# DESIGNATED SUBSTANCE AND HAZARDOUS MATERIALS ASSESSMENT

# BUILDING NO.: 17

**200 University Avenue West,**
**Waterloo, Ontario**

**Issued: June 21st, 2016**

***Prepared for:***
**Ms. Kate Windsor, *Director***
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## EXECUTIVE SUMMARY

Safetech Environmental Limited (SEL) was retained by the University of Waterloo (UW) Safety Office to conduct a designated substances and hazardous building materials assessment within the Mathematics and Computers Building (i.e. Building 17) located on the Waterloo Campus at 200 University Avenue West in Waterloo, Ontario.

The objective of our assessment was to determine and/or verify the presence, location, condition and approximate quantities of designated substances (as defined under Section 30 of the Occupational Health and Safety Act RSO 1990 c. 0.1) and other specific hazardous materials within the building that may be impacted by future work. As part of the assessment, asbestos-containing materials were re-assessed and/or verified present based on available documentation for on-going management by UW in accordance with Ontario Regulation 278/05. Samples of suspect building materials were collected where necessary to verify asbestos content by laboratory analysis.

Information contained within the University's existing Asbestos Management Database was verified and updated accordingly based on our findings, which are presented in this technical report. The database is designed to be an on-going management document and should be referenced prior to conducting any work as an initial step towards determining the presence of asbestos-containing materials. The Asbestos Management Database is managed by the University of Waterloo Safety Office.

The following types of Designated Substances and Hazardous Materials are confirmed and/or suspected present within the Mathematics and Computers Building. Assessment results and specific recommendations based on our findings are provided in Section 3 (page 9). Refer to the University's Asbestos Management Database for a detailed room-by-room inventory of building materials and conditions.

- Asbestos (friable and non-friable)
- Silica
- Lead
- Mercury
- PCBs
- Ozone Depleting Substances

Refer to the "*2015/2016 Hazardous Building Materials Cover Report" f*or additional details including, but not limited to:

- Detailed Scope of Assessment
- Survey and Sampling Methodology
- General Recommendations
- Material Condition Assessment Criteria
- Background Information
- Limitations of the Assessment

June 21st, 2016

**University of Waterloo**
Safety Office – Commissary Building
200 University Avenue West
Waterloo, Ontario N2L 3G1

**Attention: Ms. Kate Windsor,**
*Director, Safety Office*

**RE: Designated Substance and Hazardous Materials Assessment**
**Mathematics and Computers Building - BUILDING NO.: 17**
**200 University Avenue West, Waterloo, Ontario (Site)**

## 1.0 INTRODUCTION

### 1.1 Background and Objectives

On August 20th, 21st and 28th, 2015, and on September 3rd, 11th and 15th, 2015, personnel from Safetech Environmental Limited (SEL) performed an assessment for designated substances and hazardous building materials within the Mathematics and Computers building (i.e. **Building 17**) located on the Waterloo Campus at 200 University Avenue West in Waterloo, Ontario, to determine and/or verify the presence, approximate quantities, forms, and conditions of designated substances and hazardous materials present.

The survey included a review of all accessible areas of the building for the presence and extent of designated substances and hazardous building materials, which excluded rooms 1026A, 1058, 1088B, 2023, 4043, 6334, 6334A, 6334B and 6482A due to the spaces being occupied by ongoing research/classes and/or limited key access. An assessment of the building exterior was not performed as it was outside of the scope of the survey. A limited intrusive investigation was performed; however, no destructive inspection methods were conducted for the purpose of this investigation. Bulk samples were collected from building materials that were suspected of containing asbestos and paint scrapings were collected from various painted surfaces to determine lead content. Ceilings were accessed by lifting existing ceiling tiles or through existing hatches in solid ceilings. Wall cavities were accessed in select locations where access hatches were installed and no materials were physically removed (or damaged) to view conditions behind.

Under Section 30 of the Occupational Health and Safety Act RSO 1990 c. 0.1, a building owner must determine if there are any hazardous materials on site prior to any construction or demolition activity (including renovations or building alterations). Hazardous materials or "designated substances" are a list of eleven organic and inorganic contaminants defined in the Act. The building owner must provide a complete and comprehensive list of all designated substances present on site to contractors and subcontractors during the bidding process. An owner who fails to comply with Section 30 is liable to the constructor and every contractor and subcontractor who suffers any loss or damages due to non-compliance.

Identification of suspect building materials was performed by conducting appropriate laboratory analysis of bulk samples of suspect material. Other designated substances such as mercury or silica, if present, were identified by observation only. Individual assessments were made to identify designated substances and their condition and requirements for special treatment such as control programs or specialized removal and disposal techniques. In conjunction with the survey for designated substances, the presence of polychlorinated biphenyl's (PCBs) in fluorescent light fixture ballasts, ozone depleting substances, and other potentially hazardous materials associated with the building were noted.

This report documents findings of our on-site inspections related to Building No.: 17. Sampling was carried out only for those compounds that were known to be present or those deemed to have a likely source of origin in the area under study. Survey Methodologies carried out for the investigation are outlined within the cover report Titled "*2015/2016 Hazardous Building Materials Cover Report"*, dated May 27th, 2016.

## 1.2 Building Description

The building includes a total of eight (8) floor levels which includes basement and penthouse mechanical areas. The building encompasses approximately 302,000 ft² of floor space, and was originally built in 1967.

As per the MTE Asbestos Abatement Summary report dated April 19th, 2013 (which has been included in Appendix D), it is understanding that a large scale abatement occurred throughout the sixth (6th) floor level in 2013 in advance of planned renovation activities. As reported by MTE Consultants, the following removals were included in the scope of work:

- Type 3 abatement of asbestos-containing ceiling tiles, floor tiles and parging cement on mechanical pipe fittings throughout the sixth floor level. This was completed in three (3) separate phases in areas which are illustrated in the summary report they have provided in Appendix D.
- Type 1 abatement of asbestos-containing floor tile mastic materials throughout the sixth floor level.

Details regarding the extent of the abatement work (i.e. corridors/rooms that were abated) can be found in the attached report in Appendix D.

As a prudent measure, SEL investigated the areas which were included as part of the abatement scope of work. While the majority of asbestos-containing materials were verified removed during our reassessment survey, we identified remaining quantities of the aforementioned materials in multiple locations throughout the sixth floor. Additional quantities of asbestos-containing pipe insulation materials (i.e. parging cement on pipe fittings) are also suspected present in concealed locations such as wall/ceiling cavities throughout the sixth floor. Details regarding the locations and approximate quantities of asbestos-containing materials (which were visually accessible) are indicated in the Asbestos Management Database, which is provided as a separate Microsoft Excel document. This document also provides a comprehensive list of building finishes which were identified throughout the Math and Computer building.

Additionally, SEL conducted a bulk sampling event on February 19th, 2016, in relation to materials which may be impacted by future light replacement work within theatre rooms 2065 and 2066. Details of this sampling event can be found in the attached email inspection report in Appendix E. Samples retrieved on February 19th, 2016, are summarized in Table 3.

### 1.3 Past Asbestos Sampling (Historical Data)

While the information we were provided included laboratory certificates from previous sampling events conducted by other consulting firms, details regarding the sampling locations and methodology were not provided. As such, these laboratory certificates have been excluded from our report.

Past sampling performed by MTE Consultants as part of the 2011 Asbestos Audit Update was also referenced during this assessment. Unfortunately a number of sample locations and material types could not be verified. As such, the following sample(s) were included in this assessment and all other sample locations were re-sampled in order to verify site conditions.

**TABLE 1**
**MTE 2011 Designated Substance and Hazardous Building Materials Survey Report**
**Bulk Sample Analytical Results for Determination of Asbestos Content**
**Mathematics and Computers Building, Building No.: 17**

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| **33293-MC-S01** | **External parging insulation on tank** | **Mechanical/ Electrical Room 002** | **70% Chryostile** | **ACM** |
| 33293-MC-S02 | Textured ceiling plaster | Stairwell 001 | None Detected | Non-ACM |

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| **33293-MC-S03** | **12”x12” vinyl floor tiles – brown with white** | **Classroom 1056** | **2.4% Chrysotile** | **ACM** |
| **33293-MC-S04** | **2’x4’ ceiling tiles – long lengthwise wavy fissure, pinhole** | **Office 1074** | **0.5% Chrysotile** | **ACM** |
| **33293-MC-S05** | **Vinyl rolled flooring – tan and yellow, small square** | **Hall 1082** | **20% Chrysotile** | **ACM** |
| 33293-MC-S06 | 2’x’4’ ceiling tiles – thick fissure, random pinhole | Office 1020 | None Detected | Non-ACM |
| 33293-MC-S07 | 12”x12” vinyl floor tiles – blue oatmeal | Office 1059A | None Detected | Non-ACM |
| 33293-MC-S08 | 12”x12” vinyl floor tiles – grey with grey oatmeal | Office 1059 | None Detected | Non-ACM |
| 33293-MC-S09 | 12”x12” vinyl floor tiles – grey with brown streak | Information not provided | None Detected | Non-ACM |
| 33293-MC-S10 | 2’x4’ ceiling tiles – wide fissure, random pinhole | A/V Storage Room 1063 | None Detected | Non-ACM |
| **33293-MC-S11** | **12”x12” vinyl floor tiles – brown with white** | **Repair Shop 3015A** | **2.7% Chrysotile** | **ACM** |
| 33293-MC-S12 | 12”x12” vinyl floor tiles – white with black streaks | Computer Lab 3006 | None Detected | Non-ACM |
| **33293-MC-S13** | **Texture coat ceiling** | **Student Lounge 3001** | **4.3% Chrysotile** | **ACM** |
| 33293-MC-S14 | 2’x4’ ceiling tiles – random pinhole | Corridor 4125 | None Detected | Non-ACM |
| 33293-MC-S15 | 12”x12” vinyl floor tiles – tan with white and brown streak | Corridor 4125 | None Detected | Non-ACM |
| **33293-MC-S16** | **12”x12” vinyl floor tiles – brown with white streaks** | **Office 2041** | **2.8% Chrysotile** | **ACM** |
| **33293-MC-S17** | **2’x4’ ceiling tiles – lengthwise long fissure, random pinhole** | **Office 2047** | **0.5-0.75% Chrysotile** | **ACM** |

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| **33293-MC-S18** | **12"x12" vinyl floor tiles – taupe with white streaks** | **Office 2057** | **3.2% Chrysotile**<br>**Mastic Layer: 2.3% Chrysotile** | **ACM** |
| 33293-MC-S20 | 2'x4' ceiling tiles – medium fissure, random pinhole | 5136B | None Detected | Non-ACM |

## 2.0 SAMPLING – 2015/2016 REASSESSMENT & UPDATE

### 2.1 Asbestos Sampling

Results of bulk sample analysis for the determination of asbestos content are summarized in Table 1. 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 the *2015/2016 Hazardous Building Materials Cover Report* for additional details. The Laboratory Certificate of Analysis is included in Appendix A.

**TABLE 2**
**Bulk Sample Analytical Results for Determination of Asbestos Content**
**Mathematics and Computers Building, Building No.: 17**
**Sample Collection Dates: August 20th, 21st, 28th & September 3rd, 11th, 15th, 2015**

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| M8C-S01A | Textured Finish (on concrete) | Custodial Closet 1045 | None Detected | Non-ACM |
| M8C-S01B | | Stairwell 6801 | | |
| M8C-S01C | | Stairwell 7007 | | |
| M8C-S01D | | Corridor 5828 | | |
| M8C-S01E | | Corridor 4102 | | |
| M8C-S01F | | Corridor 3090 | | |
| M8C-S01G | | Men's Washroom 2064 | | |
| M8C-S03A | 12" x 12" vinyl floor tiles – beige oatmeal | Office 1049 | None Detected | Non-ACM |
| M8C-S03B | | | | |
| M8C-S03C | | | | |

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| **M8C-S05** | **Parging cement on mechanical pipe fittings** | **Office 1046** | **70% Chysotile** | **ACM** |
| M8C-S06A | 1'x'1' acoustic sound panel (textured) | Office 1078 | None Detected | Non-ACM |
| M8C-S06B | | | | |
| M8C-S06C | | | | |
| M8C-S07A | 12"x12" vinyl floor tiles – light brown with brown and white | Office 1071 | None Detected | Non-ACM |
| M8C-S07B | | | | |
| M8C-S07C | | | | |
| M8C-S08A | 2'x'4' ceiling tiles – long, thin widthwise fissure, medium pinhole | Office 1060A | None Detected | Non-ACM |
| M8C-S08B | | | | |
| M8C-S08C | | | | |
| **M8C-S09** | **'Magblock' insulation on generator exhaust line** | **Mechanical Chase 1117** | **80% Amosite** | **ACM** |
| M8C-S10A | Rough coat plaster | Electrical Room 0003 | None Detected | Non-ACM |
| M8C-S10B | | | | |
| M8C-S10C | | | | |
| M8C-S12A | 12"x12" vinyl floor tiles – white with thin brown streak | Copy Room 2044 | None Detected | Non-ACM |
| M8C-S12B | | | | |
| M8C-S12C | | | | |
| M8C-S13A | 2'x4' ceiling tiles – long, lengthwise fissure, short fissure, pinhole | Office 2057 | None Detected | Non-ACM |
| M8C-S13B | | | | |
| M8C-S13C | | | | |
| M8C-S14A | 12"x12" vinyl floor tiles – pink, mottled | Theatre Classroom 2065 | None Detected | Non-ACM |
| M8C-S14B | | | | |
| M8C-S14C | | | | |
| M8C-S18A | 12"x12" vinyl floor tiles – beige with blue, green, red and brown | Computer Lab 3010 | None Detected | Non-ACM |
| M8C-S18B | | | | |
| M8C-S18C | | | | |
| M8C-S19A | 12"x12" vinyl floor tiles – grey oatmeal | Computer Lab 3009 | None Detected | Non-ACM |
| M8C-S19B | | | | |
| M8C-S19C | | | | |
| **M8C-S21A** | **2'x'2' ceiling tiles – long, thin, wavy fissure, pinhole** | **Meeting Room 4067** | **0.5% Chrysotile** | **ACM** |
| **M8C-S21B** | | | ***Samples Not Analyzed*** | |
| **M8C-S21C** | | | | |
| M8C-S22A | 2'x4' ceiling tiles – patterned, pinhole | TA Office 4039 | None Detected | Non-ACM |
| M8C-S22B | | | | |
| M8C-S22C | | | | |

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| M8C-S24A | 2'x'4' ceiling tiles – long widthwise fissure, dense pinhole | ONR Research Lab Meeting Room 5023A | None Detected | Non-ACM |
| M8C-S24B | | | | |
| M8C-S24C | | | | |
| M8C-S25A | 12"x12" vinyl floor tiles – peach oatmeal | Meeting Room 5201 | None Detected | Non-ACM |
| M8C-S25B | | | | |
| M8C-S25C | | | | |
| **M8C-S26A** | **Vinyl sheet flooring – brown and black cobblestone pattern** | **Lounge 5511** | **60% Chrysotile (paper backing material)** | **ACM** |
| **M8C-S26B** | | | ***Samples Not Analyzed*** | |
| **M8C-S26C** | | | | |
| M8C-S27A | 2'x2' ceiling tiles – short fissure, pinhole | Vacant Room 6478 | None Detected | Non-ACM |
| M8C-S27B | | | | |
| M8C-S27C | | | | |
| M8C-S28A | Rough coat plaster | Maintenance Room 7006 | None Detected | Non-ACM |
| M8C-S28B | | | | |
| M8C-S28C | | | | |
| **M8C-S29** | **Mechanical pipe gasket debris (on floor)** | **Maintenance Room 7006** | **20% Chrysotile** | **ACM** |

**TABLE 3**
**Bulk Sample Analytical Results for Determination of Asbestos Content**
**Mathematics and Computers Building, Building No.: 17**
**Theatre Rooms 2065, 2066 (Light Replacement Work)**
**Sample Collection Date: February 19th, 2016**

| Sample No. | Material Description | Sample Location | Asbestos Content | Material Classification |
|---|---|---|---|---|
| **28/02/16-MC-S01A** | **Textured Finish (on plaster ceiling)** | **Theatre Room 2065** | **10% Chrysotile** | **ACM** |
| 28/02/16-MC-S01B | | **Theatre Room 2065** | ***Samples Not Analyzed*** | |
| 28/02/16-MC-S01C | | **Theatre Room 2065** | | |
| 28/02/16-MC-S01D | | **Theatre Room 2066** | | |
| 28/02/16-MC-S01E | | **Theatre Room 2066** | | |
| **28/02/16-MC-S02A** | **Debris on ceiling bulkhead surface** | **Theatre Room 2066** | **0.5% Chrysotile Asbestos** | **ACM** |
| 28/02/16-MC-S02B | | | ***Samples Not Analyzed*** | |
| 28/02/16-MC-S02C | | | | |

## 2.2 Lead Paint Sampling

Results of paint sample analysis for the determination of lead content are summarized in Table 2. The Laboratory Certificate of Analysis is included in Appendix A.

**TABLE 3**
**Results of Paint Condition and Lead Content University of Waterloo**
**Mathematics and Computers Building, Building No.: 17**
**Sample Collection Dates: August 20th, 21st, 28th & September 3rd, 11th, 15th, 2015**

| Sample No. | Location | Surface | Paint Colour & Condition | Lead Concentration (µg/g) |
|---|---|---|---|---|
| MRC-L01 | 1001 | Concrete floor | Grey, POOR | 1710 |
| MRC-L02 | 1107 | Concrete wall | Beige, POOR | <5 |
| MRC-L03 | 0003 | Concrete floor | Grey, POOR | 153 |
| MRC-L04 | 4069 | Concrete block wall | Beige, GOOD | <5 |
| MRC-L05 | 7005 | Concrete floor | Grey, POOR | 1450 |

## 3.0 RESULTS & RECOMMENDATIONS – BUILDING NO.: 17

The following is a list which includes observations for any designated substances and/or hazardous materials that were present and/or suspected in the surveyed areas. The survey primarily focused on building materials; however, designated substances may exist within equipment of various operations on-site.

Laboratory Certificates of Analysis detailing results of bulk samples collected during this assessment and previous sampling by others are attached in Appendix A. A photographic log with links to digital photographs of asbestos-containing materials and conditions is provided in Appendix B and are referenced in the table below (i.e. P#). The locations of damaged asbestos-containing materials identified are provided in Appendix C.

It should be noted that samples collected as part of the University's past asbestos survey for this building are referenced in this report. Building materials previously determined to contain asbestos by bulk sample analysis may not have been re-sampled during this assessment and were deemed to contain asbestos based on UW's Asbestos-Containing Building Material Database and Management Program. Where discrepancies with past analytical data existed, additional sampling was performed for verification purposes.

Results of our survey findings are summarized on the following pages.

# ASBESTOS

Asbestos-Containing Materials (ACM) that were identified include:

**Friable Materials:**

**Mechanical Insulation Materials**

- Previously sampled external parging insulation on tank units in Mechanical/Electrical Room 002 (33293-MC-S01, Photograph P1 – Appendix B).
- **‘**Magblock’ mechanical insulation on generator exhaust line (M8C-S09).
- Parging cement on mechanical pipe fittings (M8C-S05, Photograph P2 – Appendix B).

**Surfacing Materials**

- Previously sampled textured finish on plaster ceilings (33293-MC-S13, Photograph P3 – Appendix B).
- Textured finish on plaster ceilings in theatre rooms 2065 and 2066 (28/02/16-MC-S01, Photograph P4 – Appendix B).
- Asbestos-containing textured finish debris on surface of bulkhead in theatre room 2066 (28/02/16-MC-S02, Photograph P5 – Appendix B)

**Non-Friable Materials:**

**Ceiling Tile Materials**

- Previously sampled 2’x4’ ceiling tiles – long lengthwise wavy fissure, pinhole (33293-MC-S04, Photograph P6 – Appendix B).
- Previously sampled 2’x’4’ ceiling tiles – lengthwise long fissure, random pinhole (33293-MC-S17).
- 2’x2’ ceiling tiles – long, thin, wavy fissure, pinhole (M8C-S21, Photograph P7 – Appendix B).

# ASBESTOS (Continued)

Asbestos-Containing Materials (ACM) that were identified include (continued):

**Non-Friable Materials (Continued):**

**Vinyl Flooring Materials**

- Previously sampled rolled vinyl flooring – tan and yellow, small square (33293-MC-S05).
- Vinyl sheet flooring – brown and black cobblestone pattern (M8C-S26, Photograph P8 – Appendix B)
- Previously sampled 12”x12” vinyl floor tiles – brown with white streaks (33293-MC-S03, Photograph P9 – Appendix B).
- Previously sampled 12”x12” vinyl floor tiles – brown with white (33293-MC-S11).
- Previously sampled 12”x12” vinyl floor tiles – brown with white streaks (33293-MC-S16, Photograph P10 – Appendix B).
- Previously sampled 12”x12” vinyl floor tiles – taupe with white streaks (33293-MC-S18).

**Miscellaneous Materials**

- Mechanical pipe gasket debris (on floor) of Maintenance Room 7006 (M8C-S29, Photograph P11 – Appendix C).

## ASBESTOS (Continued)

Additionally, the following building materials are suspected to contain asbestos until proven otherwise by intrusive or destructive testing methods, which shall be completed prior to any building renovation, alteration, equipment removal/replacement, or demolition work). These materials were not sampled due to inaccessibility, safety hazard restriction, or to prevent material damage that would compromise the building structure and/or envelope. All asbestos-suspect building materials are presented below:

- Drywall materials
- Plaster materials (smooth coat and stipple coat)
- Vinyl flooring materials we were unable to sample in a discrete location
- Transite (asbestos-cement) rain water leader piping.
- Roof tar and felt paper (built-up bitumen material)
- Fire door internal insulation materials
- Exterior soffit overhangs
- All exterior and interior caulking materials
- Internal materials within mechanical equipment (boilers, tanks, gaskets, etc.)
- Textile duct connectors and HVAC vibration dampers
- Transite heat deflecting panelling
- Concrete levelling compounds
- Vermiculite masonry block fill
- Bell and spigot gasket inserts within original cast iron drain piping
- Mastics (i.e. adhesives for flooring, baseboards, pressed-on ceiling tiles)
- Arc shields in electrical equipment / switch gear
- Firestop material (between floor and wall penetrations)
- Underground services

No other materials suspected of containing asbestos were identified through bulk sample analysis or visual confirmation as part of our assessment.

# ASBESTOS (Continued)

Based on the investigation conducted by SEL, Appendix C summarizes all damaged ACM identified within the Mathematics and Computers Building (i.e. Building No.:17). Damaged materials are presented as 'repair' or 'removal' work. Accessibility and Action ratings are defined in the cover report titled *"2015/2016 Hazardous Building Materials Cover Report"* dated May 27th, 2016.

Friable asbestos containing materials in **POOR** condition must be removed and/or repaired immediately following applicable asbestos abatement procedures.

Friable 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. In the event the friable asbestos-containing materials are removed, Type 3 operations apply as outlined in Ontario Regulation 278/05, *Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations* – made under the Ontario Occupational Health and Safety Act. Type 2 operations can be applied for the repair of friable materials or, removal of less than 1 square metre of friable asbestos-containing materials. In addition, Glove Bag operations can be applied for the removal of asbestos-containing mechanical pipe insulation fittings as outlined in Ontario Regulation 278/05.
Non-friable asbestos-containing materials in **POOR** condition must be removed and/or repaired immediately following applicable asbestos abatement procedures. Non-friable 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. In the event the non-friable asbestos-containing materials are removed, Type 1 operations apply (provided that the material is wetted down and removed using non-powered hand held tools) as outlined in Ontario Regulation 278/05, *Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations* – made under the Ontario Occupational Health and Safety Act.

Renovation work that is planned for this building should be carefully reviewed in connection with this report and the accompanying asbestos management database to determine if asbestos abatement procedures are necessary. Intrusive investigation may be required prior to any renovation or demolition work. If a suspect material is identified (which is not listed in the management documents) then the suspect material shall be sampled to determine asbestos content prior to any disturbance.

# LEAD

Lead was not identified in concentrations above 0.5% Lead by Weight or 5000 µg/g (ppm) in any paint samples collected. Lead content greater than 0.5% by weight classifies the paint as a 'lead-based' paint as per the October 2014 Environmental Abatement Council of Ontario (EACO) *Lead Guideline for Construction, Renovation, Maintenance or Repair.*

However, two (2) of the paint samples collected from Mechanical/Electrical Room 1001 (concrete floor surface) and Mechanical Room 7005 (concrete floor surface) had lead concentrations greater than 0.1% lead by weight (1000 µg/g, pm) which would classify them as lead-containing paints.

Other paints not sampled are also suspected to contain varying quantities of lead. Therefore, additional sampling may be warranted prior to conducting any specific renovation work. Work involving the disturbance of a lead-based or lead-containing paint should follow the procedures outlined in the Ministry of Labour "*Lead on Construction Projects*" guideline and the *EACO Lead Guideline for Construction, Renovation, Maintenance or Repair*.

Lead may also be present as a component in:

- Pipes
- Solder used in pipe fittings, and in the form of lead shot in cast iron drain pipes.
- Lead-acid in emergency lighting batteries
- Ceramic tile glazing
- Mortar joints of exterior stonework

Lead-containing wastes should be recycled if practicable or handled and disposed of according to Ontario Regulation 347. If emergency lighting is removed the batteries are recommended to be sent to a recycling facility for proper treatment. As defined in clause e) of section 7.1 of the *EACO Lead Guideline,* "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" are defined as a Class 1 operation.

## SILICA

Silica (including free crystalline silica) may be a component of ceiling tiles, gypsum board, plaster, mortars, concrete (poured in place, block, pre-cast, etc.), brick, stone, terrazzo, and refractory brick materials noted in the Mathematics and Computers building. Testing for silica in these materials was not conducted.

Any work involving the disturbance of silica-containing materials should follow the procedures outlined in the Ministry of Labour "*Silica on Construction Projects*" guideline.
Type 1 operations are most common based on typical construction / renovation work; however, an assessment of specific work activities regarding silica-containing materials should be reviewed and assessed as part of the project planning stage for all jobs.

## MERCURY

Mercury is suspected present in the form of mercury vapour within fluorescent light tubes, High Intensity Discharge (HID) lamps, and in liquid form within thermostat control units mounted on walls within the mechanical rooms Liquid mercury is also suspected present within gauges associated with large mechanical equipment within the mechanical rooms..

Handle all lamps and mercury filled equipment with care and keep them intact. Send all waste lamps and decommissioned mercury-containing equipment to an approved mercury recycling/reclaim facility. Handle all equipment with care and avoid breakage/spillage. Any mercury-containing equipment that is to be removed is recommended to be recycled rather than disposed of in a landfill.

## PCBs

Suspect PCB-containing fluorescent light ballasts were observed throughout the building.

As reported by MTE Consultants in their 2011 Designated Substance Audit, oil-cooled transformer units within the basement electrical areas were visually identified as non-PCB containing based on the transformer Manufacturer Information plates. SEL is not aware of any other oil-cooled electrical equipment that may contain PCB's. A further assessment of the building's electrical systems should be conducted prior to any work which may impact this equipment.

At the time of light fixture removal, carefully remove all ballasts and determine if they are non-PCB, PCB-containing or suspect PCB-containing. Separate all PCB containing and suspect PCB-containing ballasts from other waste and dispose of as PCB waste at an authorized destruction facility.

# OZONE DEPLETING SUBSTANCES

Roof top air conditioning systems may be present; however, an assessment of the roof and exterior of the building was outside of the scope of the investigation. Small stand-alone air conditioning units may also be present in other areas of the building. All applicable regulations should be adhered to prior to removal or repair of systems that are suspected to contain CFC's.

SEL is not aware of any fire suppression systems present within the building that contain CFC's, however, it is possible that systems are present within the building in areas that were not accessible during our assessment that may have materials that contain CFC's (such as Halon 130).

Prior to the removal and disposal of any air conditioning units (if present), the unit should be purged of remaining refrigerant. This should be conducted by a certified person who holds a valid Ozone Depletion Prevention Certificate. Servicing and testing of refrigeration equipment should be conducted in accordance with Environment Canada's "*Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems*".

Any inspection, maintenance, handling or decommissioning of the fire suppression system should be conducted in accordance with Environment Canada's "*Environmental Code of Practice on Halons*" and ULC/ORD-C1058.18-2004, "*The Servicing of Halon and Clean Agent Extinguishing Systems*".

# MOULD

No visible signs of mould growth and/or water damage was identified within the surveyed areas; however, given that no destructive testing was performed during our assessment, there is a remote possibility that active mould growth could be present on materials hidden within locations such as wall/ceiling cavities. If mould growth is identified during future renovation work, work should be stopped and the affected areas should be remediated in accordance with current mould remediation guidelines (such as those provided by the Environmental Abatement Council of Ontario and the Canadian Construction Association).

# OTHER DESIGNATED SUBSTANCES

Other Designated Substances such as Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, and Vinyl Chloride were not identified nor are they suspected present within the building. Refer to the cover report for a detailed description of each type of Designated Substance and where they are typically found.

Building material(s) that are not detailed within this survey due to inaccessibility during the time of the survey and/or are uncovered during renovation/demolition activities, notably materials that are suspected to contain asbestos, should be properly assessed by qualified person prior to their disturbance.

# Appendix A

## Laboratory Certificates of Analysis (Asbestos & Lead)

emcscientific INCORPORATED

# Laboratory Analysis Report

To:

**Ben Rodricks**
Safetech Environmental Ltd.
52 McIntyre Place, Unit J
Kitchener, Ontario
N2R 1H9

**EMC LAB REPORT NUMBER:** A21028
**Job/Project Name:** UW 2015 DSA Reassessment: Building 17
**Analysis Method:** Polarized Light Microscopy – EPA 600
**Date Received:** Sep 17/15 **Date Analyzed:** Sep 23/15
**Analyst:** Bethany Schofield, *Analyst*
**Reviewed By:** Banu Gurgen-Keough, *Laboratory Manager*

**Job No:** 2-111015-001
**Number of Samples:** 61
**Date Reported:** Sep 23/15

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S01A | A21028-1 | Textured finish | 2 Phases:<br>a) Grey, cementitious material<br>b) White, texture coat | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S01B | A21028-2 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S01C | A21028-3 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S01D | A21028-4 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S01E | A21028-5 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S01F | A21028-6 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S01G | A21028-7 | Textured finish | White, texture coat | ND | | | 100 |
| M8C-S03A | A21028-8[5] | 12"x12" beige oatmeal VFT's | Off-white, vinyl floor tile | ND | | | 100 |
| M8C-S03B | A21028-9[5] | 12"x12" beige oatmeal VFT's | Off-white, vinyl floor tile | ND | | | 100 |
| M8C-S03C | A21028-10[5] | 12"x12" beige oatmeal VFT's | 2 Phases:<br>a) Off-white, vinyl floor tile<br>b) Black and yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S05 | A21028-11 | Parging cement on pipe fitting | Grey, parging cement | **Chrysotile** | **70** | | 30 |
| M8C-S06A | A21028-12 | 1'x1' acoustic sound panel | White, ceiling tile | ND | | 85 | 15 |

**EMC LAB REPORT NUMBER:** A21028
**Client's Job/Project Name/No.:** 2-111015-001
**Analyst:** Bethany Schofield, *Analyst*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S06B | A21028-13 | 1'x1' acoustic sound panel | White, ceiling tile | ND | | 85 | 15 |
| M8C-S06C | A21028-14 | 1'x1' acoustic sound panel | White, ceiling tile | ND | | 85 | 15 |
| M8C-S07A | A21028-15[5] | 12"x12" light brown with brown and white VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S07B | A21028-16[5] | 12"x12" light brown with brown and white VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S07C | A21028-17[5] | 12"x12" light brown with brown and white VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S08A | A21028-18[5] | 2'x4' long, thin WW fissure, medium PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S08B | A21028-19 | 2'x4' long, thin WW fissure, medium PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S08C | A21028-20 | 2'x4' long, thin WW fissure, medium PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S09 | A21028-21 | Mag block pipe insulation | Grey, fibrous material | **Amosite** | **80** | | 20 |
| M8C-S10A | A21028-22 | Plaster (room 0003) | Grey, plaster | ND | | | 100 |
| M8C-S10B | A21028-23 | Plaster (room 0003) | Grey, plaster | ND | | | 100 |
| M8C-S10C | A21028-24 | Plaster (room 0003) | Grey, plaster | ND | | | 100 |
| M8C-S12A | A21028-25[5] | 12"x12" white with thin brown streak VFT's | White, vinyl floor tile | ND | | | 100 |

**EMC LAB REPORT NUMBER:** A21028
**Client's Job/Project Name/No.:** 2-111015-001
**Analyst:** Bethany Schofield, *Analyst*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S12B | A21028-26[5] | 12"x12" white with thin brown streak VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S12C | A21028-27[5] | 12"x12" white with thin brown streak VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S13A | A21028-28 | 2'x4' long LW fissure, short fissured PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S13B | A21028-29 | 2'x4' long LW fissure, short fissured PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S13C | A21028-30 | 2'x4' long LW fissure, short fissured PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S14A | A21028-31[5] | 12"x12" pink / brown mottled VFT's | Pink, vinyl floor tile | ND | | | 100 |
| M8C-S14B | A21028-32[5] | 12"x12" pink / brown mottled VFT's | Pink, vinyl floor tile | ND | | | 100 |
| M8C-S14C | A21028-33[5] | 12"x12" pink / brown mottled VFT's | 2 Phases:<br>a) Pink, vinyl floor tile<br>b) Yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S18A | A21028-34[5] | 12"x12" beige with blue, green, red and brown, VFT's | White, vinyl floor tile | ND | | | 100 |
| M8C-S18B | A21028-35[5] | 12"x12" beige with blue, green, red and brown, VFT's | 2 Phases:<br>a) White, vinyl floor tile<br>b) Black, mastic | <br>ND<br>**Chrysotile** | <br><br>**0.5** | | <br>100<br>99.5 |
| M8C-S18C | A21028-36[5] | 12"x12" beige with blue, green, red and brown, VFT's | White, vinyl floor tile | ND | | | 100 |

**EMC LAB REPORT NUMBER:** A21028
**Client's Job/Project Name/No.:** 2-111015-001
**Analyst:** Bethany Schofield, *Analyst*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S19A | A21028-37[5] | 12"x12" grey oatmeal VFT's | 2 Phases:<br>a) Grey, vinyl floor tile<br>b) Yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S19B | A21028-38[5] | 12"x12" grey oatmeal VFT's | 2 Phases:<br>a) Grey, vinyl floor tile<br>b) Yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S19C | A21028-39[5] | 12"x12" grey oatmeal VFT's | 2 Phases:<br>a) Grey, vinyl floor tile<br>b) Yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S21A | A21028-40 | 2'x2' long, thin wavy fissure, PH CT's | Beige, ceiling tile | **Chrysotile** | **0.5** | 70 | 29.5 |
| M8C-S21B | A21028-41 | 2'x2' long, thin wavy fissure, PH CT's | NA | | | | |
| M8C-S21C | A21028-42 | 2'x2' long, thin wavy fissure, PH CT's | NA | | | | |
| M8C-S22A | A21028-43 | 2'x4' patterned pinhole CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S22B | A21028-44 | 2'x4' patterned pinhole CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S22C | A21028-45 | 2'x4' patterned pinhole CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S24A | A21028-46 | 2'x4' long WW fissure, dense PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S24B | A21028-47 | 2'x4' long WW fissure, dense PH CT's | Beige, ceiling tile | ND | | 70 | 30 |

**EMC LAB REPORT NUMBER:** A21028
**Client's Job/Project Name/No.:** 2-111015-001
**Analyst:** Bethany Schofield, *Analyst*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S24C | A21028-48 | 2'x4' long WW fissure, dense PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S25A | A21028-49[5] | 12"x12" peach oatmeal VFT's | 2 Phases:<br>a) Beige, vinyl floor tile<br>b) Yellow, mastic | <br>ND<br>ND | | | <br>100<br>100 |
| M8C-S25B | A21028-50[5] | 12"x12" peach oatmeal VFT's | Beige, vinyl floor tile | ND | | | 100 |
| M8C-S25C | A21028-51[5] | 12"x12" peach oatmeal VFT's | Beige, vinyl floor tile | ND | | | 100 |
| M8C-S26A | A21028-52 | Brown and black cobblestone patterned VSF | Grey, vinyl sheet backing | **Chrysotile** | **60** | | 40 |
| M8C-S26B | A21028-53 | Brown and black cobblestone patterned VSF | NA | | | | |
| M8C-S26C | A21028-54 | Brown and black cobblestone patterned VSF | NA | | | | |
| M8C-S27A | A21028-55 | 2'x2' short fissure, PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S27B | A21028-56 | 2'x2' short fissure, PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S27C | A21028-57 | 2'x2' short fissure, PH CT's | Beige, ceiling tile | ND | | 70 | 30 |
| M8C-S28A | A21028-58 | Rough coat plaster (room 7006) | Grey, plaster | ND | | | 100 |
| M8C-S28B | A21028-59 | Rough coat plaster (room 7006) | Grey, plaster | ND | | | 100 |
| M8C-S28C | A21028-60 | Rough coat plaster (room 7006) | Grey, plaster | ND | | | 100 |

emcscientific INCORPORATED

# Laboratory Analysis Report

**EMC LAB REPORT NUMBER:** A21028
**Client's Job/Project Name/No.:** 2-111015-001
**Analyst:** Bethany Schofield, *Analyst*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| M8C-S29 | A21028-61 | Mechanical gasket (room 7006) | Grey, cementitious material | **Chrysotile** | **20** | | 80 |

**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%.

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Client committed. Quality assured.

# CERTIFICATE OF ANALYSIS

Final Report

**C.O.C.: ---**

**REPORT No. B15-24356**

**Report To:**

**EMC Scientific Inc.**
5800 Ambler Dr. #100,
Mississauga ON L4W 4J4 Canada
**Attention:** Alister Haddad

**Caduceon Environmental Laboratories**
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 18-Sep-15
DATE REPORTED: 21-Sep-15
SAMPLE MATRIX: Paint Chips

JOB/PROJECT NO.: UW2015 DSA Reassess: Bldg 17
P.O. NUMBER: 2-111015-001
WATERWORKS NO.

| | Parameter | | Lead | | | | |
|---|---|---|---|---|---|---|---|
| | Units | | µg/g | | | | |
| | R.L. | | 5 | | | | |
| | Reference Method | | EPA 6010 | | | | |
| | Date Analyzed/Site | | 21-Sep-15/O | | | | |
| **Client I.D.** | **Sample I.D.** | **Date Collected** | | | | | |
| MRC-L01 - Grey on Concrete Floor (1001) | B15-24356-1 | 15-Sep-15 | 1710 | | | | |
| MRC-L02 - Beige on Concrete (1107) | B15-24356-2 | 15-Sep-15 | < 5 | | | | |
| MRC-L03 - Grey on Concrete Floor (0003) | B15-24356-3 | 15-Sep-15 | 153 | | | | |
| MRC-L04 - Beige on CB Wall (4069) | B15-24356-4 | 15-Sep-15 | < 5 | | | | |
| MRC-L05 - Grey on Concrete Floor (7005) | B15-24356-5 | 15-Sep-15 | 1450 | | | | |

Greg Clarkin , BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting LImit
Site Analyzed: K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill
Uncertainty Values available upon request

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INCORPORATED

# Laboratory Analysis Report

To:

**Ben Rodricks**
Safetech Environmental Ltd.
52 McIntyre Place, Unit J
Kitchener, Ontario
N2R 1H9

**EMC LAB REPORT NUMBER:** A23517
**Job/Project Name:** U Waterloo – M&C Light Replacement – Rooms 2065, 2066
**Job No:** 2-11015-010
**Analysis Method:** Polarized Light Microscopy – EPA 600
**Number of Samples:** 8
**Date Received:** Mar 7/16
**Date Analyzed:** Mar 10/16
**Date Reported:** Mar 10/16
**Analyst:** Bethany Schofield, *Analyst*
**Reviewed By:** Banu Gurgen-Keough, *Laboratory Manager*

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Asbestos Fibres | | Non-asbestos Fibres | Non-fibrous Material |
| 28/02/16-MC-S01A | A23517-1 | Textured finish | White, texture coat | **Chrysotile** | **10** | | 90 |
| 28/02/16-MC-S01B | A23517-2 | Textured finish | NA | | | | |
| 28/02/16-MC-S01C | A23517-3 | Textured finish | NA | | | | |
| 28/02/16-MC-S01D | A23517-4 | Textured finish | NA | | | | |
| 28/02/16-MC-S01E | A23517-5 | Textured finish | NA | | | | |
| 28/02/16-MC-S02A | A23517-6 | Debris on bulkhead surface (rm 2066) | White and grey, fibrous debris | **Chrysotile** | **0.5** | 85 | 14.5 |
| 28/02/16-MC-S02B | A23517-7 | Debris on bulkhead surface (rm 2066) | NA | | | | |
| 28/02/16-MC-S02C | A23517-8 | Debris on bulkhead surface (rm 2066) | NA | | | | |

**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 B
## Photographic Log

| Mathematics and Computers Building – Photographic Log | | | |
|---|---|---|---|
| Photograph No. | Room Number / Location | Material Type / Condition | Link (U of W file name and path) |
| 1 | 0002 | Asbestos-containing parging cement on tank units (33293-MC-S01), good. | SEL USB flash drive |
| 2 | 1084 | Asbestos-containing parging cement on mechanical pipe fittings (M8C-S05), poor. | SEL USB flash drive |
| 3 | 3002A | Asbestos-containing textured finish on plaster ceilings (33293-MC-S13), good. | SEL USB flash drive |
| 4 | 2066 | Asbestos-containing textured finish on plaster ceiling (28/02.2016-MC-S01), good. | |
| 5 | 2066 | Asbestos-containing textured finish debris on surface of bulkhood (28/02/16-MC-S02), poor. | SEL USB flash drive |
| 6 | 1074 | Asbestos-containing 2'x'4' ceiling tiles – long lengthwise wavy fissure, pinhole, good. | SEL USB flash drive |
| 7 | 4067 | Asbestos-containing 2'x'2' ceiling tiles – long, thin, wavy fissure, pinhole (M8C-S21), good. | SEL USB flash drive |
| 8 | 5511 | Asbestos-containing vinyl sheet flooring – brown and black cobblestone pattern (M8C-S26), good. | SEL USB flash drive |
| 9 | 1049A | Asbestos-containing 12"x12" vinyl floor tiles – brown with white streaks (33293-MC-S03), good. | SEL USB flash drive |

| Mathematics and Computers Building – Photographic Log | | | |
|---|---|---|---|
| Photograph No. | Room Number / Location | Material Type / Condition | Link (U of W file name and path) |
| 10 | 2041 | Asbestos-containing Asbestos-containing 12”x12” vinyl floor tiles – brown with white streaks (33293-MC-S16), good. | SEL USB flash drive |
| 11 | 7006 | Asbesbtos-containing mechanical pipe gasket debris (M8C-S29), poor. | SEL USB flash drive |

# Appendix C

## List of Damaged Asbestos-Containing Materials

UNIVERSITY OF Waterloo

| Building: | Figures: | Notes: |
|---|---|---|
| Math and Computer Science | | **HM** - Homogenous Material - Homogeneous with previously sampled material |
| Date Built: | | **SL** - Sample Location - Material Sampled |
| 1967 | | **VC** - Visually Confirmed - Deemed ACM based on surveyor recognition |
| Building Size: | | **AMP** - Asbestos Management Plan |
| 301,795 SF | | **ACM** - Asbestos-Containing Material |

All quantities listed are considered approximate and should be verified prior to any renovation or demolition work within the areas.

| Room Number | Room Description | Inspected Item | Inspected Material | Material Description | Material Detailed Location | Friability | Quantity | Condition | Sample / Identification Summary | Sample ID | Sample Report Date | % Asbestos & Fibre Type | Asbestos Classification | Recommended Action | General Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0003A | Electrical Room | Mechanical | Pipe Fitting | Parged Cement | Throughout | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Remove/Replace | |
| 1001 | Mech/Elec Room | Mechanical | Pipe Fitting | Parged Cement | Floor | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Remove/Replace | |
| 1006 | Office | Ceiling | Ceiling Tile 2' x 4' | Long Length Wavy Fissure Pinhole | Ceiling | NF | 1 | Poor | HM | S04 | 03/30/2010 | 0.75% Chrysotile | ACM | Repair | |
| 1043 | Office | Ceiling | Ceiling Tile 2' x 4' | Long Length Wavy Fissure Pinhole | Ceiling | NF | 1 | Poor | HM | S04 | 03/30/2010 | 0.75% Chrysotile | ACM | Repair | |
| 1045 | Custodial Closet | Ceiling | Ceiling Tile 2' x 4' | Long Length Wavy Fissure Pinhole | Ceiling | NF | 1 | Poor | HM | S04 | 03/30/2010 | 0.75% Chrysotile | ACM | Repair | |
| 1046 | Office | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | AMP | |
| | | Mechanical | ACM Debris | Parged Cement | Above Ceiling | F | - | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 1049A | Office | Ceiling | Ceiling Tile 2' x 4' | Long Length Wavy Fissure Pinhole | Ceiling | NF | 1 | Poor | HM | S04 | 03/30/2010 | 0.75% Chrysotile | ACM | Repair | |
| | | Mechanical | Pipe Fitting | Parged Cement | Floor | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 1084 | Mechanical Room | Mechanical | Pipe Fitting | Parged Cement | Ceiling | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| | | Mechanical | Flex Joint | - | | NF | 1 | Poor | VC | - | - | - | Suspect ACM | Repair/Replace | |
| 1095 | Corridor | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Remove/Replace | |
| 1100 | Corridor | Mechanical | Pipe Fitting | Parged Cement | Throughout | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 1115 | Return Air Shaft | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Remove/Replace | |
| 2037A | Activities Room | Ceiling | Ceiling Tile 2' x 4' | Lengthwise Long Fissure Random Pinhole | Ceiling | NF | 2 | Poor | HM | S17 | 29/06/2010 | 0.5% Chrysotile; Trace Amosite | ACM | Repair | |
| 2073 | Corridor | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Remove/Replace | |
| 3022 | Computer Lab | Ceiling | Ceiling Tile 2' x 4' | Long Length Wavy Fissure Pinhole | Ceiling | NF | 1 | Poor | HM | S04 | 03/30/2010 | 0.75% Chrysotile | ACM | Repair | |
| 5237 | Office | Ceiling | Ceiling Tile 2' x 4' | Lengthwise Long Fissure Random Pinhole | Ceiling | NF | 2 | Poor | HM | S17 | 29/06/2010 | 0.5% Chrysotile; Trace Amosite | ACM | Repair | |
| 5511 | Lounge | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 2 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 5809 | Lobby Area | Mechanical | Pipe Fitting | Parged Cement | Above Ceiling | F | 8 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 7006 | Maintenance Room | Other | Mechanical Gasket | - | Debris Pile | NF | - | Poor | SL | M&C-S29 | 09/23/2015 | 20% Chrysotile | ACM | Repair | |
| 7008 | Mechanical Room | Mechanical | Pipe Fitting | Parged Cement | Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | Photographs 2301-2302 |
| | | Mechanical | Pipe Fitting | Parged Cement | Floor | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 7011 | Mechanical Room | Mechanical | Pipe Fitting | Parged Cement | Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 7012 | Corridor | Mechanical | Pipe Fitting | Parged Cement | Ce1 | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |
| 7014 | Elevator Mech. Room | Mechanical | Pipe Fitting | Parged Cement | Ceiling | F | 1 | Poor | HM | M&C-S05 | 23/09/2015 | 70% Chrysotile | ACM | Repair | |

# Appendix D

**MTE Abatement Summary Report (M&C, 6th Fl..)**
**Dated April 19th, 2013**

April 19, 2013
MTE File No.: 33293-116

**Carlos Radic**
University of Waterloo
200 University Avenue West
**Waterloo, ON N2L 3G1**

**Re: Math and Computer Science Building (17) 6th Floor Renovation Project**
**Asbestos Removal End of Job Summary Report**
**University of Waterloo**
**200 University Avenue West, Waterloo, Ontario**

MTE Consultants Inc. (MTE) was retained by the University of Waterloo (Client) to provide asbestos abatement consulting services for the Math and Computer Science Building 6th Floor Renovation Project at the University of Waterloo located at 200 University Avenue West in Waterloo, Ontario (hereafter referred to as the "Subject Area").

The purpose of the consulting services was to document the removal of asbestos-containing materials associated with the renovation project.

## BACKGROUND

MTE was retained to provide asbestos consulting services for asbestos abatement during the 6th Floor Renovation Project and to provide abatement contractor oversight inspections and air clearance testing (in compliance with Ontario Regulation 278/05) for the duration of the project. MTE performed these services between February and April 2013.

WH Smith Construction was retained as a sub-contractor to provide asbestos abatement services.

## SCOPE OF ASSIGNMENT

Tasks related to this project included:

- Onsite asbestos abatement inspections (pre and post-abatement inspections);
- Collection of Type 3 asbestos abatement work area clearance air samples prior to dismantling of site containment to verify airborne fibre concentrations met those prescribed by Ontario Regulation 278/05;
- Correspondence and abatement oversight, and
- Preparation of this End of Job Summary Report.

## METHODOLOGY

Type 3 asbestos abatement air clearance samples were collected from numerous work area enclosures on various dates by MTE. Samples were collected in accordance with section 18(6) of Ontario Regulation 278/05 and analyzed using Phase Contrast Microscopy in accordance with NIOSH Method 7400. A copy of the Type 3 asbestos abatement air clearance letters, issued shortly after completion of field work, are provided in Attachment A.

Figures depicting the work areas are shown on the inspection sheets and in Figure 1 Include as an attachment to this report.

## ASBESTOS ABATEMENT

WH Smith Construction performed abatement in accordance with Ontario Regulation 278/05. The following activities were performed by WH Smith Construction during the asbestos abatement to facilitate the renovation project:

- Construction of Type 3 asbestos abatement work area enclosures;
- Type 3 abatement of asbestos-containing ceiling tiles, floor tiles and insulation on mechanical pipe fittings; and
- Type 1 abatement of asbestos-containing floor tile mastic.

MTE conducted inspections of the work areas during the course of the project. Items inspected for included integrity of the enclosures, maintenance of adequate negative pressure within the enclosures, enclosure cleanliness, waste removal, maintenance of workplace hygiene and housekeeping, and other practices related to compliance with Ontario Regulation 278/05.

MTE performed post-abatement site inspections of all work areas. The work areas were visually determined to be clean of asbestos waste, debris, dust and residue. Clearance air testing was performed in all Type 3 work areas in accordance with Section 18(6) of Ontario Regulation 278/05 and included the following work areas on dates;

- Phase 1, February 7, 2013;
- Phase 2 February 28, 2013; and
- Phase 3 March 29, 2013.

All clearance samples collected and analyzed were reported to be below the Ontario Regulation 278/05 clearance criteria of 0.01 fibres per cubic centimetre (fibres/cc). Copies

of the air clearance memos issued by MTE are included with this report in Attachment A.

Visual inspections confirming the completion of Type 1 removal of floor tile mastics were conducted on the following dates:

- Phase 1, February 15, 2013;
- Phase 2 March 28, 2013; and
- Phase 3 April 10, 2013.

Copies of the visual clearance memos issued by MTE are included with this report in Attachment A.

## CONCLUSION AND RECOMMENDATIONS

Based on inspections of the work areas, MTE presents the following conclusions:

- The abatement was completed in accordance with the project specifications and Ontario Regulation 278/05.
- The abatement was completed successfully.
- Asbestos-containing materials still remain within the building.
- It is required by Ontario Regulation 278/05, clause 8(5)(b) that the asbestos audit for the Math and Computer Science building is to be updated with regards to the information provided in this report.

## LIMITATIONS

Services performed by **MTE Consultants Inc**. (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and the Client. It was completed in accordance with the approved Scope of Work. As such, this report may not deal with all issues potentially applicable to the site and may omit issues, which are or may be of interest to the reader. MTE makes no representation that the present report has dealt with all-important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions, as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time might affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

**MTE CONSULTANTS INC.**

Martin Mielke, B.Sc. AMRT, CRSP
Technical Advisor, Building Health Sciences
mmielke@mte85.com

MJM:
Attach.
M:\33293\33293-116 MC 6th Floor Abatement\33293-116 - UofW - Math and Computers-6th Floor Renovation-Asbestos Removal Completion Report - Apr-19-13.doc

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# ATTACHMENT A

# TYPE 3 ASBESTOS CLEARANCE AIR TESTING LETTERS & TYPE 1 VISUAL CLEARANCE LETTERS

February 7, 2013
MTE File No.: 33293-116

Mr. Carlos Radic
University of Waterloo
Design Construction Services, Plant Operations
200 University Avenue
Waterloo, ON, N2L 3G1

**RE: Type 3 Asbestos Clearance Air Testing – University of Waterloo Math & Computer Building – 6th Floor Phase 1**
**200 University Avenue W, Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos clearance air testing within the 6th Floor Phase 1 Construction Zone of the Math & Computer Building located at 200 University Avenue in Waterloo, Ontario.

On February 6, 2013, MTE Consultants Inc. (MTE) inspected the Type 3 removal of asbestos- containing ceiling tiles, floor tiles and pipe fitting insulation located in the Phase 1 Construction Zone on the 6th Floor of the Math & Computer Building. The removal was conducted by WH Wayne & Harold Smith Construction Ltd. Asbestos removal has been completed within the above mentioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on February 6, 2013 confirmed that the work area was clean with no dust, debris, residue, or asbestos waste. Sealant was applied to the inside of the enclosure and vertical surfaces within the enclosure were dry at the time of sampling. A total of three (3) air samples (in accordance with Table 3 of Ontario Regulation 278/50) were collected from within the work area enclosure by MTE on February 7, 2013. Samples were collected in accordance with section 18(6) of Ontario Regulation 278/05 and analyzed using Phase Contrast Microscopy (PCM) in accordance with NIOSH Method 7400. All three (3) air samples reported concentrations of total fibres to be less than 0.01 fibres per cubic centimetre of air (fibres/cc) and meet the Ontario Regulation 278/05 clearance concentration of 0.01 fibres/cc.

MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, Ontario N2B 3X9
Phone: 519-743-6500
Fax: 519-743-6513
www.mte85.com

MTE provided verbal notification on February 7, 2013, and affirms this letter as written notification that the abovementioned enclosure may be dismantled. Certificates of Analysis and inspection forms are provided as an attachment to this report. In accordance with section 18(8) and 18(9) of O. Reg. 278/05 the owner shall: post a copy of the clearance air testing results in the workplace; provide a copy to the joint health and safety committee; and shall retain a copy for at least one year after receiving them.

Sincerely,

**MTE CONSULTANTS INC.**

Martin Mielke, B.Sc., AMRT, CRSP
Senior Building Health Science Technologist
MJM
Attach.
M:\33293\33293-116 MC 6th Floor Abatement\Abatement\Air Clearance\33293-116_Clearence Memo_UW M&C_6th Floor_Phase 1_Feb-7-13.Doc

MTE More Than Engineering

**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Feb 7.13 Filer Initials: ?

## LOCATION OF ASBESTOS ABATEMENT Phase 1

Site Location: Math and Computer Bldg. 6th Floor Company Name: University of Waterloo

Company Contact: Carlos Radic Phone: (519) 888-4567

Address: 200 University Avenue W. Fax:

City: Waterloo Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing ceiling tiles, floor tiles and insulated pipe fittings Phase 1

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☐:→ Type 1☐ Type 2☐ Type 2 glove bag☐ Type 3☐

Type of Asbestos: Chrysotile☑ Other than Chrysotile☐: Duration of Abatement: 1 month

Contractor PPE: None☐ ½ Face APR☐ Full Face APR☐ PAPR☐ Supplied Air☐ Coveralls☐ Other ☐

Was asbestos material replaced? Yes☐ No☐ → If Yes with what:

Has MOL notice of project been posted at Site? Yes☐ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

| Pre-Removal Jan. 28/13 DATE (d/m/y): Jan. 28.13 | Time: 1:00 a.m.☐ p.m.☑ | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | ✓ |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | ✓ |
| Has visible dust been cleaned from work area before start or work? | | | | ✓ |
| Have all items been removed from work area or been covered with sheeting? | | | | ✓ |
| Has signage been posted warning of asbestos hazard and restricting access? | | | | ✓ |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | | — |
| Has mechanical ventilation been disabled and sealed? | | | | ✓ |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | | ✓ |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | | ✓ |
| Has a device for monitoring pressure differential been installed & monitored? | | | | ✓ |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | | ✓ |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | 0.045 Approximate Air Exchanges Per Hour | | | |
| **Active/Post Removal** DATE (d/m/y): Feb 6/13 | Time: 11 a.m.☐ p.m.☑ | Type 1 | Type 2 | Type 3 |
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | | ✓ |
| Has ACM been wetted using water and a wetting agent? | | | | ✓ |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | | ✓ |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | | ✓ |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | | ✓ |
| Was "Lock Down" or sealant applied after final clean-up? | | | | ✓ |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | | ✓ |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | 0.032 Approximate Air Exchanges Per Hour | | | |

Notes:

Instructions to Contractor:

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**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Feb 7.13 Filer Initials: [illegible]

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd. Company Contact: Gary Smith

Site Supervisor: Garry Koeler. Phone: (519) 527-1079

Address: Box 809, 55 Birch Street Fax: (519) 527-1040

City: Seaforth Province: ON Postal Code: N0K 1W0

## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☑ No☐

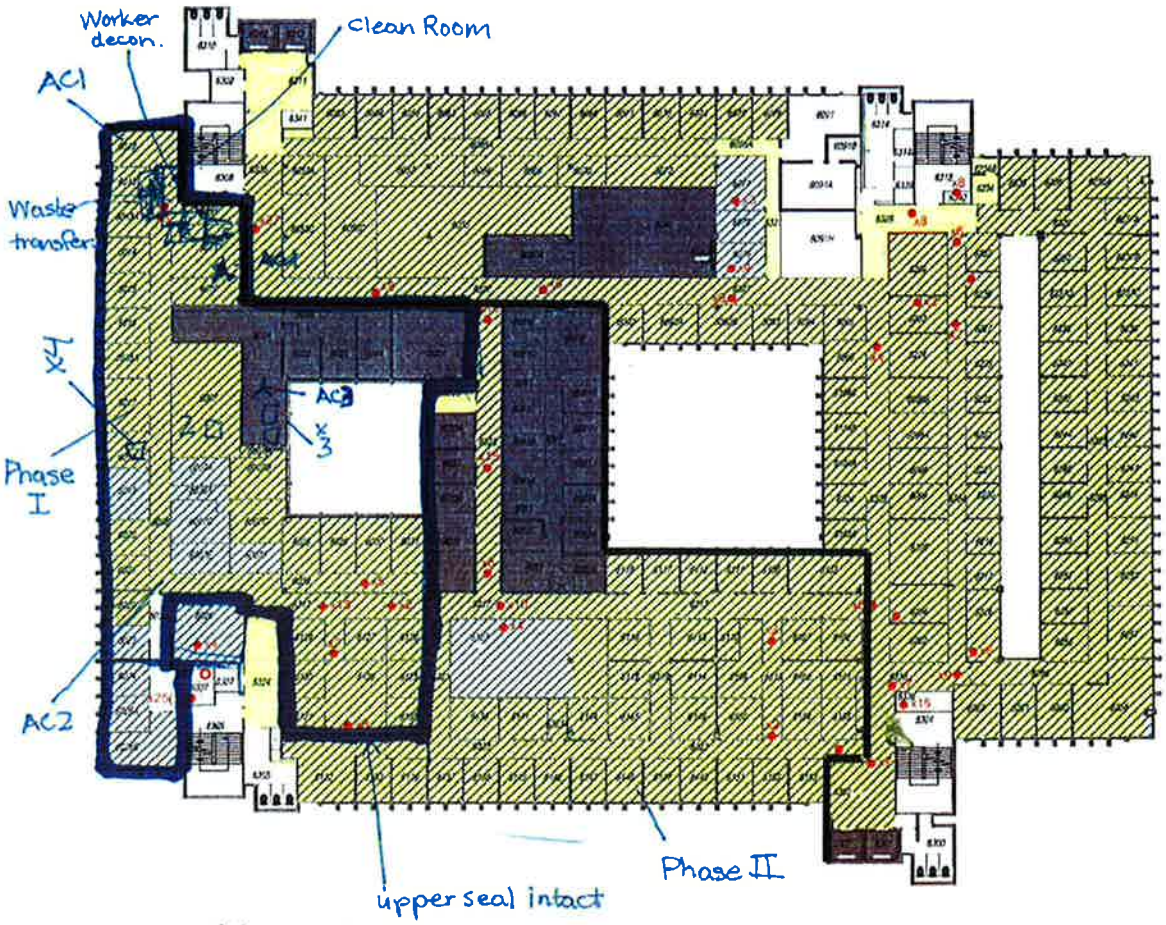
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☑ No☐

Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | Feb. 7. 13 | | Method | | | | Time | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Name | Cassette Barcode No. | PCM | TEM | Concentration (f/cc) | Flow (L/min) | On | Off | Status |
| ≤10m² | 1 | 33293-116-UW-M&C-6F-Ph1-AC1 | CH212205 | ✓ | | 0.002 | 15 | 11:20 | 2:20 | PASS |
| | 2 | 33293-116-UW-M&C-6F-Ph1-AC2 | CH212094 | ✓ | | 0.002 | 15 | 11:22 | 2:22 | PASS |
| 10-500m² | 3 | 33293-116-UW-M&C-6F-Ph1-AC3 | CH212230 | ✓ | | 0.003 | 15 | 11:23 | 2:23 | PASS |
| >500m² | 4 | | | | | | | | | |
| | 5 | | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor Phase I

| Approximate Area of Enclosure: | 320 | ☑ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | 3.5 | ☑ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|




**Notes:** All partition walls sealed with polyethylene sheeting.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Ave. W. Waterloo, ON N2L 3G1

Site Address: 200 University Ave. W. Waterloo, ON N2L 3G1

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-7-2013

Analyzed by: MJM Analysis date: Feb-7-13

Analyst Signature: _____

Manager's Signature: _____

## SAMPLE INFORMATION

Sample #: 1520 Cassette Barcode Number: CH212205

Sample ID: **33293-116-UW-M&C-6F-Ph1-AC1** Fibres/field: 0.170

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Ave. W. Waterloo, ON N2L 3G1

Site Address: 200 University Ave. W. Waterloo, ON N2L 3G1

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-7-2013

Analyzed by: MJM Analysis date: Feb-7-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1521 Cassette Barcode Number: CH212204

Sample ID: **33293-116-UW-M&C-6F-Ph1-AC2** Fibres/field: 0.120

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Ave. W. Waterloo, ON N2L 3G1

Site Address: 200 University Ave. W. Waterloo, ON N2L 3G1

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-7-2013

Analyzed by: MJM Analysis date: Feb-7-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1522 Cassette Barcode Number: CH212230

Sample ID: **33293-116-UW-M&C-6F-Ph1-AC3** Fibres/field: 0.105

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤** **0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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March 1, 2013
MTE File No.: 33293-116

Mr. Carlos Radic
University of Waterloo
Design Construction Services, Plant Operations
200 University Avenue
Waterloo, ON, N2L 3G1

**RE: Type 3 Asbestos Clearance Air Testing – University of Waterloo Math & Computer Building – 6th Floor Phase 2**
**200 University Avenue W, Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos clearance air testing within the 6th Floor Phase 2 Construction Zone of the Math & Computer Building located at 200 University Avenue in Waterloo, Ontario.

On February 27, 2013, MTE Consultants Inc. (MTE) inspected the Type 3 removal of asbestos- containing ceiling tiles, floor tiles and pipe fitting insulation located in the Phase 2 Construction Zone on the 6th Floor of the Math & Computer Building. The removal was conducted by Wayne & Harold Smith Construction Ltd. Asbestos removal has been completed within the above mentioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on February 27, 2013 confirmed that the work area was clean with no dust, debris, residue, or asbestos waste. Sealant was applied to the inside of the enclosure and vertical surfaces within the enclosure were dry at the time of sampling. A total of three (3) air samples (in accordance with Table 3 of Ontario Regulation 278/50) were collected from within the work area enclosure by MTE on February 28, 2013. Samples were collected in accordance with section 18(6) of Ontario Regulation 278/05 and analyzed using Phase Contrast Microscopy (PCM) in accordance with NIOSH Method 7400. All three (3) air samples reported concentrations of total fibres to be less than 0.01 fibres per cubic centimetre of air (fibres/cc) and meet the Ontario Regulation 278/05 clearance concentration of 0.01 fibres/cc.

MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, Ontario N2B 3X9
Phone: 519-743-6500
Fax: 519-743-6513

MTE provided verbal notification on February 28, 2013, and affirms this letter as written notification that the abovementioned enclosure may be dismantled. Certificates of Analysis and inspection forms are provided as an attachment to this report. In accordance with section 18(8) and 18(9) of O. Reg. 278/05 the owner shall: post a copy of the clearance air testing results in the workplace; provide a copy to the joint health and safety committee; and shall retain a copy for at least one year after receiving them.

Sincerely,

**MTE CONSULTANTS INC.**

Martin Mielke, B.Sc., AMRT, CRSP
Technical Advisor, Building Health Science
MJM
Attach.
M:\33293\33293-116 MC 6th Floor Abatement\Abatement\Air Clearance\6th Floor Phase 2\33293-116_Clearence Memo_UW M&C_6th Floor_Phase 2_Mar-1-13.Doc

MTE Moto Than Engineering

**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Mar.1.13 Filer Initials: Z

## LOCATION OF ASBESTOS ABATEMENT

Site Location: Math and Computer Bldg. 6th Floor
Company Contact: Carlos Radic
Address: 200 University Avenue W
City: Waterloo

Company Name: University of Waterloo
Phone: (519) 888-4567
Fax:
Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing ceiling tiles, floor tiles and insulated pipe fittings

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☐:→ Type 1☐ Type 2☐ Type 2 glove bag☐ Type 3☑
Type of Asbestos: Chrysotile☐ Other than Chrysotile☐: Duration of Abatement: 1 month
Contractor PPE: None☐ ½ Face APR☐ Full Face APR☐ PAPR☑ Supplied Air☐ Coveralls☐ Other ☐
Was asbestos material replaced? Yes☐ No☐ → If Yes with what:
Has MOL notice of project been posted at Site? Yes☑ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

| Pre-Removal | DATE (d/m/y): 15/02/13 | Time: 9:00 a.m.☑ p.m.☐ | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | | ✓ |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | | ✓ |
| Has visible dust been cleaned from work area before start or work? | | | | | ✓ |
| Have all items been removed from work area or been covered with sheeting? | | | | | ✓ |
| Has signage been posted warning of asbestos hazard and restricting access? | | | | | ✓ |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | | | – |
| Has mechanical ventilation been disabled and sealed? | | | | | ✓ |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | | | ✓ |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | | | ✓ |
| Has a device for monitoring pressure differential been installed & monitored? | | | | | ✓ |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | | | ✓ |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | 0.020 | Approximate Air Exchanges Per Hour | | | |

| Active/Post Removal | DATE (d/m/y): 27/02/13 | Time: 9:30 a.m.☐ p.m.☑ | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|---|
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | | | ✓ |
| Has ACM been wetted using water and a wetting agent? | | | | | ✓ |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | | | ✓ |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | | | ✓ |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | | | 9:50 AM |
| Was "Lock Down" or sealant applied after final clean-up? | | | | | ✓ |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | | | |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | 0.036 | Approximate Air Exchanges Per Hour | | | |

**Notes:**

**Instructions to Contractor:**



sultants Inc. Inspector(s): M. Mielke
mans Centre Drive, Kitchener, Ontario N2B 3X9 Tel: 519-743-6500 Fax: 519-743-6513 mail@mte85.com

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**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Mar. 1 13 Filer Initials:

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd. Company Contact: Gary Smith

Site Supervisor: Jerry Koeler Phone: (519) 527-1079

Address: Box 809, 55 Birch Street Fax: (519) 527-1040

City: Seaforth Province: ON Postal Code: N0K 1W0

## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☑ No☐

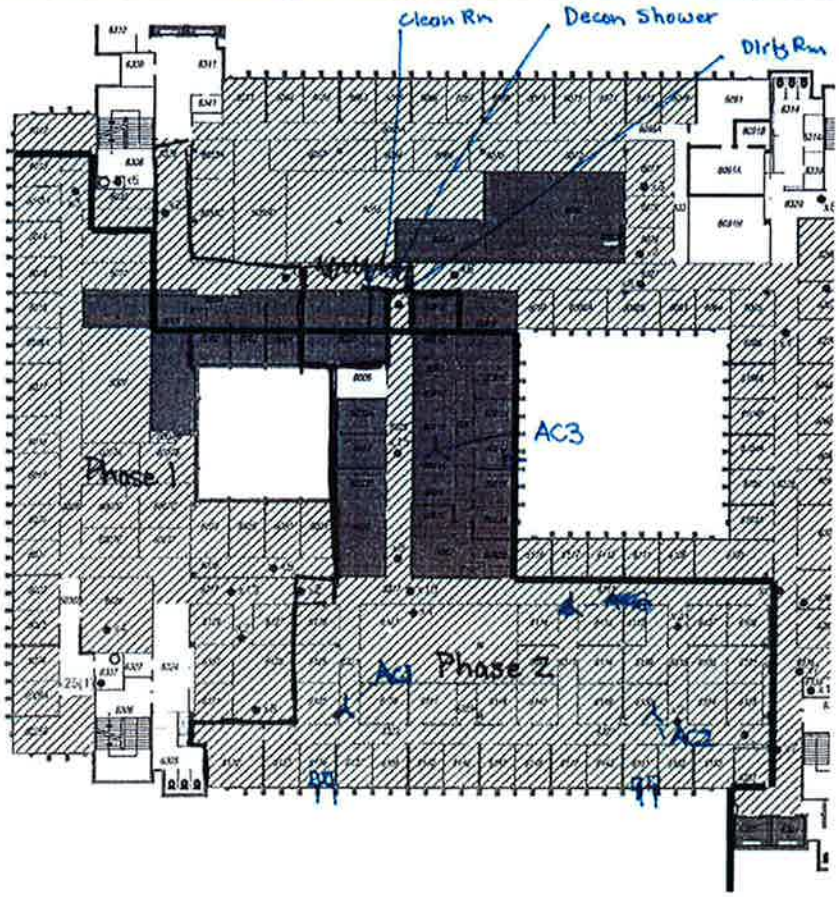
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☑ No☐

Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | Feb 28. 2013 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sample Name | Cassette Barcode No. | Method PCM | Method TEM | Concentration (f/cc) | Flow (L/min) | Time On | Time Off | Status |
| ≤10$m^2$ | 1 | 33293-116-UW-M&C-6F-Ph2-AC1 | CH212217 | ✓ | | < 0.007 | 15 | 9:12P | 12:12A PASS |
| | 2 | 33293-116-UW-M&C-6F-Ph2-AC2 | CC419805 | ✓ | | < 0.007 | 15 | 9:13P | 12:13A PASS |
| 10-500$m^2$ | 3 | 33293-116-UW-M&C-6F-Ph2-AC3 | CH 212240 | ✓ | | < 0.007 | 15 | 9:14P | 12:14A PASS |
| >500$m^2$ | 4 | | | | | | | | |
| | 5 | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor Phase 2

| Approximate Area of Enclosure: | 340 | ☑ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | 3.8 | ☑ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|




Notes:

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Avenue W., Waterloo, Ontario

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-28-2013

Analyzed by: MJM Analysis date: Feb-28-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1526 Cassette Barcode Number: CH212217

Sample ID: **33293-116-UW-M&C-6F-Ph2-AC1** Fibres/field: 0.075

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Avenue W., Waterloo, Ontario

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-28-2013

Analyzed by: MJM Analysis date: Feb-28-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1527 Cassette Barcode Number: CC419805

Sample ID: **33293-116-UW-M&C-6F-Ph2-AC2** Fibres/field: 0.055

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 200 University Avenue W., Waterloo, Ontario

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Feb-28-2013

Analyzed by: MJM Analysis date: Feb-28-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1528 Cassette Barcode Number: CH212240

Sample ID: **33293-116-UW-M&C-6F-Ph2-AC3** Fibres/field: 0.065

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007 (f/cc)**

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

April 1, 2013
MTE File No.: 33293-116

Mr. Carlos Radic
University of Waterloo
Design Construction Services, Plant Operations
200 University Avenue
Waterloo, ON, N2L 3G1

**RE: Type 3 Asbestos Clearance Air Testing – University of Waterloo Math & Computer Building – 6th Floor Phase 3**
**200 University Avenue W, Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos clearance air testing within the 6th Floor Phase 3 Construction Zone of the Math & Computer Building located at 200 University Avenue in Waterloo, Ontario.

On March 28, 2013, MTE Consultants Inc. (MTE) inspected the Type 3 removal of asbestos- containing ceiling tiles, floor tiles and pipe fitting insulation located in the Phase 3 Construction Zone on the 6th Floor of the Math & Computer Building. The removal was conducted by Wayne & Harold Smith Construction Ltd. Asbestos removal has been completed within the above mentioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on March 28, 2013 confirmed that the work area was clean with no dust, debris, residue, or asbestos waste. Sealant was applied to the inside of the enclosure and vertical surfaces within the enclosure were dry at the time of sampling. A total of three (3) air samples (in accordance with Table 3 of Ontario Regulation 278/50) were collected from within the work area enclosure by MTE on March 29, 2013. Samples were collected in accordance with section 18(6) of Ontario Regulation 278/05 and analyzed using Phase Contrast Microscopy (PCM) in accordance with NIOSH Method 7400. All three (3) air samples reported concentrations of total fibres to be less than 0.01 fibres per cubic centimetre of air (fibres/cc) and meet the Ontario Regulation 278/05 clearance concentration of 0.01 fibres/cc.

MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, Ontario N2B 3X9
Phone: 519-743-6500
Fax: 519-743-6513
www.mte85.com

MTE provided verbal notification on March 30, 2013, and affirms this letter as written notification that the abovementioned enclosure may be dismantled. Certificates of Analysis and inspection forms are provided as an attachment to this report. In accordance with section 18(8) and 18(9) of O. Reg. 278/05 the owner shall: post a copy of the clearance air testing results in the workplace; provide a copy to the joint health and safety committee; and shall retain a copy for at least one year after receiving them.

Sincerely,

**MTE CONSULTANTS INC.**

Martin Mielke, B.Sc., AMRT, CRSP
Technical Advisor, Building Health Science
MJM
Attach.
M:\33293\33293-116 MC 6th Floor Abatement\Abatement\Air Clearance\6th Floor Phase 3\33293-116_Clearance Memo_UW M&C_6th Floor_Phase 3_Apr-1-13.Doc

MTE More Than Engineering

**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Apr.1.13 Filer Initials: Q

## LOCATION OF ASBESTOS ABATEMENT

Site Location: Math and Computer Bldg. 6th Floor Company Name: University of Waterloo

Company Contact: Carlos Radic Phone: (519) 888-4567

Address: 200 University Avenue W Fax: –

City: Waterloo Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing ceiling tiles, floor tiles and insulated pipe fittings

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☐:→ Type 1☐ Type 2☐ Type 2 glove bag☐ Type 3☑

Type of Asbestos: Chrysotile☐ Other than Chrysotile☐: Duration of Abatement: ~~1 month~~ (10 days)

Contractor PPE: None☐ ½ Face APR☐ Full Face APR☐ PAPR☑ Supplied Air☐ Coveralls☐ Other ☐

Was asbestos material replaced? Yes☑ No☐ → If Yes with what: unknown

Has MOL notice of project been posted at Site? Yes☐ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

| **Pre-Removal** | **DATE (d/m/y):** 18/03/13 | **Time:** 10:15 **a.m.**☑ **p.m.**☐ | **Type 1** | **Type 2** | **Type 3** |
|---|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | | ✓ |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | | ✓ |
| Has visible dust been cleaned from work area before start or work? | | | | | ✓ |
| Have all items been removed from work area or been covered with sheeting? | | | | | ✓ |
| Has signage been posted warning of asbestos hazard and restricting access? | | | | | ✓ |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | | | – |
| Has mechanical ventilation been disabled and sealed? | | | | | ✓ |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | | | ✓ |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | | | ✓ |
| Has a device for monitoring pressure differential been installed & monitored? | | | | | ✓ |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | | | ✓ |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | -0.031 | Approximate Air Exchanges Per Hour | | | 12.5 |
| **Active/Post Removal** | **DATE (d/m/y):** 28/03/13 | **Time:** 1:30 **a.m.**☐ **p.m.**☑ | **Type 1** | **Type 2** | **Type 3** |
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | | | ✓ |
| Has ACM been wetted using water and a wetting agent? | | | | | ✓ |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | | | ✓ |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | | | ✓ |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | | | ✓ |
| Was "Lock Down" or sealant applied after final clean-up? | | | | | ✓ 2:15 PM |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | | | ✓ Q |
| Pressure Differential (In W.C. ☑ Pa ☐ ) | -0.025 | Approximate Air Exchanges Per Hour | | | 12.5 |

Notes: Mar. 18.13. some upper seals being developed along main corridor (6327) at time of inspection: completed Mar. 18.13 11:25 AM Q

**Instructions to Contractor:**



520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9 Tel: 519-743-6500 Fax: 519-743-6513 mail@mte85.com

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**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Apr. 1.13 Filer Initials: A

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd.
Site Supervisor: Jerry Koeler
Address: Box 809, 55 Birch Street
City: Seaforth

Company Contact: Gary Smith
Phone: (519) 527-1079
Fax: (519) 527-1040
Province: ON Postal Code: N0K 1W0

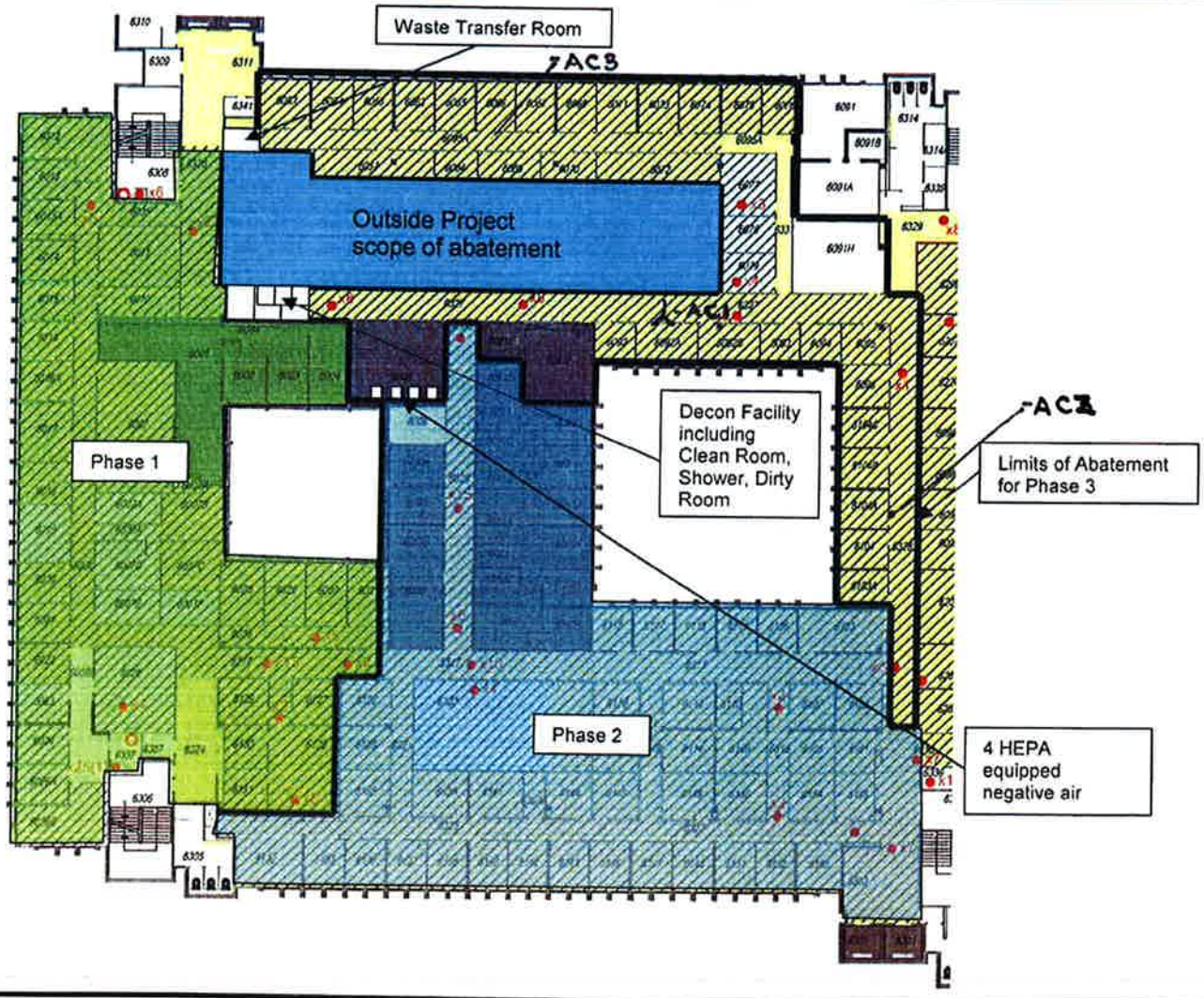
## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☑ No☐
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☑ No☐
Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | March 29, 2013 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sample Name | Cassette Barcode No. | Method PCM | Method TEM | Concentration (f/cc) | Flow (L/min) | Time On | Time Off | Status |
| ≤10m² | 1 33293-116-UW-MEC-6F-Ph3-AC1 | CH212201 | ✓ | | 0.001 | 15 | 3:05 | 6:05 | PASS |
| 10-500m² | 2 33293-116-UW-MEC-6F-Ph3-AC2 | CH212208 | ✓ | | 0.002 | 15 | 3:05 | 6:05 | PASS |
| | 3 33293-116-UW-MEC-6F-Ph3-AC3 | CH212243 | ✓ | | 0.002 | 15 | 3:05 | 6:05 | PASS |
| >500m² | 4 | | | | | | | | |
| | 5 | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor Phase 3

| Approximate Area of Enclosure: | 310 | ☑ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | 3.5 | ☑ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|



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25 YEARS 1985-2010

# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 675 Queen Street South, Kitchener, ON, N2M 1A1

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Mar-29-2013

Analyzed by: MJM Analysis date: Mar-30-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1558 Cassette Barcode Number: CH212201

Sample ID: **33293-116-UW-M&C-6F-Ph3-AC1** Fibres/field: 0.055

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤ 0.007 (f/cc)**

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 675 Queen Street South, Kitchener, ON, N2M 1A1

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Mar-29-2013

Analyzed by: MJM Analysis date: Mar-30-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1559 Cassette Barcode Number: CH212208

Sample ID: **33293-116-UW-M&C-6F-Ph3-AC2** Fibres/field: 0.120

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L.** ≤ **0.007** (f/cc)

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

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# PHASE CONTRAST MICROSCOPY (PCM) ANALYSIS REPORT

Samples were analyzed using a Zeiss Axio Star Plus or Nikon Eclipse E100 Phase Contrast Microscope in accordance with NIOSH method 7400 "Asbestos and Other Fibres by PCM". The results of this report apply only to the materials tested.

## CLIENT INFORMATION

Client Name: **University of Waterloo** Project No: **33293-116**

Client Address: 675 Queen Street South, Kitchener, ON, N2M 1A1

Site Address: 200 University Avenue W., Waterloo, Ontario

## SAMPLING INFORMATION

Sampled by: MJM Sampling date: Mar-29-2013

Analyzed by: MJM Analysis date: Mar-30-13

Analyst Signature:

Manager's Signature:

## SAMPLE INFORMATION

Sample #: 1560 Cassette Barcode Number: CH212243

Sample ID: **33293-116-UW-M&C-6F-Ph3-AC3** Fibres/field: 0.115

Flow Rate (L/min): 15.00 Cassette Size ($mm^2$): 385

Duration (min): 180 Field Size: 0.00785

Volume (L): 2700 **R.L. ≤** 0.007 **(f/cc)**

Notes:

- R.L. = Reporting Limit based on Quantitation Limit for Sampling Volume based on approximately 40 fibres/100 fields
- (f/cc) = fibres per cubic centimetre of air

MTE Consultants Inc. participates and maintains proficient standing in the Canadian Association for Laboratory Accreditation Inc. (CALA) Asbestos Proficiency Testing for Asbestos and Other Fibres in air by Phase Contrast Microscopy (PCM) analysis under Membership Number 3827.

February 16, 2013
File: 33293-116

**Carlos Radic**
University of Waterloo
200 University Avenue West
Waterloo, ON N2L 3G1

**RE: Type 1 Asbestos Clearance Memo – Math and Computer Building 6th Floor**
**University of Waterloo- Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos removal within the 6th floor Construction Zone of the Math and Computer Building located at the University of Waterloo, 200 University Avenue West in Waterloo, Ontario.

On February 15, 2013 MTE Consultants Inc. (MTE) inspected and reviewed the Type 1 removal of asbestos-containing floor tile mastic. The inspection pertained to the Phase 1 Construction Zone identified on the inspection sheet provided as an attachment to this report. The removal was conducted by Wayne and Harold Smith Construction Ltd. Asbestos removal has been completed within the abovementioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on February 15, 2013 confirmed that the work area was clean with no dust, debris, residue, and asbestos waste.

Since the abatement of floor tile mastic was conducted as a Type 1 Operation, no air clearance testing is required or warranted in accordance with Ontario Regulation 278/05. MTE provided verbal notification on February 15, 2013 and affirms this letter as written notification. Inspection sheets are provided as an attachment to this report.

Sincerely,

Martin Mielke, B.Sc., AMRT, CRSP
Technical Advisor, Building Health Sciences
mmielke@mte85.com

MJM
Attach
M:\33293\33293-116 MC 6th Floor Abatement\Clearance Memo

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**ASBESTOS ABATEMENT INSPECTION FORM**

***CONTROLLED RECORD - DO NOT DISCARD***

Project Number: 33293-116

File Date: Feb. 15. 13 Filer Initials: A

## LOCATION OF ASBESTOS ABATEMENT

Site Location: Math and Computer Bldg. 6th Floor
Company Name: University of Waterloo
Company Contact: Carlos Radic
Phone: (519) 888-4567
Address: 200 University Avenue W
Fax:
City: Waterloo
Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing floor tile mastic

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☐:→ Type 1☑ Type 2☐ Type 2 glove bag☐ Type 3☐
Type of Asbestos: Chrysotile☐ Other than Chrysotile☐: Duration of Abatement: 1 month
Contractor PPE: None☐ ½ Face APR☐ Full Face APR☐ PAPR☐ Supplied Air☐ Coveralls☐ Other ☐
Was asbestos material replaced? Yes☐ No☐ → If Yes with what:
Has MOL notice of project been posted at Site? Yes☐ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

| **Pre-Removal** | **DATE (d/m/y):** | **Time:** a.m.☐ p.m.☐ | **Type 1** | **Type 2** | **Type 3** |
|---|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | | |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | | |
| Has visible dust been cleaned from work area before start or work? | | | | | |
| Have all items been removed from work area or been covered with sheeting? | | | | | |
| Has signage been posted warning of asbestos hazard and restricting access? | | | | | |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | | | |
| Has mechanical ventilation been disabled and sealed? | | | | | |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | | | |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | | | |
| Has a device for monitoring pressure differential been installed & monitored? | | | | | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | | | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | | Approximate Air Exchanges Per Hour | | | |
| **Active/Post Removal** | **DATE (d/m/y):** 15/02/13 | **Time:** 10 a.m.☑ p.m.☐ | **Type 1** | **Type 2** | **Type 3** |
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | ✓ | | |
| Has ACM been wetted using water and a wetting agent? | | | ✓ | | |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | ✓ | | |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | ✓ | | |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | | | |
| Was "Lock Down" or sealant applied after final clean-up? | | | | | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | | | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | — | Approximate Air Exchanges Per Hour | | | — |

**Notes:**

**Instructions to Contractor:**

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd. Company Contact: Gary Smith

Site Supervisor: Jerry Koeler Phone: (519) 527-1079

Address: Box 809, 55 Birch Street Fax: (519) 527-1040

City: Seaforth Province: ON Postal Code: N0K 1W0

## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☐ No☑

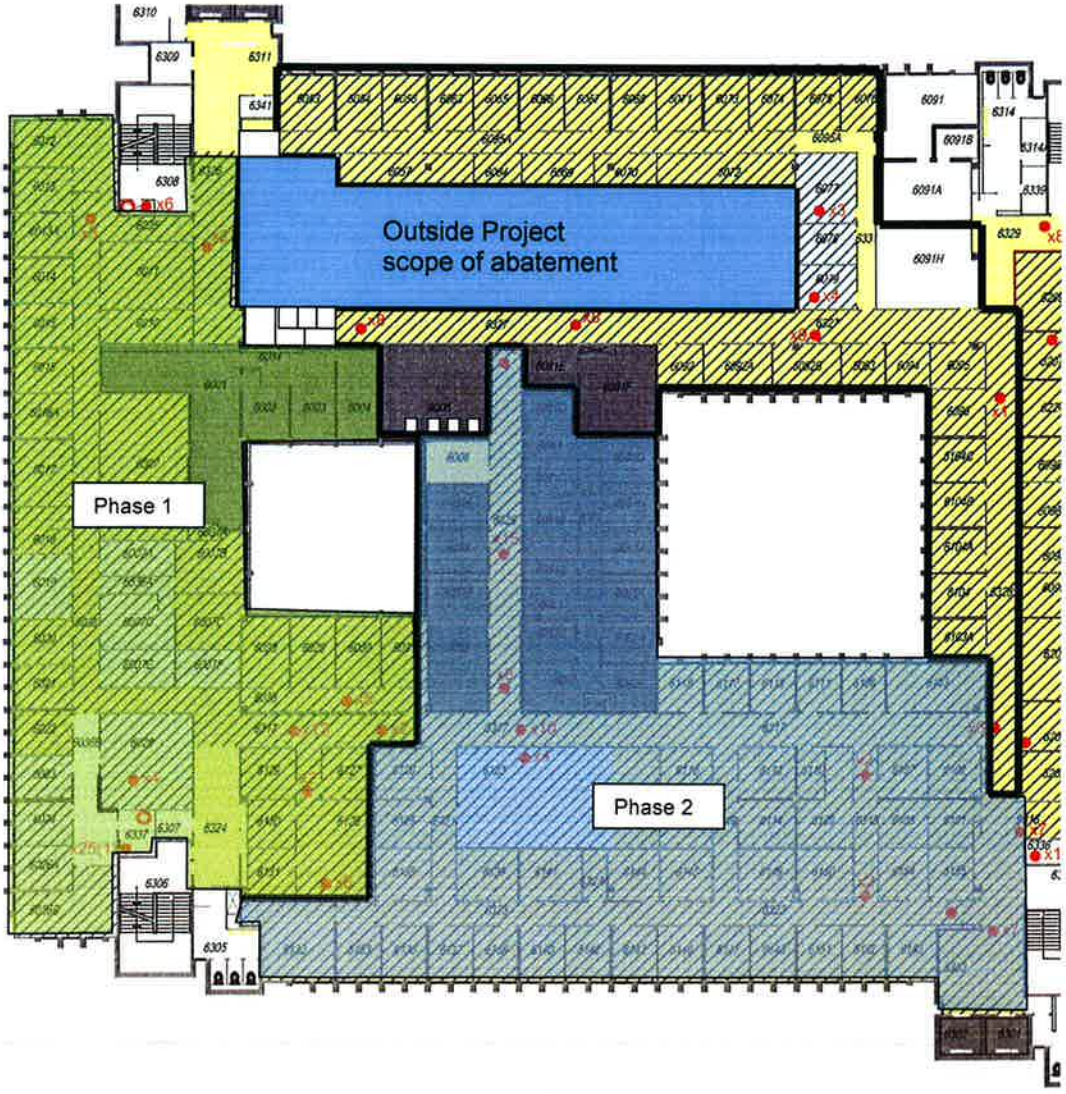
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☐ No☐

Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | Sample Name | Cassette Barcode No. | Method PCM | Method TEM | Concentration (f/cc) | Flow (L/min) | Time On | Time Off | Status |
|---|---|---|---|---|---|---|---|---|---|---|
| ≤10$m^2$ | 1 | | | | | | | | | |
| | 2 | | | | | | | | | |
| 10-500$m^2$ | 3 | | | | | | | | | |
| >500$m^2$ | 4 | | | | | | | | | |
| | 5 | | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor

| Approximate Area of Enclosure: | | ☐ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | | ☐ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|



April 1, 2013
File: 33293-116

**Carlos Radic**
University of Waterloo
200 University Avenue West
Waterloo, ON N2L 3G1

**RE: Type 1 Asbestos Clearance Memo – Math and Computer Building 6th Floor**
**University of Waterloo- Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos removal within the 6th floor Construction Zone of the Math and Computer Building located at the University of Waterloo, 200 University Avenue West in Waterloo, Ontario.

On March 28, 2013 MTE Consultants Inc. (MTE) inspected and reviewed the Type 1 removal of asbestos-containing floor tile mastic. The inspection pertained to the Phase 2 Construction Zone identified on the inspection sheet provided as an attachment to this report. The removal was conducted by Wayne and Harold Smith Construction Ltd. Asbestos removal has been completed within the abovementioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on March 28, 2013 confirmed that the work area was clean with no dust, debris, residue, and asbestos waste.

Since the abatement of floor tile mastic was conducted as a Type 1 Operation, no air clearance testing is required or warranted in accordance with Ontario Regulation 278/05. MTE provided verbal notification on March 28, 2013 and affirms this letter as written notification. Inspection sheets are provided as an attachment to this report.

Sincerely,

Martin Mielke, B.Sc., AMRT, CRSP
Technical Advisor, Building Health Sciences
mmielke@mte85.com

MJM
Attach
M:\33293\33293-116 MC 6th Floor Abatement\Clearance Memo

MTE More Than Engineering 25 YEARS 1985-2010

**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: May 28.13 Filer Initials: Q

## LOCATION OF ASBESTOS ABATEMENT

Site Location: Math and Computer Bldg. 6th Floor Company Name: University of Waterloo

Company Contact: Carlos Radic Phone: (519) 888-4567

Address: 200 University Avenue W Fax:

City: Waterloo Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing floor tile mastic

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☐:→ Type 1☑ Type 2☐ Type 2 glove bag☐ Type 3☐

Type of Asbestos: Chrysotile☐ Other than Chrysotile☐: Duration of Abatement: 1 month

Contractor PPE: None☐ ½ Face APR☐ Full Face APR☐ PAPR☐ Supplied Air☐ Coveralls☐ Other ☐

Was asbestos material replaced? Yes☐ No☐ → If Yes with what:

Has MOL notice of project been posted at Site? Yes☐ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

see Type 3 set up Phase 2

| Pre-Removal | DATE (d/m/y): | Time: a.m.☐ p.m.☐ | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | | |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | | |
| Has visible dust been cleaned from work area before start or work? | | | | | |
| Have all items been removed from work area or been covered with sheeting? | | | | | |
| Has signage been posted warning of asbestos hazard and restricting access? | | | | | |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | | | |
| Has mechanical ventilation been disabled and sealed? | | | | | |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | | | |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | | | |
| Has a device for monitoring pressure differential been installed & monitored? | | | | | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | | | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | — | Approximate Air Exchanges Per Hour | | | — |
| **Active/Post Removal** | **DATE (d/m/y): 28/03/13** | **Time: 10:30 a.m.☑ p.m.☐** | **Type 1** | **Type 2** | **Type 3** |
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | ✓ | | |
| Has ACM been wetted using water and a wetting agent? | | | ✓ | | |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | ✓ | | |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | ✓ | | |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | | | |
| Was "Lock Down" or sealant applied after final clean-up? | | | | | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | | | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | — | Approximate Air Exchanges Per Hour | | | — |

**Notes:**

**Instructions to Contractor:**

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd. Company Contact: Gary Smith
Site Supervisor: Jerry Koeler Phone: (519) 527-1079
Address: Box 809, 55 Birch Street Fax: (519) 527-1040
City: Seaforth Province: ON Postal Code: N0K 1W0

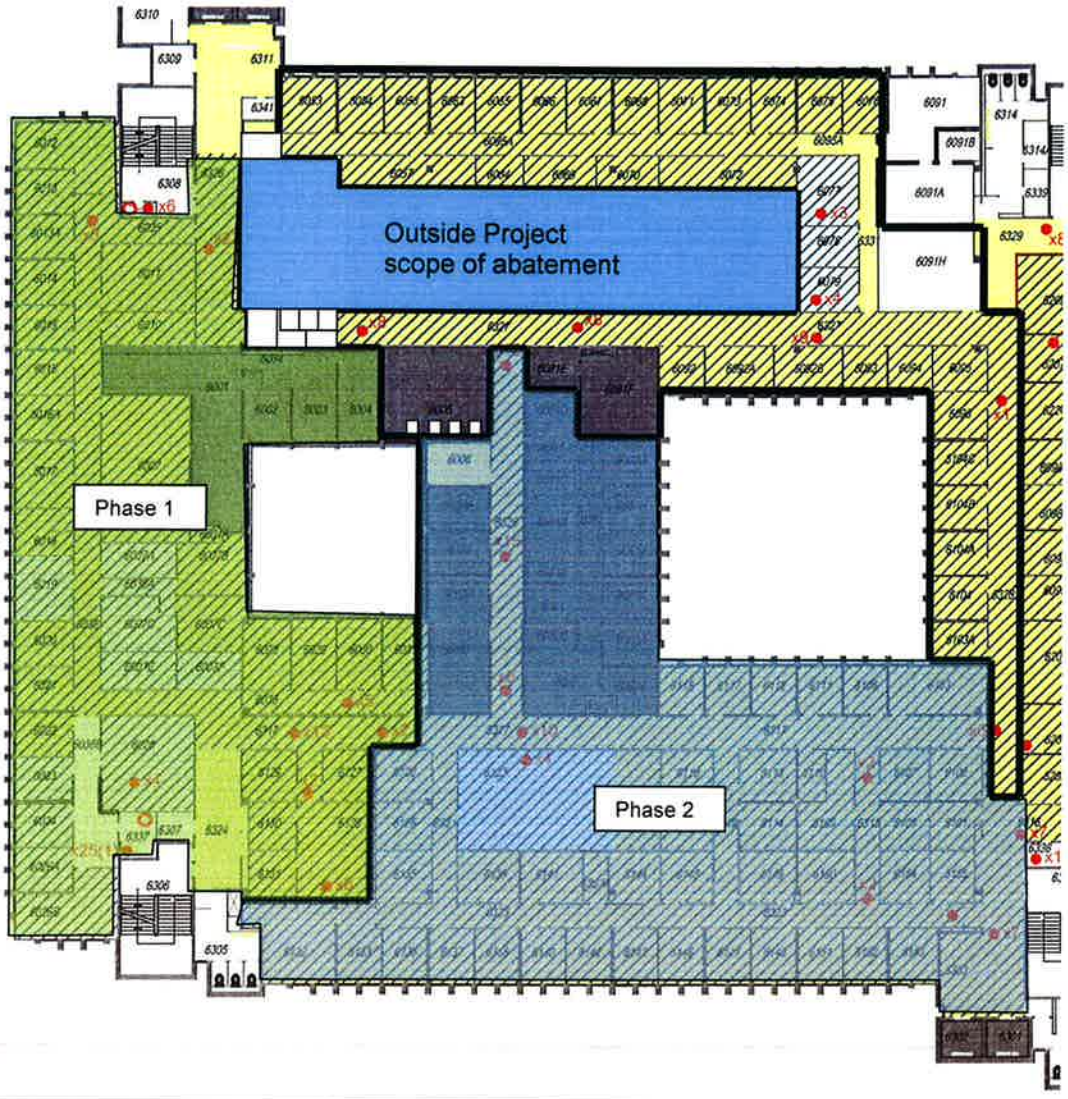
## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☐ No☑
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☐ No☐
Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | Sample Name | Cassette Barcode No. | Method PCM | Method TEM | Concentration (f/cc) | Flow (L/min) | Time On | Time Off | Status |
|---|---|---|---|---|---|---|---|---|---|---|
| ≤10m² | 1 | | | | | | | | | |
| | 2 | | | | | | | | | |
| 10-500m² | 3 | | | | | | | | | |
| >500m² | 4 | | | | | | | | | |
| | 5 | | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor

| Approximate Area of Enclosure: | | ☐ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | | ☐ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|



April 19, 2013
File: 33293-116

**Carlos Radic**
University of Waterloo
200 University Avenue West
Waterloo, ON N2L 3G1

**RE: Type 1 Asbestos Clearance Memo – Math and Computer Building 6th Floor**
**University of Waterloo- Waterloo, Ontario**

This letter is to inform the above interested parties of the status of asbestos removal within the 6th floor Construction Zone of the Math and Computer Building located at the University of Waterloo, 200 University Avenue West in Waterloo, Ontario.

On April 10, 2013 MTE Consultants Inc. (MTE) inspected and reviewed the Type 1 removal of asbestos-containing floor tile mastic. The inspection pertained to the Phase 3 Construction Zone identified on the inspection sheet provided as an attachment to this report. The removal was conducted by Wayne and Harold Smith Construction Ltd. Asbestos removal has been completed within the abovementioned area in accordance with Ontario Regulation 278/05, made under the Occupational Health and Safety Act and the project scope of work.

Visual inspection of the work area by MTE on April 10, 2013 confirmed that the work area was clean with no dust, debris, residue, and asbestos waste.

Since the abatement of floor tile mastic was conducted as a Type 1 Operation, no air clearance testing is required or warranted in accordance with Ontario Regulation 278/05. MTE provided verbal notification on April 10, 2013 and affirms this letter as written notification that the abovementioned work area may be dismantled. Inspection sheets are provided as an attachment to this report.

Sincerely,

Shauna Ivan
Building Health Science Technologist
sivan@mte85.com

Martin Mielke, B.Sc., AMRT, CRSP
Technical Advisor, Building Health Science
mmielke@mte85.com

SEI:plw
Attach
M:\33293\33293-116 MC 6th Floor Abatement\Clearance Memo

MTE More Than Engineering

**ASBESTOS ABATEMENT INSPECTION FORM**

*CONTROLLED RECORD - DO NOT DISCARD*

Project Number: 33293-116

File Date: Apr. 10/13 Filer Initials: SEI

## LOCATION OF ASBESTOS ABATEMENT

Site Location: Math and Computer Bldg. 6th Floor Company Name: University of Waterloo

Company Contact: Carlos Radic Phone: (519) 888-4567

Address: 200 University Avenue W Fax:

City: Waterloo Province: ON Postal Code: N2L 3G1

**ASBESTOS ABATEMENT DETAILS:** (List materials, location and other details): Removal of asbestos-containing floor tile mastic within the Phase 3 construction zone.

Action: Cleaning☐ Repair☐ Encapsulation☐ Removal☑ → Type 1☑ Type 2☐ Type 2 glove bag☐ Type 3☐

Type of Asbestos: Chrysotile☐ Other than Chrysotile☐: Duration of Abatement: 10 Days

Contractor PPE: None☑ ½ Face APR☐ Full Face APR☐ PAPR☐ Supplied Air☐ Coveralls☐ Other ☐

Was asbestos material replaced? Yes☑ No☐ → If Yes with what: Unknown

Has MOL notice of project been posted at Site? Yes☐ No☐ Notice of Project No. 13EN119681

## WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

| **Pre-Removal** | **DATE (d/m/y):** | **Time:** **a.m.☐ p.m.☐** | **Type 1** | **Type 2** | **Type 3** |
|---|---|---|---|---|---|
| Have washing facilities for hands and face been provided? | | | | | |
| Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed? | | | | | |
| Has visible dust been cleaned from work area before start or work? | | | | | |
| Have all items been removed from work area or been covered with sheeting? | | | | | |
| Has signage been posted warning of asbestos hazard and restricting access? | | | / | | |
| Have windows been constructed in the enclosure? (opaque enclosures only) | | | / | | |
| Has mechanical ventilation been disabled and sealed? | | | / | | |
| Has worker decon been constructed (clean & dirty change rooms, shower)? | | | / | / | |
| Has negative pressure been applied to enclosure & exhausted through HEPA? | | | / | / | |
| Has a device for monitoring pressure differential been installed & monitored? | | | / | / | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been achieved in the enclosure? | | | / | / | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | | Approximate Air Exchanges Per Hour | | | |
| **Active/Post Removal** | **DATE (d/m/y):** 10/04/13 | **Time:** 12:00 **a.m.☐ p.m.☑** | **Type 1** | **Type 2** | **Type 3** |
| Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed? | | | ✓ | | |
| Has ACM been wetted using water and a wetting agent? | | | ✓ | | |
| Have appropriate waste containers been used (dust tight, proper labelling)? | | | ✓ | | |
| Has work area been thoroughly cleaned of all asbestos waste, debris and dust? | | | ✓ | | |
| Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)? | | | / | | |
| Was "Lock Down" or sealant applied after final clean-up? | | | / | | |
| Has a min of 0.02 In W.C. (5 Pascals) "- ve" been maintained in the enclosure? | | | / | / | |
| Pressure Differential (In W.C. ☐ Pa ☐ ) | | Approximate Air Exchanges Per Hour | | | |

**Notes:** UW has instructed Smith Construction to leave their upper seals in place and UW will deal with them at a later date.

**Instructions to Contractor:** Go over hard to access area under the drinking water fountain once more. Scrape away more mastic in drinking water fountain corner.



**520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9 Tel: 519-743-6500 Fax: 519-743-6513 mail@mte85.com**

## ABATEMENT CONTRACTOR INFORMATION

Contractor: Smith Construction Ltd. Company Contact: Gary Smith

Site Supervisor: Jerry Koeler Phone: (519) 527-1079

Address: Box 809, 55 Birch Street Fax: (519) 527-1040

City: Seaforth Province: ON Postal Code: N0K 1W0

## RESULTS OF AIR MONITORING (O. Reg 278/05 Clearance Criteria 0.01 fibers/cc)

Was Air Monitoring/Clearance Air Testing performed? Yes☐ No☒

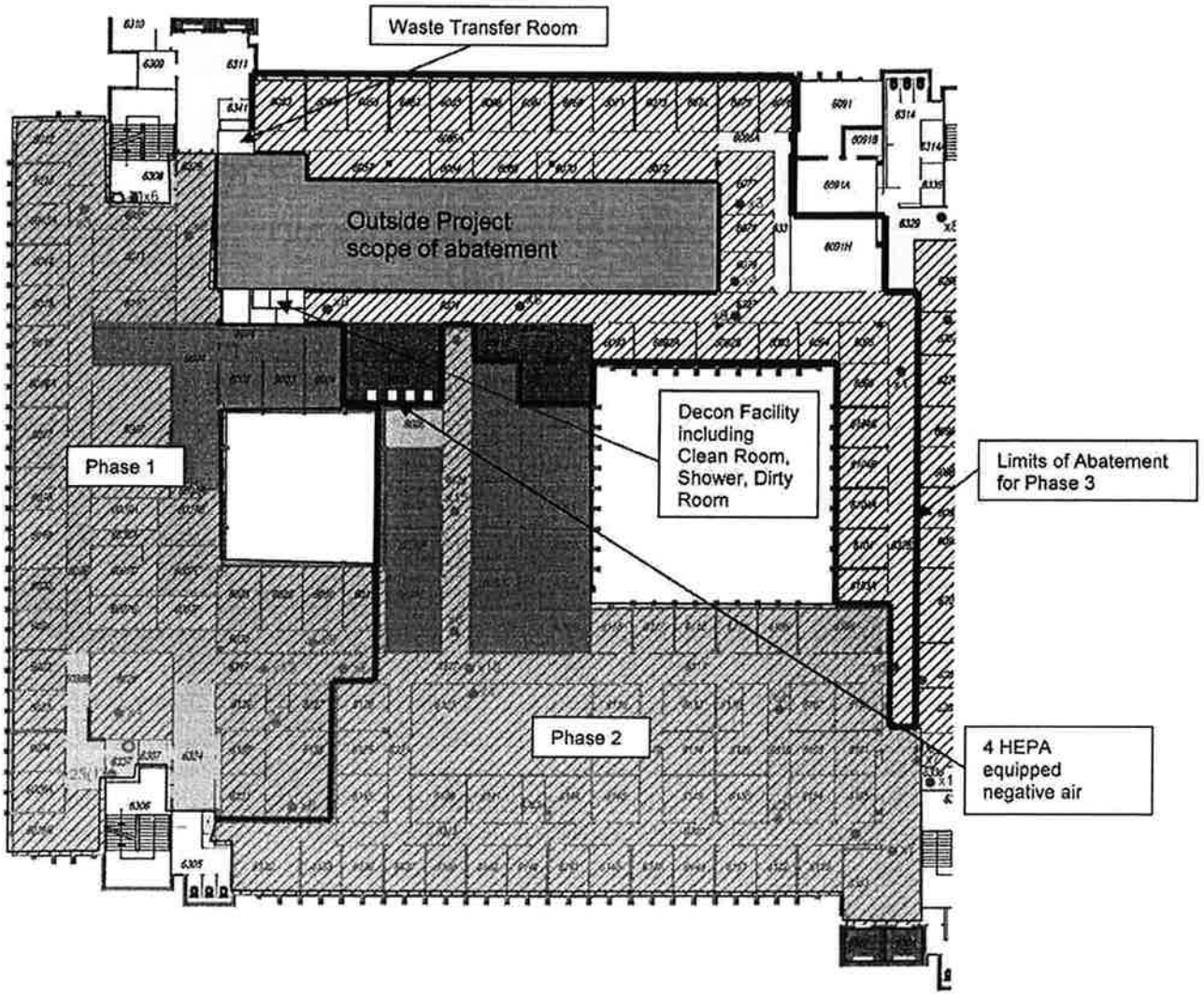
Was Forced Air used and Negative Air Pressure maintained during sampling? Yes☐ No☐

Forced Air: Step 1) Agitate - 5 min per 90 $m^2$ (1000 $ft^2$). Step 2) Suspend - one 50 cm (20 in) fan per 280 $m^3$ (10,000 $ft^3$)

| Sample Date: | | | | Method | | | | Time | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Name | Cassette Barcode No. | PCM | TEM | Concentration (f/cc) | Flow (L/min) | On | Off | Status |
| ≤10m² | 1 | | | | | | | | | |
| | 2 | | | | | | | | | |
| 10-500m² | 3 | | | | | | | | | |
| >500m² | 4 | | | | | | | | | |
| | 5 | | | | | | | | | |

## WORK AREA LOCATION DESCRIPTION & ILLUSTRATION: Math and Computer Bldg. 6th Floor Phase 3

| Approximate Area of Enclosure: | | ☐ square metres ($m^2$) ☐ square feet ($ft^2$) | 1 $m^2$ = 10.76 $ft^2$ | Approximate Height of Enclosure: | | ☐ metres (m) ☐ feet (ft) | 1 m = 3.28 ft |
|---|---|---|---|---|---|---|---|



MTE
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25 YEARS 1985-2010

# ATTACHMENT B

# LIMITS OF ABATEMENT WORK FIGURE 1

## Designated Substance Materials Legend

- Asbestos-Containing Ceiling Tile
- Asbestos-Containing Floor Tile
- Friable Debris
- x2(1) Pipe Fitting Insulation with Quantity (Brackets indicate No. of damaged fittings)
- Pipe Insulation (Vertical and Horizontal)
- 6018 Functional Space Number
- No Access


### Notes:

1. ALL DRAWINGS TO BE REFERENCED WITH THE 2012 DESIGNATED SUBSTANCE SURVEY REPORT.
2. ALL KNOWN OR SUSPECT DESIGNATED SUBSTANCES MAY NOT BE DEPICTED ON THIS DRAWING. REFER TO THE 2012 DESIGNATED SUBSTANCE SURVEY REPORT FOR A COMPLETE LIST OF IDENTIFIED KNOWN AND SUSPECT DESIGNATED SUBSTANCES.
3. BASEPLAN PROVIDED BY THE CLIENT (MAY 2009)
4. THIS FIGURE IS COLOUR DEPENDENT, PHOTOCOPIES MAY ALTER INTERPRETATION OF FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND ASBESTOS AUDIT REPORT.
5. THIS IS A SCHEMATIC DRAWING ONLY AND MAY NOT BE TO SCALE (N.T.S.).

MTE 25 YEARS 1985-2010
BUILDING HEALTH SCIENCE DIVISION

**Figure 1 - Locations of Designated Substances**

| Project Name | | | |
|---|---|---|---|
| Limited Designated Substance Survey - Math & Computers 6th Floor | | | |
| Site: University of Waterloo, Waterloo, Ontario | | Client: University of Waterloo | |
| Scale: NTS | MTE Project No.: 33293-113 | Date: April 2012 | Layout No: BH1.1 |

# Appendix E

**Bulk Sampling Report - Rooms 2065, 2066**
**(Dated March 10th, 2016)**

safeTECH ENVIRONMENTAL LTD.

**Ben Rodricks <brodricks@safetechenv.com>**

# Math and Computing - Theatre Rooms 2065, 2066

1 message

**Ben Rodricks** <brodricks@safetechenv.com> Thu, Mar 10, 2016 at 4:32 PM
To: "Rob Mullins (Ext. 30190)" <r2mullins@uwaterloo.ca>, gkursikowski@uwaterloo.ca

Good Afternoon,

As you are aware, Safetech Environmental Limited (SEL) personnel collected bulk samples of materials within the Math and Computing Theatre Rooms 2065 and 2066 on Monday, February 29th, 2016. This assessment was conducted in preparation of future overhead light replacement work which is scheduled to occur within these areas.

As indicated in the attached laboratory results, the textured finish on plaster was determined to contain 10% Chrysotile asbestos. Additionally, the debris sampled from from the surface of the bulkhead in Theatre Room 2066 was determined to contain 0.5% Chrysotile asbestos (see attached photograph). These materials are classified as friable asbestos-containing materials. Assessment of the ceiling space within Theatre Room 2065 was not possible as the access hatch opening mechanism had been stripped.

Based on our findings and discussions regarding the planned Scope of Work, it is our recommendation that any work involving light replacement where textured ceilings are present should be conducted following Type 2 asbestos procedures as it is likely that the ceiling finish will be disturbed. It is also recommended that the debris present in the lighting bulkhead in Theatre Room 2066 be cleaned up following Type 2 asbestos procedures. Other non-asbestos insulations present in the bulkhead should also be removed at the time of Type 2 clean-up of debris due to potential asbestos contamination.

It is also recommended that an assessment of the ceiling space be performed in Theatre Room 2065 to identify any potential asbestos-containing materials if lighting replacement work will include work above the solid ceiling (i.e. wiring, installation of fixtures, etc).

Should you have any additional questions, please feel free to contact me.

Best Regards,

**Ben Rodricks, BSc.**

Occupational Health and Safety Technician

Safetech Environmental Ltd.

52 McIntyre Place, Unit J

Kitchener, ON N2R 1H9

C: 519-591-5082

**2 attachments**

**DSC09659.pdf**
1099K

**A23517.pdf**
143K