

INTERNAL AUDIT
FINAL REPORT
OF THE
MACDONALD CAMPUS
ASBESTOS INVESTIGATION

MR23 03

Submitted to

Maryse Bertrand, Chair of the Board of Governors

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McGill University

September 14, 2023

McGill University is located on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. McGill honours, recognizes and respects these nations as the traditional stewards of the lands and waters on which we meet today.

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Category 1 Emergency	A minor, localized incident with limited impact on persons, property or the environment and that is unlikely to disrupt University operations or activities. Category 1 emergencies are managed using routine response protocols, procedures, and resources (Source: McGill's Emergency Management Policy).
Category 2 Emergency	A major incident that poses a high risk of serious harm to persons, or of widespread or substantial damage to property or the environment, or that disrupts or has the potential to disrupt University operations or activities. Category 2 emergencies are within the purview of the University Emergency Management Program and require the activation of all or part of the Program's emergency response structure (Source: McGill's Emergency Management Policy).
Canada Foundation for Innovation (CFI)	Not a corporation that invests in research that with FTAnaged usnm6 0 0 16 72 688.74 n0 Tw (-)Tj 0.ur cy).



Octagon	The Octagon area is located on the east end of the Raymond building, which was delivered to McGill by the General Contractor under anticipated delivery procedure.
Phase Contrast Microscopy (PCM)	A bright field light microscopy technique that can be used for counting fibers in particulate samples gathered from air, dust or bulk.
Phytorium	A research facility, located on the first floor of the west end of the Raymond building, which is equipped with controlled-environment cabinets for plant growth and plant tissue culture.
Polarized Light Microscopy (PLM)	A microscopy technique that allows identifying asbestos in bulk and dust samples, using polarized light.
Policy Group (PG)	In all cases of Category 2 emergencies and Category 1 emergencies with potential to escalate to a Category 2, McGill's Policy Group may be called upon to provide high-level strategic support and direction to the EOC, on behalf of the University. The Policy Group also addresses broader issues such as intergovernmental relations, reputational risks to the University, and high-impact decisions such as approval of class cancellations or closing the University.
Silica	Respirable crystalline silica is also known as silica dust. Silica dust is made up of small particles that become airborne during work activities with materials that contain crystalline silica. Materials can include sand, concrete, brick, block, stone, and mortar. Silicosis, an irreversible but preventable lung disease, is caused by inhalation of respirable silica dust. Work exposures to silica dust also cause other serious diseases, including lung cancer.
Transmission Electron Microscopy (TEM)	A technique for identifying asbestos in bulk and dust samples, using a transmission electron microscope.
Wipe test	<p>A test to determine the presence or absence of asbestos in dust on surfaces. Per ASTM 6480, a damp towel is used to wipe a 10 cm by 10 cm square of a non-porous surface. The sample is then put into a sample tube and sent for analysis. Both wipe and tube are provided by the laboratory that does the analysis.</p> <p>Wipe tests can be used to detect the presence or absence of asbestos but cannot indicate whether it exists in a concentration that poses health risks if airborne. A single asbestos fiber in dust collected from surfaces around a room will trigger a positive test result but does not necessarily indicate a safety threat.</p>

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STAKEHOLDERS	ROLES AND RESPONSIBILITIES
CNESST Commission des normes, de l'équité, de la santé et de la sécurité au travail	Commission for Standards, Equity, Health and Safety at Work. The organization to which the Government of Quebec has entrusted the promotion of labour rights and obligations. It ensures that they are respected by Quebec workers and employers.
External Project Manager (PM)	External Group under contract with McGill The Project Manager is defined in McGill's General Conditions of its contractual documentation as The Person who, as the Owner's representative, administers the contract. The external PM is a team of people comprised of a senior PM, several PMs, several assistant PMs, estimator(s) and administrative staff.
General Contractor (GC)	The (General) Contractor is defined in McGill's General Conditions as a person, doing business alone under his own name or under another name, or a partnership or company, contracted with the Owner for the execution of the work. The Contractor is the "Principal Contractor" (Maître d'oeuvre) as per the meaning of the Act respecting occupational health and safety by the Government of Quebec.
Industrial Hygiene Consultants	In the context of projects 17-121 and 17-105, industrial hygiene consultants are professionals who are specialized in matters related to hazardous materials such as asbestos, silicas, and lead.
McGill Project Manager (McGill PM)	McGill's PMO Project Manager Person representing McGill's PMO authority on the projects.
McGill Project Management Office (McGill PMO)	Project Management Office (PMO) leads and directs the construction/renovation of projects carried out on McGill property or other McGill facilities, including consultant and contractor tendering, selection, and contract award.
McGill University	Client and Owner of the buildings. In this project context, AES is considered a client, and a user, in a similar manner as the University.
Principal Contractor (Maître d'oeuvre)	As per the CNESST, the owner or person responsible for carrying out all the work on a construction site.
Professionals	The Professionals are defined in McGill's General Conditions as: The architect, engineer or entity responsible for designing the work in whole or in part, coordinating its study or supervising its execution. The expression includes any authorized representative of the Professional. It also includes any specialized consultant mandated by the Owner.
Specialized Subcontractors	Contractors acting as subcontractors to the General Contractor and providing speciality work such as interior systems, masonry, structural, electrical, mechanical, etc.



The Macdonald Campus Asbestos Investigation report details the findings of the investigation conducted by McGill Internal Audit (Internal Audit) to assess the events leading up to and following the detection of asbestos at the Macdonald Campus Raymond building.

Upwards of two dozen construction projects were underway across the Macdonald Campus in 2022 that were addressing repairs/renovations of varying scope. Some of the most significant projects were underway at the Raymond building, a key campus facility. Two key projects in the Raymond building that included work managed under asbestos conditions were reviewed as part of the investigation: Project 17-121 – Raymond Deferred Maintenance (DM) Project and Project 17-105 – CFI Geitmann Project.

During the Summer and Fall of 2022, members of the community and McGill staff raised concerns with various stakeholders, complaining that dust, apparently related to ongoing construction in the Raymond building, had spread outside of the construction spaces.

On November 29, 2022, the McGill Environmental Health and Safety (EHS) Unit was formally advised of the presence of dust. On January 31, 2023, EHS reported test results, confirming the presence of asbestos in the settled dust in an area accessible by the McGill community of the Raymond building, to the Senior Director of Campus Public Safety. On the same day, the Emergency Operations Centre (EOC) mobilized. Out of an abundance of caution, and due to the presence of dust, the EOC ordered the immediate closure of the three interconnected buildings: the Raymond, Macdonald-Stewart (MS) and Barton buildings. Following the closure of the three buildings, further testing directed by the EOC also detected asbestos in the MS and Barton buildings.

On February 2, 2023, in response to community and Senior Management concerns, the Vice-

We must first highlight the complexity of the DM construction project as it was carried out. The Raymond building is known to contain asbestos, and its deteriorating condition was assessed in 2015 by an external consulting firm, showing evidence of considerable accumulated DM impacting the potential life of the building. Industrial hygiene consultants produced asbestos characterization reports for the three buildings in October 2020 that identified areas where asbestos and lead coatings were detected. The characterization surveys reported that asbestos was found in conditions ranging from lightly damaged to significantly damaged. Therefore, the DM project was carried out in an environment with the constant presence of asbestos.

In the planning phases, two options were technically possible: either to remove the asbestos in all the places targeted by the project or to contain the asbestos during each stage of the construction work. The project was a DM project with a targeted scope. In other words, it was not designed to address the building spaces in a comprehensive manner. Therefore, the option of containing the asbestos was necessary, which required careful execution and increased monitoring throughout the project.

Another factor contributing to the risk of spreading asbestos and adding to the project complexity was the sharing of common spaces by members of the McGill community and the con-

CONCLUSION

As a result of the documents reviewed, information collected, and interviews conducted during the investigation, Internal Audit concludes that the reasons that led to the closure of the buildings cannot be attributed to a single cause. We noted several contributing factors that could explain the release of airborne asbestos fibers, as well as several control processes that should be strengthened to mitigate the potential risks/events associated with any similar future project. They are presented in more detail in the report and can be summarized as follows:

Potential causes and contributing factors that were highlighted during the investigation:

- On certain occasions, lack of good working practices by the General Contractor (GC) and/or subcontractors, such as non-compliance with technical specifications and regulatory obligations to carry out work in asbestos condition;
- Cohabitation of Faculty members and students with construction workers, including the shared use and travel by construction workers from the Raymond building to the loading dock and elevator located in the MS building, resulting in movement between construction sites, McGill-occupied areas and shared spaces;
- Potential inconsistent air pressure and air flows in the buildings;
- Limited effectiveness of communication mechanisms and escalation protocols used to raise and address users' concerns with dust in occupied spaces;
- The laboratory fume hoods that had been moved to room R1-038, as planned, Potels ntractors, such as nodingpr. more detail in the report and can be summarized40n<<32lows:

Asbestos management operations, plan and registry - Comprehensive compliance monitoring plan

EHS capacity and backup for key roles

Asbestos training and awareness

Health and safety culture at McGill

Proposed process improvements that could potentially mitigate the risk of similar incident management situations from reoccurring:

- EOC processes:

- Roles and responsibilities clarification

- Policy Group (PG) activation criteria

- Frequency and delivery of the communication

Considering the contributing factors and preventive control measures that could have averted these incidents, Internal Audit is recommending a set of process improvements aimed at enhancing McGill's control processes. To prevent similar situations from reoccurring, we suggest several areas of improvement which should be addressed accordingly over periods ranging from short- to long-term. While we acknowledge that every project has unique circumstances, and we do not attribute fault to any single factor, implementing these improvements should help reduce the risk of such incidents from reoccurring in the future.

Management should promptly conduct a thorough review of the asbestos monitoring mechanisms within current construction and renovation projects involving the potential presence of asbestos such that lessons learned from this incident are applied to any active projects involving the potential presence of asbestos. Furthermore, Management should

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1.1/ Objectives

The investigation objectives include specifically:

- To inventory the actions taken, roles and responsibilities, and control processes relating to asbestos detection and management during the period of review;
- To verify that asbestos management processes and controls exist and are adequate to ensure compliance with McGill policies and procedures, as well as provincial standards and regulations.

1.2/ Scope

The scope of the investigation includes the following (but not limited to):

- To the extent possible, document the chronology of events and decisions that led to the detection and subsequent management of asbestos present in the Raymond, MS, and Barton buildings;
- Assess McGill's asbestos management and project management processes and highlight process improvements to strengthen these processes.

Scope considerations with regards to provincial standards and regulations: The investigation relied on the subject matter experts, such as the industrial hygiene consultant's use of third-party laboratories for testing analysis as well as the CNESST's expertise and assurance in their area of expertise.

1.3/ Focus

Our investigation primarily focused on the events that occurred between November 25, 2022, and January 31, 2023, although we did take into account relevant facts that led up to and followed the incident.

1.4/

- 1/ Internal stakeholder interviews:
 - a. Faculty of Agricultural and Environmental Sciences (AES)
 - b. Facilities Management and Ancillary Services (FMAS):
 - i. Project Management Office (PMO)
 - ii. Campus Public Safety - Environmental Health and Safety (EHS)
 - iii. Building Operations: Satellite Facilities and Installations
 - c. Emergency Operations Centre (EOC)
- 2/ External stakeholder interviews:
 - a. General Contractor (GC)
 - b. External Project Manager (PM)
 - c. Industrial Hygiene Consultants
 - d. Architects
 - e. Mechanical-Electrical Engineers
 - f. BDC () EMC 1.8 0 Td [(F)20 (aculty of Agricultura8 vrgicul.rFé8c (External Project Man

The Macdonald Campus Asbestos Investigation report details the findings of the investigation conducted by McGill Internal Audit (Internal Audit) to assess the events leading up to and following the detection of asbestos at the Macdonald Campus Raymond building. Upwards of two dozen construction projects were underway across the Macdonald Campus in 2022 that were addressing repairs/renovations of varying scope. Some of the most significant projects were underway at the Raymond building, a key campus facility.

Two key projects in the Raymond building that included work managed under asbestos conditions were reviewed as part of the investigation: Project 17-121 – Raymond Deferred Maintenance (DM) Project and Project 17-105 – CFI Geitmann Project. See Section 2.7 for a description of the projects.

During the Summer and Fall of 2022, members of the community and McGill staff raised concerns with various stakeholders, complaining that dust, apparently related to ongoing construction in the Raymond building, had spread outside of the construction spaces (as outlined in the timeline of key events section). The investigation primarily focused on the events that occurred between November 25, 2022, and January 31, 2023, although it did take into account relevant facts that led up to and followed the incident.

On November 29, 2022, the McGill EHS Unit was notified of dust related to ongoing construction in the Raymond building. EHS conducted an air quality test and reported on the occupant site conditions to AES and EHS internally on December 7, 2022. On January 19, 2023, EHS collected samples for testing from damaged building materials at the site and from dust in several areas of the Raymond building. (Please consult the glossary entries for air testing, bulk sampling and dust sampling for explanations of the various tests conducted.)

On January 31, 2023, EHS reported test results confirming the presence of asbestos in the dust in the Raymond building: one wipe test in room R1-038 was positive for chrysotile asbestos, and three bulk sample tests taken from building materials that were in poor condition and friable, in rooms R1-038, R3-048 and R4-Hall1 were also positive for chrysotile asbestos. Of note, no asbestos was detected in the other samples, namely one wipe test in room R3-048 and eleven bulk samples from rooms R1-037, R3-048 and R4-Hall1.

It should be noted that room R1-038 is located in the construction site in the Raymond building and that McGill equipment (namely fume hoods) had been relocated there to allow researchers to proceed with their research activities. The positive wipe test indicates that, at one point in time, the dust was airborne. While the positive bulk tests do not indicate that the material had been airborne, they confirm the presence of asbestos in loose material in the Raymond building.

On the day that the test results were reported (January 31, 2023), the EOC mobilized and ordered the immediate closure of the Raymond, MS and Barton buildings. The EOC further ordered initial air tests and dust tests, as well as visual inspections to be carried out throughout the MS and Barton buildings. It also ordered:

- isolation of the Raymond building from the two other buildings;
- access restriction to the three buildings to essential activities with mandatory use of P100 masks; and
- teaching activities to be held online or relocated wherever possible (classes were cancelled if they could neither be held online nor relocated).

A subsequent extensive testing program (air testing and dust testing) took place in February throughout the three buildings. The air tests indicated that air quality was in conformity with regulatory thresholds and McGill's own (more stringent) threshold. Despite these results, some of the dust samples came back positive for asbestos in certain locations of the Raymond, MS and Barton buildings.

2.2 / , - - - - - A - - - - -

Asbestos work is categorized according to a combination of factors such as material friability, working method, the volume of debris bns

2.3 / Asbestos Surveys and Characterization

McGill contracted a firm specialized in Industrial Hygiene in October 2020 to perform surveys and characterization of ACM, materials likely to contain asbestos (MLCA) and paint coatings in the Raymond, Barton, and MS buildings.

The PMO contracts with and oversees GCs, industrial hygiene consultants, professionals, and asbestos abatement subcontractors.

These third parties manage all phases of dangerous materials management, from asbestos characterization studies to abatement. In this manner, the PMO oversees the most significant portion of the University asbestos management activities. The PMO also coordinates with the McGill community on an ongoing basis to ensure positive outcomes and to comply with legislative requirements.

Internal Audit was informed that of the approximately 320 renovation and construction projects at both the downtown and Macdonald campuses active as of August 2023, approximately 60 of these have contracted industrial hygiene consultants for the purpose of assessing and managing potentially dangerous materials present in buildings.

The PMO has project management staff in support of these efforts but has two staff positions dedicated to construction safety: a Construction Safety Manager and a Construction Safety Officer. These positions are assigned the responsibility to monitor general safety controls in coordination with contracted third parties active on McGill's construction sites. While the PMO Construction Safety Manager and the PMO Construction Safety Officer positions were both vacant at the time of the incident, McGill had retained the services of an external firm in replacement.

EHS does not perform testing in construction project sites as these are under the responsibility of the GC (in its capacity as Principal Contractor). On the other hand, the third-party industrial hygiene consultants ensure site supervision according to their mandates. However, outside of these construction project sites, EHS performs regular building inspections and prioritizes testing to support stakeholder requests and to comply with regulatory reporting requirements. Internal Audit observed that EHS establishes priorities and reports on these through various mechanisms including via the University Health and Safety Committee annual reporting.



RAYMOND BUILDING

Built in 1905, the Raymond building was originally known as the Agriculture building. The Raymond building has four stories with the basement on the west end of the three-building complex and is accessible from Lakeshore Road. Today, the Raymond building hosts the Department of Plant Science laboratory spaces, including the Phytorium, classrooms, and administrative and academic offices. Laboratory spaces are concentrated on the first and second floors, while classrooms are predominantly on the third and fourth floors. Two mechanical rooms are located under the sloped roof next to the two amphitheaters on the fourth floor.

BARTON BUILDING

The Barton building is a three-story pavilion on the east end of the complex, accessible from the pedestrian path leading to Cluster Colleges road. Initially built as a barn in 1905, the building primarily houses the campus library. The second and third floors are characterized by open spaces extending throughout most of the floor area, containing library space bookshelves and tables. The first floor houses two mechanical rooms, archives, and offices.

MACDONALD STEWART BUILDING

The MS building is a three-story pavilion with a basement. It was added in 1978 linking the existing Barton and Raymond buildings and functionally complementing them. It is largest in surface area and represents the nerve centre of the Macdonald Campus. One-third of the basement surface hosts the mechanical room and the remainder comprises laboratory space. The loading dock is located on the first floor, on the northern side of the MS building, accessible from Poultry College St. The second and third floors include wet laboratories, active learning laboratories, academic and administrative offices and the only elevator of the three buildings.

Links between the three buildings connect on the MS building's first floor and the second floor ensuring fluid movement of users. On the west side of the third floor, the MS building connects with the Raymond building.

2.6 /

The Macdonald Campus includes approximately 90 buildings, where the facilities asset maintenance de cit (also known as DM) is considerable.

As defined by the Government of Québec, asset maintenance de cit refers to the:

2.7 / ASBESTOS CONDITION

ASBESTOS CONDITION

The Raymond DM and CFI Geitmann projects involved a larger scope than asbestos abatement. Internal Audit was informed by facilities staff that DM projects are planned to consolidate varied needs that can include asbestos removal or containment. The varied needs are consolidated to minimize impacts, such as reducing the effect of disruptions to the community.

On January 31, 2023, at the beginning of the incident, the Raymond building saw mixed space usage: construction sites for two major renovation projects, which were under the control of the Principal Contractor; McGill-occupied spaces; and shared spaces used both by construction site workers as well as the Macdonald Campus community.

Two key projects in the Raymond building that included work managed under asbestos conditions were reviewed as part of the investigation:

I/ PROJECT 17 121 RAYMOND DEFERRED MAINTENANCE PROJECT

Project 17-121 addresses prioritized items from a previously assembled list of recommended DM repairs for the Raymond building. Essentially, most of the work is related to the Raymond building, with some interventions in the Barton Link.

The work planned under this project included the installation of sprinklers, emergency showers and eyewash stations; replacement of HVAC systems and related equipment; replacement of all fume hoods, ductwork and air extraction systems; replacement of roofs with; repairs to foundation and installation of French drains; and installation of chilled water loop and heat recovery systems. These activities involved work in the presence of hazardous materials such as asbestos, silicas, and lead coatings.

II/ PROJECT 17 105 CFI GEITMANN PROJECT

Project 17-105 includes the renovation of laboratory space to create a state-of-the-art research laboratory. The project is located in the northwest sector of the first floor of the Raymond building and is funded by the Canada Foundation for Innovation (CFI). These activities also involved work in the presence of hazardous materials such as asbestos, silicas and lead coatings.

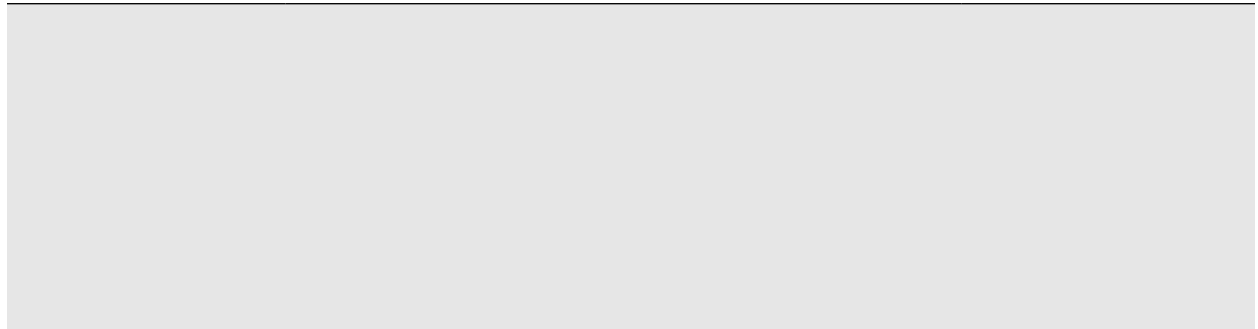
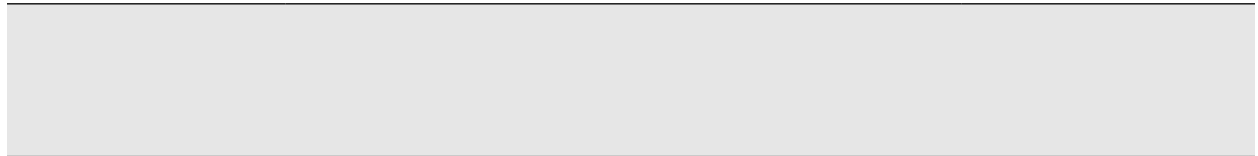


3.1/

The table below summarises the timeline of main events relating to the asbestos incident at Macdonald Campus.

(Please see Appendix 2 for floor plans of the Raymond and MS buildings for the location of the rooms mentioned in the table below.)

DATE



DATE	MAIN EVENT	BUILDING S
October 05, 2022	Test result for sample taken from construction debris on the fume hood in R1-038 positive for asbestos.	Raymond
October 17, 2022	Following a regular inspection, CNESST halted work inside the Phytorium in Raymond, until a complete cleaning of all surfaces was carried out due to the significant amount of dust that could contain silica fibers, potentially exposing workers to health and safety issues.	Raymond
November 04, 2022	Faculty Safety Committee issued a survey regarding concerns for air quality and dust. Complaints received for Raymond and MS.	Raymond, MS, Barton
November 25, 2022	Faculty verbally raised concerns to the PM about dust in room R1-033A, where the CT-Scanner is located, and in rooms R1-031A and R1-033, which are used by the laboratory which runs the CT-Scanner.	Raymond
November 28, 2022	Student expressed concerns about air quality (high carbon dioxide, formaldehyde, and dust levels) in the Octagon to her professor.	Raymond
November 29, 2022	Faculty informed EHS of student's concerns about air quality in the Octagon. A service request ticket was created for indoor air quality complaint.	Raymond
December 01, 2022	Thick smoke, resulting from roofing work of the ECP3-BSL3 laboratory in Raymond, was rushing into the roof of Raymond and MS for over four hours, indicating that MS was potentially in negative pressure compared to Raymond.	Raymond, MS
December 07, 2022	EHS tested indoor air quality parameters (carbon dioxide, humidity and temperature) in the Octagon. The EHS staff member performing tests that day was not equipped or qualified to perform dust tests. All air quality parameters are within Quebec regulatory standards and the presence of dust was reiterated as the main concern to EHS.	Raymond
December 08, 2022	EHS submitted its report of the December 07, 2022 inspection to the Faculty and highlighted dust concerns.	Raymond
January 16, 2023	EHS is notified that the BSC had been moved from Raymond to MS on August 25, 2022, when the high efficiency particulate air (HEPA) filter certification company conducting the annual certification could not find the BSC in Raymond.	MS
January 19, 2023	Following the EHS inspection report submitted to the Faculty on December 08, 2022, EHS took two wipe test samples from R1-038 and R3-048 and fourteen bulk samples from R1-037, R1-038, R3-048 and R4-Hall1. EHS informs internal PM that tests are taking place.	Raymond

DATE

DATE	MAIN EVENT	BUILDING S
February 14, 2023	CNESST halted work on the construction site in Raymond as the inspector determined there was danger to the health, safety or physical well-being of workers due to, amongst several reasons, the accumulations of dust and the friable state of certain materials likely to contain asbestos.	Raymond

3.2/

3.2.1/

Internal Audit received communications and documentation spanning several years that reflected user concerns over dust, mold, air quality and similar issues. The Faculty communicated these concerns amongst their staff and with project management stakeholders verbally and by email.

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3.2.2 /

3.2.3 /

Asbestos Detection Incidents

During the period between November 2021 and October 2022, CNESST's inspector regularly visited the construction site. During these visits, observations were made, leading to infractions, correction notices, and decisions regarding the work. This section outlines information related to asbestos detection incidents, in chronological order.

I/ NOVEMBER 15, 2021 STOPPAGE OF WORK TO DISMANTLE VENTILATION DUCTS ON THE THIRD FLOOR

The CNESST inspector noted the presence of plaster debris on the corridor floor and, in several places, the presence of cementitious plaster that was in a friable state. The CNESST inspector also observed the presence of paint likely to contain lead near ventilation ducts that had been removed. After reviewing the industrial hygiene consultants' September 2021 report, "Works in the presence of hazardous materials," CNESST noted that the third-floor surveys indicate the presence of asbestos and paint containing lead. As a consequence, the CNESST's inspector stopped the demolition work of these ventilation ducts and indicated that the CNESST's approval was necessary to resume works.

II/ OCTOBER 17, 2022 STOPPAGE OF WORK IN THE PHYTORIUM ON THE FIRST FLOOR AND REQUEST FOR COMPLETE CLEANING

The CNESST inspector noticed the presence of dust on the ground, on piping, electrical conduits, equipment, and even on the walls. At the time, two electricians were working in this room, potentially exposed to dust likely to contain silica fibers, which seemingly originated from stonework joint repairs. The CNESST infraction notice mentions that methods and techniques aimed at identifying, eliminating, and controlling the risks of exposure to crystalline silica dust were not in place. As a result of these observations, the CNESST inspector halted work inside the Phytorium until a complete cleaning of all surfaces was carried out.

III/ FEBRUARY 14, 2023 CNESST INTERVENTION LEADING TO CONSTRUCTION SITE CLOSURE

During a CNESST visit on February 2, 2023, the CNESST inspector was informed that students had noticed an accumulation of dust on fume hoods in room R1-038 (the location was the origin of the dust samples that EHS had tested and which returned positive for asbestos).

The GC informed the CNESST that room R1-038 was still part of the construction site and that it had not been officially delivered to McGill, in effect remaining in the GC's responsibility.

The GC also informed the CNESST inspector that students accessed into the construction site without the GC being able to control their access and that it was not a unique situation.

McGill University representatives from EHS and the PMO, also informed the CNESST of the closure of the Barton, MS and Raymond buildings as a result of the January 31, 2023 EOC decision.

On all four floors visited in the Raymond building, the CNESST inspector noted that

3.2.4 /

Under its Emergency Management Policy, McGill University recognizes the importance of emergency management and is committed to establish and maintain a comprehensive, all-hazards emergency management program to protect its community. The University Emergency Management Plan (UEMP) provides a framework for preventing, mitigating, preparing for, responding to, and recovering from emergencies at McGill, to ensure that incidents are managed in a timely and effective manner and that any impact to the University and its community is minimized. The UEMP establishes a temporary and distinct management structure and emergency chain of command, including defined roles and responsibilities, that coordinate response from on-site activities (Incident Command) to University-level coordination (Emergency Operations Centre), to senior administration (Policy Group).

I/ ACTIVATION OF THE EMERGENCY RESPONSE STRUCTURE

The Emergency Response Structure (ERS) is applied for major incidents that cannot be handled with Standard Operating Procedures (SOPs), i.e., Category 2 emergencies or Category 1 emergencies with potential to escalate to Category 2. The ERS allows responders from various departments to work together cohesively towards common emergency response goals.

The asbestos incident at Macdonald Campus was categorized as a Category 2 emergency and, in addition to activating Incident Command (IC), the EOC was also activated on January 31, 2023 in order to build capacity for site support and consequence management.

The EOC was activated upon EHS reporting that one wipe test in the Raymond building (room R1-038) was positive for chrysotile asbestos. On the same day, the EOC ordered the immediate closure of the Raymond, MS and Barton buildings, to conduct extensive air and dust testing. In addition to the positive wipe test, the Raymond building was closed due to positive bulk samples of friable materials in various locations and concerns observed by EHS during the site visit (both McGill-occupied areas and construction site).

The MS and Barton buildings, which were not under construction, were also closed, out of an abundance of caution, due to the connectedness of the three buildings and reports of dust in these two buildings.

II/ EMERGENCY RESPONSE

The EOC's mandate was to provide a response during the emergency period to ensure the community's safety and business continuity, starting from the closure of the Raymond, MS and Barton buildings (January 31, 2023) up to the re-opening of the MS and Barton buildings (March 14, 2023), or when a finalized plan is in place to resume teaching and research activities in the McGill-occupied areas of the Raymond building (March 29, 2023), whichever occurs later.

The main actions taken by the EOC, in collaboration with IC were as follows:

A/ MANAGE EMERGENCY ACCESS TO THE BUILDINGS WITH APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT PPE

Immediately following the building closures, emergency access protocols were implemented, requiring anyone who needed to enter the buildings to be tested for P100 masks, which has the highest filter efficiency for masks and filters at least 99.97% of airborne particles. The P100 masks requirement was maintained until all air tests were acceptable.

Building access was strictly restricted to research personnel carrying out essential research activities, namely, maintaining care of animals, plants and live cell cultures. To ensure business continuity, all academic, administrative and support staff were required to work from home while all classes were held online, relocated, or cancelled.

B/ CONDUCT AIR AND DUST TESTING IN THE BUILDINGS

Immediately following the building closures, McGill mandated the same firm of industrial hygiene consultants that was retained for project 17-121, to perform ambient air tests and to test samples of dust deposited on surfaces in the three buildings, as well as to advise McGill on the safe re-opening of the buildings.

To test the air quality, ambient air samples and the analysis by phase contrast microscopy (PCM) were carried out according to method 243-1, of the Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail (IRSST), which is the analytical method used in Québec. The industrial hygiene consultants started the ambient air tests the day after the building closures (i.e. on February 1, 2023), prioritizing the MS and Barton buildings and then the McGill-occupied areas in the Raymond building.

All air tests were below the safety threshold of 0.01 f/cm³ per the Safety Code for the Construction Industry.

To test the deposited dust for asbestos, dust samples were taken by vacuuming dusty surfaces such as desks, tops of shelves, chairs and windowsills, using a pump with a flow rate of 3 L/min and a cassette fitted with a particle filter. The samples were analyzed by transmission electron microscopy (TEM) according to the qualitative analysis method, Microvacuum Sampling (ASTM D5755-09).

prior to the re-opening, remained sealed until they underwent cleaning under moderate-risk work conditions as per asbestos safety protocols.

Following the completion of the cleaning work in areas which tested positive, the industrial hygiene consultants performed final air tests. All tests were within the safety threshold of 0.01 f/cm³ per the Safety Code for the Construction Industry.

D/ IMPLEMENT ENHANCED SAFETY MEASURES

EOC identified additional safety measures to allow safe re-entry to the buildings and to mitigate the risk of a similar incident re-occurring.

The main safety measures implemented during the emergency period are as follows:

- Sealed off areas which tested positive from areas that tested negative until cleaning was completed;
- Sealed off the Raymond building from the MS and Barton buildings;
- Ensured the Raymond building was under negative pressure, causing air to flow into the Raymond building and preventing air from inside the Raymond building from flowing into the adjoining MS Complex;
- Sealed off McGill-occupied areas in the Raymond building (such as the Octagon and the Phytorium) from the construction site;
- Ensured all damaged walls or ceilings were tarped or repaired or that missing tiles were replaced;
- Ensured procedures, on the removal of items from the Raymond building, were provided to IC and to any personnel who were removing items from the building, whose access was strictly restricted and controlled;
- Redefined the emergency egress with the approval of Fire Prevention;
- Streamlined the process for reporting concerns (such as reports of new dust accumulation or damaged building materials) through the FCC, which performs an initial assessment, and ensures the appropriate teams are mobilized for response;
- Improved coordination within FMAS teams to respond to user-reported concerns and to coordinate any work involving materials that may contain asbestos.

It is to be noted that the industrial hygiene consultants ensured that the seals put in place were sufficiently tight to prevent any potential contamination and also advised on the negative pressure setup.

As part of the additional safety measures implemented since the re-opening of the buildings, a different firm of industrial hygiene consultants was mandated to perform weekly air tests throughout the three buildings. If any test result falls short of McGill's standards, the areas in question will be assessed, closed, cleaned and re-tested.

Furthermore, additional safety measures to be implemented when construction in the Raymond building resumed were as follows:

- Full-time Safety Officer added to the construction site;
- Increased inspections from the industrial hygiene consultants to ensure ACMs are encapsulated and proper seals are maintained at the construction site.

E/ COMMUNICATION DURING THE EMERGENCY PERIOD

Since the closure of the buildings until its de-activation, the EOC issued written communications on a dedicated webpage to provide updates on the status of the building closures. The written communications were also sent by email to the Macdonald Campus community through their dedicated emailing lists for faculty, administrative and support staff and students. The student list was updated during the mobilization period to include students taking courses at Macdonald Campus who were not registered in the Faculty.

During the emergency period, an interim situation update was presented on February 17, 2023, and a Town Hall was held by the EOC on March 14, 2023, to provide updates on the air and dust testing and on actions taken for the safe re-opening of the buildings. The Town Hall also allowed the EOC to answer questions raised by the community and to hear any concerns the community had.

The EOC developed a FAQ webpage, categorised by topic (such as, health and safety, testing, academics and research, etc.), to provide information on frequently asked questions.

F/ DEACTIVATION OF THE EMERGENCY RESPONSE STRUCTURE

Upon sufficient resolution of the incident for the purpose of which they were activated and after advising or seeking concurrence of the Policy Group (PG), as needed, the EOC Director is authorized to demobilize EOC and IC, or to adapt their composition and range of interventions in order to efficiently engage in recovery activities or post-incident management.

With the MS and Barton buildings being re-opened since March 14, 2023 and a significant part of the McGill-occupied areas in the Raymond building being ready to be re-opened on March 31, 2023, the EOC and IC were de-activated on March 29, 2023. A team from the FMAS unit took over to manage the re-opening of the remaining spaces and the progress of construction in the Raymond building, in coordination with the Dean and Faculty leadership.

Prior to the de-activation of the EOC, a demobilization plan was initiated to ensure the ongoing activities were properly handed over to the appropriate lead in the FMAS Incident Management Team (IMT), which include FMAS Operations, Security Services, FMAS Project Management, FMAS Communications, EHS, Faculty, and Legal.

Regulatory bodies, as well as the University, have implemented controls that are designed to manage asbestos and to mitigate the risk of exposure to airborne asbestos fibers in its environments that would be above the regulated per cubic centimeters threshold. Amongst these processes is the role that McGill, McGill community stakeholders, and external parties, perform in following established safety laws, protocols, and standards. Despite these designed processes, the risk remains that building materials containing asbestos deteriorate to a point where airborne asbestos fibers are released or that actions performed by personnel inadvertently bring about the presence of airborne asbestos fibers into the environment above the regulated per cubic centimeters threshold.

We present in this section the main process improvements we consider will mitigate the risk of re-occurrence of these incidents, based on the factors that could have contributed to the release of airborne asbestos fibers. We recognize that each project is unique with distinctive challenges and that McGill has safely completed projects involving asbestos in the past. Hence, the proposed process improvements should be applied to projects where relevant.

FACTORS CONTRIBUTING TO THE RELEASE OF AIRBORNE ASBESTOS FIBERS

The release of airborne asbestos fibers in the MS Complex environment can be attributed to

Internal Audit met with Faculty members, architects, industrial hygiene consultants, GC, inter-

4.1 / Communication lines between University users and the project management team

4.1.1 / Communication lines between University users and the project management team

Communication lines between University users and the project management team (both McGill's PMO and external PM) were established at the onset by the project team by defining project stakeholders and responsible parties.

However, Internal Audit received comments from Faculty users and facilities operations staff that certain GC actions were taken without proper coordination. Similarly, Internal Audit was provided emails where these groups described concerns that were raised with limited feedback on actions taken.

Coordination meetings specifically for the Phytorium were initiated in the Fall of 2022 to allow for a better flow of information between the users and the PM, but these meetings were not attended by other parties (either operations groups or McGill's internal PM), resulting in a siloed approach in addressing concerns.

In addition, the Faculty representative stated that their participation at these meetings became unproductive as they were asked by the PM to submit documented issues whereas an original Faculty concern was that AES emails were not responded to fully as stated above.

The communication issues deteriorated to the point where the external project management firm adjusted the composition of its team and assigned a new PM to improve the communication lines and relationship between the parties.

Internal Audit learned that AES communicated concerns amongst colleagues via email before these were escalated to the PM or PM assistant.

Whereas the project communications lines could be considered as siloed, the EHS unit has in place a ticketing system which allows for the intake and management of service requests. The ticketing system has considerable functionality which allows the unit to track the lifecycle of a request and report on incidents across the University.

PROCESS IMPROVEMENT FMAS 01

Integration of the communication silos: Communication processes between all stakeholders should be reviewed and improved when relating to construction projects involving hazardous substances (such as asbestos). The role and responsibility of each stakeholder, including FMAS Units (internal PM, PMO, EHS, Building Operations), the PM and users in these situations, should be formally established, agreed upon and shared amongst the parties at the beginning of each project phase, to facilitate an effective communication and escalation process.

4.1.2/

The asbestos incident response protocol was designed to address different situations where there is a risk that a McGill community member encounters uncontained asbestos fibers during daily activities.

The initial complaint was not directed to the FCC, as the protocol defines, which performs service request intake and triage. The original student's air quality and dust complaint was directed to EHS given that the space in which the dust was observed was outside the construction project perimeter.

We did not observe that measures were taken to ensure that access to the areas was restricted, at the time of the initial complaint, nor when EHS staff visited the campus for air quality testing and noted the excessive dust in various locations. The response protocol indicates that where dust is discovered in the workplace, individuals are to be kept out of the area.

EHS commented during the investigation that they recommended the Faculty's Renovations Logistics Specialist to contact the project PM given that EHS considered the source of the dust was the construction project and that the complaint was therefore outside of its jurisdiction.

While the Faculty and the PM met on several occasions to address air quality and dust concerns around the time of the complaint, there is no evidence that the PM was notified by EHS or the Faculty of this particular complaint and testing to be conducted. The EHS staff member notified the McGill PM on January 19, 2023, the same day EHS visited the campus to perform tests.

The response protocol addresses both construction project and non-construction project situations and requires that all stakeholders be aware of its procedures to maximize positive outcomes.

PROCESS IMPROVEMENT FMAS 02

Asbestos incident response protocol: Given that the treatment of the dust concerns differed from the expected protocol, the asbestos incident response protocol should be reviewed to improve coordination between parties, address how triage can be better performed, improve response times, and increase awareness of the asbestos incident response protocol by responsible parties in all cases, but in particular where shared spaces and construction projects are involved.

4.2 /

4.2.1 /

4.3/

4.3.1/

4.3.1.1 / General Conditions and Subcontractor Working Practices

The GC, in its capacity as Principal Contractor, plays a crucial role in ensuring compliance with safety regulations and creating a safe work environment. As outlined below, the GC must coordinate the work activities of all contractors, subcontractors, and workers on the construction site. This involves ensuring that each party adheres to all contractual documents including the safety plan, complies with applicable regulations, and maintains a safe working environment.

Internal Audit noted that Macdonald Campus operations staff, who worked closely with the project, raised concerns with the PM with respect to the GC's compliance with McGill's general conditions.

The GC is responsible for overseeing and supervising all the work activities on the construction site. This includes regularly inspecting the site to identify and address any potential hazards or unsafe conditions promptly.

McGill's General Conditions clauses are explicit with regards to the requirements to comply with the safety codes as follows:

23.6: The Contractor undertakes to comply with and to ensure compliance by his employees, agents, subcontractors and any person having access to the worksite, with the provisions of the prevention program as well as those of any law or regulation relating to occupational health and safety, in particular, but without limiting the generality of the

Internal Audit reviewed 12 CNESST inspection reports that were issued between October 2021 and February 2023, while all reports may not have been made available by the GC. We observed that the GC was cited on three occasions, which were deemed significant enough to stop work, including the closure of the construction site on February 14, 2023, where site workers were not respecting methods and procedures related to asbestos work conditions.

These details are taken from CNESST reports and described below:

I/ STOPPAGE OF WORK BY CNESST ON NOVEMBER 15, 2021

The CNESST inspector concluded that there was a danger to the health, safety, or physical well-being of a worker, and noted the following reasons:

MLCA, such as joint compound and cementitious plaster are present in the workplace;

The materials are in a friable state;

The paint on the walls contains lead;

Workers are demolishing ventilation ducts;

Demolition work is likely to generate dust containing asbestos and lead;

The results of the sampling report dated September 27, 2021 showed the presence of asbestos and lead in the following materials: joint compound, cementitious plaster, paint;

No decontamination procedure in accordance with subsection 3.23 of the Safety Code for the Construction Industry is planned or applied;

The workers on site have no training in asbestos;

Asbestos is a proven human carcinogen that can cause occupational injuries such as asbestosis, mesothelioma and lung cancer.

II/ STOPPAGE OF WORK BY CNESST ON OCTOBER 17, 2022

While these may be isolated incidents, the CNESST inspector reviewed the GC's corrective action and work resumed thereafter. We were informed by the GC, that the interactions with the CNESST were not unusual for him such that the GC took steps to address the issues raised in a timely manner (when these were not contested).

III/

ing obligations regarding dust control and regular cleaning of construction sites, as well as adequate protection of the surrounding equipment and furniture from construction dust/debris.

PROCESS IMPROVEMENT PMO 02

Communication of CNESST reports: In coordination with McGill Legal Services, Management should implement a control process such that CNESST inspection reports be promptly communicated to McGill to enable the PM and PMO to proactively address significant concerns raised by CNESST. This proactive approach will facilitate timely corrective actions and ensure the adherence to necessary safety measures throughout the project lifecycle. If infractions are not addressed in a timely manner, the PM must escalate the issue and notify the PMO for further actions where warranted.

REGULATORY REQUIREMENT FOR SAFETY OFFICER ON A CONSTRUCTION SITE

The Safety Code for the Construction Industry in Quebec requires that a safety officer be present on construction sites where the total cost of the work exceeds \$8,000,000 to ensure compliance with safety regulations and to prevent accidents.

The GC had not retained the services of a safety officer for the project claiming a labour shortage and had hired a safety counsellor instead. Of note, safety officers hold valid certificates for having successfully completed the Construction Site Safety Officer course offered at Collège Ahuntsic, or its equivalent⁷, while safety counsellors are not certified. While the CNESST identified this issue as an infraction (on October 13, 2021), it was not deemed significant enough to stop work.

The presence on site of a safety counsellor instead of a safety officer was not addressed during the entire course of the project. The lack of qualified safety personnel may not adequately address the needs of a project of this magnitude. The resulting potential impacts such as increased accidents, insurance costs, legal liability, work closures, and reputational risk must be addressed.

PROCESS IMPROVEMENT PMO 03

Safety officer: The PMO must ensure that the GC complies with regulatory compliance requirements to hire a safety officer for the construction site in order to mitigate risks, such as increased accidents, insurance costs, legal liability and work closures as well as reputational risk.

4.3.1.2 / Managing and Monitoring Air Circulation

One of the many process controls when working in high-risk asbestos conditions on the Raymond building construction site was to put the air flows under negative pressure in the area containing asbestos. In addition to components such as engineering controls, protective enclosures and protective personal equipment, air monitoring helps control dust and to prevent it from leaving the area and thus avoids contamination. This method of controlling air pressure is a good practice that is used on construction sites where occupied spaces are adjacent to the construction site.

Professionals stated that the ventilation systems in the Raymond building construction site at the time of the student complaint on November 28, 2022, were not in operation except for in the Octagon area, which had been delivered by the GC to McGill in September 2022. The Octagon was being serviced by a temporary ventilation system designed by the mechanical engineers and operated by the GC. Filters were said to be kept in good condition.

Professionals also stated that the three buildings have separate ventilation systems that are not connected. Therefore, dust did not travel through the ventilation systems to contaminate previously non-contaminated areas.

The users and professionals noted inconsistent air pressure and air flows in the buildings throughout the construction project. An incident that occurred on December 1, 2022 indicated that the MS building was potentially in negative pressure compared to the Raymond building, raising concerns that dust could be coming from the construction site to the MS building. ECP3-BSL3 laboratory room work was taking place in the Raymond without closing the doors, which resulted in thick smoke rushing into the first floor of the Raymond and MS buildings for more than four hours.

Concerning this latter incident, an email from a Faculty member reported the PM's explanation that it was 'normal' to get smoke because the MS building was in negative pressure compared to the Raymond and because some doors were left open by the contractor.

PROCESS IMPROVEMENT PMO 04

Air circulation and ventilation systems: It is acknowledged that the management of air flows and ventilation systems is inherent to all construction projects and is one process control amongst many when managing asbestos work conditions. In environments with the presence of asbestos, and when adjacent to occupied spaces with users, additional air monitoring measures should be implemented to ensure continuous adequate air pressure within the construction site and the surrounding occupied areas. This will maintain optimal air conditions and prevent the dispersion of asbestos fibers beyond the designated construction site, hence minimizing the risk of asbestos contamination.

4.3.1.3 / Construction Site Logistics

Contrary to Project 17-121 architectural specifications, the GC confirmed using the MS building's loading dock and elevator for reception/expedition of materials and equipment, as well as to remove some construction debris. General conditions article 14.0 regarding the delivery of materials and disposal of waste reads:

"The loading dock may under no circumstances be used by the Contractor. The Contractor shall under no circumstances obstruct traffic and access to this area."

The GC reported having requested and obtained informal permission from the PM to use the loading dock and the elevator, in coordination with the PM for access and for the delivery of materials.

Workers used a corridor from the MS building loading dock area to the Raymond building to move these products in and out of the construction site.

Thus, the Octagon was used to access the construction site and the same corridor was shared by the users and the workers.

Internal Audit notes that it was possible to create dedicated access for the purposes of the GC to the Raymond construction site as well as the means for handling and lifting materials and equipment. As was confirmed by the project team, including the GC, alternative access and means could have been implemented.

PROCESS IMPROVEMENT PMO 05

Construction site logistics: McGill must prioritize at all times, and to the extent possible, construction site logistics that favor segregating construction activities from user activities, including the means and methods designed for the delivery and handling of construction materials, and for the disposal of construction waste to and from points of service, in place of overlapping with occupied spaces, to minimize the risk of contamination.

4.3.1.4 / Shared/Common Spaces

The need to carry on with academic activities during the construction period as well as several decisions regarding construction logistics generated situations in which several areas were shared between the construction workers and McGill's community.

Consequently, both construction workers and McGill users occupied some of these spaces simultaneously during certain periods to allow for uninterrupted research activities. For instance, the Faculty requested access to the Phytorium, the CT Scanner and room R1-038:

Phytorium (R1-003 and R1-011; Raymond First Floor)

A portion of the Phytorium needed to be operational and accessible to McGill's users while construction was ongoing. Minutes from the Phytorium coordination meetings had recorded concerns regarding air quality. These meetings were held frequently in Fall 2022 with the expectation that the PM would address issues required to keep portions of the Phytorium operating during the construction phase. The dust issue, plus the inadequate/faulty placement of the dust protective (membrane) was regularly communicated in these meetings:

"McGill is still requesting extra zippered protection for walk-in growth chamber to help with protection from dust.

McGill reiterated that a major concern remained dust entering the operating

Due to the history of the Raymond building, the presence of asbestos should have been

4.3.1.5 / Anticipated Delivery

The project construction plan was developed to allow for the delivery of certain spaces in phases before the end of the project. The phasing was necessary as it was technically and logistically very complex to move some of the research equipment from the Raymond building and because of the acute lack of swing space (spaces that can be temporarily used for relocated laboratory work or equipment) at the Macdonald Campus and generally, at the University. From the different options proposed by the project team, McGill chose to allow researchers to take possession of certain spaces while construction

PROCESS IMPROVEMENT PMO 07

Anticipated delivery: The PM, in coordination with project professionals and GC, must ensure that the anticipated delivery procedure and relevant documentation is officially completed before the faculty users are allowed to occupy a room, as well as notifying construction workers not to use these spaces. This will ensure clear boundaries as well as clear responsibility in terms of the maintenance and cleaning of the delivered room, hence minimizing the risks of contamination and dust accumulation.

4.3.2 /

4.3.2.1 / Project Management (External)

The PM is defined in McGill's general conditions as *The Person who, as the Owner's representative, administers the contract.*

The role of the PM is an important one and McGill has high expectations regarding the services to be performed by firms contracted in this role, as indicated in the terms of reference contained in the CFT documentation and further integrated in subsequent contractual agreements.

McGill retained the services of a Project Management firm to carry out the numerous DM projects at the Macdonald Campus. A public CFT was issued in December 2018 and subsequently, a Project Management firm was contracted in April 2019.

Essentially, the responsibility of the contracted Project Management firm consists in representing the Owner (McGill) and ensuring that any given project is managed according to industry best practices. McGill recognizes the best practices enacted by the Project Management

PROCESS IMPROVEMENT PMO 08

Rigorous project monitoring: It is in the PM's mandate to represent McGill, to act in its best interests, and thus to ensure that the project is professionally managed according to the best industry practices and McGill's framework and requirements. One of the PM's important tasks is to ensure quality control on all activities from all parties and stakeholders in the construction process so that McGill's General and Complementary Conditions and the Professionals' specifications be respected and applied on the construction site by the GC. Based on various sources of information, it appears that tighter project management on the construction site could have prevented certain situations from occurring. PMs (internal or external to McGill) should reinforce their vigilance and make sure that the GC always follows contractual General and Complementary

Per the 2018 CFT for the external PM contract, McGill's PMO must provide instructions about the projects' parameters, including expected cost and schedule, and provide the PM with all the information and data pertaining to the projects that are necessary for the PM to complete their work.

McGill's PMO also has the obligation to provide prompt instructions to the PM and to inform decisions in a timely manner so as to enable the PM's effective delivery of services.

Projects 17-121 and 17-105 were assigned one internal senior PM and contracted with an external firm for a senior PM. The contracted external PM held the primary role and managed all aspects of daily activities, while the internal PM is responsible for overseeing and supporting the PM. The project governance structure included a Project Director who provides oversight of both internal and external PM activities; however, the nature of the project did not include a steering committee.

PROCESS IMPROVEMENT PMO 10

Monitoring of the projects and PMs: As the leader and director of construction and renovation projects on McGill properties and facilities, the PMO is responsible for the tendering, selection, and awarding of contracts to consultants and contractors. However, due to limited delivery capacity, PMO had outsourced the project management role to a professional external firm. To ensure the PM's performance is monitored effectively, PMO uses various management tools and activities. For important and riskier projects, PMO should adopt a tighter approach on external PM oversight. It should require comprehensive periodic (i.e. monthly) reports prepared by the external PM to provide more detailed project progress assessments. For the scale of the projects currently reviewed, although occasional remarks about the projects were recorded in the 'Needs and Events Status' updates, a more comprehensive monthly report covering key aspects of project management should have been considered. While weekly meetings were held with the PMO during certain periods, these meetings covered multiple projects. We believe that fully documented monthly reports should be produced to effectively support project monitoring.

4.3.3 /

RISK ASSESSMENT AND PROVISION FOR RISK

The risk analysis summary for projects 17-121 and 17-105 identified risk categories and descriptions. One of the risk items is directly related to unforeseen presence of asbestos and mold in the building. However, the same table also shows that no risk contingency was allocated for any of the specific risk items listed. This is in part due to the approach used to establish a global project risk contingency. However, it is possible that project risk is understated as Internal Audit

During the investigation, auditees, including the Faculty, the PM and the industrial hygiene consultants, commented that more supervision would have been appropriate. An indication of this was seen from the fact that CNESST mandated the suspension of mechanical duct removal works on the third floor of the Raymond building as early as November 2021 because these works were not done properly under asbestos low- and moderate-risk conditions. A similar occurrence of CNESST stopping works due to possible workers exposure to silica also took place in October 2022.

The Safety Code for the Construction Industry calls for air testing inside of high-risk asbestos removal zones but does not require air testing for low- to moderate-risk work conditions. McGill's PMO and EHS have guidance on additional measures, beyond those specified in the Safety Code for the Construction Industry, to provide greater assurance to the community in close proximity to the high-risk zones. These measures involve conducting routine air testing in adjacent areas outside of high-risk asbestos abatement zones.

Air tests required by the Safety Code for the Construction Industry were performed and reported no issues for both projects; however, the additional air testing measures recommended by McGill were only performed for project 17-105 and not for project 17-121.

In all cases, the GC remains responsible for always keeping the construction site clean and applying work methods that prioritize dust control at the source, such as performing work under enclosure when necessary. Technical specifications include the obligation to adopt working practices that prevent the spread of dust. The industrial hygiene consultants highlighted that the mere existence of specifications is not a guarantee of the quality of work that will be carried out.

While all procedures and requirements are documented in the specifications, it is the responsibility of the GC to ensure that all subcontractors follow them and to be available to answer questions and provide clarifications to their subcontractors. Furthermore, in the event the construction site encounters unforeseen asbestos-related conditions, the GC should request the industrial hygiene consultants to intervene in terms of providing supervision and recommendations.

PROCESS IMPROVEMENT PMO 13

Additional supervision by industrial hygiene consultants and clarification of their mandate: The industrial hygiene consultants' site supervision must reflect and correspond to the project's context and risk conditions when related to the management of asbestos. Consequently, Management must revise the contracts of industrial hygiene consultants to ensure that site supervision during construction activities provides adequate coverage of the full scope of work, including asbestos work in moderate- and low-risk conditions when needed.

4.4 / Environmental Health and Safety (EHS) Unit

Past internal audits related to EHS and the asbestos management processes were reviewed.

These include the following:

An audit of the EHS unit in 2017 included a broad governance and operational scope, and given a rating of “needing improvement”. The report highlighted, amongst other topics, the need for greater coordination with key stakeholders, requirements for improved application systems in supporting operations, the need for improvements in certain processes such as incident management, strengthening EHS’ governance and adequate resourcing for continuity of operations.

Similarly, a 2019 audit targeting the asbestos management process was also rated as “needs improvement” and included key areas for improvement such as strengthening compliance with regulatory requirements, the reliability of the asbestos register, asbestos management roles and responsibilities, formalizing operating procedures including communication protocols, inspection and testing guidelines and asbestos activity oversight.

4.4.1 / Environmental Health and Safety (EHS) Unit

EHS is a sub-unit of the University’s Campus Public Safety group which reports up into the FMAS unit.

As per the EHS’s website, its mission statement is described as follows:

The Environmental Health and Safety (EHS) unit supports the continuous improvement of a safety culture at the University by providing advice, guidance, training, and technical support to the McGill community. The safety culture encompasses a healthy and safe environment achieved through everyone’s understanding of their related responsibilities and compliance with all regulatory requirements and University safety policies.

The oversight of asbestos management at the University involves several FMAS units, with the PMO and EHS being the most important. EHS performs key activities related to asbestos management as it establishes the University asbestos policy, the asbestos incident response protocol, training and awareness programs, as well as administering the asbestos registry.

It is important to note that EHS’s mandate is limited to a support role in construction projects. EHS does not perform testing in construction project areas as these are the responsibility of the GC and the third-party industrial hygiene consultants. EHS is reliant on these stakeholders to provide the asbestos-related data necessary to update the asbestos register in a timely manner. Outside of these projects, EHS performs facilities inspections and material testing to support trades when performing renovation or repair work and to comply with the provincial government’s asbestos reporting regulations.

The EHS unit's authority vis-à-vis the PMO and other FMAS units is not formally defined. EHS informed us that the unit does not have the necessary authority to ensure effective coordination with and compliance by key University stakeholders. Clearly defined authority and roles are relevant in coordinating asbestos management processes when these are performed by McGill stakeholders (such as the PMO, Building Services, Building Operations, IT/Network and Communications Services).

Specifically, lack of coordination and of clearly established policies and procedures could result in inconsistent implementation across the institution.

An additional concern regarding EHS' authority concerns the observation that the EHS asbestos policy is approved by the Facilities and Operations Safety Committee (FOSC) which is chaired by the FMAS Associate Vice-Principal, and not by the Board of Governors. While EHS' Internal Responsibility System outlines a comprehensive accountability framework that assigns responsibilities to the Board of Governors for adequate resources, the policy oversight mechanisms may not be sufficiently clear to define roles and responsibilities between the operational stakeholders.

PROCESS IMPROVEMENT EHS 01

The requirements of the Regulation respecting occupational health and safety ¹¹ are clear that the registry must be made available to contracted workers and their representatives. Currently, should third parties working on McGill premises need to consult the registry, reports are requested and obtained from McGill PMO or EHS.

Internal Audit observed that while asbestos characterization data for the three buildings served to guide asbestos removal work, the data is part of a backlog of entries that remains to be entered into the register.

PROCESS IMPROVEMENT EHS 03

Comprehensive compliance monitoring plan: Management must develop a comprehensive plan for monitoring compliance with established asbestos management process controls. The plan must include regular institutional policies and procedures reviews, as well as ongoing communication and training to ensure that all stakeholders (PMO and EHS) are aware of, and fulfill, their responsibilities.

4.4.3 /

There was only one EHS staff member who was qualified to perform the required asbestos tests in December 2022 and the staffer was fully booked during the period leading up to previously approved vacation until the new year. In addition to the EHS Operations Manager being on medical leave, the EHS staff's backup was not yet trained on asbestos testing. As a result, the asbestos testing was only performed in January 2023.

PROCESS IMPROVEMENT EHS 04

EHS capacity and backup for key roles: Considering that EHS services must be seen as essential, management must review EHS's staff capacity and availability at the Macdonald Campus to respond to the needs when time-sensitive requests are received. In a broader sense, the capacity must be aligned with their reviewed mandate (refer to Process Improvement EHS-01). Management should consider additional backup options to fill potential gaps and support key roles and/or critical tasks, such as contracting with external firms for additional support where the availability of internal staff is unable to provide a timely response within the protocol. Specifically relating to the Macdonald Campus, management should consider appointing a dedicated EHS resource to address all occupational health and safety matters arising at the campus.

¹¹ Source: Articles 69.16 and 69.17 of the Regulation respecting occupational health and safety

4.4.5 /

McGill has University-wide safety committees such as the University Health and Safety Committee, the University Laboratory Safety Committee, the FOSC, as well as local Faculty and Departmental safety committees that provide broad oversight over EHS matters.

The committees have advisory and/or operational roles that support policy development and provide operational activities oversight. While the EHS Unit is a member and participates in each of these committees in varying capacities, it does not chair any of these committees. The mandate of the FOSC follows:

The role of the Facilities and Operations Safety Committee (FOSC) is to promote and support the continuous improvement of health and safety practices in all McGill University facilities, with the aim of providing excellent infrastructure services, by placing the highest importance on protecting the well-being of all University community members. From a health and safety standpoint, the goal is to develop a safety culture whereby both union and management representatives are proactive and participate collaboratively in the prevention, reporting, recording, and correction of hazards. (Quebec Act & Regulation Respecting Occupational Health & Safety).

PROCESS IMPROVEMENT EHS 06

Enhancing health and safety culture: The University has a strong governance and operational foundation from which to further promote health and safety. Improving the culture of health and safety in the University setting requires a comprehensive and multi-faceted approach that involves all stakeholders. The following are some means the University should adopt to promote health and safety culture:

- Demonstrate a visible and consistent commitment to health and safety;
- Establish and communicate clear comprehensive principles and guidance (i.e. policies, programs, operating procedures) specific to the wide range of areas present at the University;
- Ensure adequate resources are available to provide awareness and training and safety programs for all members of the University community, including students, faculty and staff, as well as contractors;
- Foster effective communication channels to promote health and safety information, updates and awareness campaigns;
- Encourage reporting and investigations;
- Engage stakeholders in health and safety initiatives;
- Regularly review operations to promote continuous improvement.

4.5 /

4.5.1 /

It was reported that information gathered by the EOC was either incomplete, inaccurate or not shared on a timely basis, which resulted in suboptimal flow of information and decision-making.

In addition, it was reported that the EOC did not get the full picture of the incident as information about the construction site and CNESST interactions during the emergency period, as well as actions taken in the pre-emergency period, were not integrated in EOC discussions. The general lack of appropriate information is indicative of a lack of clarity in the responders' understanding of the role of the EOC and its objectives, as well as of their individual roles and responsibilities and of the reporting lines within the EOC.

PROCESS IMPROVEMENT EOC 01

Roles and responsibilities: To allow for increased success in emergency responses, EOC leadership should clarify the reporting lines and the roles and responsibilities of each responder, including subject matter experts, and set clear expectations at the beginning of the EOC activation. In addition, new EOC responders, especially subject matter experts, should be brought up to speed on the role of the EOC so that all responders are aligned and work towards the same objectives and priorities.

4.5.2 /

The role of the PG, which is made up of members from McGill's senior administration, is to provide high-level strategic support and direction to the EOC. The PG was not activated in response to the emergency at Macdonald Campus.

The PG could have guided the EOC on strategic decisions, especially given that the emergency occurred at the Macdonald Campus, which operates somewhat differently than the downtown campus, and given the fact that the emergency management involved high-impact decisions such as closure of buildings and class cancellations. It was further reported in the debrief of this EOC that the PG could have changed perception of priorities, hence impacting the overall efficiency and effectiveness of the emergency response.

PROCESS IMPROVEMENT EOC 02

Policy Group: Management should review under which criteria the PG should be activated to ensure the EOC is provided with appropriate consistent high-level strategic support and direction to manage an emergency.

4.5.3 /

The Macdonald Campus community raised concerns about the lack of immediacy and frequency of updates and the method of communication during the emergency period, highlighting that communication should have been more frequent and should have included interactive in-person or virtual meetings. The limited communication from the EOC stemmed from the challenges faced by the EOC to gather accurate and complete information on a timely basis.

It was also reported that the limited communication from Faculty leadership and the fact that initial written communications were being sent by someone they did not know (Senior Director of Campus Public Safety, on behalf of the EOC) was demoralizing to the Macdonald Campus community, who was already experiencing a feeling of disconnection from the downtown campus in general.

In terms of emergency notification system, the Macdonald Campus community reported that the initial communication should have been sent as an emergency alert on the cell phone, in addition to the email communication.

Furthermore, the written communications were mainly restricted to updates on the buildings' re-opening timelines. Although the results of the air and dust testing were shared with the community once available, the laboratory test results supporting these reports were not shared with the community until April 24, 2023, almost a month after the EOC was de-activated, which could be seen as insufficient transparency from the EOC.

PROCESS IMPROVEMENT EOC 03

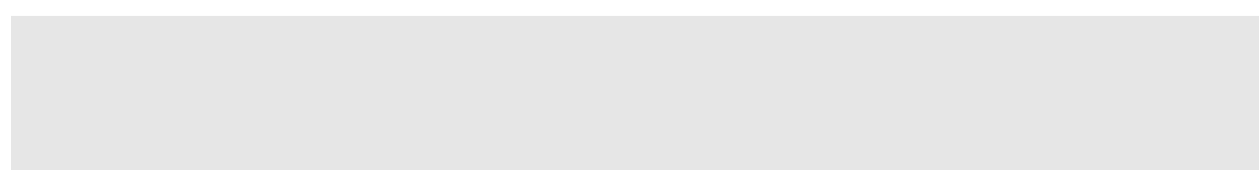
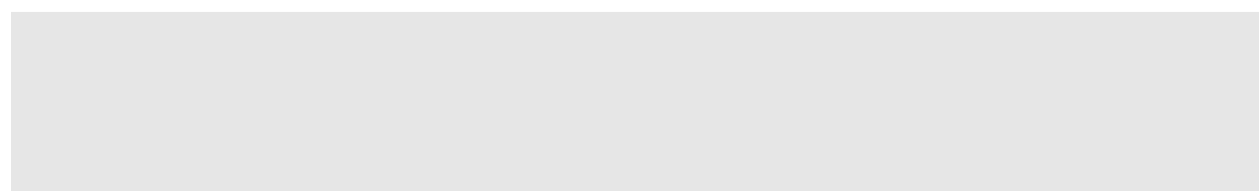
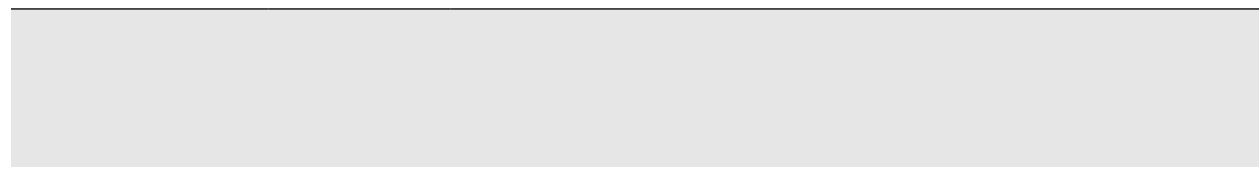
Communication: The EOC should review its overall emergency communication approach by reviewing the frequency of communication and method of communication delivery (online written communications and in-person/virtual meetings) to provide ongoing and optimal reassurance and prevent the impacted community from feeling isolated during the emergency period, in collaboration with local leadership of the impacted community. EOC leadership should brief all responders on the basics of emergency communication to ensure accurate and complete information is gathered on a timely basis which will in turn facilitate an efficient and effective ongoing communication process with the impacted community and mitigate the existing feeling of disconnection between the Macdonald Campus and the downtown campus. In addition, the EOC should consider using the emergency notification system, where warranted, by sending emergency alert messages on cell phones so that the impacted community is instantly notified of the emergency updates, especially for the initial communication. Furthermore, the EOC should review the type of information being communicated and provide any reports or other supporting documents deemed to be of importance to the impacted community on a timely basis, to ensure continuous transparency of information.



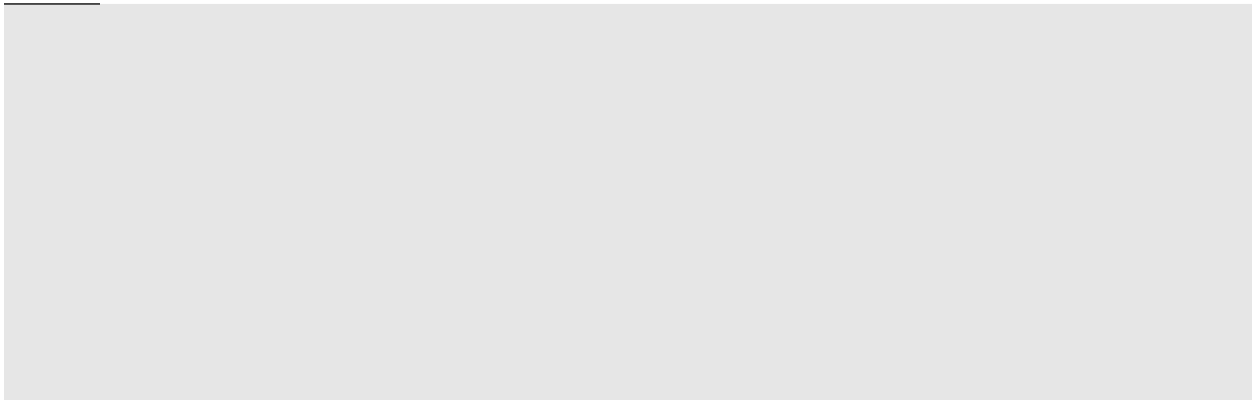
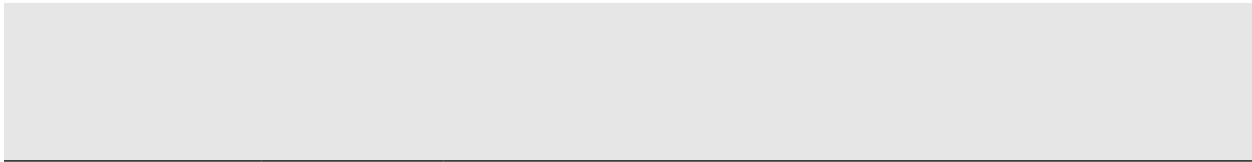
INTERNAL AUDIT MR23 03 ASBESTOS INVESTIGATION REPORT RECOMMENDATION TABLE AUGUST 2023

REFERENCE	RECOMMENDATION	TITLE	DESCRIPTION
FACILITIES MANAGEMENT AND ANCILLARY SERVICES FMAS			
IA.01	Process Improvement FMAS-01	Integration of the communication silos	Communication processes between all stakeholders should be reviewed and improved when relating to construction projects involving hazardous substances (such as asbestos). The role and responsibility of each stakeholder, including FMAS Units (internal PM, PMO, EHS, Building Operations), the PM and users in these situations should be formally established, agreed and shared amongst the parties at the beginning of each project phase, to facilitate an effective communication and escalation process.
IA.02	Process Improvement FMAS-02	Asbestos incident response protocol	Given that the treatment of the dust concerns differed from the expected protocol, the asbestos incident response protocol should be reviewed to improve coordination between parties, address how triage can be better performed, improve response times, and increase awareness of the asbestos incident response protocol by responsible parties in all cases, but in particular where shared spaces and construction projects are involved.
FACULTY OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES AES			
IA.03	Process Improvement AES-01	Moving of specialized equipment	Prior to moving any specialized equipment from construction areas that may involve MLCA, the Faculty Safety Chairs should ensure that a process is implemented such that the Faculty members are made aware of the internal procedures relating to decommissioning and decontamination so that the leader, through an appropriate role, such as the Building Director or Renovations Logistics Specialist, can coordinate with EHS accordingly.
PROJECT MANAGEMENT OFFICE PMO			
IA.04	Process Improvement PMO-01	Enforcing health and safety controls on the construction site	The PMO must ensure that further adequate oversight controls are in place to emphasize that the primary responsibility for compliance with the obligations relating to a construction site rests with the GC. Despite the constraints encountered and the complexity of the context, it is imperative that the GC ensures appropriate health and safety mechanisms are maintained. These must be in accordance with the contractual documentation and the Safety Code for the Construction Industry, both of which include many clauses dictating obligations regarding dust control and regular cleaning of construction sites, as well as adequate protection of the surrounding equipment and furniture from construction dust/debris.
IA.05	Process Improvement PMO-02	Communication of CNESST reports	In coordination with McGill Legal Services, Management should implement a control process such that CNESST inspection reports be promptly communicated to McGill to enable the PM and PMO to proactively address significant concerns raised by CNESST. This proactive approach will facilitate timely corrective actions and ensure the adherence to necessary safety measures throughout the project lifecycle. If infractions are not addressed in a timely manner, the PM must escalate the issue and notify the PMO for further actions where warranted.
IA.06	Process Improvement PMO-03	Safety officer	The PMO must ensure that the GC complies with regulatory compliance requirements to hire a safety officer for the construction site in order to mitigate risks, such as increased accidents, insurance costs, legal liability and work closures as well as reputational risk.
IA.07	Process Improvement PMO-04	Air circulation and ventilation systems	It is acknowledged that the management of air flows and ventilation systems is inherent to all construction projects and is one process control amongst many when managing asbestos work conditions. In environments with the presence of asbestos, and when adjacent to occupied spaces with users, additional air monitoring measures should be implemented to ensure continuous adequate air pressure within the construction site and the surrounding occupied areas. This will maintain optimal air conditions and prevent the dispersion of asbestos fibers beyond the designated construction site, hence minimizing the risk of asbestos contamination.
IA.08	Process Improvement PMO-05	Construction site logistics	McGill must prioritize at all times, and to the extent possible, construction site logistics that favor segregating construction activities from user activities, including the means and methods designed for the delivery and handling of construction materials, and for the disposal of construction waste to and from points of service, in place of overlapping with occupied spaces, to minimize the risk of contamination.

A. 1



REFERENCE	RECOMMENDATION	TITLE	DESCRIPTION
IA.15	Process Improvement PMO-12	Risk contingency additional to the 10% construction contingency	Projects encompass different types of contingencies that may need to be accessed during different phases of the project, such as for design and construction phases. During the management of the execution of the project, these alternative types of contingencies should be considered, particularly when there is a substantial presence of dangerous or



1/ R1 003 AND R1 011

Phytorium. Shared space used by both construction workers and McGill users.

October 17, 2022

The CNESST inspector stopped work inside the Phytorium until a complete cleaning of all surfaces was carried out.

2/ R1 029

August 25, 2022:

BSC moved from this location to MS1-067 during construction without being decontaminated.

January 26, 2023:

EHS took bulk sample from debris on top of the BSC; tests positive.

February 3, 2023:

Industrial hygiene consultants took sample from debris on top of the BSC; tests negative.

3/ R1 033A

Location of CT-Scanner. Complaints of dust in this location as well as R1-031A and R1-033. Shared space used by both construction workers and McGill users.

4/ R1 031A AND R1 033

Used by the laboratory that runs the CT-Scanner.

5/ R1 037

January 19, 2023:

Bulk sample taken; tests negative.

6/ R1 038

Fume hoods, which drew in a lot of air and possibly dust, were moved here. Shared space used by both construction workers and McGill users.

September 26, 2022:

Sample taken from construction debris on fume hood, which tests positive.

January 19, 2023:

Bulk sample and wipe sample taken. Both test positive.

7/ R1 HALL1, R1 HALL3 AND R1 HALL4

Location of corridors, hallways, entrances and exits. Shared space used by both construction workers and McGill users.

RAYMOND BUILDING LEVEL 2



8/ OCTAGON LEVELS 2, 3, 4

November 28, 2022:

Student expressed concerns about air quality (high carbon dioxide, formaldehyde, and dust levels) in Octagon.

9/ R2 HALL4

Location of corridors, hallways, entrances and exits. Shared space used by both construction workers and McGill users.



A. 2
