

DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT

Renovation Project
Humber College (North Campus)
Building E & H
205 Humber College Boulevard
Toronto, Ontario
M9W 5L7

Prepared for:
Robert Parkin

Humber College
205 Humber College Boulevard
Toronto, Ontario
M9W 5L7

Prepared by:
Safetech Environmental Limited



Joshua Cinello, B.A.Sc. (OHS)
Occupational Health and Safety Technician

Reviewed by:



James Macklin
Project Coordinator

Safetech Project Number: 3191221

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EXECUTIVE SUMMARY

Safetech Environmental Limited (Safetech) was commissioned by Humber College to conduct a designated substances and hazardous materials assessment in Humber College (North Campus) of 205 Humber College Boulevard, Toronto, Ontario.

The objective of the assessment was to determine the presence, location, condition and quantities of designated substances and other hazardous materials that have the potential to be disturbed as part of planned construction activities (i.e. Renovation Project) so that appropriate control measures can be implemented to protect workers during the work.

A summary of the assessment results and general recommendations based on our findings are provided in the following table. This table should be considered a summary only. Please refer to the Results (Section 0) and Conclusions and Recommendations (Section 2.0), Summary of ACM Occurrences (Appendix A) and Site Drawings (Appendix B) of our report for additional details.

Table 1: Summary of Hazardous Materials and Designated Substances

Designated Substance	Findings	Recommendations
Asbestos	<p>The following asbestos-containing materials were identified in the subject area that may be impacted during the project:</p> <ul style="list-style-type: none"> - pipe fitting insulation - drywall joint compound - sprayed fireproofing - contaminated HVAC components - transite (cement) drain pipe - window pane caulking 	<p>Disturbance of asbestos-containing materials must be conducted in accordance with Ontario Regulation 278/05 <i>Designated Substance – Asbestos on Construction Projects and in Building and Repair Operations</i>. Refer to Table 6 (Results of Assessment for Asbestos-Containing Materials), Section 2.1.1 (Conclusions and Recommendations), Appendix A (Summary of ACM Occurrences) and Appendix B (Site Drawings). Asbestos-containing waste must be disposed of in accordance with R.R.O. 1990, Regulation 347, <i>General - Waste Management</i>.</p>
Lead	<p>Beige paint was confirmed to be a low-level lead-containing paint ($\leq 0.1\%$ lead content).</p>	<p>Disturbance of lead-containing materials must be conducted in accordance with the Ontario Ministry</p>

	<p>The following materials are assumed to be lead-containing:</p> <ul style="list-style-type: none"> - paints and surface coatings (not sampled) - glazing associated with ceramic tiles - batteries associated with emergency lighting - solder in copper pipe fittings - solder in electrical components 	<p>of Labour <i>Lead on Construction Projects</i> guideline (2011) and/or the Environmental Abatement Council of Ontario (EACO) <i>Lead Guideline</i> (October 2014). For additional details, refer to Section 1.4.2 (Results) and Section 2.1.2 (Conclusions and Recommendations). Lead-containing wastes should be recycled if practicable or handled and disposed of according to R.R.O. 1990, Regulation 347, <i>General- Waste Management</i>.</p>
Mercury	<p>Sources of mercury were observed in the subject area and include the following:</p> <ul style="list-style-type: none"> - vapour in fluorescent lamps 	<p>If required, handle lamps and vials with care and keep intact. All waste lamps and vials are recommended to be sent to a lamp recycling facility.</p>
Silica	<p>Building materials identified that are suspected to contain crystalline silica and may be disturbed as part of the planned construction project include:</p> <ul style="list-style-type: none"> - drywall walls/drywall joint compound - concrete - mortar - acoustical ceiling tiles - sprayed fireproofing 	<p>Any work involving the disturbance of silica-containing materials should follow the procedures outlined in the Ontario Ministry of Labour “<i>Silica on Construction Projects</i>” guideline. For additional information, refer to Section 1.4.4 (Results) and Section 2.1.4 (Conclusions and Recommendations).</p>
Other Designated Substances	<p>No other designated substances are expected to be present in any significant quantities or in a form that would represent an exposure concern.</p>	<p>No protective measures or procedures specific to acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride are considered necessary.</p>
Other Hazardous Materials	Findings	Recommendations
Urea Formaldehyde Foam Insulation	No UFFI was identified or is suspected in the subject area.	No action required.
Mould Contamination	No suspect mould contamination was observed on building finishes in the subject area.	No action required.
Pest Infestation	No pest infestations were observed in the areas assessed.	No action required.
Polychlorinated Biphenyls	No suspect PCB containing was observed in the areas assessed.	No action required.
Ozone Depleting and Global Warming Substances	No equipment was observed that is suspected to contain ozone depleting and/or global warming substances	No action required.

This assessment satisfies the Owner's requirements under Section 30 of the Ontario Occupational Health and Safety Act (OHSA), Revised Statutes of Ontario 1990, as amended.

Should you have any questions regarding the information contained in the report, please contact our office.

Safetech Environmental Limited

A handwritten signature in black ink, appearing to read "J. Cinello", enclosed in a thin black rectangular border.

**Joshua Cinello, B.A.Sc. (OHS)
Occupational Health and Safety Technician**

January 10, 2020

Humber College
205 Humber College Boulevard
Toronto, Ontario
M9W 5L7

Attention: Robert Parkin

**RE: Designated Substances and Hazardous Materials Assessment
Renovation Project
Building E & H – Humber College (North Campus)
205 Humber College Boulevard, Toronto, Ontario**

1.0 INTRODUCTION

1.1 Background and Objectives

Safetech Environmental Limited (Safetech) was commissioned by Humber College to conduct a designated substances and hazardous materials assessment within the Humber College (North Campus) at 205 Humber College Boulevard, Toronto, Ontario (subject building). The objective of the assessment was to determine the presence, location, condition and quantities of designated substances and other hazardous materials in the subject building that have the potential to be disturbed as part of planned construction activities (i.e. Renovation Project) so that appropriate control measures can be implemented to protect workers during the work.

This assessment satisfies the Owner's requirements under Section 30 of the Ontario Occupational Health and Safety Act (OHSA), Revised Statutes of Ontario 1990, as amended. Section 30(1) requires a building owner to determine if there are any designated substances present at a project site prior to construction or demolition activities. Sections 30(2), (3) and (4) require the Owner and constructors for a project to provide the findings in this report as part of the tendering information for any tendered project or to prospective contractors (and subcontractors) of a project before entering into a binding contract.

This report documents findings of our on-site inspection that was conducted on December 18, 2019 and provides conclusions and recommendations based on our findings and knowledge of the planned construction project.

1.2 Scope of Work

In accordance with our fee proposal document, our scope of work included the following activities:

- A review of existing documents, including renovation documents and drawings, floor plans and existing environmental assessment reports, etc., where available;
- A visual assessment of accessible area(s) in the subject building to identify the presence, location, condition and quantities of designated substances and other hazardous materials;
- Collection, analysis and interpretation of representative bulk samples of suspect asbestos-containing building materials for the determination of asbestos content and material classification;
- Collection, analysis and interpretation of representative paint chip samples for the determination of lead content; and
- Preparation of a report to document findings and provide recommendations regarding control measures and/or special handling procedures for designated substances or specific hazardous materials that may be disturbed as part of planned construction activities.

Documents reviewed to aid in the assessment included the following:

- Humber College's Asbestos Management Program;
- Humber College's Room by Room Database;
- Print Shop Expansion Project DSS (SEL Project No. 117617)
- Java Jazz Renovation Project DSS (SEL Project No. 187218)
- Building E Loading Dock DSS (SEL Project No. 186818)

This assessment only identified designated substances and hazardous materials that were deemed to be part of the building or somehow otherwise incorporated into the building structure and its finishes. **The following items were not included in our scope of work:**

- Assessing occupant items such as stored products, furnishings, items and materials used or produced as part of a manufacturing process;
- Investigating underground materials or equipment (vessels, drums, underground storage tanks, duct-banks, pipes, or cables);
- Assessing enclosed wall or ceiling cavities; and
- Assessing risers, pipe chases or elevator shafts.

1.3 Description of Area(s) Assessed

The area(s) investigated included all accessible locations of the subject building. The extent of the area investigated is indicated on the floor plan(s) provided in Appendix B. Results

Results of our visual assessment and bulk sample analytical findings are summarized in the sections below.

1.4 Designated Substances

1.4.1 Asbestos

Results of bulk sample analysis for the determination of asbestos content are summarized in the following table. Materials have been classified as “ACM”, “Non-ACM”, “Suspected ACM” or “Presumed Non-ACM” based on analytical results. Materials classified as Suspected ACM or Presumed Non-ACM may require further analysis (depending on site-specific conditions) to verify whether the material should be classified as ACM or Non-ACM. Please refer to the Limitations section of this report (Section 3.0) for additional details. The Laboratory Certificate of Analysis is included in Appendix C.

Table 2: Bulk Sample Analytical Results for Determination of Asbestos Content (SEL Project No. 3191221 – December 2019)

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
1a	Textured Coat	Corridor HC-1	None Detected	Non-ACM
1b				
1c				
2a	Sprayed Fireproofing	Corridor HC-1	20% Chrysotile	ACM
2b			Not Analyzed	
2c				
3a	Sprayed Fireproofing	E105	None Detected	Non-ACM
3b				
3c				
4a	2x4 Lay in Ceiling Tile (textured pinhole)	Corridor HC-1	None Detected	Non-ACM
4b				
4c				
5a	2x4 Lay in Ceiling Tile (fissure pinhole)	E111	None Detected	Non-ACM
5b				
5c				
6a	Ceramic Floor Tile Grout	Corridor HC-1	None Detected	Non-ACM
6b				
6c				
7a	Ceramic Floor Tile Grout	Corridor EC-1	None Detected	Non-ACM
7b				
7c				
8a	Vinyl Sheet Flooring	Corridor Adjacent Building J	None Detected	Non-ACM
8b				
8c				

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
9a	12x12 White Vinyl Floor Tile w/black Streaks	Corridor EC-1	None Detected	Non-ACM
9a	Mastic			
9b	12x12 White Vinyl Floor Tile w/black Streaks			
9b	Mastic			
9c	12x12 White Vinyl Floor Tile w/black Streaks			
9c	Mastic			
10a	12x12 Pink Vinyl Floor Tiles	Room E105	None Detected	Non-ACM
10b				
10c				

Table 3: Bulk Sample Analytical Results for Determination of Asbestos Content (SEL Project No. 117617 – March 2017)

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
1a	Sprayed Fireproofing	Bookstore (H103), Upper (West Side)	None Detected	Non-ACM
1b				
1c				
2a	Sprayed Fireproofing	Print Shop (H106)	15% Chrysotile	ACM
2b			Not Analyzed	
2c				
3a	Drywall Joint Compound	Warehouse	None Detected	ACM
3b				
3c		Bookstore (H103)	2% Chrysotile	
3d				
3e		Print Shop (H106)	Not Analyzed	
3f				
3g				
4a	2x4 Lay in Ceiling Tile (Fissure/Pinhole)	Bookstore (H103)	None Detected	Non-ACM
4b		Warehouse		
4c		Print Shop (H106)		
5a	2x4 Lay in Ceiling Tile (Pinhole)	Bookstore (H103)	None Detected	Non-ACM
5b				
5c				

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
6a	Vinyl Floor Tiles (Beneath Carpet)	Bookstore (H103)	None Detected	Non-ACM
6b				
6c				
7a	Black Adhesive Mastic (associated w/tiles beneath carpet)	Bookstore (H103)	None Detected	Non-ACM
7b				
7c				
8a	12x12 Grey Vinyl Floor Tiles	Bookstore (H103)	None Detected	Non-ACM
8b				
8c				
9a	12x12 Beige Vinyl Floor Tiles w/Grey Streaks	Print Shop (H106)	None Detected	Non-ACM
9b				
9c				
10a	Black Window Pane Caulking	Bookstore (H103)	2% Chrysotile	ACM
10b			Not Analyzed	
10c				

Table 4: Bulk Sample Analytical Results for Determination of Asbestos Content (SEL Project No. 187218 – August 2018)

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
1a	2x2 Lay in Ceiling Tiles (Fissure/Pinhole)	H101 & H102	None Detected	Non-ACM
1b				
1c				
2a	Vinyl Sheet Flooring	H101 & H102	None Detected	Non-ACM
2b				
2c				


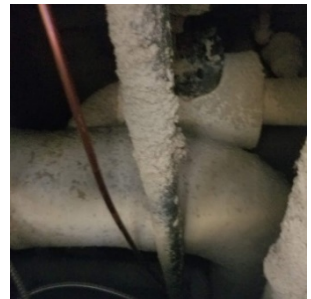
Table 5: Bulk Sample Analytical Results for Determination of Asbestos Content (SEL Project No. 186818 – August 2018)


Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
1a	Sprayed Fireproofing	Building E – Loading Dock	None Detected	Non-ACM
1b				
1c				
2a	Drywall Joint Compound	Building E – Loading Dock	None Detected	Non-ACM
2b				
2c				



Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
3a	2x4 Lay in Ceiling Tile (Fissure/Pinhole)	Building E – Loading Dock	None Detected	Non-ACM
3b				
3c				

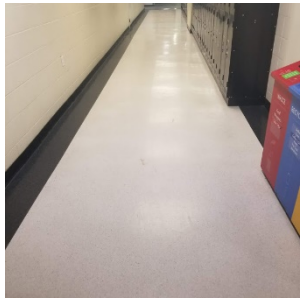
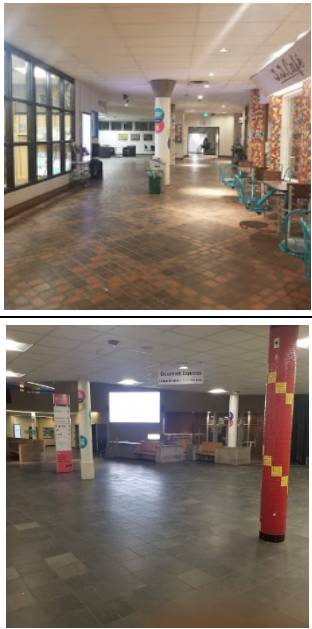
Materials assessed for asbestos content are summarized in the following table based on the type/use of the material.

Table 6: Results of Assessment for Asbestos-Containing Materials

Sprayed and Loose Fill Insulating Materials	Location/Description	
Sprayed Fireproofing	<p>Sprayed fireproofing was observed in the subject building. Bulk samples were collected during the assessment and results of analysis confirmed that this building material contains 20% chrysotile asbestos. Refer to sample set 2 in Table 2 and the location, condition, friability, and estimated quantity in Appendix A.</p> <p>Given the presence of asbestos-containing sprayed fireproofing within the areas assessed, all components of the ventilation system (e.g. ductwork) within the Print Shop and Bookstore are assumed to be contaminated with asbestos fibre as per the requirements of O.Reg. 278/05.</p>	
Sprayed Insulation	None identified in subject building.	
Loose Fill / Vermiculite Insulation	None identified in subject building. Interior portions of concrete block walls could not be assessed. However, it is not expected that these walls are insulated with loose fill or vermiculite insulation	
Thermal System Insulation	Location/Description	
Mechanical Pipe Insulation – Straights	Linear sections of mechanical piping were observed to be uninsulated or insulated with fiberglass.	
Mechanical Pipe Insulation – Fittings (elbows, valves, tees, hangars, etc.)	As per the school's ACM database, asbestos containing mechanical pipe fittings have been identified to be present in E105. This material was confirmed to be present at the time of the assessment.	

HVAC Duct Insulation	HVAC ductwork was observed to be uninsulated or insulated with fibreglass.	
Breeching / Exhaust Insulation	None identified in subject building.	
Tank Insulation	None identified in subject building.	
Boiler Insulation	None identified in subject building.	
Other Mechanical Equipment Insulation	Given the presence of asbestos-containing sprayed fireproofing within the areas assessed, all components of the ventilation system (e.g. ductwork) within the Print Shop and Bookstore are assumed to be contaminated with asbestos fibre as per the requirements of O.Reg. 278/05.	
Architectural Finishes & Finishing Materials	Location/Description	
Sprayed Texture / Stucco Finishes	Texture coat was observed within Corridor HC-1. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample set 1 in Table 2.	
Plaster Finishes	None identified in subject building.	
Drywall Joint Compound	As per the school's ACM database and SEL previous reports, drywall joint compound associated with walls, ceilings, bulkheads, and fire separation barriers have been previously confirmed to be asbestos-containing . This material was confirmed to be present at the time of the assessment.	

Ceiling Tiles	Location/Description	
<p>Lay-in Acoustic Ceiling Tiles</p>	<p>2x4 Lay-in ceiling tiles (textured pinhole & fissure/pinhole) were observed in the subject building. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample set 4 and 5 in Table 2.</p>	
<p>Glued-on Acoustic Ceiling Tiles</p>	<p>None identified in subject building.</p>	
<p>Cement Ceiling Panels</p>	<p>None identified in subject building.</p>	
Flooring	Location/Description	
<p>Vinyl Floor Tiles</p>	<p>Vinyl floor tiles were observed in project specific areas. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample sets 9 and 10 in Table 2.</p>	

<p>Vinyl Sheet Flooring</p>	<p>Vinyl sheet flooring was observed project specific areas. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample set 8 in Table 2.</p>	
<p>Mastic</p>	<p>Mastic associated with vinyl floor tiles was observed in project specific areas. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample set 9 in Table 2.</p>	
<p>Asbestos Cement Products</p>	<p style="text-align: center;">Location/Description</p>	
<p>Piping</p>	<p>As per the school's ACM database, transite (cement) piping associated with drain lines within mechanical shafts has been previously identified to be asbestos-containing.</p>	
<p>Roofing, Siding, Wallboard</p>	<p style="text-align: center;">None identified in subject building.</p>	
<p>Other Cement Products</p>	<p>Ceramic floor tiles grout was observed in project specific areas. Bulk samples were collected during the assessment and results of analysis confirmed that this building material is not asbestos-containing. Refer to sample sets 5 and 6 in Table 2.</p>	
<p>Other Building Materials</p>	<p style="text-align: center;">Location/Description</p>	
<p>Caulking</p>	<p>As per SEL Report 117617, black window pane caulking on windows of the Bookstore have been previously identified to contain Chrysotile asbestos.</p>	
<p>Suspect ACM</p>	<p style="text-align: center;">None identified in subject building.</p>	

1.4.2 Lead

Laboratory analytical results for paints tested to determine lead content are summarized in the following table. The Laboratory Certificate of Analysis is included in Appendix D. Refer to Section 2.1.2 of this report for recommended lead abatement procedures (if any) that correspond to the type of proposed construction, renovation, or demolition work.

Table 7: Results of Paint Condition and Lead Content Assessment

Sample No.	Location	Surface	Paint Colour	Condition	Lead Conc. (% by wt.)	Material Classification
L-01	Throughout	Concrete	Beige	Good	<0.0080	LLLLP

LCP: Lead-Containing Paint (>0.1% Lead Content); LLLP: Low-Level Lead Paint (≤0.1% Lead Content)

Suspect lead-containing materials observed in the subject building included the following:

- paints and surface coatings (not sampled)
- glazing associated with ceramic tiles
- batteries associated with emergency lighting
- solder in copper pipe fittings
- solder in electrical components

1.4.3 Mercury

Mercury is present in the subject building in the form of:

- vapour in fluorescent lamps

1.4.4 Silica

A number of building materials were identified in the subject building that are **suspected to contain crystalline silica**. This includes the following materials:

- drywall walls/drywall joint compound
- concrete
- mortar
- acoustical ceiling tiles
- sprayed fireproofing

1.4.5 Other Designated Substances

Acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride were not included in the assessment as these substances are not expected to be a significant component of building materials or present in a form that would represent an exposure concern. Additionally, no specific information regarding their use was provided to us.

1.5 Other Hazardous Materials

1.5.1 Chemical Hazards

No visible evidence of UFFI installation (i.e. injection openings) or overspray of foam insulation at wall/ceiling joints was identified in the subject building.

1.5.1.1 Mould Contamination

There was no visible evidence of obvious mould growth on building finishes in the subject building at the time of the assessment. In addition, there was no visible evidence of any significant water staining or discolouration to building finishes in the subject building that would suggest the potential for hidden mould growth behind these finishes.

1.5.1.2 Pest Infestation

There was no visible evidence of a pest infestation in the subject building.

1.5.2 Environmental Hazards

1.5.2.1 Polychlorinated Biphenyls (PCBs)

No sources of polychlorinated biphenyls (PCBs) were observed in the subject building.

1.5.2.2 Ozone Depleting and Global Warming Substances

No fixed equipment suspected to contain ODS/GWS was observed in the subject building.

2.0 CONCLUSIONS AND RECOMMENDATIONS

2.1 Designated Substances

2.1.1 Asbestos

As results summarized in Table 2 indicate, no asbestos was detected in any of the bulk samples of textured coat, mastic, acoustical ceiling tiles, vinyl floor tiles, or ceramic floor

tile grout retrieved for analysis. Therefore, these building materials are considered to be Non-ACM and there are no requirements for management, disturbance or removal of these materials under O. Reg. 278/05.

Results of the assessment indicated that the following asbestos-containing materials are present in the subject building that may be disturbed as part of the construction project.

- pipe fitting insulation
- drywall joint compound
- sprayed fireproofing
- contaminated HVAC components
- transite (cement) drain pipe
- window pane caulking

Refer to Appendix A (Summary of ACM Occurrences) and Appendix B (Site Drawings) for types, locations, estimated quantities, and condition of asbestos-containing materials identified in the subject area.

Removal or disturbance of identified asbestos-containing materials must be conducted in accordance with O.Reg. 278/05. Asbestos containing materials in Poor condition must be removed and/or repaired immediately following applicable asbestos abatement procedures. Asbestos-containing materials in Good condition can remain in place until major system upgrading, maintenance or demolition which could result in disturbance of this material.

Caulking & Cement (transite) Pipe: Black window pane caulking and cement piping is considered to be a non-friable ACM. As per O. Reg. 278/05, removal of non-friable ACM can be conducted following Type 1 operations; as long as the material can be removed without being broken, cut, drilled or otherwise similarly disturbed. If the material cannot be removed without it breaking or being similarly disturbed then the work should be conducted using non-powered hand tools and the material should be wetted to control the spread of dust. If the material cannot be wetted or if power tools attached to dust-collecting devices equipped with HEPA (high efficiency particulate aerosol) filters are used during removal or disturbance, then work should be performed following Type 2 operations. If non-friable materials are removed or disturbed using power tools that are not attached to dust-collecting devices that are equipped with HEPA filters then work should be conducted following Type 3 operations.

Pipe Fitting Insulation: The pipe insulation is considered to be a friable ACM. As per O. Reg. 278/05, removal or disturbance of 1 square metre or less of friable ACM is classified as a Type 2 operation. If more than 1 square metre of friable ACM is to be removed or disturbed then work should be conducted following Type 3 operations; unless the material is removed using a glove bag, in which case Type 2 operations are applicable.

Sprayed Fireproofing: Sprayed fireproofing is considered to be a friable ACM. As per O. Reg. 278/05, removal or disturbance of 1.0 m² or less of friable ACM is classified as a Type 2 operation. If more than 1.0 m² of friable ACM is to be removed or disturbed, then work should be conducted following Type 3 operations.

Given the presence of asbestos-containing sprayed fireproofing, it is cautioned that this material or related debris may be concealed on the surface of false ceilings. As such, access above a false ceiling where asbestos-containing sprayed fireproofing is present is classified as a Type 2 operation (full enclosure method for access).

Similarly, asbestos-containing sprayed fireproofing debris may be present within wall cavities. Therefore, access within these spaces is recommended to be conducted following Type 2 operations as a precautionary measure. As required by O.Reg. 278/05, cleaning or removal of ventilation components including rigid ducting (excluding filters) in the buildings with asbestos-containing sprayed fireproofing must be conducted following Type 3 procedures.

As per O.Reg. 278/05, cleaning or removing filters used in air handling equipment in a building that has sprayed fireproofing that is asbestos-containing material is classified as a Type 2 operation. As per O.Reg. 278/05, cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is asbestos-containing material is classified as a Type 3 operation.

Drywall Joint Compound: In accordance with O. Reg. 278/05, removal of less than 1 square metre of drywall where asbestos-containing drywall joint compound has been used can be conducted following Type 1 operations. If 1 square metre or more of drywall is removed where asbestos-containing drywall joint compound has been used then work should be conducted following Type 2 operations.

General Recommendations: The removal or disturbance of ACM must follow the measures and procedures indicated in O. Reg. 278/05. This work should be conducted by workers who have received proper training by a “competent person” in the hazards of asbestos exposure, personal hygiene and work practices, and the use and care of respirators and protective clothing. Any worker/supervisor who works in a Type 3 operation must successfully complete the Asbestos Abatement Worker or Supervisor Training Program approved by the Ministry of Training, Colleges and Universities. It is recommended that all work involving the removal or disturbance of ACM be subject to inspection and testing to document conformance with O. Reg. 278/05 requirements. The degree of inspection and testing is dependent on site-specific conditions such as the type, duration, size and location of the work. In most circumstances Type 3 operations require a visual inspection and clearance air testing to be conducted by a competent worker on completion of the work. The inspection should be conducted to ensure that the enclosure and the work area inside the enclosure are free from visible dust, debris or residue that may contain asbestos. Clearance air testing for Type 3 operations requires a minimum number of air samples to be taken (depending on the

size of the work area) following specific sampling and analytical procedures and all samples taken must meet the clearance criteria set out in O. Reg. 278/05.

2.1.2 Lead

Results of paint chip analysis for the determination of lead content indicated that beige paint throughout project specific areas is considered a 'low-level lead paint' ($\leq 0.1\%$ based on requirements of the Environmental Abatement Council of Ontario (EACO) Lead Guideline (2014)). If the 'low-level lead paint' is disturbed in a non-aggressive manner (no use of power tools/abrasive blasting, grinding, welding, heating, etc.), then respirators are not considered necessary. However, Class 1 measures and procedures should still be implemented during the non-aggressive disturbance of 'low-level lead paints', including, but not limited to, no smoking, eating, drinking and chewing gum in the work area; dust suppression methods must be implemented; and facilities must be made available so that workers can wash their hands and face.

Paints and surface coatings not sampled are assumed to be lead-containing ($>0.1\%$ lead content) in the subject area. Any disturbance of the lead-containing paints or surface coatings should be conducted in accordance with the procedures outlined in the Environmental Abatement Council of Ontario (EACO) "Lead Guideline" (October 2014) and/or the Ontario Ministry of Labour (MOL) "Lead on Construction Projects" guideline (April 2011). The extent of procedures required depends on the type of work to be conducted.

Emergency lighting is present on perimeter walls in the subject building and are suspected to contain lead-acid batteries. If emergency lighting is removed/replaced as part of the scheduled work activities, the batteries are recommended to be sent to a recycling facility for proper treatment.

Additional suspect lead-containing products not anticipated to be disturbed during construction includes solder on pipe fittings and electrical components. Future testing of these materials and specific handling/disposal requirements may be necessary if/when these materials are to be disturbed.

It is recommended that any contractor whose work requires lead-containing materials to be disturbed consult the EACO or Ontario MOL guidelines prior to the start of work to determine the Class/Type of operation(s) and the corresponding control measures (engineering controls, work/hygiene practices, protective clothing and equipment and worker training) necessary to conduct the work in a manner that will prevent worker overexposure to lead. The following table outlines the classification of lead disturbance based on the EACO guideline.

Operation	Description
Class 1	<ol style="list-style-type: none"> 1. Removal of lead-containing or lead-based paints and surface coatings with a chemical gel/stripper or paste; 2. Application of lead-containing or lead-based paints and surface coatings with a brush, roller or sponge. 3. Installation or removal of lead sheeting or flashing. 4. Installation or removal of lead-containing packing, babbitt, caulking, gasket or similar material. 5. Removal of materials coated with lead-containing or lead-based paints and surface coatings, using non-powered hand tools, where the material remains chiefly intact and is not crumbled, pulverized or powdered. 6. Operating construction or demolition equipment (e.g. excavator, bulldozer) during building renovation or demolition where lead-based paints or surface coatings are present on building materials and are being disturbed. 7. Soldering with lead solder. 8. Removing lead-containing or lead-based paints or surface coatings with a heat gun. 9. Removing lead-containing and lead-based paints and surface coatings using a high-pressure water jet (e.g. pressure washer).
Class 2a	<ol style="list-style-type: none"> 1. Removal of lead-containing or lead-based paints and surface coatings or lead-containing materials using a power tool that has an effective dust collection system equipped with a HEPA filter. 2. Welding, torching or high temperature cutting of lead-containing materials indoors when using an effective fume collector or smoke eater that filters and exhausts lead fume and expels it directly outdoors (away from occupants, entrances, walkways, rest areas, etc.). Fume collector or smoke eater must have effective source control and capture velocity, minimum of 0.5 metres per second (100 feet per minute) at the work surface. 3. Welding, torching or high temperature cutting of lead-containing and lead-based paints and surface coatings or lead-containing materials outdoors. 4. Removal of lead-containing mortar using handheld non-powered tools. 5. Removal of lead-containing and lead-based paints and surface coatings or lead-containing materials by scraping or sanding (including wet sanding) using non-powered hand tools. 6. Demolition of plaster or building components that crumble, pulverize or powder and are covered with lead-containing or lead-based paints or surface coatings. 7. Clean up and removal of a significant amount of lead-containing dust and debris (that can be made easily airborne) using wet methods or HEPA vacuums.
Class 2b	<ol style="list-style-type: none"> 1. Spray application of lead-containing paints and surface coatings

Operation	Description
Class 3a	<ol style="list-style-type: none"> 1. Removal of lead-containing or lead-based paints and surface coatings or lead-containing materials using a power tool without an effective dust collection system equipped with a HEPA filter. 2. Welding, torching or high temperature cutting of lead-containing materials indoors or in a confined space (e.g. within a ditch or pit). 3. Removal of lead-containing mortar using a powered cutting device. 4. Burning of a material containing lead. 5. Removal, cleaning or repair of a ventilation system or ductwork used for controlling lead exposure. 6. Spray application of lead-based paints and surface coatings. 7. In the absence of an exposure assessment: <ol style="list-style-type: none"> a. demolition or cleanup of a facility where lead-containing products were manufactured and significant dust and debris, which can be made easily airborne, is present. b. cleanup of dust and debris down range of a firing station in an indoor firing range. an operation that may expose a worker to lead dust, fume or mist that is not a Class 1, Class 2, or Class 3B operation.
Class 3b	<ol style="list-style-type: none"> 1. Abrasive blasting of lead-containing and lead-based paints and surface coatings or lead-containing materials (including wet, slurry and dry abrasive blasting and dry-ice blasting).

If practicable, all bulk lead waste materials should be separated from other wastes and sent to a recycling facility. If not practicable, lead-containing waste should be handled and disposed of according to R.R.O. 1990, Regulation 347, *General - Waste Management* (Reg. 347) made under the Environmental Protection Act. Under this regulation (and depending on the quantity of waste generated) the waste may be subject to analysis following the Toxicity Characteristic Leaching Procedure (TCLP) to determine if it is a “leachate toxic waste” based on the leachate quality criteria provided in Schedule 4 of the regulation. Such wastes must meet specific treatment requirements (Schedule 5) or undergo alternative treatment for hazardous debris (Schedule 8) prior to land disposal.

2.1.3 Mercury

Fluorescent lamps that require removal should be handled with care and kept intact to avoid potential exposure to mercury vapour present within the lamps. To prevent the release of mercury into the environment, Safetech recommends that all waste lamps be sent to a lamp recycling facility and not disposed of in landfill.

Liquid mercury is suspected to be present in thermometers, barometers and other measuring devices (pressure gauges/sensors, vacuum gauges, manometers, etc.), thermostats and a variety of other electrical switches (temperature sensitive, tilt switches, float switches, etc.) associated with mechanical equipment. These items are expected to be removed as part of the construction project. Care should be taken not to disturb these items during the work as breakage could cause a spill of liquid mercury. If

any of these items are to be removed it should be done so carefully to avoid spillage and stored/packaged in a manner that will prevent breakage or spillage. Any mercury-containing equipment that is to be removed is recommended to be recycled rather than disposed of in landfill.

Although no mercury was visibly identified in other equipment, dismantling of equipment was not conducted to verify the presence/absence of mercury. It is cautioned that thermometers, barometers and other measuring devices (pressure gauges/sensors, vacuum gauges, manometers, etc.), thermostats and a variety of other electrical switches (temperature sensitive, tilt switches, float switches, etc.) may contain mercury that may not be visible without dismantling the equipment. Such devices should be assumed to contain mercury until proven otherwise and similar precautions to those outlined above should be taken if any of these items are to be disturbed or taken out of service in the future.

2.1.4 Silica

Suspect silica-containing materials were identified to be present in the subject building. In their current state, building materials containing silica do not represent a risk to building occupants or construction workers. Risks associated with exposure to silica arise during demolition activities that cause silica dust to be created (particularly grinding, drilling or cutting operations and during major demolition), resulting in a crystalline silica inhalation hazard.

If any materials suspected to contain silica are to be removed or otherwise disturbed as a result of renovation/demolition activities it is recommended that procedures be put in place to control the generation of dust (such as routine water misting) and thus reduce the potential for worker exposure. Workers that have the potential to be exposed to airborne silica should also wear appropriate protective clothing and respiratory protection.

Any work involving the disturbance of silica-containing materials should follow the procedures outlined in the Ontario MOL "Silica on Construction Projects" guideline (April 2011). The appropriate engineering controls, work practices, hygiene practices, personal protective measures and training necessary to conduct the work in a safe manner are provided in this guideline. The general measures and procedures (or Type of operation) necessary depends on the type of work to be conducted. The following table outlines the classification of silica disturbance based on the Ontario MOL guideline.

Operation	Description
Type 1	<ol style="list-style-type: none"> 1. The drilling of holes in concrete or rock that is not part of a tunneling operation or road construction. 2. Milling of asphalt from concrete highway pavement 3. Charging mixers and hoppers with silica sand (sand consisting of at least 95% silica) or silica flour (finely ground sand consisting of at least 95% silica) 4. Any other operation at a project that requires the handling of silica-containing material in a way that may result in a worker being exposed to airborne silica. 5. Entry into a dry mortar removal or abrasive blasting area while airborne dust is visible for less than 15 minutes for inspection and/or sampling. 6. Working within 25 metres of an area where compressed air is being used to remove silica-containing dust outdoors.
Type 2	<ol style="list-style-type: none"> 1. Removal of silica containing refractory materials with a jackhammer 2. The drilling of holes in concrete or rock that is part of a tunneling or road construction. 3. The use of a power tool to cut, grind, or polish concrete, masonry, terrazzo or refractory materials. 4. The use of a power tool to remove silica containing materials. 5. Tunneling (operation of the tunnel boring machine, tunnel drilling, and tunnel mesh installation). 6. Tuckpoint and surface grinding 7. Dry mortar removal with an electric or pneumatic cutting device 8. Dry method dust cleanup from abrasive blasting operations 9. The use of compress air outdoors for removing silica dust 10. Entry into area where abrasive blasting is being carried out for more than 15 minutes
Type 3	<ol style="list-style-type: none"> 1. Abrasive blasting with an abrasive that contains >1% silica 2. Abrasive blasting of a material that contains >1% silica

2.1.5 Other Designated Substances

No other designated substances are expected to be a component of building materials in the subject building in a form that would represent an exposure concern. Therefore, no protective measures or procedures specific to acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride are considered necessary.

2.2 Other Hazardous Materials

2.2.1 Chemical Hazards

As no UFFI was identified or is suspected to be present in the subject building, no further action is required. However, given that no destructive testing was conducted, there is a remote possibility that UFFI could be hidden within locations such as exterior wall cavities. If suspect foam insulation is identified during renovation/demolition

activities work should be stopped and the area should be re-assessed to evaluate conditions and determine appropriate control measures and worker protection, if necessary.

2.2.2 Biological Hazards

2.2.2.1 Mould Contamination

No mould contamination was identified in the subject building and no further action is required at this time. Although no obvious mould contamination or evidence to suggest possible hidden mould contamination was identified in the subject building, there is still a potential for hidden mould growth to exist behind or underneath building finishes. Should suspect mould growth be discovered during the course of renovation or demolition work, Safetech recommends that all work stop so that the area can be assessed to evaluate proper control measures and remediation protocols in order to avoid worker exposure to mould and possible contamination of adjacent areas.

2.2.2.2 Pest Infestation

No visual evidence of any significant pest infestation was observed in the subject building. Therefore, no additional precautionary measures are deemed necessary for protection against biological contaminants potentially associated with pest infestation.

2.2.3 Environmental Hazards

2.2.3.1 Polychlorinated Biphenyls (PCBs)

No equipment was identified in the subject building that is expected to be PCB-containing. Additionally, it was confirmed that all original T12 fluorescent lights (including the ballasts and complete fixtures) have been replaced with T8 fluorescent lights in the subject building and, therefore, this lighting should not have PCB-containing ballasts.

2.2.3.2 Ozone Depleting and Global Warming Substances

No equipment was identified in the subject building that is expected to contain ozone depleting or global warming substances. As such, no recommendations are considered necessary at this time.

3.0 LIMITATIONS

The information and recommendations detailed in this report were carried out by trained professional and technical staff in accordance with generally accepted environmental and industrial hygiene work practices and procedures. Recommendations provided in this report have been generated in accordance with accepted industry guidelines and

practices. These guidelines and practices are considered acceptable as of the date of this report.

In preparation of this report, Safetech Environmental Limited (Safetech) relied on information supplied by others, including without limitation, information pertaining to the history and operation of the site, test results and reports of other consultants and testing services provided by independent laboratories. Except as expressly set out in this report, Safetech has not made any independent verification of information provided by independent entities.

The collection of samples at the location noted was consistent with the scope of work agreed-upon with the person or entity to whom this report is addressed and the information obtained concerning prior site investigations. As conditions between samples may vary, the potential remains for the presence of unknown additional contaminants for which there were no known indicators.

The analytical method used for determination of asbestos content meets the requirements of O. Reg. 278/05. However, small asbestos fibres may be missed by PLM due to resolution limitations of the optical microscope. Interfering binder/matrix and/or low asbestos content may also hinder positive identification by PLM. These conditions are common for vermiculite attic insulation (VAI) and non-friable organically bound (NOB) materials such as vinyl floor tiles, roofing materials, mastics and caulking and can lead to “false negative” results. If PLM analytical results for these types of materials indicate no asbestos detected they have been reported as “Presumed Non-ACM”. Due to limitations of the analytical method we cannot confirm that low quantities of asbestos are not present in these samples using solely PLM analysis. Additional analytical procedures should be considered for such materials to rule out false negative results.

Conclusions are based on site conditions at the time of inspection and can only be extrapolated to an undefined limited area around inspected locations. The extent of the limited area depends on building construction and conditions. Building materials that are not detailed within this survey due to inaccessibility during the time of survey and/or are uncovered during renovation/demolition activities should be properly assessed by a qualified person prior to their disturbance. Safetech cannot warrant against undiscovered environmental liabilities. If any information becomes available that differs from the findings in this report, we request that we be notified immediately to reassess the conclusions provided herein.

No other person or entity is entitled to use or rely upon this report without the express written consent of Safetech and the person or entity to who it is addressed. Any use that a third party makes of this report, or any reliance based on conclusions and recommendations made, are the responsibility of such third parties. Safetech accepts no responsibility for damages suffered by third parties as a result of actions based on this report.



Appendix A: Summary of ACM Occurrences

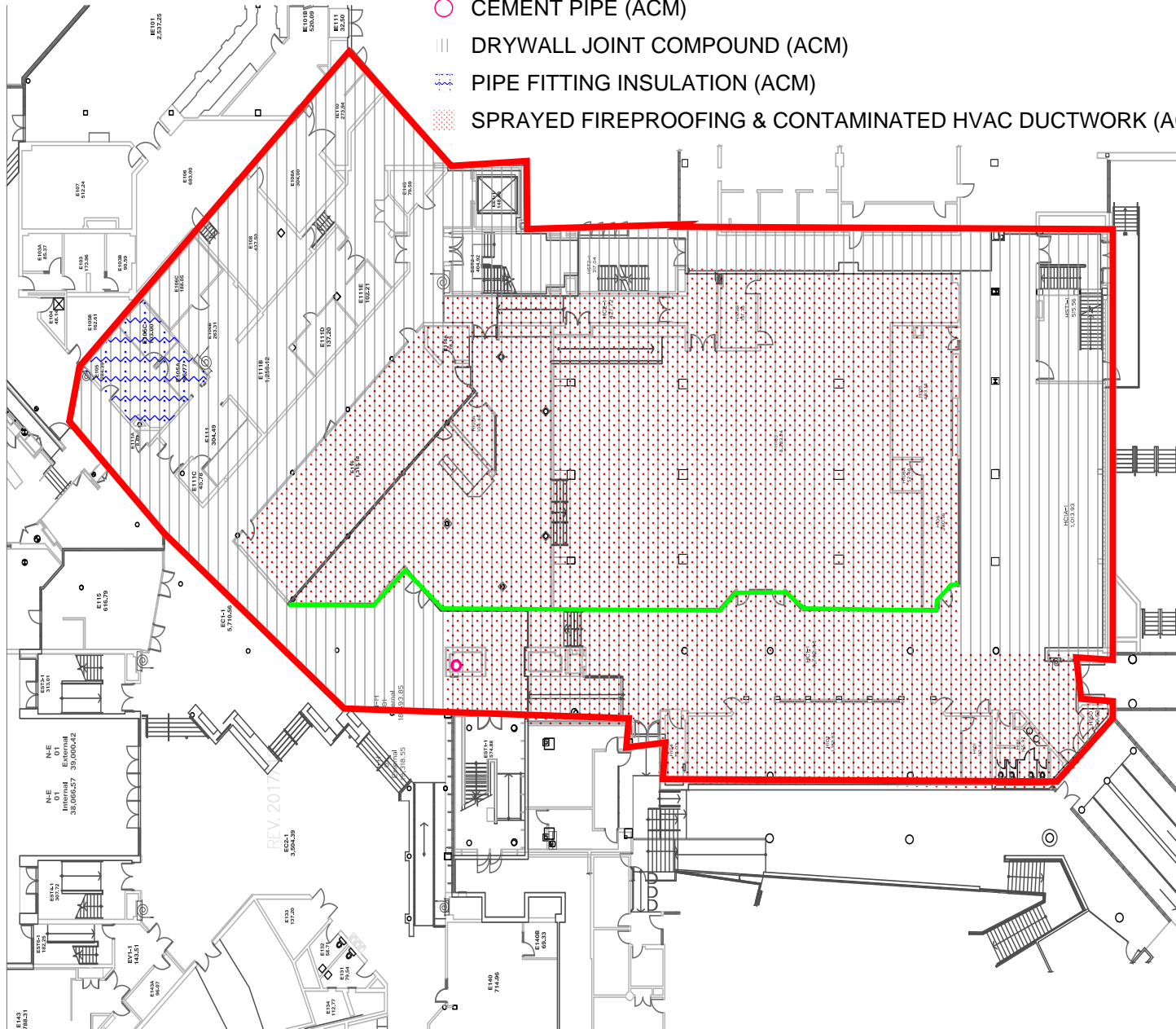
Floor	Room No.	Room Description	System	Material	Description	Classification	Friable/ Non-Friable	Condition	Est. Quantity	Unit	Access	Action
1	E105	Office	Pipe	Pipe Fitting Insulation		ACM	Friable	Good	10	Units	D	7
1	H103	Bookstore	Window	Caulking	Black Window Pane Caulking	ACM	Non-Friable	Good	15 ft per window	ft	A	7
1		Throughout	Structure	Sprayed Fireproofing		ACM	Friable	Good	N/D		D	7
1		Throughout	Structure	Sprayed Fireproofing Overspray		ACM	Friable	Good	N/D		D	7
1		Throughout	AHU	Dust (Interior)		ACM	Friable	Poor	N/D		D	7
1		Throughout	Ceiling	Drywall Joint Compound		ACM	Non-Friable	Good	N/D		D	7
1		Throughout	Wall	Drywall Joint Compound		ACM	Non-Friable	Good	N/D		A	7
-	-	Pipe Shaft	Pipe	Transite	Cement Pipe	ACM	Non-Friable	Good	N/D		A	7



Appendix B: Site Drawings

Legend

- AREA ASSESSED
- / CAULKING (ACM)
- CEMENT PIPE (ACM)
- DRYWALL JOINT COMPOUND (ACM)
- ~ PIPE FITTING INSULATION (ACM)
- SPRAYED FIREPROOFING & CONTAMINATED HVAC DUCTWORK (ACM)



- Notes:
- 1) This floor plan must be read in conjunction with the hazardous building materials report for the project.
 - 2) Asbestos-containing sprayed fireproofing is present throughout projects areas. Disturbance must be conducted following Type 3 procedures (O.Reg. 278/05).
 - 3) Cleaning or removing HVAC equipment such as ventilation ducts must be conducted following Type 3 procedures outlined in O.Reg. 278/05.
 - 4) Asbestos-containing drywall joint compound is present on all gypsum fire separations, bulkheads, columns and perimeter walls.
 - 5) Removal of asbestos-containing caulking associated with windows can be conducted following Type 1 procedures.

Project:
Renovation Project

Location:
Building E & H
Humber College
205 Humber College Blvd
Toronto, Ontario

Floor:
First

Description:
Location of Areas
Assessed

Project No.: 3191221
Date: January 2020



3045 Southcreek Road, Unit 14
Mississauga, Ontario
L4X 2X7



Appendix C: Laboratory Certificate of Analysis – Asbestos



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551915490
Customer ID: 55SELI62
Customer PO: 3191221
Project ID:

Attn: Josh Cinello Phone: (905) 624-2722
Safetech Environmental Fax: (905) 624-4306
3045 Southcreek Road Collected:
Unit 14 Received: 12/20/2019
Mississauga, ON L4X 2X7 Analyzed: 12/23/2019
Proj: Humber College, Bldg E, 3191221

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 1a **Lab Sample ID:** 551915490-0001

Sample Description: Textured Coat - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray/White	0.0%	100.0%	None Detected	*

Client Sample ID: 1b **Lab Sample ID:** 551915490-0002

Sample Description: Textured Coat - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray/White	0.0%	100.0%	None Detected	*

Client Sample ID: 1c **Lab Sample ID:** 551915490-0003

Sample Description: Textured Coat - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray/White	0.0%	100.0%	None Detected	*

Client Sample ID: 2a **Lab Sample ID:** 551915490-0004

Sample Description: Sprayed Fireproofing - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	80.0%	20% Chrysotile	

Client Sample ID: 2b **Lab Sample ID:** 551915490-0005

Sample Description: Sprayed Fireproofing - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019					Positive Stop (Not Analyzed)

Client Sample ID: 2c **Lab Sample ID:** 551915490-0006

Sample Description: Sprayed Fireproofing - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019					Positive Stop (Not Analyzed)

Client Sample ID: 3a **Lab Sample ID:** 551915490-0007

Sample Description: Sprayed Fireproofing - E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	30.0%	70.0%	None Detected	



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2756 Slough Street Mississauga, ON L4T 1G3
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<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551915490
Customer ID: 55SELI62
Customer PO: 3191221
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 3b **Lab Sample ID:** 551915490-0008
Sample Description: Sprayed Fireproofing - E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	30.0%	70.0%	None Detected	

Client Sample ID: 3c **Lab Sample ID:** 551915490-0009
Sample Description: Sprayed Fireproofing - E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	20.0%	80.0%	None Detected	

Client Sample ID: 4a **Lab Sample ID:** 551915490-0010
Sample Description: 2x4 Lay in Ceiling Tile (Textured Pinhole) - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	

Client Sample ID: 4b **Lab Sample ID:** 551915490-0011
Sample Description: 2x4 Lay in Ceiling Tile (Textured Pinhole) - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	

Client Sample ID: 4c **Lab Sample ID:** 551915490-0012
Sample Description: 2x4 Lay in Ceiling Tile (Textured Pinhole) - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	

Client Sample ID: 5a **Lab Sample ID:** 551915490-0013
Sample Description: 2x4 Lay in Ceiling Tile (Fissure/Pinhole) - E111

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	

Client Sample ID: 5b **Lab Sample ID:** 551915490-0014
Sample Description: 2x4 Lay in Ceiling Tile (Fissure/Pinhole) - E111

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	

Client Sample ID: 5c **Lab Sample ID:** 551915490-0015
Sample Description: 2x4 Lay in Ceiling Tile (Fissure/Pinhole) - E111

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	80.0%	20.0%	None Detected	



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Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551915490
Customer ID: 55SELI62
Customer PO: 3191221
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 6a **Lab Sample ID:** 551915490-0016
Sample Description: Ceramic Floor Tile Grout - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 6b **Lab Sample ID:** 551915490-0017
Sample Description: Ceramic Floor Tile Grout - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 6c **Lab Sample ID:** 551915490-0018
Sample Description: Ceramic Floor Tile Grout - Corridor HC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 7a **Lab Sample ID:** 551915490-0019
Sample Description: Ceramic Floor Tile Grout - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 7b **Lab Sample ID:** 551915490-0020
Sample Description: Ceramic Floor Tile Grout - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 7c **Lab Sample ID:** 551915490-0021
Sample Description: Ceramic Floor Tile Grout - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 8a **Lab Sample ID:** 551915490-0022
Sample Description: Vinyl Sheet Flooring - Rear Corridor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 8b **Lab Sample ID:** 551915490-0023
Sample Description: Vinyl Sheet Flooring - Rear Corridor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	



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Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 8c **Lab Sample ID:** 551915490-0024
Sample Description: Vinyl Sheet Flooring - Rear Corridor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 9a-Floor Tile **Lab Sample ID:** 551915490-0025
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 9a-Mastic **Lab Sample ID:** 551915490-0025B
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Black	0.0%	100.0%	None Detected	

Client Sample ID: 9b-Floor Tile **Lab Sample ID:** 551915490-0026
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 9b-Mastic **Lab Sample ID:** 551915490-0026B
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Black	0.0%	100.0%	None Detected	

Client Sample ID: 9c-Floor Tile **Lab Sample ID:** 551915490-0027
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 9c-Mastic **Lab Sample ID:** 551915490-0027B
Sample Description: 12x12 White Vinyl Floor Tile w/brown streaks - Corridor EC-1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Black	0.0%	100.0%	None Detected	

Client Sample ID: 10a **Lab Sample ID:** 551915490-0028
Sample Description: 12x12 Pink Vinyl Floor Tile w/beige streaks - Room E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Beige	0.0%	100.0%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551915490
Customer ID: 55SELI62
Customer PO: 3191221
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 10b **Lab Sample ID:** 551915490-0029
Sample Description: 12x12 Pink Vinyl Floor Tile w/beige streaks - Room E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 10c **Lab Sample ID:** 551915490-0030
Sample Description: 12x12 Pink Vinyl Floor Tile w/beige streaks - Room E105

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/23/2019	Beige	0.0%	100.0%	None Detected	

Analyst(s):

Anne Balayboa PLM (10)
Shorthri Kalikutty PLM (21)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Report amended: 01/13/2020 10:05:28 Replaces amended report from: 01/10/2020 11:08:19 Reason Code: Client-Change to Project



Appendix D: Laboratory Certificate of Analysis – Lead



EMSL Canada Inc.

2756 Slough Street, Mississauga, ON L4T 1G3

Phone/Fax: (289) 997-4602 / (289) 997-4607

<http://www.EMSL.com>

torontolab@emsl.com

EMSL Canada Or 551915489
CustomerID: 55SELI62
CustomerPO: 3191221
ProjectID:

Attn: **Josh Cinello**
Safetech Environmental
3045 Southcreek Road
Unit 14
Mississauga, ON L4X 2X7

Phone: (905) 624-2722
Fax: (905) 624-4306
Received: 12/20/19 3:18 PM
Collected:

Project: **Humber College, Bldg E, 3191221**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client SampleDescription</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
L-01 551915489-0001		12/21/2019	0.2489 g	0.0080 % wt	<0.0080 % wt
	Site: Beige Paint				

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON AIHA-LAP, LLC - ELLAP #196142

Report Amended: 01/13/2020 10:33:04 Replaces Report Amended: 01/10/2020 11:51:48. Reason Code: Client-Change to PO



Appendix E: Methodology

A. METHODOLOGY

The presence of hazardous materials was assessed by visual inspection. For the purpose of this assessment and this document, hazardous materials include designated substances as well as other chemical, biological and environmental hazards as defined below:

- Designated Substances (as prescribed by Ontario Regulation 490/09):
 - Acrylonitrile, Arsenic, Asbestos, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, Lead, Mercury, Silica and Vinyl Chloride.
- Other Hazardous Materials:
 - **Chemical Hazards** – Urea Formaldehyde Foam Insulation (UFFI)
 - **Biological Hazards** – Mould Contamination and Pest Infestation
 - **Environmental Hazards** – Polychlorinated Biphenyls (PCBs) and Ozone Depleting & Global Warming Substances

Concealed locations such as above solid plaster or drywall ceilings, within plaster or drywall wall cavities, enclosed mechanical/pipe shafts and bulkheads, etc. were not investigated, unless otherwise stated in Section 1.3. Similarly, motors, blowers, electrical panels, etc., were not de-energized or disassembled to examine concealed conditions. Building materials that are not detailed within this assessment due to inaccessibility at the time of our site visit and/or uncovered during renovation/demolition activities should be assessed by a qualified person prior to their disturbance.

Bulk sampling followed by laboratory analysis was also conducted to confirm the presence/absence of select hazardous materials. Bulk sampling was limited to asbestos in building materials and lead in paint on building finishes (if flaking paint was present). All other hazardous materials were identified by visual inspection only. Where possible, observations regarding the location, quantity and condition of the hazardous materials identified were made in order to determine the potential for exposure and provide appropriate recommendations for remedial action, if necessary. Specific methodology for each individual hazardous material assessed is further detailed below. Neighborhood

A.1 Designated Substances

A.1.1 Asbestos

A visual inspection for the presence of both friable and non-friable asbestos-containing material (ACM) was performed in the subject area.

If an existing asbestos survey was available for review, Safetech relied on the information present. Building materials that were visually similar to materials previously tested and that were confirmed to be either ACM or non-ACM were considered to have consistent content and were not re-sampled. Additional sampling was only conducted where the investigator believed a need existed.

Bulk samples of building materials suspected to contain asbestos were retrieved by Safetech only for materials that were deemed to have a potential to be disturbed as part of the construction project. Some suspect materials may not have been sampled during our investigation. Bulk samples were retrieved in accordance with Section 3 and Table 1 of Ontario Regulation 278/05, "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations". The number of samples collected for each material was based on the type and quantity of the material present in the subject area. Each individual sample was placed in a labeled zip-lock bag for transportation to an independent laboratory (EMSL). EMSL is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos fiber analysis.

Analysis for asbestos content was performed by the independent laboratory in accordance with the U.S. Environmental Protection Agency (EPA) Test Method *EPA/600/R-93-116: Method for the Determination of Asbestos in Bulk Building Materials (June 1993)*. This method identifies the asbestos fibre content of building materials using polarized light microscopy (PLM) analytical techniques, with confirmation of presence and type of asbestos made by dispersion staining optical microscopy. This analytical method meets the requirements set forth in Section 3 of O. Reg. 278/05.

In accordance with O. Reg. 278/05, an asbestos-containing material is defined as material that contains 0.5 per cent or more asbestos by dry weight. The laboratory was instructed to conduct "stop-positive" analysis for all materials. If a sample was found to be asbestos-containing no further analysis was conducted for samples taken from the same homogeneous material.

Locations where ACM have been identified are detailed in this report. Recommendations pertaining to ACM were made based on the friability, accessibility and condition of the material in conjunction with the potential for the planned renovation work to disturb the ACM.

A.1.2 Assessment of Asbestos-Containing Building Materials

Accessibility, Condition and Action (Priority) ratings for individual items, or defined areas were developed by Safetech to determine remedial action plans specific to the facility's needs.

A.1.2.1 Accessibility

Accessibility has been assessed as: (A) Accessible to all non-maintenance occupants of the building; (B) Accessible to maintenance staff without a ladder; (C) Accessible to maintenance staff with a ladder and exposed to view without moving a building component; (D) Accessible to maintenance staff with a ladder and concealed from view due to a building component; (E) Not accessible without demolition or removal of fixed building components or building systems

A.1.2.2 Condition

The condition of asbestos-containing materials identified in the subject area was assessed as Good (G), Fair (F) or Poor (P). The assessment criteria used to determine condition is dependent on material characteristics, such as friability. The following table summarizes the criteria used by Safetech to evaluate the condition of ACM.

Sprayed Fireproofing, Sprayed Insulation and Sprayed Texture Finishes	
Good	<ul style="list-style-type: none"> Surface shows no significant signs of damage, deterioration, or delamination (i.e. <1%). Unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed. Encapsulated fireproofing or texture finishes where encapsulation applied after damage or fallout.
Fair	<ul style="list-style-type: none"> Not utilized as part of condition assessment for these materials.
Poor	<ul style="list-style-type: none"> Greater than 1% damage, delamination, or deterioration to surface.
In areas where damage exists in isolated locations, both Good and Poor may be applicable.	
Mechanical Insulation (boilers, breeching, ductwork, piping, tanks, equipment, etc.)	
Good	<ul style="list-style-type: none"> Insulation completely covered in jacketing and exhibits no evidence of damage or deterioration. Jacketing may have minor damage (i.e. scuffs or stains), but is not penetrated.
Fair	<ul style="list-style-type: none"> Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination). Undamaged insulation that had never been jacketed. Insulation is exposed but not showing surface disintegration. Extent of missing insulation ranges from minor to none. Damage that can be repaired.
Poor	<ul style="list-style-type: none"> Original insulation jacket is missing, damaged, deteriorated, or delaminated. Insulation is exposed and significant areas have been dislodged. Damage that cannot be easily repaired.
Non-Friable and Potentially Friable Materials (includes materials such as plaster finishes, drywall compound, ceiling tiles, asbestos cement products, vinyl asbestos tile and asbestos paper backed vinyl sheet flooring, etc., which have the potential to become friable when handled)	
Good	<ul style="list-style-type: none"> No significant damage. Material may be cracked or broken but is stable and not likely to become friable upon casual contact. No friable debris present
Fair	<ul style="list-style-type: none"> Not utilized as part of condition assessment for these materials.
Poor	<ul style="list-style-type: none"> Material is severely damaged. Debris is present or binder has disintegrated to the point where the material has become friable.
Asbestos-Containing Debris (noted separately from the presumed source material)	
Poor	<ul style="list-style-type: none"> Debris is always considered to be in Poor condition.

A.1.2.3 Action

Recommended ACTION for compliance and for management of identified asbestos-

containing materials has been provided for each condition and component outlined in the above table. Recommendations have been classified under the following 8 ACTIONS:

1. Action dealing with the immediate clean-up of fallen ACM likely to be disturbed.
2. Action dealing with the need to use Type 2 asbestos procedures to enter an area (other than a ceiling space).
3. Action dealing with performing asbestos removal for compliance with regulations.
4. Action dealing with Type 2 asbestos procedures for ceiling entry where friable ACM debris is present on the top side of a ceiling system.
5. Action dealing with the removal of asbestos that goes beyond compliance requirements but simplifies the asbestos management.
6. Action dealing with the repair of asbestos.
7. Action dealing with ACM surveillance requirements of the regulation.
8. Action for dealing with material that may contain asbestos but was not conclusively identified in the survey.

A.1.2.4 Quantity

The approximate quantity and the units of measure related to the quantity (i.e.: linear feet (LF), square feet (SF) or each (EACH) as appropriate to the item) have only been provided for materials requiring remedial or corrective action (i.e. materials in Fair or Poor condition). In such circumstances any quantities provided should be considered rough estimates only and should not be solely relied upon for bidding purposes. It is the responsibility of the selected Contractor to obtain actual quantities.

A.2 Lead

If paint samples were collected, they would be collected by scraping the paint down to the base material substrate to ensure collection of all layers of paint. Care would be taken to avoid collection of the underlying substrate to reduce analytical substrate matrix interference.

If collected, paint samples would be submitted to an independent laboratory for the determination of lead content. The laboratory would participate in and accredited by the EPA (U.S. Environmental Protection Agency) for analysis of lead in paint chips through the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP). Analysis would be conducted by the laboratory following the EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Method 7000B "Flame Atomic Absorption Spectrophotometry". Result of analysis would be reported by the laboratory as the percentage of lead by weight of the total sample (% by wt.).

The presence of lead in other materials, such as lead sheeting, pigmented mortar, lead piping, lead solder, etc. would be noted where observed but not sampled to verify lead

content. Lead can be present in these materials to varying degrees, depending on their age of application and should be considered lead-containing until proven otherwise.

A.3 Mercury

The type, quantity and location of mercury-containing equipment and devices in the subject area were determined by visual inspection based on appearance, age and knowledge of historical uses. Sampling for mercury-containing building materials and dismantling of suspect mercury-containing equipment was not performed. Where possible, attempts were made to verify the presence/absence of mercury by gathering additional information such as equipment model number, serial number, etc.

A.4 Silica

The presence of crystalline silica in building materials was determined through visual inspection of building materials only, based on knowledge of the historic use of silica-containing materials in certain building materials. Sampling to verify the presence/absence of silica in building materials was not performed.

A.5 Other Designated Substances

Other designated substances (i.e. acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride) are typically not expected to be encountered in building materials as significant constituents or in a form that would represent an exposure concern. These substances were not included in the assessment unless specific information regarding their use (e.g. in a manufacturing process) was provided to us. No sampling for these designated substances was performed.

A.6 Other Hazardous Materials

A.6.1 Chemical Hazards

A.6.1.1 Urea Formaldehyde Foam Insulation (UFFI)

A visual inspection to evaluate the possible presence of Urea Formaldehyde Foam Insulation (UFFI) was conducted in the subject area. Our visual inspection was limited to identifying evidence of possible UFFI installation (i.e. repaired nozzle holes in walls) and overspray at wall/ceiling joints, etc. No destructive testing or material sampling was conducted as part of the assessment.

A.7 Biological Hazards

A.7.1.1 Mould Contamination

A visual inspection to determine the possibility of mould growth was conducted in the subject area. The assessment was limited to identifying evidence of mould growth and

water damage (staining, material deterioration, efflorescence, etc.) on the surface of building materials, which may be an indicator of hidden mould growth. No moisture content readings of building materials were taken to determine their current condition. Additionally, destructive testing to confirm the presence/absence of hidden mould growth and material sampling to verify the presence/absence of mould on suspect surfaces was beyond the scope of this assessment.

A.7.1.2 Pest Infestation

The presence and extent of pest infestation in the subject area was based on visually inspecting for evidence of significant pest activity, including signs of nesting, droppings/fecal accumulation, dead insects/carcass accumulation, etc. Evidence of minor pest presence was not considered to be indicative of pest infestation.

A.8 Environmental Hazards

A.8.1 Polychlorinated Biphenyls (PCBs)

The presence of PCB-containing electrical equipment in the subject area was identified through visual inspection and knowledge of the timeline of historical use.

For stand-alone transformers and capacitors, information from the manufacturer nameplate (such as the date of manufacture, dielectric fluid trade name or "Type Number", etc.) was gathered, where possible, to further evaluate if the equipment may contain PCBs. This information was then compared to the information provided in the Environment Canada document entitled "Handbook on PCB's in Electrical Equipment" (Third Edition, April 1988) to aid in identification. Transformers and capacitors confirmed to be manufactured after 1979 were assumed to not contain PCBs. If appropriate information could not be obtained it was assumed that the transformer or capacitor contained PCBs.

For fluorescent light ballasts, a representative number of fixtures were inspected, if possible, for assessment areas that were constructed prior to 1980 and where there was no history or evidence of a complete lighting retrofit. The light fixtures were examined by removing any lenses and ballast covers to expose the ballast and identify information such as ballast make, model number, serial number, and date code. This information was then compared to the information provided in the Environment Canada document entitled "Identification of Lamp Ballasts Containing PCBs" (Report EPS 2/CC/2 (revised) August 1991) to aid in identification. Ballasts that could not be confirmed Non-PCB-containing were assumed to contain PCBs. The light fixtures were not de-energized and ballasts were not removed to obtain manufacturer information that may be on the back of the ballast. If visual confirmation of ballast type could not be made it was assumed that light fixtures in areas constructed prior to 1980 that have not undergone a complete lighting retrofit have PCB-containing ballasts until proven otherwise.



No sampling of materials or fluids within equipment was conducted to verify the presence/absence of PCBs. Inspection and testing of other materials for PCB content, including (but not limited to) caulking, asphalt, oil-based paint, plastics, switches, electric cables and hydraulic fluids was beyond the scope of the assessment.

A.8.2 Ozone Depleting and Global Warming Substances

The presence of fixed equipment likely to contain ozone-depleting substances (ODS) and/or global-warming substances (GWS) was identified through visual inspection and knowledge of the timeline of historical use. This included equipment such as chillers, air-conditioners, walk-in refrigeration and freezer units and fixed dry-chemical fire extinguishers, where chemicals such as hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) or halons may be present. Where possible, information regarding the type and quantity of refrigerant present was obtained from the manufacturer nameplate. Our visual assessment was limited to fixed equipment in the subject area and did not include portable equipment such as stand-alone refrigerators, freezers, water coolers, air-conditioners and fire extinguishers, etc.