ONWARD ENVIRONMENTAL

October 14, 2024 ONWARD File: 100117.334

University of Waterloo
200 University Avenue West
Waterloo, Ontario N2L 3G1

Attention: Jutte Dorndorf

Re: Designated Substances Assessment
Mathematics and Computers (MC), Building 17, Various Rooms, Renovation WR52912

ONWARD Environmental Inc. (ONWARD) was retained by the University of Waterloo (UofW / Client) to complete an assessment for designated substances within various first and second floor rooms of the Mathematics and Computers (MC) building (Building No. 17) located at 200 University Avenue West in Waterloo, Ontario.

The assessment is required in advance of planned renovations within the subject areas to meet the requirements of the Ontario Occupational Health and Safety Act and Regulations.

The assessment was completed by David Niemand of ONWARD on July 11, 2024, and September 10, 2024. The assessor was unaccompanied, and the subject areas were mainly unoccupied during the ONWARD site visits.

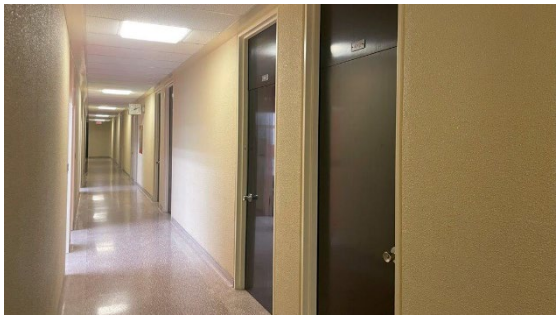


Photo 1: Entrances to office spaces, first floor corridor.

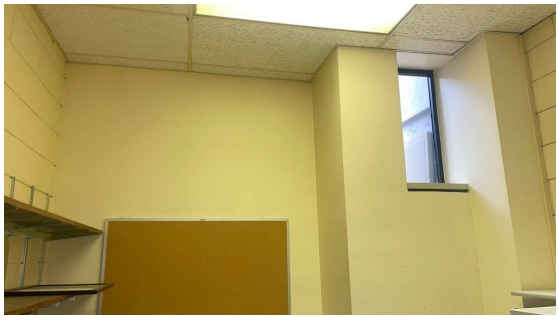


Photo 2: Typical finishes within first floor offices (Room #1038).

Photo 3: Typical finishes within first floor offices (Room #1033).

Photo 4: Typical finishes within second floor offices (Room #2024).

The assessed areas are shown on the floor plans provided in **Appendix A**.

1.0 REGULATORY FRAMEWORK

Under Ontario Regulation 490/09 (O.Reg. 490/09) of the Occupational Health and Safety Act (OHSA), there are eleven designated substances that are regulated and must be controlled for on a construction, renovation or demolition project. Of the eleven substances, four are commonly associated with buildings. These include asbestos, lead, mercury and silica. Under Section 30 of the OHSA, before beginning a project, an owner is obligated to determine whether any designated substances are present at the project site and to provide a list of designated substances to prospective contractors bidding on the work.

Additionally, Ontario Regulation 278/05 (O.Reg. 278/05) specifically regulates the disturbance of asbestos-containing materials (ACM) on construction projects and requires building owners to inform contractors of the presence of ACMs prior to requesting tenders or contracting the work. Contractors are in turn obligated to inform their sub-contractors of the presence of these materials.

O.Reg. 278/05 defines an asbestos-containing material (ACM) as that which contains 0.5 per cent or more asbestos by dry weight.

2.0 SCOPE OF WORK

ONWARD assessed the subject areas for designated substances including asbestos, lead, mercury, and silica that may be incorporated in the building's structure and finishes that may be impacted by the proposed renovation work.

The assessment excluded the following designated substances that are not typically incorporated into building materials:

- Arsenic
- Acrylonitrile
- Benzene
- Coke oven emissions

- Ethylene oxide
- Isocyanates
- Vinyl chloride (i.e. monomer form)

3.0 METHODOLGY

3.1 Asbestos

The assessment involved a review of building finishes within the subject areas for suspect asbestos-containing materials. For ease of reference, each material was assigned a unique “Building Component & Material” (BCM) number. A summary of all building components and materials that were assessed are provided in **Appendix B**. The summary includes the following information:

- BCM Reference #
- identification of each building component or material under review
- a description of the material
- whether the material is friable or not (based on the definition provided in the asbestos regulation)
- sample reference numbers and analytical results
- comments
- photographs depicting the material or building component

Where asbestos was confirmed or presumed to be present, the following additional details were provided for each building component or material:

- location/area description (i.e. common names for each room space)
- condition
- damaged quantity (as a percentage of the total quantity)
- accessibility (i.e. criterion for how easily the asbestos-containing material can be accessed by building occupants, maintenance workers etc.)
- visibility (i.e. whether the building materials are hidden from view versus those that are visible without opening hatches or removing ceiling tiles)
- comments
- recommendations for the management of the particular building component or material

Samples of building materials suspected to contain asbestos were collected based on the requirements of O.Reg. 278/05 (Table 1, Bulk Material Samples). The regulation specifies the minimum number of samples of a particular building material that should be collected and tested to consider a material non-asbestos-containing.

Samples were submitted to EMC Scientific Inc. (EMC) for PLM analysis. EMC is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the analysis of bulk asbestos samples. A “positive stop” option was used during the laboratory analysis of the bulk samples. The “positive stop”

option involves consecutively testing a series of samples of a particular building material until test results indicate the presence of asbestos. When this occurs, the remaining samples are not tested. If none of the samples in a sample set test positive for asbestos, the building material under consideration is identified as non-asbestos.

A summary of asbestos-containing materials is provided in **Appendix C**.

A copy of the laboratory Certificate of Analysis for asbestos testing is provided in **Appendix D**.

3.2 Lead

Samples of paint applications and surface coatings were not collected as to the agreed upon scope of work for this project. All paint applications and surface coatings are presumed to be lead-containing.

3.3 Mercury

Equipment, including thermostat switches, light tubes, pressure gauges, etc. that are suspected to contain liquid mercury or mercury vapour were visually assessed. Equipment was not disassembled to determine the presence of mercury. Laboratory testing for mercury was not undertaken.

3.4 Silica

Building components (i.e. cement, concrete, ceramics, masonry, mortar, etc.) that may contain crystalline silica were visually assessed and reported on but not quantified. Laboratory testing for crystalline content was not undertaken.

3.5 Extent of the Assessment

The assessment was limited to accessible building finishes within the following areas (subject areas):

- First floor: rooms 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1038, 1041 and 1042
- Second floor: rooms 2007, 2008, 2016, 2019, 2021, 2024, 2041, 2044, 2045, 2047, 2048, 2050, 2052, 2053, 2055 and 2056

4.0 SITE INFORMATION

4.1 Relevant Historic Reports

The following reports were provided to ONWARD as part of this assessment:

- “Designated Substances and Hazardous Building Materials Assessment, Building No. 17, 200 University Avenue West, Waterloo, Ontario”, by Safetech Environmental Ltd., dated June 21st, 2016, File # 2-111015-001
- University of Waterloo asbestos database Excel spreadsheet, Filename: 17-MC-Asbestos Management Database April 2024.xls
- PDF document: 52912 Design Drawings for approval

- "Designated Substances and Hazardous Building Materials Assessment – Letter of Findings, Mathematics and Computers (MC), Building 17, Data Centre WR52639", by Access Environmental Solutions, dated April 29, 2024, File # 10107.105
- "Designated Substances & Hazardous Building Materials Assessment, Final Report, Mathematics and Computers (MC), Building No. 17, Room 3009, Corridors 3085 & 3090 - WR44905, 200 University Avenue, Waterloo, Ontario", by OnPoint Environmental Solutions Inc., dated December 6, 2019, File # 100117.132

The reports provided ONWARD with an understanding of proposed scope of work for planned renovations, limits of work areas and previously identified asbestos-containing materials.

5.0 FINDINGS

5.1 Asbestos

5.1.1 Asbestos-Containing Materials (Confirmed)

Asbestos was confirmed to be present in the following building materials:

- lay-in ceiling tiles, 24"x48", lengthwise fissure and pinhole pattern
- vinyl floor tile and mastic (or glue), 12"x12", brown with white streaks
- parging cement insulation present on pipe fittings (i.e., elbows, etc.)

5.1.2 Non-Asbestos Containing Materials

Asbestos was not identified to be present in the following materials tested/examined:

- plaster
- drywall joint-fill compound
- textured plaster present in corridors
- pipe insulation (fiberglass with canvas or paper jacket)
- duct insulations (bare or fibreglass)
- lay-in ceiling tiles, 24"x48", widthwise fissure and random pinhole pattern, present in Rooms #1041 and 1042
- mastic used to adhere vinyl baseboard to substrate
- mastic used to adhere carpet to floor substrate in offices 2016 and 2019
- levelling compound
- fires stop
- primer present on block walls

5.2 Lead

Lead is presumed to be present in the following materials:

- all paints and coatings
- cable and wire sheathing
- cast iron pipe gaskets and connections
- pipes
- solder used on domestic waterlines, bell fittings for cast iron pipes

5.3 Mercury

Mercury is suspected to be present in the following materials:

- paints and adhesives (in stable form)

5.4 Silica

Silica may be present in the following materials common to buildings:

- concrete and cement
- masonry and mortar
- block walls
- ceiling tiles
- drywall
- plaster
- paints

6.0 RECOMMENDATIONS

6.1 General

- A copy of this designated substances assessment report should be kept on the premises during the renovation process.
- Building materials confirmed to contain asbestos must be removed prior to disturbance in accordance with procedures prescribed in O.Reg. 278/05. Alternatively, safe work procedures satisfying the requirements of O.Reg. 278/05 should be implemented if the asbestos-containing materials are not removed but may potentially be disturbed by any renovation, alteration, or maintenance work. Refer to **Appendix B** and **Appendix C** for recommendations.
- The asbestos record should be updated upon completion of any remedial or abatement operations.

6.2 Asbestos

- Lay-in ceilings tiles - Remove following O.Reg. 278/05 Type 2 operations (using negative air pressure vented directly outdoors).

- Vinyl floor tiles and mastic - remove floor tiles following O.Reg. 278/05 Type 1 operations (using hand-held non-powered tools, wetting the material). Remove mastic following O.Reg. 278/05 Type 2 operations using HEPA filtered grinding equipment. Negative air pressure (vented directly outdoors) is to be employed for Type 2 operations. Otherwise Type 3 operations apply.
- Pipe insulation (parging cement fittings) - Remove following O.Reg. 278/05 Glove Bag operations.
- If suspect asbestos-containing materials are uncovered during renovation work, work that may disturb the material should stop immediately. Samples of the materials should be collected and tested for asbestos content. Materials confirmed to contain asbestos should be removed prior to further disturbance in accordance with O.Reg. 278/05 work procedures. Alternatively, the suspect materials can be presumed to be asbestos-containing and removed following O.Reg. 278/05 work procedures.

6.3 Lead

- The safe work practices provided in the following documents should be followed for the disturbance of lead-containing materials:
  - "Lead on Construction Projects", Ministry of Labour, April 2011
  - "Lead Guideline for Construction, Renovation, Maintenance or Repair", Environmental Abatement Council of Canada (EACC), October 2014

  The guidelines referenced above provide specific recommendations for controlling lead hazards on construction projects including i) engineering controls; ii) work practices; iii) hygiene practices; iv) protective clothing and equipment; v) work classifications; vi) training; and, vii) medical surveillance.
- Lead exposure monitoring should be considered to determine the adequate level of protection that may be required, if any, for project-specific tasks that disturb lead-containing materials. In the absence of such monitoring, the use of personal protective equipment including respirators and implementation of other safe work practices are recommended to reduce the potential for over-exposure to lead dust.
- Building materials containing lead should be tested for leachable lead prior to disposal as they may be subject to classification as hazardous waste.

6.4 Mercury

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

6.5 Silica

- The safe work practices provided in the following document should be followed for the disturbance of silica-containing materials:
  - "Silica on Construction Projects", Ministry of Labour, April 2011

  The guideline provides specific recommendations for controlling silica hazards on construction projects including i) engineering controls; ii) work practices; iii) hygiene practices; iv) protective clothing and equipment; v) work classifications; vi) training; and, vii) medical surveillance.
- Silica exposure monitoring should be considered to determine the adequate level of protection that may be required, if any, for project-specific tasks that disturb silica-containing materials. In the absence of such monitoring, the use of personal protective equipment including respirators and implementation of other safe work practices, housekeeping and hygiene measures are recommended to reduce the potential for over-exposure to silica dust during drilling, cutting, grinding, sawing, sanding, scarifying, sweeping or other demolition activities that disturb silica-containing materials.

7.0 LIMITATIONS

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

The findings of the assessment represent the best technical judgment of ONWARD based on the information made available by the Client and on the site conditions encountered by ONWARD at the date and time the work was performed. The findings are limited to the areas assessed based on the mutually agreed to scope of work. The extent of the area that was assessed may be limited by various factors including building construction and conditions, subsurface conditions, concealed or obscured areas, weather, building usage, occupancy and other factors. Due to the nature of the investigation and the limited data available, ONWARD cannot warrant against undiscovered environmental liabilities. Conclusions presented in the report or other information provided should not be construed as legal advice.

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

8.0 CLOSURE

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

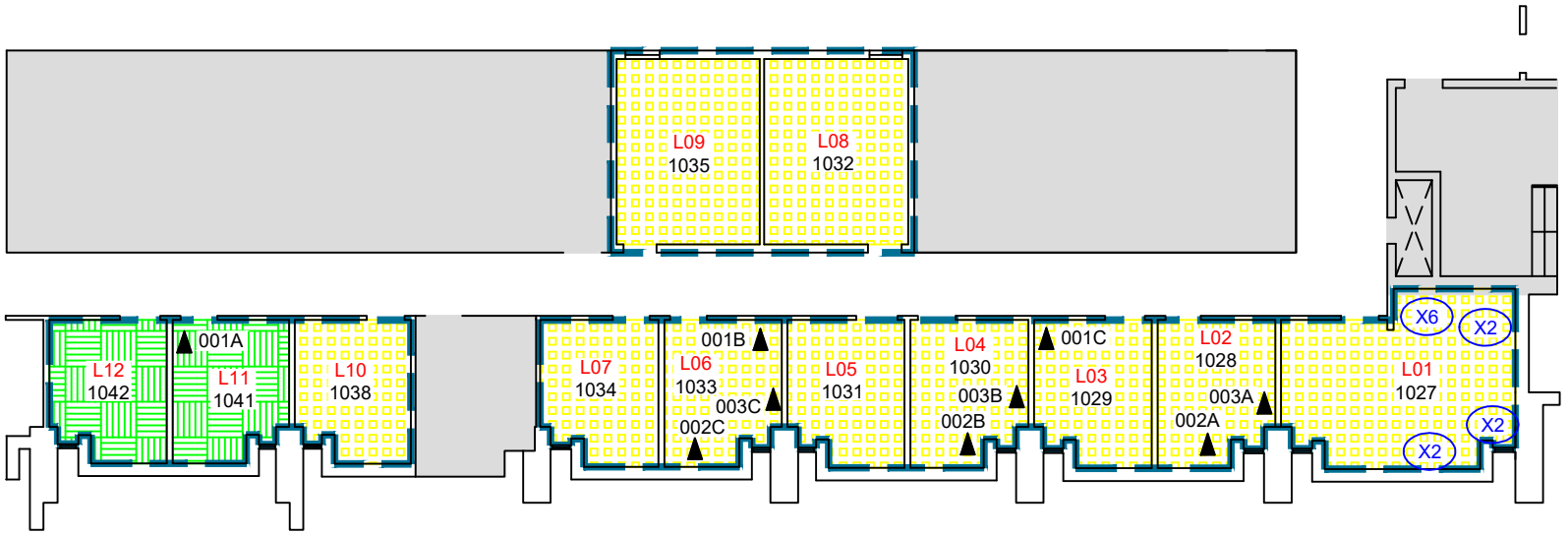
ONWARD ENVIRONMENTAL INC.

Sean Hauck, B.A., C.E.T.
Principal Consultant, Author
(519) 572-7990
shauck@onwardenvironmental.com

encl. **Appendix A** – Floor Plans
Appendix B – Building Components and Materials Assessed
Appendix C – Summary of Asbestos-Containing Materials
Appendix D – Laboratory Analytical Report - Asbestos

APPENDIX A

Floor Plans



FIRST FLOOR

LEGEND

- L# — LOCATION IDs
- BULK SAMPLING LOCATION
- SUBJECT AREA
- NOT EXAMINED

ASBESTOS-CONTAINING MATERIALS

- VINYL FLOOR TILES AND MASTIC (GLUE) AND LAY-IN CEILING TILES
- VINYL FLOOR TILES AND MASTIC (GLUE)
- X# — PARGING CEMENT FITTINGS ON PIPE SYSTEMS (ABOVE CEILING GRID)

NOTES:
1. DRAWING CONTAINS COLOURED ELEMENTS THAT MAY NOT BE VISIBLE ON BLACK AND WHITE COPIES.
2. NOT ALL ASBESTOS-CONTAINING MATERIALS (ACM) MAY BE DEPICTED ON THE DRAWINGS. REFER TO THE REPORT FOR MORE INFORMATION.
3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO AN ONWARD ENVIRONMENTAL INC. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

DESIGNATED SUBSTANCES ASSESSMENT

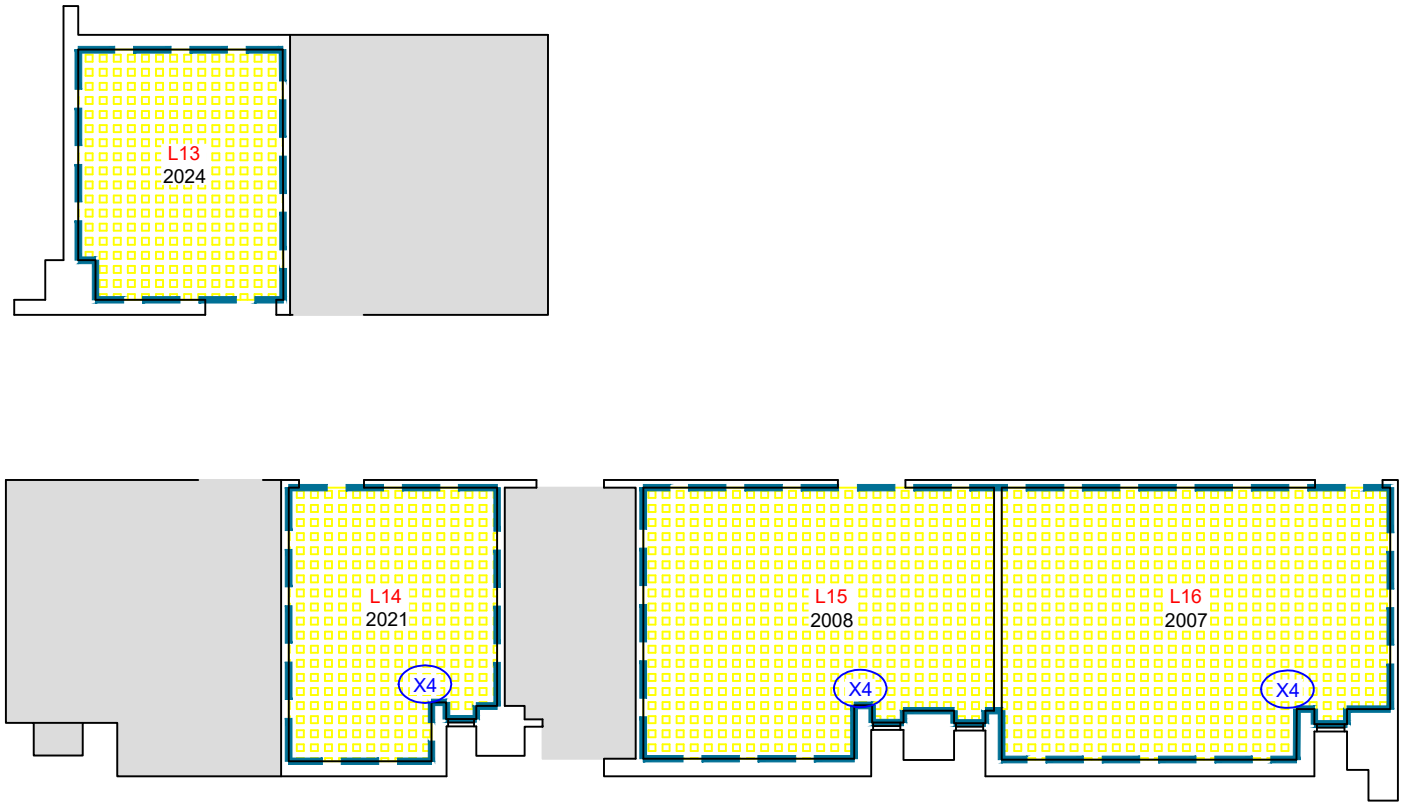
MATHEMATICS AND COMPUTERS (MC), BUILDING 17

Client: UNIVERSITY OF WATERLOO, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO N2L 3G1

Project No.:	100117.334
Scale:	N.T.S.
Date:	24/10/10
Dwn. By:	CD ON2024100049 DM/CS
App'd By:	SH

Dwg. No.: 1

ONWARD ENVIRONMENTAL



SECOND FLOOR

LEGEND

- L# — LOCATION IDs
- SUBJECT AREA
- NOT EXAMINED

ASBESTOS-CONTAINING MATERIALS

- VINYL FLOOR TILES AND MASTIC (GLUE) AND LAY-IN CEILING TILES
- X# — PARGING CEMENT FITTINGS ON PIPE SYSTEMS (ABOVE CEILING GRID)

NOTES:
1. DRAWING CONTAINS COLOURED ELEMENTS THAT MAY NOT BE VISIBLE ON BLACK AND WHITE COPIES.
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DESIGNATED SUBSTANCES ASSESSMENT

MATHEMATICS AND COMPUTERS (MC), BUILDING 17

Client: UNIVERSITY OF WATERLOO, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO N2L 3G1

Project No.:	100117.334
Scale:	N.T.S.
Date:	24/10/10
Dwn. By:	CD ON2024100050 DM/CS
App'd By:	SH

Dwg. No.: 2

ONWARD ENVIRONMENTAL

SECOND FLOOR

LEGEND

- L# — LOCATION IDs
- BULK SAMPLING LOCATION
- SUBJECT AREA

ASBESTOS-CONTAINING MATERIALS

- VINYL FLOOR TILES AND MASTIC (GLUE) AND LAY-IN CEILING TILES
- VINYL FLOOR TILES AND MASTIC (GLUE)
- X# — PARGING CEMENT FITTINGS ON PIPE SYSTEMS (ABOVE CEILING GRID)

NOTES:
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DESIGNATED SUBSTANCES ASSESSMENT

MATHEMATICS AND COMPUTERS (MC), BUILDING 17

Client: UNIVERSITY OF WATERLOO, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO N2L 3G1

Project No.:	100117.334
Scale:	N.T.S.
Date:	24/10/10
Dwn. By:	CD CS ON2024100051
App'd By:	SH

Dwg. No.: 3

ONWARD ENVIRONMENTAL

APPENDIX B

Building Components and Materials Assessed

Building Component and Materials (BCM) Inventory

BCM # 1 CEILING OR LAY-IN TILES

Description: *24”x48”, long length wavy fissure and pinhole pattern.*

Colour: *White*
Friable: No

Samples: *M&C-S04 & S17 (UofW dB)*
Lab Result: *0.75% Chrysotile*
Comment: *Ceiling tiles contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
--	Where Present	nq	good	0	C	Yes	Refer to Drawings 1, 2 and 3 for approximate locations of ceiling tiles observed.	Remove following O.Reg. 278/05 Type 2 operations (using negative air pressure vented directly outdoors).

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 2 VINYL FLOOR TILE & MASTIC

Description: *Present at various locations.*

Colour: *Brown with white streaks*
Friable: No

Samples: *M&C-S03 & S16 (tile, UofW dB), 001a.c) (mastic)*
Lab Result: *2.4% Chrysotile (tile), 0.5% Chrysotile (mastic)*
Comment: *Floor tiles and mastic (or glue) contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
--	Where Present	nq	good	0	A	Yes	Refer to Drawings 1, 2 and 3 for approximate locations of floor tiles observed. Negative air pressure (vented directly outdoors) is to be employed for Type 2 operations.	Remove floor tiles following O.Reg. 278/05 Type 1 operations (using hand-held non-powered tools, wetting the material). Remove mastic following O.Reg. 278/05 Type 2 operations using HEPA filtered grinding equipment. Otherwise Type 3 operations apply.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

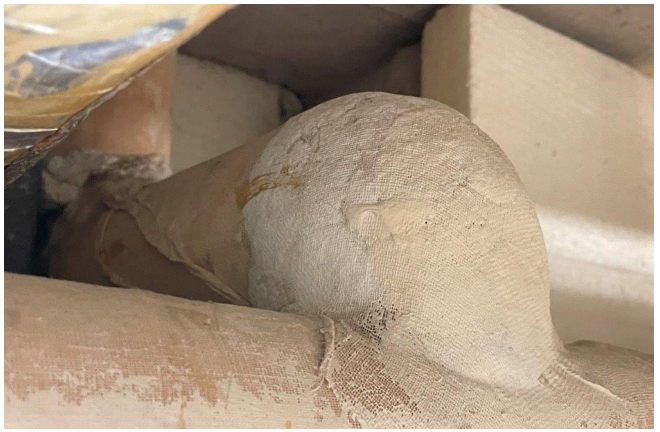
Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 3 PIPE INSULATION (PARGING CEMENT)

Description: *Present on pipe fittings (i.e., elbows, hangers, etc.).*

Colour: *White grey*
Friable: Yes

Samples: *M&C-S05 (UofW dB)*
Lab Result: *70% Chrysotile*
Comment: *Parging cement contains asbestos.*



Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
--	Where Present	~75 fittings	good	0	C	Yes	Refer to Drawings 1, 2 and 3 for approximate locations of pipe fittings observed. Concealed pipe fittings are likely present within wall cavities elsewhere.	Remove following O.Reg. 278/05 Glove Bag operations.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

Building Component and Materials (BCM) Inventory

BCM # 4 MASTIC

Description: *Used to adhere vinyl baseboard to wall substrate.*

Colour: *Brown*
Friable: na

Samples: *002a to c & 004a to c*
Lab Result: *None detected*
Comment: *Mastic (or glue) tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)

A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)

Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:

nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

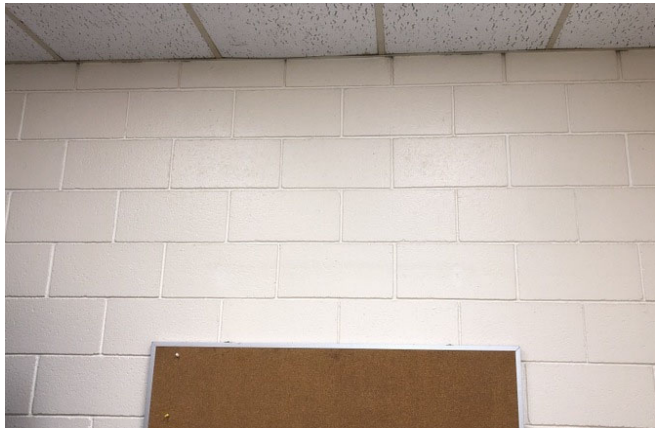
Building Component and Materials (BCM) Inventory

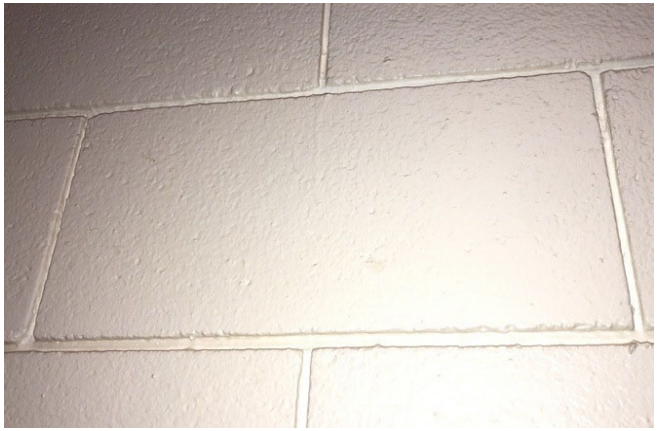
BCM # 5 PRIMER

Description: *Present on concrete block walls.*

Colour: *White*
Friable: na

Samples: *003a to c*
Lab Result: *None detected*
Comment: *Drywall joint-fill compound tested does not contain asbestos.*





Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)

A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)

Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

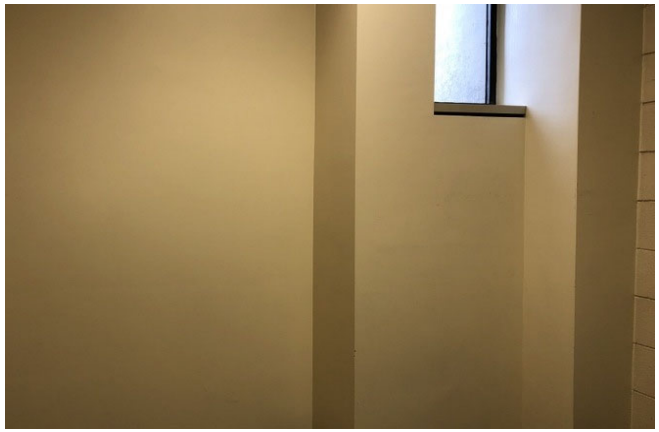
Notes:

nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

Building Component and Materials (BCM) Inventory

BCM # 6 PLASTER

Description: *Present as a wall finish.*



Colour: *Grey white*
Friable: na

Samples: *M&C-S0004A to G (UofW dB) and 002a to g (Access Rpt. 10107.105)*
Lab Result: *None detected*
Comment: *Plaster previously tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

Building Component and Materials (BCM) Inventory

BCM # 7 MASTIC

Description: *Present on ductwork insulation.*

Colour: *Yellow*
Friable: na

Samples: *003 a to c (OnPoint Rpt 100117.132)*
Lab Result: *None detected*
Comment: *Mastic previously tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
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PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
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BCM # 8 CEILING OR LAY-IN TILES

Description: *24”x48”, widthwise fissure and random pinhole pattern, present in Rooms #1041 and 1042.*

Colour: *White*
Friable: na

Samples: *M&C-S10 (UofW dB)*
Lab Result: *None detected*
Comment: *Ceiling tiles previously tested do not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
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NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 9 DUCT INSULATION

Description: *Ducting is either uninsulated or insulated with fibreglass.*

Colour: *Yellow*
Friable: na

Samples: *ns*
Lab Result: *na*
Comment: *Fibreglass insulation is not suspect to contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
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F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 10 PIPE INSULATION (FIBREGLASS)

Description: *Present on straight sections of piping with canvas jacket.*

Colour: *Yellow*
Friable: na

Samples: *ns*
Lab Result: *na*
Comment: *Fibreglass insulation is not suspect to contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
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NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 11 DRYWALL JOINT-FILL COMPOUND

Description: *Present as a wall finish at various locations.*

Colour: *White*
Friable: na

Samples: *M&C-S0005A to G (UofW dB)*
Lab Result: *None detected*
Comment: *Drywall joint-fill compound previously tested do not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
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PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

Building Component and Materials (BCM) Inventory

BCM # 12 MASTIC

Description: *Used to adhere carpet to floor substrate in offices 2016 and 2019.*

Colour: *Yellow*
Friable: na

Samples: *005a to c*
Lab Result: *None detected*
Comment: *Mastic (or glue) tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)

A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)

Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:

nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 13 LEVELLING COMPOUND

Description: *Concealed beneath flooring.*

Colour: *Grey white*
Friable: na

Samples: *001a.b), 001b.b) & 001c.b) and 004a.b), 004b.b) & 004c.b)*
Lab Result: *None detected*
Comment: *Levelling compound tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
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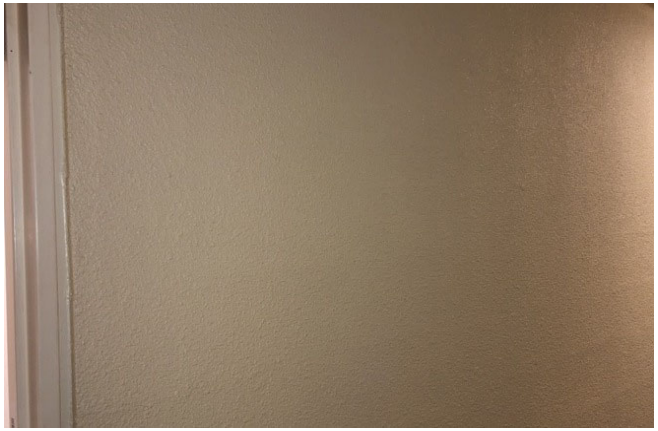
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

BCM # 14 TEXTURED PLASTER

Description: *Present as a wall finish in corridors.*



Colour: *Off-white (texture), grey (base)*
Friable: na

Samples: *001a to g (Access Rpt. 10107.105)*
Lab Result: *None detected*
Comment: *Textured plaster previously tested does not contain asbestos.*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)

A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)

Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:

nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

Building Component and Materials (BCM) Inventory

BCM # 15 FIRE STOP

Description: *Present at penetrations in concrete block masonry walls within the subject area.*

Colour: *Grey*
Friable: na

Samples: *004a to c (OnPoint Rpt 100117.160*
Lab Result: *None detected*
Comment: *Parging cement previously tested does not contain asbestos*

Summary of ACMs and PACMs

Location #	Area Description	Quantity	Condition	Damaged Qty.	Acc.	Vis.	Comments	Recommendation
								No action required.

Accessibility (Acc.)
A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility (Vis.)
Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:
nq - not quantified
na - not applicable
ns - not sampled
sf - square feet
lf - linear feet
F - friable
NF - non friable
PFM - potentially friable material
BCM - buildng component and material
ACM - asbestos-containing material
PACM - presumed asbestos-containing material

APPENDIX C

Summary of Asbestos-Containing Materials

Summary of Asbestos-Containing and Presumed Asbestos-Containing Materials

Loc. #	Loc. Description	BCM #	ACM Type	ACM Description	ACM Colour	Total Quantity	Cond.	Damaged Quantity	Acc.	Vis.	Fri?	Comments	Recommendation
--	Where Present	1	Ceiling or Lay-in Tiles	24”x48”, long length wavy fissure and pinhole pattern.	White	nq	good	0	C	Yes	No	Ceiling tiles contain asbestos.	Remove following O.Reg. 278/05 Type 2 operations (using negative air pressure vented directly outdoors).
--	Where Present	3	Pipe Insulation (Parging Cement)	Present on pipe fittings (i.e., elbows, hangers, etc.).	White grey	~75 fittings	good	0	C	Yes	Yes	Parging cement contains asbestos.	Remove following O.Reg. 278/05 Glove Bag operations.
--	Where Present	2	Vinyl Floor Tile & Mastic	Present at various locations.	Brown with white streaks	nq	good	0	A	Yes	No	Floor tiles and mastic (or glue) contain asbestos.	Remove floor tiles following O.Reg. 278/05 Type 1 operations (using hand-held non-powered tools, wetting the material). Remove mastic following O.Reg. 278/05 Type 2 operations using HEPA filtered grinding equipment. Otherwise Type 3 operations apply.

Accessibility

A - Areas of the building within reach (from floor level) of all building users
B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
D - Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall, or equipment, etc., is required to reach the asbestos

Visibility

Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

Notes:

nq - not quantified
na - not applicable
ns - not sampled
F - friable
NF - non friable
PFM - potentially friable material
ACM - asbestos-containing material
BCM - building component and material
Acc. - accessibility
Vis. - visibility

APPENDIX D

Laboratory Analytical Report - Asbestos

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Laboratory Analysis Report

To:

Sean Hauck
ONWARD Environmental Inc.
30 Forest Edge Trail
Kitchener, ON
N2P 2L9

EMC LAB REPORT NUMBER: A108447
Job/Project Name: UofW, Math & Computers
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Aug 22/24 **Date Analyzed:** Aug 22/24
Analyst: Ameerah Ngai
Reviewed By: Malgorzata Sybydlo

Job No: 100117.334
Number of Samples: 9
Date Reported: Aug 22/24

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
001a	A108447-1	Mastic and levelling compound	3 Phases: a) Brown, mastic b) Grey, cementitious material c) Black, mastic	 **ND** **ND** **Chrysotile**	 **0.5**		 100 100 99.5
001b	A108447-2	Mastic and levelling compound	3 Phases: a) Brown, mastic b) Grey, cementitious material c) NA	 **ND** **ND** **NA**			 100 100
001c	A108447-3	Mastic and levelling compound	3 Phases: a) Brown, mastic b) Grey, cementitious material c) NA	 **ND** **ND** **NA**			 100 100
002a	A108447-4	Brown mastic used to adhere vinyl baseboard to substrate	Brown, mastic	**ND**			100
002b	A108447-5	Brown mastic used to adhere vinyl baseboard to substrate	Brown, mastic	**ND**			100
002c	A108447-6	Brown mastic used to adhere vinyl baseboard to substrate	Brown, mastic	**ND**			100
003a	A108447-7	Primer on concrete block walls	White, joint compound	**ND**			100
003b	A108447-8	Primer on concrete block walls	White, joint compound	**ND**			100
003c	A108447-9	Primer on concrete block walls	White, joint compound	**ND**			100

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).

EMC LAB REPORT NUMBER: A108447
Client's Job/Project Name/No.: 100117.334
Analyst: Ameerah Ngai

3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.

emcscientific
INCORPORATED

Laboratory Analysis Report

To:

Sean Hauck
ONWARD Environmental Inc.
30 Forest Edge Trail
Kitchener, ON
N2P 2L9

EMC LAB REPORT NUMBER: A109958
Job/Project Name: MC Phase 2 Office Upgrade
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Sep 30/24 **Date Analyzed:** Oct 7/24
Analyst: Jayoda Perera
Reviewed By: Malgorzata Sybydlo

Job No: 100117.334
Number of Samples: 6
Date Reported: Oct 7/24

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
004a	A109958-1	Mastic – vinyl baseboard / Office #2016	2 Phases: a) Brown, mastic b) White, cementitious material	 **ND** **ND**			 100 100
004b	A109958-2	Mastic – vinyl baseboard / Office #2019	2 Phases: a) Brown, mastic b) White, cementitious material	 **ND** **ND**			 100 100
004c	A109958-3	Mastic – vinyl baseboard / Office #2047	2 Phases: a) Brown, mastic b) White, cementitious material	 **ND** **ND**			 100 100
005a	A109958-4	Mastic – carpet / Office #2016	Yellow, mastic	**ND**			100
005b	A109958-5	Mastic – carpet / Office #2019	Yellow, mastic	**ND**			100
005c	A109958-6	Mastic – carpet / Office #2019	Yellow, mastic	**ND**			100

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
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