

REPORT

Designated Substance and Hazardous Materials Survey

Select Areas of Former Bladen Wing & Academic Resources Building, University of Toronto Scarborough, Toronto, Ontario

Submitted to:

University of Toronto Scarborough

Science Wing, SW302
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Toronto, ON
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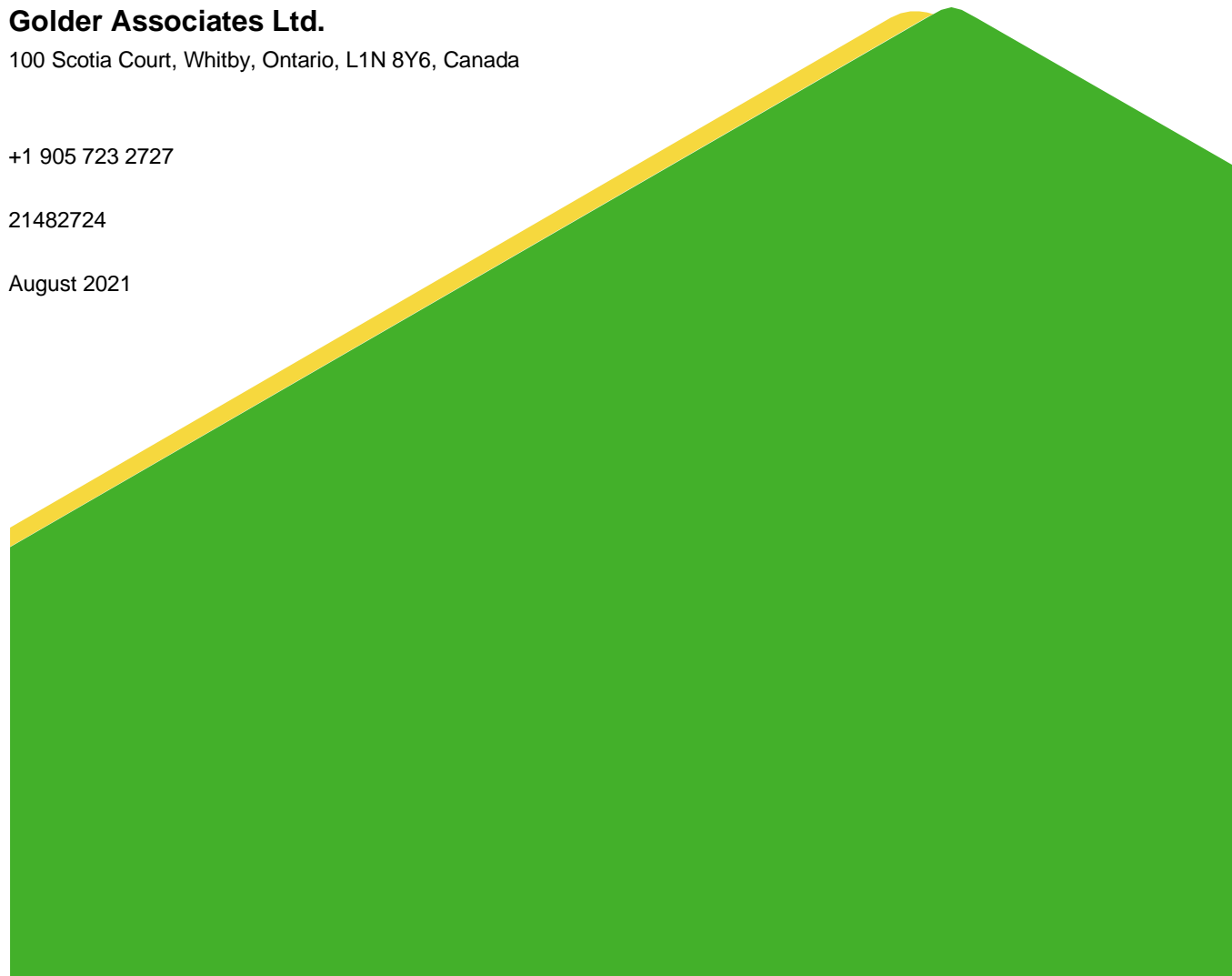
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Distribution List

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the University of Toronto Scarborough (UTSC), to conduct a pre-renovation designated substance and hazardous materials survey (DSS) in select areas of the former Bladen Wing and Academic Resources Centre at University of Toronto Scarborough, Toronto, Ontario (the Site). The survey was conducted by Mr. James Kassabian of Golder's EHS Management and Compliance Group on August 5th and 6th, 2021.

The DSS was performed with the objective of identifying the presence of designated substances as required under the Ontario *Occupational Health and Safety Act* (the *Act*) to accommodate interior renovations in select areas within the Library and IITS.

The designated substances surveyed included asbestos-containing materials (ACM), lead, mercury, and silica. The remaining designated substances (acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride) were not expected to be present, however they were noted if observed

1.1 Site Description

The Site building is an institutional facility that is part of a university campus. The survey area was comprised of two areas that were contained within portions of both Bladen Wing and Academic Resource Centre (ARC) buildings, as indicated in drawings provided by UTSC, titled "*Library / IITS Interior Renovation – ARC Building: University of Toronto Scarborough*". The survey area included select areas of the library, administrative offices, and IITS offices. The survey area occupies approximately 36,000 square feet (ft²) and was occupied in select areas at the time of the survey.

Site finishes included painted concrete, carpet, vinyl sheet and tiles floors, walls constructed of concrete/clay block, and drywall, and ceilings consisted of lay-in acoustic tiles below pre-cast concrete structure. Heating and cooling were provided by central forced air systems. Lighting was provided by fluorescent lights. Ducts were found both uninsulated and insulated with foil backed fibreglass. Straight run sections of piping were insulated with fibreglass with fittings (tees, ends, joints, valves, turns, etc.) insulated with fibreglass or asbestos.

1.2 Historical Information

Historical hazardous building material survey and abatement work has been conducted at the Site building and is detailed in the following document provided by UTSC; "Asbestos Reassessment Survey Report, Annual Update 2020, Bladen Wing, University of Toronto Scarborough", dated December 2020, prepared by OHE Consultants, OHE File 25622-002 (OHE Report).

Prior to conducting the Site investigation, Golder reviewed the above-noted reports and, where applicable, the historical report findings were referenced during the field portion of our work, and herein.

2.0 SCOPE OF WORK

The Scope of Work included the following:

- A review of historical hazardous building material survey reports provided by UTSC;
- An intrusive visual assessment of the survey area of the Site to identify suspected and presumed designated substances and other selected hazardous materials present;
- Representative bulk sampling of materials suspected to contain asbestos, and paints suspect to contain lead, to supplement visual observations from within the survey area;
- Third-party bulk analysis of collected samples for asbestos type/percentage or lead content; and,
- Provision of a report detailing the findings and any recommendations with respect to removal of any identified hazardous building materials including designated substances on Site prior to renovations occurring.

The scope of work was limited to readily accessible building materials that were part of the survey area only. Golder did not sample materials where collection could affect the integrity of a building system or operation of equipment (e.g., wiring, mechanical systems, piping contained within student benches, roof drains, etc.), or present a health and safety hazard (e.g., live electricity, working at heights). If observed, these materials were deemed to be inaccessible and noted herein.

The quantities reported herein are based on Site observations and the quantification of hazardous materials observed at the time of the assessment. Due to the limitations noted above, there may be discrepancies between the quantities reported herein and quantities present at the Site.

It should be noted that room AC203 was not accessible and not assessed at the time of the survey. As such, previous findings from the OHE report are presumed to be accurate and will be incorporated into this report where applicable.

3.0 REGULATIONS, GUIDELINES, STANDARDS AND SAMPLING METHODOLOGY

The regulations, guidelines, and standards referenced throughout this report are listed and defined in Appendix A. Similarly, the investigation and sampling methodologies are provided in Appendix B.

4.0 RESULTS AND DISCUSSION

4.1 Asbestos-Containing Materials (ACM)

Historical Document Review

Based on a review of the OHE Report, the following ACMs were previously identified within the survey area:

- Drywall with asbestos-containing joint compound;
- Parging cement on pipe fittings (elbows and hangers); and
- 12"x12" yellow-beige vinyl floor tiles.

In addition, the following materials were previously identified in the OHE Report to be non-asbestos in the survey area:

- 12"x12" grey fleck vinyl floor tiles and associated black mastic;
- 12"x12" black fleck vinyl floor tiles and associated yellow mastic;
- Joint compound associated with drywall wall and bulkhead finishes at specific locations;
- 2'x4' lay-in ceiling tiles with textured pinhole pattern (date stamp); and
- 2'x4' lay-in ceiling tiles with flat textured pattern (date stamp).

It should be noted that the following areas included in the survey area were not previously assessed by OHE in their report: AC260, AC262, AC270, AC270A, AC270K, AC275-278, AC280, AC280K, AC283, AC286-288, AC390, and AC390A, AC390B, and AC390M.

Site Assessment Results and Findings

A total of 49 samples representing 15 distinct homogenous materials were collected by Golder and analyzed for asbestos content from the survey area. The following materials were determined to be asbestos-containing:

- Joint compound (Samples DJC-05a to c) associated with perimeter drywall wall finishes enclosing the windows in AC390A, AC390B, and AC390M was identified to contain **chrysotile asbestos**. As such, all drywall finishes in these areas should be considered to have asbestos containing joint compound. All finishes present in these areas were in good condition; and
- 12"x12" beige vinyl floor tiles with brown flecks (Samples VFT-01a) present in AC284A was identified to contain **chrysotile** asbestos. Approximately 60 ft² of the asbestos containing vinyl floor tile was observed to be in good condition. Mastic beneath this style of vinyl floor tile is non-asbestos (VFT-01A-C).

Parging cement in good condition is present on pipe fittings (i.e., elbows, tees, valves, and hangers) of various pipe systems within the assessed area. This material was previously identified to contain **chrysotile** asbestos, and was noted at the following locations:

- Approximately 30 fittings throughout the ceiling space (above the lay-in ceiling tiles) in AC290;
- Approximately 8 pipe fittings on radiator lines in AC284A;
- Approximately 8 fittings in the southwest corner of the ceiling space (above the lay-in ceiling tiles) in AC200;

- Approximately 10 fittings in the north corner of the ceiling space (above the lay-in ceiling tiles) in AC204;
- Approximately 22 pipe fittings throughout the ceiling space (above the lay-in ceiling tiles) in AC205; and
- Approximately 14 large diameter pipe fittings throughout the ceiling space (above the lay-in ceiling tiles) in AC205A.

Parging cement on pipe fittings was noted by OHE to be present in AC203. Golder was not able to confirm the quantity of pipe fittings in AC203 due to inaccessibility.

The following materials sampled by Golder at the time of the survey were determined to be non-asbestos containing:

- Drywall with joint compound (Samples DJC-01a to e, DJC-02a to c, DJC-03a to c, DJC-04a to c, DJC-6a to c, and DJC-07a to c) in AC200-209, AC270-290; and AC390;
- Blue/green vinyl sheet flooring (Samples VSF-01a to c, phase a) and associated yellow mastic (Samples VSF-01a to c, phase b) in AC277 (approximately 390 ft²);
- Brown baseboard mastics (samples BM-01a to c and BM-02a to c) found throughout the surveyed area of the Site;
- Grey caulking (samples CLK-01a to c) associated with interior windows in AC390;
- Light grey caulking (samples CLK-02a to c) along the floor and concrete block wall in AC390; and
- Red firestop caulking (samples CLK-03a to c) in floor penetrations in AC390A.

Pipe straights observed in the ceiling spaces of the survey area were noted to be either uninsulated or insulated with fiberglass.

All lay-in ceiling tiles identified throughout the assessed area (including the two patterns previously noted in the areas assessed by OHE) were noted to have a date stamps from the early 2000's to the 2010's and as such, are not expected to contain asbestos.

Black fleck and grey fleck vinyl floor tiles identified in AC200-209 and AC290 were visually similar to the non-asbestos containing vinyl floor tiles discussed in the OHE report and as such, are not expected to contain asbestos. In addition, the non-asbestos containing grey fleck vinyl floor tiles were observed in AC270, AC284, and AC390.

Ducts and vents were observed to have light grey adhesives (i.e. mastics and caulking) on seams. The light grey duct adhesive is not suspected to contain asbestos and not sampled by Golder at the time of the survey. Suspect asbestos containing duct adhesives were not observed by Golder within the visually accessible areas of the survey area.

Based on drawings and historical documents provided by the Client, existing AC200-209 and AC290 were once a part of the Bladen Wing building. The Academic Resource Centre building was reportedly built in the late 1990's to early 2000's and as a result, existing areas AC200-209 and AC290 then became a part of the Academic Resource Centre. All other rooms and areas within the study area (except for AC200-209 and AC290) were constructed when the Academic Resource Centre was built. Based on the construction date, all areas of the Academic Resource Centre building that were build are not expected to contain ACMs.

A copy of the asbestos laboratory Certificate of Analysis is provided in Appendix C. Selected photographs of building materials sampled for asbestos is included in Appendix E, and a Site plan showing approximate sample locations is provided in Appendix F.

Throughout the assessment multiple concealed locations, including wall cavities and the ceiling spaces, were investigated for the presence of hazardous materials, either via pre-existing openings or intrusive investigation, which involved creating access ports into solid surfaces. Although the investigation was thorough, it may still fail to detect all hidden or concealed materials, as conditions may differ from those areas tested and intrusively assessed. Any materials found in these spaces that have not been identified should be considered asbestos containing until proven otherwise.

4.2 Lead-Containing Materials

Site Assessment Results and Findings

Nine bulk samples were collected of the most prominent paints identified within the areas surveyed and submitted for analysis of lead content. Based on the laboratory Certificate of Analysis, the following paints were determined to be lead-containing:

- White paint (Sample LS-01) collected from vertical pipes and columns in AC290 was found to contain **0.019% lead** by weight;
- Black paint (Sample LS-07) collected from drywall walls and metal faces on heaters in AC390M was found to contain **0.049% lead** by weight

The following paints were determined to have concentrations of lead below the laboratory detection limit and therefore considered to be non-lead containing:

- Grey paint (LS-02) collected from the floor in AC286A;
- Orange paint (LS-03) collected from drywall walls in AC280;
- Off-white paint (LS-04) collected from drywall walls in AC280;
- Burgundy paint (LS-05) collected from drywall walls in AC280K;
- Epoxy (LS-08) collected from the concrete floor in AC260; and
- White paint (LS-09) collected from the concrete and drywall walls in AC390.

Lead is presumed to be present within the surface coatings on the steel structural supports, and in the solder of domestic copper water pipes. Lead is not suspected to be present in the batteries of emergency lighting. Emergency lighting was noted to contain nickel-cadmium batteries.

A copy of the laboratory Certificates of Analysis for lead is provided in Appendix D. Site plans showing sample locations are provided in Appendix F.

4.3 Silica

Silica is suspected to be present in the concrete, drywall, ceiling tiles and masonry products and materials used to construct and/or finish the Site building.

4.4 Mercury

Mercury vapour is suspected within the fluorescent light tubes throughout the survey area. Materials suspected to contain mercury that are to be disturbed during future renovations should be re-used or recycled. If recycling is not practicable then they must be disposed or recycled as mercury-containing waste in accordance with Ontario Regulation 347/90 *General – Waste Management*, as amended (O. Reg 347/90).

4.5 Mould

Based on Site observations, no visual suspect mould growth or water-damaged materials were observed within the visually accessible areas of the survey area.

5.0 SUMMARY AND RECOMMENDATIONS

5.1 Asbestos-Containing Materials

Through Site investigation, review of historical reports and laboratory analytical testing, asbestos was confirmed to be present in the joint compound associated with the drywall finishes with the window-perimeter walls and 12"x12" beige vinyl floor tiles with brown flecks. Asbestos was previously identified to be present in parging cement on pipe fittings and was noted to be present in select areas of the survey area.

The following recommendations are made in accordance with the requirements of the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05):

- Joint compound associated with drywall perimeter wall finishes enclosing windows in AC390(A, B, and M) were observed to be in good condition and can be managed in place. If the drywall finishes in this area are to be disturbed during renovation activities, the drywall finishes should be removed prior to renovation disturbance following Type 2 asbestos work procedures as prescribed under O. Reg. 278/05.
- Beige 12"x12" vinyl floor tiles with brown flecks observed in AC284A were noted to be in good condition and can be managed in place. If the floor tiles are to be disturbed during renovation activities, the floor tiles should be removed following Type 1 asbestos work procedures, provided only hand-powered tools and continual misting with amended water are utilized, as prescribed under O. Reg. 278/05.
- Friable parging cement on pipe fittings in the areas observed were noted to be in good condition and can be managed in place. If the parging cement on pipe fittings are to be disturbed during renovation activities, the parging should be removed following Type 2 full enclosure, Type 2 Glove Bag or Type 3 asbestos work procedures as prescribed under O. Reg. 278/05.

Although Golder conducted a thorough investigation of the survey area, it is possible that undiscovered ACMs (e.g., concealed texture coat layers, parging cement at pipe penetrations, duct insulation, packing material within bell and spigot pipe connections, etc.) or other hazardous materials are present within inaccessible locations not investigated (e.g., inside wall cavities, inside contained ceiling ducts). For this reason, suspected ACMs found in these spaces during renovation activities should be tested to determine asbestos content prior to disturbance or presumed to contain asbestos and treated as such. The contractor retained to work on this project should be notified of this limitation and written procedures established in the event ACMs are identified.

The quantities of ACMs as reported are estimates only and may not accurately reflect the exact quantities at the Site. Contractors retained to complete asbestos abatement activities should independently confirm the reported quantities.

5.2 Lead-Containing Materials

Through Site investigation and laboratory analytical testing, the white paint on vertical pipes and columns in AC290 and the black paint on drywall finishes in AC390M were identified to be lead containing. Lead is also suspected in the solder of domestic water lines.

The Regulation Respecting Designated Substances (O. Reg. 490/09) prescribes an occupational exposure limit (OEL) for elemental lead of 0.05 milligrams per cubic meter of air (mg/m³) calculated as an 8 hour/daily and a 40 hour/weekly time-weighted average (TWA) limit. Even though O. Reg. 490/09 does not apply to a construction project, employers still have a general duty and responsibility under Section 25(2)(h) of the *Act* to protect workers.

The potential for worker exposure to lead dust and fumes is dependent on how the materials are to be disturbed. The Ministry of Labour (MOL) Guideline - Lead on Construction Projects (updated April 2011) should be consulted prior to completing any lead disturbance with the objective of evaluating the need for health and safety precautions such as engineering controls, safe work and hygiene practices, personal protective equipment, and training.

5.3 Silica

Silica is a naturally occurring mineral and may be found as common aggregates and sand in concrete products, mortar, brick, drywall, and ceiling tiles, and is present in association with the Site building. The health risk associated with exposure to silica is due primarily to the inhalation of respirable crystalline silica, particularly in the form of dust associated with the abrading or cutting of silica-containing materials.

5.4 Mercury

Mercury vapour is suspected within fluorescent light tubes observed in the assessed area. If mercury-containing lighting is to be disposed of, it should be recycled by an approved mercury recycling facility. If recycling is not practicable, the mercury-containing materials should be disposed of as mercury-containing waste in accordance with O. Reg. 347/90.

If personnel are required to perform operations where silica-containing materials will be disturbed, measures must be taken by the contractor to minimize the generation of dust and to ensure worker health and safety is protected. Specifically, the measures and precautions set out in the MOL document entitled Guideline - Silica on Construction Projects (updated April 2011) should be followed by all personnel when working with suspect silica-containing materials.

6.0 LIMITATIONS

This report was prepared for the exclusive use of University of Toronto Scarborough. The conclusions and recommendations contained in this report are based upon professional opinions with regard to the subject matter. These opinions are in accordance with applicable and currently accepted occupational health and safety or environmental assessment standards and practices applicable to these locations and are subject to the following inherent limitations:

- The data and findings presented in this report are valid as of the date of the investigation. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration at the properties, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report.
- The findings, observations and conclusions expressed by Golder in this report are not, and should not be considered, an opinion concerning compliance of any past or present owner or operator of the Site with any federal, provincial, or local laws or regulations.
- Additional hazardous building materials not identified in this report may become evident during renovation activities. Should additional information become available, Golder requests that this information be brought to our attention so that we may re-assess the conclusions presented herein. All quantities contained in this report are approximate and based on visual observations made in accessible areas.
- Golder will not be responsible for any real or perceived decrease in a property value, its saleability or ability to gain financing through the reporting of information in this report.
- This report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder cannot be responsible for use of portions of the report without reference to the entire report.
- The quantities of identified designated substances noted herein are estimated quantities for reporting purposes, and this report is limited in that regard. In the event that designated substances are scheduled to be removed in the future, it is solely the responsibility of the “contractor” to confirm the exact quantities of designated substances to be removed, prior to their removal.
- Golder’s report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental and occupational health and safety laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental and occupational health and safety laws, rules, regulations, or policies of federal, provincial, or local governmental agencies. Any use of this assessment report constitutes acceptance of the limits of Golder’s liability. Golder’s liability extends only to its client and not to other parties who may obtain this assessment report. Issues raised by the report should be reviewed by appropriate legal counsel.

- Special risks occur whenever engineering or related disciplines are applied to identify Site conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain Site conditions. The conditions that Golder interprets to exist between and beyond investigation and sampling points may differ from those that actually exist.

7.0 CLOSURE

If you have any questions or require any further information, please feel free to contact the undersigned at (905) 723-2727. Thank you for the opportunity to be of service. We look forward to working with you again.

Signature Page

Golder Associates Ltd.



James Kassabian
EHS Specialist



Michael Wilson, B.Sc.
Senior EHS Specialist

JS/MW/ng

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APPENDIX A

Regulations, Standards and Guidelines

REGULATIONS, GUIDELINES AND STANDARDS

Occupational Health and Safety Act

The Occupational Health and Safety Act (the *Act*) prescribes designated substances that may be present within buildings. The intent of the *Act* is to identify the presence of building materials and products that may contain designated substances. Section 30 of the *Act* requires that, prior to beginning a construction project (including building renovation or demolition); a document summarizing the presence of these materials must be available to contractors and subcontractors requesting tenders.

Ontario Regulation 490/09 - Designated Substances, as amended (O. Reg. 490/09), regulates all designated substances in Ontario, with the exception asbestos in building materials, which is prescribed under Ontario Regulation 278/05 - Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations, as amended (O. Reg. 278/05).

Asbestos-Containing Materials

O. Reg. 278/05 prescribes specific procedures for the identification of ACM and protocols for their removal. Under this regulation, if ACM are suspected to be present or ought reasonably to be suspected, locations of the materials must be documented. Prior to a renovation project, a document detailing the presence of all ACM must be available to contractors and subcontractors requesting tenders. All ACM must be removed or managed appropriately prior to any disturbance caused by the renovation process in accordance with provincial regulations.

Ontario Regulation 347/90 - General - Waste Management, as amended (O. Reg. 347/90), made under the *Environmental Protection Act*, prescribes requirements for general waste management including ACM. The regulation defines "asbestos waste" as "solid or liquid waste that results from the removal of asbestos-containing construction or insulation materials or from the manufacture of asbestos-containing products and contains asbestos in more than a trivial amount or proportion". This regulation requires the disposal of asbestos waste in a double sealed container, properly labelled and free of cuts, tears or punctures. The waste must be disposed of in a licensed waste facility which has been properly notified of the presence of asbestos waste.

Lead

Lead was used as a pigment and drying agent in alkyd oil-based paint. The Surface Coating Materials Regulations (SOR/2005-109) made under the *Canada Consumer Product Safety Act* restricts the lead content of paints and other liquid coatings on new furniture, household products, children's products, industrial surfaces and exterior and interior surfaces to 90 mg/kg by weight. The Canadian Paint and Coatings Association (CPCA), the national trade association for Canada's paint manufacturers recommended that the Canadian paint industry voluntarily stop using any lead compounds in consumer paints by the end of 1990. Over the years, the amount of lead in paint has continued to decrease, due to the co-operative efforts of government and industry.

O. Reg. 490/09 prescribes requirements relating to protocols for lead-containing materials in the workplace, where lead is present, produced, used, handled, or stored and at which the worker is likely to inhale, ingest, or absorb lead. However, O. Reg. 490/09 does not apply to construction projects. Nevertheless, the constructor and employers on construction projects have a duty to take all reasonable precautions to ensure that no worker is unacceptably exposed to airborne lead.

If operations that will likely produce airborne lead dust or fumes (e.g., during welding, torch cutting, sanding and sand blasting) are to occur during building renovation or construction, it is recommended that the disturbance of lead paint be carried out in accordance with procedures outlined in the Ontario Ministry of Labour (MOL) Guideline - Lead on Construction Projects dated September 2004 (revised April 2011).

The MOL currently does not promulgate a minimum defining threshold for lead-containing paint or other materials and allows for no minimum concentration of lead in paint, coatings and glazings to be acceptable as non-lead containing. Therefore, in these circumstances, Golder considers all paints, coatings or glazings with any detectable presence of lead as lead-containing. The accepted laboratory testing methods for determination of lead in paint is either atomic absorption spectroscopy (AAS) or inductively coupled plasma spectroscopy (ICP).

Mercury

Mercury is regulated under O. Reg. 490/09, which prescribes occupational exposure limits (OELs) and other requirements for engineering controls, work practices and hygiene practices and facilities for workers who may become exposed to mercury.

Silica

Silica is a naturally occurring mineral and may be found in common aggregates and sand in concrete, mortar, brick, plaster, drywall, and ceiling tiles. Silica is present in the concrete and mortar used to construct the Site. The health risks associated with exposure to silica is due primarily to the inhalation of respirable crystalline silica, particularly in the form of dust associated with the abrading or cutting of silica containing materials.

Silica is regulated under O. Reg. 490/09. This regulation prescribes OELs and requirements surrounding engineering controls, work practices and hygiene practices and facilities to protect workers who may be potentially exposed to crystalline silica. As prescribed under O. Reg. 490/09, an employer shall take all reasonable precautions to prevent worker exposure to silica. Procedures for workers involved in construction/renovation activities occurring on a Site where silica is disturbed are outlined in the MOL Guideline - Silica on Construction Projects dated September 2004 (revised April 2011).

Mould

There is no specific regulation in Ontario addressing mould contamination. However, according to Health Canada and the Environmental Abatement Council of Ontario (EACO) guidelines on assessment and remediation of fungi in indoor environments, building materials supporting mould growth should be remediated as rapidly as possible in order to ensure a healthy environment. Remediation of mould growth is based on an approximation of the extent of visible mould growth including the estimated extent of any hidden mould growth. The EACO guideline describes three levels of work practice; Small- Level 1, Medium- Level 2 and Large- Level 3. The thresholds between Small and Medium (1 m² or 10 sq. ft.) and between Medium and Large project areas (10 m² or 100 sq. ft.) are guidelines only and are subject to professional judgment. Repair of the defects that led to water accumulation should be conducted in conjunction with or prior to the remediation.

The basic principles of proper water damage restoration practice and mould remediation procedures to be followed, and the precautions to be observed, are described in the Standards for Professional Water Damage Restoration S500-2015 and Reference Guide for Professional Mould Remediation Restoration S520-2015, issued by Institute of Inspection, Cleaning and Restoration Certification (IICRC).

Other Hazardous Materials

Other hazardous materials include acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. None of these substances were expected to be present as significant constituents of the building materials and architectural finishes and, as such, no specific observations or sampling of materials potentially containing these substances was included as part of this survey and will not be discussed further in this document.

APPENDIX B

Methodology

METHODOLOGY

The Site was assessed for suspected asbestos-containing materials (ACM), lead-containing paint (LCP), mercury in thermostats and pressure sensing devices, ozone depleting substances (ODSs) in items or systems such as refrigerators and air conditioning units, and polychlorinated biphenyls (PCBs) in fluorescent light ballasts. Silica will be present in common aggregates, concrete, mortar, and brick, as outlined below.

Asbestos-Containing Materials

Readily available information was gathered regarding the building including age, type of structure, presence of renovated areas or additions, and any details regarding the building mechanical systems. The building systems reviewed as part of this investigation included mechanical systems, structural components, and architectural finishes and materials.

The areas surveyed were visually assessed on an area-by-area basis in order to identify the locations of confirmed and potential ACM. Bulk samples were collected of materials suspected of containing asbestos for confirmation purposes.

Homogeneous materials sampling was utilized during the course of the investigation on materials that were uniform in colour, texture, and installation or construction date. As per Table 1 of O. Reg. 278/05, three or seven samples per homogeneous material were collected and submitted to EMSL Canada, Inc. (EMSL) of Mississauga for analysis to determine asbestos type and percentage content, in accordance with U.S. Environmental Protection Agency (USEPA) Method EPA/600/R-93/116, as prescribed under O. Reg. 278/05.

Lead

Systematic sampling and visual identification of suspected LCP were completed as part of the survey. Samples of suspected LCP were collected and submitted to EMSL for analysis in accordance with USEPA SW 846 Method 7000B where each sample is digested, diluted and analyzed by flame atomic absorption spectroscopy (FAAS).

An inventory was made of the other known or suspected lead-containing materials (e.g., batteries for emergency lights) based on visual observations, where observed.

Mercury

A review of potential mercury-containing equipment installed at the Site was completed as part of the survey, such that any mercury-containing switches, thermostats (switch bulbs) and pressure-sensing devices were noted, if observed. Elemental mercury may be present in thermostats and trace amounts of mercury vapour may be present in metal halide light bulbs and fluorescent light tubes.

Silica

Silica is a naturally occurring mineral and is found in aggregates and sand used in the formulation of concrete, plaster, mortar, and brick. The health risk associated from exposure to silica is primarily due to the inhalation of respirable crystalline silica, particularly in the form of dust associated with the abrading or cutting of silica-containing materials.

Mould

The visual assessment included a review of readily accessible areas at the Site, which included floors, walls, and ceilings for evidence for obvious or suspect mould growth on building materials.

APPENDIX C

**Laboratory Certificates of Analysis -
Asbestos**

Laboratory Analysis Report

To:

James Kassabian
Golder Associates Ltd.
100 Scotia Court
Whitby, Ontario
L1N 8Y6

EMC LAB REPORT NUMBER: A71461

Job/Project Name: DSS_UTSC_ARC library & IITS

Analysis Method: Polarized Light Microscopy – EPA 600

Date Received: Aug 9/21

Date Analyzed: Aug 11/21

Analyst: Chengming Li

Reviewed By: Malgorzata Sybydlo, *Laboratory Manager*

Job No: 21482724 (1000)

Number of Samples: 49

Date Reported: Aug 11/21

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
DJC-01a	A71461-1	Drywall joint compound – AC290	White and off white, joint compound	ND			100
DJC-01b	A71461-2	Drywall joint compound – AC290	Off white, joint compound	ND			100
DJC-01c	A71461-3	Drywall joint compound – AC290	Off white, joint compound	ND			100
DJC-01d	A71461-4	Drywall joint compound – AC290	White, joint compound	ND			100
DJC-01e	A71461-5	Drywall joint compound – AC290	White, joint compound	ND			100
DJC-02a	A71461-6	Drywall joint compound – AC280-288	White, joint compound	ND			100
DJC-02b	A71461-7	Drywall joint compound – AC280-288	White and off white, joint compound	ND			100
DJC-02c	A71461-8	Drywall joint compound – AC280-288	White, joint compound	ND			100
DJC-02d	A71461-9	Drywall joint compound – AC280-288	White, joint compound	ND			100
DJC-02e	A71461-10	Drywall joint compound – AC280-288	Off white, joint compound	ND			100
DJC-03a	A71461-11	Drywall joint compound – AC270	White and off white, joint compound	ND			100
DJC-03b	A71461-12	Drywall joint compound – AC270	White, joint compound	ND			100
DJC-03c	A71461-13	Drywall joint compound – AC270	White, joint compound	ND			100

EMC Scientific Inc. 5800 Ambler Drive • Suite 100 • Mississauga • Ontario • L4W 4J4 • T. 905 629 9247 • F. 905 629 2607

EMC Scientific Inc. is Accredited by NVLAP (NVLAP Code 201020-0) for Bulk Asbestos Analysis

EMC LAB REPORT NUMBER: A71461
Client's Job/Project Name/No.: 21482724 (1000)
Analyst: Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
DJC-04a	A71461-14	Drywall joint compound – AC276-280K	White, joint compound	ND			100
DJC-04b	A71461-15	Drywall joint compound – AC276-280K	White, joint compound	ND			100
DJC-04c	A71461-16	Drywall joint compound – AC276-280K	White, joint compound	ND			100
DJC-05a	A71461-17	Drywall joint compound – AC390	2 Phases: a) Off white, joint compound b) Beige, joint compound	ND Chrysotile	1		100 99
DJC-05b	A71461-18	Drywall joint compound – AC390	2 Phases: a) Off white, joint compound b) Beige, joint compound	ND Chrysotile	1		100 99
DJC-05c	A71461-19	Drywall joint compound – AC390	Beige, joint compound	Chrysotile	1		99
DJC-06a	A71461-20	Drywall joint compound – AC200-209	White, joint compound	ND			100
DJC-06b	A71461-21	Drywall joint compound – AC200-209	White, joint compound	ND			100
DJC-06c	A71461-22	Drywall joint compound – AC200-209	White, joint compound	ND			100
DJC-07a	A71461-23	Drywall joint compound – AC309	White, joint compound	ND			100
DJC-07b	A71461-24	Drywall joint compound – AC309	White, joint compound	ND			100
DJC-07c	A71461-25	Drywall joint compound – AC309	White, joint compound	ND			100
VSF-01a	A71461-26	Blue/green vinyl sheet flooring – AC277	2 Phases: a) Green, vinyl flooring	ND			100

EMC LAB REPORT NUMBER: A71461
Client's Job/Project Name/No.: 21482724 (1000)
Analyst: Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
			b) Yellow, mastic	ND			100
VSF-01b	A71461-27	Blue/green vinyl sheet flooring – AC277	2 Phases: a) Green, vinyl flooring b) Yellow, mastic	ND ND			100 100
VSF-01c	A71461-28	Blue/green vinyl sheet flooring – AC277	2 Phases: a) Green, vinyl flooring b) Yellow, mastic	ND ND			100 100
VFT-01a	A71461-29	12"x12" beige VFT with brown flecks – AC2284A	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	Chrysotile ND	1		99 100
VFT-01b	A71461-30	12"x12" beige VFT with brown flecks – AC2284A	2 Phases: a) NA b) Black, mastic	NA ND			100
VFT-01c	A71461-31	12"x12" beige VFT with brown flecks – AC2284A	2 Phases: a) NA b) Black, mastic	NA ND			100
BM-01a	A71461-32	Baseboard mastic – AC290	Brown, mastic	ND			100
BM-01b	A71461-33	Baseboard mastic – AC290	Brown, mastic	ND			100
BM-01c	A71461-34	Baseboard mastic – AC290	Brown, mastic	ND			100
BM-02a	A71461-35	Baseboard mastic – AC201-206	2 Phases: a) Brown, mastic b) Off white, joint compound	ND ND			100 100
BM-02b	A71461-36	Baseboard mastic – AC201-206	2 Phases: a) Brown, mastic	ND			100

EMC LAB REPORT NUMBER: A71461
Client's Job/Project Name/No.: 21482724 (1000)
Analyst: Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
			b) Off white, joint compound	ND			100
BM-02c	A71461-37	Baseboard mastic – AC201-206	Brown, mastic	ND			100
CM-01a	A71461-38	Carpet mastic – AC270-288	Brown, mastic	ND			100
CM-01b	A71461-39	Carpet mastic – AC270-288	Brown, mastic	ND			100
CM-01c	A71461-40	Carpet mastic – AC270-288	Brown, mastic	ND			100
CLK-01a	A71461-41	Grey caulking around interior windows – AC390	Grey, caulking	ND			100
CLK-01b	A71461-42	Grey caulking around interior windows – AC390	Grey, caulking	ND			100
CLK-01c	A71461-43	Grey caulking around interior windows – AC390	Grey, caulking	ND			100
CLK-02a	A71461-44	Light grey caulking along floor to concrete block wall – AC390	Beige, caulking	ND			100
CLK-02b	A71461-45	Light grey caulking along floor to concrete block wall – AC390	Beige, caulking	ND			100
CLK-02c	A71461-46	Light grey caulking along floor to concrete block wall – AC390	Beige, caulking	ND			100
CLK-03a	A71461-47	Red firestop caulking around floor penetrations – AC390A	Red, caulking	ND		1	99
CLK-03b	A71461-48	Red firestop caulking around floor penetrations – AC390A	Red, caulking	ND		1	99
CLK-03c	A71461-49	Red firestop caulking around floor penetrations – AC390A	Red, caulking	ND		1	99

EMC LAB REPORT NUMBER: A71461
Client's Job/Project Name/No.: 21482724 (1000)
Analyst: Chengming Li

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).
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%.

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 552112842

CustomerID: 55GOLA62

CustomerPO: 2482724

ProjectID:

Attn: **James Kassabian**
Golder Associates, Ltd.
100 Scotia Court
Whitby, ON L1N 8Y6

Phone: (905) 723-2727
Fax: (905) 723-2182
Received: 8/9/2021 09:16 AM
Collected:

Project: **2482724****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
LS-01			8/9/2021	0.2448 g	0.0082 % wt	0.019 % wt
552112842-0001	Site: White paint on vertical pipes & columns - AC290					
LS-02			8/9/2021	0.2485 g	0.0080 % wt	<0.0080 % wt
552112842-0002	Site: Grey floor paint - AC286A					
LS-03			8/9/2021	0.2365 g	0.0085 % wt	<0.0085 % wt
552112842-0003	Site: Orange paint on drywall walls - AC280					
LS-04			8/9/2021	0.2479 g	0.0081 % wt	<0.0081 % wt
552112842-0004	Site: Off-white paint on drywall walls - AC280					
LS-05			8/9/2021	0.2449 g	0.0082 % wt	<0.0082 % wt
552112842-0005	Site: Burgundy paint on drywall walls - AC280K					
LS-06			8/9/2021	0.2069 g	0.0097 % wt	<0.0097 % wt
552112842-0006	Site: Beige paint on drywall walls & metal faces on heater - AC390A Insufficient sample to reach reporting limit.					
LS-07			8/9/2021	0.2464 g	0.0081 % wt	0.049 % wt
552112842-0007	Site: Black paint on drywall walls & metal faces on heaters - AC390M					
LS-08			8/9/2021	0.2496 g	0.0080 % wt	<0.0080 % wt
552112842-0008	Site: Epoxy on concrete floors - throughout library					
LS-09			8/9/2021	0.2487 g	0.0080 % wt	<0.0080 % wt
552112842-0009	Site: White paint on concrete & drywall walls - AC390					

Rowena Fanto, Lead Supervisor
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. 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. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

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. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

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

Initial report from 08/11/2021 08:54:33

APPENDIX E

Selected Photographs

APPENDIX E - Photographs

Bladen Wing and Academic Resource Centre – University of
Toronto Scarborough, 1265 Military Trail, Scarborough, Ontario

August 13, 2021

21464249 (1000)

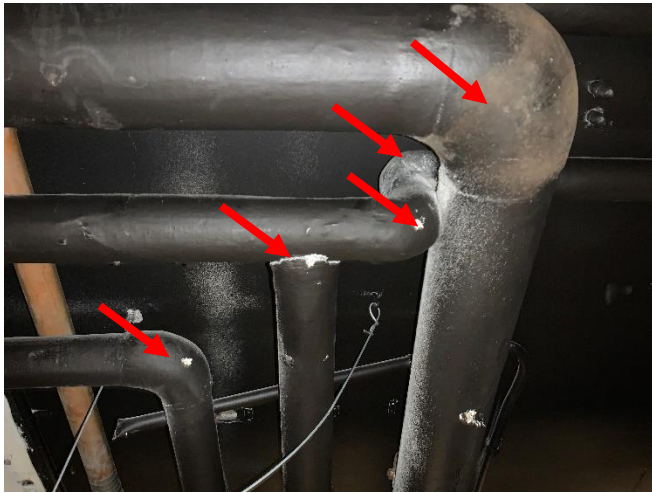


PHOTO 1

Typical view of asbestos containing parging cement on pipe fittings (see arrows) present in the ceiling space of ARC290.



PHOTO 2

View of asbestos containing 12"x12" beige vinyl floor tiles with brown flecks (see arrow) present in AC284A.

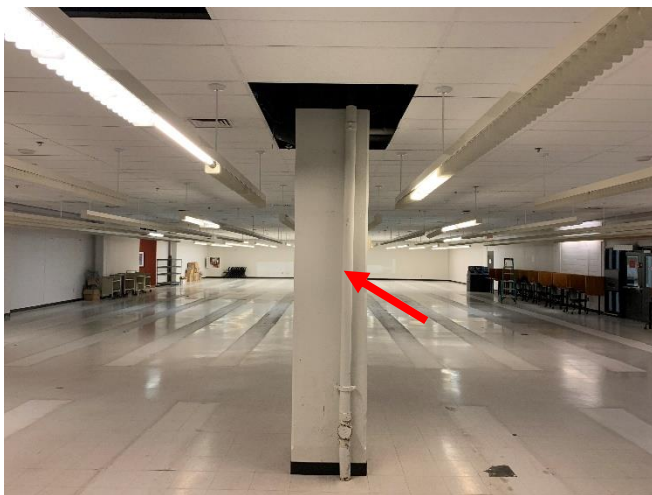


PHOTO 3

View of lead containing white paint (see arrow) present on vertical pipes, columns and walls in AC290.



PHOTO 4

View of both the lead containing black paint and drywall finishes (see arrow) with associated asbestos containing joint compound present in AC390M.

APPENDIX E - Photographs

Bladen Wing and Academic Resource Centre – University of
Toronto Scarborough, 1265 Military Trail, Scarborough, Ontario

August 13, 2021

21464249 (1000)

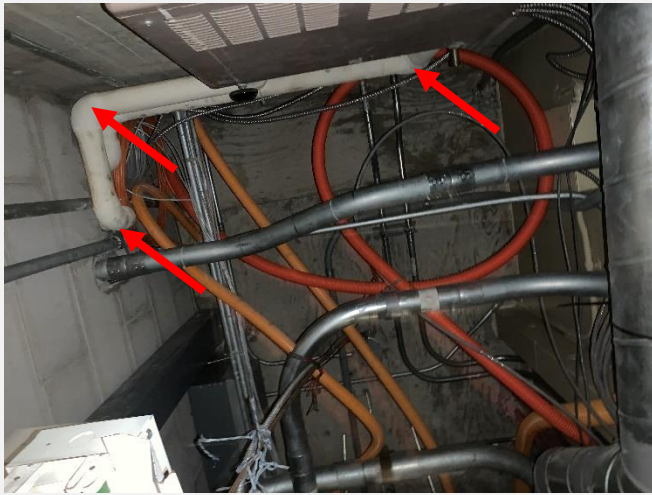


PHOTO 5

View of parging cement on pipe fittings (see arrows) present in AC284A.

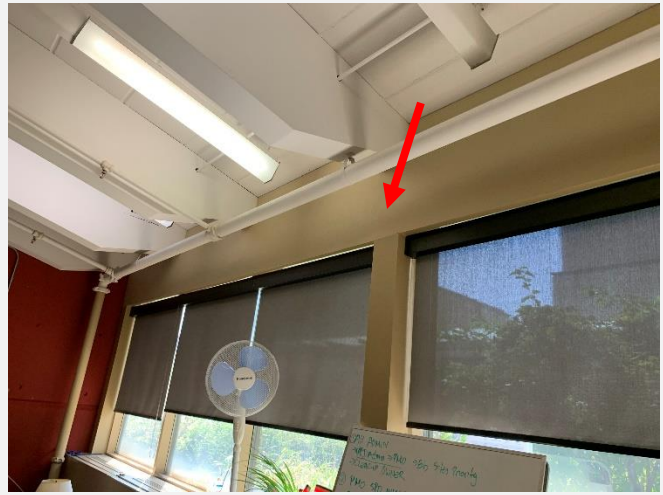


PHOTO 6

View of the drywall finishes (see arrow) with associated asbestos containing joint compound present in AC390B.

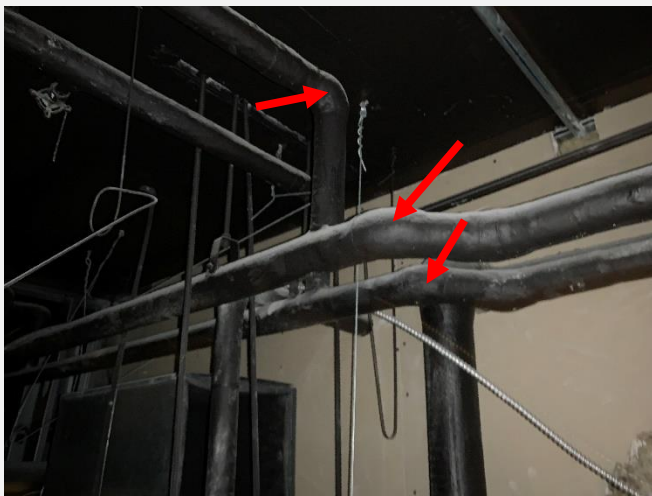


PHOTO 7

Typical view of asbestos containing parging cement on pipe fittings (see arrows) present above the lay-in ceiling tiles in AC205

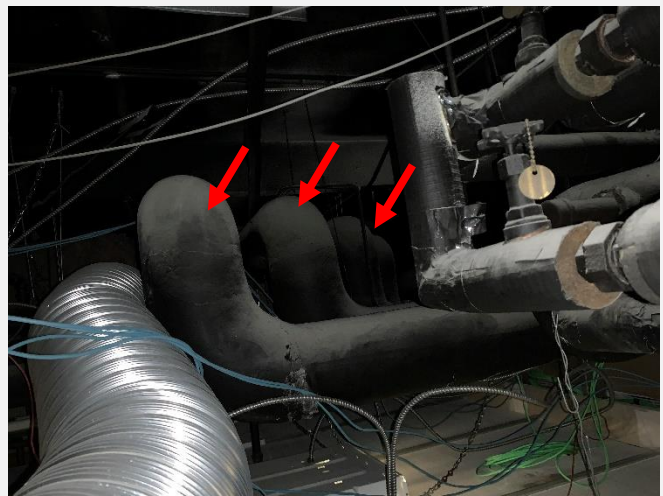
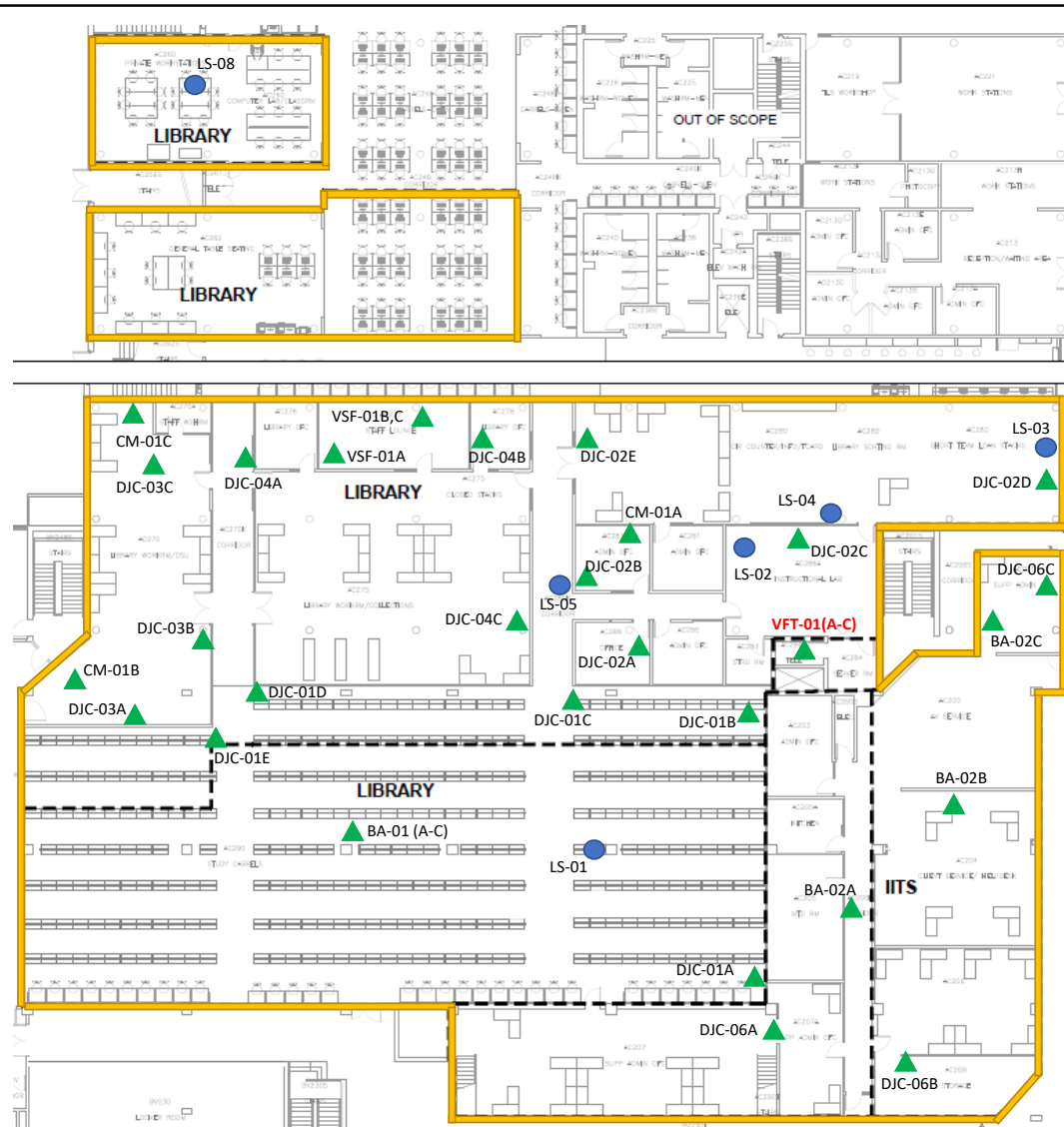


PHOTO 8

Typical view of asbestos containing parging cement on pipe fittings (see arrows) present above the lay-in ceiling tiles in AC205A

APPENDIX F

Sample Locations



LEGEND

- ▲ APPROXIMATE ASBESTOS BULK SAMPLE LOCATION
- APPROXIMATE LEAD BULK SAMPLE LOCATION
- EXTENT OF ASSESSED AREA

SAMPLE LEGEND:

ASBESTOS SAMPLE DESCRIPTION

- DJC-01 (A – E) – DRYWALL JOINT COMPOUND
- DJC-02 (A – E) – DRYWALL JOINT COMPOUND
- DJC-03 (A – C) – DRYWALL JOINT COMPOUND
- DJC-04 (A – C) – DRYWALL JOINT COMPOUND
- DJC-06 (A – C) – DRYWALL JOINT COMPOUND
- VFT-01 (A – C) – 12"X12" VINYL FLOOR TILES**
- VSF-01 (A – C) – VINYL SHEET FLOORING
- CM-01 (A – C) – CARPET MASTIC
- BM-01 (A – C) – BASEBOARD MASTIC
- BM-02 (A – C) – BASEBOARD MASTIC

LEAD SAMPLE DESCRIPTION

- LS-01 – WHITE PAINT
- LS-02 – GREY PAINT
- LS-03 – ORANGE PAINT
- LS-04 – OFF-WHITE PAINT
- LS-05 – BURGUNDY PAINT
- LS-08 – EPOXY PAINT

NOTES:

- NOT TO SCALE.
- DRAWINGS TO BE READ IN CONJUNCTION WITH REPORT.

REFERENCE

- BASE PLAN PROVIDED BY CLIENT

CLIENT: ANDREW BERNAUS

CONSULTANT



YYYY-MM-DD 2021-08-06

PREPARED JK

DESIGNED JK

REVIEWED MW

APPROVED MW

DESIGNATED SUBSTANCES & HAZARDOUS MATERIAL SURVEY
UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS
1265 MILITARY TRAIL, SCARBOROUGH, ONTARIO

TITLE

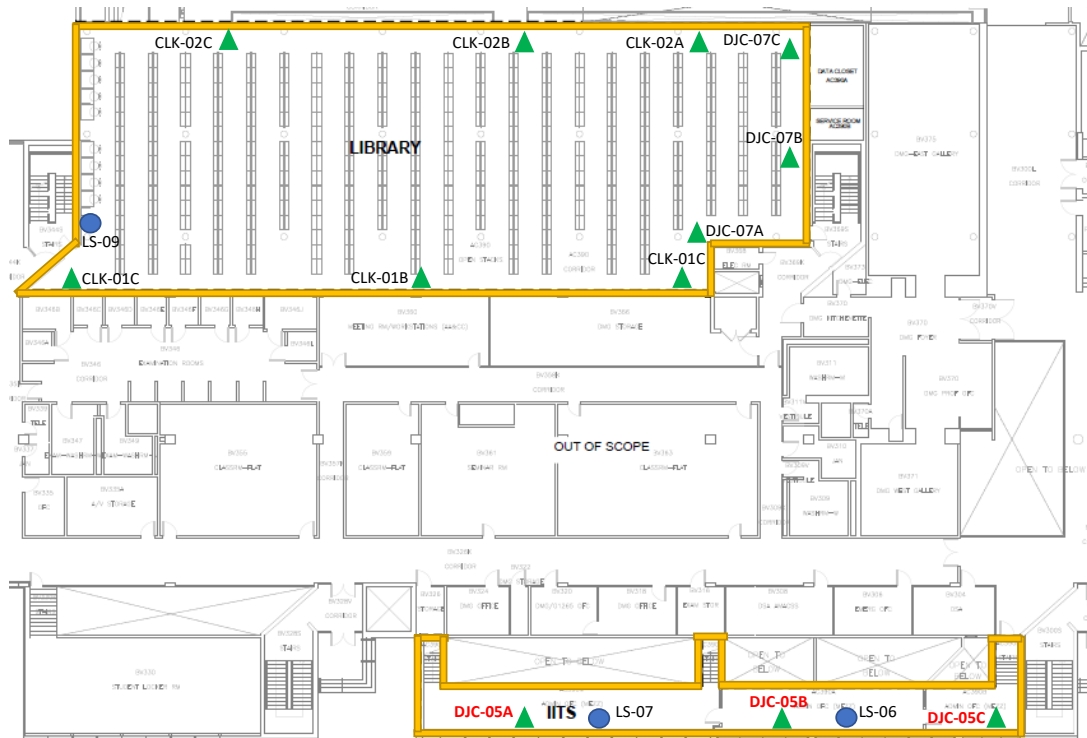
SELECT AREAS IN LIBRARY AND IITS, ACADEMIC RESOURCES CENTRE &
FORMER BLADEN WING, 2ND FLOOR - SAMPLE LOCATION PLAN

PROJECT NO.
21482724

PHASE
1000

REV.
-

FIGURE
1



LEGEND

- APPROXIMATE ASBESTOS BULK SAMPLE LOCATION
- APPROXIMATE LEAD BULK SAMPLE LOCATION
- EXTENT OF ASSESSED AREA

SAMPLE LEGEND:

ASBESTOS SAMPLE DESCRIPTION

- DJC-05 (A - C) - DRYWALL JOINT COMPOUND**
- DJC-07 (A - C) - DRYWALL JOINT COMPOUND
- CLK-01 (A - C) - WINDOW CAULKING
- CLK-02 (A - C) - FLOOR/WALL CAULKING

LEAD SAMPLE DESCRIPTION

- LS-06 - BEIGE PAINT
- LS-07 - BLACK PAINT
- LS-09 - WHITE PAINT

NOTES:

1. NOT TO SCALE.
2. DRAWINGS TO BE READ IN CONJUNCTION WITH REPORT.

REFERENCE

1. BASE PLAN PROVIDED BY CLIENT.

CLIENT: DENNIS COLE

CONSULTANT



YYYY-MM-DD 2021-08-06

PREPARED JK

DESIGNED JK

REVIEWED MW

APPROVED MW

ASBESTOS BULK SAMPLING
UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS
1265 MILITARY TRAIL, SCARBOROUGH, ONTARIO

TITLE

**SELECT AREAS IN LIBRARY AND IITS, ACADEMIC RESOURCES CENTRE &
FORMER BLADEN WING, 3RD FLOOR - SAMPLE LOCATION PLAN**

PROJECT NO.
21482724

PHASE
1000

REV.
-

FIGURE
2



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