in the Millbrook Arena to ensure that all remediation procedures are completed in accordance with, Environmental Abatement Council of Canada (EACC) guidelines and O. Reg 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations. (Attachment No.4). The purpose is to confirm that all mould growth outlined in the mould assessment report has been addressed and to

assess the air quality following mould remediation in the building. Total Estimated Cost (excluding HST) \$16,750.

Township staff reached out to Salandria Ltd. and received a quotation dated August 2024 for the removal/demolition as noted in the DSS report, including clean-up and the removal of all waste from the site as per the Ontario Regulations 347/90. The costs for demolition and abatement removal including disposal is \$260,000.

### **Conclusions:**

The Cambium Report identified significant mould growth and high airborne mould spore concentrations at the Millbrook Arena, posing serious health risks to the public and staff. Following legal advice, the Arena was closed on October 18, 2024, as a precautionary measure. Subsequent assessments confirmed extensive mould contamination, with required remediation estimated at \$2.63M, including contingencies. Remediation recommendations include removing affected materials, repairing moisture intrusion, cleaning and disinfecting and conducting post remediation air quality testing.

Given the recent information should the Township carry out the remediation and renovate the facility as per the Ontario Building Code requirements the estimated costs would be \$6.6M based on the report dated December 11, 2024. Its important to note that these are estimated costs and all works would require that the Purchasing By-law be followed to ensure accurate costs through a tender/RFP process.

It is recommended that the Millbrook Area be closed to the public based on the findings of the December 2024 Cambium Mould Assessment. Should Council decide to conduct the work described in this report, public access should only be reinstated once the work is completed along with confirmatory air testing proving the risk to health and safety has been adequately addressed.

Township staff and contractors will need to be provided with PPE if entering the facility for any reason.

This report was reviewed by the Township's solicitor Aird & Berlis LLP.

### **Financial Impact:**

The financial impact to date includes the Mould Assessment, Air sampling and Bulk Sampling provided by Cambium Inc. (Attachment No.5), Invoice Total \$12,204.00 (including HST). Financials from legal advice and engineering assessments conducted were not currently available at the time of this report.

These current costs will be billed to the Millbrook Arena contracted services which will be an over expenditure.

**Attachments:**

Attachment No 1. – Cambium Inc. Mould Air Sampling Report September 13, 2024.

Attachment No 2. – Cambium Inc. Mould Assessment, December 6, 2024

Attachment No 3. – Barry Bryan Associates Structural Consulting Services to Review Mould Assessment Report Millbrook Arena.

Attachment No 4. - Cambium Inc. Proposal for Mould Consulting Services

Attachment No 5. – Cambium Inc. Mould Air Sampling Invoice December 2, 2024

Respectfully Submitted by,

Reviewed by,

Chris Allison  
Parks and Facilities Manager

Yvette Hurley  
Chief Administrative Officer



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Building Sciences

Construction Testing  
& Inspection

**Telephone**

(866) 217.7900  
(705) 742.7900

**Facsimile**

(705) 742.7907

**Website**

[cambium-inc.com](http://cambium-inc.com)

**Mailing Address**

P.O. Box 325,  
Peterborough, Ontario  
Canada, K9J 6Z3

**Locations**

Peterborough  
Kingston  
Barrie  
Ottawa  
Whitby

**Laboratory**

Peterborough



September 13, 2024

Township of Cavan-Monaghan  
988 County Road 10  
Millbrook, ON L0A 1G0

Attn: Chris Allison  
Parks and Facilities Manager

**Re: Mould Air Sampling**  
**4 Needlers Lane, Millbrook, Ontario**  
**Cambium Reference: 21346-001**

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Dear Chris Allison,

Cambium Inc. (Cambium) was retained by the Township of Cavan-Monaghan (Client) to complete air sampling of the building at 4 Needlers Lane, Millbrook, Ontario. The sampling was prompted following concerns regarding air quality in the building.

The scope of work for the air sampling included the collection and analysis of three air samples (including outdoor air sample).

The survey was performed by Cambium on August 27, 2024. The air samples were collected from the lobby on the main floor, and the bar area on the second floor of the building.

Prior to the site visit, Cambium reviewed and made reference to the following report entitled; "Designated Substances Survey – 4 Needlers Lane, Millbrook, Ontario" dated April 18, 2024.

## METHODOLOGY

### Air Sampling

Air samples were collected in order to determine the types and relative concentrations of fungal spores in various locations of the assessed area at the time of the air sampling. The air samples were collected using an Zefon Bio-Pump air-sampling pump with Air-O-Cell® media cassettes. The sampler operates on the principle of impaction whereby airborne microorganisms are



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September 13, 2024

impacted onto a media cassette. The Air-O-Cell® cassettes collect both viable and non-viable mould spores, providing a more accurate spore count. The cassettes were analysed by spore trap analysis. The analysis includes the identification to genus or group of all fungal spores present, including the quantification to spores per cubic meter of air. The samples were collected at a flow rate of approximately 15 litres per minute for a sampling duration of five minutes for a desired volume for 75 litres of air.

There are currently no regulations or exposure values promulgated for exposure to surface or airborne quantities of fungi; however, there are several guidelines that have been developed throughout North America.

The general approach to the interpretation of the analysis results is to compare the indoor concentrations to outdoor concentrations. The approach relies on the assumption that an indoor environment free of mould growth will have similar types and relative concentrations of mould spores as the outdoor environment.

The laboratory certificate of analysis is attached.

## ANALYSIS

All samples were sent to EMC Scientific Inc. (EMC) for analysis by direct microscopic examination. EMC, located in Mississauga, Ontario, is an environmental microbiology laboratory that participates in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program.

## RESULTS

Mould spore concentrations identified in the main floor lobby area of the building were found to be slightly elevated in comparison to the exterior reference sample. Mould spore concentrations identified on the second floor of the building were found to be lower in comparison to the exterior reference sample.

## RECOMMENDATIONS

Based on the results of the sampling and laboratory analysis, the following recommendations were made:





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(866) 217.7900

(705) 742.7900

**Facsimile**

(705) 742.7907

**Website**

[cambium-inc.com](http://cambium-inc.com)

**Mailing Address**

P.O. Box 325,  
Peterborough, Ontario  
Canada, K9J 6Z3

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September 13, 2024

- Using Environmental Abatement Council of Canada Level I Mould procedures, clean and disinfect surfaces in the main floor lobby area.
- Following cleaning and disinfecting, Cambium recommends completing additional air sampling.

## LIMITATIONS

The information provided in this report with respect to the mould air sampling is limited to the specific scope of work and is solely for the exclusive use of the Township of Cavan-Monaghan. Cambium is not responsible for the use of this report by any third party. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

The field observations and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Cambium warrants that the findings and conclusions contained herein have been made in accordance with generally accepted industry evaluation methods and applicable regulations at the time of the performance of the air sampling. However, due to the nature of building construction, it is possible that conditions may exist which could not be reasonably identified within the scope of the investigation, or which were not evident during the air sampling.

Cambium believes that the information collected during the air sampling is reliable but reserves the right to review and comment on any interpretation of the data or conclusions derived from this report by the Township of Cavan-Monaghan.





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September 13, 2024

**CLOSING**

We trust that this report addresses your immediate requirements. If you have any questions or require clarification of any aspect of this submission, please do not hesitate to contact the undersigned at (705) 742-7900.

Best regards,

**Cambium Inc.**

DocuSigned by:

C5579BFF355C422...

Jackson Whitter, B. Eng  
Technician

DocuSigned by:

10BC5ABA7CC944E...

Chris Moose  
Senior Project Manager

Encl.     *Cambium Qualifications and Limitations  
Lab Results*

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Building Sciences

Construction Testing  
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September 13, 2024

## Cambium Qualifications and Limitations

### Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer, and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

### Reliance on Materials and Information

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# Laboratory Analysis Report

To:

Liam Wynne  
Cambium Inc.  
194 Sophia Street  
Peterborough, Ontario  
K9H 1E5

EMC LAB REPORT NUMBER: 97380

Job/Project Name: 4 Needlers Lane

Job/Project No: 21346-001

No. of Samples: 3

Sample Type: Air-O-Cell

Date Received: Aug 28/24

Analysis Method(s): Fungal Spore Counting

Date Analyzed: Sep 3/24

Date Reported: Sep 3/24

Analyst: Lalita Sarlashkar, Ph.D., Microbiologist

Approved By: Fajun Chen, Ph.D., Principal Mycologist

Client's Sample ID	EXT-101			AS-101			AS-102								
EMC Lab Sample No.	412096			412097			412098								
Sampling Date	Aug 27/24			Aug 27/24			Aug 27/24								
Description/Location	Exterior reference sample			Main floor			Second floor								
Air Volume (m <sup>3</sup> )	0.075			0.075			0.075								
Fungal Spores	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>	4	0	53	1	1	13									
<i>Arthrinium</i>															
Ascospores	79	10	1053	19	12	253	26	16	347						
<i>Aspergillus/Penicillium</i> type	18	2	240	25	16	333	13	8	173						
Basidiospores	85	10	1133	16	10	213	18	11	240						
<i>Cercospora</i>	3	0	40												
<i>Chaetomium</i>															
<i>Cladosporium</i>	228	28	3040	27	17	360	19	11	253						
Colorless	400	48	5333	72	45	960	88	53	1173						
<i>Curvularia</i>															
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>							1	1	13						
<i>Fusarium</i>															
<i>Oidium</i>	1	0	13												
<i>Pithomyces</i>	1	0	13												
<i>Polythrincium</i>	1	0	13	1	1	13	1	1	13						
Rusts															
Smuts, <i>Periconia</i> , Myxomycetes	3	0	40												
<i>Stachybotrys</i>															
<i>Torula</i>	3	0	40												
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	826			161			166								
Fungal fragments (0-3 +)	0+			0+			0+								
Non-fungal material (0-3 +)	1+			2+			2+								
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>11,013</b>			<b>2,147</b>			<b>2,213</b>								

## Note:

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0+ to 3+ (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3+ non-fungal material and/or 3+ fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.

# Mould Assessment – 4 Needler Lane, Millbrook, Ontario



December 6, 2024

Prepared for:  
Township of Cavan-Monaghan

Cambium Reference: 21346-001

CAMBIUM INC.

866.217.7900

[cambium-inc.com](http://cambium-inc.com)



## Executive Summary

Cambium Inc. (Cambium) was retained by the Township of Cavan-Monaghan (Client) to complete a mould assessment of the building at 4 Needlers Lane, Millbrook, Ontario. The assessment was prompted by the air sampling completed by Cambium in September 2024, which identified elevated mould spores, as compared to sampling completed by Cambium in April 2023. The Client requested additional bulk and air sampling at additional locations throughout the building, to assess whether mould and airborne mould spores were present.

The scope of work for the mould assessment consisted of the following tasks:

- Visual assessment of mould growth, water damage, and/or water intrusion.
- Collection of moisture measurements of building materials.
- Collection and analysis of 21 mould air samples (includes outdoor benchmark air samples).
- Collection and analysis of 17 bulk mould samples.

The survey was performed by Cambium on October 21, 2024, and October 31, 2024.

## Key Findings and Recommendations

During the assessment the following findings were evident:

- Significant mould growth was identified on various porous and non-porous materials and surfaces throughout the building including within the mechanical ventilation systems.
- Select mould impacted building materials associated with the building has also been confirmed as asbestos-containing.
- Direct moisture readings collected from gypsum walls in the second-floor hall were found to be damp.
- Elevated airborne mould spore concentrations, including potentially allergenic, toxigenic and pathogenic types were identified throughout the building at the time of testing.
- The source of mould growth identified in the building have likely been caused by a combination of factors including a previous water loss event and roof leaks.



Based on the findings, the following recommendations are made:

- R1. Using Environmental Abatement Council of Canada (EACC) Level 3 mould abatement procedures, complete the following:
- a. Remove mould impacted gypsum (drywall) finishes, in conjunction with Type 2 asbestos abatement procedures as outlined in Ontario Regulation 278/05, *Designated Substance — Asbestos on Construction Projects and in Buildings and Repair Operations* (O. Reg 278/05).
  - b. Remove mould impacted acoustic ceiling tiles.
  - c. Remove mould impacted wood trim.
  - d. Remove mould impacted fibreglass insulation.
  - e. Remove mould impacted vapour barrier.
  - f. Clean and disinfect mould impacted concrete.
  - g. Clean and disinfect removeable rubber flooring.
  - h. Clean and disinfect all stored items and surfaces throughout the building.
  - i. Clean and disinfect all other non-porous and porous surfaces (to the extent practical) throughout all other areas of the building utilizing HEPA sandwich cleaning techniques.
  - j. Clean and disinfect all supply and return ductwork (including all air handling equipment) throughout the building as outlined in the National Air Duct Cleaners Association (NADCA) standard, 2021 Edition.
  - k. Following all mould abatement work (as well as cleaning and disinfecting), Cambium recommends completing additional air sampling to gauge effectiveness of remedial efforts and ensure safe levels are archived prior re-occupancy.
- R2. Prior to any reinstatement activities, all finishes should be verified as dry, and all sources of moisture intrusion rectified. Cambium recommends retaining a building



envelope specialist to evaluate the cause and source of water infiltration issues associated with the roof of the building.

Complete commentary can be found in the body of this report. The executive summary is not intended to substitute for the complete report, nor does it discuss some of the specific issues documented in the report.





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## 1.0 Introduction

Cambium Inc. (Cambium) was retained by the Township of Cavan-Monaghan (Client) to complete a mould assessment of the building at 4 Needlers Lane, Millbrook, Ontario.

The assessment was prompted by the air sampling completed by Cambium in September 2024, which identified elevated mould spores, as compared to sampling completed by Cambium in April 2023. The Client requested additional bulk and air sampling at additional locations throughout the building, to assess whether mould and airborne mould spores were present.

The scope of work for the mould assessment consisted of the following tasks:

- Visual assessment of mould growth, water damage, and/or water intrusion.
- Collection of moisture measurements of building materials.
- Collection and analysis of 21 non-viable air samples (includes outdoor benchmark air samples).
- Collection and analysis of 17 bulk mould samples.

The survey was performed by Cambium on October 21, 2024, and October 31, 2024.

### 1.1 Background

The sources of mould growth identified in the building is understood to likely been caused by a combination of factors including a previous water loss event and roof leaks.

Prior to the site visit, Cambium reviewed and referred to the following reports entitled:

- “Mould Air Sampling – 4 Needlers Lane, Millbrook, Ontario”, dated September 13, 2024. Note that mould spore concentrations in the main floor lobby area were identified to be slightly elevated in comparison to the exterior reference sample.
- “Designated Substances Survey (DSS) – 4 Needlers Lane, Millbrook, Ontario”, dated April 18, 2023. Note that mould spore concentrations in the building were identified to be similar and/or lower in comparison to the exterior reference sample.



- As outlined in the DSS report, drywall joint compound (applied to gypsum finishes) was identified to be asbestos-containing.



## 2.0 Factors Related to Mould

Fungi are primitive plants that lack chlorophyll and therefore feed as parasites or feed on organic matter that they digest externally and absorb. The true fungi include yeast, mould, mildew, 'rust', smut, and mushrooms. Fungi are found on plants, foods, dry leaves, and other organic materials. They provide an important function in nature by breaking down dead organic matter such as fallen leaves and trees.

The conditions required for mould growth are the presence of moisture, a suitable temperature range, and a food source. Many indoor building materials, such as paper and paper products, cardboard, ceiling tiles, and wood and wood products are excellent nutrient sources for moulds. Other materials that support mould growth include dust, paints, wallpaper, insulation, drywall, carpet (especially jute backing), draperies, and upholstery. Most buildings have favourable indoor conditions; therefore, moulds are commonly encountered in indoor environments.

In most non-contaminated buildings, exposure to mould is not expected to present a health hazard except to specifically susceptible people such as persons that have a mould allergy or with a compromised immunity. Reactions to moulds are varied and depend upon several factors. Human factors include personal susceptibility, route of exposure, age, and state of health. Mould related factors include amount and length of time of exposure, virility and viability of the organism, and whether the effect is infection, allergenic, toxigenic, or a combination.



## 3.0 Methodology

### 3.1 Guidelines

There are no specific regulations in Ontario (or anywhere across Canada) with respect to mould assessment and remediation; however, Health Canada states once identified, mould should be remediated as soon as possible.

The following guidelines were reviewed and drawn from for the purpose of this assessment and sampling.

- The Environmental Abatement Council of Canada (EACC) – *“Mould Abatement Guideline”*.
- Canadian Construction Association (CCA) – *“Mould Guidelines for the Canadian Construction Industry”* (CCA), 2018.
- American Industrial Hygiene Association (AIHA) – *“Field Guide for The Determination of Biological Contaminants in Environmental Samples”*.
- Institute for Inspection, Cleaning and Restoration (IICRC) – *“Standard for Professional Mould Remediation”* (IICRC S520) Edition 3, 2015.
- Health Canada – *“Fungal Contamination in Public Buildings: Health Effects and Investigation Methods”*.

### 3.2 Visual Assessment

The purpose was to visually observe suspected mould growth that may be present in the building. The visual assessment was completed in accordance with American Industrial Hygiene Association (AIHA) – *“Field Guide for The Determination of Biological Contaminants in Environmental Samples”* as well as other consideration to the other guidelines listed above.

The visual assessment consisted of a walkthrough of the building to identify water damaged building materials, suspected mould growth, and/or suspected sources of water intrusion.

### 3.3 Moisture Measurements

Moisture content readings were collected from porous building materials in the areas. Moisture content readings were collected using a GE Surveymaster Protimeter Dual-Function Moisture



Meter. The meter expresses moisture content of wood as a percent (%) and all other porous building materials as a percent Wood Moisture Equivalent (%WME). All porous building materials with a moisture content reading greater than 18 % or 18 %WME were deemed “water damaged”.

### **3.4 Air Sampling**

Air samples were collected in order to determine the types and relative concentrations of fungal spores in various locations of the building at the time of the assessment. The air samples were collected using a Zefon Bio-Pump air-sampling pump with Air-O-Cell® media cassettes. The sampler operates on the principle of impaction whereby airborne microorganisms are impacted onto a media cassette. The Air-O-Cell® cassettes collect both viable and non-viable mould spores, providing a more accurate spore count. The cassettes were analysed by spore trap analysis. The analysis includes the identification to genus or group of all fungal spores present, including the quantification to spores per cubic meter of air. The samples were collected at a flow rate of approximately 15 litres per minute for a sampling duration of five minutes for a desired volume for 75 litres of air.

There are currently no regulations or exposure values promulgated for exposure to surface or airborne quantities of fungi; however, there are several guidelines that have been developed throughout North America.

The general approach to the interpretation of the analysis results is to compare the indoor concentrations to outdoor concentrations. The approach relies on the assumption that an indoor environment free of mould growth will have similar types and relative concentrations of mould spores as the outdoor environment.

The laboratory certificate of analysis is included in Appendix B.

### **3.5 Bulk Sampling**

17 mould bulk samples were collected in order to confirm the presence or absence of where suspect mould growth was observed. Where mould growth is confirmed, the analytical results of the samples will identify the types of fungal spores present on a particular building material.

The laboratory certificate of analysis is included in Appendix B.



### **3.6 Analysis**

All samples were sent to EMC Scientific Inc. (EMC) for analysis by direct microscopic examination. EMC, located in Mississauga, Ontario, is an environmental microbiology laboratory that participates in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program.





4.0 Results and Findings

The following sections provide a summary of the results and findings of the mould assessment. Photographs of materials affected by water damage and/or mould growth are included in Appendix A.

4.1 Visual Observations

4.1.1 Second Floor

The following table outlines the locations, quantities of mould growth and bulk mould sampling locations (when collected for laboratory analysis) identified on the second floor.

Table 1 Observations and Sampling Locations on Second Floor

Location	Material	Moisture Content Readings (%)	Mould Growth Identified	Sample ID	Quantity of Visible/ Accessible Mould (Square Feet (ft²))
2 <sup>nd</sup> Floor Main Room	Gypsum (wall) (Photo 3)	Damp (17%)	<i>Stachybotrys</i> (Abundant) <i>Ulocladium</i> (Abundant)	MLD-117	6 ft²
	Wood Baseboards (Photo 13)	Dry (NR to 10%)	<i>Trichoderma</i> (Abundant) <i>Aspergillus</i> (Abundant) <i>Cladosporium</i> (Abundant)	MLD-115	5 ft²
	Acoustic Ceiling Tiles (Photo 7)	Dry (NR)	<i>Stachybotrys</i> (Moderate to Abundant)	MLD-104	5 ft²
	Fibreglass Insulation (ceiling) (Photo 8 & 9)	N/A	Fungal Hyphae (Sparse) <i>Cladosporium</i> (Sparse)	MLD-101	6,000 ft²
	Ceiling Vapour Barrier (ceiling) (Photo 6)	N/A	Fungal Hyphae (Sparse) <i>Cladosporium</i> (Sparse)	MLD-102	6,000 ft²
	Air Duct (interior)	N/A	<i>Cladosporium</i> (Sparse)	MLD-105	500 ft²



Location	Material	Moisture Content Readings (%)	Mould Growth Identified	Sample ID	Quantity of Visible/ Accessible Mould (Square Feet (ft²))
			<i>Penicillium</i> (Sparse) <i>Alternaria</i> (Sparse)		
	Wood Wall Panel (Photo 3)	Dry (NR)	Fungal Hyphae (Sparse)	MLD-103	4 ft²
Washrooms	Gypsum (wall) (Photo 5)	Damp (19%)	<i>Aspergillus</i> (Abundant)	MLD-116	15 ft²
	Baseboard	N/A	Suspect Mould Growth	N/A	8 ft²



4.1.2 Main Arena

The following table outlines the locations and quantities of mould growth identified in the main arena.

Table 2 Observations and Sampling Locations in the Main Arena

Location	Material	Moisture Content Readings (%)	Mould Growth Identified	Sample ID	Quantity of Visible/ Accessible Mould (Square Feet (ft²))
Main Arena	Fibreglass Insulation (ceiling and walls) (Photo 11)	N/A	Suspect Mould Growth	N/A	25,000 ft²
	Vapour Barrier (ceiling) (Photo 11)	N/A	Suspect Mould Growth	N/A	15,000 ft²
	Concrete Wall (Photo 1 & 10)	N/A	Suspect Mould Growth	N/A	60 ft²



4.1.3 Changerooms

The following table outlines the locations, quantities of mould growth and bulk/tape lift mould sampling locations (when collected for laboratory analysis) identified in the changerrooms.

Table 3 Observations and Sampling Locations in the Changerooms

Location	Material	Moisture Content Readings (%)	Mould Growth Identified	Sample ID	Quantity of Visible/ Accessible Mould (Square Feet (ft²))
Changeroom 4	Gypsum (ceiling) (Photo 14)	Dry (NR to 10%)	Fungal Hyphae (Sparse) <i>Aspergillus/Penicillium</i> (Sparse) <i>Cladosporium</i> (Sparse)	MLD-108	1,000 ft²
	Concrete Block (wall, inside wall hatch)	N/A	Suspect Mould Growth	N/A	8 ft²
Small Changeroom	Gypsum (ceiling) (Photo 4)	Dry (NR to 10%)	Fungal Hyphae (Sparse) <i>Aspergillus/Penicillium</i> (Sparse) <i>Cladosporium</i> (Sparse)	MLD-110	250 ft²
Changeroom 3	Gypsum (ceiling) (Photo 15)	Dry (NR to 10%)	Fungal Hyphae (Sparse) <i>Cladosporium</i> (Sparse) <i>Ascospores</i> (Sparse)	MLD-111	1,000 ft²
Changeroom 2	Gypsum (ceiling)	Dry (NR to 10%)	Suspect Mould Growth	N/A	1,000 ft²
Changeroom 1	Gypsum (ceiling)	Dry (NR to 10%)	Suspect Mould Growth	N/A	1,000 ft²
Referee Changeroom	Gypsum (ceiling)	Dry (NR to 10%)	Suspect Mould Growth	N/A	250 ft²

A tape-lift sample was collected from inside the air duct in Changeroom 2 and no mould growth was identified (MLD-106).



#### 4.1.4 Main Lobby

The following table outlines the locations, quantities of mould growth and bulk/tape lift mould sampling locations (when collected for laboratory analysis) identified in the main lobby and adjacent rooms.

**Table 4 Observations and Sampling Locations in the Main Lobby and Adjacent Rooms**

Location	Material	Moisture Content Readings (%)	Mould Growth Identified	Sample ID	Quantity of Visible/Accessible Mould (Square Feet (ft <sup>2</sup> ))
Women's Washroom, Main Floor	Concrete (wall)	N/A	Fungal Hyphae (Sparse) <i>Cladosporium</i> (Sparse)	MLD-107	15 ft <sup>2</sup>
Main Floor Lobby	Gypsum (wall and ceiling) (Photo 2 & 12)	Dry (NR to 10%)	<i>Cladosporium</i> (Moderate)	MLD-109	2,700 ft <sup>2</sup>
Lobby Viewing Area	Gypsum (wall and ceiling)	Dry (NR to 10%)	<i>Ulocladium</i> (Moderate) <i>Chaetomium</i> (Moderate)	MLD-112	1,000 ft <sup>2</sup>
	Wood (wall)	Dry (NR to 10%)	<i>Ulocladium</i> (Sparse to Moderate) <i>Cladosporium</i> (Sparse to Moderate)	MLD-114	15 ft <sup>2</sup>
Mechanical room	Gypsum (ceiling)	Dry (NR to 10%)	Suspect Mould Growth	N/A	10 ft <sup>2</sup>
Canteen	Gypsum (ceiling) (Photo 16)	Dry (NR to 10%)	Suspect Mould Growth	N/A	250 ft <sup>2</sup>
Office	Gypsum (ceiling)	Dry (NR to 10%)	Suspect Mould Growth	N/A	250 ft <sup>2</sup>

Black staining was observed on the concrete floor beneath rubber flooring. A bulk sample was collected from the concrete and no mould growth was identified (sample MLD-113).



## 4.2 Spore Trap Air Sample Results

The following table outlines the results of airborne mould spore concentrations sampled for throughout the building.

**Table 5 Results of Airborne Mould Spore Concentrations**

Location	Non-Viable Air Sample Number	Elevated Fungal Spore Species
Arena Office	AS-101	* <i>Aspergillus/Penicillium</i>
Main Lobby	AS-102	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Changeroom 1	AS-103	* <i>Aspergillus/Penicillium</i>
Changeroom 2	AS-104	* <i>Aspergillus/Penicillium</i>
Woman's Washroom	AS-105	* <i>Aspergillus/Penicillium</i>
Canteen	AS-106	* <i>Aspergillus/Penicillium</i>
Men's Washroom	AS-107	** <i>Stachybotrys</i>
Small Changeroom	AS-108	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Changeroom 3	AS-109	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Changeroom 4	AS-110	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Referee Changeroom	AS-111	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
East End of Main Arena	AS-112	* <i>Aspergillus/Penicillium</i>
West End of Main Arena	AS-113	* <i>Aspergillus/Penicillium</i>
Spector Viewing Area	AS-114	* <i>Aspergillus/Penicillium</i>
Ammonia Room	AS-115	* <i>Aspergillus/Penicillium</i>
Zamboni Room	AS-116	* <i>Aspergillus/Penicillium</i>
Second Floor Hall	AS-117	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Second Floor Woman's Washroom	AS-118	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>
Second Floor Men's Washroom	AS-119	* <i>Aspergillus/Penicillium</i> ** <i>Stachybotrys</i>

\* *Aspergillus/Penicillium* fungal spore concentrations were determined to be elevated throughout the building in comparison to the exterior reference samples. Although commonly found in indoor environments, some species of the fungal genera *Aspergillus/Penicillium* are known to be toxigenic or allergenic.



*\*\*Stachybotrys fungal spore concentrations were determined to be elevated in eight locations throughout the building. Stachybotrys is known to be hazardous to human health and typically encountered in areas with water damaged materials. Comparatively, indoor concentrations are typically lower than concentrations in the outdoor environment, but it is a significant airborne toxin and a common agent for symptoms of dermatitis, inflammation of the mucous membranes, respiratory issues, fever, headache, and fatigue. The spore type can thrive in various indoor environments, appearing dark green to black.*

4.3 Discussion and Conclusions

4.3.1 Mould Air Sampling Discussion

Criteria for interpreting mould sampling results can be drawn from various guidelines, reference documents and research publications. Although numerical guidelines and recommendations have been published, criteria vary in orders of magnitude and thus no consensus or health-based guidelines exist. When interpreting airborne mould data, a combination of relevant publications outlined in Section 3.1, industry standards, expert opinion, logic and common sense are relied upon. Based on this rationale and limitations of available criteria, Cambium has determined that the following criterion with respect to the air quality findings must be considered in our conclusions.

Table 6 Air Quality Criterion to be Satisfied

Criterion	All Samples Satisfy This Criterion	All Samples <u>Do Not</u> Satisfy this Criterion
Significant numbers of certain pathogenic fungi should not be present in indoor air at levels greater than normally found outdoors.		X
The persistent presence of significant numbers of toxigenic fungi (e.g., <i>Stachybotrys</i> , <i>Aspergillus/Penicillium</i> species).		X
The confirmed presence of one or more fungal species occurring as a significant percentage of a sample in indoor air samples that not similarly present in typical outdoor air samples is evidence of a fungal amplifier.		X
The "normal" air mycoflora is qualitatively similar and quantitatively lower than that of typical outdoor air.		X



### 4.3.2 Bulk Mould Air Sampling Discussion

Suspected mould growth was sampled for and confirmed via laboratory interpretation of the results of the bulk samples collected from wood, concrete, gypsum, fibreglass insulation, vapour barrier, and acoustic ceiling tiles in various locations throughout the building.

### 4.3.3 Conclusions

Based on what has been provided in this report and our professional knowledge related to assessments of this type, Cambium concludes the following:

1. The source of mould growth identified in the changerooms, lobby, and adjacent rooms was likely caused by a previous water loss event.
2. The source of mould growth identified in the main arena space and the second floor was likely caused by roof leaks.
3. Based on elevated airborne mould spore concentrations identified in the building, airborne mould spores are presumed to be present within ductwork and air handling equipment throughout the building.
4. When comparing the indoor air concentrations identified on October 21, 2024; to the outdoor reference samples, it is likely that the observed quantity of *Stachybotrys* and *Aspergillus/Penicillium* spores within the building would have an effect on occupants, especially those considered at greater risk of experiencing adverse health effects such as infants, children, seniors, pregnant people and those with respiratory conditions such as asthma.
  - a. More recently, there is increased recognition that exposure to indoor mould and dampness may contribute to the development of asthma, bronchitis and other respiratory infections, as well as eczema.
  - b. The level of risk depends on the extent of mould growth itself (regardless of species and its toxicity), how long mould has been present along with the susceptibility and overall health of exposed individuals. As noted above, some people are more susceptible to the impact of mould and are considered to be at greater risk of experiencing adverse health effects from mould exposure.





## 5.0 Recommendations

Based on the findings of the assessment, the following recommendations are made:

1. The building owner should consider implementation of risk management actions to prevent potential exposure and adverse health effects to individuals accessing the facility. Based on the laboratory results and findings of potentially allergenic, toxigenic or pathogenic mould, risk to general occupants and workers is high. Risk management for the client can include isolating the building from occupants (general public and staff) until successful remedial measures can occur. The use of respiratory protection (suitable for mould) should be considered for at risk individuals who must enter the facility.
2. Conduct mould remediation following mould procedures as outlined in the Environmental Abatement Council of Canada (EACC) guideline entitled “*Mould Abatement Guidelines, Edition 3*”. Using EACC Level 3 mould abatement procedures, complete the following:
  - a. Remove mould impacted gypsum (drywall) finishes, in conjunction with Type 2 asbestos abatement procedures as outlined in O. Reg 278/05.
  - b. Remove mould impacted acoustic ceiling tiles.
  - c. Remove mould impacted wood trim.
  - d. Remove mould impacted fibreglass insulation.
  - e. Remove mould impacted vapour barrier.
  - f. Clean and disinfect mould impacted concrete.
  - g. Clean and disinfect removeable rubber flooring.
  - h. Clean and disinfect all stored items and surfaces throughout the building.
  - i. Clean and disinfect all other non-porous and porous surfaces (to the extent practical) throughout all other areas of the building utilizing HEPA sandwich cleaning techniques.
  - j. Clean and disinfect all supply and return ductwork (including all air handling equipment) throughout the building as outlined in the National Air Duct Cleaners Association (NADCA) standard, 2021 Edition.



- k. Following all mould abatement work (as well as cleaning and disinfecting), Cambium recommends completing additional air sampling to gauge effectiveness of remedial efforts and ensure safe levels are archived prior re-occupancy.
3. Prior to any reinstatement activities, all finishes should be verified as dry, and all sources of moisture intrusion rectified. Cambium recommends retaining a building envelope specialist to evaluate the cause and source of water infiltration issues associated with the roof of the building.



## 6.0 Mould Assessment Limitations

The information provided in this report with respect to the mould assessment is limited to the specific scope of work and is solely for the exclusive use of the Township of Cavan-Monaghan. Cambium is not responsible for the use of this report by any third party. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

The field observations and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Cambium warrants that the findings and conclusions contained herein have been made in accordance with generally accepted industry evaluation methods and applicable regulations at the time of the performance of the mould assessment. However, due to the nature of building construction, it is possible that conditions may exist which could not be reasonably identified within the scope of the investigation, or which were not evident during the mould assessment.

Cambium believes that the information collected during the mould assessment is reliable but reserves the right to review and comment on any interpretation of the data or conclusions derived from this report by the Township of Cavan-Monaghan.



## 7.0 Closing

Cambium trusts that the above meets the requirements of the Township of Cavan-Monaghan. If you have questions or comments regarding the details within this report, please do not hesitate to contact the undersigned at (705) 742-7900.

Respectfully submitted,

### Cambium Inc.

DocuSigned by:

10BC5ABA7CC944E...

Chris Moose  
Senior Project Manager

Signed by:

4108BDC2918E443...

Brad Wilson  
Senior Project Manager

DocuSigned by:

BACDB4B07C804EB...

Sadie Bachynski, P.Eng.  
Group Manager – Environmental Compliance



2024-12-06



## 8.0 Standard Limitations

### Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

### Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in its reports. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after the work is completed and a report is submitted. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its findings or results.

When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

### Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

### Reliance

Cambium's services, work and reports may be relied on by the client and its corporate directors and officers, employees, and professional advisors. Cambium is not responsible for the use of its work or reports by any other party, or for the reliance on, or for any decision which is made by any party using the services or work performed by or a report prepared by Cambium without Cambium's express written consent. Any party that relies on services or work performed by Cambium or a report prepared by Cambium without Cambium's express written consent, does so at its own risk. No report of Cambium may be disclosed or referred to in any public document without Cambium's express prior written consent. Cambium specifically disclaims any liability or responsibility to any such party for any loss, damage, expense, fine, penalty or other such thing which may arise or result from the use of any information, recommendation or other matter arising from the services, work or reports provided by Cambium.

### Limitation of Liability

Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

### Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.



Mould Assessment – 4 Needler Lane, Millbrook, Ontario  
Township of Cavan-Monaghan  
Cambium Reference: 21346-001  
December 6, 2024

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**Appendix A**  
**Photographs**

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**Photo 1 Mould growth on concrete in the main arena area.**



**Photo 2 Mould growth on gypsum in the lobby.**



**Photo 3** Mould growth on gypsum wall and wood baseboard trim in the second floor hall.



**Photo 4** Mould growth on gypsum in changeroom 3.





**Photo 5** Mould growth on gypsum in the second-floor woman's washroom.



**Photo 6** Mould growth on vapour barrier along with water-stained ceiling tiles.



**Photo 7 Mould growth on acoustic ceiling tiles.**



**Photo 8 Mould growth on vapour barrier and fibreglass ceiling insulation.**





**Photo 9 Mould growth vapour barrier and fiberglass insulation.**

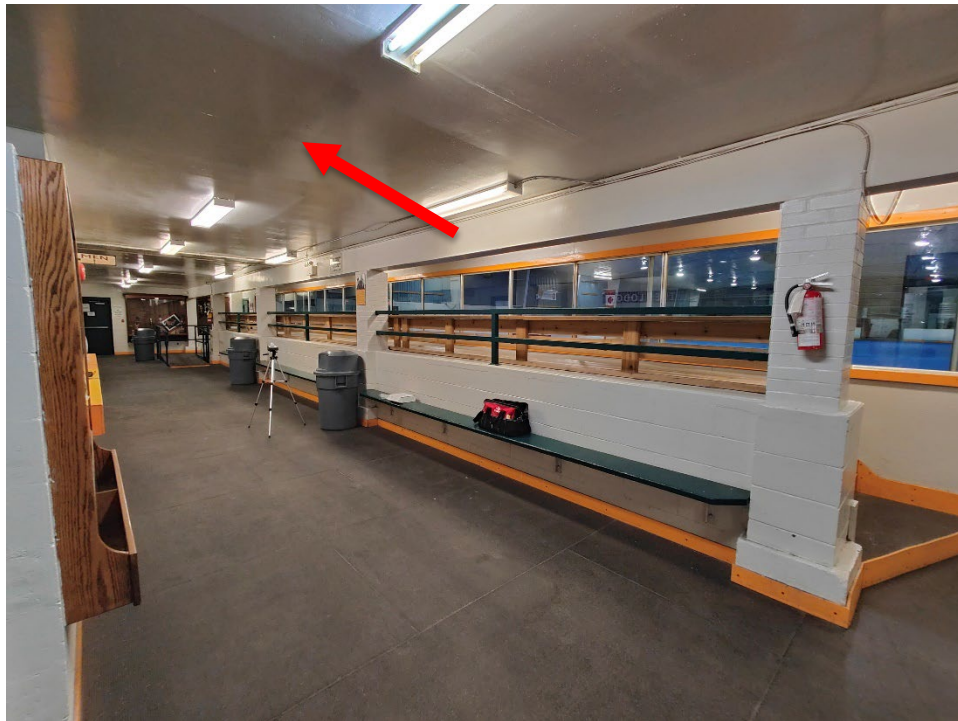


**Photo 10 Mould growth concrete block wall.**





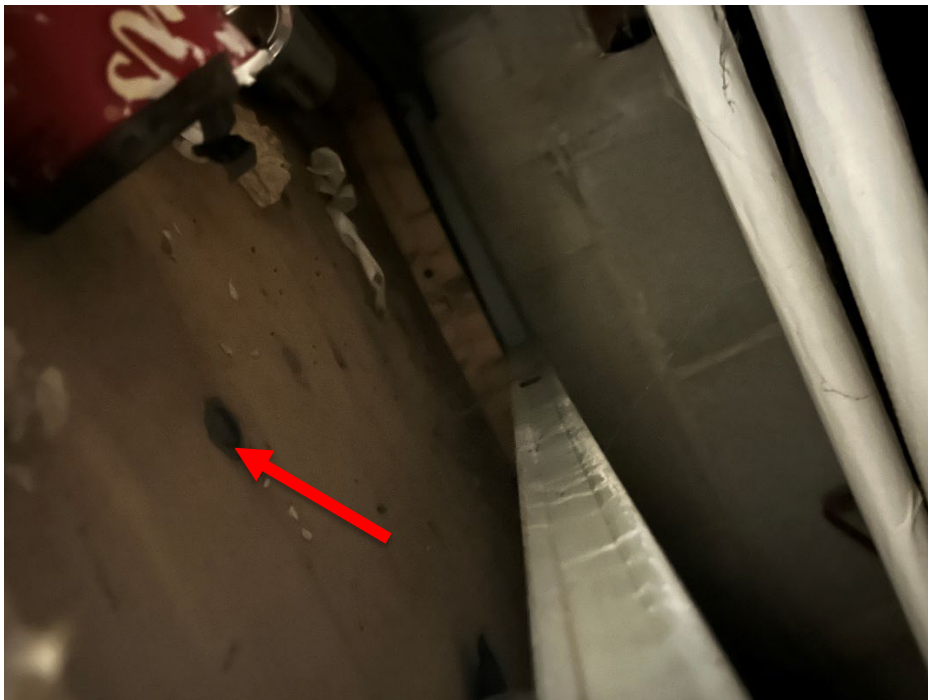
**Photo 11 Mould impacted fibreglass insulation.**



**Photo 12 Mould impacted gypsum ceiling.**



**Photo 13 Mould impacted wooden baseboard.**

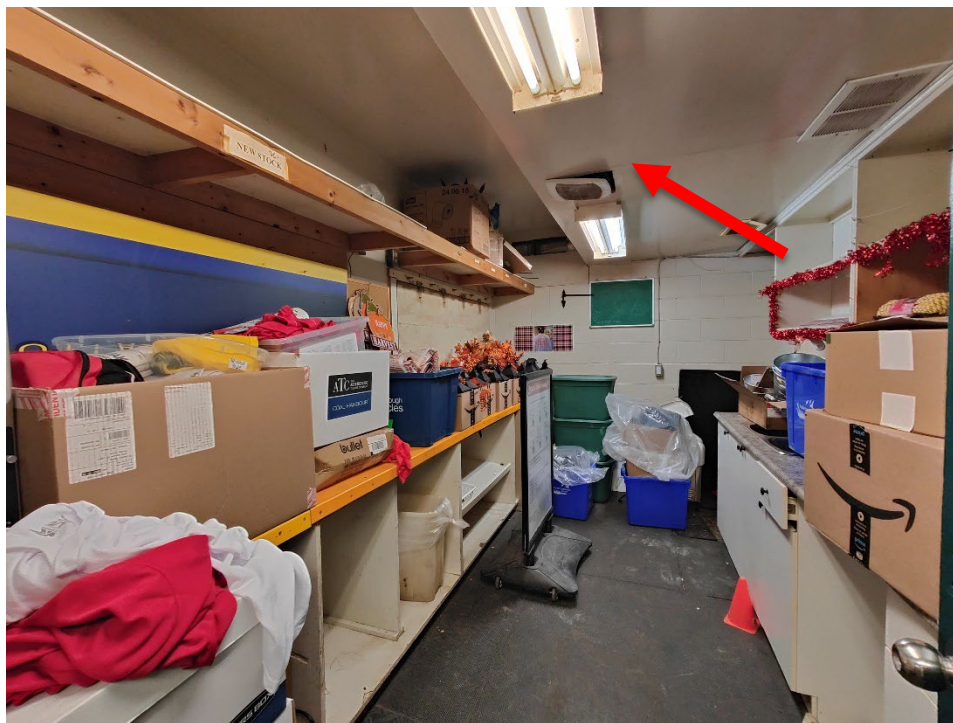


**Photo 14 Mould impacted gypsum ceiling.**





**Photo 15 Mould impacted gypsum ceiling.**



**Photo 16 Mould impacted gypsum ceiling.**



Mould Assessment – 4 Needler Lane, Millbrook, Ontario  
Township of Cavan-Monaghan  
Cambium Reference: 21346-001  
December 6, 2024

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**Appendix B**  
**Laboratory Certificate of Analysis**

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# Laboratory Analysis Report

To:

**William Bellhouse**  
Cambium Inc.  
194 Sophia Street  
Peterborough, Ontario  
K9H 1E5

**EMC LAB REPORT NUMBER:** 98425

**Job/Project Name:** 4 Needlers Lane, Millbrook

**Job/Project No:** 21346-001 **No. of Samples:** 7

**Sample Type:** Bulk/Tape **Date Received:** Oct 22/24

**Analysis Method(s):** Direct Microscopic Examination

**Date Analyzed:** Oct 25/24 **Date Reported:** Oct 25/24

**Analyst:** Fajun Chen, Ph.D., *Principal Mycologist*

Client's Sample ID	Lab Sample No.	Date Sampled	Description/Location	Mould Identified, in Rank Order	Mould Growth
MLD-101	416259	Oct 21/24	Fiberglass insulation (second floor attic)	Fungal hyphae <i>Cladosporium</i> (a few spores)	Sparse
MLD-102	416260	Oct 21/24	Vapour barrier (second floor attic)	Fungal hyphae <i>Cladosporium</i> (a few spores)	Sparse
MLD-103	416261	Oct 21/24	Wood panel (second floor main hall)	Fungal hyphae	Sparse
MLD-104	416262	Oct 21/24	Ceiling tile (second floor main hall)	<i>Stachybotrys</i>	Moderate to abundant
MLD-105	416263	Oct 21/24	Duct (second floor main hall)	<i>Cladosporium</i> <i>Penicillium</i> <i>Alternaria</i> (a few spores)	Sparse
MLD-106	416264	Oct 21/24	Duct (changeroom 2)	<i>Cladosporium</i> (a few spores) Fungal hyphal fragments (a few) Basidiospores (a few) Ascospores (a few) Rusts (a few spores) Smut-like (a few spores)	None
MLD-107	416265	Oct 21/24	Mold on concrete (women's washroom)	Fungal hyphae <i>Cladosporium</i> (a few spores)	Sparse

**Note:**

- Mould growth is subjectively assessed with description terms sparse, moderate and abundant.
- The presence of spores (lacking other fungal structures associated) is assessed as following: a few spores (< 10 spores average per microscopic field at 400X), some spores (10 - 100 spores average per microscopic field at 400X), many spores (> 100 spores average per microscopic field at 400X).
- The presence of a few spores generally represents settled spores on the surface of the sample rather than indicating mould growth.
- The results are only related to the samples analyzed.



# Laboratory Analysis Report

To:

**William Bellhouse**  
Cambium Inc.  
194 Sophia Street  
Peterborough, Ontario  
K9H 1E5

EMC LAB REPORT NUMBER: 98424

Job/Project Name: 4 Needlers Lane, Millbrook

Job/Project No: 21346-001

No. of Samples: 21

Sample Type: Air-O-Cell

Date Received: Oct 22/24

Analysis Method(s): Fungal Spore Counting

Date Analyzed: Oct 25/25

Date Reported: Oct 25/25

Analyst: Anupama Chauhan, M.Sc., Microbiologist

Approved By: Fajun Chen, Ph.D., Principal Mycologist



Client's Sample ID	EXT-101			EXT-102			AS-101			AS-102			AS-103		
EMC Lab Sample No.	416238			416239			416240			416241			416242		
Sampling Date	Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24		
Description/Location	Exterior reference			Exterior reference			Arena office			Main lobby			Changeroom 1		
Air Volume (m <sup>3</sup> )	0.075			0.075			0.075			0.075			0.075		
Fungal Spores	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>	5	1	67	10	2	133	1	1	13	1	3	13			
<i>Arthrinium</i>															
Ascospores	27	4	360	19	4	253	5	7	67	2	5	27	1	3	13
<i>Aspergillus/Penicillium</i> type	5	1	67	7	1	93	11	14	147	8	22	107	6	21	80
Basidiospores	92	14	1227	81	16	1080	8	11	107	7	19	93	3	10	40
<i>Cercospora</i>				1	0	13									
<i>Chaetomium</i>	1	0	13												
<i>Cladosporium</i>	245	38	3267	187	36	2493	29	38	387	7	19	93	9	31	120
Colorless	215	33	2867	180	35	2400	14	18	187	7	19	93	9	31	120
<i>Curvularia</i>															
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>	2	0	27	3	1	40									
<i>Fusarium</i>															
<i>Nigrospora</i>	2	0	27												
<i>Oidium</i>															
<i>Pithomyces</i>	1	0	13												
<i>Polythrincium</i>	1	0	13												
Rusts	3	0	40	4	1	53				1	3	13	1	3	13
Smuts, <i>Periconia</i> , Myxomycetes	44	7	587	22	4	293	8	11	107	1	3	13			
<i>Stachybotrys</i>										3	8	40			
<i>Torula</i>				2	0	27									
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	643			516			76			37			29		
Fungal fragments (0-3 +)	0+			0+			0+			0+			0+		
Non-fungal material (0-3 +)	2+			2+			3+			2+			2+		
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>8,573</b>			<b>6,880</b>			<b>1,013</b>			<b>493</b>			<b>387</b>		

Note:

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0 + to 3 + (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3 + non-fungal material and/or 3 + fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.

EMC Scientific Inc. 5800 Ambler Drive, Suite 100, Mississauga, ON L4W 4J4 Tel 905 629 9247, Fax 905 629 2607  
AIHA EMPAT Participant (Lab ID# 174080)



# Laboratory Analysis Report

**EMC LAB REPORT NUMBER:** 98424

**Client's Job/Project No.:** 21346-001

**Analyst:** Anupama Chauhan, M.Sc., Microbiologist

Client's Sample ID	AS-104			AS-105			AS-106			AS-107			AS-108		
EMC Lab Sample No.	416243			416244			416245			416246			416247		
Sampling Date	Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24		
Description/Location	Changeroom 2			Woman's washroom			Canteen			Men's washroom			Changeroom small		
Air Volume (m <sup>3</sup> )	0.075			0.075			0.075			0.075			0.075		
Fungal Spores	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>	2	4	27												
<i>Arthrini</i>															
Ascospores	3	6	40	6	8	80	4	7	53	3	9	40	7	2	93
<i>Aspergillus/Penicillium</i> type	9	18	120	12	16	160	18	30	240	5	14	67	320	89	4267
Basidiospores	5	10	67	17	23	227	7	12	93	5	14	67	6	2	80
<i>Cercospora</i>				1	1	13									
<i>Chaetomium</i>															
<i>Cladosporium</i>	23	45	307	19	26	253	22	37	293	9	26	120	13	4	173
Colorless	7	14	93	13	18	173	8	13	107	12	34	160	8	2	107
<i>Curvularia</i>													1		
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>	1	2	13				1	2	13						
<i>Fusarium</i>															
<i>Nigrospora</i>															
<i>Oidium</i>															
<i>Pithomyces</i>				1	1	13									
<i>Polythrincium</i>															
Rusts				1	1	13									
Smuts, <i>Periconia</i> , Myxomycetes	1	2	13	3	4	40									
<i>Stachybotrys</i>										1	3	13	6	2	80
<i>Torula</i>															
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	51			73			60			35			361		
Fungal fragments (0-3 +)	0+			0+			0+			0+			0+		
Non-fungal material (0-3 +)	2+			2+			2+			2+			2+		
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>680</b>			<b>973</b>			<b>800</b>			<b>467</b>			<b>4,813</b>		

**Note:**

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0 + to 3 + (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3 + non-fungal material and/or 3 + fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.



# Laboratory Analysis Report

**EMC LAB REPORT NUMBER:** 98424

**Client's Job/Project No.:** 21346-001

**Analyst:** Anupama Chauhan, M.Sc., Microbiologist

Client's Sample ID	AS-109			AS-110			AS-111			AS-112			AS-113		
EMC Lab Sample No.	416248			416249			416250			416251			416252		
Sampling Date	Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24		
Description/Location	Changeroom 3			Changeroom 4			Rest changeroom			Arena			Arena		
Air Volume (m <sup>3</sup> )	0.075			0.075			0.075			0.075			0.075		
Fungal Spores	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>															
<i>Arthrini</i>															
Ascospores	7	5	93	3	5	40	6	7	80	4	6	53	4	8	53
<i>Aspergillus/Penicillium</i> type	84	63	1120	32	52	427	25	30	333	23	35	307	13	27	173
Basidiospores	9	7	120	4	7	53	9	11	120	6	9	80	5	10	67
<i>Cercospora</i>															
<i>Chaetomium</i>															
<i>Cladosporium</i>	12	9	160	10	16	133	31	37	413	25	38	333	17	35	227
Colorless	18	14	240	11	18	147	7	8	93	5	8	67	8	16	107
<i>Curvularia</i>															
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>															
<i>Fusarium</i>															
<i>Nigrospora</i>															
<i>Oidium</i>															
<i>Pithomyces</i>													1	2	13
<i>Polythrincium</i>															
Rusts													1	2	13
Smuts, <i>Periconia</i> , Myxomycetes							2	2	27	2	3	27			
<i>Stachybotrys</i>	3	2	40	1	2	13	4	5	53						
<i>Torula</i>															
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	133			61			84			65			49		
Fungal fragments (0-3 +)	0+			0+			0+			0+			0+		
Non-fungal material (0-3 +)	2+			2+			3+			3+			2+		
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>1,773</b>			<b>813</b>			<b>1,120</b>			<b>867</b>			<b>653</b>		

**Note:**

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0 + to 3 + (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3 + non-fungal material and/or 3 + fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.

# Laboratory Analysis Report

**EMC LAB REPORT NUMBER:** 98424

**Client's Job/Project No.:** 21346-001

**Analyst:** Anupama Chauhan, M.Sc., Microbiologist

Client's Sample ID	AS-114			AS-115			AS-116			AS-117			AS-118		
EMC Lab Sample No.	416253			416254			416255			416256			416257		
Sampling Date	Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24			Oct 21/24		
Description/Location	Arena stands			Ammonia room			Zamboni room			Main hall (second floor)			Women's washroom (second floor)		
Air Volume (m <sup>3</sup> )	0.075			0.075			0.075			0.075			0.075		
Fungal Spores	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>										3	2	40			
<i>Arthrinium</i>															
Ascospores	5	2	67	9	8	120	4	2	53	4	3	53	7	2	93
<i>Aspergillus/Penicillium</i> type	27	12	360	17	14	227	38	22	507	31	25	413	350	84	4667
Basidiospores	8	4	107	16	13	213	23	13	307	9	7	120	14	3	187
<i>Cercospora</i>															
<i>Chaetomium</i>															
<i>Cladosporium</i>	168	76	2240	53	45	707	82	47	1093	58	46	773	32	8	427
Colorless	12	5	160	22	18	293	26	15	347	14	11	187	11	3	147
<i>Curvularia</i>															
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>							1	1	13	1	1	13			
<i>Fusarium</i>															
<i>Nigrospora</i>															
<i>Oidium</i>															
<i>Pithomyces</i>				1	1	13									
<i>Polythrincium</i>															
Rusts	1	0	13				1	1	13						
Smuts, <i>Periconia</i> , Myxomycetes	1	0	13	1	1	13				2	2	27			
<i>Stachybotrys</i>										3	2	40	4	1	53
<i>Torula</i>															
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	222			119			175			125			418		
Fungal fragments (0-3 +)	0+			0+			0+			0+			0+		
Non-fungal material (0-3 +)	2+			2+			2+			3+			2+		
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>2,960</b>			<b>1,587</b>			<b>2,333</b>			<b>1,667</b>			<b>5,573</b>		

**Note:**

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0 + to 3 + (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3 + non-fungal material and/or 3 + fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.



# Laboratory Analysis Report

**EMC LAB REPORT NUMBER:** 98424

**Client's Job/Project No.:** 21346-001

**Analyst:** Anupama Chauhan, M.Sc., Microbiologist

<b>Client's Sample ID</b>	<b>AS-119</b>														
EMC Lab Sample No.	416258														
Sampling Date	Oct 21/24														
Description/Location	Men's washroom (second floor)														
Air Volume (m <sup>3</sup> )	0.075														
<b>Fungal Spores</b>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>	raw ct.	%	spores/m <sup>3</sup>
<i>Alternaria</i>															
<i>Arthrinium</i>															
Ascospores	11	8	147												
<i>Aspergillus/Penicillium</i> type	48	34	640												
Basidiospores	18	13	240												
<i>Cercospora</i>															
<i>Chaetomium</i>															
<i>Cladosporium</i>	35	24	467												
Colorless	18	13	240												
<i>Curvularia</i>															
<i>Drechslera/Bipolaris</i> group															
<i>Epicoccum</i>	1	1	13												
<i>Fusarium</i>															
<i>Nigrospora</i>															
<i>Oidium</i>															
<i>Pithomyces</i>															
<i>Polythrincium</i>															
Rusts															
Smuts, <i>Periconia</i> , Myxomycetes	1	1	13												
<i>Stachybotrys</i>	11	8	147												
<i>Torula</i>															
<i>Ulocladium</i>															
Unidentified spores															
Number of spores/sample	143														
Fungal fragments (0-3 +)	0+														
Non-fungal material (0-3 +)	3+														
<b>TOTAL SPORES/M<sup>3</sup></b>	<b>1,907</b>														

**Note:**

1. *Aspergillus/Penicillium* type spores may include those of *Acremonium*, *Paecilomyces*, *Trichoderma* and others.
2. A scale of 0 + to 3 + (indicating increasing amount) is used to rate abundance of fungal fragments and non-fungal material, with 3+ indicating the most abundance.
3. The presence of a large amount of dust debris may obscure some spores to be counted. Spore counts from samples with 3 + non-fungal material and/or 3 + fungal material may be treated as under-counts.
4. Unidentified spores are those lacking distinguishable characteristics for correct identification. Colorless are colorless spores lacking distinguishable characteristics.
5. These results are only related to the sample(s) analyzed.



# Laboratory Analysis Report

To:

**Liam Wynne**  
Cambium Inc.  
194 Sophia Street  
Peterborough, Ontario  
K9H 1E5

**EMC LAB REPORT NUMBER:** 98656

**Job/Project Name:** 4 Needlers

**Job/Project No:** 21346-001 **No. of Samples:** 10

**Sample Type:** Bulk **Date Received:** Nov 4/24

**Analysis Method(s):** Direct Microscopic Examination

**Date Analyzed:** Nov 7/24 **Date Reported:** Nov 8/24

**Analyst:** Fajun Chen, Ph.D., *Principal Mycologist*

Client's Sample ID	Lab Sample No.	Date Sampled	Description/Location	Mould Identified, in Rank Order	Mould Growth
MLD-108	417121	Oct 31/24	Mould on gypsum / changeroom 4	Fungal hyphae <i>Aspergillus/Penicillium</i> (a few spores) <i>Cladosporium</i> (a few spores)	Sparse
MLD-109	417122	Oct 31/24	Mould on gypsum / lobby	<i>Cladosporium</i>	Moderate
MLD-110	417123	Oct 31/24	Mould on gypsum / small changeroom	Fungal hyphae <i>Aspergillus/Penicillium</i> (a few spores) <i>Cladosporium</i> (a few spores)	Sparse
MLD-111	417124	Oct 31/24	Mould on gypsum / changeroom 3	Fungal hyphae <i>Cladosporium</i> (a few spores) Ascospores (a few)	Sparse
MLD-112	417125	Oct 31/24	Mould on gypsum / lobby viewing area	<i>Ulocladium</i> <i>Chaetomium</i>	Moderate
MLD-113	417126	Oct 31/24	Mould on concrete / lobby	<i>Chaetomium</i> (a few spores) <i>Cladosporium</i> (a few spores)	None
MLD-114	417127	Oct 31/24	Mould on wood / lobby	<i>Ulocladium</i> <i>Cladosporium</i>	Sparse to moderate
MLD-115	417128	Oct 31/24	Mould on wood / second floor	<i>Trichoderma</i> <i>Aspergillus</i> <i>Cladosporium</i>	Abundant
MLD-116	417129	Oct 31/24	Mould on gypsum / second floor	<i>Aspergillus</i>	Abundant
MLD-117	417130	Oct 31/24	Mould on gypsum / second floor	<i>Stachybotrys</i> <i>Ulocladium</i>	Abundant

**Note:**

1. Mould growth is subjectively assessed with description terms sparse, moderate and abundant.
2. The presence of spores (lacking other fungal structures associated) is assessed as following: a few spores (< 10 spores average per microscopic field at 400X), some spores (10 - 100 spores average per microscopic field at 400X), many spores (> 100 spores average per microscopic field at 400X).
3. The presence of a few spores generally represents settled spores on the surface of the sample rather than indicating mould growth.
4. The results are only related to the samples analyzed.



**BARRY BRYAN  
ASSOCIATES**

Architects  
Engineers  
Project Managers



250 Water Street,  
Suite 201  
Whitby, Ontario  
Canada  
L1N 0G5

Tele: **905-666-5252**  
Fax: **905-666-5256**  
Email: [bba@bba-archeng.com](mailto:bba@bba-archeng.com)  
[www.bba-archeng.com](http://www.bba-archeng.com)

December 5, 2024

The Township of Cavan Monaghan  
988 County Road 10  
Millbrook, ON L0A 1G0

Attention: Mr. Chris Allison

Re: **Structural Consulting Services to Review Mould Assessment Report, Millbrook  
Arena,  
4 Needlers Lane, Millbrook, Ontario  
BBA Proposal No. P24-480**

Dear Mr. Allison:

## INTRODUCTION

Barry Bryan Associates (BBA) had originally undertaken a building condition assessment in 2019 and later completed an additional review in 2022 to assess feasibility of renovation or re-purposing the space as a municipal public facility for the Millbrook Arena located at 4 Needlers Lane in Millbrook, Ontario.

Based on our findings from our previous report, the facility requires remediation and repairs to remain as a serviceable facility fit for public use over the long term. Refer to attached report prepared by BBA dated September 15, 2022 for additional information.

We understand on the advice of the Township's legal counsel, the Millbrook Arena was closed to all members of the public on the morning of Friday October 18, 2024 as a result of the legal firm's review of the results from the September 2024 air quality testing. Sampling that was carried out indicated a significant and concerning increase of mould levels which in consultation with an environmental law specialist, recommended for closure of the facility until more comprehensive testing and analysis could be completed.

BBA was requested by the Township of Cavan Monaghan to provide a review of the mould assessment report recently prepared by Cambium Inc. (Cambium) and provide an order of magnitude budget to remediate the mould as per Cambium's recommendations. The assessment was prompted following the concerns regarding the presence of mould growth throughout the building.

## BUILDING DESCRIPTION

The Millbrook Arena consists of a single pad arena, an ice re-surfacing room, change rooms, washrooms, furnace room, a foyer, and a compressor room. The second storey consists of a community gathering room, storage rooms, washrooms, a kitchen area and a small gathering room.

The original arena was constructed circa 1950's. In the mid-1970s, there was an explosion in Millbrook which damaged one of the exterior walls and required that portion of the facility to be rebuilt. The building structure consists of metal decking cold form steel Z-purlins, pre-engineered steel frames, concrete masonry block walls, metal siding, precast concrete slabs and concrete slabs-on-grade.



## DISCUSSION & RECOMMENDATIONS

Cambium completed a mould assessment at the above mentioned location which consisted of the visual assessment of mould growth, water damage, and/or water intrusion, and collection and analysis of samples. Refer to attached mould assessment report prepared by Cambium Inc. dated November 28, 2024 (Cambium reference: 21346-001) for additional information.

Following the mould assessment, it was determined that there was significant mould growth present throughout the building, impacting building materials. Further, elevated airborne mould spore concentrations had also been identified.

Based on the findings, Cambium recommended for the following to be completed:

- Under Level 3 mould abatement procedures,
  - Remove mould impacted gypsum finishes, acoustic ceiling tiles, wood trim, fibreglass insulation, vapour barrier
  - Clean and disinfect mould impacted concrete, removable rubber flooring, all stored items and surfaces throughout the building, all other non-porous surfaces (to extent practical) throughout all other areas of the building utilizing HEPA sandwich cleaning techniques and all supply and return ductwork (including all air handling equipment) throughout the building
  - Prior to reinstatement activities, all finished should be verified as dry and all sources of moisture intrusion rectified. Further, additional air sampling is recommended to be completed to verify adequacy of air quality following the remedial repairs.

Further, refer to the previously-completed report from 2022 and 2019 attached to this report for further details and recommendations relating to restoring the structure to original conditions to preserve the integrity of the building envelope and structure.

We have completed an “order of magnitude” budget for the work required for the mould remediation which includes associated General Construction costs and Contingencies which has been attached. Note: budget associated with accessibility upgrades recommended within BBA’s previous issued report has not been included as part of this budget and only includes remedial repairs required for mould remediation and necessary repairs to address sources of moisture intrusion.

The total Construction Budget would be approximately **\$1.91M** of hard construction cost, and **\$2.63M** with modest contingencies. Please see attached budget for the breakdown of cost per element, and proportion of cost per SF of building area.

Please note, it is unclear as to the date in which the remedial repair work would be completed. Consequently, when interpreting the budget above, special consideration should be given to construction escalation costs, high inflation rates and potential worsening building conditions when establishing contingency budgets.

We have allowed for an 8% escalation contingency, which although historically would be considered relatively high, the current market conditions for construction both locally and beyond are experiencing very high rates of inflation. Therefore, the level of certainty for contingencies is low, and will also depend on the projection of the date when the proposed construction will take place and the market conditions of that time.

Additional follow up review, design, investment/budgeting work and consideration is required to establish a more accurate budget as the numbers above are meant to be “order of magnitude”. In order to establish a Class Budget within a specific range of accuracy, design, drawings, details and specifications will need to be completed in accordance with the class of budget desired.





## CONCLUSION

The existing conditions of the Millbrook Arena require remedial repairs to address the findings from the mould assessment completed by Cambium. Further, repairs are required to address the issues identified on BBA's previously issued report to ensure sources of moisture infiltration are corrected to restore the integrity of the existing building structure.

Due to the age and conditions of the existing facility, the remedial repairs would be considered major and would require substantial funding to achieve.

Please note, the purpose of BBA's previously prepared report dated September 15, 2022 was to revisit the past report and review the current site conditions in 2022 in order to provide recommendations regarding potential future use as a current municipal public facility with consideration for accessibility upgrades to meet standards of the Province of Ontario for community buildings. For the purpose of this report, the recommendations and costs for all accessibility upgrades have been excluded however, please note, the recommendations within our previously prepared report remains valid and will be required in order to satisfy minimum accessibility standard requirements.

Should you have any questions regarding the investigation and this report, please do not hesitate to contact us.

Yours very truly,

**Barry Bryan Associates**

*Architects, Engineers, Project Managers*



Nicole Andar (Bautista), P. Eng.



David Bovill, P.E., P. Eng.

NA/gs

Attachments:	Budget	(1 page)
	Cambium Inc. Mould Assessment Report	(42 pages)
	2022 Structural Investigation Report	(95 pages)

**Order of Magnitude Budget**  
**Millbrook Arena - Moisture Infiltration Repairs and Mould Remediation**  
December 5, 2024



Barry Bryan Associates  
Architects, Engineers, Project Managers

Gross Floor Area:			25000 SF	
				Unit Cost
<b>Building Shell</b>			\$ 1,250,000.00	\$ 50.00
Roofing	\$	450,000.00		\$ 18.00
Exterior Enclosure	\$	800,000.00		\$ 32.00
<b>Building Interiors</b>			\$ 200,000.00	\$ 8.00
Interior Repairs	\$	200,000.00		\$ 8.00
<b>Ancillary Work</b>			\$ 300,000.00	\$ 12.00
Demolition	\$	50,000.00		\$ 2.00
Mould Remediation	\$	250,000.00		\$ 10.00
<b>Subtotal</b>			\$ 1,750,000.00	\$ 70.00
<b>General Requirements</b>			\$ 157,500.00	\$ 6.30
Contractor's General Requirements	6% \$	105,000.00		\$ 4.20
Contractor's Fees	3% \$	52,500.00		\$ 2.10
<b>Subtotal (Hard Construction)</b>			\$ 1,907,500.00	\$ 76.30
<b>Construction Allowances</b>			\$ 724,850.00	\$ 28.99
Escalation	8.0%	\$ 152,600.00		\$ 6.10
Design Contingency	15.0%	\$ 286,125.00		\$ 11.45
Construction Contingency	15.0%	\$ 286,125.00		\$ 11.45
<b>Total Construction Cost Incl. Allowances</b>			\$ 2,632,350.00	\$ 105.29



**BARRY BRYAN  
ASSOCIATES**

Architects  
Engineers  
Project Managers



250 Water Street,  
Suite 201  
Whitby, Ontario  
Canada  
L1N 0G5

Tele: **905-666-5252**  
Fax: **905-666-5256**  
Email: [bba@bba-archeng.com](mailto:bba@bba-archeng.com)  
[www.bba-archeng.com](http://www.bba-archeng.com)

September 15, 2022 Revised  
July 8, 2022 Revised  
June 15, 2022

The Township of Cavan Monaghan  
988 County Road 10  
Millbrook, ON L0A 1G0

Attention: Ms. Melissa Als

Re: **Consulting Services to Update Our Structural Investigation Report to Assess the Feasibility of Renovating the Millbrook Arena or Utilizing the Space in Other Ways**  
**4 Needlers Lane, Millbrook, Ontario**  
**BBA Project No. 22059 (REVISED)**

Dear Ms. Als:

## INTRODUCTION

Barry Bryan Associates (BBA) was requested by the Township of Cavan Monaghan to provide an updated review of the Millbrook Arena located at 4 Needlers Lane in Millbrook, Ontario.

BBA had originally undertaken a building condition assessment in 2019 and issued a report on August 7, 2019 (BBA Project No. 19167) outlining our observations and recommendations. This original report has been attached for reference.

We understand since this time of our report, and the opening of the new Cavan Monaghan Community Centre, the Millbrook Arena has been actively utilized by the public for limited dry recreational activities such as lacrosse and indoor soccer. Ice has not been made within the facility since 2019.

The purpose of this review and report is to revisit our past report and current site conditions in order to provide recommendations regarding the potential future use as a current municipal public facility.

Please note we have revisited the site with staff from the Township, however we did not undertake a full inspection, nor did we request mechanical or electrical engineers to revisit the site to review any specific equipment as this was out of the scope of this review. The same statements of limitation from our original report also applies to this follow-up report.

It is our understanding that the facility may be considered for re-purpose as a community space for additional recreational activities, while no longer including recreational ice and associated refrigeration equipment.

## BUILDING DESCRIPTION

The Millbrook Arena consists of a single pad arena, an ice re-surfacing room, change rooms, washrooms, furnace room, a foyer, and a compressor room. The second storey consists of a community gathering room, storage rooms, washrooms, a kitchen area and a small gathering room.

The original arena was constructed circa 1950's. In the mid-1970s, there was an explosion in Millbrook which damaged one of the exterior walls and required that portion of the facility to be rebuilt. The building structure consists of metal decking cold form steel Z-purlins, pre-engineered steel frames, concrete masonry block walls, metal siding, precast concrete slabs and concrete slabs-on-grade.

## DISCUSSION & RECOMMENDATIONS

We understand that activities within the facility have been limited to dry recreational activities such as lacrosse and indoor soccer. The recreational ice and associated refrigeration equipment have been decommissioned and are not intended to be reinstated as part of any upgrade. Based on our investigation, the facility requires remediation and repairs to remain as a serviceable facility fit for public use over the long-term.

The basis of the consideration of the report and costing exercise is considering that all renovations would happen as a single project such that the building can open as a current public facility without continuous or recurring repairs year after year.

The building specifically requires intervention of the main building envelope and structure. Examples of items of specific concern identified during our time on site include, but are not limited to the following:

- Cracked concrete slabs.
- Damaged siding and concrete block.
- Wet, mouldy insulation.
- Damaged ceilings/liners.
- Deteriorated mortar joints.

Please refer to the previously-completed report from 2019, as well as current photos attached to this report for further details and recommendations.

Beyond immediate repairs, the facility also requires modifications as well as some elements of life cycle renewal to function as a community facility with a reasonable level of standard and state of good repair.

Currently, the building does not meet accessibility standards of the Province of Ontario for community buildings. This includes an accessible route of travel to all public/staff locations within the building. It is assumed that the building should meet a modern standard to serve the public currently and in the future.

Upgrades required to meet this standard include the following:

- Parking
- Ramps
- Doors, frames and hardware
- Operators
- Signage
- Elevators/lifts
- Clear aisles
- Universal and/or barrier free washrooms

We have completed an “order of magnitude” budget for the work which includes for accessibility upgrades, State of Good Repair upgrades, associated General Construction costs and Contingencies which has been attached.

The total Construction Budget would be approximately **\$4.45M** of hard construction cost, and **\$5.25M** with modest contingencies. Please see attached budget for the breakdown of cost per element, and proportion of cost per SF of building area.

The developed budgets are for funding that we would recommend for a life cycle replacement for a service life of an additional 25 years for the facility to act as a Public Community building. Specific values are based on the building areas as well as our investigation of the building and documented conditions.

Please note, it is unclear as to the date in which the suggested upgrades would be completed. Consequently, when interpreting the budget above, special consideration should be given to construction escalation costs, high inflation rates and potential worsening building conditions when establishing contingency budgets.



We have allowed for an 8% escalation contingency, which although historically would be considered relatively high, the current market conditions for construction both locally and beyond are experiencing very high rates of inflation. Therefore, the level of certainty for contingencies is low, and will also depend on the projection of the date when the proposed construction will take place and the market conditions of that time.

Further, costs associated with converting the facility to any specific use have not been included as it is not clear what the future use may be with any specific detail. Therefore, any upgrades associated with facilitating a new use have not been considered, i.e. introduction of multi-purpose rooms, sport surfaces or renovations for other community uses.

Additional review, design, investment/budgeting work and consideration is required to establish a more accurate budget as the numbers above are meant to be "order of magnitude". In order to establish a Class Budget within a specific range of accuracy, design, drawings, details and specifications will need to be completed in accordance with the class of budget desired.

We also recommend that a designated substances survey be completed and reviewed by a qualified person prior to finalizing an accurate budget as there may be abatement considerations which are currently unknown.

## CONCLUSION

The existing conditions of the Millbrook Arena require both accessibility upgrades and life cycle improvements to the Site, Envelope, Interiors, Mechanical and Electrical systems to effectively serve the community as a public building for the next 25 years.

Due to the age and conditions of the existing facility, the upgrades would be considered major and would require substantial funding to achieve. Additional funding may also be required to convert the building to a difference use depending on the alternate uses considered.

Should you have any questions regarding the investigation and this report, please do not hesitate to contact us.

Yours very truly,

**Barry Bryan Associates**

*Architects, Engineers, Project Managers*



Ben Koeslag, P.Eng.



David Bovill, P.E., P.Eng.

DB/gs

Attachments:	Budget	(1 page)
	Photographs	(8 pages)
	2019 Structural Investigation Report	(83 pages)

**Order of Magnitude Budget**  
**Millbrook Arena State of Good Repair**  
September 15, 2022



Barry Bryan Associates  
Architects, Engineers, Project Managers

Gross Floor Area:				25000 SF	
				Unit Cost	
<b>Building Shell</b>				<b>\$ 1,250,000.00</b>	<b>\$ 50.00</b>
Roofing	\$	450,000.00		\$	18.00
Exterior Enclosure	\$	800,000.00		\$	32.00
<b>Buildilng Interiors</b>				<b>\$ 950,000.00</b>	<b>\$ 38.00</b>
Interior Repairs	\$	200,000.00		\$	8.00
Accessibility Upgrades	\$	750,000.00		\$	30.00
<b>Mechanical</b>				<b>\$ 1,125,000.00</b>	<b>\$ 45.00</b>
Plumbing and Fixtures	\$	250,000.00		\$	10.00
HVAC and Controls	\$	800,000.00		\$	32.00
Life Safety	\$	75,000.00		\$	3.00
<b>Electrical</b>				<b>\$ 500,000.00</b>	<b>\$ 20.00</b>
Lighting, Devices and Fire Alarm	\$	500,000.00		\$	20.00
<b>Site Work Allowance</b>				<b>\$ 200,000.00</b>	<b>\$ 8.00</b>
<b>Ancillary Work</b>				<b>\$ 50,000.00</b>	<b>\$ 2.00</b>
Demolition	\$	50,000.00		\$	2.00
<b>Subtotal</b>				<b>\$ 4,075,000.00</b>	<b>\$ 163.00</b>
<b>General Requirements</b>				<b>\$ 366,750.00</b>	<b>\$ 14.67</b>
Contractor's General Requirements	6% \$	244,500.00		\$	9.78
Contractor's Fees	3% \$	122,250.00		\$	4.89
<b>Subtotal (Hard Construction)</b>				<b>\$ 4,441,750.00</b>	<b>\$ 177.67</b>
<b>Construction Allowances</b>				<b>\$ 799,515.00</b>	<b>\$ 31.98</b>
Escalation	8.0%	\$ 355,340.00		\$	14.21
Design Contingency	5.0%	\$ 222,087.50		\$	8.88
Construction Contingency	5.0%	\$ 222,087.50		\$	8.88
<b>Total Construction Cost Incl. Allowances</b>				<b>\$ 5,241,265.00</b>	<b>\$ 209.65</b>

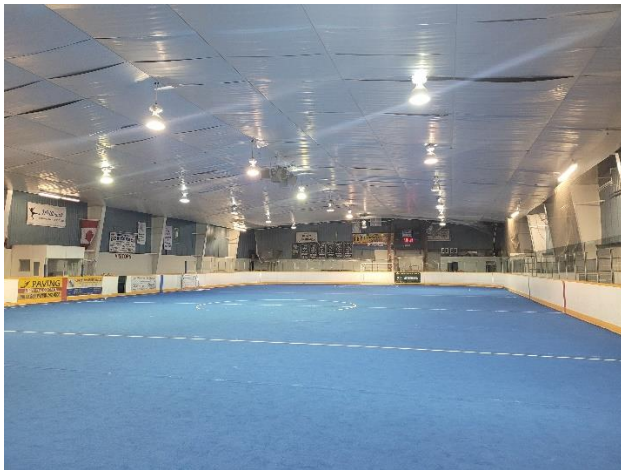


Photo 01 – Millbrook Arena



Photo 02 – Damaged Metal Siding



Photo 03 – Damaged Roof Insulation

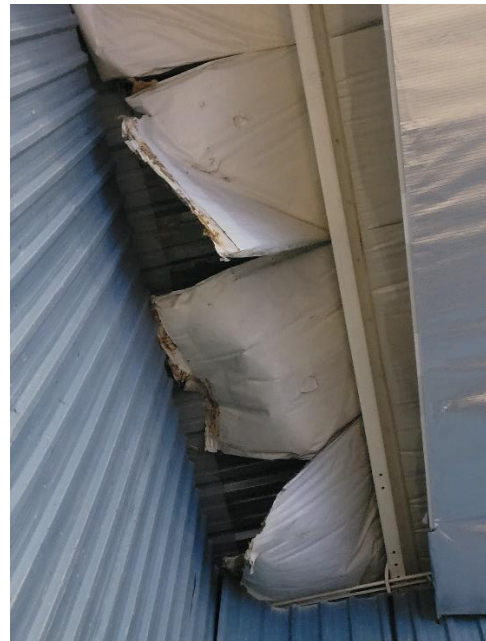


Photo 04 – Damaged Roof Insulation





Photo 05 – Damaged Block Wall



Photo 06 – Ice Resurfacing Room



Photo 07 – Cracked Apron Slab



Photo 08 – Cracked Apron Slab





Photo 09 – Arena Viewing Area

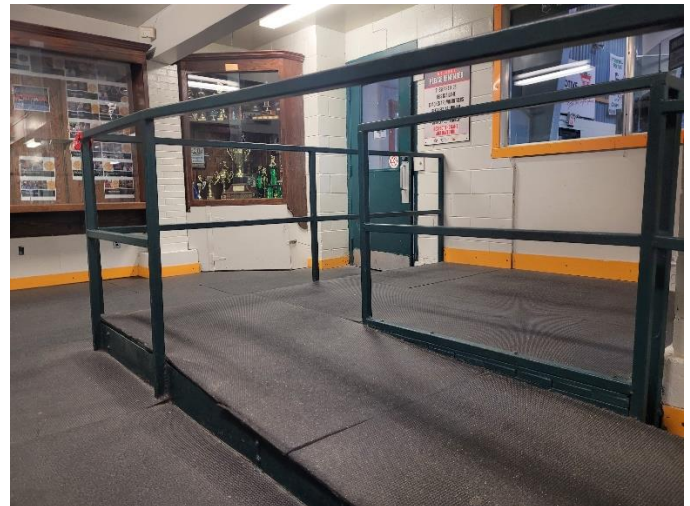


Photo 10 – Viewing Area Ramp/Rail Configuration



Photo 11 – Furnace/Electrical Room



Photo 12 – Damaged Slab in Washroom



Photo 13 – Damaged Slab in Changeroom



Photo 14 – Corroded/Damaged Stair Treads



Photo 15 – Second Floor Community Area



Photo 16 – Damaged Roof Insulation and Evidence of Moisture





Photo 17 – Mould and Evidence of Moisture



Photo 18 – Mould and Evidence of Moisture



Photo 19 – Damaged Rail



Photo 20 – Damaged Concrete Slab and Open Gap to  
Building Exterior



Photo 21 – South Elevation



Photo 22 – Damaged Split Ribbed Block at Southeast Corner



Photo 23 – Damaged Split Ribbed Block at Southeast Corner



Photo 24 – Part West Elevation





Photo 25 – Damaged Concrete Slab at Southwest Corner



Photo 26 – Damaged Split Ribbed Block at Southwest Corner



Photo 27 – Downspout at West Elevation



Photo 28 – Part West Elevation



Photo 29 – Arena Entrance on East Elevation



Photo 30 – Part East Elevation



# Structural Investigation and Report for the

## MILLBROOK ARENA

### Township of Cavan Monaghan



**BBA PROJECT NO. 19167**

**AUGUST 7, 2019**



**BARRY BRYAN ASSOCIATES**  
Architects, Engineers, Project Managers

250 Water Street  
Suite 201  
Whitby, Ontario  
Canada  
L1N 0G5

Telephone: 905 666-5252  
Toronto: 905 427-4495  
Fax: 905 666-5256  
Email: [bba@bba-archeng.com](mailto:bba@bba-archeng.com)  
Web Site: [www.bba-archeng.com](http://www.bba-archeng.com)

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## **PART 1 – INTRODUCTION**

### **1.1 AUTHORIZATION**

This structural condition audit has been undertaken by Barry Bryan Associates, Architects, Engineers, and Project Managers, for the Millbrook Arena, on behalf of the Township of Cavan Monaghan. Authorization to undertake this study was received from Mr. Gerry Barker, Park and Facilities Manager for the Township of Cavan Monaghan.

### **1.2 OBJECTIVES**

The objective of the structural review, as outlined in Barry Bryan Associates proposal for Structural Investigation and Report, dated June 3, 2019 are as follows:

1. Gather and review all previous structural audit reports and existing building plans for Millbrook Arena.
2. Visit the building and perform a visual inspection of all accessible areas of the buildings structure and note the condition and status of the items observed. The reviews will be completed in accordance with the “Guidelines for the Investigation and Repair of Arena Structures” published by the Association of Professional Engineers of Ontario in cooperation with the Safety and Technical Services Division of the Ministry of Labour. We may require some assistance during our onsite review by a member of the staff from the Township. In order to complete a thorough review, we will require that the Township provide us with safe access to the building structure. This will require the rental of lifting equipment and the provision of qualified operators to assist in our review. We have not included the costs for equipment rental in our proposal.
3. Identify any items observed during the visual review which are of concern.
4. Prepare a summary report on the structural condition of the building based on the visual review. The report will include recommendations for remedial work as required for the building to remain in service.

### **1.3 REVIEW METHODOLOGY**

Barry Bryan Associates completed a visual inspection of the building on August 7, 2019. During our inspection we undertook a detailed visual review of the various building structural components, and photographed areas reviewed including any areas of concern.

During the review we checked for evidence of deterioration and/or distress within the structural framing. In general, the structural review included looking for evidence of the following signs of distress:

- Surface deterioration on structural framing
- Deterioration/cracking of concrete
- Deterioration/cracking of concrete masonry block walls
- Excessively deflected structural framing

Complete reference drawings of the existing building structure were not available at the time of our review.

Where reference is made in this report to a Code or other standard, the most recent edition of that referenced material was used.

#### **1.4 STATEMENT OF LIMITATION**

All comments and observations contained in this report are based on visual observations made during the inspection on August 7, 2019.

No destructive testing or opening of the building systems was completed during the inspection. Further we did not review the structural steel connections.

We are unable to comment or access structure which is not exposed to view.

Any design and/or construction deficiencies not recorded herein were not evident at the time of the inspection.

## **PART 2 – BUILDING DESCRIPTION**

The Millbrook Arena consists of a single pad arena, an ice re-surfacing room, changerooms, washrooms, furnace room, a foyer, and a compressor room. The second storey consists of a community gathering room, storage rooms, washrooms, a kitchen area and a small gathering room.

The original arena was constructed circa 1950's. In the mid-1970s there was an explosion in Millbrook which damaged one of the exterior walls and required that portion of the facility to be rebuilt. The building structure consists of metal decking cold form steel Z-purlins, pre-engineered steel frames, concrete masonry block walls, metal siding, precast concrete slabs and concrete slabs-on-grade.

## PART 3 - OBSERVATIONS

BBA attended a site visit on August 7, 2019 to visually review the condition of the structural building components and exterior building façade.

We observed areas of minor to moderate deterioration and cracking at several locations. We have summarized our observations below:

### 3.1 BUILDING INTERIOR

#### 3.1.1 Roof Deck and Purlins

The roof framing above the ice pad consists of steel roof deck spanning across cold formed steel z-purlins. We were unable to complete a detailed review of the steel roof deck or purlins directly above the ice rink as this framing was enclosed by the existing insulation system within the arena. However, there was one (1) localized area where the purlins and roof deck was visible for our review. Our observations at localized areas are as follows:

- The roof deck generally appeared to be in fair condition with no evidence of water/moisture damage (Photo 001). However, at the area exposed behind the net, there were visible minor damage due to puck impacts. For aesthetics purposes, we recommend that the damaged areas are cleaned and painted as required to match original conditions.
- The cold formed steel z-purlins was generally observed to be in fair to good condition.

Generally, the roof deck and purlins appeared to be in fair to good condition.

#### 3.1.2 Pre-Engineered Frames

The main structure of the arena consists of a pre-engineered structural frame system with tapered steel girders supporting the steel purlins. The steel frames span approximately 90'-0" and are spaced at approximately 21'-1" centre to centre. We were unable to complete a detailed review of the entire extents of the tapered girders as this framing was enclosed by the existing insulation system (Photo 002). Our observations are as follows:

- Minor damage was observed at the surface of the frames resulting from repeated puck impacts (Photo 003). For aesthetics purposes, we recommend that the damaged area is cleaned and painted as required to match original conditions.
- Minor localized surface rusting was observed along several bracing members (Photo 004). This is likely due to condensation and high humidity during occupancy. We recommend for the rusted area to be wire brushed clean to bare metal and an epoxy protective coating is applied.
- Bolted connections at the braces appeared to be bent at several locations, effectively causing the nut to be displaced (Photo 005). This appears to be an original condition from the fabrication of the braced connections. Further, minor surface rusting was observed at several bolted connection locations (Photo 006). We recommend for the rusted areas be wire brushed clean to bare metal and an epoxy protective coating is applied.

- Insufficient anchor bolt thread protrusion was observed at several locations. The threads at several bolted connection was not observed to extend past the nuts at the pre-engineered frame base connections (Photo 007). As this condition does not meet the minimum code requirements for thread protrusion past the nut, we recommend that the locations be plug welded to ensure connection to the foundation below is adequate.
- The lower set of braces were observed to be missing along the bleachers (Photo 008). This appears to be an as-built condition as the braces would interfere with the bleacher seating area. A single brace at the south side of the arena appears to be experiencing some deflection, this appears to be an as-built condition (Photo 009).

Generally, the pre-engineered frames appeared to be in fair to good condition. The minor observations noted above are recommended to be addressed to maintain the original condition of the building structure.

### **3.1.3 Bleacher Seating Area**

There are three (3) rows of bleacher seating along the East side of the existing arena. The bleachers are constructed with precast concrete slabs complete with a concrete topping supported on concrete masonry block walls at each end. Our observations are as follows:

- The concrete topping was observed to experience localized minor cracking and paint chipping at localized locations (Photo 010). We recommend that all loose paint to be scraped and repainted to match existing conditions.
- Minor cracking was observed at the precast concrete joint location (Photo 011). This cracking is typical for concrete joint locations and is not a structural concern. We recommend for the joints to be routed out and infilled with a flexible calking material.

The precast concrete bleacher seating area was generally observed to be in fair to good condition.

### **3.1.4 Metal Siding**

The building structure at the arena consists of concrete masonry block wall with partial metal cladding along the North, East and West elevations. Our observations are as follows:

- Minor damage to the metal siding at the North-East corner was observed (Photo 012). This damage is likely a result of repeated impacts from pucks/balls within the arena. For aesthetics purposes, we recommend that the cladding is cleaned and painted as required to match original conditions.
- Significant damage to the metal cladding at the North Wall was observed (Photo 013). The cause of the damage is unclear. However, we recommend that the cladding be replaced at this location to restore to original conditions.
- The metal cladding at roof level along the North elevation appears to be separating from the adjacent cladding. We recommend that the cladding at the roof level be re-secured to match the existing conditions (Photo 014).

- Metal cladding appears to be separating from the wall at one of the frames along the west side of the arena (Photo 015). We recommend that the panel be re-secured to match the existing conditions.

The metal cladding reviewed at the interior of the building generally appeared to be in fair condition.

### **3.1.5 Concrete Rink Slab**

The reinforced concrete rink slab was exposed at the time of our site visit to complete our structural review. The concrete rink slab was approximately 200'-0"(L)x80'-0"(W). Our observations are as follows:

- Thermal cracking was observed throughout the entirety of the rink slab, the North side of the rink slab appeared to experience more cracking than the south side (Photo 016). This cracking is typical with age of concrete after years of pulldowns and thawing of the monolithic concrete slab.

The concrete rink slab generally appeared to be in fair condition.

### **3.1.6 Concrete Apron Slab**

The reinforced concrete apron slab extends around the concrete rink slab at the base of the bleacher seating area and at the perimeter of the arena. The apron slab was exposed on the North side of the arena at the bleachers and wraps around to the benches at the opposite end. Our observations are as follows:

- Moderate cracking was observed near the entrance of the compressor room (Photo 017). We recommend to infill the void space with suitable mortar to match existing conditions.
- Moderate cracking and spalling were observed underneath the exterior garage door on the East side of the building (Photo 018). We recommend for all loose and unsound concrete to be chipped out and removed and patched with a suitable repair mortar.
- Significant cracking was observed adjacent to the ice-surfacing room (Photo 019). This is likely due to previous differential settlement of the structure. We recommend for the slab to be repaired and patched with a suitable repair mortar to prevent further deterioration.
- Rutting was observed in the ice-resurfacing room (Photo 020). This is likely due to driving on the slab prior to the concrete completely curing after the original pour, as well as the fatigue of the concrete over the decades of repeated loading.
- Significant cracking was observed in the ice-resurfacing room extending outwards towards the dasher boards of the pad (Photos 021 and 022). This is likely due to repeated water/salts brought through the room by the resurfacing equipment over the years. We recommend for all loose and unsound concrete to be chipped out and removed and patched with a suitable repair mortar.
- Two (2) separate cracks were observed at the base of two (2) of the steel columns at the North side of the arena (Photos 023 and 024). This is likely due to the absence of slab saw cuts at the column locations. This is a serviceability issue and not a structural concern at this time.
- Cracking was observed underneath the mechanical equipment stand supports at the North-West side of the arena (Photo 025). It appears as though a concrete levelling product has been implemented in the past, resulting in a slight transition between the floor elevations. We recommend that the transition be leveled, and the cracks be infilled with suitable mortar.

The concrete apron slab generally observed to be to fair condition, with several localized areas with cracking concerns. We recommend for all cracks to be cleaned and toured out, loose and unsound concrete be removed and infilled with a suitable repair mortar. with suitable mortar.

### **3.1.7 Concrete Masonry Block Walls**

The concrete masonry walls within the complex were typically constructed of 8" and 12" thick concrete masonry blocks at the exterior and interior of the arena. Our observations are as follows:

- Significant moisture accumulation during the winter months was reported in the compressor room located at the North-East corner of the building. At the time of the review, rusting and evidence of moisture was observed on the masonry block wall (Photo 026). We recommend that the rusted sections be wire brushed clean and repainted to match the existing condition.
- Minor to moderate step cracking was observed at several localized areas within the arena (Photos 027, 028, 029, 030, 031, 032, 033 and 034). This is typical under the serviceability conditions for this type of structure and does not pose a structural concern. We recommend that all open/cracked joints be routed out and infilled with suitable mortar to prevent moisture from entering the building.
- Paint chipping and localized damage to masonry blocks was observed in the corridor leading to the compressor room. A section of one (1) masonry block appeared to be removed and infilled with wooden blocking (Photo 035). We recommend that this section be removed and replaced with new concrete masonry block to match existing and all joints be infilled with suitable mortar.
- Previous differential settlement was observed in the ice resurfacing room (Photo 036). The separation appeared to be infilled with spray foam insulation (Photo 037). This does not appear to be a new condition and does not pose structural concern. At this time we recommend that joint filler be removed and replaced with suitable mortar.
- Deterioration and displacement at the base of the concrete masonry block was observed at a localized area (Photo 038). We recommend that the deteriorated blocks be removed and replaced with concrete masonry blocks to match the existing condition.
- Minor step-cracking along at the north side exit was observed (Photo 039). The wall at this location appeared to be slightly displaced from the original location at the base (Photo 040). We recommend that the displaced section of the wall be temporarily shored to facilitate the removal and rebuilding of the wall to restore to original conditions.
- The block wall along the west elevation of the arena appeared to be in fair to good condition (Photo 041).
- Block walls within changerooms 1 through 4 appeared to be in good condition (Photo 042). Minor localized damage was observed in changeroom 3 (Photo 043).
- The bricks enclosing the steel columns within the lobby area appeared to be in good condition (Photo 044).
- The west stairwell was observed to experience minor moisture damage (Photo 045). This is exemplified by the paint chipping at the base of the stairs (Photo 046).
- Localized block failure was observed under the load bearing beam spanning into the wall on the West side of the stairwell (Photo 047). We recommend that all loose and unsound blocks be replaced, and an adequate bearing plate be implemented.
- A steel lintel in the mechanical room adjacent to changeroom 3 was observed to be bearing on a single masonry block experiencing localized cracking (Photo 048). We recommend replacing the steel lintel with a new, longer lintel with a minimum of 6" bearing on each side of the opening.



- Wall separation was observed in the storage room on the second floor (Photo 049). We recommend in filling this void space with suitable flexible mortar.
- The remainder of the south stairwell walls appeared to be in good condition (Photo 050).

### **3.1.8 Concrete Slabs-On-Grade**

The reinforced concrete slabs on grade were exposed for our review in the compressor room at the north-east end of the building as well as in the west stairwell. Our observations are as follows:

- The concrete slab within the compressor room appeared to be separated from the building structure locally at the north-east corner of the building (Photo 051). We recommend that this gap be infilled with an appropriate mortar to ensure that no moisture can accumulate at the base of the wall and cause further damage.
- Staining of the concrete surface was observed below the ammonia pump (Photo 052). This is not a structural concern at this time, however we recommend that the concrete surface is cleaned and an appropriate protective coating is applied to the concrete surface to prevent furthermore advanced deterioration in the future.
- Cracking and minor rusting was observed on the slab where the electrical conduits appear to be partially embedded in the concrete slab on grade. It appears that there may not be sufficient concrete cover around the embedded conduit (Photo 053). We recommend that the slab be cut and removed at this location and the conduit be adequately embedded within the concrete.
- Cracking and separation were observed at the base of the door in the west-side stairwell location (Photo 054). We recommend that the cracks be routed and infilled with a suitable repair mortar.

The concrete slab-on-grade generally appeared to be in fair to good condition.

### **3.1.9 Partial Second Floor Space**

The partial second floor area is located along the South side of the arena above the changeroom areas and consists of storage rooms, community gathering room, lounge room, kitchen, bar and bathrooms (Photos 055 and 056). The roof structure consists of wood and steel decking spanning across structural steel beams supported on concrete masonry block walls (Photo 057). We reviewed the roof structure within the suspended ceiling spaces at select locations. Insulation along with plastic covering the roof framing prevented visual access to review the majority of the roof structure (Photo 058). Our observations are as follows:

- Moisture damage was observed at the underside of the insulation. (Photos 059 and 060). This moisture is possibly damaging the roof framing system. We recommend that further intrusive testing be done to inspect the condition of the roof framing system.
- Numerous signs of moisture damage was observed by the water stains and plastic breakthroughs of the ceiling tiles (Photos 061 and 062).

The steel beams and concrete masonry block walls generally appeared to be in fair to good condition. Signs of Moisture were found throughout the entire second floor roofing system.

## **3.2 BUILDING EXTERIOR**

### **3.2.1 SOUTH ELEVATION**

The exterior South wall elevation is generally constructed with prefinished metal siding above a load bearing block wall. Our observations are as follows:

- The foundation wall at the south-west corner of the building appeared to be experiencing localized cracking and spalling at the concrete surface (Photos 063 and 064). Cracking at the centre foundation wall was also observed. We recommend for the cracks to be routed out and infilled with a suitable repair mortar to restore original conditions.
- Minor cracking of the mortar joints was observed along the architectural precast concrete wall panels at localized areas (Photo 065).
- Localized damage to single brick in the architectural precast concrete wall panels was observed (Photo 066). We recommend for the architectural precast concrete wall panels to be repaired and patched with a suitable repair mortar to prevent further deterioration of the architectural wall.
- Localized block damage was observed near the roof at the South-East Corner (Photo 067). We recommend for the architectural precast concrete wall panels to be repaired and patched with suitable repair mortar to prevent further deterioration of the architectural wall.
- The architectural precast concrete wall panels at the South Wall was observed to be in fair to good condition (Photo 068).
- The metal cladding above the Architectural block walls generally appeared to be in fair condition (Photo 069).
- Localized minor cracking was observed at the concrete walkway adjacent to the south elevation (Photo 070). This cracking appears to be a result of freeze and thaw cycles and heaving below the slab. This is not a structural concern.

The architectural precast concrete wall panels and metal cladding generally appeared to be in fair to good condition. However, some of the areas of concern observed on site and noted above require immediate attention to help stabilize the wall structure and prevent deterioration to the point of structural instability.

### **3.2.2 EAST ELEVATION**

The exterior East wall elevation is generally constructed of prefinished metal siding above a architectural precast concrete wall panels. Our observations are as follows:

- The foundation wall near the lobby has a significant gap, and the surrounding paved area is experiences minor deterioration (Photo 071). This is likely due to the damaged eaves that is leaking water onto the wall (Photo 072). We recommend that the crack in the foundation be repointed.
- Moss was observed to be growing along the east side wall (Photo 073). This is a sign of moisture accumulation and has resulted in deterioration of the precast concrete wall panels (Photo 074). We recommend for the architectural precast concrete wall panels to be cleaned at these locations and to prevent further more advanced damage to the wall system.

- Caulked panel joints along architectural precast concrete wall panels appear to be in good condition (Photo 075).
- Metal cladding above architectural precast concrete wall panels appears to be in good condition (Photo 076).
- Minor damage to the metal was observed above the garage door opening near the North side (Photo 077). A section of the steel lintel enclosed by the metal was visible at the damaged location and the lintel was observed to be in poor condition with significant rust accumulation and loss of cross-sectional area (Photo 078). We recommend that this lintel be exposed, removed and replaced with a new lintel to match existing conditions, and the damaged metal siding be repaired/replaced to restore to original conditions. to match the surrounding area.

The architectural precast concrete wall panels and metal cladding generally appeared to be in fair to good condition. However, some of the areas of concern observed on site and noted above require immediate attention to help stabilize the wall structure and prevent deterioration to the point of structural instability.

### 3.2.3 NORTH ELEVATION

The exterior North wall elevation consists of a low roof and high roof area. The north elevation of the low roof area generally consists of full height concrete masonry block while the high roof consists of partial concrete masonry block and prefinished metal siding. Our observations are as follows:

- Localized step Cracking and paint-peeling was observed along the north elevation (Photos 079, 080 and 081). We recommend for all cracked mortar joints to be routed and re-pointed to restore to original conditions. All areas of peeled paint should be cleaned, and new paint applied to match adjacent wall areas.
- Honeycombing at the foundation wall and mould growth was observed on the exterior of the ice-resurfacing room (Photos 082 and 083). We recommend for the block walls to be cleaned, mould accumulation to be removed at these locations. The honeycombing is likely a result from the pouring of the concrete at the time of constriction and does not pose a structural concern.
- The metal cladding was observed to be in fair to good condition (Photo 084).
- Minor damage to the base of the exterior of the garage door overhead jambs was observed (Photos 085 and 086). This is likely due to Zamboni impact while travelling in and out of the ice resurfacing room. We recommend that the enclosures are repaired to ensure more advanced damage does not occur.
- Minor damage to the metal header covers was observed above the overhead door location (087). We recommend that the enclosures are repaired to ensure more advanced damage does not occur.
- Moisture accumulation was observed along the north elevation (Photo 088). We recommend for the block walls to be cleaned to restore the original building condition.

The concrete masonry block and metal cladding generally appeared to be in fair to good condition. However, some of the areas of concern observed on site and noted above require immediate attention to help stabilize the wall structure and prevent deterioration to the point of structural instability.

### 3.2.4 WEST ELEVATION

The exterior west wall elevation generally consists of prefinished metal siding above a load bearing concrete masonry block wall. Our observations are as follows:

- An open joint was observed between foundation walls and concrete pier at the north-west corner of the building (Photo 089). We recommend that the gap be cleaned and filled with suitable joint filler material to ensure that moisture cannot penetrate into the structure causing more advanced deterioration.
- Mould accumulation was observed at the top of the foundation wall along the entire extents of the west elevation (Photo 090). We recommend that the base of the masonry wall/top of the foundation wall be cleaned and mould to be removed at these locations to prevent future more advanced deterioration.
- One (1) of the masonry control joint locations was observed to be open (Photo 091). We recommend that this joint be cleaned and infilled with a suitable joint filler material to ensure moisture does not penetrate into the existing building envelope.
- Localized deterioration at the top of the foundation wall behind a rainwater leader location was observed (Photo 092). We recommend that this area be fixed with suitable repair mortar to ensure no further damage can be done to the structure.
- An opening was observed at the top of the masonry block wall near the south side of the wall (Photo 093). We recommend that the damaged concrete block at this location is removed and replaced with new block to match existing condition to ensure further, more advanced deterioration does not occur to the building system.

The concrete masonry block, architectural block and metal cladding generally appeared to be in fair to good condition. However, some of the areas of concern observed on site and noted above require immediate attention to help stabilize the wall structure and prevent deterioration to the point of structural instability.

## PART 4 – CONCLUSION AND RECOMMENDATIONS

We completed a structural condition review of the existing building framing and exterior building façade where safe access was available for our review. Our general review of the building interior and exterior identified several issues which should be addressed to improve the long term serviceability of the building structure. We have summarized our remedial recommendations as follows:

### RECOMMENDED IMMEDIATE REPAIRS: (Recommended to be completed within next 6 months – 1 year)

1. All deteriorated/open/cracked mortar joints should be routed and infilled with a suitable repair mortar to restore the integrity of the existing building envelop.
2. The efflorescence and mould accumulation on the building exterior should be cleaned from the structural systems and an adequate protective coating applied.
3. Patch any locations of spalled concrete masonry block and/or brick with a suitable repair mortar to restore the integrity of the existing building envelop. Replace any damaged/cracked concrete masonry block or brick with new block/brick to match existing as required.
4. Any rust accumulation on the existing roof framing should be wire brushed to bare metal and epoxy painted to prevent further deterioration of the structural framing.
5. Rout out existing cracked mortar joint locations and repoint with new mortar to match original conditions.
6. Replace lintels at the 1<sup>st</sup> floor mechanical room, and above the east overhead door location.
7. Remove and replace the wooden block within the compressor room entrance way with concrete block to match the existing condition.
8. Plug weld the bolts along the base of the pre-engineered frames.

### RECOMMENDED REPAIRS: (Recommended to be completed within next 2 – 5 years)

1. Clean existing exterior wall and chip off all locations of peeled paint. Provide new paint suitable for exterior applications to match existing building colour scheme.
2. All damaged metal cladding locations in the interior of the building should be repaired or replaced.
3. Minor cracking in the concrete slab-on-grade should be routed out and infilled with a suitable epoxy injection mortar.

All masonry repairs noted above must be completed using techniques which best match the original construction of the existing building.

The structural framing and exterior walls are in fair to good condition, however remedial repair work is required to preserve the integrity of the existing building structure and restore the building envelop to original conditions.

## PART 5 – CONSTRUCTION BUDGET ESTIMATES

We provided an opinion of the order of magnitude costs for both the immediate remedial work and recommended remedial work. The budgets have been developed based on our observations from the site and our recommendations for the remedial repair work for each item. Detailed designs, drawings, and specifications regarding the repairs will need to be developed to confirm the actual project costs.

We have provided our opinion of the budget for the remedial scopes of work below. The budgets do not include HST, permitting, testing and inspection:

### IMMEDIATE REPAIRS:

1. Mobilization/General Conditions	\$10,000
2. Masonry Repairs/Cleaning	\$40,000
3. Prepping of Structural Steel	\$15,000
4. Painting Structural Steel	\$15,000
5. Lintel Replacement	\$30,000
6. Miscellaneous Repairs	\$5,000
7. Mechanical/Electrical Upgrades	TBD
<b>Sub-total</b>	<b>\$115,000</b>
15% Contingency	\$17,250
8% Engineering	\$9,200
<b>Total</b>	<b>\$141,540</b>

### RECOMMENDED RAPAIRS:

1. Mobilization/General Conditions	\$5,000
2. Masonry Cleaning	\$30,000
3. Metal Cladding Repairs	\$10,000
4. Crack Repairs	\$10,000
5. Mechanical/Electrical Upgrades	TBD
<b>Sub-total</b>	<b>\$55,000</b>
15% Contingency	\$8,250
8% Engineering	\$4,400
<b>Total</b>	<b>\$67,650</b>



We trust the above information meets your requirements. Should you have any further questions, please do not hesitate to contact our office.

Yours very truly,

**BARRY BRYAN ASSOCIATES**  
*Architects, Engineers, Project Managers*

Logan Haupt, EIT

David Bovill, P.E., P. Eng.

LH/gs

## **APPENDIX A**

### **PHOTOGRAPHS**



Photo 001 Hidden Roof Deck & Z-Purlins



Photo 002 Roof Deck Insulation covering Pre-Engineered Frames



Photo 003      Pre-Engineered Frame



Photo 004      Rust on Frame Brace



Photo 005      Bent Connection



Photo 006      Rusted Bracing Connection



Photo 007      Pre-Eng Frame Base Connections



Photo 008      Missing Brace at Southmost Frame





Photo 009      Bent Braced member



Photo 010      Paint Chipping and Crack on Bleachers



Photo 011      Bleacher Crack at Joint Location



Photo 012      Localized damage to MetalCladding



Photo 013      Significant Damage to Metal Cladding



Photo 014      Metal Cladding Damage



Photo 015      Metal Cladding Along West Side



Photo 016      Thermal Cracking on Rink Slab





Photo 017      Cracking Outside of Compressor Room



Photo 018      Apron Slab Under Garage Door



Photo 019      Major Crack in Apron Slab



Photo 020      Resurfacing Room Rutting





Photo 021      Cracking Starting in Resurfacing Room



Photo 022      Extents of Resurfacing Room Cracking



Photo 023      Cracking Under North-Side Column



Photo 024      Cracking Under North-Side Column



Photo 025      Crack Underneath Mechanical Equipment Stand

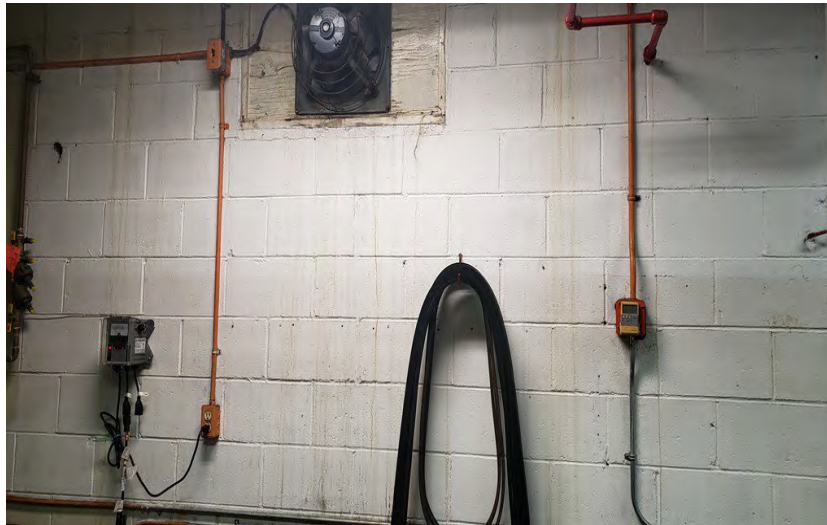


Photo 026      Block Wall in Compressor Room



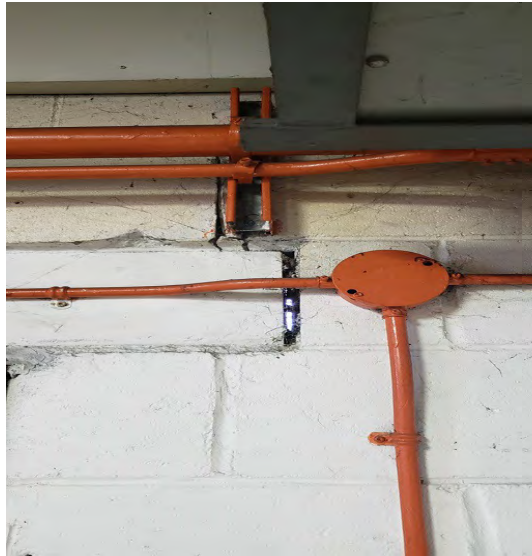


Photo 027      Step Cracking and Block Gapping

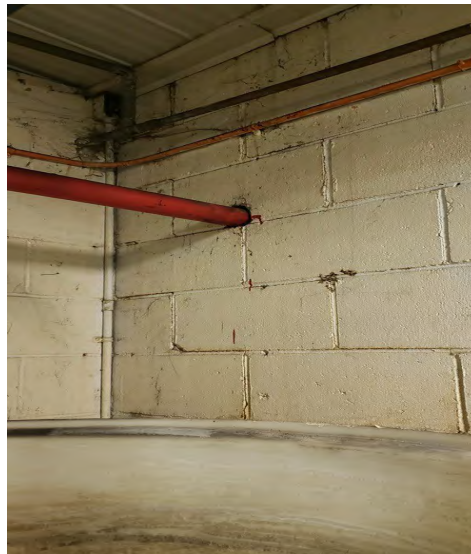


Photo 028      Multiple Step Cracks Behind Water Tank



Photo 029      Step Cracking Along South-Face Wall



Photo 030      Step Cracking in Lobby



Photo 031      Minor Step Cracking in West-Side Stairwell

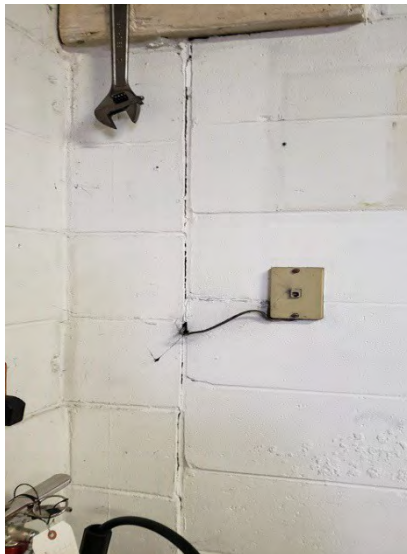


Photo 032      Mortar Joint Cracking in Compressor Room



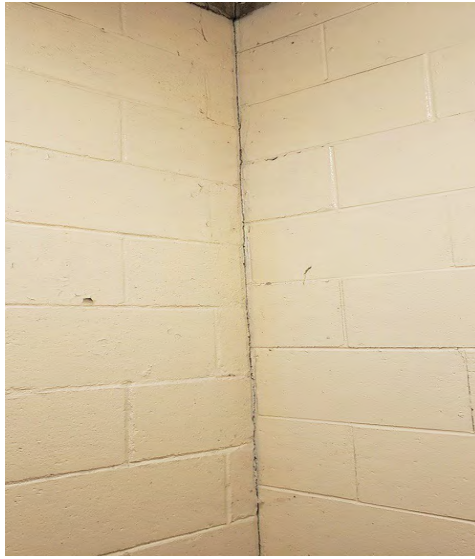


Photo 033      Mortar Joint Cracking in West-Side Stairwell

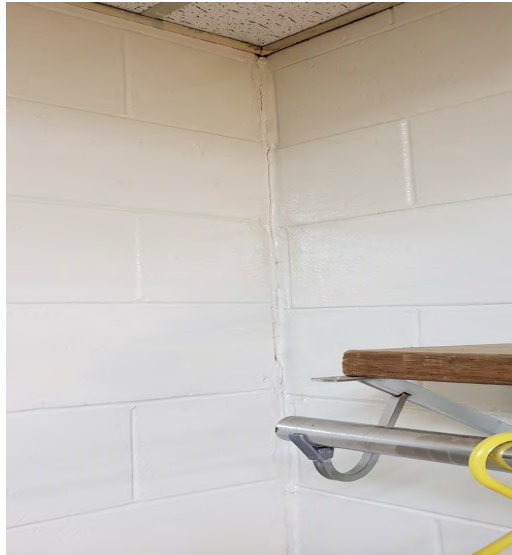


Photo 034      South-Side Stairwell Mortar JointCracking



Photo 035      Wooden Block Replacement and Cracking

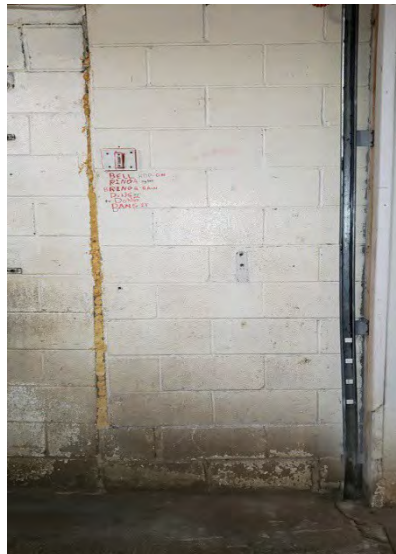


Photo 036      Differential Settlement in Ice-Resurfacing Room



Photo 037 Existing Block Separation Repairs



Photo 038 Block and Joint Damage



Photo 039      Step Cracking and Damage to West-Side Exit

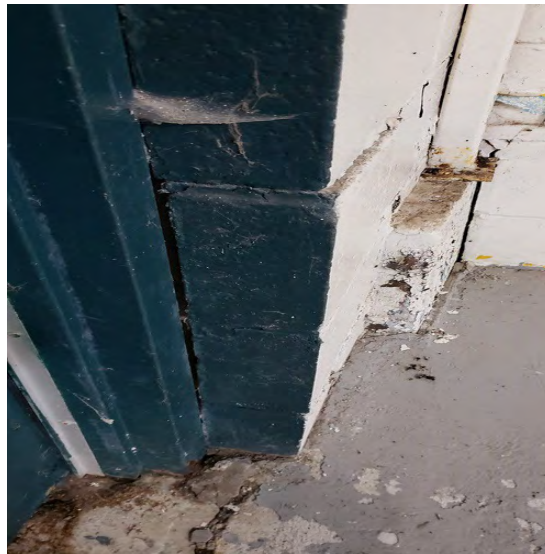


Photo 040      Wall Separation at West-Side Exit





Photo 041      West-Side Wall

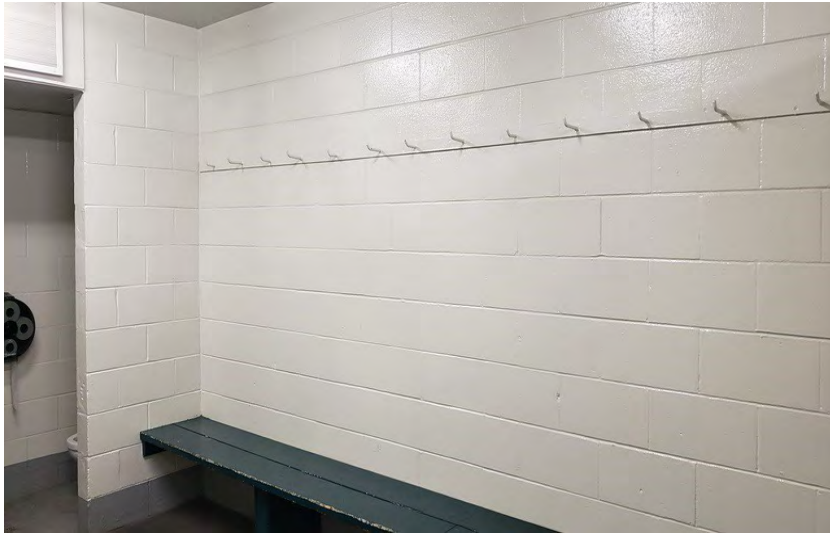


Photo 042      Block Wall Within Changerooms





Photo 043      Localized Damage in Changeroom 3

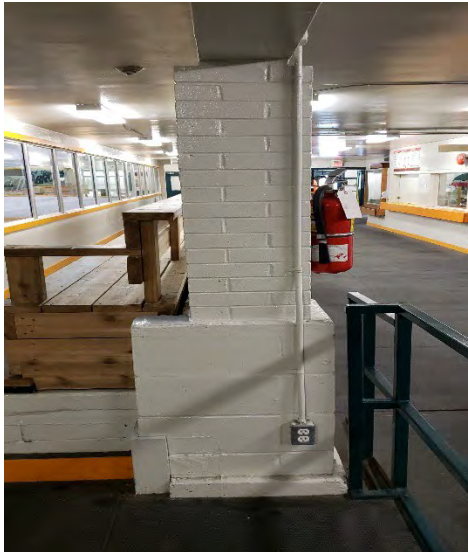


Photo 044      Columns in Lobby

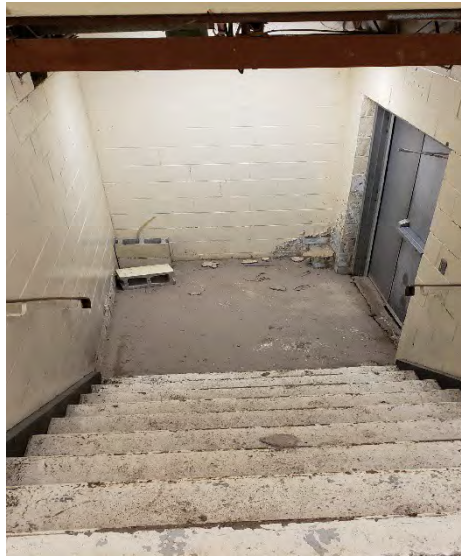


Photo 045      West-Side Stairwell



Photo 046      Paint Chipping and Moisture Damage



Photo 047      Localized Block Failure



Photo 048      Localized Block Failure



Photo 049      Wall Separation in Second-Floor Storage Room

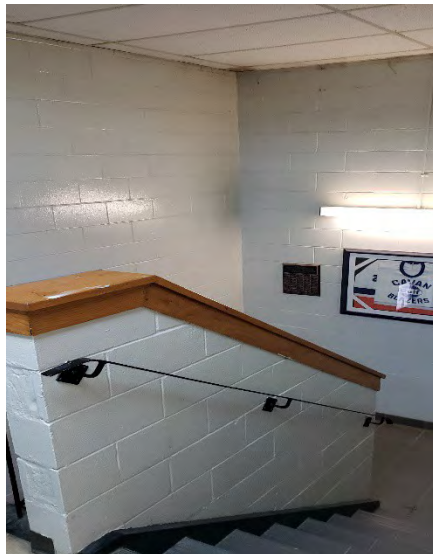


Photo 050      South-Side Stairwell Walls



Photo 051      Slab-On-Grade to Wall Separation in Compressor Room



Photo 052      Concrete Staining in Compressor Room





Photo 053      Concrete Damage at Electrical Equipment in  
Compressor Room



Photo 054      Slab-On-Grade Damage in West-Side Stairwell



Photo 055      Partial Second Floor Space



Photo 056      Second Floor Kitchen



Photo 057      Partial Second-Floor Roof Framing



Photo 058      Insulation and Plastic Covering





Photo 059      Moisture in Roofing System



Photo 060      Moisture in Roofing System



Photo 061      Signs of Moisture Damage



Photo 062      Signs of Moisture Damage





Photo 063      South-West Corner Foundation



Photo 064      Cracking at Centre Foundation Wall



Photo 065 Architectural Block Mortar Cracks



Photo 066 Localized Brick Damage





Photo 067      Localized Block Damage at South-East Corner



Photo 068      Architectural Precast Concrete Wall Panels



Photo 069      Metal Siding Along South Side



Photo 070      Damage to Sidewalk



Photo 071      Gap in Foundation Wall



Photo 072      Damaged Eaves





Photo 073 Moss Along East Side Wall



Photo 074 Deterioration of Blocks



Photo 075      Wall Joint



Photo 076      East Side Metal Cladding





Photo 077      Damage to Garage Door Opening



Photo 078      Close Up of Damage Garage Door



Photo 079      Step Cracking and Paint Peeling



Photo 080      Step Cracking and Paint Peeling



Photo 081      Step Cracking and Block Failure



Photo 082      Honeycombing and Mould Growth





Photo 083      Honeycombing and Mould at Eastside of  
Ice-resurfacing Room



Photo 084      Metal Cladding



Photo 085      Damage to Garage Door Entrance



Photo 086      Damage to Garage Door Entrance



Photo 087      Damage to Garage Door Seal



Photo 088      Mould and Moisture on Block Wal





Photo 089      North-West Corner



Photo 090      Mould Along West Side



Photo 091      Damaged Wall Joint



Photo 092      Localized Foundation Wall Damage





Photo 093      Hole in Masonry Block

## **APPENDIX B**

### **ELECTRICAL SITE CONDITION ASSESSMENT**

September 3, 2019  
Project: 6461

**Township of Cavan Monaghan**

988 County Rd. 10,  
Millbrook, ON  
L0A 1G0

Attention: **Yvette Hurley**  
Chief Administrative Officer

**Electrical Site Condition Assessment Report**

**Project:** **Millbrook Arena**  
4 Needler's Lane  
Millbrook, ON  
L0A 1G0

**Review Date:** Tuesday August 27<sup>th</sup>, 2019 at 2:00 pm  
**Reviewed by:** David Millen, P.Eng. Electrical

**1. General Comments**

- 1.1 A visual review of the electrical systems at the Millbrook Arena was conducted for inspection of equipment conditional and standards of good practice.
- 1.2 Photographs were taken as part of the site review.

**2. Utility Service**

- 2.1 The facility is powered by two separate utility services. The 120/240V 200A service that supplies the front of the building (Front Service) and the 600V/347V 400A service that supplies the rear of the building and ice plant (Rear Service).
- 2.2 A set of three pole mounted 75kVA pole mounted transformers supply the Rear Service used primarily for the ice plant. The transformers are configured as a solidly grounded 4 wire 347/600V supply at 225kVA.
  - 2.2.1 The transformers and pole assembly appear in decent condition.
  - 2.2.2 The secondary conductors run overhead individually from the service pole to the arena wall where they transition to core flex and run down the exterior wall and into the rear electrical area and the 600V main disconnect.



- 2.3 A single pole mounted 50kVA pole mounted transformers supply the Front Service used to supply front of the building, including hall, canteen changerooms and washrooms.
- 2.3.1 The transformer appears in good condition. The transformer also supplies the street lighting to the west.
- 2.3.2 The secondary conductors run overhead individually from the service pole to a wall mounted cable termination rack. The cables enter a raceway via a weather-head and drop to the utility meter on the exterior of the building.



2.4 Gauge and material of the entry cables was not determined.



### 3. Rear Service

- 3.1 The Rear Service main disconnect is a federal pioneer 347/600V rated at 400A.
- 3.2 Note that although the 400A service is rated for 333kVA at 80% de-rating the available power is limited to the 225kVA by the transformer bank
- 3.3 The Main disconnect supplies the utility meter cabinet.
- 3.4 The Meter cabinet supplies a 600V 400A 4 pole BEL splitter.
- 3.5 This splitter supplies the Refrigeration Plant (200A square D fused disconnect), a heater (30A Commander fused disconnect) and a panel board (100A federal pioneer fused disconnect).
- 3.6 The Refrigeration plant was not reviewed as part of this report.
- 3.7 The heater is located in the refrigeration plant room and appears to be in good shape.
- 3.8 The Panel board, a federal pioneer NHDP 225A 3 phase 4 pole model, supplies the ice surface lighting, de-humidifiers and exhaust fans.
- 3.9 The 600V equipment appears to be all original and is all very dated with signs of many years of wear. The splitter is completely covered in rust caused by the high humidity in the area where the equipment is installed.





- 3.10 A 100A 120/240V panel is installed at the rear of the facility that is supplied from the Front Service for exit lights, lighting, receptacles, small fans and the timeclock.
- 3.11 It is recommended to conduct an inspection and preventative maintenance of the interior.

#### 4. Front Service

- 4.1 The Front Service main disconnect is rated 120/240V at 200A complete with 200A fuses and is located in the front electrical/mechanical room which is also the location of 4 furnaces and the incoming water service.
- 4.2 The Main disconnect supplies a BEL 600V 3 pole 225A splitter.
- 4.3 This splitter supplies the first-floor panel board, and disconnects for the second-floor panel (125A breaker), office panel (50A breaker) and second floor A/C (30A fused disconnect) that is off and locked shut.
- 4.4 The first-floor panel, Federal Pioneer NBLP-32-3L, supplies power and lighting to the changerooms, offices, washrooms and lobby on the first floor as well as the furnaces and the canteen sub panel (50A 2P). There is a 2P 50A breaker for the Dental Bus outlet.
- 4.5 The Second Floor Panel supplies the power and lighting to the hall, warm up kitchen, laundry room, and washrooms on the second floor.
- 4.6 The office panel was not accessible for review.

- 4.7 The canteen panel, (Square D 16 CCT) supplies the receptacles and equipment in the canteen (refrigerator, coffee makers, popcorn machine, cash register)
- 4.8 The 240V equipment appears to be all original but is in good condition.



## 5. Lighting, Emergency Lighting and Egress Signage

5.1 The ice surface lighting is 400W 347V Metal halide.



5.2 It is recommended to replace the existing metal halide fixtures with LED for improved control, instant on capability and longevity.

5.3 Most of the existing 120V lighting fixtures are tubular florescent fixtures. Some incandescent fixtures have been upgraded to CFL lamps.



5.4 It is recommended to replace the existing fluorescent fixtures with LED, not just replace the lamps with LED equivalents.

5.5 Existing emergency lights and battery packs appear at end of life. They should be replaced with new battery packs and LED lamps.



- 5.6 Existing exit signs should be replaced with self-powered green running man signs consistent with current OBC requirements.

## 6. Fire Alarm system

- 6.1 The existing fire alarm system is a single zone Notifier CSGL-2000. While it appears to be in good working order it is outdated and should be considered for upgrade.



- 6.2 The fire alarm devices appear to be original and should be considered for replacement.
- 6.3 The notification devices are bells. Consider adding strobe coverage for improved notification.

Prepared by:

David Millen, P.Eng.

## APPENDIX C

### MECHANICAL SITE CONDITION ASSESSMENT



September 3, 2019  
Project: 6461

**Township of Cavan Monaghan**  
988 County Rd. 10,  
Millbrook, ON  
L0A 1G0

Attention: **Yvette Hurley**  
Chief Administrative Officer

### **Mechanical Site Condition Assessment Report**

**Project:** **Millbrook Arena**  
4 Needler's Lane  
Millbrook, ON  
L0A 1G0

**Review Date:** Tuesday August 27<sup>th</sup>, 2019 at 2:00 pm

**Reviewed by:** Abdulfaraj Alyas MSc, P.Eng. Mechanical Engineer

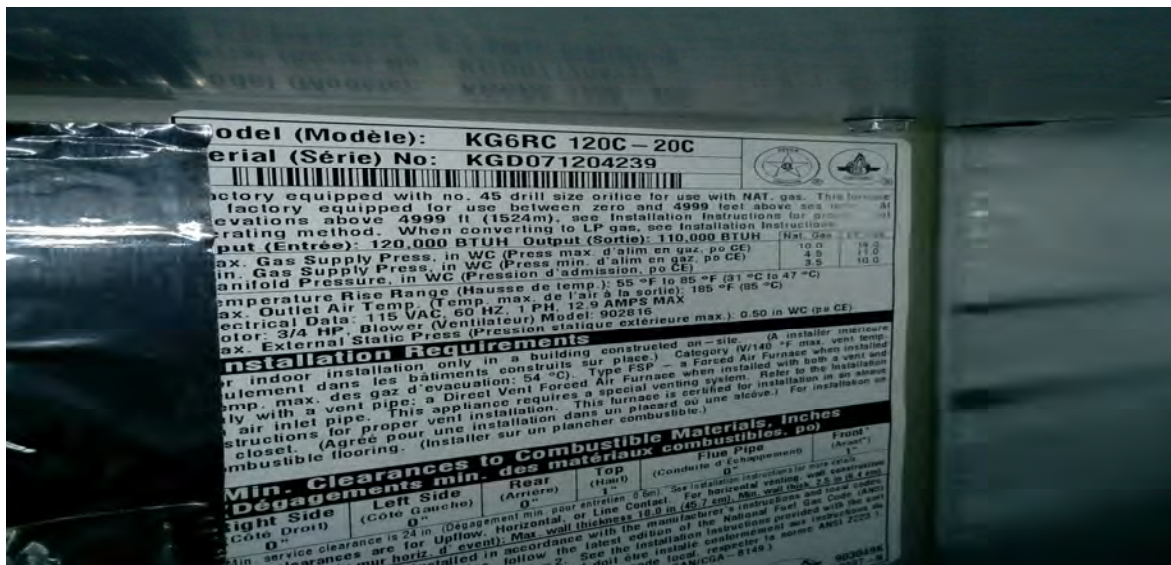
#### **1. General Comments**

- 1.1 A visual review of the Mechanical systems at the Millbrook Arena was conducted for inspection of equipment conditional and standards of good practice.
- 1.2 Photographs were taken as part of the site review.

#### **2. Heating / Cooling / Ventilation Systems**

- 2.1 The building has four Gibson furnaces for heating only, each has a capacity of 110,000 Btu/hour with efficiency of more than 90%, natural gas fueled.
- 2.2 The building has no cooling as there is no direct expansion coils above the furnaces and a roof top unit could not be verified on the roof.
- 2.3 The building has no ventilation, no heat recovery or energy recovery units, no ventilation ducts and no exhaust duct from the ducting system.
- 2.4 There are no heating, cooling or ventilation calculations to verify if the furnaces are covering the heating load or the cooling capacity required and ventilation or outside fresh air required for the whole building.
- 2.5 The mechanical room is cramped, cluttered and very small for all the equipment in it.





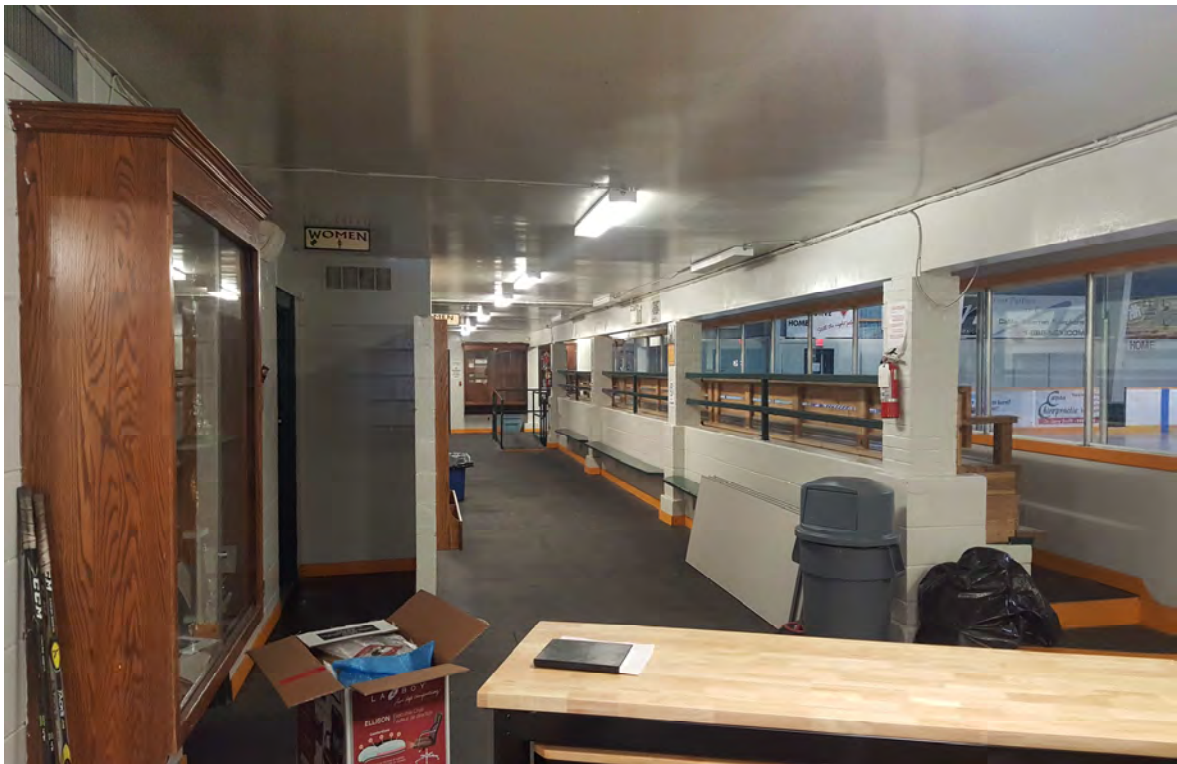
- 2.6 The ducting system had no access panels to verify if there are balancing dampers or any other dampers. The ducting was not accessible to verify how the fittings were done or if they were insulated.
- 2.7 The diffusers are in bad condition; there is very poor air and temperature distribution in the second floor. The diffusers were separated from each other by a long distance without return grills in the same space.







- 2.8 The supply diffusers were in a space and the return grills were in a different space.
- 2.9 Some other spaces had no supply diffusers nor return grills.
- 2.10 There is no heating, ventilation and cooling in the rink lobby as required by codes and standards. The whole corridor in the first floor had no diffusers or grills, which means no heating, cooling or ventilation.







### 3.0 Sanitary drainage system

3.1 The fixtures as shown in the photos are in bad conditions and old.





- 3.2 The piping system could not be verified as it is under ground.
- 3.3 The venting piping system for the sanitary piping system could not be verified.
- 3.4 The seal trap primer could not be verified also as it is underground.
- 3.5 The size of the pipes could not be verified as they are under ground.

#### **4.0 Domestic water system**

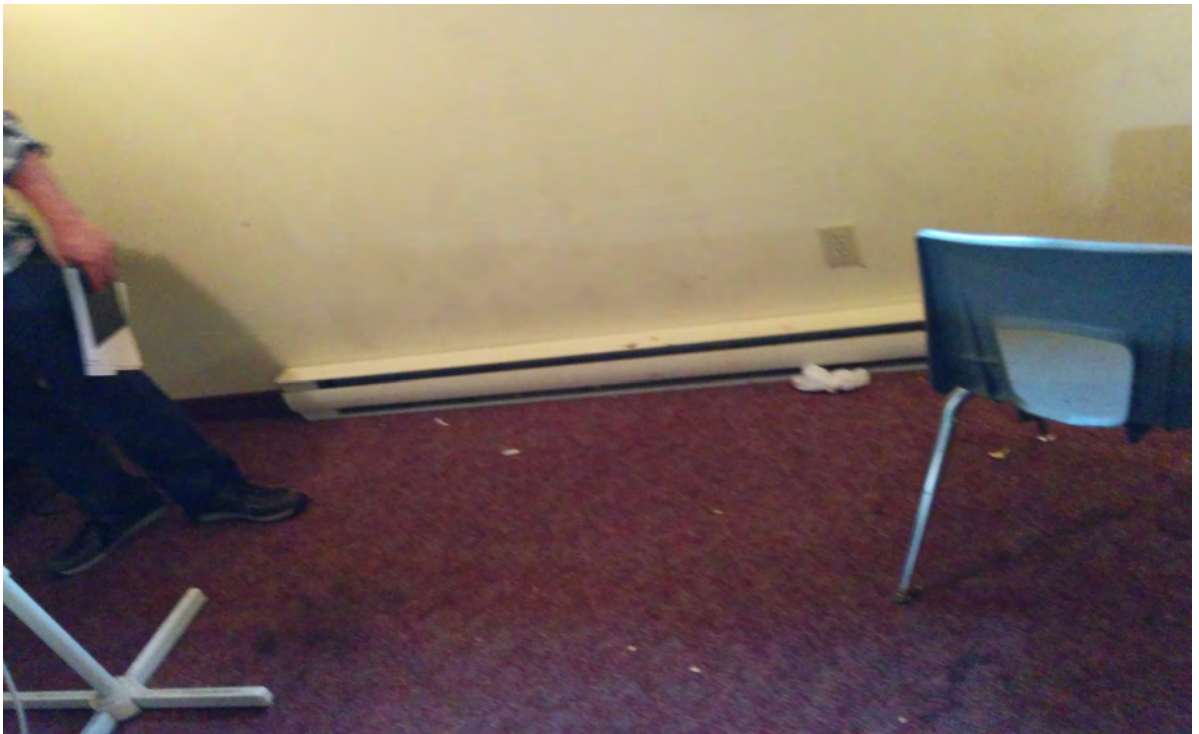
- 4.1 The fixtures are old, low efficiency and at the end of their life.
- 4.2 The pipe system could not be verified as most of it were in the ceiling space or inside walls.
- 4.3 The hot water tank is a good condition and the pipes inside the mechanical room are copper and in a good condition.
- 4.4 The incoming main domestic water pipe, valves and the meter are old, no back-flow meter was noticed.
- 4.5 No insulation on hot water pipes noticed in the whole building except some pipes in the mechanical room.
- 4.6 There was an expansion tank installed above the hot water tank.
- 4.7 No ventilation in the mechanical room and no recirculating pump.
- 4.8 No clearances around all equipment.

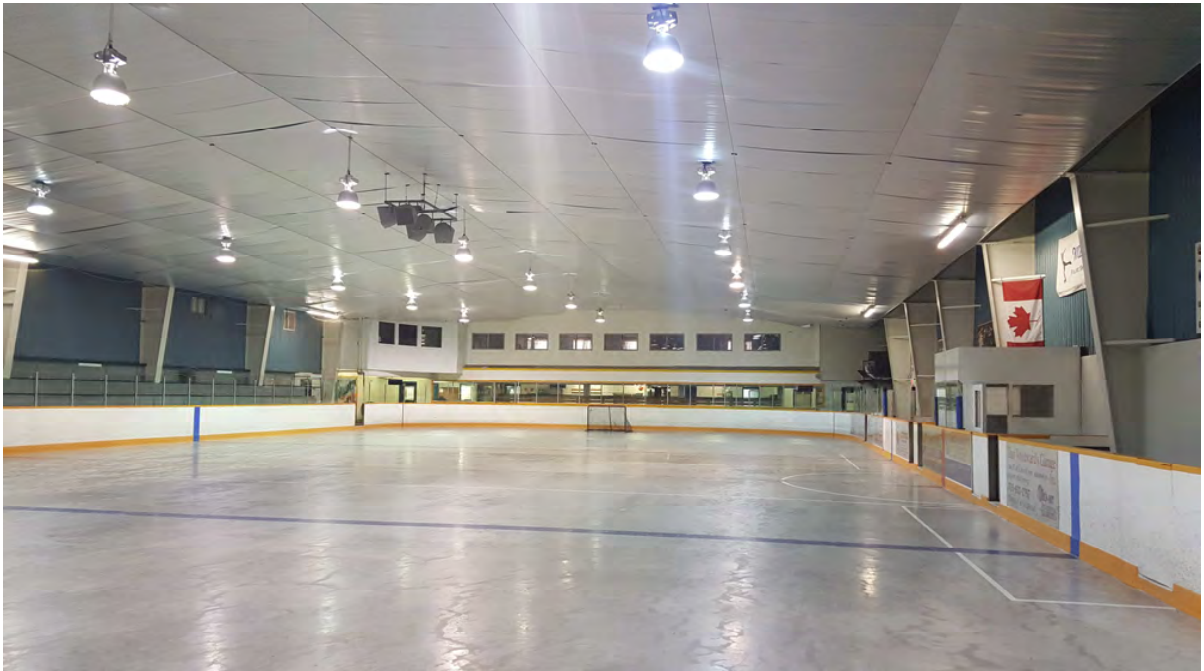


## **5.0 Other mechanical systems**

- 5.1** The exhaust air systems from washrooms, change rooms were not provided with exhaust fans or ducts as required by codes.
- 5.2** There is no heat recovery system for ventilation in the mechanical room.
- 5.3** The building roof is in bad condition with many leaks so that the mechanical system cannot work efficiently.
- 5.4** The range hood for the stove is not installed as required by codes and standards.
- 5.5** The Second-Floor room was heated with a base board electrical heater without any ventilation or exhaust fan.
- 5.6** The building has no fire suppression system.
- 5.7** The building has no automated control system for the mechanical or electrical system.
- 5.8** There are many spaces in the building that have no heating, cooling or ventilation.
- 5.9** No water treatment for the water in the mechanical room.







Prepared by:

*Abdulfaraj Alyas*

Abdulfaraj Alyas MSc, P.Éng.





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**Telephone**  
(866) 217.7900  
(705) 742.7900

**Facsimile**  
(705) 742.7907

**Website**  
cambium-inc.com

**Mailing Address**  
P.O. Box 325,  
Peterborough, Ontario  
Canada, K9J 6Z3

**Locations**  
Peterborough  
Kingston  
Barrie  
Whitby  
Ottawa

**Laboratory**  
Peterborough



December 9, 2024

Township of Cavan-Monaghan  
988 County Road 10  
Millbrook, ON L0A 1G0

Attn: Chris Allison

**Re: Proposal for Mould Consulting Services  
4 Needlers Lane, Millbrook, Ontario  
Cambium Reference: 21346-P**

Dear Chris Allison,

Cambium Inc. (Cambium) is pleased to provide the Township of Cavan-Monaghan (Client) the following proposal to complete mould consulting services in the building at 4 Needlers Lane, Millbrook, Ontario.

Cambium previously completed a mould assessment report entitled "Mould Assessment – 4 Needlers Lane, Millbrook, Ontario", dated December 6, 2024 (mould assessment report). Findings and recommendations can be found in the mould assessment report.

Cambium understands the purpose of the mould consulting services is to confirm that all mould growth outlined in the mould assessment report has been addressed and to assess the air quality following mould remediation in the building. Additionally, the mould remediation oversight will include inspection of asbestos-containing materials impacted by mould growth, which are also scheduled for removal.

Cambium proposes to complete the following services:

- Conduct start-up meeting with remediation contractor.
- Provide routine inspections throughout the remediation process.
- Provide consulting and project management throughout the remediation.
- Complete final air clearance sampling following completion of mould remediation.
- Provide a final closeout report summarizing all remediation activities.

## **Mould Remediation Management**

### **Inspection Services**

Cambium will attend a start-up meeting with the contractor who is awarded the remediation work and act as the main liaison between the contractor and the Client.

Cambium will perform up to ten site visits during onsite remediation work. Cambium will perform the following inspections during the remediation work:

### **Pre-Contamination Inspection**

Prior to the contractor commencing remediation activities, Cambium will conduct a Pre-Contamination Inspection of the building to ensure that all remediation procedures are completed in accordance with:

- contract documents,



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December 9, 2024

- Environmental Abatement Council of Canada (EACC) guideline entitled “*Mould Abatement Guidelines, Edition 3*”, and
- O. Reg 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.

### Final Visual inspection

Upon completion of removal activities and once final cleaning activities are completed for the building, Cambium will complete a Final Visual Inspection for the building. During the inspection, Cambium will ensure that all mould impacted materials as well as asbestos-containing materials have been removed, and that all surfaces within the work area are free of visible dust and debris. Any deficiencies observed will be noted and the remediation contractor will be instructed to correct deficiencies.

### Clearance Air Sampling

Air samples will be collected in order to determine the types and relative concentrations of fungal spores in the building at the time of the assessment. The air samples will be collected using a Zefon Bio-Pump with Air-O-Cell® media cassettes. The sampler operates on the principle of impaction whereby airborne microorganisms are impacted onto a media cassette. The Air-O-Cell® cassettes collect both viable and non-viable mould spores, providing a more accurate spore count. The cassettes will be analysed by spore trap analysis. The analysis includes the identification to genus or group of all fungal spores present, including the quantification to spores per cubic meter of air. The samples will be collected at a flow rate of approximately 15 litres per minute for a sampling duration of five minutes for a desired volume for 75 litres of air.

Air samples will be collected in order to ensure that airborne mould concentrations in the building are similar or lower in comparison to exterior concentrations, as outlined in the Environmental Abatement Council of Canada (EACC) guideline.

All clearance air samples for mould identification will be sent to EMC Scientific Inc. (EMC) for analysis by microscopic examination. EMC, located in Mississauga, Ontario, is an environmental microbiology laboratory that participates in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program.

All samples will be submitted on standard (i.e., 5 day) turnaround time.

### Report Preparation

Upon completion of all remediation work, Cambium will provide a Final Closeout Report. The report will summarize all mould and asbestos remediation activities and inspections performed.

The final report will be provided within 15 business days from the date of remediation completion.



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December 9, 2024

## Estimated Cost

The Estimated Cost is based on the identified scope of work and is exclusive of taxes and external fees, unless otherwise indicated. Schedules of Professional Services and Disbursement costs for the mould assessment update are provided as Table 1. Professional Services Costs include professional fees, consumables, communication, and printing. Although costs may vary between parts of the work program, the Estimated Cost for the items quoted will not be exceeded without Client authorization. The costs presented in this proposal are effective December 9, 2024 and will be honoured for 60 days.

**Table 1 Professional Services Schedule of Costs**

Service	Notes	Cost
Start-up meeting with Contractor 1 @ \$500		\$500
Mould Consulting Services (Project Management, Coordination, Health & Safety Plans, Client/Contractor/Laboratory Correspondence) <ul style="list-style-type: none"><li>• Allow to up to 20 hours @ \$240/hr</li></ul>		\$4,800
Inspections, allow for up to 10 @ \$800 each		\$8,000
Clearance air samples (mould), allow for up to 21 samples @ \$50 each		\$1,050
Final closeout report		\$2,400
<b>Total Estimated Cost (excludes HST)</b>		<b>\$16,750</b>

If it is anticipated that the Estimated Cost will be exceeded as a result of a change in the program scope or additional services, Cambium will promptly notify and consult with the Township of Cavan-Monaghan.

## Summary of Assumptions

Cambium has developed the costs presented above based upon the best information available and previous experience conducting this type of work and the following assumptions:

1. If additional inspections are required due to failed inspections or air clearance, the costs will be back-charged to the Client.

It is possible that unforeseen or unknown conditions or occurrences will be encountered, which could alter the services described above. If this occurs, Cambium will promptly notify and consult with the proponent, but will act based on Cambium's sole judgement where risk to Cambium personnel is involved.



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December 9, 2024

**Closing**

Cambium trusts that this proposal meets with your expectations, and we look forward to working with you. Cambium will begin work on the project following receipt of a signed copy of the attached General Terms of Client Engagement, and a completed Client Project Information Form.

If you have any questions or require clarification of any aspect of this submission, please do not hesitate to contact the undersigned at (705) 742-7900.

Respectively submitted,

**Cambium Inc.**

**Chris Moose**  
**Senior Project Manager**

Encl. General Terms of Client Engagement  
Financial Terms of Engagement  
Statement of Qualifications and Limitations  
Contact Details Form  
How to Make Payments to Cambium

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Proposal\2024-12-09 PRO Mould Consulting Services - 4 Needlers Lane\_Millbrook.docx





## **General Terms of Client Engagement**

We thank you for the opportunity to provide service to you and your business. It is Cambium's policy that our customers review and signed this General Terms of Client Engagement. Please review this document, which sets out our terms of engagement, to ensure you understand the scope of our business relationship and expectations. We feel this is a prudent exercise to make certain we have the resources necessary to maintain healthy working relationships with our service providers and suppliers; a critical component of Cambium's prompt delivery of service to clients such as you.

### **Purpose and Scope**

Cambium is to provide the Township of Cavan-Monaghan (the Client) with the scope of service described in the *Proposal for Mould Consulting Services* dated December 9, 2024 and submitted to Chris Allison. Subject to any written agreement to the contrary, the scope is limited to the services described therein.

### **Responsibilities**

Clients are to arrange for reasonable access by Cambium to the subject site(s), relevant individuals, and documents, and shall be responsible for both the completeness and accuracy of the information supplied to us.

It is possible that unforeseen or unknown conditions or occurrences may be encountered at a site, which could alter the timing of the delivery of services. If this occurs, Cambium Inc. will promptly consult with the Township of Cavan-Monaghan for a satisfactory resolution but will act on the sole judgement of Cambium where risk to study team personnel is identified.

### **Confidentiality**

In conducting our scope of service, information acquired by us in the course of the engagement is subject to strict confidentiality requirements. We will not disclose that information to other parties except as required or allowed for by law or with your express consent.



## **Financial Terms of Engagement**

### **Estimated Pricing**

Unless otherwise stated in writing, any estimates that we provide to you of our anticipated fees, disbursements, and charges for any services are only indicative of the amounts you can expect to be charged. Estimates are not quotes and are not binding on us.

### **Professional Services Fees**

The fee arrangement is based on the expected effort and the skill level of staff required within the presumed circumstances to complete the agreed scope of services. Where we have provided quotations for specific services within a proposal, the proposal will offer adequate detail of scope and schedule. In the event that circumstances of the services to be provided materially change from the original proposal, a revised quotation between the two parties will be agreed before any further work is undertaken.

### **Payment**

Please refer to How to Make Payments to Cambium in the attached Client Project Information Form. The terms of payment are strictly 30 days from the invoice date. Overdue accounts (outstanding greater than 30 days) will incur a financing service fee of 1.5% per month. When Cambium is acting as a sub-consultant, the Client will honour our direct engagement and not convey any delays of payment experienced by the Client.

Should you not possess the current funds and/or are subject to a draw schedule that will impair your ability to meet your financial obligations with Cambium, we trust you will make the necessary arrangements to secure access to the appropriate funds independently. Cambium reserves the right, without penalty, to discontinue services in the event of non-payment that exceeds a reasonable limit of credit that we are able to extend to you.



### Acceptance of Obligations and Terms of Service

This engagement will start upon acceptance of the terms and obligations by Township of Cavan-Monaghan as noted by execution of this letter. Alternately, in cases where the Client has issued a Purchase Order Number, Cambium will consider this an acceptance of the terms of our engagement as per the proposal scope of services and estimate of fees. Where time is of the essence, Cambium staff may begin service by special request of the Client and/or the presence of Cambium staff at the project site. However, until this letter is executed, or a Purchase Order Number is issued, Cambium reserves the right to discontinue service.

Please confer with me immediately to clarify or discuss any aspect of the terms of this engagement. If the terms are acceptable, please sign this Engagement Letter and forward it to me as evidence of your acceptance of the terms of our engagement. We also ask that you also send a completed Client Project Information Form at the same time to ensure our contact information for this specific project is accurate and complete.

We, Township of Cavan-Monaghan, agree to all of the terms and conditions as noted in this letter.

Proposal for Mould Consulting Services

21346-P

Project Name

Cambium Reference

Authorized Signature of Township of Cavan-Monaghan

Printed Name

Position

Date



## **Statement of Qualifications & Limitations**

### **Limited Warranty**

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

### **Reliance on Materials and Information**

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in its reports. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after the work is completed and a report is submitted. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its findings or results.

When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

### **Site Assessments**

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

### **Reliance**

Cambium's services, work and reports may be relied on by the client and its corporate directors and officers, employees, and professional advisors. Cambium is not responsible for the use of its work or reports by any other party, or for the reliance on, or for any decision which is made by any party using the services or work performed by or a report prepared by Cambium without Cambium's express written consent. Any party that relies on services or work performed by Cambium or a report prepared by Cambium without Cambium's express written consent, does so at its own risk. No report of Cambium may be disclosed or referred to in any public document without Cambium's express prior written consent. Cambium specifically disclaims any liability or responsibility to any such party for any loss, damage, expense, fine, penalty or other such thing which may arise or result from the use of any information, recommendation or other matter arising from the services, work or reports provided by Cambium.

### **Limitation of Liability**

Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

### **Personal Liability**

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.





## Primary Client Project Contact

Cambium Reference: 21346-P

Company: Township of Cavan-Monaghan

Contact: \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

### Physical Address:

Street: \_\_\_\_\_

City: \_\_\_\_\_

Province/State: \_\_\_\_\_

PC/ZIP: \_\_\_\_\_

Country: \_\_\_\_\_

### Mailing Address: ☐ Same as Physical

Street: \_\_\_\_\_

City: \_\_\_\_\_

Province/State: \_\_\_\_\_

PC/ZIP: \_\_\_\_\_

Country: \_\_\_\_\_

## Billing / Payment Client Project Contact

☐ Same as Primary

P.O. Number: \_\_\_\_\_

Company: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

### Physical Address:

Street: \_\_\_\_\_

City: \_\_\_\_\_

Province/State: \_\_\_\_\_

PC/ZIP: \_\_\_\_\_

Country: \_\_\_\_\_

### Mailing Address: ☐ Same as Physical

Street: \_\_\_\_\_

City: \_\_\_\_\_

Province/State: \_\_\_\_\_

PC/ZIP: \_\_\_\_\_

Country: \_\_\_\_\_

☐ Please copy the Primary Contact on all billing correspondence.



## How to Make Payments to Cambium

Retainer and invoice payments to Cambium can be made by cheque, credit card, email transfer, or wire transfer.

### Cheque

Please make the cheque payable to "Cambium Inc." and send to our Main Office in Peterborough:

#### Postal Delivery:

PO Box 325, Peterborough, ON K9J 6Z3

#### Courier or Hand Delivery:

194 Sophia Street, Peterborough, ON K9H 1E5

### Credit Card


When paying by credit card either in person or over the phone, please ask to speak with anyone from our accounting department. Note that for your protection, we do not retain client credit card information on file.

### Email Transfer

Transfers of funds via email from your banking platform sent to [ar@cambium-inc.com](mailto:ar@cambium-inc.com). Please include the Cambium Reference in the notes/message upon sending.

### Wire Transfer

Payments sent by wire transfer (also known as Electronic Funds Transfer or EFT) should be sent to our RBC Royal Bank receiving account using the following information. **Please include the Cambium Reference (21346-P) in the Message section of the ETF.**

Cambium Inc. P.O. Box 325 Peterborough, ON, K9J 6Z3			
PAY TO THE ORDER OF		\$ _____	
		/DOLLARS	
	ROYAL BANK OF CANADA 401 George St. N. Peterborough, ON K9H 3R4		
MEMO _____			
003 (Financial Institution#)		03782 (Transit)	1013317 (Account)



ENVIRONMENTAL | GEOTECHNICAL  
BUILDING SCIENCES | CONSTRUCTION MONITORING  
Peterborough | Barrie | Oshawa | Kingston  
866.217.7900 cambium-inc.com



INVOICE FROM CAMBIUM INC.

Township of Cavan-Monaghan  
988 County Rd. 10, R.R.#3  
Millbrook, ON L0A 1G0

Attention of: Chris Allison  
Parks and Facilities Manager

Invoice Number: 2024-51404  
Invoice Date: December 02, 2024  
Payment Terms: Due Upon Receipt  
GST Number: 85718 3321 RT0001

Project: 21346-001  
Project Lead: Chris Moose  
Invoicing To: December 02, 2024

Mould Air Sampling - 4 Needlers Lane, Millbrook

Invoices to: payables@cavanmonaghan.net;

Approved Services	Budgeted	Prior Billed	Current Billed
October 21 2024 Mould Assessment	\$3,350.00	\$0.00	\$3,350.00
Addional Samples	\$1,500.00	\$0.00	\$1,500.00
October 31 Addional Bulk Sampling	\$2,200.00	\$0.00	\$2,200.00
Project Management	\$2,000.00	\$0.00	\$2,000.00
Mould Air Sampling - August 27, 2024	\$1,750.00	\$0.00	\$1,750.00
Total	\$10,800.00	\$0.00	\$10,800.00
Invoice Subtotal			\$10,800.00
HST			\$1,404.00
INVOICE TOTAL (\$CAD)			\$12,204.00

Account Aging Summary

Invoice Number	Invoice Date	Outstanding	< 30 Days	Over 30	Over 60	Over 90	Over 120
Total		\$12,204.00	\$12,204.00	\$0.00	\$0.00	\$0.00	\$0.00